Town of Haymarket Planning Commission

Regular Meeting

~ AGENDA ~

Emily Kyriazi, Town Planner
http://www.townofhaymarket.org/

15000 Washington Street, Suite 100
Haymarket, VA 20169

Monday, August 14, 2023 | 7:00 PM | Council Chambers

I. Call To Order

II. Pledge of Allegiance

III. Oath of Office

IV. Appointment of Chairperson, Vice Chairperson, Liaison

V. Citizens Time

VI. Minute Approval

1. Planning Commission - Regular Meeting - Jul 24, 2023 7:00 PM

VII. Agenda Items

1. **Kiddie Academy Site Plan - 6515 Crossroads Village Center**
2. **Comprehensive Plan RPA Map: Authorize to Advertise for Public Hearing**
3. **Town Park Sidewalk**
4. **Haymarket Zoning Map**

VIII. Old Business

IX. New Business

X. Architectural Review Board Updates

XI. Town Council Updates

XII. Adjournment

Town of Haymarket Planning Commission

Regular Meeting
~ MINUTES ~

Emily Kyriazi, Town Planner
http://www.townofhaymarket.org/

15000 Washington Street, Suite 100
Haymarket, VA 20169

Monday, July 24, 2023 | 7:00 PM | Council Chambers

A Regular Meeting of the Planning Commission of the Town of Haymarket, VA, was held this evening in the Council Chambers, commencing at 7:00 PM.

Chairman Alexander Beyene called the meeting to order.

I. Call To Order

Commissioner Robert Hallet: Present, Chairman Alexander Beyene: Present, Commissioner Sandy Freeman: Absent, Commissioner Jerome Gonzalez: Present, Commissioner Pankaj Singla: Absent.

II. Pledge of Allegiance

Chairman Alexander Beyene invited everyone to stand for the Pledge of Allegiance.

III. Appointment of Chair and Vice Chair

Being that the Planning Commission did not have all members in attendance, the appointment of Chairman, Vice Chairman and Liaison was deferred until the next monthly meeting.

IV. Citizens Time

There were no citizens present at this evening's meeting.

V. Minute Approval

1. Planning Commission - Public Hearing/Regular Meeting - Jun 20, 2023 7:00 PM

Commissioner Hallet moved to approve the Planning Commission minutes from the June 20, 2023 meeting. Commissioner Gonzalez seconded the motion. The motion carried.

RESULT:	**ACCEPTED [UNANIMOUS]**
MOVER:	Robert Hallet, Commissioner
SECONDER:	Jerome Gonzalez, Commissioner
AYES:	Robert Hallet, Alexander Beyene, Jerome Gonzalez
ABSENT:	Sandy Freeman, Pankaj Singla

VI. Agenda Items

1. Kiddie Academy Site Plan

Town Planner Thomas Britt addressed the Planning Commission regarding a section of the Zoning Ordinance for them to reference as they consider the Kiddie Academy site plan. Mr. Britt stated that at the previous meeting, the Commission looked at some height adjustments and some other dimensional and zoning ordinance required adjustments to share with the applicant. He stated that the applicant made the necessary adjustments. Mr. Britt also stated that he wanted to address the student drop off that was part of the discussion at the previous meeting. Mr. Britt shared that both the Commission and staff was concerned about the safety of the children in the drop off zone. He also shared that there were no changes made in the layout. Mr. Britt referred to a section in the Zoning Ordinance that relates to parking for a child day care center. There was a discussion on the interpretation. There was a question as to how many children are expected to attend in order to determine the parking or stacking that is referenced. There was also a discussion in reference to the parcel itself, the stormwater facility and proposed parking spaces. Mr. Britt shared that in the Architectural Review Board meeting, the applicant stated that they design each building to meet local requirements for students. It was determined that after reviewing the ARB minutes, the applicant meets the minimum parking space requirements.

DRAFT

Minutes Acceptance: Minutes of Jul 24, 2023 7:00 PM (Minute Approval)

The Planning Commission asked for Mr. Britt's input. He stated that his one concern was the technicality on what it means to cross the traffic aisle. He continued to state that given the number of students projected and staff, there is sufficient drop off over time. There was a question if there would be a possibility of overflow parking from the other pad sites would go into the school parking. Mr. Britt stated that there might be one pad site that might use the school parking lot.
After the discussion, the Planning Commission asked Mr. Britt to attend the August meeting to discuss the site plan in further detail. The Planning Commission also asked that the applicant provide drop off and pick up schedule. No further decision was made on this subject.

2. Authorize to Advertise for Public Hearing: RPA Map

Town Planner Thomas Britt shared that this item is another requirement from the 2021 compliance agreement with Virginia Department of Environmental Quality for the Chesapeake Bay Preservation Act. He shared the Resource Protection Area map in the Town's Comprehensive Plan denoting what areas require special attention when a project is coming before the Planning Commission or areas that may not be built on based on the resource being protected. He shared that he designated the only resource that the Planning Commission is looking at specifically related to the Chesapeake Bay Preservation Act is the north fork Broad Run area. He stated that the requirements for RPA boundaries is to have a 100 ft buffer which is shown on the map. He shared that what this does for the Town moving forward is that if any parcels that are being developed following the RPA boundary special attention will need to be required as to what needs to be done to mitigate damage to the RPA boundaries. A short discussion followed on the comprehensive plan, the map presented and other items that will be coming to the Planning Commission. There was a suggestion that the scales of the all the maps in the Comprehensive Plan are the same for consistency purposes. The Planning Commission tabled the decision on this map until the next meeting in order to see a revised map.

VII. Old Business

Town Planner Thomas Britt shared with the Planning Commission that staff has received the final submission for the design of the Town Park sidewalk project. He also shared that the Pulte townhomes in Crossroads Villages are still under construction and that he continues to work on occupancy permits. He continued to share that the model home at Robinson Paradise is now open and that those lots should be selling soon. Mr. Britt shared the businesses that has opened in the Crossroads Village Center. He shared that Lifetime Smiles will be before the Planning Commission on their site plan.
There were questions on the updates for Lidl and Planet Fitness. Mr. Britt shared the update on both.

VIII. New Business

Town Planner Thomas Britt shared that he will be bringing forth the Bleight Drive townhomes site plan to the Planning Commission at a future meeting. Mr. Britt shared that he would be on vacation in August at their regular monthly meeting and requested to move the August meeting from August 21st to August 14th. There was a consensus of the Planning Commission to move the meeting up one week.
Mr. Britt stated that staff is stilling reviewing the first submission for the Highpointe Haymarket development. A short discussion followed on this subject.

IX. Architectural Review Board Updates

Commissioner Hallet shared that the Architectural Review Board has not had a meeting since the last Planning Commission due to meeting date changes.

X. Town Council Updates

Chairman Beyene shared that the Town Council appointed Mr. Pankaj Singla to the Planning Commission. Mr. Beyene stated that because there was an increased number of applicants for the vacancy, the Town Council asked staff to research the possibility of having a Planning Commission Board of 7 instead of 5. Mr. Beyene continued to state that this item is to be on the next work session agenda.

XI. Adjournment

With no further business before the Planning Commission, Commissioner Hallet moved to adjourn with a second by Commissioner Gonzalez. The motion carried.

Minutes Acceptance: Minutes of Jul 24, 2023 7:00 PM (Minute Approval)

1. Motion to Adjourn

RESULT:	**ADOPTED [UNANIMOUS]**
MOVER:	Robert Hallet, Commissioner
SECONDER:	Jerome Gonzalez, Commissioner
AYES:	Robert Hallet, Alexander Beyene, Jerome Gonzalez
ABSENT:	Sandy Freeman, Pankaj Singla

Submitted: Approved:

_____ _____

Kimberly Henry, Clerk of the Council Alexander Beyene, Chairman

DRAFT

Minutes Acceptance: Minutes of Jul 24, 2023 7:00 PM (Minute Approval)

Town of Haymarket
15000 Washington Street, #100
Haymarket, VA 20169
703-753-2600

Thomas Britt
Town Planner

MEMORANDUM

TO: Planning Commission
FROM: Thomas Britt, Town Planner
DATE: August 7, 2023
SUBJECT: Kiddie Academy Final Site Plan Submission

Background: The applicant has submitted a site plan for the Kiddie Academy education center at 6515 Crossroads Village Boulevard. The site is in the northwest corner of the Crossroads Village Center development, behind the Quarles Property. The second submission of the final site plan is currently under Town and outside agency review.

In the June 20 PC meeting, the Commission and Town Staff discussed a few zoning requirements to update in the site plan, and child safety during drop off. Town Staff have coordinated with J2 Engineers about the update requests. J2 Engineers has provided an updated site plan with dimensional fixes to meet the zoning ordinance. The engineers were not able to add a drop off point and lane in the proposed site.

Update: The Town Planner has met with the applicant and J2 Engineers. The applicant has agreed to attend the August 14th meeting via zoom, and has provided a writeup to clarify child drop off procedures:

- Parents are required to park their car when dropping off children.
- Parents check in via security clearance system.
- Drop off is wave based, with hours of operation from 6:30am—6:30pm.
- Staff will park in furthest parking spaces to provide ample room for drop off.
- Student population is 169, staff population is 25. School will operate at 80% capacity.

Response: The Town Planner Recommends the Planning Commission motions to approve Site Plan #2023-0510, Kiddie Academy at Crossroads Village Center.

Or an alternate motion.

Attachment: 01 Kiddie Academy at Crossroads Village Center (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

FINAL SITE PLAN

KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

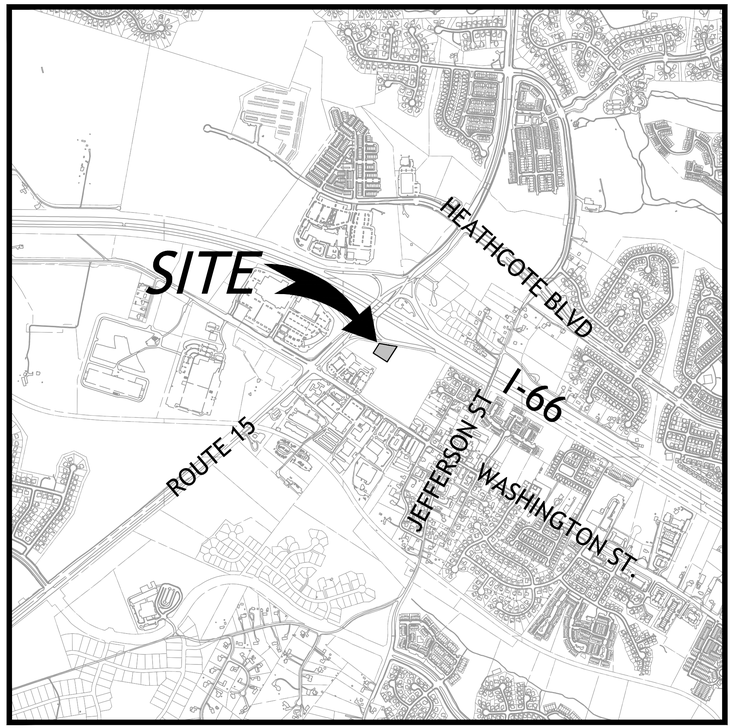
SERVICE AUTHORITY PLAN NUMBER: SA2023-0014

GENERAL NOTES:

1. THE SUBJECT PROPERTY SHOWN HEREON IS ZONED B-2 ADMINISTERED UNDER THE 2017 TOWN OF HAYMARKET ZONING AND SUBDIVISION ORDINANCE. PROPERTY ADDRESS IS 15150 WASHINGTON STREET. PRINCE WILLIAM COUNTY GPIN: 7298-21-2707
2. THE FOLLOWING LAND DEVELOPMENT APPLICATIONS ARE ASSOCIATED WITH THIS PROJECT:

SP #1977	CROSSROADS VILLAGE CENTER - FINAL SITE PLAN	11/20/2018.
	CROSSROADS VILLAGE CENTER - RETAIL PRELIMINARY PLAN	09/13/2021.
	CROSSROADS VILLAGE CENTER - FINAL SITE PLAN - OVERALL REVISION	02/10/2022.
	CROSSROADS VILLAGE CENTER - FINAL SITE PLAN - OVERALL REVISION 2	08/09/2022.
	KIDDIE ACADEMY AT CROSS ROADS VILLAGE CENTER PRELIMINARY PLAN	11/29/2022.

3. THE DISTURBED AREA IS 1.08 ACRES.
4. METES AND BOUNDS SHOWN HEREON ARE THE RESULT OF A CURRENT FIELD SURVEY.
5. THE PROPERTY DOES NOT CONTAIN ANY AREAS OF EITHER MODERATELY OR VERY STEEP SLOPES.
6. DATA SHOWN HEREON ARE ON HORIZONTAL DATUM VIRGINIA STATE PLAN COORDINATE SYSTEM NAD 1983 AND VERTICAL DATUM NAVD 1988.
7. THERE IS NO FLOODPLAIN ON THE PROPERTY THAT IS THE SUBJECT OF THIS APPLICATION. THE PROPERTY SHOWN HERON LIES WITHIN FLOOD HAZARD AREA ZONE "X" AS DEPICTED ON FLOOD INSURANCE RATE MAP, COMMUNITY PANEL 51153C0059D, HAVING AN EFFECTIVE DATE OF JANUARY 5, 1995 AND PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
8. ALL STRUCTURES WITHIN 50 FEET OF THE SUBJECT PROPERTY HAVE BEEN SHOWN ON THE EXISTING CONDITIONS MAP.
9. NO RPA IS PRESENT ON SITE. THERE ARE NO KNOWN CEMETERIES OR HISTORIC SITES ON THIS PROPERTY.
10. SOILS INFORMATION SHOWN HEREON IS TAKEN FROM DIGITAL MAPS PROVIDED BY PRINCE WILLIAM COUNTY THE SUBJECT DEVELOPMENT SITE DOES CONTAIN CLASS III SOILS AS IDENTIFIED BY THE INTERPRETIVE GUIDE TO SOILS MAP, PRINCE WILLIAM COUNTY.
11. A VSMP PERMIT WILL BE SUBMITTED WITH THE FINAL ENGINEERING PLAN.
12. UTILITIES, INCLUDING TELEPHONE, ELECTRIC, CABLE AND OTHER UTILITIES, WILL BE EXTENDED TO THE SITE.
13. PUBLIC WATER AND SEWER WILL BE PROVIDED THROUGH CONNECTIONS TO EXISTING FACILITIES (OWNED AND OPERATED BY PRINCE WILLIAM COUNTY SERVICE AUTHORITY) WHICH ARE AVAILABLE AT THE SITE BOUNDARY. THE SERVICE AUTHORITY DOES NOT GUARANTEE THE CONSTRUCTION OR TIMING WHEN UTILITIES WILL BE PLACED INTO SERVICE THAT ARE SHOWN AS EXISTING IN THIS PLAN SET. IF UTILITIES SHOWN AS EXISTING ARE NOT AVAILABLE WHEN NEEDED BY THIS PROJECT, THIS PROJECT SHALL OBTAIN THE NECESSARY RIGHTS TO INSTALL ON-SITE AND OFF-SITE WATER AND SANITARY SEWER UTILITIES FROM AN APPROVED PLAN TO PROVIDE THE DESIRED SERVICE.
14. PARKING FOR ALL USES SHALL COMPLY WITH THE REQUIREMENTS OF SECTION 58-6.1
15. VEHICLE COUNTS (VPD) ARE BASED ON THE 9th EDITION OF THE ITE TRIP GENERATION MANUAL.
16. THE APPROVAL OF THESE PLANS SHALL IN NO WAY RELIEVE THE DEVELOPER OR HIS AGENT OF ANY LEGAL RESPONSIBILITY WHICH MAYBE REQUIRED BY APPLICABLE LOCAL, STATE AND FEDERAL REQUIREMENTS OR ANY OTHER ORDINANCE ENACTED BY THE TOWN OF HAYMARKET.



VICINITY MAP

SCALE : 1"=1000'

APPLICANT/DEVELOPER

BAKER & ASSOCIATES, ARCHITECTS
673 HIGH STREET, SUITE 204
WORTHINGTON, OH 43085

OWNER

MELADON GROUP
1602 VILLAGE MARKT BLVD, SE
SUITE 235
LEESBURG, VIRGINIA 20175
571-375-1750

ENGINEER

J2 ENGINEERS
17739 MAIN STREET
SUITE 180
DUMFRIES, VA 22026
703-361-1550

TOWN REPRESENTATIVE

EMILY KYRIAZI
1500 WASHINGTON STREET
SUITE 100
HAYMARKET, VA 20169
703-753-2600 EXT. 204

NOTICE REQUIRED

CONTRACTORS SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATION OR BLASTING AT LEAST TWO WORKING DAYS, BUT NOT MORE THAN TEN WORKING DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION.

CONTACT "MISS UTILITY" AT
1-800-552-7001
FOR THESE UTILITIES

A.T.& T. CO.
VIRGINIA ELECTRIC & POWER CO.
COLUMBIA GAS TRANSMISSION CO.
FAIRFAX CO. SAN. SEWER DIV.
TRANSCO GAS PIPELINE CO.
COLUMBIA GAS OF VIRGINIA
CONTINENTAL TELEPHONE OF VIRGINIA
COLONIAL PIPELINE CO.
FAIRFAX CO. WATER AUTHORITY
WASHINGTON GAS LIGHT CO.
PRINCE WILLIAM ELEC. CO-OP.
PLANTATION PIPELINE CO.
C & P TELEPHONE CO.

CONTACT THESE UTILITIES

TRI-COUNTY ELEC. CO-OP 703-777-2151
FALLS CHURCH WATER SER. 703-241-5078
LOUDOUN WATER 571-291-7888
FAIRFAX CITY WATER SER. 703-385-7916

EMERGENCY DIAL 911
POLICE - FIRE - RESCUE
703-777-1021 703-777-2222

SHEET INDEX

01 - COVER SHEET
02 - DETAILS
03 - SOILS MAP
04 - EXISTING CONDITIONS
05 - UTILITIES LAYOUT
06 - GRADING PLAN
07 - AUTOTURN ANALYSIS
08 - EROSION AND SEDIMENT CONTROL PHASE 1
09 - EROSION AND SEDIMENT CONTROL PHASE 2
10 - EROSION & SEDIMENT NARRATIVE
11 - EROSION & SEDIMENT CONTROL DETAILS
12 - STORM COMPUTATIONS AND PROFILES
13 - SWM & BMP REFERENCE SHEET
14 - SWM & BMP REFERENCE SHEET
15 - SWM & BMP REFERENCE SHEET
16 - SWM & BMP REFERENCE SHEET
17 - SWM & BMP REFERENCE SHEET
18 - SWM & BMP REFERENCE SHEET
19 - SWM & BMP REFERENCE SHEET
20 - SWM & BMP REFERENCE SHEET
21 - SWM & BMP REFERENCE SHEET
22 - SWM & BMP REFERENCE SHEET
23 - SWM & BMP REFERENCE SHEET
24 - SWM & BMP REFERENCE SHEET
25 - SWM & BMP REFERENCE SHEET
26 - SWM & BMP REFERENCE SHEET
27 - SWM & BMP REFERENCE SHEET
28 - SWM & BMP REFERENCE SHEET
29 - SWM & BMP REFERENCE SHEET
30 - PWCSA WATER AND SANITARY SEWER INFORMATION
31 - UTILITY COMPUTATIONS AND PROFILES
32 - UTILITY PROFILES
33 - FIRE LANE MARKING
34 - HYDRANT COVERAGE PLAN
35 - LANDSCAPE PLAN
36 - LANDSCAPE NOTES & DETAILS
37 - PHOTOMETRIC PLAN
38 - PHOTOMETRIC DETAILS
39 - PHOTOMETRIC DETAILS
40 - UNIT PRICE LIST
41 - UNIT PRICE LIST
42 - PWCSA UNIT PRICE LIST
43 - PWCSA UNIT PRICE LIST

PLAN STATUS

DATE	DESCRIPTION
01/06/23	1ST SUBMISSION TO TOWN OF HAYMARKET
03/17/23	2ND SUBMISSION TO TOWN OF HAYMARKET
06/30/23	3RD SUBMISSION TO TOWN OF HAYMARKET

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# *BA2201*
DATE: *MARCH, 2023*
CONTOUR INT.= *N/A*
SCALE: *AS NOTED*

PLAN DATE
01/06/23
03/17/23
06/30/23

COVER SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

REVISIONS

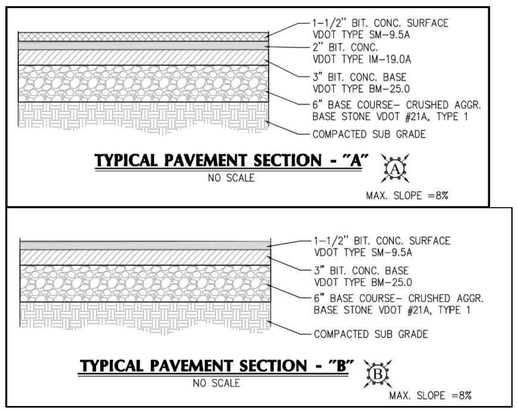
No.	DATE	DESCRIPTION

SHEET
01
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

SITE NOTES

1. THE CONTRACTOR SHALL CAREFULLY EXAMINE THE SITE AND MAKE ALL INSPECTIONS AS NECESSARY IN ORDER TO DETERMINE THE FULL EXTENT OF THE WORK REQUIRED TO MAKE THE PROPOSED WORK CONFORM TO THE DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO THE NATURE AND LOCATION OF THE WORK, CONDITIONS, AND CONFORMATION AND CONDITION OF EXISTING GROUND SURFACE AND THE CHARACTER OF THE EQUIPMENT AND FACILITIES NEEDED PRIOR TO AND DURING PROSECUTION OF THE WORK. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO THE CHARACTER, QUANTITY AND QUALITY OF SURFACE AND SUBSURFACE MATERIALS OR OBSTACLES TO BE ENCOUNTERED. ANY INACCURACIES OR DISCREPANCIES BETWEEN THE DRAWINGS AND SPECIFICATIONS MUST BE BOUGHT TO THE OWNER'S ATTENTION IN ORDER TO CLARIFY THE EXACT NATURE OF THE WORK TO BE PERFORMED PRIOR TO THE COMMENCEMENT OF ANY WORK. THE CONTRACTOR/DEVELOPER/APPLICANT SHALL BE RESPONSIBLE FOR ALL ERRORS AND INCONSISTENCIES.
2. EXCEPT WHERE NOTED HEREON, TO THE BEST OF OUR KNOWLEDGE, THE PROPOSED DEVELOPMENT OF THE SUBJECT PROPERTY CONFORMS TO ALL CURRENT APPLICABLE LAND DEVELOPMENT ORDINANCES, REGULATIONS, AND ADOPTED STANDARDS.
3. ALL UNDERGROUND UTILITIES WITHIN THE STREET RIGHT -OF WAY SHALL BE INSTALLED TO THE REQUIRED DISTANCE BEYOND THE RIGHT-OF-WAY LINE PRIOR TO THE INSTALLATION OF ANY SUBBASE MATERIAL, CURB AND GUTTER OR SIDEWALK.
4. LAND CONSERVATION NOTES- MEASURES TO CONTROL EROSION AND SILTATION SHALL BE PROVIDED PURSUANT TO AND IN COMPLIANCE WITH CURRENT STATE AND LOCAL REGULATIONS. HOWEVER, THE APPROVAL OF THESE PLANS SHALL IN NO WAY RELIEVE THE DEVELOPER OR HIS AGENT OF ANY LEGAL RESPONSIBILITIES WHICH MAY BE REQUIRED BY THE CODE OF VIRGINIA OR ANY ORDINANCE ENACTED BY THE TOWN OF HAYMARKET.
5. EROSION AND SILTATION CONTROL SHALL BE PROVIDED WHERE NECESSARY PRIOR TO CLEARING, GRADING AND CONSTRUCTION.
6. EROSION AND SEDIMENT CONTROL MEASURES WILL BE PROVIDED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (LATEST EDITION).
7. ADDITIONAL SILTATION AND EROSION CONTROL MEASURES SHALL BE INSTALLED AS DIRECTED BY VDOT AND / OR THE INSPECTOR DURING FIELD REVIEW; COSTS ASSOCIATED WITH ADDITIONAL MEASURES SHALL BE ASSUMED BY THE DEVELOPER.
8. ALL CONSTRUCTION SHALL COMPLY WITH THE LATEST U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION RULES AND REGULATIONS.
9. THE RIGHT IS SPECIFICALLY RESERVED TO UTILIZE NONSTRUCTURAL AREAS FOR BORROW PITS CONSISTENT WITH THE GEOTECHNICAL REQUIREMENTS.
10. THE APPROVAL OF THIS PLAN SHALL IN NO WAY GRANT PERMISSION BY THE COUNTY FOR THE DEVELOPER TO TRESPASS ON OFF-SITE PROPERTIES.
11. THE APPROVAL OF THESE PLANS SHALL IN NO WAY RELIEVE THE OWNER OF COMPLYING WITH OTHER APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTMENTS AND/OR RECONSTRUCTION OF ALL UTILITY COVER (MANHOLE FRAMES AND COVERS, VALVE BOX COVERS, ETC.) TO MATCH THE FINISHED GRADES OF THE AREAS EFFECTED BY THE CONSTRUCTION.
13. THE CONTRACTOR MUST HAVE THE APPROVED CONSTRUCTION DRAWINGS IN POSSESSION PRIOR TO THE START OF CONSTRUCTION. AT LEAST ONE (1) COPY OF THE APPROVED PLANS, WITH REVISIONS, MUST BE KEPT ON-SITE AT ALL TIMES.
14. ALL UTILITIES NOTED TO BE RELOCATED OR REMOVED SHALL BE AT THE DEVELOPERS EXPENSE, TO INCLUDE ALL POLES AND STRUCTURES AS REQUIRED. ALL POLES REQUIRED TO BE RELOCATED MUST BE MOVED PRIOR TO CONSTRUCTION.
15. DISTURBED AREAS WITHIN THE PROJECTS LIMITS THAT WILL REMAIN INACTIVE FOR A PERIOD OF 14 CALENDAR DAYS OR LONGER SHALL BE TEMPORARILY STABILIZED WITH SEED AND STRAW, MULCH, OR OTHER ACCEPTABLE GROUNDCOVER.
16. THE DEVELOPER IS RESPONSIBLE FOR SECURING ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION.
17. THE CONTRACTOR IS RESPONSIBLE FOR ARRANGING ALL NECESSARY INSPECTIONS.
18. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A SAFE CONSTRUCTION SITE AND COMPLYING WITH ALL OSHA REGULATIONS.
19. EMERGENCY VEHICLE ACCESS SHALL BE PROVIDED DURING ALL PHASES OF CONSTRUCTION.
20. WHERE IMPROVEMENTS ARE PROPOSED WITHIN EXISTING EASEMENTS OF RECORD, THE DEVELOPER SHALL OBTAIN WRITTEN PERMISSION FROM THE AUTHORITIES THAT ARE DOMINANT TENEMENTS OF THESE EASEMENTS FOR PERMIT FOR ANY DISTURBANCES WITHIN THESE AREAS PRIOR TO CONSTRUCTION.
21. ALL SIDEWALKS TO BE 4" THICK CONCRETE UNLESS OTHERWISE SHOWN ON THE PLAN.
22. ALL HANDICAP RAMPS SHALL BE BUILT IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS.
23. AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE. ALSO, A REPRESENTATIVE OF THE DEVELOPER MUST BE AVAILABLE AT ALL TIMES.
24. THE ENGINEER SHALL NOT HAVE CONTROL OVER OR CHARGE OF AND SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OR FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK SHOWN ON THESE PLANS. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S SCHEDULES OR FAILURE TO CARRY OUT THE WORK. THE ENGINEER IS NOT RESPONSIBLE FOR ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS, OR THEIR AGENTS OR EMPLOYEES, OR OF ANY OTHER PERSONS PERFORMING PORTIONS OF THE WORK.
25. THE CONTRACTOR/DEVELOPER/APPLICANT SHALL BE RESPONSIBLE FOR ALL ITEMS MENTIONED ABOVE.
26. PEDESTRIAN ACCESS FOR THIS DEVELOPMENT IS PROVIDED BY A SIDEWALK AND TRAFFIC SYSTEM.
27. THE PRINCE WILLIAM COUNTY SERVICE AUTHORITY (PWCSA) SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL PUBLIC SANITARY SEWER AND WATER MAIN SYSTEMS WITHIN DEDICATED EASEMENTS CONVEYED TO PWCSA AT THE TIME OF BOND RELEASE.
28. A VDOT ENTRANCE PERMIT MUST BE OBTAINED FROM THE RESIDENT ENGINEER'S OFFICE PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WITHIN THE EXISTING STATE RIGHT-OF-WAY, TO INCLUDE THE INSTALLATION OF ANY TEMPORARY CONSTRUCTION ENTRANCE.
29. THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL STREET PAVEMENTS AND STORM DRAINAGE SYSTEMS THAT ARE LOCATED WITHIN DEDICATED AND ACCEPTED PUBLIC STREET RIGHT-OF-WAYS.
30. APPROVAL OF SOIL REPORT IS REQUIRED PRIOR TO FINAL SITE PLAN APPROVAL
31. THE TOWN SHALL NOT BE RESPONSIBLE FOR REPAVING OR RESURFACING PAVED AREAS OR MAINTAINING LANDSCAPING WITHIN EASEMENTS.
32. THE FEE TITLE OWNER SHALL BE RESPONSIBLE FOR GRASS MOWING WITH REASONABLE FREQUENCY, IF APPLICABLE, AND FOR THE REMOVAL OF DEBRIS AND OTHER MATTER THAT HAS IMPEDED OR THREATENS TO IMPEDE THE FREE FLOW OF STORM WATER
33. PWCSA INSPECTOR SHALL BE NOTIFIED WHEN ANY IMPROVEMENTS PERTINENT TO HIS INSPECTION DUTIES ARE BEING INSTALLED, SPECIFIC REQUIREMENTS ARE:
    A. SITE INSPECTOR OR AREA SUPERVISOR IS TO BE NOTIFIED AT LEAST 3 DAYS PRIOR TO START OF CONSTRUCTION.
    B. A MINIMUM OF 24 HOURS NOTICE IS REQUIRED WHEN REQUESTING COMPACTION TEST AND RESIDENTIAL OR NONRESIDENTIAL USE PERMITS.
    C. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED WHEN REQUESTING TESTS PERTAINING TO SANITARY SEWER ACCEPTANCE.
34. LOCATIONS AND / OR ADDITIONAL SIGNAGE AND STRIPING REQUIREMENTS ARE TO BE DETERMINED DURING THE FINAL INSPECTION PROCESS.
35. ALL CURB AND GUTTER SHALL BE VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARD CG-6 UNLESS OTHERWISE NOTED.
36. ALL EXCAVATION SUPPORT SYSTEMS SHALL CONFORM TO AND COMPLY WITH THE CURRENT OSHA STANDARDS AND SPECIFICATIONS.
37. ALL FINISHED GRADING, SEEDING, SODDING, AND PAVING SHALL BE PERFORMED IN SUCH MANOR TO PRECLUDE THE FORMING OF FALSE GUTTERS AND AREAS OF PONDING. ALL GRADING SHALL PROVIDE FOR POSITIVE DRAINAGE TO STABILIZED OUTFALLS.



GEOTECHNICAL NOTES

1. THE SUBJECT DEVELOPMENT SITE DOES CONTAIN CLASS IV SOILS, PER THE APPROVED PRELIMINARY SOILS REVIEW INVESTIGATION AND REPORT. PRINCE WILLIAM COUNTY RECOMMENDS NO CONSTRUCTION OF STRUCTURES WITH SUBGRADE LEVELS WITHIN NATURAL DRAINAGE SWALES OR WITHIN SOILS OR SPOTS SPECIFICALLY IDENTIFIED AS WET PER THE LATEST COUNTY SOILS MAP AS IDENTIFIED BY THE INTERPRETIVE GUIDE TO SOULS MAPS, PRINCE WILLIAM COUNTY, VIRGINIA.
2. THESE PLANS WERE PREPARED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT.

CROSSROADS VILLAGE CENTER PARKING TABULATIONS

KIDDIE ACADEMY
(DAY CARE CENTER)

PARKING REQUIRED:
1 SPACE PER 300 SF OF GFA

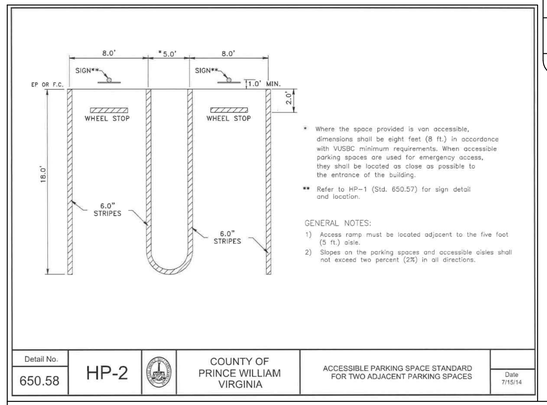
GFA = 11,250 SQFT

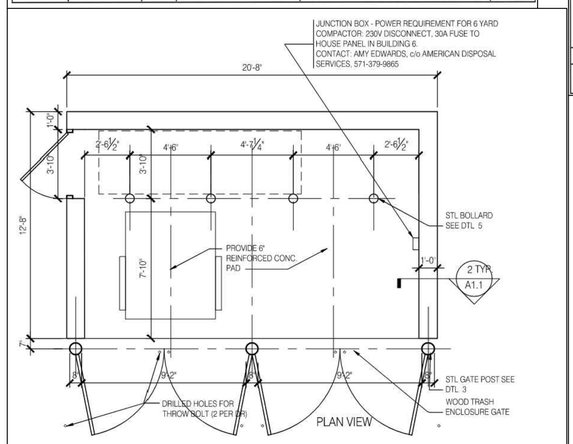
11,250 SQFT / 300 = 38 SPACES

PARKING PROVIDED:
41 SPACES

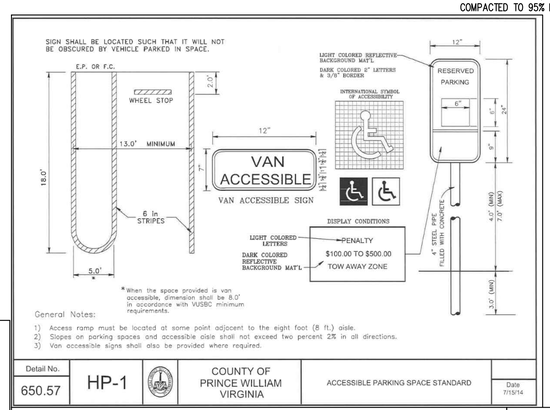
ZONING REQUIREMENTS

ZONING: B-2	REQUIRED	PROPOSED
LOT SETBACKS		
FRONT	10'	
SIDE	0' FROM ADJ SIMILAR COMMERCIAL USE, 10', 25' FROM ADJ. RES	
REAR	SAME AS SIDE	
MAXIMUM BUILDING HEIGHT	35 FT	35 FT MAX.
MAXIMUM BUILDABLE LOT COVERAGE	75%	13%
MAXIMUM LOT COVERAGE	75%	50%

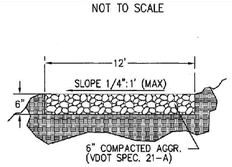




01 DUMPSTER ENCLOSURE
scale: 1/4"=1'-0"

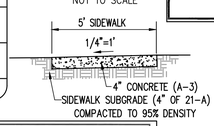


EMERGENCY TURNAROUND TYPICAL SECTION
NOT TO SCALE

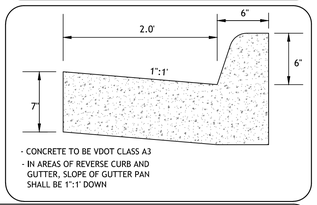


*NOTE: SUBGRADE TO BE COMPACTED TO 95% DRY WEIGHT DENSITY PER ASTM, D-698 AND SHALL BE ADEQUATE TO SUPPORT H-20 WHEEL LOADING

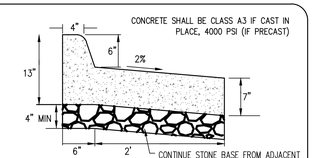
SIDEWALK DETAIL
NOT TO SCALE



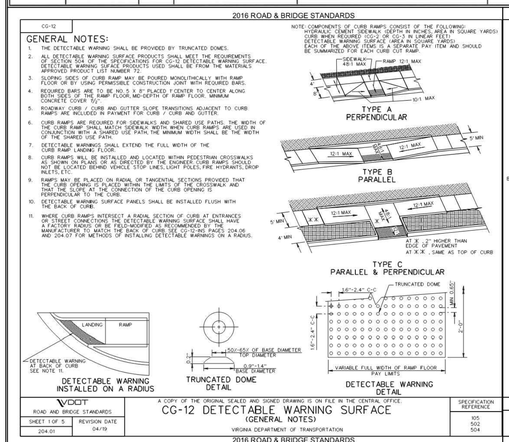
CG-6
NOT TO SCALE



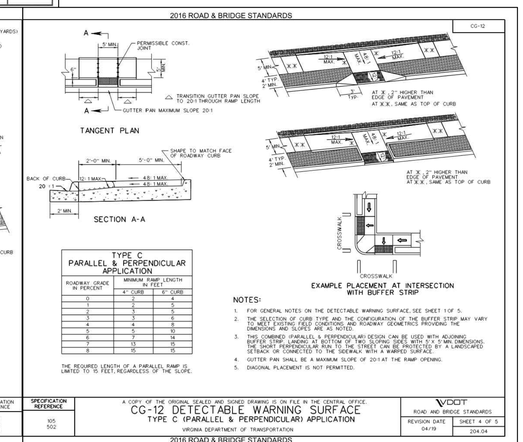
CURB & GUTTER (CG-6R)
NOT TO SCALE



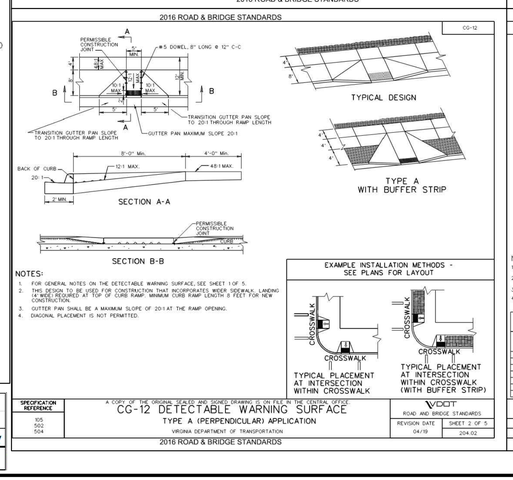
2016 ROAD & BRIDGE STANDARDS



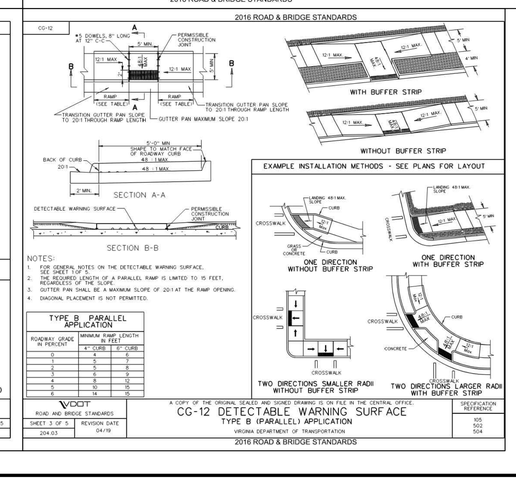
2016 ROAD & BRIDGE STANDARDS



2016 ROAD & BRIDGE STANDARDS



2016 ROAD & BRIDGE STANDARDS



AVERAGE DAILY TRAFFIC

Description/ITE Code	Units	ITE Vehicle Trip Generation Rates (peak hours are for peak hour of adjacent street traffic unless highlighted)								Expected Units	Total Generated Trips			Total Distribution of Generated Trips					
		Weekday	AM	PM	Pass-By	AM In	AM Out	PM In	PM Out		Daily	AM Hour	PM Hour	AM In	AM Out	Pass-By	PM In	PM Out	Pass-By
Daycare Center 565	KSF²	74.06	12.18	12.34		53%	47%	47%	53%	11.3	834	137	139	73	64	0	65	74	0

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: AS NOTED

PLAN DATE
01/06/23
03/17/23
06/30/23

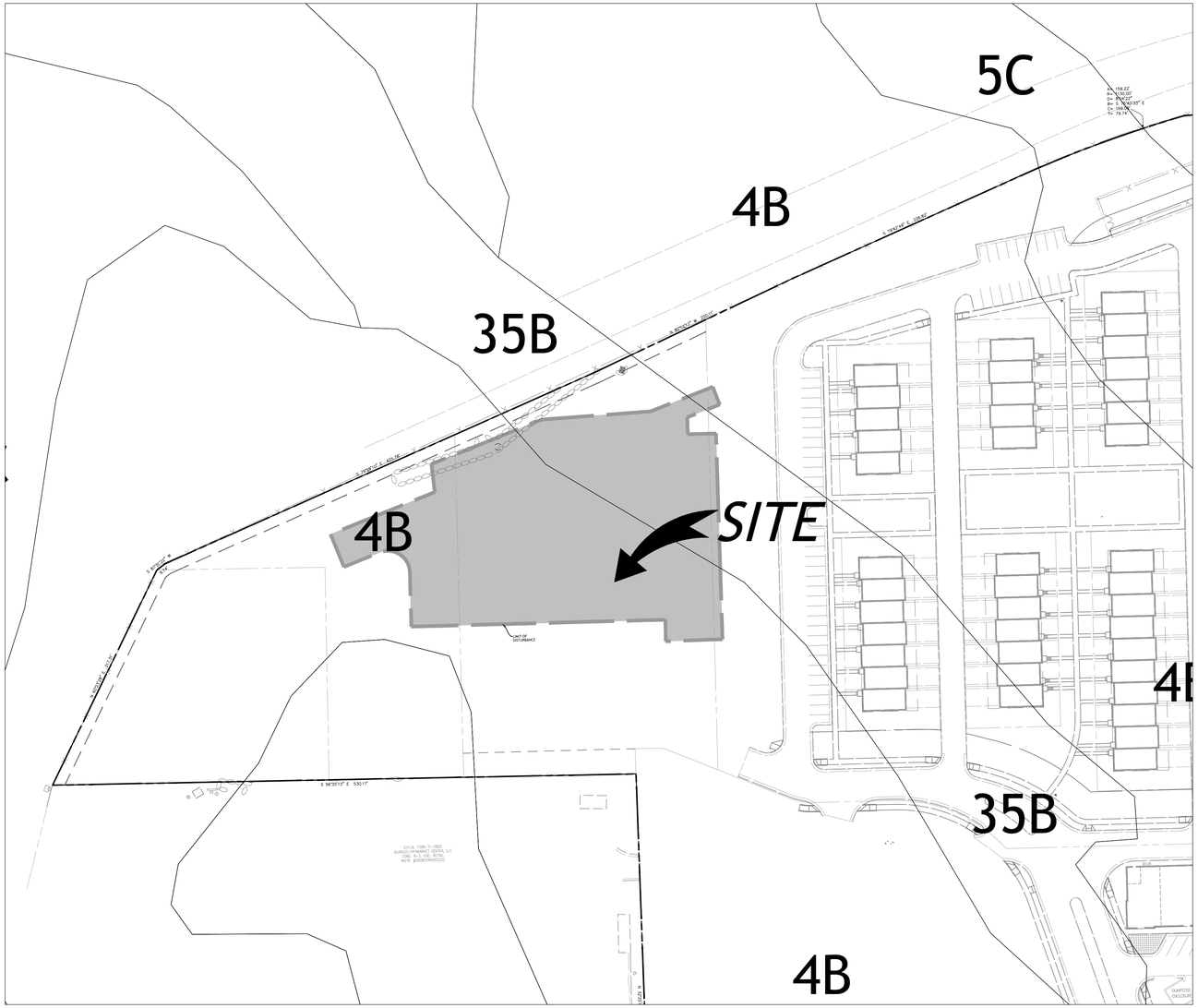
DETAILS
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
02
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

UNIT NUMBER	NAME	CATEGORY	RUNOFF	EROSION HAZARD	DEPTH TO BEDROCK	SHRINK/SWELL	FLOODING	SLOPES (%)	K VALUE	CLASS
4B	ARCOLA	C	MEDIUM	SEVERE	20"-40"	LOW	NONE	2 TO 7	0.43	II
35B	MANASSAS	B	SLOW	MODERATE	40"-60"	LOW	RARE	2 TO 7	0.37	III



J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: 1"=60'

PLAN DATE
01/06/23
03/17/23
06/30/23

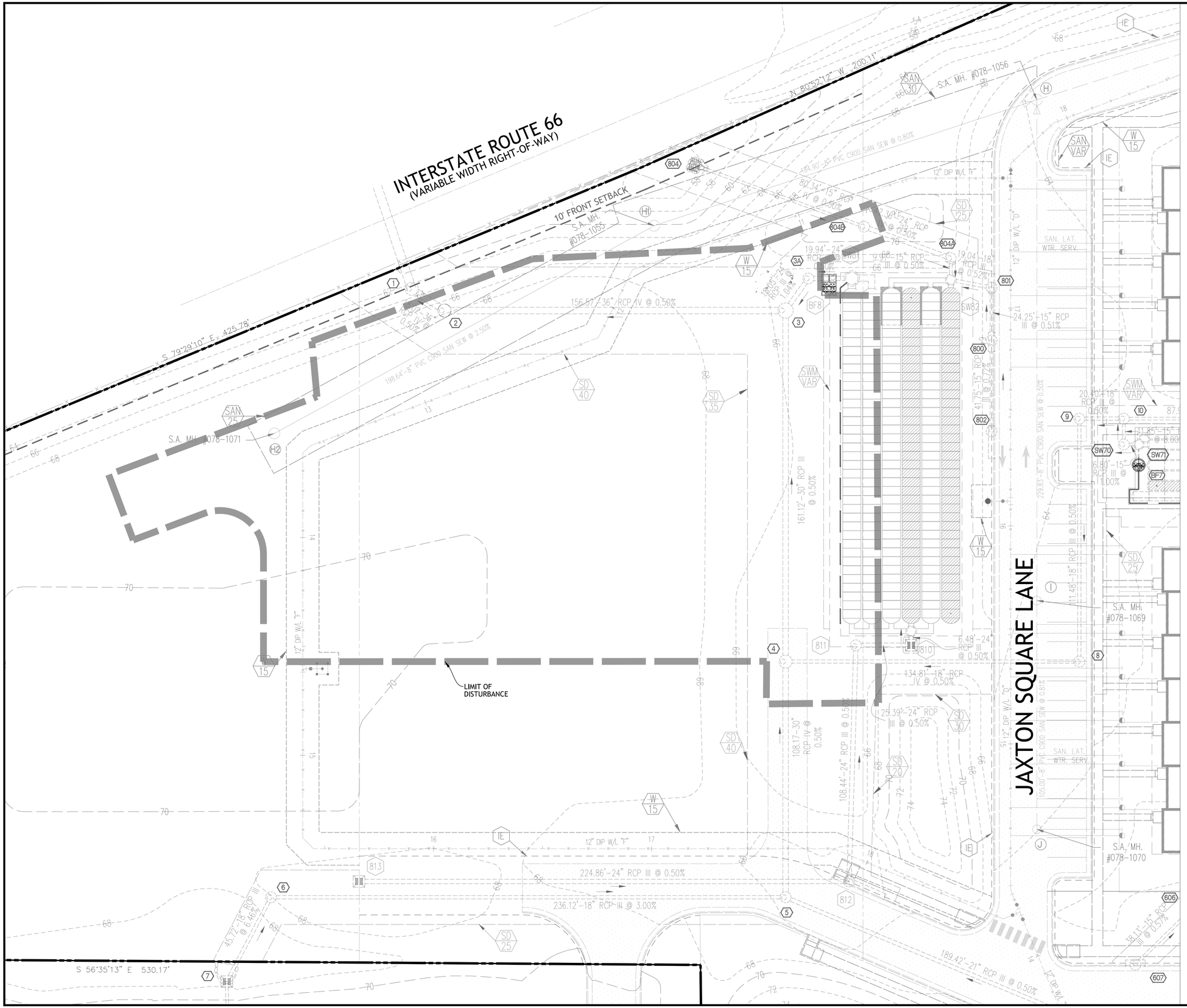
SOILS MAP
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
03
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)



NOTES:

1) THE SERVICE AUTHORITY DOES NOT GUARANTEE THE CONSTRUCTION OR TIMING WHEN UTILITIES WILL BE PLACED INTO SERVICE THAT ARE SHOWN AS EXISTING IN THIS PLAN SET. IF UTILITIES SHOWN AS EXISTING ARE NOT AVAILABLE WHEN NEEDED BY THIS PROJECT, THIS PROJECT SHALL OBTAIN THE NECESSARY RIGHTS TO INSTALL ON-SITE AND OFFSITE- WATER AND SANITARY SEWER UTILITIES FROM AN APPROVED PLAN TO PROVIDE THE DESIRED SERVICE.
2) DEVELOPER OF THIS PROJECT CANNOT CONNECT TO WATER AND SANITARY SEWER BUILT BY THE DEVELOPER OF CROSSROADS VILLAGE CENTER UNTIL THE WATER AND SANITARY SEWER UTILITIES, PASS ALL INSPECTIONS, TESTING AND PLACES THE UTILITIES INTO SERVICE THROUGH THE SERVICE AUTHORITY'S BENEFICIAL USE PROCESS.
3) IF THIS PROJECT WISHES TO CONNECT TO WATER AND SANITARY SEWER UTILITIES PLACED INTO SERVICE BY THE DEVELOPER OF CROSSROADS VILLAGE CENTER PRIOR TO THAT DEVELOPER ACHIEVING BOND RELEASE FROM THE SERVICE AUTHORITY, THE DEVELOPER OF THIS PROJECT MUST SIGN A LETTER OF INDEMNIFICATION AND ASSUMPTION OF LIABILITY PER USM 2.9A. USM 2.9A IS NO LONGER APPLICABLE ONCE THE DEVELOPER OF CROSSROADS VILLAGE CENTER ACHIEVES SERVICE AUTHORITY ACCEPTANCE OF UTILITIES THROUGH BOND RELEASE.
4) EXISTING UTILITIES SHOWN ARE TO BE INSTALLED AS PART OF THE CROSSROADS VILLAGE CENTER PLAN #PRV2022-013.

VA STATE GRID NORTH

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

LEGEND

- LOT LINE
- BOUNDARY/PHASING LINE
- EXISTING ROAD
- LIMITS OF CLEARING
- EXISTING WATERLINE
- EXISTING STORM DRAINAGE
- EXISTING SANITARY SEWER
- EXISTING OVERHEAD ELECTRICAL LINE
- EXISTING GAS LINE
- EXISTING RIPRAP
- EXISTING TREE LINE
- EXISTING MAJOR CONTOUR LINE
- EXISTING MINOR CONTOUR LINE

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= 2'
SCALE: 1"=20'

PLAN DATE
01/06/23
03/17/23
06/30/23

EXISTING CONDITIONS
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

SHEET
04
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

INTERSTATE ROUTE 66
(VARIABLE WIDTH RIGHT-OF-WAY)

S 79°29'10" E 425.78'

N 80°52'12" W 200.11'

10' FRONT SETBACK

25' SIDE SETBACK

12" X 6" TAPPING SLEEVE AND 6" TAPPING VALVE

12" X 4" TAPPING SLEEVE AND 4" TAPPING VALVE

4" DIP CL52 FULLY RESTRAINED FULLY POLYWRAPPED

6" PRIVATE FIRE LINE

GREASE TRAP

834 VPD

KIDDIE ACADEMY
FLOORS: 2
AREA: 11,256 S.F.

50' MIN
PLAYGROUND
TOTAL AREA:
4638 S.F.

AREA OF REFUGE

EMERGENCY TURNAROUND

PROP. RETAINING WALL

6" DIA AND 4' HIGH BOLLARD

PROP. FENCE

STRUCTURE 811 EXISTING MANHOLE TO BE REPLACED WITH PROPOSED DI-3C INLET.

LIMIT OF DISTURBANCE

SITE ACCESS CONSTRUCTED BY OTHERS. PLEASE SEE CROSSROADS VILLAGE CENTER FINAL SITE PLAN.

DRY UTILITIES TO BE CONSTRUCTED BY OTHERS

PAD SITE #4

PAD SITE #3

JAXTON SQUARE LANE

S 56°35'13" E 530.17'

GEOMETRY LEGEND

- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING WATER LINE
- PROPOSED WATER LINE
- 3/4" WATER METER CROCK
- PROPOSED FIRE HYDRANT
- 4" SANITARY LATERAL
- TEST PIT LOCATION
- ESM'T WIDTH — PROP. SAN. SEW. ESM'T LABEL
- ESM'T WIDTH — PROP. WATER ESM'T LABEL
- ESM'T WIDTH — PROP. STORM WATER MANAGEMENT ESM'T LABEL
- ESM'T WIDTH — PROP. STORM DRAIN ESM'T LABEL
- ESM'T WIDTH — PROP. INGRESS/EGRESS ESM'T LABEL
- ESM'T WIDTH — PROP. ACCESS ESM'T LABEL

HATCH LEGEND

- PROPOSED ROADWAY
- 5' PROP. CONCRETE SW (unless otherwise noted)
- EXISTING ROADWAY
- PROP. CONCRETE (unless otherwise noted)
- PROP. GRAVEL EMERGENCY TURNAROUND

NOTE:
1. THE LOCATION AND DESIGN OF SWM/BMP HAS ALREADY BEEN ACCOUNTED FOR THE DEVELOPMENT OF THIS SITE AND IS PROVIDED ON THE APPROVED CROSSROADS VILLAGE CENTER - FINAL SITE PLAN - OVERALL REVISION
2. A COMMERCIAL KITCHEN AND FOOD PREPARATIONS ARE PROPOSED WITHIN THE BUILDING.
3. PROPOSED FENCE SHALL BE A MINIMUM OF 4' TALL.

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= 2'
SCALE: 1"=20'

PLAN DATE
01/06/23
03/17/23
06/30/23

UTILITIES LAYOUT
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
05
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

GEOMETRY LEGEND

- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- FUTURE POTENTIAL STORM DRAIN
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER / PROPOSED SAN. LATERAL
- EXISTING WATER LINE
- PROPOSED WATER LINE
- PROPOSED WATER METER CROCK / PROPOSED FIRE HYDRANT
- TEST PIT
- PARKING COUNT
- TYPICAL PAVEMENT SECTION
- CURB TRANSITION (CG-6 / CG-6B)

EASEMENT LEGEND

- ESM'T WIDTH — PROP. SAN. SEW. ESM'T LABEL
- ESM'T WIDTH — PROP. WATER ESM'T LABEL
- ESM'T WIDTH — PROP. STORM DRAIN ESMT. LABEL
- ESM'T WIDTH — PROP. ACCESS ESMT. LABEL
- PROP. INGRESS/EGRESS ESMT. LABEL

HATCH LEGEND

- PROPOSED ASPHALT
- 5' PROP. CONCRETE SW (unless otherwise noted)
- EX. ROADWAY
- PROP. CONCRETE (unless otherwise noted)
- PROP. GRAVEL EMERGENCY ACCESS

NOTE:

1. EXISTING VALVE BOXES SHALL RESIDE OUTSIDE THE PROPOSED SIDEWALK. IF CONTRACTOR DESIRES A NEW VALVE TO TEST AGAINST, THE EXISTING 8" VALVE SHALL BE REMOVED AND REPLACED WITH A NEW VALVE.
2. SANITARY SEWER LATERAL CLEAN-OUTS WITHIN PARKING OR TRAVEL WAYS SHALL HAVE COVERS IN ACCORDANCE WITH PWCSA USM DETAIL S03.07.01, REV-2017.
3. 4" WATER SERVICE LINES TO BE D.I.P. CL 52 FULLY RESTRAINED & POLY WRAPPED FROM THE MAIN TO THE METER.
4. TRAFFIC SIGNAL, IF WARRANTED, SHALL BE SUBMITTED SEPARATELY.
5. BRICK WALK & CG-12'S WITHIN VDOT RIGHT OF WAY TO BE MAINTAINED BY THE TOWN OF HAYMARKET.

VA STATE GRID NORTH

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

INTERSTATE ROUTE 66
(VARIABLE WIDTH RIGHT-OF-WAY)

S 79°39'10" E 425.78'

10' FRONT SETBACK

25' SIDE SETBACK

N 80°52'12" W 200.17'

12" X 6" TAPPING SLEEVE AND 6" TAPPING VALVE

12" X 4" TAPPING SLEEVE AND 4" TAPPING VALVE

4" DIP CL52 FULLY RESTRAINED FULLY POLYWRAPPED

6" PRIVATE FIRE LINE

GREASE TRAP

KIDDIE ACADEMY
FLOORS: 2
AREA: 11,256 S.F.
FF=368.67

PROP. RETAINING WALL

6" DIA AND 4' HIGH BOLLARD

PLAYGROUND
TOTAL AREA:
4638 S.F.

AREA OF REFUGE

PROP. FENCE

EMERGENCY TURNAROUND

MH. #078-1071

S.A. MH. #078-1056

S.A. MH. #078-1069

S.A. MH. #078-1070

SAN. LAT. WTR. SERV.

JAXTON SQUARE LANE

STRUCTURE 811 EXISTING MANHOLE TO BE [illegible] PROPOSED PLAYGROUND

LIMIT OF DISTURBANCE

SITE ACCESS CONSTRUCTED BY OTHERS. PLEASE SEE CROSSROADS VILLAGE CENTER FINAL SITE PLAN.

UTILITIES TO BE CONSTRUCTED BY OTHERS

PAD SITE #4

FUTURE POTENTIAL LAYOUT

PAD SITE #3

FUTURE POTENTIAL LAYOUT

S 56°35'13" E 530.17'

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= 2'
SCALE: 1"=20'

PLAN DATE
01/06/23
03/17/23
06/30/23

GRADING PLAN
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

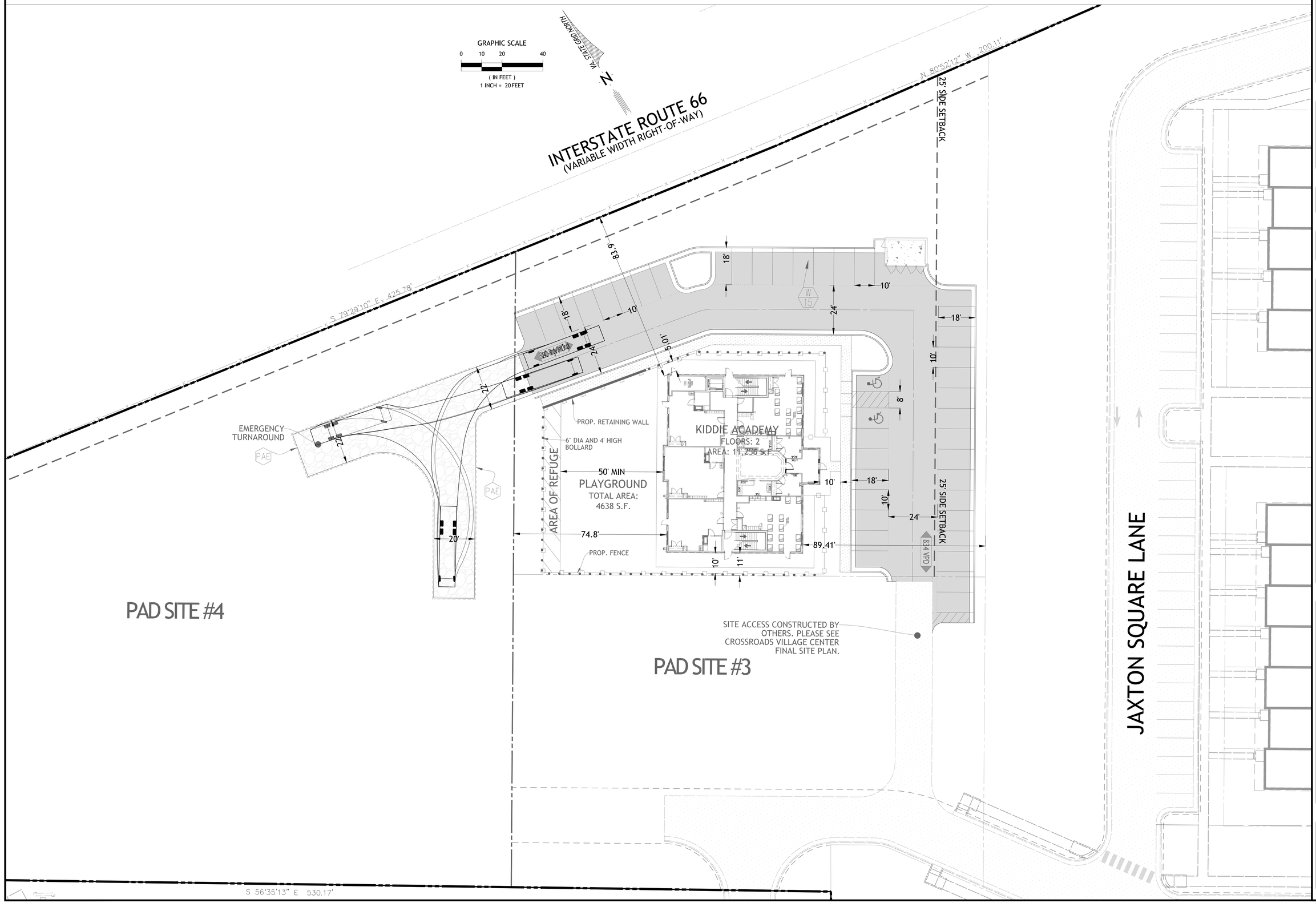
REVISIONS

No.	DATE	DESCRIPTION

SHEET
06
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

SU-40 SINGLE UNIT TRUCK



J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: 1"=40'

PLAN DATE
01/06/23
03/17/23
06/30/23

AUTOTURN ANALYSIS
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

REVISIONS
No. DATE DESCRIPTION

SHEET
07
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

INTERSTATE ROUTE 66
(VARIABLE WIDTH RIGHT-OF-WAY)

N 80°52'12" W 200.11'

10' FRONT SETBACK

S 79°29'10" E 425.78'

184.90'-8" PVC C900 SAN SEW @ 0.80%

198.64'-8" PVC C900 SAN SEW @ 2.50%

156.87'-36" RCP AV @ 0.50%

DA = 0.47 AC
TO 478' SSF

DA = 0.14 AC
TO 146' SSF

DA = 0.12 AC
TO 49' SSF

DA = 0.28 AC
TO 231' SSF

DA = 0.02 AC
TO 77 SSF

LIMIT OF DISTURBANCE

JAXTON SQUARE LANE

S.A. MH. #078-1065

S.A. MH. #078-1066

S.A. MH. #078-1071

S.A. MH. #078-1069

S.A. MH. #078-1070

12" DIP W/L "I"

SAN. LAT. WTR. SERV.

224.86'-24" RCP III @ 0.50%

236.12'-18" RCP III @ 3.00%

169.47'-21" RCP

EROSION AND SEDIMENT CONTROL LEGEND

3.02	TEMPORARY STONE CONSTRUCTION ENTRANCE	CE	
3.05	SUPER SILT FENCE	SSF	SSF SSF
3.31	TEMPORARY SEEDING	TS	
	LIMITS OF CLEARING	LOC	
	DRAINAGE DIVIDE		

NOTES:
1. CONTRACTOR TO PROVIDE TEMPORARY SEEDING & MULCHING (PS & MU) OUTSIDE OF THE PAVED AREA WITHIN LIMITS OF CLEARING.
2. FOR DETAILS, NOTES, AND NARRATIVE, SEE SHEETS 10 & 11.

THIS DRAWING IS FOR PHASE I EROSION, SEDIMENT CONTROL & DRAINAGE DIVIDE PURPOSES ONLY

VA STATE GRID NORTH

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= 2'
SCALE: 1"=20'

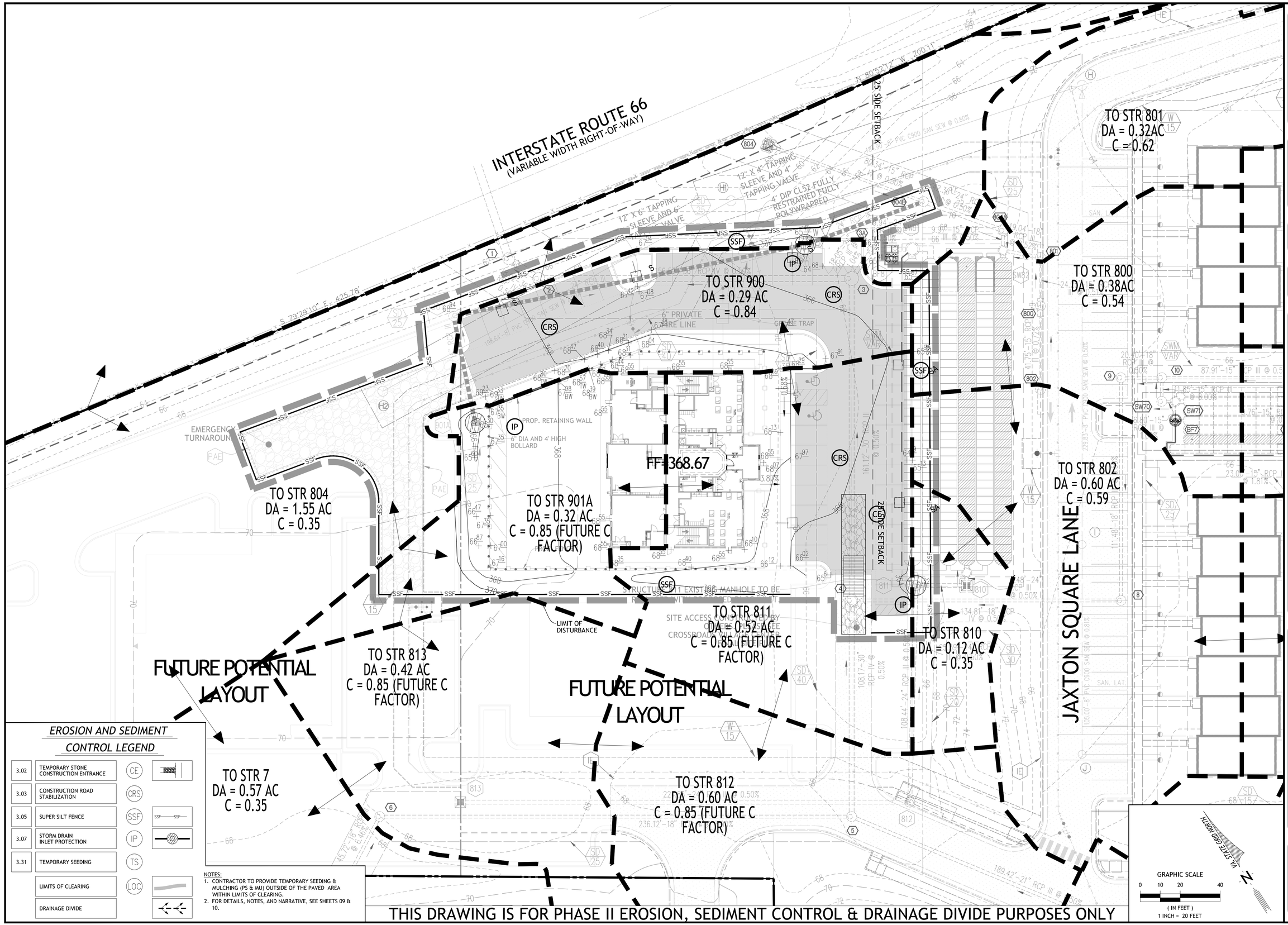
PLAN DATE
01/06/23
03/17/23
06/30/23

EROSION AND SEDIMENT CONTROL PHASE 1
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
08
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)



EROSION AND SEDIMENT CONTROL LEGEND

3.02	TEMPORARY STONE CONSTRUCTION ENTRANCE	CE	
3.03	CONSTRUCTION ROAD STABILIZATION	CRS	
3.05	SUPER SILT FENCE	SSF	SSF SSF
3.07	STORM DRAIN INLET PROTECTION	IP	
3.31	TEMPORARY SEEDING	TS	
	LIMITS OF CLEARING	LOC	
	DRAINAGE DIVIDE		

NOTES:
1. CONTRACTOR TO PROVIDE TEMPORARY SEEDING & MULCHING (PS & MU) OUTSIDE OF THE PAVED AREA WITHIN LIMITS OF CLEARING.
2. FOR DETAILS, NOTES, AND NARRATIVE, SEE SHEETS 09 & 10.

THIS DRAWING IS FOR PHASE II EROSION, SEDIMENT CONTROL & DRAINAGE DIVIDE PURPOSES ONLY

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

VA STATE GRID NORTH

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= 2'
SCALE: 1"=20'

PLAN DATE
01/06/23
03/17/23
06/30/23

EROSION AND SEDIMENT CONTROL PHASE 2
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

SHEET
09
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

MS-19 EROSION & SEDIMENT CONTROL NOTES

1. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.

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

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.

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 UPSTREAM LAND DISTURBANCE TAKES PLACE.

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 TWENTY-FIVE YEAR STORM OF 24-HOUR DURATION. RUNOFF COEFFICIENTS USED IN RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.

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

8. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CURT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.

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

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.

11. BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS OR PIPES ARE MADE OPERATIONS., ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.

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.

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.

14. ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET.

15. THE BED AND BANKS OF A WATER COURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.

16. UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:

A. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
B. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
C. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY.
D. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.
E. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.
F. APPLICABLE SAFETY REGULATIONS SHALL BE COMPLIED WITH.

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.

18. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE LOCAL PROGRAM AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.

19. PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY AND PEAK FLOW RATE OF STORMWATER RUNOFF FOR THE STATED FREQUENCY STORM OF 24-HOUR DURATION IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CRITERIA:

A. CONCENTRATED STORMWATER RUNOFF LEAVING A DEVELOPMENT SITES SHALL BE DISCHARGED DIRECTLY INTO AN ADEQUATE NATURAL OR MAN-MADE RECEIVING CHANNEL, PIPE OR STORM SEWER SYSTEMS. FOR THOSE SITES WHERE RUNOFF IS DISCHARGED INTO A PIPE OR SYSTEM, DOWNSTREAM STABILITY ANALYSIS 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). 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
(A) 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 STROMWATER WILL NOT CAUSE EROSION OF CHANNEL BED OR BANKS; AND
(B) PIPES AND STORM SYSTEMS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM TO VERIFY THAT STORMWATER WILL BE CONTAINED WITHIN THE PIPE OR SYSTEM.
C. IF EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL:
(1) IMPROVE THE CHANNEL TO A CONDITION WHERE A TEN-YEAR STORM WILL NOT OVERTOP THE BANKS AND A TWO-YEAR STORM WILL NOT CAUSE EROSION TO THE CHANNEL BED OR BANKS; OR
(2) IMPROVE THE PIPE OR PIPE SYSTEM TO A CONDITION WHERE THE TEN-YEAR STORM IS CONTAINED WITHIN THE APPURTENANCES; OR
(3) DEVELOP A SITE DESIGN THAT WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TWO-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A NATURAL CHANNEL OR WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TEN-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A MAN-MADE CHANNEL;
(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 ANALYSIS 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 DISSIPATERS SHALL BE PLACED AT THE OUTFALL OF ALL DETENTION FACILITIES AS NECESSARY TO PROVIDE A STABILIZED TRANSITION FROM THE FACILITY TO THE RECEIVING CHANNEL.
H. ALL ON-SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE.
I. INCREASED VOLUMES OF SHEET FLOWS THAT MAY CAUSE EROSION OR SEDIMENTATION ON ADJACENT PROPERTY SHALL BE DIVERTED TO A STABLE OUTLET, ADEQUATE CHANNEL, PIPE OR PIPE SYSTEM, OR TO A DETENTION FACILITY.
J. IN APPLYING THESE STORMWATER RUNOFF CRITERIA, INDIVIDUAL LOTS OR PARCELS IN A RESIDENTIAL, COMMERCIAL OR INDUSTRIAL DEVELOPMENT SHALL NOT BE CONSIDERED TO BE SEPARATE DEVELOPMENT PROJECTS. INSTEAD, THE DEVELOPMENT, AS A WHOLE, SHALL BE CONSIDERED TO BE A SINGLE DEVELOPMENT PROJECT. HYDROLOGIC PARAMETERS THAT REFLECT THE ULTIMATE DEVELOPMENT CONDITIONS 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.

EROSION & SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION:
THE SITE'S DISTURBED AREA IS 1.21 ACRES WITHIN A 21.0 ACRE MIXED USE DEVELOPMENT. THIS PROJECT IS THE DEVELOPMENT OF A DAYCARE FACILITY AND PARKING.
EXISTING SITE CONDITIONS:
THE SITE IS CLEARED WITH NO STEEP SLOPES PRESENT.

ADJACENT AREAS:
NORTH OF THE SITE IS THE EXISTING INTERSTATE 66. SOUTH, EAST AND WEST OF THE SITE IS THE EXISTING CROSSROADS VILLAGE CENTER.

OFF-SITE AREAS:
NO OFFSITE AREAS ARE PROPOSED TO BE IMPACTED WITH THIS PLAN.

SOILS:
ALL SOILS INFORMATION IS PROVIDED IN THE SOILS MAP ON SHEET 03.

CRITICAL AREAS:
THERE ARE NO CRITICAL AREAS WITHIN THE PROPOSED SITE.

PROPOSED TREE SAVE AREA:
ANY TREE OUTSIDE THE LIMITS OF CLEARING AND GRADING SHALL REMAIN UNDISTURBED UNLESS DIRECTLY INSTRUCTED BY THE TOWN OF HAYMARKET INSPECTOR.

SEDIMENT AND EROSION CONTROL PROGRAM:
THE CONTRACTOR SHALL TAKE THE FOLLOWING STEPS TO MINIMIZE THE VOLUME OF SILT:

1. CONTRACTOR SHALL EVALUATE THE SITE TO DETERMINE EXTENSIVE CUT AND FILL AREAS, AND SHALL WORK THESE AREAS TO MINIMIZE THE EXTENT OF HEAVY EQUIPMENT WORK. CONTRACTOR SHALL STRIVE TO BRING AREAS TO GRADE (ROUGH OR FINISH) AND TO STABILIZE, BY TEMPORARY OR PERMANENT VEGETATION, THESE DISTURBED AREAS PRIOR TO BEGINNING WORK IN ANOTHER AREA.
2. FILL AREAS SHALL BE COMPACTED, COMPLETELY PRIOR TO THE END OF EACH WORK DAY. FILL SLOPE SURFACES SHALL BE LEFT ROUGHENED TO REDUCE SHEET EROSION OF THE SLOPES. CONTRACTOR SHALL RE-DIRECT CONCENTRATED RUNOFF, BY EARTH BERMS OR OTHER DEVICES, AROUND ACTIVELY DISTURBED AREAS TO STABILIZE OUTLETS.
3. CUT SLOPE AS NECESSARY, SHALL BE PROTECTED FORM CONCENTRATED FLOW BY BERMS ABOVE THE SLOPE AND DIRECTED AROUND THE DISTURBED AREA TO STABILIZED OUTLETS.
4. IN NEW PAVEMENT AREAS, PLACE THE AGGREGATE BASE STONE ON THE FINISH SUBGRADE AT THE EARLIEST POSSIBLE TIME.

PHASE I:
1. INSTALL THE TEMPORARY CONSTRUCTION ENTRANCE WITH WASH RACKS AS SHOWN ON SHEET 08. WATER TRUCKS SHALL BE USED IF THERE IS NO ON-SITE WATER AVAILABLE. PROVIDE FILTER FABRIC UNDERLAIN. MUD AND DEBRIS SHALL BE WASHED FROM ALL CONSTRUCTION VEHICLES AND EQUIPMENT BEFORE LEAVING THE SITE. ANY MUD OR SILT CARRIED INTO THE STREET AFTER WASHING SHALL BE IMMEDIATELY REMOVED.
2. INSTALL INLET PROTECTION FOR ALL EXISTING STORM SEWER INLETS AS SHOWN ON THE PHASE I DRAWINGS ON SHEET 08.
3. CLEAR AND GRUB ALONG THE PERIMETER OF LIMITS OF CLEARING AND GRADING. INSTALL SAFETY FENCE AND PERIMETER CONTROLS.
4. ONCE THE THE ABOVE STEPS HAVE BEEN COMPLETED, THE CONTRACTOR SHALL CONTACT THE TOWN E&S INSPECTOR TO INSPECT THE SITE. NO FURTHER CONSTRUCTION ACTIVITY SHALL COMMENCE UNTIL THE TOWN INSPECTOR HAS PERFORMED THE SITE INSPECTION.

PHASE II:
1. ALL SUPER SILT FENCES AND SILT FENCE WILL REMAIN WHERE SHOWN ON THE PHASE II PLAN ON SHEET 08. THE CONSTRUCTION ENTRANCE SHALL BE REMOVED WHEN FINAL PAVING IS COMPLETED AND APPROVED BY THE TOWN INSPECTOR.
2. INLET PROTECTION FOR STORM INLETS SHALL BE PLACED AS SOON AS THE INLETS ARE INSTALLED.
3. FILL SLOPE SURFACES SHALL BE LEFT IN A ROUGHENED CONDITION TO REDUCE SHEET AND RILL EROSION OF THE SLOPES. THE CONTRACTOR SHALL RE-DIRECT CONCENTRATED FLOW AWAY FROM THE FILL SLOPES BY INSTALLING EARTH BERMS AND OUTLETTING THE RUNOFF TO A STABILIZED OUTLET.
4. REMOVE THE EXISTING CURB AND GUTTER IN THE LOCATIONS INDICATED ON THE PLAN.
5. INSTALL THE PROPOSED STORM DRAINS CONCURRENTLY WITH NEW CURB AND GUTTER.
6. INSTALL PAVEMENT SUBBASE AND AND INTERMEDIATE COURSE.
7. INSTALL PAVEMENT TOP COURSE AND PROPOSED SIDEWALKS.
8. COMPLETE FINAL MISCELLANEOUS SITE ITEMS INCLUDING PAVEMENT STRIPING, etc.
9. AFTER CONSTRUCTION OPERATIONS HAVE ENDED AND ALL DISTURBED AREAS HAVE BEEN STABILIZED WITH VEGETATION, THE EROSION AND SEDIMENT CONTROL MEASURES MAY BE REMOVED UPON THE APPROVAL OF THE TOWN E&S INSPECTOR.

E&S 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 HANDBOOK. THE MINIMUM STANDARDS OF THE VESCH SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY A VARIANCE.
STRUCTURAL PRACTICES

SAFETY FENCE - 3.01
A PROTECTIVE BARRIER INSTALLED TO PREVENT ACCESS TO AN EROSION CONTROL MEASURE

TEMPORARY CONSTRUCTION ENTRANCE - 3.02
A GRAVEL PAD LOCATED AT POINTS OF VEHICULAR INGRESS AND EGRESS ON A CONSTRUCTION SITE TO REDUCE THE MUD TRANSPORTED ONTO PUBLIC ROADS AND OTHER PAVED AREAS.

CONSTRUCTION ROAD STABILIZATION - 3.03
A TEMPORARY STABILIZATION OF ACCESS ROADS, AND OTHER ONSITE VEHICLE TRANSPORTATION ROUTES WITH STONE IMMEDIATELY AFTER GRADING.

SUPER SILT FENCE BARRIER - 3.05
A TEMPORARY BARRIER CONSISTING OF A SYNTHETIC FILTER FABRIC STRETCHED ACROSS AND ATTACHED TO SUPPORTING POSTS AND ENTRENCHED.

STORM DRAIN INLET PROTECTION - 3.07
A SEDIMENT FILTER OR AN EXCAVATED IMPOUNDING AREA AROUND A STORM DRAIN DROP INLET OR CURB INLET.

VEGETATIVE PRACTICES

TOPSOILING - 3.30
TOPSOIL WILL BE STRIPPED FROM AREAS TO BE GRADED AND STOCKPILED FOR LATER USE. TOPSOIL OPERATIONS SHOULD NOT BE PERFORMED WHEN THE SOIL IS WET OR FROZEN. STRIPPING SHALL BE CONFINED TO THE IMMEDIATE CONSTRUCTION AREA. A 4-TO 6-INCH STRIPPING DEPTH SHALL BE PROVIDED. ALL PERIMETER DIKES, BASINS, AND OTHER SEDIMENT CONTROLS SHALL BE IN PLACE PRIOR TO STRIPPING. TOPSOIL SHALL BE STOCKPILED IN SUCH A MANNER THAT NATURAL DRAINAGE IS NOT OBSTRUCTED AND NO OFF-SITE SEDIMENT DAMAGE SHALL RESULT. STABILIZE OR PROTECT STOCKPILES IN ACCORDANCE WITH MS #2. PERIMETER CONTROLS MUST BE PLACED AROUND THE STOCKPILE IMMEDIATELY. STOCKPILE LOCATIONS SHALL BE LOCATED ON-SITE AND ARE TO BE STABILIZED WITH TEMPORARY VEGETATION WITHIN 7 DAYS OF THE FORMATION OF THE STOCKPILE, IN ACCORDANCE WITH STD. & SPEC. 3.31, TEMPORARY SEEDING IF IT IS TO REMAIN DORMANT FOR LONGER THAN 30 DAYS (REFER TO MS #1 AND MS #2).

PRIOR TO LAND-DISTURBING ACTIVITIES, THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY E&S PLAN TO THE OWNER COVERING ANY OFF-SITESTOCKPILE AREA WHICH WOULD HAVE TO BE APPROVED BY THE PLAN APPROVING AUTHORITY BEFORE ANY OFF-SITE ACTIVITY COMMENCES. ANY OFFSITE WORK MUST BE CONDUCTETD AT A SITE WITH AN ACTIVE GRADING PERMIT AND AN APPROVED E&SC PLAN.

TOPSOIL SHALL NOT BE PLACED WHILE IN A FROZEN OR MUDDY CONDITION, WHEN TOPSOIL OR SUBGRADE IS EXCESSIVELY WET, OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING OR PROPOSED SODDING OR SEEDING. THE TOPSOIL SHALL BE UNIFORMLY DISTRIBUTED TO A MINIMUM COMPACTED DEPTH OF 2 INCHES ON 3:1 OR STEEPER SLOPES AND 4 INCHES ON FLATTER SLOPES. (SEE TABLE 3.30-A TO DETERMINE VOLUME OF TOPSOIL REQUIRED FOR APPLICATION TO VARIOUS DEPTHS). ANY IRREGULARITIES IN THE SURFACE, RESULTING FROM TOPSOILING OR OTHER OPERATIONS, SHALL BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.

TEMPORARY SEEDING - 3.31
ALL DENUDED AREAS, WHICH WILL BE LEFT DORMANT FOR EXTENDED PERIODS OF TIME, SHALL BE SEEDED WITH FAST GERMINATING TEMPORARY VEGETATION IMMEDIATELY FOLLOWING GRADING. SELECTION OF THE SEED MIXTURE WILL DEPEND ON THE TIME OF YEAR IT IS APPLIED.

PERMANENT SEEDING - 3.32
ESTABLISHMENT OF PERENNIAL VEGETATIVE COVER BY PLANTING SEED ON ROUGH GRADING 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 GRADING AREAS.

EROSION CONTROL BLANKET - 3.36 OR MULCH - 3.35
EROSION CONTROL BLANKETS WILL BE INSTALLED OVER FILL SLOPES, WHICH HAVE BEEN BROUGHT TO FINAL GRADE AND HAVE BEEN SEEDED TO PROTECT THE SLOPES FROM RILL AND GULLY EROSION AND TO ALLOW SEED TO GERMINATE PROPERLY. MULCH (STRAW OR FIBER) WILL BE USED ON RELATIVELY FLAT AREAS AND WILL BE APPLIED AS A SECOND STEP IN THE SEEDING OPERATION. (SEE SHEET 26 FOR MULCHING RATES,TABLE 3.35-A)

SPECIAL CARE NOTES:
THE CONTRACTOR SHALL TAKE SPECIAL CARE TO PROTECT THE EXISTING VEGETATION, WETLANDS AND STREAMS OUTSIDE OF THE DESIGNATED LIMITS OF WORK SHOWN ON THE PLANS. WHEN WORK IS PERFORMED IN/NEAR STREAMS AND WETLANDS, 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. THE BED AND BANKS OF THE STREAM AND WETLANDS SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN/NEAR THESE LOCATIONS IS COMPLETED.

MANAGEMENT STRATEGIES:
1. CONSTRUCTION WILL BE SEQUENCED SO THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE.
2. TEMPORARY SEEDING OR OTHER STABILIZATION WILL FOLLOW IMMEDIATELY AFTER GRADING.
3. AREAS WHICH ARE NOT TO BE DISTURBED WILL BE CLEARLY MARKED BY FLAGS, SIGNS, ETC.
4. THE JOB SUPERINTENDENT SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL PRACTICES.
5. AFTER ACHIEVING ADEQUATE STABILIZATION, THE TEMPORARY E&S CONTROLS WILL BE CLEANED UP AND REMOVED.
6. IF ON-SITE WATER IS NOT AVAILABLE, WATER TRUCKS SHALL BE PRESENT ON-SITE.

PERMANENT STABILIZATION:
ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISH GRADING. SEEDING SHALL BE DONE WITH A SITE SPECIFIC SEED, AS BASED ON TIME OF CONSTRUCTION AND AVAILABILITY, ACCORDING TO STD. & SPEC. 3.32, PERMANENT SEEDING, OF THE HANDBOOK (SEE SHEET 11). EROSION CONTROL BLANKETS WILL BE INSTALLED OVER FILL STEEP SLOPES WHICH HAVE BEEN BROUGHT TO FINAL GRADE AND HAVE BEEN SEEDED TO PROTECT THE SLOPES FROM RILL AND GULLY EROSION AND TO ALLOW SEED TO GERMINATE PROPERLY. MULCH (STRAW OR FIBER) WILL BE USED ON RELATIVELY FLAT AREAS. IN ALL SEEDING OPERATIONS, SEED, FERTILIZER AND LIME WILL BE APPLIED PRIOR TO MULCHING. SOIL TESTS SHALL BE REQUIRED TO DETERMINE SITE SPECIFIC LIME AND FERTILIZER REQUIREMENTS.

MAINTENANCE:
THE FOLLOWING IS A PROGRAM OF MAINTENANCE FOR MECHANICAL CONTROLS SPECIFIED IN THIS NARRATIVE AND ON THE PLAN:
1. THE SITE SUPERINTENDENT, OR HIS REPRESENTATIVE, SHALL MAKE A VISUAL INSPECTION OF ALL MECHANICAL CONTROLS AND NEWLY STABILIZED AREAS (I.E.-SEEDED OR SODDED AREAS) ON A DAILY BASIS (ESPECIALLY AFTER A HEAVY RAINFALL) TO INSURE THAT ALL CONTROLS ARE IN PLACE AND THAT NONE HAVE BEEN DAMAGED. ANY DAMAGED CONTROL SHALL BE REPAIRED PRIOR TO END OF THE WORK DAY TO INCLUDE RESEEDING OR RESODDING, IF NECESSARY.
2. ALL SILT TRAPPING FACILITIES SHALL BE CLEANED OUT AT 50% TRAP CAPACITY AND SEDIMENT SHALL BE DISPOSED OF BY SPREADING ON SITE (OR HAULING AWAY IF NOT SUITABLE FOR STRUCTURUAL FILL).
3. AFTER ALL CONSTRUCTION OPERATIONS HAVE ENDED AND ALL DISTURBED AREAS ARE STABILIZED, MECHANICAL SEDIMENT CONTROLS SHALL BE REMOVED AND GROUND SHALL BE RESTORED INCLUDING ESTABLISHMENT OF VEGETATION TO ITS NATURAL OR PROPOSED CONDITION. REMOVAL OF ANY CONTROL IS CONTINGENT UPON APPROVAL BY THE INSPECTOR.
4. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES AND BORROW AREAS SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES.

TEMPORARY SEEDING:
SEE SHEET III-288 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH) FOR ALLOWABLE PLANTING MATERIAL, SEEDING RATES, AND DATES. THE REQUIREMENTS OF THE 'SOUTH' PLANTING REQUIREMENTS SHALL BE FOLLOWED. LIMING SHALL BE BASED ON TABLE 3.31-A OF VESCH. FERTILIZERS SHALL BE APPLIED AS 600 LB/ACRE. THE FERTILIZER SHALL BE INCORPORATED INTO THE TOP 2-4" OF SOIL. SEED SHALL BE EVENLY APPLIED AND SMALL GRAINS SHALL BE PLANTED NO MORE THAN 1.5" DEEP. SEEDING MADE IN FALL FOR WINTER COVER AND DURING HOT SUMMER MONTHS SHALL BE MULCHED.

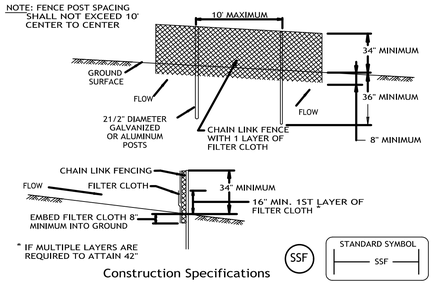
SODDING:
SODDED AREAS SHALL BE BROUGHT TO FINAL GRADE IN ACCORDANCE WITH THE APPROVED PLANS. SOIL TEST SHOULD BE MADE TO DETERMINE THE EXACT REQUIREMENTS FOR LIME AND FERTILIZER. PRIOR TO LAYING SOD, SOIL SURFACE SHALL BE CLEAR OF TRASH, DEBRIS AND LARGE OBJECTS. QUALITY OF SOD SHALL BE STATE CERTIFIED AND ENSURE GENETIC PURITY AND HIGH QUALITY. SOD SHALL NOT BE LAID IN EXCESSIVELY WET OR DRY WEATHER AND BE DELIVERED AND INSTALLED WITHIN 36 HOURS. SOD SHOULD NOT BE LAID ON FROZEN SOIL SURFACE AND SHALL BE INSTALLED PER PAGE III-339 OF VESCH.

STOCKPILING:
DURING CONSTRUCTION OF THIS PROJECT, SOIL STOCKPILES AND BORROW AREAS SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT CONTROL DEVICES.

UTILITY INSTALLATION:
UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:
1. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
2. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
3. 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.
4. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.
5. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.
6. APPLICABLE SAFETIES SHALL TAKE PLACE AND REGULATIONS SHALL BE COMPLIED WITH.

LAND CONSERVATION NOTES:
1. ALL E&S CONTROL MEASURES APPROVED WITH THE PHASE I E&S CONTROL PLAN SHALL BE PLACED PRIOR TO OR AS THE FIRST STEP IN GRADING. FIRST AREAS TO BE CLEARED ARE TO BE THOSE REQUIRED FOR THE PERIMETER CONTROLS.
2. ALL STORM AND SANITARY SEWER LINES NOT IN STREETS SHALL BE SEEDED AND MULCHED WITHIN 7 DAYS AFTER BACKFILL. NO MORE THAT 500' SHALL BE OPEN AT ANY ONE TIME.
3. ELECTRIC POWER, TELEPHONE AND GAS SUPPLY TRENCHES SHALL BE COMPACTED, SEEDED, AND MULCHED WITHIN 7 DAYS AFTER BACKFILL.
4. ALL TEMPORARY EARTH BERMS, DIVERSIONS AND SEDIMENT CONTROL DAMS SHALL BE SEEDED AND MULCHED FOR TEMPORARY VEGETATIVE COVER IMMEDIATELY (AS SOON AS POSSIBLE BUT NO LATER THAN 48 HOURS) AFTER COMPLETION OF GRADING. STRAW OR HAY MULCH IS REQUIRED. ALL SOIL STOCKPILES SHALL BE SEEDED AND MULCHED WITHIN 7 DAYS AFTER GRADING.
5. DURING CONSTRUCTION, ALL STORM SEWER INLETS SHALL BE PROTECTED BY INLET PROTECTION DEVICES,

SUPER SILT FENCE



Construction Specifications

1. Fencing shall be 42" in height and constructed in accordance with the latest VDOT Details for Chain Link Fencing.

2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.

3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.

4. Filter cloth shall be embedded a minimum of 8" into the ground.

5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.

6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height

7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

(CE) STONE CONSTRUCTION ENTRANCE

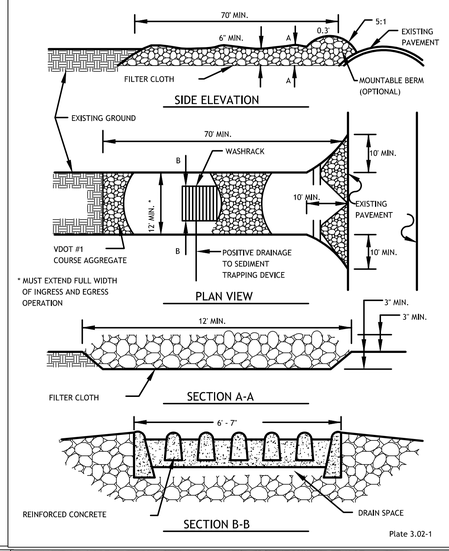


Plate 3.02-1

TABLE 3.32-D

SITE SPECIFIC SEEDING MIXTURES FOR COASTAL PLAIN AREA

	Total Lbs. Per Acre
Minimum Care Lawn	
- Commercial or Residential	
- Kentucky 31 or Turf-Type Tall Fescue	175-200 lbs.
or	
- Common Bermudagrass **	75 lbs.
High-Maintenance Lawn	
- Kentucky 31 or Turf-Type Tall Fescue	200-250 lbs.
or	
- Hybrid Bermudagrass (seed) **	40 lbs. (unhulled) 30 lbs. (hulled)
or	
- Hybrid Bermudagrass (by other vegetative establishment method, see Std. & Spec. 3.34)	
General Slope (3:1 or less)	
- Kentucky 31 Fescue	128 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop *	20 lbs.
	150 lbs.
Low Maintenance Slope (Steeper than 3:1)	
- Kentucky 31 Tall Fescue	93-108 lbs.
- Common Bermudagrass **	0-15 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop *	20 lbs.
- Sericea Lespedeza **	20 lbs.
	150 lbs.

* Use seasonal nurse crop in accordance with seeding dates as stated below:

February, March through April	Annual Rye
May 1st through August	Foxtail Millet
September, October through November 15th	Annual Rye
November 16th through January	Winter Rye

** May through October, use hulled seed. All other seeding periods, use unhulled seed. Weeping Lovegrass may be added to any slope or low-maintenance mix during warmer seeding periods; add 10-20 lbs./acre in mixes.

TABLE 3.35-A

ORGANIC MULCH MATERIALS AND APPLICATION RATES

MULCHES:	RATES: Per Acre	RATES: Per 1000 sq.ft.	NOTES:
Straw or Hay	1.5-2 Tons (Minimum 2 tons for winter cover)	70-90 lbs.	Free from weeds and coarse matter. Must be anchored. Spread with mulch blower or by hand.
Fiber Mulch	Minimum 1500lbs.	35 lbs.	Do not use as a mulch for winter cover or during hot, dry periods.* Apply as slurry.
Corn Stalks	4-6 tons	185-275 lbs.	Cut or shredded in 4-6" lengths. Air-dried. Do not use in fine turf areas. apply with a mulch blower or by hand.
Wood Chips	4-6 tons	185-275 lbs.	Free of coarse matter. Air-dried. Treat with 12lbs. Nitrogen per ton. Do not use in fine turf areas. Apply with a mulch blower, chip handler, or by hand.
Bark Chips or Shredded Bark	50-70 cu. yds.	1-2 cu. yds.	Free of coarse matter. Air-dried. Do not use in fine turf areas. Apply with a mulch blower, chip handler, or by hand.

* When fiber mulch is the only available mulch during periods when straw should be used, apply at a minimum rate of 2000 lbs./ac. or 45lbs./1000 s.f.

Source: Va. DSWC

TABLE 3.31-B

ACCEPTABLE TEMPORARY SEEDING PLANT MATERIALS

"QUICK REFERENCE FOR ALL REGIONS"

Planting Dates	Species	Rate (lbs./acre)
SEPT. 1-FEB. 15	50/50 Mix of Annual Ryegrass (Lolium multi-florum) & Cereal (Winter) Rye (Secale cereale)	50-100
FEB. 16-APR. 30	Annual Ryegrass (Lolium multi-florum)	60-100
MAY 1-AUG. 31	German Millet (Setaria italica)	50

Source: Va. DSWC

CHECKLIST

FOR EROSION AND SEDIMENT CONTROL PLANS

✓ Minimum Standards - All applicable Minimum Standards must be addressed.

NARRATIVE

✓ Project description - Briefly describes the nature and purpose of the land-disturbing activity, and the area (acres) to be disturbed.

✓ Existing site conditions - A description of the existing topography, vegetation and drainage.

✓ Adjacent areas - A description of neighboring areas such as streams, lakes, residential areas, roads, etc., which might be affeced by the land disturbance.

✓ Off-site areas - Describe any off-site land-disturbing activities that will occur (including borrow sites, waste or surplus areas, etc.). Will any other areas be disturbed?

✓ Soils - A brief description of the soils on the site giving such information as soil name, mapping unit, erodibility, permeability, depth, texture and soil structure.

✓ Critical areas - A description of areas on the site which have potentially serious erosion problems (e.g., steep slopes, channels, wet weather/ underground springs, etc.).

✓ Erosion and sediment control measures - A description of the methods which will be used to control erosion and sedimentation on the site. (Controls should satisfy minimum standards in Chapter 3.)

✓ Permanent stabilization - A brief description, including specifications, of how the site will be stabilized after construction is completed.

✓ Stormwater runoff considerations - Will the development site cause an increase in peak runoff rates? Will the increase in runoff cause flooding or channel degradation downstream? Describe the strategy to control stormwater runoff.

✓ Calculations - Detailed calculations for the design of temporary sediment basins, permanent stormwater detention basins, diversions, channels, etc. Include calculations for pre- and post-development runoff.

SITE PLAN

✓ Vicinity map - A small map locating the site in relation to the surrounding area. Include any landmarks which might assist in locating the site.

✓ Indicate north - The direction of north in relation to the site.

✓ Limits of clearing and grading - Areas which are to be cleared and graded.

✓ Existing contours - The existing contours of the site.

✓ Final contours - Changes to the existing contours, including final drainage patterns.

✓ Existing vegetation - The existing tree lines, grassed areas, or unique vegetation.

✓ Soils - The boundaries of different soil types.

✓ Existing drainage patterns - The dividing lines and the direction of flow for the different drainage areas. Include the size (acreage) of each drainage area.

✓ Critical erosion areas - Areas with potentially serious erosion problems. (See Chapter 6 for criteria.)

✓ Site Development - Show all improvements such as buildings, parking lots, access roads, utility construction, etc.

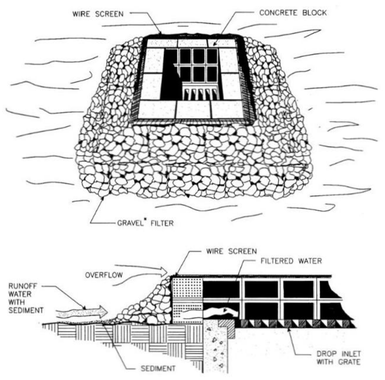
✓ Location of practices - The locations of erosion and sediment control and stormwater management practices used on the site. Use the standard symbols and abbreviations in Chapter 3 of the E&S Handbook.

✓ Off-site areas - Identify any off-site land-disturbing activities (e.g., borrow sites, waste areas, etc.). Show location of erosion controls. (Is there sufficient information to assure adequate protection and stabilization?)

✓ Detail drawings - Any structural practices used that are not referenced to the E&S Handbook or local handbooks should be explained and illustrated with detail drawings.

✓ Maintenance - A schedule of regular inspections and repair of erosion and sediment control structures should be set forth.

BLOCK AND GRAVEL DROP INLET SEDIMENT FILTER

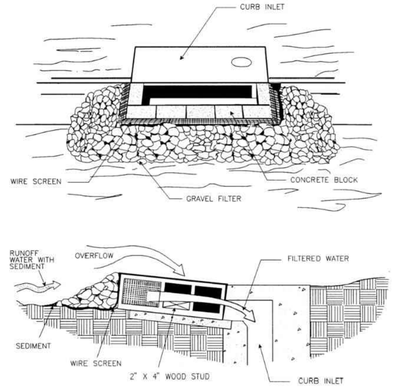


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

* GRAVEL SHALL BE VDOT #3, #357 OR #5 COARSE AGGREGATE.

BLOCK & GRAVEL CURB INLET SEDIMENT FILTER



SPECIAL APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE AN OVERFLOW CAPABILITY IS NECESSARY TO PREVENT EXCESSIVE PONDING IN FRONT OF THE STRUCTURE.

* GRAVEL SHALL BE VDOT #3, #357 OR #5 COARSE AGGREGATE

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

EROSION & SEDIMENT CONTROL DETAILS
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

SHEET
11
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

STORM SEWER DESIGN COMPUTATIONS

Project: CROSSROADS VILLAGE CENTER

From Point	To Point	Drainage Area	C Factor	C x A Increment	C x A Cumm.	Inlet Time Min.	Rain Fall In/Hr	Runoff Q C.F.S.	Invert Elev. Upper End	Invert Elev. Lower End	Length FT.	Slope %	Dia. IN.	Capacity Q C.F.S.	VEL. F.P.S.	Flow Time MIN.
EX.802	EX.800	0.60	0.59	0.35	0.35	5.00	6.41	2.27	358.98	358.60	41.75	0.91%	15	6.18	4.65	0.15
EX.800	EX.801	0.38	0.54	0.21	0.56	5.17	6.37	3.56	358.50	358.31	24.25	0.80%	15	5.79	3.48	0.12
EX.801	EX.SW82	0.32	0.62	0.20	0.76	5.29	6.34	4.80	358.21	358.11	19.0	0.50%	18	7.45	4.48	0.07
*																
EX.804	EX.804B	1.55	0.35	0.54	0.54	5.00	6.41	3.48	355.73	355.33	80.34	0.50%	15	4.58	3.38	0.40
EX.804B	EX.804A	0.00	0	0.00	1.06	5.74	6.23	6.59	355.23	355.02	42.36	0.50%	24	16.04	4.86	0.15
EX.804A	EX.SW82	0	0	0.00	1.06	5.84	6.20	6.56	354.92	354.87	10.0	0.50%	24	16.04	4.85	0.03
*																
EX.813	EX.812	0.42	0.85	0.36	0.36	5.00	6.41	2.29	359.00	357.88	224.86	0.50%	24	16.04	3.62	1.04
EX.812	811	0.60	0.85	0.51	0.87	6.01	6.16	5.34	357.78	357.23	108.44	0.50%	24	16.04	4.59	0.39
811	EX.810	0.52	0.85	0.44	1.31	6.35	6.08	7.95	357.13	357.00	25.39	0.52%	24	16.29	5.16	0.08
EX.810	EX.SW83	0.12	0.35	0.04	1.35	6.42	6.06	8.19	356.90	356.87	6.5	0.50%	24	16.04	5.13	0.02
*																
901A	901	0.32	0.85	0.27	0.27	5.00	6.41	1.74	358.54	358.00	54.50	1.00%	15	6.48	4.48	0.20
901	900	0.00	0	0.00	0.27	5.13	6.38	1.74	357.25	355.74	179.57	0.84%	24	20.74	4.01	0.75
900	EX.804B	0.29	0.84	0.24	0.52	5.58	6.27	3.23	355.64	355.33	62.96	0.50%	24	15.98	3.98	0.26
*																

STORM SEWER INLET COMPUTATIONS

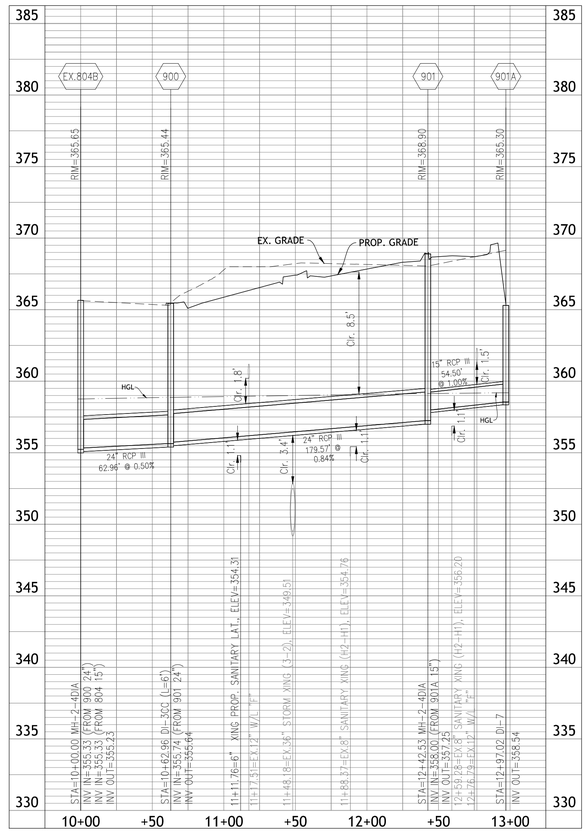
Project: CROSSROADS VILLAGE CENTER

INLET NUMBER	TYPE		STATION	DRAINAGE AREA	C	C x A	W	INTENSITY	Q INCR	Q CARRY OVER	Q TOTAL	S GUTTER	Sx CROSS SLOPE	T SPREAD	W	W/T	Sw	SwSx	Eo	a	S'w	Se	Lt	P EFFECTIVE LENGTH	Lt/t	d	E	h	Q INT	d/H	Qb CARRY OVER	T SPREAD AT SAG	REMARKS
EX.802	DI-3B	14.0		0.60	0.59	0.35	0.35	5.75	2.04		2.04	0.0400	0.0200	5.30	2.00	0.38	0.0833	4.17	0.87	3.52	0.15	0.15	12.06		1.16		1.00		2.04		0.00		
EX.800	DI-3C	8		0.19	0.68	0.13	0.13	5.75	0.74	0.00	0.74	0.02	0.02	3.09	2		0.083	4.15						11.60		0.14		0.42		0.34		7.22	
				0.19	0.68	0.13	0.13	5.75	0.74	0.00	0.74			3.09																			
EX.810	DI-1			0.12	0.35	0.04	0.04	5.75	0.24	0.00	0.24												5.17		0.06							
EX.812	DI-3C	18		0.30	0.85	0.26	0.26	5.75	1.47		1.47	0.02	0.02	5.37	2		0.083	4.15						21.60		0.15		0.42		0.36		7.51	
				0.30	0.85	0.26	0.26	5.75	1.47	0.00	1.47			5.37																			
EX.813	DI-1	6		0.42	0.85	0.36	0.36	5.75	2.05	0.00	2.05												6.42		0.22							
*																																
811	DI-3CC	12		0.26	0.85	0.22	0.22	5.75	1.27		1.27	0.0217	0.02	4.74	2		0.083	4.15						15.60		0.17		0.42		0.40		8.48	
				0.26	0.85	0.22	0.22	5.75	1.27	0.00	1.27			4.74																			
900	DI-3CC	6		0.15	0.84	0.13	0.13	5.75	0.72		0.72	0.0203	0.02	2.98	2		0.083	4.15						9.60		0.16		0.42		0.38		7.88	
				0.14	0.84	0.12	0.12	5.75	0.68	0.00	0.68			2.76																			
901A	DI-I			0.32	0.85	0.27	0.27	5.75	1.56	0.00	1.56												6.42		0.19							

HYDRAULIC GRADE LINE COMPUTATIONS

Project: CROSSROADS VILLAGE CENTER

INLET STATION (1)	UPSTREAM INLET	Outlet Water Surface Elev. (2)	Do in (3)	Qo cfs (4)	Lo ft (5)	Sfo % (6)	Hf ft (7)	JUNCTION LOSS Vo (8)	Ho (9)	Qi (10)	Vi (11)	QiVi (12)	2 Vi /2g	Hi (13)	Angle (14)	Hd (15)	Ht (16)	1.3 Ht (17)	0.5 Ht (18)	FINAL H (19)	Inlet Water Surface Elev. (20)	RIM ELEV. (21)
EXSW82																		Starting Elevation			358.39	
EX.804A		358.39	24.00	6.56	9.97	0.08	0.01	4.85	0.09					0.13		0.22	0.44	0.58	0.29	0.30	358.69	366.00
	EX.804B		24.00							6.59	4.86	31.99	0.37		70.00							
EX.804B		358.69	24.00	6.59	42.36	0.08	0.04	4.86	0.09					0.09		0.09	0.27	0.35	0.18	0.21	358.90	365.65
	EX.804		15.00							3.48	3.38	11.74	0.18	0.06	0.00	0.00						
	900		24.00							3.23	3.98	12.87	0.25	0.09	40.00	0.09						
EX.804		358.90	15.00	3.48	80.34	0.29	0.23	3.38	0.04					0.00		0.00	0.04	0.06	0.03	0.26	359.16	355.00
	0									3.48	0.00	0.00	0.00		0.00							
900		358.90	24.00	3.23	62.96	0.02	0.01	3.98	0.06					0.09		0.01	0.16	0.00	0.00	0.17	359.07	365.44
	901		24.00							1.74	4.01	6.95	0.25		8.00							
901		359.07	24.00	1.74	179.57	0.01	0.01	4.01	0.06					0.11		0.22	0.39	0.00	0.00	0.40	359.47	368.90
	901A		15.00							1.74	4.48	7.81	0.31		90.00							
901A		359.47	15.00	1.74	54.50	0.07	0.04	4.48	0.08					0.00		0.00	0.08	0.10	0.05	0.09	359.56	365.30
	0									1.74	0.00	0.00	0.00		0.00							
EX.801		358.39	18.00	4.80	19.04	0.21	0.04	4.48	0.08					0.07		0.12	0.27	0.35	0.17	0.21	358.60	362.65
	EX.800		15.00							3.56	3.48	12.39	0.19		79.00							
EX.800		359.31	15.00	3.56	24.25	0.30	0.07	3.48	0.05					0.12		0.00	0.16	0.21	0.11	0.18	359.49	362.50
	EX.802		15.00							2.27	4.65	10.55	0.34		0.00							
EX.802		359.60	15.00	2.27	41.75	0.12	0.05	4.65	0.08					0.00		0.00	0.08	0.11	0.05	0.11	359.70	362.90
	0									2.27	0.00	0.00	0.00		0.00							
EXSW83																		Starting Elevation			358.47	
EX.810		358.47	24.00	8.19	6.48	0.13	0.01	5.13	0.10					0.14		0.29	0.54	0.00	0.00	0.54	359.01	364.00
	811		24.00							7.95	5.16	41.01	0.41		90.00							
811		359.01	24.00	7.95	25.39	0.12	0.03	5.16	0.10					0.11		0.23	0.44	0.00	0.00	0.48	359.49	365.59
	EX.812		24.00							5.34	4.59	24.53	0.33		88.00							
EX.812		359.49	24.00	5.34	108.44	0.06	0.06	4.59	0.08					0.07		0.14	0.29	0.00	0.00	0.35	359.84	365.43
	EX.813		24.00							2.29	3.62	8.28	0.20		88.00							
EX.813		359.84	24.00	2.29	224.86	0.01	0.02	3.62	0.05					0.00		0.00	0.05	0.07	0.03	0.06	359.90	367.70
	0									2.29	0.00	0.00	0.00		0.00							



SWM AND BMP NARRATIVE

ALL STORMWATER AND BMP REQUIREMENTS ARE ACHIEVED BY THE UNDERGROUND DETENTION STRUCTURE PROPOSED IN THE OVERALL REVISION TO THE APPROVED CROSSROADS VILLAGE CENTER SITE PLAN #1977, SEE SHEETS 13-29. STORMTECH 8 AND BAYFILTER 8 WILL PROVIDE DETENTION AND TREATMENT FOR THIS SITE. THE EXISTING STORM DRAINAGE SYSTEM WAS DESIGNED FOR A MAXIMUM LOT COVERAGE OF 85%. THE PROPOSED LOT COVERAGE IS 50%. THEREFORE, THE DESIGN PROVIDED IN THE OVERALL REVISION TO THE APPROVED CROSSROADS VILLAGE SITE PLAN IS DEEMED ADEQUATE.

GENERAL NOTES:

1. THE CONTRACTOR SHALL IDENTIFY THE LIMITS OF EXCAVATION AND THE AMOUNT OF EXISTING WATERLINE PIPE THAT WILL BE EXPOSED WITH THE PWCSA FIELD INSPECTOR.

2. PRIOR TO EXCAVATING THE FULL TRENCH, THE CONTRACTOR SHALL TEST PIT AND EXPOSE ALL EXISTING WATERLINE PIPE JOINTS WITHIN THE PLANNED TRENCH AREA. ALL PIPE JOINTS WITHIN THE PLANNED EXCAVATION AREA SHALL BE MECHANICALLY RESTRAINED AGAINST MOVEMENT.

3. THE CONTRACTOR SHALL TEST PIPE AND EXPOSE ALL EXISTING WATERLINE PIPE JOINTS 20 FEET BEYOND THE LIMITS OF PLANNED TRENCH AREA. ALL PIPE JOINTS WITH 20 FEET OF A TRENCH WALL SHALL BE MECHANICALLY RESTRAINED AGAINST MOVEMENT.

4. THE CONTRACTOR SHALL REPLACE THE EXISTING JOINT RESTRAINTS IF THERE ARE ANY SIGNS OF CORROSION.

5. THE CONTRACTOR SHALL SECURE THE EXISTING WATERLINE THAT WILL BE EXPOSED IN THE TRENCH AGAINST MOVEMENT THAT WOULD RESULT IN A BREAK OR LEAK. AT THE REQUEST OF THE PWCSA FIELD INSPECTOR, THE CONTRACTOR SHALL HAVE A PROFESSIONAL ENGINEER CERTIFY THE MEANS AND METHODS PROPOSED TO SUPPORT THE EXISTING PIPE IN WRITING.

6. THE CONTRACTOR SHALL INSTALL #57 STONE FROM UNDISTRIBUTED SOIL TO THE SPRING LINE OF THE EXITING WATERLINE WITH 95% COMPACTION TO PREVENT VOIDS AND SETTLING OF THE BEDDING.

7. THE TOP OF THE PIPE SHALL BE BACKFILLED IN COMPLIANCE WITH PWCSA'S CURRENT UTILITY

HORIZONTAL SCALE

GRAPHIC SCALE

0 25 50 100

(IN FEET)

1 INCH = 50 FEET

VERTICAL SCALE

GRAPHIC SCALE

0 2.5 5 10

(IN FEET)

1 INCH = 5 FEET

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: AS NOTED

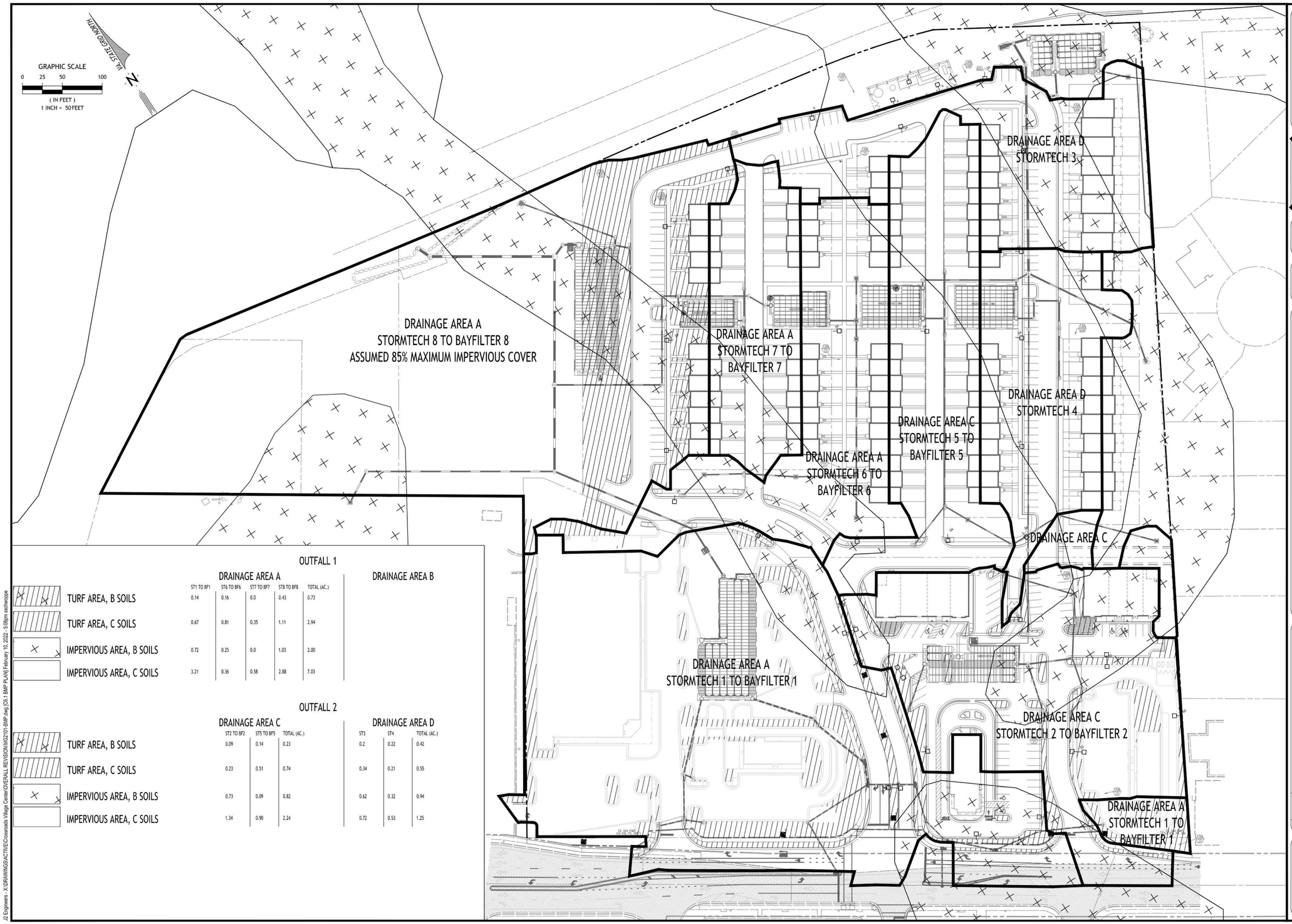
PLAN DATE
01/06/23
03/17/23
06/30/23

STORM COMPUTATIONS AND PROFILES
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

REVISIONS
No. DATE DESCRIPTION

SHEET
12
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)



OUTFALL 1

	DRAINAGE AREA A ST1 TO BF1	ST6 TO BF6	ST7 TO BF7	ST8 TO BF8	TOTAL (AC.)	DRAINAGE AREA B
TURF AREA, B SOILS	0.14	0.16	0.0	0.43	0.73	
TURF AREA, C SOILS	0.67	0.81	0.35	1.11	2.94	
IMPERVIOUS AREA, B SOILS	0.72	0.25	0.0	1.03	2.00	
IMPERVIOUS AREA, C SOILS	3.21	0.36	0.58	2.88	7.03	

OUTFALL 2

	DRAINAGE AREA C ST2 TO BF2	ST5 TO BF5	TOTAL (AC.)	DRAINAGE AREA D ST3	ST4	TOTAL (AC.)
TURF AREA, B SOILS	0.09	0.14	0.23	0.2	0.22	0.42
TURF AREA, C SOILS	0.23	0.51	0.74	0.34	0.21	0.55
IMPERVIOUS AREA, B SOILS	0.73	0.09	0.82	0.62	0.32	0.94
IMPERVIOUS AREA, C SOILS	1.34	0.90	2.24	0.72	0.53	1.25

J2 Engineers - X:\DRAWINGS\ACTIVE\Crossroads Village Center\OVERALL REVISION\MG2101-BMP.dwg [C6.1 BMP PLAN] February 10, 2022 - 5:08pm sschwoppe

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026
703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

PLAN# MG2101
DATE: OCTOBER, 2021
CONTOUR INT.= 2'
SCALE: 1"=50'

PLAN DATE
07/30/21
10/08/21
12/08/21
02/10/22

BMP PLAN
REVISION
CROSSROADS VILLAGE CENTER
GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
1.	02/10/22	BMP AREAS HAVE BEEN REVISED TO ACCOUNT FOR NEW DRAINAGE DIVIDES AND SURFACE CONDITIONS

REVISIONS

SHEET
C6.1
OF
106

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026
703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

SWM & BMP REFERENCE SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
13
OF
43

REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

Project Name:	Crossroads Village Center
Date:	8/6/2021

BMP Design Specifications List: 2013 Draft Stds & Specs

CLEAR ALL *(Ctrl+Shift+R)*

data input cells
constant values
calculation cells
final results

Site Information

Post-Development Project (Treatment Volume and Loads)

Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be		2.10	4.37		6.47
Impervious Cover (acres)		3.84	10.44		14.28
					20.75

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Total Phosphorus (TP) EMC (mg/L)	0.26
Total Nitrogen (TN) EMC (mg/L)	1.86
Target TP Load (lb/acre/yr)	0.41
Pj (unitless correction factor)	0.90

Runoff Coefficients (Rv)

	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	25.58

Site Results (Water Quality Compliance)

Area Checks	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	AREA CHECK
FOREST/OPEN SPACE (ac)	0.00	0.00	0.00	0.00	0.00	OK.
IMPERVIOUS COVER (ac)	9.03	0.00	3.06	2.19	0.00	OK.
IMPERVIOUS COVER TREATED (ac)	9.03	0.00	3.06	2.19	0.00	OK.
MANAGED TURF AREA (ac)	3.67	0.00	0.97	0.97	0.00	OK.
MANAGED TURF AREA TREATED (ac)	3.67	0.00	0.97	0.97	0.00	OK.
AREA CHECK	OK.	OK.	OK.	OK.	OK.	

Site Treatment Volume (ft^3)	54,259

Runoff Reduction Volume and TP By Drainage Area

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	TOTAL
RUNOFF REDUCTION VOLUME ACHIEVED (ft^3)	0	0	0	0	0	0
TP LOAD AVAILABLE FOR REMOVAL (lb/yr)	21.37	0.00	7.11	5.21	0.00	33.69
TP LOAD REDUCTION ACHIEVED (lb/yr)	14.94	0.00	4.97	2.08	0.00	22.00
TP LOAD REMAINING (lb/yr)	6.43	0.00	2.14	3.13	0.00	11.70
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	0.00	0.00	0.00	0.00	0.00	0.00

Total Phosphorus

FINAL POST-DEVELOPMENT TP LOAD (lb/yr)	34.09
TP LOAD REDUCTION REQUIRED (lb/yr)	25.58
TP LOAD REDUCTION ACHIEVED (lb/yr)	22.00
TP LOAD REMAINING (lb/yr):	12.10
REMAINING TP LOAD REDUCTION REQUIRED (lb/yr):	3.59

Total Nitrogen (For Information Purposes)

POST-DEVELOPMENT LOAD (lb/yr)	243.88
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	0.00
REMAINING POST-DEVELOPMENT NITROGEN LOAD (lb/yr)	243.88

LAND COVER SUMMARY – POST DEVELOPMENT

Land Cover Summary

Forest/Open Space Cover (acres)	0.00
Weighted Rv (forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	6.47
Weighted Rv (turf)	0.21
% Managed Turf	31%
Impervious Cover (acres)	14.28
Rv (impervious)	0.95
% Impervious	69%
Site Area (acres)	**20.75**
Site Rv	**0.72**

Treatment Volume and Nutrient Loads

Treatment Volume (acre-ft)	1.2456
Treatment Volume (cubic feet)	54,259
TP Load (lb/yr)	34.09
TN Load (lb/yr) (Informational Purposes Only)	243.88

WATER QUALITY NARRATIVE

USING THE VRRM SPREADSHEET, IT HAS BEEN DETERMINED THAT 25.58 LBS/YR OF PHOSPHORUS REDUCTION IS REQUIRED. THE PHOSPHORUS LOAD REDUCTION REQUIREMENT SHALL BE MET PARTIALLY THROUGH THE USE OF ISOLATOR ROWS OR APPROVED EQUALS AND BAY FILTERS OR APPROVED EQUALS. THE REMAINING 3.59 LBS/YR OF PHOSPHORUS REDUCTION SHALL BE MET THROUGH THE ACQUISITION OF OFF-SITE NUTRIENT CREDITS.

CP NUTRIENT BANK

HUC: 02070011

Applicant: Haymarket Development #1 LLC

1602 Village Market Blvd. Suite 235

Leesburg, VA 20175

RE: Nutrient Offset Availability

Ronald Green, (Broker)

Date: October 7, 2021

Project Reference: Crossroads Village Center

Attention: Scott Schwoppe

This letter is to confirm the availability of authorized nonpoint nutrient offsets at our CP Nutrient Bank project located in Westmoreland County. The CP Nutrient Bank project has received operational status through the Chesapeake Bay Watershed Nutrient Exchange Program (Virginia Code 62.1-44.19:14 et seq.) of the Virginia Department of Environmental Quality. CP Nutrient Bank currently has 27.22 pounds of phosphorus offsets and 426.25 pounds of nitrogen offsets available for transfer in the approved service area in the Potomac River watershed.

These offsets were certified pursuant to the Chesapeake Bay Nutrient Exchange Program by Virginia Department of Environmental Quality and the Virginia Department of Conservation and Recreation to be used as compensation for state or local permit water quality requirements. These offsets have been generated and are transferable according to 10.1-603.8:1 of the code of Virginia.

Per your request, the project would like to purchase 3.59 lbs/yr of phosphorus credits or 56.22 lbs./yr. of nitrogen credits. CP Nutrient Bank upon execution of a credit purchase agreement and payment shall transfer those credits to the project owner. The 3.59 phosphorus credits or 56.22 nitrogen credits shall be available for a period of 30 days from the date of this letter.

If we can provide further assistance please do not hesitate to contact me at 804-908-4171

Sincerely,

Ronald Green, (Broker)

Drainage Area A

OUTFALL 1, STORMTECH 1, 6, 7, 8 TO BAYFILTERS

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)		0.73	2.94		3.67	0.22
Impervious Cover (acres)		2.00	7.03		9.03	0.95
				Total	12.70	

CLEAR BMP AREAS

Total Phosphorus Available for Removal in D.A. A (lb/yr)	21.37
Post Development Treatment Volume in D.A. A (ft^3)	34,018

Stormwater Best Management Practices (RR = Runoff Reduction)

--Select from dropdown lists--

Practice	Runoff Reduction Credit (%)	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	Volume from Upstream Practice (ft^3)	Runoff Reduction (ft^3)	Remaining Runoff Volume (ft^3)	Total BMP Treatment Volume (ft^3)	Phosphorus Removal Efficiency (%)	Phosphorus Load from Upstream Practices (lb)	Untreated Phosphorus Load to Practice (lb)	Phosphorus Removed By Practice (lb)	Remaining Phosphorus Load (lb)	Downstream Practice to be Employed
14. Manufactured Treatment Devices (no RR)													
14.a ISOLATOR ROW	0	3.67	9.03	0	0	34,018	34,018	40	0.00	21.35	8.54	12.81	14.b. MTD - Filtering
BAYFILTER	0			34,018	0	34,018	34,018	50	12.81	0.00	6.40	6.40	

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# *BA2201*
DATE: *MARCH, 2023*
CONTOUR INT.= *N/A*
SCALE: *N/A*

PLAN DATE
01/06/23
03/17/23
06/30/23

PLAN# *MG2101*
DATE: *OCTOBER, 2021*
CONTOUR INT.= *2'*
SCALE: *1"=50'*

PLAN DATE
07/30/21
10/06/21
12/10/21
02/10/22

BMP WORKSHEET
REVISION
CROSSROADS VILLAGE CENTER
GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
1.	02/10/22	BMP AREAS HAVE BEEN REVISED TO ACCOUNT FOR NEW DRAINAGE DIVIDES AND SURFACE CONDITIONS

REVISIONS

SHEET
C6.2
OF
106

SWM & BMP REFERENCE SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
14
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

J2 Engineers - X:\DRAWINGS\ACTIVE\Crossroads Village Center\OVERALL REVISION\MG2101 BMP.dwg [26.2 BMP WORKSHEET] February 10, 2022 - 5:08pm sschwope

REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

Drainage Area C

OUTFALL 2, STORMTECH 2, 5 TO BAYFILTERS

CLEAR BMP AREAS

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)		0.23	0.74		0.97	0.22
Impervious Cover (acres)		0.82	2.24		3.06	0.95
				Total	4.03	

Total Phosphorus Available for Removal in D.A. C (lb/yr)	7.11
Post Development Treatment Volume in D.A. C (ft^3)	11,310

Stormwater Best Management Practices (RR = Runoff Reduction)

--Select from dropdown lists-

Practice	Runoff Reduction Credit (%)	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	Volume from Upstream Practice (ft^3)	Runoff Reduction (ft^3)	Remaining Runoff Volume (ft^3)	Total BMP Treatment Volume (ft^3)	Phosphorus Removal Efficiency (%)	Phosphorus Load from Upstream Practices (lb)	Untreated Phosphorus Load to Practice (lb)	Phosphorus Removed By Practice (lb)	Remaining Phosphorus Load (lb)	Downstream Practice to be Employed
14. Manufactured Treatment Devices (no RR)													
14.a ISOLATOR ROW	0	0.97	3.06	0	0	11,310	11,310	40	0.00	7.10	2.84	4.26	14.b. MTD - Filtering
BAYFILTER	0			11,310	0	11,310	11,310	50	4.26	0.00	2.13	2.13	

Drainage Area D

OUTFALL 2, STORMTECH 3, 4

CLEAR BMP AREAS

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)		0.42	0.55		0.97	0.21
Impervious Cover (acres)		0.94	1.25		2.19	0.95
				Total	3.16	

Total Phosphorus Available for Removal in D.A. D (lb/yr)	5.21
Post Development Treatment Volume in D.A. D (ft^3)	8,296

Stormwater Best Management Practices (RR = Runoff Reduction)

--Select from dropdown lists-

Practice	Runoff Reduction Credit (%)	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	Volume from Upstream Practice (ft^3)	Runoff Reduction (ft^3)	Remaining Runoff Volume (ft^3)	Total BMP Treatment Volume (ft^3)	Phosphorus Removal Efficiency (%)	Phosphorus Load from Upstream Practices (lb)	Untreated Phosphorus Load to Practice (lb)	Phosphorus Removed By Practice (lb)	Remaining Phosphorus Load (lb)	Downstream Practice to be Employed
14. Manufactured Treatment Devices (no RR)													
14.a. ISOLATOR ROW	0	0.97	2.19	0	0	8,296	8,296	40	0.00	5.21	2.08	3.12	

J2 Engineers - X:\DRAWINGS\ACTIVE\Crossroads Village Center\OVERALL REVISION\M02101.BMP.dwg f:\20.3 BMP WORKSHEET] February 10, 2022 - 5:08pm isshnoppe

REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23

PLAN# M02101
DATE: OCTOBER, 2021
CONTOUR INT.= 2'
SCALE: 1"=50'

PLAN DATE
07/30/21
10/06/21
12/20/21
02/10/22

BMP WORKSHEET
REVISION
CROSSROADS VILLAGE CENTER
GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
1.	02/10/22	BMP AREAS HAVE BEEN REVISED TO ACCOUNT FOR NEW DRAINAGE DIVIDES AND SURFACE CONDITIONS

REVISIONS

SHEET
C6.3
OF
106

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

SWM & BMP REFERENCE SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

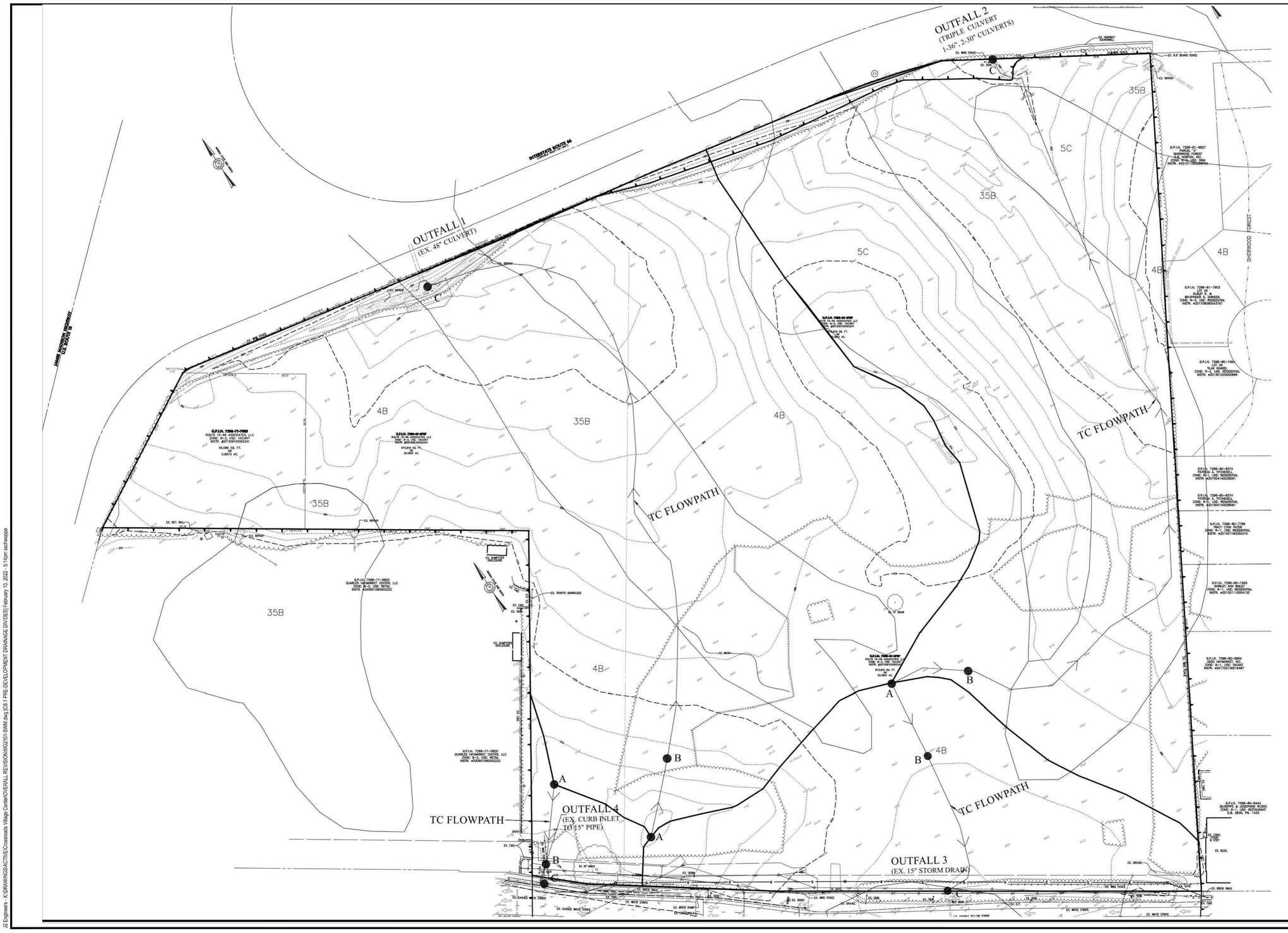
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
15
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)



J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.J2engineers.com

PLAN# MG2101
DATE: OCTOBER, 2021
CONTOUR INT.= 2'
SCALE: 1"=50'

PLAN DATE
07/30/21
12/20/21
1/20/22
02/10/22

PRE-DEVELOPMENT DRAINAGE DIVIDES

REVISION

CROSSROADS VILLAGE CENTER

GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
C8.1
OF
106

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.J2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

SWM & BMP REFERENCE SHEET

FINAL SITE PLAN

KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
16
OF
43

REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

J2 Engineers - X:\DRAWINGS\ACTIVE\Crossroads Village Center\OVERALL REVISION\MG2101-SWM.dwg [C8.1 PRE-DEVELOPMENT DRAINAGE DIVIDES] February 10, 2022 - 5:14pm aschwoppe

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

Pre-Development Flow to Outfalls

Outfall 1 Existing 48 culvert under Route 66

Assume Good Woods
Total drainage area = 10.48 Acres
2.76 Acres B Soils woods, CN = 55
7.72 Acres C Soils woods, CN = 70
Composite CN
2.76 x 55 = 151.80
7.72 x 70 = 540.40
10.48 692.20/10.48 = 66.05 = CN, use 66

Tc
A-B Overland Flow 100 LF, Change in Elevation = 6.0'
From Seelye Chart TC = 11 min.
B-C Shallow Concentrated Flow 830 LF, Change in elevation = 24.5'
S = .0295, V = 2.8 fps, 830/2.8 = 296 seconds = 4.94 min
Total TC = 11+4.94 = 15.94 min., Use 16 minutes

Energy Balance Volume
S = 1000/CN -10 = 5.15
Q = (P-.2S)^2/P+.8S = (2.51 - .2(5.15))^2/2.51 + .8(5.15) = 2.19/6.63 = .33"
Volume = 10.48 Acres x .33" x 43560 x 1/12 = 12,554 CF

Pre-Development Flow
1 YR = 2.906 cfs
2 Yr = 6.141
10 Yr = 19.51 cfs
100 Yr = 43.41 cfs

Outfall 2 Existing triple culvert under Route 66
(1-36", 2-30")

Assume Good Woods
Total drainage area = 7.46 Acres
3.21 Acres B Soils woods, CN = 55
4.25 Acres C Soils woods, CN = 70
Composite CN
3.21 x 55 = 176.55
4.25 x 70 = 297.50
7.46 474.05/7.46 = 63.546 = CN, use 63.5

Tc
A-B Overland Flow 100 LF, Change in Elevation = .35'

From Seelye Chart TC = 19 min.
B-C Shallow Concentrated Flow 1010 LF, Change in elevation = 20.7'
S = .0205, V = 2.3 fps, 1010/2.3 = 439.13 seconds = 7.3 min
Total TC = 19+7.3 = 26.3 min., Use 26 minutes

Energy Balance Volume
S = 1000/CN -10 = 1000/63.5 – 10 = 5.748
Q = (P-.2S)^2/P+.8S = (2.51 - .2(5.748))^2/2.51 + .8(5.748) = 1.85/7.108 = .26"
Volume = 7.48 Acres x .26" x 43560 x 1/12 = 7041 CF

Pre-Development Flow
1 YR = 0.959 cfs
2 Yr = 2.348 cfs
10 Yr = 8.922 cfs
100 Yr = 21.39 cfs

Outfall 3 Existing 15" storm drain across Washington Street

Assume Good Woods
Total drainage area = 2.64 Acres
0.14 Acres B Soils woods, CN = 55
2.50 Acres C Soils woods, CN = 70
Composite CN
0.14 x 55 = 7.70
2.50 x 70 = 175.00
7.46 182.7/2.64 = 69.20 = CN, use 69.2

Tc
A-B Overland Flow 100 LF, Change in Elevation = 1.20'
From Seelye Chart TC = 12.5 min.
B-C Shallow Concentrated Flow 200 LF, Change in elevation = 3.75'
S = .01875, V = 2.2 fps, 200/2.2 = 90.91 seconds = 1.52 min
Total TC = 15.5+1.52 = 17.02 min., Use 17 minutes

Energy Balance Volume
S = 1000/CN -10 = 1000/69.2 – 10 = 4.45
Q = (P-.2S)^2/P+.8S = (2.51 - .2(4.45))^2/2.51 + .8(4.45) = 2.62/6.07 = .43"
Volume = 2.64 Acres x .43" x 43560 x 1/12 = 4121 CF

Pre-Development Flow
1 YR = 1.063 cfs
2 Yr = 1.962 cfs
10 Yr = 5.412 cfs
100 Yr = 11.38 cfs

Outfall 4 Existing Storm Inlet in Washington Street

Assume Good Woods
Total drainage area = 0.37 Acres
0.37 Acres C Soils woods, CN = 70

Tc
A-B Overland Flow 100 LF, Change in Elevation = 2.90'
From Seelye Chart TC = 12.6 min.
B-C Shallow Concentrated Flow 25 LF, Change in elevation = 2.20'
S = .088, V = 4.8 fps, 25/4.8 = 5.2 seconds = 0.08 min
Total TC = 12.6+0.08 = 12.68 min., Use 13 minutes

Energy Balance Volume
S = 1000/CN -10 = 1000/70 – 10 = 4.29
Q = (P-.2S)^2/P+.8S = (2.51 - .2(4.29))^2/2.51 + .8(4.29) = 2.729/5.942 = .46"
Volume = 0.37 Acres x .46" x 43560 x 1/12 = 618 CF

Pre-Development Flow
1 YR = 0.200 cfs
2 Yr = 0.354 cfs
10 Yr = 0.927 cfs
100 Yr = 1.907 cfs

OUTFALL 1 PRE-DEVELOPMENT RELEASE RATES

1 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	2.906	1	726	12,717	----	----	----	Pre-Dev Outfall 1

2 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	6.141	1	726	21,723	----	----	----	Pre-Dev Outfall 1

10 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	19.51	1	724	58,042	----	----	----	Pre-Dev Outfall 1

25 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	30.58	1	724	88,491	----	----	----	Pre-Dev Outfall 1

100 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	43.41	1	723	134,337	----	----	----	Pre-Dev Outfall 1

OUTFALL 2 PRE-DEVELOPMENT RELEASE RATES

1 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.959	1	734	7,165	----	----	----	Pre-Dev flow to Outfall 2

2 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	2.348	1	732	12,769	----	----	----	Pre-Dev flow to Outfall 2

10 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	8.922	1	730	36,492	----	----	----	Pre-Dev flow to Outfall 2

25 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	14.82	1	730	67,610	----	----	----	Pre-Dev flow to Outfall 2

100 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	21.29	1	730	91,150	----	----	----	Pre-Dev flow to Outfall 2

OUTFALL 3 PRE-DEVELOPMENT RELEASE RATES

1 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	1.063	1	726	4,065	----	----	----	Pre-Development Flow to Outfall 3

2 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	1.962	1	726	6,834	----	----	----	Pre-Development Flow to Outfall 3

10 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	5.412	1	726	16,446	----	----	----	Pre-Development Flow to Outfall 3

100 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	11.38	1	724	33,724	----	----	----	Pre-Development Flow to Outfall 3

OUTFALL 4 PRE-DEVELOPMENT RELEASE RATES

1 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.200	1	723	608	----	----	----	Pre-Development Flow to Outfall 4

2 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.354	1	722	974	----	----	----	Pre-Development Flow to Outfall 4

10 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.927	1	721	2,373	----	----	----	Pre-Development Flow to Outfall 4

100 YEAR

Hydrograph Summary Report

HydroFlow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.0M

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	1.907	1	721	4,817	----	----	----	Pre-Development Flow to Outfall 4

Post Development to Outfall and Energy Balance Equation

Outfall 1 – ST 1, ST6, ST7, and ST 8, ST9

Outfall	Flowrates			
Facility	Q1	Q2	Q10	Q100
ST1	0.106 cfs	0.414 cfs	4.366 cfs	29.82 cfs
ST6	0.030 cfs	0.104 cfs	1.626 cfs	8.650 cfs
ST7	0.038 cfs	0.175 cfs	3.189 cfs	7.806 cfs
ST8	0.097 cfs	0.381 cfs	3.731 cfs	25.88 cfs
ST9	0.070 cfs	0.256 cfs	2.301 cfs	20.14 cfs
Total	0.341 cfs			

There is no bypass flow to Outfall 1

Total Post-Dev Volume to Outfall 1

Facility	Area	Weighted CN	Area x CN
ST1	4.31 Acres	93.7	= 403.85
ST6	1.58 Acres	75.7	= 119.61
ST7	0.93 Acres	89.0	= 82.77
ST8	3.92 Acres	84.1	= 329.67
ST9	1.90 Acres	89.4	= 169.86
	12.64 Acres		1105.8/12.64 = 87.5

Post Development Volume
S = 1000/CN – 10 = 1000/87.5 – 10 = 1.43
Q = (P-.2S)^2/P+.8S = (2.51 - .2(1.43))^2/2.51 + .8(1.43) = 4.946/3.654 = 1.35"
Volume = 12.64 Acres x 1.35" x 43560 x 1/12 = 61,942.32 CF

1 Year allowable release rate to meet Energy Balance Equation
Q1 post </= Q1 Pre (Volume Pre/Volume Post) x IF
Q1 Post </= 2.906 (12,554/61,942.32) x 0.8
Q1 Post </= 0.47 cfs from site
Since 0.341 cfs < 0.47 cfs, the Energy Balance Equation is met.

Outfall 2 – ST 2, ST3, ST4, and ST 5

Outfall	Flowrates			
Facility	Q1	Q2	Q10	Q100
ST2	0.048 cfs	0.151 cfs	1.612 cfs	20.62 cfs
ST3	0.039 cfs	0.161 cfs	1.621 cfs	12.78 cfs
ST4	0.033 cfs	0.109 cfs	0.998 cfs	11.12 cfs
ST5	0.037 cfs	0.132 cfs	1.424 cfs	13.05 cfs
Total	0.157 cfs			

See Bypass Information Below

Total Post-Dev Volume to Outfall 2

Facility	Area	Weighted CN	Area x CN
ST2	2.30 Acres	93.0	= 213.9
ST3	1.88 Acres	89.7	= 168.6
ST4	1.28 Acres	87.7	= 112.3
ST5	1.64 Acres	87.4	= 143.3
	7.10 Acres		638.1/7.10 = 89.9

Post Development Volume
S = 1000/CN – 10 = 1000/89.9 – 10 = 1.123
Q = (P-.2S)^2/P+.8S = (2.51 - .2(1.123))^2/2.51 + .8(1.123) = 5.22/3.41 = 1.53"
Volume = 7.10 Acres x 1.53" x 43560 x 1/12 = 39,433 CF

There is bypass flow to Outfall 2. This needs to be accounted for in the post-development volume and flowrate.

On-site Bypass Flow

1.05 Acres, B Soils Turf x 61 = 64.05
0.22 Acres, C Soils Turf x 74 = 16.28
0.11 Acres, B Soils Pavement x 98 = 10.78
1.38 Acres 91.11/1.38 = 66.0

Volume Bypass
S = 1000/CN – 10 = 1000/66 – 10 = 5.152
Q = (P-.2S)^2/P+.8S = (2.51 - .2(5.152))^2/2.51 + .8(5.152) = 2.19/6.63 = 0.33"
Volume = 1.38 Acres x 0.33" x 43560 x 1/12 = 1653.10 CF

Bypass Flow 1.38 Acres, CN = 66, Tc = 26 min

Q1 = 0.275 cfs
Q2 = .584 cfs
Q10 = 1.917 cfs
Q100 = 4.33 cfs

1 Year allowable release rate to meet Energy Balance Equation
Q1 post </= Q1 Pre (Volume Pre/Volume Post) x IF – Bypass Flow
Q1 Post </= 0.959 (7,041/39,433 + 1653.10) x 0.8 – 0.275 cfs
Q1 Post </= 0.13 – Bypass Flow
Since the bypass flow of 0.275 cfs is more than the allowable release rate from the site, **the Energy Balance Equation cannot be met for Outfall 2.** Adequate channel comps will be performed for Outfall 2.

Outfall 3 – Overland Flow to existing 15" SD pipe
125 SF, C soils, Turf
650 SF, C Soils Pavement

Weighted CN
.003 x 74 = .222
.015 x 98 = 1.470
.018 1.692/.018 = 94

Tc = 5 min.

Q1 = 0.059 cfs
Q2 = 0.074 cfs
Q10 = 0.119 cfs
Q100 = 0.184 cfs

Post Development Volume
S = 1000/CN – 10 = 1000/94 – 10 = 0.638
Q = (P-.2S)^2/P+.8S = (2.51 - .2(0.638))^2/2.51 + .8(0.638) = 5.676/3.020 = 1.88"
Volume = 0.018 Acres x 1.88" x 43560 x 1/12 = 545.95 CF

1 Year allowable release rate to meet Energy Balance Equation
Q1 post </= Q1 Pre (Volume Pre/Volume Post) x IF – Bypass Flow
Q1 Post </= 1.063 (4121/545.95) x 0.9
Q1 Post </= 7.221

Since, 0.059 cfs < 7.221 cfs, Energy Balance Met

Since the discharge to structure 112 is less than the pre-development flow, there is a reduction in flow to the storm drain system. The channel should then be considered adequate. The **Energy Balance Equation has been met for Outfall 3.**

Outfall 4 – Overland Flow to existing curb inlet
0.044 Acres, C soils, Turf
CN = 74
Tc = 5 min.

Q1 = 0.048 cfs
Q2 = 0.076 cfs
Q10 = 0.172 cfs
Q100 = 0.327 cfs

Post Development Volume
S = 1000/CN – 10 = 1000/74 – 10 = 3.51
Q = (P-.2S)^2/P+.8S = (2.51 - .2(3.51))^2/2.51 + .8(3.51) = 3.269/5.318 = 0.61"
Volume = 0.044 Acres x 0.61" x 43560 x 1/12 = 97.43 CF

1 Year allowable release rate to meet Energy Balance Equation
Q1 post </= Q1 Pre (Volume Pre/Volume Post) x IF – Bypass Flow
Q1 Post </= 0.200 (618/97.43) x 0.9
Q1 Post </= 1.417

Since, 0.048 cfs < 1.417 cfs, Energy Balance Met

Since the discharge to the existing curb inlet is less than the pre-development flow, there is a reduction in flow to the storm drain system. The channel should then be considered adequate. The **Energy Balance Equation has been met for Outfall 4.**

Outfall 1

There is an existing 48 inch Culvert under Route 66 at Outfall 1. This culvert was designed to pass the 100 year storm. The pre-development design includes the following flows:
2 year storm = 47.22 cfs
50 year storm = 93.29 cfs
100 year storm = 106.40 cfs.
The 100 year flow must be less than 106.40 cfs to keep the culvert adequate.

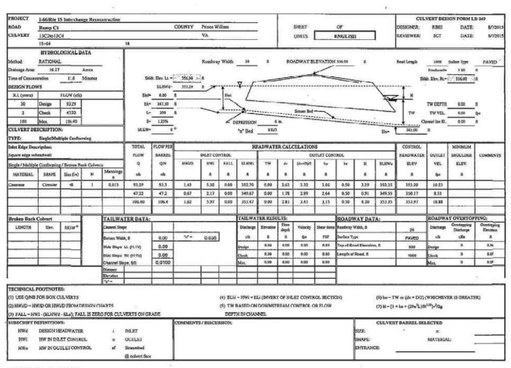
There is offsite flow to this culvert in addition to the onsite flow. The 100 year offsite flow is 12.46 cfs. The total on-site flow is 92.296 cfs. This brings the total post-development flow to the culvert to 104.76 cfs, which is less than the pre-development flow of 106.40 cfs. The existing 48" culvert should not be negatively impacted.

Outfall 2

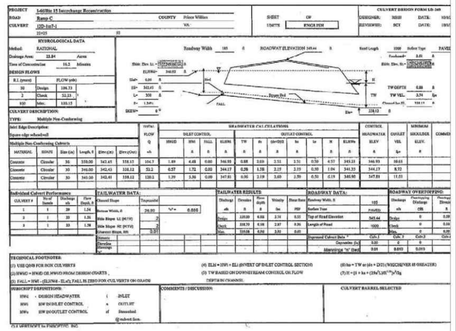
There is an existing triple culvert under Route 66 at Outfall 2. There are two 30" pipes and one 36" pipe. This culvert was designed to pass the 100 year storm. The pre-development design includes the following flows:
2 year storm = 52.23 cfs
50 year storm = 104.73 cfs
100 year storm = 120.15 cfs
The 100 year flow must be less than 120.15 cfs to keep the culvert adequate.

There is 4.18 acres of offsite water entering this culvert through the outfall pipe. There is also flow from the existing stormwater management pond. The total 100 year flow from the offsite area is 31.10 cfs. The 100 year flow from the Sherwood Forest Pond is 13.23 cfs. There is also on-site bypass flow that does not go through the stormwater management facilities, but directly to the storm drain system. The 100 year flow from the on-site bypass area is 4.33 cfs. The total on-site flow through the SWM facilities is 57.57 cfs. This brings the total flow to the culvert to 106.23 cfs, which is less than the pre-development flow of 120.15 cfs. The existing triple culvert should not be negatively impacted.

EXISTING 48" CULVERT COMPS



EXISTING TRIPLE CULVERT COMPS



FOR REVISION NARRATIVE, PLEASE SEE SHEET C8.2A.

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.J2engineers.com

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.J2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/2023
PROFESSIONAL ENGINEER

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/2023
PROFESSIONAL ENGINEER

PLAN# *BA2201*
DATE: *MARCH, 2023*
CONTOUR INT.= *N/A*
SCALE: *N/A*

PLAN# *MG2101*
DATE: *OCTOBER, 2021*
CONTOUR INT.= *N/A*
SCALE: *N/A*

PLAN DATE
07/20/22
12/20/21
12/20/21
08/10/22

PLAN DATE
01/06/23
03/17/23
06/30/23

OUTFALL ANALYSIS
REVISION
CROSSROADS VILLAGE CENTER
GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

DESCRIPTION
REVISIONS
No. DATE

SHEET
C8.2
OF
106

SWM & BMP REFERENCE SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

DESCRIPTION
REVISIONS
No. DATE

SHEET
17
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

J2 Engineers - X:\DRAWINGS\ACTIVE\Crossroads Village Center\OVERALL REVISION\MG2101-SWM.dwg [C8.2 OUTFALL ANALYSIS] February 10, 2022 - 5:14pm aschwope

REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

SWM REVISION NARRATIVE

THIS REVISION PROPOSES CHANGES TO ALL STORMTECH SYSTEMS.

OUTFALL 1

STORMTECHS 1, 6, 7, & 8 CONTRIBUTE TO OUTFALL 1.

STORMTECH 9 HAS BEEN REMOVED AND STORMTECH 8 HAS BEEN REVISED TO PROVIDE TREATMENT FOR THE ENTIRE PAD WEST OF THE ZONING LINE AT THE MAXIMUM IMPERVIOUS LOT COVERAGE ALLOWED PER MUNICIPAL CODE AT 85% IMPERVIOUS TO ACCOUNT FOR ANY FUTURE DEVELOPMENT.

STORMTECH 1 HAS A REVISED LAYOUT AND CONTROL STRUCTURE TO ACCOUNT FOR CHANGES ON THIS PORTION OF THE SITE.

STORMTECH 6 HAS A REVISED CONTROL STRUCTURE.

SOTMRTECH 7 HAS A REVISED CONTROL STRUCTURE AND LAYOUT.

THE ORIGINAL POST-CONDITION FLOWS FOR OUTFALL 1 ARE (PER SHEET C8.2):
Q1=0.341 CFS
Q10=15.213 CFS

THE REVISED POST CONDITION 1 YEAR FLOWS FOR OUTFALL 1 ARE (PER SHEETS C9.11-C9.26):
ST1: 0.104 CFS
ST6: 0.040 CFS
ST7: 0.035 CFS
ST8: 0.158 CFS
TOTAL: 0.337 CFS < 0.341 CFS

THE REVISED POST CONDITION 10 YEAR FLOWS FOR OUTFALL 1 ARE (PER SHEETS C9.11-C9.26):
ST1: 4.424 CFS
ST6: 1.563 CFS
ST7: 3.007 CFS
ST8: 5.830 CFS
TOTAL: 14.824 CFS < 15.213 CFS

SINCE THE REVISED POST-CONDITION FLOWS ARE LESS THAN THE ORIGINAL POST-CONDITION FLOWS, ANALYSIS ON SHEET C8.2 IS STILL VALID FOR OUTFALL 1.

OUTFALL 2

STORMTECHS 2, 3, 4, & 5 CONTRIBUTE TO OUTFALL 2.

STORMTECH 2 HAS A REVISED CONTROL STRUCTURE.

STORMTECH 3 HAS A REVISED LAYOUT AND CONTROL STRUCTURE.

STORMTECH 4 HAS A REVISED LAYOUT AND CONTROL STRUCTURE.

STORMTECH 5 HAS A REVISED LAYOUT AND CONTROL STRUCTURE.

THE ORIGINAL POST-CONDITION FLOWS FOR OUTFALL 2 ARE (PER SHEET C8.2):
Q1=0.157 CFS
Q10=5.655 CFS

THE REVISED POST CONDITION 1 YEAR FLOWS FOR OUTFALL 2 ARE (PER SHEETS C9.11-C9.26):
ST2: 0.048 CFS
ST3: 0.036 CFS
ST4: 0.028 CFS
ST5: 0.033 CFS
TOTAL: 0.145 CFS < 0.157 CFS

THE REVISED POST CONDITION 10 YEAR FLOWS FOR OUTFALL 3 ARE (PER SHEETS C9.11-C9.26):
ST2: 1.536 CFS
ST3: 1.604 CFS
ST4: 0.991 CFS
ST5: 1.414 CFS
TOTAL: 5.545 CFS < 5.655 CFS

1 YEAR AND 10 YEAR REVISED POST CONDITION FLOWS ARE LESS THAN ORIGINAL POST CONDITION FLOWS. HOWEVER, OUTFALL 2 DID NOT ORIGINALLY MEET ENERGY BALANCE AND ANAYLSIS OF THE EXISTING DOWNSTREAM CULVERT WAS PERFORMED. THE ORIGINAL DETAINED ON SITE 100 FLOW WAS 57.57 CFS. THE REVISED 100 YEAR POST CONDITION FLOW WAS CALCULATED USING A WEIGHTED CURVE NUMBER ENCOMPASSING THETOTAL DRIANAGE AREA TO STORMTECHS 2, 3, 4, & 5 UTILIZING A TIME OF CONCENTRATION AS SHOWN ON SHEET C8.4.

Summary for Subcatchment 106S: ONSITE DETAINED OUTFALL 2

[47] Hint: Peak is 274% of capacity of segment #2

Runoff = 69.712 cfs @ 12.00 hrs, Volume= 4.095 af, Depth> 6.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=8.03"

Area (ac)	CN	Description
* 0.650	61	B TURF
* 1.290	74	C TURF
* 1.760	98	B IMPERVIOUS
* 3.490	98	C IMPERVIOUS
7.190	90	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2					**Direct Entry, FROM STORM COMPUTATIONS**
0.2	81	0.0370	6.37	25.463	**Trap/Vee/Rect Channel Flow, DITCH FROM OUTFALL TO C** Bot.W=1.00' D=1.00' Z= 3.0 '/ Top.W=7.00' n= 0.030 Earth, grassed & winding
9.4	81	Total			

THE REVISED 100 YEAR FLOW IS 69.712 CFS, WHICH IS GREATER THEN THE ORIGINAL POST CONDITION 100 YEAR FLOW OF 57.57. HOWEVER, THE PRE-CONDITION FLOW TO THE CULVERT IS CALCULATED AS 120.15 CFS PER SHEET C8.3. THE REVISED POST-CONDITION FLOW IS NOW 118.372 CFS WHICH IS LESS THAN THE PRE- CONDITION FLOW. THE EXISTING TRIPLE CULVERT SHOULD NOT BE NEGATIVELY IMPACTED.

OUTFALLS 3 & 4 HAVE REMAINED UNCHANGED WITH THIS REVISION.

J2 engineers
J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026
703.361.1550 (office)
703.956.6845 (fax)
www.J2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# MG2101
DATE: OCTOBER, 2021
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
07/30/21
12/29/21
12/20/21
02/10/22

OUTFALL ANAYSIS
REVISION
CROSSROADS VILLAGE CENTER
GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
1.	02/10/22	SWM ANALYSIS FOR OUTFALLS 1 & 2 HAVE BEEN UPDATED PER REVISION CHANGES.

REVISIONS

SHEET
C8.2A
OF
106

J2 engineers
J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026
703.361.1550 (office)
703.956.6845 (fax)
www.J2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

SWM & BMP REFERENCE SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION

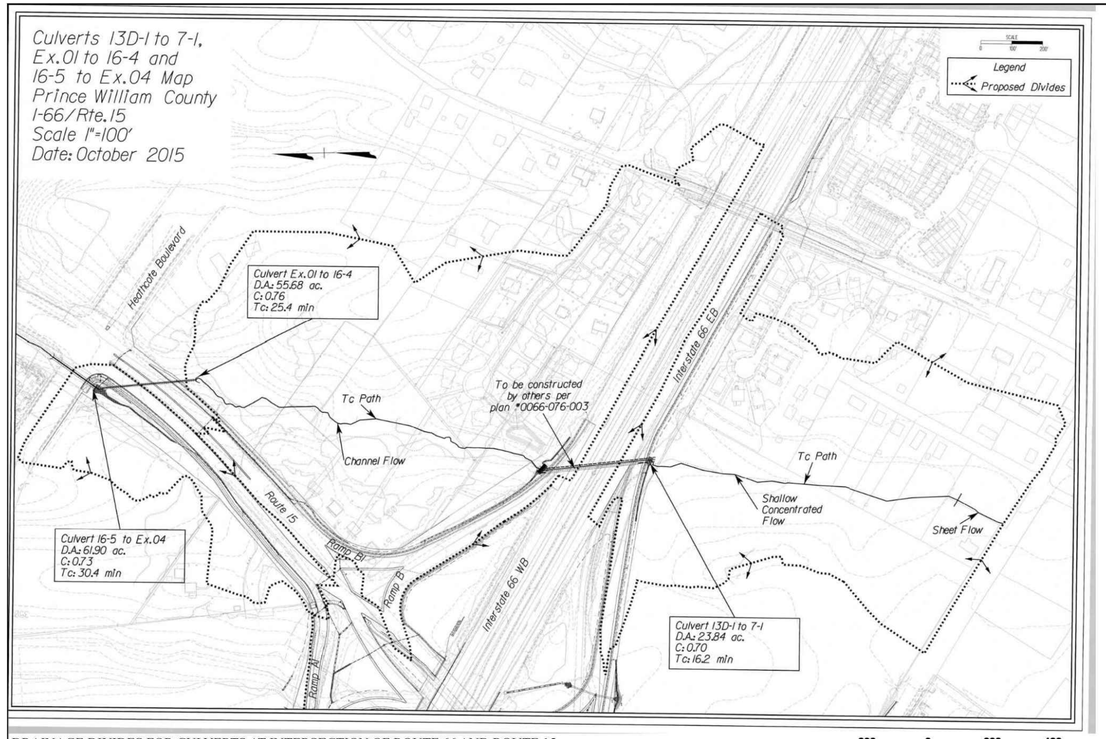
REVISIONS

SHEET
18
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

J:\2 Engineers - X:\DRAWINGS\ACTIVE\Crossroads Village Center\OVERALL REVISION\MG2101-SWM.dwg [C8.2A OUTFALL ANAYSIS] February 10, 2022 - 5:14pm sschwoppe

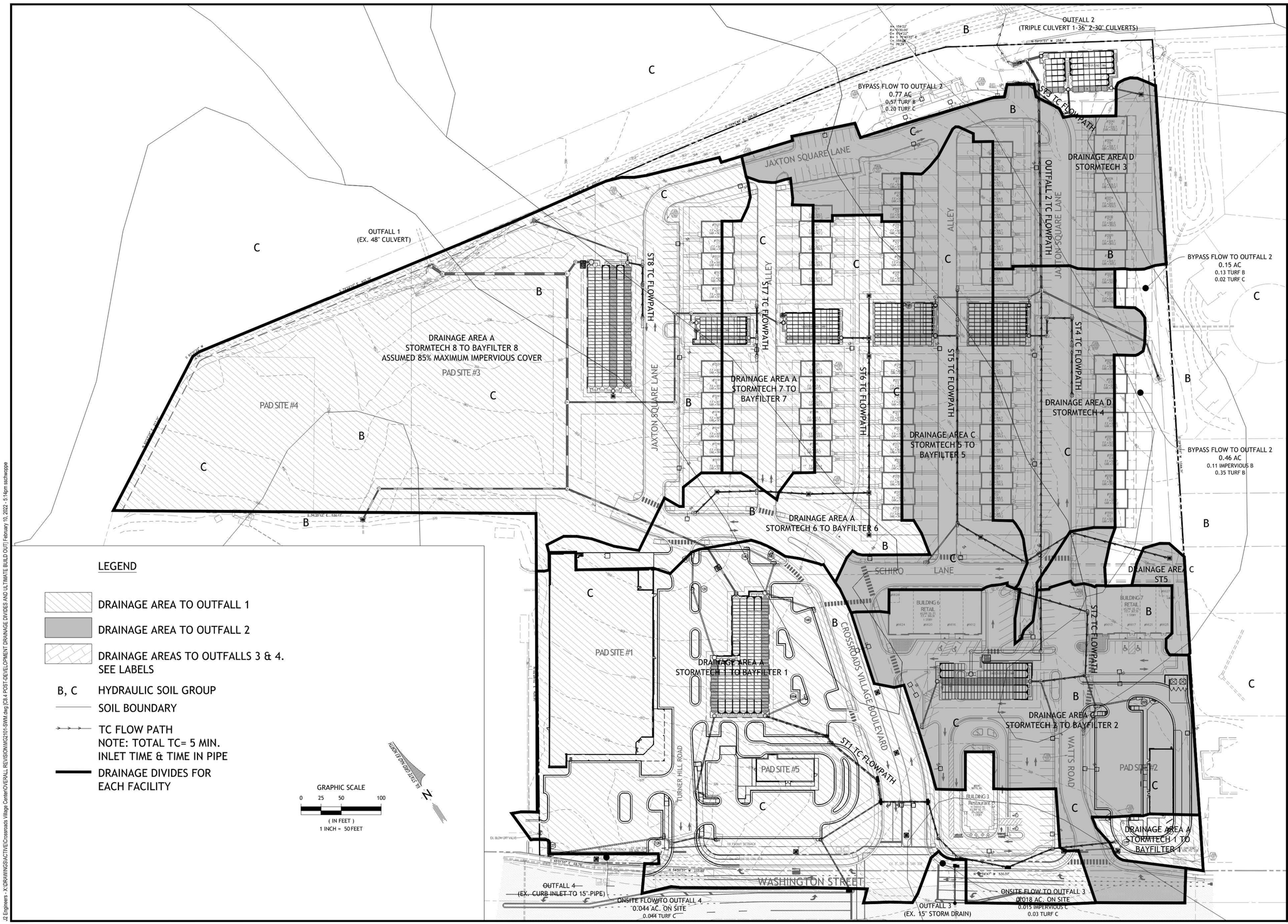
REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY



DRAINAGE DIVIDES FOR CULVERTS AT INTERSECTION OF ROUTE 66 AND ROUTE 15
FROM RDA PLANS, VDOT PROJECT 00666-076-074

CULVERT COMPS FOR CULVERT 13D-1 TO 7-1

| | | |



J2 Engineers - X:\DRAWINGS\ACTIVE\Crossroads Village Center\OVERALL REVISION\MG2101-SWM.dwg [C8.4 POST-DEVELOPMENT DRAINAGE DIVIDES AND ULTIMATE BUILD OUT] February 10, 2022 - 5:14pm sschwoppe

REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.J2engineers.com

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.J2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

PLAN# MG2101
DATE: OCTOBER, 2021
CONTOUR INT.= N/A
SCALE: 1"=50'

PLAN DATE
07/30/21
12/06/21
12/20/21
02/10/22

No.	DATE	DESCRIPTION
1.	02/10/22	BMP AREAS HAVE BEEN REVISED TO ACCOUNT FOR NEW DRAINAGE DIVIDES AND SURFACE CONDITIONS

REVISIONS

SHEET
C8.4
OF
106

POST-DEVELOPMENT DRAINAGE DIVIDES AND ULTIMATE BUILD OUT

REVISION

CROSSROADS VILLAGE CENTER

GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

SWM & BMP REFERENCE SHEET

FINAL SITE PLAN

KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
20
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	JIM CLARK 240-403-0124 JAMES.CLARK@ADS-PIPE.COM
ADS SALES REP:	TIM GIMPLE 540-235-4519 TIM.GIMPLE@ADS-PIPE.COM
PROJECT NO:	S092352

ADVANCED DRAINAGE SYSTEMS, INC.

CROSSROADS HAYMARKET

HAYMARKET, VA

STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-4500.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - THIS PROJECT REQUIRES COMPACTION OF EMBEDMENT STONE AND REQUIREMENTS FOR STONE HARDNESS AND SHAPE WHICH ARE NOT SPECIFIED IN OTHER STORMTECH DOCUMENTS. CONTRACTORS MUST FOLLOW THE SPECIAL PROVISIONS IN THIS PLAN SET.

©2013 ADS, INC.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-4500 CHAMBER SYSTEM

1. STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
12. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-4500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

©2013 ADS, INC.

STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
2. CHAMBERS SHALL BE MADE FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

©2013 ADS, INC.

STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740 OR SC-310.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN POLYPROPYLENE OR POLYETHYLENE RESINS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET ASTM F2922 (POLYETHYLENE) OR ASTM F2418-16 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2922 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310/SC-740 SYSTEM

1. STORMTECH SC-310 & SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

©2013 ADS, INC.

BAYSAVER BAYFILTER SPECIFICATIONS

PRODUCTS

A. INTERNAL COMPONENTS: ALL COMPONENTS INCLUDING CONCRETE STRUCTURE(S); PVC MANIFOLD PIPING AND FILTER CARTRIDGES, SHALL BE PROVIDED BY BAYSAVER TECHNOLOGIES LLC, 1030 DEER HOLLOW DRIVE, MOUNT AIRY, MD (800.229.7283).

B. PVC MANIFOLD PIPING: ALL INTERNAL PVC PIPE AND FITTINGS SHALL MEET ASTM D1785. MANIFOLD PIPING SHALL BE PROVIDED TO THE CONTRACTOR PARTIALLY PRE-CUT AND PRE-ASSEMBLED.

C. FILTER CARTRIDGES: EXTERNAL SHELL OF THE FILTER CARTRIDGES SHALL BE SUBSTANTIALLY CONSTRUCTED OF POLYETHYLENE OR EQUIVALENT MATERIAL ACCEPTABLE TO THE MANUFACTURER. FILTRATION MEDIA SHALL BE ARRANGED IN A SPIRAL LAYERED FASHION TO MAXIMIZE AVAILABLE FILTRATION AREA. AN ORIFICE PLATE SHALL BE SUPPLIED WITH EACH CARTRIDGE TO RESTRICT THE FLOW RATE TO A MAXIMUM OF 45 GPM.

D. FILTER MEDIA: FILTER MEDIA SHALL BE BY BAYSAVER TECHNOLOGIES LLC AND SHALL CONSIST OF THE FOLLOWING MIX: A BLEND OF ZEOLITE, PERLITE AND ACTIVATED ALUMINA.

E. PRECAST CONCRETE VAULT: CONCRETE STRUCTURES SHALL BE PROVIDED ACCORDING TO ASTM C. THE MATERIALS AND STRUCTURAL DESIGN OF THE DEVICES SHALL BE PER ASTM C478, C857 AND C858. PRECAST CONCRETE SHALL BE PROVIDED BY BAYSAVER TECHNOLOGIES, LLC.

PERFORMANCE

A. THE STORMWATER FILTER SYSTEM SHALL BE AN OFFLINE DESIGN CAPABLE OF TREATING 100% OF THE REQUIRED TREATMENT FLOW AT FULL SEDIMENT LOAD CONDITIONS
B. THE STORMWATER FILTER SYSTEM'S CARTRIDGES SHALL HAVE NO MOVING PARTS.
C. THE STORMWATER TREATMENT UNIT SHALL BE DESIGNED TO REMOVE AT LEAST 85% OF SUSPENDED SOLIDS, 65% OF TOTAL PHOSPHORUS, 65% OF TURBIDITY, 40% OF TOTAL COPPER, AND 40% OF TOTAL ZINC BASED ON FIELD DATA COLLECTED IN COMPLIANCE WITH THE TECHNOLOGY ACCEPTANCE RECIPROCITY PARTNERSHIP TIER II TEST PROTOCOL.
D. THE STORMWATER FILTRATION SYSTEM SHALL REDUCE INCOMING TURBIDITY (MEASURED AS NTUs) BY 50% OR MORE AND SHALL NOT HAVE ANY COMPONENTS THAT LEACH NITRATES OR PHOSPHATES.
E. THE STORMWATER FILTRATION CARTRIDGE SHALL BE EQUIPPED WITH A HYDRODYNAMIC BACKWASH MECHANISM TO EXTEND THE FILTER'S LIFE AND OPTIMIZE ITS PERFORMANCE.
F. THE STORMWATER FILTRATION SYSTEM SHALL BE DESIGNED TO REMOVE A MINIMUM OF 65% OF THE INCOMING TOTAL PHOSPHORUS (TP) LOAD.
G. THE STORMWATER FILTRATION SYSTEM'S CARTRIDGES SHALL HAVE A TREATED SEDIMENT CAPACITY FOR 80% TSS REMOVAL BETWEEN 150-350 LBS.

BAYFILTER MAINTENANCE

THE BAYFILTER SYSTEM REQUIRES PERIODIC MAINTENANCE TO CONTINUE OPERATING AT ITS PEAK EFFICIENCY DESIGN. THE MAINTENANCE PROCESS COMPRISES THE REMOVAL AND REPLACEMENT OF EACH BAYFILTER CARTRIDGE AND THE CLEANING OF THE VAULT OR MANHOLE WITH A VACUUM TRUCK. FOR BEST RESULTS, BAYFILTER MAINTENANCE SHOULD BE PERFORMED BY A CERTIFIED MAINTENANCE CONTRACTOR. A QUICK CALL TO AN ADS ENGINEER OR CUSTOMER SERVICE REPRESENTATIVE WILL PROVIDE YOU WITH A LIST OF RELIABLE CONTRACTORS IN YOUR AREA.

WHEN BAYFILTER IS INITIALLY INSTALLED, WE RECOMMEND THAT AN INSPECTION BE PERFORMED ON THE SYSTEM IN THE FIRST SIX (6) MONTHS. AFTER THAT, THE INSPECTION CYCLE TYPICALLY FALLS INTO A BIANNUAL PATTERN GIVEN NORMAL STORM OCCURRENCE AND ACTUAL SOLIDS LOADS.

WHEN BAYFILTER EXHIBITS FLOWS BELOW DESIGN LEVELS, THE SYSTEM SHOULD BE INSPECTED AND MAINTAINED AS SOON AS PRACTICAL. REPLACING A BAYFILTER CARTRIDGE SHOULD BE CONSIDERED AT OR ABOVE THE LEVEL OF THE MANIFOLD.

MAINTENANCE PROCEDURES

1. REMOVE THE MANHOLE COVERS AND OPEN ALL ACCESS HATCHES.
2. BEFORE ENTERING THE SYSTEM MAKE SURE THE AIR IS SAFE PER OSHA STANDARDS OR USE A BREATHING APPARATUS. USE LOW O2, HIGH CO, OR OTHER APPLICABLE WARNING DEVICES PER REGULATORY REQUIREMENTS.
3. USING A VACUUM TRUCK, REMOVE ANY LIQUID AND SEDIMENTS THAT CAN BE REMOVED PRIOR TO ENTRY.
4. USING A SMALL LIFT OR THE BOOM OF THE VACUUM TRUCK, REMOVE THE USED CARTRIDGES BY LIFTING THEM OUT.
5. ANY CARTRIDGES THAT CANNOT BE READILY LIFTED CAN BE EASILY SLID ALONG THE FLOOR TO A LOCATION THEY CAN BE LIFTED VIA A BOOM LIFT.
6. WHEN ALL THE CARTRIDGES HAVE BEEN REMOVED, IT IS NOW PRACTICAL TO REMOVE THE BALANCE OF THE SOLIDS AND WATER. LOOSEN THE STAINLESS CLAMPS ON THE FERNCO COUPLINGS FOR THE MANIFOLD AND REMOVE THE DRAINPIPES AS WELL. CAREFULLY CAP THE MANIFOLD AND THE FERNCO'S AND RINSE THE FLOOR, WASHING AWAY THE BALANCE OF ANY REMAINING COLLECTED SOLIDS.
7. CLEAN THE MANIFOLD PIPES, INSPECT, AND REINSTALL.
8. INSTALL THE EXCHANGE CARTRIDGES AND CLOSE ALL COVERS.
9. THE USED CARTRIDGES MUST BE SENT BACK TO ADS FOR EXCHANGE/RECYCLING AND CREDIT ON UNDAMAGED UNITS.

BAYFILTER INSTALLATION NOTES

1. CONTACT UTILITY LOCATOR TO MARK ANY NEARBY UNDERGROUND UTILITIES AND MAKE SURE IT IS SAFE TO EXCAVATE.
2. REFERENCE THE SITE PLAN AND STAKE OUT THE LOCATION OF THE BAYFILTER VAULT.
3. EXCAVATE THE HOLE, PROVIDING ANY SHEETING AND SHORING NECESSARY TO COMPLY WITH ALL FEDERAL, STATE AND LOCAL SAFETY REGULATIONS.
4. LEVEL THE SUB-GRADE TO THE PROPER ELEVATION. VERIFY THE ELEVATION AGAINST THE MANHOLE DIMENSIONS, THE INVERT ELEVATIONS, AND THE SITE PLANS. ADJUST THE BASE AGGREGATE, IF NECESSARY.
5. HAVE THE SOIL BEARING CAPACITY VERIFIED BY A LICENSED/ENGINEER FOR THE REQUIRED LOAD BEARING CAPACITY. ON SOLID SUB-GRADE, SET THE FIRST SECTION OF THE BAYFILTER PRE-CAST VAULT.
6. CHECK THE LEVEL AND ELEVATION OF THE FIRST SECTION TO ENSURE IT IS CORRECT BEFORE ADDING ANY RISER SECTIONS.
7. IF ADDITIONAL SECTION(S) ARE REQUIRED, ADD A WATERTIGHT SEAL TO THE FIRST SECTION OF THE BAYFILTER VAULT. SET ADDITIONAL SECTION(S) OF THE VAULT, ADDING A WATERTIGHT SEAL TO EACH JOINT.
8. INSTALL THE PVC OUTLET MANIFOLD.
9. INSTALL THE PVC OUTLET PIPE IN BAYFILTER VAULT.
10. INSTALL THE INLET PIPE TO THE BAYFILTER VAULT.
11. AFTER THE SITE IS STABILIZED, REMOVE ANY ACCUMULATED SEDIMENT OR DEBRIS FROM THE VAULT AND INSTALL THE FLOW DISKS, DRAINDOWN MODULES (IF APPLICABLE), AND THE BAYFILTER CARTRIDGES.
12. PLACE FULL SET OF HOLD DOWN BARS AND BRACKETS INTO PLACE.

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
02/17/23
06/30/23

PLAN# MG2101
DATE: OCTOBER, 2021
CONTOUR INT.= N/A
SCALE: NTS

PLAN DATE
07/30/21
12/06/21
12/20/21
02/10/22

No.	DESCRIPTION	DATE
	REVISIONS	

STORMTECH SPECIFICATIONS
REVISION
CROSSROADS VILLAGE CENTER
GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

SWM & BMP REFERENCE SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

No.	DESCRIPTION	DATE
	REVISIONS	

SHEET
C9.1
OF
106

SHEET
21
OF
43

REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

J2 Engineers - X:\DRAWINGS\ACTIVE\Crossroads Village Center\OVERALL REVISION\MC2101-SWM.dwg [C9.1 STORMTECH SPECIFICATIONS] February 10, 2022 - 5:15pm aschoppoe

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

PROPOSED LAYOUT - ST5

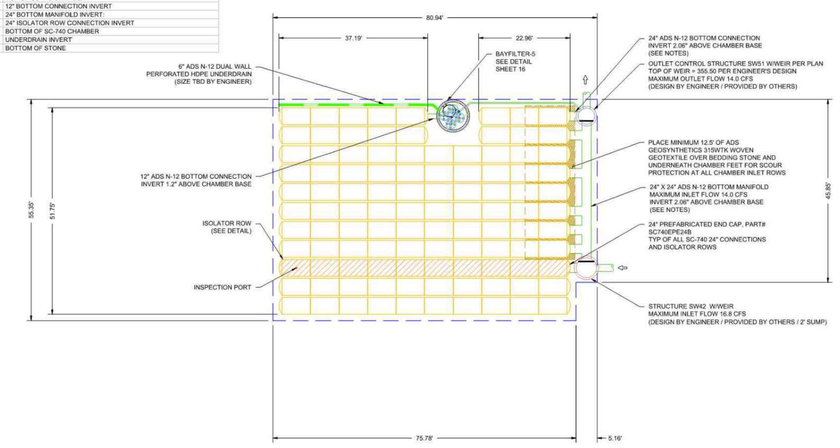
106	STORMTECH SC-740 CHAMBERS
26	STORMTECH SC-740 END CAPS
15	STONE ABOVE (in)
15	STONE BELOW (in)
40	% STONE VOID
10455	**INSTALLED SYSTEM VOLUME (CF)(ABOVE ELEVATION 354.00) (PERIMETER STONE INCLUDED)**
4431	SYSTEM AREA (ft²)
273	SYSTEM PERIMETER (ft)

PROPOSED ELEVATIONS - ST5

365.00	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
359.00	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)
358.50	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
358.50	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)
358.50	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)
358.25	TOP OF STONE
357.00	TOP OF SC-740 CHAMBER
354.60	12" BOTTOM CONNECTION INVERT
354.51	24" BOTTOM MANIFOLD INVERT
354.51	24" ISOLATOR ROW CONNECTION INVERT
354.50	BOTTOM OF SC-740 CHAMBER
354.00	UNDERDRAIN INVERT
353.25	BOTTOM OF STONE

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- THE SITE DESIGN ENGINEER MUST REVIEW THE PROXIMITY OF THE CHAMBERS TO THE BUILDING/STRUCTURE. NO FOUNDATION LOADS SHALL BE TRANSMITTED TO THE CHAMBERS. THE SITE DESIGN ENGINEER MUST CONSIDER EFFECTS OF POSSIBLE SATURATED SOILS ON BEARING CAPACITY OF SOILS AND SEEPAGE INTO BASEMENTS.



CROSSROADS HAYMARKET
HAYMARKET, VA
DATE: 8/02/18 DRAWN: LAH
PROJECT # 20502252 CHECKED: KMB

Stormtech
4365 TROUMAN BLVD
HILLIARD, OH 43026

9 SHEET OF 29

PROPOSED LAYOUT - ST6

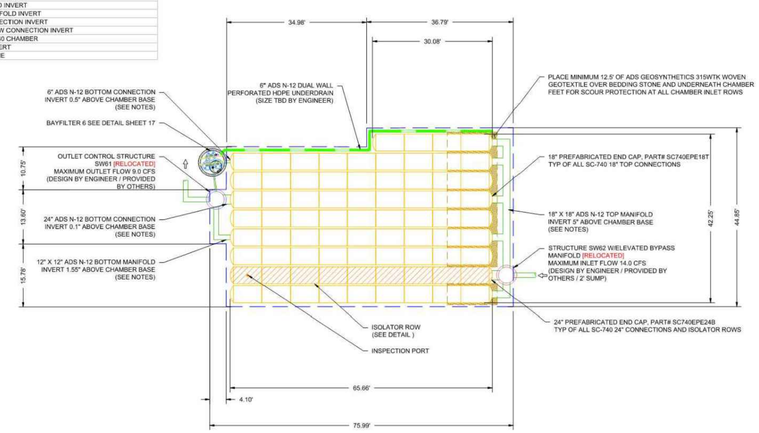
76	STORMTECH SC-740 CHAMBERS
18	STORMTECH SC-740 END CAPS
18	STONE ABOVE (in)
12	STONE BELOW (in)
40	% STONE VOID
39,558	**INSTALLED SYSTEM VOLUME (CF)(ABOVE ELEVATION 357.60) (PERIMETER STONE INCLUDED)**
3112	SYSTEM AREA (ft²)
242	SYSTEM PERIMETER (ft)

PROPOSED ELEVATIONS - ST6

368.60	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
362.60	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)
362.10	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
362.10	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)
362.10	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)
362.10	TOP OF STONE
360.60	TOP OF SC-740 CHAMBER
358.52	18" TOP MANIFOLD INVERT
358.20	12" BOTTOM MANIFOLD INVERT
358.15	6" BOTTOM CONNECTION INVERT
358.11	24" ISOLATOR ROW CONNECTION INVERT
358.10	BOTTOM OF SC-740 CHAMBER
357.60	UNDERDRAIN INVERT
357.10	BOTTOM OF STONE

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- THE SITE DESIGN ENGINEER MUST REVIEW THE PROXIMITY OF THE CHAMBERS TO THE BUILDING/STRUCTURE. NO FOUNDATION LOADS SHALL BE TRANSMITTED TO THE CHAMBERS. THE SITE DESIGN ENGINEER MUST CONSIDER EFFECTS OF POSSIBLE SATURATED SOILS ON BEARING CAPACITY OF SOILS AND SEEPAGE INTO BASEMENTS.



CROSSROADS HAYMARKET
HAYMARKET, VA
DATE: 8/02/18 DRAWN: LAH
PROJECT # 20502252 CHECKED: KMB

Stormtech
4365 TROUMAN BLVD
HILLIARD, OH 43026

10 SHEET OF 29

PROPOSED LAYOUT - ST7

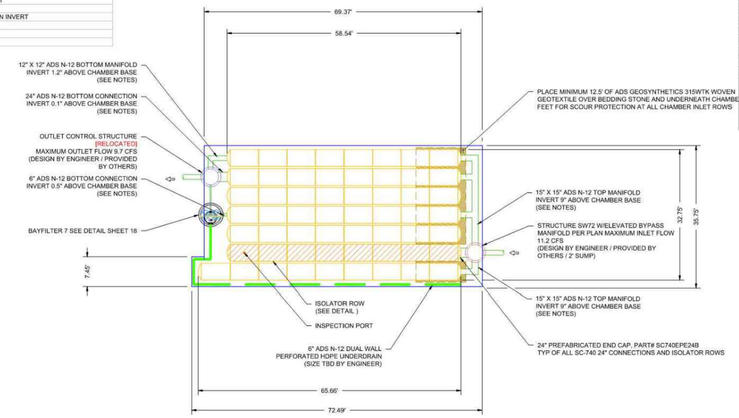
57	STORMTECH SC-740 CHAMBERS
14	STORMTECH SC-740 END CAPS
10	STONE ABOVE (in)
12	STONE BELOW (in)
40	% STONE VOID
5306	**INSTALLED SYSTEM VOLUME (CF) (ABOVE ELEVATION 359.30) (PERIMETER STONE INCLUDED)**
2475	SYSTEM AREA (ft²)
216	SYSTEM PERIMETER (ft)

PROPOSED ELEVATIONS - ST7

370.30	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
364.30	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)
363.80	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
363.80	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)
363.80	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)
363.13	TOP OF STONE
362.30	TOP OF SC-740 CHAMBER
360.22	18" TOP MANIFOLD INVERT
359.96	12" BOTTOM MANIFOLD INVERT
359.85	6" BOTTOM CONNECTION INVERT
359.81	24" BOTTOM MANIFOLD INVERT
359.81	24" ISOLATOR ROW CONNECTION INVERT
359.80	BOTTOM OF SC-740 CHAMBER
359.30	UNDERDRAIN INVERT
358.80	BOTTOM OF STONE

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- THE SITE DESIGN ENGINEER MUST REVIEW THE PROXIMITY OF THE CHAMBERS TO THE BUILDING/STRUCTURE. NO FOUNDATION LOADS SHALL BE TRANSMITTED TO THE CHAMBERS. THE SITE DESIGN ENGINEER MUST CONSIDER EFFECTS OF POSSIBLE SATURATED SOILS ON BEARING CAPACITY OF SOILS AND SEEPAGE INTO BASEMENTS.



CROSSROADS HAYMARKET
HAYMARKET, VA
DATE: 8/02/18 DRAWN: LAH
PROJECT # 20502252 CHECKED: KMB

Stormtech
4365 TROUMAN BLVD
HILLIARD, OH 43026

11 SHEET OF 29

PROPOSED LAYOUT - ST8

222	STORMTECH MC-4500 CHAMBERS
12	STORMTECH MC-4500 END CAPS
12	STONE ABOVE (in)
36	STONE BELOW (in)
40	% STONE VOID
39,558	**INSTALLED SYSTEM VOLUME (CF) ABOVE ELEVATION 352.20 (PERIMETER STONE INCLUDED)**
9,291	SYSTEM AREA (ft²)
445	SYSTEM PERIMETER (ft)

PROPOSED ELEVATIONS - ST8

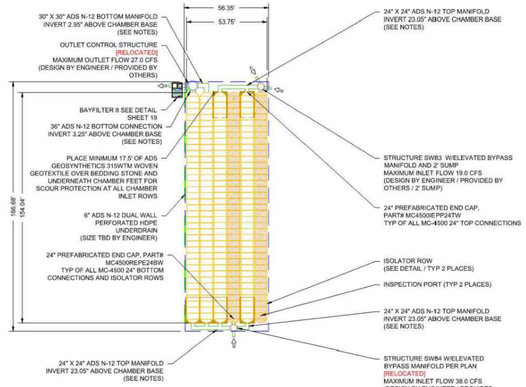
366.00	MAXIMUM GRADE ENGINEERED PLAN
360.45	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)
359.95	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
359.95	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)
359.95	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)
358.95	TOP OF STONE
357.95	TOP OF MC-4500 CHAMBER
354.87	24" TOP MANIFOLD INVERT
353.22	36" BOTTOM CONNECTION INVERT
353.20	30" BOTTOM MANIFOLD/CONNECTION INVERT
353.14	24" ISOLATOR ROW PLUS CONNECTION INVERT
352.95	BOTTOM OF MC-4500 CHAMBER
352.20	UNDERDRAIN INVERT
349.95	BOTTOM OF STONE

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.

TIER 1 DEEP COVER SPECIAL PROVISIONS

1. INSTALLATION REQUIREMENTS SHALL BE AS SPECIFIED IN THE STORMTECH DESIGN MANUALS AND CONSTRUCTION GUIDES EXCEPT AS MODIFIED IN THESE SPECIAL PROVISIONS.
2. ATTENTION IS CALLED TO "TABLE 1 - ACCEPTABLE FILL MATERIALS" IN THE STORMTECH CONSTRUCTION GUIDE AND ALL OTHER APPEARANCES OF THE "ACCEPTABLE FILL MATERIALS TABLE. FOR AREAS OF THE SYSTEM WITH COVER ABOVE 7 FEET (2.1 m) FOR THE MC-4500/MC-7200 AND ABOVE 8 FEET (2.4 m) FOR THE MC-3500, EMBEDMENT STONE SHALL BE COMPACTED WITH 1-3 PASSES OF A WALK BEHIND VIBRATORY PLATE COMPACTOR OR JUMPING JACK IN 12-18" (300-450 mm) LIFTS.
3. STONE SHALL BE CLEAN, CRUSHED, AND ANGULAR AND SHALL CONFORM TO THE SPECIFICATIONS DESIGNATED IN THE ACCEPTABLE FILL MATERIALS TABLE.
4. STONE SHALL BE HARD AND DURABLE. IT IS THE ENGINEER'S OR CONTRACTOR'S RESPONSIBILITY TO SELECT HARD AND DURABLE STONE. STORMTECH CONSIDERS AN LA ABRASION VALUE OF LESS THAN OR EQUAL TO 30 TO BE HARD STONE.
5. FOUNDATION STONE SHALL BE MECHANICALLY COMPACTED WITH A VIBRATORY ROLLER OR VIBRATORY PLATE IN 6" (152 mm) LIFTS.
6. EMBEDMENT STONE MUST BE DUMPED IN PLACE BY A STONE SHOOTER OR CONVEYOR OR EXCAVATOR.
7. INSPECTION DURING THE INSTALLATION BY THE ENGINEER, OWNER OR OTHER REPRESENTATIVE IS RECOMMENDED. THE INSPECTION SHALL INCLUDE OBSERVATIONS OF THE CHAMBER SYMMETRY DURING BACKFILLING TO ENSURE THE CONTRACTOR'S METHODS ARE NOT CAUSING UNACCEPTABLE DISTORTION OF THE CHAMBERS.
8. AN ADS FIELD TECHNICIAN WILL CONDUCT A PRE-CONSTRUCTION MEETING TO TRAIN REPRESENTATIVES INSTALLING THE CHAMBERS AND THOSE WHO MAY BE PERFORMING INSTALLATION INSPECTIONS.



CROSSROADS HAYMARKET
HAYMARKET, VA
DATE: 8/02/18 DRAWN: LAH
PROJECT # 20502252 CHECKED: KMB

Stormtech
4365 TROUMAN BLVD
HILLIARD, OH 43026

12 SHEET OF 29

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN# MG2101
DATE: OCTOBER, 2021
CONTOUR INT.= N/A
SCALE: N/S

PLAN DATE
07/20/22
10/20/22
12/20/22
02/10/23

PLAN DATE
01/06/23
03/17/23
06/30/23

STORMTECH SPECIFICATIONS
REVISION
CROSSROADS VILLAGE CENTER
GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SWM & BMP REFERENCE SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

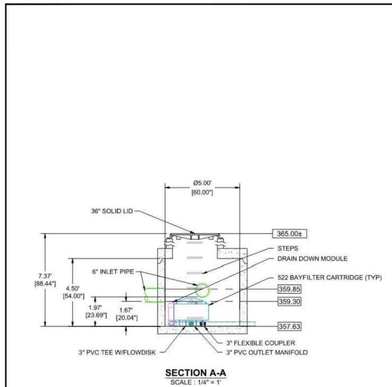
SHEET
C9.3
OF
106

SHEET
22
OF
43

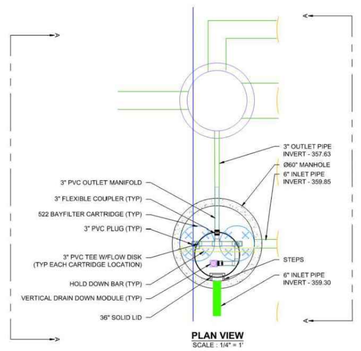
Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

J2 Engineers - X:\DRAWINGS\ACTIVE\Crossroads Village Center\OVERALL REVISION\MG2101-SWM.dwg [C9.3 STORMTECH SPECIFICATIONS] February 10, 2022 - 5:15pm aschwope

REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

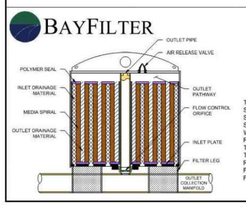


SECTION A-A
SCALE : 1/4" = 1'



PLAN VIEW
SCALE : 1/4" = 1'

BAYFILTER



522 BAYFILTER 60-2 MANHOLE	BF7
WATER QUALITY VOLUME	2,280 CF
DRAINAGE AREA	—
CARTRIDGE DESIGN VOLUME	1250 CF
# BAYFILTER CARTRIDGES	2
CAPTURED SEDIMENT CAPACITY*	262 LBS

*SEDIMENT CAPTURE PER CURRENT NJDEP APPROVAL

THE BAYFILTER STORMWATER MANAGEMENT SYSTEM IS A STORMWATER FILTRATION DEVICE DESIGNED TO REMOVE FINE SEDIMENTS, HEAVY METALS, AND PHOSPORUS. THE BAYFILTER SYSTEM RELIES ON A SPIRAL WOUND MEDIA FILTER CARTRIDGE WITH APPROXIMATELY 45 SQUARE FEET OF FILTRATION AREA. THE FILTER CARTRIDGES ARE HOUSED IN A CONCRETE STRUCTURE THAT EVENLY DISTRIBUTES THE FLOW BETWEEN CARTRIDGES. THE SYSTEM IS OFFLINE WITH AN EXTERNAL BYPASS THAT ROUTES HIGH INTENSITY STORMS AROUND THE SYSTEM. THE FILTER CARTRIDGES REMOVE POLLUTANTS FROM RUNOFF BY FILTRATION (INTERCEPTION/ATTACHMENT) AND ADSORPTION.

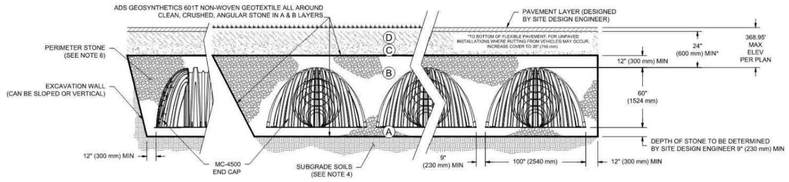
CROSSROADS HAYMARKET
HAYMARKET, VA
DATE: 8/02/18 | DRAWN: LAH
PROJECT # 20502252 | CHECKED: KMS

NO.	BY	DESCRIPTION
01/06/23	AJ	ISSUED DRAFT PERMIT SUBMITTER/ERRORS
01/09/23	AJ	ISSUED DRAFT PERMIT SUBMITTER/ERRORS
01/20/23	AJ	UPDATED BAYFILTER DETAILS
02/01/23	AJ	REV TO ST1 EXT PERIMETER STN, PLAN
02/10/23	AJ	REV TO ST1 EXT PERIMETER STN, PLAN
3/16/23	LAH	ADDRESSED ST 8 & ESD #1 & #2
3/16/23	LAH	ADDRESSED ST 8 & ESD #1 & #2
3/16/23	LAH	REV TO ST1 EXT PERIMETER STN, PLAN
3/16/23	LAH	REVISED ST 1 & 2 PER COMMENTS
3/16/23	LAH	REVISED ST 1 & 2 PER COMMENTS
3/16/23	LAH	REVISED ST 1 & 2 PER COMMENTS
3/16/23	LAH	REVISED ST 1 & 2 PER COMMENTS
3/16/23	LAH	REV TO ST1 EXT PERIMETER STN, PLAN
3/16/23	LAH	REV TO ST1 EXT PERIMETER STN, PLAN

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	COMPACTION REQUIRED. SEE SPECIAL REQUIREMENTS ON LAYOUT PAGE.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



CROSSROADS HAYMARKET ST8 SPECIFIC CROSS SECTION

NOTES:

1. MC-4500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
6. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.

CROSSROADS HAYMARKET
HAYMARKET, VA
DATE: 8/02/18 | DRAWN: LAH | CHECKED: KMB
PROJECT # 30502502

Stormtech — 70 MAXWELL DRIVE, SUITE 1 | ROCKY HILL, CT 06067 | 860.529.8188 | 888.892.2694 | WWW.STORMTECH.COM

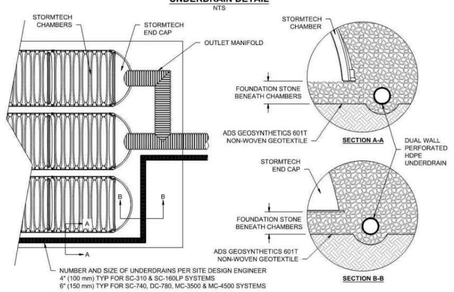
DS — ADAS TRUEMAN BLVD HILLIARD, OH 43026 | www.dsengineers.com

THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF STORMTECH AND MUST BE RETURNED UPON REQUEST. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE COPIED, USED, OR DISCLOSED IN WHOLE OR IN PART FOR ANY PURPOSE WHATSOEVER WITHOUT THE WRITTEN CONSENT OF STORMTECH. THE SUBMISSION OF THESE DRAWINGS TO ANY REGULATORY AUTHORITY DOES NOT CONSTITUTE PUBLICATION AND DOES NOT DISPLACE THE COPYRIGHT OF STORMTECH. ALL RIGHTS RESERVED. COPYRIGHT © 2018

21 SHEET OF 29

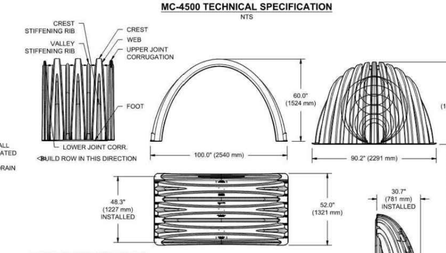
UNDERDRAIN DETAIL

NTS



MC-4500 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 48.3"	(2540 mm X 1524 mm X 1227 mm)
CHAMBER STORAGE	106.5 CUBIC FEET	(3.01 m³)
MINIMUM INSTALLED STORAGE*	162.6 CUBIC FEET	(4.60 m³)
WEIGHT	130.0 lbs.	(59.0 kg)

NOMINAL END CAP SPECIFICATIONS

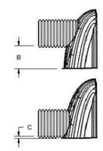
SIZE (W X H X INSTALLED LENGTH)	90.2" X 59.4" X 30.7"	(2291 mm X 1509 mm X 781 mm)
END CAP STORAGE	35.7 CUBIC FEET	(1.01 m³)
MINIMUM INSTALLED STORAGE*	108.7 CUBIC FEET	(3.08 m³)
WEIGHT	135.0 lbs.	(61.2 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC4500REPE06T	6" (150 mm)	42.54" (1.081 m)	---
MC4500REPE06B		---	0.86" (22 mm)
MC4500REPE08T	8" (200 mm)	40.50" (1.029 m)	---
MC4500REPE08B		---	1.01" (26 mm)
MC4500REPE10T	10" (250 mm)	38.37" (975 mm)	---
MC4500REPE10B		---	1.33" (34 mm)
MC4500REPE12T	12" (300 mm)	35.69" (907 mm)	---
MC4500REPE12B		---	1.55" (39 mm)
MC4500REPE15T	15" (375 mm)	32.72" (831 mm)	---
MC4500REPE15B		---	1.70" (43 mm)
MC4500REPE18TC	18" (450 mm)	29.36" (746 mm)	---
MC4500REPE18TW			
MC4500REPE18BC		---	1.97" (50 mm)
MC4500REPE18BW			
MC4500REPE24TC	24" (600 mm)	23.05" (585 mm)	---
MC4500REPE24TW			
MC4500REPE24BC		---	2.26" (57 mm)
MC4500REPE24BW			
MC4500REPE30BC	30" (750 mm)	---	2.95" (75 mm)
MC4500REPE36BC	36" (900 mm)	---	3.25" (83 mm)
MC4500REPE42BC	42" (1050 mm)	---	3.55" (90 mm)

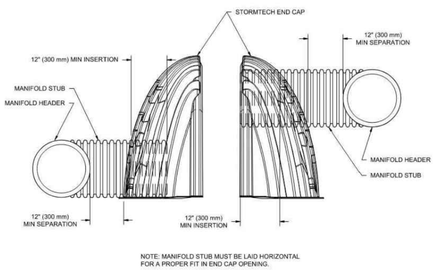
NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PRECORED INVERT'S ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-4500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

MC-SERIES END CAP INSERTION DETAIL

NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

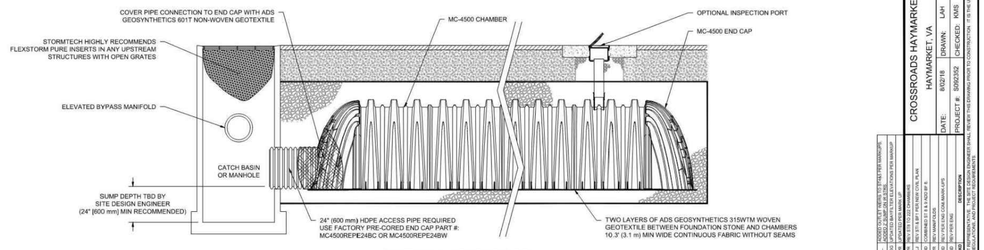
CROSSROADS HAYMARKET
HAYMARKET, VA
DATE: 8/02/18 | DRAWN: LAH | CHECKED: KMB
PROJECT # 30502502

Stormtech — 70 MAXWELL DRIVE, SUITE 1 | ROCKY HILL, CT 06067 | 860.529.8188 | 888.892.2694 | WWW.STORMTECH.COM

DS — ADAS TRUEMAN BLVD HILLIARD, OH 43026 | www.dsengineers.com

THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF STORMTECH AND MUST BE RETURNED UPON REQUEST. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE COPIED, USED, OR DISCLOSED IN WHOLE OR IN PART FOR ANY PURPOSE WHATSOEVER WITHOUT THE WRITTEN CONSENT OF STORMTECH. THE SUBMISSION OF THESE DRAWINGS TO ANY REGULATORY AUTHORITY DOES NOT CONSTITUTE PUBLICATION AND DOES NOT DISPLACE THE COPYRIGHT OF STORMTECH. ALL RIGHTS RESERVED. COPYRIGHT © 2018

23 SHEET OF 29



MC-4500 ISOLATOR ROW DETAIL

NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

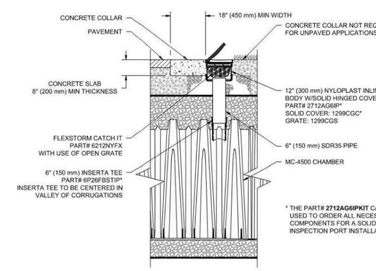
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



* THE PART# **2712AG6IPKIT** CAN BE USED TO ORDER ALL NECESSARY COMPONENTS FOR A SOLID LID INSPECTION PORT INSTALLATION

MC-4500 6" (150 mm) INSPECTION PORT DETAIL

NTS

CROSSROADS HAYMARKET
HAYMARKET, VA
DATE: 8/02/18 | DRAWN: LAH | CHECKED: KMB
PROJECT # 30502502

Stormtech — 70 MAXWELL DRIVE, SUITE 1 | ROCKY HILL, CT 06067 | 860.529.8188 | 888.892.2694 | WWW.STORMTECH.COM

DS — ADAS TRUEMAN BLVD HILLIARD, OH 43026 | www.dsengineers.com

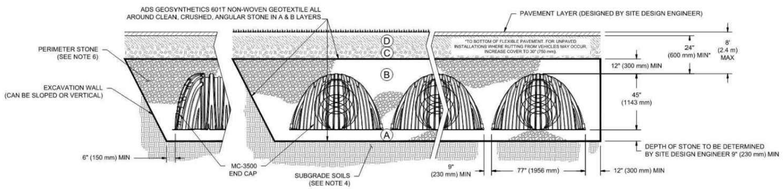
THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF STORMTECH AND MUST BE RETURNED UPON REQUEST. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE COPIED, USED, OR DISCLOSED IN WHOLE OR IN PART FOR ANY PURPOSE WHATSOEVER WITHOUT THE WRITTEN CONSENT OF STORMTECH. THE SUBMISSION OF THESE DRAWINGS TO ANY REGULATORY AUTHORITY DOES NOT CONSTITUTE PUBLICATION AND DOES NOT DISPLACE THE COPYRIGHT OF STORMTECH. ALL RIGHTS RESERVED. COPYRIGHT © 2018

22 SHEET OF 29

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. MC-3500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
6. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.

CROSSROADS HAYMARKET
HAYMARKET, VA
DATE: 8/02/18 | DRAWN: LAH | CHECKED: KMB
PROJECT # 30502502

Stormtech — 70 MAXWELL DRIVE, SUITE 1 | ROCKY HILL, CT 06067 | 860.529.8188 | 888.892.2694 | WWW.STORMTECH.COM

DS — ADAS TRUEMAN BLVD HILLIARD, OH 43026 | www.dsengineers.com

THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF STORMTECH AND MUST BE RETURNED UPON REQUEST. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE COPIED, USED, OR DISCLOSED IN WHOLE OR IN PART FOR ANY PURPOSE WHATSOEVER WITHOUT THE WRITTEN CONSENT OF STORMTECH. THE SUBMISSION OF THESE DRAWINGS TO ANY REGULATORY AUTHORITY DOES NOT CONSTITUTE PUBLICATION AND DOES NOT DISPLACE THE COPYRIGHT OF STORMTECH. ALL RIGHTS RESERVED. COPYRIGHT © 2018

24 SHEET OF 29

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026
703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# MG2101
DATE: OCTOBER, 2021
CONTOUR INT.= N/A
SCALE: NTS

PLAN DATE
07/30/22
12/05/22
12/20/22
02/10/23

PLAN DATE
01/06/23
03/17/23
06/30/23

STORMTECH SPECIFICATIONS
REVISION
CROSSROADS VILLAGE CENTER
GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
C9.6
OF
106

SWM & BMP REFERENCE SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

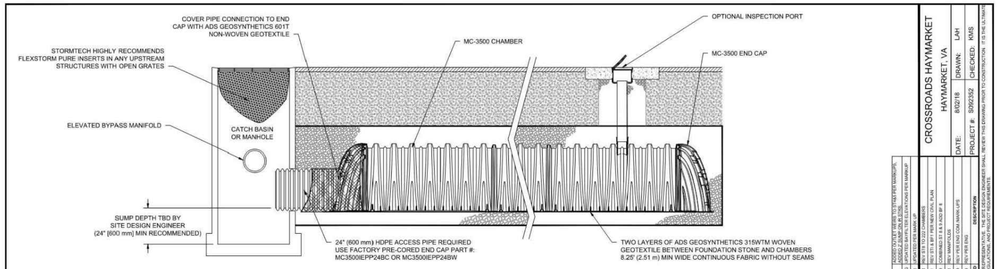
No.	DATE	DESCRIPTION
		REVISIONS

SHEET
24
OF
43

REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

J2 Engineers - X:\DRAWINGS\ACTIVE\Crossroads Village Center\OVERALL REVISION\MG2101-SWM.dwg [C9.6 STORMTECH SPECIFICATIONS] February 10, 2022 - 5:15pm sschwope



MC-3500 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

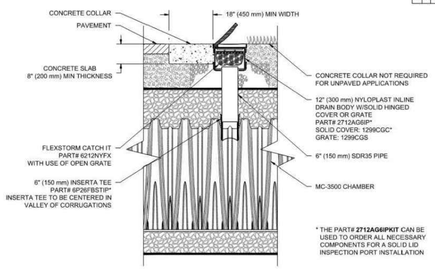
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



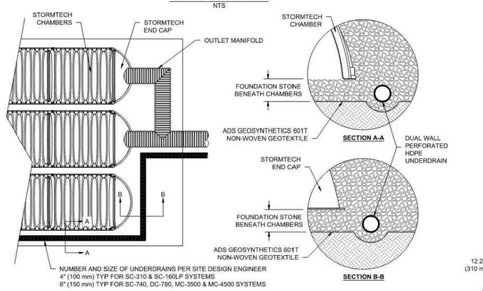
* THE PART# **2712AG6IPKIT** CAN BE USED TO ORDER ALL NECESSARY COMPONENTS FOR A SOLID LID INSPECTION PORT INSTALLATION

MC-3500 6" INSPECTION PORT DETAIL
NTS

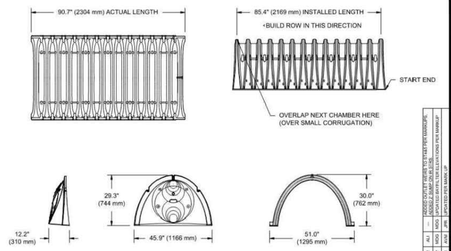
CROSSROADS HAYMARKET
HAYMARKET, VA
DATE: 8/02/18 | DRAWN: LAH
PROJECT # 82802502 | CHECKED: AXB

DESCRIPTION
ISSUED FOR PLAT REVIEW TO TRAILS FOR SUBMITTAL
UPDATED SURFACE WATER CHAMBER CONFIGURATION
UPDATED SURFACE WATER CHAMBER CONFIGURATION
UPDATED SURFACE WATER CHAMBER CONFIGURATION
UPDATED SITE PLAN
UPDATED SITE PLAN
UPDATED SITE PLAN

UNDERDRAIN DETAIL
NTS



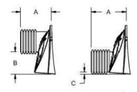
SC-740 TECHNICAL SPECIFICATION
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T / SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC			---	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

CROSSROADS HAYMARKET
HAYMARKET, VA
DATE: 8/02/18 [DRAWN] LAH
PROJECT # 82802502 [CHECKED] KAB

ISSUED	BY	DESCRIPTION
11/16/21	AJ	PRODUCT DRAWN REVISED TO REFLECT MANUFACTURING PROCESS CHANGES
12/08/21	ADG	UPDATED DETAILS, NOTES & FLOW PATH WARNING
1/13/22	LAH	ADDED STEEL MANIFOLD
7/20/21	AJ	REV. STEEL BAFF, ITEM NOTE ADDED, PLANS
3/14/19	AJ	REV. STEEL BAFF, ITEM NOTE ADDED, PLANS
3/14/19	LAH	JPR REV. MANIFOLDS
8/15/18	LAH	CJD REV. END WALL CONFIGURATIONS
8/02/18	LAH	CJD REV. STEEL BAFF
DATE		DRAWN CHKD DESCRIPTION

Stormtech
7620 TYSONS ONE BLVD, SUITE 210 MCLEAN, VA 22102
866-626-6846 888-892-2694 WWW.STORMTECH.COM

ADS TECHNICAL BLVD.
HILLIARD, OH 43026

29 SHEET OF 29

J2 Engineers - X:\DRAWINGS\ACTIVE\Crossroads Village Center\OVERALL REVISION\MAC2101-SWM.dwg [C9.8 STORMTECH SPECIFICATIONS] February 10, 2022 - 5:15pm sschwoppe

J2 engineers
J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# MG2101
DATE: OCTOBER, 2021
CONTOUR INT.= N/A
SCALE: N/S

PLAN DATE
07/30/21
10/26/21
12/20/21
02/11/22

STORMTECH SPECIFICATIONS
REVISION
CROSSROADS VILLAGE CENTER
GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
C9.8
OF
106

J2 engineers
J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

SWM & BMP REFERENCE SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
26
OF
43

REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

3-F.3.0. EXAMPLE CHECKLIST FOR A FINAL STORMWATER MANAGEMENT SITE PLAN PREPARATION AND REVIEW

1. Applicant Information

Final Plan Submission Date_____
Project Name___CROSSROADS VILLAGE CENTER
Site Plan/Permit Number_____
Site Address_15150 WASHINGTON STREET TOWN OF HAYMARKET, VA 20169
Applicant___Meladon Group Phone Number_(571) 375.1750
Applicant Legal Address_1602 Village Market Blvd. SE Suite 235 Leesburg, Virginia 20175
Owner__Same as Applicant Phone Number_(571) 375.1750
Principal Designer_J2 Engineers Phone Number_(703)-361-1550
General Contractor_____ Phone Number_____

2. ✓ Signature and stamp of licensed professional consultant and owner certification

3. Plan Status

✓ Approved
___ Not Approved

Legend: ll - Complete; Inc. - Incomplete/Incorrect; N/A - Not Applicable

4. _____ Common address and legal description of the site, including the tax reference number(s) and parcel number(s) of the property or properties affected.

Address: 15150 Washington Street, Town of Haymarket, VA 20169
Parcels 1-A, 1-B, 1-C, 1-D (Commercial + Retail)
Parcel 2 (R-2 Subdivision)

5. ✓ A narrative that includes a description of current site conditions and proposed development and final site conditions, including proposed use of environmental site design techniques and practices, stormwater control measures, relevant information pertaining to long-term maintenance of these measures (see item #12 below), and a construction schedule.

6. Existing and proposed mapping and plans (recommended scale of 1" = 50', or greater detail), which illustrates the following at a minimum:

✓ North arrow
✓ Legend
✓ Vicinity map
✓ Existing and proposed topography (minimum of 2-foot contours recommended)
✓ Property lines
✓ Perennial and intermittent streams
✓ Mapping of predominant soils from USDA soils surveys as well as the location of any site-specific test bore hole investigations that may have been conducted and information identifying the hydrologic characteristics and structural properties of soils used in the installation of stormwater management facilities
✓ Boundaries of existing predominant vegetation and proposed limits of clearing and grading

✓ Location and boundaries of natural feature protection and conservation areas (e.g., wetlands, lakes, ponds, aquifers, public drinking water supplies, etc.) and applicable setbacks (e.g., stream buffers, drinking water well setbacks, septic drainfield setbacks, building setbacks, etc.)
N/A Identification of any on-site or adjacent water bodies included on the Virginia 303(d) list of impaired waters
✓ Current land use and location of existing and proposed roads, buildings, parking lots and other impervious areas
N/A Location and description of any planned demolition of existing structures, roads, etc.
✓ Proposed land use(s) with a tabulation of the percentage of surface area to be adapted to various uses, including but not limited to planned locations of utilities, roads, parking lots, stormwater management facilities, and easements
✓ Location of existing and proposed utilities [e.g., water (including wells), sewer (including septic systems), gas, electric, telecommunications, cable TV, etc.] and easements
✓ Earthwork specifications
✓ Selection, location and design of both structural and non-structural stormwater control measures, including maintenance access and limits of disturbance
✓ Storm drainage plans for site areas *not* draining to any BMP(s)
✓ Location of existing and proposed conveyance systems, such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow, including grades, dimensions, and direction of flow
✓ Final drainage patterns and flow paths
✓ Location of floodplain/floodway limits and relationship of site to upstream and downstream properties and drainage systems
✓ Location of all contributing drainage areas and points of stormwater discharge, receiving surface waters or karst features into which stormwater discharges, the pre-development and post-development conditions for drainage areas, and the potential impacts of site stormwater on adjoining parcels
N/A Location and dimensions of proposed channel modifications, such as bridge or culvert crossings
✓ Final stabilization and landscaping plans

7. Hydrologic and hydraulic analysis, including the following:

✓ Site map with locations of design points and drainage areas (size in acres) for runoff calculations
N/A Identification and calculation of stormwater site design credits, if any apply
✓ Estimates of unified stormwater sizing criteria requirements
✓ Time of concentration (and associated flow paths)
✓ Imperviousness of the entire site and each drainage area
✓ NRCS runoff curve numbers or volumetric runoff coefficients
✓ A hydrologic analysis for the existing (pre-development) conditions, including runoff rates, volumes, and velocities, showing the methodologies used and supporting calculations
✓ A hydrologic analysis for the proposed (post-development) conditions, including runoff rates, volumes, and velocities, showing the methodologies used and supporting calculations
✓ Hydrologic and hydraulic analysis of the stormwater management system for all applicable design storms
✓ Pollution load and load reduction requirements and calculations

✓ Final good engineering and sizing calculations for stormwater control measures, including contributing drainage areas, storage, and outlet configurations, verifying compliance with the water quality and water quantity requirements of the regulations
✓ Stage-discharge or outlet rating curves and inflow and outflow hydrographs for storage facilities
✓ Final analysis of the potential downstream impacts/effects of the project, where necessary
✓ Downstream analysis, where detention is proposed
N/A Dam safety and breach analysis, where necessary

8. Representative cross-section and profile drawings and details of stormwater control measures and conveyances which include the following:

✓ Existing and proposed structural elevations (e.g., inverts of pipes, manholes, etc.)
✓ Design water surface elevations
✓ Structural details of BMP designs, outlet structures, embankments, spillways, grade control structures, conveyance channels, etc.

9. ✓ Applicable construction and material specifications, including references to applicable material and construction standards (ASTM, etc.)

10. ✓ Erosion and sediment control plan that, at a minimum, meets the requirements outlined in the Virginia Erosion and Sediment Control Regulations and Handbook

11. ✓ Landscaping plans for stormwater control measures and any site reforestation or revegetation

12. Operations and maintenance plan/agreement that includes the following:

✓ Name, legal address and phone number of the party or parties responsible for long-term maintenance activities
✓ Description and schedule of maintenance tasks
✓ Identification/description of the source of funding to support maintenance activities
✓ Description of access and safety issues
✓ Procedures for testing and disposal of sediments, if required
✓ Right-of-entry authorization for local government inspections/repairs, as needed

13. _____ Evidence of acquisition of all applicable local and non-local permits

14. N/A Waiver/exception requests

15. ✓ Evidence of acquisition of all necessary legal agreements (e.g., easements, covenants, land trusts, etc.)

16. ✓ Applicable supporting documents and studies (e.g., infiltration tests, geotechnical investigations, TMDLs, flood studies, etc.)

17. N/A Other required permits

OUTFALL NARRATIVE

DETENTION FOR THE SITE WILL BE PROVIDED BY 8 STORMTECH UNITS. THERE ARE FOUR OUTFALLS FROM THE SITE. OF THE 4 OUTFALLS, THE DISCHARGE TO 3 OF THEM MEET THE ENERGY BALANCE EQUATION. OUTFALL 2 DOES NOT MEET THE ENERGY BALANCE EQUATION, BUT IT DOES MEET THE DETENTION REQUIREMENTS FOR THE 10 YEAR STORM AND THE 100 YEAR STORM RUNOFF HAS BEEN DECREASED BELOW THE DESIGN FLOW USED TO SIZE THE DOWNSTREAM CHANNELS.

OUTFALL 1
ALLOWABLE RELEASE RATE
Q1= 0.47 CFS TO MEET ENERGY BALANCE EQUATION
Q2=6.141 CFS
Q10=19.51 CFS

ACTUAL RELEASE RATE (ST1, 6, 7, & 8)
Q1=0.337 CFS
Q2=1.343 CFS
Q10=14.824 CFS

CHANNEL PROTECTION: THE 2-YEAR RELEASE RATE FROM OUTFALL 1 IS 1.343 CFS, WHICH IS LESS THAN THE ALLOWABLE 2 YEAR RELEASE RATE OF 6.141 CFS. THEREFORE, THE CHANNEL PROTECTION FOR OUTFALL 1 IS DEEMED ADEQUATE.

FLOOD PROTECTION: THE 10-YEAR RELEASE RATE FROM OUTFALL 1 IS 14.824 CFS WHICH IS LESS THAN THE ALLOWABLE 19.51 CFS AND MEETS ENERGY BALANCE. THEREFORE, FLOOD PROTECTION FOR OUTFALL 1 IS DEEMED ADEQUATE.

OUTFALL 3
THERE IS A DRAMATIC DECREASE IN THE AREA DRAINAING TO OUTFALL 3. THE PRE-DEVELOPMENT DRAINAGE AREA IS 2.64 ACRES AND THE POST DEVELOPMENT DRAINAGE AREA IS ONLY 0.18 ACRES.

ALLOWABLE RELEASE RATE
Q1=7.221 CFS TO MEET ENERGY BALANCE EQUATION (INCREASE AS A RESULT OF LESS VOLUME)
Q2=1.962
Q10=5.412 CFS

ACTUAL RELEASE RATE
Q1=0.059 CFS
Q2=0.074 CFS
Q10=0.119 CFS

CHANNEL PROTECTION: THE 2-YEAR RELEASE RATE FROM OUTFALL 3 IS 0.074 CFS, WHICH IS LESS THAN THE ALLOWABLE 2 YEAR RELEASE RATE OF 1.962 CFS. THEREFORE, THE CHANNEL PROTECTION FOR OUTFALL 3 IS DEEMED ADEQUATE.

FLOOD PROTECTION: THE 10-YEAR RELEASE RATE FROM OUTFALL 3 IS 0.119 CFS WHICH IS LESS THAN THE ALLOWABLE 5.412 CFS AND MEETS ENERGY BALANCE. THEREFORE, FLOOD PROTECTION FOR OUTFALL 3 IS DEEMED ADEQUATE.

OUTFALL 4
THERE IS A DECREASE IN THE AREA DRAINING TO OUTFALL 4. THE PRE-DEVELOPMENT DRAINAGE AREA IS 0.37 ACRES AND THE POST DEVELOPMENT DRAINAGE AREA IS ONLY 0.044 ACRES.

ALLOWABLE RELEASE RATE
Q1=0.048 CFS TO MEET ENERGY BALANCE EQUATION
Q2=0.354 CFS
Q10=0.927 CFS

ACTUAL RELEASE RATE
Q1=0.048 CFS
Q2=0.076 CFS
Q10=0.172 CFS

CHANNEL PROTECTION: THE 2-YEAR RELEASE RATE FROM OUTFALL 4 IS 0.076 CFS, WHICH IS LESS THAN THE ALLOWABLE 2 YEAR RELEASE RATE OF 0.354 CFS. THEREFORE, THE CHANNEL PROTECTION FOR OUTFALL 4 IS DEEMED ADEQUATE.

FLOOD PROTECTION: THE 10-YEAR RELEASE RATE FROM OUTFALL 4 IS 0.172 CFS WHICH IS LESS THAN THE ALLOWABLE 0.927 CFS AND MEETS ENERGY BALANCE. THEREFORE, FLOOD PROTECTION FOR OUTFALL 4 IS DEEMED ADEQUATE.

OUTFALL 2
THE ONLY OUTFALL THAT DOES NOT MEET THE ENERGY BALANCE EQUATION FOR THE PROJECT IS OUTFALL 2. THIS IS DUE TO AN AREA OF WATER THAT DOES NOT DRAIN TO A DETENTION FACILITY. IT DOES HOWEVER MEET THE DETENTION REQUIREMENTS FOR THE 1 & 10 YEAR STORM EVENT.

ALLOWABLE RELEASE RATE
Q1=0.13 CFS TO MEET ENERGY BALANCE EQUATION
Q2=2.348 CFS
Q10=8.922 CFS

ACTUAL RELEASE RATE
Q1=0.145 CFS
Q2=0.301 CFS
Q10=5.545 CFS

CHANNEL PROTECTION: THE 2-YEAR RELEASE RATE FROM OUTFALL 2 IS 0.301 CFS, WHICH IS LESS THAN THE ALLOWABLE 2 YEAR RELEASE RATE OF 2.348 CFS. THEREFORE, THE CHANNEL PROTECTION FOR OUTFALL 2 IS DEEMED ADEQUATE.

FLOOD PROTECTION: THE 10-YEAR RELEASE RATE FROM OUTFALL 2 IS 5.545 CFS WHICH IS LESS THAN THE ALLOWABLE 8.922 CFS. THEREFORE, FLOOD PROTECTION FOR OUTFALL 2 IS DEEMED ADEQUATE.

J2 Engineers
17739 Main Street
Suite 180
Dumfries, Va. 22026
703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# MG2101
DATE: OCTOBER, 2021
CONTOUR INT.= N/A
SCALE: NTS

PLAN DATE
07/30/22
12/20/21
02/10/22

STORMWATER MANAGEMENT NARRATIVE
REVISION
CROSSROADS VILLAGE CENTER
GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
C9.9
OF
106

J2 Engineers
17739 Main Street
Suite 180
Dumfries, Va. 22026
703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

SWM & BMP REFERENCE SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
27
OF
43

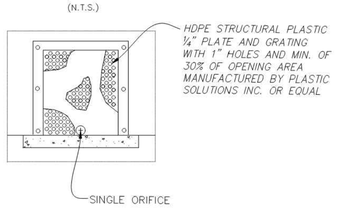
REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

J:\2 Engineers - X:\DRAWINGS\ACTIVE\Crossroads Village Center\OVERALL REVISIONS\MG2101-SWM.dwg [C9.9 STORMWATER MANAGEMENT NARRATIVE] February 10, 2022 - 5:15pm sschwoppe

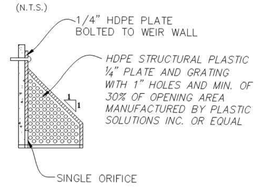
Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

TRASH RACK DETAIL

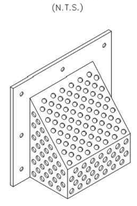
ELEVATION
(N.T.S.)

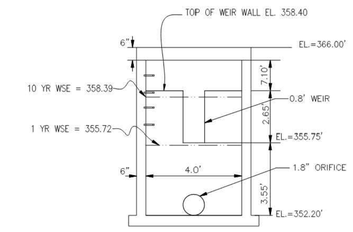


SECTION
(N.T.S.)



ISOMETRIC
(N.T.S.)





SECTION DETAIL FOR STORMTECH 8 OUTLET CONTROL STRUCTURE# SW81

N.T.S.

REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# MG2101
DATE: OCTOBER, 2021
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
07/30/21
10/26/21
12/26/21
02/10/22

STORMTECH 8 DETAILS
REVISION
CROSSROADS VILLAGE CENTER
GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
C9.25
OF
106

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

SWM & BMP REFERENCE SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
28
OF
43

J2 Engineers - X:\DRAWINGS\ACTIVE\crossroads village center\OVERALL REVISIONS\MG2101-STORMTECH DETAILS.dwg [C 9.25 STORMTECH 8 DETAILS] February 10, 2022 - 5:17pm aschwoope

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

POST - DETAINED - OUTFALL 1
DRAINAGE AREA A - STORMTECH 8 - 1 YEAR

Summary for Subcatchment 103S: DA 8

[49] Hint: Tc<2dt may require smaller dt

Runoff = 14.648 cfs @ 11.96 hrs, Volume= 0.699 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.51"

	Area (ac)	CN	Description
*	0.430	61	B TURF
*	1.110	74	C TURF
*	1.030	98	B IMP
*	2.880	98	C IMP
	5.450	90	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3					Direct Entry,

Summary for Pond 104P: STORMTECH 8

Inflow Area = 5.450 ac, Inflow Depth = 1.54" for 1-Year event
Inflow = 14.648 cfs @ 11.96 hrs, Volume= 0.699 af
Outflow = 0.158 cfs @ 20.20 hrs, Volume= 0.239 af, Atten= 99%, Lag= 494.7 min
Primary = 0.158 cfs @ 20.20 hrs, Volume= 0.239 af

Routing by Stor-Ind method, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 355.72' @ 20.20 hrs Surf.Area= 9,291 sf Storage= 23,444 cf

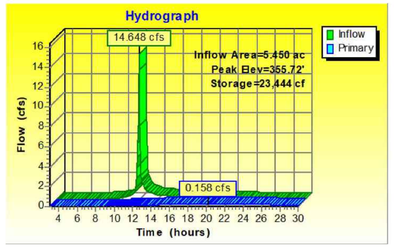
Plug-Flow detention time= 547.8 min calculated for 0.239 af (34% of inflow)
Center-of-Mass det. time= 422.2 min (1,235.1 - 812.9)

Volume	Invert	Avail.Storage	Storage Description
#1	352.20'	15,446 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 62,714 cf Overall - 24,099 cf Embedded = 38,616 cf x 40.0% Void
#2	352.95'	24,099 cf	**ADS_StormTech MC-4500 +Cap @ 4.03' L** x 222 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 222 Chambers in 6 Rows Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf
	39,545 cf		Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
352.20	9,291	0	0
358.95	9,291	62,714	62,714

Device	Routing	Invert	Outlet Devices
#1	Primary	352.20'	**36.0" Round Culvert** L= 20.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 352.20' / 352.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf
#2	Device 1	352.20'	**1.8" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	355.75'	**0.8' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.158 cfs @ 20.20 hrs HW=355.72' (Free Discharge)
└1=**Culvert** (Passes 0.158 cfs of 43.326 cfs potential flow)
└2=**Orifice/Grate** (Orifice Controls 0.158 cfs @ 8.94 fps)
└3=**Sharp-Crested Rectangular Weir** (Controls 0.000 cfs)



POST - DETAINED - OUTFALL 1
DRAINAGE AREA A - STORMTECH 8 - 10 YEAR

Summary for Subcatchment 103S: DA 8

[49] Hint: Tc<2dt may require smaller dt

Runoff = 32.386 cfs @ 11.96 hrs, Volume= 1.616 af, Depth= 3.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=4.67"

	Area (ac)	CN	Description
*	0.430	61	B TURF
*	1.110	74	C TURF
*	1.030	98	B IMP
*	2.880	98	C IMP
	5.450	90	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3					Direct Entry,

Summary for Pond 104P: STORMTECH 8

Inflow Area = 5.450 ac, Inflow Depth = 3.56" for 10-Year event
Inflow = 32.386 cfs @ 11.96 hrs, Volume= 1.616 af
Outflow = 5.830 cfs @ 12.14 hrs, Volume= 1.134 af, Atten= 82%, Lag= 11.3 min
Primary = 5.830 cfs @ 12.14 hrs, Volume= 1.134 af

Routing by Stor-Ind method, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 358.39' @ 12.14 hrs Surf.Area= 9,291 sf Storage= 37,473 cf

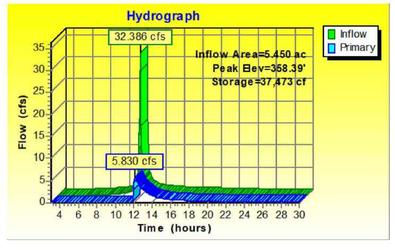
Plug-Flow detention time= 247.5 min calculated for 1.132 af (70% of inflow)
Center-of-Mass det. time= 153.0 min (942.2 - 789.2)

Volume	Invert	Avail.Storage	Storage Description
#1	352.20'	15,446 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 62,714 cf Overall - 24,099 cf Embedded = 38,616 cf x 40.0% Void
#2	352.95'	24,099 cf	**ADS_StormTech MC-4500 +Cap @ 4.03' L** x 222 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 222 Chambers in 6 Rows Cap Storage= +35.7 cf x 2 x 6 rows = 428.4 cf
	39,545 cf		Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
352.20	9,291	0	0
358.95	9,291	62,714	62,714

Device	Routing	Invert	Outlet Devices
#1	Primary	352.20'	**36.0" Round Culvert** L= 20.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 352.20' / 352.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf
#2	Device 1	352.20'	**1.8" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	355.75'	**0.8' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=5.817 cfs @ 12.14 hrs HW=358.39' (Free Discharge)
└1=**Culvert** (Passes 5.817 cfs of 73.698 cfs potential flow)
└2=**Orifice/Grate** (Orifice Controls 0.210 cfs @ 11.91 fps)
└3=**Sharp-Crested Rectangular Weir** (Weir Controls 5.607 cfs @ 5.31 fps)



J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
07/30/23
01/06/23
12/26/22
08/10/22

STORMTECH 8 COMPUTATIONS
REVISION
CROSSROADS VILLAGE CENTER
GAINESVILLE DISTRICT
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
C9.26
OF
106

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN DATE
01/06/23
03/17/23
06/30/23

SWM & BMP REFERENCE SHEET
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
29
OF
43

REFERENCE SHEET - FOR INFORMATION PURPOSES ONLY

J2 Engineers - X:\DRAWINGS\ACTIVE\crossroads village center\OVERALL REVISIONS\MG2101-STORMTECH 8 DETAILS.dwg [09.28 STORMTECH 8 COMPUTATIONS] February 10, 2022 - 5:17pm aschoppe

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

GENERAL PLAN INFORMATION

Project Plan Name:	KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
Prince William County Service Authority:	SA2023-0014
Engineering Firm:	J2 Engineers
	The site is directly in the south-east quandrant of the I
Project Location:	66 and Route 15 interchange.

SERVICE AREA INFORMATION

Pressure Zone:	Haymarket
High Hydraulic Grade Line (ft):	535
Low Hydraulic Grade Line (ft):	515
Sewer Shed:	North Branch
Local Facility Charge:	Not Applicable
Master Plan Utility Adjustment Applicable:	No

PROJECT METRICS

WATER MAIN

Size:	Length:	Material:
8-inch	0	DIP
12-inch	0	DIP
16-inch	0	
18-inch	0	
Total Length	0	Feet

GRAVITY SANITARY SEWER MAIN

Size:	Length:	Material:
8-inch	0	C-900
10-inch	0	
12-inch	0	
16-inch	0	
Total Length	0	Feet

LOW PRESSURE FORCE MAIN

Size:	Length:	Material:
1.5-inch	0	
2-inch	0	
2.5-inch	0	
4-inch		
Total Length	0	Feet

PUMP STATION FORCE MAIN

Size:	Length:	Material:
4-inch	0	DIP
6-inch	0	
8-inch	0	
12-inch	0	
Total Length	0	Feet

Total Number of 4-inch or 6-inch proposed valves:	2 Each
Total Number of 8-inch or 12-inch proposed valves:	0 Each
Total Number of 16-inch or 24-inch proposed valves:	0 Each
Total Number of Proposed Manholes:	0 Each
Total Number of Proposed Fire Hydrants:	0 Each
Total Number of Proposed Residential Meter Crocks to be Installed:	0 Each
Total Number of 5/8"x 3/4" Residential Meters to be Certified:	0 Each

PIPE TOTALS FOR FEE CALCULATIONS

Pipe Quantity Summary	Total Project Quantities Proposed By This Plan	Quantities Previously Approved & Permitted by Plan #	Net Increase
WATER MAIN INSPECTION	0		
WATER MAIN AS-BUILT	0		
SANITARY SEWER / FORCE MAIN INSP.	0		
SANITARY SEWER/FORCE MAIN AS-BUILT	0		
TV SANITARY SEWER MAIN INPECTION	0		

Minimum water main inspection fee applies for water quantities less than 100 feet:	YES
Minimum sanitary sewer / force main inspection fee applies for quantities less than 100 linear feet:	YES
Minimum as-built fee applies when total as-built cost are less than $1000.00:	Yes

Notes:

THRUST RESTRAINT ASSUMPTIONS FOR CALCULATIONS

The profile shall call out the station restraint is to start and the station restraint is end for each fitting, reducer, and dead end.

Pipe Material:		DIP - POLYWRAP
Soil Type:	Fine_Grained_Soils	CL - Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
Safety Factor:	(1.5 to 1 is typical)	1.5 to 1
Trench Type:	(Type 4 is typical for the Service Authority backfill requirements)	Type 3
Test Pressure:	(100 psi plus them max static pressure, but no less than 200 psi)	200 psi

DESIGNATION OF THE RESPONSIBLE PARTY & AS-BUILT RELEASE OF PLANS

The undersigned Engineer and /or firm, on behalf of itself and its successors, does hereby assume full liability and responsibility for the accuracy of the calculations, selections made, or information presented in this information sheet and agrees to hold harmless the Service Authority from any claim.

The undersigned Engineer and/or firm agrees that the Prince William County Service Authority shall have the right to use these plans and electronic files for the preparation of as-built records, as necessary. The Engineer and/or firm further agrees that the right to use the plans and electronic files shall be provided without cost to the Service Authority.

Signature: _____

SEBASTIAN SANDOVAL
(Type or Print)

HYDRAULIC SUMMARY

Maximum static water pressure in the proposed water system:	69 psi
Minimum static water pressure in the proposed water system:	62 psi

Information above is provided from the hydraulic model with applied maximum day water demands.

TITLE OF STUDY: REVISED CROSSROADS VILLAGE CENTER WATERY STUDY (APPROVED JULY 1, 2022)

FIRE FLOW SUMMARY

Available Fire Flow:	2500 gpm
Lowest Residual Pressure during a fire flow scenario:	22 psi

Information above is provided from the hydraulic model with applied maximum day and fire flow water demands.

Are residential fire sprinkler systems proposed?	No

DELIVERY PRESSURE SUMMARY

High Hydraulic Grade Line	535 feet
Lowest Finished Floor Elevation proposed within the development	358.7 feet
*Estimated highest static pressure at the finished floor elevation	76 psi
Low Hydraulic Grade Line	515 feet
Highest Finished Floor Elevation proposed within the development	372 feet
*Estimated lowest static pressure at the finished floor elevation	62 psi

**Estimates are made with an assumed high and low hydraulic grade line and do not take into account the effects of friction loss or water booster pumps in the water system. Actual pressures may vary and delivery pressure are not guaranteed.*

International Residential Code P2903.3 Minimum static pressure (as determined by the local water authority) at the building entrance for either public or private water service shall be 40 psi (276 kPa).

International Residential Code P2903.3.1 Maximum pressure. Maximum static pressure shall be 80 psi (551 kPa). When main pressure exceeds 80 psi (551 kPa), an approved pressure-reducing valve conforming to ASSE 1003 shall be installed on the domestic water branch main or riser at the connection to the water-service pipe.

Note: The professional engineer is responsible to account for the effects of friction loss on the delivery pressure at the finished floor elevation from the service line, meter, and other plumbing appurtenances. The Service Authority requires calculations to size the private service lines when delivery pressures are 45 psi or less and the service line is in excess of 70 feet.

☑ The hydraulic design and all finished floor elevations comply with the applicable plumbing code for pressure without a water booster pump or pressure reducing device.

☐ The use of private water booster pumps and/or pressure reducing devices are required for the following lots to comply with applicable plumbing code for pressure.

Lot# or Building ID	Elev. @ Finished Floor	High Hydraulic Grade Line (ft)	Low Hydraulic Grade Line (ft)	Estimated High Pres. (psi)	Estimated Low Pres. (psi)	Private Water Booster P. Needed	Pres. Red. Device Needed
		535	515			-	-
		535	515			-	-

AWWA WATER DEMAND ESTIMATE AND METER SIZING USING FIXTURE VALUES

(Based on AWWA M22 Manual, Second Edition)

Building Identifier:	KIDDIE ACADEMY
Multi-Dwelling Residential or Non-Residential	High Demand (e.g. Non-Residential)
Maximum static water pressure at the meter location: *(Obtained from hydraulic study at the meter location)*	70 psi

Fixture or Appliance	Fixture Value (at 60 psi)	Number of Fixtures	Subtotal Fixture Value
Toilet (tank)		0	0
Toilet (flush valve)	5	10	50
Urinal (wall or stall)		0	0
Urinal (flush valve)		0	0
Bidet		0	0
Shower (single head)		0	0
Sink / Faucet (Lavatory)	3	27	81
Kitchen Sink	4	2	8
Utility Sink	3	2	6
Dishwasher	1.4	1	1.4
Bathtub		0	0
Clothes Washer	1.4	1	1.4
Hose Connections (with 50 ft of hose)			
1/2 in.		0	0
5/8 in.		0	0
3/4 in.	2.5	2	5
Miscellaneous			
Bedpan washers		0	0
Drinking fountains	0.25	4	1
Dental units		0	0
Combined Fixture Value			153.8
Demand (gpm) from AWWA Curve			55.1 gpm
Pressure Adjustment Factor			1.09
Adjusted demand (gpm)			60 gpm
Irrigation Demand (gpm) that will occur simultaneously with normal water use			10 gpm
Water demand for equipment will occur simultaneously with normal water use			0 gpm
Total estimated peak flow			70 gpm
Required AWWA Meter Size		1.5-Inch Positive Displacement Meter	

METER SCHEDULES

MULTI-DWELLING METER SCHEDULE

Building Identifier	Building Address	Meter Use	Account Type	Number of Dwelling Units	[1]Peak Demand (GPM)	[2&3]ERU Purchase	Meter Size	Meter Type	(Reserved for Future Use)	(Reserved for Future Use)	[4]Non-Binding Estimated Availability Fee
						#N/A					
						#N/A					
						#N/A					
						#N/A					
						#N/A					
						#N/A					
						#N/A					
						#N/A					
						#N/A					

NOTES:
1 *A fixture unit list and meter sizing calculations shall be provided in the plan set for each proposed meter in accordance with the current AWWA M22 standard.*
2 *The number of ERU's for a multi-family building is 80% of the total number of dwelling units associated with the meter and is rounded up to the next full unit.*
3 *For water only accounts, the minimum purchased number of ERU units must match the allocation with the meter size as defined in Table VI: Availability Fees of the Customer Handbook.*
4 *The Availability Fee is not the total fee due. New connections may be subject to the following fees: meter, meter installation, sewer and/or water inspection, application and Local Facility charges. See the Customer Handbook for additional information.*

NON-RESIDENTIAL METER SCHEDULE

Building Identifier	Building Address	Meter Use	Account Type	[3]Est. Max Month Consumption (Gallons)	[2]Peak Demand (GPM)	[3]ERU Purchase	Meter Size	Meter Type	(Reserved for Future Use)	(Reserved for Future Use)	[4]Non-Binding Estimated Availability Fee
KIDDIE ACADEMY	DAYCARE	WATER SERVICE	Water & Sewer		70	7	1.5-Inch	Positive			$ 107,800.00

NOTES:
1 *For meters 2-inch and larger the maximum month water consumption shall be reported. The purchased number of ERU's shall be based on the estimated maximum month consumption, but shall not be less than the allocated number of ERU's allocated meter size. For meters smaller than 2-inch, the maximum month water consumption does not need to be reported.*
2 *A fixture unit list and meter sizing calculations shall be provided in the plan set for each proposed meter in accordance with the current AWWA M22 standard.*
3 *For all meters the minimum purchased number of ERU units must match the allocation with the meter size as defined in Table VI: Availability Fees of the Customer Handbook.*
4 *The Availability Fee is not the total fee due. New connections may be subject to the following fees: meter, meter installation, sewer and/or water inspection, application and Local Facility charges. See the Customer Handbook for additional information.*

DATA CENTER METER SCHEDULE

Building Identifier	Building Address	Meter Use	Account Type	[3]Est. Max Month Consumption (Gallons)	[2]Peak Demand (GPM)	[3]ERU Purchase	Meter Size	Meter Type	Meter Manufacturer	Flow Rate (gpm) Minimum	Flow Rate (gpm) Maximum	[4]Non-Binding Estimated Availability Fee

NOTES:
1 *For sewer only meters and 2-inch meters and larger, the purchased number of ERU's shall be based on the estimated maximum month consumption, but shall not be less than the allocated number of ERU's associated with the meter size.*
2 *A fixture unit list and meter sizing calculations shall be provided in the plan set for each proposed meter in accordance with the current AWWA M22 standard.*
3 *For all meters the minimum purchased number of ERU units must match the allocation with the meter size as defined in Table VI: Availability Fees of the Customer Handbook.*
4 *The Availability Fee is not the total fee due. New connections may be subject to the following fees: meter, meter installation, sewer and/or water inspection, application and Local Facility charges. See the Customer Handbook for additional information.*

GENERAL NOTES

1 Methods and materials used in the construction of water mains, sanitary sewer mains, force mains and appurtenances shall be in conformance with the current Prince William County Service Authority (Service Authority) Utility Standards Manual (USM) and the Virginia Department of Health Regulations.

2 Acceptance of these plans by the Service Authority will in no way relieve the owner from complying with the methods, policies or requirements stated in the Service Authority's USM.

3 Service Authority has Local Review Authority for water mains up to and including 18-inch and sanitary sewer mains up to and including 24-inch. Utilities outside the Service Authority's Local Review Authority, including low pressure force mains systems, are subject to the review, approval and permitting process of either the Virginia Department of Health Office of Drinking Water or Department of Environmental Quality. It is the Professional Engineer's responsibility to submit all necessary applications and plans and to secure all applicable plan approvals and permits from the different governing authorities.

4 Trees, fences, monuments, signs, entrance features, sheds, decks, overhanging canopies, or permanent structures shall not be placed in easements dedicated to the Service Authority without written permission from the Service Authority.

5 The contractor shall notify the Service Authority Inspection Manager at least two (2) business days, but not more than ten (10) business days, prior to the commencement of demolition, excavation or blasting in areas with underground water mains, sanitary sewer mains, and/or force mains.

6 All subdivision will require an address listing approved by the Prince William County Mapping Office. The address listing must be presented to the Service Authority at the time the utility permit is issued. Forms are available at the Service Authority. (Fax copies are not acceptable.)

7 Low pressure sewer force main systems are subject to the review and requirements of the Virginia Department of Environmental Quality.

8 The developer is responsible for all costs associated with damages to or relocation of water mains, sanitary sewer mains, force mains or service lines caused by the construction of this project.

9 The contractor shall coordinate all relocation of water mains, sanitary sewer mains and/or force mains with the Service Authority's Field Inspector. Water or sanitary sewer system shutdowns will not be executed without the prior approval of the Service Authority Field Inspector. The Field Inspector shall require the contractor to submit a relocation work plan for Service Authority acceptance prior to the commencement of the relocation work. The work plan will detail how the work will be done and the manpower, materials, and equipment that will be at the site to perform the work.

10 The Service Authority does not guarantee the availability or construction of utilities that are proposed by another entity even if those utilities are shown as existing in this plan set. If needed utilities shown as existing are not available or do not exist, it is the developer's responsibility to acquiring the necessary rights and permits to install on-site and off-site water and sanitary sewer utilities to provide the desired service.

11 Existing unused water service lines shall be exposed at the connection point on the water main and shall be cut and terminated (e.g. crimped) as directed by the Service Authority Field Inspector.

12 Existing unused laterals or sanitary service lines shall be cut and capped at the connection point to the sanitary sewer main or force main as directed by the Service Authority Field Inspector.

13 When an existing water service line, lateral, of sanitary service line will be reused as part of a new development, the Service Authority shall inspect the existing service line to insure that it is acceptable and meets current Service Authority material specifications. Any defects or out-of-date materials shall be repaired or replaced to the satisfaction of the Service Authority to ensure the service line is water tight before the existing service line is placed back in service.

Engineer's Seal & Signature

Service Authority
Prince William County

Water & Sanitary Sewer Information Sheet
Sheet effective as of September 1, 2019

SHEET 1 OF 2

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/2025
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/09/23
03/17/23
06/30/23

PWCSA WATER AND SANITARY SEWER INFORMATION
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

REVISIONS

No.	DESCRIPTION	DATE

SHEET 30 OF 43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

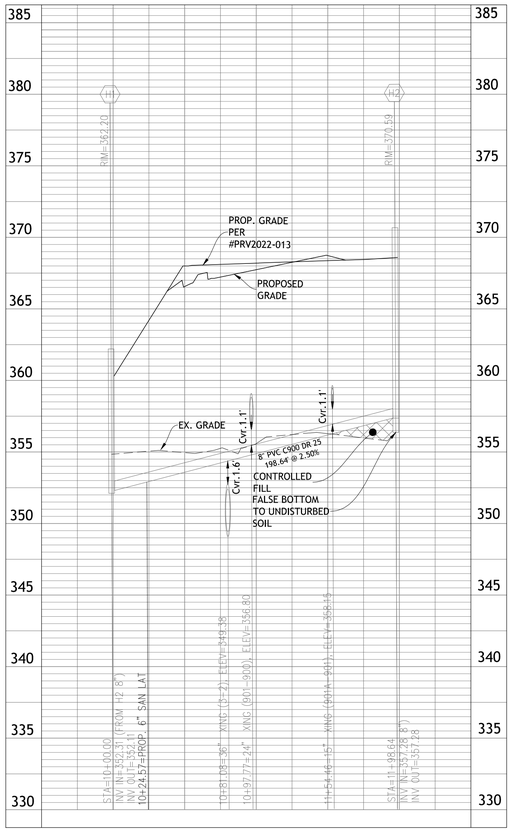
SANITARY SEWER LATERAL COMPUTATIONS

Ejector Pump Required	Lot	Station	Lower MH	/	Upper MH	Slope (%)	Overall Length (FT.)	Invert @ Main	Crown @ Main	Distance to Vert. Bend	Inv. @ Bottom of Vert. Bend	Riser Height (FT.)	Inv. @ Top of Vert. Bend	Inv. @ Lateral End	Lowest Flr.Elev. To Serve (Ft)	Diff. Lowest Floor to Crown @ Main	Lateral Material	PW/CSA Use Only Date Installed	PW/CSA Use Only Stub Installed % of Grade	Addt. length req.	Act Inv @ end	Diff lf-end of act	Lot
	1	1+05.0	@MH	/	J	2.08%	39.0	352.36	353.03	N/A	N/A	0	N/A	353.84	369.20	16.17	C-900			55	354.99	14.21	1
	2	0+91.0	I	/	J	2.08%	39.0	352.72	353.39	N/A	N/A	0	N/A	354.20	368.50	15.11	C-900			58	355.41	13.09	2
	3	0+71.1	I	/	J	2.08%	39.0	352.56	353.23	N/A	N/A	0	N/A	354.04	367.80	14.57	C-900			56	355.20	12.60	3
	4	0+51.0	I	/	J	2.08%	39.0	352.40	353.07	N/A	N/A	0	N/A	353.88	367.20	14.13	C-900			58	355.08	12.12	4
	5	0+31.0	I	/	J	2.08%	39.0	352.23	352.90	N/A	N/A	0	N/A	353.72	366.50	13.60	C-900			56	354.88	11.62	5
	6	0+11.0	I	/	J	2.08%	39.0	352.07	352.74	N/A	N/A	0	N/A	353.55	366.50	13.76	C-900			58	354.76	11.74	6
	7	2+04.7	H	/	I	2.08%	39.0	351.66	352.33	N/A	N/A	0	N/A	353.14	366.50	14.17	C-900			58	354.35	12.15	7
	8	1+18.7	H	/	I	2.08%	39.0	351.23	351.90	N/A	N/A	0	N/A	352.71	365.80	13.90	C-900			55	353.85	11.95	8
	9	1+05.8	H	/	I	2.08%	39.0	351.16	351.83	N/A	N/A	0	N/A	352.64	365.80	13.97	C-900			58	353.85	11.95	9
	10	0+85.8	H	/	I	2.08%	39.0	351.06	351.73	N/A	N/A	0	N/A	352.54	365.80	14.07	C-900			56	353.71	12.09	10
	11	0+65.8	H	/	I	2.08%	39.0	350.96	351.63	N/A	N/A	0	N/A	352.44	366.50	14.87	C-900			58	353.65	12.85	11
	12	0+36.9	H	/	I	2.08%	39.0	350.82	351.49	N/A	N/A	0	N/A	352.30	367.20	15.71	C-900			56	353.46	13.74	12
	13	0+92.4	B	/	N	2.08%	22.0	353.03	353.70	N/A	N/A	0	N/A	354.15	367.20	13.50	C-900			57	355.34	11.86	13
	14	1+20.4	B	/	N	2.08%	22.0	353.27	353.94	N/A	N/A	0	N/A	354.39	367.20	13.26	C-900			57	355.58	11.62	14
	15	1+40.4	B	/	N	2.08%	22.0	353.44	354.11	N/A	N/A	0	N/A	354.56	366.50	12.39	C-900			55	355.71	10.79	15
	16	1+60.4	B	/	N	2.08%	22.0	353.61	354.28	N/A	N/A	0	N/A	354.73	366.50	12.22	C-900			57	355.92	10.58	16
	17	1+80.6	B	/	N	2.08%	22.0	353.78	354.45	N/A	N/A	0	N/A	354.91	366.50	12.05	C-900			55	356.05	10.45	17
	18	2+98.7	B	/	N	2.08%	22.0	354.79	355.46	N/A	N/A	0	N/A	355.92	366.60	11.14	C-900			55	357.06	9.54	18
	19	3+18.7	B	/	N	2.08%	22.0	354.96	355.63	N/A	N/A	0	N/A	356.09	366.60	10.97	C-900			55	357.23	9.37	19
	20	3+38.7	B	/	N	2.08%	22.0	355.13	355.80	N/A	N/A	0	N/A	356.26	367.30	11.50	C-900			55	357.40	9.90	20
	21	3+58.7	B	/	N	2.08%	22.0	355.30	355.97	N/A	N/A	0	N/A	356.43	367.30	11.33	C-900			57	357.61	9.69	21
	22	3+78.7	B	/	N	2.08%	22.0	355.47	356.14	N/A	N/A	0	N/A	356.60	368.00	11.86	C-900			55	357.74	10.26	22
	23	3+98.7	B	/	N	2.08%	22.0	355.64	356.31	N/A	N/A	0	N/A	356.77	368.70	12.39	C-900			57	357.96	10.74	23
	24	4+20.9	B	/	N	2.08%	22.0	355.83	356.50	N/A	N/A	0	N/A	356.96	369.40	12.90	C-900			56	358.12	11.28	24
	25	4+75.4	@MH		N	2.08%	12.0	355.83	356.50	N/A	N/A	0	N/A	356.75	368.50	12.00	C-900			55	357.89	10.61	25
	26	4+56.0	B	/	N	2.08%	12.0	356.13	356.80	N/A	N/A	0	N/A	357.05	367.80	11.00	C-900			57	358.24	9.56	26
	27	4+33.4	B	/	N	2.08%	12.0	355.94	356.61	N/A	N/A	0	N/A	356.86	367.20	10.59	C-900			55	358.00	9.20	27
	28	4+13.4	B	/	N	2.08%	12.0	355.77	356.44	N/A	N/A	0	N/A	356.69	367.20	10.76	C-900			57	357.87	9.33	28
	29	3+93.4	B	/	N	2.08%	12.0	355.60	356.27	N/A	N/A	0	N/A	356.52	366.50	10.23	C-900			55	357.66	8.84	29
	30	3+73.4	B	/	N	2.08%	12.0	355.43	356.10	N/A	N/A	0	N/A	356.35	365.80	9.70	C-900			57	357.53	8.27	30
	31	3+53.4	B	/	N	2.08%	12.0	355.26	355.93	N/A	N/A	0	N/A	356.18	365.20	9.27	C-900			55	357.32	7.88	31
	32	3+33.4	B	/	N	2.08%	12.0	355.08	355.75	N/A	N/A	0	N/A	356.00	364.50	8.75	C-900			57	357.19	7.31	32
	33	3+13.4	B	/	N	2.08%	12.0	354.91	355.58	N/A	N/A	0	N/A	355.83	363.80	8.22	C-900			55	356.98	6.82	33
	34	2+93.4	B	/	N	2.08%	12.0	354.74	355.41	N/A	N/A	0	N/A	355.66	363.80	8.39	C-900			57	356.85	6.95	34
	35	1+85.3	B	/	N	2.08%	12.0	353.82	354.49	N/A	N/A	0	N/A	354.74	364.50	10.01	C-900			56	355.90	8.60	35
	36	1+66.4	B	/	N	2.08%	12.0	353.66	354.33	N/A	N/A	0	N/A	354.58	364.50	10.17	C-900			58	355.78	8.72	36
	37	1+46.4	B	/	N	2.08%	12.0	353.49	354.16	N/A	N/A	0	N/A	354.41	364.50	10.34	C-900			56	355.57	8.93	37
	38	1+26.4	B	/	N	2.08%	12.0	353.32	353.99	N/A	N/A	0	N/A	354.24	365.20	11.21	C-900			58	355.44	9.76	38
	39	1+06.4	B	/	N	2.08%	12.0	353.15	353.82	N/A	N/A	0	N/A	354.07	365.20	11.38	C-900			56	355.23	9.97	39
	40	0+86.4	B	/	N	2.08%	12.0	352.98	353.65	N/A	N/A	0	N/A	353.90	364.50	10.85	C-900			58	355.10	9.40	40
	41	0+60.7	B	/	N	2.08%	12.0	352.76	353.43	N/A	N/A	0	N/A	353.68	363.80	10.37	C-900			55	354.82	8.98	41
	42	0+15.7	D	/	E	2.08%	32.0	345.85	346.52	N/A	N/A	0	N/A	347.19	363.80	17.28	C-900			47	348.17	15.63	42
	43	0+40.9	F	/	G	2.08%	51.0	346.91	347.58	41.00	348.43	5	353.54	353.64	362.20	14.62	C-900			57	354.83	7.37	43
	44	0+60.9	F	/	G	2.08%	51.0	347.01	347.68	41.00	348.53	5	353.64	353.74	362.80	15.12	C-900			55	354.89	7.91	44
	45	0+82.9	F	/	G	2.08%	51.0	347.12	347.79	41.00	348.64	5	353.75	353.85	363.50	15.71	C-900			57	355.04	8.46	45
	46	0+94.8	F	/	G	2.08%	52.0	347.18	347.85	42.00	348.72	5	353.83	353.93	364.20	16.35	C-900			55	355.08	9.12	46
	47	1+20.9	F	/	G	2.08%	51.0	347.31	347.98	41.00	348.83	5	353.94	354.04	364.20	16.22	C-900			57	355.23	8.97	47
	48	1+40.9	F	/	G	2.08%	51.0	347.41	348.08	41.00	348.93	5	354.04	354.14	364.20	16.12	C-900			55	355.29	8.91	48
	49	1+60.9	F	/	G	2.08%	51.0	347.51	348.18	41.00	349.03	5	354.14	354.24	363.50	15.32	C-900			57	355.43	8.07	49
	50	1+80.9	F	/	G	2.08%	51.0	347.61	348.28	41.00	349.13	5	354.24	354.34	363.50	15.22	C-900			55	355.49	8.01	50
	51	0+42.9	G	/	G-1	2.08%	51.0	348.51	349.18	N/A	N/A	0	N/A	350.24	362.80	13.62	C-900			57	351.43	11.37	51
	52	0+62.5	G	/	G-1	2.08%	51.0	348.67	349.34	N/A	N/A	0	N/A	350.40	363.50	14.16	C-900			55	351.55	11.95	52
	53	0+82.5	G	/	G-1	2.08%	51.0	348.84	349.51	N/A	N/A	0	N/A	350.57	363.50	13.99	C-900			57	351.75	11.75	53
	54	1+08.8	G	/	G-1	2.08%	51.0	349.05	349.72	N/A	N/A	0	N/A	350.78	364.20	14.48	C-900			55	351.93	12.27	54
	55	1+22.5	G	/	G-1	2.08%	51.0	349.17	349.84	N/A	N/A	0	N/A	350.90	364.80	14.96	C-900			57	352.08	12.72	55
	56	1+42.5	G	/	G-1	2.08%	51.0	349.33	350.00	N/A	N/A	0	N/A	351.06	365.50	15.50	C-900			55	352.21	13.29	56
	57	1+64.6	G	/	G-1	2.08%	51.0	349.51	350.18	N/A	N/A	0	N/A	351.24	366.80	16.62	C-900			57	352.43	14.37	57
	58	1+84.5	G	/	G-1	2.08%	51.0	349.68	350.35	N/A	N/A	0	N/A	351.41	366.80	16.45	C-900			55	352.55	14.25	58
	59	2+06.9	G	/	G-1	2.08%	51.0	349.86	350.53	N/A	N/A	0	N/A	351.59	367.50	16.97	C-900			57	352.78	14.72	59
	60	2+33.0	@MH		G-1	2.08%	51.0	350.21	350.41	N/A	N/A	0	N/A	351.47	368.20	17.79	C-900			57	352.66	15.54	60
	61	2+25.8	G	/	G-1	2.08%	22.0	350.02	350.69	N/A	N/A	0	N/A	351.14	367.50	16.81	C-900			57	352.33	15.17	61
	62	2+01.8	G	/	G-1	2.08%	22.0	349.82	350.49	N/A	N/A	0	N/A	350.95	366.20	15.71	C-900			60	352.20	14.00	62
	63	1+77.8	G	/	G-1	2.08%	22.0	349.62	350.29	N/A	N/A	0	N/A	350.75	365.50	15.21	C-900			57	351.93	13.57	63
	64	1+53.8	G	/	G-1	2.08%	22.0	349.42	350.09	N/A	N/A	0	N/A	350.55	364.20	14.11	C-900			60	351.80	12.40	64
	65	1+29.8	G	/	G-1	2.08%	22.0	349.23	349.90	N/A	N/A	0	N/A	350.35	362.80	12.90	C-900			57	351.54	11.26	65
	66	1+05.8	G	/	G-1	2.08%	22.0	349.03	349.70	N/A	N/A	0	N/A	350.16	361.50	11.80	C-900			60	351.40	10.10	66
	67	0+95.6	G	/	G-1	2.08%	22.0	348.94	349.61	N/A	N/A	0	N/A	350.07	360.20	10.59	C-900			57	351.26	8.94	67
	68	0+57.8	G	/	G-1	2.08%	22.0	348.63	349.30	N/A	N/A	0	N/A	349.76	359.50	10.20	C-900			59	350.99	8.51	68
	69	0+47.8	G	/	G-1	2.08%	22.0	348.55	349.22	N/A	N/A	0	N/A	349.68	359.50	10.28	C-900			57	350.86	8.64	69
	70	1+99.8	F	/	G	2.08%	22.0	347.71	348.38	N/A	N/A	0	N/A	348.83	359.50	11.12	C-900			57	350.02	9.48	70
	71	1+75.8	F	/	G	2.08%	22.0	347.59	348.26	N/A	N/A	0	N/A	348.71	360.20	11.94	C-900			59	349.94	10.26	71
	72	1+51.8	F	/	G	2.08%	22.0	347.47	348.14	N/A	N/A	0	N/A	348.59	360.20	12.06	C-900			57	349.78	10.42	72
	73	1+27.8	F	/	G	2.08%	22.0	347.35	348.02	N/A	N/A	0	N/A	348.47	360.20	12.18	C-900			59	349.70	10.50	73
	74	1+03.8	F	/	G	2.08%	22.0	347.23	347.90	N/A	N/A	0	N/A	348.35	359.50	11.60	C-900			57	349.54	9.96	74
	75	0+79.8	F	/	G	2.08%	22.0	347.11	347.78	N/A	N/A	0	N/A	348.23	359.50	11.72	C-900			59	349.46	10.04	75
	76	0+55.8	F	/	G	2.08%	22.0	346.99	347.66	N/A	N/A	0	N/A	348.11	358.80	11.14	C-900			57	349.30	9.50	76
	77	0+31.8	F	/	G	2.08%	22.0	346.87	347.54	N/A	N/A	0	N/A	347.99	358.80	11.26	C-900			59	349.22	9.58	77
	78	0+07.8	F	/	G	2.08%	22.0	346.75	347.42	N/A	N/A	0	N/A	347.87	358.20	10.78	C-900			57	349.06	9.14	78
	79	0+00.0	@MH		G	2.08%	22.0	346.37	347.04	N/A	N/A	0	N/A	347.50	358.20	11.16	C-900			60	348.75	9.45	79
	BLDG.2	0+51.3	EX. 078/031	/	EX. 078/160	2.08%	100.3	361.95	362.62	N/A	N/A	0	N/A	364.71	371.25	8.63	C-900			77	366.31	4.94	BLDG.2
	BLDG.3	1+42.3	EX. 078/032	/	O	2.08%	126.0	360.16	360.83	N/A	N/A	0	N/A	363.45	369.24	8.41	C-900			78	365.07	4.17	BLDG.3
	BLDG.6	0+58.0	P	/	Q	1.00%	140.0	361.49	362.16	N/A	N/A	0	N/A	363.56	369.30	7.14	C-900			128	364.84	4.46	BLDG.6
	BLDG.7	0+63.0	P	/	Q	1.50%	85.0	361.51	362.18	N/A	N/A	0	N/A	363.46	367.70	5.52	C-900			114	365.17	2.53	BLDG.7
	SITE #1	2+79.9	EX. 078/031	/	EX. 078/160	1.00%	107.0	363.10	363.77	N/A	N/A	0	N/A	364.84	372.00	8.23	C-900			297	367.81	4.19	SITE #1
	SITE #2	0+64.6	O	/	P	2.08%	21.0	360.73	361.40	N/A	N/A	0	N/A	361.83	368.58	7.18	C-900			142	364.79	3.79	SITE #2
*	KA	0+24.6	H1	/	H2	2.87%	81.6	352.93	353.60	N/A	N/A	0	N/A	355.94	368.77	15.17	C-900			102	358.87	9.90	KA

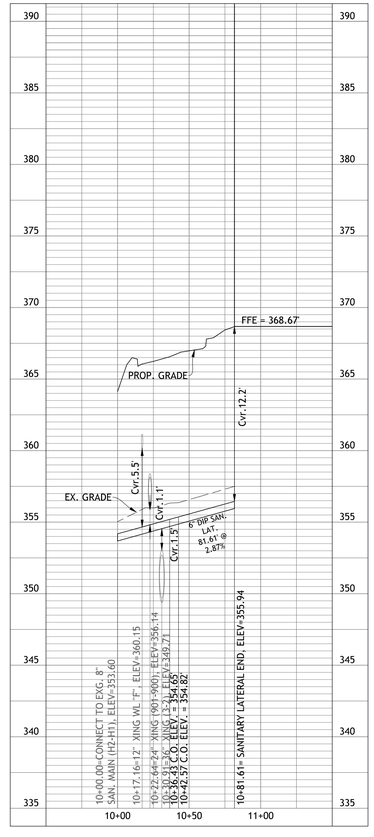
* SANITARY LATERAL PROPOSED WITH THIS SITE PLAN.

MANHOLE US	MANHOLE DS	UNITS LOTS	UNITS TOTAL	AVG.DESIGN FLOWS (GPD/UNIT)	DISCHARGE (GPD)	CUMULATIVE DISCHARGE (GPD)	P.F.F.	RESIDENTIAL PEAK FLOW (GPD)	RESIDENTIAL PEAK FLOW (cfs)	ACTUAL VELOCITY (fps)	LENGTH (ft)	PIPE DIA. (in)	SLOPE %	n	FULL FLOW CAPACITY (GPD)	FULL FLOW CAPACITY (cfs)	FULL FLOW VEL. (fps)	ELEVATION OF INVERTS US INV.	ELEVATION OF INVERTS DS INV.	d/D %	q/Q %	PIPE MATERIAL	PW/CSA Use Only Date Line Installed	PW/CSA Use Only Date Line Passed Test	PW/CSA Use Only MH ID	PW/CSA Use Only Date MH Passed Vac. Test
G-1	G	19	19	350	6650	6650	4	26600	0.0412	1.16	233.00	8	0.82%	0.013	710823	1.10	3.2	350.08	348.16	13.48%	3.74%	C-900				
G	F	18	37	350	6300	12950	4	51800	0.0802	1.29	250.00	8	0.50%	0.013	553710	0.86	2.5	347.96	346.71	23.36%	9.36%	C-900				
F	E	0	37	350	0	12950	4	51800	0.0802	1.28	61.23	8	0.49%	0.013	548145	0.85	2.4	346.51	346.21	23.50%	9.45%	C-900				
E	D	1	38	350	350	13300	4	53200	0.0823	1.36	41.56	8	0.60%	0.013	606559	0.94	2.7	346.01	345.76	22.53%	8.77%	C-900				
D	C	0	38	350	0	13300	4	53200	0.0823	1.30	152.00	8	0.50%	0.013	553710	0.86	2.5	345.56	344.80	23.73%	9.61%	C-900				
C	B	0	38	350	0	13300	4	53200	0.0823	1.31	25.00	8	0.52%	0.013	564676	0.87	2.5	344.60	344.47	23.46%	9.42%	C-900				
H1	H		3.7	2000	0	7400	4	29600	0.0458	1.20	184.90	8	0.80%	0.013	700395	1.08	3.1	352.11	350.63	14.45%	4.23%	C-900				
J	I	7	7	350	2450	2450	4	9800	0.0152	0.67	105.00	8	0.81%	0.013	704541	1.09	3.1	352.83	351.98	6.95%	1.39%	C-900				
I	H	5	12	350	1750	4200	4	16800	0.0260	0.85	229.83	8	0.50%	0.013	553710	0.86	2.5	351.78	350.63	12.07%	3.03%	C-900				
H	B	0	*	350	0	11600	4	46400	0.0718	1.25	285.91	8	0.51%	0.013	561409	0.87	2.5	350.43	349.07	21.81%	8.26%	C-900				
N	B	29	29	350	10150	10150	4	40600	0.0628	1.39	475.38	8	0.85%	0.013	723647	1.12	3.2	356.30	352.24	17.22%	5.61%	C-900				
B	A	0	*	350	0	35050	4	140200	0.2169	1.70	20.82	8	0.48%	0.013	542523	0.84	2.4	344.27	344.17	39.87%	25.84%	C-900				
A	PUMP STA	0	*		0	35050	4	140200	0.2169	1.73	29.52	8	0.50%	0.013	553710	0.86	2.5	343.97	343.82	39.43%	25.32%	C-900				
Q	P	1.91	1.91	2000	3820	3820	4	15280	0.0236	0.82	80.00	8	0.50%	0.013	553710	0.86	2.5	361.60	361.20	11.52%	2.76%	C-900				
P	O	1.07	2.98	2000	2140	5960	4	23840	0.0369	0.95	118.56	8	0.50%	0.013	553710	0.86	2.5	361.00	360.40	14.61%	4.31%	C-900				
O	EX. 078/032	0.49	3.47	2000	980	6940	4	27760	0.0430	1.01	150.62	8	0.50%	0.013	553710	0.86	2.5	360.20	359.45	16.03%	5.01%	C-900				
EX. 078/159	EX. 078/160				0	0	4	0	0.0000	0.00	38.41	8	0.50%	0.013	553710	0.86	2.5	363.52	363.33	0.00%	0.00%	C-900				
EX. 078/160	EX. 078/031	3.64	3.64	2000	7280	7280	4	29120	0.0451	1.03	285.42	8	0.50%	0.013	554817	0.86	2.5	363.13	361.70	16.50%	5.25%	C-900				
EX. 078/031	EX. 078/038				0	7280	4	29120	0.0451	1.04	401.18	8	0.51%	0.013	559220	0.87	2.5	361.50	359.45	16.41%	5.21%	C-900				
H2	H1	3.7	3.7	2000	7400	7400	4	29600	0.0458	1.77	198.64	8	2.50%	0.013	1238134	1.92	5.5	357.28	352.31	10.78%	2.39%	C-901				

8" SANITARY MAIN



6" SANITARY LATERAL



HORIZONTAL SCALE

GRAPHIC SCALE

0 25 50 100

(IN FEET)

1 INCH = 50 FEET

VERTICAL SCALE

GRAPHIC SCALE

0 2.5 5 10

(IN FEET)

1 INCH = 5 FEET

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: AS NOTED

PLAN DATE
01/06/23
03/17/23
06/30/23

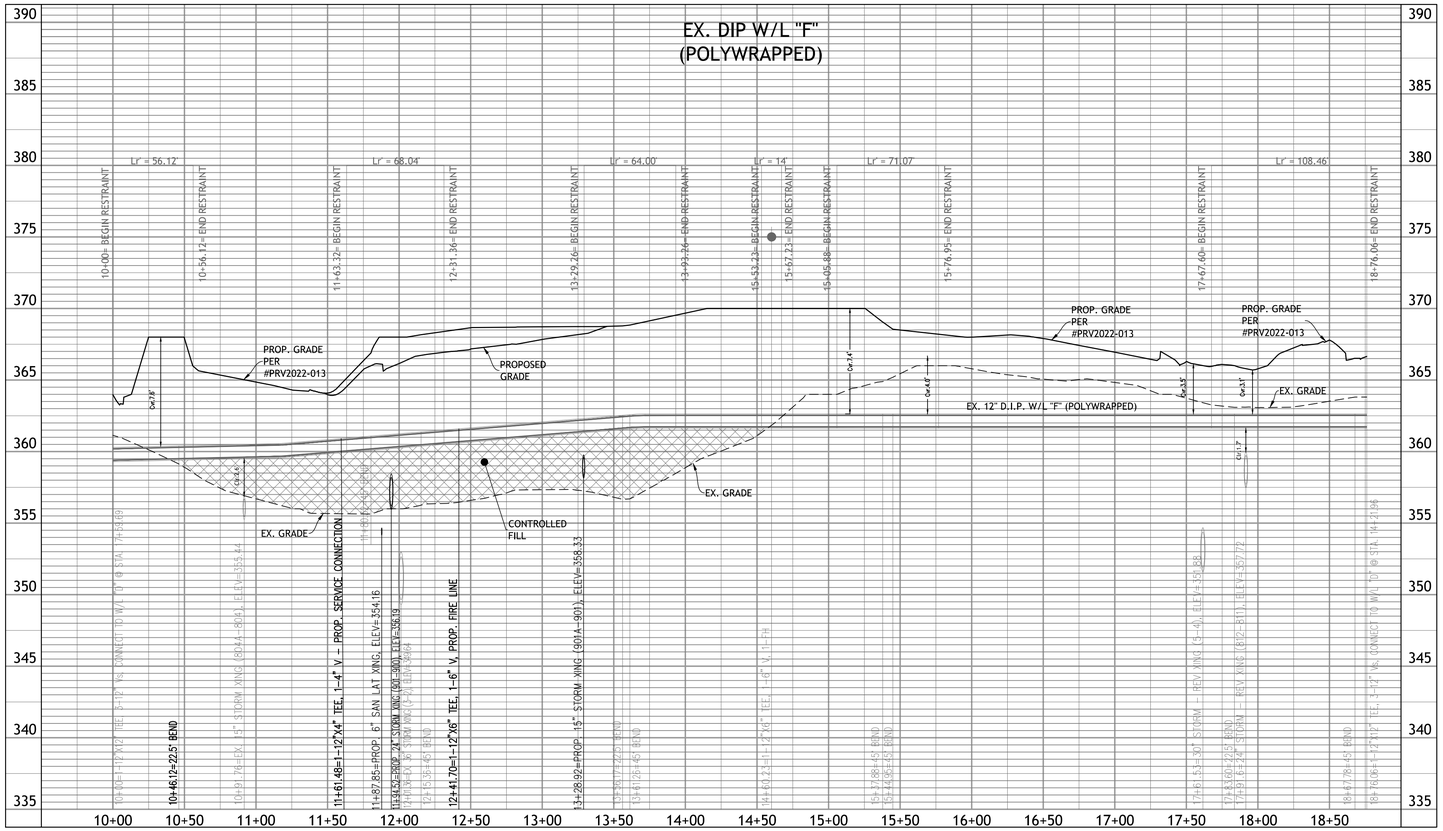
UTILITY COMPUTATIONS AND PROFILES
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

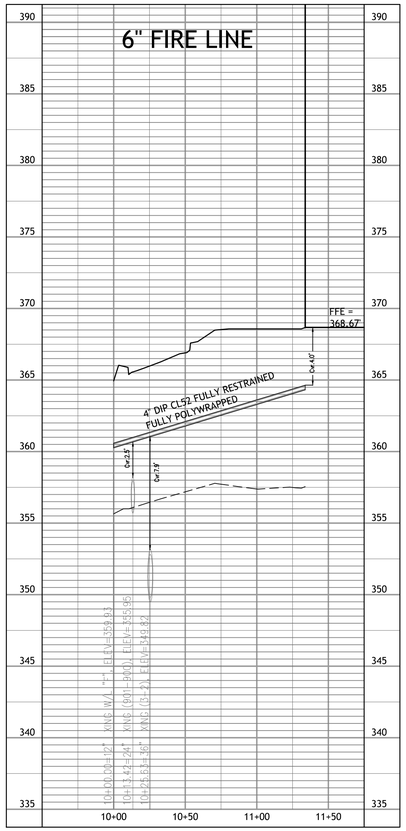
REVISIONS

No.	DATE	DESCRIPTION

SHEET
31
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)





HORIZONTAL SCALE

GRAPHIC SCALE

0 25 50 100

(IN FEET)
1 INCH = 50 FEET

VERTICAL SCALE

GRAPHIC SCALE

0 2.5 5 10

(IN FEET)
1 INCH = 5 FEET

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: AS NOTED

PLAN DATE
01/06/23
03/17/23
06/30/23

UTILITY PROFILES
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

SHEET
32
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

"NO PARKING" SIGN LEGEND

SIGN TYPE "A"

STANDARD WORDING WITH AN ARROW AT BOTTOM POINTING TO THE RIGHT. ONE SIGN MOUNTED PARALLEL TO THE LINE OF CURBING OR THE PAVEMENT EDGE AT END OF PAINTED AREA.

SIGN TYPE "B"

STANDARD WORDING WITH A TWO DIRECTIONAL ARROW. ONE SIGN MOUNTED PARALLEL TO THE LINE OF CURBING OR THE PAVEMENT EDGE IN BETWEEN SIGNS "A" & "C" IN DISTANCES GREATER THAN 100'.

SIGN TYPE "C"

STANDARD WORDING WITH AN ARROW AT BOTTOM POINTING TO THE LEFT. ONE SIGN MOUNTED PARALLEL TO THE LINE OF CURBING OR THE PAVEMENT EDGE AT END OF PAINTED AREA.

SIGN LEGEND:

- SIGNS
- STREET SIGN
- 1 STOP SIGN
- 2 STREET SIGN
- 3 HANDICAP SIGN
- A FIRE LANE "A"
- B FIRE LANE "B"
- C FIRE LANE "C"
- FIRE LANE

*SEE SHEET 02 FOR HANDICAP SIGN DETAILS

REQUIREMENTS-FIRE LANE MARKINGS AND SIGNS

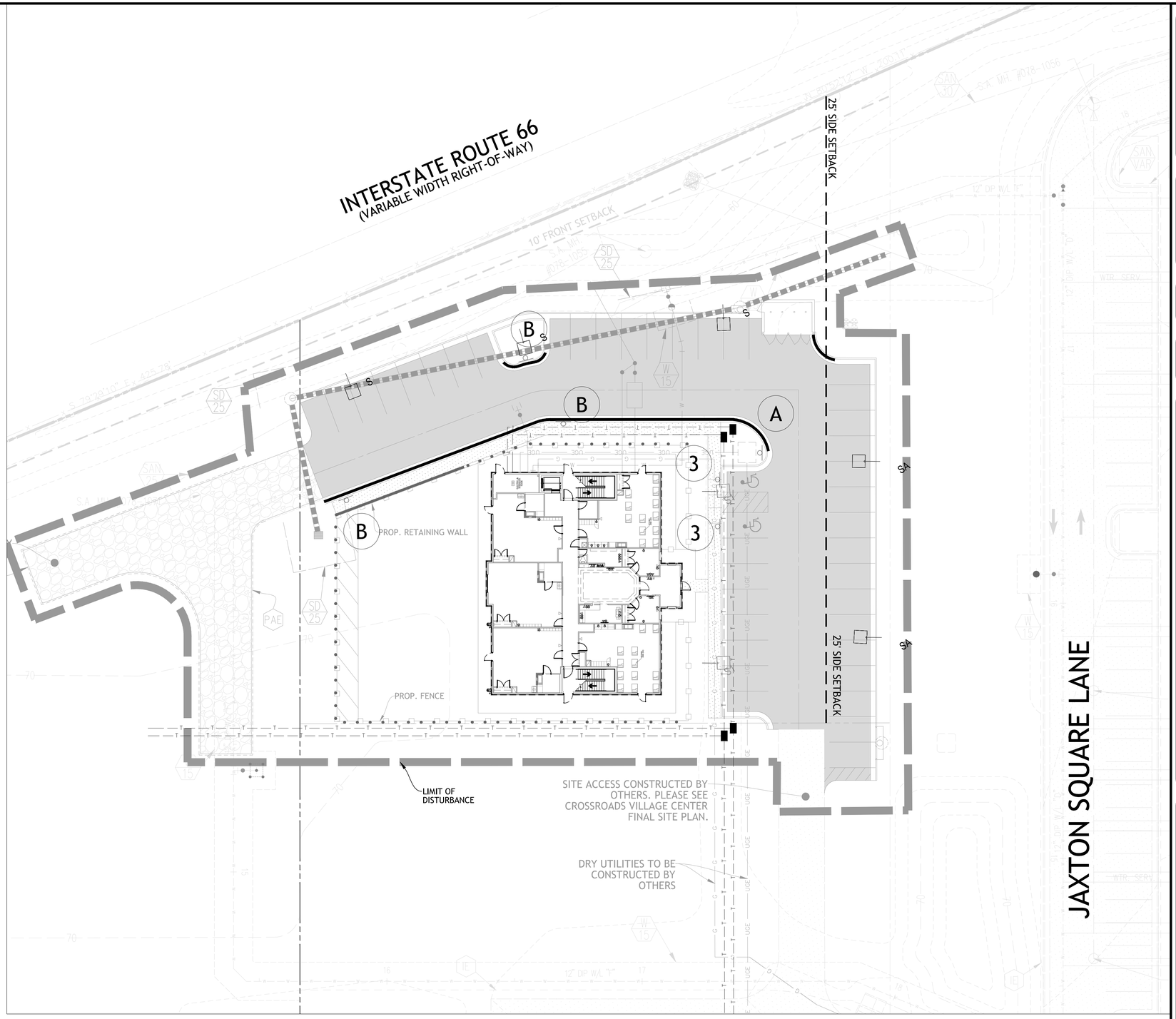
I. APPROVED SIGN SPECIFICATIONS
- A. METAL CONSTRUCTION, "12x18".
- B. RED LETTERS ON REFLECTIVE WHITE BACKGROUND WITH 3/8" RED TRIM STRIP AROUND ENTIRE OUTER EDGE OF SIGN.
- C. LETTERING ON SIGN TO BE: "NO PARKING OR STANDING FIRE LANE".
- D. LETTERING SIZE TO BE AS FOLLOWS: "NO PARKING" AND "STANDING" – 2", "OR" – 1", "FIRE LANE" – 2 1/2", ARROWS 1"x6" SOLID SHAFT WITH A SOLID HEAD 1 1/2" WIDE AND 2" DEEP.
- E. SIGNS ARE TO BE MOUNTED 7' FROM THE GROUND TO THE BOTTOM OF THE SIGN UNLESS OTHERWISE DIRECTED BY THE LOUDOUN COUNTY INSPECTOR.
- F. POSTS FOR SIGNS, WHEN REQUIRED, SHALL BE METAL AND SECURELY MOUNTED, UNLESS WRITTEN PERMISSION FOR ALTERNATIVES IS OBTAINED PRIOR TO INSTALLATION FROM THE CODE OFFICIAL.
- G. OTHER SPECIAL SIGNS AS APPROVED BY THE CODE OFFICIAL.

II. CURB DESIGNATION

FIRE LANE SIGNS SHALL BE INSTALLED AT THE BEGINNING OF A DESIGNATED FIRE LANE AND AT THE END OF A DESIGNATED FIRE LANE WITH DIRECTIONAL ARROWS POINTING IN.

III. INSPECTION NOTICE

FIRE MARSHAL FIELD INSPECTION NECESSARY FOR FINAL APPROVAL OF FIRE LANES. FIRE LANES MUST HAVE FINAL APPROVAL PRIOR TO REQUEST FOR OCCUPANCY PERMIT.



GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= 2'
SCALE: 1"=20'

PLAN DATE
01/06/23
03/17/23
06/30/23

FIRE LANE MARKING
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

SHEET
33
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

HATCH LEGEND:

ROAD HATCH

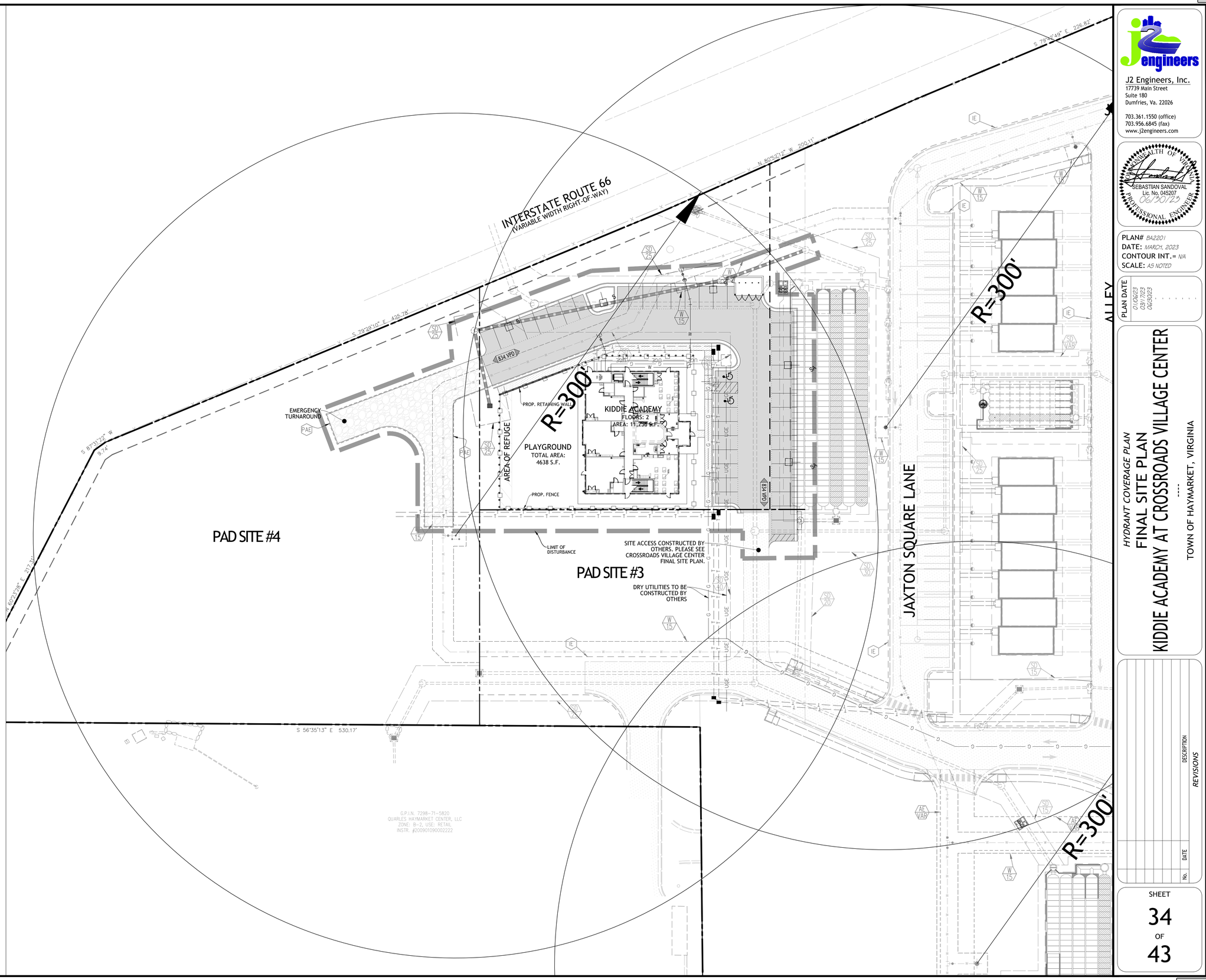
SIDEWALK HATCH

FIRE HYDRANT COVERAGE NOTES:
1. FIRE HYDRANT COVERAGE: SHOULD COMPLY WITH DCSM SECTION 302.08 (PWC DCSM Table 3-2)
-SINGLE FAMILY DWELLINGS ATTACHED - 300 FT
2. NO OBSTRUCTION OF ARE PERMITTED WITHIN 3' OF A FIRE HYDRANT (PLANTINGS, FENCES, RETAINING WALL, ETC.) OR 10' OF A AUTOMATIC SPRINKLER SYSTEM OR STANDPIPE SYSTEM FIRE DEPARTMENT CONNECTION.
3. ALL FIRE HYDRANTS AND WATER MAINS LOCATED IN OR ON PARKING STRUCTURES SHALL BE PROTECTED FROM FREEZING (NO HEAT TAPE).
4. FIRE HYDRANTS IN SINGLE FAMILY DWELLING AREAS SHALL BE LOCATED AS FOLLOWS:
(A) LOT LINE AND/OR
(B) CURVE OF PAVEMENT
5. FIRE HYDRANTS SUBJECT TO IMPACT BY VEHICLES MUST BE PROTECTED BY GUARD POSTS OR OTHER APPROVED MEANS.

FIRE FLOW NOTES:
1. ADEQUATE FIRE FLOW (2500 GPM @ 20 PSI MINIMUM RESIDUAL PRESSURE) MUST BE AVAILABLE ON SITE.
2. FIRE LINE PROPERLY SIZED. (MINIMUM 6" IN DIAMETER)

N. STATE ROAD NO. 81 NORTH

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 INCH = 30 FEET



J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: AS NOTED

PLAN DATE
01/06/23
03/17/23
06/30/23

HYDRANT COVERAGE PLAN
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

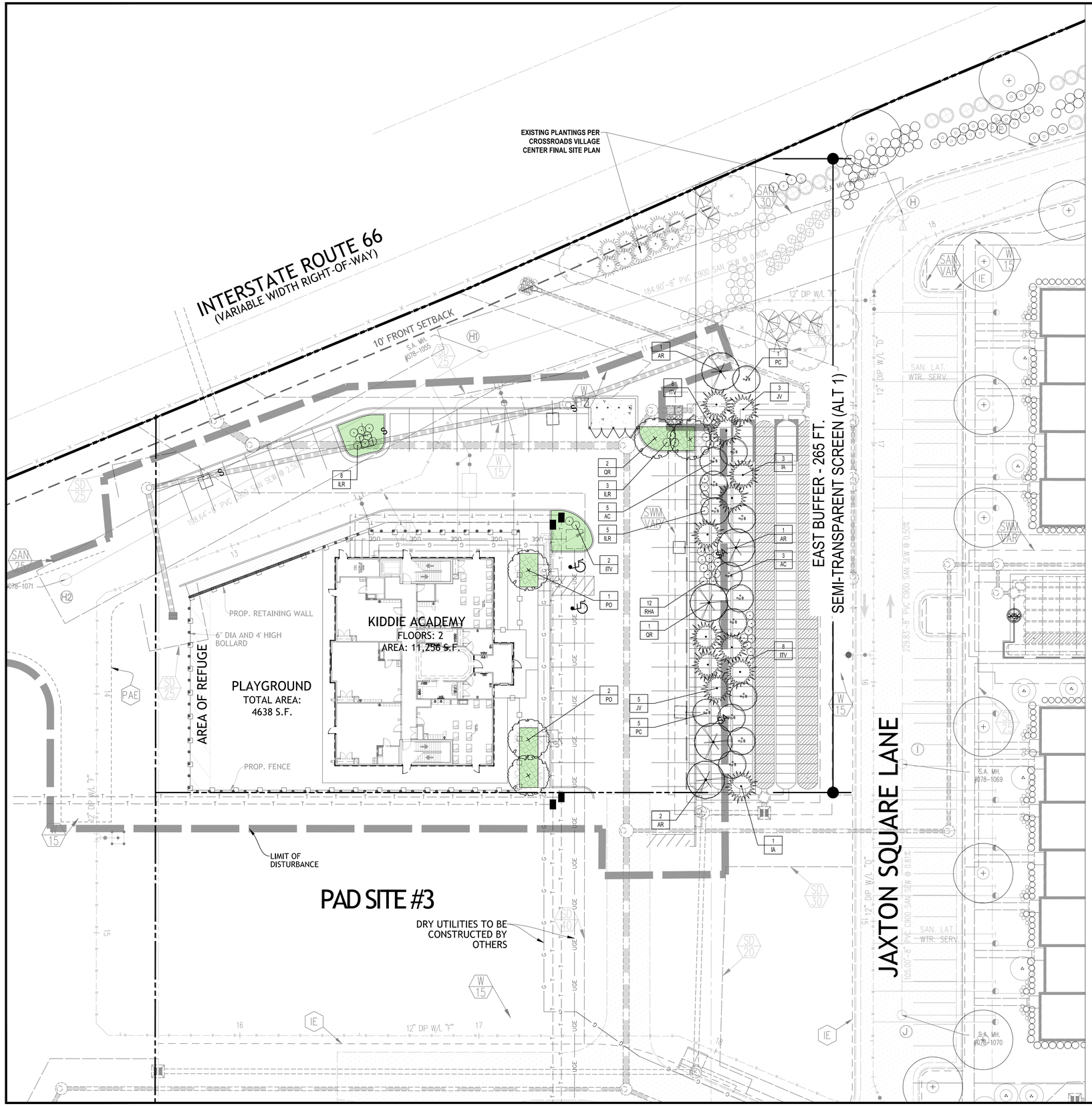
TOWN OF HAYMARKET, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

SHEET
34
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)



LEGEND

- PARKING LOT LANDSCAPE AREA
- INTERIOR PARKING LOT - CANOPY TREE
- CANOPY TREE
- ORNAMENTAL TREE
- EVERGREEN TREE
- SHRUB
- PLANT TAG (XX / XX)

GENERAL NOTE
PROPOSED PLANT MATERIAL THAT ARE PROVIDED IN THE EASEMENTS OR ON TOP OF THE UNDERGROUND STORM STRUCTURE WILL NOT BE DETRIMENTAL TO THE EASEMENT OR STRUCTURE. IT WILL BE REPLACED IN KIND BY THE OWNER IF DAMAGED OR REMOVED AS PART OF UTILITY MAINTENANCE.

INTERIOR PARKING LOT LANDSCAPING
- THIS PLAN ONLY PROVIDES INTERIOR PARKING LOT LANDSCAPING AND COMPUTATIONS FOR PROPOSED DEVELOPMENT - KIDDIE ACADEMY.
- SEE INTERIOR PARKING LOT LANDSCAPING SCHEMATIC PLAN AND COMPUTATIONS ON SHEET 36.

BUFFER YARD
BUFFER YARD IS ONLY PROVIDED FOR PROPOSED DEVELOPMENT (KIDDIE ACADEMY) THAT IS PART OF THIS APPLICATION.

SECTION 58-17.10 / 58-17.8
BUFFER YARDS & SCREENING

Buffer Yard	EAST	
Required buffer width:	25	ft
Provided buffer width:	25	ft
Buffer Length:	265	ft
Buffer Area:	6,625	sq.ft.
Required Screen	**S.S. (Semi Transparent Screen)**	
Screening Alternative	**ALT 1**	

Canopy Trees Required:	1 per	1,000	s.f.	=	**7**	Existing:	2	Proposed:	5	Total Provided: **7**
Ornamental Trees Required:	1 per	500	s.f.	=	**14**	Existing:	0	Proposed:	14	Total Provided: **14**
Evergreen Trees Required:	1 per	500	s.f.	=	**14**	Existing:	2	Proposed:	12	Total Provided: **14**
Shrubs Required:	1 per	100	s.f.	=	**67**	Existing:	34	Proposed:	33	Total Provided: **67**

PLANT SCHEDULE - TREES

Location / Use	Qty.	Key	Scientific Name	Common Name	Size	Root Type
			CANOPY TREES			
Buffer Yard	4	AR	Acer rubrum	Red Maple	2.5" cal.	B&B
Interior Parking Lot	3	PO	Platanus occidentalis	American Sycamore	2.5" cal.	B&B
Buffer Yard/Interior Parking Lot	3	QR	Quercus rubra	Northern Red Oak	2.5" cal.	B&B
			ORNAMENTAL TREES			
Buffer Yard	8	AC	Amelanchier canadensis	Serviceberry	5-6' ht.	B&B
Buffer Yard	6	PC	Prunus cerasifera	Cherry Plum	5-6' ht.	B&B
			EVERGREEN TREES			
Buffer Yard	4	IA	Ilex x attenuata 'Fosteri'	Foster's Holly	6-8' ht.	B&B
Buffer Yard	8	JV	Juniperus virginiana	Eastern Red Cedar	6-8' ht.	B&B

PLANT SCHEDULE - SHRUBS

Location / Use	Qty.	Key	Scientific Name	Common Name	Size	Root Type
			DECIDUOUS SHRUBS			
Buffer Yard/Interior Parking Lot	18	ITV	Ilex verticillata	Winterberry	12-24" Ht.	Cont.
Buffer Yard	12	RHA	Rhododendron atlanticum	Dwarf Azalea	12-24" Ht.	Cont.
			EVERGREEN SHRUBS			
Buffer Yard/Interior Parking Lot	16	ILR	Ilex crenata	Japanese Holly	12-24" Ht.	Cont.

VA. STATE GRID NORTH

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026
703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: 1"=20'

PLAN DATE
01/06/23
03/17/23
06/30/23

LANDSCAPE PLAN
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
35
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

PLANTING SPECIFICATIONS

1. QUALITY ASSURANCE:
   - A. Landscape planting and related work shall be performed by a firm with a minimum of five years experience specializing in this type and scale of work.
   - B. Applicable Specifications and Standards:
     Town of Haymarket Zoning Ordinance;
     Virginia Stormwater Management Handbook;
     American Joint Committee on Horticultural Nomenclature;
     American Standard for Nursery Stock (ANSI Z60.1), latest edition;
     Landscape Specification Guidelines for Baltimore Washington Metropolitan Areas, latest edition, by Landscape Contractors Association MD, DC, VA.
   - C. The Contractor shall guarantee all landscape improvements, including sod/seeding, for one full year from the date of initial acceptance by the owner. Contractor must contact owner at least 10 business days in advance to schedule acceptance inspection(s). Contractor must replace all dead or unacceptable plants during the following planting season.
2. SUBMITTALS: Submit the following to the Owner's Representative prior to beginning work:
   - A. Copies of manufacturer's data for all materials required.
   - B. Samples of required mulch material.
   - C. Chemical and mechanical analysis and samples of all existing soil, topsoil, organic matter and soil mix to be used.
   - D. Planting schedule showing the dates (earliest and latest) proposed for each type of plant specified, schedule each type of planting within the normal planting seasons for such work. Include requests for any proposed changes in the approved planting season and a list of proposed sources for all plant materials.
   - E. List of proposed sources for all plant material.
3. DELIVERY, HANDLING, AND STORAGE:
   - A. Deliver packaged materials in manufacturer's unopened containers or bundles, fully identified with name, brand, type, weight, and analysis. Store packaged materials in such a manner as to prevent damage or intrusion of foreign matter.
   - B. Dig balled and burlapped (B&B) plants with firm, natural balls of earth, of a diameter not less than that shown on the plant list nor less than recommended by the American Standard for Nursery Stock, and of sufficient depth to include the fibrous and feeding roots. B&B plants will not be accepted if the ball is cracked or broken before or during planting operation.
   - C. Deliver trees and shrubs after preparations for planting have been completed. Do not bend, bind, or tie trees or shrubs in such a manner as to damage bark, break branches or destroy natural shape. If planting is delayed more than 6 hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist by heeling-in bare root stock and covering plant balls with soil, peat moss or other acceptable material for balled stock. Plants shall be kept well watered and shall not remain unplanted for longer than ten (10) days after delivery.
   - D. Plants shall be lifted and handled from the bottom of the ball only.
   - E. Do not remove container-grown stock from containers until planting time.
4. DRAINAGE: Before planting, determine that areas to receive plant material have adequate subdrainage.
   - A. The landscape contractor is responsible for drainage tests as necessary to identify any problems prior to beginning planting operations. Upon commencement of planting operations the landscape contractor assumes responsibility for soil conditions.
   - B. Dig planting pits to full depth and dimensions indicated on drawings.
   - C. At bottom of planting pit, excavate rectangular pit 12 inches by 12 inches by 18 inches deep. Quickly pour water into pit to a depth of 6 inches (approximately 3-3 3/4 gallon). Note time required for water to be completely absorbed. Divide time noted by 6 to achieve average rate of absorption for 1 inch of water. Where rate of absorption exceeds 60 minutes per inch, notify owner immediately for directions on how to proceed.
5. PLANTING DATES: Planting shall be done only within the following dates except as approved by Owner.
   - A. Deciduous Trees and Shrubs: March 1 to May 31 and October 15 to December 15.
   - B. Evergreen Trees, Shrubs and Vines: March 1 to May 31 and September 1 to November 15.
   - C. All plant material shall be guaranteed by the Contractor for a period of 1 year from the date final acceptance to be in good, healthy and flourishing condition.
6. MATERIALS FOR PLANTING: Contractor must provide, load, haul, mix and spread all materials for plantings as required.
   - A. Topsoil: shall be a fertile, friable natural loam, uniform in composition, free of stones, lumps, plants and their roots, debris and other extraneous matter over 1 inch in diameter, capable of sustaining vigorous plant growth. Soil shall be harvested at a single source from the O and/or A horizons of the soil profile.
     1) Topsoil shall have a pH range of 5.5 to 7.5.
     2) Topsoil shall contain 1.5-5% organic matter by dry weight .
     3) Soil Texture: sandy loam, sandy clay loam with the following particle size distribution:

Gravel	Less than 10%
Silt	15-30%
Clay	20-35%

     4) Chemical Levels shall be:

Magnesium Mg	100+ units
Phosphorus P205	150+ units
Potassium - K20	120+ units

     5) Soluble Salts/ Conductivity - Not to exceed 900 ppm/0.9 mmhos/cm (in soil); not to exceed 3000 ppm/2.5 mmhos/cm (in high organic mix)
     6) Cation exchange capacity shall be a minimum of 8 meq/100g.
   - B. Clay Loam to Sandy Clay Loam Soil: shall be a fertile, friable natural loam, uniform in composition, free of stones, lumps, plants and their roots, debris and other extraneous matter over 1 inch in diameter, capable of sustaining vigorous plant growth.
     1) Soil shall have a pH range of 5.5 to 6.5.
     2) Soil shall contain 2-5% organic content by volume.
     3) Soil Texture: Clay loam to sandy clay loam with the following particle size distribution:

Gravel	Less than 10%
Sand	20-50%
Silt	<35%
Clay	20-40%

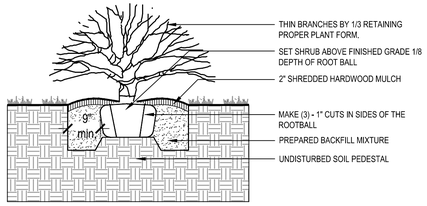
     4) Chemical Levels shall be:

Magnesium Mg	100+ units
Phosphorus P205	150+ units
Potassium - K20	120+ units

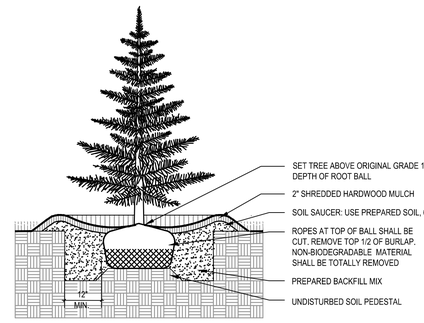
     5) Soluble Salts/ Conductivity - Not to exceed 900 ppm/0.9 mmhos/cm (in soil); not to exceed 3000 ppm/2.5 mmhos/cm (in high organic mix)
     6) Cation exchange capacity shall be 20-35 meq/100g.
   - C. Compost: Compost shall be mature, stable, weed free, and produced by aerobic decomposition of organic matter. Compost feedstock shall be plant matter, such as high lignin forestry products or yard waste (leaves, brush and yard trimmings).
     1) The product must not contain any visible refuse or other physical contaminants, substances toxic to plants, or over 5% sand, silt, clay or rock material by dry weight.
     2) Compost shall be sampled and tested as required by the Seal of Testing Assurance Program of the United States Composting Council (USCC) and shall meet the physical requirements for compost as determined by USCC.
     3) The product shall possess no objectionable odors. The product must meet all applicable USEPA CFR, Title 40, Part 503 Standards for Class A biosolids.
     4) The moisture level shall be such that no visible water or dust is produced when handling the material.
   - D. Composted Pine Bark Fines: Shall be approved composted, ground pine bark having no particle with a dimension greater than 3/4 inch. No more than 10% shall be wood.
   - E. Mulch: Shall be shredded hardwood bark for trees and shrubs. Fine bark mulch is to be used for perennial beds.
   - F. Sand: Shall be quartz based sharp concrete sand, ASTM C-33 Fine Aggregate, with a Fines Modulus Index between 2.8 and 3.2.
   - G. Trace Elements: Shall be commercially available slow release materials containing zinc (Zn), Molybdenum (Mo), Copper (Cu), Boron (B), and Magnesium (Mn).
   - H. Fertilizer: A commercial fertilizer for ornamental trees, shrubs and ground cover with an analysis of 10% Nitrogen, 6% Phosphorus and 4% Potassium shall be used. This fertilizer shall be granular with a minimum of 50% of the total Nitrogen in organic form. 14-14-14-Osmocote (or approved equal) shall be applied at a rate of 10 lbs. per square foot, tilled to a depth of 8 inch, shall be used for perennials.
   - I. Soil Separator: Shall be rot resistant non-woven polypropylene filter fabric, water permeable, and unaffected by freezing and thawing. Acceptable products include: Mirafi 140N, Mirafi Civil Engineering Co., or Stabilenka Type T-80, American Enka Co., Enka, N.C.
   - J. Planter Drainage Fabric: Shall be prefabricated planter drainage fabric Miradrain 9000, a composite system consisting of a Mirafi drainage fabric bonded to a three-dimensional highly impact-resistant plastic core. The core shall have the following attributes:
     1) Compressive Strength: (ASTM D-1621), 15,000 + PSF.
     2) Overlaps: Shall be capable of mechanically interlocking so as to prevent separation of the overlaps during backfill.
7. PLANT MATERIALS: Refer to the PLANT LIST on the drawings for specific types and quantities of plants:
   - A. Plants shall be nursery grown in accordance with good horticultural practices. Plants shall either be obtained from local nurseries and/or others, which have soil (heavy clay) and climatic conditions similar to those in the locality of the project.
   - B. Plant material grown in sandy, well-drained soil will not be approved for this project. Plants shall be true to species and variety and unless specifically noted otherwise, all plants shall be of specimen quality, exceptionally heavy, symmetrical, tightly-knit plants, so trained or favored in their development and appearance as to be superior in form, number of branches, compactness and symmetry.
   - C. Plants shall be sound, healthy and vigorous, well branched and densely foliated when in leaf, free of disease, insect pests, eggs or larvae and shall have healthy, well-developed root systems. They shall be free from physical damage or any conditions that would prevent thriving health and the desired appearance.
   - D. Trees, which have a damaged or crooked leader, or multiple leaders, unless specified in the plant list, will be rejected. Trees with abrasion of the bark, sun scald, disfiguring knots, or pruning cuts more than 1 1/4 inch diameter which have not completely callused, will be rejected.
   - E. Plants shall conform to measurements specified in the plant schedules except that plants larger than specified may be used if acceptable to the Landscape Architect or owner. Use of such plants shall not increase the contract price. If larger plants are accepted, the root ball shall be sized for the larger plant.
   - F. Caliper Measurement: Shall be taken at a point on the trunk 6 inches above natural ground line for trees up to 4 inches diameter, and at a point 12 inches above the natural ground line for trees over 4 inches diameter.
   - G. Plants shall be measured when branches are in the normal position. Height and spread dimensions specified refer to the main body of the plant and not from branch tip to tip.
8. SOIL MIXING PROCEDURES:
   - A. Topsoil used in sand/soil mixes shall be screened or shredded prior to mixing in sands. Maximum clod inclusion for soil mixes shall not exceed:

Clod size (largest dimension)	% of the soil mix volume
Less than 1"	Unlimited
1 to 3 inches	20%
3 to 6 inches	5%
>6 inches	Less than 2%

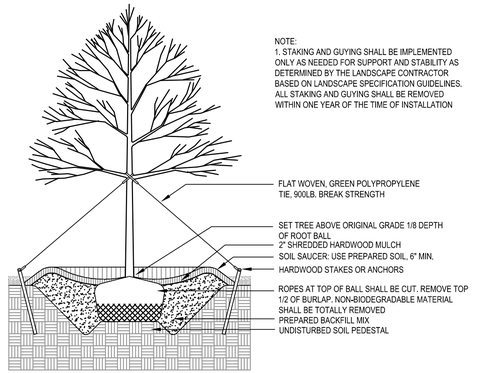
   - B. Source material and soil mix stockpiles shall be protected from rain by covering with filter cloth.
9. INSPECTION:
   - A. Examine the areas and conditions where soil mix is to be installed and notify the Landscape Architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.
   - B. Cooperate with other Contractors and trades working in and adjacent to other work areas. Examine drawings which show development of entire project and become familiar with scope of other work required.
10. SOIL INSTALLATION - GENERAL PROCEDURES:
    - A. If subgrade soil compaction exceeds 80%, existing soil shall be ripped to a depth of 14 inches to alleviate compaction which has taken place during construction. Prior to loosening of soil, Contractor must locate existing utilities and coordinate with Owner any underground electric lines, drainage pipes, conduits, etc.
    - B. Prepare the subgrade by roughening the top 3 inches of the subsoil by dragging the teeth of a backhoe bucket across the surface.
    - C. Begin soil installation as soon as subsoil is prepared. Use low impact equipment with track belts, large tires, or low tire pressure to lower compaction and soil damage during installation.
    - D. Monitor compaction during installation and loosen soils as needed if compaction exceeds 80%.
    - E. Install specified soil in 12-18 inch thick lifts. Compact each lift sufficiently to reduce settling but not enough to prevent the movement of water and feeder roots through the soil. The soils in each lift should feel firm to the foot in all areas and make only slight heel prints.
11. INSTALLATION OF SOIL MIX FOR LAWN AREAS ON GRADE:
    - A. Soil Mix for Lawns on Grade: shall consist of 10% compost and 90% topsoil, by volume. These materials must meet specifications described in Section 2.00.
    - B. Loosen subgrade lawn areas to a minimum of 3 inches. Remove stones more than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter. Limit preparation to areas which will be planted promptly after preparation.
    - C. Spread soil mix for lawn areas on grade to a minimum depth of 6 inches as required to meet grade and elevations shown on drawings, after lightly rolling and natural settlement. Allow for sod thickness in areas to be sodded.
12. INSTALLATION OF SOIL MIX FOR TREE PITS ON GRADE
    - A. Confirm that native subsoil drains at a rate of at least ½ inch per hour. If drainage is less than ½ inch per hour, provide subsurface drainage lines.
    - B. Install 30-36 inches of Soil Mix for Tree Pit Backfill on Grade, which shall consist of 3 parts existing clay loam to sandy clay loam soil, amended per soil test results instructions and incorporating 1 part Compost and/or Composted Pine Bark Fines.
    - C. Till 4 inches of compost into the top 6 inches of the installed Soil Mix.
13. INSTALLATION OF SOIL MIX FOR MULCHED SHRUB AND PERENNIAL BEDS:
    - A. Confirm that native subsoil drains at a rate of at least ½ inch per hour. If drainage is less than ½ inch per hour, provide subsurface drainage lines.
    - B. Install 14-18 inches of Soil Mix for Mulched Shrub and Perennial Beds, which shall consist of 3 parts existing clay loam to sandy clay loam soil, amended per soil test results instructions and incorporating 1 part Compost and/or Composted Pine Bark Fines.
    - C. Till 4 inches of compost into the top 6 inches of the installed Soil Mix.
14. EROSION CONTROL MATERIAL AND PLANTING ON STEEP SLOPES:
    - A. Material meeting the requirements of the specifications shall be installed and maintained on the designated areas as shown and specified. The areas to be covered shall be prepared and fertilized as specified before the erosion material is placed. Immediately prior to the planting operations, the material shall be laid evenly, smoothly and in contact with the soil throughout.
    - B. Lay erosion control materials with one inch nominal openings in accordance with manufacturer's instructions. Unroll in direction of water flow. Overlap sheets by at least 6 inches. Where strips are to be spliced lengthwise, overlap strips by 8 inches. Upgrade section shall be on top of all splices.
    - C. The Contractor shall maintain and protect the erosion control material until the final inspection. Maintenance shall consist of repairs made necessary by erosion, wind or any other cause. Following the restoration of damaged areas under plant and turf guarantee and establishment requirements for applicable underlying items; the erosion control material shall be repaired or replaced to meet the original requirements and maintained until the final inspection.
15. GENERAL PLANT INSTALLATION:
    - A. Excavation: Excavate all tree pits and planting areas to the width and depth shown in the planting details.
    - B. Center plant in pit and orient for the best visual effect. Set plants plumb and hold rigidly in position until soil has been tamped firmly around root ball.
    - C. Mix soil amendments and fertilizers with existing soil in accordance with soil recommendations for plant type, based upon soil test results as approved by Owner. Delay mixing of fertilizer if planting will not occur within a few days.
    - D. Backfill pit with planting soil mix, consisting of 2/3 existing soil and 1/3 organic material, and fertilizer, until two-thirds full. Tamp and water each layer thoroughly to settle soil. After soil settles, fill pit with remaining planting soil mix, water and shape surface so that it slopes to drain from trunk and matches ground at edge of planting pit.
    - E. Mulch within 48 hours after planting and after applying the pre-emergent herbicide, except ground cover areas (which shall have organic material placed before planting) with a 2 inch layer of mulch immediately after planting. All bed lines shall be cut with a smooth consistent edge to a minimum depth of 3 inches. Keep mulch out of the crowns of shrubs and off buildings, sidewalks, light standards, and other structures.
    - F. All planting areas to conform to specified grades after full settlement has occurred and mulch has been applied. Provide saucers around tree pits as shown on planting details. Remove all tags, labels, strings, etc. from all plants.
16. PERMANENT SEEDING OR SODDING FOR GRASS AREAS:
    - A. Lawn Seed or Sod varieties shall be an improved variety turf-type tall fescue blend. The landscape contractor shall select from varieties approved by the Maryland or Virginia Department of Agriculture.
    - B. Refer to the Virginia Erosion and Sediment Control Handbook, for guidelines, specifications and installation techniques of seed and sod.
    - C. Maintenance shall begin immediately after each plant and lawn area is installed and shall continue until 90 days after final acceptance of the last section.



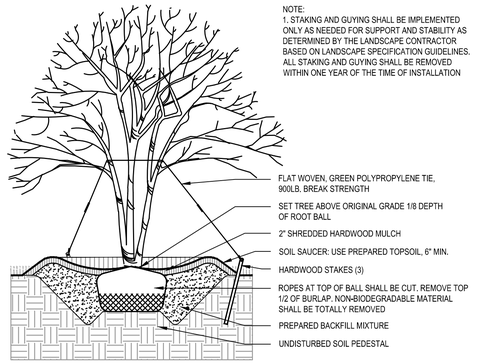
TYP. B&B SHRUB PLANTING
N.T.S.



EVERGREEN TREE PLANTING
N.T.S.



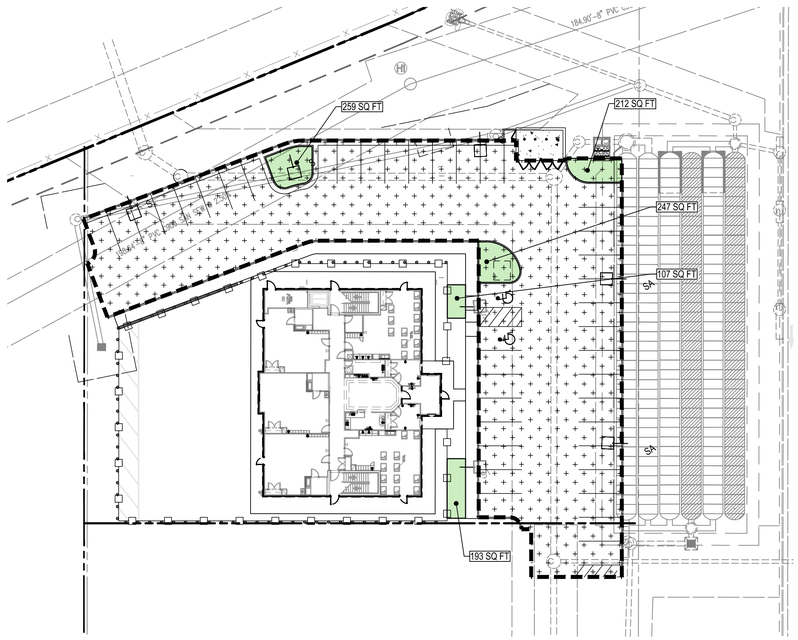
DECIDUOUS TREE PLANTING
N.T.S.



ORNAMENTAL TREE PLANTING
N.T.S.

LEGEND
- PARKING LOT AREA
- PARKING LOT LANDSCAPE AREA

SECTION 58-17.13(e)		
INTERIOR PARKING LOT LANDSCAPING		
REQUIRED		
Gross Area of parking lot:	17,118	
% landscape area required:	5%	
Landscape area required:	856	s.f.
PROVIDED		
Landscape Area Provided:	1,018	s.f.
Total number of parking spaces provided:	41	
Number of trees required:	5	
Trees Provided:	5	
Number of shrubs required:	13	
Shrubs Provided:	13	



INTERIOR PARKING LOT AREA: SCHEMATIC PLAN
SCALE - 1:30

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: AS SHOWN

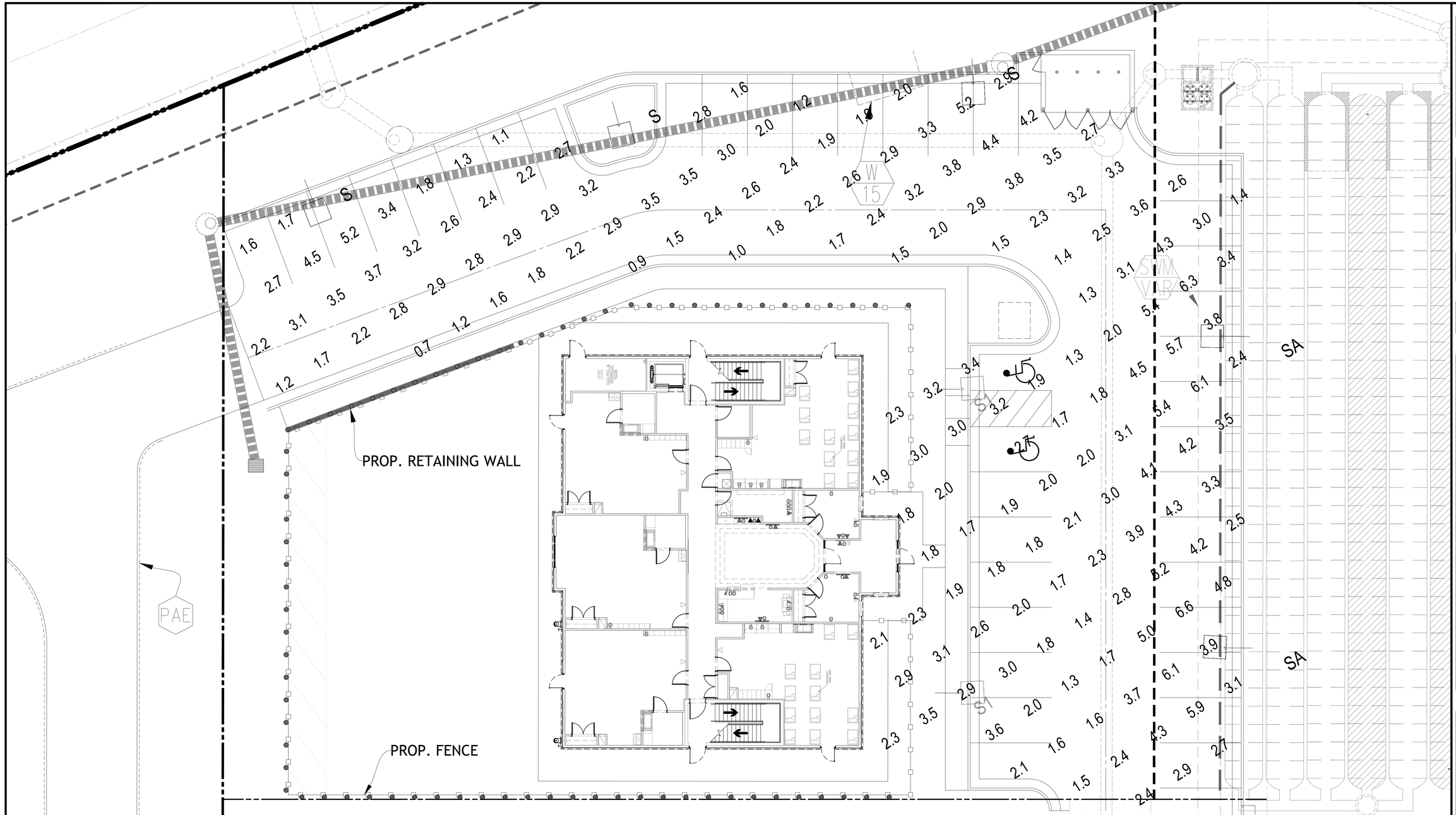
PLAN DATE
01/08/23
03/17/23
06/30/23

LANDSCAPE NOTES & DETAILS
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER
TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
36
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)



Luminaire Schedule								
Symbol	Qty	Label	Arrangement	Description	LLF	Luminaire Lumens	Luminaire Watts	Total Watts
	3	S	Single	LSI 1/MRM-LED-12L-SIL-FT-40-70CRI-IL, 16' AFG	0.900	8110	94	282
	2	S1	Single	LSI 1/MRM-LED-12L-SIL-5W-40-70CRI, 16' AFG	0.900	12269	94	188
	2	SA	Single	LSI 1/MRM-LED-12L-SIL-3-40-70CRI-IL, 16' AFG	0.900	9449	94	188

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
FRONT AREA OF BLDG	Illuminance	Fc	2.51	3.5	1.7	1.48	2.06
PARKING & DRIVE AISLE	Illuminance	Fc	2.83	6.6	0.7	4.04	9.43

NOTE:
1. SEE SHEETS 38 - 39 FOR PHOTOMETRIC PLAN DETAILS AND CUTSHEETS.
2. LIGHT FIXTURES ON THIS PLAN WILL BE PERMITTED, OPERATED AND MAINTAINED BY KIDDIE ACADEMY

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: 1"=10'

PLAN DATE
01/06/23
03/17/23
06/30/23

PHOTOMETRIC PLAN
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

SHEET
37
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

Catalog # : Project : Type :
Prepared By : Date :

Mirada Medium (MRM)

Outdoor LED Area Light

IP66 IK08

OVERVIEW	
Lumen Package	7,000 - 48,000
Wattage Range	48 - 401
Efficacy Range (LPW)	117 - 160
Weight lbs(kg)	30 (13.6)

QUICK LINKS

Ordering Guide | Performance | Photometrics | Dimensions

FEATURES & SPECIFICATIONS

Construction

- Rugged die-cast aluminum housing contains factory prewired driver and optical unit. Cast aluminum wiring access door located underneath.
- Designed to mount to square or round poles.
- Fixtures are finished with LSI's DuraGrip® polyester powder coat finishing process. The DuraGrip finish withstands extreme weather changes without cracking or peeling. Other standard LSI finishes available. Consult factory.
- Shipping weight: 37 lbs in carton.

Optical System

- State-of-the-Art one piece silicone optic sheet delivers industry leading optical control with an integrated gasket to provide IP66 rated sealed optical chamber in 1 component.
- Proprietary silicone refractor optics provide exceptional coverage and uniformity in IES Types 2, 3, SW, FT, FTA and AM.
- Silicone optical material does not yellow or crack with age and provides a typical light transmittance of 93%.
- Zero uplight.
- Available in 5000K, 4000K, and 3000K color temperatures per ANSI C78.377. Also Available in Phosphor Converted Amber with Peak intensity at 610nm.
- Minimum CRI of 70.
- Integral louver (IL) and integral half louver (IH) options available for enhanced backlight control.

Electrical

- High-performance programmable driver features over-voltage, under-voltage, short-circuit and over temperature protection. Custom lumen and wattage packages available.
- 0-10V dimming (10% - 100%) standard.
- Standard Universal Voltage (120-277 Vac) Input 50/60 Hz or optional High Voltage (347-480 Vac).
- L80 Calculated Life: >100k Hours (See Lumen Maintenance chart)
- Total harmonic distortion: <20%
- Operating temperature: -40°C to +50°C (-40°F to +122°F), 42L and 48L lumen packages rated to +40°C.
- Power factor: >.90
- Input power stays constant over life.
- Field replaceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).
- High-efficacy LEDs mounted to metal-core circuit board to maximize heat dissipation
- Components are fully encased in potting material for moisture resistance. Driver complies with FCC standards. Driver and key electronic components can easily be accessed.

Controls

- Optional integral passive infrared Bluetooth™ motion and photocell sensor (see page 8 for more details). Fixtures operate independently and can be commissioned via iOS or Android configuration app
- LSI's AirLink™ wireless control system options reduce energy and maintenance costs while optimizing light quality 24/7. (see controls section for more details).

Installation

- Designed to mount to square or round poles.
- A single fastener secures the hinged door, underneath the housing and provides quick & easy access to the electrical compartment.
- Included terminal block accepts up to 12 ga. wire.
- Utilizes LSI's traditional 3" drill pattern B3 for easy fastening of LSI products.

Warranty

- LSI LED Fixtures carry a 5-year warranty.

Listings

- Listed to UL 1598 and UL 8750.
- Meets Buy American Act requirements.
- IDA compliant; with 3000K color temperature selection.
- Title 24 Compliant; see local ordinance for qualification information.
- Suitable for wet Locations.
- IP66 rated Luminaire per IEC 60598.
- 3G rated for ANSI C136.31 high vibration applications are qualified.
- DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL, to confirm which versions are qualified.
- Patented Silicone Optics (US Patent NO. 10,816,165 B2)
- IK08 rated luminaire per IEC 66262 mechanical impact code

Mirada Medium Outdoor LED Area Light

Type :

Have questions? Call us at (800) 436-7800

ORDERING GUIDE

Back to Quick Links

TYPICAL ORDER EXAMPLE: MRM LED 36L SIL FTA UNV DIM 50 70CRI ALSCS04 BRZ IL

Prefix	Light Source	Lumen Package	Lens	Distribution	Orientation[1]	Voltage	Driver
MRM - Mirada Medium Area Light	**LED**	**7L** - 7,000 lms **9L** - 9,000 lms **12L** - 12,000 lms **18L** - 18,000 lms **24L** - 24,000 lms **30L** - 30,000 lms **36L** - 36,000 lms **42L** - 42,000 lms **48L** - 48,000 lms Custom Lumen Packages[1]	**SIL** - Silicone	**2** - Type 2 **3** - Type 3 **SW** - Type 5 Wide **FT** - Forward Throw **FTA** - Forward Throw: Automotive **AM** - Automotive Merchandise	**(blank)** - standard **L** - Optics rotated left 90° **R** - Optics rotated right 90°	**UNV** - Universal Voltage (120-277V) **HV** - High Voltage (347-480V)	**DIM** - 0-10V Dimming (0-10%)

Color Temp	Color Rendering	Finish		Options
50 - 5,000 CCT **40** - 4,000 CCT **30** - 3,000 CCT **APB** - Phosphor Converted Amber[2]	**70CRI** - 70 CRI	**BLK** - Black **BRZ** - Dark Bronze **GMG** - Gun Metal Gray **GPT** - Graphite	**MSV** - Metallic Silver **PLP** - Platinum Plus **SVG** - Satin Verde Green **WHT** - White	**(Blank)** - None **IH** - Integral Half Louver (Moderate Spill Light Cutoff)[3] **IL** - Integral Louver (Sharp Spill Light Cutoff)[3]

Controls (Choose One)

(Blank) - None

Wireless Controls System
ALSC - AirLink Synapse Control System
ALSCH2 - AirLink Synapse Control System with 12-20' Motion Sensor
ALSCHSD12 - AirLink Synapse Control System Host / Satellite with 12-20' Motion Sensor [1]
ALSCS04 - AirLink Synapse Control System with 20-40' Motion Sensor
ALSCHSD04 - AirLink Synapse Control System Host / Satellite with 20-40' Motion Sensor [1]
ALBCS1 - AirLink Blue Wireless Motion & Photo Sensor Controller (8-24' mounting height)
ALBCS2 - AirLink Blue Wireless Motion & Photo Sensor Controller (25-40' mounting height)

Stand-Alone Controls
EXT - 0-10v Dimming leads extended to housing exterior
CR7P - 7 Pin Control Receptacle ANSI C136.41 [1]
IMSBT1 - Integral Bluetooth™ Motion and Photocell Sensor (8-24' MH)[1]
IMSBT2 - Integral Bluetooth™ Motion and Photocell Sensor (25-40' MH)[1]

Button Type Photocells
PC1220 - 120V
PC2090-277 - 208-277V
PC347 - 347V

Need more information? Click here for our glossary

Have additional questions? Call us at (800) 436-7800

ACCESSORY ORDERING INFORMATION[7]

CONTROLS ACCESSORIES	
Description	**Order Number**
PC120 Photocell for use with CR7P option (120V)[7]	122134
PC208-277 Photocell for use with CR7P option (208V, 240V, 277V)[7]	122135
Twist Lock Photocell (347V) for use with CR7P[7]	122136
Twist Lock Photocell (480V) for use with CR7P[7]	1225180
Airlink 5 Pin Twist Lock Controller [4]	668409
Airlink 7 Pin Twist Lock Controller [4]	668410
Shorting Cap for use with CR7P	1415128

FUSING OPTIONS[8]	
Single Fusing (120V)	See Fusing Accessory Guide
Single Fusing (277V)	
Double Fusing (208V, 240V)	
Double Fusing (480V)	
Double Fusing (347V)	

SHIELDING OPTIONS	
Mirada Small	See Shielding Guide
Mirada Medium	
Mirada Large	
Zone Medium	
Zone Large	
Slice Medium	

1. Custom lumen and wattage packages available, consult factory. Values are within industry standard tolerances but not DLC listed.
2. Not available with 50A distribution
3. Consult factory for availability.
4. Not available in 4K.
5. IMSBT is field configurable via the LSI app that can be downloaded from your smartphone's native app store.
6. Control device or shorting cap must be ordered separately. See Accessory Ordering Information.
7. Accessories are shipped separately and field installed.
8. Factory installed (CR7P option required). See Options.
9. "CLR" denotes finish. See Finish options.
10. Only available with ALSC/ALSCH control options.
11. Fusing must be located in hand hole of pole. See Fusing Accessory Guide for compatability.
12. Only available in 9L, 12L, 18L and 24L Lumen Packages. Consult factory for lead time and availability.

Mirada Medium Outdoor LED Area Light

Type :

Have questions? Call us at (800) 436-7800

ACCESSORIES

MOUNTING ACCESSORIES

Side Arm

Universal Mounting Bracket
Mounts to a 3" square or round (tapered/straight) poles with (2) mounting hole spaces between 5.5" to 5".
Part Number: DBA UMB CLR

Quick Mount Plate
Your one person installation to existing/new construction poles with hole spaces between 2.4 to 4.6"
Part Number: DBA PQM B3BS XX CLR

11" Tilt Quick Mount Plate
Your one person installation to existing/new construction poles with hole spaces between 2.4 to 4.6"
Part Number: DBA PQM B3BS XX CLR

Square Internal Slipfitter
Mounts inside 4" or 5" square pole and allows for mounting up to 4 luminaires.
Part Number: DBA H_FSF * CLR

Wall Mount Bracket
Mounts onto vertical wall surface (hardware/anchors not included)
Part Number: DBA XBG WM CLR

Wall Mount Pole Bracket
Mounts onto wooden poles (6" minimum OD, hardware/anchors not inlcuded)
Part Number: DBA XBG WP CLR

Tenon / Slipfitter

Square Tenon Top
Mounts onto a 2" (Sleen) Ø 2.375" (60mm) O.D. tenon and allows for mounting up to 4 luminaires.
Part Number: DBA XMM *

Adjustable Slipfitter
Mounts onto a 2" (Sleen) Ø 2.375" (60mm) O.D. tenon and provides 180° of tilt (max 45° above horizontal).
Part Number: DBA ASF CLR

Poles

Square Poles
14 - 35' steel and aluminum poles in 4", 5" and 6" sizes for retrofit and new construction
Part Number: 416/550/616

Round Poles
10 - 30' steel and aluminum poles in 4" and 5" sizes for retrofit and new construction
Part Number: 489/589

Tapered Poles
20' - 35' steel and aluminum poles for retrofit and new construction
Part Number: RTP

Misc.

Bird Spikes
10' Linear Bird Spike Kit, 4' recommended per luminaire, includes silicone adhesive and application tool
Part Number: 716795

SHIELDING, POLES & MISC. ACCESSORIES

Shielding

Integral Louver
Field Install Integral Louver provides maximum backlight control by shielding each individual row of LEDS.
Part Number: 686485

Integral Half Louver
Field Install Integral Half Louver provides great backlight control without impacting front side distribution.
Part Number: 745486

External Shield
External shield blocks view of light source from anyside of luminaire, additional shielding configurations available
Part Number: 705970BLK (7") / 705962BLK (6")

Poles

Square Poles
14 - 35' steel and aluminum poles in 4", 5" and 6" sizes for retrofit and new construction
Part Number: 416/550/616

Round Poles
10 - 30' steel and aluminum poles in 4" and 5" sizes for retrofit and new construction
Part Number: 489/589

Tapered Poles
20' - 35' steel and aluminum poles for retrofit and new construction
Part Number: RTP

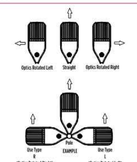
Misc.

Bird Spikes
10' Linear Bird Spike Kit, 4' recommended per luminaire, includes silicone adhesive and application tool
Part Number: 716795

Keyless QLE with paint finish description
Keyless XE with 50 for square pole or 90 for round pole (ex:" 50)
Keyless* with E (Single), DBU (Double @180°), DBQ (Double @90°), TRI (triple), QAD (Quad)
Keyless_ with a 6" square pole) or 5 (5" square pole)

OPTICS ROTATION

Top View



ACCESSORIES/OPTIONS

Integral Louver (IL) and House-Side Shield (IH)
Integral louver (IL) and half louver (IH) accessory shields available for improved backlight control. Ideal for applications where street side performance is key. Integral Louver (IL) and Integral House-Side Shield (IH) provide maximum backlight control. Louver efficiency reduces spill light behind the poles for applications with pole locations close to adjacent properties. The design maximizes forward reflected light while reducing glare, maintaining the optical distribution selected, and most importantly eliminating light trespass. Both options rotate

Luminaire Shown with integral Louver (IL)

Luminaire Shown with IMSBT Option

7 Pin Photoelectric Control
7-pin ANSI C136.41-2013 control receptacle option available for twist lock photocontrols or wireless control modules. Control accessories sold separately. Dimming leads from the receptacle will be connected to the driver dimming leads (Consult factory for alternate wiring).

Luminaire Shown with CR7P

Mirada Medium Outdoor LED Area Light

Type :

Have questions? Call us at (800) 436-7800

PERFORMANCE

Back to Quick Links

DELIVERED LUMENS*

Lumen Package	Distribution	CRI	3000K CCT			4000K CCT			5000K CCT			Wattage
			Delivered Lumens	Efficacy	BUG Rating	Delivered Lumens	Efficacy	BUG Rating	Delivered Lumens	Efficacy	BUG Rating	
7L	2	70	7560	157	B2-U0-G2	7560	157	B2-U0-G2	7560	157	B2-U0-G2	48
	3		7616	159	B1-U0-G2	7616	159	B1-U0-G2	7616	159	B1-U0-G2	
	SW		7292	152	B3-U0-G3	7292	152	B3-U0-G3	7292	152	B3-U0-G3	
	FT		7562	158	B2-U0-G2	7562	158	B2-U0-G2	7562	158	B2-U0-G2	
	FTA		7595	158	B2-U0-G2	7595	158	B2-U0-G2	7595	158	B2-U0-G2	
	AM		7687	160	B1-U0-G1	7687	160	B1-U0-G1	7687	160	B1-U0-G1	
9L	2	70	9853	159	B2-U0-G2	9853	159	B2-U0-G2	9853	159	B2-U0-G2	62
	3		9926	160	B2-U0-G2	9926	160	B2-U0-G2	9926	160	B2-U0-G2	
	SW		9504	153	B3-U0-G2	9504	153	B3-U0-G2	9504	153	B3-U0-G2	
	FT		9856	159	B2-U0-G3	9856	159	B2-U0-G3	9856	159	B2-U0-G3	
	FTA		9900	160	B2-U0-G2	9900	160	B2-U0-G2	9900	160	B2-U0-G2	
	AM		10009	162	B2-U0-G3	10009	162	B2-U0-G3	10009	162	B2-U0-G3	
12L	2	70	13135	155	B3-U0-G2	13135	155	B3-U0-G2	13135	155	B3-U0-G2	85
	3		13232	156	B2-U0-G2	13232	156	B2-U0-G2	13232	156	B2-U0-G2	
	SW		12669	149	B4-U0-G2	12669	149	B4-U0-G2	12669	149	B4-U0-G2	
	FT		13138	155	B2-U0-G3	13138	155	B2-U0-G3	13138	155	B2-U0-G3	
	FTA		13196	155	B2-U0-G2	13196	155	B2-U0-G2	13196	155	B2-U0-G2	
	AM		13355	157	B2-U0-G2	13355	157	B2-U0-G2	13355	157	B2-U0-G2	
18L	2	70	19318	143	B3-U0-G3	19318	143	B3-U0-G3	19318	143	B3-U0-G3	135
	3		19461	144	B1-U0-G3	19461	144	B1-U0-G3	19461	144	B1-U0-G3	
	SW		18635	138	B4-U0-G2	18635	138	B4-U0-G2	18635	138	B4-U0-G2	
	FT		19324	143	B3-U0-G3	19324	143	B3-U0-G3	19324	143	B3-U0-G3	
	FTA		19408	144	B3-U0-G3	19408	144	B3-U0-G3	19408	144	B3-U0-G3	
	AM		19641	145	B3-U0-G2	19641	145	B3-U0-G2	19641	145	B3-U0-G2	
24L	2	70	25957	147	B4-U0-G3	25957	147	B4-U0-G3	25957	147	B4-U0-G3	176
	3		26149	149	B3-U0-G4	26149	149	B3-U0-G4	26149	149	B3-U0-G4	
	SW		25037	142	B5-U0-G3	25037	142	B5-U0-G3	25037	142	B5-U0-G3	
	FT		25964	148	B3-U0-G4	25964	148	B3-U0-G4	25964	148	B3-U0-G4	
	FTA		26077	148	B3-U0-G3	26077	148	B3-U0-G3	26077	148	B3-U0-G3	
	AM		26393	150	B1-U0-G2	26393	150	B1-U0-G2	26393	150	B1-U0-G2	
30L	2	70	32417	140	B4-U0-G3	32417	140	B4-U0-G3	32417	140	B4-U0-G3	252
	3		32656	141	B5-U0-G4	32656	141	B5-U0-G4	32656	141	B5-U0-G4	
	SW		31267	135	B5-U0-G3	31267	135	B5-U0-G3	31267	135	B5-U0-G3	
	FT		32424	140	B5-U0-G4	32424	140	B5-U0-G4	32424	140	B5-U0-G4	
	FTA		32566	140	B4-U0-G3	32566	140	B4-U0-G3	32566	140	B4-U0-G3	
	AM		32960	142	B5-U0-G3	32960	142	B5-U0-G3	32960	142	B5-U0-G3	
36L	2	70	38275	133	B4-U0-G4	38275	133	B4-U0-G4	38275	133	B4-U0-G4	288
	3		38557	134	B4-U0-G5	38557	134	B4-U0-G5	38557	134	B4-U0-G5	
	SW		36897	128	B5-U0-G4	36897	128	B5-U0-G4	36897	128	B5-U0-G4	
	FT		38285	133	B4-U0-G5	38285	133	B4-U0-G5	38285	133	B4-U0-G5	
	FTA		38450	134	B4-U0-G4	38450	134	B4-U0-G4	38450	134	B4-U0-G4	
	AM		38916	135	B3-U0-G3	38916	135	B3-U0-G3	38916	135	B3-U0-G3	

Mirada Medium Outdoor LED Area Light

Type :

Have questions? Call us at (800) 436-7800

PERFORMANCE (CONT.)

DELIVERED LUMENS*

Lumen Package	Distribution	CRI	3000K CCT			4000K CCT			5000K CCT			Wattage
			Delivered Lumens	Efficacy	BUG Rating	Delivered Lumens	Efficacy	BUG Rating	Delivered Lumens	Efficacy	BUG Rating	
42L	2	70	44118	125	B5-U0-G4	44118	125	B5-U0-G4	44118	125	B5-U0-G4	354
	3		44444	126	B4-U0-G5	44444	126	B4-U0-G5	44444	126	B4-U0-G5	
	SW		42555	120	B5-U0-G4	42555	120	B5-U0-G4	42555	120	B5-U0-G4	
	FT		44130	125	B4-U0-G5	44130	125	B4-U0-G5	44130	125	B4-U0-G5	
	FTA		44322	125	B4-U0-G4	44322	125	B4-U0-G4	44322	125	B4-U0-G4	
	AM		44859	127	B4-U0-G3	44859	127	B4-U0-G3	44859	127	B4-U0-G3	
48L	2	70	48795	122	B5-U0-G4	48795	122	B5-U0-G4	48795	122	B5-U0-G4	401
	3		49156	123	B4-U0-G5	49156	123	B4-U0-G5	49156	123	B4-U0-G5	
	SW		47066	117	B5-U0-G4	47066	117	B5-U0-G4	47066	117	B5-U0-G4	
	FT		48809	122	B4-U0-G5	48809	122	B4-U0-G5	48809	122	B4-U0-G5	
	FTA		49021	122	B5-U0-G4	49021	122	B5-U0-G4	49021	122	B5-U0-G4	
	AM		49605	124	B4-U0-G3	49605	124	B4-U0-G3	49605	124	B4-U0-G3	

ELECTRICAL DATA (AMPS)*

Lumens	120V	208V	240V	277V	347V	480V
7L	0.40	0.23	0.20	0.17	0.14	0.10
9L	0.52	0.30	0.26	0.22	0.18	0.13
12L	0.71	0.41	0.35	0.31	0.24	0.18
18L	1.13	0.65	0.56	0.49	0.39	0.28
24L	1.47	0.85	0.73	0.64	0.51	0.37
30L	1.93	1.12	0.97	0.84	0.67	0.48
36L	2.40	1.38	1.20	1.04	0.83	0.60
42L	2.95	1.70	1.48	1.28	1.02	0.74
48L	3.44	1.98	1.74	1.54	1.24	0.84

ELECTRICAL DATA - PHOSPHOR CONVERTED AMBER (AMPS)*

Lumens	Watts	120V	208V	240V	277V	347V	480V
9L	74.5	0.64	0.44	0.38	0.34	0.24	0.24
12L	102.9	0.94	0.54	0.48	0.44	0.34	0.24

*Electrical data at 25°C (77°F). Actual wattage may differ by +/-10%.

RECOMMENDED LUMEN MAINTENANCE[2] (7-18L)

Ambient	Initial[3]	25k[3]	50k[3]	75k[3]	100k[3]
0-50 C	100%	96%	92%	88%	84%

RECOMMENDED LUMEN MAINTENANCE[2] (24-48L)

Ambient	Initial[3]	25k[3]	50k[3]	75k[3]	100k[3]
0-40 C	100%	100%	97%	94%	92%

1. Lumens maintenance values at 25C are calculated per TM-21 based on LM-80 data and in-situ testing.
2. In accordance with IESNA TM-21-11, Projected Values represent interpolated value based on time durations that are within six times the IESNA LM-80-08 total test duration for the device under testing.
3. In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times the IESNA LM-80-08 total test duration for the device under testing.

DELIVERED LUMENS*

Lumen Package	Distribution	Phosphor Converted Amber (Peak 610nm)			Wattage
		Delivered Lumens	Efficacy	BUG Rating	
9L	2	5848	80	B2-U0-G2	74
	3	6008	82	B1-U0-G2	
	SW	5473	74	B3-U0-G2	
	FT	5808	79	B1-U0-G2	
	FTA	5924	80	B1-U0-G1	
	AM	5995	81	B1-U0-G1	
12L	2	7530	74	B2-U0-G2	102
	3	7749	76	B1-U0-G2	
	SW	7045	69	B3-U0-G2	
	FT	7470	73	B2-U0-G2	
	FTA	7628	75	B2-U0-G2	
	AM	7720	76	B1-U0-G1	
18L	2	9311	69	B2-U0-G2	135
	3	9582	71	B2-U0-G2	
	SW	8712	65	B3-U0-G2	
	FT	9257	68	B2-U0-G2	
	FTA	9453	70	B2-U0-G2	
	AM	9546	71	B2-U0-G1	
24L	2	10955	63	B2-U0-G2	175
	3	11273	64	B2-U0-G2	
	SW	10249	59	B3-U0-G2	
	FT	10867	62	B2-U0-G2	
	FTA	11097	63	B2-U0-G2	
	AM	11230	64	B2-U0-G1	

*LEDs are frequently updated therefore values are nominal.

Mirada Medium Outdoor LED Area Light

Type :

Have questions? Call us at (800) 436-7800

PHOTOMETRICS

Back to Quick Links

Luminaire photometry has been conducted by a NVLAP accredited testing laboratory in accordance with IESNA LM-79-08. As specified by IESNA LM-79-08 the entire luminaire is tested as the source resulting in a luminaire efficiency of 100%.

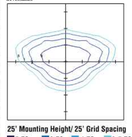
See the individual product page on https://www.lsicorp.com/ for detailed photometric data.

MRM-LED-30L-SIL-2-40-70CRI

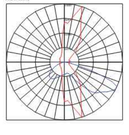
Luminaire Data	
Type 2 Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	32,486
Watts	212
Efficacy	160
IES Type	Type II - Short
BUG Rating	B4-U0-G5

Zonal Lumen Summary		
Zone	**Lumens**	**% Luminaire**
Low (0-30°)	4796	15%
Medium (30-60°)	15811	49%
High (60-90°)	7474	23%
Very High (80-90°)	535	1%
Uplight (90-180°)	0	0%
Total Flux	32486	100%

ISO Footcandle



POLAR CURVE



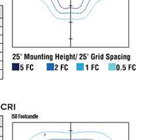
25' Mounting Height/ 25' Grid Spacing
5 FC 2 FC 1 FC 0.5 FC

MRM-LED-30L-SIL-3-40-70CRI

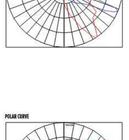
Luminaire Data	
Type 3 Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	32,656
Watts	212
Efficacy	161
IES Type	Type III - Short
BUG Rating	B3-U0-G4

Zonal Lumen Summary		
Zone	**Lumens**	**% Luminaire**
Low (0-30°)	3385	10%
Medium (30-60°)	16250	50%
High (60-90°)	12450	38%
Very High (80-90°)	981	2%
Uplight (90-180°)	0	0%
Total Flux	32656	100%

ISO Footcandle



POLAR CURVE



25' Mounting Height/ 25' Grid Spacing
5 FC 2 FC 1 FC 0.5 FC

MRM-LED-30L-SIL-FT-40-70CRI

Luminaire Data	
Type FT Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	32,424
Watts	212
Efficacy	140
IES Type	Type IV - Short
BUG Rating	B5-U0-G4

Zonal Lumen Summary		
Zone	**Lumens**	**% Luminaire**
Low (0-30°)	3952	12%
Medium (30-60°)	17005	48%
High (60-80°)	12379	38%
Very High (80-90°)	688	2%
Uplight (90-180°)	0	0%
Total Flux	32024	100%

ISO Footcandle

POLAR CURVE

25' Mounting Height/ 25' Grid Spacing
5 FC 2 FC 1 FC 0.5 FC

Mirada Medium Outdoor LED Area Light

Type :

Have questions? Call us at (800) 436-7800

PHOTOMETRICS (CONT)

MRM-LED-30L-SIL-5W-40-70CRI

Luminaire Data	
Type 5W Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	31,267
Watts	212
Efficacy	155
IES Type	Type V5 - Short
BUG Rating	B5-U0-G3

Zonal Lumen Summary		
Zone	**Lumens**	**% Luminaire**
Low (0-30°)	3318	10%
Medium (30-60°)	15751	47%
High (60-90°)	14548	47%
Very High (80-90°)	2196	7%
Uplight (90-180°)	0	0%
Total Flux	31267	100%

ISO Footcandle

POLAR CURVE

25' Mounting Height/ 25' Grid Spacing
5 FC 2 FC 1 FC 0.5 FC

MRM-LED-30L-SIL-FTA-40-70CRI

Luminaire Data	
Type FTA Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	32,566
Watts	212
Efficacy	140
IES Type	Type V5 - Short
BUG Rating	B4-U0-G3

Zonal Lumen Summary		
Zone	**Lumens**	**% Luminaire**
Low (0-30°)	6996	22%
Medium (30-60°)	19172	59%
High (60-80°)	5875	18%
Very High (80-90°)	554	2%
Uplight (90-180°)	0	0%
Total Flux	32566	100%

ISO Footcandle

POLAR CURVE

Catalog # : Project :

Prepared By : Date :

Steel Poles

Round Tapered

QUICK LINKS

Ordering Guide | Configurations | Dimensions | EPA

FEATURES & SPECIFICATIONS

Pole Shaft
- Steel round poles are 4" or 5" in diameter
- Pole shaft is electro-welded ASTM-A500 Grade C Steel Tubing with a minimum yield strength of 55,000 psi.
- On Tenon Mount steel poles, tenon is high-strength pipe. Tenon N option is 2-3/8" O.D. x 4-3/4" tall.

Hand-Hole
- Standard hand-hole location is 12" above pole base.
- Hand-hole size is 4" x 6" and reinforced.

Base
- Pole base is ASTM-A36 hot-rolled steel plate with a minimum yield strength of 36,000 psi.
- Two-piece square base cover is optional. Decorative base cover is also available

Anchor Bolts
- Steel Round Tapered Poles of 11 gauge material are furnished with anchor bolts featuring zinc-plated double nuts and washers. Galvanized anchor bolts are optional
- Poles of 7 gauge material are furnished with galvanized anchor bolts as a standard. Anchor Bolts conform to aSTM F 1554-07a Grade 55 with a minimum yield strength of 55,000 psi.

Ground Lug
- Ground lug is standard.

Duplex Receptacle
- Weatherproof duplex receptacle is optional.

Ground Fault Circuit Interrupter
- Self-testing Ground fault circuit interrupter is optional.

Finishes
- Every pole is provided with the DuraGrip® Protection System and a 5-year limited warranty:
- When the top-of-the line DuraGrip® Plus Protection System is selected, in addition to the DuraGrip® Protection System, a non-porous, automotive-grade corrosion coating is applied to the lower portion of the pole interior, sealing and further protecting it from corrosion. This option extends the limited warranty to 7 years.

Determining The Luminaire/Pole Combination For Your Application:
- Select luminaire from luminaire ordering information.
- Select bracket configuration if required
- Determine EPA value from luminaire/bracket EPA chart
- Select Pole Height
- Select MPH to match wind speed in the application area (See windspeed maps).
- Confirm pole EPA equal to or exceeding value of luminaire/bracket EPA
- Consult factory for special wind load requirements and banner brackets.

Pole Vibration Damper
- A pole vibration damper is recommended in open terrain areas of the country where low steady state winds are common.
- Non-tapered poles and lightly loaded poles are more susceptible to destructive vibration if a damper is not installed.

Listings
- UL Listed
- BAA/TAA Compliant

ORDERING GUIDE

Back to Quick Links

TYPICAL ORDER EXAMPLE: **RTP B3 S11G 35 S PLP DGP**

Pole Series	Mounting Method	Material	Height [1]	Mounting Configuration	Pole Finish	Options
RTP - Round Tapered Pole (New Build) **RTPU** - Round Tapered Pole (Retrofit)	**Bolt-On Mount[2]** - See pole selection guide for patterns and fixture matches. **B5** – 5" Traditional Drilling Pattern **B3** – 3" Reduced Drilling Pattern **B2** – 2" Reduced Drilling Pattern **T** - Tenon Mount - See pole selection guide for patterns and fixture matches **I** - No Mounting Holes[3] - Use with: BKA-IFM4 - Flush Mount Adapter[4] Greenlee Lifestyle CH Mounting Style Enterprise, Lexington, Constitution PT Single Mounting[5]	**S11G** - 11 Ga. Steel (4SQ/4SQU and 5SQ/5SQU Only) **S07G** - 07 Ga. Steel	**20'** **22'** **22' 6"** **25'** **27'** **30'** **32'** **35'** **39'**	**S** – Single/Parallel **D180** – Double **D90** – Double **DN90** – Double **T90** – Triple **TN120** – Triple **Q90** – Quad **QN90** – Quad **N** – Tenon Mount (Standard Tenon size is 2-3/8" O.D.)[6] **4N** - Tenon Mount (5RPT only. For 4" poles only, use 4RPS)[7] **4N-6** - Tenon Mount (5RPT only. For 4" poles use 4RPS)	**BRZ** – Bronze **BLK** – Black **PLP** – Platinum Plus **WHT** – White **SVG** – Satin Verde Green **GPT** – Graphite **MSV** – Metallic Silver **BZA** – Alternate Bronze	**GA** – Galvanized Anchor Bolts **SF** – Single Flood[1] **DF** – Double Flood[1] **DGP** – DuraGrip® Plus **LAB** – Less Anchor Bolts **CRDX** - Conduit Raceway

Accessory Ordering Information

Description	Order Number
35 SRTBC Square Based Cover (for 35' RTP Poles)	1568380CLR
25 SRTBC Square Based Cover (for 22', 22' 6", and 25' RTP Poles)	1568390CLR
30 SRTBC Square Based Cover (for 27' and 30' RTP Poles)	1568392CLR
35 SRTBC Square Based Cover (for 32' and 35' RTP Poles)	1568540CLR
39 SRTBC Square Based Cover (for 39' RTP Poles)	1568872CLR
MH5 – mounting Hole Plugs for use with 5" traditional drill pattern (3 set of 3 plugs)	133336
MH3 – mounting Hole Plugs for use with 3" reduced drill pattern (3 sets of 3 plugs)	681126
MH2 - Mounting Hole Plugs for use with 2" reduced drill pattern (3 sets of 3 plugs)	725841

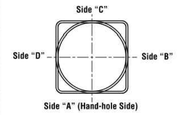
Description	Order Number
MH2 - Mounting Hole Plugs for use with 2" reduced drill pattern (3 sets of 3 plugs)	725841
ER2 – Weatherproof RTP Duplex Receptacle	122568CLR
GFI – Ground Fault RTP Circuit Interrupter	122569CLR

FOOTNOTES:
1 - See Area Light Brackets - 3" Reduced Drill Pattern and Area Light Brackets - 5" Traditional Drill Pattern Spec Sheets.
2 - Pole heights will have a +/- 1/2" tolerance. Max height for 4RP S10G is 24'. Max height of the SRP S11G is 26'
3 - See Flood Lighting Brackets section for choice of FBO Brackets
4 - Only use with 4 inch pole.
5 - For Enterprise, Lexington, and Constitution PT mounting configuration styles, see Tenon Mount (4N) and Lifestyle Slipfit Pole Series
6 - Use with BKA-IFM4.
7 - For Enterprise and Lexington D180 or other mounting configuration styles using BK MPT BO accessories order with B3 or B5 drill pattern.

DRILLING LOCATIONS

Back to Quick Links

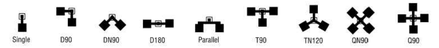
Sides	A	B	C	D
Hand-hole	X			
Single	X			
D180		X		X
D90	X			X
DN90[1]				
T90	X	X		
TN120[1]	X			
Q90	X	X	X	X
QN90[1]				
Single FBO	X			
Double FBO		X		X



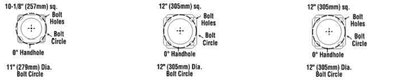
NOTES:
1 - Two locations will be 45° to the left and right of Side A.
2 - Other two locations will be 120° to the left and right of Side A.
3 - Two locations will be 45° to the left and right of Side A and two locations will be 135° to the left and right of Side A.

Consult factory for custom variations. Standard SF and DF pole preparations are located 3/4 of the height of the pole from the base, except on 20' poles. Maximum height for SF and DF pole preparations on 20' poles is 13' from the base.

FIXTURE CONFIGURATIONS



BOLT CIRCLE



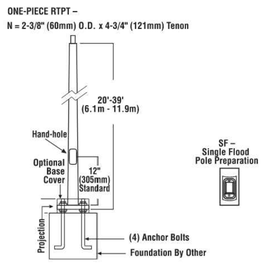
Bolt Circle Designator	N	O	S
Bolt Circle	Slotted 11" (279mm)	Slotted 12" (305mm)	Slotted 12" (305mm)
Anchor Bolt Size	1" x 36" (25mm x 914mm)	1" x 36" (25mm x 914mm)	1-1/4" x 42" (32mm x 1067mm)
Anchor Bolt Projection	4" (102mm)	4" (102mm)	5" (127mm)
Base Plate Dimensions	10-1/8" sq. x 1" thk. (257mm x 25mm)	12" sq. x 1" thk. (305mm x 25mm)	12" sq. x 1-1/4" thk. (305mm x 32mm)
Pole Gauge	11	11	7 (39' only)

Note: Base plate illustrations may change without notice. Do not use for setting anchor bolts. Consult factory for the appropriate anchor bolt template.

Bolt Circle Designator	T	U	V	W	X	Y
Bolt Circle	Slotted 8-1/2" - 11" (216mm-279mm)	Slotted 9" - 13" (229mm-330mm)	Slotted 10" - 14" (254mm-356mm)	Slotted 11" - 13-1/2" (279mm-343mm)	Slotted 11-1/2" - 14-1/2" (292mm-368mm)	Slotted 12" - 15" (305mm-406mm)
Anchor Bolt Size	1" x 36" (25mm-914mm)	1" x 36" (25mm-914mm)	1" x 36" (25mm x 914mm)	1" x 36" (25mm x 914mm)	1" x 36" (25mm x 914mm)	1-1/4" x 42" (32mm x 1067mm)
Anchor Bolt Projection	4" (102mm)	4" (102mm)	4" (102mm)	4" (102mm)	4" (102mm)	5" (127mm)
Base Plate Opening for Wireway Entry	5-9/10" (150mm)	6-7/10" (171mm)	7-5/8" (194mm)	8-5/8" (219mm)	9-1/8" (232mm)	9-1/8" (232mm)
Base Plate Dimensions	9-7/8" sq. x 1" thk. (251mm x 25mm)	11-1/4" sq. x 1" thk. (286mm x 25mm)	12" sq. x 1" thk. (305mm x 25mm)	13-1/8" sq. x 1" thk. (308mm x 25mm)	13" sq. x 1" thk. (330mm x 25mm)	14-3/8" sq. x 1-1/4" thk. (365mm x 32mm)
Pole Gauge	11	11	11	11	11	7 (39' Only)

Note: Base plate illustrations may change without notice. Do not use for setting anchor bolts. Consult factory for the appropriate anchor bolt template.

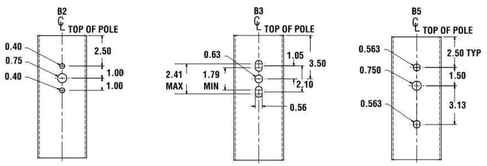
PRODUCT DIMENSIONS



SHIPPING WEIGHTS	
20' (6.1m) 5ft Ga. is approximately	137 lbs. (62kg)
22' (6.7m) 5ft Ga. is approximately	165 lbs. (75kg)
25' (7.6m) 5ft Ga. is approximately	183 lbs. (83kg)
27' (8.2m) 5ft Ga. is approximately	219 lbs. (99kg)
30' (9.1m) 5ft Ga. is approximately	234 lbs. (106kg)
32' (9.7m) 5ft Ga. is approximately	286 lbs. (130kg)
35' (10.7m) 5ft Ga. is approximately	310 lbs. (140kg)
39' (11.9m) 5ft Ga. is approximately	346 lbs. (157kg)
39' (11.9m) 5ft7 Ga. is approximately	527 lbs. (239kg)
Anchor Bolts (1" x 36")(25mm x 914mm)	30 lbs. (14kg)/set
Anchor Bolts (1-1/4" x 42")(32mm x 1069mm)	63 lbs. (29kg)/set

ONE-PIECE SHAFT Height	Pole Bottom	Pole Top
20' (6.1m)	5.80" (147mm)O.D.	3.00" (76mm)O.D.
22' (6.1m)	6.60" (168mm)O.D.	3.52" (89mm)O.D.
25' (7.1m)	6.60" (168mm)O.D.	3.10" (79mm)O.D.
27' (8.2m)	7.50" (191mm)O.D.	3.72" (94mm)O.D.
30' (9.1m)	7.50" (191mm)O.D.	3.30" (84mm)O.D.
32' (9.7m)	8.50" (216mm)O.D.	4.02" (102mm)O.D.
35' (10.7m)	8.50" (216mm)O.D.	3.60" (91mm)O.D.
39' (11.9m)	9.00" (229mm)O.D.	3.54" (90mm)O.D.

Bolt-On Mount 2-Bolt Pattern



WIND SPEED

EPA Information
All LSI Industries' poles are guaranteed to meet the EPA requirements listed. LSI Industries is not responsible if a pole order has a lower EPA rating than the indicated wind-loading zone where the pole will be located.
CAUTION: This guarantee does not apply if the pole/bracket/fixture combination is used to support any other items such as flags, pennants, or signs, which would add stress to the pole. LSI Industries cannot accept responsibility for harm or damage caused in these situations.

NOTE: Pole calculations include a 1.3 gust factor over steady wind velocity. Example: poles designed to withstand 80 MPH steady wind will withstand gusts to 104 MPH. EPAs are for locations 100 miles away from hurricane ocean lines. Consult LSI for other areas. Note: Hurricane ocean lines are the Atlantic and Gulf of Mexico coastal areas. For applications in Florida or Canada, consult factory.

Use ONLY with "Wind Speed Map for ASCE 7-10

POLE[1]	Mtg. Height Length (ft)	Wall Thick (ga)	BOLT CIRCLE			EPA							
			Designator	Dia. (in)	Anchor bolt Dia (in)	110 MPH	115 MPH	120 MPH	130 MPH	140 MPH	150 MPH	160 MPH	170 MPH	180 MPH
11-ga x 20'	20	11	N	11	1.00	14.5	13.1	12.0	10.0	8.5	7.3	6.3	5.5	4.8
11-ga x 22'	22	11	N	11	1.00	16.6	15.0	13.8	11.6	9.8	8.4	7.3	6.4	5.6
11-ga x 25'	25	11	N	11	1.00	13.1	12.0	10.9	9.0	7.6	6.5	5.6	4.9	4.2
11-ga x 27'	27	11	N	11	1.00	15.2	13.8	12.5	10.5	8.8	7.6	6.5	5.7	5.0
11-ga x 30'	30	11	N	11	1.00	12.3	11.1	10.1	8.4	7.0	6.0	5.1	4.4	3.8
11-ga x 32'	32	11	Q	12	1.00	12.3	11.1	10.1	8.4	7.0	6.0	5.1	4.4	3.8
11-ga x 35'	35	11	Q	12	1.00	10.1	9.1	8.2	6.7	5.6	4.7	3.9	3.4	2.9
11-ga x 39'	39	11	Q	12	1.00	7.6	6.8	6.1	4.9	4.0	3.3	2.7	2.3	1.9
7-ga x 39'	39	7	S	12	1.25	10.2	9.1	8.2	6.7	5.6	4.7	3.9	3.3	2.8

All LSI Industries' poles are guaranteed to meet the EPA requirements listed. LSI Industries is not responsible if a pole order has a lower EPA rating than the indicated wind-loading zone where the pole will be located.
CAUTION: This guarantee does not apply if the pole/bracket/fixture combination is used to support any other items such as flags, pennants, or signs, which would add stress to the pole. LSI Industries cannot accept responsibility for harm or damage caused in these situations.

Note:
1- Poles shorter than these listed here in for each gauge have EPA rating equal to or greater than what is provided in this table. To Confirm EPA ratings on shorter poles, contact LSI Industries.

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026
703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
02/17/23
06/30/23

PHOTOMETRIC DETAILS
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET
39
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

PRINCE WILLIAM COUNTY
Department of Development Services - Land Development Division

UNIT PRICE LIST

(Performance Bonds, Landscape Escrows, Siltation & Erosion Control Escrows, and Floodplain Item Escrows)

Effective: March 1, 2022

Project Name: KIDDIE ACADEMY AT CROSSROADS VILLAGE

PWC File #: _____ **Date Prepared:** 10/22/2022

NOTE: This form is to be used to estimate Performance Bond, Landscape Escrow, Siltation Erosion Escrow and Floodplain Items Escrow prices posted with Prince William County. These prices do not include items that are to be bonded separately with the Virginia Department of Transportation.

1. MOBILIZATION/DEMOBILIZATION OF CONSTRUCTION EQUIPMENT

Quantity	Item	Price	Cost
1	Mobilization/Demobilization	@ Lump Sum $15,000 min.	$ 15,000.00

2. STORM DRAINAGE

A. Structures

Quantity	Item	Price	Cost
	DI-1	@ $6,900 EA	$ -
2	DI-3	@ $6,900 EA	$ 13,800.00
	DI-4	@ $6,900 EA	$ -
1	MH-1	@ $4,900 EA	$ 4,900.00
	MH-2	@ $4,500 EA	$ -
	JB-1	@ $7,175 EA	$ -
1	DI-7	@ $6,800 EA	$ 6,800.00
	DI-12	@ $6,800 EA	$ -
		Subtotal for Structures:	**$ 25,500.00**

B. Concrete Pipe

Quantity	Item	Price	Cost
	12"0	@ $82 LF	$ -
54.5	15"0	@ $82 LF	$ 4,469.00
	18"0	@ $82 LF	$ -
	21"0	@ $82 LF	$ -
242.53	24"0	@ $103 LF	$ 24,980.59
	27"0	@ $103 LF	$ -
	30"0	@ $103 LF	$ -
	33"0	@ $207 LF	$ -
	36"0	@ $207 LF	$ -
	42"0	@ $207 LF	$ -
	48"0	@ $207 LF	$ -
	54"0	@ $365 LF	$ -
	60"0	@ $365 LF	$ -
	66"0	@ $365 LF	$ -
	72"0	@ $453 LF	$ -
		Subtotal for Concrete Pipe:	**$ 29,449.59**

Subtotal for this page:	**$ 69,949.59**

C. End Walls

Quantity	Item	Price	Cost
	12"0	@ $1,950 EA	$ -
	15"0	@ $1,950 EA	$ -
	18"0	@ $1,950 EA	$ -
	21"0	@ $1,950 EA	$ -
	24"0	@ $1,950 EA	$ -
	27"0	@ $1,950 EA	$ -
	30"0	@ $2,100 EA	$ -
	33"0	@ $2,300 EA	$ -
	36"0	@ $2,800 EA	$ -
	42"0	@ $7,236 EA	$ -
	48"0	@ $7,236 EA	$ -
	54"0	@ $7,236 EA	$ -
	60"0	@ $7,236 EA	$ -
	66"0	@ $7,236 EA	$ -
	72"0	@ $9,854 EA	$ -
		Subtotal for End Walls:	**$ -**

D. End Sections (ES-1)

Quantity	Item	Price	Cost
	12"0	@ $1,048 EA	$ -
	15"0	@ $1,048 EA	$ -
	18"0	@ $1,048 EA	$ -
	21"0	@ $1,048 EA	$ -
	24"0	@ $1,048 EA	$ -
	27"0	@ $1,200 EA	$ -
	30"0	@ $1,300 EA	$ -
	33"0	@ $1,500 EA	$ -
	36"0	@ $1,900 EA	$ -
	42"0 - 60"	@ $3,050 EA	$ -
		Subtotal for End Section ES-1:	**$ -**

E. Corrugated Metal Pipe

Quantity	Item	Price	Cost
	12"0	@ $40 LF	$ -
	15"0	@ $60 LF	$ -
	18"0	@ $60 LF	$ -
	24"0	@ $80 LF	$ -
	30"0	@ $80 LF	$ -
	36"0	@ $140 LF	$ -
	42"0	@ $140 LF	$ -
	48"0	@ $140 LF	$ -
	54"0	@ $250 LF	$ -
	60"0	@ $250 LF	$ -
		Subtotal for CM Pipe:	**$ -**

Subtotal for this page:	**$ -**

F. End Section (ES-2)

Quantity	Item	Price	Cost
	15"0	@ $870 EA	$ -
	18"0	@ $870 EA	$ -
	24"0	@ $870 EA	$ -
	30"0	@ $870 EA	$ -
	36"0	@ $1,100 EA	$ -
	42"0	@ $1,400 EA	$ -
	48"0	@ $1,800 EA	$ -
		Subtotal for End Sections (ES-2):	**$ -**

G. AD N-12 (HDPE)

Quantity	Item	Price	Cost
	12"0	@ $45 LF	$ -
	15"0	@ $106 LF	$ -
	18"0	@ $106 LF	$ -
	24"0	@ $106 LF	$ -
	30"0	@ $106 LF	$ -
	36"0	@ $170 LF	$ -
	42"0	@ $170 LF	$ -
	48"0	@ $170 LF	$ -
	60"0	@ $250 LF	$ -
		Subtotal for AD N-12 (HDPE):	**$ -**

Subtotal for this page:	**$ -**

H. Stormwater Management/BMP Facilities Cost Estimates Per Impervious Acre Treated (See Note 3)

Quantity	Item	Price	Cost
Non-Proprietary BMP(Engineer Estimate for all SWM)			
	Dry Retention Pond	By itemized cost	
	Dry Extended Detention Pond	By itemized cost	
	Wet Pond/Wetlands	By itemized cost	
	Bioswale	By itemized cost	
	Vegetated Grass Channel	By itemized cost	
	Micro-Bio-Retention (Raingarden)	By itemized cost	
	Infiltration Practices without Sand	By itemized cost	
	Infiltration Practices with Sand	By itemized cost	
	Filtering Practices with Sand Below Ground	By itemized cost	
	Filtering Practices with Sand Above Ground	By itemized cost	
	Permeable Pavement Level 2 Design	By itemized cost	
	Vegetated Roof Level 1 Design	By itemized cost	
	Vegetated Roof Level 2 Design	By itemized cost	
	Soil Compost Amendment	By itemized cost	
	Rooftop Impervious Surface Disconnection	By itemized cost	
	Sheet Flow to a Vegetated Filter Strip	By itemized cost	
Proprietary/Manufactured BMP-manufacturer's Certified Cost Plus Construction Cost			
	Aqua-Swirl® Stormwater Treatment System	By itemized cost	
	BaySeparator™	By itemized cost	
	Continuous Defective Separator® (CDS)	By itemized cost	
	Downstream Defender®	By itemized cost	
	Hydroguard	By itemized cost	
	Stormceptor® MAX	By itemized cost	
	Stormceptor® OSR	By itemized cost	
	Stormceptor® STC	By itemized cost	
	StormPro	By itemized cost	
	Storm Water Quality Unit	By itemized cost	
	V2B1	By itemized cost	
	The Vortechs® System	By itemized cost	
	Aqua-Filter Stormwater™ Filtration System	By itemized cost	
	Storm Tech® Isolater Row™	By itemized cost	
	Up-Flo Filter® with CPZ Media	By itemized cost	
	The Stormwater Management StormFilter® with ZPG Media	By itemized cost	
	BayFilter™ Stormwater Cartridge System	By itemized cost	
	Filterra Bioretention Systems	By itemized cost	
	Jellyfish® Filter	By itemized cost	
	Modular Wetland System Linear (MWS-Linear)	By itemized cost	
	Perk Filter	By itemized cost	
	The Stormwater Management StormFilter® with Phosphosorb Media	By itemized cost	
	Subtotal for Stormwater Management/BMP Facilities Cost Estimates Per Impervious Acre Treated:		**$ -**

Subtotal for this page:	**$ -**

I. Miscellaneous Stormwater Management

Quantity	Item	Price	Cost
	Seed, Fertilizer & Mulch ($200 Min.)	@ $3.00 SY	$ -
	Sod	@ $8.00 SY	$ -
	Hydraulic Cem. Conc. - 4" depth	@ $8.00 SF	$ -
	Bituminous Concreate - 1" depth	@ $6.00 SY	$ -
	Rip-Rap	@ $7.75 SF	$ -
	Grouted Rip-Rap	@ $9.00 SF	$ -
	Erosion Control Stone (EC-1)	@ $130 TON	$ -
	#57 - Coarse Aggregate	@ $30 TON	$ -
	4' High Chain Link Fence (#9 gauge or better, including braces, end posts and gate)	@ $45 LF	$ -
	6' High Chain Link Fence (#9 gauge or better, including braces, end posts and gate)	@ $45 LF	$ -
	SWM Sign (WATER RISES RAPIDLY) (Minimum 3 signs per facility)	@ $390 EA	$ -
	Access Road	By Itemized Cost	
		Subtotal for Miscellaneous Stormwater Management	**$ -**

J. Miscellaneous Drainage Items

Quantity	Item	Price	Cost
	Box Culvert	@ $ 840 CY of conc.	$ -
	Energy Dissipater	@ $2,250 EA	$ -
	Wing Walls	@ $990 CY of conc.	$ -
Ditches:			
	Roadside Standard Ditches (Seed, Fertilize & Mulch)	@ $8.00 LF	$ -
	Sod Ditches	@ $10.50 LF	$ -
	Paved Ditches	@ $8.50 SF	$ -
	Filter Cloth Fabric & Gabion Stone	@ $22 SF	$ -
	Rip-Rap	@ $7.75 SF	$ -
	Grouted Rip-Rap	@ $9.00 SF	$ -
	Paved Flume	@ $10 SF	$ -
	Flush the Drainage System	$290/Hr. (Min 8 Hrs.)	$ -
		Subtotal for Miscellaneous Drainage Items:	**$ -**

Subtotal for this page:	**$ -**

3. CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY AND/OR PRIVATE INGRESS/EGRESS EASEMENTS

A. Site Work

Quantity	Item	Price	Cost
	Clear & Grub	@ $12,800	$ -
	Excavation	@ $35 CY	$ -
	Embankment** (cut and fill)	@ $25 CY	$ -
	Embankment (haul off)	@ $36 CY	$ -
	Final Grading	@ $5,000 AC	$ -
	Rock Excavation	@ $75 CY	$ -
	Slope Stabilization - Hydroseeding (3:1 or flutter) $1,000 Min.	@ $1.25 SY	$ -
	Slope Stab. - Jute Mesh, matting Blankets, etc. (Between 2:1 to 3:1) $200 Min	@ $6.00 SY	$ -
	Slope Stab. - Sod (Between 2:1 to 3:1) $200 Min	@ $8.00 SY	$ -
	Steep Slopes (Grading and Stabilization with Jute Mesh, Netting, Blankets, etc.)	@ $20 SY	$ -
		Subtotal for Site Work:	**$ -**

B. Subgrade, Subbase, and Base Course Items

Quantity	Item	Price	Cost
1639	Subgrade preparation (Subbase and base course)	@ $3.50 SY	$ 5,736.50
9834	Aggregate (21A/21B)	@ $3 SY per Inch Depth	$ 29,502.00
10653.5	Bituminous Concrete	@ $6.25 SY per Inch Depth	$ 66,584.38
192	Reinforced Concrete Pavement	@ $18 SY per Inch Depth	$ 3,456.00
	Gravel Shoulders (4" Depth)	@ $12 SY (4" Depth)	$ -
	Soil Cement Stabilization (4%)	@ $24 SY (6" Depth)	$ -
	Lime Stabilization (10%)	@ $16 SY (6" Depth)	$ -
	Cement Treated Aggregate	@ $11 per Inch Depth	$ -
Underdrains:			
	UD-1	@ $21 LF	$ -
	UD-2	@ $21 LF	$ -
	UD-3	@ $21 LF	$ -
	UD-4	@ $21 LF	$ -
		Subtotal for Subgrade, Subbase, Base Course Items & Underdrains (Public):	**$ 105,278.88**

Subtotal for this page:	**$ 105,278.88**

C. Entrances and Pipe Stems

Quality	Item	Price	Cost
	DE-1	@ $1,800 EA	$ -
	DE-2	@ $1,950 EA	$ -
	DE-3	@ $2,000 EA	$ -
	DE-4	@ $2,300 EA	$ -
	PP-1 (1 Lot)	@ $2,000 EA	$ -
	PP-1 (2-5 Lots)	@ $2,300 EA	$ -
	PP-2 (1 Lot)	@ $1,725 EA	$ -
	PP-2 (2-5 Lots)	@ $1,725 EA	$ -
	CG-9D or equal: 30' Width	@ $5,750 EA	$ -
	CG-9D or equal: 40' Width	@ $7,475 EA	$ -
	CG-10A or equal: 30' Width	@ $4,738 EA	$ -
	CG-10A or equal: 40' Width	@ $6,095 EA	$ -
	CG-11: Concrete Entrance	@ $3,450 EA	$ -
	Valley Gutter	@ $61 SY	$ -
	Pipestem Driveway - 10' (1 Lot)	@ $61 LF	$ -
	Pipestem Driveway - 18' (2-5 Lots)	@ $81 LF	$ -
		Subtotal for Entrance and Pipe Stems:	**$ -**

Subtotal for this page:	**$ -**

D. Miscellaneous Construction Items

Quantity	Item	Price	Cost
263	Sidewalk (5' Width)	@ $40 LF	$ 10,520.00
	Header Curb (CG-2/CG-3)	@ $25 LF	$ -
706	Curb & Gutter	@ $28 LF	$ 19,768.00
	CG-12 (Truncated Dome)	@ $2,000 EA	$ -
	Bicycle Trail/Walkway	@ $11.00 SF	$ -
	Raised Concrete Median (MS-1A)	@ $81 SY	$ -
	Trail (Wood Chip)	@ $19 SY	$ -
	Trail (Stone Dust)	@ $19 SY	$ -
Retaining Walls:			
	Timber	@ $34 SF	$ -
	Crib	@ $44 SF	$ -
	MSE/Geogrid	@ $50 SF	$ -
	Gravity Wall	@ $72 SY	$ -
	Excavation for tiebacks in walls in cut areas	@ $29 CY	$ -
	Anti-Graffiti Paint (Concrete Retaining Walls only-treatment/sealant)	@ $18 SF (Min. $2,500)	$ -
	Guardrail	@ $45 LF	$ -
	GR-7 NCHRP 350	@ $3,640 EA	$ -
	GR-9	@ $3,640 EA	$ -
	Address Sign (Entrance to Pipestems)	@ $460 EA	$ -
	Street Name Sign	@ $525	$ -
	Traffic Control Sign	@ $450	$ -
	Bus Stop Sign	@ $415	$ -
	Bus Shelter	@ $24,000	$ -
	Traffic Signal	@ (Lump Sum)	
2	HC Parking Space Sign	@ $720 EA	$ 1,440.00
	Bike Rack	@ $350 EA	$ -
	Roadside Delineators (ED-1)	@ $75 EA	$ -
	Hand Rail (HR-1)	@ $120 LF	$ -
	Pavement Marking (Paint)	@ $2.50 SF	$ -
	Pavement Marking (Thermoplastic)	@ $7.00 SF	$ -
	Traffic Barricade (TB-1)	@ $1,725 EA	$ -
	Street Lighting	@ $5,500 EA	$ -
	Utilities Relocation	(Min. $46,000) (Lump Sum or provide estimate from utility co.)	$ -
	VDOT Street Acceptance Package	@ $7,000	$ -
	P.E. Certified "As-Built" Plans	Lump Sum (Min. $12,000)	$ -
		Subtotal for Miscellaneous Construction Items:	**$ 31,728.00**

Subtotal for this page:	**$ -**

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026
703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

UNIT PRICE LIST
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS

SHEET 40 OF 43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

Subtotal for this page:	**$**	**31,728.00**

4. SANITARY SEWER & WATER LINE CONSTRUCTION

Quantity	Item	Price		Cost
	Fire Hydrant Assembly	@ $9,200	EA	$ -
	Central Sewer Lift/Pump Station Construction	@ (Lump Sum)		

Water Main (Exclusive of Fire Hydrants)

Quantity	Item	Price		Cost
	4"0 DIP	@ $60	LF	$ -
	6"0 DIP	@ $75	LF	$ -
	8"0 DIP	@ $90	LF	$ -
	12"0 DIP	@ $125	LF	$ -
	16"0 DIP	@ $165	LF	$ -
	18'0 DIP	@ $185	LF	$ -
	4"0 or 6"0 RW Valve (with accessories)	@ $1,200	EA	$ -
	8"0 or 12"0 RW Valve (with accessories)	@ $3,000	EA	$ -
	16"0 or 24"0 RW Valve (with accessories)	@ $7,000	EA	$ -
	Standard Meter Crock & Appurtenances (Angle valve, backflow preventer, yoke, frame & cover, and service line)	@ $2,500	EA	$ -
	Meter Vault & Appurtenances (3 meters & larger)	@ $40,000	EA	$ -
	Water Main Blow-off Assembly	@ $3,000	EA	$ -
	Air Release Assembly	@ $6,800	EA	$ -
	Dead End Anchor System	@ $10,000	EA	$ -
	Subtotal for Water Main:			**$ -**

Subtotal for this page:	**$**	**-**

Sanitary Sewer Pipe Line (Exclusive of Manhole Structures)

Quantity	Item	Price		Cost
	1.5"0 thru 4"0 LPFM (Low Pressure Force Main System)	@ $35	LF	$ -
	8"0 PVC	@ $81	LF	$ -
	8"0 DIP	@ $95	LF	$ -
	10"0 PVC	@ $100	LF	$ -
	10"0 DIP	@ $110	LF	$ -
	12"0 PVC	@ $170	LF	$ -
	12"0 DIP	@ $185	LF	$ -
	15"0 PVC	@ $225	LF	$ -
	4' Dia. Sanitary Sewer Manhole	@ $11,000	EA	$ -
	5' Dia. Sanitary Sewer Manhole	@ $11,000	EA	$ -
	Street Manhole Frame & Cover Assembly (Including rain bowl & chimney seal)	@ $1,200	EA	$ -
	Easement Manhole Frame & Cover Assembly (Including chimney seal)	@ $1,200	EA	$ -
	Abandonment of Manhole	@ $290	VF	$ -
	4"0 PVC Lateral (including clean-out stack)	@ $50	LF	$ -
	4"0 DIP Lateral (including clean-out stack)	@ $60	LF	$ -
38.7	6"0 PVC Lateral (including clean-out stack)	@ $70	LF	$ 2,709.00
	6"0 DIP Later (including clean-out stack)	@ $75	LF	$ -
	LPFM Flushing Station	@ $2,900	EA	$ -
	Sewerage Air Release/Vacuum Breaker Assembly	@ $4,050	EA	$ -
	Steel Casing	@ $600	LF	$ -
	Grease Trap (500 gal. minimum)	@ $5,200	EA	$ -
		@		$ -
		@		$ -
		@		$ -
	Subtotal for Sanitary Sewer Pipe:			**$ 2,709.00**

Note: For sizes larger than 15"0, add $4.60 per inch increase in diameter.

Subtotal for this page:	**$**	**2,709.00**
TOTAL CONSTRUCTION COST: (Pages 1 through 10)	**$**	**209,665.47**

5. MISCELLANEAOUS COSTS

A. Administrative Cost - 10% of the total construction cost, not to exceed $50,000	$	20,966.55
B. Inflation Cost - Compounded annually at 3.0% per year of the total Construction Cost	$	6,289.96
TOTAL PERFORMANCE BOND AMOUNT:	**$**	**236,921.98**

6. FLOODPLAIN ITEMS ESCROW

Quantity	Item	Price	Cost
	LOMR	$18,000	$ -
	Elevation Certificate	$1,000	$ -
	LOMC (SF Detached)	$1,800	$ -
	Stream Restoration (By Itemized Cost)		
	TOTAL FLOODPLAIN ITEMS ESCROW:		**$ -**

7. LANDSCAPING ESCROW

A. Deciduous Trees

Quantity	Item	Price		Cost
	5'-6'	@ $300	EA	$ -
	1" - 1.5" or 1.5"- 2"	@ $450	EA	$ -
	2" - 2.5" or 2.5 - 3"	@ $600	EA	$ -
	3" - 3.5" or 3.5" - 4"	@ $959	EA	$ -
	Subtotal for Deciduous Trees:			**$ -**

B. Evergreen Trees

Quantity	Item	Price		Cost
	5' - 6'	@ $250	EA	$ -
13	6' - 7'	@ $270	EA	$ 3,510.00
	7' - 8'	@ $450	EA	$ -
	8' - 10'	@ $830	EA	$ -
	Subtotal for Evergreen Trees:			**$ 3,510.00**

C. Shrubs

Quantity	Item	Price		Cost
78	18" - 24"	@ $60	EA	$ 4,680.00
	24" - 30"	@ $80	EA	$ -
	Subtotal for Shrubs:			**$ 4,680.00**

D. Ornamental

Quantity	Item	Price	Cost
	1 Gal. (#1)	@ $35	$ -
	2 Gal. (#2)	@ $45	$ -
	3 Gal. (#3)	@ $50	$ -
	Subtotal for Ornamentals:		**$ -**

E. Perennial

Quantity	Item	Price	Cost
	18" - 24"	@ $15.00	$ -
	Subtotal for Perennial:		**$ -**

F. Reforestation

Quantity	Item	Price		Cost
	# of Acres	@ $11,700	AC	$ -
	Subtotal for Reforestation			**$ -**
	TOTAL LANDSCAPE ESCROW AMOUNT:			**$ 8,190.00**

8. SILTATION AND EROSION CONTROL ESCROWS

Quantity	Item	Price		Cost
	Diversion Dike	@ $7.00	LF	$ -
	Cleaning out SWM Facilities, Silt Traps and Silt Basins	$600/Hr. Lump Sum (Min. $20,000 or actual estimate provided by engineer to the satisfaction of the plan review)		$ -
906	Silt Fence: 0' - 1000' (installation, maintenance for 1 year & removal)	@ $8.00	LF	$ 7,248.00
	Silt Fence: 1001' - 1000' (installation, maintenance for 1 year & removal)	@ $6.00	LF	$ -
	Silt Fence: 10,000' + (installation, maintenance for 1 year & removal)	@ $4.00	LF	$ -
	Super Silt Fence: 0' - 1000' (installation, maintenance for 1 year & removal)	@ $20	LF	$ -
	Super Silt Fence: 1001' - 10000 (installation, maintenance for 1 year & removal)	@ $12	LF	$ -
	Super Silt Fence: 10,000' + (installation, maintenance for 1 year & removal)	@ $11.00	LF	$ -
	Sod	@ $8.00	SY	$ -
	Seed, Fertilizer & Mulch	@ $3.00 SY ($200 Min)		$ -
	Steep Slopes (Grading and Stabilization with jute mesh, netting, blankets, etc.)	@ $18	SY	$ -
	Coarse Aggregates (#1 or #57)	@ $35	TON	$ -
	Inlet Protection	@ $190	EA	$ -
	Check Dam	@ $250	EA	$ -
1	Temp. Construction Entrance	@ $2,300	EA	$ 2,300.00
1	Wash Rack	@ $2,000	EA	$ 2,000.00
	Temp. Sediment Trap	@ $1,000		$ -
		@ $1,500		$ -
		@ $2,000		$ -
	Temporary Sediment Basin	By itemized cost		
	Channel Diversion	By itemized cost		
	6' Chain-link Safety Fence	@ $50	LF	$ -
	4' Plastic Orange Safety Fence	@ $4.00	LF	$ -
	Yard utility refurbishment	@ $875 EA Single Family Lot		$ -
	Stockpile Removal (Quantity based on policy)	@ $30	CY	$ -
0.77	Removal of Erosion Control Measures (Min. $1000) cost per acre	@		$ 1,000.00
	Level Spreader	By itemized cost		
				$ -
		Total Cost:		**$ 12,548.00**
		Administrative Cost (10% of Total Cost):		$ 1,254.80

TOTAL SILTATION & EROSION CONTROL ESCROW AMOUNT:	**$**	**13,802.80**

Minimum acceptable amount for Siltation and Erosion Control is $2,500.00

I hereby certify that the above is my best estimate of the quantities and current cost of bondable improvements, landscaping items, Siltation & Erosion Control Escrow and floodplain items in this subdivision or site plan.

Preparer's Signature

Sebastian Sandoval
Name (Print)

(703) 361-1550 x401
Telephone #

J2 Engineers
Company or Firm

NOTES:

1. For items identified with ** the quantity for the embankment material is the net difference of total fill material needed and cut material available at the project site, if excavated or cut material is suitable for embankment.
2. The excavation and embankment costs include necessary grading, spreading and/or compaction of soil in accordance with County and State Standards and Specifications
3. The unit cost for each of the items in the Unit Price Lists is the installation cost which includes factors such as materials, excavation, bedding backfilling, compaction, form work, etc.
4. Inflation has been calculated based on Northern Virginia Consumer Price Index of the Washington D.C. area provided by the Bureau of Labor and Statistics.
5. Whoever certifies the site development plans must also certify the total cost of the bonded items, landscaping escrow and siltation and erosion control escrow and must sign "Preparer's Signature" on page 10 of this form.
6. Floodplain Items Escrow not to be part of Bond/Escrow reduction.

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

UNIT PRICE LIST
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

SHEET
41
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

PRINCE WILLIAM COUNTY SERVICE AUTHORITY
Department of Engineering Development
UNIT PRICE LIST

Effective: March 1, 2022

Project Name: KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

PWC File #: _____ **Date Prepared:** 10/20/2022

NOTE: This form is to be used to estimate Performance Bond, Landscape Escrow, Siltation Erosion Escrow and Floodplain Items Escrow prices posted with Prince William County. These prices do not include items that are to be bonded separately with the Virginia Department of Transportation.

1. MOBILIZATION/DEMOBILIZATION OF CONSTRUCTION EQUIPMENT

Quantity	Item	Price	Cost
	Mobilization/Demobilization	@ Lump Sum $15,000 min.	$ -

2. STORM DRAINAGE

A. Structures

Quantity	Item	Price	Cost
	DI-1	@ $6,900 EA	$ -
	DI-3	@ $6,900 EA	$ -
	DI-4	@ $6,900 EA	$ -
	MH-1	@ $4,900 EA	$ -
	MH-2	@ $4,500 EA	$ -
	JB-1	@ $7,175 EA	$ -
	DI-7	@ $6,800 EA	$ -
	DI-12	@ $6,800 EA	$ -
		Subtotal for Structures:	**$ -**

B. Concrete Pipe

Quantity	Item	Price	Cost
	12"0	@ $82 LF	$ -
	15"0	@ $82 LF	$ -
	18"0	@ $82 LF	$ -
	21"0	@ $82 LF	$ -
	24"0	@ $103 LF	$ -
	27"0	@ $103 LF	$ -
	30"0	@ $103 LF	$ -
	33"0	@ $207 LF	$ -
	36"0	@ $207 LF	$ -
	42"0	@ $207 LF	$ -
	48"0	@ $207 LF	$ -
	54"0	@ $365 LF	$ -
	60"0	@ $365 LF	$ -
	66"0	@ $365 LF	$ -
	72"0	@ $453 LF	$ -
		Subtotal for Concrete Pipe:	**$ -**

		Subtotal for this page:	**$ -**

C. End Walls

Quantity	Item	Price	Cost
	12"0	@ $1,950 EA	$ -
	15"0	@ $1,950 EA	$ -
	18"0	@ $1,950 EA	$ -
	21"0	@ $1,950 EA	$ -
	24"0	@ $1,950 EA	$ -
	27"0	@ $1,950 EA	$ -
	30"0	@ $2,100 EA	$ -
	33"0	@ $2,300 EA	$ -
	36"0	@ $2,800 EA	$ -
	42"0	@ $7,236 EA	$ -
	48"0	@ $7,236 EA	$ -
	54"0	@ $7,236 EA	$ -
	60"0	@ $7,236 EA	$ -
	66"0	@ $7,236 EA	$ -
	72"0	@ $9,854 EA	$ -
		Subtotal for End Walls:	**$ -**

D. End Sections (ES-1)

Quantity	Item	Price	Cost
	12"0	@ $1,048 EA	$ -
	15"0	@ $1,048 EA	$ -
	18"0	@ $1,048 EA	$ -
	21"0	@ $1,048 EA	$ -
	24"0	@ $1,048 EA	$ -
	27"0	@ $1,200 EA	$ -
	30"0	@ $1,300 EA	$ -
	33"0	@ $1,500 EA	$ -
	36"0	@ $1,900 EA	$ -
	42"0 - 60"	@ $3,050 EA	$ -
		Subtotal for End Section ES-1:	**$ -**

E. Corrugated Metal Pipe

Quantity	Item	Price	Cost
	12"0	@ $40 LF	$ -
	15"0	@ $60 LF	$ -
	18"0	@ $60 LF	$ -
	24"0	@ $80 LF	$ -
	30"0	@ $80 LF	$ -
	36"0	@ $140 LF	$ -
	42"0	@ $140 LF	$ -
	48"0	@ $140 LF	$ -
	54"0	@ $250 LF	$ -
	60"0	@ $250 LF	$ -
		Subtotal for CM Pipe:	**$ -**

		Subtotal for this page:	**$ -**

F. End Section (ES-2)

Quantity	Item	Price	Cost
	15"0	@ $870 EA	$ -
	18"0	@ $870 EA	$ -
	24"0	@ $870 EA	$ -
	30"0	@ $870 EA	$ -
	36"0	@ $1,100 EA	$ -
	42"0	@ $1,400 EA	$ -
	48"0	@ $1,800 EA	$ -
		Subtotal for End Sections (ES-2):	**$ -**

G. AD N-12 (HDPE)

Quantity	Item	Price	Cost
	12"0	@ $45 LF	$ -
	15"0	@ $106 LF	$ -
	18"0	@ $106 LF	$ -
	24"0	@ $106 LF	$ -
	30"0	@ $106 LF	$ -
	36"0	@ $170 LF	$ -
	42"0	@ $170 LF	$ -
	48"0	@ $170 LF	$ -
	60"0	@ $250 LF	$ -
		Subtotal for AD N-12 (HDPE):	**$ -**

		Subtotal for this page:	**$ -**

H. Stormwater Management/BMP Facilities Cost Estimates Per Impervious Acre Treated (See Note 3)

Quantity	Item	Price	Cost

Non-Proprietary BMP(Engineer Estimate for all SWM)

	Dry Retention Pond	By itemized cost	
	Dry Extended Detention Pond	By itemized cost	
	Wet Pond/Wetlands	By itemized cost	
	Bioswale	By itemized cost	
	Vegetated Grass Channel	By itemized cost	
	Micro-Bio-Retention (Raingarden)	By itemized cost	
	Infiltration Practices without Sand	By itemized cost	
	Infiltration Practices with Sand	By itemized cost	
	Filtering Practices with Sand Below Ground	By itemized cost	
	Filtering Practices with Sand Above Ground	By itemized cost	
	Permeable Pavement Level 2 Design	By itemized cost	
	Vegetated Roof Level 1 Design	By itemized cost	
	Vegetated Roof Level 2 Design	By itemized cost	
	Soil Compost Amendment	By itemized cost	
	Rooftop Impervious Surface Disconnection	By itemized cost	
	Sheet Flow to a Vegetated Filter Strip	By itemized cost	

Proprietary/Manufactured BMP-manufacturer's Certified Cost Plus Construction Cost

	Aqua-Swirl® Stormwater Treatment System	By itemized cost	
	BaySeparator™	By itemized cost	
	Continuous Defective Separator® (CDS)	By itemized cost	
	Downstream Defender®	By itemized cost	
	Hydroguard	By itemized cost	
	Stormceptor® MAX	By itemized cost	
	Stormceptor® OSR	By itemized cost	
	Stormceptor® STC	By itemized cost	
	StormPro	By itemized cost	
	Storm Water Quality Unit	By itemized cost	
	V2B1	By itemized cost	
	The Vortechs® System	By itemized cost	
	Aqua-Filter Stormwater™ Filtration System	By itemized cost	
	Storm Tech® Isolater Row™	By itemized cost	
	Up-Flo Filter® with CPZ Media	By itemized cost	
	The Stormwater Management StormFilter® with ZPG Media	By itemized cost	
	BayFilter™ Stormwater Cartridge System	By itemized cost	
	Filterra Bioretention Systems	By itemized cost	
	Jellyfish® Filter	By itemized cost	
	Modular Wetland System Linear (MWS-Linear)	By itemized cost	
	Perk Filter	By itemized cost	
	The Stormwater Management StormFilter® with Phosphosorb Media	By itemized cost	
	Subtotal for Stormwater Management/BMP Facilities Cost Estimates Per Impervious Acre Treated:		**$ -**

		Subtotal for this page:	**$ -**

I. Miscellaneous Stormwater Management

Quantity	Item	Price	Cost
	Seed, Fertilizer & Mulch ($200 Min.)	@ $3.00 SY	$ -
	Sod	@ $8.00 SY	$ -
	Hydraulic Cem. Conc. - 4" depth	@ $8.00 SF	$ -
	Bituminous Concreate - 1" depth	@ $6.00 SY	$ -
	Rip-Rap	@ $7.75 SF	$ -
	Grouted Rip-Rap	@ $9.00 SF	$ -
	Erosion Control Stone (EC-1)	@ $130 TON	$ -
	#57 - Coarse Aggregate	@ $30 TON	$ -
	4' High Chain Link Fence (#9 gauge or better, including braces, end posts and gate)	@ $45 LF	$ -
	6' High Chain Link Fence (#9 gauge or better, including braces, end posts and gate)	@ $45 LF	$ -
	SWM Sign (WATER RISES RAPIDLY) (Minimum 3 signs per facility)	@ $390 EA	$ -
	Access Road	By Itemized Cost	
		Subtotal for Miscellaneous Stormwater Management	**$ -**

J. Miscellaneous Drainage Items

Quantity	Item	Price	Cost
	Box Culvert	@ $40 CY of conc.	$ -
	Energy Dissipater	@ $2,250 EA	$ -
	Wing Walls	@ 990 CY of conc.	$ -
Ditches:			
	Roadside Standard Ditches (Seed, Fertilize & Mulch)	@ $8.00 LF	$ -
	Sod Ditches	@ $10.50 LF	$ -
	Paved Ditches	@ $8.50 SF	$ -
	Filter Cloth Fabric & Gabion Stone	@ $22 SF	$ -
	Rip-Rap	@ $7.75 SF	$ -
	Grouted Rip-Rap	@ $9.00 SF	$ -
	Paved Flume	@ $10 SF	$ -
	Flush the Drainage System	$290/Hr. (Min 8 @ Hrs.)	$ -
		Subtotal for Miscellaneous Drainage Items:	**$ -**

		Subtotal for this page:	**$ -**

3. CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY AND/OR PRIVATE INGRESS/EGRESS EASEMENTS

A. Site Work

Quantity	Item	Price	Cost
	Clear & Grub	@ $12,800	$ -
	Excavation	@ $35 CY	$ -
	Embankment** (cut and fill)	@ $25 CY	$ -
	Embankment (haul off)	@ $36 CY	$ -
	Final Grading	@ $5,000 AC	$ -
	Rock Excavation	@ $75 CY	$ -
	Slope Stabilization - Hydroseeding (3:1 or flatter) $1,000 Min.	@ $1.25 SY	$ -
	Slope Stab. - Jute Mesh, matting Blankets, etc. (Between 2:1 to 3:1) $200 Min	@ $6.00 SY	$ -
	Slope Stab. - Sod (Between 2:1 to 3:1) $200 Min	@ $8.00 SY	$ -
	Steep Slopes (Grading and Stabilization with Jute Mesh, Netting, Blankets, etc.)	@ $20 SY	$ -
		Subtotal for Site Work:	**$ -**

B. Subgrade, Subbase, and Base Course Items

Quantity	Item	Price	Cost
	Subgrade preparation (Subbase and base course)	@ $3.50 SY	$ -
	Aggregate (21A/21B)	@ $3 SY per Inch Depth	$ -
	Bituminous Concrete	@ $6.25 SY per Inch Depth	$ -
	Reinforced Concrete Pavement	@ $18 SY per Inch Depth	$ -
	Gravel Shoulders (4" Depth)	@ $12 SY (4" Depth)	$ -
	Soil Cement Stabilization (4%)	@ $24 SY (6" Depth)	$ -
	Lime Stabilization (10%)	@ $16 SY (6" Depth)	$ -
	Cement Treated Aggregate	@ $11 per Inch Depth	$ -
Underdrains:			
	UD-1	@ $21 LF	$ -
	UD-2	@ $21 LF	$ -
	UD-3	@ $21 LF	$ -
	UD-4	@ $21 LF	$ -
		Subtotal for Subgrade, Subbase, Base Course Items & Underdrains (Public):	**$ -**

		Subtotal for this page:	**$ -**

C. Entrances and Pipe Stems

Quality	Item	Price	Cost
	DE-1	@ $1,800 EA	$ -
	DE-2	@ $1,950 EA	$ -
	DE-3	@ $2,000 EA	$ -
	DE-4	@ $2,300 EA	$ -
	PP-1 (1 Lot)	@ $2,000 EA	$ -
	PP-1 (2-5 Lots)	@ $2,300 EA	$ -
	PP-2 (1 Lot)	@ $1,725 EA	$ -
	PP-2 (2-5 Lots)	@ $1,725 EA	$ -
	CG-9D or equal: 30' Width	@ $5,750 EA	$ -
	CG-9D or equal: 40' Width	@ $7,475 EA	$ -
	CG-10A or equal: 30' Width	@ $4,738 EA	$ -
	CG-10A or equal: 40' Width	@ $6,095 EA	$ -
	CG-11: Concrete Entrance	@ $3,450 EA	$ -
	Valley Gutter	@ $61 SY	$ -
	Pipestem Driveway - 10' (1 Lot)	@ $61 LF	$ -
	Pipestem Driveway - 18' (2-5 Lots)	@ $81 LF	$ -
		Subtotal for Entrance and Pipe Stems:	**$ -**

		Subtotal for this page:	**$ -**

D. Miscellaneous Construction Items

Quantity	Item	Price	Cost
	Sidewalk (5' Width)	@ $40 LF	$ -
	Header Curb (CG-2/CG-3)	@ $25 LF	$ -
	Curb & Gutter	@ $28 LF	$ -
	CG-12 (Truncated Dome)	@ $2,000 EA	$ -
	Bicycle Trail/Walkway	@ $11.00 SF	$ -
	Raised Concrete Medium (MS-1A)	@ $81 SY	$ -
	Trail (Wood Chip)	@ $19 SY	$ -
	Trail (Stone Dust)	@ $19 SY	$ -
Retaining Walls:			
	Timber	@ $34 SF	$ -
	Crib	@ $44 SF	$ -
	MSE/Geogrid	@ $50 SF	$ -
	Gravity Wall	@ $72 SY	$ -
	Excavation for tiebacks in walls in cut areas	@ $29 CY	$ -
	Anti-Graffiti Paint (Concrete Retaining Walls only-treatment/sealant)	@ $18 SF (Min. $2,500)	$ -
	Guardrail	@ $45 LF	$ -
	GR-7 NCHRP 350	@ $3,640 EA	$ -
	GR-9	@ $3,640 EA	$ -
	Address Sign (Entrance to Pipestems)	@ $460 EA	$ -
	Street Name Sign	@ $525	$ -
	Traffic Control Sign	@ $450	$ -
	Bus Stop Sign	@ $415	$ -
	Bus Shelter	@ $24,000	$ -
	Traffic Signal	@ (Lump Sum)	
	HC Parking Space Sign	@ $720 EA	$ -
	Bike Rack	@ $350 EA	$ -
	Roadside Delineators (ED-1)	@ $75 EA	$ -
	Hand Rail (HR-1)	@ $120 LF	$ -
	Pavement Marking (Paint)	@ $2.50 SF	$ -
	Pavement Marking (Thermoplastic)	@ $7.00 SF	$ -
	Traffic Barricade (TB-1)	@ $1,725 EA	$ -
	Street Lighting	@ $5,500 EA	$ -
	Utilities Relocation	(Min. $46,000) (Lump Sum or provide estimate from utility co.)	$ -
	VDOT Street Acceptance Package	@ $7,000	$ -
	P.E. Certified "As-Built" Plans	Lump Sum (Min. $12,000)	$ -
		Subtotal for Miscellaneous Construction Items:	**$ -**

		Subtotal for this page:	**$ -**

4. SANITARY SEWER & WATER LINE CONSTRUCTION

Quantity	Item	Price	Cost
	Fire Hydrant Assembly	@ $9,200 EA	$ -
	Central Sewer Lift/Pump Station Construction	@ (Lump Sum)	
	4"0 DIP	@ $60 LF	$ -
	6"0 DIP	@ $75 LF	$ -
	8"0 DIP	@ $90 LF	$ -
	12"0 DIP	@ $125 LF	$ -
	16"0 DIP	@ $165 LF	$ -
	18"0 DIP	@ $185 LF	$ -
2	4"0 or 6"0 RW Valve (with accessories)	@ $1,200 EA	$ 2,400.00
	8"0 or 12"0 RW Valve (with accessories)	@ $3,000 EA	$ -
	16"0 or 24"0 RW Valve (with accessories)	@ $7,000 EA	$ -
1	Standard Meter Crock & Appurtenances (Angle valve, backflow preventer, yoke, frame & cover, and service line)	@ $2,500 EA	$ 2,500.00
	Meter Vault & Appurtenances (3 meters & larger)	@ $40,000 EA	$ -
	Water Main Blow-off Assembly	@ $3,000 EA	$ -
	Air Release Assembly	@ $6,800 EA	$ -
	Dead End Anchor System	@ $10,000 EA	$ -
		Subtotal for Water Main:	**$ 4,900.00**

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

PWCSA UNIT PRICE LIST
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION

SHEET
42
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

Subtotal for this page:	**$**	**4,900.00**

Sanitary Sewer Pipe Line (Exclusive of Manhole Structures)

Quantity	Item	Price		Cost
	1.5"0 thru 4"0 DIPFM (DIP Force Main System)	@ $35	LF	$ -
	8"0 PVC	@ $81	LF	$ -
	8"0 DIP	@ $95	LF	$ -
	10"0 PVC	@ $100	LF	$ -
	10"0 DIP	@ $110	LF	$ -
	12"0 PVC	@ $170	LF	$ -
	12"0 DIP	@ $185	LF	$ -
	15"0 PVC	@ $225	LF	$ -
	4' Dia. Sanitary Sewer Manhole	@ $11,000	EA	$ -
	5' Dia. Sanitary Sewer Manhole	@ $11,000	EA	$ -
	Street Manhole Frame & Cover Assembly (Including rain bowl & chimney seal)	@ $1,200	EA	$ -
	Easement Manhole Frame & Cover Assembly (Including chimney seal)	@ $1,200	EA	$ -
	Abandonment of Manhole	@ $290	VF	$ -
	4"0 PVC Lateral (including clean-out stack)	@ $50	LF	$ -
	4"0 DIP Lateral (including clean-out stack)	@ $60	LF	$ -
42.92	6"0 PVC Lateral (including clean-out stack)	@ $70	LF	$ 3,004.40
	6"0 DIP Later (including clean-out stack)	@ $75	LF	$ -
	LPFM Flushing Station	@ $2,900	EA	$ -
	Sewerage Air Release/Vacuum Breaker Assembly	@ $4,050	EA	$ -
	Steel Casing	@ $600	LF	$ -
	Grease Trap (500 gal. minimum)	@ $5,200	EA	$ -
		@		$ -
		@		$ -
		@		$ -
	Subtotal for Sanitary Sewer Pipe:			**$ 3,004.40**

Note: For sizes larger than 15"0, add $4.00 per inch increase in diameter.

Subtotal for this page:	**$**	**3,004.40**
TOTAL CONSTRUCTION COST: (Pages 1 through 10)	**$**	**7,904.40**

5. MISCELLANEAOUS COSTS

A. Administrative Cost - 10% of the total construction cost, not to exceed $50,000	$	790.44
B. Inflation Cost - Compounded annually at 3.0% per year of the total Construction Cost	$	237.13
TOTAL PERFORMANCE BOND AMOUNT:	**$**	**8,931.97**

6. FLOODPLAIN ITEMS ESCROW

Quantity	Item	Price	Cost
	LOMR	$18,000	$ -
	Elevation Certificate	$1,000	$ -
	LOMC (SF Detached)	$1,800	$ -
Stream Restoration			
	Stream Restoration	By itemized cost	
	TOTAL FLOODPLAIN ITEMS ESCROW:		**$ -**

7. LANDSCAPING ESCROW

A. Deciduous Trees

Quantity	Item	Price		Cost
	5'-6'	@ $300	EA	$ -
	1" - 1.5" or 1.5"- 2"	@ $450	EA	$ -
	2" - 2.5" or 2.5 - 3"	@ $600	EA	$ -
	3" - 3.5" or 3.5" - 4"	@ $959	EA	$ -
	Subtotal for Deciduous Trees:			**$ -**

B. Evergreen Trees

Quantity	Item	Price		Cost
	5' - 6'	@ $250	EA	$ -
	6' - 7'	@ $270	EA	$ -
	7' - 8'	@ $450	EA	$ -
	8' - 10'	@ $830	EA	$ -
	Subtotal for Evergreen Trees:			**$ -**

C. Shrubs

Quantity	Item	Price		Cost
	18" - 24"	@ $60	EA	$ -
	24" - 30"	@ $80	EA	$ -
	Subtotal for Shrubs:			**$ -**

D. Ornamental

Quantity	Item	Price		Cost
	1 Gal. (#1)	@ $35		$ -
	2 Gal. (#2)	@ $45		$ -
	3 Gal. (#3)	@ $50		$ -
	Subtotal for Ornamentals:			**$ -**

E. Perennial

Quantity	Item	Price		Cost
	18" - 24"	@ $15.00		$ -
	Subtotal for Perennial:			**$ -**

F. Reforestation

Quantity	Item	Price		Cost
	# of Acres	@ $11,700	AC	$ -
	Subtotal for Reforestation			**$ -**

TOTAL LANDSCAPE ESCROW AMOUNT: $ -

8. SILTATION AND EROSION CONTROL ESCROWS

Quantity	Item	Price		Cost
	Diversion Dike	@ $7.00	LF	$ -
	Cleaning out SWM Facilities, Silt Traps and Silt Basins	$600/Hr. Lump Sum (Min. $20,000 or actual estimate provided by engineer to the satisfaction of the plan review)		$ -
	Silt Fence: 0' - 1000' (installation, maintenance for 1 year & removal)	@ $8.00	LF	$ -
	Silt Fence: 1001' - 1000' (installation, maintenance for 1 year & removal)	@ $6.00	LF	$ -
	Silt Fence: 10,000' + (installation, maintenance for 1 year & removal)	@ $4.00	LF	$ -
	Super Silt Fence: 0' - 1000' (installation, maintenance for 1 year & removal)	@ $20	LF	$ -
	Super Silt Fence: 1001' - 10000 (installation, maintenance for 1 year & removal)	@ $12	LF	$ -
	Super Silt Fence: 10,000' + (installation, maintenance for 1 year & removal)	@ $11.00	LF	$ -
	Sod	@ $8.00	SY	$ -
	Seed, Fertilizer & Mulch	@ $3.00 SY ($200 Min)		$ -
	Steep Slopes (Grading and Stabilization with jute mesh, netting, blankets, etc.)	@ $18	SY	$ -
	Coarse Aggregates (#1 or #57)	@ $35	TON	$ -
	Inlet Protection	@ $190	EA	$ -
	Check Dam	@ $250	EA	$ -
	Temp. Construction Entrance	@ $2,300	EA	$ -
	Wash Rack	@ $2,000	EA	$ -
	Temp. Sediment Trap	@ $1,000		$ -
		@ $1,500		$ -
		@ $2,000		$ -
	Temporary Sediment Basin	By itemized cost		$ -
	Channel Diversion	By itemized cost		
	6' Chain-link Safety Fence	@ $50	LF	$ -
	4' Plastic Orange Safety Fence	@ $4.00	LF	$ -
	Yard utility refurbishment	@ $875 EA Single Family Lot		$ -
	Stockpile Removal (Quantity based on policy)	@ $30	CY	$ -
	Removal of Erosion Control Measures	@ AC (min $500)		$ -
	Level Spreader	By itemized cost		
				$ -
	Total Cost:			**$ -**
	Administrative Cost (10% of Total Cost):			$ -
	TOTAL SILTATION & EROSION CONTROL ESCROW AMOUNT:			**$ -**

Minimum acceptable amount for Siltation and Erosion Control is $2,000.00

I hereby certify that the above is my best estimate of the quantities and current cost of bondable improvements, landscaping items, Siltation & Erosion Control Escrow and floodplain items in this subdivision or site plan.

Preparer's Signature

(703) 361-1550 x401
Telephone #

Sebastian Sandoval
Name (Print)

J2 Engineers
Company or Firm

NOTES:

1. For items identified with ** the quantity for the embankment material is the net difference of total fill material needed and cut material available at the project site, if excavated or cut material is suitable for embankment.
2. The excavation and embankment costs include necessary grading, spreading and/or compaction of soil in accordance with County and State Standards and Specifications
3. The unit cost for each of the items in the Unit Price Lists is the installation cost which includes factors such as materials, excavation, bedding backfilling, compaction, form work, etc.
4. Inflation has been calculated based on Northern Virginia Consumer Price Index of the Washington D.C. area provided by the Bureau of Labor and Statistics.
5. Whoever certifies the site development plans must also certify the total cost of the bonded items, landscaping escrow and siltation and erosion control escrow and must sign "Preparer's Signature" on page 10 of this form.
6. Floodplain Items Escrow not to be part of Bond/Escrow reduction.

J2 Engineers, Inc.
17739 Main Street
Suite 180
Dumfries, Va. 22026

703.361.1550 (office)
703.956.6845 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
SEBASTIAN SANDOVAL
Lic. No. 045207
06/30/23
PROFESSIONAL ENGINEER

PLAN# BA2201
DATE: MARCH, 2023
CONTOUR INT.= N/A
SCALE: N/A

PLAN DATE
01/06/23
03/17/23
06/30/23

PWCSA UNIT PRICE LIST
FINAL SITE PLAN
KIDDIE ACADEMY AT CROSSROADS VILLAGE CENTER

TOWN OF HAYMARKET, VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

SHEET
43
OF
43

Attachment: 02 Kiddie Academy at CVC with Updated Drop Off (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

PROPOSED KIDDIE ACADEMY® OF HAYMARKET, VA

KIDDIE ACADEMY®
EDUCATIONAL CHILD CARE

AUGUST 4, 2023

Attachment: 03 Parking Traffic Study (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

Proposed Kiddie Academy of Haymarket, VA

OPERATIONAL INFORMATION

Days of Operation: Monday thru Friday
Hours of Operation: 6:30 AM - 6:30 PM
Holiday Closings: 6 Major Holidays
Square Footage: 11,256 sq. ft.

OCCUPANT CHART

Room	Age Grougs	Child per Staff	Capacity	Staff	Administration
1	Infants	4	12	3	
2	Infants	4	12	3	
3	Toddlers	5	15	3	
4	2 Year Olds	8	16	2	
5	2 Year Olds	8	16	2	
6	3 Year Olds	10	20	2	
7	3 Year Olds	10	20	2	
8	4 Year Olds	10	20	2	
9	4 Year Olds	10	20	2	
10	School Age	18	18	1	
				Director	1
				Cook	1
		TOTALS	169	22	

Attachment: 03 Parking Traffic Study (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

OUTDOOR PLAY AREA

- Total playground square footage: **6,506** square feet
- Play area divided into a minimum of three separate play areas for safety.
- Infant/toddler area approximately: **1,125** square feet
- Pre-school play area approximately: **1,500** square feet, and
- School age play area approximately: **1,350** square feet
- Children will have outdoor play twice a day.
- Outdoor play schedules will rotate in accordance with program scheduling (see below). This proposed play schedule is provided for illustrative purposes only and is subject to change based upon age groups.

Infant/Toddler Playground Schedule

- The largest infant/toddler group size at any given time would be **fifteen (15)** children allowing **75** square feet per child.

Morning

Staff/Child Ratio	Age Group	Time Schedule
1:4	Infant	10:00 - 10:30 AM
1:5	toddler	10:30 - 11:00 AM
1:8	2 years	11:00 - 11:30 AM

Afternoon

Staff/Child Ratio	Age Group	Time Schedule
1:4	Infant	3:00 - 3:30 PM
1:5	toddler	3:30 - 4:00 PM
1:8	2 years	4:00 - 4:30 PM

Pre-School and School Age Playground Schedule

- The largest group size at any given time would be **twenty (20)** children allowing **75** square feet per child.

Morning

Staff/Child Ratio	Age Group	Time Schedule
1:10	3 years	9:30 - 10:00 AM
1:10	4 years	10:00 - 10:30 AM
1:18	5 years	10:30 - 11:00 AM

Afternoon

Staff/Child Ratio	Age Group	Time Schedule
1:10	3 years	3:00 - 3:30 PM
1:10	4 years	3:30 - 4:00 PM
1:18	5 years	4:00 - 4:30 PM

Attachment: 03 Parking Traffic Study (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

TRAFFIC FLOW

HOURS OF OPERATION: 6:30 AM - 6:30 PM

CAPACITY 169

PARENT PARKING

DROP OFF AM

Time	Children Drop Off	Cumulative Children	Number of Cars	Time	Children Drop Off	Cumulative Children	Number of Cars
6:30 - 6:40	3	3	2	8:00 - 8:10	15	88	11
6:40 - 6:50	5	8	4	8:10 - 8:20	15	103	11
6:50 - 7:00	5	14	4	8:20 - 8:30	14	117	9
7:00 - 7:10	7	20	5	8:30 - 8:40	12	128	8
7:10 - 7:20	8	29	6	8:40 - 8:50	12	140	8
7:20 - 7:30	10	39	7	8:50 - 9:00	12	152	8
7:30 - 7:40	10	49	7	9:00 - 9:30	8	161	6
7:40 - 7:50	12	61	8	9:30 - 10:00	5	166	4
7:50 - 8:00	12	73	8	10:00 - 10:30	3	169	2

PICK-UP PM

Time	Children Pick up	Cumulative Children	Number of Cars	Time	Children Pick up	Cumulative Children	Number of Cars
3:00 - 3:10	2	167	1	4:40 - 5:00	12	98	8
3:10 – 3:20	3	164	2	5:00 - 5:10	14	85	9
3:20 - 3:30	3	161	2	5:10 - 5:20	14	71	9
3:30 - 3:40	4	156	3	5:20 - 5:30	15	56	11
3:40 - 3:50	4	152	3	5:30 - 5:40	15	41	11
3:50 - 4:00	5	147	4	5:40 - 5:50	15	25	11
4:00 - 4:10	7	140	5	5:50 - 6:00	10	15	7
4:10 - 4:20	8	132	6	6:00 – 6:10	7	8	5
4:20 - 4:30	10	122	7	6:10 – 6:20	5	3	3
4:30 - 4:40	12	110	8	6:20 – 6:30	3	0	3

PARENT AND STAFF PARKING

TOTAL (AM)

Time	# of Staff at Academy	Total Cars (Staff & Parents)*		Time	# of Staff at Academy	Total Cars (Staff & Parents)*
6:30 – 6:40	2	5		8:00 – 8:10	12	21
6:40 – 6:50	3	7		8:10 – 8:20	13	22
6:50 – 7:00	3	7		8:20 – 8:30	15	23
7:00 – 7:10	4	9		8:30 – 8:40	16	22
7:10 – 7:20	5	11		8:40 – 8:50	17	24
7:20 – 7:30	6	13		8:50 – 9:00	19	25
7:30 – 7:40	7	14		9:00 – 9:30	20	23
7:40 – 7:50	9	16		9:30 – 10:00	20	21
7:50 – 8:00	10	17		10:00 – 10:30	21	20

**Considers 15% of Staff do not park a car at the Academy*

Mid-day	Total Projected Cars*
10:30 – 3:00	18

TOTAL (PM)

Time	# of Staff at Academy	Total Cars (Staff & Parents)*		Time	# of Staff at Academy	Total Cars (Staff & Parents)*
3:00 - 3:10	21	22		4:40 - 5:00	12	20
3:10 – 3:20	21	23		5:00 - 5:10	10	20
3:20 - 3:30	21	23		5:10 - 5:20	9	18
3:30 - 3:40	20	23		5:20 - 5:30	7	18
3:40 - 3:50	18	20		5:30 - 5:40	5	16
3:50 - 4:00	17	20		5:40 - 5:50	4	14
4:00 - 4:10	16	21		5:50 - 6:00	3	10
4:10 - 4:20	16	21		6:00 – 6:10	2	7
4:20 - 4:30	14	21		6:10 – 6:20	2	5
4:30 - 4:40	13	21		6:20 – 6:30	2	5

**Considers 15% of Staff do not park a car at the Academy*

Attachment: 03 Parking Traffic Study (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

TRAFFIC FLOW RESULTS

Drop off / Pick up Schedules of Children

- Approximately 96 parent cars are projected during peak drop off (7:00 – 9:00 AM) in intervals of 10 minutes.
- Approximately 92 parent cars are projected during peak pick up (4:00 – 6:00 PM) in intervals of 10 minutes.
- Approximately 1/3 of children enrolled in program are 2 sibling households.

Staff Parking

- A maximum of twenty-two (22) teachers and two (2) administrators (part time food service personnel and director) are planned to maintain staff/child ratios and management of the academy throughout the day. This equates to a total of twenty-four (24) staff members.
- Approximately 15% of staff is dropped off at the academy or has another means of transportation to the academy.

Total Projected Parking

- Given the projected total number of parent and staff cars for any period of time, we recommend 38 parking stalls for this location.

Attachment: 03 Parking Traffic Study (6261 : Kiddie Academy Site Plan - 6515 Crossroads Village Center)

Town of Haymarket
15000 Washington Street, #100
Haymarket, VA 20169
703-753-2600

Thomas Britt
Town Planner

MEMORANDUM

TO: Planning Commission
FROM: Thomas Britt, Town Planner
DATE: August 7, 2023
SUBJECT: Comprehensive Plan Update: RPA Map

Background: As part of the Virginia DEQ's external review of the Town of Haymarket's compliance with required CBPA items, the DEQ noted that the Town of Haymarket Comprehensive Plan did not include an updated Resource Protection Area map. To comply with state code 9VAC25-830-170, DEQ advised the Town to update this map.

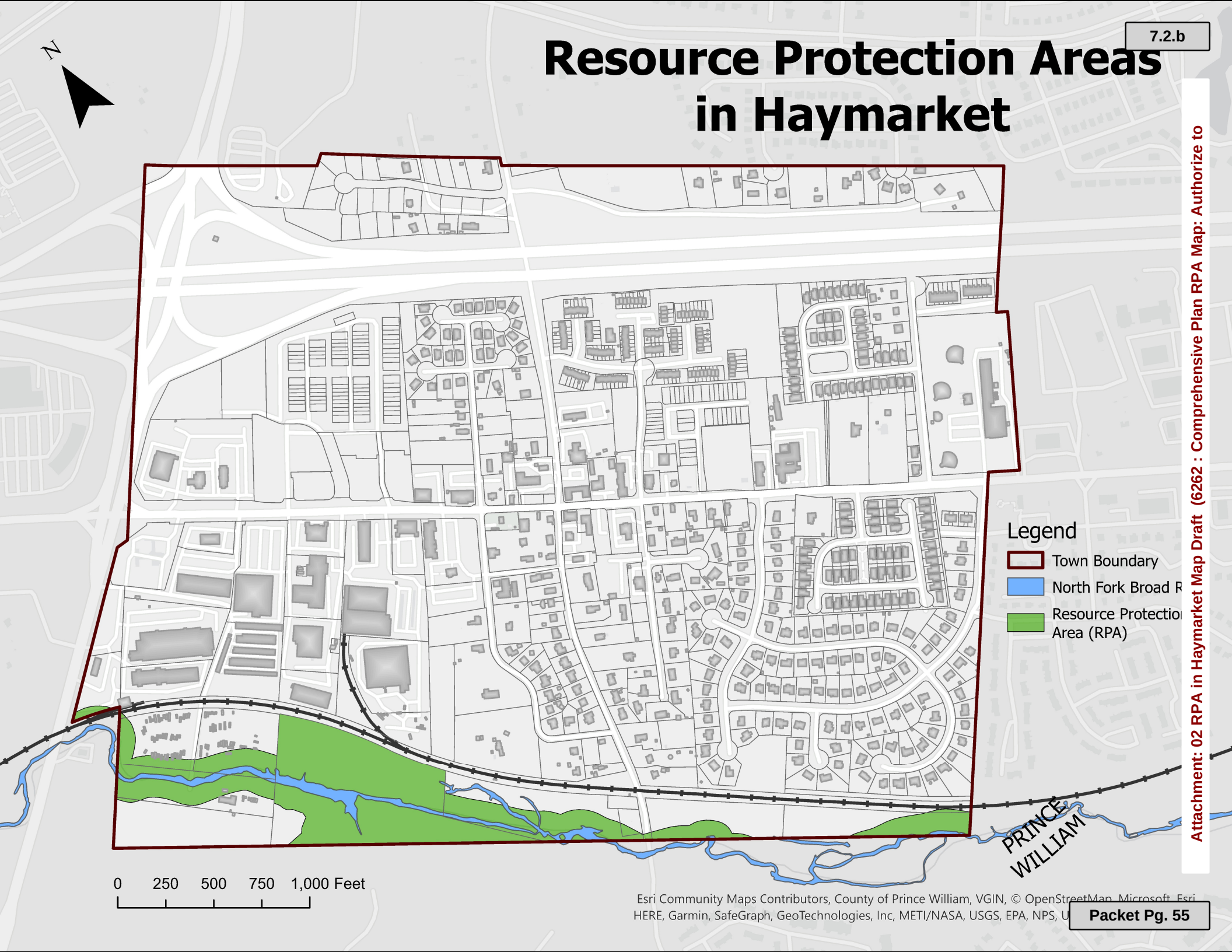
The Town Planner has provided a map showing the Resource Protection Area (RPA) boundaries found within the Town of Haymarket. The Resource Protection Areas are located along the North Fork Broad Run on the southern end of Town. The Town Planner has also updated the RPA map scale to measure distance in feet vs miles as requested by the Planning Commission.

Response: The Town Planner recommends the Planning Commission move to hold a public hearing for the adoption of the Haymarket RPA Map in the Town Comprehensive Plan.

Or an alternate motion.

Attachment: 01 RPA Map Update (6262 : Comprehensive Plan RPA Map: Authorize to Advertise for Public Hearing)

Resource Protection Areas in Haymarket



Attachment: 02 RPA in Haymarket Map Draft (6262 : Comprehensive Plan RPA Map: Authorize to

Town of Haymarket
15000 Washington Street, #100
Haymarket, VA 20169
703-753-2600

Thomas Britt
Town Planner

MEMORANDUM

TO: Planning Commission
FROM: Thomas Britt, Town Planner
DATE: August 7, 2023
SUBJECT: Town Park Streetscape and Sidewalk Updates

Background: Town Staff have worked with The Engineering Groupe on the design of a sidewalk and streetscape updates along Washington Street in front of the Town Park. The streetscape updates include a left turn lane and a sidewalk addition on the north side of Washington Street. Town Staff have coordinated with Dominion Energy to ensure no disruptions of power lines/power poles will occur.

Response: The Town Planner recommends the Planning Commission approve the completed Washington Streetscape redesign.

Or an alternate motion.

Attachment: 01 Town Park Streetscape Updates (6263 : Town Park Sidewalk)

HAYMARKET TOWN PARK STREETSCAPE

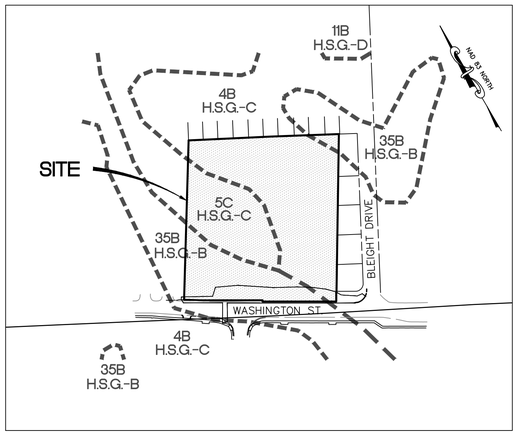
RFP: 2022-001

TOWN OF HAYMARKET, VIRGINIA

JULY 14, 2023

SOILS MAP

SCALE 1"=200'



SOILS DATA

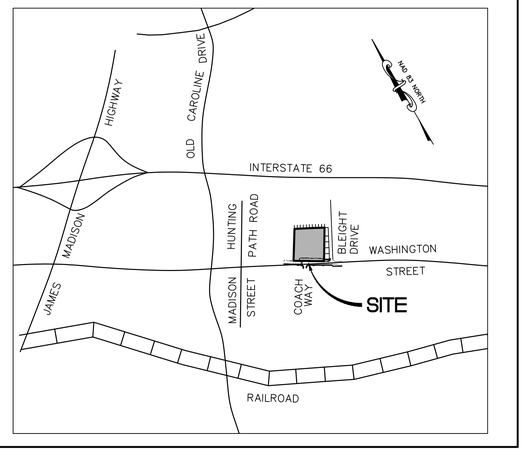
SOILS SYMBOL	SOILS NAME	ERODIBILITY	SLOPE RANGE	SOIL CATEGORY	SURFACE RUNOFF	DEPTH TO BEDROCK	SHRINK/ SWELL	FLOODING	K-VALUE
☐4 B	ARCOLA SILT LOAM	SEVERE	2% to 7%	C	MEDIUM	20-40"	LOW	NONE	0.37
☐5 C	ARCOLA NESTORIA COMPLEX	SEVERE	7% to 15%	C	RAPID	20-40"	LOW	NONE	0.37
☐43 E	NESTORIA GRAVELLY SILT LOAM	SEVERE	25% to 50%	C/D	VERY RAPID	10-20"	LOW	NONE	0.28
☐53 B	SYCOLINE KELLY COMPLEX	MODERATE	2% to 7%	D	SLOW TO MEDIUM	20-40"	MODERATE	NONE	0.43

SHEET INDEX

Sheet No.	Sheet Title	NOTES
1	COVER SHEET	
2	GENERAL NOTES	
3	EXISTING CONDITIONS & DEMOLITION PLAN	
4	GRADING PLAN	
5	GEOMETRIC PLAN AND DETAILS – WASHINGTON STREET	
6	STORM SEWER PROFILE & COMPUTATIONS	
7	EROSION & SEDIMENT CONTROL NOTES AND DETAILS	
8	EROSION & SEDIMENT CONTROL PLAN – PHASE 1	
9	EROSION & SEDIMENT CONTROL PLAN – PHASE 2	
10	BMP AREA MAP	
11	VIRGINIA RUNOFF REDUCTION METHOD	
12	PRE DEVELOPMENT DRAINAGE MAP	
13	POST DEVELOPMENT DRAINAGE MAP	
14	SWM NARRATIVE, COMPUTATIONS, & DETAILS	
15	SWM COMPUTATIONS & ROUTING	
16	LANDSCAPE AND PHOTOMETRIC PLAN	
17	LANDSCAPE NOTES AND PHOTOMETRIC SPECIFICATIONS	
18	TRANSPORTATION MANAGEMENT DETAILS AND NARRATIVE	
19	TRANSPORTATION MANAGEMENT PLAN	
20	SIGNAGE & STRIPING PLAN	
21	GEOTECHNICAL RECOMMENDATIONS	
22	UNIT PRICE LIST	

VICINITY MAP

SCALE 1"=1000'



COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

REV	DATE:	DESCRIPTION

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.enggroupe.com

Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH 703.670.0985

South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH 703.670.0985

West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH 703.670.0985

FILE NO. PP-286

SHEET 1 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)

VDOT GENERAL NOTES (8/2017)

1. VDOT APPROVED EXCEPTIONS/WAIVERS (MUST BE INCORPORATED IN THE PLAN):
   - ACCESS MANAGEMENT – DATE OF APPROVAL: _____N/A_____
   - SSAR– DATE OF APPROVAL: _____N/A_____
   - DESIGN WAIVER –DATE OF APPROVAL: _____N/A_____
   - OTHER___N/A_____ DATE OF APPROVAL: _____N/A_____

2. SSAR CONNECTIVITY SUMMARY (PROVIDE A CHECK MARK X WHERE APPLICABLE OR WRITE N/A):
   - CONNECTIONS IN MULTIPLE DIRECTIONS (FIRST CONNECTION MUST BE TO A VDOT MAINTAINED ROAD, THE SECOND CONNECTION MAY EITHER BE TO A VDOT ROAD OR TO A STUB OUT) N/A
   - STUB OUT CONNECTION (THE PROP. RIGHT OF WAY TERMINATES AT PARCEL ABUTTING THE DEVELOPMENT AND CONSISTS OF A SHORT SEGMENT THAT IS INTENDED TO SERVE CURRENT AND FUTURE DEVELOPMENT; THE APPLICANT MUST VERIFY THAT CONNECTION WITH A FUTURE STREET IS FEASIBLE) N/A

3. ALL WORK ON THIS PROJECT SHALL CONFORM TO THE CURRENT EDITIONS OF AND LATEST REVISIONS TO THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) ROAD AND BRIDGE SPECIFICATIONS AND STANDARDS, THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS, AND ANY OTHER APPLICABLE STATE, FEDERAL OR LOCAL REGULATIONS. IN CASE OF A DISCREPANCY OR CONFLICT BETWEEN THE STANDARDS OR SPECIFICATIONS AND REGULATIONS, THE MOST STRINGENT SHALL GOVERN.

4. METHODS AND MATERIALS USED SHALL CONFORM TO CURRENT COUNTY/TOWN AND VDOT STANDARDS AND SPECIFICATIONS.

5. ALL UTILITIES, INCLUDING ALL POLES, ARE TO BE RELOCATED AT THE DEVELOPER'S EXPENSE, PRIOR TO CONSTRUCTION.

6. OPEN CUTTING OF PAVED OR SURFACE TREATED ROADS IS NOT PERMITTED. ALL UTILITIES WHICH WILL BE PLACED UNDER EXISTING STREETS ARE TO BE BORED OR JACKED. ANY EXCEPTIONS, DUE TO EXTENUATING CIRCUMSTANCES, ARE TO BE ADDRESSED AT THE PERMIT STAGE.

7. ANY TYPE OF REVERSE CURB (SPILL CURB, CG–6R, ETC.) AND TRANSITION TO THESE CURBS SHALL NOT BE USED WITHIN THE PUBLIC RIGHT OF WAY.

8. THE DEVELOPER IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING ROADS AND UTILITIES WHICH OCCUR AS A RESULT OF PROJECT CONSTRUCTION WITHIN OR CONTIGUOUS TO EXISTING RIGHT OF WAY.

9. A SMOOTH GRADE SHALL BE MAINTAINED FROM THE CENTERLINE OF THE EXISTING ROAD TO THE PROPOSED EDGE OF PAVEMENT TO PRECLUDE THE FORMING OF FALSE GUTTERS AND/OR THE PONDING OF ANY WATER IN THE ROADWAY.

10. STANDARD GUARDRAILS AND/OR HANDRAILS SHALL BE INSTALLED AT HAZARDOUS LOCATIONS AS DESIGNATED DURING FIELD REVIEW BY THE COUNTY/TOWN INSPECTOR OR VDOT.

11. THE DEVELOPER IS RESPONSIBLE FOR ALL TRAFFIC CONTROL. THE DEVELOPER SHALL SUBMIT A SIGNING, STRIPING AND/OR SIGNALIZATION PLAN TO THE VDOT LAND DEVELOPMENT SECTION PRIOR TO PERMIT APPLICATION. THE DEVELOPER SHALL NOT COMMENCE CONSTRUCTION OF ANY PAVEMENT COURSE WITHOUT AN APPROVED STRIPING PLAN.

12. PAVEMENT DESIGN SHALL BE PROVIDED IN ACCORDANCE WITH THE PAVEMENT DESIGN GUIDE FOR SUBDIVISION AND SECONDARY ROADS IN VIRGINIA. FOR PRIMARY ROADS AND INTERSTATE HIGHWAYS WHERE TRUCK TRAFFIC EXCEEDS 5%, PAVEMENT DESIGN SHALL BE PROVIDED IN ACCORDANCE WITH AASHTO GUIDELINES. TYPICAL PAVEMENT SECTIONS SHALL DEPICT THE TOP 6" OF THE SUBGRADE IMMEDIATELY UNDER THE PAVEMENT STRUCTURE COMPACTED TO 100% OF THE THEORETICAL MAXIMUM DRY DENSITY.

13. ASPHALT PAVEMENT WIDENING SHALL CONFORM TO VDOT STANDARD WP–2.

14. ALL RIGHT OF WAY DEDICATED TO PUBLIC USE SHALL BE CLEAR AND UNENCUMBERED.

15. FLOWERS, SHRUBS, TREES, AND IRRIGATION SHALL NOT BE PLACED WITHIN STATE MAINTAINED RIGHT OF WAY LIMITS WITHOUT AN APPROVED SET OF PLANS AND AN APPROVED PLANTING AGREEMENT. NO IRRIGATION (SPRINKLER) SYSTEMS, BRICK COLUMNS, END WALLS, AND/OR BRICK MAILBOXES WILL BE CONSTRUCTED OR INSTALLED WITHIN STATE MAINTAINED RIGHT OF WAY LIMITS WITHOUT A PERMIT. ANY OF THE ABOVE ITEMS FOUND IN THE RIGHT OF WAY WITHOUT A PERMIT WILL BE REMOVED, AND ALL COSTS OF THE REMOVAL WILL BE BORNE BY THE OWNER AND/OR DEVELOPER.

16. THE COUNTY/TOWN SHALL OBTAIN A PERMIT FOR ALL SIDEWALKS/CROSSWALKS WITHIN THE RIGHT OF WAY THAT DO NOT QUALIFY FOR VDOT MAINTENANCE.

17. TRAFFIC CONTROL DEVICES OR ADVISORY SIGNS, SUCH AS MULTIWAY STOPS, SPEED LIMITS, WATCH FOR CHILDREN, PEDESTRIAN TRAFFIC ETC., SHALL NOT BE INSTALLED UNLESS SPECIFICALLY SHOWN ON THESE PLANS OR A VDOT APPROVED PLAN REVISION. SPEED STUDY CERTIFIED BY PROFESSIONAL ENGINEER SHALL BE SUBMITTED FOR VDOT APPROVAL PRIOR TO THE STREET ACCEPTANCE FOR ANY ROAD TO BE POSTED OTHER THAN THE STATUTORY SPEED LIMIT. SHOULD UNAPPROVED SIGNS BE NOTED AT THE TIME OF VDOT INSPECTION, THE ROAD ACCEPTANCE PROCESS SHALL BE TERMINATED IMMEDIATELY AND NOT RECOMMENCED UNTIL A DETERMINATION IS MADE REGARDING THE APPROVAL OF ANY ADDITIONAL SIGNS. IMMEDIATE REMOVAL OF SUCH SIGNS SHALL NOT NEGATE THE NEED FOR THE SUBMISSION OF A REVISION.

18. DURING CONSTRUCTION, THE MAINTENANCE OF TRAFFIC SHALL CONFORM TO THE REQUIREMENTS IN THE MOST RECENT VERSION OF THE VIRGINIA WORK AREA PROTECTION MANUAL AND THE MUTCD.

CONSTRUCTION NOTES:

1. DAMAGE TO ANY EXISTING ENTRANCES, CURB AND GUTTER, SIDEWALK OR PAVEMENT WITHIN STATE RIGHT–OF–WAY NOT PROPOSED TO BE DISTURBED WITH THIS DEVELOPMENT WILL BE THE RESPONSIBILITY OF THE DEVELOPER TO REPAIR TO THE SATISFACTION OF THE AFFECTED PARTIES.

2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REPORT ANY UNDERGROUND UTILITIES LOCATED BY MISS UTILITY, THAT ARE NOT REFLECTED ON THIS PLAN AT SUCH TIME AS THESE UTILITIES ARE MARKED IN THE FIELD.

3. TEMPORARY CHEMICAL TOILETS MUST BE PROVIDED WITH A RATIO OF ONE TOILET PER THIRTY WORKERS.

4. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND/OR DIMENSIONS ON THE SITE.

5. THE ENGINEERING GROUPE DOES NOT CERTIFY AS TO THE LOCATION OR EXISTENCE OF ANY UNDERGROUND UTILITIES NOR AS TO SOIL OR GROUND CONDITIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR OR DEVELOPER TO HAVE ADEQUATE SOILS AND FOUNDATION TESTING PERFORMED TO DETERMINE THAT THE SUPPORT VALUES ARE ADEQUATE FOR THE STANDARDS SHOWN ON THIS PLAN.

6. IF PRECAST STRUCTURES ARE TO BE USED IN LIEU OF VDOT STANDARD STRUCTURES SPECIFIED ON THESE PLANS, WRITTEN APPROVAL OF THE SHOP DRAWINGS BY THE DESIGN ENGINEER SHOULD BE OBTAINED PRIOR TO ORDERING FROM MANUFACTURER AND INSTALLATION TO INSURE THERE ARE NO DESIGN CONFLICTS.

7. CONTRACTOR IS RESPONSIBLE FOR BEING AWARE OF AND CONFORMING TO OSHA RULES AND REGULATIONS AS THEY APPLY TO CONSTRUCTION PROCEDURES ON THIS SITE.

8. THERE ARE NO RESOURCE PROTECTION AREA OR FLOOD HAZARD AREAS ON THIS SITE PER PRINCE WILLIAM COUNTY GIS COUNTY MAPPER.

9. THE SOIL SURVEY OF PRINCE WILLIAM COUNTY WAS UTILIZED IN DETERMINING EXISTING SOILS CONDITIONS. NO SUBSURFACE INVESTIGATION HAS BEEN PERFORMED BY THE ENGINEERING GROUPE, INC. TO ATTEST TO THE SOIL CONDITIONS AND TO THE PRESENCE OF TOXIC AND CONTAMINATED WASTE.

10. ALL CONSTRUCTION INVOLVING PROBLEM SOILS MUST BE PERFORMED UNDER THE FULL–TIME INSPECTION OF A PROFESSIONAL GEOTECHNICAL ENGINEER.

11. ANY EXISTING CEMETERIES, GRAVESITES AND/OR HISTORIC SITES FOUND ON THIS SITE SHALL BE PRESERVED IN ACCORDANCE WITH COUNTY AND STATE REGULATIONS. THERE ARE NO KNOWN CEMETERIES ON THIS SITE.

12. PRIOR TO ANY CLEARING & GRADING ON SLOPES 25% OR GREATER, ALL SURFACE DRAINAGE WILL BE ROUTED AWAY FROM THE AREA TO BE GRADED.

13. ALL FILL MATERIALS AND THEIR SUBGRADE WILL BE APPROVED BY THE SOILS ENGINEER FOR THIS SITE.

14. STORM WATER MANAGEMENT, AND BEST MANAGEMENT PRACTICES FACILITIES AND SYSTEMS TO WILL BE MAINTAINED BY THE TOWN. THE TOWN SHALL BE RESPONSIBLE FOR MAINTAINING LANDSCAPING WITHIN THE VDOT RIGHT OF WAY. THE TOWN SHALL BE RESPONSIBLE FOR GRASS MOWING WITH REASONABLE FREQUENCY, IF APPLICABLE, AND FOR THE REMOVAL OF DEBRIS AND OTHER MATTER THAT HAS IMPEDED OR THREATENS TO IMPEDE THE FREE FLOW OF STORM WATER.

15. ALL EXISTING & PROPOSED UTILITIES SHALL BE INSTALLED UNDERGROUND IN ACCORDANCE WITH APPLICABLE TOWN ORDINANCES.

16. A COPY OF THE MOST CURRENT APPROVED PLANS AND PLATS MUST BE LOCATED ONSITE, DURING CONSTRUCTION.

17. THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATES MAPS (MAP NUMBERS 51153C–0067D AND 51153C–0059D) SHOWS THE PROPERTIES ARE IN ZONE X, WHICH ARE OUTSIDE THE LIMITS OF THE 100–YEAR FLOODPLAIN.

18. NO WETLANDS ARE PRESENT ON THE SITE.

GENERAL CHECKLIST NOTES:

1. NAME AND ADDRESS OF DEVELOPMENT: HAYMARKET TOWN PARK STREETSCAPE

2. ADDRESSES OF DEVELOPMENT: 14750; 14744; 14740 AND 14710 WASHINGTON STREET, HAYMARKET VA 20169

3. OWNER: TOWN OF HAYMARKET VA, 15000 WASHINGTON STREET, SUITE 100, HAYMARKET, VA 20169

4. APPLICANT: THE ENGINEERING GROUPE, 13580 GROUPE DRIVE, SUITE 200, WOODBRIDGE, VA 22192. (TEG)

5. EXISTING TOPOGRAPHY BASED UPON A DRONE SURVEY BY TEG DATED DECEMBER 6, 2022 AND FIELD SHOT TOPO DATED DECEMBER 14, 2022 AND MARCH 28, 2023 THAT REFERENCES A VERTICAL DATUM OF NAVD88.

6. BOUNDARY SHOWN HELD MONUMENT PW11; MERIDIAN NAD83 NORTH; NOT TITLE REPORT FURNISHED.

7. TOTAL PROJECT ACREAGE: 4.44 ACRES.

8. THERE ARE NO WETLANDS, MAPPED RPA'S OR 100–YEAR FLOOD AREAS WITHIN THE BOUNDARIES OF THESE IMPROVEMENTS.

GENERAL NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO EXISTING STATE AND TOWN CODES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE AWARE OF ALL APPLICABLE STANDARDS AND SPECIFICATIONS AS WELL AS REQUIRED METHODS OF CONSTRUCTION.

2. THE CONTRACTOR OR THEIR AGENT FOR CONTRACTOR SHALL BE RESPONSIBLE DETERMINING THE EXACT LOCATION OF ANY EXISTING UNDERGROUND UTILITIES PRIOR TO THE BEGINNING OF CONSTRUCTION. UTILITIES SHOWN HEREON ARE BASED ON AVAILABLE INFORMATION. IF DURING CONSTRUCTION OPERATIONS THE CONTRACTOR SHOULD ENCOUNTER ANY UTILITIES OTHER THAN THOSE SHOWN ON THESE PLANS, HE SHALL IMMEDIATELY NOTIFY THE ENGINEER AND TAKE NECESSARY AND PROPER STEPS TO PROTECT THE FACILITY AND ASSURE CONTINUANCE OF SERVICES. ANY DAMAGES WHICH OCCUR BY FAILURE TO LOCATE OR PRESERVE THESE UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

3. NO TITLE REPORT WAS FURNISHED FOR THIS PROJECT.

4. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE 1992 VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND TOWN ORDINANCES.

5. CONSTRUCTION SHOULD BE SEQUENCED SO THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE. SEDIMENT TRAPPING MEASURES, SUCH AS SILT FENCES, SHALL BE INSTALLED AND MADE FUNCTIONAL BEFORE ANY LAND DISTURBING ACTIVITY BEGINS.

6. ALL EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED IN GOOD WORKING CONDITION AT ALL TIMES DURING CONSTRUCTION. REMOVAL OF SAID CONTROLS SHALL BE AUTHORIZED BY A TOWN INSPECTOR BUT, AT THE LEAST, SHALL NOT BE REMOVED UNTIL PERMANENT VEGETATIVE COVER HAS BEEN ESTABLISHED ON ALL DENUDED AREAS.

7. PERMANENT AND TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN (7) DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN UNDISTURBED FOR LONGER THAN 14 DAYS.

8. PRIOR TO DEVELOPMENT, THE LIMITS OF CLEARING SHALL BE CLEARLY MARKED WITH PROTECTIVE BARRIERS. IN PARTICULAR, BARRIERS SHALL BE INSTALLED FIVE (5) FEET OUTSIDE THE DRIPLINE OF ANY TREE OR STAND OF TREES TO BE PRESERVED. THE BARRIERS SHALL REMAIN IN PLACE THROUGH ALL PHASES OF CONSTRUCTION. THE STORAGE OF EQUIPMENT, MATERIALS, DEBRIS OR FILL SHALL NOT BE ALLOWED WITHIN THE AREA PROTECTED BY THE BARRIER.

9. ENGINEERED FILL AND BACKFILL SHALL BE APPROVED SELECT MATERIALS AND SHALL THROUGHOUT. EACH LAYER OF ENGINEERED FILL SHALL BE COMPACTED AT OPTIMUM MOISTURE, PLUS OR MINUS TWO PERCENT, TO A DENSITY OF NOT LESS THAN 95 PERCENT IN ACCORDANCE WITH A.S.T.M. D–698.

NOTICE TO CONTRACTORS AND OWNERS

IF THE CONTRACTOR/OWNER DETERMINES THAT AN ERROR, DISCREPANCY, OMISSION, ETC. EXISTS ON THE SITE PLAN, THE CONTRACTOR /OWNER SHALL NOTIFY THE ENGINEER PRIOR TO PRECASTING, STAKEOUT, INSTALLATION OR CONSTRUCTION OF ANY IMPROVEMENTS SHOWN ON THE SITE PLAN. THE ENGINEER WILL REVIEW THE PLANS AND PROVIDE A CLARIFICATION OR AN ADDENDUM AS PROMPTLY AS POSSIBLE.

STORMWATER CONSTRUCTION INSPECTION NOTE

INSPECTIONS ARE NEEDED DURING CONSTRUCTION TO ENSURE THAT THE FACILITIES ARE BUILT IN ACCORDANCE WITH THE APPROVED PLANS AND DESIGN SPECIFICATIONS. THE DEVELOPER/OWNER SHALL PROVIDE FOR PERIODIC INSPECTIONS OF THE FACILITY DURING CONSTRUCTION. DETAILED INSPECTION CHECKLISTS SHALL BE USED THAT INCLUDE SIGN–OFFS BY A LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER REGISTERED IN VIRGINIA AT CRITICAL STAGES OF CONSTRUCTION, TO ENSURE THAT THE CONTRACTOR'S INTERPRETATION OF THE PLAN IS CONSISTENT WITH THE DESIGNER'S INTENT. THE ACTUAL INSPECTIONS MAY BE PERFORMED BY AN INDIVIDUAL UNDER THE DIRECT SUPERVISION OF THE LICENSED PROFESSIONAL.

STORMWATER AS-BUILT CERTIFICATION NOTE

AFTER THE FACILITY HAS BEEN CONSTRUCTED, THE DEVELOPER SHALL HAVE AN AS–BUILT CERTIFICATION CONDUCTED BY A LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER REGISTERED IN VIRGINIA AND SUBMITTED TO THE TOWN ALONG WITH THE AS–BUILT CHECKLIST AND AS–BUILT PLAN. THE AS–BUILT CERTIFICATION VERIFIES THAT THE FACILITY WAS INSTALLED AS DESIGNED AND APPROVED.

The Engineering Groupe, Inc.
Engineers | Surveyors | Planners
www.engrgroupe.com
Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0065
West Office
42796 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0065
South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0065

NO.	DATE	COUNTY REVISIONS

GENERAL NOTES

HAYMARKET TOWN PARK STREETSCAPE
RFP: 2022–001
TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: N/A
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP–286
SHEET 2 OF 22

G:\PROJECT\Town of Haymarket-Streetscape\ENG\DWG\00-K0501 NOTES-DETAILS-SECT.dwg, 7/17/2023 1

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)

NOTES AND LEGEND

1		REMOVE EXISTING DRIVEWAY CULVERT
2		REMOVE EXISTING GRAVEL DRIVE & GRAVEL SHOULDER
3		INDICATES EX. WOOD POST TO BE REMOVED
4		EX. TWO-WAY DIRECTIONAL ARROW
5	—S—S—	EX. SAN. SEWER. ADJUST ,AMHOLE TOPS AS NECESSARY
6	—W—W—	EX. WATER LINE
7		PORTION OF EXISTING UTILITY EASEMENTS TO BE VACATED
8		REMOVE EX. CURB AND GUTTER
9		PLUG EX. 15" CMP @ BOTH ENDS
10	*	INFORMATION TAKEN FROM COUNTY GIS MAPS

EXISTING SANITARY & STORM STRUCTURES

(1) San MH Top=365.14 Inv=361.28	(1) Storm MH Top=365.90 Inv A=358.45 Inv B=357.70 Inv C=357.55
(2) San MH Top=361.22 Inv A=359.94 Inv B=359.87	(2) Grate Inlet Top=362.79 Inv A=357.29 Inv B=357.24
(3) San MH Top=368.56 Inv A=358.72 Inv B=358.62 Inv C=358.57	(3) Curb Inlet Top=365.7 Inv=358.6
	(4) Grate Inlet Top=363.96 Inv A=357.96 Inv B=357.91
	(5) Grate Inlet Top=363.23 Inv A=356.83 Inv B=356.80
	(6) Grate Inlet Top=361.27 Inv A=356.67 Inv B=356.62

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsgroupe.com

Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0965

South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0965

West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0965

NO.	DATE	COUNTY REVISIONS

EXISTING CONDITIONS & DEMOLITION PLAN

HAYMARKET TOWN PARK STREETSCAPE

RFP: 2022-001

TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

DATE:	JULY 14, 2023
SCALE:	1"= 25'
DESIGNER: JM.,R.A.P.,J.B. DRAFTSMAN: Y.O.	
FILE NO.	PP-286
SHEET	3 OF 22

DATE	ACTION

GRAPHIC SCALE
0 25 50 100
(IN FEET)
1 inch = 25 ft.

LEGEND	
*	INFORMATION TAKEN FROM COUNTY GIS MAPS
	CONTOURS TAKEN FROM COUNTY GIS MAPS
LOD	LIMITS OF CLEARING AND/OR GRADING

EXISTING SANITARY & STORM STRUCTURES

(1) San MH Top=365.14 Inv=361.28	(1) Storm MH Top=365.90 Inv A=358.45 Inv B=357.70 Inv C=357.55
(2) San MH Top=367.22 Inv A=359.94 Inv B=359.87	(2) Grate Inlet Top=362.79 Inv A=357.29 Inv B=357.24
(3) San MH Top=368.56 Inv A=358.72 Inv B=358.62 Inv C=358.57	(3) Curb Inlet Top=365.7 Inv=358.6
	(4) Grate Inlet Top=363.96 Inv A=357.36 Inv B=357.31
	(5) Grate Inlet Top=361.23 Inv A=356.83 Inv B=356.80
	(6) Grate Inlet Top=361.27 Inv A=356.67 Inv B=356.62

NOTES:

1. ADJUST TOPS OF EXISTING SANITARY SEWER MANHOLES AS NEEDED TO MEET PROPOSED PAVEMENT WIDENING.
2. CONTRACTOR TO COORDINATE WITH ELECTRIC COMPANY TO ENSURE STABILITY OF EXISTING ELECTRICAL POLES ALONG WASHINGTON STREET DURING CONSTRUCTION.

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsvcgroupe.com
Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0065
West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0065
South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0065

NO.	DATE	COUNTY REVISIONS

GRADING PLAN

HAYMARKET TOWN PARK STREETSCAPE
RFP: 2022-001

TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

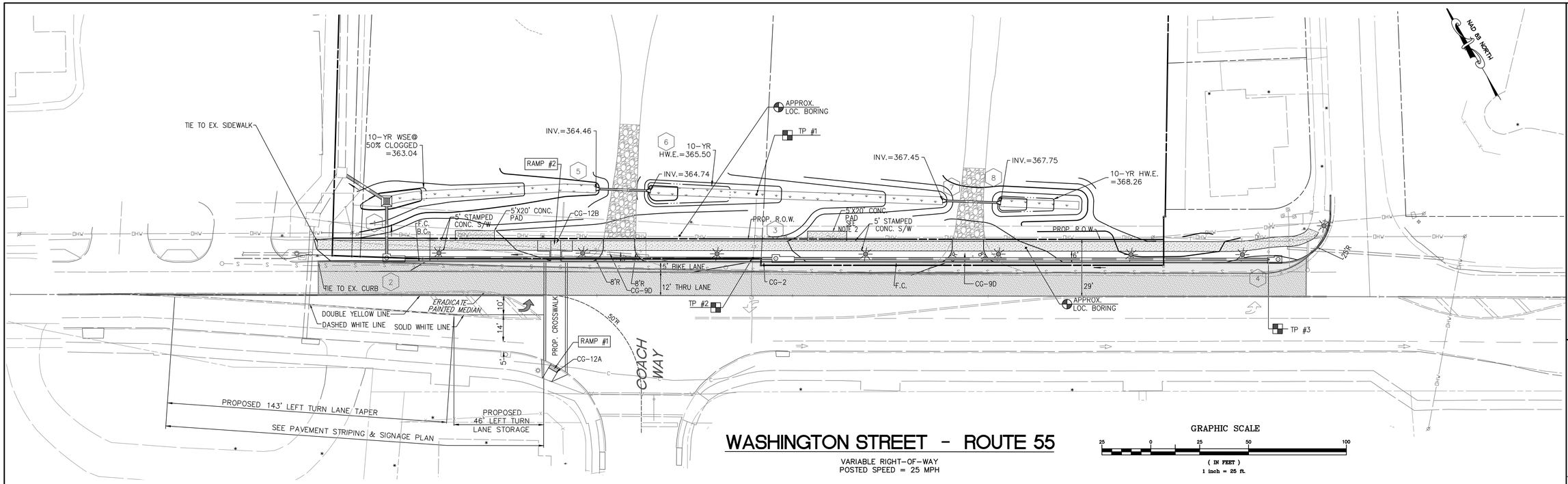
GRAPHIC SCALE
25 0 25 50 100
(IN FEET)
1 inch = 25 ft.

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: 1"=25'
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP-286
SHEET 4 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)



WASHINGTON STREET - ROUTE 55

VARIABLE RIGHT-OF-WAY
POSTED SPEED = 25 MPH

GRAPHIC SCALE
25 0 25 50 100
(IN FEET)
1 inch = 25 ft.

NOTES TO CONTRACTOR

1. SEE ADDITIONAL VDOT NOTES ON SHEET 3.
2. TOWN TO PROVIDE AND INSTALL BENCHES AND TRASH CANS AT EACH CONCRETE PAD.
3. CONTRACTOR TO COORDINATE WITH ELECTRIC COMPANY TO ENSURE STABILITY OF EXISTING ELECTRICAL POLES ALONG WASHINGTON STREET DURING CONSTRUCTION.

NOTES:

1. ALL CURB RADII WERE TAKEN ALONG FACE OF CURB UNLESS OTHERWISE NOTED.
2. ADJUST TOPS OF EXISTING SANITARY SEWER MANHOLES AS NEEDED TO MEET PROPOSED PAVEMENT WIDENING.

LEGEND

- * INFORMATION TAKEN FROM COUNTY GIS MAPS
- DENOTES LIMITS OF NEW ASPHALT
- DENOTES LIMITS OF ASPHALT MILL AND OVERLAY PER VDOT W-2 STANDARD DETAIL

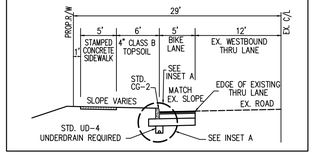
EXISTING SANITARY AND STORM STRUCTURES

1. San MH Top=365.14 Inv=361.28
2. San MH Top=367.22 Inv A=359.94 Inv B=359.87
3. San MH Top=368.56 Inv A=358.72 Inv B=358.62 Inv C=358.57
1. Storm MH Top=365.90 Inv A=358.45 Inv B=357.70 Inv C=357.55
2. Grate Inlet Top=362.79 Inv A=357.29 Inv B=357.24
3. Curb Inlet Top=±365.7 Inv=±358.6
4. Grate Inlet Top=363.96 Inv A=357.36 Inv B=357.31
5. Grate Inlet Top=363.23 Inv A=356.83 Inv B=356.80
6. Grate Inlet Top=361.27 Inv A=356.67 Inv B=356.62

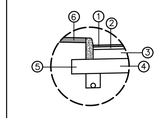
PRIVATE ENTRANCES

6" 21A

TYPICAL SECTION (N.T.S.)

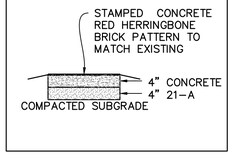


INSET A (N.T.S.)



1. 1.5" ASPHALT CONCRETE TYPE SM-9.5D @ 176 LB PER S.Y.
2. 2" ASPHALT CONCRETE TYPE IM-19.0D @ 235 LB PER S.Y.
3. 8" ASPHALT CONCRETE BASE TYPE BM-25.0 A
4. 12" AGGREGATE SUBBASE MATERIAL TYPE I, SIZE No 21 B CONNECTED TO A STANDARD UD-4 EDGEDRAIN LOCATED BENEATH THE CURB AND GUTTER.
5. AGGREGATE BASE MATERIAL TYPE I No. 21B TO EXTEND 1' BEHIND THE BACK OF CURB.
6. 4" TOPSOIL CLASS B
7. PAVEMENT SECTION IS PRELIMINARY. FINAL PAVEMENT DESIGN SHALL BE SUBMITTED TO VDOT FOR APPROVAL ONCE CBR VALUES ARE DETERMINED.

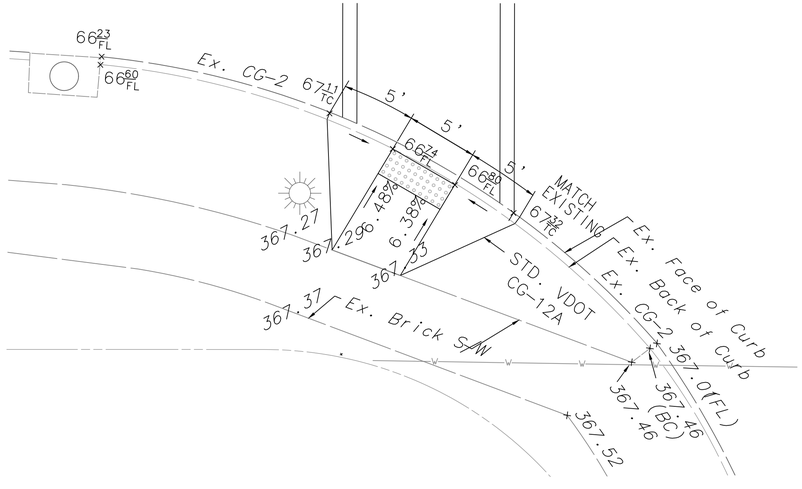
STAMPED CONCRETE SIDEWALK (N.T.S.)



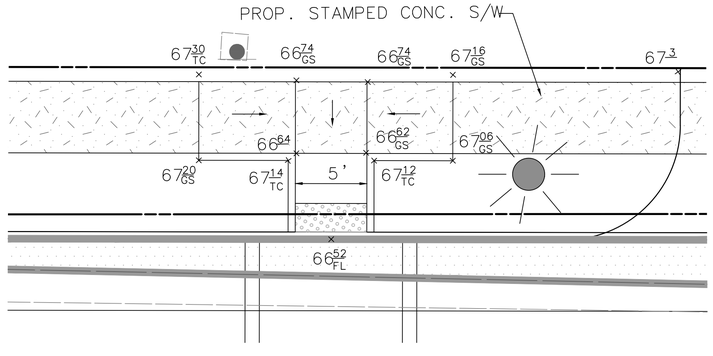
HANDICAP RAMP DETAILS

SCALE: 1" = 5'

GRAPHIC SCALE
5 0 5 10
(IN FEET)
1 inch = 5 ft.



RAMP 1



RAMP 2

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsvcgroup.com

West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.6700965

South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.6700965

Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.6700965

NO.	DATE	COUNTY REVISIONS

GEOMETRIC PLAN AND DETAILS - WASHINGTON STREET

HAYMARKET TOWN PARK STREETSCAPE

RFP: 2022-001

TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: AS SHOWN
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP-286
SHEET 5 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)

Culvert Report

Project filename: CULVERTS.cst

Culvert Studio v 2.0.0.28 — 04-19-2023

8-7 — **Culvert 1**

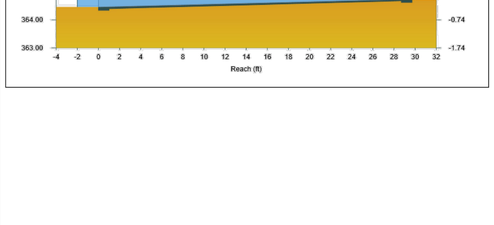
CULVERT		EMBANKMENT	
Shape	= Circular	Top Width	= 12.20 ft
Inlet Edge	= Square Edge/ Hdwall	Top Elevation	= 369.60 ft
Material	= HDPE	Crest Length	= 10.00 ft
Manning's n	= 0.013		
Rise	= 12 in	**DISCHARGE**	
Span	= 12 in	Method	= User-defined
Invert Elev. Down	= 367.45 ft		
Length	= 29.7 ft	NOTE: SINCE 2-YR VELOCITY IS LOWER THAN ALLOWABLE VELOCITY THROUGH THE PROPOSED CHANNEL OF 3.8 FPS, NO RIPRAP IS REQUIRED	
Slope	= 0.010 ft/ft		
Invert Elev. Up	= 367.75 ft		
No. Barrels	= 1	**TAILWATER**	
Plan Skew Angle	= 0 degrees	Tailwater Elevation	= 368.25 ft

CALCULATION SAMPLE 2-YR STORM

Discharge			Velocity		Depth		HGL @ Hw/D = 0.50		
Total	Culvert	Over Top	Down	Up	Down	Up	Down	Up	Hw
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(in)	(in)	(ft)	(ft)	(ft)
0.18	0.18	0.00	0.27	0.46	9.6	6.0	368.25	368.25	368.25

CALCULATION SAMPLE 10-YR STORM

Discharge			Velocity		Depth		HGL @ Hw/D = 0.51		
Total	Culvert	Over Top	Down	Up	Down	Up	Down	Up	Hw
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(in)	(in)	(ft)	(ft)	(ft)
0.43	0.43	0.00	0.64	1.10	9.6	6.0	368.25	368.25	368.26



Culvert Report

Project filename: CULVERTS.cst

Culvert Studio v 2.0.0.28 — 04-19-2023

6-5 — **Culvert 2**

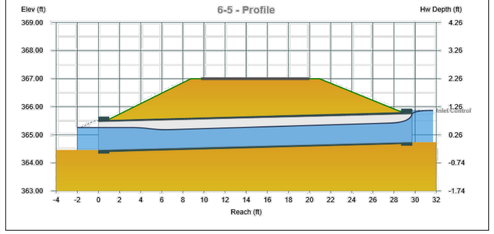
CULVERT		EMBANKMENT	
Shape	= Circular	Top Width	= 12.20 ft
Inlet Edge	= Square Edge/ Hdwall	Top Elevation	= 367.00 ft
Material	= HDPE	Crest Length	= 10.00 ft
Manning's n	= 0.013		
Rise	= 12 in	**DISCHARGE**	
Span	= 12 in	Method	= User-defined
Invert Elev. Down	= 364.46 ft		
Length	= 29.7 ft	NOTE: SINCE 2-YR VELOCITY IS LOWER THAN ALLOWABLE VELOCITY THROUGH THE PROPOSED CHANNEL OF 3.8 FPS, NO RIPRAP IS REQUIRED	
Slope	= 0.009 ft/ft		
Invert Elev. Up	= 364.74 ft		
No. Barrels	= 1	**TAILWATER**	
Plan Skew Angle	= 0 degrees	Tailwater Elevation	= 365.26 ft

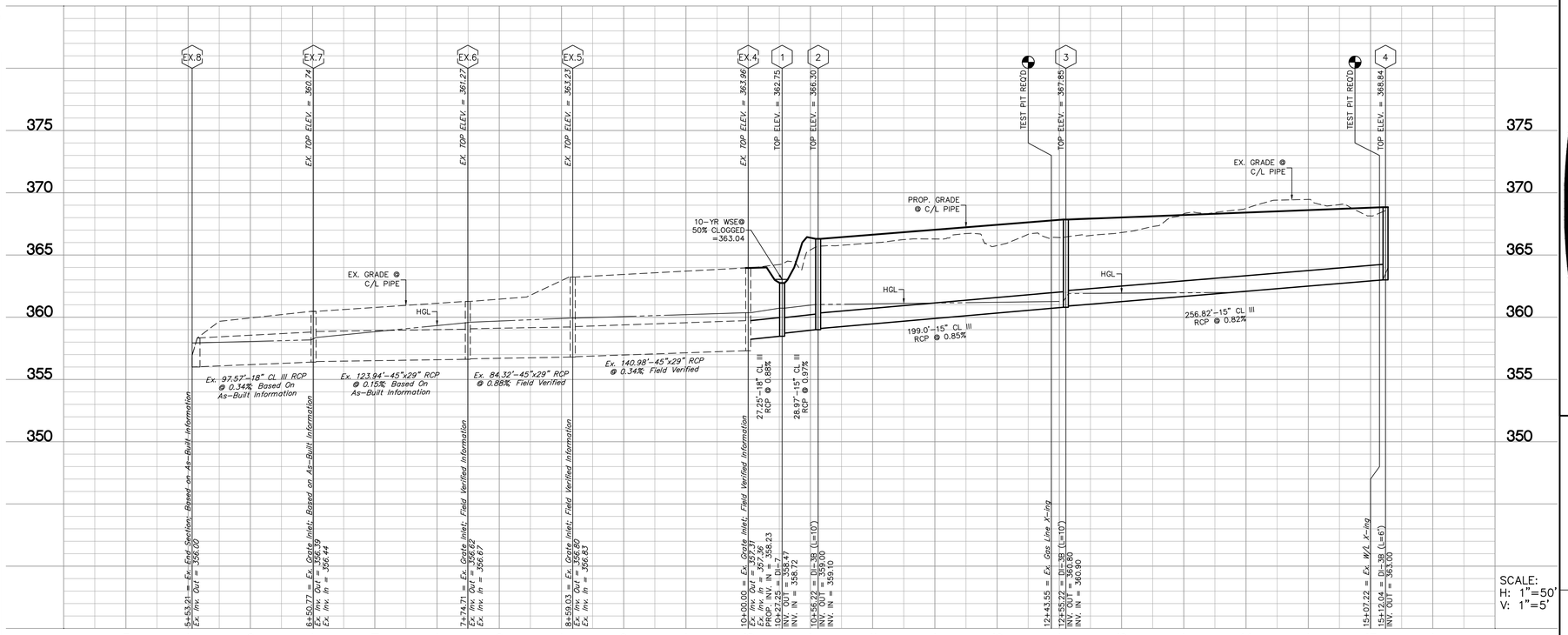
CALCULATION SAMPLE 2-YR STORM

Discharge			Velocity		Depth		HGL @ Hw/D = 0.65		
Total	Culvert	Over Top	Down	Up	Down	Up	Down	Up	Hw
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(in)	(in)	(ft)	(ft)	(ft)
1.19	1.19	0.00	1.77	2.94	9.6	6.1	365.26	365.25	365.39

CALCULATION SAMPLE 10-YR STORM

Discharge			Velocity		Depth		HGL @ Hw/D = 1.13		
Total	Culvert	Over Top	Down	Up	Down	Up	Down	Up	Hw
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(in)	(in)	(ft)	(ft)	(ft)
2.67	2.67	0.00	3.96	4.52	9.6	8.4	365.26	365.44	365.87





SCALE:
H: 1"=50'
V: 1"=5'

STORM HGL COMPUTATIONS

Inlet Station 1	Down-Stream Invert Out Elev.	Down-Stream Invert Elev. + 0.8*D	Water Surface Elev. 2.00	Do 3	Qo 4	Lo 5	Sfo (ft/ft) 6	Hf 7	Vo 8	Ho 9	Qi 10	Vi 11	QiVi 12	Vi²/2g 13	Hi 14	Angle 15	HΔ 16	Ht 17	1.30 Ht 18	0.50 Ht 19	Final H 20	Inlet Water Surface Elev. 21	TOP Elev. 22
OUTFALL AT EX. 4																							
EX.7	356.00	357.93	357.93	29 x 45e	18.14	98	0.00076	0.07	6.76	0.18	16.02	4.01	64.24	0.25	0.09	11		0.26	0.34	0.17	0.25	358.18	363.66
EX.6	356.44	358.37	358.37	29 x 45e	16.02	124	0.00059	0.07	4.01	0.06	14.83	4.17	61.84	0.27	0.09	1		0.16	0.20	0.10	0.18	358.55	363.36
EX.5	357.67	359.60	359.60	29 x 45e	14.83	84	0.00051	0.04	4.17	0.07	13.06	5.79	75.62	0.52	0.18	37	0.18	0.43	0.56	0.28	0.32	359.93	363.05
EX.4	356.83	358.76	359.93	29 x 45e	13.06	141	0.00039	0.06	5.79	0.13	5.54	5.74	31.80	0.51	0.18	58	0.27	0.58	0.76	0.38	0.43	360.36	362.90
1	358.23	359.43	360.36	18 "	5.54	27	0.00278	0.08	5.74	0.13	2.38	4.80	11.42	0.36	0.13	58	0.19	0.44	0.58	0.29	0.36	360.73	362.75
2	358.72	359.72	360.73	15 "	2.38	29	0.00136	0.04	4.80	0.09	1.80	4.26	7.67	0.28	0.10	90	0.20	0.39	0.50	0.25	0.29	361.02	366.30
3	359.10	360.10	361.02	15 "	1.80	199	0.00078	0.15	4.26	0.07	1.24	3.77	4.67	0.22	0.08			0.15	0.19	0.10	0.25	361.27	367.85
4	360.90	361.90	361.90	15 "	1.24	257	0.00037	0.09	3.77	0.06								0.06	0.07	0.04	0.13	363.00	368.84

STORM PIPE COMPUTATIONS

Start Node	Stop Node	Upstream Inlet Area (acres)	Upstream Inlet C	INCRE. CA (acres)	ACCUM. CA (acres)	Upstream Inlet Tc (min)	Upstream Intensity (in/h)	System Flow (ft³/s)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Length (ft)	Slope (%)	Section Size (in)	Capacity (Full Flow) (ft³/s)	Velocity (ft/s)	System Flow Time (min)	Flow / Capacity (Full) (%)
Outfall at Ex. 4																	
4	3	0.31	0.62	0.19	0.19	5.00	6.41	1.24	363.00	360.90	256.82	0.82	15	5.84	3.77	1.13	21.0
3	2	0.14	0.74	0.10	0.30	6.10	6.07	1.80	360.80	359.10	199.00	0.85	15	5.97	4.26	0.78	30.0
2	1	0.14	0.80	0.11	0.41	6.90	5.86	2.38	359.00	358.72	28.97	0.97	15	6.35	4.80	0.10	38.0
1	EX.4	1.39	0.39	0.54	0.95	7.00	5.84	5.54	358.47	358.23	27.26	0.88	18	9.85	5.74	0.08	56.0
EX.4	EX.5	2.16	0.60	1.30	2.25	7.10	5.82	13.06	357.31	356.83	140.98	0.34	29 x 45e	38.65	5.79	0.42	34.0
EX.5	EX.6	0.76	0.46	0.35	2.60	7.50	5.71	14.83	357.80	357.67	84.32	0.15	29 x 45e	26.01	4.17	0.35	57.0
EX.6	EX.7	0.44	0.57	0.25	2.85	7.90	5.63	16.02	356.62	356.44	123.94	0.15	29 x 45e	25.24	4.01	0.48	63.0
EX.7	EX.8	0.70	0.63	0.44	3.29	8.40	5.52	18.14	356.39	356.00	97.57	0.40	29 x 45e	41.88	6.76	0.25	43.0

STORM INLET COMPUTATIONS

INLET NUMBER	Inlet	Curb Opening Length (ft)	Drainage Area (acres)	C	CA (acres)	SUM CA (acres)	I (in/h)	Q INCR (ft³/s)	Qb, CARRY-OVER (ft³/s)	Qt, GUTTER FLOW (ft³/s)	S, GUTTER SLOPE (%)	Sx, CROSS SLOPE (%)	T, SPREAD (ft)	W (ft)	Sw (%)	Eo (%)	Se	Lt, Required Length (ft)	E (%)	Qi, INTER-CEPTED FLOW (ft³/s)	Qb, BYPASSED FLOW (ft³/s)	Gutter Depth (in)	Bypass Target
4	Curb DI-3B	6	0.31	0.62	0.19	0.19	4	0.77	0.00	0.77	0.53%	2.08%	7.01	0.00	0.00%	100.0%	2.08%	14.16	62.9%	0.49	0.29	1.75	
3	Curb DI-3B	10	0.14	0.74	0.10	0.10	4	0.42	0.00	0.42	1.15%	2.08%	4.81	0.00	0.00%	100.0%	2.08%	13.81	90.2%	0.38	0.04	1.20	2
2	Curb DI-3B	10	0.14	0.80	0.11	0.11	4	0.44	0.04	0.48	0.84%	2.08%	5.42	0.00	0.00%	100.0%	2.08%	13.32	91.8%	0.44	0.04	1.36	

STORM GRATE HEADWATER COMPUTATIONS

GRATE HEADWATER COMPUTATIONS - 10 YR. 50% CAPACITY

STR NUMBER	STR. TYPE	DRAINAGE AREA (AC)	C	CA	Tc (Mins)	10-YR INTENSITY (IN/HR)	Q INCR (CFS)	INLET PERIMETER (FT)	INLET AREA (SQFT)	DEPTH OF WATER (WEIR) (FT)	DEPTH OF WATER (ORIFICE) (FT)	DEPTH OF WATER (FT)	TOP OF STR (FT)	10 YR. HWE @ 50 % CLOGGED (FT)
1	DI-7	1.39	0.39	0.54	9.00	5.38	2.92	12.80	6.00	0.29	0.03	0.29	362.75	363.04

INLETS ARE ASSUMED TO BE 50% CLOGGED

The Engineering Groupe, Inc.
Engineers | Surveyors | Planners
www.engsurvgroup.com
Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0065
South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0065
West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0065

NO.	DATE	COUNTY REVISIONS

STORM SEWER PROFILE & COMPUTATIONS

HAYMARKET TOWN PARK STREETSCAPE

RFP: 2022-001

TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: AS SHOWN
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP-286
SHEET 6 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)

EROSION AND SEDIMENT CONTROL NARRATIVE:

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF THE CONSTRUCTION OF THE WIDENING OF WASHINGTON STREET TO INCLUDE A BIKE LANE, SIDEWALK, STREETSCAPE AND ASSOCIATED STORM DRAINAGE IMPROVEMENTS. TWO COMMERCIAL ENTRANCES ALONG WASHINGTON STREET WILL BE INSTALLED TO ACCESS THE TOWN PARK, AND STAMPED CONCRETE SIDEWALK WITH TWO SEATING AREAS. APPROXIMATELY 0.63 AC. WILL BE DISTURBED.

EXISTING SITE CONDITIONS

THE TOPOGRAPHY ON THIS SITE RANGES IN ELEVATION FROM 380 FEET TO 364 FEET ABOVE SEA LEVEL. THE MAJORITY OF THE SITE BEING DEVELOPED RUNS FROM EAST TO WEST AN EXISTING ENCLOSED STORM PIPE SYSTEM RUNNING FROM ROUTE 55 AND ALONG THE WESTERN, SHARED PROPERTY LINE WITH THE ADJACENT CHURCH PROPERTY AND THEN TO AN OUTFALL SWALE BEHIND A RESIDENTIAL LOT NORTH OF THE CHURCH PROPERTY. SLOPES ON SITE RANGE FROM 0.5% TO 3%.

ADJACENT PROPERTIES

THE SITE IS BOUND TO THE WEST BY HAYMARKET BAPTIST CHURCH, TO THE SOUTH BY WASHINGTON STREET, TO THE NORTH AND EAST BY EXISTING SINGLE FAMILY HOMES,

SOILS

A SOILS MAP AND SUPPORTING SOILS DATA HAVE BEEN PROVIDED ON **SHEET** 1 OF THIS PLAN SET.

OFF-SITE AREAS

THE EARTHWORK FOR THIS SITE BALANCES. ADDITIONAL OFFSITE BORROW OR SPOIL AREAS ARE NOT NEEDED. A STORM SEWER PIPE CONNECTION WILL BE NECESSARY FOR THIS DEVELOPMENT.

CRITICAL EROSION AREAS

THERE ARE NO CRITICAL AREAS ASSOCIATED WITH THIS PROJECT.

STORMWATER RUNOFF CONSIDERATIONS:

SEE SHEET 14.

MINIMUM STANDARDS

FOR EVERY MEASURE EMPLOYED TO SATISFY EACH OF THE NINETEEN MINIMUM STANDARDS APPLICABLE TO THIS DEVELOPMENT, THE NUMBER FOR THE PARTICULAR STANDARD BEING SATISFIED HAS BEEN PLACED IN PARENTHESES NEXT TO THE CORRESPONDING MEASURE. STORM SEWER COMPUTATIONS HAVE BEEN PROVIDED ON SHEET 6, DEMONSTRATING COMPLIANCE WITH MS-19. THE FOLLOWING MINIMUM STANDARDS DO NOT APPLY TO THIS DEVELOPMENT: (MS-5)(MS-9)(MS-12) (MS-13) (MS-14) (MS-15).

EROSION AND SEDIMENT CONTROL MEASURES

UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.

NO DISTURBED AREAS SHALL BE LEFT DENUDED. THE DISTURBED LAND WHERE WORK HAS BEEN COMPLETED WILL BE STABILIZED ON A DAILY BASIS. (MS-1)

ANY STOCKPILED MATERIAL WHICH WILL REMAIN IN PLACE LONGER THAN SEVEN (7) DAYS SHALL BE SEEDED AND MULCHED FOR TEMPORARY VEGETATION. WHEN NECESSARY TO DE-WATER A TRENCH, THE PUMP DISCHARGE HOSE SHALL BE OUTLETTED INTO A STABILIZED AREA OR SEDIMENT TRAPPING STRUCTURE. (MS-1, MS-2)

THE CONTRACTOR SHALL MAKE PROVISIONS FOR DUST CONTROL DURING CONSTRUCTION ACTIVITIES. ACCEPTABLE MEASURES FOR DUST CONTROL INCLUDE TEMPORARY VEGETATIVE COVER, MULCHING, TILLAGE, IRRIGATION, SPRAY-ON ADHESIVES, STONE, BARRIERS, AND CALCIUM CHLORIDE. PLEASE SEE STD & SPEC 3.39 OF THE VESCH FOR A DESCRIPTION OF EACH METHOD, AND HOW IT IS USED MOST EFFECTIVELY.

STRUCTURAL PRACTICES

TEMPORARY CONSTRUCTION ENTRANCE – 3.02 A TEMPORARY CONSTRUCTION ENTRANCE WITH A WASH RACK SHALL BE INSTALLED ON WASHINGTON STREET ROUTE 55. SEE SHEET 8 FOR CONSTRUCTION ENTRANCE LOCATION. A WATER TANK TRUCK WILL BE USED TO WASH VEHICLES AS THEY LEAVE THE SITE. (MS-17)

OUTLET PROTECTION – 3.18 RIPRAP IS TO BE PLACED AT THE OUTLET OF ALL PIPES AS INDICATED ON THE E&S PHASE 1 PLAN. (MS-11)

TEMPORARY CULVERT INLET PROTECTION – 3.08 TEMPORARY INLET PROTECTION SHALL BE INSTALLED AT EXISTING AND PROPOSED CULVERTS TO PREVENT SEDIMENT FROM ENTERING STORM DRAINAGE SYSTEMS PRIOR TO PERMANENT STABILIZATION. (MS-10)

TEMPORARY DIVERSION DIKE – 3.09 A TEMPORARY RIDGE OF COMPACTED SOIL AT THE TOP OF A SLOPING DISTURBED AREA TO DIVERT RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM UNPROTECTED DISTURBED AREAS TO A STABILIZED OUTLET. (MS-10)

SILT FENCE BARRIER – 3.05 SILT FENCE SEDIMENT BARRIERS WILL BE INSTALLED DOWNSLOPE OF AREAS WITH MINIMAL GRADES TO FILTER SEDIMENT-LADEN RUNOFF FROM SHEET FLOW AS INDICATED ON THE SITE PLAN.

STORM DRAIN INLET PROTECTION – 3.07 ALL STORM SEWER INLETS SHALL BE PROTECTED DURING CONSTRUCTION. SEDIMENT-LADEN WATER SHALL BE FILTERED BEFORE ENTERING THE STORM SEWER INLETS. (MS-10)

TOPSOILING – 3.30 PROVIDE A SUITABLE GROWTH MEDIUM FOR FINAL SITE STABILIZATION WITH VEGETATION. PERIMETER CONTROLS MUST BE PLACED AROUND THE STOCKPILE IMMEDIATELY; SEEDING OF STOCKPILES SHALL BE COMPLETED WITHIN 7 DAYS OF THE FORMATION OF THE STOCKPILE, IN ACCORDANCE WITH STD. & SPEC. 3.31 TEMPORARY SEEDING IF IT IS TO REMAIN DORMANT FOR LONGER THAN 30 DAYS. TOPSOIL WILL BE RESPREAD AT AN AVERAGE OF 8 INCHES ACROSS OPEN AREAS ONSITE UNTIL ALL TOPSOIL HAS BEEN USED. THERE WILL BE NO EXCESS MATERIAL AFTER FINAL GRADES ARE ESTABLISHED. (MS-1 & MS-2)

DUST CONTROL – 3.39 REDUCING SURFACE AND AIR MOVEMENT OF DUST DURING LAND DISTURBING, DEMOLITION AND CONSTRUCTION ACTIVITIES TO PREVENT SURFACE AND AIR MOVEMENT OF DUST FROM EXPOSED SOIL SURFACES.

TEMPORARY SEEDING SPECIFICATION – 3.31 ESTABLISHMENT OF TEMPORARY GRADE WITHIN A PERIOD OF MORE THAN 30 DAYS) BY SEEDING AND MULCHING WITH VEGETATIVE COVER ON DISTURBED AREAS (THAT WILL NOT BE BROUGHT TO FINAL FAST GERMINATING TEMPORARY VEGETATION. (MS-1)

PLANT SELECTION – TEMPORARY SEEDING PLANT MATERIALS SHALL BE APPLIED AS LISTED IN THE FOLLOWING TABLE.

TEMPORARY SEEDING PLANT MATERIALS		
PLANTING DATES	SPECIES	RATE (LBS/AC)
SEPT. 1 – FEB. 15	50/50 MIX OF ANNUAL RYEGRASS & CEREAL (WINTER RYE)	75
FEB. 16 – APR. 30	ANNUAL RYEGRASS	80
MAY 1 – AUG. 31	GERMAN MILLET	50

SURFACE ROUGHENING – IF THE AREA HAS BEEN RECENTLY LOOSENED OR DISTURBED, NO FURTHER ROUGHENING IS REQUIRED. WHEN THE AREA IS COMPACTED, CRUSTED, OR HARDENED, THE SOIL SURFACE SHALL BE LOOSENED BY DISCING, RAKING, HARROWING, OR OTHER ACCEPTABLE MEANS (SEE SURFACE ROUGHENING, STD. & SPEC. 3.29 VE&SCH).

SEEDING – SEED SHALL BE EVENLY APPLIED WITH A BROADCAST SEEDER, DRILL, CULTIPACKER SEEDER OR HYDROSEEDER. SMALL GRAINS SHALL BE PLANTED NO MORE THAN ONE INCH DEEP. GRASSES AND LEGUMES SHALL BE PLANTED WITH NO LESS THAN 1/4" SOIL COVER.

RE-SEEDING – AREAS WHICH FAIL TO ESTABLISH VEGETATIVE COVER ADEQUATE TO PREVENT RILL EROSION WILL BE RE-SEEDED AS SOON AS SUCH AREAS ARE IDENTIFIED.

PERMANENT SEEDING SPECIFICATION: 3.32 – ESTABLISHMENT OF PERENNIAL VEGETATIVE COVER ON ROUGH GRADED AREAS WHICH WILL NOT BE BROUGHT TO FINAL GRADE FOR A YEAR OR MORE OR WHERE PERMANENT, LONG-LIVED VEGETATIVE COVER IS NEEDED TO STABILIZE THE SOIL. THE PROJECT SITE IS IN THE COASTAL PLAIN REGION OF PRINCE WILLIAM COUNTY THEREFORE PLANT MATERIALS SHOULD BE SELECTED SPECIFICALLY FOR THIS REGION. (MS-3)

PLANT SELECTION – SELECT PLANT MATERIALS BASED ON CLIMATE, TOPOGRAPHY, SOILS, LAND USE, AND PLANTING SEASON. USE THE FOLLOWING TABLE FOR PERMANENT SEEDING REQUIREMENTS:

PERMANENT SEEDING PLANT MATERIALS	TOTAL LBS/AC.
MINIMAL CARE LAWN	
TALL FESCUE***	175–200 LBS.
OR	
BERMUDA GRASS*	75 LBS.
GENERAL SLOPE (3:1 OR LESS)	
TALL FESCUE***	128 LBS.
RED TOP GRASS	2 LBS.
SEASONAL NURSE CROP**	20 LBS.
	150 LBS.

*MAY THROUGH OCTOBER, USE HULLED SEED. ALL OTHER SEEDING PERIODS, USE UNHULLED SEED. WEEPING LOVEGRASS MAY BE ADDED TO ANY SLOPE OR LOW-MAINTENANCE MIX DURING WARMER SEEDING PERIODS; ADD 10–20 LBS./AC. IN MIXES

**USE SEASONAL NURSE CROP IN ACCORDANCE WITH SEEDING DATES AS STATED BELOW:

FEBRUARY; MARCH THROUGH APRIL.....ANNUAL RYE
MAY 1ST THROUGH AUGUST.....FOXTAIL MILLET
SEPTEMBER, OCTOBER THROUGH NOVEMBER 15TH.....ANNUAL RYE
NOVEMBER 16TH THROUGH JANUARY.....WINTER RYE

FROM VESCH TABLE 3.32-D.

***NOTE:
DD'S STABILIZED WITH FESCUE CANNOT BE USED UNTIL THE GRASS IS ESTABLISHED TO THE SATISFACTION OF THE INSPECTOR.

SEEDBED REQUIREMENTS – VEGETATION SHOULD NOT BE ESTABLISHED ON SLOPES THAT ARE UNSUITABLE DUE TO INAPPROPRIATE SOIL TEXTURE, POOR INTERNAL STRUCTURE OR INTERNAL DRAINAGE, VOLUME OF OVERLAND FLOW, OR EXCESSIVE STEEPNESS, UNTIL MEASURES HAVE BEEN TAKEN TO CORRECT THESE PROBLEMS (SEE STD. & SPEC. 3.32 FOR THESE REQUIREMENTS).

TOPSOILING – SPREAD 4 INCHES OF TOPSOIL ON AREAS IN PREPARATION FOR PERMANENT SEEDING. REMOVE ROOTS AND ROCKS LARGER THAN 1–INCH.

SOIL CONDITIONERS – IF REQUIRED, THE FOLLOWING MATERIALS MAY BE ADDED TO THE SOIL TO IMPROVE THE STRUCTURE, TEXTURE, OR DRAINAGE CHARACTERISTICS OF THE SOIL: PEAT, SAND, VERMICULITE, RAW MANURE, ROTTED SAWDUST, TREATED SEWAGE SLUDGE. A DESCRIPTION OF THESE MATERIALS AND APPLICATIONS CAN BE FOUND IN STD. & SPEC. 3.32 VE&SCH.

SOIL TESTS – SOIL TESTS SHALL BE MADE TO DETERMINE APPLICATIONS OF LIME AND FERTILIZER. THE TEST RESULTS WILL BE DELIVERED TO THE CONTRACTOR AND COUNTY INSPECTOR NO LATER THAN THE PRE-CONSTRUCTION MEETING.

INCORPORATION – LIME AND FERTILIZER SHALL BE INCORPORATED INTO THE TOP 4– 6 INCHES OF THE SOIL BY DISCING OR OTHER MEANS WHEREVER POSSIBLE. FOR EROSION CONTROL, WHEN APPLYING LIME AND FERTILIZER WITH A HYDROSEEDER, APPLY TO A ROUGH, LOOSE SURFACE.

SEEDING – CERTIFIED SEED WILL BE USED FOR ALL PERMANENT SEEDING. THE SEED MUST MEET PUBLISHED STATE STANDARDS AND BEAR AN OFFICIAL "CERTIFIED SEED" LABEL. LEGUME SEED SHOULD BE APPROPRIATELY INOCULATED TO THE SPECIES. SEED OF LESPEDEZAS, THE CLOVERS AND CROWNVETCH SHOULD BE SCARIFIED TO PROMOTE UNIFORM GERMINATION. APPLY SEED UNIFORMLY WITH A BROADCAST SEEDER, DRILL, CULTI-PACKER SEEDER, OR HYDROSEEDER ON A FIRM, FRIABLE SEEDBED. SEEDING DEPTH SHOULD BE 1/4 TO 1/2 INCH.

HYDROSEEDING SPECIAL REQUIREMENTS – TO AVOID POOR GERMINATION RATES AS A RESULT OF SEED DAMAGE DURING HYROSEEDING, IT IS RECOMMENDED THAT IF A MACHINERY BREAKDOWN OF 30 MINUTES TO 2 HOURS OCCURS, 50% MORE SEED SHOULD BE ADDED TO THE TANK, BASED ON PROPORTIONS OF THE SLURRY REMAINING IN THE TANK. BEYOND 2 HOURS A BATCH OF NEW SEED MAY BE NECESSARY. IN INACCESSIBLE AREAS, LIME MAY HAVE TO BE APPLIED SEPARATELY IN PELLETIZED OR LIQUID FORM. SURFACE ROUGHENING IS PARTICULARLY IMPORTANT WHEN HYDROSEEDING BECAUSE A ROUGHENED SLOPE WILL PROVIDE SOME NATURAL COVERAGE OF LIME, FERTILIZER, AND SEED. LEGUME INOCULANTS SHOULD BE APPLIED AT FIVE TIMES THE RECOMMENDED RATE WHEN INOCULANT IS INCLUDED IN THE HYDROSEEDER SLURRY.

MULCHING, WATERING, RE-SEEDING – ALL PERMANENT SEEDING MUST BE MULCHED IMMEDIATELY UPON COMPLETION OF SEED APPLICATION (SEE MULCHING STD. & SPEC. 3.35 VE&SCH). NEW SEEDINGS SHOULD BE SUPPLIED WITH ADEQUATE MOISTURE. INSPECT SEEDED AREAS FOR LACK OF GERMINATION AND MAKE NECESSARY REPAIRS AND RE-SEEDINGS WITHIN THE SAME SEASON, IF POSSIBLE.

MAINTENANCE FERTILIZATION – COOL SEASON GRASSES SHOULD BEGIN TO BE FERTILIZED 90 DAYS AFTER PLANTING TO ENSURE PROPER STAND AND DENSITY. WARM SEASON FERTILIZATION SHOULD BEGIN AT 30 DAYS AFTER PLANTING. SEE STD. & SPEC. 3.32 VE&SCH FOR PROPER MAINTENANCE FERTILIZATION BASED ON SITE CONDITIONS.

SODDING: 3.33 – STABILIZING FINE GRADED AREAS BY ESTABLISHING PERMANENT GRASS STANDS WITH SOD PROVIDES IMMEDIATE PROTECTION AGAINST EROSION AND IS ESPECIALLY EFFECTIVE IN GRASSED SWALES AND WATERWAYS OR IN AREAS WHERE IMMEDIATE AESTHETIC EFFECT IS DESIRABLE.

MULCHING: 3.35 – APPLICATION OF PLANT RESIDUES OR OTHER SUITABLE MATERIALS TO DISTURBED SURFACES TO PREVENT EROSION AND REDUCE OVERLAND FLOW VELOCITIES FOSTER PLANT GROWTH BY INCREASING AVAILABLE MOISTURE AND PROVIDING INSULATION AGAINST EXTREME HEAT OR COLD. APPLICABLE TO ALL SEEDING OPERATIONS, OTHER PLANT MATERIALS WHICH DO NOT PROVIDE ADEQUATE SOIL PROTECTION BY THEMSELVES, AND BARE AREAS WHICH CANNOT BE SEEDED DUE TO THE SEASON BUT WHICH STILL NEED SOIL PROTECTION.

SOIL STABILIZATION BLANKETS AND MATTING: 3.36 – THE INSTALLATION OF A PROTECTIVE COVERING (BLANKET) OR A SOIL STABILIZATION MAT ON A PREPARED PLANTING AREA OF A STEEP SLOPE, CHANNEL OR SHORELINE. BLANKETS AND MATTING SHOULD BE USED TO ESTABLISH VEGETATION ONLY ON SLOPES THAT ARE 3:1 OR STEEPER.

NOTE:
1. PERMANENT SEEDING SHALL BE PLACED ON ALL CUT/FILL SLOPES ADJACENT TO THE LIMITS OF CLEARING AND TEMPORARY SEEDING SHALL BE PLACED ON ALL AREAS THAT WILL BE DENUDED FOR MORE THAN 7 DAYS, EXCEPT FOR THAT PORTION IN WHICH WORK WILL BE CONTINUOUS BEYOND 7 DAYS.

2. PER VESCH STD. 3.30, PLANTING SOIL MUST HAVE ENOUGH FINES, SUFFICIENT PORE SPACE, DEPTH, AND FREE OF DELETERIOUS MATERIALS TO PROMOTE GROWTH.

3. IF THE ENTIRE SITE WILL NOT BE PERMANENTLY STABILIZED BEFORE DECEMBER 1, THE RESPONSIBLE LAND DISTURBER SHALL CONTACT THE COUNTY EROSION AND SEDIMENT CONTROL STAFF TO SCHEDULE A PER-WINTER MEETING TO OCCUR BEFORE OCTOBER 1.

CONSTRUCTION SEQUENCING

CONSTRUCTION WILL BE SEQUENCED SO THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE. IN PARTICULAR, INSTALLATION OF CONTROLS SHALL FOLLOW THIS ORDER:

PHASE I EROSION AND SEDIMENT CONTROL PLAN:

1. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD WITH TOWN OF HAYMARKET PRIOR TO ANY WORK BEING PERFORMED ON-SITE.

2. A TEMPORARY CONSTRUCTION ENTRANCE WITH AN OPTIONAL WASH RACK SHALL BE INSTALLED ON WASHINGTON STREET ROUTE 55. SEE SHEET 8 FOR CONSTRUCTION ENTRANCE LOCATION. A WATER TANK TRUCK WILL BE USED TO WASH VEHICLES AS THEY LEAVE THE SITE.

2. PERFORM MINIMAL CLEARING ONLY AS NECESSARY TO INSTALL ALL PERIMETER SEDIMENT CONTROL SILT FENCE. INSTALL INLET PROTECTION, DIVERSION DIKE, AND CULVERT AND INLET PROTECTION. (MS-4)

3. CONTRACTOR SHALL RECEIVE APPROVAL FROM THE SITE INSPECTOR AFTER INSTALLATION OF ALL PHASE I E&S CONTROLS PRIOR TO BEGINNING OF CONSTRUCTION.

4. BEGIN ROUGH GRADING, PAVEMENT AND CURB AND GUTTER REMOVAL.

5. IF NECESSARY, FIELD ADJUSTMENTS SHALL BE MADE TO PERIMETER CONTROLS TO ACCOMMODATE CHANGING DRAINAGE PATTERNS AND TO FACILITATE POSITIVE DRAINAGE.

6. FINISH TOP ROUGH GRADING.

7. INSTALLATION OF STORM SEWER AND CURB AND GUTTER, PAVEMENT BASE STONE, SHALL PROCEED AS FINAL GRADE IS REACHED WITHIN THE SITE.

PHASE II EROSION AND SEDIMENT CONTROL PLAN:

1. TRANSITION FROM PHASE I TO PHASE II CONTROLS SHALL OCCUR AS FINAL GRADE IS REACHED AND CURB AND GUTTER, PAVEMENT, ETC. ARE IN PLACE.

2. PHASE II CONTROLS INCLUDE STORM INLET PROTECTION, CULVERT INLET PROTECTION, SILT FENCE, TEMPORARY SEEDING, MULCHING, AND DUST CONTROL.

3. BASE STONE FOR PAVED AREAS SHALL BE PLACED AND COMPACTED UPON A COMPACTED SUBGRADE WITHIN 7 DAYS OF THE SUBGRADE REACHING FINAL GRADE.

4. START RE-VEGETATION AS AREAS ARE BROUGHT TO GRADE OR STAND IDLE FOR MORE THAN SEVEN (7) DAYS.

5. STABILIZE AREAS NOT BUILT UPON OR COVERED BY PAVEMENT, WITH TOP SOIL AND PERMANENT SEEDING. (MS-3)

7. 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, WITH PERMISSION OF THE EROSION CONTROL INSPECTOR. (MS-18)

MAINTENANCE PROGRAM

DAILY SITE INSPECTION WILL BE REQUIRED AND DAMAGED CONTROLS REPAIRED BY CLOSE OF THAT DAY. INSPECTIONS SHALL ALSO FOLLOW EACH SIGNIFICANT RAINFALL. IN PARTICULAR THE FOLLOWING SHALL BE INSPECTED:

1. THE GRAVEL AND SILT FENCE INLET PROTECTION WILL BE CHECKED REGULARLY FOR SEDIMENT BUILDUP WHICH WILL PREVENT DRAINAGE. IF THE GRAVEL IS CLOGGED BY SEDIMENT, IT SHALL BE REMOVED AND CLEANED OR REPLACED.

2. THE SILT FENCE BARRIER WILL BE CHECKED REGULARLY FOR UNDERMINING OR DETERIORATION OF THE FABRIC. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL OF SEDIMENT DEPOSITION REACHES HALFWAY TO THE TOP OF THE BARRIER.

3. THE SEEDED AREAS AND CUT AND FILL SLOPES WILL BE CHECKED REGULARLY TO INSURE THAT A GOOD STAND OF VEGETATION IS MAINTAINED. AREAS SHALL BE FERTILIZED AND RESEEDED AS NEEDED. (MS-7)

EROSION AND SEDIMENT CONTROL NOTES

1. THE CONTRACTOR MUST NOTIFY TOWN OF HAYMARKET AT LEAST 24 HOURS PRIOR TO THE START OF CONSTRUCTION. CONTROLS.

2. THE CONTRACTOR ONSITE SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT

3. ALL CONSTRUCTION SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE 1992 VIRIGNIA EROSION & SEDIMENT CONTROL HANDBOOK.

4. ALL EROSION CONTROL MEASURES SHOWN ON THE APPROVED PLAN MUST BE IN PLACE AND INSPECTED AND APPROVED BY THE TOWN OF HAYMARKET INSPECTOR PRIOR TO CLEARING, STRIPPING OF TOPSOIL OR GRADING.

5. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ONSITE AT ALL TIMES.

6. THE SITE SHALL BE CLEARED AND GRUBBED AND UNSUITABLE MATERIAL SHALL BE REMOVED.

7. FILL MATERIAL SHALL BE TAKEN FROM APPROVED, ONSITE BORROW AREA WHICH SHALL BE FREE FROM ROOTS, WOODY VEGETATION AND OVERSIZED

8. WHEN SEDIMENT IS TRANSPORTED ONTO A PAVED ROAD SURFACE, THE ROAD WILL BE CLEANED THOROUGHLY AT THE END OF EACH DAY ACCORDING TO THE FOLLOWING PROCEDURE: SEDIMENT SHALL BE REMOVED FROM THE ROAD SURFACE BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING WILL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.

9. PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS, A SUPPLEMENTARY EROSION CONTROL PLAN SHALL BE SUBMITTED AND APPROVED BY TOWN OF HAYMARKET.

10. CONCENTRATED RUN-OFF SHALL NOT FLOW DOWN CUT AND FILL SLOPES UNLESS CONTAINED IN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, SLOPE DRAIN OR OTHER PERTINENT STRUCTURE. IF WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR PROTECTION SHALL BE PROVIDED. **(MS-8, MS-9)**

11. 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 STREAM OR OFF-SITE PROPERTY;
d. MATERIAL USED FOR BACK-FILLING TRENCHES SHALL BE COMPACTED TO MINIMIZE EROSION AND PROMOTE STABILIZATION;
e. RE-STABILIZATION SHALL BE ACCOMPLISHED WITH THESE REGULATIONS; AND
f. APPLICABLE SAFETY REGULATIONS SHALL BE COMPLIED WITH. **(MS-16)**

12. IF THE ENTIRE SITE WILL NOT BE PERMANENTLY STABILIZED BEFORE DECEMBER 1, THE RESPONSIBLE LAND DISTURBER SHALL CONTACT THE COUNTY EROSION AND SEDIMENT CONTROL STAFF TO SCHEDULE A PRE-WINTER MEETING TO OCCUR BEFORE OCTOBER 1.

EROSION CONTROL NOTES

1. ALL EROSION CONTROL MEASURES SHOWN ON THE APPROVED PLAN MUST BE IN PLACE AND INSPECTED AND APPROVED BY THE TOWN PRIOR TO CLEARING, STRIPPING OF TOPSOIL OR GRADING.

2. THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE TOWN.

3. ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL COMPLETE AND ADEQUATE STABILIZATION IS ACHIEVED.

4. WATER MUST BE PUMPED INTO AN APPROVED FILTERING DEVICE DURING DEWATERING OPERATIONS.

5. ALL EROSION AND SEDIMENT CONTROL PRACTICES MUST BE CONSTRUCTED AND MAINTAINED ACCORDING TO THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND THE VIRGINIA REGULATIONS VR 625-02-00 EROSION AND SEDIMENT CONTROL REGULATIONS. THE DEVELOPER/DEVELOPER'S REPRESENTATIVE WILL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL PRACTICES AT ALL TIMES.

6. THE CONTRACTOR SHALL INSPECT ALL EROSION AND SEDIMENT CONTROL MEASURES DAILY AND AFTER EACH SIGNIFICANT RAINFALL. THE FOLLOWING ITEMS WILL BE CHECKED IN PARTICULAR:

a. GRAVEL OUTLETS WILL BE CHECKED REGULARLY FOR SEDIMENT BUILDUP WHICH WILL PREVENT DRAINAGE. IF THE GRAVEL IS CLOGGED BY SEDIMENT, IT SHALL BE REMOVED AND CLEANED OR REPLACED.
b. 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.
c. SEEDED AREAS WILL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED AND RESEEDED AS NEEDED.
d. CONVEYANCE CHANNELS SHALL BE INSPECTED DAILY AND AFTER EACH RAIN TO ENSURE THEY'RE FUNCTIONING PROPERLY AND THAT THE INTEGRITY OF THE LININGS ARE NOT IMPAIRED.ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE IMMEDIATELY AFTER THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES MUST BE MADE INSPECTION.

9. SEDIMENT TRAPPING MEASURES WILL BE INSTALLED AS A FIRST STEP IN GRADING AND WILL BE IMMEDIATELY FOLLOWING INSTALLATION. SEEDED AND MULCHED

10. PERMANENT SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE.

11. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN (7) DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN UNDISTURBED FOR LONGER THAN FOURTEEN (14) DAYS.

12. SEEDING AND SELECTION OF THE SEED MIXTURE SHALL BE IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK STANDARD AND SPECIFICATION 3.32.

13. ROADS AND DRIVEWAYS AREAS SHALL BE STABILIZED WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED.

14. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES WILL BE REMOVED WITHIN 30 DAYS AFTER ADEQUATE SITE STABILIZATION AND AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, AS AUTHORIZED BY THE PRINCE WILLIAM COUNTY INSPECTORS. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES WILL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.

15. WHEN SEDIMENT IS TRANSPORTED ONTO A PAVED ROAD SURFACE, THE ROAD WILL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT WILL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING WILL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.

16. AREAS WHICH ARE NOT TO BE DISTURBED WILL BE CLEARLY MARKED BY FLAGS, SIGNS, ETC.

17. TREE SAVE AREAS SHALL BE CLEARLY MARKED IN THE FIELD BY ORANGE SAFETY FENCE.

18. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES MAY BE NECESSARY TO BE INSTALLED UPON THE DISCRETION OF THE TOWN OF HAYMARKET INSPECTORS DURING CONSTRUCTION.

19. ALL EROSION AND SEDIMENT CONTROL MEASURE ON PHASE I SHALL REMAIN THROUGH THE DURATION OF PHASE II CONSTRUCTION. SEDIMENT CONTROLLING DEVICES MAY BE MODIFIED AS GRADING PROGRESSES WITH THE TOWN OF HAYMARKET APPROVAL. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WITH APPROVAL FROM TOWN OF HAYMARKET INSPECTORS.

EROSION AND SEDIMENT CONTROL POLLUTANT DISCHARGE NOTES :

1. MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER AND OTHER WASH WATERS;

2. MINIMIZE THE EXPOSURE OF BUILDING MATERIALS, BUILDING PRODUCTS, CONSTRUCTION WASTES, TRASH, LANDSCAPE MATERIALS, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE, AND OTHER MATERIALS PRESENT ON-SITE TO PRECIPITATION AND TO STORMWATER;
a. PROHIBIT THE DISCHARGE OF WASTEWATER FROM THE WASHOUT OF CONCRETE;
b. PROHIBIT THE DISCHARGE OF WASTEWATER FROM THE WASHOUT AND CLEANOUT OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS, AND OTHER CONSTRUCTION MATERIALS; AND
c. PROHIBIT THE DISCHARGE OF FUELS, OILS, OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE.

MINIMUM STANDARDS CHECKLIST

YES	NO	N/A		
X			MS-1	HAVE TEMPORARY AND PERMANENT STABILIZATION BEEN ADDRESSED IN NARRATIVE?
X				ARE PRACTICES SHOWN ON THE PLAN?
X				SEED SPECIFICATIONS?
X				MULCHING?
X				GRAVEL?
X			MS-2	HAS STABILIZATION OF SOIL STOCKPILES BEEN ADDRESSED?
X				ARE SEDIMENT TRAPPING MEASURES PROVIDED?
X			MS-3	HAS MAINTENANCE OF PERMANENT STABILIZATION BEEN ADDRESSED?
X			MS-4	ARE SEDIMENT TRAPPING FACILITIES TO BE CONSTRUCTED AS A FIRST STEP IN LDA?
X				HAS MAINTENANCE OF PRACTICES BEEN ADDRESSED? (I.E. REPAIR OF STRUCTURES AND REMOVAL OF ACCUMULATED SEDIMENT)
		X	MS-5	HAS STABILIZATION OF EARTHEN STRUCTURES BEEN ADDRESSED?
X			MS-6	ARE SEDIMENT TRA

SEDIMENT AND EROSION CONTROL LEGEND			
NO.	TITLE	KEY	SYMBOL
3.05	TEMPORARY STONE CONSTRUCTION ENTRANCE	CE	
3.07	STORM DRAIN INLET PROTECTION	IP	
3.08	CULVERT INLET PROTECTION	CIP	
3.09	TEMPORARY DIVERSION DIKE	DD	
3.11	TEMPORARY RIGHT-OF-WAY DIVERSION	RWD	
3.31	TEMPORARY SEEDING	TS	
	FLOW ARROW DRAINAGE DIVIDE		

NOTE:

REFER TO E&S NARRATIVE AND VIRGINIA STATE EROSION & SEDIMENT CONTROL HANDBOOK FOR MORE INFORMATION.

THIS SHEET TO BE USED FOR EROSION AND SILTATION CONTROL ONLY !!!!!!!!

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

1 inch = 30 ft.

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsroupe.com

Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0065

South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0065

West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0065

NO.	DATE	COUNTY REVISIONS

EROSION & SEDIMENT CONTROL PLAN – PHASE 1

HAYMARKET TOWN PARK STREETSCAPE

RFP: 2022-001

TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: 1"= 30'
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.O.=
FILE NO. PP-286
SHEET 8 OF 22

G:\PROJECT\Town of Haymarket-Streetscape\ENG\DWG\00-K4800 E&S 1.dwg, 7/17/2023 1

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)

TO STR EX.7
D.A.=0.70 Ac.
C=0.63

TO STR EX.6
D.A.=0.44 Ac.
C=0.56

TO STR EX.5
D.A.=0.76 Ac.
C=0.46

TO STR EX.4
D.A.=2.16 Ac.
C=0.60

TO STR 1
D.A.=1.39 Ac.
C=0.39

TO STR 2
D.A.=0.14 Ac.
C=0.80

TO STR 3
D.A.=0.14 Ac.
C=0.74

TO STR 4
D.A.=0.31 Ac.
C=0.62

TO STR 6
D.A.=0.76 Ac.
C=0.44

TO STR 8
D.A.=0.12 Ac.
C=0.30

ADJ 1
N/F
TRUSTEES OF HAYMARKET
BAPTIST CHURCH
GPIN: 7397-09-2355

N/F
TOWN OF HAYMARKET, VIRGINIA
Instr. 201209120087671
GPIN: 7397-09-3847
USE: PARK
ZONE: R-1

N/F
TOWN OF HAYMARKET, VIRGINIA
Instr. 200509220164097
GPIN: 7397-09-4049
USE: PARK
ZONE: R-1

N/F
TOWN OF HAYMARKET, VIRGINIA
Instr. 200509220164097
GPIN: 7397-09-4941
USE: PARK
ZONE: R-1

LOT 48
USE: SFD
ZONE: R-2

LOT 49
USE: SFD
ZONE: R-2

LOT 50
USE: SFD
ZONE: R-2

LOT 51
USE: SFD
ZONE: R-2

LOT 52

15" Storm Drn. Esmt.
Inst. 201302200018428

Jet Landscape Buffer Yard
Inst. 201302200018428

Temporary Slope Esmt.
Inst. 201212210123075

Permanent Drn. Esmt.
Inst. 201212210123075

Combined Dominion VA Power And Verizon Esmt.
Inst. 201109260078827

Verizon Esmt.
INST. 201110200083500

VEPCO Esmt.
INST. 201110200086195

Temporary Slope Esmt.
Inst. 201212210123075

Permanent Pedestrian Access And Landscape Esmt.
And Permanent Drn. Esmt. Inst. 201212210123075

Temporary Slope Esmt.
Inst. 201109260078827

VEPCO Esmt.
Inst. 201510150085948

Dominion Power Esmt.
Inst. 201510150085948

Dominion Power Pole

Ex. E.P.

Ex. Stm. Pipe

45"x29" RCP
Based On As-Built Information

18" RCP

15" RCP

12" HDPE

10-YR WSE@ 50% CLOSURE =363.04

10-YR HW.E. =364.50

END SECTION INV.=364.46

END SECTION INV.=364.74

END SECTION INV.=367.45

END SECTION INV.=367.75

10-YR H.W.E. =368.26

APPROX. LOC. BORING

TP #1

TP #2

TP #3

Sign "HAYMARKET" Solar Powered

Ex. Water Valve

Ex. F.H.

Verizon Vault

Ex. Tele.Ped.

Ex. Utility Pole

Ex. Light Pole

Ex. Guy Wire

Ex. Elec. Vault

Ex. Transformer

Ex. Gas Valve

Ex. Gas Meter

Ex. Sign

Ex. Bollard

Ex. Mail Box

Ex. Trash Can

Ex. Benches

Ex. Brick Sidewalk

Ex. Conc. Sidewalk

Ex. Brick Walk

Ex. Steps

Ex. Curb Inlet

Ex. Grate Inlet

Ex. Storm Manhole

Ex. Sanitary Manhole

Ex. Sanitary Cleanout

Ex. Water Meter

Ex. Water Manhole

Ex. Fire Hydrant

Ex. Irrigation Control Valve

Ex. Irrigation Valve

Ex. Irrigation Backflow Preventer

Ex. Irrigation Quick Coupler

Ex. Irrigation Sprinkler

Ex. Irrigation Meter

Ex. Irrigation Manhole

Ex. Irrigation Cleanout

Ex. Irrigation Pump

Ex. Irrigation Well

Ex. Irrigation Tank

Ex. Irrigation Filter

Ex. Irrigation Valve Box

Ex. Irrigation Valve Box Cover

Ex. Irrigation Valve Box Lid

Ex. Irrigation Valve Box Cover Lid

Ex. Irrigation Valve Box Cover Lid Bolt

Ex. Irrigation Valve Box Cover Lid Bolt Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt

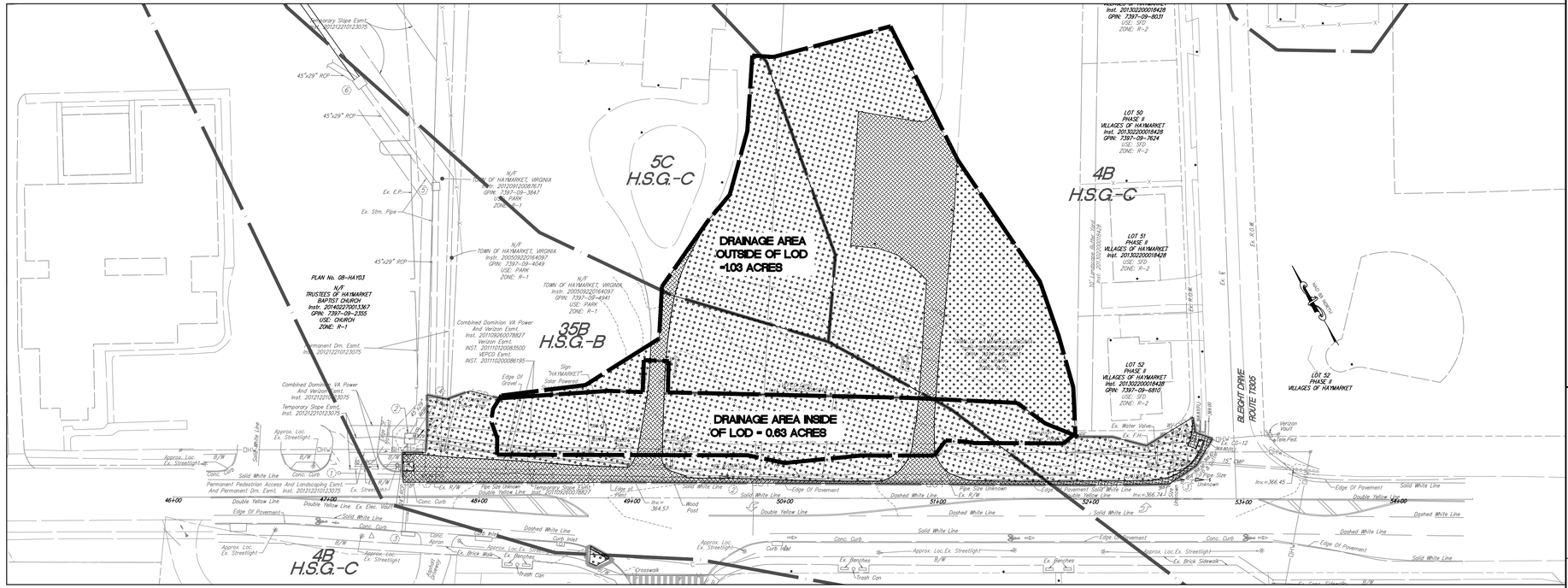
Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut

Ex. Irrigation Valve Box Cover Lid Bolt Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer Nut Bolt Nut Washer

PRE-DEVELOPMENT LAND COVERAGE MAP

PRE-DEVELOPMENT LEGEND

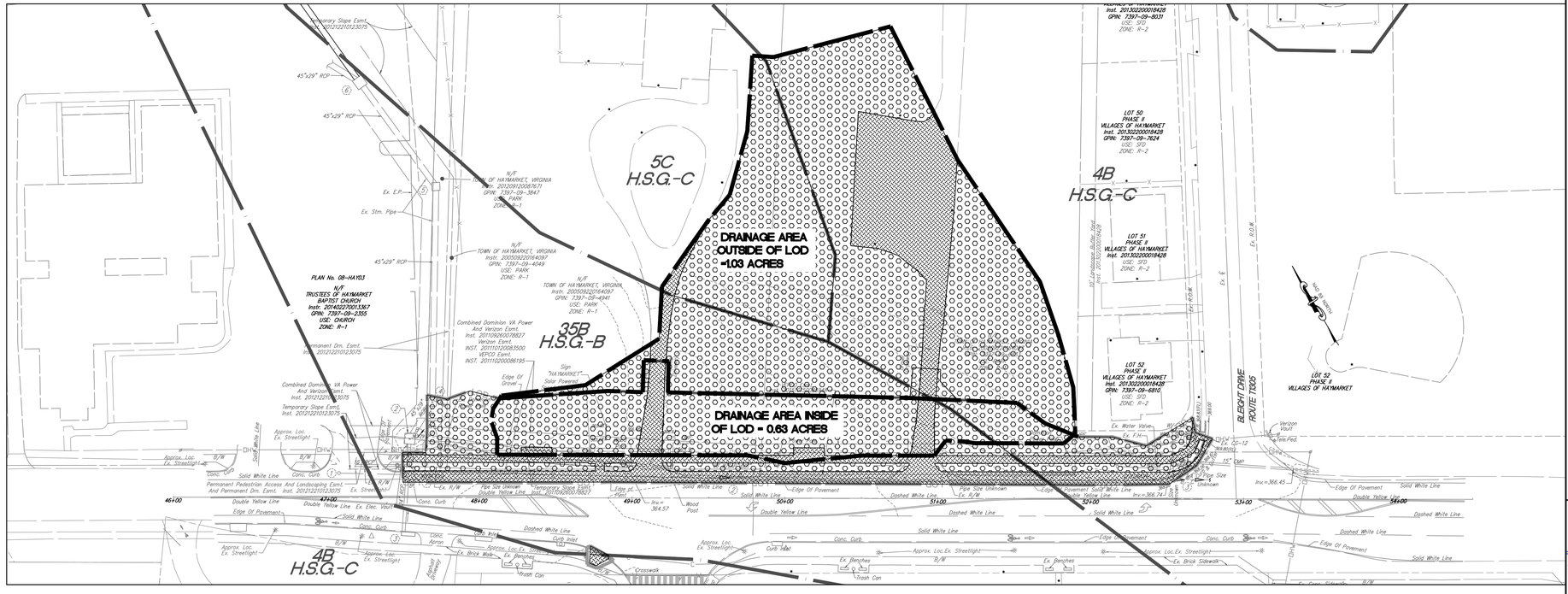
- SOIL BOUNDARIES
- LOD — LIMITS OF DISTURBANCE = 0.63 ACRES
- LIMITS OF AREA TO BE TREATED BY BMP
- IMPERVIOUS COVER = 0.29 ACRES
  - B–SOILS = 0.12 ACRES
  - C–SOILS = 0.17 ACRES
- MANAGED TURF = 1.37 ACRES
  - B–SOILS = 0.57 ACRES
  - C–SOILS = 0.80 ACRES



POST-DEVELOPMENT LAND COVERAGE MAP

POST-DEVELOPMENT LEGEND

- SOIL BOUNDARIES
- LOD — LIMITS OF DISTURBANCE = 0.63 ACRES
- LIMITS OF AREA TO BE TREATED BY BMP
- IMPERVIOUS COVER = 0.37 ACRES
  - B–SOILS = 0.17 ACRES
  - C–SOILS = 0.20 ACRES
- MANAGED TURF = 1.29 ACRES
  - B–SOILS = 0.52 ACRES
  - C–SOILS = 0.77 ACRES



GRAPHIC SCALE

80 0 20 40 80 160

(IN FEET)

1 inch = 40 ft.

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsgroupe.com
Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0065
South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0065
West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0065

NO.	DATE	COUNTY REVISIONS

BMP AREA MAP

HAYMARKET TOWN PARK STREETSCAPE

RFP: 2022-001

TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: 1"=40'
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP-286
SHEET 10 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)

G:\PROJECT\Town of Haymarket-Streetscape\ENG\DWG\00-K6300 BMP AREA MAP.dwg, 7/17/2023 1

Project Name: Town of Haymarket - Streetscape
Date: 2/17/2023
Linear Development Project? No

CLEAR ALL (Ctrl+Shift+R)

data input cells | constant values | calculation cells | final results

Site Information

Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area *(acres)* → 0.63

Maximum reduction required:	*10%*
The site's net increase in impervious cover (acres) is:	*0.08*
Post-Development TP Load Reduction for Site (lb/yr):	*0.27*

Check:
BMP Design Specifications List: 2011 Stds & Specs
Linear project? No
Land cover areas entered correctly? ✓
Total disturbed area entered? ✓

Pre-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed forest/open space					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be		0.57	0.80		1.37
Impervious Cover (acres)		0.12	0.17		0.29
					1.66

Post-Development Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be		0.52	0.77		1.29
Impervious Cover (acres)		0.17	0.20		0.37
Area Check	OK.	OK.	OK.	OK.	1.66

NOTE:
THE TOTAL LAND COVER AREA INCLUDES 0.63 AC INSIDE OF THE LIMITS OF DISTURBANCE AND 1.03 AC. OUTSIDE OF THE LIMITS OF DISTURBANCE.

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Total Phosphorus (TP) EMC (mg/L)	0.26
Total Nitrogen (TN) EMC (mg/L)	1.86
Target TP Load (lb/acre/yr)	0.41
Pj (unitless correction factor)	0.90

Runoff Coefficients (Rv)

	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

LAND COVER SUMMARY -- PRE-REDEVELOPMENT

Land Cover Summary-Pre		
Pre-ReDevelopment	**Listed**	**Adjusted[1]**
Forest/Open Space Cover (acres)	0.00	0.00
Weighted Rv(forest)	0.00	0.00
% Forest	0%	0%
Managed Turf Cover (acres)	1.37	1.29
Weighted Rv(turf)	0.21	0.21
% Managed Turf	83%	82%
Impervious Cover (acres)	0.29	0.29
Rv(impervious)	0.95	0.95
% Impervious	17%	18%
Total Site Area (acres)	**1.66**	**1.58**
Site Rv	**0.34**	**0.35**

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary-Post (Final)	
Post ReDev. & New Impervious	
Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	1.29
Weighted Rv (turf)	0.21
% Managed Turf	78%
Impervious Cover (acres)	0.37
Rv(impervious)	0.95
% Impervious	22%
Final Site Area (acres)	**1.66**
Final Post Dev Site Rv	**0.38**

Land Cover Summary-Post	
Post-ReDevelopment	
Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	1.29
Weighted Rv (turf)	0.21
% Managed Turf	82%
ReDev. Impervious Cover (acres)	0.29
Rv(impervious)	0.95
% Impervious	18%
Total ReDev. Site Area (acres)	**1.58**
ReDev Site Rv	**0.35**

Land Cover Summary-Post	
Post-Development New Impervious	
New Impervious Cover (acres)	0.08
Rv(impervious)	0.95

Treatment Volume and Nutrient Load

Pre-ReDevelopment Treatment Volume (acre-ft)	0.0470	0.0456	
Pre-ReDevelopment Treatment Volume (cubic feet)	2,045	1,985	
Pre-ReDevelopment TP Load (lb/yr)	**1.29**	**1.25**	
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	0.78	0.79	
Baseline TP Load (lb/yr) (**0.41 lbs/acre/yr** applied to pre-redevelopment area excluding pervious land proposed for new impervious cover)		*0.65*	

Final Post-Development Treatment Volume (acre-ft)	0.0519	**Post-ReDevelopment Treatment Volume (acre-ft)**	0.0456	**Post-Development Treatment Volume (acre-ft)**	0.0063
Final Post-Development Treatment Volume (cubic feet)	2,261	**Post-ReDevelopment Treatment Volume (cubic feet)**	1,985	**Post-Development Treatment Volume (cubic feet)**	276
Final Post-Development TP Load (lb/yr)	**1.42**	**Post-ReDevelopment Load (TP) (lb/yr)***	**1.25**	**Post-Development TP Load (lb/yr)**	**0.17**
Final Post-Development TP Load per acre (lb/acre/yr)	0.86	Post-ReDevelopment TP Load per acre (lb/acre/yr)	0.79		
		Max. Reduction Required (Below Pre-ReDevelopment Load)	**10%**		
		TP Load Reduction Required for Redeveloped Area (lb/yr)	**0.12**	**TP Load Reduction Required for New Impervious Area (lb/yr)**	**0.14**

[1] *Adjusted Land Cover Summary:*
Pre ReDevelopment land cover minus pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover.

Adjusted total acreage is consistent with Post-ReDevelopment acreage (minus acreage of new impervious cover).

Column I shows load reduction requirement for new impervious cover (based on new development load limit, 0.41 lbs/acre/year).

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	**0.27**

Nitrogen Loads (Informational Purposes Only)

Pre-ReDevelopment TN Load (lb/yr)	9.19	Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr)	10.16

Drainage Area A

Total Phosphorus Available for Removal in D.A. A (lb/yr): 1.01
Post Development Treatment Volume in D.A. A (ft³): 1,610

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)		0.42	0.73		1.15	0.21
Impervious Cover (acres)		0.05	0.16		0.21	0.95
				Total	1.36	

4. Grass Channel (RR)												
4.a. Grass Channel A/B Soils (Spec #3)	20	0.42	0.05	0	96	383	479	15	0.00	0.30	0.10	0.20
4.b. Grass Channel C/D Soils (Spec #3)	10	0.73	0.16	0	113	1,018	1,131	15	0.00	0.71	0.17	0.54

4. Grass Channel (RR)					
20	0.00	2.15	0.77	1.38	
20	0.00	5.08	1.42	3.66	

Site Results (Water Quality Compliance)

Area Checks	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	AREA CHECK
FOREST/OPEN SPACE (ac)	0.00	0.00	0.00	0.00	0.00	OK.
IMPERVIOUS COVER (ac)	0.21	0.00	0.00	0.00	0.00	OK.
IMPERVIOUS COVER TREATED (ac)	0.21	0.00	0.00	0.00	0.00	OK.
MANAGED TURF AREA (ac)	1.15	0.00	0.00	0.00	0.00	OK.
MANAGED TURF AREA TREATED (ac)	1.15	0.00	0.00	0.00	0.00	OK.
AREA CHECK	OK.	OK.	OK.	OK.	OK.	

Site Treatment Volume (ft³) 2,261

Runoff Reduction Volume and TP By Drainage Area

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	TOTAL
RUNOFF REDUCTION VOLUME ACHIEVED (ft³)	209	0	0	0	0	209
TP LOAD AVAILABLE FOR REMOVAL (lb/yr)	1.01	0.00	0.00	0.00	0.00	1.01
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.26	0.00	0.00	0.00	0.00	0.26
TP LOAD REMAINING (lb/yr)	0.75	0.00	0.00	0.00	0.00	0.75
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	2.20	0.00	0.00	0.00	0.00	2.20

Total Phosphorus

FINAL POST-DEVELOPMENT TP LOAD (lb/yr)	1.42
TP LOAD REDUCTION REQUIRED (lb/yr)	0.27
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.26
TP LOAD REMAINING (lb/yr):	1.16
REMAINING TP LOAD REDUCTION REQUIRED (lb/yr):	**0.00** **

**No further TP load reduction required (Required - Achieved < 0.005 lb/yr)

Total Nitrogen (For Information Purposes)

POST-DEVELOPMENT LOAD (lb/yr)	10.16
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	2.20
REMAINING POST-DEVELOPMENT NITROGEN LOAD (lb/yr)	7.97

Runoff Volume and Curve Number Calculations

Enter design storm rainfall depths (in):

1-year storm	2-year storm	10-year storm
2.51	3.04	4.67

Use NOAA Atlas 14 (http://hdsc.nws.noaa.gov/hdsc/pfds/)

***Notes (see below):**

[1] The curve numbers and runoff volumes computed in this spreadsheet for each drainage area are limited in their applicability for determining and demonstrating compliance with water quantity requirements. See VRRM User's Guide and Documentation for additional information.

[2] Runoff Volume (RV) for pre- and post-development drainage areas must be in volumetric units (e.g., acre-feet or cubic feet) when using the Energy Balance Equation. Runoff measured in watershed-inches and shown in the spreadsheet as RV(watershed-inch) can only be used in the Energy Balance Equation when the pre- and post-development drainage areas are equal. Otherwise RV(watershed-inch) must be multiplied by the drainage area.

[3] Adjusted CNs are based on runoff reduction volumes as calculated in D.A. tabs. An alternative CN adjustment calculation for Vegetated Roofs is included in BMP specification No. 5.

Drainage Area Curve Numbers and Runoff Depths*

Curve numbers (CN, CNadj) and runoff depths ($RV_{Developed}$) are computed with and without reduction practices.

Drainage Area A		A Soils	B Soils	C Soils	D Soils
Forest/Open Space -- undisturbed, protected forest/open space or reforested land	Area (acres)	0.00	0.00	0.00	0.00
	CN	30	55	70	77
Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed	Area (acres)	0.00	0.42	0.73	0.00
	CN	39	61	74	80
Impervious Cover	Area (acres)	0.00	0.05	0.16	0.00
	CN	98	98	98	98

Total Area (acres): 1.36
Runoff Reduction Volume (ft³): 209

$CN_{(D.A. A)}$ = 74

	1-year storm	2-year storm	10-year storm
$RV_{Developed}$ *(watershed-inch)* with no Runoff Reduction*	0.61	0.93	2.10
$RV_{Developed}$ *(watershed-inch)* with Runoff Reduction*	0.57	0.89	2.06
Adjusted CN*	73	73	73

**See Notes above*

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsgroupe.com
West Office 42795 Generation Drive, Suite 200 Ashburn, VA 20147 PH: 703.6700985
South Office 10333 Southpoint Landing Blvd, Suite 121 Fredericksburg, VA 22407 PH: 703.6700985
Central Office 13580 Groupe Drive, Suite 200 Woodbridge, VA 22192 PH: 703.6700985

NO.	DATE	COUNTY REVISIONS

VIRGINIA RUNOFF REDUCTION METHOD
HAYMARKET TOWN PARK STREETSCAPE
RFP: 2022-001
TOWN OF HAYMARKET, VIRGINIA

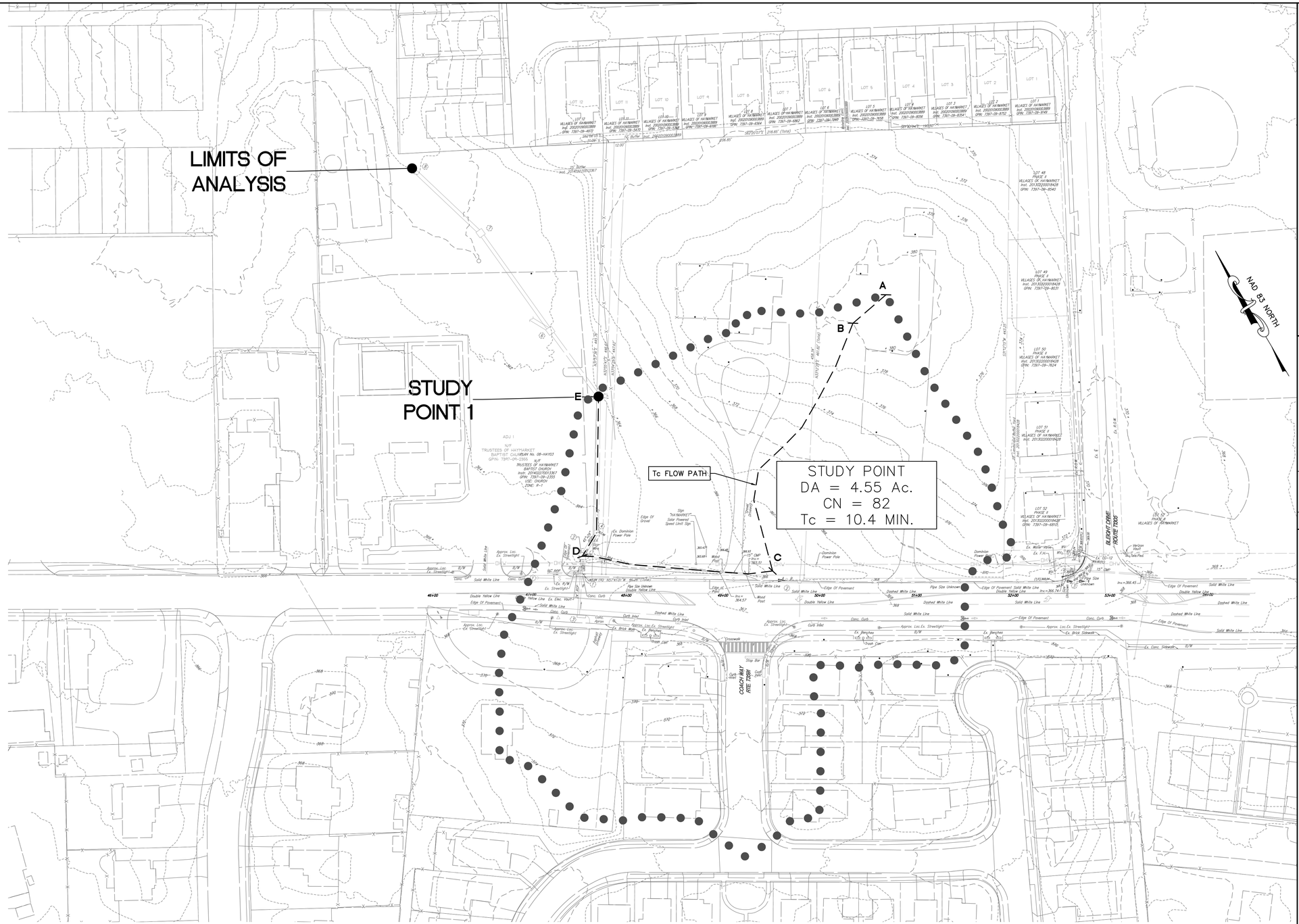
COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: N/A
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP-286
SHEET 11 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)



RUNOFF CURVE NUMBER (CN)

TOWN OF HAYMARKET – STREETSCAPE
POST–Development Conditions
Prince William NOAA_C County, Virginia
Sub–Area Time of Concentration Details

SUB–AREA IDENTIFIER	LAND USE	HYDROLOGIC SOIL GROUP	SUB–AREA AREA (Ac.)	CURVE NUMBER
STUDY	Open space; grass cover > 75% (good)	B	1.108	61
POINT 1	Open space; grass cover > 75% (good)	D	1.815	80
	Paved parking lots, roofs, driveways	B	0.614	98
	Paved parking lots, roofs, driveways	D	1.009	98
	Total Area / Weighted Curve Number		4.55	82

TIME OF CONCENTRATION (Tc)

TOWN OF HAYMARKET – STREETSCAPE
POST–Development Conditions
Prince William NOAA_C County, Virginia
Sub–Area Time of Concentration Details

Sub–Area Identifier/ .	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
SP 1 Post – Controlled							
A–B SHEET	45	0.0100	0.150				0.117
B–C SHALLOW	230	0.0478	0.050				0.023
C–D CHANNEL	198					1.000	0.055
D–E CHANNEL	169					3.000	0.016
					Time of Concentration		0.211

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsgroupe.com

Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0505

South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0505

West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0505

NO.	DATE	COUNTY REVISIONS

PRE DEVELOPMENT DRAINAGE MAP

HAYMARKET TOWN PARK STREETSCAPE

RFP: 2022–001

TOWN OF HAYMARKET, VIRGINIA

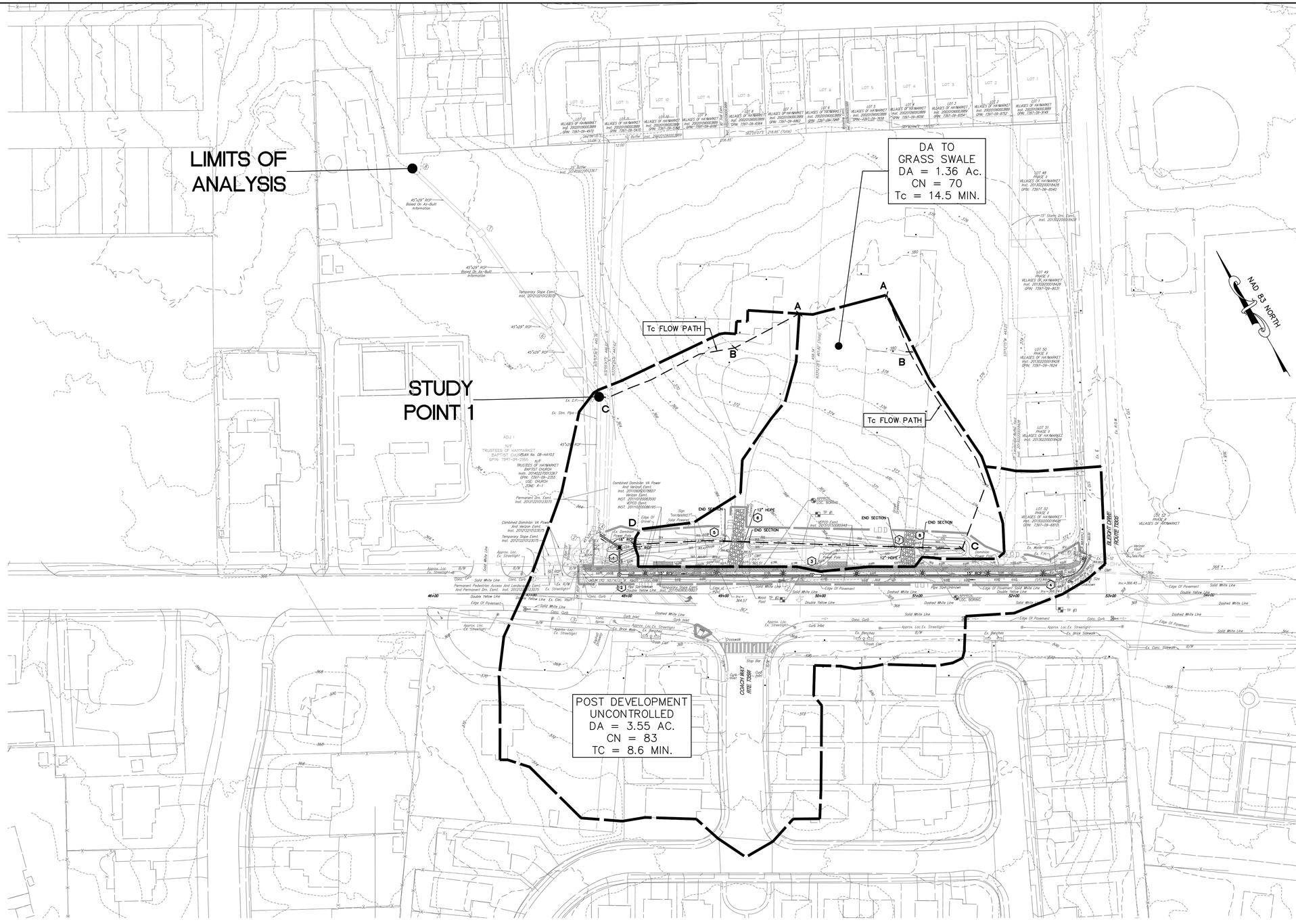
COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: 1"=50'
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP–286
SHEET 12 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)



RUNOFF CURVE NUMBER (CN)

TOWN OF HAYMARKET – STREETSCAPE
POST–Development Conditions
Prince William NOAA_C County, Virginia
Sub–Area Time of Concentration Details

SUB–AREA IDENTIFIER	LAND USE	HYDROLOGIC SOIL GROUP	SUB–AREA AREA (Ac.)	CURVE NUMBER
GRASS SWALE	Open space; grass cover > 75% (good)	B	0.863	61
	Open space; grass cover > 75% (good)	C	0.282	74
	Paved parking lots, roofs, driveways	B	0.035	98
	Paved parking lots, roofs, driveways	C	0.176	98
	Total Area / Weighted Curve Number		1.36	70
STUDY POINT 1 UNCONT.	Open space; grass cover > 75% (good)	B	0.619	61
	Open space; grass cover > 75% (good)	C	1.239	74
	Paved parking lots, roofs, driveways	B	0.647	98
	Paved parking lots, roofs, driveways	C	1.045	98
	Total Area / Weighted Curve Number		3.55	83

TIME OF CONCENTRATION (Tc)

TOWN OF HAYMARKET – STREETSCAPE
POST–Development Conditions
Prince William NOAA_C County, Virginia
Sub–Area Time of Concentration Details

Sub–Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (ft)	Wetted Perimeter (sq ft)	Velocity (ft/sec)	Travel Time (hr)
SP 1 Post – Controlled							
A–B SHEET	63	0.0300	0.150				0.099
B–C SHALLOW	230	0.0435	0.050				0.018
C–D CHANNEL	339					0.760	0.124
				Time of Concentration			0.241
SP 2 Post – Uncontrolled							
A–B SHEET	75	0.0200	0.150				0.134
B–C SHALLOW	151	0.0927	0.050				0.009
				Time of Concentration			0.143

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

The Engineering Groupe, Inc.
Engineers | Surveyors | Planners
www.engsgroupe.com
Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0505
South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0505
West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0505

NO.	DATE	COUNTY REVISIONS

POST DEVELOPMENT DRAINAGE MAP

HAYMARKET TOWN PARK STREETSCAPE

RFP: 2022–001

TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

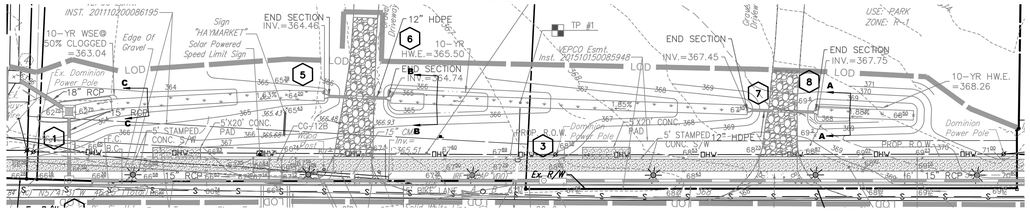
DATE	ACTION

DATE: JULY 14, 2023
SCALE: 1"=50'
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP–286
SHEET 13 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)

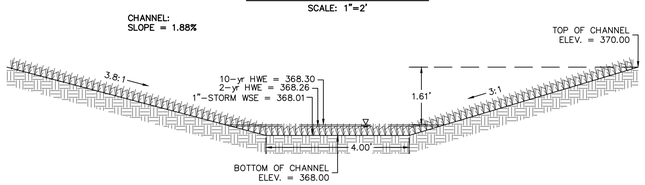
GRASS SWALE PLANVIEW

SCALE: 1"=30'



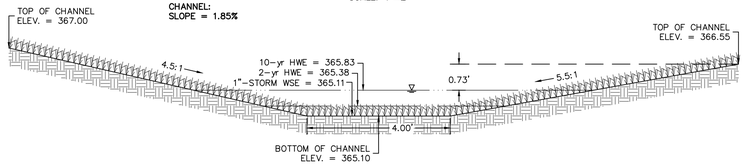
CROSS SECTION A-A

SCALE: 1"=2'



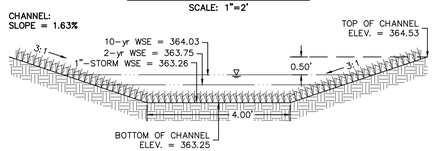
CROSS SECTION B-B

SCALE: 1"=2'



CROSS SECTION C-C

SCALE: 1"=2'



NATURAL CHANNEL POST-DEVELOPMENT COMPUTATIONS

GRASS SWALE	DRAINAGE AREA (ACRES)	CN VALUE	SLOPE %	Soil/Cover	PERMISSIBLE VELOCITY (FT/S)	n Value	Tc (MIN)	1-IN STORM Q (CFS)	1-IN STORM V (FT/S)	1-IN STORM D (FT)	2-YEAR STORM Q (CFS)	2-YEAR STORM V (FT/S)	10-YEAR STORM Q (CFS)	10-YEAR STORM D (FT)	DITCH DEPTH (FT)	SIDE SLOPES (H:V) LEFT	SIDE SLOPES (H:V) RIGHT	REMARKS
A-A	0.13	72	1.88	Kentucky Bluegrass	3.80	0.200	5	0.001	0.03	0.01	0.18	0.27	0.43	0.30	1.93	3.8:1	3:1	Trapezoidal Channel
B-B	0.77	75	1.85	Kentucky Bluegrass	3.80	0.17-0.19	7	0.001	0.03	0.01	1.19	0.49	2.67	0.72	1.90	4.5:1	5.5:1	Trapezoidal Channel
C-C	1.39	69	1.63	Kentucky Bluegrass	3.80	0.17-0.19	9	0.001	0.03	0.01	1.38	0.54	3.86	0.78	1.27	3:1	3:1	Trapezoidal Channel

RESIDENCE TIME GIVEN THE GRASS CHANNEL LENGTH:

T=L/V

L= 351.75 ft V= 0.54 fps

T = 1 min/60sec. x 351.75 ft/0.54 fps = 10.9 min. > 9 min.

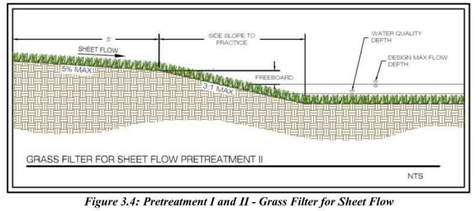


Figure 3.4: Pretreatment I and II - Grass Filter for Sheet Flow

VA DEQ STORMWATER DESIGN SPECIFICATION NO. 3 GRASS CHANNELS

SECTION 4: TYPICAL DETAILS

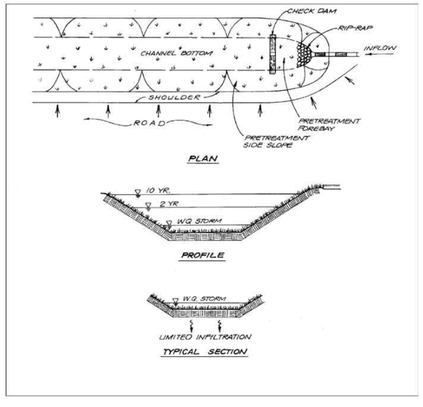


Figure 3.1. Grass Channel – Typical Plan, Profile and Section

STORMWATER MANAGEMENT NARRATIVE

PROJECT DESCRIPTION

THE TOWN OF HAYMARKET STREETSCAPE PROJECT IS LOCATED IN THE TOWN OF HAYMARKET. THE SITE IS BOUNDED BY WASHINGTON STREET, STATE ROUTE 55, TO THE SOUTH, BY AN EXISTING PARK TO THE NORTH, BY A CHURCH TO THE WEST AND BLEIGHT DRIVE TO THE EAST. THE PROJECT DISTURBANCE IS APPROXIMATELY 0.63 ACRES. THE EXISTING SITE IS A MIX OF MANAGED TURF AND ROADS WITH THE HIGHEST ELEVATIONS LOCATED ON THE EASTERN BOUNDARY OF THE SITE. THE PROPERTY CURRENTLY DRAINS TO AN EXISTING GRATE INLET WHICH ULTIMATELY DISCHARGES TOWARDS AN EXISTING CULVERT CROSSING I-66 TOWARDS THE LITTLE BULL RUN. THE PROPOSED SITE CONSISTS OF THE INSTALLATION OF A PROPOSED SIDEWALK AND CURB IMPROVEMENTS ALONG WASHINGTON STREET, AND PROPOSED STORM DRAIN AND STORMWATER MANAGEMENT SYSTEMS.

A GRASS SWALE WILL BE CONSTRUCTED TO PROVIDE STORMWATER QUALITY AND QUANTITY CONTROL FOR THE TOWN OF HAYMARKET STREETSCAPE. A STORM DRAIN SYSTEM WILL COLLECT WATER AND DISCHARGE INTO AN EXISTING GRATE INLET WHICH ULTIMATELY DISCHARGES TOWARDS AN EXISTING CULVERT CROSSING I-66 TOWARDS THE LITTLE BULL RUN.

THE GRASS SWALE IS DESIGNED AS SPECIFIED IN THE VIRGINIA DEQ BMP CLEARINGHOUSE.

HYDROLOGIC ANALYSIS

THE PROJECT LOCATION IS WITHIN THE BULL RUN BRANCH WATERSHED. THE SCS METHOD WAS USED TO COMPUTE PEAK DISCHARGES AND DEVELOP PRE- AND POST-DEVELOPMENT HYDROGRAPHS. HYDROLOGY STUDIO 2022 V. 3.0.0.27 COMPUTER SOFTWARE WAS USED TO ROUTE THE POST-DEVELOPMENT HYDROGRAPHS THROUGH THE GRASS SWALE. TIME OF CONCENTRATION WERE CALCULATED USING USDA NRCS' WINTR-55 TO BE 8.6 MINUTES FOR THE UNIMPROVED AREAS AND THE TIME OF CONCENTRATION FOR THE GRASS SWALE AT 14.5 MINUTES. CURVE NUMBER VALUES WERE COMPUTED USING USDA NRCS' WINTR-55. THE RAINFALL DISTRIBUTION USED FOR THE HYDROLOGIC ANALYSIS WAS TYPE II, 24-HOUR, INCORPORATING PRINCE WILLIAM COUNTY RAINFALL DEPTHS FOR 24-HOUR STORM EVENTS OBTAINED FROM NOAA ATLAS 14 PRECIPITATION ESTIMATES.

THE PRE-DEVELOPED DRAINAGE AREAS ARE SHOWN ON SHEET 12. THIS AREA DRAIN TO STUDY POINT 1. THE POST-DEVELOPED DRAINAGE AREAS ARE SHOWN ON SHEET 13. THIS AREAS DRAIN TO STUDY POINT 1. A SUMMARY OF THE 2- & 10-YEAR STORM EVENTS FOR THE PRE- AND POST-DEVELOPED CONDITIONS IS SHOWN IN THE FOLLOWING TABLE:

	PRE-DEV DRAINAGE AREA (ACRES)	PRE-DEV CURVE NUMBER	POST-DEV DRAINAGE (ACRES)	POST-DEV CURVE NUMBER	STORM EVENT (YEAR)	PRE-DEV FLOW (cfs)	CHANNEL DISCHARGE (cfs)	POST-DEV UNCONTROLLED FLOW (cfs)	POST-DEV COMBINED FLOW (cfs)
STUDY POINT 1	4.55	82	4.91	79	2	8.04	0.96	6.60	7.08
					10	15.93	2.74	12.82	14.69

AS SHOWN IN THE TABLE ABOVE, THE POST-DEVELOPMENT PEAK DISCHARGES FOR THE 2- AND 10-YEAR STORM EVENTS ARE EQUAL TO OR LESS THAN THE PRE-DEVELOPMENT PEAK DISCHARGES.

CHANNEL PROTECTION:

THE SITE DISCHARGES TOWARDS AN EXISTING GRATE INLET WHICH OUTFALLS TO A MAN-MADE CHANNEL. THE DOWNSTREAM PIPES CONSIST OF 45"x29" ELLIPTICAL CONCRETE PIPES WITH A MAXIMUM ALLOWABLE VELOCITY OF 20 FPS. AN ANALYSIS OF THE DOWNSTREAM STORM DRAIN SYSTEM DEMONSTRATES A MAXIMUM VELOCITY GENERATED BY THE SITE AT **STUDY POINT 1** OF 6.76 FPS WHICH IS BELOW THE ALLOWABLE VELOCITY OF CONCRETE PIPES. FURTHERMORE, THE POST DEVELOPMENT FLOW FOR THE 2-YEAR STORM IS 7.08 CFS WHICH IS LESS THAN THE PRE-DEVELOPMENT FLOW OF 8.04 CFS AT **STUDY POINT 1**. SINCE THE POST DEVELOPMENT FLOWS FOR THE 2-YEAR STORM EVENT IS LESS THAN THE EXISTING 2-YR FLOW RATE AND THE MAXIMUM ALLOWABLE VELOCITY FOR A CONCRETE PIPE, CHANNEL PROTECTION AT **STUDY POINT 1** IS MET IN ACCORDANCE WITH SECTION 9VAC25-870-66.B.1.a AND NO FURTHER ANALYSIS IS REQUIRED.

FLOOD PROTECTION:

THE SITE DISCHARGES TOWARDS AN EXISTING GRATE INLET WHICH OUTFALLS TO A MAN-MADE CHANNEL. THE DOWNSTREAM PIPES CONSIST OF 45"x29" ELLIPTICAL PIPES WITH A FLOW CAPACITY OF 25.24 CFS. AN ANALYSIS OF THE DOWNSTREAM STORM DRAIN SYSTEM DEMONSTRATES A MAXIMUM FLOW RATE GENERATED BY THE SITE AT **STUDY POINT 1** OF 14.69 CFS WHICH IS BELOW THE CAPACITY OF THE EXISTING PIPES AND DEMONSTRATES FULL CONTAINMENT OF THE 10-YR STORM EVENT WITHIN THE PIPES. FURTHERMORE, THE POST DEVELOPMENT FLOW FOR THE 10-YEAR STORM IS 14.69 CFS WHICH IS LESS THAN THE PRE-DEVELOPMENT FLOW OF 15.93 CFS AT **STUDY POINT 1**. SINCE THE POST DEVELOPMENT FLOWS FOR THE 10-YEAR STORM EVENT IS LESS THAN THE EXISTING 10-YR FLOW RATE AND FULL CONTAINMENT OF THE 10-YR STORM EVENT IS DEMONSTRATED WITHIN THE PIPE, FLOOD PROTECTION AT **STUDY POINT 1** IS MET IN ACCORDANCE WITH SECTION 9VAC25-870-66.C.2.a AND NO FURTHER ANALYSIS IS REQUIRED.

LIMITS OF ANALYSIS

THE LIMITS OF ANALYSIS FOR THIS SITE IS THE OUTFALL OF THE MANMADE CONVEYANCE SYSTEM WHICH CONSISTS OF A STORM DRAIN SYSTEM ON THE NORTH SIDE OF THE ADJACENT PROPERTY. SEE SHEETS 12 THROUGH 13 FOR LOCATION. THIS OUTFALL CURRENTLY EXPERIENCES A LOCALIZED FLOODING CONDITION AND SINCE THE SITE DISCHARGES INTO AN EXISTING MANMADE CHANNEL, AN ANALYSIS AT **STUDY POINT 1** OF THE 2- AND 10-YEAR STORM EVENTS WAS PERFORMED WHICH DEMONSTRATE A REDUCTION IN FLOW RATES FROM PRE- TO POST-DEVELOPMENT ILLUSTRATING COMPLIANCE WITH THE CHANNEL AND FLOOD PROTECTION REQUIREMENTS IN PURSUANT OF 9VAC25-870-66.B.1.a AND 9VAC25-870-66.C.2.a.

ADEQUATE OUTFALL

THERE IS ONE OUTFALL POINT FOR THIS SITE, AS SHOWN ON SHEETS 12 THROUGH 13. A SUMMARY IS PRESENTED ON THE TABLE ON THIS SHEET.

STUDY POINT NO. 1:
DISCHARGE FROM THIS PROPERTY TO STUDY POINT 1 OUTFALLS INTO A MANMADE CONVEYANCE SYSTEM (EXISTING GRATE INLET) THAT FURTHER DRAINS TOWARDS AN EXISTING NATURAL CHANNEL ON THE NORTH SIDE OF THE ADJACENT PROPERTY. THE DOWNSTREAM PIPES CONSIST OF 45"x29" ELLIPTICAL PIPES WITH A FLOW CAPACITY OF 25.24 CFS. AN ANALYSIS OF THE DOWNSTREAM STORM DRAIN SYSTEM DEMONSTRATES A MAXIMUM FLOW RATE GENERATED BY THE SITE OF 18.14 CFS WHICH IS BELOW THE CAPACITY OF THE EXISTING PIPES. FURTHERMORE, HGL COMPUTATIONS DEMONSTRATE WATER SURFACE ELEVATIONS TO BE BELOW THE TOP OF THE DOWNSTREAM STRUCTURES WITH NO ADVERSE EROSIVE VELOCITIES, SEE SHEET 6 FOR STORM DRAIN PROFILES AND COMPUTATIONS.

WATER QUALITY NARRATIVE

TOWN OF HAYMARKET STREETSCAPE SITE AREA USED FOR THE VIRGINIA RUNOFF REDUCTION METHOD (VRRM) SPREADSHEET, DISPLAYED ON SHEET 11, IS APPROXIMATELY 1.66 ACRES WHICH INCLUDES THE AREAS WITHIN THE LIMITS OF DISTURBANCE (0.63 Ac.) AND THE LIMITS OF THE AREA TO BE TREATED BY THE PROPOSED BMP (1.03 Ac.) OUTSIDE OF THE LIMITS OF DISTURBANCE. A BREAKDOWN OF THESE AREAS IN PRE- AND POST-DEVELOPMENT ARE SHOWN ON THE BMP AREA MAP, SEE SHEET 10. THE POLLUTANT LOAD REQUIREMENT FOR THE SITE IS 0.27 LB/YR. A REDUCTION OF 0.26 LB/YR IS ACHIEVED THROUGH IMPLEMENTATION OF A GRASS SWALE AND THEREFORE TOTAL PHOSPHOROUS REMOVAL RATE IS SATISFIED FOR THE STORMWATER MANAGEMENT QUALITY CONTROL REQUIREMENT.

SECTION 8: CONSTRUCTION

8.1. Construction Sequence

The following is a typical construction sequence to properly install a grass channel, although steps may be modified to reflect different site conditions. Grass channels should be installed at a time of year that is best to establish turf cover without irrigation. Some local agencies restrict planting to the following periods of time: February 15 through April 15 and September 15 through November 15.

Step 1: Protection during Site Construction. Ideally, grass channels should remain outside the limit of disturbance during construction to prevent soil compaction by heavy equipment. However, this is seldom practical, given that the channels are a key part of the drainage system at most sites. In these cases, temporary E&S controls such as dikes, silt fences and other erosion control measures should be integrated into the swale design throughout the construction

sequence. Specifically, barriers should be installed at key check dam locations, and erosion control fabric shoud be used to protect the channel.

Step 2. Grass channel installation may only begin after the entire contributing drainage area has been stabilized with vegetation. Any accumulation of sediments that does occur within the channel must be removed during the final stages of grading to achieve the design cross-section. Erosion and sediment controls for construction of the grass channel should be installed as specified in the erosion and sediment control plan. Stormwater flows must not be permitted into the grass channel until the bottom and side slopes are fully stabilized.

Step 3. Grade the grass channel to the final dimensions shown on the plan.

Step 4. Install check dams, driveway culverts and internal pre-treatment features as shown on the plan. Fill material used to construct check dams should be placed in 8- to 12-inch lifts and compacted to prevent settlement. The top of each check dam should be constructed level at the design elevation.

Step 5 (Optional). Till the bottom of the channel to a depth of 1 foot and incorporate compost amendments according to Stormwater Design Specification No. 4.

Step 6. Add soil amendments as needed, hydro-seed the bottom and banks of the grass channel, and peg in erosion control fabric or blanket where needed. After initial planting, a biodegradable erosion control fabric should be used, conforming to Standard and Specification 3.36 of the Virginia Erosion and Sediment Control Handbook.

Step 7. Prepare planting holes for any trees and shrubs, then plant materials as shown in the landscaping plan and water them weekly in the first two months. The construction contract should include a Care and Replacement Warranty to ensure vegetation is properly established and survives during the first growing season following construction.

Step 8. Conduct the final construction inspection and develop a punchlist for facility acceptance.

8.2 Construction Inspection

Inspections during construction are needed to ensure that the grass channel is built in accordance with these specifications. An example construction phase inspection checklist for Grass Channels can be accessed at the Center for Watershed Protection website at:

http://www.cwp.org/Resource_Library/Controlling_Runoff_and_Discharges/sm.htm
(scroll to Tool6: Plan Review, BMP Construction, and Maintenance Checklists) Some

common pitfalls can be avoided by careful post-storm inspection of the grass channel:

Make sure the desired coverage of turf or erosion control fabric has been achieved following construction, both on the channel beds and their contributing side-slopes.
Inspect check dams and pre-treatment structures to make sure they are at correct elevations, are properly installed, and are working effectively.
Make sure outfall protection/energy dissipation at concentrated inflows are stable.

The real test of a grass swale occurs after its first big storm. Minor adjustments are normally needed as part of this post-storm inspection (e.g., spot reseeding, gully repair, added armoring at inlets, or realignment of outfalls and check dams).

SECTION 9: MAINTENANCE

9.1 Maintenance Agreements

Section 4 VAC 50-60-124 of the regulations specifies the circumstances under which a maintenance agreement must be executed between the owner and the local program. This section sets forth inspection requirements, compliance procedures if maintenance is neglected, notification of the local program upon transfer of ownership, and right-of-entry for local program personnel.

All grass channels must be covered by a drainage easement to allow inspection and maintenance. If a grass channel is located in a residential private lot, the existence and purpose of the grass channel shall be noted on the deed of record. Homeowners will need to be provided a simple document that explains their purpose and routine maintenance needs. A deed restriction or other mechanism enforceable by the qualifying local program must be in place to help ensure that grass channels are maintained with proper line and grade. The mechanism should, if possible, grant authority for local agencies to access the property for inspection or corrective action.

9.2. Maintenance Inspections

Annual inspections are used to trigger maintenance operations such as sediment removal, spot re-vegetation and inlet stabilization. Several key maintenance inspection points are detailed in **Table 3.5**. Ideally, inspections should be conducted in the spring of each year. Example maintenance inspection checklists for Grass Channels can be accessed in Appendix C of Chapter 9 of the *Virginia Stormwater Management Handbook* (2010) or at the CWP website at:

http://www.cwp.org/Resource_Library/Controlling_Runoff_and_Discharges/sm.htm
(scroll to Tool6: Plan Review, BMP Construction, and Maintenance Checklists)

9.3. Ongoing Maintenance

Once established, grass channels have minimal maintenance needs outside of the spring clean up, regular mowing, repair of check dams and other measures to maintain the hydraulic efficiency of the channel and a dense, healthy grass cover.

Table 3.5. Suggested Spring Maintenance Inspections/Cleanups for Grass Channels

Activity
Add reinforcement planting to maintain 90% turf cover. Reseed any salt-killed vegetation.
Remove any accumulated sand or sediment deposits behind check dams.
Inspect upstream and downstream of check dams for evidence of undercutting or erosion, and remove and trash or blockages at weepholes.
Examine channel bottom for evidence of erosion, braiding, excessive ponding or dead grass.
Check inflow points for clogging and remove any sediment.
Inspect side slopes and grass filter strips for evidence of any rill or gully erosion and repair.
Look for any bare soil or sediment sources in the contributing drainage area and stabilize immediately.

The Engineering Groupe, Inc.
Engineers | Surveyors | Planners
www.engsgroupe.com
Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0065
West Office
42796 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0065
South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0065

NO.	DATE	COUNTY REVISIONS

SWM NARRATIVE, COMPUTATIONS, & DETAILS

HAYMARKET TOWN PARK STREETSCAPE
RFP: 2022-001
TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: AS SHOWN
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP-286
SHEET 14 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.27 — 04-13-2023

Pre Dev. — Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.379 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.08 hrs
Time Interval	= 5 min	Runoff Volume	= 1,760 cuft
Drainage Area	= 4.546 ac	Curve Number	= 82
Tc Method	= User	Time of Conc. (Tc)	= 12.7 min
Total Rainfall	= 1.00 in	Design Storm	= Type II
Storm Duration	= 24 hrs	Shape Factor	= 484

Post Dev - C — Hyd. No. 1

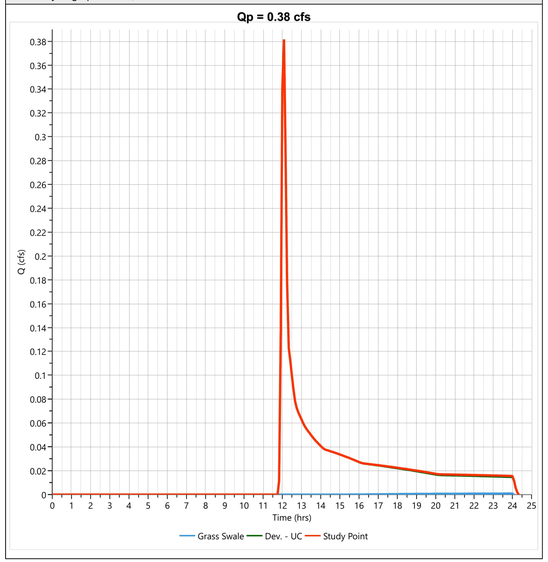
Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.001 cfs
Storm Frequency	= 1-yr	Time to Peak	= 24.00 hrs
Time Interval	= 5 min	Runoff Volume	= 21.3 cuft
Drainage Area	= 1.356 ac	Curve Number	= 70
Tc Method	= User	Time of Conc. (Tc)	= 14.5 min
Total Rainfall	= 1.00 in	Design Storm	= Type II
Storm Duration	= 24 hrs	Shape Factor	= 484

Post Dev. - UC — Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.382 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.08 hrs
Time Interval	= 5 min	Runoff Volume	= 1,592 cuft
Drainage Area	= 3.549 ac	Curve Number	= 83
Tc Method	= User	Time of Conc. (Tc)	= 8.6 min
Total Rainfall	= 1.00 in	Design Storm	= Type II
Storm Duration	= 24 hrs	Shape Factor	= 484

Study Point — Hyd. No. 4

Hydrograph Type	= Junction	Peak Flow	= 0.382 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.08 hrs
Time Interval	= 5 min	Hydrograph Volume	= 1,608 cuft
Inflow Hydrographs	= 2, 3	Total Contrib. Area	= 4.549 ac



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.27 — 04-13-2023

Pre Dev. — Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 8.043 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.00 hrs
Time Interval	= 5 min	Runoff Volume	= 21,822 cuft
Drainage Area	= 4.546 ac	Curve Number	= 82
Tc Method	= User	Time of Conc. (Tc)	= 12.7 min
Total Rainfall	= 3.04 in	Design Storm	= Type II
Storm Duration	= 24 hrs	Shape Factor	= 484

Post Dev - C — Hyd. No. 1

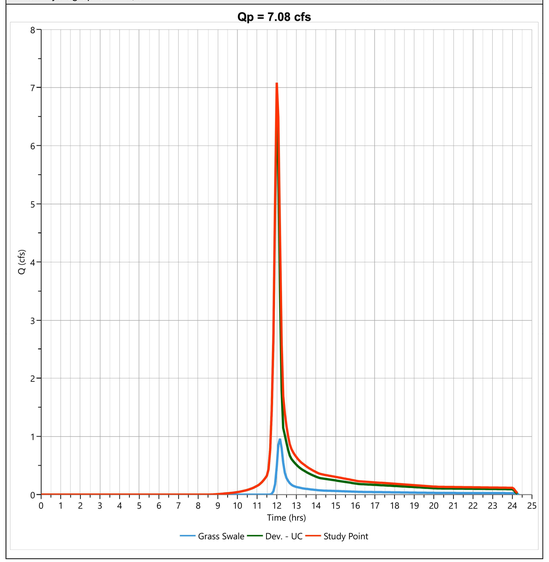
Hydrograph Type	= NRCS Runoff	Peak Flow	= 1.102 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.00 hrs
Time Interval	= 5 min	Runoff Volume	= 3,399 cuft
Drainage Area	= 1.356 ac	Curve Number	= 70
Tc Method	= User	Time of Conc. (Tc)	= 14.5 min
Total Rainfall	= 3.04 in	Design Storm	= Type II
Storm Duration	= 24 hrs	Shape Factor	= 484

Post Dev. - UC — Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 6.600 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.00 hrs
Time Interval	= 5 min	Runoff Volume	= 17,861 cuft
Drainage Area	= 3.549 ac	Curve Number	= 83
Tc Method	= User	Time of Conc. (Tc)	= 8.6 min
Total Rainfall	= 3.04 in	Design Storm	= Type II
Storm Duration	= 24 hrs	Shape Factor	= 484

Study Point — Hyd. No. 4

Hydrograph Type	= Junction	Peak Flow	= 7.079 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.00 hrs
Time Interval	= 5 min	Hydrograph Volume	= 21,256 cuft
Inflow Hydrographs	= 2, 3	Total Contrib. Area	= 4.549 ac



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.27 — 04-13-2023

Pre Dev. — Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 15.93 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.00 hrs
Time Interval	= 5 min	Runoff Volume	= 43,096 cuft
Drainage Area	= 4.546 ac	Curve Number	= 82
Tc Method	= User	Time of Conc. (Tc)	= 12.7 min
Total Rainfall	= 4.67 in	Design Storm	= Type II
Storm Duration	= 24 hrs	Shape Factor	= 484

Post Dev - C — Hyd. No. 1

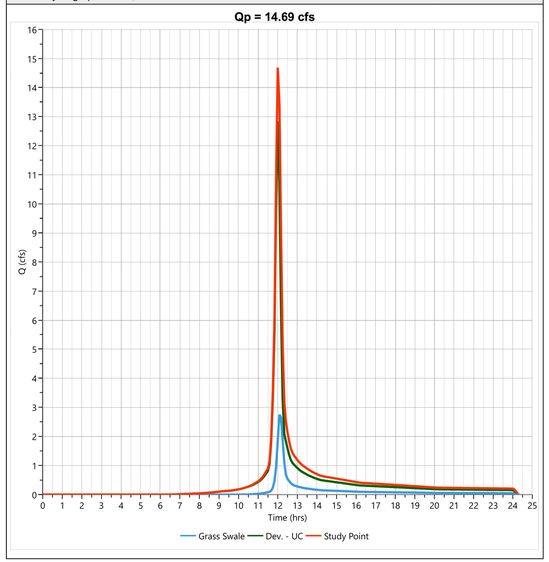
Hydrograph Type	= NRCS Runoff	Peak Flow	= 2.998 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.00 hrs
Time Interval	= 5 min	Runoff Volume	= 8,284 cuft
Drainage Area	= 1.356 ac	Curve Number	= 70
Tc Method	= User	Time of Conc. (Tc)	= 14.5 min
Total Rainfall	= 4.67 in	Design Storm	= Type II
Storm Duration	= 24 hrs	Shape Factor	= 484

Post Dev. - UC — Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 12.82 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.00 hrs
Time Interval	= 5 min	Runoff Volume	= 34,749 cuft
Drainage Area	= 3.549 ac	Curve Number	= 83
Tc Method	= User	Time of Conc. (Tc)	= 8.6 min
Total Rainfall	= 4.67 in	Design Storm	= Type II
Storm Duration	= 24 hrs	Shape Factor	= 484

Study Point — Hyd. No. 4

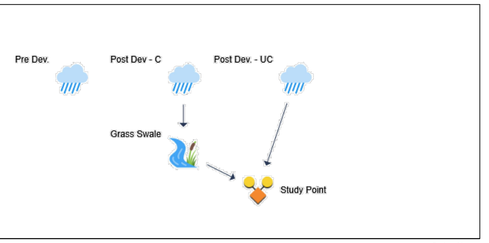
Hydrograph Type	= Junction	Peak Flow	= 14.69 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.00 hrs
Time Interval	= 5 min	Hydrograph Volume	= 43,032 cuft
Inflow Hydrographs	= 2, 3	Total Contrib. Area	= 4.549 ac



Basin Model

Project Name:

Hydrology Studio v 3.0.0.27 — 04-13-2023



Hydrograph by Return Period

Project Name:

Hydrology Studio v 3.0.0.27 — 04-13-2023

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Outflow (cfs)							
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
1	NRCS Runoff	Post Dev - C	0.001	1.102			2.998			
2	Reach	Grass Swale	0.001	0.959			2.744			
3	NRCS Runoff	Post Dev. - UC	0.382	6.600			12.82			
4	Junction	Study Point	0.382	7.079			14.69			
5	NRCS Runoff	Pre Dev.	0.379	8.043			15.93			

Hydrograph 1-yr Summary

Project Name:

Hydrology Studio v 3.0.0.27 — 04-13-2023

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Post Dev - C	0.001	24.00	21.3	----		
2	Reach	Grass Swale	0.001	24.00	15.8	1		
3	NRCS Runoff	Post Dev. - UC	0.382	12.08	1,592	----		
4	Junction	Study Point	0.382	12.08	1,608	2, 3		
5	NRCS Runoff	Pre Dev.	0.379	12.08	1,760	----		

Hydrograph 2-yr Summary

Project Name:

Hydrology Studio v 3.0.0.27 — 04-13-2023

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Post Dev - C	1.102	12.00	3,399	----		
2	Reach	Grass Swale	0.959	12.17	3,395	1		
3	NRCS Runoff	Post Dev. - UC	6.600	12.00	17,861	----		
4	Junction	Study Point	7.079	12.00	21,256	2, 3		
5	NRCS Runoff	Pre Dev.	8.043	12.00	21,822	----		

Hydrograph 10-yr Summary

Project Name:

Hydrology Studio v 3.0.0.27 — 04-13-2023

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Post Dev - C	2.998	12.00	8,284	----		
2	Reach	Grass Swale	2.744	12.08	8,283	1		
3	NRCS Runoff	Post Dev. - UC	12.82	12.00	34,749	----		
4	Junction	Study Point	14.69	12.00	43,032	2, 3		
5	NRCS Runoff	Pre Dev.	15.93	12.00	43,096	----		

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsurvgroup.com
West Office
42796 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.870.0985
South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.870.0985
Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.870.0985

NO.	DATE	COUNTY REVISIONS

SWM COMPUTATIONS & ROUTING

HAYMARKET TOWN PARK STREETSCAPE

RFP: 2022-001

TOWN OF HAYMARKET, VIRGINIA

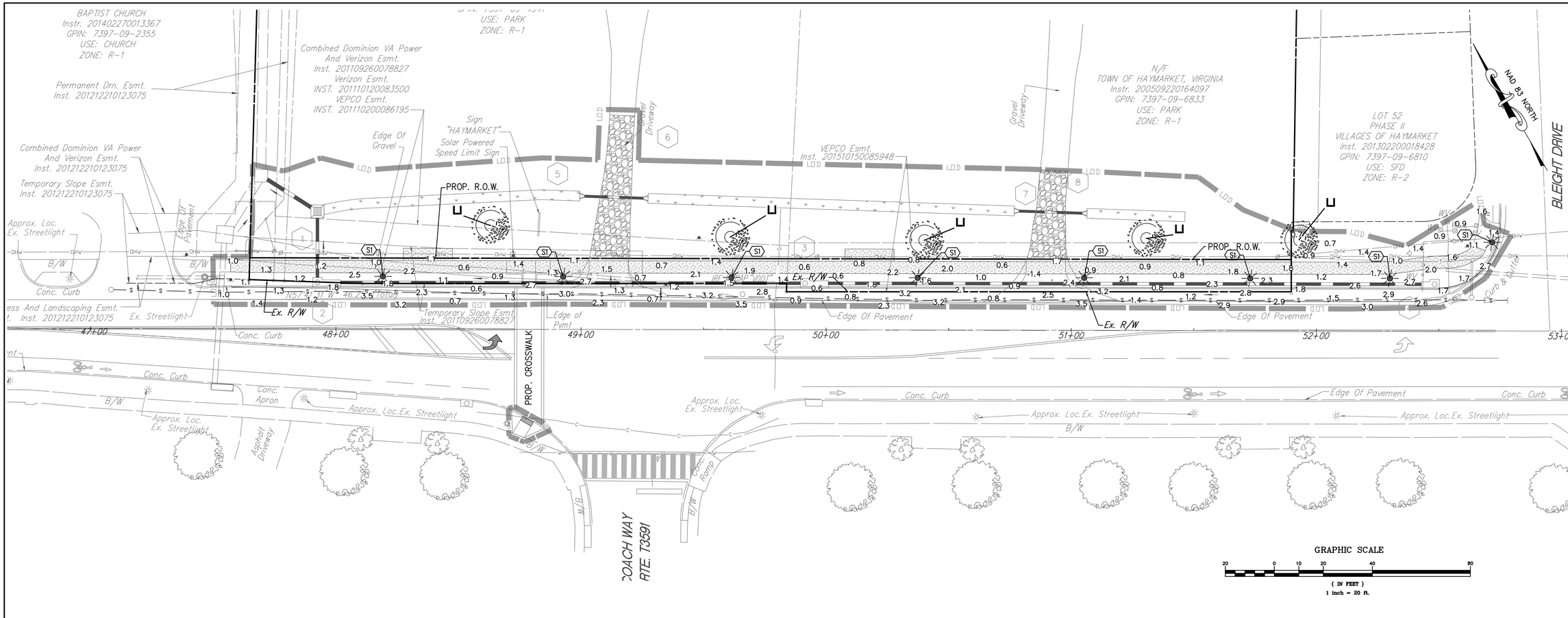
COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

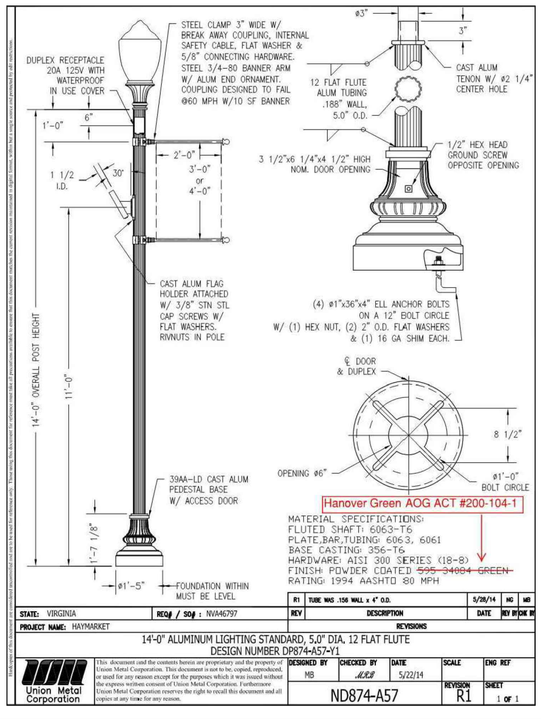
ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: N/A
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP-286
SHEET 15 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)





PHOTOMETRIC STATISTICS

AVERAGE FOOT-CANDLES	1.66
MAXIMUM FOOT-CANDLES	3.5
MINIMUM FOOT-CANDLES	0.6
MAXIMUM TO MINIMUM FC RATIO	6.18
AVERAGE TO MINIMUM FC RATIO	2.89

TYPICAL PLANT LIST

SYMBOL	BOTANICAL NAME/ COMMON NAME	QUANTITY	CALIPER	CLASSIFICATION
LI	LAGERSTROMIA INDICA/ CRAPE MYRTLE	5	2"	ORNAMENTAL TREE BAG & BURLAP

LEGEND

	EX. STREET TREES
	EX. ORNAMENTAL STREET TREES
	PROP. STREETLIGHT

LUMINAIRE SCHEDULE

SYMBOL	CALLOUT	DESCRIPTION	LAMP	VOLTS	QUANTITY	LAMP DEPRECIATION	MOUNTING	MODEL	NOTE 1	NOTE 2
	S1	MainView LED post top	(1) 77W (3) LEDGine Vertical Light Engine DRIVEN AT 530mA	120V 1P 2W	8	0.85	POLE	Signify Canada LTD, MV-CA-G1-530-3-740	MOUNTING HEIGHT = 14'	WASHINGTON STEEL (FLUTED) POST

LIGHTING NOTES:
1. LIGHTING LEVELS SHALL EXCEED A MINIMUM OF 0.6 FOOT-CANDLES ACROSS THE SITE.
2. THE DEVELOPER/OWNER IS RESPONSIBLE FOR PERMITS, OPERATION, AND ASSOCIATED MAINTENANCE COSTS.
3. PROPOSED STREET LIGHT FIXTURES WILL BE IN CONFORMANCE WITH TOWN STANDARDS. REFER TO DETAILS ON THIS SHEET AND SHEET 17 FOR SPECIFIC INFORMATION. CONTRACTOR TO CONFIRM CURRENT STANDARDS WITH TOWN PRIOR TO PURCHASE AND INSTALLATION.

THIS SHEET IS TO BE USED FOR LANDSCAPE AND LIGHTING PURPOSES ONLY !!!!!!!!!

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsgroupe.com
Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0065
West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0065
South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0065

NO.	DATE	COUNTY REVISIONS

LANDSCAPE AND PHOTOMETRIC PLAN

HAYMARKET TOWN PARK STREETSCAPE

RFP: 2022-001

TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: 1"=20'
DESIGNER: JM.,R.,ZF.,J.B.
DRAFTSMAN: Y.Q.ZF
FILE NO. PP-286
SHEET 16 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)

LANDSCAPING REQUIREMENTS

1). THE CONTRACTOR SHALL FURNISH AND INSTALL ALL PLANTS AS SHOWN ON THE PLANTING PLAN, IN ACCORDANCE WITH THE QUANTITIES, SIZES, AND SPECIFICATIONS LISTED IN THE PLANT MATERIALS SCHEDULE.

2). TOTAL NUMBER OF PLANTS SHALL BE AS DRAWN ON THE LANDSCAPE PLAN. IF THIS DIFFERS FROM THE PLANT KEY THE CONTRACTOR IS TO NOTIFY THE OWNER OR OWNERS REPRESENTATIVE.

3). ALL PLANTS SHALL BE NURSERY GROWN.

4). PLANT DIMENSIONS SHALL BE IN ACCORDANCE WITH AMERICAN STANDARDS FOR NURSERY STOCK, LATEST EDITION. BALLED AND BURLAPPED SHALL BE DUG WITH FIRM NATURAL BALLS OF EARTH AND SHALL BE PRUNED, STORED, DUG IN ACCORDANCE WITH CURRENT ASNS PLANTS SHALL BE IN PROPER NURSERY CONDITION.

5). NO B & B PLANTS SHALL BE PLANTED IF BALL IS CRACKED OR EITHER BROKEN DURING THE PROCESS OF PLANTING.

6). ALL PLANTS SHALL BE HARDY UNDER CLIMATE CONDITIONS IN THE LOCALITY OF THE PROJECT.

7). ALL PLANTS SHALL HAVE A NORMAL HABIT OF GROWTH AND SHALL BE SOUND, HEALTHY, VIGOROUS, FREE FROM DISEASE AND INSECT INFESTATION. ANY TREE WITH A WEAK, THIN TRUNKS NOT CAPABLE OF SUPPORTING ITSELF WHEN IN THE OPEN WILL NOT BE ACCEPTABLE. THE MINIMUM ACCEPTABLE SIZE OF ALL PLANTS MEASURED BEFORE PRUNING WITH THE BRANCHES IN NORMAL POSITION SHALL CONFORM TO DIMENSIONS AS SHOWN ON PLANTING SCHEDULE. LARGER PLANTS OF EQUAL QUALITY MAY BE ACCEPTED AT NO ADDITIONAL COST TO THE OWNER.

8). SUBSTITUTION OF PLANTS MATERIAL SHALL NOT BE PERMITTED UNLESS AUTHORIZED BY OWNER OR OWNER'S REPRESENTATIVE AND APPROVED BY COUNTY AGENT.

9). THE CONTRACTOR SHALL LAY OUT, WITH IDENTIFIABLE STAKES THE LOCATION OF ALL TREES, UNDERGROUND UTILITIES AND OUTLINE OF PLANTING BEDS AS INDICATED ON THE DRAWING. IN EVENT THAT ROCK OR UNDERGROUND CONSTRUCTION WORK, OBSTRUCTION OR UTILITY LINES ARE ENCOUNTERED DURING THESE OPERATIONS OR IN EXCAVATION OF ANY PLANT PITS UNDER THIS CONTRACT ALTERNATE LOCATIONS MAY BE SELECTED BY THE L.A. WITH NO ADDITIONAL COST TO THE OWNER.

10). PLANTING SOIL SHALL BE AN AMENDED SOIL MIX.

11). MULCH SHALL BE APPLIED IMMEDIATELY AFTER PLANTING OPERATIONS. MULCH SHALL BE FREE OF DEBRIS, WEEDS, SPORES OR OTHER FOREIGN MATERIAL, AND MUST BE WELL ROOTED AND OF SUCH CHARACTER AS NOT BE EASILY REMOVED BY WIND.

12). PRIOR TO INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE OWNER AND OR LANDSCAPES ARCHITECTS OF ALL SOIL OR DRAINAGE CONDITIONS WHICH ARE DETRIMENTAL TO THE GROWTH OF PLANTS. HE SHALL STATE THE CONDITIONS AND SUBMIT A PROPOSAL FOR CORRECTING THE CONDITIONS, INCLUDING ANY CHANGES IN THE COST, FOR REVIEW AND ACCEPTANCE BY THE OWNER.

13). CONTAINER GROWN PLANTS– ALL PLANTS DESIGNATED CONTAINER GROWN IN THE PLANT SCHEDULE SHALL BE HEALTHY VIGOROUS, WELL ROOTED, AND ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE SOLD. THEY SHALL HAVE TOPS WHICH ARE OF GOOD QUALITY AND ARE IN HEALTHY CONDITION. AN ESTABLISHED CONTAINER GROWN PLANT SHALL BE DEFINED AS A PLANT TRANSPLANTED INTO A CONTAINER AND GROWN IN THAT CONTAINER SUFFICIENTLY LONG FOR THE NEW FIBROUS ROOTS TO HAVE DEVELOPED SO THAT CONTAINER MASS WILL RETAIN ITS SHAPE AND HOLD TOGETHER WHEN REMOVED FROM THE CONTAINER. NO ROOT BOUND GROWN CONTAINER PLANTS, AS DETERMINED BY THE LANDSCAPE ARCHITECT, WILL BE PERMITTED. NO CONTAINER GROWN PLANT SHALL BE PLANTED IF THE ROOT MASS IS BROKEN EITHER BEFORE OR DURING THE PROCESS OF PLANTING.

14). PREPARATION OF PLANTS– ALL PLANT PITS SHALL BE CIRCULAR IN OUTLINE: ALL EXCAVATIONS SHALL HAVE VERTICALS SIDES. THE DEPTHS AND WIDTHS FOR EXCAVATION OF PLANTS PITS SHALL BE DEPTHS AND WIDTHS AS SPECIFIED ON PLANTING DETAILS OR AS APPROVED BY THE LANDSCAPE ARCHITECT. LOOSEN SUB GRADE 6" BELOW BOTTOM OF THE PIT. SOIL SEPARATION– SUB GRADE SOILS SHALL BE SEPARATED FROM THE UPPER "TOPSOIL" PORTIONS AND REMOVED IMMEDIATELY WHEREVER ENCOUNTERED DURING PLANTING OPERATIONS. EXCESS SOILS SHALL BE REMOVED AND LEGALLY DISPOSED.

15). SETTING PLANTS– IN GENERAL, SET PLANTS AT SAME RELATION TO FINISHED GRADE AS THE BORE TO THE GROUND FROM WHICH THEY WERE DUG. PREPARE PLANTS PITS AS SPECIFIED AND AS SHOWN ON THE DRAWINGS, PRIOR TO INSERTING PLANTS. USE TOPSOIL MIXTURE TO BACKFILL PLANT PITS. WHEN PLANTING PITS HAVE BEEN BACKFILLED APPROXIMATELY 2/3 FULL, WATER THOROUGHLY BEFORE INSTALLING REMINDER OF THE SOIL TO THE TOP OF THE PIT. SET TREES PLUMB AND BRACE RIGIDLY IN POSITION UNTIL THE PLANTING SOIL HAS BEEN TAMPED SOLIDLY AROUND THE BALL AND THE ROOTS.

16). GUYING AND STAKING– SHALL BE REQUIRED FOR ALL TREES OR TREE–LIKE SHRUBS IN ACCORDANCE WITH DETAILED DRAWINGS. GUYING AND STAKING SHALL BE DONE WITHIN 24 HOURS AFTER PLANTING.

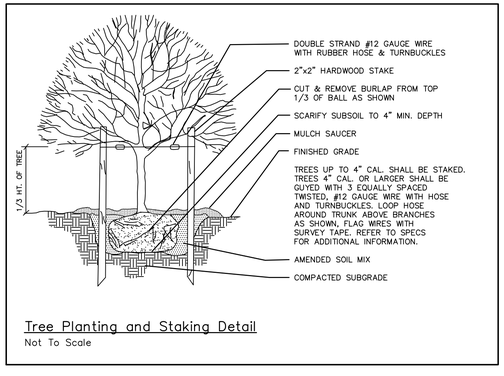
17). MAINTENANCE OF NEW PLANTINGS SHALL CONSIST OF PRUNING, WATER, CULTIVATING, WEEDING, MULCHING, TIGHTENING, AND RESETTING PLANTS TO PROPER GRADES OR UPRIGHT POSITION, RESTORATION OF THE PLANTING SAUCER, AND FURNISHING AND APPLYING SUCH SPRAYS AS ARE NECESSARY TO KEEP THE PLANTING FREE FROM INSECTS AND DISEASE. MAINTENANCE SHALL BE PROVIDED UNTIL TIME OF PROVISIONAL ACCEPTANCE.

18). PLANTING AREAS AND PLANTING SHALL BE PROTECTED AT ALL TIMES AGAINST TRESPASSING AND DAMAGE OF ANY KIND FOR DURATION OF THE MAINTENANCE PERIOD. IF ANY PLANTS BECOME DAMAGED OR INJURED, THEY SHALL BE TREATED OR REPLACED BY THE CONTRACTOR AS DIRECTED BY ARCHITECT AT NO ADDITIONAL COST TO THE OWNER. NO WORK SHALL BE DONE WITHIN, ADJACENT TO, OR OVER ANY PLANT OR PLANTING AREA WITHOUT PROPER SAFEGUARDS AND PROTECTION TO MATERIALS.

19). ALL PLANT MATERIAL SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR FROM THE DATE OF PROVISIONAL ACCEPTANCE, TO BE IN GOOD, HEALTHY, AND FLOURISHING CONDITION.

20). THE CONTRACTOR SHALL PROVIDE THE OWNER SPECIFIC MAINTENANCE RECOMMENDATIONS IN WRITING FOR WATERING, AND FERTILIZING AND MAINTAINING THE PLANT MATERIAL.

21). NO PLANTINGS SHALL IMPEDE THE SIGHT DISTANCE FOR INGRESS & EGRESS TO THE SITE. NO SIGNAGE, TREES OR PLANT MATERIAL WITH EXPECTED MATURE GROWTH HEIGHTS OF 2.5' FEET SHALL BE PLANTED WITHIN THE BOUNDARY LINES.



Tree Planting and Staking Detail
Not To Scale

HADCO by Signify | Urban | MainView | MV Post top

Project: Town of Haymarket Streetscape
Location: Town of Haymarket
Cat.No:
Type:
Lamps: Qty:
Notes:

Hadco MainView LED post top is is a traditionally styled luminaire created for comfort and ease of maintenance. This post top offers offers you multiple wattage options and is designed to be future-proof, giving you maximum flexibility at an affordable price. MainView facilitates lower maintenance due to easy component replacement, a longer life, and fewer internal parts than traditional post tops. This makes the MainView a clear choice for communities looking to provide comfortable lighting for less.

Ordering guide

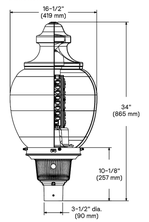
example: MV-G-CA-G1-425-5-730-A-S-N-R7-SP1-BKS

Product code	Post	Roof/roof	Generation code	Drive current	Optic	Color temperature	Voltage	Options
MV	G	CA	G1	530	3	740	A	
MV MainView post top	G Tall round fluted 3"	CA Visual comfort acorn	G1 Generation 1	250 250mA 350 350mA 450 450mA 530 530mA 600 600mA 200 200mA 290 290mA 300 300mA 350 350mA 425 425mA	3 Asymmetric[1] SM with HSS 5 Symmetric	727 2700K (70 CRI) 730 3000K (70 CRI) 740 4000K (70 CRI)	A 120-277V B 347-480V	

Integral controls	Pod photo control	Internal future-proof receptacle	Surge protection	Finish
DL[1] DALI (default: logarithmic) SRD[1,2] Sensor ready driver, standard configuration SRD-M[1,2] Sensor ready driver, alternate configuration S FAWS Field Adjustable Wattage Selector N None	R 3 Pin Receptacle N None	R7[3] 7 Pin Receptacle on top of LED engine N None	SP1 Parallel 10kV standard SP2 Parallel 20kV	BKS Black Smooth WHS White Smooth BZS Bronze Smooth GNS Green Smooth BK Black Texture WH White Texture BZ Bronze Texture GN Green Texture

1. Contact Custom Engineering for specific programming required.
2. Not available with 347-480V.
3. If ordering Interact City control node, use the Astroclock version.

Dimensions



Width: 16-1/2" / 419 mm diameter
Height: 34" / 865 mm
EPA: 1.17 sq. ft (maximum)
Weight: 20 lbs / 9.1 kg (maximum)

MV MainView

LED post top

Field Adjustable Wattage Selector (FAWS) Multiplier Chart

Type 3

FAWS Position	Power Ratio	Lumen Ratio
1	0.30	0.33
2	0.50	0.532
3	0.58	0.63
4	0.69	0.71
5	0.74	0.74
6	0.80	0.71
7	0.860	0.87
8	0.91	0.89
9	0.95	0.91
10	1	1

Note: Typical value accuracy +/- 5%

Type 5

FAWS Position	Power Ratio	Lumen Ratio
1	0.30	0.46
2	0.50	0.54
3	0.58	0.62
4	0.69	0.72
5	0.74	0.77
6	0.80	0.72
7	0.86	0.88
8	0.91	0.89
9	0.95	0.96
10	1	1

Note: Typical value accuracy +/- 5%

LED Wattage and Lumen Values

Asymmetric with comfort globe

					Type 3		
Catalog Number	LED Qty	System Current (mA)	Color Temperature	Avg System Wattage (W)	Lumen Output	Efficacy (Lm/W)	BUG Rating
MV-CA-G1-250-x-730	48	250	3000	37	4627	124	B1-U5-G3
MV-CA-G1-350-x-730	48	350	3000	51	6309	124	B2-U5-G3
MV-CA-G1-450-x-730	48	450	3000	66	7975	121	B2-U5-G3
MV-CA-G1-530-x-730	48	530	3000	77	9130	119	B2-U5-G4
MV-CA-G1-600-x-730	48	600	3000	88	10157	116	B2-U5-G4
MV-CA-G1-250-x-740	48	250	4000	37	5341	144	B1-U5-G3
MV-CA-G1-350-x-740	48	350	4000	51	7282	143	B2-U5-G3
MV-CA-G1-450-x-740	48	450	4000	66	9205	140	B2-U5-G4
MV-CA-G1-530-x-740	48	530	4000	77	10537	137	B2-U5-G4
MV-CA-G1-600-x-740	48	600	4000	88	11723	134	B3-U5-G4

Asymmetric with comfort globe and internal house-side shield

					Type 3H		
Catalog Number	LED Qty	System Current (mA)	Color Temperature	Avg System Wattage (W)	Lumen Output	Efficacy (Lm/W)	BUG Rating
MV-CA-G1-250-x-730	48	250	3000	37	4441	119	B1-U5-G3
MV-CA-G1-350-x-730	48	350	3000	51	6055	119	B1-U5-G3
MV-CA-G1-450-x-730	48	450	3000	66	7654	116	B2-U5-G3
MV-CA-G1-530-x-730	48	530	3000	77	8762	114	B2-U5-G4
MV-CA-G1-600-x-730	48	600	3000	88	9747	111	B2-U5-G4
MV-CA-G1-250-x-740	48	250	4000	37	5126	138	B1-U5-G3
MV-CA-G1-350-x-740	48	350	4000	51	6988	137	B1-U5-G3
MV-CA-G1-450-x-740	48	450	4000	66	8834	134	B2-U5-G4
MV-CA-G1-530-x-740	48	530	4000	77	10113	131	B2-U5-G4
MV-CA-G1-600-x-740	48	600	4000	88	11250	128	B2-U5-G4

Symmetric with comfort globe

					Type 5		
Catalog Number	LED Qty	System Current (mA)	Color Temperature	Avg System Wattage (W)	Lumen Output	Efficacy (Lm/W)	BUG Rating
MV-CA-G1-200-x-730	64	200	3000	40	5227	131	B2-U5-G3
MV-CA-G1-250-x-730	64	250	3000	49	6418	131	B2-U5-G3
MV-CA-G1-300-x-730	64	300	3000	59	7576	129	B3-U5-G3
MV-CA-G1-350-x-730	64	350	3000	68	8696	128	B3-U5-G3
MV-CA-G1-425-x-730	64	425	3000	83	10255	124	B3-U5-G3
MV-CA-G1-200-x-740	64	200	4000	40	5920	149	B2-U5-G3
MV-CA-G1-250-x-740	64	250	4000	49	7268	148	B2-U5-G3
MV-CA-G1-300-x-740	64	300	4000	59	8579	146	B3-U5-G3
MV-CA-G1-350-x-740	64	350	4000	68	9848	145	B3-U5-G3
MV-CA-G1-425-x-740	64	425	4000	83	11614	141	B3-U5-G4

Actual performance may vary due to installation variables including optics, mounting/ceiling height, dirt depreciation, light loss factor, etc.; highly recommended to confirm performance with a layout - contact Applications at outdoorlighting.applications@signify.com.

MV MainView

LED post top

Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions.L70 is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L70 hours limited to 6 times actual LED test hours.

Ambient Temperature °C	Driver mA	Calculated L_{70} Hours	L_{70} per TM-21	Lumen Maintenance % at 54,000 hrs
25°C	500 mA	>100,000 hours	>60,000 hours	>96%

Specifications

Housing/fitter
Tall Round fluted fitter is constructed of diecast 360 aluminum alloy with removable door providing entry into the fitter assembly for easy access to the electrical components. Wiring block to accept three #8 solid or stranded wires. Easy access to photo eye through the door on the pod. Heavy cast aluminum post fitter utilizes four 5/16-18 black cadmium stainless steel set screws (Hex head) for mounting to 3" O.D. post tenon. Globe holder has an internal water trap to prevent water from entering ballast compartment. Globe is held by utilizing four 5/16-18 black cadmium stainless steel fasteners (Hex head). All hardware to be stainless steel and captive. Pod height is 10-1/8" and width is 10-1/2".

Light engine
Light engine is composed of four main components: Heat Sink, LED, Optical System, and Driver. Electrical components are RoHS compliant.

Entire luminaire is rated for operation in ambient temperature of -40°C / -40°F up to +40°C / +104°F. B Voltage configurations rated for operation in ambient temperature of -40°C / -40°F up to +25°C / +95°F.

LED and optics
Composed of 48 or 64 high power LEDs. LED board substrate is MCPCB (Metal Core Printed Circuit Board), designed to minimize thermal resistance from LED junction to heat sinks. Color temperature as per ANSI/NEMA bin Neutral White, 4000 Kelvin nominal (3985K+/- 275K or 3710K to 4260K) or Warm White, 3000 Kelvin nominal (3045K +/- 175K or 2870K to 3220K), CRI 70 Min. 75 Typical.

Type 3 and Type 5 distribution choices are available.

Optics form an IP66 light engine to ensure complete environmental protection against water and dust ingress and corrosion, critical to long term LED reliability. All wiring is full copper, with 105C rated insulation. LED modules are secured to heatsinks using #8 stainless steel hardware, guaranteeing construction rigidity and vibration resistance.

Heat sinks
LED Engine construction consists of four 6063-T5 aluminum heat sinks, clear anodized to MIL-A-8625 specifications for excellent corrosion resistance and surface finish. Fin spacing has been optimized for maximum convective heat transfer under natural convection conditions, maximizing LED life and efficiency. Heat sinks provide greater than 700 sq. in. of convective surface area total, ensuring proper junction temperature control, luminaire performance, and system reliability. Extruded heatsinks meet or exceed tolerances as specified by AEC (Aluminum Extruders Council) standards and have been designed to provide superior surface flatness, ensuring excellent contact between heatsinks and LEDs.

Product does not use any cooling device with moving parts (passive cooling only).

Heat sinks are secured using galvanized steel brackets and stainless steel hardware to provide additional corrosion resistance.

Driver
Driver comes standard with 0-10V dimming capability. High power factor of 95%. Electronic driver, operating from 50/60 Hz. Auto adjusting universal voltage input from 120 to 277 VAC rated for both application line to line or line to neutral, Class 1, THD of 20% max. Driver operating ambient temperature range is -40F (-40C) to +130F (+55C). Certified in compliance to UL1310 cULus requirement (dry and damp location). Driver is part of the light engine assembly. The light engine assembly is removable by loosening two screws and twisting the light engine assembly. Quick connect Wago connectors are used for the power and ground wires to the light engine. The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction. Standard built in driver surge protection of 2.5kV (min).

SRD: Sensor Ready Driver including SR communication (used for dimming and other functionalities) 24V auxiliary supply connected and enabled. Logical signal input (LSI) connected to the top NEMA twist lock receptacle, functionality disabled.

SRD1: Sensor Ready Driver including SR communication (used for dimming and other functionalities) but with 24V auxiliary supply and a logical signal input (LSI) not connected to the top NEMA twist, functionality disabled for LSI and 24V auxiliary supply.

DL: Pre-set driver compatible with the DALI control system. Logarithmic standard.

FAWS
Field Adjustable Wattage Selector, pre set to the highest position, can be easily switched in the field to the required position. This reduces total luminaire wattage consumption and reduces the light level – see the FAWS multiplier chart for more details. Note: It is not recommended to use FAWS with other dimming or controls; if you do, set the switch to position 10 (maximum output) to enable the other dimming or controls. Switching FAWS to any position other than 10 will disable the other dimming or controls.

Surge protection
SP1: Surge protection device tested in accordance with ANSI/IEEE C62.45 per ANSI/ IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line-Ground, Line-Neutral and Neutral-Ground, and in accordance with DOE MSSLC Model Specification for LED Roadway Luminaires Appendix D Electrical Immunity High test level 10kV/10kA.

SP2: Optional 20kV / 10kA surge protection device that provides extra protection beyond the SP1 10kV/10kA level.

Photo control options
R7: Available on top of the LED engine inside the globe. (if inside the globe an astro-clock smart node must be used) Receptacle with 7 pins enabling dimming and additional functionality (to be determined). Can be used with a twist lock node or a shorting cap. Will ship with a shorting cap installed for this product. Remove shorting cap when you are ready to install your node.

Luminaire useful life
Refer to IES files for energy consumption and delivered lumens for each option. Based on ISTMT in situ thermal testing in accordance with UL1598 and UL8750, using LM-80 data from LED manufacturers and engineering prediction methods, the luminaire useful life is expected to reach 100,000+ hours with >L70 lumen maintenance @ 25°C Luminaire useful life accounts for LED lumen maintenance and additional factors, including LED life, driver life, PCB substrate, solder joints on/off cycles and burning hours for nominal applications.

Hardware
All non-ferrous fasteners prevent corrosion and ensure longer life.

Wiring
18 AWG wire, 6" (152mm) minimum exceeding from luminaire.

Options
House side shield included for optional field installation.

Finish
Color in accordance with the AAMA 2603 standard. Application of polyester powder coat paint (4 mils/100 microns) with ± 1 mils / 24 microns of tolerance. The Thermosetting resins provides a discoloration resistant finish in accordance with the ASTM D2244 standard, as well as luster retention in keeping with the ASTM D523 standard and humidity proof in accordance with the ASTM D2247 standard. The surface treatment achieves a minimum of 2000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard.

BKS: Black Smooth
WHS: White Smooth
BZS: Bronze Smooth
GNS: Green Smooth
BK: Black Texture
WH: White Texture
BZ: Bronze Texture
GN: Green Texture

MV MainView

LED post top

Specifications

LED products
manufacturing standard
Electrostatic discharge (ESD) such as light emitting diodes (LEDs) are assembled in compliance with IEC61340-5-1 and ANSI/ ESD S20.20 standards so as to eliminate ESD events that could decrease the useful life of the product.

Quality Control
The manufacturer must provide a written confirmation of its ISO 9001:2008 and ISO 14001:2004 International Quality Standards Certification. Meets the ANSI C136.31:2010, American national Standard for Roadway Luminaire Vibration specifications for Normal Applications.

Certifications and Compliance
Manufactured to ISO 9001:2008 Standards. UL8750 and UL1598 compliant. ETL listed to U.S. safety standards for wet locations. cETL listed to Canadian safety standards for wet locations. LM80 & LM79 tested.

Warranty
5 year standard warranty. Options available for extended warranties – contact factory. See signify.com/warranties for details and restrictions.

Signify

© 2020 Signify Holding. All rights reserved. This document may be subject to change. No representation or warranty as to the accuracy or completeness of the information included herein is given and any liability for any action in reliance therein is disclaimed. All trademarks are owned by Signify Holding or their respective owners.

Signify North America Corporation
200 Franklin Square Drive,
Somerset, NJ 08873
Telephone 855-486-2216

Signify Canada Ltd.
281 Hillmount Road,
Markham, ON, Canada L6C 2S3
Telephone 800-668-9008

www.hadco.com

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsurvgrp.com
West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.870.0965

South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.870.0965

Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.870.0965

NO.	DATE	COUNTY REVISIONS

LANDSCAPE NOTES AND PHOTOMETRIC SPECIFICATIONS

HAYMARKET TOWN PARK STREETSCAPE

RFP: 2022-001

TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: N/A
DESIGNER: JM.,R.,ZF.,J.B.
DRAFTSMAN: Y.Q.ZF
FILE NO. PP-286
SHEET 17 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)

Typical Traffic Control
Lane Closure on a Two-Lane Roadway Using Flaggers
(Figure TTC-23.2)

NOTES

Guidance:

1. *Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, and 500'-800' where the posted speed limit is greater than 45 mph.*
2. *Care should be exercised when establishing the limits of the work zone to insure maximum possible sight distance in advance of the flagger station and transition, based on the posted speed limit and at least equal to or greater than the values in Table 6H-3. Generally speaking, motorists should have a clear line of sight from the graphic flagger symbol sign to the flagger.*
3. *To maintain efficient traffic flow in a flagging operation on a two-lane roadway, the maximum time motorists should be stopped at a flagger station is 8 minutes for high volume roadways (average daily traffic of 500 or more vehicles per day) to a maximum of 12 minutes for low volume roadways (less than 500 vehicles per day). For additional information see Section 6E.07.*[2]

Standard:

4. **Portable Temporary Rumle Strips (PTRS) shall be used as noted in Section 6F.99.**
5. **Flagging stations shall be located far enough in advance of the work space to permit approaching traffic to reduce speed and/or stop before passing the work space and allow sufficient distance for departing traffic in the left lane to return to the right lane before reaching opposing traffic (see Table 6H-3 on Page 6H-5).**
6. **All flaggers shall be state certified and have their certification card in their possession when performing flagging duties (see Section 6E.01, Qualifications for Flaggers).**
7. **Cone spacing shall be based on the posted speed and the values in Table 6H-4 on Page 6H-6.**[1]
8. **A shadow vehicle with at least one high intensity amber rotating, flashing, or**[1] **oscillating light shall be parked 80'-120' in advance of the first work crew.**

Option:

8. A SLOW (W21-V10) sign[2] may be required in this area to give advance warning of the operation ahead by slowing approaching traffic prior to reaching the flagger station or queued traffic.

Guidance:

9. *If the queue of traffic reaches the BE PREPARED TO STOP (W3-4) sign then the signs, and if used the* PTRS[1] *should be readjusted at greater distances.*
10. *When a highway-rail crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the highway-rail grade crossing, the temporary traffic control zone should be extended so that the transition area precedes the highway-rail crossing (see Figure TTC-56 for additional information on highway-rail crossings).*

Standard:

11. **At night, flagger stations shall be illuminated, except in emergencies (see Section 6E.08).**

Option:

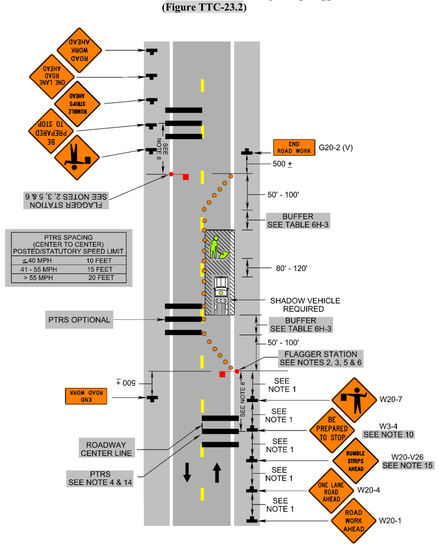
12. Cones may be eliminated when using a pilot vehicle operation or when the total roadway width is 20 feet or less.
13. For low-volume situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used (see Chapter 6E).

Standard:[1]

14. **When used**[2]**, three portable temporary rumble (PTRS) strips shall be installed across the entire travel lane adjacent to the BE PREPARED TO STOP (W3-4) sign. The portable temporary rumble strips shall be monitored and adjusted as necessary during the work shift to ensure proper placement on the roadway. When the PTRS are installed, the RUMBLE STRIPS AHEAD (W20-V26) sign shall also be utilized.**

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Lane Closure on a Two-Lane Roadway Using Flaggers
(Figure TTC-23.2)



1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019
3: Revision 2.1 – 11/1/2020

Typical Traffic Control
Temporary Pavement Marking and Marker Guidelines
(Figure TTC-60.0)

NOTES

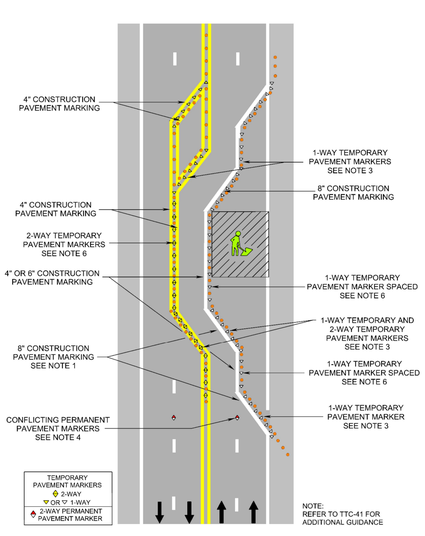
Standard:

1. **Unless otherwise noted, construction pavement marking lane lines in transitions shall be 8 inches in width.**
2. **For long-term stationary work (more than 3 days duration), existing conflicting pavement markings shall be removed and temporary markings shall be installed.**
3. **Temporary pavement markers, on 20 foot center to center spacing, shall be installed in transitions.**
4. **Conflicting permanent pavement markers shall be covered or removed.**
5. **Eradication of existing pavement markings shall be as shown in Figure TTC-55.**

Option:

6. Temporary pavement markers, on a 40' center to center spacing, may be added between transitions/shifting tapers as directed by the engineer.
7. For short-term stationary work (less than 3 days duration), lanes may be delineated by retroreflectorized channelizing devices or removable pavement marking instead of temporary pavement markings.

Temporary Pavement Marking and Marker Guidelines
(Figure TTC-60.0)



Typical Traffic Control
Shoulder Operation with Minor Encroachment
(Figure TTC-5.2)

NOTES

Standard

1. **For required sign assemblies for multi-lane roadways see Note 1, TTC-4.**[1]

Guidance

2. *Sign spacing should be 1300'-1500' for Limited Access highways. For all other roadways, the sign spacing should be 500'-800' where the posted speed limit is greater than 45 mph, and 350'-500' where the posted speed limit is 45 mph or less.*
3. *When work takes up part of a lane on a high volume roadway; vehicular traffic volumes, vehicle mix, speed and capacity should be analyzed to determine whether the affected lane should be closed. Unless the lane encroachment analysis permits a remaining lane width of 10 feet, the lane should be closed. If the closure operation is on a Limited Access highway, the minimum lane width is 11 feet.*

Option:

4. The ROAD WORK AHEAD (W20-1) sign on an intersecting roadway may be omitted where drivers emerging from that roadway will encounter another advance warning sign prior to this activity area.

Standard:

5. **A shadow vehicle with either an arrow board operating in the caution mode, or at least one high-intensity amber rotating, flashing, or**[1] **oscillating light shall be parked 80' - 120' in advance of the first work crew.**
6. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity amber rotating, flashing, or**[1] **oscillating lights. Vehicle hazard warning signals can be used to supplement high-intensity amber rotating, flashing, or**[1] **oscillating lights.**
7. **Taper length (L) and channelizing device spacing shall be at the following:**

Taper Length L

Speed Limit (mph)	Lane Width (Feet) 9	10	11	12	Remarks	Speed Limit (mph)	Lane Width (Feet) 9	10	11	12	Remarks
25	95	105	115	125	L=S*W/60	50	450	500	550	600	L=SW
30	135	150	165	180	L=S*W/60	55	495	550	605	660	L= SW
35	185	205	225	245	L=S*W/60	60	540	600	660	720	L=SW
40	240	270	295	320	L=S*W/60	65	585	650	715	780	L=SW
45	405	450	495	540	L=SW	70	630	700	770	840	L=SW

Limited Access highways shall use a 1000' merging taper regardless of the posted speed, a 750' shifting taper for posted speeds < 65 mph and a 1000' shifting taper for posted speeds ≥ 65 mph.[2]

Shoulder Taper = ½ L Minimum

8. **Channelizing device spacing shall be at the following:**

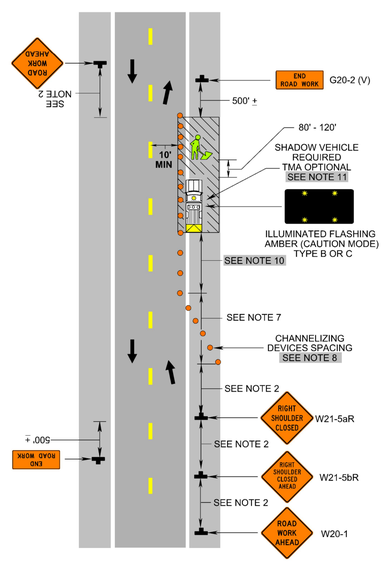
Channelizing Device Spacing								
Location Spacing	Speed Limit (mph) 0 -35	36 +	Location Spacing	Speed Limit (mph) 0 -35	36 +	Location Spacing	Speed Limit (mph) 0 -35	36 +
Transition	20'	40'	Travelway	40'	80'	*Construction Access	80'	120'

*Construction access spacing may be increased to this distance, but shall not exceed one access per ¼ mile.

9. **On roadways with paved shoulders having a width of 8 feet or more, channelizing devices shall be used to close the shoulder in advance of the merging taper to direct vehicular traffic to remain within the traveled way.**[2]
10. **The buffer space length The buffer space length shall be as shown in Table 6H-3 on Page 6H-5 for the posted speed limit.**
11. **A truck-mounted attenuator (TMA) shall be used on Limited Access highways and multi-lane roadways with posted speed limit equal to or greater than 45 mph.**
12. **When a side road intersects the highway within the temporary traffic control zone, additional traffic control devices shall be placed as needed.**

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Shoulder Operation with Minor Encroachment
(Figure TTC-5.2)



1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

MAINTENANCE OF TRAFFIC:

1. THE CONTRACTOR SHALL PLAN AND EXECUTE THE WORK IN ACCORDANCE WITH THIS PLAN UNLESS A CHANGE IS APPROVED OR DIRECTED BY VDOT. IT IS NOT THE INTENT OF THIS PLAN TO ENUMERATE EVERY DETAIL WHICH MUST BE CONSIDERED IN THE CONSTRUCTION OF EACH STAGE, BUT TO ONLY SHOW THE GENERAL HANDLING OF TRAFFIC.
2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2011 VIRGINIA WORK AREA PROTECTION MANUAL REVISION 2.1 – NOVEMBER 1, 2020 AND THE FEDERAL HIGHWAY ADMINISTRATION'S 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS.
3. THE VDOT INSPECTOR IS TO BE CONSULTED FOR USE AND APPLICATION OF SIGNAGE AND OTHER TRAFFIC CONTROL DEVICES.
4. VEHICULAR AND PEDESTRIAN TRAFFIC SAFETY AND ACCESS SHALL BE MAINTAINED THROUGHOUT THE LIMITS OF DISTURBANCE BY PROVIDING AND MAINTAINING ALL PRACTICABLE TRAFFIC CONTROL DEVICES CONFORMING TO THE MUTCD AND THE 2011 REVISION 2.1 – NOVEMBER 1, 2020 VIRGINIA WORK AREA PROTECTION MANUAL.
5. TEMPORARY PAVEMENT OVERLAY MAY BE REQUIRED ADJACENT TO AREAS OF NEW PAVEMENT CONSTRUCTION IN ORDER TO ALLOW TRAFFIC FLOW DURING THE SEQUENCE OF CONSTRUCTION.
6. THE CONTRACTOR SHALL COORDINATE HIS CONSTRUCTION ACTIVITIES WITH AFFECTED AERIAL AND UNDERGROUND UTILITY COMPANIES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, SPECIAL PROVISIONS AND PLANS.
7. ALL TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE REMOVED AS SOON AS PRACTICAL WHEN THEY ARE NO LONGER NEEDED, WHEN WORK IS SUSPENDED FOR SHORT PERIODS, ADVANCE WARNING SIGNS THAT ARE NO LONGER APPROPRIATE SHALL BE REMOVED FROM THE ROADWAY, AND OTHER INAPPROPRIATE DEVICES REMOVED FROM THE WORK AREA SO THEY ARE NOT VISIBLE TO DRIVERS.
8. THE CONTRACTOR NEEDS TO CONTACT NORTHERN VIRGINIA REGION OPERATIONS TRAFFIC SIGNALS AT (703) 383–8368 FOR A MARK OUT OF THE TRAFFIC SIGNAL EQUIPMENT A MINIMUM OF 72 HOURS PRIOR TO WORK BEGINNING WHEN WORKING WITHIN 1,000 FEET OF A TRAFFIC SIGNAL.
9. A SHADOW VEHICLE WITH EITHER AN ARROW BOARD OPERATING IN THE CAUTION MODE (TYPE B), OR AT LEAST ONE HIGH INTENSITY ROTATING, OSCILLATING, OR AMBER STROBE LIGHT SHALL BE PARKED 80–120' IN ADVANCE OF THE FIRST WORK CREW.
10. ALL WORK WILL BE PERFORMED IN ACCORDANCE WITH THE APPROVED SITE PLAN.
11. ACCESS TO AND FROM ADJACENT PROPERTIES SHALL BE MAINTAINED AT ALL TIMES.
12. SEVEN DAY ADVANCE NOTICE FOR LANE CLOSURES, PROPERTY ACCESS IMPACTS AND PARKING RESTRICTIONS SHOULD BE PROVIDED TO VDOT AND ADJACENT PROPERTY OWNERS.
13. THE CONTRACTOR IS REQUIRED TO PROVIDE AT LEAST ONE PERSON WHO, AT MINIMUM, IS VERIFIED BY VDOT IN THE LANE CLOSURE ADVISORY MANAGEMENT SYSTEM (FOR LCAMS TRAINING COURSE REGISTRATION PLEASE CONTACT CARLENE.MCWHIRT@VDOT.VIRGINIA.GOV OR CALL 571–350–2078)
14. AT THE END OF EACH DAY, THE CONTRACTOR WILL FILL THE OPEN TRENCH WITH GRAVEL AND PLACE TEMPORARY PAVEMENT ACROSS IT HOWEVER STEEL PLATES MAY BE USED WITH VDOT APPROVAL. TEMPORARY LANE MARKINGS MAY BE REQUIRED TO BE PLACED AT THE END OF EACH DAY UNTIL THE ENTIRE LENGTH OF STORM DRAIN MANHOLE IS CONSTRUCTED AND TESTED. AFTER THE STORM DRAIN MANHOLE LINES ARE TESTED, PERMANENT PAVEMENT WILL BE INSTALLED AND LANES WILL BE MARKED IN ACCORDANCE WITH THE FEDERAL HIGHWAY ADMINISTRATION'S 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS.
15. WORK ON THIS PLAN IS TO BE DONE UTILIZING TTC PLAQUES FROM THE VIRGINIA WORK AREA PROTECTION MANUAL (2020 REV. 2.1) IF THERE IS ANY SIGNIFICANT DEVIATION FROM THE TTC PLAQUES THEN A REVISION SHALL BE SUBMITTED FOR REVIEW. WORK WILL ONLY BE ALLOWED TO PROCEED UNDER EXISTING TTC PLAQUES UNTIL THE REVIEW IS COMPLETE.

MILLING & OVERLAY NARRATIVE

A PORTION OF THE WESTBOUND LANE ALONG WASHINGTON STREET WILL BE CLOSED. THIS PHASE WILL FOLLOW TTC 23.2. THE CONSTRUCTION DURING THIS PHASE WILL CONSIST OF MILLING & OVERLAY ALONG WASHINGTON STREET.

VDOT IIM 241.5 NOTES:

- THE TRANSPORTATION MANAGEMENT PLAN SHOWN IS CONSIDERED: TYPE "A"–SIMPLE PROJECT INCLUDING SHOULDER CLOSURE.

THE WORK ZONE IS LOCATED WITHIN THE WEST BOUND SHOULDER OF WASHINGTON STREET STATE ROUTE 55.

- THE WORK ZONE ALONG WASHINGTON STREET IS APPROXIMATELY 520' LONG.
- WORK ACTIVITY IN THE ROADWAY WILL BE ALLOWED FROM 9:30 AM TO 3:00 PM MONDAY THROUGH THURSDAY AND 9:30 AM TO 2:00 PM ON FRIDAY. FOR ALTERNATE WORK HOURS THE CONTRACTOR MUST SUBMIT IN WRITING THE PROPOSED ALTERNATE HOURS TO THE VDOT HAYMARKET RESIDENCY PERMITS OFFICE FOR REVIEW AND APPROVAL.
- CONSTRUCTION EQUIPMENT LOCATION WILL BE DETERMINED ON SITE BY THE CONTRACTOR.
- ALL TEMPORARY TRAFFIC CONTROL DEVICES HAVE BEEN OUTLINED IN THE LEGEND WITHIN THIS PLAN.
- THE MAJOR TYPE OF TRAVELERS IN THIS AREA ARE RESIDENTIAL AND COMMUTER VEHICULAR TRAFFIC.

Table 6H-3, Length of the Longitudinal Buffer Space[1]

Posted Speed Limit (mph)	Distance (Feet)
≤ 20	115 – 120
25	155 – 165[1]
30	200 – 210
35	250 – 260
40	305 – 325[1]
45	360 – 380
50	425 – 445
55	500 – 530[1]
60	570 – 600[1]
65	645 – 675
70	730 – 760

1: Revision 1 – 4/1/20152: Revision 2 – 9/1/2019

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsgroupe.com
Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0065
West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0065
South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0065

NO.	DATE	COUNTY REVISIONS

TRANSPORTATION MANAGEMENT DETAILS AND NARRATIVE

HAYMARKET TOWN PARK STREETSCAPE
RFP: 2022–001

TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

I, DENAR H. C. ANTELO, HAVE SUCCESSFULLY COMPLETED THE VDOT ADVANCED WORK ZONE TRAFFIC CONTROL TRAINING. MY CERTIFICATE NUMBER IS 0301221136 WITH AN EXPIRATION DATE OF 3/31/2026.

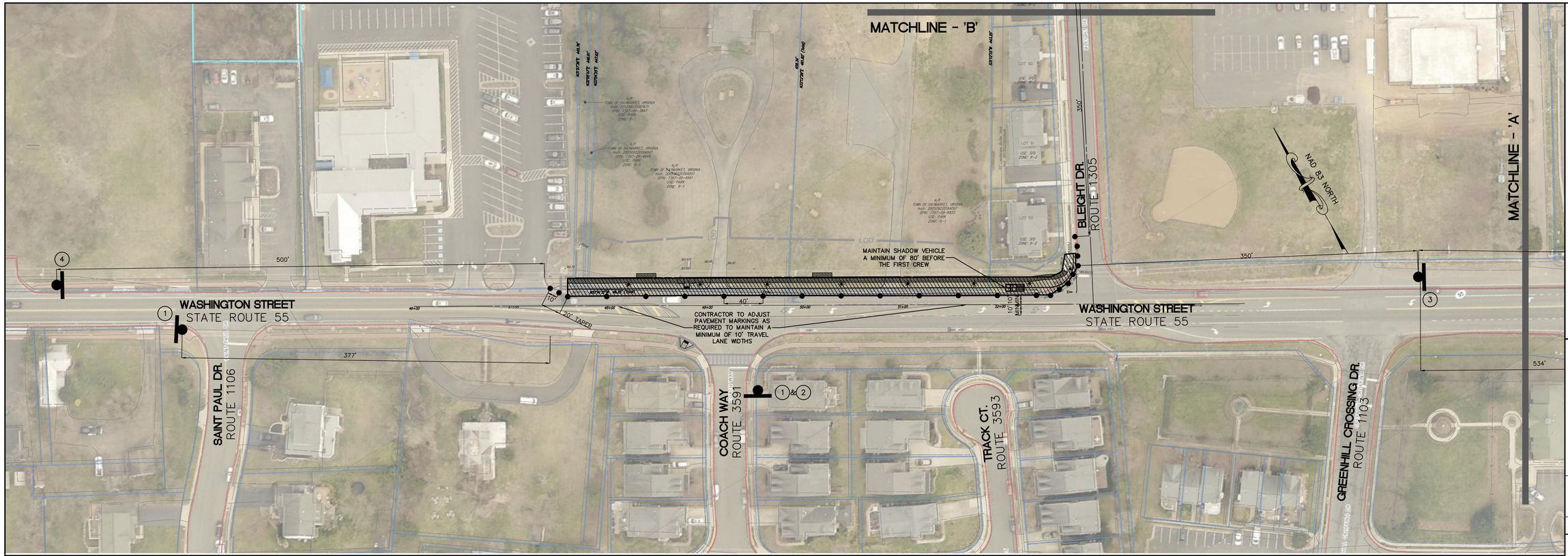
ENGINEERING GROUPE PROJECT STATUS

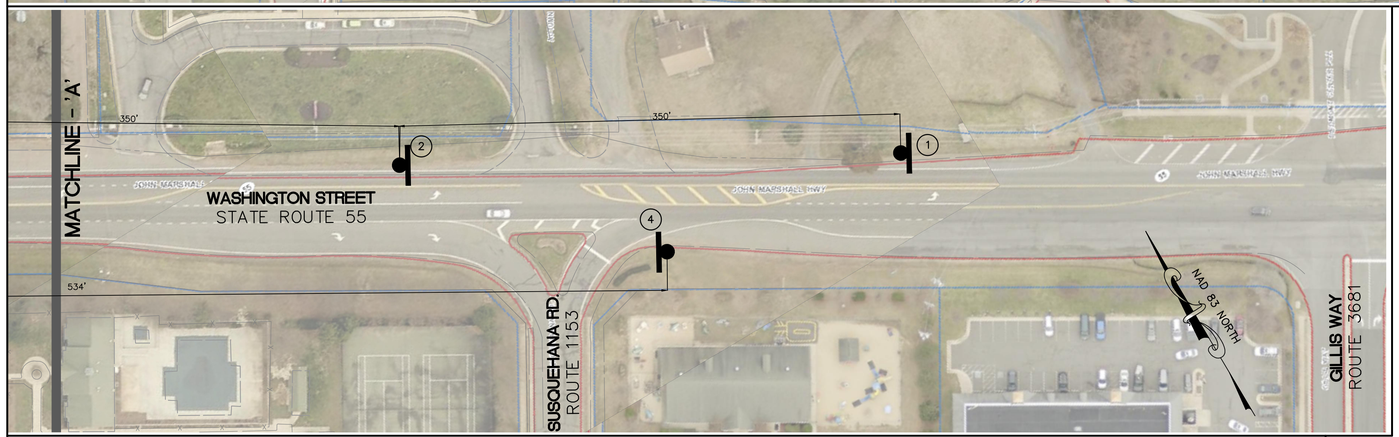
DATE	ACTION

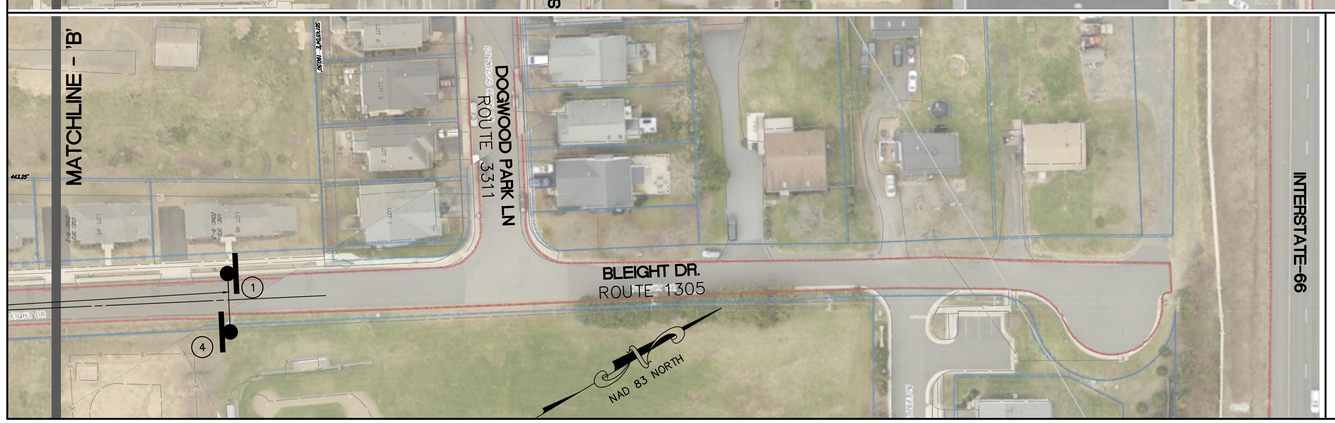
DATE: JULY 14, 2023
SCALE: N/A
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP–286
SHEET 18 OF 22

NOTE: THIS PLAN IS FOR TRAFFIC MANAGEMENT ONLY!

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)







MAINTENANCE OF TRAFFIC NARRATIVE

DURING THIS PHASE OF CONSTRUCTION A PORTION OF THE WESTBOUND SHOULDER ALONG WASHINGTON STREET WILL BE CLOSED. EXISTING PAVEMENT MARKING LINES WILL BE MODIFIED AS REQUIRED TO MAINTAIN A MINIMUM OF 10' TRAVEL LANE WIDTHS AND IS TO BE ERADICATED AND RE-STRIPED ONCE CONSTRUCTION IS COMPLETED. THIS PHASE WILL FOLLOW A COMBINATION OF TTC 5.2 AND 60.1. THE CONSTRUCTION DURING THIS PHASE WILL CONSIST OF CURB IMPROVEMENTS ALONG WASHINGTON STREET AND THE INSTALLATION OF A STORM DRAIN SYSTEM.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

SIGN LEGEND

1	2	3	4
ROAD WORK AHEAD	RIGHT SHOULDER CLOSED AHEAD	RIGHT SHOULDER CLOSED	END ROAD WORK
48" X 48"	48" X 48"	48" X 48"	48" X 24"
W20-1	W21-5bR	W21-5oR	G20-2 (V)

KEY

- SIGN POST (SEE SIGN LEGEND FOR TYPE OF SIGN)
- SIGN FACE
- SHADOW VEHICLE
- WORK ZONE
- GROUP 2 DEVICE

NOTE: THIS PLAN IS FOR TRAFFIC MANAGEMENT ONLY!

I, DENAR H. C. ANTELO, HAVE SUCCESSFULLY COMPLETED THE VDOT ADVANCED WORK ZONE TRAFFIC CONTROL TRAINING. MY CERTIFICATE NUMBER IS 030122136 WITH AN EXPIRATION DATE OF 3/31/2026.

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

The Engineering Groupe, Inc.
Engineers | Surveyors | Planners
www.engroupe.com

Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0065

South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0065

West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0065

NO.	DATE	COUNTY REVISIONS

TRANSPORTATION MANAGEMENT PLAN

HAYMARKET TOWN PARK STREETSCAPE

RFP: 2022-001

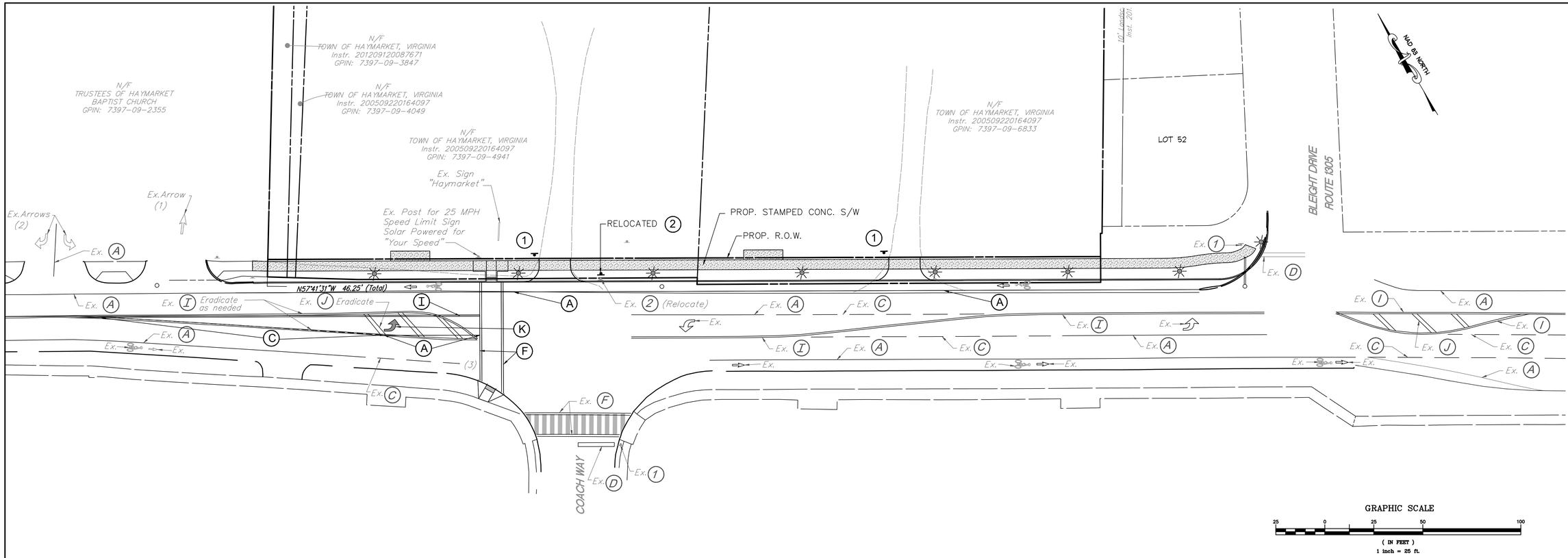
TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

DATE: JULY 14, 2023
SCALE: 1"=50'
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP-286
SHEET 19 OF 22

G:\PROJECT\Town of Haymarket-Streetscape\ENG\DWG\00-K7300 TMP.dwg, 7/17/2023 1

Attachment: 02 Town of Haymarket Streetscape Streetscape (6263 : Town Park Sidewalk)



GRAPHIC SCALE

25 0 25 50 100

(IN FEET)

1 inch = 25 ft.

NOTES

1. ALL PROPOSED PAVEMENT MARKING AND SIGNING SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE FOLLOWING AND ANY REVISION THERETO:
2. ALL PAVEMENT MARKING SHALL BE TYPE B, UNLESS OTHERWISE NOTED.
3. PROPOSED SIGN LOCATIONS ARE APPROXIMATE AND SHALL BE MODIFIED IN THE FIELD TO AVOID CONFLICT WITH UNDERGROUND UTILITIES OR OTHER OBSTRUCTIONS AND TO COMPLY WITH STANDARDS REFERENCED IN NOTE #1.
4. ANY EXISTING PAVEMENT MARKINGS WHICH WILL CONFLICT WITH PROPOSED PAVEMENT MARKINGS SHALL BE COMPLETELY ERADICATED.
5. LIMITS SHOWN OF PROPOSED MARKINGS ARE APPROXIMATE AND SHALL BE MODIFIED IN THE FIELD TO INSURE THAT PROPOSED PAVEMENT MARKINGS CONTINUE UNTIL EXISTING PAVEMENT MARKINGS CAN BE MATCHED. REFER TO APPROVED TRAFFIC SIGNAL PLAN FOR PROPER LOCATIONS OF STOP LINES AND CROSSWALKS WHEN APPLICABLE.
6. CROSSWALKS SHALL BE STRIPED WITH HIGH VISIBILITY PAVEMENT MARKINGS IN ACCORDANCE WITH IIM-TE-384.1.
7. PALL PAVEMENT MARKING AND SIGNS TO CONFORM TO WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC DEVICES (MUTCD).
8. THE DEVELOPER ACKNOWLEDGES THAT VDOT WILL NOT MAINTAIN ANY SIGNAGE OUTSIDE OF THEIR RIGHT OF WAY. DURING THE ACCEPTANCE PROCESS OF THE ROADWAY THE DEVELOPER WILL WORK WITH THE OWNERS OF PIEDMONT CENTER PLAZA TO SECURE AN AGREEMENT TO ALLOW FOR MAINTENANCE AND OPERATION OF THEIR LEG OF THE ROUNDABOUT.

PAVEMENT MARKING LEGEND

- (A) TYPE B, CLASS 1, WHITE, 4" WIDTH.
- (B) TYPE B, CLASS 1, WHITE, 4" WIDTH, 10' LONG, 30' GAP.
- (C) TYPE B, CLASS 1, WHITE, 4" WIDTH 2' LONG, 10' GAP.
- (D) TYPE B, CLASS 1, WHITE, 24" WIDTH.
- (E) TYPE B, CLASS 1, WHITE, 24" WIDTH, 20' SPACING, 45 DEGREE ANGLE.
- (F) TYPE B, CLASS 1, WHITE, 6" WIDTH.
- (G) TYPE B, CLASS 1, WHITE, 8" WIDTH.
- (H) TYPE B, CLASS 1, YELLOW, 4" WIDTH.
- (I) TYPE B, CLASS 1, YELLOW, 4" WIDTH, DOUBLE LINE, SEPARATED BY A 4" SPACE.
- (J) TYPE B, CLASS 1, YELLOW, 24" WIDTH, 20' SPACING, 45 DEGREE ANGLE.
- (K) TYPE B, CLASS 1, WHITE, ELONGATED ARROW.
- * TYPE B, CLASS 1, WHITE, WORD MESSAGE "ONLY"
- (T) TYPE B, CLASS 1, WHITE, 24" WIDTH, 20' SPACING, 45 DEGREE ANGLE CHEVRON.

SIGN LEGEND

SIGN #	(1)	(2)	(3)
SIGN	STOP		SPEED LIMIT 25
STD. #	R1-1	W1-7	R2-1
SIZE	30" X 30"	48" X 24"	24"X 30"

SIGN DETAIL

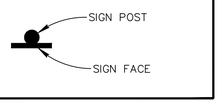
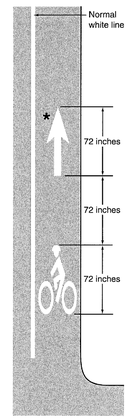


Figure 9C-3. Word, Symbol, and Arrow Pavement Markings for Bicycle Lanes



B - Helmeted Bicyclist Symbol

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsgroupe.com
Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0085
South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0085
West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0085

NO.	DATE	COUNTY REVISIONS

SIGNAGE & STRIPING PLAN

HAYMARKET TOWN PARK STREETSCAPE

RFP: 2022-001

TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: 1"=25'
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP-286
SHEET 20 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)

GEOTECHNICAL REQUIREMENTS
TOWN OF HAYMARKET
14740 & 14710 WASHINGTON ST, HAYMARKET
PRINCE WILLIAM COUNTY, VIRGINIA 20169
JANUARY 10TH, 2023

PROJECT NUMBER: 22-50023V

BY SOIL CONSULTANTS ENGINEERING, LLC.
9303 CENTER STREET, MANASSAS, VIRGINIA
PHONE NUMBER: 703-366-3000
FACSIMILIE NUMBER: 703-366-3400

The following recommendations pertain to the geotechnical aspects of the design and construction of paved roadway at 14740 and 14710 Washington Street, located in Haymarket, Prince William County, Virginia 20169.

1. Earthwork

a. Site Preparation

Before the start of any other construction, all unsuitable materials shall be removed from all building and pavement areas including offsets as defined below.

Unsuitable material includes but is not limited to: uncontrolled fill; vegetation; topsoil; organic soils; soil mixed with excessive amounts of roots or other deleterious materials; soft, very wet and loose soils; and any building remains, including foundations and slabs, existing utility lines, pavements, debris, septic tanks and drain fields and backfill soil. Holes formed by the removal of trees shall be cleaned and backfilled with compacted, controlled fill, as specified herein.

Offsets for building and pavement areas shall be at least 10 feet or 5 feet plus the height of any required fill, whichever is greater, outside all pavement lines. For compacted, controlled fill within any slope, the cleared area shall include offsets of at least 10 feet beyond the toe of the slope.

Once the clearing and removal of unsuitable materials, as defined above, is complete, a geotechnical engineer or the engineer's qualified representative shall observe the subgrade of the excavation. The cleared pavement subgrades or areas to receive fill, shall be proof-rolled using a fully loaded dump truck with an axle weight of at least 10 tons.

The truck shall make at least two complete "passes" of all cleared areas in the presence of the geotechnical engineer or the engineer's qualified representative. If pumping or rutting is observed, the soft or wet material shall be removed down to firm subgrade and replaced with suitable fill.

If high shrink-swell potential soil (soil with a Liquid Limit of 40 or greater or with a Plasticity Index of 15 or greater) is encountered within 2 vertical feet of the subgrade of slabs-on-grade, pavements (including driveways), sidewalks, or curb and gutter, it shall be undercut to a depth of at least 2 feet below the design subgrade elevation and replaced by compacted, controlled fill (See **c. Shrink Swell Soils** below).

If the soil at the subgrade of an excavation becomes wet, due to surface water or groundwater entering the excavation, the excavation shall be halted. Dewatering measures shall be applied to lower the groundwater or prevent surface water from entering the excavation. Excavation shall be resumed only after the geotechnical engineer or the engineer's qualified representative has confirmed that the groundwater level has been lowered at least 2 feet below the level of the planned excavation.

If softening of the subgrade occurs, or if water permeates the excavation, it will be necessary to remove all the soft and/or excessively wet soils, and replace them with compacted, controlled fill. If the soils in an undercut area are moist and pump under the load of heavy construction equipment, the geotechnical engineer shall be informed so that appropriate remedial action may be designed.

Utility trenches shall be sloped or shored in accordance with the current OSHA and VOSHA regulations.

b. Shallow Depth to Rock

Shallow depth to bedrock was encountered in B-1 at 7.0 feet, and in B-2 at 4.5 feet. Groundwater tends to pond around foundations that are excavated into bedrock. The pit used for the foundation acts as a bowl due to the impermeability of the bedrock. Therefore, it will be essential to provide adequate, dependable drainage for this building.

There is no site-specific information regarding the fracture pattern and fracture frequency of the rock or weathered rock. Rock excavation techniques to include blasting may not be necessary for the excavation. If rock excavation is required within this latter zone, ripping, hoe ramming and jack hammers shall be used.

Utility trenches shall be sloped or shored in accordance with the current OSHA and VOSHA regulations.

c. Structural Fill

Compacted, controlled fill shall consist of clean, non-plastic Sandy SILT (ML) or more granular soil (per ASTM D 2487) with a Liquid Limit less than 40 and Plasticity Index less than 15 (See **c. Shrink Swell Soils** below). The fill material shall not contain organics or roots, plastic clay or silt lumps, deleterious materials, or stones larger than 3 inches. It shall have a maximum dry density, per ASTM D 698, and uncorrected for gravel, of not less than 105 pounds per cubic foot.

Fill shall be placed in layers of 6 to 8 inches and compacted to a density of not less than 95 percent of the maximum dry density according to ASTM D 698. (Fill placed in VDOT rights-of-way shall be placed and compacted in accordance with VDOT specifications.) A qualified technician shall test the density of each layer of such fill.

Additional fill shall be placed only after the test results show that the required compaction has been achieved. Compacted, controlled fill shall extend outside all building and pavement lines a distance of at least 10 feet or 5 feet plus the height of the fill, whichever is greater.

The sides of all excavations shall be sloped back or shall be supported according to County, State and Federal regulations.

d. Shrink-Swell Soils

High expansive potential (i.e. shrink-swell) soils were not encountered. Other locations that were not explored may have potential shrink-swell soils. These soils are not suitable for foundation subgrade, structural fill or for backfill around foundation walls.

With regard to such soils, Prince William County has issued the following IBC/IRC regulations defining "expansive" soil. The policy became effective January 2009. All geotechnical submissions shall be required to meet the guidelines stipulated below:

Definitions

A. Expansive soil is defined by the International Building Code and the International Residential Code as:

"Soils meeting all four of the following provisions shall be considered expansive, except that tests to show compliance with Items 1, 2 and 3 shall not be required if the test prescribed in Item 4 is conducted:

1. Plasticity Index (PI) of 15 or greater determined in accordance with ASTM D 4318.
2. More than 10 percent of the soil particles pass a No. 200 sieve (0.75 µm), determined in accordance with ASTM D 422.
3. More than 10 percent of the soil particles are less than 5 micrometers in size, determined in accordance with ASTM D 422.
4. Expansion Index greater than 20, determined in accordance with ASTM D 4829."

B. Plastic Index Corrected

$$PI_{cor} = PI \times \frac{(\% \text{ Passing No. 40 Sieve})}{100}$$

C. Expansive Index Corrected

$$EI_{cor} = EI \times \frac{(\% \text{ Passing No. 4 Sieve})}{100}$$

D. Liquid Limit – The water content corresponding to the behavior change between the liquid and plastic state of silt or clay soil, determined in accordance with ASTM D 4318.

Policy

If the Plasticity Index of the soil is 20 or less (e.g. PI <= 20) and the Liquid Limit is 45 or less (e.g. LL <= 45), the Plasticity Index Corrected (PI_{cor}) or the Expansion Index Corrected (EI_{cor}) may be substituted in the definition of Expansive Soil.

In support of this policy, Prince William County has defined unacceptably expansive soils beneath roadways as those with Liquid Limits (LL) and Plasticity Indexes (PI) greater than 40 and 15, respectively.

Beneath buildings and retaining walls unacceptably expansive soils are those with Liquid Limits and Plasticity Indexes of 40 and 15, or greater, respectively. This includes not only PLASTIC CLAY (CH) and ELASTIC SILT (MH) but also some Lean CLAY (CL) and SILT (ML).

If expansive soils, as defined above, are observed within 2 vertical feet of slabs, pavements, sidewalks, or curbs and gutters, they must be removed to a depth of at least 2 feet below the design subgrade and replaced with suitable well-graded compacted, controlled fill.

If expansive soils are observed at the design foundation bearing elevation, the footings for the proposed structures should extend through the expansive soils to bear on the underlying stiff or dense non-expansive soils.

Alternatively, foundations may rest on these expansive soils at a depth of at least 4 feet below the final exterior grades. This places the bearing elevation below the zone of normal seasonal moisture change.

If these soils are observed at the design footing elevation and within 4 feet of the design exterior grades, the footings for the proposed structures must be extended through the elastic or plastic soils to bear on the underlying stiff or dense non-plastic soils. This places the bearing elevation below the zone of normal seasonal moisture change.

If this alternative is selected the foundation may be constructed at the under-cut depth or the undercut may be back-filled to design footing bearing elevation with lean concrete, so- called "flowable fill".

e. On-Site Utilities

All underground utilities shall be installed in accordance with County and State regulations.

The sides of all excavations shall be sloped back or shall be supported according to County, State (VOSHA) and Federal (OSHA) regulations.

Backfill for utilities shall be placed in accordance with section **b. Structural Fill**, above, except that fill placed in landscaped areas need only be compacted to 95 percent of the maximum dry density according to ASTM D 698.

2. Site Drainage

All unpaved ground surfaces shall slope away from the buildings at a minimum grade of 5 %. This shall occur over a distance of not less than 10 feet. Roof drains must discharge beyond the limits of excavation for the foundations.

3. Road Construction

"The pavements design recommendations shall conform to the latest VDOT – Road and Bridge Standards and Specifications". Partial construction of the pavement section, a common practice in the industry, is likely to result in pavement and subgrade failure, due to inadequate support capability of an incomplete pavement, heavier than design traffic loads and maneuvering of construction traffic. Subgrade failures will likely translate to additional maintenance and poor performance of the permanent pavement if not repaired.

The subgrade for the paved road shall consist of firm, natural, inorganic, non-plastic soils or controlled, compacted fill, placed in accordance with item **1. Earthwork**, above.

If Highly Plastic SILT (MH) or CLAY (CH) is located within 2 vertical feet of the subgrade of the pavement, then the plastic soil shall be excavated to a depth of 2 feet below the pavement subgrade. The excavated material shall be replaced with compacted, controlled fill.

The soil subgrade in the paved areas, including the sidewalk, curb and gutter, and driveway aprons, is recommended to be compacted to at least 98 percent of the maximum dry density as determined by ASTM D698 Method (Standard Proctor) for soils up to 12 inches below the planned subgrade elevations for structural fills. The moisture content of the subgrade soils should be within plus or minus two (±2) percentage points of the optimum moisture content for these soils.

If the existing soils on site do not have the minimum CBR value of 3, the soil in pavement areas shall be scarified and re-compacted or replaced with suitable material to increase CBR values to the minimum specified. Alternatively, if soils in the pavement area do not satisfy the minimum CBR value, the design professional shall create a design that corrects the deficient subgrade conditions.

Graded Aggregate Course should be placed in accordance with the specification in the latest VDOT – Road and Bridge Standards and Specifications". Aggregate base course should be placed on a subgrade compacted to 98% of maximum dry density per Standard Proctor (ASTM D698).

4. Construction Monitoring

Soil Consultants recommends that all footing, slab and pavement subgrades and all fill operations, to include proof-rolling of subgrades as well as fill placement, be monitored during construction. Because of our familiarity with the site conditions and the recommendations of this report, Soil Consultants can effectively perform the required construction monitoring services.
Construction monitoring should include the following services during the construction phase of the project:

- Observe footing, slab, and pavement subgrades.
- Verify the suitability of off-site and on-site material for use as compacted, controlled fill beneath the structures by performing laboratory tests as required.
- Monitor and test subgrade and fill layers before, during and after fill placement.

- Perform at least one field density test for every 2500 square feet of fill placed to confirm that the required soil compaction has been achieved.
- Perform at least one field density test for each lift of fill placed for each 200 feet of utility trench, to confirm that required soil compaction has been achieved.
- Submit a daily field report for each day's work during construction summarizing the compaction test results, observations, and general quality control comments.
- Monitor concrete placement and perform laboratory compressive strength tests as required for compliance with project specifications.

REMARKS

The evaluations and recommendations of this report are based upon the observations at point locations using soil borings. Soil conditions often change from one point to another. Therefore, different conditions may be encountered during construction in areas outside the test locations. If conditions observed at the site during construction are different from those described in this report, we shall be immediately notified so that we may decide if such situations will require any changes in the geotechnical recommendations. Soil Consultants will not be responsible for any modification to, or incorrect interpretation of, its recommendations by others.

This report contains geotechnical-engineering requirements that must be followed to provide suitable subgrades for building foundations, slabs, and pavements. When a final site plan and architectural and structural drawings are available, Soil Consultants shall be authorized to review these plans, and to decide if any changes to the geotechnical requirements are necessary.

Soil Consultants Engineering has provided this report for use by the client and client's design professionals to make site evaluations and to aid in the design of the project. This report may be made available to contractors. However, the report would be for their information only and it may not be sufficient to estimate costs and quantities. Our scope of services did not include environmental matters, wetlands, specific construction dewatering recommendations, slope stability analysis, storm water management and cost/quantity estimates.

Sincerely,

For: **SOIL CONSULTANTS ENGINEERING, LLC.**

Julia DiGaetano
Geotechnical Project Manager

Lubomir D. Peytchev, P.E.
Senior Geotechnical Engineer

QUALIFICATIONS

All findings presented in this report are based upon the assumption that the subsurface conditions do not deviate appreciably from those revealed by the soil boring locations.

Since the subsurface conditions may vary substantially from those shown in the subsurface exploration, any change in soil type during construction, or change in location plan and/or grade should be provided to Soil Consultants so that the conclusions and recommendations might be modified.

In conducting this investigation, our professional services have been performed, our findings obtained, and our recommendations made according to generally accepted engineering principles and practices. This warranty is instead of all other warranties either expressed or implied. Any conclusions or recommendations based on data contained in this report made by others are the responsibilities of others.

SCE Project No. 22-50023V

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engsurvgrp.com
Central Office
13580 Groupe Drive, Suite 200
Woodbridge, VA 22192
PH: 703.670.0085
South Office
10333 Southpoint Landing Blvd, Suite 121
Fredericksburg, VA 22407
PH: 703.670.0085
West Office
42795 Generation Drive, Suite 200
Ashburn, VA 20147
PH: 703.670.0085

NO.	DATE	COUNTY REVISIONS

GEOTECHNICAL RECOMMENDATIONS
HAYMARKET TOWN PARK STREETSCAPE
RFP: 2022-001
TOWN OF HAYMARKET, VIRGINIA

ENGINEERING GROUPE PROJECT STATUS

DATE	ACTION

DATE: JULY 14, 2023
SCALE: N/A
DESIGNER: JM.,R.A.P.,J.B.
DRAFTSMAN: Y.Q.
FILE NO. PP-286
SHEET 21 OF 22

G:\PROJECT\Town of Haymarket-Streetscape\ENG\DWG\00-K7000 GEOTECH.dwg, 7/17/2023 1

7.3.b
Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)
Packet Pg. 77

EFFECTIVE DATE: March 1, 2022

PRINCE WILLIAM COUNTY
DEPARTMENT OF DEVELOPMENT SERVICES - LAND DEVELOPMENT DIVISION
UNIT PRICE LIST
FOR
PERFORMANCE BONDS, LANDSCAPE ESCROWS, SILTATION & EROSION CONTROL ESCROWS, AND FLOODPLAIN ITEM ESCROWS

PROJECT NAME: Haymarket Town Park Streetscape
P.W.C. FILE#: DATE PREPARED: July 12, 2023

NOTE:
This form is to be used to estimate Performance Bond, Landscape Escrow, Siltation Erosion Escrow and Floodplain Item prices prices posted with Prince William County. These prices do not include items that are to be bonded separately with the Virginia Department of Transportation.

1. MOBILIZATION/DEMOBILIZATION OF CONSTRUCTION EQUIPMENT

Mobilization/Demobilization	Lump Sum	$15,000.00	(min.)

2. STORM DRAINAGE

A. STRUCTURES

QUANTITY				COST
	DI-1	@	$6,900.00 EA	
	DI-3	@	$6,900.00 EA	
	DI-4	@	$6,900.00 EA	
	MH-1	@	$4,900.00 EA	
	MH-2	@	$4,500.00 EA	
	JB-1	@	$7,175.00 EA	
1	DI-7	@	$6,800.00 EA	6,800.00
	DI-12	@	$6,800.00 EA	
			Subtotal for Structures:	$6,800.00

B. CONCRETE PIPE

QUANTITY				COST
	12" DIA.	@	$82.00 LF	
	15" DIA.	@	$82.00 LF	
28	18" DIA.	@	$82.00 LF	2,296.00
	21" DIA.	@	$82.00 LF	
	24" DIA.	@	$103.00 LF	
	27" DIA.	@	$103.00 LF	
	30" DIA.	@	$103.00 LF	
	33" DIA.	@	$207.00 LF	
	36" DIA.	@	$207.00 LF	
	42" DIA.	@	$207.00 LF	
	48" DIA.	@	$207.00 LF	
	54" DIA.	@	$365.00 LF	
	60" DIA.	@	$365.00 LF	
	66" DIA.	@	$365.00 LF	
	72" DIA.	@	$453.00 LF	
			Subtotal for Concrete Pipes:	$2,296.00

C. END WALLS

QUANTITY				COST
	12" DIA.	@	$1,950.00 EA	
	15" DIA.	@	$1,950.00 EA	
	18" DIA.	@	$1,950.00 EA	
	21" DIA.	@	$1,950.00 EA	
	24" DIA.	@	$1,950.00 EA	
	27" DIA.	@	$1,950.00 EA	
	30" DIA.	@	$2,100.00 EA	
	33" DIA.	@	$2,300.00 EA	
	36" DIA.	@	$2,800.00 EA	
	42" DIA.	@	$7,236.00 EA	
	48" DIA.	@	$7,236.00 EA	
	54" DIA.	@	$7,236.00 EA	
	60" DIA.	@	$7,236.00 EA	
	66" DIA.	@	$7,236.00 EA	
	72" DIA.	@	$9,854.00 EA	
			Subtotal for End Walls:	$0.00

D. END SECTIONS (ES-1)

QUANTITY				COST
2	12" DIA.	@	$1,048.00 EA	2,096.00
	15" DIA.	@	$1,048.00 EA	
	18" DIA.	@	$1,048.00 EA	
	21" DIA.	@	$1,048.00 EA	
	24" DIA.	@	$1,048.00 EA	
	27" DIA.	@	$1,200.00 EA	
	30" DIA.	@	$1,130.00 EA	
	33" DIA.	@	$1,500.00 EA	
	36" DIA.	@	$1,900.00 EA	
	42"-60" DIA.	@	$3,050.00 EA	
			Subtotal for End Sections ES-1	$2,096.00

E. CORRUGATED METAL PIPES

QUANTITY				COST
60	12" DIA.	@	$40.00 LF	2,400.00
	15" DIA.	@	$60.00 LF	
	18" DIA.	@	$80.00 LF	
	24" DIA.	@	$80.00 LF	
	30" DIA.	@	$80.00 LF	
	36" DIA.	@	$140.00 LF	
	42" DIA.	@	$140.00 LF	
	48" DIA.	@	$140.00 LF	
	54" DIA.	@	$250.00 LF	
	60" DIA.	@	$250.00 LF	
			Subtotal for End Sections ES-1	$2,400.00

F. END SECTION (ES-2)

QUANTITY				COST
2	15" DIA.	@	$870.00 EA	1,740.00
	18" DIA.	@	$870.00 EA	
	24" DIA.	@	$870.00 EA	
	30" DIA.	@	$1,100.00 EA	
	42" DIA.	@	$1,400.00 EA	
	48" DIA.	@	$1,800.00 EA	
			Subtotal for End Sections (ES-2):	$1,740.00

G. AD N-12 (HDPE)

QUANTITY				COST
	12" DIA.	@	$45.00 LF	
	15" DIA.	@	$106.00 LF	
	18" DIA.	@	$106.00 LF	
	24" DIA.	@	$106.00 LF	
	30" DIA.	@	$106.00 LF	
	36" DIA.	@	$170.00 LF	
	42" DIA.	@	$170.00 LF	
	48" DIA.	@	$170.00 LF	
	60" DIA.	@	$250.00 LF	
			Subtotal for AD N-12 HDPE:	$0.00

H. STORMWATER MANAGEMENT/BMP FACILITIES COST ESTIMATES PER IMPERVIOUS ACRE TREATED (See note #3)

QUANTITY	ITEM	PRICE	COST
	Non-Proprietary BMP (Engineer Estimate for all SWM)		
	Dry Retention Pond		
	Dry Extended Detention Pond		
	Wet Pond/Wetlands		
	Bioswale		
	Vegetated Grass Channel		
	Micro-Bio Retention (Raingarden)		
	Infiltration Practices without Sand		
	Infiltration Practices with Sand		
	Filtering Practices with Sand Below Ground		
	Filtering Practices with Sand Above Ground		
	Permeable Pavement Level 2 Design		
	Vegetated Roof Level 1 Design		
	Vegetated Roof Level 2 Design		
	Soil Compost Amendment		
	Rooftop Impervious Surface Disconnection		
	Sheet Flow to a Vegetated Filter Strip		
	Proprietary/Manufactured BMP-manufacturer's Certified Cost Plus Construction Cost		
	Aqua-Swirl Stormwater Treatment System		
	BaySeparator		
	Continuous Defective Separator (CDS)		
	Downstream Defender		
	Hydroguard		
	Stormceptor MAX		
	Stormceptor OSR		
	Srormceptor STC		
	StormPro		
	Storm Water Quality Unit		
	V2B1		
	The Vortechs System		
	Aqua-Filter Stormwater Filtration System		
	Storm Tech Isolator Row		
	Up-Flow Filter with CPZ Media		
	The Stormwater Management Storm Filter with ZPG Media		
	Bay Filter Stormwater Carridge System		
	Filtera Bioretention Systems		
	Jellyfish Filter		
	Modular Wetland System Linear (MWS-Linear)		
	Perk Filter		
	The Stormwater Management Storm Filter with Phosphosorb Media		

Subtotal for Stormwater Management/BMP Facilities Cost Estimates Per Impervious Acre Treated: $0.00

I. MISCELLANEOUS STORMWATER MANAGEMENT:

QUANTITY	ITEM		PRICE	COST
	Seed, Fertilizer & Mulch ($200 Min.)	@	$3.00 SY	
	Sod	@	$8.00 SY	
	Hydraulic Cement Concrete - 4" depth	@	$8.00 SF	
	Bituminous Concrete - 1" depth	@	$6.00 SY	
	Rip Rap	@	$7.75 SF	
	Grouted Rip-Rap	@	$9.00 SF	
	Erosion Control Stone (EC-1)	@	$130.00 TON	
	#57 - Coarse Agregate	@	$30.00 TON	
	4' High Chain Link Fence (#9 gauge of better, including braces, end posts and gate)	@	$45.00 LF	
	6' High Chain Link Fence (#9 gauge or better, including braces, end posts and gate)	@	$45.00 LF	
	SWM Sign (WATER RISES RAPIDLY) (Minimum 3 signs per facility)	@	$390.00 EA	
	Access Road	By itemized cost		

Subtotal for Miscellaneous Stormwater Management: $0.00

J. MISCELLANEOUS DRAINAGE ITEMS:

QUANTITY	ITEM		PRICE	COST
	Box Culvert	@	$840.00 CY of Concrete	
	Energy Dissipator	@	$2,250.00 EA	
	Wing Walls	@	$990.00 CY of Concrete	
	Ditches			
	Roadside Standard Ditches (Seed, Fertilize and Mulch)	@	$8.00 LF	
	Sod Ditches	@	$10.50 LF	
	Paved Ditches	@	$8.50 SF	
	Filter Cloth Fabric & Gabion Stone	@	$22.00 SF	
	Rip Rap	@	$7.75 SF	
	Grouted Rip-Rap	@	$9.00 SF	
	Paved Flume	@	$10.00 SF	
	Flush the Drainage System	@	$290.00 Hr(Min 8 Hr)	

Subtotal for Miscellaneous Drainage Items: $0.00

3. CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY AND/OR PRIVATE INGRESS/EGRESS EASEMENTS

A. SITE WORK

QUANTITY			COST
	Clear & Grub	@ $12,800.00 AC	
	Excavation	@ $35.00 CY	
	Embankment* (Cut & Fill)	@ $25.00 CY	
	Embankment (Haul Off)	@ $36.00 CY	
	Final Grading	@ $5,000.00 AC	
	Rock Excavation	@ $75.00 CY	
	Slope Stabilization - Hydro Seeding		
	3:1 or flatter ($1,000 Min.)	@ $1.25 SY	
	Slope Stabilization - Jute Mesh, Matting, Blankets, etc.		
	Between 2:1 to 3:1 ($200 Min.)	@ $6.00 SY	
	Slope Stabilization - Sod		
	Between 2:1 to 3:1 ($200 Min.)	@ $8.00 SY	
	Steep Slopes (Grading and Stabilization with Jute Mesh, Netting, Blankets, etc.)	@ $20.00 SY	

Subtotal for Site Work: $0.00

B. SUBGRADE, SUBBASE AND BASE COURSE ITEMS

QUANTITY			COST
	Subgrade preparation (Subbase and Base Course)	@ $3.50 SY	
	Aggregate (21A/21B)	@ $3.00 SY Per Inch Depth	
	Bituminous Concrete	@ $6.25 SY Per Inch Depth	
	Reinforced Concrete Pavement	@ $18.00 SY Per Inch Depth	
	Gravel Shoulders (4" Depth)	@ $12.00 SY (4" Depth)	
	Soil Cem. Stabilization (4%)	@ $24.00 SY (6" Depth)	
	Lime Stabilization (10%)	@ $16.00 SY (6" Depth)	
	Cement Treated Aggregate	@ $11.00 SY (per Inch Depth)	
	UNDERDRAINS:		
	UD-1	@ $21.00 LF	
	UD-2	@ $21.00 LF	
	UD-3	@ $21.00 LF	
	UD-4	@ $21.00 LF	

Subtotal for Subgrade, Subbase, Base Course Items & Underdrains (Public): $0.00

VDOT BOND					
QUANTITY	ITEM				COST
355	12" Aggregate (/21B)	@	$3.00	SY Per Inch Depth	$12,780.00
273	11.5" Bituminous Concrete	@	$6.25	SY Per Inch Depth	$19,621.88
492	UD-4	@	$21.00	LF	$10,332.00
2	CG-12B	@	$2,000.00	EA	$2,000.00
2	CG-9D	@	$5,750.00	EA	$11,500.00
510	Sidewalk (5' Width)	@	$40.00	LF	$20,400.00
485	Curb (CG-2)	@	$25.00	LF	$12,125.00
3	DI-3	@	$6,900.00	EA	$20,700.00
485	15" RCP Pipe	@	$82.00	LF	$39,770.00
5	Street Lights	@	$5,500.00	EA	$27,500.00
				TOTAL	$176,728.88

C. ENTRANCES AND PIPESTEMS

QUANTITY	ITEM			COST
	DE-1	@	$1,800.00 EA	
	DE-2	@	$1,950.00 EA	
	DE-3	@	$2,000.00 EA	
	DE-4	@	$2,300.00 EA	
	PP-1 (1 lot)	@	$2,000.00 EA	
	PP-1 (2-5 lots)	@	$2,300.00 EA	
	PP-2 (1 lot)	@	$1,725.00 EA	
	PP-2 (2-5 lots)	@	$1,725.00 EA	
	CG-9D or equal : 30' Width	@	$5,750.00 EA	
	CG-9D or equal : 40' Width	@	$7,475.00 EA	
	CG-10A or equal : 30' Width	@	$4,738.00 EA	
	CG-10A or equal : 40' Width	@	$6,095.00 EA	
	CG-11 : Concrete Entrance	@	$3,450.00 EA	
	Valley Gutter	@	$61.00 SY	
	Pipestem Driveway - 10' (1 lot)	@	$61.00 LF	
	Pipestem Driveway - 18' (2-5 lots)	@	$81.00 LF	

Subtotal for Entrance and Pipe Stems: $0.00

D. MISCELLANEOUS CONSTRUCTION ITEMS

QUANTITY	ITEM			COST
	Sidewalk (5' Width)	@	$40.00 LF	
	Header Curb (CG-2/CG-3)	@	$25.00 LF	
	Curb & Gutter	@	$28.00 LF	
	CG-12 (Truncated Dome)	@	$2,000.00 EA	
	Bicycle Trail/Walkway	@	$11.00 SF	
	Raised Concrete Median (MS-1A)	@	$81.00 SY	
	Trail (Wood Chip)	@	$19.00 SY	
	Trail (Stone Dust)	@	$19.00 SY	
	Retaining Walls			
	Timber	@	$34.00 SF	
	Crib	@	$44.00 SF	
	MSE/Geogrid	@	$50.00 SF	
	Gravity Wall	@	$72.00 SY	
	Excavation for Tiebacks in walls in cut areas	@	$29.00 CY	
	Anti-graffiti Pain (Concrete Retaining Walls only-treatment/sealant) ($2,500 Min.)	@	$18.00 SF	
	Guardrail	@	$45.00 LF	
	GR-7 NCHRP 350	@	$3,640.00 EA	
	GR-9	@	$3,640.00 EA	
	Address Sign (Entrance to Pipestems)	@	$460.00 EA	
	Street Name Sign	@	$525.00 EA	
	Traffic Control Sign	@	$450.00 EA	
	Bus Stop Sign	@	$415.00 EA	
	Bus Shelter	@	$24,000.00 EA	
	Traffic Signal (Lump Sum)	@		
	HC Parking Space Sign	@	$720.00 EA	
	Bike Rack	@	$350.00 EA	
	Roadside Delineators (ED-1)	@	$75.00 EA	
	Hand Rail (HR-1)	@	$120.00 LF	
	Pavement Marking (Paint)	@	$2.50 SF	
	Pavement Marking (Thermoplastic)	@	$7.00 SF	
	Traffic Barricade (TB-1)	@	$1,725.00 EA	
	Street Lighting	@	$5,500.00 EA	
	Utilities Relocation (Lump Sum) (Min $46,000) (or provide an estimate from utility company)	(Min.	$46,000.00)	
	VDOT Street Acceptance Package	@	$7,000.00 EA	
1	P.E. Certified "As-Built" Plans (Lump Sum)	(Min.	$12,000.00)	12,000.00

Subtotal for Miscellaneous Construction Items: $12,000.00

4. SANITARY SEWER & WATER LINE CONSTRUCTION

QUANTITY	ITEM			COST
	Fire Hydrant Assembly	@	$9,200.00 EA	
	Central Sewer Lift/Pump Station Construction	@	Lump Sum	
	WATER MAIN (Exclusive of Fire Hydrants)			
	4" DIA. DIP	@	$60.00 LF	
	6" DIA. DIP	@	$75.00 LF	
	8" DIA. DIP	@	$90.00 LF	
	12" DIA. DIP	@	$125.00 LF	
	16" DIA. DIP	@	$165.00 LF	
	18" DIA. DIP	@	$185.00 LF	
	4" DIA. or 6" DIA. RW Valve (with accessories)	@	$1,200.00 EA	
	8" DIA. or 12"DIA. RW Valve (with accessories)	@	$3,000.00 EA	
	16"DIA. or 24"DIA. RW Valve (with accessories)	@	$7,000.00 EA	
	Standard Meter Crock & Appurtenances (Angle Valve,Backflow Preventer, Yoke, Frame & Cover & Service Line)	@	$2,500.00 EA	
	Meter Vault & Appurtenances (3" meters & larger)	@	$40,000.00 EA	
	Water Main Blow-Off Assembley	@	$3,000.00 EA	
	Air Release Assembly	@	$6,800.00 EA	
	Dead End Anchor System	@	$10,000.00 EA	

Subtotal for Water Main: $0.00

QUANTITY	ITEM			COST
	SANITARY SEWER PIPE LINE (Exclusive of Manhole Structures)			
	1.5" DIA. thru 4" DIA. LPFM (Low Pressure Force Main System)	@	$35.00 LF	
	8" DIA. PVC	@	$81.00 LF	
	8" DIA. DIP	@	$95.00 LF	
	10" DIA. PVC	@	$100.00 LF	
	10" DIA. DIP	@	$110.00 LF	
	12" DIA. PVC	@	$170.00 LF	
	12" DIA. DIP	@	$185.00 LF	
	15" DIA. PVC	@	$225.00 LF	
	4' DIA. Sanitary Sewer Manhole	@	$11,000.00 EA	
	5' DIA. Sanitary Sewer Manhole	@	$11,000.00 EA	
	Street Manhole Frame & Cover Assembly (including rain bowl and chimney seal)	@	$1,200.00 EA	
	Easement Manhole Frame & Cover Assembly (including Chimney Seal)	@	$1,200.00 EA	
	Abandonment of Manhole	@	$290.00 VF	
	4" DIA. PVC Lateral (including clean-out stack)	@	$50.00 LF	
	4" DIA. DIP Lateral (including clean-out stack)	@	$60.00 LF	
	6" DIA. PVC Lateral (including clean-out stack)	@	$70.00 LF	
	6" DIA. DIP Lateral (including clean-out stack)	@	$75.00 LF	
	LPFM Flushing Station	@	$2,900.00 EA	
	Sewerage Air Release/Vaccuum Breaker Assembly	@	$4,050.00 EA	
	Steel Casing	@	$600.00 LF	
	Grease Trap (500 gal. Minimum)	@	$5,200.00 EA	

For sizes larger than 15" Dia., add $4.60 per inch increase in diameter.

Subtotal for Sanitary Sewer Pipe: $0.00

TOTAL CONSTRUCTION COST = $40,236.00

5. MISCELLANEOUS COSTS

A. Administrative Cost - 10% of the total construction cost, not to exceed $50,000. = $4,023.60

B. Inflation Cost - Compounded anually at 3.0% per year of the total construction cost. = $1,810.62

TOTAL PERFORMANCE BOND AMOUNT: $46,070.22

6. FLOODPLAIN ITEMS ESCROW

QUANTITY	ITEM	PRICE	COST
	LOMR	@ $18,000.00 EA	
	Elevation Certificate	@ $1,000.00 EA	
	LOMC (SF Detached)	@ $1,800.00 EA	
	Stream Restoration		
	By Itemized Cost		

TOTAL FLOODPLAIN ITEMS ESCROW: $0.00

7. LANDSCAPING ESCROWS

	A. Deciduous Trees			
	4'-5'	@	EA	
	5'-6'	@	$300.00 EA	
5	1"-1 1/2" or 1 1/2"-2"	@	$450.00 EA	2,250.00
	2"-2 1/2" or 2 1/2"-3"	@	$600.00 EA	
	3"-3 1/2" or 3 1/2"-4"	@	$959.00 EA	
	B. Evergreen Trees			
	4'-5'	@	EA	
	5'-6'	@	$250.00 EA	
	6'-7'	@	$270.00 EA	
	7'-8'	@	$450.00 EA	
	8'-10'	@	$830.00 EA	
	C. Shrubs			
	18"-24"	@	$60.00 EA	
	24"-30"	@	$80.00 EA	
	D. Ornamental			
	1 Gal (#1)	@	$35.00 EA	
	2 Gal (#2)	@	$45.00 EA	
	3 Gal (#3)	@	$50.00 EA	
	E. Perenial			
	18"-24"	@	$15.00 EA	
	F. Reforestation			
	# of Acres	@	$11,700.00 AC	

TOTAL LANDSCAPE ESCROW AMOUNT: $2,250.00

8. SILTATION AND EROSION CONTROL ESCROWS

QUANTITY				COST
426	Diversion Dike	@	$7.00 LF	2,982.00
	Cleaning out SWM Facilities, Silt Traps and Silt Basins	@	$600.00 /Hr. Lump Sum (Min. $20,000)	
608	Silt Fence: 0' - 1,000' (installation, maintenance for 1 year & removal)	@	$8.00 LF	4,864.00
	Silt Fence: 1,001' - 10,000' (installation, maintenance for 1 year & removal)	@	$6.00 LF	
	Silt Fence: 10,001' + (installation, maintenance for 1 year & removal)	@	$4.00 LF	
	Super Silt Fence: 0' - 1,000' (installation, maintenance for 1 year & removal)	@	$20.00 LF	
	Super Silt Fence: 1,001' - 10,000' (installation, maintenance for 1 year & removal)	@	$12.00 LF	
	Super Silt Fence: 10,001' + (installation, maintenance for 1 year & removal)	@	$11.00 LF	
3049	Sod	@	$8.00 SY	9,147.00
	Seed, fertilizer & Mulch ($200 min.)	@	$3.00 SY	
	Steep Slopes (Grading and Stabilization with Jute Mesh, Netting, Blankets, etc.)	@	$18.00 SY	
	Coarse Aggregates (#1 or #57)	@	$35.00 TON	
9	Inlet Protection	@	$190.00 EA	1,710.00
	Check Dam	@	$250.00 EA	
1	Temp. Const. Entrance	@	$2,300.00 EA	2,300.00
1	Wash Rack	@	$2,000.00 EA	2,000.00
	Temp. Sediment Trap (D.A. up to 1 Ac.)	@	$1,000.00 EA	
	(D.A. 1-2 Ac.)	@	$1,500.00 EA	
	(D.A. 2-3 Ac.)	@	$2,000.00 EA	
	Temporary Sediment Basin:	By itemized Cost		
	Channel Diversion	By itemized Cost		
	6' Chain-Link Safety Fence	@	$50.00 LF	
	4' Plastic Orange Safety Fence (TP)	@	$4.00 LF	
	Yard Utility Refurbishment	@	$875.00 EA Single Family Lot	
	Stockpile Removal (Quantity based on policy)	@	$30.00 CY	
1	Removal of Erosion Control Measures	@	$1,000.00 AC (min $1000 per AC)	1,000.00
	Level Spreader	@	By itemized cost	

TOTAL COST = $24,003.00

Administrative Cost [10% of Total Cost] = $2,400.30

TOTAL SILTATION & EROSION CONTROL ESCROW AMOUNT: $26,403.30

Minimum acceptable amount for Siltation and Erosion Control Escrow is $2,500.00

I hereby certify that the above is my best estimate of the quantities and current costs of bondable improvements, landscaping items, Siltation & Erosion Control Escrow and Floodplain items in this subdivision or site plan.

PREPARER'S SIGNATURE — 703-670-0985 TELEPHONE#

DENAR H. C. ANTELO — NAME (print)

THE ENGINEERING GROUP E, INC. — COMPANY OR FIRM

NOTES:

1. For items identified with ** the quantity for the embankment material is the net difference of total fill material needed and cut material available at the project site, if excavated or cut material is suitable for embankment.
2. The excavation and embankment costs include the necessary grading, spreading, and/or compaction of soil in accordance with County and State Standards and Specifications.
3. The unit cost for each of the items in this Unit Price List is the installation cost which includes factors such as materials, excavation, bedding, backfilling, compaction, form work, etc.
4. Inflation has been calculated based on the Northern Virginia Consumer Price Index of the Washington D.C. area provided by the Bureau of Labor and Statistics.
5. Whoever certifies the site development plans must also certify the total cost of the bonded items, landscaping escrow and siltation and erosion control escrow and must sign of "Prepare's Signature" of this form.
6. Floodplain Items Escrow not to be part of Bond/Escrow redduction.

The Engineering Groupe Inc.
Engineers | Surveyors | Planners
www.engroupe.com
West Office: 42795 Generation Drive, Suite 200, Ashburn, VA 20147, (P) 1 703-670-0985
South Office: 10333 Southpoint Landing Blvd, Suite 121, Fredericksburg, VA 22407, (P) 1 703-670-0985
Central Office: 13580 Groupe Drive, Suite 200, Woodbridge, VA 22192, (P) 1 703-670-0985

NO.	DATE	COUNTY REVISIONS

UNIT PRICE LIST
HAYMARKET TOWN PARK STREETSCAPE
RFP: 2022-001
TOWN OF HAYMARKET, VIRGINIA

COMMONWEALTH OF VIRGINIA
DENAR H. C. ANTELO
Lic. No. 38680
7/14/2023
PROFESSIONAL ENGINEER

ENGINEERING GROUPE PROJECT STATUS		
		DATE: JULY 14, 2023
		SCALE: N/A
		DESIGNER: JM.,R.A.P.,J.B. DRAFTSMAN: Y.O.
		FILE NO. PP-286
DATE	ACTION	SHEET 22 OF 22

Attachment: 02 Town of Haymarket Streetscape (6263 : Town Park Sidewalk)

Town of Haymarket
15000 Washington Street, #100
Haymarket, VA 20169
703-753-2600

Thomas Britt
Town Planner

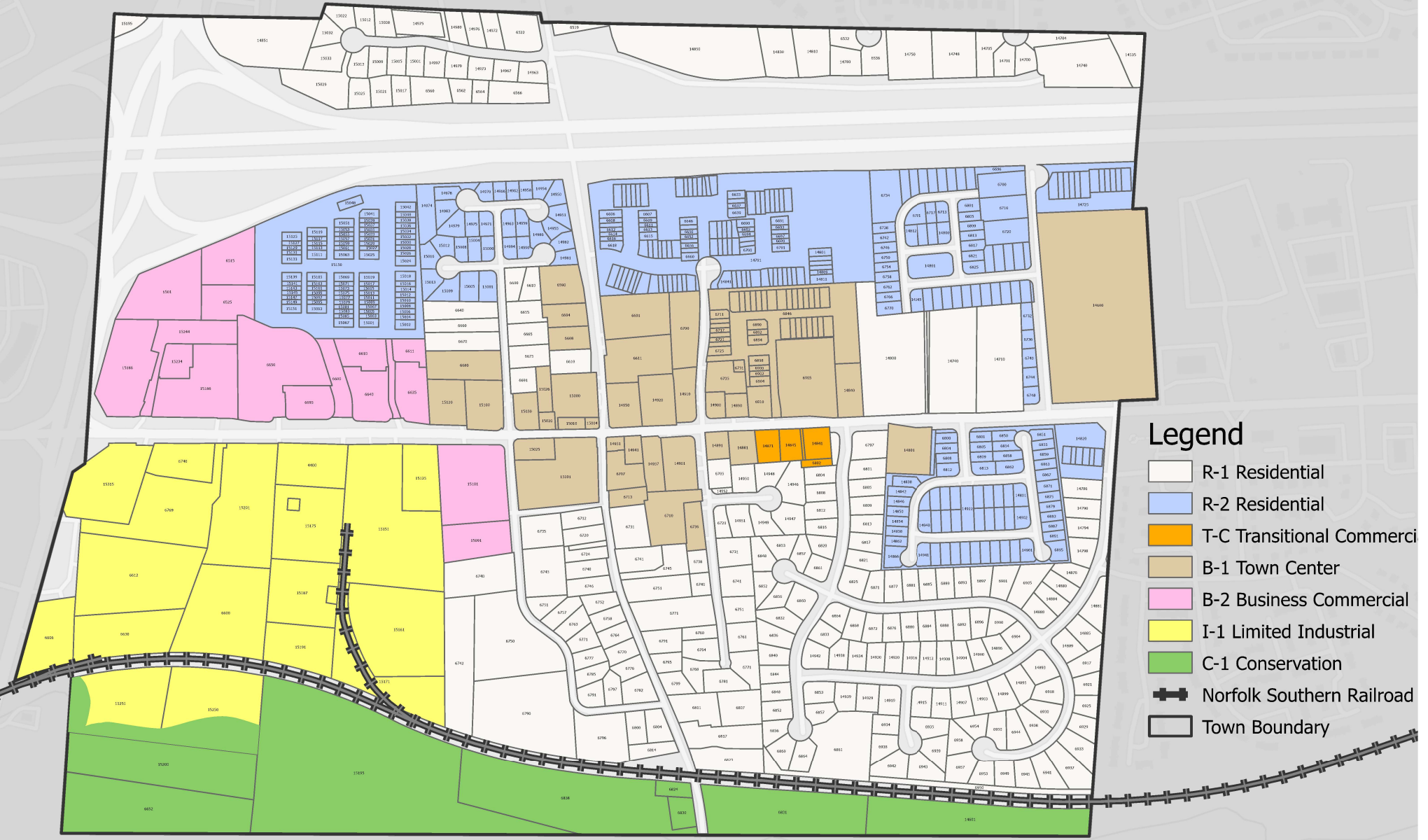
MEMORANDUM

TO: Planning Commission
FROM: Thomas Britt, Town Planner
DATE: August 7, 2023
SUBJECT: Haymarket Zoning Map

Background: The Haymarket Zoning Map as found in the Zoning Ordinance has not been updated to show newer developments and parcels within the Town. The Town Planner has provided an updated zoning map for the Planning Commission to review and provide feedback on the design and other elements of the map.

Attachment: 01 Town Park Streetscape Updates (6264 : Haymarket Zoning Map)

Town of Haymarket Zoning



Attachment: 02 Haymarket Zoning Map Draft (6264 : Haymarket Zoning Map)

Esri Community Maps Contributors, County of Prince William, VGIN, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, U