TIFFANY ESTATES

CONSTRUCTION PLAN

CONP-23-019202

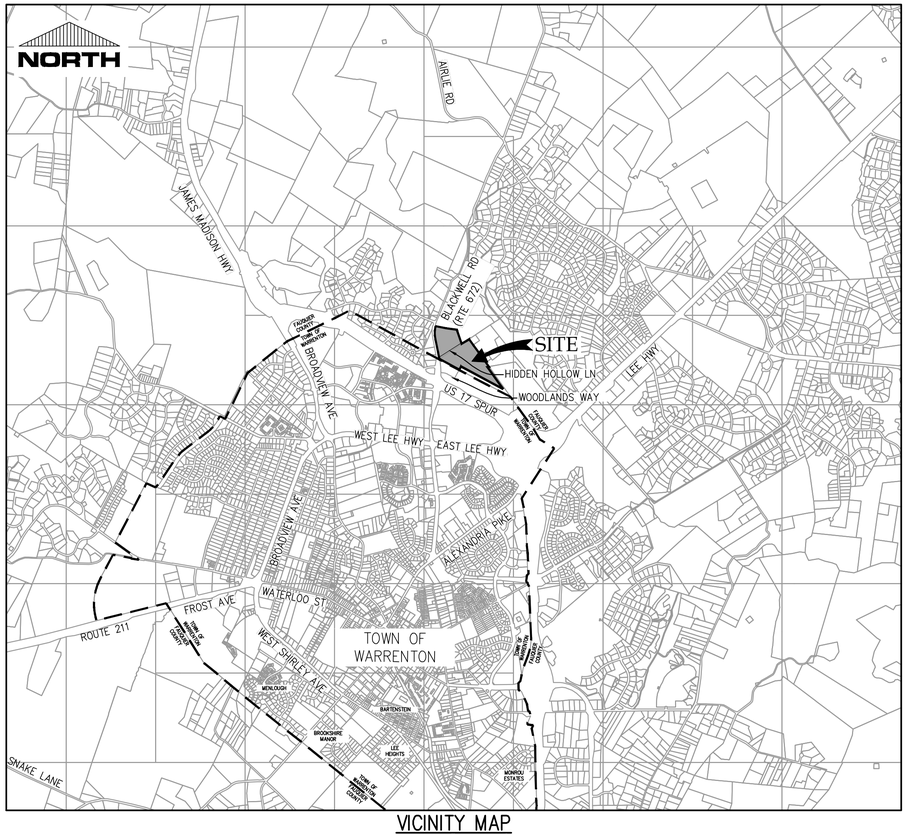
CENTER MAGISTERIAL DISTRICT
WARRENTON SERVICE DISTRICT
FAUQUIER COUNTY, VIRGINIA

GENERAL NOTES

1. THE PROPERTY SHOWN HEREON IS DESIGNATED AS FAUQUIER COUNTY PARCEL IDENTIFICATION NUMBER (GPIN) 6985-51-6810-000 AND 6985-60-5718-000. THE TOTAL PARCEL AREA IS 32.18 ACRES. THE SITE IS CURRENTLY ZONED R1.
2. THIS PROPERTY IS IN THE NAME OF DAVID M. DOBSON AS RECORDED IN DEED BOOK 1119 AT PAGE 1311 AND DEED BOOK 1119 AT PAGE 1316 AMONG THE LAND RECORDS OF FAUQUIER COUNTY.
3. THE PLAT AND THE SURVEY UPON WHICH THIS PLAN IS BASED SHOWS ONLY THOSE IMPROVEMENTS THAT ARE OBSERVABLE AND CAN BE LOCATED USING NORMAL SURVEY METHODS. THE INTERIOR IMPROVEMENTS SHOWN HEREON ARE COMPILED FROM AN AERIAL SURVEY OF THE PROPERTY. THERE IS NO GUARANTEE THAT THE UTILITIES SHOWN HEREON COMPRISE ALL UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED NOR THAT THE UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. UNDERGROUND UTILITIES HAVE NOT BEEN PHYSICALLY LOCATED.
4. THE SUBJECT PROPERTY IS LOCATED ON FEMA FLOOD INSURANCE RATE MAP FOR FAUQUIER COUNTY, VIRGINIA, COMMUNITY PANEL NUMBER 51061C0306D, EFFECTIVE DATE APRIL 25, 2024. THE PROPERTY IS LOCATED IN ZONE X.
5. THERE ARE CURRENTLY NO MAPPED DAM BREAK INUNDATION ZONES ON THE SITE.
6. TOPOGRAPHIC INFORMATION SHOWN HEREON WAS OBTAINED FROM AN AERIAL SURVEY OF THE PROPERTY CONDUCTED BY BOWMAN CONSULTING GROUP, LTD. ON SEPTEMBER 28, 2022 AND IS SHOWN AT A 2' CONTOUR INTERVAL. OFFSITE TOPOGRAPHIC INFORMATION WAS OBTAINED FROM FAUQUIER COUNTY GIS INFORMATION AND IS SHOWN AT A 5' CONTOUR INTERVAL. VERTICAL INFORMATION SHOWN IS BASED ON NAVD 88.
7. THE BOUNDARY INFORMATION SHOWN HEREON IS COMPILED FROM EXISTING LAND RECORDS OF FAUQUIER COUNTY AND A FIELD SURVEY BY BOWMAN CONSULTING GROUP, LTD. ON FEBRUARY 17-24, 2022. THE HORIZONTAL DATUM AS REFERENCED HEREON WAS ESTABLISHED BY STATIC GPS CONTROL METHODS. THE HORIZONTAL DATUM IS REFERENCED TO VIRGINIA STATE GRID, NORTH ZONE, NAD 83 (2011) AND IS REFERENCED IN U.S. SURVEY FEET.
8. NO EVIDENCE WAS FOUND OF: EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS WITHIN RECENT MONTHS; CHANGES IN STREET RIGHT OF WAY LINES EITHER COMPLETED OR PROPOSED, AND AVAILABLE FROM THE CONTROLLING JURISDICTION; RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS; THE PROPERTY BEING USED AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.
9. THE EXISTING PROPERTY SHOWN HEREIN IS PROPOSED TO BE SUBDIVIDED INTO RESIDENTIAL LOTS. THE PROPOSED PLAN IS FOR THE CONSTRUCTION OF 21 RESIDENTIAL UNITS, ONE EXISTING HOME THAT WILL REMAIN ON A PROPOSED LOT, AND FOUR RESIDUAL OPEN SPACE LOTS.
10. SEWER SERVICE FOR ALL RESIDENTIAL LOTS SHALL BE PROVIDED BY INDIVIDUAL ON-LOT DRAINFIELDS. WATER SERVICE WILL BE PROVIDED BY THE TOWN OF WARRENTON.
11. METHODS AND MATERIALS USED IN THE CONSTRUCTION OF THE IMPROVEMENTS HEREIN SHALL CONFORM TO THE CURRENT FAUQUIER COUNTY CONSTRUCTION STANDARDS AND SPECIFICATIONS AND/OR CURRENT VDOT STANDARDS AND SPECIFICATIONS.
12. MEASURES TO CONTROL EROSION AND SILTATION, INCLUDING DETENTION PONDS SERVING AS SILT BASINS DURING CONSTRUCTION, MUST BE PROVIDED PRIOR TO ISSUANCE OF THE SITE DEVELOPMENT PERMIT. THE APPROVAL OF THESE PLANS IN NO WAY RELIEVES THE DEVELOPER OR HIS AGENT OF THE RESPONSIBILITIES CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
13. A PERMIT MUST BE OBTAINED FROM VDOT PRIOR TO CONSTRUCTION IN EXISTING STREET RIGHT-OF-WAY.
14. APPROVAL OF THIS PLAN DOES NOT GUARANTEE ISSUANCE OF AN ENTRANCE PERMIT BY VDOT WHEN SUCH PERMIT IS REQUIRED UNDER STATE LAW.
15. THE EXACT LOCATION OF ALL GUARD RAILS WILL BE DETERMINED BY VDOT. A JOINT INSPECTION WILL BE HELD WITH THE DEVELOPER, AND REPRESENTATIVES OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) TO DETERMINE IF AND WHERE GUARD RAIL AND/OR PAVED DITCHES WILL BE NEEDED. THE DEVELOPER WILL BE RESPONSIBLE FOR PROVIDING GUARDRAIL AND PAVED DITCHES AS DETERMINED BY THIS JOINT INSPECTION." REFER TO VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) GUARD RAIL AND PAVED DITCH SPECIFICATIONS.
16. AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE.
17. WARNING SIGNS, MARKERS, BARRICADES OR FLAG MEN SHOULD BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
18. ALL UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE CONSTRUCTION LIMITS OF THE ROADWAY BEFORE PLACING EMBANKMENT.
19. ALL PAVEMENT SECTIONS SHOWN ON THESE PLANS ARE PRELIMINARY. FINAL PAVEMENT DESIGN SHALL BE PERFORMED UPON RECEIPT OF CBR TESTING.
20. ALL SPRINGS SHALL BE CAPPED AND PIPED TO THE NEAREST STORM SEWER MANHOLES OR CURB INLET. THE PIPE SHALL BE MINIMUM 6" DIAMETER AND CONFORM TO VDOT STANDARD SB-1.
21. CONSTRUCTION DEBRIS SHALL BE CONTAINERIZED IN ACCORDANCE WITH THE VIRGINIA LITTER CONTROL ACT; NO LESS THAN ONE LITTER RECEPTACLE SHALL BE PROVIDED AT THE CONSTRUCTION SITE.
22. NOTIFICATION SHALL BE GIVEN TO THE APPROPRIATE UTILITY COMPANY PRIOR TO CONSTRUCTION OF WATER AND/OR SANITARY SEWER LINES. INFORMATION SHOULD ALSO BE OBTAINED FROM THE APPROPRIATE AUTHORITY CONCERNING PERMITS, CUT SHEETS, AND CONNECTIONS TO EXISTING LINES.
23. WHEN GRADING IS PROPOSED WITHIN EASEMENTS OF UTILITIES, LETTERS OF PERMISSION FROM ALL INVOLVED COMPANIES MUST BE PROVIDED TO FAUQUIER COUNTY PRIOR TO ISSUANCE OF GRADING AND/OR SITE DEVELOPMENT PERMITS.
24. THE DEVELOPER WILL BE RESPONSIBLE FOR THE RELOCATION OF ANY UTILITIES WHICH ARE REQUIRED AS A RESULT OF THIS PROJECT.
25. THERE ARE NO KNOWN GRAVE SITES LOCATED ON THIS PROPERTY. IN THE EVENT GRAVE SITES ARE DISCOVERED DURING CONSTRUCTION, THE OWNER AND ENGINEER MUST BE NOTIFIED IMMEDIATELY.
26. THE CONTRACTOR IS TO VERIFY FIELD CONDITIONS PRIOR TO AND DURING CONSTRUCTION AND NOTIFY BOWMAN CONSULTING GROUP IMMEDIATELY OF ANY DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND THE APPROVED PLAN.
27. CONTROLLED FILLS SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY METHOD "A" PER STANDARD PROCTOR AASHTO-T99, ASTM-D698, OR VTM-1 AS APPLICABLE. DENSITY SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER AND RESULTS SUBMITTED TO VDOT AND FAUQUIER COUNTY PRIOR TO PAVEMENT CONSTRUCTION.
28. CONTRACTORS SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATING OR BLASTING AT LEAST TWO (2) WORKING DAYS, BUT NOT MORE THAN TEN (10) WORKING DAYS, PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION.
29. CONTRACTOR SHALL SCHEDULE INSPECTION OF PUBLIC IMPROVEMENTS AND OBTAIN APPROPRIATE APPROVALS PRIOR TO COVERING OVER IMPROVEMENTS, INCLUDING ELECTRICAL INSTALLATIONS.
30. EXISTING WETLANDS SHOWN HEREON WERE DELINEATED BY BOWMAN CONSULTING GROUP, LTD., DATED OCTOBER 2022.
31. THE PROPOSED PLAN DOES NOT INCLUDE THE DEMOLITION OF ANY EXISTING BUILDINGS. A SEPARATE PERMIT IS REQUIRED FOR THE DEMOLITION OF THE EXISTING BUILDINGS. IF BLASTING IS REQUIRED A BLASTING PLAN SHALL BE COORDINATED WITH FCWSA PRIOR TO ALL BLASTING.
32. THIS PLAN HAS BEEN PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND DOES NOT NECESSARILY INDICATE ANY OR ALL ENCUMBRANCES ON THE SUBJECT PROPERTY.

ESTIMATED AVERAGE DAILY WATER USAGE

WATER MAIN CALCULATIONS:
FACILITY TO BE SERVED:
SINGLE FAMILY RESIDENTIAL = 350 GPD PER UNIT = 22 UNITS x 350 GPD = 7,700 GPD



VICINITY MAP
SCALE: 1" = 2000'

OWNER

DAVID M. DOBSON
9198 NORTH CLIFF LANE
RIXEYVILLE, VA 22737
(540) 937-7010

APPLICANT

MARONDA HOMES
7051 HEATHCOTE VILLAGE WAY
SUITE 255
GAINESVILLE, VA 20155
(703) 743-4250
ATTN: BRYAN HURST

NOTES:

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, PRIOR TO THE INSTALLATION OF ANY UTILITIES, TO VERIFY THAT ADEQUATE COVER SHALL BE PROVIDED OVER ALL UTILITIES AS SHOWN ON THESE PLANS, INCLUDING BUT NOT LIMITED TO THE AREAS OF STREAMS AND/OR WETLANDS CROSSINGS.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE STREAM BED ELEVATIONS AT THE CULVERT LOCATIONS TO ENSURE THE CULVERTS WILL BE COUNTER-SUNK AS SHOWN IN THIS PLAN. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO INSTALLATION OF SAID CULVERTS.
3. ALL DETAILS AND SPECIFICATIONS HEREIN ARE PROVIDED FROM THE MANUFACTURER OR GOVERNING LOCALITY. BCG ACCEPTS NO RESPONSIBILITY OR LIABILITY FOR VERIFICATION OF THE ACCURACY OF SAID DETAILS OR SPECIFICATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND/OR MANUFACTURER TO VERIFY THE ACCURACY OF DETAILS OR SPECIFICATIONS AND TO PROVIDE MATERIALS TESTING ON ANY MATERIALS TO BE USED IN THE CONSTRUCTION OF THIS PROJECT PRIOR TO THEIR INSTALLATION.

NOTICE TO CONTRACTORS AND OWNERS:

CERTIFICATION OF STORM SEWERS, STORMWATER CONVEYANCE CHANNELS, STORMWATER MANAGEMENT DEVICES, ETC. SHALL BE PROVIDED TO FAUQUIER COUNTY PRIOR TO RELEASE OF RELATED SECURITIES. THE CERTIFICATION SHALL BE IN ACCORDANCE WITH THE FAUQUIER COUNTY DESIGN STANDARDS MANUAL.

PRIOR TO STARTING CONSTRUCTION:

THE CONTRACTOR MUST CONSULT WITH THE CERTIFYING PROFESSIONALS (INCLUDING GEOTECHNICAL ENGINEERS) WHO WILL PROVIDE THE CERTIFICATIONS OF THESE MEASURES. THIS CERTIFICATION INCLUDES ALL ASPECTS OF DESIGN AND CONSTRUCTION AND MUST BE ACCOMPANIED BY AS-BUILT PLANS AND, WHERE APPLICABLE, A GEOTECHNICAL INSPECTIONS REPORT.

VDOT NOTE:

THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE 2011 VDOT SECONDARY STREET ACCEPTANCE REQUIREMENTS.

MISS UTILITY

CALL "MISS UTILITY" AT 1-800-257-7777, 48 HOURS PRIOR TO THE START OF WORK. THE EXCAVATOR MUST NOTIFY ALL PUBLIC UTILITY COMPANIES WITH UNDER GROUND FACILITIES IN THE AREA OF PROPOSED EXCAVATION AND HAVE THOSE FACILITIES LOCATED BY THE UTILITY COMPANIES PRIOR TO COMMENCING EXCAVATION. THE EXCAVATOR IS RESPONSIBLE FOR COMPLIANCE WITH REQUIREMENTS OF THE TOWN OF FRONT ROYAL, VIRGINIA CODES AND REGULATIONS.

ENGINEER'S CERTIFICATION:

I HEREBY CERTIFY THAT THE PROPERTY SHOWN HEREON IS NOW IN THE NAME OF DAVID M. DOBSON, RECORDED IN DEED BOOK 1119 AT PAGE 1311 (GPIN 6985-60-5718-000) AND IN DEED BOOK 1119 AT PAGE 1316 (GPIN 6985-51-6810-000) AMONG THE LAND RECORDS OF FAUQUIER COUNTY, VIRGINIA.

SIGNATURE

ENGINEER'S CERTIFICATION:

I HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS PLAN IS CORRECT AND COMPLIES WITH STATE AND FAUQUIER COUNTY CODES AND ORDINANCES.

SIGNATURE

APPROVAL BLOCK

FAUQUIER COUNTY	DATE
FAUQUIER COUNTY HEALTH DEPARTMENT	DATE
FAUQUIER COUNTY REVIEW ENGINEER (SWM, BMP, PRIVATE STREETS)	DATE
FAUQUIER COUNTY SOIL SCIENTIST	DATE
FAUQUIER COUNTY ENVIRONMENTAL DIVISION	DATE
TOWN OF WARRENTON	DATE
VDOT	DATE

SHEET INDEX

NO.	DESCRIPTION
1	COVER SHEET
2	LEGEND, ABBREVIATIONS, AND NOTES
3	SITE TABULATIONS, NOTES, DETILS & TYPICAL SECTIONS
4	EXISTING CONDITIONS & DEMOLITION PLAN
5	TYPE 1 SOILS MAP
6	TYPE 1 SOILS REPORT
7	OVERALL & KEY PLAN
8 - 10	LAYOUT PLAN
11 - 13	GRADING PLAN
14 - 16	UTILITY AND EASEMENT PLAN
17 - 18	NICOLAS WAY PLAN & PROFILE
19	NOAH COURT AND NASH COURT PLAN & PROFILE
20 - 21	SIGHT DISTANCE PLAN & PROFILES
22	RETAINING WALL PLAN & PROFILES
23 - 25	WATERLINE PLAN & PROFILES
26	STORM SEWER PROFILES
27	DRAINAGE DIVIDES MAP
28 - 29	STORM SEWER COMPUTATIONS
30	OVERLAND RELIEF MAP
31 - 32	EROSION & SEDIMENT CONTROL PLAN - PHASE I
33 - 34	EROSION & SEDIMENT CONTROL PLAN - PHASE II
35	EROSION AND SEDIMENT CONTROL NARRATIVE & NOTES
36 - 37	EROSION AND SEDIMENT CONTROL NOTES & DETAILS
38	PRE-DEVELOPED DRAINAGE DIVIDES
39	POST-DEVELOPED DRAINAGE DIVIDES
40	SWM NARRATIVE & CALCULATIONS
41 - 42A	SWM CALCULATIONS
43	BMP & LAND COVER MAP
44	BMP CALCULATIONS
45 - 46	SWM POND 'A' DETAILS
47	BIORETENTION BASIN 'A' DETAILS
48 - 49	SWM NOTES & DETAILS
50	TREE INVENTORY PLAN
51 - 52	LANDSCAPE PLAN
53	LANDSCAPE NOTES & DETAILS
54	WATER NOTES & DETAILS
55 - 55A	VDOT DETAILS
56	BOND ESTIMATE
57 - 58	GEOTECHNICAL RECOMMENDATIONS

OSE CERTIFICATION:

I HEREBY CERTIFY THAT MY SOIL AND SITE EVALUATION(S), SEWER DISPOSAL SYSTEM DESIGN(S) AND/OR SIZE(S) AND LOCATION(S) OF THE SEWAGE DISPOSAL FIELD(S) AS SHOWN ON SHEETS 11-13 OF THE CONSTRUCTION PLAN COMPLIES WITH ALL APPLICABLE LAWS, REGULATIONS AND POLICIES IMPLIED BY THE VIRGINIA DEPARTMENT OF HEALTH AND FAUQUIER COUNTY. FURTHERMORE, I CERTIFY THAT ALL REQUIRED STATEMENTS CONCERNING SAID INDIVIDUAL SEWAGE DISPOSAL SYSTEMS HAVE BEEN INCLUDED ON SHEETS 11-13 OF THE TIFFANY ESTATES CONSTRUCTION PLAN.

SIGNATURE DATE

Bowman Consulting Group Ltd
1300 Central Park Boulevard
Fredericksburg, Virginia 22401
Phone: (540) 371-0268
bowman.com
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COVER SHEET
TIFFANY ESTATES
CONSTRUCTION PLAN
FAUQUIER COUNTY, VIRGINIA
CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION
DATE	DESCRIPTION

WED	WED	WED
DESIGN	DRAWN	CHKD

SCALE H: V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 1 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\001-6642-D-CP-001-COVER.dwg

LEGEND

EXISTING	DESCRIPTION	PROPOSED
40	INDEX CONTOUR	40
38	INTERMEDIATE CONTOUR	38
EX. E/P	EDGE OF PAVEMENT	PROP. E/P
EX. C & G	CURB AND GUTTER	CG-6
–	TRANSITION FROM CG-6 TO CG-6R	CG-6R
–	PROPOSED HEADER CURB	
–	PROPERTY LINE	
–	DEPARTING PROPERTY LINE	
	LOT LINE	
	RIGHT-OF-WAY	
	CENTERLINE	
	FLOOD PLAIN	
–	CLEARING AND GRADING	
	TREE LINE	
–	FLOW LINE OF SWALE	
–	STREAM	
–	OVERLAND RELIEF PATHWAY	
x	FENCE LINE	x
	EASEMENT	
EX 8" W/L W	WATER LINE	8" DIP W/L W
W EX. W/V W	WATER VALVE	W PROP. W/V
EX. R.	REDUCER	PROP. R.
EX 8" SAN	SANITARY SEWER	8" PVC SAN
EX 18"	STORM SEWER	18"RCP
–	CABLE TV	CATV
E	ELECTRIC SERVICE	E
T	TELEPHONE SERVICE	T
G	GAS LINE	G
+ 25.32	SPOT ELEVATION	+25 32
⌀	UTILITY POLE	⌀
	SIGN	
EX A; EX 1 A	SANITARY SEWER IDENTIFIER	A; 1 A
EX 2; EX 1 2	STORM DRAIN IDENTIFIER	2; 1 2
W	EASEMENT IDENTIFIER	W
	WATER METER	
	FIRE HYDRANT	
–	PARKING INDICATOR INDICATES THE NUMBER OF TYPICAL PARKING SPACES	25
	STREET LIGHT	
–	VEHICLES PER DAY (TRAFFIC COUNT)	255 VPD
–	TEST PIT LOCATION RECOMMENDED/REQUIRED	TP
–	CRITICAL SLOPE SLOPES TO BE STABILIZED PURSUANT TO VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK	★
	HANDICAP RAMP (CG-12) DENOTES LOCATION OF STD VDOT CG-12 AND/OR JURISDICTIONAL STANDARD RAMP CONSTRUCTION	
–	DENOTES CLEAR SIGHT TRIANGLE	
EX 5" PINE; 15" OAK	TREE	
–	BENCHMARK	BM #1 TRV #1 ELEV=101.62
	ASPHALT TRAIL	
	CONCRETE SIDEWALK	
	END WALLS	
	END SECTIONS	
	STOP SIGN	
	STREET SIGN	
OHE	OVERHEAD ELECTRIC	OHE
OHT	OVERHEAD TELEPHONE	OHT
VAN	HANDICAP PARKING SPACE (VAN)	VAN
	RIP RAP	
	CROSSWALK	

ABBREVIATIONS

A	A	AREA OF ARC
	AD	ALGEBRAIC DIFFERENCE
	ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
	AC.	ACRE
	AGGR.	AGGREGATE
	ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
	ASPH	ASPHALT
	AWWA	AMERICAN WATER WORKS ASSOCIATION
B	B	BREADTH
	BC	BOTTOM OF CURB
	BF	BASEMENT FLOOR
	BLDG	BUILDING
	BM	BENCHMARK
	BMP	BEST MANAGEMENT PRACTICES
	BOV	BLOW OFF VALVE
	BRL	BUILDING RESTRICTION LINE
	BVCS	BEGINNING VERTICAL CURVE STATION
	BVCE	BEGINNING VERTICAL CURVE ELEVATION
	BW	BOTTOM OF WALL
C	c,e	CENTER CORRECTION ON VERTICAL CURVE
	C	COEFFICIENT OF RUNOFF
	CATV	CABLE TELEVISION
	CB	CATCH BASIN OR CHORD BEARING
	CC	CENTER TO CENTER
	CFS (Q)	CUBIC FEET PER SECOND
	CH	CHORD
	CG	CURB AND GUTTER
	CIP	CAST IRON PIPE
	C	CENTERLINE
	CL	CLASS
	CMP	CORRUGATED METAL PIPE
	CONC.	CONCRETE
	CO	CLEAN OUT
	CONT.	CONTINUATION
	CS	CURB STOP
	CT	COURT
	C/L	CENTERLINE
D	D,d	DEPTH
	DA	DRAINAGE AREA
	DB	DEED BOOK
	DET.	DETAIL
	DI	DROP INLET
	DIA.	DIAMETER
	DIP	DUCTILE IRON PIPE
	DM	DROP MANHOLE
	DR.	DRIVE
	DRNG	DRAINAGE
	DRWG.	DRAWING
	D/W	DRIVE WAY
	Δ	DELTA
	DU	DWELLING UNITS
	DOM	DOMESTIC
E	e	RATE OF SUPER ELEVATION
	EC	EROSION CONTROL
	EGL	ENERGY GRADIENT LINE
	EQC	ENVIRONMENTAL QUALITY CORRIDOR
	ESM'T	EASEMENT
	EG	EDGE OF GUTTER
	ELEV.	ELEVATION
	ENT.	ENTRANCE
	EP	EDGE OF PAVEMENT
	ES	END SECTION
	EVCS	ENDING VERTICAL CURVE STATION
	EVCE	ENDING VERTICAL CURVE ELEVATION
	EW	END WALL
	EX.	EXISTING
	ELEC.	ELECTRICAL
	EBL	EAST BOUND LANE
F	F	FIRE LINE
	FAR	FLOOR AREA RATIO
	FC	FACE OF CURB
	FCWA	FAIRFAX COUNTY WATER AUTHORITY
	FF	FIRST FLOOR
	FG	FINISHED GRADE
	FH	FIRE HYDRANT
	FL	FLOW LINE
	FP	FLOOD PLAIN
	FS	FACTOR OF SAFETY
	FT.	FOOT
	FCPA	FAIRFAX COUNTY PARK AUTHORITY
	FOY.	FOYER
	FPS	FEET PER SECOND
G	g	GRAVITY
	G	GAS
	GFA	GROSS FLOOR AREA
	Gr.	GRADE
	GR	GUARD RAIL
	GAR	GARAGE
H	H,h	HEIGHT
	H	HEAD
	HC	HANDICAPPED PARKING SPACE
	HGL	HYDRAULIC GRADIENT LINE
	HP	HIGH POINT
	HR	HAND RAIL
	HT.	HEIGHT
	HW	HEADWATER
I	I	RAINFALL INTENSITY
	ID	INSIDE DIAMETER
	IN	INCH
	INV.	INVERT
	IP	IRON PIPE
	IPF	IRON PIPE FOUND
	IPS	IRON PIPE SET
J	JB	JUNCTION BOX
K	K	SIGHT DISTANCE COEFFICIENT
	Ke	CULVERT ENTRANCE LOSS COEFFICIENT
L	L	LENGTH
	LAT.	LATERAL
	LF	LINEAR FOOT
	LL	LOWER LEVEL
	LOS	LINE OF SIGHT
	LP	LOW POINT
	LS	LOADING SPACE
	LCG	LIMITS OF CLEARING & GRADING
	LT	LEFT
M	M	MONUMENT FOUND
	MECH.	MECHANICAL
	MH	MANHOLE
	MI.	MILE
	MPH	MILES PER HOUR
	MS	MEDIAN STRIP
	MSL	MEAN SEA LEVEL
	MIN	MINIMUM
	MAX	MAXIMUM
N	N/F	NOW OR FORMERLY
	NFA	NET FLOOR AREA
	NO.,#	NUMBER
	NBL	NORTH BOUND LANE
	N/A	NOT APPLICABLE
O	OC	ON CENTER
	OD	OUTSIDE DIAMETER
	OH	OVERHANG
	O/H	OVERHEAD
P	P	PERIMETER
	PC	POINT OF CURVATURE
	PCC	POINT OF COMPOUND CURVE
	PCEP	POINT OF CURVE EDGE OF PAVEMENT
	PCTC	POINT OF CURVATURE TOP OF CURB
	PFM	PUBLIC FACILITIES MANUAL
	PG.	PAGE
	PGL	POINT OF GRADE LINE
	PI	POINT OF INTERSECTION
	PL	PROPERTY LINE
	PRC	POINT OF REVERSE CURVES
	PRELIM.	PRELIMINARY
	PROP.	PROPOSED
	PT	POINT OF TANGENCY
	PVC	POINT OF VERTICAL CURVATURE
	PVC	POLY VINYL CHLORIDE
	PVI	POINT OF VERTICAL INTERSECTION
	PVM'T	PAVEMENT
	PVRC	POINT OF VERTICAL REVERSE CURVE
	PVT	POINT OF VERTICAL TANGENT
	P&P	PLAN AND PROFILE
Q	Q(C.F.S.)	AMOUNT OF RUNOFF
R	R,r	RADIUS
	REQD	REQUIRED
	RCP	REINFORCED CONCRETE PIPE
	RD.	ROAD
	RET.	RETAINING
	REV.	REVISION
	RR	RAILROAD
	RTE.	ROUTE
	R/W	RIGHT OF WAY
	RGP	ROUGH GRADING PLAN
	ROM	REMOTE OUTSIDE MONITOR
	RMA	RESOURCE MANAGEMENT AREA
	RPA	RESOURCE PROTECTION AREA
	RT	RIGHT
S	S	SPEED OR SLOPE
	SAN.	SANITARY
	SBL	SOUTH BOUND LANE
	SD	SIGHT DISTANCE
	SECT.	SECTION
	SEW.	SEWER
	SH.	SHOULDER
	SF	SQUARE FEET
	SP.	SPACE
	SP	SITE PLAN
	SPEC.	SPECIFICATION
	STA.	STATION
	STD.	STANDARD
	STK.	STACK
	STM.	STORM
	SVC.	SERVICE
	SWM	STORM WATER MANAGEMENT
	S/W	SIDE WALK
	Sx	CROSS SLOPE
T	T	TANGENT
	TB	TEST BORE
	TC	TOP OF CURB
	Tc	TIME OF CONCENTRATION
	TEL	TELEPHONE
	TP	TEST PIT
	TP	TREE PROTECTION
	TB	TOP OF BANK
	TW	TOP OF WALL
	TW	TAILWATER
U	UD	UNDERDRAIN
	UG	UNDERGROUND
	UL	UPPER LEVEL
	UP	UTILITY POLE
	VAN	HANDICAPPED VAN PARKING SPACE
V	V	VELOCITY
	V	VOLUME
	VA	VIRGINIA
	VC	VERTICAL CURVE
	VDOT	VA. DEPT. OF TRANSPORTATION
	VF	VERTICAL FOOT
W	W	WEIGHT OR WIDTH
	W/M	WATER MAIN
	WBL	WEST BOUND LANE
	WQIA	WATER QUALITY IMPACT ASSESSMENT
X	XF	TRANSFORMER
Y	YI	YARD INLET
	YR	YEAR

GENERAL NOTES AND SPECIFICATIONS

1. ALL CONSTRUCTION METHODS AND MATERIALS SHALL CONFORM TO CURRENT FAUQUIER COUNTY AND/OR VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS AND FCWSA UTILITY STANDARDS MANUAL STANDARDS AND SPECIFICATIONS.
2. ALL CONSTRUCTION SHALL COMPLY WITH THE LATEST U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION RULES AND REGULATIONS. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A SAFE CONSTRUCTION SITE AND COMPLYING WITH ALL OSHA REGULATIONS.
3. 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.
4. THE CONTRACTOR SHALL CONTACT MISS UTILITY AT 1-800-257-7777, UTILITY COMPANY REPRESENTATIVES, PERFORM TEST PITS, REVIEW CURRENT TEST PIT DATA, AND WHATEVER OTHER OPERATIONS AVAILABLE TO INSURE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES IN THE AREA OF CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY BOWMAN CONSULTING GROUP, LTD. OF ANY POTENTIAL CONFLICTS PRIOR TO COMMENCING CONSTRUCTION.
5. 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. ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE. ALSO, A REPRESENTATIVE OF THE DEVELOPER MUST BE AVAILABLE AT ALL TIMES.
6. UTILITY COMPANIES SHALL BE NOTIFIED 72 HOURS IN ADVANCE OF ANY EXCAVATION.
7. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD BEFORE STARTING CONSTRUCTION AND NOTIFY THE DESIGN ENGINEER OF ANY DISCREPANCIES.
8. THE CONTRACTOR SHALL CAREFULLY EXAMINE THE SITE AND MAKE ALL INSPECTIONS 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.
9. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THE MOST CURRENT APPROVED ARCHITECTURAL PLANS AND COORDINATE SAME WITH THE SITE PLAN, PRIOR TO BEGINNING CONSTRUCTION OPERATIONS.
10. IF WHEN DURING THE COURSE OF CONSTRUCTION, ANY OBJECT OF AN UNUSUAL NATURE IS ENCOUNTERED, THE CONTRACTOR SHALL CEASE WORK IN THAT AREA AND IMMEDIATELY NOTIFY THE PROPER AUTHORITY, FAUQUIER COUNTY, AND THE ARCHITECT/ENGINEER.
11. THE EXISTING UNDERGROUND UTILITIES SHOW HEREON ARE BASED UPON AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL UTILITIES BEFORE COMMENCING WORK AND FOR ANY DAMAGES WHICH OCCUR BY HIS FAILURE TO LOCATE OR PRESERVE THESE UNDERGROUND UTILITIES. IF DURING CONSTRUCTION OPERATIONS THE CONTRACTOR SHOULD ENCOUNTER UTILITIES OTHER THAN THOSE SHOWN ON THE PLANS, HE SHALL IMMEDIATELY NOTIFY THE ENGINEER AND TAKE NECESSARY AND PROPER STEPS TO PROTECT THE FACILITY AND ASSURE THE CONTINUANCE OF SERVICE.
12. ALL STEPS WITH THREE OR MORE RISERS SHALL HAVE HAND RAILS.
13. STANDARD GUARD RAIL AND HAND RAILS SHALL BE INSTALLED AT HAZARDOUS LOCATIONS AS DESIGNATED DURING THE FINAL INSPECTION BY FAUQUIER COUNTY, AND/OR VDOT.
14. THE CONTRACTOR SHALL ERECT STREET SIGNS AND TRAFFIC CONTROL SIGNS AS INDICATED ON THE SUBDIVISION CONSTRUCTION PLANS. THE SIGNS SHALL CONFORM TO VDOT AND COUNTY SPECIFICATIONS. ALL PROPOSED SIGNS ARE TO BE INSTALLED PER STP-1 OF THE 2016 ROAD AND BRIDGE STANDARDS.
15. CONTROLLED FILLS SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY METHOD "A" PER STANDARD PROCTOR AASHTO-T99, ASTM-D698, OR VTM-1 AS APPLICABLE. DENSITY SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER AND RESULTS SUBMITTED TO FAUQUIER COUNTY PRIOR TO PAVEMENT CONSTRUCTION.
16. COMPACTION OF BACKFILL IN UTILITY TRENCHES SHALL BE IN ACCORDANCE WITH FAUQUIER COUNTY AND/OR VDOT STANDARDS & SPECIFICATIONS AND FCWSA UTILITY STANDARDS MANUAL STANDARDS AND SPECIFICATIONS.
17. ALL FILL SOILS UNDER EXPANDED PAVED AREAS SHALL BE COMPACTED TO 95% OF THEORETICAL MAXIMUM DENSITY AS DETERMINED BY ASTM SPECIFICATION D-698 STANDARD PROCTOR METHOD, WITH + OR - 2% OF OPTIMUM MOISTURE FOR THE FULL WIDTH OF ANY DEDICATED RIGHT-OF-WAY AND ALL PARKING LOTS; PRIVATE STREETS; PARKING BAYS; CURB AND GUTTER; AND SIDEWALKS ADJACENT TO STREETS AND PARKING LOTS (NOT INTENDED TO INCLUDE LEAD WALKS), WITH UPPER 1.0 FT. COMPACTED TO 100% OF THE MAXIMUM DRY DENSITY PER ASTM D-698.
18. OPEN CUTTING OF PAVED OR SURFACE TREATED ROADS IS NOT PERMITTED. ALL UTILITIES WHICH WILL BE PLACED UNDER EXISTING STREETS SHALL BE BORED OR JACKED. ANY EXCEPTIONS, DUE TO EXTENUATING CIRCUMSTANCES, SHALL BE ADDRESSED AT THE PERMIT STAGE.
19. ADDITIONAL DITCH LININGS OR SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROVIDED, AT THE DEVELOPER'S EXPENSE, AS DETERMINED NECESSARY BY VDOT AND/OR FAUQUIER COUNTY DURING FIELD REVIEW. ALL COSTS SHALL BE ASSUMED BY THE DEVELOPER.
20. A SMOOTH GRADE SHALL BE MAINTAINED FROM THE CENTERLINE OF EXISTING ROAD TO PROPOSED CURB AND GUTTER AND/OR PROPOSED EDGE OF PAVEMENT TO PRECLUDE THE FORMING OF FALSE GUTTERS AND/OR THE PONDING OF ANY WATER IN THE ROADWAY. REMOVE AND RECONSTRUCT EXISTING PAVEMENT AND/OR CURB AS DICTATED BY FIELD CONDITIONS TO PROVIDE POSITIVE DRAINAGE AT TIE-IN-POINTS.
21. PRIOR TO CONSTRUCTION OF STREET WIDENING, CONTRACTOR SHALL OBTAIN 25-FOOT FIELD SURVEYED CROSS SECTIONS OF EXISTING STREET. BASED ON INFORMATION OBTAINED AND CONTRACTOR'S OORDINATION WITH VDOT AND COUNTY INSPECTOR(S), MILLING AND/OR OVERLAY, OF EXISTING ROADWAY MAY BE REQUIRED TO AVOID FALSE GUTTERS, MAINTAIN POSITIVE DRAINAGE, AND TO GAIN ACCEPTANCE OF THE CONSTRUCTED IMPROVEMENTS. ADDITIONAL OVERLAY AND/OR MILLING MAY NECESSITATE ADJUSTMENTS TO THE EDGE OF PAVEMENT AND/OR CURB ELEVATIONS SHOWN ON THIS PLAN.
22. PROPOSED SIDEWALKS MUST BE CONSTRUCTED WITH UD3 UNDERDRAINS WHEN LONGITUDINAL GRADES ARE 3% OR GREATER UNLESS SOIL TEST CONFIRM THAT THEY ARE NOT NEEDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION (APPLIES TO SIDEWALK IN RIGHT-OF-WAY ONLY). ALL SIDEWALKS TO BE 4" THICK CONCRETE UNLESS OTHERWISE SHOWN ON THE PLAN.
23. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING ROADS AND UTILITIES WHICH OCCURS AS A RESULT OF THE PROJECT CONSTRUCTION WITHIN OR CONTIGUOUS TO THE EXISTING RIGHT-OF-WAY. 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 AFFECTED BY THE CONSTRUCTION
24. ALL UTILITIES INCLUDING UTILITY POLES DESIGNATED TO BE RELOCATED SHALL BE RELOCATED PRIOR TO CONSTRUCTION AT THE DEVELOPER'S EXPENSE.
25. THE DESIGN OF PAVEMENT PLACED WITHIN THE RIGHT-OF-WAY SHOULD EQUAL OR EXCEED THE THICKNESS OF THE EXISTING PAVEMENT.
26. OVERLAY OF EXISTING PAVEMENT SHALL BE MINIMUM OF 1 1/2 INCH DEPTH; ANY COST ASSOCIATED WITH PAVEMENT OVERLAY, OR THE MILLING OF EXISTING PAVEMENT TO OBTAIN REQUIRED DEPTH, SHALL BE ASSUMED BY THE DEVELOPER.
27. THE PAVEMENT DESIGN AND DEPTH OF STREETS SHOWN HEREON IS BASED ON AN ASSUMED CBR VALUE. PRIOR TO CONSTRUCTION SOIL TESTS OF SUBGRADE MUST BE PERFORMED BY A GEOTECHNICAL ENGINEER OF RECORD AND MUST BE SUBMITTED TO THE ENGINEER FOR ACTUAL DETERMINATION AND CALCULATION OF THE REQUIRED PAVEMENT DESIGN AND SUBBASE THICKNESS. NO PAVEMENT CONSTRUCTION MAY COMMENCE WITHOUT THE FINAL PAVEMENT DESIGN APPROVAL BY FAUQUIER COUNTY AND/OR VDOT.
28. STREET CUT AND PATCH WORK IN PUBLIC RIGHT-OF-WAY REQUIRED FOR UTILITIES INSTALLATION SHALL BE PERFORMED IN STRICT ACCORDANCE WITH COUNTY AND/OR VDOT STANDARDS AND SPECIFICATIONS.
29. THE DEVELOPER IS RESPONSIBLE FOR ALL TRAFFIC CONTROL. THE DEVELOPER SHALL SUBMIT A SIGNING, STRIPING AND/OR SIGNALIZATION PLAN TO VDOT LAND DEVELOPMENT SECTION A MINIMUM OF 30 DAYS PRIOR TO PERMIT APPLICATION. THE DEVELOPER SHALL NOT COMMENCE CONSTRUCTION OF ANY PAVEMENT COURSE WITHOUT AN APPROVED STRIPING PLAN.
30. ALL RIGHT-OF-WAY DEDICATED FOR PUBLIC USE SHALL BE CLEAR AND UNENCUMBERED.
31. EROSION AND SEDIMENT CONTROL WILL BE INSTALLED IN ACCORDANCE WITH THE CURRENT EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND THE REGULATIONS OF FAUQUIER COUNTY.
32. AN AIR QUALITY PERMIT WILL BE OBTAINED IF REQUIRED.
33. ANY LIGHTING SHOWN HEREON IS AS SPECIFIED BY THE CLIENT AND IS INCLUDED FOR INFORMATION PURPOSES ONLY, AS DIRECTED BY THE OWNER AND/OR PUBLIC AGENCY REQUIREMENTS. BOWMAN CONSULTING GROUP, LTD. HAS NOT PERFORMED THE LIGHTNING DESIGN, AND THEREFORE DOES NOT WARRANT AND IS NOT RESPONSIBLE FOR THE DEGREE AND/OR ADEQUACY OF ILLUMINATION ON THIS PROJECT.
34. 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.
35. ALL SURFACED STREETS SHALL BE MAINTAINED IN A CLEAR CONDITION; FREE OF DUST, MUD OR SNOW AT ALL TIMES. THE DEVELOPER SHALL PROVIDE ADEQUATE MEANS TO CLEAN TRUCKS AND OTHER EQUIPMENT USING SURFACED STREETS.
36. THE APPROVAL OF THIS PLAN SHALL IN NO WAY GRANT PERMISSION BY THE COUNTY FOR THE DEVELOPER TO TRESPASS ON OFF-SITE PROPERTIES.
37. THE APPROVAL OF THESE PLANS SHALL IN NO WAY RELIEVE THE DEVELOPER OR HIS AGENT OF COMPLYING WITH OTHER APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS.
38. THESE PLANS MAKE NO REPRESENTATION AS TO THE SUBSURFACE CONDITIONS AND THE PRESENCE OF SUBSURFACE WATER OR THE NEED FOR SUBSURFACE DRAINAGE FACILITIES.
39. STORM SEWER AND CULVERT PIPE SHALL CONFORM TO VDOT ROAD AND BRIDE SPECIFICATIONS SECTION 232 AND VDOT ROAD AND BRIDGE STANDARD PC-1.
40. THE DEVELOPER IS RESPONSIBLE FOR SECURING ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION.
41. THE CONTRACTOR IS RESPONSIBLE FOR ARRANGING ALL NECESSARY INSPECTIONS.
42. EMERGENCY VEHICLE ACCESS SHALL BE PROVIDED DURING ALL PHASES OF CONSTRUCTION.
43. 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.
44. ALL FINISHED GRADING, SEEDING, SODDING OR PAVING SHALL BE DONE IN SUCH A MANNER TO PRECLUDE THE PONDING OF WATER.
45. TYPICAL SECTIONS ARE INTENDED TO SHOW GENERAL FEATURES OF THE PROPOSED CONSTRUCTION. FOR EXACT DETAILS AT ANY GIVEN LOCATION, SEE THE SITE PLAN SHEETS.
46. ALL HANDICAP RAMPS SHALL BE BUILT IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS.
47. ALL GAS LINES REQUIRE A MINIMUM OF 1 FOOT VERTICAL AND 5 FEET HORIZONTAL SEPARATION. CONSTRUCTION WITHIN 10 FEET OF THE GAS LINE REQUIRES A GAS LINE REPRESENTATIVE TO BE PRESENT DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE GAS COMPANY PRIOR TO CONSTRUCTION.
48. NO TREES SHALL BE PLANTED IN THE WATER AND SEWER EASEMENTS. NO PLANTINGS SHALL BE WITHIN 5 FEET OF A FIRE HYDRANT.

CONSTRUCTION NOTES FOR VDOT (REV. 9/19/2017)

1. SUBDIVISIONS ONLY – THESE REQUIREMENTS WERE PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF (SELECT ONE):
   - O VDOT'S 2005 SUBDIVISION STREET REQUIREMENTS (SSR)
   - O VDOT'S 2009 SECONDARY STREET ACCEPTANCE REQUIREMENTS (SSAR)
   - O VDOT'S 2011 SECONDARY STREET ACCEPTANCE REQUIREMENTS (SSAR 2011)
2. ALL WORK SHOWN HEREON SHALL BE IN STRICT ACCORDANCE WITH THE LATEST ROAD AND BRIDGE STANDARDS AND THE LATEST ROAD AND BRIDGE SPECIFICATIONS OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) AND COUNTY ORDINANCES.
3. IT IS THE INTENT OF THESE DRAWINGS TO SHOW ALL NECESSARY WORK. ANY ITEM OF WORK NOT SPECIFICALLY SHOWN, BUT NECESSARY TO ELIGIBILITY FOR ACCEPTANCE IS HEREBY IMPLIED.
4. A VDOT PERMIT MUST BE OBTAINED PRIOR TO STARTING CONSTRUCTION WITHIN ANY STATE HIGHWAY RIGHTS-OF-WAY.
5. THE CONTRACTOR/OWNER SHALL PERFORM CBR TESTING ON THE SUBGRADE IN ACCORDANCE WITH VDOT SPECIFICATIONS BY A CERTIFIED GEOTECHNICAL ENGINEER TO DETERMINE BASE AND PAVEMENT DESIGNS, AND THIS INFORMATION MUST BE FORWARDED TO VDOT AND REVIEWED PRIOR TO PLACEMENT OF AGGREGATE BASE.
6. THE CONTRACTOR/OWNER MUST SPECIFY IN WRITING TO VDOT PRIOR TO CONSTRUCTION, THE TYPE OF SUBBASE, BASE AND SURFACE PAVEMENT TO BE UTILIZED ON EACH STREET FOR EACH TRAFFIC GROUP.
7. THE CONTRACTOR SHALL NOTIFY VDOT 72 HOURS PRIOR TO PLACEMENT OF BASE MATERIALS AND PRIOR TO THE PLACEMENT OF ASPHALT MATERIAL TO ENSURE VDOT'S ABILITY TO PERFORM TESTING, SUCH AS PROOF-ROLLING, DEPTH CHECKS, COMPACTION, AND CONTAMINATION. OPTION: A CERTIFIED ANALYSIS FROM A PRIVATE ENGINEERING/TESTING FIRM MAY BE SUBMITTED WITHIN 7 WORKING DAYS OF THE REQUIRED TESTS. 72 HOURS NOTICE IS STILL REQUIRED PRIOR TO EACH ACTIVITY.
8. ALL CULVERT AND DRIVEWAY PIPES SHALL BE OF A TYPE APPROVED BY VDOT AND THE LOCALITY. NOTE THAT THE USE OF CORRUGATED METAL PIPE IN ANY LOCATION WILL ONLY BE CONSIDERED AFTER THE REQUIREMENTS OF STANDARD PC-1, TABLES C AND D OF THE 2016 ROAD AND BRIDGE STANDARDS ARE ADDRESSED.
9. ALL ENTRANCE PIPES FOR DRIVEWAYS SHALL BE A MINIMUM OF 15" IN DIAMETER, AND 30' IN LENGTH (CONCRETE CULVERTS MAY BE 28' IN LENGTH), UNLESS OTHERWISE APPROVED BY VDOT. DRIVEWAY CULVERTS IN CUL-DE-SACS SHALL BE CONCRETE. SEE APPROVED ROAD PLANS FOR THE PROPER CULVERT SIZES.
10. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD BEFORE STARTING CONSTRUCTION AND NOTIFY THE DESIGN ENGINEER OF ANY DISCREPANCIES.
11. THE CONTRACTOR SHALL ERECT STREET SIGNS AND TRAFFIC CONTROL SIGNS AS INDICATED ON THE SUBDIVISION CONSTRUCTION PLANS. THE SIGNS SHALL CONFORM TO VDOT AND COUNTY SPECIFICATIONS. ALL PROPOSED SIGNS ARE TO BE INSTALLED PER STP-1 OF THE 2016 ROAD AND BRIDGE STANDARDS. ALL PAVEMENT MARKINGS INSTALLED WITHIN VDOT RIGHT-OF-WAY WILL BE TYPE B CLASS I THERMOPLASTIC.
12. A MINIMUM 35' PAVEMENT FILLET RADIUS IS RECOMMENDED.
13. THE CONTRACTOR SHALL DO SUCH OVERLOT GRADING AS NECESSARY TO PRECLUDE THE PONDING OF WATER ADJACENT TO THE ROADWAY.
14. SLOPE EASEMENTS WILL BE REQUIRED AT ALL LOCATIONS WHERE THE TOP OF THE CUT OR THE TOE OF THE FILL EXCEEDS THE PROPOSED DEDICATION OF RIGHT-OF-WAY. SEE PLAT FOR EXACT LOCATION.
15. IF RUNNING WATER IS PRESENT IN ANY OUTLET CHANNEL DURING CONSTRUCTION WHERE DITCH PROTECTION IS REQUIRED, THE BOTTOM OF THE CHANNEL SHALL BE LINED WITH RIP-RAP STONE WITH EC-1 PLACEMENT. FURTHER, EC-2 OR EC-3 MUST HAVE A MINIMUM WIDTH OF 4' IN FILL SECTIONS, AND 5' IN CUT SECTIONS.
16. THE CONTRACTOR SHALL BE RESPONSIBLE TO SEE THAT ALL EROSION AND SEDIMENT CONTROL STANDARDS ARE MET, AND THE CONTRACTOR MUST SEED AND MULCH ALL DISTURBED AREAS ALONG WITH ALL GRADED AREAS WITHIN THE PROPOSED RIGHT-OF-WAY IN ACCORDANCE WITH VDOT STANDARDS AND SPECIFICATIONS.
17. FINAL LOCATION OF MANHOLES, VALVES, FIRE HYDRANTS, AND OTHER APPURTENANCES SHALL NOT CONFLICT WITH OR CONSTRICT ROADWAY DRAINAGE. CONTRACTOR SHALL ADJUST MANHOLES AND/OR DITCH ALIGNMENT TO ENSURE PROPER ROADSIDE DRAINAGE, COMPATIBLE WITH EXISTING FIELD CONDITIONS.
18. ALL WATER, SANITARY SEWER, AND STORM SEWER TRENCHES SHALL BE COMPACTED TO 95% DENSITY IN 6" LAYERS. COMPACTION TESTS MAY BE REQUIRED BY VDOT.
19. VDOT WILL REQUIRE DENSITY TESTS FROM A CERTIFIED ENGINEERING FIRM FOR ALL CULVERT INSTALLATIONS WITH A DIAMETER OF 36" OR LARGER.
20. VIDEO INSPECTION MAY BE REQUIRED ON ALL STORM SEWER SYSTEMS PRIOR TO FINAL CONSTRUCTION APPROVAL. A VDOT INSPECTOR MUST BE ON-SITE DURING THE VIDEO INSPECTION PROCESS.
21. THE CONTRACTOR NEEDS TO CONTACT THE NORTHWESTERN REGIONAL OPERATIONS CENTER (540) 332-9500 FOR A MARK OUT OF THE TRAFFIC SIGNAL EQUIPMENT A MINIMUM OF 72 HOURS PRIOR TO WORK BEGINNING WHEN WORKING WITHIN A 1,000 FEET OF A TRAFFIC SIGNAL.
22. THE FINAL FOOTAGE AND LOCATION FOR VDOT STANDARD GUARDRAIL IS TO BE ESTABLISHED PRIOR TO THE COMPLETION OF FINE GRADING BY JOINT INSPECTION WITH THE CONTRACTOR, VDOT, AND THE OWNER'S REPRESENTATIVE. ANY GUARDRAIL INSTALLATION, REMOVAL, OR ADJUSTMENTS MUST BE MADE BY A VDOT-CERTIFIED GUARDRAIL CONTRACTOR.
23. WHENEVER TYING IN TO AN EXISTING ROAD, VDOT'S WP-2 STANDARD WILL APPLY, WHICH INCLUDE MILLING AND OVERLAY OF THE ADJACENT TRAVEL LANE.
24. A PAVEMENT LEVELING COURSE MAY BE REQUIRED TO MEET THE INTENDED CROSS-SLOPE AND TYPICAL SECTION.
25. ALL STORM STRUCTURES SHALL HAVE IS-1 INVERT SHAPING, AND SL-1'S (SAFETY LANDINGS) WILL BE REQUIRED IN ALL STRUCTURES WITH A DEPTH OVER 12'. ST-1'S (STEPS) ARE REQUIRED IN ANY STRUCTURE WITH A DEPTH OF 4' OR GREATER.

Bowman

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LEGEND, ABBREVIATIONS, AND NOTES
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

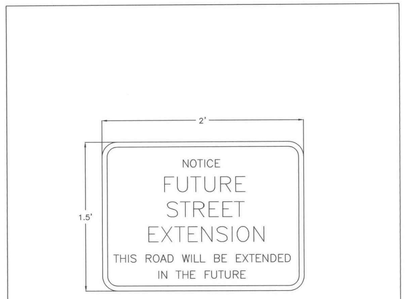
COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION
DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: V:
JOB No. 6642-02-002
DATE : FEBRUARY 10, 2023
FILE No. 6642-D-CP-001
SHEET 2 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\002-6642-D-CP-001-LGD.dwg



GENERAL NOTES:
1. MOUNT ON NINE (9) FEET METAL POLE WITH MINIMUM OF THREE (3) FEET IN GROUND.

Fauquier County Design Standards Manual	STREET EXTENSION NOTIFICATION SIGN	PLATE NO.

TOWN OF WARRENTON
Department of Public Works & Utilities

PO BOX 341
WARRENTON, VIRGINIA 20188
http://www.warrentonva.gov
TELEPHONE (540) 347-1858
FAX (540) 349-2414

February 15, 2024

Mr. David M. Dobson
9198 North Cliff Lane
Rixeyville, Virginia 22737

Re: Revised Water & Sewer Availability-Tiffany Estates: Parcels
PIN 6985-51-6810-000, 6985-60-5718-000 (Fauquier County),
& PIN 6985-60-5718-500 (Town of Warrenton)

Dear Mr. Dobson:

This letter is to provide information regarding the availability of public water and/or sanitary sewer services to the referenced properties from the Town of Warrenton system.

PIN 6985-60-5718-500 is currently within the Town limits and consists of 21.773 acres, zoned Industrial/Limited. Therefore, both water and sanitary sewer can be made available to this portion of the property. A sanitary trunk sewer runs through this parcel. A water main is not currently on the parcel, so a water main will need to be extended through the property. With the information available at this time, the potential projected water and sewer requirements for this property is estimated between 7,000 and 8,000 gallons per day.

PIN 6985-51-6810-000 and 6985-60-5718-000 are outside the Town limits and currently within the Fauquier County Center Service District. The property is zoned R-1. Neither of these properties are within the area covered by the Tri-Party Agreement for wastewater or water services from the Town at this time. However, there have been discussions about including these parcels within the service area for water. The combined land area of these parcels is 32.171 acres. If approved, that would allow a maximum of from 25 to 28 lots with septic drainfields. This would require a maximum of 7,500 to 8,400 gallons per day of water demand from the Town.

If you have any questions or need additional information, please don't hesitate to ask.

Sincerely,

Paul A. Bernard, P.E.
Town Engineer, Public Works & Utilities

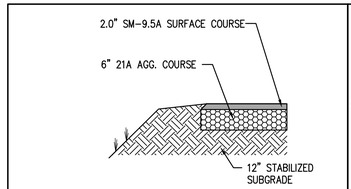
Cc: Steven Friend, Assistant Director of Public Utilities
Will Duncanson, Bowman Consulting

David M. Dobson ("Owner") hereby provides authorization for appropriate County and State personnel permission to enter the property shown hereon for their review and approval of the enclosed construction plan and for inspection purposes.

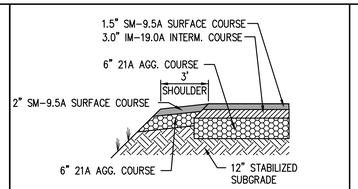
David M. Dobson

By: David M. Dobson, Owner

Name: DAVID M. DOBSON, OWNER

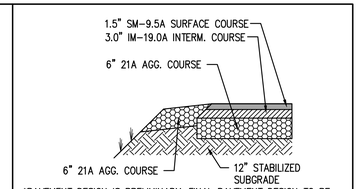


LIGHT DUTY ASPHALT PAVING SECTION
(NOT TO SCALE)



*PAVEMENT DESIGN IS PRELIMINARY. FINAL PAVEMENT DESIGN TO BE BASED UPON FIELD OBTAINED CBR VALUES TAKEN IN THE PRESENCE OF THE VDOT INSPECTOR.

STANDARD ASPHALT PAVING SECTION AT CUL-DE-SAC
(NOT TO SCALE)



*PAVEMENT DESIGN IS PRELIMINARY. FINAL PAVEMENT DESIGN TO BE BASED UPON FIELD OBTAINED CBR VALUES TAKEN IN THE PRESENCE OF THE VDOT INSPECTOR.

STANDARD ASPHALT PAVING SECTION
(NOT TO SCALE)

TRANSPORTATION NOTES:

1. METHOD AND MATERIALS USED SHALL CONFORM TO CURRENT FAUQUIER COUNTY AND VDOT STANDARDS AND/OR SPECIFICATIONS.
2. CONTACT VDOT AND FAUQUIER COUNTY TWO DAYS BEFORE EXCAVATION IN ANY STATE RIGHT-OF-WAY. A SPECIAL EXCAVATION PERMIT MAY BE REQUIRED WHEN WORKING IN THE RIGHT OF WAY.
3. DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION, CONTROL AND SAFETY OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY FAUQUIER COUNTY.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL TRAFFIC CONTROL.
5. ALL UTILITIES INCLUDING UTILITY POLES DESIGNATED TO BE RELOCATED SHALL BE RELOCATED PRIOR TO BUILDING CONSTRUCTION.
6. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING ROADS AND UTILITIES WHICH OCCURS AS A RESULT OF THE PROJECT CONSTRUCTION WITHIN OR CONTIGUOUS TO THE EXISTING RIGHT-OF-WAY.
7. A SMOOTH GRADE SHALL BE MAINTAINED FROM THE CENTERLINE OF EXISTING ROAD TO PROPOSED CURB AND GUTTER AND/OR PROPOSED EDGE OF PAVEMENT TO PRECLUDE THE FORMING OF FALSE GUTTERS AND/OR THE PONDING OF ANY WATER IN THE ROADWAY. REMOVE AND RECONSTRUCT EXISTING PAVEMENT AND/OR CURB AS DICTATED BY FIELD CONDITIONS TO PROVIDE POSITIVE DRAINAGE AT TIE-IN-POINTS.
8. OVERLAY OF EXISTING PAVEMENT SHALL BE MINIMUM OF 1 1/2 INCHES DEPTH; ANY COST ASSOCIATED WITH PAVEMENT OVERLAY, OR THE MILLING OF EXISTING PAVEMENT TO OBTAIN REQUIRED DEPTH, SHALL BE ASSUMED BY THE CONTRACTOR.
9. ALL RIGHT-OF-WAY DEDICATED FOR PUBLIC USE SHALL BE CLEAR AND UNENCUMBERED.

PAVEMENT NOTES:

1. AN ACTUAL COPY OF THE CBR REPORT IS TO BE SUBMITTED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE MATERIAL. THE PRELIMINARY DESIGN IS BASED ON A CBR VALUE OF 4 AND A RESILIENCY FACTOR (RF) OF 1.0 PER THE VDOT PAVEMENT DESIGN GUIDE. IF THE CBR AND RF VALUES ARE LESS THAN THOSE ASSUMED, THE PAVEMENT SECTION SHALL BE INCREASED BASED ON THE GEOTECHNICAL ENGINEER'S RECOMMENDATION.
2. ALL FINAL PAVEMENT AND BASE COURSE THICKNESS MAY BE DESIGNED IN ACCORDANCE WITH THE "DESIGN GUIDE FOR SUBDIVISION ROAD PAVEMENTS IN VIRGINIA", BY N.K. VASWANI, AND SHALL BE BASED ON A SUFFICIENT NUMBER OF CBR TEST TO DETERMINED THE TRUE SUPPORT VALUES OF THE VARIOUS SOILS IN THE SUBGRADE.
3. SUFFICIENT ENGINEER CERTIFIED CBR TESTS MUST BE RUN TO DETERMINE THE SOIL SUPPORT VALUE (SSV) OF THE VARIOUS SOILS IN THE SUBGRADE.
4. ALL BASE, SUBBASE AND SUBGRADE MATERIAL SHALL BE COMPACTED TO 95% AS DETERMINED BY AASHTO T-99 METHOD "A" WITHIN 20% OF OPTIMUM MOISTURE.
5. STONE SUBBASE MATERIAL SHALL EXTEND UNDER THE CURB AND GUTTER A MINIMUM DISTANCE OF 18" FROM THE FACE OF CURB. THE STONE THICKNESS UNDER THE CURB AND GUTTER SHALL BE THE PAVEMENT DEPTH IN EXCESS OF THE 7" DEPTH OF THE GUTTER FACE BUT NO LESS THAN 4".
6. SUBGRADE MUST BE APPROVED BY FAUQUIER COUNTY AND VDOT FOR GRADE, TEMPLATE, AND COMPACTION BEFORE AGGREGATE IS PLACED.
7. ENTRANCES SHALL BE MILLED FOR CLEAN JOINT WITH EXISTING PAVEMENT.
8. THE PRICE BID FOR SAW CUTTING OF THE EXISTING PAVEMENT IS TO INCLUDE REMOVING, AND DISPOSING OF THE EXISTING PAVEMENT AND MATERIALS. WIDTH OF THE REMOVED SECTION IS 6" MIN.
9. THE USE OF AN AGGREGATE SPREADER IS REQUIRED WHEN PLACING AGGREGATE BASE.
10. PRIME COAT MUST BE APPLIED TO BASE MATERIAL PRIOR TO PLACEMENT OF ASPHALT (PRIME COAT RC-250 @ 0.3 GAL/SY).

ENVIRONMENTAL PERMIT NOTES

1. THE CONTRACTOR SHALL ENSURE THAT EROSION AND SEDIMENT (E&S) CONTROL DEVICES ARE IN PLACE PRIOR TO CLEARING AND GRADING AND THAT THEY ARE MAINTAINED IN GOOD WORKING ORDER TO MINIMIZE IMPACTS TO STATE WATERS IN ACCORDANCE WITH THE CURRENT EDITION OF THE VIRGINIA EROSION AND SEDIMENTATION HANDBOOK. ALL EARTHWORK OPERATION SHALL BE CARRIED OUT IN SUCH A MANNER AS TO PREVENT THE EROSION OF THESE MATERIALS AND PRECLUDE THEIR ENTRY INTO STATE WATERS. THESE CONTROLS SHALL REMAIN IN PLACE UNTIL THE AREA STABILIZES. SOIL STABILIZATION PRACTICES SHALL BE APPLIED TO ALL DENUDED AREAS WITHIN 7 DAYS AFTER FINAL GRADE IS REACHED WITHIN ANY IMPACT AREA.
2. ALL UTILITY WORK IN STATE WATERS SHALL BE PERFORMED IN A MANNER AS TO MINIMIZE DISTURBANCE AND THE AREA MUST BE RETURNED TO ITS ORIGINAL CONTOURS AND STABILIZED.
3. THE POURING OF CONCRETE DIRECTLY INTO STATE WATERS SHALL BE STRICTLY PROHIBITED.
4. CONTINUOUS FLOW OF PERENNIAL SPRINGS SHALL BE MAINTAINED. PIPES AND CULVERTS SHALL BE COUNTERSUNK A MINIMUM OF 6 INCHES TO PROVIDE FOR THE RE-ESTABLISHMENT OF NATURAL STREAM BOTTOM AND A LOW STREAM CHANNEL.

CONSTRUCTION NOTES

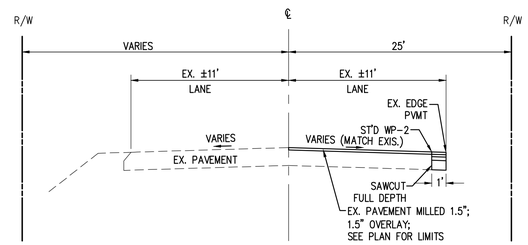
1. ALL WORK SHOWN HEREON SHALL BE IN STRICT ACCORDANCE WITH THE FAUQUIER COUNTY CODE AND CONSTRUCTION SPECIFICATIONS AND STANDARDS.
2. WHERE CONFLICTS EXIST BETWEEN THE CONSTRUCTION PLANS AND FAUQUIER COUNTY CODE, SPECIFICATIONS, OR STANDARDS AND THE VIRGINIA EROSION AND SEDIMENT CONTROL MANUAL, THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR A RESOLUTION OF THE CONFLICT.
3. CONTRACTOR IS RESPONSIBLE FOR SCHEDULING A PRE-CONSTRUCTION MEETING WITH THE ENGINEER, VDOT AND FAUQUIER COUNTY OFFICIAL A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION.
4. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD BEFORE STARTING CONSTRUCTION AND NOTIFY THE ENGINEER OF ANY DIFFERENCES.
5. CONTRACTOR SHALL BE RESPONSIBLE TO SEE THAT ALL EROSION AND SEDIMENT CONTROL STANDARDS ARE MET AND THE CONTRACTOR SHALL SEED AND MULCH ALL DISTURBED AREAS IN ACCORDANCE WITH COUNTY STANDARDS.
6. ALL WATER AND SEWER LINE TRENCHES SHALL BE COMPACTED TO 95% DENSITY IN 6" LAYERS. COMPACTION TESTS MAY BE REQUIRED BY THE COUNTY.
7. THE CONTRACTOR IS RESPONSIBLE FOR SECURING APPROPRIATE CONSTRUCTION PERMITS REQUIRED BY VDOT AND FAUQUIER COUNTY.
8. CLEARING AND GRUBBING IS TO BE CONFINED TO THOSE AREAS NEEDED FOR CONSTRUCTION. NO TREES OR SHRUBS IN UN-GRADED AREAS ARE TO BE CUT WITHOUT THE PERMISSION OF THE OWNER.
9. WHERE UNSUITABLE MATERIAL IS ENCOUNTERED IN THE SITE, IT SHALL BE REMOVED FROM THE ENTIRE SITE AND REPLACED WHERE NECESSARY WITH SUITABLE MATERIAL TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER.
10. ALL VEGETATION AND OVERBURDEN TO BE REMOVED FROM SITE PRIOR TO THE CONSTRUCTION OF THE SUBGRADE.
11. ALL GROWTH OF TREES AND VEGETATION SHALL BE CLEARED AND GRUBBED FOR THE ENTIRE RIGHT OF WAY. OTHER TREES AND VEGETATION WHICH OBSTRUCT SIGHT DISTANCES AT ROAD INTERSECTIONS SHALL BE REMOVED.
12. THE GRADE LINES DENOTE TOP OF FINISHED PAVEMENT UNLESS SHOWN OTHERWISE ON TYPICAL SECTIONS OR PLANS.
13. CONTRACTOR SHALL DO GRADING AS NECESSARY TO PRECLUDE THE PONDING OF WATER ADJACENT TO THE ROADWAY.

GRADING AND DRAINAGE NOTES:

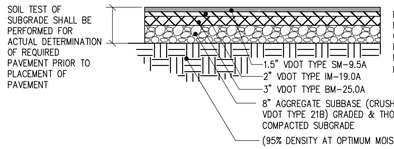
1. THE CONTRACTOR SHALL DISPOSE OF ALL SURPLUS MATERIAL OFF-SITE IN AN APPROVED AREA AND IN ACCORDANCE WITH THE APPROVED E&S PLAN.
2. DISTURBED AREAS NOT TO BE PAVED, LANDSCAPED, OR SODDED SHALL BE TOPSOILED, SEEDED, AND MULCHED ACCORDING TO VESCH STANDARDS. GRADED AREAS AT A SLOPE OF 3:1 OR STEEPER SHALL HAVE SURFACE ROUGHENING IN ACCORDANCE TO VESCH STANDARDS.
3. THE CONTRACTOR SHALL MAINTAIN DRAINAGE FACILITIES AT ALL TIMES DURING CONSTRUCTION. PROVIDE TEMPORARY FACILITIES, PUMPING ARRANGEMENTS, AND/OR CONNECTIONS AS REQUIRED TO MAINTAIN DRAINAGE.
4. CONTRACTOR SHALL MATCH EXISTING GRADE WHERE NEW SIDEWALK/ASPHALT/CURB/GUTTER MEETS EXISTING SIDEWALK/ASPHALT/CURB/GUTTER, RESPECTIVELY.
5. HANDICAPPED RAMPS AND CURB RAMPS SHALL BE INSTALLED AT 8.33% MAXIMUM SLOPE AND 2% MAX. CROSS SLOPE. HANDICAP PARKING SPACES AND AISLES SHALL BE INSTALLED AT 2% MAX. SLOPE IN ANY DIRECTION.
6. PAVEMENT SUBGRADES SHALL BE PREPARED IN ACCORDANCE WITH THE GEOTECHNICAL SPECIFICATIONS.

SITE CONSTRUCTION NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD BEFORE STARTING CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
2. IF RUNNING WATER IS PRESENT IN OUTLET CHANNELS DURING CONSTRUCTION WHERE DITCH PROTECTION IS REQUIRED, THE BOTTOM OF THE CHANNEL SHALL BE LINED WITH RIP-RAP STONE, FURTHER, EC-2 OR EC-3 MUST HAVE A MINIMUM WIDTH OF 4' FILL SECTIONS AND 5' CUT SECTIONS.
3. CONTRACTOR SHALL BE RESPONSIBLE TO SEE THAT ALL EROSION AND SEDIMENT CONTROL STANDARDS ARE MET AND THE CONTRACTOR TO SEED AND MULCH ALL DISTURBED AREAS IN ACCORDANCE WITH FAUQUIER COUNTY STANDARDS.
4. FINAL LOCATION OF MANHOLES SHALL NOT CONFLICT WITH OR CONSTRICT ROADSIDE DRAINAGE, CONTRACTOR SHALL ADJUST MANHOLES AND/OR DITCH ALIGNMENT TO INSURE PROPER ROADSIDE DITCH DRAINAGE COMPATIBLE WITH EXISTING FIELD CONDITIONS.
5. ALL WATER AND SEWER LINE TRENCHES SHALL BE COMPACTED TO 95% DENSITY IN 6" LAYERS.
6. THIS SITE SHALL BE CONSTRUCTED IN CONFORMANCE TO THE FAUQUIER DESIGN STANDARDS MANUAL AND THE PLATES/DETAILS LOCATED WITHIN.



TYPICAL SECTION
BLACKWELL RD
THRU ENTRANCE
NOT TO SCALE



NOTE: PAVEMENT DESIGNED FOR 3,000 ADT. FINAL PAVEMENT DESIGN SHALL BE BASED ON EXISTING PAVEMENT DEPTHS OR ACTUAL CBR TEST, WHICHEVER IS GREATER. SUBBASE AND PAVEMENT DEPTHS SHALL MATCH OR EXCEED EXISTING PAVEMENT DEPTHS, AS DETERMINED BY PAVEMENT CORES. ALL MATERIALS AND METHODS OF CONSTRUCTION TO CONFORM TO THE APPLICABLE REQUIREMENTS OF THE LATEST EDITION OF VDOT'S ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS..

TYPICAL BLACKWELL ROAD PAVEMENT SECTION
NOT TO SCALE

STREET CLASSIFICATION CHART

STREET NAME	CLASSIFICATION	DESIGN ADT (VPD)	PROPOSED ADT (VPD)	DESIGN SPEED (MPH)	POSTED SPEED (MPH)	ROW WIDTH	MINIMUM CENTERLINE RADIUS	MINIMUN SIGHT DISTANCE (FT) STOPPING	MINIMUN SIGHT DISTANCE (FT) INTERSECTION	PAVEMENT WIDTH (EP TO EP)	SHOULDER WIDTH
NICOLAS WAY	LOCAL ROAD (DITCH)	UP TO 2000	280	25	25	50'	200'	155'	280'	24'	3'
NOAH COURT	LOCAL ROAD (DITCH)	UP TO 2000	30	25	25	50'	200'	155'	280'	20'	3'
NASH COURT	LOCAL ROAD (DITCH)	UP TO 2000	30	25	25	50'	200'	155'	280'	20'	3'

SITE TABULATION

ZONING REQUIREMENTS

GPIN:
ZONING: R-1 CONVENTIONAL
PROPOSED USE: DWELLING, SINGLE FAMILY DETACHED

AREA TABULATION

GPIN 6985-60-5718-000 (PORTION):	22.1728 AC
GPIN 6985-51-6810-000:	10.0055 AC
TOTAL	32.1783 AC

PER ZONING ORDINANCE SECTION 2-308(4):
In all other zoning district categories, the maximum density shall be calculated on the gross area of the lot except that:

A. Only fifty (50) percent density allowance shall be calculated on that area of a lot comprised of existing water bodies.

B. Only thirty (30) percent density allowance shall be calculated on that area of a lot comprised of slopes in excess of twenty-five (25) percent grade.

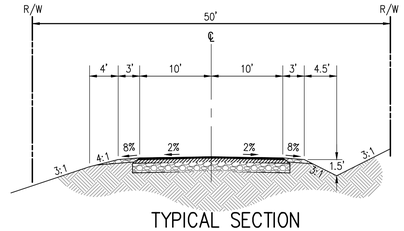
C. Only fifty (50) percent density allowance shall be calculated on that area of a lot comprised of slopes in excess of fourteen (14) percent but equal to or less than twenty-five (25) percent grade.

D. No density allowance shall be calculated for any area of a lot in an existing street right-of-way, floodplain, or quarry.

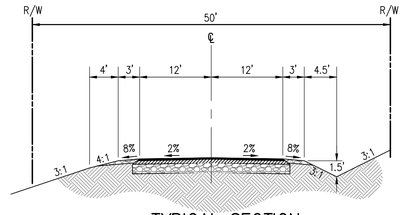
DENSITY CALCULATIONS	
PROJECT AREA =	32.1783 AC
ALLOWED DENSITY =	0.90 DU/AC.
EX. WATER BODIES =	0.5474 AC.
50% OF AREA =	0.2737 AC.
SLOPES >25% =	2.2035 AC.
30% OF AREA =	0.6610 AC.
SLOPES >14% &=25% =	8.8476 AC.
50% OF AREA =	4.4238 AC.
FLOODPLAIN =	0.0000 AC.
0% OF AREA	0.0000 AC.
REMAINDER OF AREA =	20.5798 AC.
100% OF AREA=	20.5798 AC.
NET DENSITY AREA=	**25.9384**
TOTAL LOTS ALLOWED = *(BASED ON 0.90 DU/AC)*	**23 LOTS**
PROPOSED LOTS =	**22 LOTS**

ZONING COMPLIANCE TABLE (ZONE R-1)				
ZONING REQUIREMENT	REQUIRED		PROVIDED	
MAXIMUM DENSITY =	0.90	DU/AC	0.85	DU/AC
MINIMUM LOT SIZE =	40,000	SQ.FT.	43,569	SQ.FT.
MINIMUM LOT WIDTH =	135	FT	135	FT
MINIMUM FRONT YARD =	60	FT	60	FT
MINIMUM SIDE AND REAR YARD =	25	FT	25	FT
MAXIMUM BUILDING HEIGHT =	35	FT	35	FT
MAXIMUM LOT COVERAGE =	-		-	
*MINIMUM OPEN SPACE =	25	%	N/A	

*FEWER THAN 25 LOTS PROPOSED. OPEN SPACE REQUIREMENTS DO NOT APPLY.



TYPICAL SECTION
NASH CT & NOAH CT
GS-SSAR SHOULDER & DITCH
25 MPH DESIGN SPEED (ADT 0-400)
NOT TO SCALE



TYPICAL SECTION
NICOLAS WAY
GS-SSAR SHOULDER & DITCH
25 MPH DESIGN SPEED (ADT UP TO 2000)
NOT TO SCALE

PROPOSED LOT TABULATIONS

LOT NO.	LOT WIDTH (BRL)	AREA (SF)	AREA (AC)
1	220.40	45,423	1.04
2	229.25	48,665	1.12
3	358.99	46,319	1.06
4	143.14	43,592	1.00
5	144.72	43,793	1.01
6	331.45	56,200	1.29
7	215.55	45,676	1.05
8	211.86	45,492	1.04
9	145.74	43,583	1.00
10	145.50	43,650	1.00
11	145.50	43,650	1.00
12	333.56	50,306	1.15
13	271.80	119,572	2.74
14	270.93	55,483	1.27
15	135.00	53,092	1.22
16	181.59	43,627	1.00
17	390.87	43,641	1.00
18	442.48	54,053	1.24
19	167.18	43,569	1.00
20	261.68	43,581	1.00
21	209.28	49,162	1.13
22	287.19	51,935	1.19

TOTAL AREA IN LOTS:	1,114,064 SF	
	25.58 ACRES	
RIGHT-OF-WAY DEDICATION:	163,545 SF	
	3.75 ACRES	
OPEN SPACE PARCEL A:	18,884 SF	
	0.43 ACRES	
OPEN SPACE PARCEL B:	73,671 SF	
	1.69 ACRES	
OPEN SPACE PARCEL C:	31,523 SF	
	0.72 ACRES	
TOTAL AREA IN OPEN SPACE:	124,078 SF	
	2.85 ACRES	
TOTAL SITE AREA:	32.17833 ACRES	

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SITE TABULATIONS, NOTES, DETAILS & TYPICAL SECTIONS

TIFFANY ESTATES
CONSTRUCTION PLANS

CENTER MAGISTERIAL DISTRICT — FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN | WED DRAWN | WED CHKD

SCALE H: N/A V:

JOB No. 6642-02-002

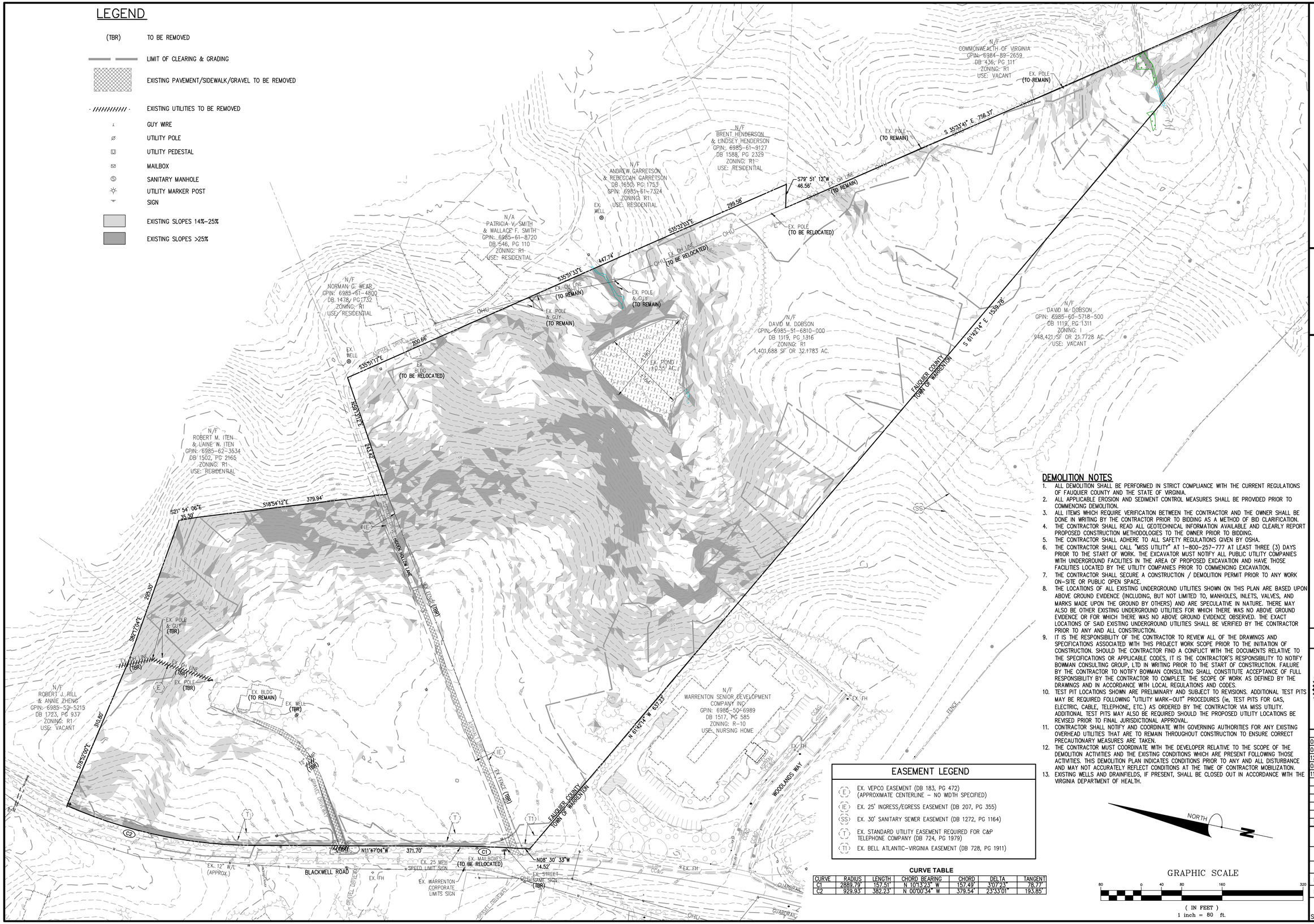
DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\003-6642-D-CP-001-NTS.dwg

LEGEND

(TBR)	TO BE REMOVED
	LIMIT OF CLEARING & GRADING
	EXISTING PAVEMENT/SIDEWALK/GRAVEL TO BE REMOVED
	EXISTING UTILITIES TO BE REMOVED
	GUY WIRE
	UTILITY POLE
	UTILITY PEDESTAL
	MAILBOX
	SANITARY MANHOLE
	UTILITY MARKER POST
	SIGN
	EXISTING SLOPES 14%-25%
	EXISTING SLOPES >25%



DEMOLITION NOTES

1. ALL DEMOLITION SHALL BE PERFORMED IN STRICT COMPLIANCE WITH THE CURRENT REGULATIONS OF FAUQUIER COUNTY AND THE STATE OF VIRGINIA.
2. ALL APPLICABLE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED PRIOR TO COMMENCING DEMOLITION.
3. ALL ITEMS WHICH REQUIRE VERIFICATION BETWEEN THE CONTRACTOR AND THE OWNER SHALL BE DONE IN WRITING BY THE CONTRACTOR PRIOR TO BIDDING AS A METHOD OF BID CLARIFICATION.
4. THE CONTRACTOR SHALL READ ALL GEOTECHNICAL INFORMATION AVAILABLE AND CLEARLY REPORT PROPOSED CONSTRUCTION METHODOLOGIES TO THE OWNER PRIOR TO BIDDING.
5. THE CONTRACTOR SHALL ADHERE TO ALL SAFETY REGULATIONS GIVEN BY OSHA.
6. THE CONTRACTOR SHALL CALL "MISS UTILITY" AT 1-800-257-777 AT LEAST THREE (3) DAYS PRIOR TO THE START OF WORK. THE EXCAVATOR MUST NOTIFY ALL PUBLIC UTILITY COMPANIES WITH UNDERGROUND FACILITIES IN THE AREA OF PROPOSED EXCAVATION AND HAVE THOSE FACILITIES LOCATED BY THE UTILITY COMPANIES PRIOR TO COMMENCING EXCAVATION.
7. THE CONTRACTOR SHALL SECURE A CONSTRUCTION / DEMOLITION PERMIT PRIOR TO ANY WORK ON-SITE OR PUBLIC OPEN SPACE.
8. THE LOCATIONS OF ALL EXISTING UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE BASED UPON ABOVE GROUND EVIDENCE (INCLUDING, BUT NOT LIMITED TO, MANHOLES, INLETS, VALVES, AND MARKS MADE UPON THE GROUND BY OTHERS) AND ARE SPECULATIVE IN NATURE. THERE MAY ALSO BE OTHER EXISTING UNDERGROUND UTILITIES FOR WHICH THERE WAS NO ABOVE GROUND EVIDENCE OR FOR WHICH THERE WAS NO ABOVE GROUND EVIDENCE OBSERVED. THE EXACT LOCATIONS OF SAID EXISTING UNDERGROUND UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO ANY AND ALL CONSTRUCTION.
9. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THIS PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS RELATIVE TO THE SPECIFICATIONS OR APPLICABLE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY BOWMAN CONSULTING GROUP, LTD IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY BOWMAN CONSULTING SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN ACCORDANCE WITH LOCAL REGULATIONS AND CODES.
10. TEST PIT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO REVISIONS. ADDITIONAL TEST PITS MAY BE REQUIRED FOLLOWING "UTILITY MARK-OUT" PROCEDURES (ie, TEST PITS FOR GAS, ELECTRIC, CABLE, TELEPHONE, ETC.) AS ORDERED BY THE CONTRACTOR VIA MISS UTILITY. ADDITIONAL TEST PITS MAY ALSO BE REQUIRED SHOULD THE PROPOSED UTILITY LOCATIONS BE REVISED PRIOR TO FINAL JURISDICTIONAL APPROVAL.
11. CONTRACTOR SHALL NOTIFY AND COORDINATE WITH GOVERNING AUTHORITIES FOR ANY EXISTING OVERHEAD UTILITIES THAT ARE TO REMAIN THROUGHOUT CONSTRUCTION TO ENSURE CORRECT PRECAUTIONARY MEASURES ARE TAKEN.
12. THE CONTRACTOR MUST COORDINATE WITH THE DEVELOPER RELATIVE TO THE SCOPE OF THE DEMOLITION ACTIVITIES AND THE EXISTING CONDITIONS WHICH ARE PRESENT FOLLOWING THOSE ACTIVITIES. THIS DEMOLITION PLAN INDICATES CONDITIONS PRIOR TO ANY AND ALL DISTURBANCE AND MAY NOT ACCURATELY REFLECT CONDITIONS AT THE TIME OF CONTRACTOR MOBILIZATION.
13. EXISTING WELLS AND DRAINFIELDS, IF PRESENT, SHALL BE CLOSED OUT IN ACCORDANCE WITH THE VIRGINIA DEPARTMENT OF HEALTH.

EASEMENT LEGEND

(E)	EX. VEPCO EASEMENT (DB 183, PG 472) (APPROXIMATE CENTERLINE – NO WIDTH SPECIFIED)
(IE)	EX. 25' INGRESS/EGRESS EASEMENT (DB 207, PG 355)
(SS)	EX. 30' SANITARY SEWER EASEMENT (DB 1272, PG 1164)
(T)	EX. STANDARD UTILITY EASEMENT REQUIRED FOR C&P TELEPHONE COMPANY (DB 724, PG 1979)
(T1)	EX. BELL ATLANTIC-VIRGINIA EASEMENT (DB 728, PG 1911)

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C1	2889.79'	157.51'	N 10°13'23" W	157.49'	3°07'23"	78.77'
C2	929.93'	382.23'	N 00°00'34" W	379.54'	23°33'01"	193.85'

NORTH

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

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EXISTING CONDITIONS & DEMOLITION PLAN

TIFFANY ESTATES
CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT — FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
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11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=80'
V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 4 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\004-6642-D-CP-001-EXC.dwg

LEGEND

- EPHEMERAL DRAINAGEWAY
- ROCK OUTCROP

NOTES:

1. SOILS INFORMATION WITHIN THE SITE BOUNDARY WAS PROVIDED BY THE FAUQUIER COUNTY SOILS SCIENTIST OFFICE VIA A TYPE 1 SOIL REPORT, DATED 01/04/2023 AND 5/17/2001.
2. BASEMENTS ARE NOT RECOMMENDED IN MAPPING UNITS 15A, 17B, AND 17C. BASEMENTS IN THESE MAPPING UNITS ARE SUBJECT TO FLOODING DUE TO HIGH SEASONAL WATER TABLES. SUMP SYSTEMS MAY RUN CONTINUOUSLY, LEADING TO POSSIBLE PREMATURE PUMP FAILURE.
3. PRIOR TO FINAL CONSTRUCTION PLAN APPROVAL, IT SHALL BE AGREED THAT ALL DRAINFIELD AREAS ARE TO BE SURROUNDED BY SAFETY FENCING AND NO CONSTRUCTION TRAFFIC SHALL CROSS NOT SHALL LAND DISTURBANCE OCCUR IN THESE AREAS. THE FENCING OF THESE AREAS IS TO BE VERIFIED BY COUNTY STAFF BEFORE THE ISSUANCE OF THE LAND DISTURBING PERMIT.
4. FOUNDATIONS PLACED IN SOIL MAPPING UNITS THAT SHOW A MODERATE, HIGH, OR VERY HIGH SHRINK-SWELL POTENTIAL IN THE MOST RECENT INTERPRETIVE GUIDE TO THE SOILS OF FAUQUIER COUNTY, VIRGINIA WILL REQUIRE A GEOTECHNICAL EVALUATION IN ORDER TO DETERMINE PROPER DESIGN.
5. THE COUNTY RECOMMENDS THAT BEFORE ROAD OR HOME CONSTRUCTION BEGINS IN SOIL MAPPING UNITS 33C, 140C, 140D, 141D, 240C, 241D, 340B, AND 340E A SITE SPECIFIC EVALUATION BE CONDUCTED SO THAT SHALLOW TO BEDROCK AREAS ARE IDENTIFIED. THESE AREAS MAY REQUIRE BLASTING IF DEEP CUTS OR EXCAVATION IS DONE. FIRE MARSHAL'S OFFICE SHALL BE CONTACTED PRIOR TO BLASTING.

NORTH

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

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Phone: (540) 371-0288
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TYPE 1 SOILS MAP

TIFFANY ESTATES

CONSTRUCTION PLAN

FAUQUIER COUNTY, VIRGINIA

CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION
DATE	DESCRIPTION

WED	WED	WED
DESIGN	DRAWN	CHKD

SCALE H: 1"=80'
V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 5 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\005-006-6642-D-CP-001-SOILS.dwg

MAP UNIT SYMBOL	SOIL NAME SLOPE	SOIL DESCRIPTION	General Characteristics: SOIL FEATURES					LAND POTENTIALS	DEVELOPMENT POTENTIAL AND PROBLEMS USING: CENTRAL WATER AND CENTRAL SEWER	DEVELOPMENT POTENTIAL AND PROBLEMS USING: CONVENTIONAL SEPTIC TANK AND DRAINFIELD
							K_{SAT}			
15A	Seneca loam	Very deep, moderately w ell drained, yellow ish-brow n loamy soils w ith intermittent high w ater tables in concave sw ales and along small drainagew ays; developed in recent colluvium and local w ash from crystalline and metamorphic uplands	Slope (%)	0 - 2	Erosion Hazard Potential:	Slight	Surface: Moderate	**AGRICULTURE**	POOR Frequent flooding; intermittent high w ater table; concentrated runoff from higher areas; low bearing capacity w hen w et	NOT SUITED High w ater table Landscape position
			Bedrock Depth (in.):	> 60	K Factor (surface):	0.37	Subsoil: Moderate	SECONDARY CROPLAND		
			Watertable Depth (in.):	20-40	K Factor (subsoil):	0.28	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	B		**FORESTRY (HARDWOOD)**		
		May have Hydric Soil Inclusions	Bearing Capacity:	Mod.				MODERATELY HIGH		
17B	Middleburg loam	Very deep, w ell drained, brow n loamy soils in concave sw ales and along small drainagew ays; developed in recent colluvium and local w ash from crystalline uplands	Slope (%)	2-7	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	POOR Frequent flooding; intermittent high w ater table; concentrated runoff from higher areas; low bearing capacity w hen w e	NOT SUITED Landscape position
			Bedrock Depth (in.):	> 60	K Factor (surface):	0.37	Subsoil: Moderate	PRIME CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.32	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	B		**FORESTRY (HARDWOOD)**		
		May have Hydric Soil Inclusions	Bearing Capacity:	Mod.				HIGH		
17C	Middleburg loam	Very deep, w ell drained, brow n loamy soils in concave sw ales and along small drainagew ays; developed in recent colluvium and local w ash from crystalline uplands	Slope (%)	7-15	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	POOR Frequent flooding; intermittent high w ater table; concentrated runoff from higher areas; low bearing capacity w hen w e	NOT SUITED Landscape position
			Bedrock Depth (in.):	> 60	K Factor (surface):	0.37	Subsoil: Moderate	SECONDARY CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.32	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	B		**FORESTRY (HARDWOOD)**		
		May have Hydric Soil Inclusions	Bearing Capacity:	Mod.				HIGH		
33C	Brinklow silt loam	Moderately deep, w ell drained, yellow ish-red silty soils on strongly sloping sidesloses; developed in residuum from sericite and biotite schist, gneiss and phyllites.	Slope (%)	7-15	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	FAIR Shallow to rock	POOR Shallow to rock
			Bedrock Depth (in.):	20-40	K Factor (surface):	0.37	Subsoil: Moderate	SECONDARY CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.32	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	B	Weathered Bedrock: Impermeable	**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.			Hard Bedrock: Impermeable	MODERATELY HIGH		
40C	Myersville silt loam, stony	Deep, w ell drained, strong brow n silty soils on rolling summits and strongly sloping backslopes; developed in residuum from greenstone and chloritic schist	Slope (%)	7-15	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	FAIR Shallow to rock	MARGINAL Shallow to rock
			Bedrock Depth (in.):	40-60	K Factor (surface):	0.37	Subsoil: Moderate	SECONDARY CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.32	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	B	Weathered Bedrock: Impermeable	**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				MODERATELY HIGH		
43B	Alanthus silt loam	Very deep, w ell drained, yellow ish-red silty soils on undulating summits and gently sloping backslopes; developed in residuum from greenstone and chloritic schist	Slope (%)	2-7	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	GOOD	GOOD
			Bedrock Depth (in.):	>60	K Factor (surface):	0.37	Subsoil: Moderate	PRIME CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.32	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	B		**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				HIGH		
43C	Alanthus silt loam	Very deep, w ell drained, yellow ish-red silty soils on strongly sloping backslopes; developed in residuum from greenstone and chloritic schist	Slope (%)	7-15	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	GOOD	GOOD
			Bedrock Depth (in.):	>60	K Factor (surface):	0.37	Subsoil: Moderate	SECONDARY CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.32	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	B		**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				HIGH		
45B	Fauquier silt loam	Very deep, w ell drained, red clayey soils on undulating summits and gently sloping backslopes; developed in residuum from massive greenstone and chloritic schist	Slope (%)	2-7	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	GOOD	MARGINAL Slow percolation
			Bedrock Depth (in.):	>60	K Factor (surface):	0.32	Subsoil: Moderate	PRIME CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.28	Substratum: Moderate			
			Shrink-Sw ell Potential	Mod.	Hydrologic Group:	C		**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				HIGH		
45C	Fauquier silt loam	Very deep, w ell drained, red clayey soils on strongly sloping backslopes; developed in residuum from massive greenstone and chloritic schist	Slope (%)	7-15	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	GOOD	MARGINAL Slow percolation
			Bedrock Depth (in.):	>60	K Factor (surface):	0.32	Subsoil: Moderate	SECONDARY CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.28	Substratum: Moderate			
			Shrink-Sw ell Potential	Mod.	Hydrologic Group:	C		**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				HIGH		
47B	Elioak - Fauquier complex	ELIOAK Very deep, w ell drained, micaceous, dark red clayey soils on undulating summits and gently sloping backslopes; developed in residuum from micaceous acid crystalline rock and chloritic schist	Slope (%)	2 - 7	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	GOOD	MARGINAL Slow percolation
			Bedrock Depth (in.):	>60	K Factor (surface):	0.32	Subsoil: Moderate	PRIME CROPLAND		
			Watertable Depth (in.):	> 40	K Factor (subsoil):	0.28	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	C		**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	low				MODERATELY HIGH		
		FAUQUIER Very deep, w ell drained, red clayey soils on undulating summits and gently sloping backslopes; developed in residuum from micaceous acid crystalline rock and chloritic schist	Slope (%)	2 - 7	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**		
			Bedrock Depth (in.):	>60	K Factor (surface):	0.32	Subsoil: Moderate	PRIME CROPLAND		
			Watertable Depth (in.):	> 40	K Factor (subsoil):	0.28	Substratum: Moderate			
			Shrink-Sw ell Potential	Mod.	Hydrologic Group:	C		**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				HIGH		
53C	Glenelg loam	Very deep, w ell drained, micaceous, dark brow n loamy soils on rolling summits and strongly sloping backslopes; developed in residuum from micaceous acid crystalline rock	Slope (%)	7-15	Erosion Hazard Potential:	High	Surface: Moderate	**AGRICULTURE**	GOOD High mica content in substratum may interfer w ith compaction	GOOD
			Bedrock Depth (in.):	>60	K Factor (surface):	0.32	Subsoil: Moderate	SECONDARY CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.43	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	B		**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	low				MODERATE		

MAP UNIT SYMBOL	SOIL NAME SLOPE	SOIL DESCRIPTION	General Characteristics: SOIL FEATURES					LAND POTENTIALS	DEVELOPMENT POTENTIAL AND PROBLEMS USING: CENTRAL WATER AND CENTRAL SEWER	DEVELOPMENT POTENTIAL AND PROBLEMS USING: CONVENTIONAL SEPTIC TANK AND DRAINFIELD
							K_{SAT}			
140C	Pignut silt loam	Moderately deep, w ell drained, strong brow n silty soils w ith few rock outcrops, stones and boulders on convex strongly sloping backslopes in highly dissected landscapes; developed in residuum from greenstone	Slope (%)	7-15	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	FAIR Shallow to rock	POOR Shallow to rock
			Bedrock Depth (in.):	20-40	K Factor (surface):	0.37	Subsoil: Moderate	SECONDARY CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.32	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	C	Weathered Bedrock: Impermeable	**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.			Hard Bedrock: Impermeable	MODERATELY LOW		
140D	Pignut silt loam	Moderately deep, w ell drained, strong brow n silty soils on moderately steep backslopes in highly dissected landscapes; developed in residuum from greenstone	Slope (%)	15-25	Erosion Hazard Potential:	High	Surface: Moderate	**AGRICULTURE**	FAIR Steep slopes Shallow to rock	POOR Steep slopes Shallow to rock
			Bedrock Depth (in.):	20-40	K Factor (surface):	0.37	Subsoil: Moderate	SECONDARY CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.32	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	C	Weathered Bedrock: Impermeable	**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.			Hard Bedrock: Impermeable	MODERATELY LOW		
141D	Pignut - Alanthus Complex, very stony	PIGNUT Moderately deep, w ell drained, strong brow nsilty soils on moderately steep backslopes; surface cover is represented by .01 – 3% stones and cobbles, and 0 – 0.1% rock outcrop; developed in residuum from greenstone	Slope (%)	15-25	Erosion Hazard Potential:	High	Surface: Moderate	**AGRICULTURE**	POOR Steep slopes Shallow to rock Stoniness	POOR Steep slopes Shallow to rock
			Bedrock Depth (in.):	20 - 40	K Factor (surface):	0.37	Subsoil: Moderate	SECONDARY PASTURE		
			Watertable Depth (in.):	> 40	K Factor (subsoil):	0.32	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	C	Weathered Bedrock: Impermeable	**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.			Hard Bedrock: Impermeable	MODERATELY LOW		
		ALANTHUS Very deep, w ell drained, yellow ish-red silty soils on moderately steep backslopes; surface cover is represented by .01 – 3% stones and cobbles, and 0 – 0.1% rock outcrop; developed in residuum from greenstone	Slope (%)	15-25	Erosion Hazard Potential:	High	Surface: Moderate	**AGRICULTURE**		
			Bedrock Depth (in.):	>60	K Factor (surface):	0.37	Subsoil: Moderate	PRIME PASTURE		
			Watertable Depth (in.):	> 40	K Factor (subsoil):	0.32	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	B		**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				MODERATELY LOW		
200	Cut and/or Fill	Disturbed areas of cutting and/ or filling	**HIGHLY VARIABLE**							
240C	Catoctin silt loam (shallow phase)	Shallow , w ell drained, olive brow n, loamy- skeletal soils on strongly sloping backslopes; may have a few cobbles and/or stones on the surface; developed in residuum from greenstone	Slope (%)	7-15	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	POOR Shallow to rock	NOT SUITED Shallow to rock
			Bedrock Depth (in.):	10-20	K Factor (surface):	0.32	Subsoil: Moderate	PRIME PASTURE		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.17	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	D	Hard Bedrock: Impermeable	**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				LOW		
241D	Pignut - Alanthus Complex	PIGNUT Moderately deep, w ell drained, strong brow n silty soils on moderately steep backslopes; soil surface may contain a few cobbles and/or stones; developed in residuum from greenstone	Slope (%)	15-25	Erosion Hazard Potential:	High	Surface: Moderate	**AGRICULTURE**	POOR Shallow to rock; Steep slopes	POOR Shallow to rock; Steep slopes
			Bedrock Depth (in.):	20 - 40	K Factor (surface):	0.37	Subsoil: Moderate	PRIME PASTURE		
			Watertable Depth (in.):	> 40	K Factor (subsoil):	0.23	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	C	Weathered Bedrock: Impermeable	**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.			Hard Bedrock: Impermeable	MODERATE		
		ALANTHUS Very deep, w ell drained, yellow ish-red silty soils on moderately steep backslopes; soil surface may contain a few cobbles and/or stones; developed in residuum from greenstone	Slope (%)	15-25	Erosion Hazard Potential:	High	Surface: Moderate	**AGRICULTURE**		
			Bedrock Depth (in.):	>60	K Factor (surface):	0.37	Subsoil: Moderate	PRIME PASTURE		
			Watertable Depth (in.):	> 40	K Factor (subsoil):	0.23	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	B		**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				MODERATELY HIGH		
340B	Catoctin silt loam	Moderately deep, w ell drained, strong brow n loamy-skeletal soils containing more than 35% rock fragments in the subsoil on undulating summits and gently sloping backslopes in highly dissected landscapes; developed in residuum from greenstone	Slope (%)	2-7	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	FAIR Shallow to rock	POOR Shallow to rock
			Bedrock Depth (in.):	20-40	K Factor (surface):	0.32	Subsoil: Moderate	SECONDARY CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.17	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	C	Hard Bedrock: Impermeable	**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				MODERATELY LOW		
340E	Catoctin silt loam	Moderately deep, w ell drained, strong brow n loamy-skeletal soils containing more than 35% rock fragments in the subsoil on steep backslopes in highly dissected landscapes; developed in residuum from greenstone	Slope (%)	25-45	Erosion Hazard Potential:	Very High	Surface: Moderate	**AGRICULTURE**	POOR Shallow to rock; Very steep slopes	NOT SUITED Shallow to rock Very steep slopes
			Bedrock Depth (in.):	20-40	K Factor (surface):	0.32	Subsoil: Moderate	SECONDARY PASTURE		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.17	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	C	Hard Bedrock: Impermeable	**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				MODERATELY LOW		
417B	Middleburg Variant loam	Very deep, w ell drained, brow n loamy soils on gently sloping colluvial benches and toeslopes; developed in recent colluvium from basic crystalline rock materials	Slope (%)	2-7	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	GOOD Intermittent high w ater table	MARGINAL Landscape position
			Bedrock Depth (in.):	>60	K Factor (surface):	0.37	Subsoil: Moderate	PRIME CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.32	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	B		**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				HIGH		
417C	Middleburg Variant loam	Very deep, w ell drained, brow n loamy soils on strongly sloping colluvial benches and toeslopes; developed in recent colluvium from basic crystalline rock materials	Slope (%)	7-15	Erosion Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	GOOD Intermittent high w ater table	MARGINAL Landscape position
			Bedrock Depth (in.):	>60	K Factor (surface):	0.37	Subsoil: Moderate	SECONDARY CROPLAND		
			Watertable Depth (in.):	>40	K Factor (subsoil):	0.32	Substratum: Moderate			
			Shrink-Sw ell Potential	low	Hydrologic Group:	B		**FORESTRY (HARDWOOD)**		
			Bearing Capacity:	Mod.				HIGH		

Bowman

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Fredericksburg, Virginia 22401
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TYPE 1 SOILS REPORT
TIFFANY ESTATES
CONSTRUCTION PLAN
FAUQUIER COUNTY, VIRGINIA
CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS

02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: N/A V:

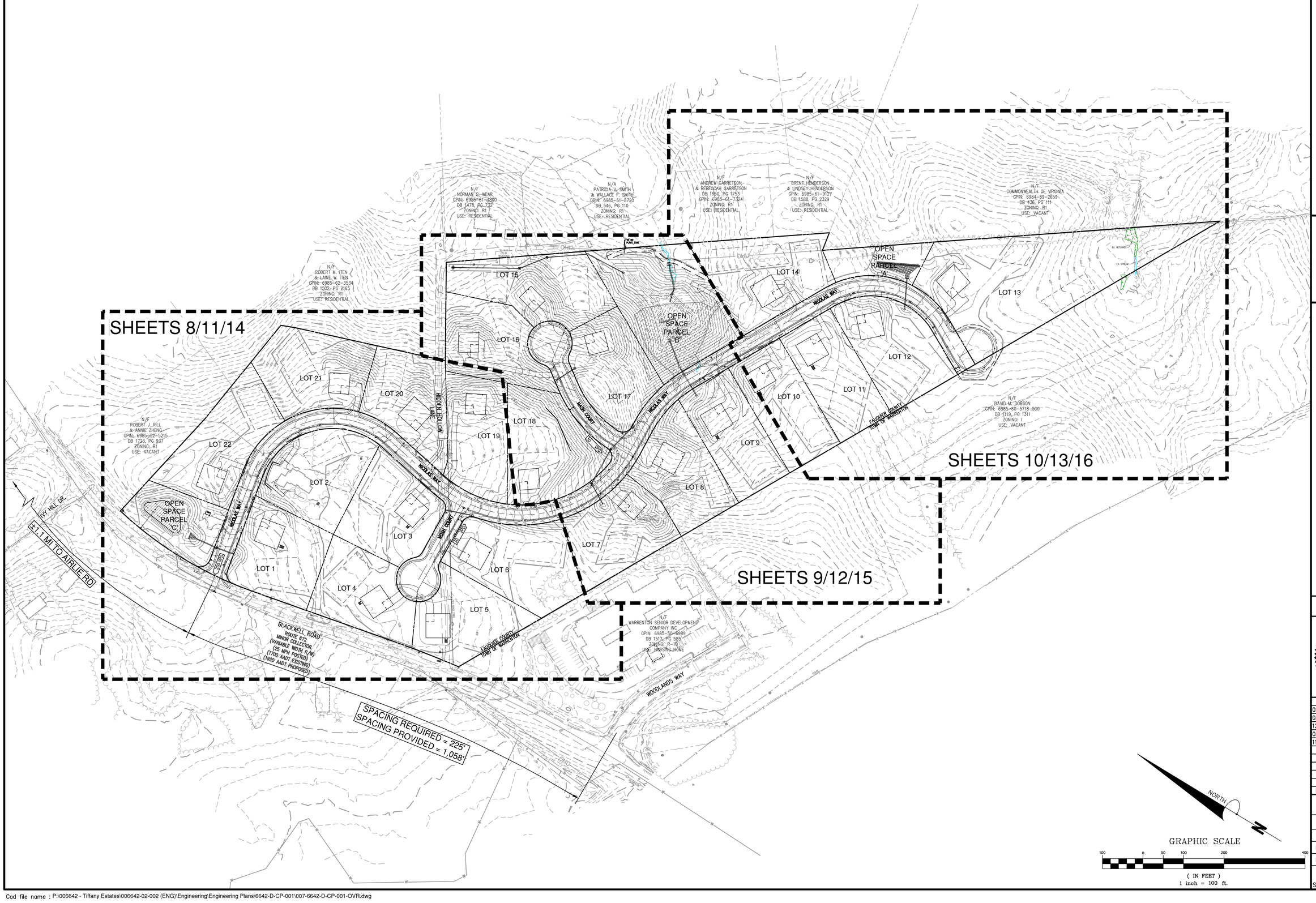
JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 6 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\005-006-6642-D-CP-001-SOILS.dwg



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Fredericksburg, Virginia 22401
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OVERALL & KEY PLAN
TIFFANY ESTATES
CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT

FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION
DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD
SCALE	H: 1"=100' V:	
JOB No. 6642-02-002		
DATE : FEBRUARY 10, 2023		
FILE No. 6642-D-CP-001		
SHEET 7 OF 58		

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\007-6642-D-CP-001-OVR.dwg

SIGN LEGEND

SIGN NUMBER	①	②	④
SIGN	STOP		FIRE LANE NO PARKING
STD. NUMBER	R1-1	STREET SIGN	FIRE LANE SIGN
SIZE	30" X 30"	VARIES	12" X 18"

PAVEMENT LEGEND

SEE SHEET 3 FOR PAVEMENT DEPTHS

- DENOTES MILL AND OVERLAY
- DENOTES PROPOSED STANDARD ASPHALT PAVEMENT
- DENOTES PROPOSED LIGHT DUTY ASPHALT PAVEMENT

EASEMENT LEGEND

- (IE) DENOTES PROP. INGRESS/EGRESS EASEMENT
- (TT) DENOTES PROP. TEMPORARY TURNAROUND EASEMENT
- (SI) DENOTES PROP. SIGHT DISTANCE EASEMENT
- (E) EX. VEPCO EASEMENT (DB 183, PG 472) (APPROXIMATE CENTERLINE – NO WIDTH SPECIFIED)
- (IE) EX. 25' INGRESS/EGRESS EASEMENT (DB 207, PG 355)
- (SS) EX. 30' SANITARY SEWER EASEMENT (DB 1272, PG 1164)
- (T) EX. STANDARD UTILITY EASEMENT REQUIRED FOR C&P TELEPHONE COMPANY (DB 724, PG 1979)
- (T1) EX. BELL ATLANTIC–VIRGINIA EASEMENT (DB 728, PG 1911)
- DENOTES PORTION OF EXISTING EASEMENT TO BE VACATED

NOTES

1. ALL DIMENSIONS ARE TO EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
2. ALL PROPOSED SIGNING AND PAVEMENT MARKING SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF EACH OF THE FOLLOWING AND ANY REVISION THERETO:
   - MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
   - THE VIRGINIA SUPPLEMENT TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
   - THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS.
   - THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS.
3. PROPOSED SIGN LOCATIONS ARE APPROXIMATE AND SHALL BE MODIFIED IN THE FIELD TO AVOID CONFLICT WITH UNDERGROUND UTILIZES OR OTHER OBSTRUCTIONS, AND TO COMPLY WITH STANDARDS REFERENCED IN NOTE 2.
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.
6. ALL SIGNAGE SHALL COMPLY WITH ARTICLE 8 OF THE ZONING ORDINANCE.
7. ALL DRIVEWAY ENTRANCES SHALL BE PE-1.
8. DRIVEWAYS MAY BE CONSTRUCTED WITH ASPHALT OR CONCRETE SURFACE.

N/F
ROBERT M. ITEN
& LAINE W. ITEN
GPIN: 6985-62-3534
DB 1502, PG 2165
ZONING: R1
USE: RESIDENTIAL

N/F
ROBERT J. RILL
& ANNIE ZHENG
GPIN: 6985-52-5215
DB 1723, PG 937
ZONING: R1
USE: VACANT

N/F
WARRENTON SENIOR DEVELOPMENT COMPANY INC
GPIN: 6985-50-6989
DB 1517, PG 585
ZONING: R-10
USE: NURSING HOME

LOT 1 45,423 SF
LOT 2 48,665 SF
LOT 3 46,319 SF
LOT 4 43,592 SF
LOT 5 43,793 SF
LOT 6 56,200 SF
LOT 7 45,676 SF
LOT 18 54,053 SF
LOT 19 43,569 SF
LOT 20 43,581 SF
LOT 21 49,162 SF
LOT 22 51,935 SF
LOT 16 43,627 SF
OPEN SPACE PARCEL 'C' 31,523 SF
BIORETENTION BASIN 'A' TOP(SURFACE)=512.00 BOTTOM=507.50

163,545 SF TO BE DEDICATED TO PUBLIC STREET PURPOSES

NICOLAS WAY (50' R/W) 12+00
NOAH COURT (50' R/W) 11+00
NASH COURT (50' R/W)
MATCHLINE - SHEET 9
HIDDEN HOLLOW LANE
BLACKWELL ROAD ROUTE 672 MINOR COLLECTOR (VARIABLE WIDTH R/W) (25 MPH POSTED) (1700 AADT EXISTING) (1920 AADT PROPOSED)

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

NORTH

Bowman Consulting Group Ltd
1300 Central Park Boulevard
Fredericksburg, Virginia 22401
Phone: (540) 371-0268
bowman.com
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LAYOUT PLAN
TIFFANY ESTATES
CONSTRUCTION PLAN

FAUQUIER COUNTY, VIRGINIA

CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION	
WED DESIGN	WED DRAWN	WED CHKD
SCALE	H: 1"=40' V:	
JOB No. 6642-02-002		
DATE : FEBRUARY 10, 2023		
FILE No. 6642-D-CP-001		
SHEET 8 OF 58		

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\008-010-6642-D-CP-001-DIM.dwg

PAVEMENT LEGEND

SEE SHEET 3 FOR PAVEMENT DEPTHS

- DENOTES MILL AND OVERLAY
- DENOTES PROPOSED STANDARD ASPHALT PAVEMENT
- DENOTES PROPOSED LIGHT DUTY ASPHALT PAVEMENT

SIGN LEGEND

SIGN NUMBER	①	②	④
SIGN	STOP		FIRE LANE NO PARKING
STD. NUMBER	R1-1	STREET SIGN	FIRE LANE SIGN
SIZE	30" X 30"	VARIES	12" X 18"

NOTES

1. ALL DIMENSIONS ARE TO EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
2. ALL PROPOSED SIGNING AND PAVEMENT MARKING SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF EACH OF THE FOLLOWING AND ANY REVISION THERETO:
   - MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
   - THE VIRGINIA SUPPLEMENT TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
   - THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS.
   - THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS.
3. PROPOSED SIGN LOCATIONS ARE APPROXIMATE AND SHALL BE MODIFIED IN THE FIELD TO AVOID CONFLICT WITH UNDERGROUND UTILIZES OR OTHER OBSTRUCTIONS, AND TO COMPLY WITH STANDARDS REFERENCED IN NOTE 2.
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.
6. ALL SIGNAGE SHALL COMPLY WITH ARTICLE 8 OF THE ZONING ORDINANCE.
7. ALL DRIVEWAY ENTRANCES SHALL BE PE-1.
8. DRIVEWAYS MAY BE CONSTRUCTED WITH ASPHALT OR CONCRETE SURFACE.

EASEMENT LEGEND

- (IE) DENOTES PROP. INGRESS/EGRESS EASEMENT
- (TT) DENOTES PROP. TEMPORARY TURNAROUND EASEMENT
- (SI) DENOTES PROP. SIGHT DISTANCE EASEMENT
- (E) EX. VEPCO EASEMENT (DB 183, PG 472) (APPROXIMATE CENTERLINE – NO WIDTH SPECIFIED)
- (IE) EX. 25' INGRESS/EGRESS EASEMENT (DB 207, PG 355)
- (SS) EX. 30' SANITARY SEWER EASEMENT (DB 1272, PG 1164)
- (T) EX. STANDARD UTILITY EASEMENT REQUIRED FOR C&P TELEPHONE COMPANY (DB 724, PG 1979)
- (T1) EX. BELL ATLANTIC-VIRGINIA EASEMENT (DB 728, PG 1911)
- DENOTES PORTION OF EXISTING EASEMENT TO BE VACATED

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

1 inch = 40 ft.

Bowman

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TIFFANY ESTATES

CONSTRUCTION PLAN

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SCALE	H: 1"=40' V:	
JOB No. 6642-02-002		
DATE : FEBRUARY 10, 2023		
FILE No. 6642-D-CP-001		
SHEET 9 OF 58		

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\008-010-6642-D-CP-001-DIM.dwg

EASEMENT LEGEND

- IE — DENOTES PROP. INGRESS/EGRESS EASEMENT
- TT — DENOTES PROP. TEMPORARY TURNAROUND EASEMENT
- SI — DENOTES PROP. SIGHT DISTANCE EASEMENT
- E — EX. VEPCO EASEMENT (DB 183, PG 472) (APPROXIMATE CENTERLINE – NO WIDTH SPECIFIED)
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SIGN LEGEND

SIGN NUMBER	①	②	④
SIGN	STOP		FIRE LANE NO PARKING
STD. NUMBER	R1-1	STREET SIGN	FIRE LANE SIGN
SIZE	30" X 30"	VARIES	12" X 18"

PAVEMENT LEGEND

SEE SHEET 3 FOR PAVEMENT DEPTHS

- DENOTES MILL AND OVERLAY
- DENOTES PROPOSED STANDARD ASPHALT PAVEMENT
- DENOTES PROPOSED LIGHT DUTY ASPHALT PAVEMENT

MATCHLINE - BELOW

MATCHLINE - ABOVE

MATCHLINE - SHEET 9

N/F
ANDREW GARRETSON
& REBECCAH GARRETSON
DB 1650, PG 1753
GPIN: 6985-61-7324
ZONING: R1
USE: RESIDENTIAL

N/F
BRENT HENDERSON
& LINDSEY HENDERSON
GPIN: 6985-61-9127
DB 1588, PG 2329
ZONING: R1
USE: RESIDENTIAL

N/F
COMMONWEALTH OF VIRGINIA
GPIN: 6984-89-2659
DB 436, PG 111
ZONING: R1
USE: VACANT

N/F
DAVID M. DOBSON
GPIN: 6985-60-5718-500
DB 1119, PG 1311
ZONING: I
USE: VACANT

OPEN SPACE PARCEL 'A' 18,884 SF

163,545 SF TO BE DEDICATED TO PUBLIC STREET PURPOSES

OPEN SPACE PARCEL 'B' 73,671 SF

LOT 14 55,483 SF

LOT 13 119,572 SF

LOT 12 50,306 SF

LOT 11 43,650 SF

LOT 10 43,650 SF

LOT 9 43,583 SF

NICOLAS WAY (50' R.O.W.)

FALQUIER COUNTY (TOWN OF WARRENTON)

EX. WETLANDS

EX. STREAM

EX. POND

EX. POLE & GUY (TO REMAIN)

EX. POLE (TO BE RELOCATED)

EX. OH LINE (TO REMAIN)

EX. OH LINE (TO BE RELOCATED)

PERMANENT POOL =441.00

RESERVE DRAINFIELD

INSTALL DRAINFIELD

FIRE LANE SIGN

STREET EXTENSION SIGN

60'x60' PAD GF=470.74 FF=472.49 BF=463.49 W/O

60'x60' PAD GF=472.82 FF=474.57 BF=465.57 W/O

60'x60' PAD GF=471.17 FF=478.92 BF=469.92

50'x60' PAD GF=476.98 FF=478.73 BF=469.73

60'x60' PAD GF=473.25 FF=475.00 BF=466.00

60'x60' PAD GF=463.40 FF=465.15 BF=456.15

60'x60' PAD GF=486.88 FF=488.64 BF=479.64 W/O

N35°51'33"W 50.33'

N35°32'03"W 299.58'

N17°31'17"E 46.56'

N35°33'41"W 276.01'

N35°33'41"W 707.33'

S36°02'07"W 66.01'

N65°29'58"E 118.58'

N61°42'14"W 699.63'

S61°42'14"E 235.81'

S61°42'14"E 167.31'

N61°42'14"W 145.50'

N61°42'14"W 14.59'

N61°42'14"W 97.52'

S61°42'14"E 145.50'

S61°42'14"E 189.59'

N28°17'46"E 125.00'

S28°17'46"W 125.00'

S28°17'46"W 300.00'

N28°17'46"E 300.00'

N28°17'46"E 295.78'

N61°17'46"E 288.28'

S28°17'46"W 300.00'

S28°17'46"W 300.00'

C19 280' SPL

C24

C43

C45

P.I. = 331+64.32

P.I. = 283+71.03

P.I. = 276+00

P.I. = 294+00

P.I. = 304+00

OBJ. 274+00

26+00

28+00

29+00

30+00

31+00

32+00

33+00

34+00

CURVE TABLE

CURVE #	RADIUS	ARC	DELTA
C1	929.93'	229.50'	14°08'26"
C2	25.00'	42.99'	98°31'12"
C3	235.00'	162.48'	39°36'56"
C4	235.00'	187.90'	45°48'43"
C5	235.00'	107.76'	26°16'19"
C6	285.00'	176.32'	35°26'51"
C7	285.00'	283.62'	57°01'03"
C8	25.00'	42.05'	96°22'04"
C9	325.00'	180.18'	31°45'51"
C10	325.00'	11.64'	2°03'09"
C11	25.00'	22.39'	51°19'04"
C12	55.00'	114.39'	119°09'36"
C13	55.00'	99.96'	104°08'02"
C14	55.00'	56.96'	59°20'30"
C15	25.00'	22.39'	51°19'04"
C16	275.00'	158.38'	32°59'50"
C17	25.00'	41.78'	95°45'13"
C18	325.00'	116.42'	20°31'26"
C19	325.00'	61.11'	10°46'24"
C20	225.00'	30.39'	7°44'21"
C21	224.97'	194.25'	49°28'16"
C22	225.00'	128.79'	32°47'47"

CURVE TABLE

CURVE #	RADIUS	ARC	DELTA
C23	175.00'	274.89'	90°00'00"
C24	275.00'	150.22'	31°17'50"
C25	335.00'	59.82'	10°13'54"
C26	335.00'	198.49'	33°56'56"
C27	335.00'	217.51'	37°12'06"
C28	25.00'	35.07'	80°22'11"
C29	25.00'	22.39'	51°19'04"
C30	55.00'	112.82'	117°31'37"
C31	55.00'	112.03'	116°42'13"
C32	55.00'	46.47'	48°24'19"
C33	25.00'	22.39'	51°19'04"
C34	25.00'	36.50'	83°39'23"
C35	335.00'	37.49'	6°24'41"
C36	185.00'	10.29'	3°11'13"
C37	185.00'	350.37'	108°30'45"
C38	25.00'	38.29'	87°45'48"
C39	929.93'	49.49'	3°02'57"
C40	2,889.79'	47.64'	0°56'40"
C41	2,889.79'	109.87'	2°10'42"
C43	275.00'	150.22'	31°17'50"

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Bowman

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LAYOUT PLAN
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR.
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
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DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=40' V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 10 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\008-010-6642-D-CP-001-DIM.dwg

NOTES:

1. CONTRACTOR SHALL VERIFY ELEV. AT BENCHMARKS PRIOR TO CONSTRUCTION AND SHALL NOTIFY THE ENGINEER IMMEDIATELY WITH ANY DISCREPANCIES.
2. ALL EX. MAJOR UNDERGROUND UTILITIES ARE APPROXIMATE IN LOCATION AND SHALL BE FIELD VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES. ENGINEER SHALL BE NOTIFIED IMMEDIATELY WITH ANY DISCREPANCIES.
3. **CONTRACTOR SHALL COORDINATE CLEARING OF DRAINFIELDS WITH AOSE. NO CONSTRUCTION EQUIPMENT IS ALLOWED ON THE PROPOSED DRAINFIELDS WITHOUT APPROVAL FROM THE AOSE.**
4. LOTS 6, 7, 9, 12, 13, 14, 15, 17, 19, 20, 21, AND 22 HAVE HOUSE FOUNDATION ON FILL MATERIAL. THE CONTRACTOR MUST CONTACT THE BUILDING OFFICIAL TO DETERMINE REQUIRED PROCEDURES PRIOR TO FILL OPERATIONS ON THESE LOTS.

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROP. SPOT ELEVATION
- TC: TOP OF CURB
- FC: FACE OF CURB
- EP: EDGE OF PAVEMENT
- SW: SIDEWALK
- FG: FINISHED GRADE
- FF: FINISHED FLOOR
- HP: HIGH POINT
- LP: LOW POINT
- INV: INVERT

GRAPHIC SCALE
(IN FEET)
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GRADING PLAN
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CONSTRUCTION PLANS
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

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WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=40' V:

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SHEET 11 OF 58

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LEGEND

66	EXISTING CONTOUR
66	PROPOSED CONTOUR
20.50 EP	PROP. SPOT ELEVATION

TC: TOP OF CURB
FC: FACE OF CURB
EP: EDGE OF PAVEMENT
SW: SIDEWALK
FG: FINISHED GRADE
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+20 59 EP	PROP. SPOT ELEVATION
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HP:	HIGH POINT
LP:	LOW POINT
INV:	INVERT

MATCHLINE - BELOW

MATCHLINE - ABOVE

MATCHLINE - SHEET 12

N/F
ANDREW GARRETSON
& REBECCAH GARRETSON
DB 1630, PG 1753
GPIN: 6985-61-7324
ZONING: R1
USE: RESIDENTIAL

N/F
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& LINDSEY HENDERSON
GPIN: 6985-61-9127
DB 1588, PG 2329
ZONING: R1
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DB 436, PG 111
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USE: VACANT

N/F
DAVID M. DOBSON
GPIN: 6985-60-5718-500
DB 1119, PG 1311
ZONING: I
USE: VACANT

EX. WELL

EX. OH LINE (TO BE RELOCATED)

EX. OH LINE (TO REMAIN)

EX. WETLANDS

EX. STREAM

159 SQ. YDS.
ST'D EC-1 GL A1
REQ'D; TYPE A
INSTALLATION

OPEN SPACE
PARCEL 'A'
18,884 SF

OPEN SPACE
PARCEL 'B'
73,671 SF

LOT 14
55,483 SF

LOT 13
119,572 SF

LOT 12
50,306 SF

LOT 11
43,650 SF

LOT 10
43,650 SF

LOT 9
43,583 SF

NICOLAS WAY
(50' R.O.W.)

POND ACCESS ROAD (12')

LIMITS OF CLEARING AND GRADING

RESERVE DRAINFIELD

INSTALL DRAINFIELD

LEVEL SPREADER

EC-2 (TYP)

EC-3 (TYPE 3)

EC-3 (TYPE 1)

10-YR WSE =468.36

10-YR WSE =469.39

10-YR WSE =468.22

10-YR WSE =463.52

10-YR WSE =457.60

10-YR WSE =459.51

PERMANENT POOL =441.00

FAUQUIER COUNTY
TOWN OF WARRENTON

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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CONSTRUCTION PLAN

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11/22/24	2nd SUBMISSION

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WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=40'
V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 13 OF 58

EASEMENT LEGEND

- (SD) DENOTES PROP. STORM DRAINAGE EASEMENT
- (IE) DENOTES PROP. INGRESS/EGRESS EASEMENT
- (W) DENOTES PROP. WATERLINE EASEMENT
- (TT) DENOTES PROP. TEMPORARY TURNAROUND EASEMENT
- (SI) DENOTES PROP. SIGHT DISTANCE EASEMENT
- (SWM) DENOTES PROP. STORMWATER MANAGEMENT EASEMENT
- (ST) DENOTES PROP. 10' STREET TREE EASEMENT
- (E) EX. VEPCO EASEMENT (DB 183, PG 472) (APPROXIMATE CENTERLINE – NO WIDTH SPECIFIED)
- (IE) EX. 25' INGRESS/EGRESS EASEMENT (DB 207, PG 355)
- (SS) EX. 30' SANITARY SEWER EASEMENT (DB 1272, PG 1164)
- (T) EX. STANDARD UTILITY EASEMENT REQUIRED FOR C&P TELEPHONE COMPANY (DB 724, PG 1979)
- (T1) EX. BELL ATLANTIC–VIRGINIA EASEMENT (DB 728, PG 1911)
- DENOTES PORTION OF EXISTING EASEMENT TO BE VACATED

NOTES:
1. ALL EASEMENTS ARE PERMANENT UNLESS SPECIFICALLY NOTED AS TEMPORARY.
2. ALL EASEMENTS ALONG WATER MAINS ARE 15' WIDE EXCEPT AS NOTED OTHERWISE.
3. ALL EASEMENTS ALONG STORM DRAINS ARE AS SHOWN BELOW, EXCEPT AS NOTED OTHERWISE:

PIPE DIAMETER	EASEMENT WIDTH
15"–23"	15'
24"–32"	20'
33"–48"	25'

4. ALL EASEMENTS ARE PUBLIC EXCEPT AS NOTED OTHERWISE.

N/F
ROBERT M. ITEN
& LAINE W. ITEN
GPIN: 6985-62-3534
DB 1502, PG 2165
ZONING: R1
USE: RESIDENTIAL

N/F
ROBERT J. RILL
& ANNIE ZHENG
GPIN: 6985-52-5215
DB 1723, PG 937
ZONING: R1
USE: VACANT

N/F
WARRENTON SENIOR DEVELOPMENT COMPANY INC.
GPIN: 6985-50-6989
DB 1517, PG 585
ZONING: R-10
USE: NURSING HOME

LOT 1 · LOT 2 · LOT 3 · LOT 4 · LOT 5 · LOT 6 · LOT 7 · LOT 16 · LOT 18 · LOT 19 · LOT 20 · LOT 21 · LOT 22

OREN SPACE PARCEL 'C'
BIORETENTION BASIN 'A'
TOP(SURFACE)=512.00
BOTTOM=507.50

NICOLAS WAY (50' R.O.W.) · NOAH COURT (50' R.O.W.) · NASH COURT (50' R.O.W.) · HIDDEN HOLLOW LANE · BLACKWELL ROAD
ROUTE 672
MINOR COLLECTOR
(VARIABLE WIDTH R/W)
(25 MPH POSTED)
(1700 AADT EXISTING)
(1920 AADT PROPOSED)

MATCHLINE - SHEET 15

FAUQUIER COUNTY
TOWN OF WARRENTON

NOTES:
1. CONTRACTOR SHALL VERIFY ELEVATION AT BENCHMARKS PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER IMMEDIATELY WITH ANY DISCREPANCIES.
2. **ALL EX. MAJOR UNDERGROUND UTILITIES ARE APPROXIMATE IN LOCATION AND SHALL BE FIELD VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES. ENGINEER SHALL BE NOTIFIED IMMEDIATELY WITH ANY DISCREPANCIES.**
3. ALL STORM STRUCTURES SHALL HAVE IS-1 INVERT SHAPING, AND SL-1'S (SAFETY LANDINGS) WILL BE REQUIRED IN ALL STRUCTURES WITH A DEPTH OVER 12'. ST-1'S (STEPS) ARE REQUIRED IN ANY STRUCTURE WITH A DEPTH OF 4' OR GREATER.
4. ALL WATERLINES SHALL BE DUCTILE IRON CLASS 52 EXCEPT AS NOTED OTHERWISE.
5. ALL WATER SERVICE LINES SHALL BE TYPE K SOFT COPPER.
6. STORM SEWER PIPE SHALL BE RCP.
7. IN AREAS OF BACKFILL AND FILL, CONTRACTOR SHALL ENSURE UNDERLYING SOIL IN THE UTILITY TRENCH IS COMPACTED TO NOT LESS THAN 95% OF MAXIMUM DENSITY AT A MOISTURE CONTENT WITHIN 2 PERCENTAGE POINTS OF OPTIMUM IN ACCORDANCE WITH ASTM D698

NORTH

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

Bowman

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1300 Central Park Boulevard
Fredericksburg, Virginia 22401
Phone: (540) 371-0268
bowman.com
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UTILITY AND EASEMENT PLAN
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD
SCALE	H: 1"=40' V:	
JOB No. 6642-02-002		
DATE : FEBRUARY 10, 2023		
FILE No. 6642-D-CP-001		
SHEET 14 OF 58		

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\014-016-6642-D-CP-001-UTIL.dwg

N/F
NORMAN G. WEAR
GPIN: 6985-61-4800
DB 1478, PG 732
ZONING: R1
USE: RESIDENTIAL

N/A
PATRICIA V. SMITH
& WALLACE F. SMITH
GPIN: 6985-61-8720
DB 546, PG 116
ZONING: R1
USE: RESIDENTIAL

N/F
ROBERT M. ITEN
& LAINE W. ITEN
GPIN: 6985-62-3534
DB 1502, PG 2165
ZONING: R1
USE: RESIDENTIAL

N/F
DAVID M. DOBSON
GPIN: 6985-60-5718-500
DB 1119, PG 1311
ZONING: I
USE: VACANT

N/F
WARRENTON SENIOR DEVELOPMENT
COMPANY INC
GPIN: 6985-50-6989
DB 1517, PG 585
ZONING: R-10
USE: NURSING HOME

LOT 6
LOT 7
LOT 8
LOT 9
LOT 10
LOT 14
LOT 15
LOT 16
LOT 17
LOT 18
LOT 19

OPEN SPACE
PARCEL 'B'

POND 'A'
WET POND
LEVEL 1

NICOLAS WAY
(50' R.O.W.)

NOAH COURT
(50' R.O.W.)

NASH COURT
(50' R.O.W.)

HIDDEN HOLLOW LANE

POND ACCESS ROAD (12%)

MATCHLINE - SHEET 14

MATCHLINE - SHEET 16

TOP OF DAM=448.00

PERMANENT POOL =441.00

1-YR WSE=442.27
10-YR WSE=444.29
100-YR WSE=445.97

10' NO PLANT ZONE

7 SQ. YDS. ST'D EC-1 CL A1 REQ'D; TYPE A INSTALLATION

5.5 SQ. YDS. ST'D EC-1 CL II REQ'D; TYPE A INSTALLATION

3.1 SQ. YDS. ST'D EC-1 CL A1 REQ'D; TYPE A INSTALLATION

1.6 SQ. YDS. ST'D EC-1 CL I REQ'D; TYPE A INSTALLATION

TREE PRESERVATION/ CONSERVED OPEN SPACE EASEMENT

RETAINING WALL #2 W/ HANDRAIL (DES. BY OTHERS)

EX. WELL

EX. BLDG (TO BE RELOCATED)

EX. OH LINE (TO BE RELOCATED)

EX. OH LINE (TO REMAIN)

EX. POLE (TO BE RELOCATED)

EX. POLE & GUY (TO REMAIN)

EX. STREAM

EX. ASPHALT DRIVE

EX. FENCE (TBR)

PROP. R/W

10-YR WSE =489.93
10-YR WSE =531.95
10-YR WSE =531.46
10-YR WSE =518.75
10-YR WSE =495.55
10-YR WSE =486.74
10-YR WSE =463.52
10-YR WSE =468.22
10-YR WSE =469.39

8"x6" REDUCER; 1-6" G.V.; 1-F.H. ASSEMBLY

8"x45° H. BEND

8"x8" TEE; 3-8" G.V.

8"x6" TEE; 1-6" G.V.; 1-F.H. ASSEMBLY

8"x6" TEE; 1-6" G.V.; 1-F.H. ASSEMBLY

8" DIP W/L "A"

8" DIP W/L "B"

8" DIP W/L "C"

EC-1 CD-1

EC-2 (TYP)

EC-3 (TYPE 1)

EC-3 (TYPE 3)

W/O 50'x50' PAD GF=532.06 FF=533.81 BF=524.81

W/O 50'x50' PAD GF=500.80 FF=502.55 BF=493.55

W/O 40'x50' PAD GF=487.44 FF=489.19 BF=480.19

W/O 50'x50' PAD GF=488.13 FF=489.88 BF=481.88

W/O 50'x50' PAD GF=523.30 FF=525.05 BF=516.05

W/O 60'x60' PAD GF=538.48 FF=540.23 BF=531.23

W/O 60'x60' PAD GF=498.89 FF=498.64 BF=479.64

W/O 50'x50' PAD GF=502.63 FF=504.38 BF=495.38

W/O 60'x60' PAD GF=473.25 FF=475.00 BF=466.00

W/O 50'x50' PAD GF=476.98 FF=478.73 BF=469.73

W/O 60'x60' PAD GF=470.74 FF=472.49 BF=463.49

W/O 60'x60' PAD GF=477.17 FF=478.92 BF=469.92

NOTES:

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3. ALL STORM STRUCTURES SHALL HAVE IS-1 INVERT SHAPING, AND SL-1'S (SAFETY LANDINGS) WILL BE REQUIRED IN ALL STRUCTURES WITH A DEPTH OVER 12'. ST-1'S (STEPS) ARE REQUIRED IN ANY STRUCTURE WITH A DEPTH OF 4' OR GREATER.
4. ALL WATERLINES SHALL BE DUCTILE IRON CLASS 52 EXCEPT AS NOTED OTHERWISE.
5. ALL WATER SERVICE LINES SHALL BE TYPE K SOFT COPPER.
6. STORM SEWER PIPE SHALL BE RCP.
7. IN AREAS OF BACKFILL AND FILL, CONTRACTOR SHALL ENSURE UNDERLYING SOIL IN THE UTILITY TRENCH IS COMPACTED TO NOT LESS THAN 95% OF MAXIMUM DENSITY AT A MOISTURE CONTENT WITHIN 2 PERCENTAGE POINTS OF OPTIMUM IN ACCORDANCE WITH ASTM D698

EASEMENT LEGEND

- (SD) DENOTES PROP. STORM DRAINAGE EASEMENT
- (IE) DENOTES PROP. INGRESS/EGRESS EASEMENT
- (W) DENOTES PROP. WATERLINE EASEMENT
- (TT) DENOTES PROP. TEMPORARY TURNAROUND EASEMENT
- (SI) DENOTES PROP. SIGHT DISTANCE EASEMENT
- (SWM) DENOTES PROP. STORMWATER MANAGEMENT EASEMENT
- (ST) DENOTES PROP. 10' STREET TREE EASEMENT
- (E) EX. VEPCO EASEMENT (DB 183, PG 472) (APPROXIMATE CENTERLINE – NO WIDTH SPECIFIED)
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- (T) EX. STANDARD UTILITY EASEMENT REQUIRED FOR C&P TELEPHONE COMPANY (DB 724, PG 1979)
- (T1) EX. BELL ATLANTIC–VIRGINIA EASEMENT (DB 728, PG 1911)

DENOTES PORTION OF EXISTING EASEMENT TO BE VACATED

NOTES:
1. ALL EASEMENTS ARE PERMANENT UNLESS SPECIFICALLY NOTED AS TEMPORARY.
2. ALL EASEMENTS ALONG WATER MAINS ARE 15' WIDE EXCEPT AS NOTED OTHERWISE.
3. ALL EASEMENTS ALONG STORM DRAINS ARE AS SHOWN BELOW, EXCEPT AS NOTED OTHERWISE:

PIPE DIAMETER	EASEMENT WIDTH
15"–23"	15'
24"–32"	20'
33"–48"	25'

4. ALL EASEMENTS ARE PUBLIC EXCEPT AS NOTED OTHERWISE.

NORTH

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

Bowman

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1300 Central Park Boulevard
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UTILITY AND EASEMENT PLAN
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION	
WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=40' V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 15 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\014-016-6642-D-CP-001-UTIL.dwg

NOTES:

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5. ALL WATER SERVICE LINES SHALL BE TYPE K SOFT COPPER.
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7. IN AREAS OF BACKFILL AND FILL, CONTRACTOR SHALL ENSURE UNDERLYING SOIL IN THE UTILITY TRENCH IS COMPACTED TO NOT LESS THAN 95% OF MAXIMUM DENSITY AT A MOISTURE CONTENT WITHIN 2 PERCENTAGE POINTS OF OPTIMUM IN ACCORDANCE WITH ASTM D698

MATCHLINE - BELOW

TREE PRESERVATION/ CONSERVED OPEN SPACE EASEMENT

N/F
ANDREW GARRETSON
& REBECCAH GARRETSON
DB 1650, PG 1753
GPIN: 6985-61-7324
ZONING: R1
USE: RESIDENTIAL

EX. WELL

N/F
BRENT HENDERSON
& LINDSEY HENDERSON
GPIN: 6985-61-9127
DB 1588, PG 2329
ZONING: R1
USE: RESIDENTIAL

N/F
COMMONWEALTH OF VIRGINIA
GPIN: 6984-89-2659
DB 436, PG 111
ZONING: R1
USE: VACANT

MATCHLINE - ABOVE

EX. POLE (TO BE RELOCATED)

EX. OH LINE (TO REMAIN)

EX. OH LINE (TO BE RELOCATED)

RESERVE DRAINFIELD

INSTALL DRAINFIELD

LOT 14

159 SQ. YDS. ST'D EC-1 CL A1 REQ'D; TYPE A INSTALLATION

OPEN SPACE PARCEL 'A'

LEVEL SPREADER

TREE PRESERVATION/ CONSERVED OPEN SPACE EASEMENT

EX. WETLANDS

EX. STREAM

EX. POLE & OH (TO REMAIN)

OPEN SPACE PARCEL 'B'

POND ACCESS ROAD (12%)

PERMANENT POOL =441.00

EX. POND

NICOLAS WAY (50' R.O.W.)

8"x11.25° H. BEND

8" DIP W/L "A"

24" RCP

15" RCP

EC-2 (TYP)

EC-3 (TYPE 3)

EC-3 (TYPE 1)

8"x6" TEE; 1-6" G.V.; 1-F.H. ASSEMBLY

8" DIP W/L "1"

EW-12

W/M

W/O

ST

SD

10-YR WSE =469.39

10-YR WSE =468.22

10-YR WSE =463.52

10-YR WSE =468.36

10-YR WSE =457.60

10-YR WSE =459.51

60'x60' PAD GF=470.74 FF=472.49 BF=463.49

60'x60' PAD GF=472.82 FF=474.57 BF=465.57

60'x60' PAD GF=476.92 FF=478.67 BF=469.92

50'x60' PAD GF=476.98 FF=478.73 BF=469.73

60'x60' PAD GF=473.25 FF=475.00 BF=466.00

60'x60' PAD GF=463.40 FF=465.15 BF=456.15

LOT 13

LOT 12

LOT 11

LOT 10

LOT 9

RESERVE DRAINFIELD

INSTALL DRAINFIELD

TREE PRESERVATION/ CONSERVED OPEN SPACE EASEMENT

FAUQUIER COUNTY / TOWN OF WARRENTON

MATCHLINE - SHEET 15

8" PLUG

WATER SAMPLING STATION

N/F
DAVID M. DOBSON
GPIN: 6985-60-5718-500
DB 1119, PG 1311
ZONING: I
USE: VACANT

EASEMENT LEGEND

- SD — DENOTES PROP. STORM DRAINAGE EASEMENT
- IE — DENOTES PROP. INGRESS/EGRESS EASEMENT
- W — DENOTES PROP. WATERLINE EASEMENT
- TT — DENOTES PROP. TEMPORARY TURNAROUND EASEMENT
- SI — DENOTES PROP. SIGHT DISTANCE EASEMENT
- SWM — DENOTES PROP. STORMWATER MANAGEMENT EASEMENT
- ST — DENOTES PROP. 10' STREET TREE EASEMENT
- E — EX. VEPCO EASEMENT (DB 183, PG 472) (APPROXIMATE CENTERLINE – NO WIDTH SPECIFIED)
- IE — EX. 25' INGRESS/EGRESS EASEMENT (DB 207, PG 355)
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- T — EX. STANDARD UTILITY EASEMENT REQUIRED FOR C&P TELEPHONE COMPANY (DB 724, PG 1979)
- T1 — EX. BELL ATLANTIC-VIRGINIA EASEMENT (DB 728, PG 1911)
- DENOTES PORTION OF EXISTING EASEMENT TO BE VACATED

NOTES:
1. ALL EASEMENTS ARE PERMANENT UNLESS SPECIFICALLY NOTED AS TEMPORARY.
2. ALL EASEMENTS ALONG WATER MAINS ARE 15' WIDE EXCEPT AS NOTED OTHERWISE.
3. ALL EASEMENTS ALONG STORM DRAINS ARE AS SHOWN BELOW, EXCEPT AS NOTED OTHERWISE:

PIPE DIAMETER	EASEMENT WIDTH
15"-23"	15'
24"-32"	20'
33"-48"	25'

4. ALL EASEMENTS ARE PUBLIC EXCEPT AS NOTED OTHERWISE.

NORTH

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\014-016-6642-D-CP-001-UTIL.dwg

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Bowman Consulting Group Ltd

UTILITY AND EASEMENT PLAN
TIFFANY ESTATES
CONSTRUCTION PLAN
FAUQUIER COUNTY, VIRGINIA
CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

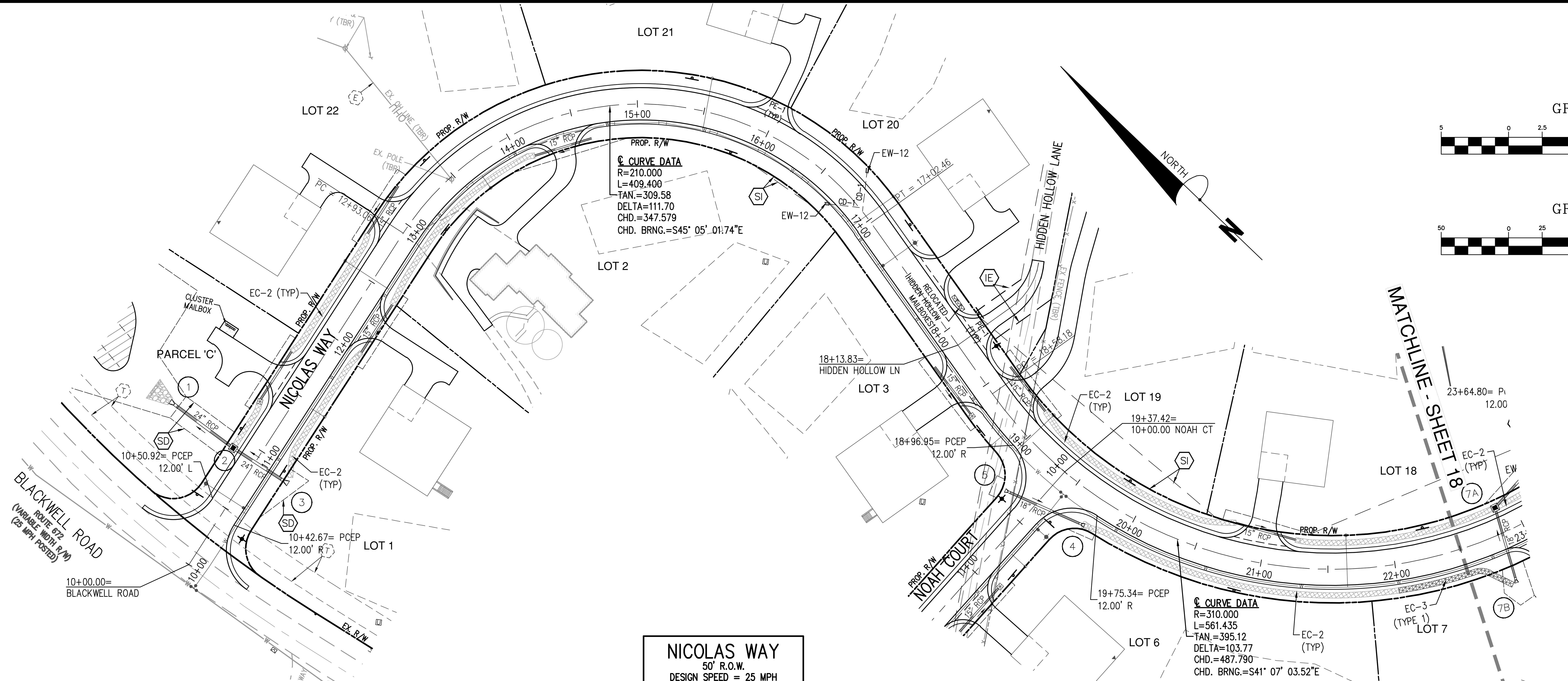
WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=40' V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001



GRAPHIC SCALE

(IN FEET)
1 inch = 5 ft.

GRAPHIC SCALE

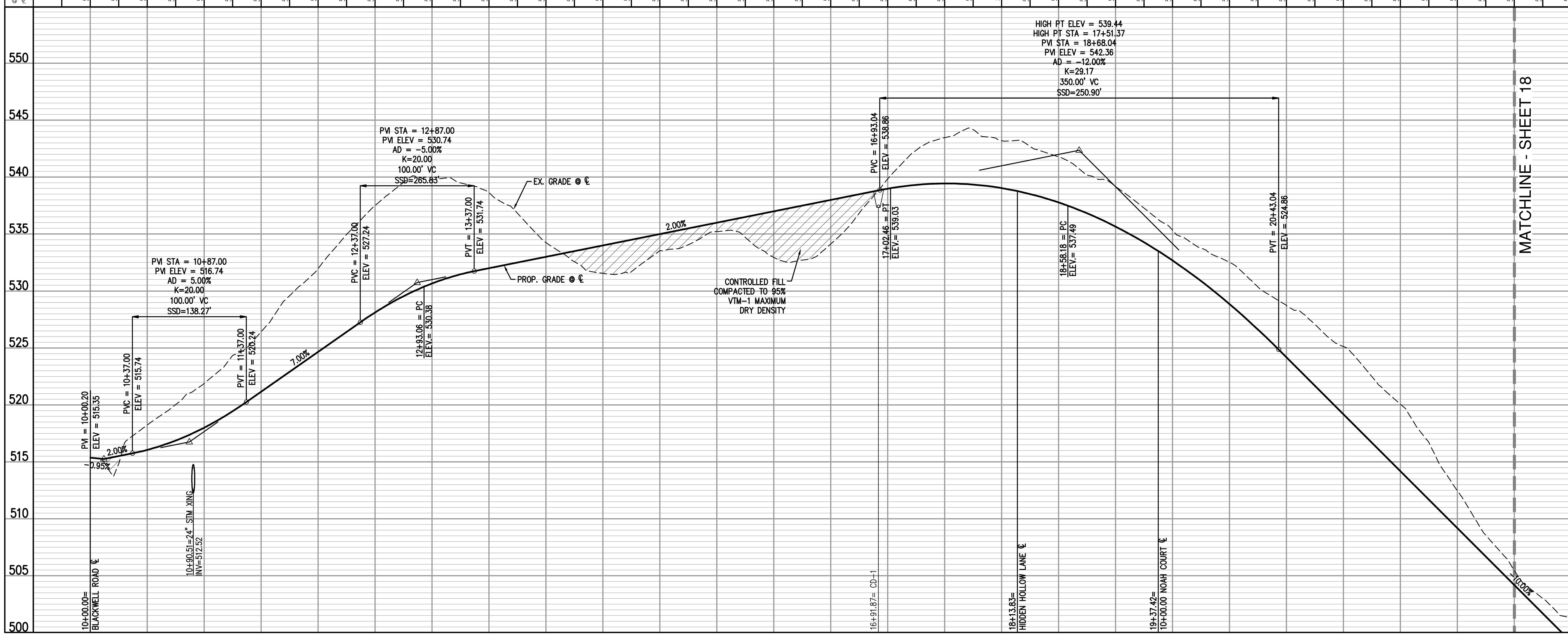
(IN FEET)
1 inch = 50 ft.

NICOLAS WAY
50' R.O.W.
DESIGN SPEED = 25 MPH

PROP GRADE @ ℄			515.50	516.04	516.86	517.99	519.44	521.15	522.90	524.65	526.40	528.11	529.54	530.66	531.46	532.00	532.50	533.00
EX GRADE @ ℄		515.36	514.82	518.22	520.03	521.87	524.33	526.40	529.58	531.95	534.96	537.50	539.53	539.77	539.50	538.62	536.83	534.25

PROP GRADE @ ℄	533.50	534.00	534.50	535.00	535.50	536.00	536.50	537.00	537.50	538.00	538.50	538.99	539.32	539.44	539.35	539.04	538.51	537.78
EX GRADE @ ℄	532.58	531.55	531.70	533.54	534.07	535.22	534.72	532.95	532.72	534.12	536.83	539.85	542.36	543.47	544.17	543.21	542.70	541.79

PROP GRADE @ ℄	536.82	535.66	534.28	532.68	530.87	528.85	526.61	524.16	521.66	519.16	516.66	514.16	511.66	509.16	506.66	504.16	501.66	499.16	
EX GRADE @ ℄	540.20	539.18	537.28	535.34	533.76	532.52	530.35	528.73	527.07	525.12	522.48	520.06	516.68	512.45	508.55	505.43	502.98	500.96	



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NICOLAS WAY PLAN & PROFILE
TIFFANY ESTATES
CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

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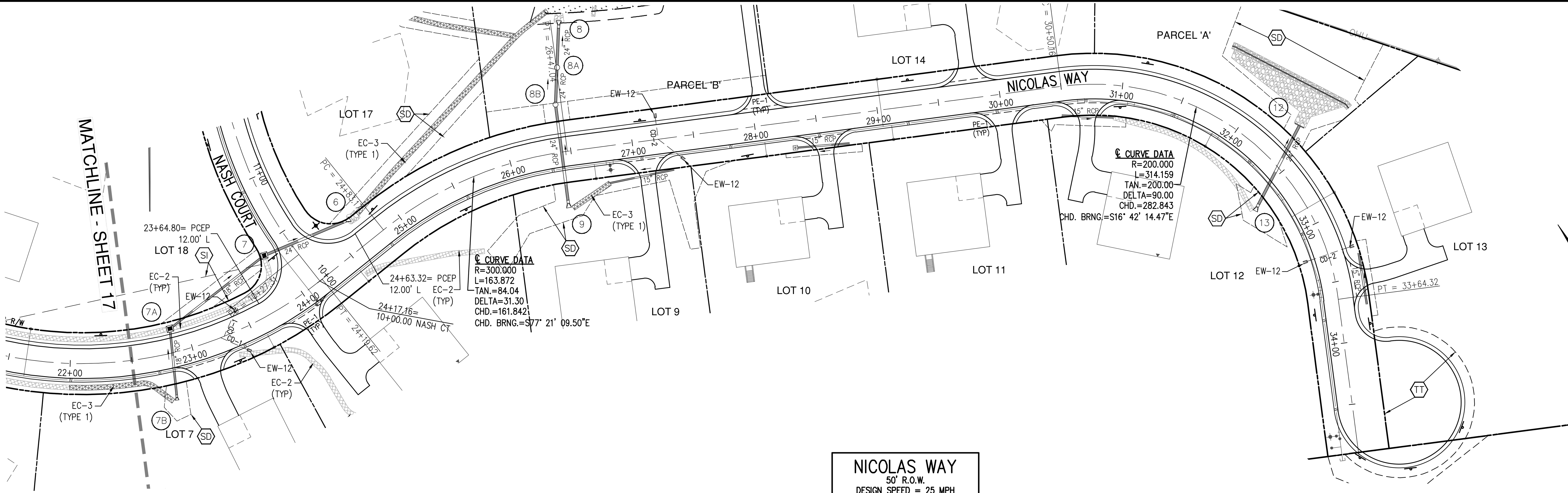
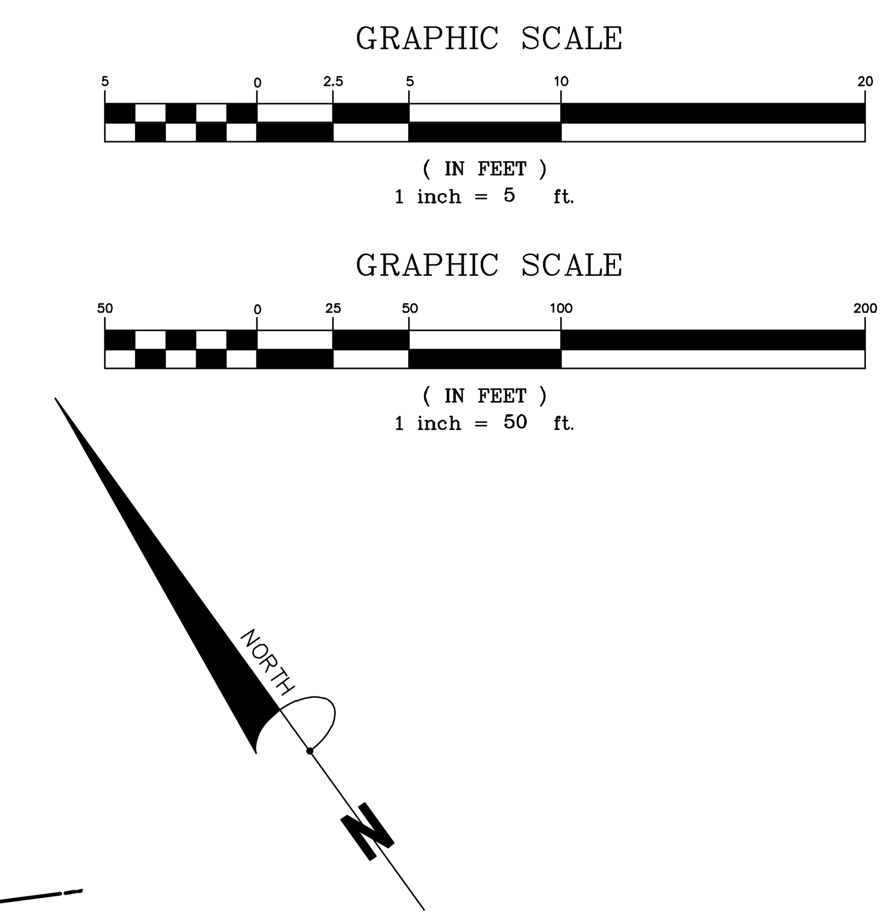
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION
DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD
SCALE	H: 1"=50' V: 1"=5'	
JOB No. 6642-02-002		
DATE : FEBRUARY 10, 2023		
FILE No. 6642-D-CP-001		

SHEET 17 OF 58





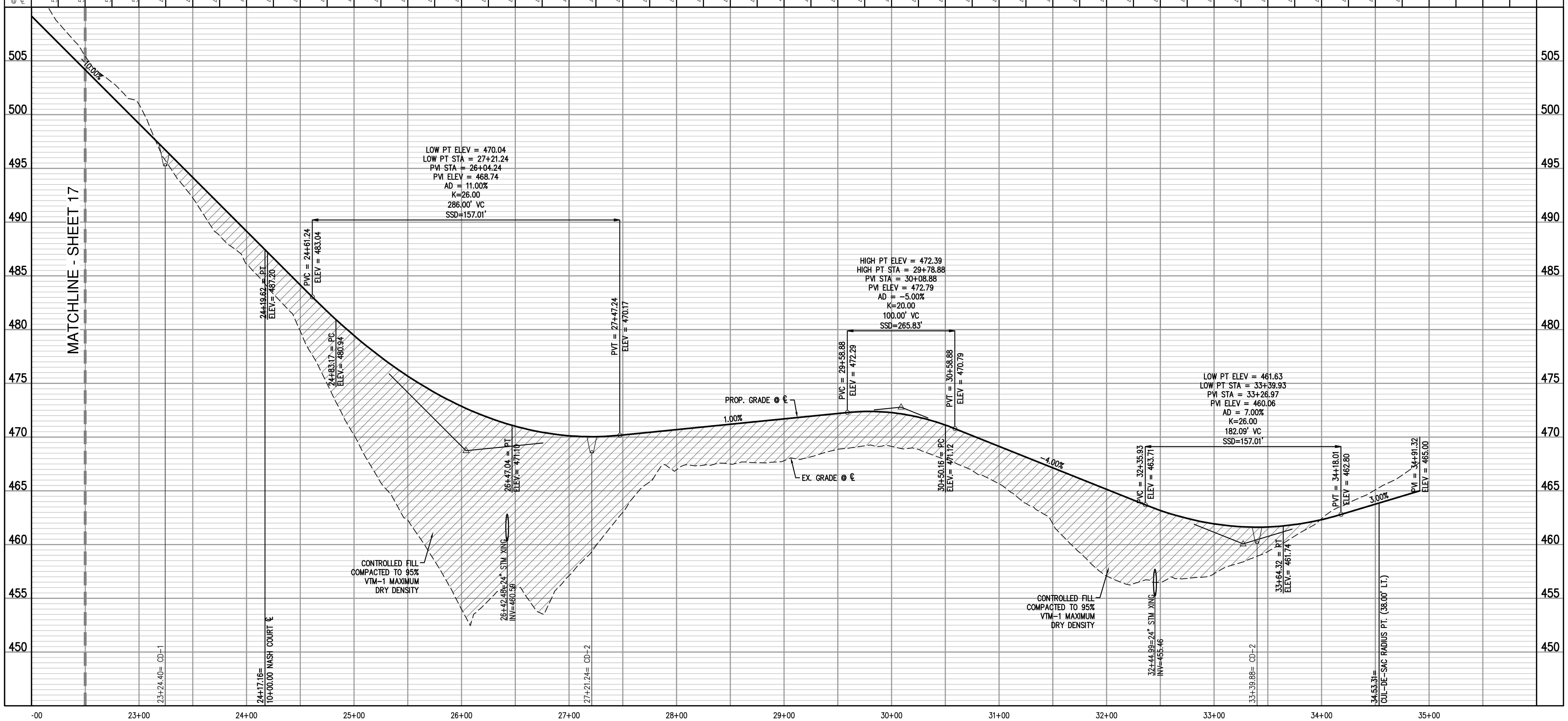
NICOLAS WAY

50' R.O.W.
DESIGN SPEED = 25 MPH

PROP GRADE @ ℄	506.66	504.16	501.66	499.16	496.66	494.16	491.66	489.16	486.66	484.16	481.70	479.45	477.45	475.68	474.15	472.87	471.82
EX GRADE @ ℄	508.55	505.43	502.98	500.96	495.68	492.25	488.74	486.10	483.32	479.85	474.96	470.19	465.76	462.29	458.48	453.99	454.78

PROP GRADE @ ℄	471.02	470.45	470.13	470.04	470.20	470.45	470.70	470.95	471.20	471.45	471.70	471.95	472.20	472.38	472.28	471.86	471.12
EX GRADE @ ℄	456.00	453.57	457.12	459.89	463.00	465.82	466.97	467.39	467.50	467.62	467.81	468.17	468.87	469.20	469.14	468.85	467.95

PROP GRADE @ ℄	470.14	469.14	468.14	467.14	466.14	465.14	464.14	463.18	462.44	461.93	461.67	461.65	461.86	462.32	463.01	463.76	464.51
EX GRADE @ ℄	466.89	465.65	463.82	461.93	459.27	457.09	456.37	456.47	456.86	457.29	458.34	459.36	460.80	462.42	463.89	465.09	466.46



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NICOLAS WAY PLAN & PROFILE

TIFFANY ESTATES

CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT

FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

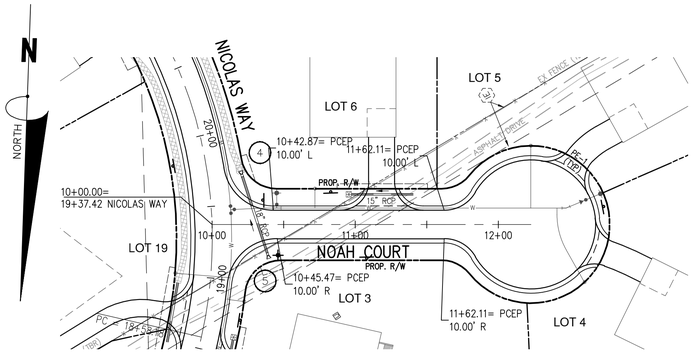
PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION
DATE	DESCRIPTION

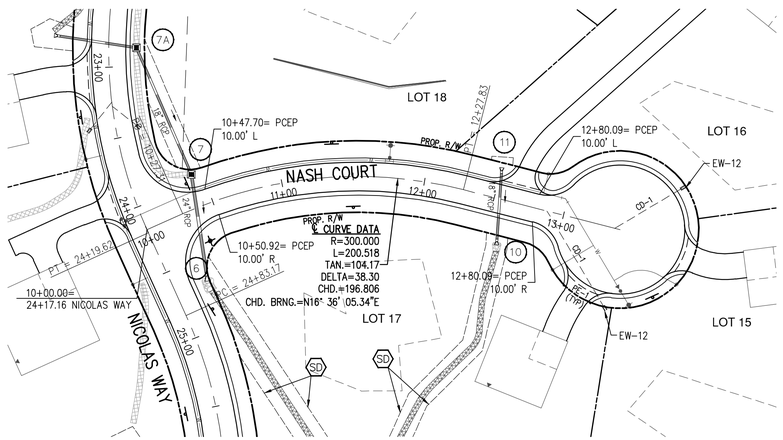
WED DESIGN	WED DRAWN	WED CHKD
SCALE	H: 1"=50' V: 1"=5'	

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

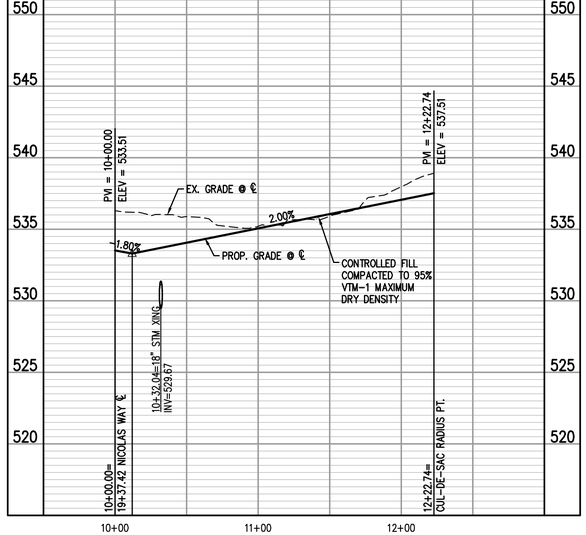
FILE No. 6642-D-CP-001





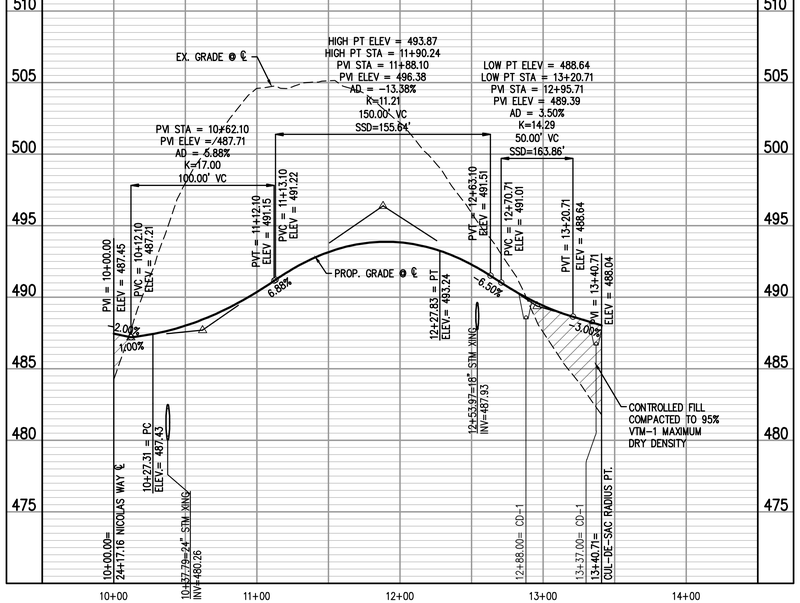
NOAH COURT
50' R.O.W.
DESIGN SPEED = 25 MPH

PROP GRADE @ ℄		533.51	533.55	534.05	534.55	535.05	535.55	536.05	536.55	537.05				
EX GRADE @ ℄		536.28	535.94	535.88	535.23	535.21	535.66	535.91	537.04	537.92				



NASH COURT
50' R.O.W.
DESIGN SPEED = 25 MPH

PROP GRADE @ ℄		487.45	487.39	488.01	489.00	490.36	491.98	493.15	493.77	493.63	493.34	492.28	490.74	488.41	488.51				
EX GRADE @ ℄		484.26	491.35	497.96	501.63	504.58	504.71	505.12	504.95	502.19	499.36	496.89	492.35	487.56	484.05				



GRAPHIC SCALE

5 0 2.5 5 10 20

(IN FEET)
1 inch = 5 ft.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\017-019-6642-D-CP-001-RPP.dwg

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NOAH COURT AND NASH COURT PLAN & PROFILE
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

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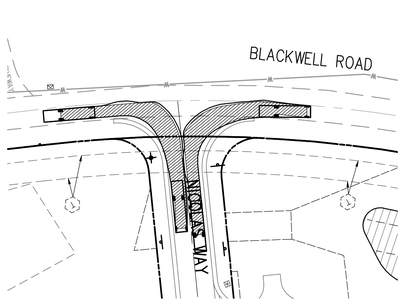
SCALE H: 1"=50'
V: 1"=5'

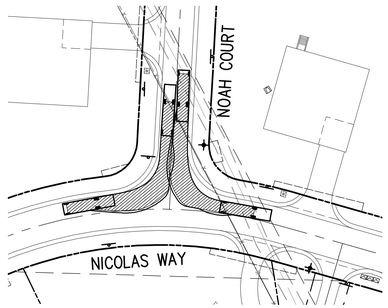
JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

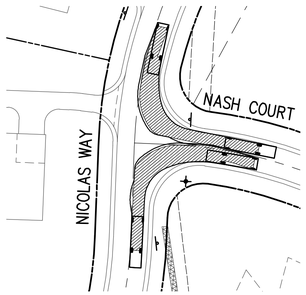
FILE No. 6642-D-CP-001

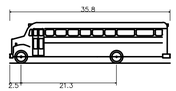
SHEET 19 OF 58





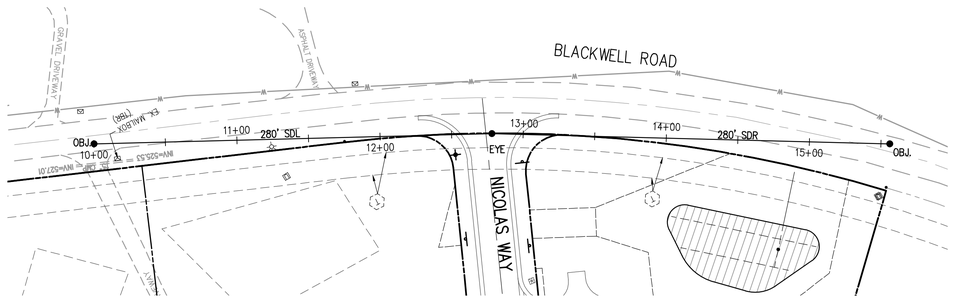
INTERSECTION TURNING MOVEMENT ANALYSIS

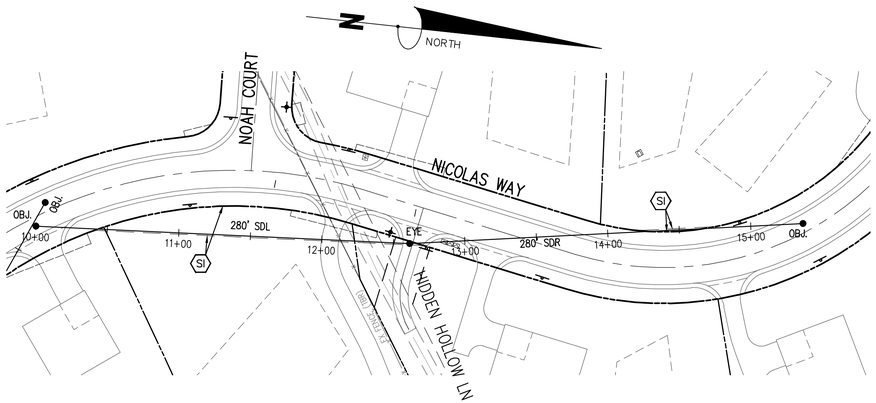


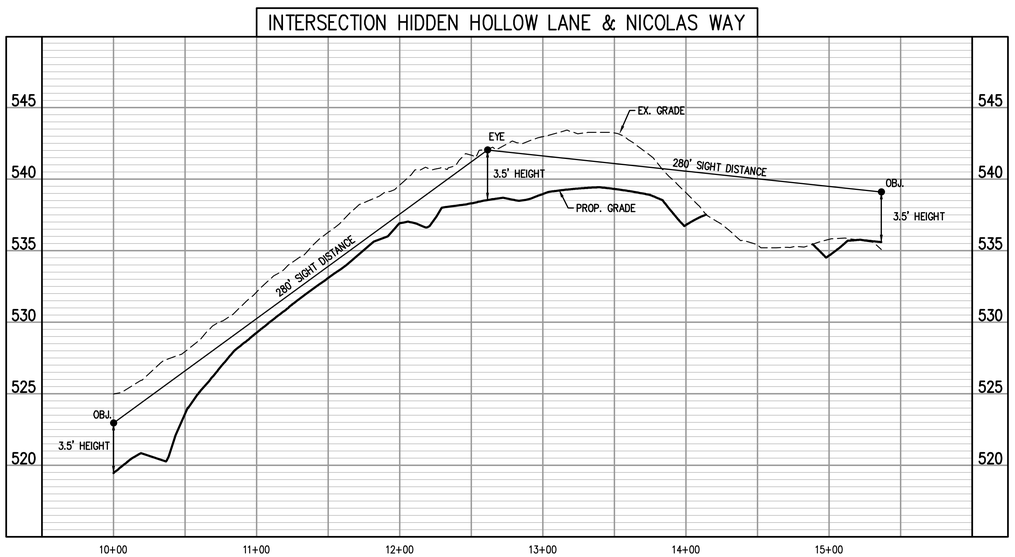


S-BUS-36 - Conventional School Bus (65 pass.)

Overall Length	35.800ft
Overall Width	8.000ft
Overall Body Height	9.063ft
Min Body Ground Clearance	1.184ft
Track Width	8.000ft
Lock-to-lock time	5.00s
Max Steering Angle (Virtual)	37.60°







GRAPHIC SCALE

(IN FEET)
1 inch = 5 ft.

GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.

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SIGHT DISTANCE PLAN & PROFILES
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

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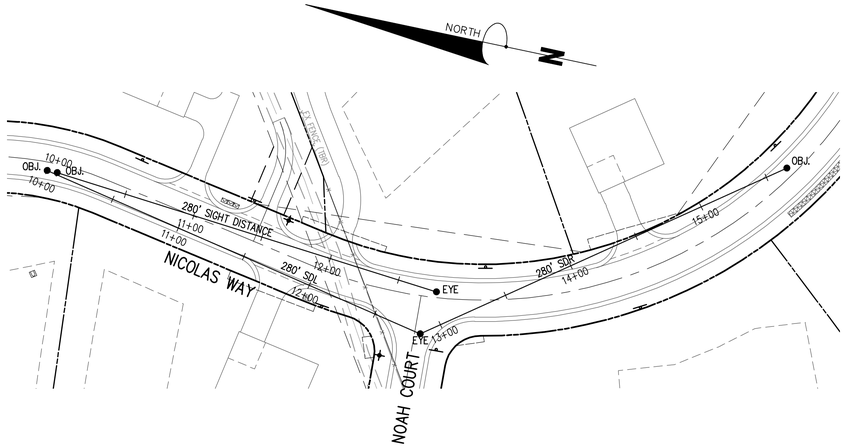
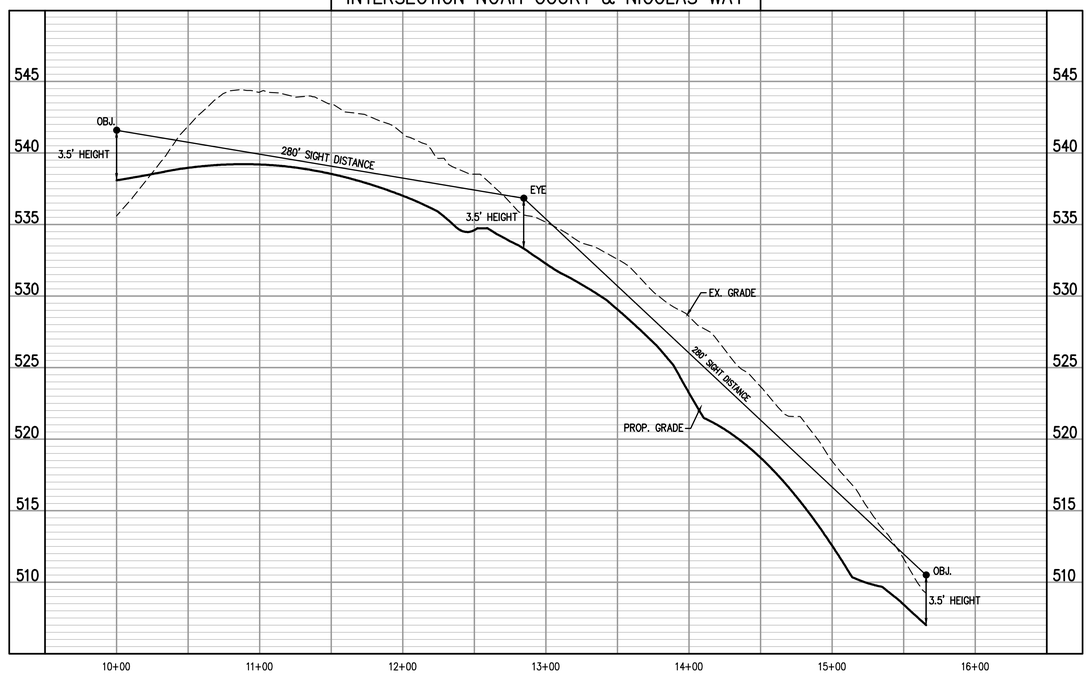
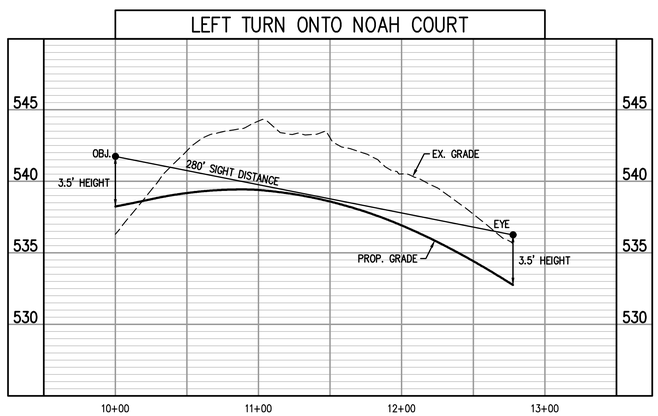
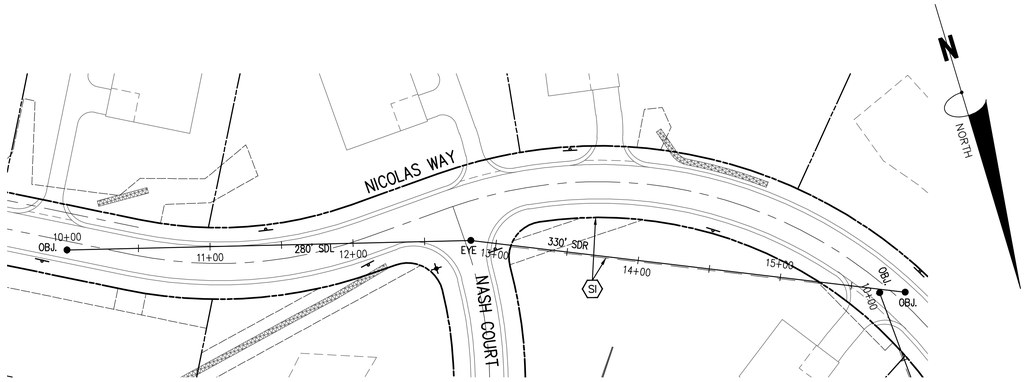
JOB No. 6642-02-002		
DATE : FEBRUARY 10, 2023		
FILE No. 6642-D-CP-001		
SHEET 20 OF 58		

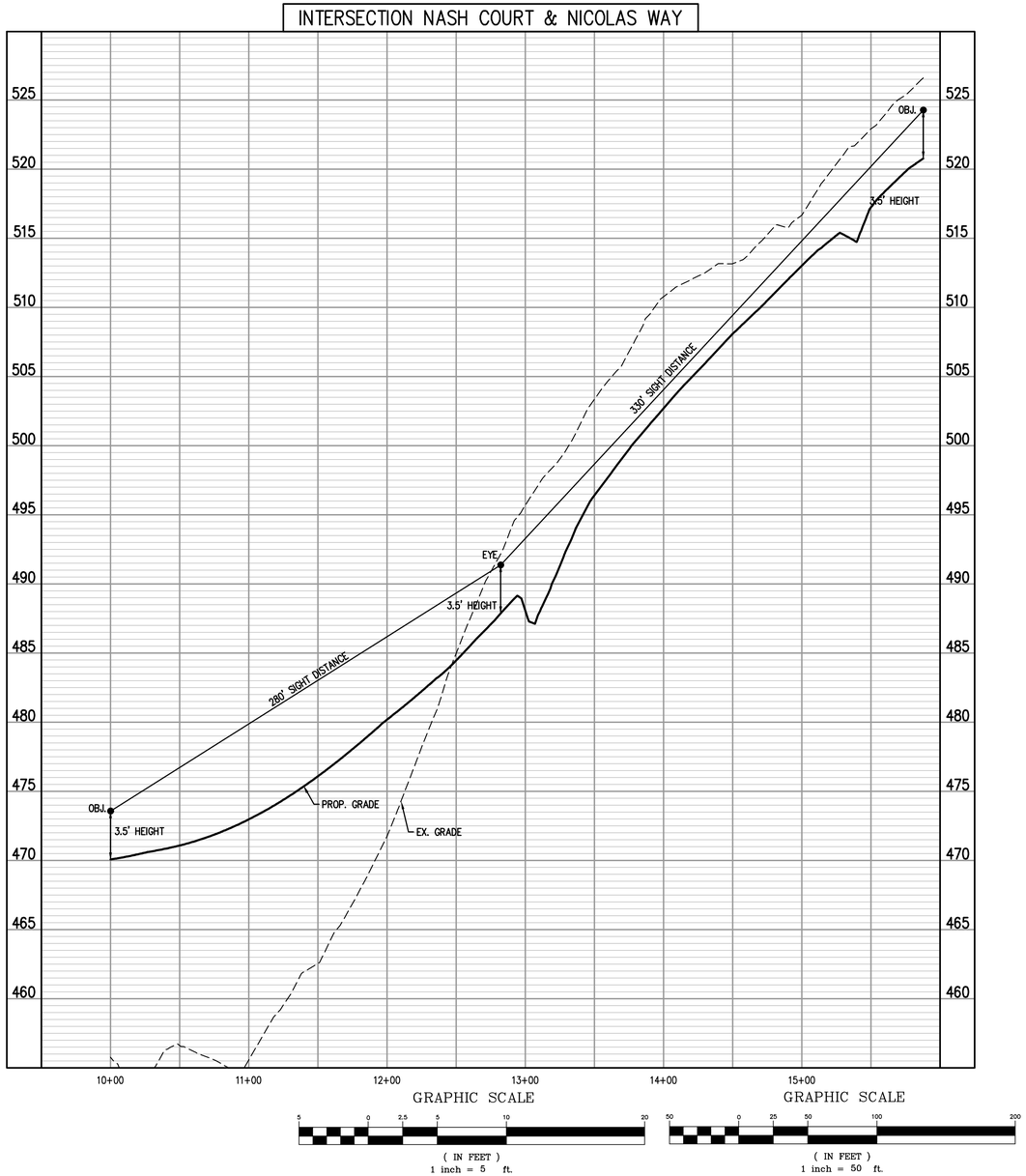
Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\020-021-6642-D-CP-001-STP.dwg











GRAPHIC SCALE

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(IN FEET)
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GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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SIGHT DISTANCE PLAN & PROFILES

TIFFANY ESTATES

CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT

FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

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WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
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11/22/24	2nd SUBMISSION
DATE	DESCRIPTION

WED	WED	WED
DESIGN	DRAWN	CHKD

SCALE H: 1"=50'
V: 1"=5'

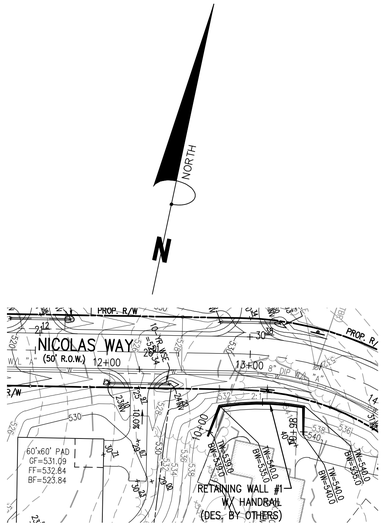
JOB No. 6642-02-002

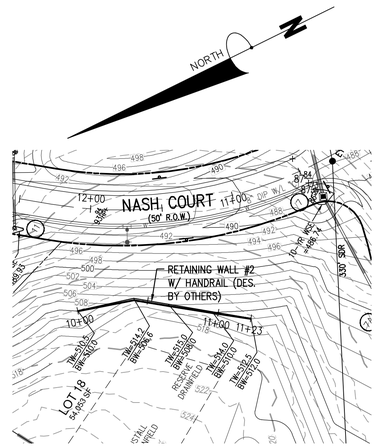
DATE : FEBRUARY 10, 2023

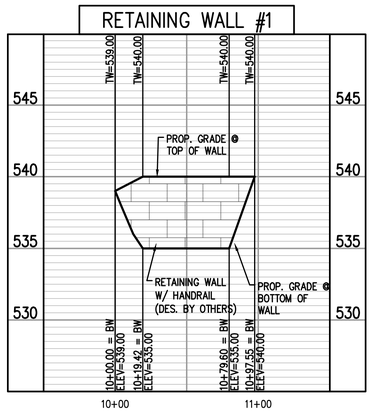
FILE No. 6642-D-CP-001

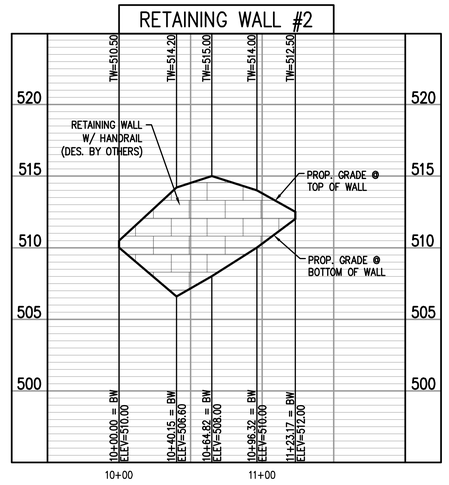
SHEET 21 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\020-021-6642-D-CP-001-STP.dwg









GRAPHIC SCALE

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(IN FEET)
1 inch = 5 ft.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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RETAINING WALL PLAN & PROFILES
TIFFANY ESTATES
CONSTRUCTION PLAN

FAUQUIER COUNTY, VIRGINIA

CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR.
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
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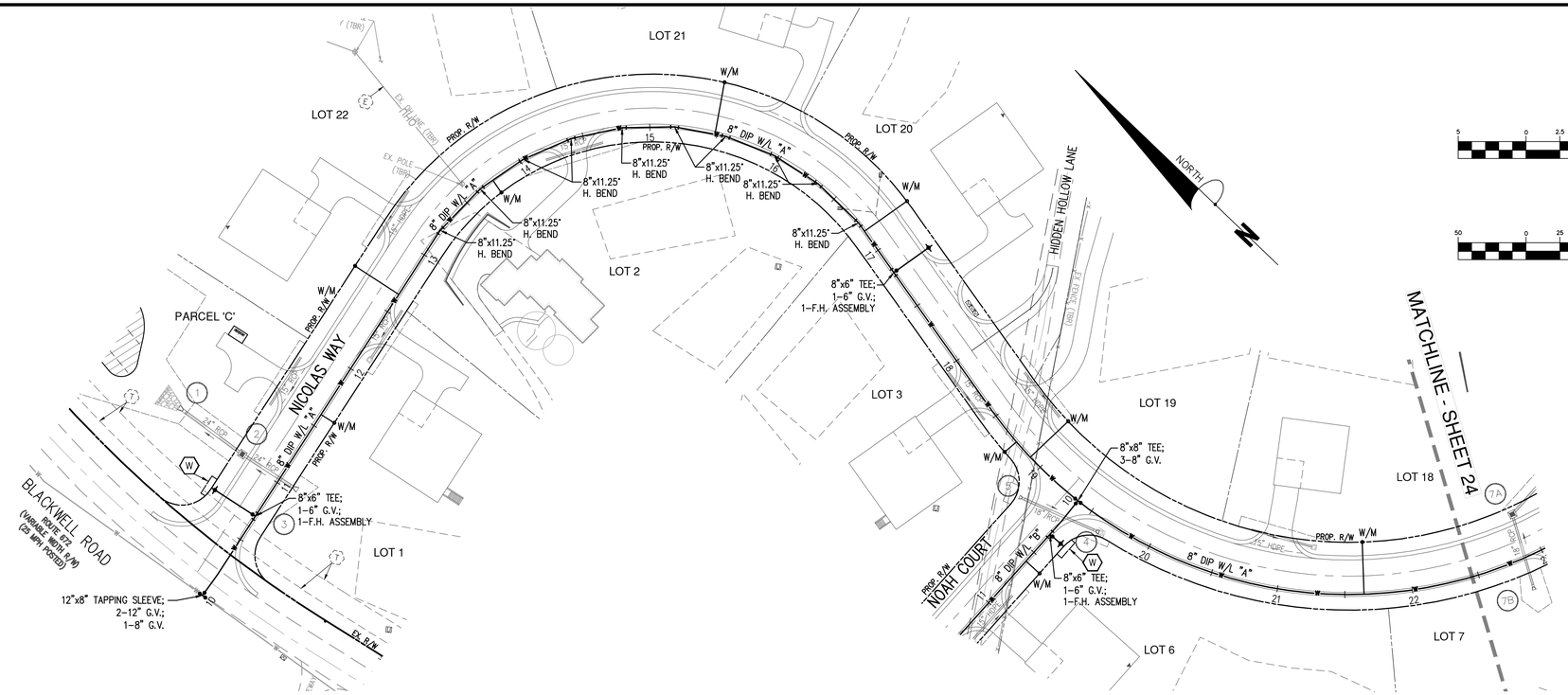
DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD
SCALE	H: 1"=50' V: 1"=5'	
JOB No. 6642-02-002		
DATE : FEBRUARY 10, 2023		
FILE No. 6642-D-CP-001		
SHEET 22 OF 58		



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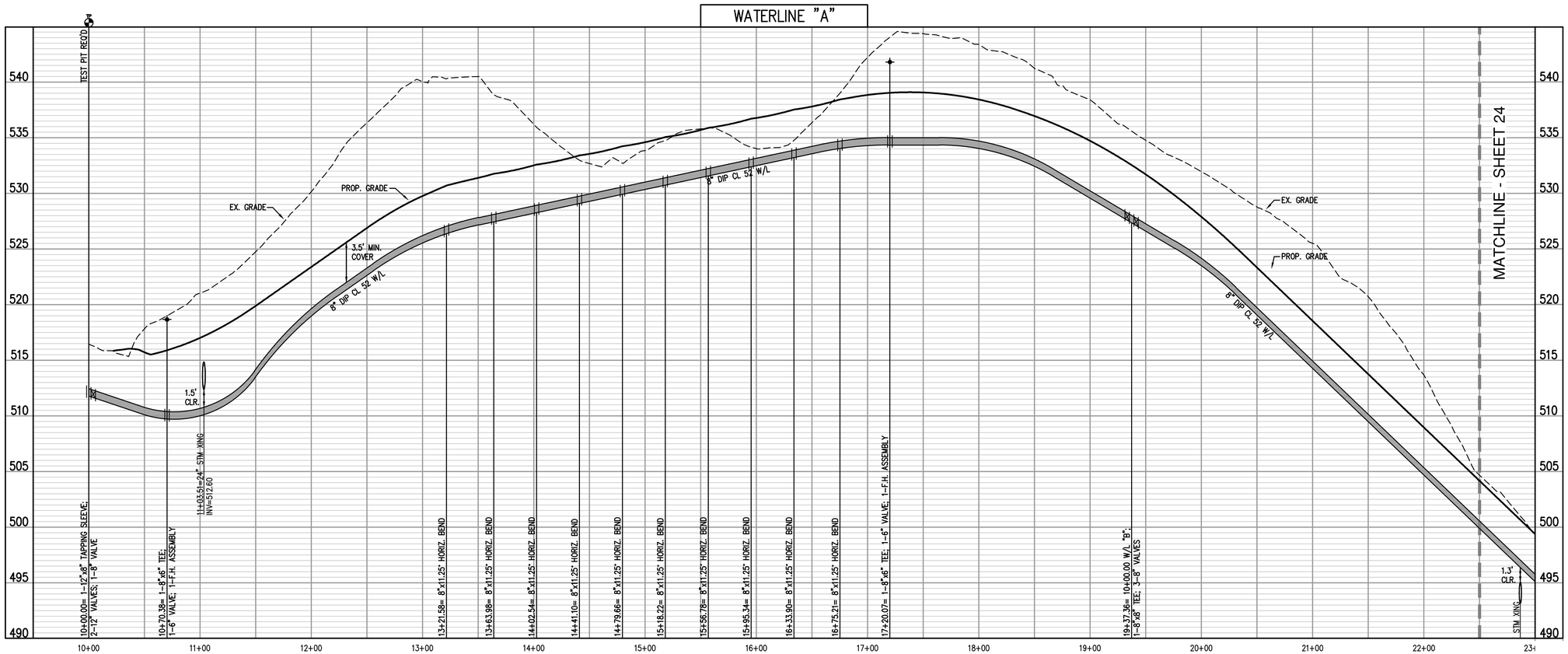

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WATERLINE PLAN & PROFILES
TIFFANY ESTATES
CONSTRUCTION PLAN
FAUQUIER COUNTY, VIRGINIA
CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

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WILLIAM E. DUNCANSON JR
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SCALE H: 1"=50' V: 1"=5'

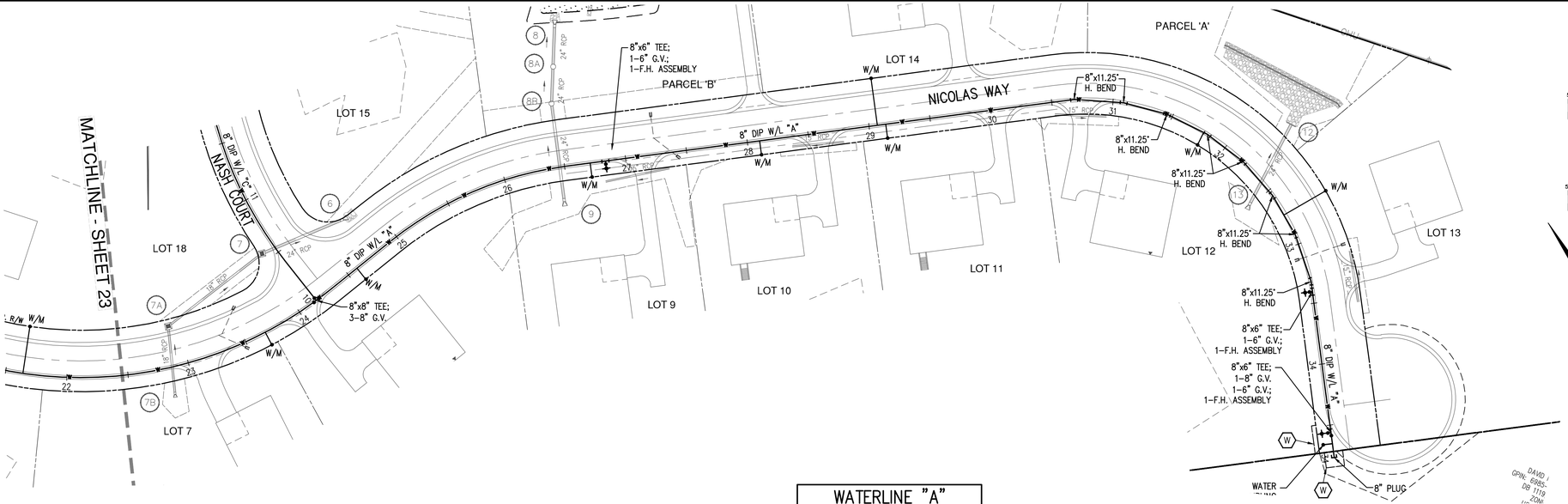
JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 23 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\023-025-6642-D-CP-001-WLP.dwg



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GRAPHIC SCALE

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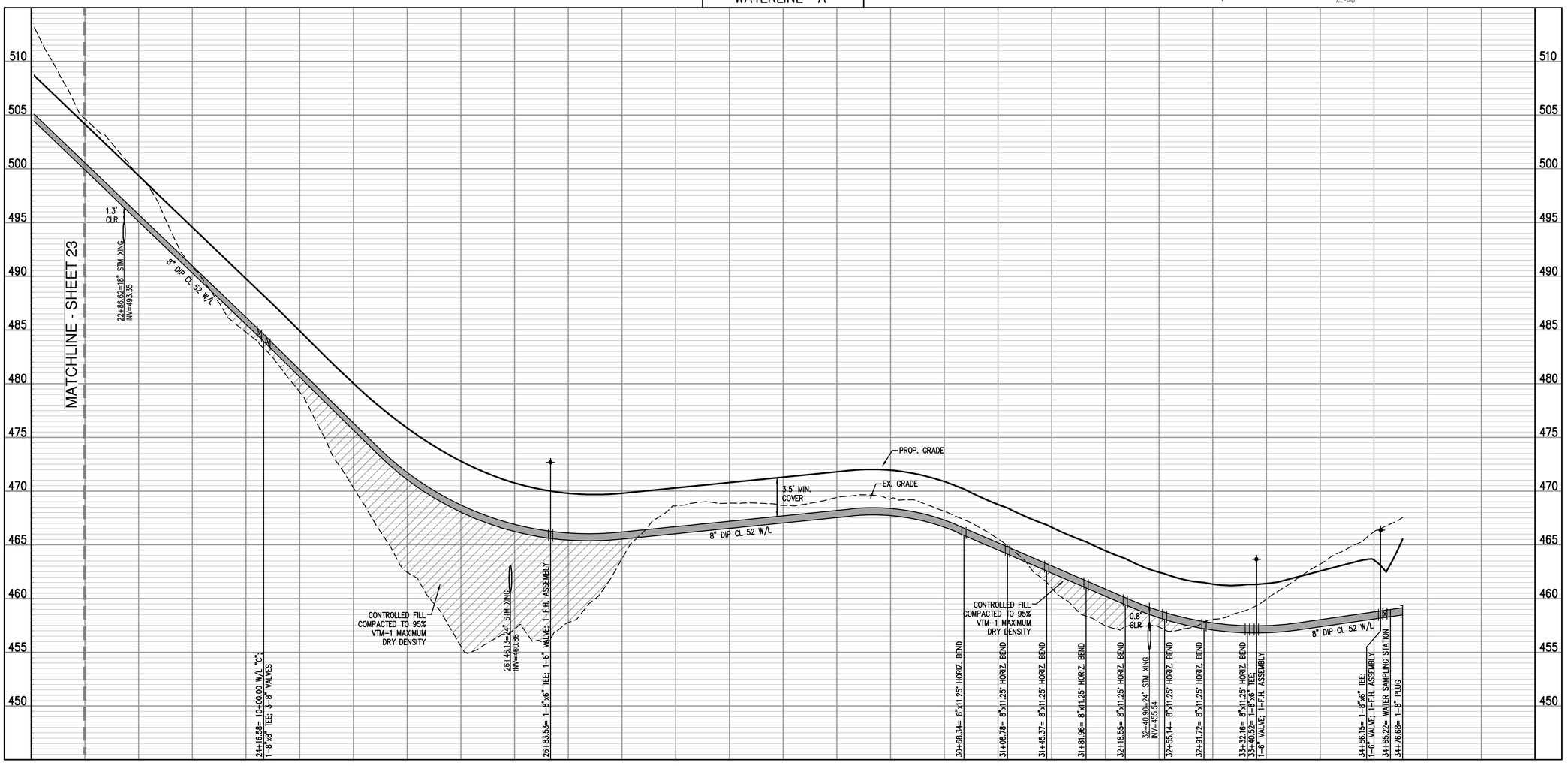
(IN FEET)
1 inch = 50 ft.

WATERLINE "A"



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SCALE	H: 1"=50' V: 1"=5'	
JOB No. 6642-02-002		
DATE : FEBRUARY 10, 2023		
FILE No. 6642-D-CP-001		
SHEET 24 OF 58		

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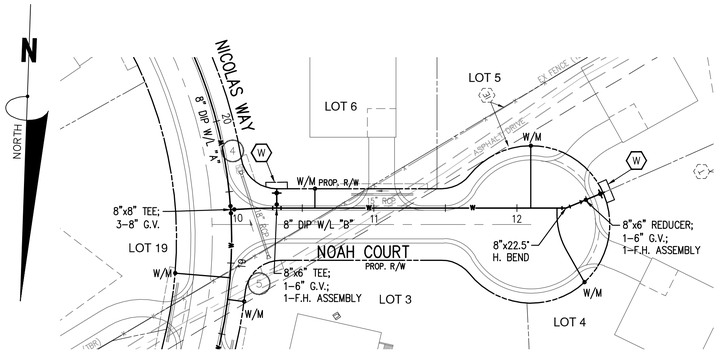

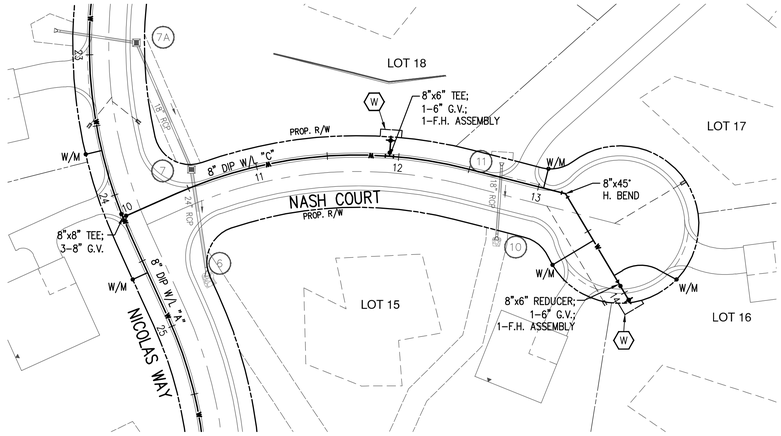

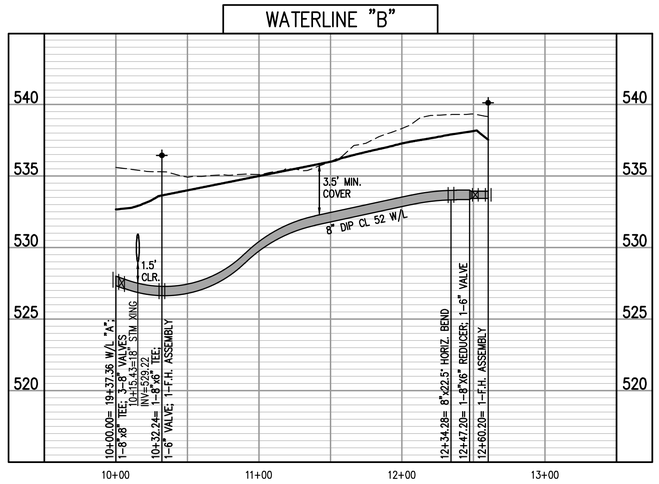

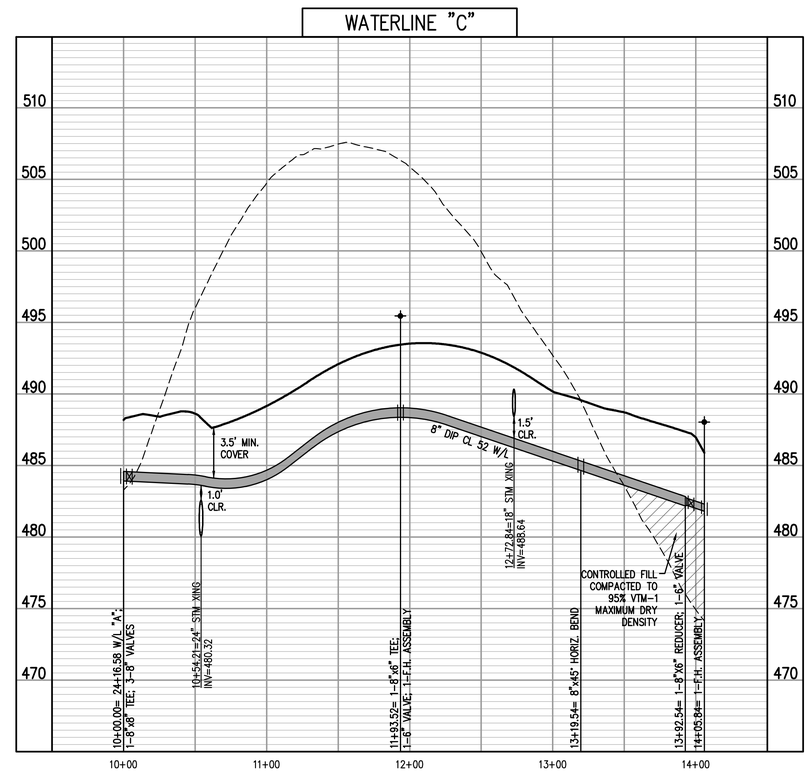

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WATERLINE PLAN & PROFILES

TIFFANY ESTATES

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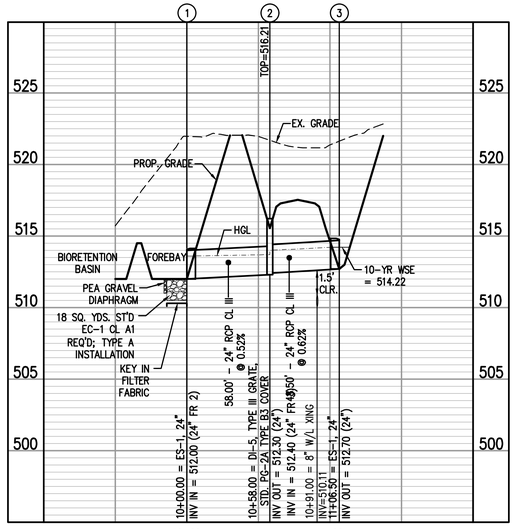
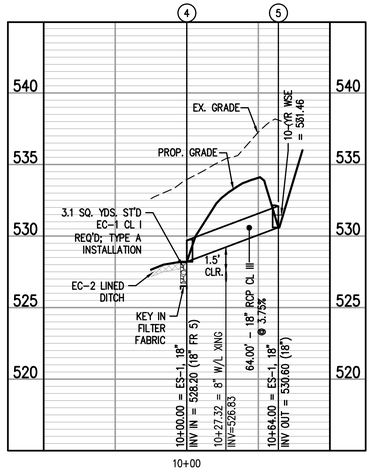
DATE	DESCRIPTION

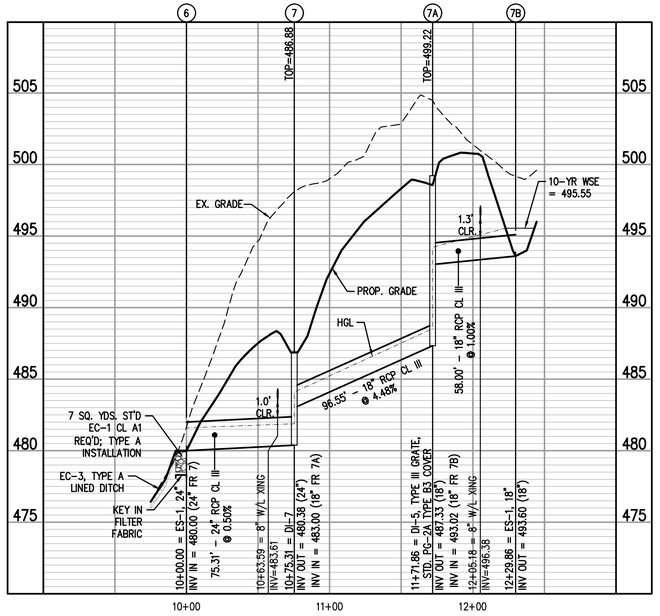
WED DESIGN	WED DRAWN	WED CHKD
SCALE	H: 1"=50' V: 1"=5'	
JOB No. 6642-02-002		
DATE : FEBRUARY 10, 2023		
FILE No. 6642-D-CP-001		

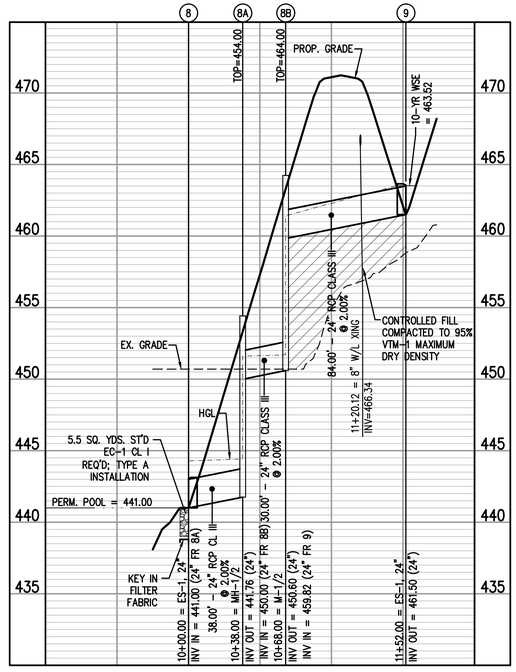
SHEET 25 OF 58

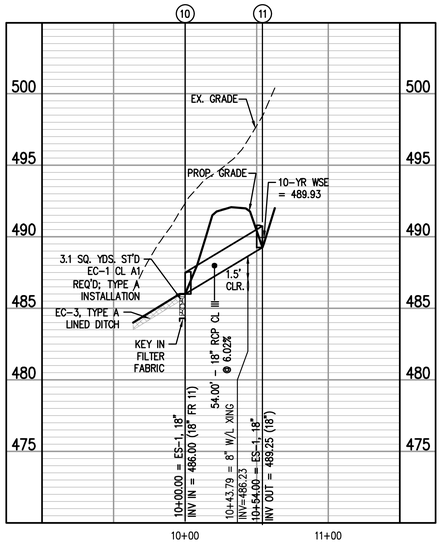
Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\023-025-6642-D-CP-001-WLP.dwg

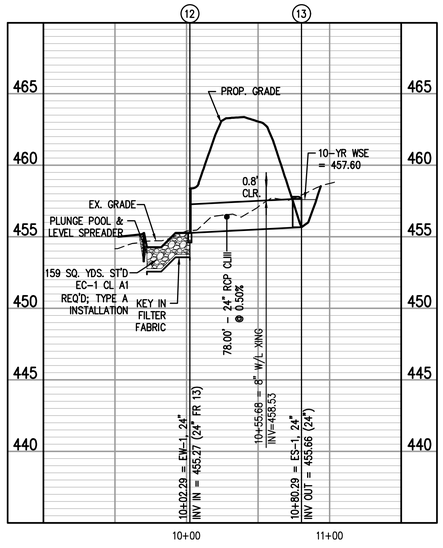


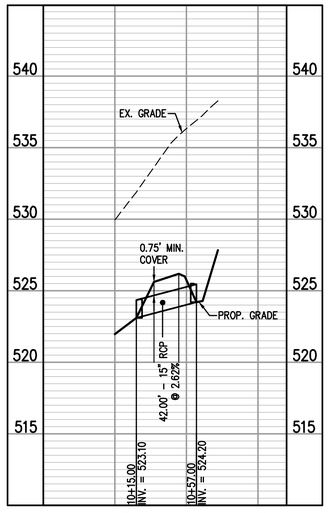




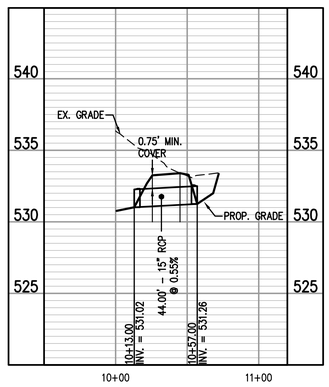




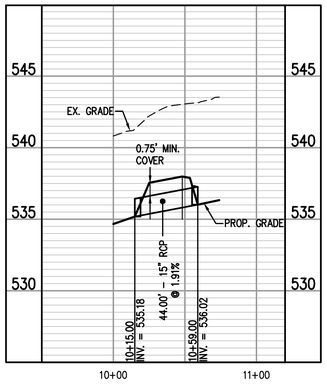




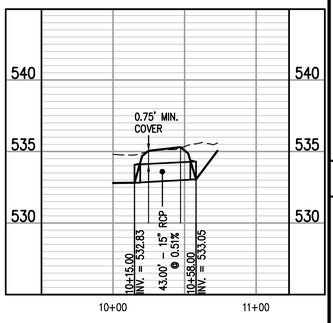
LOT 1 DW CULV PROFILE VIEW



LOT 2 DW CULV PROFILE VIEW



LOT 3 DW CULV PROFILE VIEW



LOT 6 DW CULV PROFILE VIEW

NOTES:

1. ALL STORM STRUCTURES SHALL HAVE IS-1 INVERT SHAPING.
2. SL-1 (SAFETY LANDINGS) SHALL BE REQUIRED IN ALL STRUCTURES WITH A HEIGHT GREATER THAN 12'.
3. ST-1 (STEPS) ARE REQUIRED IN ALL STRUCTURES WITH A HEIGHT GREATER THAN 4'.
4. PIPE BEDDING SHALL BE IN ACCORDANCE WITH VDOT STANDARD PB-1.

GRAPHIC SCALE

5 0 2.5 5 10 20

(IN FEET)
1 inch = 5 ft.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Bowman

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1300 Central Park Boulevard
Fredericksburg, Virginia 22401
Phone: (540) 371-0268
bowman.com
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STORM SEWER PROFILES

TIFFANY ESTATES

CONSTRUCTION PLAN

FAUQUIER COUNTY, VIRGINIA

CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=50'
V: 1"=5'

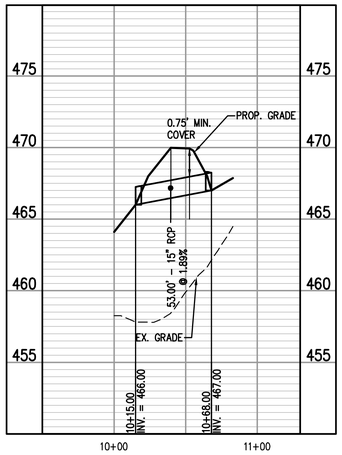
JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

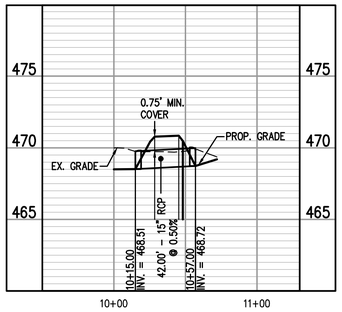
FILE No. 6642-D-CP-001

SHEET 26 OF 58

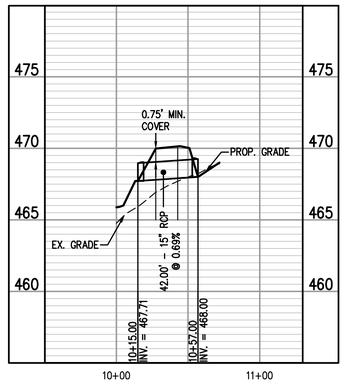
Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\026-26A-6642-D-CP-001-SDP.dwg



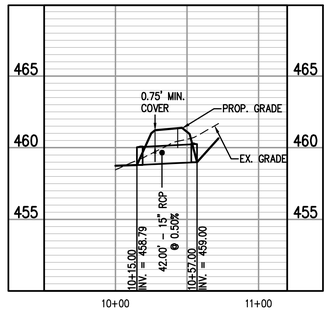
LOT 9 DW CULV PROFILE VIEW



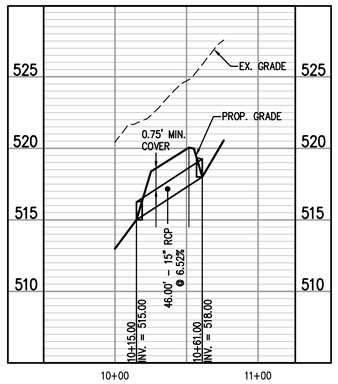
LOT 10 DW CULV PROFILE VIEW



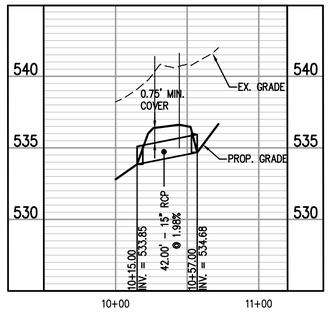
LOT 12 DW CULV PROFILE VIEW



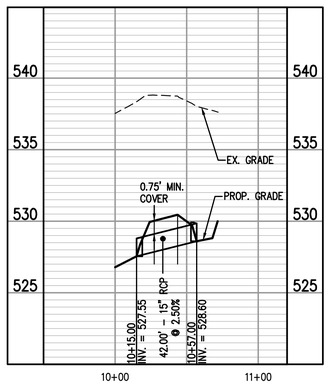
LOT 13 DW CULV PROFILE VIEW



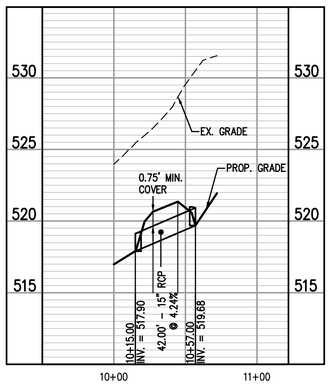
LOT 18 DW CULV PROFILE VIEW



LOT 19 DW CULV PROFILE VIEW



LOT 22 DW CULV PROFILE VIEW



LOT C DW CULV PROFILE VIEW

NOTES:

1. ALL STORM STRUCTURES SHALL HAVE IS-1 INVERT SHAPING.
2. SL-1 (SAFETY LANDINGS) SHALL BE REQUIRED IN ALL STRUCTURES WITH A HEIGHT GREATER THAN 12'.
3. ST-1 (STEPS) ARE REQUIRED IN ALL STRUCTURES WITH A HEIGHT GREATER THAN 4'.
4. PIPE BEDDING SHALL BE IN ACCORDANCE WITH VDOT STANDARD PB-1.

GRAPHIC SCALE

5 0 2.5 5 10 20

(IN FEET)
1 inch = 5 ft.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Bowman

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STORM SEWER PROFILES

TIFFANY ESTATES

CONSTRUCTION PLAN

FAUQUIER COUNTY, VIRGINIA

CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=50' V: 1"=5'

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 26A OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\026-26A-6642-D-CP-001-SDP.dwg

LEGEND

- DRAINAGE DIVIDE
- Tc PATH
- A BEGIN OVERLAND FLOW
- B BEGIN SHALLOW CONCENTRATED FLOW
- C BEGIN OPEN CHANNEL FLOW

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

Bowman

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Fredericksburg, Virginia 22401
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DRAINAGE DIVIDES MAP

TIFFANY ESTATES

CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT

FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
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12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION	
WED DESIGN	WED DRAWN	WED CHKD
SCALE	H: 1"=80' V:	
JOB No. 6642-02-002		
DATE : FEBRUARY 10, 2023		
FILE No. 6642-D-CP-001		

SHEET 27 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\027-6642-D-CP-001-DDM.dwg

DRAINAGE AREA CALCULATIONS

STRUCTURE ID / DRAINAGE AREA	ONSITE DRAINAGE AREA — B SOILS — 98 IMPERVIOUS AREA (AC)	B SOILS — 61 TURF (AC)	B SOILS — 55 WOODS/ PROTECTED OPEN SPACE (AC)	C SOILS — 98 IMPERVIOUS AREA (AC)	C SOILS — 74 TURF (AC)	C SOILS — 70 WOODS/ PROTECTED OPEN SPACE (AC)	D SOILS — 98 IMPERVIOUS AREA (AC)	D SOILS — 80 TURF (AC)	D SOILS — 77 WOODS/ PROTECTED OPEN SPACE (AC)	OFFSITE DRAINAGE AREA — IMPERVIOUS — 98 IMPERVIOUS AREA (AC)	A SOILS — 39 TURF (AC)	A SOILS — 30 WOODS/ PROTECTED OPEN SPACE (AC)	B SOILS — 61 TURF (AC)	B SOILS — 55 WOODS/ PROTECTED OPEN SPACE (AC)	C SOILS — 74 TURF (AC)	C SOILS — 70 WOODS/ PROTECTED OPEN SPACE (AC)	D SOILS — 80 TURF (AC)	D SOILS — 77 WOODS/ PROTECTED OPEN SPACE (AC)	TOTAL DRAINAGE AREA TO STRUCTURE CALCULATIONS — TOTAL DRAINAGE AREA	0.9 TOTAL IMPERVIOUS AREA (AC)	0.35 TOTAL TURF AREA (AC)	0.3 TOTAL WOODS AREA (AC)	SCS CN	RATIONAL C-FACTOR	NOTES
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	0.00	-	-	0.19	0.24	-	-	-	-	-	-	-	-	-	-	-	-	-	0.43	0.19	0.24	-	85	0.59	INCL. LOT C&22 D/W
3	0.05	0.26	0.05	0.51	2.87	0.24	-	-	-	0.12	-	-	0.12	-	0.05	-	-	-	4.28	0.68	3.31	0.29	76	0.43	INCL. LOT 1&2 D/W
LOT C D/W CULVERT	0.00	-	-	0.14	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	0.32	0.14	0.18	-	85	0.60	INC. LOT 22 D/W
LOT 1 D/W CULVERT	-	-	-	0.35	1.03	-	-	-	-	-	-	-	-	-	-	-	-	-	1.38	0.35	1.03	-	80	0.49	INCL. LOT 2 D/W
LOT 2 D/W CULVERT	-	-	-	0.12	0.68	-	-	-	-	-	-	-	-	-	-	-	-	-	0.80	0.12	0.68	-	78	0.44	
LOT 22 D/W CULVERT	-	-	-	0.04	0.07	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	0.04	0.07	-	83	0.55	
SURFACE TO BIO 'A'	0.01	0.17	0.05	0.05	0.39	0.04	-	-	-	-	-	-	-	-	-	0.01	-	-	0.71	0.05	0.56	0.10	71	0.39	
TOTAL TO BIO 'A'	0.0635	0.4338	0.0981	0.7443	3.4982	0.2826	-	-	-	0.1221	-	-	0.1228	-	0.0547	0.0078	-	-	5.43	0.93	4.11	0.39	76	0.44	
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	0.11	0.26	-	0.23	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0707	0.34	0.73	-	78	0.53	INCL. LOT 3 D/W
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	0.03	0.19	-	0.05	0.69	-	0.02	0.02	-	-	-	-	-	-	-	-	-	-	0.9968	0.10	0.90	-	74	0.41	
7A	0.18	0.45	-	0.06	0.16	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8442	0.24	0.60	-	74	0.51	INCL. LOT 18&19 D/W
7B	0.47	1.42	0.43	0.32	0.76	0.01	0.02	0.19	0.36	-	-	-	0.07	0.02	-	-	0.02	0.02	4.1079	0.81	2.46	0.84	72	0.45	INCL. 5 & LOT 6 D/W
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9	0.25	1.00	0.04	0.33	1.11	0.64	0.14	0.37	0.08	0.68	-	-	0.58	1.85	0.00	0.04	0.02	0.02	7.1384	1.39	3.08	2.67	71	0.44	INCL. LOT 9 D/W
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11	-	-	-	0.08	0.63	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7051	0.08	0.63	-	77	0.41	
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
16	0.05	0.36	-	0.11	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5401	0.17	0.37	-	73	0.52	
17	0.03	0.22	-	0.11	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5689	0.14	0.43	-	75	0.48	
18	-	0.21	0.17	0.18	0.66	-	-	-	-	0.03	-	-	-	0.05	-	0.02	-	-	1.3161	0.21	0.87	0.24	73	0.43	
LOT 3 D/W CULVERT	-	-	-	0.05	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2003	0.05	0.15	-	80	0.48	
LOT 6 D/W CULVERT	0.09	0.07	-	0.09	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2989	0.18	0.12	-	85	0.68	
LOT 9 D/W CULVERT	0.09	0.43	0.02	0.20	0.60	0.28	-	-	-	-	-	-	-	0.36	-	0.01	-	-	1.9969	0.29	1.03	0.68	70	0.41	INCL. LOT 10 D/W
LOT 10 D/W CULVERT	-	0.08	-	0.12	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4178	0.12	0.30	-	78	0.51	
LOT 18 D/W CULVERT	0.05	0.29	-	0.06	0.16	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5635	0.12	0.45	-	72	0.46	INCL. LOT 19 D/W
LOT 19 D/W CULVERT	-	-	-	0.03	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0579	0.03	0.03	-	86	0.63	
SURFACE TO POND 'A'	0.15	0.81	-	0.20	1.00	-	0.23	0.45	-	-	-	-	-	-	-	-	-	-	2.8389	0.58	2.26	-	76	0.46	
TOTAL TO POND 'A'	1.17	4.65	0.63	1.43	5.23	0.65	0.41	1.03	0.44	0.70	-	-	0.65	1.93	0.00	0.06	0.03	0.03	19.0564	3.71	11.60	3.75	73	0.45	
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
13	0.33	1.40	0.47	0.09	0.19	-	-	-	-	-	0.10	0.58	0.77	5.28	-	-	-	-	9.21	0.42	2.46	6.33	57	0.34	INCL. LOT 12 D/W
LOT 12 D/W CULVERT	0.01	0.02	-	0.03	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.05	0.07	-	82	0.57	
LOT 13 D/W CULVERT	0.11	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.19	0.11	0.08	-	82	0.66	
SURF. TO LEVEL SPREADER	0.25	0.36	0.03	0.02	0.15	0.04	-	-	-	-	-	-	-	-	-	-	-	-	0.8522	0.27	0.51	0.07	75	0.52	
TOTAL TO LEVEL SPREADER	0.69	1.84	0.50	0.11	0.34	0.04	-	-	-	-	0.10	0.58	0.77	5.28	-	-	-	-	10.26	0.80	3.05	6.40	59	0.36	
SECTION A-A (TOTAL)	-	-	-	0.11	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-	0.97	0.11	0.86	-	77	0.41	INCL. STR 11
SECTION B-B	0.01	0.00	-	0.02	0.08	0.03	0.12	0.35	0.06	-	-	-	0.13	0.03	-	-	0.01	0.02	0.84	0.14	0.57	0.13	78	0.44	

DITCH COMPUTATIONS

STA TO STA	DRAINAGE AREA (ACRES) INCR.	ACCUM.	C	C x A INCR.	ACCUM.	Tc (min)	I_2 IN/HR	$Q_{2\text{-years}}$ CFS	I_{10} IN/HR	Q_{10} CFS	SLOPE FT/FT	V_{allow} FPS	"n"	$V_{2\text{-years}}$ FPS	$d_{2\text{-years}}$ FT	$V_{10\text{-years}}$ FPS	$d_{10\text{-years}}$ FT	LINING
NICOLAS WAY																		
LEFT	*LHS*																	
10+50.00	0.04	0.04	0.60	0.03	0.03	5	5.01	0.13	6.52	0.16	0.0460	3.0	0.03	1.83	0.15	1.96	0.17	GRASS
11+00.00	0.11	0.40	0.59	0.07	0.24	7	4.65	1.11	6.07	1.45	0.0660	4.0	0.05	2.47	0.39	2.64	0.43	EC-2
12+00.00	0.18	0.28	0.63	0.11	0.17	6	4.81	0.82	6.27	1.07	0.0700	4.0	0.05	2.34	0.34	2.50	0.38	EC-2
13+00.00	0.10	0.10	0.55	0.06	0.06	5	5.01	0.28	6.52	0.37	0.0330	3.0	0.03	1.98	0.22	2.12	0.24	GRASS
19+00.00	0.09	0.09	0.69	0.06	0.30	5	5.01	1.49	6.52	1.94	0.0330	3.0	0.03	3.01	0.41	3.21	0.45	GRASS
20+00.00	0.07	0.15	0.61	0.04	0.34	6	4.88	1.65	6.36	2.15	0.0800	4.0	0.05	2.93	0.43	3.13	0.48	EC-2
21+00.00	0.41	0.56	0.39	0.16	0.50	6	4.74	2.36	6.18	3.08	0.1000	4.0	0.05	3.48	0.48	3.72	0.53	EC-2
22+00.00	0.16	0.72	0.69	0.11	0.61	7	4.63	2.81	6.05	3.67	0.1000	4.0	0.05	3.64	0.51	3.89	0.56	EC-2
23+00.00	0.12	0.84	0.48	0.06	0.67	7	4.54	3.02	5.94	3.96	0.1000	4.0	0.05	3.70	0.52	3.96	0.58	EC-2
24+00.00	0.37	0.37	0.39	0.14	0.14	5	5.01	0.73	6.52	0.94	0.1000	4.0	0.05	2.59	0.31	2.77	0.34	EC-2
25+00.00	2.09	6.18	0.33	0.69	2.98	13	3.58	10.66	4.75	14.15	0.1700	7.0	0.05	6.19	0.76	6.65	0.84	EC-3
26+00.00	0.29	6.48	0.41	0.12	3.10	13	3.55	11.01	4.72	14.62	0.1800	7.0	0.05	6.38	0.76	6.85	0.84	EC-3
RIGHT	*RHS*																	
10+50.00	0.09	1.69	0.46	0.04	0.85	12	3.71	3.15	4.91	4.17	0.0460	4.0	0.05	2.80	0.61	3.00	0.68	EC-2
11+00.00	0.18	1.60	0.58	0.11	0.81	12	3.75	3.03	4.96	4.01	0.0660	4.0	0.05	3.17	0.56	3.40	0.63	EC-2
12+00.00	0.43	1.42	0.53	0.23	0.70	11	3.82	2.68	5.04	3.54	0.0700	4.0	0.05	3.14	0.53	3.37	0.59	EC-2
13+00.00	0.11	0.99	0.61	0.07	0.47	10	3.93	1.85	5.19	2.45	0.0330	4.0	0.05	2.16	0.53	2.32	0.59	EC-2
14+00.00	0.47	0.88	0.46	0.22	0.41	10	4.03	1.63	5.31	2.15	0.0200	3.0	0.03	2.55	0.46	2.73	0.51	GRASS
15+00.00	0.16	0.41	0.46	0.07	0.19	7	4.50	0.84	5.89	1.10	0.0200	3.0	0.03	2.16	0.36	2.31	0.40	GRASS
16+00.00	0.20	0.24	0.44	0.09	0.11	6	4.69	0.53	6.13	0.69	0.0200	3.0	0.03	1.92	0.30	2.05	0.33	GRASS
17+00.00	0.05	0.05	0.54	0.03	0.03	5	5.01	0.13	6.52	0.17	0.0150	3.0	0.03	1.21	0.19	1.30	0.21	GRASS
18+00.00	0.06	0.06	0.50	0.03	0.03	5	5.01	0.14	6.52	0.18	0.0150	3.0	0.03	1.24	0.20	1.33	0.22	GRASS
19+00.00	0.24	0.30	0.53	0.13	0.15	6	4.69	0.73	6.13	0.95	0.0330	3.0	0.03	2.51	0.31	2.68	0.34	GRASS
20+00.00	0.08	1.60	0.64	0.05	0.91	12	3.77	3.45	4.99	4.56	0.0800	4.0	0.05	3.52	0.57	3.78	0.63	EC-2
21+00.00	0.16	1.76	0.47	0.08	0.99	12	3.71	3.67	4.91	4.86	0.1000	4.0	0.05	3.89	0.56	4.17	0.62	EC-2
22+00.00	0.24	2.00	0.43	0.10	1.09	12	3.65	3.99	4.84	5.29	0.1000	4.0	0.05	3.97	0.58	4.26	0.64	EC-2
23+00.00	0.11	2.11	0.49	0.06	1.15	13	3.60	4.14	4.78	5.49	0.1000	7.0	0.05	4.01	0.59	4.30	0.65	EC-3
24+00.00	0.11	0.11	0.62	0.07	0.07	5	5.01	0.33	6.52	0.44	0.1800	4.0	0.05	2.66	0.20	2.85	0.23	EC-2
25+00.00	0.14	0.14	0.58	0.08	0.08	5	5.01	0.42	6.52	0.54	0.2200	4.0	0.05	3.03	0.21	3.24	0.24	EC-2
26+00.00	0.24	0.39	0.47	0.11	0.20	6	4.88	0.95	6.36	1.24	0.1800	4.0	0.05	3.46	0.30	3.70	0.33	EC-2
26+50.00	1.54	2.14	0.36	0.56	0.88	13	3.61	3.18	4.80	4.22	0.1300	7.0	0.05	4.14	0.51	4.44	0.56	EC-3
27+50.00	0.07	0.60	0.59	0.04	0.32	6	4.69	1.52	6.13	1.98	0.0150	3.0	0.03	2.25	0.47	2.40	0.52	GRASS
28+00.00	0.34	0.53	0.49	0.17	0.28	6	4.78	1.34	6.24	1.74	0.0150	3.0	0.03	2.17	0.45	2.32	0.50	GRASS
29+00.00	0.18	0.18	0.62	0.11	0.11	5	5.01	0.56	6.52	0.73	0.0150	3.0	0.03	1.75	0.33	1.87	0.36	GRASS
31+00.00	0.14	0.14	0.59	0.08	0.08	5	5.01	0.42	6.52	0.55	0.1450	4.0	0.05	2.60	0.23	2.78	0.26	EC-2
32+00.00	0.18	0.32	0.60	0.11	0.19	6	4.86	0.93	6.33	1.21	0.0700	4.0	0.05	2.41	0.36	2.58	0.40	EC-2
32+50.00	0.06	0.38	0.52	0.03	0.22	6	4.78	1.05	6.24	1.38	0.0900	4.0	0.05	2.74	0.36	2.92	0.40	EC-2
34+00.00	0.69	0.69	0.36	0.25	0.25	5	5.01	1.25	6.52	1.63	0.0300	3.0	0.03	2.77	0.39	2.96	0.43	GRASS
NOAH COURT																		
LEFT	*LHS*																	
10+00.00	0.11	0.45	0.63	0.07	0.30	7	4.65	1.41	6.07	1.84	0.0200	3.0	0.03	2.45	0.44	2.62	0.48	GRASS
11+00.00	0.19	0.34	0.71	0.13	0.23	6	4.81	1.12	6.27	1.47	0.0200	3.0	0.03	2.32	0.40	2.48	0.44	GRASS
12+00.00	0.15	0.15	0.65	0.10	0.10	5	5.01	0.51	6.52	0.66	0.0200	3.0	0.03	1.90	0.30	2.03	0.33	GRASS
RIGHT	*RHS*																	
10+00.00	0.13	0.78	0.53	0.07	0.41	7	4.65	1.90	6.07	2.48	0.0200	3.0	0.03	2.64	0.49	2.83	0.54	GRASS
11+00.00	0.47	0.65	0.50	0.24	0.34	6	4.81	1.64	6.27	2.13	0.0200	3.0	0.03	2.55	0.46	2.72	0.51	GRASS
12+00.00	0.18	0.18	0.59	0.10	0.10	5	5.01	0.52	6.52	0.68	0.0200	3.0	0.03	1.91	0.30	2.05	0.33	GRASS
NASH COURT																		
LEFT	*LHS*																	
10+00.00	0.21	0.63	0.40	0.09	0.24	11	3.92	0.96	5.17	1.26	0.0400	3.0	0.03	2.89	0.33	3.10	0.37	GRASS
11+00.00	0.41	0.41	0.38	0.16	0.16	10	4.00	0.63	5.27	0.83	0.0580	3.0	0.03	2.99	0.26	3.21	0.29	GRASS
13+00.00	0.15	0.15	0.42	0.06	0.06	5	5.01	0.31	6.52	0.40	0.0450	3.0	0.03	2.27	0.21	2.43	0.23	GRASS
RIGHT	*RHS*																	
10+00.00	0.07	0.14	0.65	0.05	0.08	6	4.83	0.41	6.30	0.54	0.0400	3.0	0.03	2.34	0.24	2.50	0.27	GRASS
11+00.00	0.07	0.07	0.53	0.04	0.04	5	5.01	0.18	6.52	0.24	0.0580	3.0	0.03	2.19	0.17	2.34	0.18	GRASS
13+00.00	0.06	0.06	0.53	0.03	0.03	5	5.01	0.16	6.52	0.21	0.0450	3.0	0.03	1.94	0.17	2.07	0.18	GRASS
CROSS SECTIONS																		
SECTION A-A	0.97	0.97	0.41	0.40	0.40	9	4.16	1.66	5.47	2.19	0.2000	7.0	0.05	4.14	0.37	4.43	0.41	EC-3
SECTION B-B	0.84	0.84	0.43	0.36	0.36	5	5.01	1.79	6.52	2.33	0.0500	4.0	0.05	2.51	0.49	2.68	0.54	EC-2

CULVERT/STORM DRAIN Tc PATH CALCULATIONS

STRUCTURE	SHEET FLOW (A-B) LENGTH (L_{sh}) (FT)	SLOPE (S_{sh}) (FT/FT)	MANNING'S n (n_{ol})	T_{sh} (MIN)	SHALLOW CONCENTRATED FLOW (B-C) LENGTH (FT)	AVG. SLOPE (FT/FT)	PAVED	Tt (MIN)	CHANNEL FLOW (C-D) LENGTH (FT)	AVG. SLOPE (FT/FT)	n	AREA (FT^2)	WETTED PERIM. (FT)	Tt (MIN)	TOTAL Tc (MIN)	COMMENTS
3	100	0.025	0.24	**13.18**	375	0.078	NO	**1.39**	-	-	-	-	-	**-**	**14.6**	
5	100	0.040	0.24	**10.92**	20	0.120	NO	**0.06**	120.00	0.022	0.030	3.00	6.30	**0.42**	**11.397**	
7	100	0.070	0.24	**8.73**	200	0.205	NO	**0.46**	120.00	0.050	0.030	3.00	6.30	**0.30**	**9.5**	
7B	100	0.070	0.24	**8.73**	480	0.076	NO	**1.80**	-	-	-	-	-	**-**	**10.5**	
9	100	0.050	0.40	**15.03**	539	0.130	NO	**1.54**	-	-	-	-	-	**-**	**16.6**	
11	100	0.085	0.24	**8.08**	175	0.165	NO	**0.45**	105.00	0.120	0.030	3.00	6.30	**0.18**	**8.7**	
13	100	0.045	0.40	**15.67**	870	0.082	NO	**3.14**	-	-	-	-	-	**-**	**18.8**	
LOT 1 D/W CULVERT	100	0.055	0.24	**9.61**	40	0.075	NO	**0.15**	230.00	0.038	0.030	3.00	6.30	**0.66**	**10.4**	
LOT 2 D/W CULVERT	100	0.055	0.24	**9.61**	40	0.075	NO	**0.15**	28.00	0.020	0.030	3.00	6.30	**0.06**	**9.8**	
LOT 9 D/W CULVERT	100	0.100	0.40	**11.39**	356	0.087	NO	**1.25**	111.00	0.020	0.030	3.00	6.30	**0.06**	**12.7**	

Tc= 5 MIN IF NOT LISTED HERE Sheet Flow - (NRCS Method)

STORM SEWER COMPUTATIONS FOR A 10-YR STORM EVENT

Structure From	Structure To	Drainage Area (acre) Incr.	Accum.	Runoff Coef.	CA Incr.	CA Accum.	Tc (min.)	I (10) (in/hr)	QiVi	Q (10) (cfs)	Slope (%) (min)	(actual)	From Invert Out	To Invert In	From Top	To Top	Structure Depth (ft) From	Minimum Depth (ft) From	n	Diameter (in)	Velocity Full Flow FPS	Prop. Q (fps)	Length (ft)	Flow Time (min.)	Capacity (cfs)	q/Q (%)	HGL Angle at TO Structure (Degrees)	Remarks
18	17	1.32	1.32	0.43	0.57	0.57	11.40	5.03	11.12	**2.84**	0.19	0.50	458.50	457.68	461.50	467.00	3.00	3.92	0.013	15	3.72	3.91	164.000	0.70	**4.57**	**62.28%**	**23**	
17	16	0.57	1.89	0.48	0.27	0.84	12.10	4.91	48.28	**4.12**	0.41	7.64	457.58	452.00	467.00	455.50	9.42	3.92	0.013	15	14.55	11.72	73.020	0.10	**17.86**	**23.06%**	**17**	
16	15	0.54	2.43	0.52	0.28	1.12	12.20	4.88	58.59	**5.46**	0.71	4.84	451.90	447.00	455.50	451.00	3.60	3.92	0.013	15	11.58	10.73	101.310	0.16	**14.21**	**38.43%**	**32**	
15	14	0.00	2.43	0.00	0.00	1.12	12.36	4.86	61.60	**5.44**	0.71	5.67	446.90	441.40	451.00	-	4.10	3.92	0.013	15	12.53	11.32	97.000	0.14	**15.38**	**35.38%**	**0**	
9	8B	7.14	7.14	0.44	3.14	3.14	16.57	4.28	130.64	**13.43**	0.35	2.00	461.50	459.82	463.50	464.00	2.00	4.67	0.013	24	10.18	9.73	84.000	0.14	**31.99**	**41.99%**	**10**	
8B	8A	0.00	7.14	0.00	0.00	3.14	16.71	4.25	129.76	**13.36**	0.35	2.00	450.60	450.00	464.00	454.00	13.40	4.67	0.013	24	10.18	9.71	30.000	0.05	**31.99**	**41.75%**	**0**	
8A	8	0.00	7.14	0.00	0.00	3.14	16.77	4.25	129.76	**13.36**	0.35	2.00	441.76	441.00	454.00	-	12.24	4.67	0.013	24	10.18	9.71	38.000	0.07	**31.99**	**41.75%**	**0**	
7B	7A	4.11	4.11	0.45	1.85	1.85	10.53	5.17	64.13	**9.56**	0.83	1.00	493.60	493.02	495.10	499.22	1.50	4.17	0.013	18	5.94	6.71	58.000	0.14	**10.50**	**91.01%**	**58**	
7A	7	0.84	4.95	0.51	0.43	2.28	10.67	5.15	149.10	**11.74**	1.25	4.48	487.33	483.00	499.22	486.50	11.89	4.17	0.013	18	12.59	12.70	96.550	0.13	**22.25**	**52.79%**	**15**	
7	6	1.00	5.95	0.41	0.41	2.69	10.80	5.13	79.05	**13.80**	0.37	0.50	480.38	480.00	486.50	-	6.12	4.67	0.013	24	5.12	5.73	75.310	0.22	**16.07**	**85.88%**	**0**	
3	2	4.28	4.28	0.43	1.84	1.84	14.56	4.53	46.16	**8.35**	0.14	0.62	512.70	512.40	514.70	516.21	2.00	4.67	0.013	24	5.66	5.53	48.500	0.15	**17.79**	**46.92%**	**4**	
2	1	0.43	4.71	0.59	0.25	2.10	14.71	4.51	50.46	**9.44**	0.17	0.52	512.30	512.00	516.21	-	3.91	4.67	0.013	24	5.18	5.34	58.000	0.18	**16.27**	**58.03%**	**0**	

APPENDIX 9B-3 LD-347 HYDRAULCIC GRADE LINE COMPUTATIONS
LD-347 REV. 7/00
HYDRAULIC GRADE LINE

STORM FREQUENCY = 10-YR STROM

INLET NUMBER (1)	Outlet Water Surface Elev. (ft) (2)	Do Diameter Outlet (in) (3)	Qo Flow Outlet Pipe (cfs) (4)	Lo Length of Pipe (ft) (5)	Sfo Friction Slope (ft/ft) (6)	Hf Friction Head Loss (ft) (7)	HGL at Invert Out of Structure (ft) (8)	Vo Velocity in Outlet Pipe (fps) (8)	Ho Exit Loss (ft) (9)	Qi Flow Intlet Pipe (cfs) (10)	Vi Velocity in Inlet Pipe (fps) (11)	QiVi (12)	Hi Entrance Headloss (ft) (13)	Angle (Degrees) (14)	H(delta) Headloss at a Bend (ft) (15)	Ht total Junction Losses (ft) (16)	1.3 Ht (ft) (17)	Inlet Shaping (IS-1)	0.5 Ht (ft) (18)	Final H (ft) (19)	Inlet Water Surface Elev. (ft) (20)	Rim Elevation (ft) (21)
2	**513.60**	24	9.44	58.00	0.0017	**0.10**	**513.70**	5.34	**0.11**	8.35	5.53	46.16	**0.17**	4	**0.02**	**0.30**	**-**	YES	**0.15**	**0.25**	**513.85**	**516.21**
3	**514.00**	24	8.35	48.50	0.0014	**0.07**	**514.07**	5.53	**0.12**	-	-	-	**-**	-	**-**	**0.12**	**0.15**	YES	**0.08**	**0.14**	**514.14**	**514.70**
7	**481.60**	24	13.80	75.31	0.0037	**0.28**	**481.88**	5.73	**0.13**	11.74	12.70	149.10	**0.88**	15	**0.48**	**1.48**	**1.92**	YES	**0.96**	**1.24**	**482.84**	**486.50**
7A	**484.20**	18	11.74	96.55	0.0125	**1.21**	**485.41**	12.70	**0.63**	9.56	6.71	64.13	**0.24**	58	**0.38**	**1.25**	**1.63**	YES	**0.81**	**2.02**	**486.22**	**499.22**
7B	**494.22**	18	9.56	58.00	0.0083	**0.48**	**494.70**	6.71	**0.17**	-	-	-	**-**	-	**-**	**0.17**	**0.23**	YES	**0.11**	**0.59**	**494.81**	**495.10**
8A	**444.29**	24	13.36	38.00	0.0035	**0.13**	**444.42**	4.25	**0.07**	13.36	9.71	129.76	**0.51**	-	**-**	**0.58**	**0.76**	YES	**0.38**	**0.51**	**444.80**	**454.00**
8B	**451.60**	24	13.36	30.00	0.0035	**0.10**	**451.70**	9.71	**0.37**	13.43	9.73	130.64	**0.51**	10	**0.19**	**1.07**	**1.39**	YES	**0.70**	**0.80**	**452.40**	**464.00**
9	**461.42**	24	13.43	84.00	0.0035	**0.30**	**461.72**	9.73	**0.37**	-	-	-	**-**	-	**-**	**0.37**	**0.48**	YES	**0.24**	**0.53**	**461.95**	**463.50**
15	**444.29**	15	5.44	97.00	0.0071	**0.69**	**444.98**	11.32	**0.50**	5.46	10.73	58.59	**0.63**	32	**0.65**	**1.78**	**-**	YES	**0.89**	**1.58**	**445.87**	**451.00**
16	**448.00**	15	5.46	101.31	0.0071	**0.72**	**448.72**	10.73	**0.45**	4.12	11.72	48.28	**0.75**	17	**0.46**	**1.65**	**2.15**	YES	**1.07**	**1.80**	**449.80**	**455.50**
17	**453.00**	15	4.12	73.02	0.0041	**0.30**	**453.30**	11.72	**0.53**	2.84	3.91	11.12	**0.08**	23	**0.07**	**0.68**	**0.89**	YES	**0.44**	**0.74**	**453.74**	**467.00**
18	**458.68**	15	2.84	164.00	0.0019	**0.32**	**459.00**	3.91	**0.06**	-	-	-	**-**	-	**-**	**0.06**	**0.08**	YES	**0.04**	**0.36**	**459.04**	**461.50**

HYDRAULIC GRADE LINE COMPUTATION TERMS

Do = Outflow Pipe Diameter, inches
Qo = Discharge for Outflow Pipe, cfs
Lo = Length of Outflow Pife, ft.
Sf = Friction slope of Outflow Pipe, ft/ft
Hf = Lo * Sf, Friction Head Loss, ft.
Ao = Area of Outflow Pipe, sq.ft.
Vo = Qo/Ao Velocity of outflow, fps
Ho = **0.25** (Vo^2/2g) Contraction Los
where g = 32.2 ft/sec^2

Di = Inflow Pipe Diameter, inches
Qi = Discharge of pipe into junction, cfs
Ai = Area of Inflow Pipe, sq.ft.
Vi = Qi/Ai, Velocity of inflow, fps
Hi = **0.35** (Vi^2/2g) Expansion Loss, ft.
Angle "K" Value = Choose value based on angle of pipes at junction
** Note: Round off angles to values given.
VDOT= 0.25 Ha = K(Vi^2/2g) Bend Loss, ft.
VDOT= 0.3(Ht = Ho + Hi + Ha Total Head Loss, ft.
(First Structure Only)

JUNCTION BEND LOSSES

Angle (deg.)		"K" Values
90	=	0.70
80	=	0.66
70	=	0.61
60	=	0.56
50	=	0.50
40	=	0.43
30	=	0.35
25	=	0.30
20	=	0.25
15	=	0.19
10	=	0.13
5	=	0.06

Bowman

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STORM SEWER COMPUTATIONS
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION
DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: N/A V: N/A
JOB No. 6642-02-002
DATE : FEBRUARY 10, 2023
FILE No. 6642-D-CP-001

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\028-029-6642-D-CP-001-SDC.dwg

Culvert Calculator Report
CULVERT 2-3 - 2YR

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	0.00 ft	Headwater Depth/Height	0.65
Computed Headwater Eleva	513.99 ft	Discharge	6.26 cfs
Inlet Control HW Elev.	513.93 ft	Tailwater Elevation	513.22 ft
Outlet Control HW Elev.	513.99 ft	Control Type	Entrance Control
Grades			
Upstream Invert	512.70 ft	Downstream Invert	512.40 ft
Length	58.00 ft	Constructed Slope	0.005172 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	0.86 ft
Slope Type	Steep	Normal Depth	0.86 ft
Flow Regime	Supercritical	Critical Depth	0.89 ft
Velocity Downstream	4.84 ft/s	Critical Slope	0.004677 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.00 ft
Section Size	24 inch	Rise	2.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	513.99 ft	Upstream Velocity Head	0.34 ft
Ke	0.20	Entrance Loss	0.07 ft
Inlet Control Properties			
Inlet Control HW Elev.	513.93 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	3.1 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Calculator Report
CULVERT 4-5 - 2YR

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	0.00 ft	Headwater Depth/Height	0.53
Computed Headwater Eleva	531.40 ft	Discharge	2.16 cfs
Inlet Control HW Elev.	531.33 ft	Tailwater Elevation	528.52 ft
Outlet Control HW Elev.	531.40 ft	Control Type	Entrance Control
Grades			
Upstream Invert	530.60 ft	Downstream Invert	528.20 ft
Length	64.00 ft	Constructed Slope	0.037500 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	0.33 ft
Slope Type	Steep	Normal Depth	0.33 ft
Flow Regime	Supercritical	Critical Depth	0.56 ft
Velocity Downstream	7.49 ft/s	Critical Slope	0.004966 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.50 ft
Section Size	18 inch	Rise	1.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	531.40 ft	Upstream Velocity Head	0.21 ft
Ke	0.20	Entrance Loss	0.04 ft
Inlet Control Properties			
Inlet Control HW Elev.	531.33 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	1.8 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Calculator Report
CULVERT 7A-7B - 2YR

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	0.00 ft	Headwater Depth/Height	1.08
Computed Headwater Eleva	495.21 ft	Discharge	7.25 cfs
Inlet Control HW Elev.	495.17 ft	Tailwater Elevation	493.90 ft
Outlet Control HW Elev.	495.21 ft	Control Type	Entrance Control
Grades			
Upstream Invert	493.60 ft	Downstream Invert	493.02 ft
Length	58.00 ft	Constructed Slope	0.010000 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	0.92 ft
Slope Type	Steep	Normal Depth	0.92 ft
Flow Regime	Supercritical	Critical Depth	1.04 ft
Velocity Downstream	6.41 ft/s	Critical Slope	0.006918 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.50 ft
Section Size	18 inch	Rise	1.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	495.21 ft	Upstream Velocity Head	0.47 ft
Ke	0.20	Entrance Loss	0.09 ft
Inlet Control Properties			
Inlet Control HW Elev.	495.17 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	1.8 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Calculator Report
CULVERT 8B-9 - 2YR

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	0.00 ft	Headwater Depth/Height	0.84
Computed Headwater Eleva	463.19 ft	Discharge	10.03 cfs
Inlet Control HW Elev.	463.10 ft	Tailwater Elevation	460.57 ft
Outlet Control HW Elev.	463.19 ft	Control Type	Entrance Control
Grades			
Upstream Invert	461.50 ft	Downstream Invert	459.82 ft
Length	84.00 ft	Constructed Slope	0.020000 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	0.77 ft
Slope Type	Steep	Normal Depth	0.77 ft
Flow Regime	Supercritical	Critical Depth	1.13 ft
Velocity Downstream	8.92 ft/s	Critical Slope	0.005208 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.00 ft
Section Size	24 inch	Rise	2.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	463.19 ft	Upstream Velocity Head	0.46 ft
Ke	0.20	Entrance Loss	0.09 ft
Inlet Control Properties			
Inlet Control HW Elev.	463.10 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	3.1 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Calculator Report
CULVERT 10-11 - 2YR

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	0.00 ft	Headwater Depth/Height	0.39
Computed Headwater Eleva	489.84 ft	Discharge	1.22 cfs
Inlet Control HW Elev.	489.77 ft	Tailwater Elevation	486.21 ft
Outlet Control HW Elev.	489.84 ft	Control Type	Entrance Control
Grades			
Upstream Invert	489.25 ft	Downstream Invert	486.00 ft
Length	54.00 ft	Constructed Slope	0.060185 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	0.22 ft
Slope Type	Steep	Normal Depth	0.22 ft
Flow Regime	Supercritical	Critical Depth	0.41 ft
Velocity Downstream	7.48 ft/s	Critical Slope	0.004912 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.50 ft
Section Size	18 inch	Rise	1.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	489.84 ft	Upstream Velocity Head	0.15 ft
Ke	0.20	Entrance Loss	0.03 ft
Inlet Control Properties			
Inlet Control HW Elev.	489.77 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	1.8 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Calculator Report
CULVERT 12-13 - 2YR

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	0.00 ft	Headwater Depth/Height	0.81
Computed Headwater Eleva	457.28 ft	Discharge	9.35 cfs
Inlet Control HW Elev.	457.21 ft	Tailwater Elevation	456.32 ft
Outlet Control HW Elev.	457.28 ft	Control Type	Outlet Control
Grades			
Upstream Invert	455.66 ft	Downstream Invert	455.27 ft
Length	78.00 ft	Constructed Slope	0.005000 ft/ft
Hydraulic Profile			
Profile	M2	Depth, Downstream	1.09 ft
Slope Type	Mild	Normal Depth	1.10 ft
Flow Regime	Subcritical	Critical Depth	1.09 ft
Velocity Downstream	5.33 ft/s	Critical Slope	0.005093 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.00 ft
Section Size	24 inch	Rise	2.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	457.28 ft	Upstream Velocity Head	0.43 ft
Ke	0.20	Entrance Loss	0.09 ft
Inlet Control Properties			
Inlet Control HW Elev.	457.21 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	3.1 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Calculator Report
CULVERT 2-3 - 10YR

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	0.00 ft	Headwater Depth/Height	0.76
Computed Headwater Eleva	514.22 ft	Discharge	8.35 cfs
Inlet Control HW Elev.	514.15 ft	Tailwater Elevation	513.37 ft
Outlet Control HW Elev.	514.22 ft	Control Type	Entrance Control
Grades			
Upstream Invert	512.70 ft	Downstream Invert	512.40 ft
Length	58.00 ft	Constructed Slope	0.005172 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	1.02 ft
Slope Type	Steep	Normal Depth	1.02 ft
Flow Regime	Supercritical	Critical Depth	1.03 ft
Velocity Downstream	5.21 ft/s	Critical Slope	0.004938 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.00 ft
Section Size	24 inch	Rise	2.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	514.22 ft	Upstream Velocity Head	0.41 ft
Ke	0.20	Entrance Loss	0.08 ft
Inlet Control Properties			
Inlet Control HW Elev.	514.15 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	3.1 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Calculator Report
CULVERT 4-5 - 10YR

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	0.00 ft	Headwater Depth/Height	0.62
Computed Headwater Eleva	531.53 ft	Discharge	2.85 cfs
Inlet Control HW Elev.	531.46 ft	Tailwater Elevation	528.56 ft
Outlet Control HW Elev.	531.53 ft	Control Type	Entrance Control
Grades			
Upstream Invert	530.60 ft	Downstream Invert	528.20 ft
Length	64.00 ft	Constructed Slope	0.037500 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	0.38 ft
Slope Type	Steep	Normal Depth	0.38 ft
Flow Regime	Supercritical	Critical Depth	0.64 ft
Velocity Downstream	8.12 ft/s	Critical Slope	0.005101 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.50 ft
Section Size	18 inch	Rise	1.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	531.53 ft	Upstream Velocity Head	0.24 ft
Ke	0.20	Entrance Loss	0.05 ft
Inlet Control Properties			
Inlet Control HW Elev.	531.46 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	1.8 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Calculator Report
CULVERT 7A-7B - 10YR

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	0.00 ft	Headwater Depth/Height	1.30
Computed Headwater Eleva	495.55 ft	Discharge	9.56 cfs
Inlet Control HW Elev.	495.55 ft	Tailwater Elevation	494.08 ft
Outlet Control HW Elev.	495.54 ft	Control Type	Inlet Control
Grades			
Upstream Invert	493.60 ft	Downstream Invert	493.02 ft
Length	58.00 ft	Constructed Slope	0.010000 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	1.12 ft
Slope Type	Steep	Normal Depth	1.12 ft
Flow Regime	Supercritical	Critical Depth	1.19 ft
Velocity Downstream	6.74 ft/s	Critical Slope	0.008753 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.50 ft
Section Size	18 inch	Rise	1.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	495.54 ft	Upstream Velocity Head	0.62 ft
Ke	0.20	Entrance Loss	0.12 ft
Inlet Control Properties			
Inlet Control HW Elev.	495.55 ft	Flow Control	Submerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	1.8 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Calculator Report
CULVERT 8B-9 - 10YR

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	0.00 ft	Headwater Depth/Height	1.01
Computed Headwater Eleva	463.52 ft	Discharge	13.43 cfs
Inlet Control HW Elev.	463.44 ft	Tailwater Elevation	460.71 ft
Outlet Control HW Elev.	463.52 ft	Control Type	Entrance Control
Grades			
Upstream Invert	461.50 ft	Downstream Invert	459.82 ft
Length	84.00 ft	Constructed Slope	0.020000 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	0.92 ft
Slope Type	Steep	Normal Depth	0.90 ft
Flow Regime	Supercritical	Critical Depth	1.32 ft
Velocity Downstream	9.53 ft/s	Critical Slope	0.005905 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.00 ft
Section Size	24 inch	Rise	2.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	463.52 ft	Upstream Velocity Head	0.58 ft
Ke	0.20	Entrance Loss	0.12 ft
Inlet Control Properties			
Inlet Control HW Elev.	463.44 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	3.1 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Calculator Report
CULVERT 10-11 - 10YR

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	0.00 ft	Headwater Depth/Height	0.45
Computed Headwater Eleva	489.93 ft	Discharge	1.60 cfs
Inlet Control HW Elev.	489.85 ft	Tailwater Elevation	486.24 ft
Outlet Control HW Elev.	489.93 ft	Control Type	Entrance Control
Grades			
Upstream Invert	489.25 ft	Downstream Invert	486.00 ft
Length	54.00 ft	Constructed Slope	0.060185 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	0.25 ft
Slope Type	Steep	Normal Depth	0.25 ft
Flow Regime	Supercritical	Critical Depth	0.48 ft
Velocity Downstream	8.10 ft/s	Critical Slope	0.004909 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.50 ft
Section Size	18 inch	Rise	1.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	489.93 ft	Upstream Velocity Head	0.17 ft
Ke	0.20	Entrance Loss	0.03 ft
Inlet Control Properties			
Inlet Control HW Elev.	489.85 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	1.8 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Calculator Report
CULVERT 12-13 - 10YR

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	0.00 ft	Headwater Depth/Height	0.97
Computed Headwater Eleva	457.59 ft	Discharge	12.59 cfs
Inlet Control HW Elev.	457.53 ft	Tailwater Elevation	456.53 ft
Outlet Control HW Elev.	457.59 ft	Control Type	Outlet Control
Grades			
Upstream Invert	455.66 ft	Downstream Invert	455.27 ft
Length	78.00 ft	Constructed Slope	0.005000 ft/ft
Hydraulic Profile			
Profile	M2	Depth, Downstream	1.28 ft
Slope Type	Mild	Normal Depth	1.34 ft
Flow Regime	Subcritical	Critical Depth	1.28 ft
Velocity Downstream	5.95 ft/s	Critical Slope	0.005709 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.00 ft
Section Size	24 inch	Rise	2.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	457.59 ft	Upstream Velocity Head	0.49 ft
Ke	0.20	Entrance Loss	0.10 ft
Inlet Control Properties			
Inlet Control HW Elev.	457.53 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	3.1 ft²
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

CULVERT SUMMARY

	DA Specifics						Flows			Culvert Info					Headwater Levels			HW/D	
CULVERT	DA (ac.)	C	Tc (min)	I2	I10	I100	Q2 (cfs)	Q10 (cfs)	Q100 (cfs)	Size (in)	Length (ft)	Inv. In	Inv. Out	Slope	2yr WSEL	10yr WSEL	100yr WSEL	(10-YR)	Notes
2-3	4.28	0.43	14.6	3.40	4.53	6.13	6.26	8.35	11.28	24	58	512.70	512.40	0.52%	513.99	514.22	514.51	0.76	
4-5	1.07	0.53	11.4	3.80	5.03	6.76	2.16	2.85	3.84	18	64	530.60	528.20	3.75%	531.40	531.53	531.70	0.62	
7A-7B	4.11	0.45	10.5	3.92	5.17	6.95	7.25	9.56	12.85	18	58	493.60	493.02	1.00%	495.21	495.55	469.29	1.30	
8B-9	7.14	0.44	16.6	3.19	4.28	5.81	10.03	13.43	18.23	24	84	461.50	459.82	2.00%	463.19	463.52	463.96	1.01	
10-11	0.71	0.41	8.7	4.21	5.54	7.44	1.22	1.60	2.15	18	54	489.25	486.00	6.02%	489.84	489.93	490.05	0.45	
12-13	9.21	0.34	18.8	2.99	4.02	5.49	9.35	12.59	17.19	24	78	455.66	455.27	0.50%	457.28	457.60	457.93	0.97	
LOT 1	1.38	0.49	10.4	3.93	5.19	6.97	2.66	3.51	4.71	15	42	524.20	523.10	2.62%	525.17	525.34	-	0.91	
LOT 2	0.80	0.44	9.8	4.03	5.31	7.13	1.43	1.88	2.52	15	44	531.26	531.02	0.55%	531.94	532.05	-	0.63	
LOT 3	0.20	0.48	5.0	5.01	6.52	8.84	0.48	0.63	0.85	15	44	536.02	535.18	1.91%	536.40	536.46	-	0.35	
LOT 6	0.30	0.68	5.0	5.01	6.52	8.84	1.02	1.32	1.80	15	43	533.05	532.83	0.51%	533.62	533.70	-	0.52	
LOT 9	2.00	0.41	12.7	3.63	4.81	6.48	2.97	3.94	5.31	15	53	467.00	466.00	1.89%	468.03	468.22	-	0.98	
LOT 10	0.42	0.51	5.0	5.01	6.52	8.84	1.07	1.39	1.88	15	42	468.72	468.51	0.50%	469.30	469.39	-	0.54	
LOT 12	0.11	0.57	5.0	5.01	6.52	8.84	0.32	0.42	0.57	15	42	468.00	467.71	0.69%	468.31	468.36	-	0.29	
LOT 13	0.19	0.66	5.0	5.01	6.52	8.84	0.64	0.83	1.13	15	42	459.00	458.79	0.50%	459.45	459.51	-	0.41	
LOT 18	0.56	0.46	5.0	5.01	6.52	8.84	1.30	1.69	2.29	15	46	518.00	515.00	6.52%	518.65	518.75	-	0.60	
LOT 19	0.06	0.63	5.0	5.01	6.52	8.84	0.18	0.24	0.32	15	42	534.68	533.85	1.98%	534.91	534.95	-	0.22	
LOT 22	0.10	0.55	5.0	5.01	6.52	8.84	0.28	0.37	0.50	15	42	528.60	527.55	2.50%	528.89	528.93	-	0.26	
LOT C	0.32	0.60	5.0	5.01	6.52	8.84	0.96	1.26	1.70	15	42	519.68	517.90	4.24%	520.23	520.32	-	0.51	

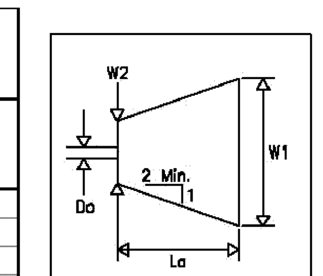
GRATE INLET DESIGN COMPUTATIONS

				SURFACE	10-YR	10-YR	100-YR	100-YR	GRATE DESIGN			DEPTH		TOP	ELEVATION	
Structure #	Type	Area (Ac.)	"C"	Tc	"I"	FLOW	"I"	FLOW	GRATE	PERIM	AREA	10-YR	100-YR	ELEV.	10-YR	100-YR
2	DI-5 (ON GRADE)	0.43	0.59	5.00	6.52	1.66	8.84	2.25	TYPE B3	12.8	3.25	0.195	0.239	516.21	516.41	516.45
7	DI-7	1.00	0.41	9.48	5.39	2.20	7.24	2.96	A-III	12.8	3.25	0.236	0.287	486.50	486.74	486.79
7A	DI-5 (ON GRADE)	0.84	0.51	5.00	6.52	2.81	8.84	3.81	TYPE B3	12.8	3.25	0.277	0.340	499.22	499.50	499.56
16	DI-7	0.54	0.52	5.00	6.52	1.83	8.84	2.48	A-III	12.8	3.25	0.209	0.256	455.50	455.71	455.76
17	DI-7	0.57	0.48	5.00	6.52	1.78	8.84	2.42	A-III	12.8	3.25	0.205	0.251	467.00	467.20	467.25
18	DI-7	1.32	0.43	5.00	6.52	3.69	8.84	5.01	A-III	12.8	3.25	0.333	0.408	461.50	461.83	461.91

GRATE WAS ASSUMED TO BE 50% CLOGGED WHEN CALCULATING THE DEPTH OF FLOW AND ELEVATION

RIPRAP OUTFALL DESIGN CALCULATIONS

OUTFALL STR. #	TW CONDITION	Q (cfs)	PIPE SIZE (in.)	2-YR OUTLET VELOCITY (fps)	La REQUIRED (ft.)	La PROVIDED (ft.)	Do (ft.)	W1 (ft.)	W2 (ft.)	MIN. "T" (FT)	d_{50} (FT)	OUTLET PROTECTION CLASS REQUIRED	NOTES
1	Minimum	9.44	24	4.97	14.00	14.00	2.00	16.00	6.00	1.50	0.8	EC-1 CL A1 DRY RIPRAP	TYPE A
4	Minimum	2.82	18	7.49	4.50	3.75	1.50	4.50	4.50	1.50	0.8	EC-1 CL A1 DRY RIPRAP	TYPE A
6	Minimum	4.48	24	5.44	6.00	3.75	2.00	7.50	6.00	1.50	0.8	EC-1 CL A1 DRY RIPRAP	TYPE A
8	Minimum	15.80	24	8.96	6.00	44.00	2.00	6.00	6.00	2.00	1.1	EC-1 CL I DRY RIPRAP	TYPE A
10	Minimum	1.60	18	7.48	4.50	3.75	1.50	4.50	4.50	1.50	0.8	EC-1 CL A1 DRY RIPRAP	TYPE A
12	Minimum	11.85	24	5.33	6.00	10.00	2.00	6.00	6.00	1.50	0.8	EC-1 CL A1 DRY RIPRAP	TYPE A
14	Minimum	5.44	15	10.61	3.75	4.00	1.25	3.75	3.75	2.00	1.1	EC-1 CL I DRY RIPRAP	TYPE A
A1	Minimum	7.58	30	4.97	7.50	7.50	2.50	7.50	7.50	1.50	0.8	EC-1 CL A1 DRY RIPRAP	TYPE A
LOT 1 D/W CULVERT	Minimum	3.51	15	7.04	3.75	3.75	1.25	3.75	3.75	1.50	0.8	EC-1 CL A1 DRY RIPRAP	TYPE A
LOT 2 D/W CULVERT	Minimum	1.88	15	3.40	3.75	3.75	1.25	3.75	3.75	N/A	N/A	EC-2	TYPE A
LOT 3 D/W CULVERT	Minimum	0.63	15	3.87	3.75	3.75	1.25	3.75	3.75	N/A	N/A	EC-3 TYPE 3	TYPE A
LOT 6 D/W CULVERT	Minimum	1.32	15	3.04	3.75	3.75	1.25	3.75	3.75	N/A	N/A	EC-3 TYPE 3	TYPE A
LOT 9 D/W CULVERT	Minimum	3.94	15	6.51	3.75	3.75	1.25	3.75	3.75	N/A	N/A	EC-3 TYPE 3	TYPE A
LOT 10 D/W CULVERT	Minimum	1.39	15	3.09	3.75	3.75	1.25	3.75	3.75	N/A	N/A	EC-3 TYPE 3	TYPE A
LOT 12 D/W CULVERT	Minimum	0.42	15	2.21	3.75	3.75	1.25	3.75	3.75	N/A	N/A	GRASS	TYPE A
LOT 13 D/W CULVERT	Minimum	0.83	15	2.67	3.75	3.75	1.25	3.75	3.75	N/A	N/A	GRASS	TYPE A
LOT 18 D/W CULVERT	Minimum	1.69	15	8.02	3.75	3.75	1.25	3.75	3.75	2.00	1.1	EC-1 CL I DRY RIPRAP	TYPE A
LOT 19 D/W CULVERT	Minimum	0.24	15	2.92	3.75	3.75	1.25	3.75	3.75	N/A	N/A	GRASS	TYPE A
LOT 22 D/W CULVERT	Minimum	0.37	15	3.62	3.75	3.75	1.25	3.75	3.75	N/A	N/A	EC-2	TYPE A
LOT C D/W CULVERT	Minimum	1.26	15	6.30	3.75	3.75	1.25	3.75	3.75	N/A	N/A	EC-3 TYPE 3	TYPE A



NOTE:
SEE VDOT EC-1 DETAIL

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STORM SEWER COMPUTATIONS
TIFFANY ESTATES
CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION
DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: N/A V: N/A

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 29 OF 58

OVERLAND RELIEF NARRATIVE:

THE SITE HAS BEEN GRADED SUCH THAT DURING A 100-YR STORM EVENT THERE IS ADEQUATE OVERLAND RELIEF TO PREVENT THE FLOODING OF ALL ON-SITE STRUCTURES. THIS OVERLAND RELIEF MAP SHOWS THE APPROXIMATE WATER SURFACE AREA OF THE 100-YR STORM EVENT AS IT TRAVELS THROUGH THE SITE.

THE PROPOSED OVERLAND RELIEF PATHS AND ELEVATIONS ARE BASED ON THE ASSUMPTION THAT ALL OF THE INLETS AND CULVERTS ARE 100% CLOGGED.

DENOTES 100-YR OVERLAND RELIEF WATER SURFACE ELEVATION

100 YEAR OVERLAND RELIEF

WEIR/ STRUCTURE	CUMULATIVE CA	Tc (min.)	I (in/hr)	Q100 (cfs)	L (ft)	H (ft)	WEIR ELEV (ft)	100 OVERLAND RELIEF ELEV.
3	1.84	14.60	6.11	11.25	22	0.31	516.00	516.31
5	0.57	11.40	6.74	3.82	15	0.19	533.90	534.09
7	0.41	9.50	7.21	2.95	20	0.13	488.00	488.13
9	3.14	16.50	5.82	18.28	35	0.31	470.10	470.41
11	0.29	8.70	7.44	2.15	25	0.09	492.00	492.09
13	3.13	18.80	5.50	17.23	25	0.37	461.65	462.02
7B	1.85	10.50	6.95	12.85	15	0.43	499.00	499.43
LOT 10 D/W CULVERT	0.21	5.00	8.84	1.88	16	0.12	471.04	471.16
LOT 12 D/W CULVERT	0.06	5.00	8.84	0.57	20	0.04	470.21	470.25

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

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OVERLAND RELIEF MAP

TIFFANY ESTATES
CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT

FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
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12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=80'
V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 30 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\030-6642-D-CP-001-OLR.dwg

NO.	TITLE	KEY	SYMBOL
3.01	SAFETY FENCE	SAF	
3.02	TEMPORARY STONE CONSTRUCTION ENTRANCE	CE	
3.05	SILT FENCE	SF	
	SUPER SILT FENCE	SSF	
3.08	CULVERT INLET PROTECTION	CIP	
3.09	TEMPORARY DIVERSION DIKE	DD	
3.14	TEMPORARY SEDIMENT BASIN	SB	
3.18	OUTLET PROTECTION	OP	
3.31	TEMPORARY SEEDING	TS	
3.38	TREE PRESERVATION & PROTECTION	TP	
	DRAINAGE DIVIDE		

DA TO SSF = 3.33 AC.

DA TO SSF = 1.10 AC.

DA TO SB #1 = 18.23 AC.

DA TO SSF = 3.20 AC.

DA TO SF = 0.92 AC.

LIMITS OF CLEARING AND GRADING

POTENTIAL PORTABLE TOILET LOCATION

POTENTIAL FUEL CONTAINMENT AREA

POTENTIAL DUMPSTER LOCATION

WASH RACK

HIDDEN HOLLOW LANE

BLACKWELL ROAD

MATCHLINE - SHEET 32

POOL ELEV.= 441.75

PLYWOOD BAFFLE

STREAM

Tc PATH

N/F ROBERT M. ITEN & LAINE W. ITEN GPIN: 6985-62-3534 DB 1502, PG 2165 ZONING: R1 USE: RESIDENTIAL

N/F ROBERT J. BILL & ANNIE ZHENG GPIN: 6985-52-5215 DB 1723, PG 932 ZONING: R1 USE: VACANT

N/F WARRENTON SENIOR DEVELOPMENT COMPANY INC GPIN: 6985-50-6989 DB 1517, PG 585 ZONING: R-10 USE: NURSING HOME

N/F DAVID M. DOBSON GPIN: 6985-60-5718-500 DB 1119, PG 1331 ZONING: I USE: VACANT

N/F WALLACE F. SMITH GPIN: 6985-61-8720 DB 546, PG 110 ZONING: R1 USE: RESIDENTIAL

N/F ROBERT M. ITEN & LAINE W. ITEN GPIN: 6985-61-4800 DB 1478, PG 732 ZONING: R1 USE: RESIDENTIAL

NOTES:

1. CONTRACTOR SHALL COORDINATE CLEARING OF DRAINFIELDS WITH AOSE. NO CONSTRUCTION EQUIPMENT IS ALLOWED ON THE PROPOSED DRAINFILEDS WITHOUT APPROVAL FROM THE AOSE.
2. ACCESS TO HIDDEN HOLLOW LANE SHALL REMAIN OPEN DURING ALL PHASES OF CONSTRUCTION.
3. PRIOR TO FINAL CONSTRUCTION PLAN APPROVAL, IT SHALL BE AGREED THAT ALL DRAINFIELD AREAS ARE TO BE SURROUNDED BY SAFETY FENCING AND NO CONSTRUCTION TRAFFIC SHALL CROSS NOT SHALL LAND DISTURBANCE OCCUR IN THESE AREAS. THE FENCING OF THESE AREAS IS TO BE VERIFIED BY COUNTY STAFF BEFORE THE ISSUANCE OF THE LAND DISTURBING PERMIT.

✱ DENOTES CRITICAL AREA

DENOTES TREE PRESERVATION EASEMENT

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

NORTH

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\031-032-6642-D-CP-001-ES1.dwg

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EROSION & SEDIMENT CONTROL PLAN - PHASE I

TIFFANY ESTATES

CONSTRUCTION PLAN

FAUQUIER COUNTY, VIRGINIA

CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

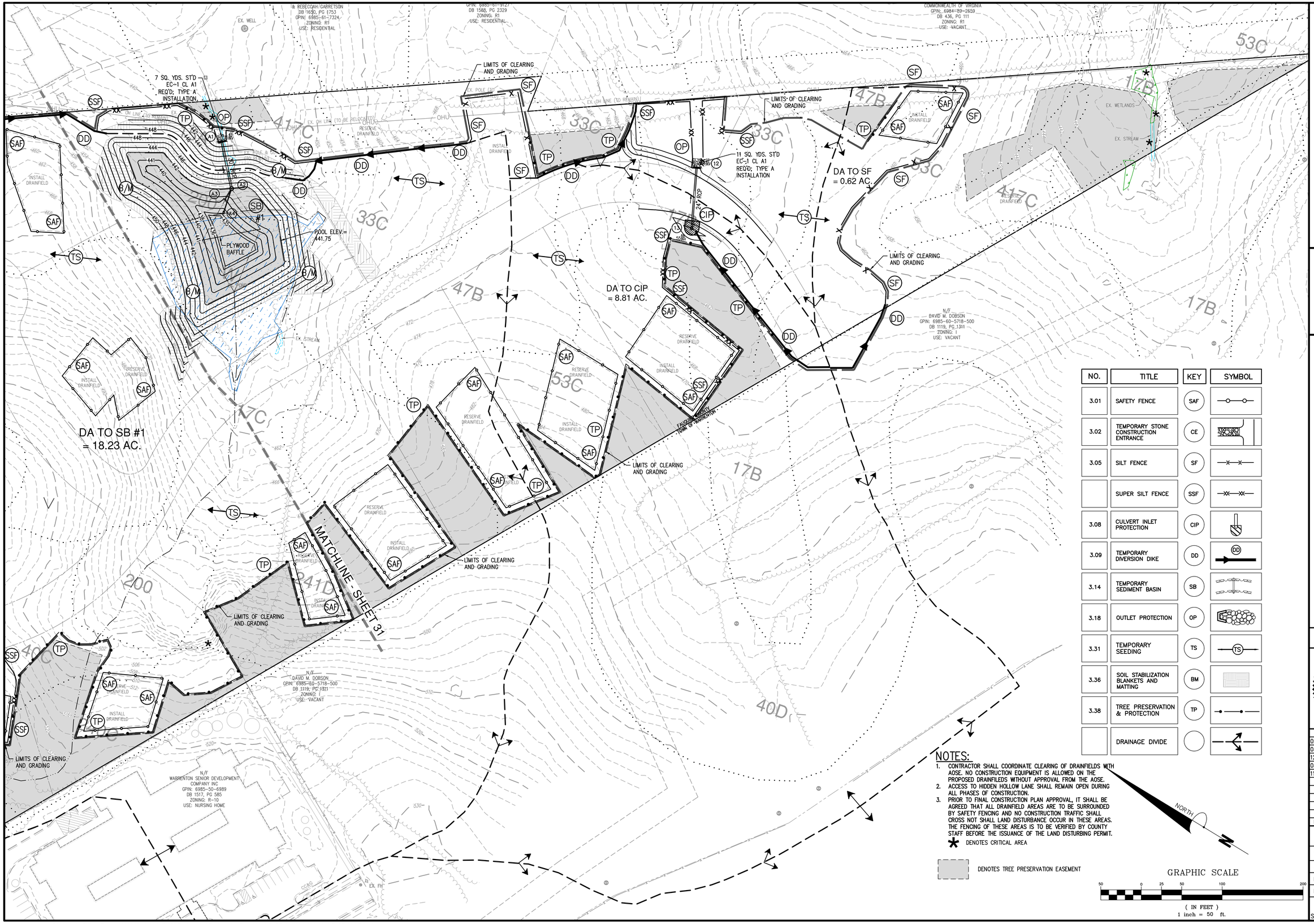
SCALE H: 1"=50' V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 31 OF 58



NO.	TITLE	KEY	SYMBOL
3.01	SAFETY FENCE	SAF	
3.02	TEMPORARY STONE CONSTRUCTION ENTRANCE	CE	
3.05	SILT FENCE	SF	
	SUPER SILT FENCE	SSF	
3.08	CULVERT INLET PROTECTION	CIP	
3.09	TEMPORARY DIVERSION DIKE	DD	
3.14	TEMPORARY SEDIMENT BASIN	SB	
3.18	OUTLET PROTECTION	OP	
3.31	TEMPORARY SEEDING	TS	
3.36	SOIL STABILIZATION BLANKETS AND MATTING	BM	
3.38	TREE PRESERVATION & PROTECTION	TP	
	DRAINAGE DIVIDE		

NOTES:

1. CONTRACTOR SHALL COORDINATE CLEARING OF DRAINFIELDS WITH AOSE. NO CONSTRUCTION EQUIPMENT IS ALLOWED ON THE PROPOSED DRAINFILEDS WITHOUT APPROVAL FROM THE AOSE.
2. ACCESS TO HIDDEN HOLLOW LANE SHALL REMAIN OPEN DURING ALL PHASES OF CONSTRUCTION.
3. PRIOR TO FINAL CONSTRUCTION PLAN APPROVAL, IT SHALL BE AGREED THAT ALL DRAINFIELD AREAS ARE TO BE SURROUNDED BY SAFETY FENCING AND NO CONSTRUCTION TRAFFIC SHALL CROSS NOT SHALL LAND DISTURBANCE OCCUR IN THESE AREAS. THE FENCING OF THESE AREAS IS TO BE VERIFIED BY COUNTY STAFF BEFORE THE ISSUANCE OF THE LAND DISTURBING PERMIT.

✱ DENOTES CRITICAL AREA

DENOTES TREE PRESERVATION EASEMENT

NORTH

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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EROSION & SEDIMENT CONTROL PLAN - PHASE I
TIFFANY ESTATES
CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=50'
V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 32 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\031-032-6642-D-CP-001-ES1.dwg

NO.	TITLE	KEY	SYMBOL
3.01	SAFETY FENCE	SAF	
3.02	TEMPORARY STONE CONSTRUCTION ENTRANCE	CE	
3.05	SILT FENCE	SF	
	SUPER SILT FENCE	SSF	
3.07	STORM DRAIN INLET PROTECTION	IP	
3.08	CULVERT INLET PROTECTION	CIP	
3.09	TEMPORARY DIVERSION DIKE	DD	
3.14	TEMPORARY SEDIMENT BASIN	SB	
3.18	OUTLET PROTECTION	OP	
3.20	ROCK CHECK DAM	CD	

NO.	TITLE	KEY	SYMBOL
3.32	PERMANENT SEEDING	PS	
3.35	MULCHING	MU	
3.36	SOIL STABILIZATION BLANKETS AND MATTING	BM	
3.38	TREE PRESERVATION & PROTECTION	TP	
	DRAINAGE DIVIDE		

NOTES:

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2. ACCESS TO HIDDEN HOLLOW LANE SHALL REMAIN OPEN DURING ALL PHASES OF CONSTRUCTION.
3. SEE SHEET 28 FOR DRAINAGE AREA CALCULATIONS.
4. PRIOR TO FINAL CONSTRUCTION PLAN APPROVAL, IT SHALL BE AGREED THAT ALL DRAINFIELD AREAS ARE TO BE SURROUNDED BY SAFETY FENCING AND NO CONSTRUCTION TRAFFIC SHALL CROSS NOT SHALL LAND DISTURBANCE OCCUR IN THESE AREAS. THE FENCING OF THESE AREAS IS TO BE VERIFIED BY COUNTY STAFF BEFORE THE ISSUANCE OF THE LAND DISTURBING PERMIT.

* DENOTES CRITICAL AREA

DENOTES TREE PRESERVATION EASEMENT

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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EROSION & SEDIMENT CONTROL PLAN - PHASE II

TIFFANY ESTATES

CONSTRUCTION PLAN

FAUQUIER COUNTY, VIRGINIA

CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=50' V:

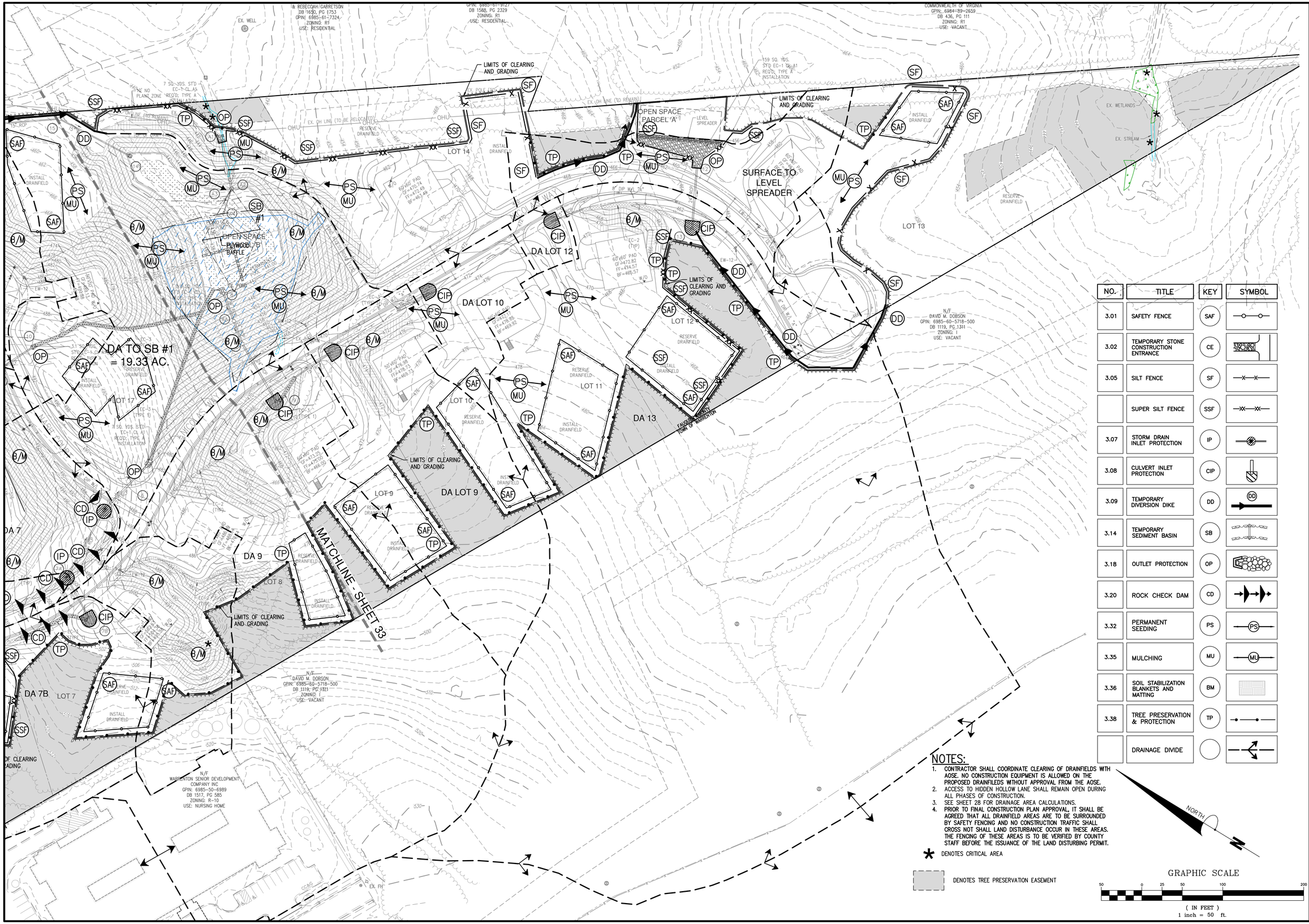
JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 33 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\033-034-6642-D-CP-001-ES2.dwg



NO.	TITLE	KEY	SYMBOL
3.01	SAFETY FENCE	SAF	
3.02	TEMPORARY STONE CONSTRUCTION ENTRANCE	CE	
3.05	SILT FENCE	SF	
	SUPER SILT FENCE	SSF	
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3.09	TEMPORARY DIVERSION DIKE	DD	
3.14	TEMPORARY SEDIMENT BASIN	SB	
3.18	OUTLET PROTECTION	OP	
3.20	ROCK CHECK DAM	CD	
3.32	PERMANENT SEEDING	PS	
3.35	MULCHING	MU	
3.36	SOIL STABILIZATION BLANKETS AND MATTING	BM	
3.38	TREE PRESERVATION & PROTECTION	TP	
	DRAINAGE DIVIDE		

NOTES:

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2. ACCESS TO HIDDEN HOLLOW LANE SHALL REMAIN OPEN DURING ALL PHASES OF CONSTRUCTION.
3. SEE SHEET 28 FOR DRAINAGE AREA CALCULATIONS.
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* DENOTES CRITICAL AREA

DENOTES TREE PRESERVATION EASEMENT

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Bowman

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EROSION & SEDIMENT CONTROL PLAN - PHASE II
TIFFANY ESTATES
CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT

FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
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12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=50' V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 34 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\033-034-6642-D-CP-001-ES2.dwg

EROSION AND SEDIMENT CONTROL NARRATIVE:

PROJECT DESCRIPTION:
THIS PROJECT CONSISTS OF THE CONSTRUCTION OF 22 SINGLE FAMILY DETACHED LOTS AND ASSOCIATED INFRASTRUCTURE. THE SITE IS LOCATED ALONG THE EASTERN SIDE OF BLACKWELL ROAD, TO THE SOUTHEAST OF THE INTERSECTION OF BLACKWELL ROAD AND IVY HILL DRIVE, AND NORTH OF THE US 17 SPUR. THE PROJECT PROPOSES THAT APPROXIMATELY 25.40 ACRES OF LAND BE DISTURBED. ALL AREAS OUTSIDE OF THE PROPOSED ROADWAYS SHALL BE PERMANENTLY SEEDED (APPROXIMATELY 19.7 ACRES) IMMEDIATELY FOLLOWING FINISHED GRADING.

EXISTING CONDITIONS:
THE MAJORITY OF THE SITE DRAINS TOWARDS THE EXISTING POND AND ITS EASTERN BOUNDARY. A PORTION OF THE SITE DRAINS TOWARD THE EXISTING ROADSIDE DITCH ALONG BLACKWELL ROAD. THE EXISTING SITE CONSISTS PRIMARILY OF WOODED AREAS. AN EXISTING HOUSE, WHICH IS TO REMAIN, TWO DRIVEWAYS, AND SMALL YARD AREAS ALSO EXISTING ON THE SITE. THE SLOPES ONSITE RANGE FROM 1% ALONG THE RIDGE TOPS TO 50% ALONG THE VALLEYS.

ADJACENT PROPERTY:
RESIDENTIAL LOTS AND VACANT WOODED LAND BORDER THE SITE TO THE NORTH AND EAST. AN EXISTING DRIVEWAY (HIDDEN HOLLOW LANE) BISECTS THE SITE AND PROVIDES ACCESS TO THE RESIDENTIAL LOTS TO THE NORTH AND EAST. ACCESS TO THESE LOTS SHALL BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION. VACANT WOODED LAND BORDERS THE SITE TO THE SOUTHWEST. BLACKWELL ROAD AND A MEMORY CARE FACILITY BORDER THE SITE TO THE NORTHWEST.

OFF-SITE AREAS:
NO OFFSITE CONSTRUCTION IS PROPOSED WITH THIS DEVELOPMENT. SOIL WILL BE STOCKPILED WITHIN THE APPROVED CLEARING LIMITS AND THE CONTRACTOR SHALL ADHERE TO ALL THE REQUIREMENTS OF THE VESCH. THE STOCKPILES SHALL BE STABILIZED WITH TEMPORARY VEGETATION TO PREVENT SOIL LOSS AND SEDIMENT TRANSPORT FROM THE STOCKPILE ITSELF UNTIL NEEDED. ALL CONSTRUCTION DEBRIS SHALL BE STOCKPILED ONSITE. THE SITE IS ANTICIPATED TO BALANCE CUT AND FILL. IF FOR ANY REASON THE CONTRACTOR NEEDS TO STOCKPILE SOIL OFFSITE OR OUTSIDE OF THE APPROVED CLEARING LIMITS HE SHALL, PRIOR TO LAND DISTURBING ACTIVITIES, SUBMIT A SUPPLEMENTARY EROSION AND SEDIMENT CONTROL PLAN COVERING THE OFFSITE AREAS THAT WILL BE DISTURBED. THE SUPPLEMENTAL PLAN SHALL BE APPROVED BY FAUQUIER COUNTY PRIOR TO CONSTRUCTION ACTIVITY. IF SOIL IS TRANSPORTED OFFSITE, A SOIL TRANSPORT FORM IS REQUIRED TO BE SUBMITTED TO FAUQUIER COUNTY EACH DAY THAT SOIL IS TRANSPORTED TO OR FROM THE SITE.

SOILS:
SEE SHEETS 5-6 FOR THE TYPE 1 SOILS REPORT.

CRITICAL EROSION AREAS:
THE EXISTING STREAM AT THE POND OUTFALL AND THE EXISTING STEEP SLOPES ONSITE ARE CRITICAL AREAS. THEREFORE, CARE SHALL BE TAKEN TO MINIMIZE LAND DISTURBANCE IN THESE AREAS, AND SEDIMENT TRAPPED ON THE SITE. MEASURES HAVE BEEN PROVIDED IN THESE AREAS TO MINIMIZE THE IMPACTS. THE CONTRACTOR SHALL TAKE EXTREME CARE TO PREVENT SEDIMENT LADEN RUNOFF FROM LEAVING THE LIMITS OF CLEARING AND GRADING AND ENTERING ADJACENT PROPERTIES, THE EXISTING ROADWAY, AND THE DENOTED CRITICAL AREAS.

EROSION AND SEDIMENT CONTROL MEASURES:
UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VESCH AND FAUQUIER COUNTY. THE MINIMUM STANDARDS OF THE VESCH SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY A VARIANCE. SEE THIS SHEET FOR THE VESCH MINIMUM STANDARDS.

VEGETATIVE PRACTICES:
1. 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. SEE THIS SHEET MINIMUM STANDARD #1 PERTAINING TO SEEDING.
2. TOPSOILING - 3.30
   TOPSOIL SHALL BE SPREAD ON ALL DISTURBED AREAS OUTSIDE OF IMPERVIOUS AREAS TO PROVIDE SUITABLE GROWTH MEDIUM FOR FINAL STABILIZATION WITH VEGETATION.
3. PERMANENT SEEDING - 3.32
   ALL DENUDED AREAS, WHICH WILL BE LEFT DORMANT FOR EXTENDED PERIODS, SHALL BE SEEDED WITH PERMANENT VEGETATION IMMEDIATELY FOLLOWING GRADING. REFER TO PERMANENT STABILIZATION SECTION FOR MORE INFORMATION.
4. DUST CONTROL - 3.39
   DUST CONTROL MEASURES ARE USED TO PREVENT SURFACE AND AIR MOVEMENT OF DUST FROM EXPOSED SOIL SURFACES AND THE REDUCE THE PRESENCE OF HARMFUL AIRBORNE SUBSTANCES.

STRUCTURAL PRACTICES:
1. SAFETY FENCE - 3.01
   SAFETY FENCE SHALL BE INSTALLED AROUND THE DRAINFIELDS TO PROHIBIT CONSTRUCTION TRAFFIC FROM TRACKING ACROSS THE DRAINFIELDS.
2. TEMPORARY CONSTRUCTION ENTRANCE - 3.02
   A TEMPORARY CONSTRUCTION ENTRANCE SHALL BE INSTALLED AS SHOWN ON THE PLAN. CONSTRUCTION VEHICLES ARE REQUIRED TO CLEAN THEIR WHEELS BEFORE EXITING ONTO THE ROADWAY.
3. SILT FENCE - 3.05
   SILT FENCE AND SUPER SILT FENCE SHALL BE INSTALLED DOWN SLOPE AND ON CONTOURS AS SHOWN ON THE PHASE I AND PHASE II E&S PLAN.
4. 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.
5. CULVERT INLET PROTECTION - 3.08
   ALL CULVERTS SHALL BE PROTECTED DURING CONSTRUCTION. SEDIMENT LADEN WATER SHALL BE FILTERED BEFORE ENTERING THE CULVERTS.
6. TEMPORARY DIVERSION DIKE - 3.09
   TEMPORARY DIVERSION DIKES WILL DIRECT FLOW INTO THE SEDIMENT TRAPS. THEY WILL BE INSTALLED ALONG THE MAJORITY OF THE LIMITS OF CLEARING AND GRADING AS SHOWN ON THE PHASE I & II E&S PLANS.
7. TEMPORARY SEDIMENT BASIN - 3.14
   THE TEMPORARY SEDIMENT BASIN SHALL BE INSTALLED AS SHOWN ON THE PHASE I AND II PLANS AND PER THE SEDIMENT BASIN COMPUTATIONS AND DETAILS.
8. OUTLET PROTECTION - 3.18
   RIPRAP OUTLET PROTECTION SHALL BE INSTALLED AT THE OUTFALLS OF ALL CULVERTS AND STORM SEWER SYSTEMS TO PREVENT SCOUR AT OUTLETS AND TO MINIMIZE THE POTENTIAL FOR DOWNSTREAM EROSION BY REDUCING THE VELOCITY AND ENERGY OF CONCENTRATED STORMWATER FLOWS.
9. ROCK CHECK DAM - 3.20
   ROCK CHECK DAMS SHALL BE INSTALLED WITHIN DITCHES AS INDICATED ON THE PHASE II E&S PLANS TO REDUCE VELOCITY OF CONCENTRATED STORMWATER FLOWS TO ALLOW ESTABLISHMENT OF PERMANENT LINING AND STABILIZATION.
10. SURFACE ROUGHENING - 3.29
    SURFACE ROUGHENING SHALL BE APPLIED ON ALL SLOPES 3:1 OR STEEPER TO AID IN ESTABLISHMENT OF VEGETATIVE COVER WITH SEED, TO REDUCE RUNOFF VELOCITY AND INCREASE INFILTRATION, AND TO REDUCE EROSION AND PROVIDE FOR SEDIMENT TRAPPING.
11. SOIL STABILIZATION BLANKETS & MATTING - 3.36
    ALL STEEP SLOPES (3:1) SHALL BE PROTECTED BY APPLYING SOIL STABILIZATION BLANKETS AND/OR MATS AS SHOWN ON THE PHASE II E&S PLAN.
12. TREE PRESERVATION & PROTECTION - 3.38
    TREE PROTECTION SHALL BE INSTALLED ALONG THE TREE PRESERVATION AREAS ADJACENT TO THE LIMITS OF DISTURBANCE AS SHOWN ON THE PHASE I & II E&S PLAN.

MANAGEMENT STRATEGIES:
PHASE I:
1. THE LIMITS OF CLEARING AND GRADING SHALL BE FLAGGED PRIOR TO THE PRE-CONSTRUCTION MEETING.
2. CONSTRUCTION WILL BE SEQUENCED SO THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE. ADDITIONAL PHASE I CONTROLS SHALL BE PLACED PER THIS PLAN AND/OR AT THE REQUEST OF THE COUNTY INSPECTOR.
3. PHASE I WILL BE IMPLEMENTED PRIOR TO MAJOR CLEARING OPERATIONS AND DENUDING OF THE ADDITIONAL AREA TO BE DISTURBED WITH THIS PLAN. TEMPORARY MEASURES AS SHOWN ON THE PHASE I PLAN WILL BE INSTALLED, INCLUDING A CONSTRUCTION ENTRANCE, SILT FENCE, DIVERSION DIKES, AND SEDIMENT BASINS. CONTRACTOR SHALL PROVIDE AVAILABILITY OF A WATER TANK TRUCK AND HOSE AS NECESSARY TO CLEAN ALL VEHICLES AND EQUIPMENT PRIOR TO THEIR EXIT FROM SITE.
4. SEDIMENT TRAPPING MEASURES WILL BE INSTALLED AS A FIRST STEP IN GRADING. DISTURBANCE SHALL BE MINIMIZED TO ONLY PERMIT THEIR INSTALLATION, AND THEY SHALL BE SEEDED AND MULCHED IMMEDIATELY FOLLOWING INSTALLATION. THE CONTRACTOR SHALL STRIVE TO WORK IN STEAM AREAS ON FAIR-WEATHER DAYS, OR PROVIDED METHODS AND EQUIPMENT, SUCH AS DAMMING AND PUMPING, TO DIVERT WATER AWAY FROM ACTIVE CONSTRUCTION AREAS.
5. TEMPORARY SEEDING AND OTHER STABILIZATION WILL FOLLOW IMMEDIATELY AFTER GRADING.
6. AREAS WHICH ARE NOT TO BE DISTURBED WILL BE CLEARLY MARKED WITH FLAGGING.
7. THE TEMPORARY STOCKPILING OF EARTH AND CONSTRUCTION MATERIALS SHALL ONLY BE PERMITTED IN AREAS SCHEDULED FOR DEVELOPMENT. EARTH STOCKPILES SHALL BE STABILIZED WITH TEMPORARY VEGETATION IN ACCORDANCE WITH COUNTY AND STATE EROSION CONTROL PRACTICES. NO STOCKPILING SHALL OCCUR OUTSIDE OF THE PROPOSED LIMITS OF CLEARING AND GRADING UNLESS APPROVED BY FAUQUIER COUNTY.
8. DUST CONTROL - THROUGHOUT THE ACTIVE CONSTRUCTION PHASE OF THIS PROJECT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF DUST. DUST CONTROL SHALL BE IN CONFORMANCE WITH THE STD. 3.39 OF THE VA EROSION/SEDIMENT CONTROL HANDBOOK AND/OR VDOT SEC. 511 OF THE VDOT ROAD AND BRIDGE SPECIFICATIONS.
9. THE JOB SUPERINTENDENT SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL PRACTICES.

PHASE II:
1. ONCE E&S CONTROLS ARE INSTALLED, AN INITIAL E&S INSPECTION IS REQUIRED PRIOR TO CLEARING AND GRUBBING.
2. AFTER CONTROLS OF PHASE I ARE IN PLACE, CLEARING AND CONSTRUCTION ON THE REMAINDER OF THE SITE MAY PROCEED. THE PROPOSED UTILITIES SHALL BE INSTALLED AS THE SITE IS BEING GRADED.
3. DISTURBED AREAS SHALL BE STABILIZED AS QUICKLY AS POSSIBLE. INLET PROTECTION SHALL BE PROVIDED FOR DRAINAGE SYSTEM INSTALLED DURING CONSTRUCTION.
4. DEWATER ALL PROPOSED SEDIMENT TRAPS AND BASINS TO THE PROPER DEWATERING DEVICE PRIOR TO FINAL CONSTRUCTION.
5. AFTER CONSTRUCTION IS COMPLETE, WITH ALL AREAS OF THE SITE 100% STABILIZED, AND ONLY AFTER WRITTEN APPROVAL OF THE COUNTY INSPECTOR, THE TEMPORARY CONTROLS MAY BE REMOVED. CONSULT WITH THE COUNTY INSPECTOR PRIOR TO CONVERSION OF SEDIMENT BASINS INTO PERMANENCT SWM PONDS.

PERMANENT STABILIZATION:
ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISH GRADING. SEEDING SHALL BE DONE WITH KENTUCKY 31 TALL FESCUE ACCORDING TO STANDARD SPEC 3.32, PERMANENT SEEDING, OF THE HANDBOOK. 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. IN ALL SEEDING OPERATIONS, SEED, FERTILIZER AND LIME WILL BE APPLIED PRIOR TO MULCHING.

STORMWATER MANAGEMENT:
REFER TO THE STORMWATER MANAGEMENT PLAN LOCATED ON SHEETS 38-49.

MAINTENANCE:
IN GENERAL, ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH SIGNIFICANT RAINFALL. ALL MEASURES ARE TO BE INSPECTED DAILY BY THE SITE SUPERINTENDENT. ANY DAMAGED MECHANICAL DEVICES SHALL BE REPAIRED AND/OR REPLACED BY THE CLOSE OF THE DAY. NO CONTROLS ARE TO BE REMOVED WITHOUT THE APPROVAL OF THE SITE INSPECTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES OR PENALTIES CAUSED BY HIS FAILURE TO COMPLY WITH THE EROSION AND SEDIMENT CONTROL PROGRAM OR THE DIRECTION OF THE SITE INSPECTOR. THE DESIGN ENGINEER SHALL NOT BE RESPONSIBLE FOR CHANGES TO THE E&S PROGRAM.

THE FOLLOWING ITEMS WILL BE CHECKED IN PARTICULAR:

1. TTHE SEDIMENT TRAPS AND SEDIMENT BASINS WILL BE CHECKED REGULARLY FOR SEDIMENT CLEANOUT.
2. THE 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.
3. THE SILT FENCE AND SUPER 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.
4. THE SEEDED AREAS WILL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE FERTILIZED AND RE-SEEDED AS NEEDED.
5. THE CONSTRUCTION ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR THE WASHING AND REWORKING OF EXISTING STONE AS CONDITIONS DEMAND. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY. THE USE OF WATER TRUCKS TO REMOVE MATERIALS DROPPED, WASHED, OR TRACKED ONTO ROADWAYS WILL NOT BE PERMITTED UNDER ANY CIRCUMSTANCE.
6. THE DIVERSION DIKES SHALL BE INSPECTED AFTER EVERY RAIN EVENT AND REPAIRS MADE AS NECESSARY. ONCE EVERY TWO WEEKS, WHETHER OR NOT A STORM EVENT HAS OCCURRED, THE DIVERSION DIKES SHALL BE INSPECTED AND REPAIRS MADE IF NEEDED.
7. THE CULVERT INLET PROTECTION SHALL BE INSPECTED REGULARLY AND AFTER EACH RAIN AND REPAIRS MADE AS NEEDED. FOR OPTIONAL STONE COMBINATION, AGGREGATE SHALL BE REPLACED OR CLEANED WHEN INSPECTION REVEALS THAT CLOGGED VOIDS ARE CAUSING PONDING PROBLEMS WHICH INTERFERE WITH ONSITE CONSTRUCTION. SEDIMENT SHALL BE REMOVED WHEN THE THE LEVEL OF SEDIMENT DEPOSITION REACHES HALFWAY TO THE TOP OF THE STONE BARRIER. FOR SILT FENCE OPTION, REFER TO SILT FENCE MAINTENANCE.
8. THE STORM DRAIN INLET PROTECTION SHALL BE INSPECTED REGULARLY AND AFTER EACH RAIN AND REPAIRS MADE AS NEEDED. FOR CURB INLET SEDIMENT RETENTION ROLLS, ENSURE ROLL COVERS THE ENTIRE INLET THROAT. SEDIMENT SHALL BE REMOVED WHEN IT HAS ACCUMULATED ONE-HALF THE EXPOSED HEIGHT OF THE ROLL. FOR SILT FENCE DROP INLET PROTECTION, REFER TO SILT FENCE MAINTENANCE.
9. SOIL STABILIZATION BLANKETS AND MATTING SHALL BE INSPECTED PERIODICALLY AFTER INSTALLATION, PARTICULARLY AFTER RAINSTORMS, TO CHECK FOR EROSION AND UNDERMINING. ANY DISLOCATION OR FAILURE SHOULD BE REPAIRED IMMEDIATELY. IF WASHOUTS OR BREAKAGE OCCURS, RE-INSTALL THE MATERIAL AFTER REPAIRING DAMAGE TO THE SLOPE OR DITCH.

CONSTRUCTION SEQUENCE:
PHASE I E&S
1. FLAG SITE AS DESCRIBED IN THE MANAGEMENT STRATEGIES PRIOR TO PRE-CONSTRUCTION MEETING.
2. INSTALL CONSTRUCTION ENTRANCE WITH MOUNTABLE BERM AT THE CONNECTION TO THE PUBLIC ROADWAY.
3. INSTALL SAFETY FENCE AROUND DRAINFIELDS.
4. INSTALL PERIMETER CONTROLS (DIVERSION DIKES, SILT FENCE, SUPER SILT FENCE, ETC.).
5. INSTALL SEDIMENT BASIN. A STAKE OR SPRAY PAINT MARKER SHALL BE INSTALLED WITHIN THE SEDIMENT BASIN AT THE CLEANOUT POINT.
6. INSTALL ROAD CROSSING CULVERT FROM STRUCTURE 12 TO 13 ALONG WITH CULVERT INLET PROTECTION. INSTALL TEMPORARY OUTLET PROTECTION AS SHOWN ON THE PHASE I PLAN.
7. APPLY TEMPORARY SEEDING AS NEEDED.
8. DAILY INSPECTION AND MAINTENANCE OF E&S CONTROLS AS REQUIRED.

PHASE II E&S
1. INSTALL ADDITIONAL PERIMETER CONTROLS AS NEEDED.
2. ONCE E&S CONTROLS ARE INSTALLED, AN INITIAL E&S INSPECTION IS REQUIRED PRIOR TO CLEARING AND GRUBBING.
3. PERFORM CLEARING AND GRUBBING OPERATIONS.
4. BEGIN ROUGH GRADING AND EARTHWORK OPERATIONS.
5. APPLY TEMPORARY SEEDING WHEN REQUIRED.
6. PERFORM ROUGH GRADING FOR ROADS AND BUILDING PADS.
   6.1. ACCESS TO HIDDEN HOLLOW LANE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
7. INSTALL UTILITIES, STORM DRAINAGE SYSTEM AND STORM DRAIN INLET PROTECTION, AND CULVERTS AND CULVERT INLET PROTECTION.
8. PERFORM ROAD FINE GRADING, INCLUDING AGGREGATE SUBBASE AND PAVING.
   8.1. ONCE NICOLAS WAY HAS BEEN CONSTRUCTED TO HIDDEN HOLLOW LANE AND THE REALIGNED ENTRANCE HAS BEEN CONSTRUCTED, THE EXISTING PORTION OF HIDDEN HOLLOW LANE FROM BLACKWELL ROAD TO NICOLAS WAY MAY BE REMOVED.
9. CONVERT SEDIMENT BASIN #1 TO PERMANENT SWM POND 'A' WHEN ALL UPHILL AREAS HAVE BEEN STABILIZED AND/OR REDIRECTED TO FINAL PROPOSED SWM PONDS AND ONLY AFTER WRITTEN AUTHORIZATION FROM THE COUNTY E&S INSPECTOR HAS BEEN OBTAINED.
10. PERMANENT SEEDING OPERATION.
11. ONCE UPHILL AREAS HAVE BEEN STABILIZED, INSTALL PLUNGE POOL AND LEVEL SPREADER DOWNSTREAM OF STRUCTURE 12 AND INSTALL VEGETATED FILTER STRIP.
12. INSTALL BIORETENTION BASIN 'A' ONCE ALL UPHILL AREAS HAVE BEEN COMPLETELY STABILIZED. SILT FENCE SHALL BE INSTALLED ALONG THE MAXIMUM PONDING DEPTH OF THE BIORETENTION BASIN TO PREVENT SEDIMENT LADEN RUNOFF FROM ENTERING THE AREA WHERE THE ENGINEERED SOILS MEDIA AND STONE RESERVOIR ARE TO BE INSTALLED.
13. DAILY INSPECTION AND MAINTENANCE OF E&S CONTROLS AS REQUIRED.
14. REMOVE E&S CONTROLS WITH APPROVAL FROM THE SITE INSPECTOR.

TOPSOIL NARRATIVE:

FIELD EXPLORATION SHALL BE MADE TO DETERMINE IF THERE IS SUFFICIENT SURFACE SOIL OF GOOD QUALITY TO JUSTIFY STRIPPING. TOPSOIL SHALL BE FRIABLE AND LOAMY (LOAM, SANDY LOAM, SILT LOAM, SANDY CLAY LOAM, CLAY LOAM). IT SHALL BE FREE OF DEBRIS, TRASH, STUMPS, ROCKS, ROOTS, AND NOXIOUS WEEDS, AND SHALL GIVE EVIDENCE OF BEING ABLE TO SUPPORT HEALTHY VEGETATION. IT SHALL CONTAIN NO SUBSTANCE THAT IS POTENTIALLY TOXIC TO PLANT GROWTH.

ALL TOPSOIL SHALL BE TESTED BY A RECOGNIZED LABORATORY FOR THE FOLLOWING CRITERIA:

ORGANIC MATTER: CONTENT SHALL BE NOT LESS THAN 1.5% BY WEIGHT.

pH RANGE: SHALL BE FROM 6.0-7.5. IF pH IS LESS THAN 6.0, LIME SHALL BE ADDED IN ACCORDANCE WITH SOIL TEST RESULTS OR IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE VEGETATIVE ESTABLISHMENT PRACTICE BEING USED.

SOLUBLE SALTS: SHALL NOT EXCEED 500 PPM.

IF ADDITIONAL OFF-SITE TOPSOIL IS NEEDED, IT MUST MEET THE STANDARDS STATED ABOVE.

STRIPPING:
TOPSOIL OPERATIONS SHALL 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 IS COMMON, BUT DEPTH MAY VARY DEPENDING ON THE PARTICULAR SOIL. ALL PERIMETER DIKES, BASINS, AND OTHER SEDIMENT CONTROLS SHALL BE IN PLACE PRIOR TO STRIPPING.

STOCKPILING:
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. THE SIDE SLOPES OF THE STOCKPILE SHALL NOT EXCEED 2:1. PERIMETER CONTROLS SHALL 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 14 DAYS.

SITE PREPARATION PRIOR TO AND MAINTENANCE DURING TOP SOILING:
BEFORE TOPSOILING, ESTABLISH NEEDED EROSION AND SEDIMENT CONTROL PRACTICES. THESE PRACTICES MUST BE MAINTAINED DURING TOPSOILING. PREVIOUSLY ESTABLISHED GRADES ON THE AREAS TO BE TOPSOILED SHALL BE MAINTAINED ACCORDING TO THE APPROVED PLAN. WHERE THE pH OF THE SUBSOIL ID 6.0 OR LESS, OR THE SOIL IS COMPOSED OF HEAVY CLAYS, AGRICULTURAL LIMESTONE SHALL BE SPREAD IN ACCORDANCE WITH THE SOIL TEST OR THE VEGETATIVE ESTABLISHMENT PRACTICE BEING USED. AFTER THE AREAS TO BE TOPSOILED HAVE BEEN BROUGHT TO GRADE, AND IMMEDIATELY PRIOR TO DUMPING AND SPREADING THE TOPSOIL, THE SUBGRADE SHALL BE LOOSENED BY DISCING OR SCARIFYING TO A DEPTH OF AT LEAST 2 INCHES TO ENSURE BONDING OF THE TOPSOIL AND SUBSOIL.

APPLYING TOPSOIL:
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 STEEPED SLOPES AND 4 INCHES ON FLATTER SLOPES. 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.

IT IS NECESSARY TO COMPACT THE TOPSOIL ENOUGH TO ENSURE GOOD CONTACT WITH THE UNDERLYING SOIL AND TO OBTAIN A LEVEL SEEDBED FOR THE ESTABLISHMENT OF HIGH MAINTENANCE TURF. HOWEVER, UNDUE COMPACTION IS TO BE AVOIDED AS IT INCREASES RUNOFF VELOCITY AND VOLUME, AND DETERS SEED GERMINATION. SPECIAL CONSIDERATION SHOULD BE GIVEN TO THE TYPES OF EQUIPMENT USED TO PLACE TOPSOIL IN AREAS TO RECEIVE FINE TURF. AVOID UNNECESSARY COMPACTION BY HEAVY MACHINERY WHENEVER POSSIBLE. IN AREAS WHICH ARE NOT GOING TO BE MOWED, THE SURFACE SHALL BE LEFT ROUGH IN ACCORDANCE WITH SURFACE ROUGHENING STD & SPEC 3.29.

NO SOD OR SEED SHALL BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS UNTIL SUFFICIENT TIME HAS ELAPSED TO PERMIT DISSIPATION OF TOXIC MATERIALS.

MINIMUM STANDARDS

1. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.
2. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCK PILES 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 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 UPSLOPE 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 25-YEAR STORM OF 24-HOUR DURATION. RUNOFF COEFFICIENTS USED IN RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.
7. CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED.
8. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.
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 STORM WATER CONVEYANCE CHANNELS ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHELL 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. NON-ERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THE STRUCTURES IF ARMORED BY NON-ERODIBLE COVER MATERIALS.
13. WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY SIX-MONTH PERIOD, A TEMPORARY STREAM CROSSING CONSTRUCTED OF NON-ERODIBLE MATERIAL SHALL BE PROVIDED.
14. ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE ADHERED TO.
15. THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN A 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. RE-STABILIZATION 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 SUBDIVISION 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 VESCP AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.
19. PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION, AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY, AND PEAK FLOW RATE OF STORMWATER RUNOFF FOR THE STATED FREQUENCY STORM OF 24-HOUR DURATION IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CRITERIA. STREAM RESTORATION AND RELOCATION PROJECTS THAT INCORPORATE NATURAL CHANNEL DESIGN CONCEPTS ARE NOT MAN-MADE CHANNELS AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS:
   a. CONCENTRATED STORMWATER RUNOFF LEAVING A DEVELOPMENT SITE SHALL BE DISCHARGED DIRECTLY INTO AN ADEQUATE NATURAL OR MAN-MADE RECEIVING CHANNEL, PIPE, OR STORM SEWER SYSTEM. FOR THOSE SITES WHERE RUNOFF IS DISCHARGED INTO A PIPE OR PIPE SYSTEM DOWNSTREAM STABILITY ANALYSES AT THE OUTFALL OF THE PIPE OR PIPE SYSTEM SHALL BE PERFORMED.
   b. ADEQUACY OF ALL CHANNELS AND PIPES SHALL BE VERIFIED IN THE FOLLOWING MANNER.
   i. 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 QUESTIONS; OR
   ii. (A) NATURAL CHANNELS SHALL BE ANALYZED BY THE USE OF A TWO-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP CHANNEL BANKS NOR CAUSE EROSION OF CHANNEL BED OR BANKS;
   (B) ALL PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP ITS BANKS AND BY THE USE OF A TWO-YEAR STORM TO DEMONSTRATE THAT STORMWATER WILL NOT CAUSE EROSION OF CHANNEL BED OR BANKS; AND
   (C) PIPES AND STORM SEWER SYSTEMS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM TO VERIFY THAT STORMWATER WILL BE CONTAINED WITHIN THE PIPE OR SYSTEM.
   c. IF THE EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL:
   i. 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, THE BED, OR THE BANKS; OR
   ii. IMPROVE THE PIPE OR PIPE SYSTEM TO A CONDITION WHERE THE TEN-YEAR STORM IS CONTAINED WITHIN THE APPURTENANCES; OR
   iii. DEVELOP A SITE DESIGN THAT WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TWO-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALL INTO A NATURAL CHANNEL, OR WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TEN-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A MAN-MADE CHANNEL; OR
   iv. PROVIDE A COMBINATION OF CHANNEL IMPROVEMENT, STORMWATER DETENTION, OR OTHER MEASURES WHICH IS SATISFACTORY TO THE VESCP AUTHORITY TO PREVENT DOWNSTREAM EROSION.
   d. THE APPLICANT SHALL PROVIDE EVIDENCE OF PERMISSION TO MAKE THE IMPROVEMENTS.
   e. ALL HYDROLOGIC ANALYSES SHALL BE BASED ON THE EXISTING WATERSHED CHARACTERISTICS AND THE ULTIMATE DEVELOPMENT CONDITION OF THE SUBJECT PROJECT.
   f. IF THE APPLICANT CHOOSES AN OPTION THAT INCLUDES STORMWATER DETENTION, HE SHALL OBTAIN APPROVAL FROM THE VESCP OF A PLAN FOR MAINTENANCE OF THE DETENTION FACILITIES. THE PLAN SHALL SET FORTH THE MAINTENANCE REQUIREMENTS OF THE FACILITY AND THE PERSON RESPONSIBLE FOR PERFORMING THE MAINTENANCE.
   g. OUTFALL FROM A DETENTION FACILITY SHALL BE DISCHARGED TO A RECEIVING CHANNEL, AND ENERGY DISSIPATORS SHALL BE PLACED AT THE OUTFALL OF ALL DETENTION FACILITIES AS NECESSARY TO PROVIDE A STABILIZED TRANSITION FROM THE FACILITY TO THE RECEIVING CHANNEL.
   h. ALL ON-SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE.
   i. INCREASED VOLUMES OF SHEET FLOWS THAT MAY CAUSE EROSION OR SEDIMENTATION ON ADJACENT PROPERTY SHALL BE DIVERTED TO A STABLE OUTLET, ADEQUATE CHANNEL, PIPE OR PIPE SYSTEM, OR TO A DETENTION FACILITY.
   j. IN APPLYING THESE STORMWATER MANAGEMENT CRITERIA, INDIVIDUAL LOTS OR PARCELS IN A RESIDENTIAL, COMMERCIAL OR INDUSTRIAL DEVELOPMENT SHALL NOT BE CONSIDERED TO BE SEPARATE DEVELOPMENT PROJECTS. INSTEAD, THE DEVELOPMENT, AS A WHOLE SHALL BE CONSIDERED TO BE A SINGLE DEVELOPMENT PROJECT. HYDROLOGIC PARAMETERS THAT REFLECT THE ULTIMATE DEVELOPMENT CONDITION SHALL BE USED IN ALL ENGINEERING CALCULATIONS.
   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.
   l. ANY PLAN APPROVED PRIOR TO JULY 1, 2014, THAT PROVIDES FOR STORMWATER MANAGEMENT THAT ADDRESSES ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS SHALL SATISFY THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS IF THE PRACTICES ARE DESIGNED TO (i) DETAIN THE WATER QUALITY VOLUME AND TO RELEASE IT OVER 48 HOURS; (ii) DETAIN AND RELEASE OVER A 24-HOUR PERIOD TH EXPECTED RAINFALL RESULTING FROM THE ONE YEAR, 24-HOUR STORM; AND (iii) REDUCE THE ALLOWABLE PEAK FLOW RATE RESULTING FROM THE 1.5, 2, AND 10-YEAR, 24-HOUR STORMS TO A LEVEL THAT IS LESS THAN OR EQUAL TO THE PEAK FLOW RATE FROM THE SITE ASSUMING IT WAS IN A GOOD FORESTED CONDITION, ACHIEVED THROUGH MULTIPLICATION OF THE FORESTED PEAK FLOW RATE BY A REDUCTION FACTOR THAT IS EQUAL TO THE RUNOFF VOLUME FORM THE SITE WHEN IT WAS IN A GOOD FORESTED CONDITION DIVIDED BY THE RUNOFF VOLUME FROM THE SITE IN ITS PROPOSED CONDITION, AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS AS DEFINED IN ANY REGULATIONS PROMULGATED PURSUANT TO SEC. 62.1-44.15:28 OF THE CODE OF VIRGINIA (VESMA) OR 62.1-44.15:54 OR 62.1-44.15:65 OF THE CODE OF VIRGINIA (ESCL).
   m. FOR PLANS APPROVED ON OR AFTER JULY 1, 2014, THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS OF SEC. 62.1-44.15:52 A OF THE CODE OF VIRGINIA (ESCL) AND THIS SUBDIVISION 19 SHALL BE SATISFIED BY COMPLIANCE WITH WATER QUANTITY REQUIREMENTS IN THE VESMA AND ATTENDANT REGULATIONS, UNLESS SUCH LAND-DISTURBING ACTIVITIES(I) ARE IN ACCORDANCE WITH PROVISIONS FOR TIME LIMITS ON APPLICABILITY OF APPROVED DESIGN CRITERIA IN 9VAC25-875-480 OR GRANDFATHERING IN 9VAC25-875-490 IN WHICH CASE THE FLOW RATE CAPACITY REQUIREMENTS OF 62.1-44.15:52 A OF THE CODE OF VIRGINIA (ESCL) SHALL APPLY; OR (II) ARE EXEMPT PURSUANT TO 62.1-44.15:34 G 2 OF THE CODE OF VIRGINIA (VESMA)
   n. COMPLIANCE WITH THE WATER QUANTITY MINIMUM STANDARDS SET OUT IN 9VAC25-875-600 SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF THIS SUBDIVISION 19.

GENERAL EROSION & SEDIMENT CONTROL NOTES:

1. UNLESS OTHERWISE NOTED, ALL VEGETATIVE AND EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE TO THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE 1992 VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
2. FOR ADDITIONAL DETAILS AND SPECIFICATIONS NOT SHOWN HEREON, REFER TO THE 1992 VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
3. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ONSITE AT ALL TIMES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NOT SHOWN HEREON THAT ARE DEEMED NECESSARY BY THE APPROVING AUTHORITY AND/OR THE SITE INSPECTOR.
5. THE CONTRACTOR SHALL INSPECT ALL EROSION AND SEDIMENT CONTROL DEVICES DAILY. ANY DAMAGED CONTROLS SHALL BE REPAIRED OR REPLACED BY THE CLOSE OF EACH WORKING DAY.
6. ALL CULVERTS SHALL BE INSTALLED DURING DRY CONDITIONS.
7. SEEDING MADE IN FALL FOR WINTER COVER AND DURING SUMMER MONTHS SHALL BE MULCHED.
8. IF THE ENTIRE SITE WILL NOT 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.

FAUQUIER COUNTY E&S NOTES:

1. THE E&S INSPECTOR HAS THE AUTHORITY TO ADD OR DELETE E&S CONTROLS AS NECESSARY IN THE FIELD AS SITE CONDITIONS CHANGE. IN ADDITION, NO E&S CONTROLS CAN BE REMOVED WITHOUT WRITTEN PERMISSION.
2. PERIMETER SEDIMENT TRAPPING MEASURES MUST BE INSTALLED ON SITE AS A FIRST STEP.
3. ONCE THIS PLAN HAS BEEN APPROVED, A PRE-CONSTRUCTION CONFERENCE MUST BE COORDINATED BY THE APPLICANT THROUGH THE FAUQUIER COUNTY EROSION AND SEDIMENT CONTROL INSPECTOR.
4. NO SEDIMENT TRAP OR BASIN SHALL BE REMOVED UNTIL ALL UPSLOPE AREAS HAVE BEEN STABILIZED, AND THE E&S INSPECTOR HAS GIVEN WRITTEN PERMISSION FOR THEIR REMOVAL.

DUST CONTROL

CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE ENTIRE CONSTRUCTION PHASE BY THE APPLICATION OF WATER AND/OR APPROVED ADHESIVES PER STD. 3.39 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.

SEE THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK FOR ADDITIONAL CONSTRUCTION SPECIFICATIONS AND MAINTENANCE REQUIREMENTS FOR THE PROPOSED EROSION AND SEDIMENT CONTROL MEASURES SPECIFIED ON THIS PLAN.

Bowman

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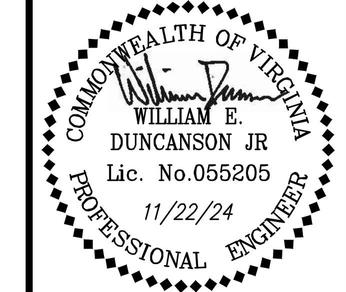
EROSION AND SEDIMENT CONTROL NARRATIVE & NOTES
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER



PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION
DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: N/A V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\035-037-6642-D-CP-001-ESD.dwg

LIME AND FERTILIZER REQUIREMENTS

LIME AND FERTILIZER NEEDS SHALL BE DETERMINED BY SOIL TESTS. SOIL TESTS MAY BE PERFORMED BY THE COOPERATIVE EXTENSION SERVICE SOIL TESTING LABORATORY AT VPI&SU OR BY A REPUTABLE COMMERCIAL LABORATORY. INFORMATION CONCERNING THE STATE SOIL TESTING LABORATORY IS AVAILABLE FROM COUNTY EXTENSION AGENTS. REFERENCE APPENDIX 3.32–D OF THE VESCH FOR LIMING APPLICATIONS (IN LBS.) NEEDED TO CORRECT UNDESIRABLE pH FOR VARIOUS SOIL TYPES.

TABLE 3.32-F

LBS. OF GROUND AGRICULTURAL LIMESTONE* PER THOUSAND SQUARE FEET NEEDED TO CORRECT pH LEVEL OF ACID SOILS TO 6.5

Existing pH	Soil Texture		
	Sandy Loam	Loam	Clay Loam
6.2	20	35	40
6.0	40	55	70
5.8	55	65	85
5.6	70	80	105
5.4	90	100	125
5.2	105	120	140
5.0	120	140	160
4.8	125	180	205
4.6	155	210	230
4.0	200	250	300

* Lime should always be applied in accordance with the results of a soil test, such as may be obtained through the soil testing laboratory at VPI&SU or through a reputable commercial laboratory.

PERMANENT SEEDING TABLE

TABLE 3.32-D
SITE SPECIFIC SEEDING MIXTURES FOR PIEDMONT AREA

	Total Lbs. Per Acre
Minimum Care Lawn	
- Commercial or Residential	175-200 lbs.
- Kentucky 31 or Turf-Type Tall Fescue	95-100%
- Improved Perennial Ryegrass	0-5%
- Kentucky Bluegrass	0-5%
High-Maintenance Lawn	200-250 lbs.
- Kentucky 31 or Turf-Type Tall Fescue	100%
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 Fescue	108 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop *	20 lbs.
- Crownvetch **	20 lbs.
	150 lbs.

* Use seasonal nurse crop in accordance with seeding dates as stated below:
February 16th through April ..... Annual Rye
May 1st through August 15th ..... Foxtail Millet
August 16th through October ..... Annual Rye
November through February 15th ..... Winter Rye

** Substitute Sericea lespedeza for Crownvetch east of Farmville, Va. (May through September use hulled Sericea, all other periods, use unhulled Sericea). If Flatpea is used in lieu of Crownvetch, increase rate to 30 lbs./acre. All legume seed must be properly inoculated. Weeping Lovegrass may be added to any slope or low-maintenance mix during warmer seeding periods; add 10-20 lbs./acre in mixes.

TABLE 3.31-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

TABLE 3.32-E

QUALITY OF SEED*

	Minimum Seed Purity (%)	Minimum Germination (%)
Legumes		
Crownvetch	98	65**
Lespedeza, Korean	97	85**
Lespedeza, Sericea	98	85**
Grasses		
Bluegrass, Kentucky	97	85
Fescue, Tall (Improved, Turf-Type Cultivars)	98	85
Fescue, Tall (Ky-31)	97	85
Fescue, Red	98	85
Redtop	94	80
Reed Canarygrass	98	80
Perennial Ryegrass	98	90
Weeping Lovegrass	98	87
Annuals		
Annual Ryegrass	97	90
German Millet	98	85
Oats	98	80
Cereal Rye	98	85

* Seed containing prohibited or restricted noxious weeds should not be accepted. Seed should not contain in excess of 0.5% weed seed. To calculate percent pure, live seed, multiply germination times purity and divide by 100.

Example: Ky-31 Tall Fescue with a germination of 85 percent and a purity of 97 percent.

97 x 85 = 8245. 8245 ÷ 100 = 82.45 percent pure live seed.

** Includes "hard seed"

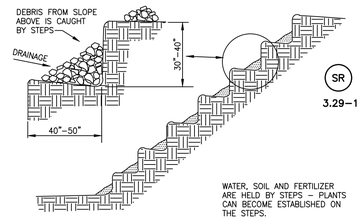
TABLE 3.35-A

ORGANIC MULCH MATERIALS AND APPLICATION RATES

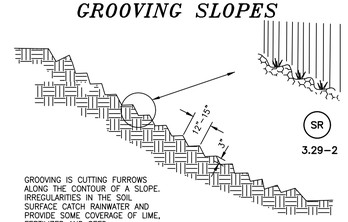
MULCHES:	RATES: Per Acre	RATES: Per 1000 sq. ft.	NOTES:
Straw or Hay	1½ - 2 tons (Minimum 2 tons for winter cover)	70 - 90 lbs.	Free from weeds and coarse matter. Must be anchored. Spread with mulch blower or by hand.
Fiber Mulch	Minimum 1500 lbs.	35 lbs.	Do not use as mulch for winter cover or during 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 mulch blower or by hand.
Wood Chips	4 - 6 tons	185 - 275 lbs.	Free of coarse matter. Air-dried. Treat with 12 lbs nitrogen per ton. Do not use in fine turf areas. Apply with 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 mulch blower, chip handler, or by hand.

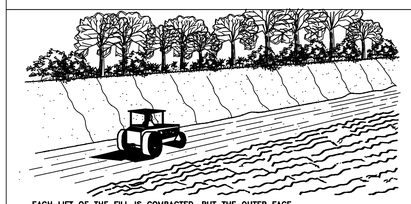
* When fiber mulch is the only available mulch during periods when straw should be used, apply at a minimum rate of 2000 lbs./ac. or 45 lbs./1000 sq. ft.

STAIR STEPPING CUT SLOPES

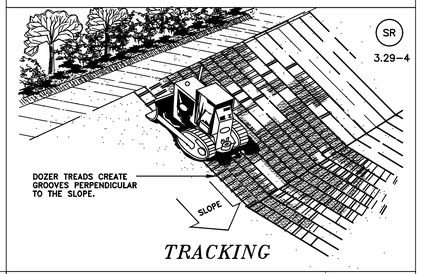


GROOVING SLOPES



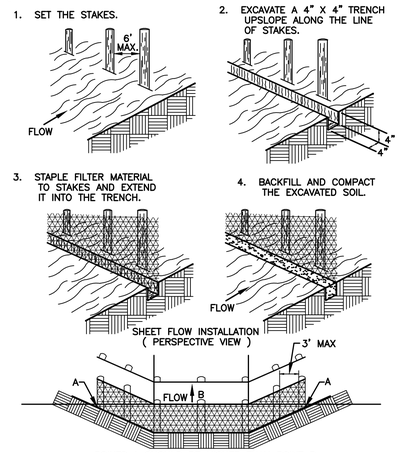


FILL SLOPE TREATMENT

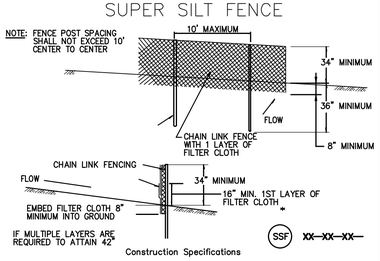


TRACKING

SILT FENCE (WITHOUT WIRE SUPPORT) 3.05–2



SUPER SILT FENCE

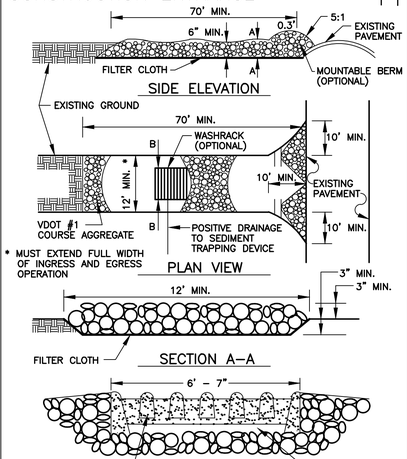


Construction Specifications

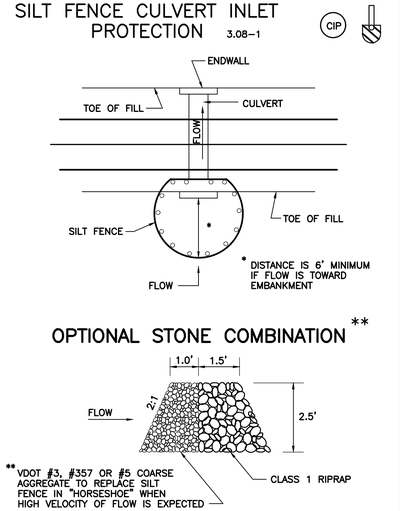
1. Fencing shall be 42" in height and constructed in accordance with the latest VDOT Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42" fabric and 6' length posts.
2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower 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/ft²/minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

TEMPORARY STONE CONSTRUCTION ENTRANCE 3.02–1



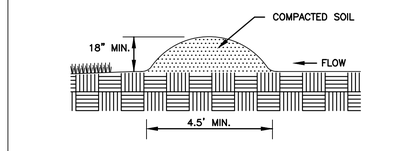
SILT FENCE CULVERT INLET PROTECTION 3.08–1



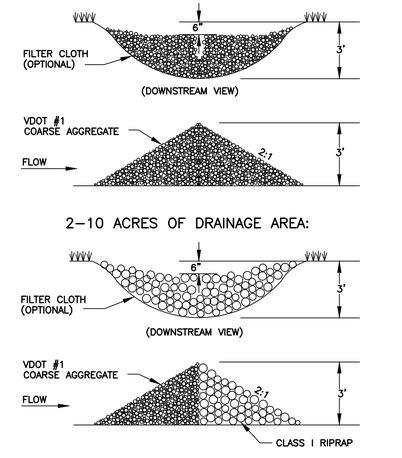
OPTIONAL STONE COMBINATION **

** VDOT #3, #357 OR #5 COARSE AGGREGATE TO REPLACE SILT FENCE IN "HORSESHOE" WHEN HIGH VELOCITY OF FLOW IS EXPECTED

TEMPORARY DIVERSION DIKE 3.09–1

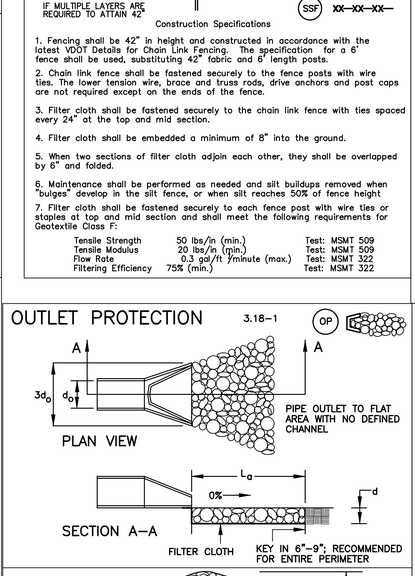


ROCK CHECK DAM 3.20–1



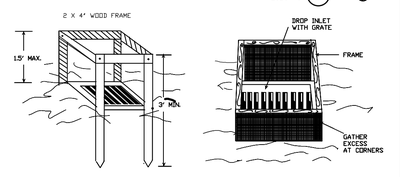
SEE THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK FOR ADDITIONAL CONSTRUCTION SPECIFICATIONS AND MAINTENANCE REQUIREMENTS FOR THE PROPOSED EROSION AND SEDIMENT CONTROL MEASURES SPECIFIED ON THIS PLAN.

OUTLET PROTECTION 3.18–1

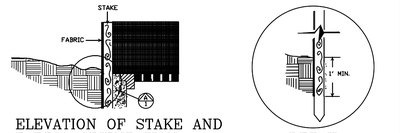


NOTES:
1. APRON LINING MAY BE RIPRAP, GROUTED RIPRAP, GABION BASKET, OR CONCRETE.
2. La IS THE LENGTH OF THE RIPRAP APRON AS CALCULATED USING PLATES 3.18–3 AND 3.18–4.
3. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER, BUT NOT LESS THAN 6 INCHES.

SILT FENCE DROP INLET PROTECTION 3.07–1



PERSPECTIVE VIEWS



ELEVATION OF STAKE AND FABRIC ORIENTATION

DETAIL A

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPE NO GREATER THAN 5%) WHERE THE INLET SHEET OR OVERLAND FLOWS (NOT EXCEEDING 1 C.F.S.) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS. SUCH AS IN STREET OR HIGHWAY MEDIANS.

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EROSION AND SEDIMENT CONTROL NOTES & DETAILS

TIFFANY ESTATES

CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H:
V:

JOB No. 6642-02-002

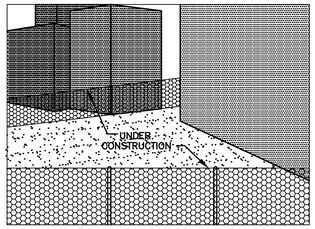
DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

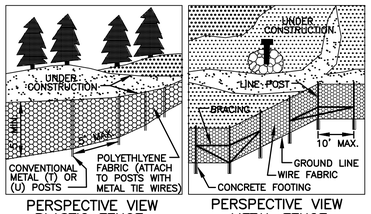
SHEET 36 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\035-037-6642-D-CP-001-ESD.dwg

SAFETY FENCE 3.01–1 (SAF)



PERSPECTIVE VIEW

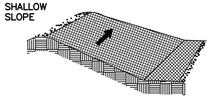


PERSPECTIVE VIEW
PLASTIC FENCE

PERSPECTIVE VIEW
METAL FENCE

SOIL STABILIZATION BLANKETS TREATMENT – 1 3.36–1 (B/M) TREAT.–1

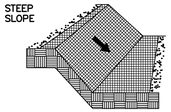
SHALLOW SLOPE



ON SHALLOW SLOPES, STRIPS OF NETTING PROTECTIVE COVERINGS MAY BE APPLIED ACROSS THE SLOPE.

WHERE THERE IS A BERM AT THE TOP OF THE SLOPE, BRING THE MATERIAL OVER THE BERM AND ANCHOR IT BEHIND THE BERM.

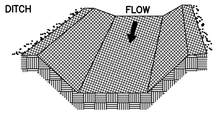
STEEP SLOPE



ON STEEP SLOPES, APPLY PROTECTIVE COVERING PARALLEL TO THE DIRECTION OF FLOW AND ANCHOR SECURELY.

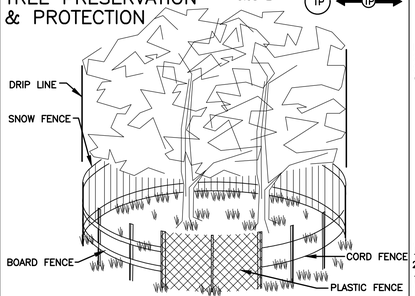
BRING MATERIAL DOWN TO A LEVEL AREA BEFORE TERMINATING THE INSTALLATION, TURN THE END UNDER 4" AND STAPLE AT 12" INTERVALS.

DITCH



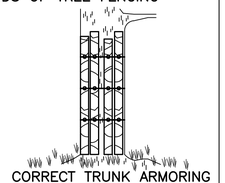
IN DITCHES, APPLY PROTECTIVE COVERING PARALLEL TO THE DIRECTION OF FLOW. USE CHECK SLOTS AS REQUIRED. AVOID JOINING MATERIAL IN THE CENTER OF THE DITCH IF AT ALL POSSIBLE.

TREE PRESERVATION & PROTECTION 3.38–2 (TP)



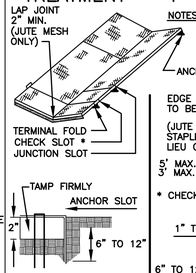
CORRECT METHODS OF TREE FENCING

TRIANGULAR BOARD FENCE



CORRECT TRUNK ARMORING

SOIL STABILIZATION BLANKETS TREATMENT – 1 3.36–2 (B/M) TREAT.–1



NOTES APPROXIMATELY 200 STAPLES REQUIRED PER 100 SQ. YDS. OF MATERIAL ROLL. ANCHOR SLOTS, JUNCTION SLOTS & CHECK SLOTS TO BE BURIED 6" TO 12".

12" MAX. 4:1 OR FLATTER
6" MAX. STEEPER THAN 4:1

EDGE AND END JOINTS TO BE SNUGLY ABUTTED

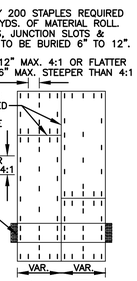
(JUTE MESH WILL HAVE STAPLED LAP JOINT IN LIEU OF EDGE JOINT)

5" MAX. 4:1 OR FLATTER
3" MAX. STEEPER THAN 4:1

* CHECK SLOT

1" TO 2"

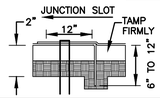
6" TO 12" MIN.

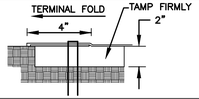


PLAN VIEW
STAPLING DIAGRAM

STAPLE FORMED FROM NO.11 STEEL WIRE. 8" STAPLE MIN. LENGTH FOR SANDY SOIL. 6" STAPLE MIN. LENGTH FOR OTHER SOIL.

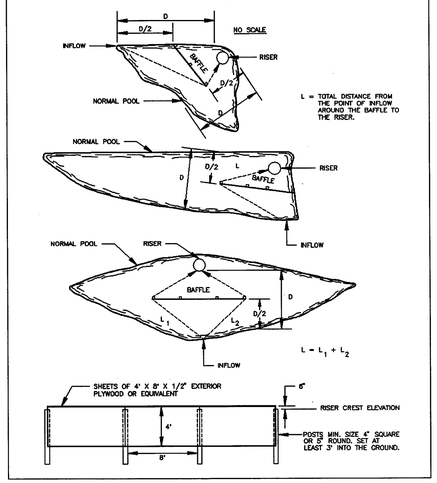
* CHECK SLOTS AT MIN. 50' C–C INTERVALS; NOT REQ'D. WITH ALL "COMBINATION" BLANKETS





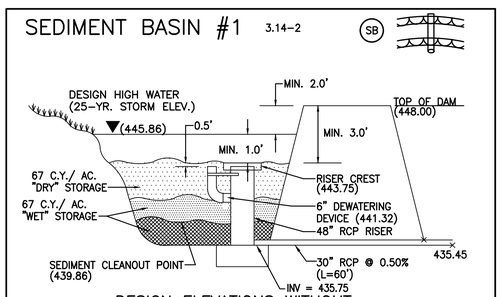
1992 3.14

EXAMPLE PLAN VIEWS OF BAFFLE LOCATIONS IN SEDIMENT BASINS



Source: USDA-SCS Plate 3.14-6

SEDIMENT BASIN #1 3.14–2 (SB)



DESIGN ELEVATIONS WITHOUT EMERGENCY SPILLWAY
(RISER PASSES 25–YR. EVENT)

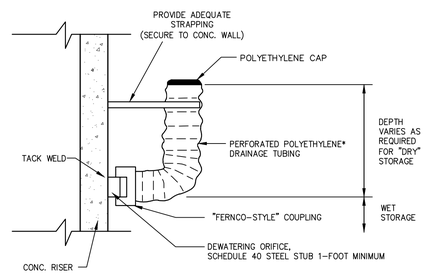
ELEVATIONS IN PARENTHESIS DENOTE ACTUAL DIMENSIONS

PROCEDURE FOR CONVERTING SEDIMENT BASINS:

1. CONVERSION TO THE PERMANENT SWM/BMP FACILITY SHALL TAKE PLACE ONLY AFTER FINAL STABILIZATION IS COMPLETE AND WITH THE WRITTEN AUTHORIZATION FROM THE COUNTY E&S INSPECTOR.
2. PUMP DOWN BASIN–USE APPROVED DE–WATERING MEASURES. EFFLUENT MUST BE FILTERED AND DISCHARGED TO A STABILIZED RECEIVING CHANNEL.
3. REMOVE ACCUMULATED SEDIMENT (AS NEEDED) TO ESTABLISH FINAL GRADE OF THE POND.
4. SEDIMENT MUST BE DISPOSED OF IN AN APPROVED AREA WITHIN THE LIMITS OF CLEARING.
5. GRADE AND ROUGHEN THE BOTTOM OF THE POND TO PREPARE FOR SEEDING.
6. UNPLUG THE LOW FLOW ORIFICE ON STRUCTURE A3 AND THE POND DEWATERING ORIFICE STRUCTURE A4 AND INSTALL DEBRIS/TRASH RACK DEVICE ON THE LOW–FLOW ORIFICE TO PREVENT CLOGGING.
7. PLUG ORIFICE USED FOR TEMPORARY DEWATERING DEVICE.
8. SEED, MULCH, AND TACK JUTE MESH OR OTHER SUITABLE MATTING TO THE BOTTOM OF THE POND.
9. AFTER THE CONVERSION IS COMPLETE, PREPARE AND SUBMIT AS–BUILT PLANS OF THE POND(S) IN CONJUNCTION WITH THE BOND RELEASE REQUEST.

RECOMMENDED DEWATERING SYSTEM FOR SEDIMENT BASINS

N.T.S.



NOTE: WITH CONCRETE RISER, USE PVC SCHEDULE 40 STUB FOR DEWATERING ORIFICE

*DRAINAGE TUBING SHALL COMPLY WITH ASTM F667 AND AASHTO M294

Temporary Sediment Basin #1 - Design Calculations

Storage - Elevation Table

Elevation (ft.)	Area (ft^2)	Volume (cf.)	Volume (cyd.)	Total (cyd.)
435	1620	0.0	0.00	0.00
436	2218	1919.0	71.07	71.07
438	3660	6615.0	245.00	316.07
440	6615	9901.0	366.70	682.78
441	9901	16386.0	606.89	1289.67
442	16386	20233.0	749.37	2039.04
444	20233	24370.0	902.59	2941.63
446	24370	28755.0	1065.00	4006.63
448	28755	28755.0	1065.00	5071.63

Basin Volume Design

Wet Storage:

1. Minimum required volume = 67 cu. Yds. x Total Drainage Area (acres.) 67 cu. Yds. 19.33 (acres.) = 1295.1 cu. Yds.
2. Available basin volume at dewatering orifice = 1529.5 cu. Yds. at elevation 441.32 (From Storage - Elevation Curve)
3. Available volume before cleanout required. 34 cu. Yds. x 19.33 (acres) = 657.2 cu. Yds.
4. Elevation corresponding to cleanout level = 439.86 (From Storage - Elevation Curve)
5. Distance from invert of dewatering orifice to cleanout level = 1.46

Dry Storage:

6. Minimum required volume = 67 cu. Yds. x Total Drainage Area (acres.) 67 cu. Yds. 19.33 (acres.) = 1295.1 cu. Yds.
7. Total available basin volume at crest of riser* = 2828.8 cu. Yds. at elevation 443.75 (From Storage - Elevation Curve)
   * Minimum = 134 cu. Yds. / acre of total drainage area. = 2590.2 cu. Yds.

   Dewatering Orifice Calculation S= 1295.11 CY
   Q = S/ 21,600 Q= 1.62 cfs
   h = (Top Ris - Wet Stor El)/2 h= 1.22 ft
   A = Q/((64.32 * h)^.5 * 0.6) A= 0.31 ft^2
   d = 2 * (A/3.1415)^0.5 d= 0.62 ft
   d= 7.5 inches
8. Diameter of dewatering orifice = 6.0 in.
9. Diameter of flexible tubing = 8.0 in. (Diameter of dewatering orifice plus 2 inches.)

Preliminary Design Elevations

10. Crest of Riser = 443.75; Top of Dam = 448.00; Design High Water = 446.00; Downstream Toe of Dam = 436.00

Basin Shape

11. Length of Flow L= 290 ft; Effective Width We = 41 ft; Surface Area Normal Pool A = 11976 sf; Length to Width Ratio = 7.0 (with baffle)
    If > 2, baffles are not required
    If < 2, baffles are required

Runoff

Drainage Area:

Impervious:	3.71 Acres (C=0.90)		
Woods:	3.75 Acres (C=0.25)		
Open Space:	0.78 Acres (C=0.35)		
Disturbed:	14.8 Acres (C=0.60)	Time of Concentration:	
Total:	19.33 Acres	Sheet Flow	Shallow Concentrated Flow
Tc =	7.75 Minutes	L = 100	L = 1150 (ft)
I(2) =	4.40 in/hr	Slope = 0.025	Slope = 0.087 (ft/ft)
I(25) =	6.60 in/hr	n= 0.05	Paved = No
C-factor =	0.69	t= 3.72	t = 4.03 (min)

12. Q_2 = 59.10 cfs
13. Q_{25} = 88.58 cfs

Principal Spillway Design

14. With emergency spillway, required spillway capacity Qp = Q_2 = 59.10 cfs. (Riser and barrel.)
    Without emergency spillway, required spillway capacity Qp = Q25 = 88.58 cfs. (Riser and barrel)
15. Without emergency spillway: Assumed available head (h) = 2.25 ft. Using Q_{25})
    h = Design High Water Elevation - Crest of Riser Elevation
16. Riser diamter (Dr) = 48 in. Actual head (h) = 2.11 ft. (From Plate 3.14-8)
17. Barrel length (l) = 60 ft. Head (H) on barrel through embankment = 9.30 ft.
18. Barrel diameter = 30 in. (From Plate 3.14-B [concrete pipe] or Plate 3.14-A [corrugated pipe].)
19. Trash rack and anti-vortex device Diameter = N/A inches. Install permanent trash rack Height = N/A inches. (from Table 3.14-D)

Anti-Seep Collar Design

20. Depth of water at principal spillway crest (Y) = 7.75 ft; Slope of upstream face of embankment (Z) = 3.00 ft; Slope of principal spillway barrel (Sb) = 0.005 ft/ft; Length of barel in saturated zone (Ls) = 55.06 ft.
21. Number of collars required = N/A dimensions = N/A (From Plate 3.14-12.) Install permanent anti-seepage control

Final Design Elevations

Principal Spillway Crest =	443.75	
Dewatering Orifice Invert =	441.32	
Cleanout Elevation =	439.86	
Embankment Width =	10.00 ft	OK
Dam Height =	12.00	
Dam Side Slopes =	3:1	
Top of Dam =	448.00	
Bottom of Wet Storage =	435.00	
Design High Water = (Q(25) flow)	445.86	
Distance from Design High Water = to Crest of Dam	2.14	OK

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SCALE H: V:

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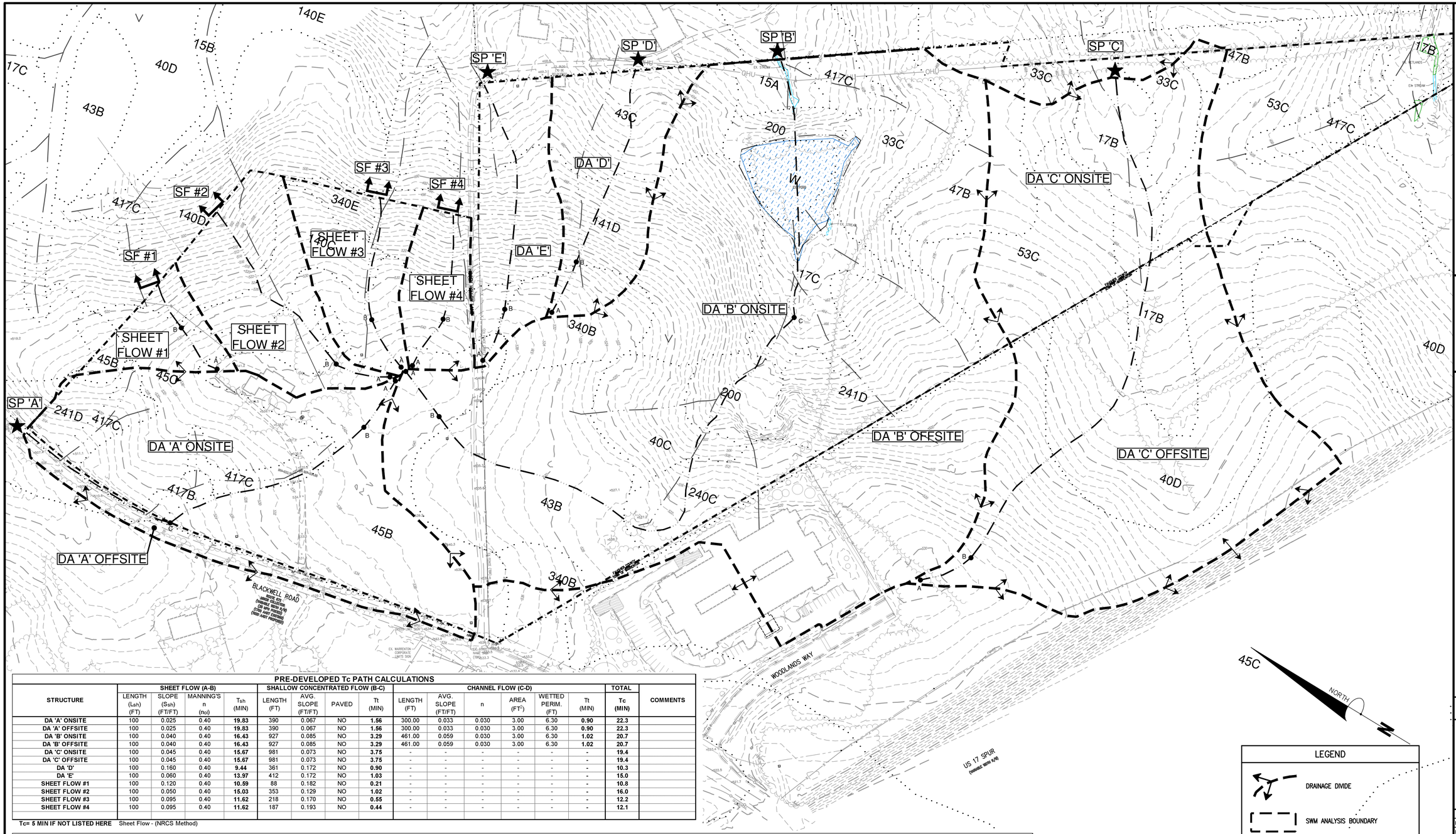
FILE No. 6642-D-CP-001

SHEET 37 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\035-037-6642-D-CP-001-ESD.dwg



PRE-DEVELOPED Tc PATH CALCULATIONS

STRUCTURE	SHEET FLOW (A-B) LENGTH (L_{sh}) (FT)	SHEET FLOW (A-B) SLOPE (S_{sh}) (FT/FT)	SHEET FLOW (A-B) MANNING'S n ($n_{o|}$)	SHEET FLOW (A-B) T_{sh} (MIN)	SHALLOW CONCENTRATED FLOW (B-C) LENGTH (FT)	SHALLOW CONCENTRATED FLOW (B-C) AVG. SLOPE (FT/FT)	SHALLOW CONCENTRATED FLOW (B-C) PAVED	SHALLOW CONCENTRATED FLOW (B-C) Tt (MIN)	CHANNEL FLOW (C-D) LENGTH (FT)	CHANNEL FLOW (C-D) AVG. SLOPE (FT/FT)	CHANNEL FLOW (C-D) n	CHANNEL FLOW (C-D) AREA (FT^2)	CHANNEL FLOW (C-D) WETTED PERIM. (FT)	CHANNEL FLOW (C-D) Tt (MIN)	TOTAL Tc (MIN)	COMMENTS
DA 'A' ONSITE	100	0.025	0.40	**19.83**	390	0.067	NO	**1.56**	300.00	0.033	0.030	3.00	6.30	**0.90**	**22.3**	
DA 'A' OFFSITE	100	0.025	0.40	**19.83**	390	0.067	NO	**1.56**	300.00	0.033	0.030	3.00	6.30	**0.90**	**22.3**	
DA 'B' ONSITE	100	0.040	0.40	**16.43**	927	0.085	NO	**3.29**	461.00	0.059	0.030	3.00	6.30	**1.02**	**20.7**	
DA 'B' OFFSITE	100	0.040	0.40	**16.43**	927	0.085	NO	**3.29**	461.00	0.059	0.030	3.00	6.30	**1.02**	**20.7**	
DA 'C' ONSITE	100	0.045	0.40	**15.67**	981	0.073	NO	**3.75**	-	-	-	-	-	**-**	**19.4**	
DA 'C' OFFSITE	100	0.045	0.40	**15.67**	981	0.073	NO	**3.75**	-	-	-	-	-	**-**	**19.4**	
DA 'D'	100	0.160	0.40	**9.44**	361	0.172	NO	**0.90**	-	-	-	-	-	**-**	**10.3**	
DA 'E'	100	0.060	0.40	**13.97**	412	0.172	NO	**1.03**	-	-	-	-	-	**-**	**15.0**	
SHEET FLOW #1	100	0.120	0.40	**10.59**	88	0.182	NO	**0.21**	-	-	-	-	-	**-**	**10.8**	
SHEET FLOW #2	100	0.050	0.40	**15.03**	353	0.129	NO	**1.02**	-	-	-	-	-	**-**	**16.0**	
SHEET FLOW #3	100	0.095	0.40	**11.62**	218	0.170	NO	**0.55**	-	-	-	-	-	**-**	**12.2**	
SHEET FLOW #4	100	0.095	0.40	**11.62**	187	0.193	NO	**0.44**	-	-	-	-	-	**-**	**12.1**	

Tc= 5 MIN IF NOT LISTED HERE Sheet Flow - (NRCS Method)

PRE-DEVELOPED DRAINAGE AREA CALCULATIONS

STRUCTURE ID / DRAINAGE AREA	ONSITE DRAINAGE AREA B SOILS 98 IMPERVIOUS AREA (AC)	B SOILS 61 TURF (AC)	B SOILS 55 WOODS/ PROTECTED OPEN SPACE (AC)	C SOILS 98 IMPERVIOUS AREA (AC)	C SOILS 74 TURF (AC)	C SOILS 70 WOODS/ PROTECTED OPEN SPACE (AC)	D SOILS 98 IMPERVIOUS AREA (AC)	D SOILS 80 TURF (AC)	D SOILS 77 WOODS/ PROTECTED OPEN SPACE (AC)	OFFSITE DRAINAGE AREA IMPERVIOUS (AC)	A SOILS 39 TURF (AC)	A SOILS 30 WOODS/ PROTECTED OPEN SPACE (AC)	B SOILS 61 TURF (AC)	B SOILS 55 WOODS/ PROTECTED OPEN SPACE (AC)	C SOILS 74 TURF (AC)	C SOILS 70 WOODS/ PROTECTED OPEN SPACE (AC)	D SOILS 80 TURF (AC)	D SOILS 77 WOODS/ PROTECTED OPEN SPACE (AC)	TOTAL DRAINAGE AREA TO STRUCTURE CALCULATIONS TOTAL DRAINAGE AREA	0.9 TOTAL IMPERVIOUS AREA (AC)	0.35 TOTAL TURF AREA (AC)	0.3 TOTAL WOODS AREA (AC)	SCS CN	RATIONAL C-FACTOR	NOTES
DA 'A' ONSITE	0.01	0.01	0.64	0.15	0.26	3.36	-	-	-	-	-	-	-	-	-	-	-	-	4.4201	0.16	0.27	3.99	69	0.32	TO SP 'A'
DA 'A' ONSITE (WOODS)	-	-	0.65	-	-	3.77	-	-	-	-	-	-	-	-	-	-	-	-	4.4201	-	-	4.42	68	0.30	TO SP 'A'
DA 'A' OFFSITE	-	-	-	-	-	-	-	-	-	0.30	0.04	-	0.14	-	0.09	0.01	-	-	0.5750	0.30	0.27	0.01	81	0.63	TO SP 'A'
DA 'B' ONSITE	0.20	0.20	6.22	0.04	0.26	5.08	0.39	0.10	1.41	-	-	-	-	-	-	-	-	-	13.8963	0.63	0.56	12.71	65	0.33	TO SP 'B'
DA 'B' ONSITE (WOODS)	-	-	6.63	-	-	5.38	-	-	1.89	-	-	-	-	-	-	-	-	-	13.8963	-	-	13.90	64	0.30	TO SP 'B'
DA 'B' OFFSITE	-	-	-	-	-	-	-	-	-	0.68	-	-	0.65	1.88	0.00	0.04	0.03	0.03	3.3113	0.68	0.68	1.95	66	0.43	TO SP 'B'
DA 'C' ONSITE	-	0.01	2.86	-	0.05	0.46	-	-	-	-	-	-	-	-	-	-	-	-	3.38	-	0.06	3.32	57	0.30	TO SP 'C'
DA 'C' ONSITE (WOODS)	-	-	2.87	-	-	0.51	-	-	-	-	-	-	-	-	-	-	-	-	3.3779	-	-	3.38	57	0.30	TO SP 'C'
DA 'C' OFFSITE	-	-	-	-	-	-	-	-	-	-	0.10	0.58	0.72	4.87	0.01	0.01	-	-	6.29	-	0.83	5.46	53	0.31	TO SP 'C'
DA 'D'	0.01	-	0.92	-	-	0.85	-	-	-	-	-	-	-	-	-	-	-	-	1.78	0.01	-	1.77	62	0.30	
DA 'E'	0.00	-	0.40	0.03	0.02	1.05	-	-	-	-	-	-	-	-	-	-	-	-	1.50	0.03	0.02	1.45	67	0.31	
SHEET FLOW #1	-	0.01	-	0.01	0.01	0.57	-	-	-	-	-	-	-	-	-	-	-	-	0.60	0.01	0.02	0.57	70	0.31	
SHEET FLOW #2	-	-	-	0.04	0.25	1.39	-	-	-	-	-	-	-	-	-	-	-	-	1.68	0.04	0.25	1.39	71	0.32	
SHEET FLOW #3	-	-	-	-	-	1.21	-	-	-	-	-	-	-	-	-	-	-	-	1.21	-	-	1.21	70	0.30	
SHEET FLOW #4	-	-	-	0.03	0.02	0.70	-	-	-	-	-	-	-	-	-	-	-	-	0.75	0.03	0.02	0.70	71	0.32	

LEGEND

- DRAINAGE DIVIDE
- SWM ANALYSIS BOUNDARY
- Tc PATH
- A BEGIN OVERLAND FLOW
- B BEGIN SHALLOW CONCENTRATED FLOW
- C BEGIN OPEN CHANNEL FLOW

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

Bowman

Bowman Consulting Group Ltd
1300 Central Park Boulevard
Fredericksburg, Virginia 22401
Phone: (540) 371-0268
bowman.com
Bowman Consulting Group Ltd

PRE-DEVELOPED DRAINAGE DIVIDES

TIFFANY ESTATES
CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=80'
V:

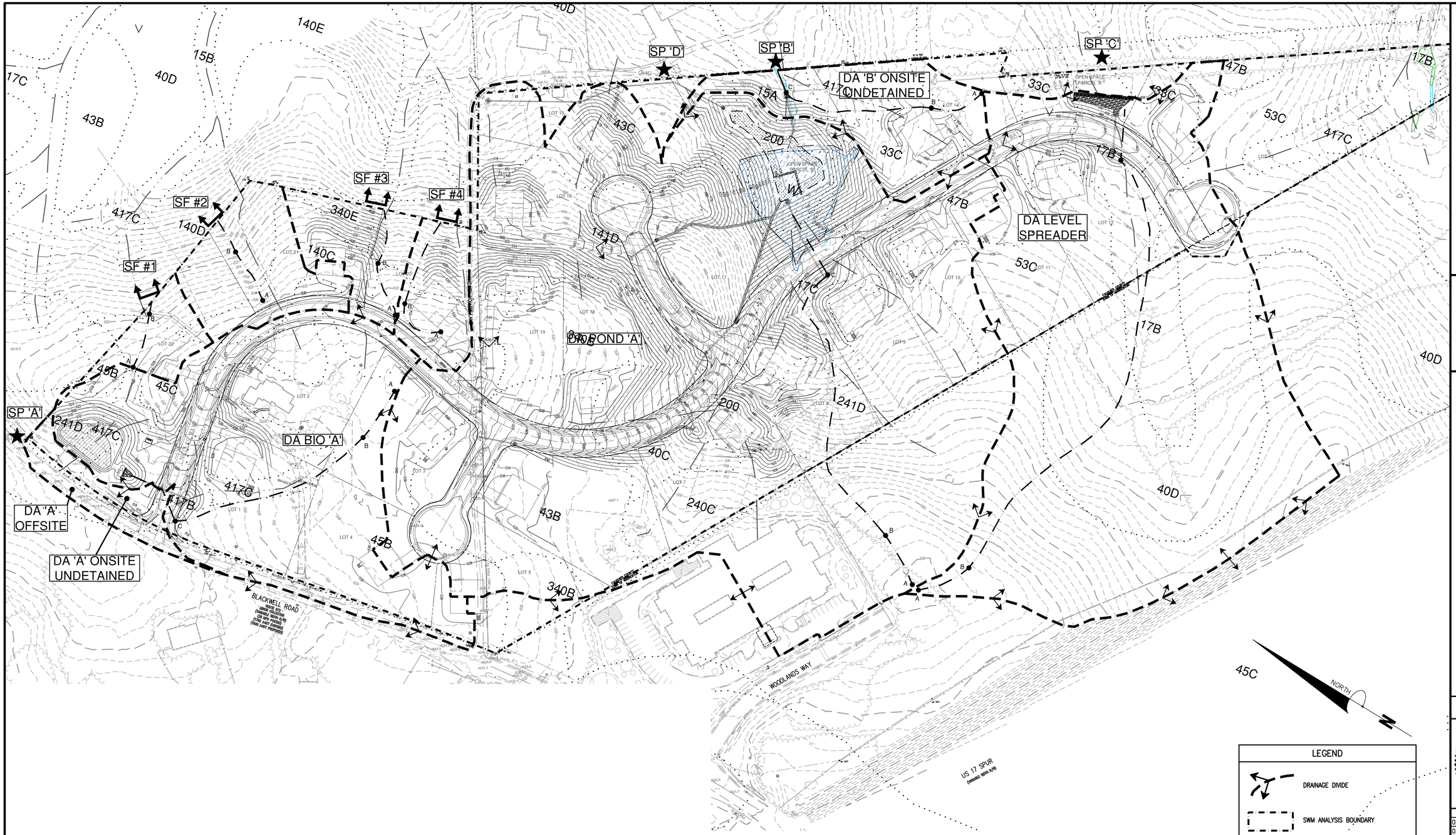
JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 38 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\038-6642-D-CP-001-DDX.dwg



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POST-DEVELOPED DRAINAGE DIVIDES

TIFFANY ESTATES

CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT

FAUQUIER COUNTY, VIRGINIA

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COUNTY PROJECT NUMBER

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DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD
SCALE	H: 1"=80' V:	
JOB No. 6642-02-002		
DATE : FEBRUARY 10, 2023		
FILE No. 6642-D-CP-001		
SHEET 39 OF 58		

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\039-6642-D-CP-001-DDP.dwg

PRE-DEVELOPED SWM CALCULATIONS

PRE-DEVELOPED MASTER SUMMARY

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
DA 'A' ONSITE	1-YR	1	0.170	12.150	1.57
DA 'A' ONSITE	10-YR	10	0.665	12.100	7.67
DA 'A' OFFSITE	1-YR	1	0.049	12.100	0.56
DA 'A' OFFSITE	10-YR	10	0.135	12.100	1.62
DA 'B' ONSITE	1-YR	1	0.384	12.150	3.04
DA 'B' ONSITE	10-YR	10	1.755	12.100	20.69
DA 'B' OFFSITE	1-YR	1	0.100	12.150	0.84
DA 'B' OFFSITE	10-YR	10	0.437	12.100	5.21
DA 'C' ONSITE	1-YR	1	0.038	12.250	0.11
DA 'C' ONSITE	10-YR	10	0.280	12.100	3.03
DA 'A' ONSITE (WOODS)	1-YR	1	0.158	12.150	1.39
DA 'A' ONSITE (WOODS)	10-YR	10	0.638	12.100	7.30
DA 'B' ONSITE (WOODS)	1-YR	1	0.350	12.150	2.57
DA 'B' ONSITE (WOODS)	10-YR	10	1.674	12.100	19.52
DA 'C' OFFSITE	1-YR	1	0.036	13.450	0.05
DA 'C' OFFSITE	10-YR	10	0.402	12.150	3.81
DA 'C' ONSITE (WOODS)	1-YR	1	0.038	12.250	0.11
DA 'C' ONSITE (WOODS)	10-YR	10	0.280	12.100	3.03
SHEET FLOW #2	1-YR	1	0.075	12.100	0.90
SHEET FLOW #2	10-YR	10	0.274	12.050	3.81
SHEET FLOW #3	1-YR	1	0.050	12.050	0.67
SHEET FLOW #3	10-YR	10	0.190	12.050	2.88
SHEET FLOW #4	1-YR	1	0.034	12.050	0.46
SHEET FLOW #4	10-YR	10	0.122	12.000	1.87
DA 'E'	1-YR	1	0.049	12.100	0.54
DA 'E'	10-YR	10	0.207	12.050	2.93
DA 'D'	1-YR	1	0.037	12.050	0.34
DA 'D'	10-YR	10	0.194	12.000	2.97
SHEET FLOW #1	1-YR	1	0.025	12.050	0.35
SHEET FLOW #1	10-YR	10	0.094	12.000	1.50

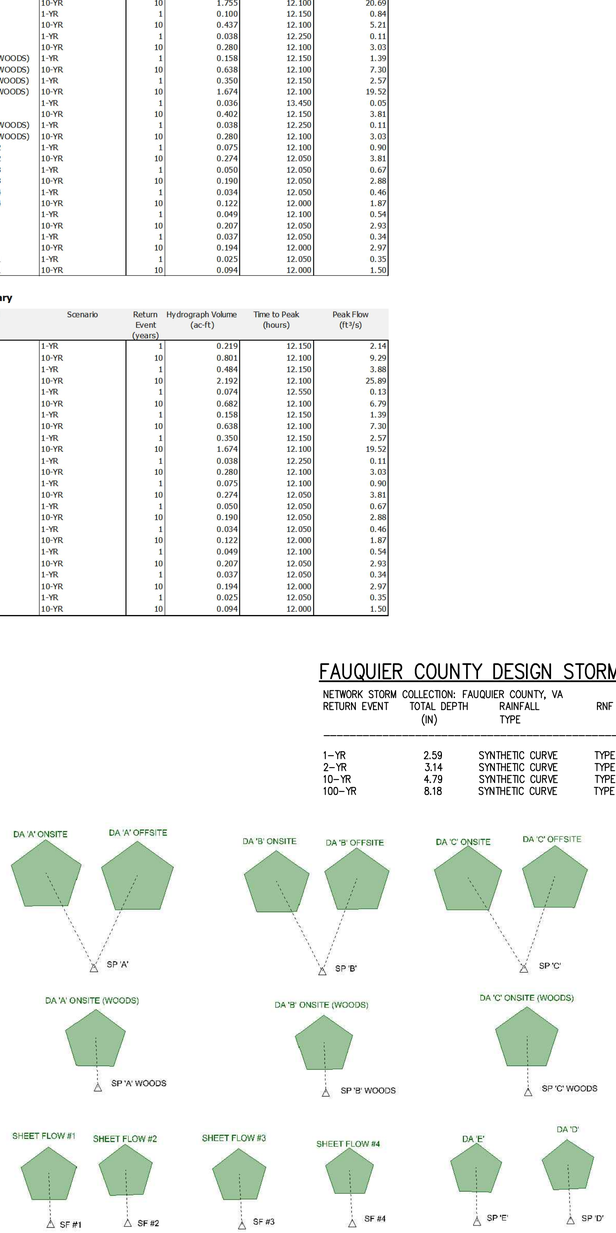
Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
SP 'A'	1-YR	1	0.219	12.150	2.14
SP 'A'	10-YR	10	0.801	12.100	9.29
SP 'B'	1-YR	1	0.484	12.150	3.88
SP 'B'	10-YR	10	2.192	12.100	25.89
SP 'C'	1-YR	1	0.074	12.550	0.13
SP 'C'	10-YR	10	0.682	12.100	6.79
SP 'A' WOODS	1-YR	1	0.158	12.150	1.39
SP 'A' WOODS	10-YR	10	0.638	12.100	7.30
SP 'B' WOODS	1-YR	1	0.350	12.150	2.57
SP 'B' WOODS	10-YR	10	1.674	12.100	19.52
SP 'C' WOODS	1-YR	1	0.038	12.250	0.11
SP 'C' WOODS	10-YR	10	0.280	12.100	3.03
SF #2	1-YR	1	0.075	12.100	0.90
SF #2	10-YR	10	0.274	12.050	3.81
SF #3	1-YR	1	0.050	12.050	0.67
SF #3	10-YR	10	0.190	12.050	2.88
SF #4	1-YR	1	0.034	12.050	0.46
SF #4	10-YR	10	0.122	12.000	1.87
SP 'E'	1-YR	1	0.049	12.100	0.54
SP 'E'	10-YR	10	0.207	12.050	2.93
SP 'D'	1-YR	1	0.037	12.050	0.34
SP 'D'	10-YR	10	0.194	12.000	2.97
SF #1	1-YR	1	0.025	12.050	0.35
SF #1	10-YR	10	0.094	12.000	1.50

FAUQUIER COUNTY DESIGN STORMS:

NETWORK STORM COLLECTION: FAUQUIER COUNTY, VA

RETURN EVENT	TOTAL DEPTH (IN)	RAINFALL TYPE	RNF I.D.
1-YR	2.59	SYNTHETIC CURVE	TYPE II 24 HR
2-YR	3.14	SYNTHETIC CURVE	TYPE II 24 HR
10-YR	4.79	SYNTHETIC CURVE	TYPE II 24 HR
100-YR	8.18	SYNTHETIC CURVE	TYPE II 24 HR



PRE-DEVELOPED NETWORK MAP

POST-DEVELOPED SWM CALCULATIONS

POST-DEVELOPED MASTER SUMMARY

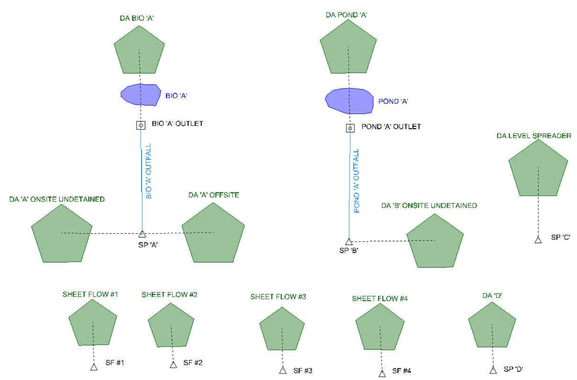
Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
DA 'A' ONSITE	1-YR	1	0.015	11.950	0.25
DA 'A' ONSITE	10-YR	10	0.047	11.950	0.86
DA 'A' OFFSITE	1-YR	1	0.029	11.950	0.53
DA 'A' OFFSITE	10-YR	10	0.074	11.900	1.34
DA 'B' ONSITE UNDETAINED	1-YR	1	0.050	12.050	0.63
DA 'B' ONSITE UNDETAINED	10-YR	10	0.210	12.000	3.27
DA POND 'A'	1-YR	1	0.980	12.100	12.09
DA POND 'A'	10-YR	10	3.363	12.050	46.03
DA LEVEL SPREADER	1-YR	1	0.151	12.200	0.66
DA LEVEL SPREADER	10-YR	10	0.955	12.100	10.95
DA BIO 'A'	1-YR	1	0.339	12.050	4.65
DA BIO 'A'	10-YR	10	1.070	12.050	15.56
SHEET FLOW #2	1-YR	1	0.067	12.000	1.07
SHEET FLOW #2	10-YR	10	0.217	12.000	3.62
SHEET FLOW #3	1-YR	1	0.051	11.950	0.86
SHEET FLOW #3	10-YR	10	0.157	11.950	2.78
SHEET FLOW #4	1-YR	1	0.056	12.050	0.84
SHEET FLOW #4	10-YR	10	0.156	12.000	2.38
DA 'D'	1-YR	1	0.006	12.000	0.08
DA 'D'	10-YR	10	0.034	11.950	0.59
SHEET FLOW #1	1-YR	1	0.023	12.000	0.36
SHEET FLOW #1	10-YR	10	0.078	12.000	1.31

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
SP 'A'	1-YR	1	0.363	12.350	1.52
SP 'A'	10-YR	10	1.172	12.200	9.15
SP 'B'	1-YR	1	1.030	12.100	1.07
SP 'B'	10-YR	10	3.573	12.300	18.52
SP 'C'	1-YR	1	0.151	12.200	0.66
SP 'C'	10-YR	10	0.955	12.100	10.95
SF #2	1-YR	1	0.067	12.000	1.07
SF #2	10-YR	10	0.217	12.000	3.62
SF #3	1-YR	1	0.051	11.950	0.86
SF #3	10-YR	10	0.157	11.950	2.78
SF #4	1-YR	1	0.056	12.050	0.84
SF #4	10-YR	10	0.156	12.000	2.38
SP 'D'	1-YR	1	0.006	12.000	0.08
SP 'D'	10-YR	10	0.034	11.950	0.59
SF #1	1-YR	1	0.023	12.000	0.36
SF #1	10-YR	10	0.078	12.000	1.31

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
BIO 'A' (IN)	1-YR	1	0.339	12.050	4.65	(N/A)	(N/A)
BIO 'A' (OUT)	1-YR	1	0.320	12.350	1.41	510.91	0.102
BIO 'A' (IN)	10-YR	10	1.070	12.050	15.56	(N/A)	(N/A)
BIO 'A' (OUT)	10-YR	10	1.059	12.200	8.80	513.56	0.333
POND 'A' (IN)	1-YR	1	0.980	12.100	12.09	(N/A)	(N/A)
POND 'A' (OUT)	1-YR	1	0.980	14.050	0.95	442.27	0.436
POND 'A' (IN)	10-YR	10	3.363	12.050	46.03	(N/A)	(N/A)
POND 'A' (OUT)	10-YR	10	3.363	12.300	17.73	444.29	1.308



POST-DEVELOPED NETWORK MAP

1-YR ALLOWABLE PEAK FLOWRATE SUMMARY

STUDY POINT A	
AREA	FLOW @ 12.15 HR
DA 'A' OFFSITE	0.56
DA 'A' ONSITE (ENERGY BALANCE)	0.98
TOTAL ALLOWABLE PEAK FLOWRATE	**1.54**

STUDY POINT B	
AREA	FLOW @ 12.15 HR
DA 'B' OFFSITE	0.84
DA 'B' ONSITE (ENERGY BALANCE)	0.99
TOTAL ALLOWABLE PEAK FLOWRATE	**1.83**

SWM NARRATIVE

THE SITE IS LOCATED ALONG THE EASTERN SIDE OF BLACKWELL ROAD, TO THE SOUTHEAST OF THE INTERSECTION OF BLACKWELL ROAD AND IVY HILL DRIVE, AND NORTH OF THE US 17 SPUR. THE EXISTING SITE IS APPROXIMATELY 32.23 ACRES; CONSISTS OF ONE RESIDENTIAL DWELLING, AN EXISTING POND, AN EXISTING DRIVEWAY, AND WOODED AREAS; AND IS COMPRISED OF HYDROLOGIC SOIL GROUPS (HSG) B, C, AND D. THE PROJECT CONSISTS OF THE CONSTRUCTION OF 22 SINGLE FAMILY DETACHED LOTS ALONG WITH ASSOCIATED IMPROVEMENTS.

CONCENTRATED STORMWATER RUNOFF DISCHARGES FROM THE SITE IN TWO DISTINCT LOCATIONS. THE RUNOFF TO STUDY POINT 'A' DISCHARGES TO AN EXISTING ROADSIDE DITCH ALONG BLACKWELL ROAD. THE RUNOFF TO STUDY POINT 'B' DISCHARGES TO AN EXISTING NATURAL CHANNEL DOWNSTREAM OF THE EXISTING POND. AN ADDITIONAL POINT OF ANALYSIS WAS INCLUDED AT STUDY POINT 'C', WHERE RUNOFF DISCHARGES IN A BROAD SWALE REPRESENTATIVE OF SHEET FLOW CONDITIONS IN THE PRE-DEVELOPED CONDITION. TWO ADDITIONAL POINTS OF ANALYSIS WERE INCLUDED AT STUDY POINTS 'D' AND 'E'. THE RUNOFF TO STUDY POINT 'D' DISCHARGES TO AN EXISTING DITCH LOCATED ALONG HIDDEN HOLLOW LANE. THE RUNOFF TO STUDY POINT 'E' DISCHARGES TO A LOW POINT ADJACENT TO HIDDEN HOLLOW LANE AND EITHER FLOW OVER HIDDEN HOLLOW LANE OR DISCHARGES INTO A CULVERT ALL OTHER RUNOFF FROM THE SITE DISCHARGES FROM THE LIMITS OF DISTURBANCE UNDER NON-EROSIVE SHEET FLOW CONDITIONS, AS DEMONSTRATED IN THE SHEET FLOW CALCULATIONS ON SHEET 42A.

ONE LEVEL 1 WET POND (POND 'A'), ONE LEVEL 2 BIORETENTION BASIN (BIORETENTION 'A'), AND ONE LEVEL SPREADER ARE PROPOSED TO PROVIDE WATER QUANTITY CONTROL. STORMWATER RUNOFF WILL BE COLLECTED IN A COMBINATION OF OPEN CHANNELS AND CLOSED CONDUIT STORM SEWER PRIOR TO DISCHARGING TO THE SWM FACILITIES.

CHANNEL PROTECTION

STUDY POINT 'A' IS LOCATED AT THE EXISTING ROADSIDE DITCH ALONG BLACKWELL ROAD. THE DRAINAGE AREA TO THIS OUTFALL WAS SEPARATED INTO AN ONSITE AREA AND AN OFFSITE AREA. THE ENERGY BALANCE EQUATION WAS APPLIED ONLY TO THE ONSITE AREA. THE RUNOFF REDUCTION ACHIEVED BY IMPLEMENTING A LEVEL 2 BIORETENTION BASIN (BIORETENTION 'A') REDUCES THE 1-YR POST-DEVELOPED CURVE NUMBER FROM 76 TO 70. THIS ADJUSTED CURVE NUMBER WAS USED IN THE ENERGY BALANCE EQUATION. PER THE ENERGY BALANCE EQUATION, THE ALLOWABLE PEAK FLOWRATE OF THE 1-YR STORM FROM THE ONSITE AREA IS 0.98 CFS. THE PRE-DEVELOPED 1-YR PEAK FLOWRATE GENERATED BY DA 'A' OFFSITE WAS ADDED TO THE ALLOWABLE PEAK FLOWRATE DETERMINED BY THE ENERGY BALANCE EQUATION TO ACHIEVE A COMBINED ALLOWABLE PEAK FLOWRATE AT STUDY POINT 'A'. THE PRE-DEVELOPED PEAK FLOWRATE AT STUDY POINT 'A' OCCURS AT 12.15 HOURS. THEREFORE, THE PEAK FLOWRATE FOR DA 'A' OFFSITE WAS DERIVED FROM ITS RESPECTIVE HYDROGRAPH AT A TIME OF 12.15 HOURS. AS SUMMARIZED IN THE TABLE ON THIS SHEET, THE TOTAL ALLOWABLE 1-YR PEAK FLOWRATE TO STUDY POINT 'A' IS 1.54 CFS. BY DETAINING RUNOFF IN BIORETENTION 'A', THE POST-DEVELOPED PEAK FLOWRATE IS 1.52 CFS, WHICH IS LESS THAN THE COMBINED ALLOWABLE PEAK FLOWRATE. THEREFORE, THE VSMP CHANNEL PROTECTION REQUIREMENTS HAVE BEEN SATISFIED.

STUDY POINT 'B' IS LOCATED AT AN EXISTING NATURAL CHANNEL DOWNSTREAM OF THE EXISTING POND. THE DRAINAGE AREA TO THIS OUTFALL WAS SEPARATED INTO AN ONSITE AREA AND AN OFFSITE AREA. THE ENERGY BALANCE EQUATION WAS APPLIED ONLY TO THE ONSITE AREA. PER THE ENERGY BALANCE EQUATION, THE ALLOWABLE PEAK FLOWRATE OF THE 1-YR STORM FROM THE ONSITE AREA IS 0.99 CFS. THE PRE-DEVELOPED 1-YR PEAK FLOWRATE GENERATED BY DA 'B' OFFSITE WAS ADDED TO THE ALLOWABLE PEAK FLOWRATE DETERMINED BY THE ENERGY BALANCE EQUATION TO ACHIEVE A COMBINED ALLOWABLE PEAK FLOWRATE AT STUDY POINT 'B'. THE PRE-DEVELOPED PEAK FLOWRATE AT STUDY POINT 'B' OCCURS AT 12.15 HOURS. THEREFORE, THE PEAK FLOWRATE FOR DA 'B' OFFSITE WAS DERIVED FROM ITS RESPECTIVE HYDROGRAPH AT A TIME OF 12.15 HOURS. AS SUMMARIZED IN THE TABLE ON THIS SHEET, THE TOTAL ALLOWABLE 1-YR PEAK FLOWRATE TO STUDY POINT 'B' IS 1.83 CFS. BY DETAINING RUNOFF IN POND 'A', THE POST-DEVELOPED PEAK FLOWRATE IS 1.07 CFS, WHICH IS LESS THAN THE COMBINED ALLOWABLE PEAK FLOWRATE. THEREFORE, THE VSMP CHANNEL PROTECTION REQUIREMENTS HAVE BEEN SATISFIED.

STUDY POINT 'C' IS LOCATED AT AN EXISTING BROAD SWALE REPRESENTATIVE OF SHEET FLOW CONDITIONS. THE PROPOSED ROAD CULVERT CHANNELIZES RUNOFF JUST UPSTREAM OF THIS STUDY POINT. A PLUNGE POOL AND LEVEL SPREADER HAS BEEN INCORPORATED INTO THE CULVERT OUTLET PROTECTION TO ENSURE THE RUNOFF IS CONVERTED TO SHEET FLOW PRIOR TO DISCHARGING FROM THE LIMITS OF DISTURBANCE. PER THE LEVEL SPREADER SHEET FLOW CALCULATIONS ON SHEET 42A, THE DEPTH OF FLOW OVER THE LEVEL SPREADER LIP IS 0.10'.

STUDY POINT 'D' IS LOCATED AT A DITCH ALONGSIDE HIDDEN HOLLOW LANE. PER THE ENERGY BALANCE EQUATION, THE ALLOWABLE PEAK FLOWRATE OF THE 1-YR STORM IS 0.34 CFS. WITH THE REDUCTION IN DRAINAGE AREA TO THIS STUDY POINT, THE POST-DEVELOPED PEAK FLOWRATE IS 0.08 CFS. THEREFORE, THE VSMP CHANNEL PROTECTION REQUIREMENTS HAVE BEEN SATISFIED.

STUDY POINT 'E' IS LOCATED AT A LOW POINT ADJACENT TO HIDDEN HOLLOW LANE. ALL DRAINAGE AREA TO THIS STUDY POINT HAS BEEN REDIRECTED TO STUDY POINT 'B', RESULTING IN NO FLOW TO THIS STUDY POINT IN THE POST-DEVELOPED CONDITION.

FLOOD PROTECTION

THE PRE-DEVELOPED 10-YR FLOWRATE TO STUDY POINT 'A' IS 9.29 CFS. BY DETAINING RUNOFF IN BIORETENTION 'A' THE POST-DEVELOPED FLOWRATE IS 9.15 CFS, WHICH IS LESS THAN PRE-DEVELOPED PEAK FLOWRATE FROM THE 10-YR STORM.

THE PRE-DEVELOPED 10-YR FLOWRATE TO STUDY POINT 'B' IS 25.89 CFS. BY DETAINING RUNOFF IN POND 'A' THE POST-DEVELOPED FLOWRATE IS 18.52 CFS, WHICH IS LESS THAN PRE-DEVELOPED PEAK FLOWRATE FROM THE 10-YR STORM.

A PLUNGE POOL AND LEVEL SPREADER HAS BEEN INCORPORATED INTO THE CULVERT OUTLET PROTECTION AT STUDY POINT 'C' TO ENSURE THE RUNOFF IS CONVERTED TO SHEET FLOW PRIOR TO DISCHARGING FROM THE LIMITS OF DISTURBANCE. PER THE LEVEL SPREADER SHEET FLOW CALCULATIONS ON SHEET 42A, THE DEPTH OF FLOW FROM THE 10-YR STORM OVER THE LEVEL SPREADER LIP IS 0.10'.

THE PRE-DEVELOPED 10-YR FLOWRATE TO STUDY POINT 'D' IS 2.97 CFS. WITH THE REDUCTION IN DRAINAGE AREA TO THIS STUDY POINT, THE POST-DEVELOPED FLOWRATE IS 0.59 CFS, WHICH IS LESS THAN PRE-DEVELOPED PEAK FLOWRATE FROM THE 10-YR STORM.

STUDY POINT 'E' IS LOCATED AT A LOW POINT ADJACENT TO HIDDEN HOLLOW LANE. ALL DRAINAGE AREA TO THIS STUDY POINT HAS BEEN REDIRECTED TO STUDY POINT 'B', RESULTING IN NO FLOW TO THIS STUDY POINT IN THE POST-DEVELOPED CONDITION.

SWM SUMMARY

STUDY POINT	1-YR STORM FLOWRATES: PRE/ ALLOWABLE (cfs)	1-YR STORM FLOWRATES: POST (cfs)	1-YR STORM FLOWRATES: PRE/POST DIFFERENCE	CHANNEL PROTECTION COMMENTS	10-YR STORM FLOWRATES: PRE (cfs)	10-YR STORM FLOWRATES: POST (cfs)	10-YR STORM FLOWRATES: PRE/POST DIFFERENCE	FLOOD PROTECTION COMMENTS
A	1.54	1.52	-0.02		9.29	9.15	-0.14	
B	1.83	1.07	-0.76		25.89	18.52	-7.37	
C	0.04	0.66	0.62	CONVERTED TO SHEET FLOW	6.79	10.95	4.16	CONVERTED TO SHEET FLOW
D	0.34	0.08	-0.26		2.97	0.59	-2.38	
E	0.54	0.00	-0.54		2.93	0.00	-2.93	
SF #1	0.35	0.36	0.01	SHEET FLOW	1.50	1.31	-0.19	SHEET FLOW
SF #2	0.90	1.07	0.17	SHEET FLOW	3.81	3.62	-0.19	SHEET FLOW
SF #3	0.67	0.86	0.19	SHEET FLOW	2.88	2.78	-0.10	SHEET FLOW
SF #4	0.46	0.84	0.38	SHEET FLOW	1.87	2.38	0.51	SHEET FLOW

VSMP CHANNEL PROTECTION CALCULATIONS

STUDY POINT	DRAINAGE AREA SPECIFICS: DA_{pre} (ac)	DA_{post} (ac)	CN_{forest}	CN_{pre}	CN_{post}	$CN_{postAdjusted}$	CHANNEL PROTECTION (1-YR STORM): I.F.	P (in)	RV_{forest} (in)	RV^*_{forest} (ac-in.)	RV_{pre} (in)	RV^*_{pre} (ac-in.)	RV_{post} (in)	RV^*_{post} (ac-in.)	$RV_{postAdjusted}$ (in)	$RV^*_{postAdjusted}$ (ac-in.)	$q_{pForest}$ (cfs)	q_{pPre} (cfs)	$q_{pAllowable}$ (cfs)	NOTES
A	4.42	5.37	68	69	76	70	0.80	2.59	0.43	1.89	0.46	2.04	0.75	4.03	0.50	2.68	1.39	1.57	**0.98**	
B	13.90	17.16	64	65	74	74	0.80	2.59	0.30	4.21	0.33	4.61	0.66	11.32	0.66	11.32	2.57	3.04	**0.99**	
C	3.38	3.52	57	57	70	65	0.80	2.59	0.14	0.46	0.14	0.46	0.50	1.76	0.33	1.17	0.11	0.11	**0.04**	
D	1.78	0.31	62	62	62	62	0.80	2.59	0.25	0.44	0.25	0.44	0.25	0.08	0.25	0.08	0.34	0.34	**0.34**	
E	1.50	0.00	67	67	67	67	0.80	2.59	0.39	0.59	0.39	0.59	0.39	0.00	0.39	0.00	0.54	0.54	**0.54**	

$$RV = \frac{(P - 0.2S)^2}{(P + 0.8S)} \qquad S = \frac{1000}{CN} - 10$$

Where:
RV = runoff depth (in)
P = rainfall depth (in)
S = potential maximum retention after runoff begins

$$RV^* = RV \times DA$$

Where:
RV* = runoff volume (ac-in)
RV = runoff depth (in)
DA = drainage area (ac.)

Energy Balance Equation:

$$q_{pAllowable} = I.F. \times (q_{pre} \times RV^*_{pre}) / RV^*_{post}$$

Where:
I.F. = Improvement Factor (0.8 for sites > 1 acre or 0.9 for sites ≤ 1 acre
$q_{pAllowable}$ = allowable peak flowrate of runoff from the developed site (cfs)
q_{pre} = peak flowrate of runoff in the pre-developed condition (cfs)

Under no condition shall $q_{pAllowable}$ be greater than q_{pre} nor shall $q_{pAllowable}$ be required to be less than:

$$(q_{forest} \times RV^*_{forest}) / RV^*_{post}$$

Where:
q_{forest} = peak flowrate of runoff from the site in a forested condition (cfs)

Bowman

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SWM NARRATIVE & CALCULATIONS
TIFFANY ESTATES
CONSTRUCTION PLAN
FAUQUIER COUNTY, VIRGINIA
CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS

DATE	DESCRIPTION
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: N/A V: N/A
JOB No. 6642-02-002
DATE : FEBRUARY 10, 2023
FILE No. 6642-D-CP-001
SHEET 40 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\040-042-6642-D-CP-001-SWM.dwg

POND 'A' ELEVATION VOLUME TABLE

Elevation (ft)	Planimeter (ft²)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
441.00	0.0	0.227	0.000	0.000	0.000
441.40	0.0	0.351	0.861	0.115	0.115
442.00	0.0	0.376	1.091	0.218	0.333
444.00	0.0	0.464	1.259	0.839	1.172
446.00	0.0	0.559	1.534	1.022	2.194
448.00	0.0	0.660	1.827	1.218	3.413

POND 'A' OUTLET STRUCTURE INPUT

Requested Pond Water Surface Elevations

Minimum (Headwater)	441.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	448.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Stand Pipe	Riser - 1	Forward	Culvert - 1	443.75	448.00
Orifice-Circular	Orifice - 1	Forward	Culvert - 1	441.00	448.00
Culvert-Circular	Culvert - 1	Forward	TW	435.75	448.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Culvert - 1
Structure Type: Culvert-Circular

Number of Barrels	1
Diameter	30.0 in
Length	60.00 ft
Length (Computed Barrel)	60.00 ft
Slope (Computed)	0.005 ft/ft

Outlet Control Data

Manning's n	0.013
Ke	0.500
Kb	0.009
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data

Equation Form	Form 1
K	0.0098
M	2.0000
C	0.0398
Y	0.6700
T1 ratio (HW/D)	1.158
T2 ratio (HW/D)	1.304
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,

T1 Elevation	438.64 ft	T1 Flow	27.16 ft³/s
T2 Elevation	439.01 ft	T2 Flow	31.05 ft³/s

Structure ID: Riser - 1
Structure Type: Stand Pipe

Number of Openings	1
Elevation	443.75 ft
Diameter	48.0 in
Orifice Area	12.6 ft²
Orifice Coefficient	0.600
Weir Length	12.57 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	False

Structure ID: Orifice - 1
Structure Type: Orifice-Circular

Number of Openings	1
Elevation	441.00 ft
Orifice Diameter	6.0 in
Orifice Coefficient	0.600

Structure ID: TW
Structure Type: TW Setup, DS Channel

Tailwater Type	Free Outfall

Convergence Tolerances

Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

POND 'A' OUTLET STRUCTURE RATING TABLE

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
441.00	0.00	(N/A)	0.00	(no Q: Riser - 1,Orifice - 1,Culvert - 1)
441.50	0.47	(N/A)	0.00	Orifice - 1,Culvert - 1 (no Q: Riser - 1)
442.00	0.82	(N/A)	0.00	Orifice - 1,Culvert - 1 (no Q: Riser - 1)
442.50	1.06	(N/A)	0.00	Orifice - 1,Culvert - 1 (no Q: Riser - 1)
443.00	1.25	(N/A)	0.00	Orifice - 1,Culvert - 1 (no Q: Riser - 1)
443.50	1.42	(N/A)	0.00	Orifice - 1,Culvert - 1 (no Q: Riser - 1)
443.75	1.49	(N/A)	0.00	Orifice - 1,Culvert - 1 (no Q: Riser - 1)
444.00	6.28	(N/A)	0.00	Riser - 1,Orifice - 1,Culvert - 1
444.50	26.19	(N/A)	0.00	Riser - 1,Orifice - 1,Culvert - 1
445.00	54.22	(N/A)	0.00	Riser - 1,Orifice - 1,Culvert - 1
445.50	69.95	(N/A)	0.00	Riser - 1,Culvert - 1 (no Q: Orifice - 1)
446.00	72.08	(N/A)	0.00	Riser - 1,Culvert - 1 (no Q: Orifice - 1)
446.50	74.15	(N/A)	0.00	Riser - 1,Culvert - 1 (no Q: Orifice - 1)
447.00	76.16	(N/A)	0.00	Riser - 1,Culvert - 1 (no Q: Orifice - 1)
447.50	78.12	(N/A)	0.00	Riser - 1,Culvert - 1 (no Q: Orifice - 1)
448.00	80.04	(N/A)	0.00	Riser - 1,Culvert - 1 (no Q: Orifice - 1)

POND 'A' E-V-Q TABLE

Infiltration

Infiltration Method (Computed)	No Infiltration

Initial Conditions

Elevation (Water Surface, Initial)	441.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (acres)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
441.00	0.00	0.000	0.227	0.00	0.00	0.00
441.50	0.47	0.150	0.355	0.00	0.47	73.12
442.00	0.82	0.333	0.376	0.00	0.82	161.95
442.50	1.06	0.526	0.397	0.00	1.06	255.77
443.00	1.25	0.730	0.419	0.00	1.25	354.76
443.50	1.42	0.946	0.442	0.00	1.42	459.06
443.75	1.49	1.057	0.453	0.00	1.49	513.25
444.00	6.28	1.172	0.464	0.00	6.28	573.54
444.50	26.19	1.410	0.487	0.00	26.19	708.61
445.00	54.22	1.660	0.511	0.00	54.22	857.42
445.50	69.95	1.921	0.535	0.00	69.95	999.68
446.00	72.08	2.194	0.559	0.00	72.08	1,134.21
446.50	74.15	2.480	0.584	0.00	74.15	1,274.61
447.00	76.16	2.778	0.609	0.00	76.16	1,420.92
447.50	78.12	3.089	0.634	0.00	78.12	1,573.26
448.00	80.04	3.413	0.660	0.00	80.04	1,731.78

POND 'A' 1-YR ROUTING SUMMARY

Infiltration

Infiltration Method (Computed)	No Infiltration

Initial Conditions

Elevation (Water Surface, Initial)	441.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary

Flow (Peak In)	12.09 ft³/s	Time to Peak (Flow, In)	12.100 hours
Flow (Peak Outlet)	0.95 ft³/s	Time to Peak (Flow, Outlet)	14.050 hours

Elevation (Water Surface, Peak)	442.27 ft
Volume (Peak)	0.436 ac-ft

Mass Balance (ac-ft)

Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	0.980 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	0.980 ac-ft
Volume (Retained)	0.000 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

POND 'A' 1-YR ROUTING CALCULATIONS

Pond Routing Calculations (Total Out)

Time (hours)	Flow (Total In) (ft³/s)	2S/t - O (ft³/s)	2S/t + O (ft³/s)	Infiltration (ft³/s)	Flow (Outlet) (ft³/s)	Volume (ac-ft)	Elevation (ft)
0.000	0.00	0.00	0.00	0.00	0.00	0.000	441.00
11.500	0.00	0.00	0.00	0.00	0.00	0.000	441.00
11.550	0.00	0.00	0.00	0.00	0.00	0.000	441.00
11.600	0.01	0.02	0.02	0.00	0.00	0.000	441.00
11.650	0.07	0.10	0.10	0.00	0.00	0.000	441.00
11.700	0.21	0.37	0.38	0.00	0.00	0.001	441.00
11.750	0.56	1.13	1.14	0.00	0.01	0.002	441.01
11.800	1.18	2.83	2.86	0.00	0.02	0.004	441.02
11.850	2.34	6.26	6.35	0.00	0.04	0.010	441.04
11.900	4.32	12.76	12.92	0.00	0.08	0.021	441.09
11.950	7.01	23.77	24.09	0.00	0.16	0.041	441.16
12.000	9.79	40.05	40.58	0.00	0.26	0.074	441.28
12.050	11.69	60.73	61.53	0.00	0.40	0.122	441.42
12.100	12.09	83.48	84.51	0.00	0.52	0.173	441.56
12.150	10.79	105.16	106.37	0.00	0.60	0.217	441.69
12.200	8.87	123.47	124.82	0.00	0.67	0.255	441.79
12.250	6.99	137.87	139.33	0.00	0.73	0.285	441.87
12.300	5.64	148.95	150.50	0.00	0.77	0.309	441.94
12.350	4.70	157.68	159.29	0.00	0.81	0.327	441.99
12.400	4.02	164.74	166.40	0.00	0.83	0.342	442.02
12.450	3.53	170.61	172.29	0.00	0.84	0.354	442.06
12.500	3.13	175.55	177.26	0.00	0.86	0.364	442.08
12.550	2.80	179.74	181.47	0.00	0.87	0.372	442.10
12.600	2.52	183.30	185.06	0.00	0.88	0.380	442.12
12.650	2.29	186.35	188.12	0.00	0.88	0.386	442.14
12.700	2.11	188.98	190.76	0.00	0.89	0.391	442.15
12.750	1.97	191.26	193.05	0.00	0.90	0.396	442.17
12.800	1.86	193.28	195.08	0.00	0.90	0.400	442.18
12.850	1.77	195.09	196.90	0.00	0.91	0.404	442.19
12.900	1.70	196.73	198.55	0.00	0.91	0.407	442.20
12.950	1.64	198.23	200.06	0.00	0.91	0.410	442.20
13.000	1.58	199.61	201.45	0.00	0.92	0.413	442.21
13.250	1.35	204.91	206.78	0.00	0.93	0.424	442.24
13.300	1.32	205.72	207.58	0.00	0.93	0.426	442.24
13.500	1.20	208.27	210.15	0.00	0.94	0.431	442.26
13.550	1.17	208.76	210.64	0.00	0.94	0.432	442.26
13.600	1.14	209.19	211.08	0.00	0.94	0.433	442.26
13.650	1.12	209.56	211.45	0.00	0.94	0.434	442.26
13.700	1.09	209.88	211.77	0.00	0.94	0.434	442.27
13.750	1.07	210.15	212.04	0.00	0.95	0.435	442.27
13.800	1.05	210.38	212.27	0.00	0.95	0.435	442.27
13.850	1.02	210.56	212.45	0.00	0.95	0.436	442.27
13.900	1.00	210.69	212.58	0.00	0.95	0.436	442.27
13.950	0.98	210.78	212.67	0.00	0.95	0.436	442.27
14.000	0.96	210.83	212.72	0.00	0.95	0.436	442.27
14.050	0.94	210.84	212.73	0.00	0.95	0.436	442.27
14.100	0.92	210.80	212.70	0.00	0.95	0.436	442.27
14.150	0.90	210.73	212.62	0.00	0.95	0.436	442.27
14.200	0.89	210.63	212.52	0.00	0.95	0.436	442.27
14.250	0.87	210.50	212.39	0.00	0.95	0.436	442.27
14.500	0.83	209.56	211.45	0.00	0.94	0.434	442.26
15.000	0.76	206.69	208.56	0.00	0.94	0.428	442.25
15.500	0.69	202.56	204.41	0.00	0.93	0.419	442.23
16.000	0.61	197.16	198.98	0.00	0.91	0.408	442.20
16.500	0.56	190.69	192.48	0.00	0.90	0.395	442.16
17.000	0.53	183.91	185.67	0.00	0.88	0.381	442.13
18.000	0.48	169.81	171.49	0.00	0.84	0.352	442.05
19.000	0.42	154.97	156.57	0.00	0.80	0.322	441.97
20.000	0.36	139.95	141.42	0.00	0.74	0.290	441.88
21.000	0.34	125.43	126.80	0.00	0.68	0.259	441.80
22.000	0.33	112.60	113.86	0.00	0.63	0.233	441.73
23.000	0.32	101.23	102.40	0.00	0.59	0.209	441.66
24.000	0.31	91.11	92.20	0.00	0.55	0.188	441.61
24.050	0.30	90.62	91.71	0.00	0.54	0.187	441.60
24.100	0.27	90.10	91.18	0.00	0.54	0.186	441.60
24.150	0.21	89.50	90.58	0.00	0.54	0.185	441.60
24.200	0.15	88.79	89.86	0.00	0.54	0.184	441.59
24.250	0.10	87.97	89.04	0.00	0.53	0.182	441.59
24.300	0.06	87.07	88.14	0.00	0.53	0.180	441.58
24.350	0.04	86.12	87.18	0.00	0.53	0.178	441.58
24.400	0.03	85.15	86.19	0.00	0.52	0.176	441.57
24.450	0.02	84.15	85.19	0.00	0.52	0.174	441.57
24.500	0.01	83.15	84.18	0.00	0.52	0.172	441.56
24.550	0.01	82.14	83.16	0.00	0.51	0.170	441.56
24.600	0.00	81.14	82.15	0.00	0.51	0.168	441.55
25.000	0.00	73.31	74.26	0.00	0.48	0.152	441.51
26.000	0.00	56.51	57.25	0.00	0.37	0.112	441.39
27.000	0.00	43.57	44.14	0.00	0.29	0.082	441.30
28.000	0.00	33.59	34.03	0.00	0.22	0.061	441.23
29.000	0.00	25.89	26.23	0.00	0.17	0.045	441.18
30.000	0.00	19.96	20.22	0.00	0.13	0.034	441.14
31.000	0.00	15.39	15.59	0.00	0.10	0.026	441.11
32.000	0.00	11.86	12.02	0.00	0.08	0.020	441.08
33.000	0.00	9.15	9.27	0.00	0.06	0.015	441.06
34.000	0.00	7.05	7.14	0.00	0.05	0.011	441.05
35.000	0.00	5.44	5.51	0.00	0.04	0.009	441.04
36.000	0.00	4.19	4.24	0.00	0.03	0.007	441.03
37.000	0.00	3.23	3.27	0.00	0.02	0.005	441.02
38.000	0.00	2.49	2.52	0.00	0.02	0.004	441.02
40.000	0.00	1.48	1.50	0.00	0.01	0.002	441.01
41.900	0.00	0.90	0.91	0.00	0.01	0.001	441.01
41.950	0.00	0.89	0.90	0.00	0.01	0.001	441.01
42.000	0.00	0.88	0.89	0.00	0.01	0.001	441.01
42.050	0.00	0.87	0.88	0.00	0.01	0.001	441.01
42.100	0.00	0.86	0.87	0.00	0.01	0.001	441.01
42.150	0.00	0.85	0.86	0.00	0.01	0.001	441.01
42.200	0.00	0.83	0.85	0.00	0.01	0.001	441.01
42.250	0.00	0.82	0.83	0.00	0.01	0.001	441.01

POND 'A' 10-YR ROUTING SUMMARY

Infiltration

Infiltration Method (Computed)	No Infiltration

Initial Conditions

Elevation (Water Surface, Initial)	441.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary

Flow (Peak In)	46.03 ft³/s	Time to Peak (Flow, In)	12.050 hours
Flow (Peak Outlet)	17.73 ft³/s	Time to Peak (Flow, Outlet)	12.300 hours

Elevation (Water Surface, Peak)	444.29 ft
Volume (Peak)	1.308 ac-ft

Mass Balance (ac-ft)

Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	3.363 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	3.363 ac-ft
Volume (Retained)	0.000 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

POND 'A' 10-YR ROUTING CALCULATIONS

Pond Routing Calculations (Total Out)

Time (hours)	Flow (Total In) (ft³/s)	2S/t - O (ft³/s)	2S/t + O (ft³/s)	Infiltration (ft³/s)	Flow (Outlet) (ft³/s)	Volume (ac-ft)	Elevation (ft)
0.000	0.00	0.00	0.00	0.00	0.00	0.000	441.00
9.150	0.00	0.00	0.00	0.00	0.00	0.000	441.00
9.200	0.00	0.00	0.00	0.00	0.00	0.000	441.00
9.500	0.02	0.05	0.05	0.00	0.00	0.000	441.00
9.750	0.08	0.49	0.49	0.00	0.00	0.001	441.00
10.000	0.15	1.55	1.57	0.00	0.01	0.002	441.01
10.250	0.26	3.43	3.48	0.00	0.02	0.005	441.02
10.500	0.41	6.40	6.48	0.00	0.04	0.010	441.04
10.750	0.60	10.79	10.93	0.00	0.07	0.018	441.07
11.000	0.89	17.22	17.44	0.00	0.11	0.029	441.12
11.050	0.95	18.81	19.06	0.00	0.12	0.032	441.13
11.100	1.03	20.53	20.79	0.00	0.13	0.035	441.14
11.150	1.11	22.37	22.67	0.00	0.15	0.039	441.15
11.200	1.21	24.38	24.70	0.00	0.16	0.042	441.17
11.250	1.32	26.56	26.91	0.00	0.17	0.047	441.18
11.300	1.45	28.96	29.34	0.00	0.19	0.051	441.20
11.350	1.59	31.58	32.00	0.00	0.21	0.057	441.22
11.400	1.74	34.46	34.91	0.00	0.23	0.062	441.24
11.450	1.90	37.60	38.09	0.00	0.25	0.069	441.26
11.500	2.08	41.04	41.58	0.00	0.27	0.076	441.28
11.550	2.35	44.88	45.47	0.00	0.29	0.085	441.31
11.600	2.87	49.46	50.11	0.00	0.32	0.095	441.34
11.650	3.83	55.44	56.16	0.00	0.36	0.109	441.38
11.700	5.43	63.87	64.70	0.00	0.42	0.130	441.44
11.750	7.98	76.30	77.28	0.00	0.49	0.158	441.52
11.800	11.54	94.69	95.82	0.00	0.56	0.196	441.63
11.850	16.82	121.72	123.05	0.00	0.67	0.252	441.78
11.900	24.39	161.28	162.92	0.00	0.82	0.335	442.01
11.950	33.60	217.34	219.27	0.00	0.96	0.450	442.31
12.000	41.77	290.46	292.71	0.00	1.13	0.601	442.69
12.050	46.03	375.68	378.26	0.00	1.29	0.778	443.11
12.100	45.03	463.89	466.74	0.00	1.43	0.961	443.54
12.150	38.76	539.22	547.67	0.00	4.23	1.122	443.89
12.200	31.00	585.97	608.97	0.00	11.50	1.233	444.13
12.250	23.91	608.47	640.88	0.00	16.20	1.289	444.25
12.300	18.87	615.79	651.25	0.00	17.73	1.308	444.29
12.350	15.43	614.96	650.08	0.00	17.56	1.305	444.28
12.400	12.93	610.19	643.32	0.00	16.56	1.294	444.26
12.450	11.15	603.81	634.26	0.00	15.23	1.278	444.22
12.500	9.74	597.06	624.69	0.00	13.82	1.261	444.19
12.550	8.59	590.50	615.39	0.00	12.45	1.245	444.15
12.600	7.68	584.41	606.77	0.00	11.18	1.229	444.12
12.650	6.92	578.94	599.00	0.00	10.03	1.216	444.09
12.700	6.31	574.11	592.16	0.00	9.02	1.204	444.07
12.750	5.84	569.96	586.27	0.00	8.16	1.194	444.05
12.800	5.48	566.44	581.28	0.00	7.42	1.185	444.03
12.850	5.20	563.50	577.12	0.00	6.81	1.178	444.01
12.900	4.97	561.08	573.68	0.00	6.30	1.172	444.00
12.950	4.78	558.70	570.83	0.00	6.06	1.167	443.99
13.000	4.60	556.39	568.09	0.00	5.85	1.162	443.98
13.250	3.89	546.14	555.90	0.00	4.88	1.138	443.93
13.500	3.42	538.40	546.70	0.00	4.15	1.121	443.89
13.750	3.03	532.52	539.70	0.00	3.59	1.107	443.86
14.000	2.70	527.88	534.20	0.00	3.16	1.097	443.84
14.250	2.44	524.12	529.73	0.00	2.80	1.088	443.82
14.500	2.31	521.44	526.54	0.00	2.55	1.082	443.81
15.000	2.10	518.17	522.66	0.00	2.24	1.075	443.79
15.500	1.88	515.71	519.73	0.00	2.01	1.070	443.78
16.000	1.65	513.34	516.91	0.00	1.78	1.064	443.77
17.000	1.43	510.16	513.15	0.00	1.49	1.057	443.75
18.000	1.28	504.74	507.72	0.00	1.49	1.046	443.72
19.000	1.11	493.36	496.30	0.00	1.47	1.022	443.67
20.000	0.94	476.17	479.06	0.00	1.45	0.986	443.59
21.000	0.88	455.09	457.92	0.00	1.42	0.943	443.49
22.000	0.85	433.89	436.65	0.00	1.38	0.898	443.39
23.000	0.82	412.80	415.49	0.00	1.35	0.854	443.29
24.000	0.79	391.79	394.41	0.00	1.31	0.811	443.19
24.250	0.26	384.52	387.13	0.00	1.30	0.796	443.16
24.500	0.03	372.66	375.23	0.00	1.28	0.772	443.10
24.600	0.01	367.62	370.17	0.00	1.28	0.761	443.07
24.650	0.01	365.10	367.64	0.00	1.27	0.756	443.06
24.700	0.00	362.57	365.11	0.00	1.27	0.751	443.05
25.000	0.00	347.55	350.03	0.00	1.24	0.720	442.98
26.000	0.00	299.89	302.18	0.00	1.15	0.621	442.73
27.000	0.00	255.85	257.97	0.00	1.06	0.531	442.51
28.000	0.00	215.59	217.50	0.00	0.96	0.446	442.30
29.000	0.00	179.20	180.93	0.00	0.87	0.371	442.10
30.000	0.00	146.51	148.04	0.00	0.76	0.304	441.92
32.000	0.00	94.21	95.33	0.00	0.56	0.195	441.63
34.000	0.00	56.74	57.48	0.00	0.37	0.112	441.39
36.000	0.00	33.72	34.16	0.00	0.22	0.061	441.23
38.000	0.00	20.04	20.30	0.00	0.13	0.034	441.14
40.000	0.00	11.91	12.07	0.00	0.08	0.020	441.08
42.000	0.00	7.08	7.17	0.00	0.05	0.011	441.05
44.000	0.00	4.21	4.26	0.00	0.03	0.007	441.03
46.000	0.00	2.50	2.53	0.00	0.02	0.004	441.02
48.000	0.00	1.49	1.51	0.00	0.01	0.002	441.01
50.000	0.00	0.88	0.89	0.00	0.01	0.001	441.01
51.250	0.00	0.64	0.65	0.00	0.00	0.001	441.00
51.450	0.00	0.61	0.61	0.00	0.00	0.001	441.00
51.500	0.00	0.60	0.61	0.00	0.00	0.001	441.00
51.650	0.00	0.57	0.58	0.00	0.00	0.001	441.00
51.700	0.00	0.57	0.57	0.00	0.00	0.001	441.00
51.750	0.00	0.56	0.57	0.00	0.00	0.001	441.00

POND 'A' 100-YR ROUTING SUMMARY

*100-YR STORM WAS ROUTED THROUGH POND ASSUMING LOW FLOW ORIFICE WAS 100% CLOGGED.

Infiltration

Infiltration Method (Computed)	No Infiltration

Initial Conditions

Elevation (Water Surface, Initial)	441.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary

Flow (Peak In)	108.92 ft³/s	Time to Peak (Flow, In)	12.050 hours
Flow (Peak Outlet)	71.96 ft³/s	Time to Peak (Flow, Outlet)	12.200 hours

Elevation (Water Surface, Peak)	445.97 ft
Volume (Peak)	2.179 ac-ft

Mass Balance (ac-ft)

Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	7.894 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	6.836 ac-ft
Volume (Retained)	1.057 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

POND 'A' 100-YR ROUTING CALCULATIONS

Pond Routing Calculations (Total Out)

Time (hours)	Flow (Total In) (ft³/s)	2S/t - O (ft³/s)	2S/t + O (ft³/s)	Infiltration (ft³/s)	Flow (Outlet) (ft³/s)	Volume (ac-ft)	Elevation (ft)
0.000	0.00	0.00	0.00	0.00	0.00	0.000	441.00
6.500	0.00	0.00	0.00	0.00	0.00	0.000	441.00
7.000	0.06	0.32	0.32	0.00	0.00	0.001	441.00
7.500	0.19	2.82	2.82	0.00	0.00	0.004	441.02
8.000	0.34	8.18	8.18	0.00	0.00	0.013	441.06
8.500	0.56	16.96	16.96	0.00	0.00	0.028	441.12
9.000	0.89	31.24	31.24	0.00	0.00	0.056	441.21
9.500	1.19	52.27	52.27	0.00	0.00	0.101	441.36
10.000	1.63	79.78	79.78	0.00	0.00	0.164	441.54
10.500	2.47	120.14	120.14	0.00	0.00	0.247	441.77
11.000	3.95	182.88	182.88	0.00	0.00	0.377	442.12
11.500	7.37	290.54	290.54	0.00	0.00	0.599	442.68
11.550	8.14	306.05	306.05	0.00	0.00	0.631	442.76
11.600	9.68	323.87	323.87	0.00	0.00	0.668	442.85
11.650	12.49	346.04	346.04	0.00	0.00	0.715	442.96
11.700	17.08	375.61	375.61	0.00	0.00	0.775	443.11
11.750	24.07	416.76	416.76	0.00	0.00	0.860	443.30
11.800	33.38	474.20	474.20	0.00	0.00	0.979	443.58
11.850	46.41	547.38	553.99	0.00	3.31	1.137	443.93
11.900	64.08	623.27	657.87	0.00	17.30	1.322	444.32
11.950	84.60	698.36	771.95	0.00	36.80	1.517	444.72
12.000	101.57	772.27	884.52	0.00	56.13	1.711	445.10
12.050	108.92	846.92	982.75	0.00	67.92	1.890	445.44
12.100	104.40	918.43	1,060.24	0.00	70.91	2.043	445.73
12.150	88.61	967.99	1,111.43	0.00	71.72	2.147	445.92
12.200	70.14	982.81	1,126.73	0.00	71.96	2.179	445.97
12.250	53.60	963.27	1,106.55	0.00	71.64	2.137	445.90
12.300	41.95	917.06	1,058.83	0.00	70.88	2.040	445.72
12.350	33.98	854.71	993.00	0.00	69.14	1.909	445.48
12.400	28.23	796.89	916.92	0.00	60.01	1.769	445.21
12.450	24.16	746.41	849.29	0.00	51.44	1.648	444.98
12.500	20.97	710.53	791.54	0.00	40.51	1.550	444.78
12.550	18.39	684.65	749.89	0.00	32.62	1.481	444.64
12.600	16.35	665.70	719.39	0.00	26.85	1.430	444.54
12.650	14.67	650.74	696.72	0.00	22.99	1.392	444.46
12.700	13.33	638.02	678.73	0.00	20.36	1.359	444.40
12.750	12.31	627.37	663.67	0.00	18.15	1.332	444.34
12.800	11.52	618.56	651.20	0.00	16.32	1.310	444.29
12.850	10.90	611.33	640.97	0.00	14.82	1.292	444.26
12.900	10.41	605.44	632.64	0.00	13.60	1.278	444.22
12.950	10.00	600.63	625.85	0.00	12.61	1.266	444.20
13.000	9.62	596.67	620.25	0.00	11.79	1.256	444.18
13.050	9.26	593.35	615.55	0.00	11.10	1.248	444.16
13.100	8.92	590.51	611.53	0.00	10.51	1.241	444.15
13.150	8.61	588.05	608.05	0.00	10.00	1.235	444.13
13.200	8.34	585.89	605.00	0.00	9.55	1.229	444.12
13.250	8.08	584.00	602.31	0.00	9.16	1.225	444.11
13.300	7.86	582.32	599.94	0.00	8.81	1.220	444.10
13.350	7.65	580.83	597.83	0.00	8.50	1.217	444.10
13.400	7.46	579.49	595.94	0.00	8.22	1.213	444.09
13.450	7.27	578.27	594.21	0.00	7.97	1.210	444.08
13.500	7.08	577.14	592.62	0.00	7.74	1.208	444.08
13.550	6.89	576.08	591.12	0.00	7.52	1.205	444.07
13.600	6.72	575.07	589.69	0.00	7.31	1.203	444.07
13.650	6.55	574.12	588.34	0.00	7.11	1.200	444.06
13.700	6.39	573.20	587.05	0.00	6.92	1.198	444.06
13.750	6.23	572.34	585.82	0.00	6.74	1.196	444.05
13.800	6.09	571.52	584.66	0.00	6.57	1.194	444.05
13.850	5.95	570.74	583.56	0.00	6.41	1.192	444.04
13.900	5.81	569.99	582.50	0.00	6.26	1.190	444.04
13.950	5.68	569.27	581.48	0.00	6.11	1.188	444.04
14.000	5.55	568.57	580.50	0.00	5.96	1.187	444.03
14.500	4.72	563.48	573.30	0.00	4.91	1.174	444.00
15.000	4.27	560.19	569.18	0.00	4.49	1.167	443.99
15.500	3.81	555.62	563.76	0.00	4.07	1.156	443.97
16.000	3.34	550.71	557.94	0.00	3.61	1.145	443.94
16.500	3.05	546.44	552.87	0.00	3.22	1.135	443.92
17.000	2.88	544.01	550.00	0.00	2.99	1.130	443.91
18.000	2.55	540.32	545.62	0.00	2.65	1.121	443.89
19.000	2.22	536.71	541.34	0.00	2.32	1.113	443.87
20.000	1.88	533.07	537.02	0.00	1.98	1.105	443.85
21.000	1.75	530.90	534.46	0.00	1.78	1.100	443.84
22.000	1.69	530.13	533.55	0.00	1.71	1.099	443.84
23.000	1.62	529.42	532.70	0.00	1.64	1.097	443.84
24.000	1.55	528.71	531.85	0.00	1.57	1.095	443.83
24.500	0.05	518.77	520.07	0.00	0.65	1.073	443.78
24.550	0.03	517.75	518.86	0.00	0.56	1.071	443.78
24.600	0.02	516.86	517.80	0.00	0.47	1.069	443.78
24.650	0.01	516.09	516.89	0.00	0.40	1.067	443.77
24.700	0.01	515.43	516.11	0.00	0.34	1.066	443.77
24.750	0.00	514.86	515.44	0.00	0.29	1.064	443.77
25.000	0.00	513.09	513.33	0.00	0.12	1.060	443.76
25.500	0.00	512.00	512.04	0.00	0.02	1.058	443.75
26.000	0.00	511.80	511.81	0.00	0.00	1.057	443.75
26.050	0.00	511.79	511.80	0.00	0.00	1.057	443.75
26.100	0.00	511.79	511.79	0.00	0.00	1.057	443.75
26.150	0.00	511.78	511.79	0.00	0.00	1.057	443.75
26.200	0.00	511.78	511.78	0.00	0.00	1.057	443.75
26.250	0.00	511.77	511.78	0.00	0.00	1.057	443.75

Bowman

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SWM CALCULATIONS
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION
DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: N/A V: N/A
JOB No. 6642-02-002
DATE : FEBRUARY 10, 2023
FILE No. 6642-D-CP-001

BIORETENTION 'A' ELEVATION VOLUME TABLE

Pond Elevation (ft)	Pond Volume (ac-ft)
507.50	0.000
508.75	0.049
512.00	0.128
512.50	0.178
513.00	0.242
514.00	0.407

BIORETENTION 'A' OUTLET STRUCTURE INPUT

Requested Pond Water Surface Elevations

Minimum (Headwater)	507.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	514.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	Culvert - 1	Forward	TW	508.00	514.00
Irregular Weir	Weir - 1	Forward	TW	513.00	514.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Culvert - 1
Structure Type: Culvert-Circular

Number of Barrels	1
Diameter	6.0 in
Length	38.00 ft
Length (Computed Barrel)	38.00 ft
Slope (Computed)	0.005 ft/ft

Outlet Control Data

Manning's n	0.010
Ke	0.500
Kb	0.047
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data

Equation Form	Form 1
K	0.0098
M	2.0000
C	0.0398
Y	0.6700
T1 ratio (HW/D)	1.157
T2 ratio (HW/D)	1.304
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,

T1 Elevation	508.58 ft	T1 Flow	0.49 ft³/s
T2 Elevation	508.65 ft	T2 Flow	0.56 ft³/s

Structure ID: Weir - 1
Structure Type: Irregular Weir

Station (ft)	Elevation (ft)
0.00	514.00
3.00	513.00
7.00	513.00
10.00	514.00

Lowest Elevation	513.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: TW
Structure Type: TW Setup, DS Channel

Tailwater Type	Free Outfall

Convergence Tolerances

Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

BIORETENTION 'A' OUTLET STRUCTURE RATING TABLE

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
507.50	0.00	(N/A)	0.00	None Contributing
508.00	0.00	(N/A)	0.00	None Contributing
508.50	0.37	(N/A)	0.00	Culvert - 1
509.00	0.74	(N/A)	0.00	Culvert - 1
509.50	0.95	(N/A)	0.00	Culvert - 1
510.00	1.13	(N/A)	0.00	Culvert - 1
510.50	1.29	(N/A)	0.00	Culvert - 1
511.00	1.43	(N/A)	0.00	Culvert - 1
511.50	1.56	(N/A)	0.00	Culvert - 1
512.00	1.67	(N/A)	0.00	Culvert - 1
512.50	1.78	(N/A)	0.00	Culvert - 1
513.00	1.89	(N/A)	0.00	Culvert - 1 + Weir - 1
513.50	7.35	(N/A)	0.00	Culvert - 1 + Weir - 1
514.00	20.44	(N/A)	0.00	Culvert - 1 + Weir - 1

BIORETENTION 'A' E-V-Q TABLE

Infiltration

Infiltration Method (Computed)	No Infiltration

Initial Conditions

Elevation (Water Surface, Initial)	507.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (acres)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
507.50	0.00	0.000	0.000	0.00	0.00	0.00
508.00	0.00	0.020	0.000	0.00	0.00	9.47
508.50	0.37	0.039	0.000	0.00	0.37	19.31
509.00	0.74	0.055	0.000	0.00	0.74	27.38
509.50	0.95	0.067	0.000	0.00	0.95	33.51
510.00	1.13	0.079	0.000	0.00	1.13	39.61
510.50	1.29	0.092	0.000	0.00	1.29	45.69
511.00	1.43	0.104	0.000	0.00	1.43	51.75
511.50	1.56	0.116	0.000	0.00	1.56	57.79
512.00	1.67	0.128	0.000	0.00	1.67	63.83
512.50	1.78	0.178	0.000	0.00	1.78	87.95
513.00	1.89	0.242	0.000	0.00	1.89	118.86
513.50	7.35	0.324	0.000	0.00	7.35	164.34
514.00	20.44	0.407	0.000	0.00	20.44	217.44

BIORETENTION 'A' 1-YR ROUTING SUMMARY

Infiltration

Infiltration Method (Computed)	No Infiltration

Initial Conditions

Elevation (Water Surface, Initial)	507.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary

Flow (Peak In)	4.65 ft³/s	Time to Peak (Flow, In)	12.050 hours
Flow (Peak Outlet)	1.41 ft³/s	Time to Peak (Flow, Outlet)	12.350 hours
Elevation (Water Surface, Peak)	510.91 ft		
Volume (Peak)	0.102 ac-ft		

Mass Balance (ac-ft)

Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	0.339 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	0.320 ac-ft
Volume (Retained)	0.020 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

BIORETENTION 'A' 1-YR ROUTING CALCULATIONS

Pond Routing Calculations (Total Out)

Time (hours)	Flow (Total In) (ft³/s)	2S/t - O (ft³/s)	2S/t + O (ft³/s)	Infiltration (ft³/s)	Flow (Outlet) (ft³/s)	Volume (ac-ft)	Elevation (ft)
0.000	0.00	0.00	0.00	0.00	0.00	0.000	507.50
11.300	0.01	0.01	0.01	0.00	0.00	0.000	507.50
11.350	0.01	0.03	0.03	0.00	0.00	0.000	507.50
11.400	0.02	0.07	0.07	0.00	0.00	0.000	507.50
11.450	0.03	0.12	0.12	0.00	0.00	0.000	507.51
11.500	0.04	0.20	0.20	0.00	0.00	0.000	507.51
11.550	0.06	0.31	0.31	0.00	0.00	0.001	507.52
11.600	0.10	0.46	0.46	0.00	0.00	0.001	507.52
11.650	0.16	0.72	0.72	0.00	0.00	0.001	507.54
11.700	0.28	1.16	1.16	0.00	0.00	0.002	507.56
11.750	0.48	1.91	1.91	0.00	0.00	0.004	507.60
11.800	0.80	3.19	3.19	0.00	0.00	0.007	507.67
11.850	1.31	5.31	5.31	0.00	0.00	0.011	507.78
11.900	2.16	8.78	8.78	0.00	0.00	0.018	507.96
11.950	3.22	13.80	14.15	0.00	0.17	0.029	508.24
12.000	4.14	20.26	21.16	0.00	0.45	0.044	508.61
12.050	4.65	27.45	29.05	0.00	0.80	0.058	509.14
12.100	4.41	34.43	36.52	0.00	1.04	0.073	509.75
12.150	3.69	40.12	42.54	0.00	1.21	0.085	510.24
12.200	2.87	44.06	46.68	0.00	1.31	0.094	510.58
12.250	2.18	46.37	49.10	0.00	1.37	0.099	510.78
12.300	1.75	47.50	50.29	0.00	1.40	0.101	510.88
12.350	1.45	47.89	50.71	0.00	1.41	0.102	510.91
12.400	1.25	47.79	50.60	0.00	1.40	0.102	510.91
12.450	1.10	47.36	50.14	0.00	1.39	0.101	510.87
12.500	0.98	46.68	49.43	0.00	1.38	0.099	510.81
12.550	0.87	45.82	48.53	0.00	1.36	0.097	510.73
12.600	0.79	44.82	47.48	0.00	1.33	0.095	510.65
12.650	0.72	43.72	46.33	0.00	1.30	0.093	510.55
12.700	0.67	42.55	45.10	0.00	1.28	0.091	510.45
12.750	0.62	41.36	43.84	0.00	1.24	0.088	510.35
12.800	0.59	40.16	42.58	0.00	1.21	0.085	510.24
12.850	0.57	38.97	41.32	0.00	1.18	0.083	510.14
12.900	0.55	37.80	40.09	0.00	1.15	0.080	510.04
12.950	0.53	36.65	38.88	0.00	1.11	0.078	509.94
13.000	0.51	35.54	37.70	0.00	1.08	0.076	509.84
13.050	0.50	34.46	36.55	0.00	1.04	0.073	509.75
13.100	0.48	33.41	35.44	0.00	1.01	0.071	509.66
13.150	0.46	32.40	34.36	0.00	0.98	0.069	509.57
13.200	0.45	31.42	33.31	0.00	0.95	0.067	509.48
13.250	0.44	30.48	32.31	0.00	0.91	0.065	509.40
13.300	0.43	29.59	31.35	0.00	0.88	0.063	509.32
13.350	0.42	28.74	30.44	0.00	0.85	0.061	509.25
13.400	0.41	27.94	29.57	0.00	0.82	0.059	509.18
13.450	0.40	27.17	28.74	0.00	0.79	0.058	509.11
13.500	0.39	26.44	27.96	0.00	0.76	0.056	509.05
13.750	0.35	23.40	24.63	0.00	0.61	0.051	508.83
14.000	0.31	21.25	22.26	0.00	0.50	0.046	508.68
14.250	0.28	19.69	20.53	0.00	0.42	0.042	508.58
14.500	0.27	18.58	19.31	0.00	0.37	0.039	508.50
14.750	0.26	17.77	18.43	0.00	0.33	0.037	508.46
15.000	0.25	17.12	17.73	0.00	0.31	0.036	508.42
15.500	0.22	16.12	16.65	0.00	0.27	0.034	508.37
16.000	0.20	15.32	15.79	0.00	0.23	0.032	508.32
16.500	0.18	14.66	15.08	0.00	0.21	0.031	508.29
17.000	0.17	14.22	14.60	0.00	0.19	0.030	508.26
18.000	0.15	13.63	13.97	0.00	0.17	0.029	508.23
19.000	0.13	13.14	13.43	0.00	0.15	0.027	508.20
20.000	0.11	12.65	12.90	0.00	0.13	0.026	508.17
21.000	0.11	12.30	12.52	0.00	0.11	0.026	508.16
22.000	0.10	12.15	12.36	0.00	0.11	0.025	508.15
23.000	0.10	12.05	12.26	0.00	0.10	0.025	508.14
24.000	0.10	11.96	12.16	0.00	0.10	0.025	508.14
24.050	0.09	11.95	12.15	0.00	0.10	0.025	508.14
24.100	0.08	11.93	12.12	0.00	0.10	0.025	508.13
24.150	0.06	11.88	12.07	0.00	0.10	0.025	508.13
24.200	0.04	11.79	11.98	0.00	0.09	0.025	508.13
24.250	0.02	11.68	11.86	0.00	0.09	0.024	508.12
24.300	0.01	11.55	11.72	0.00	0.08	0.024	508.11
24.350	0.01	11.42	11.57	0.00	0.08	0.024	508.11
24.400	0.01	11.29	11.43	0.00	0.07	0.023	508.10
24.450	0.00	11.16	11.30	0.00	0.07	0.023	508.09
25.000	0.00	10.20	10.26	0.00	0.03	0.021	508.04
25.500	0.00	9.81	9.84	0.00	0.01	0.020	508.02
26.000	0.00	9.63	9.64	0.00	0.01	0.020	508.01
26.050	0.00	9.62	9.63	0.00	0.01	0.020	508.01
26.100	0.00	9.60	9.62	0.00	0.01	0.020	508.01
26.150	0.00	9.59	9.60	0.00	0.00	0.020	508.01
26.200	0.00	9.59	9.59	0.00	0.00	0.020	508.01
26.250	0.00	9.58	9.59	0.00	0.00	0.020	508.01

BIORETENTION 'A' 10-YR ROUTING SUMMARY

Infiltration

Infiltration Method (Computed)	No Infiltration

Initial Conditions

Elevation (Water Surface, Initial)	507.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary

Flow (Peak In)	15.56 ft³/s	Time to Peak (Flow, In)	12.050 hours
Flow (Peak Outlet)	8.80 ft³/s	Time to Peak (Flow, Outlet)	12.200 hours
Elevation (Water Surface, Peak)	513.56 ft		
Volume (Peak)	0.333 ac-ft		

Mass Balance (ac-ft)

Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	1.070 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	1.050 ac-ft
Volume (Retained)	0.020 ac-ft
Volume (Unrouted)	0.000 ac-ft
Error (Mass Balance)	0.0 %

BIORETENTION 'A' 10-YR ROUTING CALCULATIONS

Pond Routing Calculations (Total Out)

Time (hours)	Flow (Total In) (ft³/s)	2S/t - O (ft³/s)	2S/t + O (ft³/s)	Infiltration (ft³/s)	Flow (Outlet) (ft³/s)	Volume (ac-ft)	Elevation (ft)
0.000	0.00	0.00	0.00	0.00	0.00	0.000	507.50
8.750	0.01	0.02	0.02	0.00	0.00	0.000	507.50
9.000	0.02	0.15	0.15	0.00	0.00	0.000	507.51
9.250	0.04	0.46	0.46	0.00	0.00	0.001	507.52
9.500	0.06	0.96	0.96	0.00	0.00	0.002	507.55
9.750	0.08	1.66	1.66	0.00	0.00	0.003	507.59
10.000	0.11	2.62	2.62	0.00	0.00	0.005	507.64
10.250	0.15	3.93	3.93	0.00	0.00	0.008	507.71
10.500	0.21	5.71	5.71	0.00	0.00	0.012	507.80
10.750	0.28	8.11	8.11	0.00	0.00	0.017	507.93
10.800	0.30	8.69	8.69	0.00	0.00	0.018	507.96
10.850	0.32	9.30	9.30	0.00	0.00	0.019	507.99
10.900	0.34	9.92	9.96	0.00	0.02	0.021	508.02
10.950	0.36	10.53	10.61	0.00	0.04	0.022	508.06
11.000	0.38	11.14	11.27	0.00	0.07	0.023	508.09
11.050	0.41	11.74	11.92	0.00	0.09	0.024	508.12
11.100	0.43	12.35	12.58	0.00	0.12	0.026	508.16
11.150	0.46	12.96	13.24	0.00	0.14	0.027	508.19
11.200	0.50	13.59	13.92	0.00	0.17	0.028	508.23
11.250	0.54	14.25	14.63	0.00	0.19	0.030	508.26
11.300	0.59	14.94	15.38	0.00	0.22	0.031	508.30
11.350	0.64	15.66	16.16	0.00	0.25	0.033	508.34
11.400	0.69	16.43	16.99	0.00	0.28	0.035	508.38
11.450	0.75	17.24	17.86	0.00	0.31	0.036	508.43
11.500	0.81	18.10	18.80	0.00	0.35	0.038	508.47
11.550	0.91	19.05	19.82	0.00	0.39	0.040	508.53
11.600	1.13	20.19	21.08	0.00	0.45	0.043	508.61
11.650	1.51	21.77	22.82	0.00	0.53	0.048	508.72
11.700	2.17	24.15	25.45	0.00	0.65	0.052	508.88
11.750	3.13	27.83	29.45	0.00	0.81	0.059	509.17
11.800	4.50	33.43	35.46	0.00	1.01	0.071	509.66
11.850	6.38	41.80	44.31	0.00	1.25	0.089	510.39
11.900	9.13	54.22	57.31	0.00	1.55	0.115	511.46
11.950	12.29	72.18	75.63	0.00	1.73	0.153	512.24
12.000	14.67	95.49	99.13	0.00	1.82	0.201	512.68
12.050	15.56	120.30	125.72	0.00	2.71	0.254	513.08
12.100	14.23	138.81	150.08	0.00	5.64	0.298	513.34
12.150	11.59	149.78	164.63	0.00	7.42	0.325	513.50
12.200	8.83	152.61	170.21	0.00	8.80	0.333	513.56
12.250	6.60	151.51	168.04	0.00	8.26	0.330	513.53
12.300	5.21	148.86	163.32	0.00	7.23	0.322	513.49
12.350	4.25	145.07	158.32	0.00	6.63	0.313	513.43
12.400	3.61	140.97	152.93	0.00	5.98	0.304	513.37
12.450	3.12	136.99	147.70	0.00	5.35	0.294	513.32
12.500	2.75	133.33	142.87	0.00	4.77	0.285	513.26
12.550	2.44	130.02	138.52	0.00	4.25	0.277	513.22
12.600	2.19	127.09	134.66	0.00	3.78	0.270	513.17
12.650	1.98	124.51	131.27	0.00	3.38	0.264	513.14
12.700	1.83	122.28	128.32	0.00	3.02	0.259	513.10
12.750	1.71	120.37	125.81	0.00	2.72	0.254	513.08
12.800	1.62	118.76	123.69	0.00	2.47	0.250	513.05
12.850	1.55	117.42	121.93	0.00	2.25	0.247	513.03
12.900	1.49	116.31	120.46	0.00	2.08	0.245	513.02
12.950	1.44	115.37	119.23	0.00	1.93	0.242	513.00
13.000	1.38	114.42	118.19	0.00	1.88	0.240	512.99
13.250	1.17	108.41	112.14	0.00	1.86	0.228	512.89
13.500	1.03	100.94	104.61	0.00	1.84	0.212	512.77
13.750	0.91	92.43	96.05	0.00	1.81	0.195	512.63
14.000	0.81	83.15	86.70	0.00	1.78	0.175	512.47
14.250	0.74	73.37	76.83	0.00	1.73	0.155	512.27
14.500	0.70	63.50	66.87	0.00	1.69	0.135	512.06
14.550	0.69	61.54	64.89	0.00	1.68	0.131	512.02
14.750	0.67	54.18	57.27	0.00	1.54	0.115	511.46
15.000	0.63	46.31	49.04	0.00	1.37	0.099	510.78
15.500	0.57	34.56	36.66	0.00	1.05	0.074	509.76
16.000	0.50	27.21	28.79	0.00	0.79	0.058	509.12
16.500	0.46	23.12	24.31	0.00	0.60	0.050	508.81
17.000	0.43	21.23	22.24	0.00	0.50	0.046	508.68
17.500	0.41	20.23	21.13	0.00	0.45	0.044	508.61
18.000	0.38	19.56	20.39	0.00	0.42	0.042	508.57
19.000	0.33	18.49	19.21	0.00	0.36	0.039	508.50
20.000	0.28	17.33	17.96	0.00	0.32	0.036	508.43
21.000	0.27	16.44	17.00	0.00	0.28	0.035	508.38
22.000	0.26	16.06	16.58	0.00	0.26	0.034	508.36
23.000	0.25	15.79	16.29	0.00	0.25	0.033	508.35
24.000	0.24	15.54	16.02	0.00	0.24	0.033	508.33
24.250	0.06	14.85	15.28	0.00	0.22	0.031	508.30
24.300	0.04	14.54	14.95	0.00	0.20	0.030	508.28
24.350	0.02	14.22	14.60	0.00	0.19	0.030	508.26
24.400	0.01	13.90	14.25	0.00	0.18	0.029	508.24
24.450	0.01	13.59	13.92	0.00	0.17	0.028	508.23
24.500	0.00	13.30	13.60	0.00	0.15	0.028	508.21
24.750	0.00	12.08	12.29	0.00	0.10	0.025	508.14
25.000	0.00	11.25	11.39	0.00	0.07	0.023	508.10
25.500	0.00	10.29	10.36	0.00	0.03	0.021	508.05
26.000	0.00	9.85	9.88	0.00	0.02	0.020	508.02
26.500	0.00	9.65	9.66	0.00	0.01	0.020	508.01
26.550	0.00	9.63	9.65	0.00	0.01	0.020	508.01
26.600	0.00	9.62	9.63	0.00	0.01	0.020	508.01
26.650	0.00	9.61	9.62	0.00	0.01	0.020	508.01
26.700	0.00	9.60	9.61	0.00	0.01	0.020	508.01
26.750	0.00	9.59	9.60	0.00	0.00	0.020	508.01
26.800	0.00	9.58	9.59	0.00	0.00	0.020	508.01
26.850	0.00	9.57	9.58	0.00	0.00	0.020	508.01
26.900	0.00	9.57	9.57	0.00	0.00	0.020	508.01
26.950	0.00	9.56	9.57	0.00	0.00	0.020	508.00
27.000	0.00	9.55	9.56	0.00	0.00	0.020	508.00

Bowman

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SWM CALCULATIONS
TIFFANY ESTATES
CONSTRUCTION PLAN
FAUQUIER COUNTY, VIRGINIA
CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: N/A V: N/A

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 42 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\040-042-6642-D-CP-001-SWM.dwg

Worksheet for SHEET FLOW #1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.168 ft/ft
Discharge	1.31 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	512.06
0+00	512.03
0+04	511.70
0+19	511.86
0+25	511.87
0+31	511.87
0+36	511.99

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 512.06)	(0+36, 511.99)	0.030

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.1 ft
Roughness Coefficient	0.030
Elevation	511.80 ft
Elevation Range	511.7 to 512.1 ft
Flow Area	0.5 ft²
Wetted Perimeter	9.9 ft
Hydraulic Radius	0.0 ft
Top Width	9.93 ft
Normal Depth	0.1 ft
Critical Depth	0.1 ft
Critical Slope	0.032 ft/ft
Velocity	2.71 ft/s
Velocity Head	0.11 ft
Specific Energy	0.21 ft
Froude Number	2.165
Flow Type	Supercritical

Cross Section for SHEET FLOW #1

Worksheet for SHEET FLOW #2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.213 ft/ft
Discharge	3.62 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	491.98
0+02	491.73
0+04	491.58
0+09	491.33
0+14	491.32
0+22	491.62
0+25	491.91
0+27	492.16

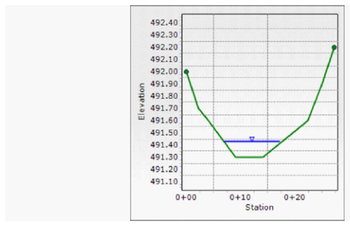
Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 491.98)	(0+27, 492.16)	0.030

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.1 ft
Roughness Coefficient	0.030
Elevation	491.43 ft
Elevation Range	491.3 to 492.2 ft
Flow Area	0.8 ft²
Wetted Perimeter	10.2 ft
Hydraulic Radius	0.1 ft
Top Width	10.22 ft
Normal Depth	0.1 ft
Critical Depth	0.2 ft
Critical Slope	0.026 ft/ft
Velocity	4.32 ft/s
Velocity Head	0.29 ft
Specific Energy	0.40 ft
Froude Number	2.661
Flow Type	Supercritical

Cross Section for SHEET FLOW #2



Worksheet for SHEET FLOW #3

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.219 ft/ft
Discharge	2.78 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	495.39
0+01	495.29
0+02	495.26
0+02	495.24
0+05	495.07
0+14	494.63
0+16	494.61
0+18	494.64
0+25	494.85
0+43	495.40

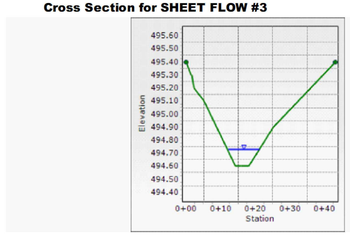
Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 495.39)	(0+43, 495.40)	0.030

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.1 ft
Roughness Coefficient	0.030
Elevation	494.73 ft
Elevation Range	494.6 to 495.4 ft
Flow Area	0.7 ft²
Wetted Perimeter	9.1 ft
Hydraulic Radius	0.1 ft
Top Width	9.07 ft
Normal Depth	0.1 ft
Critical Depth	0.2 ft
Critical Slope	0.027 ft/ft
Velocity	4.11 ft/s
Velocity Head	0.26 ft
Specific Energy	0.39 ft
Froude Number	2.655
Flow Type	Supercritical

Cross Section for SHEET FLOW #3



Worksheet for SHEET FLOW #4

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.198 ft/ft
Discharge	2.38 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	497.49
0+02	497.33
0+05	497.08
0+12	497.03
0+20	497.34
0+20	497.32
0+22	497.38
0+25	497.47
0+25	497.48

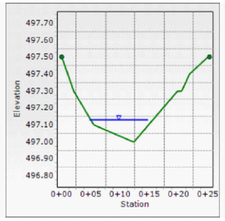
Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 497.49)	(0+25, 497.48)	0.030

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	0.1 ft
Roughness Coefficient	0.030
Elevation	497.13 ft
Elevation Range	497.0 to 497.5 ft
Flow Area	0.7 ft²
Wetted Perimeter	10.0 ft
Hydraulic Radius	0.1 ft
Top Width	9.95 ft
Normal Depth	0.1 ft
Critical Depth	0.2 ft
Critical Slope	0.028 ft/ft
Velocity	3.61 ft/s
Velocity Head	0.20 ft
Specific Energy	0.30 ft
Froude Number	2.475
Flow Type	Supercritical

Cross Section for SHEET FLOW #4



Worksheet for LEVEL SPREADER

Project Description	
Solve For	Headwater Elevation

Input Data	
Discharge	10.95 cfs
Crest Elevation	455.27 ft
Tailwater Elevation	455.27 ft
Weir Coefficient	3.33 ft^(1/2)/s
Crest Length	100.0 ft
Number Of Contractions	0

Results	
Headwater Elevation	455.37 ft
Headwater Height Above Crest	0.10 ft
Tailwater Height Above Crest	0.00 ft
Flow Area	10.3 ft²
Velocity	1.07 ft/s
Wetted Perimeter	100.2 ft
Top Width	100.00 ft

Bowman

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SWM CALCULATIONS
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

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11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD
SCALE	H: N/A V: N/A	

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 42A OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\040-042-6642-D-CP-001-SWM.dwg

MEDIA POROSITY	
SOIL MEDIA =	0.25
GRAVEL =	0.40
SURFACE PONDING =	1.00

BIORETENTION 'A' MEDIA VOLUME CALCULATIONS

LAYER DESCRIPTION	SURFACE AREA (FT^2)	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	DEPTH (FT)	VOLUME (CF)	NOTES
MULCH	4,262	512.00	511.75	0.25	266.38	POROSITY 0.25
SOIL	4,262	511.75	508.75	3.00	3196.50	POROSITY 0.25
CHOKER STONE	4,262	508.75	508.50	0.25	426.20	POROSITY 0.40
STONE RESERVOIR	4,262	508.50	507.50	1.00	1704.80	POROSITY 0.40
				TOTAL=	5593.88	

BIORETENTION 'A' ELEVATION-VOLUME TABLE

ELEVATION	AREA (FT^2)	INCREMENTAL VOLUME (CF)	CUMULATIVE VOLUME (CF)	NOTES
507.50	4262	0.00	0.00	
508.75	4262	2131.00	2131.00	
512.00	4262	3462.88	5593.88	
512.50	4381	2160.75	7754.63	
513.00	6712	2773.25	10527.88	TV_{BMP}
514.00	7692	7202	17729.88	

NOTE: MATERIALS WITH THE SAME VOID RATIOS (E.G. STONE RESERVOIR & CHOKER STONE) HAVE BEEN COMBINED INTO ONE ELEVATION STAGE.

BIORETENTION 'A' SURFACE AREA CALCULATIONS

LAYER DESCRIPTION	SURFACE AREA (FT^2)	DEPTH (FT)	VOID RATIO	STORAGE DEPTH (FT)
SURFACE STORAGE	4,262	1.00	1.00	1.000
MULCH	4,262	0.25	0.25	0.063
SOIL	4,262	3.00	0.25	0.750
CHOKER STONE	4,262	0.25	0.40	0.100
STONE RESERVOIR	4,262	1.00	0.40	0.400
			TOTAL STORAGE DEPTH:	2.313

TOTAL TREATMENT VOLUME REQUIRED: 7,374 CF
SURFACE AREA REQUIRED: 3,189 SF
SURFACE AREA PROVIDED: 4,262 SF

ELEVATION STORAGE CURVE - BIORETENTION FOREBAY

ELEVATION (FT)	ELEVATION DIFFERENCE	SURFACE AREA (SF)	VOLUME (CF)	CUMULATIVE VOLUME (CF)	CUMULATIVE VOLUME (AC-FT)	NOTES
512		347				
	1		467			
513		598		467	0.011	
	1		747			
514		907		1,214	0.028	

TOTAL TREATMENT VOLUME REQUIRED: 7,374 CF
TOTAL FOREBAY VOLUME REQUIRED (15% Tv): 1,106 CF
SPILLWAY ELEVATION: 514.00
FOREBAY VOLUME PROVIDED: 1,214 CF

ELEVATION STORAGE CURVE - POND 'A' MAIN POOL

ELEVATION (FT)	ELEVATION DIFFERENCE	SURFACE AREA (SF)	VOLUME (CF)	CUMULATIVE VOLUME (CF)	CUMULATIVE VOLUME (AC-FT)	NOTES
436		0				
	2		2365			
438		3,548		2,365	0.054	
	1.5		6314			
439.5		4,907		8,679	0.199	
	0.5		2840			
440		6,491		11,519	0.264	
	1		8057			
441		9,733		19,577	0.449	
	0.4		4926			
441.4		15,092		24,503	0.563	
	0.6		9379			
442		16,176		33,881	0.778	
	2		36105			
444		19,996		69,986	1.607	
	2		44046			
446		24,114		114,032	2.618	
	2		52825			
448		28,780		166,857	3.831	

TOTAL TREATMENT VOLUME REQUIRED: 18,826 CF
CONTROL ORIFICE ELEVATION: 441.00 (PERM. POOL ELEV.)
WQV MAIN POOL: 19,577 CF

Pond Volume Equations

Volume = (1/3) * (EL2 - EL1) * (Area1 + Area2 + sqr(Area1 * Area2))

Where: EL1, EL2 — Lower and upper elevations of the increment
Area1, Area2 — Areas computed for EL1, EL2, respectively
Volume — Incremental volume between EL1 and EL2

ELEVATION STORAGE CURVE - FOREBAY

ELEVATION (FT)	ELEVATION DIFFERENCE	SURFACE AREA (SF)	VOLUME (CF)	CUMULATIVE VOLUME (CF)	CUMULATIVE VOLUME (AC-FT)	NOTES
437.4		0				
	0.6		115			
438		574		115	0.003	
	1.5		1044			
439.5		826		1,159	0.027	
	0.5		466			
440		1,041		1,625	0.037	
	1		1288			
441		1,551		2,912	0.067	

TOTAL TREATMENT VOLUME REQUIRED: 18,826 CF
TOTAL FOREBAY VOLUME REQUIRED (15% Tv): 2,824 CF
SPILLWAY ELEVATION: 441.00
FOREBAY VOLUME PROVIDED: 2,912 CF

WET POND VOLUME REQUIREMENT

THE TOTAL REQUIRED TREATMENT VOLUME IN THE WET POND IS 18,826 CUBIC FEET (SEE DA 'B' TAB IN VRRM). PER THE ELEVATION-STORAGE TABLE ON THIS SHEET, THE TOTAL TREATMENT VOLUME PROVIDED IN THE PERMANENT POOL IS 19,577 CUBIC FEET, WHICH IS GREATER THAN THE REQUIRED TREATMENT VOLUME.

THE REQUIRE FOREBAY VOLUME IS 15% OF THE REQUIRED TREATMENT VOLUME, OR 2,824 CUBIC FEET. PER THE FOREBAY ELEVATION-STORAGE TABLE ON THIS SHEET, THE TOTAL FOREBAY VOLUME PROVIDED IS 2,912 CUBIC FEET, WHICH IS GREATER THAN THE REQUIRED FOREBAY VOLUME.

BMP NARRATIVE

THE SITE IS LOCATED ALONG THE EASTERN SIDE OF BLACKWELL ROAD, TO THE SOUTHEAST OF THE INTERSECTION OF BLACKWELL ROAD AND IVY HILL DRIVE, AND NORTH OF THE US 17 SPUR. THE EXISTING SITE IS APPROXIMATELY 32.23 ACRES; CONSISTS OF ONE RESIDENTIAL DWELLING, AN EXISTING POND, AN EXISTING DRIVEWAY, AND WOODED AREAS; AND IS COMPRISED OF HYDROLOGIC SOIL GROUPS (HSG) B, C, AND D. THE PROJECT CONSISTS OF THE CONSTRUCTION OF 22 SINGLE FAMILY DETACHED LOTS ALONG WITH ASSOCIATED IMPROVEMENTS.

BASED ON THE LAND COVER PROPOSED WITH THIS PLAN, THE TOTAL PHOSPHOROUS LOAD REDUCTION REQUIRED FOR THIS SITE IS 9.70 LB/YR, PER THE VIRGINIA RUNOFF REDUCTION METHOD (VRRM) COMPLIANCE SPREADSHEET FOR REDEVELOPMENT. ONE LEVEL 1 WET POND (POND 'A'), ONE LEVEL 2 BIORETENTION BASIN (BIORETENTION 'A'), AND SHEET FLOW TO A VEGETATED FILTER STRIP ARE PROPOSED TO PROVIDE WATER QUALITY TREATMENT. THE TOTAL PHOSPHOROUS LOAD REDUCTION ACHIEVED BY IMPLEMENTING THESE BMP DEVICES IS 10.61 LB/YR, WHICH IS GREATER THAN THE REQUIRED TOTAL PHOSPHOROUS LOAD REDUCTION. THEREFORE, WATER QUALITY REQUIREMENTS HAVE BEEN SATISFIED.

LEGEND

- DRAINAGE DIVIDE
- SWM ANALYSIS BOUNDARY
- IMPERVIOUS AREA (5.27 AC.)
- MANAGED TURF AREA (23.04 AC.)
- FOREST/OPEN SPACE AREA (3.95 AC.)
- AREAS TO WET POND LEVEL 1
- AREAS TO SHEET FLOW TO VEGETATED FILTER STRIP
- AREAS TO BIORETENTION LEVEL 2

BIORETENTION VOLUME REQUIREMENT

THE BASE TREATMENT VOLUME REQUIRED IN BIORETENTION 'A' IS 6,041 CUBIC FEET (SEE DA 'A' TAB IN VRRM). SINCE THE BIORETENTION BASIN WAS DESIGNED AS A LEVEL 2 BIORETENTION BASIN, THE TOTAL TREATMENT VOLUME REQUIRED IS 1.25 TIMES THE BASE TREATMENT VOLUME, OR 7,374 CUBIC FEET. PER THE ELEVATION-STORAGE TABLE ON THIS SHEET, THE TOTAL TREATMENT VOLUME PROVIDED IN THE PERMANENT POOL IS 10,528 CUBIC FEET, WHICH IS GREATER THAN THE REQUIRED TREATMENT VOLUME.

THE REQUIRE FOREBAY VOLUME IS 15% OF THE REQUIRED TREATMENT VOLUME, OR 1,106 CUBIC FEET. PER THE FOREBAY ELEVATION-STORAGE TABLE ON THIS SHEET, THE TOTAL FOREBAY VOLUME PROVIDED IS 1,214 CUBIC FEET, WHICH IS GREATER THAN THE REQUIRED FOREBAY VOLUME.

GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)
1 inch = 80 ft.

Bowman
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BMP & LAND COVER MAP
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
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11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=80' V:
JOB No. 6642-02-002
DATE : FEBRUARY 10, 2023
FILE No. 6642-D-CP-001
SHEET 43 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\043-044-6642-D-CP-001-BMP.dwg

DEQ Virginia Runoff Reduction Method Re-Development Compliance Spreadsheet - Version 3.0

BMP Design Specifications List: **2011 Stds & Specs**

Update Summary Sheet

Print Preview | Print

Site Summary

Total Rainfall (in):	43
Total Disturbed Acreage:	27.21

Site Land Cover Summary

Pre-ReDevelopment Land Cover (acres)

	A soils	B Soils	C Soils	D Soils	Totals	% of Total
Forest/Open (acres)	0.00	13.10	15.09	1.41	29.60	92
Managed Turf (acres)	0.00	0.62	1.02	0.10	1.74	5
Impervious Cover (acres)	0.00	0.22	0.31	0.39	0.92	3
					32.26	100

Post-ReDevelopment Land Cover (acres)

	A soils	B Soils	C Soils	D Soils	Totals	% of Total
Forest/Open (acres)	0.00	1.89	1.62	0.44	3.95	12 *
Managed Turf (acres)	0.00	9.96	12.03	1.05	23.04	71
Impervious Cover (acres)	0.00	2.09	2.77	0.41	5.27	16
* Forest/Open Space areas must be protected in accordance with the Virginia Runoff Reduction Method					32.26	100

Site Tv and Land Cover Nutrient Loads

	Final Post-Development (Post-ReDevelopment & New Impervious)	Post-ReDevelopment	Post-Development (New Impervious)	Adjusted Pre-ReDevelopment
Site Rv	0.31	0.21	0.95	0.08
Treatment Volume (ft³)	36,485	21,485	15,001	7,837
TP Load (lb/yr)	22.92	13.50	9.43	4.92
	Baseline TP Load (lb/yr):	11.4431*	*Reduction below new development load limitation not required	

Pre-ReDevelopment TP Load per acre (lb/acre/yr)	Final Post-Development TP Load per acre (lb/acre/yr)	Post-ReDevelopment TP Load per acre (lb/acre/yr)
0.18	0.71	0.48

Total TP Load Reduction Required (lb/yr)	9.70	2.06	7.64

	Final Post-Development Load (Post-ReDevelopment & New Impervious)	Pre-ReDevelopment
TN Load (lb/yr)	163.99	37.76

Site Compliance Summary

Maximum % Reduction Required Below Pre-ReDevelopment Load	20%

** Note: % Reduction will reduce post-development TP load to less than or equal to baseline load of 11.44 lb/yr (0.41 lb/ac/yr) [Required reduction for Post-ReDev. = Post-ReDev TP load - baseline load of 11.4431 lb/yr], baseline load = site area x 0.41 lb/ac/yr*

Total Runoff Volume Reduction (ft³)	6,902
Total TP Load Reduction Achieved (lb/yr)	10.61
Total TN Load Reduction Achieved (lb/yr)	59.52
Remaining Post Development TP Load (lb/yr)	12.31
Remaining TP Load Reduction (lb/yr) Required	0.00

** TARGET TP REDUCTION EXCEEDED BY 0.91 LB/YEAR **

**Reduction below new development load limitation not required*

Drainage Area Summary

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Total
Forest/Open (acres)	0.38	1.78	0.54	0.00	0.00	2.70
Managed Turf (acres)	4.15	12.20	2.18	0.00	0.00	18.53
Impervious Cover (acres)	0.84	3.18	0.80	0.00	0.00	4.82
Total Area (acres)	5.37	17.16	3.52	0.00	0.00	26.05

Drainage Area Compliance Summary

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Total
TP Load Reduced (lb/yr)	3.33	5.91	1.37	0.00	0.00	10.61
TN Load Reduced (lb/yr)	24.36	25.36	9.80	0.00	0.00	59.52

Drainage Area A Summary

Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest/Open (acres)	0.00	0.10	0.28	0.00	0.38	7
Managed Turf (acres)	0.00	0.48	3.67	0.00	4.15	77
Impervious Cover (acres)	0.00	0.09	0.75	0.00	0.84	16
					5.37	

BMP Selections

Practice	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	BMP Treatment Volume (ft³)	TP Load from Upstream Practices (lbs)	Untreated TP Load to Practice (lbs)	TP Removed (lb/yr)	TP Remaining (lb/yr)	Downstream Treatment to be Employed
6.b. Bioretention #2 or Micro-Bioretention #2 (Spec #9)	3.93	0.81	5,898.78	0.00	3.70	3.33	0.37	

Total Impervious Cover Treated (acres)	0.81
Total Turf Area Treated (acres)	3.93
Total TP Load Reduction Achieved in D.A. (lb/yr)	3.33
Total TN Load Reduction Achieved in D.A. (lb/yr)	24.36

Drainage Area B Summary

Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest/Open (acres)	0.00	0.69	0.65	0.44	1.78	10
Managed Turf (acres)	0.00	5.69	5.46	1.05	12.20	71
Impervious Cover (acres)	0.00	1.27	1.50	0.41	3.18	19
					17.16	

BMP Selections

Practice	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	BMP Treatment Volume (ft³)	TP Load from Upstream Practices (lbs)	Untreated TP Load to Practice (lbs)	TP Removed (lb/yr)	TP Remaining (lb/yr)	Downstream Treatment to be Employed
13.a. Wet Pond #1 (Spec #14)	10.91	3.01	18,825.55	0.00	11.81	5.91	5.91	

Total Impervious Cover Treated (acres)	3.01
Total Turf Area Treated (acres)	10.91
Total TP Load Reduction Achieved in D.A. (lb/yr)	5.91
Total TN Load Reduction Achieved in D.A. (lb/yr)	25.36

Drainage Area C Summary

Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest/Open (acres)	0.00	0.50	0.04	0.00	0.54	15
Managed Turf (acres)	0.00	1.84	0.34	0.00	2.18	62
Impervious Cover (acres)	0.00	0.69	0.11	0.00	0.80	23
					3.52	

BMP Selections

Practice	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	BMP Treatment Volume (ft³)	TP Load from Upstream Practices (lbs)	Untreated TP Load to Practice (lbs)	TP Removed (lb/yr)	TP Remaining (lb/yr)	Downstream Treatment to be Employed
9.c. Sheetflow to Vegetated Filter Strip, A Soils or Compost Amended B/C/D Soils (Spec #2 & #4)	2.18	0.8	4,366.16	0.00	2.74	1.37	1.37	

Total Impervious Cover Treated (acres)	0.80
Total Turf Area Treated (acres)	2.18
Total TP Load Reduction Achieved in D.A. (lb/yr)	1.37
Total TN Load Reduction Achieved in D.A. (lb/yr)	9.80

Runoff Volume and CN Calculations

	1-year storm	2-year storm	10-year storm
Target Rainfall Event (in)	2.59	3.14	4.79

Drainage Areas	RV & CN	Drainage Area A	Drainage Area B	Drainage Area C	Drainage Area D	Drainage Area E
CN		76	74	70	0	0
RR (ft³)		4,719	0	2,183	0	0
1-year return period	RV wo RR (ws-in)	0.75	0.66	0.50	0.00	0.00
	RV w RR (ws-in)	0.51	0.66	0.33	0.00	0.00
	CN adjusted	70	74	65	0	0
2-year return period	RV wo RR (ws-in)	1.11	1.00	0.79	0.00	0.00
	RV w RR (ws-in)	0.87	1.00	0.62	0.00	0.00
	CN adjusted	71	74	66	0	0
10-year return period	RV wo RR (ws-in)	2.36	2.20	1.88	0.00	0.00
	RV w RR (ws-in)	2.12	2.20	1.71	0.00	0.00
	CN adjusted	73	74	68	0	0

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03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=80' V:

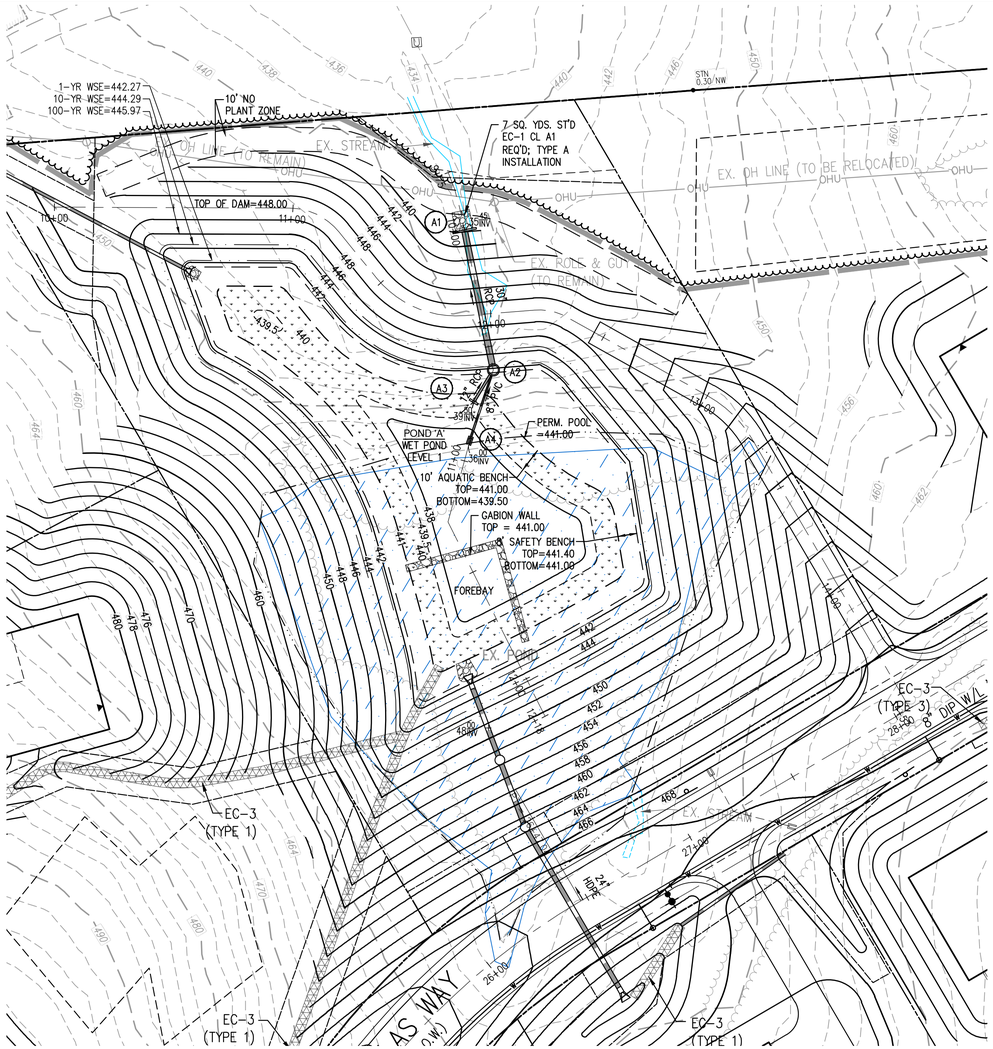
JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

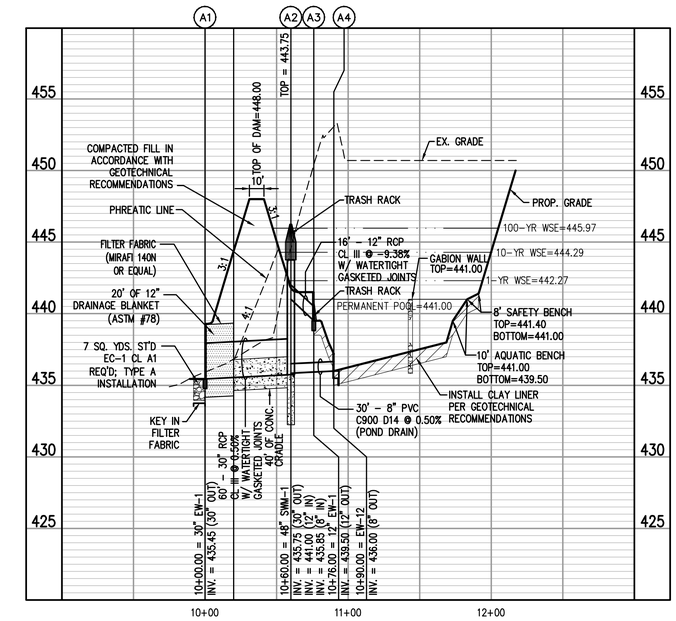
FILE No. 6642-D-CP-001

SHEET 44 OF 58

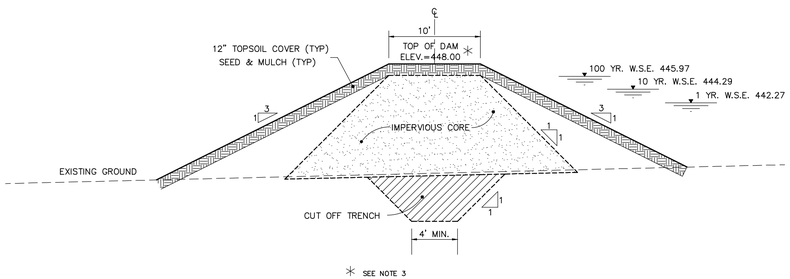
Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\043-044-6642-D-CP-001-BMP.dwg



POND 'A' PLAN
SCALE: 1"=30'



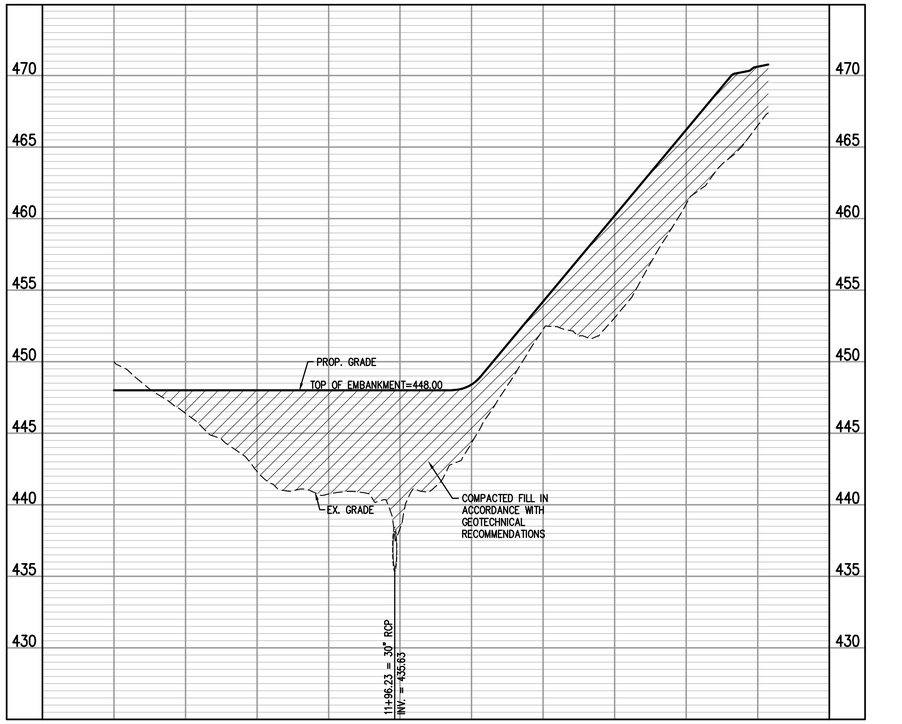
PRINCIPAL SPILLWAY PROFILE
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE: 1"=5'



SECTION THRU DAM EMBANKMENT SWM/BMP POND 'B'
SCALE: NONE

NOTES:

1. THE EMBANKMENT MAY BE CONSTRUCTED AS A HOMOGENOUS EMBANKMENT DAM. FILL MATERIAL SHALL BE TAKEN FROM AN APPROVED, DESIGNATED BORROW AREA. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6 INCHES, AND FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL FOR CENTER OF THE EMBANKMENT AND THE CUTOFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION ML, CL, MH, CH, OR SC. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT BASED ON THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER SUPERVISING THE DESIGN AND CONSTRUCTION.
2. THE FILL SHALL BE CONSTRUCTED AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
3. THE EMBANKMENT SHALL BE CONSTRUCTED TO A MINIMUM ELEVATION 10% HIGHER THAN THE DESIGNED HEIGHT, OR BASED ON GEOTECHNICAL REPORT, TO ALLOW FOR SETTLEMENT WHEN MECHANICAL COMPACTORS ARE USED FOR CONSTRUCTION.
4. THE CUTOFF TRENCH SHALL EXTEND A MINIMUM OF 4' BELOW SUBGADE.
5. DESIGN AND CONSTRUCTION OF THE PROPOSED DAM IS SUBJECT TO RECOMMENDATIONS AND INSPECTION BY A QUALIFIED GEOTECHNICAL ENGINEER.
6. PRINCIPAL SPILLWAY AND RISER STRUCTURE SHALL BE INSTALLED IN ACCORDANCE WITH THE GEOTECHNICAL RECOMMENDATIONS.



EMBANKMENT PROFILE
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE: 1"=5'

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

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1300 Central Park Boulevard
Fredericksburg, Virginia 22401
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SWM POND 'A' DETAILS

TIFFANY ESTATES
CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT

FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
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DATE	DESCRIPTION

WED	WED	WED
DESIGN	DRAWN	CHKD

SCALE H: AS NOTED V: AS NOTED

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

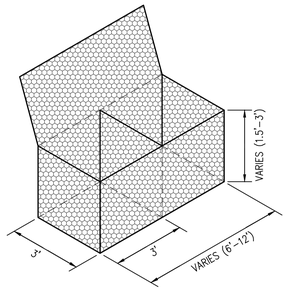
FILE No. 6642-D-CP-001

SHEET 45 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\045-049-6642-D-CP-001-SWM DET.dwg

GABION BASKET CONSTRUCTION SPECIFICATIONS

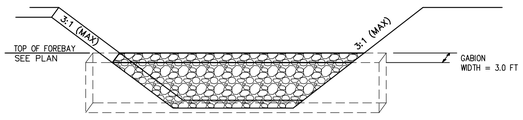
1. WIRE (ZINC COATED) TO BE 11 GAUGE WIRE OR HEAVIER WITH A MAXIMUM TENSILE STRENGTH OF 75,000 PSI, IN ACCORDANCE WITH ASTM A641/A641M.
2. GALVANIZED (ZINC COATED) WOVEN WIRE MESH (8 x 10 MESH TYPE):
   - WIRE MESH: DIAMETER – 0.120 IN.
   - SELVEDGE WIRE: DIAMETER – 0.153 IN.
   - MESH OPENING: NOMINAL DIMENSION D = 3.25 IN.
3. GALVANIZED (ZINC COATED) LACING WIRE AND INTERNAL STIFFENERS:
   - LACING WIRE: DIAMTER – 0.087 IN.
   - CROSS TIE/STIFFENING WIRE: DIAMETER – 0.087 IN.
   - PREFORMED STIFFENER: DIAMETER – 0.153 IN.
4. STEEL MESH:
   - MESH TENSILE STRENGTH SHALL BE A MINIMUM 3500 LB/FT IN ACCORDANCE WITH ASTM A975 SECTION 13.1.1
   - PUNCH TEST RESISTANCE SHALL HAVE A MINIMUM RESISTANCE OF 6000 LB IN ACCORDANCE WITH ASTM A975 SECTION 13.1.4
   - CONNECTION TO SELVEDGES SHALL HAVE A MINIMUM RESISTANCE OF 1400 LB/FT IN ACCORDANCE WITH ASTM A975
5. OVERLAPPING FASTENERS MAY BE USED IN LIEU OF, OR TO COMPLEMENT, LACING WIRE, PROVIDED:
   - HIGH TENSILE FASTENERS SHALL HAVE A NOMINAL SPACING OF 4 IN. NOT TO EXCEED 6 IN.
   - FASTENERS USED FOR ASSEMBLY OR INSTALLATION IN THE FIELD SHALL BE TESTED FOR COMPLIANCE WITH ASTM A975 SECTION 13.1.2.2. PRODUCER OR SUPPLIER OF THE WIRE MESH SHALL PROVIDE CERTIFICATION NO LATER THAN 15 DAYS PRIOR TO STARTING CONSTRUCTION.
   - THE AVERAGE MINIMUM RESISTANCE OF FASTENERS FROM THE FIELD SHALL NOT BE LOWER THAN 90% OF THE RESISTANCE PROVIDED IN THE CERTIFICATION.
   - GALVANIZED FASTENERS: DIAMETER – 0.12 IN., ACCORDING TO ASTM A764, TYPE B, CLASS 3
   - TESNSILE STRENGTH: 230,000 TO 273,000 PSI IN ACCORDANCE WITH ASTM 764 TABLE 2
   - A PROPERLY FORMED OVERLAPPING FASTENER SHALL HAVE A NOMINAL OVERLAP OF 1 IN. AFTER CLOSURE.
6. FILL GABIONS WITH CLEAN, HARD, ANGULAR TO ROUND, AND DURABLE STONE RANGING IN SIZE FROM 4 IN. TO 8 IN. THE SIZE SHALL BE SUCH THAT A MINIMUM OF TWO LAYERS OF ROCK CAN BE ACHIEVED WHEN FILLING THE GABION.
7. INSTALL GABIONS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS



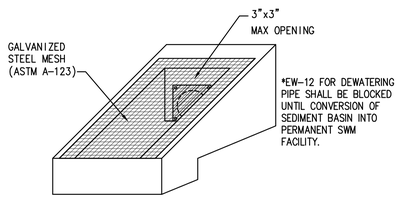
GABION BASKET
NOT TO SCALE

NOTE:

STRUCTURAL AND GEOTECHNICAL ENGINEERS SHALL PROVIDE FINAL DESIGN AND RECOMMENDATIONS FOR THE GABION WALL.



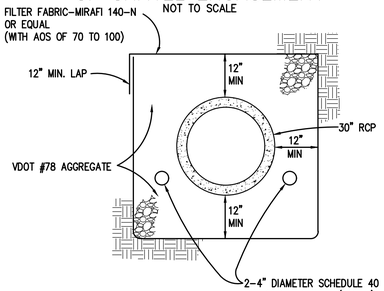
SEDIMENT FOREBAY GABION SECTION
NOT TO SCALE



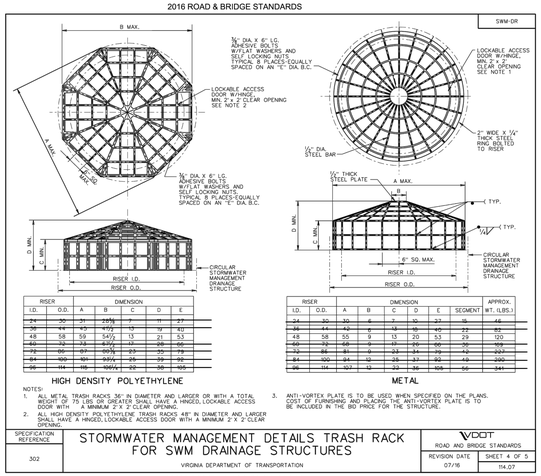
TYPICAL EW-12 TRASH RACK DETAL
NTS

TYPICAL SECTION OF GRAVEL ENCASEMENT

NOT TO SCALE

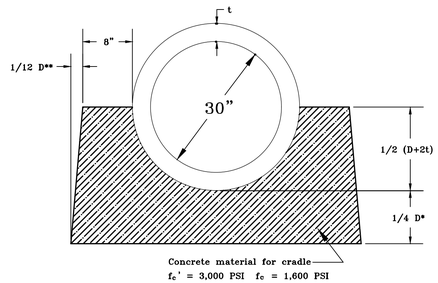


2016 ROAD & BRIDGE STANDARDS



2016 ROAD & BRIDGE STANDARDS

Concrete Cradle



f_c' = Ultimate compressive strength of concrete
f_c = Design strength of concrete

* But not less than 6"
** If the pipe is laid in an excavated trench, then the side walls may conform to the trench shape (ie the trench may become the cradle form)

Source: SCS; ES-154, A2 Cradle

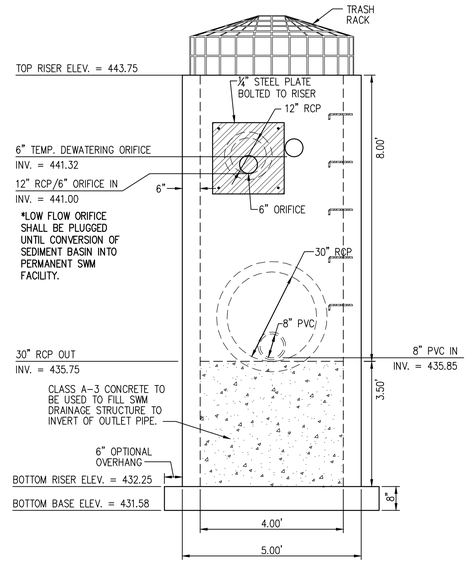
STANDARD CONCRETE CRADLE DETAILS FOR CIRCULAR CONDUITS EXTENDING THROUGH DAM EMBANKMENTS (N.T.S.)

POND OUTLET STRUCTURE NOTES

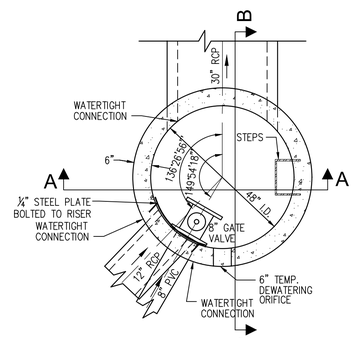
1. RISER, SPILLWAY AND FOOTING DIMENSIONS AND/OR THICKNESS AS WELL AS REINFORCEMENT, BUOYANCY CALCULATIONS AND THE METHOD OF JOINING THE VARIOUS STRUCTURAL ELEMENTS ARE SUBJECT TO DESIGN BY A PROFESSIONAL STRUCTURAL ENGINEER.
2. CONSTRUCTION AND CONTRACTION JOINTS ARE TO BE PROVIDED AS REQUIRED BY THE LATEST EDITION OF THE ACI CODE.
3. ALL CONNECTION/JOINTS SHALL BE WATERTIGHT.
4. SUBGRADE PREPARATION AND BEDDING REQUIREMENTS FOR ALL STRUCTURAL ELEMENTS ARE SUBJECT TO DESIGN BY A PROFESSIONAL GEOTECHNICAL ENGINEER.
5. PRECAST CONCRETE IS TO ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. CAST IN PLACE CONCRETE IS TO BE VDOT CLASS A3.
6. REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ASTM A-615 (REINFORCING BARS).
7. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4".
8. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL BE IN STRICT CONFORMANCE TO THE LATEST VDOT STANDARDS AND SPECIFICATIONS.
9. TEMPORARY DEWATERING ORIFICE SHALL BE PLUGGED DURING CONVERSION OF SEDIMENT BASIN TO PERMANENT SWM FACILITY.
10. SHOP DRAWINGS ARE TO BE SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO FABRICATION.

NOTE:

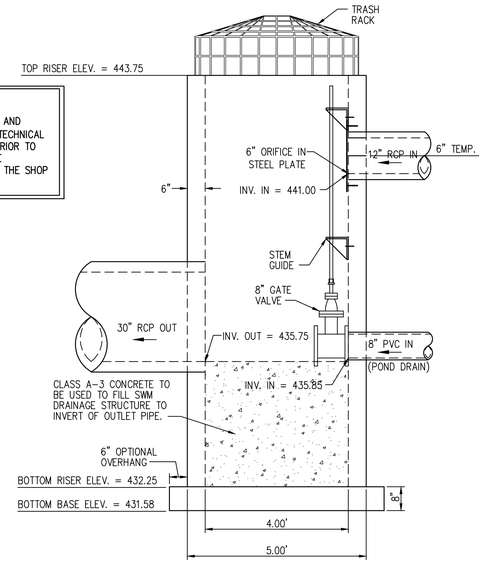
CONCRETE RISER STRUCTURE SHOWN FOR SCHEMATIC PURPOSES ONLY. RISER TOP AND ORIFICE SIZE/ELEVATIONS PER DESIGN INCLUDED IN PLAN. STRUCTURAL AND GEOTECHNICAL ENGINEERS SHALL PROVIDE FINAL DESIGN OF RISER. SHOP DRAWINGS REQUIRED PRIOR TO MANUFACTURING. SHOP DRAWINGS, INCLUDING BUOYANCY CALCULATIONS, SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. ONCE APPROVED BY THE ENGINEER, THE SHOP DRAWINGS SHALL BE SUBMITTED TO THE COUNTY FOR ACCEPTANCE.



OUTFALL STRUCTURE (SECTION A-A)
SCALE: 1"=2'



OUTFALL STRUCTURE (TOP)
SCALE: 1"=2'



OUTFALL STRUCTURE (SECTION B-B)
SCALE: 1"=2'

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SWM POND 'A' DETAILS
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
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03/14/23	2nd MSR SUBMISSION
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WED	WED	WED
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SCALE	H: AS NOTED V: AS NOTED	
JOB No. 6642-02-002		
DATE : FEBRUARY 10, 2023		
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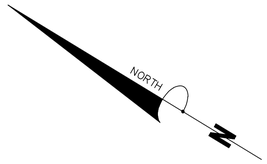
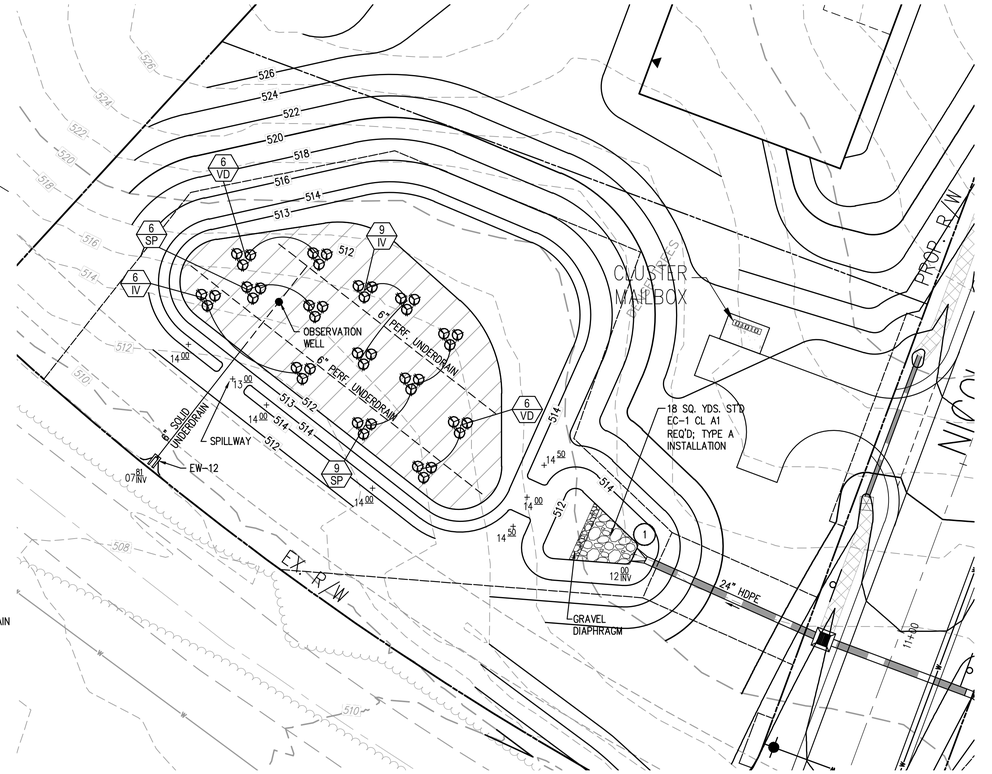
SHEET 46 OF 58		

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\045-049-6642-D-CP-001-SWM DET.dwg

BIORETENTION BASIN 'A' PLANT SCHEDULE					
BIORETENTION PLANT TEMPLATE: PERENNIAL GARDEN WITH SHRUBS					
QUANTITY		BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
BIORETENTION BASIN STABILIZATION MIX (HERBACEOUS GROUND COVER)					
	20%	AGROSTIS ALBA	REDTOP GRASS	SEED	CONTRACTOR SHALL HYDROSEED DISTRUBED AREAS WITH THE STABILIZATION SEED MIX AT A RATE OF 30 LBS/AC.
	20%	ANDROPOGON GERARDI	BIG BLUESTEM	SEED	
	25%	LOBELIA CARDINALIS	CARDINAL FLOWER	SEED	
	25%	ELYMUS VIRGINICUS	VIRGINIA WILD RYE	SEED	
	10%	PANICUM VIRGATUM	SWITCHGRASS	SEED	
BIORETENTION BASIN SHRUB LAYER					
IV	15	ILEX VERTICILLATA	WINTERBERRY	30"	SHRUBS SHALL BE PLANTED IN CLUSTERS AT APPROXIMATELY 10 FEET ON CENTER AT DENSITIES OF 2 TO 3 FEET ON CENTER.
SP	15	CLETHRA AINIFOLIA	SWEET PEPPER BUSH	30"	
VD	12	VIBURNUM DENTATUM	ARROWOOD	30"	





BIORETENTION 'A' PLAN

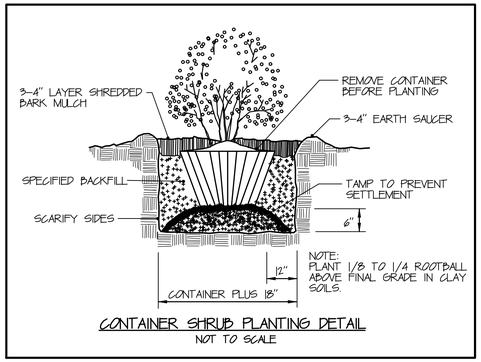
SCALE: 1"=20' GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

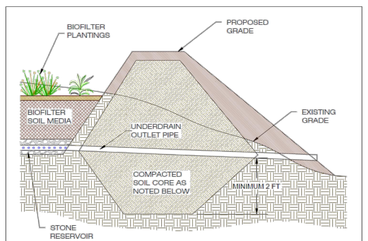
LEGEND

- DENOTES SOLID UNDERDRAIN
- DENOTES PERFORATED UNDERDRAIN
- DENOTES MULCH COVER/ LIMITS OF SOIL MEDIA
- DENOTES SHRUB
- 1 / QR — DENOTES QUANTITY / DENOTES PLANT TYPE



CONTAINER SHRUB PLANTING DETAIL

NOT TO SCALE

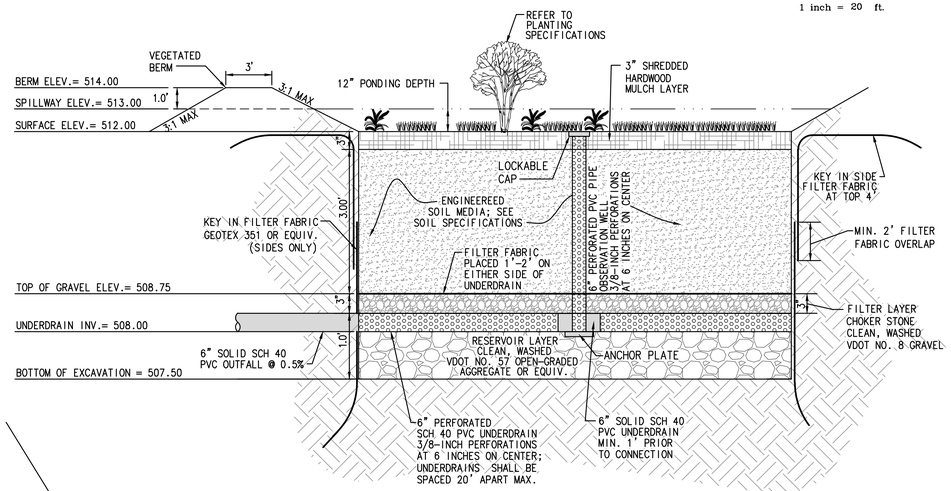


NOTES:

1) STABILIZE BERM AND SPILLWAY WITH EC-3 MATTING.

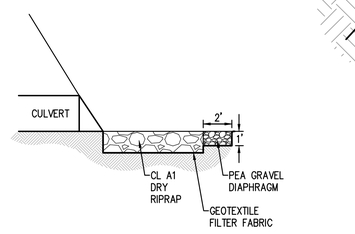
2) REMAINING DISTURBED SLOPES SHALL BE STABILIZED WITH EC-3 MATTING.

3) ALL BERM FILL MATERIAL SHALL CONSIST OF ML, CL, SC, OR GC SOILS (USCS) OR AS APPROVED BY GEOTECHNICAL ENGINEER TO CREATE AN ACCEPTABLE EMBANKMENT AS APPLICATBLE FOR THE CONDISTIONS. COMPACTED FILL SHALL BE FREE OF WOOD, ROOTS, ROCKS, OR ANY OTHER NON-COMPACTIBLE SOIL. COMPACTED FILL SHALL BE INSTALLED IN MAXIMUM 6-INCH LIFTS TO A DRY DENSITY OF 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSTIY ASTM D698.



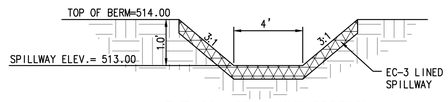
BIORETENTION 'A' DETAIL

NTS



TYPICAL GRAVEL DIAPHRAGM SECTION

NOT TO SCALE



TYPICAL SPILLWAY SECTION

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BIORETENTION BASIN 'A' DETAILS

TIFFANY ESTATES

CONSTRUCTION PLAN

FAUQUIER COUNTY, VIRGINIA

CENTER MAGISTERIAL DISTRICT

CONP-23-019202

COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
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SHEET 47 OF 58

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NOTES FOR CONCRETE USED IN CONSTRUCTION OF DAMS

1. UNLESS OTHERWISE SPECIFIED IN THE APPROVED SITE OR CONSTRUCTION PLAN, THE FOLLOWING APPLY TO ALL CONCRETE. MINIMUM STRENGTH IS 3,000 POUNDS. MINIMUM SLUMP IS 1" AND MAXIMUM SLUMP IS 3". CEMENT SHALL BE TYPE I; IF SOIL IS FOUND TO BE HIGH IN SOLUBLE SULFATES, TYPE V SHOULD BE USED AFTER CONSULTING WITH THE DESIGN ENGINEER (OR THE ENGINEER WHO IS TO CERTIFY THE STRUCTURE). EXPOSED CONCRETE WILL BE WATER CURED OR COVERED WITH CLEAR OR WHITE POLYETHYLENE FILM. ALL MATERIALS SHALL CONFORM TO APPROPRIATE ASTMS. FORMS SHALL BE CLEAR OF SOIL AND OTHER MATERIALS. CHAMFER STRIPS SHALL BE PLACED IN THE CORNERS OF THE FORMS AND AT THE TOPS OF WALL PLACEMENTS TO PRODUCE BEVELED EDGES ON PERMANENTLY EXPOSED CONCRETE SURFACES. EDGES OF CONSTRUCTION JOINTS SHALL NOT BE BEVELED EXCEPT WHERE INDICATED ON THE DRAWINGS. CONSOLIDATION OF ALL CONCRETE SHALL BE BY IMMERSION-TYPE VIBRATORS OPERATED IN A NEARLY VERTICAL POSITION. CONCRETE SHALL BE PLACED ACCORDING TO AMERICAN CONCRETE INSTITUTE (ACI) PROCEDURES FOR HOT AND COLD WEATHER CONCRETE.
2. UNLESS IT HAS BEEN SHOWN THAT THE ENTRAINED AIR CONTENT OF THE CONCRETE IS AT LEAST 4% BY VOLUME, AS DISCHARGED AT PLACEMENT, AN AIR ENTRAINING ADMIXTURE SHALL BE USED IN THE CONCRETE. THE ADMIXTURE SHALL CONFORM TO ASTM C 260; ANY AIRENTRAINING ADMIXTURE USED WITH TYPE F OR G CHEMICAL ADMIXTURE SHALL BE NEUTRALIZED VINSOL RESIN FORMULATION. ALL ADMIXTURES WILL BE USED AS SPECIFIED IN THE DESIGNS OR AS APPROVED BY THE DESIGN OR CERTIFYING ENGINEER. ANY ADMIXTURE, SUCH AS CALCIUM CHLORIDE, OR COMBINATION OF ADMIXTURES WHICH WILL INTRODUCE MORE THAN 0.1% CHLORIDE (TO CEMENT, BY WEIGHT) SHALL NOT BE USED IN CONCRETE IN WHICH ALUMINUM GALVANIZED METALWORK OR PRESTRESSING STEEL IS TO BE EMBEDDED.
3. NOTE REBAR SCHEDULE IN DRAWINGS. LUBRICATION OF FORMS IS REQUIRED UNLESS OTHERWISE SPECIFIED. FORMS SHALL BE REMOVED WITHIN 24 HOURS AFTER THE CONCRETE HAS HARDENED SUFFICIENTLY TO PREVENT DAMAGE BY CAREFUL FORM REMOVAL AND SPECIFIED REPAIR AND CURING WILL BE COMMENCED IMMEDIATELY THEREAFTER.
4. ALL MATERIALS TO BE WITHIN THE CONCRETE SHALL BE APPROPRIATE METAL REBAR, ELECTRICALLY WELDED WIRE FABRIC, MESH, TIES, METAL SUPPORTS, ETC. INTERIOR WOODEN BRACES ARE NOT ACCEPTABLE. BEFORE REINFORCEMENT IS EMBEDDED IN THE CONCRETE, THE SURFACES OF THE BARS, FABRIC AND SUPPORTS SHALL BE CLEANED OF HEAVY FLAKY RUST, LOOSE MILL SCALE, DIRT, GREASE OR OTHER FOREIGN SUBSTANCES WHICH ARE OBJECTIONABLE. HEAVY FLAKE RUST WHICH CAN BE REMOVED BY FIRM RUBBING WITH BURLAP, OR EQUIVALENT TREATMENT, IS CONSIDERED OBJECTIONABLE. PLASTIC FORM SPACERS ARE ACCEPTABLE. WHERE APPLICABLE, FIBER REINFORCEMENT IS ACCEPTABLE. EMBEDDED TIES FOR HOLDING FORMS SHALL REMAIN EMBEDDED AND EXCEPT WHERE F1 FINISH IS PERMITTED, SHALL TERMINATE NOT LESS THAN TWO DIAMETERS OR TWICE THE MINIMUM DIMENSION OF THE TIE, WHICHEVER IS GREATER, FROM THE FORMED SURFACES OF THE CONCRETE. RECESSES SHALL BE FILLED WITH APPROPRIATE MATERIAL.
5. ALL CONCRETE SHALL BE VIBRATED OR SUPER-PLASTICIZED IT SHALL NOT BE "WATERED DOWN" TO MAKE IT FLOW.
6. WHERE CONCRETE IS USED TO BED PIPE LARGER THAN 12 INCHES IN DIAMETER, IT SHALL BE VIBRATED OR SUPER-PLASTICIZED
7. POND RISERS SHALL BE PROPERLY SUPPORTED BY METAL OR CONCRETE BLOCKS PRIOR TO POURING THE BASE. AN ALTERNATIVE WOULD BE TO POUR THE BASE TO THE ELEVATION OF THE BOTTOM OF THE RISER, SET THE BOTTOM UNIT OF THE RISER IN PLACE AND THEN FINISH POURING THE BASE.
8. CONCRETE SURFACES LIKELY TO BE WALKED UPON, SUCH AS CHANNEL TYPE SPILLWAYS, SHALL HAVE A ROUGH SURFACE TO IMPROVE TRACTION.
9. CONCRETE SHALL BE DEPOSITED AS NEARLY AS PRACTICAL IN ITS FINAL POSITION AND SHALL NOT BE ALLOWED TO FLOW IN SUCH A MANNER THAT THE LATERAL MOVEMENT WILL CAUSE SEGREGATION OF THE COARSE AGGREGATE FROM THE CONCRETE MASS. METHODS AND EQUIPMENT EMPLOYED IN DEPOSITING CONCRETE IN FORMS SHALL MINIMIZE CLUSTERS OF COARSE AGGREGATE. CLUSTERS THAT OCCUR SHALL BE SCATTERED BEFORE THE CONCRETE IS VIBRATED. PLACING OF ADDITIONAL CONCRETE IN FORMS SHALL NOT BE DELAYED SO LONG THAT THE CONCRETE PLACED BEFORE THE DELAY IS NOT READILY PENETRATED BY VIBRATORS. IT IS ESPECIALLY IMPORTANT THAT ADEQUATE CONSOLIDATION BE ACHIEVED IN THE CONCRETE AT THE INTERFACE OF THE FRESH CONCRETE AND THE UNDERLYING CONCRETE. THE VIBRATOR SHALL REPEATEDLY PENETRATE AND THOROUGHLY RECONSOLIDATE THE UPPER PORTION OF THE UNDERLYING CONCRETE WHICH WAS PLACED BEFORE THE DELAY.
10. WHERE LIFT HOLES ARE PERMITTED IN CONCRETE PIPE, THEY SHALL BE FULLY GROUTED AND THE SURFACE OF THE GROUT ON THE INSIDE OF THE PIPE SHALL BE UNIFORM WITH THE INSIDE WALL OF THE PIPE. PIPE IN WHICH THE SMALLEST DIMENSION (DIAMETER IN ROUND PIPE) IS LESS THAN 36 INCHES SHALL NOT CONTAIN LIFT HOLES. LIFT HOLES ARE NOT PERMITTED IN POND BARRELS. WHERE PIPES ENTER RISERS, JUNCTION BOXES, MANHOLES, ETC., THE SPACE BETWEEN THE OUTSIDE WALL OF THE PIPE AND THE WALL OF THE OPENING SHALL BE FILLED WITH APPROPRIATE NON-SHRINKING CEMENT PASTE OR CEMENT MORTAR. WHERE THE OPENINGS ARE LARGE, CONCRETE BRICKS MAY ALSO BE USED. OTHER TYPES (CLAY, CINDERBLOCK) OF BRICK ARE NOTACCEPTABLE. ALL SURFACES OF THE BRICKS MUST BE COVERED WITH CEMENT. THE FINISHED SURFACES OF THE CEMENT MUST BE UNIFORM WITH THE INSIDE AND OUTSIDE WALLS OF THE STRUCTURE. THE SURFACES SHALL BE SMOOTH TO MINIMIZE ADVERSE EFFECTS OF FREEZING AND THAWING AND BRICKS SHALL NOT BE VISIBLE. O-RINGS SHALL BE PROPERLY LUBRICATED AND PROPERLY INSTALLED. ALL OTHER TYPES OF JOINTS SHALL BE PROPERLY SEALED. CONCRETE RISER SEGMENTS SHALL BE CONNECTED BY BOLTING FOUR GALVANIZED OR STAINLESS STEEL PLATES (6" X 18" X 1/4" MIN.), UNIFORMLY SPACED, TO EACH PAIR OF ADJOINING SEGMENTS.
11. THE BOTTOMS OF ALL RISERS, MANHOLES, JUNCTION BOXES, ETC. SHALL BE SHAPED IN ACCORDANCE WITH VDOT'S IS-1.

MAINTENANCE PLAN FOR STORMWATER DETENTION & RETENTION PONDS

1. THIS SWM FACILITIES ARE ONE LEVEL 1 WET POND; IT WILL STORE WATER DURING PERIODS OF HIGH INTENSITY RAINFALL. WITHIN SEVERAL HOURS MOST OF THE WATER WILL DRAIN OUT OF THE PONDS. WATER WILL REMAIN IN THE PERMANENT POOL OF THE WET POND. THE DEVELOPMENT OF THE SITE INCREASED THE AMOUNT OF RAINFALL WATER WHICH LEAVES THE SITE BECAUSE ABSORBENT SOIL WAS COVERED WITH IMPERVIOUS SURFACES SUCH AS BUILDINGS AND ROADS. THE PURPOSE OF THIS TEMPORARY STORAGE IS TO ENSURE THAT THE PEAK RATE/VOLUME OF FLOW TO THE CHANNEL BELOW THE SITE AREA WERE NOT INCREASED. SUCH INCREASES CAUSE FLOODING AND CHANNEL EROSION DOWNSTREAM FROM THE POND.
2. MOWING. ALL GRASSES SHOULD BE MOWED AT LEAST TWICE EACH YEAR. GRASSES SUCH AS TALL FESCUE SHOULD BE MOWED IN EARLY SUMMER AFTER EMERGENCE OF THE HEADS ON COOL SEASON GRASSES. THEY SHOULD BE MOWED AGAIN IN THE EARLY FALL TO PREVENT SEEDS OF ANNUAL WEEDS FROM MATURING. MOWING OF LEGUMES SUCH AS SERICEA LESPEDEZA AND CROWN VETCH CAN BE PERMITTED TO GROW ON THE DAM OR IN ANY PART OF THE EMERGENCY SPILLWAY.
3. LIMING AND FERTILIZING. THE SOIL SHOULD BE SAMPLED ACCORDING TO RECOMMENDED PROCEDURES AT LEAST ONCE EVERY 4 YEARS. THE SAMPLE SHOULD BE TESTED AT A QUALIFIED SOIL TESTING LABORATORY (SUCH AS THE ONE AT VPI&SU). LIME AND FERTILIZER SHOULD BE APPLIED IN ACCORDANCE WITH RECOMMENDATIONS BASED ON THE TESTS.
4. REPLANTING AND OVERSEEDING. IF VEGETATION COVERS LESS THAN 40% OF THE SOIL SURFACE, LIME, FERTILIZE AND SEED IN ACCORDANCE WITH CURRENT RECOMMENDATIONS FOR NEW SEEDINGS. IF VEGETATION COVERS MOST THAN 40% BUT LESS THAN 70% OF THE SOIL SURFACE, LIME FERTILIZE AND OVERSEED IN ACCORDANCE WITH CURRENT RECOMMENDATIONS.
5. VEGETATION. MONITOR THE GROWTH OF WETLAND PLANTS, TREES, AND SHRUBS PLANTED, ESPECIALLY DURING DROUGHT CONDITIONS. IRRIGATE VEGETATION DURING DROUGHT CONDITIONS AS NECESSARY TO PRESERVE VEGETATION. REMOVE AND REPLACE ALL DEAD PLANTS.
6. REMOVING TRASH AND DEBRIS. TRASH, LITTER AND VEGETATION WILL BE REMOVED AS NEEDED TO PREVENT OBSTRUCTION TO THE FLOW OF WATER, TO PREVENT MOVEMENT OF TRASH AND LITTER TO DOWNSTREAM PROPERTIES, TO MAINTAIN THE INTEGRITY OF THE STRUCTURE, TO PROVIDE AN ATTRACTIVE APPEARANCE AND TO MINIMIZE WATER POLLUTION.
7. REMOVING SEDIMENT. SOIL MATERIALS (INCLUDING CLAY,SILT, SAND AND GRAVEL) WILL BE REMOVED BEFORE THE RETENTION POOL OR THE BMP POOL LOSES 50% OF THE DESIGNED STORAGE CAPACITY. IF FOREBAYS ARE INCLUDED IN THE DESIGN, SEDIMENT SHOULD BE REMOVED BEFORE THE FOREBAY LOSES 50% OF THE DESIGN CAPACITY OF THE FOREBAY.
8. SEDIMENT DISPOSAL. SEDIMENT DISPOSAL SHOULD BE IN ACCORDANCE WITH CURRENT PROCEDURES FOR DISPOSAL OF SEDIMENT. WHERE DEEMED NECESSARY OR DESIRABLE, THE SEDIMENT WILL BE TESTED FOR APPROPRIATE POLLUTANTS BEFORE IT IS REMOVED FROM THE POND.
9. REPAIRS. REPAIR SLIDES, SLUMPS AND ERODED AREAS PROMPTLY AND IN A WORKMANLIKE MANNER TRASH RACKS, PIPES, HEADWALLS, ETC. WILL BE MAINTAINED, REPAIRED AND/OR REPLACED AS NEEDED TO MAINTAIN THE INTEGRITY OF THE STRUCTURE. EXPOSED METAL SURFACES WILL BE PAINTED TO MINIMIZE DAMAGE DUE TO RUST.
10. DEWATERING. WHEN NECESSARY, THE WET POND SHALL BE DRAINED BY A POND DRAIN BY OPENING THE GATE VALE. THE WATER WILL BE DISCHARGED INTO THE EXISTING POND OUTFALL. DEWATERING SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
11. MAINTENANCE INSPECTIONS. A REPRESENTATIVE OF THE OWNER(S) WILL INSPECT EACH STORMWATER MANAGEMENT STRUCTURE AFTER EACH SIGNIFICANT RAINFALL. ONCE EACH YEAR. A REPRESENTATIVE OF THE COUNTY WILL JOINTLY INSPECT EACH STORMWATER MANAGEMENT STRUCTURE. APPROPRIATE ACTION WILL BE TAKEN TO ENSURE APPROPRIATE MAINTENANCE. ALL MAINTENANCE COSTS WILL BE BORNE BY THE OWNER(S). WHERE STRUCTURES ARE TO BE MAINTAINED BY MORE THAN ONE PARTY, ALLOCATION OF COSTS WILL BE IN ACCORDANCE WITH TERMS SET FORTH IN THE MAINTENANCE AGREEMENT. KEYS TO LOCKED ACCESS POINTS SHALL BE AVAILABLE TO SPOTSYLVANIA COUNTY PERSONNEL UPON REQUEST.
12. MAINTENANCE RECORDS. THE LANDOWNER, OR SOMEONE DESIGNATED BY THE LANDOWNER, SHALL INSPECT THE DETENTION POND WITHIN 24 HOURS AFTER EACH RAINFALL EVENT OF ONE INCH OR MORE OF RAIN. THE OWNER OR THE DESIGNEE SHALL KEEP WRITTEN RECORDS OF THESE INSPECTIONS. THE RECORDS SHALL ALSO INCLUDE MAINTENANCE AND REPAIRS PERFORMED COPIES OF THESE RECORDS SHALL BE PROVIDED TO THE COUNTY UPON REQUEST.
13. THE SWM FACILITIES SHALL NOT BE MODIFIED IN ANY WAY WITHOUT PRIOR APPROVAL BY THE COUNTY.

THE PURPOSE OF THESE PLANS IS TO PROVIDE THE BASIC INFORMATION REQUIRED TO CONTROL THE CONSTRUCTION OF THE COMBINATION PRINCIPAL & EMERGENCY SPILLWAYS.

GENERAL SPECIFICATIONS FOR SWM DAM AND FACILITY

1. AREAS UNDER THE EMBANKMENT AND ANY STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL, ROOTS OR OTHER OBJECTIONABLE MATERIAL. WOODY STEMMED SPECIES, PROPOSED OR EXISTING SHALL NOT BE PERMITTED WITHIN 25 FT OF EMBANKMENT FILL.
2. THE SUITABILITY AND ACCEPTABILITY OF ALL FILL MATERIAL WILL BE DETERMINED BY REGULAR PERIODIC SOIL ANALYSIS AND COMPACTION TESTS, WHICH SHALL BE MADE BY A QUALIFIED GEOTECHNICAL ENGINEER.
3. TESTS FOR SOIL ANALYSIS, MOISTURE CONTENT, AND COMPACTION ARE TO BE CONDUCTED IN ACCORDANCE WITH THE LATEST APPLICABLE ASTM STANDARDS AND SPECIFICATIONS.
4. THE EMBANKMENT MAY BE CONSTRUCTED AS A HOMOGENOUS EMBANKMENT DAM. FILL MATERIAL SHALL BE TAKEN FROM AN APPROVED, DESIGNATED BORROW AREA. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6 INCHES, AND FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL FOR CENTER OF THE EMBANKMENT AND THE CUTOFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION ML, CL, SC OR CC. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT BASED ON THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER SUPERVISING THE DESIGN AND CONSTRUCTION.
5. THE MINIMUM REQUIRED DENSITY IS 95% MAXIMUM OF DRY DENSITY WITH A MOISTURE CONTENT WITHIN 2% OF THE OPTIMUM, UNLESS OTHERWISE SPECIFIED BY THE GEOTECHNICAL ENGINEER. EACH LAYER OF THE FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN MINIMUM DENSITY AND THE ENGINEER SHALL CERTIFY, AT THE TIME OF CONSTRUCTION, THAT EACH FILL LATER MEETS THE MINIMUM DENSITY REQUIREMENT. ALL COMPACTION IS TO BE DETERMINED BY EITHER STANDARD PROCTOR TEST (ASTM D698) OR THE MODIFIED PROCTOR TEST (ASTM D1557) AS DIRECTED BY THE GEOTECHNICAL ENGINEER BASED ON SITE AND SOIL CONDITIONS AND THE SIZE AND TYPE OF STRUCTURE BEING BUILT.
6. THE FILL SHALL BE CONSTRUCTED AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
7. THE EMBANKMENT SHALL BE CONSTRUCTED TO A MINIMUM ELEVATION 10% HIGHER THAN THE DESIGNED HEIGHT, OR BASED ON GEOTECHNICAL REPORT, TO ALLOW FOR SETTLEMENT WHEN MECHANICAL COMPACTORS ARE USED FOR CONSTRUCTION.
8. IF SUFFICIENT ACCEPTABLE MATERIAL IS NOT AVAILABLE ON THE SITE TO PROPERLY COMPLETE THE FILL, THE CONTRACTOR IS RESPONSIBLE FOR ACQUIRING ACCEPTABLE BORROW MATERIAL.
9. AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED BEFORE ITS PLACEMENT. FILL MATERIAL SHALL BE PLACED IN LAYERS A MAXIMUM OF 8 INCHES THICK (BEFORE COMPACTION), WHICH SHALL BE CONTINUOUS OVER THE ENTIRE LENGTH OF FILL. THE MOST PERMEABLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE PRINCIPLE SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.
10. CUTOFF TRENCH SHALL BE EXCAVATED INTO IMPERVIOUS MATERIAL ALONG OR PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE EQUIPMENT USED FOR EXCAVATION SHOULD GOVERN THE BOTTOM WIDTH OF THE TRENCH, WITH THE MINIMUM WIDTH BEING 4'. THE DEPTH SHALL BE AT LEAST 4' BELOW THE EXISTING GRADE OR AS SHOWN ON THE PLANS. THE SIDE SLOPES OF THE TRENCH SHALL BE 1H:1V OR FLATTER. THE BACKFILL SHALL BE COMPACTED ACCORDING TO NOTE 5.
11. THE SURFACE LAYER OF COMPACTED FILL SHALL BE SCARIFIED PRIOR TO PLACEMENT OF AT LEAST 6 INCHES OF TOPSOIL. THE TOPSOIL SHALL BE STABILIZED IN ACCORDANCE WITH THE VESCH, LATEST EDITION.

DAM CONSTRUCTION NOTES

1. STAKE OUT THE ENTIRE AREA TO BE COVERED BY THE DAM AND RELATED STRUCTURES.
2. REMOVE ALL TOPSOIL, ORGANIC MATTER AND STONES FROM THE AREA. INSTALL A COFFER DAM OR SOME OTHER APPROPRIATE STRUCTURE TO DIVERT RUNOFF AWAY FROM THE WORK AREA DURING CONSTRUCTION.
3. THE GEOTECHNICAL ENGINEER SHOULD PERFORM TEST PITS ALONG THE CENTERLINE OF THE EMBANKMENT DURING CONSTRUCTION TO EVALUATE THAT THE ACTUAL SUBSURFACE CONDITIONS ARE CONSISTENT WITH THE BORINGS AND PROVIDE RECOMMENDATIONS WITH RESPECT TO REQUIRED CUT-OFF TRENCH.
4. EXCAVATE FOR CUT-OFF TRENCH AND BEGIN FILLING. THE CUT-OFF TRENCH SHALL BE A MINIMUM 4' BELOW THE EXISTING GRADE.
5. INSTALL THE POND BARREL AND THE RISER. THE UPSTREAM 2/3 OF THE POND BARREL WILL BE BEDDED IN A CONCRETE CRADLE; THE CONCRETE MUST BE PLASTICIZED OR VIBRATED TO ENSURE THAT THERE WILL BE NO VOIDS. THE DOWNSTREAM 1/3 OF THE BARREL WILL BE SURROUNDED IN GRAVEL WRAPPED IN FILTER FABRIC. IF THE PLAN INCLUDES TOE DRAINS, THEY MAY BE CONNECTED TO THE GRAVEL BEDDING. FILL ADJACENT TO AND OVER THE BARREL ARE TO BE COMPACTED BY MANUALLY OPERATED EQUIPMENT (NOT PULLED BY OR MOUNTED ON TRACK-TYPE OR WHEEL-TYPE EQUIPMENT). TAMPERS MOUNTED ON BACKHOES ARE NOT ACCEPTABLE. AFTER THE DEPTH OF FILL OVER THE BARREL HAS REACHED A DEPTH OF AT LEAST 2 FEET, LARGE EQUIPMENT, BUT NOT VIBRATORY ROLLERS, MAY BE USED. VIBRATORY ROLLERS MAY BE USED AFTER THE DEPTH OF FILL OVER THE BARREL EXCEEDS 3 FEET.
6. PLACE FILL AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
7. SIDE SLOPES SHALL BE AS FLAT AS THOSE SHOWN ON THE APPROVED PLANS.
8. A SETTLING ALLOWANCE OF AT LEAST 10%, OR AS DICTATED BY THE GEOTECHNICAL ENGINEER, IS REQUIRED.
9. DURING THE BACKFILLING OPERATION, EQUIPMENT SHOULD NOT BE DRIVEN CLOSER THAN 4 FEET, AS MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE. ALSO, EQUIPMENT SHOULD NEVER BE DRIVEN OVER ANY PART OF A STRUCTURE OR PIPE, UNLESS COMPACTED FILL HAS BEEN PLACED TO A DEPTH SPECIFIED BY THE STRUCTURAL LIVE LOAD CAPACITY OF THE STRUCTURE OR PIPE IN ORDER TO ADEQUATELY DISTRIBUTE THE LOAD. BACKFILL THAT IS BESIDE THE PIPE OR STRUCTURES SHALL BE OF THE SAME TYPE AND QUALITY OF THE ADJOINING FILL MATERIAL. THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED 4 INCHES IN THICKNESS (BEFORE COMPACTION) AND COMPACTED BY HAND TAMPERS, OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL SHALL COMPLETELY FILL ALL SPACES UNDER AND BESIDE THE PIPE AND STRUCTURES.

MAINTENANCE RESPONSIBILITY

THE MAINTENANCE RESPONSIBILITY SHALL BE ESTABLISHED IN THE REQUIRED DEED OF DEDICATION.

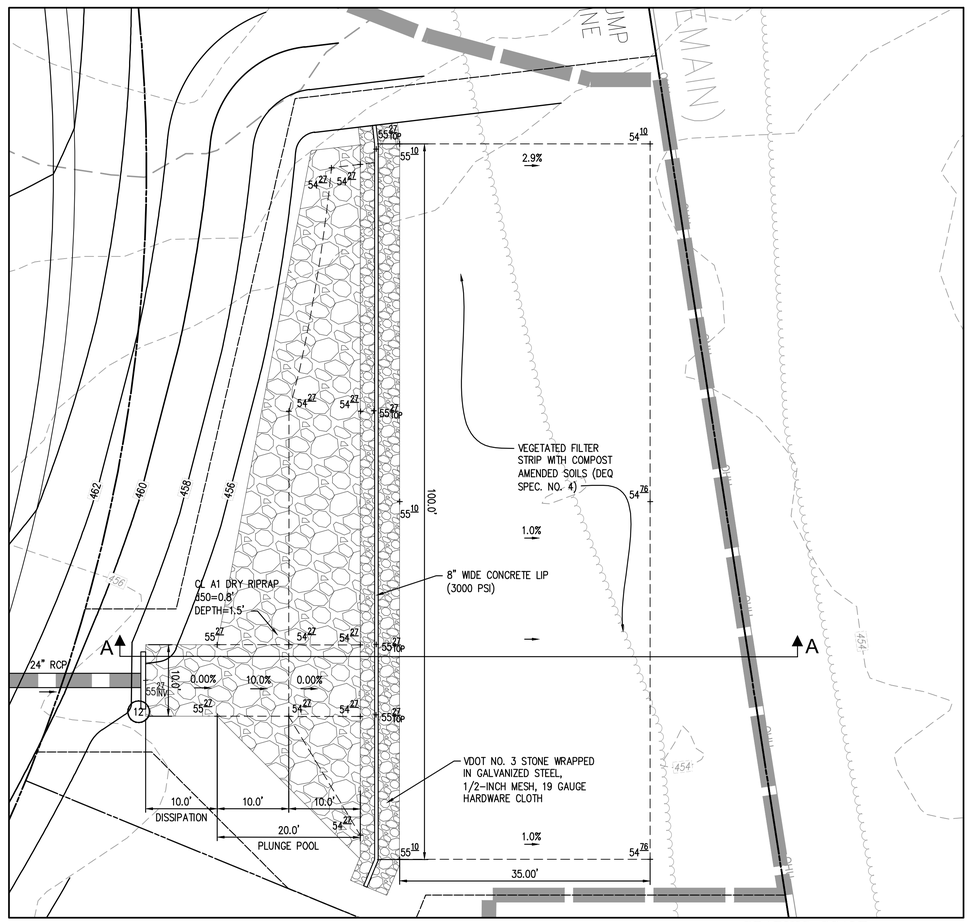
FIRST YEAR MAINTENANCE OPERATIONS

INITIAL INSPECTIONS
FOR THE FIRST SIX MONTHS FOLLOWING CONSTRUCTION, THE SITE SHOULD BE INSPECTED WITHIN 24 HOURS AFTER STORM EVENTS THAT EXCEED A 1/2-INCH OF RAINFALL.

PLANTING OF AQUATIC BENCHES
THE AQUATIC BENCHES SHOULD BE PLANTED WITH EMERGENT WETLAND SPECIES, FOLLOWING THE PLANTING RECOMMENDATIONS CONTAINED IN DEQ STORMWATER DESIGN SPECIFICATION NO. 13 (CONSTRUCTED WETLANDS).

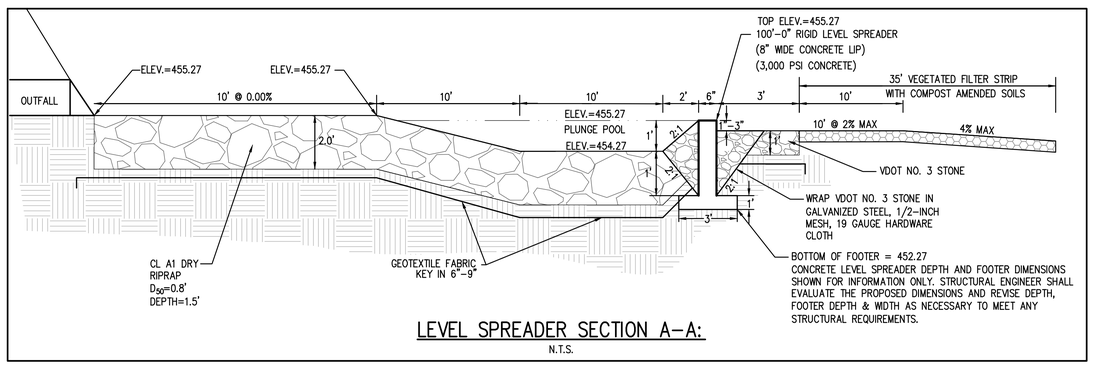
SPOT RESEEDING
INSPECTORS SHOULD LOOK FOR BARE OR ERODING AREAS IN THE CONTRIBUTING DRAINAGE AREA OR AROUND THE POND BUFFER, AND MAKE SURE THEY ARE IMMEDIATELY STABILIZED WITH GRASS COVER.

WATERING
TREES PLANTED IN THE POND BUFFER NEED TO BE WATER DURING THE FIRST GROWING SEASON. IN GENERAL, CONSIDER WATERING EVERY 3 DAYS FOR FIRST MONTH, AND THEN WEEKLY DURING THE REMAINDER OF THE FIRST GROWING SEASON (APRIL-OCTOBER), DEPENDING ON RAINFALL.



LEVEL SPREADER PLAN:
SCALE: 1"=10'

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.



LEVEL SPREADER SECTION A-A:
N.T.S.

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SWM NOTES & DETAILS
TIFFANY ESTATES
CONSTRUCTION PLAN
CENTER MAGISTERIAL DISTRICT
FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS

02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED	WED	WED
DESIGN	DRAWN	CHKD

SCALE H: AS NOTED V: AS NOTED
JOB No. 6642-02-002
DATE : FEBRUARY 10, 2023
FILE No. 6642-D-CP-001
SHEET 48 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\045-049-6642-D-CP-001-SWM DET.dwg

8.1. Construction Sequence for Conserved Open Space Areas

The Conserved Open Space must be fully protected during the construction stage of development and kept outside the limits of disturbance on the Erosion and Sediment (E&S) Control Plan.

- No clearing, grading or heavy equipment access is allowed except temporary disturbances associated with incidental utility construction, restoration operations or management of nuisance vegetation.
- The perimeter of the Conserved Open Space shall be protected by super silt fence, chain link fence, orange safety fence, or other measures to prevent sediment discharge.
- The limits of disturbance should be clearly shown on all construction drawings and identified and protected in the field by acceptable signage, silt fence, snow fence or other protective barrier.
- Construction of the gravel diaphragm or engineered level spreader shall not commence until the contributing drainage area has been stabilized and perimeter E&S controls have been removed and cleaned out.
- Some light grading may be needed at the Filter Strip boundary; this should be done with tracked vehicles to prevent compaction.
- Stormwater should not be diverted into the Vegetated Filter Strip until the gravel diaphragm and/or level spreader are installed and stabilized.

8.2. Construction Sequence for Vegetated Filter Strips

Vegetated Filter Strips can be within the limits of disturbance during construction. The following procedures should be followed during construction:

- Before site work begins, Vegetated Filter Strip boundaries should be clearly marked.
- Only vehicular traffic used for Filter Strip construction should be allowed within 10 feet of the Filter Strip boundary (City of Portland, 2004).
- If existing topsoil is stripped during grading, it shall be stockpiled for later use.
- Construction runoff should be directed away from the proposed Filter Strip site, using perimeter silt fence, or, preferably, a diversion dike.
- Construction of the gravel diaphragm or engineered level spreader shall not commence until the contributing drainage area has been stabilized and perimeter E&S controls have been removed and cleaned out.
- Vegetated Filter Strips require light grading to achieve desired elevations and slopes. This should be done with tracked vehicles to prevent compaction. Topsoil and or compost amendments should be incorporated evenly across the filter strip area, stabilized with seed, and protected by biodegradable erosion control matting or blankets.
- Stormwater should not be diverted into the Filter Strip until the turf cover is dense and well established.

8.3. Construction Inspection

Construction inspection is critical to obtain adequate spot elevations, to ensure the gravel diaphragm or ELS is completely level, on the same contour, and constructed to the correct design elevation. As-built surveys should be required to ensure compliance with design standards. Inspectors should evaluate the performance of the Filter Strip after the first big storm to look for evidence of gullies, outflanking, undercutting or sparse vegetative cover. Spot repairs should be made, as needed.

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 Vegetated Filter Strips must be covered by a drainage easement to allow inspection and maintenance. If the filter area is a natural Conserved Open Space, it must be protected by a perpetual easement or deed restriction that assigns the responsible party to ensure that no future development, disturbance or clearing may occur within the area, except as stipulated in the vegetation maintenance plan.

If the Vegetated Filter Strip is located on a residential private lot, the existence and purpose of the Filter Strip shall be noted on the deed of record. Homeowners will need to be provided a simple document that explains the purpose of the Filter Strip and routine maintenance needs. A deed restriction or other mechanism enforceable by the qualifying local program must be in place to help ensure that Filter Strips are maintained and Conserved Open Space Areas are not converted or disturbed. 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 level spreader repair. Ideally, inspections should be conducted in the non-growing season when it easier to see the flow path. Example maintenance inspection checklists for Sheet Flow to a Filter Strip or Conserved Open Space areas can be accessed in Appendix C of Chapter 9 of the Virginia Stormwater Management Handbook or at the Center for Watershed Protection's website at:

http://www.cwp.org/Resource_Library/Controlling_Runoff_and_Discharges/sm.htm
(scroll to Tool6: Plan Review, BMP Construction, and Maintenance Checklists)

Inspectors should check to ensure that:

- Flows through the Filter Strip do not short-circuit the overflow control section;
- Debris and sediment does not build up at the top of the Filter Strip;
- Foot or vehicular traffic does not compromise the gravel diaphragm;
- Scour and erosion do not occur within the Filter Strip;
- Sediments are cleaned out of Level Spreader forebays and flow splitters; and
- Vegetative density exceeds a 90% cover in the boundary zone or grass filter.

9.3. Ongoing Maintenance

Once established, Vegetated Filter Strips 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 strip and a dense, healthy grass cover. Vegetated Filter Strips that consist of grass/turf cover should be mowed at least twice a year to prevent woody growth.

BIORETENTION CONSTRUCTION NOTES:

CONSTRUCTION RUNOFF:

BIORETENTION BASIN BMPS SHALL BE CONSTRUCTED AFTER THE SITE WORK IS COMPLETE AND STABILIZATION MEASURES HAVE BEEN IMPLEMENTED. IF THIS IS NOT POSSIBLE, STRICT IMPLEMENTATION OF E&S PROTECTIVE MEASURES MUST BE INSTALLED AND MAINTAINED IN ORDER TO PROTECT THE BIORETENTION FACILITY FROM PREMATURE CLOGGING AND FAILURE.

CONSTRUCTION SPECIFICATIONS:

THE CONSTRUCTION OF BIORETENTION BASINS SHALL BE IN ACCORDANCE WITH VADEQ STORMWATER DESIGN SPECIFICATION NO. 9 (BIORETENTION), AS WELL AS THE CRITERIA SET FORTH BELOW.

BIORETENTION CONSTRUCTION:

CONSTRUCTION STAGE E&S CONTROLS

MICRO-BIORETENTION AND SMALL-SCALE BIORETENTION AREAS SHOULD BE FULLY PROTECTED BY SILT FENCE OR CONSTRUCTION FENCING, PARTICULARLY IF THEY WILL RELY ON INFILTRATION (I.E., HAVE NO UNDERDRAINS). IDEALLY, BIORETENTION SHOULD REMAIN OUTSIDE THE LIMIT OF DISTURBANCE DURING CONSTRUCTION TO PREVENT SOIL COMPACTION BY HEAVY EQUIPMENT.

BIORETENTION INSTALLATION SEQUENCE

THE FOLLOWING IS A TYPICAL CONSTRUCTION SEQUENCE TO PROPERLY INSTALL A BIORETENTION BASIN. THE INSTALLATION OF A BIORETENTION BASIN WILL INCLUDE INTERMEDIATE INSPECTIONS AT CRITICAL STAGES OF CONSTRUCTION WITH INSPECTOR SIGN-OFF THAT THE PARTICULAR ELEMENTS OF THE BIORETENTION ARE CONSTRUCTED ACCORDING THE APPROVED PLANS AND SPECIFICATIONS. AS AN ALTERNATIVE, IF ALLOWED BY THE VSMP AUTHORITY, THE CONTRACTOR MAY RELY ON THE ENGINEER OF RECORD OR OTHER QUALIFIED INDIVIDUAL TO CONDUCT THE INTERMEDIATE INSPECTIONS AND CERTIFICATIONS OF COMPLIANCE. THE CONSTRUCTION SEQUENCE FOR MICRO-BIORETENTION IS MORE SIMPLIFIED. THESE STEPS MAY BE MODIFIED TO REFLECT DIFFERENT BIORETENTION APPLICATIONS OR EXPECTED SITE CONDITIONS:

1. CONSTRUCTION OF THE BIORETENTION AREA MAY ONLY BEGIN AFTER THE ENTIRE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED WITH VEGETATION. IT MAY BE NECESSARY TO BLOCK CERTAIN CURB OR OTHER INLETS WHILE THE BIORETENTION AREA IS BEING CONSTRUCTED. THE PROPOSED SITE SHOULD BE CHECKED FOR EXISTING UTILITIES PRIOR TO ANY EXCAVATION.

2. THE DESIGNER AND THE INSTALLER SHOULD HAVE A PRECONSTRUCTION MEETING, CHECKING THE BOUNDARIES OF THE CONTRIBUTING DRAINAGE AREA AND THE ACTUAL INLET ELEVATIONS TO ENSURE THEY CONFORM TO ORIGINAL DESIGN. SINCE OTHER CONTRACTORS MAY BE RESPONSIBLE FOR CONSTRUCTING PORTIONS OF THE SITE, IT IS QUITE COMMON TO FIND SUBTLE DIFFERENCES IN SITE GRADING, DRAINAGE AND PAVING ELEVATIONS THAT CAN PRODUCE HYDRAULICALLY IMPORTANT DIFFERENCES FOR THE PROPOSED BIORETENTION AREA. THE DESIGNER SHOULD CLEARLY COMMUNICATE, IN WRITING, ANY PROJECT CHANGES DETERMINED DURING THE PRECONSTRUCTION MEETING TO THE INSTALLER AND THE PLAN REVIEW/INSPECTION AUTHORITY.

3. TEMPORARY E&S CONTROLS ARE NEEDED DURING CONSTRUCTION OF THE BIORETENTION AREA TO DIVERT STORMWATER AWAY FROM THE BIORETENTION AREA UNTIL IT IS COMPLETED. SPECIAL PROTECTION MEASURES SUCH AS EROSION CONTROL FABRICS MAY BE NEEDED TO PROTECT VULNERABLE SIDE SLOPES FROM EROSION DURING THE CONSTRUCTION PROCESS.

4. ANY PRE-TREATMENT CELLS SHOULD BE EXCAVATED FIRST AND THEN SEALED TO TRAP SEDIMENTS.

5. EXCAVATORS OR BACKHOES SHOULD WORK FROM THE SIDES TO EXCAVATE THE BIORETENTION AREA TO ITS APPROPRIATE DESIGN DEPTH AND DIMENSIONS. EXCAVATING EQUIPMENT SHOULD HAVE SCOOPS WITH ADEQUATE REACH SO THEY DO NOT HAVE TO SIT INSIDE THE FOOTPRINT OF THE BIORETENTION AREA. CONTRACTORS SHOULD USE A CELL CONSTRUCTION APPROACH IN LARGER BIORETENTION BASINS, WHEREBY THE BASIN IS SPLIT INTO 500 TO 1,000 SQ. FT. TEMPORARY CELLS WITH A 10-15 FOOT EARTH BRIDGE IN BETWEEN, SO THAT CELLS CAN BE EXCAVATED FROM THE SIDE.

6. IT MAY BE NECESSARY TO RIP THE BOTTOM SOILS TO A DEPTH OF 6 TO 12 INCHES TO PROMOTE GREATER INFILTRATION.

7. PLACE GEOTEXTILE FABRIC ON THE SIDES OF THE BIORETENTION AREA WITH A 6-INCH OVERLAP ON THE SIDES. PLACE THE APPROPRIATE DEPTH OF #57 STONE ON THE BOTTOM AND ADD APPROXIMATELY 3 INCHES OF CHOKER STONE/PEA GRAVEL AS A FILTER BETWEEN THE STONE STORAGE LAYER AND THE SOIL MEDIA LAYER.

8. OBTAIN SOIL THE MEDIA FROM A QUALIFIED VENDOR, AND STORE IT ON AN ADJACENT IMPERVIOUS AREA OR PLASTIC SHEETING. AFTER VERIFYING THAT THE MEDIA MEETS THE SPECIFICATIONS, APPLY THE MEDIA IN 12-INCH LIFTS UNTIL THE DESIRED TOP ELEVATION OF THE BIORETENTION AREA IS ACHIEVED. WAIT A FEW DAYS TO CHECK FOR SETTLEMENT, AND ADD ADDITIONAL MEDIA, AS NEEDED, TO ACHIEVE THE DESIGN ELEVATION.

9. PREPARE PLANTING HOLES FOR ANY TREES AND SHRUBS, INSTALL THE VEGETATION, AND WATER ACCORDINGLY. INSTALL ANY TEMPORARY IRRIGATION.

10. PLACE THE SURFACE COVER IN BOTH CELLS (MULCH, RIVER STONE OR TURF), DEPENDING ON THE DESIGN. IF COIR OR JUTE MATTING WILL BE USED IN LIEU OF MULCH, THE MATTING WILL NEED TO BE INSTALLED PRIOR TO PLANTING (STEP 9), AND HOLES OR SLITS WILL HAVE TO BE CUT IN THE MATTING TO INSTALL THE PLANTS.

11. INSTALL THE PLANT MATERIALS AS SHOWN IN THE LANDSCAPING PLAN, AND WATER THEM DURING WEEKS OF NO RAIN FOR THE FIRST TWO MONTHS.

CONSTRUCTION INSPECTION

INSPECTIONS DURING AND IMMEDIATELY AFTER CONSTRUCTION ARE NEEDED TO ENSURE THAT ALL THE ELEMENTS OF BIORETENTION BASINS ARE BUILT IN ACCORDANCE WITH THESE SPECIFICATIONS. USE A DETAILED INSPECTION CHECKLIST THAT REQUIRES SIGN-OFFS BY QUALIFIED INDIVIDUALS AT CRITICAL STAGES OF CONSTRUCTION AND TO ENSURE THAT THE CONTRACTOR'S INTERPRETATION OF THE PLAN IS CONSISTENT WITH THE DESIGNER'S INTENT. THE FOLLOWING IDENTIFIES THE CRITICAL STAGES OF CONSTRUCTION WHERE AN INTERMEDIATE INSPECTION AND SIGN-OFF BY A QUALIFIED INDIVIDUAL IS RECOMMENDED SINCE THE ITEMS CAN'T BE VERIFIED AFTER CONSTRUCTION IS COMPLETED. A CONSTRUCTION INSPECTION CHECKLIST THAT INCLUDES CERTIFICATIONS OF INSPECTION AT CRITICAL STAGES CAN BE FOUND IN VADEQ SWM DESIGN SPEC NO. 9. PHOTO DOCUMENTATION SHALL BE PROVIDED DURING THE INSTALLATION PROCESS.

THE FOLLOWING REPRESENTS ITEMS THAT ARE FREQUENTLY OVERLOOKED DURING CONSTRUCTION INSPECTION BUT REPRESENT IMPORTANT ELEMENTS FOR ENSURING THE SUCCESS OF THE BIORETENTION FACILITY DURING THE INITIAL BREAK-IN PERIOD.

- VERIFY THE PROPER COVERAGE AND DEPTH OF MULCH, VEGETATION, OR SOIL MATTING HAS BEEN ACHIEVED FOLLOWING CONSTRUCTION, BOTH ON THE FILTER BED AND THE SIDE-SLOPES.
- INSPECT THE PRE-TREATMENT FORBAYS AND FILTER STRIPS TO VERIFY THAT THEY ARE PROPERLY INSTALLED, STABILIZED, AND WORKING EFFECTIVELY BEFORE OPENING THE FACILITY TO RUNOFF.
- CHECK THAT OUTFALL PROTECTION/ENERGY DISSIPATION MEASURES AT CONCENTRATED INFLOW AND OUTFLOW POINTS ARE STABLE.

UPON FINAL ACCEPTANCE OF THE FACILITY, LOG THE PRACTICE'S GPS COORDINATES AND SUBMIT THEM FOR ENTRY INTO THE VSMP AUTHORITY'S BMP MAINTENANCE TRACKING DATABASE.

BIORETENTION AREA SOIL SPECIFICATIONS:

THE FILTER MEDIA MIX SHALL BE CERTIFIED BY THE SUPPLIER.

1. PLANTING SOIL

THE BIORETENTION AREAS SHALL CONTAIN A PLANTING SOIL MIXTURE OF 80%-90% SAND, 10%-20% SOIL FINES, AND 3%-5% SOIL FINES.

A MORE ORGANIC FILTER MEDIA IS RECOMMENDED WITHIN THE PLANTING HOLES FOR TREES, WITH A RATIO OF 50% SAND, 30% TOPSOIL AND 20% LEAF COMPOST (FULLY COMPOSTED, NOT PARTIALLY ROTTED LEAVES). TOPSOIL SHALL BE SANDY LOAM OR LOAMY SAND OF UNIFORM COMPOSITION, CONTAINING NO MORE THAN 5% CLAY, FREE OF STONES, STUMPS, ROOTS, OR SIMILAR OBJECTS GREATER THAN ON INCH, BRUSH, OR ANY OTHER MATERIAL OR SUBSTANCE WHICH MAY BE HARMFUL TO PLANT GROWTH, OR HINDRANCE TO PLANT GROWTH OR MAINTENANCE.

THE TOP SOIL SHALL BE FREE OF PLANTS OR PLANT PARTS OF BERMUDA GRASS, QUAK GRASS, JOHNSON GRASS, MUGWORT, NUTSEDGE, POISON IVY, AND CANADIAN THISTLE OR OTHERS AS SPECIFIED. IT SHALL NOT CONTAIN TOXIC SUBSTANCES HARMFUL TO PLANT GROWTH.

THE TOP SOIL SHALL BE TESTED AND MEET THE FOLLOWING CRITERIA:

PH RANGE:	5.0-7.0
ORGANIC MATTER:	GREATER THAN 1.5
MAGNESIUM (MG):	100+ UNITS
PHOSPHORUS (P2O5):	150+ UNITS
POTASSIUM (K2O):	120+ UNITS
SOLUBLE SALTS:	NOT TO EXCEED 900 PPM / 0.9 MMHOS / CM (SOIL) NOT TO EXCEED 3,000 PPM / 2.5 MMHOS / CM (ORGANIC MIX)

THE FOLLOWING TESTING FREQUENCIES SHALL APPLY TO THE ABOVE SOIL CONSTITUENTS:

PH, ORGANIC MATTER:

1 TEST PER 90 CUBIC YARDS, BUT NO MORE THAN 1 TEST PER BIORETENTION AREA

MAGNESIUM, PHOSPHORUS, POTASSIUM, SOLUBLE SALTS:

1 TEST PER 500 CUBIC YARDS, BUT NO LESS THAN 1 TEST PER BORROW SOURCE

ONE GRAIN SIZE ANALYSIS SHALL BE PERFORMED PER 90 CUBIC YARDS OF PLANTING SOIL, BUT NO LESS THAN 1 TEST PER BIORETENTION AREA. SOIL TESTS MUST BE VERIFIED BY A QUALIFIED PROFESSIONAL.

2. MULCH

A MULCH LAYER SHALL BE PROVIDED ON TOP OF THE PLANTING SOIL. AN ACCEPTABLE MULCH LAYER SHALL INCLUDE SHREDDED HARDWOOD OR OTHER SIMILAR PRODUCT. THE APPROVED MULCH PRODUCTS ALL MUST BE WELL AGED, UNIFORM IN COLOR, AND FREE OF FOREIGN MATERIAL INCLUDING PLANT MATERIAL. AN HERBACEOUS GROUND COVER MAY BE PLANTED IN LIEU OF A MULCH LAYER.

3. SAND

THE SAND SHALL CONSIST OF SILICA BASED COARSE AGGREGATE, ANGULAR OR ROUND IN SHAPE AND MEET THE MIXTURE GRAIN SIZE DISTRIBUTION BELOW. NO SUBSTITUTION OF ALTERNATE MATERIALS ARE ACCEPTED. MICA CAN MAKE UP NO MORE THAN 5% OF THE TOTAL SAND FRACTION. THE SAND FRACTION MAY ALSO CONTAIN A LIMITED AMOUNT OF PARTICLES > 2.0 MM AND < 9.5 MM PER THE TABLE BELOW, BUT THE OVERALL SAND FRACTION MUST MEET THE SPECIFICATION OF > 75% BEING COARSE OR VERY COARSE SAND.

SIEVE	SIZE	% PASSING
⅜ IN	9.50 MM	100
NO. 4	4.75 MM	95 TO 100
NO. 8	2.36 MM	80 TO 100
NO. 16	1.18 MM	45 TO 85
NO. 30	0.60 MM	15 TO 60
NO. 50	0.30 MM	3 TO 15
NO. 100	0.15 MM	0 TO 4

4. COMPACTION

SOIL SHALL BE PLACED IN 12-INCH LIFTS AND LIGHTLY COMPACTED (MINIMAL COMPACTIVE EFFORT) BY TAMPING OR ROLLED WITH A HAND-OPERATED LANDSCAPE ROLLER.

BIORETENTION AREA PLANTING SPECIFICATIONS

1. ROOT STOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT FROM THE SOURCE TO THE JOB SITE AND UNTIL PLANTED.

2. WALLS OF PLANTING PIT SHALL BE DUG SO THAT THEY ARE VERTICAL.

3. THE DIAMETER OF THE PLANTING PIT MUST BE A MINIMUM OF SIX INCHES (6") LARGER THAN THE DIAMETER OF THE BALL OF THE TREE.

4. THE PLANTING PIT SHALL BE DEEP ENOUGH TO ALLOW 1/8 OF THE OVERALL DIMENSION OF THE ROOT BALL TO BE ABOVE GRADE. LOOSE SOIL AT THE BOTTOM OF THE PIT SHALL BE TAMPED BY HAND.

5. THE APPROPRIATE AMOUNT OF FERTILIZER IS TO BE PLACED AT THE BOTTOM OF THE PIT (SEE BELOW FOR FERTILIZATION RATES).

6. THE PLANT SHALL BE REMOVED FROM THE CONTAINER AND PLACED IN THE PLANTING PIT BY LIFTING AND CARRYING THE PLANT BY ITS BALL (NEVER LIFT BY BRANCHES OR TRUNK).

7. SET THE PLANT STRAIGHT AND IN THE CENTER OF THE PIT SO THAT APPROXIMATELY 1/8 OF THE DIAMETER OF THE ROOT BALL IS ABOVE THE FINAL GRADE.

8. BACKFILL PLANTING PIT WITH EXISTING SOIL.

9. MAKE SURE PLANT REMAINS STRAIGHT DURING BACKFILLING PROCEDURE.

10. NEVER COVER THE TOP OF THE BALL WITH SOIL. MOUND SOIL AROUND THE EXPOSED BALL.

11. TREES SHALL BE BRACED BY USING 2" BY 2" WHITE OAK STAKES. STAKES SHALL BE PLACED PARALLEL TO WALKWAYS AND BUILDINGS. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL. UTILIZING HOSE AND WIRE THE TREE IS BRACED TO THE STAKES.

12. BECAUSE OF THE HIGH LEVELS OF NUTRIENTS IN STORMWATER RUNOFF TO BE TREATED, BIORETENTION BASIN PLANTS SHOULD NOT REQUIRE CHEMICAL FERTILIZATION.

Table 9.8, Suggested Annual Maintenance Activities for Bioretention

Maintenance Tasks	Frequency
• Mowing of grass filter strips and bioretention turf cover	At least 4 times a year
• Spot weeding, erosion repair, trash removal, and mulch raking	Twice during growing season
• Add reinforcement planting to maintain desired the vegetation density • Remove invasive plants using recommended control methods • Stabilize the contributing drainage area to prevent erosion	As needed
• Spring inspection and cleanup • Supplement mulch to maintain a 3 inch layer • Prune trees and shrubs	Annually
• Remove sediment in pre-treatment cells and inflow points	Once every 2 to 3 years
• Replace the mulch layer	Every 3 years

BIORETENTION MAINTENANCE & INSPECTIONS

MAINTENANCE AGREEMENTS

THE VIRGINIA STORMWATER MANAGEMENT REGULATIONS (4 VAC 50-60) SPECIFY THE CIRCUMSTANCES UNDER WHICH A MAINTENANCE AGREEMENT MUST BE EXECUTED BETWEEN THE OWNER AND THE VSMP AUTHORITY, AND 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 BIORETENTION PRACTICES MUST INCLUDE A LONG TERM MAINTENANCE AGREEMENTS CONSISTENT WITH THE PROVISIONS OF THE VSMP REGULATIONS, AND MUST INCLUDE THE RECOMMENDED MAINTENANCE TASKS AND A COPY OF AN ANNUAL INSPECTION CHECKLIST.
- WHEN MICRO-SCALE BIORETENTION PRACTICES ARE APPLIED ON PRIVATE RESIDENTIAL LOTS, HOMEOWNERS SHOULD BE EDUCATED REGARDING THEIR ROUTINE MAINTENANCE NEEDS BY BEING PROVIDED A SIMPLE DOCUMENT THAT EXPLAINS THEIR PURPOSE AND ROUTINE MAINTENANCE NEEDS. .
- A DEED RESTRICTION, DRAINAGE EASEMENT OR OTHER MECHANISM ENFORCEABLE BY THE VSMP AUTHORITY MUST BE IN PLACE TO HELP ENSURE THAT RAIN GARDENS AND BIORETENTION FILTERS ARE MAINTAINED AND NOT CONVERTED OR DISTURBED, AS WELL AS TO PASS THE KNOWLEDGE ALONG TO ANY SUBSEQUENT OWNERS.
- THE MECHANISM SHOULD, IF POSSIBLE, GRANT AUTHORITY FOR THE VSMP AUTHORITY TO ACCESS THE PROPERTY FOR INSPECTION OR CORRECTIVE ACTION.

FIRST YEAR MAINTENANCE OPERATIONS

SUCCESSFUL ESTABLISHMENT OF BIORETENTION AREAS REQUIRES THAT THE FOLLOWING TASKS BE UNDERTAKEN IN THE FIRST YEAR FOLLOWING INSTALLATION:

1. INITIAL INSPECTIONS: FOR THE FIRST 6 MONTHS FOLLOWING CONSTRUCTION, THE SITE SHOULD BE INSPECTED AT LEAST TWCE AFTER STORM EVENTS THAT EXCEED 1/2 INCH OF RAINFALL.

2. SPOT RESEEDING: INSPECTORS SHOULD LOOK FOR BARE OR ERODING AREAS IN THE CONTRIBUTING DRAINAGE AREA OR AROUND THE BIORETENTION AREA, AND MAKE SURE THEY ARE IMMEDIATELY STABILIZED WITH GRASS COVER.

3. FERTILIZATION: ONE-TIME, SPOT FERTILIZATION MAY BE NEEDED FOR INITIAL PLANTINGS.

4. WATERING: WATERING IS NEEDED ONCE A WEEK DURING THE FIRST 2 MONTHS, AND THEN AS NEEDED DURING FIRST GROWING SEASON (APRIL-OCTOBER), DEPENDING ON RAINFALL.

5. REMOVE AND REPLACE DEAD PLANTS: SINCE UP TO 10% OF THE PLANT STOCK MAY DIE OFF IN THE FIRST YEAR, CONSTRUCTION CONTRACTS SHOULD INCLUDE A CARE AND REPLACEMENT WARRANTY TO ENSURE THAT VEGETATION IS PROPERLY ESTABLISHED AND SURVIVES DURING THE FIRST GROWING SEASON FOLLOWING CONSTRUCTION. THE TYPICAL THRESHOLDS BELOW WHICH REPLACEMENT IS REQUIRED ARE 85% SURVIVAL OF PLANT MATERIAL AND 100% SURVIVAL OF TREES.

MAINTENANCE INSPECTIONS

IT IS HIGHLY RECOMMENDED THAT A SPRING MAINTENANCE INSPECTION AND CLEANUP BE CONDUCTED AT EACH BIORETENTION AREA. THE FOLLOWING IS A LIST OF SOME OF THE KEY MAINTENANCE PROBLEMS TO LOOK FOR:

1. CHECK TO SEE IF 75% TO 90% COVER (MULCH PLUS VEGETATIVE COVER) HAS BEEN ACHIEVED IN THE BED, AND MEASURE THE DEPTH OF THE REMAINING MULCH.

2. CHECK FOR SEDIMENT BUILDUP AT CURB CUTS, GRAVEL DIAPHRAGMS OR PAVEMENT EDGES THAT PREVENTS FLOW FROM GETTING INTO THE BED, AND CHECK FOR OTHER SIGNS OF BYPASSING.

3. CHECK FOR ANY WINTER- OR SALT-KILLED VEGETATION, AND REPLACE IT WITH HARDIER SPECIES.

4. NOTE PRESENCE OF ACCUMULATED SAND, SEDIMENT AND TRASH IN THE PRE-TREATMENT CELL OR FILTER BEDS, AND REMOVE IT.

5. INSPECT BIORETENTION SIDE SLOPES AND GRASS FILTER STRIPS FOR EVIDENCE OF ANY RILL OR GULLY EROSION, AND REPAIR IT.

6. CHECK THE BIORETENTION BED FOR EVIDENCE OF MULCH FLOTATION, EXCESSIVE PONDING, DEAD PLANTS OR CONCENTRATED FLOWS, AND TAKE APPROPRIATE REMEDIAL ACTION.

7. CHECK INFLOW POINTS FOR CLOGGING, AND REMOVE ANY SEDIMENT.

8. LOOK FOR ANY BARE SOIL OR SEDIMENT SOURCES IN THE CONTRIBUTING DRAINAGE AREA, AND STABILIZE THEM IMMEDIATELY.

9. CHECK FOR CLOGGED OR SLOW-DRAINING SOIL MEDIA, A CRUST FORMED ON THE TOP LAYER, INAPPROPRIATE SOIL MEDIA, OR OTHER CAUSES OF INSUFFICIENT FILTERING TIME, AND RESTORE PROPER FILTRATION CHARACTERISTICS.

EXAMPLE MAINTENANCE INSPECTION CHECKLISTS FOR BIORETENTION AREAS CAN BE ACCESSED IN APPENDIX C OF CHAPTER 9 OF THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK (2010).

ROUTINE AND NON-ROUTINE MAINTENANCE TASKS

MAINTENANCE OF BIORETENTION AREAS SHOULD BE INTEGRATED INTO ROUTINE LANDSCAPE MAINTENANCE TASKS. IF LANDSCAPING CONTRACTORS WILL BE EXPECTED TO PERFORM MAINTENANCE, THEIR CONTRACTS SHOULD CONTAIN SPECIFICS ON UNIQUE BIORETENTION LANDSCAPING NEEDS, SUCH AS MAINTAINING ELEVATION DIFFERENCES NEEDED FOR PONDING, PROPER MULCHING, SEDIMENT AND TRASH REMOVAL, AND LIMITED USE OF FERTILIZERS AND PESTICIDES. A CUSTOMIZED MAINTENANCE SCHEDULE MUST BE PREPARED FOR EACH BIORETENTION FACILITY, SINCE THE MAINTENANCE TASKS WILL DIFFER DEPENDING ON THE SCALE OF BIORETENTION, THE LANDSCAPING TEMPLATE CHOSEN, AND THE TYPE OF SURFACE COVER. A GENERALIZED SUMMARY OF COMMON MAINTENANCE TASKS AND THEIR FREQUENCY IS PROVIDED IN TABLE 9.8.

THE MOST COMMON NON-ROUTINE MAINTENANCE PROBLEM INVOLVES STANDING WATER. IF WATER REMAINS ON THE SURFACE FOR MORE THAN 48 HOURS AFTER A STORM, ADJUSTMENTS TO THE GRADING MAY BE NEEDED OR UNDERDRAIN REPAIRS MAY BE NEEDED. THE SURFACE OF THE FILTER BED SHOULD ALSO BE CHECKED FOR ACCUMULATED SEDIMENT OR A FINE CRUST THAT BUILDS UP AFTER THE FIRST SEVERAL STORM EVENTS. THERE ARE SEVERAL METHODS THAT CAN BE USED TO REHABILITATE THE FILTER (TRY THE EASIEST THINGS FIRST, AS LISTED BELOW):

1. OPEN THE UNDERDRAIN OBSERVATION WELL OR CLEANOUT AND POUR IN WATER TO VERIFY THAT THE UNDERDRAINS ARE FUNCTIONING AND NOT CLOGGED OR OTHERWISE IN NEED OF REPAIR. THE PURPOSE OF THIS CHECK IS TO SEE IF THERE IS STANDING WATER ALL THE WAY DOWN THROUGH THE SOIL. IF THERE IS STANDING WATER ON TOP, BUT NOT IN THE UNDERDRAIN, THEN THERE IS A CLOGGED SOIL LAYER. IF THE UNDERDRAIN AND STAND PIPE INDICATES STANDING WATER, THEN THE UNDERDRAIN MUST BE CLOGGED AND WILL NEED TO BE SNAKED.

2. REMOVE ACCUMULATED SEDIMENT AND TILL 2 TO 3 INCHES OF SAND INTO THE UPPER 8 TO 12 INCHES OF SOIL.

3. INSTALL SAND WICKS FROM 3 INCHES BELOW THE SURFACE TO THE UNDERDRAIN LAYER. SAND WICKS CAN BE INSTALLED BY EXCAVATING OR AUGERING (USING A TREE AUGER OR SIMILAR TOOL) DOWN TO THE GRAVEL STORAGE ZONE TO CREATE VERTICAL COLUMNS WHICH ARE THEN FILLED WITH A CLEAN OPEN-GRADED COARSE SAND MATERIAL (COARSE SAND MIX SIMILAR TO THE GRADATION USED FOR THE SOIL MEDIA). A SUFFICIENT NUMBER OF WICK DRAINS OF SUFFICIENT DIMENSION SHOULD BE INSTALLED TO MEET THE DESIGN DEWATERING TIME FOR THE FACILITY.

4. LAST RESORT – REMOVE AND REPLACE SOME OR ALL OF THE SOIL MEDIA.

Bowman

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SWM NOTES & DETAILS

TIFFANY ESTATES
CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT — FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION	
WED DESIGN	WED DRAWN	WED CHKD

SCALE H: N/A V: N/A

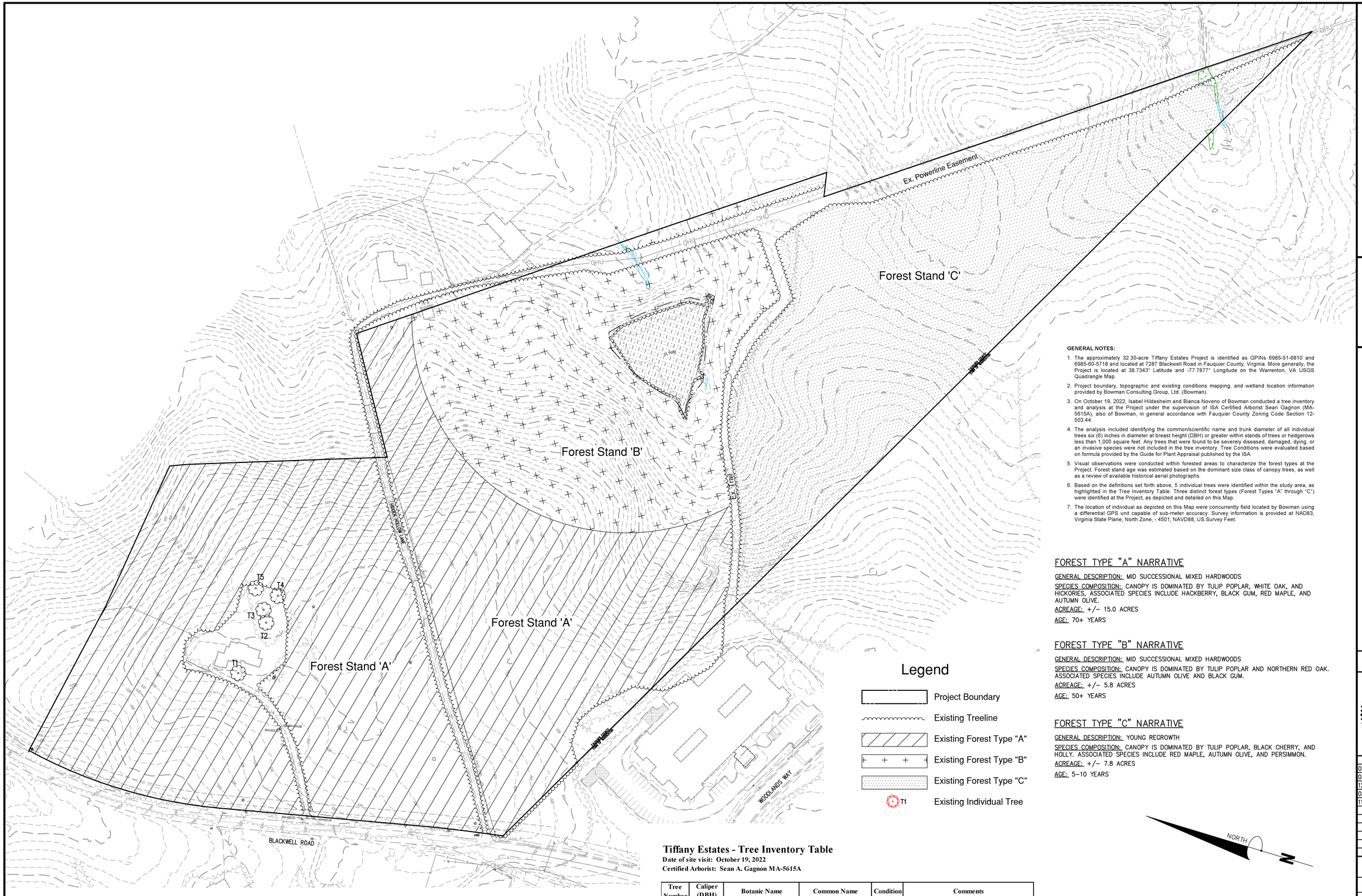
JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 49 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\045-049-6642-D-CP-001-SWM DET.dwg



Legend

- Project Boundary
- Existing Treeline
- Existing Forest Type "A"
- Existing Forest Type "B"
- Existing Forest Type "C"
- T1 — Existing Individual Tree

GENERAL NOTES:

1. The approximately 32.30-acre Tiffany Estates Project is identified as GPINs 6985-51-6810 and 6985-60-5718 and located at 7287 Blackwell Road in Fauquier County, Virginia. More generally, the Project is located at 38.7343° Latitude and -77.7877° Longitude on the Warrenton, VA USGS Quadrangle Map.
2. Project boundary, topographic and existing conditions mapping, and wetland location information provided by Bowman Consulting Group, Ltd. (Bowman).
3. On October 19, 2022, Isabel Hildesheim and Bianca Noveno of Bowman conducted a tree inventory and analysis at the Project under the supervision of ISA Certified Arborist Sean Gagnon (MA-5615A), also of Bowman, in general accordance with Fauquier County Zoning Code Section 12-503.44.
4. The analysis included identifying the common/scientific name and trunk diameter of all individual trees six (6) inches in diameter at breast height (DBH) or greater within stands of trees or hedgerows less than 1,000 square feet. Any trees that were found to be severely diseased, damaged, dying, or an invasive species were not included in the tree inventory. Tree Conditions were evaluated based on formula provided by the Guide for Plant Appraisal published by the ISA.
5. Visual observations were conducted within forested areas to characterize the forest types at the Project. Forest stand age was estimated based on the dominant size class of canopy trees, as well as a review of available historical aerial photographs.
6. Based on the definitions set forth above, 5 individual trees were identified within the study area, as highlighted in the Tree Inventory Table. Three distinct forest types (Forest Types "A" through "C") were identified at the Project, as depicted and detailed on this Map.
7. The location of individual as depicted on this Map were concurrently field located by Bowman using a differential GPS unit capable of sub-meter accuracy. Survey information is provided at NAD83, Virginia State Plane, North Zone, - 4501, NAVD88, US Survey Feet.

FOREST TYPE "A" NARRATIVE

GENERAL DESCRIPTION: MID SUCCESSIONAL MIXED HARDWOODS

SPECIES COMPOSITION: CANOPY IS DOMINATED BY TULIP POPLAR, WHITE OAK, AND HICKORIES, ASSOCIATED SPECIES INCLUDE HACKBERRY, BLACK GUM, RED MAPLE, AND AUTUMN OLIVE.

ACREAGE: +/- 15.0 ACRES

AGE: 70+ YEARS

FOREST TYPE "B" NARRATIVE

GENERAL DESCRIPTION: MID SUCCESSIONAL MIXED HARDWOODS

SPECIES COMPOSITION: CANOPY IS DOMINATED BY TULIP POPLAR AND NORTHERN RED OAK. ASSOCIATED SPECIES INCLUDE AUTUMN OLIVE AND BLACK GUM.

ACREAGE: +/- 5.8 ACRES

AGE: 50+ YEARS

FOREST TYPE "C" NARRATIVE

GENERAL DESCRIPTION: YOUNG REGROWTH

SPECIES COMPOSITION: CANOPY IS DOMINATED BY TULIP POPLAR, BLACK CHERRY, AND HOLLY. ASSOCIATED SPECIES INCLUDE RED MAPLE, AUTUMN OLIVE, AND PERSIMMON.

ACREAGE: +/- 7.8 ACRES

AGE: 5-10 YEARS

Tiffany Estates - Tree Inventory Table

Date of site visit: October 19, 2022
Certified Arborist: Sean A. Gagnon MA-5615A

Tree Number	Caliper (DBH)	Botanic Name	Common Name	Condition	Comments
1	32.5	*Quercus rubura*	Northern Red Oak	Poor	Crown damage
2	28.2	*Quercus alba*	White Oak	Fair	Minor crown damage
3	25.8	*Carya glabra*	Pignut Hickory	Good	
4	33.3	*Liriodendron tulipifera*	Tulip Poplar	Fair	Minor crown damage
5	31.3	*Liriodendron tulipifera*	Tulip Poplar	Fair	Minor crown damage

NORTH

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

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TREE INVENTORY PLAN
TIFFANY ESTATES
CONSTRUCTION PLAN
FAUQUIER COUNTY, VIRGINIA
CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION	
WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=80' V:
JOB No. 6642-02-002
DATE : FEBRUARY 10, 2023
FILE No. 6642-D-CP-001
SHEET 50 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\050-6642-D-CP-001-TREEINV.dwg

TREE PRESERVATION/ CONSERVED OPEN SPACE EASEMENT (7,243 SF)

TREE PRESERVATION/ CONSERVED OPEN SPACE EASEMENT (3,246 SF)

CONSERVATION AREA SIGN (TYP)

TREE PRESERVATION/ CONSERVED OPEN SPACE EASEMENT (18,239 SF)

TREE PRESERVATION/ CONSERVED OPEN SPACE EASEMENT (4,772 SF)

CONSERVATION AREA SIGN (TYP)

OPEN SPACE PARCEL 'C'

CONSERVATION AREA SIGN (TYP)

TREE PRESERVATION/ CONSERVED OPEN SPACE EASEMENT (12,598 SF)

CONSERVATION AREA SIGN (TYP)

CONSERVATION AREA SIGN (TYP)

OPEN SPACE PARCEL 'B'

TREE PRESERVATION/ CONSERVED OPEN SPACE EASEMENT (48,531 SF)

LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7
LOT 8
LOT 15
LOT 16
LOT 17
LOT 18
LOT 19
LOT 20
LOT 21
LOT 22

HIDDEN HOLLOW LANE
NICHOLAS MILL
NASH COURT
MATCHLINE - SHEET 52
BLACKWELL ROAD
FAUQUIER COUNTY / TOWN OF WARRENTON

CONSERVATION AREA
DO NOT DISTURB BEYOND THIS POINT

SIGNS SHALL BE POSTED ON EXISTING TREES ALONG THE TREE PERSERVATION/CONSERVED OPEN SPACE EASEMENT EVERY ±300' OR AS GENERALLY SHOWN ON THE PLAN..

CONSERVATION AREA SIGN DETAIL
N.T.S.

LEGEND

- DENOTES LARGE DECIDUOUS TREE
- AQUATIC BENCH SEED MIX & PLUGS (±4,710 SF)
- LOW NATIVE GRASS SEED MIX (±32,446 SF)
- DENOTES TREE PRESERVATION EASEMENT
- CONSERVATION AREA SIGN
- DENOTES QUANTITY
- DENOTES TREE TYPE

NORTH

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

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Fredericksburg, Virginia 22401
Phone: (540) 371-0268
bowman.com
Bowman Consulting Group Ltd

LANDSCAPE PLAN
TIFFANY ESTATES
CONSTRUCTION PLAN
FAUQUIER COUNTY, VIRGINIA
CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

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SCALE H: 1"=50' V:

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 51 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\051-053-6642-D-CP-001-LSP.dwg

TREE PRESERVATION/
CONSERVED OPEN
SPACE EASEMENT
(2,378 SF)

CONSERVATION
AREA SIGN (TYP)

LOT 14

TREE PRESERVATION/
CONSERVED OPEN
SPACE EASEMENT
(3,812 SF)

CONSERVATION
AREA SIGN (TYP)

OPEN SPACE
PARCEL 'A'

TREE PRESERVATION/
CONSERVED OPEN
SPACE EASEMENT
(1,938 SF)

CONSERVATION
AREA SIGN (TYP)

TREE PRESERVATION/
CONSERVED OPEN
SPACE EASEMENT
(6,219 SF)

TREE PRESERVATION/
CONSERVED OPEN
SPACE EASEMENT
(18,760 SF)

LOT 13

OPEN SPACE
PARCEL 'B'

NICOLAS WAY

TREE PRESERVATION/
CONSERVED OPEN
SPACE EASEMENT
(11,188 SF)

LOT 12

CONSERVATION
AREA SIGN (TYP)

LOT 11

CONSERVATION
AREA SIGN (TYP)

LOT 10

TREE PRESERVATION/
CONSERVED OPEN
SPACE EASEMENT
(6,663 SF)

FAUQUIER COUNTY
TOWN OF WARRENTON

LOT 17

NASH COURT

NICOLAS WAY

LOT 9

MATCHLINE - SHEET 51

TREE PRESERVATION/
CONSERVED OPEN
SPACE EASEMENT
(22,165 SF)

LOT 8

CONSERVATION
AREA SIGN (TYP)

LOT 7

TREE PRESERVATION/

CONSERVATION AREA
DO NOT DISTURB BEYOND THIS POINT

SIGNS SHALL BE POSTED ON EXISTING TREES ALONG THE TREE PERSERVATION/CONSERVED OPEN SPACE EASEMENT EVERY ±300' OR AS GENERALLY SHOWN ON THE PLAN..

CONSERVATION AREA SIGN DETAIL
N.T.S.

NORTH

LEGEND

- DENOTES LARGE DECIDUOUS TREE
- AQUATIC BENCH SEED MIX & PLUGS (±4,710 SF) SEE SHEET 53
- LOW NATIVE GRASS SEED MIX (±32,446 SF) SEE SHEET 53
- DENOTES TREE PRESERVATION EASEMENT
- CONSERVATION AREA SIGN
- 1 QR — DENOTES QUANTITY / DENOTES TREE TYPE

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\051-053-6642-D-CP-001-LSP.dwg

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LANDSCAPE PLAN

TIFFANY ESTATES

CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT

FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
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SCALE H: 1"=50'
V:

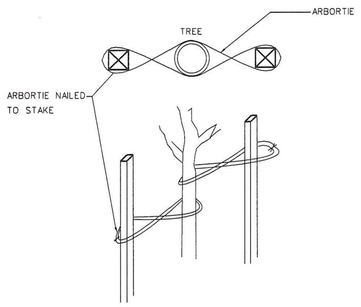
JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

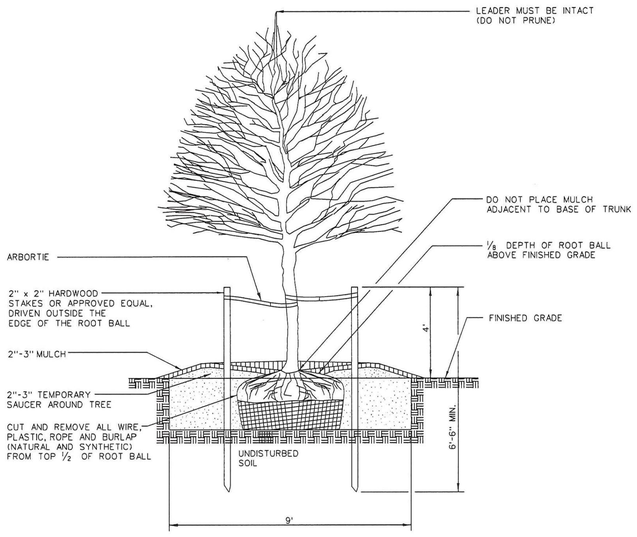
FILE No. 6642-D-CP-001

SHEET 52 OF 58

DECIDUOUS TREE PLANTING



STAKING DETAIL



DECIDUOUS TREE PLANTING W/ STAKES

LSC PLANT MATERIAL SPECIFICATIONS AND PROCEDURES:

1. ALL PLANT MATERIAL SHALL CONFORM TO CURRENT AMERICAN ASSOCIATION OF NURSERYMEN'S STANDARDS AND TO HORTUS THIRD (1977 EDITION) FOR BOTANICAL AND COMMON NAMES.
2. BALLED AND BURLAPPED PLANTS SHALL BE DUG WITH FIRM NATURAL BALLS OF EARTH. BALL SIZES SHALL BE IN ACCORDANCE WITH A.A.N. SPECIFICATIONS. ALL CONTAINER GROWN STOCK SHALL BE WELL ROOTED AND ESTABLISHED IN THE CONTAINER IN WHICH IT IS SOLD. AN ESTABLISHED CONTAINER GROWN PLANT SHALL HAVE A ROOT SYSTEM DEVELOPED SUFFICIENTLY TO RETAIN ITS SHAPE WHEN REMOVED.
3. ALL PLANT MATERIAL SHALL BE NURSERY GROWN UNLESS OTHERWISE SPECIFIED. NO PRUNING SHALL BE DONE BEFORE PLANTING OR DURING THE PLANTING OPERATION EXCEPT FOR PRUNING OF BROKEN LIMBS DUE TO HANDLING.
4. ALL PLANT MATERIAL SHALL BE COVERED AND PROTECTED FROM EXCESSIVE DRYING DURING TRANSIT AND DURING ONSITE STORAGE. ROOTBALLS/ CONTAINERIZED PLANTS ARE TO BE THOROUGHLY WATERED DAILY IN THE MORNING. UNDER NO CIRCUMSTANCES ARE TREES TO BE STORED ONSITE FOR MORE THAN ONE WEEK.
5. ANTI-DESICCANTS SHALL BE APPLIED ON ALL MATERIAL DUG WHILE IN LEAF.
6. MULCH MATERIAL SHALL BE DOUBLE SHREDDED HARDWOOD MULCH. MATERIAL SHALL BE UNIFORM IN SIZE AND FREE OF FOREIGN MATTER.
7. PLANTING SOIL MIXTURE SHALL CONFORM TO THE REQUIREMENTS PROVIDED IN THE SPECIFICATIONS.
8. PLANTING PROCEDURES FOR TREES AND SHRUBS:
   - A. PLANTING SHALL OCCUR IN ACCORDANCE WITH ALL DETAILS.
   - B. REMOVE ALL TAGS, RIBBONS AND BINDING MATERIALS BEFORE PLANTING.
   - C. TREES AND SHRUBS SHALL BE PLACED IN THE PLANTING PIT, AND MANEUVERED BY LIFTING FROM THE BALL (NEVER FROM THE BRANCHES OR TRUNK). ALL PLANT MATERIAL SHALL BE PLACED IN A VERTICAL POSITION WITHIN THE PLANTING PIT WITH THE MOST DESIRABLE SIDE PLACED TOWARD THE PROMINENT VIEW (SIDEWALK, STREET, ETC.).
   - D. THE TREE OR SHRUB PIT SHALL BE BACKFILLED WITH A SOIL MIXTURE, AS PER #7 OF THESE SPECS. THE PIT SHALL BE FILLED HALFWAY, INITIALLY AND TAMPED FIRMLY. ALL ROPES AROUND THE ROOTBALL SHALL BE CUT, TAGS TO BE REMOVED (AND GIVEN TO THE CLIENT, AS REQUIRED), WIRE BASKETS ARE TO BE CUT/ REMOVED HALF OF THE DEPTH OF THE BALL, AND THE BURLAP OR BALL WRAP IS TO BE PULLED BACK ONE-THIRD ON ALL B & B PLANT MATERIAL. COMPLETE BACKFILLING THE PLANT PIT AND TAMP FIRMLY. BACKFILL SOILS SHALL NOT COVER THE TOP OF THE ROOTBALL. MULCH THE ROOTBALL AND SAUCER WITH A MINIMUM OF 3" SHREDDED HARDWOOD MULCH. TAPER THE MULCH TO THE BASE OF THE TRUNK. UNDER NO CIRCUMSTANCES IS THE TRUNK TO BE BURIED IN ANY DEPTH OF MULCH. THE CONTRACTOR SHALL BE REQUIRED TO RE-VISIT THE SITE AND FIX ANY DEFICIENTCIES NOTED IN THE POST-CONSTRUCTION CERTIFICATIONS PER THE ABOVE REFERENCED REQUIREMENT.

GENERAL STANDARDS:

1. ALL TREES TO BE PLANTED SHALL MEET THE SPECIFICATIONS OF THE AMERICAN LANDSCAPE AND NURSERY ASSOCIATION.
2. THE PLANTING TREES SHALL BE DONE IN ACCORDANCE WITH EITHER THE STANDARDIZED LANDSCAPE SPECIFICATIONS JOINTLY ADOPTED BY THE VIRGINIA NURSERYMEN'S ASSOCIATION, THE VIRGINIA SOCIETY OF LANDSCAPE DESIGNERS, AND THE VIRGINIA CHAPTER OF THE AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS, OR THE ROAD AND BRIDGE SPECIFICATIONS OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION. THE COUNTY SHALL MAINTAIN CURRENT COPIES OF THESE SPECIFICATIONS TO THE PUBLIC.
3. THE MINIMUM CALIPER OF ALL DECIDUOUS TREES PLANTED SHALL BE 2 ½ INCH, AND THE MINIMUM HEIGHT OF ALL EVERGREEN TREES SHALL BE SIX (6) FEET.
4. THE OWNER, OR HIS AGENT, SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR AND REPLACEMENT OF ALL REQUIRED LANDSCAPE MATERIALS, SCREENING AND BUFFERING AS MAY BE REQUIRED BY THE PROVISIONS OF ARTICLE 7, SECTION 600 OF THE FAUQUIER COUNTY ZONING ORDINANCE. ALL PLANT MATERIAL SHALL BE TENDED AND MAINTAINED IN A HEALTHY GROWING CONDITION, REPLACED WHEN NECESSARY AND KEPT FREE OF REFUSE AND DEBRIS. FENCES SHALL BE MAINTAINED IN GOOD REPAIR. OPENINGS WITHIN THE BARRIERS MAY BE REQUIRED BY THE ZONING ADMINISTRATOR FOR ACCESSIBILITY TO AN AREA FOR NECESSARY MAINTENANCE.

LSC PLANTING GENERAL NOTES:

1. THIS PLAN FOR PLANTING LOCATIONS ONLY.
2. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL PLANT MAINTENANCE, INCLUDING SHRUBS AND GROUNDCOVER, AND SHALL MAINTAIN AREA IN A WEED AND DEBRIS FREE CONDITION THROUGHOUT THE ONE YEAR GUARANTEE PERIOD.
3. CONTRACTOR SHALL LAY OUT AND CLEARLY STAKE ALL PROPOSED IMPROVEMENTS INCLUDED ON THIS PLAN.
4. CONTRACTOR IS RESPONSIBLE FOR CONTACTING MISS UTILITY PRIOR TO BEGINNING CONSTRUCTION FOR LOCATION OF ALL UTILITY LINES. TREES SHALL BE LOCATED A MINIMUM OF 4' FROM SEWER/WATER EASEMENTS. CONTRACTOR SHALL BE LIABLE FOR DAMAGE TO ANY AND ALL PUBLIC OR PRIVATE UTILITIES.
5. CONTRACTOR TO VERIFY PLANT LIST TOTALS WITH QUANTITIES SHOWN ON PLAN. LANDSCAPE ARCHITECT SHALL BE ALERTED BY CONTRACTOR OF ANY DISCREPANCIES PRIOR TO FINAL BID NEGOTIATION. UNIT PRICES FOR ALL MATERIAL SHALL BE SUPPLIED TO THE OWNER AT BIDDING TIME.
6. ALL MATERIALS SHALL BE SUBJECT TO APPROVAL BY THE LANDSCAPE ARCHITECT. OWNER SHALL RECEIVE TAG FROM EACH PLANT SPECIES AND A LIST OF PLANT SUPPLIERS. WHERE ANY REQUIREMENTS ARE OMITTED FROM THE PLANT LIST, THE PLANTS FURNISHED SHALL MEET THE NORMAL REQUIREMENTS FOR THE VARIETY PER THE AMERICAN STANDARD FOR NURSERY STOCK, LATEST EDITION, PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN (AAN). PLANTS SHALL BE PRUNED PRIOR TO DELIVERY ONLY UPON THE APPROVAL OF THE LANDSCAPE ARCHITECT.
7. WHERE TREES ARE PLANTED IN ROWS, THEY SHALL BE UNIFORM IN SIZE AND SHAPE.
8. SIZES SPECIFIED IN THE PLANT LIST ARE MINIMUM SIZES TO WHICH THE PLANTS ARE TO BE JUDGED. FAILURE TO MEET MINIMUM SIZE ON ANY PLANT WILL RESULT IN REJECTION OF THAT PLANT.
9. ALL PLANTS SHALL BE FRESHLY DUG, SOUND, HEALTHY, VIGOROUS, WELL BRANCHED, FREE OF DISEASE, INSECT EGGS, AND LARVAE, AND SHALL HAVE ADEQUATE ROOT SYSTEMS.
10. NO EXISTING TREES SHALL BE REMOVED WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER EXCEPT WHERE NOTED ON PLANS. NO GRUBBING SHALL OCCUR WITHIN EXISTING TREE AREAS.
11. TREES SHALL BE LOCATED A MINIMUM OF 4' FROM WALLS AND WALKS WITHIN THE PROJECT. IF CONFLICTS ARISE BETWEEN ACTUAL SIZE OF AREA AND PLANS, CONTRACTOR SHALL CONTACT LANDSCAPE ARCHITECT FOR RESOLUTION. FAILURE TO MAKE SUCH CONFLICTS KNOWN TO THE OWNER OR LANDSCAPE ARCHITECT WILL RESULT IN CONTRACTOR'S LIABILITY TO RELOCATE MATERIALS.
12. CONTRACTOR TO SLIGHTLY ADJUST PLANT LOCATIONS IN THE FIELD AS NECESSARY TO BE CLEAR OF DRAINAGE SWALES AND UTILITIES. FINISHED PLANTING BEDS SHALL BE GRADED SO AS TO NOT IMPEDE DRAINAGE.
13. TREE STAKING AND GUYING SHALL BE DONE PER DETAILS, IF NECESSARY. CONTRACTOR SHALL ENSURE THAT TREES REMAIN UPRIGHT FOR THE DURATION OF THE ONE YEAR GUARANTEE PERIOD. AT THE END OF ONE, YEAR, ALL RUBBER HOSE AND WIRE STAKES, AND ANY MISC. TAGS ARE REMOVED FROM THE TREES AND THE SITE (AS APPLICABLE).
14. MULCH IS TO BE DOUBLE SHREDDED HARDWOOD BARK FOR TREES AND SHRUBS.
15. SHADE TREES: HEIGHT SHALL BE MEASURED FROM THE CROWN OF THE ROOT BALL TO THE TOP OF MATURE GROWTH. SPREAD SHALL BE MEASURED TO THE END OF BRANCHING EQUALLY AROUND THE CROWN FROM THE ENTER OF THE TRUNK MEASUREMENTS ARE NOT TO INCLUDE ANY TERMINAL GROWTH.
16. ALL CONTRACTORS SHALL BE REQUIRED TO COMPLETELY REMOVE ALL TRASH DEBRIS AND EXCESS MATERIALS FROM THE WORK AREA AND THE PROPERTY (ESPECIALLY AT ALL CURB, GUTTERS AND SIDEWALKS) DAILY DURING INSTALLATION.
17. DEAD PLANTS ARE TO BE REMOVED FROM THE JOB BY THE CONTRACTOR WEEKLY. CONTRACTOR SHALL MAINTAIN AN UPDATED, COMPREHENSIVE LIST OF ALL DEAD MATERIALS REMOVED AND PRESENT A COPY OF THE LIST TO THE OWNER AT THE END OF EVERY MONTH DURING THE CONTRACT PERIOD.
18. CONTRACTOR SHALL GUARANTEE ALL LANDSCAPE IMPROVEMENTS, INCLUDING TREES, SHRUBS, VINES, ORNAMENTAL GRASSES, GROUND COVERS, BIENNIALS, PERENNIALS AND OTHER PLANTS FOR ONE FULL YEAR FROM THE POINT OF SUBSTANTIAL COMPLETION. CONTRACTOR MUST CONTACT THE OWNER AT LEAST 10 WORKING DAYS IN ADVANCE TO SCHEDULE ACCEPTANCE INSPECTION(S). CONTRACTOR MUST REPLACE ALL DEAD OR UNACCEPTABLE PLANTS DURING THE FOLLOWING RECOMMENDED PLANTING SEASON.
19. NO TREES SHALL BE PLANTED IN THE WATER AND SEWER EASEMENTS. NO PLANTINGS SHALL BE WITHIN 5 FEET OF A FIRE HYDRANT.

AQUATIC BENCH SEED MIX

SCIENTIFIC NAME	COMMON NAME	PERCENT OF MIX
Asclepias incarnate	Swamp Milkweed	5%
Carex comosa	Cosmos (Bristly) Sedge	3%
Carex crinata	Long Hair Sedge	4%
Carex lurida	Lurid (Shallow) Sedge	5%
Carex stricta	Tussock Sedge	5%
Carex vulpinoidea	Fox Sedge	10%
Cinna arendinacea	Wood Reedgrass	2%
Dulichium arendinaceum	Three Way Sedge	2%
Elymus virginicus	Virginia Wild Rye	15%
Eupatorium dubium	Joe Pye Weed	8%
Lobelia cardinalis	Cardinal Flower	5%
Mimulus ringens	Monkey Flower	4%
Onoclea sensibilis	Sensitive Fern	8%
Pontederia cordata	Pickerel Weed	5%
Sagittaria latifolia	Duck Potato (Arrowhead)	8%
Scirpus atrovirens	Green Bulrush	5%
Sparganium americanum	Eastern Bur Reed	6%
	TOTAL	**100%**
COVER CROP		
Avena sativa	Annual oats	

Plant any trees, shrubs, or potted plants prior to application of specified compost blanket. Apply a 3-inch blanket of specified compost prior to or during seed application. Compost shall be Soilmate® compost or an approved equal. The paperwork (shipping invoices), samples and U.S. Composting Council's Seal of Testing Assurances (STA) certifications for the product shall be submitted to and approved by the Engineer prior to purchase. 3Proposed equal products must be STA approved.

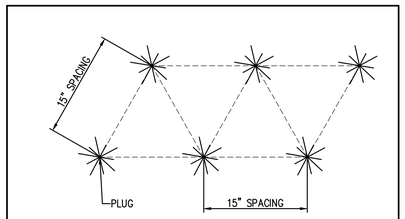
Broadcast or pump seed at $^1/_2$ lb/1000 ft^2 and certified weed-free annual oats (**Avena sativa**) at 1 lb/1000 ft^2 on top of applied 3-inch blanket of specified compost. Substitue winter wheat fo annual oats if seeding after October 1. Reseed and mulch all areas with less than 80% germination.

Custom ERNST native seed mix or approved equivalent. The paper work and certifications for all seed mixes shall be submitted and approved by the Engineer prior to installation.

LOW NATIVE GRASS SEED MIX

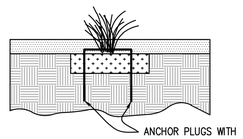
SCIENTIFIC NAME	COMMON NAME	PERCENT OF MIX
Agrostis Perennans	Autumn Bentgrass	9.10%
Festuca Rubra	Creeping Red Fescue	81.60%
Juncus tenuis	Path Rush, NC Ecotype	0.10%
Juncus tenuis	Path Rush, PA Ecotype	0.10%
Lolium multiflorum	Annual Ryegrass	9.10%
	TOTAL	**100%**

Grass seed mix or approved equal shall be applied at 3-5 pounds per 1,000 SF.



NOTE:
PLUG QUANTITIES MAY BE FIELD ADJUSTED BY THE CONTRACTOR WITH CITY APPROVAL TO ALIGN WITH QUANTITIES AVAILABLE PER FLAT AT THE TIME OF PURCHASE.

PLUG PLANTING DETAIL
(NTS)



PLUG ANCHOR DETAIL
(NTS)

AQUATIC BENCH PLUG SCHEDULE

AQUATIC BENCH PLUGS - 4,710 S.F. @ 15" O.C. = 3,537 PLUGS			
NO. OF PLUGS	**SCIENTIFIC NAME**	**COMMON NAME**	**SIZE**
393	*ANDROPOGON GERARDII*	BIG BLUESTEM	5" PLUG OR QT. CONTAINER
393	*ASCLEPIAS TUBEROSA*	BUTTERFLY WEED	5" PLUG OR QT. CONTAINER
393	*BAPTISTA AUSTRALIS*	FALSE INDIGO	5" PLUG OR QT. CONTAINER
393	*CHASMANTHIUM LATIFOLIUM*	RIVER OATS	5" PLUG OR QT. CONTAINER
393	*HELIOPSIS HELANTHOIDES*	SMOOTH OX EYE	5" PLUG OR QT. CONTAINER
393	*HIBISCUS MOSCHEUTOS*	SWAMP ROSE MALLOW	5" PLUG OR QT. CONTAINER
393	*JUNCUS EFFUSUS*	SOFT RUSH	5" PLUG OR QT. CONTAINER
393	*MONARDA FISTULOSA*	WILD BERGAMOT	5" PLUG OR QT. CONTAINER
393	*SORGHASTRUM NUTANS*	INDIAN GRASS	5" PLUG OR QT. CONTAINER

STREET TREE CALCULATIONS

BLACKWELL ROAD	
LINEAR FEET OF R.O.W.:	**925.96 LF**
STREET TREES REQUIRED (1 / 50 LF OF ROW):	19 TREES
STREET TREES PROVIDED	**19 TREES**
NICOLAS WAY	
LINEAR FEET OF R.O.W.:	**4759.21 LF**
STREET TREES REQUIRED (1 / 50 LF OF ROW):	95 TREES
STREET TREES PROVIDED	**95 TREES**
NOAH COURT	
LINEAR FEET OF R.O.W.:	**615.18 LF**
STREET TREES REQUIRED (1 / 50 LF OF ROW):	12 TREES
STREET TREES PROVIDED	**12 TREES**
NASH COURT	
LINEAR FEET OF R.O.W.:	**850.99 LF**
STREET TREES REQUIRED (1 / 50 LF OF ROW):	17 TREES
STREET TREES PROVIDED	**17 TREES**

PLANT SCHEDULE

QTY.	SYM.	SCIENTIFIC NAME	COMMON NAME	SIZE CALIPER	SIZE HEIGHT	CONDITION	20 YEAR CANOPY (SF)*	TOTAL 20 YEAR CANOPY (SF)
LARGE DECIDUOUS TREES								
95	AR	ACER RUBRUM	RED MAPLE	3"	12'-14'	B&B	350	33,250
48	QC	QUERCUS COCCINEA	SCARLET OAK	3"	12'-14'	B&B	325	15,600
143		**LARGE DECIDUOUS TREE TOTAL**						**48,850**

TREE COVER CALCULATIONS

DEVELOPMENT AREA:		**32.1783 AC.**	**1,401,688 SF**
EXCLUDED ACREAGE:			
PONDS		0.9133 AC.	39,785 SF
NON-WOODED WETLANDS		0.00 AC.	0 SF
ADJUSTED DEVELOPMENT AREA:		**31.2650 AC.**	**1,361,903 SF**
EXISTING ZONE:		R1	
TOTAL TREE COVER REQUIRED	**15%**	**4.6897 AC.**	**204,285 SF**
TOTAL 20-YEAR TREE COVER PROVIDED:	**15.97%**	**4.9940 AC.**	**217,537 SF**
BY PRESRVATION	12.39%	3.8725 AC.	168,687 SF
BY PLANTING	3.59%	1.1214 AC.	48,850 SF

Bowman

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LANDSCAPE NOTES & DETAILS

TIFFANY ESTATES
CONSTRUCTION PLAN

FAUQUIER COUNTY, VIRGINIA

CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

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DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: N/A V:

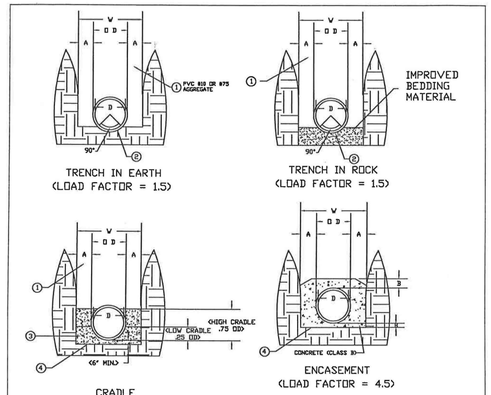
JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 53 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\051-053-6642-D-CP-001-LSP.dwg



CRADLE
CONCRETE (CLASS B)
LOW CRADLE (LOAD FACTOR=2.4)
HIGH CRADLE (LOAD FACTOR=3.4)
IMPROVED BEDDING MATERIAL
LOW CRADLE (LOAD FACTOR=1.5)
HIGH CRADLE (LOAD FACTOR=1.9

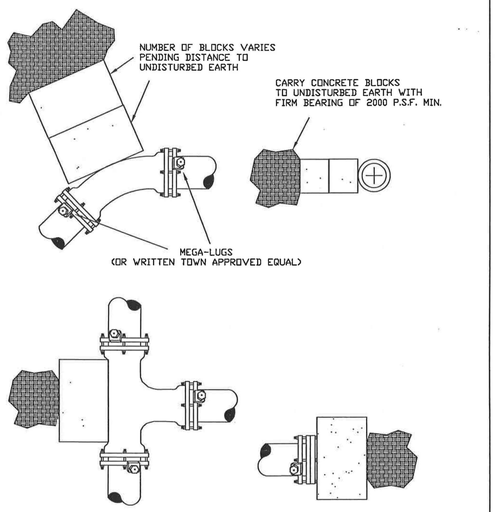
PIPE DIA. "D"	MAXIMUM "A"	MINIMUM "B"
6" TO 15"	8" ⑥	6"
18" TO 21"	10"	9"
24" TO 30"	12"	12"
33" TO 42"	15"	12"
48" & UP	18"	12"

MAXIMUM TRENCH WIDTH "W" TAKEN AT TOP OF PIPE

NOTES
① APPROVED BACK FILL TAMPED IN 6" LAYERS TO 1'-0" ABOVE PIPE.
② BOTTOM QUADRANT OF PIPE BEDDED FULL LENGTH OF BARREL.
③ IMPROVED BEDDING MATERIAL OR CONCRETE AS DIRECTED.
④ POUR CONCRETE AGAINST UNDISTURBED MATERIAL.
⑤ DETAILS SHOWN ARE FOR NORMAL SOIL CONDITIONS. A SPECIAL DESIGN WILL BE REQUIRED FOR UNUSUAL SOIL CONDITIONS.
⑥ MAXIMUM TRENCH WIDTH "W" FOR PIPES 10-INCH AND SMALLER SHALL BE 30-INCHES.

TOWN OF WARRENTON VIRGINIA	APPROVED: 1/20/05 DIRECTOR OF PUBLIC WORKS / UTILITIES	PIPE TRENCH BEDDING DETAIL	DRAWING NO: E-1

125



ALL BEARING SURFACES FOR CONCRETE BLOCKING SHALL BE UNDISTURBED EARTH WITH A MINIUM BEARING VALUE OF 2000 P.S.F. THE MINIMUM THICKNESS OF UNDISTURBED EARTH BEHIND BLOCKING SHALL BE 5 FEET.

BLOCKING SHOWN IS FOR MAXIUM STATIC PRESSURE OF 120 P.S.I. PLUS WATER HAMMER ALLOWANCE.

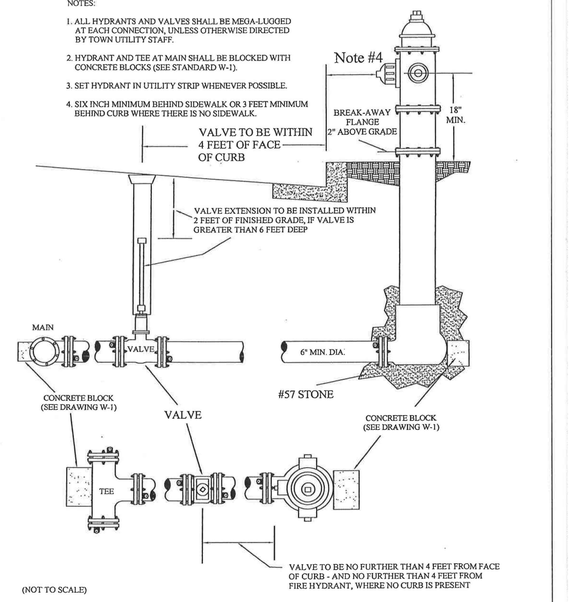
SPECIAL BLOCKING WILL BE DESIGNED FOR CONDITIONS OTHER THAN THOSE INDICATED.

TOWN OF WARRENTON VIRGINIA	APPROVED: 1/20/05 DIRECTOR OF PUBLIC WORKS / UTILITIES	CONCRETE BLOCKING FOR ALL BENDS, TEES, CAPS & PLUGS	DRAWING NO: W-1

137

NOTES:

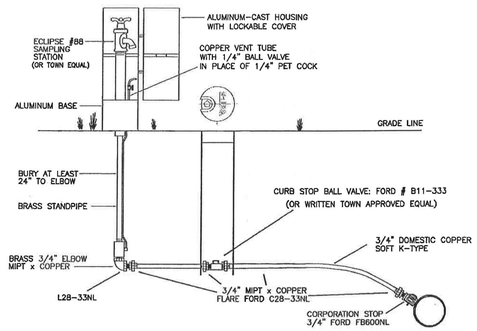
1. ALL HYDRANTS AND VALVES SHALL BE MEGA-LUGGED AT EACH CONNECTION, UNLESS OTHERWISE DIRECTED BY TOWN UTILITY STAFF.
2. HYDRANT AND TEE AT MAIN SHALL BE BLOCKED WITH CONCRETE BLOCKS (SEE STANDARD W-1).
3. SET HYDRANT IN UTILITY STRIP WHENEVER POSSIBLE.
4. SIX INCH MINIMUM BEHIND SIDEWALK OR 3 FEET MINIMUM BEHIND CURB WHERE THERE IS NO SIDEWALK.



(NOT TO SCALE)

TOWN OF WARRENTON VIRGINIA	APPROVED: 7/10/12 DIRECTOR OF PUBLIC WORKS / UTILITIES	FIRE HYDRANT SETTING	DRAWING NO: W-5

WATER SAMPLING STATION



Sampling Stations shall have unthreaded faucet nozzle.

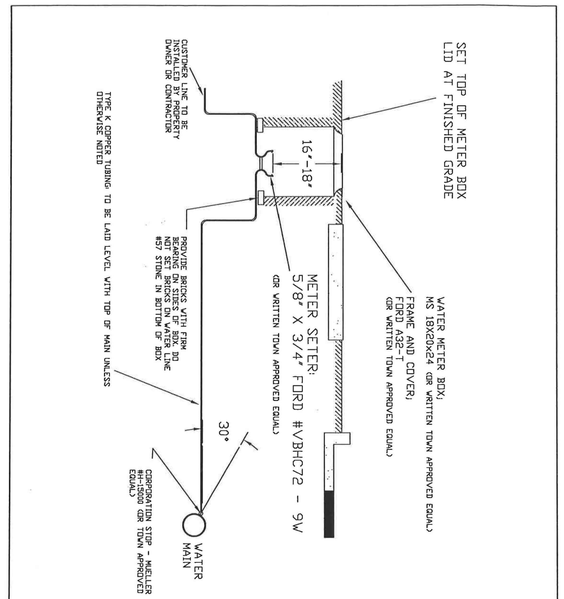
All stations shall be enclosed in a lockable, nonremovable, aluminum-cast housing, set within Town of Warrenton right-ofway.

When opened, the station shall require no key for operation, and the water will flow in an all brass waterway.

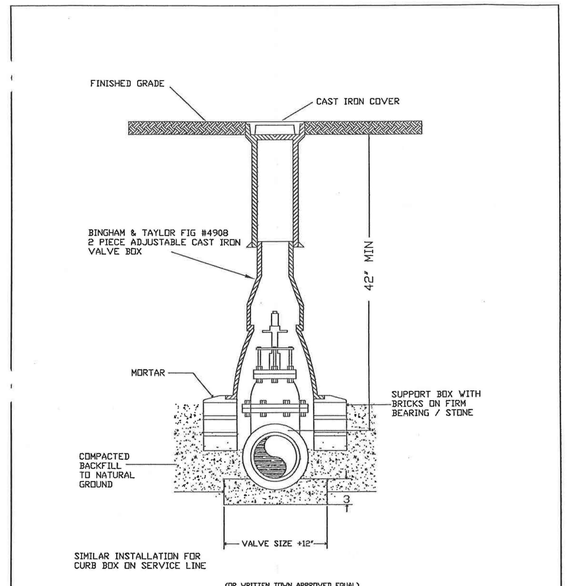
All working parts will also be of brass and be removable from above ground without excavating. Exterior piping shall be brass.

A copper vent tube will enable each station to be pumped free of standing water to prevent freezing and to minimize bacteria growth.

TOWN OF WARRENTON VIRGINIA	APPROVED: 11/8/16 DIRECTOR OF PUBLIC WORKS / UTILITIES	WATER SAMPLING STATION	DRAWING NO: W-23



TOWN OF WARRENTON VIRGINIA	APPROVED: 2/28/12 DIRECTOR OF PUBLIC WORKS / UTILITIES	WATER SERVICE CONNECTION 5/8" X 3/4"	DRAWING NO: W-9



TOWN OF WARRENTON VIRGINIA	APPROVED: 1/20/05 DIRECTOR OF PUBLIC WORKS / UTILITIES	VALVE BOX INSTALLATION	DRAWING NO: W-15

144

Bowman

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Fredericksburg, Virginia 22401
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bowman.com
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WATER NOTES & DETAILS
TIFFANY ESTATES
CONSTRUCTION PLAN
FAUQUIER COUNTY, VIRGINIA
CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

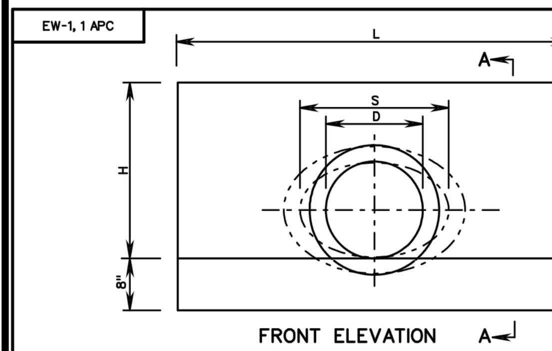
DATE	DESCRIPTION

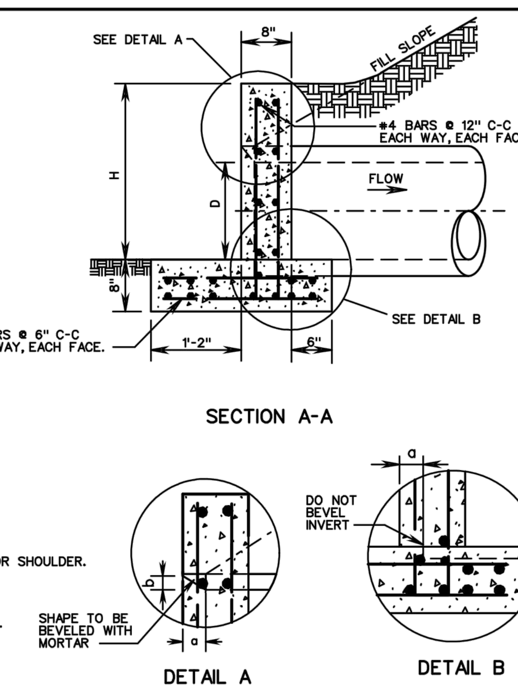
WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=50' V: 1"=5'
JOB No. 6642-02-002
DATE : FEBRUARY 10, 2023
FILE No. 6642-D-CP-001
SHEET 54 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\054-056-6642-D-CP-001-DET.dwg

EW-1, 1 APC





NOTES:

1. CONCRETE TO BE 4000 PSI MINIMUM COMPRESSIVE STRENGTH.
2. IF PIPE IS TO BE SKEWED THE OPENING WILL BE ADJUSTED TO ACCOMMODATE ANGLES UP TO 45°.
3. REINFORCING STEEL IN ACCORDANCE WITH ASTM A-615 (REINFORCING BARS).
4. PIPE OPENINGS IN PRECAST DRAINAGE UNITS SHALL NOT EXCEED 4 INCHES AT ANY GIVEN POINT BETWEEN THE PIPE AND THE PRECAST UNIT.
5. DIMENSIONS SHOWN ARE MINIMUM. ACTUAL MEASUREMENTS MAY VARY WITH MANUFACTURER'S TOLERANCE.
6. IN NO CASE SHALL TOP OF ENDWALL PROJECT ABOVE FILL SLOPE, DITCH SLOPE, OR SHOULDER.
7. HEADWALL TO BE BEVELED IN ALL AREAS EXCEPT WHERE A CONFLICT WITH INVERT OR WINGWALL OCCUR.
8. BEVEL EDGE IS REQUIRED ON THE HEADWALL AT THE INLET END OF THE CULVERT. HEADWALL AT OUTLET END MAY BE EITHER SQUARE EDGE OR BEVELED.
9. ¾" CHAMFER MAY BE PROVIDED ON ALL EDGES AT MANUFACTURER'S OPTION.

EW-1PC

ENDWALL FOR CIRCULAR PIPE

DIAMETER OF PIPE CULVERT						
D	12"	15"	18"	21" OR 24"	27" OR 30"	33" OR 36"
H	2'-0"	2'-3"	2'-6"	3'-2"	3'-10"	4'-4"
L	4'-0"	5'-0"	6'-0"	8'-0"	10'-0"	12'-0"
a	0'-1¼"	0'-1¾"	0'-2"	0'-2½"	0'-3¼"	0'-3¾"
b	0'-1"	0'-1¼"	0'-1½"	0'-2"	0'-2½"	0'-3"

EW-1APC

ENDWALL FOR ELLIPTICAL PIPE

SIZE OF ELLIPTICAL PIPE CULVERT (SPAN x RISE)								
S x D	23" x 14"	30" x 19"	34" x 22"	38" x 24"	42" x 27"	45" x 29"	49" x 32"	53" x 34"
H	1'-10"	2'-4"	2'-7"	2'-9"	3'-1"	3'-3"	3'-6"	3'-8"
L	5'-5"	7'-2"	8'-6"	9'-2"	10'-2"	10'-11"	12'-1"	12'-11"
a	0'-2½"	0'-3¼"	0'-3½"	0'-4"	0'-4½"	0'-4¾"	0'-5"	0'-5½"
b	0'-2"	0'-2½"	0'-2¾"	0'-3"	0'-3½"	0'-3¾"	0'-4"	0'-4½"

VDOT ROAD AND BRIDGE STANDARDS | SHEET 1 OF 1 | REVISION DATE | 101.02

PRECAST ENDWALL FOR PIPE CULVERTS

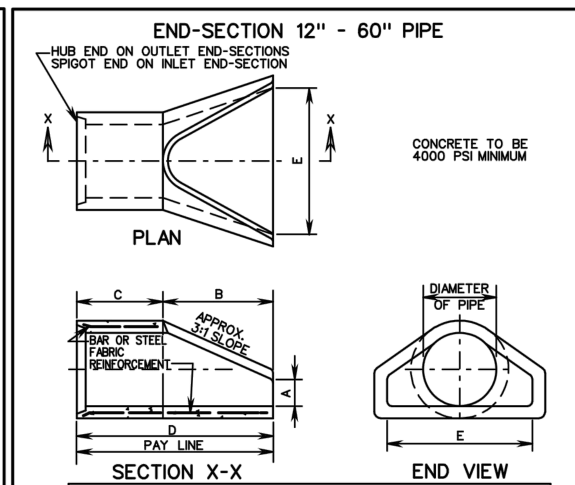
12" - 36" CIRCULAR AND 23" x 14" - 53" x 34" ELLIPTICAL PIPES

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE: 105, 302

ES-1

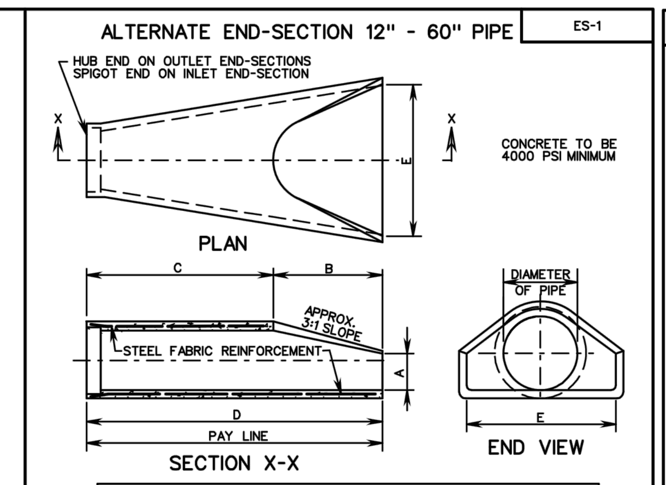
END-SECTION 12" - 60" PIPE



END SECTION DIMENSIONS

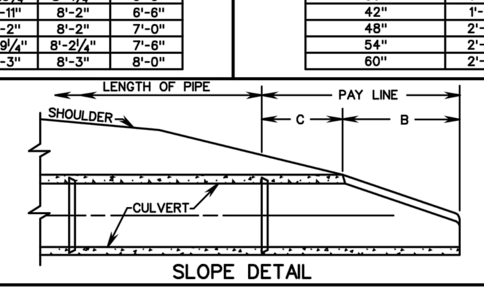
PIPE DIAMETER	A	B	C	D	E
12"	4"	2'-0"	2'-0"	4'-0"	2'-0"
15"	6"	2'-3"	1'-9"	4'-0"	2'-6"
18"	9"	2'-3"	1'-9"	4'-0"	3'-0"
21"	9¼"	2'-11"	2'-1"	5'-0"	3'-6"
24"	9½"	3'-7"	2'-6"	6'-1"	4'-0"
27"	10¾"	4'-0"	2'-1"	6'-1"	4'-6"
30"	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"
33"	1'-1½"	4'-10½"	2'-3¼"	7'-1¾"	5'-6"
36"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	6'-0"
42"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"
48"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"
54"	2'-3"	5'-5"	2'-9¼"	8'-2¼"	7'-6"
60"	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"

ALTERNATE END-SECTION 12" - 60" PIPE



END SECTION DIMENSIONS

PIPE DIAMETER	A	B	C	D	E
12"	4"	2'-0"	4'-1"	6'-1"	2'-0"
15"	6"	2'-3"	3'-10"	6'-1"	2'-6"
18"	9"	2'-3"	3'-10"	6'-1"	3'-0"
21"	9"	2'-11"	3'-2"	6'-1"	3'-6"
24"	10"	3'-7"	2'-8"	6'-3"	4'-0"
27"	10½"	4'-0"	2'-1½"	6'-1½"	4'-6"
30"	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"
33"	1'-1½"	4'-10½"	3'-3¼"	8'-1¾"	5'-6"
36"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	6'-0"
42"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"
48"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"
54"	2'-3"	5'-5"	2'-11"	8'-4"	7'-6"
60"	2'-6"	5'-0"	3'-3"	8'-3"	8'-0"



NOTES:
PIPE LENGTHS SHOWN ON PLANS ARE BASED ON END-SECTION DESIGN SHOWN ON THE LEFT. IF THE CONTRACTOR ELECTS TO USE THE ALTERNATE DESIGN SHOWN ON THE RIGHT, LENGTHS WILL BE REDUCED BY THE DIFFERENCE IN DIMENSION "D".

SPECIFICATION REFERENCE: 302

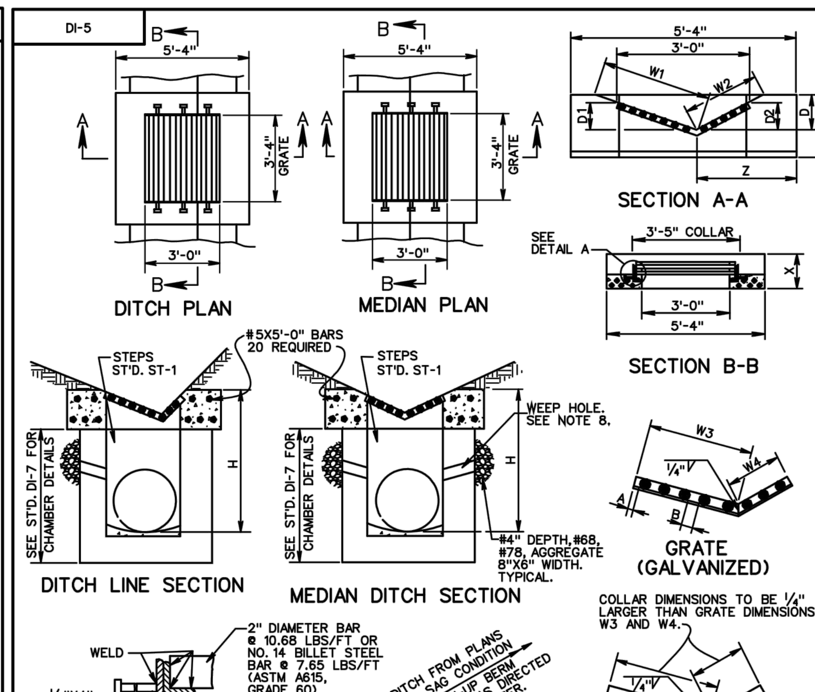
FLARED END SECTION

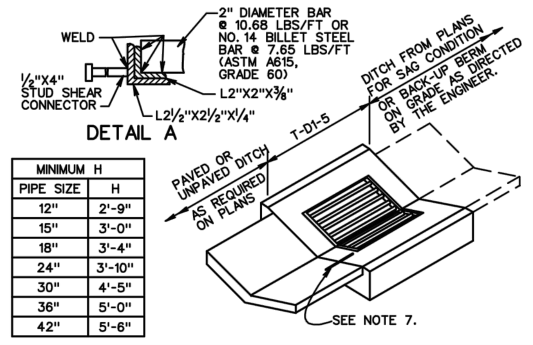
12" - 60" CONCRETE PIPE CULVERTS

VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT ROAD AND BRIDGE STANDARDS | REVISION DATE | SHEET 1 OF 1 | 102.01

DI-5





MINIMUM H	
PIPE SIZE	H
12"	2'-9"
15"	3'-0"
18"	3'-4"
24"	3'-10"
30"	4'-5"
36"	5'-0"
42"	5'-6"

GRATE BAR SPACING CHART

GRATE TYPE	MAXIMUM DIMENSION A	MAXIMUM DIMENSION B
A I	½"	3"
A III	1"	1"

COVER DIMENSIONS AND QUANTITIES

ST'D PG-2A TYPE	W1	W2	W3	W4	✱D	D1	D2	X	Z
A1,A2,A3	3'-0½"	2'-0¾"	2'-0 5/16"	1'-0⅜"	6"	4"	3"	14"	2'-2"
B1,B2,B3,B4 C1,C2,C3	2'-9"	2'-9"	1'-6 9/16"	1'-6 9/16"	8"	4½"	4½"	16"	2'-8"
E	2'-3"	2'-3"	1'-8 1/16"	1'-8 1/16"	12"	9"	9"	19"	2'-8"

✱ TOLERANCE ± ½"

NOTES

1. DEPTH OF INLET (H) TO BE SHOWN ON PLANS.
2. THE "H" DIMENSION SHOWN ON THE STANDARDS AND SPECIFIED ON THE PLANS WILL BE MEASURED FROM THE INVERT OF THE OUTFALL PIPE TO THE TOP OF THE STRUCTURE. PLAN "H" DIMENSIONS ARE APPROX. ONLY FOR ESTIMATING PURPOSES AND THE ACTUAL DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR FROM FIELD CONDITIONS.
3. WHEN SPECIFIED ON THE PLANS THE INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD IS-1. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.
4. IN THE EVENT THE INVERT OF THE OUTFALL PIPE IS HIGHER THAN THE BOTTOM OF THE STRUCTURE, THE INVERT OF THE STRUCTURE SHALL BE SHAPED WITH CEMENT MORTAR TO PREVENT STANDING OR PONDING OF WATER IN THE STRUCTURE. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.
5. STEPS ARE TO BE PROVIDED WHEN H IS 4'-0" OR GREATER. FOR DETAILS SEE STANDARD ST-1.
6. CHAMBER MAY BE CAST IN PLACE, PRECAST, BRICK OR CONCRETE BLOCK. SEE DI-7 FOR DETAILS.
7. WHERE PAVED DITCHES ARE REQUIRED, JOINTS ARE TO BE DOWELED WITH #4 X 8" SMOOTH RODS AT APPROXIMATELY 12" C-C IN ALL AREAS ADJACENT TO ABUTTING CONCRETE TO PREVENT SETTLEMENT. IN LIEU OF DOWELS A 2" X 4" NOTCH MAY BE PROVIDED. SEE ST'D T-DI-3, 4 FOR ALTERNATE DESIGN.
8. 3" DIAMETER WEEP HOLE TO BE LOCATED TO DRAIN SUBBASE MATERIAL. WEEP HOLE WITH 12"X12" PLASTIC HARDWARE CLOTH ¼" MESH OR GALVANIZED STEEL WIRE, MINIMUM WIRE DIAMETER 0.03", NUMBER 4 MESH HARDWARE CLOTH ANCHORED FIRMLY TO THE OUTSIDE OF THE STRUCTURE.
9. ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 2" AND BE CUT CLEAR OF ALL OPENINGS BY 2".
10. CAST-IN PLACE CONCRETE IS TO BE CLASS A3 (3000 PSI). PRECAST CONCRETE IS TO BE 4000 PSI.
11. PROVIDED SAFETY SLABS WHEN SPECIFIED ON THE PLANS.
12. DI-5 IS TO BE UTILIZED IN LOCATIONS NOT NORMALLY SUBJECT TO TRAFFIC.

VDOT ROAD AND BRIDGE STANDARDS | SHEET 1 OF 1 | REVISION DATE | 104.21

STANDARD DITCH DROP INLET

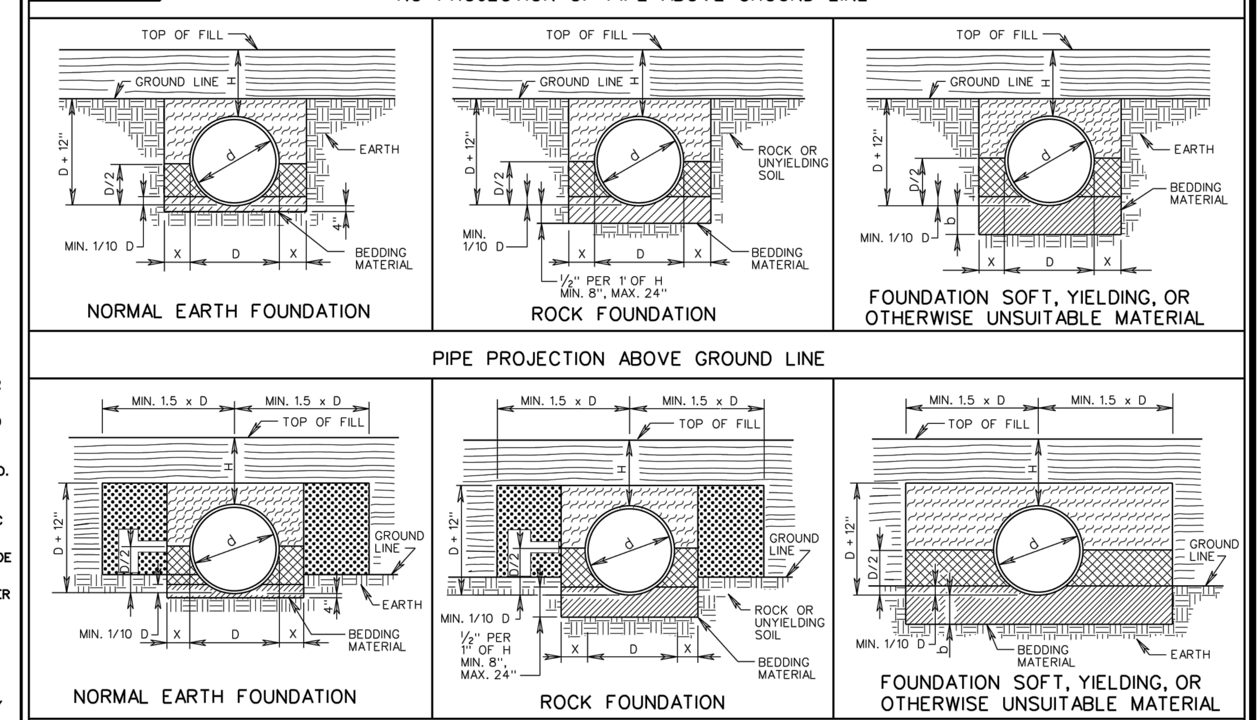
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE: 233, 302

PB-1

NO PROJECTION OF PIPE ABOVE GROUND LINE

PIPE PROJECTION ABOVE GROUND LINE



BEDDING MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.

CLASS I BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.

FOR PLASTIC PIPE : 6" MINIMUM CLASS I BACKFILL MATERIAL PLACED DIRECTLY OVER PIPE AND 6" REGULAR BACKFILL MATERIAL, OR 12" OF CLASS I BACK FILL MATERIAL, IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.

EMBANKMENT

REGULAR BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.

FOR ALL OTHER PIPE REGULAR BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.

NOTES:
FOR GENERAL NOTES ON PIPE BEDDING, SEE INSTALLATION OF PIPE CULVERTS AND STORM SEWERS GENERAL NOTES ON SHEET 107.00.

CRUSHED GLASS CONFORMING TO THE SIZE REQUIREMENTS FOR CRUSHER RUN AGGREGATE SIZE 25 AND 26 MAY BE USED IN PLACE OF CLASS I BACKFILL.

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

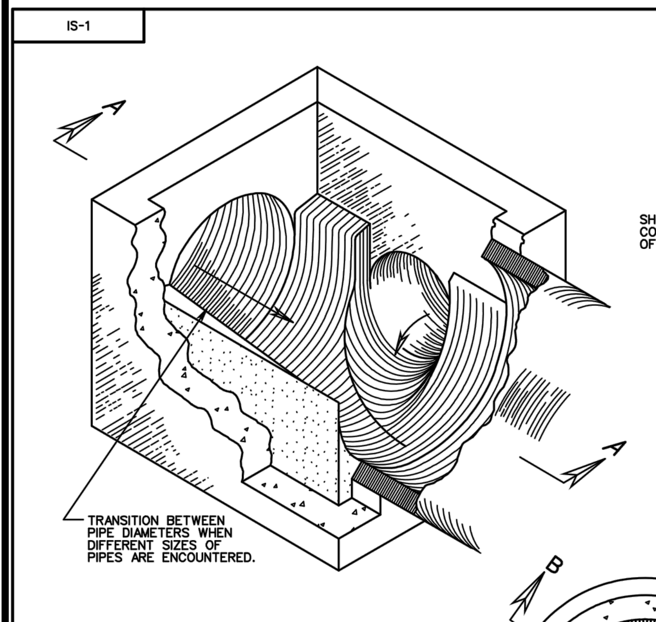
VDOT ROAD AND BRIDGE STANDARDS | SHEET 1 OF 4 | REVISION DATE 07/19 | 107.01

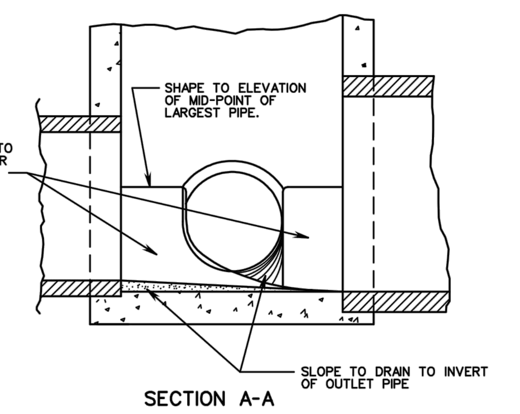
INSTALL. OF PIPE CULVERTS AND STORM SEWERS CIRC. PIPE BEDDING AND BACKFILL - METHOD "A"

VIRGINIA DEPARTMENT OF TRANSPORTATION

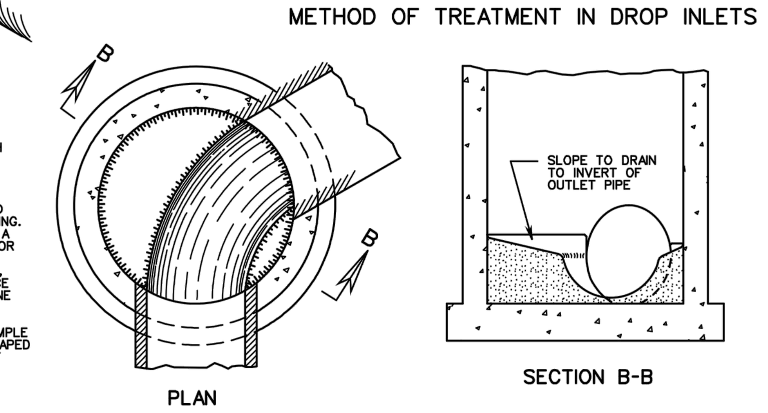
SPECIFICATION REFERENCE: 302, 303

IS-1





METHOD OF TREATMENT IN DROP INLETS



METHOD OF TREATMENT IN MANHOLES

NOTES:
SHAPING OF MANHOLE AND INLET INVERTS IN ACCORDANCE WITH THIS DRAWING IS TO APPLY TO THOSE STRUCTURES SPECIFIED ON PLANS OR WHERE INVERT OF PIPE IS ABOVE INVERT OF STRUCTURE.

MANHOLE OR DROP INLET IS TO BE FORMED AND CONSTRUCTED IN ACCORDANCE WITH APPLICABLE STANDARD OR SPECIAL DRAWING. THE INVERT SHAPING AS DETAILED HEREON IS TO CONSIST OF A PORTLAND CEMENT CONCRETE MIX CONFORMING TO CLASS A3 OR CLASS C1, EXCEPT THAT 25% OF COARSE AGGREGATE MAY BE UP TO 4" IN DIAMETER AND CONSIST OF STONE, BROKEN BRICK, BROKEN CONCRETE OR BROKEN CONCRETE BLOCK. THE SURFACE SHALL BE LEFT SMOOTH BY MEANS OF HAND TROWELLING. NONE OF THE COARSE AGGREGATE SHALL REMAIN EXPOSED.

DETAILS OF INVERT SHAPING AS SHOWN HEREON ARE FOR EXAMPLE PURPOSES ONLY. EACH MANHOLE OR DROP INLET IS TO BE SHAPED INDIVIDUALLY TO BEST FIT THE PARTICULAR INLET AND OUTLET CONFIGURATION AND FLOW LINES.

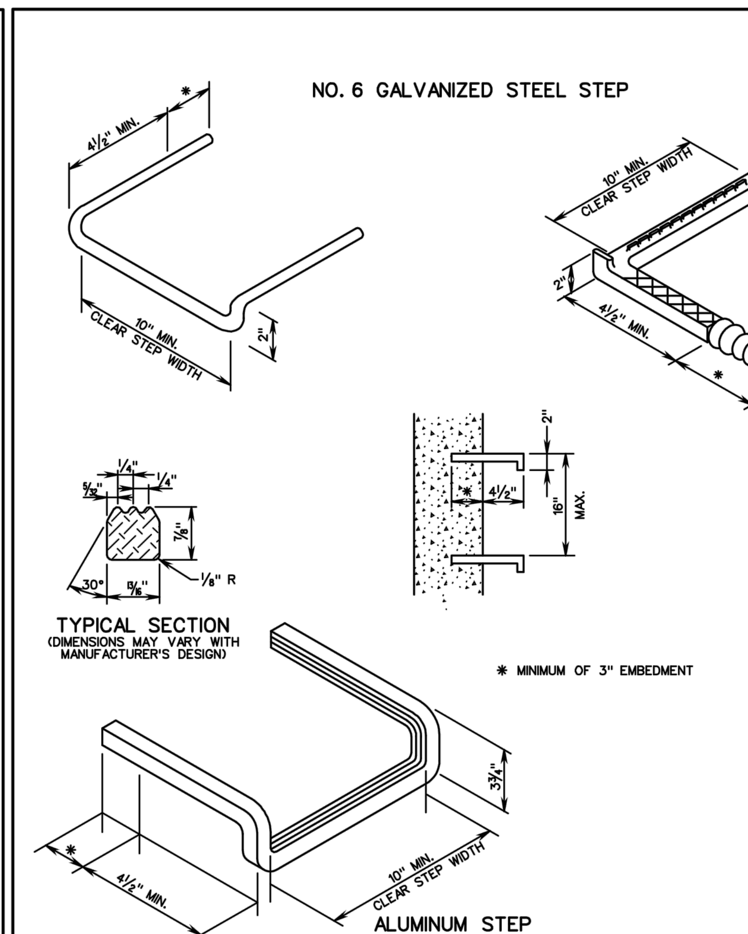
VDOT ROAD AND BRIDGE STANDARDS | SHEET 1 OF 1 | REVISION DATE | 106.08

STANDARD METHOD OF SHAPING MANHOLE & INLET INVERTS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE: 302

ST-1



#4, GRADE 60, REINFORCING ROD ENCASED IN A CORROSION RESISTANT RUBBER OR OTHER MATERIAL APPROVED BY THE ENGINEER. (DIMENSION MAY VARY WITH MANUFACTURER'S DESIGN)

CORROSION RESISTANT MATERIAL

#4 REINFORCING ROD

TYPICAL SECTION

NOTES:
STEPS WILL BE REQUIRED IN ALL STRUCTURES WITH A DEPTH OF 4'-0" OR GREATER UNLESS OTHERWISE NOTED ON THE PLANS.

ALL STEPS SHALL PROTRUDE 4½" FROM INSIDE FACE OF STRUCTURE WALL.

MAXIMUM STEP SPACING TO BE 16" C-C.

STEPS SHALL WITHSTAND A MINIMUM FORCE OF 300 POUNDS WHEN EXTENDED 4½" FROM THE FACE OF THE SUPPORT.

STEPS ARE TO BE VERTICALLY ALIGNED AND UNIFORMALY SPACED FOR THE ENTIRE DEPTH OF ANY STRUCTURE.

IN PRECAST UNITS STEPS MAY BE CAST IN PLACE, MORTARED INTO HOLES PROVIDED BY THE FABRICATOR, OR DRIVEN.

STEPS DIFFERING IN DIMENSIONS, CONFIGURATION, OR MATERIALS FROM THOSE SHOWN MAY ALSO BE USED PROVIDED THEY MEET THE MINIMUM REQUIREMENTS SHOWN HEREON AND THE CONTRACTOR HAS FURNISHED THE ENGINEER WITH DETAILS AND CERTIFIED TEST REPORTS OF THE PROPOSED SUBSTITUTE AND HAS RECEIVED WRITTEN APPROVAL FROM THE ENGINEER FOR THE USE OF SUCH STEPS.

ALL STEPS INSTALLED SHALL BE PROVIDED WITH SLIP-RESISTANT SURFACES SUCH AS BUT NOT LIMITED TO, CORRUGATED KNURLED, OR DIMPLED SURFACES.

ALUMINUM STEPS SHALL BE FABRICATED IN ACCORDANCE WITH ASTM B221, ALLOY 6005-T5. THAT PORTION OF THE STEP ENCASED IN MASONRY SHALL BE UNIFORMLY COATED WITH A BITUMINOUS, SOLVENT TYPE, ASBESTOS FILLED ALUMINUM PIGMENTED COATING CONFORMING TO FEDERAL SPECIFICATION TC-C-00498A.

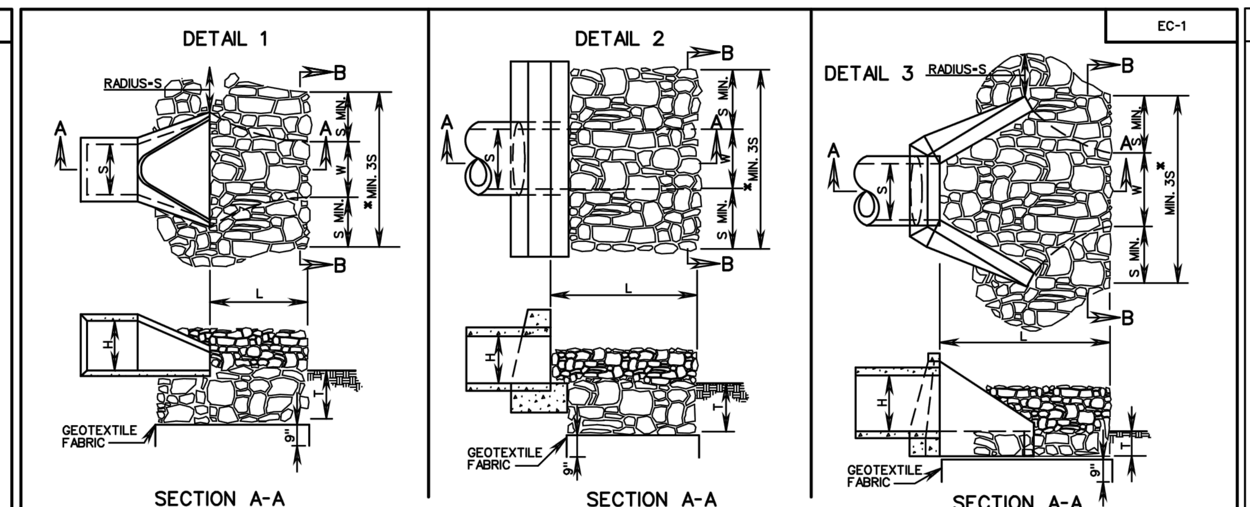
SPECIFICATION REFERENCE

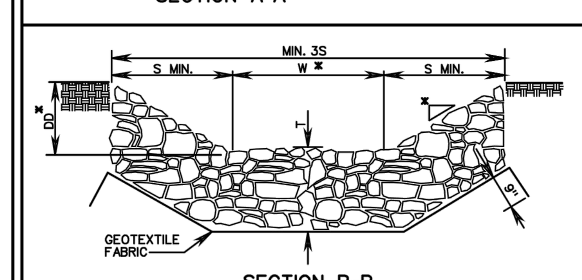
STANDARD STEP

VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT ROAD AND BRIDGE STANDARDS | REVISION DATE | SHEET 1 OF 1 | 106.09

EC-1





TYPE OF OUTLET PROTECTION MATERIAL		MAXIMUM OUTLET VELOCITY (FOR DESIGN STORM)	MINIMUM "T" (INCHES)
CLASS AI	CLASS AI DRY RIPRAP	8 fps	18
CLASS I	CLASS I DRY RIPRAP	14 fps	24
CLASS II	CLASS II DRY RIPRAP	19 fps	36

NOTES:

1. FOR MULTIPLE LINE INSTALLATIONS, DIMENSION S IS TO GOVERN THE PROTECTION OUTSIDE THE CHANNEL WIDTH (W).
2. ON ANY INSTALLATION REQUIRING CULVERT OUTLET PROTECTION WHERE NO ENDWALL OR ENDSECTION IS SPECIFIED ON THE PLANS, CONSTRUCTION IS TO BE IN ACCORDANCE WITH DETAIL 2 SHOWN ABOVE.
3. GEOTEXTILE FABRIC TO BE INSTALLED UNDER CLASS AI, I, AND II MATERIALS IN ACCORDANCE WITH THE SPECIFICATIONS.
4. S = DIAMETER OF CIRCULAR CULVERT OR SPAN FOR BOX, ELLIPTICAL OR ARCH CULVERT. H = DIAMETER OF CIRCULAR CULVERT OR RISE/HEIGHT FOR BOX, ELLIPTICAL OR ARCH CULVERT.

✱ USE TYPICAL SECTION SHOWN ON PLANS FOR SIDE SLOPE, BOTTOM WIDTH AND DEPTH OF CHANNEL OR MATCH EXISTING DITCH OR NATURAL GROUND.

OUTLET PROTECTION MINUMUM LENGTH (L)	
TYPE A INSTALLATION	3H
TYPE B INSTALLATION	5H

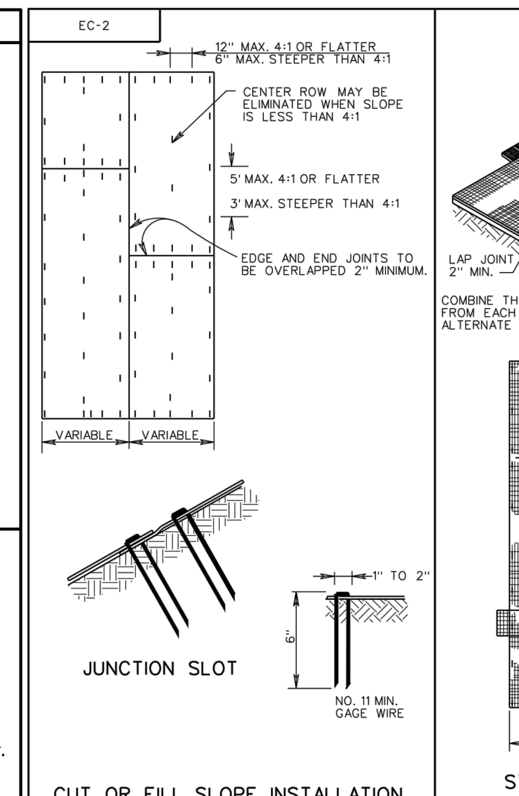
SPECIFICATION REFERENCE: 204, 245, 303, 414

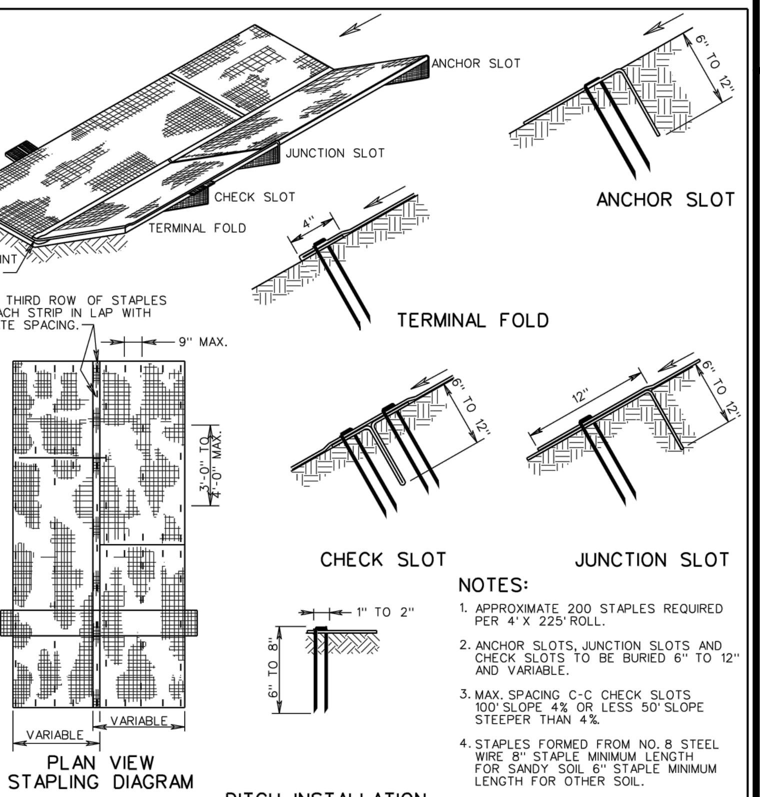
CULVERT OUTLET PROTECTION

VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT ROAD AND BRIDGE STANDARDS | REVISION DATE | SHEET 1 OF 1 | 113.01

EC-2





NOTES:

1. APPROXIMATE 200 STAPLES REQUIRED PER 4' X 225' ROLL.
2. ANCHOR SLOTS, JUNCTION SLOTS AND CHECK SLOTS TO BE BURIED 6" TO 12" AND VARIABLE.
3. MAX. SPACING C-C CHECK SLOTS 100' SLOPE 4% OR LESS 50' SLOPE STEEPER THAN 4%.
4. STAPLES FORMED FROM NO. 8 STEEL WIRE 8" STAPLE MINIMUM LENGTH FOR SANDY SOIL 6" STAPLE MINIMUM LENGTH FOR OTHER SOIL.

GENERAL NOTES:

1. ROLLED EROSION CONTROL PRODUCT IS TO BE LOCATED AS INDICATED ON THE PLANS IN ACCORDANCE WITH THE DIMENSIONS SPECIFIED ON TYPICAL SECTION.
2. "T-TOP" STAPLES OR OTHER MANUFACTURER'S DESIGN APPROVED BY THE ENGINEER MAY BE SUBSTITUTED FOR THE STAPLES SHOWN.
3. WIDTH OF MATERIAL MAY VARY FROM MINIMUM DIMENSION BY INCREMENTS OF 4 OR 5 FEET.
4. FOR SOURCES OF APPROVED MATERIAL SEE VDOT'S APPROVED PRODUCTS LIST FOR EC-2 MATERIALS TYPES 1, 2, 3, OR 4.

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

VDOT ROAD AND BRIDGE STANDARDS | SHEET 1 OF 1 | REVISION DATE 07/16 | 113.02

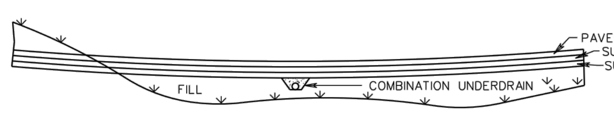
ROLLED EROSION CONTROL PRODUCT PROTECTIVE COVERING INSTALLATION CRITERIA

(TEMPORARY USE)

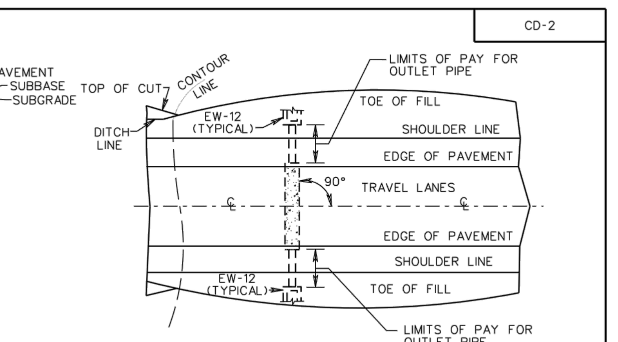
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE: 244, 606

CD-2

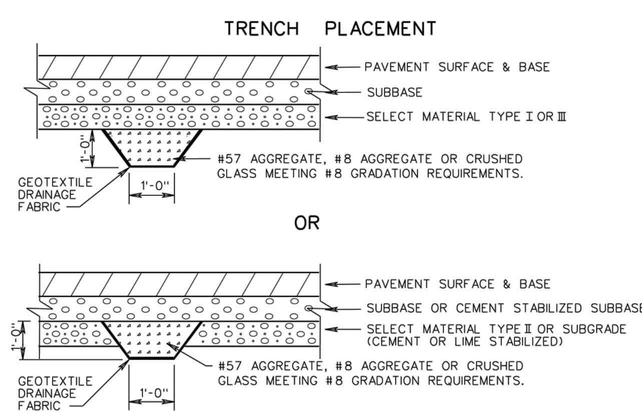


CROSSDRAIN CD-2 ON FILLS CENTER LINE SECTION
(WITH TYPE 1 SELECT MATERIAL)



PLAN VIEW SHOWING PLACEMENT OF CD-2 CROSSDRAIN

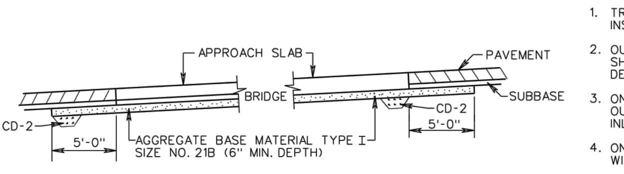
TRENCH PLACEMENT



NON-PERFORATED OUTLET PIPE

TYPE OF PIPE	CRUSHING STRENGTH ✱W.T.	4" NOM. DIAMETER	✱W.T.	6" NOM. DIAMETER
SMOOTH WALL PVC	.103		0.153	
SMOOTH WALL PE		70 PSI ✱✱✱		70 PSI ✱✱✱

✱ WALL THICKNESS (MIN) - INCHES
✱✱✱ TESTED ACCORDING TO ASTM D-2412 AT 5% DEFLECTION.



PLACEMENT OF CD-2 CROSSDRAIN AT BRIDGE APPROACH SLABS

GENERAL NOTES

1. TRENCH SHALL BE FILLED WITH AGGREGATE AND THROUGHLY HAND TAMPED TO INSURE COMPACTNESS.
2. OUTLET PIPE SHALL BEGIN AT THE EDGE OF THE TRAVEL LANE PAVEMENT AND SHALL BE PLACED ON A GRADE PARALLEL TO THE SHOULDER SLOPE 2 % MIN. (3% DESIRABLE) GRADE.
3. ON CURB AND GUTTER SECTIONS, WHERE IT IS IMPOSSIBLE TO OTHERWISE PROVIDE OUTLETS FOR CROSSDRAINS, THEY ARE TO BE LOCATED SO AS TO DRAIN INTO DROP INLETS OR MANHOLES.
4. ON SUPERELEVATED SECTIONS, TRENCH IS TO BE UNDER ENTIRE PAVEMENT AREA WITH OUTLET PIPE ON LOW SIDE ONLY.
5. INVERT ELEVATION AT OUTLET END OF OUTLET PIPE TO BE A MINIMUM OF 1'-0" ABOVE INVERT ELEVATION OF RECEIVING DRAINAGE DITCH OR STRUCTURE.
6. ALL CONNECTIONS (ELBOWS, WYES, ETC.) WITHIN PAY LIMITS FOR OUTLET PIPE ARE TO BE OF THE SAME CRUSHING STRENGTH AS THE OUTLET PIPE.
7. OUTLET PIPE TO BE SECURELY CONNECTED TO EW-12OR OTHER DRAINAGE STRUCTURE.

SPECIFICATION REFERENCE: 232, 501, 701

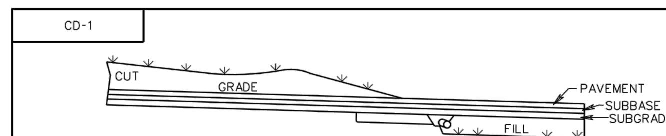
STANDARD CROSSDRAIN

(AT GRADE SAGS AND BRIDGE APPROACHES)

VIRGINIA DEPARTMENT OF TRANSPORTATION

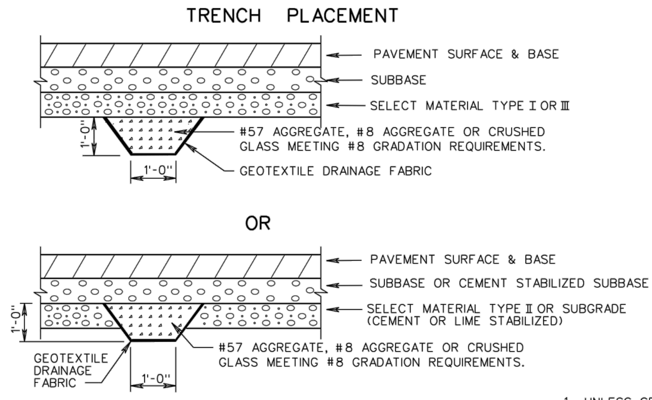
VDOT ROAD AND BRIDGE STANDARDS | REVISION DATE 07/16 | SHEET 1 OF 1 | 108.05

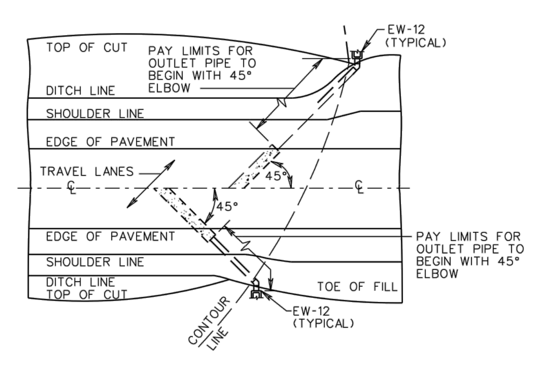
CD-1



CROSSDRAIN CD-1 AT LOWER END OF CUTS CENTER LINE SECTION
(WITH TYPE 1 SELECT MATERIAL)

TRENCH PLACEMENT





PLAN VIEW
(PLACEMENT OF CD-1 CROSSDRAIN)

NON-PERFORATED OUTLET PIPE

TYPE OF PIPE	CRUSHING STRENGTH ✱W.T.	4" NOM. DIAMETER	✱W.T.	6" NOM. DIAMETER
SMOOTH WALL PVC	.103		0.153	
SMOOTH WALL PE		70 PSI ✱✱✱		70 PSI ✱✱✱

✱ WALL THICKNESS (MIN) - INCHES
✱✱✱ TESTED ACCORDING TO ASTM D-2412 AT 5% DEFLECTION.

GENERAL NOTES

1. UNLESS SPECIFICALLY INDICATED, CROSSDRAIN WILL NOT BE LOCATED AT THIS POINT WHEN BOTH SUBBASE AND SUBGRADE ARE STABILIZED.
2. TRENCH SHALL BE FILLED WITH AGGREGATE AND THROUGHLY HAND TAMPED TO INSURE COMPACTNESS.
3. OUTLET PIPE SHALL BEGIN AT THE EDGE OF THE TRAVEL LANE PAVEMENT AND SHALL BE PLACED ON A GRADE PARALLEL TO THE SHOULDER SLOPE 2 % MIN. (3 % DESIRABLE) GRADE.
4. ON CURB AND GUTTER SECTIONS, WHERE IT IS IMPOSSIBLE TO OTHERWISE PROVIDE OUTLETS FOR CROSSDRAINS, THEY ARE TO BE LOCATED SO AS TO DRAIN INTO DROP INLETS OR MANHOLES.
5. ON SUPERELEVATED SECTIONS, TRENCH IS TO BE UNDER ENTIRE PAVEMENT AREA WITH OUTLET PIPE ON LOW SIDE ONLY.
6. INVERT ELEVATION AT OUTLET END OF OUTLET PIPE TO BE A MINIMUM OF 1'-0" ABOVE INVERT ELEVATION OF RECEIVING DRAINAGE DITCH OR STRUCTURE.
7. ALL CONNECTIONS (ELBOWS, WYES, ETC.) WITHIN PAY LIMITS FOR OUTLET PIPE ARE TO BE OF THE SAME CRUSHING STRENGTH AS THE OUTLET PIPE.
8. OUTLET PIPE TO BE SECURELY CONNECTED TO EW-12OR OTHER DRAINAGE STRUCTURE.

VDOT ROAD AND BRIDGE STANDARDS | SHEET 1 OF 1 | REVISION DATE 07/16 | 108.04

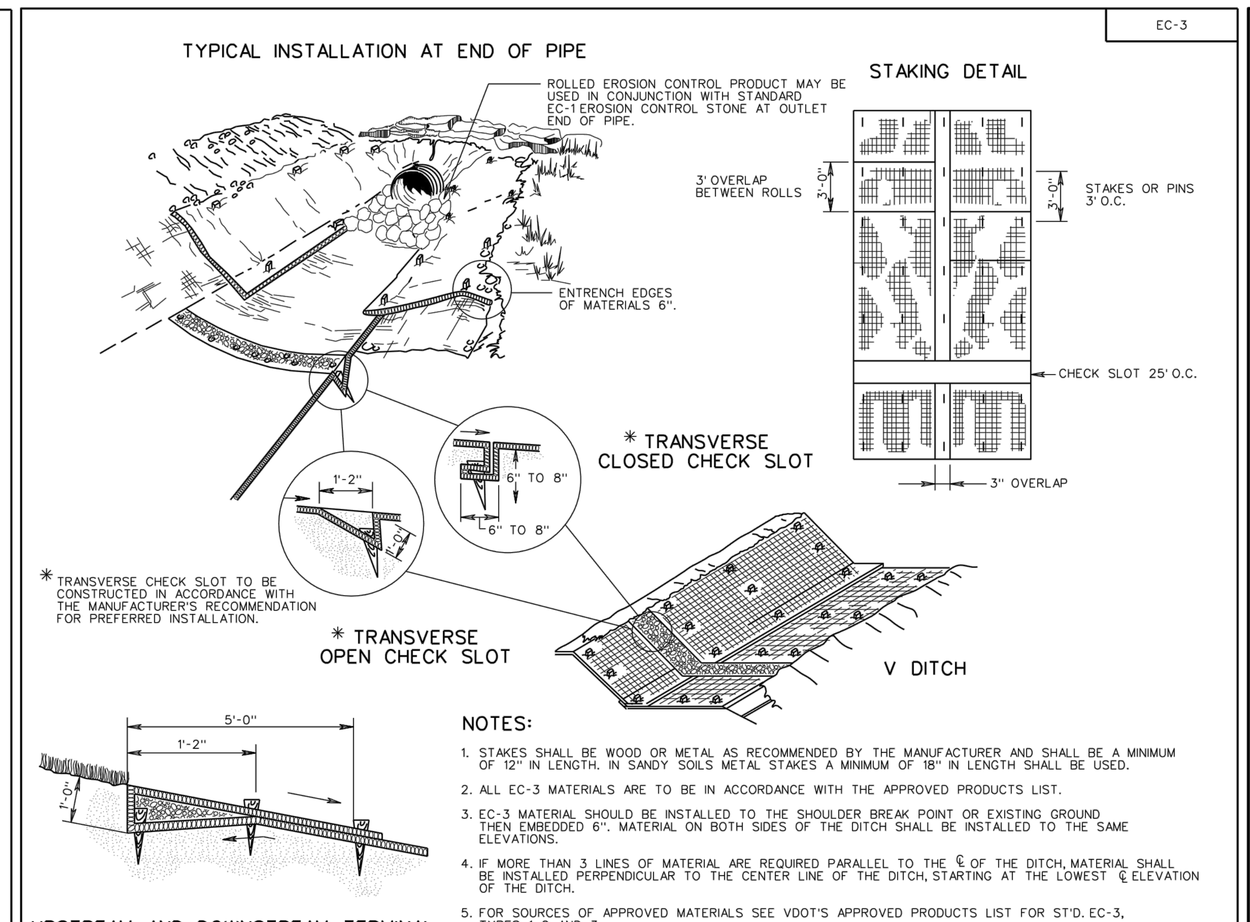
STANDARD CROSSDRAIN

(AT LOWER END OF CUTS)

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE: 232, 501, 701

EC-3



NOTES:

1. STAKES SHALL BE WOOD OR METAL AS RECOMMENDED BY THE MANUFACTURER AND SHALL BE A MINIMUM OF 12" IN LENGTH. IN SANDY SOILS METAL STAKES A MINIMUM OF 18" IN LENGTH SHALL BE USED.
2. ALL EC-3 MATERIALS ARE TO BE IN ACCORDANCE WITH THE APPROVED PRODUCTS LIST.
3. EC-3 MATERIAL SHOULD BE INSTALLED TO THE SHOULDER BREAK POINT OR EXISTING GROUND THEN EMBEDDED 6". MATERIAL ON BOTH SIDES OF THE DITCH SHALL BE INSTALLED TO THE SAME ELEVATIONS.
4. IF MORE THAN 3 LINES OF MATERIAL ARE REQUIRED PARALLEL TO THE ℄ OF THE DITCH, MATERIAL SHALL BE INSTALLED PERPENDICULAR TO THE CENTER LINE OF THE DITCH, STARTING AT THE LOWEST ℄ ELEVATION OF THE DITCH.
5. FOR SOURCES OF APPROVED MATERIALS SEE VDOT'S APPROVED PRODUCTS LIST FOR ST'D. EC-3, TYPES 1, 2, AND 3.

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

SPECIFICATION REFERENCE: 244, 606

ROLLED EROSION CONTROL PRODUCT SOIL STABILIZATION MAT

(PERMANANT DITCH INSTALLATION)

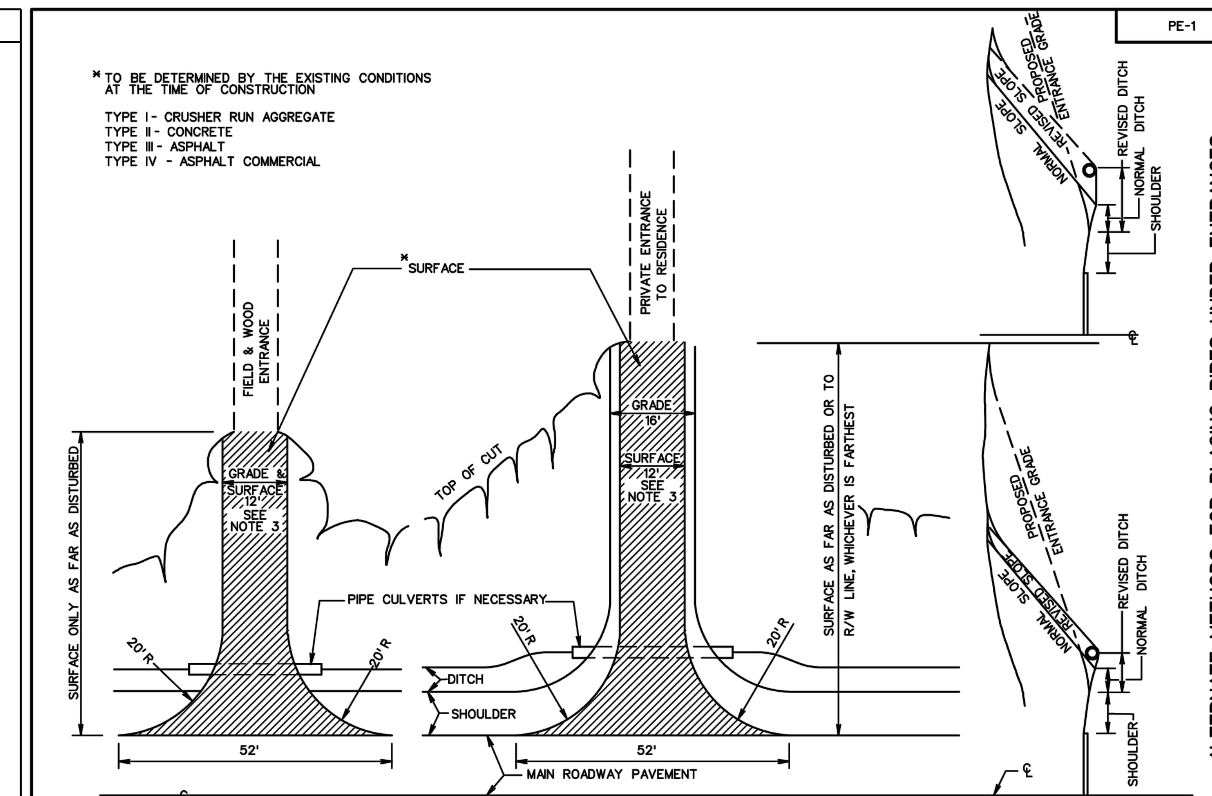
VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT ROAD AND BRIDGE STANDARDS | REVISION DATE 07/16 | SHEET 1 OF 3 | 113.03

PE-1

✱ TO BE DETERMINED BY THE EXISTING CONDITIONS AT THE TIME OF CONSTRUCTION

TYPE I - CRUSHER RUN AGGREGATE
TYPE II - CONCRETE
TYPE III - ASPHALT
TYPE IV - ASPHALT COMMERCIAL



NOTES:

1. ALL ENTRANCE GRADES SHALL START BACK OF THE SHOULDER LINE. IF DRAINAGE IS NECESSARY, THE DITCH MAY BE MOVED BACK TO PROVIDE AT LEAST 9" OF COVER OVER PIPE, AS SHOWN IN THE ALTERNATE METHODS FOR PLACING PIPE UNDER ENTRANCES DIAGRAM.
2. ENTRANCE GRADES ARE TO BE SMOOTHLY TIED INTO THE ROADWAY BY ROUNDING AS NECESSARY.
3. 12' OR EXISTING WIDTH WHICHEVER IS GREATER.
4. LENGTHS OF CULVERTS SHOWN ON ROAD PLANS FOR ENTRANCES ARE APPROXIMATE AND SHALL BE ADJUSTED TO OBTAIN ABOVE ROADWAY WIDTHS.
5. ENTRANCES IN FILL TO BE SAME AS ABOVE EXCEPT LOCATION OF CULVERT (WHEN NECESSARY).

SPECIFICATION REFERENCE: 512

STANDARD PRIVATE ENTRANCES

VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT ROAD AND BRIDGE STANDARDS | REVISION DATE | SHEET 1 OF 1 | 602.02

Bowman

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Fredericksburg, Virginia 22401
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bowman.com

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VDOT DETAILS

TIFFANY ESTATES

CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT

FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM E. DUNCANSON JR
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS

DATE	DESCRIPTION
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DESIGN	DRAWN	CHKD
WED	WED	WED

SCALE H: 1"=50' V: 1"=5'

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

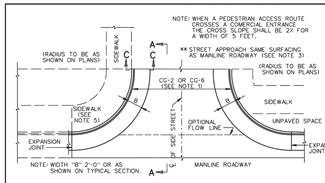
FILE No. 6642-D-CP-001

SHEET 55 OF 58

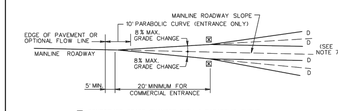
Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\054-056-6642-D-CP-001-DET.dwg

2016 ROAD & BRIDGE STANDARDS

CG-11

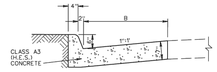


PLAN VIEW



⊠ CONSTRUCT GRADE CHANGES WITH A PARABOLIC CURVE.

SECTION A - A



SECTION C-C

GENERAL NOTES

1. WHEN USED IN CONJUNCTION WITH STANDARD CG-3, OR CG-7, THE CURB FACE ON THIS STANDARD IS TO BE ADJUSTED TO MATCH THE MOUNTABLE CURB CONFIGURATION.
2. SEE STANDARD CG-12 FOR CURB RAMP DESIGN TO BE USED WITH THIS STANDARD.
3. MAINLINE PAVEMENT SHALL BE CONSTRUCTED TO THE R/W LINE (EXCEPT ANY SUBGRADE STABILIZATION REQUIRED FOR MAINLINE PAVEMENT WHICH CAN BE OMITTED IN THE ENTRANCE.)
4. RADIAL CURB OR COMBINATION CURB AND GUTTER SHALL NOT BE CONSTRUCTED BEYOND THE R/W LINE EXCEPT FOR REPLACEMENT PURPOSES.

ENTRANCE NOTES

5. WHEN THE ENTRANCE RADII CANNOT ACCOMMODATE THE TURNING REQUIREMENTS OF ANTICIPATED HEAVYY TRUCK TRAFFIC, THE DEPTH FOR SIDEWALK & CURB RAMPS WITHIN THE LIMITS OF THE RADII SHOULD BE INCREASED TO 7". (SEE CG-12)
6. PLANS ARE TO INDICATE WHEN CONSTRUCTION OF A FLOW LINE IS REQUIRED TO PROVIDE POSITIVE DRAINAGE ACROSS THE ENTRANCE.
7. THE DESIRABLE AND MAXIMUM ENTRANCE GRADE CHANGES "D" ARE LISTED IN THE ALLOWABLE ENTRANCE GRADE TABLE. THESE VALUES ARE NOT APPLICABLE TO STREET CONNECTIONS.

INTERSECTION NOTES

8. WHEN CG-11 IS USED FOR STREET CONNECTIONS, THE CONNECTION MUST BE DESIGNED IN ACCORDANCE WITH AASHTO POLICY AND THE APPLICABLE REQUIREMENTS OF THE VDOT ROAD DESIGN MANUAL, INCLUDING STOPPING SIGHT DISTANCE AND K VALUE REQUIREMENTS.
9. OPTIONAL FLOWLINE MAY REQUIRE WARPING OF A PORTION OF GUTTER TO PROVIDE POSITIVE DRAINAGE ACROSS THE INTERSECTION.

ALLOWABLE ENTRANCE GRADE CHANGES

ENTRANCE VOLUME		GRADE CHANGE "D"	
		DESIRABLE	MAXIMUM
HIGH	MORE THAN 1500 VPD	0 %	3 %
MEDIUM	500-1500 VPD	≤ 3 %	6 %
LOW	LESS THAN 500 VPD	≤ 6 %	8 %

NOTE: ALLOWABLE ENTRANCE GRADE TABLE IS NOT APPLICABLE TO STREET CONNECTIONS

SPECIFICATION REFERENCE	METHOD OF TREATMENT (CONNECTION FOR STREET INTERSECTIONS AND COMMERCIAL ENTRANCES) VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS
502		REVISION DATE 07/15 — SHEET 1 OF 1 — 203.04

2016 ROAD & BRIDGE STANDARDS

2016 ROAD & BRIDGE STANDARDS

PC-1

DIAMETER INCHES	AREA SQ. FT.	MAXIMUM HEIGHT OF COVER IN FEET				DIAMETER INCHES
		NONREINFORCED CONCRETE (STRENGTH) (SEE NOTE 4)	REINFORCED CONCRETE CLASS			
			III	IV	V	
12	0.8	14' (1800)	14'	19'	29'	12
15	1.2	14' (2125)	14'	19'	29'	15
18	1.8	14' (2400)	14'	20'	29'	18
21	2.4	13' (2700)	14'	20'	29'	21
24	3.1	13' (3000)	14'	20'	29'	24
27	4.0		14'	20'	29'	27
30	4.9		14'	20'	29'	30
33	5.9		14'	20'	29'	33
36	7.1		14'	20'	30'	36
42	9.6		14'	21'	30'	42
48	12.6		14'	21'	30'	48
54	15.9		14'	21'	30'	54
60	19.6		14'	21'	30'	60
66	23.8		14'	21'	30'	66
72	28.3		14'	21'	30'	72
78	33.2		14'	21'	30'	78
84	38.5		14'	21'	30'	84
90	44.4		14'	21'	30'	90
96	50.3		14'	21'	30'	96
102	56.7		14'	21'	30'	102
108	63.6		14'	21'	30'	108

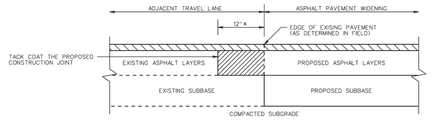
NOTES:

1. COVER HEIGHTS INDICATED IN TABLES ARE FOR FINISHED CONSTRUCTION. THE COVER HEIGHTS SHOWN ARE INTENDED TO MATCH THE COVER HEIGHTS BASED ON ALLOWABLE STRESS DESIGN. COVER HEIGHTS WERE NOT RE-CALCULATED USING LRFD.
2. TO PROTECT PIPE DURING CONSTRUCTION, MINIMUM HEIGHTS OF COVER PRIOR TO ALLOWING CONSTRUCTION TRAFFIC TO CROSS INSTALLATION ARE TO BE ½ DIAMETER OR 3'0" WHICHEVER IS GREATER. THE COVER SHALL EXTEND THE FULL LENGTH OF THE PIPE. THE APPROACH FILL RAMP IS TO EXTEND A MINIMUM OF ½(DIAMETER + 36") FROM THE END OF THE PIPE, OR TO THE INTERSECTION WITH A CUT.
3. STANDARD MINIMUM FINISHED HEIGHT OF COVER FOR ALL PIPES, EXCEPT THOSE UNDER ENTRANCES, SHALL BE 2'0" OR ½ DIAMETER, WHICHEVER IS GREATER. WHERE THE STANDARD MINIMUM COVER CANNOT BE ACHIEVED, AN ABSOLUTE MINIMUM FINISHED COVER HEIGHT OF 1'0" WILL BE ALLOWED ONLY IF ALL POSSIBLE MEANS TO OBTAIN THE STANDARD VALUE HAVE BEEN EXHAUSTED. THE MINIMUM FINISHED HEIGHT OF COVER FOR PIPES UNDER ENTRANCES IS 9".
4. CRUSHING STRENGTH (POUNDS PER LINEAR FOOT ULTIMATE STRENGTH) PER ASTM C76: 2000 LBS FOR CLASS II PIPE 3000 LBS FOR CLASS III PIPE 3000 LBS FOR CLASS IV PIPE 3750 LBS FOR CLASS V PIPE
5. FOR HEIGHT OF COVER GREATER THAN THAT SHOWN FOR CLASS V, A SPECIAL DESIGN CONCRETE PIPE IS REQUIRED.
6. NONREINFORCED PIPE TO BE USED ONLY UNDER ENTRANCES AND LOWER FUNCTIONAL CLASSIFICATION (LFC) ROADWAYS (SEE SHEET 17 OF 18).
7. SEE STANDARD PB-1 FOR PIPE BEDDING AND BACKFILL REQUIREMENTS.
8. PIPE WITH LESS THAN THE STANDARD MINIMUM COVER IS TO BE MINIMUM CLASS III REINFORCED.

VDOT ROAD AND BRIDGE STANDARDS	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. CONCRETE PIPE HEIGHT OF COVER TABLE FOR HL-93 LIVE LOAD VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 18 — REVISION DATE 11/15 — 107.05		302 232

2016 ROAD & BRIDGE STANDARDS
2016 ROAD & BRIDGE STANDARDS

WP-2



CONSTRUCTION JOINT DETAIL

▨ REMOVE EXISTING ASPHALT LAYERS TO EXISTING SUBBASE AND REPLACE WITH PROPOSED ASPHALT WIDENING LAYERS

▧ PROPOSED MINIMUM 1½ INCH THICK ASPHALT SURFACE COURSE (SEE NOTE 5)

× MINIMUM 12 INCHES, OR GREATER AS NECESSARY TO ABUT THE FULL THICKNESS OF EXISTING ASPHALT LAYERS AS DETERMINED BY CORES (SEE NOTE 3)

NOTES:

1. ASPHALT PAVEMENT WIDENING SHALL HAVE A PAVEMENT DESIGN IN ACCORDANCE WITH CURRENT VDOT PROCEDURES AND BE APPROVED BY THE ENGINEER.
2. THE PAVEMENT DESIGN FOR ASPHALT PAVEMENT WIDENING SHALL MEET OR EXCEED THE DEPTHS AND TYPES OF THE LAYERS OF EXISTING PAVEMENT. SUBSURFACE DRAINAGE OF THE EXISTING AND PROPOSED PAVEMENT SHALL BE ADDRESSED IN THE PAVEMENT DESIGN.
3. A MINIMUM OF THREE CORES SHALL BE TAKEN ALONG THE CENTER OF THE ADJACENT TRAVEL LANE TO DETERMINE THE TYPE AND THICKNESS OF EXISTING PAVEMENT LAYERS. THESE CORES SHALL BE SPACED NO MORE THAN 500 FEET APART.
4. THE ADJACENT TRAVEL LANE SHALL BE MILLED A MINIMUM DEPTH OF 1½ INCHES AND REPLACED WITH AN ASPHALT SURFACE COURSE TO MATCH THE PROPOSED PAVEMENT WIDENING SURFACE COURSE, UNLESS WAIVED BY THE ENGINEER.
5. THE ENGINEER MAY REQUIRE THE MILLING DEPTH OF THE EXISTING PAVEMENT TO BE ADJUSTED TO ACHIEVE AN ACCEPTABLE PAVEMENT CROSS-SLOPE AND EFFECTIVE SURFACE DRAINAGE.
6. EXISTING PAVEMENT MARKINGS AND MARKERS WITHIN THE PROJECT LIMITS SHALL BE RESTORED SUBJECT TO THE APPROVAL OF THE ENGINEER.
7. FINAL TRANSVERSE PAVEMENT TIE-IN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 315 OF THE SPECIFICATIONS EXCEPT THAT ALL JOINTS AT TIE-IN LOCATIONS SHALL BE TESTED USING A 10 FOOT STRAIGHTEDGE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 315 OF THE SPECIFICATIONS.

VDOT ROAD AND BRIDGE STANDARDS	ASPHALT PAVEMENT WIDENING FOR WIDENING SUBJECT TO TRAFFIC VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 1 — REVISION DATE — 303.02		315

2016 ROAD & BRIDGE STANDARDS

Bowman

Bowman Consulting Group Ltd
1300 Central Park Boulevard
Fredericksburg, Virginia 22401
Phone: (540) 371-0268
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VDOT DETAILS

TIFFANY ESTATES

CONSTRUCTION PLAN

FAUQUIER COUNTY, VIRGINIA

CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

COMMONWEALTH OF VIRGINIA
WILLIAM B. DUNCANSON JR.
Lic. No.055205
11/22/24
PROFESSIONAL ENGINEER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

DATE	DESCRIPTION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=50' V: 1"=5'

JOB No. 6642-02-002

DATE : FEBRUARY 10, 2023

FILE No. 6642-D-CP-001

SHEET 55A OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\054-056-6642-D-CP-001-DET.dwg

FAUQUIER COUNTY BOND ESTIMATE REVIEW

Tiffany Estates
November 22, 2024

	Co. Quantity		Co. Unit Price		Co. Total
Site Works					
Mobilization	1.00	EA	$10,000.00		$10,000.00
Clearing and Grubbing					
Heavy		AC	$15,000		$0.00
Moderate	25.40	AC	$11,700		$297,180.00
Light		AC	$7,800		$0.00
HEAVY: Anything exceeding the Light and Moderate categories.					
MODERATE: In addition to Light category, grading up to 4 feet depth, removal of trees under 24 inch diameter, removal of medium size shrubs.					
LIGHT: Grading less than 2 feet in depth. Removal of vegetation, grass areas, and small shrubs, small trees less than 12 inches in diameter.					
Earthwork					
Site Grading: to include rough and fine grading	91650	SY	$1		$91,650.00
				Subtotal	**$398,830.00**
Erosion and Sediment Controls					
Construction Entrance	1	EA	$2,500		$2,500.00
Silt Fence	2095	LF	$5		$10,475.00
Super Silt Fence	4229	LF	$12		$50,748.00
Safety Fence (Orange Plastic)	7676	LF	$3		$23,028.00
Tree Protection	5011	LF	$3		$15,033.00
Diversion Dike	607	LF	$4		$2,428.00
Sediment Trap		EA	$2,000		$0.00
Sediment Basin		See Itemized Cost Below			
Excavation		CY	$20		$0.00
48" Riser Structure	11.50	LF	$1,000		$11,500.00
30" RCP Outfall	60.00	LF	$110		$6,600.00
Trash Rack	1.00	EA	$1,500		$1,500.00
30" EW-1	1.00	EA	$2,100		$2,100.00
Rip Rap	7.00	SY	$50		$350.00
Stream Diversion		Provide Itemized Cost			$0.00
Utility Stream Crossing		Provide Itemized Cost			$0.00
Paved Flume		SY	$70		$0.00
Outlet Protection - Concrete		EA	$300		$0.00
Outlet Protection - Grouted rip rap		EA	$350		$0.00
Outlet Protection - Non-grouted rip rap		EA	$200		$0.00
Storm Drain Inlet Protection	6	EA	$180		$1,080.00
Culvert Inlet Protection	16	EA	$300		$4,800.00
Rip Rap	201.00	SY	$50		$10,050.00
Grouted rip rap		SY	$70		$0.00
Check dams	30.00	EA	$200		$6,000.00
Temp. Level Spreader		EA	$1,500		$0.00
Permanent Seeding	95350	SY	$2		$190,700.00
Jute mesh	20314.00	SY	$2		$40,628.00
EC-1		SY	$6		$0.00
EC-2 (non-perm, ditch lining, egg, jute mesh)	656.00	SY	$8		$5,248.00
EC-3 (permanent ditch lining)	256.00	SY	$7		$1,792.00
Sodding		SY	$9		$0.00
Gabion Revetment		CY	$170		$0.00
Other					$0.00
Rip Rap					
Dry, Class 1, 18"		SY	$50		$0.00
Dry, Class II, 18"		SY	$50		$0.00
Grouted, Class I 18"		SY	$70		$0.00
Sodded Ditch					
Sodded Ditch (Includes lining)		SY	$10		$0.00
				Subtotal	**$386,560.00**
				E&S Maintenance (35%)	**$135,296.00**
				E&S Total	**$920,686.00**
SWM/BMP					
Non-Proprietary BMP (Engineer Estimate for all SWM)		Provide Itemized Cost			$0.00
Bioretention Basin	4262.00	SF	$18		$76,716.00
Level Spreader	1.00	EA	$1,500		$1,500.00
PG-5 Paved Ditch		SY	$60		$0.00
Grass Swale		Provide Itemized Cost			$0.00
Impermeable Pond Lining (Earthen, 12" Depth)	1255.00	SY	$10		$12,550.00
8" PVC	30.00	LF	$40		$1,200.00
12" RCP	16.00	LF	$50		$800.00
12" EW-1	1.00	EA	$900		$900.00
Excavation					
Cut & Work In-Place	5390.00	CY	$20		$107,800.00
Cut & Spoil Onsite		CY	$30		$0.00
Access Road		Provide Itemized Cost			$0.00
6" 21A	80.00	TON	$25		$2,000.00
2" SM 9.5A	27.00	TON	$90		$2,430.00
Aquatic Bench Plugs	3537	EA	$2		$7,074.00
Aquatic Bench Seed Mix	7.00	LB	$100		$700.00
FEMA Processing LOMR/CLOMR		EA	$7,600		$0.00
Gabion Revetment	36.00	CY	$170		$6,120.00
As-Built Certification	1.00	EA	$9,500		$9,500.00
				Subtotal	**$229,290.00**
Roadway/Parking Lot/Alleyways					
Shoulders Type I - Aggregate (SY*IN Depth)	11252.00	SY/Inch Depth	$3		$33,756.00
Subbase - Aggregate (21A/21B) (SY*IN Depth)	60833.00	SY/Inch Depth	$6		$364,998.00
Base Asphalt - BM-25.0 Base Course (SY*IN Depth)	30417.00	SY/Inch Depth	$7		$212,919.00
Surface Asphalt - SM-9.5A (SY*IN Depth)	15208.00	SY/Inch Depth	$20		$304,160.00
Road Stabilization (Stone)		Provide Itemized Cost			$0.00
Road Stabilization (Fabric)		Provide Itemized Cost			$0.00
Concrete Curb & Gutter (CG-6/CG-7)		LF	$25		$0.00
Head Curb (CG-2/CG3)		LF	$20		$0.00
Curb Ramp CG-12		EA	$650		$0.00
Sidewalk (Concrete)		SY	$50		$0.00
Driveway Culvert (15" Min. Size)	12.00	EA	$500		$6,000.00
Driveway Apron		EA	$1,500		$0.00
Guardrail		LF	$40		$0.00
Street Name Sign	4.00	EA	$500		$2,000.00
Traffic Control Sign (Stop, HC, Speed, Etc.)	34.00	EA	$200		$6,800.00
Striping 4" width (VDOT Type B)		LF	$2		$0.00
Concrete Wheel Stops		EA	$70		$0.00
Street Lighting		EA	$5,000		$0.00
Traffic Barricade		EA	$1,500		$0.00

Underdrains					
UD-1		LF	$16		$0.00
UD-2		LF	$18		$0.00
UD-3		LF	$19		$0.00
UD-4		LF	$21		$0.00
CD-1/2	309.00	LF	$21		$6,489.00
Complete Street Acceptance Package	1.00	EA	$8,000		$8,000.00
Video Inspection ROW Storm	684.00	LF	$10		$6,840.00
Other		Provide Itemized Cost			$0.00
				Subtotal	**$951,962.00**
Surveying					
Steel Pipe Property Corner Marker Included in Survey	25.00	LOT	$180		$4,500.00
				Subtotal	**$4,500.00**
Storm Drain Structures					
Drop Inlets					
Cast in Place - 48"					
DI-1 12"-24" Pipe		EA	$3,700		$0.00
DI-1A 12"-24" Pipe		EA	$5,600		$0.00
DI-2 12"-24" Pipe		EA	$7,000		$0.00
DI-2A 12"-24" Pipe		EA	$8,800		$0.00
Precast - 48"					
DI-1APC 12"-24" Pipe		EA	$3,000		$0.00
DI-1PC 12"-24" Pipe		EA	$3,000		$0.00
DI-2APC 12"-24" Pipe		EA	$5,200		$0.00
Curb Drop Inlets					
DI-3A 12"-30" Pipe		EA	$4,800		$0.00
DI-3AA 12"-30" Pipe 2'-6" Length		EA	$5,400		$0.00
DI-3B & DI-12 12"-30" Pipe					
Inlet Length					
4'		EA	$5,300		$0.00
6'		EA	$5,600		$0.00
8'		EA	$4,900		$0.00
10'		EA	$5,100		$0.00
12'		EA	$4,300		$0.00
16'		EA	$5,500		$0.00
20'		EA	$5,800		$0.00
DI-3BB 12"-30" Pipe					
Inlet Length					
4'		EA	$4,200		$0.00
6'		EA	$4,900		$0.00
8'		EA	$5,500		$0.00
10'		EA	$5,800		$0.00
12'		EA	$6,000		$0.00
16'		EA	$6,300		$0.00
20'		EA	$6,600		$0.00
DI-3C 12"-30" Pipe					
Inlet Length					
6'		EA	$4,000		$0.00
8'		EA	$4,600		$0.00
10'		EA	$4,900		$0.00
12'		EA	$5,200		$0.00
16'		EA	$5,800		$0.00
20'		EA	$6,400		$0.00
DI-3CC 12"-30" Pipe					
Inlet Length					
6'		EA	$4,800		$0.00
8'		EA	$5,300		$0.00
10'		EA	$5,700		$0.00
12'		EA	$6,000		$0.00
16'		EA	$6,800		$0.00
20'		EA	$7,500		$0.00
DI-3D 12"-30" Pipe					
Inlet Length					
2'-6' Length		EA	$3,700		$0.00
DI-3DD 12"-30" Pipe					
Inlet Length					
2'-6'		EA	$4,400		$0.00
DI-3E 12"-30" Pipe					
Inlet Length					
4'		EA	$4,100		$0.00
8'		EA	$4,800		$0.00
10'		EA	$4,800		$0.00
12'		EA	$4,900		$0.00
16'		EA	$6,100		$0.00
20'		EA	$6,700		$0.00
DI-3EE 12"-30" Pipe					
Inlet Length					
6'		EA	$7,600		$0.00
8'		EA	$7,900		$0.00
10'		EA	$8,000		$0.00
12'		EA	$8,200		$0.00
16'		EA	$8,500		$0.00
20'		EA	$8,800		$0.00
DI-3F 12"-30" Pipe					
Inlet Length					
6'		EA	$3,800		$0.00
8'		EA	$4,500		$0.00
10'		EA	$4,800		$0.00
12'		EA	$5,100		$0.00
16'		EA	$5,800		$0.00
20'		EA	$6,400		$0.00
DI-3FF 12"-30" Pipe					
Inlet Length					
6'		EA	$8,100		$0.00
8'		EA	$8,300		$0.00
10'		EA	$8,500		$0.00
12'		EA	$8,700		$0.00
16'		EA	$9,100		$0.00
20'		EA	$9,500		$0.00
DI-4A 36"-48" Pipe					
Inlet Length					
4'		EA	$4,900		$0.00
DI-4B 36"-48" Pipe					
Inlet Length					
6'		EA	$6,900		$0.00
8'		EA	$5,500		$0.00
10'		EA	$5,700		$0.00
12'		EA	$5,900		$0.00
16'		EA	$6,300		$0.00
20'		EA	$6,600		$0.00
DI-4BB 36"-48" Pipe					
Inlet Length					
6'		EA	$10,300		$0.00
8'		EA	$10,700		$0.00
10'		EA	$10,900		$0.00
12'		EA	$11,000		$0.00
16'		EA	$11,400		$0.00
20'		EA	$11,700		$0.00

DI-4C 36"-48" Pipe					
Inlet Length					
8'		EA	$5,700		$0.00
10'		EA	$5,800		$0.00
12'		EA	$6,000		$0.00
16'		EA	$6,400		$0.00
20'		EA	$6,700		$0.00
DI-4CC 36"-48" Pipe					
Inlet Length					
8'		EA	$13,400		$0.00
10'		EA	$13,700		$0.00
12'		EA	$14,100		$0.00
16'		EA	$14,800		$0.00
20'		EA	$15,400		$0.00
DI-4D 36"-48" Pipe					
Inlet Length					
4'		EA	$5,000		$0.00
DI-4DD 36"-48" Pipe					
Inlet Length					
4'		EA	$9,500		$0.00
DI-4E 36"-48" Pipe					
Inlet Length					
6'		EA	$5,300		$0.00
8'		EA	$5,700		$0.00
10'		EA	$5,900		$0.00
12'		EA	$6,300		$0.00
16'		EA	$7,000		$0.00
20'		EA	$7,700		$0.00
DI-4EE 36"-48" Pipe					
Inlet Length					
6'		EA	$9,200		$0.00
8'		EA	$9,500		$0.00
10'		EA	$9,900		$0.00
12'		EA	$10,200		$0.00
16'		EA	$10,900		$0.00
20'		EA	$11,500		$0.00
DI-4F 36"-48" Pipe					
Inlet Length					
8'		EA	$5,900		$0.00
10'		EA	$6,300		$0.00
12'		EA	$6,600		$0.00
16'		EA	$7,300		$0.00
20'		EA	$8,000		$0.00
DI-4FF 36"-48" Pipe					
Inlet Length					
8'		EA	$8,900		$0.00
10'		EA	$9,200		$0.00
12'		EA	$9,500		$0.00
16'		EA	$10,000		$0.00
20'		EA	$10,600		$0.00
DI-5	2.00	EA	$5,300		$10,600.00
DI-7	4.00	EA	$5,800		$23,200.00
YI-1		EA	$4,800		$0.00
YI-2		EA	$4,900		$0.00
Manhole (Up to 6' Depth)	3.00	EA	$3,000		$9,000.00
JB-1 (Concrete)		EA	$5,900		$0.00
Culverts					
Single Box Culverts					
4' x 4'		LF	$340		$0.00
5' x 5'		LF	$410		$0.00
6' x 6'		LF	$500		$0.00
8' x 8'		LF	$700		$0.00
10' x 10'		LF	$900		$0.00
Double Box Culverts					
4' x 4'		LF	$600		$0.00
5' x 5'		LF	$700		$0.00
6' x 6'		LF	$900		$0.00
8' x 8'		LF	$1,200		$0.00
10' x 10'		LF	$1,500		$0.00
Oversized Single Box Culvert					
12' x 6'		LF	$1,100		$0.00
12' x 8'		LF	$1,200		$0.00
12' x 10'		LF	$1,300		$0.00
12' x 12'		LF	$1,400		$0.00
Triple Box Culvert					
4' x 4'		LF	$900		$0.00
5' x 5'		LF	$1,000		$0.00
6' x 6'		LF	$1,300		$0.00
8' x 8'		LF	$1,700		$0.00
10' x 10'		LF	$2,500		$0.00
Pipes					
Concrete Pipe (RCP)					
12"		LF	$50		$0.00
15"	435.00	LF	$60		$26,100.00
18"	273.00	LF	$70		$19,110.00
21"		LF	$80		$0.00
24"	412.00	LF	$90		$37,080.00
27"		LF	$100		$0.00
30"		LF	$110		$0.00
33"		LF	$120		$0.00
36"		LF	$130		$0.00
42"		LF	$140		$0.00
48"		LF	$160		$0.00
54"		LF	$170		$0.00
60"		LF	$230		$0.00
66"		LF	$260		$0.00
72"		LF	$300		$0.00
Corrugated Metal Pipe (CMP)					
12"		LF	$30		$0.00
15"		LF	$40		$0.00
18"		LF	$50		$0.00
24"		LF	$60		$0.00
30"		LF	$70		$0.00
36"		LF	$90		$0.00
42"		LF	$100		$0.00
48"		LF	$120		$0.00
54"		LF	$130		$0.00
60"		LF	$150		$0.00

High Density Polyethylene (HDPE)					
12"		LF	$30		$0.00
15"		LF	$40		$0.00
18"		LF	$60		$0.00
24"		LF	$70		$0.00
30"		LF	$80		$0.00
36"		LF	$90		$0.00
42"		LF	$100		$0.00
48"		LF	$120		$0.00
60"		LF	$150		$0.00
End Walls					
12"		EA	$900		$0.00
15"		EA	$1,100		$0.00
18"		EA	$1,300		$0.00
21"		EA	$1,500		$0.00
24"	1.00	EA	$1,700		$1,700.00
27"		EA	$1,900		$0.00
30"		EA	$2,100		$0.00
33"		EA	$2,300		$0.00
37"		EA	$2,500		$0.00
42"		EA	$2,700		$0.00
48"		EA	$2,800		$0.00
54"		EA	$3,200		$0.00
60"		EA	$3,800		$0.00
66"		EA	$4,200		$0.00
72"		EA	$4,700		$0.00
Other		Provide Itemized Cost			$0.00
End Sections (ES-1)					
12"		EA	$530		$0.00
15"	1.00	EA	$550		$550.00
18"	5.00	EA	$600		$3,000.00
21"		EA	$650		$0.00
24"	6.00	EA	$750		$4,500.00
27"		EA	$1,100		$0.00
30"		EA	$1,200		$0.00
33"		EA	$1,800		$0.00
36"		EA	$1,900		$0.00
Other		Provide Itemized Cost			$0.00
End Sections (ES-2)					
15"		EA	$350		$0.00
18"		EA	$400		$0.00
24"		EA	$450		$0.00
30"		EA	$600		$0.00
36"		EA	$1,000		$0.00
42"		EA	$1,200		$0.00
48"		EA	$1,500		$0.00
Other		Provide Itemized Cost			$0.00
				Subtotal	**$134,840.00**
Landscaping					
Canopy Tree	143.00	EA	$450		$64,350.00
Understory Tree		EA	$400		$0.00
Shrubs		EA	$60		$0.00
Other		Provide Itemized Cost			$0.00
Fencing					
Chain Link Fence		LF	$16		$0.00
Board Fence (6' Privacy)		LF	$18		$0.00
Other		Provide Itemized Cost			$0.00
Tot Lots					
Tot Lots		Provide Itemized Cost			$0.00
Baseball/Softball Fields					
Baseball Field (to include infield, backstop, fencing, bleachers)		Provide Itemized Cost			$0.00
Softball In-field		Provide Itemized Cost			$0.00
Courts					
Multi-Use Court & Equipment		Provide Itemized Cost			$0.00
Tennis Courts (2)		Provide Itemized Cost			$0.00
Tennis Practice Court and Wall		Provide Itemized Cost			$0.00
Soccer Fields					
Seeded Field		Provide Itemized Cost			$0.00
Sodded Field		Provide Itemized Cost			$0.00
Swimming Pool					
Community		Provide Itemized Cost			$0.00
School (Olympic)		Provide Itemized Cost			$0.00
Trails					
Bituminous Trail 6' to 10' Wide		SY	$50		$0.00
Metal Ballard's		EA	$800		$0.00
Pedestrian Bridges		Provide Itemized Cost			$0.00
Other					
		Provide Itemized Cost			$0.00
				Subtotal	**$64,350.00**
				Total	**$2,305,628.00**
				10% Admin & Contingency	**$230,562.80**
				Grand total	**$2,536,190.80**
				SAY	**$2,536,191**

*For the purpose of determining Erosion and Sediment Control bond amounts, the line items of mobilization, and clearing and grubbing under Site Works shall be included along with the applicable line items under Erosion and Sediment Control.

Land Disturbing Permit Fee (Maximum $25,000) $25,000.00

Bowman

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1300 Central Park Boulevard
Fredericksburg, Virginia 22401
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CENTER MAGISTERIAL DISTRICT
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SCALE H: 1"=50' V: 1"=5'

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FILE No. 6642-D-CP-001

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SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING REPORT

FOR:

TIFFANY ESTATES SWM POND AND BIORETENTION BASIN
7287 BLACKWELL ROAD AND TAX PIN: 6981-34-0470-000
HIDDEN HOLLOW LANE, WARRENTON,
FAUQUIER COUNTY, VIRGINIA 20187

SCE PROJECT NO: 23-0086V

APRIL 12th, 2023

PREPARED FOR: **Mr. Jeff Hughes**
Maronda Homes
13050 Ford Road
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AUTHORIZATION

Mr. Jeff Hughes is planning to develop a Storm Water Management (SWM) Pond and Bioretention Basin at Tiffany Estates located along Hidden Hollow Lane in Warrenton, Fauquier County, Virginia 20187. The site sits on two properties. The address and Tax Parcel Identification Number for these properties are 7287 Blackwell Road and 6985-60-5718-000, respectively. Previously, Mr. Hughes from Maronda Homes, authorized Soil Consultants Engineering, LLC. (SCE) to perform a subsurface exploration and prepare a geotechnical engineering report for the proposed project. This report summarizes the results of the subsurface exploration and the geotechnical engineering study. It specifically addresses the following topics:

- Scope of services and procedures used during this investigation.
- Site description.
- Brief review of published geologic and soil mapping.
- Observed subsurface conditions, including soil stratigraphy, and depths to groundwater.
- Our evaluation of the effects of the observed subsurface conditions on the proposed construction.
- Recommendations for:
  - Earthwork Specifications
  - SWM Facilities
  - Site drainage

Mr. Jeff Hughes provided SCE with a copy of the Grading Plan, drafted by Bowman Consulting Group Ltd., plan dated February 10th, 2023. A portion of the plan has been reproduced as our "**Test Pit Location Plan**" enclosed in the appendix of this report.

SITE DESCRIPTION AND PROPOSED PROJECT

The address and Tax Parcel Identification Number for the proposed properties are 7287 Blackwell Road and 6985-60-5718-000, respectively. The site is located along Hidden Hollow Lane, Warrenton, Fauquier County, Virginia 20187. For the details, please refer to the appended "**Site Vicinity Map**."

The site is currently partially developed with existing abandoned buildings, overgrown road, wetlands, and extensive woodlands. The site slopes from north to south, with elevations ranging from 540 to 440 feet.

The project includes the construction of a Storm Water Management (SWM) Pond and Bioretention Basin.

SOIL MAPPING AND GEOLOGY

According to the *"Virginia Division of Mineral Resources, 1993, Geologic Map of Virginia: Virginia Division of Mineral Resources,"* the site is mapped as the **Catoctin Formation – Metabasalt (Zc).**

The **Catoctin Formation – Metabasalt (Zc)** is described by the USGS as: fine-grained, grayish-green to dark-yellowish-green, schistose chlorite- and actinolite-bearing metabasalt. This unit is volcanoclastic rocks interbedded with basaltic flows.

According to the Natural Resource Conservation Service (NRCS), the soils on this site are mapped as the ***Middleburg loam (17B)***, the ***Myersville silt loam (40D)***, the ***Fauquier silt loam (45B)***, and the ***Fauquier silt loam (45C)***.

The ***Middleburg loam (17B)*** is a well-drained soil with slopes of 2 to 7 percent. The parent material is composed of alluvium and/or colluvium derived from igneous and metamorphic rock. A typical soil profile consists of loam from 0 to 9 inches, silty clay loam from 9 to 48 inches, and silt loam from 48 to 61 inches. The typical depth to restrictive features is more than 80 inches, and depth to water table is more than 80 inches.

The ***Myersville silt loam (40D)*** is a well-drained soil with slopes of 15 to 25 percent. The parent material is composed of residuum weathered from greenstone. A typical soil profile consists of silt loam from 0 to 8 inches, silty clay loam from 8 to 43 inches, silt loam from 43 to 55 inches, and bedrock from 55 to 71 inches. The typical depth to restrictive features is 40 to 60 inches to paralithic bedrock, and depth to water table is more than 80 inches.

The ***Fauquier silt loam (45B)*** is a well-drained soil with slopes of 2 to 7 percent. The parent material is composed of residuum weathered from greenstone. A typical soil profile consists of silt loam from 0 to 6 inches, clay from 6 to 36 inches, and silt loam from 36 to 60 inches. The typical depth to restrictive features is more than 80 inches, and depth to water table is more than 80 inches.

The ***Fauquier silt loam (45C)*** is a well-drained soil with slopes of 7 to 15 percent. The parent material is composed of residuum weathered from greenstone. A typical soil profile consists of silt loam from 0 to 6 inches, clay from 6 to 36 inches, and silt loam from 36 to 60 inches. The typical depth to restrictive features is more than 80 inches, and depth to water table is more than 80 inches.

The mean annual precipitation of these soils is about 34 to 46 inches, and the mean annual air temperature is 43 to 66 degrees Fahrenheit.

SCOPE OF SERVICE

Soil Consultants personnel explored the subsurface conditions at the site by advancing six (6) test pits, (TP-1 to TP-6) total on the lot, with two (2) test pits (TP-1 and TP-2) within the footprint of the proposed bioretention basin, and four (4) test pits (TP-3 through TP-6) within the footprint of the proposed wet pond.

SCE personal selected the locations and the number of test pits based on a review of the site plan and estimated the location of the test pits in the field by using existing site features. The test pits were excavated by Venture 1, LLC using a John Deere 410E (TP-1 to TP-4) and John Deere 35D Excavator (TP-5 and TP-6).

A Soil Consultants geologist observed and visually identified the excavated soils per ASTM D-2488 procedures. The geologist prepared field logs that described the depth and identity of the observed materials, logged all recovered soil samples, and observed groundwater conditions.

SCE laboratory performed four (4) classification tests on representative soil samples in accordance with ASTM D-2487 and six (6) natural moisture tests in accordance with ASTM D-2216.

The approximate test pit locations are shown on a copy of the site plan entitled "**Test Pit Location Plan**," which is presented as an appendix of this report.

OBSERVED SUBSURFACE CONDITIONS

In TP-1, an approximately 6-inch organic surface layer was encountered. From 0.5 to 3.1 feet, a firm, brownish-red, Sandy SILT (ML), few organics was encountered. This layer was deemed natural. From 3.1 to 4.3 feet, a firm, brownish-red, Sandy Lean CLAY (CL), little gravel, few cobbles was encountered. From 4.3 to 5.6 feet, a medium dense to dense, brownish-yellow, Silty GRAVEL (GM) some sand, few cobbles was encountered. Bucket refusal on weathered bedrock was encountered at 5.6 feet. Soil bearing capacity was measured to be 1500 psf at 1.0, 2.0, 3.0, and 4.0 feet, 2000 psf at 5.0 feet, and 2500 psf at 5.6 feet.

In TP-2, an approximately 5-inch organic surface layer was encountered. From 0.4 to 2.9 feet, a firm, brownish-red, Sandy SILT (ML), few organics was encountered. This layer was deemed natural. From 2.9 to 5.5 feet, a medium dense, brownish-red, Clayey SAND (SC), little gravel was encountered. From 5.5 to 6.8 feet, a stiff to very stiff, yellowish-red, Sandy ELASTIC SILT (MH) was encountered. Bucket refusal on weathered bedrock was encountered at 6.8 feet. Soil bearing capacity was measured to be 1500 psf at 2.0 feet, 2000 psf at 4.0 and 6.0 feet, and 2500 psf at 6.8 feet.

In TP-3, an approximately 3-inch organic surface layer was encountered. From 0.2 to 1.9 feet, a firm, yellowish-brown, Sandy SILT (ML), trace organics, trace mica was encountered. This layer was deemed natural. From 1.9 to 4.2 feet, a firm to stiff, brownish-red, Lean CLAY (CL), trace mica, some sand was encountered. From 4.2 to 8.9 feet, a medium dense to dense, grayish-brown, Silty SAND (SM), few mica was encountered. Bucket refusal on weathered bedrock was encountered at 8.9 feet. Soil bearing capacity was measured to be 1500 psf at 2.0 and 4.0 feet, 2000 psf at 6.0 and 8.0 feet, and 2500 psf at 8.9 feet.

In TP-4, an approximately 3-inch organic surface layer was encountered. From 0.2 to 2.1 feet, a firm, brownish-red, Sandy SILT (ML), trace organics was encountered. This layer was deemed natural. From 2.1 to 4.9 feet, a stiff, reddish-brown, Sandy SILT (ML), trace gravel was encountered. From 4.9 to 6.5 feet, a stiff, grayish-brown, Sandy SILT (ML), trace mica was encountered. Soil bearing capacity was measured to be 1500 psf at 2.0 feet, and 2000 psf at 4.0 and 6.0 feet.

In TP-5, an approximately 6-inch organic surface layer was encountered. From 0.5 to 1.5 feet, a firm, yellowish-brown, Lean CLAY (CL), trace organics was encountered. This layer was deemed natural. From 1.5 to 8.9 feet, a medium dense, yellowish-brown, Silty SAND (SM) with gravel was encountered. Soil bearing capacity was measured to be 1500 psf at 1.0 foot and 2000 psf at 3.0, 5.0, and 7.0 feet.

In TP-6, an approximately 6-inch organic surface layer was encountered. From 0.5 to 8 feet, a firm, yellowish-brown, SILT (ML), few mica was encountered. This layer was deemed natural. Soil bearing capacity was measured to be 1500 psf at 2.0 feet and 2000 psf at 4.0, 6.0, and 8.0 feet.

Mottling, an indication of high seasonal water table, was not encountered during subsurface exploration. Groundwater was encountered in TP-5 at 7.9 feet at time of excavation and 3.0 feet at end of excavation, and in TP-6 at 8.0 feet at end of excavation.

Table of Soil Classification Results

Boring No.	Depth (feet)	Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Gravel %	Sand %	% <200 Sieve	Classification	Water Content (%)
TP-2	6.5	67	49	18	3.5	44.2	52.3	MH	31.5
TP-3	6.5	-	-	-	-	-	-	-	22.3
TP-3	8.0	37	NP	NP	0	63.7	36.3	SM	20.9
TP-4	4.5	46	32	14	13.5	21.7	64.8	ML	27.1
TP-5	7.5	35	NP	NP	15.8	57.8	26.4	SM	26.6
TP-6	7.8	-	-	-	-	-	-	-	41.6

EVALUATION

While the site may be developed as proposed, there are some conditions which merit special attention in engineering analysis, design, and construction.

Organic Soils and Surface Layer

An organic surface layer was encountered in all six (6) test pits to depths between 0.2 to 0.6 feet. An organic surface layer may be encountered in other areas of the site. Organic surface layers, the underlying soils (when containing organic matter), and any soft or excessively wet or disturbed soils are unsuitable as subgrade materials for building foundations, pavements, and slabs-on-grade, and for areas to receive compacted, controlled fill. Such unsuitable soils should be removed from all building and pavement areas, areas to receive fill.

These near surface soils can become soft or excessively wet due to construction traffic, and wet weather, especially next to or within low-lying areas and swales. Near trees the depth of organic materials may be deeper than observed in the test pit locations.

Any undercutting below finished subgrades should be replaced with compacted, controlled fill. The amount of required undercutting depends to a large extent on the weather conditions and the time of the year during which the earthwork operations are done.

Extra undercutting due to soft or excessively wet soils will be required if earthwork is done during a wet period, and less undercutting will be required during a dry period.

Please note the information in our report and on our test pit logs may not be sufficient for earthwork take-off and estimates.

High Seasonal Water Table

Groundwater was encountered in TP-5 at 7.9 feet at time of excavation and 3.0 feet at end of excavation, and in TP-6 at 8.0 feet at end of excavation. Mottling, an indication of high seasonal water table, was not encountered during subsurface exploration. Groundwater and mottling may exist in other areas that were not explored. The site grading must ensure that surface water is carried away from any structure.

During construction, the groundwater must be maintained at least 2 feet below the bottom of an excavation. If water is allowed to enter an excavation, the bottom of the excavation can heave, and the sides of the excavation can become unstable.

If it becomes obvious that groundwater is within 2 feet of the bottom of an excavation, all construction activities must cease until the groundwater can be lowered accordingly.

The geotechnical engineer or the engineer's qualified representative shall observe the groundwater level before the resumption of construction activities. The contractor shall be responsible for the ways and means of dewatering.

Expansive Soils

SCE encountered expansive (i.e. shrink-swell) soils in TP-2 between 5.5 to 6.8 feet. Expansive soils may exist in areas that were not explored. Regarding such soils, Fauquier County has issued the following:

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, Fauquier County has defined unacceptably expansive soils beneath structures as those with Liquid Limits and Plasticity Indexes greater than 40 and 15, respectively.

Beneath roadways and pavements, unacceptably expansive soils are those with Liquid Limits and Plasticity Indexes equal to or greater than 40 and 15, respectively.

This includes not only PLASTIC CLAY (CH) soil and ELASTIC SILT (MH) but also some Lean CLAY (CL) and SILT (ML). By these definitions, some tested soil at this site is acceptable for use under pavements or structures.

If expansive soils are observed within 2 vertical feet of structure subgrade, they must be removed to a depth of at least 2 feet below the design subgrade and replaced with suitable compacted, engineered 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, the 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 this alternative is selected, the foundation may be constructed at the under-cut depth or the undercut may be backfilled to design footing bearing elevation with lean concrete, so-called "flowable fill."

There must be at least 3 feet of non-expansive backfill between foundation walls and the expansive soils exposed in the sidewalls of the excavation. It is likely when the excavation below grade is completed, the foundations may be below the potential shrink / swell soils.

Existing Fill

Uncontrolled/existing fill was not encountered during subsurface exploration. Existing fill may be found in unexplored areas of the site. Such unsuitable soils should be removed from all foundation, and pavement areas, and other areas to receive fill, including the required offsets.

Any undercutting below finished subgrades should be replaced with compacted, controlled fill, except foundations may rest on non-expansive soils with adequate bearing capacity when footings are extended to more than 4 feet (per County regulations) below exterior grade.

Use of On-Site Soils for Fill

Controlled, compacted soil fill should consist of material that is free from trash, organic materials, clay lumps, stones larger than 3 inches (except as noted below), and other deleterious material.

The fill should consist of Sandy SILT (ML) or more granular material (not including "clean sands or gravels," i.e. SP, SW, GP, or GW) with a Liquid Limit less than 40 and a Plastic Limit less than 15.

Some observed soils are not suitable for structural fills or wall backfill. Soil Consultants suggests that laboratory classification, moisture density relationship, and moisture content tests should be performed on potential fill materials before construction to verify their suitability.

Shallow Depth to Bedrock

Bucket refusal on weathered bedrock was encountered in TP-1, TP-2, and TP-3 at 5.6, 6.8, and 8.9 feet, respectively, below surface elevation. 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 development.

Use of Rock Excavating Techniques

The backhoe could excavate to depths as shallow as 5.0 to 9.0 feet below the existing grades. While larger track-hoes will be able to excavate deeper, it is probable that rock excavation techniques will be required in some of the road and utility cuts. Standard blasting techniques may yield rock fragments that are too large for use as fill without being crushed.

In order to attain blast spoils that meet the criteria for fill or rock fill, the contractor may wish to consider a closer spaced blasting charge pattern and/or having a rock crusher on-site. Blasting shall not be performed within any proposed SWM facility.

Stormwater Management (SWM) Facility

The storm water management concept is proposed to meet the county required storm water management goals via a Bioretention Basin, and via a Wet Pond in the vicinity of the existing pond, within the footprint of the newly proposed Wet Pond. Test pits TP-1 and TP-2 were excavated within the footprint of the proposed Bioretention Basin, and test pits TP-3 to TP-6 were excavated within the footprint of the Wet Pond. The Bioretention Basin has a designed bottom elevation of 507.50 feet, and a top (surface) elevation of 512.00 feet. The Wet Pond has a designed bottom elevation of 438.00 feet, a top-of-pond elevation of 442.20 feet, and a top of dam elevation of 448.00 and 470.00 at Nicolas Way. 1-Year WSE of 442.20, 10-Year WSE of 444.57, and 100-Year WSE of 445.99.

The soils observed below the ground surface were firm, Sandy SILT (ML), SILT (ML) and Lean CLAY (CL), over firm to stiff, Sandy SILT (ML), SILT (ML) and Sandy Lean CLAY (CL), sitting on top of medium dense to dense, Silty SAND (SM) and Silty GRAVEL (GM), and stiff to very stiff, Sandy ELASTIC SILT (MH).

Most of the bedding subgrade should be in Sandy SILT (ML) over Silty SAND (SM), Silty GRAVEL (GM) and Sandy SILT (ML). During construction, the SWM Facility subgrade soils shall be carefully examined. If any plastic, soft, loose, or wet soils are observed, these materials shall be removed and replaced with compacted controlled fill as directed by the geotechnical engineer or his qualified representative.

Details for a Bioretention Basin and Wet Pond design and construction are provided in the "**Geotechnical Requirements**" below.

SEISMIC CLASSIFICATION AND OSHA SOIL TYPE

It is SCE's opinion that the soil conditions at this site can be categorized as Site Class D per the ASCE/SEI Standard 7-16 and the 2018 International Building Code. This categorization is based on the near surface test pit results, general geologic information for the region, and the information contained in the ASCE/SEI Standard 7-16 and IBC 2018 codes. The onsite soils are classified as OSHA Type "B."

GEOTECHNICAL REQUIREMENTS

TIFFANY ESTATES SWM POND AND BIORETENTION BASIN
7287 BLACKWELL ROAD AND TAX PIN: 6981-34-0470-000
HIDDEN HOLLOW LANE, WARRENTON
FAUQUIER COUNTY, VIRGINIA
APRIL 12TH, 2023
PROJECT NUMBER: 23-0086V

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 a Storm Water Management (SWM) Pond and Bioretention Basin. The address and Tax Parcel Identification Number for these site properties are 7287 Blackwell Road and 6985-60-5718-000, respectively. The site is located along Hidden Hollow Lane, in Warrenton, Fauquier County, Virginia 20187.

1. Earthwork

a. Site Preparation

Before the start of any other construction, all unsuitable materials shall be removed from all subgrades 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 structure 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, it shall be undercut to a depth of at least 2 feet below the design subgrade elevation and replaced by compacted, controlled fill (See **d. 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. Uncontrolled Fill

Uncontrolled/existing fill was not encountered during subsurface exploration. Existing fill may be encountered in other locations on site and must be removed before construction is continued. Existing fill soils can be highly variable, and some debris and organic matter was observed. We highly recommend that SCE be retained as the project geotechnical engineer for the project during construction, so we can verify our assumptions concerning any existing fill materials.

Additional soil testing and all necessary excavation and removal or relocation of existing fill should be completed. We recommend that any existing fill inside of the planned construction area to be removed and replaced with structural fill. The resulting excavations should be backfilled in accordance with the recommendations presented in the "**c. Structural Fill**" section of this report. Soil density tests should be performed to verify that the backfill materials have been placed in accordance with the recommendations of this report.

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 **d. 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

SCE encountered expansive (i.e. shrink-swell) soils in TP-2 between 5.5 to 6.8 feet. Other locations that were not explored may also have potential shrink-swell soils. These soils are not suitable for subgrade.

Regarding such soils, Fauquier County has issued the following IBC/IRC regulations defining "expansive" soil. The policy became effective in 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, Fauquier County has defined unacceptably expansive soils beneath structures as those with Liquid Limits (LL) and Plasticity Indexes (PI) greater than 40 and 15, respectively.

Beneath roadways and pavements, unacceptably expansive soils are those with Liquid Limits and Plasticity Indexes of 40 and 15, or greater, respectively. This includes not only highly PLASTIC CLAY (CH) soil 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 bearing elevation, 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. Shallow Depth to Bedrock

Bucket refusal on highly weathered bedrock was encountered in TP-1, TP-2, and TP-3 at 5.6, 6.8, and 8.9 feet, respectively, below surface elevation. Groundwater tends to pool 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 development.

f. Use of Rock Excavating Techniques

The backhoe could excavate to depths as shallow as 5.0 to 9.0 feet below the existing grades. While larger track-hoes will be able to excavate deeper, it is probable that rock excavation techniques will be required in some of the road and utility cuts. Standard blasting techniques may yield rock fragments that are too large for use as fill without being crushed.

In order to attain blast spoils that meet the criteria for fill or rock fill, the contractor may wish to consider a closer spaced blasting charge pattern and/or having a rock crusher on-site. Blasting shall not be performed within any proposed SWM facility.

g. 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. SWM/BMP Facilities

The storm water management concept is proposed to meet the county required storm water management goals via a Bioretention Basin, and via a Wet Pond in the vicinity of the existing pond, within the footprint of the newly proposed Wet Pond. Test pits TP-1 and TP-2 were excavated within the footprint of the proposed Bioretention Basin, and test pits TP-3 to TP-6 were excavated within the footprint of the Wet Pond. The Bioretention Basin has a designed bottom elevation of 507.50 feet, and a top (surface) elevation of 512.00 feet. The Wet Pond has a designed bottom elevation of 438.00 feet, a top-of-pond elevation of 442.20 feet, and a top of dam elevation of 448.00 and 470.00 at Nicolas Way. 1-Year WSE of 442.20, 10-Year WSE of 444.57, and 100-Year WSE of 445.99.

The soils observed below the ground surface were firm, Sandy SILT (ML), SILT (ML) and Lean CLAY (CL), over firm to stiff, Sandy SILT (ML), SILT (ML) and Sandy Lean CLAY (CL), sitting on top of medium dense to dense, Silty SAND (SM) and Silty GRAVEL (GM), and stiff to very stiff, Sandy ELASTIC SILT (MH).

Most of the bedding subgrade should be in Sandy SILT (ML) over Silty SAND (SM), Silty GRAVEL (GM) and Sandy SILT (ML). During construction, the SWM Facility subgrade soils shall be carefully examined. If any plastic, soft, loose, or wet soils are observed, these materials shall be removed and replaced with compacted controlled fill as directed by the geotechnical engineer or his qualified representative.

Bucket refusal on weathered rock was encountered in TP-1 at 5.6 feet, and TP-2 at 6.8 feet, with both test pits dug in the vicinity of the proposed Bioretention Basin. Bucket refusal on weathered rock was encountered in TP-3 at 8.9 feet in the vicinity of the proposed Wet Pond. The Virginia DSR Stormwater Design Specification No. 9 – Bioretention – Version 2.0, January 1, 2013 does not require sub-soil testing when an underdrain is used, and infiltration tests were not performed during SCE field visit.

a. Construction

Before construction of the SWM Facilities, the subgrade shall be stripped and proof-rolled as described in section "**1. Earthwork, a. Site Preparation**," above. At that time, the geotechnical engineer or his/her qualified representation shall observe the subgrade conditions. The proposed facility shall be constructed in accordance with the specifications and details as shown on the civil site plans.

The upstream and downstream slopes of the pond embankments shall be graded at 3:1 (horizontal:vertical). We feel these grades will be acceptable when the embankment is constructed of Lean CLAY (CL), Sandy SILT (ML), Silty SAND (SM), Clayey SAND (SC) or more granular, well-graded materials.

The fill for the embankment shall be placed as compacted fill. The fill material shall have a drained friction angle of at least 30 degrees. Rock excavation techniques may be necessary; blasting shall not be performed within the vicinity of the proposed SWM facility.

b. Rock and Blasting

There were six (6) test pits excavated in the vicinity of the stormwater management facilities. TP-1 and TP-2 were excavated in the vicinity of the proposed SWM Bioretention Basin and encountered bucket refusal at 5.8 and 6.8 feet, respectively, on weathered bedrock. TP-3 to TP-6 were excavated in the vicinity of the proposed SWM Pond; TP-3 encountered bucket refusal at 8.9 feet on weathered bedrock. Rock excavation techniques to include blasting may not be necessary for the excavation.

c. Underdrain Piping System

Underdrain outlet pipes shall be installed to have a positive drainage, to be tied/connected to a nearby storm structure or pipes. The outlet shall be installed to prevent future storm water backflow in the event that the structures are clogged.

3. Site Drainage

All unpaved ground surfaces shall slope away from the structures at a minimum grade of 5 %. This shall occur over a distance of not less than 10 feet.

4. Construction Monitoring

Soil Consultants recommends that all subgrades 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 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 test pits. 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.

COMMONWEALTH OF VIRGINIA
LUBOMIR D PEYTCHEV
Lic. No. 0402053888
PROFESSIONAL ENGINEER

Lubomir Peytchev
Apr 12 2023 9:27 AM

Lauren Harner
Geotechnical Assistant

Lubomir D. Peytchev, P.E.
Principal 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 test pit 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. 23-0086V

Bowman

Bowman Consulting Group Ltd
1300 Central Park Boulevard
Fredericksburg, Virginia 22401
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GEOTECHNICAL RECOMMENDATIONS
TIFFANY ESTATES
CONSTRUCTION PLAN
FAUQUIER COUNTY, VIRGINIA
CENTER MAGISTERIAL DISTRICT

CONP-23-019202
COUNTY PROJECT NUMBER

PLAN STATUS	
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION
DATE	DESCRIPTION

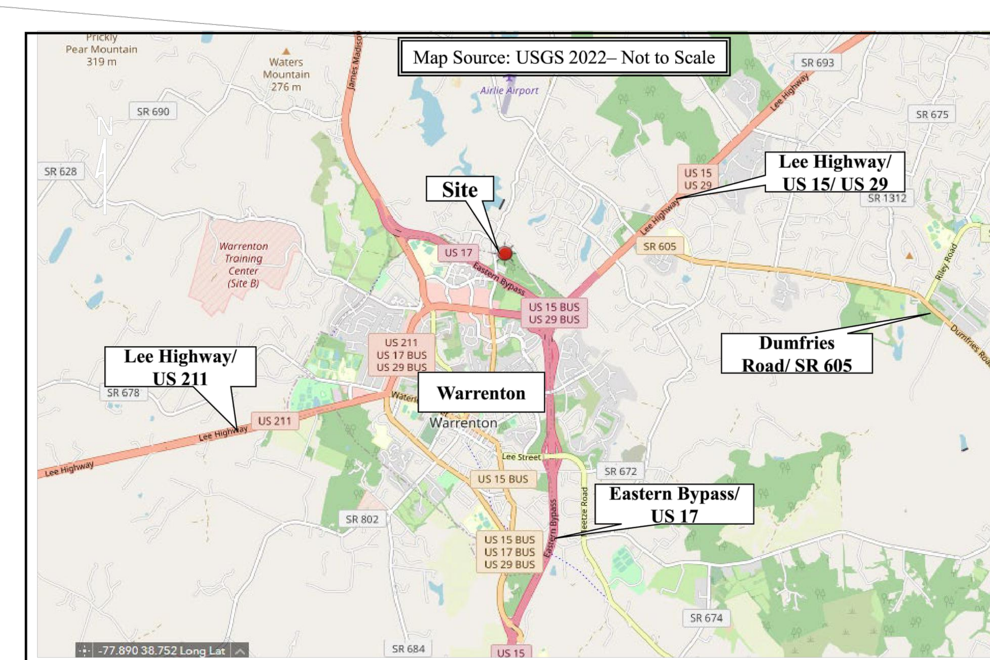
WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=50' V: 1"=5'
JOB No. 6642-02-002
DATE : FEBRUARY 10, 2023
FILE No. 6642-D-CP-001
SHEET 57 OF 58

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\057-058-6642-D-CP-001-GEO.dwg

SITE VICINITY MAP

Map Source: USGS 2022– Not to Scale



SCE	REVISIONS
SITE VICINITY MAP Tiffany Estates SWM Pond and Bioretention Basin	
7287 Blackwell Road and Tax Pin: 6985-60-5718-000, Warrenton, VA 20187	04/12/2023
LH | Not Drawn To Scale	23-0086V

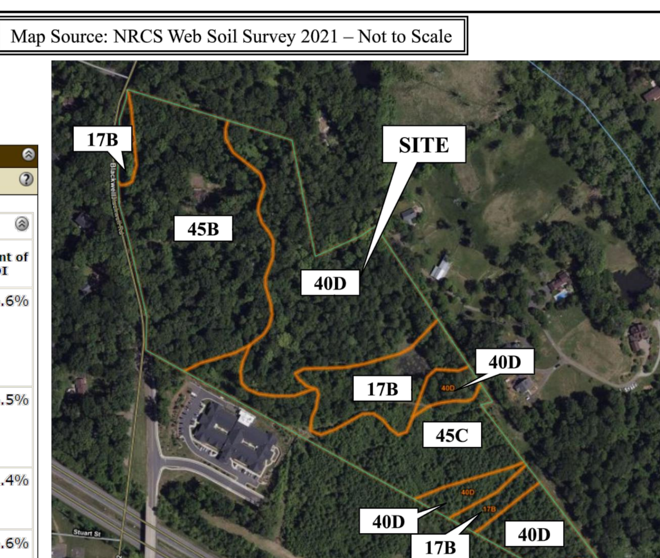
SOIL SITE VICINITY MAP

Map Source: NRCS Web Soil Survey 2021 – Not to Scale

Map Unit Legend

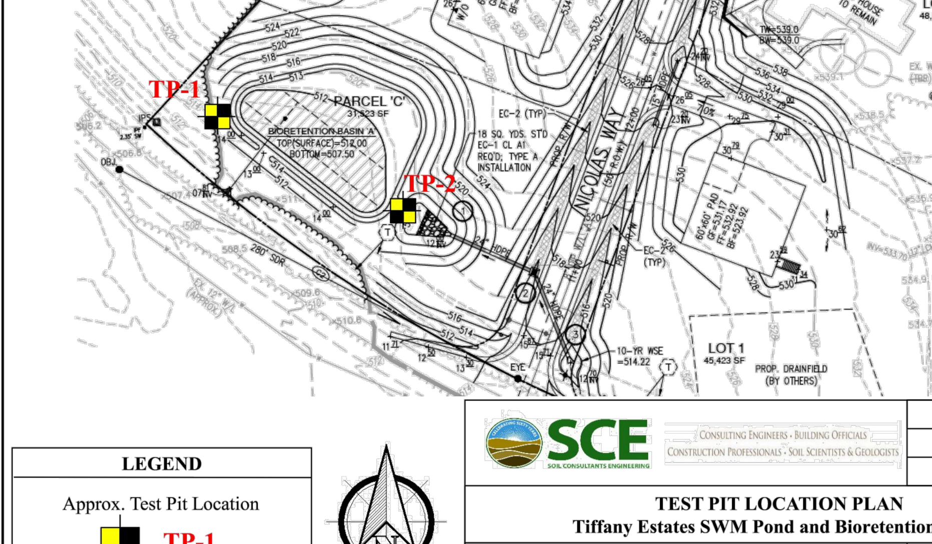
Fauquier County, Virginia (VA061)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
17B	Middleburg loam, 2 to 7 percent slopes, frequently flooded	4.6	14.6%
40D	Myersville silt loam, 15 to 25 percent slopes, stony	11.5	36.5%
45B	Fauquier silt loam, 2 to 7 percent slopes	10.2	32.4%
45C	Fauquier silt loam, 7 to 15 percent slopes	5.2	16.6%
Totals for Area of Interest		31.6	100.0%



SCE	REVISIONS
SOIL SITE VICINITY MAP Tiffany Estates SWM Pond and Bioretention Basin	
7287 Blackwell Road and Tax Pin: 6985-60-5718-000, Warrenton, VA 20187	04/12/2023
LH | Not Drawn To Scale	23-0086V

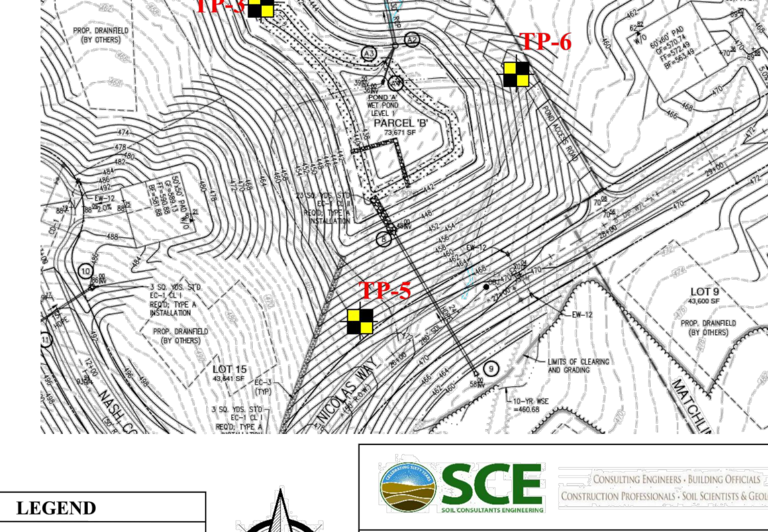
TEST PIT LOCATION PLAN



LEGEND

Approx. Test Pit Location — TP-1

SCE	REVISIONS
TEST PIT LOCATION PLAN Tiffany Estates SWM Pond and Bioretention Basin	
7287 Blackwell Road and Tax Pin: 6985-60-5718-000, Warrenton, VA 20187	04/12/2023
LH | Not Drawn To Scale	23-0086V



LEGEND

Approx. Test Pit Location — TP-1

SCE	REVISIONS
TEST PIT LOCATION PLAN Tiffany Estates SWM Pond and Bioretention Basin	
7287 Blackwell Road and Tax Pin: 6985-60-5718-000, Warrenton, VA 20187	04/12/2023
LH | Not Drawn To Scale	23-0086V

TEST PIT NUMBER TP-1
PAGE 1 OF 1

Soil Consultants Engineering, LLC, 9303 Center Street, Manassas, VA 20110, Telephone: (703) 366-3000, Fax: (703) 366-3400

CLIENT Mr. Jeff Hughes — PROJECT NAME Tiffany Estates SWM Pond and Bioretention Basin
PROJECT NUMBER 23-0086V — PROJECT LOCATION Hidden Hollow Lane, Warrenton, VA 20187
DATE STARTED 3/22/23 — COMPLETED 3/22/23 — GROUND ELEVATION 516 ft — TEST PIT SIZE 24 inches
EXCAVATION CONTRACTOR Venture 1, LLC — GROUND WATER LEVELS:
EXCAVATION METHOD John Deere 410E — AT TIME OF EXCAVATION --- Dry
LOGGED BY Julia DiGaetano — CHECKED BY Lubo Peytchev — AT END OF EXCAVATION --- Dry
NOTES ARMY CORPS Engineering Static Penetrometer (ACESP) — AFTER EXCAVATION --- N/A

Depth (ft)	Tests	U.S.C.S.	Material Description	Elev.
0–0.5		OL	(OL) Approximately 6-Inch Organic Surface Layer	515.5
0.5–3.1	PP = 0.75 tsf; PP = 0.75 tsf; PP = 0.75 tsf	ML	(ML) Firm, brownish-red, Sandy SILT, few organics; Moist; Natural	512.9
3.1–4.3	PP = 0.75 tsf	CL	(CL) Firm, brownish-red, Sandy Lean CLAY, little gravel, few cobbles; Moist; Natural	511.7
4.3–5.6	PP = 1 tsf; PP = 1.25 tsf	GM	(GM) Medium dense to dense, brownish-yellow, Silty GRAVEL, some sand, few cobbles; Moist; Natural; Bucket refusal on weathered bedrock at 5.6 feet	510.4

Refusal at 5.6 feet.
Bottom of test pit at 5.6 feet.

TEST PIT NUMBER TP-2
PAGE 1 OF 1

CLIENT Mr. Jeff Hughes — PROJECT NAME Tiffany Estates SWM Pond and Bioretention Basin
PROJECT NUMBER 23-0086V — PROJECT LOCATION Hidden Hollow Lane, Warrenton, VA 20187
DATE STARTED 3/22/23 — COMPLETED 3/22/23 — GROUND ELEVATION 518 ft — TEST PIT SIZE 24 inches
EXCAVATION CONTRACTOR Venture 1, LLC — GROUND WATER LEVELS:
EXCAVATION METHOD John Deere 410E — AT TIME OF EXCAVATION --- Dry
LOGGED BY Julia DiGaetano — CHECKED BY Lubo Peytchev — AT END OF EXCAVATION --- Dry
NOTES ARMY CORPS Engineering Static Penetrometer (ACESP) — AFTER EXCAVATION --- N/A

Depth (ft)	Tests	U.S.C.S.	Material Description	Elev.
0–0.4		OL	(OL) Approximately 5-Inch Organic Surface Layer	517.6
0.4–2.9	PP = 0.75 tsf	ML	(ML) Firm, brownish-red, Sandy SILT, few organics; Moist; Natural	515.1
2.9–5.5	PP = 1 tsf	SC	(SC) Medium dense, brownish-red, Clayey SAND, little gravel; Moist; Natural	512.5
5.5–6.8	PP = 1 tsf; MC = 32%; LL = 67; PL = 49; Fines = 52%; PP = 1.25 tsf	MH	(MH) Stiff to very stiff, yellowish-red, Sandy ELASTIC SILT; Moist; Natural; Bucket refusal on weathered bedrock at 6.8 feet	511.2

Refusal at 6.8 feet.
Bottom of test pit at 6.8 feet.

TEST PIT NUMBER TP-3
PAGE 1 OF 1

CLIENT Mr. Jeff Hughes — PROJECT NAME Tiffany Estates SWM Pond and Bioretention Basin
PROJECT NUMBER 23-0086V — PROJECT LOCATION Hidden Hollow Lane, Warrenton, VA 20187
DATE STARTED 3/22/23 — COMPLETED 3/22/23 — GROUND ELEVATION 446 ft — TEST PIT SIZE 24 inches
EXCAVATION CONTRACTOR Venture 1, LLC — GROUND WATER LEVELS:
EXCAVATION METHOD John Deere 410E — AT TIME OF EXCAVATION --- Dry
LOGGED BY Julia DiGaetano — CHECKED BY Lubo Peytchev — AT END OF EXCAVATION --- Dry
NOTES ARMY CORPS Engineering Static Penetrometer (ACESP) — AFTER EXCAVATION --- N/A

Depth (ft)	Tests	U.S.C.S.	Material Description	Elev.
0–0.2		OL	(OL) Approximately 3-Inch Organic Surface Layer	445.8
0.2–1.9		ML	(ML) Firm, yellowish-brown, Sandy SILT, trace organics, trace mica; Moist; Natural	444.1
1.9–4.2	PP = 0.75 tsf; PP = 0.75 tsf	CL	(CL) Firm to stiff, brownish-red, Lean CLAY, trace mica, some sand; Moist; Natural	441.8
4.2–8.9	PP = 1 tsf; MC = 22%; PP = 1 tsf; MC = 21%; LL = 37; PL = NP; Fines = 36%; PP = 1.25 tsf	SM	(SM) Medium dense to dense, grayish-brown, Silty SAND, few mica; Natural; Bucket refusal on weathered bedrock at 8.9 feet	437.1

Refusal at 8.9 feet.
Bottom of test pit at 8.9 feet.

TEST PIT NUMBER TP-4
PAGE 1 OF 1

CLIENT Mr. Jeff Hughes — PROJECT NAME Tiffany Estates SWM Pond and Bioretention Basin
PROJECT NUMBER 23-0086V — PROJECT LOCATION Hidden Hollow Lane, Warrenton, VA 20187
DATE STARTED 3/22/23 — COMPLETED 3/22/23 — GROUND ELEVATION 446 ft — TEST PIT SIZE 24 inches
EXCAVATION CONTRACTOR Venture 1, LLC — GROUND WATER LEVELS:
EXCAVATION METHOD John Deere 410E — AT TIME OF EXCAVATION --- Dry
LOGGED BY Julia DiGaetano — CHECKED BY Lubo Peytchev — AT END OF EXCAVATION --- Dry
NOTES ARMY CORPS Engineering Static Penetrometer (ACESP) — AFTER EXCAVATION --- N/A

Depth (ft)	Tests	U.S.C.S.	Material Description	Elev.
0–0.2		OL	(OL) Approximately 3-Inch Organic Surface Layer	445.8
0.2–2.1		ML	(ML) Firm, brownish-red, Sandy SILT, trace orgaincs; Moist; Natural	443.9
2.1–4.9	PP = 0.75 tsf; PP = 1 tsf; MC = 27%; LL = 46; PL = 32; Fines = 65%	ML	(ML) Stiff, reddish-brown, Sandy SILT, trace gravel; Moist; Natural	441.1
4.9–6.5	PP = 1 tsf	ML	(ML) Stiff, grayish-brown, Sandy SILT, trace mica; Moist; Natural	439.5

Bottom of test pit at 6.5 feet.

TEST PIT NUMBER TP-5
PAGE 1 OF 1

CLIENT Mr. Jeff Hughes — PROJECT NAME Tiffany Estates SWM Pond and Bioretention Basin
PROJECT NUMBER 23-0086V — PROJECT LOCATION Hidden Hollow Lane, Warrenton, VA 20187
DATE STARTED 3/27/23 — COMPLETED 3/27/23 — GROUND ELEVATION 456 ft — TEST PIT SIZE 24 inches
EXCAVATION CONTRACTOR Venture 1, LLC — GROUND WATER LEVELS:
EXCAVATION METHOD John Deere 35D Excavator — AT TIME OF EXCAVATION 7.90 ft / Elev 448.10 ft
LOGGED BY Julia DiGaetano — CHECKED BY Lubo Peytchev — AT END OF EXCAVATION 3.00 ft / Elev 453.00 ft
NOTES ARMY CORPS Engineering Static Penetrometer (ACESP) — AFTER EXCAVATION --- N/A

Depth (ft)	Tests	U.S.C.S.	Material Description	Elev.
0–0.5		OL	(OL) Approximately 6-Inch Organic Surface Layer	455.5
0.5–1.5	PP = 0.75 tsf	CL	(CL) Firm, yellowish-brown, Lean CLAY, trace organics; Moist; Natural	454.5
1.5–7.9	PP = 1 tsf; PP = 1 tsf; PP = 1 tsf; MC = 27%; LL = 35; PL = NP; Fines = 26%	SM	(SM) Medium dense, yellowish-brown, Silty SAND with gravel; Moist; Natural	448.1

Bottom of test pit at 7.9 feet.

TEST PIT NUMBER TP-6
PAGE 1 OF 1

CLIENT Mr. Jeff Hughes — PROJECT NAME Tiffany Estates SWM Pond and Bioretention Basin
PROJECT NUMBER 23-0086V — PROJECT LOCATION Hidden Hollow Lane, Warrenton, VA 20187
DATE STARTED 3/27/23 — COMPLETED 3/27/23 — GROUND ELEVATION 452 ft — TEST PIT SIZE 24 inches
EXCAVATION CONTRACTOR Venture 1, LLC — GROUND WATER LEVELS:
EXCAVATION METHOD John Deere 35D Excavator — AT TIME OF EXCAVATION 8.00 ft / Elev 444.00 ft
LOGGED BY Julia DiGaetano — CHECKED BY Lubo Peytchev — AT END OF EXCAVATION 8.00 ft / Elev 444.00 ft
NOTES ARMY CORPS Engineering Static Penetrometer (ACESP) — AFTER EXCAVATION --- N/A

Depth (ft)	Tests	U.S.C.S.	Material Description	Elev.
0–0.5		OL	(OL) Approximately 6-Inch Organic Surface Layer	451.5
0.5–8.0	PP = 0.75 tsf; PP = 1 tsf; PP = 1 tsf; MC = 42%; PP = 1 tsf	ML	(ML) Firm, yellowish-brown, SILT, few mica; Moist; Natural	444.0

Bottom of test pit at 8.0 feet.

KEY TO TERMS AND SYMBOLS

USCS SYMBOLS

- FILL – MAN-PLACED SOILS
- ASPHALT
- CONCRETE
- BEDROCK
- PEAT
- (OL) LOW PLASTICITY ORGANIC CLAY OR SILT
- (OH) ORGANIC SILT OR CLAY
- (ML) SILT
- (MH) ELASTIC SILT
- (CL) LEAN CLAY
- (CH) FAT CLAY
- (GP) POORLY-GRADED GRAVEL
- (GW) WELL-GRADED GRAVEL
- (GM) SILTY GRAVEL
- (GC) CLAYEY GRAVEL
- (SP) POORLY-GRADED SAND
- (SW) WELL-GRADED SAND
- (SC) CLAYEY SAND
- (SM) SILTY SAND

PENETRATION (SPT) RESISTANCE

DENSITY (SANDS, GRAVELS)		CONSISTENCY (SILTS, CLAYS)	
N-VALUE	TERM	N-VALUE	TERM
0 – 4	VERY LOOSE	0 – 2	VERY SOFT
5 – 10	LOOSE	3 – 4	SOFT
11 – 30	MED. DENSE	5 – 8	FIRM
31 – 50	DENSE	9 – 15	STIFF
50+	VERY DENSE	16 – 30	VERY STIFF
		31 – 50	HARD
		50+	VERY HARD

PARTICLE SIZE IDENTIFICATION

BOULDERS		GREATER THAN 12 INCHES
COBBLES		3 TO 12 INCHES
GRAVEL	COARSE -	3/4 INCH - 3 INCHES
	FINE -	4.75 MM - 3/4 INCH
SAND	COARSE -	2 MM – 4.75 MM
	MEDIUM -	0.425 MM – 2 MM
	FINE -	0.075 MM – 0.42 MM
SILT		0.005 MM – 0.075 MM
CLAY		LESS THAN 0.005 MM

WATER LEVEL DESIGNATION

- ▽ LEVEL AT TIME OF DRILLING
- ▼ LEVEL AT END OF DRILLING
- LEVEL AFTER DRILLING (24H+)

RELATIVE COMPOSITION OF SOILS

MAJOR CONSTITUENT
CONSTITUENT 50% OR MORE OF THE SAMPLE AND IS WRITTEN IN CAPITAL LETTERS. IF NO COMPONENT IS GREATER THAN 50%, THE PREDOMINANT COMPONENT IS CAPITALIZED.
MINOR CONSTITUENT
CONSTITUENT 25% - 40% OF SOIL TYPE AND WILL BE WRITTEN WITH THE FIRST LETTER OF THE SOIL TYPE CAPITALIZED.
ACCESSORY CONSTITUENTS
TRACE = <5%, *FEW* = 5 TO 10%, *LITTLE* = 11 TO 20%, *WITH* = 15 TO 25%, *SOME* = 21 TO 35%, *AND* = 36 TO 50%

ROCK KEY TO TERMS AND SYMBOLS

DEGREE OF WEATHERING

UNWEATHERED	ROCK GENERALLY FRESH, JOINTS LIGHTLY STAINED AND DISCOLORATION EXTENDS INTO ROCK NO MORE THAN ½ IN, OPEN JOINTS MAY CONTAIN CLAY, CORE RINGS UNDER HAMMER IMPACT.
WEATHERED	ROCK MASS DECOMPOSED 50% OR LESS, SIGNIFICANT DISCOLORATION, CORE CANNOT BE BROKEN BY HAND OR SCRAPED BY KNIFE
HIGHLY WEATHERED	ROCK MASS IS MORE THAN 50% DECOMPOSED, COMPLETE DISCOLORATION OF ROCK FABRIC, CORE MAY BE EXTREMELY BROKEN AND GIVES CLUNK SOUND WHEN STRUCK BY HAMMER, MAY BE SHAVED WITH A KNIFE.

ROCK QUALITY DESCRIPTION

ROCK MASS DESCRIPTION	RQD VALUE (%)
EXCELLENT	90-100
GOOD	75-90
FAIR	50-75
POOR	25-50
VERY POOR	LESS THAN 25

SCALE OF RELATIVE ROCK HARDNESS

TSF	CONSISTENCY
EXTREMELY SOFT	2.5 - 10
VERY SOFT	10 - 50
SOFT	50 - 250
MEDIUM HARD	250 – 525
MODERATELY HARD	525-1,050
HARD	1,050 – 2,600
VERY HARD	> 2,600

ROCK BEDDING THICKNESS

DESCRIPTION	CRITERIA
VERY THICK BEDDED	GREATER THAN 3 FT
THICK BEDDED	1 FT – 3 FT
MEDIUM BEDDED	4 IN – 1 FT
THIN BEDDED	1 ¼ IN – 4 IN
VERY THIN BEDDED	½ IN – 1 ¼ IN
THICKLY LAMINATED	1/8 IN – ½ IN
THINLY LAMINATED	1/8 IN OR LESS

ROCK VOIDS

VOIDS	VOID DIAMETER
PIT	< ½ IN
VUG	½ IN – 2 IN
CAVITY	2 IN – 24 IN
CAVE	>24 IN

GRAIN SIZE TERMINOLOGY

COMPONENT	SIZE RANGE
VERY COARSE GRAINED	>4.76 MM
COARSE GRAINED	2.0 MM – 4.76 MM
MEDIUM GRAINED	0.42 MM – 2.0 MM
FINE GRAINED	0.075 MM – 0.42 MM
VERY FINE GRAINED	<0.075 MM

STRUCTURE DESCRIPTION

DESCRIPTION	CRITERIA	DESCRIPTION	CRITERIA
STRATIFIED	ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS AT LEAST ¼ -IN THICK	LENSED	INCLUSION OF SMALL POCKETS OF DIFFERENT SOILS
LAMINATED	ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS LESS THAN ¼ -IN THICK	LAYER	INCLUSION GREATER THAN 3-IN THICK
FISSURED	BREAKS ALONG DEFINITE PLANES OF FRACTURE WITH LITTLE RESISTANCE TO FRACTURING	SEAM	INCLUSION 1/8 IN – 3 IN THICK EXTENDING THROUGH THE SAMPLE
SLICKENED	FRACTURE PLANES APPEAR POLISHED OR GLOSSY, SOMETIMES STRIATED	PARTING	INCLUSION LESS THAN 1/8 IN THICK
BLOCKY	COHESIVE SOIL THAT CAN BE BROKEN DOWN INTO SMALL ANGULAR LUMPS WHICH RESIST FURTHER BREAKDOWN		

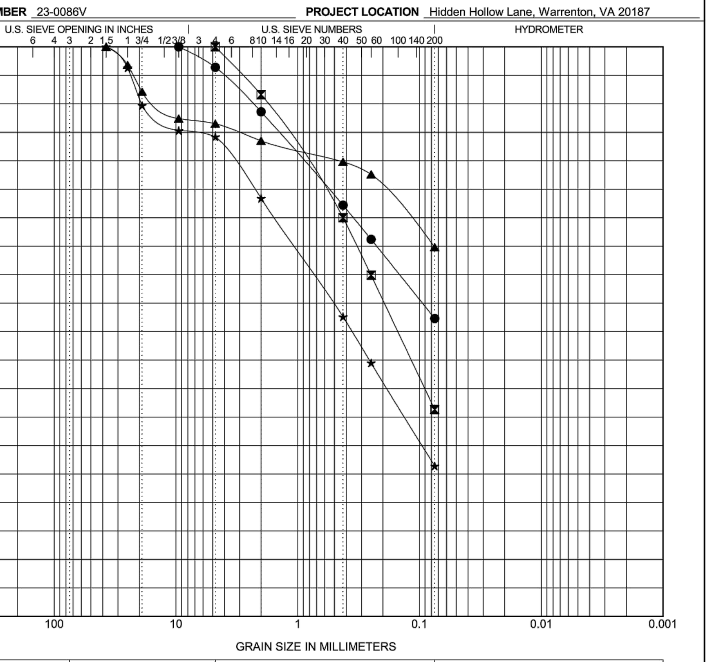
SUMMARY OF LABORATORY RESULTS
PAGE 1 OF 1

CLIENT Mr. Jeff Hughes — PROJECT NAME Tiffany Estates SWM Pond and Bioretention Basin
PROJECT NUMBER 23-0086V — PROJECT LOCATION Hidden Hollow Lane, Warrenton, VA 20187

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Class-ification	Water Content (%)	Dry Density (pcf)	Satur-ation (%)	Void Ratio
TP-2	6.5	67	49	18	9.5	52	MH	31.5			
TP-3	6.5							22.3			
TP-3	8.0	37	NP	NP	4.75	36	SM	20.9			
TP-4	4.5	46	32	14	37.5	65	ML	27.1			
TP-5	7.5	35	NP	NP	37.5	26	SM	26.6			
TP-6	7.8							41.6			

GRAIN SIZE DISTRIBUTION

CLIENT Mr. Jeff Hughes — PROJECT NAME Tiffany Estates SWM Pond and Bioretention Basin
PROJECT NUMBER 23-0086V — PROJECT LOCATION Hidden Hollow Lane, Warrenton, VA 20187

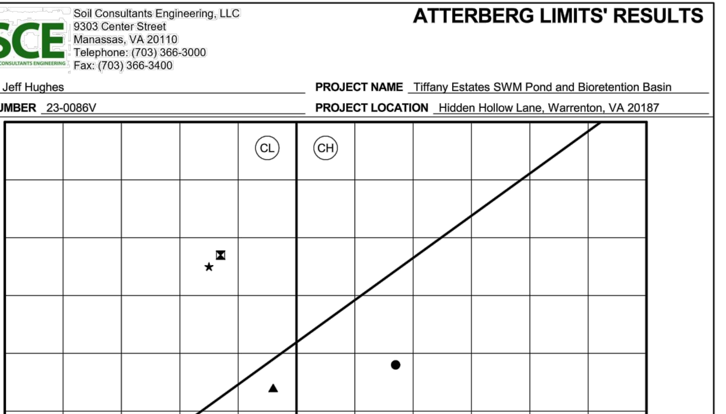


BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● TP-2	6.5	SANDY ELASTIC SILT(MH)	67	49	18		
⊠ TP-3	8.0	SILTY SAND(SM)	37	NP	NP		
▲ TP-4	4.5	SANDY SILT(ML)	46	32	14		
★ TP-5	7.5	SILTY SAND with GRAVEL(SM)	35	NP	NP		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP-2	6.5	9.5	0.146			3.6	44.1	52.3	
⊠ TP-3	8.0	4.75	0.251			0.0	63.7	36.3	
▲ TP-4	4.5	37.5				13.5	21.7	64.8	
★ TP-5	7.5	37.5	0.737	0.095		15.8	57.8	26.4	

ATTERBERG LIMITS' RESULTS

CLIENT Mr. Jeff Hughes — PROJECT NAME Tiffany Estates SWM Pond and Bioretention Basin
PROJECT NUMBER 23-0086V — PROJECT LOCATION Hidden Hollow Lane, Warrenton, VA 20187



BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
● TP-2	6.5	67	49	18	52	SANDY ELASTIC SILT(MH)
⊠ TP-3	8.0	37	NP	NP	36	SILTY SAND(SM)
▲ TP-4	4.5	46	32	14	65	SANDY SILT(ML)
★ TP-5	7.5	35	NP	NP	26	SILTY SAND with GRAVEL(SM)

Bowman

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GEOTECHNICAL RECOMMENDATIONS
TIFFANY ESTATES
CONSTRUCTION PLAN

CENTER MAGISTERIAL DISTRICT — FAUQUIER COUNTY, VIRGINIA

CONP-23-019202
COUNTY PROJECT NUMBER

PLAN STATUS

DATE	DESCRIPTION
02/10/23	MSR SUBMISSION
03/14/23	2nd MSR SUBMISSION
12/29/23	3rd MSR SUBMISSION
03/15/24	1st SUBMISSION
11/22/24	2nd SUBMISSION

WED DESIGN	WED DRAWN	WED CHKD

SCALE H: 1"=50' V: 1"=5'
JOB No. 6642-02-002
DATE : FEBRUARY 10, 2023
FILE No. 6642-D-CP-001

Cad file name : P:\006642 - Tiffany Estates\006642-02-002 (ENG)\Engineering\Engineering Plans\6642-D-CP-001\057-058-6642-D-CP-001-GEO.dwg