SITE DEVELOPMENT PLAN

MIXED USE DEVELOPMENT

TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY
FOR: JOHN & PATRICIA STUECKLER

SITE PLAN NOTES

#	DESCRIPTION
1	THESE PLANS AND SPECIFICATIONS ARE THE PROPERTY OF: COLLINSON, OLIFF AND ASSOCIATES, INC.
2	IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MEET ALL OF THE REQUIREMENTS OF THE FEDERAL, STATE, AND LOCAL AUTHORITIES, HEALTH DEPARTMENT AND UTILITY COMPANIES, IN ADDITION TO THE INFORMATION STATED
3	IN CASE OF CONFLICT BETWEEN ANY PART OF THESE PLANS AND SPECIFICATIONS, OR IF ANY ERRORS OR OMISSIONS ARE DISCOVERED IN THE LINES, GRADES AND DIMENSIONS, THE CONTRACTOR SHALL NOTIFY THE SITE CONSULTANT IMMEDIATELY AND SHALL REQUEST A WRITTEN DETERMINATION PRIOR TO PROCEEDING WITH THE WORK INVOLVED. IF THE WORK PROCEEDS WITH THE KNOWLEDGE OF THE ERROR OR OMISSION, AND WITHOUT A WRITTEN DETERMINATION, SUCH WORK WILL NOT BE CONSIDERED IN COMPLIANCE WITH THESE PLANS AND SPECIFICATIONS.
4	PRIOR TO CONSTRUCTION, CONTACT: THE ENFORCEMENT DIVISION, DEPARTMENT OF THE ENVIRONMENT SEDIMENT AND STORMWATER MANAGEMENT ADMINISTRATION 1800 WASHINGTON BLVD. BALTIMORE, MARYLAND 21230 PHONE: (410) 537-3000
5	NOTIFY THE CALVERT COUNTY DEPARTMENT OF INSPECTIONS AND PERMITS, (410) 535-2155, THE CALVERT COUNTY SOIL CONSERVATION DISTRICT, (410) 535-1521, AND MISS UTILITY, (800) 257-7777, 3 DAYS PRIOR TO THE START OF ANY WORK ON THIS SITE.
6	OWNER(S): BAY AVENUE DEVELOPMENT LLC 111 LORINS DRIVE HUNTINGTOWN, MARYLAND 20639 PHONE: (301) 908-2540 - (301) 908-2541
7	DEVELOPER(S): BAY AVENUE DEVELOPMENT LLC 111 LORINS DRIVE HUNTINGTOWN, MARYLAND 20639 PHONE: (301) 908-2540 - (301) 908-2541
8	IT SHALL BE DISTINCTLY UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NATURALLY BE REQUIRED TO COMPLETE THIS PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO COMPLETE SUCH WORK
9	AS CONSTRUCTION PROCEEDS, ADDITIONAL MEASURES MAY BE EMPLOYED WITH THE ENGINEER'S APPROVAL, IF CONDITIONS WARRANT, TO ENSURE EFFECTIVE STORMWATER DRAINAGE AND SEDIMENT CONTROL.
10	SEDIMENT CONTROL MEASURES AND PROPOSED TREE LINE REPRESENTS LIMIT OF WORK UNLESS OTHERWISE STATED.
11	ALL ELEVATIONS SHOWN HEREON ARE IN REFERENCE TO BENCH MARKS AND MUST BE FIELD VERIFIED BY THE GENERAL CONTRACTOR PRIOR TO CONSTRUCTION.
12	ALL EXTERIOR LIGHTING PROPOSED FOR THIS SITE SHALL BE DARK SKIES FRIENDLY, PERMANENTLY INSTALLED AND MOUNTED IN ACCORDANCE WITH THE IESNA LIGHTING HANDBOOK & RECOMMENDED PRACTICES AS DESCRIBED IN THE C.C.Z.O. ARTICLE 6-6.01. FIXTURES SHALL MEET FULL CUTOFF CRITERIA.
13	EXISTING ELEVATIONS SHOWN HEREON ARE FROM A FIELD RUN SURVEY BY C.O.A., INC. DATED 7/24/19 AND SUPPLEMENTED WITH CALVERT COUNTY AERIAL TOPOGRAPHY REFERENCED TO NAVD 88. EXISTING UTILITIES SHOWN ARE TAKEN FROM FIELD INFORMATION AND THE BEST AVAILABLE PLANS OF THE EXISTING UTILITIES. THE BEARINGS SHOWN HEREON ARE REFERENCED TO NAD 83.
14	PROPERTY LINE SHOWN HEREON BASED ON SURVEY PERFORMED BY C.O.A., INC. FOR THE PREPARATION OF BOUNDARY SURVEY DATED 7/24/19
15	THIS PLAN WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT.
16	THIS PLAT IS NOT A BOUNDARY SURVEY AND DOES NOT MEET THE MINIMUM STANDARDS FOR A BOUNDARY SURVEY AS DEFINED BY COMAR REGULATION.
17	THE ENTIRE SITE IS WITHIN THE 1000' CRITICAL AREA LINE AND IS CLASSIFIED INTENSELY DEVELOPED AREA (IDA). NO CRITICAL AREA BUFFER IMPACTS THIS SITE.
18	THIS PLAN MEETS THE REQUIREMENTS FOR FOREST CONSERVATION VIA AN EXEMPTION UNDER 8-3.02.B.

DEVELOPMENT PLAN NOTES

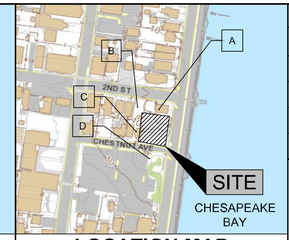
#	DESCRIPTION
1	DEVELOPMENT AGREEMENT WAIVER APPROVED PER PLANNING COMMISSION MEETING ON 01/20/2020
2	CONSTRUCTION PHASING: PHASE 1 - CONSTUCTION TO INCLUDE ALL OF THE SITE IMPROVEMENTS AS SHOWN AND THE CONSTRUCTION OF THE PHASE 1 BUILDING TO THE SOUTH. PHASE 2 - CONSTUCTION OF THE PHASE 2 BUILDING, ANY REMAINING SITE IMPROVEMENTS AND MAINTENANCE/REPAIR AS NEEDED.

BENCHMARK INFORMATION ~ NAD 83 & NAVD 88

BM#	DESCRIPTION	NORTHING	EASTING	ELEVATION
BM A	TOP OF CURB CUT	378,069.38	1,445,827.11	8.08'
BM B	TOP OF CURB CUT	377,964.84	1,445,812.46	6.95'

VICINITY MAP

ADC MAP 4 GRID G-8 SCALE: 1"=400'



LOCATION MAP

SCALE: 1"=250'

ADJACENT PROPERTY INFORMATION

	LOT #	OWNER(S)	DEED REF.	TAX ID #
A	25 & 26	*HANSON CAROLYN J*	K.P.S. *[2494/437]*	03-055507
B	25 & 26	*HANSON CAROLYN J*	K.P.S. *[2494/437]*	03-055507
C	33A	*GALLIMORE JESSICA*	K.P.S. *[1356/728]*	03-052893
D	VARIOUS	*ROMAN CATHOLIC ARCHBISHOP*	K.P.S. *[15/598]*	03-057941

SITE DATA BLOCK

TM	200	BLK	1	LOT	23 & 24	DEED	5504/255	TAX ID#	03 - 053687
PARCEL AREA (SF)				9,790					
ZONING				W-1 - WATERFRONT LIMITED DISTRICT					
BUILDING RESTRICTION LINES: FT				FRONT	10	SIDE	5	REAR	5
PARKING RESTRICTION LINES: FT				FRONT	-	SIDE	-	REAR	-
LAND USE				EXISTING		VACANT			
				PROPOSED		MIXED USE RESIDENTIAL AND COMMERCIAL			
BUILDING DATA (EXTERIIOR INFO)				AREA SF±		3,840			
				HEIGHT FT±		< 40'			
				USE		MIXED USE RESIDENTIAL AND COMMERCIAL			
				# OF EMPLOYEES		TBD			
FLOOR AREA RATIO (INTERIOR INFO)				EXISTING SF±		0			
				PROPOSED SF ±		PH 1 = 5760 | | PH 2 = 5760			
				TOTAL SF±		PH 1 = 5760 | | PH 2 = 5760			
				F.A.R.		1.18			
				F.A.R. MIN		1.50			
				F.A.R. MAX		N/A			
UTILITIES				WATER		W - 1 : PUBLIC WATER (EXISTING)			
				SEWER		S - 1 : PUBLIC SEWER (EXISTNG)			
PREDOMINANT SOILS				SOIL SYMBOL - SOIL NAME (HSG)				HYDRIC	K VALUE
				KwB - KEYPORT SILT LOAM (C/D)				YES	0.49
POWER				ELECTRIC					
WASTE				RESIDENTIAL CURB SIDE SERVICE					
LAND COVERAGE				IMPERVIOUS		GREEN	FOREST		TOTAL
EXISTING SITE SF ±				266		9,709	0		9,975
PROPOSED SITE SF ±				7,802		2,173	0		9,975

PARKING & LOADING REQUIREMENTS

DESCRIPTION APPROVED USES	GROSS AREA OR USE (SF)	PARKING RATIO # / UNIT	PARKING		LOADING	
			REQ'D	PRO'D	REQ'D	PRO'D
PH#1 - 1ST FLOOR COMMERCIAL		ON STREET PARKING				
PH#1-2ND & 3RD FLOOR RESIDENTIAL	1 DWELLING UNIT (DU)	2 / DU	2	2	0	0
PH#2 - 1ST FLOOR COMMERCIAL		ON STREET PARKING				
PH#2-2ND & 3RD FLOOR RESIDENTIAL	1 DWELLING UNIT (DU)	2 / DU	2	2	0	0
GRAND TOTAL			4	4	0	0

LEGEND

DESCRIPTION	EXISTING	PROPOSED
BENCHMARK	BM A	
BUILDING		
CURB		
DOWNSPOUT	DS#1	DS #1
ELEVATION - CONTOUR	118 120	
ELEVATION - SPOT	123.45	
FENCE - SCREENING		
FENCE - SECURITY		
FLOW ARROW		
GUARD RAIL		
LIGHT - BUILDING MOUNTED		
LIGHT - PARKING LOT		
LIGHT - STREET		
LIMIT OF DISTURBANCE		LOD
MICRO-BIORETENTION - PLANTER BEDS		
PAVEMENT - GRAVEL		
PAVEMENT - SHA / COUNTY		
PAVEMENT - SITE		
PIPE FOUND/IRON ROD FOUND	PF / IRF	
PROPERTY LINE OR R/W LINE		
RETAINING WALL		
SIDEWALK - BRICK		
SIDEWALK - CONCRETE		
SIGN	STOP	
SOILS		
STEEP SLOPES 15%		
STEEP SLOPES 25%		
SURGE STONE / RIP-RAP		
TO BE REMOVED		
TREE LINE		
UTILITY CUT REPAIR PER RD-24		
UTILITY - GAS LINE	EX G	GAS
UTILITY - OVER HEAD WIRES	OHW	
UTILITY - POLE		
UTILITY - SEWER LINE	EX 4in S	S
UTILITY - STORMDRAIN	15" CMP	18" HDPE
UTILITY - STORMDRAIN INLET		
UTILITY - WATER LINE	EX W	W
UTILITY - WELL		

LIST OF ABBRIVIATIONS

ASP-2	ALUMINIZED STEEL PIPE-TYPE 2
BC	BOTTOM OF CURB
BRL	BUILDING RESTRICTION LINE
BW	BOTTOM OF WALL
CONC	CONCRETE
COTG	CLEANOUT TO GRADE
EL	ELEVATION
ELEC	ELECTRIC
ES	END SECTION
EX	EXISTING
FFE	FINISH FLOOR ELEVATION
FH	FIRE HYDRANT
FM	FORCE MAIN
HB	HORIZONTAL BEND
HC	HANDICAP
I	INLET
L	LENGTH
LOD	LIMIT OF DISTURBANCE
MH	MANHOLE
OAE	OR APPROVED EQUAL
PC	POINT OF CURVATURE
PRL	PARKING RESTRICTION LINE
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
R	RADIUS
R/W	RIGHT-OF-WAY
S	SANITARY SEWER
SHC	SEWER HOUSE CONNECTION
STA	STATION
TBR	TO BE REMOVED
TC	TOP OF CURB
TRANS	TRANSFORMER
TS&V	TAPPING SLEEVE & VALVE
TW	TOP OF WALL
VHC	VAN HANDICAP
W	WATERLINE
WHC	WATER HOUSE CONNECTION
WM	WATER METER
WV	WATER VALVE
YC	YELLOW CURB

SURVEYOR'S / ENGINEER'S CERTIFICATE

I HEREBY CERTIFY THAT THE PROPOSED SIDEWALKS, RAMPS AND CURB RAMPS SHOWN HERON HAVE BEEN DESIGNED IN ACCORDANCE WITH THE DEPARTMENT OF JUSTICE ADA STANDARDS FOR ACCESSIBLE DESIGN MANUAL SPECIFICALLY SECTIONS 4.3.1 TO 4.3.8, 4.7, AND 4.8.

I HEREBY CERTIFY THAT THIS PLAN OF EROSION AND SEDIMENT CONTROL MEETS THE REQUIREMENTS, STANDARDS AND SPECIFICATIONS OF THE CALVERT COUNTY SOIL CONSERVATION DISTRICT.

I HEREBY CERTIFY THAT THE SIGHT DISTANCE OF THE PROPOSED ENTRANCE LOCATION MEETS OR EXCEEDS THE REQUIREMENTS OF AASHTO, SUBJECT TO THE COMPLETION OF THE CORRECTIVE MEASURES AS SHOWN ON THE PLAT AND DESCRIBED AS FOLLOWS: NO IMPROVEMENTS REQUIRED BY CALVERT COUNTY FOR THIS SUBMITTAL.

BY: _____ DATE 05/15/2020
DANIEL J. KELSH MD PE #17627

OWNER'S / DEVELOPER'S CERTIFICATE

I HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY STATE OF MARYLAND, DEPARTMENT OF THE ENVIRONMENT, COMPLIANCE INSPECTORS.

BY: _____ DATE 05/15/2020
FOR: JOHN & PATRICIA STUECKLER

INDEX OF DRAWINGS

SHEET NAME	SHEET #	OF	TOTAL #
COVER SHEET	C 1.0	OF	15
SPECIFICATIONS	C 1.1	OF	15
EXISTING CONDITIONS PLAN	C 1.2	OF	15
SEDIMENT & EROSION CONTROL PLAN	C 2.0	OF	15
SEDIMENT & EROSION CONTROL DETAILS	C 2.1	OF	15
GRADING PLAN	C 3.0	OF	15
UTILITY PLAN	C 4.0	OF	15
UTILITY PROFILES	C 4.1	OF	15
UTILITY DETAILS	C 4.2	OF	15
UTILITY DETAILS	C 4.3	OF	15
SITE LAYOUT & LANDSCAPE PLAN	C 5.0	OF	15
SITE DETAILS	C 5.1	OF	15
STORMWATER MANAGEMENT PLAN	C 6.0	OF	15
ENLARGED STORMWATER MANAGEMENT PLAN	C 6.1	OF	15
STORMWATER MANAGEMENT DETAILS	C 6.2	OF	15

AGENCY APPROVAL STAMPS

DEPT. OF PUBLIC WORKS STATEMENT

DPW APPROVAL SIGNIFIES A FINDING OF COMPLIANCE TO THE CALVERT COUNTY ROAD AND STORMWATER MANAGEMENT ORDINANCES, REGARDLESS OF SUCH APPROVAL, THE DESIGN PROFESSIONAL, DEVELOPER, AND CONTRACTOR REMAIN SOLELY RESPONSIBLE FOR THE DESIGN AND FOR CORRECTING ANY AND ALL ERRORS, PROBLEMS, AND CODE VIOLATIONS PRIOR TO ANY ACCEPTANCE OF A FACILITY OR STRUCTURE BY THE COUNTY. THE APPROVAL OF DPW IS NOT A WAIVER OR RELEASE FOR DEFECTS OR DEVIATION IN DESIGN OR CONSTRUCTION.

COLLINSON, OLIFF & ASSOCIATES, INC.
SURVEYORS • ENGINEERS
LAND PLANNERS
P.O. BOX 2209 ~ 110 MAIN STREET
PRINCE FREDERICK, MARYLAND 20678
410-535-3101 • 301-855-1599
FAX: 410-535-3103 • EMAIL: INFO@COAINC.COM

STATE OF MARYLAND DANIEL J. KELSH No. 17627 PROFESSIONAL ENGINEER
MD PE #17627
05/15/2020
DANIEL J. KELSH DATE

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.: 17627, EXPIRATION DATE: 12/13/2021

FOLDER REFERENCE	TM 200 BLOCK 1 LOTS 23 & 24
DATE	REVISION
02/27/2020	SITE PLAN REVISIONS
05/15/2020	-
-	-
-	-
-	-
-	-
-	-
-	-
SCALE	AS SHOWN
DATE	FEB. 2020
JOB NO.	1-13187
DRAWN BY	JRM
APPROVED	DJK

GRA #: 2020-3365

PLAN #: 3

SITE

COVER SHEET

MIXED USE DEVELOPMENT
TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY
FOR: JOHN & PATRICIA STUECKLER

THIS STAMP IN RED COLOR INDICATES ORIGINAL

C 1.0

FILE #: B - 58 - 28 A

SITE WORK SPECIFICATIONS

1) CLEARING:

THE EXISTING VEGETATION AND ROOTMAT IS TO BE CLEARED AND GRUBBED FROM THE SITE WITHIN THE LIMIT OF WORK UNLESS NOTED OTHERWISE. BURNING IS BY PERMIT ONLY.

2) EARTHWORK:

A) GENERAL:

1. ALL TREES, STUMPS, RUBBISH, DEBRIS, ROOTMAT AND ORGANIC MATERIAL SHALL BE REMOVED FROM THE LIMITS OF THE GRADING.
2. FILLING MAY BE ACCOMPLISHED AFTER DEMOLITION, CLEARING AND GRUBBING IS COMPLETED AND UNSUITABLE SOILS HAVE BEEN REMOVED.
3. NO FILL IS TO BE PLACED ON FROZEN GROUND.
4. NO SLOPES ARE TO BE GREATER THAN 2:1 WITHOUT MECHANICAL STABILIZATION.
5. ALL FILL SLOPES SHALL BE STABILIZED IMMEDIATELY AFTER COMPLETION OF GRADING SAID SLOPES.
6. TOPSOIL SHALL BE REMOVED PRIOR TO PLACING ANY CONTROLLED FILLS.
7. ALL AREAS TO BE SEEDED AND MULCHED ARE TO RECEIVE A MINIMUM 4 INCHES OF TOPSOIL.

B) SITE CONSTRUCTION STATED ON THESE PLANS SHALL BE IN ACCORDANCE WITH THE MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, DATED 2018, AS AMENDED. THE CONSTRUCTION SHALL ALSO BE BE GOVERNED BY THE STATE OF MARYLAND DEPARTMENT OF THE ENVIRONMENT PERMITS, U.S. ARMY CORPS OF ENGINEER PERMITS, AND THE MARYLAND STATE HIGHWAY AND COUNTY ROAD, GRADING AND BUILDING PERMITS, WHERE APPLICABLE.

C) COMPACTION:

1) GENERAL: CONTROL SOIL COMPACTION DURING CONSTRUCTION PROVIDING MINIMUM PERCENTAGE OF DENSITY SPECIFIED FOR EACH AREA CLASSIFICATION INDICATED BELOW. IF COMPACTION AS INDICATED CANNOT BE ACHIEVED, REMOVE UNSUITABLE SOIL TO DEPTH REQUIRED, FILL AND COMPACT SOIL TO MEET REQUIREMENTS OR AS DIRECTED BY THE OWNERS REPRESENTATIVE.

2) PERCENTAGE OF MAXIMUM DENSITY REQUIREMENTS: COMPACT SOIL TO NOT LESS THAN THE FOLLOWING PERCENTAGES OF MAXIMUM DENSITY FOR SOILS WHICH EXHIBIT A WELL-DEFINED MOISTURE RELATIONSHIP DETERMINED IN ACCORDANCE WITH ASTM D 698.

a) AREAS OF PROPOSED CONCRETE SLAB AND PARKING SPACES: COMPACT TOP 12" OF EXISTING SUBGRADE AND EACH LAYER OF BACKFILL OR FILL MATERIAL AT 95%. COMPACT THE TOP 6" OF SUBGRADE AND BASE COURSE PAVEMENT MATERIAL TO AT LEAST 97% MAXIMUM DENSITY.

b) LAWN OR UNPAVED AREAS: COMPACT EACH LAYER OF BACKFILL OR FILL MATERIAL AT 90%.

c) WALKWAYS: COMPACT EACH LAYER OF BACKFILL OR FILL MATERIAL AT 95% MAXIMUM DENSITY.

d) BACKFILL: COMPACT EACH LAYER AT 95%.

3) MOISTURE CONTROL:

a) GENERAL: (MOISTURE CONTENT SHALL BE WITH IN 2 PERCENT OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D 698.)

a) WHERE SUBGRADE OR LAYER OF SOIL MATERIAL MUST BE MOISTURE CONDITIONED BEFORE COMPACTION, UNIFORMLY APPLY WATER TO SURFACE OF SUBGRADE, OR LAYER OF SOIL MATERIAL. APPLY WATER IN MANNER TO PREVENT FREE WATER APPEARING ON SURFACE DURING OR SUBSEQUENT TO COMPACTION OPERATIONS. 'MOISTURE CONTENT SHALL BE WITH- IN 3 PERCENT OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D 698.'

b) IF SOILS ARE FOUND TO EXCEED THE OPTIMUM MOISTURE CONTENT RANGE, THEN THE SOILS SHALL BE SCARIFIED TO BE BROUGHT INTO COMPLIANCE.

D) BACKFILL AND FILL:

1) USE SATISFACTORY ONSITE SOIL MATERIAL, APPROVED FOR USE BY THE OWNER OR THEIR REPRESENTATIVE.

2) GENERAL: PLACE ACCEPTABLE SOIL MATERIAL IN LAYERS TO REQUIRED SUBGRADE ELEVATIONS FOR EACH AREA CLASSIFICATION LISTED BELOW.

a) UNDER EXCAVATIONS AND BACKFILL, USE SATISFACTORY EXCAVATED OR BORROW MATERIAL.

b) UNDER GRASSED AREAS, USE SATISFACTORY EXCAVATED OR BORROW MATERIAL.

c) UNDER WALKS, PARKING AREA, AND CONCRETE SLAB AREAS, USE SUBBASE MATERIAL, OR SATISFACTORY EXCAVATED OR BORROW MATERIAL, OR COMBINATION OF BOTH AS INDICATED ON THESE PLANS.

d) UNDER PIPING AND CONDUIT, USE SUBBASE MATERIAL WHERE SUBBASE IS INDICATED UNDER PIPING OR CONDUIT; SHAPE TO FIT BOTTOM 90 DEGREES OF CYLINDER.

3) PLACEMENT AND COMPACTION: a) PLACE BACKFILL AND FILL MATERIALS IN LAYERS NOT MORE THAN 8" IN LOOSE DEPTH PER LAYER FOR MATERIAL COMPACTED BY HEAVY COMPACTION EQUIPMENT, AND NOT MORE THAN 4" IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND-OPERATED TAMPERS.

E) GRADING:

1) GENERAL: UNIFORMLY GRADE AREAS WITHIN LIMITS OF GRADING. SMOOTH FINISHED SURFACES WITHIN SPECIFIED TOLERANCES, COMPACT WITH UNIFORM LEVELS OR SLOPES BETWEEN POINTS WHERE ELEVATIONS ARE INDICATED, OR BETWEEN SUCH POINTS AND EXISTING GRADES. GRADE SMOOTH AND EVEN, TO BE FREE OF VOIDS, COMPACTED AS SPECIFIED, AND TO REQUIRED ELEVATION. PROVIDE FINAL GRADES WITHIN A TOLERANCE OF 1/2", WITH POSITIVE DRAINAGE.

2) COMPACTION: AFTER GRADING, COMPACT SUBGRADE SURFACES TO THE DEPTH AND INDICATED PERCENTAGE OF MAXIMUM OR RELATIVE DENSITY FOR EACH AREA CLASSIFICATION.

F) PARKING SURFACE:

1) GENERAL: SUBBASE COURSE IS TO CONSIST OF PLACING SUBBASE MATERIAL IN LAYERS OF SPECIFIED THICKNESS, OVER SUBGRADE SURFACE TO SUPPORT A PAVEMENT BASE AND SURFACE COURSE.

2) GRADE CONTROL: DURING CONSTRUCTION, MAINTAIN LINES AND GRADES INCLUDING CROWN AND CROSS- SLOPE OF SUBBASE COURSE.

3) MATERIALS AND INSTALLATION: GRAVEL AND BITUMINOUS CONCRETE MATERIALS AND INSTALLATION ARE TO BE IN ACCORDANCE WITH THE MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION (SHA) STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, DATED 2018, AS AMENDED, AND INSTALLED AS SHOWN ON PLANS.

G) FIELD QUALITY CONTROL:

1) QUALITY CONTROL TESTING DURING CONSTRUCTION: THE OWNER MAY RETAIN OR REQURE THE CONTRACTOR TO RETAIN A TESTING SERVICE TO INSPECT AND APPROVE THE SITEWORK CONSTRUCTION.

2) IF, IN THE OPINION OF THE OWNER OR TESTING REPRESENTATIVE, BASED ON TESTING, MATERIALS AND/ OR PLACEMENT OF MATERIALS ARE SUBSTANDARD, THE CONTRACTOR IS TO PROVIDE NEW MATERIALS, CONSTRUCTED AND TESTED, AT NO ADDITIONAL EXPENSE TO THE OWNER.

H) MAINTENANCE:

1) PROTECTION OF GRADED AREAS:

a) PROTECT NEWLY GRADED AREAS FROM TRAFFIC AND EROSION. KEEP FREE OF TRASH AND DEBRIS.

b) REPAIR AND REESTABLISH GRADES IN SETTLED ERODED, AND RUTTED AREAS TO SPECIFIED TOLERANCES.

I) DISPOSAL OF EXCESS AND WASTE MATERIALS (IF REQUIRED):

1) REMOVE EXCESS EXCAVATED MATERIAL, TRASH, DEBRIS AND WASTE MATERIALS AND DISPOSE OF IT OFF OWNER'S PROPERTY IN A MANNER CONSISTENT WITH LOCAL, STATE AND FEDERAL AGENCIES.

J) DEWATERING:

1) THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TEMPORARY DRAINAGE AND KEEP THE SAME OPERATING UNTIL PERMANENT DRAINAGE HAS BEEN COMPLETED. IF WATER IS ENCOUNTERED IN EXCAVATING AND UTILITY CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE AND MAINTAIN PUMPS OF SUFFICIENT CAPACITY TO REMOVE THE WATER WHILE THE EXCAVATIONS ARE BEING MADE AND UNTIL THE CONCRETE FOOTINGS HAVE BEEN POURED THE FOUNDATION WALLS OR OTHER STRUCTURES ERECTED UP TO GRADE, AND THE EXCAVATION HAS BEEN BACKFILLED.

K) BRACING OR SHEETING:

1) THE CONTRACTOR SHALL SUPPORT THE SIDES AND ENDS OF ALL EXCAVATIONS WHEREVER NECESSARY OR DIRECTED WITH BRACES, SHEETING, SHORES OR STRINGERS OF THE QUALITY AND CHARACTER REQUIRED TO PROVIDE ADEQUATE SUPPORT, AS GOVERNED BY LOCAL, STATE, AND FEDERAL REGULATIONS.

3) SEEDING: PERMANENT AND TEMPORARY SEEDING:

A) SEED PREPARATION: APPLY 100 POUNDS PER 1000 SQUARE FEET OF PULVERIZED LIMESTONE AND 12 POUNDS PER 1000 SQUARE FEET OF 10-20-20 EQUIVALENT FERTILIZER, HARROW OR DISC ON THE CONTOUR INTO THE SOIL TO A DEPTH OF 3 TO 4 INCHES, CONTINUE TILLAGE UNTIL A REASONABLY FINE SEEDBED HAS BEEN PREPARED.

SITE WORK SPECIFICATIONS (CONT.)

2) EARTHWORK: (CONT)

B) SEEDING: USE KENTUCKY 31, TALL FESCUE AT THE RATE OF 5 TO 7 POUNDS PER 1000 SQUARE FEET ON A MOIST SEEDBED, MINIMUM COVERAGE ¼ INCH. STABILIZE BY MULCHING WITH UNWEATHERED, UNCHOPPED, SMALL GRAIN STRAW SPREAD AT THE RATE OF 1-1/2 TO 2 TONS PER ACRE. MULCH IS TO BE ANCHORED BY ASPHALT TIE- DOWN METHOD (OAE). SEEDING IS TO BE DONE ONLY BETWEEN FEBRUARY 1 AND APRIL 15 OR AUGUST 15 TO OCTOBER 15.

C) TEMPORARY SEEDING TO BE DONE ON COMPLETION OF CONSTRUCTION SODDING: TO BE ROOTED KENTUCKY 31 TALL FESCUE. SOD SHALL BE TRANSPLANTED WITHIN 36 HOURS OF HARVESTING. EACH STRIP OF SOD TO BE PLANTED WITH AT LEAST 2 STAKES SPACED NOT MORE THAN 2 FEET APART.

D) VEGETATIVE STABILIZATION:

ALL VEGETATIVE STABILIZATION PREPARATIONS, PROCEDURES, AND MATERIALS ARE TO BE IN COMPLIANCE WITH SECTION B GRADING AND STABILIZATION SUB-SECTION B-4 OF THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL MANUAL PREPARED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION IN ASSOCIATION WITH THE NATURAL RESOURCES CONSERVATION SERVICE AND THE MARYLAND ASSOCIATION OF SOIL CONSERVATION DISTRICTS, AS AMENDED. FOLLOWING THE INITIAL DISTURBANCE OR RE-DISTRUBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:

1) THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS (SUCH AS DIKES, SWALES, DITCHES), AND SLOPES STEEPER THAN 3H TO 1V (3:1) AND:

2) SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED AREAS ON THE PROJECT SITE.

E) THE REQUIREMENTS OF COMAR .08.05.01.06,(B)(E)(IV) DO NOT APPLY TO THOSE AREAS WHICH ARE SHOWN ON THE PLAN AND ARE CURRENTLY BEING USED FOR MATERIAL STORAGE, OR FOR THOSE OF A SURFACE MINE SITE, WHERE THE STABILIZATION MATERIAL WOULD CONTAMINATE THE RECOVERABLE RESOURCE. MAINTENANCE SHALL BE PERFORMED AS NECESSARY TO ENSURE THAT THE STABILIZED AREAS CONTINUOUSLY MEET THE APPROPRIATE REQUIREMENTS OF THE "STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL IN DEVELOPING AREAS" (2011), WHICH IS INCORPORATED BY REFERENCE IN REGULATION COMAR .08.05.01.10.

4) SEDIMENT AND EROSION CONTROL:

SEDIMENT AND EROSION CONTROL MEASURES ARE TO BE INSTALLED PER THE "MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" MARYLAND DEPARTMENT OF THE ENVIRONMENT (2011) AS CURRENTLY AMENDED AND AS DETAILS STATED PER THESE PLANS.

5) FIRE PROTECTION:

A) FIRE DEPARTMENT VEHICULAR ACCESS TO ALL STRUCTURES UNDER CONSTRUCTION SHALL BE PROVIDED AT ALL TIMES. IN AREAS WHERE GROUND SURFACES ARE SOFT OR LIKELY TO BECOME SOFT, HARD ALL-WEATHER SURFACE ACCESS ROADS SHALL BE PROVIDED.

B) TRASH AND DEBRIS SHALL BE REMOVED FROM THE CONSTRUCTION SITE AS OFTEN AS NECESSARY TO MAINTAIN A FIRE-SAFE CONSTRUCTION SITE.

C) AS-BUILT DRAWINGS SHOWING BUILDING FLOOR PLANS, FIRE PROTECTION SYSTEMS, AND ITEMS OF FIRE SUPPRESSION INTEREST SUCH AS STANDPIPE CONNECTIONS, SPRINKLER CONNECTIONS, HYDRANTS, ETC. SHALL BE SUBMITTED TO THIS PRIOR TO ISSUANCE OF USE AND OCCUPANCY PERMIT UPON COMPLETION OF THE PROJECT.

D) FIRE SUPPRESSION TANK (IF REQUIRED) TO BE FILLED WITH WATER PRIOR TO USE AND OCCUPANCY.

6) SOIL TESTS:

NO SITE SOIL BORINGS FOR EARTHWORK OPERATIONS PERFORMED FOR THE PREPARATION OF THESE PLANS.

7) WATER & SEWER / WELL & SEPTIC SYSTEM:

PUBLIC WATER & SEWER AND/OR PRIVATE WELL & SEPTIC SYSTEMS ARE TO BE CONSTRUCTED OR UTILIZED IN ACCORDANCE WITH ALL COUNTY AND STATE REQUIREMENTS SPECIFICATIONS AND PERMITS.N

8) SIGNAGE

A) ALL SITE SIGNAGE IS TO BE IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" DATED 2009 OR AS CURRENTLY AMENDED.

B) ALL HANDICAP SPACES AND SIGNAGE ARE TO BE IN ACCORDANCE WITH THE AMERICAN DISABILITIES ACT (ADA) STANDARDS.

9) BOUNDARY INFORMATION

A) THIS PLAT IS A SPECIAL PURPOSE SURVEY PER SECTION 09.13.06.10 OF COMAR REGULATIONS.

B) THE PROPERTY LINES SHOWN HEREON ARE BASED ON FIELD WORK PERFORMED BY C.O.A., INC.

C) THIS PLAT IS NOT A BOUNDARY SURVEY AND DOES NOT MEET THE MINIMUM STANDARDS FOR A BOUNDARY SURVEY AS DEFINED BY COMAR REGULATION.

10) STORMWATER MANAGEMENT:

THE CONSTRUCTION OF THE STORMWATER MANAGEMENT SYSTEM(S) SYSTEM(S) IS TO BE IN ACCORDANCE WITH THE CALVERT COUNTY STORMWATER MANAGEMENT ORDINANCE, MAY 4, 2010 WHICH INCORPORATES BY REFERENCE THE MARYLAND DEPT. OF THE ENVIRONMENT 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I & II REVISED MAY 2009 AND THE USDA NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD POND CODE 378 ALL AS CURRENTLY AMENDED.

11) ARCHAEOLOGICAL AND HISTORICAL RESOURCES:

CONTRACTORS WORKING ON THIS PROJECT ARE HEREBY INFORMED THAT THERE IS A POSSIBILITY THAT ARCHAEOLOGICAL ARTIFACTS WILL BE ACCIDENTALLY DISCOVERED DURING ANY GROUND-DISTURBING ACTIVITIES, INCLUDING GRADING AND EXCAVATION. ARTIFACTS COULD INCLUDE STONE TOOLS (ARROWHEADS, FOR EXAMPLE), POTTERY, METALS, BRICKS, GLASS, BONE, ETC. IF ARTIFACTS ARE DISCOVERED, THE CONTRACTOR OR APPLICANT MUST CEASE WORK AND CONTACT THE DEPARTMENT OF PLANNING & ZONING, HISTORIC PRESERVATION PLANNER AT 410-535-2348 FOR PROMPT EVALUATION OF THE OBJECTS AND TO AVOID DELAYS TO THE PROJECT. BY LAW, ALL ARTIFACTS BELONG TO THE PROPERTY OWNER, UNLESS THEY ARE HUMAN REMAINS WHICH CANNOT BE DISTURBED WITHOUT WRITTEN AUTHORIZATION FROM THE STATES ATTORNEY. EVALUATION IN THE INTEREST OF DOCUMENTING THE HERITAGE AND UNDERSTAND THE PAST OF CALVERT COUNTY.

12) ENVIRONMENTAL FEATURES: (IF SHOWN ON PLANS)

A) THE ISSUANCE OF COUNTY PERMITS OR APPROVALS IS A LOCAL PROCESS AND DOES NOT IMPLY THAT THE APPLICANT HAS MET STATE AND FEDERAL REQUIREMENTS FOR WETLANDS UNDER COMAR;THE FEDERAL WATER POLLUTION CONTROL ACT; OR THE RIVERS AND HARBORS ACT.

B) A BUFFER ZONE OF 50-FOOT ADJACENT TO NON-TIDAL WETLANDS AND A 100-FOOT ADJACENT TO TIDAL WETLANDS SHALL BE MAINTAINED AND THE FOLLOWING ADDITIONAL REQUIREMENTS SHALL BE MET.

C) ANY BUFFER AREAS SHOWN ON THESE PLANS ARE TO BE LEFT UNDISTURBED IN PERPETUITY AND TO SERVE FOR WATER QUALITY BENEFITS.

D) PROTECTIVE SNOW FENCING SHALL BE INSTALLED ALONG THE 50 FT WETLAND BUFFER WITHIN 100-FT OF THE LIMITS OF DISTURBANCE AND INSPECTED PRIOR TO ISSUANCE OF ANY BUILDING OR GRADING PERMITS FOR THE PROJECT.

E) A 10-FOOT SETBACK SHALL BE MAINTAINED FROM THE EDGE OF THE WETLAND BUFFER.

F) FOREST RETENTION AREAS (FRA'S) ARE TO BE LEFT UNDISTURBED UNLESS APPROPRIATE APPROVALS OR PERMITS HAVE BEEN OBTAINED FOR THE REMOVAL OF TREES AND/OR UNDER STORY VEGETATION. TIMBER HARVESTS MAY OCCUR WITHIN (FRA'S) WITH AN APPROVED FORESTS HARVEST PLAN AND OTHER APPROPRIATE APPROVALS AND/OR PERMITS. OTHER THAN TIMBER HARVESTS, PERMITS MAY ONLY BE ISSUED FOR THE REMOVAL OF TREES OR UNDER STORY VEGETATION IF THEY ARE A THREAT TO STRUCTURES OR TO PROHIBIT THE SPREAD OF PLANT DISEASES. PERMITS MAY ALSO BE ISSUED FOR THE REMOVAL OF UNDER STORY PLANTS COMPOSED OF INVASIVE OR NOXIOUS PLANTS OR WEEDS. OTHERWISE, NO EQUIPMENT, MACHINERY, MOTOR VEHICLES, MATERIALS, STOCKPILING, DUMPING OF TRASH OR STRUCTURES ARE ALLOWED WITHIN THE FOREST RETENTION AREA. HIKING, NATURE OBSERVATION AND STUDY, AND WILDLIFE MANAGEMENT ACTIVITIES MAY OCCUR IN THE FOREST RETENTION AREAS.

G) FOREST PROTECTION MEASURES ARE TO BE IN PLACE AND INSPECTED ON EACH LOT PRIOR TO ISSUANCE OF ANY BUILDING OR GRADING PERMITS FOR EACH LOT. STAKING, FLAGGING, FENCING AND POSTING SIGNS SHALL MARK THE BOUNDARY OF THE (FRA). ALL PROTECTIVE MEASURES SHALL BE MAINTAINED THROUGHOUT THE PROJECT.

13) STATE HIGHWAY ADMINISTRATION (S.H.A.) NOTE: (IF REQUIRED)

ALL CONSTRUCTION WITHIN THE PUBLIC S.H.A. RIGHT-OF-WAY (IF REQUIRED) SHALL BE IN ACCORDANCE WITH THE S.H.A. ENGINEERING ACCESS AND UTILITY PERMITS TO BE ISSUED FOR THIS SITE.

14) CALVERT COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) NOTE: (IF REQUIRED)

ALL CONSTRUCTION WITHIN THE PUBLIC COUNTY RIGHT-OF-WAY (IF REQUIRED) SHALL BE IN ACCORDANCE WITH THE COUNTY ACCESS AND UTILITY PERMITS TO BE ISSUED FOR THIS SITE.

SITE WORK SPECIFICATIONS (CONT.)

15) SITE PLAN NOTES

A) ALL EXISTING FEATURES ARE TO REMAIN UNLESS NOTED OTHERWISE.

B) EXISTING PAVED SURFACES WHICH ARE PROPOSED TO BE LANDSCAPED GREEN AREAS SHALL HAVE ALL PAVEMENT, GRAVEL SUB GRADE MATERIAL REMOVED AND REPLACED WITH TOPSOIL TO THE EXTENT REQUIRED TO PROVIDE SUITABLE SOILS FOR THE ESTABLISHMENT OF LANDSCAPE MATERIALS.

C) IN LOCATIONS WHERE PROPOSED PAVEMENT (ASPHALT OR CONCRETE) IS TO MEET EXISTING PAVEMENT, THE EXISTING PAVEMENT SHALL BE SAW CUT TO PROVIDE A NEAT AND CLEAN EDGE TO CONSTRUCT THE IMPROVEMENTS SHOWN HEREON.

D) SEE ARCHITECTURAL PLANS FOR INFORMATION RELATED TO BUILDING, FOUNDATION AND UTILITY COORDINATION.

E) ALL EXTERIOR LIGHTING PROPOSED FOR THIS SITE SHALL BE DARK SKIES FRIENDLY, PERMANENTLY INSTALLED AND MOUNTED IN ACCORDANCE WITH THE IESNA LIGHTING HANDBOOK & RECOMMENDED PRACTICES AS DESCRIBED IN THE C.C.Z.O. ARTICLE 6-6.01. FIXTURES SHALL MEET FULL CUTOFF CRITERIA.

SANITARY SEWERS

PART 1.0 - GENERAL

A. DESCRIPTION

WORK INCLUDED

THE SECTION INCLUDES FURNISHING OF ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, SERVICES AND PERFORMING OF ALL WORK NECESSARY TO COMPLETE THE CONSTRUCTION OF SEWERS AS HEREIN SPECIFIED TO THE LINES AND GRADES SHOWN ON THE DRAWINGS, AND AS DIRECTED. THE CONTRACTOR IS TO NOTIFY THE LOCAL WATER AND SEWER DEPARTMENT 48 HOURS PRIOR TO COMMENCING WITH SEWER LINE CONSTRUCTION.

B. SUBMITTALS

MATERIALS LIST

SUBMIT THREE COPIES OF A COMPLETE LIST OF ALL MATERIALS AND EQUIPMENT PROPOSED TO BE FURNISHED GIVING MANUFACTURER'S NAME AND CATALOG NUMBER.

RECORD DRAWINGS

DURING THE PROGRESS OF THE WORK, MAINTAIN AN ACCURATE RECORD OF THE LOCATION OF THE PIPING WITH REFERENCE TO JOB BASE LINES, GRADES AND ELEVATIONS. SHOW ALL CHANGES MADE IN THE PIPING LAYOUT AND REFERENCED DISTANCES FROM THE CENTERLINE OF THE NEAREST MANHOLES TO INSTALLED STRUCTURE DRAINS AND BUILDING SERVICE CONNECTIONS. THIS REDLINE DRAWING IS TO BE PROVIDED TO THE OWNER OR OWNER'S REPRESENTATIVE AT THE COMPLETION OF TESTING.

C. PRODUCT HANDLING

PROTECTION

USE ALL MEANS NECESSARY TO PROTECT THE MATERIALS OF THIS SECTION AND TO PROTECT THE INSTALLED WORK.

REPLACEMENT

IN THE EVENT OF DAMAGE, IMMEDIATELY MAKE ALL REPAIRS AND REPLACEMENTS NECESSARY TO THE APPROVAL OF THE ENGINEER AND AT NO ADDITIONAL COST TO THE OWNER.

PART 2.0 - PRODUCTS

A. POLYVINYL CHLORIDE (PVC) SEWER PIPE

THE GRAVITY SEWER PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM D-3034, SDR 35 SPECIFICATION FOR TYPE PSM POLYVINYL CHLORIDE (PVC) SEWER PIPE AND FITTINGS, UTILIZING A RUBBER RING JOINT.

JOINTS FOR BOTH PIPE AND FITTINGS SHALL BE OF THE INTEGRAL BELL TYPE, CONSISTING OF AN INTEGRAL WALL SECTION WITH A SOLID CROSS-SECTION RUBBER RING, FACTORY ASSEMBLED AND SECURELY LOCKED IN PLACE TO PREVENT DISPLACEMENT.

RUBBER GASKETS SHALL COMPLY IN ALL RESPECTS WITH THE PHYSICAL REQUIREMENTS SPECIFIED IN ASTM F-477 AND THE LUBRICANT USED FOR JOINT ASSEMBLY SHALL HAVE NOT DETRIMENTAL EFFECT ON THE RING OR PIPE.

PIPE CONNECTIONS AT MANHOLES SHALL BE ACCOMPLISHED BY MEANS OF AN ELASTOMERIC GASKET TO PROVIDE FLEXIBILITY AND ADEQUATE JOINT TIGHTNESS.

B. PLUGS AND BULKHEADS

EXCEPT AS OTHERWISE SHOWN, APPROVED MANUFACTURED PLUGS MADE ESPECIALLY TO FIT THE BELL OF THE SIZE OF PIPE REQUIRING A PLUG SHALL BE INSTALLED AT THE ENDS OF ALL PIPE INCLUDING MANHOLE STUBS AS SOON AS THESE PIPE ENDS ARE INSTALLED TO PREVENT EARTH, WATER AND FOREIGN MATTER FROM ENTERING THE SANITARY SEWER SYSTEM. IN ADDITION, APPROVED MANUFACTURED TEMPORARY PLUGS SHALL BE INSTALLED ON ALL SEWER LINES AT THE END OF EACH DAY'S WORK OR AT THE ENDS OF INCOMPLETE LINES WHERE WORK IS TEMPORARILY DISCONTINUED FOR ANY REASON. BRICK MASONRY BULKHEADS SHALL BE CONSTRUCTED WHERE SHOWN ON THE DRAWINGS OR AS DIRECTED.

C. BRANCHES AND STANDPIPES

THE CONTRACTOR SHALL PLACE WYE FITTINGS AND/OR SADDLES AT SUCH POINTS ALONG THE SEWERS AND IN SUCH POSITIONS, AS SHOWN ON THE DRAWINGS AND AS DIRECTED IN THE FIELD. THE BRANCH ITSELF SHALL BE SET AT SUCH VERTICAL ANGLE AS SHALL BE NECESSARY TO BRING THE BUILDING CONNECTIONS AT THE PROPER DEPTH. IN GENERAL, THIS ANGLE SHALL BE FROM 30° TO 45°, MEASURED FROM THE HORIZONTAL. THE LENGTH OF WYE BRANCHES SHALL BE NOT LESS THAN TWO (2) FEET, NOR MORE THAN THREE (3) FEET, AS MAY BE NECESSARY TO BRING BRANCHES TO THE PROPER LOCATION.

WHERE THE BUILDING CONNECTION WOULD OTHERWISE BE TOO DEEP, THE BRANCH OF THE WYE SHALL BE PLACED VERTICALLY, AND IF REQUIRED, THE BUILDING CONNECTION CONNECTING THEREWITH SHALL BE BUILT TO SUCH VERTICAL HEIGHT AS MAY BE DIRECTED, BEFORE LEAVING THE SEWER TRENCH. THE CHANGE OF DIRECTION AT THE UPPER END OF STANDPIPE SHALL BE MADE BY A SINGLE OR DOUBLE WYE BRANCH, FOR THE PURPOSE OF CONNECTING RESPECTIVELY, ONE (1) WAY. CONCRETE, 2500 PSI, AS SHOWN ON THE DRAWINGS, OR AS DIRECTED, SHALL BE PLACED AROUND THE WYE-BRANCH DESIGNATED.

D. POROUS FILL OR SELECT GRANULAR FILL FOR PIPE TRENCH BACKFILL

AGGREGATE MATERIAL SHALL BE CLEAN, WASHED GRAVEL OR CRUSHED STONE, FREE OF CLAY, VEGETABLE MATTER, LOAM AND DELETERIOUS MATTER. MATERIAL SHALL BE GRADED TO MEET AASHTO M-43, NO. 57.

PART 3.0 - EXECUTION

A. INSTALLATION - GENERAL

EACH LENGTH OF PIPE SHALL BE CAREFULLY INSPECTED BY THE CONTRACTOR FOR POSSIBLE DEFECTS BEFORE LAYING. THE PIPES SHALL BE THOROUGHLY CLEANED BEFORE THEY ARE LAID AND SHALL BE KEPT CLEAN UNTIL THE ACCEPTANCE OF THE COMPLETED WORK. THE UPPER ENDS OF ALL PIPE LINES SHALL BE PROVIDED WITH A CAREFULLY FITTED STOPPER, WHICH SHALL BE USED AT ALL TIMES, TO PREVENT THE ENTRANCE OF DIRT OR OTHER SUBSTANCES.

PIPE SHALL BE CAREFULLY HANDLED OR LOWERED INTO THE TRENCH AND LAID TRUE TO LINE AND GRADE. BELL HOLES SHALL BE DUG SUFFICIENTLY LARGE TO INSURE THE MAKING OF PROPER JOINTS AND TO PROVIDE A FIRM, SOLID BEARING FOR THE ENTIRE LENGTH OF THE PIPE.

SPECIAL CARE SHALL BE TAKEN TO INSURE THAT EACH LENGTH SHALL ABUT AGAINST THE NEXT IN SUCH A MANNER THAT THERE SHALL BE NO SHOULDER OR UNEVENNESS OF ANY KIND ALONG THE INSIDE OF THE BOTTOM HALF OF THE PIPES AS LAID.

BEFORE JOINTS ARE MADE, EACH PIPE SHALL BE WELL BEDDED ON A SOLID FOUNDATION AND NO PIPE SHALL BE BROUGHT INTO POSITION UNTIL THE PRECEDING LENGTH HAS BEEN THOROUGHLY EMBEDDED AND SECURED IN PLACE. AFTER PIPES HAVE BEEN LAID, THERE SHALL BE NO WALKING ON OR WORKING OVER THEM, EXCEPT SUCH AS MAY BE NECESSARY IN TAMPING, UNTIL THERE IS A COVERING AT LEAST TWO (2) FEET IN DEPTH OVER THEIR TOP. AFTER JOINTS HAVE BEEN MADE, THE GREATEST CARE SHALL BE USED NOT TO DISTURB OR DAMAGE THEM DURING THE REFILLING PROCESS, OR AT ANY OTHER TIME. THE CONTRACTOR'S ATTENTION IS DIRECTED TO COMPACTION REQUIREMENTS FOR HAUNCH SUPPORT OF PVC PIPE.

PROPER AND SUITABLE TOOLS AND APPLIANCES FOR THE SAFE AND CONVENIENT HANDLING AND LAYING OF PIPES AND FITTINGS SHALL BE USED. GREAT CARE SHALL BE TAKEN TO PREVENT THE PIPE LINING AND COATING FROM BEING DAMAGED, AND ANY LINING OR COATING DAMAGED IN ANY WAY SHALL BE FULLY REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.

THE EXCAVATIONS IN WHICH PIPE IS BEING LAID SHALL BE KEPT FREE FROM WATER. NO WATER SHALL BE ALLOWED TO RISE OVER OR RUN THROUGH THE PIPE WHILE ANY JOINT IS BEING MADE, NOR UNTIL AFTER IT HAS THOROUGHLY SET. ANY DEFECTS DUE TO SETTLEMENT SHALL BE MADE GOOD BY THE CONTRACTOR AT HIS OWN EXPENSE.

PART 3.0 - EXECUTION (CONTINUED)

WHENEVER A PIPE REQUIRES CUTTING TO FIT INTO THE LINE OR TO BRING IT TO THE REQUIRED LOCATION, THE WORK SHALL BE DONE IN A SATISFACTORY MANNER SO AS TO LEAVE A SMOOTH END, AND WITHOUT EXTRA COMPENSATION.

NO PIPE SHALL BE LAID UPON A FOUNDATION INTO WHICH FROST HAS PENETRATED, NOR AT ANY TIME WHEN THERE IS DANGER OF THE FORMATION OF ICE OR THE PENETRATION OF FROST AT THE BOTTOM OF THE EXCAVATION UNLESS ALL PRECAUTIONS AS TO THE MINIMUM LENGTH OF OPEN TRENCH AND PROMPTNESS OF REFILLING ARE OBSERVED.

A. INSTALLATION - GENERAL (CONTINUED)

ALL TRENCHES SHALL BE BACKFILLED IMMEDIATELY AFTER THE PIPE IS LAID PRIOR TO PRESSURE TESTING. THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH THE EXCAVATED MATERIALS APPROVED FOR BACKFILLING, DEPOSITED IN SIX INCH (6") LAYERS AND THOROUGHLY AND CAREFULLY TAMPED UP TO A LEVEL AT LEASE ONE FOOT ABOVE THE TOP OF THE PIPE. BACKFILLING SHALL BE CARRIED OUT SIMULTANEOUSLY ON BOTH SIDES OF THE PIPE. THE REMAINDER OF THE BACKFILL SHALL BE DEPOSITED AND COMPACTED BY MECHANICAL TAMPERS EXCEPT IN AREAS WHERE PAVING IS TO BE PLACED OVER THE BACKFILL SHALL BE DEPOSITED IN EIGHT INCH (8") LAYERS AND COMPACTED BY HAND OR MECHANICAL TAMPERS. COMPACTION SHALL BE CARRIED OUT TO ACHIEVE A DENSITY OF AT LEAST 95% OF THE MAXIMUM DENSITY AS DETERMINED BY ASTM D-1557. IT IS THE INTENT OF THIS SPECIFICATION TO SECURE A CONDITION WHERE NO FURTHER SETTLEMENT OF TRENCHES WILL OCCUR SO THAT WHEN BACKFILLING IS COMPLETED SIDEWALKS AND ROADWAY BASE SURFACING MAY BE PLACED.

THE CONTRACTOR SHALL, AT THIS OWN EXPENSE, SUSTAIN IN THEIR PLACES AND PROTECT FROM DIRECT OR INDIRECT DAMAGE, ALL PIPES, POLES, UTILITIES, WALLS, BUILDINGS, AND OTHER STRUCTURES OR PROPERTY IN THE VICINITY OF HIS WORK, WHETHER ABOVE OR BELOW GROUND, OR THAT MAY APPEAR IN THE EXCAVATION. HE SHALL AT ALL TIMES HAVE A SUFFICIENT QUANTITY OF TIMBER AND PLANK, CHAINS, ROPES, ETC., ON THE GROUND AND SHALL USE THEM AS NECESSARY FOR SHEETING HIS EXCAVATIONS AND FOR SUSTAINING OR SUPPORTING ANY STRUCTURES THAT ARE UNCOVERED, UNDETERMINED, ENDANGERED, THREATENED OR WEAKENED. THE CONTRACTOR SHALL TAKE ALL RISKS ATTENDING THE PRESENCE OR PROXIMITY OF PIPES, POLES, WALLS, BUILDINGS AND OTHER STRUCTURES AND PROPERTY OF EVERY KIND AND DESCRIPTION IN THE VICINITY OF HIS WORK, WHETHER ABOVE OR BELOW THE SURFACE OF THE GROUND AND HE SHALL BE RESPONSIBLE FOR ALL DAMAGE AND ASSUME ALL EXPENSE FOR DIRECT OR INDIRECT INJURY, CAUSED BY HIS WORK, TO ANY OF THEM OR TO ANY PERSON OR PROPERTY BY REASON OF INJURY TO THEM, WHETHER SUCH STRUCTURES ARE OR ARE NOT SHOWN ON THE DRAWINGS.

PVC PIPE SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D-2321 "STANDARD RECOMMENDED PRACTICE FOR UNDERGROUND INSTALLATION OF FLEXIBLE THERMOPLASTIC SEWER PIPE" AND THE "HANDBOOK OF PVC PIPE" AS PUBLISHED BY THE UNI-BELL PIPE ASSOCIATION.

ALLOWABLE PIPE DEFLECTION FOR PVC PIPE PROVIDED UNDER THIS SPECIFICATION SHALL BE INSTALLED SUCH THAT A DEFLECTION OF NO MORE THAN 3% MAY BE ANTICIPATED. DEFLECTION SHALL BE COMPUTED BY DIVIDING THE AMOUNT OF DEFLECTION (NOMINAL DIAMETER LESS THE MINIMUM DIAMETER MEASURED) IS THE NOMINAL DIAMETER OF THE PIPE. AVERAGE DEFLECTION BETWEEN TWO ADJACENT MANHOLES SHALL NOT EXCEED 4% AND NO DEFLECTION AT ANY POINT SHALL EXCEED 5% AS PER THE PIPE MANUFACTURER'S RECOMMENDATION UTILIZING THE GO/NO GO GAUGE METHOD.

IF AFTER INITIAL INSPECTION, IN THE OPINION OF THE ENGINEER THE DEFLECTION APPEARS EXCESSIVE, HE MAY ORDER THE CONTRACTOR TO ARRANGE FOR A TAKE OF ACCURATE MEASUREMENTS OF THE PIPE AT WHATEVER INTERVALS AND AT WHATEVER LOCATIONS BETWEEN ADJACENT MANHOLES DEEMED ADVISABLE. ALL COST INVOLVED IN TAKING MEASUREMENTS ORDERED BY THE ENGINEER FOLLOWING INITIAL INSPECTION SHALL BE BORNE BY CONTRACTOR IF THE DEFLECTION IN THE PIPE EXCEEDS EITHER OF THE MAXIMUM LIMITS SPECIFIED HERE. IF THE MAXIMUM LIMITS ARE NOT EXCEEDED ALL COST SHALL BE BORNE BY THE OWNER.

ALL PIPE, PIPE FITTINGS, PIPE PLUGS AND OTHER COMPONENTS SHALL BE CAREFULLY EXAMINED AND INSPECTED FOR DEFECTS AND ANY FOUND IMPERFECT WILL NOT BE UTILIZED IN THE WORK.

B. CORRECTION OF DEFECTS

IF AT ANY TIME BEFORE THE FINAL ACCEPTANCE OF THE CONTRACT, ANY DEFECTS ARE FOUND IN THE SEWER MAINS OR ITS APPURTENANCES THE CONTRACTOR SHALL REMOVE AND REPLACE THE DEFECTIVE AREA. THE CONTRACTOR, FOR ANY SECTION OF THE SEWER THAT FAILS ANY OF THE TEST, SHALL TAKE STEPS TO ELIMINATE THE CAUSE OF FAILURE. THE CORRECTION OF DEFECTS SHALL BE DONE WITHOUT EXTRA COMPENSATION FOR THE LABOR AND MATERIAL REQUIRED EVEN THOUGH SUCH DAMAGE OR FAILURE MAY NOT HAVE BEEN DUE TO ANY ACT, DEFAULT OR NEGLIGENCE ON THE PART OF THE CONTRACTOR.

THE CONTRACTOR IS TO SUPPLY COMPACTION TESTS BY A LICENSED GEOTECHNICAL ENGINEER ON A 50 FOOT INTERVAL ALONG ALL GRAVITY SEWER MAINS. DEPTHS AND LOCATIONS OF THESE TESTS ARE TO BE DETERMINED BY THE GEOTECHNICAL ENGINEER.

C. TESTING

THE CONTRACTOR SHALL REPLACE OR REPAIR ALL VISIBLE LEAKS AND DEFECTS ON ALL SECTIONS OF SEWER FAILING TO MEET THE LEAKAGE TESTS. THE MAXIMUM LEAKAGE ALLOWANCE IN THE COMPLETED SEWER LINES SHALL NOT BE GREATER THAN OUTLINED BY THE UNI-BELL PIPE ASSOCIATION "HANDBOOK ON PVC PIPE".

ONCE REQUIRED COMPACTION IS ACHIEVED TWO COPIES OF THE FINAL REPORT ARE TO BE SUPPLIED TO THE OWNER OR THE ENGINEER.

THE CONTRACTOR IS TO NOTIFY THE LOCAL WATER AND SEWER DEPARTMENT 48 HOURS PRIOR TO TESTING SEWER LINES TO HAVE A LOCAL WATER AND SEWER REPRESENTATIVE PRESENT AT TESTING. ALSO CONTACT SITE ENGINEER TO BE PRESENT.

D. AS-BUILTS

A SET OF COMPLETE AS-BUILT DRAWINGS CERTIFIED BY A REGISTERED ENGINEER IS TO BE PROVIDED BY THE CONTRACTOR TO THE OWNER WITHIN 30 DAYS OF THE COMPLETION OF WORK.

WATER LINES

PART 1.0 - GENERAL

A. DESCRIPTION

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL MATERIALS EQUIPMENT, TOOLS, AND LABOR NECESSARY TO PERFORM AND COMPLETE THE WORK UNDER THIS CONTRACT AS REQUIRED BY THESE SPECIFICATIONS, INDICATED ON PLANS, OR AS DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL ALSO DO ALL THE NECESSARY CLEARING, REMOVING OF PAVED AND UNPAVED SURFACES IN THE LINE OF WORK AS REQUIRED BY STATE AND/OR LOCAL AGENCIES HAVING JURISDICTION OVER THE WORK OR AS DIRECTED BY THE ENGINEER.

THE WATER MAINS SHALL BE INSTALLED AT THE ELEVATIONS INDICATED ON THE DRAWINGS. EARTH COVER IN THE REFILL TRENCH SHALL NOT BE LESS THAN THREE AND ON HALF (3-1/2) FEET OVER THE TOP OF THE PIPE UNLESS INDICATED OTHERWISE ON THE DRAWINGS OR APPROVED BY THE ENGINEER.

THE CONTRACTOR IS TO NOTIFY THE LOCAL WATER AND SEWER DEPARTMENT 48 HOURS PRIOR TO COMMENCING WATER LINE CONSTRUCTION

RELATED WORK DESCRIBED ELSEWHERE

CONCRETE FOR SUPPORTS, THRUST BLOCKS AND ENCASEMENT SHALL MEET THE REQUIREMENTS AS SHOWN ON THE DRAWINGS. EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH TRENCH BACKFILL IN SANITARY SEWER SECTION.

B. SUBMITTALS

SHOP DRAWINGS

FURNISH THREE (3) COPIES OF COMPLETE SHOP DRAWINGS OR CATALOG DATA BEFORE DELIVERY OF ANY MATERIAL TO THE JOB SITE. SHOP DRAWINGS OR CATALOG DATA SHALL BE SUBMITTED SHOWING ALL PIPE FITTINGS, VALVES AND EQUIPMENT TO BE USED.

MATERIAL LIST

SUBMIT THREE (3) COPIES OF COMPLETE LIST OF ALL MATERIALS AND EQUIPMENT PROPOSED TO BE FURNISHED GIVING MANUFACTURER'S NAME AND CATALOG NUMBER.

RECORD DRAWINGS

DURING THE PROGRESS OF THE WORK, MAINTAIN AN ACCURATE RECORD OF THE LOCATION OF THE PIPING WITH REFERENCES TO JOB BASE LINES, GRADES AND ELEVATIONS. SHOW ALL CHANGES MADE IN THE PIPING INSTALLATION FROM THE LAYOUT AND MATERIALS SHOWN ON THE APPROVED SHOP DRAWINGS.

C. PRODUCT HANDLING

PROTECTION

USE ALL MEANS NECESSARY TO PROTECT THE MATERIALS OF THE SECTION BEFORE, DURING, AND AFTER INSTALLATION AND TO PROTECT THE INSTALLED WORK AND MATERIALS OF ALL OTHER TRADES.

WATER LINES (CONTINUED)

REPLACEMENT

IN THE EVENT OF DAMAGE, IMMEDIATELY MAKE ALL REPAIRS AND REPLACEMENTS NECESSARY TO THE APPROVAL OF THE ENGINEER AND AT NO ADDITIONAL COST TO THE OWNER.

PART 2.0 - PRODUCTS

A. PVC PIPE - 4" AND LARGER

PVC PIPE SHALL BE IN ACCORDANCE WITH AWWA C-900 CLASS 150 (DR-18) IN SIZES FOUR INCH (4") AND LARGER.

B. FITTINGS AND GASKETS

FITTINGS SHALL BE IN ACCORDANCE WITH ASTM D-1784 OF SAME COLOR AND RATING. BELL AND SPIGOT WITH "0" RING SEAL SHALL BE USED AND SHALL CONFORM TO ASTM REQUIREMENTS FOR EXPANSION JOINTS SO AS TO ALLOW 1 INCH EXPANSION PER HUNDRED FEET LENGTH OF PIPE.

GASKETS SHALL BE IN ACCORDANCE WITH ASTM F-477.

C. GATE VALVES

GATE VALVES SHALL BE IRON BODY, FULLY BRONZE MOUNTED, DOUBLE DISC TYPE CONFORMING TO AWWA C-500 AND SHALL HAVE A WORKING PRESSURE RATING OF AT LEAST 150 PSI. GATE VALVES SHALL OPEN COUNTER CLOCKWISE.

D. CURB AND VALVE BOXES

CURB BOXES SHALL BE ADJUSTABLE, MALAR H-10350 BUFFALO TYPE COMPLETE, 90 SERIES BINGHAM-TAYLOR, OR EQUAL.

E. SERVICE PIPE AND CONNECTION

SERVICE PIPING SHALL BE 1.0 INCH DIAMETER UNLESS INDICATED OTHERWISE ON THE PLANS, TYPE "K" SOFT ANNEALED COPPER TUBING IN CONFORMANCE WITH ASTM SPECIFICATION B-88. CONNECTION SHALL BE MADE WITH FLARED ENDS AND CAST BRASS OR WROUGHT COPPER COUPLINGS.

F. DETECTOR TAPE

DETECTOR TAPE SHALL BE CONSTRUCTED OF FOUR (4) MIL. INERT POLYETHYLENE WITH A ONE (1) MIL. FOIL CORE. THE MAGNETIC 3-INCH WIDE TAPE SHALL BE BLUE IN COLOR WITH CONTRACTING PERMANENT INK IDENTIFYING THE WATER MAIN. THE TAPE SHALL BE "TERRA TAPE" AS MANUFACTURED BY REEF INDUSTRIES, INC. HOUSTON TEXAS, OR EQUAL.

G. FIRE HYDRANTS

FIRE HYDRANTS SHALL BE OF THE DRY BARREL TYPE IN ACCORDANCE WITH AWWA C-502-85 OR FROST PROOF WITH A FOUR AND ONE-HALF (4-1/2) INCH PUMPER CONNECTION AND TWO AND ONE-HALF (2-1/2) INCH DISCHARGE OUTLETS ON EITHER SITE. THESE CONNECTIONS SHALL HAVE NATIONAL STANDARD THREADS. THE BOTTOM VALVE OPENING SHALL BE 5-1/2". THE OUTLET SHALL BE OF SMOOTH AND ROUND DESIGN WITH A COEFFICIENCY OF 0.90. A POSITIVE OPERATION CORROSION RESISTANCE DRAIN OR DRIP VALVE SHALL BE PROVIDED. A UNIFORM SIZE PENTAGONAL OPERATIONS NUT MEASURING ONE AND ONE-HALF (1-1/2) INCHES FROM POINT TO FLAT AT THE BASE AND ONE AND SEVEN-SIXTEENTH (1-7/16) INCHES AT THE TOP SHALL BE PROVIDED. THE SPACES SHALL BE TAPERED UNIFORMLY AND THE HEIGHT OF THE NUT SHOULD NOT BE LESS THAN ONE (1) INCH. THE HYDRANT SHALL OPEN COUNTER CLOCKWISE AND SHALL BE MANUFACTURED BY THE MUELLER COMPANY, OR EQUAL, AND SHALL BE APPROVED BY THE OWNER.

H. TAPPING SLEEVES

TAPPING SLEEVES ARE TO BE MANUFACTURED IN ACCORDANCE WITH AWWA C-110-93 AS AMENDED.

PART 3.0 - EXECUTION

A. INSTALLATION

ALL PIPE AND FITTINGS SHALL BE THOROUGHLY CLEANED AND SHALL BE ENTIRELY FREE FROM GREASE OR OIL AND SUBSTANTIALLY FREE FROM BLACKING, DIRT, SAND, RUST, SLAG OR FLUXING MATERIALS.

PVC PIPE SHALL BE INSTALLED IN ACCORDANCE WITH UNI-BELL HANDBOOK AND PVC PIPE, CHAPTER VI CONSTRUCTION "RECOMMENDED CONSTRUCTION PRACTICES FOR PVC PIPE".

A VALVE BOX SHALL BE PROVIDED FOR EVERY VALVE AND SHALL BE CAREFULLY PLACED AND SET AT A RIGHT ANGLE TO THE WATER MAIN.

THE VALVE BOX SHALL NOT TRANSMIT SHOCK OR STRESS TO THE VALVE AND SHALL BE CENTERED AND PLUMB OVER THE WRENCH NUT OF THE VALVE, WITH THE BOX COVER FLUSH WITH THE SURFACE OF THE FINISHED PAVEMENT OR SET TO THE ELEVATION SHOWN ON THE DRAWINGS. THE FLANGE AT THE BOTTOM OF THE TOP SECTION SHALL REST UPON PLANKS WHICH SHALL EXTEND INTO SOLID GROUND ON EACH SITE OF THE TRENCH FOR A MINIMUM OF EIGHT INCHES.

IN TAMPING THE BACKFILL AROUND THE VALVE, SPECIAL CARE SHALL BE TAKEN TO KEEP THE BOX IN PLACE AND TO HAVE IT FIRMLY SUPPORTED SO AS TO AVOID SETTLEMENT. ANY BOX WHICH IS GROUND OUT OF PLACE OR WHICH IS NOT FIRMLY SUPPORTED SHALL BE DUG UP AND RESET IN A SATISFACTORY MANNER AT THE CONTRACTOR'S EXPENSE.

ALL FITTINGS SHALL BE FIRMLY BLOCKED WITH CONCRETE AGAINST UNDISTURBED EARTH AS SHOWN IN THE DETAILS.

FOR VALVE BOXES NOT PLACED IN ROADWAY AREAS, BUT IN GRADED AREAS, THE TOP SHALL BE SET AT THE EXISTING FINISHED GRADE OR AS DIRECTED BY THE ENGINEER.

A MAGNETIC DETECTOR TAPE SHALL BE PLACED ABOVE THE WATER MAIN. THE TAP SHALL RUN CONTINUOUSLY OVER THE WATER MAIN AND BE PLACED 15 TO 18 INCHES BELOW THE FINISHED GRADE.

IN AN OPEN ROAD SECTION THE HYDRANTS SHALL BE SET BACK NOT LESS THAN TWENTY-FOUR (24) INCHES FROM THE EDGE OF THE ROADWAY BUT, NOT MORE THAN SEVENTY-TWO (72) INCHES AND AT NO TIME SHALL BE HYDRANT BE PLACED IN HE ACTUAL FLOW PATH OF THE DITCH. IN AREAS WITH CURB CLOSED ROAD SECTIONS, THE HYDRANT SHOULD NOT BE SET BACK LESS THAN EIGHTEEN (18) INCHES, NOR MORE THAN NINETY-SIX (96) INCHES FROM BACK OF CURB.

TAPS INTO EXISTING MAIN LINES ARE TO BE MADE UNDER THE SUPERVISION OF THE LOCAL WATER AND SEWER DEPARTMENT REPRESENTATIVE. THE WATER AND SEWER DEPARTMENT IS TO BE NOTIFIED 48 HOURS PRIOR TO TAP BEING MADE.

B. CLOSING IN UNINSPECTED WORK

DO NOT COVER UP OR ENCLOSE WORK UNTIL IT HAS BEEN PROPERLY AND COMPLETELY INSPECTED AND APPROVED.

SHOULD ANY OF THE WORK BE COVERED UP OR ENCLOSED PRIOR TO ALL REQUIRED INSPECTIONS AND APPROVAL, UNCOVER WORK AS REQUIRED AND, AFTER IT HAS BEEN COMPLETELY INSPECTED AND APPROVED, MAKE ALL REPAIRS AND REPLACEMENTS WITH SUCH MATERIAL AS ARE NECESSARY TO THE APPROVAL OF THE ENGINEER AND GOVERNING AGENCIES, AND AT NO ADDITIONAL COST TO THE OWNER.

C. TESTING

WATER MAINS SHALL BE PRESSURE AND LEAKAGE TESTED IN ACCORDANCE WITH UNI-BELL PLASTIC PIPE ASSOCIATION AND AS SPECIFIED HEREIN. TESTS SHALL BE MADE PRIOR TO CONNECTION TO NEW LINE FOR A MINIMUM OF 2 HOURS. THE LOCAL WATER AND SEWER DEPARTMENT IS TO BE NOTIFIED 48 HOURS PRIOR TO TESTING. TO HAVE A LOCAL WATER AND SEWER REPRESENTATIVE PRESENT AT THE TIME OF TESTS.

D. DISINFECTION

DISINFECTION PROCEDURES SHALL BE COMPLETED IN ACCORDANCE WITH AWWA STANDARDS AND MARYLAND DEPARTMENT OF HEALTH REGULATIONS.

ALL LABOR, TOOLS, MATERIALS, EQUIPMENT, GAUGES AND METERS NECESSARY FOR MAKING THE TESTS AND CHLORINATING THE MAINS SHALL BE FURNISHED BY THE CONTRACTOR.

WATER USED FOR DISINFECTIONS HALL BE PROPERLY DISPOSED BY THE CONTRACTOR IN ACCORDANCE WITH A METHOD APPROVED BY THE STATE HEALTH DEPARTMENT. IF THE WATER IS HEAVILY CHLORINATED, IT SHALL BE NEUTRALIZED PRIOR TO DISPOSAL.

E. AS-BUILTS

A SET OF COMPLETE AS-BUILT DRAWINGS CERTIFIED BY A REGISTERED ENGINEER IS TO BE PROVIDED BY THE CONTRACTOR TO THE OWNER WITHIN 30 DAYS OF THE COMPLETION OF WORK.

COLLINSON, OLIFF & ASSOCIATES, INC.
SURVEYORS • ENGINEERS
LAND PLANNERS
P.O. BOX 2209 ~ 110 MAIN STREET
PRINCE FREDERICK, MARYLAND 20678
410-535-3101 • 301-855-1599
FAX: 410-535-3103 • EMAIL: INFO@COAINC.COM

STATE OF MARYLAND · DANIEL J. KELSH · NO. 17627 · REGISTERED PROFESSIONAL ENGINEER

DANIEL J. KELSH MD PE #:17627
05/15/2020
DATE

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. 17627, EXPIRATION DATE: 12/13/2021

SCALE AS SHOWN	FOLDER REFERENCE TM 200 BLOCK 1 LOTS 23 & 24	
DATE FEB, 2020	DATE	REVISION
JOB NO. 1-13187	02/27/2020	SITE PLAN REVISIONS
DRAWN BY JRM	05/15/2020	-
APPROVED DJK	-	-
	-	-
	-	-
	-	-

PLAN #: 3

GRA #: 2020-3365

SITE

SPECIFICATIONS

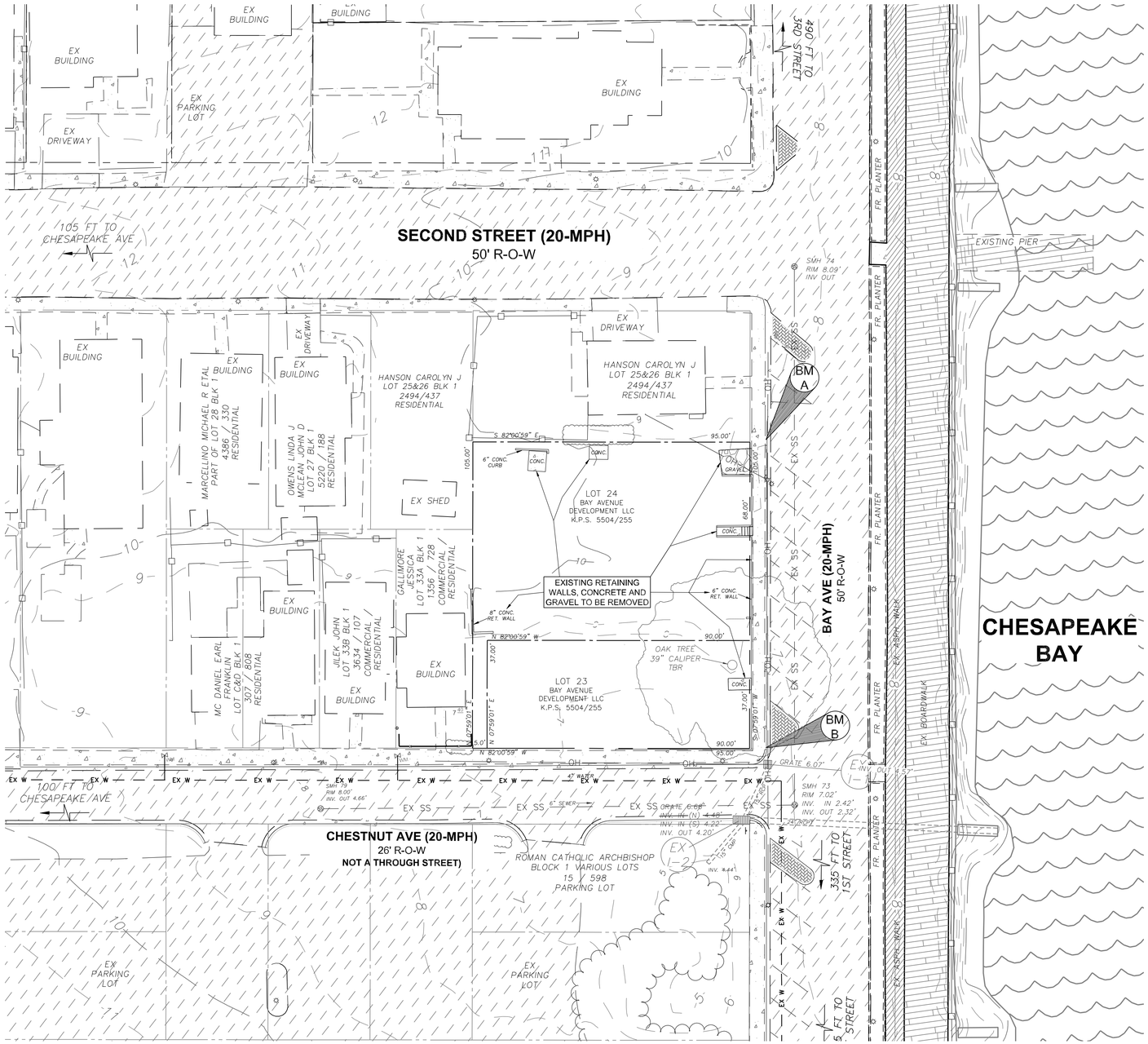
MIXED USE DEVELOPMENT
TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY

FOR: JOHN & PATRICIA STUECKLER

THIS STAMP IN RED COLOR INDICATES ORIGINAL

C 1.1

FILE #: B - 58 - 28 A.1



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NOTE: ENTIRE SITE IS UNDERLAIN BY KEYPORT SILT LOAM (KwB) SOIL CLASSIFICATION WHICH IS HSG 'C'

BENCHMARK INFORMATION ~ NAD 83 & NAD 88				
BM#	DESCRIPTION	NORTHING	EASTING	ELEVATION
BM A	TOP OF CURB CUT	378,069.38	1,445,827.11	8.08'
BM B	TOP OF CURB CUT	377,964.84	1,445,812.46	6.95'

CRITICAL AREA LOT COVERAGE				
DESCRIPTION	EXISTING		PROPOSED	
	SF	%	SF	%
STRUCTURES	0	0.00%	3840	38.50%
DRIVEWAYS/SIDEWALKS/WALLS	266	2.67%	3222	32.30%
PATIOS	0	0.00%	618	6.20%
PLANTER BEDS	0	0.00%	2024	20.29%
GRASS	9709	97.33%	271	2.72%
TOTAL LOT COVERAGE	9975	100.00%	9975	100.00%

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STATE OF MARYLAND DANIEL J. KELSH No. 17627 PROFESSIONAL ENGINEER

DANIEL J. KELSH MD PE #17627
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FOLDER REFERENCE: TM 200 BLOCK 1 LOTS 23 & 24

DATE	REVISION
02/27/2020	SITE PLAN REVISIONS
05/15/2020	-
-	-
-	-
-	-
-	-

GRA #: 2020-3365

SCALE: AS SHOWN
DATE: FEB. 2020
JOB NO.: 1-13187
DRAWN BY: JRM
APPROVED: DJK

PLAN #: 3

SITE

EXISTING CONDITIONS PLAN

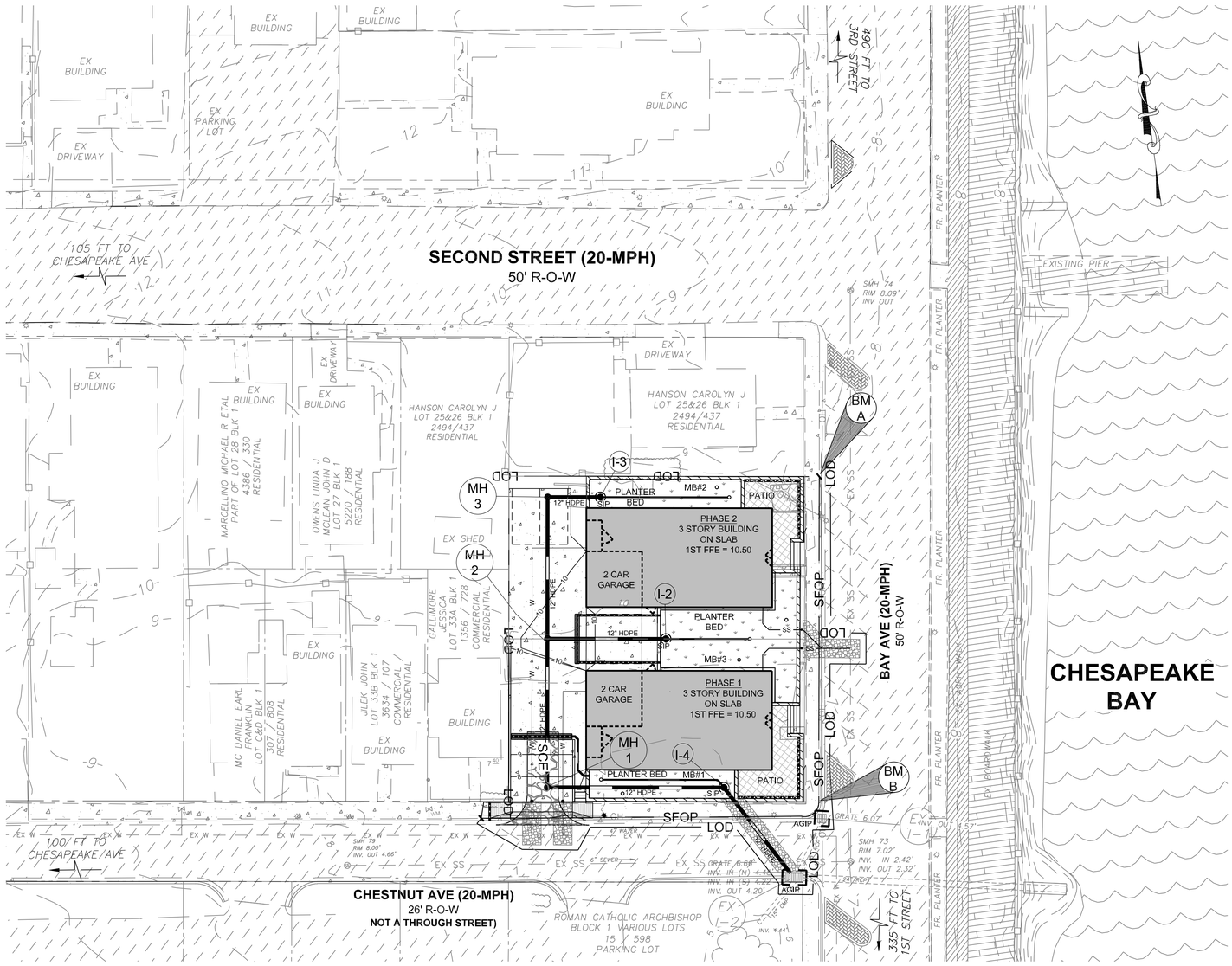
MIXED USE DEVELOPMENT
TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY

FOR: JOHN & PATRICIA STUECKLER

THIS STAMP IN RED COLOR INDICATES ORIGINAL

C 1.2

FILE #: B - 58 - 28 A.2



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

SEQUENCE OF SITE CONSTRUCTION

A	CONTACT CALVERT SOIL CONSERVATION DISTRICT (410) 535-1521 AT 489 MAIN STREET. SUITE 101, PRINCE FREDERICK, MARYLAND AND NORTH BEACH DEPARTMENT OF PUBLIC WORKS (410) 257-6335 AT 4030 11TH STREET NORTH BEACH, MD TO SCHEDULE A PRE-CONSTRUCTION MEETING 10 DAYS PRIOR TO THE BEGINNING OF ANY CONSTRUCTION.
B	CONTRACTOR/DEVELOPER IS TO NOTIFY THE CALVERT COUNTY DEPARTMENT OF INSPECTIONS AND PERMITS (410) 535-2155 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
C	ALL SEDIMENT CONTROLS SHALL BE REGULARLY INSPECTED AND MAINTAINED IN ACCORDANCE WITH MDE 2011 REGULATIONS. INSPECTIONS SHALL OCCUR AT A MINIMUM WEEKLY AND AFTER EACH RAIN EVENT THROUGHOUT THE LIFE OF THIS CONSTRUCTION.
D	LIMIT OF DISTURBANCE MUST BE STAKED/MARKED IN THE FIELD PRIOR TO BEGINNING CONSTRUCTION.

ITEM	DESCRIPTION	ESTIMATED TIME DAYS
1	DISTURB ONLY WHERE NEEDED TO INSTALL REQUIRED EROSION AND SEDIMENT CONTROL PRACTICES.	2
2	INSTALL EROSION AND SEDIMENT CONTROL PRACTICES WHERE INDICATED ON THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN.	5
3	CONTACT THE APPROPRIATE INSPECTING AGENCY. NO FURTHER CLEARING, GRADING, OR OTHER LAND DISTURBANCE ACTIVITY IS PERMITTED UNTIL THE INSPECTING AGENCY CERTIFIES THAT ALL REQUIRED EROSION AND SEDIMENT CONTROLS ARE PROPERLY INSTALLED ACCORDING TO THE RELEVANT CONSTRUCTION STANDARD. ALL OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THE INITIAL APPROVAL BY THE INSPECTING AGENCY IS GIVEN.	-
4	SEDIMENT CONTROL PRACTICES WILL BE MAINTAINED ACCORDING TO THE MARYLAND 2011 STANDARDS AND COUNTY REGULATIONS, UNTIL THE ENTIRE SITE IS STABILIZED, INSPECTED AND FINAL APPROVAL IS GIVEN BY THE APPROPRIATE STATE/COUNTY AGENCY	-
5	CLEAR AND GRADE TO THE LIMITS AND GRADE AS SHOWN ON THE APPROVED PLAN.	5
6	INSTALL UTILITIES IN ACCORDANCE WITH THE APPROVED PLANS. STORMWATER MANAGEMENT FACILITIES ARE NOT TO BE INSTALLED UNTIL UPSTREAM DRAINAGE AREAS ARE STABILIZED &/OR PERIMETER CONTROLS PROTECTING FILTER MEDIA IS INSTALLED.	10
7	CONSTRUCT ENTRANCE, DRIVEWAY & BUILDING PER DETAILS.	100
8	PERMANENTLY STABILIZE ALL DISTURBED AREAS. GRASS AREAS TO RECEIVE 4" TOPSOIL, SEED AND MULCH OR IF STABILIZATION OCCURS OUTSIDE OF PLANTING SEASON, SOD IS REQUIRED.	5
9	PREFORM FINAL EXCAVATION AND IMPLEMENTATION OF STORMWATER MANAGEMENT SYSTEM. UPON COMPLETION OF PERMANENT STABILIZATION, CONTACT DEPARTMENT OF PUBLIC WORKS FOR APPROVAL PRIOR TO REMOVAL OF SEDIMENT AND EROSION CONTROL DEVICES PERTAINING TO IMPLEMENTATION OF SWM DEVICES.	10
10	COMPLETE FINE GRADING AND INSTALL LANDSCAPING PER APPROVED PLAN. SEED ALL REMAINING DISTURBED AREAS. GRASS AREAS TO RECEIVE 4" TOPSOIL, SEED AND MULCH OR IF STABILIZATION OCCURS OUTSIDE OF PLANTING SEASON, SOD IS REQUIRED.	5
11	REQUEST AGENCY APPROVAL FOR THE REMOVAL OF EROSION AND SEDIMENT CONTROL PRACTICES/DEVICES, AND REMOVE EROSION AND SEDIMENT CONTROL PRACTICES. STABILIZE WHERE NEEDED AND REQUEST APPROVAL.	2
	TOTAL ESTIMATED SITE WORK CONSTRUCTION TIME:	144

SEDIMENT & EROSION CONTROL NOTES

1	ALL TRENCHES OR HOLES CREATED FOR UTILITY INSTALLATION SHALL BE BACKFILLED, COMPACTED AND STABILIZED AT THE END OF EACH WORKING DAY. EXCAVATED TRENCH MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF THE TRENCH OR HOLE. NO TRENCH/HOLE SHALL BE OPEN MORE THAN CAN BE STABILIZED THE SAME DAY. IF AN AREA MUST BE LEFT UNSTABILIZED OVERNIGHT, SILT FENCE WILL BE PLACED IMMEDIATELY DOWNHILL OF ALL DISTURBED AREAS AND STOCKPILES AND APPROPRIATE SAFETY MEASURES WILL BE INSTALLED AS REQUIRED.

SEDIMENT & EROSION CONTROL

DESCRIPTION	SYMBOL	UNITS	PHASE 1	PHASE 2	TOTAL
LIMIT OF DISTURBANCE (LOD)	LOD	SQ.FT±	-	-	12485.00
CLEARED AREA		SQ.FT±	-	-	9975.00
VEGETATED AREA		SQ.FT±	-	-	2175.00
STABILIZED CONSTRUCTION ENTRANCE	SCE	EACH	1	-	1
SILT FENCE ON PAVEMENT(SFOP)	SFOP	LF ±	190	-	190
STANDARD INLET PROTECTION	SIP	EACH	3	-	3
AT-GRADEINLET PROTECTION	AGIP	EACH	2	-	2
EARTHWORK CUT		CY ±	58	-	58
EARTHWORK FILL		CY ±	461	-	461

NOTE: QUANTITIES ARE FOR OBTAINING PERMITS ONLY. QUANTITIES TO BE VERIFIED BY CONTRACTOR

BENCHMARK INFORMATION ~ NAD 83 & NAD 88

BM#	DESCRIPTION	NORTHING	EASTING	ELEVATION
BM A	TOP OF CURB CUT	378,069.38	1,445,827.11	8.08'
BM B	TOP OF CURB CUT	377,964.84	1,445,812.46	6.95'

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STATE OF MARYLAND DANIEL J. KELSH No. 17627 PROFESSIONAL ENGINEER

DANIEL J. KELSH MD PE #17627
05/15/2020
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FOLDER REFERENCE	
TM 200 BLOCK 1 LOTS 23 & 24	
DATE	REVISION
02/27/2020	SITE PLAN REVISIONS
05/15/2020	-
-	-
-	-
-	-
-	-
-	-

GRA #: 2020-3365

SCALE AS SHOWN	PLAN #: 3
DATE FEB. 2020	
JOB NO. 1-13187	
DRAWN BY JRM	
APPROVED DJK	

SITE

SEDIMENT & EROSION CONTROL PLAN

MIXED USE DEVELOPMENT

TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY

FOR: JOHN & PATRICIA STUECKLER

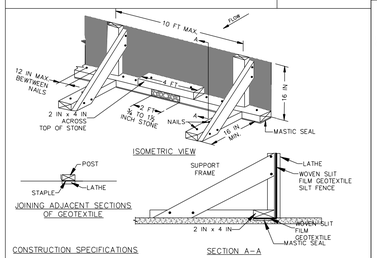
THIS STAMP IN RED COLOR INDICATES ORIGINAL

C 2.0

FILE #: B - 58 - 28 B

DETAIL E-2 SILT FENCE ON PAVEMENT

STANDARD SYMBOL —SFOP—



CONSTRUCTION SPECIFICATIONS

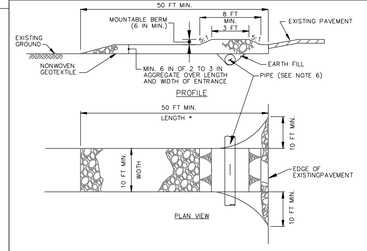
1. USE NOMINAL 2 INCH X 4 INCH LUMBER.
2. USE WOVEN SLIT FILM GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
3. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
4. SPACE UPRIGHT SUPPORTS NO MORE THAN 10 FEET APART.
5. PROVIDE A TWO FOOT OPENING BETWEEN EVERY SET OF SUPPORTS AND PLACE STONE IN THE OPENING OVER GEOTEXTILE.
6. KEEP SILT FENCE TAUT AND SECURELY STAPLE TO THE UPSLOPE SIDE OF UPRIGHT SUPPORTS. EXTEND GEOTEXTILE UNDER 2x4.
7. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, FOLD, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL. ATTACH LATHE.
8. PROVIDE A MASTIC SEAL BETWEEN PAVEMENT, GEOTEXTILE, AND 2x4 TO PREVENT SEDIMENT-LADEN WATER FROM ESCAPING BENEATH SILT FENCE INSTALLATION.
9. SECURE BOARDS TO PAVEMENT WITH 40D 5 INCH MINIMUM LENGTH NAILS.
10. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. MAINTAIN WATER TIGHT SEAL ALONG BOTTOM. REPLACE STONE IF DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL SCE-6



CONSTRUCTION SPECIFICATIONS

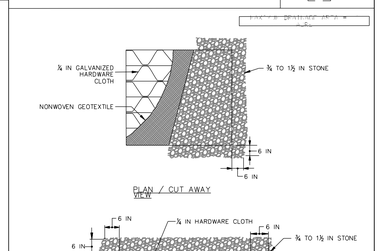
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-2 AT-GRADE INLET PROTECTION

STANDARD SYMBOL AGIP



CONSTRUCTION SPECIFICATIONS

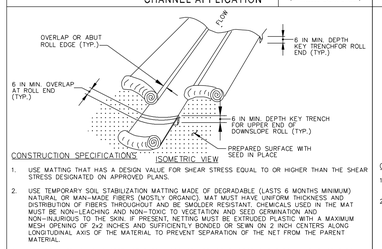
1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL TSSMC * lb/ft² (* INCLUDE SHEAR STRESS)



CONSTRUCTION SPECIFICATIONS

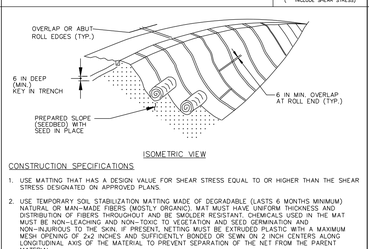
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. KEY-IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
7. OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-B TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL TSSMS * lb/ft² (* INCLUDE SHEAR STRESS)



CONSTRUCTION SPECIFICATIONS

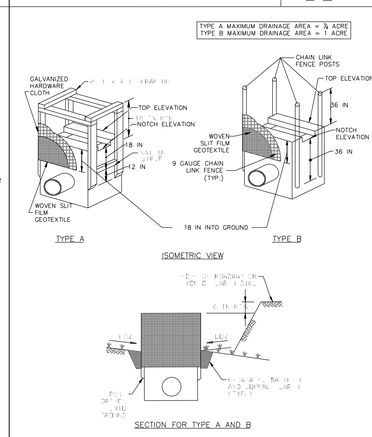
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
7. KEY IN THE UPSLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL IP



1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL IP

CONSTRUCTION SPECIFICATIONS

1. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18 INCHES BELOW THE NOTCH ELEVATION.
3. FOR TYPE A, USE NOMINAL 2 INCH X 4 INCH CONSTRUCTION GRADE LUMBER POSTS, DRIVEN 1 FOOT INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2x4 FRAME AS SHOWN. STRETCH ½ INCH GALVANIZED HARDWARE CLOTH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. FASTEN GEOTEXTILE SECURELY TO THE HARDWARE CLOTH WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND HARDWARE CLOTH A MINIMUM OF 18 INCHES BELOW THE WEIR CREST. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED TO THE POST.

   FOR TYPE B, USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH, DRIVEN A MINIMUM OF 36 INCHES BELOW THE WEIR CREST AT EACH CORNER OF THE STRUCTURE. FASTEN 9 GAUGE OR HEAVIER CHAIN LINK FENCE, 42 INCHES IN HEIGHT, SECURELY TO THE FENCE POSTS WITH WIRE TIES. FASTEN GEOTEXTILE SECURELY TO THE CHAIN LINK FENCE, WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 18 INCHES BELOW THE WEIR CREST.
4. BACKFILL AROUND THE INLET IN LOOSE 4 INCH LIFTS AND COMPACT UNTIL SOIL IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.
5. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

COLLINSON, OLIFF & ASSOCIATES, INC.
SURVEYORS • ENGINEERS
LAND PLANNERS
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PRINCE FREDERICK, MARYLAND 20678
410-535-3101 • 301-855-1599
FAX: 410-535-3103 • EMAIL: INFO@COAINC.COM

STATE OF MARYLAND — DANIEL J. KELSH — No. 17627 — PROFESSIONAL ENGINEER

MD PE #:17627
05/15/2020
DATE

DANIEL J. KELSH

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.: 17627, EXPIRATION DATE: 12/13/2021

FOLDER REFERENCE
TM 200 BLOCK 1 LOTS 23 & 24

DATE	REVISION
02/27/2020	SITE PLAN REVISIONS
05/15/2020	-
-	-
-	-
-	-
-	-
-	-

GRA #: 2020-3365

SCALE AS SHOWN
DATE FEB. 2020
JOB NO. 1-13187
DRAWN BY JRM
APPROVED DJK

PLAN #: 3

SITE

SEDIMENT & EROSION CONTROL DETAILS

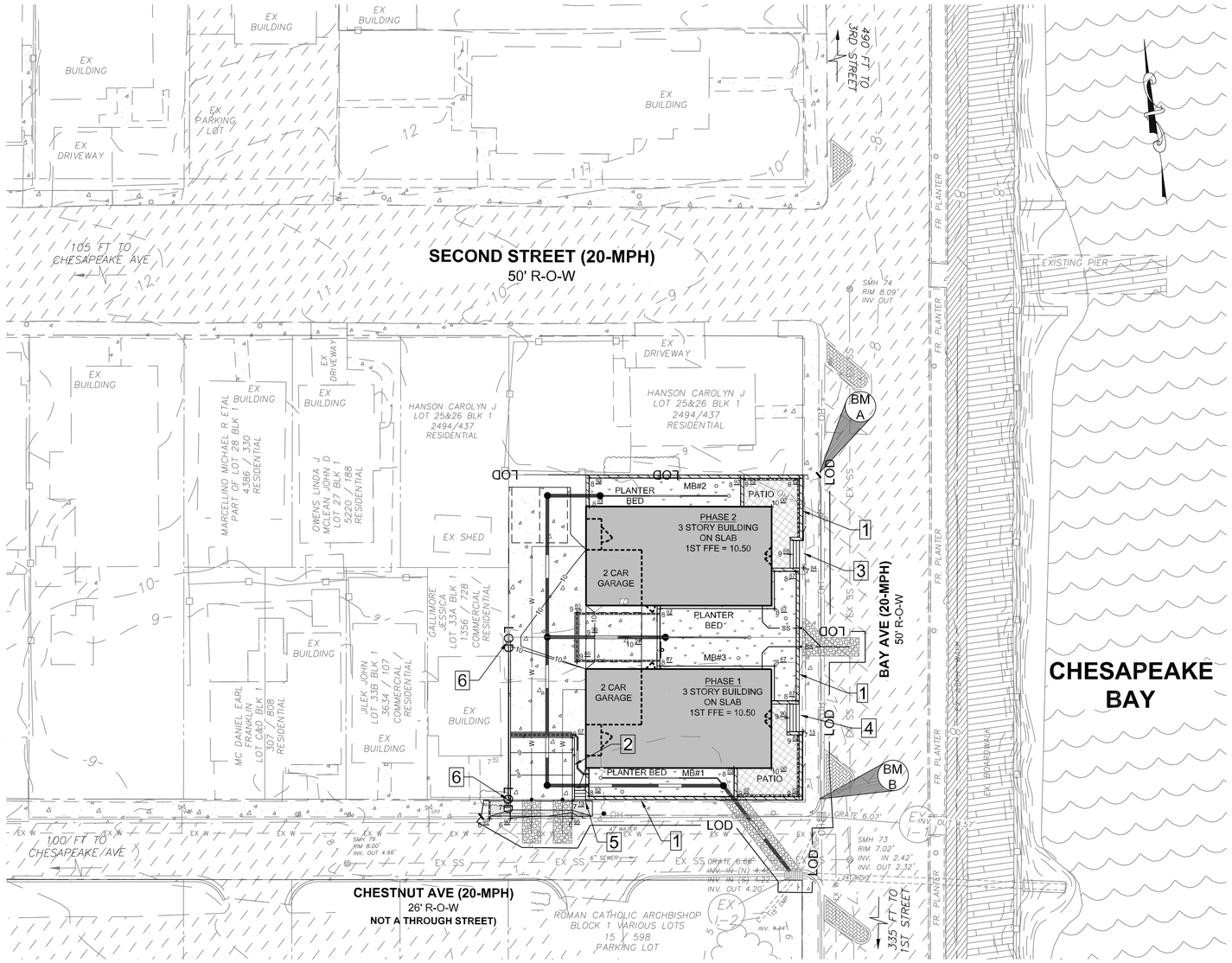
MIXED USE DEVELOPMENT
TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY

FOR: JOHN & PATRICIA STUECKLER

THIS STAMP IN RED COLOR INDICATES ORIGINAL

C 2.1

FILE #: B - 58 - 28 B.1



GRADING PLAN NOTES

#	DESCRIPTION
1	THE TEMPORARY STOCKPILE SHALL BE LOCATED ON SITE WITHIN THE LIMIT OF DISTURBANCE. A LINE OF SILT FENCE SHALL BE PLACED ALONG THE DOWNSTREAM SIDE OF THE STOCKPILE TO ENSURE NO DOWNSTREAM SEDIMENTATION.
2	ACCESS TO ALL EXISTING STRUCTURES SHALL BE MAINTAINED CONTINUOUSLY THROUGHOUT THE LIFE OF THE CONSTRUCTION.
3	CONTRACTOR SHALL BE AWARE THAT THERE MAY BE UNDERGROUND UTILITIES WITHIN THE LIMITS OF DISTURBANCE AND IMMEDIATE VICINITY. INFORMATION SHOWN ON THESE PLANS IS FROM THE BEST AVAILABLE SOURCES, HOWEVER THE CONTRACTOR MUST CONTACT MISS UTILITY AND PERFORM TEST PITS TO ACCURATELY LOCATE UTILITIES AND TO ENSURE NO DAMAGE TO UTILITIES WILL OCCUR. ANY DAMAGE TO THE VARIOUS UTILITIES SHALL BE REPAIRED IMMEDIATELY AND AT THE CONTRACTOR'S EXPENSE.
4	THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING POSITIVE GRADE AND DRAINAGE OVER ALL PAVED SURFACES. NO PONDING OR PUDDLING IS ALLOWABLE FOLLOWING PAVEMENT PLACEMENT.
5	EXISTING PAVED SURFACES WHICH ARE PROPOSED LANDSCAPE GREEN AREAS SHALL HAVE ALL PAVEMENT, GRAVEL, AND SUB-GRADE MATERIAL REMOVED AND REPLACED WITH TOPSOIL UNTIL SUITABLE SOILS FOR THE ESTABLISHMENT OF LANDSCAPE MATERIAL IS REACHED.
6	ALL EXISTING FEATURES ARE TO REMAIN UNLESS NOTED OTHERWISE.
7	ALL SIDEWALKS SHALL MEET CURRENT ADA STANDARDS EXCEPT WHERE STEPS ARE PROPOSED.
8	SEE ARCHITECTURAL PLANS FOR FOUNDATION, FLOOR PLAN AND COORDINATION OF UTILITY CONNECTION INFORMATION.
9	ALL SLOPES STEEPER THAN 3:1 SHALL BE STABILIZED WITH EROSION MATTING AFTER FINAL GRADE IS ACHIEVED. SOLID SOD MAY BE REQUIRED IF SCOURING OCCURS DURING CONSTRUCTION AND PRIOR TO FULL VEGETATIVE RE-ESTABLISHMENT.
10	AREAS OF CURB & PAVEMENT TO BE REMOVED TO CONSTRUCT ENTRANCES & SITE IMPROVEMENTS SHALL BE SAWCUT TO FACILITATE REMOVAL AND INSTALLATION.

GRADING KEYED NOTES

#	
1	TOP OF RETAINING WALL = 10.0'
2	TOP OF 8" WIDE RETAINING WALL = 10.0'
3	STEPS - 1' TREADS, 6" RISERS
4	STEPS - 1' TREADS, 6.5" RISERS
5	STEPS - 1' TREADS, 6.5" RISERS
6	6" CURB - NOSE DOWN IN 2'

BENCHMARK INFORMATION ~ NAD 83 & NAD 88

BM#	DESCRIPTION	NORTHING	EASTING	ELEVATION
BM A	TOP OF CURB CUT	378,069.38	1,445,827.11	8.08'
BM B	TOP OF CURB CUT	377,964.84	1,445,812.46	6.95'

COLLINSON, OLIFF & ASSOCIATES, INC.
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STATE OF MARYLAND DANIEL J. KELSH No. 17627 PROFESSIONAL ENGINEER

DANIEL J. KELSH MD PE #17627
05/15/2020
DATE

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. 17627, EXPIRATION DATE: 12/13/2021

SCALE	AS SHOWN
DATE	FEB. 2020
JOB NO.	1-13187
DRAWN BY	JRM
APPROVED	DJK

FOLDER REFERENCE: TM 200 BLOCK 1 LOTS 23 & 24

DATE	REVISION
02/27/2020	SITE PLAN REVISIONS
05/15/2020	-
-	-
-	-
-	-
-	-

PLAN #: 3

GRA #: 2020-3365

SITE

GRADING PLAN

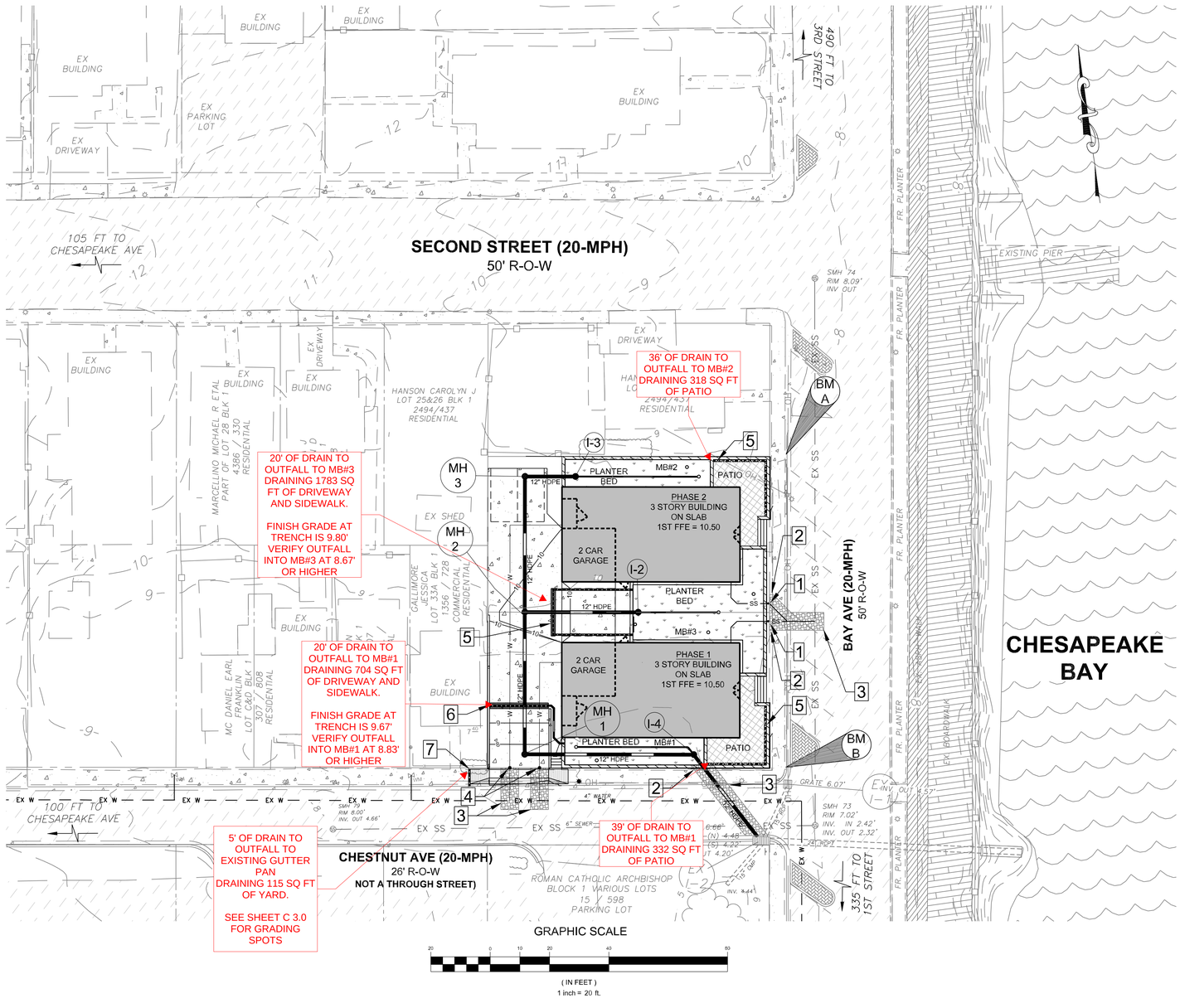
MIXED USE DEVELOPMENT
TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY

FOR: JOHN & PATRICIA STUECKLER

THIS STAMP IN RED COLOR INDICATES ORIGINAL

C 3.0

FILE #: B - 58 - 28 C



SEE SHEET C 3.0 FOR MORE DETAILED GRADING.

UTILITY PLAN NOTES

#	DESCRIPTION
1	THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITIY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THESE PLANS.
2	TEST PITS ARE REQUIRED TO DETERMINE THE EXACT LOCATION AND ELEVATION OF ANY EXISTING WATERLINE, SEWERLINE AND STORMDRAIN AT ALL UTILITY CROSSINGS.
3	WATER AND SEWER CONNECTIONS SHALL BE CONSTRUCTED AND/OR UTILIZED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS.
4	PVC DRAINAGE PIPE MAY BE SUBSTITUTED FOR HDPE DRAINAGE PIPE AT CONTRACTOR'S OPTION WITH ENGINEER'S APPROVAL.
5	ALL EXISTING FEATURES ARE TO REMAIN UNLESS NOTED OTHERWISE.
6	EXISTING UTILITY SURFACE FEATURES INCLUDING BUT NOT LIMITED TO STORM DRAIN, STORM WATER MANAGEMENT, WATER, SEWER AND GAS SHALL BE ADJUSTED TO THE PROPOSED GRADES ON THIS PLAN.
7	ROOF LEADERS SHALL BE DISCHARGED INTO THE ON-SITE STORMWATER MANAGEMENT SYSTEM.
8	ANY PROPOSED SEWER MAIN SHALL BE PRESSURE AND LEAKAGE TESTED IN ACCORDANCE WITH UNI-BELL PLASTIC PIPE ASSOCIATION AND AS SPECIFIED HEREIN. TESTS SHALL BE MADE PRIOR TO CONNECTION TO NEW LINE FOR A MINIMUM OF 2 HOURS. THE LOCAL WATER AND SEWER DEPARTMENT IS TO BE NOTIFIED 48 HOURS PRIOR TO TESTING, TO HAVE A LOCAL WATER AND SEWER REPRESENTATIVE PRESENT AT THE TIME OF TESTS.
9	ANY PROPOSED WATERLINE SHALL HAVE A MINIMUM OF 42 INCHES OF COVER FROM PROPOSED GRADE.
10	ALL TRENCHES OR HOLES CREATED FOR UTILITY INSTALLATION SHALL BE BACKFILLED, COMPACTED AND STABILIZED AT THE END OF EACH WORKING DAY. EXCAVATED TRENCH MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF THE TRENCH OR HOLE. NO TRENCH/HOLE SHALL BE OPEN MORE THAN CAN BE STABILIZED THE SAME DAY. IF AN AREA MUST BE LEFT UNSTABILIZED OVERNIGHT, SILT FENCE WILL BE PLACED IMMEDIATELY DOWNHILL OF ALL DISTURBED AREAS AND STOCKPILES AND APPROPRIATE SAFETY MEASURES WILL BE INSTALLED AS REQUIRED.

UTILITY KEYED NOTES

#	
1	SEWER CLEANOUT TO BE SET BACK 6" FROM PROPERTY LINE IN RECORDED SEWER EASEMENT.
2	SEE ARCHITECTURAL PLANS FOR DETAIL OF UTILITY PIPES THROUGH FOOTER.
3	SEE DETAIL SHEET C 4.2 FOR UTILITY CUT DETAILS.
4	WATER METER TO BE TRAFFIC BEARING PER DETAIL W-4.1. SEE SHEET C 4.2.
5	ACO KLASSIKDRAIN K100 WITH CLASS A GRATE FOR PATIOS TO OUTFALL TO MICRO-BIO PLANTER BEDS
6	ACO DRAIN H200K WITH CLASS C GRADE FOR DRIVEWAY TO OUTFALL TO MICRO-BIO PLANTER BEDS
7	ACO KLASSIKDRAIN K100 WITH CLASS C GRATE FOR DRIVEWAY TO OUTFALL TO MICRO-BIO PLANTER BEDS
8	ACO SIDEWALK DRAIN S100K TO OUTFALL TO EXISTING GUTTER PAN

BENCHMARK INFORMATION ~ NAD 83 & NAD 88

BM#	DESCRIPTION	NORTHING	EASTING	ELEVATION
BM A	TOP OF CURB CUT	378,069.38	1,445,827.11	8.08'
BM B	TOP OF CURB CUT	377,964.84	1,445,812.46	6.95'

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE WATER, SEWER AND STORM DRAIN UTILITIES SHOWN ON THE PLANS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS APPROVED BY THE NORTH BEACH DEPARTMENT OF PUBLIC WORKS., EXCEPT AS NOTED IN RED ON THE "AS-BUILT" DRAWINGS.

BY: _____ DATE: _____

DANIEL J. KELSH MD PE #17627

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GRA #: 2020-3365

PLAN #: 3

SITE

UTILITY PLAN

MIXED USE DEVELOPMENT

TM 200 BLOCK 1 LOTS 23 & 24
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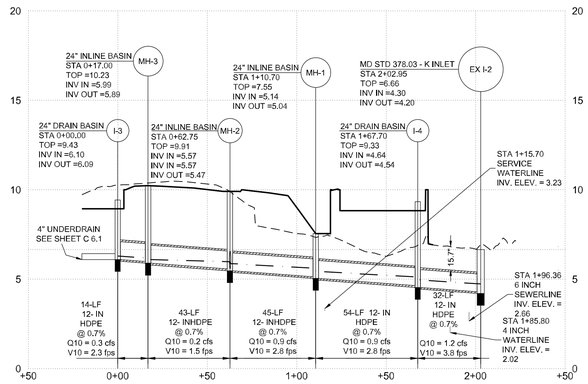
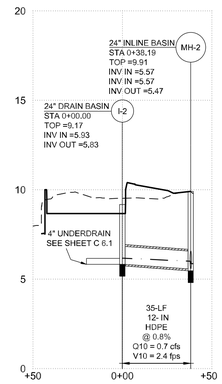


STORM DRAIN PROFILE: I-3 TO EX I-2

SCALE: H 1"=40' ~ V 1"=4'



STORMDRAIN PROFILE: I-2 TO MH-2

SCALE: H 1"=40' ~ V 1"=4'

STORM DRAIN FLOW TABULATION - 10-YR STORM

US NODE	DS NODE	DA (AC)	C INC	CXA INC	DA SUM (AC)	CXA SUM	TC SUM (MIN)	I (IN/HR)	RUN OFF (CFS)	Q10 (CFS)	DIA (IN)	TYPE	N	S_O (%)	V_F (FPS)	L_O (FT)	Tt (MIN)	Q_F (CFS)	S_F (%)	Dn (IN)	US HGL (FT)	DS HGL (FT)
I-3	MH-3	0.04	0.85	0.85	0.04	0.04	5.00	7.00	0.25	0.25	12	HDPE	0.012	0.62	2.34	17	0.12	3.26	0.6	2.34	6.29	6.19
MH-3	MH-2	0.00	0.50	0.85	0.00	0.04	5.00	7.00	0.00	0.25	12	HDPE	0.012	0.70	0.82	46	0.51	3.48	0.1	4.93	6.10	5.98
I-2	MH-2	0.11	0.85	0.85	0.10	0.10	5.00	7.00	0.67	0.67	12	HDPE	0.012	0.69	2.05	38	0.26	3.45	0.3	5.20	6.17	6.00
MH-2	MH-1	0.00	0.50	0.85	0.00	0.13	5.00	7.00	0.00	0.91	12	HDPE	0.012	0.70	2.46	48	0.29	3.46	0.3	5.72	5.87	5.62
MH-1	I-4	0.00	0.50	0.85	0.00	0.14	5.00	7.00	0.00	0.97	12	HDPE	0.012	0.70	2.51	57	0.33	3.48	0.4	5.91	5.45	5.13
I-4	EX I-2	0.06	0.85	0.85	0.05	0.19	5.00	7.00	0.35	1.28	12	HDPE	0.012	0.68	3.84	35	0.15	3.43	0.7	5.29	4.98	4.74

STORMDRAIN STRUCTURE SCHEDULE

STRUCT ID	TYPE	DETAIL	RIM/GRATE/ INVERT ELEV	NORTHING	EASTING
I-2	24" DRAIN BASIN	NYLOPLAST	RIM=9.17 INV IN=5.93 INV OUT=5.83	378,023	1,445,770
I-3	24" DRAIN BASIN	NYLOPLAST	RIM=9.43 INV IN=6.10 INV OUT=6.09	378,072	1,445,756
MH-3	24" INLINE BASIN	NYLOPLAST	RIM=10.23 INV IN=5.99 INV OUT=5.89	378,074	1,445,739
MH-2	24" INLINE BASIN	NYLOPLAST	RIM=9.91 INV IN=5.57 INV IN=5.57 INV OUT=5.47	378,029	1,445,733
MH-1	24" INLINE BASIN	NYLOPLAST	RIM=7.55 INV IN=5.14 INV OUT=5.04	377,981	1,445,726
I-4	24" DRAIN BASIN	NYLOPLAST	RIM=9.33 INV IN=6.00 INV IN=4.64 INV OUT=4.54	377,973	1,445,782
EX I-2	EXISING INLET	-	RIM=6.66 INV IN=4.30 INV OUT=4.20	377,943	1,445,800

STORMDRAIN PIPE SCHEDULE

PIPE ID	US ID	DS ID	DIA (IN)	TYPE	L_O (FT)	S_O (%)
P-1	I-3	MH-3	12	HDPE	17	0.75
P-2	MH-3	MH-2	12	HDPE	46	0.75
P-3	MH-2	MH-1	12	HDPE	48	0.74
P-4	MH-1	I-4	12	HDPE	57	0.74
P-5	I-4	EX I-1	12	HDPE	35	0.71
P-6	I-2	MH-2	12	HDPE	38	0.75

PROFILE LEGEND

HGL,10 YEAR Storm
EX. GRADE
PROP'D GRADE

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE WATER, SEWER AND STORM DRAIN UTILITIES SHOWN ON THE PLANS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS APPROVED BY THE NORTH BEACH DEPARTMENT OF PUBLIC WORKS., EXCEPT AS NOTED IN RED ON THE "AS-BUILT" DRAWINGS.

BY: _____ DATE: _____
DANIEL J. KELSH MD PE #17627

COLLINSON, OLIFF & ASSOCIATES, INC.
SURVEYORS • ENGINEERS
LAND PLANNERS
P.O. BOX 2209 ~ 110 MAIN STREET
PRINCE FREDERICK, MARYLAND 20678
410-535-3101 • 301-855-1599
FAX: 410-535-3103 • EMAIL: INFO@COAINC.COM

STATE OF MARYLAND DANIEL J. KELSH No. 17627 PROFESSIONAL ENGINEER

DANIEL J. KELSH MD PE #17627
05/15/2020
DATE

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. 17627, EXPIRATION DATE: 12/13/2021

FOLDER REFERENCE: TM 200 BLOCK 1 LOTS 23 & 24

DATE	REVISION
02/27/2020	SITE PLAN REVISIONS
05/15/2020	-
-	-
-	-
-	-
-	-
-	-

GRA #: 2020-3365

SCALE: AS SHOWN
DATE: FEB. 2020
JOB NO.: 1-13187
DRAWN BY: JRM
APPROVED: DJK

PLAN #: 3

UTILITY PROFILES

SITE

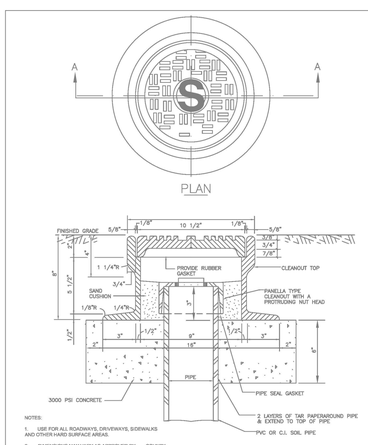
MIXED USE DEVELOPMENT
TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY

FOR: JOHN & PATRICIA STUECKLER

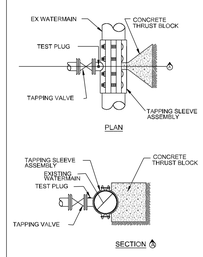
THIS STAMP IN RED COLOR INDICATES ORIGINAL

C 4.1

FILE #: B - 58 - 28 D.1



REVISIONS:	CALVERT COUNTY DEPARTMENT OF PUBLIC WORKS–BUREAU OF UTILITIES APPROVED: BUREAU CHIEF DATE: DECEMBER 15, 2004	STANDARD DETAILS	S 1.24
		CLEANOUT TOP FOR PAVEMENT AREAS	



NOTES

1. TAPPING SLEEVE SHALL BE STAINLESS STEEL WITH DUCTILE IRON OUTLET FLANGE AND 3/4" NPT BRASS TEST PLUG AND SHALL BE MUELLER H-304 OR APPROVED EQUAL.

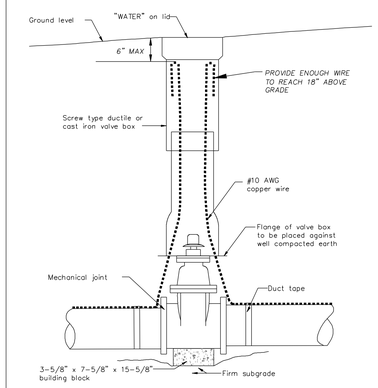
2. THE TAPPING VALVE SHALL BE A RESILIENT WEDGE GATE VALVE MEETING THE REQUIREMENTS FOR AWWA C509, THE ENDS SHALL BE M.J. BY FL. THE VALVE SHALL BE SUPPLIED WITH A 2" OPERATING NUT, SHALL BE EPOXY COATED PER AWWA C550 AND SHALL BE INSTALLED WITH STAINLESS STEEL FASTENERS. THE TAPPING VALVE SHALL BE MUELLER T-2360 OR APPROVED EQUAL.

3. AFTER INSTALLING THE TAPPING SLEEVE BUT BEFORE DRILLING INTO THE EXISTING PIPE, THE ASSEMBLY SHALL BE PRESSURIZED TO 150 PSI AND LET STAND FOR 10 MINUTES WITH NO LOSS OF PRESSURE.

4. SEE STANDARD DETAIL W1.04 FOR ADDITIONAL INSTALLATION DETAILS AND REQUIREMENTS FOR THE TAPPING VALVE.

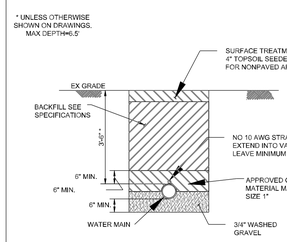
5. SEE STANDARD DETAIL B1.02 FOR INSTALLATION DETAILS FOR THE CONCRETE TRUST BLOCK.

REVISIONS:	CALVERT COUNTY DEPARTMENT OF PUBLIC WORKS–BUREAU OF UTILITIES APPROVED: BUREAU CHIEF DATE: DECEMBER 15, 2004	STANDARD DETAILS	W 1.10
		TAPPING SLEEVE & VALVE	



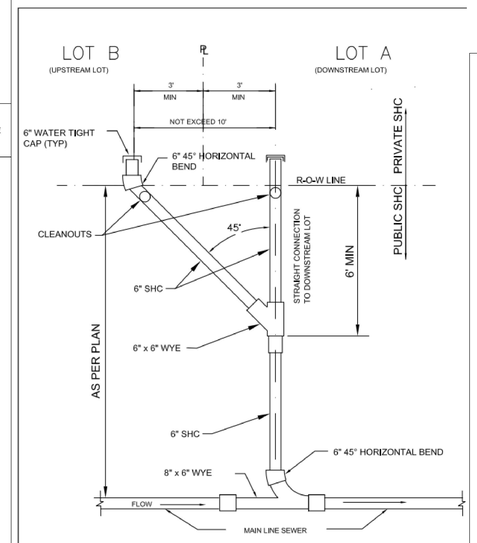
Note:
This detail applies to all projects approved after May 5, 2008

REVISIONS:	CALVERT COUNTY DEPARTMENT OF PUBLIC WORKS–BUREAU OF UTILITIES APPROVED: BUREAU CHIEF DATE: DECEMBER 15, 2004	STANDARD DETAILS	W 1.04
5-7-08		IN-LINE WATER VALVE	

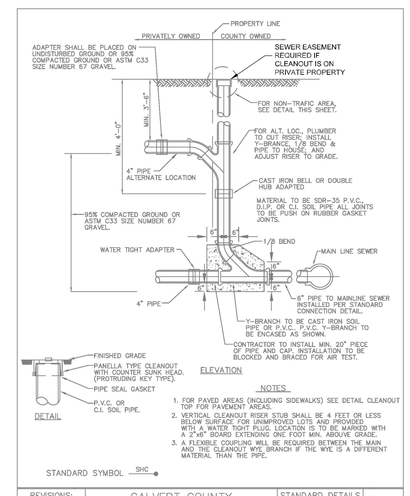


NOTE:
THIS DETAIL APPLIES TO ALL PROJECTS APPROVED AFTER MAY 5, 2008

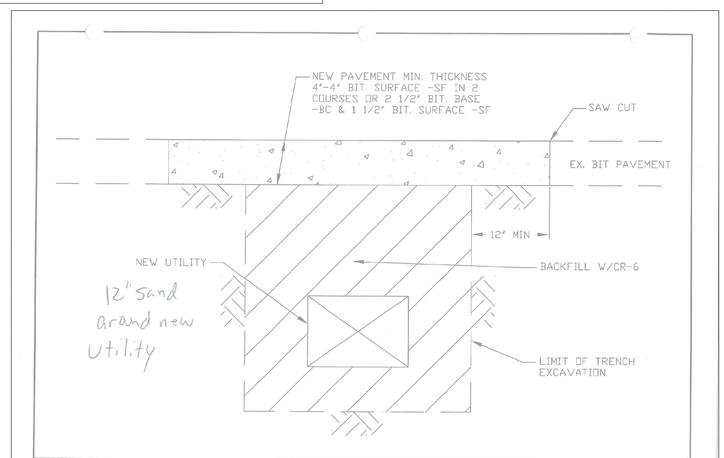
REVISIONS:	CALVERT COUNTY DEPARTMENT OF PUBLIC WORKS–BUREAU OF UTILITIES APPROVED: BUREAU CHIEF DATE: DECEMBER 15, 2004	STANDARD DETAILS	W 1.01
5-1-08		WATER MAIN TRENCH	



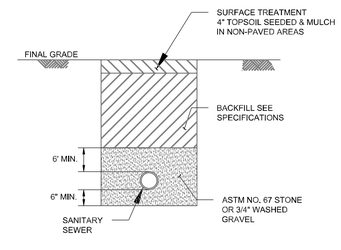
REVISIONS:	CALVERT COUNTY DEPARTMENT OF PUBLIC WORKS–BUREAU OF UTILITIES APPROVED: BUREAU CHIEF DATE: DECEMBER 15, 2004	STANDARD DETAILS	S 1.21
		DOUBLE SEWER HOUSE CONN.	



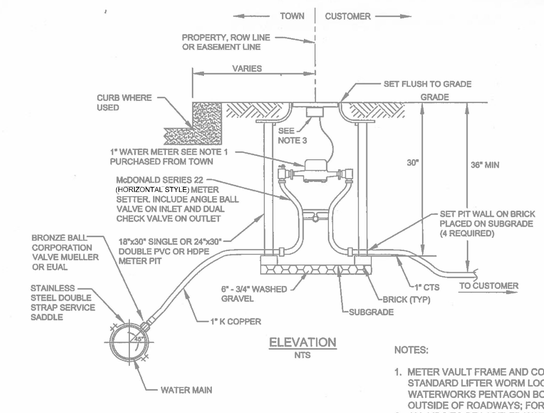
REVISIONS:	CALVERT COUNTY DEPARTMENT OF PUBLIC WORKS–BUREAU OF UTILITIES APPROVED: BUREAU CHIEF DATE: DECEMBER 15, 2004	STANDARD DETAILS	S 1.22
		SEWER CLEANOUT	



TOWN OF NORTH BEACH MARYLAND	APPROVED TOWN ENGINEER DATE	STANDARD DETAIL PAVEMENT TRENCH REPAIR	REVISED DATE BY	STANDARD NUMBER PTR-1



REVISIONS:	CALVERT COUNTY DEPARTMENT OF PUBLIC WORKS–BUREAU OF UTILITIES APPROVED: BUREAU CHIEF DATE: DECEMBER 15, 2004	STANDARD DETAILS	S 1.01
		SANITARY SEWER TRENCH	



NOTES:

1. METER VAULT FRAME AND COVER TO HAVE 11-1/2 INCH LID WITH STANDARD LIFTER WORM LOCK ASSEMBLY (STANDARD WATERWORKS PENTAGON BOLT-27/32 INCH). FORD NO. 1-32 T OUTSIDE OF ROADWAYS; FORD NO. A322HH-T IN TRAFFIC AREAS
2. ALL LIDS TO BE LABELED WATER METER.
3. RADIO READ TRANSMITTER MOUNTED ON UNDERSIDE OF LID.

TOWN OF NORTH BEACH MARYLAND	APPROVED MAYOR DATE TOWN ENGINEER DATE	STANDARD DETAIL STANDARD INSTALLATION 1" METERED DOMESTIC SERVICE FOR HOUSES WITH SPRINKLER SYSTEM	REVISED DATE BY	STANDARD NUMBER W-4.1

COLLINSON, OLIFF & ASSOCIATES, INC.
SURVEYORS • ENGINEERS
LAND PLANNERS
P.O. BOX 2209 ~ 110 MAIN STREET
PRINCE FREDERICK, MARYLAND 20678
410-535-3101 • 301-855-1599
FAX: 410-535-3103 • EMAIL: INFO@COAINC.COM

STATE OF MARYLAND — DANIEL J. KELSH — No. 17627 — PROFESSIONAL ENGINEER

DANIEL J. KELSH MD PE #17627
05/15/2020
DATE

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FOLDER REFERENCE	TM 200 BLOCK 1 LOTS 23 & 24
DATE	REVISION
02/27/2020	SITE PLAN REVISIONS
05/15/2020	-
-	-
-	-
-	-
-	-
-	-

SITE — UTILITY DETAILS

MIXED USE DEVELOPMENT
TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY

FOR: JOHN & PATRICIA STUECKLER

SCALE	AS SHOWN
DATE	FEB. 2020
JOB NO.	1-13187
DRAWN BY	JRM
APPROVED	DJK

PLAN #: 3

GRA #: 2020-3365

THIS STAMP IN RED COLOR INDICATES ORIGINAL

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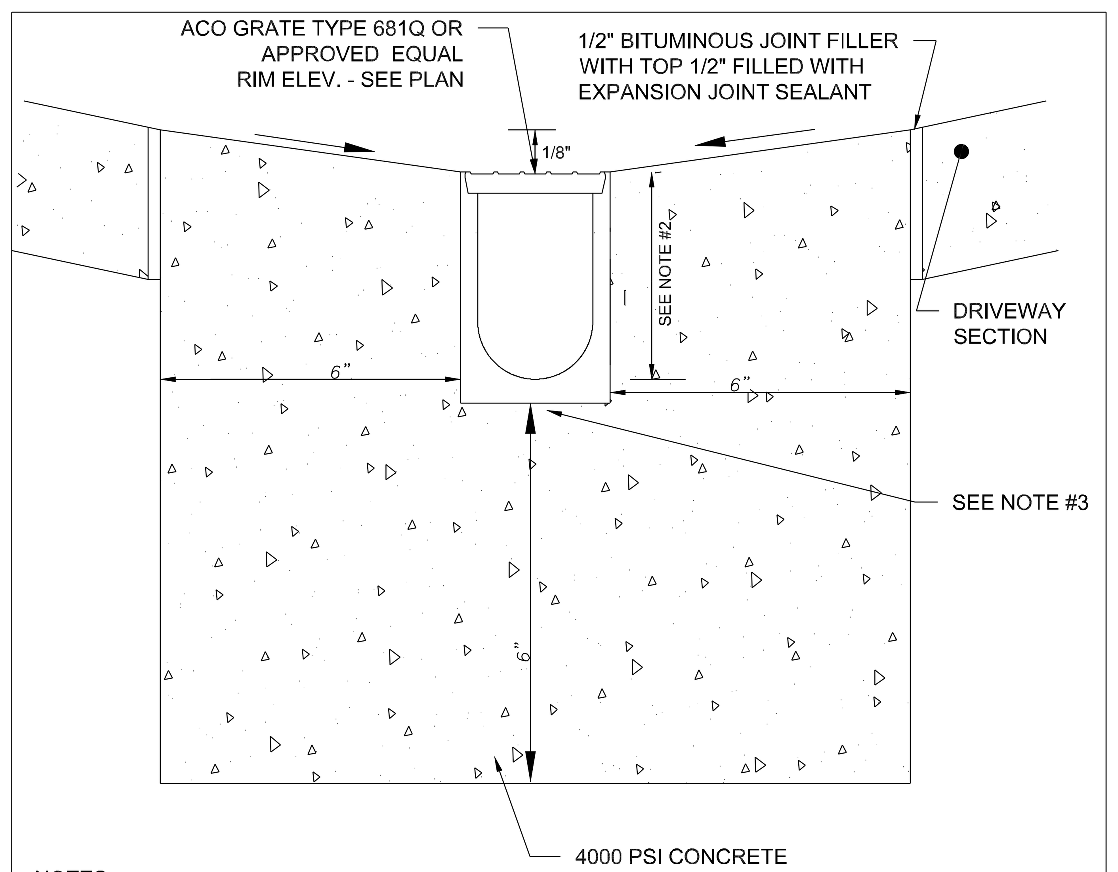
FILE #: B - 58 - 28 D.2



NOTES:

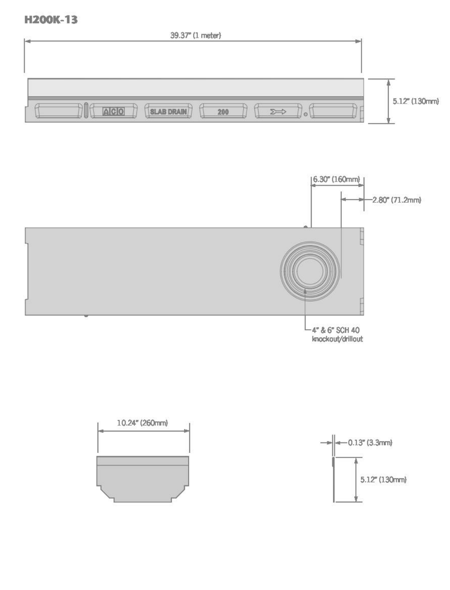
1. DRAIN TO BE ACO DRAIN H200K OR APPROVED EQUAL.
2. TRENCH DRAINS HEIGHT = 4.13" (PART H200KS-13-93455).
3. OUTLET B BOTTOM OUTLET - H200K TO CONNECT 6" SCH 40 MICRO-BIO PLANTER BEDS.

TYPICAL SLAB DRAIN - ACO DRAIN H200K

NTS

ACO DRAIN

SlabDrain - H200K-13 galvanized steel edge rail channel system



Outlet flow rates

Product	Outlet size (Sch. 40)	Invert Depth	GPM	CFS
H200K-13 channel	4" round	4.00	108	0.24
H200K-13 channel	6" round	4.00	243	0.54

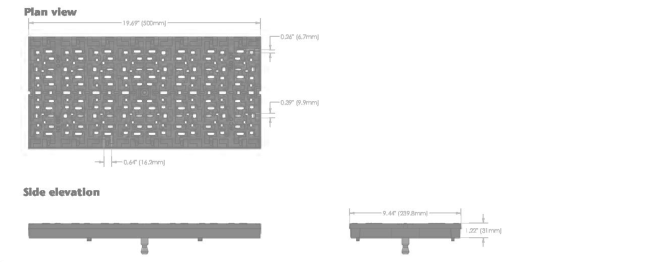
Note: These are the pipe flow rates at the specified outlet, NOT channel flow rates.

ACO Specification Information

April 2018 www.ACODrain.us

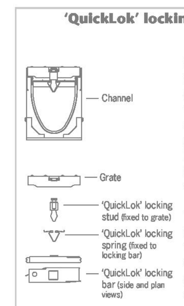
ACO DRAIN

Type 681Q Deco ductile iron grate



Description	Part No.	Length inches (mm)	Width inches (mm)	Weight lbs.
QuickLok grate				
Type 681Q Deco ductile iron grate	93956	19.69 (500)	9.41 (239)	27.0
QuickLok locking bar	10457	-	-	0.5
QuickLok grate removal tool	01318	-	-	0.3

'QuickLok' locking mechanism



ACO 'QuickLok' is a patented boltless locking system, grates are removed and replaced with the minimum time and effort for ease of maintenance. The unique design provides a positive 'snap down' fit into the locking bar. A stud is fixed to the grate which 'locks' into the spring clip in the locking bar.

The 'QuickLok' stud is made from stainless steel and high density nylon, the locking bar and clip are stainless steel, for use in both general purpose and corrosive environments.

ACO Specification Information

ACO, Inc.
Northeast Sales Office, 9470 Pinecone Drive, Mentor, Ohio 44060, Tel: (440) 639-7230, Toll free: (800) 543-4764, Fax: (440) 285-7005
West Sales Office, 825 W. Beechcraft St., Casa Grande, AZ 85122, Tel: (520) 421-9988, Toll Free: (888) 490-9552, Fax: (520) 421-9899
Southeast Sales Office, 4211 Pleasant Road, Fort Mill, SC 29708, Toll free: (800) 543-4764, Fax: (803) 802-1063
Follow us on
Electronic Contact: info@ACODrain.us www.ACODrain.us

SPEC INFO ACO

© April 2018, ACO, Inc. This information is believed to be accurate but it is not guaranteed to be so. We cannot assume liability for results that buyer obtains with our product since conditions of use are beyond the control of the company. It is the customer's responsibility to evaluate suitability and safety of product for his own use. ACO, Inc. reserves the right to change the products and specifications without notice.

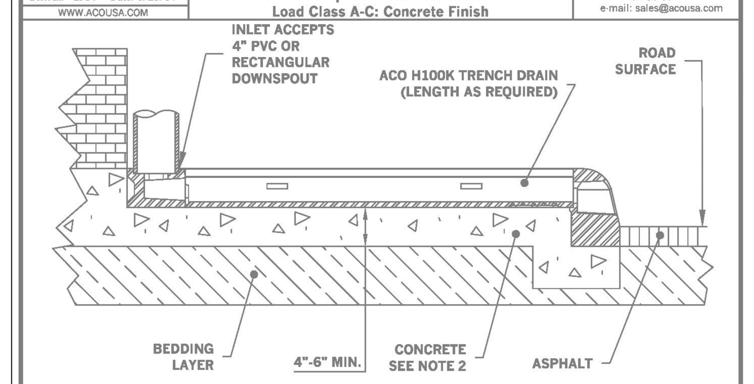
April 2018 www.ACODrain.us

ACO drain — INSTALLATION DRAWING

DRWG# 1734 Date: 6/29/04 WWW.ACOUSA.COM

Cross Footpath w/H100K Channel: Load Class A-C: Concrete Finish

ACO Polymer Products Inc., P.O. Box 245, Chardon, OH 44024, PH: 440-285-7000, FX: 440-285-8517, e-mail: sales@acousa.com



NOTES:
1. It is necessary to ensure the minimum dimensions shown are suitable for the existing ground conditions. *Engineering advice may be required.*
2. A minimum concrete strength of 3000 PSI is recommended. The concrete should be vibrated to eliminate air pockets.
3. Expansion and crack control joints are recommended to protect the channel and the concrete surround. *Engineering advice may be required.*
4. Refer to ACO'S latest installation instructions for complete details.

ACO drain — SPECIFICATION CLAUSE

DRWG# 1734 Date: 6/29/04 WWW.ACOUSA.COM

Cross Footpath w/H100K Channel

ACO Polymer Products Inc., P.O. Box 245, Chardon, OH 44024, PH: 440-285-7000, FX: 440-285-8517, e-mail: sales@acousa.com

The surface drainage system shall be polymer concrete H100K channel system with a cast-in stainless or galvanized steel rail as manufactured by ACO Polymer Products, Inc., Chardon, Oh.

Cross Footpath Outlet, Inlet and channels will be manufactured from polyester resin polymer concrete.

Cross Footpath Outlet shall be 6 in. (153mm) overall width and 7.9 in. (200mm) overall depth.

Cross Footpath Inlet shall be 5.5 in. (140mm) overall width and 3.9 in. (100mm) overall depth.

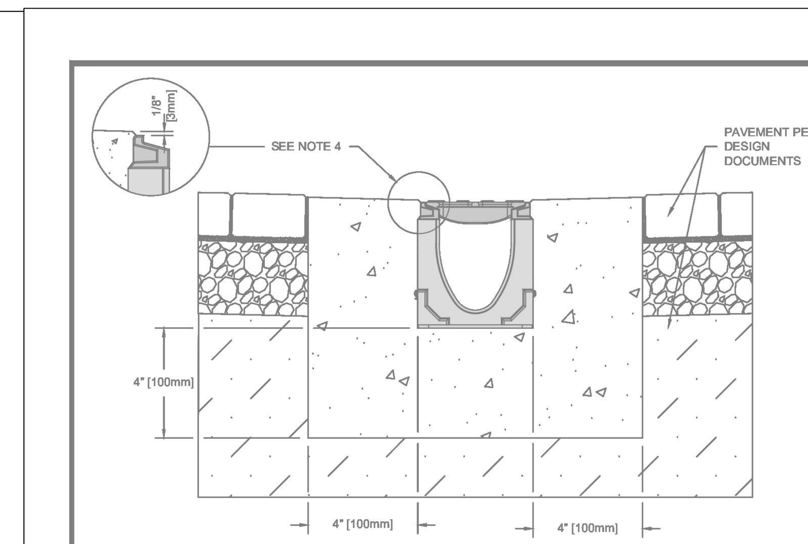
The H100K channels shall be 4 inches (100mm) nominal inside width with a 5.2 in. (131mm) overall width and 3.9 in. (100mm) overall depth. All pieces shall be interlocking with a male/female joint.

The complete drainage system shall be by ACO Polymer Products, Inc. Any deviation or partial system design and/or improper installation will void any and all warranties provided by ACO Polymer Products, Inc.

The channel sytem shall be independantly certified to withstand loadings to load class C (DIN19580). Grates shall be secured using 'Quicklok' boltless locking system. Grate and Locking system shall be fully removable from channel.

Polymer Concrete shall have material properties of: compressive strength range between 14,000-14,500 psi; flexural strength between 3600-4500 psi; tensile strength of 1500 psi. The material water absorption rate shall not exceed 0.1 % by weight and shall be resistant to prolonged salt exposure, repetitive frost cycles and chemically resistant to dilute acids and alkalis.

The system shall be installed in accordance with the manufacturer's instructions and recommendations.



SPECIFICATION CLAUSE

S100K POWERDRAIN - LOAD CLASS A

GENERAL
THE SURFACE DRAINAGE SYSTEM SHALL BE POLYMER CONCRETE S100K CHANNEL SYSTEM WITH DUCTILE IRON RAILS AS MANUFACTURED BY ACO POLYMER PRODUCTS, INC.

MATERIALS
CHANNELS SHALL BE MANUFACTURED FROM POLYESTER RESIN POLYMER CONCRETE WITH AN INTEGRALLY CAST-IN DUCTILE IRON RAIL.
MINIMUM PROPERTIES OF POLYMER CONCRETE WILL AS FOLLOWS:

COMPRESSIVE STRENGTH:	14,000 PSI
FLEXURAL STRENGTH:	4,000 PSI
TENSILE STRENGTH:	1,500 PSI
WATER ABSORPTION:	0.07%
FROST PROOF	YES
DILUTE ACID AND ALKALI RESISTANT	YES
B117 SALT SPRAY TEST COMPLIANT	YES

THE SYSTEM SHALL BE 4" (100mm) NOMINAL INTERNAL WIDTH WITH A 6.29" (160mm) OVERALL WIDTH AND A BUILT-IN SLOPE OF 0.5%. CHANNEL INVERT SHALL HAVE DEVELOPED "V" SHAPE. ALL CHANNELS SHALL BE INTERLOCKING WITH A MALE/FEMALE JOINT.

THE COMPLETE DRAINAGE SYSTEM SHALL BE BY ACO POLYMER PRODUCTS, INC. ANY DEVIATION OR PARTIAL SYSTEM DESIGN AND/OR IMPROPER INSTALLATION WILL VOID ANY AND ALL WARRANTIES PROVIDED BY ACO POLYMER PRODUCTS, INC.

CHANNEL SHALL WITHSTAND LOADING TO PROPER LOAD CLASS AS OUTLINED BY EN 1433. GRATE TYPE SHALL BE APPROPRIATE TO MEET THE SYSTEM LOAD CLASS SPECIFIED AND INTENDED APPLICATION. GRATES SHALL BE SECURED USING POWERLOK' BOLTLESS LOCKING SYSTEM. CHANNEL AND GRATE SHALL BE CERTIFIED TO MEET THE SPECIFIED EN 1433 LOAD CLASS. THE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

NOTES:
1. IT IS NECESSARY TO ENSURE MINIMUM DIMENSIONS SHOWN ARE SUITABLE FOR EXISTING GROUND CONDITIONS. *ENGINEERING ADVICE MAY BE REQUIRED.*
2. MINIMUM CONCRETE STRENGTH OF 4,000 PSI IS RECOMMENDED. CONCRETE SHOULD BE VIBRATED TO ELIMINATE AIR POCKETS.
3. EXPANSION AND CONTRACTION CONTROL JOINTS AND REINFORCEMENT ARE RECOMMENDED TO PROTECT CHANNEL AND CONCRETE SURROUND. *ENGINEERING ADVICE MAY BE REQUIRED.*
4. THE FINISHED LEVEL OF THE CONCRETE SURROUND MUST BE APPROX. 1/8" [3mm] ABOVE THE TOP OF THE CHANNEL EDGE.
5. CONCRETE BASE THICKNESS SHOULD MATCH SLAB THICKNESS. ENGINEERING ADVICE MAY BE REQUIRED TO DETERMINE PROPER LOAD CLASS.
6. REFER TO ACO'S LATEST INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS.

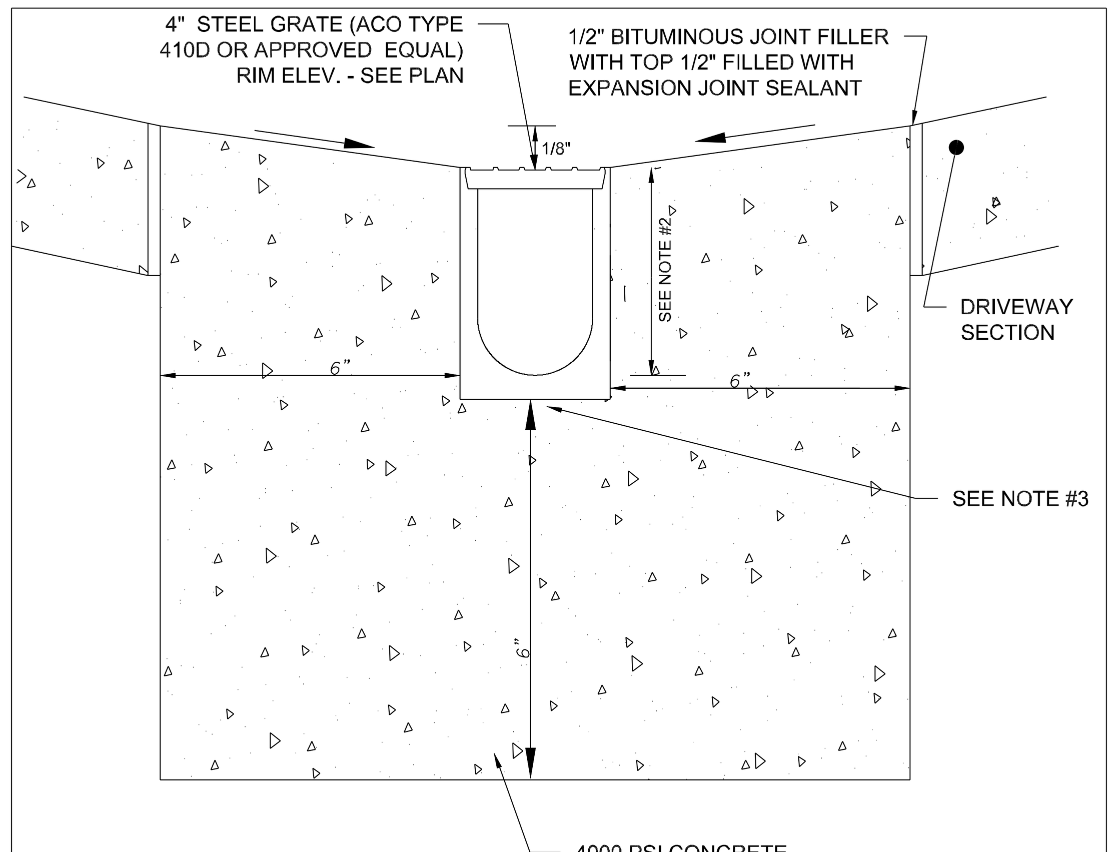
SK1-A-EPP — DATE: 08/25/15

S100K - POWERDRAIN - LOAD CLASS: A
Exposed Paver Pavement
INSTALLATION DRAWING - ACO DRAIN

ACO Polymer Products, Inc.

825 W. Beechcraft St, Casa Grande, AZ 85122, Tel: 520-421-9988, Fax: 520-421-9899	9470 Pinecone Dr., Mentor, OH 44060, Tel: 440-639-7230, Fax: 440-639-7235	4211 Pleasant Rd., Fort Mill, SC 29708, Tel: 440-639-7230, Fax: 803-802-1063

Arizona Tel: 888-490-9552 e-mail: sales@acousa.com Ohio Tel: 800-543-4764 www.acousa.com South Carolina Tel: 800-543-4764



NOTES:

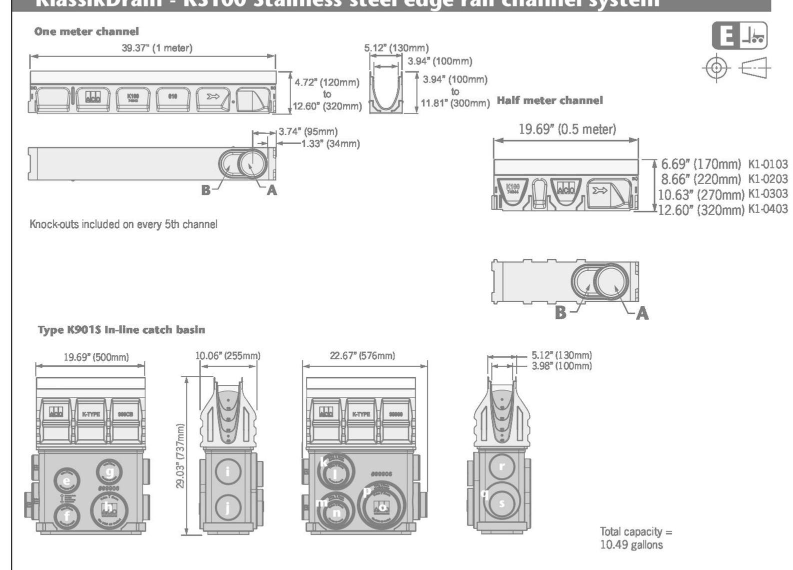
1. DRAIN TO BE ACO KLASSIKDRAIN KS100 OR APPROVED EQUAL.
2. TRENCH DRAINS VARIABLE HEIGHT 4.13" TO 5.12" (PARTS KS1-1 THROUGH KS1-6).
3. ACO PART # 95140 TO CONNECT 6" SCH 40 MICRO-BIO PLANTER BEDS.

TYPICAL TRENCH DRAIN - ACO KLASSIKDRAIN K100

NTS

ACO DRAIN

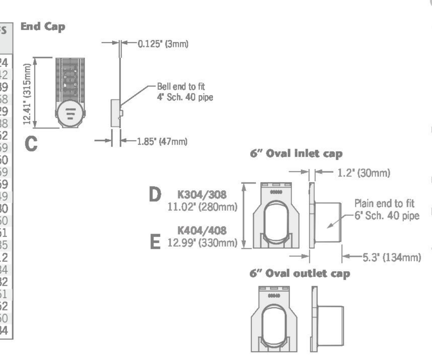
KlassikDrain - KS100 Stainless steel edge rail channel system



Outlet flow rates

Outlet	Product	Outlet size (Sch. 40)	Invert Depth	GPM	CFS
A	Bottom outlet - KS00	4" round	3.94"	108	0.24
A	Bottom outlet - KS40	4" round	11.81"	187	0.42
B	Bottom outlet - KS00	6" oval	3.94"	177	0.39
B	Bottom outlet - KS40	6" oval	11.81"	306	0.68
C	End outlet - KS20	4" round	7.87"	132	0.29
C	End outlet - KS40	4" round	11.81"	171	0.38
D	KS1-308-6 6" outlet cap	6" oval	9.84"	233	0.52
E	KS1-408-6 6" outlet cap	6" oval	11.81"	264	0.59
F	Type KS1-901S	4" round	19.30"	226	0.50
G	Type KS1-901S	4" round	25.67"	265	0.59
H	Type KS1-901S	4" round	25.30"	263	0.59
I	Type KS1-901S	4" round	18.56"	222	0.49
J	Type KS1-901S	6" round	25.85"	586	1.30
K	Type KS1-901S	4" round	26.43"	269	0.60
L	Type KS1-901S	4" round	19.36"	227	0.51
M	Type KS1-901S	6" round	27.30"	604	1.35
N	Type KS1-901S	6" round	19.99"	505	1.12
O	Type KS1-901S	8" round	27.30"	1051	2.34
P	Type KS1-901S	6" round	26.43"	593	1.32
Q	Type KS1-901S	4" round	27.17"	273	0.61
R	Type KS1-901S	4" round	20.68"	235	0.52
S	Type KS1-901S	4" round	18.99"	224	0.50
T	Type KS1-901S	6" round	27.17"	602	1.34

Note: These are the pipe flow rates at the specified outlet, NOT channel flow rates. Catch basin flow rates are without trash bucket - using trash bucket reduces flow.

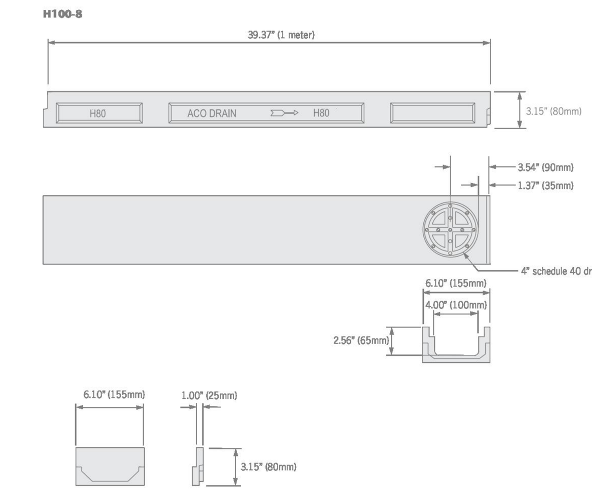


ACO Specification Information

April 2018 www.ACODrain.us

ACO DRAIN

SlabDrain - H100-8 channel system



Outlet flow rates

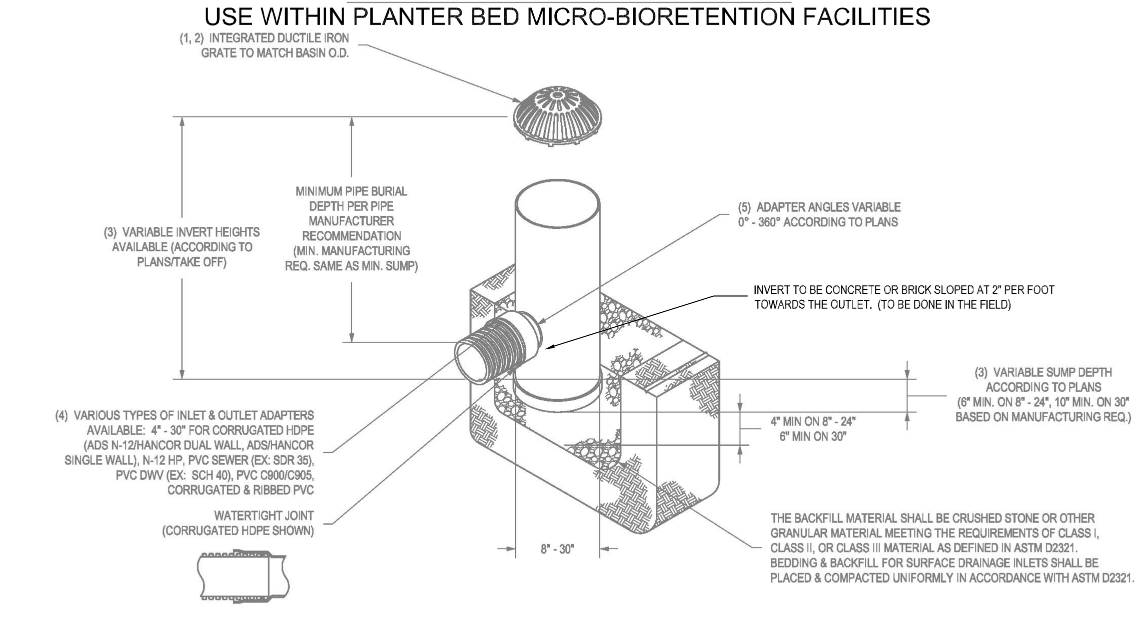
Product	Outlet size (Sch. 40)	Invert Depth	GPM	CFS
H100-8 channel	4" round	2.56	87	0.20

Note: These are the pipe flow rates at the specified outlet, NOT channel flow rates.

ACO Specification Information

April 2018 www.ACODrain.us

NYLOPLAST DRAIN BASIN WITH DOME GRATE
USE WITHIN PLANTER BED MICRO-BIORETENTION FACILITIES



1 - 8" - 30" DOME GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - 8" & 10" DOME GRATES FIT ONTO THE DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001-110-045.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" - 24").
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.
6 - 8" - 30" DOME GRATES HAVE NO LOAD RATING.

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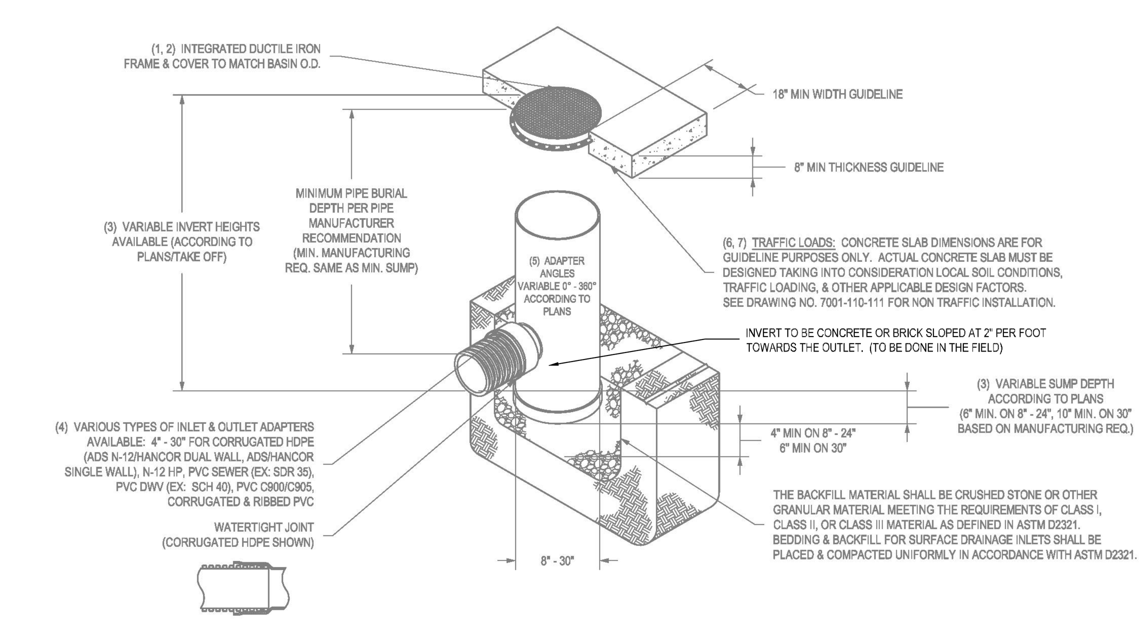
DRAWN BY EBC — DATE 03-25-10 — REVISED BY NMH — DATE 03-11-16 — MATERIAL — PROJECT NO./NAME — DWG SIZE A — SCALE 1:40 — SHEET 1 OF 1
Nyloplast — 3130 VERONA AVE, BUFORD, GA 30518, PHN (770) 932-2443, FAX (770) 932-2490, www.nyloplast-us.com
TITLE: DRAIN BASIN WITH DOME GRATE QUICK SPEC INSTALLATION DETAIL — DWG NO. 7001-110-397 — REV D

NYLOPLAST DRAIN BASIN WITH SOLID COVER



1 - 8" - 30" SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - 12" - 30" FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05. 8" & 10" SOLID COVERS FIT DIRECTLY ONTO DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001-110-045.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" - 24").
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.
6 - 12" - 30" SOLID COVERS SHALL MEET H-20 LOAD RATING.
7 - 8" & 10" SOLID COVERS ARE RATED FOR LIGHT DUTY APPLICATIONS ONLY; NO CONCRETE COLLAR NEEDED FOR LIGHT DUTY RATING.

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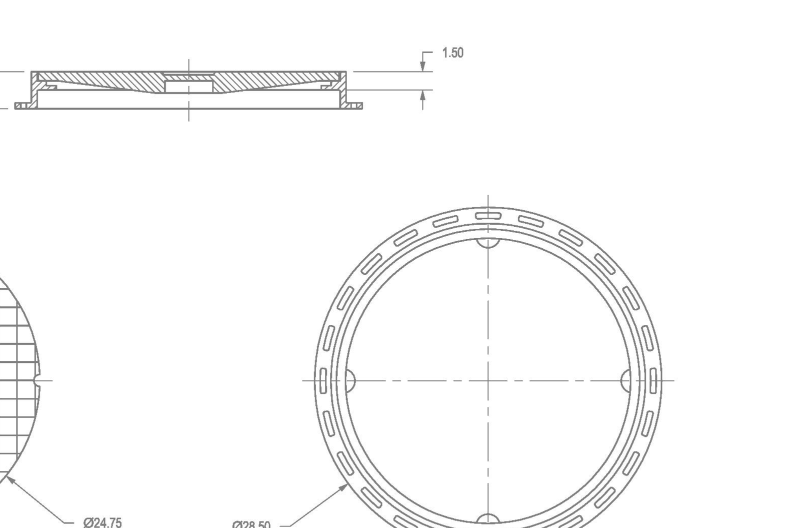
DRAWN BY EBC — DATE 09-14-07 — REVISED BY NMH — DATE 03-11-16 — MATERIAL — PROJECT NO./NAME — DWG SIZE A — SCALE 1:40 — SHEET 1 OF 1
Nyloplast — 3130 VERONA AVE, BUFORD, GA 30518, PHN (770) 932-2443, FAX (770) 932-2490, www.nyloplast-us.com
TITLE: DRAIN BASIN WITH SOLID COVER QUICK SPEC INSTALLATION DETAIL — DWG NO. 7001-110-298 — REV D

2499CGC

APPROX. WEIGHT WITH FRAME = 138.00 LBS



DIMENSIONS ARE FOR REFERENCE ONLY
ACTUAL DIMENSIONS MAY VARY
DIMENSIONS ARE IN INCHES
GRATE MEETS H-20 LOAD RATING
QUALITY: MATERIALS SHALL CONFORM TO ASTM A536 GRADE 70-50-05
PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT
LOCKING DEVICE AVAILABLE UPON REQUEST SEE DRAWING NO. 7001-110-025

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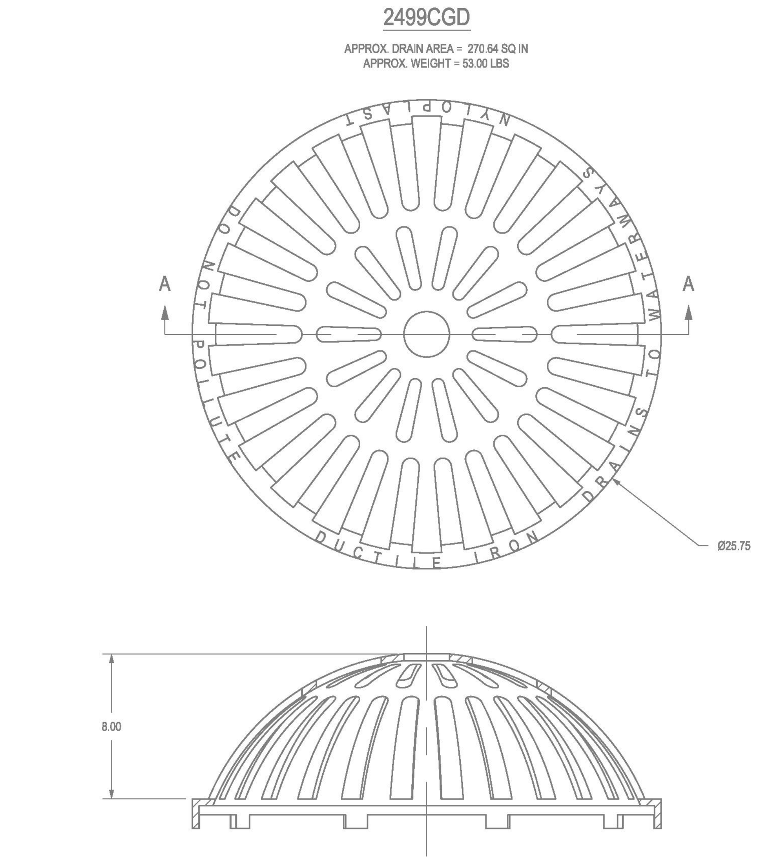
DRAWN BY EBC — DATE 3-8-06 — REVISED BY EBC — DATE 3-13-10 — MATERIAL DUCTILE IRON — PROJECT NO./NAME — DWG SIZE A — SCALE 1:10 — SHEET 1 OF 1
Nyloplast — 3130 VERONA AVE, BUFORD, GA 30518, PHN (770) 932-2443, FAX (770) 932-2490, www.nyloplast-us.com
TITLE: 24 IN SOLID COVER ASSEMBLY - TYPE B — DWG NO. 7001-110-218 — REV C

2499CGD

APPROX. DRAIN AREA = 270.64 SQ IN
APPROX. WEIGHT = 53.00 LBS



DIMENSIONS ARE FOR REFERENCE ONLY
ACTUAL DIMENSIONS MAY VARY
DIMENSIONS ARE IN INCHES
QUALITY: MATERIALS SHALL CONFORM TO ASTM A536 GRADE 70-50-05
PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT
LOCKING DEVICE AVAILABLE UPON REQUEST

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DRAWN BY EBC — DATE 3-8-06 — REVISED BY EBC — DATE 3-24-11 — MATERIAL DUCTILE IRON — PROJECT NO./NAME — DWG SIZE A — SCALE 1:6 — SHEET 1 OF 1
Nyloplast — 3130 VERONA AVE, BUFORD, GA 30518, PHN (770) 932-2443, FAX (770) 932-2490, www.nyloplast-us.com
TITLE: 24 IN DOME GRATE — DWG NO. 7001-110-219 — REV D

ACO DRAIN

Type 410D/412D Perforated galvanized steel grate (ADA)

Product Features

- Certified to EN 1433 Load Class A - 3,500 lbs - 70 psi
- Uses 'DrainLok' boltless locking system
- Suitable for use with K100, KS100, and H100K-8 channels
- Manufactured from 16 gauge galvanized steel
- Patented reinforcement underneath designed to prevent bowing and collapse
- Complies with ADA - American Disabilities Act of 1990 Section 4.5.4

Specifications

General
The surface drainage system shall be ACO Drain K100, KS100, and H100K-8 channels*, complete with ACO Type 410D/412D Perforated galvanized steel grate with 'DrainLok' locking as manufactured by ACO, Inc. or similar approved.

Materials
The covers shall be manufactured from galvanized steel and have ***minimum*** properties as follows:-

- ***Independently certified to meet Load Class A to EN 1433 - 3,500 lbs - 70 psi***
- ***16 gauge galvanized steel***
- ***Intake area of 14.1 sq. in. (91.0 cm²) per half meter of grate***

The overall width of 4.84" (123mm) and overall length of 39.37" (1000mm) (Type 410D) and 19.69" (500mm)(Type 412D). Perforations measure 0.25" (6.35mm) in diameter.

Installation
The trench drain system and grates shall be installed in accordance with the manufacturer's installation instructions and recommendations.

* delete as appropriate

ACO Specification Information

April 2018 www.ACODrain.us

COLLINSON, OLIFF & ASSOCIATES, INC.
SURVEYORS • ENGINEERS LAND PLANNERS
P.O. BOX 2209 ~ 110 MAIN STREET
PRINCE FREDERICK, MARYLAND 20678
410-535-3101 • 301-855-1599
FAX: 410-535-3103 • EMAIL: INFO@COAINC.COM

COA

STATE OF MARYLAND — DANIEL J. KELSH — NO. 17627 — REGISTERED PROFESSIONAL ENGINEER

DANIEL J. KELSH MD PE #:17627
05/15/2020
DATE

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. 17627, EXPIRATION DATE: 12/13/2021

FOLDER REFERENCE: TM 200 BLOCK 1 LOTS 23 & 24

DATE	REVISION
02/27/2020	SITE PLAN REVISIONS
05/15/2020	-
-	-
-	-
-	-
-	-
-	-

SCALE: AS SHOWN
DATE: FEB. 2020
JOB NO.: 1-13187
DRAWN BY: JRM
APPROVED: DJK

GRA #: 2020-3365

PLAN #: 3

UTILITY DETAILS

SITE

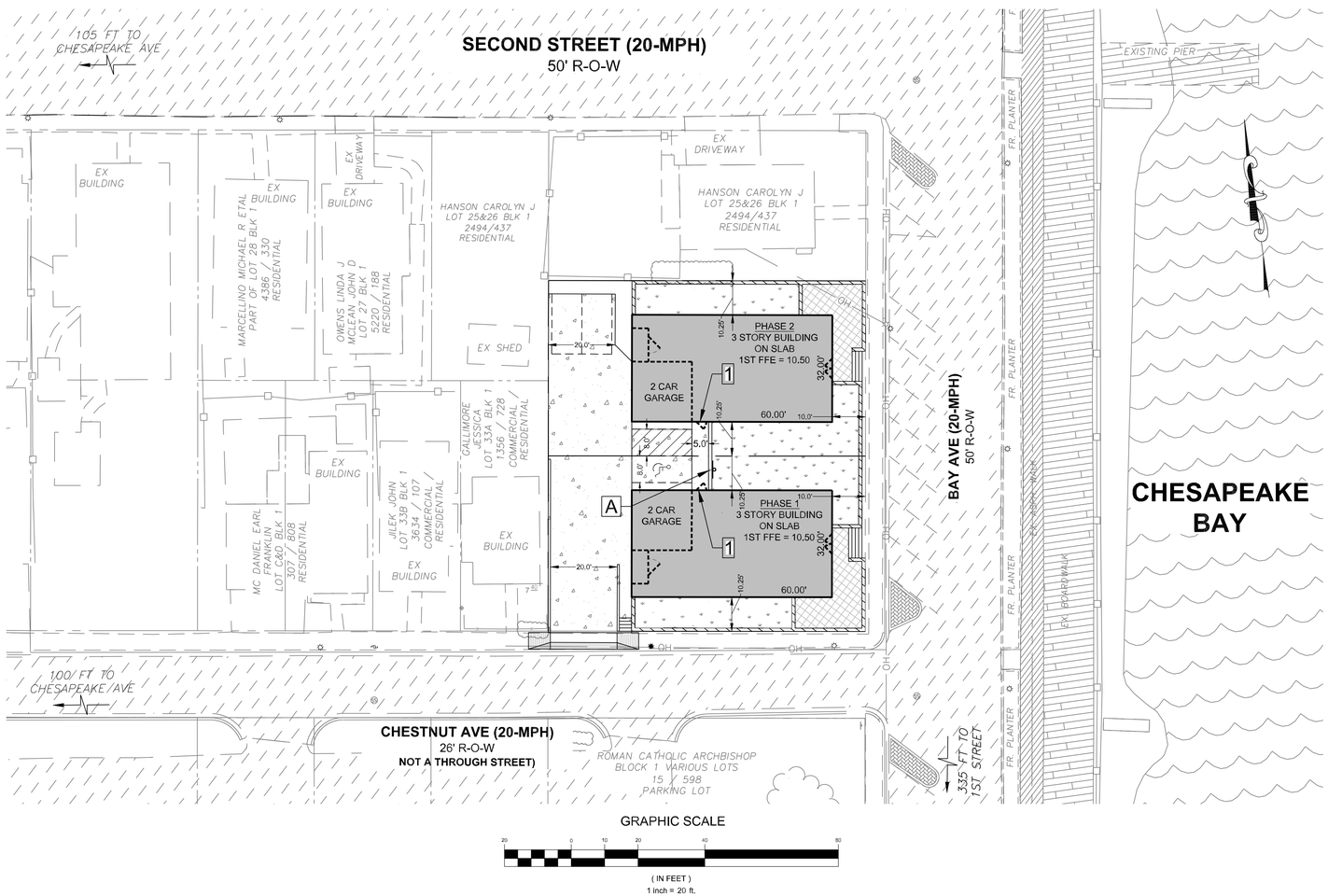
MIXED USE DEVELOPMENT
TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY

FOR: JOHN & PATRICIA STUECKLER

THIS STAMP IN RED COLOR INDICATES ORIGINAL

C 4.3

FILE #: B - 58 - 28 D.3



SITE PLAN NOTES

#	DESCRIPTION
1	ALL EXISTING FEATURES ARE TO REMAIN UNLESS NOTED OTHERWISE.
2	EXISTING PAVED SURFACES WHICH ARE PROPOSED TO BE LANDSCAPED GREEN AREAS SHALL HAVE ALL PAVEMENT, GRAVEL & SUB GRADE MATERIAL REMOVED AND REPLACED WITH TOPSOIL TO THE EXTENT REQUIRED TO PROVIDE SUITABLE SOILS FOR THE ESTABLISHMENT OF LANDSCAPE MATERIALS.
3	NO EXTERIOR STORAGE IS PROPOSED OR APPROVED AS PART OF THESE PLANS EXCEPT AS SHOWN ON THESE PLANS.
4	ALL EXTERIOR LIGHTING PROPOSED FOR THIS SITE SHALL BE PERMANENTLY INSTALLED AND MOUNTED IN ACCORDANCE WITH THE IESNA LIGHTING HANDBOOK & RECOMMENDED PRACTICES AS DESCRIBED IN THE N.B.Z.O. ARTICLE 117-20. FIXTURES SHALL MEET FULL CUTOFF CRITERIA.

SIGN LEGEND

#	QUANTITY	DESCRIPTION OR TEXT ON SIGN	MUTCD STD NUMBER
A	1	HANDICAP "RESERVED PARKING"	R7-8

LANDSCAPE PLAN NOTES

#	DESCRIPTION
1	ALL SIGNS ARE TO BE INSTALLED ON 4 IN x 4 IN TREATED WOODEN POST AND PER "THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND THE CALVERT COUNTY ROAD ORDINANCE AS CURRENTLY AMENDED.
2	SEE SHEET 6.0 STORMWATER MANAGEMENT FOR SITE LANDSCAPING PLANS.

SITE AND LAYOUT KEYED NOTES

#	
1	PROVIDE ADA HANDICAP ACCESS TO BUILDING PER ARCHITECTUAL PLANS AND DETAILS.

LIGHTING SCHEDULE

SYMBOL	QUANTITY	ARRANGEMENT	DESCRIPTION
☼	-	SINGLE	EXISTING LIGHT TO REMAIN
✹	1	SINGLE	RELOCATED LIGHT

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STATE OF MARYLAND DANIEL J. KELSH No. 17627 PROFESSIONAL ENGINEER

DANIEL J. KELSH MD PE #17627
05/15/2020
DATE

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DATE	REVISION
02/27/2020	SITE PLAN REVISIONS
05/15/2020	-
-	-
-	-
-	-
-	-

SITE

SITE LAYOUT & LANDSCAPE PLAN

MIXED USE DEVELOPMENT

TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY

FOR: JOHN & PATRICIA STUECKLER

SCALE: AS SHOWN
DATE: FEB. 2020
JOB NO.: 1-13187
DRAWN BY: RRM
APPROVED: DJK

FOLDER REFERENCE: TM 200 BLOCK 1 LOTS 23 & 24

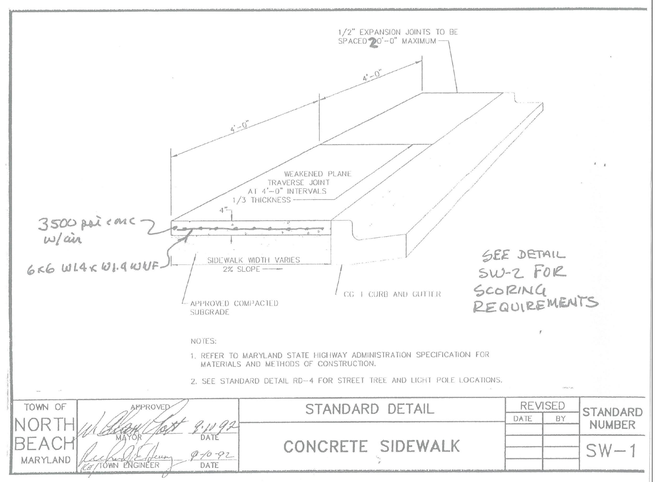
PLAN #: 3

GRA #: 2020-3365

THIS STAMP IN RED COLOR INDICATES ORIGINAL

C 5.0

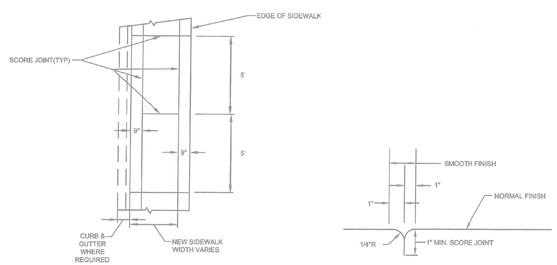
FILE #: B - 58 - 28 E



NOTES:

1. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATION FOR MATERIALS AND METHODS OF CONSTRUCTION.
2. SEE STANDARD DETAIL RD-4 FOR STREET TREE AND LIGHT POLE LOCATIONS.

TOWN OF NORTH BEACH MARYLAND	APPROVED	STANDARD DETAIL	REVISED DATE	REVISED BY	STANDARD NUMBER
	MAYOR 8/10/92 DATE	CONCRETE SIDEWALK			SW-1
	TOWN ENGINEER 8/10/92 DATE				



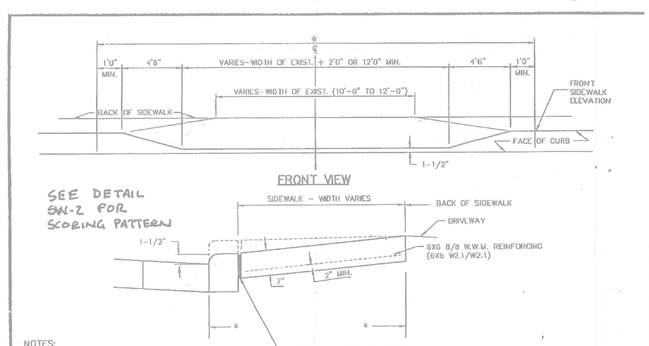
SCORING PATTERN

NTS

SCORING JOINT

NTS

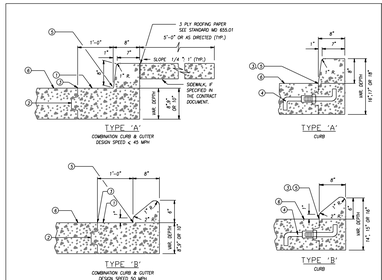
TOWN OF NORTH BEACH MARYLAND	APPROVED	STANDARD DETAIL	REVISED DATE	REVISED BY	STANDARD NUMBER
	MAYOR DATE	SIDEWALK SCORING JOINT & PATTERN			SW-2
	TOWN ENGINEER DATE				



NOTES:

1. REFER TO LATEST EDITION OF MSHA SPECIFICATIONS FOR MATERIALS AND METHOD OF CONSTRUCTION.

TOWN OF NORTH BEACH MARYLAND	APPROVED	STANDARD DETAIL	REVISED DATE	REVISED BY	STANDARD NUMBER
	MAYOR 8/10/92 DATE	TYPICAL DRIVEWAY ENTRANCE CURB & GUTTER ROADWAY			DE-1
	TOWN ENGINEER 8/10/92 DATE				



1. SLOPE GUTTER PAN: 1/2" PER FOOT TOWARD FLOW LINE ON ALL ROADWAYS INCLUDING SUPERELEVATED SECTIONS, EXCEPT INTERCHANGE RAMPS.
2. PROVIDE KEY AND LONGITUDINAL TIE BAR AS REQUIRED; SEE NOTE A
3. ROADWAY PAVEMENT CONSTRUCTION JOINT
4. LONGITUDINAL TIE DOWEL "J" BAR MODIFIED
5. FLOW LINE
6. ROADWAY PAVEMENT SLOPE

NOTES

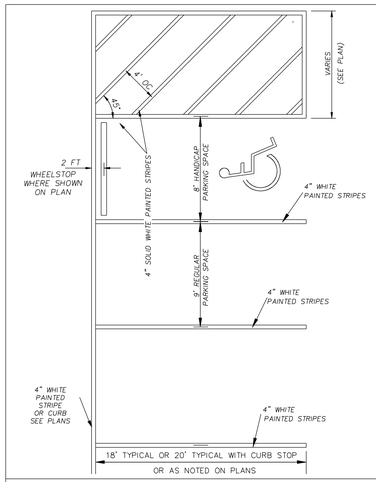
A. RIGID PAVEMENT ROADWAY ADJACENT TO COMBINATION CURB AND GUTTER AND CLOSED SECTION ROADWAY USING RIGID PAVEMENT WITH COMBINATION CURB AND GUTTER SHALL BE KEYED AND TIED AT THE ROADWAY PAVEMENT CONSTRUCTION JOINT. REFER TO STANDARD MD 537.01 FOR METHOD OF KEYWAY AND LONGITUDINAL TIE DEVICES. SPACING OF THE TIE BARS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS. RIGID PAVEMENT AND CURB SHALL BE CONSTRUCTED AS INDICATED. TIE DEVICES AND KEYS ARE NOT REQUIRED WHEN USING FLOBASE PAVEMENT FOR ROADWAY.

B. MAXIMUM JOINT SPACING FOR CONCRETE CURB AND COMBINATION CURB & GUTTER IS 10'. SEE SPECIFICATION FOR LOCATIONS AND DESCRIPTION OF TREATMENT FOR THE TYPES OF JOINTS USED.

C. TYPE A OR B COMBINATION CURB AND GUTTER IS TO BE USED FOR ALL APPLICABLE NEW CONSTRUCTION AND IN THOSE AREAS WHERE TYPE A COMBINATION CURB AND GUTTER IS TO BE REPLACED IN KIND.

D. TYPE A OR B CURB SHALL BE USED FOR THE REPLACEMENT OF LIKE KIND OF CURB ONLY, NOT TO BE USED FOR NEW CONSTRUCTION EXCEPT WHERE INDICATED ON APPROPRIATE INLET STANDARDS.

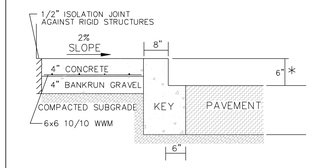
SPECIFICATION 602	CATEGORY CODE ITEMS	Maryland Department of Transportation STATE HIGHWAY ADMINISTRATION STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES.
APPROVED	DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	STANDARD TYPES A & B COMBINATION CONCRETE CURB AND GUTTER
SHA State Highway Administration	APPROVAL & SHA REVISIONS / APPROVAL & FEDERAL HIGHWAY ADMINISTRATION	STANDARD NO. MD 620.02



STRIPING DETAIL

NTS

NOTE: THIS SECTION MAY BE SUBSTITUTED WITH SIDEWALK SECTION WITH SITE CURB AND GUTTER.



* 6" OR FLUSH WITH EXISTING PAVEMENT (SEE SITE PLAN FOR GRADES)

NOTES:

1. 3500 PSI CONCRETE.
2. MATERIALS AND CONSTRUCTION SHALL BE AS PER MSHA SPECIFICATIONS FOR MATERIALS AND CONSTRUCTION SECTION 500.
3. PROVIDE A CONTROL JOINT AT A MAXIMUM 5' SPACING.
4. CURB AND GUTTER MAY BE USED IM PLACE OF MONOLITHIC POUR.

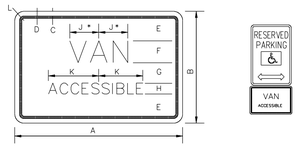
SIDEWALK SECTION TYPICAL

NTS

MOUNTED ON 4" x 4" TREATED TIMBER (O.A.E.), WITH BOTTOM OF SIGN AT LEAST 7 FT ABOVE GROUND. A MINIMUM 2 FT OF TIMBER SHALL BE EMBEDDED INTO THE GROUND. IF MOUNTED ON THE BUILDING, THE BOTTOM OF SIGN SHALL BE AT LEAST 6 FT ABOVE GRADE.

HANDICAP PARKING SIGN DETAIL

NTS



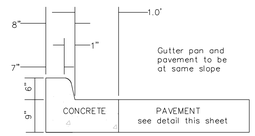
* INCREASE SPACING 50%

	DIMENSION (INCHES)											
SIGN	A	B	C	D	E	F	G	H	I	J	K	L
MIN.	12	6	3/8	3/8	1-1/2 D	1-1/2 D	1/2	1 D		2-1/2	4	1-1/2
STD.	18	9	3/8	5/8	2-1/4	2 D	1	1-1/2 D		2-3/4	7	1

COLORS:
REGULATORY (COLORS MAY BE REVERSED)
LEGEND: GREEN OR BLACK
BACKGROUND: WHITE (RETROREFLECTIVE)

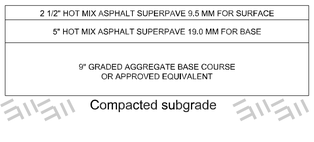
(REQUIRED BELOW THE RESERVED PARKING SIGN)

VAN ACCESSIBLE PARKING SPACE SIGN



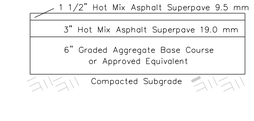
SITE CURB AND GUTTER

NTS



COUNTY PAVEMENT DETAIL

NTS

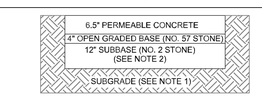


NOTE:

1. A MAXIMUM LIFT THICKNESS OF 2" SHALL BE USED WHEN PLACING BASE PAVEMENT.

SITE PAVEMENT DETAIL

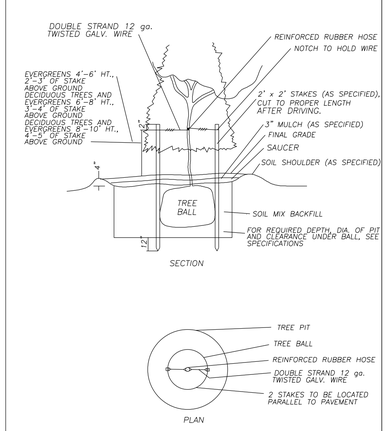
NTS



1. CONSTRUCTION TO BE PERFORMED WITH LIGHTWEIGHT, WIDE TRACKED EQUIPMENT TO MINIMIZE COMPACTION.
2. SUBBASE (NO. 2 STONE) TO EXTEND TO EXISTING GRADE (12" MINIMUM DEPTH).

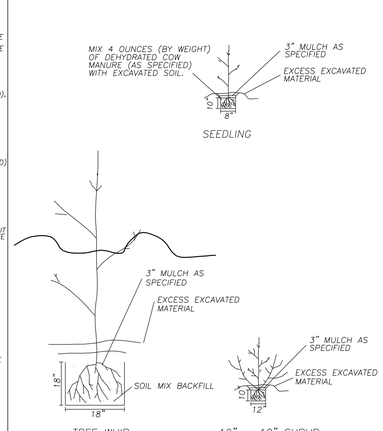
PERVIOUS CONCRETE SECTION

NTS



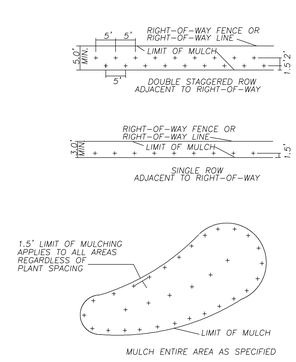
LANDSCAPE STAKING DETAIL

NTS



LANDSCAPE PLANTING DETAIL

NTS

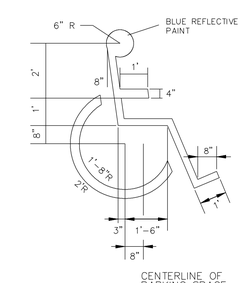


NOTES:

1. NO SHRUB SHALL BE PLANTED CLOSER THAN 6' FROM ANY MAJOR, MINOR, EVERGREEN TREES IN BED.
2. SPACING OF SHRUBS AND WIDTH OF BED ARE AS SHOWN ON THE PLANS OR AS OTHERWISE DIRECTED.

LANDSCAPE BEDDING DETAIL

NTS



NOTE: SYMBOL TO BE PAINTED ON SMOOTH PAVEMENT WHERE PROVIDED.

INTERNATIONAL HANDICAP SYMBOL

NTS

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P.O. BOX 2209 - 110 MAIN STREET
PRINCE FREDERICK, MARYLAND 20678
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FAX: 410-535-3103 • EMAIL: INFO@COAINC.COM

STATE OF MARYLAND DANIEL J. KELSH No. 17627 PROFESSIONAL ENGINEER

MD PE #17627
05/15/2020
DATE

DANIEL J. KELSH

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FOLDER REFERENCE
TM 200 BLOCK 1 LOTS 23 & 24

DATE	REVISION
02/27/2020	SITE PLAN REVISIONS
05/15/2020	"
"	"
"	"
"	"
"	"

SCALE AS SHOWN
DATE FEB. 2020
JOB NO. 1-13187
DRAWN BY JRM
APPROVED DJK

PLAN #: 3

GRA #: 2020-3365

SITE DETAILS

SITE

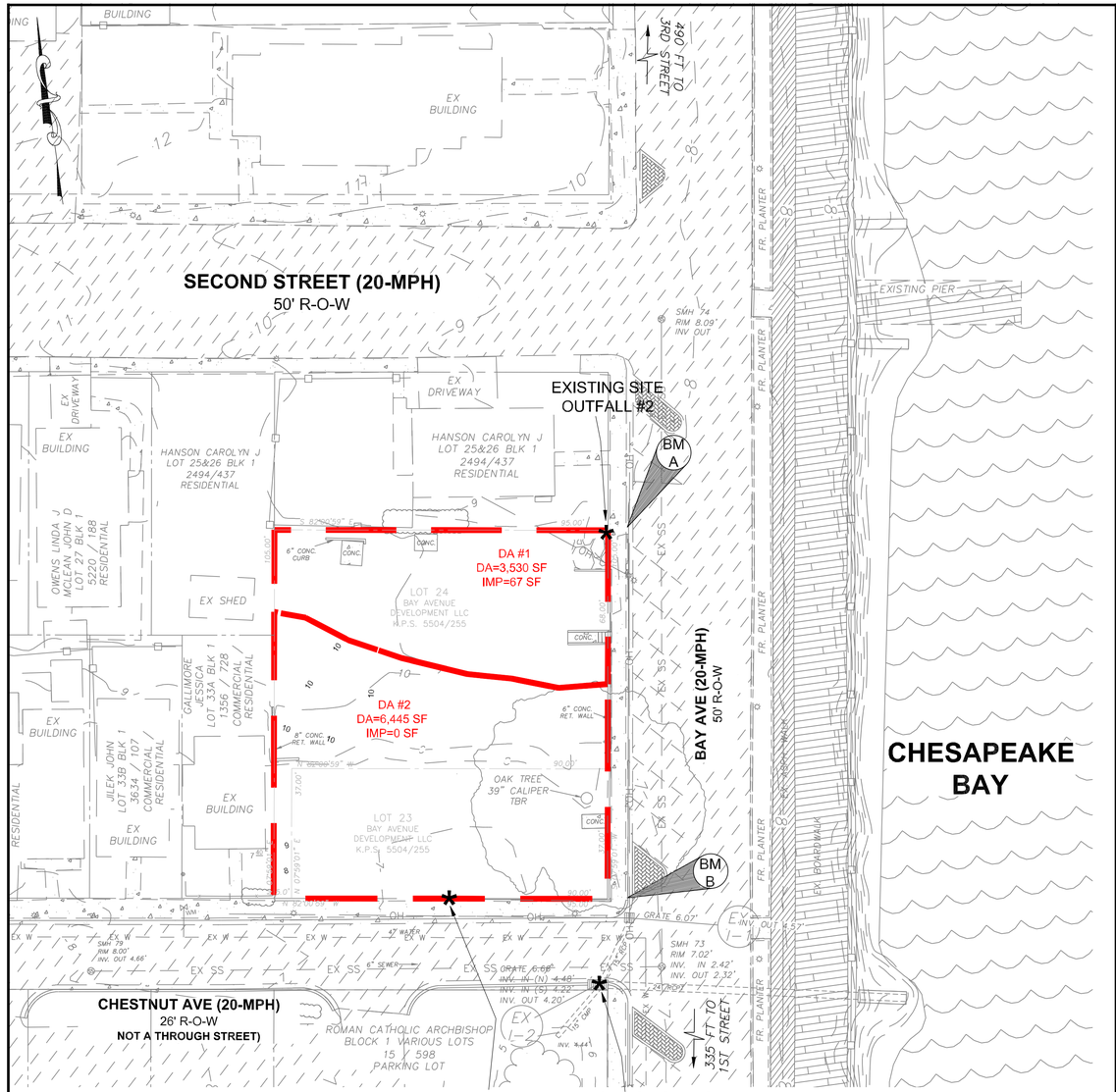
MIXED USE DEVELOPMENT
TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY

FOR: JOHN & PATRICIA STUECKLER

THIS STAMP IN RED COLOR INDICATES ORIGINAL

C 5.1

FILE #: B - 58 - 28 E.1

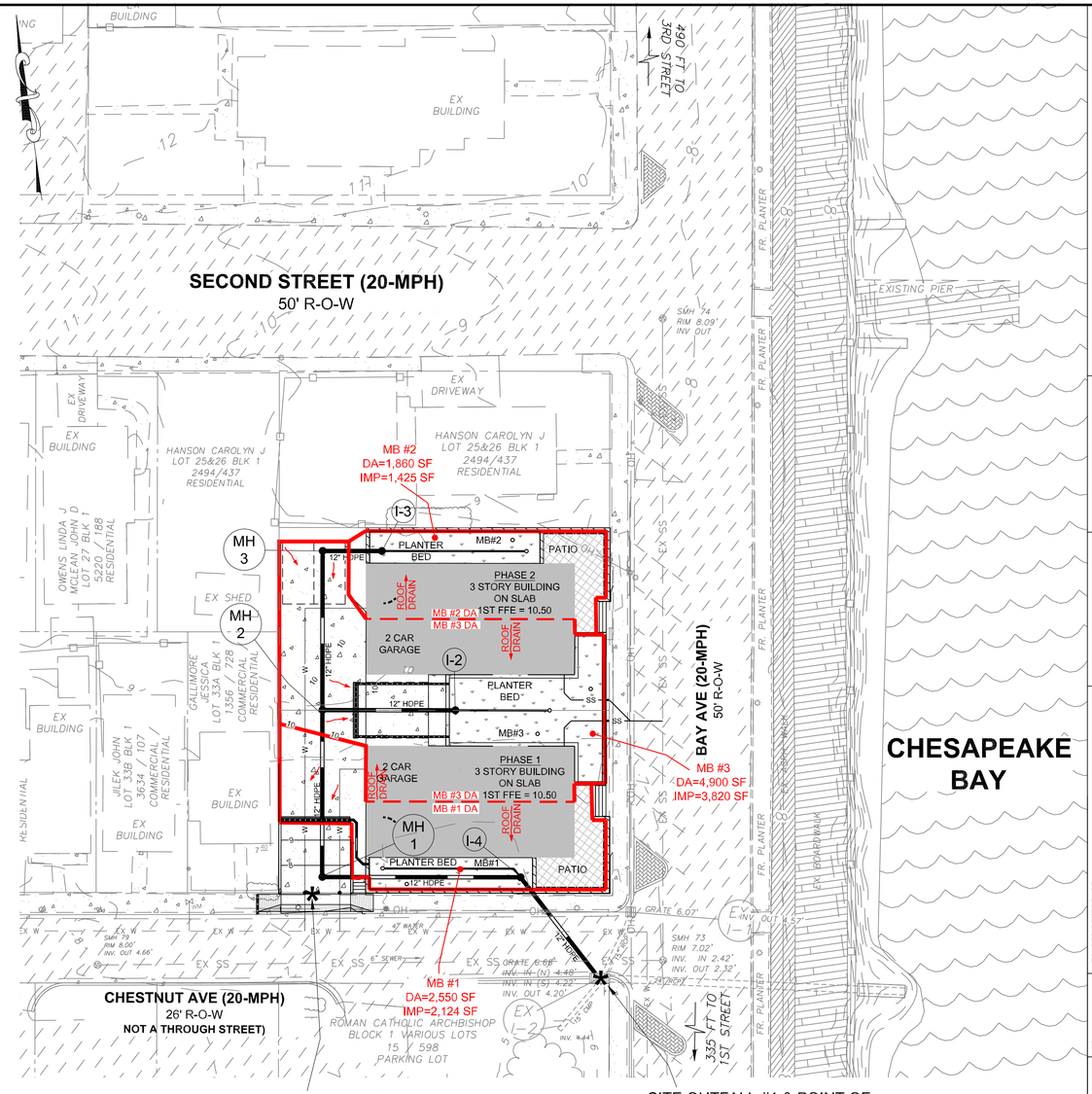


EXISTING SITE OUTFALL #1

EXISTING POINT OF CONFLUENCE IN EXISTING CLOSED STORM DRAIN SYSTEM

NOTE: ENTIRE SITE IS UNDERLAIN BY KEYPORT SILT LOAM (KwB) SOIL CLASSIFICATION WHICH IS HSG 'C'

PRE-DEVELOPMENT



SITE OUTFALL #2 - UNMANAGED AREA DUE TO SITE CONSTRAINTS

SITE OUTFALL #1 & POINT OF CONFLUENCE IN THE EXISTING CLOSED STORM DRAIN SYSTEM

POST-DEVELOPMENT

LEGEND

DESCRIPTION	EXISTING	PROPOSED
SOIL BOUNDARY	BrB "A" / DwE "A"	
WOODSLINE		
BUILDING		
PAVEMENT		
CONCRETE		
PATIO		
MICRO-BIO AREA		
> 15% STEEP SLOPES		
> 25% STEEP SLOPES		
DRAINAGE AREA LINE		
LIMIT OF DISTURBANCE (LOD)		LOD

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

Stormwater Management Summary Table

Site Area ac / sf	Existing Impervious ac / sf	Proposed Impervious s.f.	Existing % Impervious	Proposed % Impervious	Rv	Qe	Target Pe	Target ESDv REQ ac-ft / cf	WQv REQ ac-ft / cf	Target Cpv RCN	Total ESDv Provided ac-ft / cf	AS-BUILT ESDv Provided ac-ft / cf
0.23	0.00	0.18	0.7%	77.0%	0.74	1.49	2.00	0.03	0.01	70	0.04	
9,975	67	7,680						1,235	618		1,658	

SWM BMP SUMMARY

BMP NAME	BMP TYPE	DESIGN: DRAINAGE AREA (sf)	Impervious Area (sf)	Surface Area (sf)	VOLUMES PROVIDED: Pe Credit	Rv	ESDv (cf)	MAX ESDv (cf)	AS-BUILT ESDv (cf)
MB#1	M-6	2,212	1,777	435	3.97	0.773	566	399	
MB#2	M-6	1,807	1,354	453	5.40	0.724	589	305	
MB#3	M-6	5,457	4,238	1,136	4.34	0.749	1,477	954	
TOTAL MANAGED		9,476	7,369	2,024			2,631	1,658	

NOTE: PLANTER BOX MICRO-BIORETENTION FACILITIES SHALL HAVE AN IMPERMEABLE LINER WITHIN 10' OF THE FOUNDATION.

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE STORMWATER MANAGEMENT FACILITIES (BOTH BMPS AND ESD PRACTICES) SHOWN ON THE PLANS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS APPROVED BY THE CALVERT COUNTY DEPARTMENT OF PUBLIC WORKS., EXCEPT AS NOTED IN RED ON THE "AS-BUILT" DRAWINGS.

BY: _____ DATE: _____
DANIEL J. KELSH MD PE #17627

BENCHMARK INFORMATION ~ NAD 83 & NAD 88

BM#	DESCRIPTION	NORTHING	EASTING	ELEVATION
BM A	TOP OF CURB CUT	378,069.38	1,445,827.11	8.08'
BM B	TOP OF CURB CUT	377,964.84	1,445,812.46	6.95'

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FOLDER REFERENCE: TM 200 BLOCK 1 LOTS 23 & 24

DATE	REVISION
02/27/2020	SITE PLAN REVISIONS
05/15/2020	-
-	-
-	-
-	-
-	-

SCALE: AS SHOWN
DATE: FEB. 2020
JOB NO.: 1-13187
DRAWN BY: JRM
APPROVED: DJK

PLAN #: 3

GRA #: 2020-3365

STORMWATER MANAGEMENT PLAN

SITE

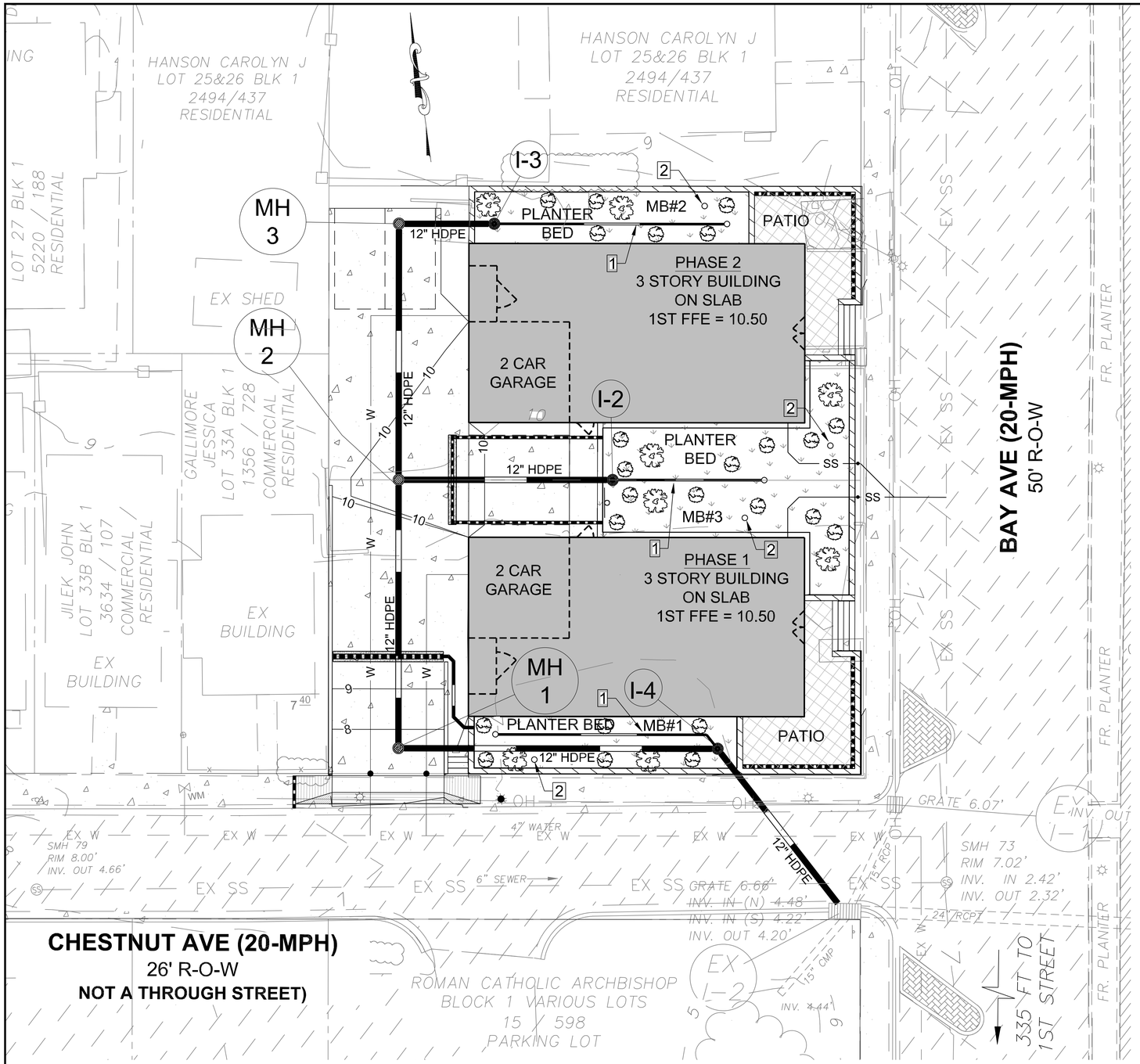
MIXED USE DEVELOPMENT
TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY

FOR: JOHN & PATRICIA STUECKLER

THIS STAMP IN RED COLOR INDICATES ORIGINAL

C 6.0

FILE #: B - 58 - 28 D



STORMWATER MANAGEMENT LANDSCAPING CRITERIA				
FACILITY	SURFACE AREA	TREES	SHRUBS	GRASSES
Micro-Bioretention #1	426	2	6	18

LANDSCAPING TO BE USED FOR STORMWATER MANAGEMENT

SYMBOL	TYPE	NUM.	BOTANICAL NAME	COMMON NAME	SIZE, ROOT PREPARATION	SPACING
	TREE	1	*Cornus asperifolia*	Dogwood, Flowering	1"-1.5" Cal. B&B	10' OC
	TREE	1	*Amerlanchier arborea*	Service-Berry, Downy	1.5"-2" Cal. B&B	10' OC
	SHRUB	3	*Cephalanthus occidentalis*	Buttonbush	3 GAL CONT	3' OC
	SHRUB	3	*Vaccinium corymbosum*	Highbush Blueberry	3 GAL CONT	3' OC
	GRASS	9	*Panicum virgatum*	Switchgrass	PLUGS	2' OC
	GRASS	9	*Dichanthelium clandestinum*	Deer-Tongue	PLUGS	2' OC

STORMWATER MANAGEMENT LANDSCAPING CRITERIA				
FACILITY	SURFACE AREA	TREES	SHRUBS	GRASSES
Micro-Bioretention #2	453	2	6	18

LANDSCAPING TO BE USED FOR STORMWATER MANAGEMENT

SYMBOL	TYPE	NUM.	BOTANICAL NAME	COMMON NAME	SIZE, ROOT PREPARATION	SPACING
	TREE	1	*Cornus asperifolia*	Dogwood, Flowering	1"-1.5" Cal. B&B	10' OC
	TREE	1	*Amerlanchier arborea*	Service-Berry, Downy	1.5"-2" Cal. B&B	10' OC
	SHRUB	3	*Cephalanthus occidentalis*	Buttonbush	3 GAL CONT	3' OC
	SHRUB	3	*Vaccinium corymbosum*	Highbush Blueberry	3 GAL CONT	3' OC
	GRASS	9	*Panicum virgatum*	Switchgrass	PLUGS	2' OC
	GRASS	9	*Dichanthelium clandestinum*	Deer-Tongue	PLUGS	2' OC

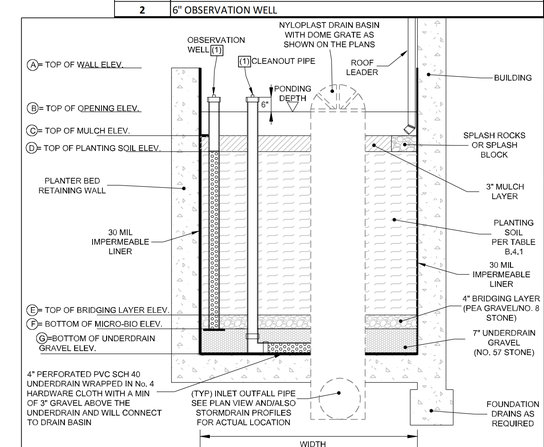
STORMWATER MANAGEMENT LANDSCAPING CRITERIA				
FACILITY	SURFACE AREA	TREES	SHRUBS	GRASSES
Micro-Bioretention #3	1,080	4	12	36

LANDSCAPING TO BE USED FOR STORMWATER MANAGEMENT

SYMBOL	TYPE	NUM.	BOTANICAL NAME	COMMON NAME	SIZE, ROOT PREPARATION	SPACING
	TREE	2	*Cornus asperifolia*	Dogwood, Flowering	1"-1.5" Cal. B&B	10' OC
	TREE	2	*Amerlanchier arborea*	Service-Berry, Downy	1.5"-2" Cal. B&B	10' OC
	SHRUB	6	*Cephalanthus occidentalis*	Buttonbush	3 GAL CONT	3' OC
	SHRUB	6	*Vaccinium corymbosum*	Highbush Blueberry	3 GAL CONT	3' OC
	GRASS	18	*Panicum virgatum*	Switchgrass	PLUGS	2' OC
	GRASS	18	*Dichanthelium clandestinum*	Deer-Tongue	PLUGS	2' OC

NOTE: LANDSCAPING PLANTS HAVE BEEN TAKEN FROM THE U.S. FISH & WILDLIFE SERVICE, NATIVE PLANTS FOR WILDLIFE HABITAT AND CONSERVATION LANDSCAPING CHESAPEAKE BAY WATERSHED. ANY SUBSTITUTION SHALL BE FROM THE SAME.

#	STORMWATER MANAGEMENT KEYED NOTES
1	4" PERFORATED PVC SCH 40 UNDERDRAIN
2	6" OBSERVATION WELL



MICRO-BIORETENTION SYSTEM DETAIL (MB#2 & MB#3)
NTS

(1) NOTES:
- 4in SCH 40 PVC W/ REMOVABLE SCREW TOP LID
- TOP TO BE 6in ABOVE ESDv ELEVATION.
- PVC SHALL BE SOLID ABOVE PLANTING SOIL
- OBSERVATION WELL SHALL BE PERFORATED PVC UNDER PLANTING SOIL WRAPPED IN FILTER FABRIC
- ONE OBSERVATION WELL PER 1,000 SF OF SURFACE AREA
- CLEANOUT PIPE TO BE SOILD PVC AND CONNECTS TO UPSTREAM END OF UNDERDRAIN
- OBSERVATION WELL IS A STAND ALONE DEVICE WITH A BLOCK FOOT PLATE AT THE BOTTOM OF THE FACILITY.

MICRO-BIORETENTION SUMMARY TABLE						
	MB #1	MB #1 AS-BUILT	MB #2	MB #2 AS-BUILT	MB #3	MB #3 AS-BUILT
A	10.00	-	10.00	-	10.00	-
B	9.33	-	9.43	-	9.17	-
C	8.83	-	8.93	-	8.67	-
D	8.58	-	8.68	-	8.42	-
E	6.92	-	7.02	-	6.75	-
F	6.58	-	6.68	-	6.42	-
G	6.00	-	6.10	-	5.83	-
LENGTH	*±	-	*±	-	*±	-
WIDTH	*±	-	*±	-	*±	-
SURFACE AREA	435 SF	-	453 SF	-	1,136 SF	-

*NOTE: DUE TO THE IREGULAR SHAPE OF THE MICRO BIO'S ACTUAL LENGTH AND WIDTH MAY DIFFER AS LONG AS THE SURFACE AREA SQUARE FOOTAGE IS HELD.

AS-BUILT CERTIFICATION

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-	-
-	-
-	-
-	-
-	-

GRA #: 2020-3365

SCALE	DATE
AS SHOWN	FEB. 2020
JOB NO.	DRAWN BY
1-13187	JRM
APPROVED	PLAN #: 3
DJK	

SITE

ENLARGED MB#1/PP#1 PLAN

MIXED USE DEVELOPMENT
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THIRD DISTRICT, CALVERT COUNTY

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C 6.1

FILE #: B - 58 - 28 D.1

B.4.C SPECIFICATIONS FOR MIRCO-BIORETENTION. RAIN GARDENS, LANDSCAPE INFILTRATION & INFILTRATION BERMS

1. MATERIAL SPECIFICATIONS

THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.

2. FILTERING MEDIA OR PLANTING SOIL

THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05.

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

- SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION)
- ORGANIC CONTENT - MINIMUM 10% BY DRY WEIGHT (ASTM D2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60% - 65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).
- CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
- PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED INTO THE SOIL TO INCREASE OR DECREASE PH.

THERE SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

3. COMPACTION

IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING A LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.

COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS A CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACTURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.

ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE.

WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE.

WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

4. PLANT MATERIAL

RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION A.2.3.

5. PLANT INSTALLATION

COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.

ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION.

TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.

GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL AREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

6. UNDERDRAINS

UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:

- PIPE- SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTMF 758, TYPE PS 28, OR AASHTO-M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OR HDPE).
- PERFORATIONS- IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A ¼" (NO. 4 OR 4X4) GALVANIZED HARDWARE CLOTH.
- GRAVEL- THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAIN.
- THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.
- A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,0000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER.
- A 4" LAYER OF PEA GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES INTO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

THE MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

7. MISCELLANEOUS

THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

Table B.4.1 Materials Specifications for Micro-Bioretention, 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		Aged 6 months, minimum; no pine or wood chips
Pea Gravel diaphragm	Pea gravel: ASTM-D-448	NO. 8 or NO. 9 (1/8" to 3/8")	
Curtain drain	Ornamental stone: washed cobbles	Stone: 2" to 5"	
Geotextile		N/A	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 or NO. 6 AGGREGATE (3/8" to ¾"))	
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 underneath pipes. Perforated pipe shall be wrapped with ¼-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing 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 State or local standards requires design drawings sealed and approved by a professional structurail engineer licensed in the State of Maryland – design to include meeting ACI Code 350. R/89; 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	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone (AASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

MICRO-BIORETENTION CONSTRUCTION, INSPECTION, AND MAINTENANCE CRITERIA:

1. CONSTRUCTION CRITERIA:

THE FOLLOWING ITEMS SHOULD BE ADDRESSED DURING CONSTRUCTION OF PROJECTS WITH MICRO-BIORETENTION:

a. EROSION AND SEDIMENT CONTROL: MICRO-BIORETENTION PRACTICES SHOULD NOT BE CONSTRUCTED UNTIL THE CONTRIBUTING DRAINAGE AREA IS STABILIZED. IF THIS IS IMPRACTICAL, RUNOFF FROM DISTURBED AREAS SHALL BE DIVERTED AWAY AND NO SEDIMENT CONTROL PRACTICES SHALL BE USED NEAR THE PROPOSED LOCATION.

b. SOIL COMPACTION: EXCAVATION SHOULD BE CONDUCTED IN DRY CONDITIONS WITH EQUIPMENT LOCATED OUTSIDE OF THE PRACTICE TO MINIMIZE BOTTOM AND SIDEWALL COMPACTION. ONLY LIGHTWEIGHT, LOW GROUND-CONTACT EQUIPMENT SHOULD BE USED WITHIN MICRO-BIORETENTION PRACTICES AND THE BOTTOM SCARIFIED BEFORE INSTALLING UNDERDRAINS AND FILTERING MEDIA.

c. UNDERDRAIN INSTALLATION: GRAVEL FOR THE UNDERDRAIN SYSTEM SHOULD BE CLEAN, WASHED, AND FREE OF FINES. UNDERDRAIN PIPES SHOULD BE CHECKED TO ENSURE THAT BOTH THE MATERIAL AND PERFORATIONS MEET SPECIFICATIONS. THE UPSTREAM ENDS OF THE UNDERDRAIN PIPE SHOULD BE CAPPED PRIOR TO INSTALLATION.

d. FILTER MEDIA INSTALLATION: BIORETENTION SOILS MAY BE MISSED ON-SITE BEFORE PLACEMENT. HOWEVER, SOILS SHOULD NOT BE PLACED UNDER SATURATED CONDITIONS. THE FILTER MEDIA SHOULD BE PLACED AND GRADED USING EXCAVATORS OR BACKHOES OPERATING ADJACENT TO THE PRACTICE AND BE PLACE IN HORIZONTAL LAYERS (12 INCHES PER LIFT MAXIMUM). PROPERTY COMPACTION OF THE MEDIA WILL OCCUR NATURALLY. SPRAYING OR SPRINKLING WATER ON EACH LIFT UNTIL SATURATED MAY QUICKEN SETTLING TIMES.

e. LANDSCAPE INSTALLATION: THE OPTIMUM PLANTING TIME IS DURING THE FALL. SPRING PLANTING IS ALSO ACCEPTABLE BUT MAY REQUIRE WATERING.

2. INSPECTION:

a. REGULAR INSPECTIONS SHALL BE MADE DURING THE FOLLOWING STAGES OF CONSTRUCTION:
b. DURING EXCAVATION TO SUBGRADE AND PLACEMENT AND BACKFILL OF UNDERDRAIN SYSTEMS.
c. DURING PLACEMENT OF FILTER MEDIA.
d. DURING CONSTRUCTION OF APPURTENANT CONVEYANCE.
e. UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.

3. MAINTENANCE CRITERIA:

a. THE FOLLOWING ITEMS SHOULD BE ADDRESSED TO ENSURE PROPER MAINTENANCE AND LONG-TERM PERFORMANCE OF MICRO-BIORETENTION PRACTICES:

b. PRIVATELY OWNED PRACTICES SHALL HAVE A MAINTENANCE PLAN AND SHALL BE PROTECTED BY EASEMENT, DEED RESTRICTION, ORDINANCE, OR OTHER LEGAL MEASURES PREVENTING ITS NEGLECT, ADVERSE ALTERATION, AND REMOVAL.

c. THE TOP FEW INCHES OF FILTER MEDIA SHOULD BE REMOVED AND REPLACED WHEN WATER PONDS FOR MORE THAN 48 HOURS. SILTS AND SEDIMENT SHOULD BE REMOVED FROM THE SURFACE OF THE FILTER BED WHEN ACCUMULATION EXCEEDS ONE INCH.

d. WHERE PRACTICES ARE USED TO TREAT AREAS WITH HIGHER CONCENTRATIONS OF HEAVY METALS (E.G., PARKING LOTS, ROADS), MULCH SHOULD BE REPLACED ANNUALLY. OTHERWISE, THE TOP TWO TO THREE INCHES SHOULD BE REPLACED AS NECESSARY.

e. OCCASIONAL PRUNING AND REPLACEMENT OF DEAD VEGETATION IS NECESSARY. IF SPECIFIC PLANTS ARE NOT SURVIVING, MORE APPROPRIATE SPECIES SHOULD BE USED. WATERING MAY BE REQUIRED DURING PROLONGED DRY PERIODS.

9. **MAINTENANCE SCHEDULE:**

a. MOW GRASS FILTER AREAS SURROUNDING THE FACILITY AT LEAST FOUR TIMES A YEAR

b. REMOVE WEEDS AND TRASH FROM THE FILTER AS NEEDED. RAKE THE MULCH TWICE EVERY SPRING.

c. A 3-INCH DEEP MULCH COVER SHOULD BE MAINTAINED IN A MICRO-BIORETENTION PRACTICE. MULCH SHOULD BE ADDED TO THE FILTER YEARLY TO KEEP IT AT THIS THICKNESS. MULCH SHOULD BE COMPLETELY REPLACED EVERY THREE YEARS.

d. PRUNE TREES AND SHRUBS YEARLY.

e. WATER SHOULD NOT STAND IN THE FILTER FOR MORE THAN 3-4 DAYS. IF THIS HAPPENS, YOUR PIPE MAY NEED TO BE CLEANED OR THE FILTER MATERIAL MAY HAVE TO BE REPLACED.

f. IF YOU HAVE BARE SOIL SHOWING, STORMWATER MAY BE MOVING TOO QUICKLY INTO OR ACROSS THE FILTER. PLANT NEW VEGETATION AND/OR REPLACE DEAD PLANTS UPHILL OF THE FACILITY, OR ADD MEDIUM TO LARGE ROCKS UPHILL OF THE FILTER TO SLOW WATER FLOW.

a. DO NOT USE FERTILIZER OR PESTICIDES NEAR A MICRO-BIORETENTION PRACTICE.

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE STORMWATER MANAGEMENT FACILITIES (BOTH BMPS AND ESD PRACTICES) SHOWN ON THE PLANS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS APPROVED BY THE CALVERT COUNTY DEPARTMENT OF PUBLIC WORKS., EXCEPT AS NOTED IN RED ON THE "AS-BUILT" DRAWINGS.

BY: _____ DATE: _____
DANIEL J. KELSH MD PE #17627

COLLINSON, OLIFF & ASSOCIATES, INC.
SURVEYORS • ENGINEERS
LAND PLANNERS
P.O. BOX 2209 ~ 110 MAIN STREET
PRINCE FREDERICK, MARYLAND 20678
410-535-3101 • 301-855-1599
FAX: 410-535-3103 • EMAIL: INFO@COAINC.COM

STATE OF MARYLAND — DANIEL J. KELSH — No. 17627 — PROFESSIONAL ENGINEER

MD PE #17627
05/15/2020
DATE

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.: 17627, EXPIRATION DATE: 12/13/2021

DATE	REVISION
02/27/2020	SITE PLAN REVISIONS
05/15/2020	-
-	-
-	-
-	-
-	-

FOLDER REFERENCE: TM 200 BLOCK 1 LOTS 23 & 24

SCALE: AS SHOWN
DATE: FEB. 2020
JOB NO.: 1-13187
DRAWN BY: JRM
APPROVED: DJK

PLAN #: 3

GRA #: 2020-3365

SITE: STORMWATER MANAGEMENT DETAILS

MIXED USE DEVELOPMENT
TM 200 BLOCK 1 LOTS 23 & 24
8832 BAY AVE
NORTH BEACH, MARYLAND 20714
THIRD DISTRICT, CALVERT COUNTY

FOR: JOHN & PATRICIA STUECKLER

THIS STAMP IN RED COLOR INDICATES ORIGINAL

C 6.2

FILE #: B - 58 - 28 D.2