

CHECKLIST FOR IMPROVEMENT PLAN SUBMISSION

- Title these plans as Improvement plan.
- Add all the information provided in the SWM development plan.
- Address any pending comments from SWM development plan review.
- Development detail and site data including site area, disturbed area, new impervious area, and total impervious area.
- Existing and proposed topography.
- Existing and proposed drainage areas.
- Representative Cross sections and details (existing and proposed structure elevations and water surface elevations).
- The locations of existing and proposed structures.
- Construction specifications.
- Operation and maintenance plans.
- As-Built design certification block.
- Inspection schedule.
- Easements and right of way.
- Certification by the owner/developer that all construction will be done according to the plan.
- Final erosion and sediment control plans.
- SWM Facility sizing table.
- Stormwater management design report including:
 - A narrative to support the final design and demonstrate that ESD will be achieved to MEP.
 - Table showing ESD and Unified Sizing Criteria.
 - Hydrology and hydraulic analysis of the stormwater management system for applicable sizing criteria.
 - Final sizing calculations for stormwater controls including drainage area, storage, discharge points.
 - Final analysis of stable conveyance to downstream discharge points.
 - Geotechnical investigations report including soil maps, borings, and site-specific recommendations.

**BATCH STAMP
AREA**

PROJECT NAME:

COMMERCIAL RETAIL CENTER LINGANORE TOWN CENTER IMPROVEMENT PLAN - LOT C9

APPLICATION TYPE:

NOTE: FREDERICK COUNTY ASSUMES NO LIABILITY FOR DESIGN
AND/OR CONSTRUCTION.


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SHEETS INDEX

IP REQUIRED BLOCKS:

CERTIFICATION OF THE QUANTITIES

I hereby certify that the estimated total amount of excavation and fill as shown on these plans has been computed to 100 c.y. of excavation, 100 c.y. of fill and the total area to be disturbed as shown on these plans has been determined to be 114,905 square feet.

Signature:  Date: 08/25/2020

Printed Name: Timothy James Crawford Registration Number: 41425

Note: These figures are estimated quantities for Sediment Control purposes only.

ENGINEER/ARCHITECT DESIGN CERTIFICATION

"I hereby certify that the plans have been designed in accordance with local ordinances, COMAR 26.17.01, and 2011 Maryland Standards and Specifications for Soil and Sediment Control."

Signature:  Date: 08/25/2020

Printed Name: Timothy James Crawford Registration Number: 41425

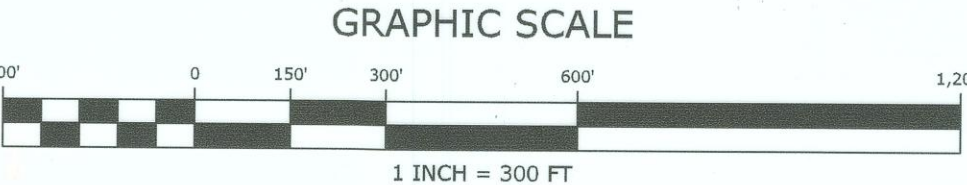
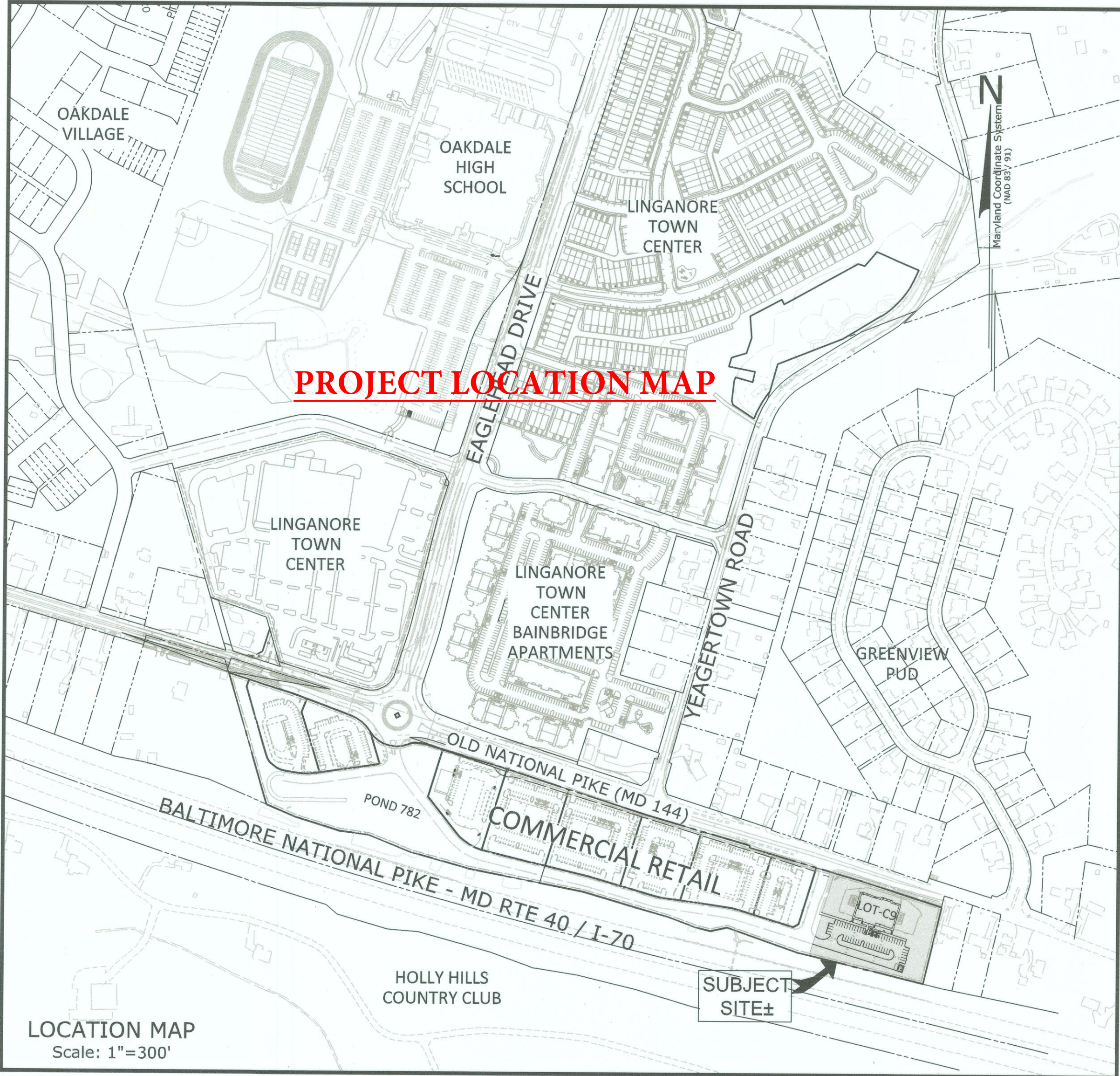
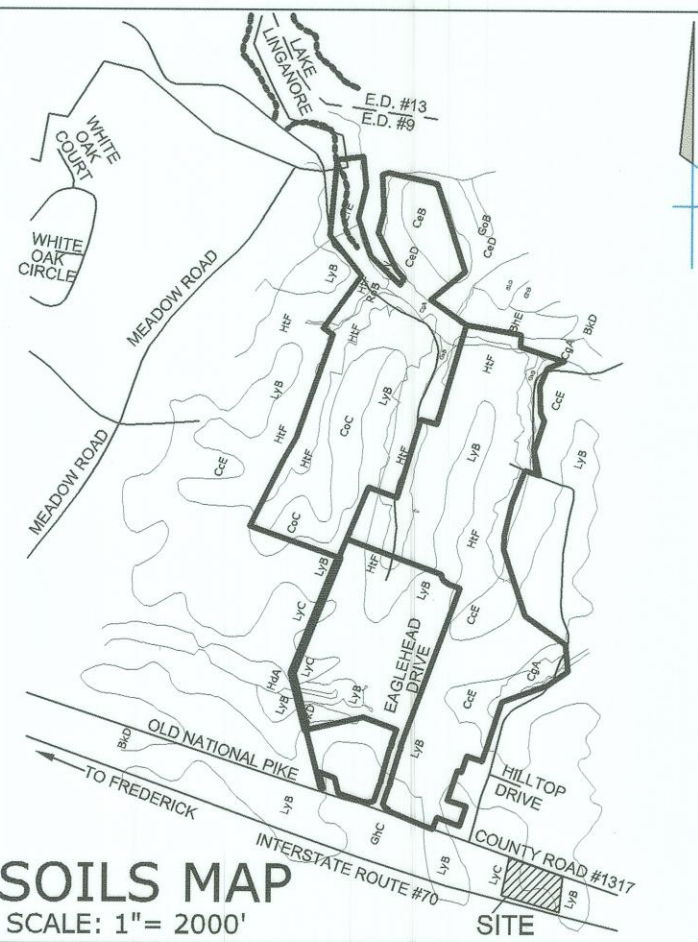
OWNER'S/DEVELOPER'S CERTIFICATION

I certify that this plan of Sediment Control will be implemented to the fullest extent, and all structures will be installed to the design and specifications as spelled out in this plan and that any responsible personnel involved in construction project will have a certification of attendance at a Department of Natural Resources approved training program for the control of sediment and erosion before beginning the project. I also authorized periodic on site evaluation by the Frederick Soil Conservation District personnel and cooperating agencies.

Owner/Developer Certificate: NATELLI COMMUNITIES

By:  Date: 08/25/2020

Paul Coleman, Authorized Person



DOMESTIC DEMAND = 76 GPM
SPRINKLER = 256 GPM
FIRE SERVICE = 456 GPM
OUTSIDE HOSE DEMAND = 100 GPM
TOTAL DEMAND = 888 GPM

SWM FACILITY SIZING TABLE

GENERAL NOTES:

- ALL CONSTRUCTION ON THESE PLANS SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE SHA "BOOK OF STANDARDS, HIGHWAY AND INCIDENTAL STRUCTURES" AND "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS BY MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION," 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL BY WATER RESOURCES ADMINISTRATION, SOIL CONSERVATION SERVICE AND STATE SOIL CONSERVATION COMMITTEE.
- NO SUBSURFACE INVESTIGATION HAS BEEN PERFORMED BY RODGERS CONSULTING, INC. TO DETERMINE GROUND WATER, ROCK OR ANY OTHER NATURAL OR MANMADE EXISTING FEATURE.
- THE CONTRACTOR SHALL NOTIFY THE APPLICABLE COUNTY AND/OR STATE AUTHORITIES AT LEAST 48 HRS BEFORE BEGINNING ANY WORK WITHIN PUBLIC RIGHTS OF WAY.
- THE OWNER/CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR COMPLYING WITH ALL APPLICABLE LEGAL AND REGULATORY REQUIREMENTS.
- THE LOCATION OF EXISTING UTILITIES SHOWN IS APPROXIMATE ONLY. CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION AND DEPTH OF ANY UTILITIES AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE ENGINEERS IN THE EVENT OF ANY DISCREPANCIES IN THE PLANS OR IN THE RELATIONSHIPS OF FINISHED GRADES TO EXISTING GRADE PRIOR TO BEGINNING WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF TRAFFIC ON ANY EXISTING ROADS IN ACCORDANCE WITH SHA TRAFFIC CONTROL STANDARDS FOUND IN THE SHA BOOK OF STANDARDS AND THE MARYLAND "MUTCD." IF REQUIRED, A SPECIFIC MAINTENANCE OF TRAFFIC PLAN MAY BE PREPARED AND SUBMITTED.
- THE CONTRACTOR SHALL NOTE THAT IN CASE OF A DISCREPANCY BETWEEN THE SCALED AND FIGURED DIMENSIONS SHOWN ON THESE PLANS THE FIGURED DIMENSIONS SHALL GOVERN & ENGINEER CONTACTED TO CONFIRM.
- IT SHALL BE DISTINCTLY UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NORMALLY BE REQUIRED TO COMPLETE THE PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO PERFORM SUCH WORK.
- ALL EXISTING PAVING DISTURBED BY THE CONTRACTOR'S OPERATION SHALL BE REPLACED IN ACCORDANCE WITH THE MSHA OR COUNTY INSPECTOR'S DIRECTION.
- ALL RIP-RAP SPECIFIED SHALL BE LOOSE LAID STONE, RIP-RAP PLACED AT STORM DRAIN OUTFALLS IN EXISTING SWALES SHALL BE PLACED SO AS TO COMPLETELY LINE THE EXISTING SWALE WITH ONLY THE MINIMUM POSSIBLE GRADING OR SHAPING OF THE SWALE.
- INLETS IN SUMPS SHALL BE CONSTRUCTED LEVEL AT THE FINISHED GRADE OF THE SURFACE. ADJUST THE FINISHED GRADE OF THE TOP SLAB MATCHES THE GRADE OF THE CURB.
- ALL PLACED ROAD MATERIALS SHALL BE COMPACTED IN ACCORDANCE WITH THE LATEST STATE HIGHWAY ADMINISTRATION STANDARDS AND SPECIFICATIONS.
- CERTAIN AREAS OF FREDERICK COUNTY ARE LOCATED WITHIN THE MONOCACY VALLEY REGION WHICH IS HISTORICALLY CONSIDERED TO CONTAIN SUBSURFACE LIMESTONE FORMATIONS WITH INHERENT SOLUTION CAVITIES COMMONLY REFERRED TO AS SINKHOLES. ENGINEERS RECOMMEND THAT THE PARTY RESPONSIBLE FOR THE CONSTRUCTION OF THIS DEVELOPMENT, RETAIN THE SERVICES OF A PROFESSIONAL GEOTECHNICAL ENGINEER TO INVESTIGATE THE SITES SUITABILITY FOR CONSTRUCTION AND MAKE RECOMMENDATIONS FOR SITE DEVELOPMENT AND CORRECTIVE MEASURES IF SUBSURFACE CONDITIONS AFFECTING THE SITE ARE DISCOVERED.
- ANY ATTEMPTS TO ESTIMATE COSTS ASSOCIATED WITH ROCK HANDLING / REMOVAL AND/OR SUBSURFACE CONDITIONS MUST BE BASED ON GEOTECHNICAL REPORTS AND RECOMMENDATIONS. GEOTECHNICAL REPORTS MAY INCLUDE INFORMATION PERTINENT TO THE DEVELOPMENT OF THE SITE WHICH IS NOT INCLUDED ON THESE PLANS. THE CONTRACTOR MUST CONSULT ANY EXISTING GEOTECHNICAL OR OTHER CONSULTANT'S REPORTS IN CONJUNCTION WITH THIS SET OF PLANS.
- ALL SIDEWALKS, DRIVEWAY ENTRANCES AND SIDEWALK RAMPS SHALL CONFORM TO THE SHA'S ADA GUIDELINES. THE LATEST EDITION CAN BE FOUND ON THE SHA WEBSITE, WWW.MARYLANDROADS.COM. SIDEWALK RAMPS TO BE INSTALLED AT EACH END OF MARKED AND UNMARKED CROSSTRAKS.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ALL LOCAL, STATE & FEDERAL CONSTRUCTION SAFETY REGULATIONS ARE FOLLOWED DURING THE CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS PROJECT.
- ENGINEERS ARE NOT RESPONSIBLE FOR THE CONTRACTOR'S MEANS OR METHODS FOR CONSTRUCTION, INCLUDING, BUT NOT LIMITED TO THE CONTRACTOR'S UTILIZATION OF MEN, MATERIALS, EQUIPMENT OR SAFETY MEASURE IN THE PERFORMANCE OF ANY WORK FOR THIS CONSTRUCTION. THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR PERFORMING THE WORK CORRECTLY AND IN CONFORMANCE WITH ALL FEDERAL, STATE, AND LOCAL CODE AND/OR REGULATORY REQUIREMENTS.
- THE CONTRACTOR SHALL CONTACT MISS UTILITY AT 1-800-257-7777 48 HOURS BEFORE THE START OF CONSTRUCTION AND SHALL NOT COMMENCE ANY EXCAVATION WORK UNTIL ALL UTILITIES ARE LOCATED.
- STORMWATER MANAGEMENT QUALITY AND QUANTITY CONTROL SHALL BE PROVIDED THROUGH ENVIRONMENTAL SITE DESIGN (ESD) MEASURES INCLUDING MICRO-BIORETENTION IN ACCORDANCE WITH THE 2000 MD SWM DESIGN MANUAL AND THE 2007 SWM SUPPLEMENT INCLUDING ALL REVISION AND AMENDMENTS TO MAXIMUM EXTENT PRACTICABLE (MEP). SEE A/P #19258 FOR THE APPROVED COMBINED SWM CONCEPT/ SWM DEVELOPMENT PLAN.
- ALL REQUIRED ROADWAY SIGNS, BARRICADES, STRIPING AND PAVEMENT MARKINGS WITHIN PRIVATE R/W SHALL BE IN ACCORDANCE WITH THE LATEST VERSION MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES MARYLAND(MUTCD).
- THE SITE WILL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE MARYLAND ACCESSIBILITY CODE (MAC), THE AMERICAN DISABILITY ACT (ADA) AND ANSI A117.1-2009. IF THERE ARE CONFLICTING REQUIREMENTS, THE MOST STRINGENT SHALL APPLY.
- HANDICAPPED PARKING, SIDEWALKS AND CURB RAMPS SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE MARYLAND ACCESSIBILITY CODE (MAC), THE AMERICAN DISABILITIES ACT 2010 (ADA) AND ANSI A117.1-2009. IF THERE ARE CONFLICTING REQUIREMENTS, THE MOST STRINGENT SHALL APPLY.
- THE SITE PLAN ASSOCIATED WITH THIS APPLICATION (A/P 19218) WAS APPROVED BY FREDERICK COUNTY ON 07/07/2020.
- NO WETLANDS OR FLOODPLAINS EXIST WITHIN THE LIMITS OF THIS APPLICATION.

DIVISION OF UTILITIES & SOLID WASTE MANAGEMENT NOTES:

- A WASTE FUTURE COUNT MUST BE PREPARED BY THE FREDERICK COUNTY DUSWM, DIVISION OF ENGINEERING AND PLANNING BEFORE A BUILDING PERMIT CAN BE APPROVED.
- EACH TENANT OR OWNER SHALL COMPLETE AN INDUSTRIAL WASTE SURVEY AND COMPLY WITH THE FREDERICK COUNTY INDUSTRIAL WASTE ORDINANCE. FURNISHMENT AND INSTALLATION OF MONITORING MANHOLES, GREASE TAPS AND OTHER PRE TREATMENT DEVICES SHALL BE THE RESPONSIBILITY OF THE OWNER OR CONTRACT PURCHASER OF THE LOT. THE FINAL LOCATION OF SAID DEVICES ARE SUBJECT TO REVIEW AND APPROVAL BY FREDERICK COUNTY DUSWM AS PART OF THE SITE IMPROVEMENT PLAN.

PRIVATE UTILITY NOTE:

UPON APPROVAL OF THE IMPROVEMENT PLANS AND PRIOR TO ISSUANCE OF THE GRADING PERMIT, A PLUMBING PERMIT THAT COVERS ONSITE PRIVATE WATER, SEWER AND STORM DRAIN UTILITY WORK IS REQUIRED. THE APPLICATION MUST BE APPROVED PRIOR TO START OF CONSTRUCTION FOR ALL PROPOSED PRIVATE PORTIONS OF UTILITIES INCLUDING STORM DRAINS, WATER AND SEWER LINES, MONITORING MANHOLES, HYDRANTS, AND ANY OTHER ON-SITE PRIVATE UTILITY WORK. APPLICATIONS CAN BE SUBMITTED BY THE FREDERICK COUNTY LICENSED UTILITY CONTRACTOR VIA THE CITIZEN PORTAL. planningandpermitting.frederickcountymd.gov

PROFESSION CERT:


PROFESSIONAL CERTIFICATION

"I hereby certify that these documents were prepared or approved by me that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 41425, Expiration Date: 01/05/2022."

DATE: 8/31/20

FREDERICK SOIL CONSERVATION DISTRICT

SCD BLOCK

APPROVED BY:  DISTRICT MANAGER

DATE: 8/31/20

SCD approval for sediment and erosion control is contingent upon issuance of all applicable regulatory permits.

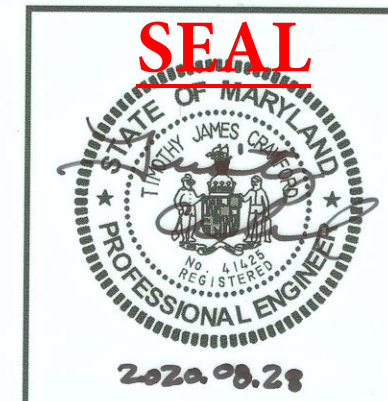
**ROUTING
STAMP**

Development Review

File #: S829T

A/P #: PW260210

Due Date:



COVER SHEET

**RODGERS
CONSULTING**

19847 Century Boulevard, Suite 200, Germantown, Maryland 20874
Ph: 301.948.4700 Fx: 301.948.6256 www.rodgers.com

IMPROVEMENT PLAN - COMMERCIAL RETAIL CENTER
Lot C9
Linganore Town Center

TAX MAP 79, PARCEL 17
ELECTION DISTRICT NO. 9
FREDERICK COUNTY, MARYLAND

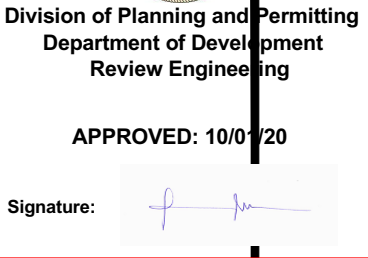
SCALE: 1" = 300'

JOB No. 0529AJ

DATE: JULY 2020

INDEX No. COV-01

SHEET No. 01 OF 17



NOTE: FREDERICK COUNTY ASSUMES NO LIABILITY FOR DESIGN AND/OR CONSTRUCTION.

PROVIDE ATTACHEMENTS AS REQUIRED
FOR PROPOSED IMPROVEMENTS

ATTACHMENT "D"
SUBDIVISION CONSTRUCTION INSPECTION
GENERAL NOTES
REVISED OCTOBER 2014

- A PRE-CONSTRUCTION MEETING SHALL BE REQUIRED WITH THE DEPARTMENT OF ENGINEERING AND CONSTRUCTION MANAGEMENT (DECM) TO DISCUSS CONSTRUCTION PHASING, UNUSUAL SITE CONDITIONS, SPECIAL REQUIREMENTS, ETC. PLEASE CALL 301-660-3508, 5 DAYS IN ADVANCE AND REQUEST A HIGHWAY DESIGNER (MD SHA) AND ONE (1) CIVIL ENGINEER.
- ALL SIDEWALKS SHALL BE INSTALLED IN ACCORDANCE WITH CURRENT AMERICANS WITH DISABILITIES ACT (ADA) STANDARDS AND LAWS.
- PROGRESS MEETINGS AMONG REPRESENTATIVES OF DECM, THE CONTRACTOR, AND THE DEVELOPER MAY BE REQUIRED ON AN ADDED TIME BASIS TO MONITOR CONSTRUCTION PROGRESS.
- AN INSPECTION OF THE CONSTRUCTION STAKEOUT IS REQUIRED BY DECM.
- ALL WORK, CONSTRUCTION METHODS AND MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND STANDARD DRAWINGS OF THE ADMINISTRATION (MD SHA) STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS DATED JULY 2008, HEREIN REFERRED TO AS THE SHA GRAY BOOK, AND ALL CURRENT REVISIONS AND SUPPLEMENTS. THESE SPECIFICATIONS AND STANDARDS FOR ITEMS SUCH AS INLET AND MANHOLE STRUCTURES ARE AVAILABLE ONLINE FROM THE SHA WEBSITE WWW.MDSHA.GOV/DESIGN/PUBLICATIONS/PUBLICATIONSONLINE/OHD/BOOKST/INDEX.ASP.
- THE CONTRACTOR SHALL CONTACT DECM 24 HOURS IN ADVANCE OF PLACING ANY CONTROLLED FILL WITHIN THE PROPOSED ROAD RIGHT-OF-WAY. MOISTURE/DENSITY TESTING IS REQUIRED IN ACCORDANCE WITH THE APPROVED SPECIFICATIONS AND SECTION 204 OF THE SHA GRAY BOOK, AND ALL CURRENT REVISIONS AND SUPPLEMENTS. ALL MOISTURE/DENSITY TESTING FOR FILL AREAS, SUBGRADE, CULVERT AND STRUCTURE BACKFILL IS TO BE PERFORMED AND APPROVED BY THE DEVELOPER'S GEOTECHNICAL ENGINEER AND MONITORED BY DECM. ANY FAILING TESTS SHALL BE RECORDED SO THAT THE PROJECT RECORDS WILL REFLECT THEM IN ORDER TO OBTAIN FINAL APPROVAL. IF WET AREAS ARE DETERMINED PRESENT IN THE PROPOSED ROAD RIGHT OF WAY, UNDER DRAIN AND UNDER DRAIN MEDIAN SHALL BE INSTALLED TO ALLEVIATE POTENTIAL SUBGRADE FAILURE.
- PROVIDE DRAINAGE DOWNS AND OUTLETS BEHIND ALL CURB AND GUTTER MONUMENTAL ISLANDS IN THE ROADWAY MEDIUM.
- ALL REQUIRED ROADWAY SIGNS, BARRICADES, STRIPING AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST MARYLAND VERSION OF THE FEDERAL HIGHWAY ADMINISTRATION'S (FHWA) MUTCD. ALL REQUIRED TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE LATEST MD REQUIRED ROADWAY SIGNS, INCLUDING STREET NAME SIGNS, SHALL COMMENCE THE NEXT BUSINESS DAY AFTER THE PLACEMENT OF THE BASE COURSE ASPHALT.
- IF REQUIRED, A MAINTENANCE OF TRAFFIC (MOT) PLAN SHALL BE SUBMITTED TO THE FEDERICK COUNTY COMMUNITY DEVELOPMENT DIVISION PRIOR TO COMMENCEMENT OF THE WORK. THE CONTACT NUMBER IS 301-660-1138. **ANY ANTICIPATED ROAD CLOSURES SHALL BE REQUESTED IN WRITING AND REQUIRE AN APPROVED MOT/DETOUR PLAN. ALL ROAD CLOSURE REQUESTS SHALL BE APPROVED IN WRITING BY THE COUNTY PRIOR TO IMPLEMENTATION.**
- BENCHMARKS SHALL BE ESTABLISHED AND MAINTAINED UNTIL ACCEPTANCE OF THE ROADWAY IMPROVEMENTS.
- THE CONTRACTOR SHALL BE REQUIRED TO CONTACT DECM AT LEAST 24 HOURS IN ADVANCE OF INSTALLING STORM DRAINS, STORM DRAINAGE APPURTENANCES AND CURB AND GUTTER. A PROOF ROLL IS REQUIRED PRIOR TO PLACING CURB AND GUTTER.
- PROVIDE FOR WEEP GUTTERS IN AN INLET THROAT OPENING TO ALLOW WATER IN THE GUTTER PAN TO EXIST WITHOUT CAUSING DAMAGE TO THE AFTER PLACING BASE PAVING.
- THE CONTRACTOR SHALL SCHEDULE POOL ROOF INSPECTIONS WITH DECM A MINIMUM OF 24 HOURS IN ADVANCE, PRIOR TO PLACEMENT OF BASE ASPHALT COURSE, AND AFTER FINAL SATISFACTORY COMPLETION OF SUBGRADE DENSITY/MOISTURE TESTING; SHA GRAY BOOK SPECIFICATIONS.
- PRIOR TO PLACING THE SURFACE ASPHALT COURSE, THE BASE COURSE SHALL BE INSPECTED BY DECM. THE CONTRACTOR IS REQUIRED TO CONTACT DECM A MINIMUM OF 24 HOURS IN ADVANCE OF PLACING THE SURFACE ASPHALT COURSE.
- THE FOLLOWING SHALL BE REQUIRED PRIOR TO PLACEMENT OF THE FINAL SURFACE ASPHALT COURSE:
- a) ALL EXISTING BASE PAVEMENT SHALL BE EXAMINED FOR ANY DEFECTIVE AREAS. EXAMPLES INCLUDE CRACKS, PATCHES, SPALLS, CHIPS, POLES, HOLES, UNIFORMITY OF CURB AND GUTTER, SETTLEMENT OF PAVED AREAS AND INLET AND MANHOLE STRUCTURES, ETC., ETC.
 - b) REVIEW EXISTING BASE ASPHALT FOR A SMOOTH POLISHED SURFACE CAUSED BY CONSTRUCTION AND/OR EXISTING TRAFFIC. FOR EXAMPLE, DURING THE HOME BUILDING PROCESS.
 - c) REMOVE AND REPLACE ANY CRACKS OR PATCHES ABOVE 1" DEPTHS. WHEN REPAIRED OR REPLACED IN ACCORDANCE WITH THE ORIGINAL APPROVED DRAWINGS TO THE SATISFACTION OF DECM.
 - d) POLISHED SURFACES SHALL BE "SKIM MILLED" WITH A MILLING MACHINE TO ROUGHEN THE BASE ASPHALT SURFACE AND THEN TACK COATED, TO ENHANCE ADHESION OF THE FINAL SURFACE ASPHALT COURSE.
 - e) CHECK CURB AND GUTTER FOR DAMAGE AND REPLACE OR REPAIR.
 1. REPLACE CURB THAT HAS DAMAGE GREATER THAN 3" DEPTH AND 6" LENGTH DIAMETER.
 2. REPLACE CURB THAT HAS BEEN CRACKED COMPLETELY THROUGH AND HAS SETTLEMENT IN EXCESS OF 1/8"
 3. REPLACE CURB AT INLETS IF THERE ARE GAP'S GREATER THAN THE 1/2" FORMED EXPANSION MATERIAL.
 - f) WHEN REPLACING CURB, ANY JOINT SPACING SHALL NOT BE LESS THAN FOUR (4) FEET IN LENGTH.
 - g) REPAIR ANY MINOR CRACKS AND CHIPS IN CURB.
 - h) SEAL ANY CRACKS IN GUTTER PAN. APPLY SEALER TO THE ENTIRE GUTTER PORTION AND 1" UP THE FACE OF ALL JOINTS, AS PER SECTION 602.03.01G OF THE SHA STANDARD SPECIFICATIONS.
- ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS PRIOR TO DECM RECOMMENDING ACCEPTANCE OF THE STREET(S) BY THE BOARD OF COUNTY COMMISSIONERS (BOCC). **ALL PROPOSED STREETS TO BE ACCEPTED MUST PASS A FINAL WALK-THROUGH INSPECTION BY DECM AND THE FEDERICK COUNTY OFFICE OF HIGHWAY MAINTENANCE (COMH).**
- PLEASE CONTACT THE DECM INSPECTION STAFF OR SUPERVISOR WITH ANY QUESTIONS.

ATTACHMENT 'E'

PRE-CAST MATERIAL ACCEPTANCE POLICY

EFFECTIVE DATE: JANUARY 1, 2002

REVISÉ FEBRUARY 6, 2003 AND SEPTEMBER 23, 2003

1. ALL PRE-CAST CONCRETE STORM DRAINAGE STRUCTURES, MANHOLE FRAMES AND COVERS, AND INLET GRATES TO BE INSTALLED IN CONJUNCTION WITH STORM DRAIN SYSTEMS WITHIN PUBLIC STREET RIGHTS OF WAY INTENDED TO BE DEDICATED AND ACCEPTED INTO THE FREDERICK COUNTY PUBLIC STREET SYSTEM SHALL COMPLY WITH SHA SPECIFICATIONS AS STATED ON THE APPROVED PLANS.

THE COUNTY SHALL REQUIRE SEPARATE CERTIFICATIONS FOR THE PRE-CAST CONCRETE STORM DRAINAGE STRUCTURES, THE MANHOLE FRAMES AND COVERS, AND THE INLET GRATES.

THE CERTIFICATIONS SHALL BE IN ACCORDANCE WITH ALL PROVISIONS OF THE MARYLAND STATE HIGHWAY (SHA) ADMINISTRATION'S STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS DATED JULY 2008, AS THEY MAY BE REVISED, INCLUDING BUT NOT LIMITED TO: SECTION 305.03.06, 909.04 EXCEPT AS INDICATED BELOW:

UNLESS THE IMPROVEMENT PLANS OR CONTRACT DOCUMENTS EXPRESSLY INDICATE THE USE OF FEDERAL OR STATE FUNDS FOR THE PROJECT, THE CERTIFICATION FOR METAL PRODUCTS IS NOT REQUIRED TO INCLUDE A STATEMENT THAT "THE MATERIAL WAS MELTED AND MANUFACTURED IN THE UNITED STATES" (SEE TC-1.02, SECTION 909.00) AND:

A) BE MANUFACTURED OR PRODUCED BY ENTITIES LISTED ON THE CURRENT MARYLAND STATE HIGHWAY (SHA) OFFICE OF MATERIALS AND TECHNOLOGY LIST OF APPROVED SUPPLIERS AT THE TIME OF MANUFACTURE;

B) BE ACCOMPANIED BY A CERTIFICATION FROM THE PRODUCER, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER CURRENTLY LICENSED AND REGISTERED IN THE STATE OF MARYLAND, THAT THE MATERIALS SUPPLIED COMPLY WITH THE CONTRACT DOCUMENTS AND SHA SPECIFICATIONS; AND

C) CERTIFICATION DOCUMENTS MUST BE PROVIDED TO THE COUNTY INSPECTOR PRIOR TO INSTALLATION, AND THE MATERIALS MUST PASS A VISUAL INSPECTION BY THE COUNTY'S INSPECTOR FOR DEFECTS, PRIOR TO INSTALLATION.

2. FREDERICK COUNTY SHALL HAVE THE RIGHT TO OBTAIN INDEPENDENT VERIFICATION OF ANY, AND/OR ALL OF THE MATERIALS UTILIZED IN THE PRE-CAST MANUFACTURING PROCESS TO ENSURE THAT THEY COMPLY WITH THE CURRENT SHA SPECIFICATIONS. THE VERIFICATION SHALL BE FROM AN SHA APPROVED INDEPENDENT TESTING LABORATORY. ALL COSTS FOR THE TESTING AND VERIFICATION PROCESS SHALL BE BORNE BY THE OTHER PARTY TO THE EXECUTED DEVELOPER PUBLIC WORKS AGREEMENT WITH FREDERICK COUNTY.

REQUIREMENTS FOR PLACING

CONTROLLED FILL IN RIGHT-OF-WAY

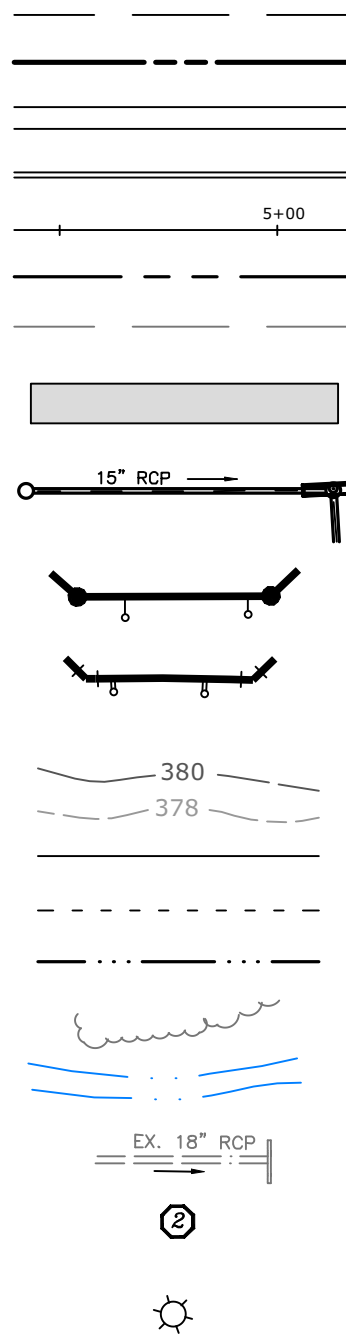
(REF. SHA STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS SECTIONS 204 & 916)

1. AASHTO T-180, METHOD C PROCTOR WILL BE REQUIRED FOR EACH TYPE OF SOIL USED IN CONTROLLED FILLS AND STORM SEWER TRENCHED IN THE RIGHT-OF-WAY. PROCTOR CURVE IS REQUIRED WITH MAXIMUM DENSITY, OPTIMUM MOISTURE AND SOIL TYPE DESCRIPTION. AN ADEQUATE NUMBER OF TESTS SHALL BE SHOWN TO MEET SPECIFICATION CUT FOUR (4). THIS INFORMATION MUST BE APPROVED BY DOT'S PRIOR TO PLACEMENT OF ANY FILL.
2. AN ALTERNATIVE METHOD OF COMPACTION TO THE AASHTO T-180, METHOD C MAY BE SUBMITTED TO FREDERICK COUNTY'S BUREAU OF PROGRAM DEVELOPMENT FOR CONSIDERATION OF APPROVAL. ANY ALTERNATIVE METHOD SUBMITTED SHALL BE SEALED BY A MARYLAND REGISTERED PROFESSIONAL ENGINEER AND IF IMPLEMENTED SHALL BE MONITORED BY A REGISTERED PROFESSIONAL GEOTECHNICAL ENGINEER.
3. BEFORE OPERATIONS COMMENCE, A PROOF ROLL MAY BE REQUIRED AT THE DISCRETION OF DOT'S ON SPECIFIC AREA(S) TO DETERMINE METHOD OF PLACEMENT OF FILL IF NECESSARY.
4. PRIOR TO PLACEMENT OF FILL, THE PROPOSED TESTING METHODS AND REQUIRED REPORTS WILL BE REVIEWED BY DOT'S.
5. A ONE-STEP MOISTURE DENSITY TEST WILL BE REQUIRED IF SOIL TYPE, MOISTURE, OR OTHER CHANGES ARE DETECTED; GEOTECH/DOT'S WILL DETERMINE IF NEEDED.
6. THE NUMBER OF COMPACTION TESTS WILL BE DECIDED ON THE JOB BY JOB BASIS. NORMALLY, AFTER TESTING EACH OF THE FIRST THREE (3) LIFTS, TESTS WILL BE TAKEN ON EVERY TWO (2) FEET OF FILL AND/OR ONCE A DAY.
7. EACH LIFT TESTED SHALL HAVE REQUIRED PERCENTAGE OF COMPACTION AND +/- 2% OPTIMUM MOISTURE BEFORE NEXT LIFT IS PLACED.
8. ALL FAILING TEST AREAS WILL BE CORRECTED IN ACCORDANCE WITH SHA SECTION 204.03.04 BY REWORKING, DRYING, ETC. AND WILL BE RETESTED UNTIL THE REQUIRED PERCENTAGE OF COMPACTION AND/OR PROPER PERCENT MOISTURE IS OBTAINED AND AN EXPLANATION OF CORRECTIVE ACTION WILL BE SHOWN FOR EACH FAILING TEST ON THE DAILY REPORT
9. IT IS DESIRED TO HAVE THE TEST RESULTS AND CERTIFICATION OF THE EMBANKMENT FILLS RETURNED TO DOT'S WITHIN FORTY-EIGHT (48) HOURS; HOWEVER THEY SHALL BE RECEIVED BY DOT'S A MINIMUM OF TWENTY-FOUR (24) HOURS IN ADVANCE OF THE NEXT DAY. THE CONTRACTOR'S REPRESENTATIVE SHALL SIGN OFF ON EACH DAY'S TEST RESULTS

ABBREVIATION LIST

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
100YR	100 YEAR	N.	NORTH
10YR	10 YEAR	N.B.	NORTH BOUND
50YR	50 YEAR	NO.	NUMBER
2YR	2 YEAR	N/F	NOW OR FORMERLY
A.D.	ALGEBRAIC DIFFERENCE		
Ac.	ACRE	P/R	POINT OF ROTATION
AVE.	AVENUE	PC	POINT OF CURVE (HORIZONTAL)
		PCC	POINT OF COMPOUND CURVE
B.F.	BASEMENT FLOOR		(HORIZONTAL)
B/L	BASELINE	PGL	PROPOSED GRADE LINE
BLVD.	BOULEVARD	PIE	PUBLIC IMPROVEMENTS EASEMENT
		PL	PROPERTY LINE
c.f.s.	CUBIC FEET per SECOND	PRC	POINT OF REVERSE CURVE
C&G	CURB & GUTTER		(HORIZONTAL)
CY	CUBIC YARD	PT	POINT OF TANGENT (HORIZONTAL)
CDS	CUL-DE-SAC	PUE	PUBLIC UTILITIES EASEMENT
CL	CENTERLINE	PVC	POINT OF VERTICAL CURVE
CMB	COMBINATION	PCVC	POINT OF COMPOUND VERTICAL CURVE
CMP	CORRUGATED METAL PIPE	PVMT	PAVEMENT
CMPA	CORRUGATED METAL PIPE ARCH	PVT	POINT OF VERTICAL TANGENT
CONC.	CONCRETE		
CT.	COURT	QTY.	QUANTITY
D/W	DRIVEWAY	R	RADIUS
DR.	DRIVE	R/W	RIGHT-OF-WAY
		RCP	REINFORCE CONCRETE PIPE
E.	EAST	RCPR	REINFORCE CONCRETE PIPE
E.B.	EAST BOUND		WITH RUBBER GASKETS
ELEC.	ELECTRIC	RD.	ROAD
ELEV.	ELEVATION	RT	RIGHT
EP	EDGE OF PAVEMENT	RTE	ROUTE
ESMT	EASEMENT		
		S	SEWER
F.F.	FIRST FLOOR	S.	SOUTH
F.H.	FIRE HYDRANT	S.B.	SOUTH BOUND
FC	FACE OF CURB	S.D.	STORM DRAIN
FL	FLOW LINE	S/E	SUPER ELEVATION
FCDPW	FREDERICK COUNTY	S/W	SIDEWALK
	DEPARTMENT PUBLIC WORKS	SAN.	SANITARY
Fc&BZ	FREDERICK COUNTY	SB	SOIL BORING
	PLANNING & ZONING	SF	SQUARE FOOT
FcPc	FREDERICK COUNTY	SH	SEWER HOUSE CONNECTION
	PLANNING COMMISSION	STA	STATION
FcdCoM	FREDERICK COUNTY DEPARTMENT	STD.	STANDARD
	OF CONSTRUCTION MANAGEMENT		
FcdToTS	FREDERICK COUNTY DIVISION	T/C	TOP OF CURB
	OF TECHNICAL SERVICES	Tc	TIME OF CONCENTRATION
		TEL.	TELEPHONE
GAR	GARAGE FLOOR	TERR.	TERRACE
		TP	TEST PIT
H/C	HANDICAPPED	TRAN	TRANSITION
HERCP	HORIZONTAL ELLIPTICAL		
	REINFORCE CONCRETE PIPE	UTIL	UTILITY
HGL	HYDRAULIC GRADE LINE		
HORZ.	HORIZONTAL	V.C.	VERTICAL CURVE
HP	HIGH POINT	VERCP	VERTICAL ELLIPTICAL
			REINFORCE CONCRETE PIPE
INTX.	INTERSECTION	VERT.	VERTICAL
INV.	INVERT		
		W	WATER
LN.	LANE	W.	WEST
LOD	LIMIT OF DISTURBANCE	W.B.	WEST BOUND
LOG	LIMIT OF GRADING	WHC	WATER HOUSE CONNECTION
LP	LOW POINT	WSE	WATER SURFACE ELEVATION
L/P	LIGHT POLE		
LT	LEFT		
MD	MARYLAND		
MH	MANHOLE		
MSHA	MARYLAND STATE HIGHWAY		
	ADMINISTRATION		

LEGEND



PROPOSED UTILITY EASEMENT

PROPOSED RIGHT-OF-WAY

PROPOSED SIDEWALK/BIKEPATH

PROPOSED CURB & GUTTER

PROPOSED BASELINE OR CENTERLINE

PROPOSED LOTS

PROPOSED WATER AND SEWER EASEMENT

PROPOSED PAVEMENT

PROPOSED STORM DRAIN

PROPOSED SEWER AND SEWER LATERALS

PROPOSED WATER AND WATER LATERALS

EXISTING TOPO w/ CONTOUR LABEL

EXISTING WETLAND

EXISTING WETLAND BUFFER

EXISTING 100 YR FLOOD PLAIN

EXISTING TREE LINE

EXISTING STREAM EDGE

EXISTING STORM DRAIN

CENTERLINE / BASELINE
CURVE NUMBER

PROPOSED STREET LIGHT



REVISION	DATE	REVISION	DATE	BY	DATE
				BASE DATA	CADD
				DESIGNED	SN
				DRAWN	SN
				REVIEWED	TJC
				RELEASE FOR <input type="text"/>	
				BY	DATE

Owner:
NATELLI COMMUNITIES
506 MAIN STREET
3RD FLOOR
GAITHERSBURG, MD 20878
PHONE: 1-301-670-4020
CONTACT: PAUL COLEMAN

NOTES & LEGEND

RODGERS
CONSULTING

19847 Century Boulevard, Suite 200, Germantown, Maryland 20877
Ph: 301.948.4700 Fx: 301.948.6256 www.rodgers.com

IMPROVEMENT PLAN - COMMERCIAL RETAIL CENTER
Lot C9
Linganore Town Center

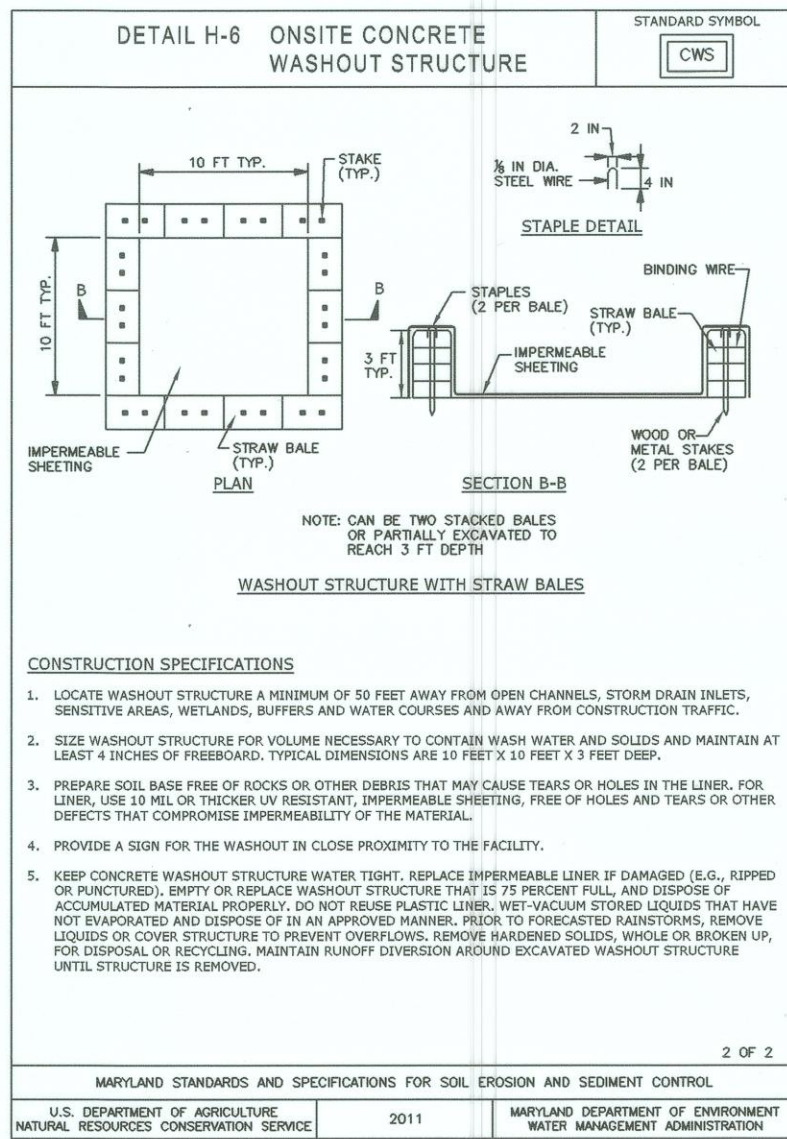
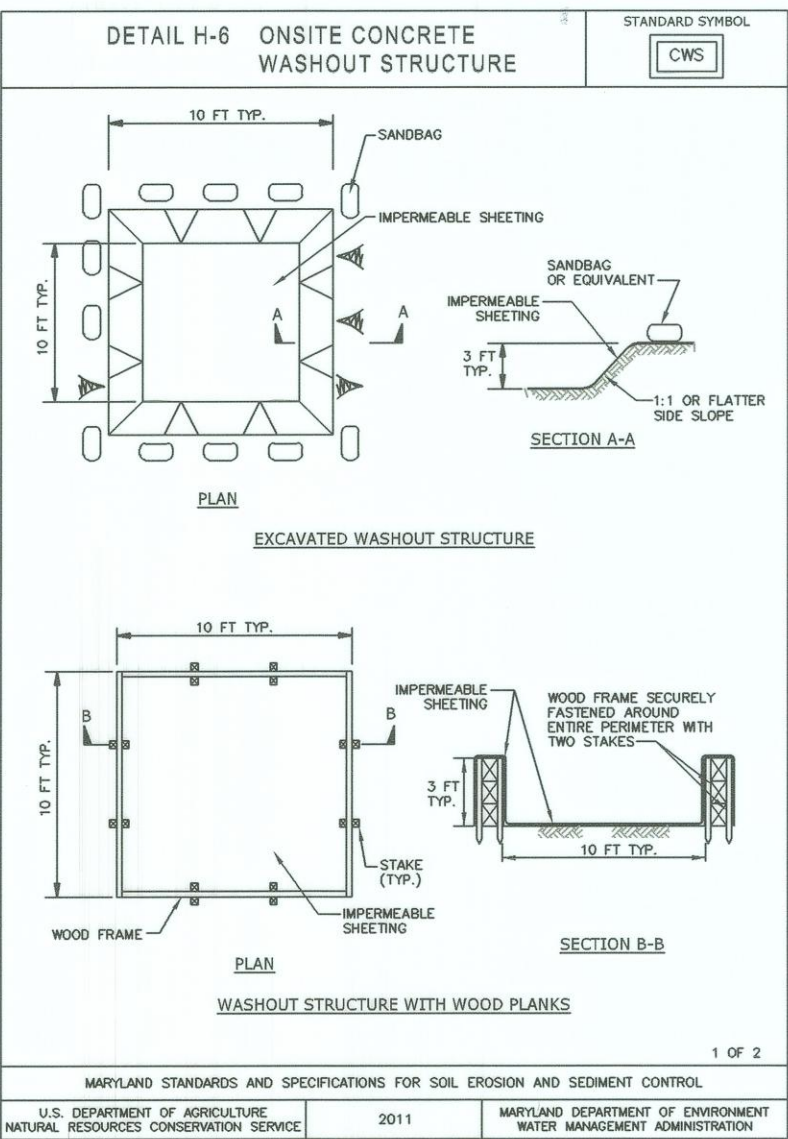
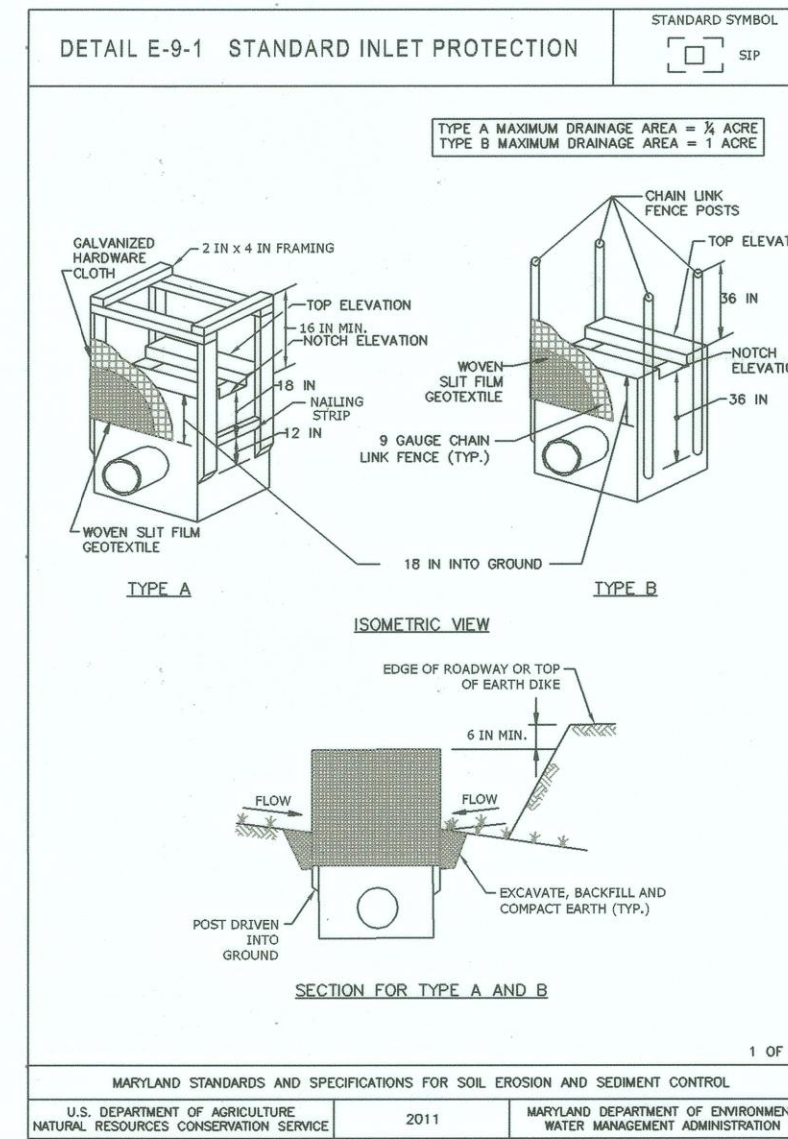
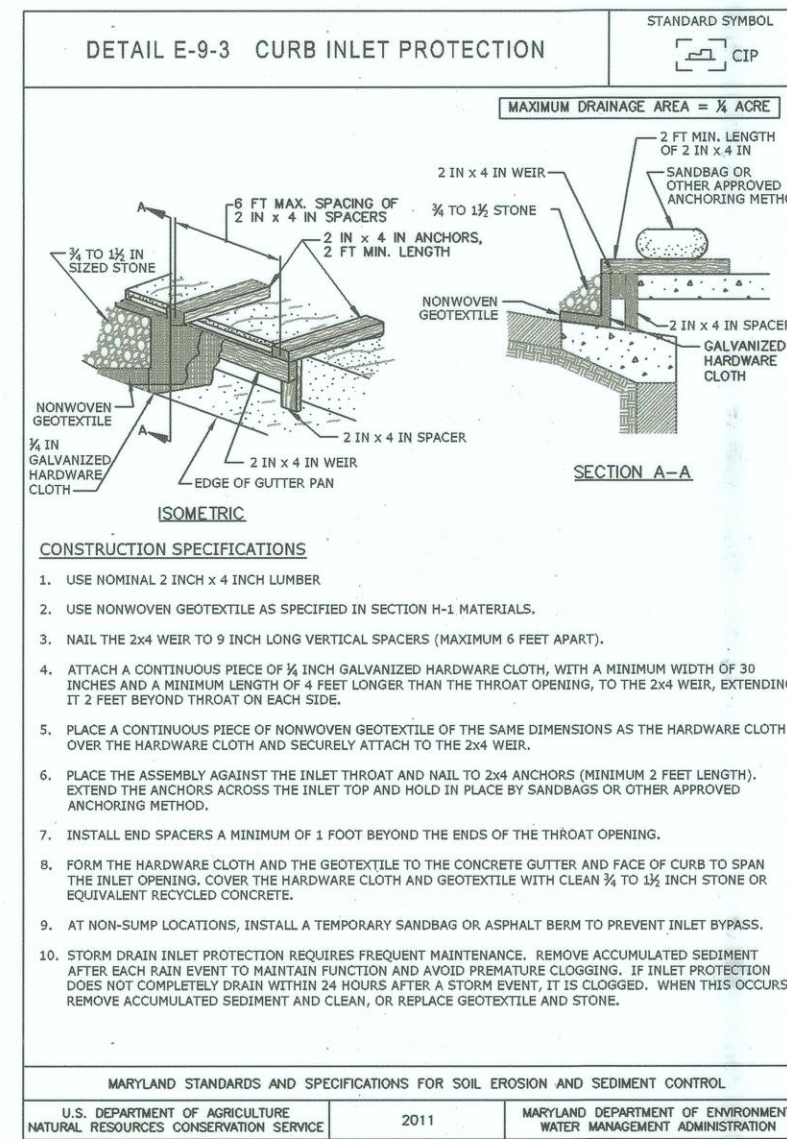
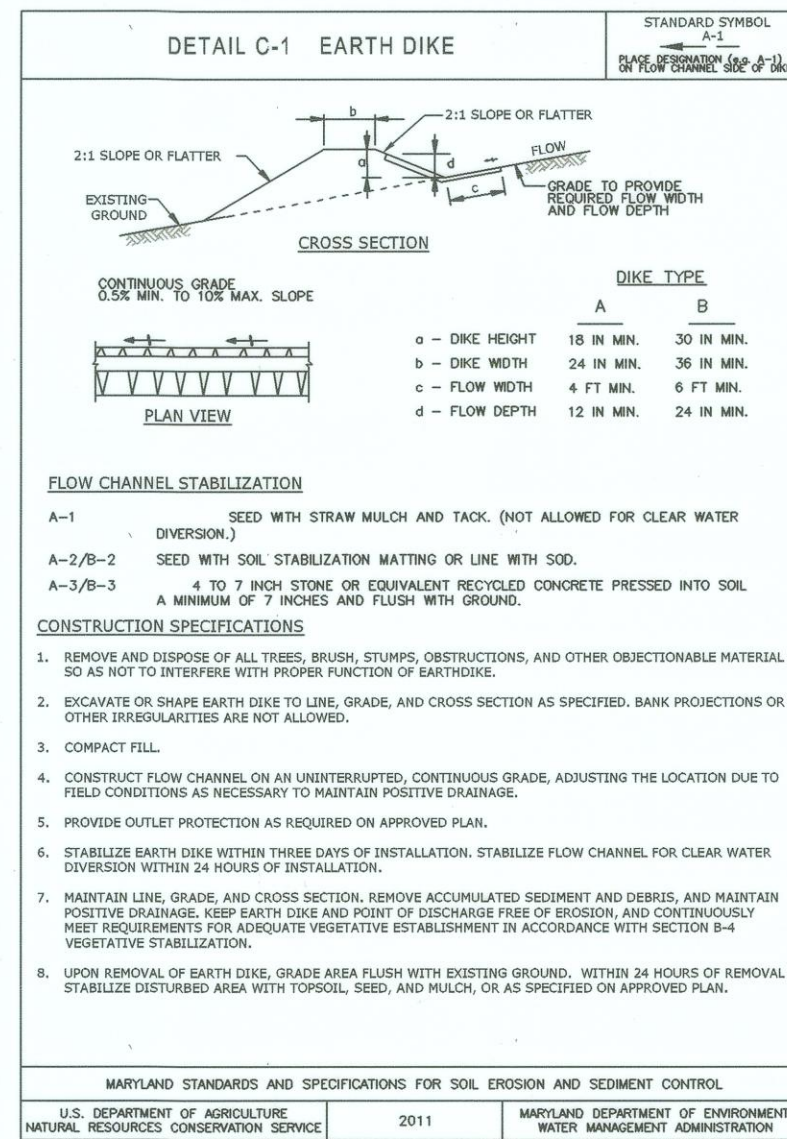
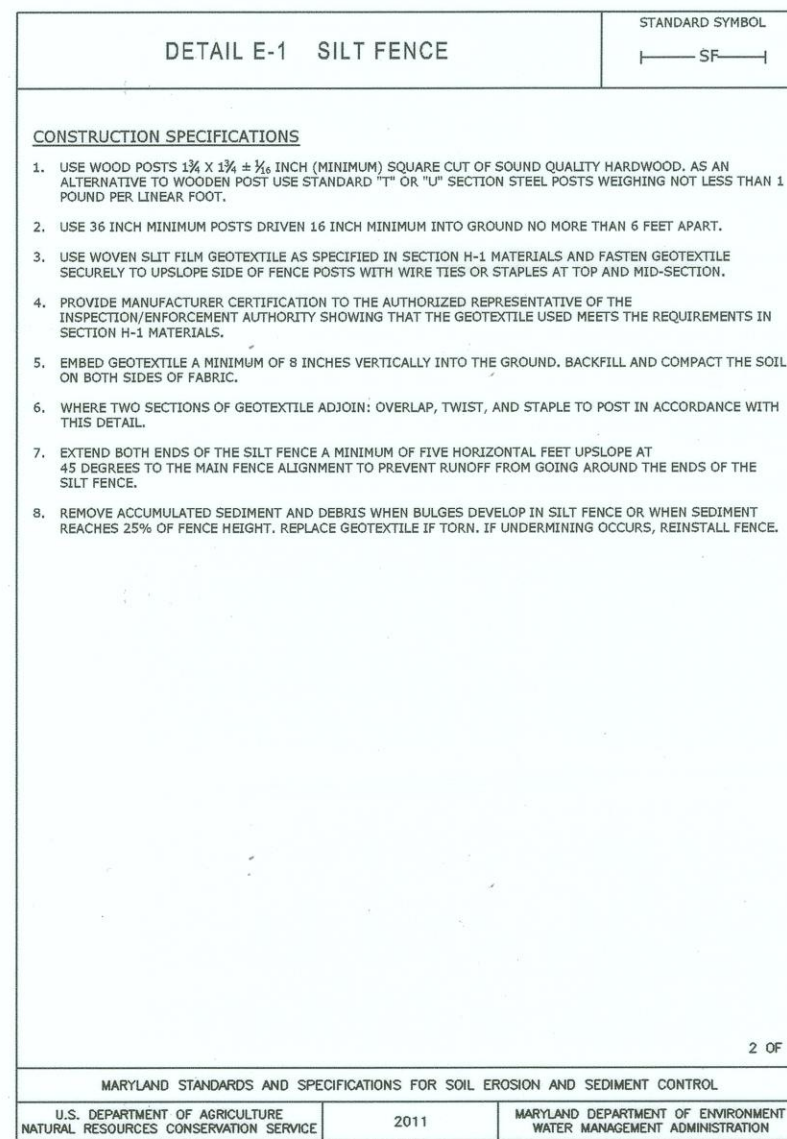
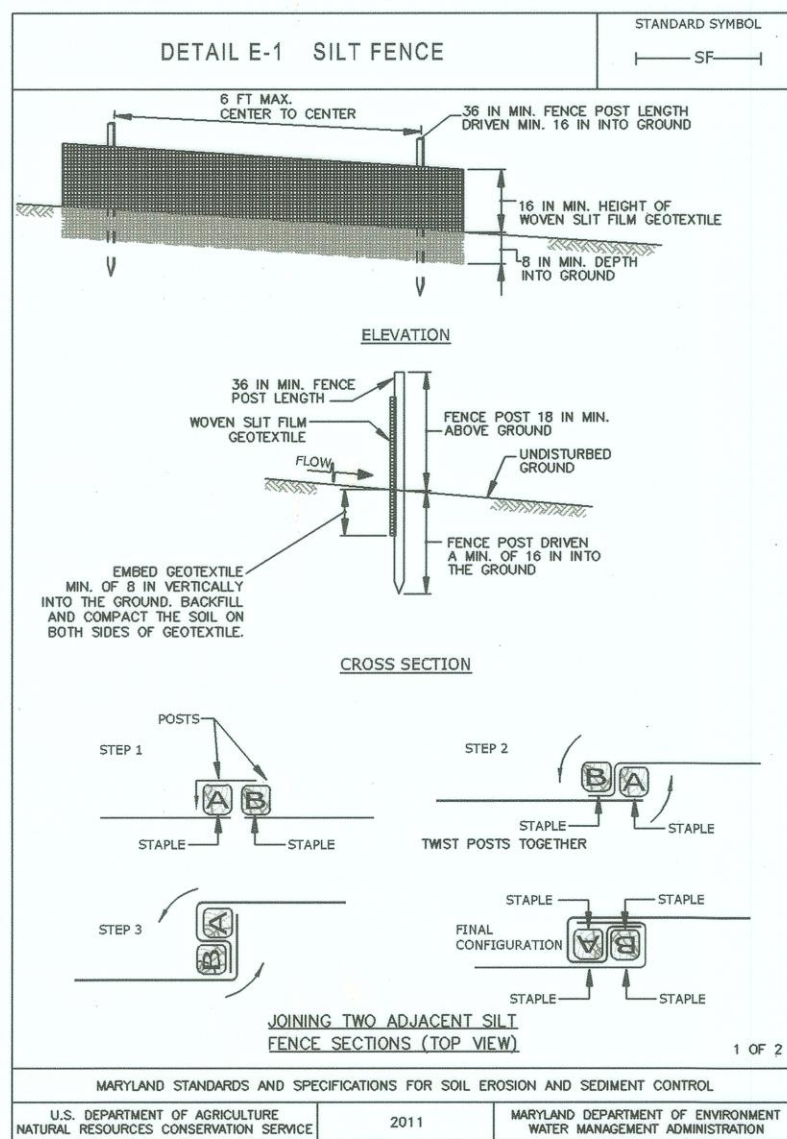
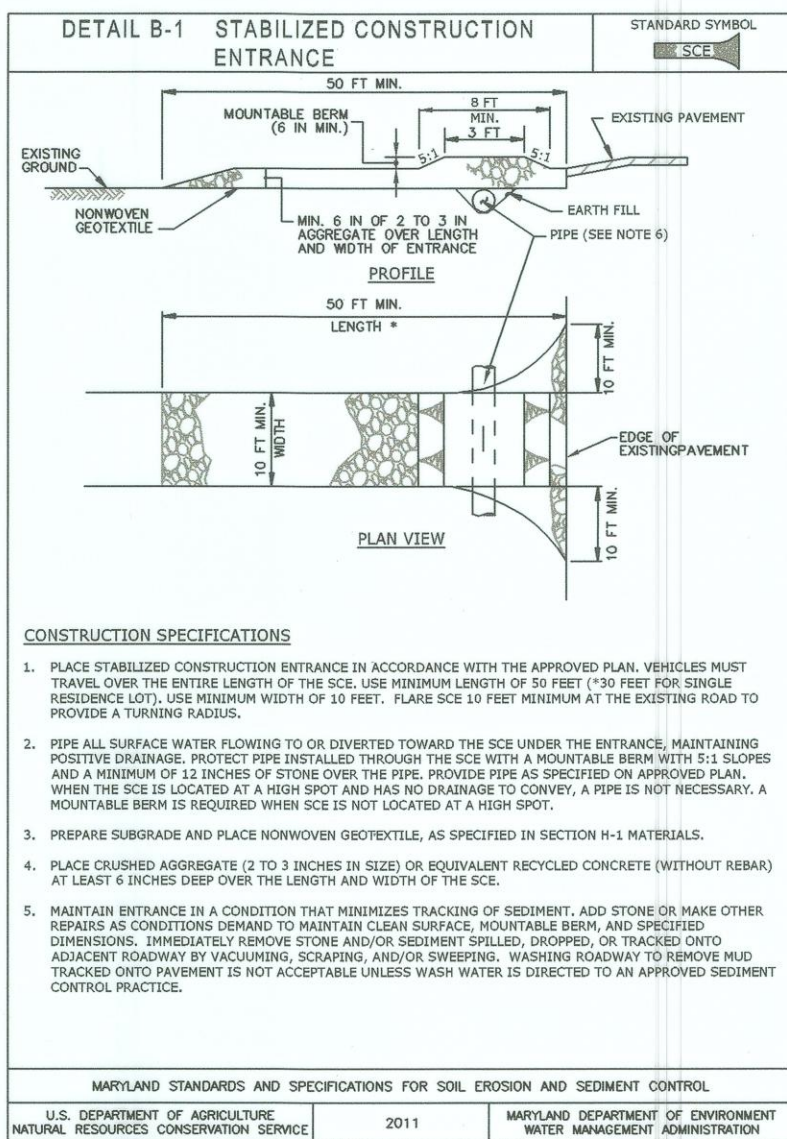
TAX MAP 79, PARCEL 17
ELECTION DISTRICT NO. 9
FREDERICK COUNTY, MARYLAND

SCALE:	1" = 30'
JOB No.	0529AJ
DATE:	JULY 2020
INDEX No.	COV-02
SHEET No.	02 OF 17



FOR CONSTRUCTION

NOTE: FREDERICK COUNTY ASSUMES NO LIABILITY FOR DESIGN AND/OR CONSTRUCTION.



TEMPORARY SEEDING NOTES

1. SCOPE: PLANTING SHORT TERM VEGETATION TO STABILIZED, CLEARED OR GRADED AREAS SUBJECT TO EROSION FOR A PERIOD OF 7 DAYS OR MORE.
 2. STANDARDS: TEMPORARY SEEDING SHALL CONFORM TO ALL REQUIREMENTS OF 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION SEDIMENT CONTROL* PUBLISHED JOINTLY BY THE WATER RESOURCES ADMINISTRATION THE NATURAL RESOURCES CONSERVATION SERVICE, AND THE STATE SOIL CONSERVATION COMMITTEE.
 3. SEDIMENT & EROSION CONTROL: ALL PERIMETER CONTROL MUST BE STABILIZED IN 3 DAYS. ALL INTERIOR CONTROLS MUST BE STABILIZED IN 7 DAYS.
- SPECIFICATIONS**
1. SITE PREPARATIONS:
 - A. PRIOR TO SEEDING INSTALL ALL REQUIRED SEDIMENT AND EROSION CONTROL MEASURES.
 - B. FINAL GRADING NOT REQUIRED FOR TEMPORARY SEEDING.
 2. SOIL AMENDMENTS:
 - A. FERTILIZER SHALL BE APPLIED AT THE RATE OF 800 LBS/ACRE USING 10-10-10 OR EQUIVALENT.
 - B. ACID SOILS SHALL BE LIMED.
 3. SEEDBED PREPARATION:
 - A. SOIL SHALL BE LOOSENOED TO A DEPTH OF 3 INCHES BY RAKING, DISKING, OR OTHER ACCEPTABLE MEANS PRIOR TO SEEDING.
 4. SEEDING:
 - A. SEED A MIXTURE FROM TABLE B.1 IN THE STANDARD SPECIFICATIONS.
 - B. APPLY SEED UNIFORMLY WITH A CYCLONE SEEDER DRILL, CULTIPACKER OR HYDRO SEEDER.
 5. MULCHING:
 - C. MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING.
 - D. MULCH MATERIALS AND APPLICATIONS SHALL CONFORM TO THE STANDARD SPECIFICATIONS.

PERMANENT SEEDING & SOD NOTES

- GENERAL**
1. SPECIES: PLANTING PERMANENT, LONG LIVED VEGETATIVE COVER ON GRADED OR CLEARED AREAS.
 2. STANDARDS: PERMANENT SEEDING SHALL CONFORM TO ALL REQUIREMENTS OF 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION/SEEDMENT CONTROL* PUBLISHED JOINTLY BY THE WATER RESOURCES ADMINISTRATION THE NATURAL RESOURCES CONSERVATION SERVICE, AND THE STATE SOIL CONSERVATION COMMITTEE.
- SPECIFICATIONS**
1. SITE PREPARATIONS:
 - A. PRIOR TO SEEDING INSTALL ALL REQUIRED SEDIMENT AND EROSION CONTROL MEASURES.
 - B. FINAL GRADING NOT REQUIRED FOR TEMPORARY SEEDING.
 2. SOIL AMENDMENTS:
 - A. FERTILIZER SHALL BE APPLIED AT THE RATE OF 1000 LBS./ACRES USING 10-10-10 OR EQUIVALENT.
 - B. ACID SOILS SHALL BE LIMED.
 3. SEEDBED PREPARATION:
 - A. SOIL SHALL BE LOOSENOED TO A DEPTH OF 3 INCHES BY RAKING, DISKING, OR OTHER ACCEPTABLE MEANS PRIOR TO SEEDING.
 - B. APPLY SEED UNIFORMLY WITH A CYCLONE SEEDER DRILL, CULTIPACKER OR HYDRO SEEDER (SLURRY INCLUDES SEED AND FERTILIZER ON A FIRM, MOIST SEEDBED.) MAXIMUM SEED DEPTH SHOULD BE 1/4" INCH ON CLAYEY SOILS AND 1/2 INCH ON SANDY SOILS, WHEN USING OTHER THAN HYDROSEEDER METHOD OF APPLICATION.
- NOTE:** IF HYDROSEEDING IS USED AND THE SEED AND FERTILIZER IS MIXED, THEY WILL BE MIXED ON SITE AND THE SEEDING SHALL BE IMMEDIATE WITHOUT INTERRUPTION.

PERMANENT STABILIZATION WITH SOD

1. ALL SPECIFICATIONS, SITE PREPARATION, INSTALLATION AND MAINTENANCE OF SOD FOR PERMANENT, LONG LIVED VEGETATIVE COVER SHALL CONFORM TO SECTION B OF "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION SEDIMENT CONTROL" PUBLISHED JOINTLY BY THE WATER RESOURCES ADMINISTRATION, THE NATURAL RESOURCES CONSERVATION SERVICE, AND THE STATE SOIL CONSERVATION COMMITTEE.

Owner:
NATELLI COMMUNITIES
506 MAIN STREET
3RD FLOOR
GAITHERSBURG, MD 20878
PHONE: 1-301-670-4020
CONTACT: PAUL COLEMAN

SEDIMENT CONTROL NOTES & DETAILS

RODGERS
CONSULTING
19847 Century Boulevard, Suite 200, Germantown, Maryland 20876
Ph: 301.948.4700 Fx: 301.948.6256 www.rogers.com

IMPROVEMENT PLAN - COMMERCIAL RETAIL CENTER
Lot C9
Linganore Town Center
TAX MAP 79, PARCEL 17
ELECTION DISTRICT NO. 9
FREDERICK COUNTY, MARYLAND



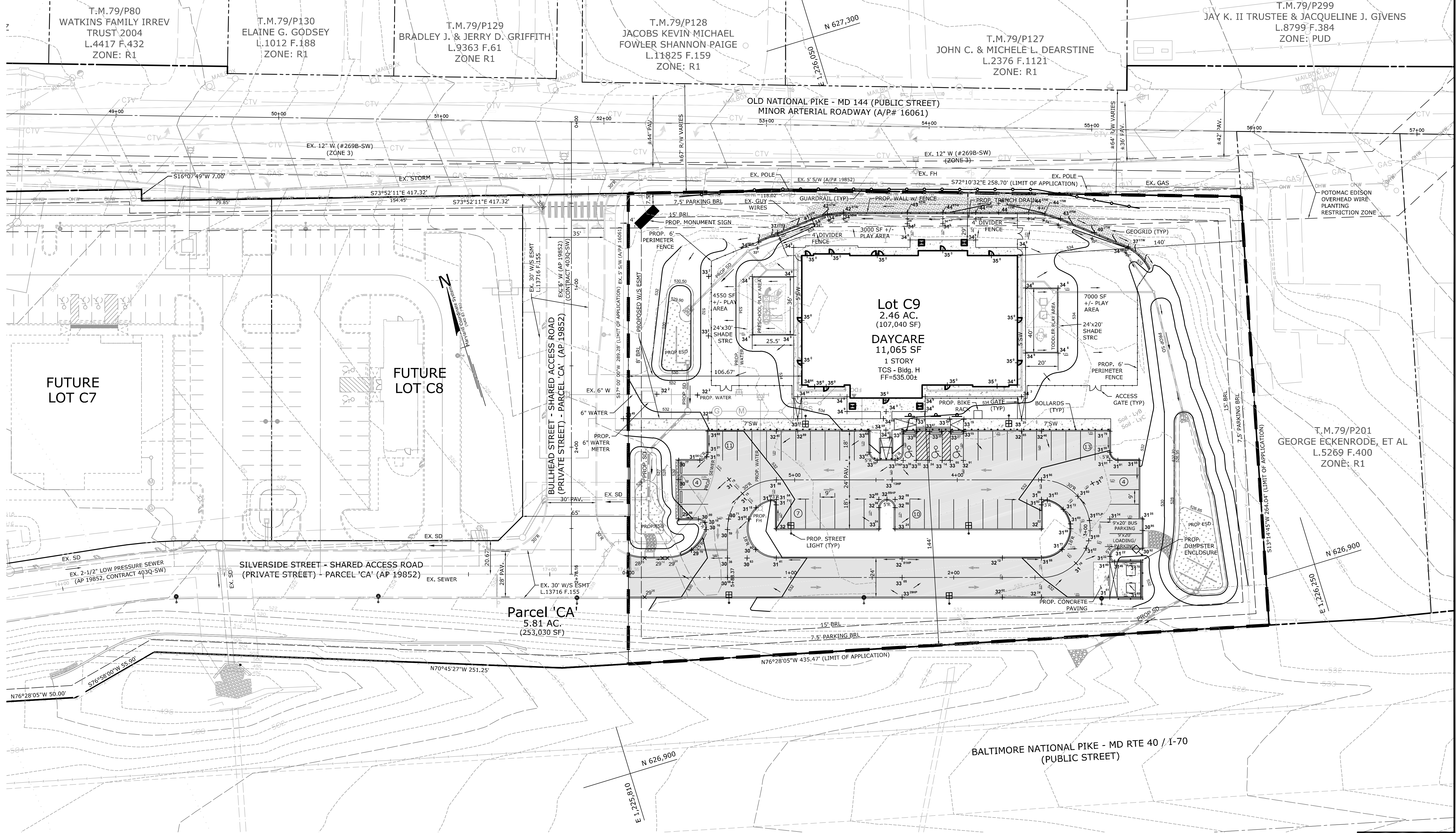
2020. 08. 28

SCALE:	NONE
JOB No.	0529AJ
DATE:	JULY 2020
INDEX No.	SED-01
SHEET No.	03 OF 12

FOR CONSTRUCTION

Signature

NOTE: FREDERICK COUNTY ASSUMES NO LIABILITY FOR DESIGN AND/OR CONSTRUCTION.

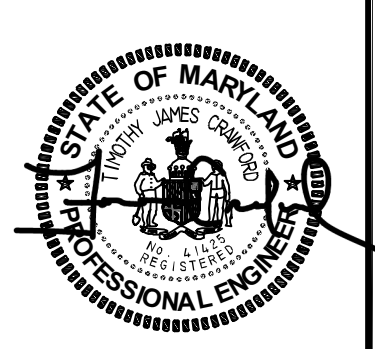


EQUIPMENT NOTE:

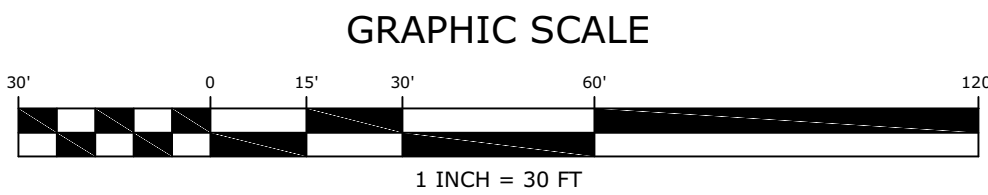
PLAYGROUND EQUIPMENT IS DESIGNED WITH THE PRIMARY COLORS BLUE, RED, GREEN AND YELLOW. DEVELOPER/DESIGN PROFESSIONAL TO CONFIRM THAT THERE ARE NO RESTRICTIONS THAT WILL NOT PERMIT THE INSTALLATION OF EQUIPMENT WITH THESE COLORS. DEVELOPER/DESIGN PROFESSIONAL TO VERIFY WITH ANY GOVERNING BODY NOT LIMITED TO PLANNING AND ZONING BOARDS, ARCHITECTURAL REVIEW BOARDS, OR HOMEOWNERS ASSOCIATIONS AS TO ANY RESTRICTIONS NOT LIMITED TO THE REVIEW. ANY COVENANTS OR RESTRICTIONS OR DESIGN GUIDELINES. GODDARD SYSTEMS, INC. (GSI) CAN PROVIDE COLOR ELEVATIONS OF THE EQUIPMENT IF NECESSARY. PLEASE CONTACT YOUR GSI REPRESENTATIVE IF THE PRIMARY COLORS ARE NOT PERMITTED.

NOTE:

1. INFORMATION SHOWN AS "EXISTING" UNDER A/P 19852 IS ANTICIPATED TO BE CONSTRUCTED PRIOR TO CONSTRUCTION USE OF LOT C9. U & O PERMIT WILL NOT BE ISSUED UNTIL THE WORK UNDER A/P 19852 IS COMPLETED.
2. LOTS C7 & C8 SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
3. LOTS C7 & C8 WILL REQUIRE FUTURE SITE PLAN.



 CALL "MISS UTILITY" AT
1-800-257-7777
72 Hours Before Start Of Construction



REVISION	DATE	REVISION	DATE		BY	DATE
				BASE DATA	CADD	
				DESIGNED	SN	
				DRAWN	SN	
				REVIEWED	TJC	
				RELEASE FOR <div></div>		
				BY _____ DATE _____		

Owner:
NATELLI COMMUNITIES
506 MAIN STREET
3RD FLOOR
GAITHERSBURG, MD 20878
PHONE: 1-301-670-4020
CONTACT: PAUL COLEMAN

SITE PLAN

RODGERS
CONSULTING

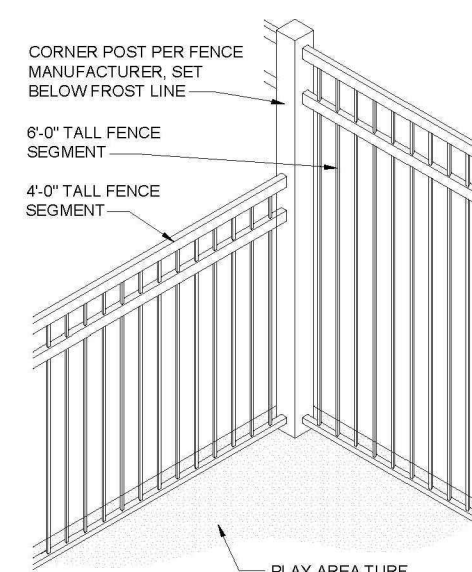
19847 Century Boulevard, Suite 200, Germantown, Maryland 20874
Ph: 301.948.4700 Fax: 301.948.6256 www.rodgers.com

IMPROVEMENT PLAN - COMMERCIAL RETAIL CENTER
Lot C9
Linganore Town Center

TAX MAP 79, PARCEL 17
ELECTION DISTRICT NO. 9
FREDERICK COUNTY, MARYLAND

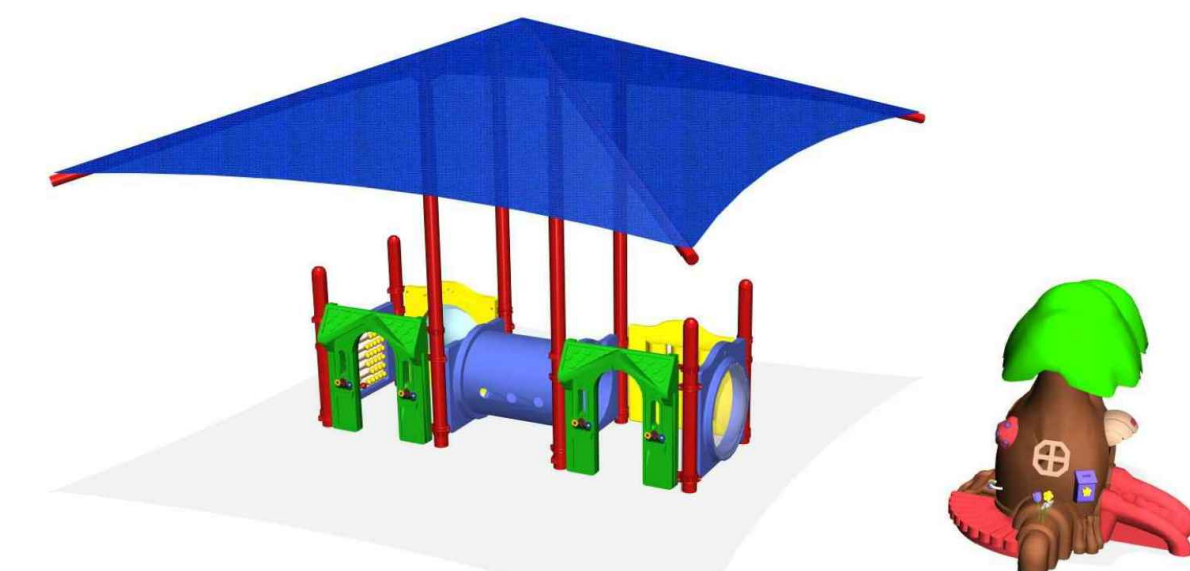
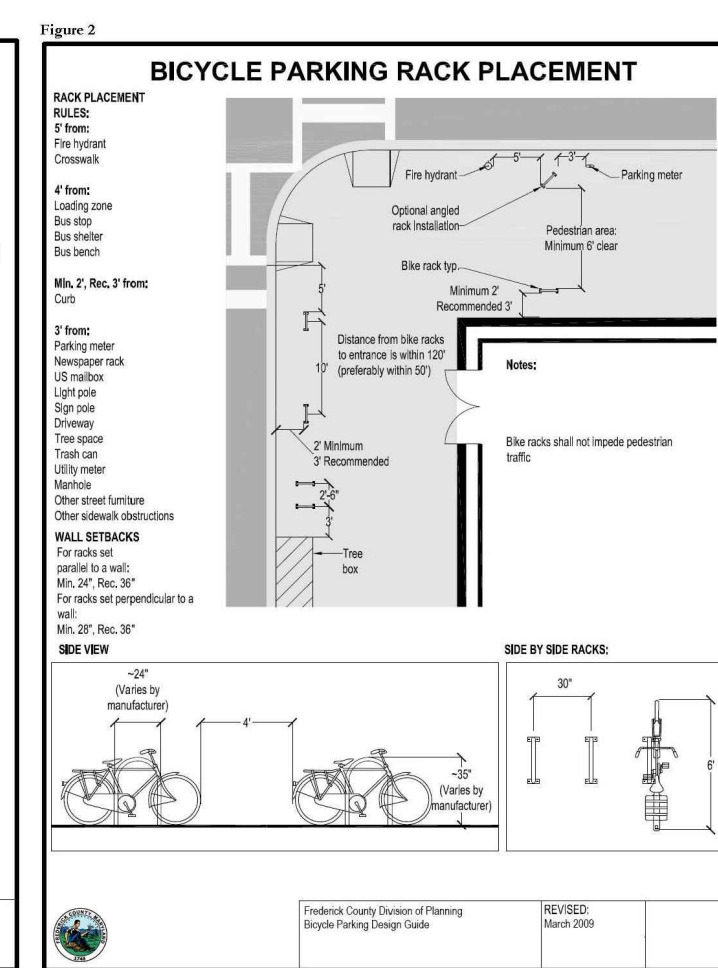
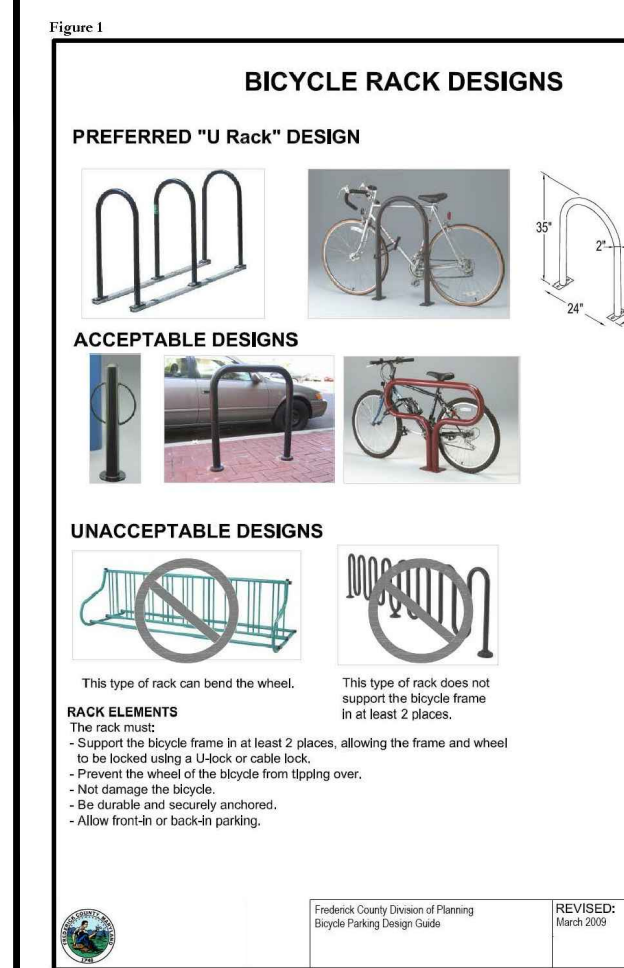
SCALE:	1" = 30'
JOB No.	0529AJ
DATE:	JULY 2020
INDEX No.	SP-01
SHEET No.	05 OF 17

FOR CONSTRUCTION



DETAIL

Fence Details
Or Approved Equivalency



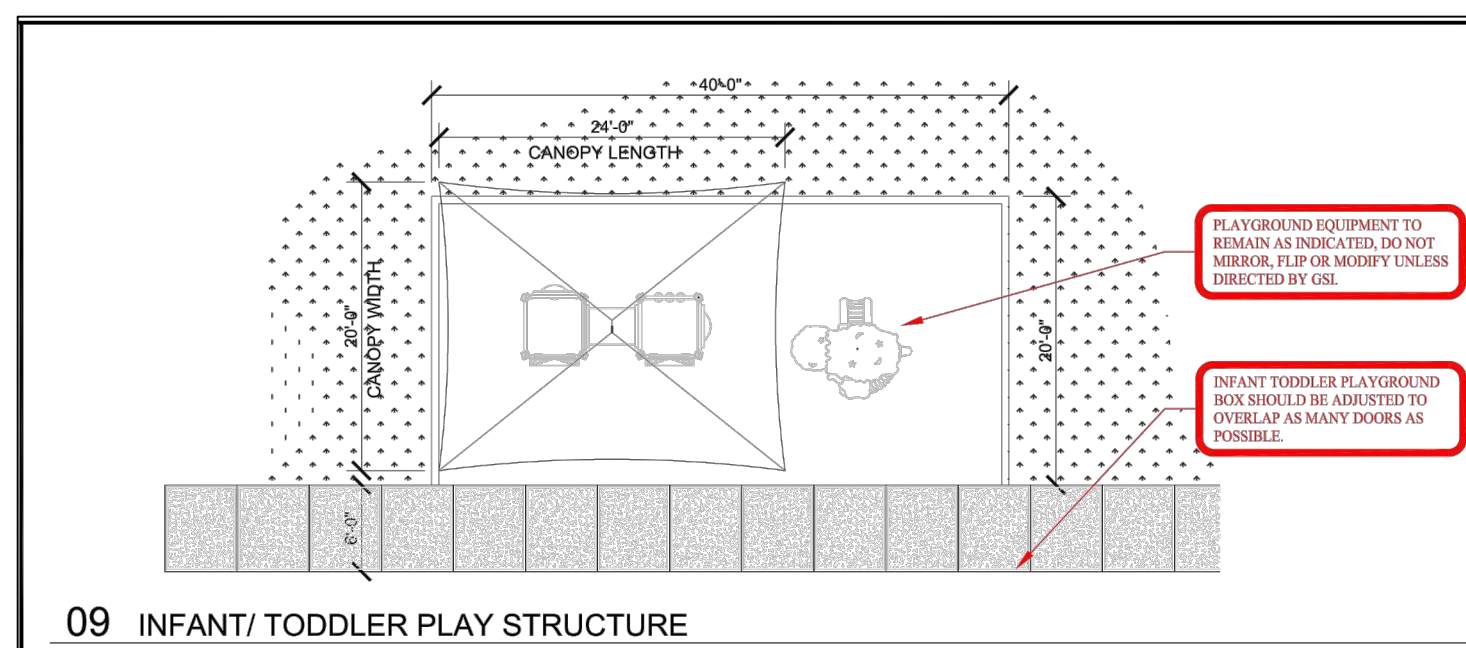
11 TODDLER PLAYGROUND RENDERING



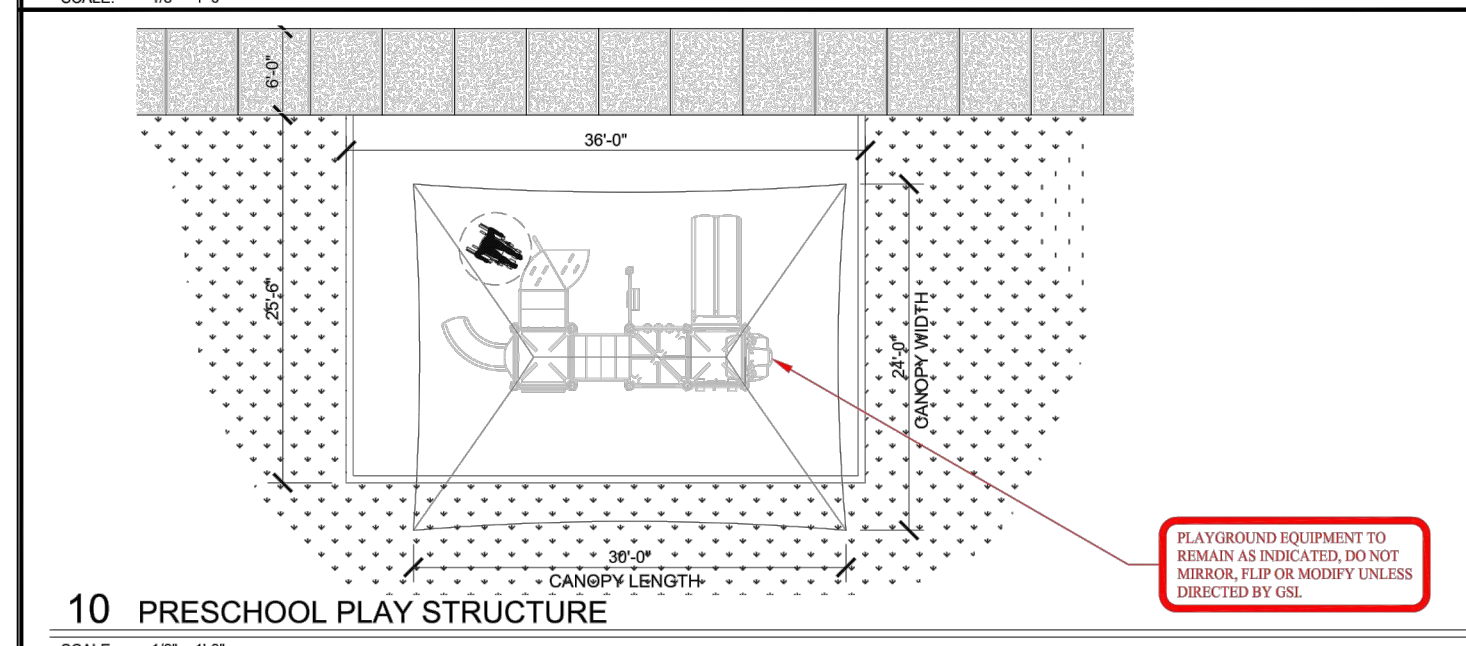
REFER TO 10/C1.2

12 PRESCHOOL PLAYGROUND RENDERING

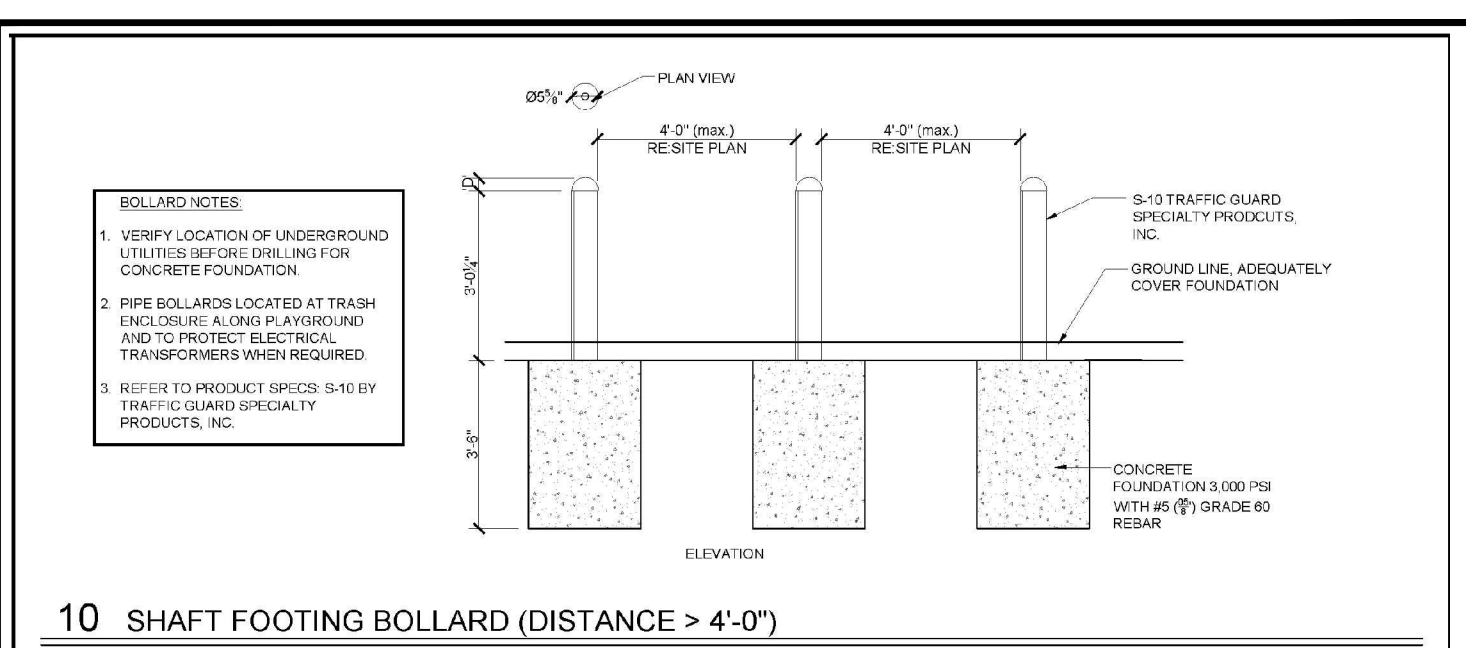
Playground Details
Or Approved Equal



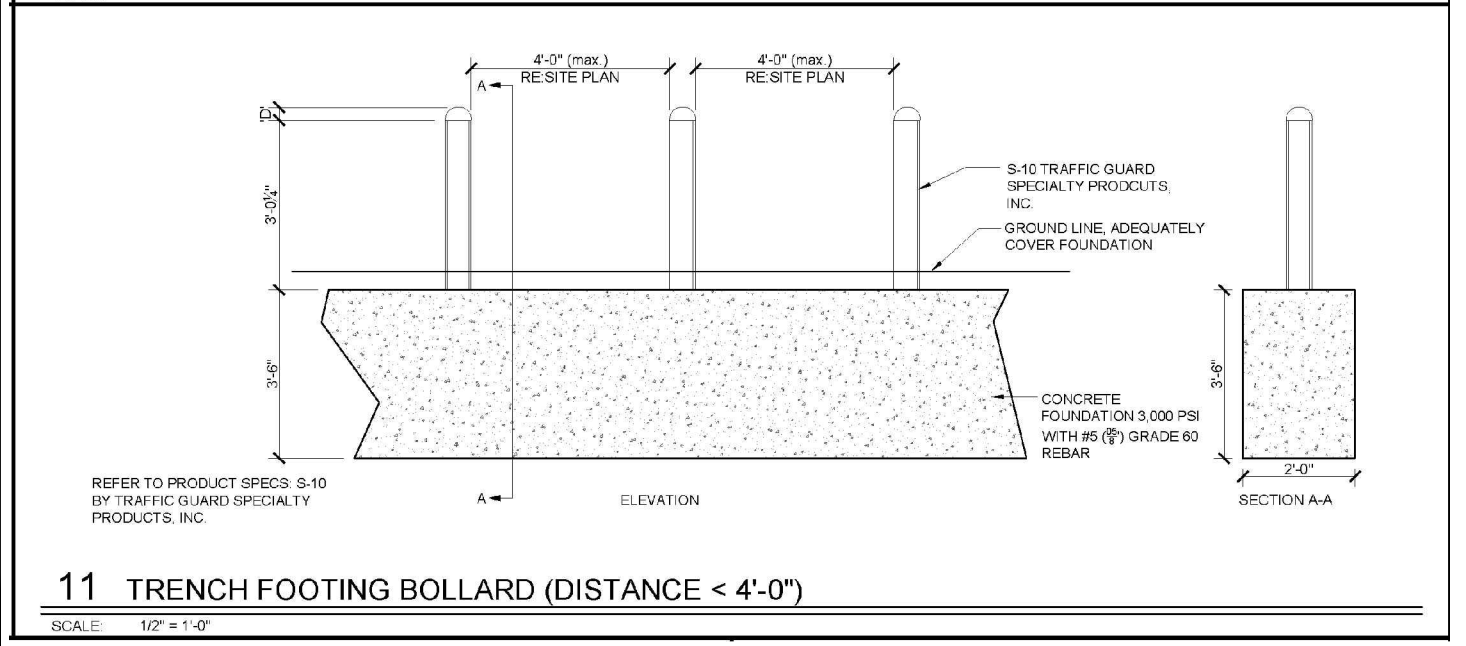
09 INFANT/ TODDLER PLAY STRUCTURE



10 PRESCHOOL PLAY STRUCTURE

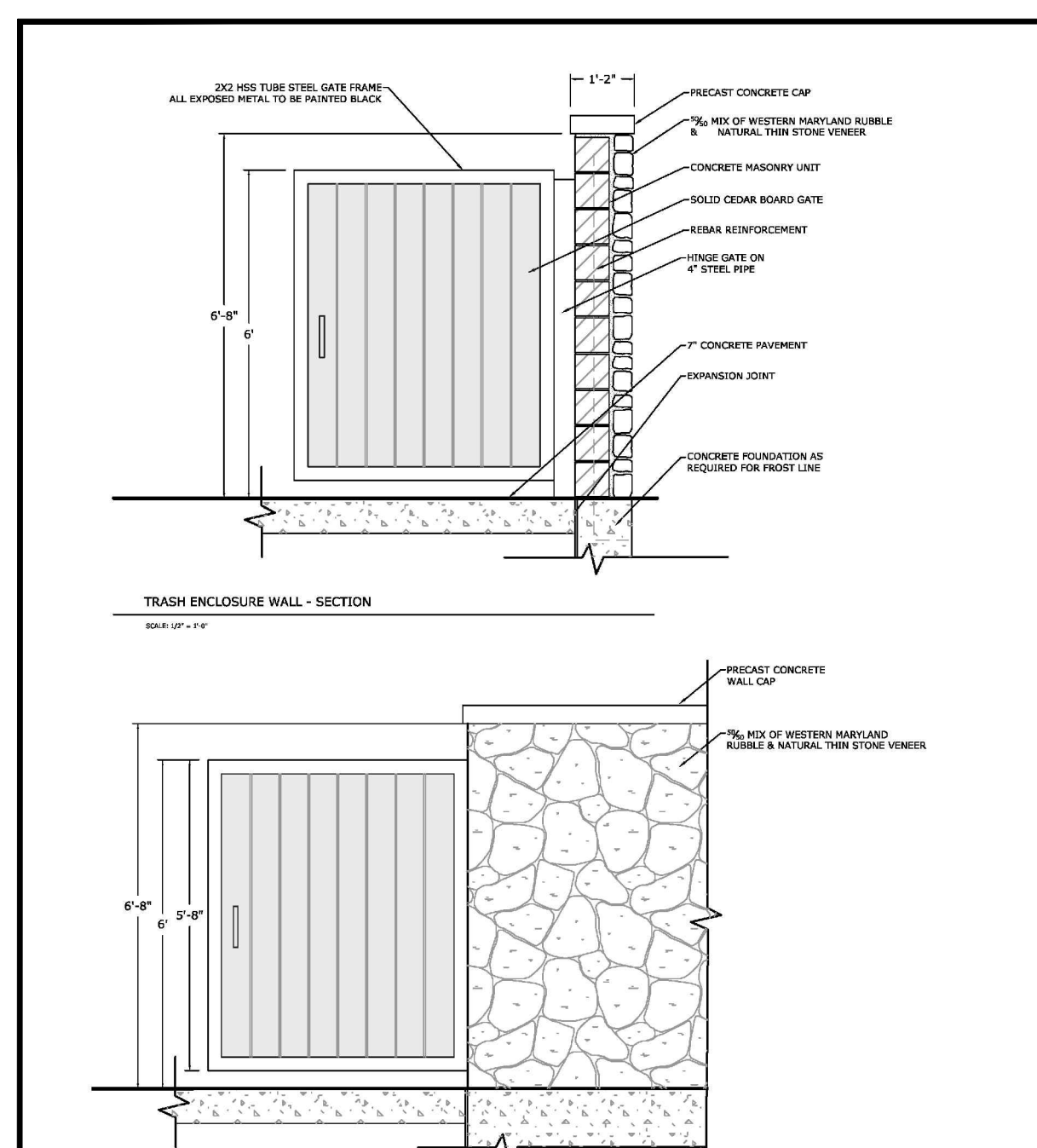


10 SHAFT FOOTING BOLLARD (DISTANCE > 4'-0")

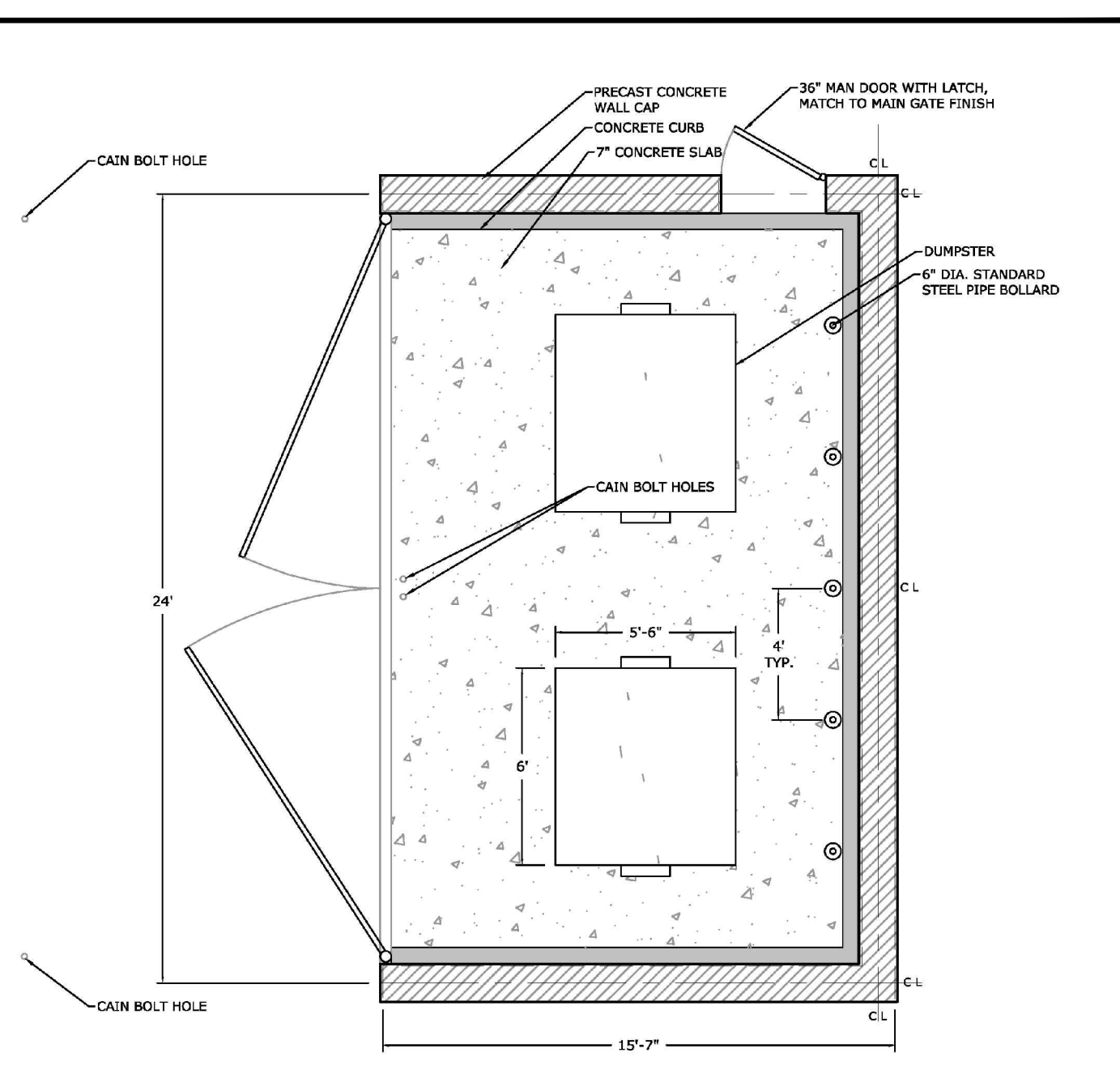


11 TRENCH FOOTING BOLLARD (DISTANCE < 4'-0"

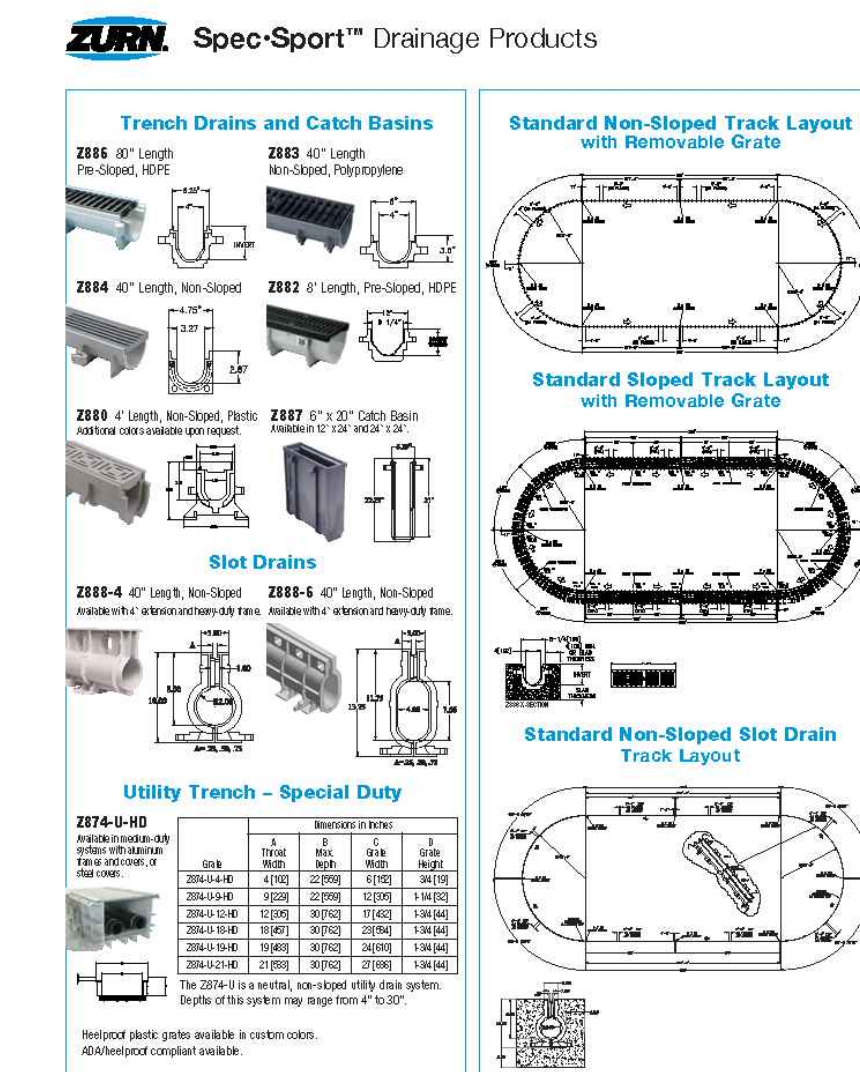
Bollard Details
Or Approved Equa



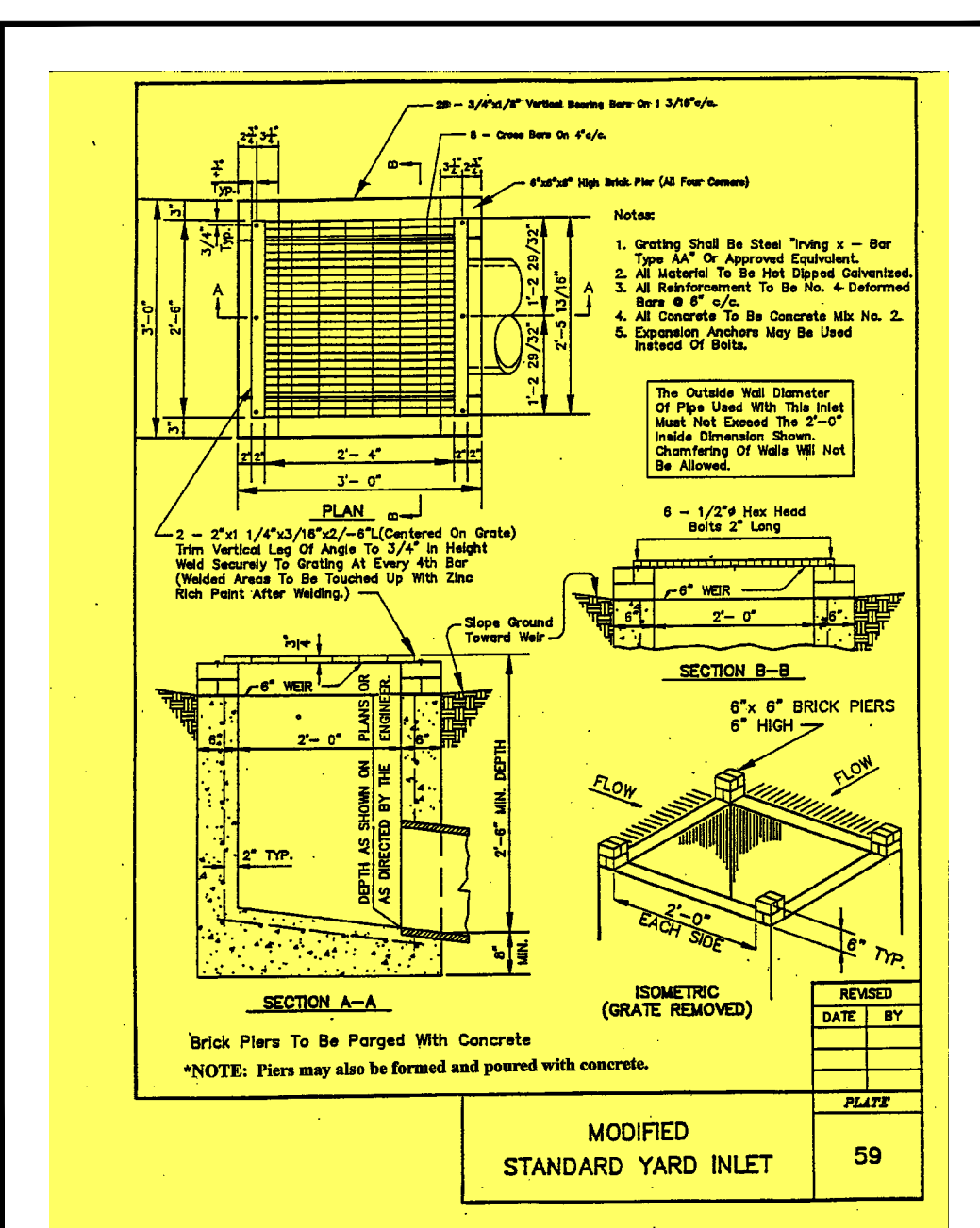
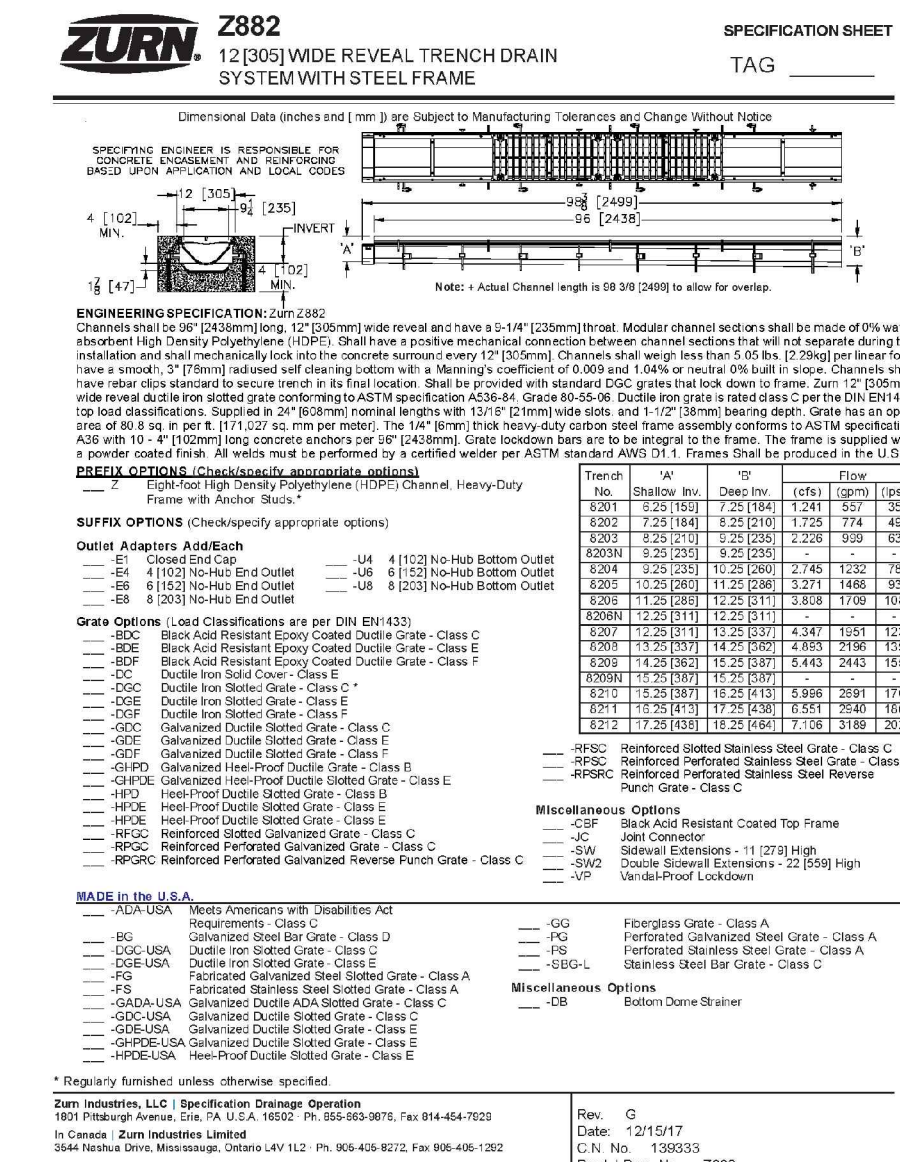
Trash Enclosure wall - Elevation
Or Approved Equal



**Trash Enclosure
Or Approved Equal**



Trench Drain Details
Or Approved Equal



FOR CONSTRUCTION

 CALL "MISS UTILITY" AT
1-800-257-7777
72 Hours Before Start Of Construction

REVISION	DATE	REVISION	DATE	BASE DATA	BY	DATE
				DESIGNED	CADD	
					SN	
				DRAWN	SN	
				REVIEWED	TJC	
				RELEASE FOR <input type="checkbox"/>		
				BY _____ DATE _____		

Owner:
NATELLI COMMUNITIES
506 MAIN STREET
3RD FLOOR
GAITHERSBURG, MD 20878
PHONE: 1-301-670-4020
CONTACT: PAUL COLEMAN

DETAILS

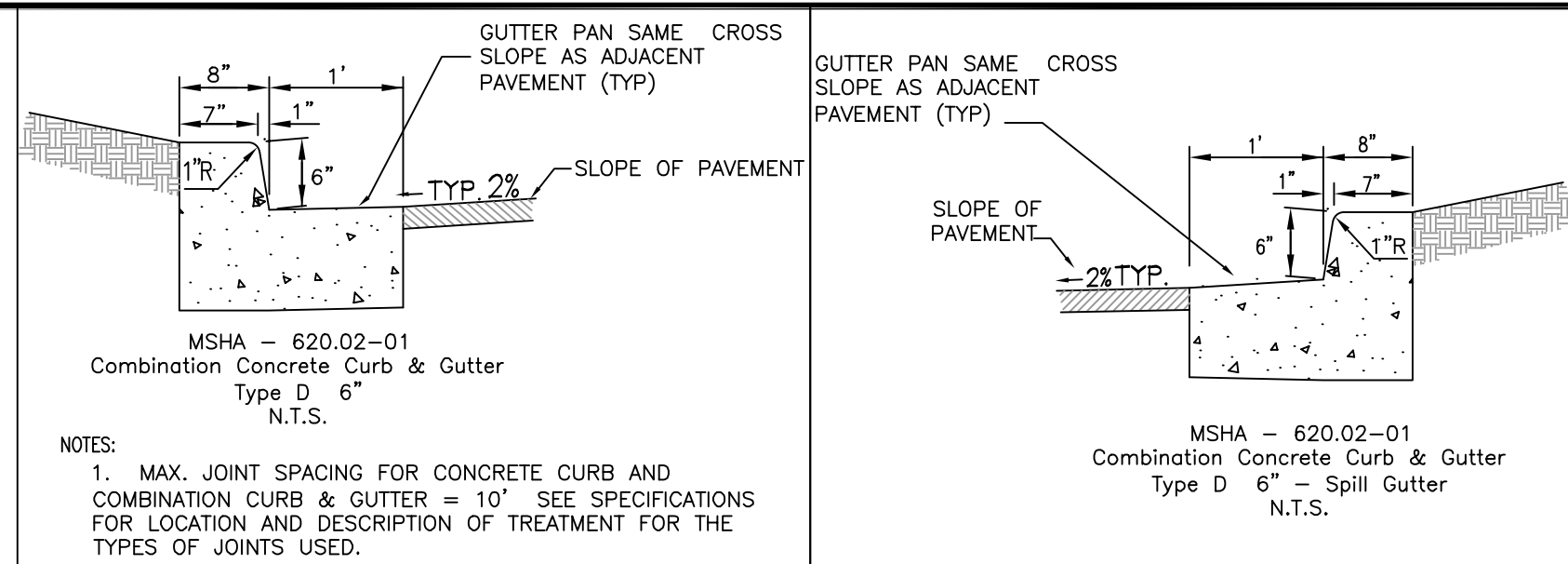
RODGERS
CONSULTING

19847 Century Boulevard, Suite 200, Germantown, Maryland 20877
Ph: 301.948.4700 Fx: 301.948.6256 www.rodgers.com

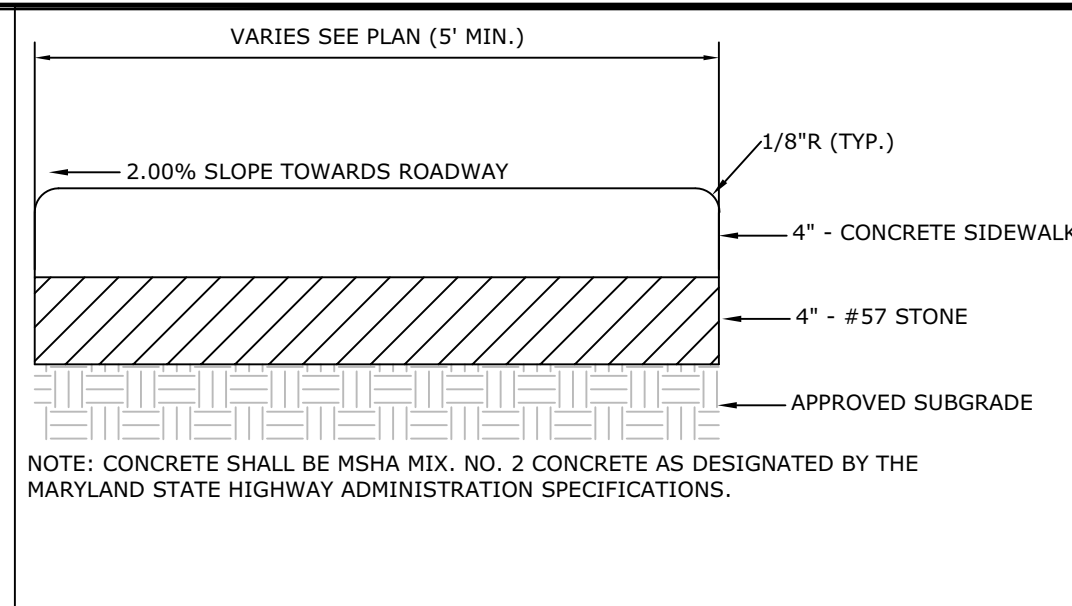
IMPROVEMENT PLAN - COMMERCIAL RETAIL CENTER
Lot C9
Linganore Town Center
TAX MAP 79, PARCEL 17
ELECTION DISTRICT NO. 9
FREDERICK COUNTY, MARYLAND

SCALE:	NONE
JOB No.	0529AJ
DATE:	JULY 2020
INDEX No.	DET-01
SHEET No.	06 OF 17

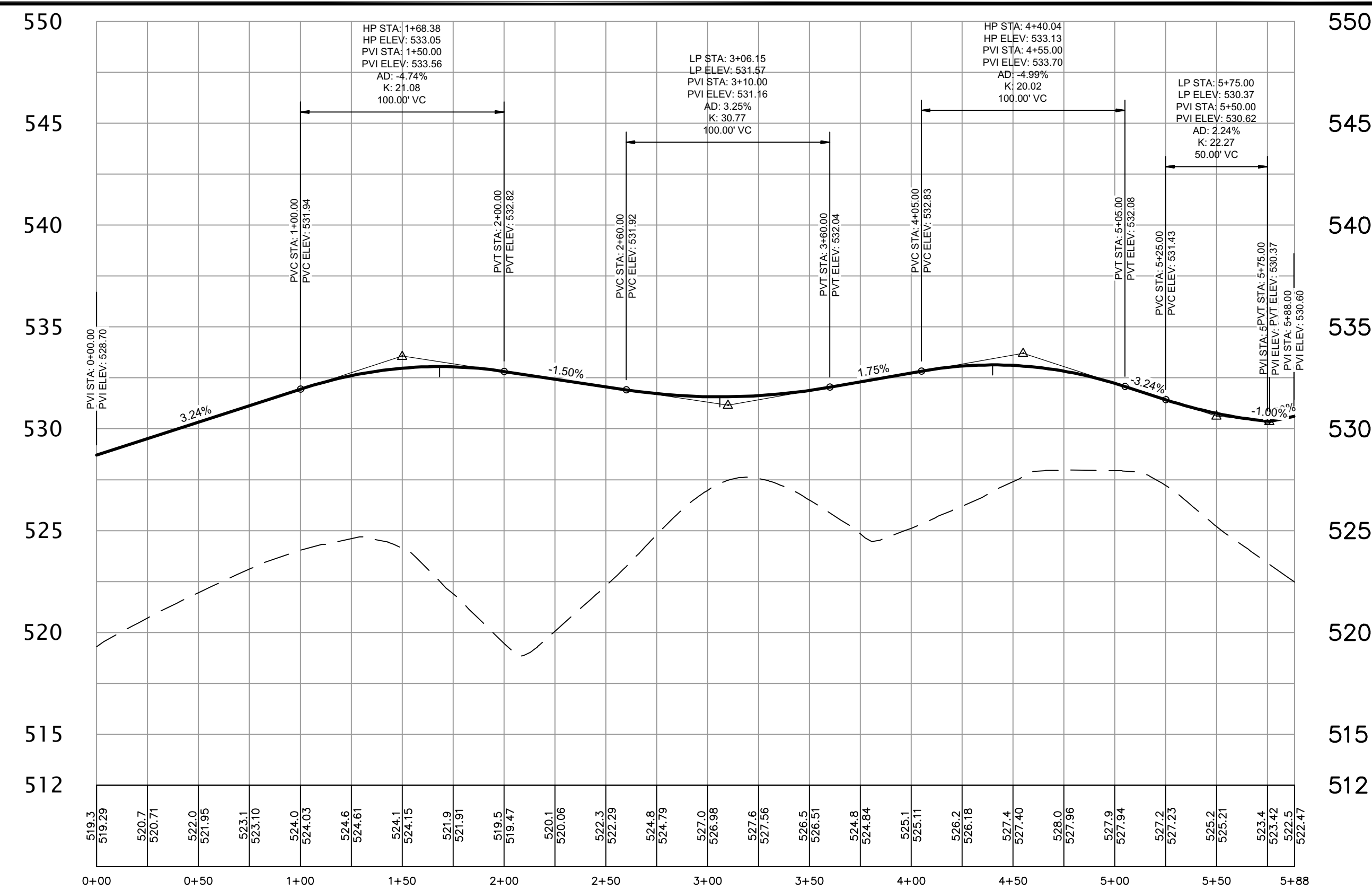
NOTE: FREDERICK COUNTY ASSUMES NO LIABILITY FOR DESIGN AND/OR CONSTRUCTION.



Typical Curb & Gutter Details



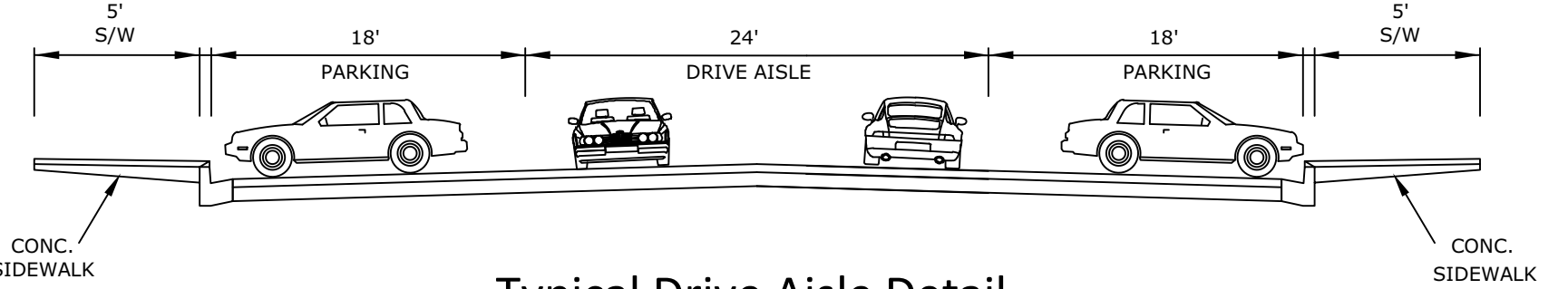
Typical Sidewalk Detail



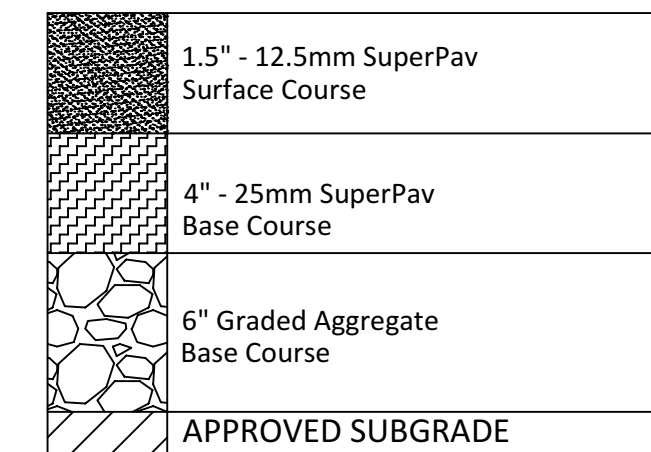
PRIVATE ACCESS DRIVE - PROFILE

H: 1" = 50'

V: 1" = 5'



Typical Drive Aisle Detail
NTS



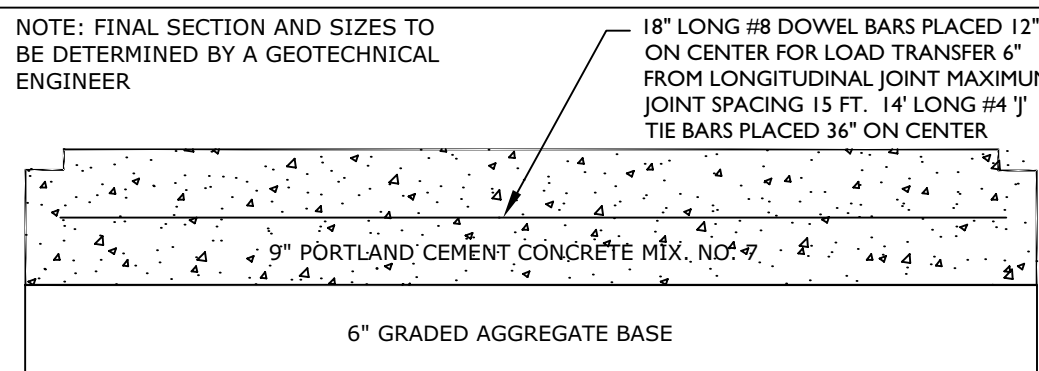
Note: Pavement sections shown on this plan are from County standard paving sections and are shown for bidding purposes only. They have not been reviewed or analyzed by Rodgers Consulting, Inc. for structural adequacy for this project. The owner or the developer is responsible to employ the services of a geotechnical engineer to investigate, test, and analyze the pavement subgrade and design the pavement section to support construction and other anticipated traffic for a 20-year minimum service life. Rodgers Consulting, Inc. assumes no responsibility for pavement design.

FINAL ADJUSTMENTS TO THE PAVEMENT DESIGN SECTIONS MAY BE REQUIRED BASED ON RESULTS OF CBR TEST TAKEN OF THE PAVEMENT SUBGRADES SOILS AT THE TIME OF CONSTRUCTION. THE ASPHALT CONCRETE AND BASE COURSE SHOULD BE IN ACCORDANCE WITH THE APPLICABLE MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATIONS.

NOTES:

1. THE FIRST OR INTERMEDIATE SURFACE COURSE MUST BE PLACED AS SOON AS FIELD CONDITIONS ALLOW AFTER THE BITUMINOUS CONCRETE BASE HAS BEEN PLACED. NO TRAFFIC ALLOWED ON BASE COURSE UNTIL FIRST SURFACE COURSE HAS BEEN PLACED.
2. CONTRACTOR TO PREPARE SUBGRADE IN ACCORDANCE W/ SECTION 204 & 208 OF THE LATEST MD SHA STANDARDS & SPECIFICATIONS FOR CONSTRUCTION MATERIAL.

Typical Asphalt Paving Detail

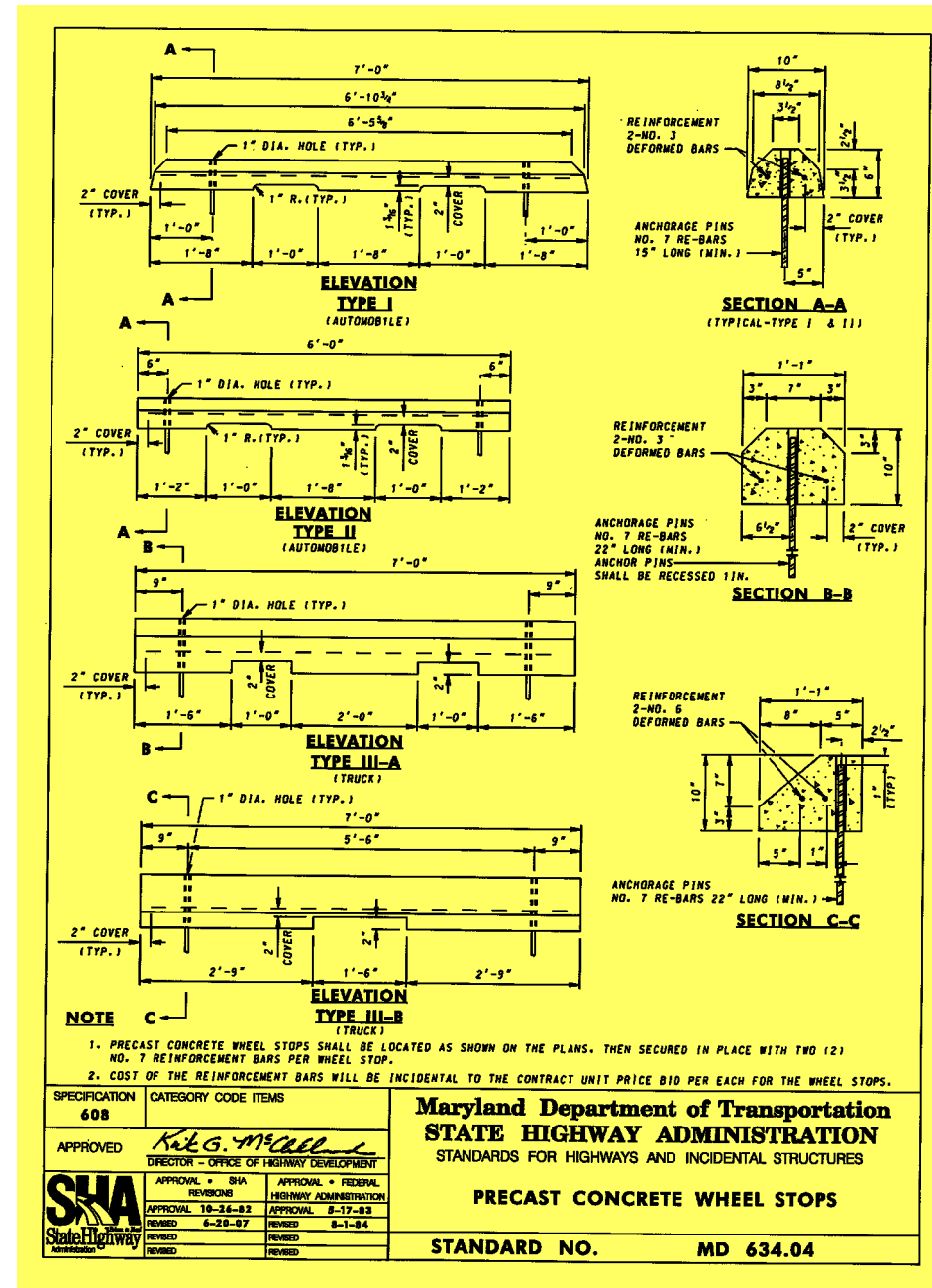


NOTE:
FINAL ADJUSTMENTS TO THE PAVEMENT DESIGN SECTIONS MAY BE REQUIRED BASED ON RESULTS OF CBR TEST TAKEN OF THE PAVEMENT SUBGRADES SOILS AT THE TIME OF CONSTRUCTION. THE ASPHALT CONCRETE AND BASE COURSE SHOULD BE IN ACCORDANCE WITH THE APPLICABLE MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATIONS.

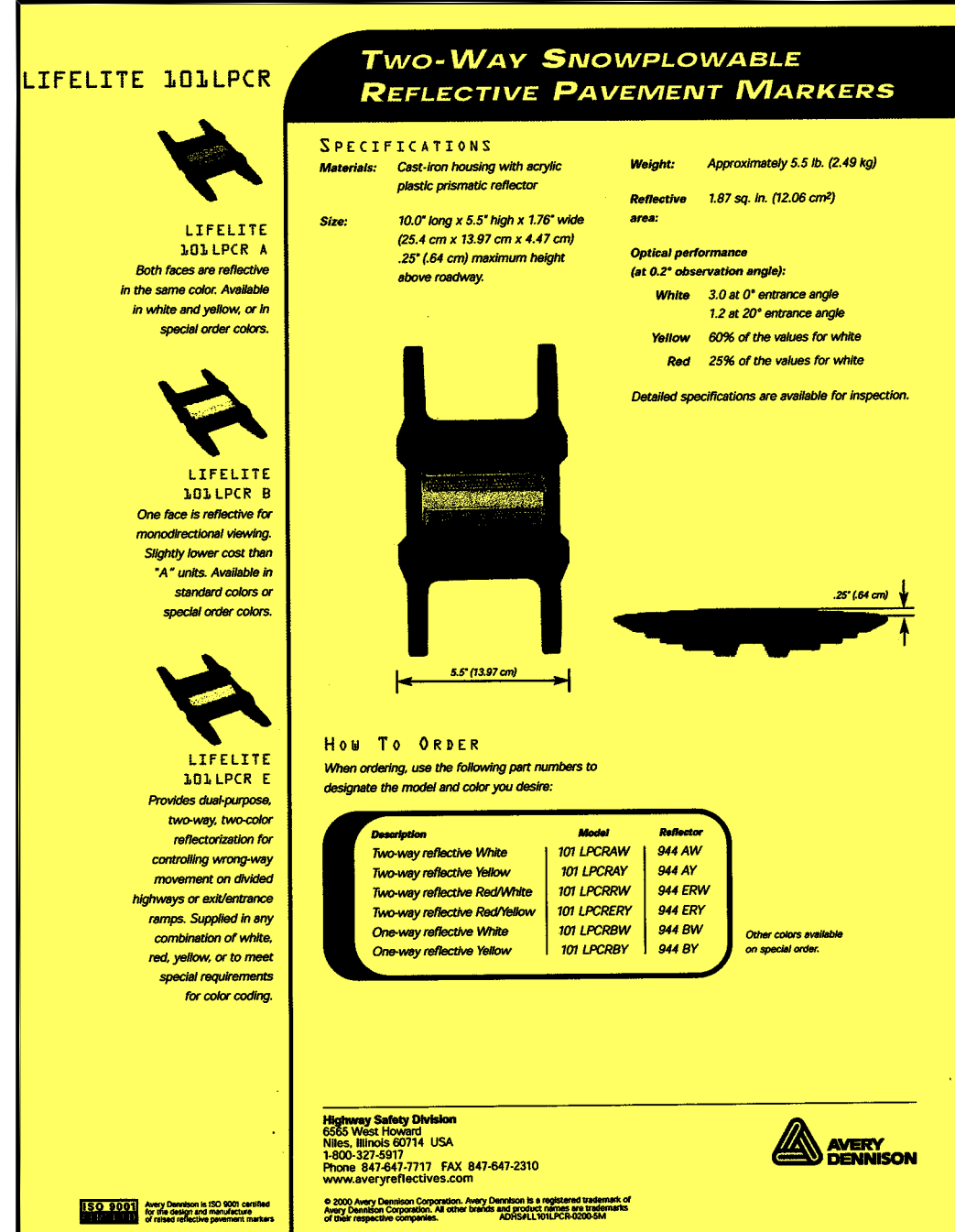
Typical Concrete Paving Detail

PAVING NOTES:

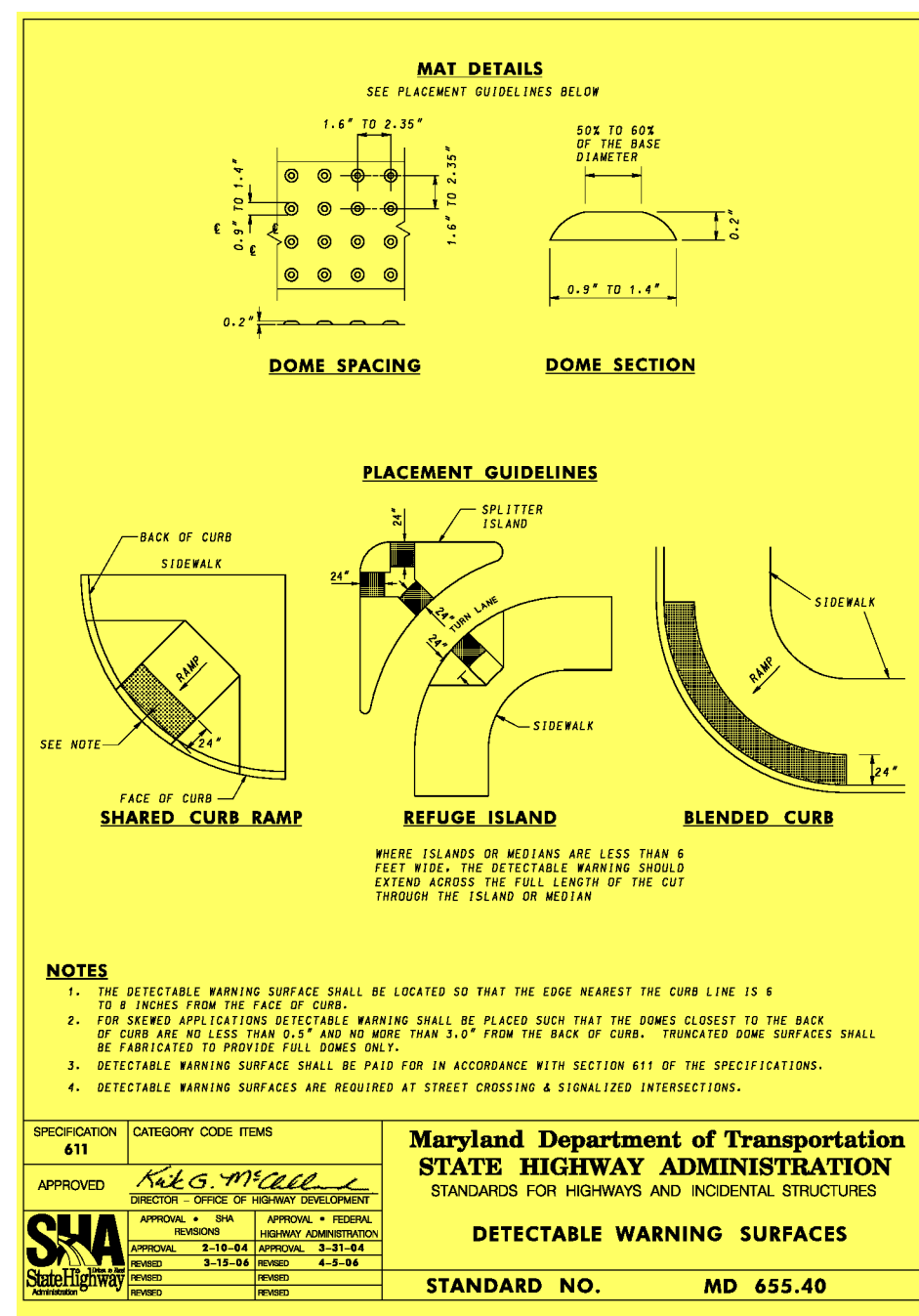
1. ALL WORKS AND MATERIALS SHALL CONFORM TO MSHA CONSTRUCTION SPECIFICATIONS, STANDARDS ADDENDA, NOTES HEREON AND FREDERICK COUNTY SPECIFICATIONS.
2. ALL CONSTRUCTION IS UNDER THE GENERAL INSPECTION OF FCDPW.
3. ALL INDIVIDUAL DRIVEWAY ENTRANCES ARE TO BE PAVED TO THE BACK OF SIDEWALK. SEE DETAIL THIS SHEET.
4. ALL STREET AND ROADWAY PAVING SHALL CONSIST OF 1.5" SUPERPAVE SURFACE COURSE WITH 4" SUPERPAVE BASE COURSE AND A MINIMUM OF 6" GRADED AGGREGATE BASE COURSE BASED ON A DESIGN CBR OF 8 AND WITH AN APPROVED SUBGRADE IN ACCORDANCE WITH DESIGN CRITERIA OF SECTION 3 OF THE FREDERICK COUNTY STREETS & ROADS MANUAL AND GENERALLY ACCEPTED CONSTRUCTION PRACTICES. ALL STREET AND ROADWAY BITUMINOUS PAVEMENT DESIGN IS TO BE VERIFIED BY GEOTECHNICAL ENGINEER BASED ON THE ACTUAL SITE CBR'S. (SEE PAVING SECTION DETAIL THIS SHEET). THE GEOTECHNICAL ENGINEER SHALL ACCOUNT FOR ANTICIPATED CONSTRUCTION TRAFFIC IN THE PAVEMENT SECTION ANALYSIS AND DESIGN.
5. ALL CURB TO BE MSHA-620.02-01 TYPE "D" 6" VERTICAL FACE CURB & GUTTER EXCEPT AS NOTED OTHERWISE.
6. PROVIDE HANDICAP RAMPS AT EACH CURB RETURN AND FILLET INTERSECTIONS AS SHOWN ON PLANS. REFER TO THE DETAILS ON THIS SHEET FOR RAMP CONSTRUCTION.
7. INFORMATION CONCERNING UNDERGROUND UTILITIES WERE OBTAINED FROM AVAILABLE RECORDS AND DESIGN DRAWINGS AND MUST BE CONFIRMED BY THE CONTRACTOR BY DIGGING A TEST PIT AT CROSSINGS WELL IN ADVANCE OF TRENCHING. IF LOCATION AND CLEARANCE ARE NOT AS SHOWN ON THIS PLAN, CONTACT DECW, THE UTILITY COMPANY, AND THE ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION.
8. ALL AREAS DISTURBED BY CONSTRUCTION, ACCESS ROUTES, ETC., ARE TO BE GRADED FOR POSITIVE DRAINAGE AND STABILIZED.
9. THE CONTRACTOR SHALL NOTIFY MISS UTILITY @ 1-800-257-7777 48 HOURS IN ADVANCE OF ANY EXCAVATION.
10. ALL ELEVATIONS SHOWN ARE FOR PAVEMENT SURFACE/CURB FLOWLINE UNLESS NOTED OTHERWISE.
11. FLOWLINE GRADE SHALL BE MAINTAINED AT ALL TRANSITIONS IN CURB AND GUTTER.
12. CONTRACTOR SHALL PROVIDE SPILL GUTTER ON CURB FILETS AS NECESSARY TO CONVEY WATER ACROSS INTERSECTIONS.
13. ALL PROPOSED ROAD/PAVEMENT CONNECTIONS TO EXISTING PAVEMENT SHALL BE WITH A CLEAN, VERTICAL JOINT.
14. THE GEOTECHNICAL ENGINEER SHALL VERIFY THAT ANY EXISTING ROADWAY FILLS CONSTRUCTED DURING PREVIOUS MASS GRADING OPERATIONS HAVE COMPLIED WITH FREDERICK COUNTY/MSHA COMPACTION STANDARDS, PRIOR TO ANY ROAD CONSTRUCTION ACTIVITIES. ANY EXISTING ROADWAY FILLS MUST BE COMPACTED PER THE "REQUIREMENTS FOR PLACING CONTROLLED FILL IN RIGHT-OF-WAY"



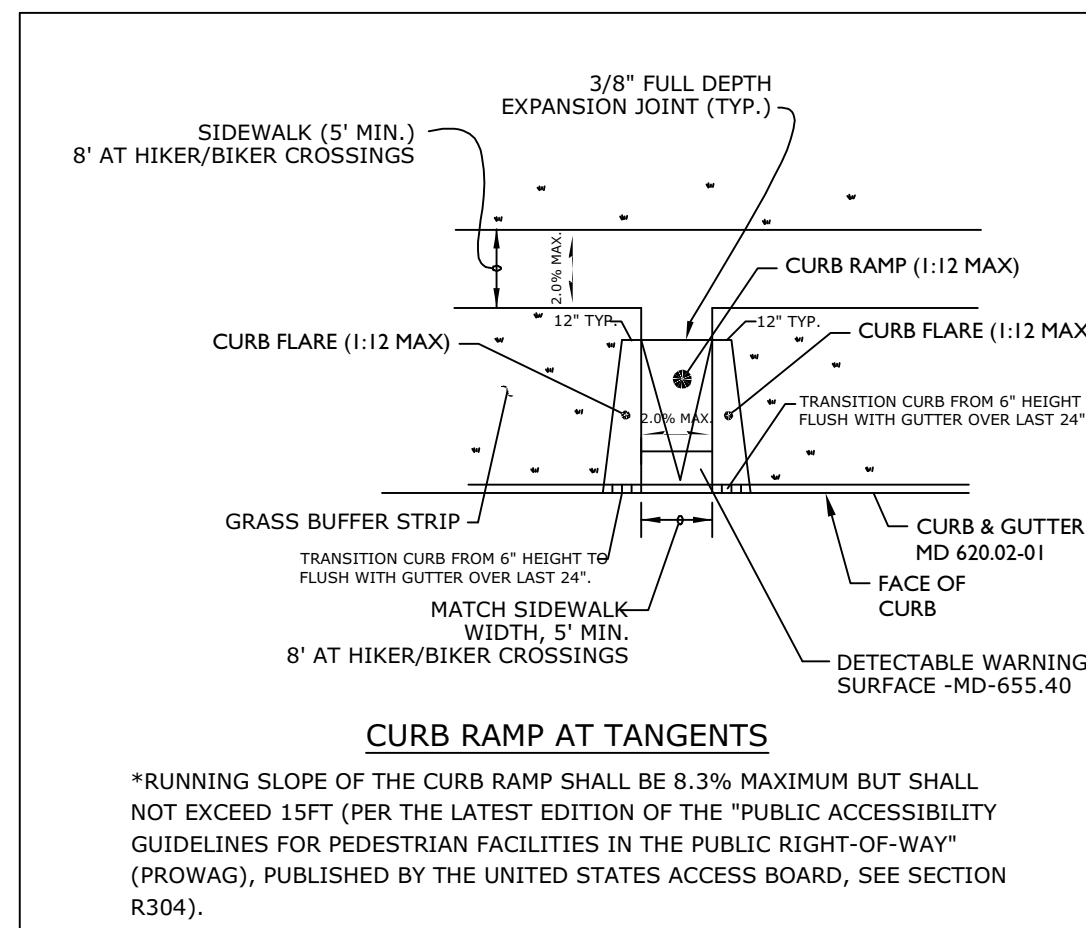
Wheel Stops Detail



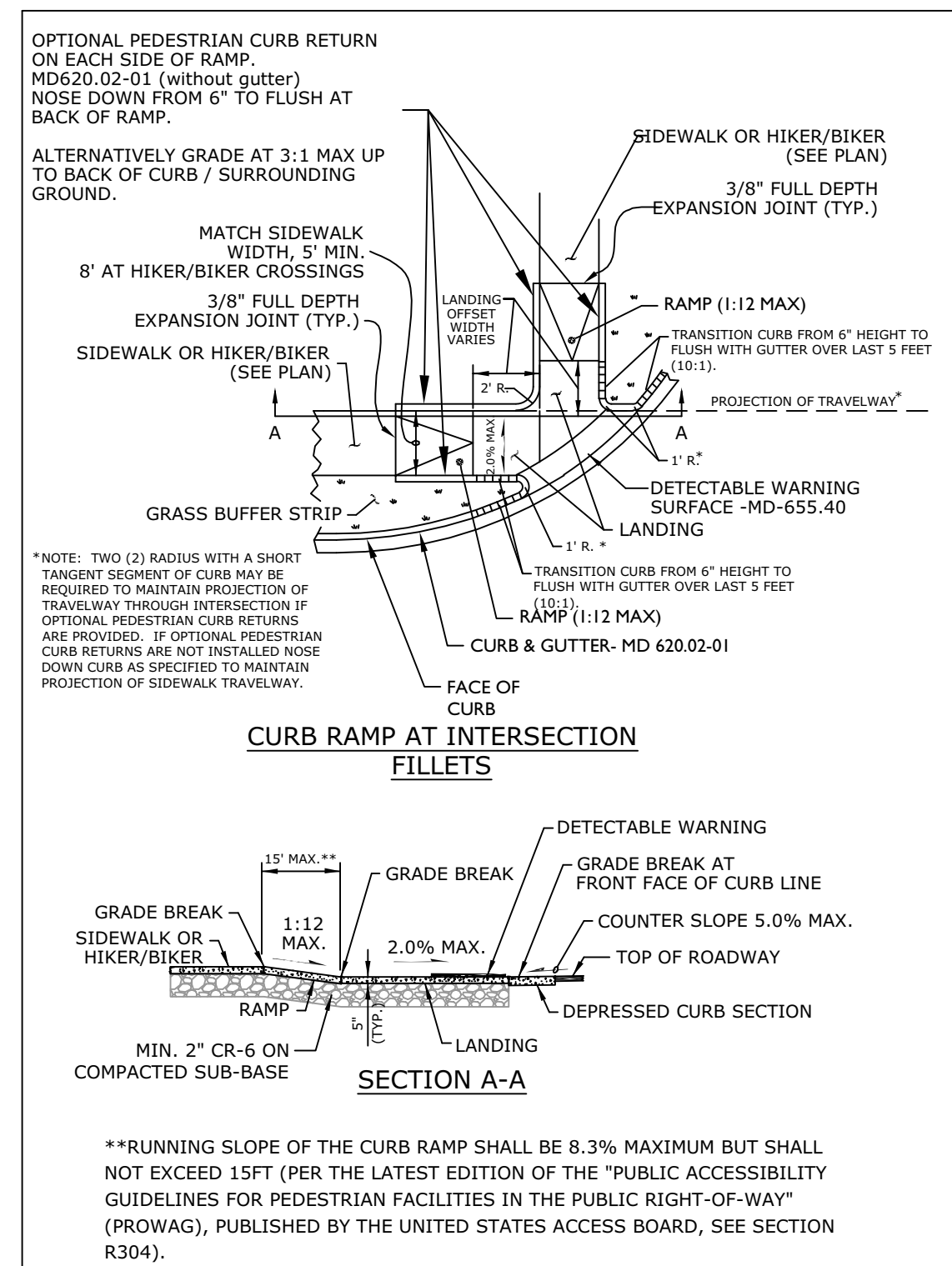
Reflective Pavement Markers Detail



Detectable Warning Surface Detail



Curb Ramp Details



E CURB RAMP SHALL BE 8.3% N



CALL "MISS UTILITY" AT
1-800-257-7777
72 Hours Before Start Of Construction

REVISION	DATE	REVISION	DATE		BY	DATE
				BASE DATA	CADD	
				DESIGNED	SN	
				DRAWN	SN	
				REVIEWED	TJC	
				RELEASE FOR <input type="checkbox"/>		
				BY _____ DATE _____		

Owner:
NATELLI COMMUNITIES
506 MAIN STREET
3RD FLOOR
GAITHERSBURG, MD 20878
PHONE: 1-301-670-4020
CONTACT: PAUL COLEMAN

ROAD PROFILE & DETAILS

RODGERS
CONSULTING

19847 Century Boulevard, Suite 200, Germantown, Maryland 20874
Ph: 301.948.4700 Fx: 301.948.6256 www.rodgers.com

IMPROVEMENT PLAN - COMMERCIAL RETAIL CENTER
Lot C9
Linganore Town Center

TAX MAP 79, PARCEL 17
ELECTION DISTRICT NO. 9
FREDERICK COUNTY, MARYLAND

SCALE: AS SHOWN

JOB No. 0529A1

DATE: JULY 2020

INDEX No. GFP-01

SHEET No. _____

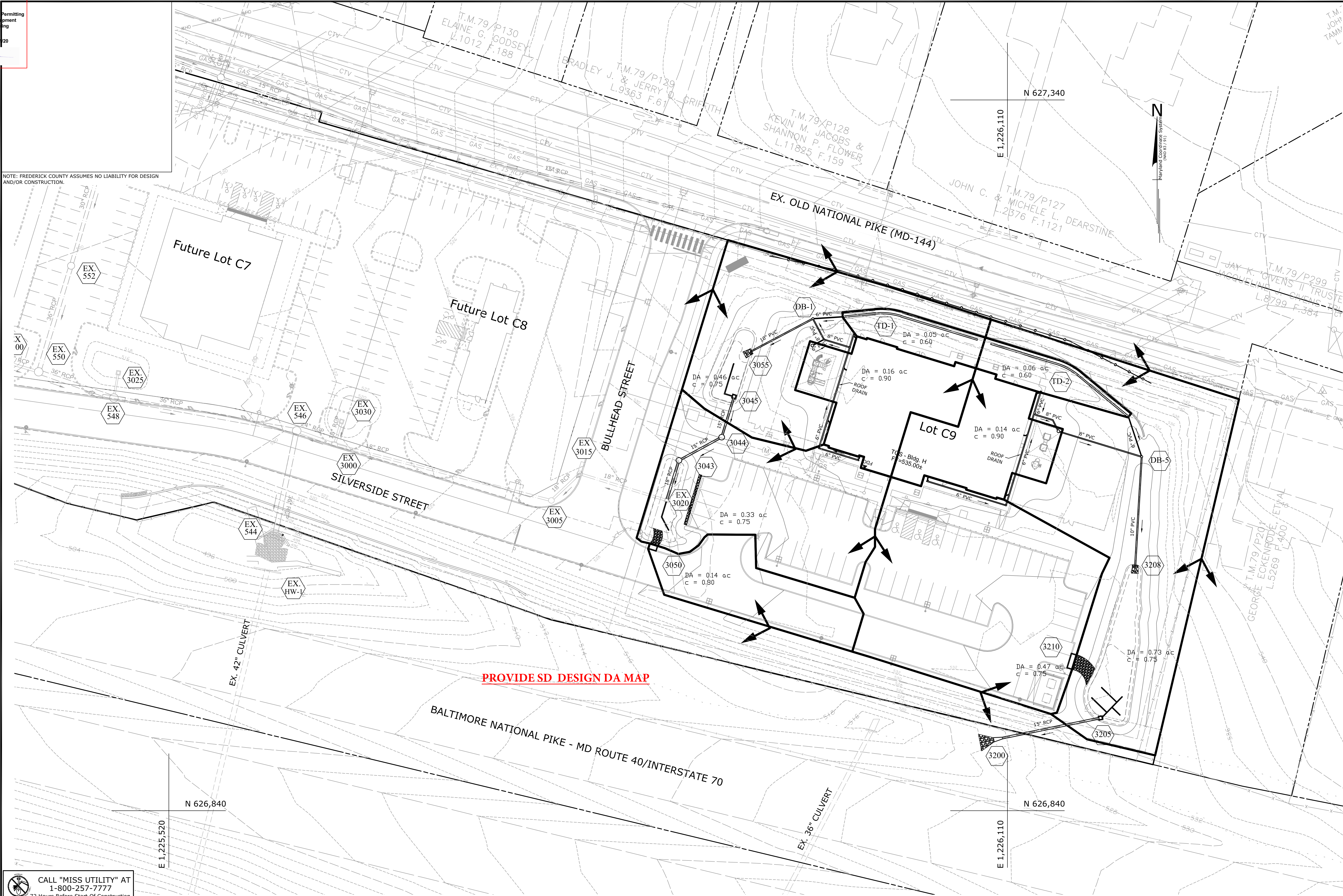
FOR CONSTRUCTION

NOTE: FREDERICK COUNTY ASSUMES NO LIABILITY FOR DESIGN AND/OR CONSTRUCTION.

8/25/2020 SCD Mylar Submittal

8/11/2020

7/7/2020



PROVIDE SD DESIGN DA MAP

CALL "MISS UTILITY" AT
1-800-257-7777
72 Hours Before Start Of Construction

REVISION	DATE	REVISION	DATE	BY	DATE
		BASE DATA		CADD	
		DESIGNED		SN	
		DRAWN		SN	
		REVIEWED		TJC	
RELEASE FOR					
BY					DATE

Owner:
NATELLI COMMUNITIES
506 MAIN STREET
3RD FLOOR
GAITHERSBURG, MD 20878
PHONE: 1-301-670-4020
CONTACT: PAUL COLEMAN

STORM DRAIN DRAINAGE AREA MAP

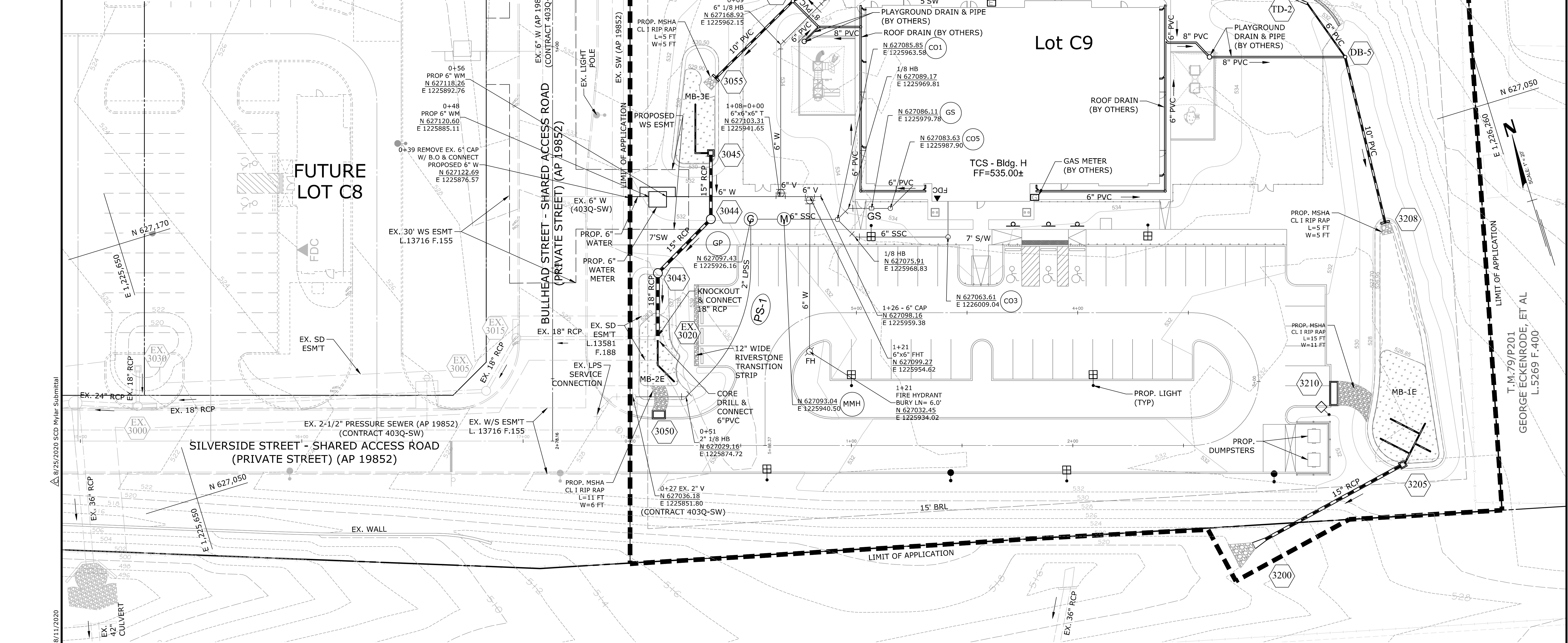
RODGERS
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19847 Century Boulevard, Suite 200, Germantown, Maryland 20874
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IMPROVEMENT PLAN - COMMERCIAL RETAIL CENTER
Lot C9
Linganore Town Center
TAX MAP 79, PARCEL 17
ELECTION DISTRICT NO. 9
FREDERICK COUNTY, MARYLAND

SCALE: 1" = 30'
JOB No. 0529AJ
DATE: JULY 2020
INDEX No. SDA-01
SHEET No. 08 OF 17

FOR CONSTRUCTION

NOTE: FREDERICK COUNTY ASSUMES NO LIABILITY FOR DESIGN AND/OR CONSTRUCTION.



8/25/2020 SCD Mylar Submittal

8/11/2020

7/7/2020

CALL "MISS UTILITY" AT 1-800-257-7777
72 Hours Before Start Of Construction

CURVE	RADIUS	LENGTH	TANGENT	CHORD	BEARING	DELTA	PC STA.	COORDINATES	PT STA.	COORDINATES
PS-1	70.00'	54.95'	28.98'	53.55'	N 39°33'02" E	44°58'51"	0+63.42	N 627034.91 E 1225885.54	1+18.38	N 627076.20 E 1225919.64

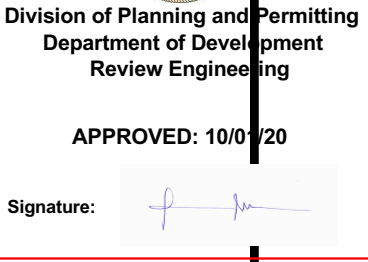
DOMESTIC DEMAND = 76 GPM
SPRINKLER = 256 GPM
FIRE SERVICE = 456 GPM
OUTSIDE HOSE DEMAND = 100 GPM
TOTAL DEMAND = 888 GPM

NOTE: FIRE HYDRANTS CONNECTED TO A PRIVATE WATER SYSTEM SHALL BE PAINTED RED.

GRAPHIC SCALE
1" = 20' FT

NOTE:
1. INFORMATION SHOWN AS "EXISTING" UNDER A/P 19852 IS ANTICIPATED TO BE CONSTRUCTED PRIOR TO CONSTRUCTION USE OF LOT C9. U & O PERMIT WILL NOT BE ISSUED UNTIL THE WORK UNDER A/P 19852 IS COMPLETED.
2. LOTS C7 & C8 SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
3. LOTS C7 & C8 WILL REQUIRE FUTURE SITE PLAN.

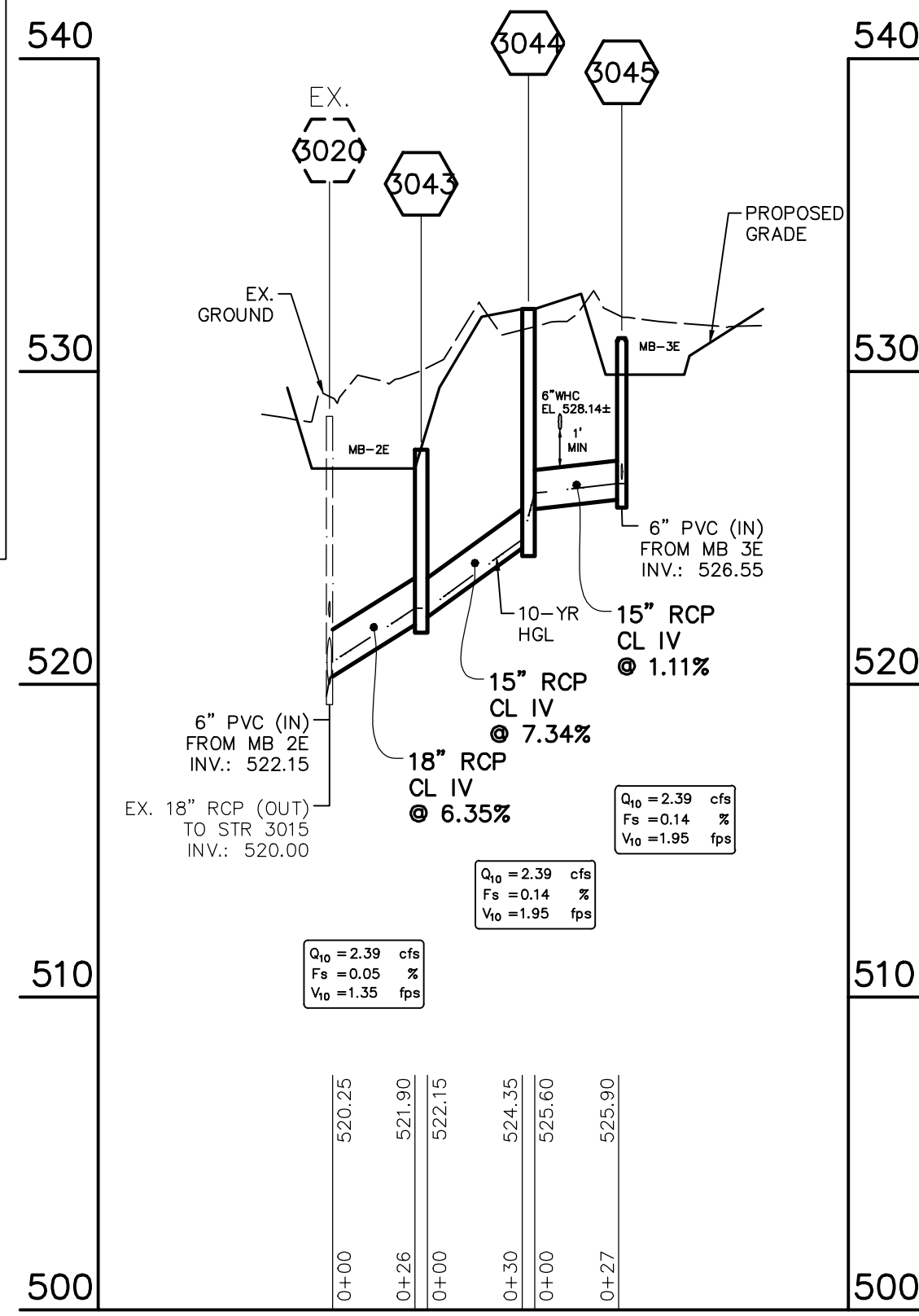
FOR CONSTRUCTION



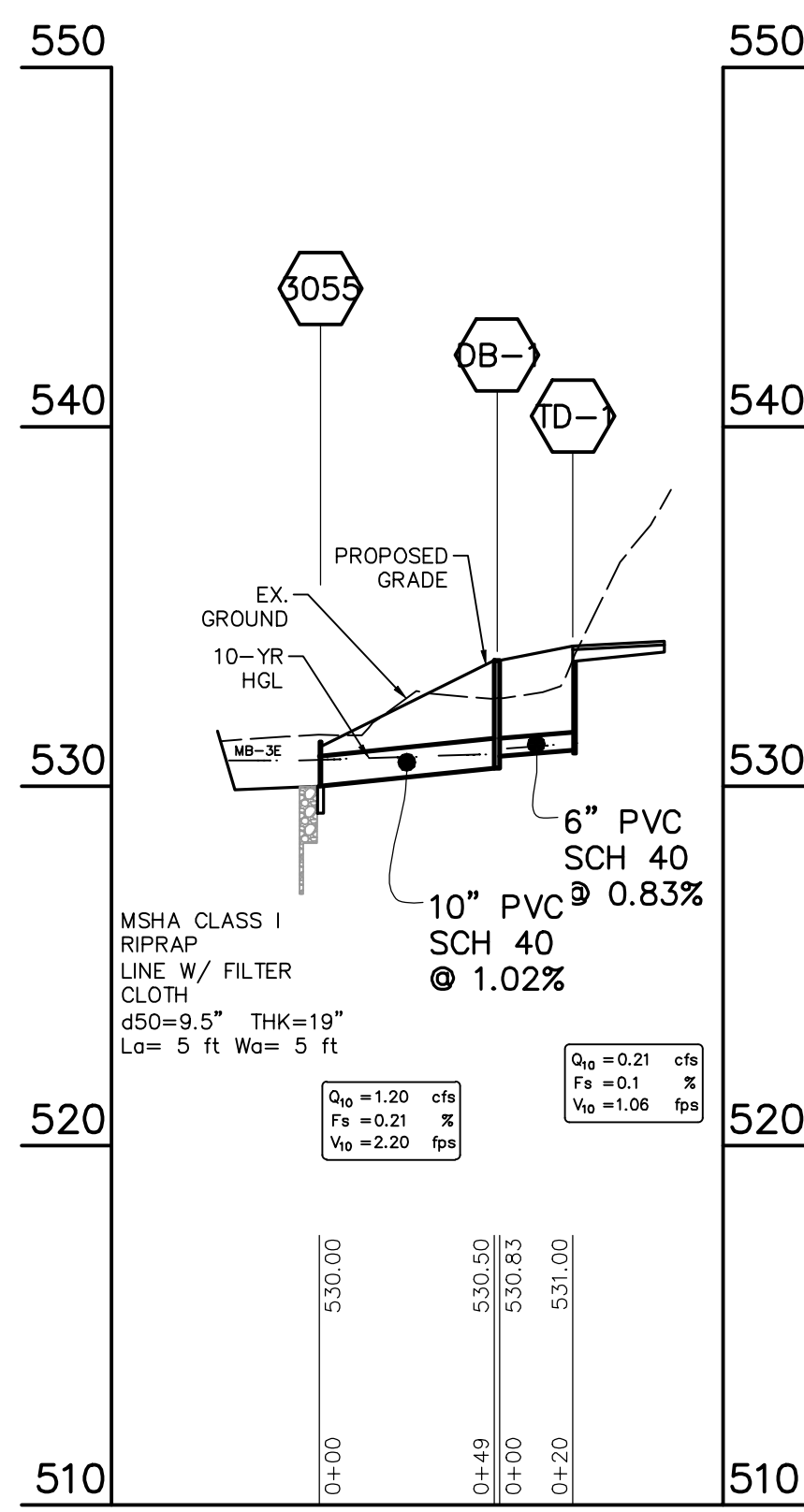
NOTE: FREDERICK COUNTY ASSUMES NO LIABILITY FOR DESIGN AND/OR CONSTRUCTION.

SCALE

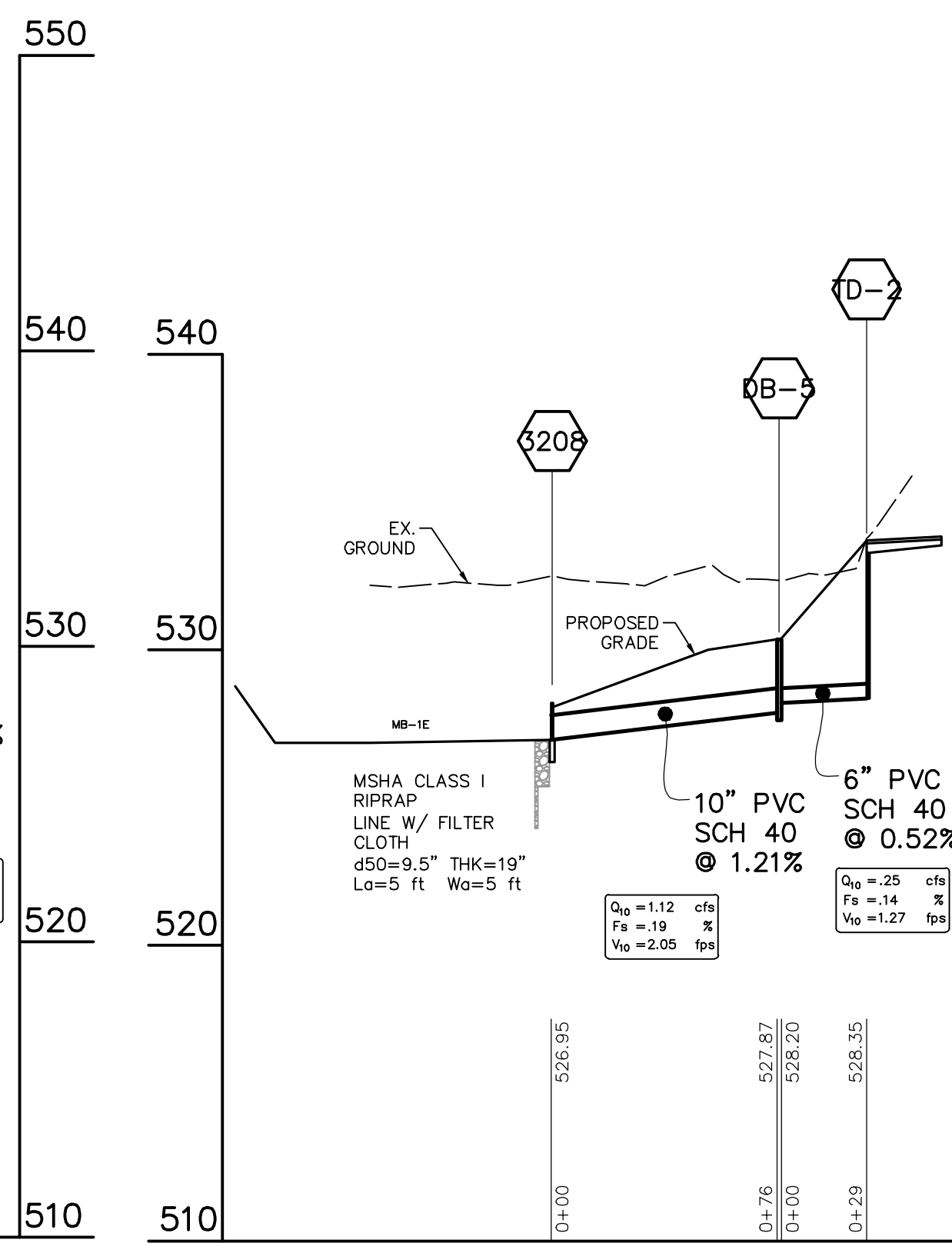
VERTICAL: 1" = 5'
HORIZONTAL: 1" = 50'



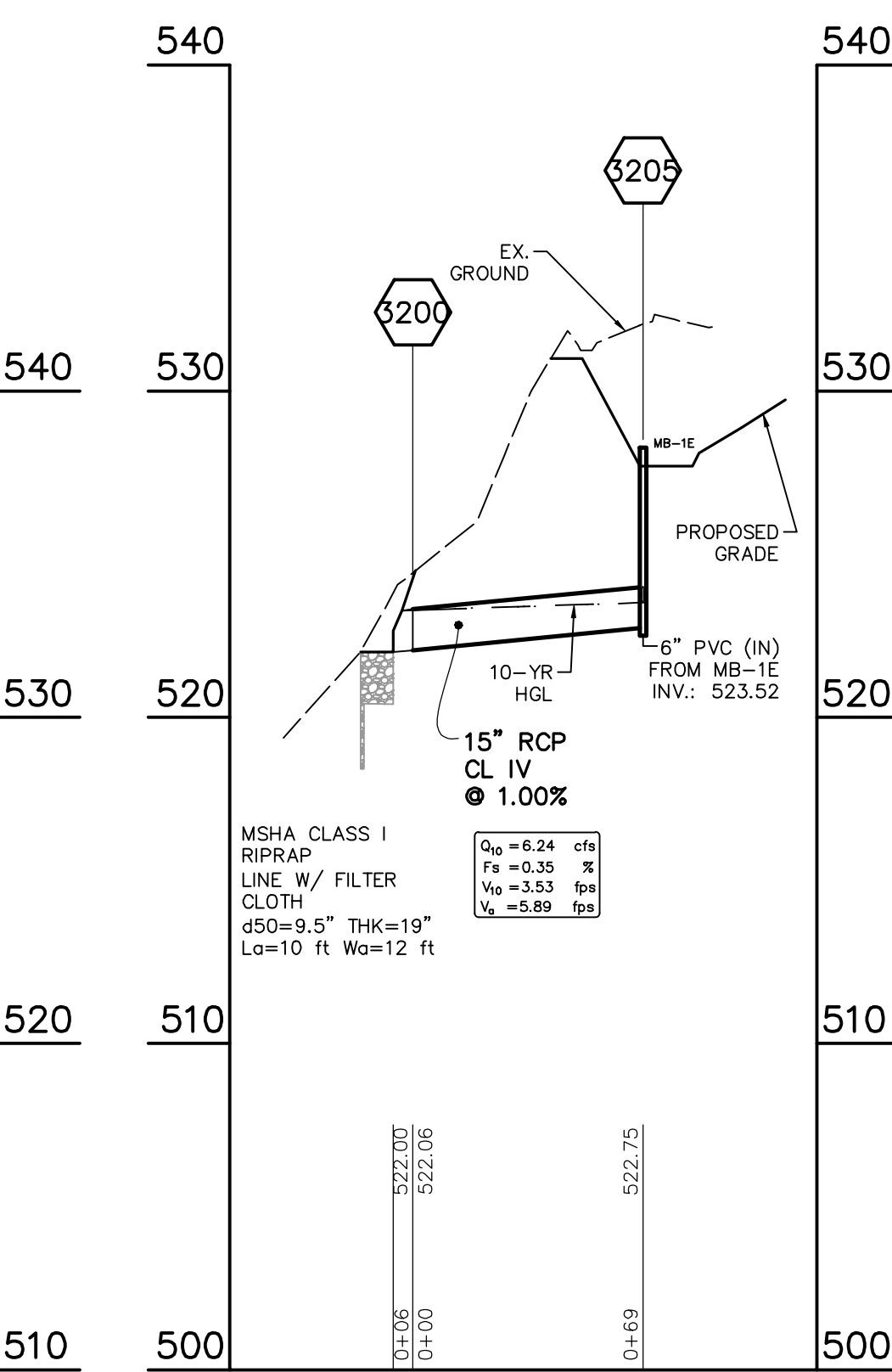
3045 TO EX. 3020



TD-1 TO 3055



TD-2 TO 3208



3205 TO 3200

STORM DRAINAGE GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH MARYLAND STATE HIGHWAY ADMINISTRATION GENERAL SPECIFICATIONS AND FREDERICK COUNTY STANDARDS AND SPECIFICATIONS.
2. ALL CONSTRUCTION IS UNDER THE GENERAL SUPERVISION OF THE PROJECT ENGINEER AND INSPECTED BY FREDERICK COUNTY.
3. THE TYPES OF STORM DRAINAGE STRUCTURES REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION STANDARD OR APPROVED EQUIVALENT. FPC IS FREDERICK PRECAST CONCRETE, INC.
4. ALL INLETS AND MANHOLES SHALL HAVE A PAVED INVERT AND THOSE WITH THROUGH PIPES SHALL HAVE A ROUNDED CHANNEL. IN ACCORDANCE WITH FREDERICK COUNTY REQUIREMENTS. (UNLESS NOTED OTHERWISE)
5. INFORMATION CONCERNING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS AND DESIGN DRAWINGS AND MUST BE CONFIRMED BY THE CONTRACTOR BY DIGGING A TEST PIT AT CROSSINGS WELL IN ADVANCE OF TRENCHING. IF LOCATION AND CLEARANCES ARE NOT AS SHOWN ON THIS PLAN, CONTACT THE ENGINEERS BEFORE PROCEEDING WITH CONSTRUCTION.
6. ALL AREAS DISTURBED BY CONSTRUCTION, ACCESS ROUTES, ETC., ARE TO BE GRADED FOR POSITIVE DRAINAGE AND STABILIZED.
7. CONTRACTOR SHALL NOTIFY MISS UTILITY (1-800-257-7777) 48 HOURS IN ADVANCE OF ANY EXCAVATION.
8. MAINTAIN 1' MINIMUM VERTICAL AND 5' HORIZONTAL CLEARANCE BETWEEN STORM DRAIN SYSTEM AND ALL OTHER UTILITIES.
9. SEE SITE PLAN & DETAIL SHEET FOR ALL DETAILS AND TYPICAL SECTIONS PERTAINING TO PAVING DESIGN AND CONSTRUCTION.
10. ALL STORM DRAIN PIPE BEDDING SHALL BE PER THE MANUFACTURER'S STANDARDS AND SPECIFICATIONS.
11. WHERE ANY PART OF THE STORM DRAIN SYSTEM IS LOCATED IN A FILL SECTION, PROVIDE SELECT FILL MATERIAL, COMPACTED TO 95% AASHTO T-180 DENSITY FROM APPROVED SUBGRADE TO THE STRUCTURE BOTTOM SLAB AND/OR THE PIPE BEDDING.
12. ALL CURB INLETS TO BE DESIGNED FOR MSHA "TYPE D" 6" CURB & GUTTER UNLESS NOTED OTHERWISE. PRECASTER TO MODIFY MD STD. 374.21 STRUCTURES AS REQUIRED TO MATCH ADJACENT CURB HEIGHT.
13. ALL RIP-RAP OUTFALLS REFER TO DETAIL D-4-1-A & D-4-1-B PG. D.20& D.21 IN SCS. 2011 STANDARDS FOR SEDIMENT CONTROL.
14. INSPECTOR TO VERIFY MATERIALS AND INSPECT PIPE PRIOR TO BACKFILL. ALL BACKFILL TO BE PER THE MANUFACTURER'S SPECIFICATIONS AT A MINIMUM. TYPICAL BACKFILL SHALL BE SUITABLE MATERIAL, SUCH AS FREE-DRAINING SANDS AND GRAVEL CONFORMING TO ASTM D2321 CLASS I, II OR III MATERIALS AND BE PLACED IN LIFTS AS NECESSARY AND COMPACTED TO 95 PERCENT MINIMUM DRY DENSITY ACCORDING TO AASHTO T99 MINIMUM (PER AASHTO T180 IN ROAD RIGHT-OF-WAY AREAS).
15. PROVIDE 5 FT MINIMUM SEPARATION FROM ALL WATER AND SEWER AND APPEARANCES.
16. THE CONTRACTOR SHALL INDICATE THE CHOSEN PIPE MATERIAL TO THE PRECAST MANUFACTURER, WHO SHALL MODIFY PIPE OPENINGS IN ALL PRECAST STORM DRAIN STRUCTURES ACCORDINGLY.
17. ALL MANHOLES AND INLET BASE DIAMETERS TO BE 48" UNLESS NOTED OTHERWISE. IN GENERAL, MANHOLES AND INLET BASES SHALL BE SIZED TO ACCOMMODATE PIPE MATERIAL, SIZE, AND NUMBER OF PIPES ENTERING/EXITING SAID MANHOLE OR INLET BASE, ACCORDING TO THE APPLICABLE MSHA STANDARD.
18. TEMPORARILY BRICK SHUT ENDS OF STORM DRAIN STUB OUTS.
19. ALL REINFORCED CONCRETE STORM DRAIN SPECIFIED TO BE WATERTIGHT SHALL UTILIZE RUBBER O-RINGS, RUBBER STRIP GASKETS OR OTHER ACCEPTED WATERTIGHT PRACTICE. SMOOTHER, HIGH-DENSITY POLYETHYLENE PIPE SHALL UTILIZE WATERTIGHT SLEEVES AND RUBBER GASKETS. EXAMPLES INCLUDE HANCOX TITELINE, ADS PROLINK-WT OR AN APPROVED EQUIVALENT.
20. CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE TO OUTLET PIPE AT THE BOTTOM OF PRECAST STRUCTURES.
21. WHERE STRUCTURE IS LOCATED AT A SIDEWALK THE CONTRACTOR SHALL ROTATE THE CONE TO ENSURE THAT THE LID IS LOCATED COMPLETELY INSIDE OR OUTSIDE THE LIMITS OF THE SIDEWALK.
22. CONTRACTOR TO PROVIDE TRAFFIC BEARING GRATES FOR INLETS LOCATED IN TRAVELWAYS OR PARKING AREAS.

STRUCTURE SCHEDULE: LINGANORE TOWN CENTER COMMERCIAL RETAIL CENTER LOT C9 - OUTFALL 544

PR	STRUCTURE TYPE	STRUCTURE LOCATION					STRUCTURE TOP ELEVATION		MSHA STD. NO.	BASE	REMARKS
		STREET	STATION	OFFSET	NORTHING	EASTING	DOWNSTREAM	UPSTREAM			
3043	MANHOLE	--	--	--	627086.33	1225878.84	RIM = 527.50		384.01	48"	
3044	MANHOLE	--	--	--	627102.70	1225908.92	RIM = 532.00		384.01	48"	
3045	MODIFIED FC YARD INLET	--	--	--	627131.29	1225917.66	GRATE = 531.06 WEIR = 530.50		--		FREDERICK CO. DETAIL NO. 59
3050	COG 5 OPENING	--	--	--	627024.11	1225857.20	529.28	529.47	374.68		WIDTH = 4'
3055	END WALL	--	--	--	627162.89	1225929.43	INV OUT = 530.00		--	--	SEE DETAIL THIS SHEET
DB-1	NYLOPLAST DRAIN BASIN	--	--	--	627186.08	1225973.11	RIM = 533.50		--	18"	RECOMMEND SOLID GRATE
TD-1	TRENCH DRAIN	--	--	--	627187.44	1225994.18	GRATE = 533.90		--	--	WIDTH = 12" LENGTH = 97'

STRUCTURE SCHEDULE: LINGANORE TOWN CENTER COMMERCIAL RETAIL CENTER LOT C9 - OUTFALL 3200

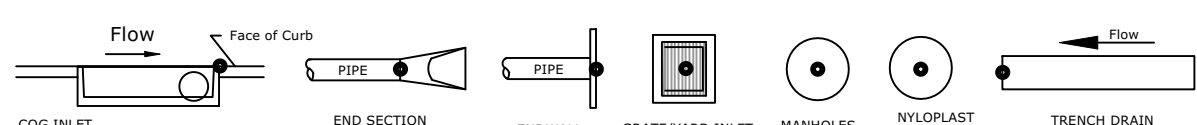
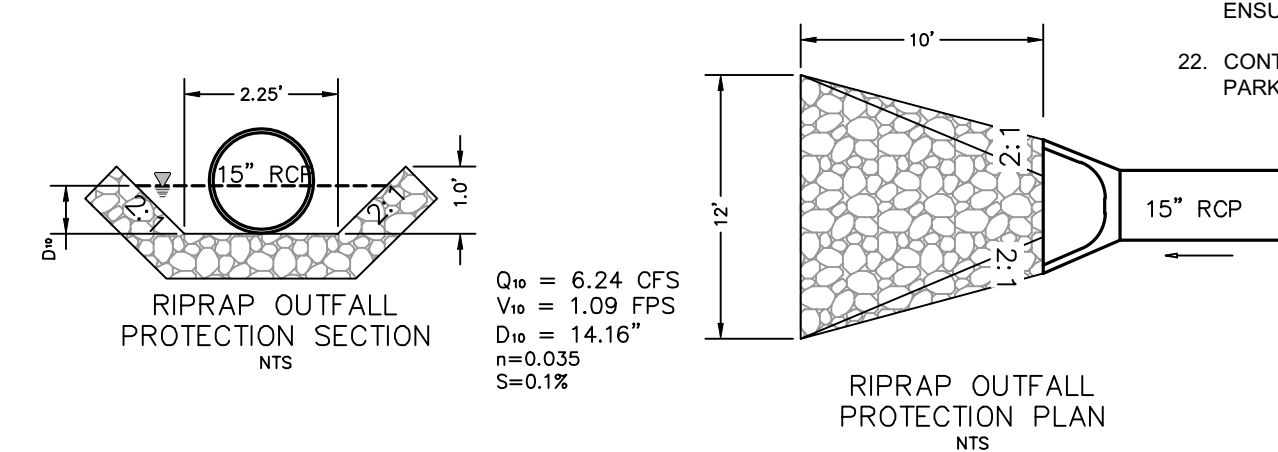
PR	STRUCTURE TYPE	STRUCTURE LOCATION					STRUCTURE TOP ELEVATION		MSHA STD. NO.	BASE	REMARKS
		STREET	STATION	OFFSET	NORTHING	EASTING	DOWNSTREAM	UPSTREAM			
3200	15" RCP END SECTION	--	--	--	626891.11	1226106.42	INV OUT = 522.00		368.01	--	
3205	MODIFIED FC YARD INLET	--	--	--	626905.23	1226175.47	GRATE = 528.26 WEIR = 527.70		--	--	FREDERICK CO. DETAIL NO. 59
3208	END WALL	--	--	--	627011.88	1226199.83	INV OUT = 526.95		--	--	SEE DETAIL THIS SHEET
3210	COG 10 OPENING	--	--	--	626940.38	1226151.59	531.43	531.45	374.68	--	WIDTH = 4'
DB-1	NYLOPLAST DRAIN BASIN	--	--	--	627088.93	1226204.39	RIM = 530.35		--	18"	RECOMMEND SOLID GRATE
TD-2	TRENCH DRAIN	--	--	--	627492.54	1224641.14	GRATE = 533.70		--	--	WIDTH = 12" LENGTH = 112'

PIPE SCHEDULE

DIA (IN)	TYPE	LENGTH (LF)
6"	PVC	49
10"	PVC	125
15"	RCP	126
18"	RCP	26

NOTES:

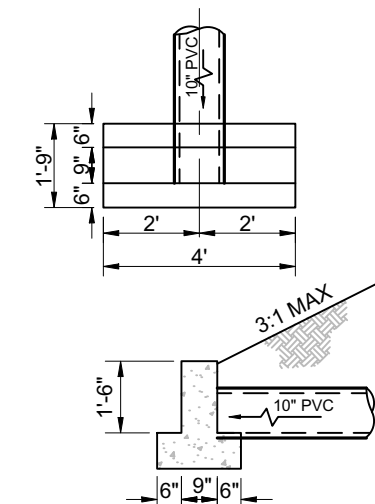
1. PIPE LENGTHS SHOWN ON SCHEDULE ARE BASED UPON PROFILE LENGTHS FROM INSIDE WALL OF STRUCTURE TO INSIDE WALL OF STRUCTURE FOR ALL STRUCTURES.
2. INSPECTOR IS TO VERIFY MATERIALS AND INSPECT AND/OR PRESSURE TEST RCPR PER INDUSTRY STANDARDS PRIOR TO BACKFILLING.
3. CONTRACTOR SHALL HAVE THE OPTION TO UTILIZE HDPE PIPE IN PLACE OF CONCRETE (CULVERTS TO REMAIN CONCRETE). CONTRACTOR TO MEET ALL MANUFACTURER & COUNTY SPECIFICATIONS. SUBSTITUTE 24" HDPE FOR 21" RCP. SUBSTITUTE HDPE W/ WJ JOINTS/GASKETS FOR RCPR.
4. CONTRACTOR MAY SUBSTITUTE RCP FOR HP STORM.



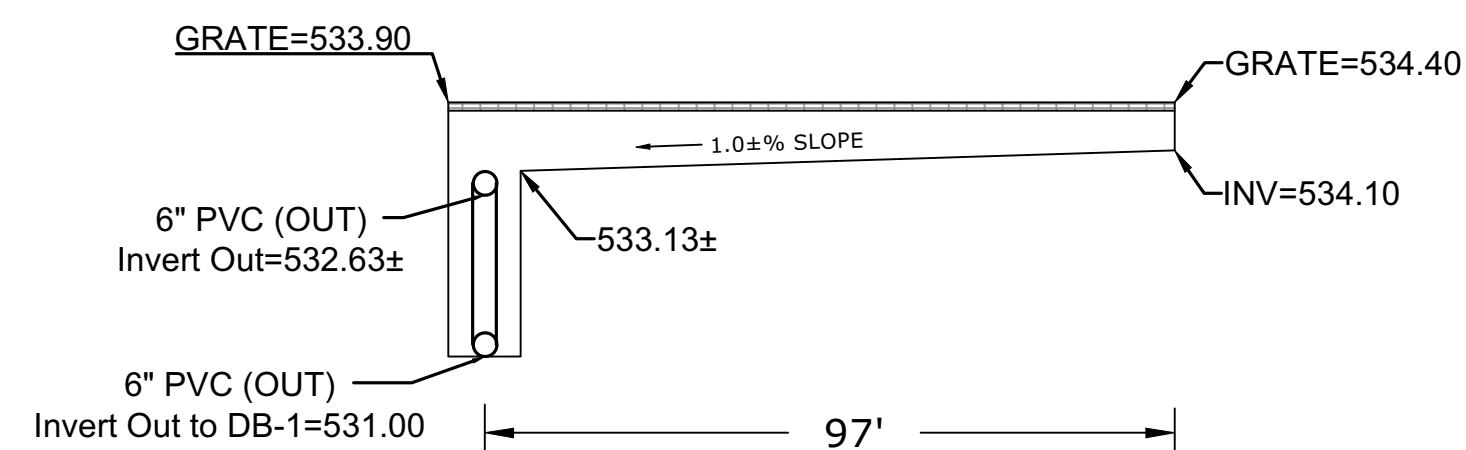
- DENOTES TOP OF STRUCTURE FOR/ STATIONS AND COORDINATES.

NOTES:

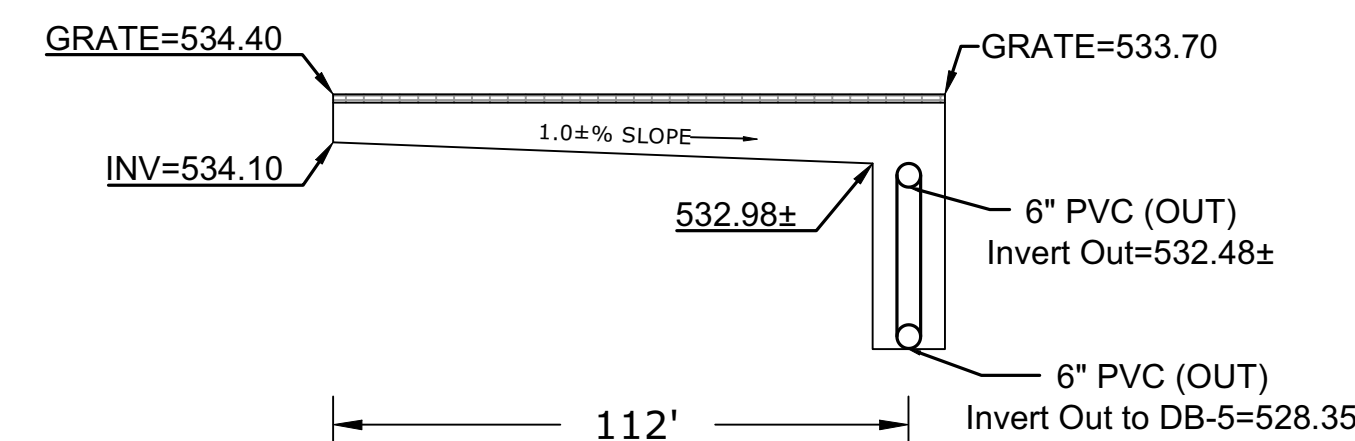
1. STATIONS AND OFFSETS REFER TO THE DOWNSTREAM EDGE OF THE OUTSIDE WALL FOR CURB INLETS ON GRADE, THE CENTER OF THE OUTSIDE WALL FOR CURB INLETS AT SUMP, THE CENTER OF THE STRUCTURE FOR MANHOLES, GRATE/ YARD INLETS AND COMB. GRATE/ SLOT OPENING INLETS (AS INDICATED BELOW) UNLESS OTHERWISE NOTED IN THE REMARKS.
2. ELEVATIONS ARE PROVIDED AT THE TOP OF CURB FOR CURB INLETS, THE CENTER OF THE STRUCTURE FOR MANHOLES, THE TOP OF THE CURB FOR CURB INLETS AT SUMP, INVERT OF SLOT FOR COMB. GRATE/ SLOT OPENING INLETS AND INVERT AT END OF END SECTION.
3. ALL CURB INLETS SHALL BE CAST FOR 6" CURB & GUTTER, PER ROAD TYPICAL SECTION.
4. ALL CURB INLETS SHALL HAVE 2" DEPRESSION WITH 6" CURB & GUTTER.
5. PRECAST STRUCTURES ARE PER FREDERICK COUNTY AND MSHA REQUIREMENTS.



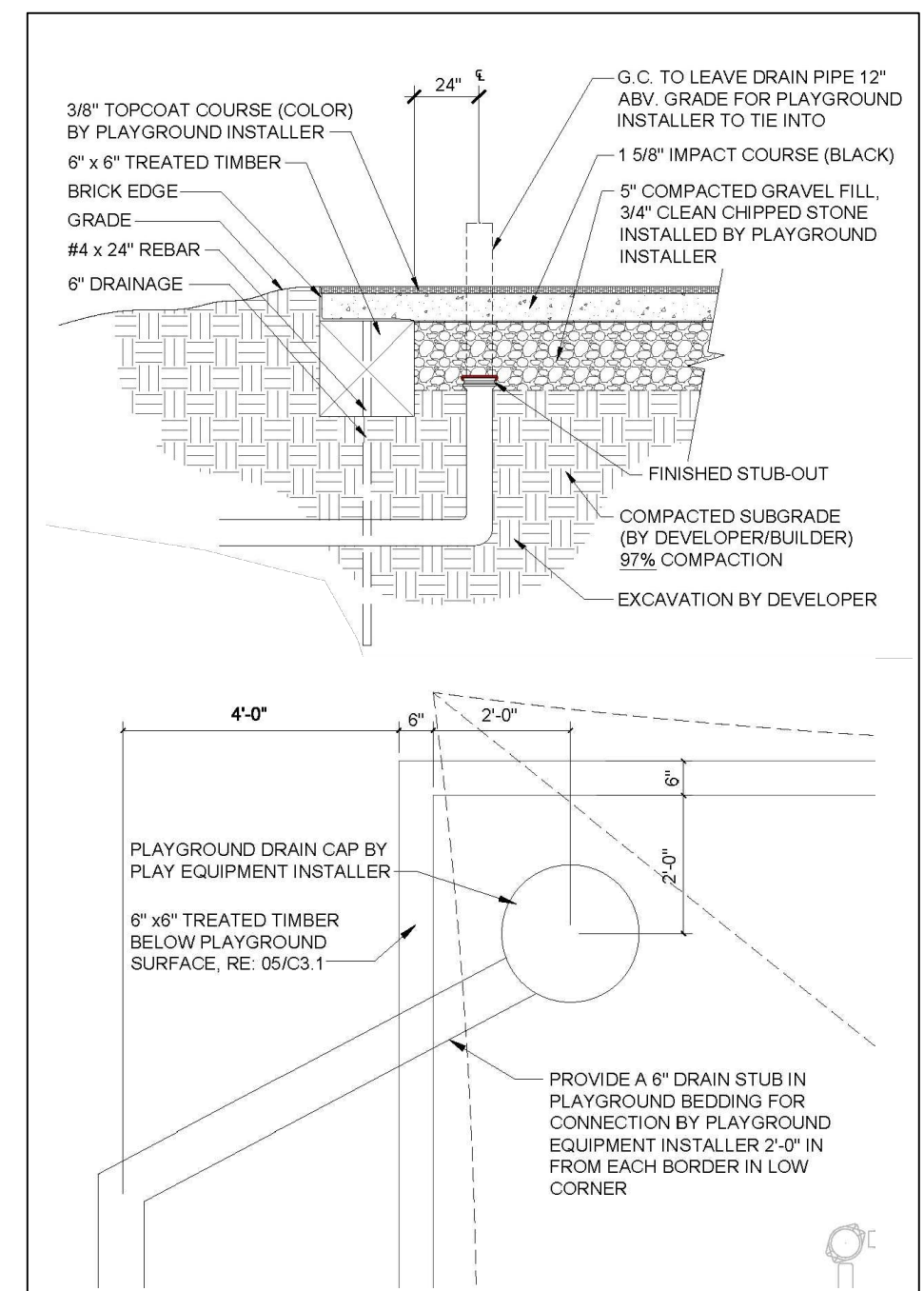
END WALL DETAIL
N.T.S



TYPICAL SECTION
TRENCH DRAIN TD-
(SEE DETAILS ON SHEET 6, DET-C
(NTS)



TYPICAL SECTION
TRENCH DRAIN TD-2
(SEE DETAILS ON SHEET 6, DET-01)
(NTS)



PLAYGROUND DRAINAGE DETAIL
N.T.S



 CALL "MISS UTILITY" AT
1-800-257-7777
72 Hours Before Start Of Construction

REVISION		DATE		BY		DATE	
				BASE DATA	CADD		
				DESIGNED	SN		
				DRAWN	SN		
				REVIEWED	TJC		
				RELEASE FOR			<input type="checkbox"/>
				BY _____ DATE _____			

Owner:
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506 MAIN STREET
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PHONE: 1-301-670-4020
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STORM DRAIN PROFILES & NOTES

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IMPROVEMENT PLAN - COMMERCIAL RETAIL CENTER
Lot C9
Linganore Town Center

TAX MAP 79, PARCEL 17
ELECTION DISTRICT NO. 9
FREDERICK COUNTY, MARYLAND

SCALE:	AS SHOWN
JOB No.	0529AJ
DATE:	JULY 2020
INDEX No.	SDP-01
SHEET No.	10 OF 17

FOR CONSTRUCTION

NOTE: FREDERICK COUNTY ASSUMES NO LIABILITY FOR DESIGN AND/OR CONSTRUCTION.

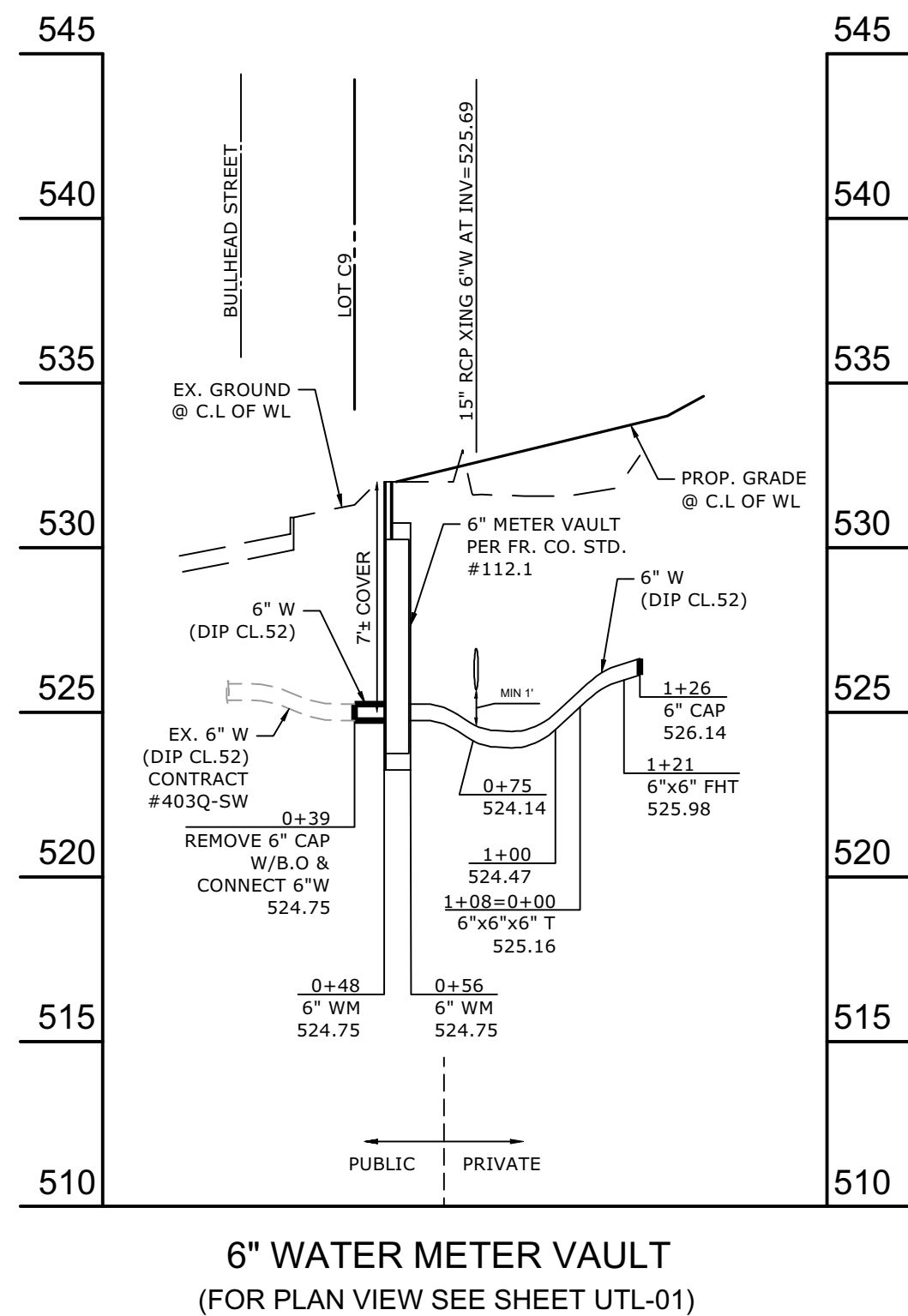
THRUST BEARING/RESTRAINT NOTES

WATER SYSTEMS

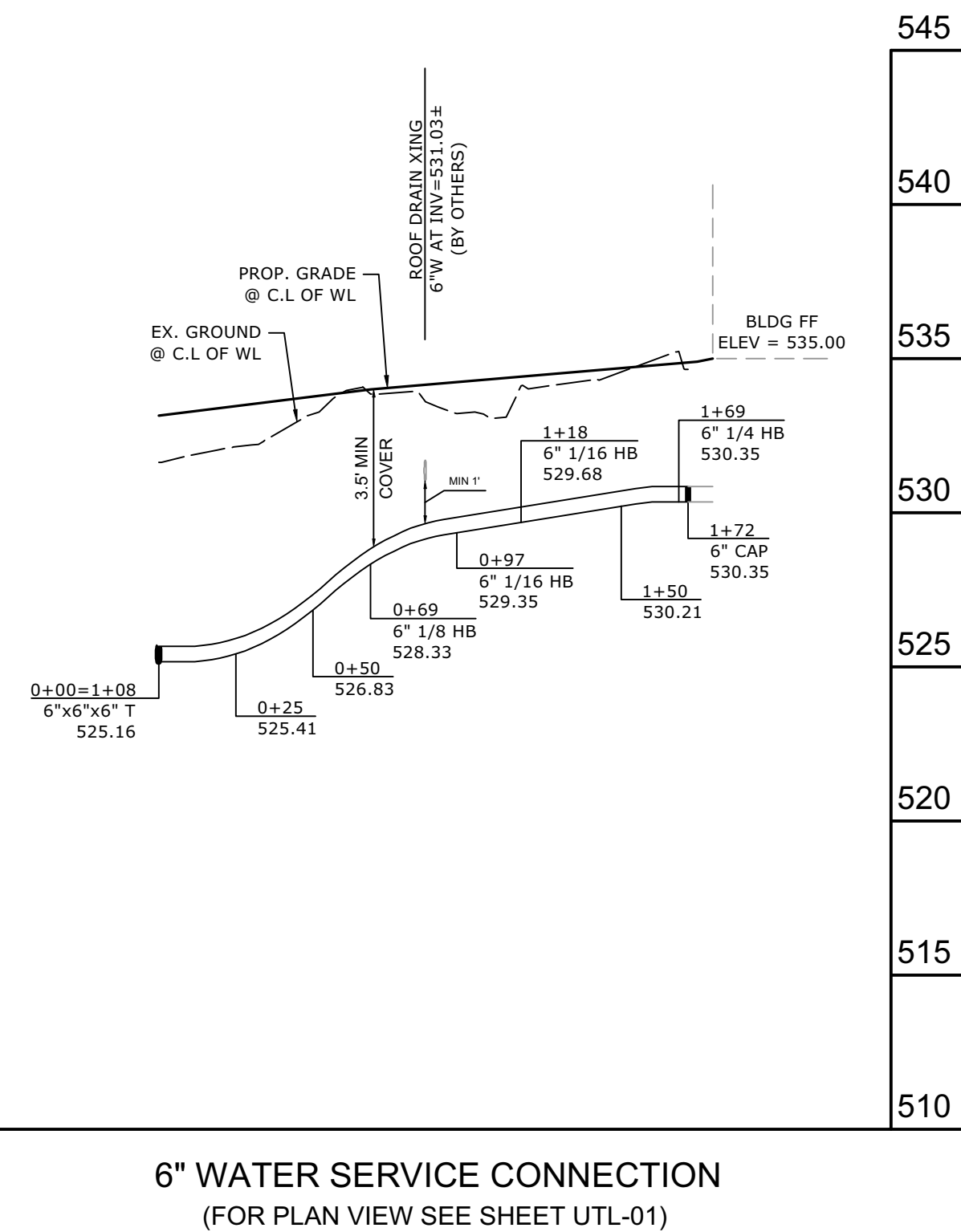
- BLOCK ALL HORIZONTAL AND LOWER VERTICAL BENDS WITH CONCRETE PER FREDERICK COUNTY STD DETAIL 102.1. OR USING MEGALUG PIPE RESTRAINTS PER COUNTY SPECS. OR APPROVED EQUAL.
- BLOCK ALL UPPER VERTICAL BENDS WITH CONCRETE PER FREDERICK COUNTY STD. DETAIL 105.1. OR USING MEGALUG PIPE RESTRAINTS PER COUNTY SPECS. OR APPROVED EQUAL.
- BLOCK ALL OTHER FITTINGS WITH CONCRETE PER FREDERICK COUNTY STD. DETAIL 103.1. OR USING MEGALUG PIPE RESTRAINTS PER COUNTY SPECS. OR APPROVED EQUAL.

WATER & SEWER GENERAL NOTES

- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE INDICATED.
- DEVELOPER SHALL SET ALL PROPERTY PIPES AND CONTROL POINTS AS NECESSARY TO STAKE OUT THIS CONSTRUCTION.
- ALL WATER CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FREDERICK COUNTY GENERAL CONDITIONS AND STANDARD SPECIFICATIONS AND DETAILS FOR WATER MAINS, AND RELATED STRUCTURES, SPECIAL PROVISIONS AND PROVISIONS AND AMENDMENTS THERETO.
- THE CONTRACTOR SHALL NOT TAP OR PENETRATE EXISTING WATER MAINS WITHOUT THE APPROVAL FROM THE FREDERICK COUNTY DUSWM.
- THE CONTRACTOR SHALL NOT OPERATE VALVES ON EXISTING COUNTY - OWNED WATER MAINS.
- CONTRACTOR TO ASSUME ALL RESPONSIBILITY IN VERIFYING LOCATIONS AND ELEVATIONS OF ALL EXISTING UNDERGROUND UTILITIES IN THE VICINITY OF THIS CONSTRUCTION. THE CONTRACTOR SHALL LOCATE EXISTING UTILITIES A MINIMUM OF TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS IN THE VICINITY OF PROPOSED UTILITIES AND AT HIS OWN EXPENSE.
- EXISTING UTILITIES ARE SHOWN FROM BEST AVAILABLE RECORDS. THE CONTRACTOR SHALL TEST PIT IN THE AREA OF KNOWN UTILITIES TO VERIFY SIZE, ELEVATION, LOCATION AND TYPE PRIOR TO PERFORMING ANY WORK. ANY UTILITY, WHETHER SHOWN OR NOT, THAT IS DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED IMMEDIATELY AT NO EXPENSE TO THE OWNER. SHOULD THE CONTRACTOR DISCOVER DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE OWNER / ENGINEER IS TO BE NOTIFIED IMMEDIATELY. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT THE AUTHORIZATION OF THE OWNER / DESIGN ENGINEER, THEN THE CONTRACTOR ASSUMES THE RESPONSIBILITY / LIABILITY FOR SAID CORRECTIONS OR ADJUSTMENTS.
- CLEAR ALL UTILITIES BY A MINIMUM OF 1'-0" VERTICALLY. CLEAR ALL POLES BY 5'-0" HORIZONTALLY OR TUNNEL AS REQUIRED. COST FOR TUNNELING OR BRACING AT POLES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR WATER MAIN CONSTRUCTION.
- ANY NECESSARY ADJUSTMENTS TO EXISTING VALVE BOXES, ETC., ARE TO BE DONE SO BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING AND REPLACING ANY EXISTING FENCES, DRIVEWAYS, SIGNS, DRAINAGE PIPES, MAILBOXES, SHRUBS, TREES, ETC., DAMAGED OR REMOVED DURING CONSTRUCTION. ALL DISTURBED AREAS SHALL BE RETURNED TO THEIR ORIGINAL CONDITION OR BETTER.
- THE CONTRACTOR SHALL NOTIFY MISS UTILITY (1-800-257-7777) A MINIMUM OF 5 DAYS PRIOR TO START OF CONSTRUCTION.
- ALL MATERIAL STOCKPILES LEFT AT THE END OF EACH WORK DAY REQUIRE STABILIZATION UNTIL THE NEXT REDISTURBANCE.
- CONTRACTOR SHALL REPAIR/REPLACE ANY DAMAGED SEDIMENT CONTROL DEVICES DURING THE SAME WORKING DAY. REFER TO SEPARATE SEDIMENT & EROSION CONTROL PLAN AS REVIEWED AND APPROVED BY FREDERICK SCD.
- MAINTAIN A MINIMUM OF 10'-0" HORIZONTAL CLEARANCE BETWEEN WATER AND SEWER HOUSE CONNECTIONS, AND 5'-0" HORIZONTAL BETWEEN ALL OTHER UTILITIES.
- ALL VALVES SPECIFIED MUST BE RESILIENT SEAT GATE VALVES FOR 16 INCHES WATERMAIN OR SMALLER. ALL VALVES FOR THE 16" WATER MAIN OR GREATER MUST BE BUTTERFLY VALVES.
- ALL PUBLIC FITTINGS, AND VALVES ARE TO BE RESTRAINED BY USE OF MEGA-LUGS OR EQUALS. (SEE DUSWM STANDARD DETAIL #107.1 AND SPECIFICATIONS).
- ALL WATER LINE TO BE BUILT WITH 3.5 FEET MINIMUM COVER BELOW FINISHED GRADE. (UNLESS OTHERWISE SPECIFIED)
- THE WATER PRESSURE ZONE FOR THIS CONSTRUCTION IS ZONE #3 (473 TO 600).
- EXCAVATION WITHIN A STATE RIGHT OF WAY SHALL BE PERFORMED IN ACCORDANCE WITH THE PROVISIONS IN THE PERMIT ISSUED BY THE MARYLAND STATE HIGHWAY ADMINISTRATION (SHA).
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING SILT AND DEBRIS OUT OF THE STORM DRAINAGE SYSTEM FOR THE DURATION OF THE CONTRACT.
- THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTY OWNERS AT ALL TIMES. THE CONTRACTOR, WITH OWNER APPROVAL, WILL COORDINATE WITH PROPERTY OWNERS IF ACCESS MUST BE INTERRUPTED FOR SHORT TIME PERIODS.
- ALL WATER OR SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FREDERICK COUNTY GENERAL CONDITIONS AND STANDARD SPECIFICATIONS AND DETAILS FOR WATER MAINS, SANITARY SEWER AND RELATED STRUCTURES, SPECIAL PROVISIONS AND AMENDMENTS THERETO.



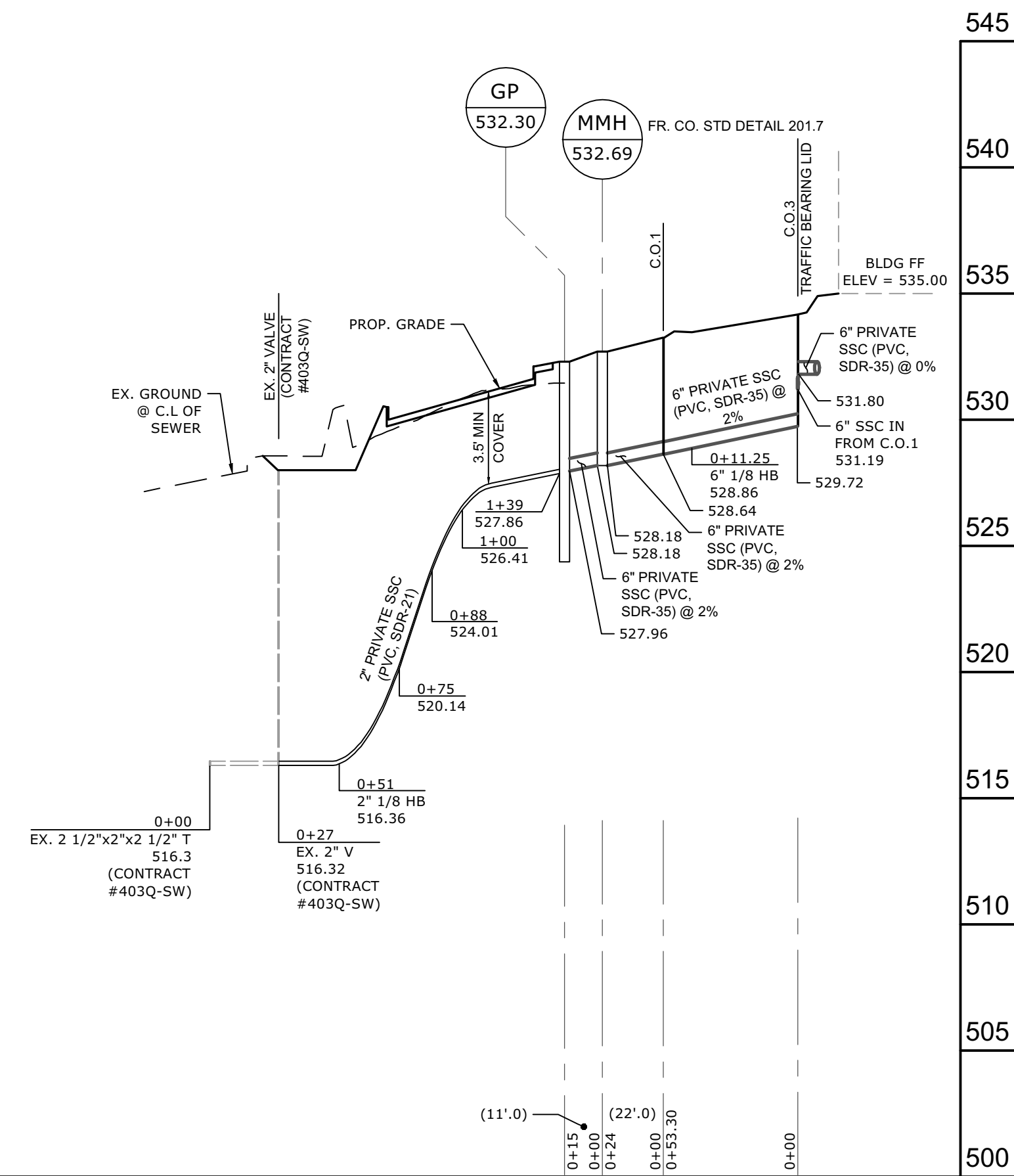
6" WATER METER VAULT
(FOR PLAN VIEW SEE SHEET UTL-01)



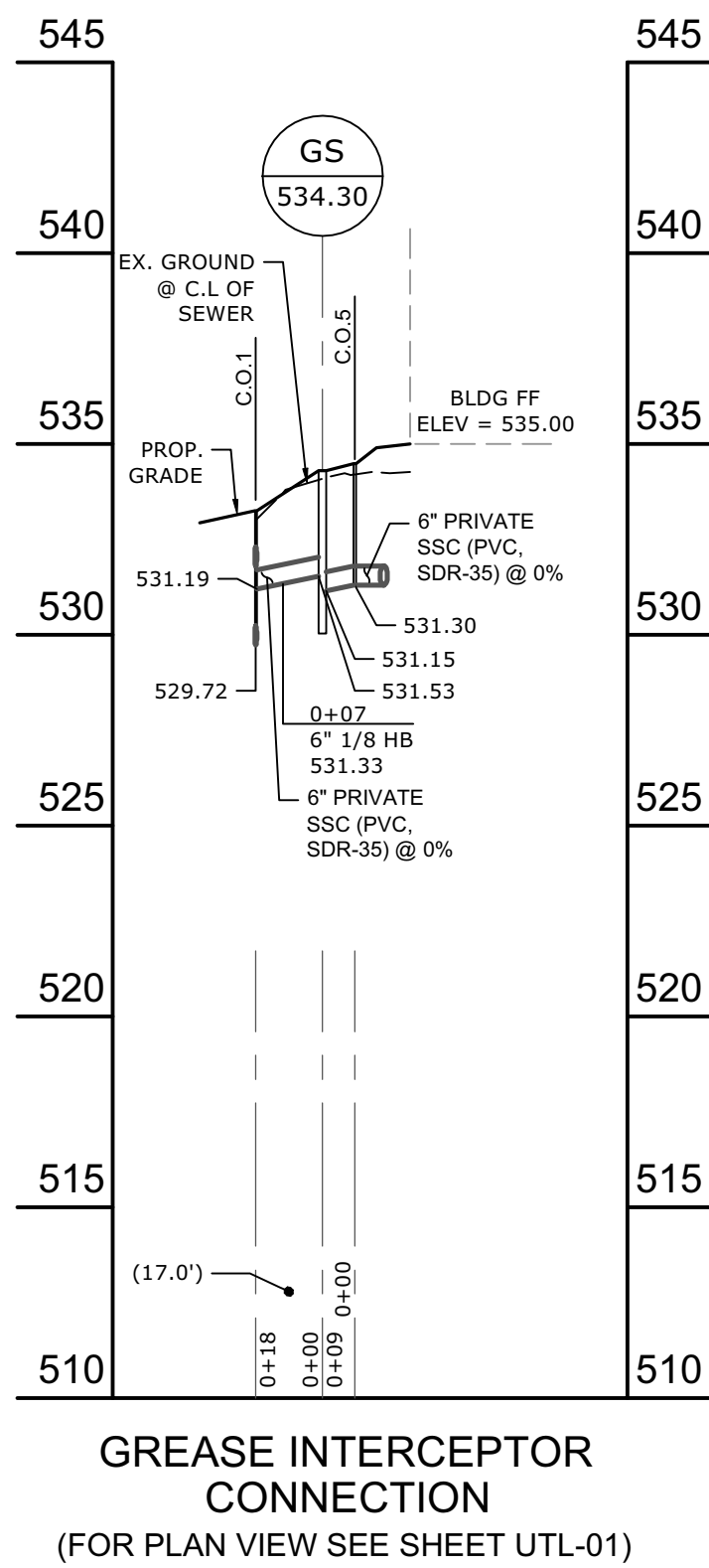
6" WATER SERVICE CONNECTION
(FOR PLAN VIEW SEE SHEET UTL-01)

SCALE

VERTICAL: 1" = 5'
HORIZONTAL: 1" = 50'



2" LOW PRESSURE SEWER SERVICE
(FOR PLAN VIEW SEE SHEET UTL-01)



WATERLINE BACTERIAL TESTING REQUIREMENT:

DISINFECTION AND VERIFICATION TESTING WILL BE PERFORMED IN ACCORDANCE WITH AWWA C651-05, OR LATEST EDITION. THE CONTRACTOR SHALL BE REQUIRED TO HAVE BACTERIAL TESTING PERFORMED ON ALL NEW "PUBLIC" WATER MAINS TO DEMONSTRATE BACTERIAL LEVELS MEET STATE MDE REQUIREMENTS PRIOR TO THE COUNTY GRANTING CONDITIONAL ACCEPTANCE OF THE CONTRACT. REQUIREMENTS INCLUDE BUT ARE NOT LIMITED TO OBTAINING TWO CONSECUTIVE SETS OF ACCEPTABLE SAMPLES THAT ARE COLLECTED A MINIMUM OF 24 HOURS APART. ONE SAMPLE SHALL BE COLLECTED FOR EVERY 1200 FEET, END OF EACH BRANCH, AND THE END OF THE LINE FOR RESIDUAL CHLORINE, TOTAL COLIFORM, AND E. COLI ANALYSIS. AFTER DISINFECTION THE LINE MUST BE FLUSHED. CHLORINE RESIDUAL SAMPLE MUST YIELD A RESULT OF 1.0 PPM OR LESS BEFORE TOTAL COLIFORM OR E. COLI ANALYSIS MAY BE PERFORMED. ALL SAMPLE COLLECTIONS SHALL BE PERFORMED BY INDIVIDUALS CERTIFIED FOR DRINKING WATER SAMPLE COLLECTION BY THE MARYLAND DEPARTMENT OF ENVIRONMENT. LABORATORIES UTILIZED FOR THE ANALYSIS SHALL BE CERTIFIED BY THE MARYLAND DEPARTMENT OF ENVIRONMENT FOR TOTAL COLIFORM AND E. COLI ANALYSIS. IF THE CONTRACTOR HAS ALLOWED CONTAMINANTS TO ENTER THE PIPE DURING CONSTRUCTION (THIS SHALL BE DETERMINED BY INSPECTOR) THEN SAMPLING MAY BE REQUIRED AT REDUCED DISTANCE INTERVALS AS DETERMINED BY THE DUSWM. DISINFECTED WATER SOF CHLORINE RESIDUAL 1.0 PPM OR LESS) WILL STAND IN THE LINE FOR AT LEAST 16 HOURS AFTER A FINAL FLUSH. CERTIFIED BACTERIAL TEST RESULTS SHALL BE PROVIDED TO THE DUSWM AND SHALL INCLUDE CERTIFICATION INFORMATION FOR BOTH THE SAMPLE COLLECTOR AND LABORATORY.

PUBLIC MATERIALS/QUANTITIES LIST (NOT FOR BIDDING PURPOSES)				
ITEM: WATER	UNIT	ESTIMATED	AS-BUILT	SUPPLIER/MATERIAL
(TO BE COMPLETED BY THE COUNTY)				
6" D.I.P. CL. 52	LF	37		
6" WATER METER VAULT PER DUSWM DET. 112.1	EA.	1		

PRIVATE MATERIALS/QUANTITIES LIST (NOT FOR BIDDING PURPOSES)				
ITEM: WATER	UNIT	ESTIMATED	AS-BUILT	SUPPLIER/MATERIAL
(TO BE COMPLETED BY THE COUNTY)				
6" D.I.P. CL. 52	LF	291		
6"x6"x6" TEE	EA.	1		
6" 1/8 HORIZONTAL BEND (DUCTILE IRON)	EA.	1		
6" 1/16 HORIZONTAL BEND (DUCTILE IRON)	EA.	2		
6" 1/4 HORIZONTAL BEND (DUCTILE IRON)	EA.	1		
6" CAP (DUCTILE IRON)	EA.	2		
6"x6" HYDRANT TEE (DUCTILE IRON)	EA.	1		
FIRE HYDRANT ASSEMBLY (INCL. 6" VALVE, VALVE BOX, LEAD & PIPE) (FIRE HYDRANT AS MANUFACTURED BY AMERICAN DARLING CORP.)	EA.	1		
ITEM: SEWER	UNIT	ESTIMATED	AS-BUILT	SUPPLIER/MATERIAL
(TO BE COMPLETED BY THE COUNTY)				
2" PVC LOW PRESSURE SEWER (SDR-21)	LF	114		
2" - 1/8 HORIZONTAL BEND (PVC SDR-21)	EA.	1		
6" SEWER SERVICE CONNECTION (PVC SDR-35)	LF	113		
6" - 1/8 HORIZONTAL BEND (PVC SDR-35)	EA.	2		
COMMERCIAL MONITORING MANHOLE - TYPE I	EA.	1		
GRINDER PUMP	EA.	1		
GREASE SEPARATOR	EA.	1		
6" CLEANOUT	EA.	3		

NOTES:

- FOR MONITORING MANHOLE DETAIL AND SPECIFICATIONS, SEE DUSWM STANDARD DETAIL # 201.7.
- FOR CLEANOUT DETAIL AND SPECIFICATIONS, SEE DUSWM STANDARD DETAIL #206.4.
- FOR GRINDER PUMP DETAILS AND SPECIFICATION, REFER TO THE MANUFACTURE SHOP DRAWINGS.
- FOR GREASE SEPARATOR DETAILS AND SPECIFICATION, REFER TO THE MANUFACTURE SHOP DRAWINGS.



REVISION	DATE	REVISION	DATE	BY	DATE
		BASE DATA		CADD	
		DESIGNED		SN	
		DRAWN		SN	
		REVIEWED		TJC	
RELEASE FOR					
BY					DATE

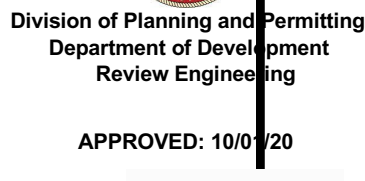
Owner:
NATELLI COMMUNITIES
506 MAIN STREET
3RD FLOOR
GAITHERSBURG, MD 20878
PHONE: 1-301-670-4020
CONTACT: PAUL COLEMAN

W/S CONTRACT NO.: 403QC9-SW
**WATER SEWER
PROFILES & DETAILS**

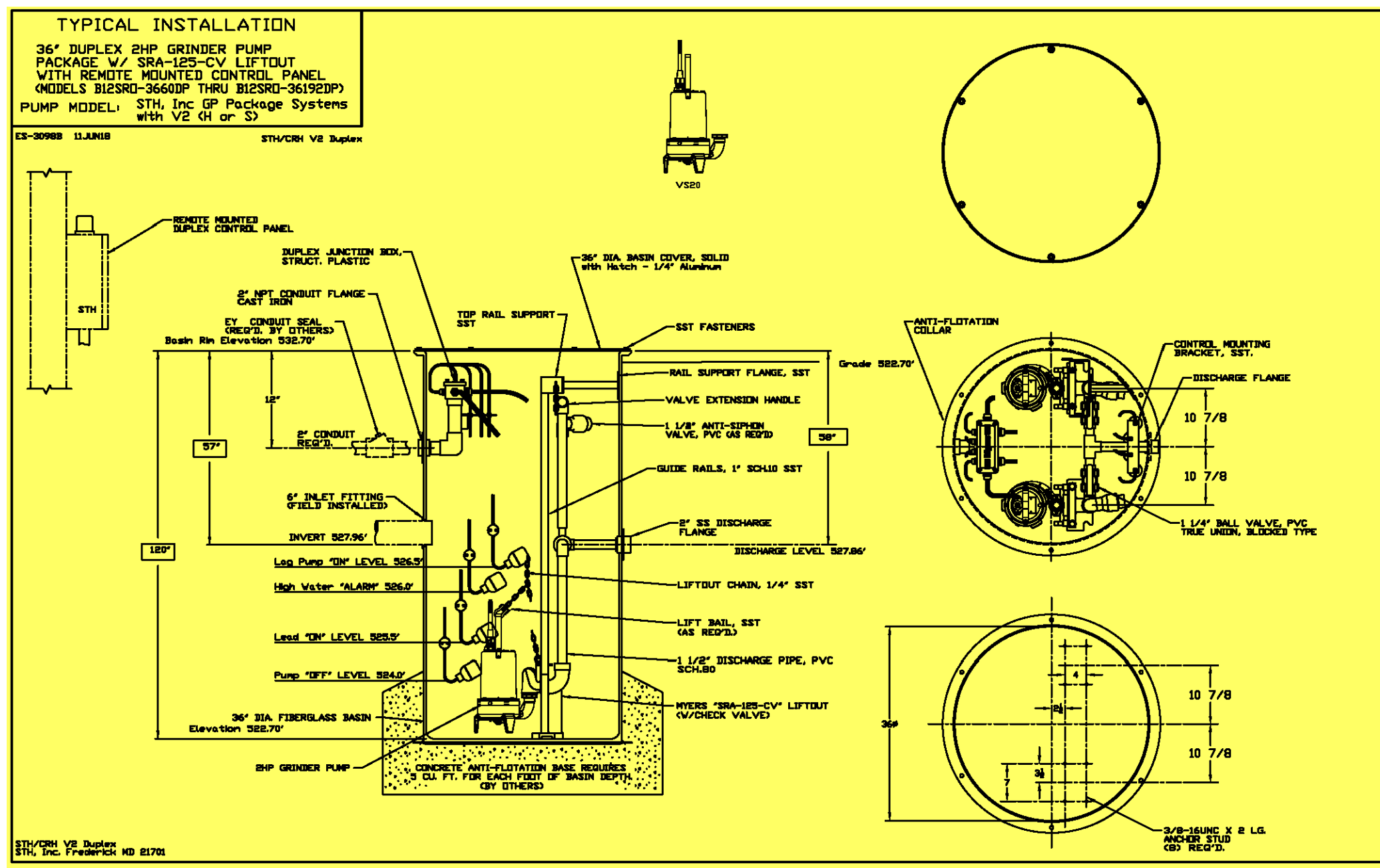
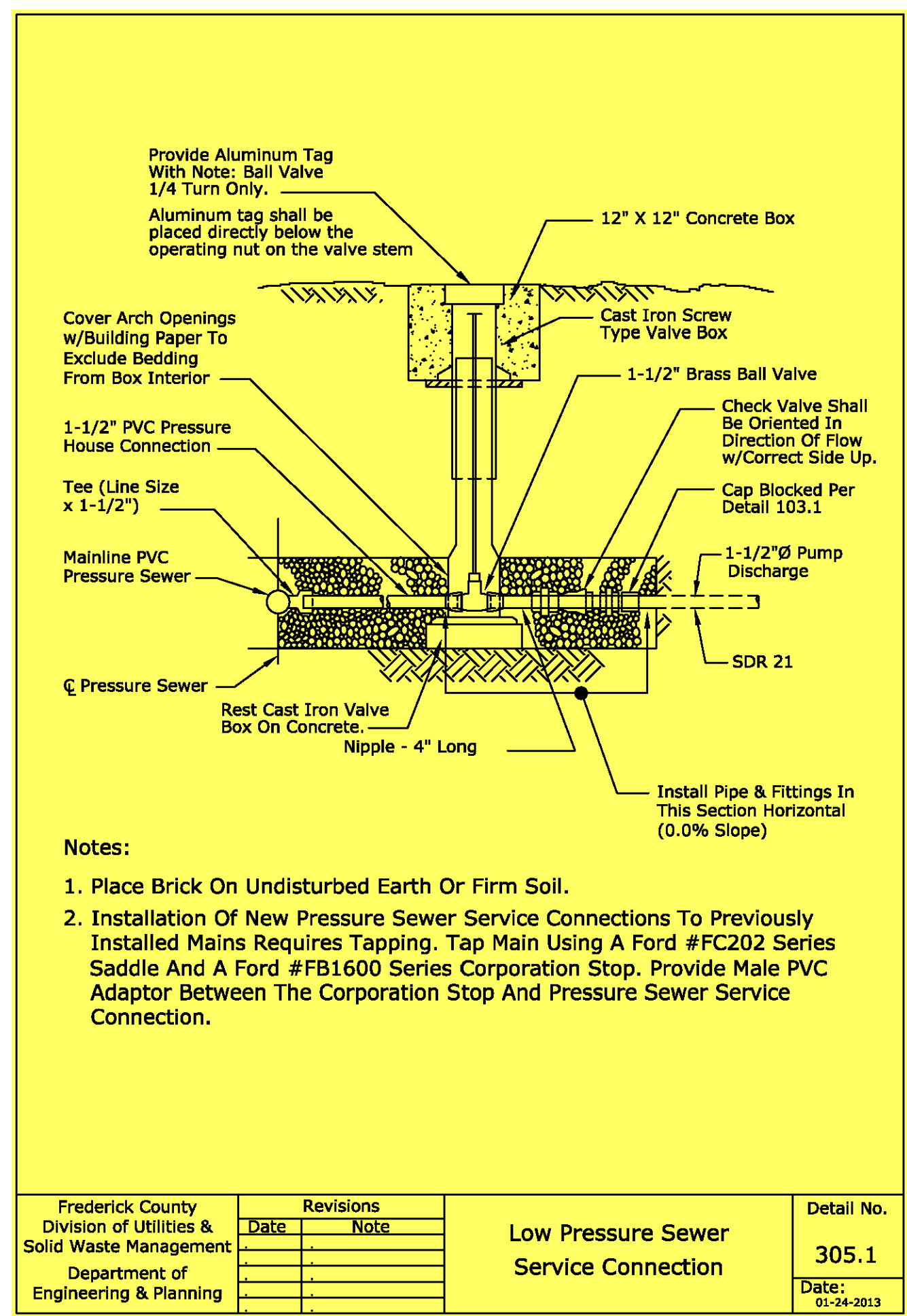
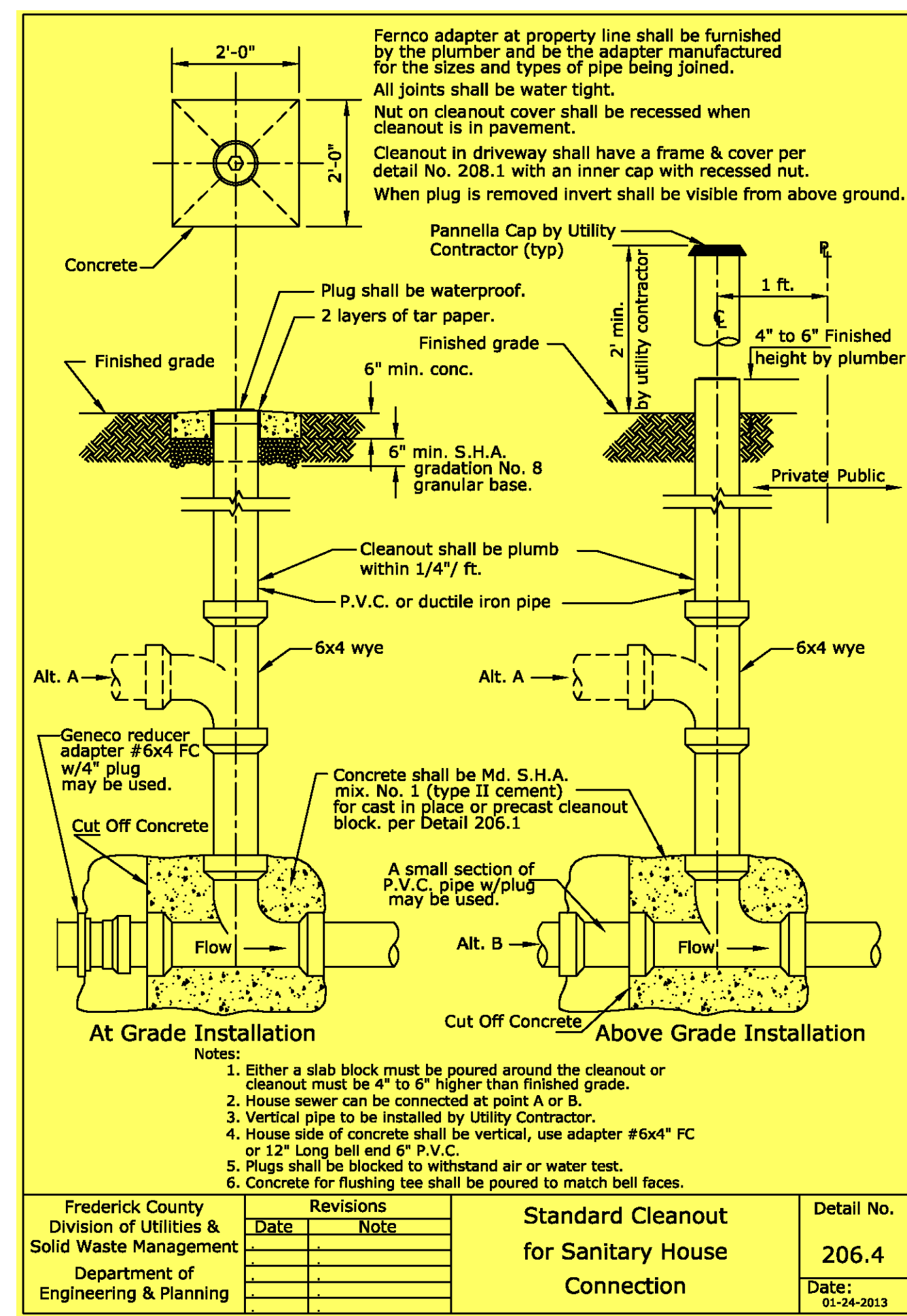
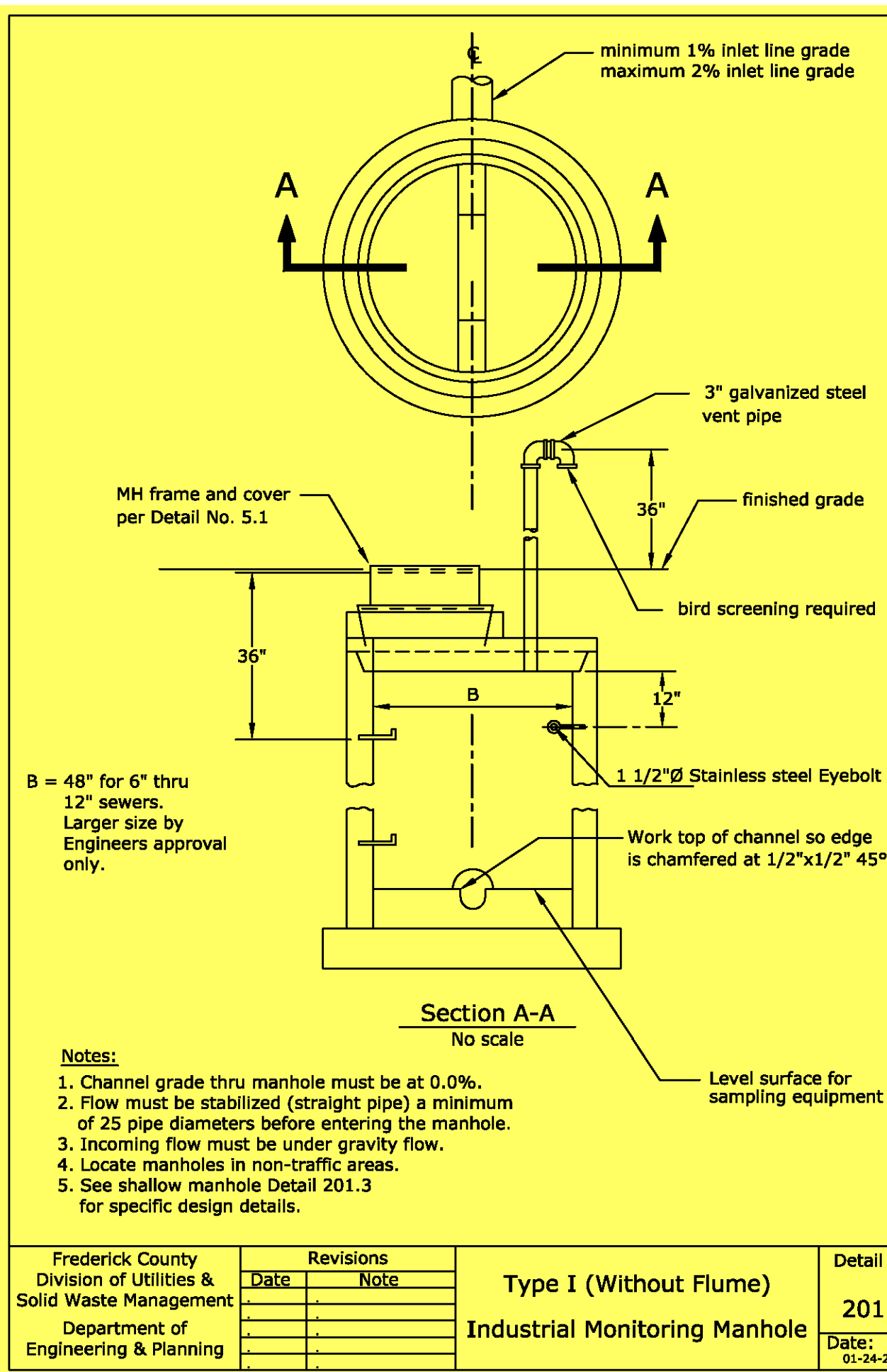
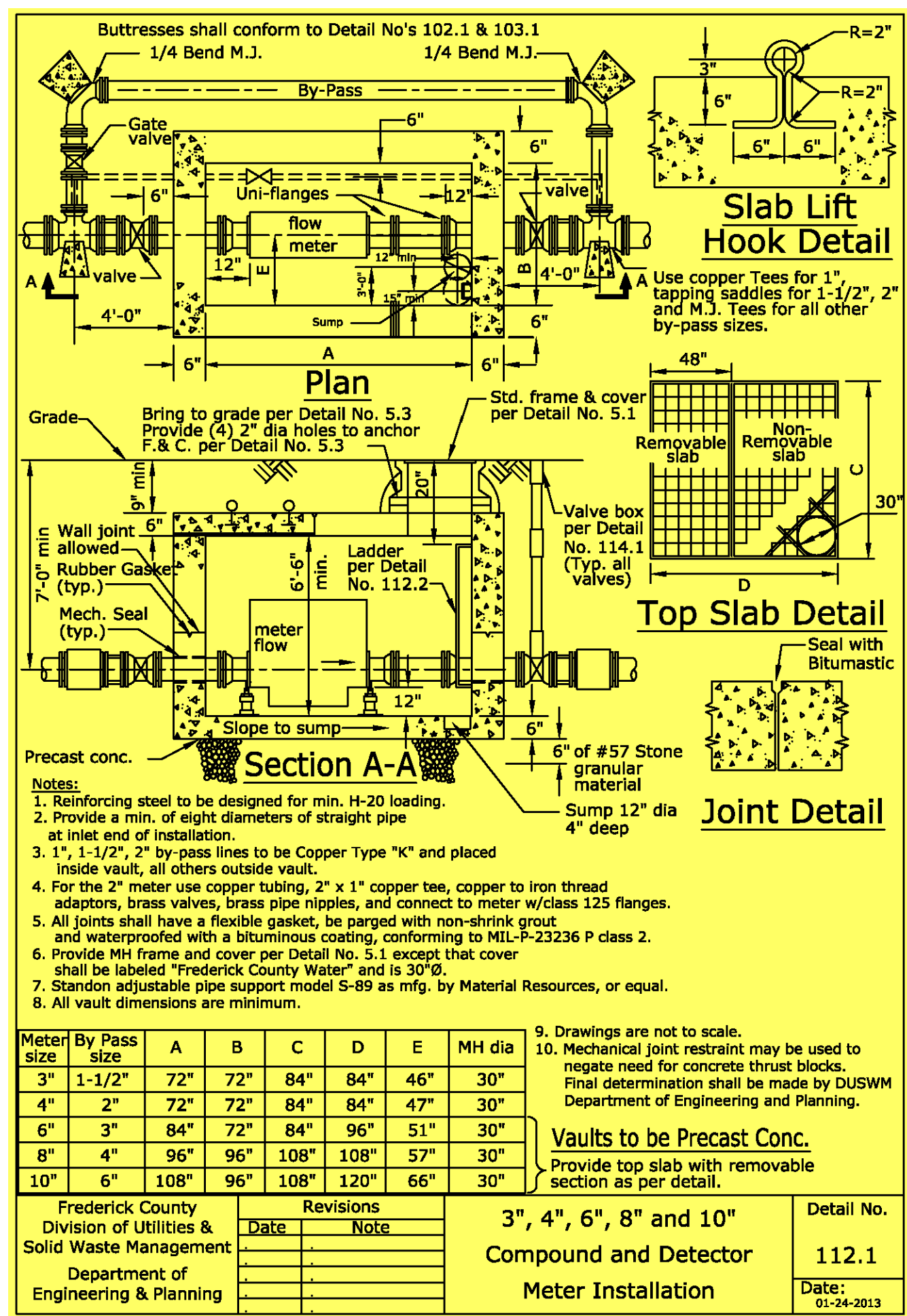
**RODGERS
CONSULTING**
19847 Century Boulevard, Suite 200, Germantown, Maryland 20874
Ph: 301.948.4700 Fx: 301.948.6256 www.rodgers.com

IMPROVEMENT PLAN - COMMERCIAL RETAIL CENTER
Lot C9
Linganore Town Center
TAX MAP 79, PARCEL 17
ELECTION DISTRICT NO. 9
FREDERICK COUNTY, MARYLAND

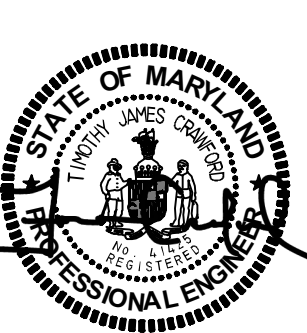
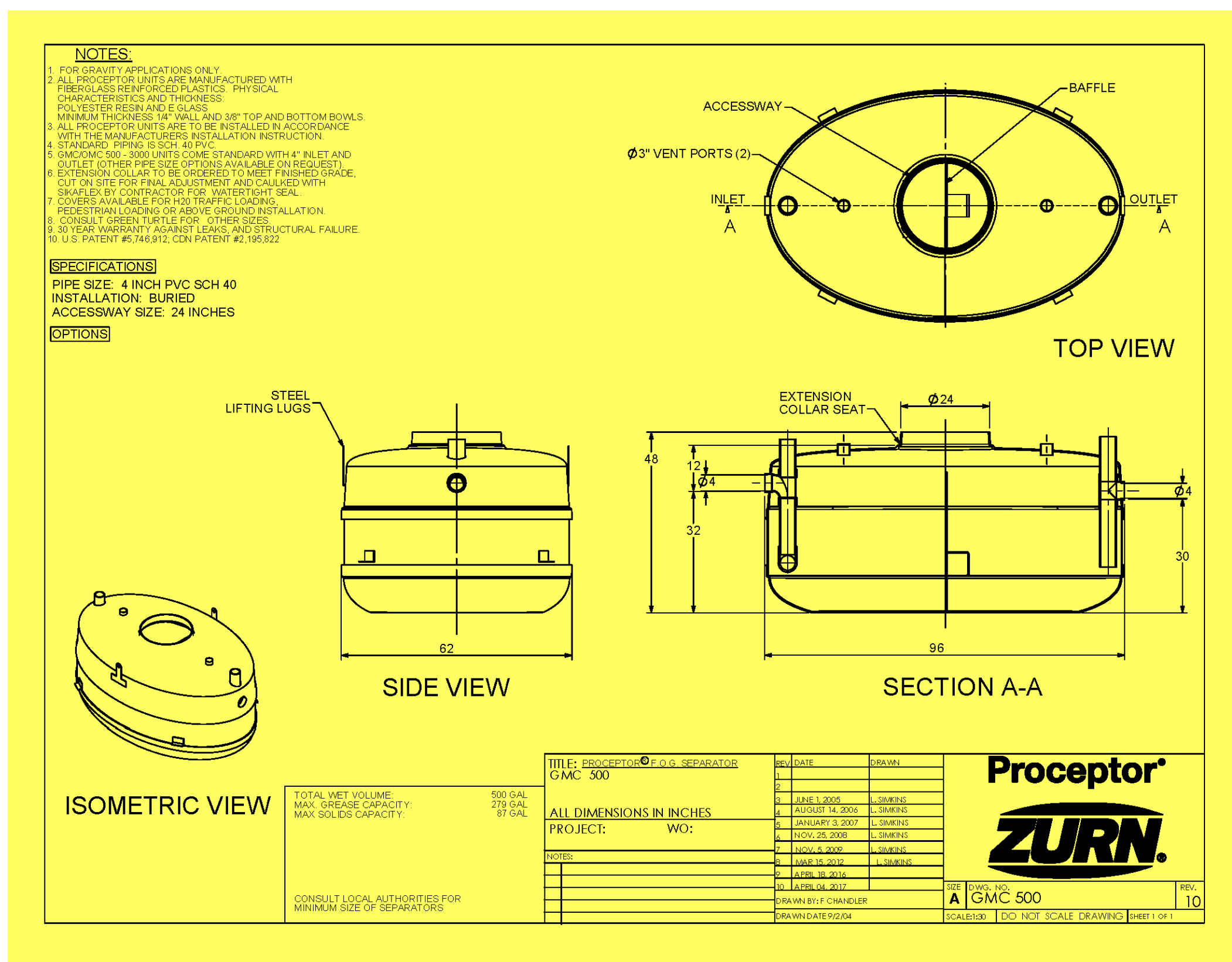
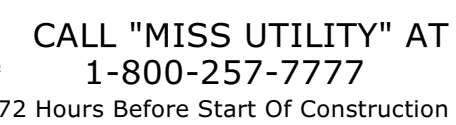
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JOB No.	0529AJ
DATE:	JULY 2020
INDEX No.	WSP-01
SHEET No.	11 OF 17



NOTE: FREDERICK COUNTY ASSUMES NO LIABILITY FOR DESIGN AND/OR CONSTRUCTION.



DUPLEX GRINDER PUMP DETAIL
(or approved equal)
Not to scale



FOR CONSTRUCTION

REVISION	DATE	REVISION	DATE	BASE DATA	BY	DATE	Owner: NATELLI COMMUNITIES 506 MAIN STREET 3RD FLOOR GAITHERSBURG, MD 20878 PHONE: 1-301-670-4020 CONTACT: PAUL COLEMAN
				DESIGNED	SN		
				DRAWN	SN		
				REVIEWED	TJC		
				RELEASE FOR		<input type="checkbox"/>	
				BY	DATE		

WATER SEWER DETAILS

RODGERS
CONSULTING

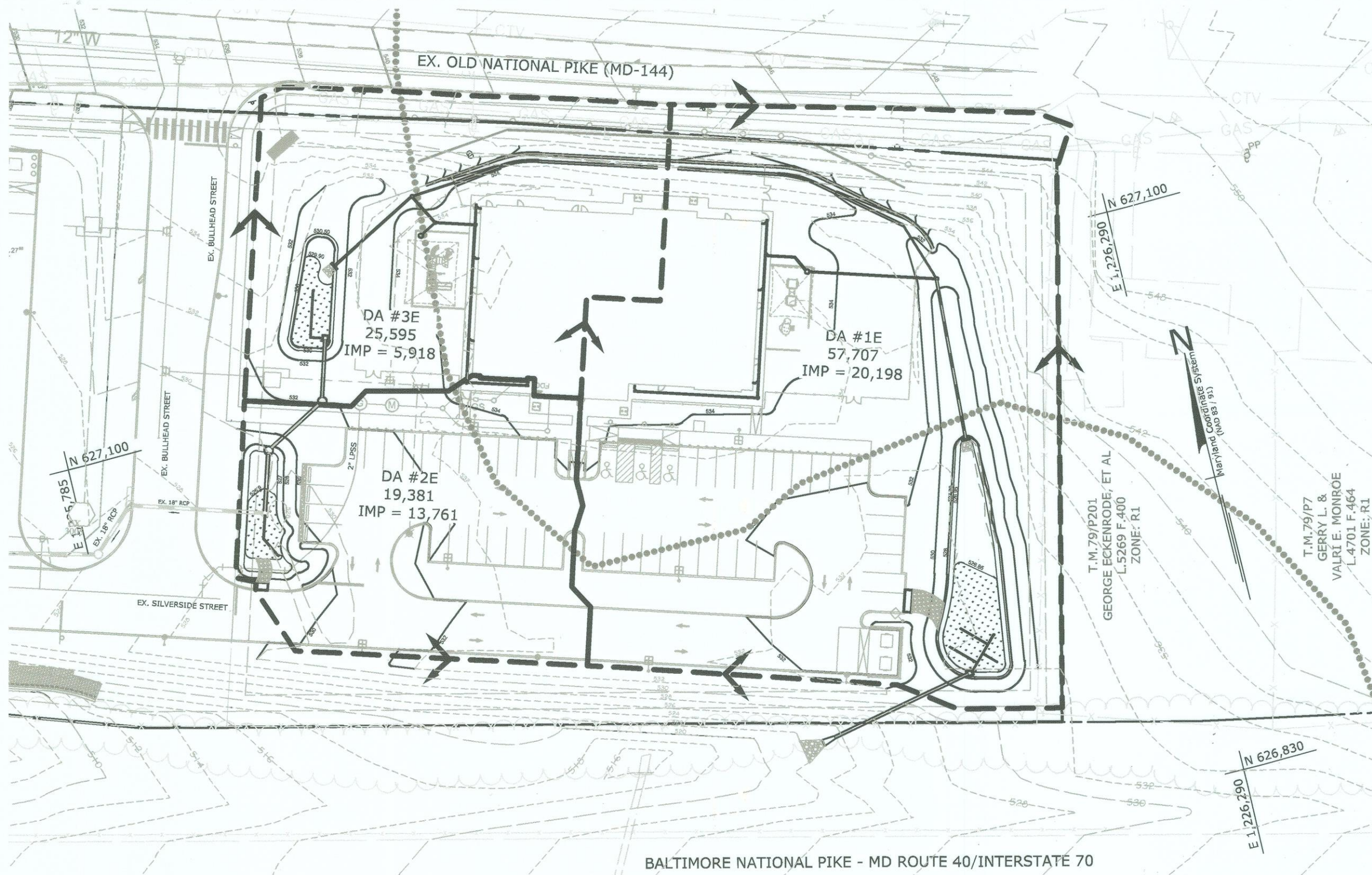
19847 Century Boulevard, Suite 200, Germantown, Maryland 20874
Ph: 301.948.4700 Fx: 301.948.6256 www.rodgers.com

IMPROVEMENT PLAN - COMMERCIAL RETAIL CENTER
Lot C9
Linganore Town Center

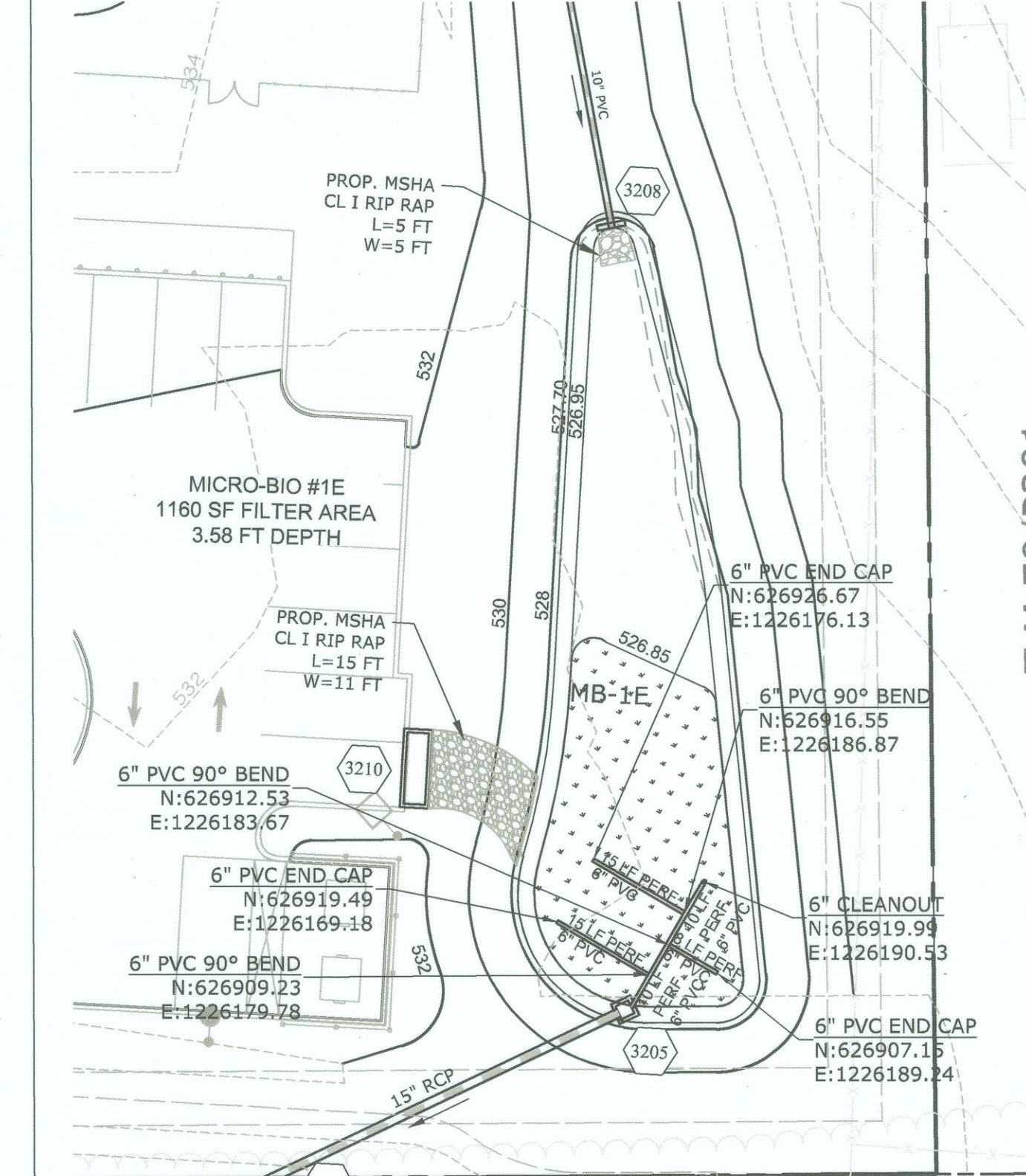
TAX MAP 79, PARCEL 17
ELECTION DISTRICT NO. 9
FREDERICK COUNTY, MARYLAND

SCALE:	NONE
JOB No.	0529AJ
DATE:	JULY 2020
INDEX No.	WSD-01
SHEET No.	12 OF 17

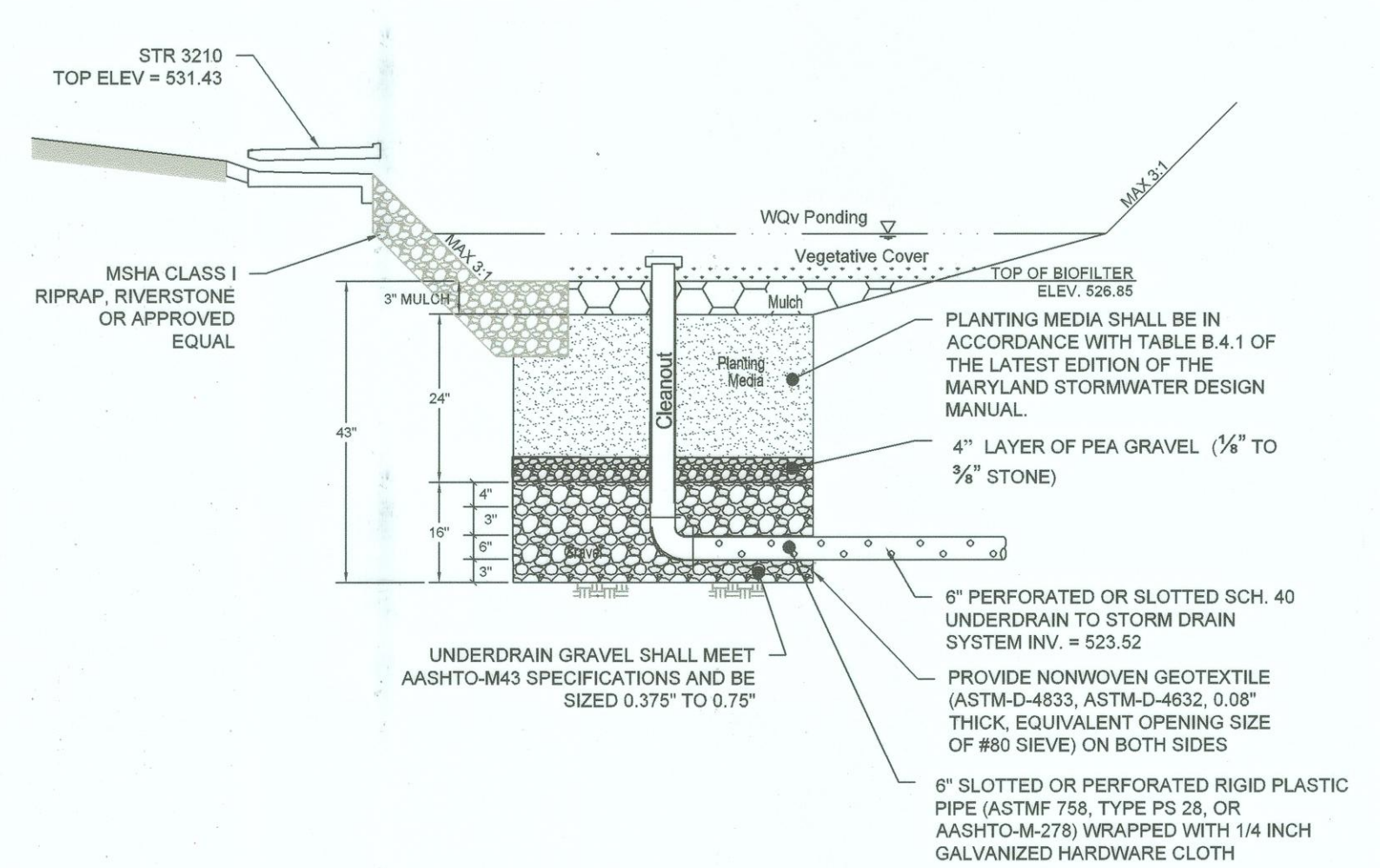
NOTE: FREDERICK COUNTY ASSUMES NO LIABILITY FOR DESIGN AND/OR CONSTRUCTION.



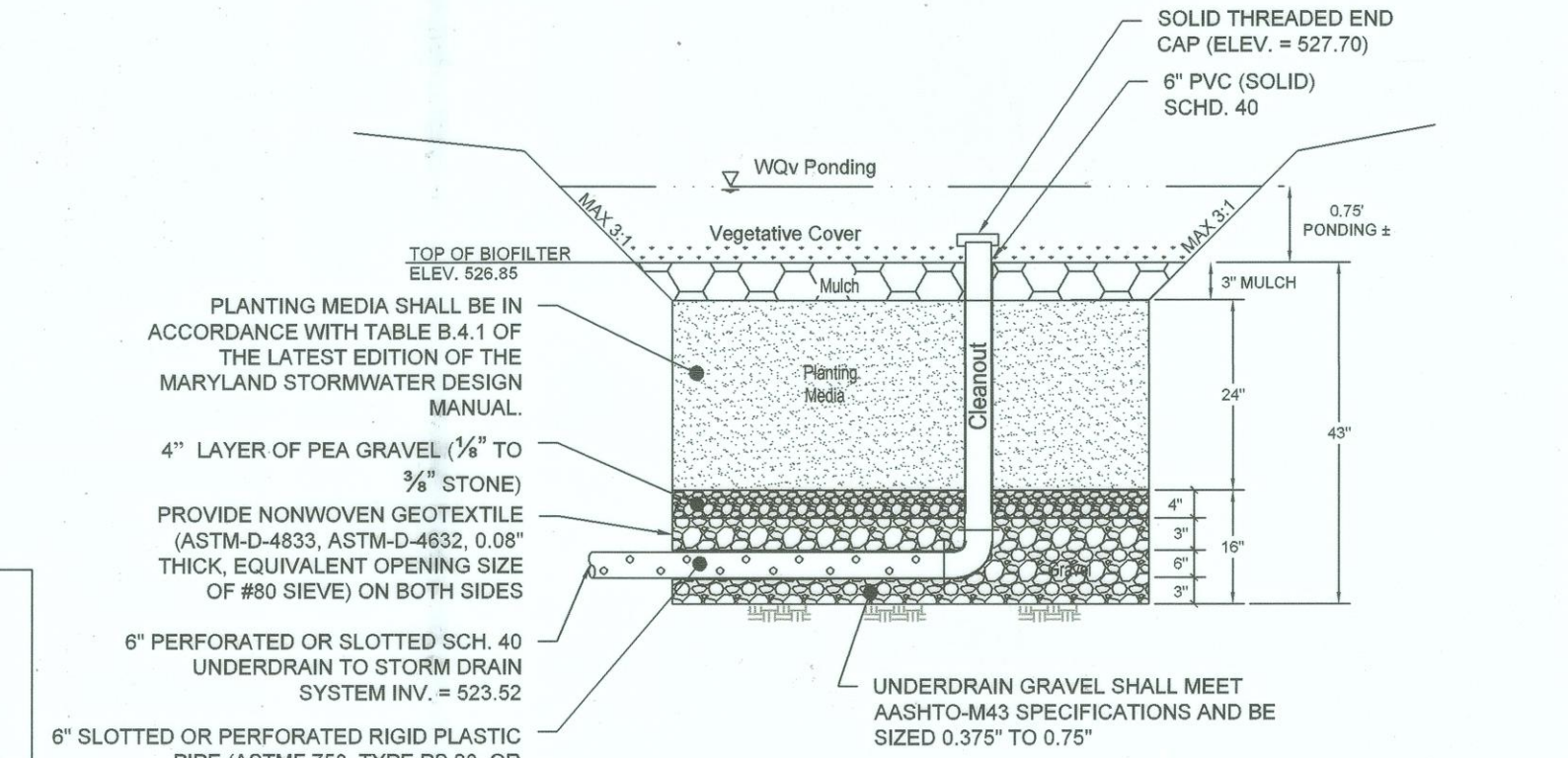
ESD DA MAP
SCALE: 1" = 50'



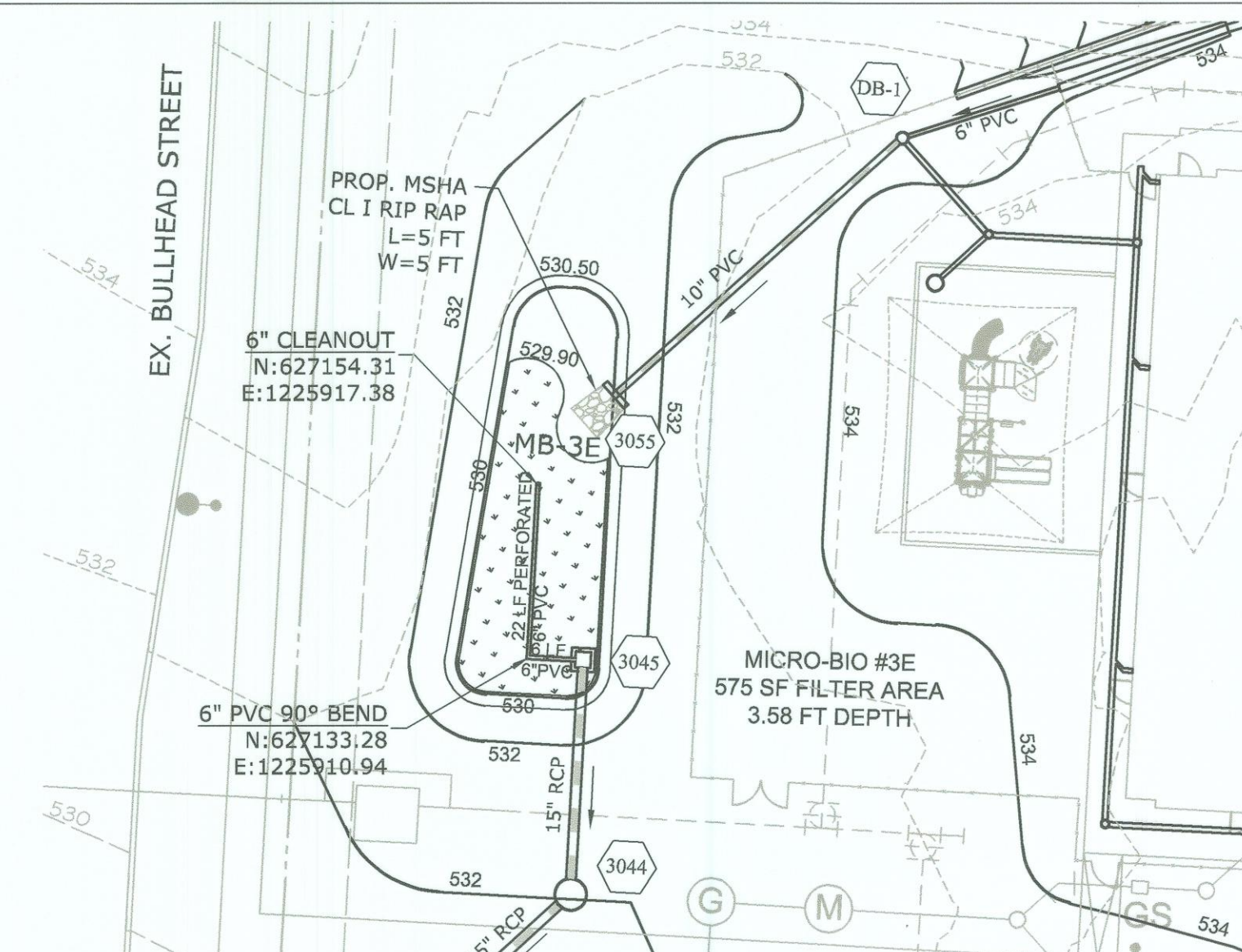
MICRO-BIORETENTION 1E PLAN VIEW
SCALE: 1" = 20'



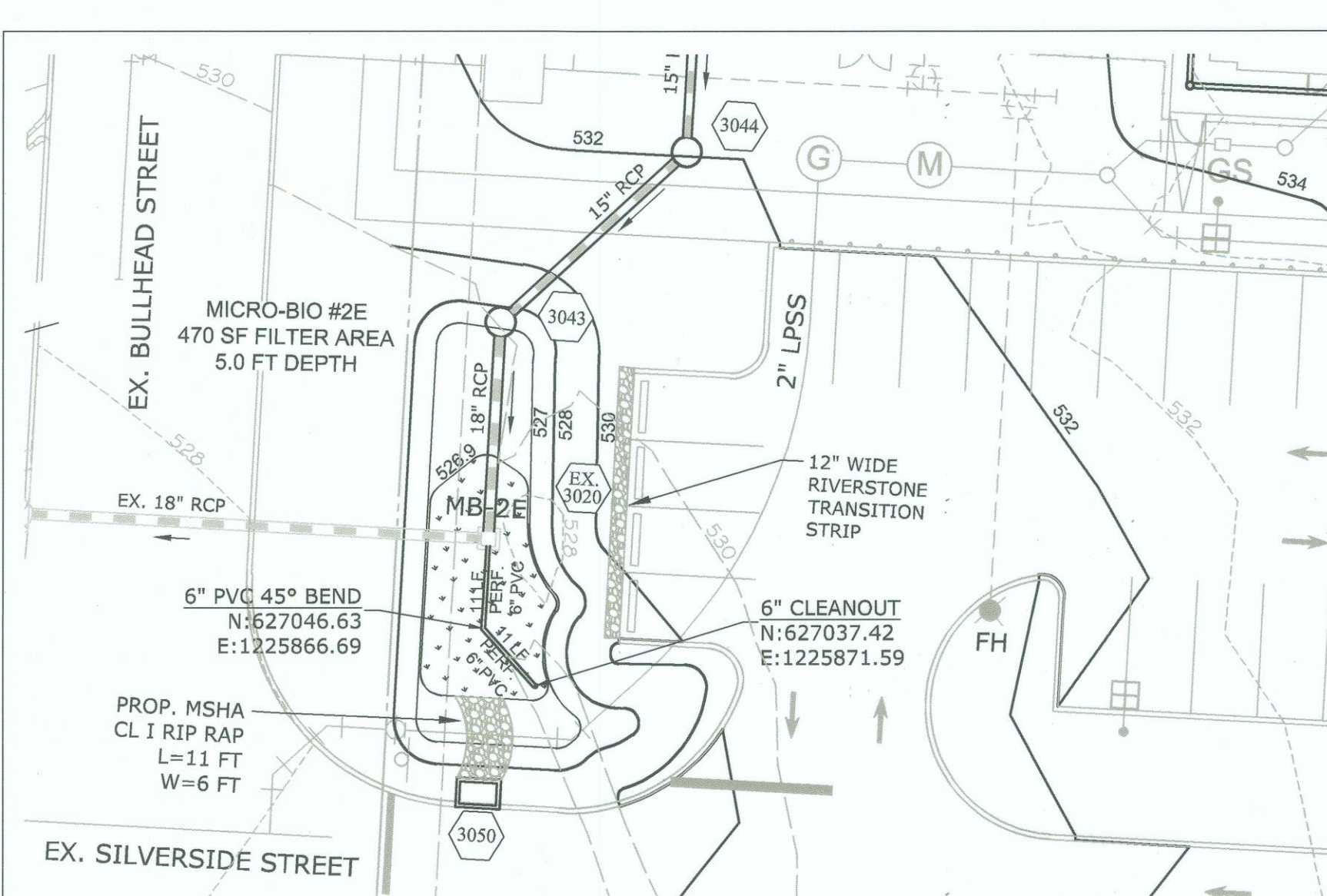
MICRO-BIORETENTION 1E DETAIL/ CROSS SECTION
N.T.S.



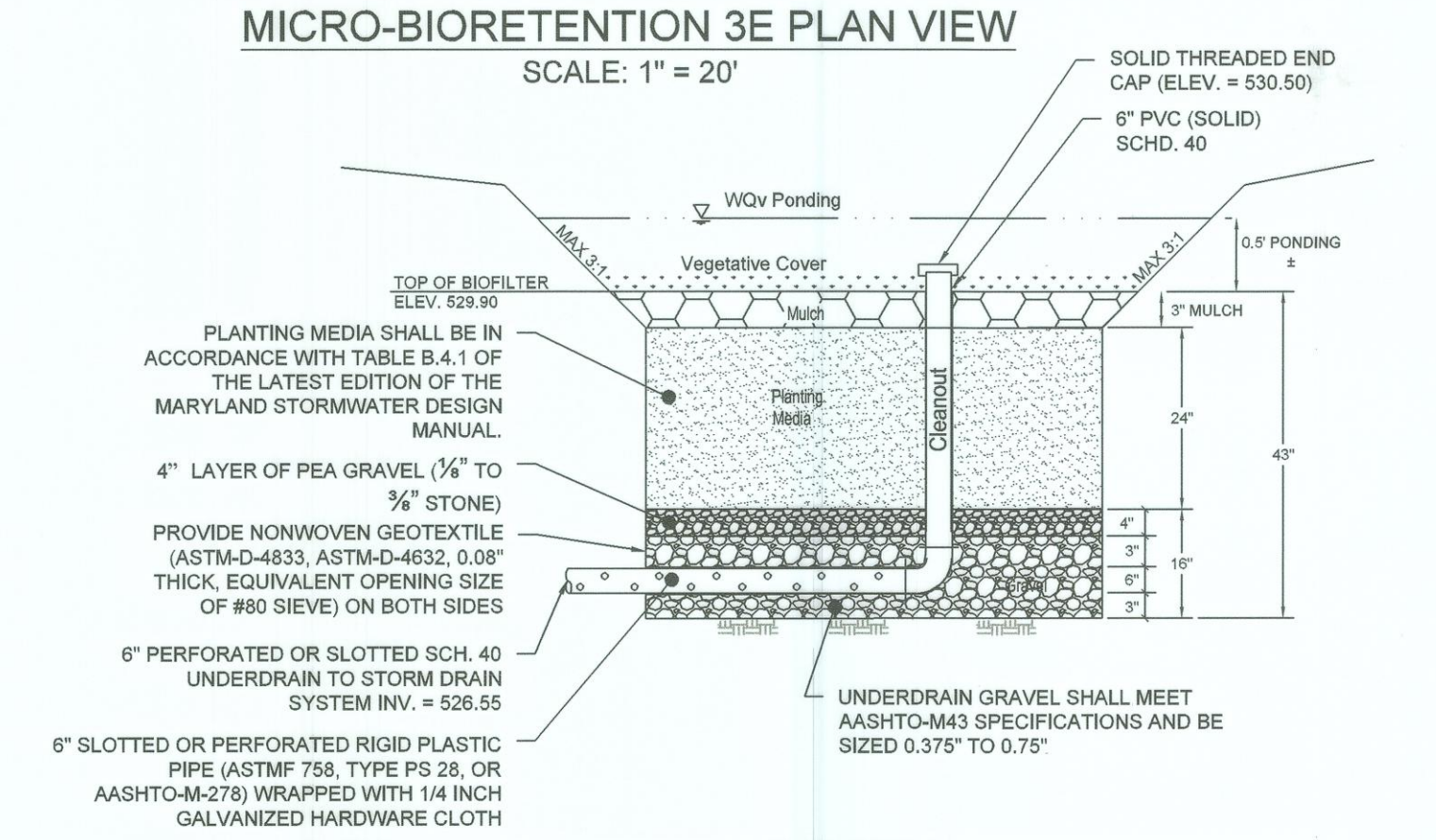
MICRO-BIORETENTION 1E ELEVATION VIEW
N.T.S.



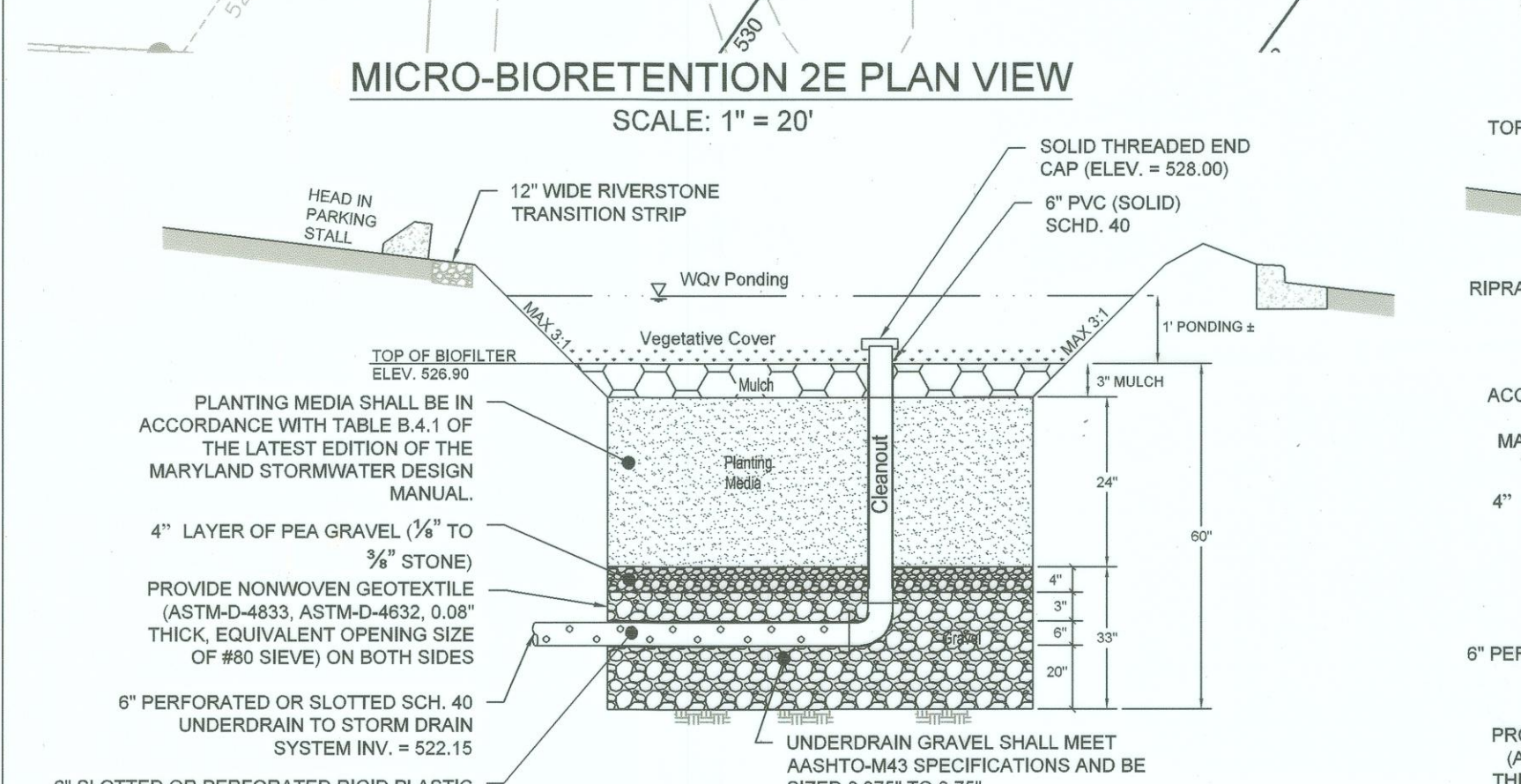
MICRO-BIORETENTION 3E PLAN VIEW
SCALE: 1" = 20'



MICRO-BIORETENTION 2E PLAN VIEW
SCALE: 1" = 20'

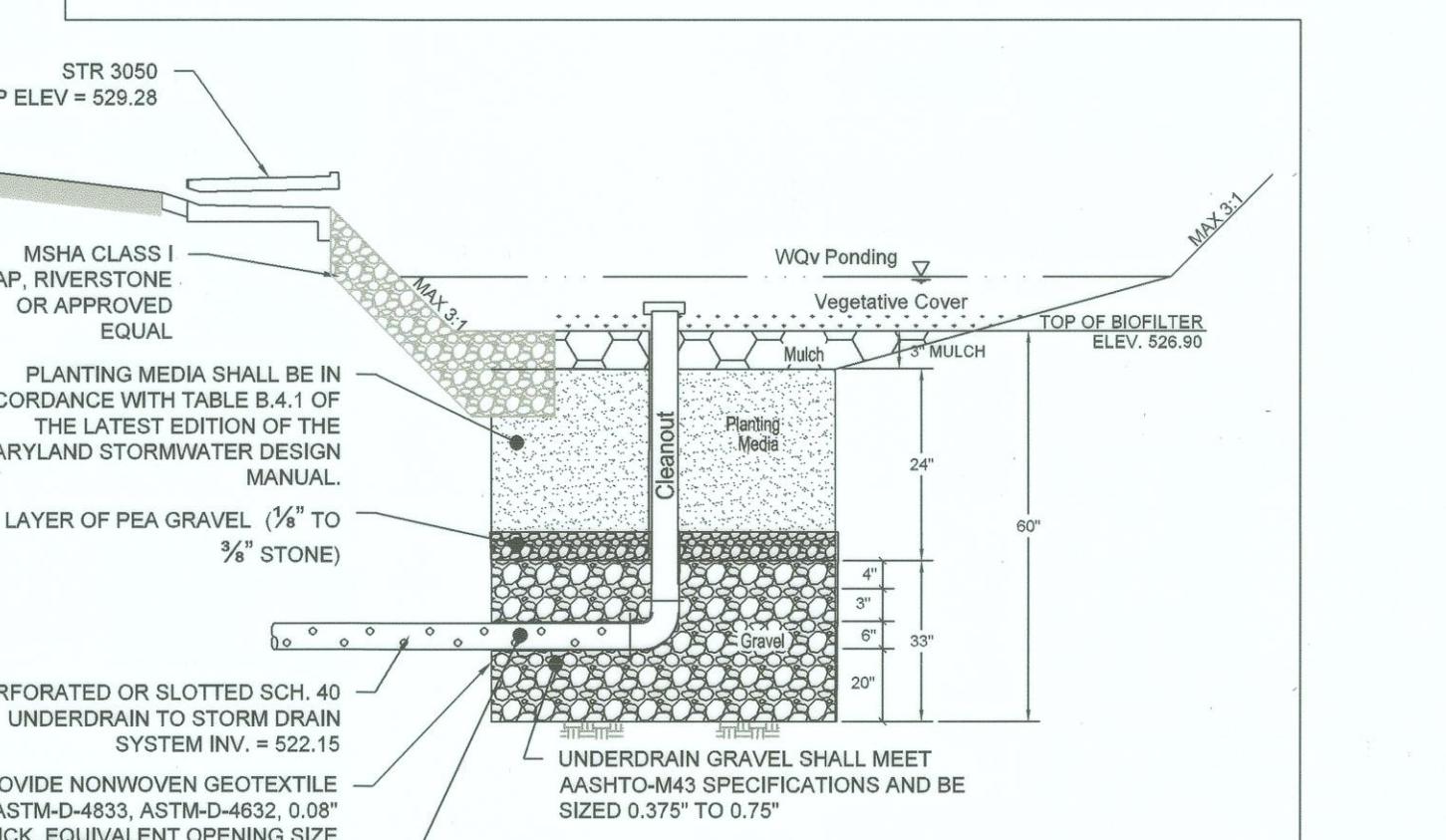


MICRO-BIORETENTION 3E DETAIL/ CROSS SECTION
N.T.S.



MICRO-BIORETENTION 2E ELEVATION VIEW
N.T.S.

Table B.4.1 Materials Specifications for Micro-Bioretenction, Rain Gardens & Landscape Infiltration-			
Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil (2' to 4' deep)	loamy sand (60 - 65%) & compost (35 - 40%) or sandy loam (30%) & coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam, clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mulch	shredded hardwood		
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	aged 6 months, minimum; no pine or wood chips
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile	AASHTO M-43	n/a	PE Type I nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe, 3/8" perf. @ 6" on center, 4 holes per row, minimum of 3" of gravel over pipes, not necessary underdrain pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth.
Poured in place concrete (if required)	MSHA Mix No. 3, f'c = 3500 psi (28 days, normal weight, air-entrained) conforming to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test, all concrete design (cast-in-place or pre-cast) not using previously approved data or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACT Code 350.8.9; vertical loading (H-10 or H-20); allowable horizontal loading (based on soil pressure); and analysis of potential cracking.
Sand	AASHTO-M-6 or ASTM-C-33	0.075" to 0.04"	Sand substitutions such as Duabase and Gypsum (AASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.



MICRO-BIORETENTION 2E DETAIL/ CROSS SECTION
N.T.S.

Maryland DNR Dry Meadow Establishment (for ESD facilities)
4913 sf (0.11 acres) of ESD facility to plant using the following methods.
<https://dnr.maryland.gov/wildlife/Pages/habitat/wawildflowers.aspx>
Beardtongue (Penstemon digitalis)-W
Bee balm (Monarda didyma)- W
Big bluestem (Andropogon gerardii)- G
Black-eyed susan (Rudbeckia hirta)- W
Blazingstar (Liatris spicata)- W
Canada wild rye (Elymus canadensis)- W
Common milkweed (Asclepias syriaca)- W
Butterflyweed (Asclepias tuberosa)- W
Evening primrose (Oenothera biennis)- W
Indian grass (Sorghastrum nutans)- G
Little bluestem (Schizachyrium scoparium)- G
New England aster (Aster novae-angliae)-W
New York ironweed (Vernonia noveboracensis)-W
Partridge pea (Chamaecrista fasciculata)- L
Purple coneflower (Echinacea purpurea)- W
Purpletop (Tridens flavus)- G
Roundhead bush clover- (Lespedeza capitata)- L
Spotted beebalm (Monarda punctata)- W
Sunflowers (Helianthus annuus)- W
Virginia wild rye (Elymus virginicus)- G

It should be noted that cheaper seeds and brands from national or regional distributors could have a large percentage of seed that is not viable. This means less seed will germinate. Also, pre-mixed blends of seeds often contain seeds that have incompatible environmental requirements. The best way to buy seeds for your meadow is to use a reputable, specialized source, which can help put together a mix that is fresh and contains varieties that work well together and in the environment you can provide. Follow the seeding rate recommended by the nursery that prepared your mix. When ordering seed, be sure to ask for "Pure Live Seed" (PLS). PLS is the percentage of live (viable) seed found in a bulk seed bag. A bag of bulk seed should be at least 75 percent PLS for good meadow establishment. The remaining percentage of the bulk seed bag contains plant parts.

For mixes with warm-season grasses, the Department of Natural Resource recommends the following seeding rate/acre in pounds of pure live seed:

Upland/Dry Soils-Grasses: 3 lbs. Indian Grass, 2 lbs. Big bluestem, 1 lb. Little bluestem with your choice of legumes and forbs. After you have decided on the plants to include, you have to choose a method of planting your meadow. Depending on your budget, your time and size of area, you can start slow or fast. Even if you plant full-size plants, chances are they will need several years to settle in and weave their roots together. The following list contains ways in which to plant your meadow.

Sow seeds. The seedbed must be firm when you plant, and seeds should be planted at a depth of 1/2 inch. Plant "seed" plants. Let the seed plants spread, or help them by scattering their seeds. Plant "plugs" or bare-root plants. After planting, mulch in between them (lowest maintenance but most initial work). Plant some plants and scatter seeds between them. Once everything has been planted, maintenance is relatively low. In the first year, when plants reach 12-18 inches in height, mow them down to 6 inches. Do not mow less than 6 inches as this can encourage weed growth. Most native plants will have extensive root systems by their first year, so mowing them will not damage them.

In the second year, cut back plants to about one foot high since plants will be larger. This can be achieved using a string trimmer for smaller areas. Don't use herbicides!

In the third year, mow the field close to the ground in late Fall or early Spring. Be sure to remove debris to allow plants to grow. Fall is usually the best time for this maintenance as many animals nest in meadows in the spring.

FREDERICK SOIL CONSERVATION DISTRICT

APPROVED BY [Signature] DISTRICT MANAGER

DATE 8/21/20

SCD approval for sediment and erosion control is contingent upon issuance of all applicable regulatory permits.



CALL "MISS UTILITY" AT 1-800-257-7777 72 Hours Before Start Of Construction

REVISION	DATE	REVISION	DATE	BY	DATE
		BASE DATA		CADD	
		DESIGNED		SN	
		DRAWN		SN	
		REVIEWED		TJC	
		RELEASE FOR			
		BY		DATE	

Owner: NATELLI COMMUNITIES
506 MAIN STREET
3RD FLOOR
GAITHERSBURG, MD 20878
PHONE: 1-301-670-4020
CONTACT: PAUL COLEMAN

STORMWATER MANAGEMENT PLAN

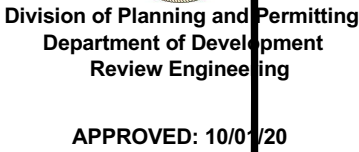
RODGERS CONSULTING

19847 Century Boulevard, Suite 200, Germantown, Maryland 20874
Ph: 301.948.4700 Fx: 301.948.6256 www.rodgers.com

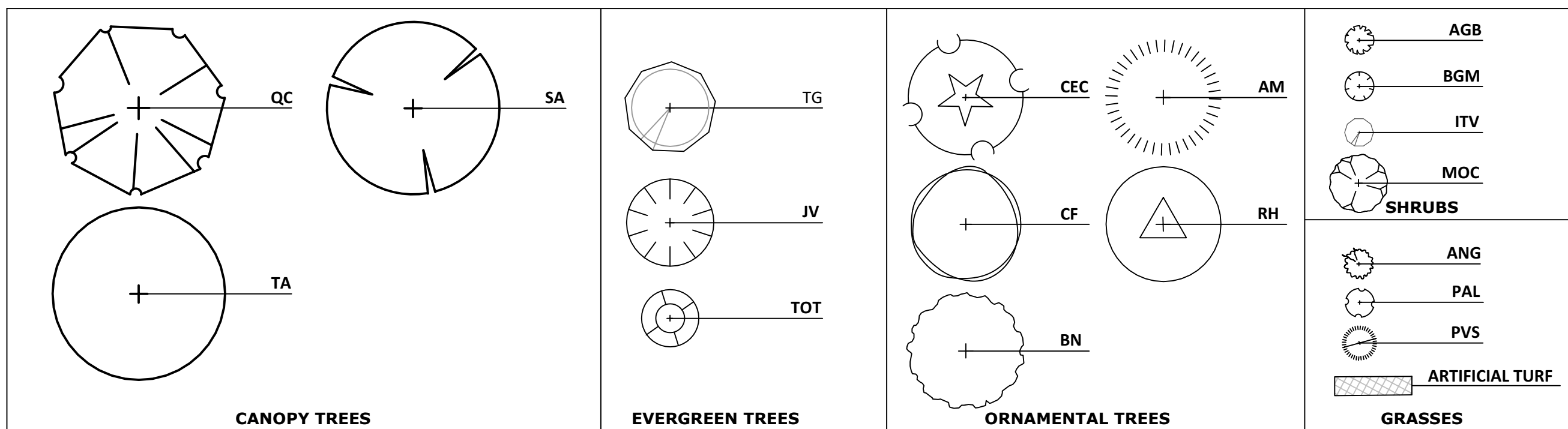
IMPROVEMENT PLAN - COMMERCIAL RETAIL CENTER
Lot C9
Lingamore Town Center

TAX MAP 79, PARCEL 17
ELECTION DISTRICT NO. 9
FREDERICK COUNTY, MARYLAND

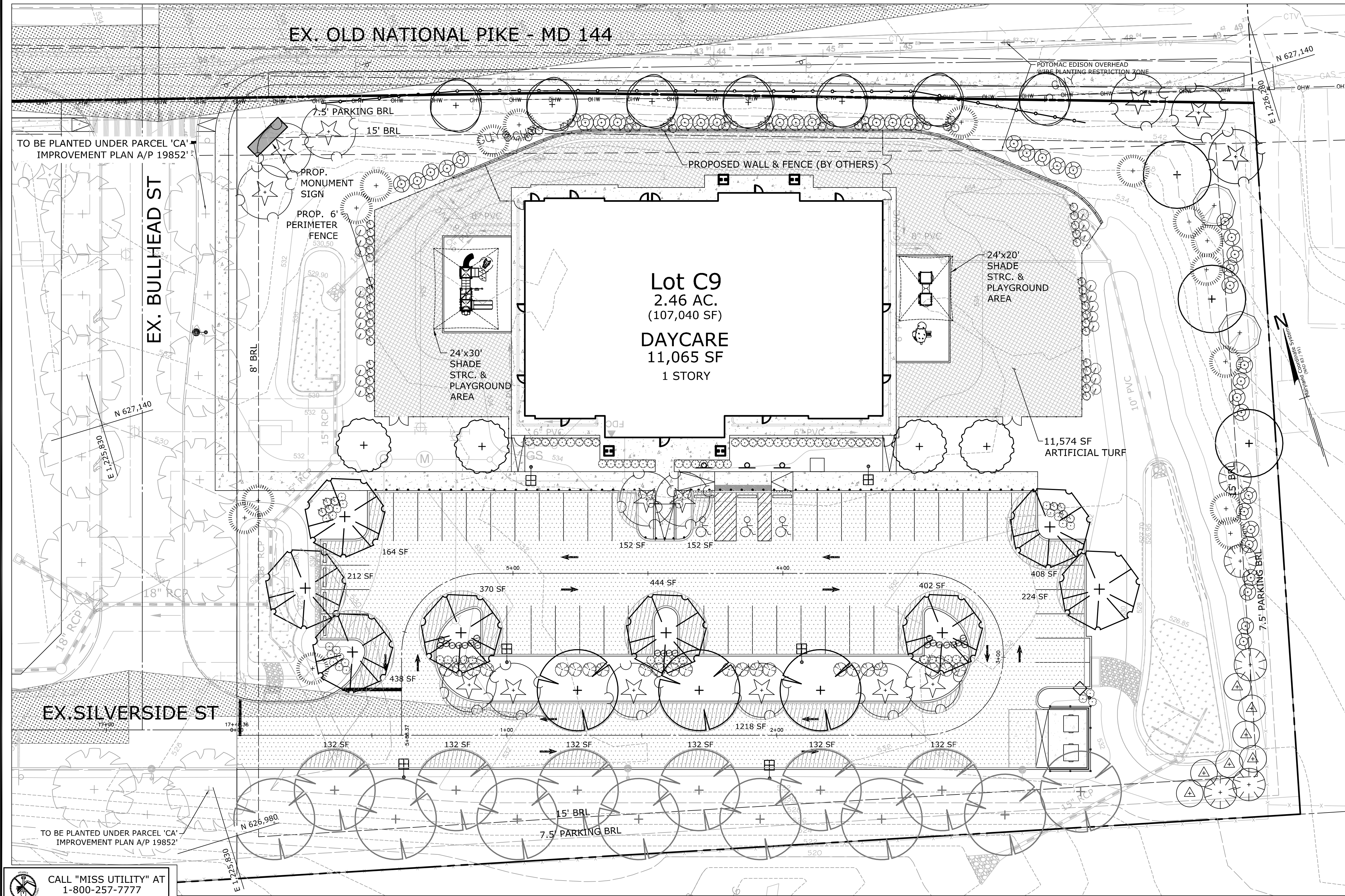
SCALE: AS SHOWN
JOB No. 0529AJ
DATE: JULY 2020
INDEX No. SWM-02
SHEET No. 14 OF 17



KEY



NOTE: FREDERICK COUNTY ASSUMES NO LIABILITY FOR DESIGN AND/OR CONSTRUCTION.





LANDSCAPE NOTES:

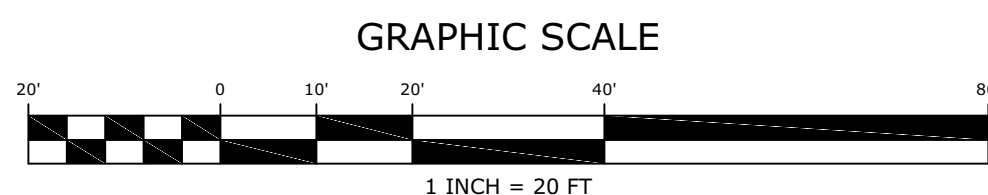
3. Planting schedule is on sheet LP-02 LANDSCAPE DETAILS.
4. Plants shall conform to current "American Standards for Nursery Stock" by the American Nursery & Landscape Association (ANLA), particularly with regards to site, growth, and size of ball and density of branch structure. Contractor to insure conformance to national and local building codes and ordinances.
5. All landscaping shall be maintained in living condition.
6. All plants (888 or container) shall be properly identified by weatherproof labels securely attached hereto before delivery to project site. Labels shall identify plants by name, species and size. Labels shall not be removed until the final inspection by the owners representative.
7. Any material and/or work may be rejected by the owners representative if it does not meet the requirements of the specifications. The contractor shall remove all rejected materials from the site.
8. The contractor shall furnish all plants in quantities and sizes to complete the work as specified in plant schedule. The landscape contractor shall be responsible to verify all plant quantities on the plans prior to commencement of work. Quantities in the plant schedule are for the contractors convenience only and do not constitute the final count.
9. Substitutions in plant species or size shall not be permitted except with the written approval of the owners representative. See table below for permitted and excluded species.
10. Plants shall be located as shown on the drawings and by scaling or as designated in the field by the owners representative. All locations are to be approved by the owners representative before excavation.
11. Contractor shall locate and mark all underground utility lines and irrigation systems prior to excavating plant beds or pits. All utility easement areas where no planting shall take place shall also be marked on the site, prior to locating and digging the tree pits. If utility lines are encountered in excavation of tree pits, other locations for the trees shall be selected by the owners representative. Such changes shall be made by the contractor without additional compensation. No changes of location shall be made without the approval of the owners representative.
12. All equipment and tools shall be placed so as not to interfere or hinder the pedestrian and vehicular traffic flow.
13. During planting operations, excess and waste materials shall be promptly and frequently removed from the site.
14. All plant shrub beds are to be dug to a minimum of 24" deep and all existing soil, construction debris, roots and other foreign material are to be removed and discarded off site. All plant shrub beds are to be excavated to the width shown on the plans.
15. All tree pits are to be excavated to a minimum depth to allow the tree root ball to be a minimum of 4" higher than finish grade. The tree root ball is to rest on undisturbed soil, or a compacted bed must be prepared for the tree root ball to rest on and which will not subside causing the tree to sink below finish grade. All tree pits are to be a minimum of 12" larger on every side of the trees root ball.
16. The planter beds are to be entirely cleaned out to the undisturbed soil level. All existing soil, construction debris, roots and other foreign material are to be removed and discarded offsite.
17. The topsoil to be used to fill the tree pits, shrub beds and planters is to be plant specific. The topsoil for the trees, shrubs and planter shall consist of a maximum 2/3 existing topsoil from the site, which is cleaned and free of clay, a minimum of 1/3 peat moss, or other approved organic material or imported new loamy topsoil and 10% cow manure. All of these materials are to be mixed prior to placing in the planter or backfilling when planting.
18. The contractor is responsible to ensure that all tree pits, shrub beds and planter are well drained. The landscape contractor without cost to the owner will replace all plant material, which is affected by poor drainage.
19. All lawn areas outside the play yard fences are to be seeded with grass seed appropriate for each of the sunlight conditions, which exist on the site.
20. Lawn areas within the play yard fences are to be artificial turf.
21. All other lawn areas are to be tilled to a depth of 6" and all foreign material removed which will inhibit the healthy growth of the lawn. All old grass and grass roots are to be removed from the site. New topsoil of a minimum 4" is to be placed over the areas to be sodded. The grass areas are to be fine graded to ensure that no undulations occur in the lawn. The lawns are to be graded in such a way as to appear perfectly well tailored and even. The lawn topsoil is to be rolled and lightly irrigated prior to placing of the seed. The seed is not to be laid on frozen or soaked soil
22. The existing trees are to be protected during the preparation of the lawn areas. The roots of the trees are to be undisturbed during the cleaning of the topsoil.
23. The trees and shrubs are to be handled with the best care and attention to ensure that the plants are not bruised, broken, torn, damaged in any way which will affect the plants general appearance and well being.
24. The trees and shrubs are to be planted with the accepted standards of the American Association of Nurserymen. The plants are to be properly watered and backfilled during the planting. All care must be taken to ensure that the plants are upright, a plant's best side is exposed to the point of the plants greatest visibility.
25. The trees must be staked in accordance with acceptable nursery practice to ensure that they are secure in the ground and will grow straight and uniform. The trees are to be wrapped if the contractor deems it necessary to protect the trees from sun scald or insect attack.
26. The Landscape Contractor is to provide a 1-year guarantee for all plant material and other work done on site.
27. Keep street trees limbed/pruned so street signs are visible at all times and so they do not interfere with street lights, sight distance or pedestrians.
28. Large growing plants are not to be planted in front of windows, under building overhangs, or in drainage swales. Shrubs planted near H.V.A.C units to be located so that shrubs at maturity will maintain 1 foot airspace between unit and plant.
29. 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 not to impede drainage away from buildings.
30. Trees shall be located a minimum of 3 feet from walls and walks.
31. Quantities as shown on the plan shall govern over plant list quantities. Contractor to verify plant list totals with quantities shown on plan.
32. Groups of shrubs shall be placed in a continuous mulch bed with smooth continuous lines. All mulched bed edges shall be curvilinear in shape following the contour of the plant mass. Trees located within 4 feet of shrub beds shall share same mulch bed.
33. Where utility, signage, lighting and all other site plan requirements permit landscaping to be provided within required parking areas in accordance with Frederick County Code 1-19-6.400.D1 and 1-19-6.400.D2. See Detail on LA-11 for graphic representation of Frederick County Code 1-19-6.400.D1 and 1-19-6.400.D2

CANOPY COVERAGE REQUIREMENT:

FREDERICK ZONING CODE: 1-19-6.400 D2 LANDSCAPING & SCREENING

	AREA OF NEEDED CANOPY COVERAGE (TOTAL PARKING LOT AREA 23,673.5/ 20%):	4,734.69
	AREA OF PROVIDED TREE CANOPY (COVERAGE MEETS 20% OF TOTAL AREA)	- 4,976.00
TOTAL SF SURPLUS		241.31

NOTE: The canopy coverage area is measured to the property line.



REVISION	DATE	REVISION	DATE	BASE DATA	BY	DATE
				DESIGNED	SN	
				DRAWN	SN	
				REVIEWED	TJC	
				RELEASE FOR <input type="text"/>		
				BY _____ DATE _____		

Owner:
NATELLI COMMUNITIES
506 MAIN STREET
3RD FLOOR
GAITHERSBURG, MD 20878
PHONE: 1-301-670-4020
CONTACT: PAUL COLEMAN

LANDSCAPE PLAN

RODGERS
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IMPROVEMENT PLAN - COMMERCIAL RETAIL CENTER
Lot C9
Linganore Town Center

TAX MAP 79, PARCEL 17
ELECTION DISTRICT NO. 9
FREDERICK COUNTY, MARYLAND

SCALE:	1" = 20'
JOB No.	0529AJ
DATE:	JULY 2020
INDEX No.	LP-01
SHEET No.	16 OF 17

FOR CONSTRUCTION

**FINAL REPORT SHALL HAVE ALL INFORMATION FROM SWM CONCEPT, DEVELOPMENT
AND FINAL IMPROVEMENT PLANS.**

LINGANORE TOWN CENTER

COMMERCIAL RETAIL CENTER – LOT C9 STORMWATER MANAGEMENT COMBINED DEVELOPMENT / IP & STORM DRAIN REPORT

PREPARED FOR:

NATELLI COMMUNITIES
506 MAIN STREET, 3RD FLOOR
GAITHERSBURG, MD 20878
TEL: (301) 670-4020

PREPARED BY:

RODGERS CONSULTING, INC.
19847 CENTURY BLVD., SUITE 200
GERMANTOWN, MARYLAND 20874
TEL: (301) 948-4700 ■ FAX: (301) 948-6256

RCI No. 0529AJ

AUGUST, 2020



PROFESSIONAL CERTIFICATION

"I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 41425, EXPIRATION DATE: JANUARY 05, 2022."

SHEET INDEX

Linganore Town Center Commercial Retail Center – Lot C9
Stormwater Management Report

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I Hydrologic and Hydraulic Summary

PROJECT INTRODUCTION , SITE INFORMATION, SWM DESIGN DISCUSSION INCLUDING ESD TO MEP, LARGER STORMS CONTROL AND SAFE CONVEYANCE ETC.

Linganore Town Center Commercial Retail Center – Lot C9
Stormwater Management Report

A. Introduction

In accordance with the regulations of Frederick County, Maryland the purpose of stormwater management is to protect, maintain and enhance the public health, safety and welfare and to control the adverse impacts associated with increased stormwater runoff as a result of development.

This report contains the criteria established to design the appropriate stormwater management facilities for the subject property. It includes reasoning behind the design, as well as the computations and calculations to supplement the plans as submitted for review.

B. Site Information

- The property is located on Frederick County Tax Map 79 Parcel 34; being more particularly described as exhibit A-1, part 1 and part 2 of the property acquired by Dryden Investments L.C, by a deed recorded in Liber 9827 at Folio 8.
- The Lot C9 site is located south of MD 144 (Old National Pike) along Eaglehead Drive and is generally bounded by Baltimore National Pike to the south and Old National Pike to the north.
- The area of this plan is 2.46 acres +/-.
- This application is for the approval of the Stormwater Management Development Plan and Improvement Plan in support of the Preliminary Plan submittal for Linganore Town Center Commercial Retail Center.

C. Natural Resources

The natural resources as identified in Chapter 5, Table 5.1 in the MDE Stormwater Design Manual have been evaluated for the subject property and are summarized below. All impacts to natural resources on the site have been submitted to MDE under a Joint Federal/State Application and shall be mitigated in accordance with MDE criteria.

- Wetlands or Wetlands of Special State Concern: No Wetlands exist on the property.
- Wetland Buffers: No Wetland buffers exist on the property.
- Major Waterways: The site drains to the tributaries of Long Branch Creek.
- Floodplains: No FEMA floodplains exist on the site.
- Perennial or Intermittent Streams: No streams exist on the site.
- Stream Buffers or Enhanced Stream Buffers: Stream buffers exist on the site and have been identified on the plans.
- Forests: No forested areas exist on the site.
- Forest Buffers: No forest buffers have been identified on the site.
- Critical Areas: No critical areas have been identified on the site.
- Topography/ Steep Slopes: The topography of the site is rolling with slopes in the range of 3-15%. No steep slopes are present.
- Springs or Seeps: No springs or seeps have been identified on the site at this time.
- Vegetative Cover: The site is an abandoned pasture and agricultural area.

Linganore Town Center Commercial Retail Center – Lot C9
Stormwater Management Report

- The Natural Resources Conservation Service, <http://websoilsurveys.nrcs.usda.gov>, web soil survey indicates the following hydrologic soil groups on the subject property:

BkD – Brinklow – Blocktown channery loam, 15-25% slopes.

CcE – Catoctin channery loam, 25-45% slopes.

CeB – Catoctin – Spoolsville complex, 3-8% slopes

CeD – Catoctin – Spoolsville complex, 15-25% slopes

CgA – Codorus and Hatboro silt loams, 0-3% slopes

CoC – Conestoga and Letort silt loams, 8-15% slopes

GhC – Glenelg – Blocktown gravelly loams, 8-15% slopes

GvB – Glenville – Codorus complex, 3-8% slopes

HtF – Hyattstown very channery loam, 25-65% slopes, rocky

LyB – Linganore – Hyattstown channery silt loams, 3-8% slopes

LyC – Linganore- Hyattstown channery silt loams, 8-15% slopes

RoB – Rohrsersville – Lantz silt loams, 0-8% slopes

These groups consist of hydrologic soil groups 'B', 'C' & 'D' soils.

- Highly Erodible Soils: Based on the NRCS web soil survey, the hydrologic soils groups that make up the site have 'K' factors for whole soil ranging from 0.24 to 0.37. These values do not qualify in the category of highly erodible soils.
- Bedrock/ Geology: This site falls in an area of Frederick County where karstic geology and bedrock formations are known to exist. Additional geotechnical investigation is required prior to any proposed infiltration practices on the site.
- Existing Drainage Areas: The runoff from the site converges into tributaries of the Long Branch Creek.

D. Design Methodology

- The Lot C9 site drains to two drainage areas. The western portion DA "B" outfalls toward the existing I-70 42" RCP culvert. The eastern portion of the site DA "C" outfalls toward the existing I-36" RCP culvert.
- Site impervious area and percent imperviousness were calculated for each drainage area.
- Based on the impervious area and soil type, a target P_E was determined to return the site to a composite RCN for woods in good condition.
- A target ESD_v was calculated using the target P_E , R_v and area for each drainage area.
- Each drainage area was evaluated for the actual ESD_v provided by the measures proposed.
- The individual ESD_v 's provided were added together and compared to the target ESD_v .
- If the actual ESD_v equals or exceeds the target ESD_v then SWM requirements are met for the site. If the actual ESD_v was less than the target ESD_v additional structural control methods have been provided where it was determined necessary to provide safe conveyance downstream.

E. Design Details

The site was determined to be type C soil with a P_E requirement of 2.29" for drainage area "B", and 1.77" for drainage area "C".

Treatment methods for each drainage area were determined based on available open space and site layout and grading. The treatment options chosen for this site were micro bio-retention. Other practices were determined to be impracticable due to site and development constraints.

F. On-Site ESD Planning Techniques

On-site ESD Planning techniques are to be used to the maximum extent practicable without conflicting with the existing state law or local ordinances, regulations and policies, or unreasonably introduce water to foundations.

- a. Preserving and Protecting Natural Resources – The areas of forest, wetlands, 100-year floodplain, intermittent and perennial streams, and specimen trees on the property were preserved to the maximum extent practicable while still meeting all Frederick County codes and design criteria required to maintain the safety and welfare of present and future residents in the community. All impacts to these resources has been documented and proposed mitigation techniques have been submitted to MDE in a Joint Federal/State Application for review and approval. In addition, the development footprint has been designed in order to avoid existing slopes in excess of 25 percent to the maximum extent practicable. There were no rare, threatened, or endangered (RTE) species observed on the property.
- b. Conserving Natural Drainage Patterns- Proposed grading and drainage divides will maintain the existing divides to the extent practicable.
- c. Minimizing Impervious Area- Future site and improvement plans will attempt to minimize the footprint of the improvements while meeting all appropriate Frederick County requirements and design criteria.
- d. Reducing Runoff Volume- Runoff Volume is reduced through the use of nonstructural and micro-scale practices.
- e. Using ESD Practices to maintain 100 percent of the annual predevelopment groundwater recharge volume- ESD measures provided will meet the required recharge volume to the maximum extent practicable if soils investigation determines that infiltration practices can be achieved and the site is not located within a karstic area.
- f. Using green roofs, permeable pavement, reinforced turf, and other alternative surfaces- The use of green roofs, permeable pavements and other alternative surfaces was explored but was not practicable. The site layout lends itself to utilize micro-scale practices to provide stormwater controls.
- g. Limiting soil disturbance, mass grading, and compaction- To the extent practicable soil disturbance and grading will be limited to what is necessary for the development operations. Special consideration will be given to the areas where the ESD micro-practices are located to minimize any activity that would compromise their intended function. Proposed quantity

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control facilities may be used for sediment control to prevent additional earth moving activity at final site grading and stabilization.

- h. Clustering Development- The proposed development program has clustered the development as much as practicable to be consistent with Frederick County zoning and subdivision regulations. The site layout represented is very conceptual in nature and will be further developed during the site plan review process.

G. On-Site ESD Practices

On-site ESD practices are to be used to the maximum extent practicable. An evaluation of the existing site and the proposed development plan was needed to determine the maximum extent of treatment using ESD. The results of the study are shown below.

Alternative Surfaces – The following practices are applied to reduce the RCN for impervious surfaces.

- a. Permeable Pavements - This practice covers the 3 basic types of permeable pavements: porous bituminous asphalt, pervious concrete, and permeable interlocking concrete pavers. *The use of permeable pavement was explored but was determined to be impractical as the site lends itself to utilize micro-scale practices.*
- b. Reinforced Turf – These systems are made of interlocking structural units with open areas for placing gravel or growing grass. These systems should be used for emergency vehicle access roads, light traffic loads, and overflow parking areas. *Reinforced turf is impracticable for use on this site as there are no areas appropriate areas for its use.*

Nonstructural Practices – These practices use grading and landscaping to divert runoff into vegetated areas and away from the storm drain system

- c. Disconnect of Rooftop Runoff- This practice involves diverting the runoff from rooftop downspouts to vegetated areas. *Disconnection of rooftop runoff is impracticable due to site layout.*
- d. Disconnect of Non-Rooftop Runoff- This practice involves diverting the runoff from impervious surfaces onto vegetated areas. *Disconnection of non-rooftop runoff is impracticable due to site layout.*
- e. Sheetflow to Conservation Areas- This practice involves directing flow from impervious areas to adjacent natural areas. *No conservation areas exist that would allow this practice to be implemented.*

Micro-Scale Practices- These practices consist of smaller water quality treatment devices.

- f. Submerged Gravel Wetlands- This is a small-scale filter that uses wetlands plants and rock media for water quality treatment. *Submerged gravel wetlands are impracticable for this project due to area constraints and the requirement for a high water table.*
- g. Landscape Infiltration – This is the use of on-site vegetated planting areas to capture and treat stormwater runoff. *Landscape infiltration may be practicable if soil studies show adequate infiltration rates. The use of this practice will be revisited if found feasible, based on the results of the future on-site geo-technical evaluation.*

Linganore Town Center Commercial Retail Center – Lot C9
Stormwater Management Report

- h. Infiltration Berms- This consists of a mound of earth that is placed along a contour of a relatively gentle slope. *There is no appropriate place on site to provide infiltration berms.*
- i. Dry Wells - *Dry wells have not been utilized as the site layout lends itself to utilize rooftop disconnection.*
- j. Micro-Bioretenention- This practice operates the same as the larger bio-retention but has a smaller maximum drainage area. *Micro-bioretenention is proposed wherever feasible.*
- k. Swales – This practice uses channels to provide conveyance, water quality treatment and flow attenuation. There are currently 3 design variants grass swales, wet swales, and bio swales. *Swales are proposed wherever practicable.*

H. Quality Control:

Based upon analysis of the ESD techniques all drainage areas will meet the required 1" treatment for water quality.

I. ESD Requirements

Based upon analysis of the ESD techniques additional treatment and storage shall be required in end of line facilities in order to meet the full PE requirement for drainage area "B". For the drainage area "B", the ESD has been provided to the MEP. The end of line facility could not be provided due to the site constraints. However, the post development flow for different storm events have been reduced from the predevelopment condition. So the existing I-70 42" RCP culvert has been analyzed for 100 yr flow using the reduced RCN method to ensure downstream safe conveyance. Full treatment has been provided for the drainage area "C".

ESD Summary:

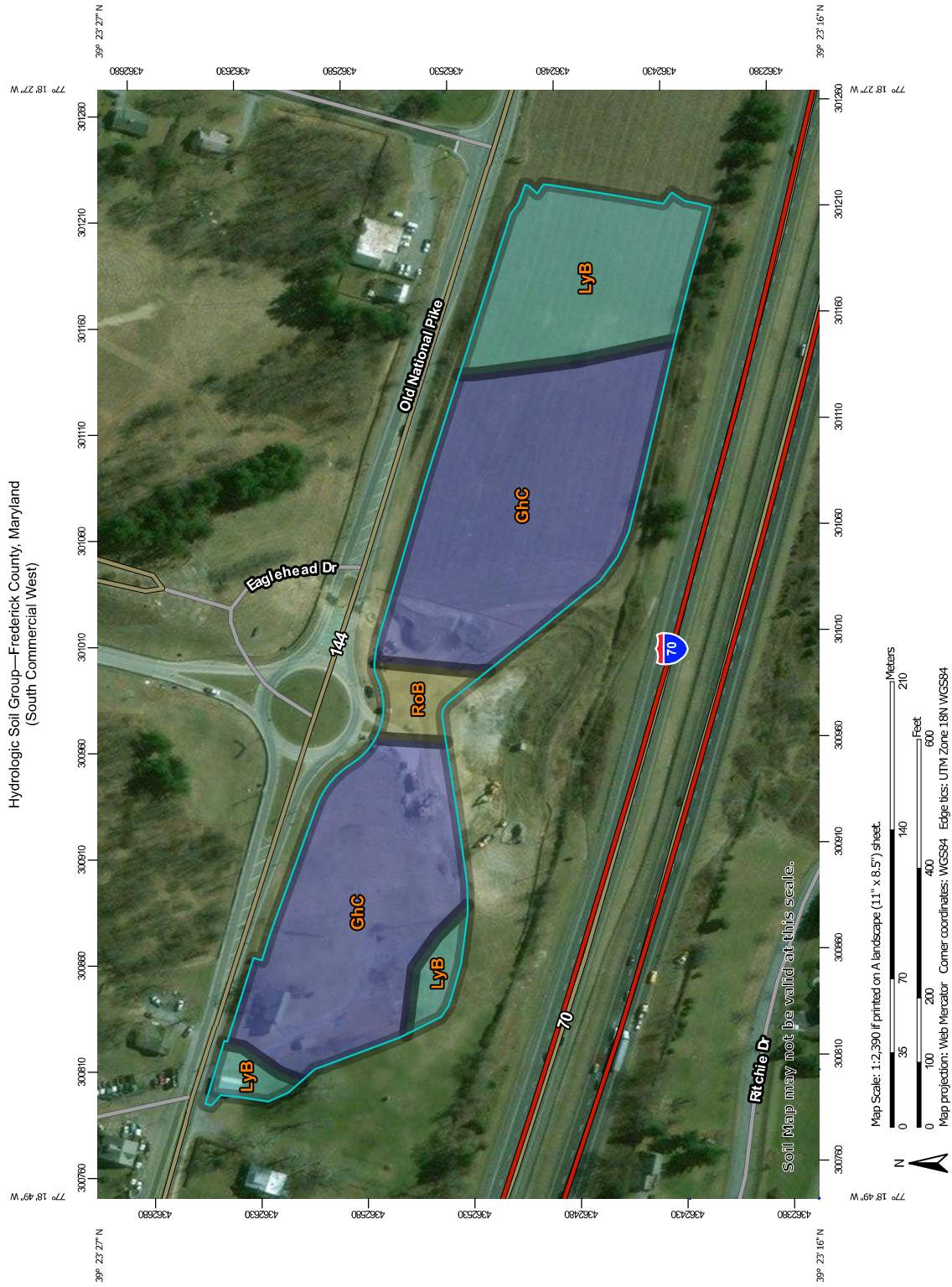
Total Lot C9 Area =	2.46 ac
LOD Area =	2.36 ac
Impervious Area =	0.92 ac
Target Pe =	1.88"
Target ESDv for full Pe =	6,429 CF
Total ESDv provided =	6,826 CF

Drainage Area "B" =	5.82 ac
LOD Area =	5.08 ac
Impervious Area =	3.32 ac
Target Pe =	2.29"
Target ESDv for full Pe =	27,033 CF
Total ESDv provided =	3,469 CF
Remaining ESDv will be provided by the ultimate buildout of the drainage area "B" to the maximum extent practicable.	

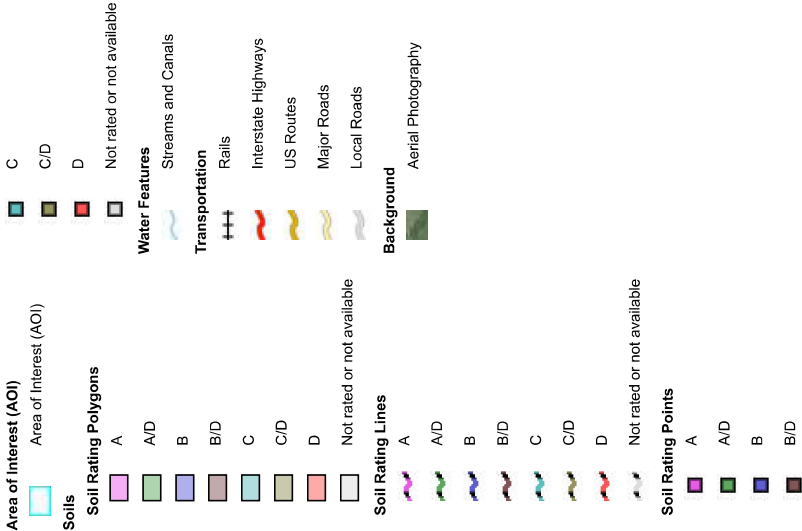
Linganore Town Center Commercial Retail Center – Lot C9
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Drainage Area "C" =	1.36 ac
LOD Area =	1.23 ac
Impervious Area =	0.43 ac
Target Pe =	1.77"
Target ESDv for full Pe =	2,923 CF
Total ESDv provided =	3,357 CF
Target ESDv for full treatment has been met.	

II Soil Maps & Information



MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.
Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Frederick County, Maryland
Survey Area Data: Version 15, Sep 11, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 23, 2013—Feb 22, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
GhC	Glenelg-Blocktown gravelly loams, 8 to 15 percent slopes	B	6.1	70.6%
LyB	Linganore-Hyattstown channery silt loams, 3 to 8 percent slopes	C	2.2	25.8%
RoB	Rohrersville-Lantz silt loams, 0 to 8 percent slopes	C/D	0.3	3.6%
Totals for Area of Interest			8.6	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D

C
C/D
D
Not rated or not available

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Date(s) aerial images were photographed: Aug 23, 2013—Feb 22, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
LyB	Linganore-Hyattstown channery silt loams, 3 to 8 percent slopes	C	2.1	33.0%
LyC	Linganore-Hyattstown channery silt loams, 8 to 15 percent slopes	C	3.2	51.8%
RoB	Rohrersville-Lantz silt loams, 0 to 8 percent slopes	C/D	1.0	15.2%
Totals for Area of Interest			6.2	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

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Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

III Existing Conditions

Linganore Town Center Commercial Retail Center – Lot C9
Stormwater Management Report

Existing Conditions:

The eastern portion drains toward two existing culverts under Baltimore National Pike (MD I-70) and eventually makes its way into tributaries of the Long Branch Creek (see Existing SWM DA Map). The point at which the runoff leaves the property into the existing 42" RCP culvert (Study Point "B") and 36" RCP culvert (Study Point "C") under MD I-70 was chosen as the study points for analysis. Under current conditions this area is currently mass graded with sediment controls provided by downstream silt fence (AP 19852).

The analysis of the existing conditions are as follows:

WinTR-55 Current Data Description

--- Identification Data ---

User: 602 Date: 7/7/2020
 Project: LTC South Commercial Units: English
 SubTitle: DA B - Existing Condition Areal Units: Acres
 State: Maryland
 County: Frederick
 Filename: \\gtdata\SHAREROOT\MD-Frederick\Linganore Town Center\documents\Technical\SWM\South Commercial F

--- Sub-Area Data ---

Name	Description	Reach	Area (ac)	RCN	Tc
DA B1		Outlet	14.39	72	.291
DA B2		Outlet	8.42	89	0.139

Total area: 22.81 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.07	3.9	4.64	5.77	6.79	7.95	2.54

Storm Data Source: Frederick NOAA_C County, MD (NRCS)
 Rainfall Distribution Type: Type II
 Dimensionless Unit Hydrograph: <standard>

LTC South Commercial
DA B - Existing Condition
Frederick County, Maryland

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.07	3.9	4.64	5.77	6.79	7.95	2.54

Storm Data Source: Frederick NOAA_C County, MD (NRCS)
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

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LTC South Commercial
 DA B - Existing Condition
 Frederick County, Maryland

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period					
	2-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)	1-Yr (cfs)

SUBAREAS						
DA B1	13.34	32.02	47.20	61.53	78.22	8.05
DA B2	23.65	40.47	52.51	63.38	75.65	18.04
REACHES						
OUTLET	33.42	66.22	91.49	114.89	141.93	23.41

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LTC South Commercial
 DA B - Existing Condition
 Frederick County, Maryland

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period					
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)	1-Yr (cfs) (hr)

SUBAREAS						
DA B1	13.34 12.08	32.02 12.08	47.20 12.07	61.53 12.07	78.22 12.07	8.05 12.09
DA B2	23.65 11.95	40.47 11.95	52.51 11.95	63.38 11.95	75.65 11.95	18.04 11.96
REACHES						
OUTLET	33.42	66.22	91.49	114.89	141.93	23.41

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LTC South Commercial
DA B - Existing Condition
Frederick County, Maryland

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
DA B1	14.39	0.291	72	Outlet	
DA B2	8.42	0.139	89	Outlet	

Total Area: 22.81 (ac)					

LTC South Commercial
DA B - Existing Condition
Frederick County, Maryland

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
DA B1							
SHEET	100	0.0200	0.240				0.243
SHALLOW	148	0.0300	0.050				0.015
SHALLOW	282	0.1100	0.050				0.015
CHANNEL	315					5.000	0.018
					Time of Concentration		.291 =====
DA B2							
User-provided							0.139
					Time of Concentration		0.139 =====

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LTC South Commercial
DA B - Existing Condition
Frederick County, Maryland

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
DA B1	Paved parking lots, roofs, driveways	C	2.54	98
	Brush - brush, weed, grass mix (good)	C	9.04	65
	Woods - grass combination (good)	C	2.01	72
	Woods (good)	C	.8	70
	Total Area / Weighted Curve Number		14.39 =====	72 ==
DA B2	Paved parking lots, roofs, driveways	C	.96	98
	Newly graded area (pervious only)	C	6.54	91
	Brush - brush, weed, grass mix (good)	C	.36	65
	Woods (good)	C	.56	70
	Total Area / Weighted Curve Number		8.42 =====	89 ==

Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Tuesday, Jul 7 2020

Existing SHA I-70 42-inch RCP Culvert - Q10 Existing Conditions

Invert Elev Dn (ft) = 485.04
 Pipe Length (ft) = 241.00
 Slope (%) = 3.64
 Invert Elev Up (ft) = 493.82
 Rise (in) = 42.0
 Shape = Circular
 Span (in) = 42.0
 No. Barrels = 1
 n-Value = 0.013
 Culvert Type = Circular Concrete
 Culvert Entrance = Square edge w/headwall (C)
 Coeff. K,M,c,Y,k = 0.0098, 2, 0.0398, 0.67, 0.5

Embankment

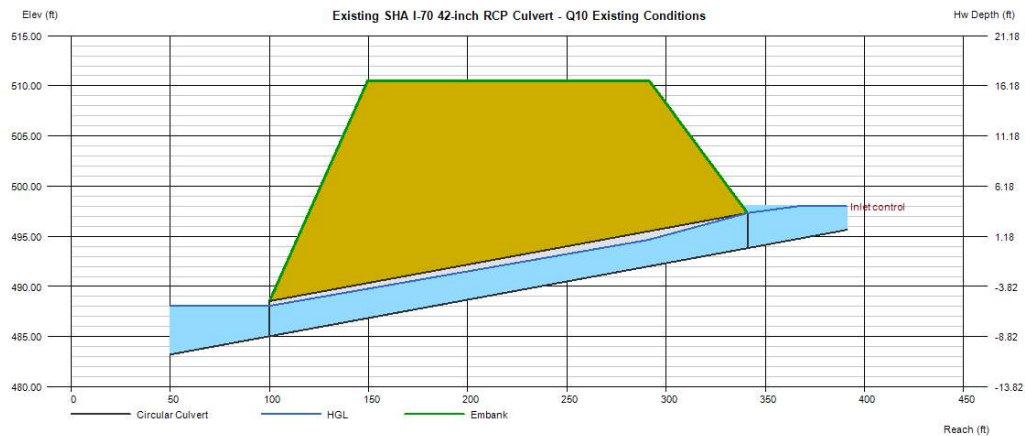
Top Elevation (ft) = 510.50
 Top Width (ft) = 142.00
 Crest Width (ft) = 50.00

Calculations

Qmin (cfs) = 0.00
 Qmax (cfs) = 66.22
 Tailwater Elev (ft) = (dc+D)/2

Highlighted

Qtotal (cfs) = 66.22
 Qpipe (cfs) = 66.22
 Qovertop (cfs) = 0.00
 Veloc Dn (ft/s) = 7.49
 Veloc Up (ft/s) = 8.82
 HGL Dn (ft) = 488.06
 HGL Up (ft) = 496.37
 Hw Elev (ft) = 497.99
 Hw/D (ft) = 1.19
 Flow Regime = Inlet Control



Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Tuesday, Jul 7 2020

Existing SHA I-70 42-inch RCP Culvert - Q25 Existing Conditions

Invert Elev Dn (ft)	= 485.04
Pipe Length (ft)	= 241.00
Slope (%)	= 3.64
Invert Elev Up (ft)	= 493.82
Rise (in)	= 42.0
Shape	= Circular
Span (in)	= 42.0
No. Barrels	= 1
n-Value	= 0.013
Culvert Type	= Circular Concrete
Culvert Entrance	= Square edge w/headwall (C)
Coeff. K,M,c,Y,k	= 0.0098, 2, 0.0398, 0.67, 0.5

Embankment

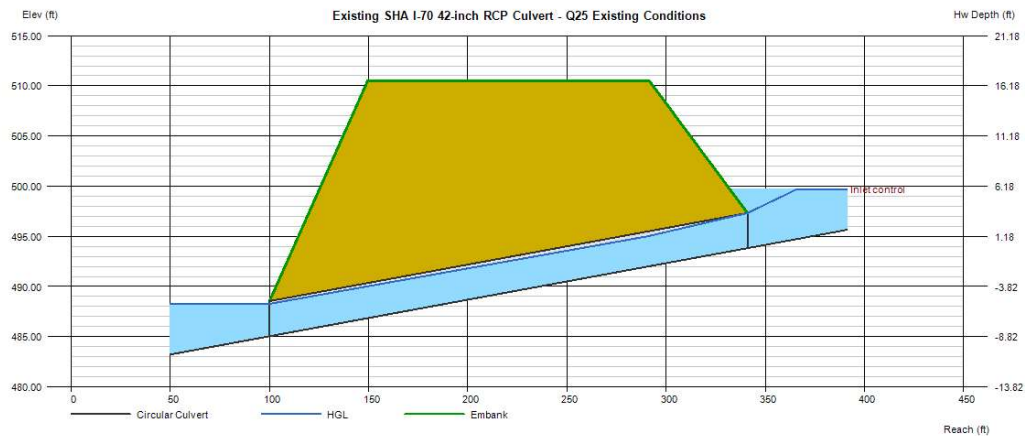
Top Elevation (ft)	= 510.50
Top Width (ft)	= 142.00
Crest Width (ft)	= 50.00

Calculations

Qmin (cfs)	= 0.00
Qmax (cfs)	= 91.49
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

Qtotal (cfs)	= 91.49
Qpipe (cfs)	= 91.49
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 9.86
Veloc Up (ft/s)	= 10.54
HGL Dn (ft)	= 488.27
HGL Up (ft)	= 496.78
Hw Elev (ft)	= 499.70
Hw/D (ft)	= 1.68
Flow Regime	= Inlet Control



Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Tuesday, Jul 7 2020

Existing SHA I-70 42-inch RCP Culvert - Q100 Existing Conditions

Invert Elev Dn (ft) = 485.04
 Pipe Length (ft) = 241.00
 Slope (%) = 3.64
 Invert Elev Up (ft) = 493.82
 Rise (in) = 42.0
 Shape = Circular
 Span (in) = 42.0
 No. Barrels = 1
 n-Value = 0.013
 Culvert Type = Circular Concrete
 Culvert Entrance = Square edge w/headwall (C)
 Coeff. K,M,c,Y,k = 0.0098, 2, 0.0398, 0.67, 0.5

Embankment

Top Elevation (ft) = 510.50
 Top Width (ft) = 142.00
 Crest Width (ft) = 50.00

Calculations

Qmin (cfs) = 0.00
 Qmax (cfs) = 141.93
 Tailwater Elev (ft) = (dc+D)/2

Highlighted

Qtotal (cfs) = 141.93
 Qpipe (cfs) = 141.93
 Qovertop (cfs) = 0.00
 Veloc Dn (ft/s) = 14.82
 Veloc Up (ft/s) = 14.95
 HGL Dn (ft) = 488.47
 HGL Up (ft) = 497.18
 Hw Elev (ft) = 504.76
 Hw/D (ft) = 3.13
 Flow Regime = Inlet Control



WinTR-55 Current Data Description

--- Identification Data ---

User: 602 Date: 7/7/2020
 Project: LTC South Commercial Units: English
 SubTitle: DA C - Existing Condition Areal Units: Acres
 State: Maryland
 County: Frederick
 Filename: \\gtdata\SHAREROOT\MD-Frederick\Linganore Town Center\documents\Technical\SWM\South Commercial F

--- Sub-Area Data ---

Name	Description	Reach	Area (ac)	RCN	Tc
DA C		Outlet	6.09	81	.215

Total area: 6.09 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.07	3.9	4.64	5.77	6.79	7.95	2.54

Storm Data Source: Frederick NOAA_C County, MD (NRCS)
 Rainfall Distribution Type: Type II
 Dimensionless Unit Hydrograph: <standard>

602

LTC South Commercial
DA C - Existing Condition
Frederick County, Maryland

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.07	3.9	4.64	5.77	6.79	7.95	2.54

Storm Data Source: Frederick NOAA_C County, MD (NRCS)
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

602

LTC South Commercial
DA C - Existing Condition
Frederick County, Maryland

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period				
	2-Yr (cfs)	10-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)	1-Yr (cfs)

SUBAREAS					
DA C	10.84	21.17	36.00	44.09	7.63
REACHES					
OUTLET	10.84	21.17	36.00	44.09	7.63

602

LTC South Commercial
DA C - Existing Condition
Frederick County, Maryland

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period				
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)	1-Yr (cfs) (hr)

SUBAREAS					
DA C	10.84 12.03	21.17 12.02	36.00 12.01	44.09 12.01	7.63 12.03
REACHES					
OUTLET	10.84	21.17	36.00	44.09	7.63

602

LTC South Commercial
DA C - Existing Condition
Frederick County, Maryland

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
DA C	6.09	0.215	81	Outlet	

Total Area:	6.09 (ac)				

602

LTC South Commercial
DA C - Existing Condition
Frederick County, Maryland

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
DA C							
SHEET	100	0.0400	0.240				0.184
SHALLOW	316	0.0760	0.050				0.020
CHANNEL	191					5.000	0.011
Time of Concentration							.215
							=====

602

LTC South Commercial
 DA C - Existing Condition
 Frederick County, Maryland

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
DA C	Paved parking lots, roofs, driveways	C	1.5	98
	Newly graded area (pervious only)	C	1.62	91
	Brush - brush, weed, grass mix (good)	C	2.24	65
	Woods (good)	C	.73	70
Total Area / Weighted Curve Number			6.09 =====	81 ==

IV Proposed Conditions

Proposed Conditions:

The proposed conditions for this application included the private roadway, storm drain, water and sewer, stormwater and sediment control improvements for Lot C9.

Proposed Commercial Retail Center runoff to Existing I-70 Culverts:

The proposed development for Drainage area “B” includes private road, utilities and Lot improvements. Based on the site layout the target PE for the drainage area “B” is 2.29”. Ultimate development of this drainage area is not addressed by these plans but will be addressed by on-site ESDv. The western portion of Lot C9 treatment areas are internal to the drainage area for the existing 42” culvert, drainage area “B”. The grading for this area was designed to mimic existing conditions as much as practicable while still maintain connections to the surrounding existing roadways, water, sewer, and storm drain. With the implementation of ESD techniques for a PE of 0.29” is achieved.

- Target ESDv required for full treatment = 27,033 CF
- ESDv required for 1” treatment = 11,791 CF
- ESDv provided by Lot C9 improvements = 3,469 CF
- ESDv remainder = 27,033 CF – 3,469 CF = 23,564 CF will be provided by the ultimate buildout of the drainage area “B” to the maximum extent possible.

The proposed development for Drainage area “C” includes private road, utilities and Lot improvements. Based on the site layout the target PE for the drainage area “C” is 1.77”. The eastern portions are internal to the drainage area for the existing 36” culvert under MD I-70. With the implementation of ESD techniques for a PE of 1.89” is achieved.

The storm event flow rates are calculated at the Study Point “B” and “C” after ESD treatments are implemented. The existing 42” RCP & 36” RCP culverts has been analyzed for the 50-yr and 100 yr design storm events.

The analysis of the proposed condition are as follows:

Summary

On-site stormwater controls have been provided in accordance with Frederick County and State of Maryland regulations to ensure that existing open channel drainage systems and waterways are not adversely impacted due to this development.

JOB NUMBER:	064302	
SUBJECT:	Linganore Town Center - South Commercial	
	Lot C9	
BY:	SN	DATE: 8/6/2020
CHKD:		DATE:

Rainfall Target, Pe

Site Area (Acres)	2.46	Site
LOD Area (acres)	2.36	
Site Impervious Area (acres)	0.92	
Impervious %	38	for Site
RCN*	82	for Site
Pe (in.)	1.88	
Target ESDv for full Pe (CF)	6,429	
Target ESDv for 1" Pe (CF)	3,427	
LOD Impervious Area (acres)	0.92	
Rv	0.40	for LOD

$$= \text{SITE IMPERVIOUS AREA} / \text{SITE AREA} = .92 / 2.46$$

$$= (\text{Pe} \times \text{Rv} \times (\text{LOD AREA} \times 43560)) / 12 = (1.88 \times .40(2.36 \times 43560)) / 12$$

$$= (\text{Pe} \times \text{Rv} \times (\text{LOD AREA} \times 43560)) / 12 = (1 \text{ INCH} \times .40(2.36 \times 43560)) / 12$$

$$= .05 + (0.009 \times 100 \times \text{LOD IMPERVIOUS AREA} / \text{LOD AREA}) = .05 + (0.009 \times 100 \times .92 / 2.36)$$

Site Soil Conditions			
HSG	RCN	Area (acres)	Percent
A	38.00	0.00	0.0
B	55.00	0.00	0.0
C	70.00	2.46	100.0
D	77.00	0.00	0.0

RCN	
	0.00
	0.00
82	82.00
	0.00
RCN=	82.00

Weighted Target RCN (woods)

73

Soil Group		Imp
HSG		Pe (in)
A		-
B		-
C		1.8
D		-

Weighted Target Pe (woods)

1.88

*From TR-55

Formulas

$$I (\%) = ((\text{Impervious Area}) / (\text{Drainage Area})) * 100$$

$$R_v = 0.05 + 0.009 * I$$

$$\text{ESDv} = (\text{Pe})(\text{Rv})(\text{A}) / 12$$

JOB NUMBER:	0643o2	SHEET:	OF
SUBJECT:	Linganore Town Center		
	South Commercial - Lot C9		
BY:	SN	DATE:	8/6/2020 11:14
CHKD:		DATE:	

ESDv Summary

Drainage Area	ESDv Provided
DA B	3469
DA C	3357

Total ESDv Provided =	6826	ESDv Target Met
Total ESDv Required =	6429	
ESDv Required for 1" Pe =	3427	

JOB NUMBER:	064302	
SUBJECT:	Linganore Town Center - Commercial Retail Center	
	DA "B"	
BY:	SN	DATE: 7/7/2020
CHKD:		DATE:

Rainfall Target, Pe

Site Area (Acres)	5.82	Site
LOD Area (acres)	5.08	
Site Impervious Area (acres)	3.32	
Impervious %	58	for Site
RCN*	88	for Site
Pe (in.)	2.29	
Target ESDv for full Pe (CF)	27,033	
Target ESDv for 1" Pe (CF)	11,791	
LOD Impervious Area (acres)	3.32	
Rv	0.64	for LOD

$$= \text{SITE IMPERVIOUS AREA} / \text{SITE AREA} = 3.32 / 5.82$$

$$= (\text{Pe} \times \text{Rv} \times (\text{LOD AREA} \times 43560)) / 12 = (2.29 \times .64(5.08 \times 43560)) / 12$$

$$= (\text{Pe} \times \text{Rv} \times (\text{LOD AREA} \times 43560)) / 12 = (1 \text{ INCH} \times .64(5.08 \times 43560)) / 12$$

$$= .05 + (0.009 \times 100 \times \text{LOD IMPERVIOUS AREA} / \text{LOD AREA}) = .05 + (0.009 \times 100 \times 3.32 / 5.08)$$

Site Soil Conditions			
HSG	RCN	Area (acres)	Percent
A	38.00	0.00	0.0
B	55.00	0.00	0.0
C	70.00	5.82	100.0
D	77.00	0.00	0.0

RCN	
	0.00
	0.00
88	88.00
	0.00
RCN=	88.00

Weighted Target RCN (woods) 70

Soil Group		Imp
HSG		Pe (in)
A		-
B		-
C		2.0
D		-

Weighted Target Pe (woods) 2.29

*From TR-55

Formulas

$$I (\%) = ((\text{Impervious Area}) / (\text{Drainage Area})) * 100$$

$$R_v = 0.05 + 0.009 * I$$

$$\text{ESDv} = (\text{Pe})(R_v)(A) / 12$$

ESD Design Spreadsheet

DA-East 2

DA: DA #2E

Area(SF)= 19381
Area(AC)= 0.44

Area Impervious (SF)= 13761
Area Impervious (AC)= 0.32

Imp%= 71
Rv= 0.69

Rv = .05 + 0.009 x Imp%

Micro- Bioretention

For Micro-Bioretention an ESDv is determined by the storage provided in the facility and in the filter media.

Drainage area excluding Micro-bio= 18904

V1 = Storage in Filter Media = Af (SF) x d (FT) x 0.4 , Where Af is the filter area, D is the filter media depth, and 0.4 is the void ratio.

Af (SF)= 477

d(FT)= 5

Af % of DA = 2.5 OK

V1= 954

V2= Storage above Media Max depth 1 FT

d(FT)= 1

Bottom Contour Elevation = 527

Area (SF)= 882

Top Contour Elevation = 528

Area (SF)= 1375

V2 = 1128.5

ESDv = V1 + V2 = 2083 CF

Treatment Summary

ESDv Total (CF) = 2083 OK

Max ESDv (CF) = 2786 using Pe = 2.5

Pe Provided = 1.87

Target ESDv (CF) = 2006 using Pe = 1.80

ESD Design Spreadsheet

DA-East 2

DA: DA #3E

Area(SF)= 25595

Area(AC)= 0.59

Area Impervious (SF)=

6143

Area Impervious (AC)=

0.14

Imp%= 24

Rv= 0.27

Rv = .05 + 0.009 x Imp%

Micro- Bioretention

For Micro-Bioretention an ESDv is determined by the storage provided in the facility and in the filter media.

Drainage area excluding Micro-bio= 25023

V1 = Storage in Filter Media = Af (SF) x d (FT) x 0.4 , Where Af is the filter area, D is the filter media depth, and 0.4 is the void ratio.

Af (SF)= 572

d(FT)= 3.5

Af % of DA = 2.3 OK

V1= 800.8

V2= Storage above Media Max depth 1 FT

d(FT)= 0.5

Bottom Contour Elevation = 530

Area (SF)= 1074

Top Contour Elevation = 530.5

Area (SF)= 1269

V2 = 585.75

ESDv = V1 + V2 = 1387 CF

Treatment Summary

ESDv Total (CF) = 1387 OK

Max ESDv (CF) = 1440 using Pe = 2.5

Pe Provided = 2.41

Target ESDv (CF) = 1037 using Pe = 1.80

JOB NUMBER:	0643o2	SHEET:	OF
SUBJECT:	Linganore Town Center		
	South Commercial - DA "B"		
BY:	SN	DATE:	7/7/2020 13:02
CHKD:		DATE:	

ESDv Summary

Drainage Area	ESDv Provided
DA 2E	2083
DA 3E	1387

Total ESDv Provided =	3469	Additional Management Required
Total ESDv Required =	27033	
ESDv Required for 1" Pe =	11791	
Pe Provided =	0.29	

WinTR-55 Current Data Description

--- Identification Data ---

User: 602 Date: 7/7/2020
 Project: LTC South Commercial Units: English
 SubTitle: DA B - Proposed Condition Areal Units: Acres
 State: Maryland
 County: Frederick
 Filename: \\gtdata\SHAREROOT\MD-Frederick\Linganore Town Center\documents\Technical\SWM\South Commercial F

--- Sub-Area Data ---

Name	Description	Reach	Area (ac)	RCN	Tc
DA B1		Outlet	14.39	72	.291
DA B2		Outlet	8.42	87	0.127

Total area: 22.81 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.07	3.9	4.64	5.77	6.79	7.95	2.54

Storm Data Source: Frederick NOAA_C County, MD (NRCS)
 Rainfall Distribution Type: Type II
 Dimensionless Unit Hydrograph: <standard>

602

LTC South Commercial
DA B - Proposed Condition
Frederick County, Maryland

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.07	3.9	4.64	5.77	6.79	7.95	2.54

Storm Data Source: Frederick NOAA_C County, MD (NRCS)
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

602

LTC South Commercial
 DA B - Proposed Condition
 Frederick County, Maryland

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period					
	2-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)	1-Yr (cfs)

SUBAREAS						
DA B1	13.34	32.02	47.20	61.53	78.22	8.05
DA B2	22.23	39.29	51.61	62.72	75.30	16.65
REACHES						
OUTLET	31.70	64.25	89.35	112.68	139.52	21.85

602

LTC South Commercial
DA B - Proposed Condition
Frederick County, Maryland

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period					
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)	1-Yr (cfs) (hr)

SUBAREAS						
DA B1	13.34 12.08	32.02 12.08	47.20 12.07	61.53 12.07	78.22 12.07	8.05 12.09
DA B2	22.23 11.95	39.29 11.95	51.61 11.94	62.72 11.94	75.30 11.95	16.65 11.95
REACHES						
OUTLET	31.70	64.25	89.35	112.68	139.52	21.85

602

LTC South Commercial
DA B - Proposed Condition
Frederick County, Maryland

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
DA B1	14.39	0.291	72	Outlet	
DA B2	8.42	0.127	87	Outlet	

Total Area: 22.81 (ac)					

602

LTC South Commercial
DA B - Proposed Condition
Frederick County, Maryland

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
DA B1							
SHEET	100	0.0200	0.240				0.243
SHALLOW	148	0.0300	0.050				0.015
SHALLOW	282	0.1100	0.050				0.015
CHANNEL	315					5.000	0.018
						Time of Concentration	.291
							=====
DA B2							
SHEET	50	0.0280	0.150				0.084
SHALLOW	188	0.0320	0.050				0.018
CHANNEL	458					5.000	0.025
						Time of Concentration	0.127
							=====

602

LTC South Commercial
DA B - Proposed Condition
Frederick County, Maryland

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
DA B1	Paved parking lots, roofs, driveways	C	2.67	98
	Brush - brush, weed, grass mix (good)	C	9.22	65
	Woods - grass combination (good)	C	2.29	72
	Woods (good)	C	.21	70
	Total Area / Weighted Curve Number		14.39 =====	72 ==
DA B2	Open space; grass cover > 75% (good)	C	2.62	74
	Paved parking lots, roofs, driveways	C	4.88	98
	Brush - brush, weed, grass mix (good)	C	.36	65
	Woods (good)	C	.56	70
	Total Area / Weighted Curve Number		8.42 =====	87 ==

Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Tuesday, Jul 7 2020

Existing SHA I-70 42-inch RCP Culvert - Q10 Proposed Conditions

Invert Elev Dn (ft) = 485.04
 Pipe Length (ft) = 241.00
 Slope (%) = 3.64
 Invert Elev Up (ft) = 493.82
 Rise (in) = 42.0
 Shape = Circular
 Span (in) = 42.0
 No. Barrels = 1
 n-Value = 0.013
 Culvert Type = Circular Concrete
 Culvert Entrance = Square edge w/headwall (C)
 Coeff. K,M,c,Y,k = 0.0098, 2, 0.0398, 0.67, 0.5

Embankment

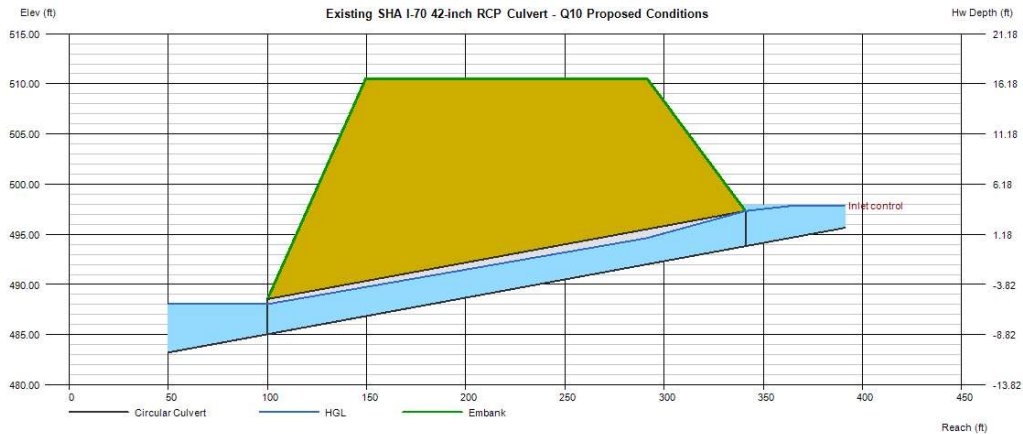
Top Elevation (ft) = 510.50
 Top Width (ft) = 142.00
 Crest Width (ft) = 50.00

Calculations

Qmin (cfs) = 0.00
 Qmax (cfs) = 64.25
 Tailwater Elev (ft) = (dc+D)/2

Highlighted

Qtotal (cfs) = 64.25
 Qpipe (cfs) = 64.25
 Qovertop (cfs) = 0.00
 Veloc Dn (ft/s) = 7.31
 Veloc Up (ft/s) = 8.70
 HGL Dn (ft) = 488.05
 HGL Up (ft) = 496.33
 Hw Elev (ft) = 497.88
 Hw/D (ft) = 1.16
 Flow Regime = Inlet Control



Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Tuesday, Jul 7 2020

Existing SHA I-70 42-inch RCP Culvert - Q25 Proposed Conditions

Invert Elev Dn (ft)	= 485.04
Pipe Length (ft)	= 241.00
Slope (%)	= 3.64
Invert Elev Up (ft)	= 493.82
Rise (in)	= 42.0
Shape	= Circular
Span (in)	= 42.0
No. Barrels	= 1
n-Value	= 0.013
Culvert Type	= Circular Concrete
Culvert Entrance	= Square edge w/headwall (C)
Coeff. K,M,c,Y,k	= 0.0098, 2, 0.0398, 0.67, 0.5

Embankment

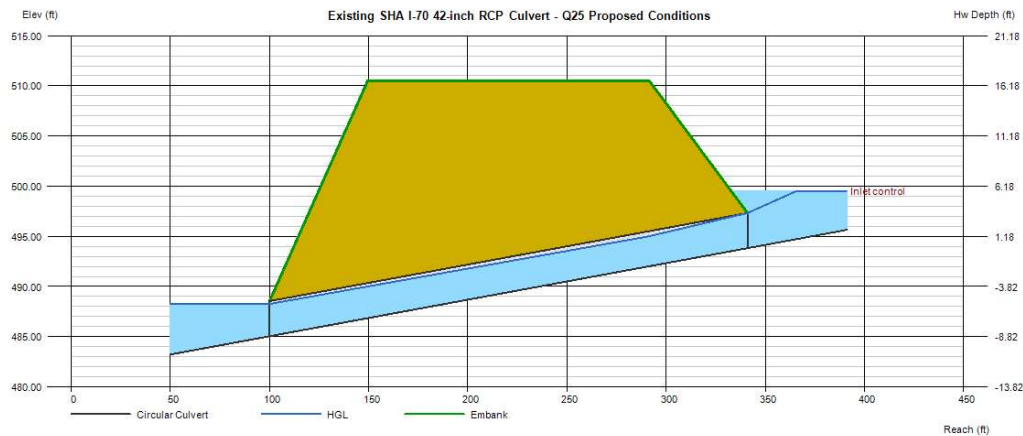
Top Elevation (ft)	= 510.50
Top Width (ft)	= 142.00
Crest Width (ft)	= 50.00

Calculations

Qmin (cfs)	= 0.00
Qmax (cfs)	= 89.35
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

Qtotal (cfs)	= 89.35
Qpipe (cfs)	= 89.35
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 9.66
Veloc Up (ft/s)	= 10.38
HGL Dn (ft)	= 488.26
HGL Up (ft)	= 496.75
Hw Elev (ft)	= 499.53
Hw/D (ft)	= 1.63
Flow Regime	= Inlet Control



Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Tuesday, Jul 7 2020

Existing SHA I-70 42-inch RCP Culvert - Q100 Proposed Conditions

Invert Elev Dn (ft)	= 485.04
Pipe Length (ft)	= 241.00
Slope (%)	= 3.64
Invert Elev Up (ft)	= 493.82
Rise (in)	= 42.0
Shape	= Circular
Span (in)	= 42.0
No. Barrels	= 1
n-Value	= 0.013
Culvert Type	= Circular Concrete
Culvert Entrance	= Square edge w/headwall (C)
Coeff. K,M,c,Y,k	= 0.0098, 2, 0.0398, 0.67, 0.5

Embankment

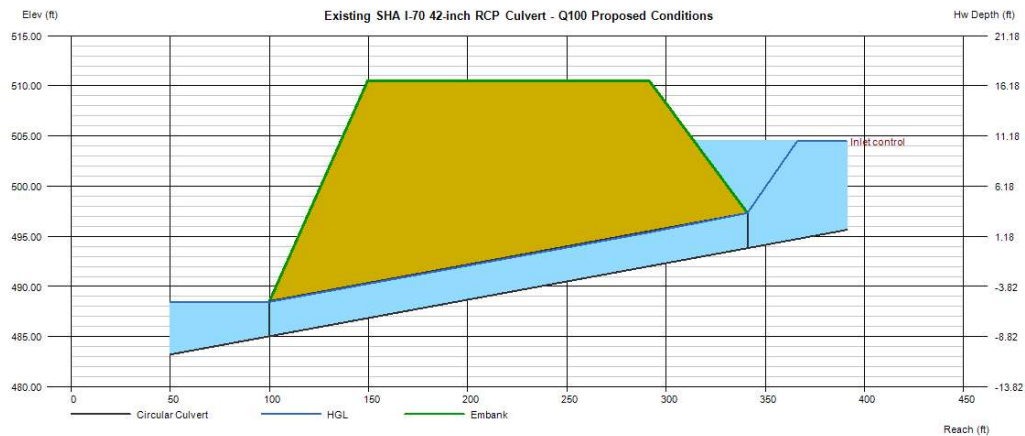
Top Elevation (ft)	= 510.50
Top Width (ft)	= 142.00
Crest Width (ft)	= 50.00

Calculations

Qmin (cfs)	= 0.00
Qmax (cfs)	= 139.52
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

Qtotal (cfs)	= 139.52
Qpipe (cfs)	= 139.52
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 14.58
Veloc Up (ft/s)	= 14.72
HGL Dn (ft)	= 488.47
HGL Up (ft)	= 497.17
Hw Elev (ft)	= 504.47
Hw/D (ft)	= 3.04
Flow Regime	= Inlet Control



JOB NUMBER:	064302	
SUBJECT:	Linganore Town Center - South Commercial	
	DA "C"	
BY:	SN	DATE: 6/29/2020
CHKD:		DATE:

Rainfall Target, Pe

Site Area (Acres)	1.36	Site
LOD Area (acres)	1.23	
Site Impervious Area (acres)	0.43	
Impervious %	32	for Site
RCN*	82	for Site
Pe (in.)	1.77	
Target ESDv for full Pe (CF)	2,923	
Target ESDv for 1" Pe (CF)	1,655	
LOD Impervious Area (acres)	0.43	
Rv	0.37	for LOD

$$= \text{SITE IMPERVIOUS AREA} / \text{SITE AREA} = .43 / 1.36$$

$$= (\text{Pe} \times \text{Rv} \times (\text{LOD AREA} \times 43560)) / 12 = (1.77 \times .37(1.23 \times 43560)) / 12$$

$$= (\text{Pe} \times \text{Rv} \times (\text{LOD AREA} \times 43560)) / 12 = (1 \text{ INCH} \times .37(1.23 \times 43560)) / 12$$

$$= .05 + (0.009 \times 100 \times \text{LOD IMPERVIOUS AREA} / \text{LOD AREA}) = .05 + (0.009 \times 100 \times .43 / 1.23)$$

Site Soil Conditions			
HSG	RCN	Area (acres)	Percent
A	38.00	0.00	0.0
B	55.00	0.00	0.0
C	70.00	1.36	100.0
D	77.00	0.00	0.0

RCN	
	0.00
	0.00
82	82.00
	0.00
RCN=	82.00

Weighted Target RCN (woods) 77

Soil Group		Imp
HSG		Pe (in)
A		-
B		-
C		1.6
D		-

Weighted Target Pe (woods) 1.77

*From TR-55

Formulas

$$I (\%) = ((\text{Impervious Area}) / (\text{Drainage Area})) * 100$$

$$R_v = 0.05 + 0.009 * I$$

$$\text{ESDv} = (\text{Pe})(R_v)(A) / 12$$

ESD Design Spreadsheet

DA-East 1

DA: DA #1E

Area(SF)= 57707

Area(AC)= 1.32

Area Impervious (SF)=

20198

Area Impervious (AC)=

0.46

Imp%= 35

Rv= 0.37

Rv = .05 + 0.009 x Imp%

Micro- Bioretention

For Micro-Bioretention an ESDv is determined by the storage provided in the facility and in the filter media.

Drainage area excluding Micro-bio= 56546

V1 = Storage in Filter Media = Af (SF) x d (FT) x 0.4 , Where Af is the filter area, D is the filter media depth, and 0.4 is the void ratio.

Af (SF)= 1161

d(FT)= 3.58

Af % of DA = 2.1 OK

V1= 1662.552

V2= Storage above Media Max depth 1 FT

d(FT)= 0.75

Bottom Contour Elevation = 526.95

Area (SF)= 1977

Top Contour Elevation = 527.7

Area (SF)= 2542

V2 = 1694.625

ESDv = V1 + V2 = 3357 CF

Treatment Summary

ESDv Total (CF) = 3357 OK

Pe Provided = 1.89

Max ESDv (CF) = 4448 using Pe = 2.5

Target ESDv (CF) = 3142 using Pe = 1.77

JOB NUMBER:	0643o2	SHEET:	OF
SUBJECT:	Linganore Town Center		
	South Commercial - DA "C"		
BY:	SN	DATE:	6/29/2020 13:43
CHKD:		DATE:	

ESDv Summary

Drainage Area	ESDv Provided
DA 1E	3357

Total ESDv Provided =	3357	ESDv Target Met
Total ESDv Required =	2923	
ESDv Required for 1" Pe =	1655	

WinTR-55 Current Data Description

--- Identification Data ---

User: 602 Date: 7/7/2020
 Project: LTC South Commercial Units: English
 SubTitle: DA C - Proposed Condition Areal Units: Acres
 State: Maryland
 County: Frederick
 Filename: \\gtdata\SHAREROOT\MD-Frederick\Linganore Town Center\documents\Technical\SWM\South Commercial F

--- Sub-Area Data ---

Name	Description	Reach	Area (ac)	RCN	Tc
DA C		Outlet	6.09	78	.215

Total area: 6.09 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.07	3.9	4.64	5.77	6.79	7.95	2.54

Storm Data Source: Frederick NOAA_C County, MD (NRCS)
 Rainfall Distribution Type: Type II
 Dimensionless Unit Hydrograph: <standard>

LTC South Commercial
DA C - Proposed Condition
Frederick County, Maryland

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.07	3.9	4.64	5.77	6.79	7.95	2.54

Storm Data Source: Frederick NOAA_C County, MD (NRCS)
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

602

LTC South Commercial
DA C - Proposed Condition
Frederick County, Maryland

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period					
	2-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)	1-Yr (cfs)

SUBAREAS						
DA C	9.26	19.15	26.75	33.74	41.81	6.26
REACHES						
OUTLET	9.26	19.15	26.75	33.74	41.81	6.26

602

LTC South Commercial
DA C - Proposed Condition
Frederick County, Maryland

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period					
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)	1-Yr (cfs) (hr)

SUBAREAS						
DA C	9.26 12.04	19.15 12.02	26.75 12.02	33.74 12.02	41.81 12.01	6.26 12.05
REACHES						
OUTLET	9.26	19.15	26.75	33.74	41.81	6.26

602

LTC South Commercial
DA C - Proposed Condition
Frederick County, Maryland

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
DA C	6.09	0.215	78	Outlet	

Total Area:	6.09 (ac)				

LTC South Commercial
DA C - Proposed Condition
Frederick County, Maryland

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
<hr/>							
DA C							
SHEET	100	0.0400	0.240				0.184
SHALLOW	316	0.0760	0.050				0.020
CHANNEL	191					5.000	0.011
					Time of Concentration		.215
							=====

602

LTC South Commercial
DA C - Proposed Condition
Frederick County, Maryland

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
DA C	Open space; grass cover > 75%	(good)	C	.91	74
	Paved parking lots, roofs, driveways		C	1.99	98
	Brush - brush, weed, grass mix	(good)	C	2.42	65
	Woods	(good)	C	.77	70
	Total Area / Weighted Curve Number			6.09 =====	78 ==

V Storm Drain Computations



Spread Computations - Outfall 544

Project:	Linganore Town Center
Location:	Frederick, Maryland
Date:	June 26, 2020
Condition:	Existing
Storm Event:	2-YR
Computed by:	TNE/SN
	25-YR
	100-YR

Outfall 544

Structure Number	DA (acres)	C	Bypass CA	Total CA (acres)	Tc (min)	I (in/hr)	Q (cfs)	Inlet Type	Cross Slope (%)	Street Grade (%)	Spread (ft)	Efficiency (%)	Bypass Flow (cfs)	Bypass CA	Bypass to structure
3050	0.14	0.80	0.00	0.11	5.00	5.33	0.80	COG-5	2.00	3.24%	4.67	99%	0.00	0.00	3000

Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Friday, Jun 26 2020

3050

Curb Inlet

Location	= On grade
Curb Length (ft)	= 5.00
Throat Height (in)	= 4.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

Slope, Sw (ft/ft)	= 0.020
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 5.00
Gutter Width (ft)	= 1.00
Gutter Slope (%)	= 3.24
Gutter n-value	= 0.015

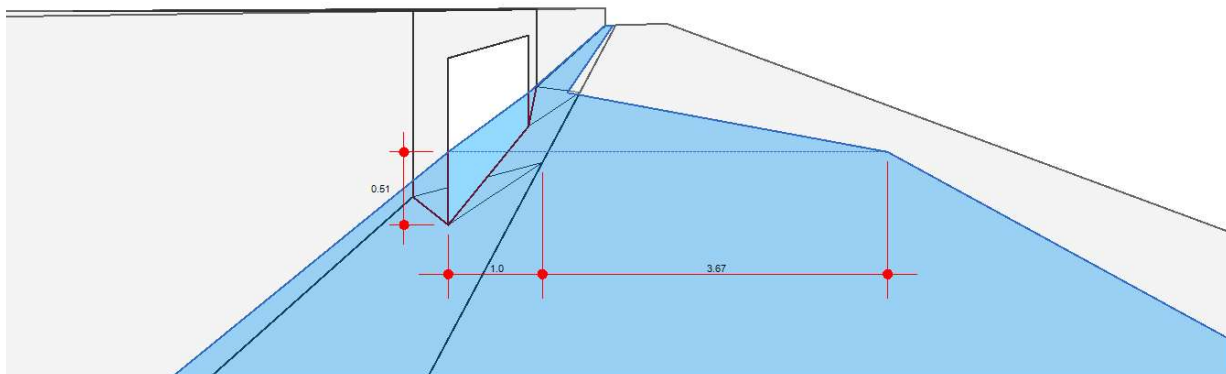
Calculations

Compute by:	Known Q
Q (cfs)	= 0.60

Highlighted

Q Total (cfs)	= 0.60
Q Capt (cfs)	= 0.60
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 6.12
Efficiency (%)	= 99
Gutter Spread (ft)	= 4.67
Gutter Vel (ft/s)	= 2.76
Bypass Spread (ft)	= 0.76
Bypass Depth (in)	= 0.18

All dimensions in feet



Spread Computations - Outfall 544														
Project:		Linganore Town Center												
Location:		Frederick, Maryland												
Date:		June 26, 2020												
Condition:		Existing		Proposed										
Storm Event:		2-YR		10-YR		25-YR		100-YR						
Computed by:		TNB/SN												
Weir Analysis:														
Orifice Analysis:														
Structure Number	DA (acres)	C	Total CA (acres)	Tc (min)	Storm Event (Year)	I (in/hr)	Q (cfs)	Inlet Type	Inlet Length (ft)	Inlet Width (ft)	Ponding Depth (ft)			
											Weir Analysis	Orifice Analysis	Rim Elev.	Max. Ponding Elev.
3020	0.47	0.75	0.35	5.00	2	5.33	1.88	Yard Inlet	2	2		528.00	528.18	
					10	6.93	2.44						528.21	
					25	7.92	2.79						528.23	
					100	9.40	3.31						528.26	
3045	0.46	0.75	0.35	5.00	2	5.33	1.84	Yard Inlet	2	2		530.50	530.68	
					10	6.93	2.39						530.71	
					25	7.92	2.73						530.73	
					100	9.40	3.24						530.76	

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STORM DRAIN DESIGN COMPUTATIONS-OUTFALL 544

Project: LTC - Outfall 544										Jurisdiction: Frederick			Storm Event: 10-Year			Computed By: NB/SN			Date: 6/29/2020		
From Structure	To Structure	Drainage Area		C Factor	C x A		Tc Min.	Rain Fall In / Hr	Runoff Q cfs	Min. Slope %	Pipe Size In.	Pipe Material	Mannings n	Invert Elevations		Actual Slope %	Pipe Length Ft	Actual Velocity ft / s	Flow Time Min.	Full Flow Q cfs	Friction Velocity fps
		Inc. Ac	Cum. Ac		Inc.	Cum.								Upper End	Lower End						
TD-1	DB-1	0.05	0.05	0.60	0.03	0.03	5.00	6.93	0.21	0.098	6	PVC	0.011	531.00	530.83	0.85	20	2.81	0.12	0.61	1.06
	DB-1	0.16	0.21	0.90	0.14	0.17	5.12	6.90	1.20	0.214	10	PVC	0.011	530.50	530.00	1.02	49	4.70	0.17	2.62	2.20
*																					
3045	3044	0.46	0.46	0.75	0.35	0.35	5.00	6.93	2.39	0.136	15	CL IV - RCP	0.013	525.90	525.60	1.11	27	5.07	0.09	6.81	1.95
3044	3043	0.00	0.46	0.00	0.00	0.35	5.09	6.91	2.38	0.135	15	CL IV - RCP	0.013	524.35	522.15	7.33	30	9.99	0.05	17.49	1.94
3043	3020	0.00	0.46	0.00	0.00	0.35	5.14	6.90	2.38	0.051	18	CL IV - RCP	0.013	521.90	520.25	6.35	26	9.31	0.05	26.46	1.35
*																					
3020	3015	0.47	0.93	0.75	0.35	0.70	5.19	6.89	4.80	0.208	18	CL IV - RCP	0.013	520.00	519.00	1.64	61	7.00	0.15	13.45	2.72
3015	3005	0.25	1.18	0.80	0.20	0.90	5.33	6.85	6.15	0.341	18	CL IV - RCP	0.013	518.75	517.90	3.70	23	10.05	0.04	20.19	3.48
3005	3000	0.00	1.18	0.00	0.00	0.90	5.37	6.85	6.14	0.340	18	CL IV - RCP	0.013	517.65	511.85	3.79	153	10.14	0.25	20.45	3.48
*																					
3030	3000	0.71	0.71	0.75	0.53	0.53	5.00	6.93	3.69	0.123	18	CL IV - RCP	0.013	512.00	511.85	1.07	14	5.57	0.04	10.87	2.09
3000	546	0.24	2.13	0.85	0.20	1.63	5.62	6.79	11.09	0.239	24	CL IV - RCP	0.013	511.60	511.35	1.09	23	7.41	0.05	23.59	3.53
546	544	0.00	19.99	0.00	0.00	12.64	18.44	4.46	56.40	0.711	36	CL IV - RCP	0.013	494.78	494.06	1.00	72	10.61	0.11	66.70	7.98

HYDRAULIC GRADE LINE COMPUTATIONS-OUTFALL 544

Project: LTC - Outfall 544				Jurisdiction: Frederick				Storm Event: 10-Year		Computed By: SN		Date: 6/29/2020					
Structure	Up Stream Structure	HGL @ Bottom Of Outlet Pipe ft	Size D o in	Outflow Q o cfs	Length L o ft	Friction Slope S f o %	Pipe Loss			Junction Loss			HGL @ Structure Inlet ft	Rim Elev.			
							Head Loss H f ft	Invert Out @ Str	Normal Depth	HGL @ Top of Outlet Pipe ft	Friction Velocity V f o fps	Q i cfs			V i fps	Incoming Angle deg	Resultant Velocity
*																	
3020		519.62	18	4.80	61	0.21	0.13	520	0.62	520.62	2.72	2.38	1.35	90	0.47	0.11	520.73
3043		520.62	18	2.38	26	0.05	0.01	521.9	0.30	522.20	1.35	2.38	1.94	45	1.80	-0.02	522.20
3044		522.46	15	2.38	30	0.14	0.04	524.35	0.31	524.66	1.94	2.38	1.94	45	1.81	0.01	524.67
3045		526.11	15	2.39	27	0.14	0.04	525.9	0.51	526.41	1.95	2.39	1.95	45	1.81	0.01	524.67
3045		526.11	15	2.39	27	0.14	0.04	525.9	0.51	526.41	1.95						526.41
*																	
3055		530.71	10	1.20	49	0.21	0.10	530.5	0.40	530.90	2.20						530.71
DB-1		530.71	10	1.20	49	0.21	0.10	530.5	0.40	530.90	2.20						530.71
TD-1		531.03	6	0.21	20	0.10	0.02	531	0.20	531.20	1.06	0.21	1.06	24	0.18	0.07	530.97
TD-1		531.03	6	0.21	20	0.10	0.02	531	0.20	531.20	1.06						531.20

Spread Computations																	
Project:		LTC Commercial Retail Center					<div>Notes:</div>										
Location:		Frederick, Maryland															
Date:		July 7, 2020															
Condition:		Existing		Proposed													
Storm Event:		2-YR	10-YR	25-YR	100-YR												
Computed by:		SN															
Structure Number	DA (acres)	C	Total CA (acres)	Tc (min)	I (in/hr)	Q (cfs)	Bypass Flow (cfs)	Total Q (cfs)	Inlet Type	Cross Slope (%)	Street Grade (%)	Spread (ft)	Spread Outside Parking Bay (ft)	Efficiency (%)	Bypass Flow (cfs)	Bypass CA	Bypass to structure
OUTFALL 3200																	
3210	0.47	0.75	0.35	5.00	5.33	1.88	--	1.88	COS-10	2.00%	LP	8.43	0.00	100.00%	0.00	0	N/A



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Friday, Jun 26 2020

3210

Curb Inlet

Location	= Sag
Curb Length (ft)	= 10.00
Throat Height (in)	= 4.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

Slope, Sw (ft/ft)	= 0.020
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 5.00
Gutter Width (ft)	= 1.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

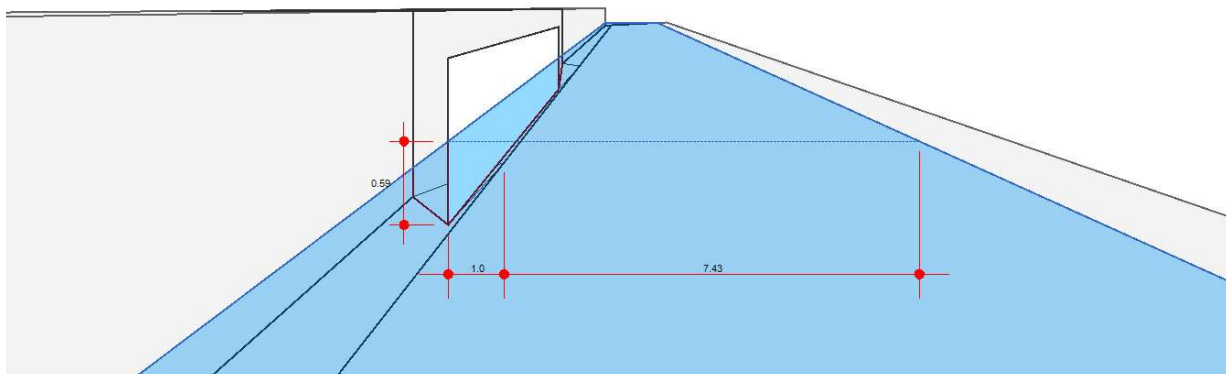
Calculations

Compute by:	Known Q
Q (cfs)	= 1.88

Highlighted

Q Total (cfs)	= 1.88
Q Capt (cfs)	= 1.88
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 7.02
Efficiency (%)	= 100
Gutter Spread (ft)	= 8.43
Gutter Vel (ft/s)	= 2.76
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-

All dimensions in feet



Spread Computations										<div><div>RODGERS</div><div>CONSULTING</div><div>Knowledge • Creativity • Enduring Values</div></div>					
Project:		LTC Commercial Retail Center													
Location:		Frederick, Maryland													
Date:		July 7, 2020													
Condition:		Existing		Proposed											
Storm Event:		2-YR	10-YR	25-YR											100-YR
Computed by:		SN													
OUTFALL 3200											Ponding Depth (ft)				
Structure Number	D _A (acres)	C	Total C _A (acres)	T _c (min)	Storm Event (Year)	I (in/hr)	Q (cfs)	Inlet Type	Inlet Length (ft)	Inlet Width (ft)	Weir Analysis	Orifice Analysis	Rim Elev.	Max. Ponding Elev.	
3205	1.19	0.75	0.90	5.00	2	5.33	4.78	Y a l r e d	2	2	0.33	0.25	530.20	530.53	
					10	6.93	6.21				0.40	0.42		530.62	
					25	7.92	7.10				0.43	0.54		530.74	
					100	9.40	8.42				0.49	0.77		530.97	

STORM DRAIN DESIGN COMPUTATIONS - OUTFALL 3200

Project: Linganore Town Center - Commercial Retail Center										Jurisdiction:			Storm Event:		10-Year		Computed By:		SN		Date:		6/30/2020	
From Structure	To Structure	Drainage Area		C	C x A		Tc	Rain Fall In / Hr	Runoff Q cfs	Min. Slope %	Pipe Size In.	Pipe Material	Mannings n	Invert Elevations		Lower End	Actual Slope %	Pipe Length Ft	Actual Velocity ft / s	Flow Time Min.	Flow Q cfs	Friction Velocity fps		
		Inc. Ac	Cum. Ac		Inc.	Cum.								Upper End										
TD-2	DB-5	0.06	0.06	0.60	0.04	0.04	5.00	6.93	0.25	0.141	6	PVC	0.011	528.35	528.20	0.52	29	2.46	0.20	0.48	1.27			
DB-5	3208	0.14	0.20	0.90	0.13	0.16	5.20	6.88	1.12	0.185	10	PVC	0.011	528.10	526.95	1.51	76	5.33	0.24	3.19	2.04			
*																								
3205	3200	1.20	1.20	0.75	0.90	0.90	5.00	6.93	6.24	0.927	15	CL IV - RCP	0.013	522.75	522.00	1.00	75	6.01	0.21	6.46	5.08			

HYDRAULIC GRADE LINE COMPUTATIONS

Project: Languore Town Center - Commercial Retail Center										Jurisdiction: Frederick		Storm Event: 10-Year										Computed By: SN		Date: 44012.489	
Structure	Up Stream Structure	HGL @ Bottom of Outlet Pipe ft	Size D o in	Outflow Q o cfs	Length L o ft	Friction Slope S f o %	Head Loss H f ft	Invert in @ Down Stream Structure	Normal Depth Top of Outlet Pipe ft	HGL @ Outlet Pipe ft	Friction Velocity V f o fps	Q i cfs	V i fps	2 V i / 2g	Incoming Angle deg	Inlet / Manhole	K i	Control Angle	K b	H b	HGL @ Structure Inlet ft	Rim Elev.			
3200		523.25	15	6.24	75	0.93	0.70	522.75	0.99	523.95	5.08											523.25			
3205																	Inlet					523.95			
										Starting Elevation															

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Tuesday, Jun 30 2020

Riprap at Outfall 3200

Trapezoidal

Bottom Width (ft) = 2.50
Side Slopes (z:1) = 2.00, 2.00
Total Depth (ft) = 2.00
Invert Elev (ft) = 522.00
Slope (%) = 0.10
N-Value = 0.035

Calculations

Compute by: Known Q
Known Q (cfs) = 6.24

Highlighted

Depth (ft) = 1.18
Q (cfs) = 6.240
Area (sqft) = 5.73
Velocity (ft/s) = 1.09
Wetted Perim (ft) = 7.78
Crit Depth, Yc (ft) = 0.51
Top Width (ft) = 7.22
EGL (ft) = 1.20

