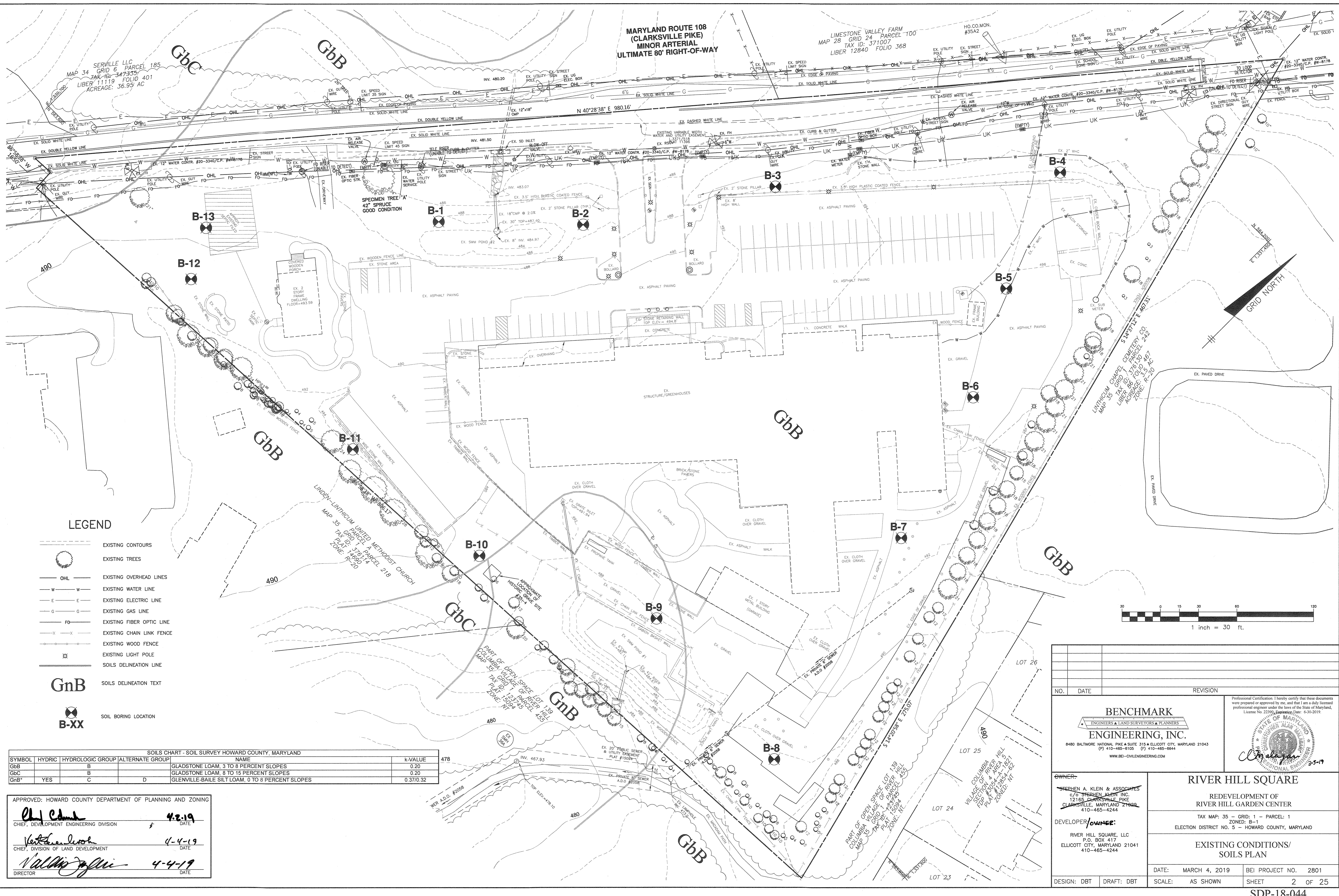


**MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY**

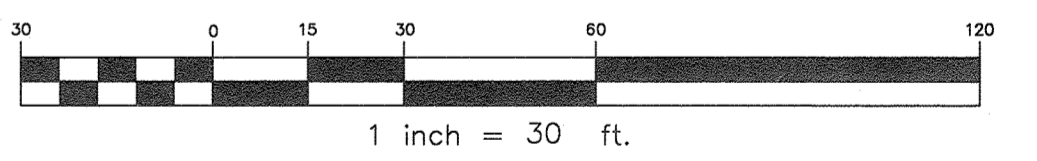
LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 100
TAX ID: 371007
LIBER 12840 FOLIO 368

SERVILLE LLC PARCEL 185
MAP 34 GRID 6
TAX ID: 347325
LIBER 11119 FOLIO 401
ACREAGE: 36.95 AC



LEGEND

- EXISTING CONTOURS
- EXISTING TREES
- EXISTING OVERHEAD LINES
- EXISTING WATER LINE
- EXISTING ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING FIBER OPTIC LINE
- EXISTING CHAIN LINK FENCE
- EXISTING WOOD FENCE
- EXISTING LIGHT POLE
- SOILS DELINEATION LINE
- GnB** SOILS DELINEATION TEXT
- SOIL BORING LOCATION



SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND

SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	K-VALUE
GbB		B		GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.20
GbC		B		GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	0.20
GnB*	YES	C	D	GLENNVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37/0.32

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT

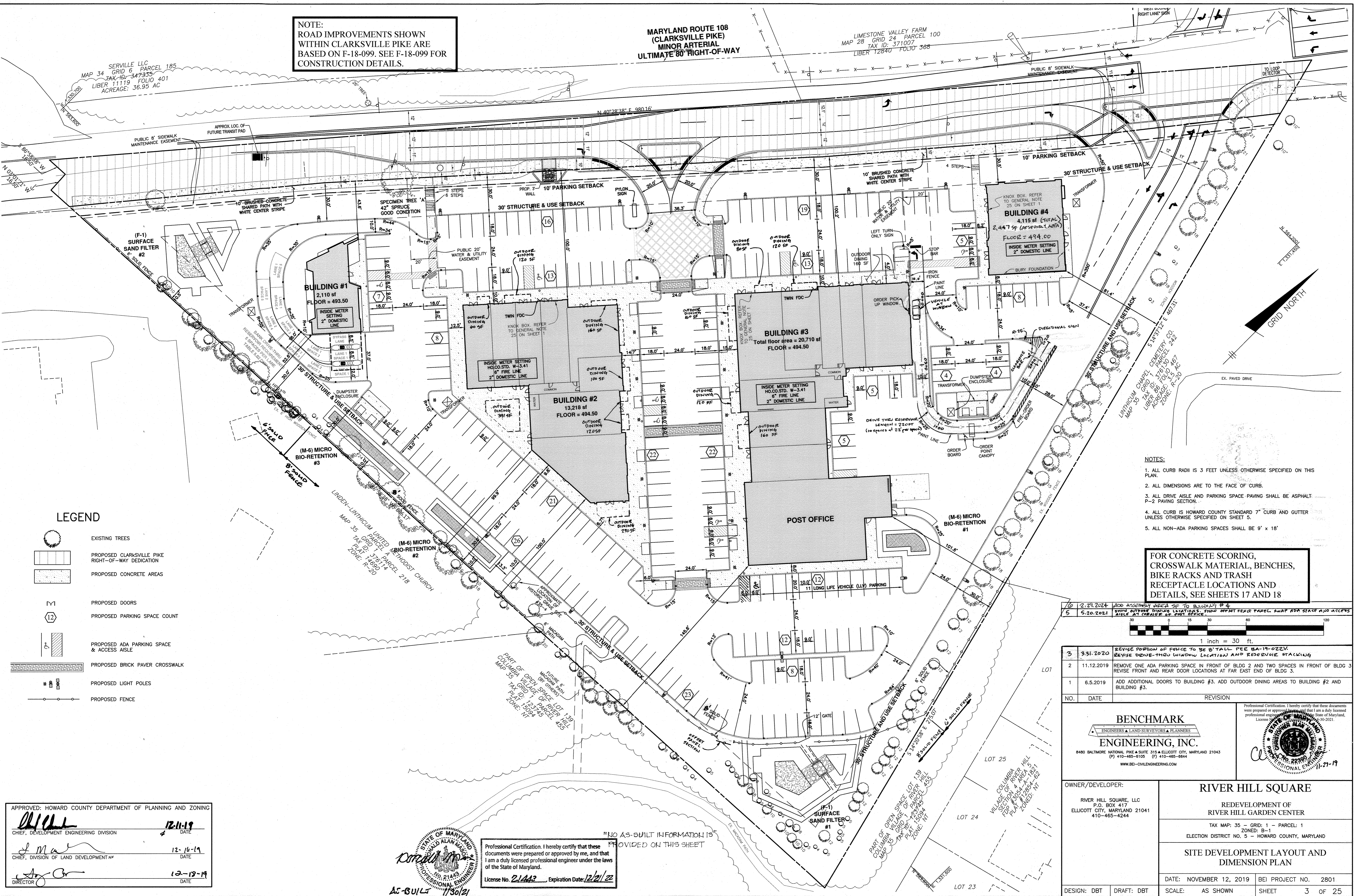
[Signature] 4-4-19
DIRECTOR

NO.		DATE	REVISION
<p>BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE SUITE 315 ELLICOTT CITY, MARYLAND 21043 (P) 410-465-8105 (F) 410-465-6644 WWW.BE-CIVILENGINEERING.COM</p>			
OWNER:		<p>RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 - HOWARD COUNTY, MARYLAND ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>	
DEVELOPER/OWNER:		<p>RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244</p>	
DATE:		MARCH 4, 2019	BEI PROJECT NO. 2801
DESIGN:		DBT	DRAFT: DBT
SCALE:		AS SHOWN	SHEET 2 OF 25

NOTE:
ROAD IMPROVEMENTS SHOWN
WITHIN CLARKSVILLE PIKE ARE
BASED ON F-18-099. SEE F-18-099 FOR
CONSTRUCTION DETAILS.

MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 100
TAX ID: 371007
LIBER 12840 FOLIO 368

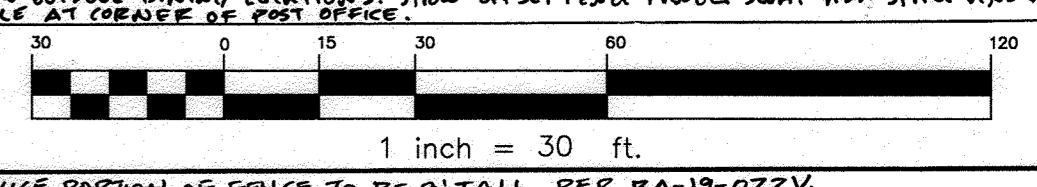


- LEGEND**
- EXISTING TREES
 - PROPOSED CLARKSVILLE PIKE RIGHT-OF-WAY DEDICATION
 - PROPOSED CONCRETE AREAS
 - PROPOSED DOORS
 - PROPOSED PARKING SPACE COUNT
 - PROPOSED ADA PARKING SPACE & ACCESS AISLE
 - PROPOSED BRICK PAVER CROSSWALK
 - PROPOSED LIGHT POLES
 - PROPOSED FENCE

- NOTES:**
1. ALL CURB RADII IS 3 FEET UNLESS OTHERWISE SPECIFIED ON THIS PLAN.
 2. ALL DIMENSIONS ARE TO THE FACE OF CURB.
 3. ALL DRIVE AISLE AND PARKING SPACE PAVING SHALL BE ASPHALT P-2 PAVING SECTION.
 4. ALL CURB IS HOWARD COUNTY STANDARD 7" CURB AND GUTTER UNLESS OTHERWISE SPECIFIED ON SHEET 5.
 5. ALL NON-ADA PARKING SPACES SHALL BE 9' x 18'

FOR CONCRETE SCORING,
CROSSWALK MATERIAL, BENCHES,
BIKE RACKS AND TRASH
RECEPTACLE LOCATIONS AND
DETAILS, SEE SHEETS 17 AND 18

NO.	DATE	REVISION
6	2.29.2024	ADD ASSEMBLY AREA 50' TO BUILDING #4
5	5.20.2021	SHOW OUTDOOR DINING LOCATIONS, SHOW OFFSET FENCE PANEL SWAP ADA SPACE AND ACCESS AISLE AT CORNER OF POST OFFICE
3	3.31.2020	REVISE PORTION OF FENCE TO BE 8" TALL PER BA-19-022V. REVISE DRIVE THRU WINDOW LOCATION AND RESERVE STACKING
2	11.12.2019	REMOVE ONE ADA PARKING SPACE IN FRONT OF BLDG 2 AND TWO SPACES IN FRONT OF BLDG 3. REVISE FRONT AND REAR DOOR LOCATIONS AT FAR EAST END OF BLDG 3.
1	6.5.2019	ADD ADDITIONAL DOORS TO BUILDING #3. ADD OUTDOOR DINING AREAS TO BUILDING #2 AND BUILDING #3.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 12-11-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 12-16-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 12-12-19
DIRECTOR DATE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 21443, Expiration Date: 12/21/22

AS-BUILT 11/30/21

BENCHMARK ENGINEERING, INC.
ENGINEERS & LAND SURVEYORS & PLANNERS
8480 BALTIMORE NATIONAL PIKE & SUITE 315 • ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BE-ENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22300, Expiration Date: 6-30-2021.

RIVER HILL SQUARE

REDEVELOPMENT OF RIVER HILL GARDEN CENTER

TAX MAP: 35 - GRID: 1 - PARCEL: 1
ZONED: B-1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT LAYOUT AND DIMENSION PLAN

DATE: NOVEMBER 12, 2019 BEI PROJECT NO. 2801

DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN SHEET 3 OF 25

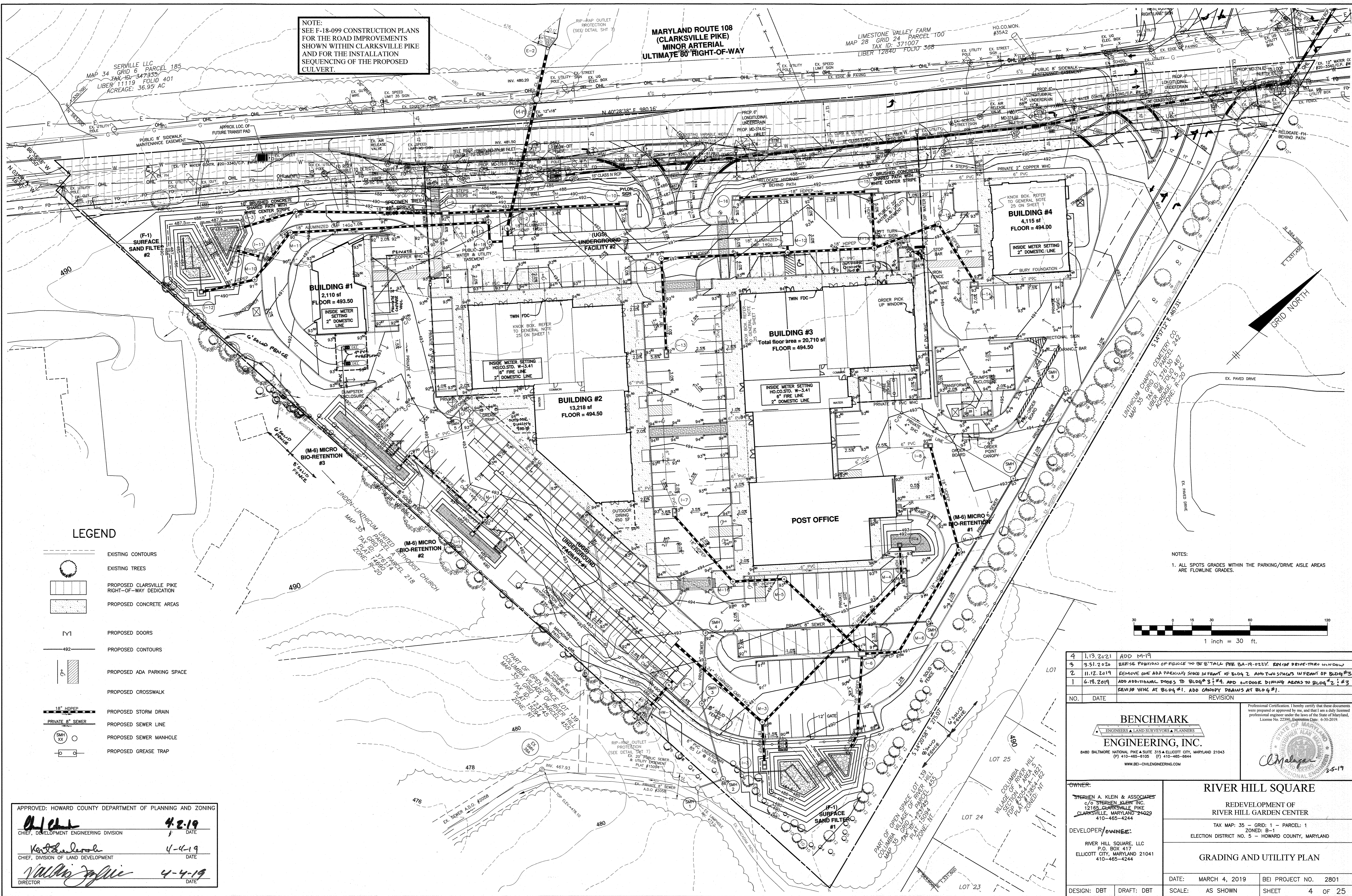
AS-BUILT SDP-18-044

NOTE:
SEE F-18-099 CONSTRUCTION PLANS
FOR THE ROAD IMPROVEMENTS
SHOWN WITHIN CLARKSVILLE PIKE
AND FOR THE INSTALLATION
SEQUENCING OF THE PROPOSED
CULVERT.

MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 700
TAX ID: 371007
LIBER 12840 FOLIO 388

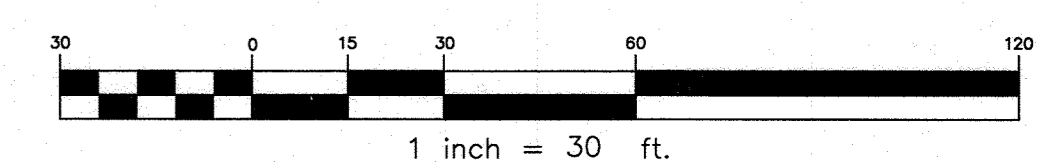
SERVILLE LLC
GRID 6 PARCEL 185
TAX ID: 347335
LIBER 11119 FOLIO 401
ACREAGE: 36.95 AC



LEGEND

- EXISTING CONTOURS
- EXISTING TREES
- PROPOSED CLARKSVILLE PIKE RIGHT-OF-WAY DEDICATION
- PROPOSED CONCRETE AREAS
- PROPOSED DOORS
- PROPOSED CONTOURS
- PROPOSED ADA PARKING SPACE
- PROPOSED CROSSWALK
- PROPOSED STORM DRAIN
- PROPOSED SEWER LINE
- PROPOSED SEWER MANHOLE
- PROPOSED GREASE TRAP

NOTES:
1. ALL SPOTS GRADES WITHIN THE PARKING/DRIVE AISLE AREAS ARE FLOWLINE GRADES.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 4-4-19
DIRECTOR DATE

NO.	DATE	REVISION
4	1.13.2021	ADD M-19
3	9.31.2020	REVISE POSITION OF PEOPLE TO BE 8" TALL PER BA-19-022Y. REVISE DRIVE-THRU WINDOW
2	11.12.2019	REMOVE ONE ADA PARKING SPACE IN FRONT OF BLDG 2 AND TWO SPACES IN FRONT OF BLDG #3
1	4.18.2019	ADD ADDITIONAL DOORS TO BLDG #3 & #4. ADD OUTDOOR DINING AREAS TO BLDG #2 & #3. REVISE WHC AT BLDG #1. ADD CANOPY DECKS AT BLDG #1.

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE SUITE 315 & ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BE-CVLENGINEERING.COM

Professional Certification I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22390, Expiration Date: 6-30-2019.

[Signature] 3-5-19

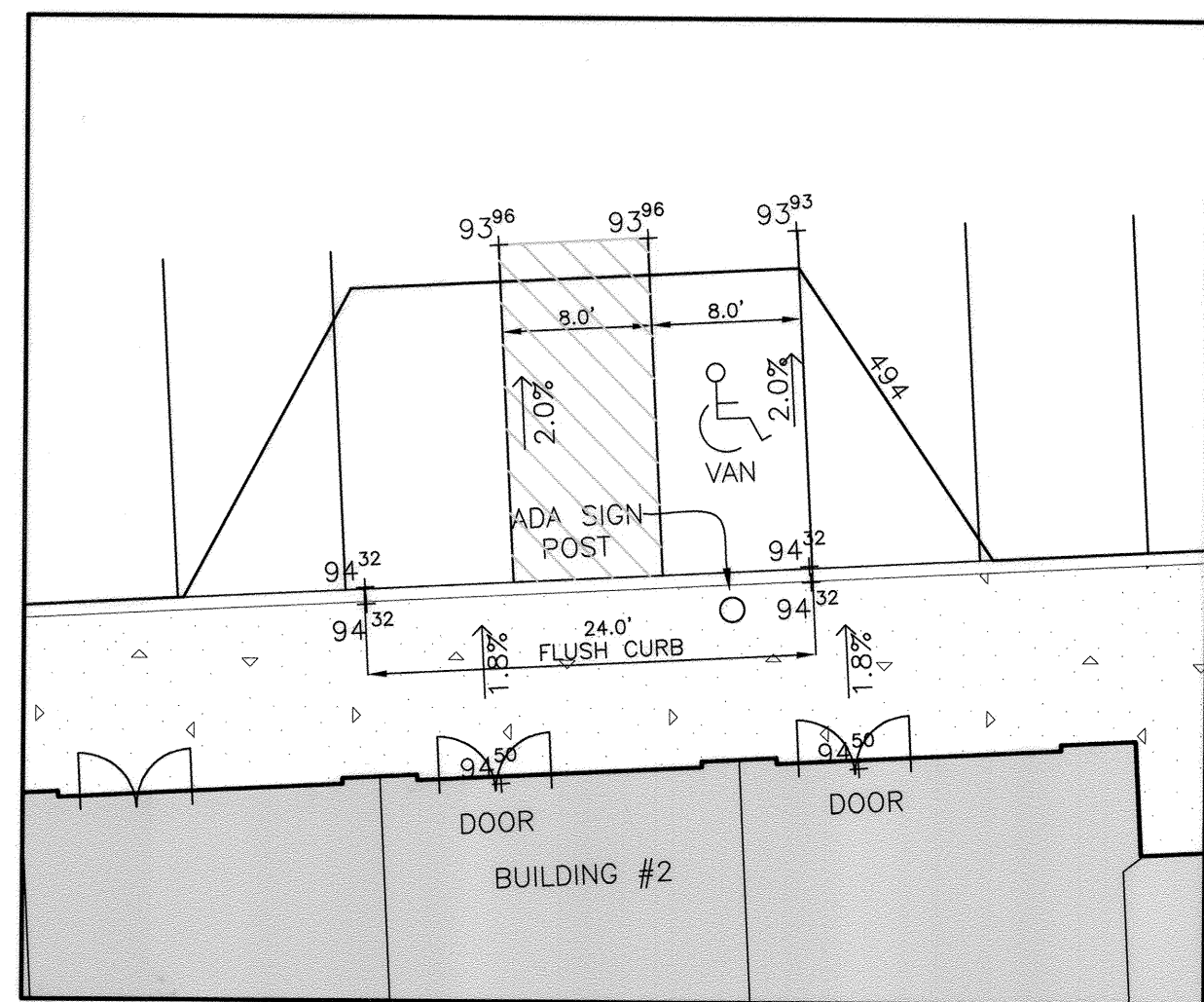
OWNER:
STERHEN A. KLEIN & ASSOCIATES
C/O STERHEN KLEIN, INC.
12185 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21029
410-465-4244

DEVELOPER/OWNER:
RIVER HILL SQUARE, LLC
P.O. BOX 417
ELLICOTT CITY, MARYLAND 21041
410-465-4244

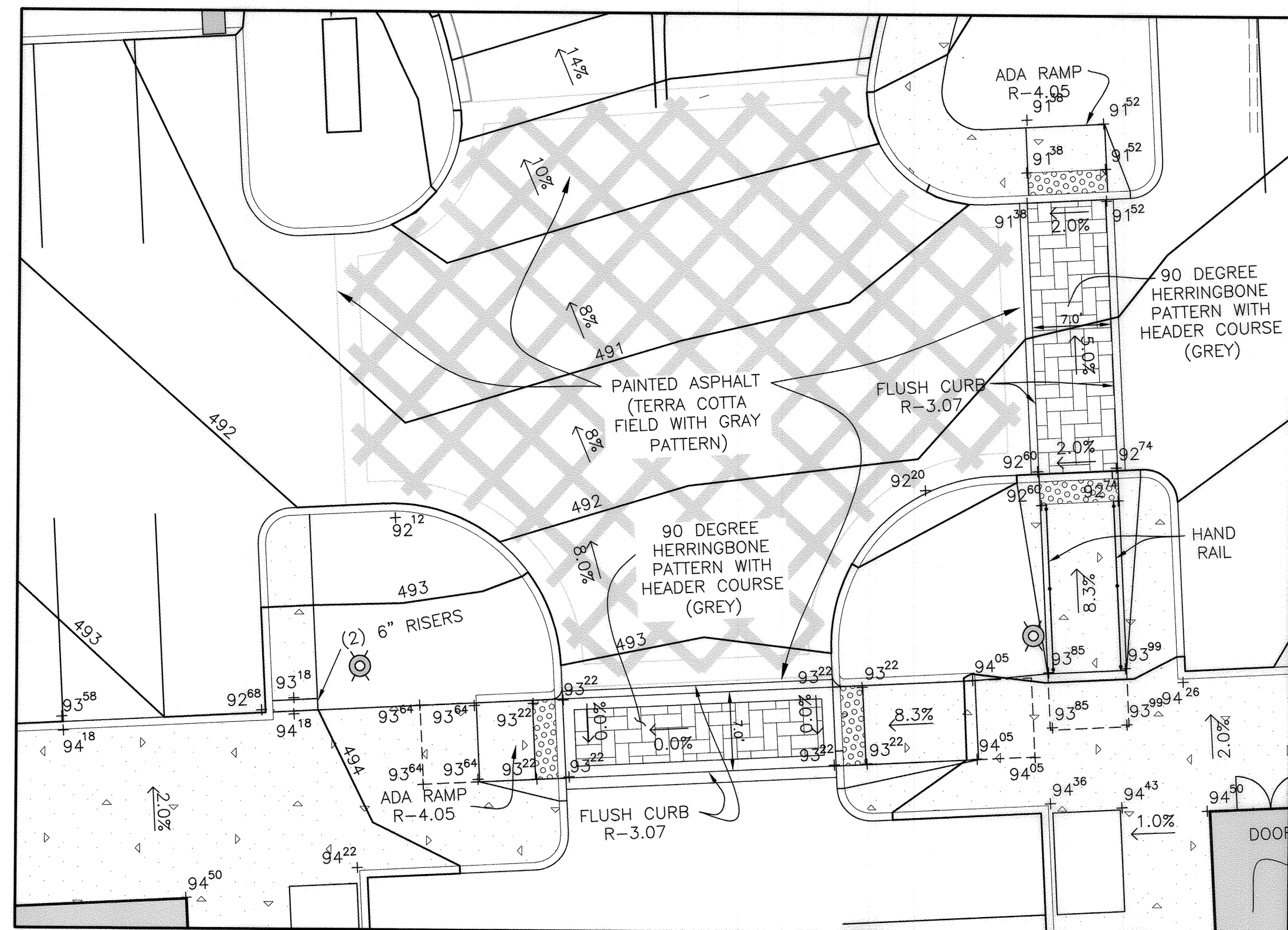
RIVER HILL SQUARE
REDEVELOPMENT OF
RIVER HILL GARDEN CENTER
TAX MAP: 35 - GRID: 1 - PARCEL: 1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

GRADING AND UTILITY PLAN

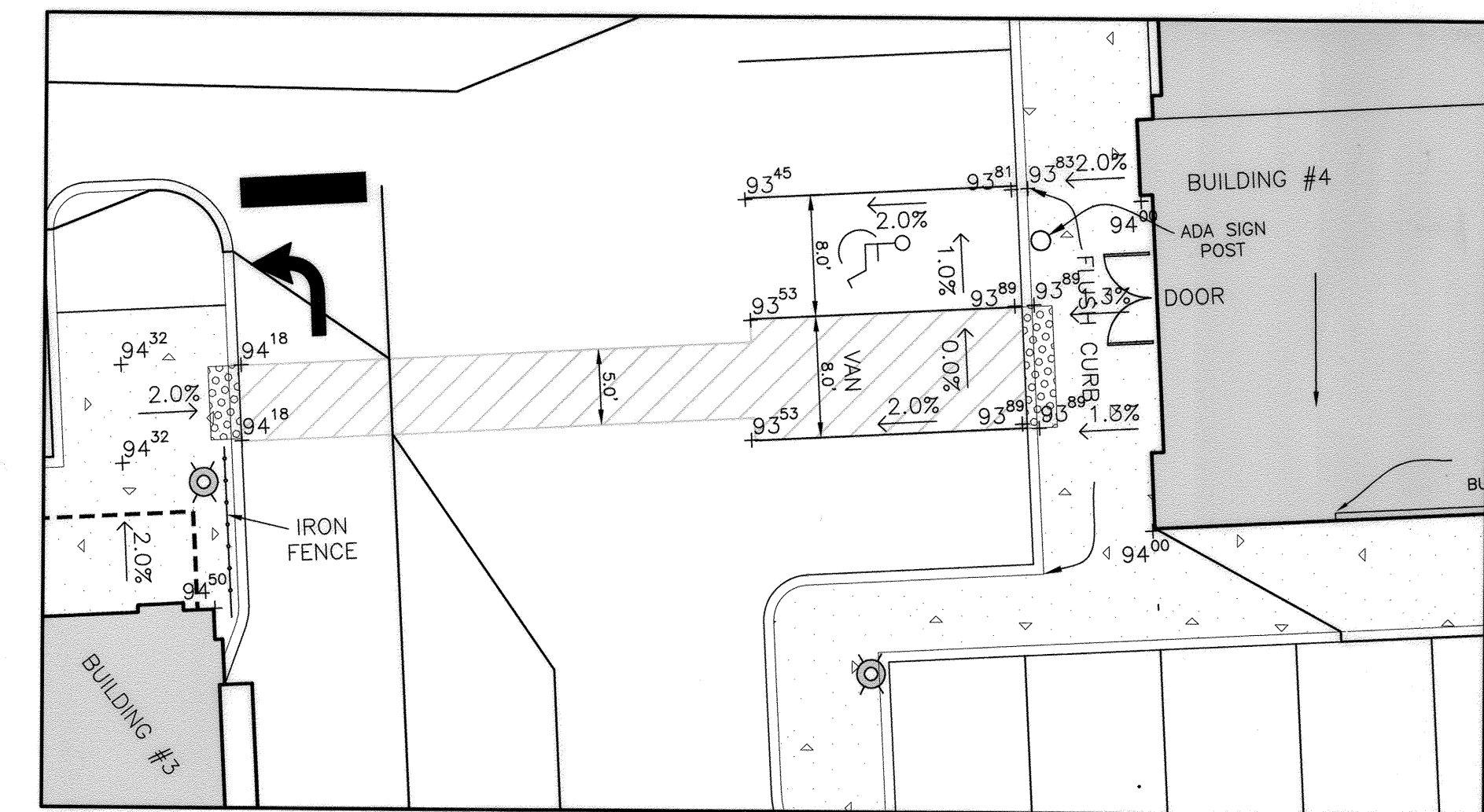
DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN SHEET 4 OF 25



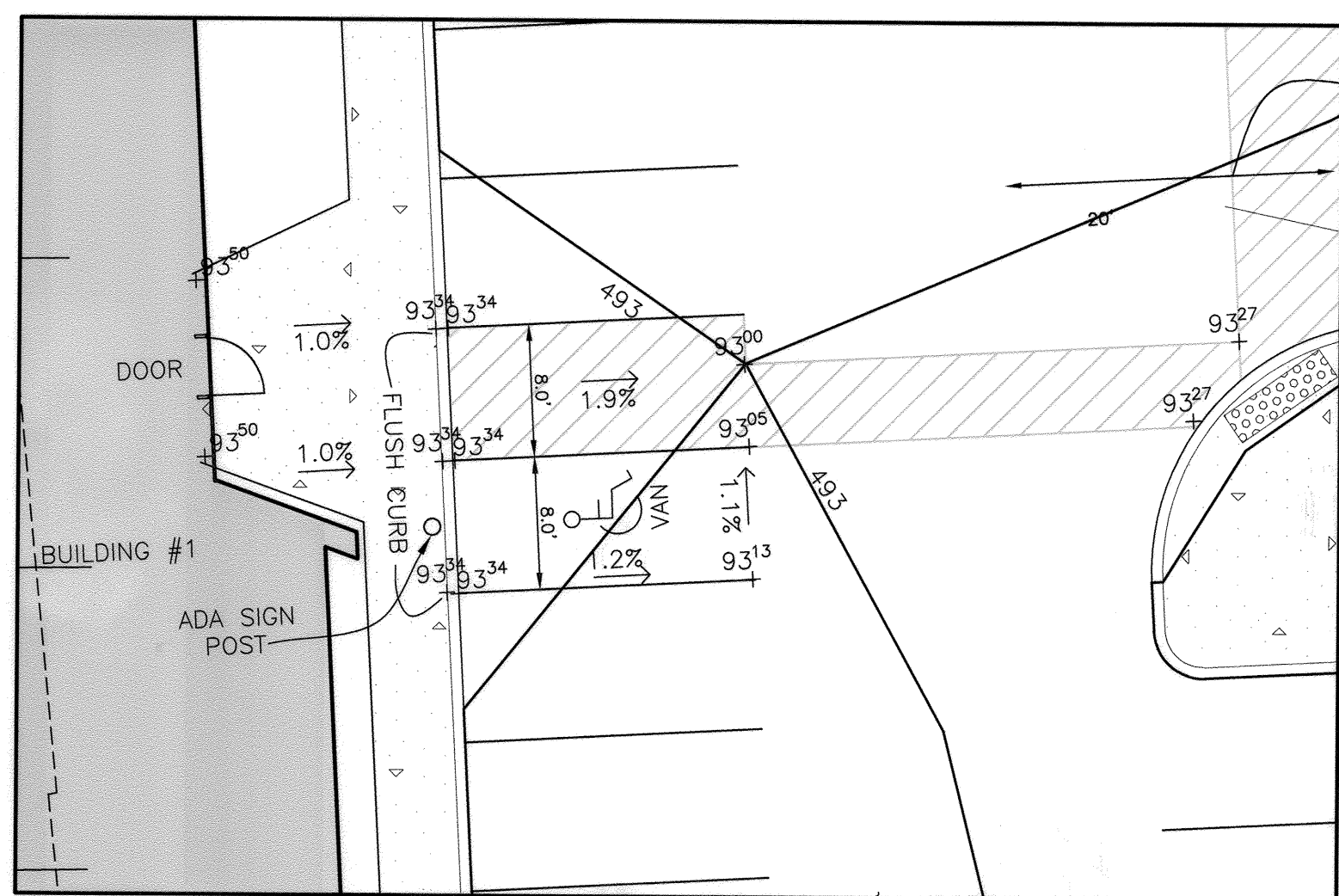
BUILDING #2



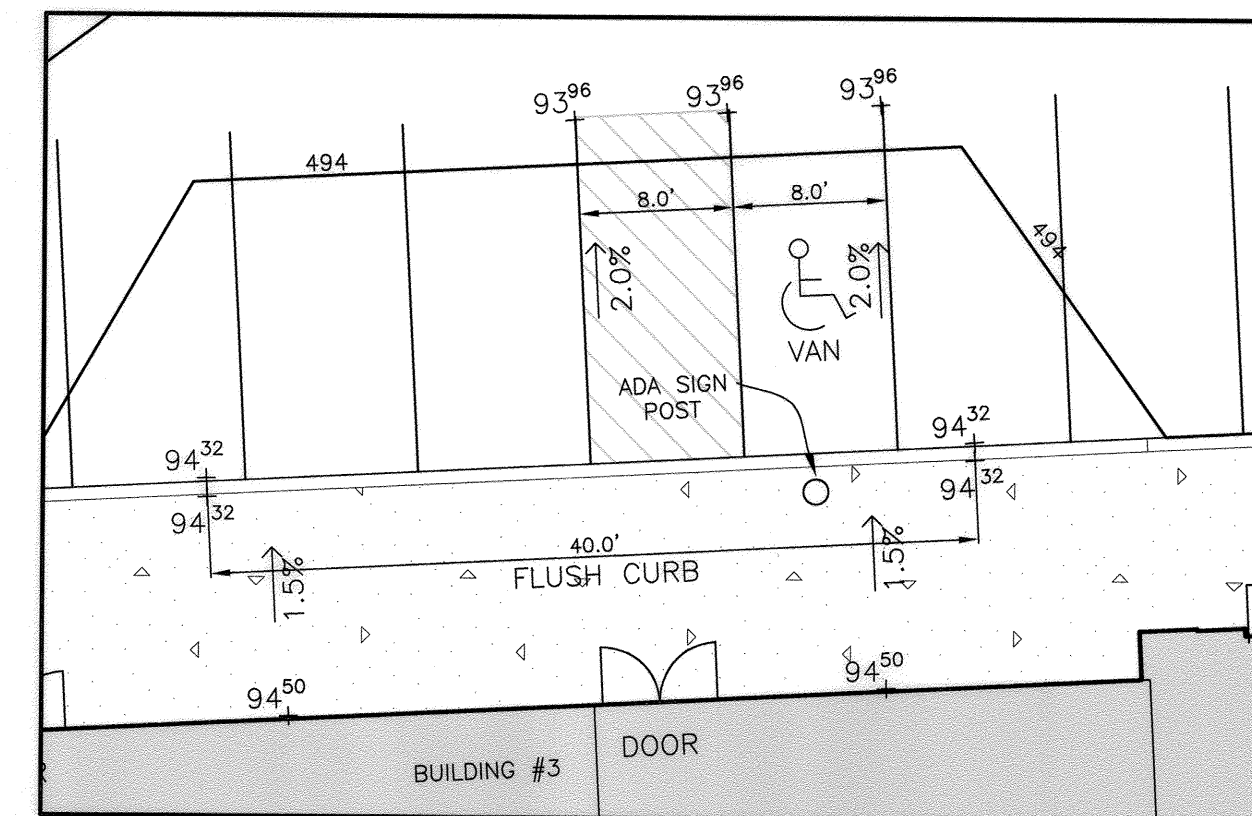
MAIN INTERSECTION AT RIGHT-IN/RIGHT-OUT



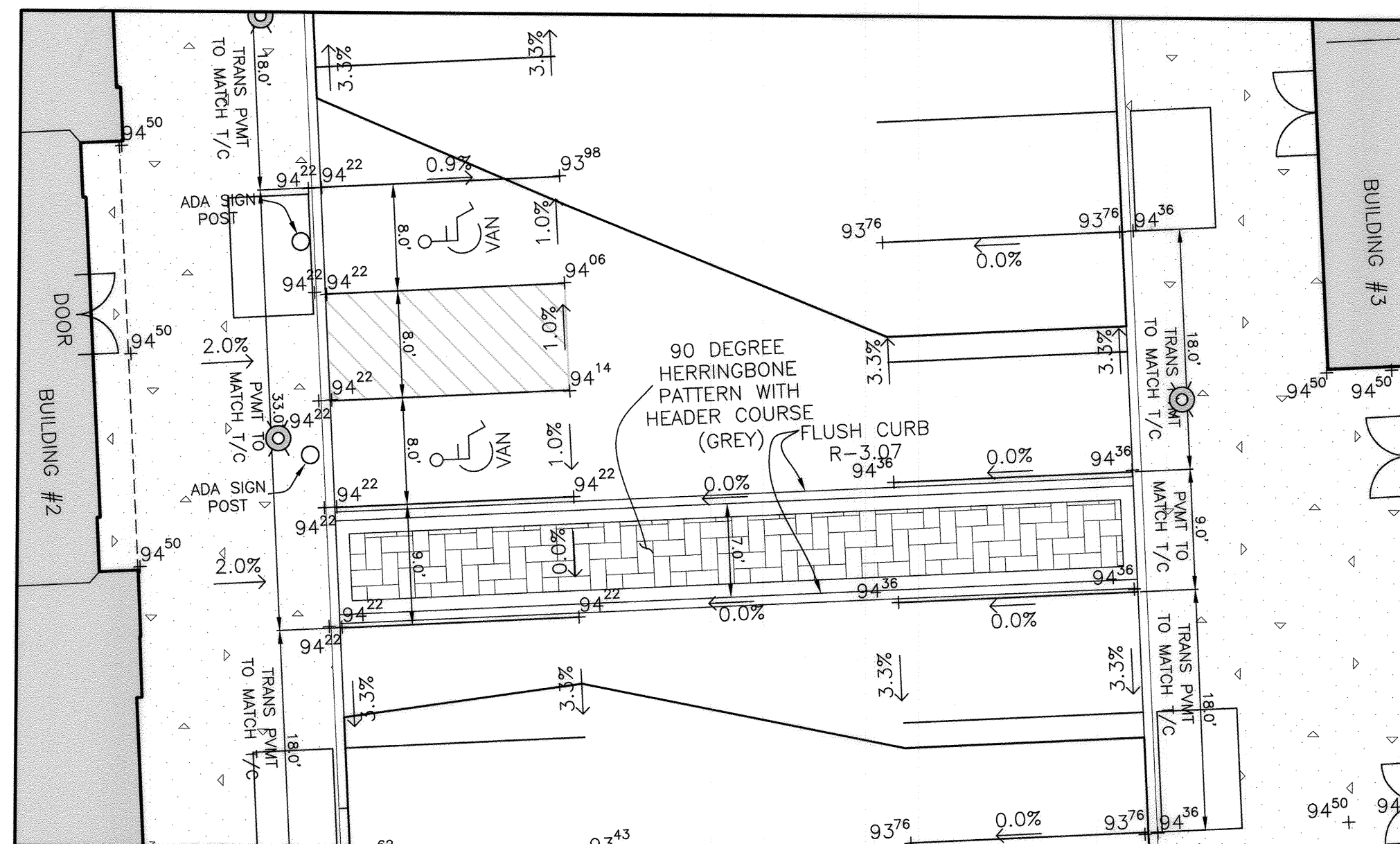
BUILDING #4



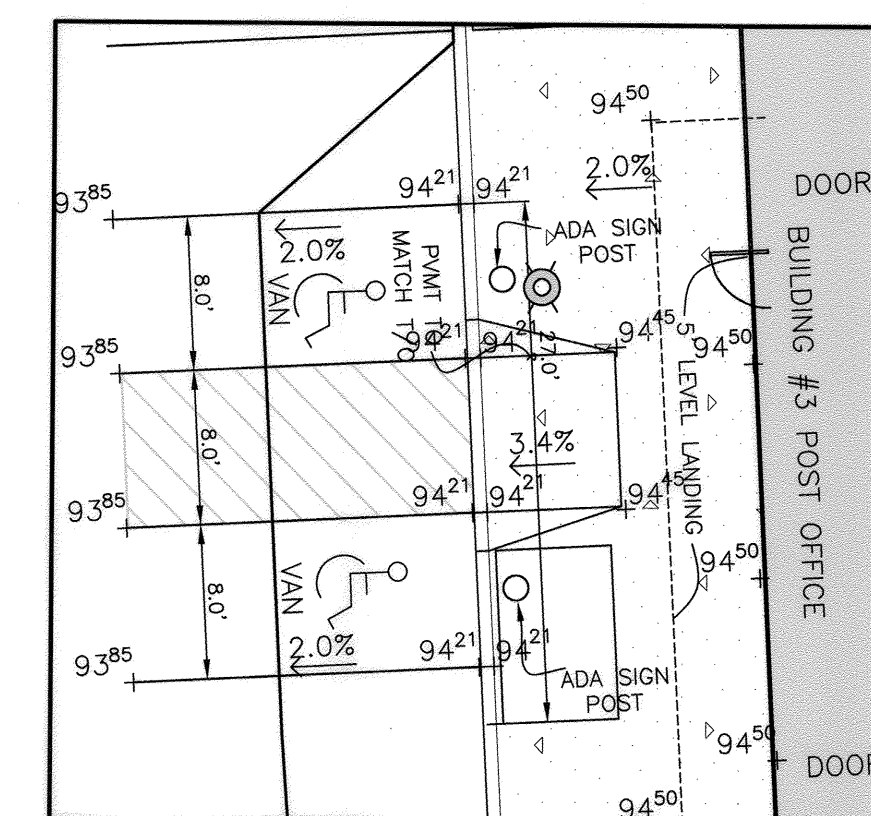
BUILDING #1



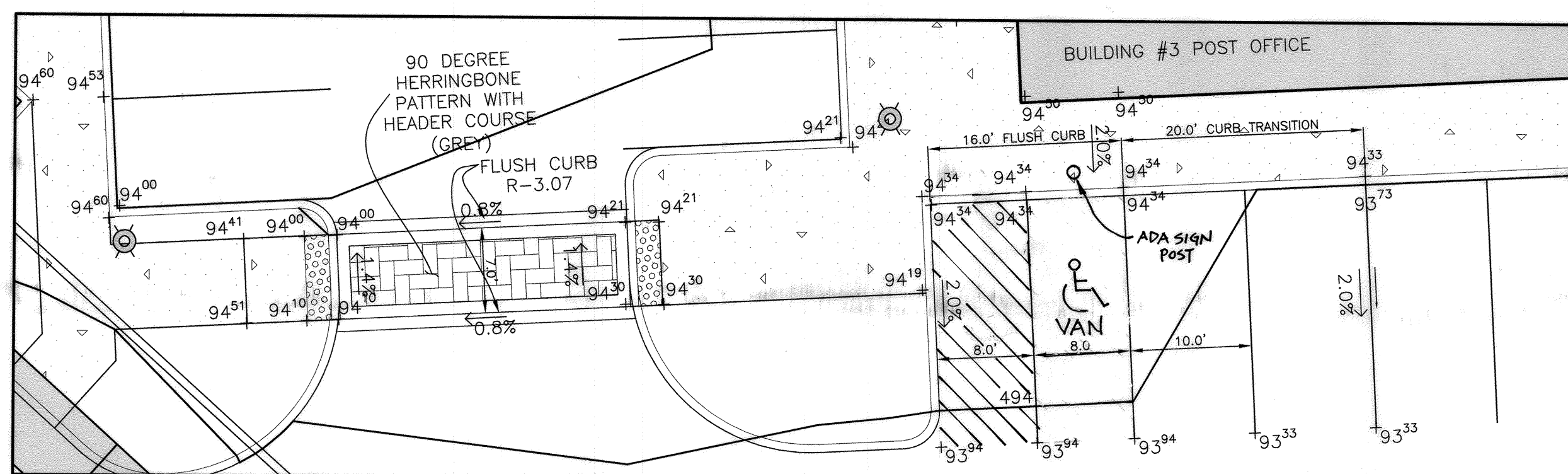
BUILDING #3



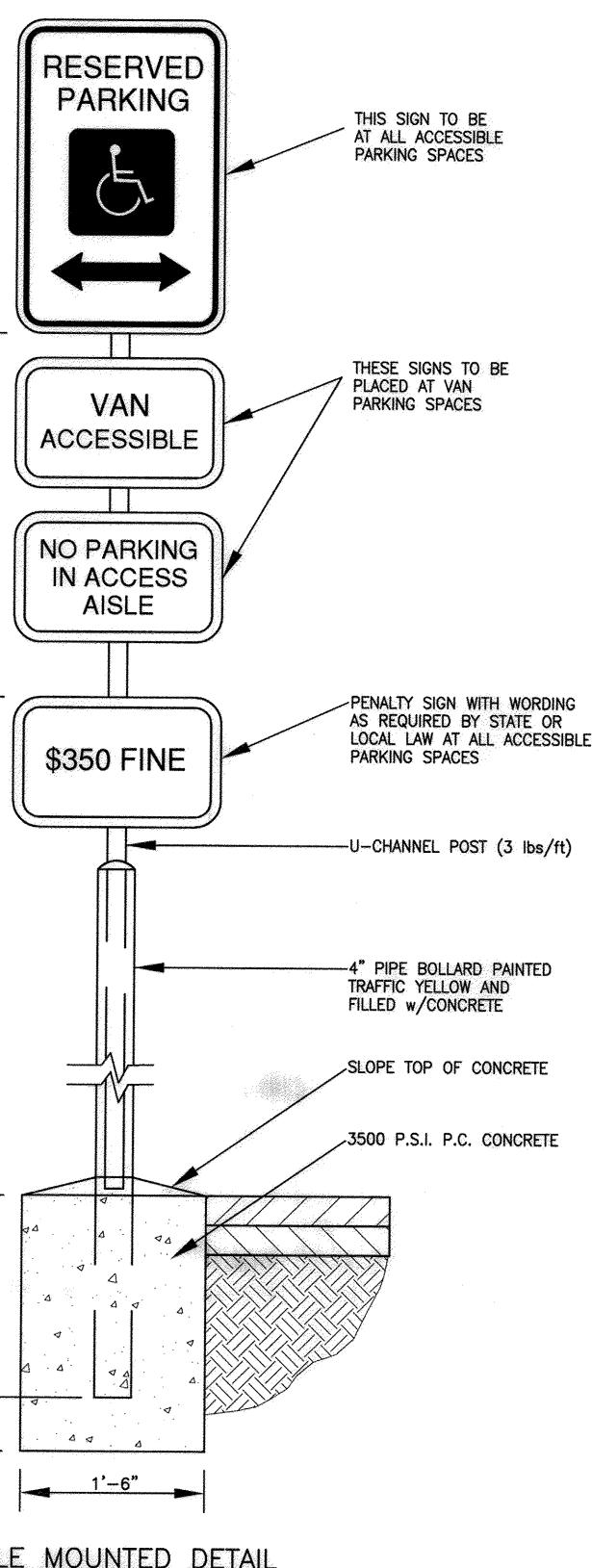
CROSSWALK MID-BUILDING BUILDINGS #2 AND #3



POST OFFICE

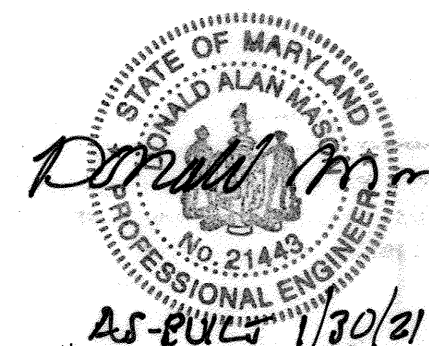


CROSSWALK REAR OF SITE BUILDINGS #2 AND #3

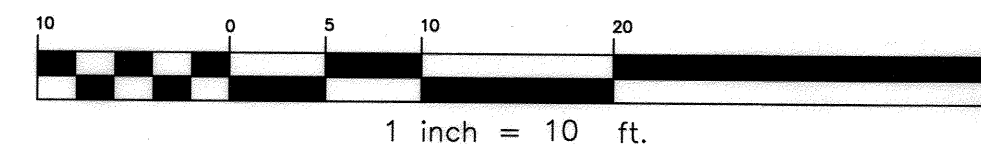


ADA POLE DETAIL NOT TO SCALE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443 Expiration Date: 12/31/22

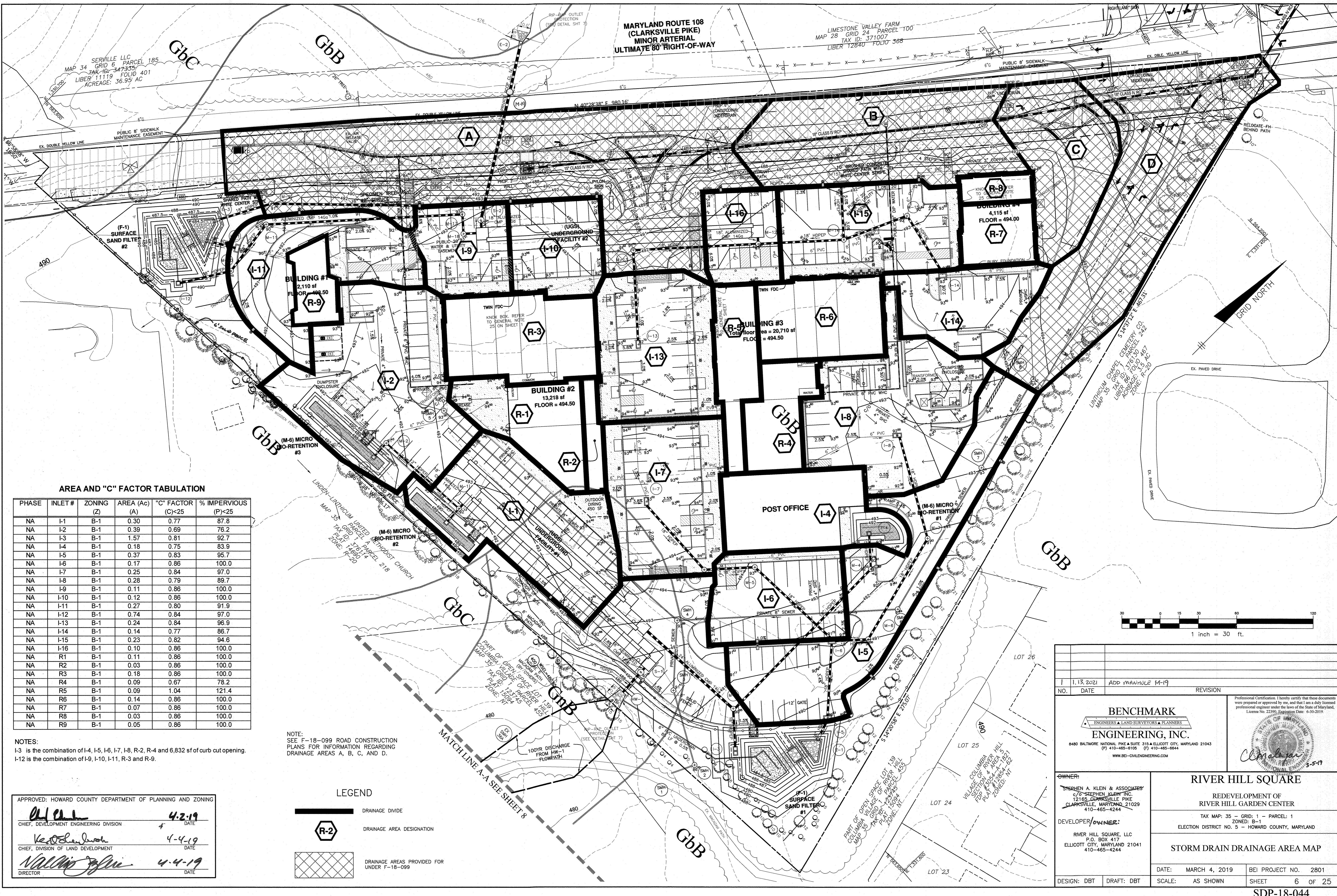


"NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET"



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division
 J. Man... 12-16-19
 Chief, Division of Land Development
 Director
 12-13-19

2 5-20-2021 SWAY ADA PARKING SPACE AND ACCESS AISLE AT CORNER OF POST OFFICE	
1 11.12.2019 REMOVE ONE ADA PARKING SPACE IN FRONT OF BLDG 2 AND TWO SPACES IN FRONT OF BLDG 3	
NO.	DATE REVISION
BENCHMARK ENGINEERING, INC. ENGINEERS & LAND SURVEYORS & PLANNERS 8480 BALTIMORE NATIONAL PIKE & SUITE 315 • ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BE-CIVILENGINEERING.COM	
OWNER/DEVELOPER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244	
RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND	
ADA COMPLIANCE PLAN	
DATE: NOVEMBER 12, 2019	BEI PROJECT NO. 2801
DESIGN: DBT	DRAFT: DBT
SCALE: AS SHOWN	SHEET 5 OF 25



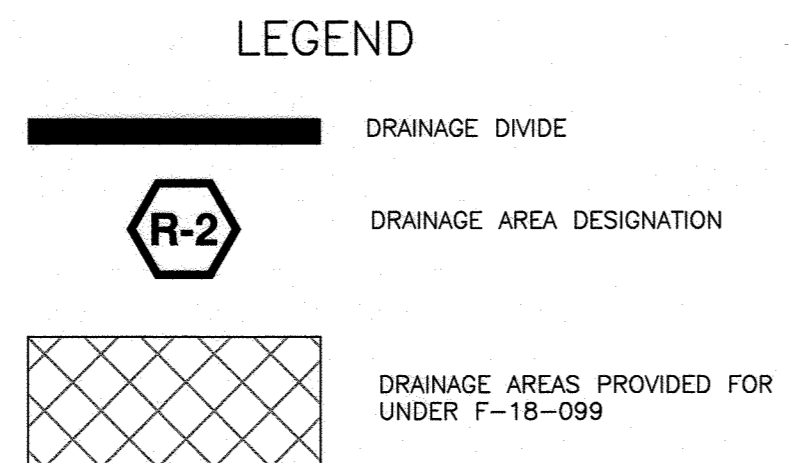
AREA AND "C" FACTOR TABULATION

PHASE	INLET #	ZONING (Z)	AREA (Ac) (A)	"C" FACTOR (C)<25	% IMPERVIOUS (P)<25
NA	I-1	B-1	0.30	0.77	87.8
NA	I-2	B-1	0.39	0.69	76.2
NA	I-3	B-1	1.57	0.81	92.7
NA	I-4	B-1	0.18	0.75	83.9
NA	I-5	B-1	0.37	0.83	95.7
NA	I-6	B-1	0.17	0.86	100.0
NA	I-7	B-1	0.25	0.84	97.0
NA	I-8	B-1	0.28	0.79	89.7
NA	I-9	B-1	0.11	0.86	100.0
NA	I-10	B-1	0.12	0.86	100.0
NA	I-11	B-1	0.27	0.80	91.9
NA	I-12	B-1	0.74	0.84	97.0
NA	I-13	B-1	0.24	0.84	96.9
NA	I-14	B-1	0.14	0.77	86.7
NA	I-15	B-1	0.23	0.82	94.6
NA	I-16	B-1	0.10	0.86	100.0
NA	R1	B-1	0.11	0.86	100.0
NA	R2	B-1	0.03	0.86	100.0
NA	R3	B-1	0.18	0.86	100.0
NA	R4	B-1	0.09	0.67	78.2
NA	R5	B-1	0.09	1.04	121.4
NA	R6	B-1	0.14	0.86	100.0
NA	R7	B-1	0.07	0.86	100.0
NA	R8	B-1	0.03	0.86	100.0
NA	R9	B-1	0.05	0.86	100.0

NOTES:
 I-3 is the combination of I-4, I-5, I-6, I-7, I-8, R-2, R-4 and 6,832 sf of curb cut opening.
 I-12 is the combination of I-9, I-10, I-11, R-3 and R-9.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4-2-19
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 [Signature] 4-4-19
 CHIEF, DIVISION OF LAND DEVELOPMENT
 [Signature] 4-4-19
 DIRECTOR

NOTE:
 SEE F-18-099 ROAD CONSTRUCTION PLANS FOR INFORMATION REGARDING DRAINAGE AREAS A, B, C, AND D.



1 1.13.2021 ADD MANHOLE M-19
 NO. DATE REVISION

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE SUITE 315 & ELLICOTT CITY, MARYLAND 21043
 (P) 410-465-6105 (F) 410-465-6644
 WWW.BEI-CIVILENGINEERING.COM

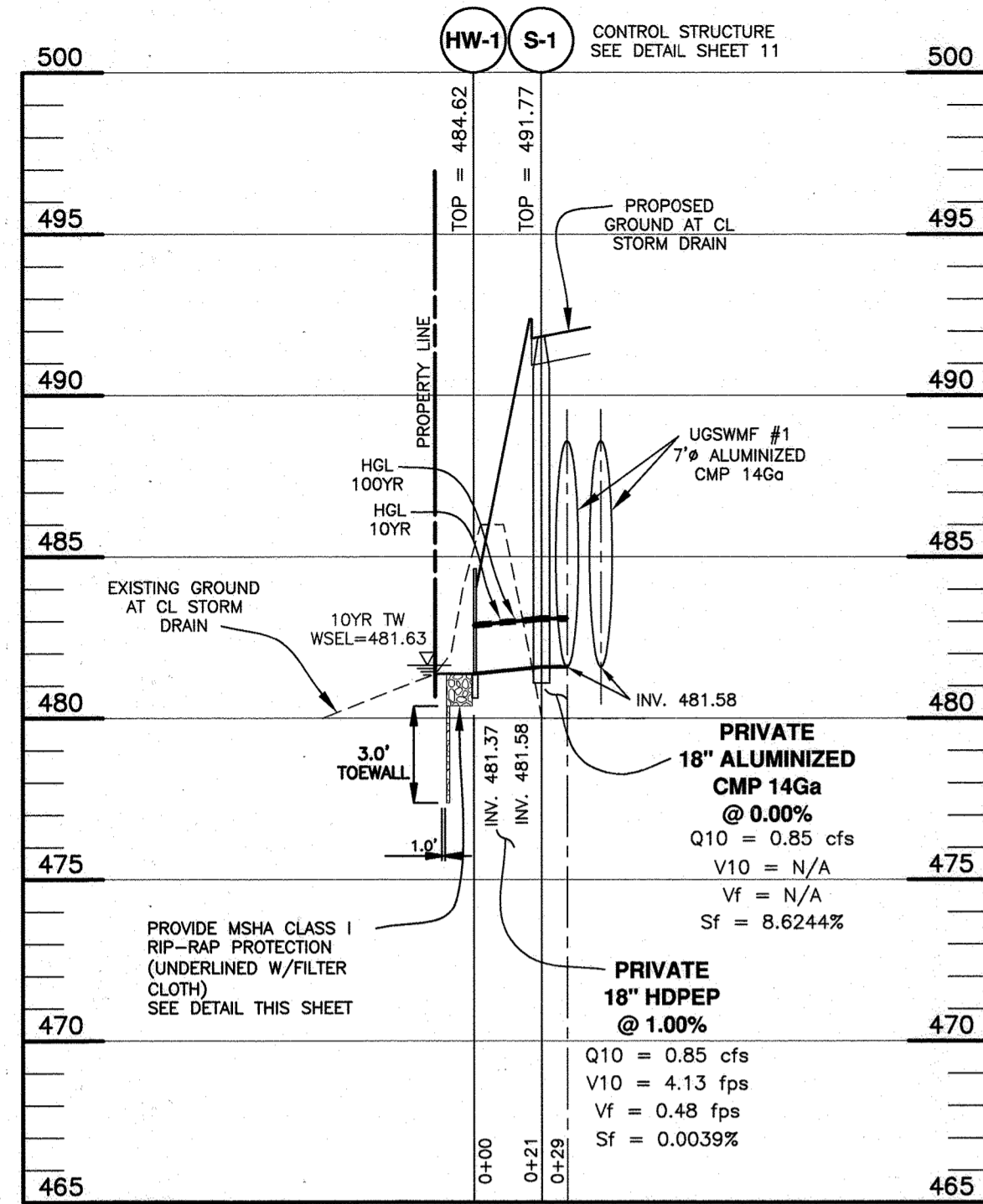
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22390, Expiration Date: 6-30-2019.

RIVER HILL SQUARE
 REDEVELOPMENT OF RIVER HILL GARDEN CENTER
 TAX MAP: 35 - GRID: 1 - PARCEL: 1
 ZONED: B-1
 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

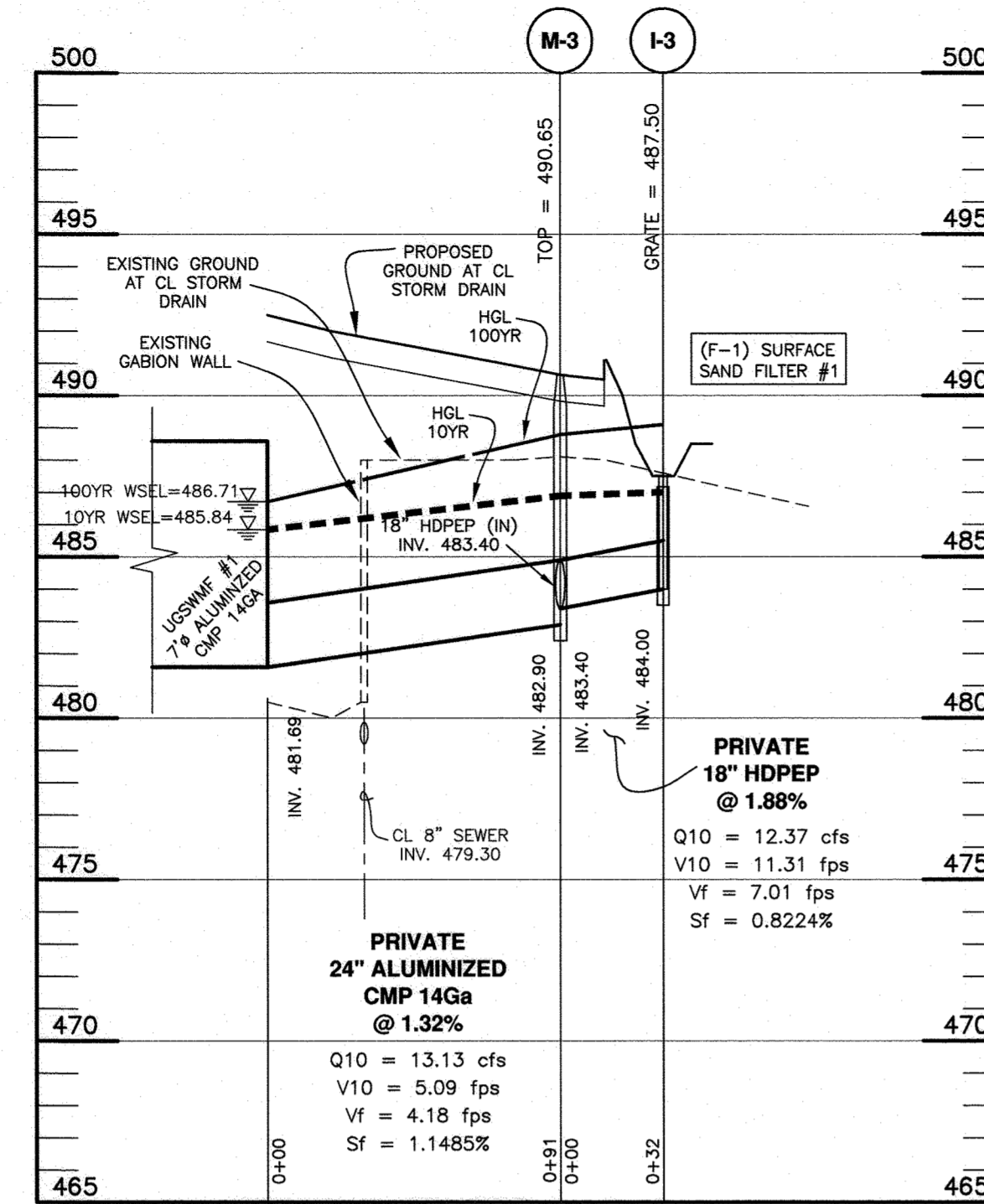
DEVELOPER/OWNER:
 RIVER HILL SQUARE, LLC
 P.O. BOX 417
 ELLICOTT CITY, MARYLAND 21041
 410-465-4244

DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN SHEET 6 OF 25

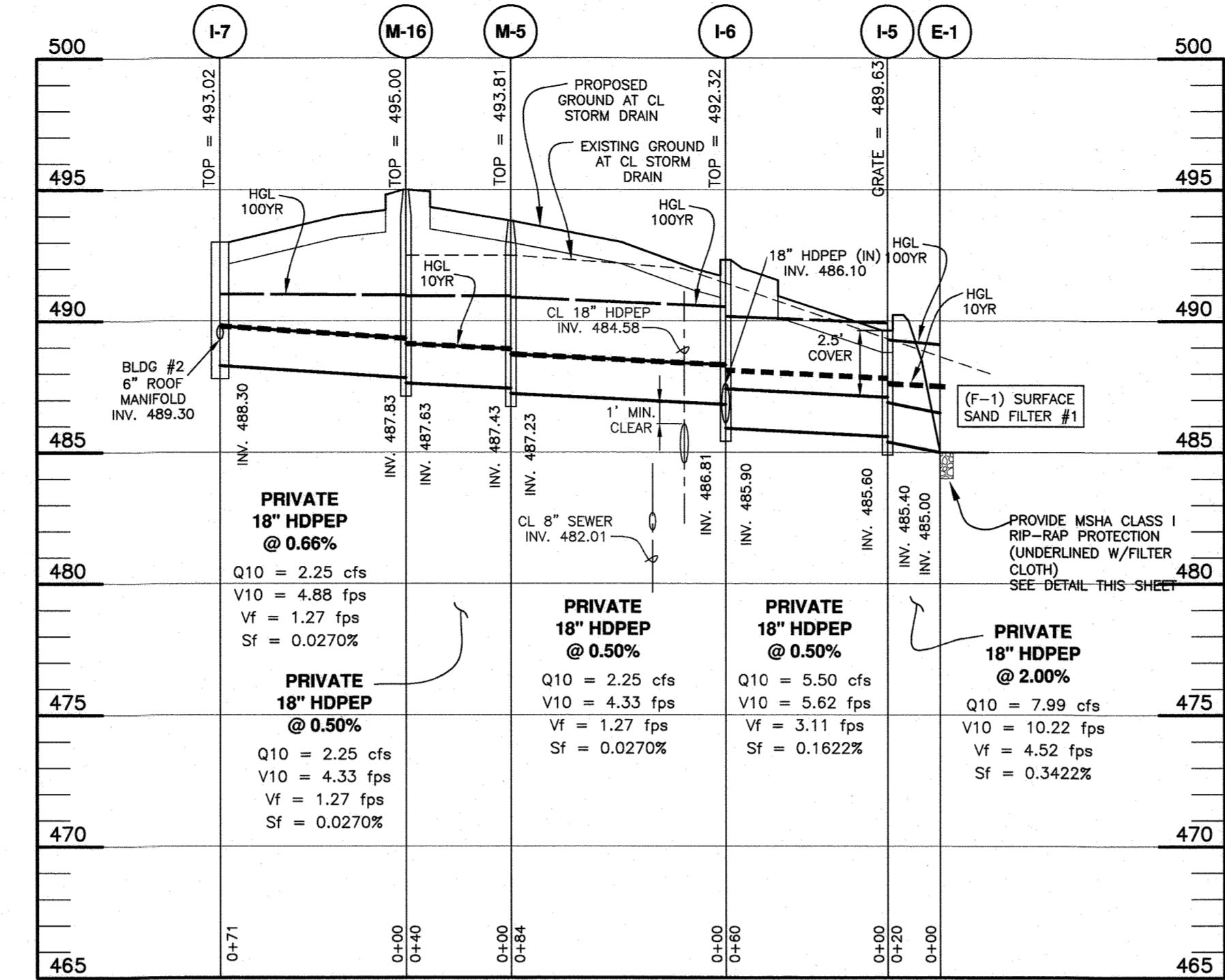
DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
 DATE: MARCH 4, 2019 SHEET 6 OF 25



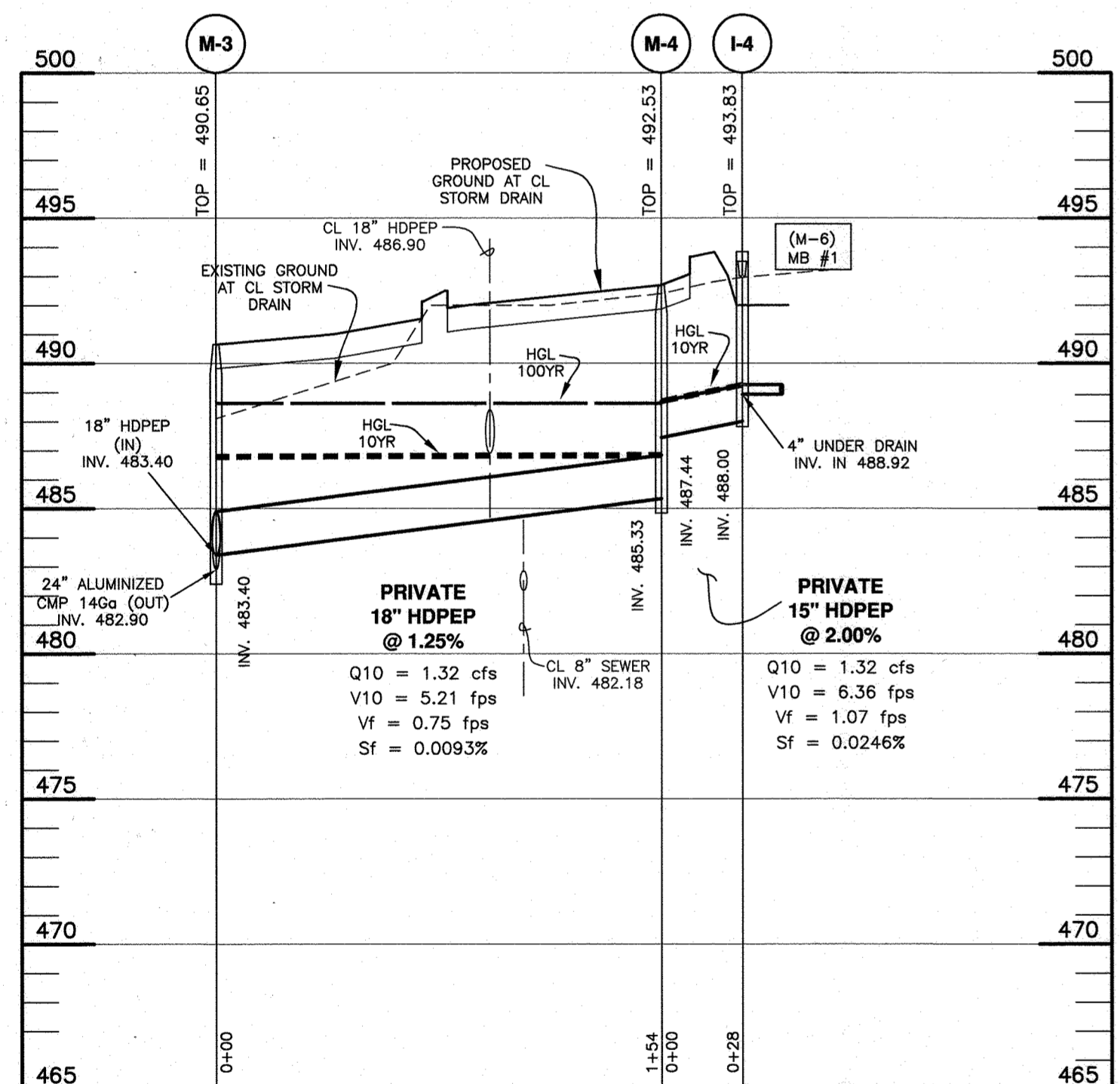
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



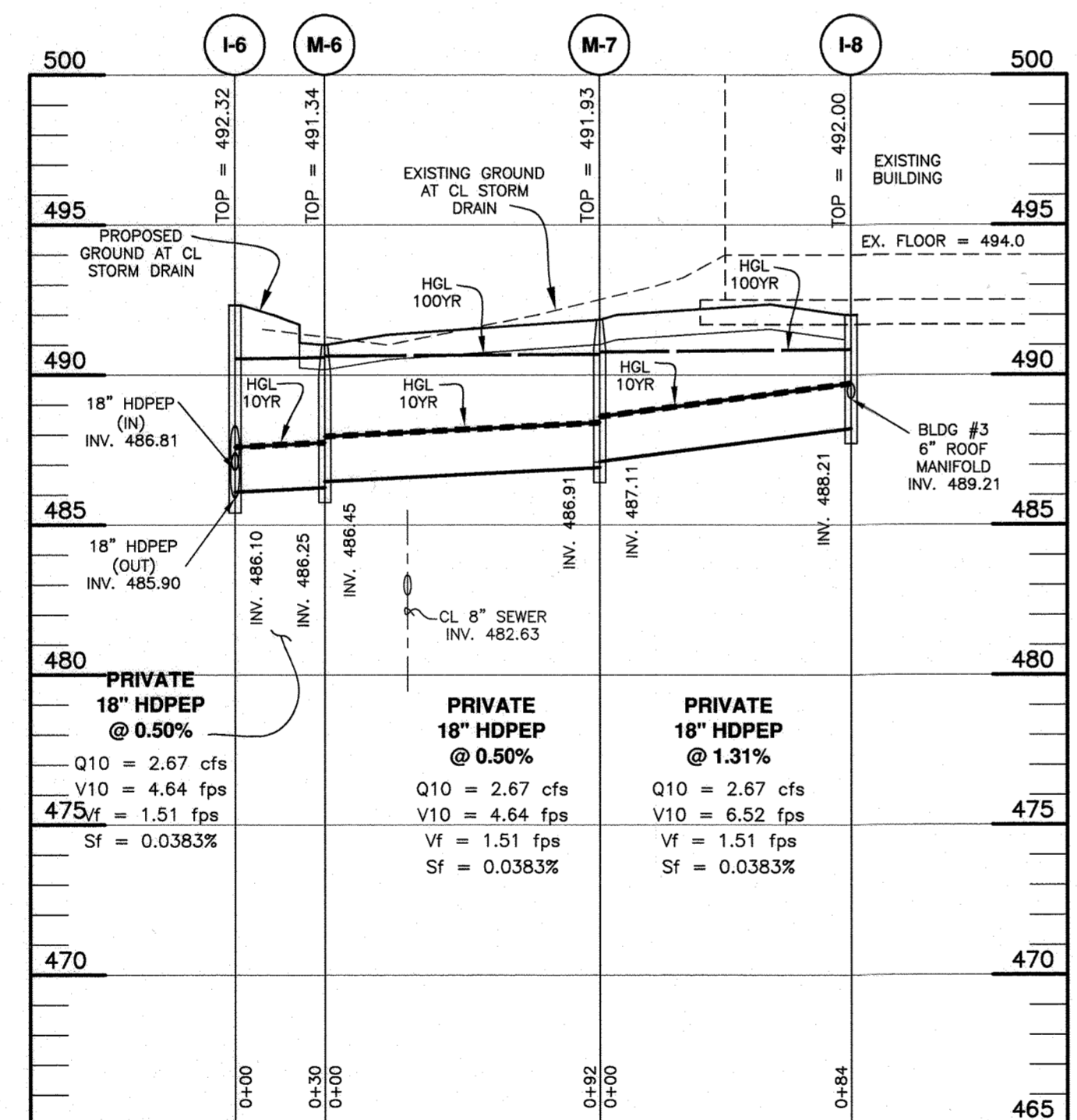
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



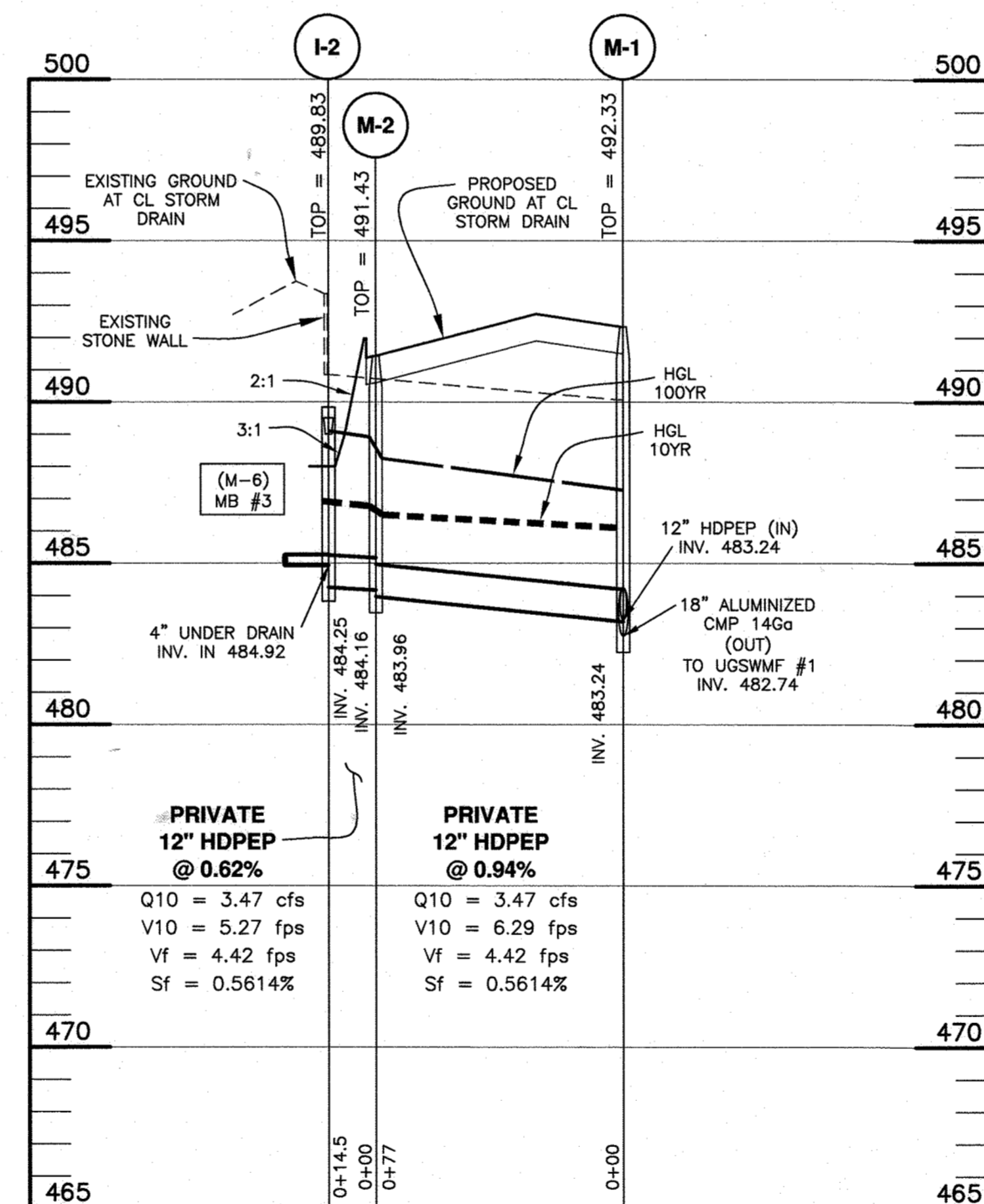
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



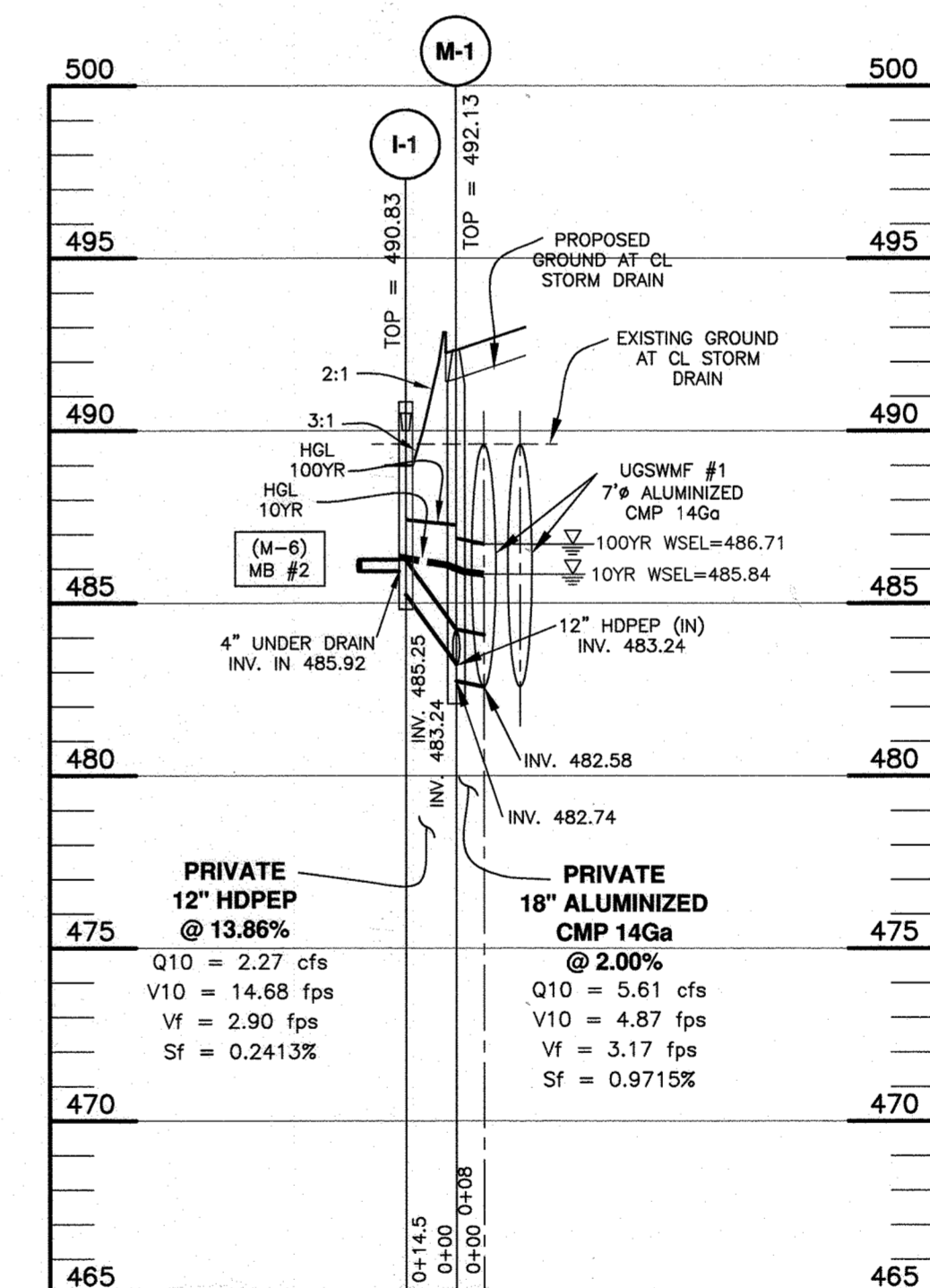
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



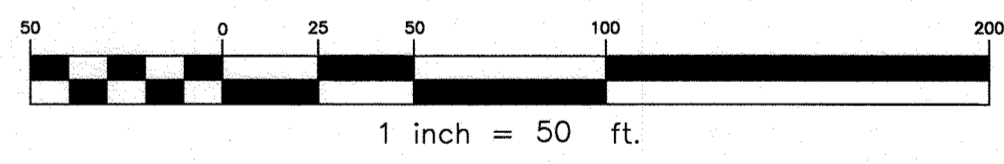
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

STORM DRAIN STRUCTURE SCHEDULE									
STRUCT NO.	TYPE	HO.CO. STD. DETAIL	LOCATION	INVERT IN	INVERT OUT	TOP ELEVATION	THROAT ELEVATION	MAINTENANCE	
INLETS									
I-1	D inlet (open on 2 sides)	D-4.10	N 563568.61 E 1331154.10	485.92 (4")	485.25 (12")	490.83	490.00	PRIVATE	
I-2	D inlet (open on 2 sides)	D-4.10	N 563584.34 E 1331077.58	484.92 (4")	484.25 (12")	488.83	488.00	PRIVATE	
I-3	double S inlet	D-4.23	N 563623.22 E 1331439.21	-	484.00 (18")	487.50	NA	PRIVATE	
I-4	D inlet (open on 2 sides)	D-4.10	N 563816.37 E 1331394.34	488.92 (4")	488.00 (15")	493.83	493.00	PRIVATE	
I-5	S comb	D-4.32	N 563691.81 E 1331472.99	485.60 (18")	485.40 (18")	489.63	NA	PRIVATE	
I-6	A-5 (3.0' wide)	D-4.01	N 563737.86 E 1331431.56	488.81 (18")	486.10 (18")	492.32	491.72	PRIVATE	
I-7	double S inlet	D-4.23	N 563710.72 E 1331253.38	489.30 (6")	-	489.00	NA	PRIVATE	
I-8	double S inlet	D-4.23	N 563888.30 E 1331555.69	489.21 (6")	-	488.21	NA	PRIVATE	
I-9	A-5 (3.0' wide)	D-4.01	N 563747.62 E 1330965.54	487.31 (6")	486.51 (18")	492.64	492.04	PRIVATE	
I-10	A-5 (3.0' wide)	D-4.01	N 563849.87 E 1331056.71	-	487.54 (18")	491.16	490.56	PRIVATE	
I-11	A-5 (2.5' wide)	D-4.01	N 563624.94 E 1330888.51	487.00 (6")	-	484.75 (18")	489.75	PRIVATE	
I-12	S inlet	D-4.22	N 563572.71 E 1330873.42	-	481.80 (6")	481.80	NA	PRIVATE	
I-13	double S inlet	D-4.23	N 563703.08 E 1331429.51	488.03 (8")	-	487.20	NA	PRIVATE	
I-14	A-5 (2.5' wide)	D-4.01	N 563598.60 E 1331294.10	490.00 (6")	-	486.85 (18")	483.64	PRIVATE	
I-15	A-10 (3.0' wide)	D-4.03	N 563593.16 E 1331186.67	-	486.05 (18")	485.85 (18")	492.35	PRIVATE	
I-16	A-5 (3.0' wide)	D-4.01	N 563915.29 E 1331116.68	-	487.10 (18")	491.80	491.20	PRIVATE	
MANHOLES									
M-1	See detail sheet 14	NA	N 563613.12 E 1331344.57	-	481.58 (18")	481.58 (18")	491.77	PRIVATE	
M-2	See detail sheet 15	NA	N 563774.84 E 1331006.15	-	479.00 (18")	476.05 (24")	493.25	PRIVATE	
M-1	4" Diameter Pre-Cast	G-5.12	N 563603.02 E 1331153.34	483.24 (12")	483.24 (12")	482.74 (18")	492.13	PRIVATE	
M-2	4" Diameter Pre-Cast	G-5.12	N 563598.96 E 1331076.81	-	484.16 (12")	483.96 (12")	491.43	PRIVATE	
M-3	4" Diameter Pre-Cast	G-5.12	N 563644.18 E 1331415.97	483.40 (18")	483.40 (18")	482.90 (24")	490.65	PRIVATE	
M-4	4" Diameter Pre-Cast	G-5.12	N 563797.81 E 1331414.94	-	487.44 (18")	486.33 (18")	492.53	PRIVATE	
M-5	4" Diameter Pre-Cast	G-5.12	N 563734.48 E 1331349.66	-	487.43 (18")	487.23 (18")	493.81	PRIVATE	
M-6	4" Diameter Pre-Cast	G-5.12	N 563757.43 E 1331452.17	-	486.45 (18")	486.25 (18")	491.00	PRIVATE	
M-7	4" Diameter Pre-Cast	G-5.12	N 563633.08 E 1331429.51	487.11 (18")	-	487.11 (18")	492.70	PRIVATE	
M-8	4" Diameter Pre-Cast	G-5.12	N 563667.63 E 1330880.94	-	485.18 (18")	484.98 (18")	491.00	PRIVATE	
M-9	4" Diameter Pre-Cast	G-5.12	N 563608.23 E 1330895.99	-	481.33 (18")	481.13 (18")	491.10	PRIVATE	
M-10	4" Diameter Pre-Cast	G-5.12	N 563653.22 E 1330889.53	-	480.62 (18")	480.42 (18")	490.40	PRIVATE	
M-11	4" Diameter Pre-Cast	G-5.12	N 563915.15 E 1331173.10	484.50 (18")	484.50 (18")	484.30 (18")	493.96	PRIVATE	
M-12	4" Diameter Pre-Cast	G-5.12	N 563842.29 E 1331107.42	-	486.44 (18")	486.24 (18")	491.76	PRIVATE	
M-13	4" Diameter Pre-Cast	G-5.12	N 563565.03 E 1331216.07	490.07 (8"x18.5" (18")	485.57 (18")	485.37 (18")	493.36	PRIVATE	
M-14	4" Diameter Pre-Cast	G-5.12	N 564013.27 E 1331240.01	489.00 (8")	486.30 (18")	486.10 (18")	492.64	PRIVATE	
M-15	4" Diameter Pre-Cast	G-5.12	N 563704.93 E 1331323.03	-	487.83 (18")	487.63 (18")	495.00	PRIVATE	
M-16	4" Diameter Pre-Cast	G-5.12	N 563767.73 E 1330992.75	-	479.65 (18")	479.45 (18")	492.86	PRIVATE	
M-17	4" Diameter Pre-Cast	G-5.12	N 563757.52 E 1331004.08	-	479.30 (18")	479.10 (18")	493.21	PRIVATE	
M-18	4" Diameter Pre-Cast	G-5.12	N 563611.26 E 1330865.25	-	484.50 (18")	484.30 (18")	493.21	PRIVATE	
M-19	4" Diameter Pre-Cast	G-5.12	N 563592.15 E 1331345.68	475.34 (24")	474.09 (24")	482.2	482.2	PRIVATE	
END SECTIONS									
E-1	18" HDPE	NA	N 563673.60 E 1331479.79	-	-	485.00 (18")	-	PRIVATE	
E-2	24" Concrete	D-5.61	N 563895.80 E 1330929.83	-	-	475.33 (24")	-	PRIVATE	
E-3	18" HDPE	NA	N 563625.73 E 1330858.60	-	-	484.50 (18")	-	PRIVATE	
E-4	18" HDPE	NA	N 563611.26 E 1330865.25	-	-	484.50 (18")	-	PRIVATE	
HW-1	Type C 18" Concrete	D-5.21	N 563592.15 E 1331345.68	-	-	481.37 (18")	484.62	PRIVATE	

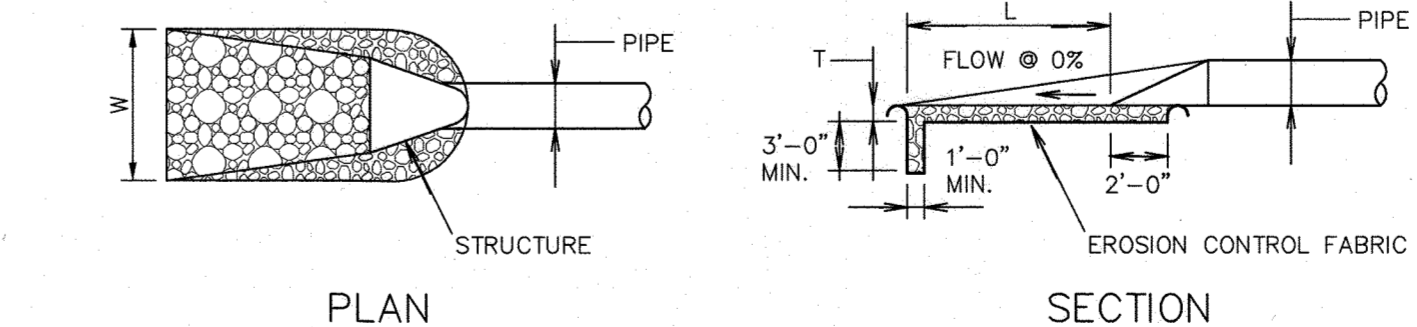
STRUCTURE LOCATION FOR MANHOLES IS AT THE CENTER OF THE MANHOLE
STRUCTURE LOCATION FOR TYPE 'A' INLETS IS AT THE MIDPOINT ALONG THE GUTTER PAN
STRUCTURE LOCATION FOR TYPE 'S' INLETS IS AT THE CENTER OF THE GRADE
STRUCTURE LOCATION FOR END SECTIONS IS AT THE MIDPOINT OF THE END OF THE STRUCTURE
PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.

STORM DRAIN PIPE SCHEDULE			
SIZE	TYPE	LENGTH (L.F.)	MAINTENANCE
6"	PVC (ROOF DRAIN MANIFOLD)	1378	PRIVATE
8"	PVC (ROOF DRAIN MANIFOLD)	204	PRIVATE
12"	HDPEP	106	PRIVATE
15"	HDPEP	28	PRIVATE
18"	HDPEP	1783	PRIVATE
18"	ALUMINIZED CMP 14Ga	72	PRIVATE
24"	ALUMINIZED CMP 14Ga	91	PRIVATE
24"	RCCP CL IV	138	PRIVATE

All HDPE pipes shall have smooth interior. No interior corrugations.



- CONSTRUCTION SPECIFICATIONS**
- THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
 - THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.
 - GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE PREPARED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.
 - STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR THE RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.
 - THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.



STRUCTURE	Q ₂ (cfs)	V ₂ (fps)	d ₂ (ft)	Q ₁₀ (cfs)	V ₁₀ (fps)	d ₁₀ (ft)	d ₅₀	LENGTH (L)	WIDTH (W)	THICK (T)	SHA CLASS
HW-1	0.67	3.90	0.23	0.85	4.13	0.26	9.5"	8'	9.5'	19"	I
E-1	-	-	-	7.99	14.94	0.51	9.5"	FOREBAY	FOREBAY	19"	I
E-2	0.72	2.58	0.23	0.93	2.71	0.33	9.5"	8'	10'	19"	I
E-3	-	-	-	2.71	6.05	0.50	9.5"	FOREBAY	FOREBAY	19"	I
E-4	-	-	-	2.46	5.69	0.30	9.5"	FOREBAY	FOREBAY	19"	I

OUTLET PROTECTION DETAIL
NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Howard County Department of Planning and Zoning
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE: 4-2-19

Howard County Department of Land Development
CHIEF, DIVISION OF LAND DEVELOPMENT
DATE: 4-4-19

Howard County Department of Planning and Zoning
DIRECTOR
DATE: 4-4-19

NO. 1 DATE 1/13/2021 ADD MANHOLE M-19 TO STRUCTURE SCHEDULE REVISION

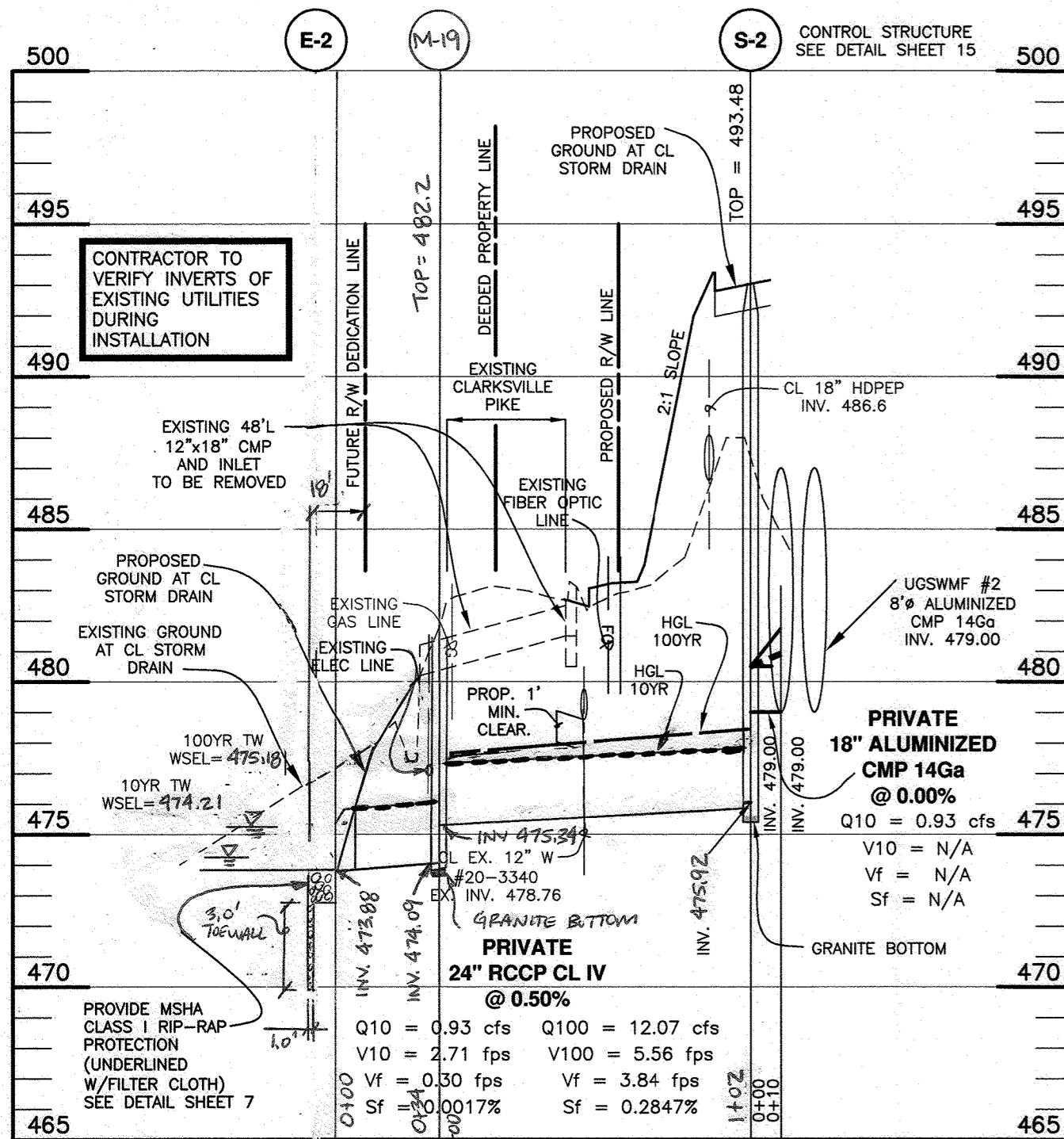
BENCHMARK ENGINEERING, INC.
ENGINEERS & LAND SURVEYORS & PLANNERS
8480 BALTIMORE NATIONAL PIKE SUITE 315 & ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

OWNER: STEPHEN A. KLEIN & ASSOCIATES
C/O STEPHEN KLEIN, INC.
12165 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21029
410-465-4244

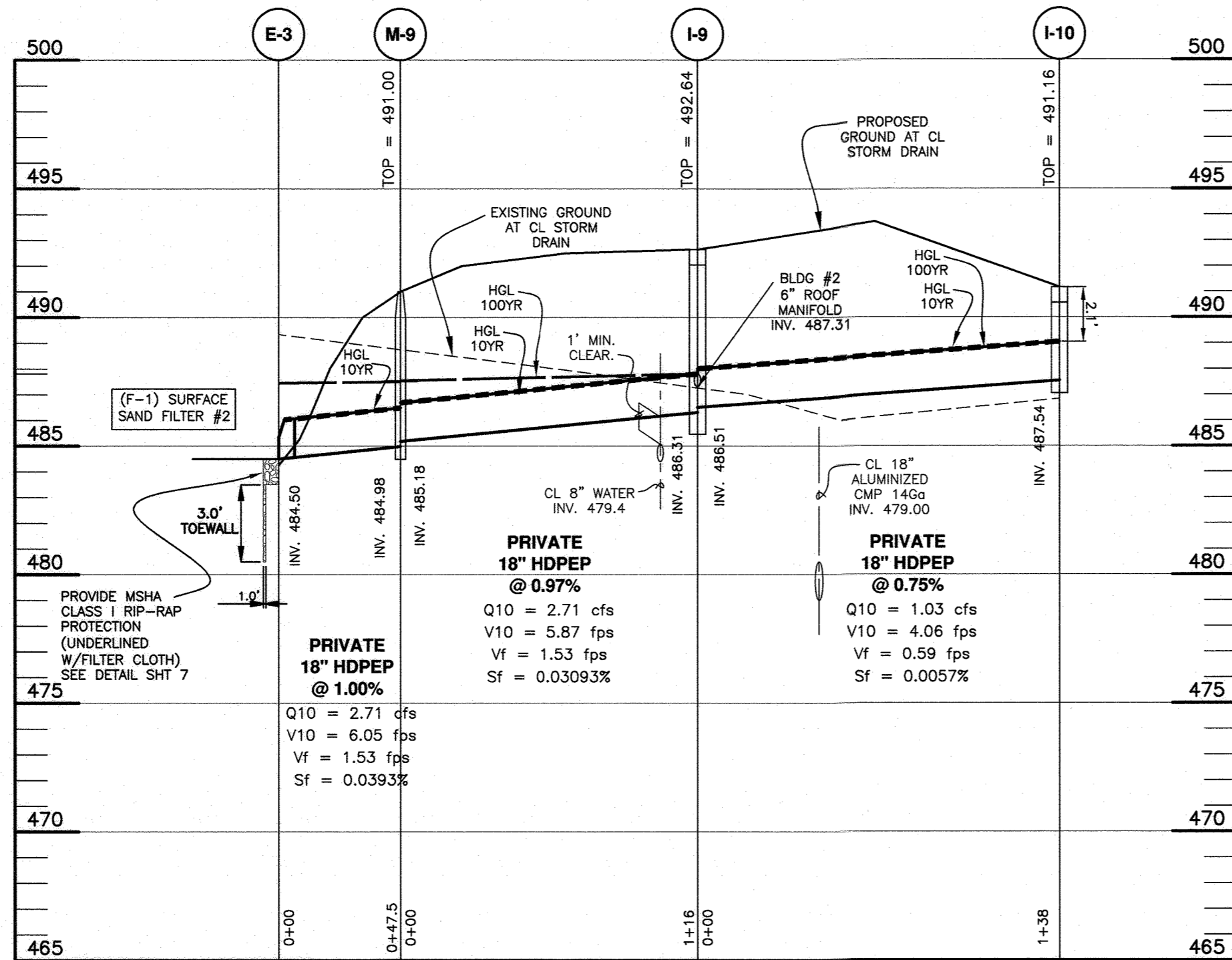
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC
P.O. BOX 417
ELLICOTT CITY, MARYLAND 21041
410-465-4244

RIVER HILL SQUARE
REDEVELOPMENT OF RIVER HILL GARDEN CENTER
TAX MAP: 35 - GRID: 1 - PARCEL: 1
ZONED: B-1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

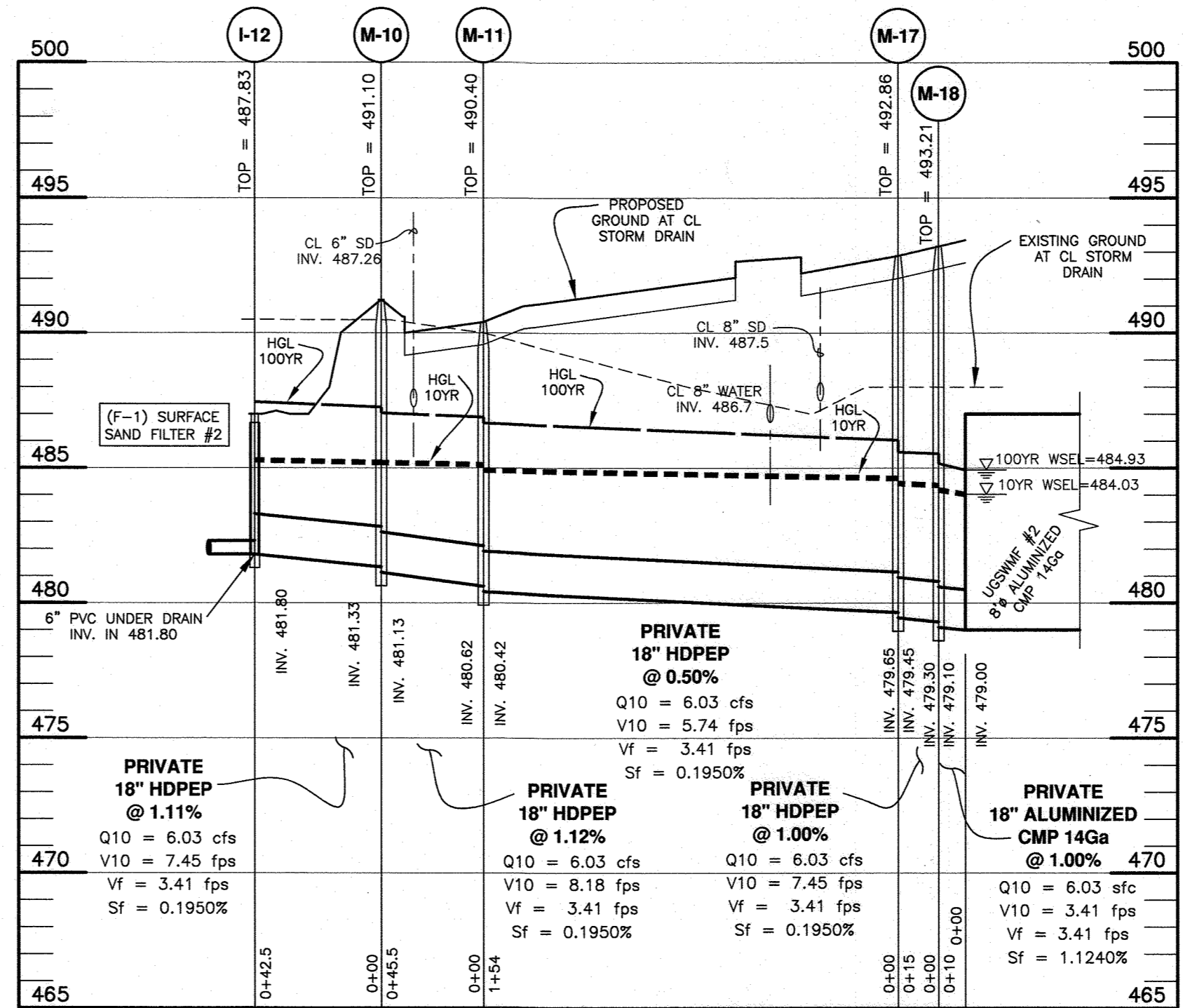
STORM DRAIN PROFILES & DETAILS
DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN SHEET 7 OF 25



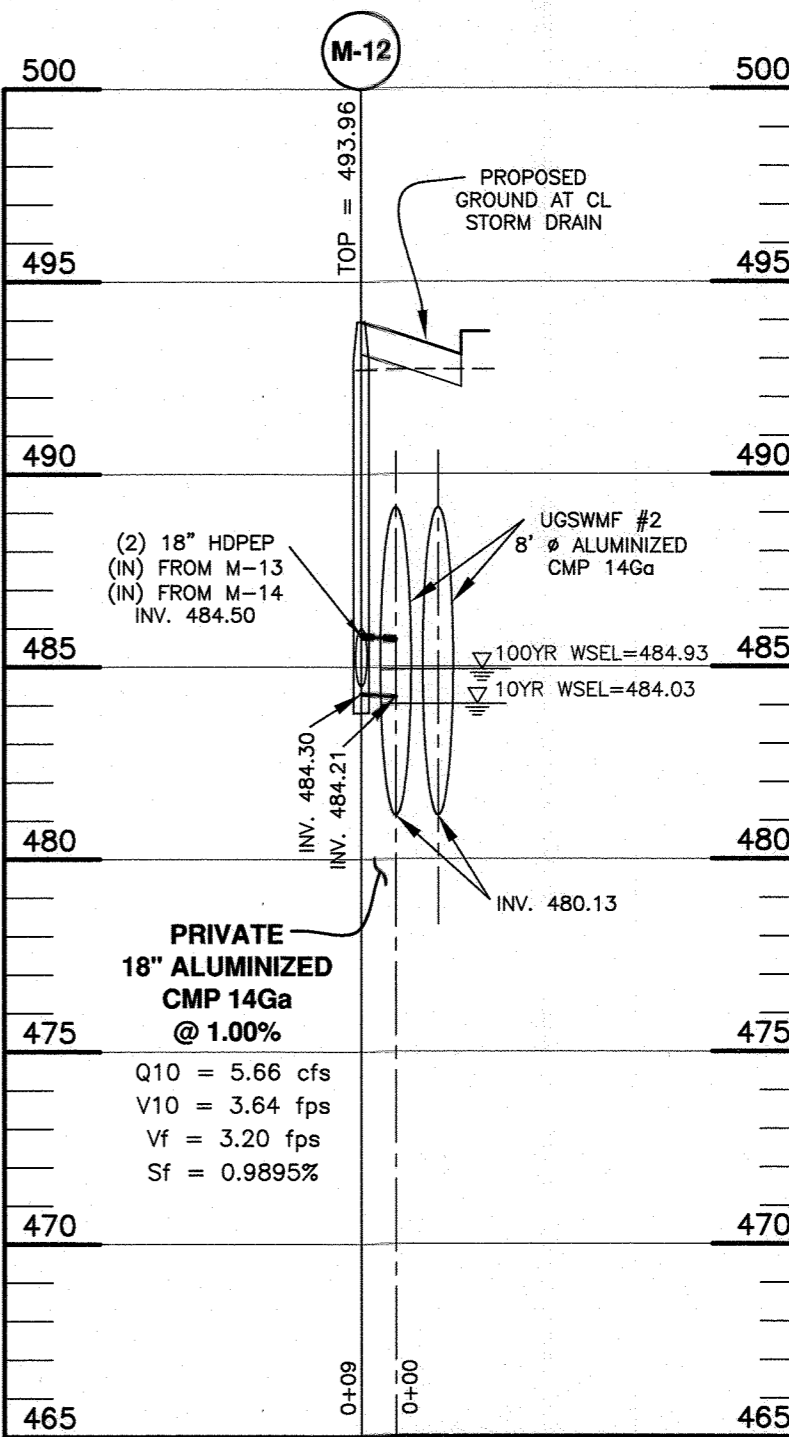
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



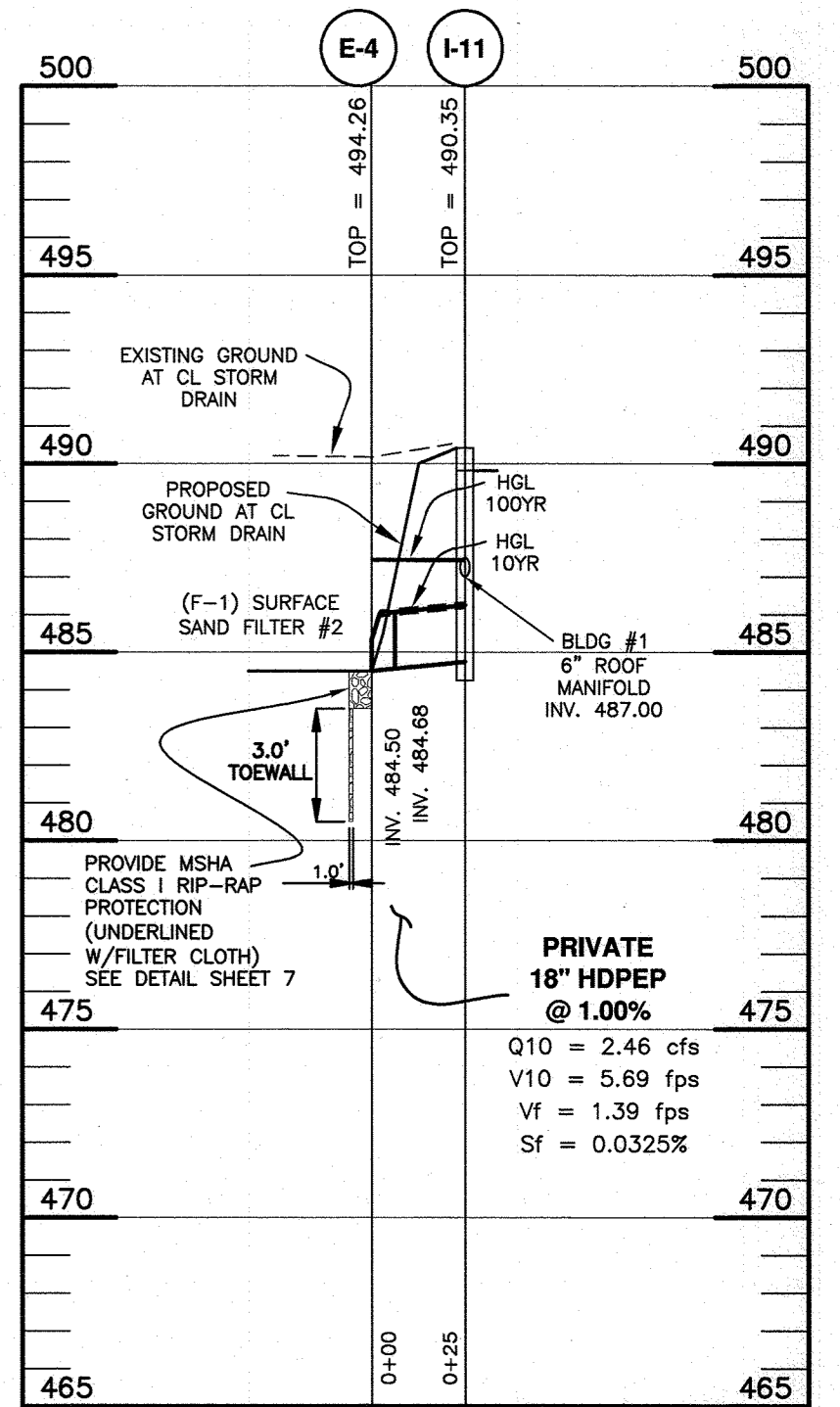
STORM DRAIN PROFILE
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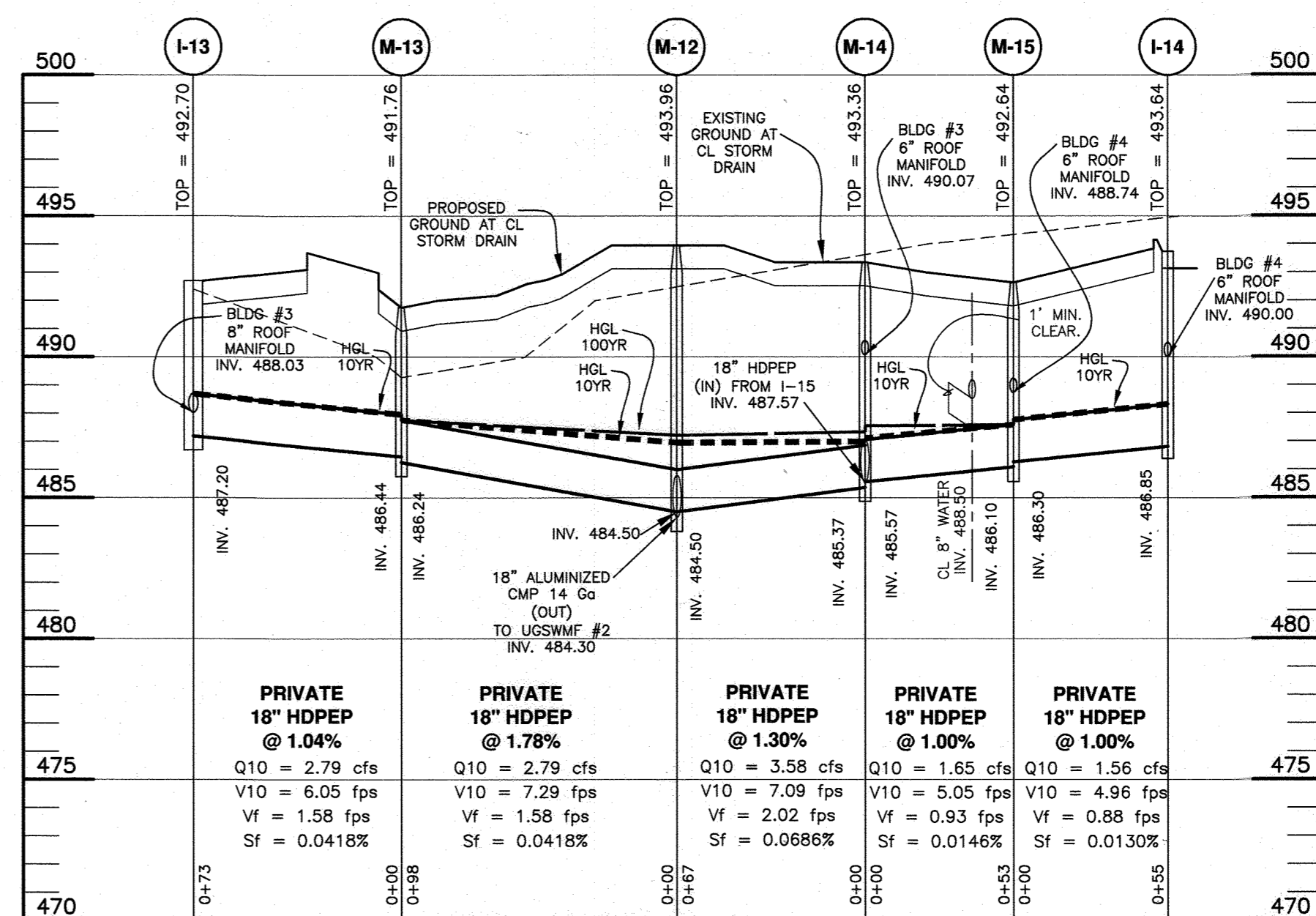
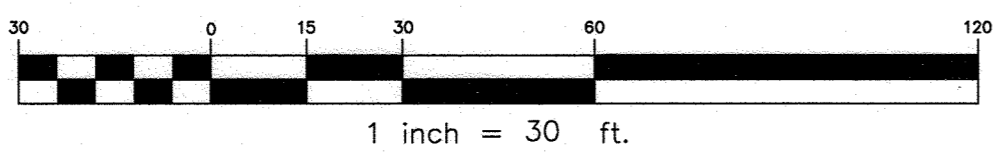
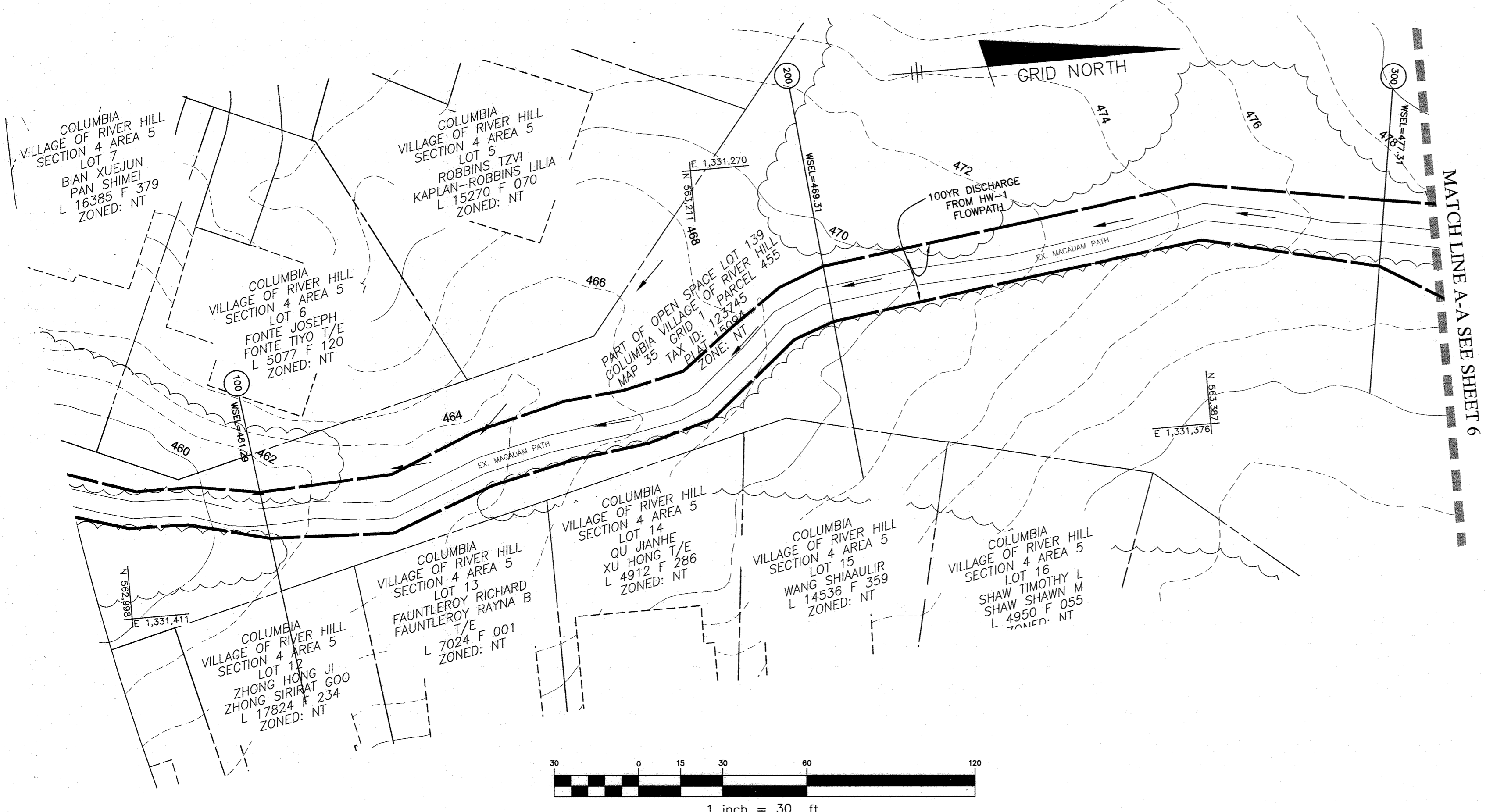
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



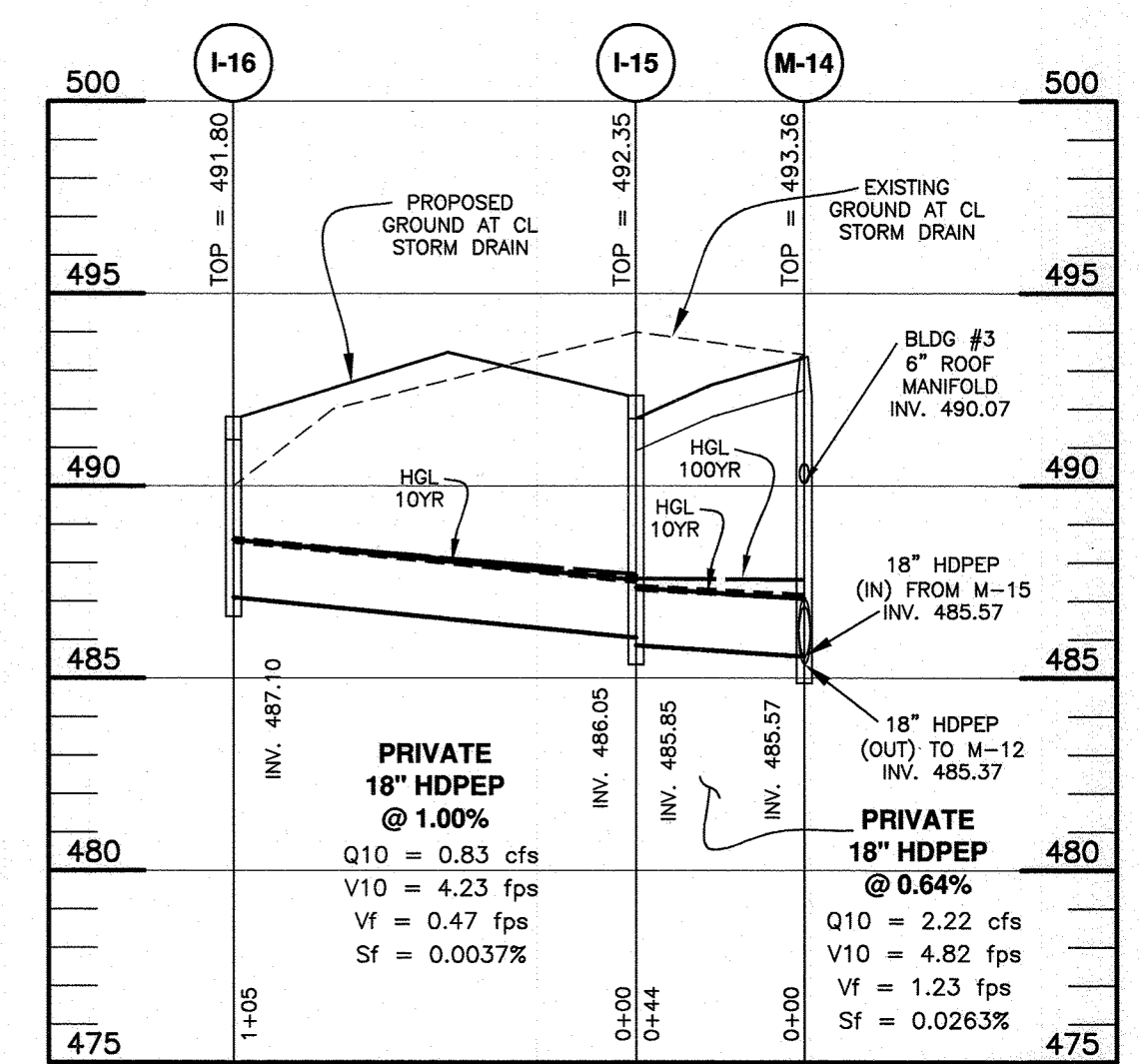
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



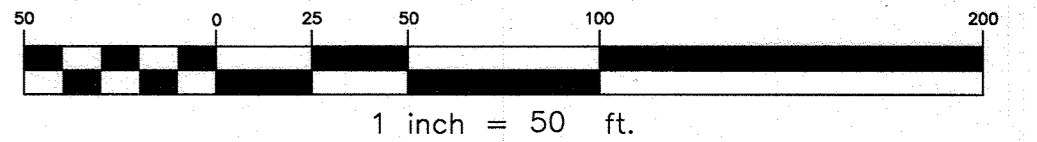
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



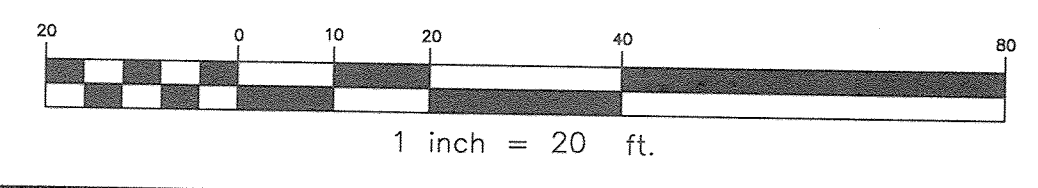
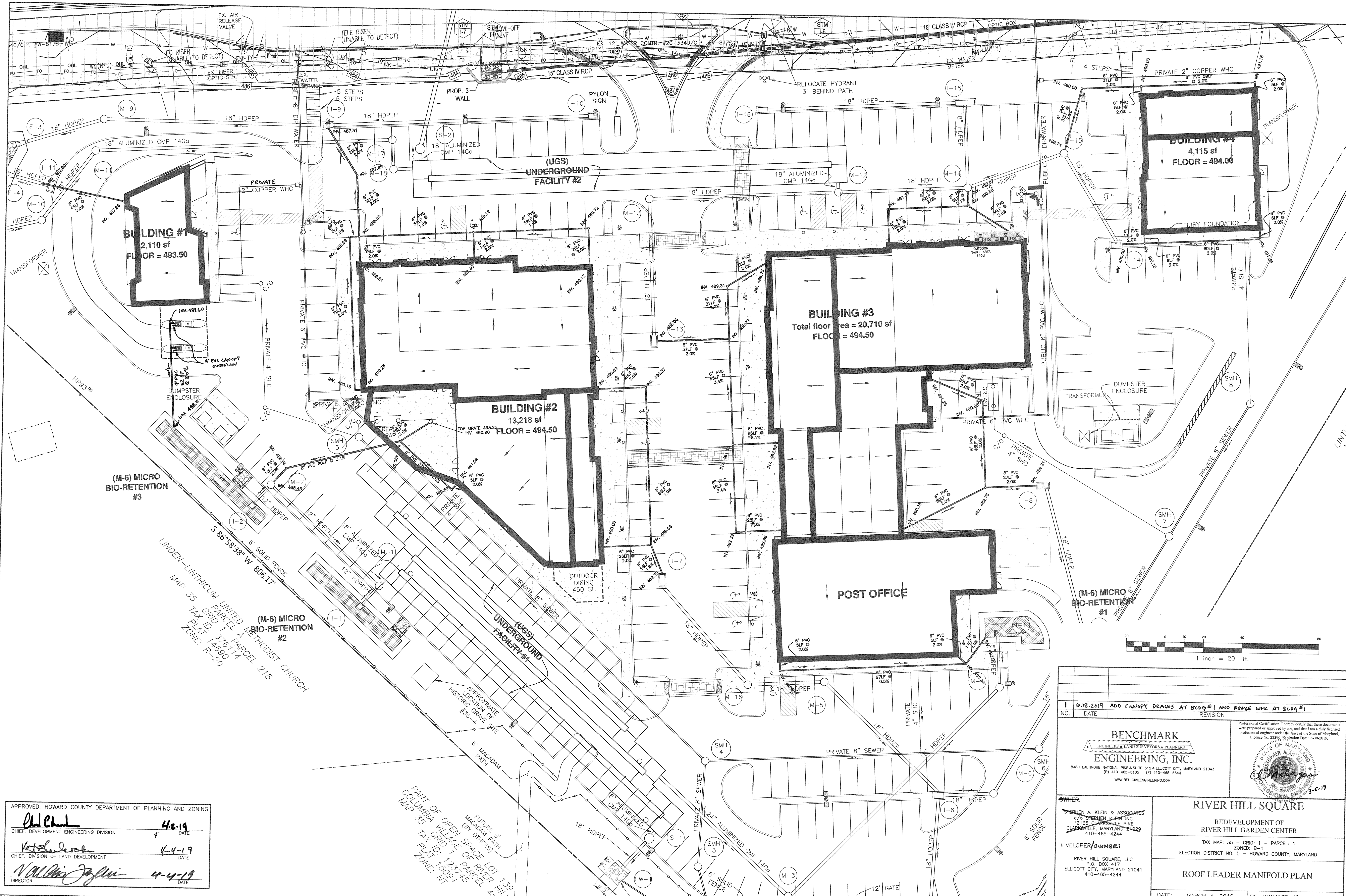
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4-4-19
DIRECTOR

1 1.12.2021 REVISE PROFILE FROM E-2 TO S-2 TO ADD MANHOLE M-19 NO. DATE REVISION	
BENCHMARK ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BEI-CIVILENGINEERING.COM	
PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22399, Expiration Date: 6-30-2019.	
OWNER: STEPHEN A. KLEIN & ASSOCIATES c/o STEPHEN KLEIN, INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244	
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244	
RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND	
STORM DRAIN PROFILES	
DESIGN: DBT	DRAFT: DBT
DATE: MARCH 4, 2019	BEI PROJECT NO. 2801
SCALE: AS SHOWN	SHEET 8 OF 25



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Howard 4-2-19 DATE
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

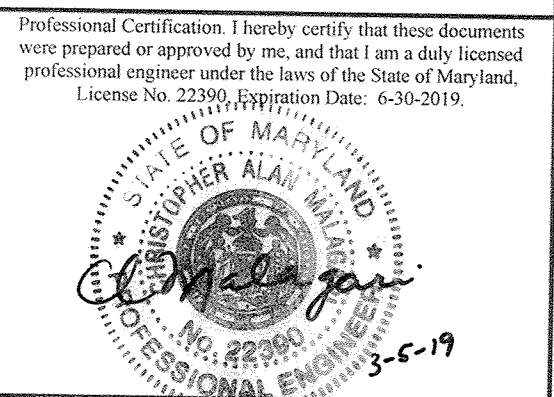
Kate 4-4-19 DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT

N. Vallin 4-4-19 DATE
 DIRECTOR

PART OF OPEN SPACE LOT 139
 COLUMBIA VILLAGE OF RIVER HILL
 MAP 35 GRID 1 OF PARCEL 218
 TAX ID: 123745
 PLAT: 15094
 ZONE: NT

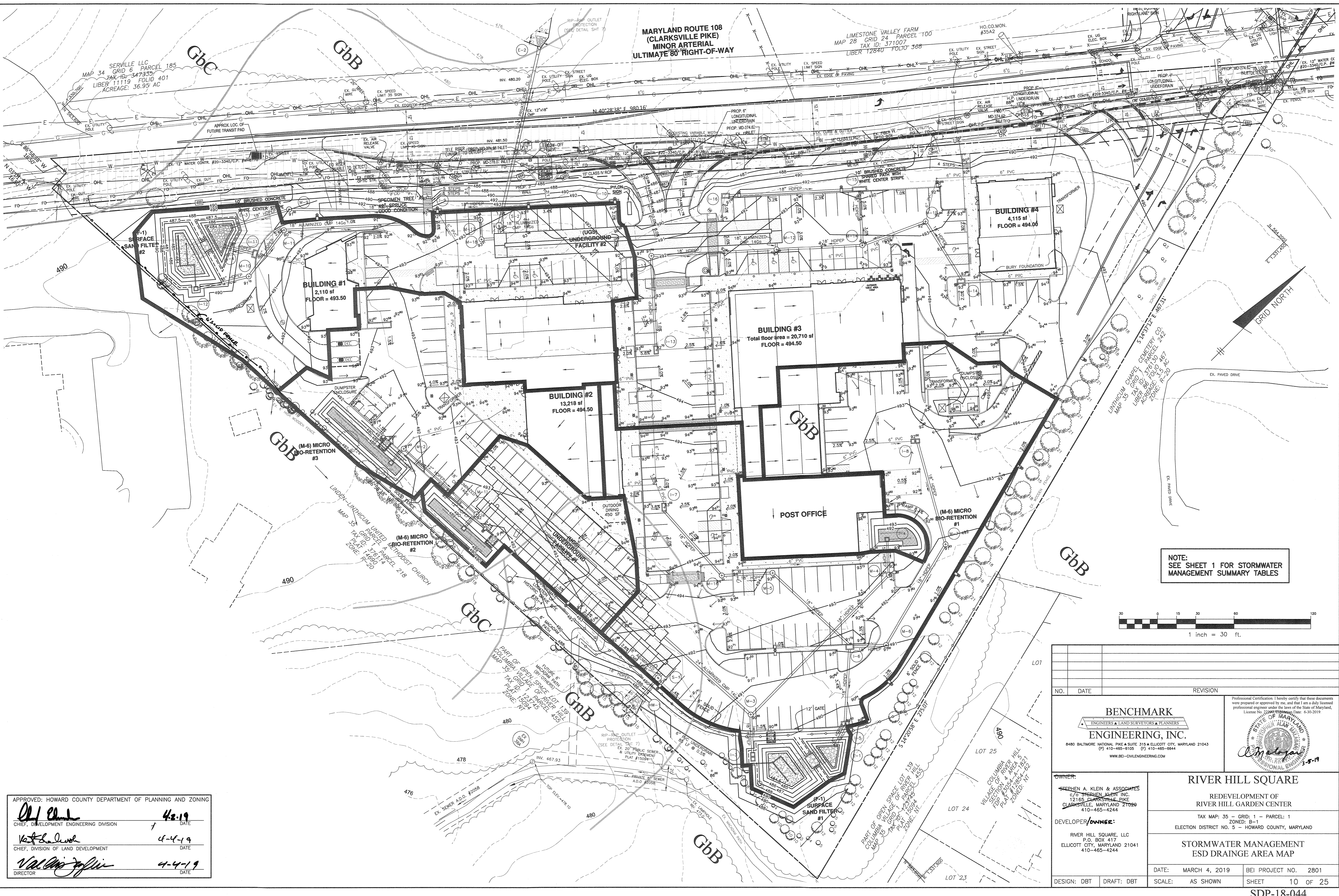
FUTURE 6' MACADAM PATH (BY OTHERS)

1 0-18-2019 ADD CANOPY DRAINS AT BLDG #1 AND REVEGE WHC AT BLDG #4		REVISION
NO.	DATE	REVISION
<p>BENCHMARK ENGINEERING, INC. ENGINEERS & LAND SURVEYORS & PLANNERS 8480 BALTIMORE NATIONAL PIKE & SUITE 315A ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BEI-CIVILENGINEERING.COM</p>		
<p>RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>		
<p>ROOF LEADER MANIFOLD PLAN</p>		
DATE: MARCH 4, 2019	BEI PROJECT NO. 2801	
DESIGN: DBT	DRAFT: DBT	SCALE: AS SHOWN SHEET 9 OF 25

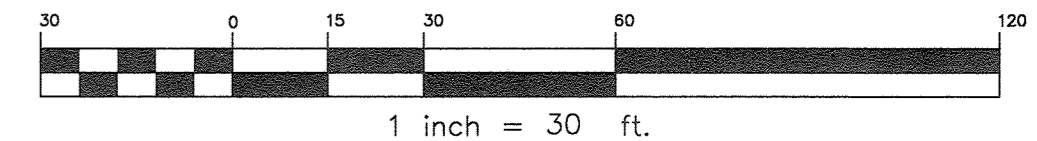


OWNER:
 STEPHEN A. KLEIN & ASSOCIATES
 C/O STEPHEN KLEIN INC.
 12165 CLARKSVILLE PIKE
 CLARKSVILLE, MARYLAND 21029
 410-465-4244

DEVELOPER/OWNER:
 RIVER HILL SQUARE, LLC
 P.O. BOX 417
 ELLICOTT CITY, MARYLAND 21041
 410-465-4244



NOTE:
SEE SHEET 1 FOR STORMWATER
MANAGEMENT SUMMARY TABLES



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Clark 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION

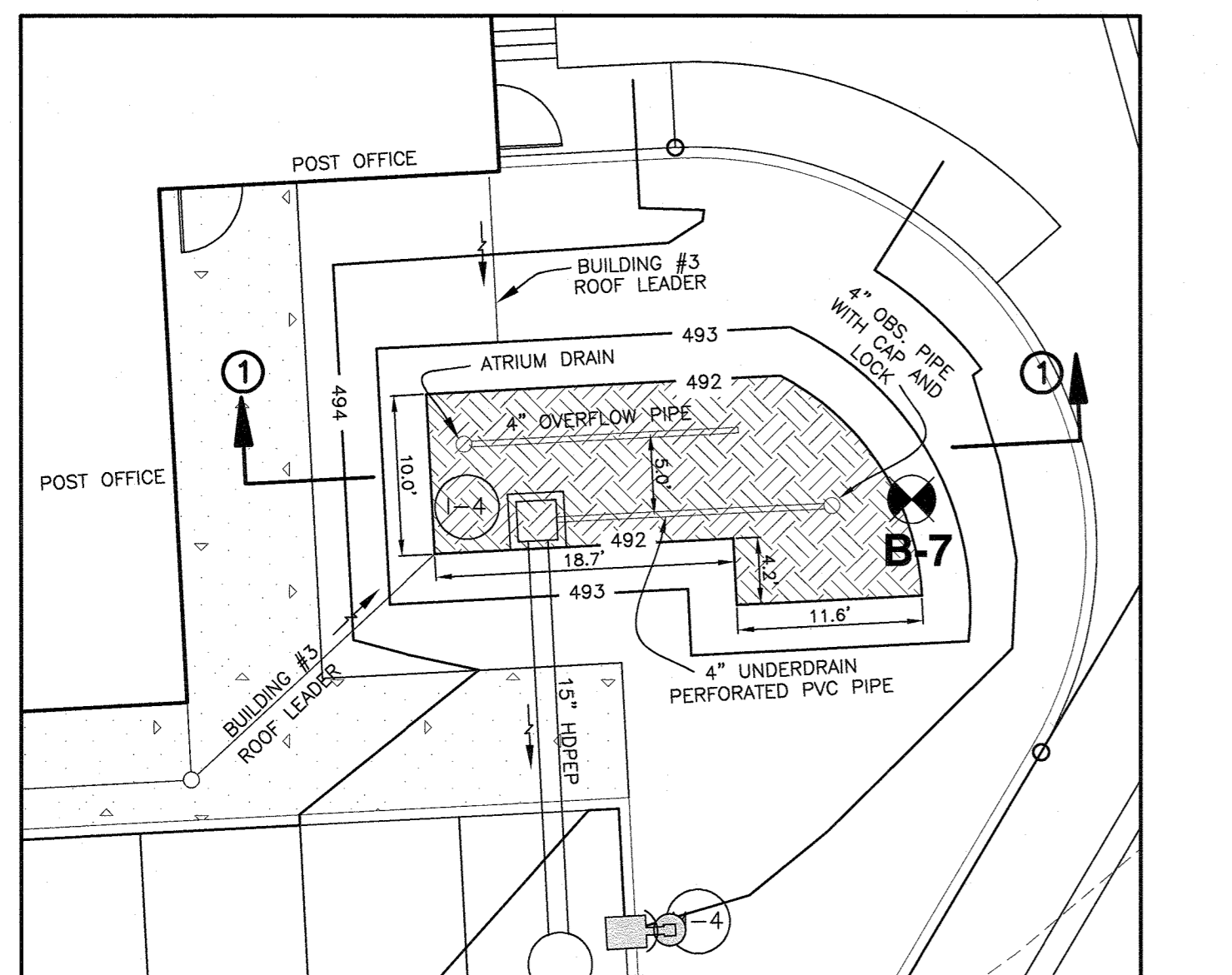
Val Davis 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT

Val Davis 4-4-19
DIRECTOR

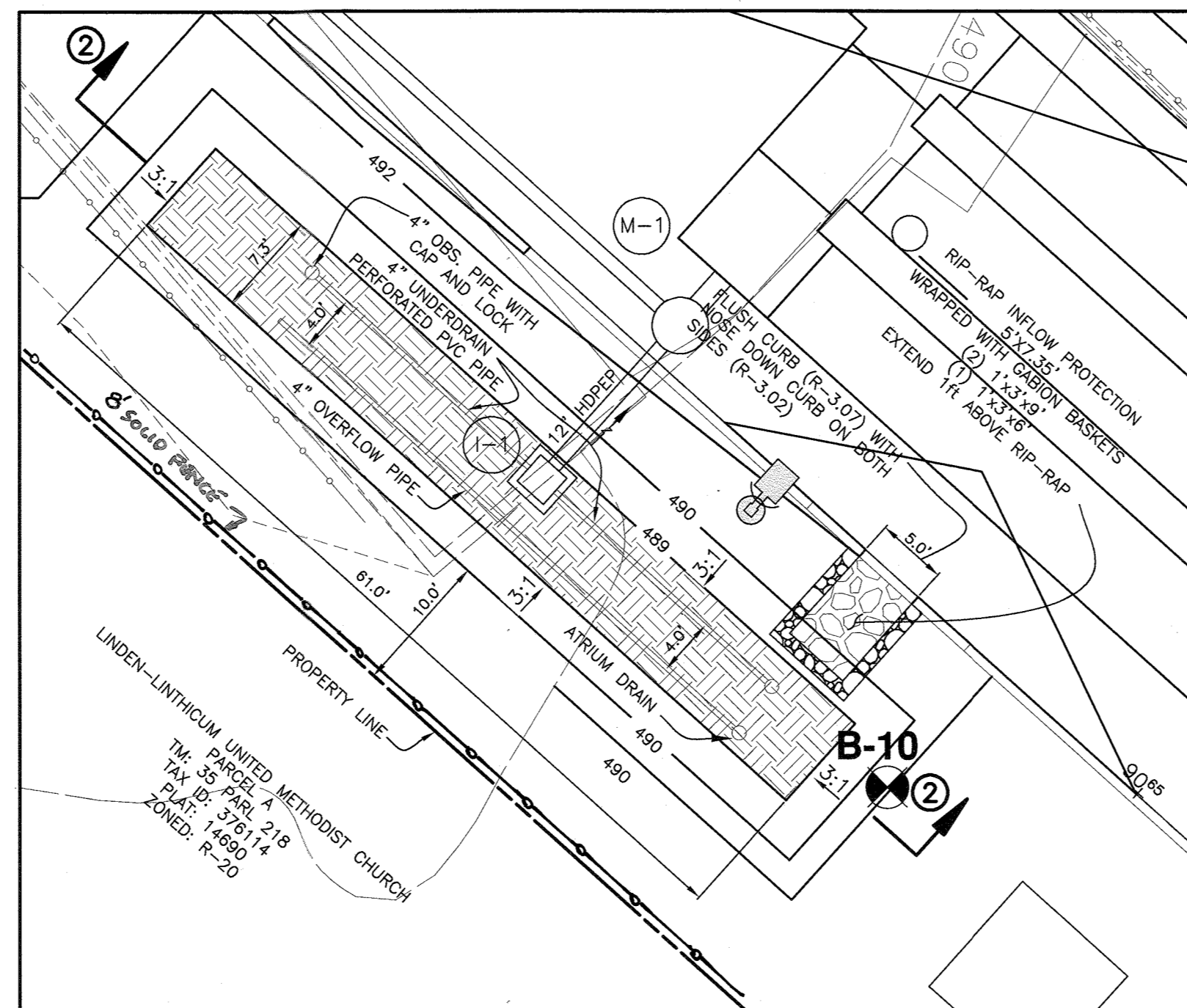
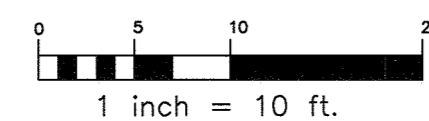
NO.	DATE	REVISION

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
8480 BALTIMORE NATIONAL PIKE SUITE 315 ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6444
WWW.BE-CIVILENGINEERING.COM

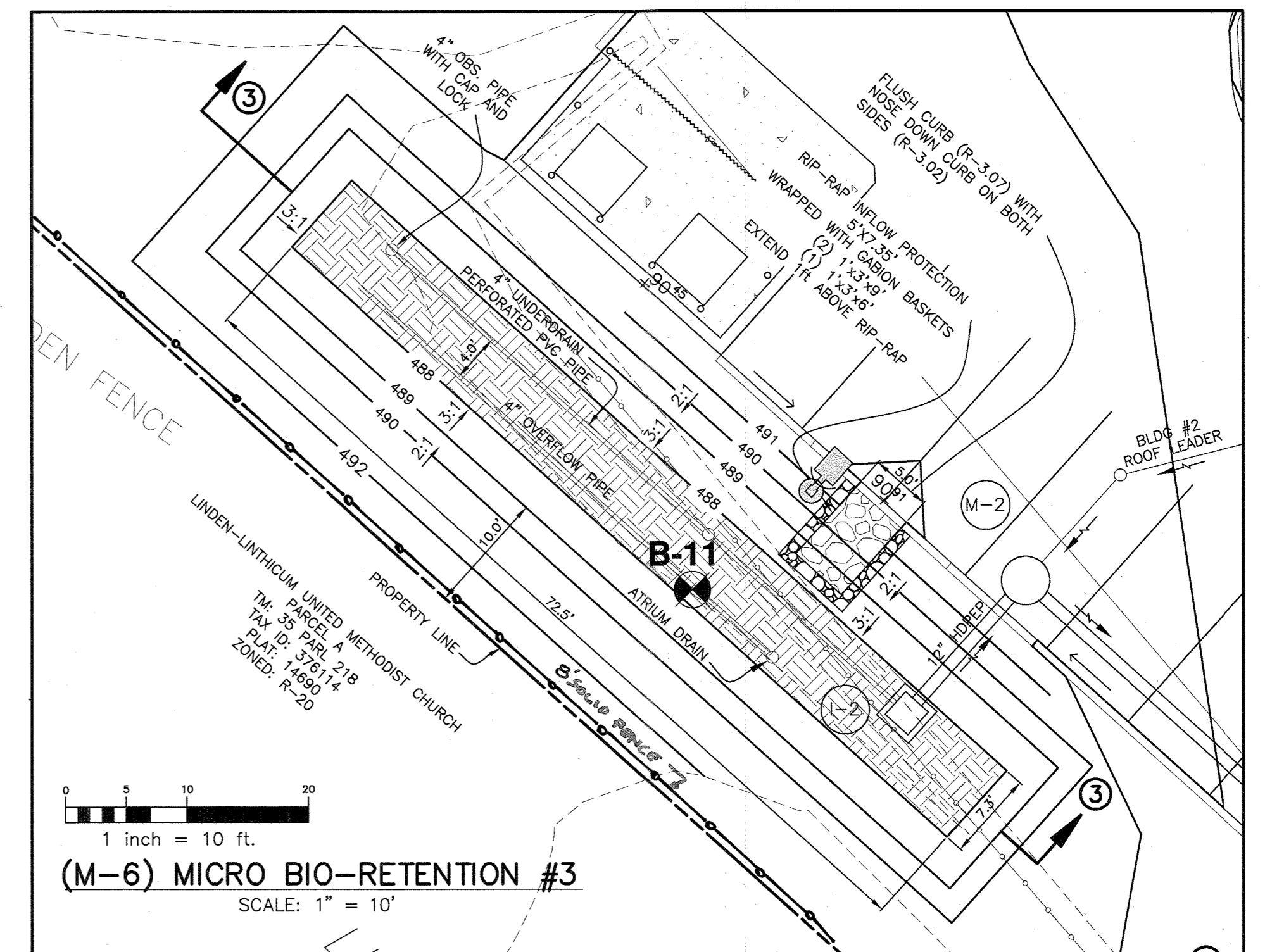
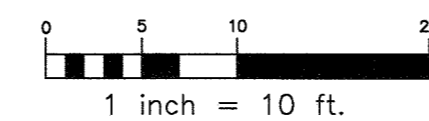
<p>OWNER: STEPHEN A. KLEIN & ASSOCIATES 270 SHERMAN ALERT INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244</p> <p>DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244</p>	<p>RIVER HILL SQUARE</p> <p>REDEVELOPMENT OF RIVER HILL GARDEN CENTER</p> <p>TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p> <p>STORMWATER MANAGEMENT ESD DRAINAGE AREA MAP</p>
<p>DESIGN: DBT DRAFT: DBT</p>	<p>DATE: MARCH 4, 2019 BEI PROJECT NO. 2801</p> <p>SCALE: AS SHOWN SHEET 10 OF 25</p>



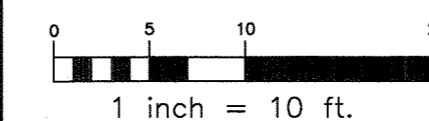
(M-6) MICRO BIO-RETENTION #1
SCALE: 1" = 10'



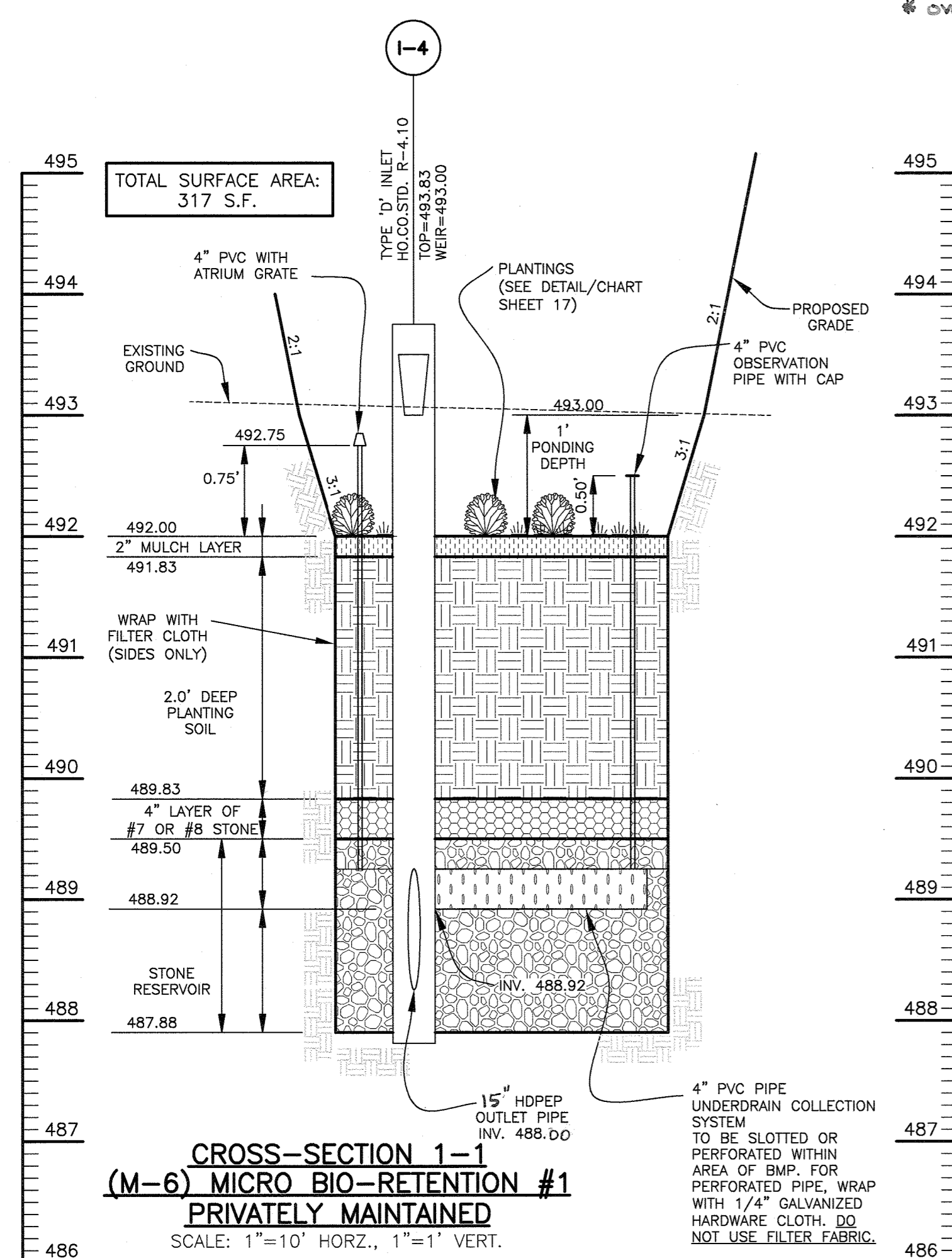
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SCALE: 1" = 10'



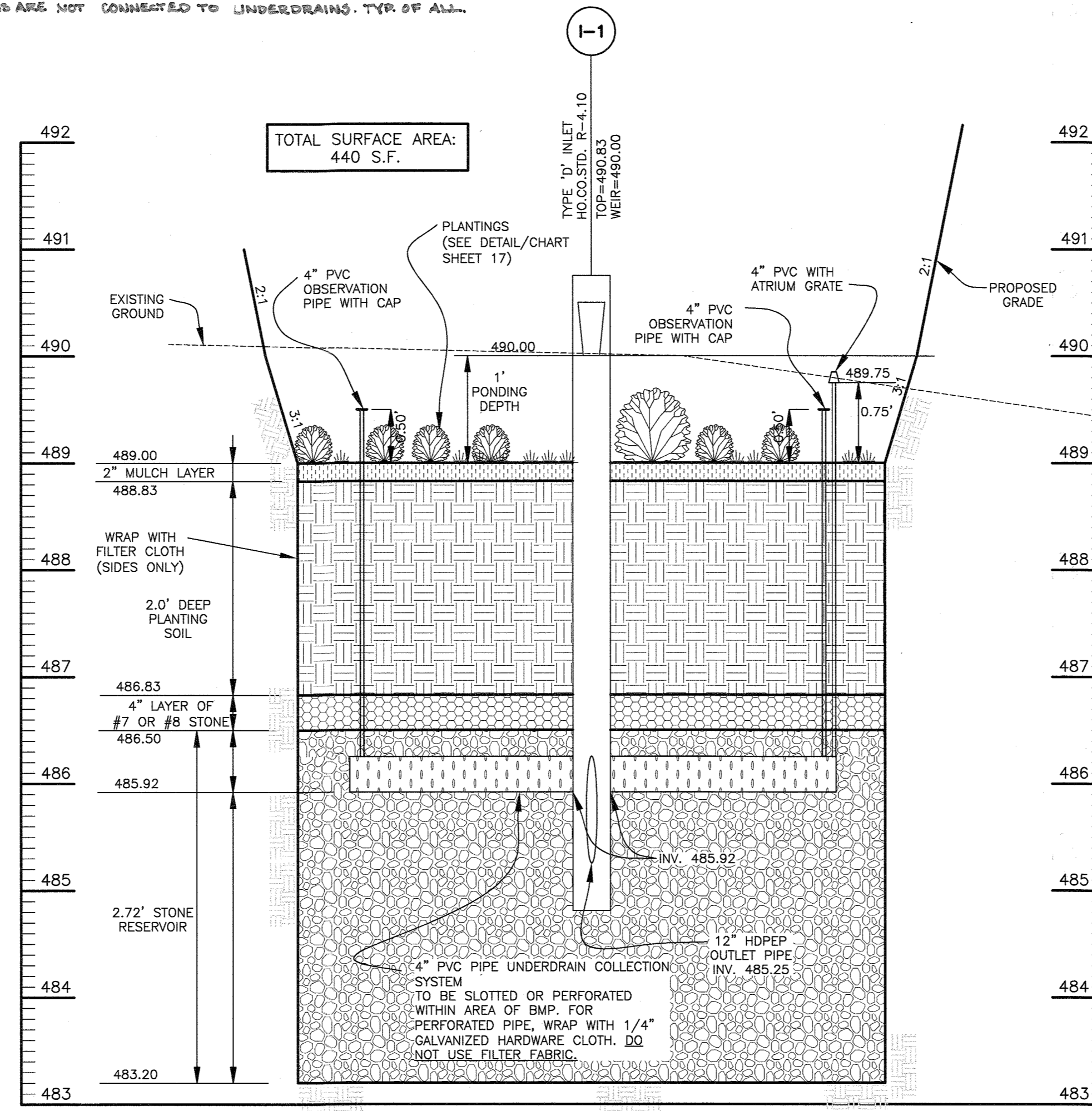
(M-6) MICRO BIO-RETENTION #3
SCALE: 1" = 10'



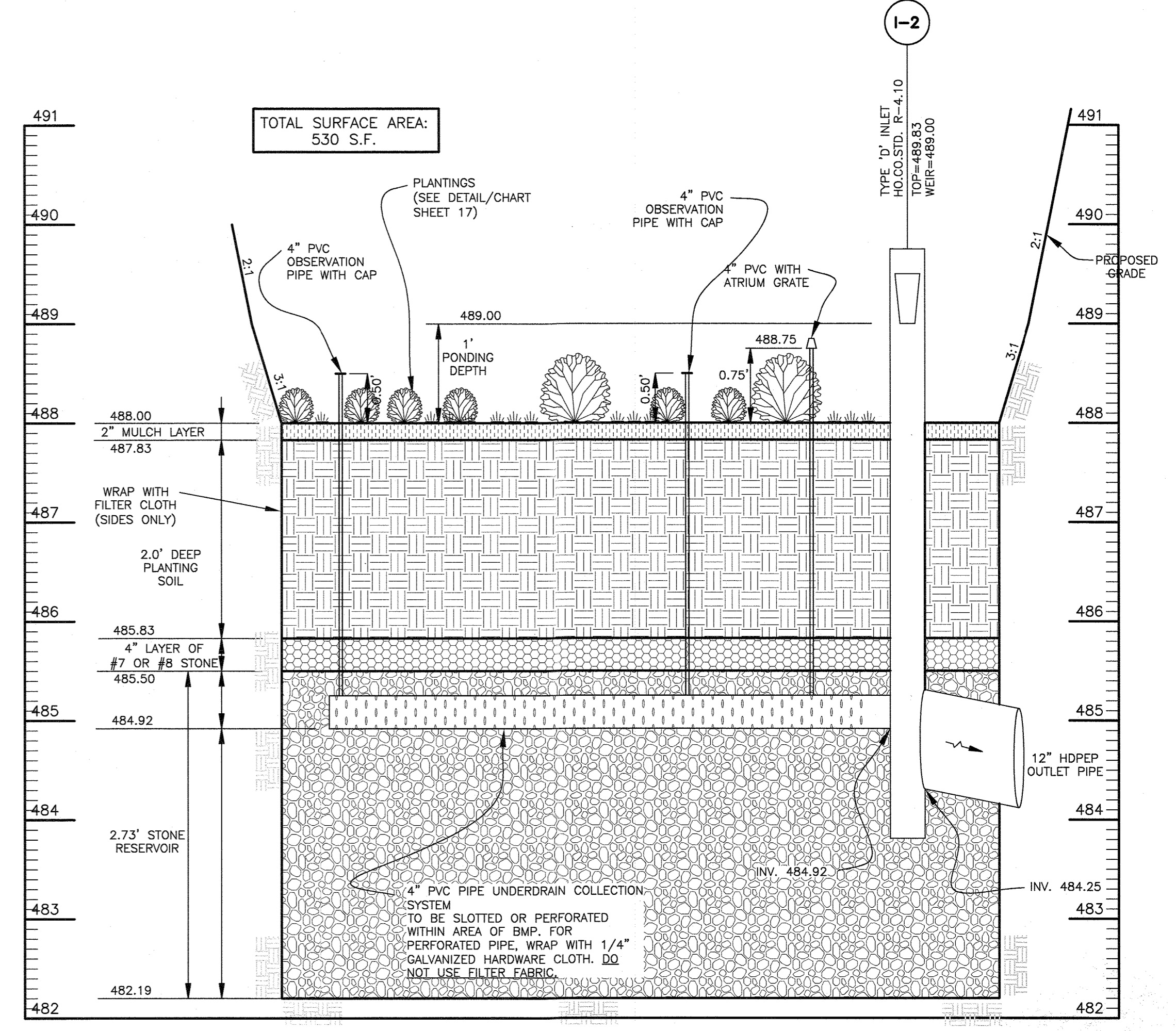
* OVERFLOW DRAINS ARE NOT CONNECTED TO UNDERDRAINS. TYP. OF ALL.



CROSS-SECTION 1-1
(M-6) MICRO BIO-RETENTION #1
PRIVATELY MAINTAINED
SCALE: 1"=10' HORZ., 1"=1' VERT.



CROSS-SECTION 2-2
(M-6) MICRO BIO-RETENTION #2
PRIVATELY MAINTAINED
SCALE: 1"=10' HORZ., 1"=1' VERT.



CROSS-SECTION 3-3
(M-6) MICRO BIO-RETENTION #3
PRIVATELY MAINTAINED
SCALE: 1"=10' HORZ., 1"=1' VERT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 4-9-19
DIRECTOR DATE

NO.	DATE	REVISION
1	3.31.2020	REVISE FENCE TO BE 6" TALL PER BA-19-022V IN MB#2 AND MB#3 DETAIL. CORRECT SIDE AND INVERT OF PIPE @ I-4 IN MB#1 CROSS-SECTION.

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
6480 BALTIMORE NATIONAL PIKE & SUITE 315 A ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BE-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2019.

[Signature] 3-5-19

OWNER:
STEPHEN A. KLEIN & ASSOCIATES
C/O STEPHEN KLEIN INC.
12165 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21029.
410-465-4244

DEVELOPER/OWNER:
RIVER HILL SQUARE, LLC
P.O. BOX 417
ELLCOTT CITY, MARYLAND 21041
410-465-4244

RIVER HILL SQUARE
REDEVELOPMENT OF
RIVER HILL GARDEN CENTER
TAX MAP: 35 - GRID: 1 - PARCEL: 1
ZONED: B-1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

SWM DETAILS
(M-6) MICRO BIO-RETENTION

DESIGN: DBT DRAFT: DBT
DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
SCALE: AS SHOWN SHEET 11 OF 25

Table B.4.1 Materials Specifications for Micro-Bioretenion, 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 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; $f'_c = 3500$ psi @ 28 days, normal weight, air-entrained; 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) <i>not using previously approved State or local standards</i> requires design drawings sealed and approved by a professional structural 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 pressures); 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.

B.4.7

Supp. 1

OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6)

- The Owner shall maintain the plant material, mulch layer and soil layer annually. Maintenance of mulch and soil is limited to correcting areas of erosion or wash out. Any mulch replacement shall be done in the spring. Plant material shall be checked for disease and insect infestation and maintenance will address dead material and pruning. Acceptable replacement plant material is limited to the following: 2000 Maryland Stormwater Design Manual Volume II, Table A.4.1 and 2.
- The Owner shall perform a plant inspection in the spring and in the fall of each year. During the inspection, the Owner shall remove dead and diseased vegetation considered beyond treatment, replace dead plant material with acceptable replacement plant material, treat diseased trees and shrubs, and replace all deficient stakes and wires.
- The Owner shall inspect the mulch each spring. The mulch shall be replaced every two to three years. The previous mulch layer shall be removed the new layer is applied.
- The Owner shall correct soil erosion on an as needed basis, with a minimum of once per month and after each heavy storm.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4-4-19
DIRECTOR

CONSTRUCTION SPECIFICATIONS

B.4.C Specifications for Micro-Bioretenion, 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-bioretenion 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 D 2974). In general, this can be met with a mixture of loamy and (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 textual 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 2" 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-bioretenion 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 urea fertilizer at a rate of 2 pounds per 1000 square feet.

6. Underdrains:

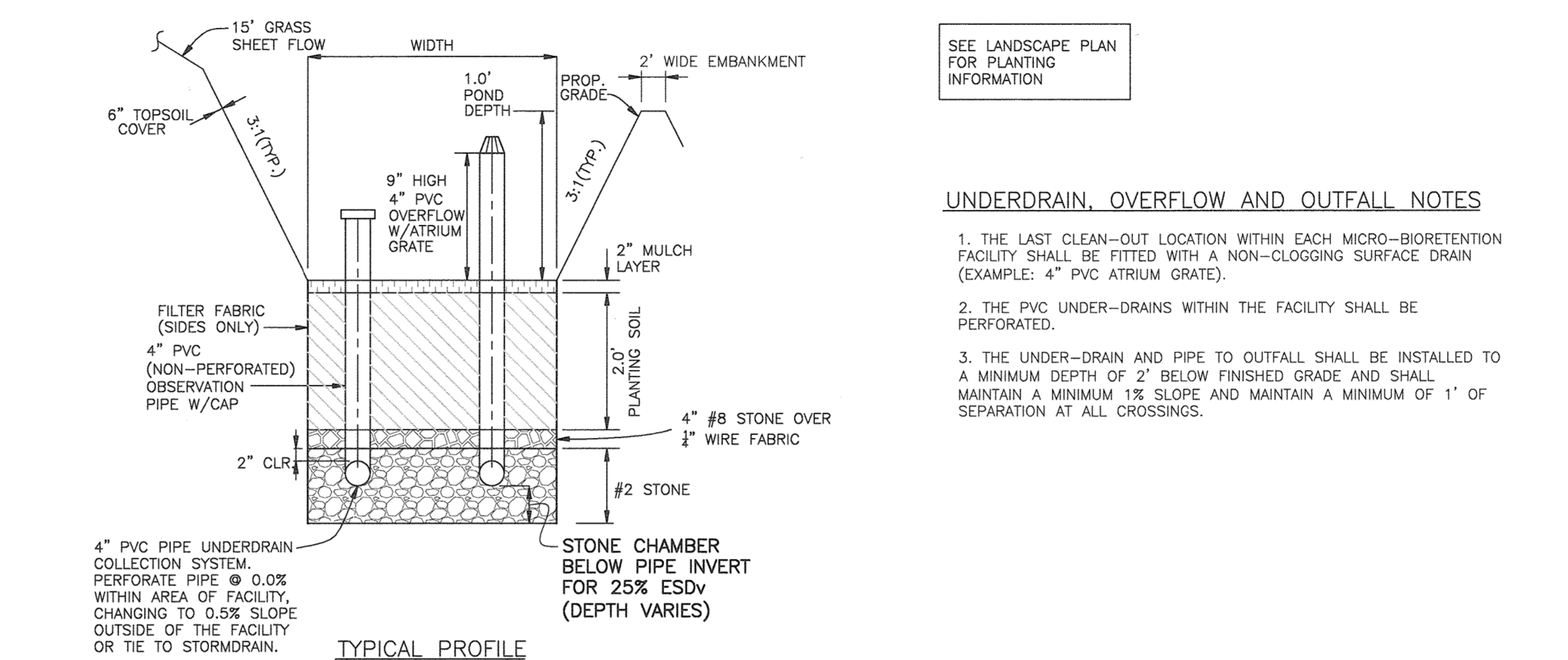
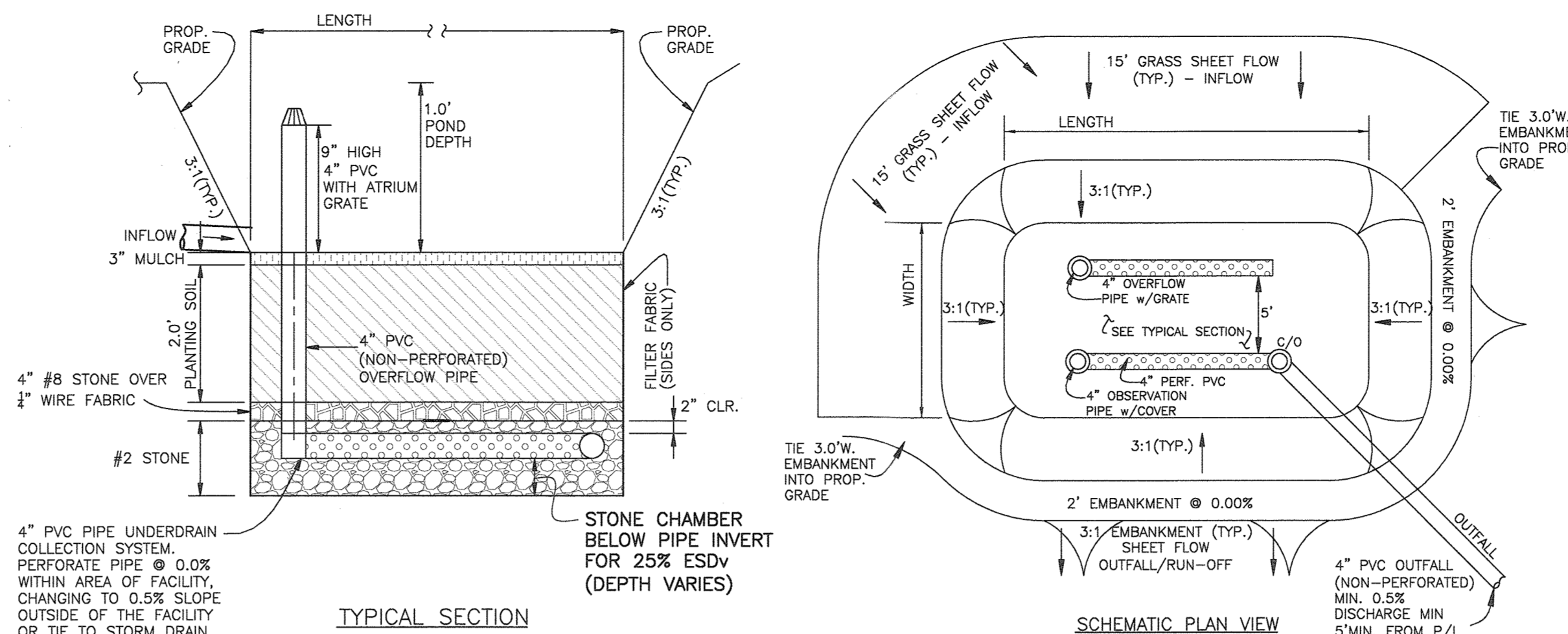
Underdrains should meet the following criteria:

- Pipe- Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTM F 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 3/4" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a 1/4" (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 1,000 square feet) to provide a clean-out port and monitor performance of the filter.
- A 4" layer of pea gravel (1/4" 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:

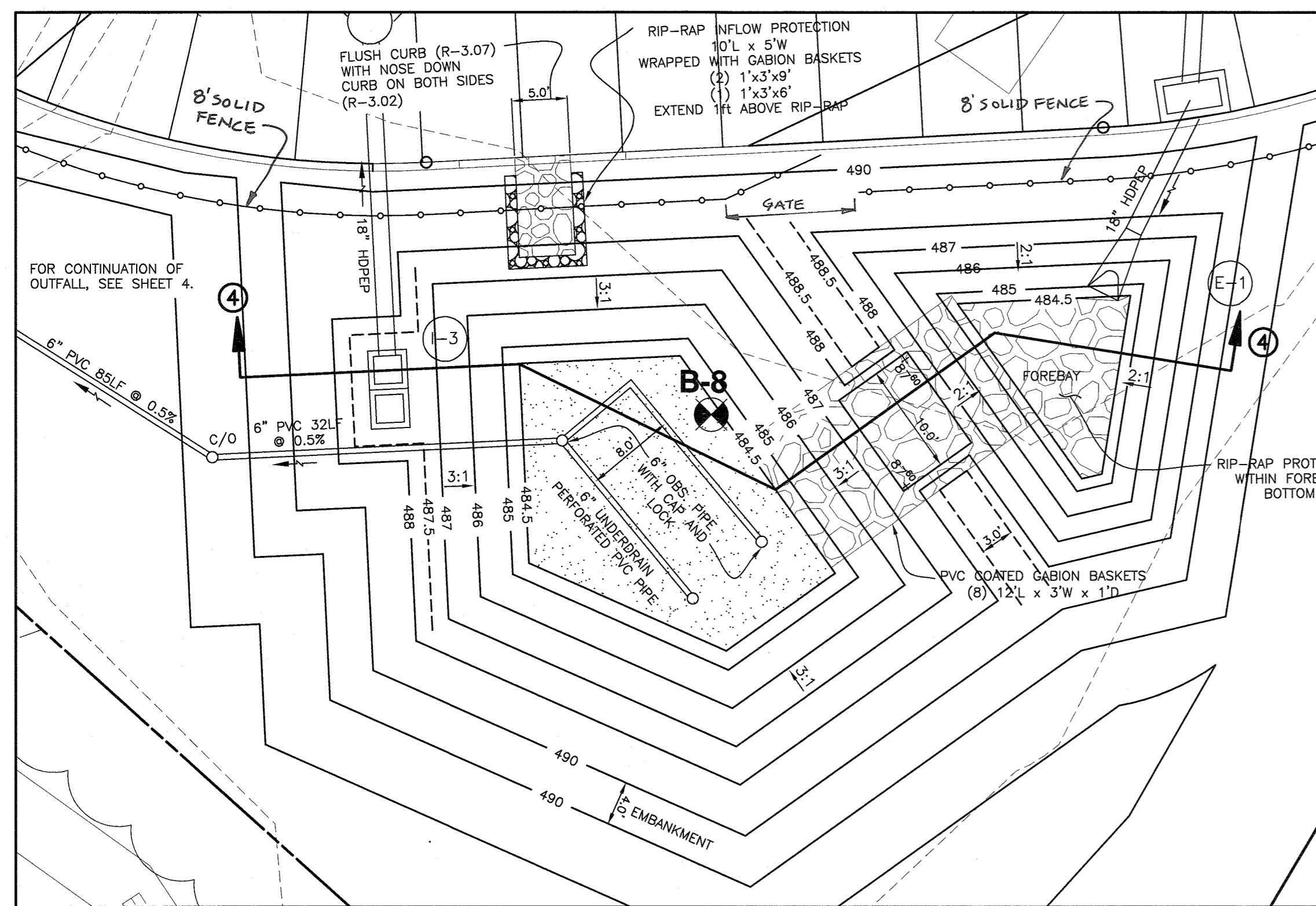
These practices may not be constructed until all contributing drainage area has been stabilized.



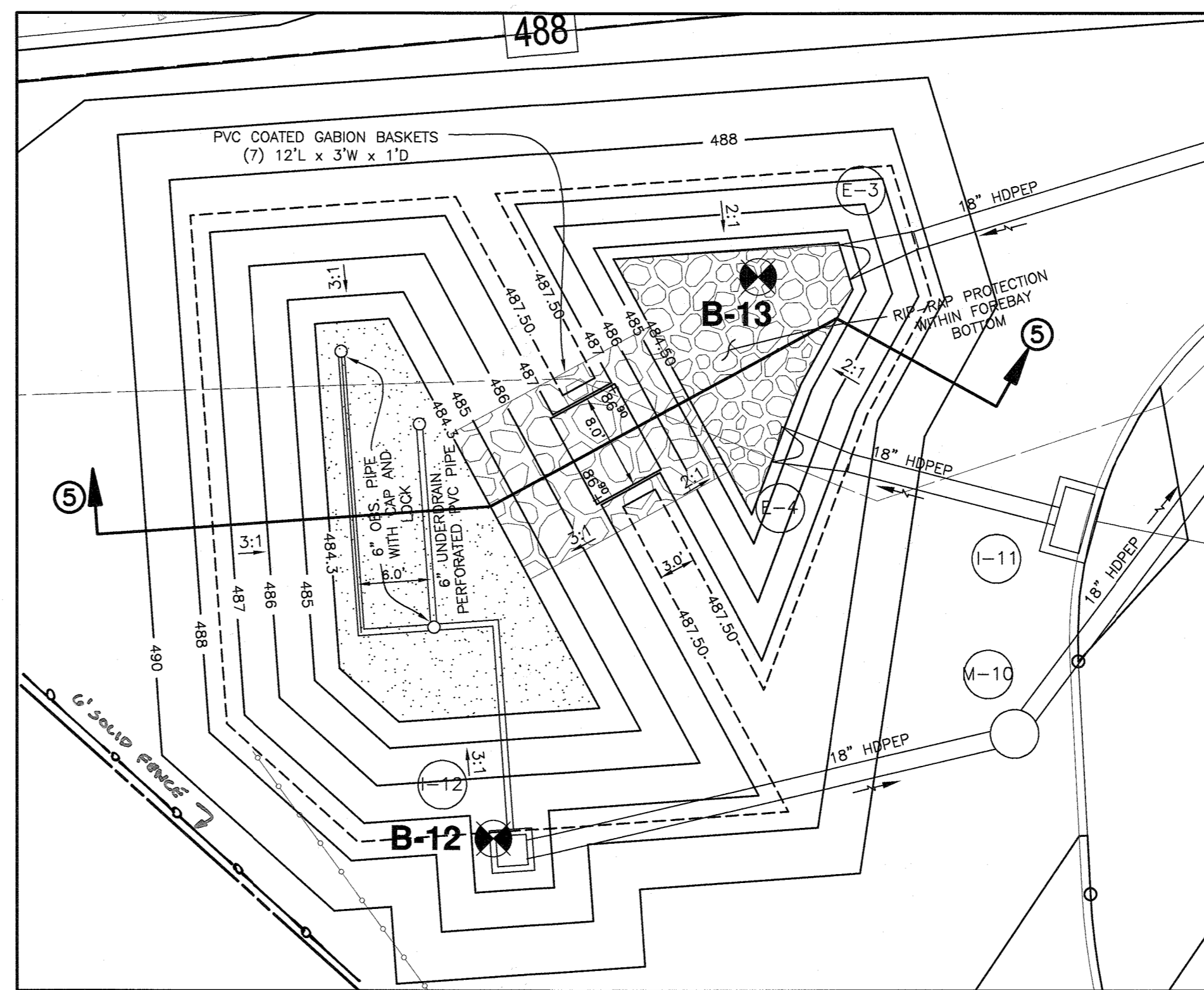
- UNDERDRAIN, OVERFLOW AND OUTFALL NOTES**
- THE LAST CLEAN-OUT LOCATION WITHIN EACH MICRO-BIORETENTION FACILITY SHALL BE FITTED WITH A NON-CLOGGING SURFACE DRAIN (EXAMPLE: 4" PVC ATRIUM GRATE).
 - THE PVC UNDER-DRAINS WITHIN THE FACILITY SHALL BE PERFORATED.
 - THE UNDER-DRAIN AND PIPE TO OUTFALL SHALL BE INSTALLED TO A MINIMUM DEPTH OF 2' BELOW FINISHED GRADE AND SHALL MAINTAIN A MINIMUM 1% SLOPE AND MAINTAIN A MINIMUM OF 1' OF SEPARATION AT ALL CROSSINGS.

STANDARD MICRO-BIORETENTION DETAILS
NOT TO SCALE

NO.		DATE		REVISION	
 8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BE-CIVILENGINEERING.COM					
Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2019.					
OWNER: STEPHEN A. KLEIN & ASSOCIATES C/O STEPHEN KLEIN INC 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244			RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND		
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244					
SWM DETAILS (M-6) MICRO BIO-RETENTION					
DESIGN:	DBT	DRAFT:	DBT	SCALE:	AS SHOWN
DATE:	MARCH 4, 2019	BEI PROJECT NO.:	2801	SHEET:	12 OF 25



(F-1) SURFACE SAND FILTER #1
SCALE: 1" = 10'



(F-1) SURFACE SAND FILTER #2
SCALE: 1" = 10'

Material	Specification/Test Method	Size	Notes
sand	clean AASHTO-M-6 or ASTM-C-33 concrete sand	0.02" to 0.04"	Sand substitutions such as Diabase and Grystone #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.
peat	ash content: < 15% pH range: 5.2 to 4.9 lime bulk density 0.12 to 0.15 t/cu	n/a	The material must be reed-edge hemic peat, shredded, uncompacted, uniform, and clean.
leaf compost	AASHTO-M-43	0.375" to 0.75"	n/a
underdrain gravel	ASTM-D-4833 (puncture strength - 125 lb.) ASTM-D-4632 (Tensile Strength - 300 lb.)	0.08" thick equivalent opening size of #80 sieve	Must maintain 125 gms per sq. ft. flow rate. Note: a 4" pea gravel layer may be substituted for geotextiles must to "separate" sand and filter layers.
impermeable liner (if required)	ASTM-D-4833 (thickness) ASTM-D-412 (tensile strength 1,100 lb., elongation 200%) ASTM-D-624 (Tear resistance - 150 lb./in.) ASTM-D-471 (water adsorption: 4.8 to 2.5 mm)	30 mil thickness	Liner to be ultraviolet resistant. A geotextile fabric should be used to protect the liner from puncture.
underdrain piping	F751, Type PS 25 or AASHTO-M-278	4" - 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel cover pipes; not necessary underdrain pipes
concrete (cast-in-place)	MSHA Standards and Specs. Section 902, Mix No. 3, f' = 3000 psi, normal weight, air-entrained; re-inforcing 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 structural engineer licensed in the State of Maryland
concrete (pre-cast)	per pre-cast manufacturer	n/a	SBE ABOVE NOTE
non-rebar steel	ASTM A-36	n/a	structural steel to be hot-dipped galvanized ASTM-A-123

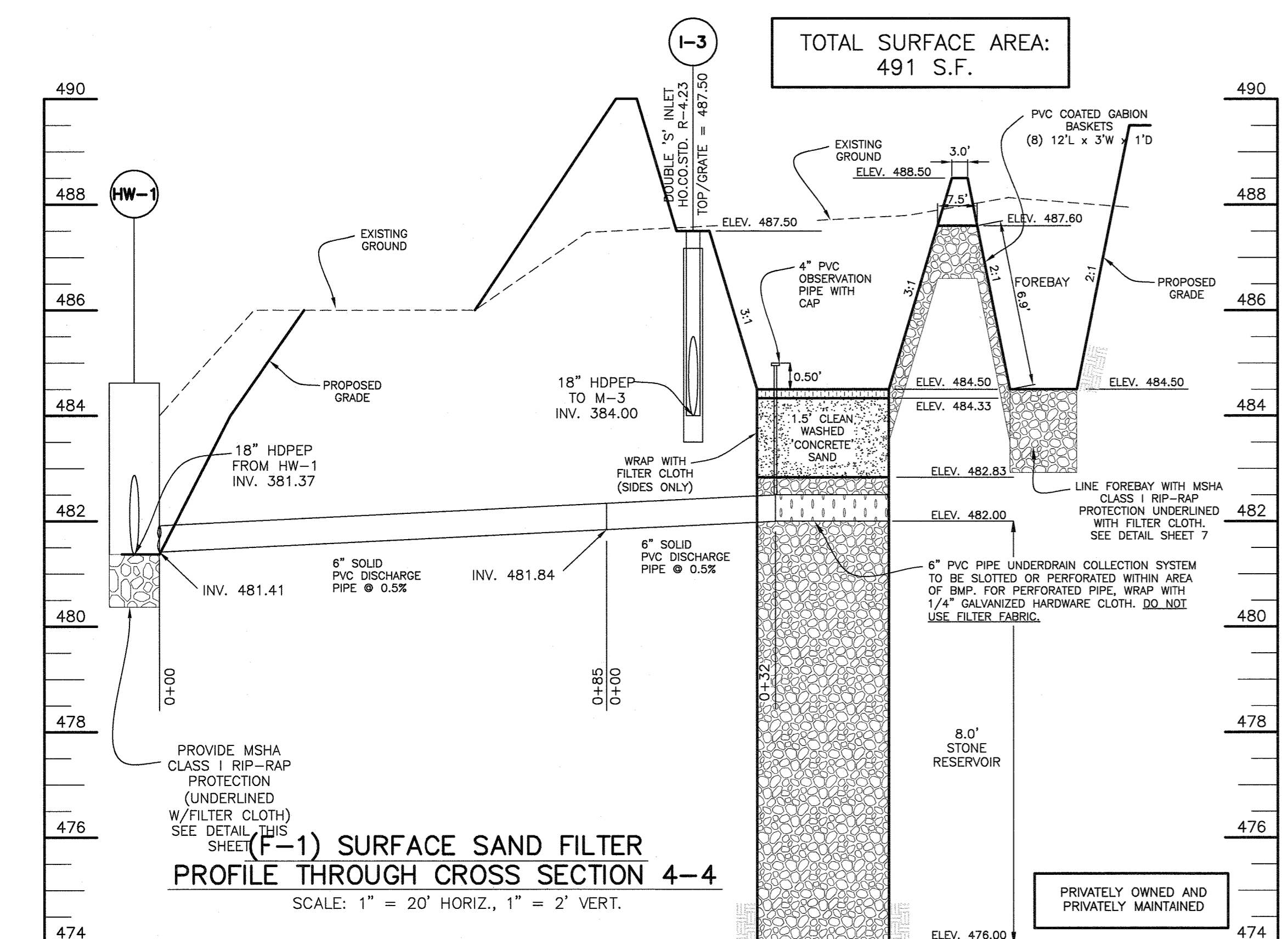
OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND PRIVATELY MAINTAINED (F-1) SURFACE SAND FILTER

ROUTINE MAINTENANCE

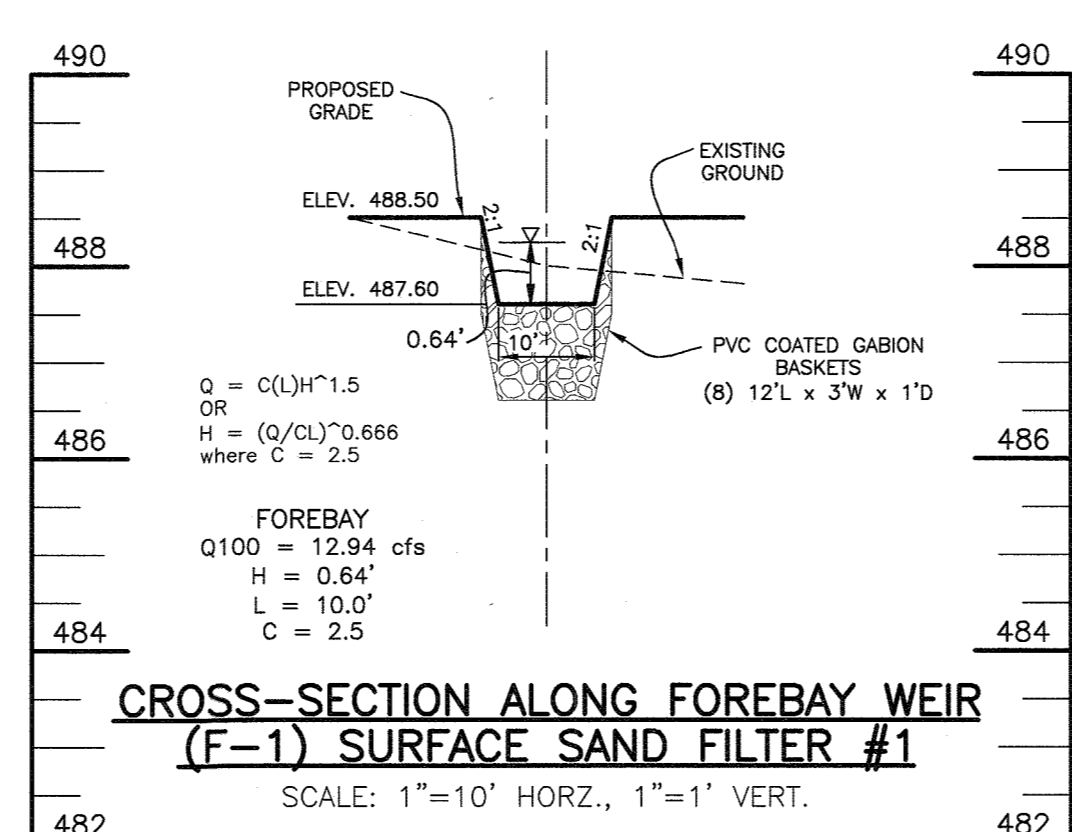
- THE STORMWATER WETLAND FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE FACILITY IS FUNCTIONING PROPERLY.
- THE TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF ONCE PER YEAR, WHEN VEGETATION REACHES 18" IN HEIGHT OR AS NEEDED.
- FILTERS THAT HAVE A GRASS COVER SHALL BE MOWED A MINIMUM OF THREE (3) TIMES PER GROWING SEASON TO MAINTAIN A MAXIMUM GRASS HEIGHT OF LESS THAN 12 INCHES.
- DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
- VISIBLE SIGNS OF EROSION IN THE FACILITY SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
- REMOVE SILT WHEN IT EXCEEDS FOUR (4) INCHES DEEP IN THE FOREBAY, IF APPLICABLE.
- WHEN WATER PONDS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 72 HOURS, THE TOP FEW INCHES OF DISCOLORED MATERIAL SHALL BE REPLACED WITH FRESH MATERIAL. PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIALS AND LIQUID MUST BE FOLLOWED BY THE OWNER.
- A LOGBOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
- THE MAINTENANCE LOGBOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
- ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION SYSTEM HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

NON-ROUTINE MAINTENANCE

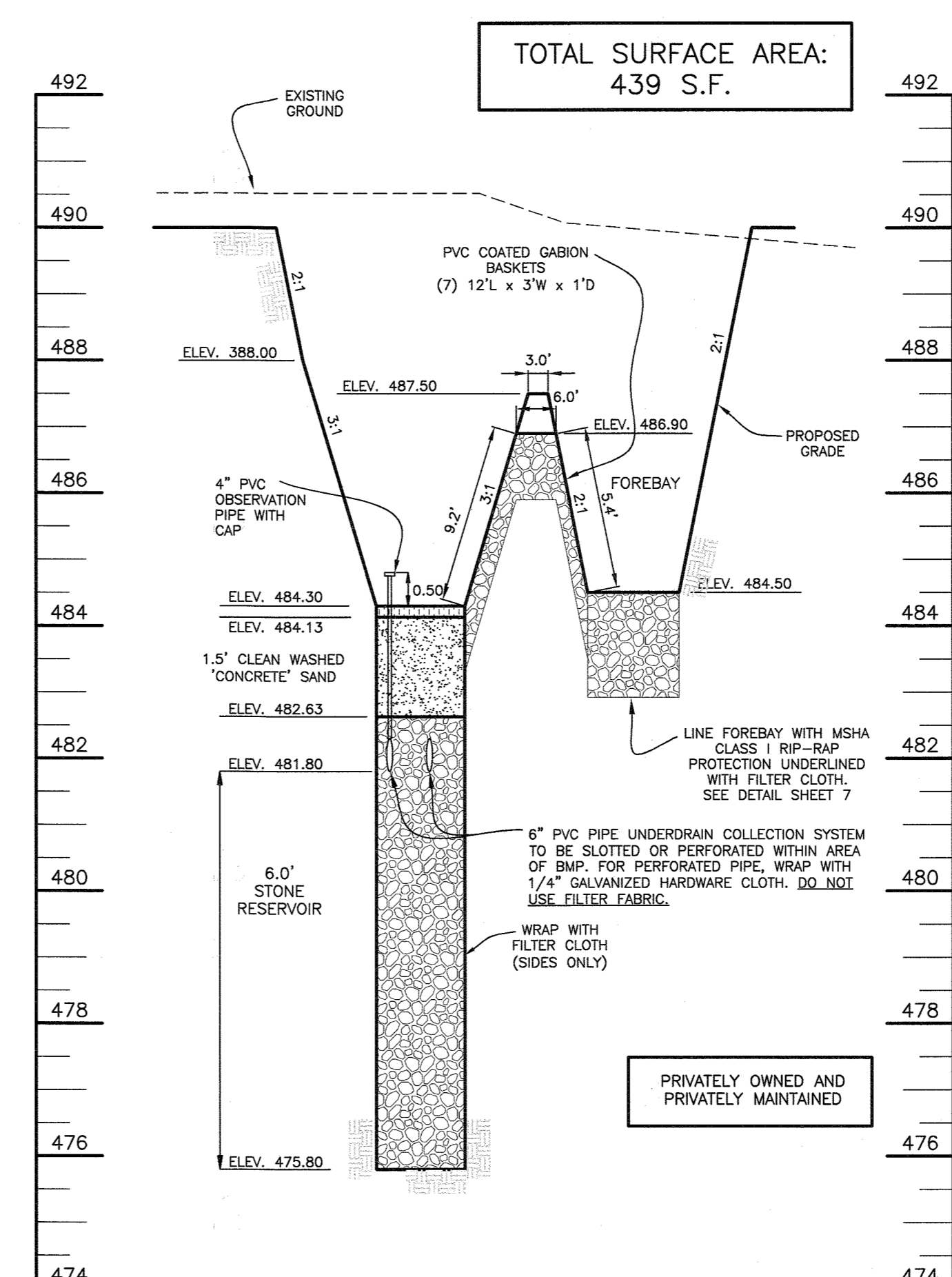
- STRUCTURAL COMPONENTS OF THE POND SUCH AS THE EMBANKMENT, THE RISER STRUCTURE AND TRASH RACK AND PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THESE COMPONENTS SHALL BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.



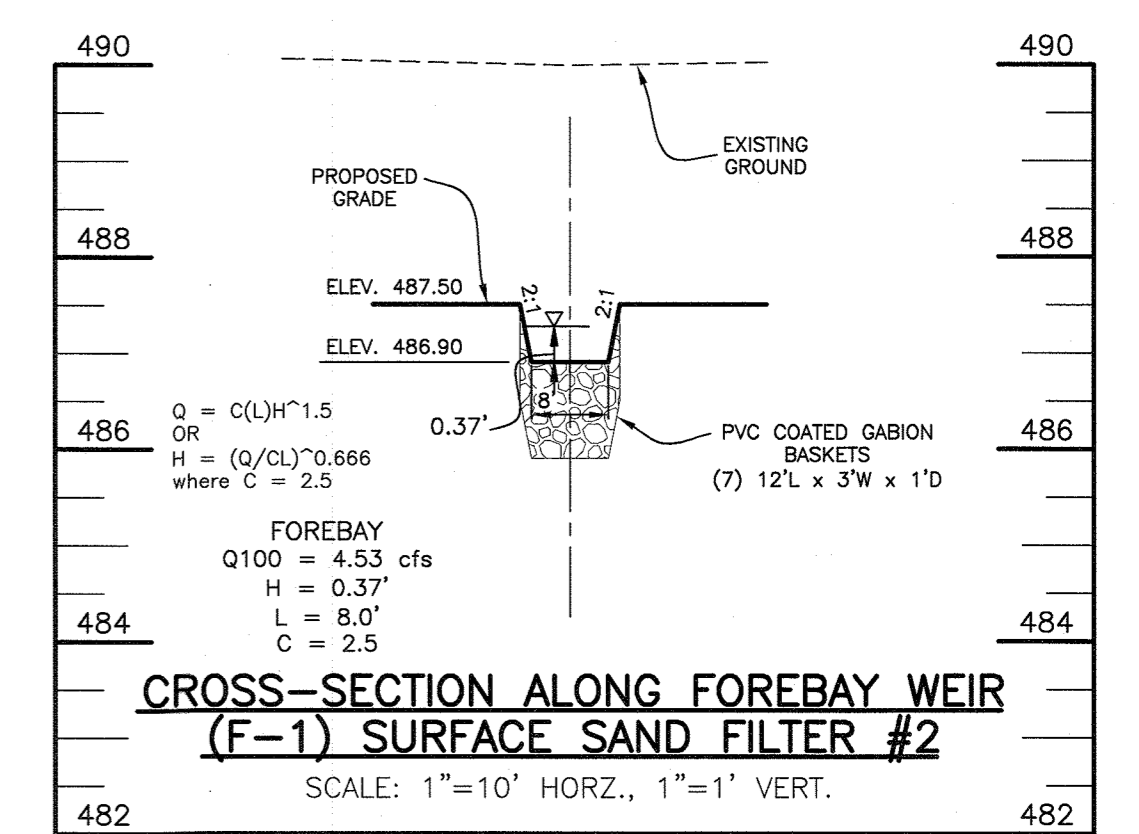
(F-1) SURFACE SAND FILTER
PROFILE THROUGH CROSS SECTION 4-4
SCALE: 1" = 20' HORIZ., 1" = 2' VERT.



(F-1) SURFACE SAND FILTER #1
PROFILE THROUGH CROSS SECTION 5-5
SCALE: 1" = 10' HORIZ., 1" = 1' VERT.



(F-1) SURFACE SAND FILTER
PROFILE THROUGH CROSS SECTION 5-5
SCALE: 1" = 20' HORIZ., 1" = 2' VERT.



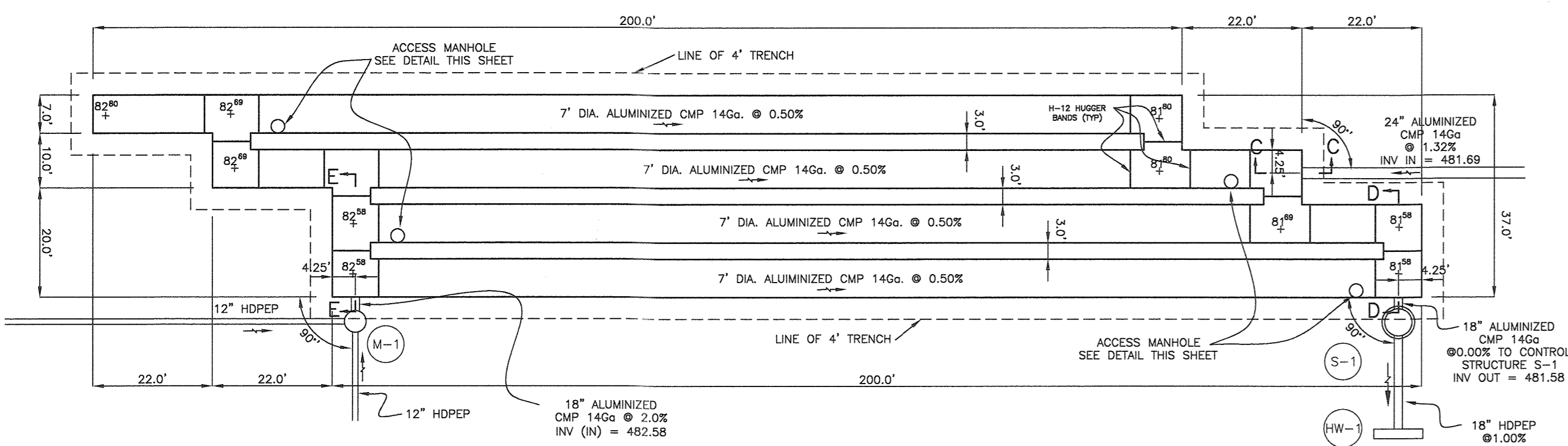
CROSS-SECTION ALONG FOREBAY WEIR
(F-1) SURFACE SAND FILTER #2
SCALE: 1" = 10' HORIZ., 1" = 1' VERT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4-2-19
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 [Signature] 4-4-19
 CHIEF, DIVISION OF LAND DEVELOPMENT
 [Signature] 4-4-19
 DIRECTOR

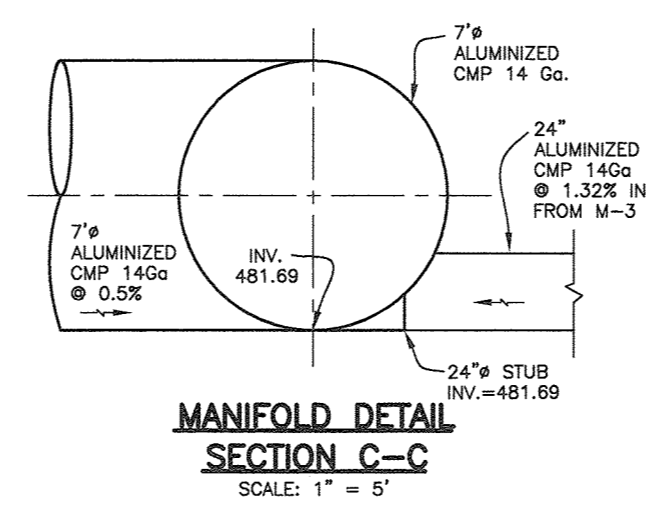
1 3/31/2020 LABEL B' SOLID FENCE IN SURFACE SAND FILTER #1 NO. DATE REVISION		PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22390, Expiration Date: 6-30-2019.
BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 • ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BD-CIVLENGINEERING.COM		
OWNER: STEPHEN A. KLEIN & ASSOCIATES c/o STEPHEN KLEIN INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244		RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244		
DATE: MARCH 4, 2019 BEI PROJECT NO. 2801		SHEET 13 OF 25 SDP-18-044
DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN		

OPERATION AND MAINTENANCE SCHEDULE FOR UNDERGROUND STORMWATER MANAGEMENT FACILITIES

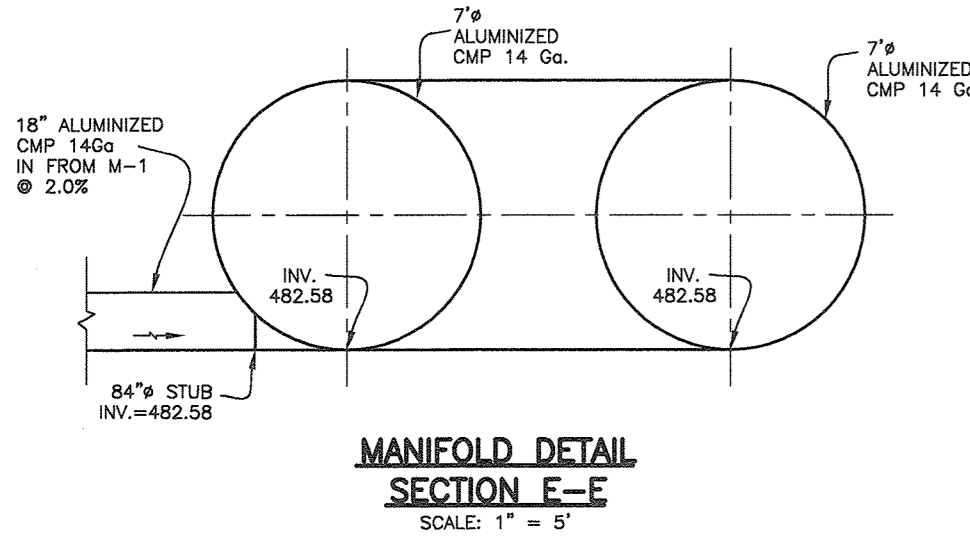
1. THE UNDERGROUND STORM WATER MANAGEMENT FACILITY IS PRIVATELY OWNED AND IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO PERIODICALLY INSPECT AND CLEAN THE FACILITY TO MAINTAIN ITS OPERATION AND FUNCTION.
2. THE UNDERGROUND STORM WATER MANAGEMENT FACILITY SHALL BE INSPECTED YEARLY AT A MINIMUM AND AFTER ESPECIALLY SEVERE STORM EVENTS.
3. WHEN SEDIMENT ACCUMULATION OF MORE THAN 2" IS OBSERVED OR ANY DEBRIS THAT MIGHT OBSTRUCT THE OUTFALL IS OBSERVED, THE FACILITY SHALL BE CLEANED.
4. THE FACILITY SHALL BE CLEANED IMMEDIATELY AFTER PETROLEUM SPILLS. THE OWNER SHALL CONTACT THE APPROPRIATE REGULATORY AGENCIES NOTIFYING THEM OF THE SPILL AND CLEAN-UP OPERATION.
5. THE SEDIMENT AND DEBRIS SHALL BE REMOVED FROM THE UNDERGROUND STORM WATER MANAGEMENT FACILITY BY VACUUM TRUCK OR OTHER MANUAL MEANS. THE OWNER SHALL FOLLOW PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIAL AND LIQUID.
6. THE INLET AND OUTLET PIPES SHALL BE CHECKED FOR ANY OBSTRUCTIONS AT LEAST ONCE EVERY SIX(6) MONTHS. IF OBSTRUCTIONS ARE FOUND, THE OWNER SHALL HAVE THEM REMOVED AND PROPERLY DISPOSED OF.



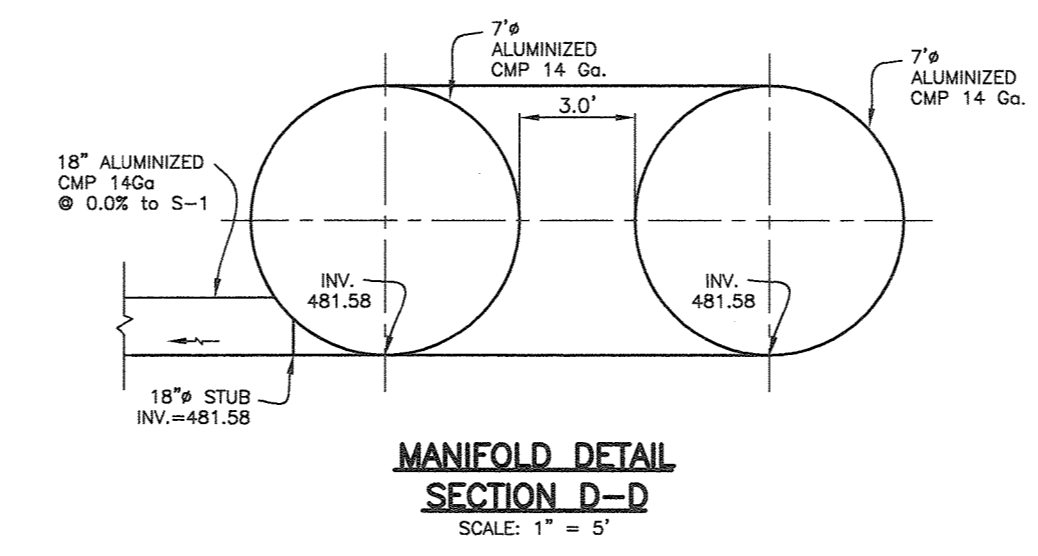
**(UGS) UNDERGROUND FACILITY #1
PIPE LAYOUT PLAN**
SCALE: 1" = 20'



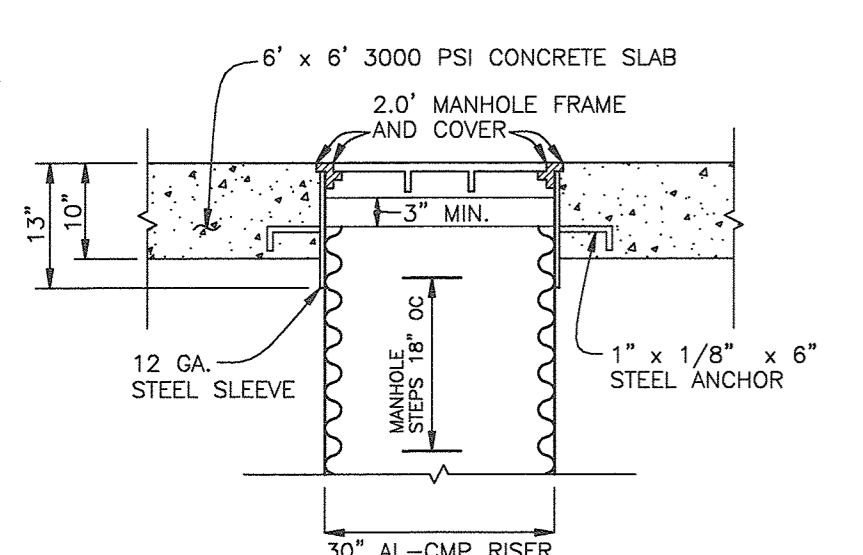
**MANIFOLD DETAIL
SECTION C-C**
SCALE: 1" = 5'



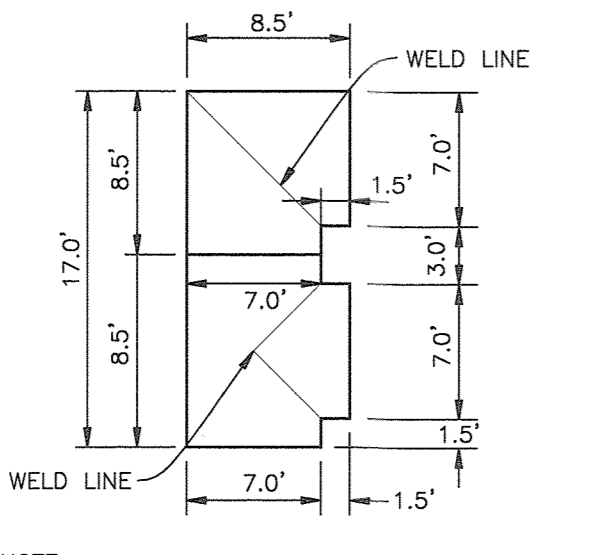
**MANIFOLD DETAIL
SECTION E-E**
SCALE: 1" = 5'



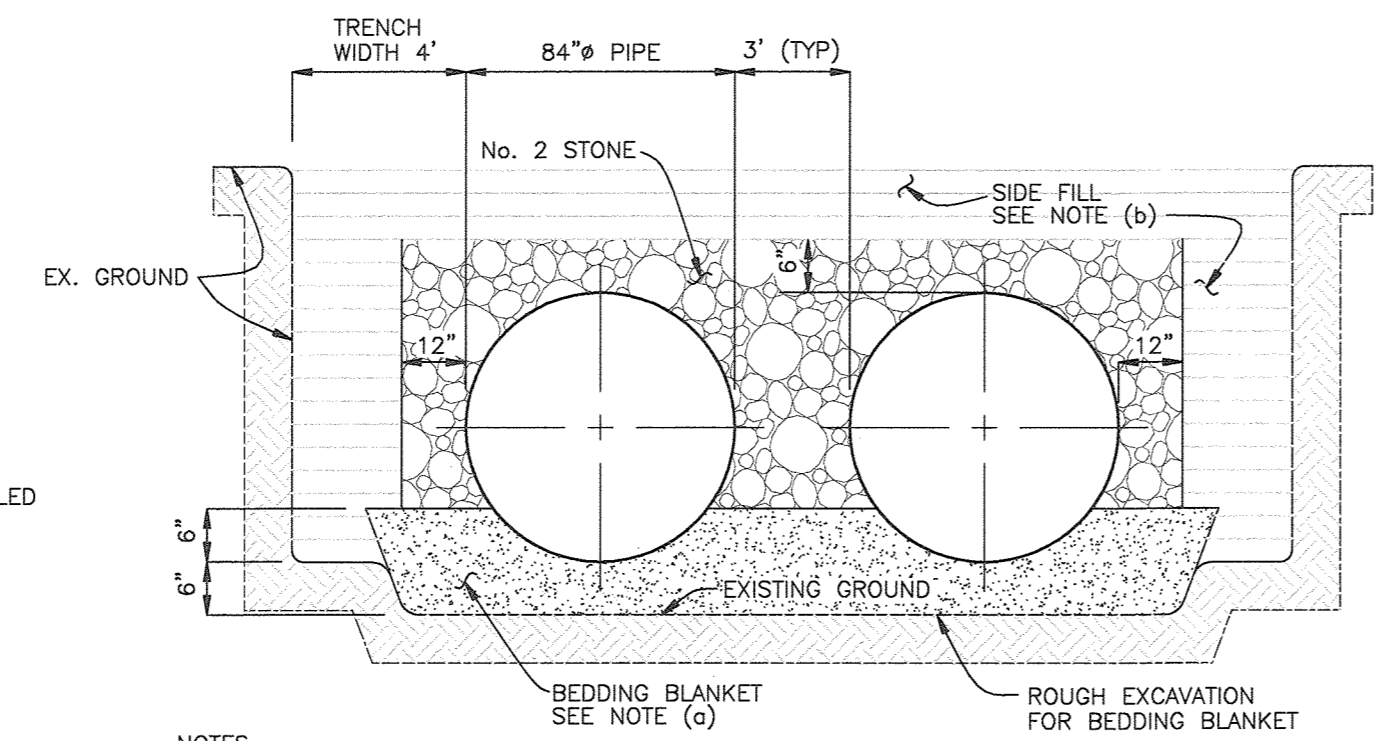
**MANIFOLD DETAIL
SECTION D-D**
SCALE: 1" = 5'



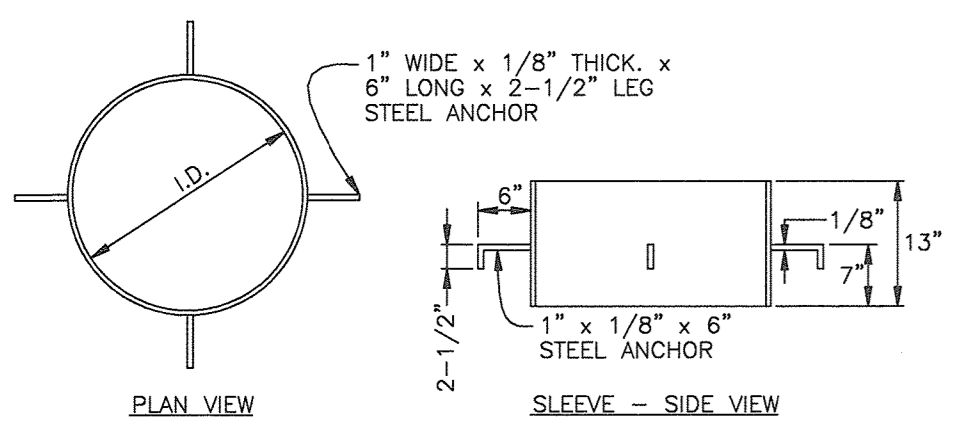
**TYPICAL ALUMINIZED CMP RISER
MANHOLE SLEEVE DETAIL**
NOT TO SCALE



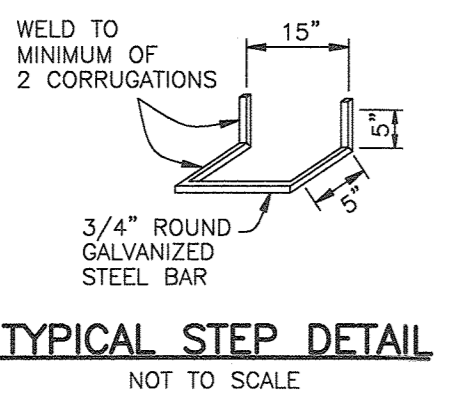
TYPICAL ELBOW/TEE DETAIL
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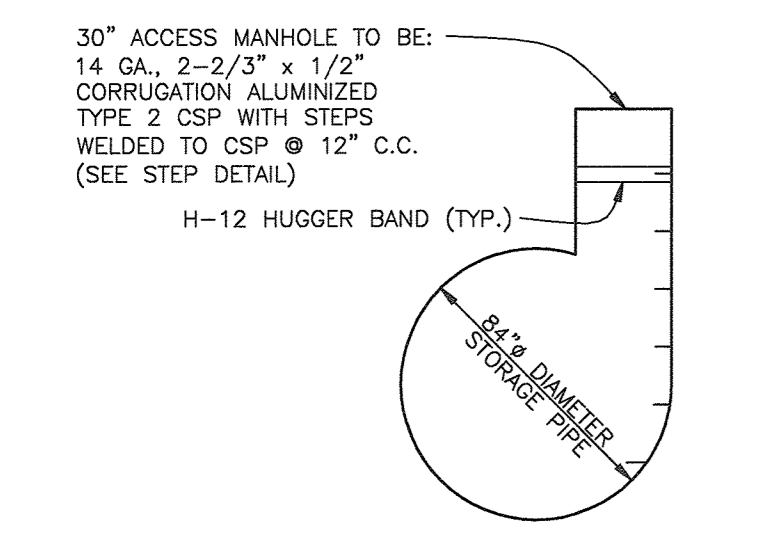
TYPICAL BEDDING AND BACKFILL DETAIL
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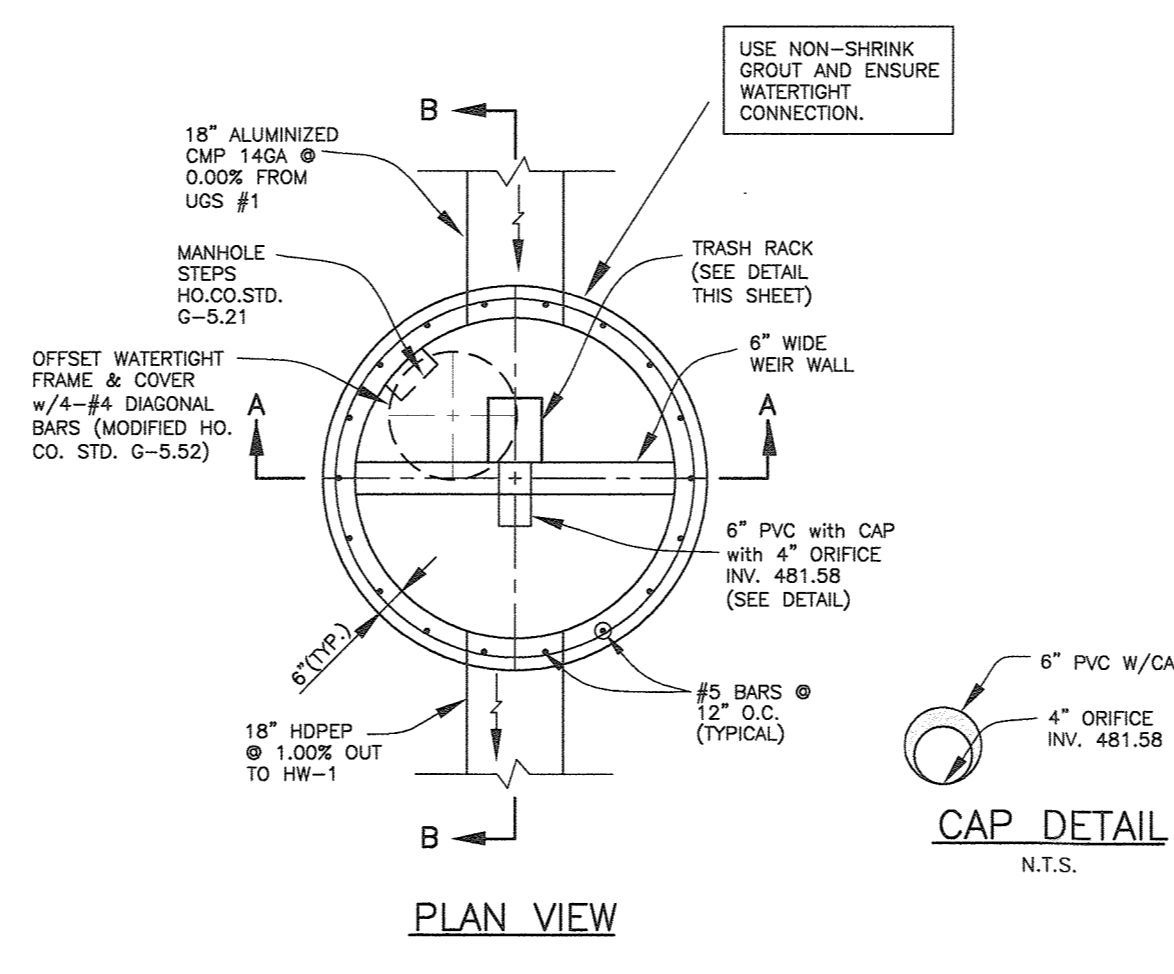
TYPICAL MANHOLE SLEEVE DETAIL
NOT TO SCALE



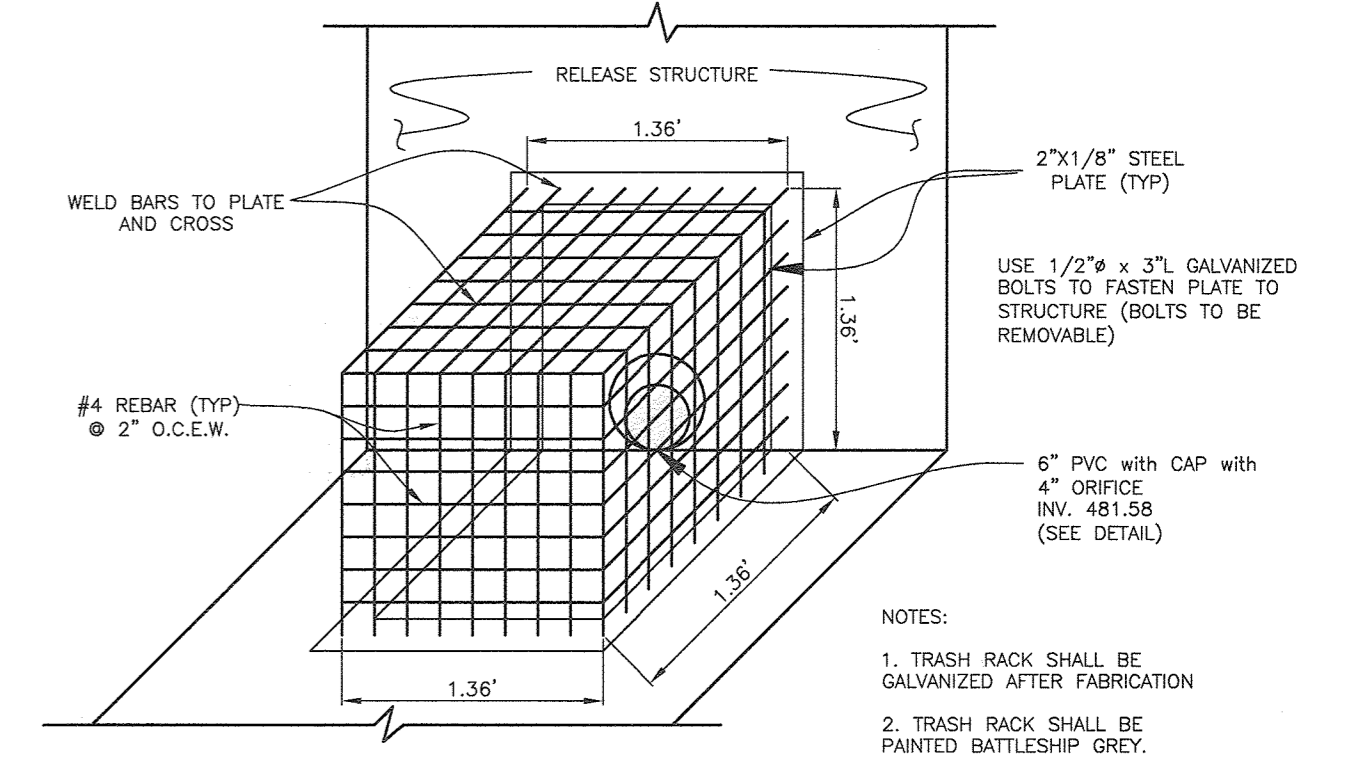
TYPICAL STEP DETAIL
NOT TO SCALE



TYPICAL ACCESS MANHOLE DETAIL
NOT TO SCALE



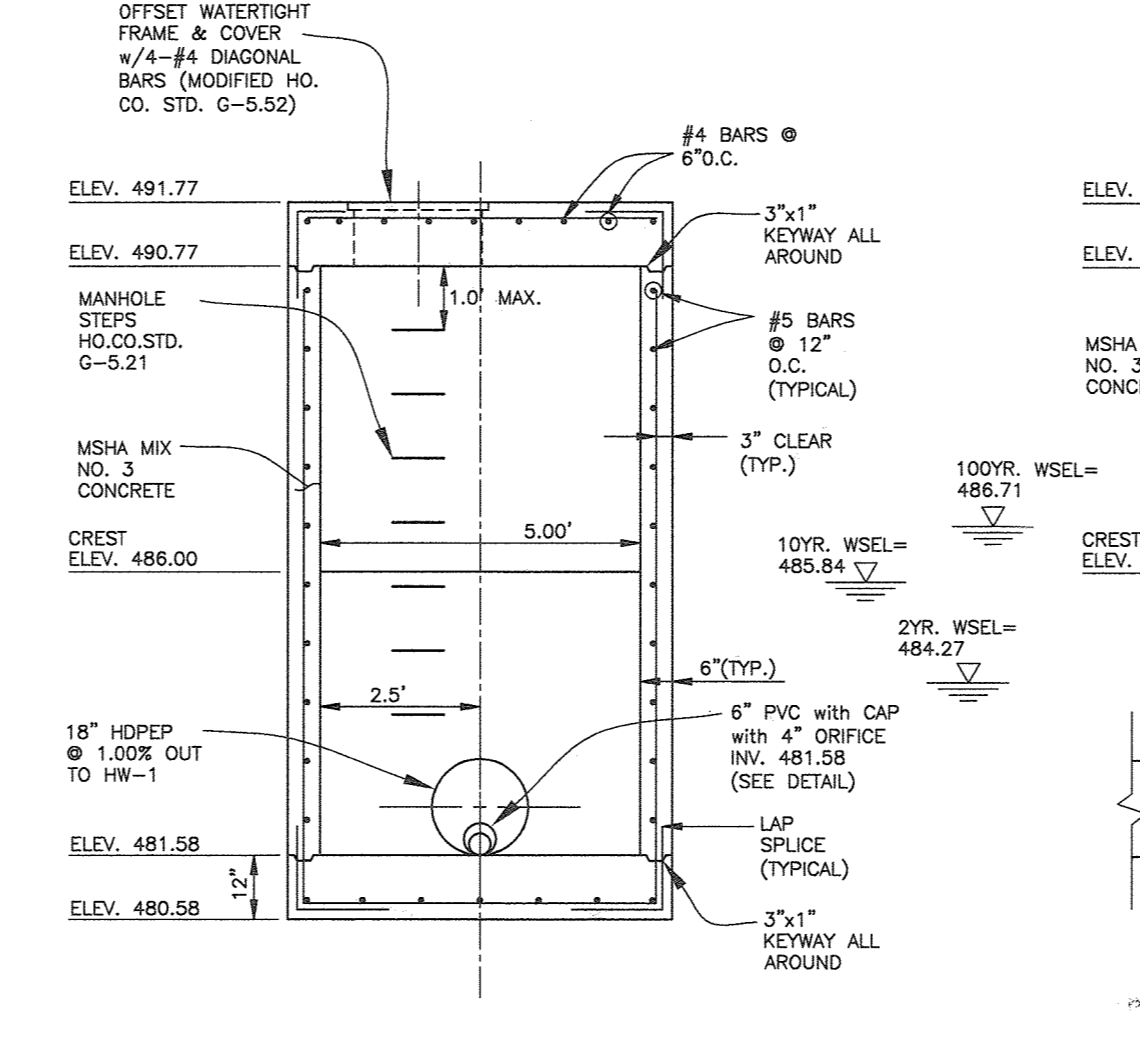
CAP DETAIL
N.T.S.



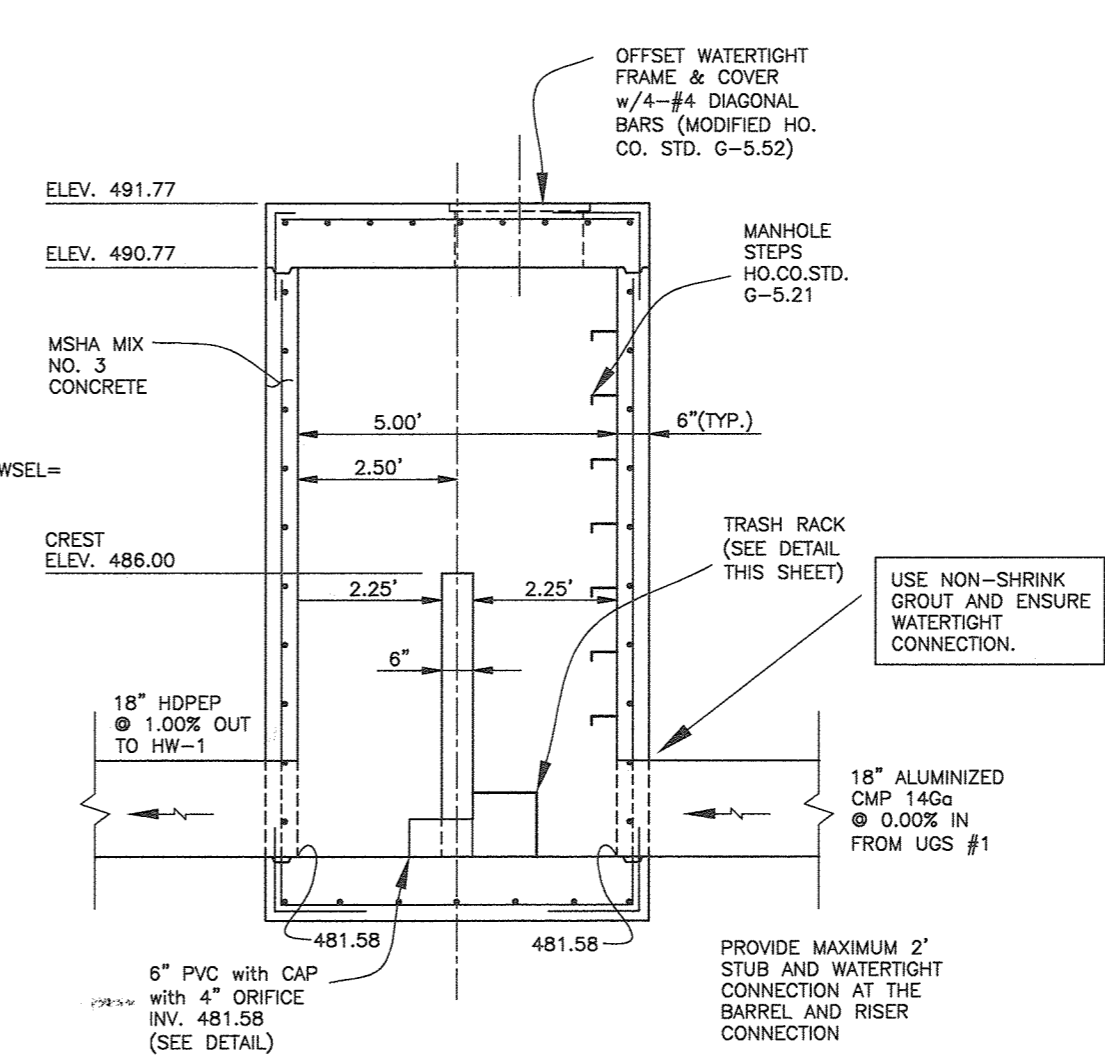
TRASH RACK DETAIL @ S-1
SCALE: 1" = 1'-0"

CONSTRUCTION SPECIFICATIONS

- A. BEDDING**
1. THE BED SHALL BE PLACED TO UNIFORM GRADE AND LINE TO ENSURE GOOD VERTICAL ALIGNMENT AND TO AVOID EXCESSIVE STRESSES AT PIPE JOINTS. THE BEDDING SHALL BE FREE OF ROCK FORMATIONS, PROTRUDING STONES, FROZEN LUMPS, ROOTS, AND FOREIGN MATERIAL. THE BEDDING FOUNDATION MUST BE A STABLE, WELL GRADED GRANULAR MATERIAL. ANY MATERIAL THAT HAS INADEQUATE BEARING CAPACITY MUST BE REMOVED AND REPLACED WITH A COMPACTED SELECT FILL APPROVED BY THE GEO-TECHNICAL ENGINEER.
- B. BACKFILL**
1. THE FILL MATERIAL SHALL BE FREE OF ROCKS, FROZEN LUMPS, AND FOREIGN MATTER THAT COULD CAUSE HARD SPOTS IN BACKFILL OR THAT COULD DECOMPOSE AND CREATE VOIDS.
 2. BACKFILL MATERIAL SHALL BE A WELL GRADED GRANULAR MATERIAL.
 3. HIGHLY PLASTIC SILTS, HIGHLY PLASTIC CLAYS, ORGANIC SILTS, ORGANIC CLAYS AND PEATS SHALL NOT BE USED AS BACKFILL MATERIAL.
 4. BACKFILL SHALL BE PLACED SYMMETRICALLY ON EACH SIDE OF THE STRUCTURE IN SIX-INCH TO EIGHT-INCH LOOSE LAYERS TO ONE FOOT ABOVE THE TOP OF THE PIPE. EACH LAYER IS TO BE COMPACTED TO THE SPECIFIED DENSITY (MINIMUM 90%) BEFORE PLACING THE NEXT LAYER. REFERENCE ASTM A798.
- C. PIPE**
1. THE PIPE FABRICATOR SHALL PROVIDE SPECIFICATIONS OF ALL MATERIALS (BASED ON HS25 LOADING).
 2. SHOP DRAWINGS ARE TO BE PROVIDED BY FABRICATOR. APPROVAL BY ENGINEER IS REQUIRED PRIOR TO CONSTRUCTION.
 3. CONTRACTOR IS REQUIRED TO COORDINATE APPROVAL OF SHOP DRAWINGS AND SPECIFICATIONS AND SHALL BE OBLIGATED FOR ANY COST THEREOF.
- D. GENERAL**
1. DEBRIS IS TO BE KEPT OUT OF THE FACILITY DURING AND AFTER CONSTRUCTION.



**SECTION A-A
FRONT VIEW**



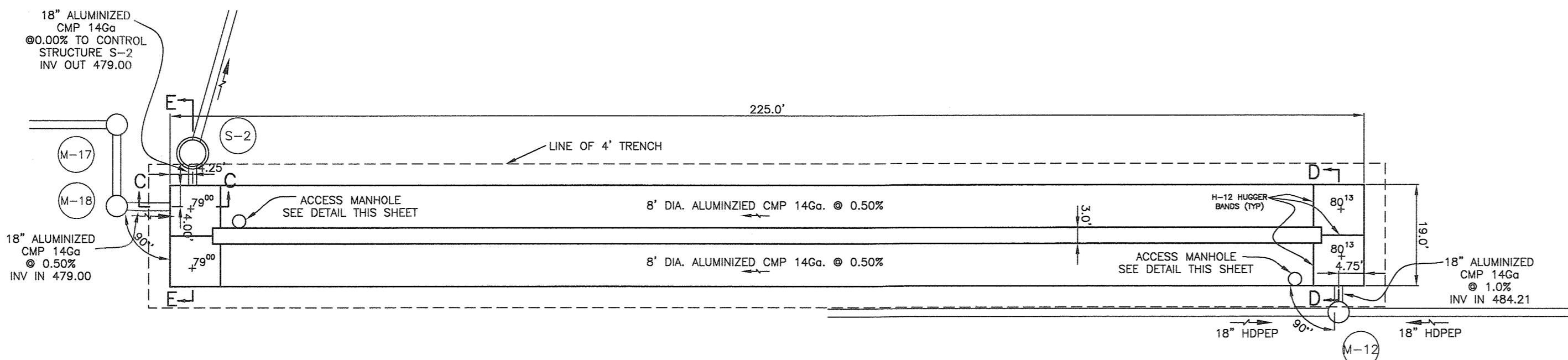
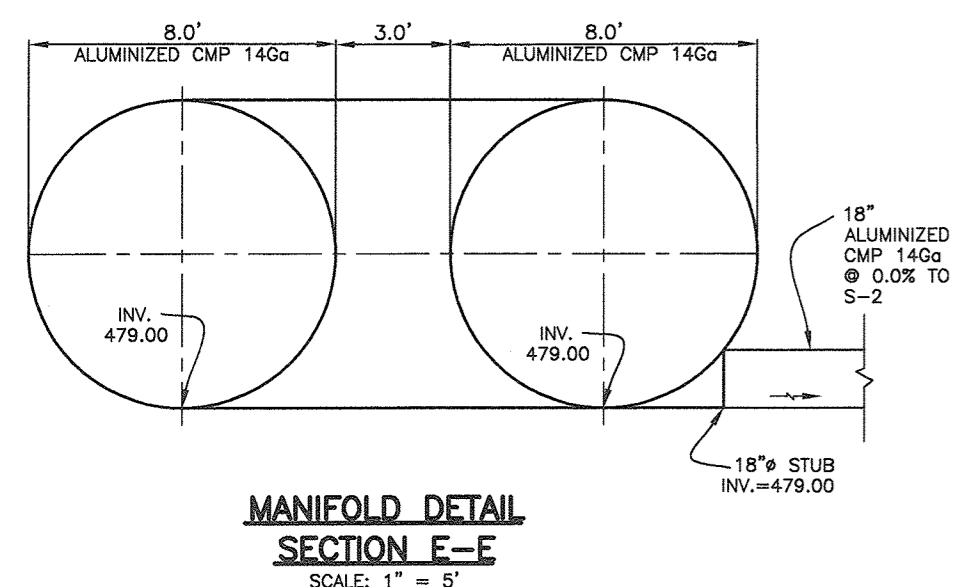
**SECTION B-B
SIDE VIEW**

S-1 DETAIL
SCALE: 1" = 3'

NOTE: SEE GENERAL NOTE 34 ON SHEET 1 FOR DESIGN MANUAL WAIVER INFORMATION REGARDING THIS STRUCTURE.

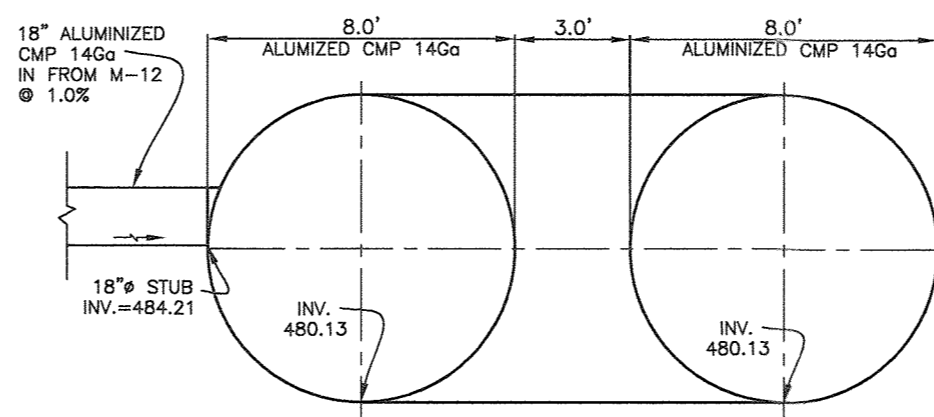
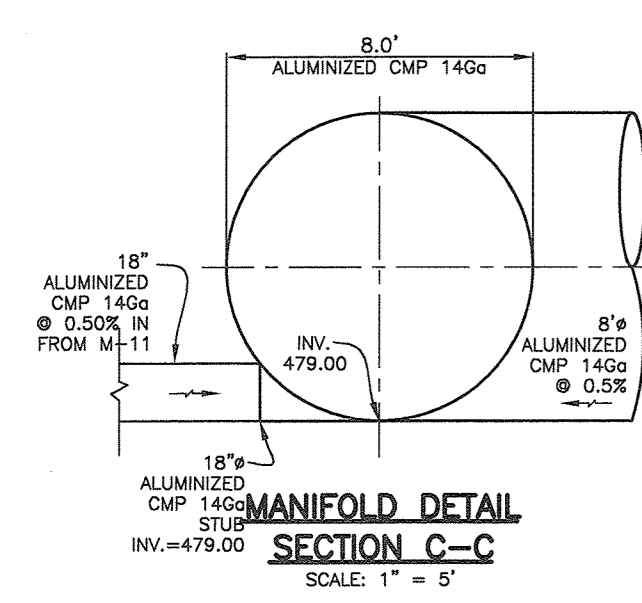
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	
<i>[Signature]</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	4-2-19 DATE
<i>[Signature]</i> CHIEF, DIVISION OF LAND DEVELOPMENT	4-4-19 DATE
<i>[Signature]</i> DIRECTOR	4-4-19 DATE

<p>NO. DATE REVISION</p>	
<p>BENCHMARK ENGINEERING, INC. ENGINEERS & LAND SURVEYORS & PLANNERS 8480 BALTIMORE NATIONAL PIKE SUITE 315 ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6444 WWW.BE-CIVILENGINEERING.COM</p>	
<p>Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22389 (Exp. 12/31/2019) Date: 6-30-2019.</p>	
<p>OWNER: STERGEN A. KLEIN & ASSOCIATES C/O STEPHEN ALBERT INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244</p>	
<p>DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244</p>	
<p>RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER</p>	
<p>TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>	
<p>SWM DETAILS (UGS) UNDERGROUND FACILITY #1</p>	
DATE: MARCH 4, 2019	BEI PROJECT NO. 2801
DESIGN: DBT	DRAFT: DBT
SCALE: AS SHOWN	SHEET 14 OF 25



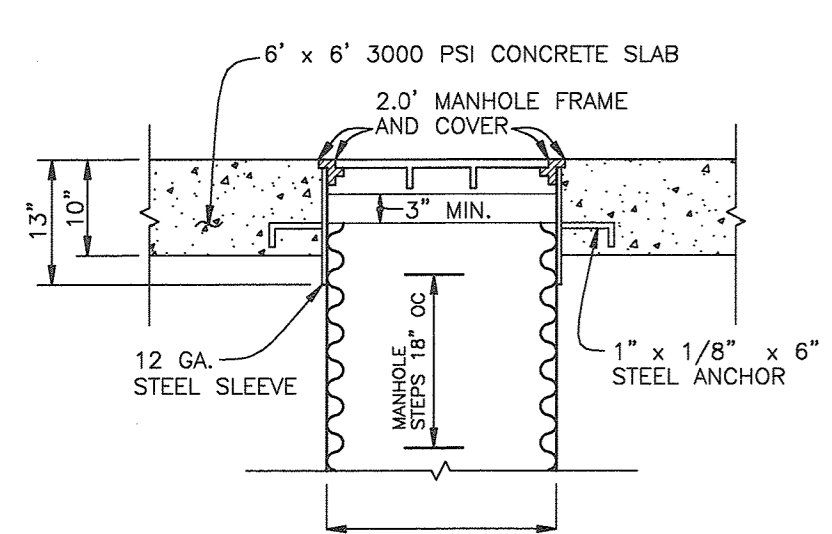
(UGS) UNDERGROUND FACILITY #2
PIPE LAYOUT PLAN

SCALE: 1" = 20'

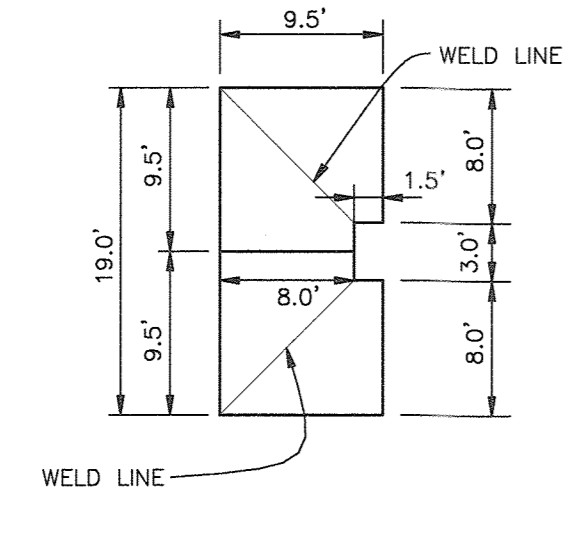


MANIFOLD DETAIL SECTION D-D

SCALE: 1" = 5'

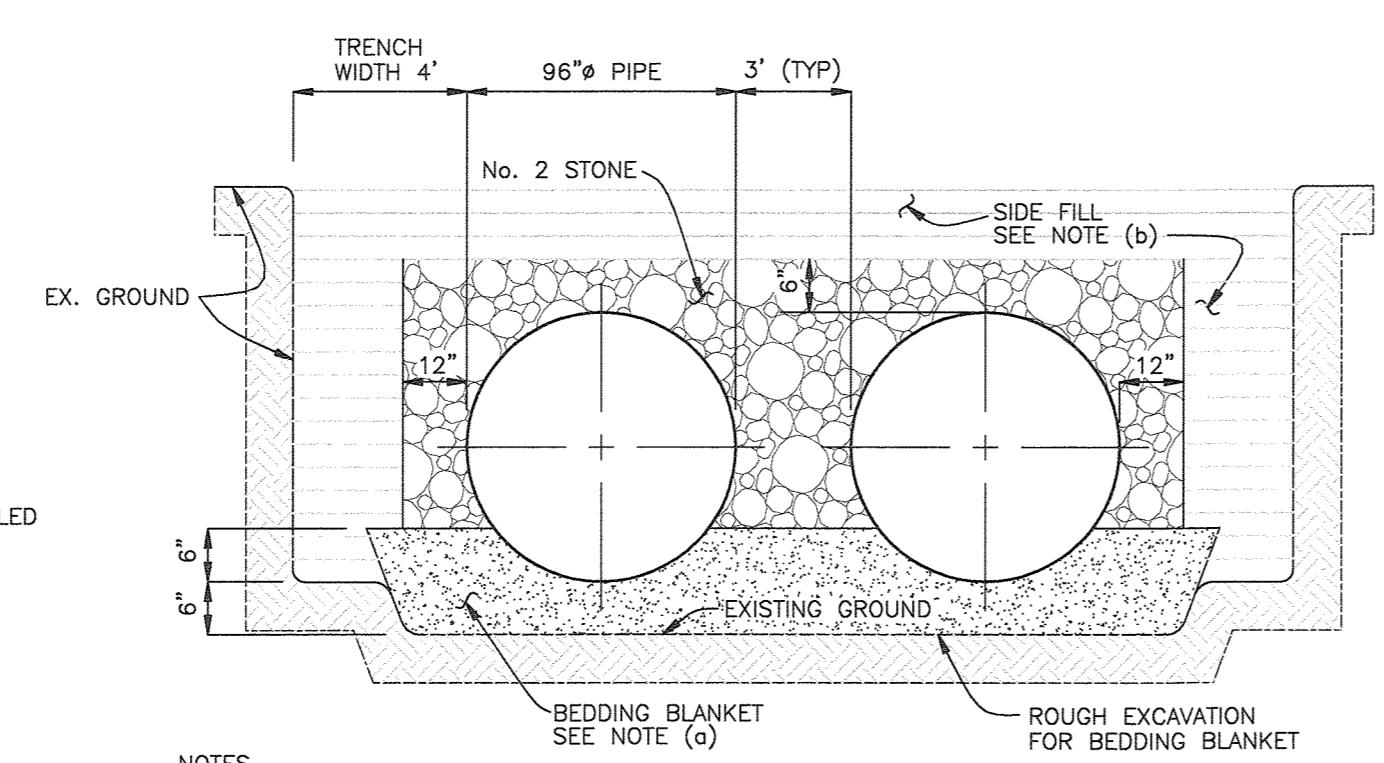


TYPICAL ALUMINIZED CMP RISER MANHOLE SLEEVE DETAIL



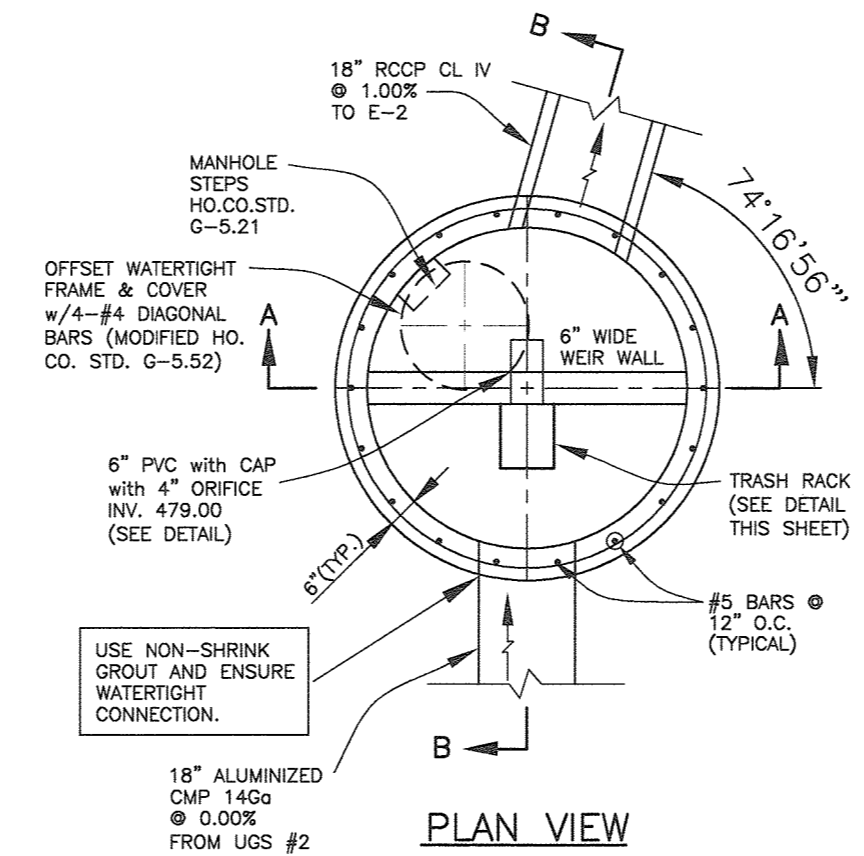
TYPICAL ELBOW/TEE DETAIL

NOTE: ALL ADJOINING PIPES AND ELBOWS TO BE COUPLED USING THE H-12 HUGGER BAND, BY CONTECH CONSTRUCTION PRODUCTS, INC., OR EQUIVALENT

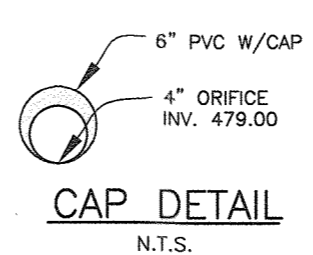


TYPICAL BEDDING AND BACKFILL DETAIL

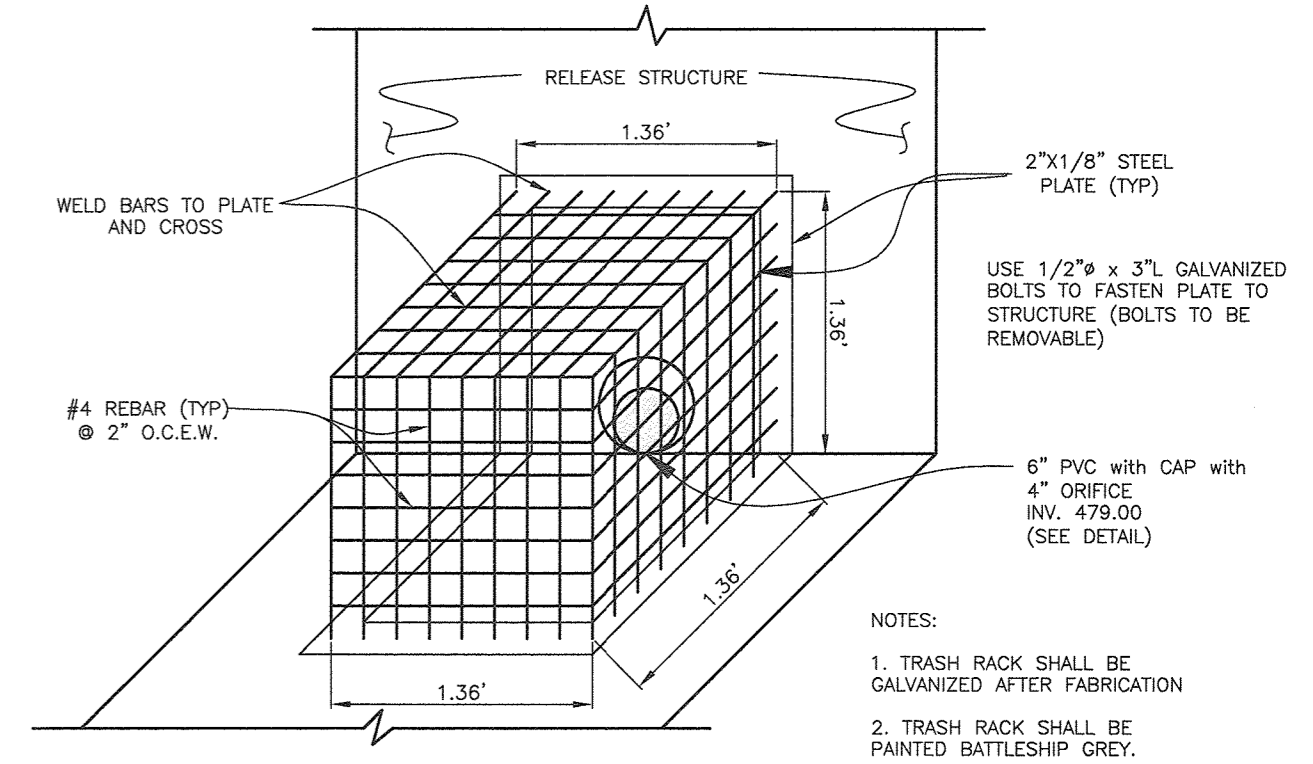
NOTES:
(a) BEDDING BLANKET OF LOOSE GRANULAR FILL ROUGHLY SHAPED TO FIT BOTTOM OF PIPE. MINIMUM THICKNESS BEFORE PLACING PIPE SHALL BE SIX INCHES.
(b) SIDE FILL TO BE COMPACTED IN 6 TO 8 INCHES OF COMPACTED LAYERS. COMPACTION SHALL NOT BE LESS THAN 90% STANDARD PROCTOR DENSITY (AASHTO 199).



PLAN VIEW

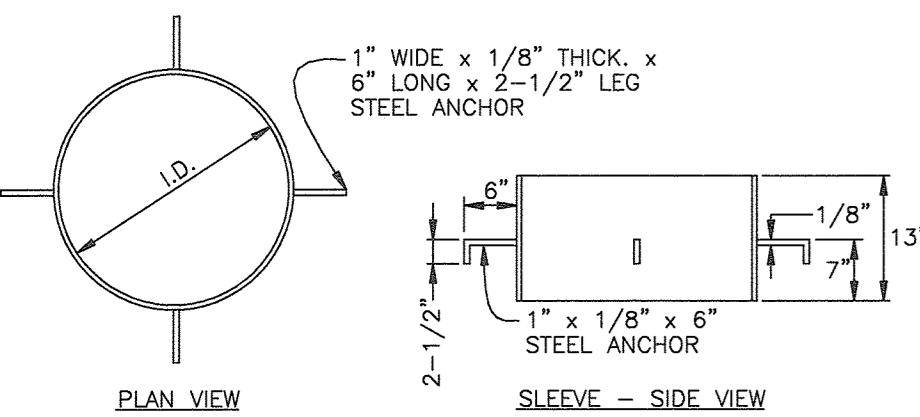


CAP DETAIL

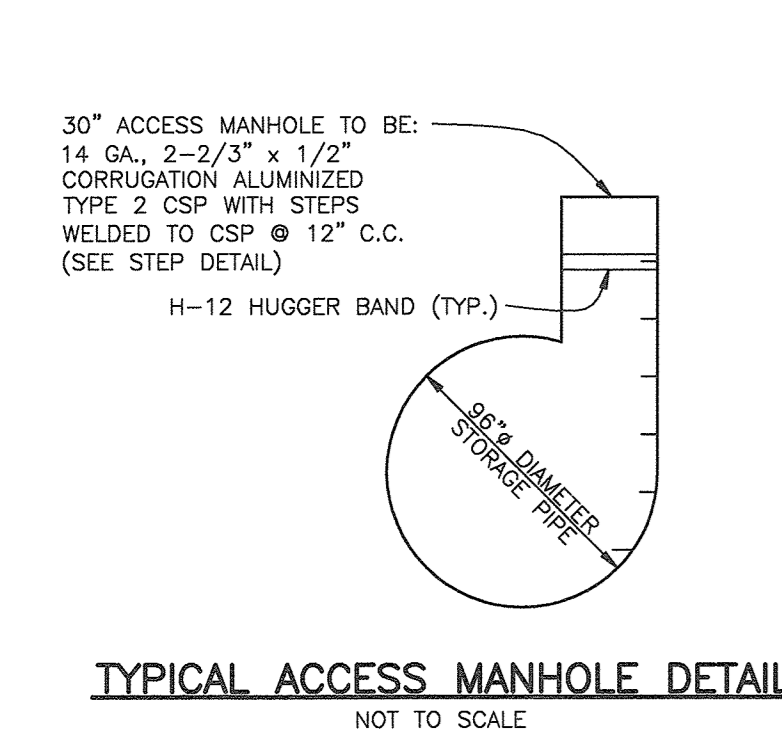


TRASH RACK DETAIL @ S-1

SCALE: 1" = 1'-0"



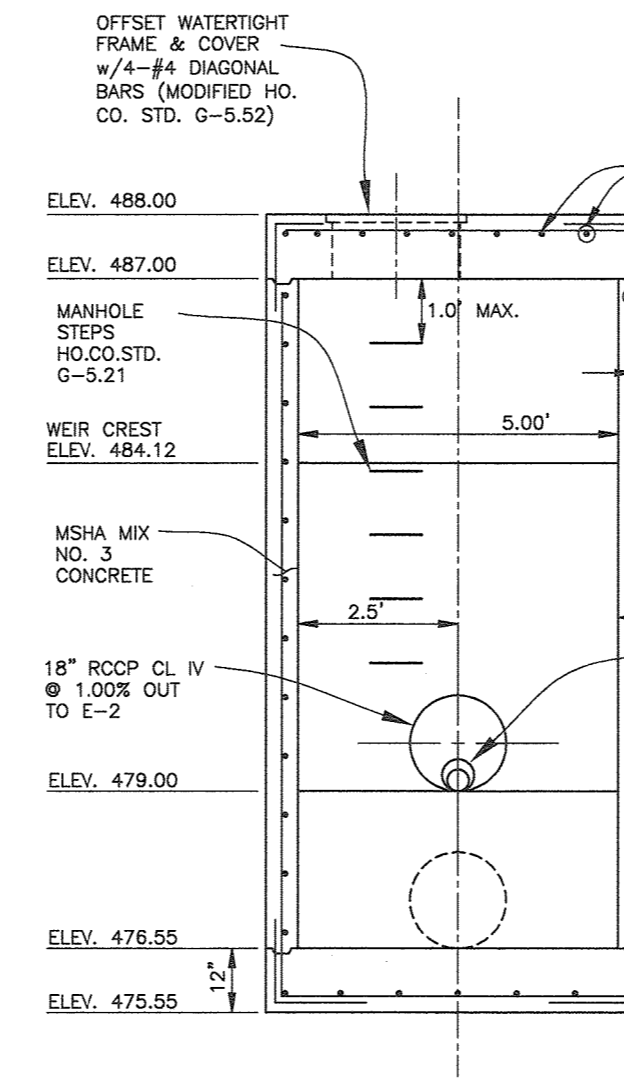
TYPICAL MANHOLE SLEEVE DETAIL



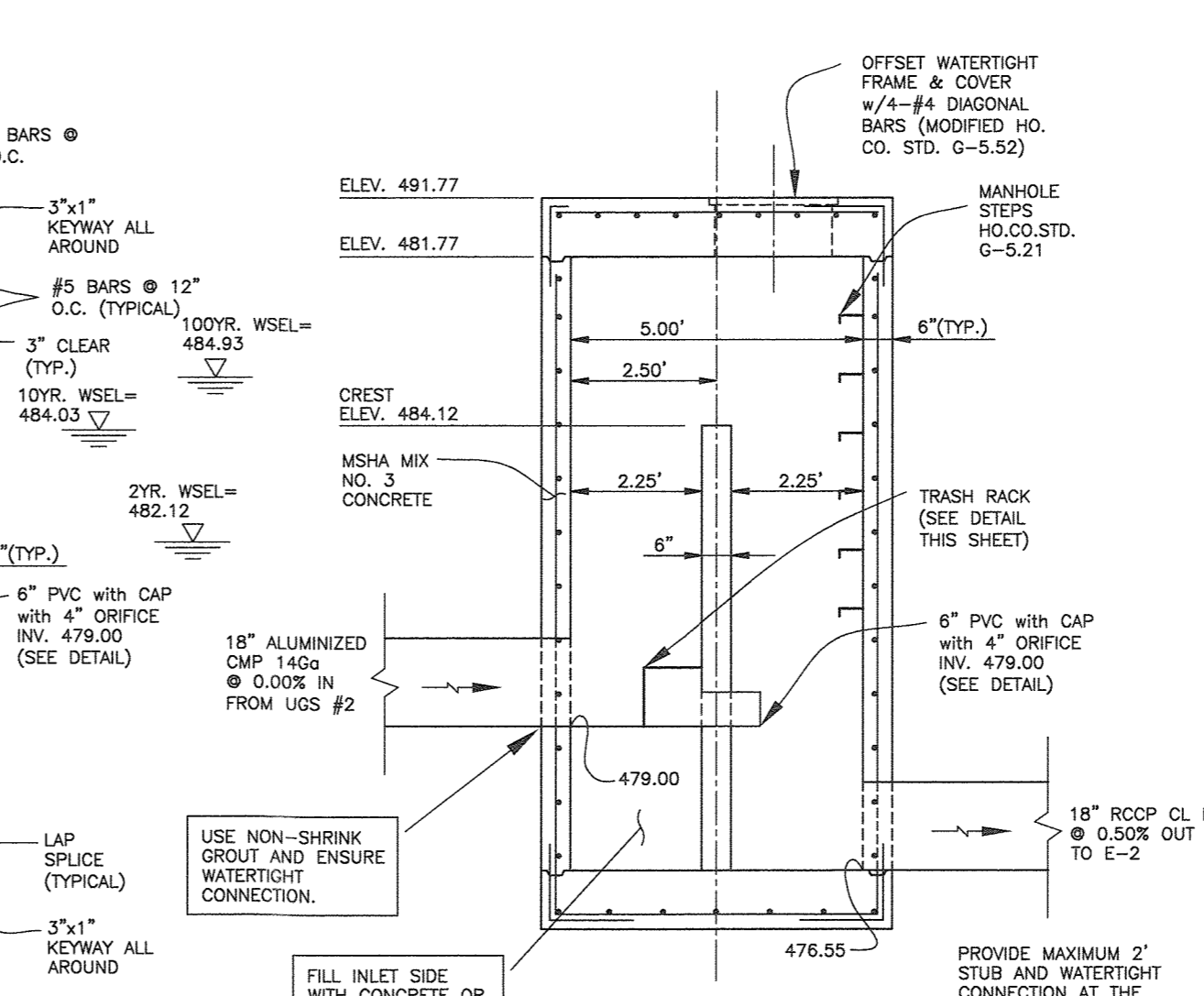
TYPICAL ACCESS MANHOLE DETAIL

CONSTRUCTION SPECIFICATIONS

- A. BEDDING
- THE BED SHALL BE PLACED TO UNIFORM GRADE AND LINE TO ENSURE GOOD VERTICAL ALIGNMENT AND TO AVOID EXCESSIVE STRESSES AT PIPE JOINTS. THE BEDDING SHALL BE FREE OF ROCK FORMATIONS, PROTRUDING STONES, FROZEN LUMPS, ROOTS, AND FOREIGN MATERIAL. THE BEDDING FOUNDATION MUST BE A STABLE, WELL GRADED GRANULAR MATERIAL. ANY MATERIAL THAT HAS INADEQUATE BEARING CAPACITY MUST BE REMOVED AND REPLACED WITH A COMPACTED SELECT FILL APPROVED BY THE GEO-TECHNICAL ENGINEER.
- B. BACKFILL
- THE FILL MATERIAL SHALL BE FREE OF ROCKS, FROZEN LUMPS, AND FOREIGN MATTER THAT COULD CAUSE HARD SPOTS IN BACKFILL OR THAT COULD DECOMPOSE AND CREATE VOIDS.
 - BACKFILL MATERIAL SHALL BE A WELL GRADED GRANULAR MATERIAL.
 - HIGHLY PLASTIC SILTS, HIGHLY PLASTIC CLAYS, ORGANIC SILTS, ORGANIC CLAYS AND PEATS SHALL NOT BE USED AS BACKFILL MATERIAL.
 - BACKFILL SHALL BE PLACED SYMMETRICALLY ON EACH SIDE OF THE STRUCTURE IN SIX-INCH TO EIGHT-INCH LOOSE LAYERS TO ONE FOOT ABOVE THE TOP OF THE PIPE. EACH LAYER IS TO BE COMPACTED TO THE SPECIFIED DENSITY (MINIMUM 90%) BEFORE PLACING THE NEXT LAYER. REFERENCE ASTM #708.
- C. PIPE
- THE PIPE FABRICATOR SHALL PROVIDE SPECIFICATIONS OF ALL MATERIALS (BASED ON HS25 LOADING).
 - SHOP DRAWINGS ARE TO BE PROVIDED BY FABRICATOR. APPROVAL BY ENGINEER IS REQUIRED PRIOR TO CONSTRUCTION.
 - CONTRACTOR IS REQUIRED TO COORDINATE APPROVAL OF SHOP DRAWINGS AND SPECIFICATIONS AND SHALL BE OBLIGATED FOR ANY COST THEREOF.
- D. GENERAL
- DEBRIS IS TO BE KEPT OUT OF THE FACILITY DURING AND AFTER CONSTRUCTION.



SECTION A-A FRONT VIEW



SECTION B-B SIDE VIEW

S-2 DETAIL

SCALE: 1" = 3'

NOTE: SEE GENERAL NOTE 34 ON SHEET 1 FOR DESIGN MANUAL WATER INFORMATION REGARDING THIS STRUCTURE.

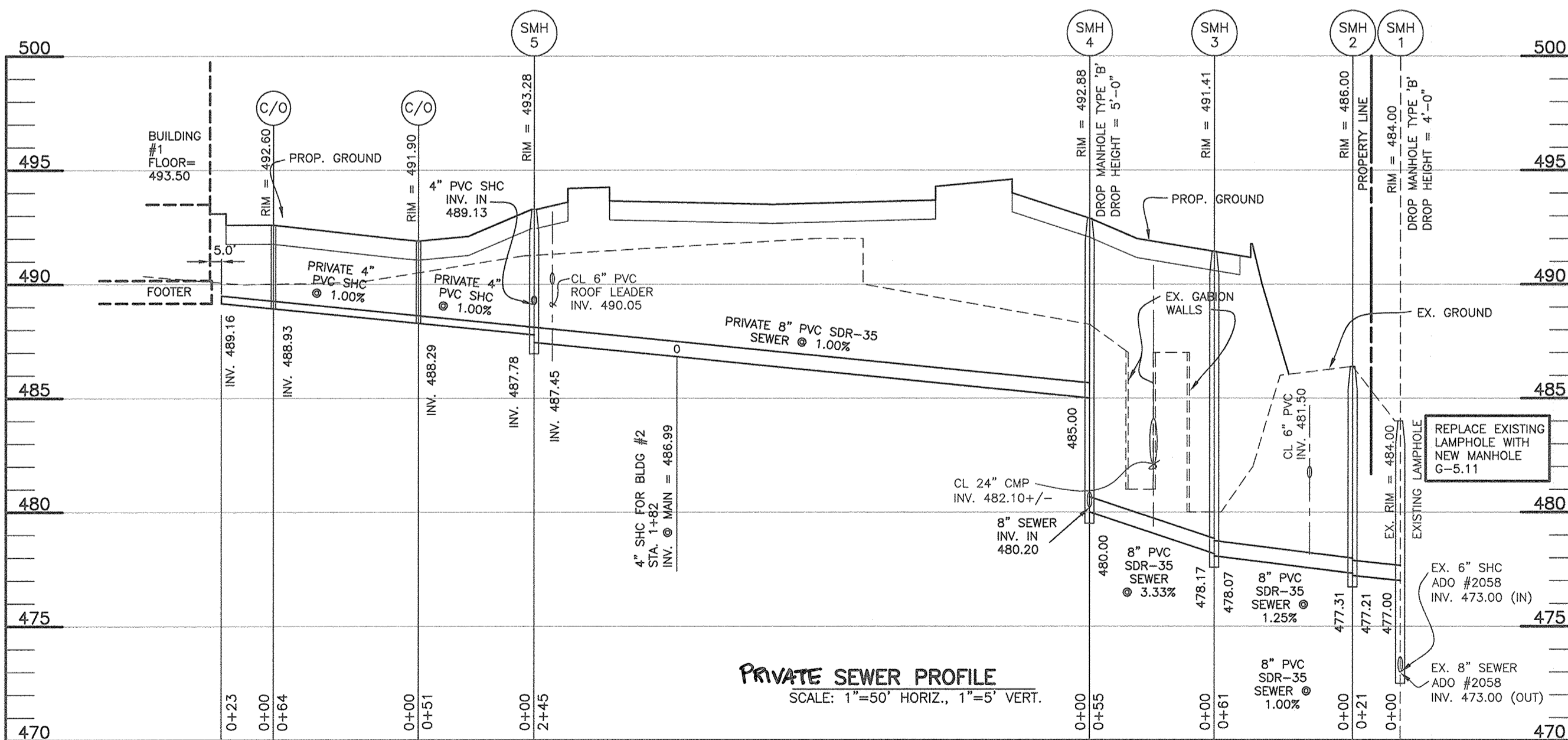
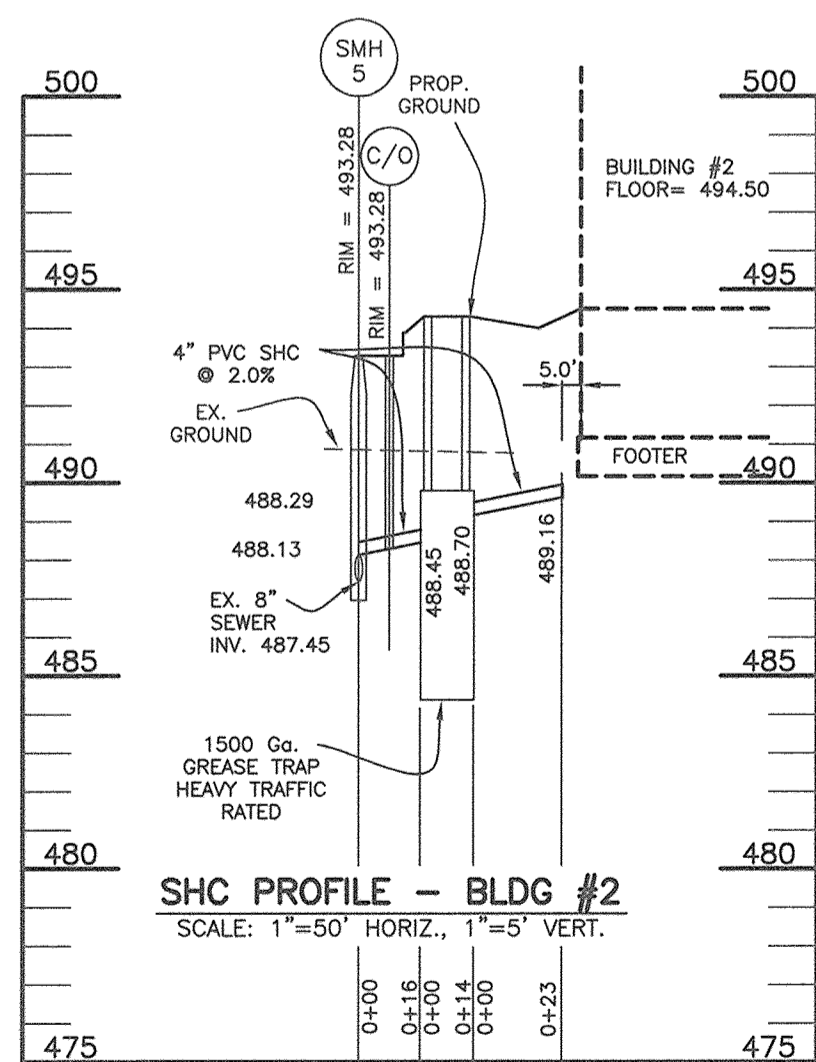
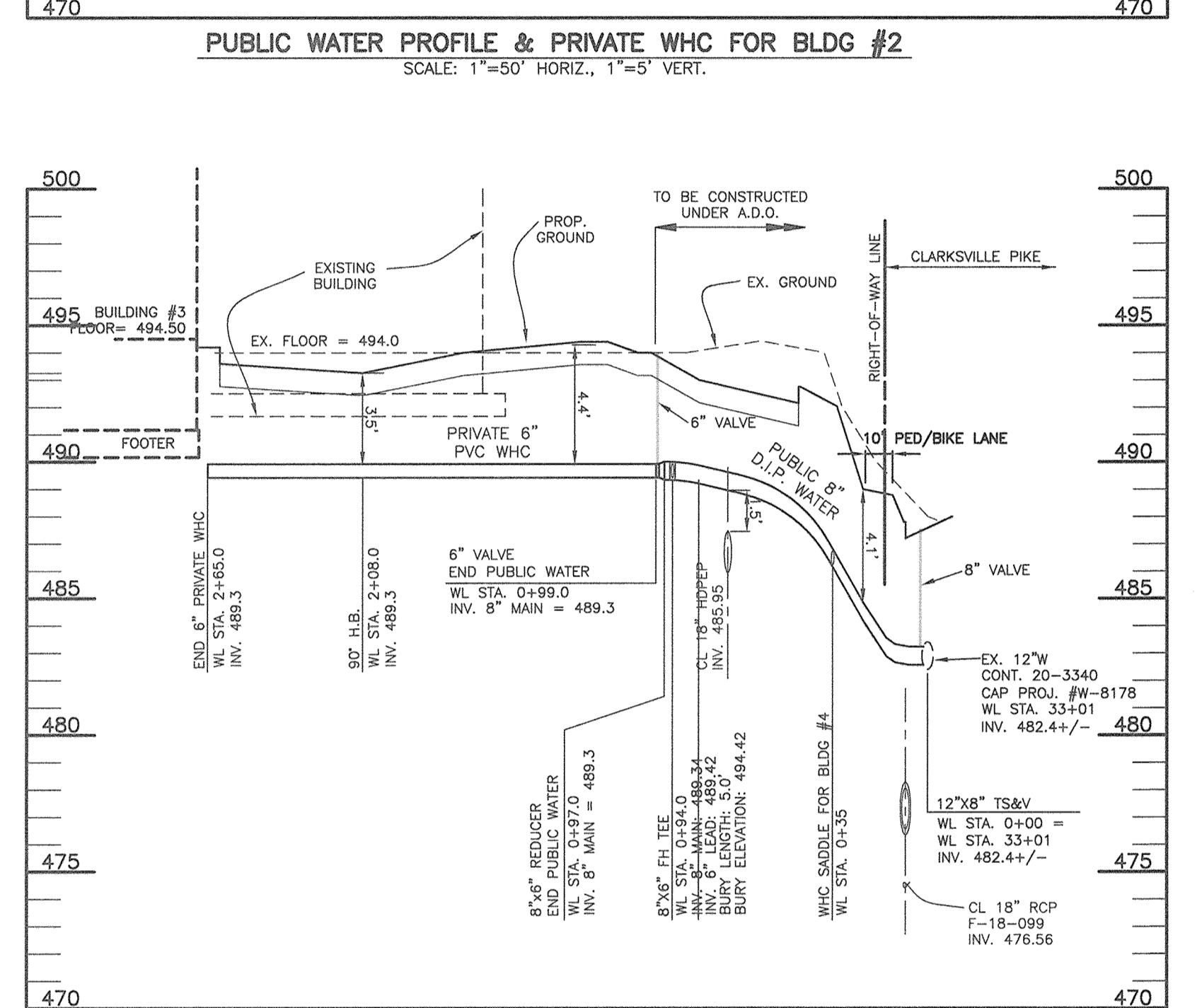
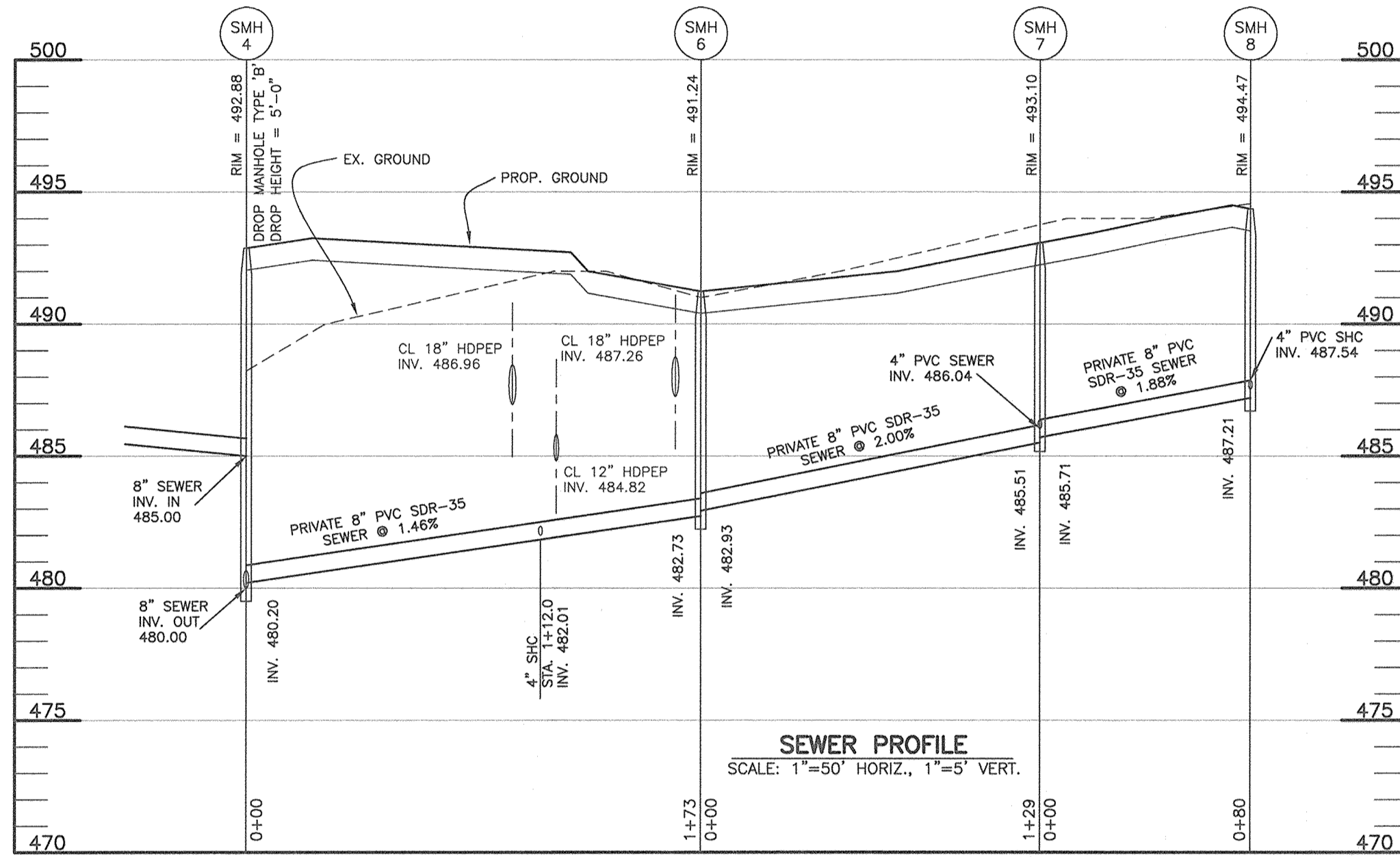
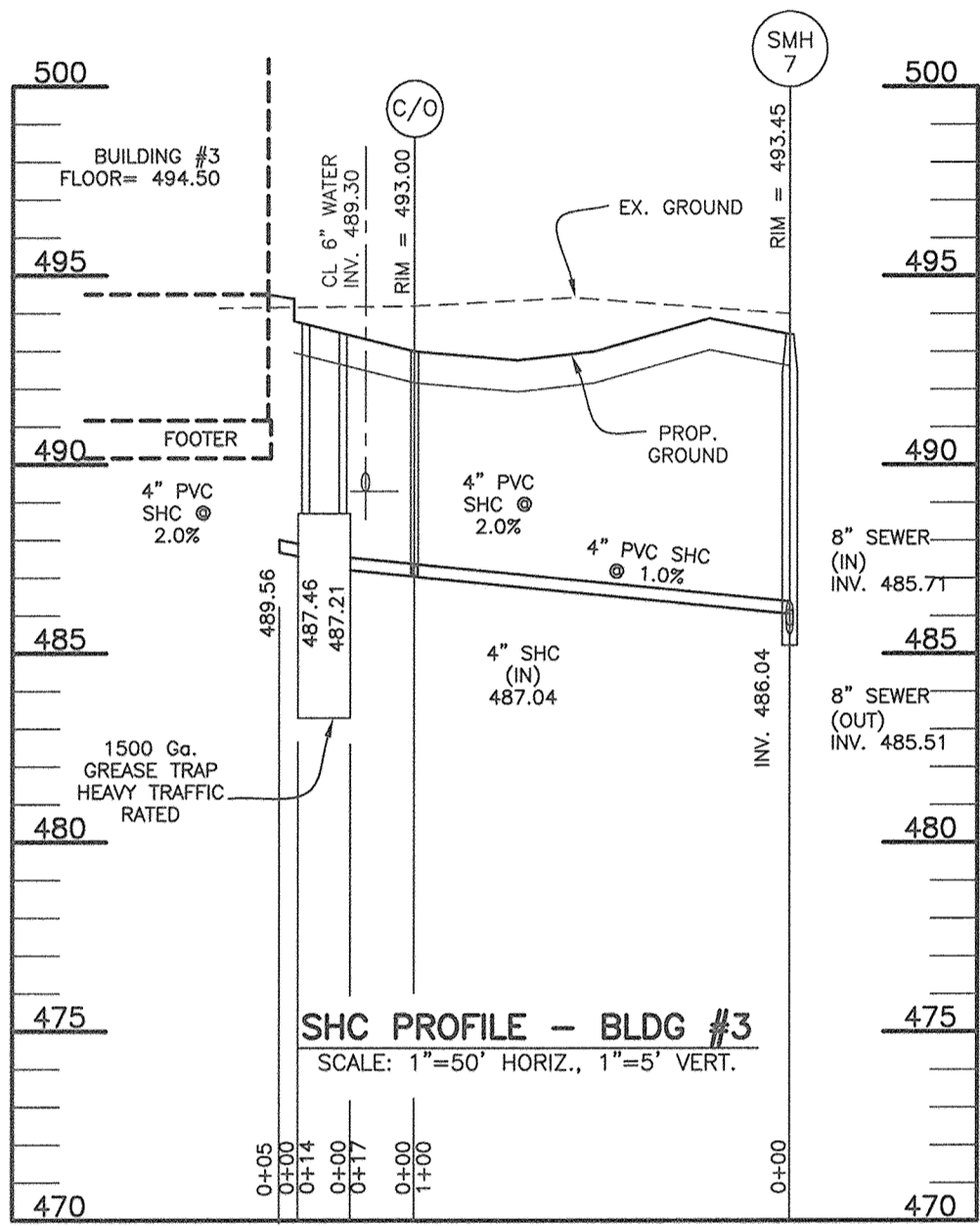
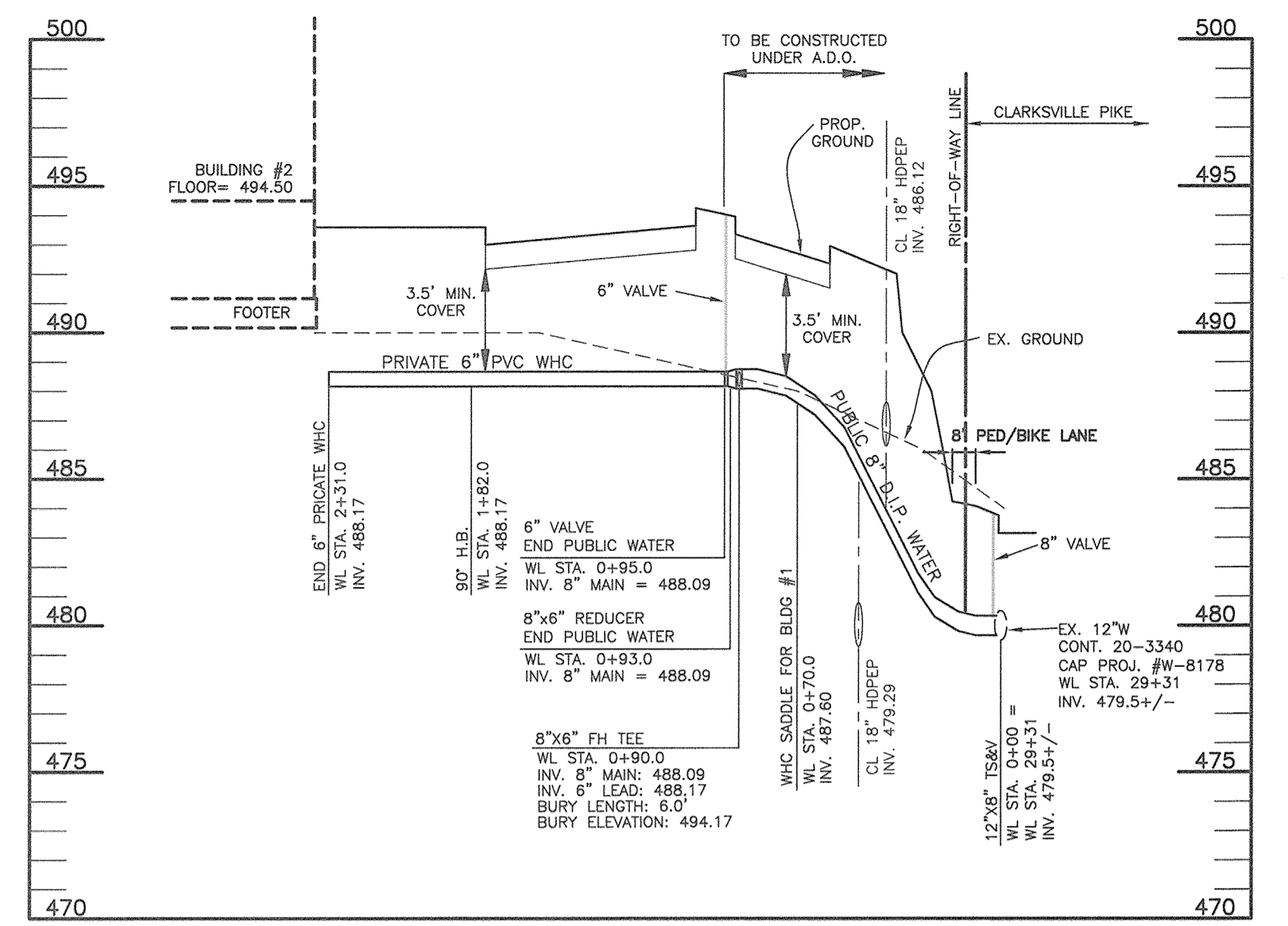
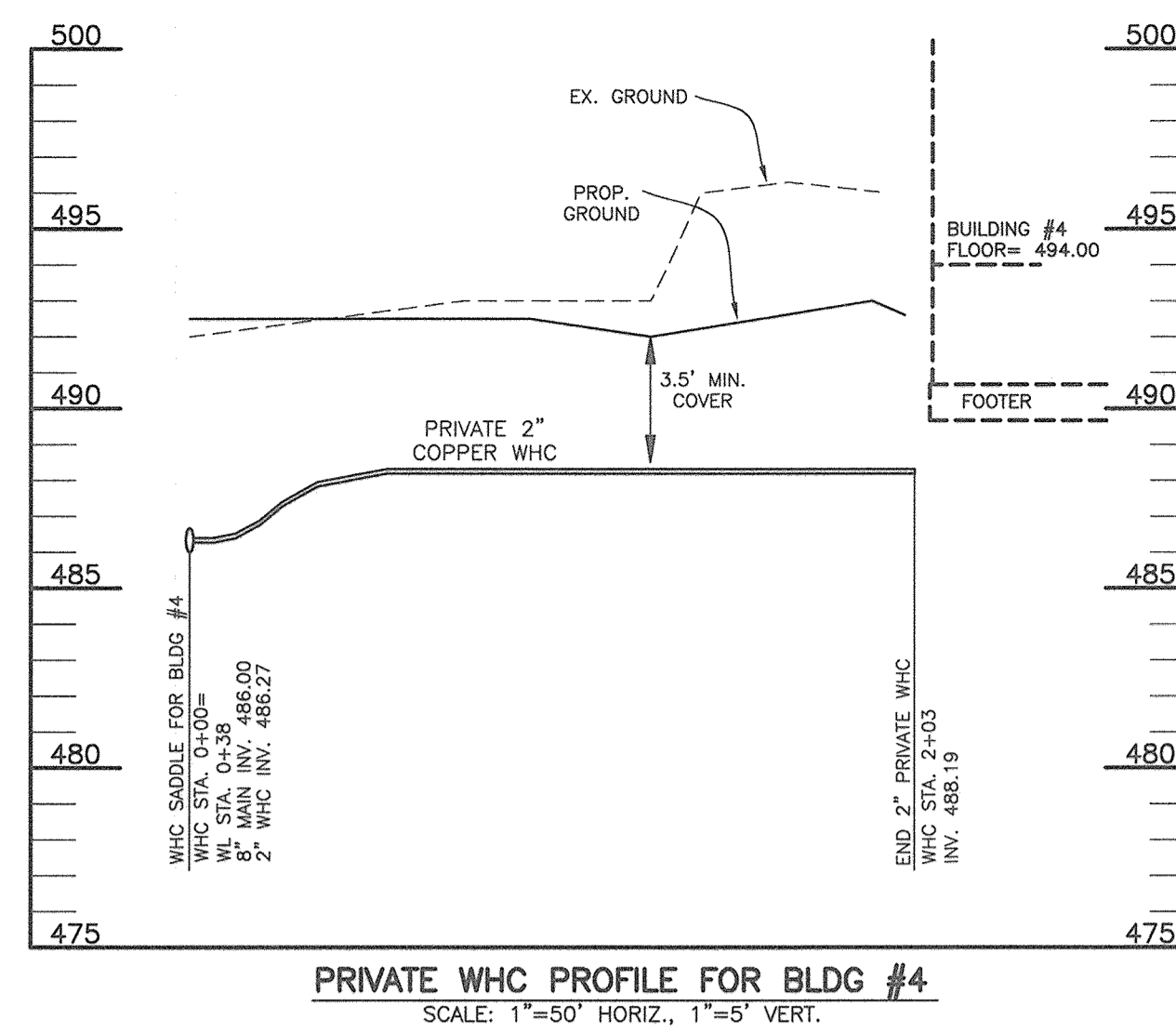
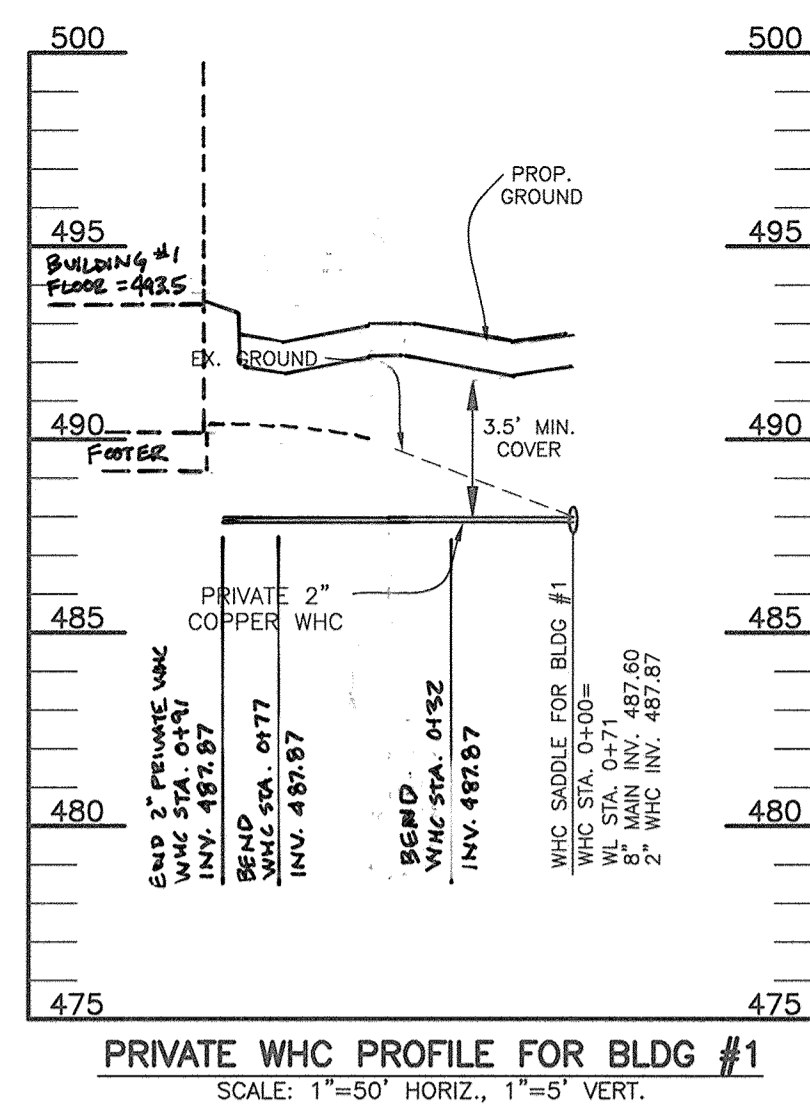
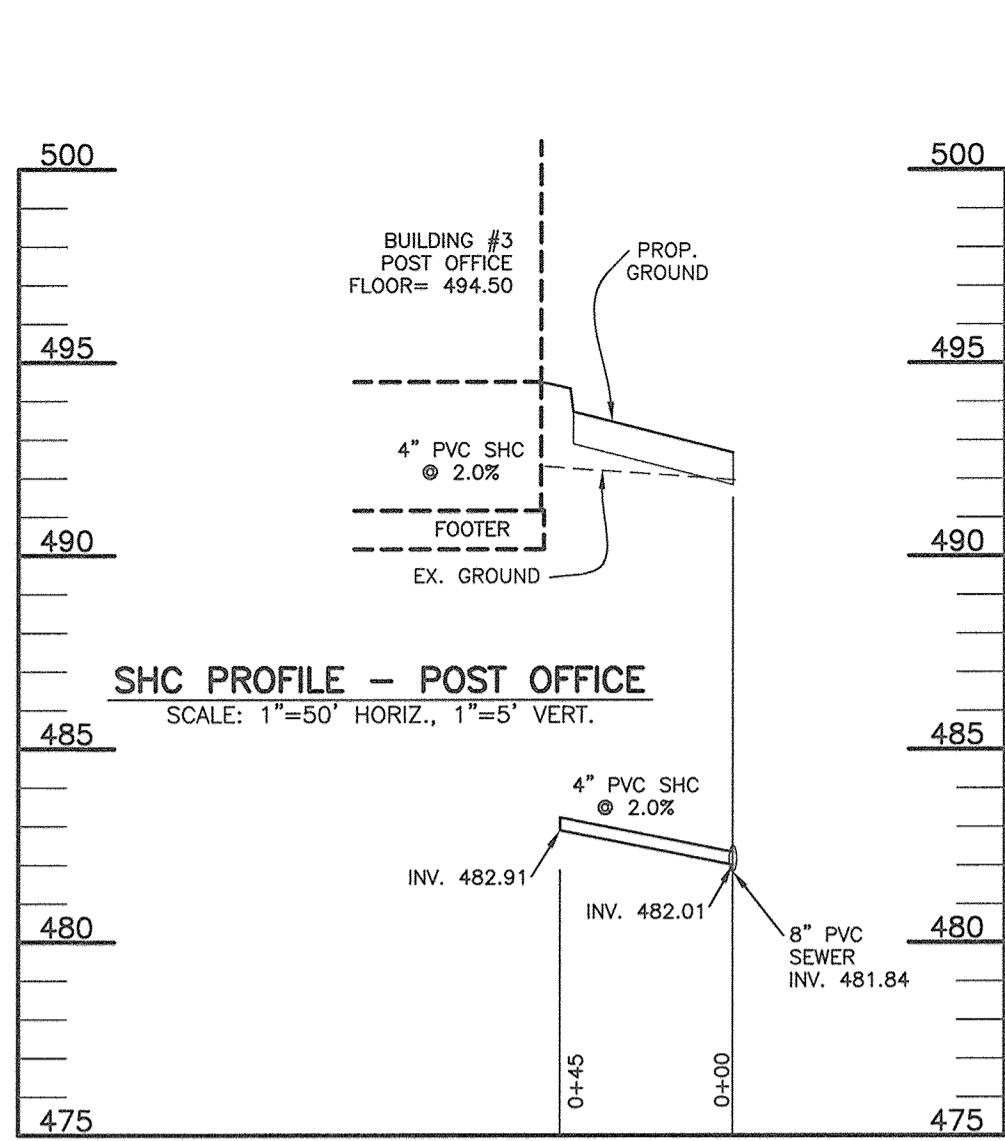
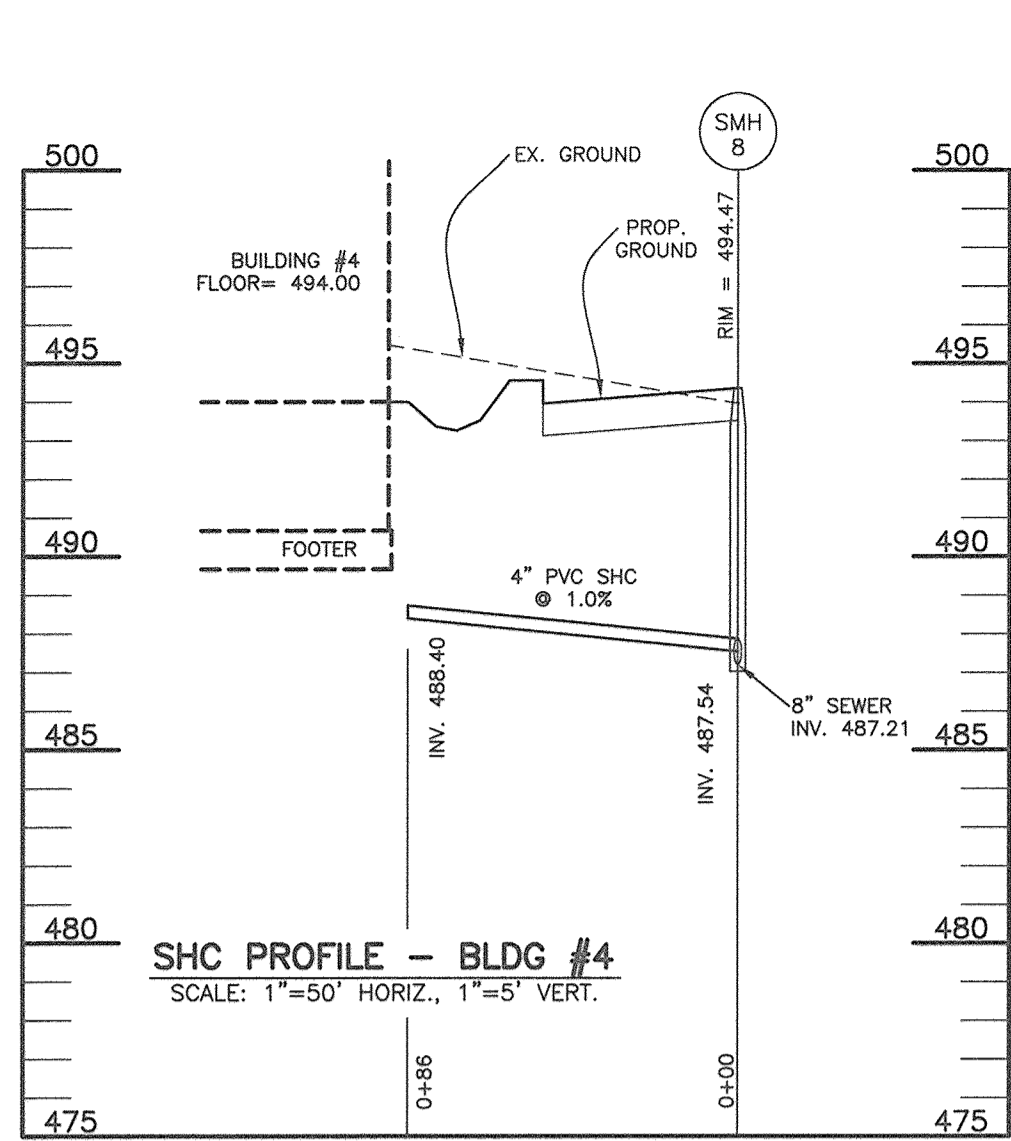
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

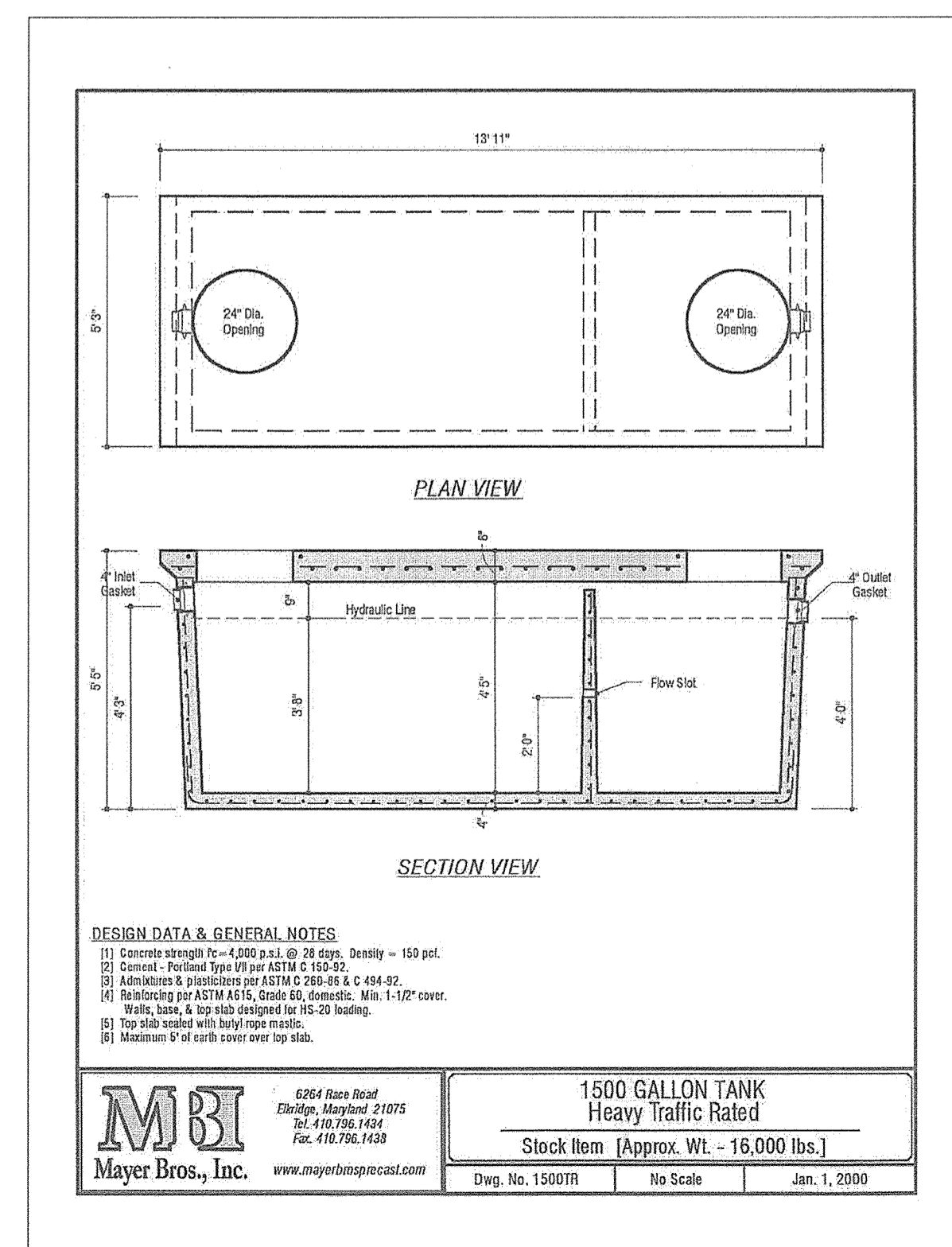
[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 4-4-19
DIRECTOR DATE

NO. DATE REVISION		<p>Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22390, Expiration Date: 6-30-2019.</p> <p>BENCHMARK ENGINEERS, INC. ENGINEERS & LAND SURVEYORS & PLANNERS 8480 BALTIMORE NATIONAL PIKE SUITE 315 ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6444 WWW.BE-CIVILENGINEERING.COM</p>	<p>STATE OF MARYLAND PROFESSIONAL ENGINEER <i>[Signature]</i> 3-5-19</p>
OWNER: STEPHEN A. KLEIN & ASSOCIATES C/O STEPHEN KLEIN, INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244			
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244		<p>RIVER HILL SQUARE</p> <p>REDEVELOPMENT OF RIVER HILL GARDEN CENTER</p> <p>TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>	<p>SWM DETAILS (UGS) UNDERGROUND FACILITY #2</p> <p>DATE: MARCH 4, 2019 BEI PROJECT NO. 2801 SCALE: AS SHOWN SHEET 15 OF 25</p>
DESIGN: DBT	DRAFT: DBT	<p>SDP-18-044</p>	



PRIVATE SEWER MANHOLE SCHEDULE					
Manhole Number	Location (NAD '83)	Invert		Rim Elevation	Ho.Co.Std. Detail
		In	Out		
1	N 563572.59 E 1331416.51	477.00 (8")	EX. 473.00 (8")	484.00	G-5.11 & S-1.33
2	N 563591.58 E 1331425.51	477.31 (8")	477.21 (8")	486.00	G-5.11
3	N 563621.13 E 1331372.65	478.17 (8")	478.07 (8")	491.41	G-5.11
4	N 563661.74 E 1331335.97	485.00 (8")	480.20 (8")	492.88	G-5.11 & S-1.33
5	N 563648.80 E 1331090.99	487.78 (4")	489.13 (4")	493.28	G-5.11
6	N 563790.45 E 1331452.00	482.95 (8")	482.73 (8")	491.24	G-5.11
7	N 563934.46 E 1331415.16	486.61 (8")	486.74 (4")	493.45	G-5.11
8	N 563992.94 E 1331400.20	487.54 (4")	487.21 (8")	494.47	G-5.11



1 6.18.2019 REVISE PRIVATE WHC PROFILE FOR BLDG #1.

NO. DATE REVISION

BENCHMARK ENGINEERING, INC.
ENGINEERS & LAND SURVEYORS & PLANNERS
8480 BALTIMORE NATIONAL PIKE SUITE 315 A ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6844
WWW.BE-ENGINEERING.COM

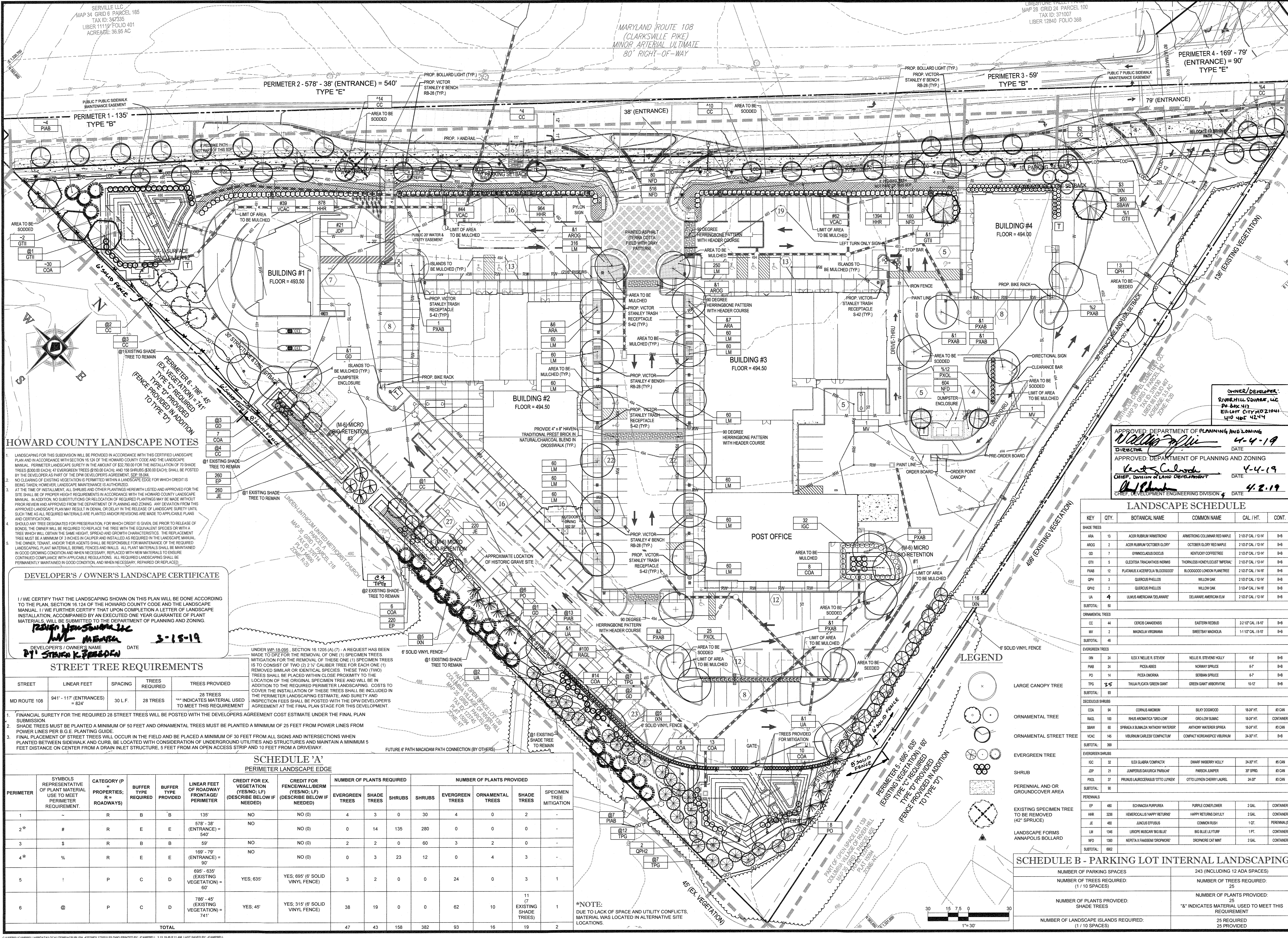
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 27799-4447.

RIVER HILL SQUARE
REDEVELOPMENT OF RIVER HILL GARDEN CENTER
TAX MAP: 35 - GRID: 1 - PARCEL: 1
ZONED: B-1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

WATER AND SEWER PROFILES AND DETAILS
DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
SCALE: AS SHOWN SHEET 16 OF 25

OWNER: STEPHEN A. KLEIN & ASSOCIATES c/o STEPHEN KLEIN INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-6105

DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244



SERVILLE LLC
MAP 34 GRID 8 PARCEL 185
TAX ID: 347335
LIBER 11119 FOLIO 401
ACREAGE: 36.35 AC

MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL ULTIMATE
80' RIGHT-OF-WAY

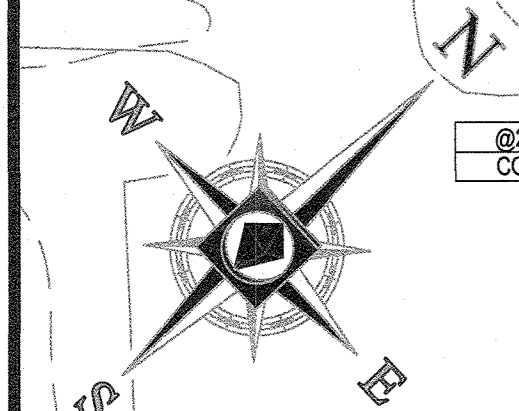
LIBERTY HILL PARCEL 100
MAP 28 GRID 24 PARCEL 100
TAX ID: 371007
LIBER 12840 FOLIO 368

PERIMETER 4 - 169' - 79'
(ENTRANCE) = 90'
TYPE "E"

PERIMETER 2 - 578' - 38' (ENTRANCE) = 540'
TYPE "E"

PERIMETER 3 - 59'
TYPE "B"

PERIMETER 1 - 135'
TYPE "B"



HOWARD COUNTY LANDSCAPE NOTES

- LANDSCAPING FOR THIS SUBDIVISION WILL BE PROVIDED IN ACCORDANCE WITH THIS CERTIFIED LANDSCAPE PLAN AND IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. PERIMETER LANDSCAPE SURVEY IS THE INSTALLATION OF 70 SHADE TREES (\$300.00 EACH), 47 EVERGREEN TREES (\$150.00 EACH), AND 158 SHRUBS (\$50.00 EACH); SHALL BE POSTED BY THE DEVELOPER AS PART OF THE DPW DEVELOPER'S AGREEMENT, SDP 18-044.
- NO CLEARING OF EXISTING VEGETATION IS PERMITTED WITHIN A LANDSCAPE EDGE FOR WHICH CREDIT IS BEING TAKEN UNLESS LANDSCAPE MAINTENANCE IS AUTHORIZED, SDP 18-044.
- AT THE TIME OF INSTALLATION, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THE SITE SHALL BE OF PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELIEF PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DELAY OR CANCELLATION OF THE RELEASE OF LANDSCAPE SURVEY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATIONS.
- SHOULD ANY TREE DESIGNATED FOR PRESERVATION FOR WHICH CREDIT IS GIVEN, PRIOR TO RELEASE OF BONDS, THE OWNER WILL BE REQUIRED TO REPLACE THE TREE WITH THE EQUIVALENT SPECIES OR WITH A TREE WHICH WILL OBTAIN THE SAME HEIGHT, SPREAD AND GROWTH CHARACTERISTICS. THE REPLACEMENT TREE MUST BE A MINIMUM OF 3 INCHES IN CALIPER AND INSTALLED AS REQUIRED IN THE LANDSCAPE MANUAL BY THE OWNER, TENANT, AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING PLANT MATERIALS, BERMES, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION AND WHEN NECESSARY, REPAIRED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.

DEVELOPER'S / OWNER'S LANDSCAPE CERTIFICATE

I / WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. I / WE FURTHER CERTIFY THAT UPON COMPLETION A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

Paula Hanson
Julie Meana
DATE: 3-15-19

DEVELOPER'S / OWNER'S NAME

1 / WE STRAIN K. RABOLD

STREET TREE REQUIREMENTS

STREET	LINEAR FEET	SPACING	TREES REQUIRED	TREES PROVIDED
MD ROUTE 108	941' - 117' (ENTRANCES) = 824'	30 L.F.	28 TREES	28 TREES

- FINANCIAL SURETY FOR THE REQUIRED 28 STREET TREES WILL BE POSTED WITH THE DEVELOPER'S AGREEMENT COST ESTIMATE UNDER THE FINAL PLAN SUBMISSION.
- SHADE TREES MUST BE PLANTED A MINIMUM OF 50 FEET AND ORNAMENTAL TREES MUST BE PLANTED A MINIMUM OF 25 FEET FROM POWER LINES FROM POWER LINES PER R.G.E. PLANTING GUIDE.
- FINAL PLACEMENT OF STREET TREES WILL OCCUR IN THE FIELD AND BE PLACED A MINIMUM OF 30 FEET FROM ALL SIGNS AND INTERSECTIONS WHEN PLANTED BETWEEN SIDEWALK AND CURB, BE LOCATED WITH CONSIDERATION OF UNDERGROUND UTILITIES AND STRUCTURES AND MAINTAIN A MINIMUM 5 FEET DISTANCE CENTER FROM A DRAIN INLET STRUCTURE, 5 FEET FROM AN OPEN ACCESS STRIP AND 10 FEET FROM A DRIVEWAY.

SCHEDULE 'A' PERIMETER LANDSCAPE EDGE

PERIMETER	SYMBOLS REPRESENTATIVE OF PLANT MATERIAL USE TO MEET PERIMETER REQUIREMENT.	CATEGORY (P=PROPERTIES; R=ROADWAYS)	BUFFER REQUIRED	BUFFER PROVIDED	LINEAR FEET OF ROADWAY/FENCE/PERIMETER	CREDIT FOR EX. VEGETATION (YES/NO, L/F) (DESCRIBE BELOW IF NEEDED)	CREDIT FOR FENCE/WALL/BERM (YES/NO, L/F) (DESCRIBE BELOW IF NEEDED)	NUMBER OF PLANTS REQUIRED					SPECIMEN TREE MITIGATION		
								EVERGREEN TREES	SHADE TREES	SHRUBS	SHRUBS	EVERGREEN TREES		ORNAMENTAL TREES	SHADE TREES
1	-	R	B	B	135'	NO	NO (0)	4	3	0	30	4	0	2	-
2*	-	R	E	E	578' - 38' (ENTRANCE) = 540'	NO	NO (0)	0	14	135	280	4	0	2	-
3	S	R	B	B	59'	NO	NO (0)	2	2	0	60	3	2	0	-
4*	%	R	E	E	169' - 79' (ENTRANCE) = 90'	NO	NO (0)	0	3	23	12	0	4	3	-
5	-	P	C	D	695' - 635' (EXISTING VEGETATION) = 60'	YES, 635'	YES, 695' (6' SOLID VINYL FENCE)	3	2	0	0	24	0	3	1
6	@	P	C	D	785' - 45' (EXISTING VEGETATION) = 741'	YES, 45'	YES, 315' (6' SOLID VINYL FENCE)	38	19	0	0	62	10	11 (7 EXISTING SHADE TREES)	1
TOTAL								47	43	158	382	93	16	19	2

SCHEDULE 'B' - PARKING LOT INTERNAL LANDSCAPING

NUMBER OF PARKING SPACES	243 (INCLUDING 12 ADA SPACES)
NUMBER OF TREES REQUIRED: (1 / 10 SPACES)	NUMBER OF TREES REQUIRED: 25
NUMBER OF PLANTS PROVIDED: SHADE TREES	NUMBER OF PLANTS PROVIDED TO MEET THIS REQUIREMENT: 25
NUMBER OF LANDSCAPE ISLANDS REQUIRED: (1 / 10 SPACES)	25 REQUIRED 25 PROVIDED

*NOTE: DUE TO LACK OF SPACE AND UTILITY CONFLICTS, MATERIAL WAS LOCATED IN ALTERNATIVE SITE LOCATIONS.

APPROVED DEPARTMENT OF PLANNING AND ZONING
Walter J. [Signature] 4-4-19
DIRECTOR

APPROVED DEPARTMENT OF PLANNING AND ZONING
Keith S. [Signature] 4-4-19
CHIEF, DEPARTMENT OF LAND DEVELOPMENT

CHIEF, DEVELOPMENT ENGINEERING DIVISION 4 DATE 4-2-19

LANDSCAPE SCHEDULE

KEY	QTY.	BOTANICAL NAME	COMMON NAME	CAL. HT.	CONT.
SHADE TREES					
ARA	13	ACER RUBRUM 'HONESTY'	ARMSTRONG COLLONAR RED MAPLE	2 1/2" CAL. 13'x14"	B/B
AROG	2	ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE	2 1/2" CAL. 13'x14"	B/B
GD	7	ONYCHIAUS SODUS	KENTUCKY COFFEE TREE	2 1/2" CAL. 13'x14"	B/B
GTI	5	GLEDITSIA TRACANTARUS 'NEMUS'	THORNLESS HONEYLOCUST 'NEMUS'	2 1/2" CAL. 13'x14"	B/B
PXAB	12	PLATANUS X ACERIFOLIA 'BLOODGOOD'	BLOODGOOD LONDON PLANETREE	2 1/2" CAL. 14'x16"	B/B
OPH	3	QUERCUS PHellos	WILLOW OAK	2 1/2" CAL. 13'x14"	B/B
OPH2	2	QUERCUS PHellos	WILLOW OAK	3 1/4" CAL. 14'x16"	B/B
UA	4	LAMIS AMERICANA 'DELAWARE'	DELAWARE AMERICAN ELM	2 1/2" CAL. 13'x14"	B/B
SUBTOTAL:	60				
ORNAMENTAL TREES					
CC	44	CORUS CANADENSIS	EASTERN REDBUD	2 1/2" CAL. 13'x14"	B/B
MV	2	MAGNOLIA VIRGINIANA	SWEETBAY MAGNOLIA	1 1/2" CAL. 8'x10"	B/B
SUBTOTAL:	46				
EVERGREEN TREES					
DXN	24	ILEX NELLE'S STEVEN	NELLE'S STEVEN HOLLY	6"	B/B
PAB	34	PIZA ABIES	NORWAY SPRUCE	6"	B/B
PO	14	PIZA OMORICA	SERBIAN SPRUCE	6"	B/B
TPG	35	THALIA PLICATA 'GREEN GANT'	GREEN GANT ARBORVITAE	10-12"	B/B
SUBTOTAL:	99				
DECIDUOUS SHRUBS					
COA	94	CORUS ANONUM	SILKY DOGWOOD	18-24" HT.	#1 CAN
RAQ	100	RUS AROMATICA 'YRLOW'	GRLOW SIAMC	18-24" HT.	CONTAINER
SBAY	60	SPRAYS X BANALUA 'ANTHONY WATERER'	ANTHONY WATERER SPREA	18-24" HT.	#1 CAN
VCAC	145	VIBURNUM CARLESI 'COMPACTUM'	COMPACT KOREANSPICE VIBURNUM	24-30" HT.	B/B
SUBTOTAL:	399				
EVERGREEN SHRUBS					
IGC	32	ILEX GLABRA 'COMPACTA'	DWARF HERRBERTY HOLLY	24-30" HT.	#5 CAN
JOP	21	JUNIPERUS DAURICA 'PARGSON'	PARGSON JUNPER	30" SPRL	#3 CAN
PXOL	37	PRUNUS LAUROCARUS 'OTTO LUYKEN'	OTTO LUYKEN CHERRY LAUREL	24-30"	#3 CAN
SUBTOTAL:	90				
PERENNIAL AND OR GROUNDCOVER AREA					
EP	400	EDINAZEA PURPUREA	PURPLE CORNERWY	2 GAL.	CONTAINER
HHR	328	HEMERICALLIS 'HAPPY RETURN'	HAPPY RETURN DAYLILY	2 GAL.	CONTAINER
JE	400	JANUS EFFUSUS	COMMON RUSH	1 QT.	PERENNIALS
LM	1346	LIRIOPE MURCARI 'BIG BLUE'	BIG BLUE LILYTURF	1 PT.	CONTAINER
NFD	1350	NEPETA X FASSENI 'DROPCARE'	DROPCARE CAT MINT	2 GAL.	CONTAINER
SUBTOTAL:	1822				
EXISTING SPECIMEN TREE TO BE REMOVED (42' SPRUCE)					
LANDSCAPE FORMS ANNAPOLIS BOLLARD					

BOHLER ENGINEERING

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING PROGRAM MANAGEMENT LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN PERMITTING SERVICES TRANSPORTATION SERVICES

OFFICES:
• ANNAPOLIS, MD
• BALTIMORE, MD
• BOSTON, MA
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• PHILADELPHIA, PA
• PITTSBURGH, PA
• RICHMOND, VA
• SOUTH BEND, IN
• SOUTH EASTERN PA
• WASHINGTON, DC

REVISIONS

REV.	DATE	COMMENT
1	3-31-2019	REVISED TO SHOW TREES TO BE PLANTED BETWEEN PERIMETER 1 AND 2 TO BE 4' EVERGREENS. LEVEL ELEVATION OF PERIMETER TO BE 540' (PERIMETER 1) TO BE 541' (PERIMETER 2)

KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG

It's fast. It's free. It's the law.

PROJECT NO: MDL173001
DRAWN BY: JCV
CHECKED BY: ERM
DATE: 2/23/18
SCALE: 1" = 30'
CAD I.D.: LPS

SITE PLAN

FOR RIVER HILL SQUARE

LOCATION OF SITE
CLARKSVILLE PIKE
HOWARD COUNTY
MARYLAND

BOHLER ENGINEERING

22636 DAVIS DRIVE, SUITE 250
STERLING, VIRGINIA 20164
Phone: (703) 709-9500
Fax: (703) 709-9501
VA@BohlerEng.com

E.R. MANNING

REGISTERED PROFESSIONAL LANDSCAPE ARCHITECT

PROFESSIONAL SEAL

LANDSCAPE PLAN

SHEET NUMBER: 17 of 25

SDP-18-044

LANDSCAPE SPECIFICATIONS

1. SCOPE OF WORK:
THE LANDSCAPE CONTRACTOR SHALL BE REQUIRED TO PERFORM ALL CLEARING, FINISHED GRADING, SOIL PREPARATION, PERMANENT SEEDING OR SODDING, PLANTING AND MULCHING INCLUDING ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT NECESSARY FOR THE COMPLETION OF THIS PROJECT, UNLESS OTHERWISE CONTRACTED BY THE GENERAL CONTRACTOR.

2. MATERIALS
A. GENERAL - ALL HARDSCAPE MATERIALS SHALL MEET OR EXCEED SPECIFICATIONS AS OUTLINED IN THE STATE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.
B. TOPSOIL - NATURAL, FRIABLE, LOAMY SILT SOIL, HAVING AN ORGANIC CONTENT NOT LESS THAN 5%, A PH RANGE BETWEEN 4.5-7.0, IT SHALL BE FREE OF DEBRIS, ROCKS LARGER THAN ONE (1) INCH, WOOD, ROOTS, VEGETABLE MATTER AND CLAY CLOS.

C. LAWN - ALL DISTURBED AREAS ARE TO BE TREATED WITH A MINIMUM SIX (6) INCH THICK LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, AND SEEDED OR SODDED IN ACCORDANCE WITH THE PERMANENT STABILIZATION METHODS INDICATED WITHIN THE SOIL EROSION AND SEDIMENT CONTROL NOTES.
1.1. LAWN SEED MIXTURE SHALL BE FRESHLY CLEAN AND FREE FROM WEED SEEDS.
1.2. SOD SHALL BE STRONGLY ROOTED, WEED AND DISEASE/FEST FREE WITH A UNIFORM THICKNESS.
1.3. SOD INSTALLED ON SLOPES GREATER THAN 4:1 SHALL BE PEGGED TO HOLD SOD IN PLACE.

D. MULCH - THE MULCH AROUND THE PERIMETER OF THE BUILDING SHALL BE A 3" LAYER OF DOUBLE SHREDDED BLACK CEDAR MULCH ONLY. ALL OTHER AREAS SHALL BE MULCHED WITH A 3" LAYER OF DOUBLE SHREDDED DARK BROWN HARDWOOD BARK MULCH, UNLESS OTHERWISE STATED ON THE LANDSCAPE PLAN.

E. FERTILIZER
1.1. FERTILIZER SHALL BE DELIVERED TO THE SITE MIXED AS SPECIFIED IN THE ORIGINAL UNOPENED STANDARD BAGS SHOWING WEIGHT, ANALYSIS AND NAME OF MANUFACTURER. FERTILIZER SHALL BE STORED IN A WEATHERPROOF PLACE SO THAT IT CAN BE KEPT DRY PRIOR TO USE.
1.2. FOR THE PURPOSE OF BIDDING, ASSUME THAT FERTILIZER SHALL BE 10% NITROGEN, 6% PHOSPHORUS AND 4% POTASSIUM BY WEIGHT. A FERTILIZER SHOULD NOT BE SELECTED WITHOUT A SOIL TEST PERFORMED BY A CERTIFIED SOIL LABORATORY.

F. PLANT MATERIAL
1.1. ALL PLANTS SHALL IN ALL CASES CONFORM TO THE REQUIREMENTS OF THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1), LATEST EDITION, AS PUBLISHED BY THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION.
1.2. IN ALL CASES, BOTANICAL NAMES SHALL TAKE PRECEDENCE OVER COMMON NAMES FOR ANY AND ALL PLANT MATERIAL.
1.3. PLANTS SHALL BE LEGIBLY TAGGED WITH THE PROPER NAME AND SIZE. TAGS ARE TO REMAIN ON AT LEAST ONE PLANT OF EACH SPECIES FOR VERIFICATION PURPOSES DURING THE FINAL INSPECTION.
1.4. TREES WITH ABRASION OF THE BARK, SUN SCALDS, DISFIGURATION OR FRESH CUTS OF LIMBS OVER 1/2", WHICH HAVE NOT BEEN COMPLETELY CALLEDUS, SHALL BE REJECTED. PLANTS SHALL NOT BE BOUND WITH WIRE OR ROPE AT ANY TIME SO AS TO DAMAGE THE BARK OR BREAK BRANCHES.
1.5. ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY AND SHALL HAVE A NORMAL HABIT OF GROWTH WITH WELL DEVELOPED BRANCHES, DENSELY FOLIATED, VIGOROUS ROOT SYSTEMS AND BE FREE OF DISEASE, INSECTS, PESTS, EGGS OR LARVAE.
1.6. CALIPER MEASUREMENTS OF NURSERY GROWN TREES SHALL BE TAKEN AT A POINT ON THE TRUNK SIX (6) INCHES ABOVE THE NATURAL GRADE FOR TREES UP TO AND INCLUDING A FOUR (4) INCH (4") CALIPER SIZE. IF THE CALIPER AT SIX (6) INCHES (6") ABOVE THE GROUND EXCEEDS FOUR (4) INCHES (4"), THE CALIPER SHOULD BE MEASURED AT A POINT 12" ABOVE THE NATURAL GRADE.
1.7. SHRUBS SHALL BE MEASURED TO THE AVERAGE HEIGHT OR SPREAD OF THE SHRUB, AND NOT TO THE LONGEST BRANCH.
1.8. TREES AND SHRUBS SHALL BE HANDLED WITH CARE BY THE ROOT BALL.

G. GENERAL WORK PROCEDURES
A. CONTRACTOR TO UTILIZE WORKMANLIKE INDUSTRY STANDARDS IN PERFORMING ALL LANDSCAPE CONSTRUCTION. THE SITE IS TO BE LEFT IN A CLEAN STATE AT THE END OF EACH WORKDAY. ALL DEBRIS, MATERIALS AND TOOLS SHALL BE PROPERLY STORED, STOCKPILED OR DISPOSED OF.
B. WASTE MATERIALS AND DEBRIS SHALL BE COMPLETELY DISPOSED OF AT THE CONTRACTOR'S EXPENSE. DEBRIS SHALL NOT BE BURIED, INCLUDING ORGANIC MATERIALS, BUT SHALL BE REMOVED COMPLETELY FROM THE SITE.
C. SITE PREPARATIONS
A. BEFORE AND DURING PRELIMINARY GRADING AND FINISHED GRADING, ALL WEEDS AND GRASSES SHALL BE DUG OUT BY THE ROOTS AND DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES OUTLINED HEREIN.
B. ALL EXISTING TREES TO REMAIN SHALL BE PRUNED TO REMOVE ANY DAMAGED BRANCHES. THE ENTIRE LIMB OF ANY DAMAGED BRANCH SHALL BE CUT OFF AT THE TRUNK. CONTRACTOR SHALL ENSURE THAT CUTS ARE SMOOTH AND STRAIGHT. ANY EXPOSED ROOTS SHALL BE CUT BACK WITH CLEAN, SHARP TOOLS AND TOPSOIL SHALL BE PLACED AROUND THE REMAINDER OF THE ROOTS. EXISTING TREES SHALL BE MONITORED ON A REGULAR BASIS FOR ADDITIONAL ROOT OR BRANCH DAMAGE AS A RESULT OF CONSTRUCTION. ROOTS SHALL NOT BE LEFT EXPOSED FOR MORE THAN ONE (1) DAY. CONTRACTOR SHALL WATER EXISTING TREES AS NEEDED TO PREVENT SHOCK OR DECLINE.
C. CONTRACTOR SHALL ARRANGE TO HAVE A UTILITY STAKE-OUT TO LOCATE ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY LANDSCAPE MATERIAL. UTILITY COMPANIES SHALL BE CONTACTED THREE (3) DAYS PRIOR TO THE BEGINNING OF WORK.

D. TREE PROTECTION
A. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING TREES TO REMAIN. A TREE PROTECTION ZONE SHALL BE ESTABLISHED AT THE DRIP LINE OR 15 FEET FROM THE TRUNK OR AT THE LIMIT OF CONSTRUCTION DISTURBANCE, WHICHEVER IS GREATER. LOCAL STANDARDS THAT MAY REQUIRE A MORE STRICT TREE PROTECTION ZONE SHALL BE HONORED.
B. A FORTY-EIGHT (48") HIGH WOODEN SNOW FENCE OR ORANGE COLORED HIGH-DENSITY 'VIS-FENCE', OR APPROVED EQUAL, MOUNTED ON STEEL POSTS SHALL BE PLACED ALONG THE BOUNDARY OF THE TREE PROTECTION ZONE. POSTS SHALL BE LOCATED AT A MAXIMUM OF EIGHT FEET (8') ON CENTER OR AS INDICATED WITHIN THE TREE PROTECTION DETAIL.
C. WHEN THE TREE PROTECTION FENCING HAS BEEN INSTALLED, IT SHALL BE INSPECTED BY THE APPROVING AGENCY PRIOR TO DEMOLITION, GRADING, TREE CLEARING OR ANY OTHER CONSTRUCTION. THE FENCING ALONG THE TREE PROTECTION ZONE SHALL BE REGULARLY INSPECTED BY THE LANDSCAPE CONTRACTOR AND MAINTAINED UNTIL ALL CONSTRUCTION ACTIVITY HAS BEEN COMPLETED.
D. AT NO TIME SHALL MACHINERY, DEBRIS, FALLEN TREES OR OTHER MATERIALS BE PLACED, STOCKPILED OR LEFT STANDING IN THE TREE PROTECTION ZONE.

E. SOIL MODIFICATIONS
A. CONTRACTOR SHALL OBTAIN A SOIL TEST FOR ALL AREAS OF THE SITE PRIOR TO CONDUCTING ANY PLANTING. SOIL TESTS SHALL BE PERFORMED BY A CERTIFIED SOIL LABORATORY.
B. LANDSCAPE CONTRACTOR SHALL REPORT ANY SOIL OR DRAINAGE CONDITIONS CONSIDERED DETRIMENTAL TO THE GROWTH OF PLANT MATERIAL. SOIL MODIFICATIONS, AS SPECIFIED HEREIN, MAY BE CONDUCTED BY THE LANDSCAPE CONTRACTOR DEPENDING ON SITE CONDITIONS.
C. THE FOLLOWING AMENDMENTS AND QUANTITIES ARE APPROXIMATE AND ARE FOR BIDDING PURPOSES ONLY. COMPOSITION OF AMENDMENTS SHOULD BE REVISED DEPENDING ON THE OUTCOME OF A TOPSOIL ANALYSIS PERFORMED BY A CERTIFIED SOIL LABORATORY.
1.1. TO INCREASE A SANDY SOIL'S ABILITY TO RETAIN WATER AND NUTRIENTS, THOROUGHLY TILL ORGANIC MATTER INTO THE TOP 6-12". USE COMPOSTED BARK, COMPOSTED LEAF MULD OR PEAT MOSS. ALL PRODUCTS SHOULD BE COMPOSTED TO A DARK COLOR AND BE FREE OF PIECES WITH IDENTIFIABLE LEAF OR WOOD STRUCTURE. AVOID MIXING WITH A PH HIGHER THAN 7.5.
1.2. TO INCREASE DRAINAGE, MODIFY HEAVY CLAY OR SILT (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) AND/OR AGRICULTURAL GYPSUM. COARSE SAND MAY BE USED IF ENOUGH IS ADDED TO BRING THE SAND CONTENT TO MORE THAN 80% OF THE TOTAL MIX. SURFACE DRAINAGE LINES MAY BE ADDED TO INCREASE DRAINAGE.
1.3. MODIFY EXTREMELY SANDY SOILS (MORE THAN 85% BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX.

F. FINISHED GRADING
A. UNLESS OTHERWISE CONTRACTED, THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF TOPSOIL AND THE ESTABLISHMENT OF FINE-GRADING WITHIN THE DISTURBANCE AREA OF THE SITE.
B. LANDSCAPE CONTRACTOR SHALL VERIFY THAT SUBGRADE FOR INSTALLATION OF TOPSOIL HAS BEEN ESTABLISHED. THE SUBGRADE OF THE SITE MUST MEET THE FINISHED GRADE LESS THE REQUIRED TOPSOIL THICKNESS (1"±).
C. ALL LAWN AND PLANTING AREAS SHALL BE GRADED TO A SMOOTH, EVEN AND UNIFORM PLANE WITH NO ABRUPT CHANGE OF SURFACE AS DEPICTED WITHIN THIS SET OF CONSTRUCTION PLANS, UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER OR LANDSCAPE ARCHITECT.
D. ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED TO ALLOW FREE FLOW OF SURFACE WATER IN AND AROUND THE PLANTING BEDS. STANDING WATER SHALL NOT BE PERMITTED IN PLANTING BEDS.

G. TOPSOILING
A. CONTRACTOR SHALL PROVIDE A SIX (6) INCH THICK MINIMUM LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, IN ALL PLANTING AREAS. TOPSOIL SHOULD BE SPREAD OVER A PREPARED SURFACE IN A UNIFORM LAYER TO ACHIEVE THE DESIRED COMPACTED THICKNESS.
B. ON-SITE TOPSOIL MAY BE USED TO SUPPLEMENT THE TOTAL AMOUNT REQUIRED. TOPSOIL FROM THE SITE MAY BE REJECTED IF IT HAS NOT BEEN PROPERLY REMOVED, STORED AND PROTECTED PRIOR TO CONSTRUCTION.
C. CONTRACTOR SHALL FURNISH TO THE APPROVING AGENCY AN ANALYSIS OF BOTH IMPORTED AND ON-SITE TOPSOIL TO BE UTILIZED IN ALL PLANTING AREAS. THE PH AND NUTRIENT LEVELS MAY BE ADJUSTED THROUGH SOIL MODIFICATIONS AS NEEDED TO ACHIEVE THE REQUIRED LEVELS AS SPECIFIED IN THE MATERIALS SECTION ABOVE.
D. ALL PLANTING AND LAWN AREAS ARE TO BE CULTIVATED TO A DEPTH OF SIX (6) INCHES (6"). ALL DEBRIS EXPOSED FROM EXCAVATION AND CULTIVATION SHALL BE DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES SECTION ABOVE. THE FOLLOWING SHALL BE TILLED INTO THE TOP FOUR (4) INCHES (4") IN TWO DIRECTIONS (QUANTITIES BASED ON A 1,000 SQUARE FOOT AREA):
1.1. 20 POUNDS 'GROW POWER' OR APPROVED EQUAL.
1.2. 20 POUNDS NITRO-FORM (COURSE) 39-0-0 BLUE CHIP.
E. THE SPREADING OF TOPSOIL SHALL NOT BE CONDUCTED UNDER MUDDY OR FROZEN CONDITIONS.

3. PLANTING
A. IN SO FAR THAT IT IS FEASIBLE, PLANT MATERIAL SHALL BE PLANTED ON THE DAY OF DELIVERY. IN THE EVENT THAT THIS IS NOT POSSIBLE, LANDSCAPE CONTRACTOR SHALL PROTECT UNINSTALLED PLANT MATERIAL. PLANTS SHALL NOT REMAIN UNPLANTED FOR LONGER THAN A THREE DAY PERIOD AFTER DELIVERY. PLANTS THAT WILL NOT BE PLANTED FOR A PERIOD OF TIME GREATER THAN THREE DAYS SHALL BE HEALED IN WITH TOPSOIL OR MULCH TO HELP PRESERVE ROOT MOISTURE.
B. PLANTING OPERATIONS SHALL BE PERFORMED DURING PERIODS WITHIN THE PLANTING SEASON WHEN WEATHER AND SOIL CONDITIONS ARE SUITABLE AND IN ACCORDANCE WITH ACCEPTED LOCAL PRACTICE. PLANTS SHALL NOT BE INSTALLED IN TOPSOIL THAT IS IN A MUDDY OR FROZEN CONDITION.
C. ANY INJURED ROOTS OR BRANCHES SHALL BE PRUNED TO MAKE CLEAN-CUT ENDS PRIOR TO PLANTING. UTILIZING CLEAN, SHARP TOOLS. ONLY INJURED OR DISEASED BRANCHING SHALL BE REMOVED.
D. ALL PLANTING CONTAINERS AND NON-BIODEGRADABLE MATERIALS SHALL BE REMOVED FROM ROOT BALLS DURING PLANTING. NATURAL FIBER BURLAP MUST BE CUT FROM AROUND THE TRUNK OF THE TREE AND FOLDED DOWN AGAINST THE ROOT BALL PRIOR TO BACKFILLING.
E. POSITION TREES AND SHRUBS AT THEIR INTENDED LOCATIONS AS PER THE PLANS AND SECURE THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO EXCAVATING PITS, MAKING NECESSARY ADJUSTMENTS AS DIRECTED.
F. PRIOR TO THE ISSUANCE OF ANY CERTIFICATE OF OCCUPANCY, THE PROPOSED LANDSCAPE, AS SHOWN ON THE APPROVED LANDSCAPE PLAN, MUST BE INSTALLED, INSPECTED AND APPROVED BY THE APPROVING AGENCY. THE APPROVING AGENCY SHALL TAKE INTO ACCOUNT SEASONAL CONSIDERATIONS IN THIS REGARD AS FOLLOWS: THE PLANTING OF TREES, SHRUBS, VINES OR GROUND COVER SHALL OCCUR ONLY DURING THE FOLLOWING PLANTING SEASONS:
1.1. PLANTS: MARCH 15 TO DECEMBER 15
1.2. LAWN: MARCH 15 TO JUNE 15 OR SEPT. 1 TO DECEMBER 1
G. PLANTINGS REQUIRED FOR A CERTIFICATE OF OCCUPANCY SHALL BE PROVIDED DURING THE NEXT APPROPRIATE SEASON AT THE MUNICIPALITY'S DISCRETION. CONTRACTOR SHOULD CONTACT APPROVING AGENCY FOR POTENTIAL SUBSTITUTIONS.
H. FURTHERMORE, THE FOLLOWING TREE VARIETIES ARE UNUSUALLY SUSCEPTIBLE TO WINTER DAMAGE. WITH TRANSPORT SHOCK AND THE SEASONAL LACK OF NITROGEN AVAILABILITY, THE RISK OF PLANT DEATH IS GREATLY INCREASED. IT IS NOT RECOMMENDED THAT THESE SPECIES BE PLANTED DURING THE FALL PLANTING SEASON:
ACER RUBRUM PLATANUS X ACERIFOLIA
BETULA VARIETIES POPULOUS VARIETIES
CARPINUS VARIETIES PRUNUS VARIETIES
CRATAEGUS VARIETIES PYRUS VARIETIES
KOELREUTERIA QUERCUS VARIETIES
LIQUIDAMBER VARIETIES TILIA TOMENTOSA
LIRIODENDRON TULIPIFERA ZELKOVA VARIETIES

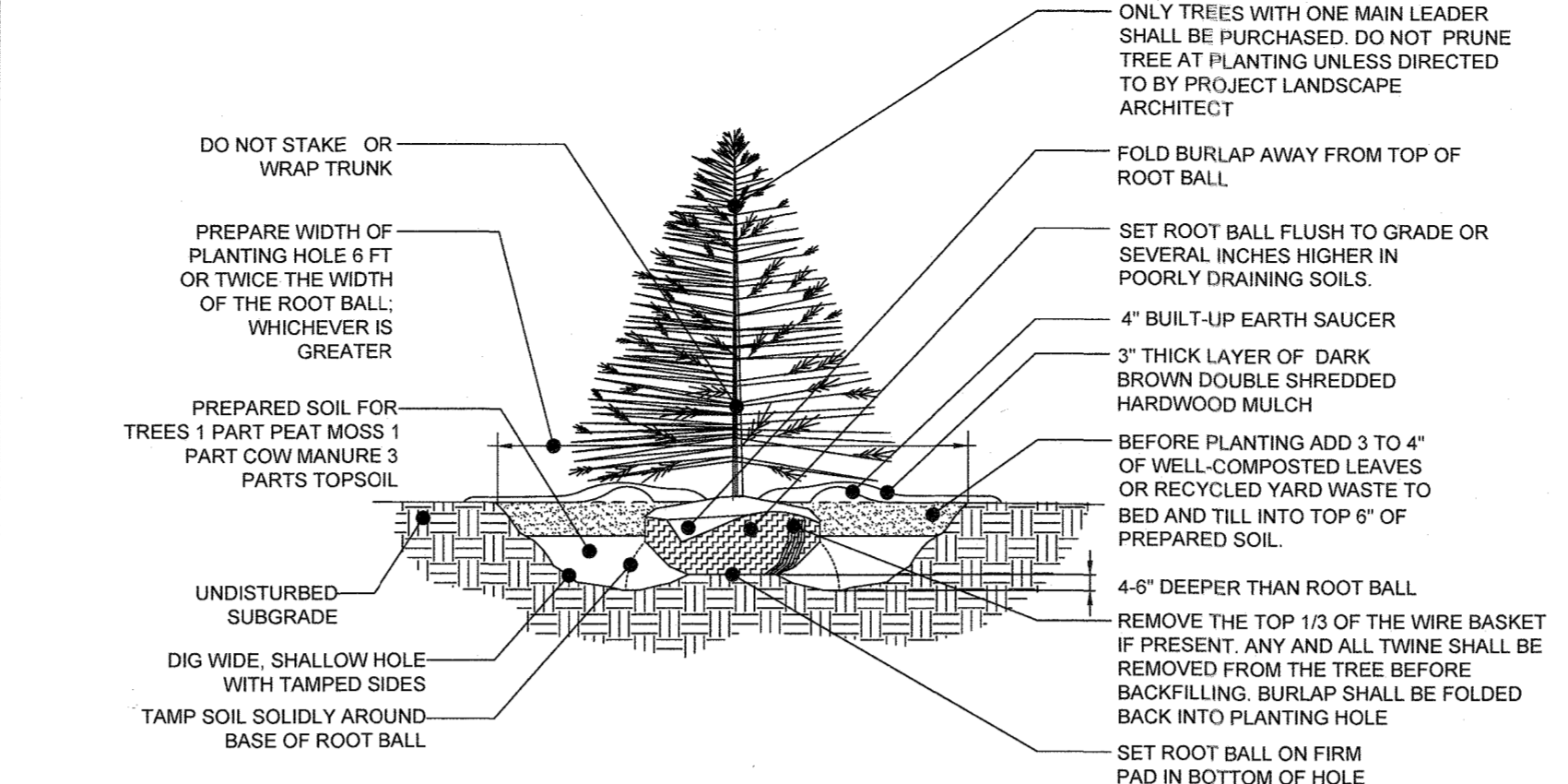
I. PLANTING PITS SHALL BE DUG WITH LEVEL BOTTOMS, WITH THE WIDTH TWICE THE DIAMETER OF ROOT BALL. THE ROOT BALL SHALL REST ON UNDISTURBED GRADE. EACH PLANT PIT SHALL BE BACKFILLED IN LAYERS WITH THE FOLLOWING PREPARED SOIL MIXED THOROUGHLY:
• 1 PART PEAT MOSS
• 1 PART COMPOSTED COW MANURE BY VOLUME
• 3 PARTS TOPSOIL BY VOLUME
• 21 GRAMS AGRIFORM PLANTING TABLETS (OR APPROVED EQUAL) AS FOLLOWS:
A) 2 TABLETS PER 1 GALLON PLANT
B) 3 TABLETS PER 1 GALLON PLANT
C) 4 TABLETS PER 15 GALLON PLANT
D) LARGER PLANTS: 2 TABLETS PER 1/2" CALIPER OF TRUNK
J. FILL PREPARED SOIL AROUND BALL OF PLANT HALF-WAY AND INSERT PLANT TABLETS. COMPLETE BACKFILL AND WATER THOROUGHLY.
K. ALL PLANTS SHALL BE PLANTED SO THAT THE TOP OF THE ROOT BALL, THE POINT AT WHICH THE ROOT FLARE BEGINS, IS SET AT GROUND LEVEL AND IN THE CENTER OF THE PIT. NO SOIL IS TO BE PLACED DIRECTLY ON TOP OF THE ROOT BALL.
L. ALL PROPOSED TREES DIRECTLY ADJACENT TO WALKWAYS OR DRIVEWAYS SHALL BE PRUNED AND MAINTAINED TO A MINIMUM BRANCHING HEIGHT OF 7' FROM GRADE.
M. GROUND COVER AREAS SHALL RECEIVE A 1/2" LAYER OF HUMUS RAKED INTO THE TOP 1" OF PREPARED SOIL PRIOR TO PLANTING. ALL GROUND COVER AREAS SHALL BE WEEDED AND TREATED WITH A PRE-EMERGENT CHEMICAL AS PER MANUFACTURER'S RECOMMENDATION.
N. NO PLANT, EXCEPT GROUND COVERS, GRASSES OR VINES, SHALL BE PLANTED LESS THAN TWO FEET (2') FROM EXISTING STRUCTURES AND SIDEWALKS.
O. ALL PLANTING AREAS AND PLANTING PITS SHALL BE MULCHED AS SPECIFIED HEREIN TO FILL THE ENTIRE BED AREA OR SAUCER. NO MULCH IS TO TOUCH THE TRUNK OF THE TREE OR SHRUB.
P. ALL PLANTING AREAS SHALL BE WATERED IMMEDIATELY UPON INSTALLATION IN ACCORDANCE WITH THE WATERING SPECIFICATIONS AS LISTED HEREIN.

4. TRANSPLANTING (WHEN REQUIRED)
A. ALL TRANSPLANTS SHALL BE DUG WITH INTACT ROOT BALLS CAPABLE OF SUSTAINING THE PLANT.
B. IF PLANTS ARE TO BE STOCKPILED BEFORE REPLANTING, THEY SHALL BE HEALED IN WITH MULCH OR SOIL, ADEQUATELY WATERED AND PROTECTED FROM EXTREME HEAT, SUN AND WIND.
C. PLANTS SHALL NOT BE DUG FOR TRANSPLANTING BETWEEN APRIL 10 AND JUNE 30.
D. UPON REPLANTING, BACKFILL SOIL SHALL BE AMENDED WITH FERTILIZER AND ROOT GROWTH HORMONE.
E. TRANSPLANTS SHALL BE GUARANTEED FOR THE LENGTH OF THE GUARANTEE PERIOD SPECIFIED HEREIN.
F. IF TRANSPLANTS DIE, SHRUBS AND TREES LESS THAN SIX (6) INCHES (6") DBH SHALL BE REPLACED IN KIND. TREES GREATER THAN SIX (6) INCHES (6") DBH MAY BE REQUIRED TO BE REPLACED IN ACCORDANCE WITH THE MUNICIPALITY'S TREE REPLACEMENT GUIDELINES.

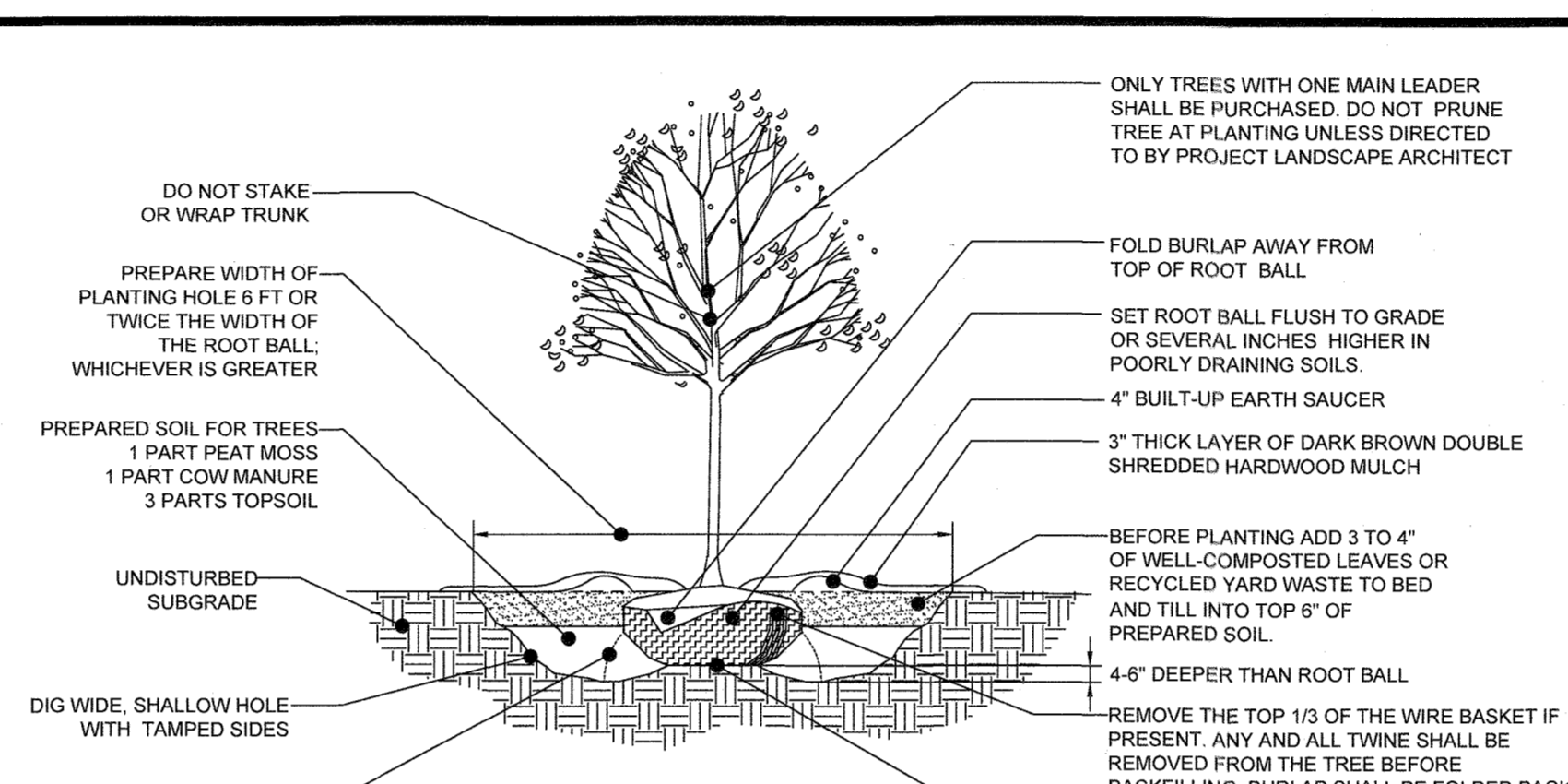
5. WATERING
A. NEW PLANTINGS OR LAWN AREAS SHALL BE ADEQUATELY IRRIGATED BEGINNING IMMEDIATELY AFTER PLANTING. WATER SHALL BE APPLIED TO EACH TREE AND SHRUB IN SUCH MANNER AS NOT TO DISTURB BACKFILL AND TO THE EXTENT THAT ALL MATERIALS IN THE PLANTING HOLE ARE THOROUGHLY SATURATED. WATERING SHALL CONTINUE AT LEAST UNTIL PLANTS ARE ESTABLISHED.
B. SITE OWNER SHALL PROVIDE WATER IF AVAILABLE ON SITE AT TIME OF PLANTING. IF WATER IS NOT AVAILABLE ON SITE, CONTRACTOR SHALL SUPPLY ALL NECESSARY WATER. THE USE OF WATERING BAGS IS RECOMMENDED FOR ALL NEWLY PLANTED TREES.
C. IF AN IRRIGATION SYSTEM HAS BEEN INSTALLED ON THE SITE, IT SHALL BE USED TO WATER PROPOSED PLANT MATERIAL, BUT ANY FAILURE OF THE SYSTEM DOES NOT ELIMINATE THE CONTRACTOR'S RESPONSIBILITY OF MAINTAINING THE DESIRED MOISTURE LEVEL FOR VIGOROUS, HEALTHY GROWTH.

6. GUARANTEE
A. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANTS FOR A PERIOD OF ONE (1) YEAR FROM APPROVAL OF LANDSCAPE INSTALLATION BY THE APPROVING AGENCY. CONTRACTOR SHALL SUPPLY THE OWNER WITH A MAINTENANCE BOND FOR TEN PERCENT (10%) OF THE VALUE OF THE LANDSCAPE INSTALLATION WHICH WILL BE RELEASED AT THE CONCLUSION OF THE GUARANTEE PERIOD AND WHEN A FINAL INSPECTION HAS BEEN COMPLETED AND APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.
B. ANY DEAD OR DYING PLANT MATERIAL SHALL BE REPLACED FOR THE LENGTH OF THE GUARANTEE PERIOD. REPLACEMENT OF PLANT MATERIAL SHALL BE CONDUCTED AT THE FIRST SUCCEEDING PLANTING SEASON. ANY DEBRIS SHALL BE DISPOSED OF OFF-SITE, WITHOUT EXCEPTION.
C. TREES AND SHRUBS SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION AND THROUGHOUT THE 90 DAY MAINTENANCE PERIOD AS SPECIFIED HEREIN. CULTIVATION, WEEDING, WATERING AND THE PREVENTATIVE TREATMENTS SHALL BE PERFORMED AS NECESSARY TO KEEP PLANT MATERIAL IN GOOD CONDITION AND FREE OF INSECTS AND DISEASE.
D. LAWNS SHALL BE MAINTAINED THROUGH WATERING, FERTILIZING, WEEDING, MOWING, TRIMMING AND OTHER OPERATIONS SUCH AS ROLLING, REGARDING AND REPLANTING AS REQUIRED TO ESTABLISH A SMOOTH, ACCEPTABLE LAWN, FREE OF ERODED OR BARE AREAS.

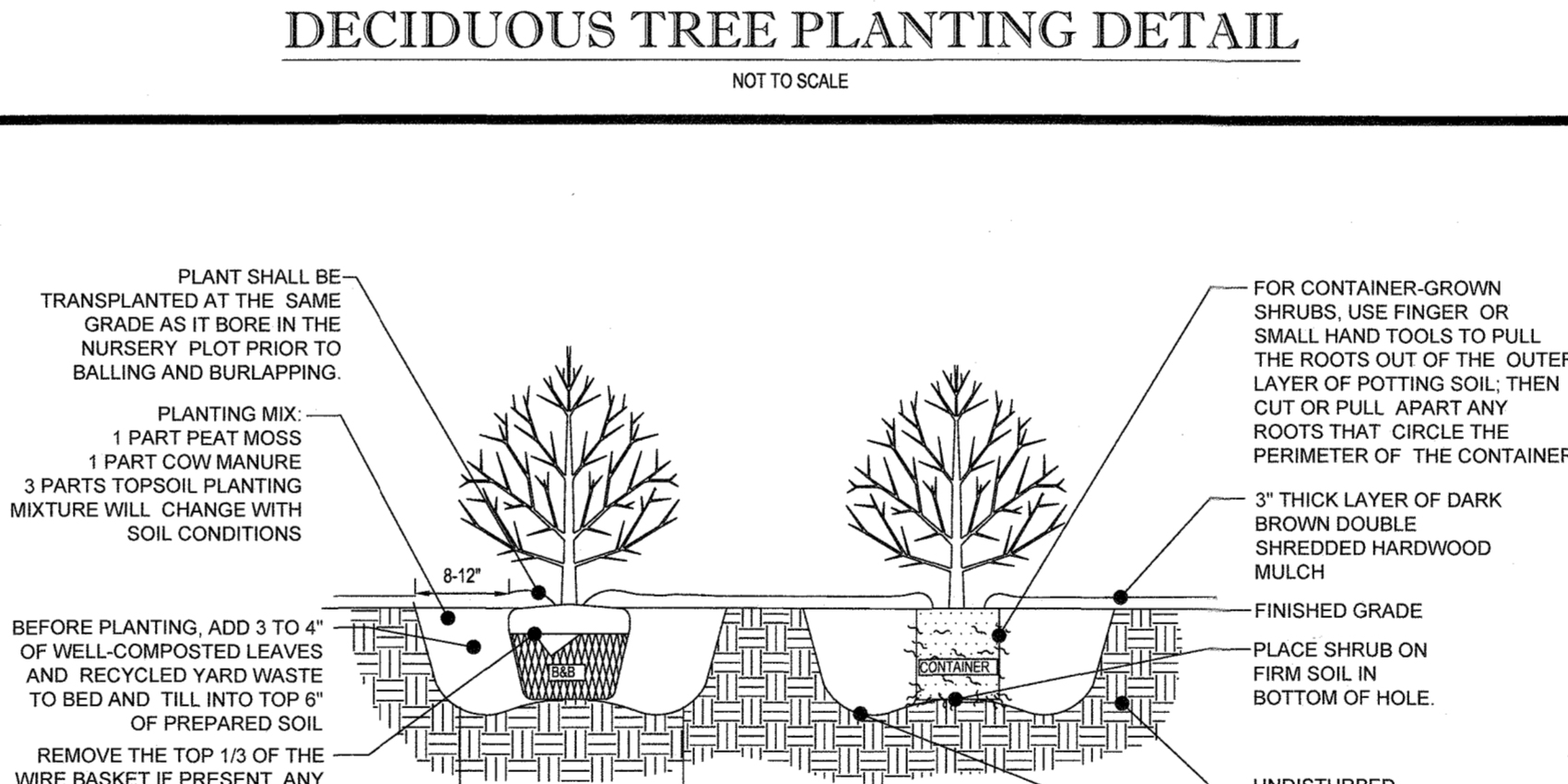
7. CLEANUP
A. UPON THE COMPLETION OF ALL LANDSCAPE INSTALLATION AND BEFORE THE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL UNUSED MATERIALS, EQUIPMENT AND DEBRIS FROM THE SITE. ALL PAVED AREAS ARE TO BE CLEANED.
B. THE SITE SHALL BE CLEANED AND LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.



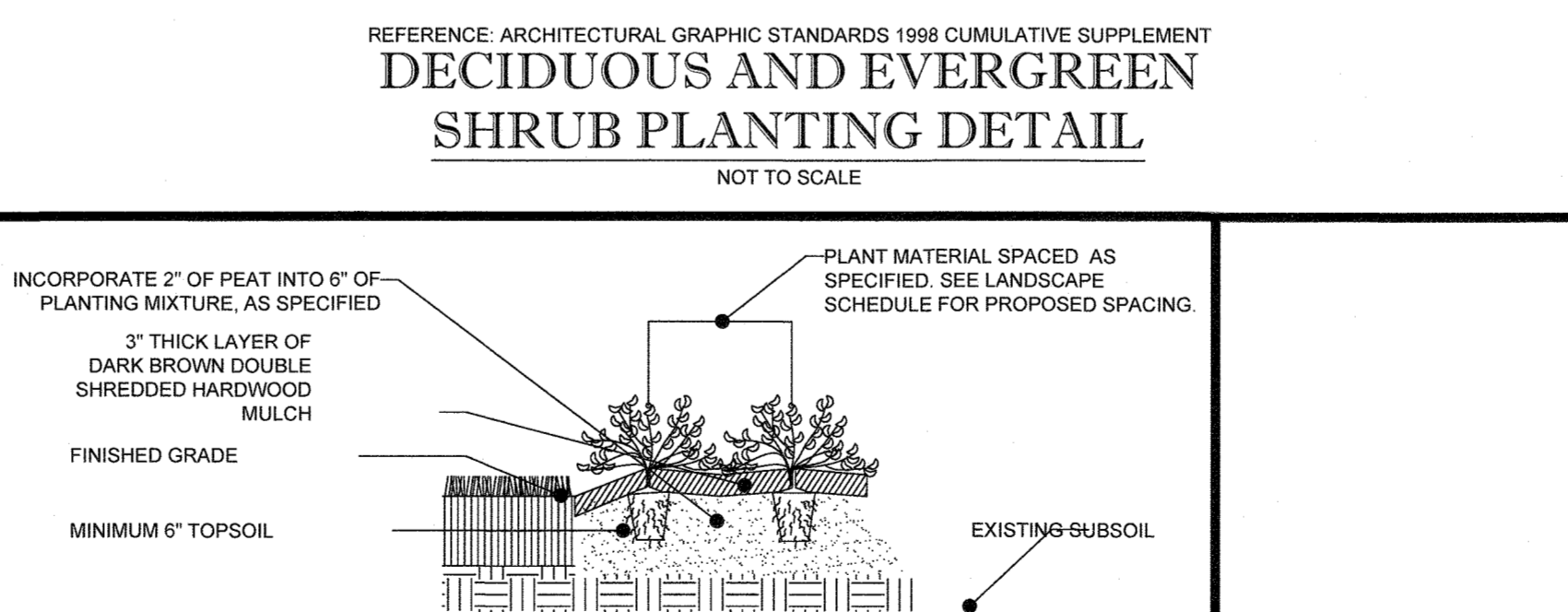
EVERGREEN TREE PLANTING DETAIL
NOT TO SCALE



DECIDUOUS TREE PLANTING DETAIL
NOT TO SCALE



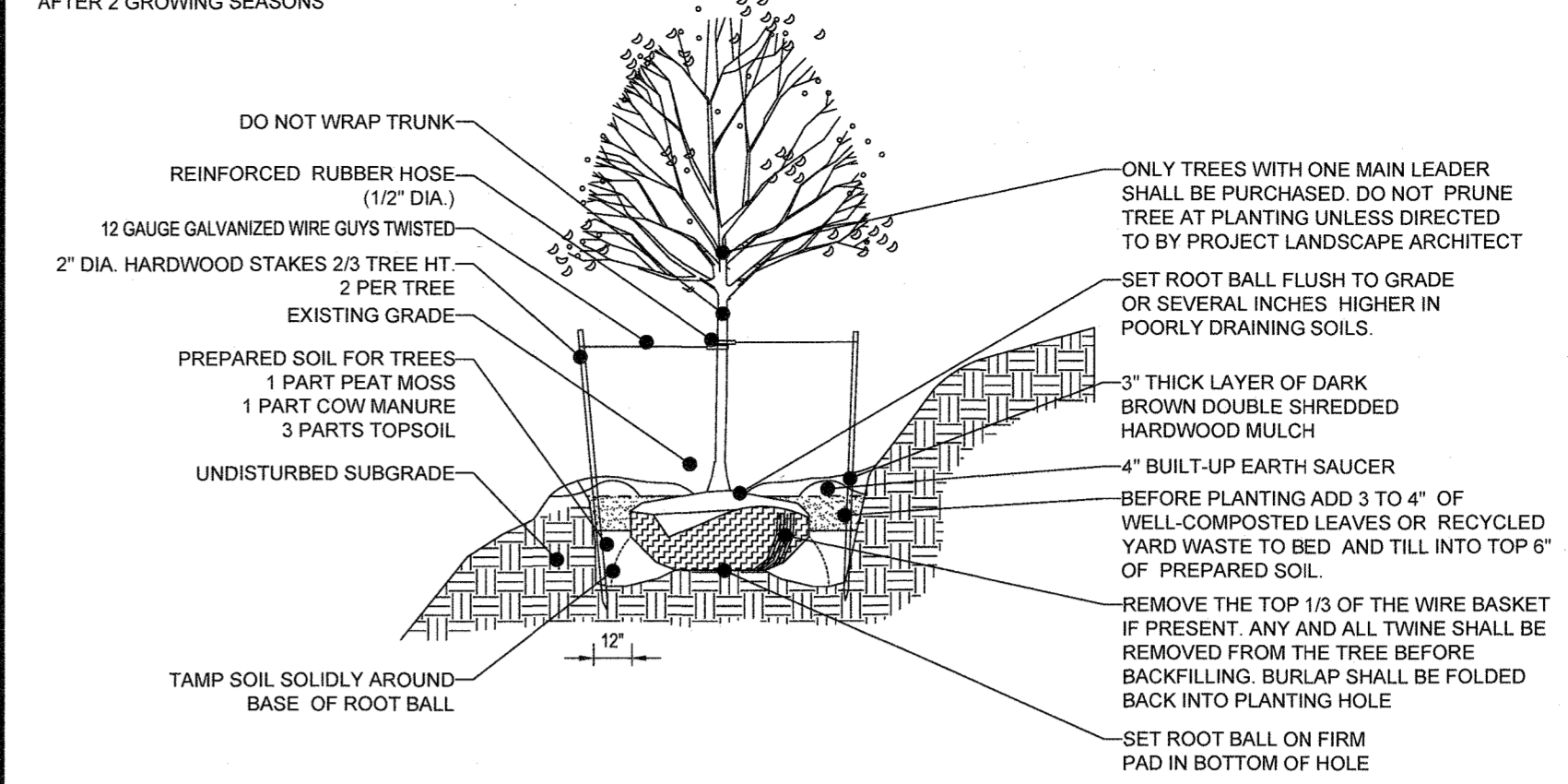
DECIDUOUS AND EVERGREEN SHRUB PLANTING DETAIL
NOT TO SCALE



TYPICAL PERENNIAL AND GROUND COVER SPACING & LAYOUT
NOT TO SCALE

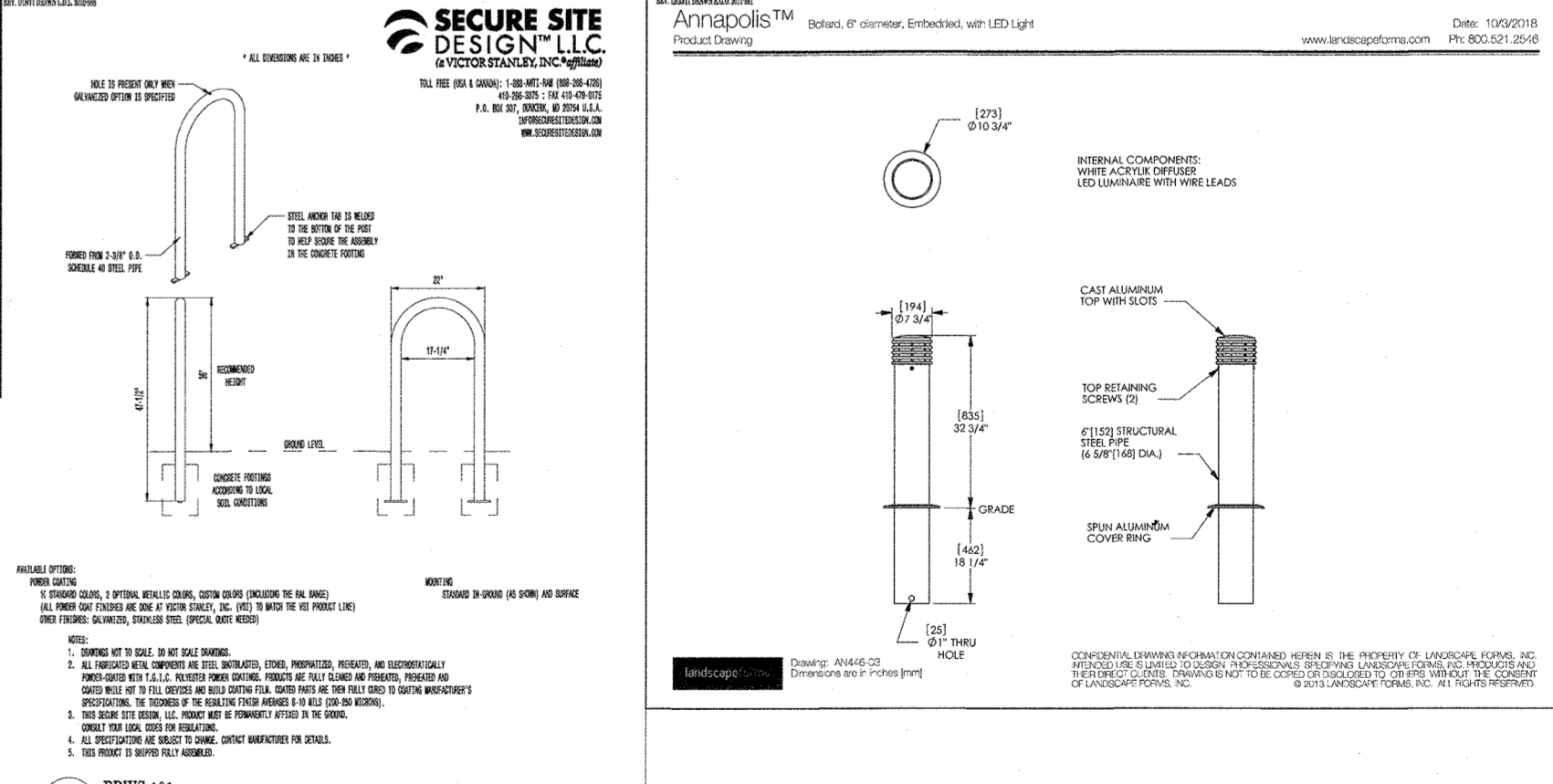
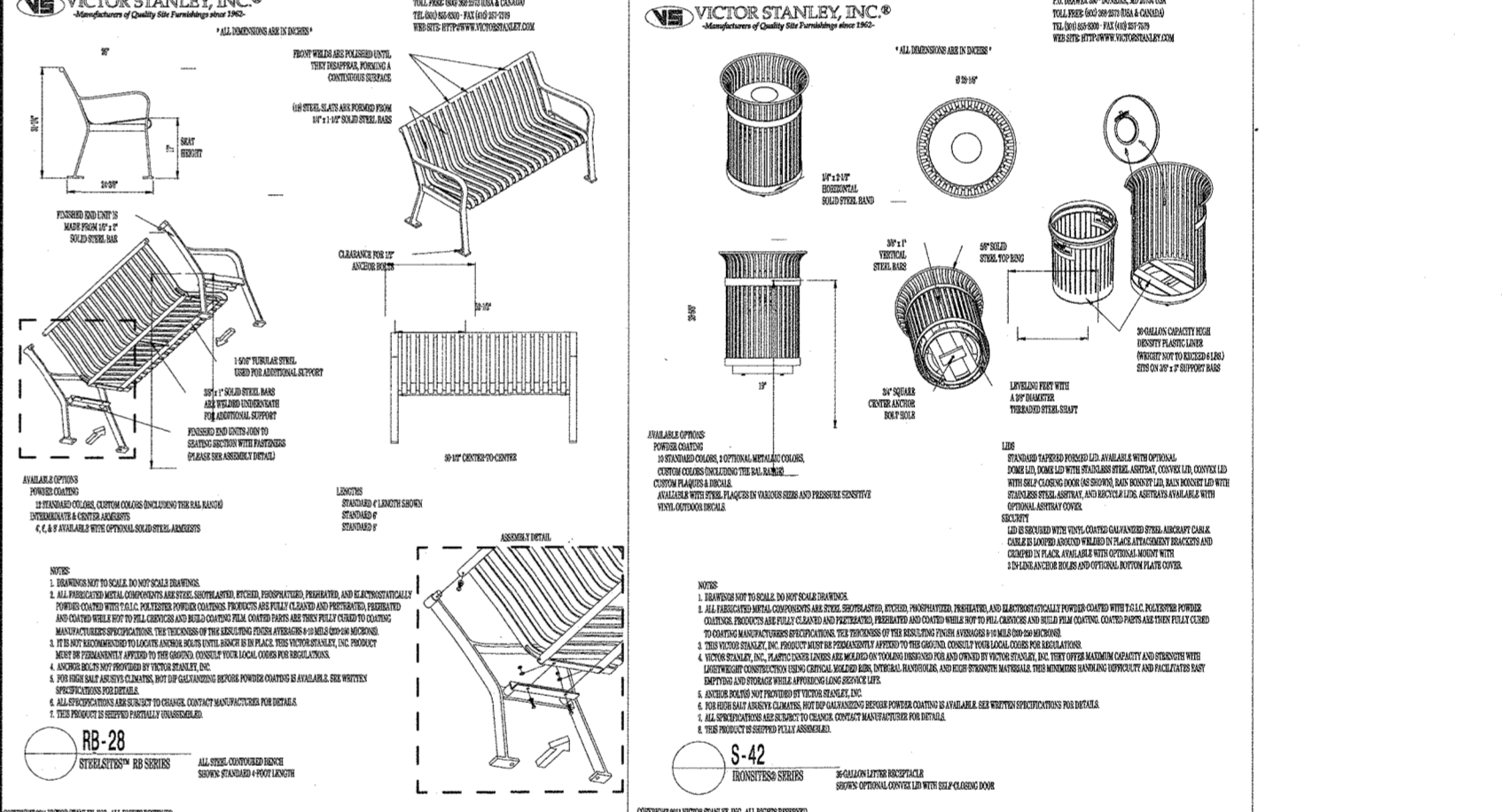
SEEDING SPECIFICATIONS

1.	PRIOR TO SEEDING, AREA IS TO BE TOPSOILED, FINE GRADED, AND RAKED OF ALL DEBRIS LARGER THAN 2" DIAMETER.
2.	PRIOR TO SEEDING, CONSULT MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
3.	SEEDING RATES: PERENNIAL RYEGRASS 1/2 LBS/1,000 SQ FT KENTUCKY BLUEGRASS 1 LBS/1,000 SQ FT RED FESCUE 1 1/2 LBS/1,000 SQ FT SPREADING FESCUE 1 1/2 LBS/1,000 SQ FT FERTILIZER (20:10:10) 14 LBS/1,000 SQ FT MULCH 90 LBS/1,000 SQ FT
4.	GERMINATION RATES WILL VARY AS TO TIME OF YEAR FOR SOWING. CONTRACTOR TO IRRIGATE SEEDED AREA UNTIL AN ACCEPTABLE STAND OF COVER IS ESTABLISHED BY OWNER.



TREE PLANTING ON SLOPE DETAIL
NOT TO SCALE

OWNER MAINTENANCE RESPONSIBILITIES
UPON OWNER'S (OR OWNER CONTRACTOR'S) COMPLETION OF LANDSCAPING WORK, THE OWNER IS FULLY RESPONSIBLE FOR ALL FUTURE MAINTENANCE, CARE, UPKEEP, WATERING, AND TRIMMING OF ALL INSTALLED VEGETATION, PLANTS, TREES, BUSHES, SHRUBS, GRASSES, ORNAMENTAL PLANTS AND FLOWERS, FLOWERS, GROUND COVER, AND LANDSCAPING, INCLUDING ALL LANDSCAPE ISLANDS AND AREAS ADJACENT OR PART OF THE LANDSCAPED AREAS. THIS RESPONSIBILITY INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING:
• TREES ADJACENT TO WALKWAYS AND AREAS OF PEDESTRIAN TRAFFIC MUST BE MAINTAINED TO ASSURE THAT ANY BRANCHES MUST BE LIMBED UP TO A CLEARANCE HEIGHT OF 7' FT. (FROM ALL PAVED, TRAVELED SURFACES), OR AS OTHERWISE INDICATED ON THE PLANS.
• VEGETATIVE GROUND COVER, SHRUBS AND ORNAMENTAL PLANTS AND GRASSES MUST BE TRIMMED SO THAT NO PORTION OF THE PLANT EXCEEDS 30 INCHES ABOVE GRADE (OF ALL PAVED, TRAVEL SURFACES) ALONG AND WITHIN THE SIGHT LINES OF PARKING LOTS AND INGRESS-EGRESS WAYS.
• FALLEN PLANT FLOWERS, FRUIT, SEEDS AND DEBRIS DROPPINGS ARE TO BE REMOVED IMMEDIATELY FROM VEHICULAR AND PEDESTRIAN TRAFFIC AREAS TO PREVENT TRIPPING, SLIPPING OR ANY OTHER HAZARDS.
THESE REQUIREMENTS DO NOT AFFECT THE PLANT LIFE GUARANTEES THE LANDSCAPE CONTRACTOR IS REQUIRED TO PROVIDE.



OWNER/DEVELOPER:
RIVER HILL SQUARE, LLC
ELLICOTT CITY, MARYLAND 21041
410-465-4244
APPROVED:
HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
4-2-19 DATE
4-4-19 DATE
4-4-19 DATE

BOHLER ENGINEERING
SUSTAINABLE DESIGN PROGRAM MANAGEMENT LANDSCAPE ARCHITECTURE TRANSPORTATION SERVICES
OFFICE: 1000 W. WASHINGTON ST. SUITE 200, WASHINGTON, DC 20004
BALTIMORE, MD • CHARLOTTE, NC
DALLAS, TX • DENVER, CO
HOUSTON, TX • LOS ANGELES, CA
MEMPHIS, TN • NEW YORK, NY
PHILADELPHIA, PA
PITTSBURGH, PA
RICHMOND, VA
SAN ANTONIO, TX
WASHINGTON, DC

REVISIONS

REV	DATE	COMMENT	BY
1	06/12/18	PER AGENCY COMMENTS	JCW
2	10/12/18	PER AGENCY COMMENTS	JWC
3	01/14/19	PER AGENCY COMMENTS	JWC
4	2/27/19	COMPLIANCE CHART CORRECTED	JWC

KNOW WHAT'S BELOW
ALWAYS CALL 811
BEFORE YOU DIG
It's fast. It's free. It's the law.

PROJECT No.: MDL17300
DRAWN BY: JWC
CHECKED BY: ERM
DATE: 2/23/18
SCALE: 1" = 30'
CAD I.D.: LPS

SITE PLAN
FOR
RIVER HILL SQUARE
LOCATION OF SITE
CLARKSVILLE PIKE
HOWARD COUNTY
MARYLAND

BOHLER ENGINEERING
22638 DAVIS DRIVE, SUITE 250
STERLING, VIRGINIA 20164
Phone: (703) 709-9500
Fax: (703) 709-9501
VA@BohlerEng.com

E.R. McWILLIAMS
REGISTERED PROFESSIONAL LANDSCAPE ARCHITECT
PROF. MEMBER OF THE NATIONAL SOCIETY OF PROFESSIONAL LANDSCAPE ARCHITECTS
UNDER THE LAWS OF THE STATE OF MARYLAND,
LICENSE NO. 3697, EXPIRATION DATE: 06/30/20

SHEET TITLE:
LANDSCAPE PLAN
SHEET NUMBER:
18
of 25
SDP-18-044

SERVILLE LLC
 MAP 34 GRID 6 PARCEL 185
 TAX ID: 347335
 LIBER 11119 FOLIO 401
 ACREAGE: 36.95 AC

LINES ONE VILLAGE
 MAP 28 GRID 24 PARCEL 100
 TAX ID: 371007
 LIBER 12840 FOLIO 388

MARYLAND ROUTE 108
 (CLARKSVILLE PIKE)
 MINOR ARTERIAL ULTIMATE
 80' RIGHT-OF-WAY



BOHLER ENGINEERING

LETTERS AND VIDEOS AVAILABLE
 LAND SURVEYING PROGRAM MANAGEMENT LANDSCAPE ARCHITECTURE
 SUSTAINABLE DESIGN PERMITTING SERVICES TRANSPORTATION SERVICES

• BALTIMORE, MD • CHARLOTTE, NC
 • BOSTON, MA • CHICAGO, IL
 • DENVER, CO • HOUSTON, TX
 • LOS ANGELES, CA • MIAMI, FL
 • NEW YORK, NY • PHOENIX, AZ
 • PITTSBURGH, PA • RICHMOND, VA
 • RICHMOND BEACH, VA • WASHINGTON, DC
 • WEST PALM BEACH, FL • DALLAS, TX

REVISIONS

REV	DATE	COMMENT	BY
1	06/12/18	PER AGENCY COMMENTS	JCW
2	10/12/18	PER AGENCY COMMENTS	JWC
3	01/14/19	PER AGENCY COMMENTS	JWC
4	2/27/19	COMPLIANCE CHART CORRECTED	JWC

**KNOW WHAT'S BELOW
 ALWAYS CALL 811
 BEFORE YOU DIG**

It's fast. It's free. It's the law.

PROJECT No: MDL173001
 DRAWN BY: JCW
 CHECKED BY: ERM
 DATE: 2/23/18
 SCALE: 1" = 30'
 CAD ID: LPS

PROJECT:
SITE PLAN
 FOR
RIVER HILL SQUARE

LOCATION OF SITE
 CLARKSVILLE PIKE
 HOWARD COUNTY
 MARYLAND

BOHLER ENGINEERING

22636 DAVIS DRIVE, SUITE 250
 STERLING, VIRGINIA 20164
 Phone: (703) 709-9500
 Fax: (703) 709-9501
 VA@BohlerEng.com

E.R. McWILLIAMS

REGISTERED PROFESSIONAL ARCHITECT
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND THAT I AM A REGISTERED PROFESSIONAL ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 9655 EXPIRATION DATE: 9/20/20

SHEET TITLE:
LIGHTING PLAN

SHEET NUMBER:
19
 of 25

SDP-18-044

OWNER/DEVELOPER:
 RIVER HILL SQUARE, LLC
 P.O. BOX 417
 ELLICOTT CITY, MARYLAND 21041
 410-465-4244

APPROVED:
 HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-2-19 DATE
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 4-4-19 DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4-4-19 DATE
 DIRECTOR

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LF	Description
1	1	100'-S-48"-800'-NW-02-4-H	SHGL	N/A	0.900	100'-S-48"-800'-NW-02-4-HS
2	1	100'-S-48"-800'-NW-02-4-H	SHGL	N/A	0.900	100'-S-48"-800'-NW-02-4-HS
3	1	100'-S-48"-800'-NW-02-4-HS	SHGL	N/A	0.900	100'-S-48"-800'-NW-02-4-HS
4	1	100'-S-48"-800'-NW-02-4-HS	SHGL	N/A	0.900	100'-S-48"-800'-NW-02-4-HS
5	1	100'-S-48"-800'-NW-02-4-HS	SHGL	N/A	0.900	100'-S-48"-800'-NW-02-4-HS

Calculation Summary

Category	Units	Avg	Min	Max	Foot/Cft	Min/Max
Eastern Property Line	Luminaire	0.50	0.50	0.50	N/A	N/A
Northern Property Line	Luminaire	0.18	0.28	0.28	N/A	N/A
Northern Property Line_1	Luminaire	1.79	13.4	0.0	N/A	N/A
Northern Property Line	Luminaire	0.20	0.20	0.20	N/A	N/A
Parking Lot Area	Luminaire	2.94	8.0	0.5	5.28	18.00
Central Lot Area_1	Luminaire	2.11	10.0	0.3	21.15	118.00
Ratio Area	Luminaire	2.03	7.1	0.5	4.05	14.80

HPXAKL173001DRAWINGPLAN SETPAC173001DWS PRINTED BY: JCAMPELL 5:26:19 @ 6:42 AM LAST SAVED BY: JCAMPELL

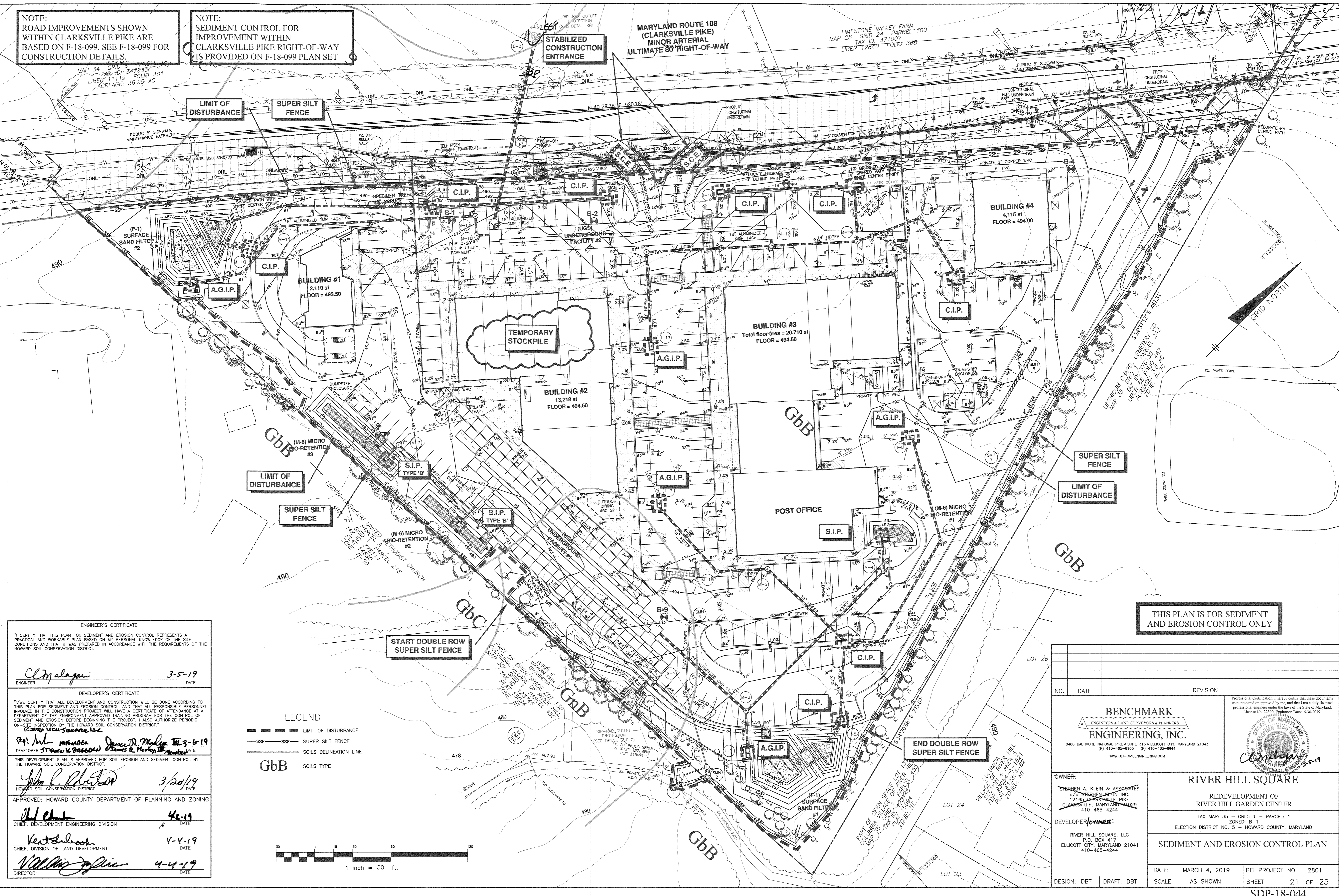
NOTE:
ROAD IMPROVEMENTS SHOWN
WITHIN CLARKSVILLE PIKE ARE
BASED ON F-18-099. SEE F-18-099 FOR
CONSTRUCTION DETAILS.

NOTE:
SEDIMENT CONTROL FOR
IMPROVEMENT WITHIN
CLARKSVILLE PIKE RIGHT-OF-WAY
IS PROVIDED ON F-18-099 PLAN SET

STABILIZED
CONSTRUCTION
ENTRANCE

MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 100
TAX ID: 371007
LIBER 12840 FOLIO 368



ENGINEER'S CERTIFICATE
I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Cl. Malaga 3-5-19
ENGINEER DATE

DEVELOPER'S CERTIFICATE
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

James K. Basson 3-5-19
DEVELOPER DATE

John R. Robertson 3-20-19
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

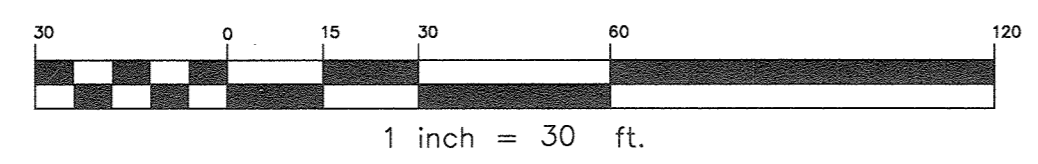
John C. H. [Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Kent [Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

William [Signature] 4-4-19
DIRECTOR DATE

LEGEND

- LIMIT OF DISTURBANCE
- SUPER SILT FENCE
- SOILS DELINEATION LINE
- GbB SOILS TYPE



THIS PLAN IS FOR SEDIMENT
AND EROSION CONTROL ONLY

NO.	DATE	REVISION

BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE SUITE 315 ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6444
WWW.BEI-CIVILENGINEERING.COM

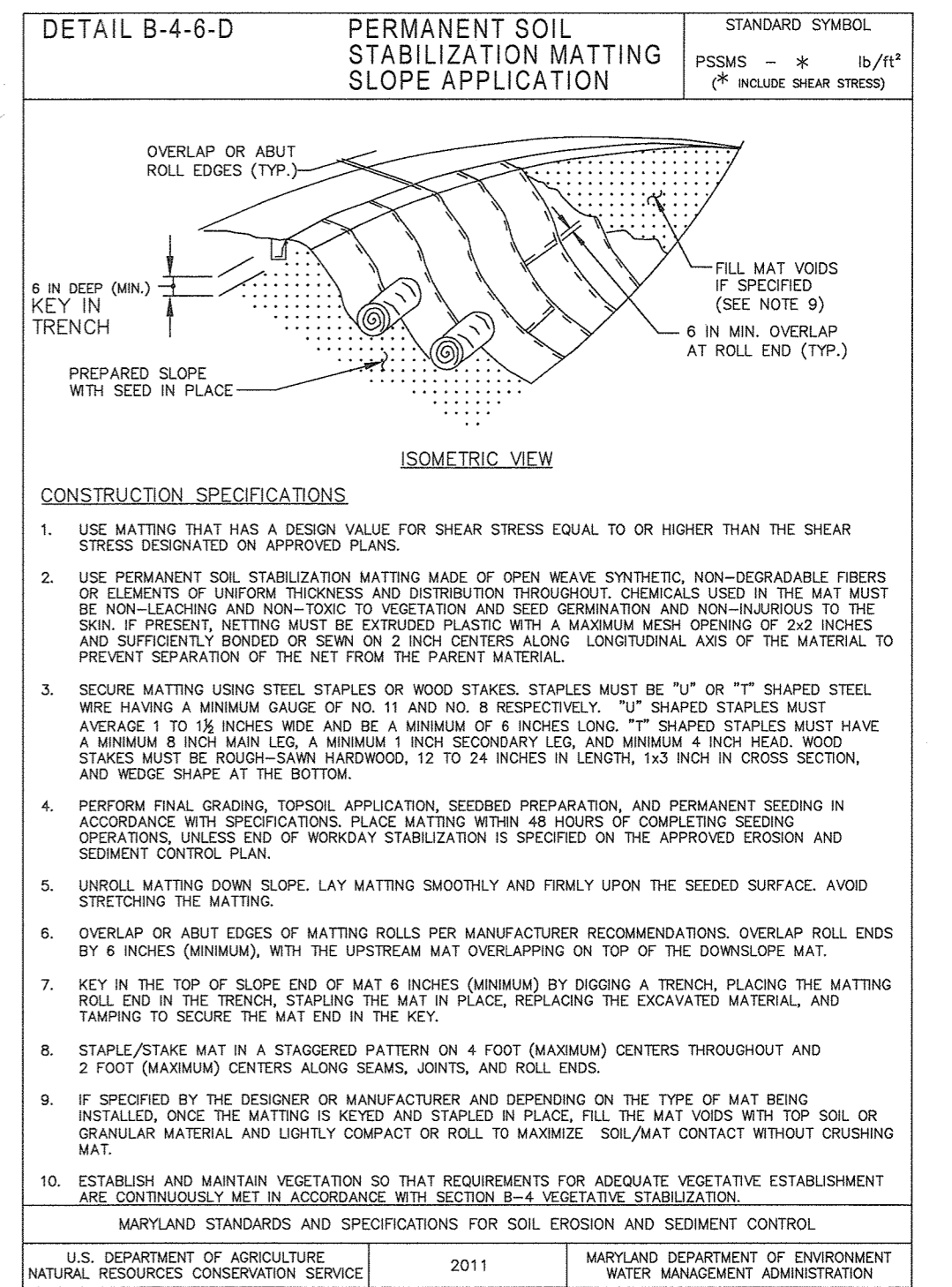
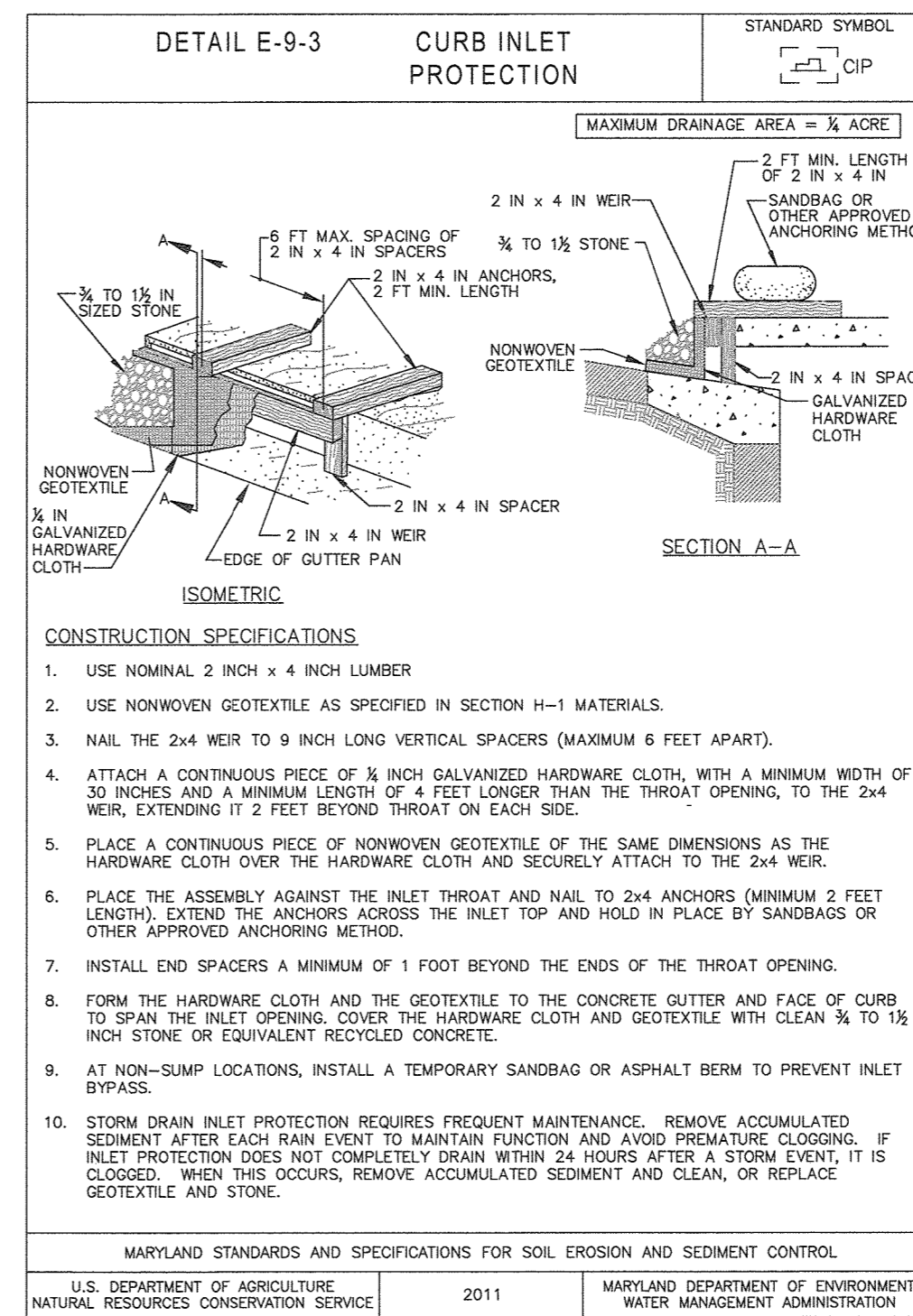
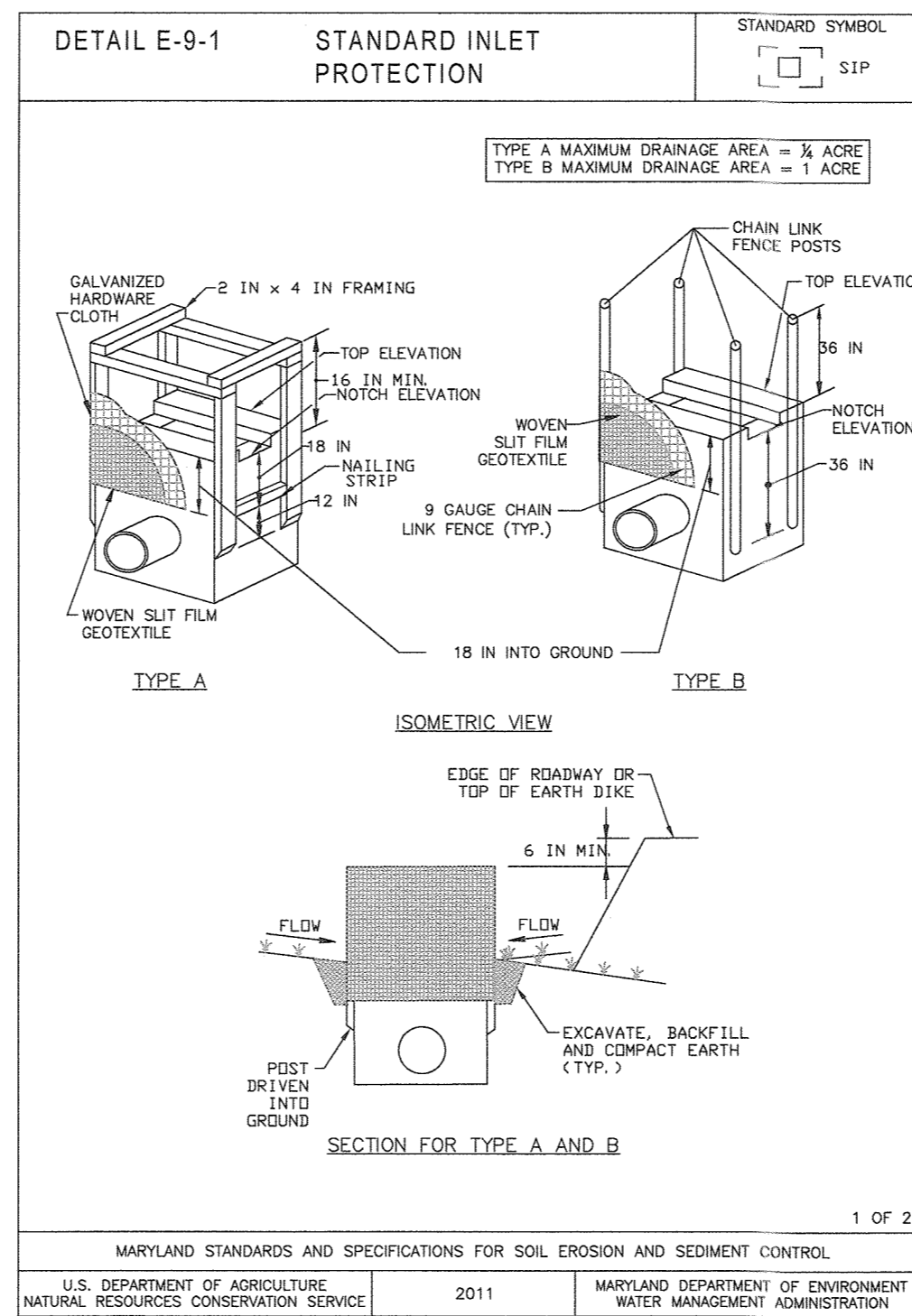
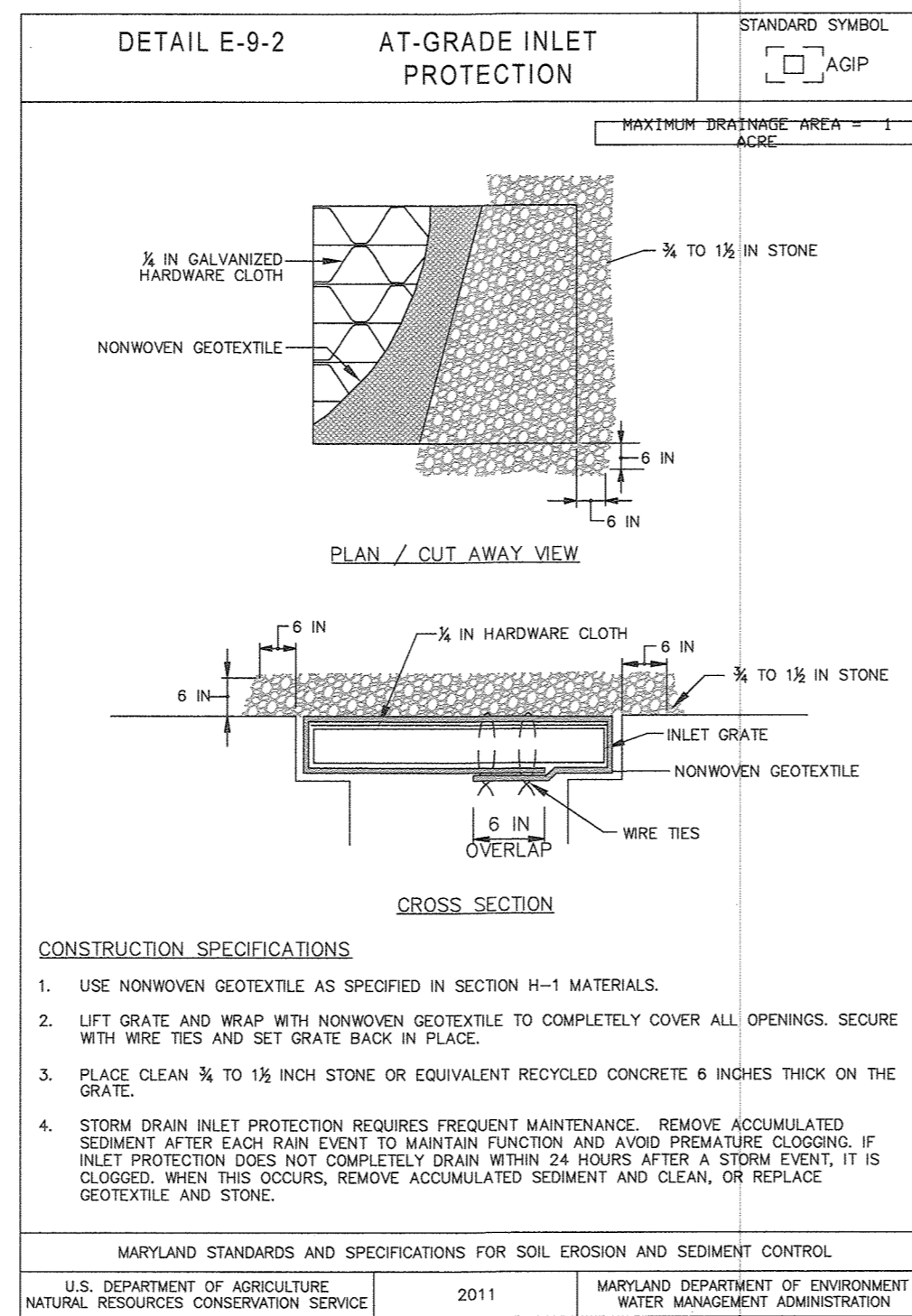
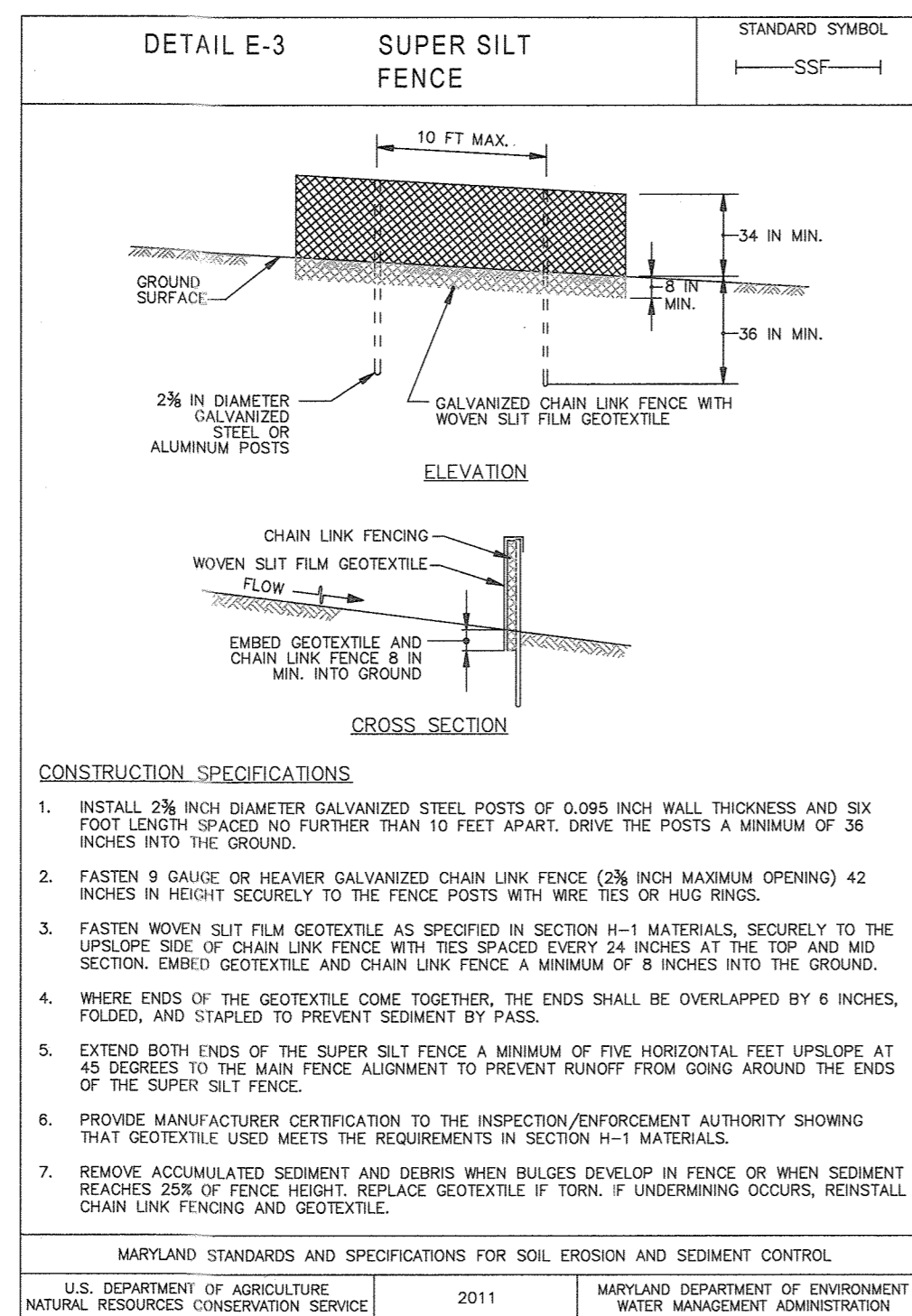
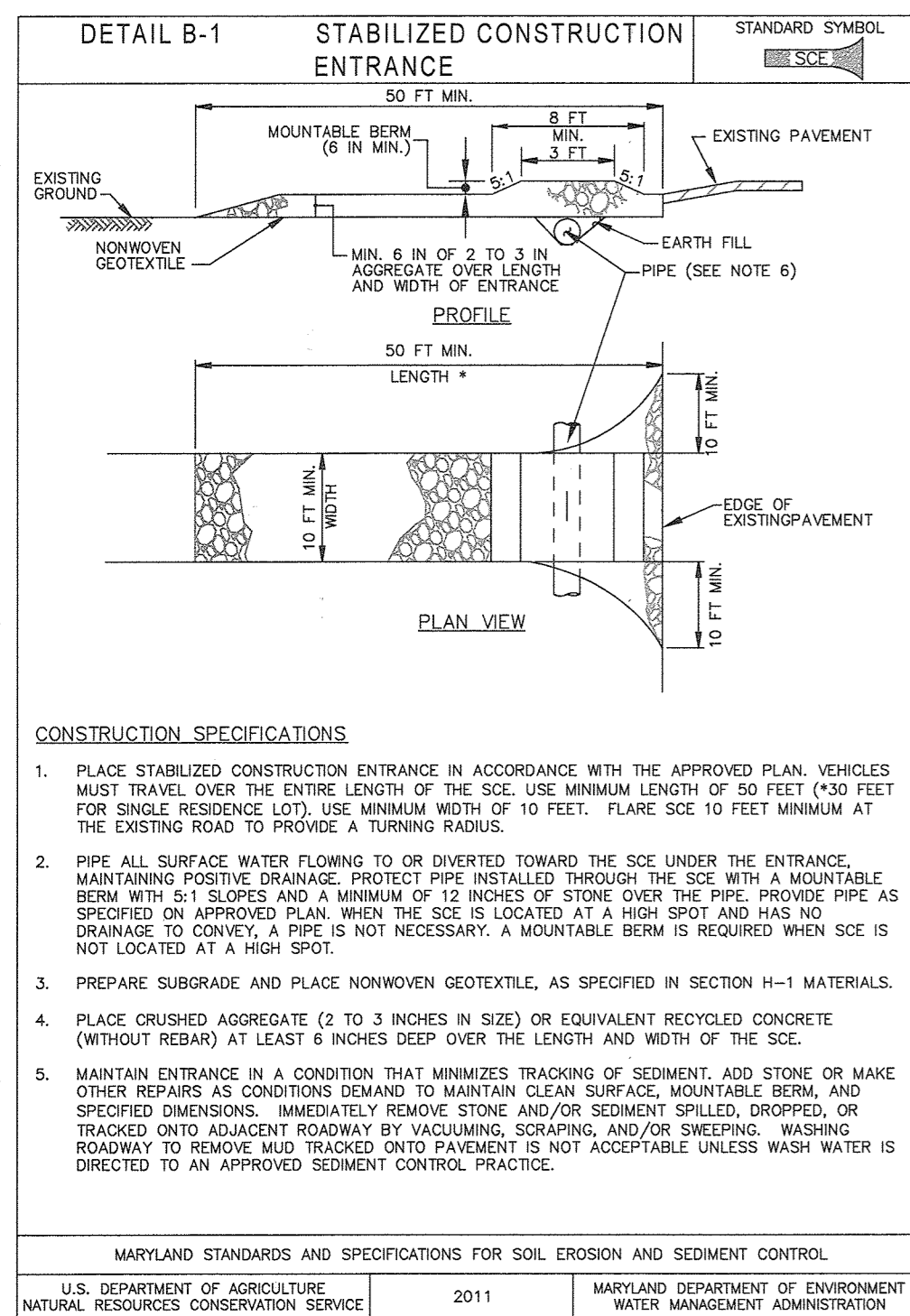
OWNER:
STEVEN A. KLEIN & ASSOCIATES
C/O SHERIDAN HECHT INC.
12165 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21029
410-465-4244

DEVELOPER/OWNER:
RIVER HILL SQUARE, LLC
P.O. BOX 417
ELLICOTT CITY, MARYLAND 21041
410-465-4244

RIVER HILL SQUARE
REDEVELOPMENT OF
RIVER HILL GARDEN CENTER
TAX MAP: 35 - GRID: 1 - PARCEL: 1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

SEDIMENT AND EROSION CONTROL PLAN

DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN SHEET 21 OF 25



ENGINEER'S CERTIFICATE

I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Clay Alayari 3-5-19
ENGINEER DATE

DEVELOPER'S CERTIFICATE

I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

Stevan K. Breznan 3-6-19
DEVELOPER DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

John R. Pletcher 3/21/19
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cheryl... 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Veronica... 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Nancy... 4-4-19
DIRECTOR DATE

NO.	DATE	REVISION
BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE #4 SUITE 315A ELLICOTT CITY, MARYLAND 21143 (P) 410-465-6105 (F) 410-465-6644 WWW.BE-CIVILENGINEERING.COM		
Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22391, Expiration Date: 6-30-2019.		
OWNER: RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND		
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244		
SEDIMENT AND EROSION CONTROL DETAILS		
DESIGN: DBT	DRAFT: DBT	DATE: MARCH 4, 2019
SCALE: AS SHOWN	SHEET 23 OF 25	BEI PROJECT NO. 2801

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-1

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
484.535	1	Asphalt - 3.0"	Topsoil - 5.0"	12"		1-2.3	10
484.535	1	Brown, dark red, silty, medium stiff to stiff, CLAY, some sand, trace to some gravel, with roots. (CL, FLL)	Groundwater was not encountered while drilling	18"		4-5.9	14
484.535	1	Dark green-brown, moist, very loose to medium dense, silty SAND, some weathered rock. (SM)	Boring was backfilled and patched after 24 hours	18"		3-4.5	9
484.535	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	18"		4-5.5	10

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-2

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
485.649	1	Asphalt - 3.0"	Topsoil - 4.0"	14"		2-3.5	8
485.649	1	Brown, moist, silty, medium stiff to stiff, CLAY, some sand, trace to some gravel, with roots. (CL, FLL)	Groundwater was not encountered while drilling	18"		11-10.8	18
485.649	1	Dark green, moist, medium dense, silty SAND, some gravel and weathered rock fragments. (SM, FLL)	Boring was backfilled and patched after 24 hours	18"		2-2.4	6
485.649	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	18"		5-6.6	12

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-3

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
492.261	1	Asphalt - 3.0"	Gravel - 8.0"	14"		7-6.5	11
492.261	1	Dark green, moist, medium dense, silty SAND, some gravel, trace to some mica. (SM, FLL)	Groundwater was not encountered while drilling	18"		1-1.2	3
492.261	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	18"		3-4.7	11

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-4

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
496.452	1	Asphalt - 6.0"	Gravel - 6.0"	18"		7-3.3	6
496.452	1	Brown, moist, silty, medium stiff to stiff, CLAY, some sand. (CL, FLL)	Groundwater was not encountered while drilling	18"		4-3.3	6
496.452	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	18"		5-9.6	15
496.452	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	18"		3-5.6	11

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-5

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
495.902	1	Asphalt - 5.0"	Gravel - 5.0"	18"		10-6.7	15
495.902	1	Brown, moist, silty, medium stiff to stiff, CLAY, some sand. (CL, FLL)	Groundwater was not encountered while drilling	18"		6-10.7	17
495.902	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	18"		6-10.7	17
495.902	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	18"		4-5.6	11

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-6

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
494.567	1	Asphalt - 8.0"	Gravel - 8.0"	17"		4-8.8	15
494.567	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Groundwater was not encountered while drilling	18"		5-4.7	14
494.567	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	18"		4-4.5	11
494.567	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	18"		4-5.6	11

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-7

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
492.683	1	Gravel - 8.0"	Gravel - 8.0"	12"		7-12.5	17
492.683	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Groundwater was not encountered while drilling	12"		3-2.4	6
492.683	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	12"		3-2.4	6
492.683	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	12"		2-3.4	7

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-8

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
488.872	1	Topsoil - 3.0"	Gravel - 7.0"	6"		1-2.4	3
488.872	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Groundwater was not encountered while drilling	12"		3-3.4	7
488.872	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	12"		2-3.3	5
488.872	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	12"		3-3.4	7

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-9

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
488	1	Gravel - 7.0"	Gravel - 7.0"	6"		2-1.2	3
488	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Groundwater was not encountered while drilling	6"		3-5.6	11
488	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	6"		9-2.2	7
488	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	6"		3-5.07	50.07

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-10

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
489.555	1	Topsoil - 3.0"	Gravel - 3.0"	12"		3-3.4	7
489.555	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Groundwater was not encountered while drilling	6"		3-5.6	11
489.555	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	6"		4-4.6	10
489.555	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	6"		5-5.6	11

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-11

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
492.189	1	Asphalt - 3.0"	Gravel - 7.0"	12"		4-2.4	8
492.189	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Groundwater was not encountered while drilling	12"		4-3.5	8
492.189	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	12"		5-1.1	2
492.189	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	12"		1-3.3	6

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-12

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
494.086	1	Topsoil - 8.0"	Gravel - 8.0"	6"		2-2.3	5
494.086	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Groundwater was not encountered while drilling	6"		11-7.1	12
494.086	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	6"		7-8.12	20
494.086	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	6"		7-9.9	18

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-13

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
490.872	1	Topsoil - 4.0"	Gravel - 4.0"	18"		2-3.5	8
490.872	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Groundwater was not encountered while drilling	18"		4-4.5	9
490.872	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	18"		7-30.34	64

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-14

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
490.872	1	Topsoil - 4.0"	Gravel - 4.0"	18"		2-3.5	8
490.872	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Groundwater was not encountered while drilling	18"		4-4.5	9
490.872	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	18"		7-30.34	64

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: River Hill Square SWM, Location: Clarksville, MD, Job #: 18053A, Boring No.: B-15

Sampler: Hammer Wt. 140 lbs., Hole Diameter 2.0 in., Foreman N. Lazaro

Elevation	SOIL SAMPLE LOCATION	Description	Boring and Sampling Notes	Rec.	NMTL	SPT Blows	SPT Blows/Feet
492.086	1	Topsoil - 8.0"	Gravel - 8.0"	6"		2-2.3	5
492.086	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Groundwater was not encountered while drilling	6"		11-7.1	12
492.086	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	6"		7-8.12	20
492.086	1	tan, dry, medium dense, silty SAND, some gravel and weathered rock fragments. (SM)	Boring was backfilled and patched after 24 hours	6"		7-9.9	18

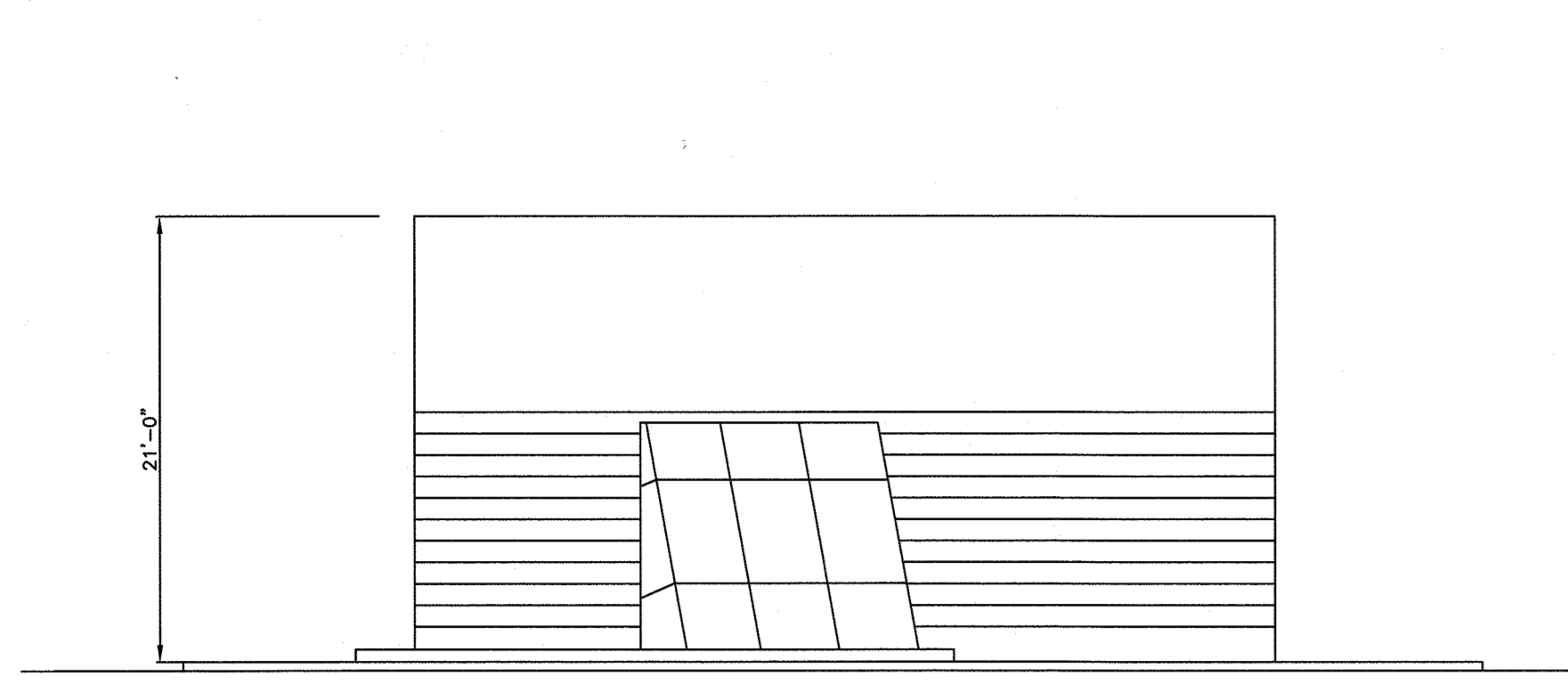
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-4-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION

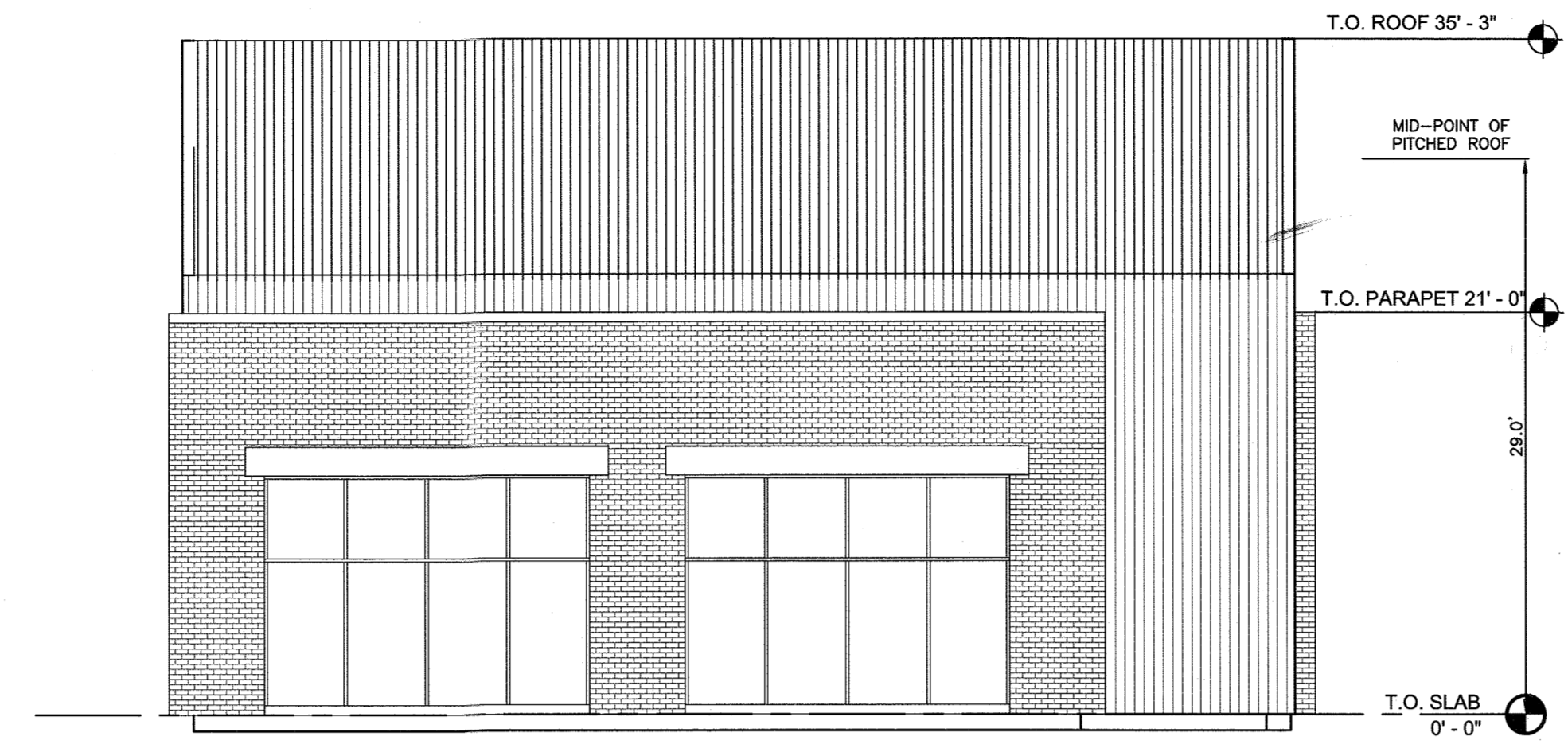
[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4-4-19
DIRECTOR

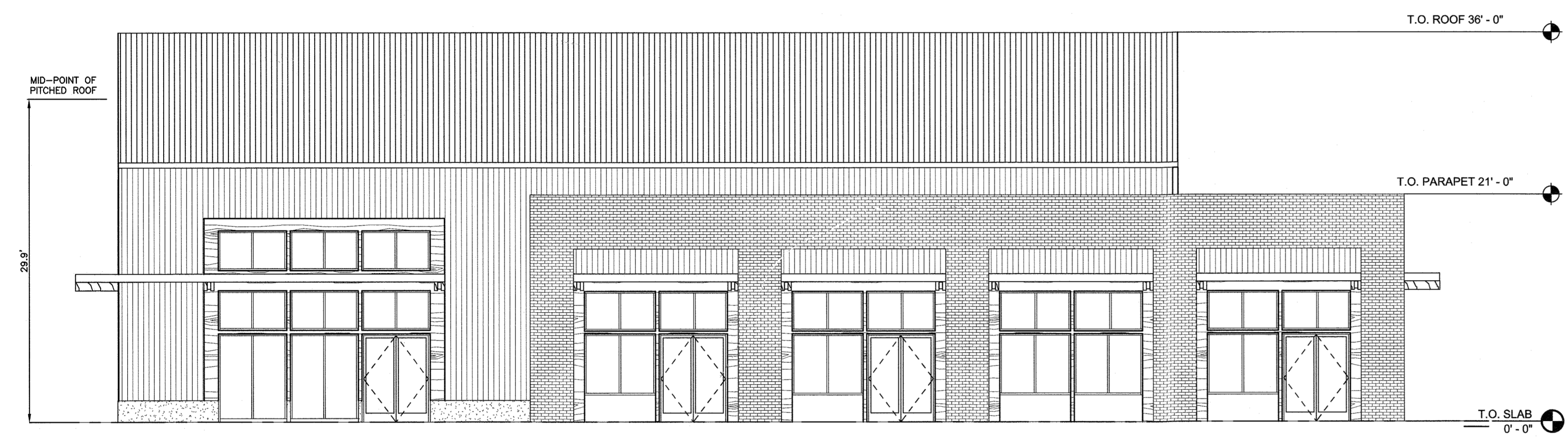
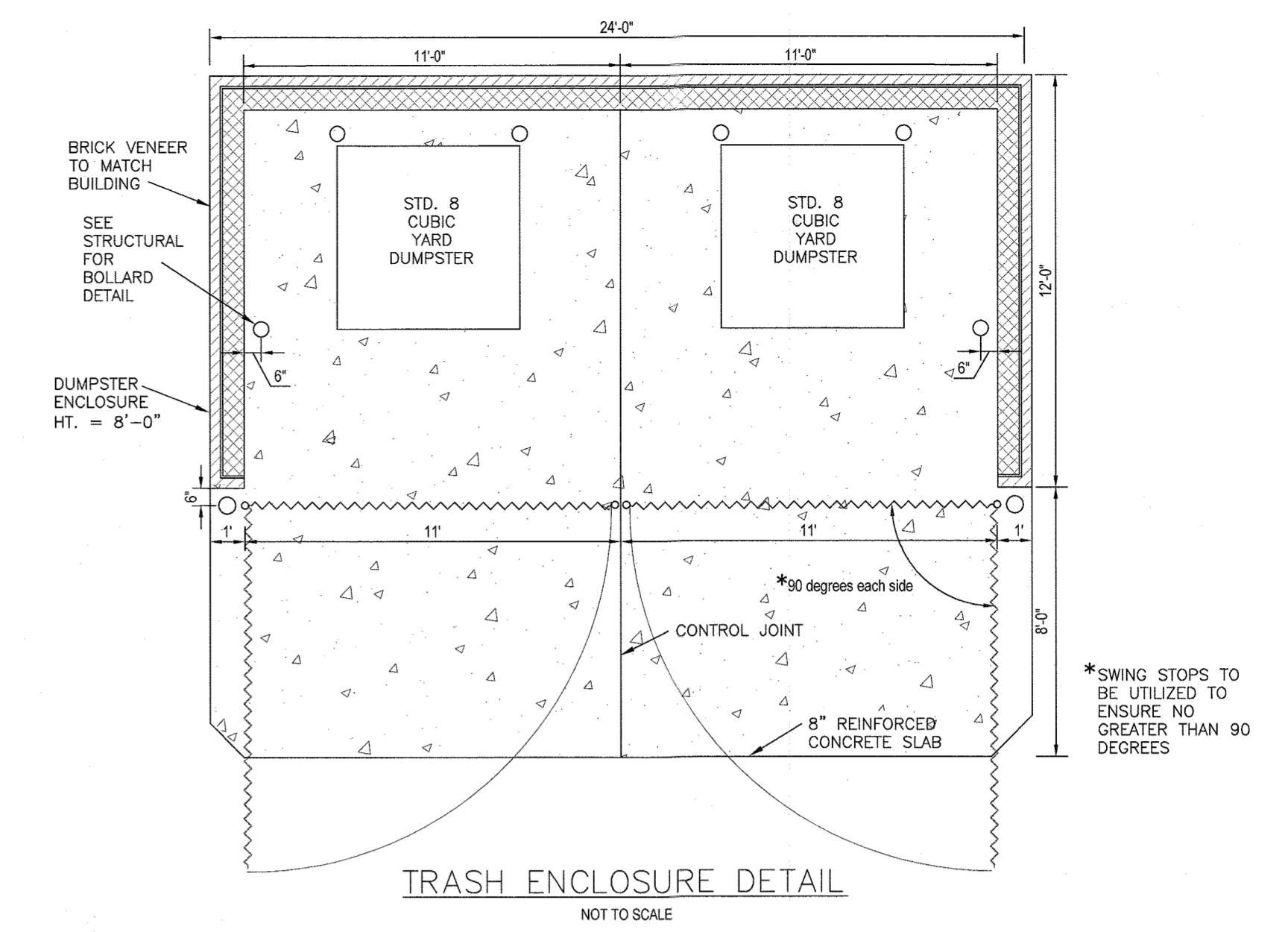
NO.	DATE	REVISION
<p>Professional Certification I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 28101, Date: 6-30-2019.</p> <p>BENCHMARK ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6444 WWW.BE-CIVILENGINEERING.COM</p>		
<p>OWNER: STEVEN A. KLEIN & ASSOCIATES C/O SHERIDAN KLEIN INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244</p>		<p>RIVER HILL SQUARE</p> <p>REDEVELOPMENT OF RIVER HILL GARDEN CENTER</p> <p>TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>
<p>DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244</p>		<p>SOIL BORING LOGS</p> <p>DATE: MARCH 4, 2019 BEI PROJECT NO. 2801 SCALE: AS SHOWN SHEET 24 OF 25</p>



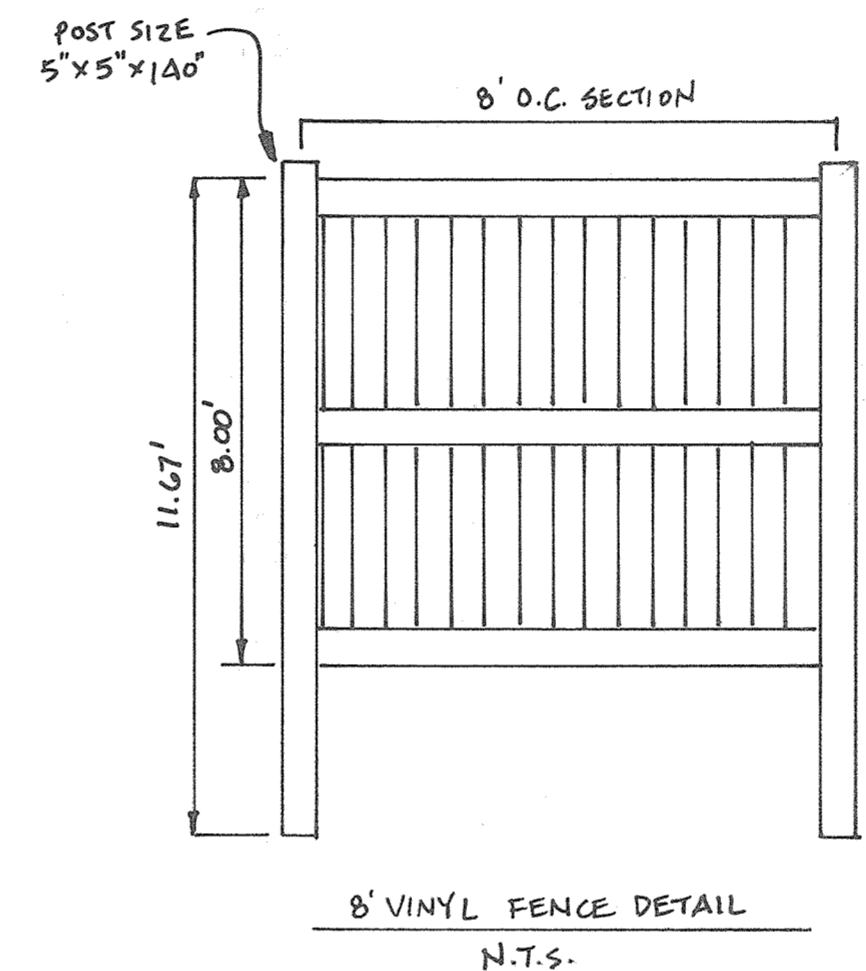
BUILDING #1 SIDE FACING CLARKSVILLE PIKE



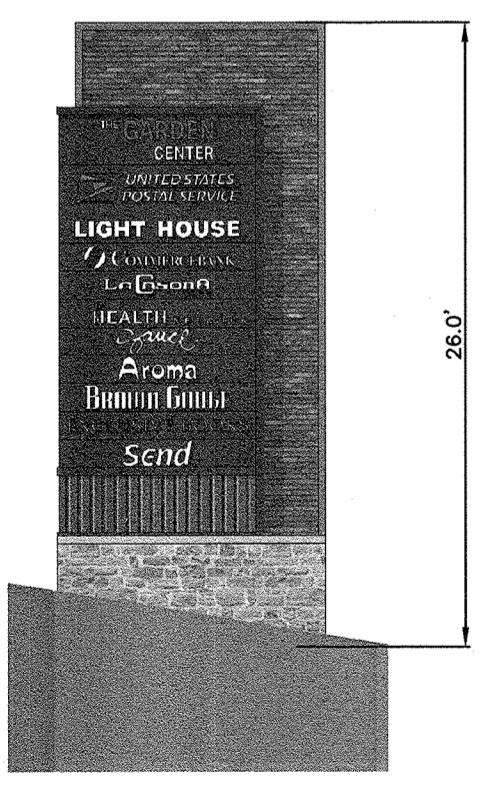
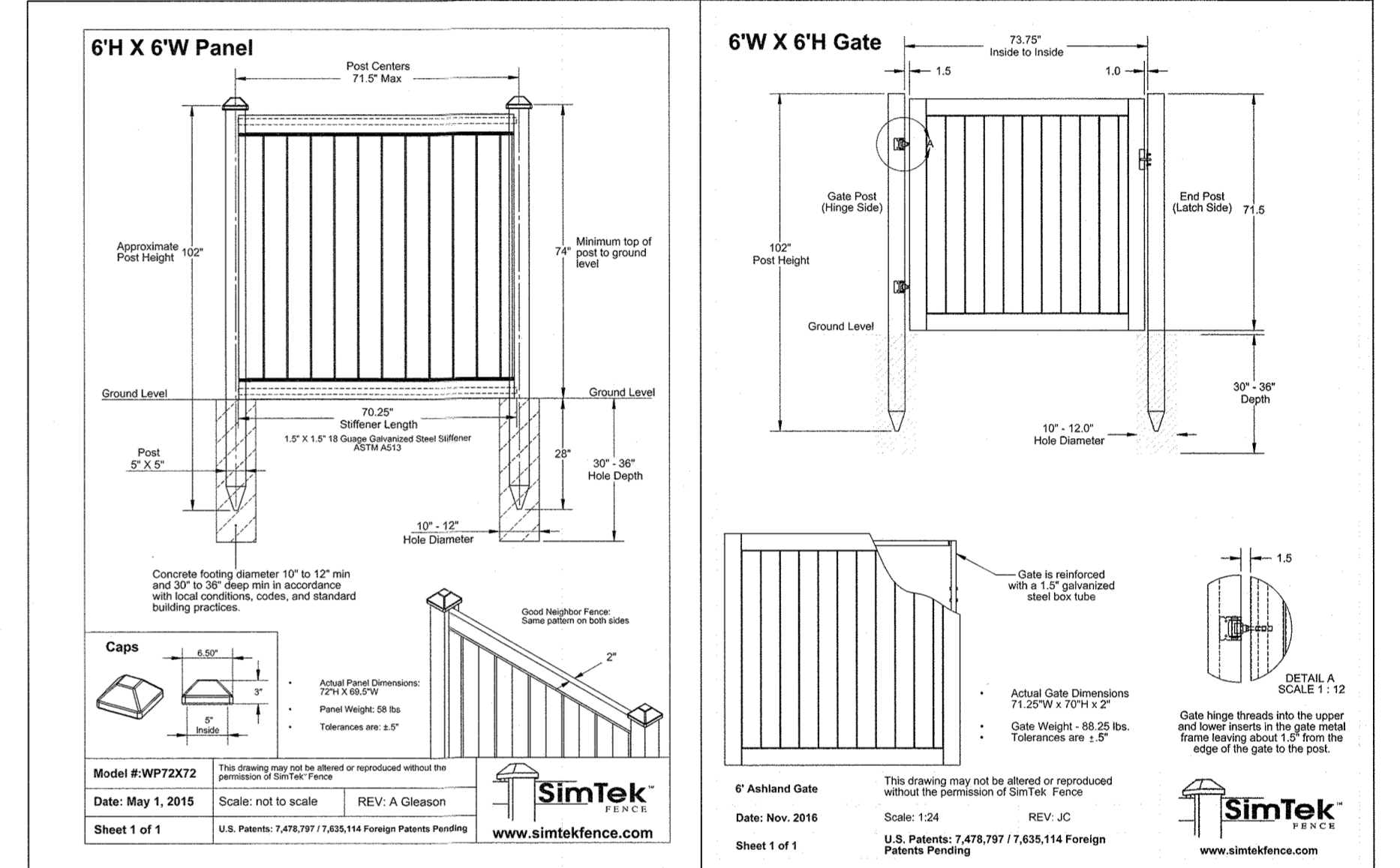
BUILDING #4 SIDE FACING CLARKSVILLE PIKE



BUILDING #2 SIDE FACING CLARKSVILLE PIKE



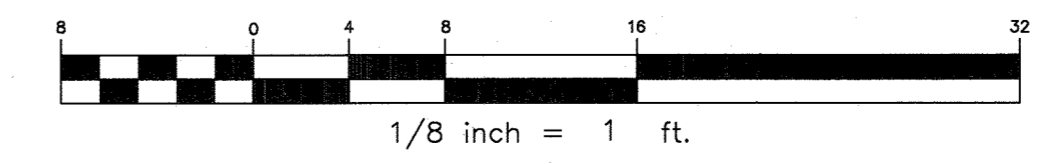
- NOTES:
1. STOREFRONT GLAZING SHALL BE CLEAR, OPAQUE OR REFLECTIVE GLASS SHALL ONLY BE USED FOR SPANDREL ELEMENTS IN ACCORDANCE WITH CLARKSVILLE PIKE STREETSCAPE PLAN AND DESIGN GUIDELINES.
 2. ALL TENANT SIGNS SHALL BE IN ACCORDANCE WITH THE CLARKSVILLE PIKE STREETSCAPE PLAN AND DESIGN GUIDELINES.
 3. ELEVATION VIEWS FROM ALL 4 SIDES OF EACH BUILDING SHALL BE SUBMITTED WITH THE BUILDING PERMIT.



PYLON SIGN



BUILDING #3 SIDE FACING CLARKSVILLE PIKE



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	
<i>[Signature]</i>	4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE
<i>[Signature]</i>	4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
<i>[Signature]</i>	4-7-19
DIRECTOR	DATE

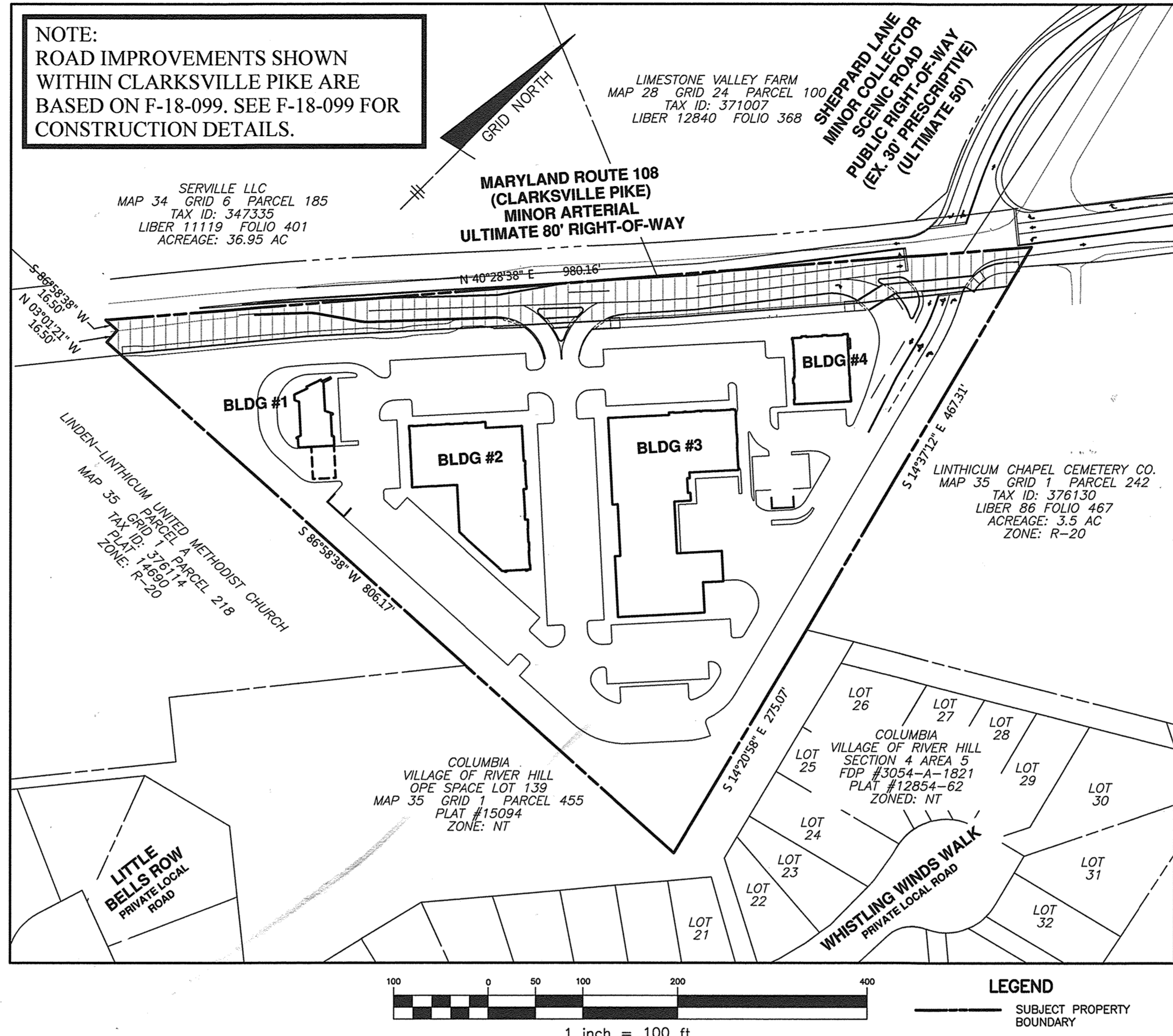
NO.	DATE	REVISION
1	3.31.2020	ADD 8' FENCE DETAIL
BENCHMARK ENGINEERING, INC. ENGINEERS • LAND SURVEYORS • PLANNERS 8480 BALTIMORE NATIONAL PIKE & SUITE 315 • ELLICOTT CITY, MARYLAND 21043 (P) 410-465-8105 (F) 410-465-6644 WWW.BE-CIVILENGINEERING.COM		
OWNER: STEPHEN A. KLEIN & ASSOCIATES C/O STEPHEN KLEIN, INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244		PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer and/or planner of the State of Maryland. License No. 22390, Expiration Date: 6-30-2019. <i>[Signature]</i> 3-5-19
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244		RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND
BUILDING ELEVATIONS AND DETAILS		
DESIGN: DBT	DRAFT: DBT	DATE: MARCH 4, 2019
		BEI PROJECT NO. 2801
		SCALE: AS SHOWN
		SHEET 25 OF 25

GENERAL NOTES

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLMS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- THIS SUBJECT PROPERTY IS ZONED B-1 PER THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN.
- THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.
- THE EXISTING TOPOGRAPHY ON-SITE IS FROM A FIELD RUN SURVEY PREPARED BY DART, McCUNE, & WALKER, INC. IN JANUARY, 2009. THE EXISTING TOPOGRAPHY ALONG CLARKSVILLE PIKE AND UP TO PROPOSED RIGHT-OF-WAY DEDICATION IS FROM A FIELD RUN SURVEY PERFORMED BY BENCHMARK ENGINEERING, INC. IN JANUARY, 2017.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENTS #0044 AND #35A2 WERE USED FOR THIS PROJECT.
- THIS SITE IS WITHIN THE METROPOLITAN DISTRICT.
- WATER IS PUBLIC. THE EXISTING CONTRACT NUMBER IS 20-3340/C.P. W-8178. AN ADVANCED DEPOSIT ORDER (A.D.O.) WAS SUBMITTED FOR THE ONSITE PUBLIC WATER AND APPROVED ON AUGUST 27, 2018 AS #3485. THE DRAINAGE AREA IS "PATUKENT".
- EXISTING UTILITIES SHOWN ARE BASED ON FIELD SURVEY LOCATIONS BY BENCHMARK ENGINEERING, INC. IN JANUARY 2017, AND BY DART, McCUNE, & WALKER, INC. IN JANUARY, 2009.
- THERE ARE NO WETLANDS, STREAMS, THEIR REQUIRED BUFFERS, 100-YEAR FLOODPLAIN OR STEEP SLOPES 25% OR GREATER WITH MORE THAN 20,000 SF OF CONTIGUOUS AREA LOCATED ON THIS SITE.
- THE EXISTING HOUSE ON THE PROPERTY IS A HISTORIC STRUCTURE THAT DATES TO THE 1920'S. AN APPLICATION FOR ADVISORY COMMENTS WAS HEARD BY THE HISTORIC PRESERVATION COMMISSION ON MARCH 2, 2017 IN CASE HPC-17-18. THE COMMISSION RECOMMENDED PRESERVING THE HISTORIC HOUSE AND SAID IT CONTRIBUTES TO THE STREETScape.
- THERE IS A HISTORIC GRAVE SITE LOCATED ON THIS PROPERTY THAT IS IDENTIFIED AS #35-4 ON THE HOWARD COUNTY CEMETERY SITE INVENTORY MAP. THE LOCATION SHOWN ON THIS SDP IS DERIVED FROM OLD AERIAL MAPS, ORAL HISTORY, AND GROUND PENETRATING RADAR PERFORMED BY FORREST ENVIRONMENTAL SERVICES, INC. CEMETERY #35-4 WAS REMOVED BY THE CP&B ON MARCH 6, 2018. CP&B REQUESTED TO KEEP THE PERIMETER OF THE CEMETERY LARGER SINCE THE SPECIFIC FOOTPRINT OF THE CEMETERY WERE NOT KNOWN. CEMETERY #35-4 IS TO REMAIN.
THE HOWARD COUNTY CEMETERY PRESERVATION BOARD HAS REVIEWED THE CASE FOR THE GRAVE SITES. IF GRAVE SITES ARE DISCOVERED DURING CONSTRUCTION, PER SECTION 16.1305 OF THE HOWARD COUNTY ZONING ORDINANCE, WORK IN THAT AREA SHALL BE SUSPENDED UNTIL A DETERMINATION CAN BE MADE BY DPZ AS TO HOW TO ADDRESS THE SITE.
- THERE IS AN EXISTING HOUSE LOCATED ON THIS SITE THAT IS CURRENTLY BEING LIVED IN BY THE OWNER. THERE ARE SEVERAL OTHER STRUCTURES LOCATED ON THIS SITE CONSISTING OF A COMMERCIAL GARDEN CENTER, GREENHOUSES, STORAGE AREAS THAT ARE DEFINED BY STONE WALLS, ENTRANCE MONUMENTS, ETC. ALL STRUCTURES ARE TO BE REMOVED.
- THE TRAFFIC IMPACT STUDY WAS PREPARED BY THE TRAFFIC CONCEPTS, INC. DATED NOVEMBER 8, 2017. IT WAS APPROVED BY SHA ON 12-19-2017 AND APPROVED BY HOWARD COUNTY ON 5-2-2018.
- A NOISE STUDY IS NOT REQUIRED SINCE THIS IS A COMMERCIAL PROJECT.
- THE GEOTECHNICAL REPORT WAS PREPARED BY HILLIS-CARNES ENGINEERING ASSOCIATES, INC. DATED FEBRUARY, 2018.
- THIS SITE DOES NOT ABUT A SCENIC ROAD.
- A SIMPLIFIED FOREST STAND DELINEATION WAS PREPARED BY J. CHRIS OGLE IN NOVEMBER, 2016. THERE ARE NO FOREST COMMUNITIES LOCATED ON THIS SITE. THERE IS ONE SPECIMEN TREE LOCATED ON THIS SITE, A 42" SPRUCE IN GOOD CONDITION. THE SPECIMEN TREE IS TO BE REMOVED.
- THE DESIGN ADVISORY PANEL MEETING WAS FIRST HELD ON FEBRUARY 8, 2017. AFTER ADDRESSING PANEL MEMBERS CONCERNS, A SECOND MEETING WAS HELD ON 12-13-2017.
- STORMWATER MANAGEMENT FOR THIS PROJECT IS BASED ON REDEVELOPMENT CRITERIA. 50% OF THE EXISTING IMPERVIOUS AREA AND 100% OF NEW OR ADDITIONAL IMPERVIOUS AREA SHALL BE TREATED VIA ESD TO THE MEP. THIS IS BEING ACCOMPLISHED VIA THREE (M-6) MICRO BIO-RETENTION FACILITIES AND TWO (F-1) SURFACE SAND FILTERS. IN ADDITION, QUANTITY MANAGEMENT IS BEING PROVIDED IN TWO (UGS) UNDERGROUND STORAGE FACILITIES SUCH THAT THE POST DEVELOPED 2, 10, AND 100-YR RUNOFF AMOUNTS DO NOT EXCEED THE CURRENT RUNOFF AMOUNTS. ALL FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.
\$2,710.00 70
- THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL HAVE BEEN ADDRESSED BY A CERTIFIED LANDSCAPE PLAN WITHIN THIS PLAN SET. THE FINANCIAL SURETY IN THE AMOUNT OF \$150,000 (FOR 48 SHADE TREES AND 47 EVERGREEN TREES) FOR THE REQUIRED PERIMETER AND PARKING ISLAND LANDSCAPING SHALL BE POSTED AS PART OF THE DEVELOPERS AGREEMENT, AND (58 SHADES) 47
- THE PROVISIONS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION IS BEING MET BY THE PAYMENT OF A FEE-IN-LIEU IN THE AMOUNT OF \$9,801.00 FOR THE 0.3 ACRE OBLIGATION. THE OBLIGATION AMOUNT IS BASED ON THE DIFFERENCE BETWEEN THE PROPOSED ON-SITE LIMIT OF DISTURBANCE AND THE EXISTING ON-SITE IMPERVIOUS AREAS PER THE DEPARTMENT OF PLANNING AND ZONING MEMO, "FOREST CONSERVATION PROGRAM CHANGE FOR PREVIOUSLY DEVELOPED AREAS COVERED BY IMPERVIOUS SURFACE, EFFECTIVE DECEMBER 1, 2015. MARYLAND'S FOREST PRESERVATION ACT OF 2013 (STATE HOUSE BILL NO. 708)". THE PROPOSED ON-SITE LIMIT OF DISTURBANCE AMOUNTS TO 5.75 ACRES AND THE EXISTING ON-SITE IMPERVIOUS AREAS AMOUNTS TO 3.90 ACRES FOR A "TRACT AREA" AMOUNT OF 1.85 ACRES. THE OBLIGATION AMOUNTS TO 0.28 ACRES. SEE FOREST CONSERVATION WORKSHEET ON THIS SHEET.
- ALL PROPOSED EXTERIOR LIGHTING SHALL BE DIRECTED/REFLECTED AWAY FROM ALL ADJACENT PUBLIC ROADS AND RESIDENTIAL ZONING DISTRICTS IN ACCORDANCE WITH SECTION 134.0 OF THE HOWARD COUNTY ZONING REGULATIONS.
- KNOX BOX SHALL BE PLACED ON THE FRONT OF ALL BUILDINGS NO MORE THAN 6' TO THE RIGHT OF THE MAIN ENTRANCE AT A HEIGHT OF 4'-6" IT SHALL BE ELECTRONICALLY SURVEYED TO NOTIFY THE OWNER THAT IT IS BEING ACCESSED (INTEGRATED WITH THE FIRE SYSTEM). MORE THAN ONE KNOX BOX PER BUILDING MAY BE REQUIRED. THE CONSTRUCTION SUPERINTENDENT SHOULD COORDINATE WITH THE OFFICE OF THE FIRE MARSHAL TO DETERMINE THE NUMBER OF KNOX BOXES REQUIRED AND THE PLACEMENT LOCATIONS.
- ALL PLAN DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
- TRASH PICK-UP, SNOW REMOVAL AND PARKING LOT MAINTENANCE SHALL BE PRIVATE.
- ENVIRONMENTAL CONCEPT PLAN, ECP-17-023, WAS APPROVED ON JANUARY 20, 2017.
- A PRE-SUBMISSION COMMUNITY MEETING WAS HELD ON JANUARY 24, 2018.
- APPLICABLE DEPARTMENT OF PLANNING AND ZONING FILE REFERENCES:
SDP-91-002, ECP-17-023, F-18-099, WP-18-095
- FOR ROAD IMPROVEMENTS ALONG CLARKSVILLE PIKE AND RELOCATED SHEPPARD LANE, SEE FINAL ROAD CONSTRUCTION PLANS F-18-099. THESE PLANS WERE SUBMITTED TO STATE HIGHWAY ADMINISTRATION ON 6-6-2018 AND TO HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING ON 7-6-2018 FOR INITIAL REVIEW.
- WP-18-095, A REQUEST FOR AN ALTERNATE COMPLIANCE TO SECTION 16.1205(C)(7) TO REMOVE SPECIMEN TREE 'A' WAS APPROVED ON APRIL 25, 2018 WITH THE FOLLOWING CONDITIONS:
1. COMPLIANCE WITH ALL SRC AGENCY COMMENTS GENERATED WITH THE REVIEW OF THE SUBMITTED SITE DEVELOPMENT PLAN, SDP-18-044.
2. TWO (2) 2.5"-3" CALIPER, NATIVE SHADE TREES AS MITIGATED FOR THE REMOVAL OF THE SINGLE (1) SPECIMEN TREE FROM THE PROPERTY. SURETY FOR THE MITIGATION TREES SHALL BE ADDED TO THE LANDSCAPE SURETY WITH THE FINAL PLAN SUPPLEMENTAL AND ROAD CONSTRUCTION PLANS.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME II (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)". A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREETLIGHT AND ANY TREE.
ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 gauge) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 gauge) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
- A DESIGN MANUAL WAIVER TO DESIGN MANUAL VOLUME I, SECTION 5.2.5.E.1.s WHICH SPECIFIES THAT CONTROL STRUCTURE SHALL BE COMPOSED OF THE SAME MATERIAL AS THE PIPE ATTENUATION FACILITY TO ALLOW THE ALUMINIZED CMP ATTENUATION FACILITY TO DISCHARGE INTO A CONCRETE CONTROL STRUCTURE (S-1 AND S-2) WAS APPROVED ON AUGUST 14, 2018.
- BOA CASE NO. 19-022V, A VARIANCE TO REDUCE THE 30 FOOT STRUCTURE AND USE SETBACK FROM A RESIDENTIAL ZONING DISTRICT TO 0 FEET WAS GRANTED ON FEBRUARY 21, 2020 PROVIDED THAT:
a) THE VARIANCE SHALL ONLY APPLY TO THE FENCE.
b) SDP-18-044 IS REDLINED TO SHOW THE FENCE
c) A REFERENCE TO BA-19-022V IS ADDED TO THE GENERAL NOTES.
d) PETITIONER OBTAINS ALL NECESSARY PERMITS.

COMMERCIAL SITE DEVELOPMENT PLAN

RIVER HILL SQUARE



NOTE:
ROAD IMPROVEMENTS SHOWN
WITHIN CLARKSVILLE PIKE ARE
BASED ON F-18-099. SEE F-18-099 FOR
CONSTRUCTION DETAILS.

FOREST CONSERVATION WORKSHEET
VERSION 1.0
(Enter in Yellow Cells)

NET TRACT AREA:

A. Total tract area	1.85
B. Area within 100 year floodplain	0.00
C. Area to remain in agricultural production	0.00
D. Net tract area	1.85

LAND USE CATEGORY: (from table 3.2.1, page 40, Manual)

Input the number "1" under the appropriate land use zoning, and limit to only one entry.

ARA	MDR	IDA	HDR	MPD	CIA
0	0	0	0	0	1

E. Afforestation Threshold..... 15% x D = 0.3
F. Conservation Threshold..... 15% x D = 0.3

EXISTING FOREST COVER:

G. Existing forest cover (excluding floodplain)	0.0
H. Area of forest above afforestation threshold	0.0
I. Area of forest above conservation threshold	0.0

BREAK EVEN POINT (BEP):

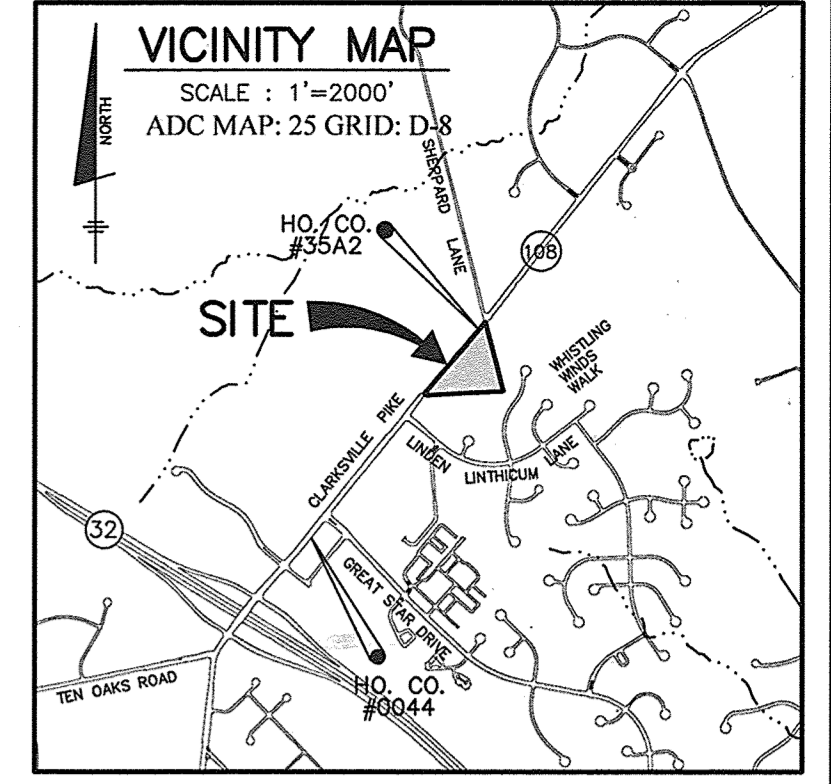
J. Forest retention above threshold with no mitigation (BEP)	0.0
K. Clearing permitted without mitigation	0.0

PROPOSED FOREST CLEARING:

L. Total area of forest to be cleared	0.0
M. Total area of forest to be retained	0.0

PLANTING REQUIREMENTS:

N. Reforestation for clearing above conservation threshold	0.0
P. Reforestation for clearing below conservation threshold	0.0
Q. Credit for retention above conservation threshold	0.0
R. Total reforestation required	0.0
S. Total afforestation required	0.3
T. Total reforestation and afforestation required	0.3



SHEET INDEX

NO.	DESCRIPTION
1	TITLE SHEET
2	EXISTING CONDITIONS/SOILS PLAN PLAN
3	SITE DEVELOPMENT LAYOUT AND DIMENSION PLAN
4	GRADING & UTILITY PLAN
5	ADA COMPLIANCE PLAN
6	STORM DRAIN DRAINAGE AREA MAP
7	STORM DRAIN PROFILES & DETAILS
8	STORM DRAIN PROFILES
9	ROOF LEADER MANIFOLD PLAN
10	STORMWATER MANAGEMENT ESD DRAINAGE AREA MAP
11-12	SWM DETAILS - (M-6) MICRO BIO-RETENTIONS
13	SWM DETAILS - (F-1) SURFACE SAND FILTERS
14	SWM DETAILS - UNDERGROUND FACILITY #1
15	SWM DETAILS - UNDERGROUND FACILITY #2
16	SEWER PROFILES AND DETAILS
17-18	LANDSCAPE PLAN
19-20	LIGHTING PLAN
21	SEDIMENT AND EROSION CONTROL PLAN
22	SEDIMENT AND EROSION CONTROL NOTES
23	SEDIMENT AND EROSION CONTROL DETAILS
24	SOIL BORING LOGS
25	BUILDING ELEVATIONS AND DETAILS

ADDRESS CHART

BUILDING	STREET ADDRESS
1	12179 CLARKSVILLE PIKE
2	12175 CLARKSVILLE PIKE
3	12165 CLARKSVILLE PIKE
3 (POST OFFICE)	12171 CLARKSVILLE PIKE
4	12161 CLARKSVILLE PIKE

PARKING TABULATION CHART

Building (Use)	Square Footage	Zoning Section	Parking Requirement	# of spaces req.	ADA spaces
Building #1 (Bank)	2,110	133.0.D.4.b	3.3 spaces per 1,000 sf	7	
Building #2 (Shopping Center)	14,568	133.0.D.4.r	6.0 spaces per 1,000 sf	88	
Building #3 (Shopping Center)	20,370	133.0.D.4.r	6.0 spaces per 1,000 sf	124	
Building #4 (Retail)	4,115	133.0.D.4.q	5.0 spaces per 1,000 sf	21	
Total Required:				242	7
Total Provided:				242	9

- Notes:
- Includes 1,350 sq ft of outdoor dining space.
 - Does not include the 11 LLV parking spaces reserved for post office vehicles.
 - Above chart is based on "Table 208.2 Parking Spaces" of the 2010 ADA Standards for Accessible Design for the entire site.
 - Per the Maryland Accessibility Code, Section .07.B.3.a, one in every four accessible parking spaces, but not less than one, shall "Van Accessible".
 - Includes 160 sq ft of outdoor seating area.

Stormwater Management Information

Lot/Parcel	Facility Name & Number	Practice Type (Quantity)	Public	Private	HOA Maintains	Misc.
1	(F-1) Surface Sand Filter	2	YES	NA	Privately Maintained	
1	(M-6) Micro Bio-Retention	3	YES	NA	Privately Maintained	
1	(UGS) Underground Storage	2	YES	NA	Privately Maintained	

Stormwater Management Summary Table - Quantity Analysis

Study Point	Condition @ Study point	Q2-yr (cfs)	Q10-yr (cfs)	Q100-yr (cfs)
1	existing per SDP-01-002	0.8	3.0	12.5
	existing per BEI analysis	1	7	11
	developed (SDP-18-044)	0.67	0.85	10.84
2	existing per SDP-01-002 *	1.6 *	4.6 *	9.6 *
	existing per BEI analysis	4	10	20
	developed (SDP-18-044)	0.72	0.93	12.07

Stormwater Management Summary Table

Practice	Drainage Area (sf)	Impervious Area (sf)	% Imp	Rv	Pe Required	ESDv Required (cf)	ESDv Provided (cf)	Pe Provided	Rev Required (cf)	Rev Provided (cf)	Ownership
(M-6) Micro Bio-Retention #1	7,850	6,597	84%	0.81	1.0	527	591	1.1		132	Private
(M-6) Micro Bio-Retention #2	13,039	10,873	83%	0.80	1.0	870	899	1.0		484	Private
(M-6) Micro Bio-Retention #3	17,435	12,858	74%	0.71	1.0	1037	1044	1.0	3737	577	Private
(F-1) Surface Sand Filter #1	63,768	56,368	88%	0.85	1.0	4493	4491	1.0		1571	Private
(F-1) Surface Sand Filter #2	41,077	30,035	73%	0.71	1.5	3636	3959	1.6		1054	Private
Totals per individual ESD Practice						143,169	116,731			10563	
Totals per Overall Site						285,716	183,823	70%	0.68	9566	
Total impervious untreated											67,092

Redevelopment Summary

	Existing	New	Total
Impervious Area On-Site (sf)	169,884	13,939	183,823
Impervious Area Required to be treated (sf)	84,942	13,939	98,881
Total Impervious Area Treated (sf)			116,731

- Notes:
- The Pe required for Surface Sand Filter #2 is weighted based on 0.32 acres of new impervious at a Pe of 2.6" 0.32 acres of new impervious at a Pe of 2.6" 0.62 acres of redevelopment impervious at a Pe of 1.0"
 - The total ESDv provided exceeds the total ESDv Required.
 - The REV is being provided for in the stone chambers below the facilities.



"NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET"

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-22

SITE ANALYSIS DATA CHART

- TOTAL PROJECT AREA: 6.99 acres
- AREA OF PLAN SUBMISSION: 6.99 acres
- AREA OF LAND DEDICATION TO SHA: 0.89 acres
- REMAINDER SITE AREA AFTER DEDICATION: 6.10 acres
- LIMIT OF DISTURBED AREA: 5.6 acres
- PRESENT ZONING: B-1
- PROPOSED USE OF SITE: COMMERCIAL
- FLOOR AREA (BUILDINGS 1 thru 4): 40,153 SF
- NUMBER OF PARKING SPACES REQUIRED: SEE "PARKING TABULATION CHART"
- OPEN SPACE ON-SITE: N/A
- BUILDING COVERAGE OF SITE: 0.92 AC. PERCENTAGE OF GROSS AREA: 13.2%
- APPLICABLE DPZ FILE REFERENCES: SEE GENERAL NOTE 30.

PERMIT INFORMATION CHART

SUBDIVISION NAME:	RIVER HILL SQUARE	SECTION/AREA:	N/A	LOT/PARCEL #	PAR. 1
PLAT No. OR L/F	GRID No.	ZONE	TAX MAP NO	ELECTION DISTRICT	CENSUS TRACT
L 5082 F 679	1	B-1	35	5	605505

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Edman 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION

Kate Johnson 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT

William J. Miller 4-4-19
DIRECTOR

3 3.31.2020 ADD GENERAL NOTE 35 REFERENCING BA-19-022V

2 11.12.2019 REVISE ADA SPACES PROVIDED FROM 12 TO 9 IN PARKING TAB CHART

1 04.18.2019 REVISE PARKING TABULATION CHART

NO. DATE REVISION

BENCHMARK ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043
(410) 465-9105 (410) 465-6644
WWW.BEI-CVLENGINEERING.COM

OWNER: STEPHEN A. KLEIN & ASSOCIATES
C/O STEPHEN KLEIN INC.
12165 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21029
410-465-4244

DEVELOPER/OWNER: RIVER HILL SQUARE, LLC
P.O. BOX 417
ELLICOTT CITY, MARYLAND 21041
410-465-4244

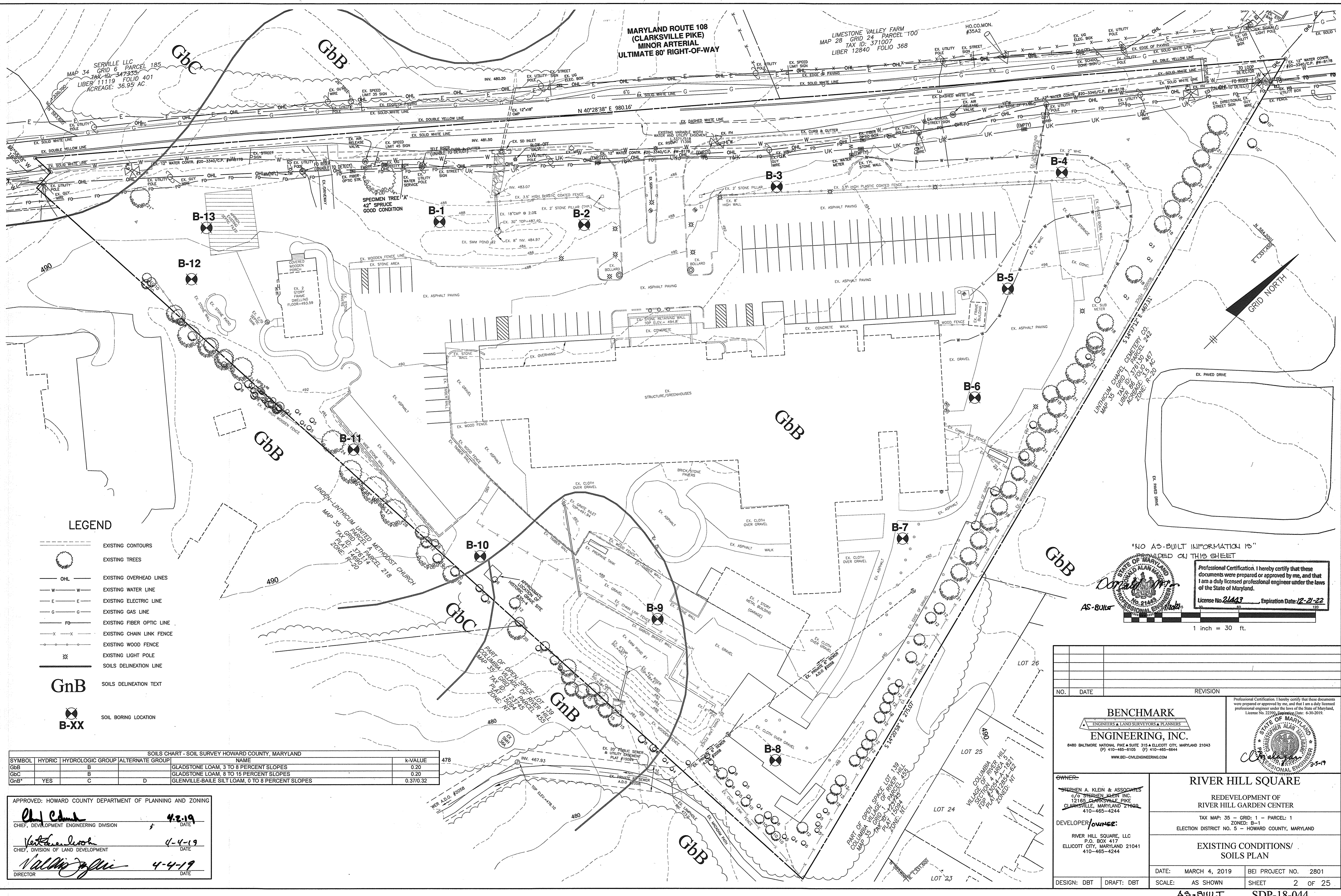
RIVER HILL SQUARE
REDEVELOPMENT OF
RIVER HILL GARDEN CENTER

TAX MAP: 35 - GRID: 1 - PARCEL: 1
ZONED: B-1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

COVER SHEET

DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
SCALE: AS SHOWN SHEET 1 OF 25

DESIGN: DBT DRAFT: DBT



MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 100
TAX ID: 371007
LIBER 12840 FOLIO 368

SERVILLE LLC PARCEL 185
MAP 34 GRID 6
TAX ID: 347335
LIBER 11119 FOLIO 401
ACREAGE: 36.95 AC

"NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET"

Professional Certification, I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 21443 Expiration Date: 12-21-22

AS-BUILT

1 inch = 30 ft.

LEGEND

- EXISTING CONTOURS
- EXISTING TREES
- EXISTING OVERHEAD LINES
- EXISTING WATER LINE
- EXISTING ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING FIBER OPTIC LINE
- EXISTING CHAIN LINK FENCE
- EXISTING WOOD FENCE
- EXISTING LIGHT POLE
- SOILS DELINEATION LINE
- SOILS DELINEATION TEXT
- SOIL BORING LOCATION

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND

SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k-VALUE
Gbb		B		GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.20
Gbc		B		GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	0.20
Gnb	YES	C	D	GLENNVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37/0.32

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Edmister 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Veronica Anderson 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Valerie J. Jaffe 4-4-19
DIRECTOR DATE

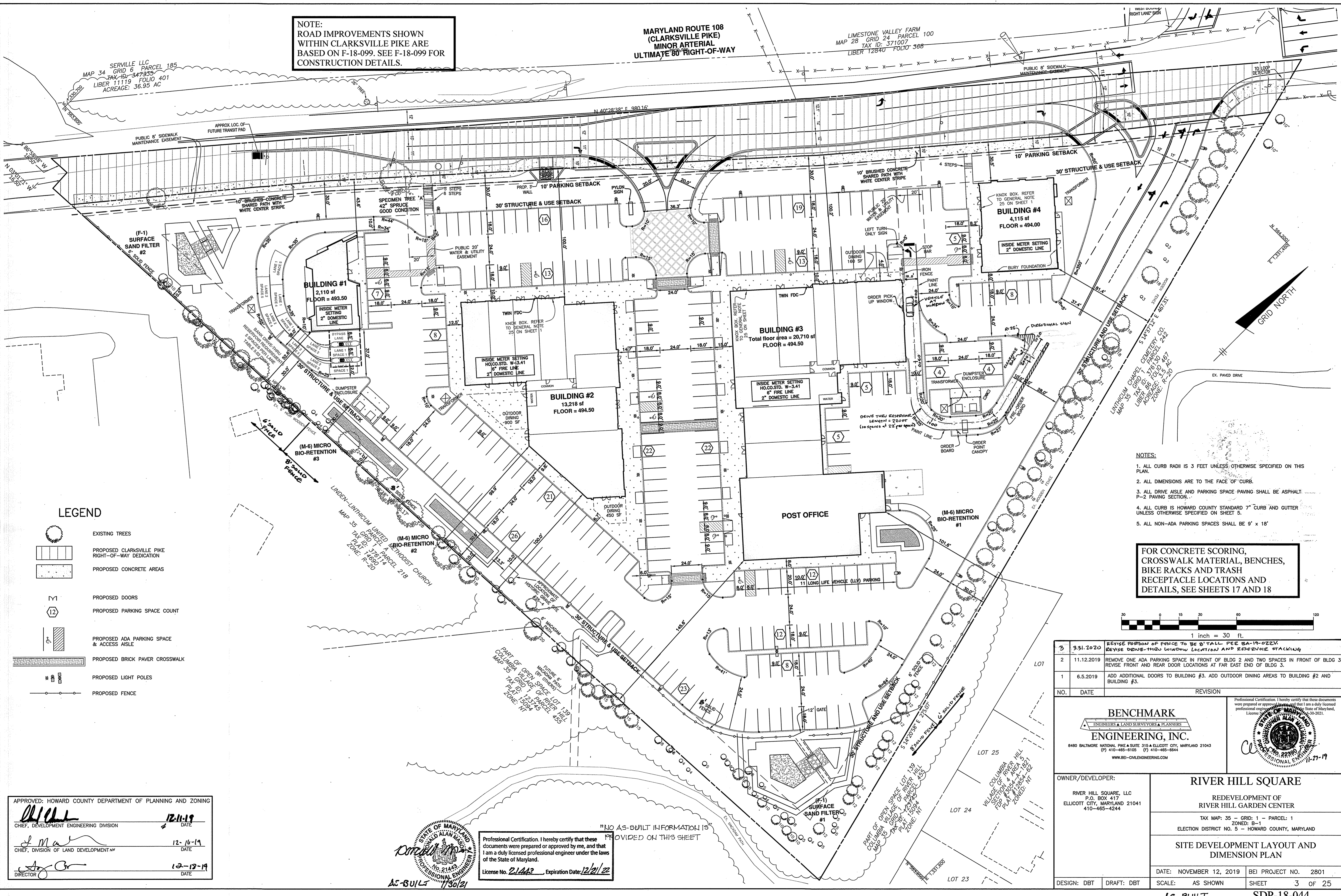
NO.		DATE		REVISION	
<p>BENCHMARK ENGINEERS, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BE-CIVILENGINEERING.COM</p>					
OWNER:			<p>RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER</p>		
DEVELOPER/OWNER:			<p>TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>		
DATE:			BEI PROJECT NO. 2801		
SCALE: AS SHOWN			SHEET 2 OF 25		
DESIGN: DBT			DRAFT: DBT		
AS-BUILT			SDP-18-044		

NOTE:
ROAD IMPROVEMENTS SHOWN
WITHIN CLARKSVILLE PIKE ARE
BASED ON F-18-099. SEE F-18-099 FOR
CONSTRUCTION DETAILS.

MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 100
TAX ID: 371007
LIBER 12340 FOLIO 388

SERVILLE LLC PARCEL 185
MAP 34 GRID 6 PARCEL 185
TAX ID: 347935
LIBER 11119 FOLIO 401
ACREAGE: 36.95 AC



LEGEND

- EXISTING TREES
- PROPOSED CLARKSVILLE PIKE RIGHT-OF-WAY DEDICATION
- PROPOSED CONCRETE AREAS
- PROPOSED DOORS
- PROPOSED PARKING SPACE COUNT
- PROPOSED ADA PARKING SPACE & ACCESS AISLE
- PROPOSED BRICK PAVEMENT CROSSWALK
- PROPOSED LIGHT POLES
- PROPOSED FENCE

- NOTES:
1. ALL CURB RADIUS IS 3 FEET UNLESS OTHERWISE SPECIFIED ON THIS PLAN.
 2. ALL DIMENSIONS ARE TO THE FACE OF CURB.
 3. ALL DRIVE AISLE AND PARKING SPACE PAVING SHALL BE ASPHALT P-2 PAVING SECTION.
 4. ALL CURB IS HOWARD COUNTY STANDARD 7" CURB AND GUTTER UNLESS OTHERWISE SPECIFIED ON SHEET 5.
 5. ALL NON-ADA PARKING SPACES SHALL BE 9' x 18'

FOR CONCRETE SCORING,
CROSSWALK MATERIAL, BENCHES,
BIKE RACKS AND TRASH
RECEPTACLE LOCATIONS AND
DETAILS, SEE SHEETS 17 AND 18

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 12-11-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 12-16-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 12-18-19
DIRECTOR DATE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 21443 Expiration Date: 12/21/22

AS-BUILT 11/30/21

NO.	DATE	REVISION
3	3.31.2020	REVISE PORTION OF FENCE TO BE 8' TALL PER BA-19-022V. REVISE DEVE-THRU WINDOW LOCATION AND REEVEN STACKING
2	11.12.2019	REMOVE ONE ADA PARKING SPACE IN FRONT OF BLDG 2 AND TWO SPACES IN FRONT OF BLDG 3. REVISE FRONT AND REAR DOOR LOCATIONS AT FAR EAST END OF BLDG 3.
1	6.5.2019	ADD ADDITIONAL DOORS TO BUILDING #3. ADD OUTDOOR DINING AREAS TO BUILDING #2 AND BUILDING #3.

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043
(P) 410-465-8105 (F) 410-465-8944
WWW.BE-CMLEENGINEERS.COM

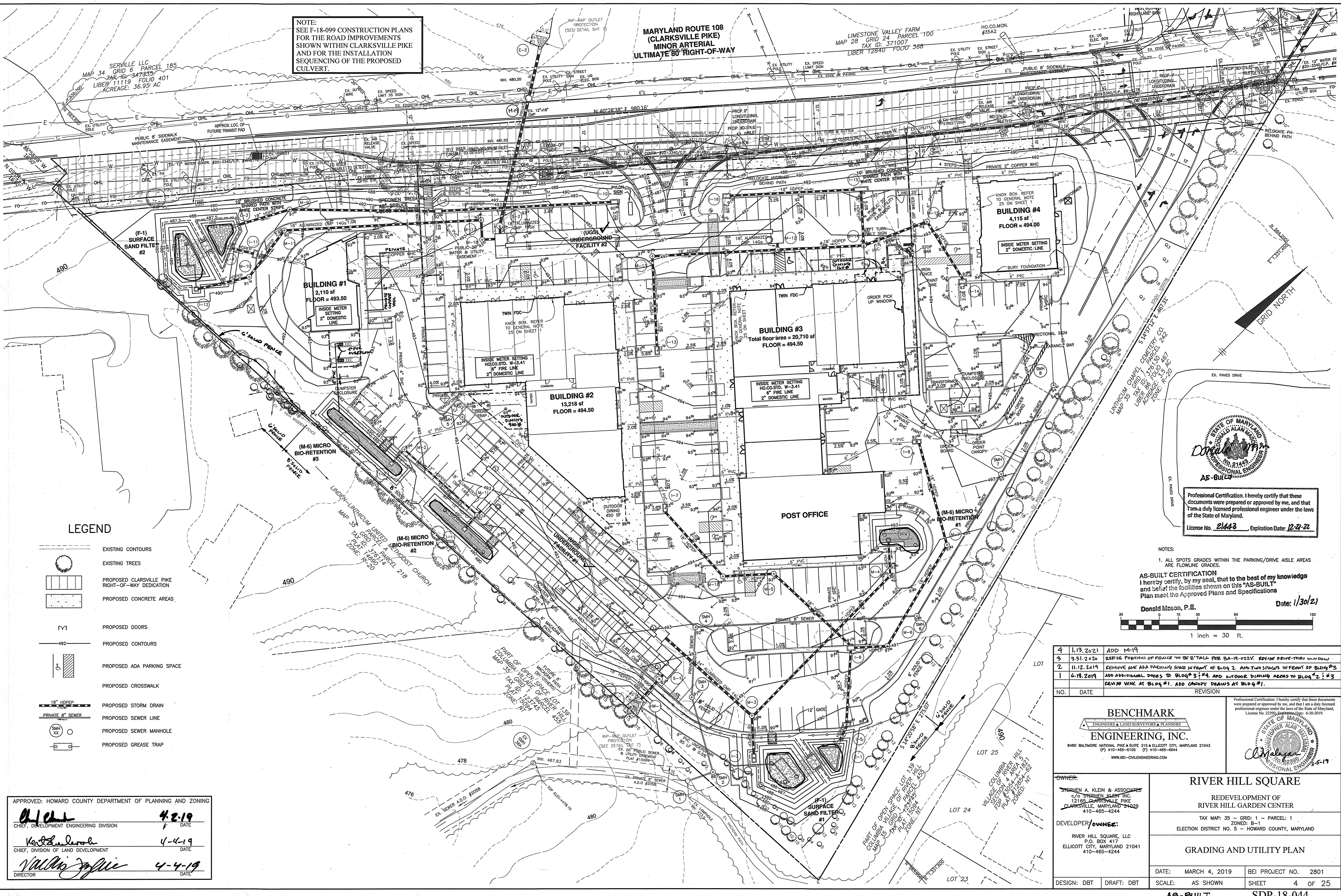
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 22398 Expiration Date: 11-21-19

OWNER/DEVELOPER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLCOTT CITY, MARYLAND 21041 410-465-4244	RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND
DATE: NOVEMBER 12, 2019 SCALE: AS SHOWN	BEI PROJECT NO. 2801 SHEET 3 OF 25

NOTE:
SEE F-18-099 CONSTRUCTION PLANS
FOR THE ROAD IMPROVEMENTS
SHOWN WITHIN CLARKSVILLE PIKE
AND FOR THE INSTALLATION
SEQUENCING OF THE PROPOSED
CULVERT.

MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 100
TAX ID: 371007
LIBER 72840 FOLIO 368



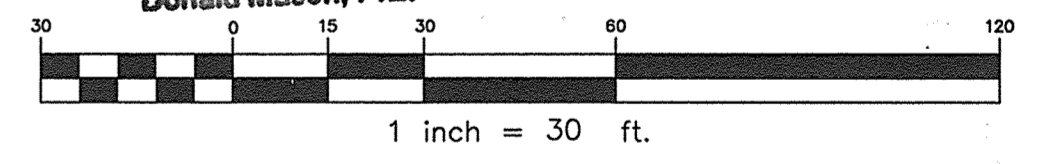
LEGEND

- EXISTING CONTOURS
- EXISTING TREES
- PROPOSED CLARKSVILLE PIKE RIGHT-OF-WAY DEDICATION
- PROPOSED CONCRETE AREAS
- PROPOSED DOORS
- PROPOSED CONTOURS
- PROPOSED ADA PARKING SPACE
- PROPOSED CROSSWALK
- PROPOSED STORM DRAIN
- PROPOSED SEWER LINE
- PROPOSED SEWER MANHOLE
- PROPOSED GREASE TRAP



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-22

NOTES:
1. ALL SPOTS GRADES WITHIN THE PARKING/DRIVE AISLE AREAS ARE FLOWLINE GRADES.
AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Date: 1/30/21
Donald Mison, P.E.



NO.	DATE	REVISION
4	1.13.2021	ADD M-19
3	9.31.2020	REVISE POSITION OF FENCE TO BE 8' TALL PER BA-19-022V. REVISE DRIVE-THRU WINDOW
2	11.12.2019	REMOVE ONE ADA PARKING SPACE IN FRONT OF BLDG 2 AND TWO SPACES IN FRONT OF BLDG #3
1	6.18.2019	ADD ADDITIONAL DOORS TO BLDG #3; #4. ADD OUTDOOR DINING AREAS TO BLDG #2; #3 SEWER WHC AT BLDG #1. ADD CANOPY DECKS AT BLDG #1.

BENCHMARK ENGINEERING, INC.
ENGINEERS & LAND SURVEYORS & PLANNERS
8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6100 (F) 410-465-6444
WWW.BEI-CVLENGINEERING.COM

OWNER:
STEPHEN A. KLEIN & ASSOCIATES
C/O STEPHEN KLEIN INC.
12155 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21029
410-465-4244

DEVELOPER/OWNER:
RIVER HILL SQUARE, LLC
P.O. BOX 417
ELLICOTT CITY, MARYLAND 21041
410-465-4244

RIVER HILL SQUARE
REDEVELOPMENT OF
RIVER HILL GARDEN CENTER
TAX MAP: 35 - GRID: 1 - PARCEL: 1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

GRADING AND UTILITY PLAN

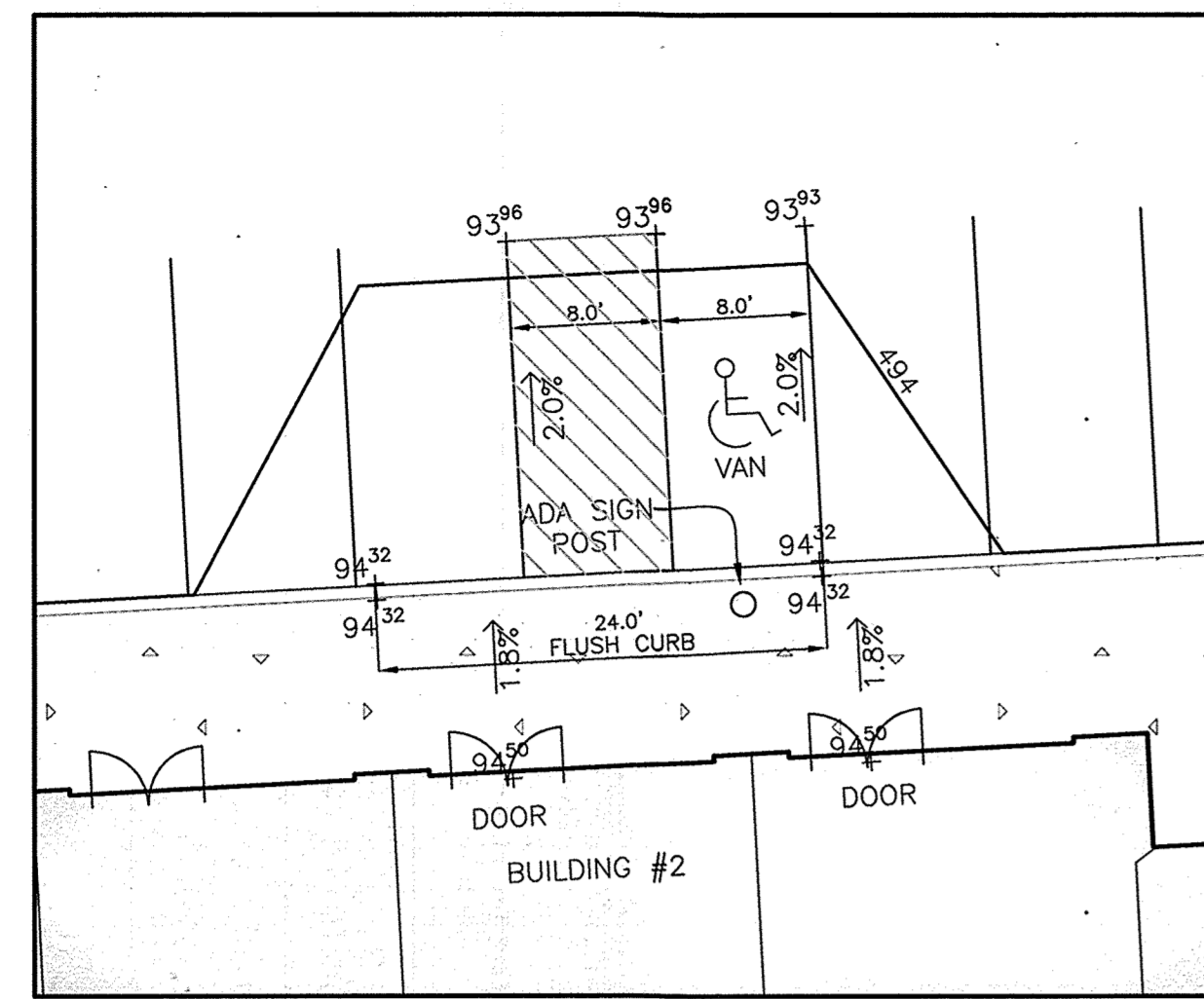
DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN SHEET 4 OF 25

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

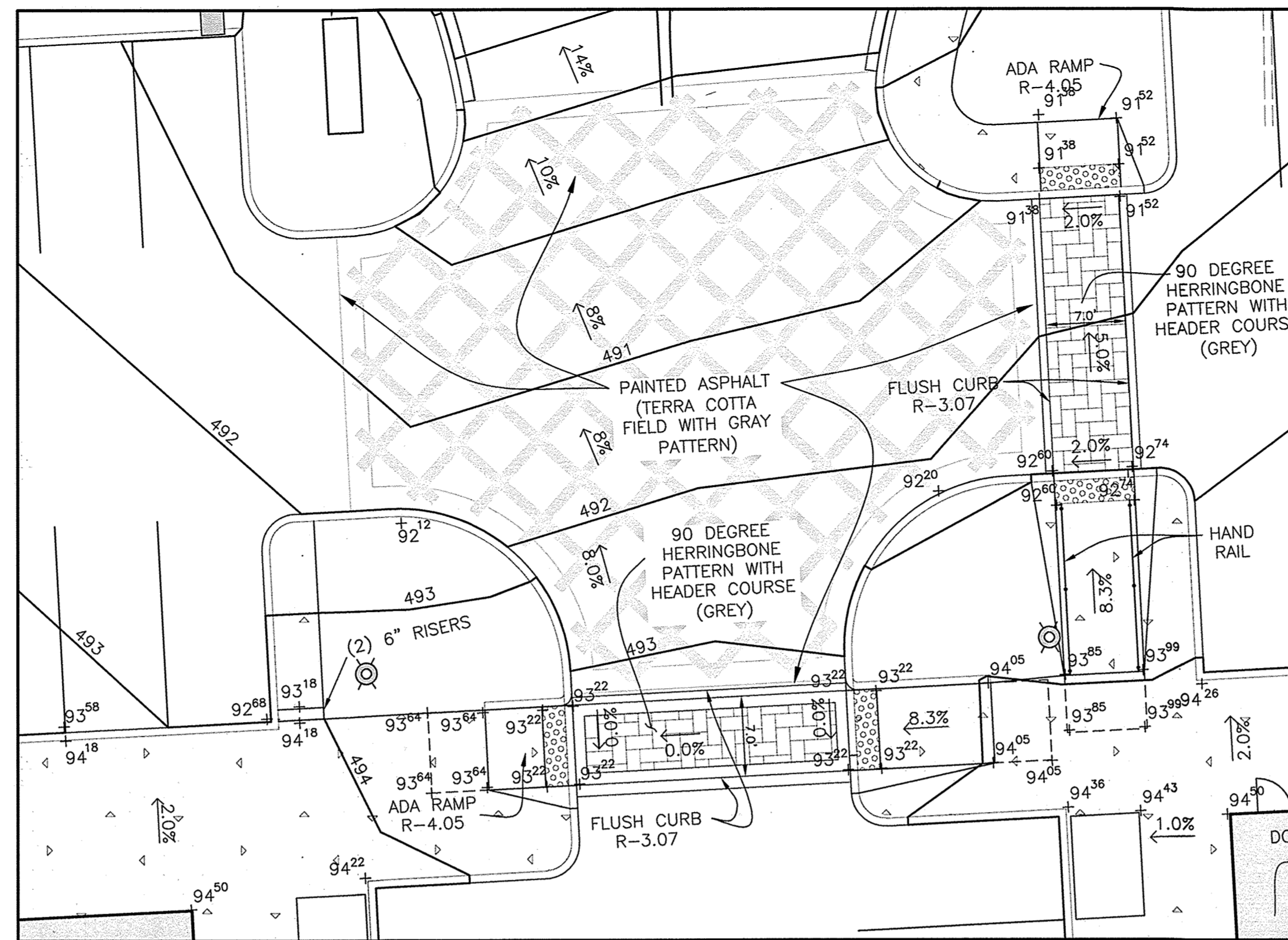
Chieh 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Veronica 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

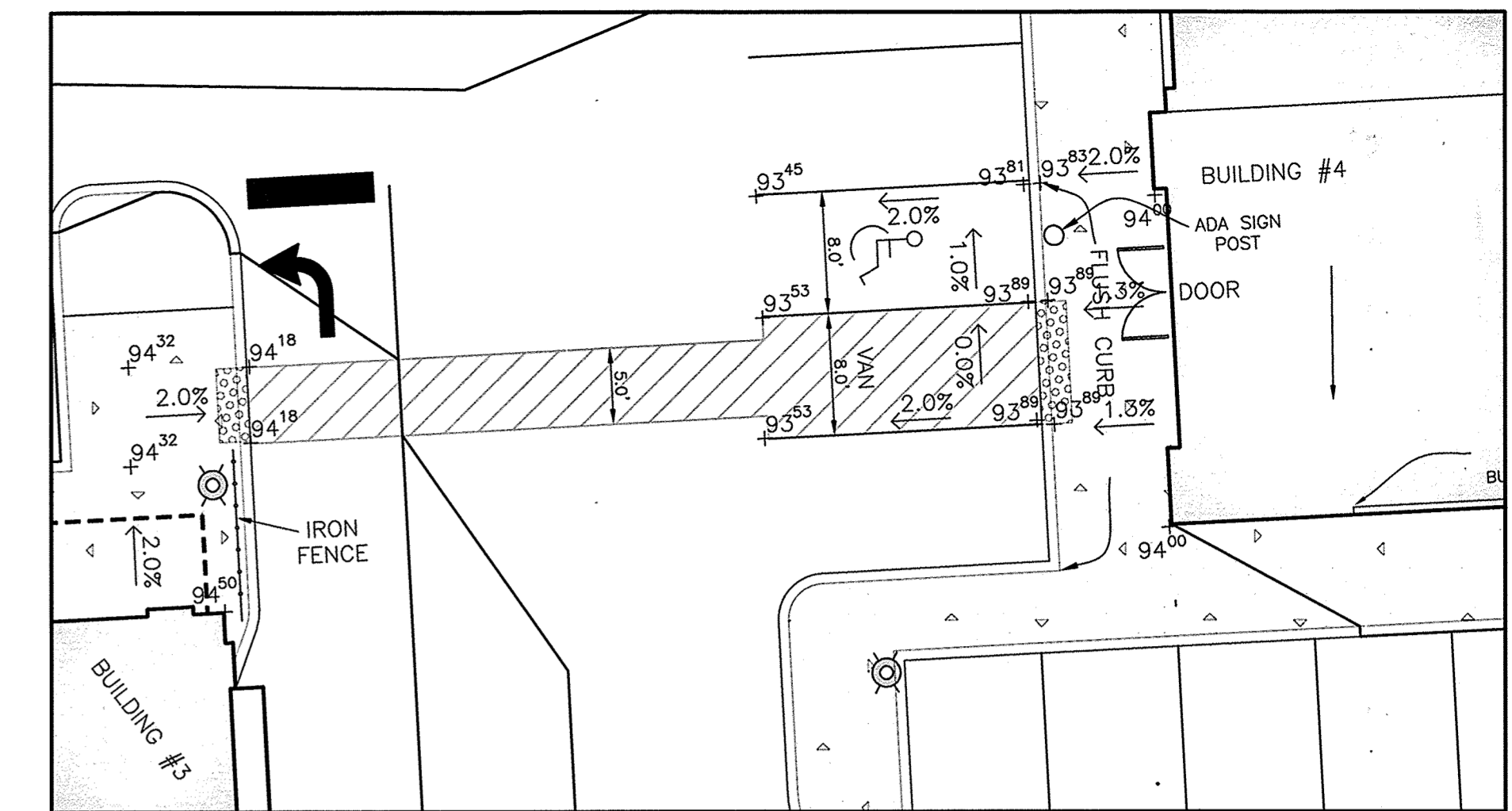
Natalia 4-4-19
DIRECTOR DATE



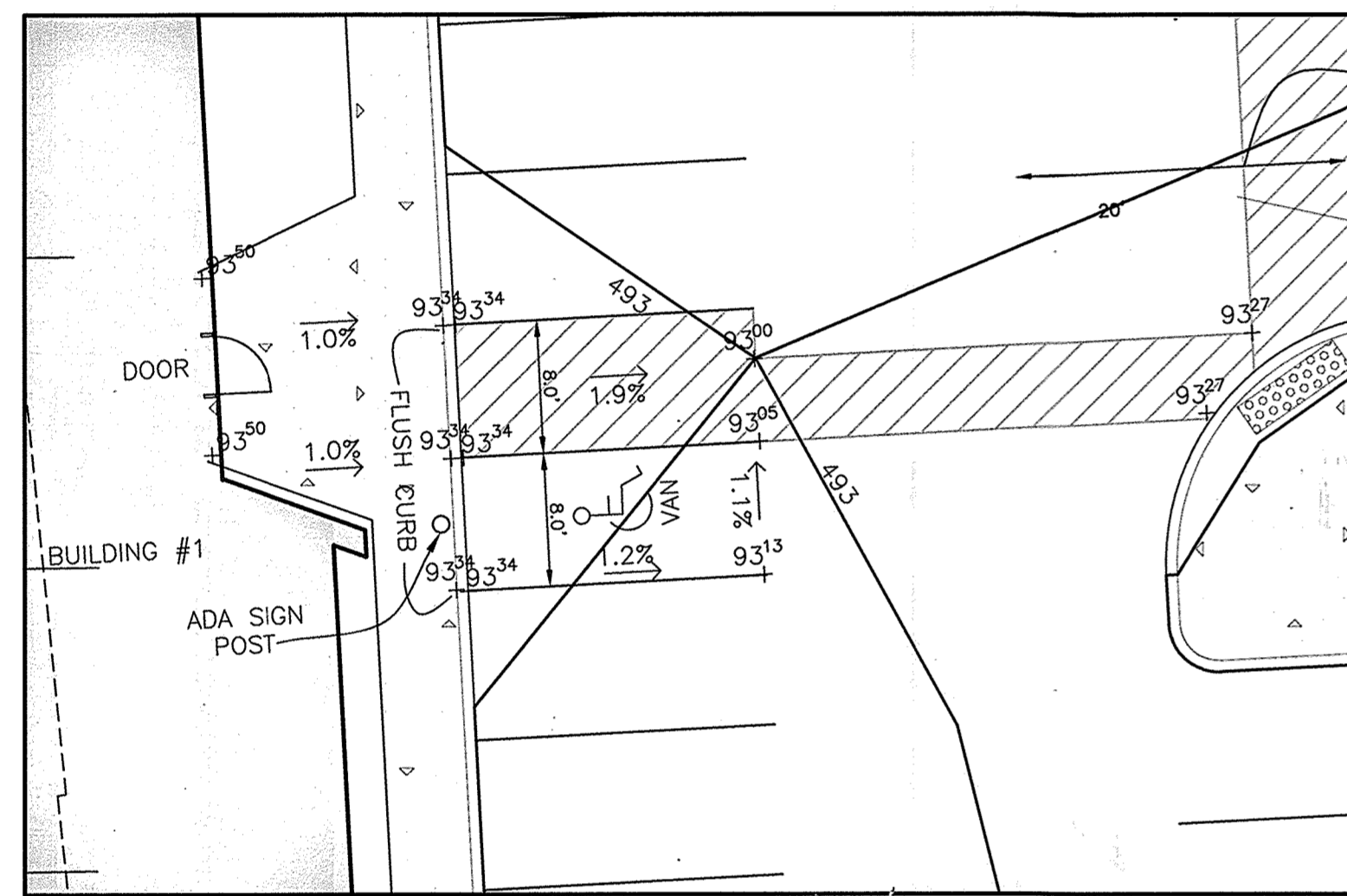
BUILDING #2



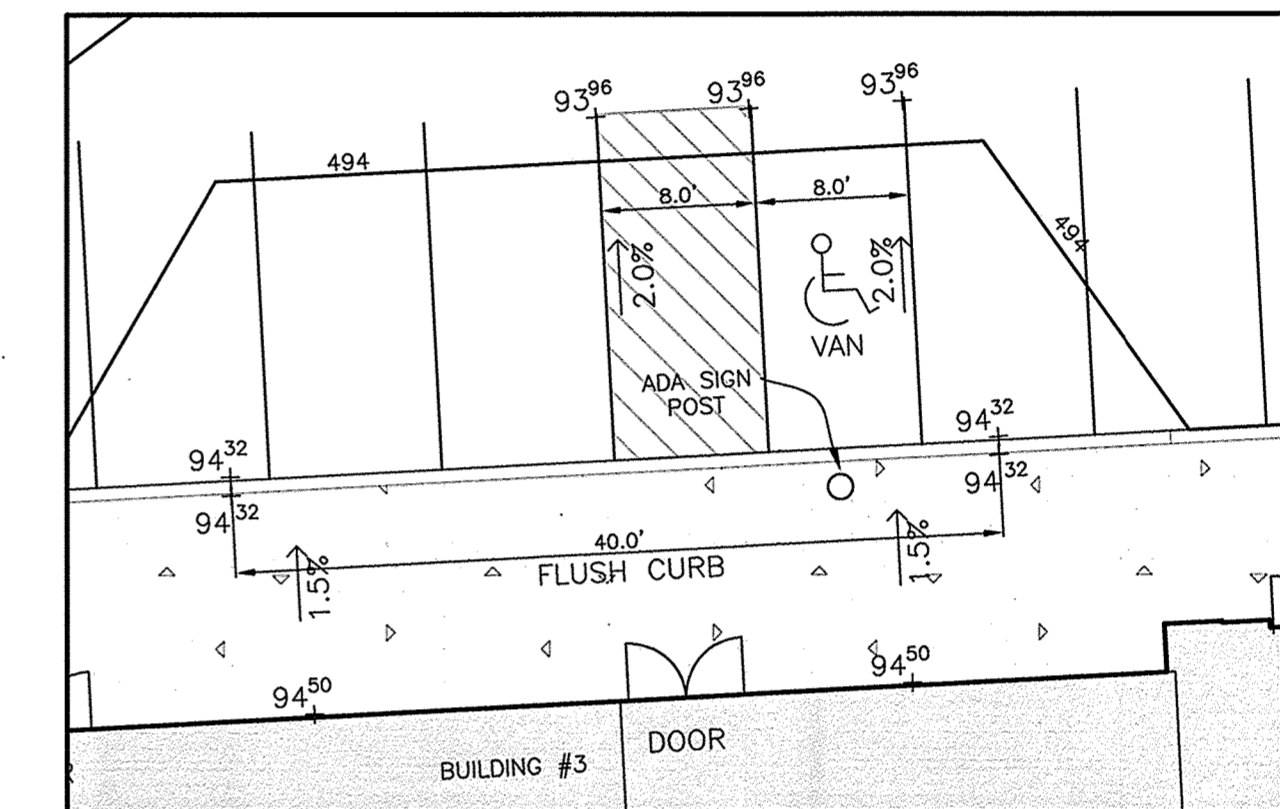
MAIN INTERSECTION AT RIGHT-IN/RIGHT-OUT



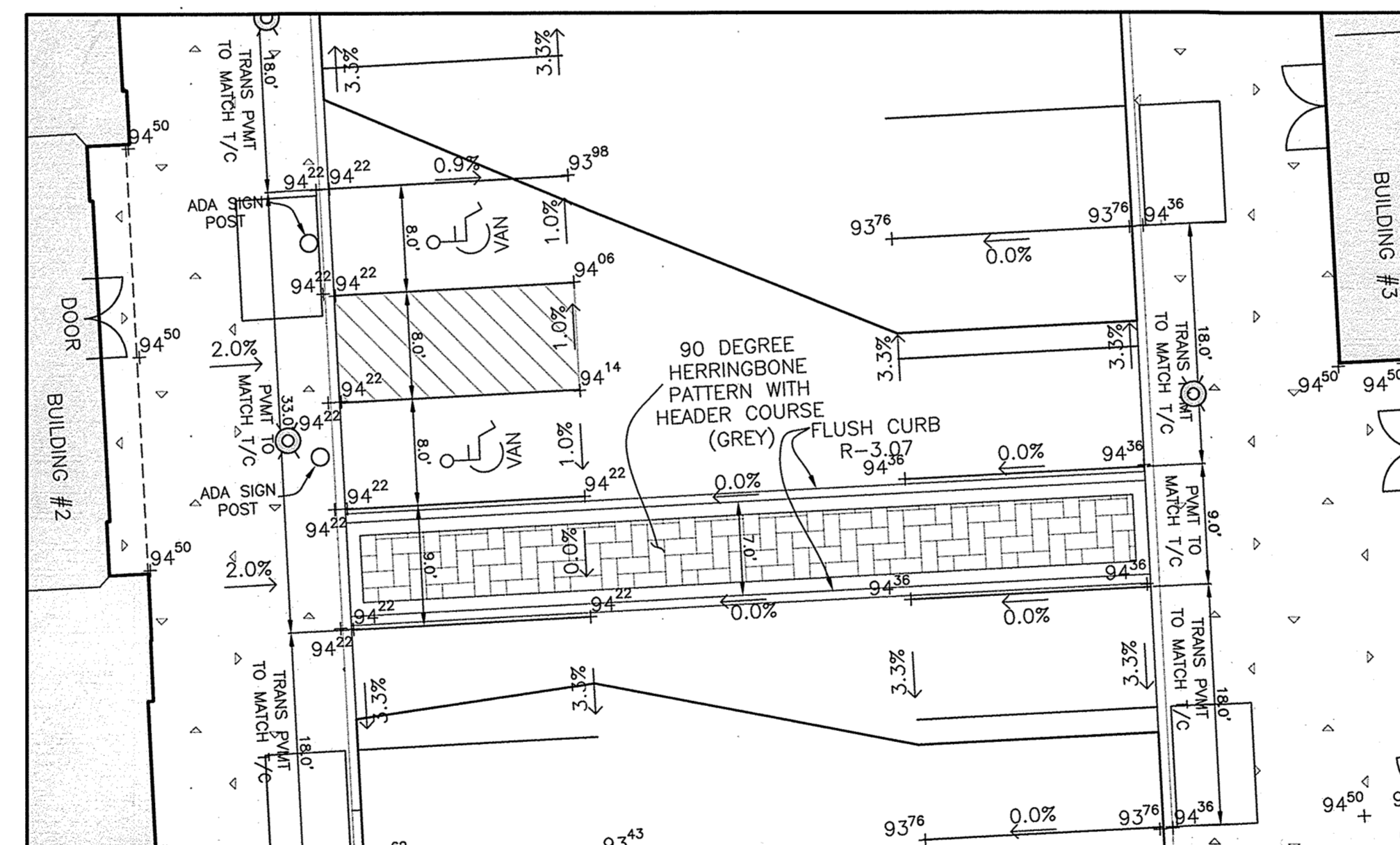
BUILDING #4



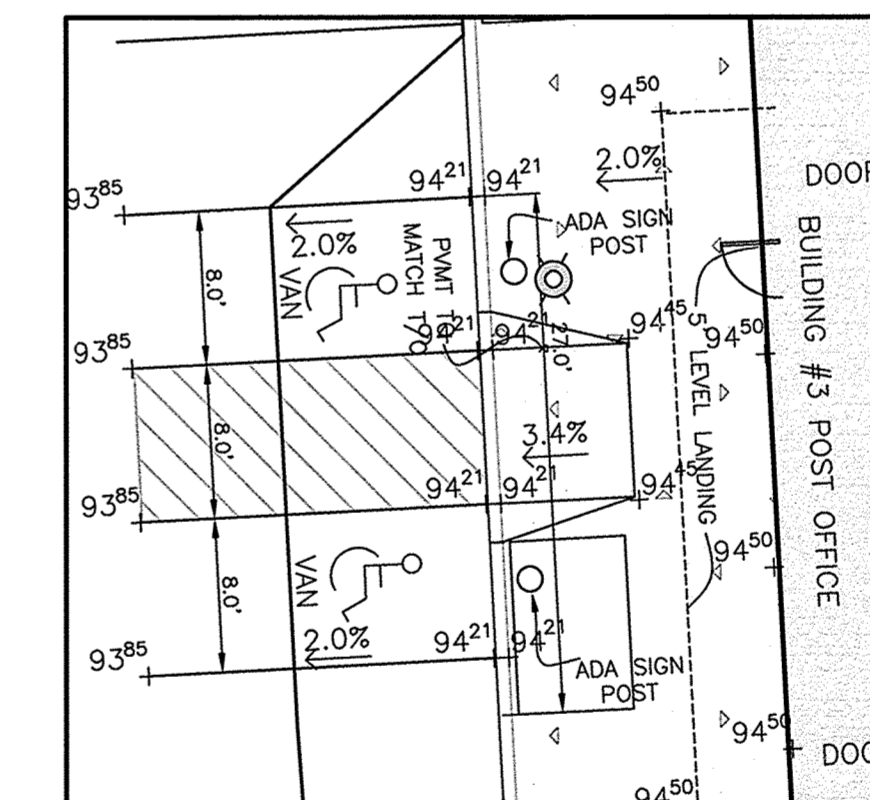
BUILDING #1



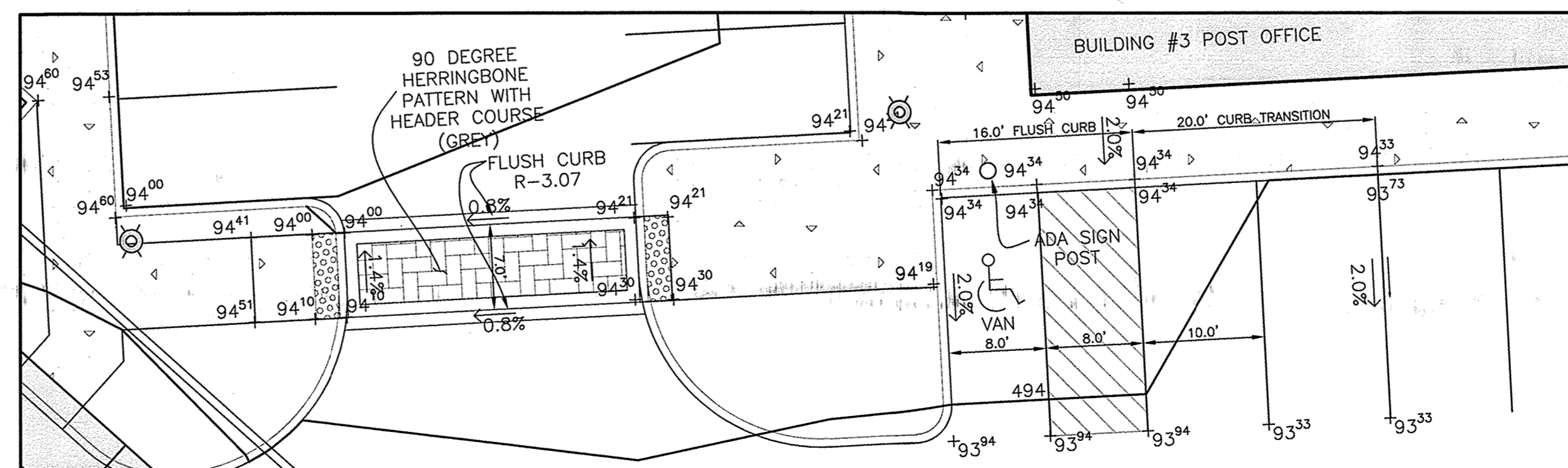
BUILDING #3



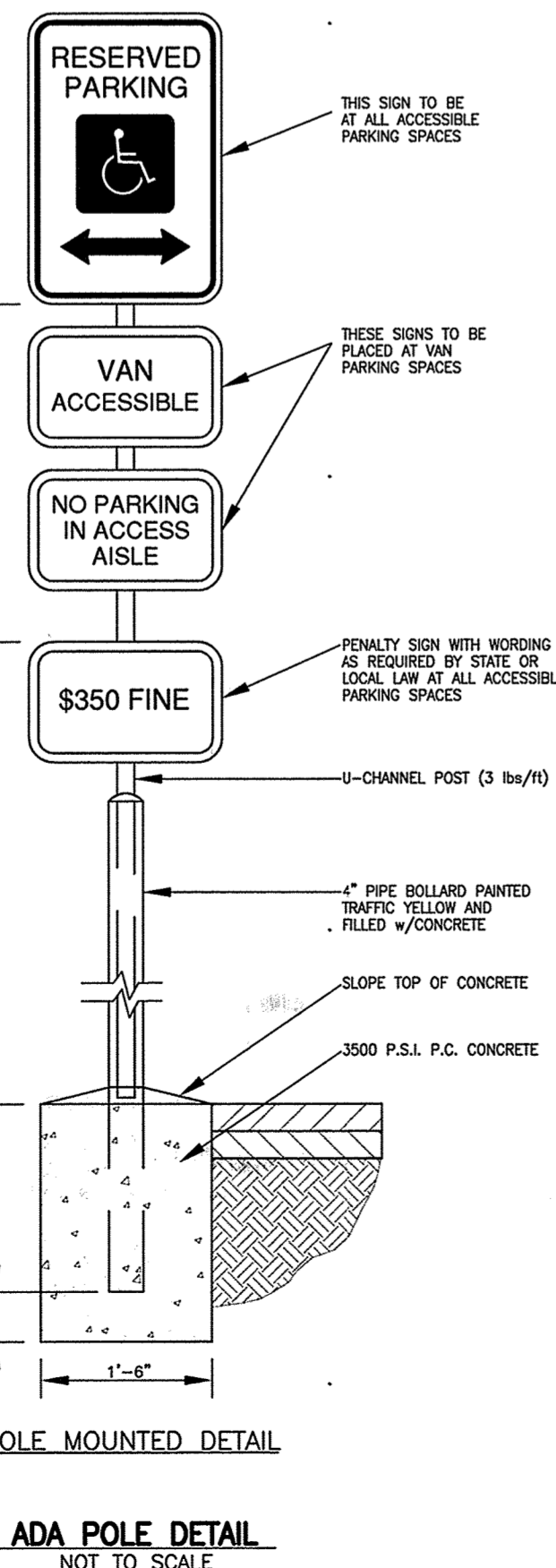
CROSSWALK MID-BUILDING BUILDINGS #2 AND #3



POST OFFICE



CROSSWALK REAR OF SITE BUILDINGS #2 AND #3



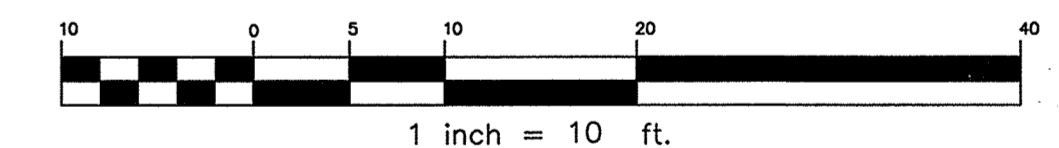
POLE MOUNTED DETAIL

ADA POLE DETAIL NOT TO SCALE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12/21/22

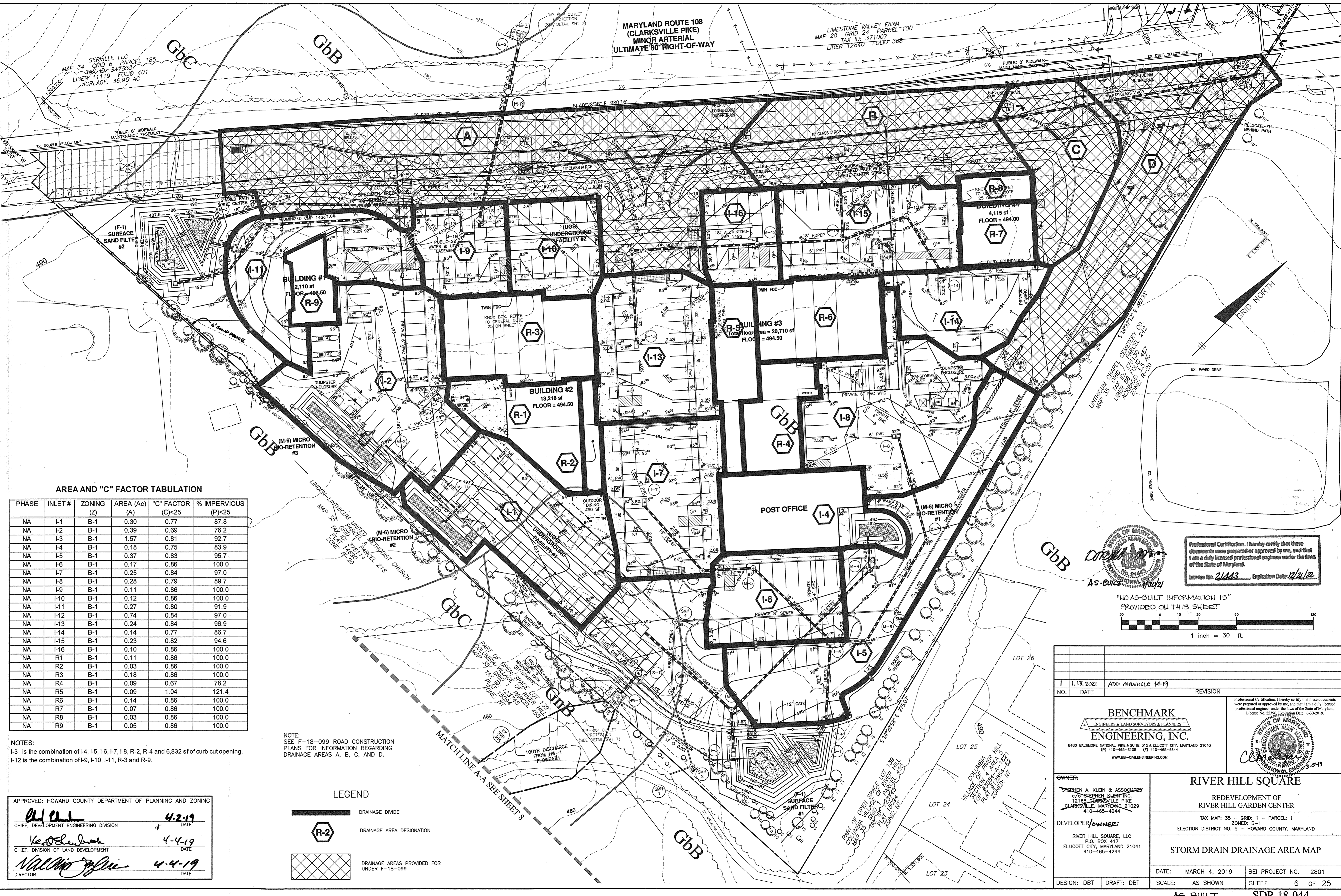


"NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET"



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division: 12-11-19
 Chief, Division of Land Development: 12-16-19
 Director: 12-13-19

1 11.12.2019 REMOVE ONE ADA PARKING SPACE IN FRONT OF BLDG 2 AND TWO SPACES IN FRONT OF BLDG 3	
NO.	DATE REVISION
BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043 (P) 410-465-8105 (F) 410-465-8944 WWW.BE-CMLEENGINEERING.COM	
OWNER/DEVELOPER:	RIVER HILL SQUARE
RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244	REDEVELOPMENT OF RIVER HILL GARDEN CENTER
TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND	
ADA COMPLIANCE PLAN	
DATE: NOVEMBER 12, 2019	BEI PROJECT NO. 2801
DESIGN: DBT	DRAFT: DBT
SCALE: AS SHOWN	SHEET 5 OF 25

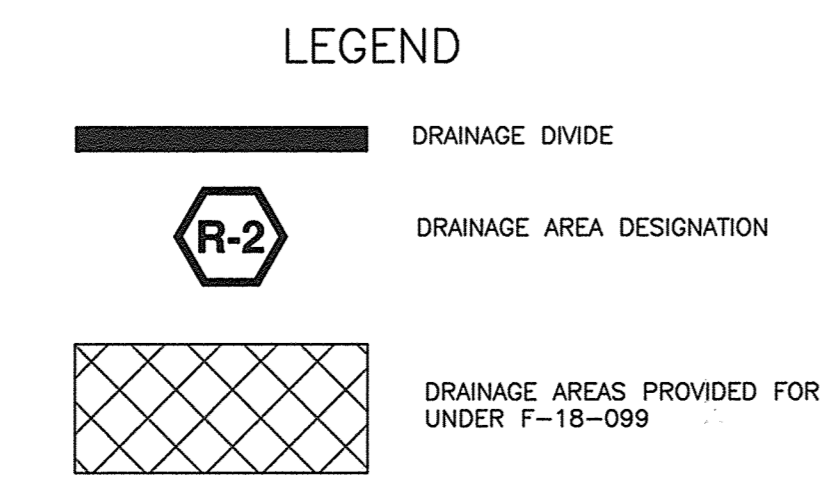


AREA AND "C" FACTOR TABULATION

PHASE	INLET #	ZONING (Z)	AREA (Ac) (A)	"C" FACTOR (C)<25	% IMPERVIOUS (P)<25
NA	I-1	B-1	0.30	0.77	87.8
NA	I-2	B-1	0.39	0.69	76.2
NA	I-3	B-1	1.57	0.81	92.7
NA	I-4	B-1	0.18	0.75	83.9
NA	I-5	B-1	0.37	0.83	95.7
NA	I-6	B-1	0.17	0.86	100.0
NA	I-7	B-1	0.25	0.84	97.0
NA	I-8	B-1	0.28	0.79	89.7
NA	I-9	B-1	0.11	0.86	100.0
NA	I-10	B-1	0.12	0.86	100.0
NA	I-11	B-1	0.27	0.80	91.9
NA	I-12	B-1	0.74	0.84	97.0
NA	I-13	B-1	0.24	0.84	96.9
NA	I-14	B-1	0.14	0.77	86.7
NA	I-15	B-1	0.23	0.82	94.6
NA	I-16	B-1	0.10	0.86	100.0
NA	R1	B-1	0.11	0.86	100.0
NA	R2	B-1	0.03	0.86	100.0
NA	R3	B-1	0.18	0.86	100.0
NA	R4	B-1	0.09	0.67	78.2
NA	R5	B-1	0.09	1.04	121.4
NA	R6	B-1	0.14	0.86	100.0
NA	R7	B-1	0.07	0.86	100.0
NA	R8	B-1	0.03	0.86	100.0
NA	R9	B-1	0.05	0.86	100.0

NOTES:
 I-3 is the combination of I-4, I-5, I-6, I-7, I-8, R-2, R-4 and 6,832 sf of curb cut opening.
 I-12 is the combination of I-9, I-10, I-11, R-3 and R-9.

NOTE:
 SEE F-18-099 ROAD CONSTRUCTION PLANS FOR INFORMATION REGARDING DRAINAGE AREAS A, B, C, AND D.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

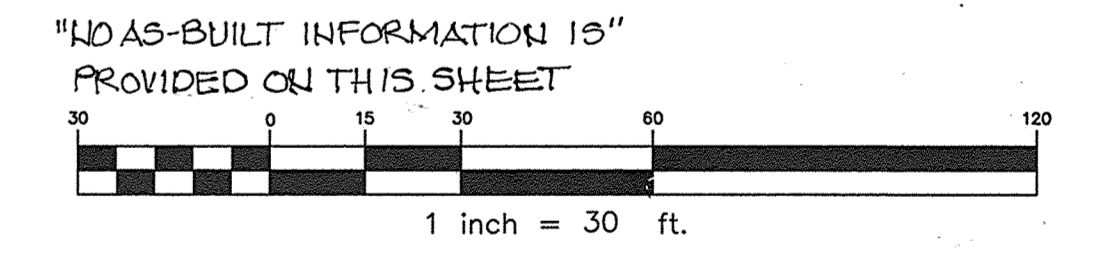
[Signature] 4-2-19
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 4-4-19
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 4-4-19
 DIRECTOR DATE



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12/21/22



NO.	DATE	REVISION
1	1.13.2021	ADD MANHOLE M-19

BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS, INC.
 8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043
 (P) 410-465-6108 (F) 410-465-6444
 WWW.BEI-COALENGINEERING.COM

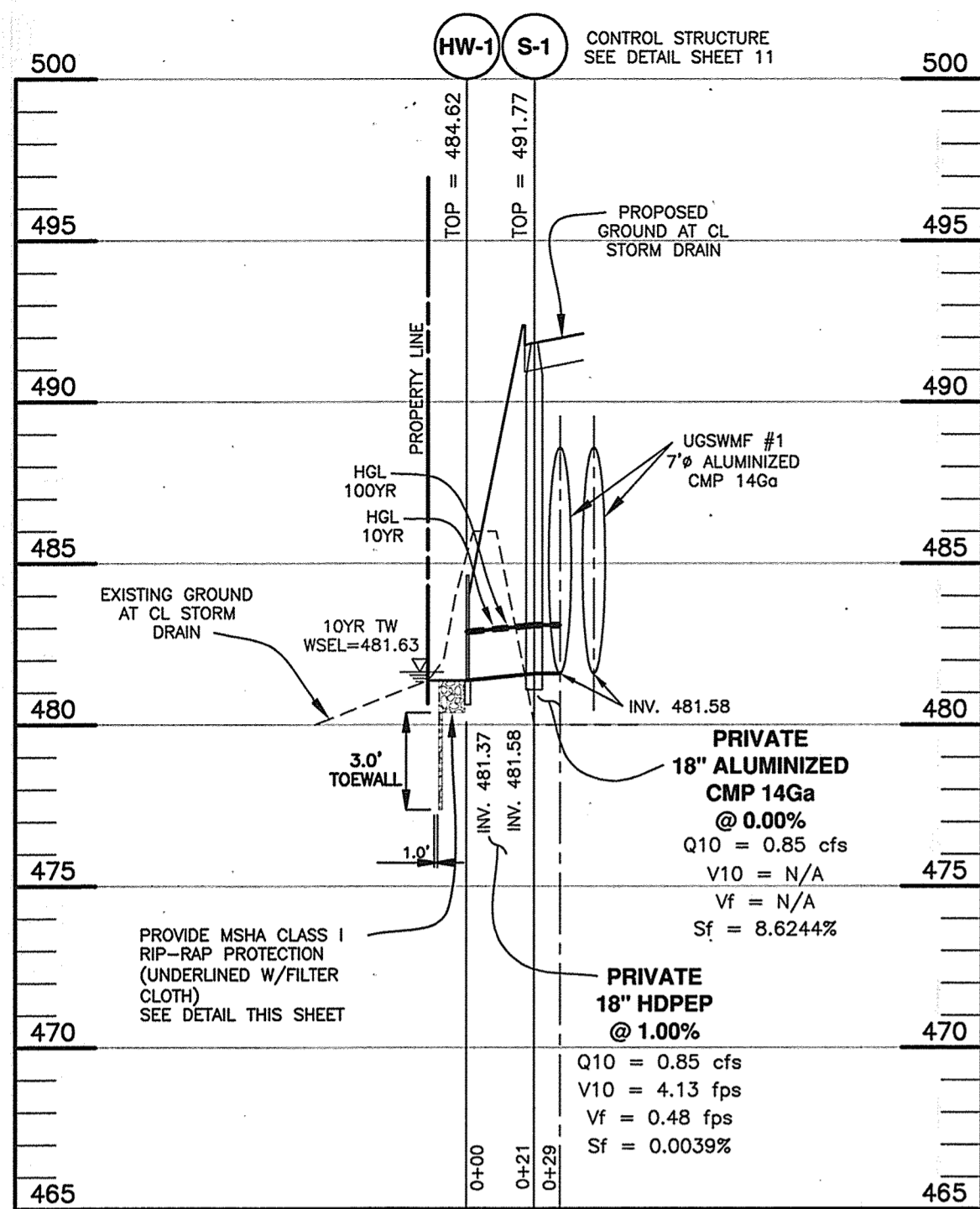
OWNER: STEPHEN A. KLEIN & ASSOCIATES, C/O STEPHEN KLEIN, INC., 12165 CLARKSVILLE PIKE, CLARKSVILLE, MARYLAND, 21029, 410-465-4244

DEVELOPER/OWNER: RIVER HILL SQUARE, LLC, P.O. BOX 417, ELLICOTT CITY, MARYLAND 21041, 410-465-4244

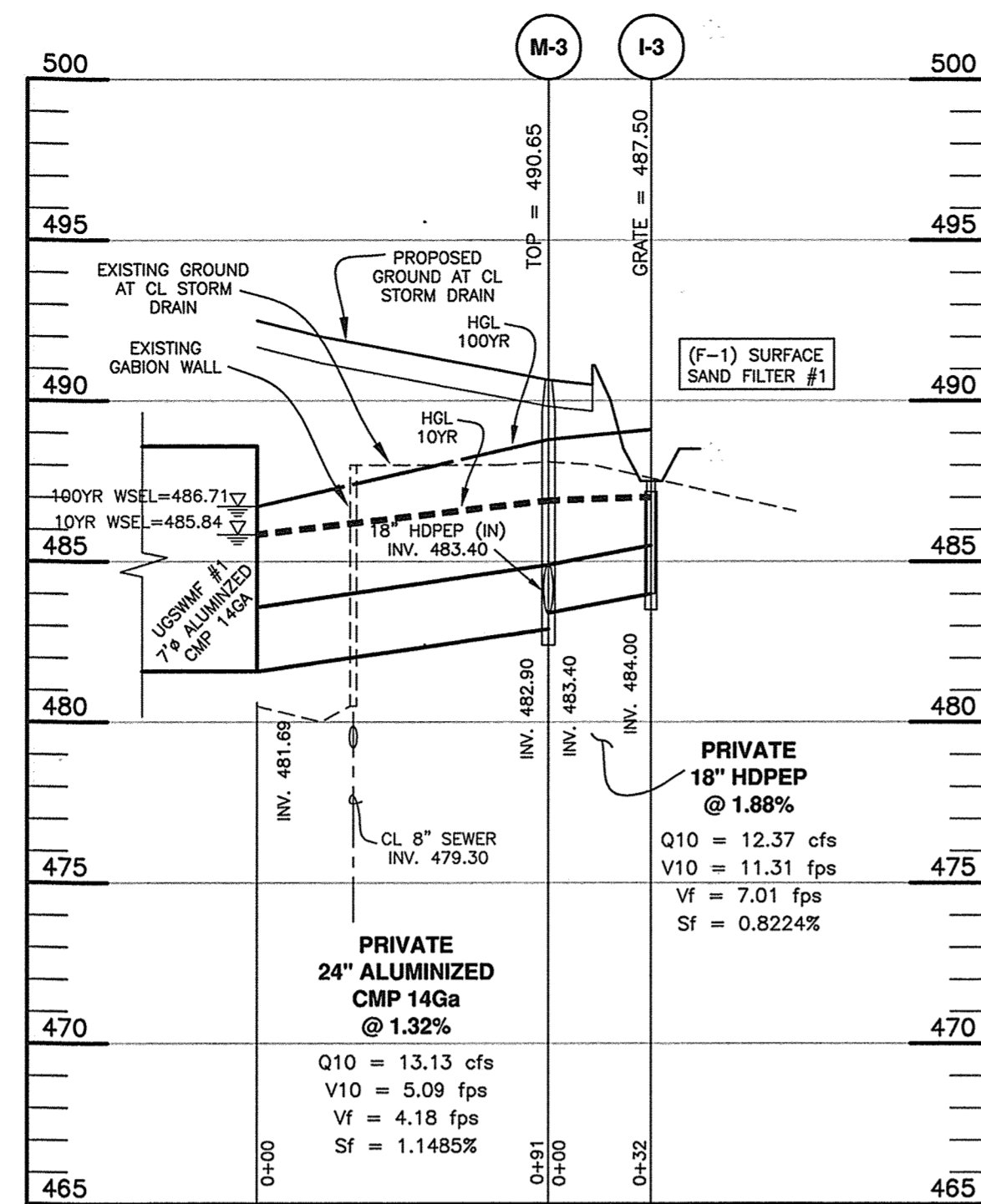
RIVER HILL SQUARE
 REDEVELOPMENT OF RIVER HILL GARDEN CENTER
 TAX MAP: 35 - GRID: 1 - PARCEL: 1
 ZONED: B-1
 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

DATE: MARCH 4, 2019
 BEI PROJECT NO. 2801
 SCALE: AS SHOWN
 SHEET 6 OF 25

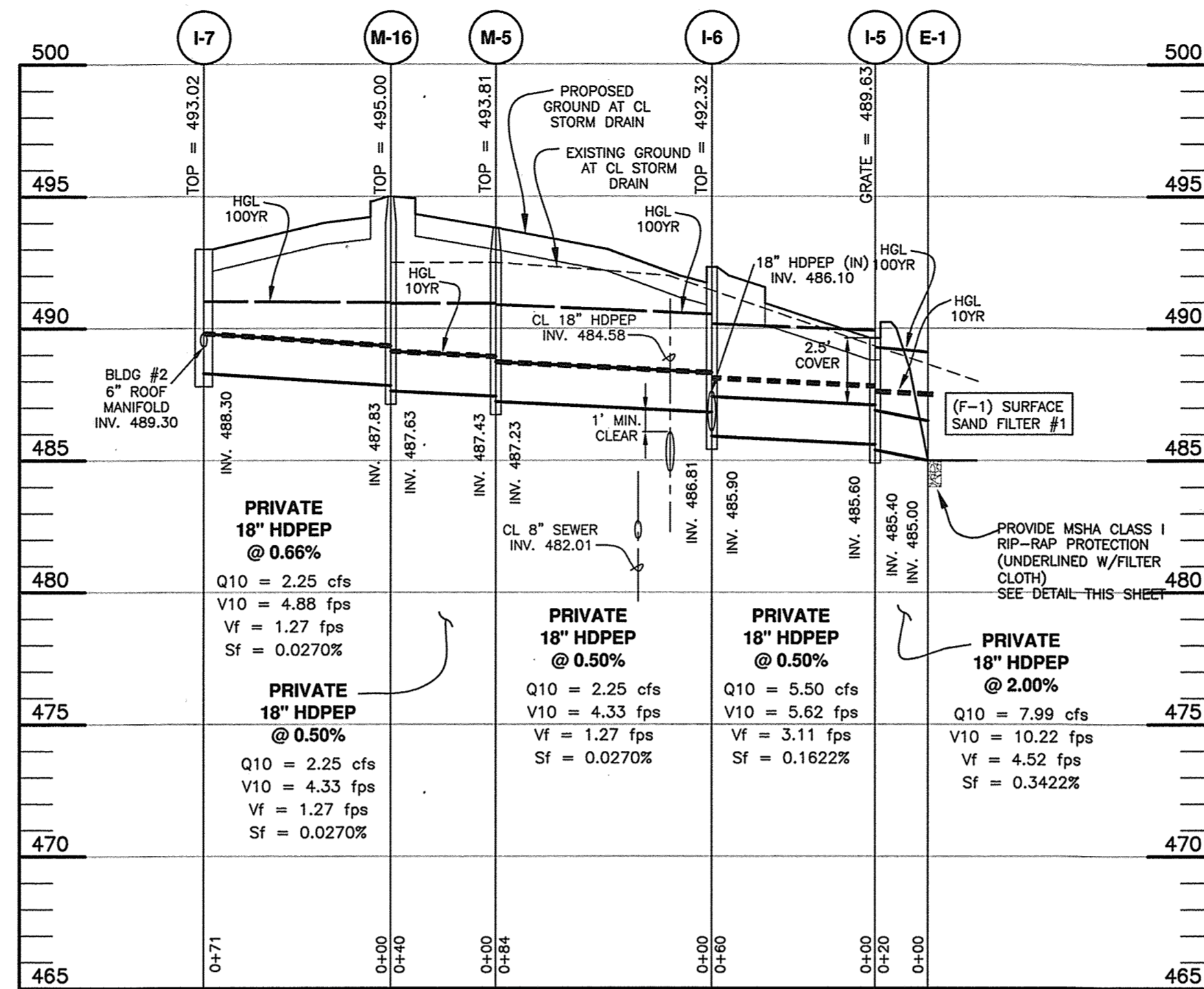
DESIGN: DBT DRAFT: DBT



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

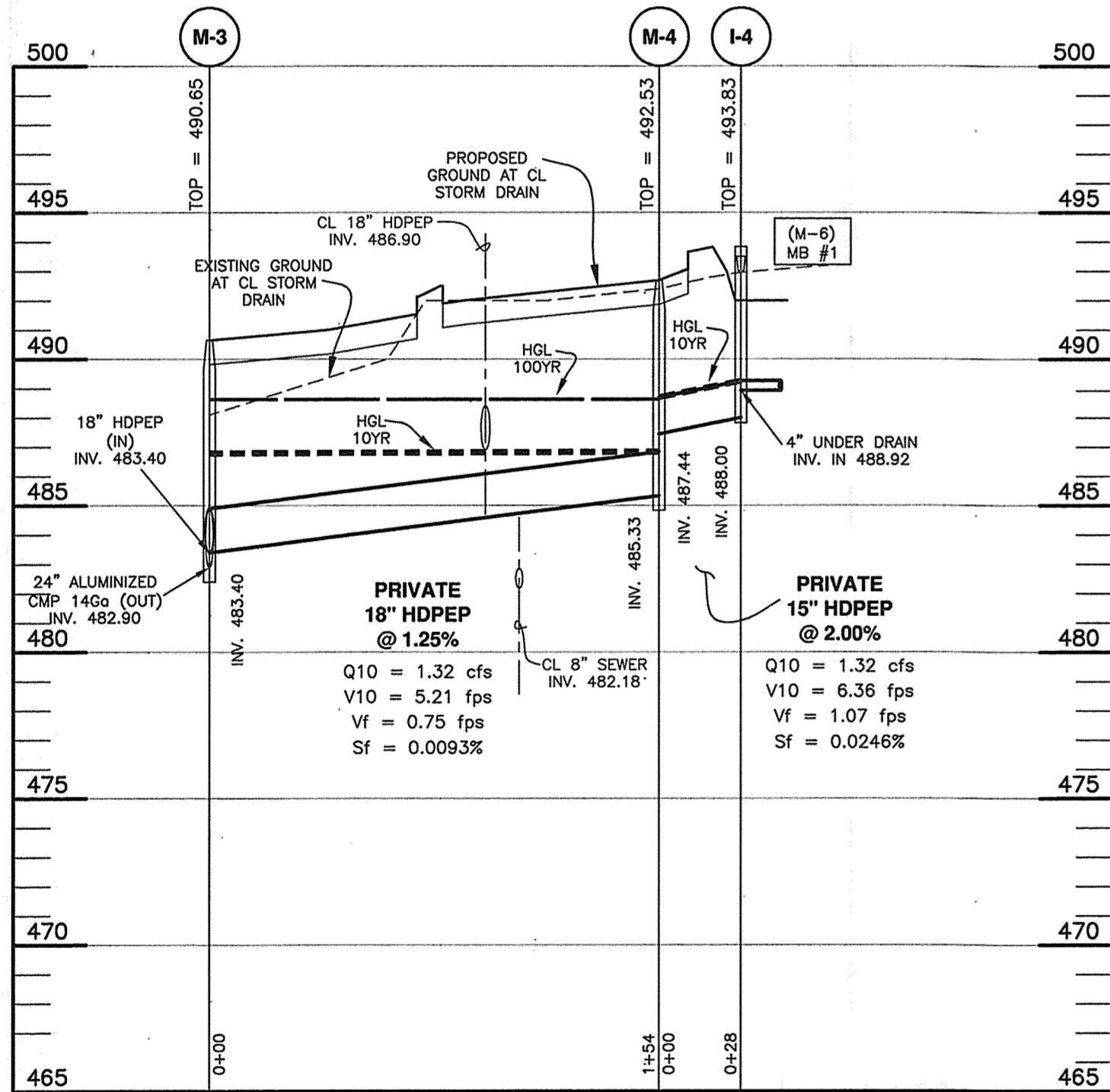


STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

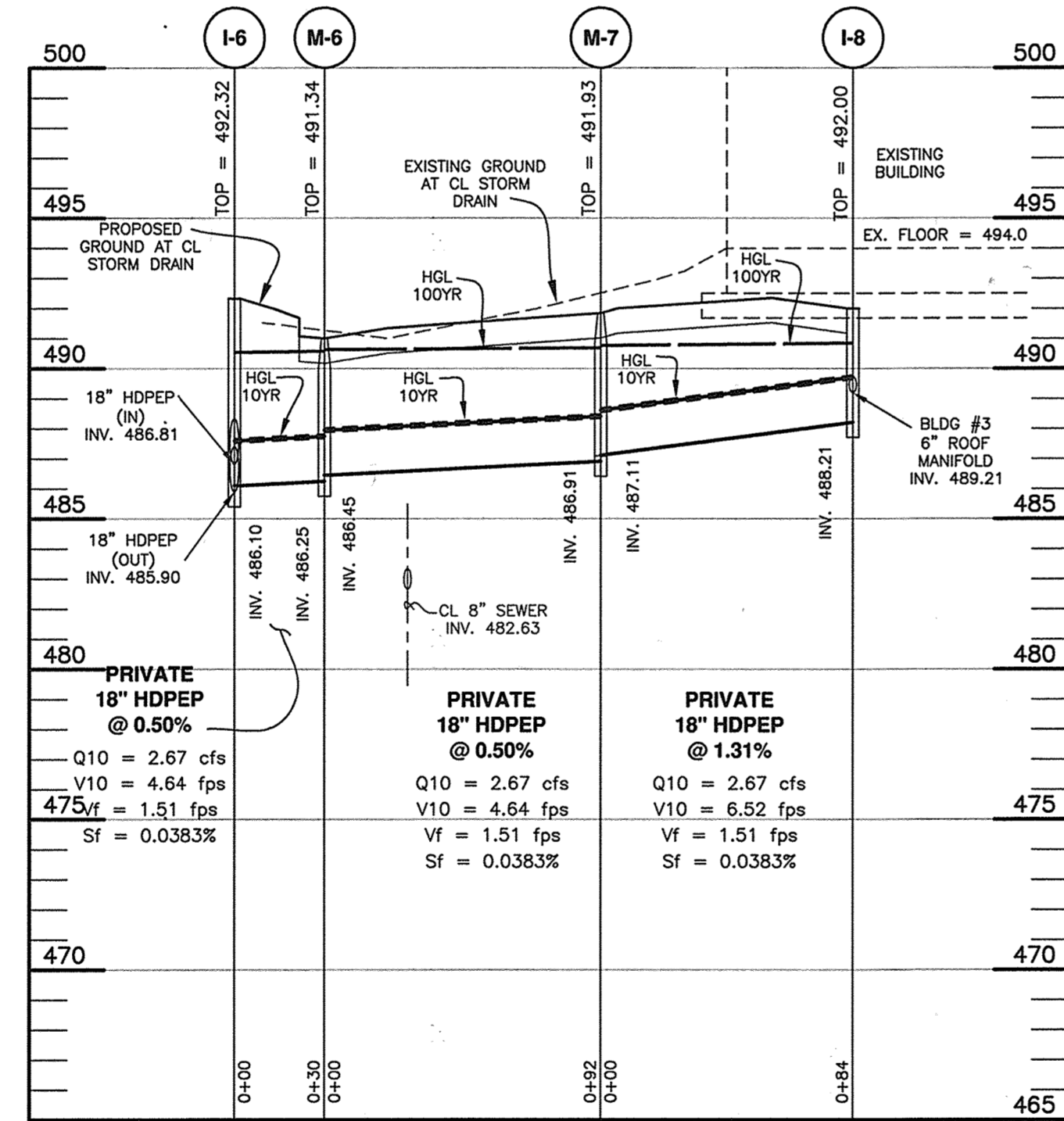


STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

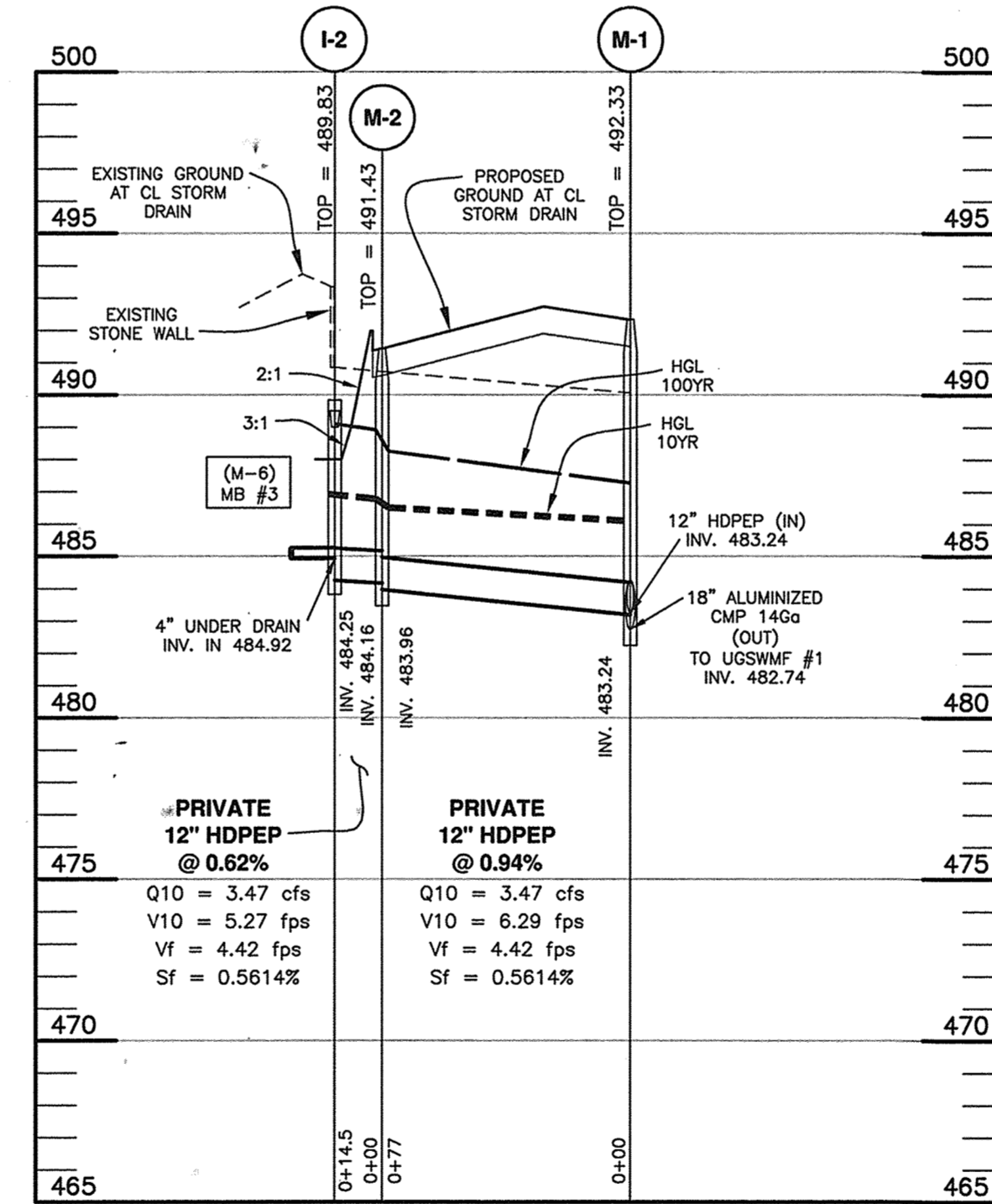
STORM DRAIN STRUCTURE SCHEDULE										
STRUCT NO.	TYPE	H.O.CO.	STD. DETAIL	LOCATION	INVERT IN	INVERT OUT	TOP ELEVATION	THROAT ELEVATION	MAINTENANCE	
I-1	D inlet (open on 2 sides)	D-4.10		N 563588.61 E 1331154.10	-	485.92 (4")	485.25 (12")	490.83	490.00	PRIVATE
I-2	D inlet (open on 2 sides)	D-4.10		N 563584.34 E 1331077.58	-	484.92 (4")	484.25 (12")	489.83	489.00	PRIVATE
I-3	double S inlet	D-4.23		N 563623.22 E 1331439.21	-	-	484.00 (18")	487.50	NA	PRIVATE
I-4	D inlet (open on 2 sides)	D-4.10		N 563816.37 E 1331394.34	-	488.92 (4")	488.00 (18")	493.83	493.00	PRIVATE
I-5	S comb	D-4.32		N 563591.81 E 1331472.99	-	485.60 (18")	485.40 (18")	489.83	NA	PRIVATE
I-6	A-5 (3.0' wide)	D-4.01		N 563737.86 E 1331451.51	488.81 (18")	485.90 (18")	485.30 (18")	482.00	491.72	PRIVATE
I-7	double S inlet	D-4.23		N 563710.72 E 1331253.38	-	488.30 (6")	488.00 (18")	493.00	NA	PRIVATE
I-8	double S inlet	D-4.23		N 563886.30 E 1331355.69	489.21 (6")	-	488.21 (18")	492.00	NA	PRIVATE
I-9	A-5 (3.0' wide)	D-4.01		N 563747.62 E 1330965.54	487.31 (6")	486.51 (18")	482.64 (18")	492.00	491.72	PRIVATE
I-10	A-5 (3.0' wide)	D-4.01		N 563849.87 E 1331056.71	-	-	487.54 (18")	491.16	486.56	PRIVATE
I-11	A-5 (2.5' wide)	D-4.01		N 563624.94 E 1330888.51	487.00 (6")	-	484.75 (18")	490.35	489.75	PRIVATE
I-12	S inlet	D-4.22		N 563572.21 E 1330873.42	-	481.80 (6")	481.80 (18")	487.00	NA	PRIVATE
I-13	PRIVATE 18\"/>									
I-14	A-5 (2.5' wide)	D-4.01		N 563698.60 E 1331294.10	490.00 (6")	-	486.85 (18")	493.64	493.04	PRIVATE
I-15	A-10 (3.0' wide)	D-4.03		N 563893.16 E 1331186.87	-	486.05 (18")	485.85 (18")	492.35	491.75	PRIVATE
I-16	A-5 (3.0' wide)	D-4.01		N 563915.29 E 1331116.68	-	-	487.10 (18")	491.80	491.20	PRIVATE
MANHOLES										
S-1	See detail sheet 14	NA		N 563613.12 E 1331344.57	-	481.58 (18")	481.58 (18")	491.77		PRIVATE
S-2	See detail sheet 15	NA		N 563774.84 E 1331006.15	-	478.00 (18")	478.00 (24")	493.33		PRIVATE
M-1	4\"/>									
M-2	4\"/>									
M-3	4\"/>									
M-4	4\"/>									
M-5	4\"/>									
M-6	4\"/>									
M-7	4\"/>									
M-8	4\"/>									
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M-14	4\"/>									
M-15	4\"/>									
M-16	4\"/>									
M-17	4\"/>									
M-18	4\"/>									
M-19	4\"/>									
END SECTIONS										
E-1	18\"/>									
E-2	24\"/>									
E-3	18\"/>									
E-4	18\"/>									
HW-1	Type 'C' 18\"/>									



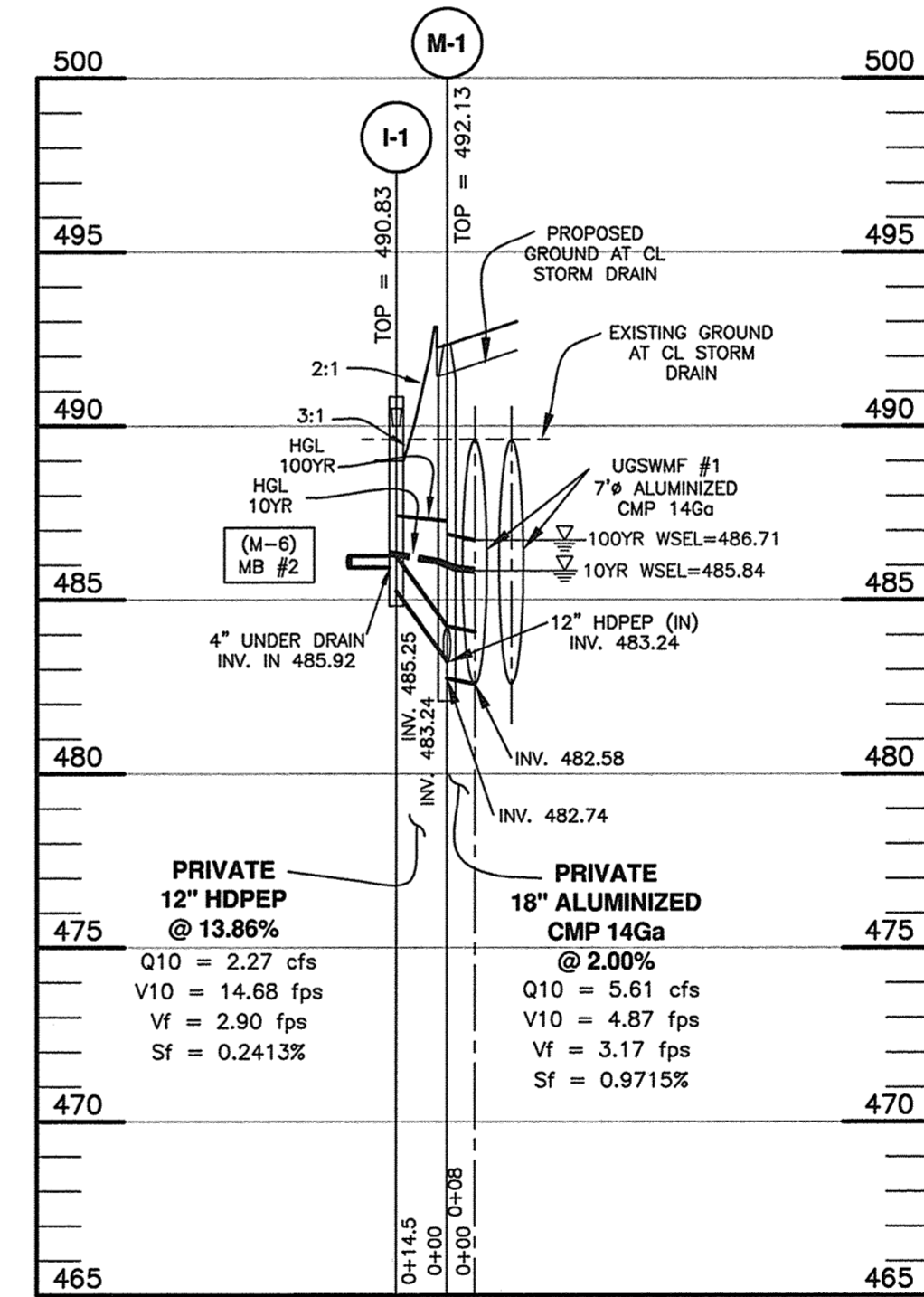
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



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SCALE: 1"=50' HORIZ., 1"=5' VERT.

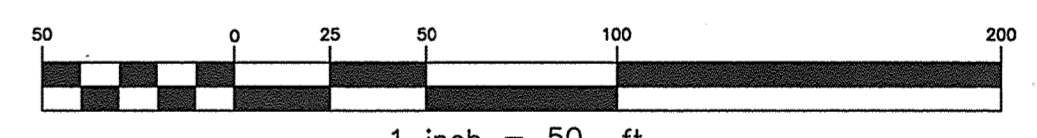
SIZE	TYPE	LENGTH (L.F.)	MAINTENANCE
6"	PVC (ROOF DRAIN MANIFOLD)	1378	PRIVATE
8"	PVC (ROOF DRAIN MANIFOLD)	204	PRIVATE
12"	HDPEP	106	PRIVATE
15"	HDPEP	28	PRIVATE
18"	HDPEP	1763	PRIVATE
24"	ALUMINIZED CMP 14Ga	91	PRIVATE
24"	ALUMINIZED CMP 14Ga	138	PRIVATE

All HDPE pipes shall have smooth interior. No interior corrugations.

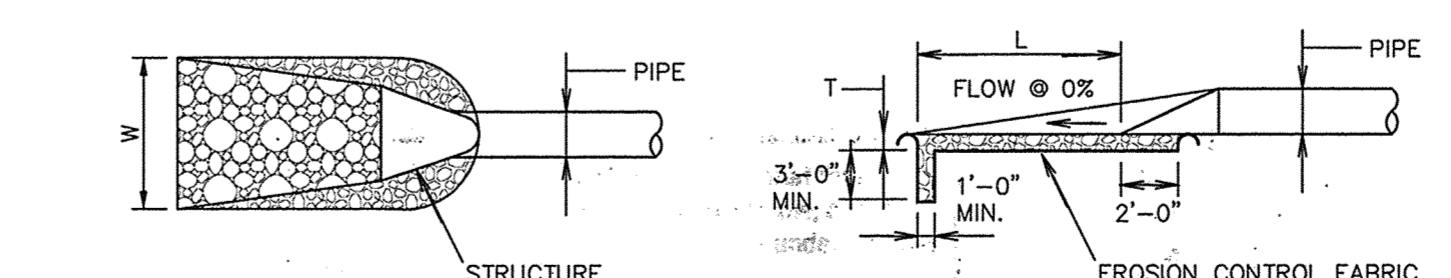


Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21243, Expiration Date 12-31-22

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Donald Mason, P.E.
Date: 1/30/21



- CONSTRUCTION SPECIFICATIONS**
- THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
 - THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS, WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.
 - GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE PREPARED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.
 - STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR THE RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.
 - THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.



STRUCTURE	Q ₂ fps	V ₂ fps	d ₂ (ft)	Q ₁₀ fps	V ₁₀ fps	d ₁₀ (ft)	d50	LENGTH(L)	WIDTH(W)	THICK.(T)	SHA CLASS
HW-1	0.67	3.90	0.23	0.85	4.13	0.26	9.5"	8'	9.5'	19"	I
E-1	-	-	-	-	-	-	9.5"	FOREBAY	FOREBAY	19"	I
E-2	0.72	2.58	0.23	0.93	2.71	0.33	9.5"	8'	10'	19"	I
E-3	-	-	-	-	-	-	9.5"	FOREBAY	FOREBAY	19"	I
E-4	-	-	-	-	-	-	9.5"	FOREBAY	FOREBAY	19"	I

OUTLET PROTECTION DETAIL
NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4-2-19
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 [Signature] 4-4-19
 CHIEF, DIVISION OF LAND DEVELOPMENT
 [Signature] 4-4-19
 DIRECTOR

BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS
 840 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043
 (P) 410-465-6108 (F) 410-465-6944
 WWW.BE-CVLENGINEERING.COM

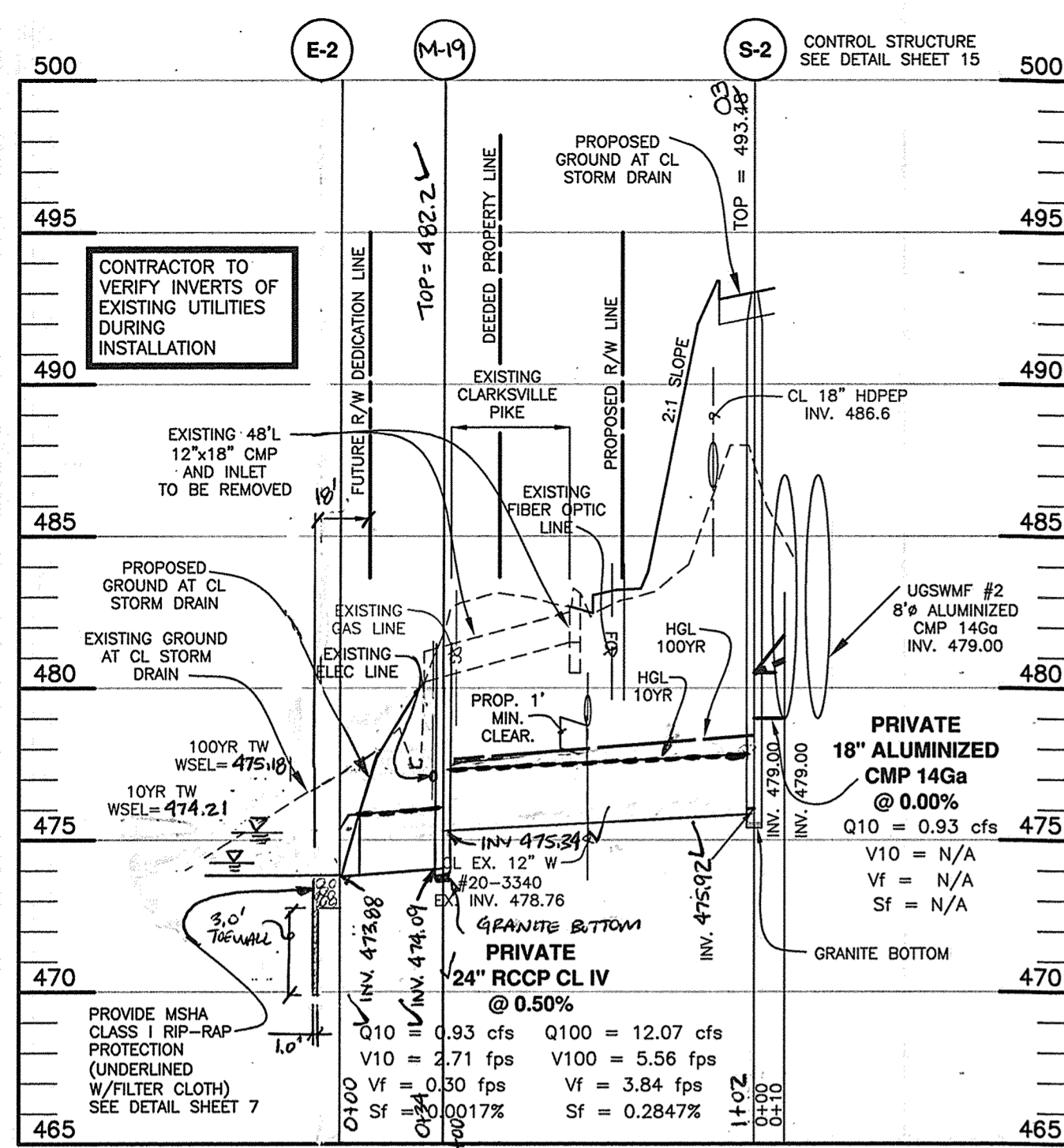
RIVER HILL SQUARE
 REDEVELOPMENT OF RIVER HILL GARDEN CENTER
 TAX MAP: 35 - GRID: 1 - PARCEL: 1
 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

OWNER:
 STEPHEN A. KLEIN & ASSOCIATES
 C/O STEPHEN KLEIN INC.
 12165 CLARKSVILLE PIKE
 CLARKSVILLE, MARYLAND 21029
 410-465-4244

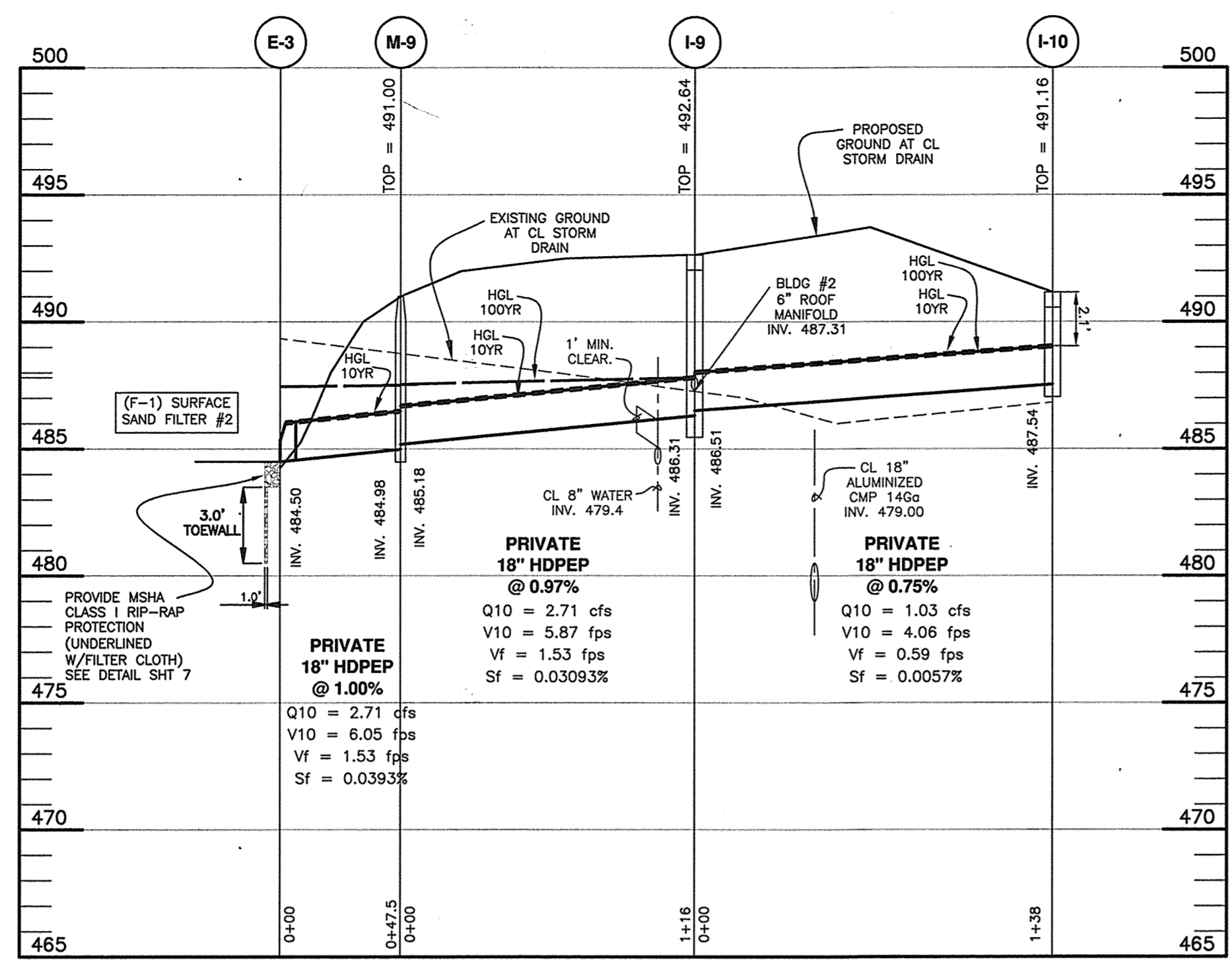
DEVELOPER/OWNER:
 RIVER HILL SQUARE, LLC
 P.O. BOX 417
 ELLICOTT CITY, MARYLAND 21041
 410-465-4244

DATE: MARCH 4, 2019
 BEI PROJECT NO. 2801
 SCALE: AS SHOWN
 SHEET 7 OF 25

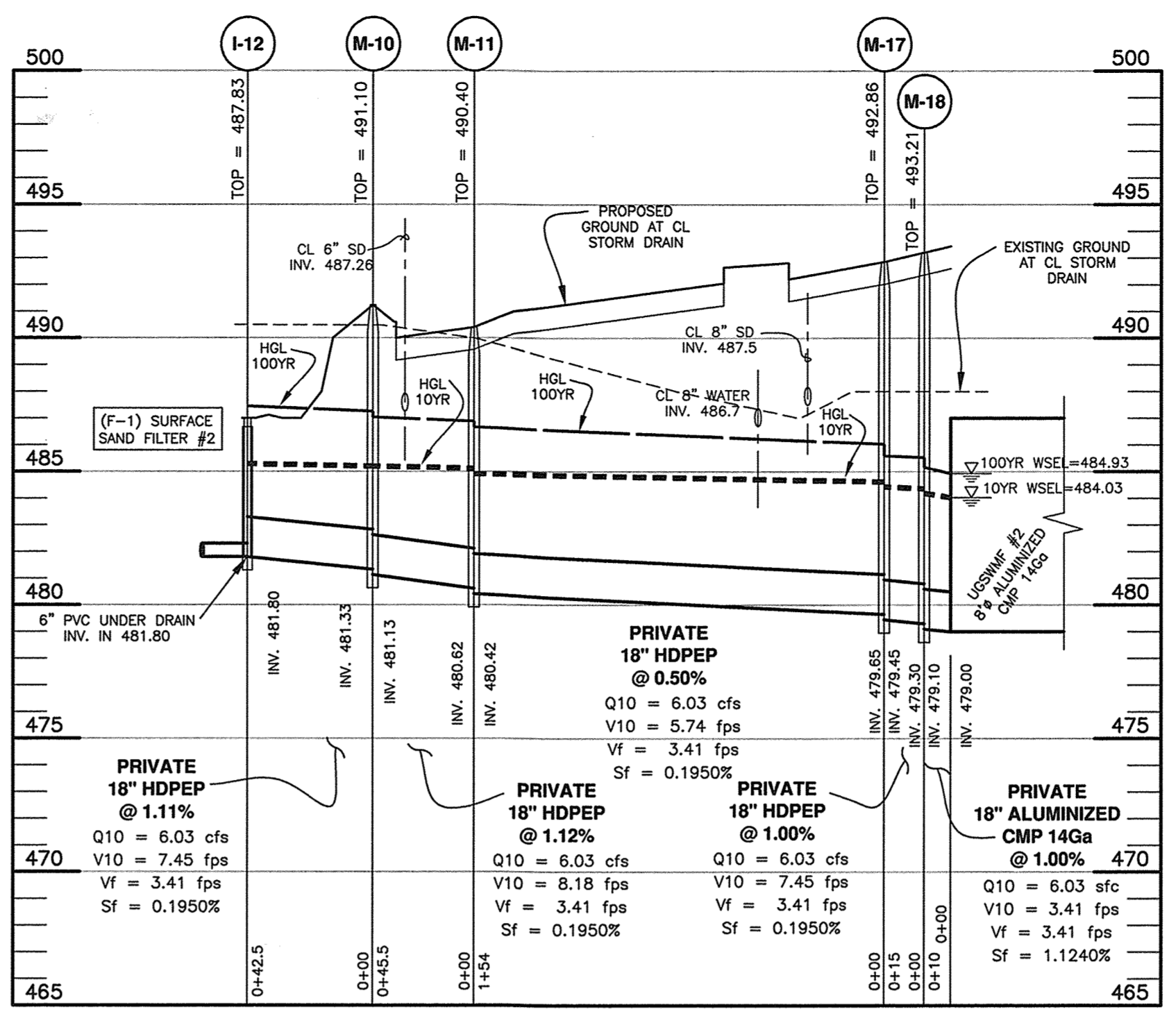
AS-BUILT SDP-18-044



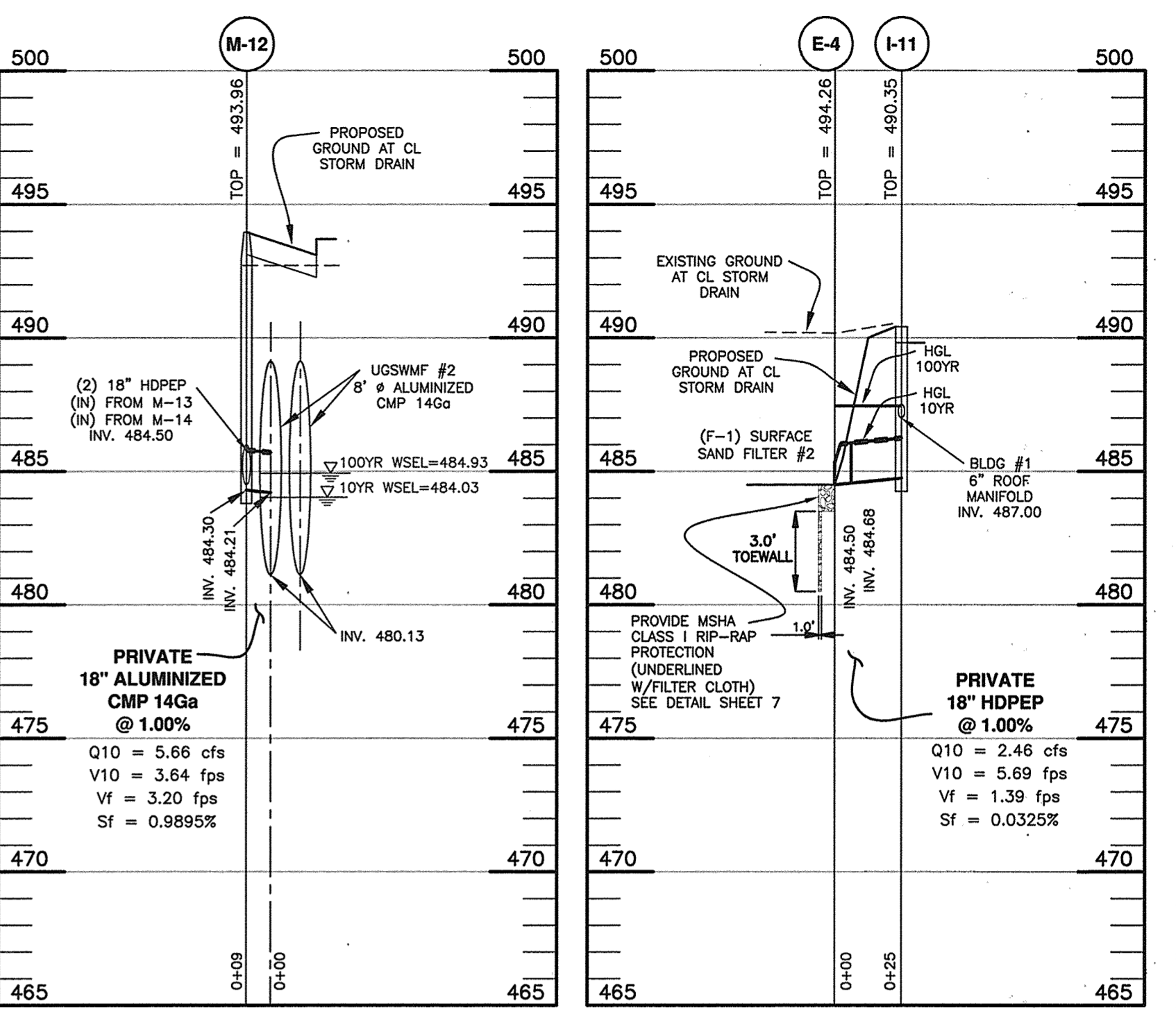
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

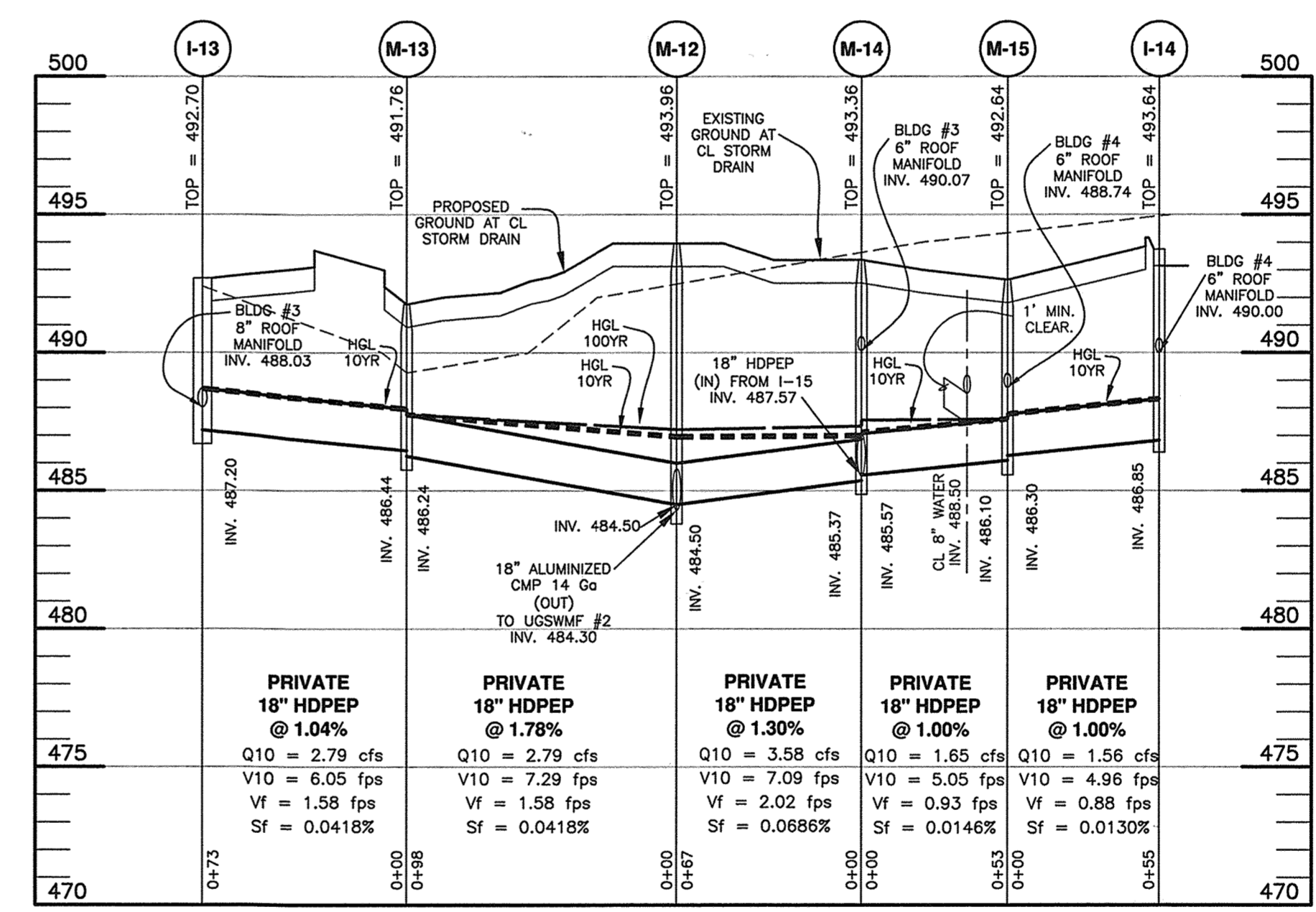
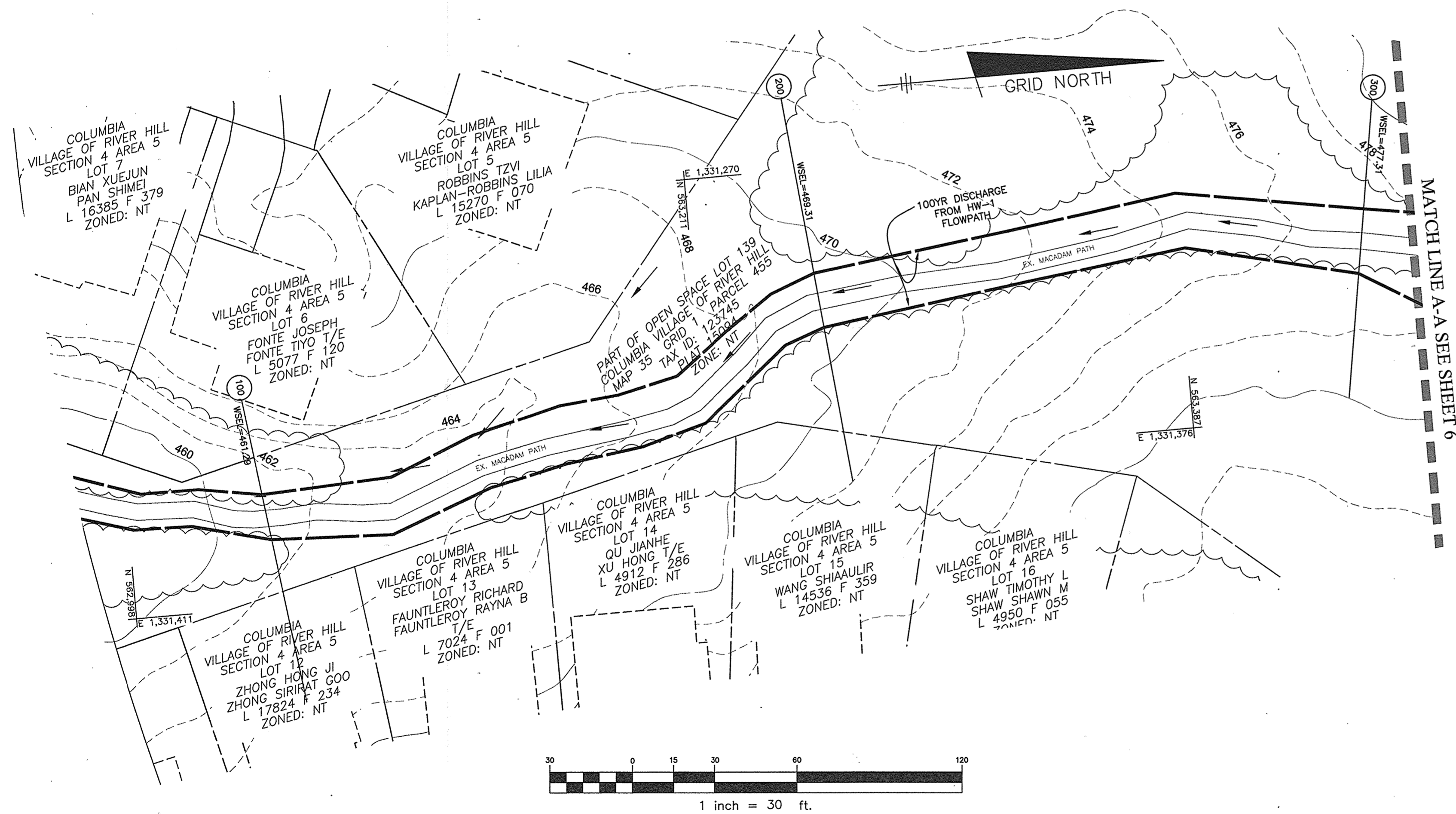


STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

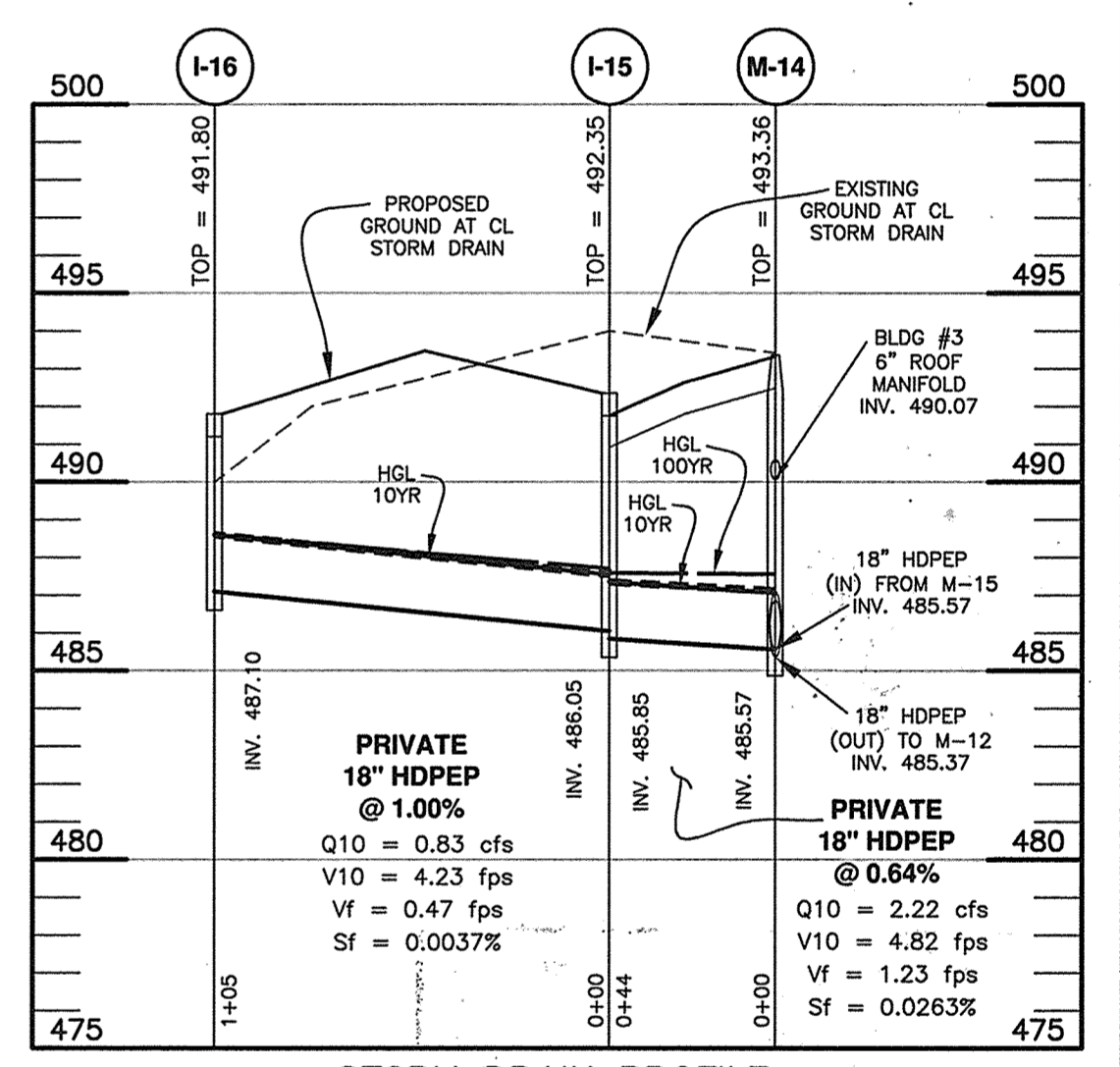


STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

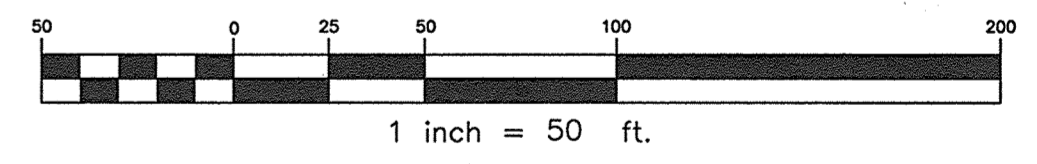
STORM DRAIN PROFILE
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STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 4-4-19
DIRECTOR DATE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

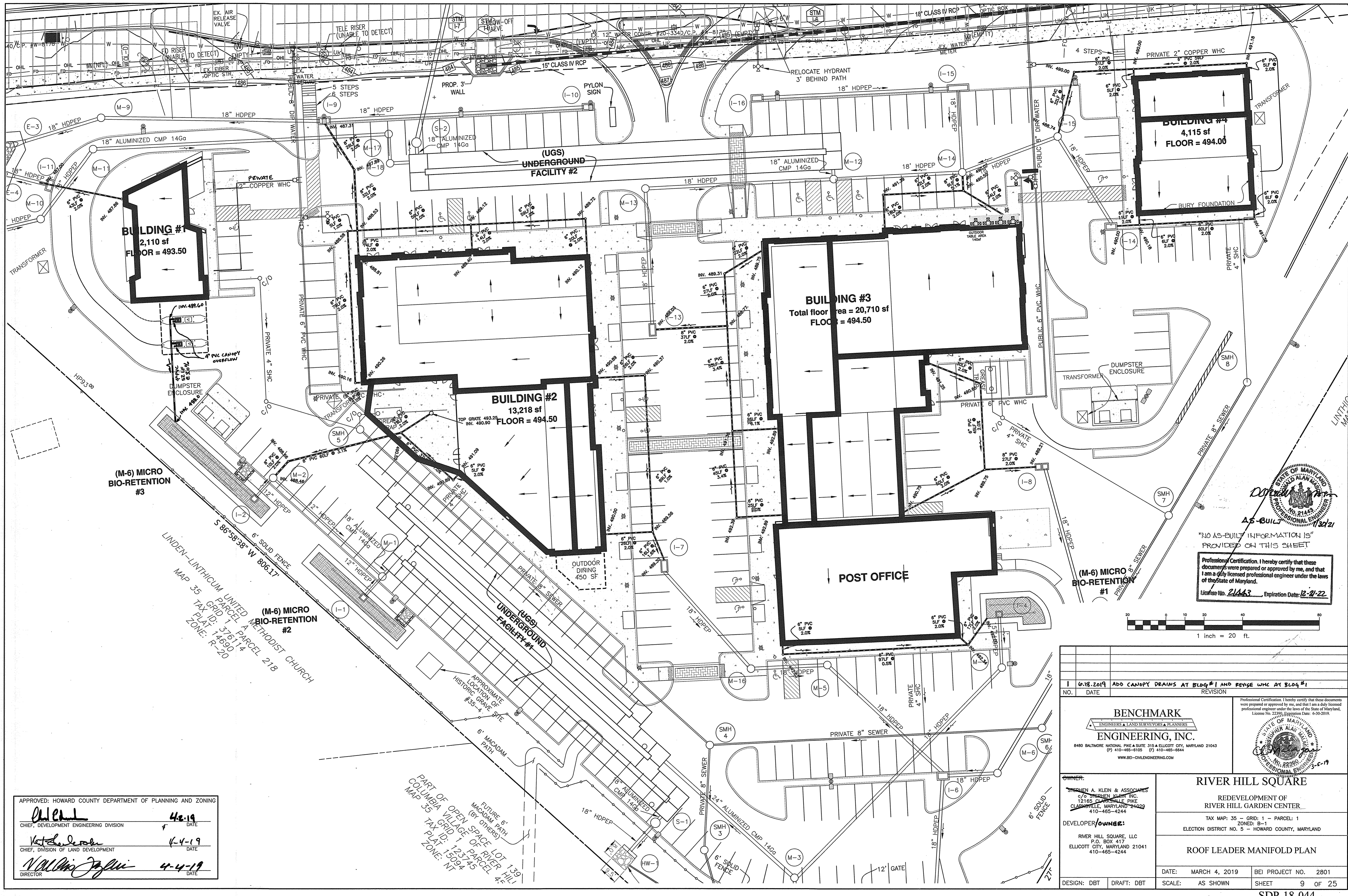
License No. 21443 Expiration Date: 12-2-22



AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. Date: 11/30/21

NO. DATE REVISION		1 1.13.2021 REVISE PROFILE FROM E-2 TO S-2 TO ADD MANHOLE M-19	
 8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043 (P) 410-465-1105 (F) 410-465-6844 WWW.BE-CVLENGINEERING.COM			
OWNER: STERHEN A. KLEIN & ASSOCIATES C/O STERHEN KLEIN INC. 12155 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244		RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND	
DESIGNER: DBT		DATE: MARCH 4, 2019	
DRAFTER: DBT		BEI PROJECT NO. 2801	
SCALE: AS SHOWN		SHEET 8 OF 25	
AS-BUILT		SDP-18-044	



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Howard 4-2-19 DATE
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

Kathleen 4-4-19 DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT

N. Williams 4-4-19 DATE
 DIRECTOR

PART OF OPEN SPACE LOT 139
 COLUMBIA VILLAGE OF RIVER HILL
 MAP 35 TAX GRID 1 PARCEL 45
 PLAT 15094
 ZONE: NT

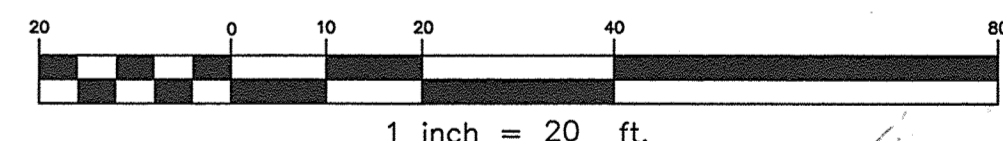
FUTURE 6' MACADAM PATH
 (BY OTHERS)

STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 No. 21443
 12/21

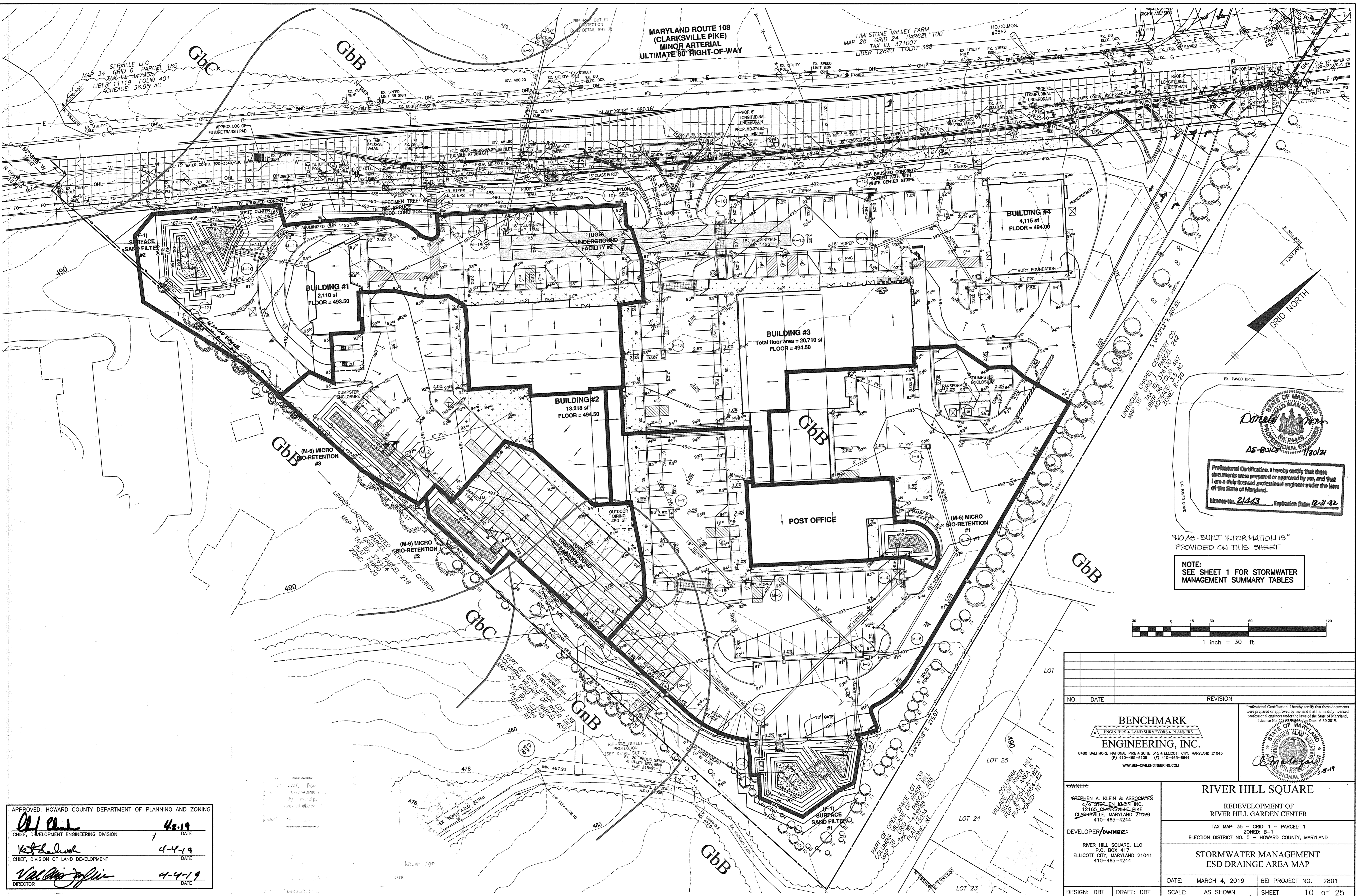
AS-BUILT

"NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET"

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12-21-22



NO. 1		DATE 0-18-2019	REVISION ADD CANOPY DRAINS AT BLDG #1 AND REVEGE WHC AT BLDG #1
<p>BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043 (P) 410-485-6105 (F) 410-485-6644 WWW.BEI-CVLENGINEERING.COM</p>			
OWNER:		<p>RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER</p>	
DEVELOPER/OWNER:		<p>STEPHEN A. KLEIN & ASSOCIATES c/o STEPHEN KLEIN, INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-485-4244</p>	
DATE: MARCH 4, 2019		BEI PROJECT NO. 2801	
SCALE: AS SHOWN		SHEET 9 OF 25	
DESIGN: DBT		DRAFT: DBT	



MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 100
TAX ID: 371007
LIBER 12840 FOLIO 368

SERVILLE LLC PARCEL 185
MAP 34 GRID 6
TAX ID: 347325
LIBER 11119 FOLIO 401
ACREAGE: 36.95 AC

BUILDING #4
4,115 sf
FLOOR = 494.00

BUILDING #1
2,110 sf
FLOOR = 493.50

BUILDING #3
Total floor area = 20,710 sf
FLOOR = 494.50

BUILDING #2
13,218 sf
FLOOR = 494.50

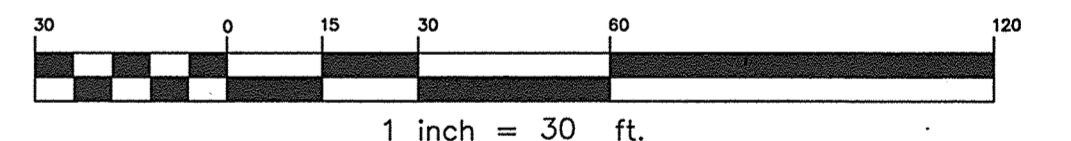
POST OFFICE



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21A43, Expiration Date: 12-2-22

"NO AS-BUILT INFORMATION IS" PROVIDED ON THIS SHEET

NOTE:
SEE SHEET 1 FOR STORMWATER MANAGEMENT SUMMARY TABLES



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Howard 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION

Kat 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT

Nal 4-4-19
DIRECTOR

NO.	DATE	REVISION

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21A43, Expiration Date: 12-2-22

OWNER:
STEPHEN A. KLEIN & ASSOCIATES
C/O STEPHEN KLEIN, INC.
12165 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21029
410-465-4244

DEVELOPER/OWNER:
RIVER HILL SQUARE, LLC
P.O. BOX 417
ELLICOTT CITY, MARYLAND 21041
410-465-4244

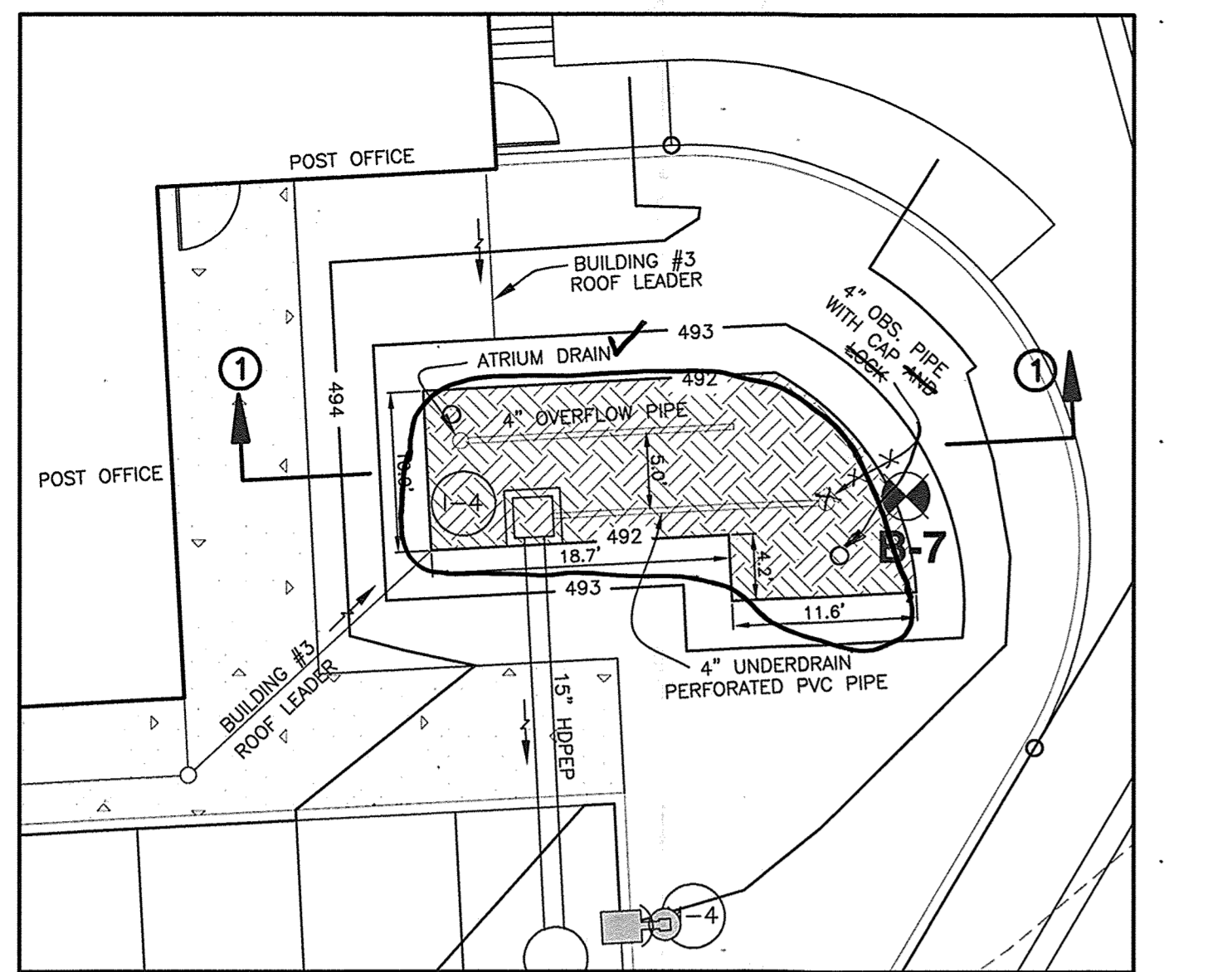
RIVER HILL SQUARE
REDEVELOPMENT OF
RIVER HILL GARDEN CENTER

TAX MAP: 35 - GRID: 1 - PARCEL: 1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

**STORMWATER MANAGEMENT
ESD DRAINAGE AREA MAP**

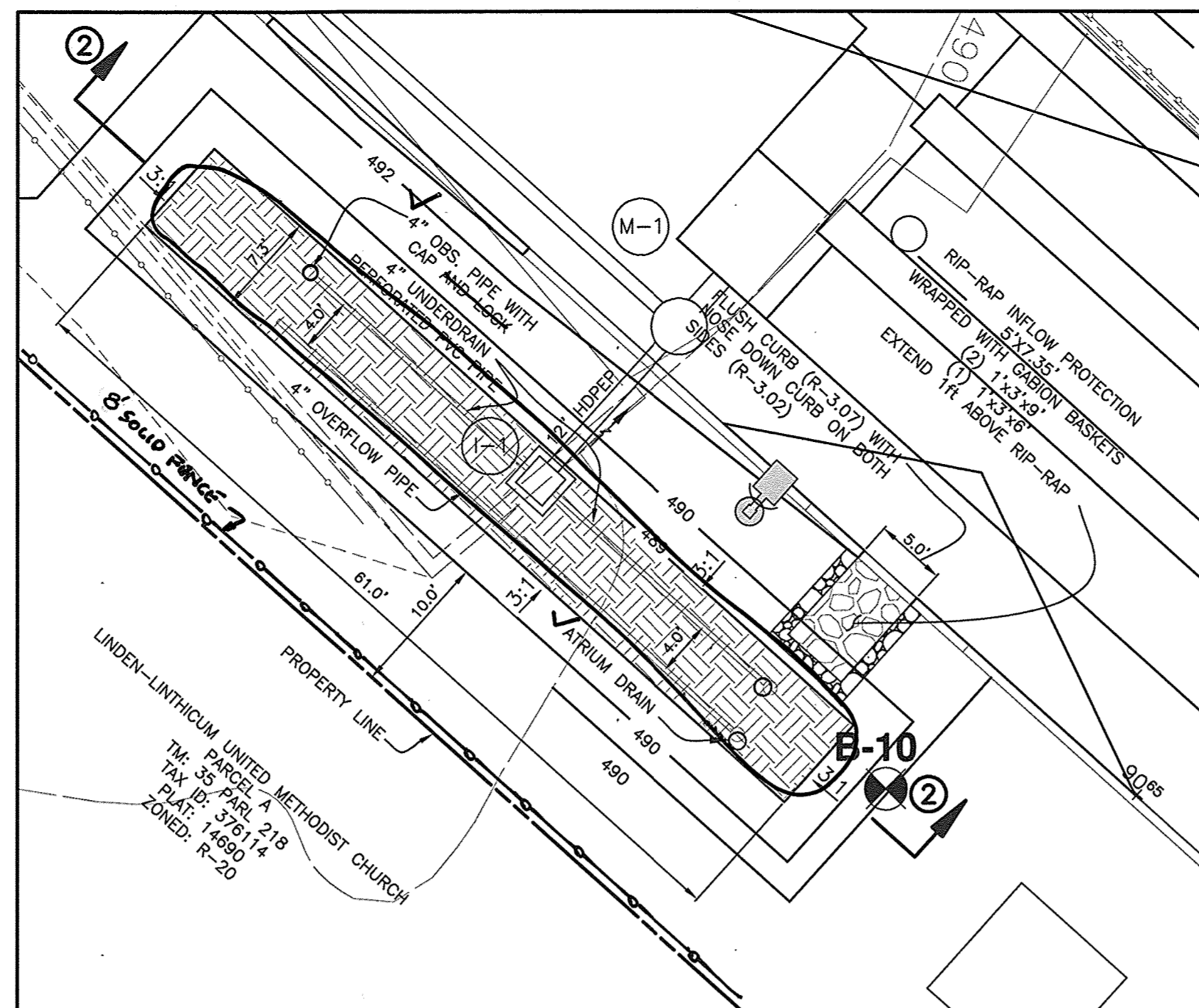
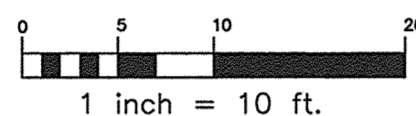
DESIGN: DBT DRAFT: DBT

DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
SCALE: AS SHOWN SHEET 10 OF 25



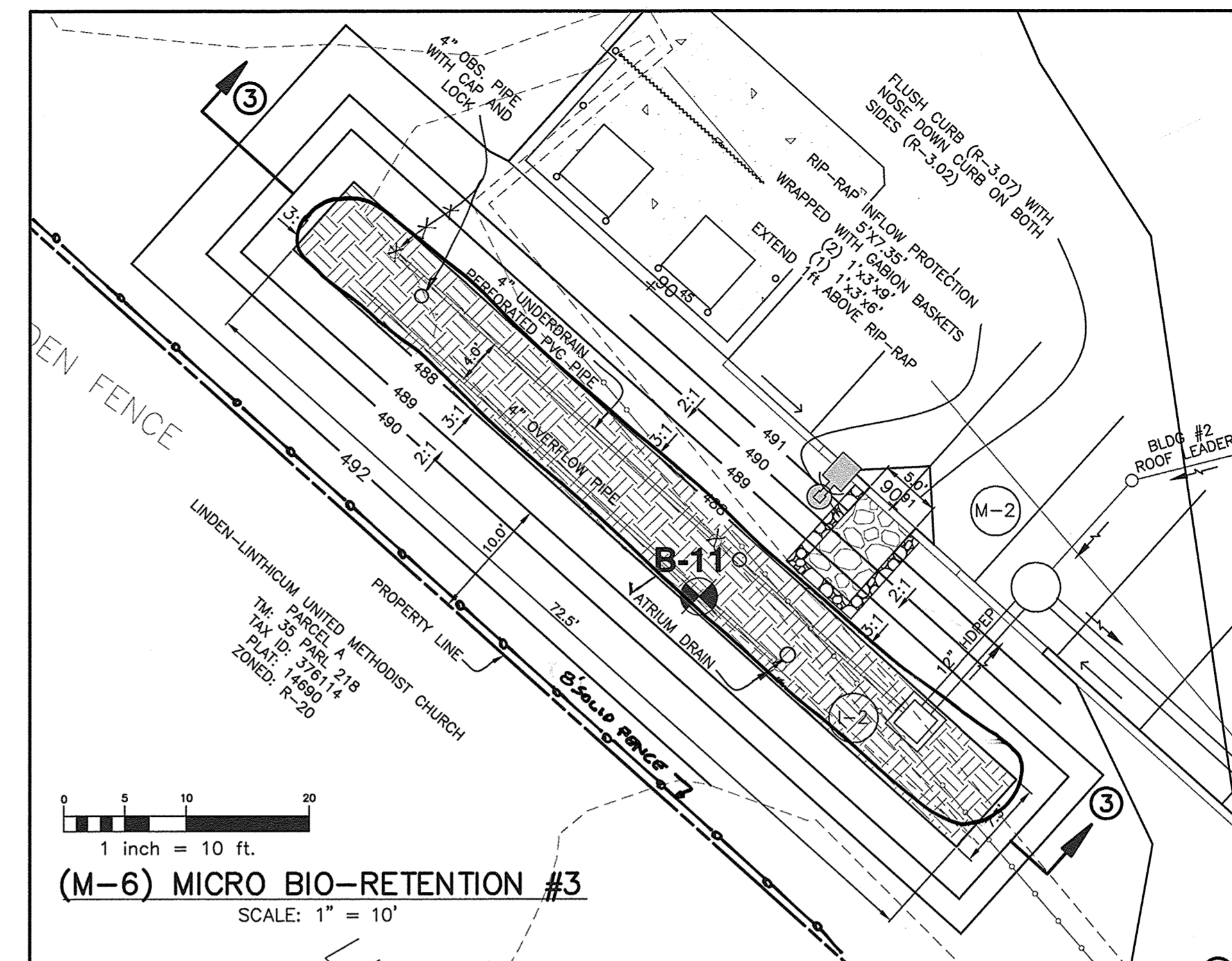
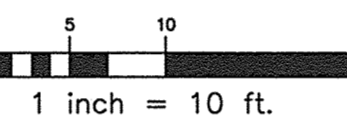
(M-6) MICRO BIO-RETENTION #1

SCALE: 1" = 10'



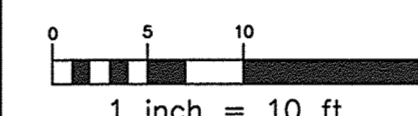
(M-6) MICRO BIO-RETENTION #2

SCALE: 1" = 10'

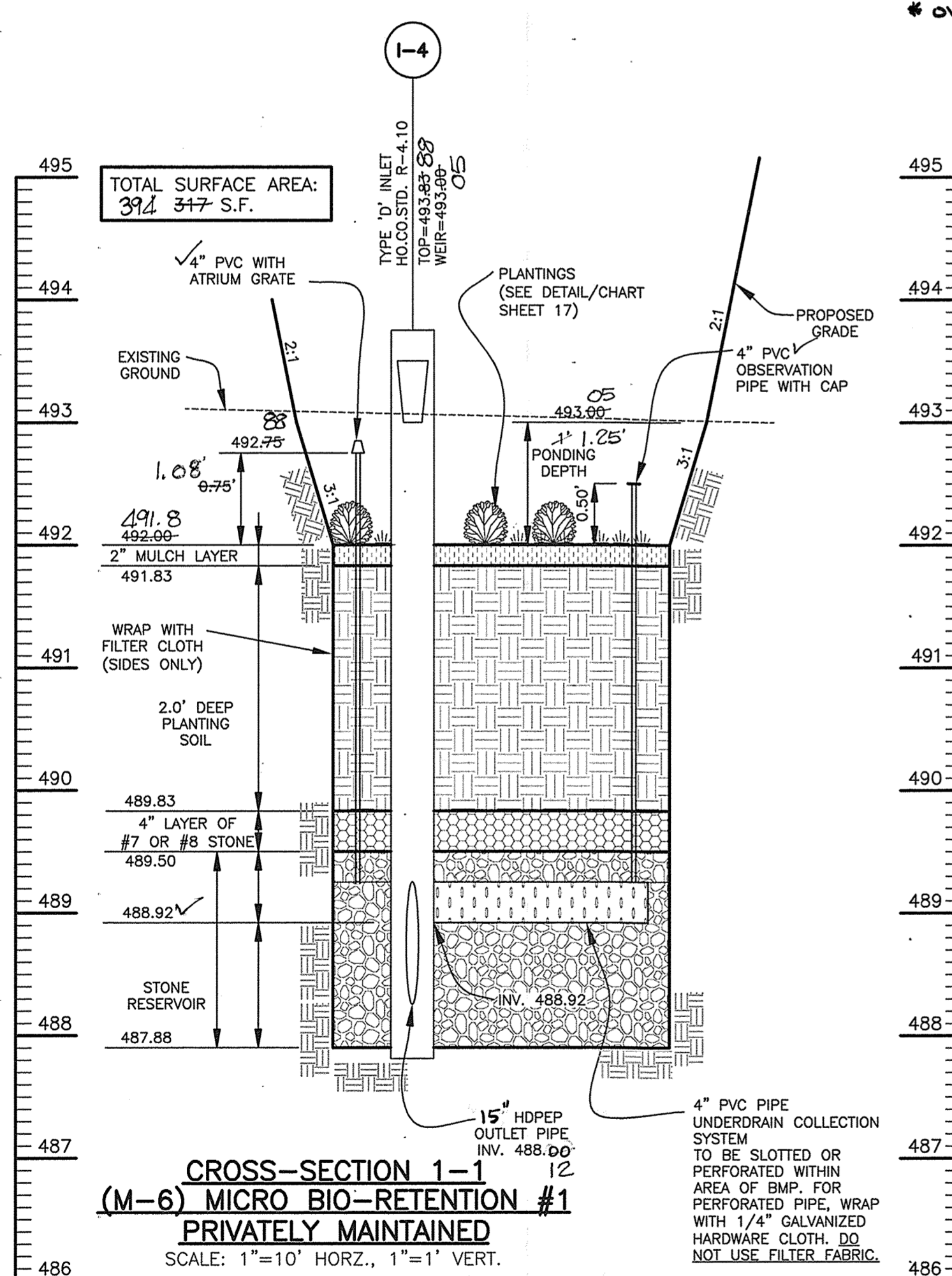


(M-6) MICRO BIO-RETENTION #3

SCALE: 1" = 10'

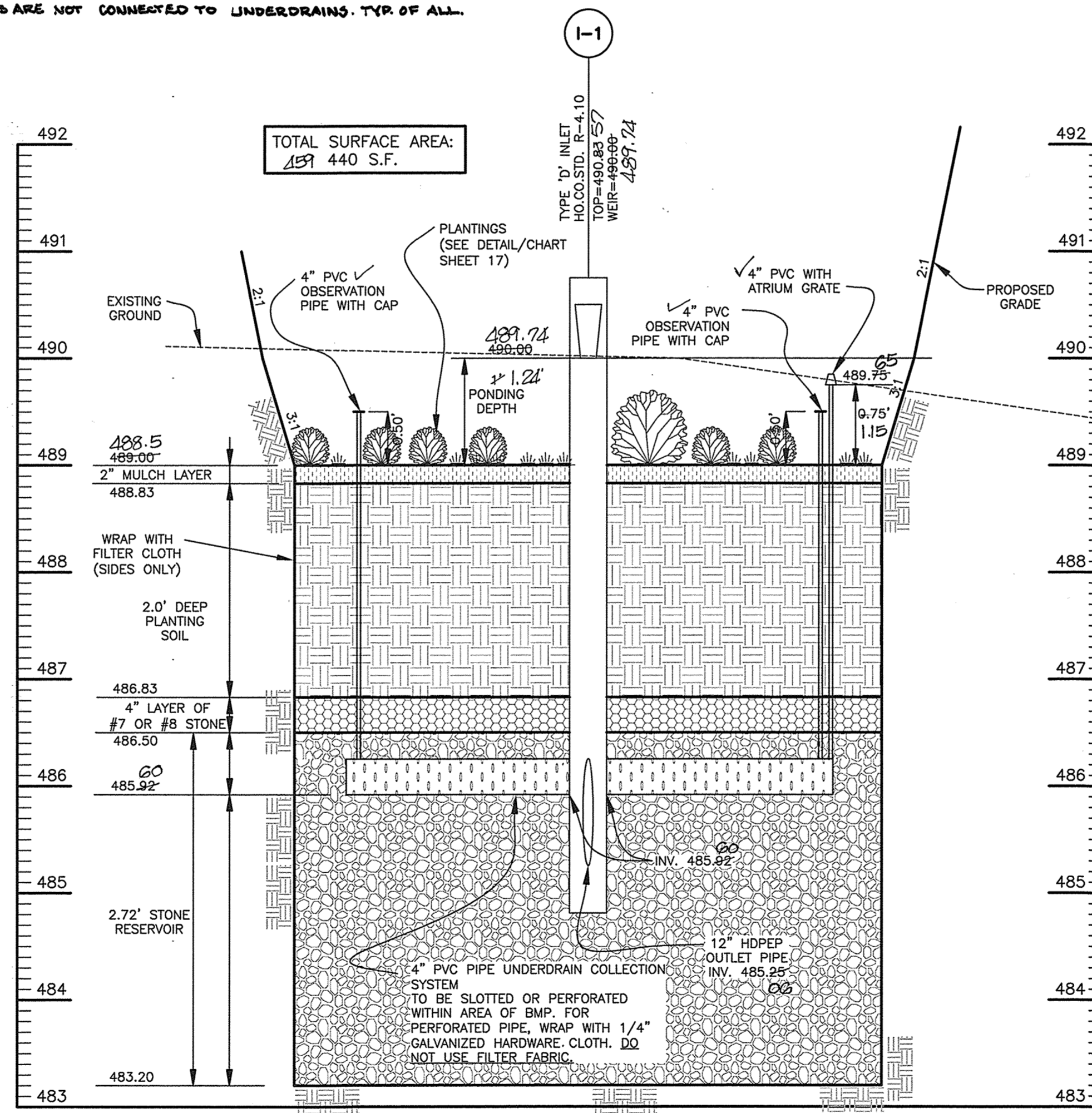


* OVERFLOW DRAINS ARE NOT CONNECTED TO UNDERDRAINS. TYP. OF ALL.



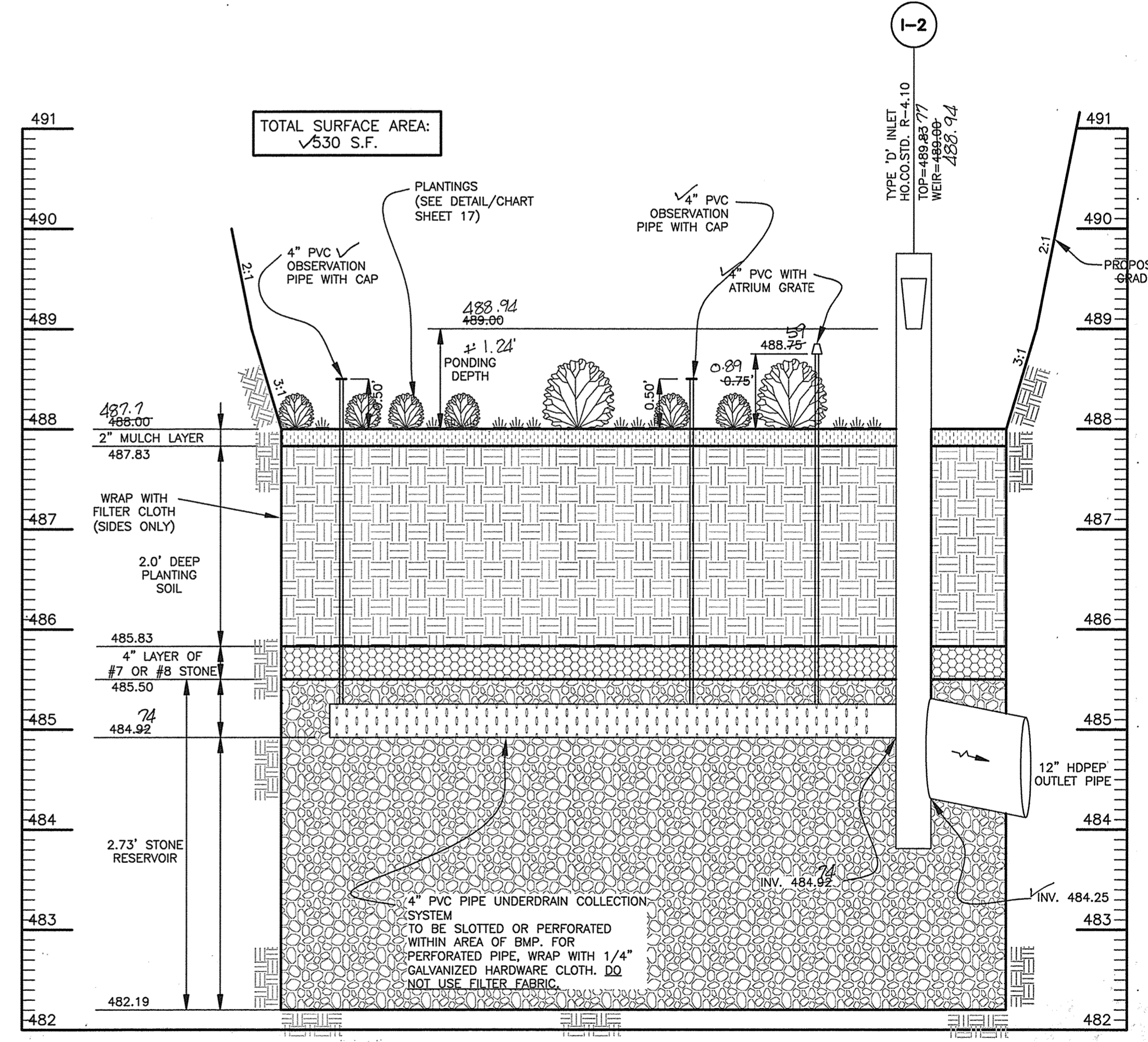
CROSS-SECTION 1-1
(M-6) MICRO BIO-RETENTION #1
PRIVATELY MAINTAINED

SCALE: 1"=10' HORZ., 1"=1' VERT.



CROSS-SECTION 2-2
(M-6) MICRO BIO-RETENTION #2
PRIVATELY MAINTAINED

SCALE: 1"=10' HORZ., 1"=1' VERT.



CROSS-SECTION 3-3
(M-6) MICRO BIO-RETENTION #3
PRIVATELY MAINTAINED

SCALE: 1"=10' HORZ., 1"=1' VERT.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 21443 Expiration Date: 12-21-22



AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E.

Date: 1/30/21

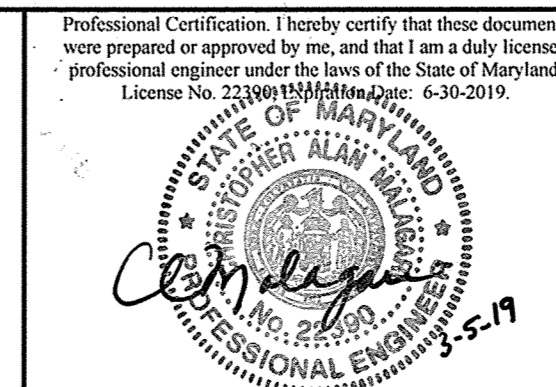
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION
CHIEF, DIVISION OF LAND DEVELOPMENT
DIRECTOR

4-2-19
4-4-19
4-4-19

NO.	DATE	REVISION
1	3.31.2020	REVISE FENCE TO BE 8' TALL PER BA-19-022V IN MB#2 AND MB#3 DETAIL CORRECT SIZE AND INVERT OF PIPE & I-4 IN MB#1 CROSS-SECTION

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE & SUITE 315 A ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6109 (F) 410-465-6944
WWW.BC-ENL.ENGINEERING.COM



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 21443, dated 3-5-19.

<p>OWNER: STEPHEN A. KLEIN & ASSOCIATES c/o STEPHEN KLEIN, INC. 12165 CLARKSTONE PIKE CLARKSVILLE, MARYLAND 21030 410-465-4244</p>		<p>RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER</p>	
<p>DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244</p>		<p>TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>	
<p>SWM DETAILS (M-6) MICRO BIO-RETENTION</p>			
DATE:	MARCH 4, 2019	BEI PROJECT NO.	2801
SCALE:	AS SHOWN	SHEET	11 OF 25
DESIGN:	DBT	DRAFT:	DBT

AS-BUILT SDP-18-044

Table B.4.1 Materials Specifications for Micro-Bioretenion, 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 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; $f_c = 3500$ psi @ 28 days, normal weight, air-entrained; 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) <i>not using previously approved State or local standards</i> requires design drawings sealed and approved by a professional structural 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 pressures); 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.

B.4.7

Supp. 1

OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6)

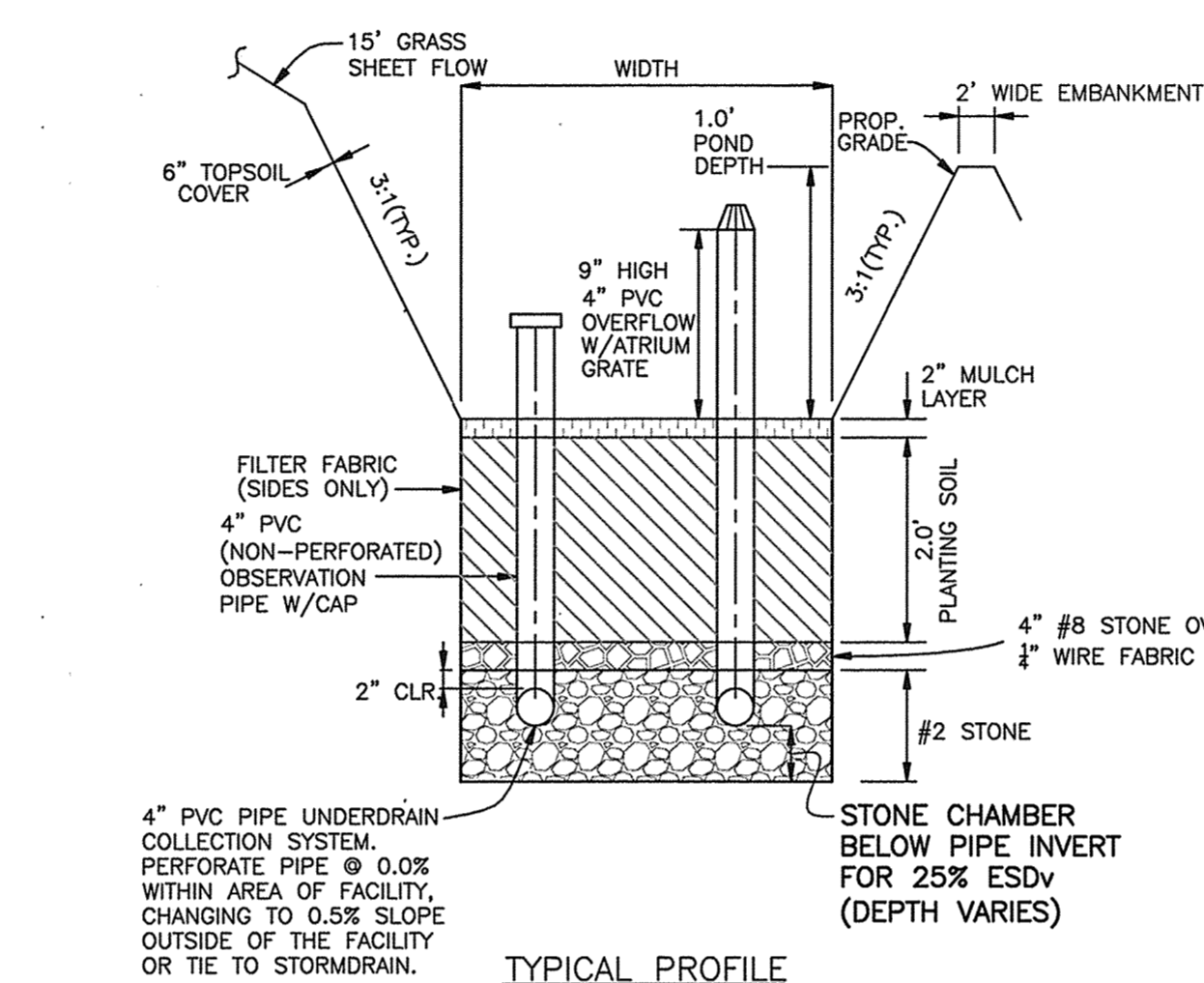
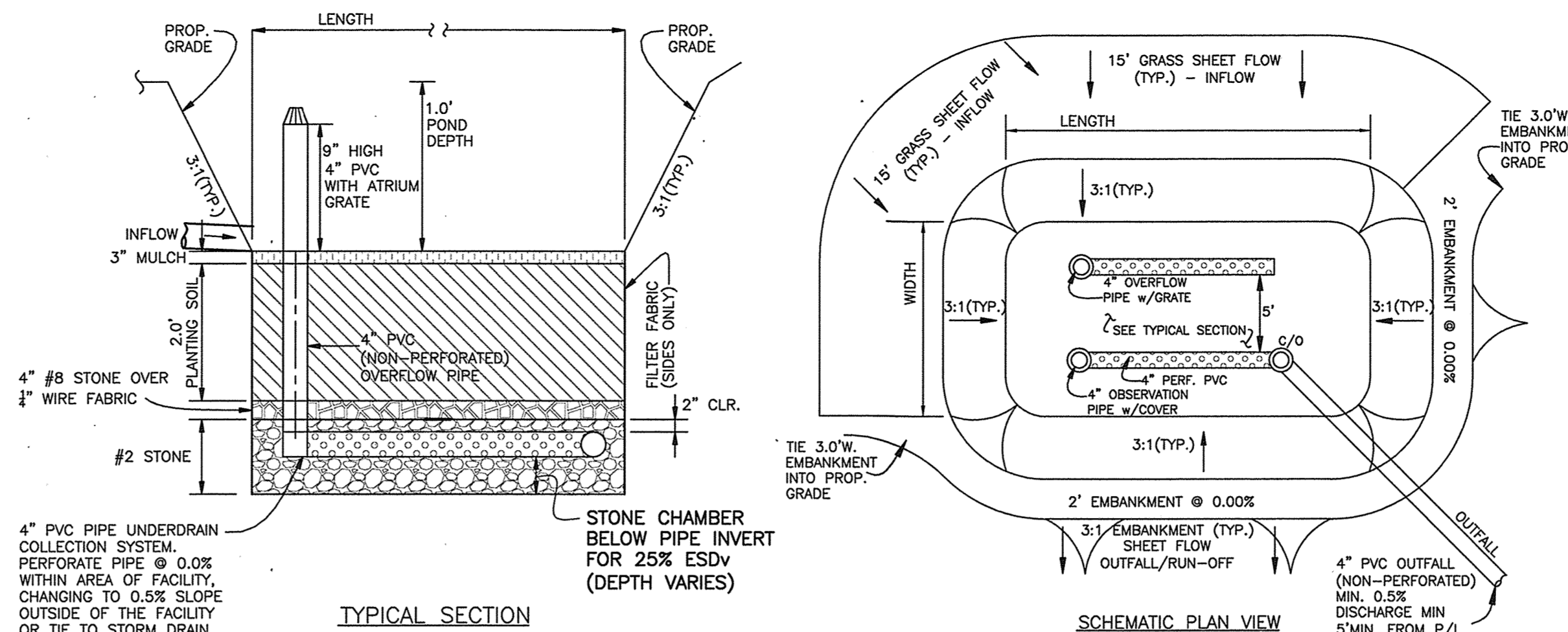
- The Owner shall maintain the plant material, mulch layer and soil layer annually. Maintenance of mulch and soil is limited to correcting areas of erosion or wash out. Any mulch replacement shall be done in the spring. Plant material shall be checked for disease and insect infestation and maintenance will address dead material and pruning. Acceptable replacement plant material is limited to the following: 2000 Maryland Stormwater Design Manual Volume II, Table A.4.1 and 2.
- The Owner shall perform a plant inspection in the spring and in the fall of each year. During the inspection, the Owner shall remove dead and diseased vegetation considered beyond treatment, replace dead plant material with acceptable replacement plant material, treat diseased trees and shrubs, and replace all deficient stakes and wires.
- The Owner shall inspect the mulch each spring. The mulch shall be replaced every two to three years. The previous mulch layer shall be removed the new layer is applied.
- The Owner shall correct soil erosion on an as needed basis, with a minimum of once per month and after each heavy storm.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4-4-19
DIRECTOR



STANDARD MICRO-BIORETENTION DETAILS
NOT TO SCALE

UNDERDRAIN, OVERFLOW AND OUTFALL NOTES

- THE LAST CLEAN-OUT LOCATION WITHIN EACH MICRO-BIORETENTION FACILITY SHALL BE FITTED WITH A NON-CLOGGING SURFACE DRAIN (EXAMPLE: 4" PVC ATRIUM GRATE).
- THE PVC UNDER-DRAINS WITHIN THE FACILITY SHALL BE PERFORATED.
- THE UNDER-DRAIN AND PIPE TO OUTFALL SHALL BE INSTALLED TO A MINIMUM DEPTH OF 2' BELOW FINISHED GRADE AND SHALL MAINTAIN A MINIMUM 1% SLOPE AND MAINTAIN A MINIMUM OF 1' OF SEPARATION AT ALL CROSSINGS.

CONSTRUCTION SPECIFICATIONS

B.4.C Specifications for Micro-Bioretenion, Rain Gardens, Landscape Infiltration & Infiltration Berms

- Material Specifications:**
The allowable materials to be used in these practices are detailed in Table B.4.1.
- 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-bioretenion 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 D 2974). In general, this can be met with a mixture of loamy and (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-bioretenion 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 urea fertilizer at a rate of 2 pounds per 1000 square feet.

- Underdrains:**
Underdrains should meet the following criteria:
 - Pipe - Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTM F 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 3/4" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a 1/4" (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 1,000 square feet) to provide a clean-out port and monitor performance of the filter.
 - A 4" layer of pea gravel (1/4" to 3/4" 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).

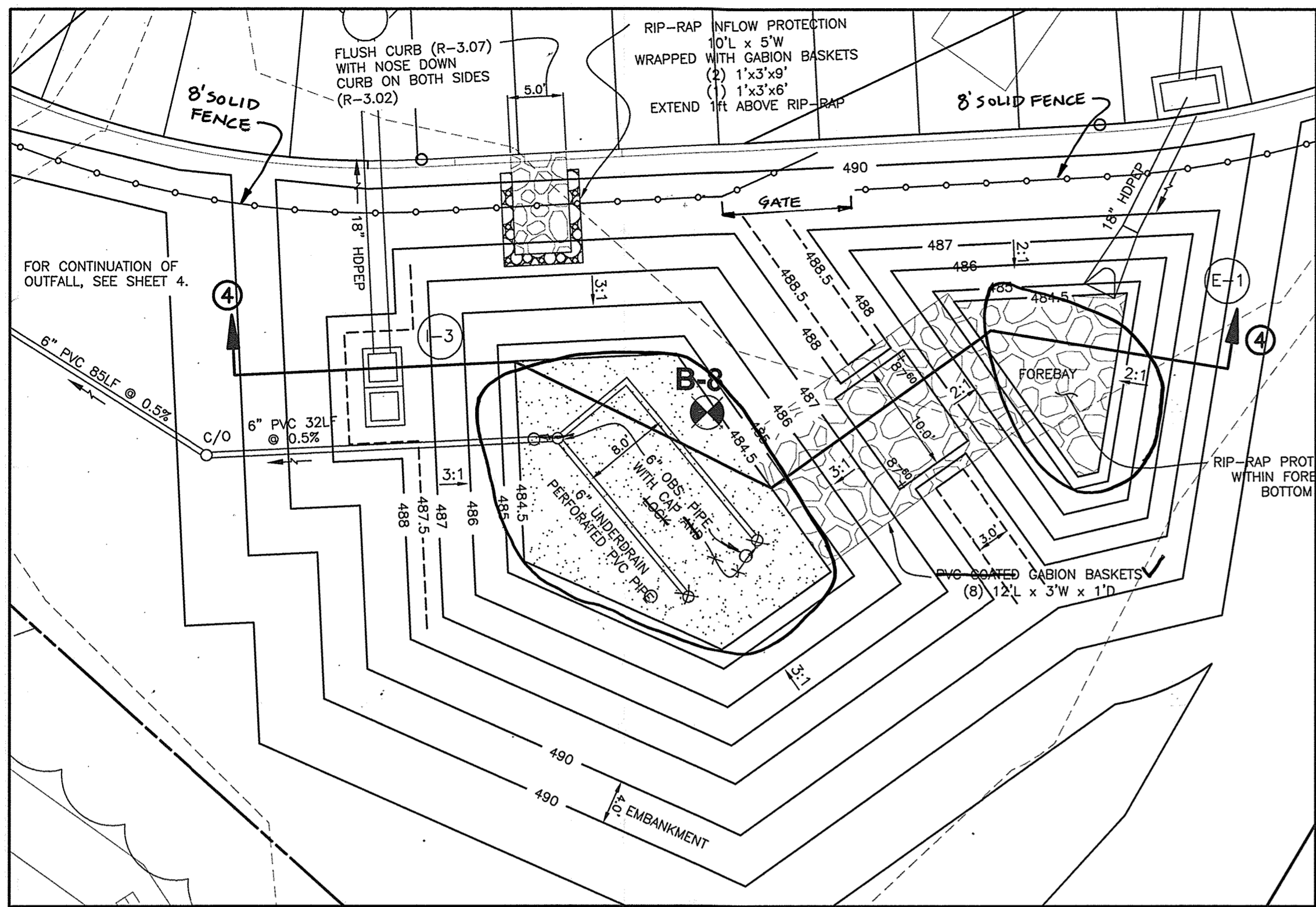
7. Miscellaneous:
These practices may not be constructed until all contributing drainage area has been stabilized

"NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET"

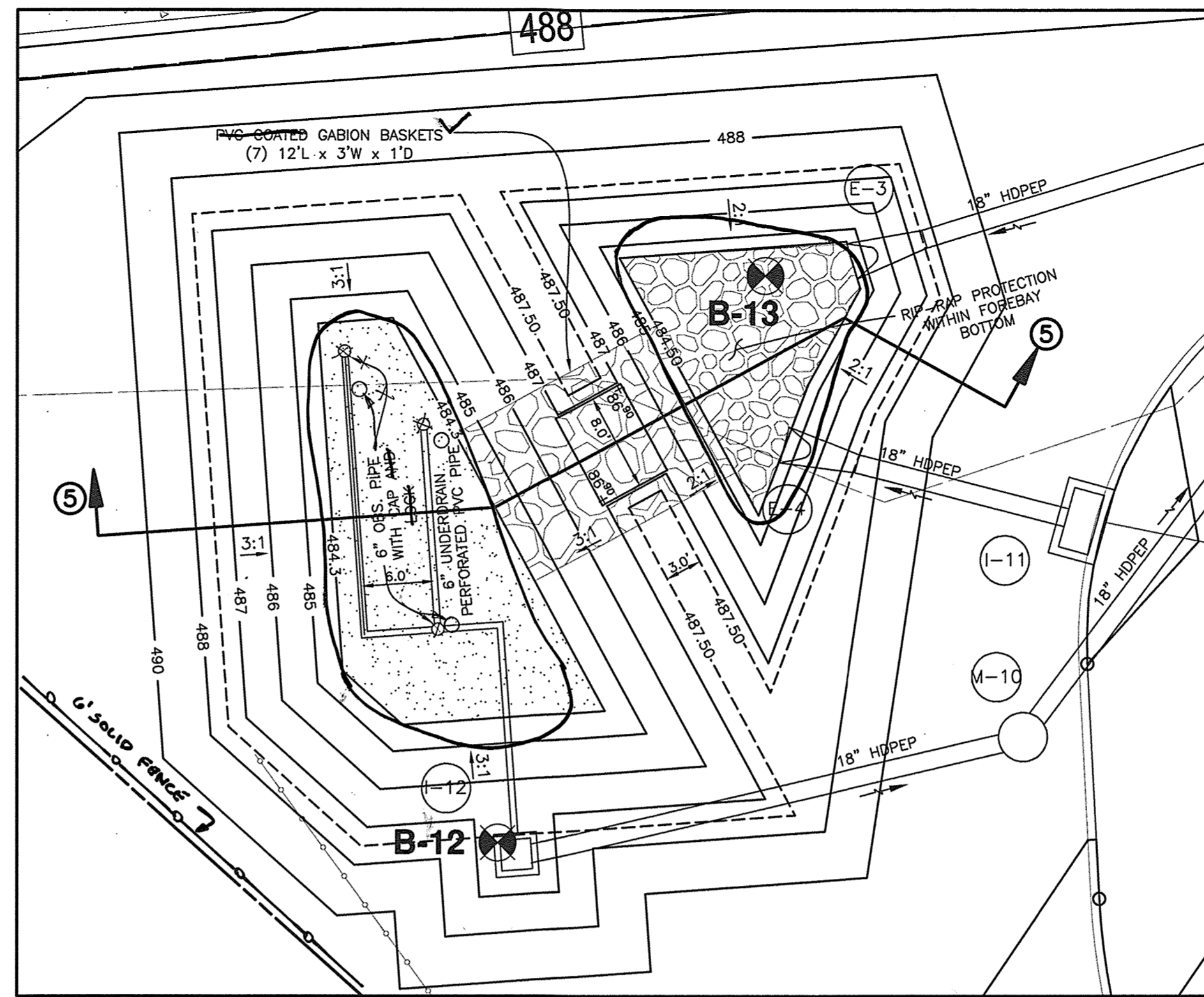
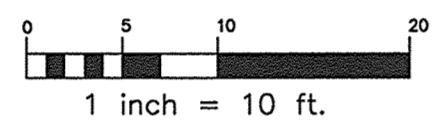
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-22

Professional Engineer Seal for Donald Alan Moore, License No. 21443, State of Maryland, expires 12/30/21.

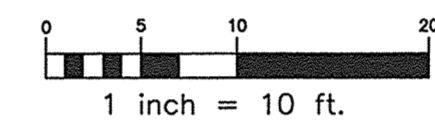
NO. DATE REVISION		Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22394, Expiration Date: 6-30-2019.	
<p>BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315A ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6100 (F) 410-465-6644 WWW.BE-CVLENGINEERING.COM</p>		<p>STATE OF MARYLAND DONALD ALAN MOORE PROFESSIONAL ENGINEER LICENSE NO. 21443 EXPIRES 12/30/21</p>	
<p>OWNER: STEVEN A. KLEIN & ASSOCIATES c/o STEPHEN CLERT INC. 12155 CLARKVILLE PIKE CLARKVILLE, MARYLAND 21029 410-465-4244</p>		<p>RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>	
<p>DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244</p>		<p>SWM DETAILS (M-6) MICRO BIO-RETENTION DATE: MARCH 4, 2019 BEI PROJECT NO. 2801 DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN SHEET 12 OF 25</p>	



(F-1) SURFACE SAND FILTER #1
SCALE: 1" = 10'



(F-1) SURFACE SAND FILTER #2
SCALE: 1" = 10'



Material	Specification/Test Method	Size	Notes
sand	clean AASHTO-M-6 or ASTM-C-33 concrete sand	0.075" to 0.425"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonate or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.
peat	ash content: < 15% pH range: 5.2 to 4.5 lime bulk density 0.12 to 0.15 g/cc	n/a	The material must be reed-seed hemic peat, shredded, uncompacted, uniform, and clean.
leaf compost	AASHTO-M-43	0.375" to 0.75"	n/a
underdrain gravel	ASTM-D-4833 (puncture strength - 125 lb.) ASTM-D-4832 (Tensile Strength - 300 lb.)	0.08" thick equivalent opening size of #80 sieve	Must maintain 125 gms per sq. ft. flow rate. Note: a 4" pea gravel layer may be substituted for geotextiles meant to "trap" sand filter layers.
geotextile fabric (if required)	ASTM-D-4833 (thickness) ASTM-D-412 (tensile strength 1,100 lb., elongation 200%) ASTM-D-624 (Tear resistance - 150 lb./in.) ASTM-D-471 (water adsorption: +8 to -2% mass)	30 mil thickness	Liner to be ultraviolet resistant. A geotextile fabric should be used to protect the liner from puncture.
impermeable liner (if required)	MSHA Standards and Specs. Section 902, Min. No. 3, F _c = 3500 psi, normal weight, air-entrained; re-inforcing 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 structural engineer licensed in the State of Maryland
underdrain piping	F 758, Type P9 28 or AASHTO-M-278	4" - 6" rigid schedule 40 PVC or SDR35	3/8" part. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
concrete (cast-in-place)	per pre-cast manufacturer	n/a	SEB ABOVE NOTE
concrete (pre-cast)	ASTM A-36	n/a	structural steel to be hot-dipped galvanized ASTM-A-123

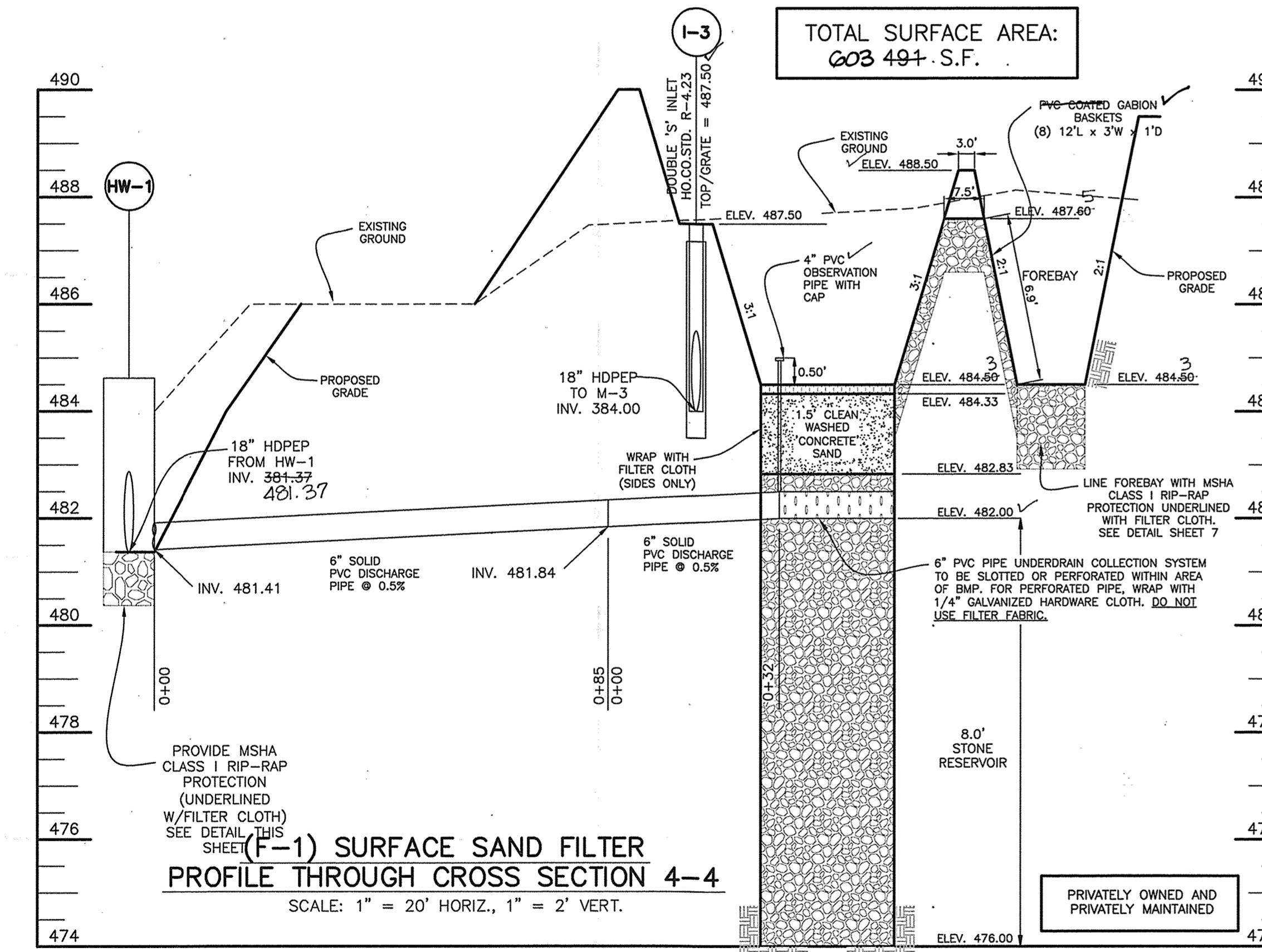
OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND PRIVATELY MAINTAINED (F-1) SURFACE SAND FILTER

ROUTINE MAINTENANCE

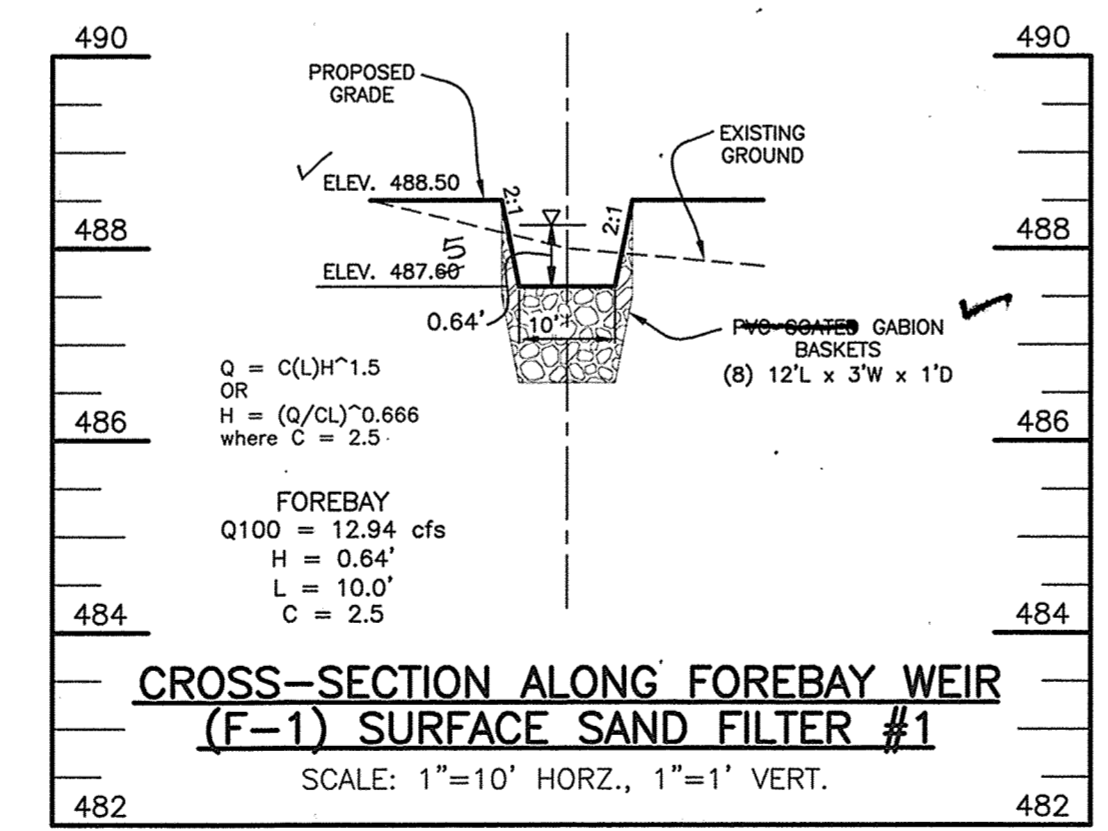
- THE STORMWATER WETLAND FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE FACILITY IS FUNCTIONING PROPERLY.
- THE TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF ONCE PER YEAR, WHEN VEGETATION REACHES 18" IN HEIGHT OR AS NEEDED.
- FILTERS THAT HAVE A GRASS COVER SHALL BE MOWED A MINIMUM OF THREE (3) TIMES PER GROWING SEASON TO MAINTAIN A MAXIMUM GRASS HEIGHT OF LESS THAN 12 INCHES.
- DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
- VISIBLE SIGNS OF EROSION IN THE FACILITY SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
- REMOVE SILT WHEN IT EXCEEDS FOUR (4) INCHES DEEP IN THE FOREBAY, IF APPLICABLE.
- WHEN WATER PONDS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 72 HOURS, THE TOP FEW INCHES OF DISCOLORED MATERIAL SHALL BE REPLACED WITH FRESH MATERIAL. PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIALS AND LIQUID MUST BE FOLLOWED BY THE OWNER.
- A LOGBOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
- THE MAINTENANCE LOGBOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
- ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION SYSTEM HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

NON-ROUTINE MAINTENANCE

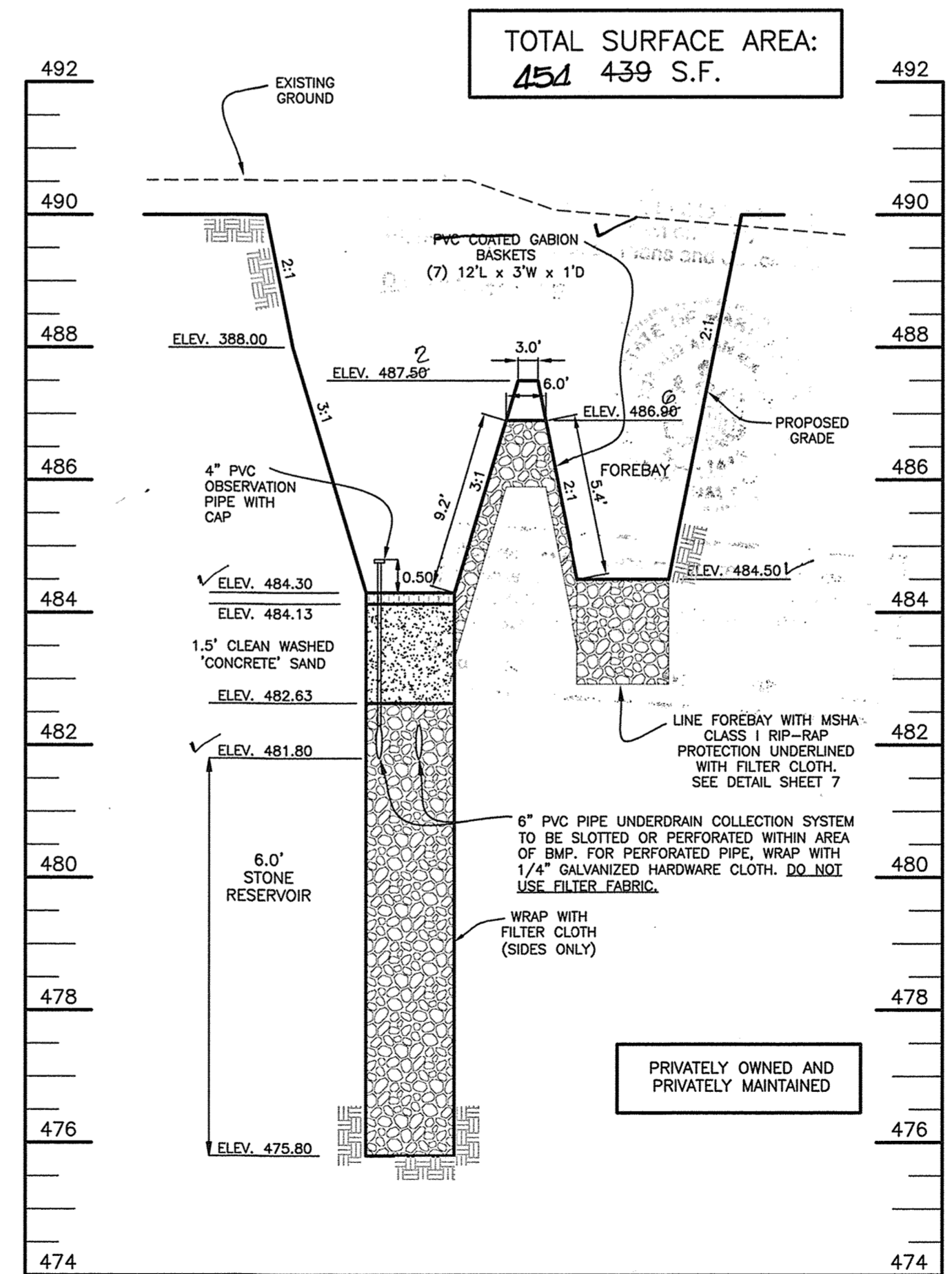
- STRUCTURAL COMPONENTS OF THE POND SUCH AS THE EMBANKMENT, THE RISER STRUCTURE AND TRASH RACK, AND PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THESE COMPONENTS SHALL BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.



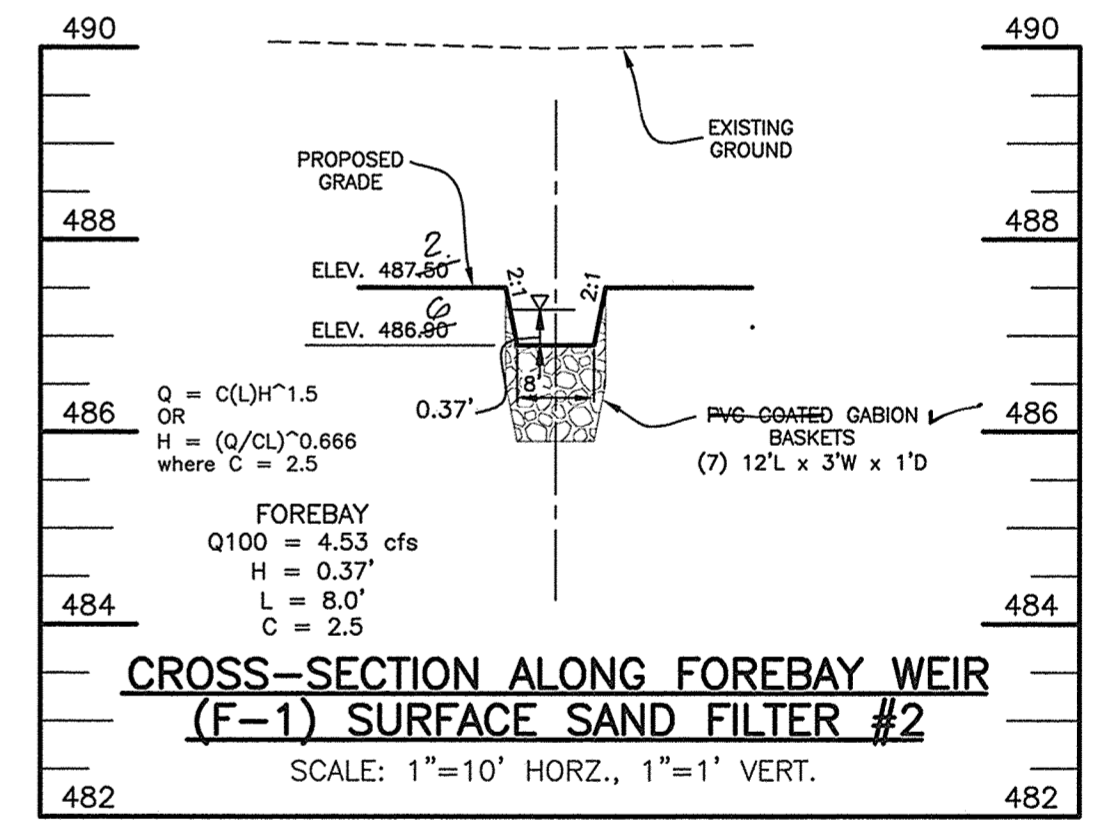
(F-1) SURFACE SAND FILTER PROFILE THROUGH CROSS SECTION 4-4
SCALE: 1" = 20' HORIZ., 1" = 2' VERT.



CROSS-SECTION ALONG FOREBAY WEIR (F-1) SURFACE SAND FILTER #1
SCALE: 1" = 10' HORIZ., 1" = 1' VERT.

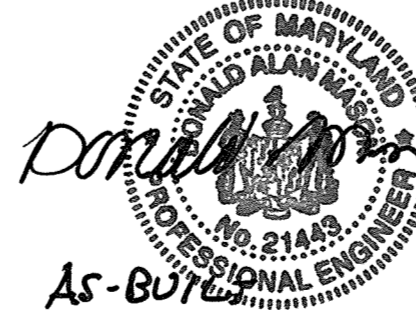


(F-1) SURFACE SAND FILTER PROFILE THROUGH CROSS SECTION 5-5
SCALE: 1" = 20' HORIZ., 1" = 2' VERT.



CROSS-SECTION ALONG FOREBAY WEIR (F-1) SURFACE SAND FILTER #2
SCALE: 1" = 10' HORIZ., 1" = 1' VERT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4-2-19 DATE
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 [Signature] 4-4-19 DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT
 [Signature] 4-7-19 DATE
 DIRECTOR



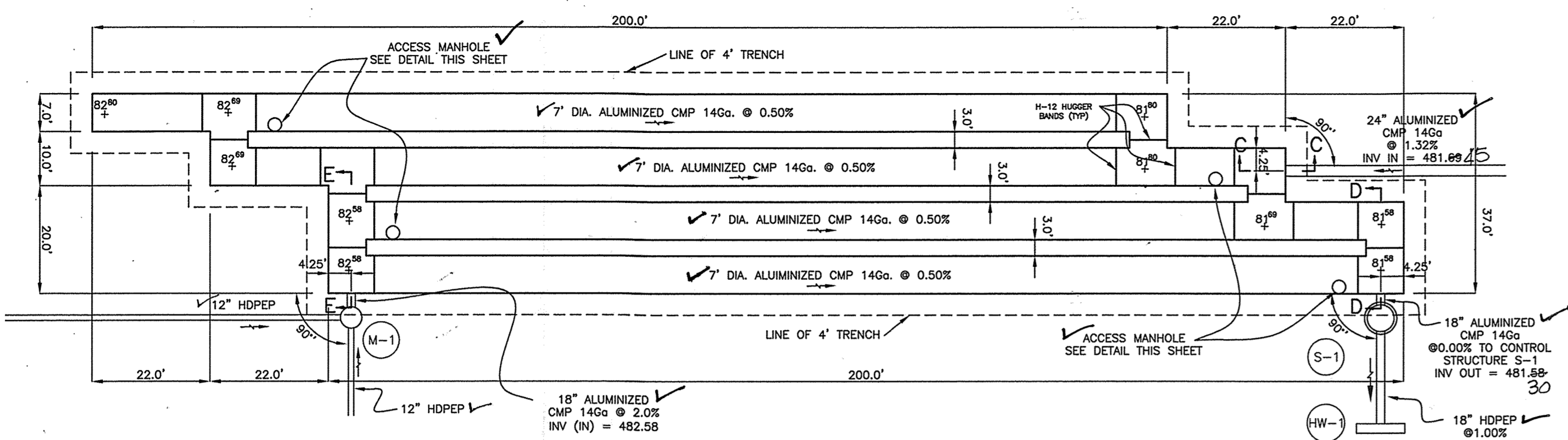
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443 Expiration Date: 12-21-22

AS-BUILT CERTIFICATION
 I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
 Donald Mason, P.E. Date: 1/30/21

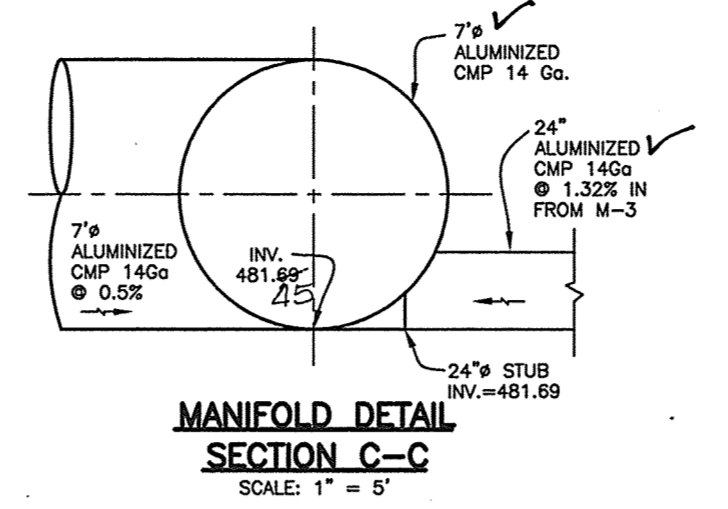
3.31.2020 LABEL B' SOLID FENCE IN SURFACE SAND FILTER #1 NO. DATE REVISION		Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22391, Exp. Date: 6-30-2019. BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 A ELLICOTT CITY, MARYLAND 21043 (P) 410-465-1100 (F) 410-465-6644 WWW.BE-CVLENGINEERING.COM
OWNER: STEPHEN A. KLEIN & ASSOCIATES C/O STEPHEN KLEIN, INC. 12165 CHARLES MILLS PIKE CLARKSVILLE, MARYLAND 21034 410-465-4244		
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244		RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND SWM DETAILS (F-1) SURFACE SAND FILTERS DATE: MARCH 4, 2019 BEI PROJECT NO. 2801 SCALE: AS SHOWN SHEET 13 OF 25 AS-BUILT SDP-18-044

OPERATION AND MAINTENANCE SCHEDULE FOR UNDERGROUND STORMWATER MANAGEMENT FACILITIES

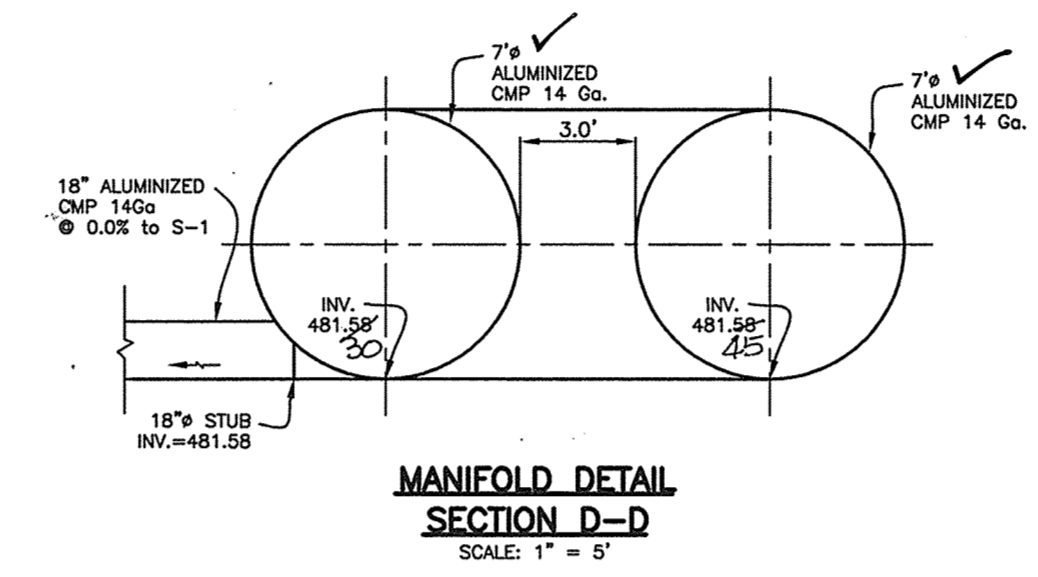
1. THE UNDERGROUND STORM WATER MANAGEMENT FACILITY IS PRIVATELY OWNED AND IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO PERIODICALLY INSPECT AND CLEAN THE FACILITY TO MAINTAIN ITS OPERATION AND FUNCTION.
2. THE UNDERGROUND STORM WATER MANAGEMENT FACILITY SHALL BE INSPECTED YEARLY AT A MINIMUM AND AFTER ESPECIALLY SEVERE STORM EVENTS.
3. WHEN SEDIMENT ACCUMULATION OF MORE THAN 2" IS OBSERVED OR ANY DEBRIS THAT MIGHT OBSTRUCT THE OUTFALL IS OBSERVED, THE FACILITY SHALL BE CLEANED.
4. THE FACILITY SHALL BE CLEANED IMMEDIATELY AFTER PETROLEUM SPILLS. THE OWNER SHALL CONTACT THE APPROPRIATE REGULATORY AGENCIES NOTIFYING THEM OF THE SPILL AND CLEAN-UP OPERATION.
5. THE SEDIMENT AND DEBRIS SHALL BE REMOVED FROM THE UNDERGROUND STORM WATER MANAGEMENT FACILITY BY VACUUM TRUCK OR OTHER MANUAL MEANS. THE OWNER SHALL FOLLOW PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIAL AND LIQUID.
6. THE INLET AND OUTLET PIPES SHALL BE CHECKED FOR ANY OBSTRUCTIONS AT LEAST ONCE EVERY SIX (6) MONTHS. IF OBSTRUCTIONS ARE FOUND, THE OWNER SHALL HAVE THEM REMOVED AND PROPERLY DISPOSED OF.



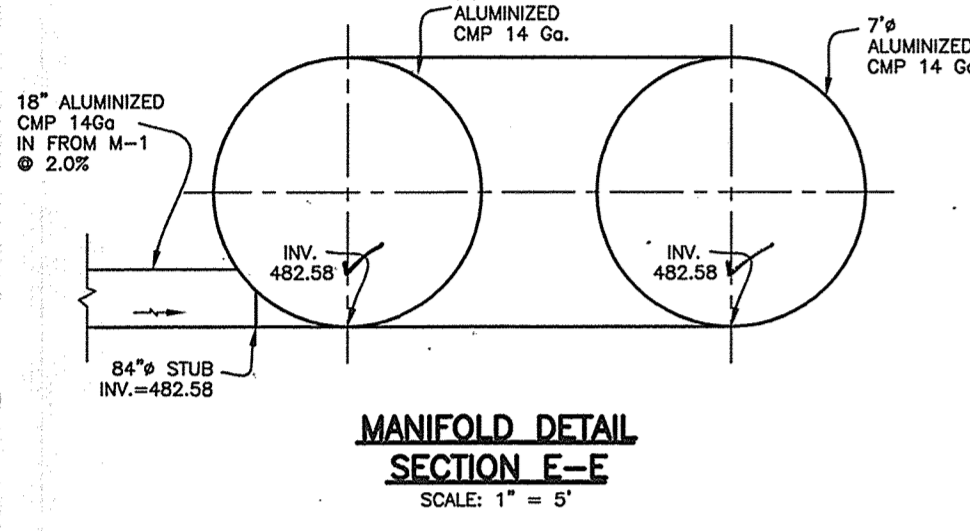
(UGS) UNDERGROUND FACILITY #1 PIPE LAYOUT PLAN
SCALE: 1" = 20'



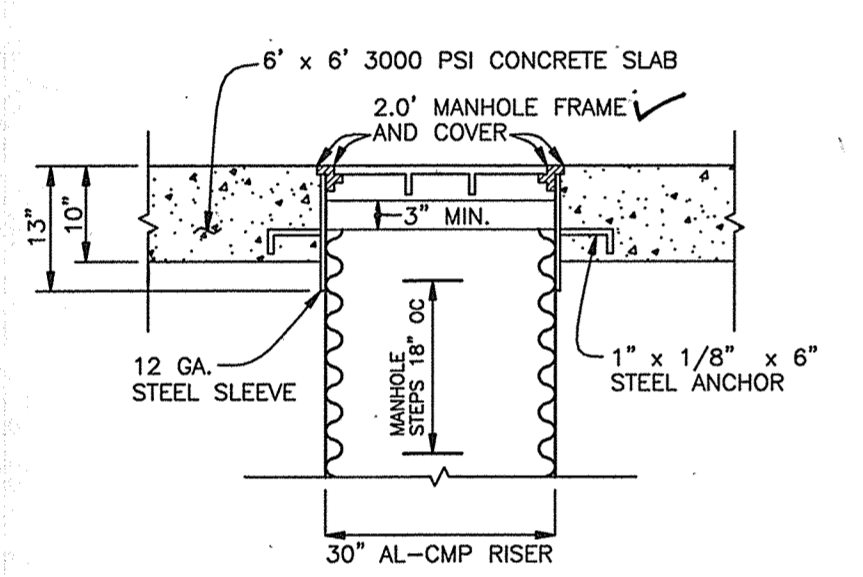
MANIFOLD DETAIL SECTION C-C
SCALE: 1" = 5'



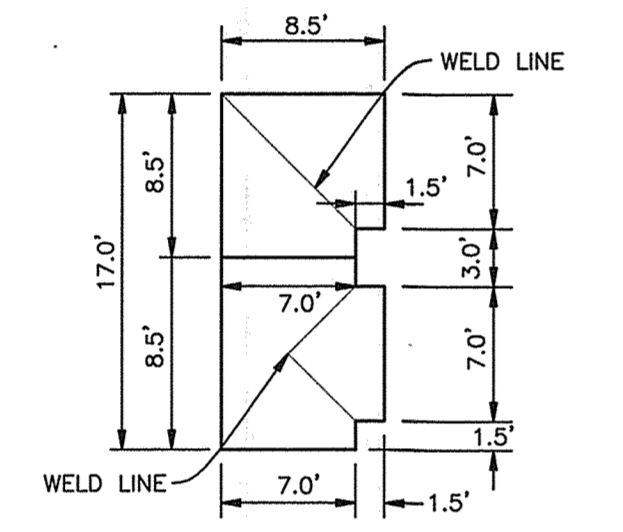
MANIFOLD DETAIL SECTION D-D
SCALE: 1" = 5'



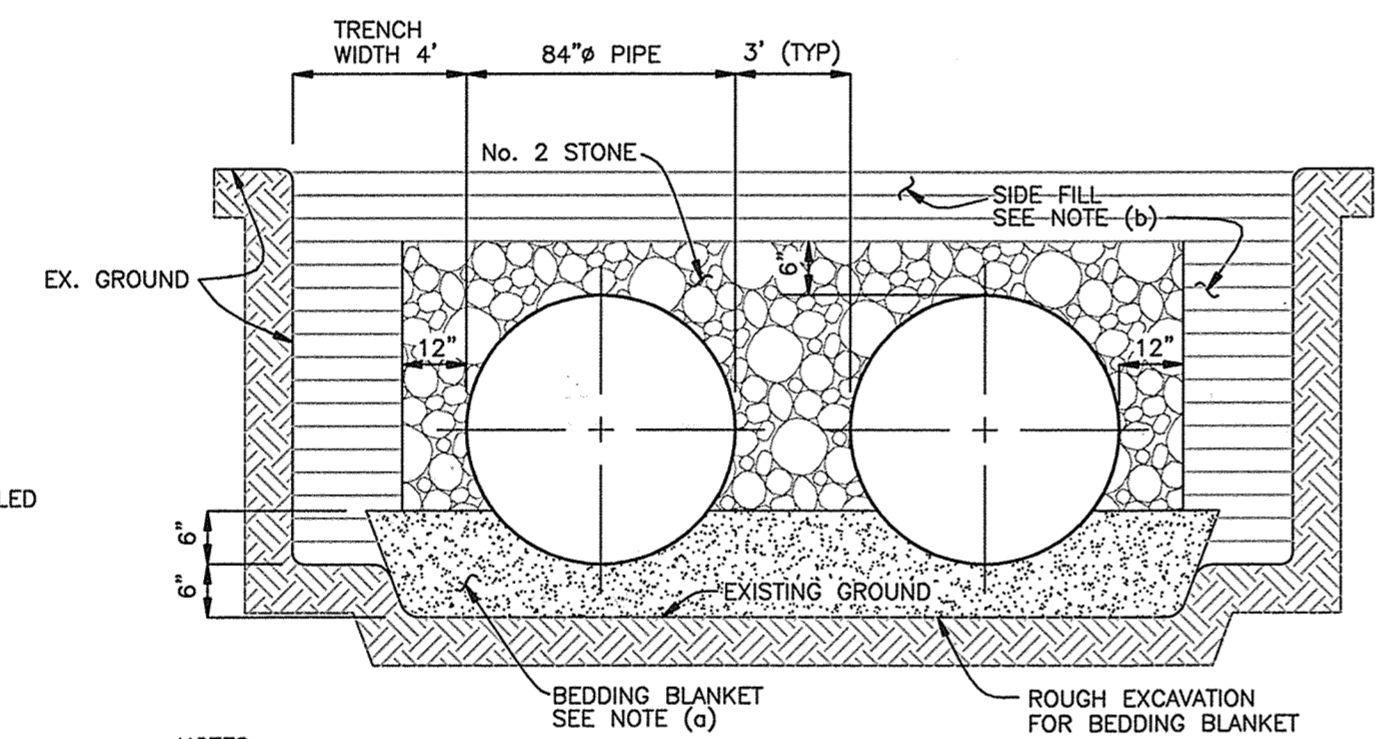
MANIFOLD DETAIL SECTION E-E
SCALE: 1" = 5'



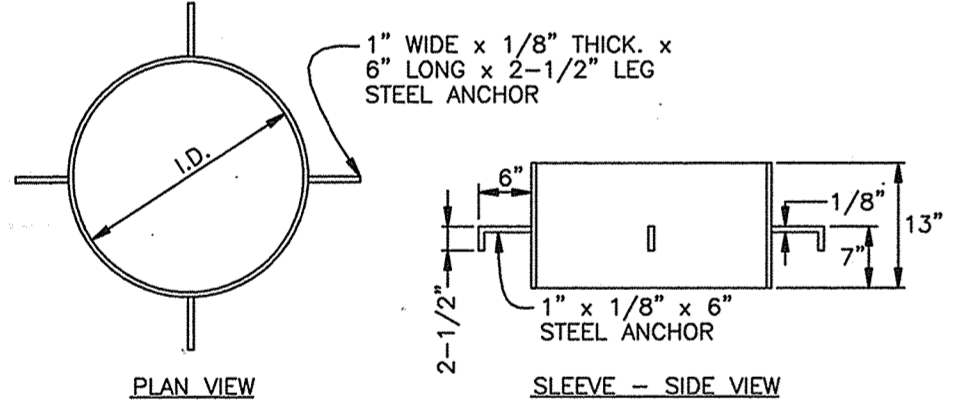
TYPICAL ALUMINIZED CMP RISER MANHOLE SLEEVE DETAIL
NOT TO SCALE



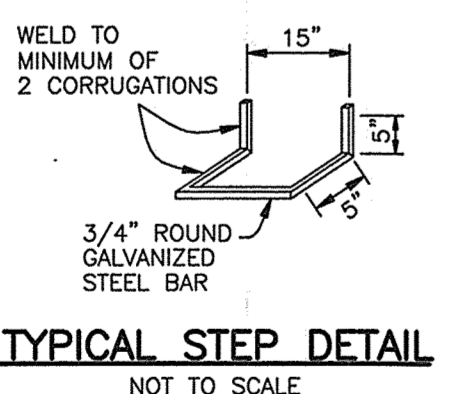
TYPICAL ELBOW/TEE DETAIL
NOT TO SCALE



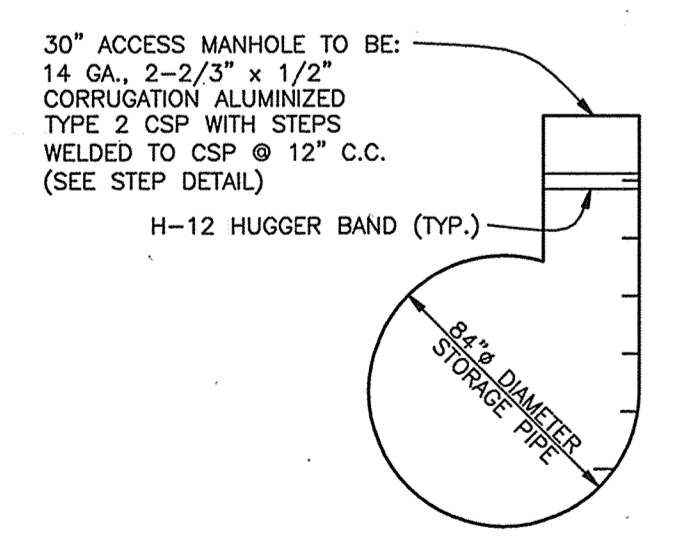
TYPICAL BEDDING AND BACKFILL DETAIL
NOT TO SCALE



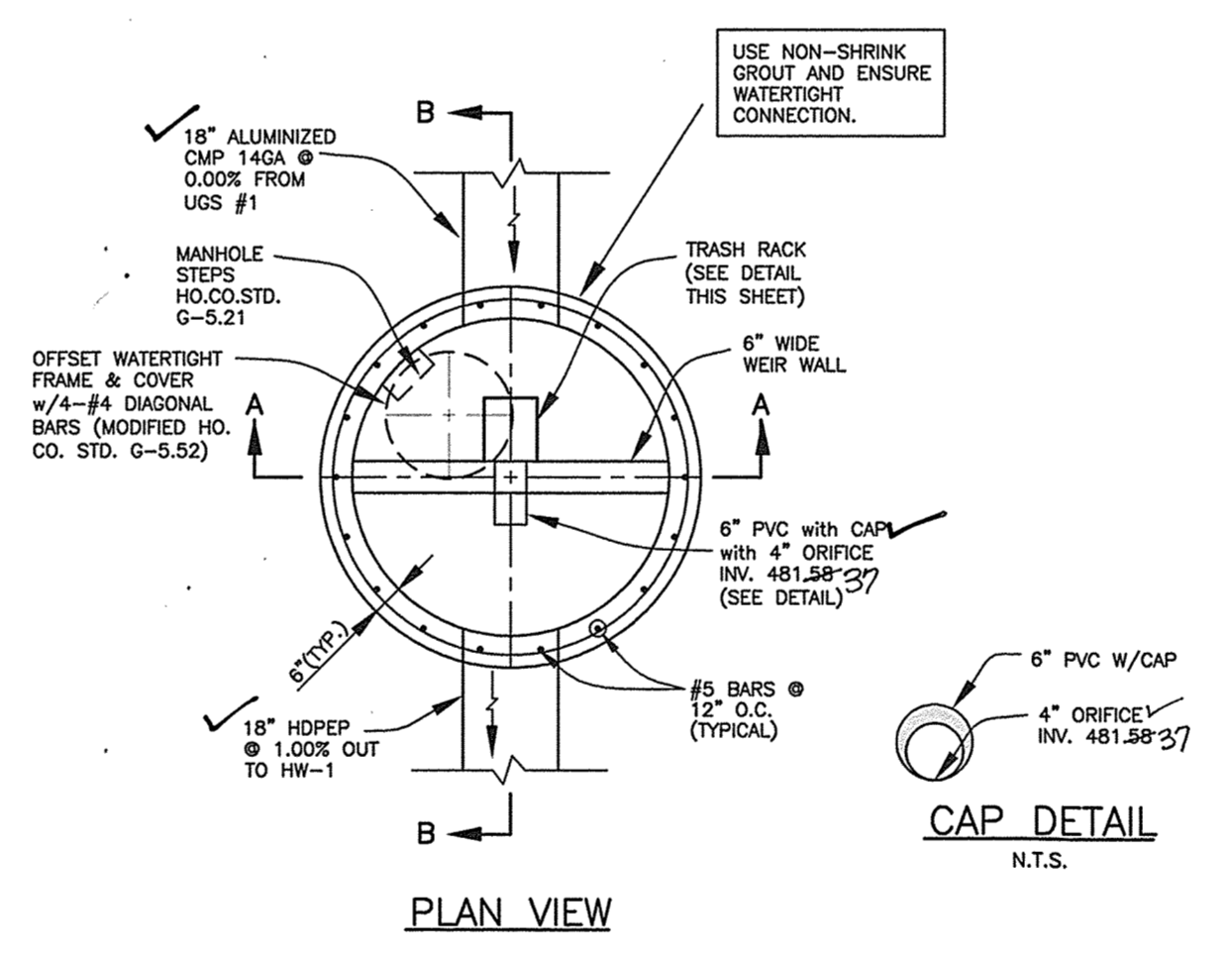
TYPICAL MANHOLE SLEEVE DETAIL
NOT TO SCALE



TYPICAL STEP DETAIL
NOT TO SCALE



TYPICAL ACCESS MANHOLE DETAIL
NOT TO SCALE

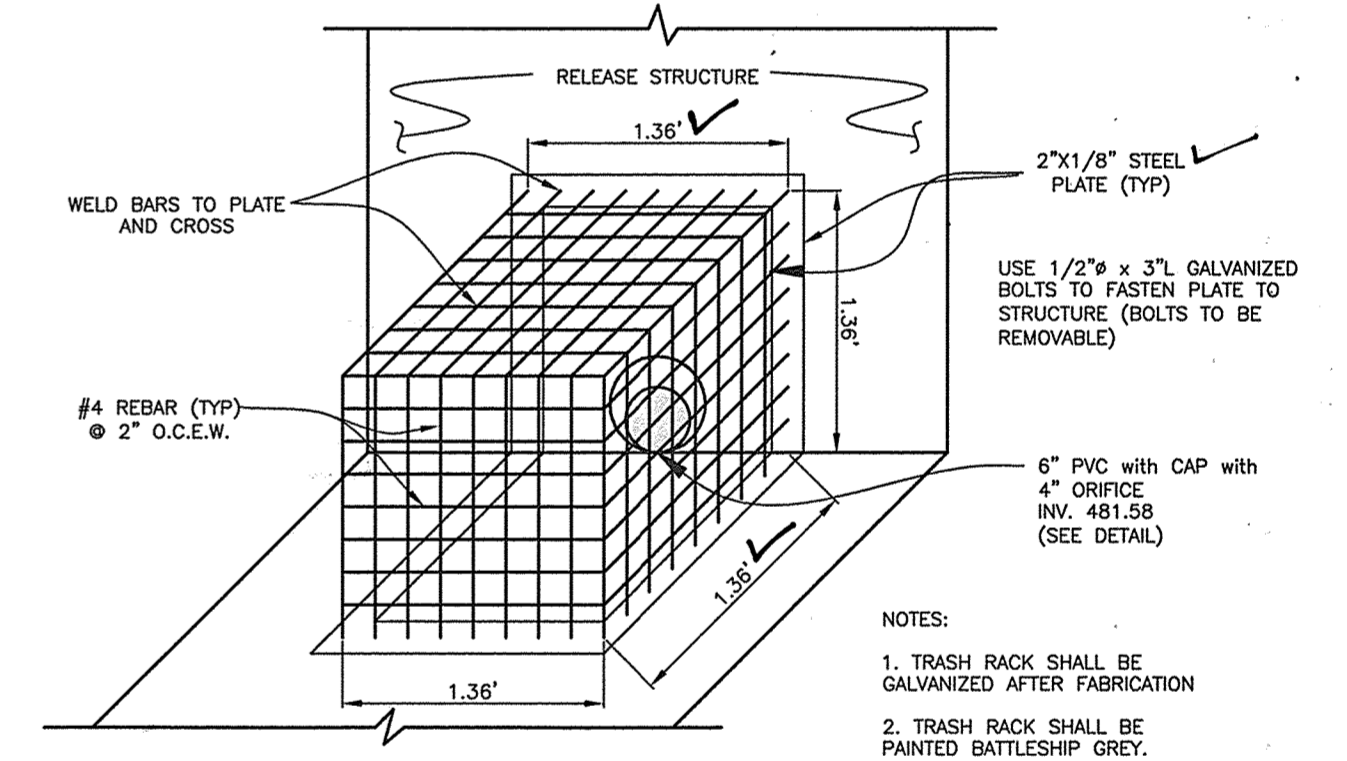


CAP DETAIL
N.T.S.

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E.
Date: 1/30/21

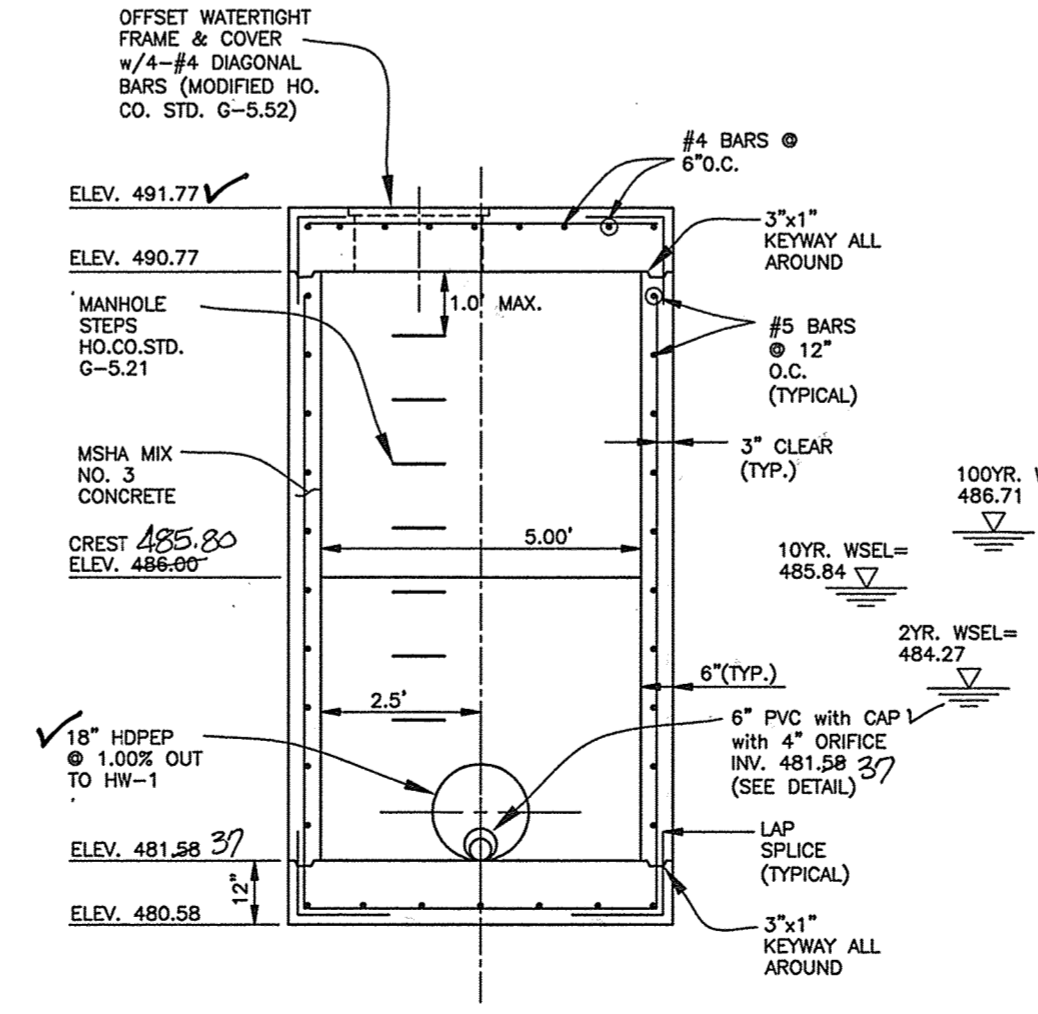
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-22



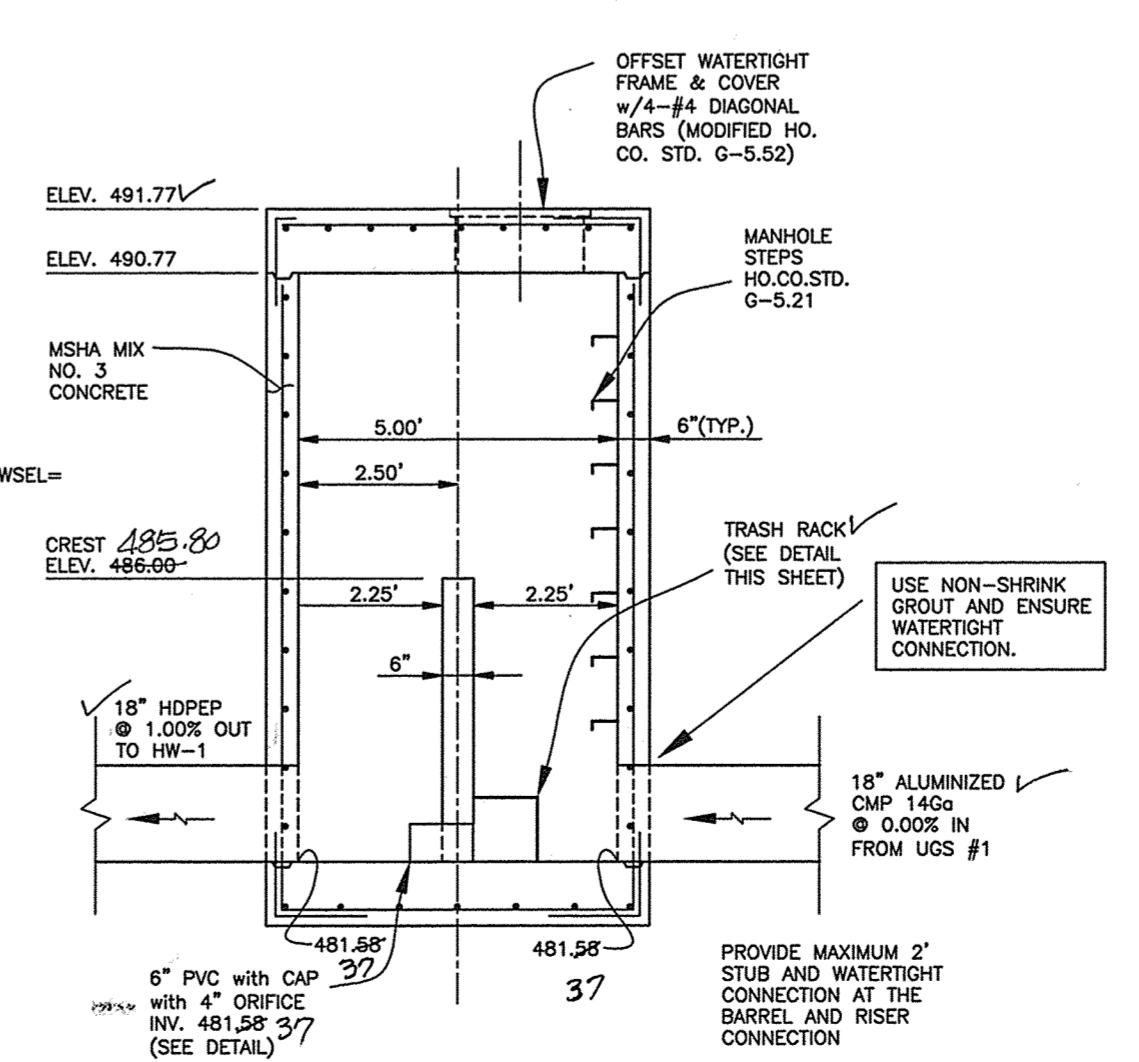
TRASH RACK DETAIL @ S-1
SCALE: 1" = 1'-0"

CONSTRUCTION SPECIFICATIONS

- A. BEDDING**
1. THE BED SHALL BE PLACED TO UNIFORM GRADE AND LINE TO ENSURE GOOD VERTICAL ALIGNMENT AND TO AVOID EXCESSIVE STRESSES AT PIPE JOINTS. THE BEDDING SHALL BE FREE OF ROCK FORMATIONS, PROTRUDING STONES, FROZEN LUMPS, ROOTS, AND FOREIGN MATERIAL. THE BEDDING FOUNDATION MUST BE A STABLE, WELL GRADED GRANULAR MATERIAL. ANY MATERIAL THAT HAS INADEQUATE BEARING CAPACITY MUST BE REMOVED AND REPLACED WITH A COMPACTED SELECT FILL APPROVED BY THE GEO-TECHNICAL ENGINEER.
- B. BACKFILL**
1. THE FILL MATERIAL SHALL BE FREE OF ROCKS, FROZEN LUMPS, AND FOREIGN MATTER THAT COULD CAUSE HARD SPOTS IN BACKFILL OR THAT COULD DECOMPOSE AND CREATE VOIDS.
 2. BACKFILL MATERIAL SHALL BE A WELL GRADED GRANULAR MATERIAL.
 3. HIGHLY PLASTIC SILTS, HIGHLY PLASTIC CLAYS, ORGANIC SILTS, ORGANIC CLAYS AND PEATS SHALL NOT BE USED AS BACKFILL MATERIAL.
 4. BACKFILL SHALL BE PLACED SYMMETRICALLY ON EACH SIDE OF THE STRUCTURE IN SIX-INCH TO EIGHT-INCH LOOSE LAYERS TO ONE FOOT ABOVE THE TOP OF THE PIPE. EACH LAYER IS TO BE COMPACTED TO THE SPECIFIED DENSITY (MINIMUM 80%) BEFORE PLACING THE NEXT LAYER. REFERENCE ASTM A798.
- C. PIPE**
1. THE PIPE FABRICATOR SHALL PROVIDE SPECIFICATIONS OF ALL MATERIALS (BASED ON HS25 LOADING).
 2. SHOP DRAWINGS ARE TO BE PROVIDED BY FABRICATOR. APPROVAL BY ENGINEER IS REQUIRED PRIOR TO CONSTRUCTION.
 3. CONTRACTOR IS REQUIRED TO COORDINATE APPROVAL OF SHOP DRAWINGS AND SPECIFICATIONS AND SHALL BE OBLIGATED FOR ANY COST THEREOF.
- D. GENERAL**
1. DEBRIS IS TO BE KEPT OUT OF THE FACILITY DURING AND AFTER CONSTRUCTION.



SECTION A-A FRONT VIEW



SECTION B-B SIDE VIEW

S-1 DETAIL
SCALE: 1" = 3'

NOTE: SEE GENERAL NOTE 34 ON SHEET 1 FOR DESIGN MANUAL WAIVER INFORMATION REGARDING THIS STRUCTURE.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION

4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT

4-4-19
DIRECTOR

NO.	DATE	REVISION

BENCHMARK ENGINEERS & PLANNERS, INC.
12165 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21043
410-465-6100 (F) 410-465-6844
WWW.BE-CIVILENGINEERING.COM

RIVER HILL SQUARE
REDEVELOPMENT OF RIVER HILL GARDEN CENTER
TAX MAP: 35 - GRID: 1 - PARCEL: 1
ZONED: B-1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

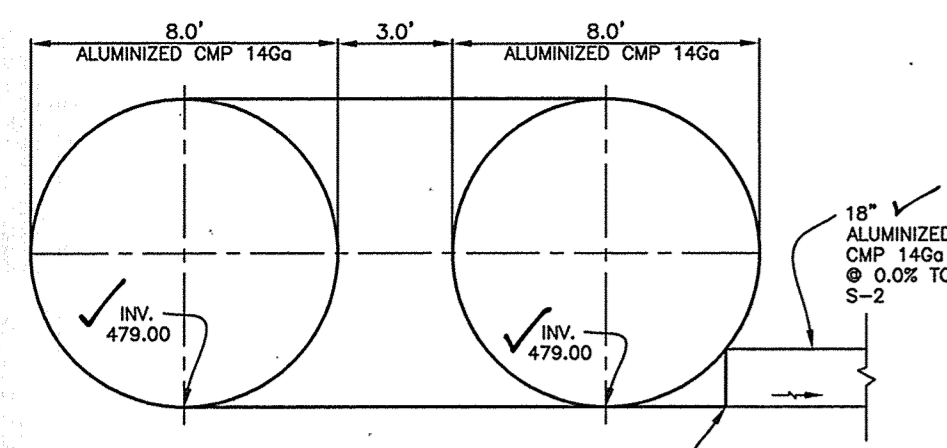
SWM DETAILS (UGS) UNDERGROUND FACILITY #1

OWNER: **STERHEN A. KLEIN & ASSOCIATES**
c/o STERHEN KLEIN, INC.
12165 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21043
410-465-4244

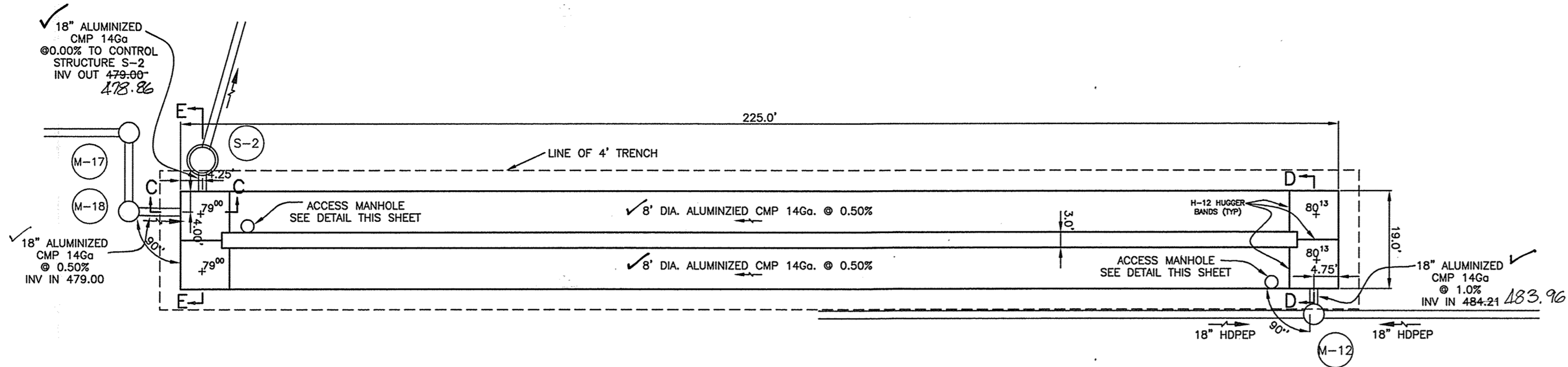
DEVELOPER/OWNER: **RIVER HILL SQUARE, LLC**
P.O. BOX 417
ELLCOTT CITY, MARYLAND 21041
410-465-4244

DATE: MARCH 4, 2019
SCALE: AS SHOWN

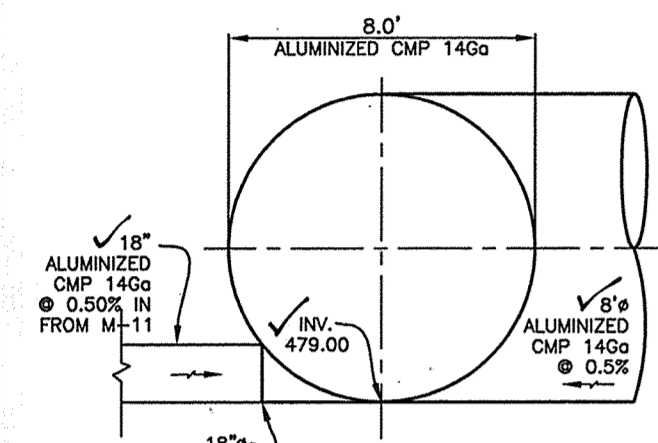
BEI PROJECT NO. 2801
SHEET 14 OF 25



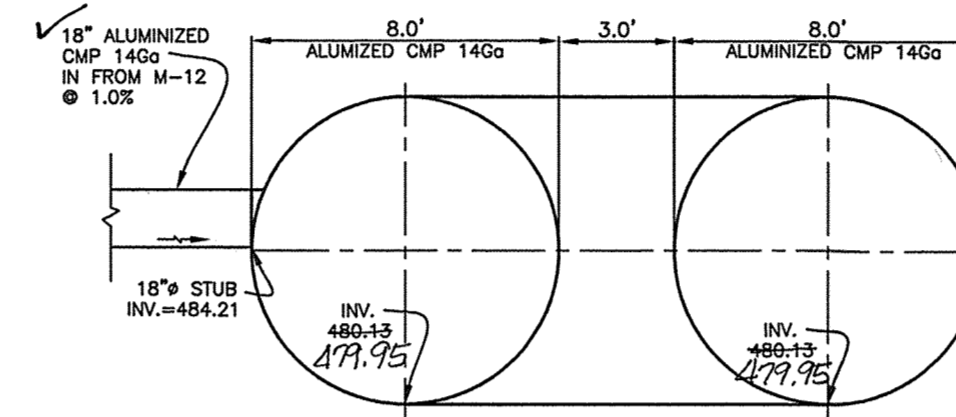
MANIFOLD DETAIL
SECTION E-E
SCALE: 1" = 5"



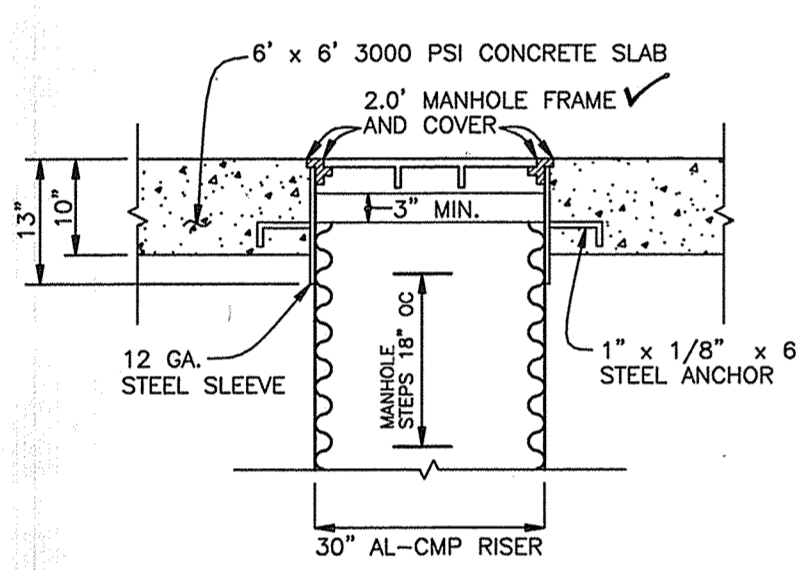
(UGS) UNDERGROUND FACILITY #2
PIPE LAYOUT PLAN
SCALE: 1" = 20'



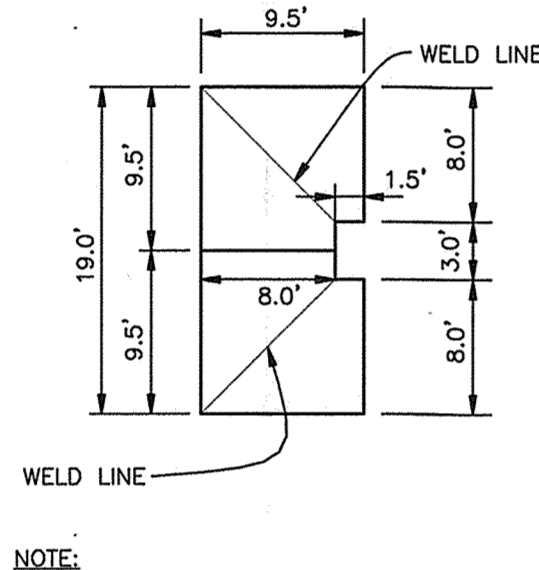
MANIFOLD DETAIL
SECTION C-C
SCALE: 1" = 5"



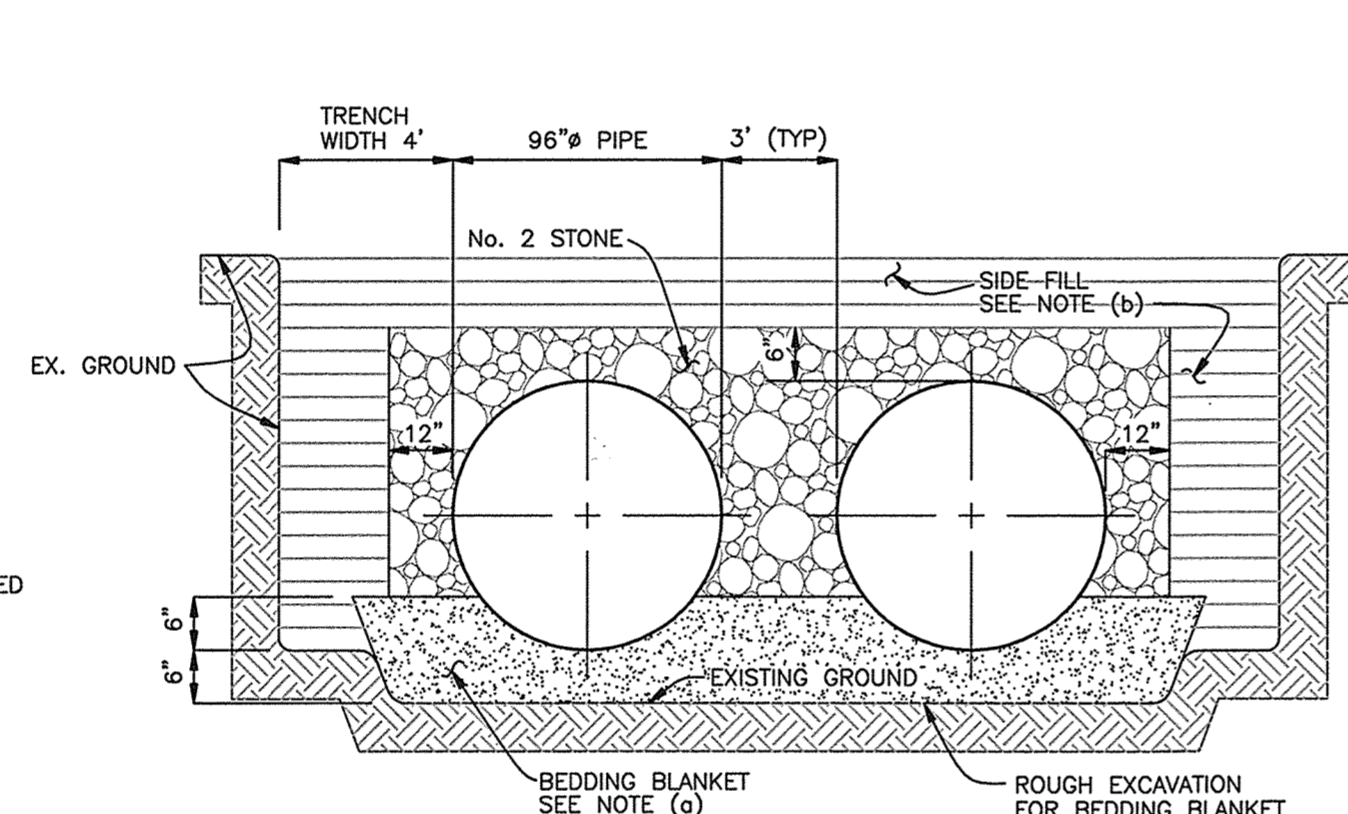
MANIFOLD DETAIL
SECTION D-D
SCALE: 1" = 5"



TYPICAL ALUMINIZED CMP RISER
MANHOLE SLEEVE DETAIL
NOT TO SCALE



TYPICAL ELBOW/TEE DETAIL
NOT TO SCALE

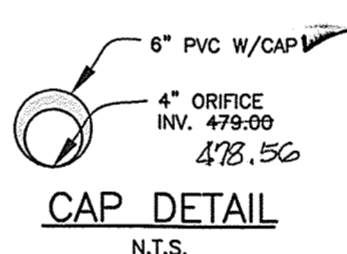
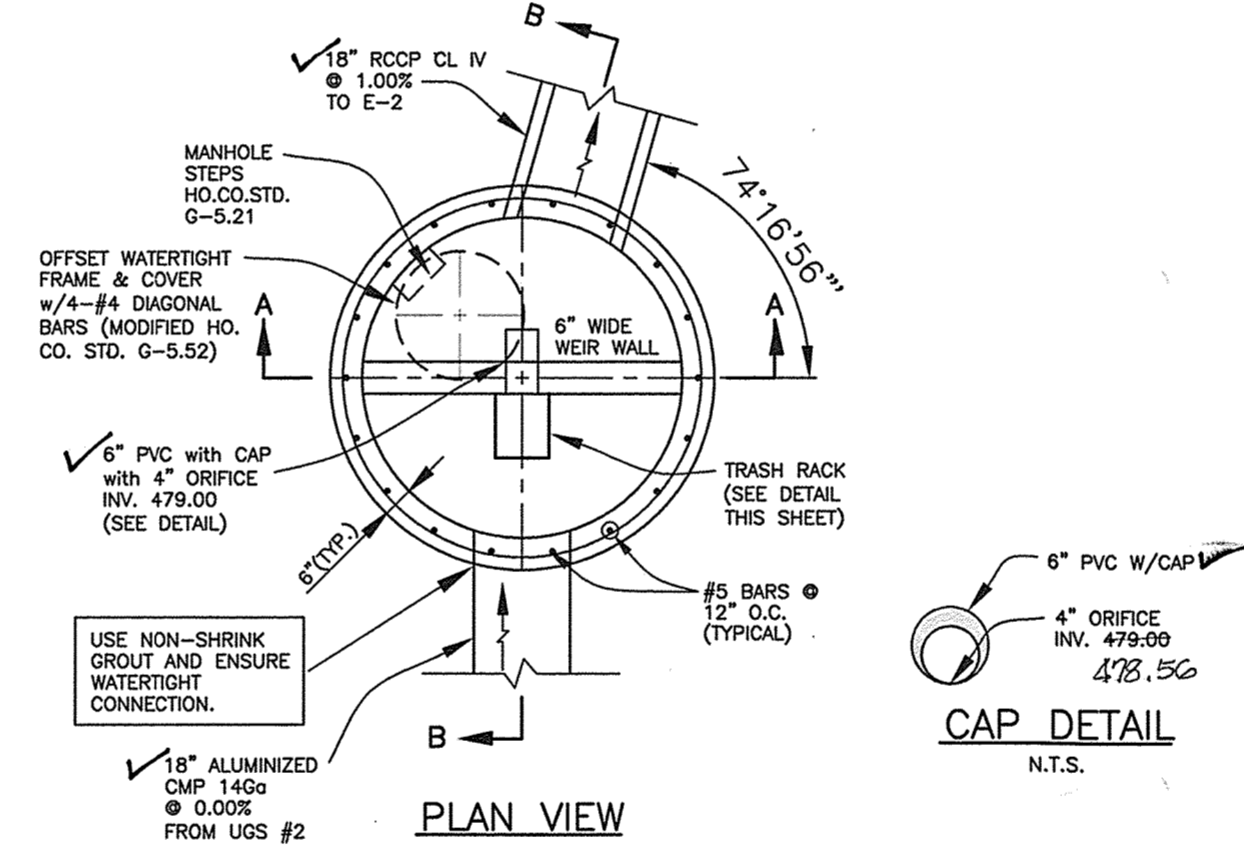


- NOTES
- BEDDING BLANKET OF LOOSE GRANULAR FILL ROUGHLY SHAPED TO FIT BOTTOM OF PIPE. MINIMUM THICKNESS BEFORE PLACING PIPE SHALL BE SIX INCHES.
 - SIDE FILL TO BE COMPACTED IN 6 TO 8 INCHES OF COMPACTED LAYERS. COMPACTION SHALL NOT BE LESS THAN 90% STANDARD PROCTOR DENSITY (AASHTO 199).

TYPICAL BEDDING AND BACKFILL DETAIL
NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

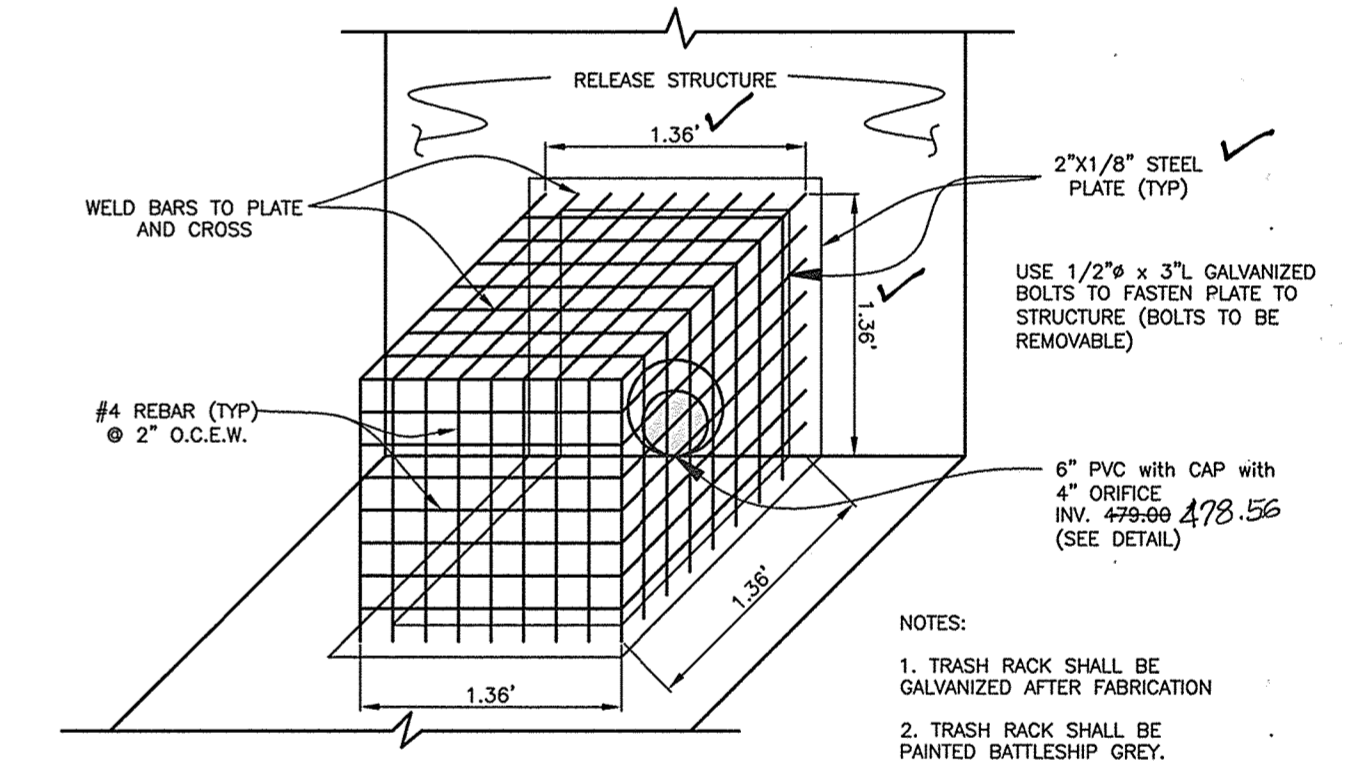
- BEDDING**
 - THE BED SHALL BE PLACED TO UNIFORM GRADE AND LINE TO ENSURE GOOD VERTICAL ALIGNMENT AND TO AVOID EXCESSIVE STRESSES AT PIPE JOINTS. THE BEDDING SHALL BE FREE OF ROCK FORMATIONS, PROTRUDING STONES, FROZEN LUMPS, ROOTS, AND FOREIGN MATERIAL. THE BEDDING FOUNDATION MUST BE A STABLE, WELL GRADED GRANULAR MATERIAL. ANY MATERIAL THAT HAS INADEQUATE BEARING CAPACITY MUST BE REMOVED AND REPLACED WITH A COMPACTED SELECT FILL APPROVED BY THE GEO-TECHNICAL ENGINEER.
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 - SHOP DRAWINGS ARE TO BE PROVIDED BY FABRICATOR. APPROVAL BY ENGINEER IS REQUIRED PRIOR TO CONSTRUCTION.
 - CONTRACTOR IS REQUIRED TO COORDINATE APPROVAL OF SHOP DRAWINGS AND SPECIFICATIONS AND SHALL BE OBLIGATED FOR ANY COST THEREOF.
- GENERAL**
 - DEBRIS IS TO BE KEPT OUT OF THE FACILITY DURING AND AFTER CONSTRUCTION.



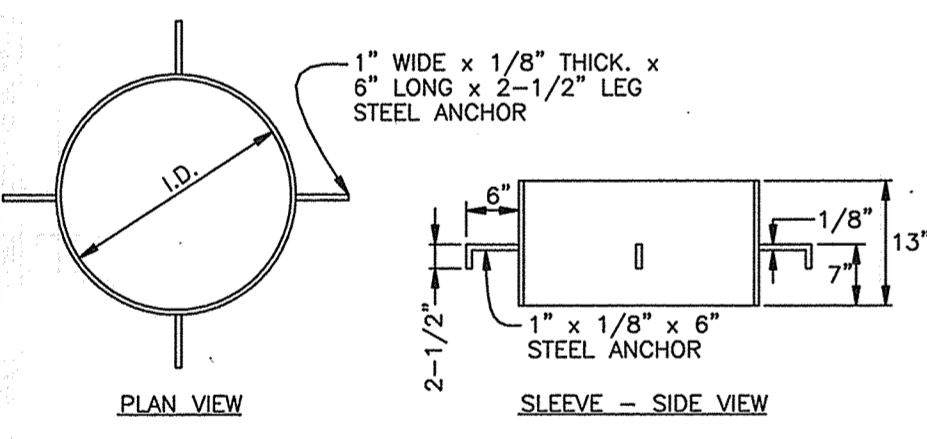
AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Donald Mason, P.E.
Date: 1/30/21



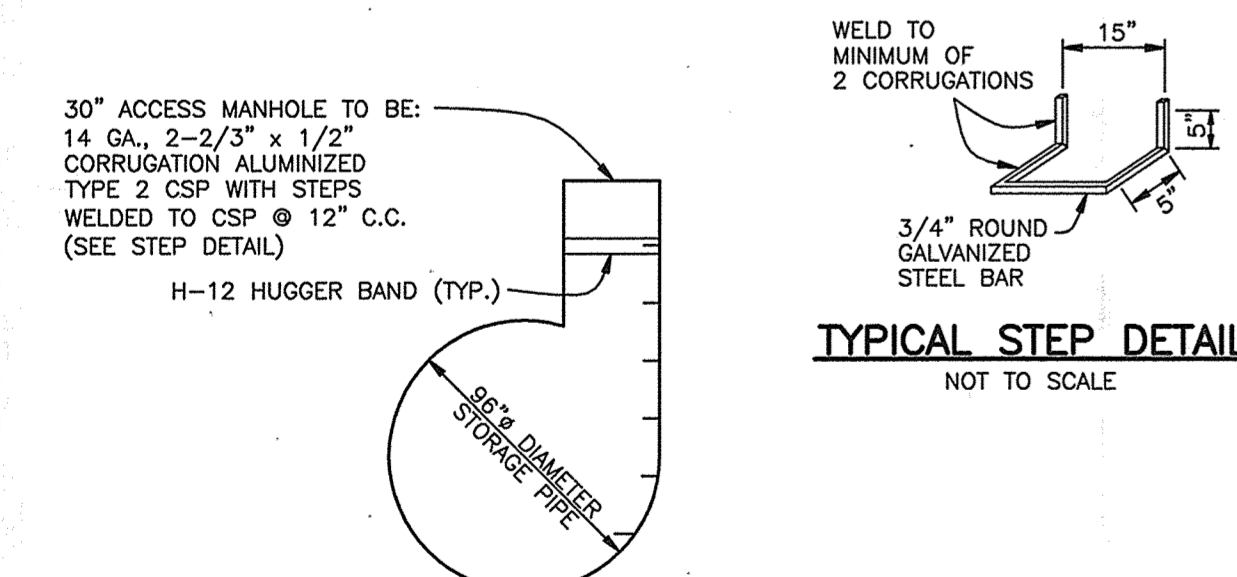
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-31-22



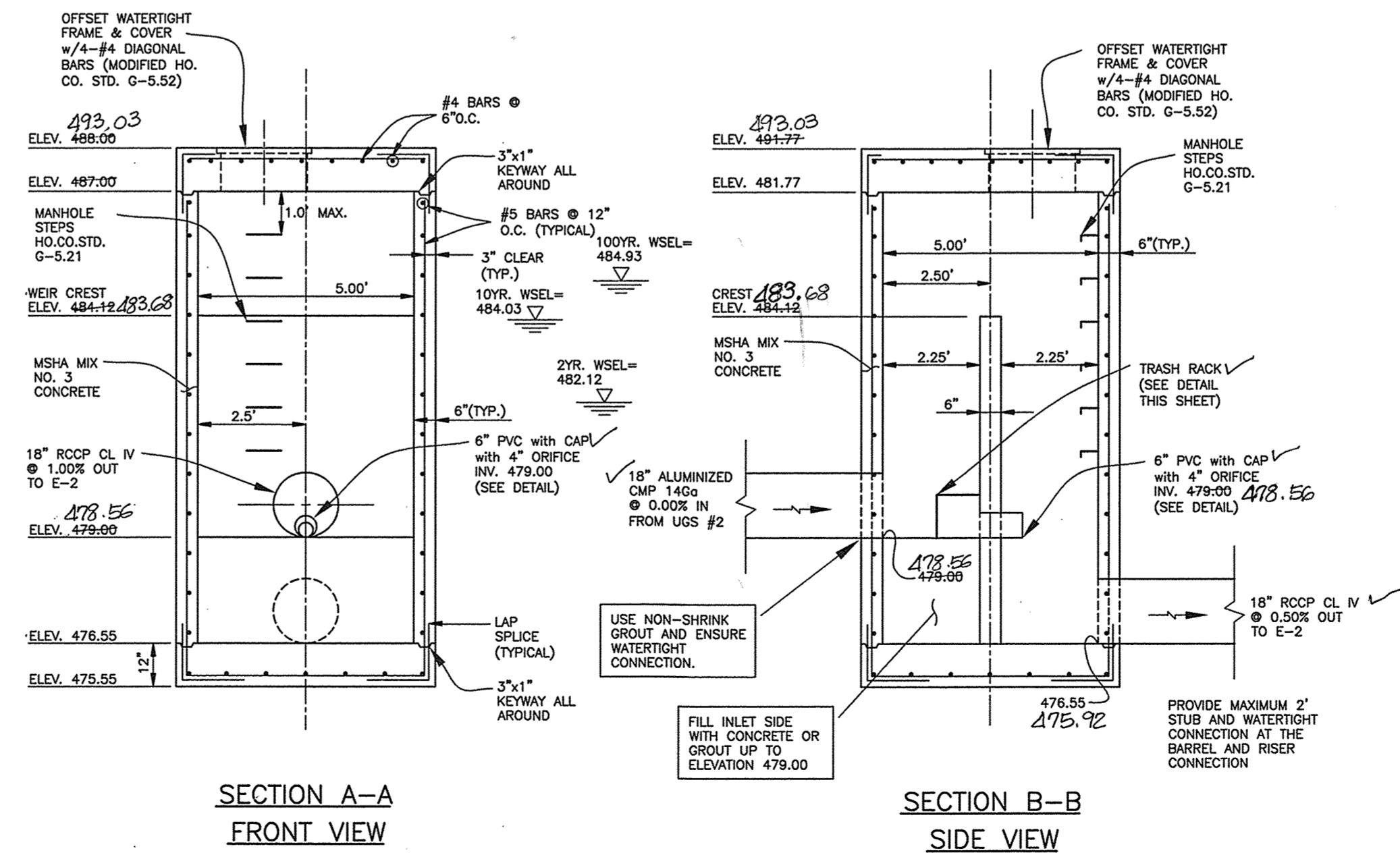
TRASH RACK DETAIL @ S-1
SCALE: 1" = 1'-0"



TYPICAL MANHOLE SLEEVE DETAIL
NOT TO SCALE



TYPICAL ACCESS MANHOLE DETAIL
NOT TO SCALE



SECTION A-A
FRONT VIEW

SECTION B-B
SIDE VIEW

S-2 DETAIL
SCALE: 1" = 3"

NOTE: SEE GENERAL NOTE 34 ON SHEET 1 FOR DESIGN MANUAL WAIVER INFORMATION REGARDING THIS STRUCTURE.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	4-2-19
<i>Howard County</i>	DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	7
<i>Stephen A. Klein</i>	DATE
CHIEF, DIVISION OF LAND DEVELOPMENT	4-4-19
<i>Valerie J. J. J.</i>	DATE
DIRECTOR	4-4-19

NO.	DATE	REVISION

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043
(P) 410-465-8100 (F) 410-465-6644
WWW.BED-CIVILENGINEERING.COM

OWNER: STEPHEN A. KLEIN & ASSOCIATES c/o STEPHEN A. KLEIN, INC. 12165 CHARTERS PIKE CLARKESVILLE, MARYLAND 21029 410-465-4244	DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELICOTT CITY, MARYLAND 21041 410-465-4244
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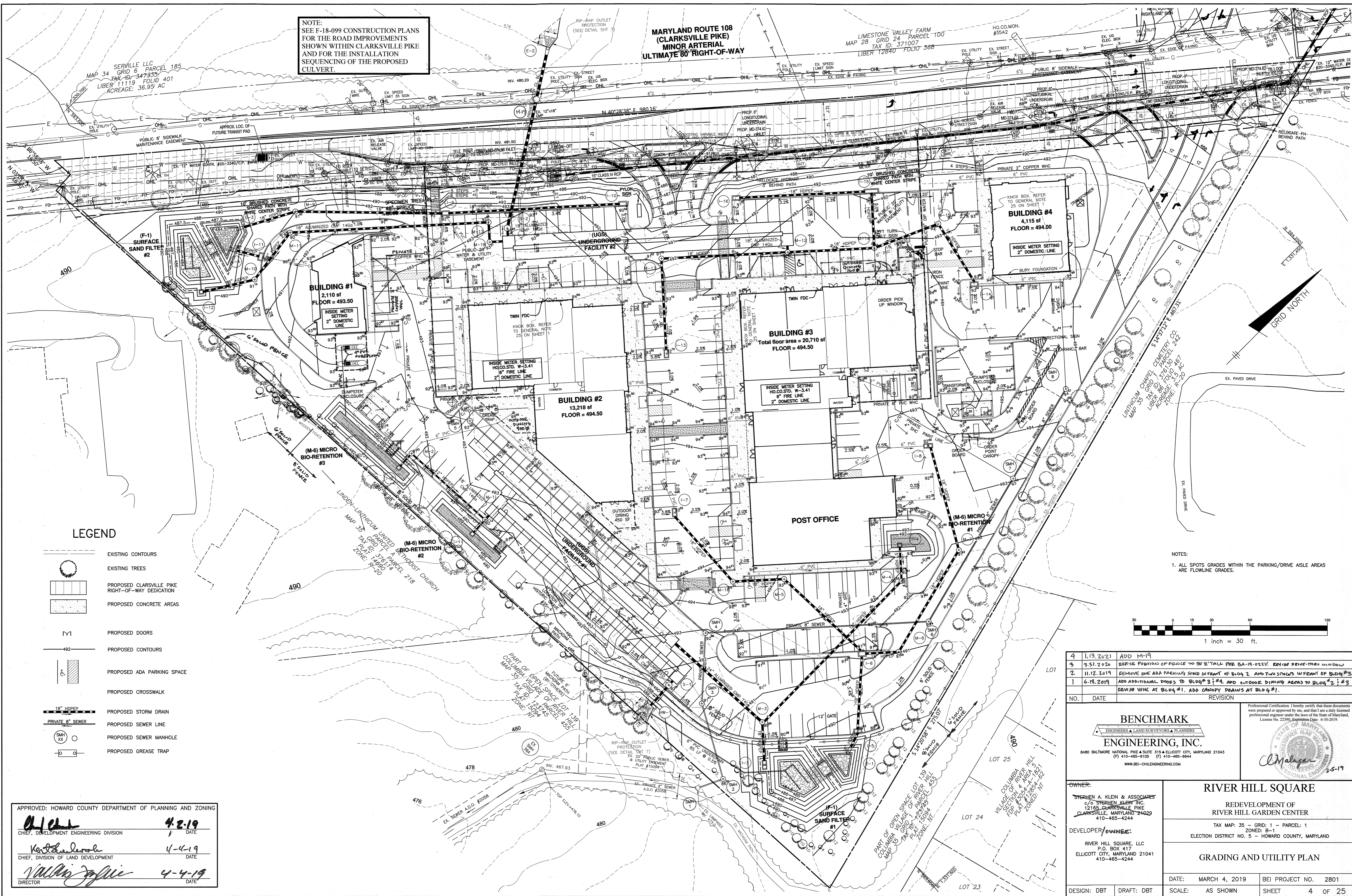
RIVER HILL SQUARE	
REDEVELOPMENT OF RIVER HILL GARDEN CENTER	
TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND	
SWM DETAILS (UGS) UNDERGROUND FACILITY #2	
DATE: MARCH 4, 2019	BEI PROJECT NO.: 2801
DESIGN: DBT	DRAFT: DBT
SCALE: AS SHOWN	SHEET 15 OF 25

NOTE:
SEE F-18-099 CONSTRUCTION PLANS
FOR THE ROAD IMPROVEMENTS
SHOWN WITHIN CLARKSVILLE PIKE
AND FOR THE INSTALLATION
SEQUENCING OF THE PROPOSED
CULVERT.

MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 700
TAX ID: 371007
LIBER 12840 FOLIO 388

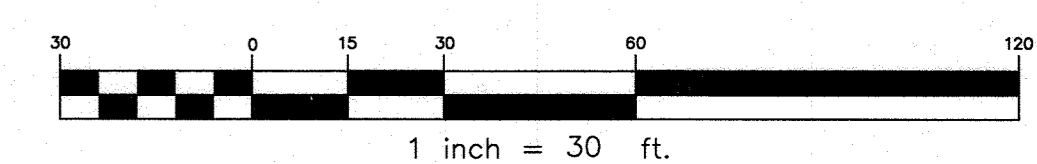
SERVILLE LLC
GRID 6 PARCEL 185
TAX ID: 347335
LIBER 11119 FOLIO 401
ACREAGE: 36.95 AC



LEGEND

- EXISTING CONTOURS
- EXISTING TREES
- PROPOSED CLARKSVILLE PIKE RIGHT-OF-WAY DEDICATION
- PROPOSED CONCRETE AREAS
- PROPOSED DOORS
- PROPOSED CONTOURS
- PROPOSED ADA PARKING SPACE
- PROPOSED CROSSWALK
- PROPOSED STORM DRAIN
- PROPOSED SEWER LINE
- PROPOSED SEWER MANHOLE
- PROPOSED GREASE TRAP

NOTES:
1. ALL SPOTS GRADES WITHIN THE PARKING/DRIVE AISLE AREAS ARE FLOWLINE GRADES.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Howard 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Kent 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Val 4-4-19
DIRECTOR DATE

NO.	DATE	REVISION
4	1.13.2021	ADD M-19
3	9.31.2020	REVISE POSITION OF PEOPLE TO BE 8" TALL PER BA-19-022Y. REVISE DRIVE-THRU WINDOW
2	11.12.2019	REMOVE ONE ADA PARKING SPACE IN FRONT OF BLDG 2 AND TWO SPACES IN FRONT OF BLDG #3
1	4.18.2019	ADD ADDITIONAL DOORS TO BLDG #3 & #4. ADD OUTDOOR DINING AREAS TO BLDG #2 & #3. REVISE WHC AT BLDG #1. ADD CANOPY DECKS AT BLDG #1.

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE SUITE 315 & ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BE-CVLENGINEERING.COM

Professional Certification I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22390, Expiration Date: 6-30-2019.

Almalagan 3-5-19

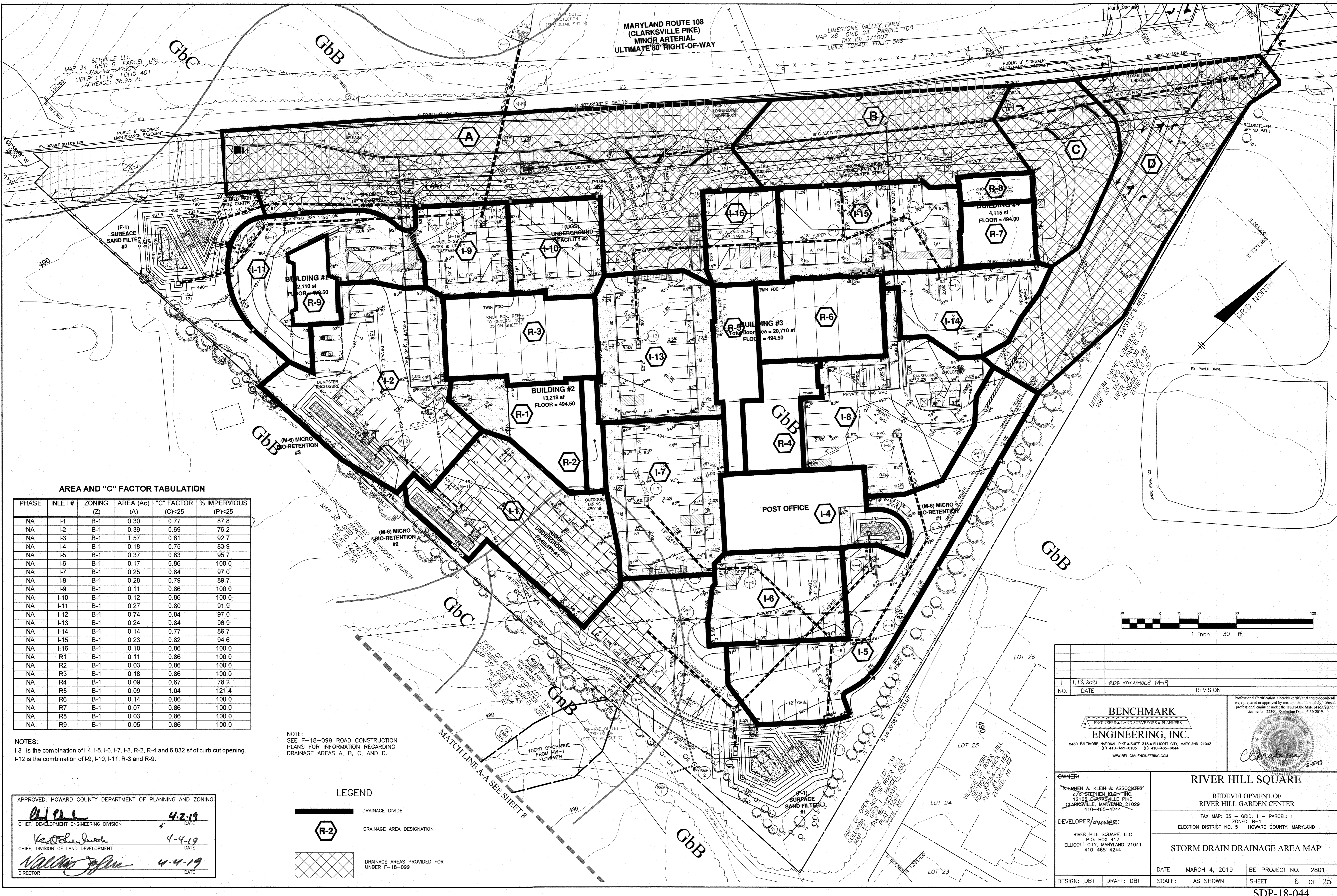
OWNER:
STERHEN A. KLEIN & ASSOCIATES
C/O STERHEN KLEIN, INC.
12185 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21029
410-465-4244

DEVELOPER/OWNER:
RIVER HILL SQUARE, LLC
P.O. BOX 417
ELLICOTT CITY, MARYLAND 21041
410-465-4244

RIVER HILL SQUARE
REDEVELOPMENT OF
RIVER HILL GARDEN CENTER
TAX MAP: 35 - GRID: 1 - PARCEL: 1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

GRADING AND UTILITY PLAN

DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN SHEET 4 OF 25



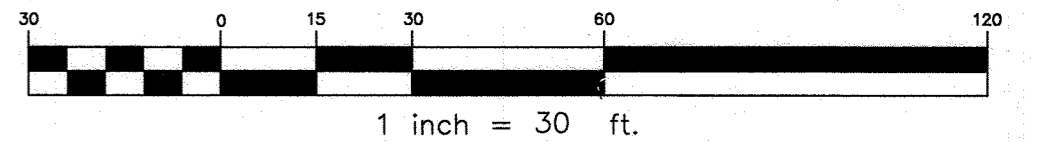
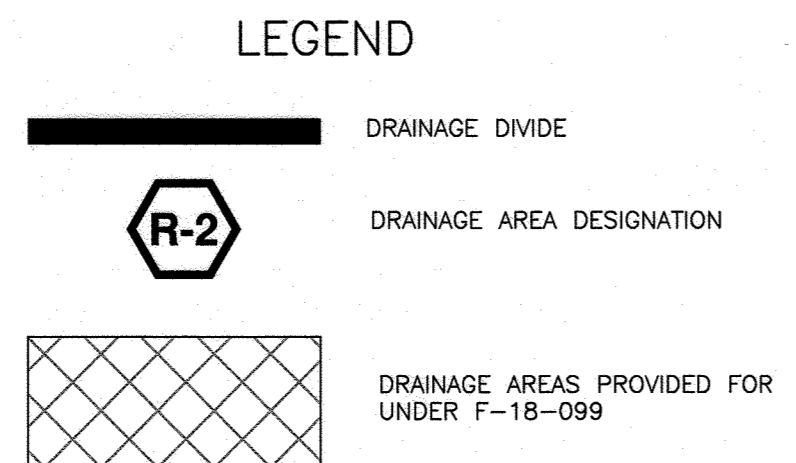
AREA AND "C" FACTOR TABULATION

PHASE	INLET #	ZONING (Z)	AREA (Ac) (A)	"C" FACTOR (C)>25 (C)<25	% IMPERVIOUS (P)>25 (P)<25
NA	I-1	B-1	0.30	0.77	87.8
NA	I-2	B-1	0.39	0.69	76.2
NA	I-3	B-1	1.57	0.81	92.7
NA	I-4	B-1	0.18	0.75	83.9
NA	I-5	B-1	0.37	0.83	95.7
NA	I-6	B-1	0.17	0.86	100.0
NA	I-7	B-1	0.25	0.84	97.0
NA	I-8	B-1	0.28	0.79	89.7
NA	I-9	B-1	0.11	0.86	100.0
NA	I-10	B-1	0.12	0.86	100.0
NA	I-11	B-1	0.27	0.80	91.9
NA	I-12	B-1	0.74	0.84	97.0
NA	I-13	B-1	0.24	0.84	96.9
NA	I-14	B-1	0.14	0.77	86.7
NA	I-15	B-1	0.23	0.82	94.6
NA	I-16	B-1	0.10	0.86	100.0
NA	R1	B-1	0.11	0.86	100.0
NA	R2	B-1	0.03	0.86	100.0
NA	R3	B-1	0.18	0.86	100.0
NA	R4	B-1	0.09	0.67	78.2
NA	R5	B-1	0.09	1.04	121.4
NA	R6	B-1	0.14	0.86	100.0
NA	R7	B-1	0.07	0.86	100.0
NA	R8	B-1	0.03	0.86	100.0
NA	R9	B-1	0.05	0.86	100.0

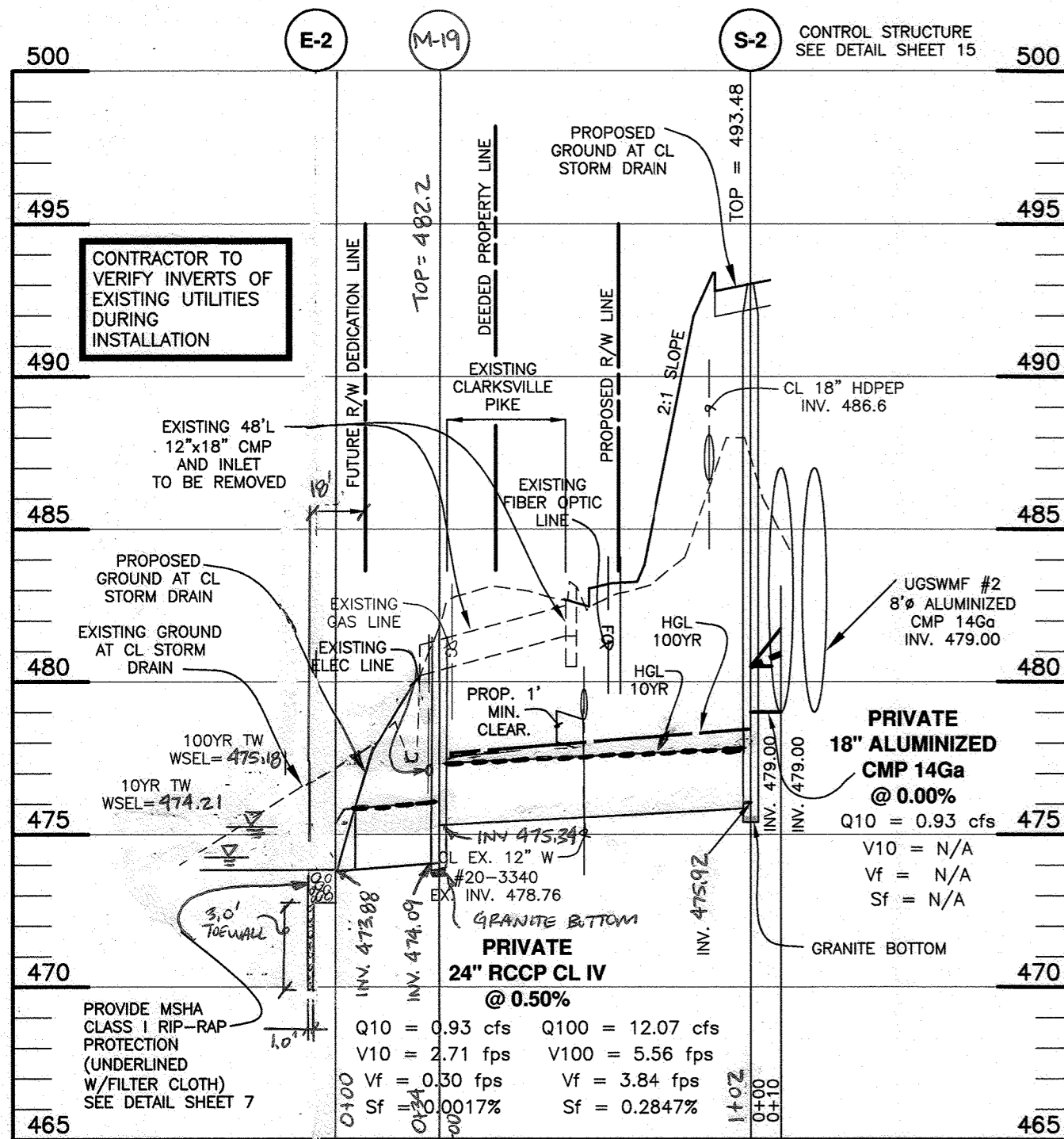
NOTES:
 I-3 is the combination of I-4, I-5, I-6, I-7, I-8, R-2, R-4 and 6,832 sf of curb cut opening.
 I-12 is the combination of I-9, I-10, I-11, R-3 and R-9.

NOTE:
 SEE F-18-099 ROAD CONSTRUCTION PLANS FOR INFORMATION REGARDING DRAINAGE AREAS A, B, C, AND D.

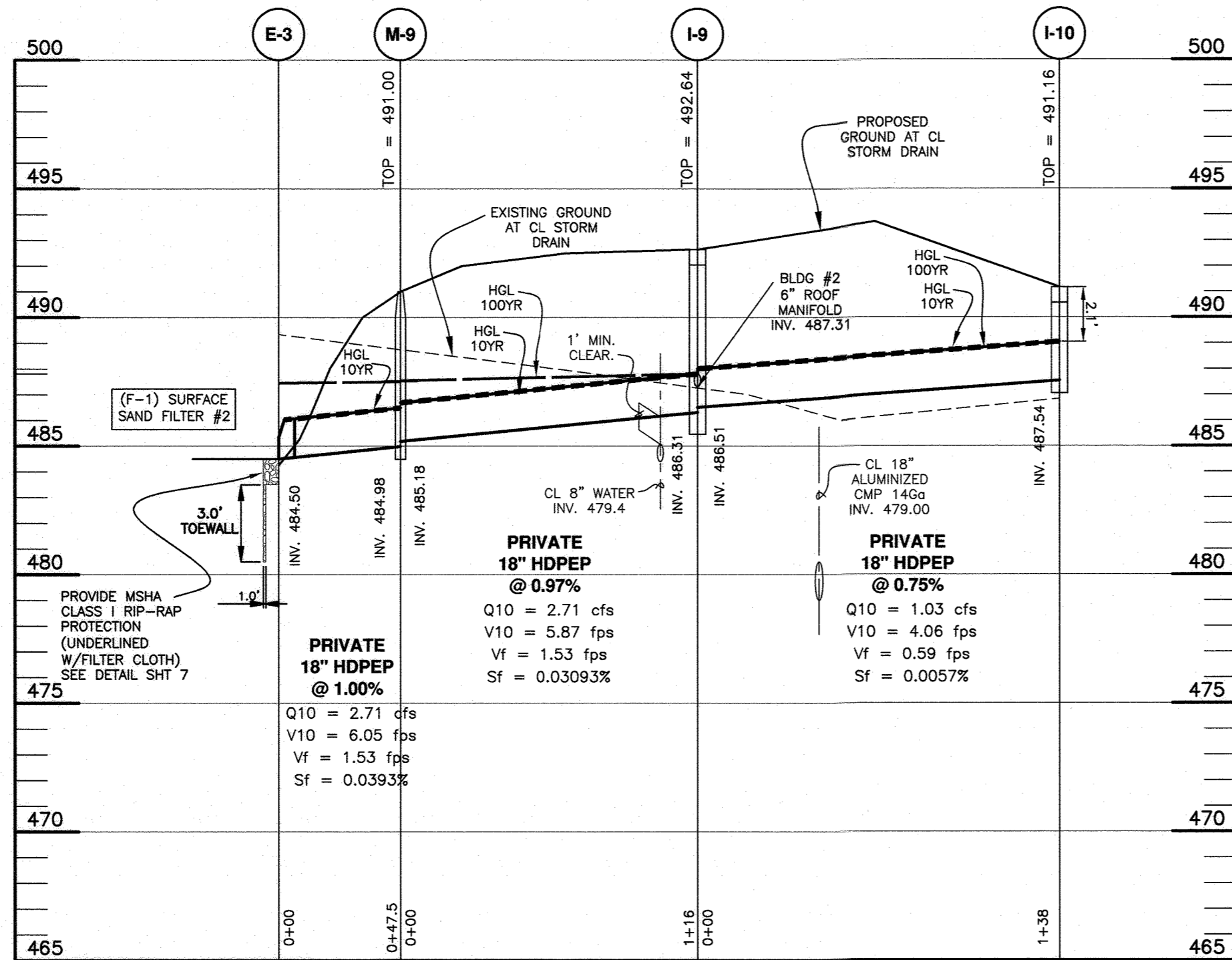
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4-2-19
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 [Signature] 4-4-19
 CHIEF, DIVISION OF LAND DEVELOPMENT
 [Signature] 4-4-19
 DIRECTOR



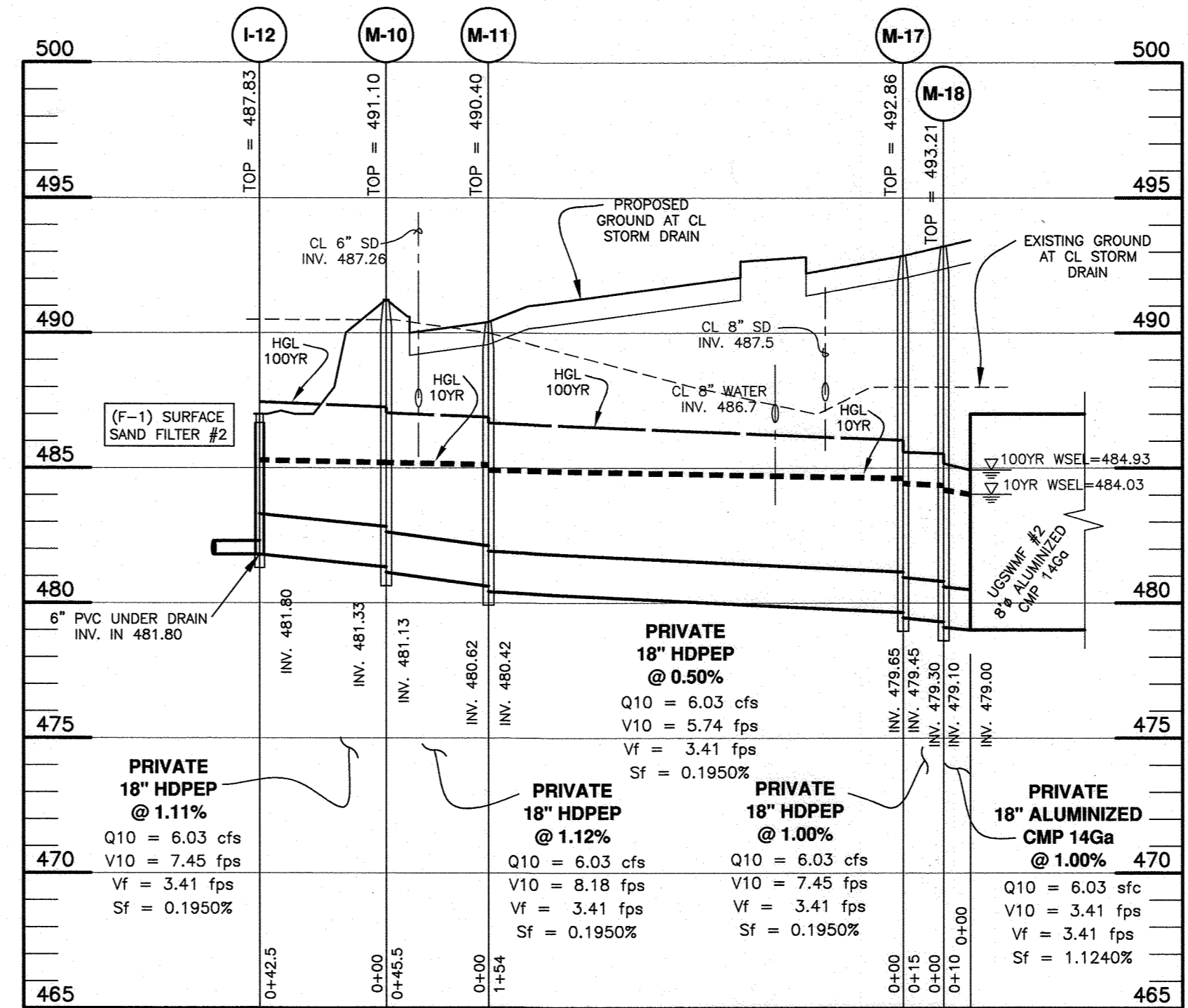
1 1.13.2021 ADD MANHOLE M-19		REVISION
<p align="center">BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS 8480 BALTIMORE NATIONAL PIKE SUITE 315 & ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BEI-CIVILENGINEERING.COM</p>		
<p>OWNER: STEPHEN A. KLEIN & ASSOCIATES C/O STEPHEN KLEIN, INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244</p>		<p align="center">RIVER HILL SQUARE</p> <p align="center">REDEVELOPMENT OF RIVER HILL GARDEN CENTER</p> <p align="center">TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>
<p>DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244</p>		
DESIGN: DBT	DRAFT: DBT	<p>DATE: MARCH 4, 2019 BEI PROJECT NO. 2801 SCALE: AS SHOWN SHEET 6 OF 25</p>



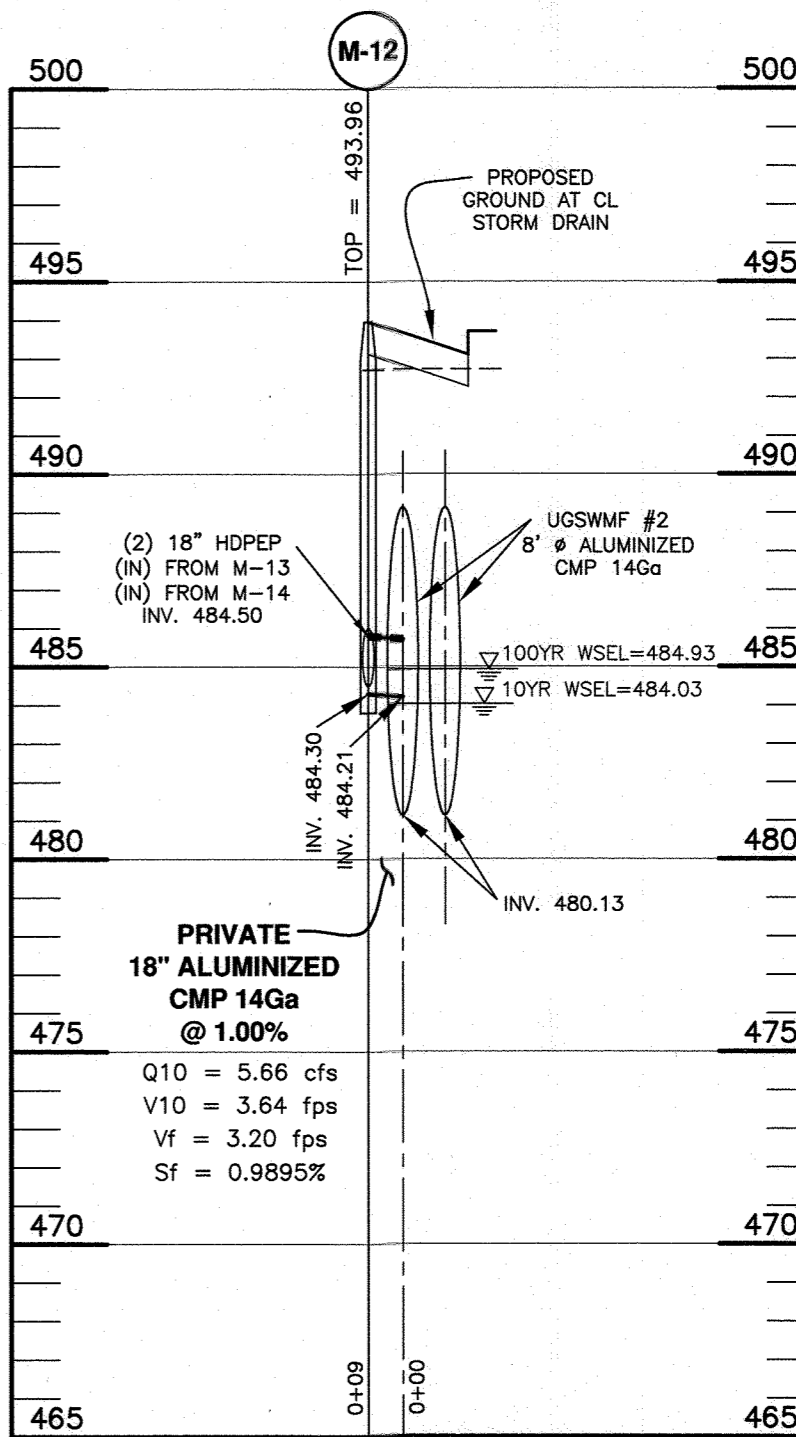
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



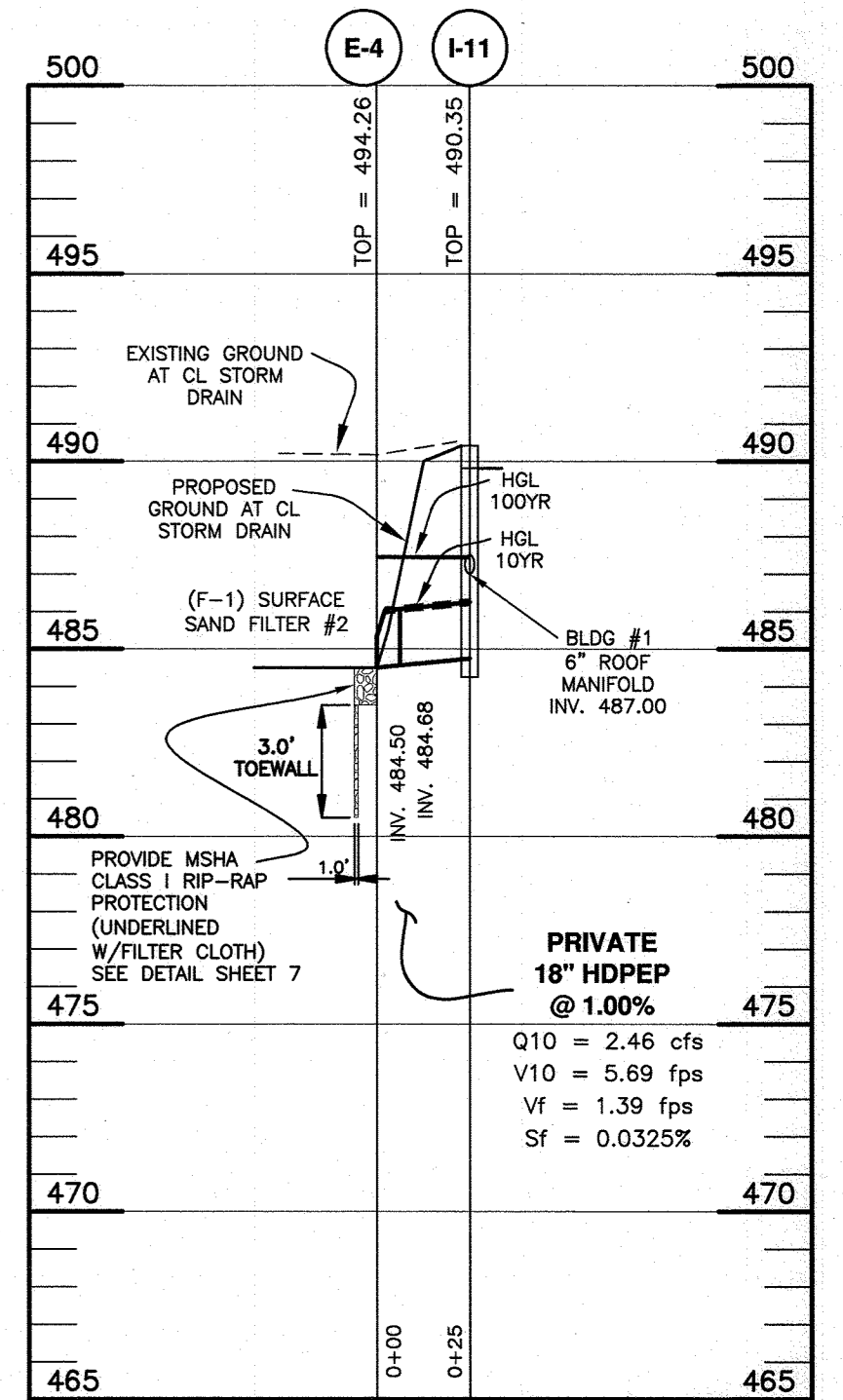
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



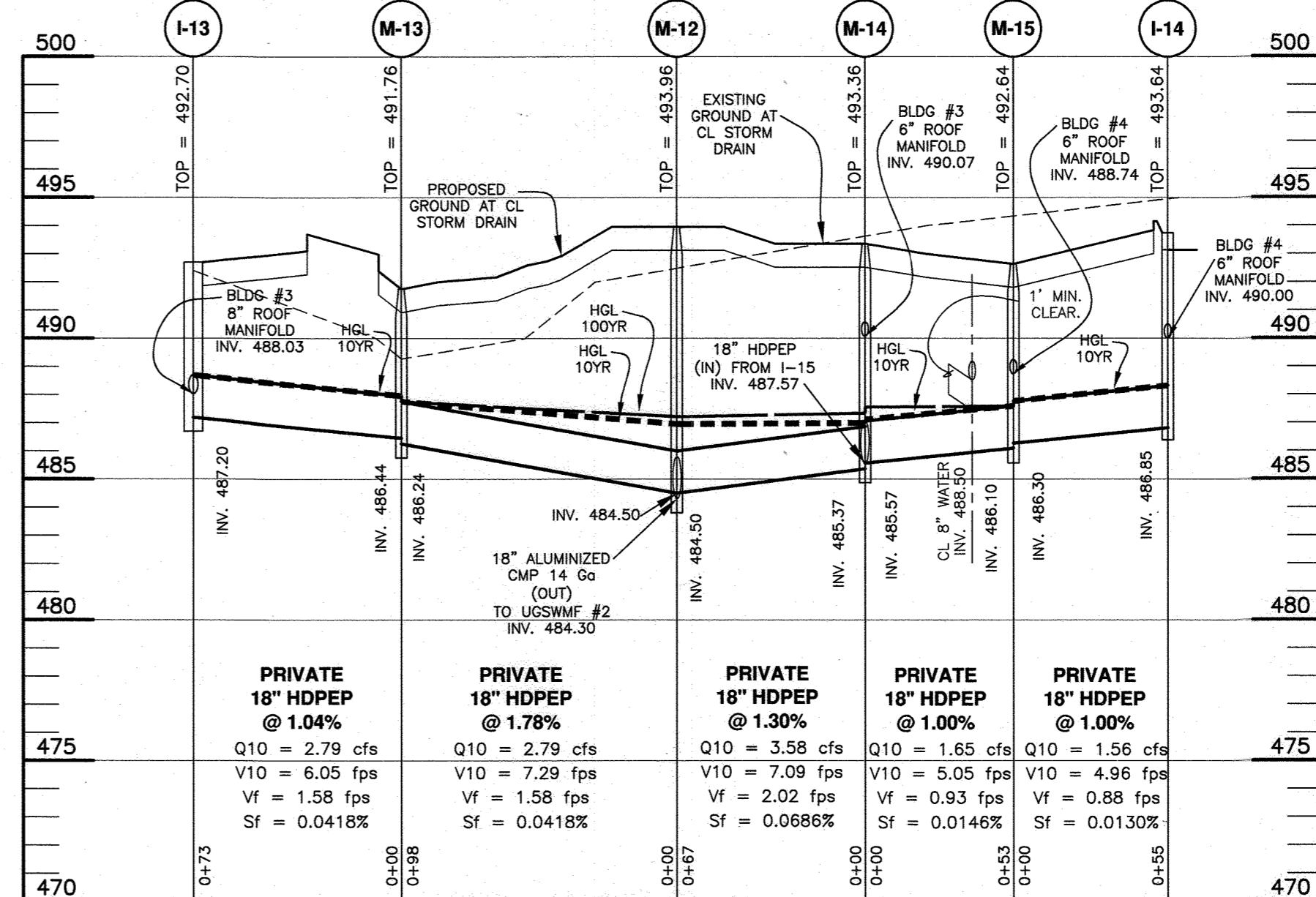
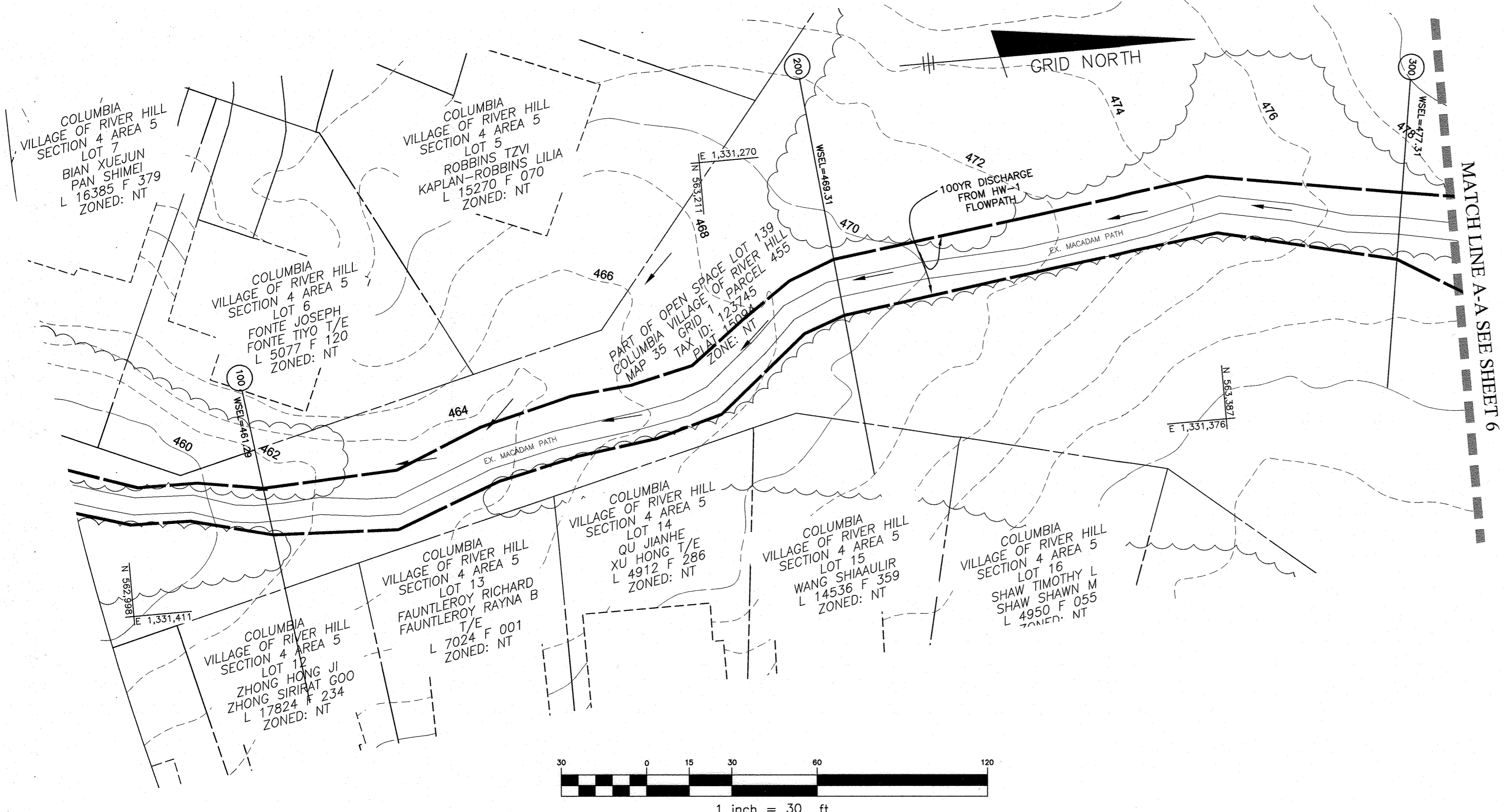
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



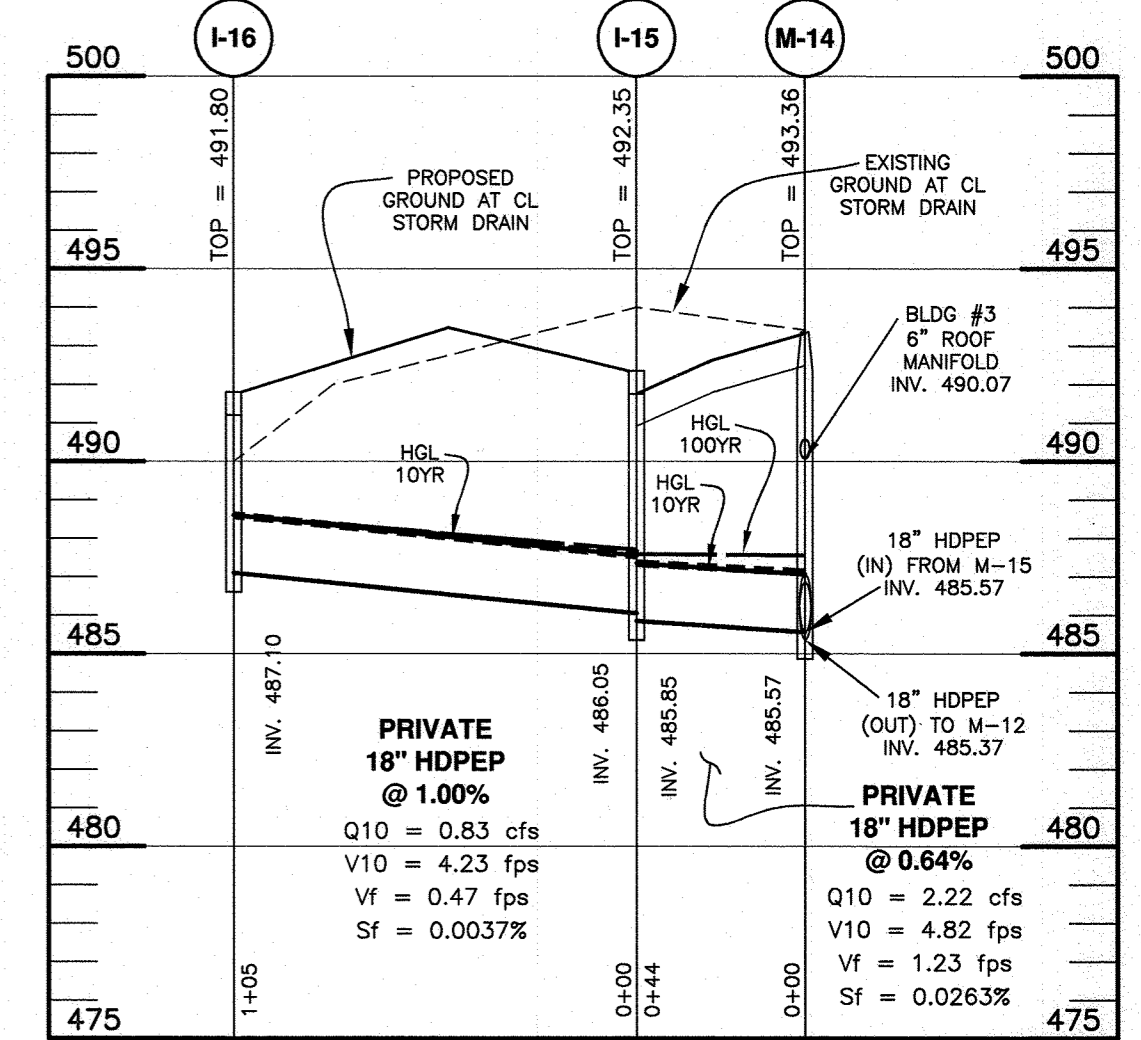
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



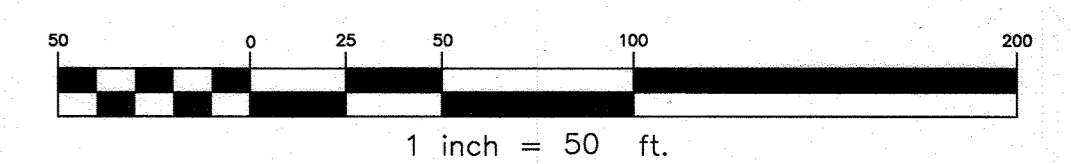
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 4-4-19
DIRECTOR DATE

1 1.12.2021 REVISE PROFILE FROM E-2 TO S-2 TO ADD MANHOLE M-19 NO. DATE REVISION	
BENCHMARK ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BEI-CIVILENGINEERING.COM	
PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22399, Expiration Date: 6-30-2019.	
OWNER: STEPHEN A. KLEIN & ASSOCIATES c/o STEPHEN KLEIN, INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244	
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244	
RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND	
STORM DRAIN PROFILES	
DESIGN: DBT	DRAFT: DBT
DATE: MARCH 4, 2019	BEI PROJECT NO. 2801
SCALE: AS SHOWN	SHEET 8 OF 25

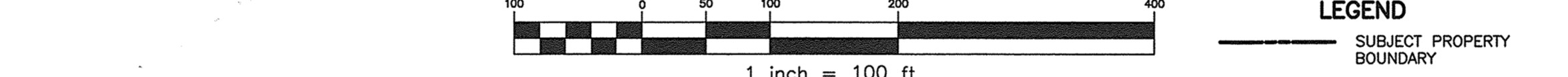
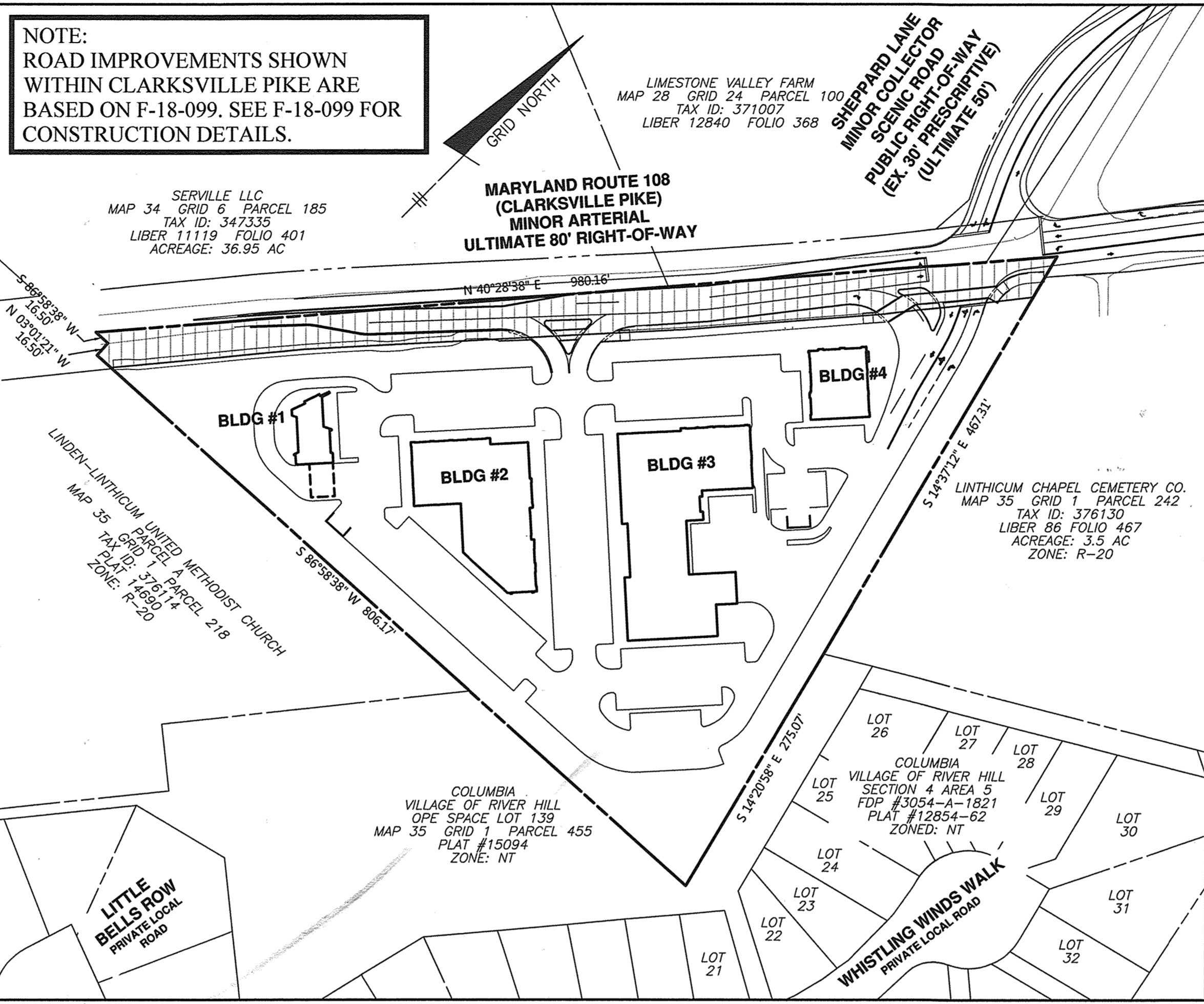
GENERAL NOTES

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLMS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
3. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
... (Notes 1-33) ...

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[Signature] 4-2-19 DATE
[Signature] 4-4-19 DATE
[Signature] 4-4-19 DATE

- a) THE VARIANCE SHALL ONLY APPLY TO THE FENCE.
b) SDP-18-044 IS REDLINED TO SHOW THE FENCE
c) A REFERENCE TO BA-19-022V IS ADDED TO THE GENERAL NOTES.
d) PETITIONER OBTAINS ALL NECESSARY PERMITS.

COMMERCIAL SITE DEVELOPMENT PLAN
RIVER HILL SQUARE



Stormwater Management Information table with columns: Lot/Parcel, Facility Name & Number, Practice Type (Quantity), Public, Private, HOA Maintains, Misc.

Stormwater Management Summary Table - Quantity Analysis table with columns: Study Point, Condition @ Study point, Q2-yr (cfs), Q10-yr (cfs), Q100-yr (cfs).

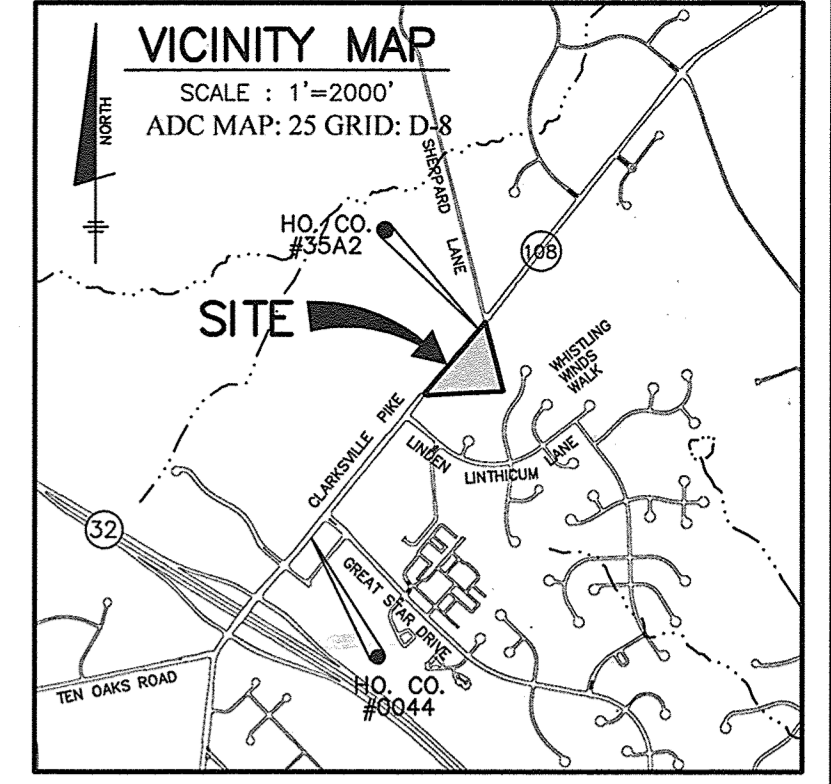
Stormwater Management Summary Table table with columns: Practice, Drainage Area (sf), Impervious Area (sf), % Imp, Rv, Pe, ESDv Required (cf), ESDv Provided (cf), Pe Provided, Rev Required (cf), Rev Provided (cf), Ownership.

Redevelopment Summary table with columns: Existing, New, Total. Rows for Impervious Area On-Site (sf), Impervious Area Required to be treated (sf), Total Impervious Area Treated (sf).

Notes:
1. The Pe required for Surface Sand Filter #2 is weighted based on 0.32 acres of new impervious at a Pe of 2.6'
2. The total ESDV provided exceeds the total ESDV Required.
3. The REV is being provided for in the stone chambers below the facilities.

BENCH MARKS (NAD83)

HO. CO. No. 0044 ELEV. 484.477
STAMPED BRASS DISK SET ON TOP OF CONCRETE (3" DEEP) COLUMN.
... (Benchmark details) ...



FOREST CONSERVATION WORKSHEET VERSION 1.0 (Enter in Yellow Cells)

Table with rows: NET TRACT AREA, A. Total tract area, B. Area within 100 year floodplain, C. Area to remain in agricultural production, D. Net tract area.

Table with rows: LAND USE CATEGORY, Input the number "1" under the appropriate land use zoning, and E. Afforestation Threshold, F. Conservation Threshold.

Table with rows: EXISTING FOREST COVER, G. Existing forest cover (excluding floodplain), H. Area of forest above afforestation threshold, I. Area of forest above conservation threshold.

Table with rows: BREAK EVEN POINT (BEP), J. Forest retention above threshold with no mitigation (BEP), K. Clearing permitted without mitigation.

Table with rows: PROPOSED FOREST CLEARING, L. Total area of forest to be cleared, M. Total area of forest to be retained.

Table with rows: PLANTING REQUIREMENTS, N. Reforestation for clearing above conservation threshold, P. Reforestation for clearing below conservation threshold, Q. Credit for retention above conservation threshold, R. Total reforestation required, S. Total afforestation required, T. Total reforestation and afforestation required.

* Total tract area equals difference between existing on-site impervious area and proposed on-site limit of disturbance. See General Note #23.

SHEET INDEX table with columns: NO., DESCRIPTION. Lists sheets 1 through 25 including Title Sheet, Site Development Layout and Dimension Plan, Grading & Utility Plan, etc.

ADDRESS CHART table with columns: BUILDING, STREET ADDRESS. Lists buildings 1 through 4 and their addresses on Clarksville Pike.

PARKING TABULATION CHART table with columns: Building (Use), Square Footage, Zoning Section, Parking Requirement, # of spaces req., ADA spaces. Includes a Total Required and Total Provided summary row.

- Notes:
1. Includes 1,350 sq ft of outdoor dining space.
2. Does not include the 11 LLV parking spaces reserved for post office vehicles.
3. Above chart is based on "Table 208.2 Parking Spaces" of the 2010 ADA Standards for Accessible Design for the entire site.
4. Per the Maryland Accessibility Code, Section .07.B.3.a, one in every four accessible parking spaces, but not less than one, shall "Van Accessible".
5. Includes 160sf of outdoor seating area.

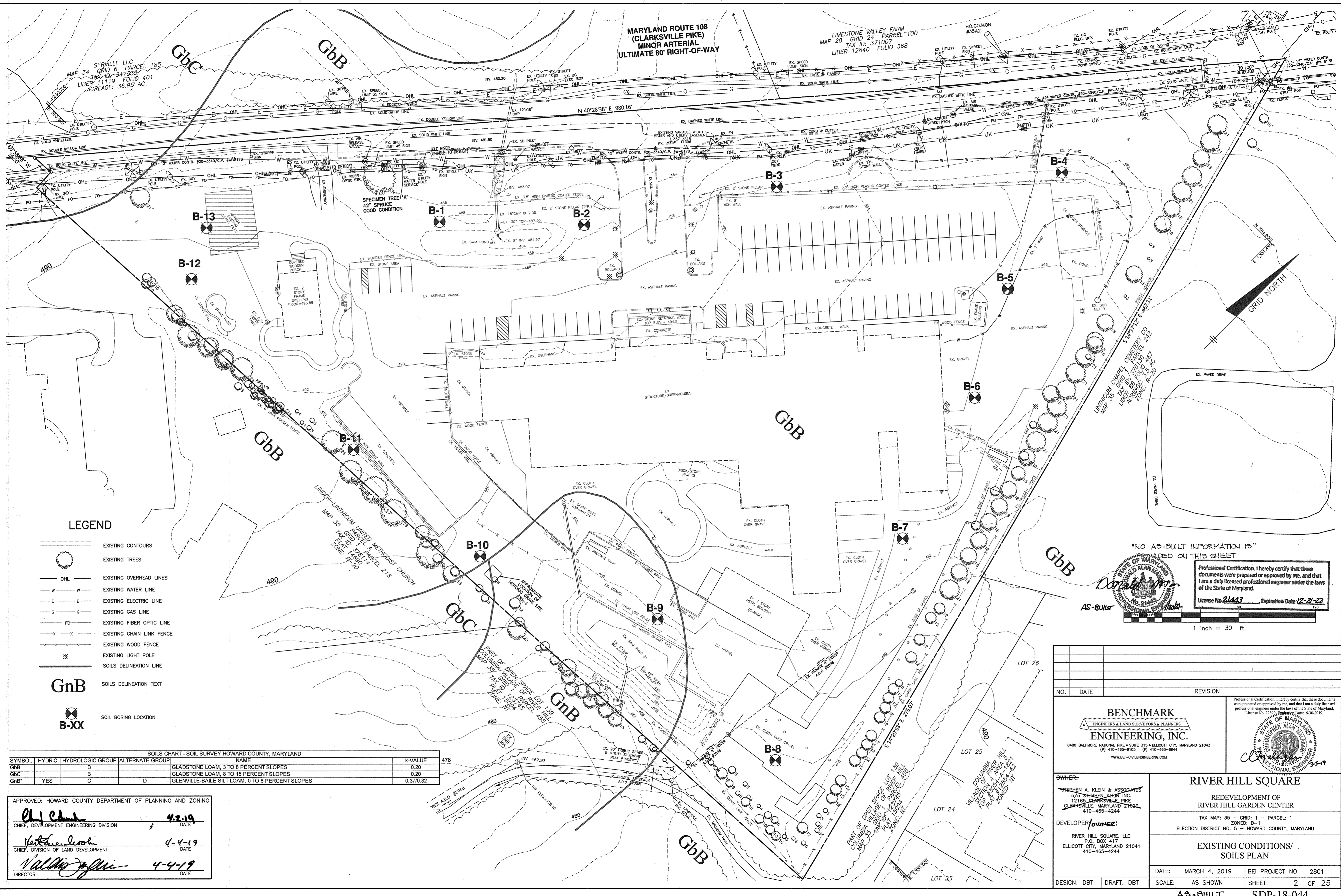
SITE ANALYSIS DATA CHART

- A.) TOTAL PROJECT AREA 6.99 acres
B.) AREA OF PLAN SUBMISSION 6.99 acres
C.) AREA OF LAND DEDICATION TO SHA 0.89 acres
D.) REMAINDER SITE AREA AFTER DEDICATION 6.10 acres
E.) LIMIT OF DISTURBED AREA 5.6 acres
F.) PRESENT ZONING: B-1
G.) PROPOSED USE OF SITE: COMMERCIAL
H.) FLOOR AREA (BUILDINGS 1 thru 4) 40,153 SF
I.) NUMBER OF PARKING SPACES REQUIRED SEE "PARKING TABULATION CHART"
J.) OPEN SPACE ON-SITE N/A
K.) BUILDING COVERAGE OF SITE 0.92 AC. PERCENTAGE OF GROSS AREA 13.2%
L.) APPLICABLE DPZ FILE REFERENCES: SEE GENERAL NOTE 30.

PERMIT INFORMATION CHART

Table with columns: SUBDIVISION NAME, SECTION/AREA, LOT/PARCEL #, PLAT No. OR L/F, GRID No., ZONE, TAX MAP NO, ELECTION DISTRICT, CENSUS TRACT.

Professional seal and title block for BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS. Includes project name RIVER HILL SQUARE, REDEVELOPMENT CENTER, RIVER HILL GARDEN CENTER, and sheet information (DATE: MARCH 4, 2019, SHEET 1 OF 25).



MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 100
TAX ID: 371007
LIBER 12840 FOLIO 368

SERVILLE LLC PARCEL 185
MAP 34 GRID 6
TAX ID: 347335
LIBER 11119 FOLIO 401
ACREAGE: 36.95 AC

"NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET"

Professional Certification, I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 21443 Expiration Date: 12-21-22

AS-BUILT

1 inch = 30 ft.

LEGEND

- EXISTING CONTOURS
- EXISTING TREES
- EXISTING OVERHEAD LINES
- EXISTING WATER LINE
- EXISTING ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING FIBER OPTIC LINE
- EXISTING CHAIN LINK FENCE
- EXISTING WOOD FENCE
- EXISTING LIGHT POLE
- SOILS DELINEATION LINE
- SOILS DELINEATION TEXT
- SOIL BORING LOCATION

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND

SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k-VALUE
GbB		B		GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.20
GbC		B		GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	0.20
GnB	YES	C	D	GLENNVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37/0.32

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Edmister 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Veronica Anderson 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Valerie J. Jaffe 4-4-19
DIRECTOR DATE

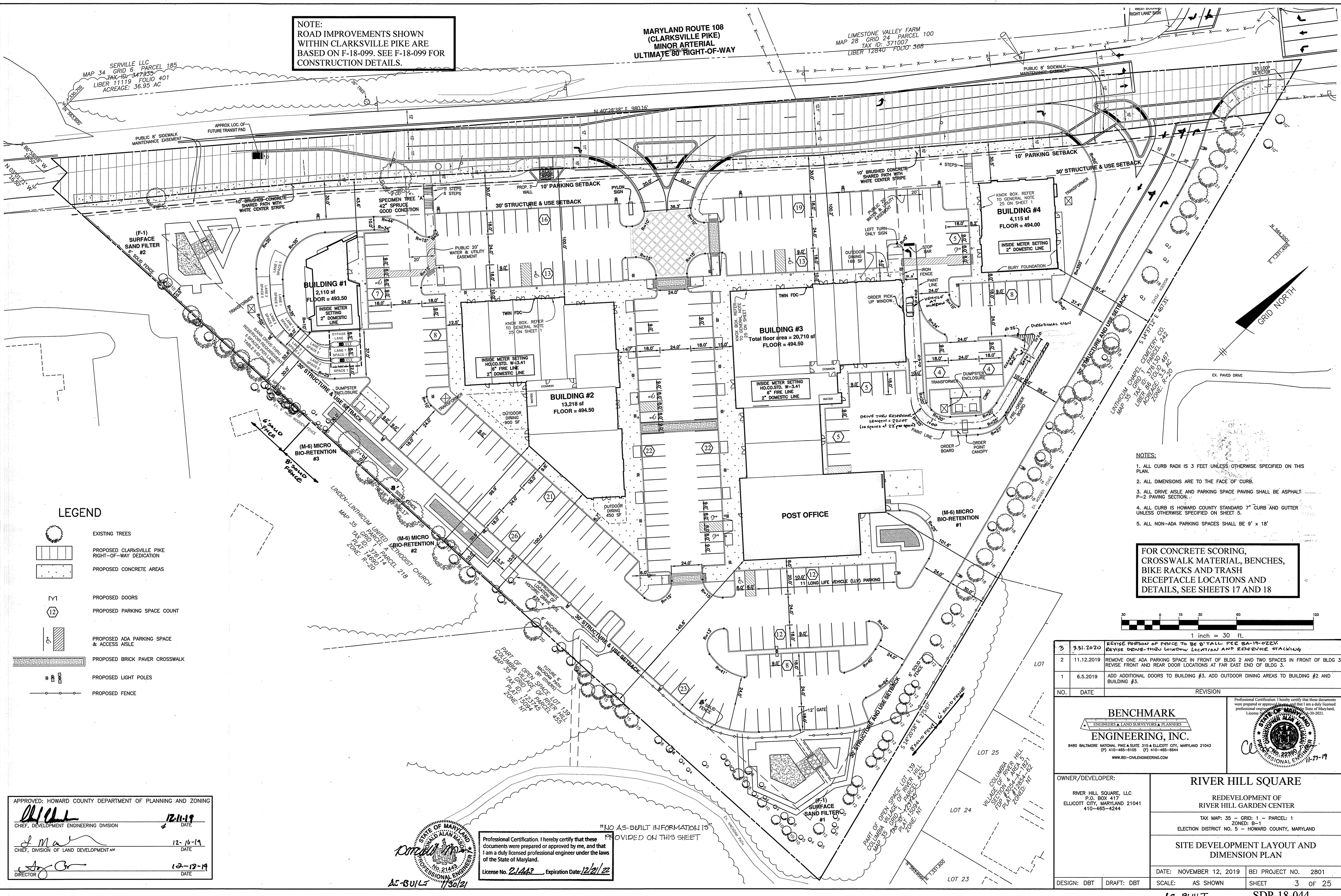
NO.	DATE	REVISION
 BENCHMARK ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BE-CIVILENGINEERING.COM		
OWNER: STEPHEN A. KLEIN & ASSOCIATES C/O STEPHEN KLEIN, INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21044 410-465-4244		
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244		
RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND		
EXISTING CONDITIONS/ SOILS PLAN		
DATE: MARCH 4, 2019	BEI PROJECT NO. 2801	
DESIGN: DBT	DRAFT: DBT	SHEET 2 OF 25
AS-BUILT SDP-18-044		

NOTE:
ROAD IMPROVEMENTS SHOWN
WITHIN CLARKSVILLE PIKE ARE
BASED ON F-18-099. SEE F-18-099 FOR
CONSTRUCTION DETAILS.

MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 100
TAX ID: 371007
LIBER 12340 FOLIO 388

SERVILLE LLC PARCEL 185
MAP 34 GRID 6 PARCEL 185
TAX ID: 347935
LIBER 11119 FOLIO 401
ACREAGE: 36.95 AC



- NOTES:
1. ALL CURB RADI IS 3 FEET UNLESS OTHERWISE SPECIFIED ON THIS PLAN.
 2. ALL DIMENSIONS ARE TO THE FACE OF CURB.
 3. ALL DRIVE AISLE AND PARKING SPACE PAVING SHALL BE ASPHALT P-2 PAVING SECTION.
 4. ALL CURB IS HOWARD COUNTY STANDARD 7" CURB AND GUTTER UNLESS OTHERWISE SPECIFIED ON SHEET 5.
 5. ALL NON-ADA PARKING SPACES SHALL BE 9' x 18'

FOR CONCRETE SCORING,
CROSSWALK MATERIAL, BENCHES,
BIKE RACKS AND TRASH
RECEPTACLE LOCATIONS AND
DETAILS, SEE SHEETS 17 AND 18

LEGEND

- EXISTING TREES
- PROPOSED CLARKSVILLE PIKE RIGHT-OF-WAY DEDICATION
- PROPOSED CONCRETE AREAS
- PROPOSED DOORS
- PROPOSED PARKING SPACE COUNT
- PROPOSED ADA PARKING SPACE & ACCESS AISLE
- PROPOSED BRICK PAVER CROSSWALK
- PROPOSED LIGHT POLES
- PROPOSED FENCE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 12-11-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 12-16-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 12-18-19
DIRECTOR DATE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 21443 Expiration Date: 12/21/22

AS-BUILT 11/30/21

NO.	DATE	REVISION
3	3.31.2020	REVISE PORTION OF FENCE TO BE 8" TALL PER BA-19-022V. REVISE DEVE-THRU WINDOW LOCATION AND REEVEN STACKING
2	11.12.2019	REMOVE ONE ADA PARKING SPACE IN FRONT OF BLDG 2 AND TWO SPACES IN FRONT OF BLDG 3. REVISE FRONT AND REAR DOOR LOCATIONS AT FAR EAST END OF BLDG 3.
1	6.5.2019	ADD ADDITIONAL DOORS TO BUILDING #3. ADD OUTDOOR DINING AREAS TO BUILDING #2 AND BUILDING #3.

BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLCOTT CITY, MARYLAND 21043
(P) 410-465-8105 (F) 410-465-8144
WWW.BE-CMLEENGINEERS.COM

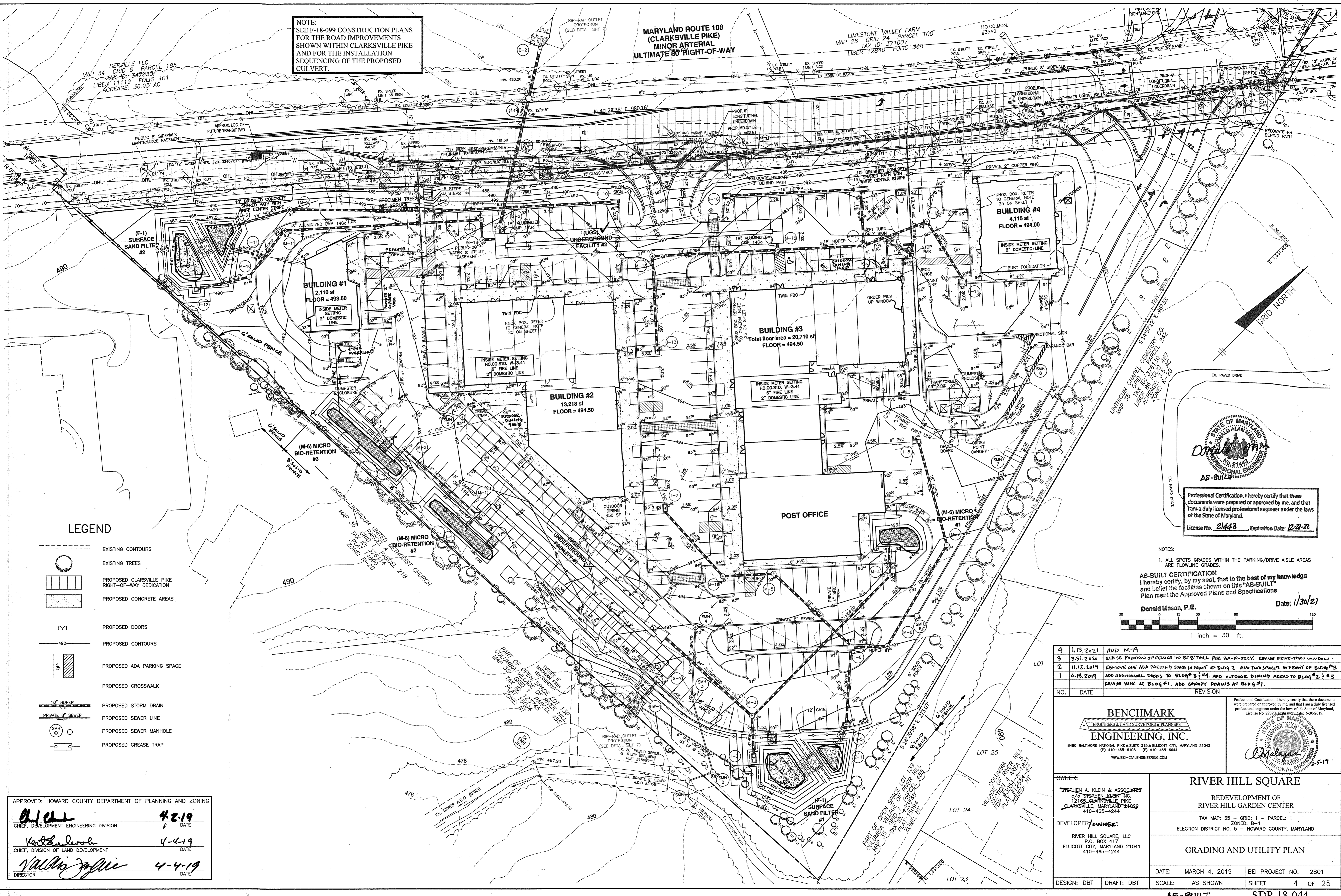
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License #22398

OWNER/DEVELOPER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLCOTT CITY, MARYLAND 21041 410-465-4244	RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND
DATE: NOVEMBER 12, 2019 SCALE: AS SHOWN	BEI PROJECT NO. 2801 SHEET 3 OF 25

NOTE:
SEE F-18-099 CONSTRUCTION PLANS
FOR THE ROAD IMPROVEMENTS
SHOWN WITHIN CLARKSVILLE PIKE
AND FOR THE INSTALLATION
SEQUENCING OF THE PROPOSED
CULVERT.

MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 100
TAX ID: 371007
LIBER 72840 FOLIO 368



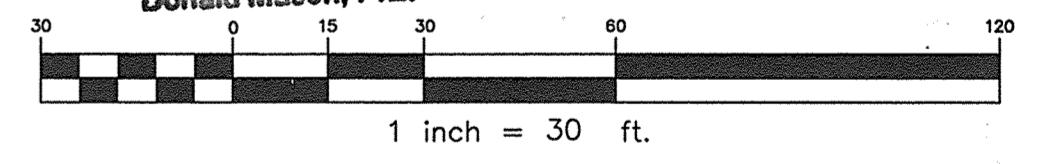
LEGEND

- EXISTING CONTOURS
- EXISTING TREES
- PROPOSED CLARKSVILLE PIKE RIGHT-OF-WAY DEDICATION
- PROPOSED CONCRETE AREAS
- PROPOSED DOORS
- PROPOSED CONTOURS
- PROPOSED ADA PARKING SPACE
- PROPOSED CROSSWALK
- PROPOSED STORM DRAIN
- PROPOSED SEWER LINE
- PROPOSED SEWER MANHOLE
- PROPOSED GREASE TRAP



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-22

NOTES:
1. ALL SPOTS GRADES WITHIN THE PARKING/DRIVE AISLE AREAS ARE FLOWLINE GRADES.
AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Date: 1/30/21
Donald Mison, P.E.



NO.	DATE	REVISION
4	1.13.2021	ADD M-19
3	9.31.2020	REVISE POSITION OF FENCE TO BE 8' TALL PER BA-19-022V. REVISE DRIVE-THRU WINDOW
2	11.17.2019	REMOVE ONE ADA PARKING SPACE IN FRONT OF BLDG 2 AND TWO SPACES IN FRONT OF BLDG #3
1	6.18.2019	ADD ADDITIONAL DOORS TO BLDG #3; #4. ADD OUTDOOR DINING AREAS TO BLDG #2; #3 SEWER WHC AT BLDG #1. ADD CANOPY DECKS AT BLDG #1.

BENCHMARK ENGINEERING, INC.
ENGINEERS & LAND SURVEYORS & PLANNERS
8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6100 (F) 410-465-6444
WWW.BEI-CVLENGINEERING.COM

OWNER:
STEPHEN A. KLEIN & ASSOCIATES
C/O STEPHEN KLEIN INC.
12155 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21029
410-465-4244

DEVELOPER/OWNER:
RIVER HILL SQUARE, LLC
P.O. BOX 417
ELLICOTT CITY, MARYLAND 21041
410-465-4244

RIVER HILL SQUARE
REDEVELOPMENT OF
RIVER HILL GARDEN CENTER
TAX MAP: 35 - GRID: 1 - PARCEL: 1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

GRADING AND UTILITY PLAN

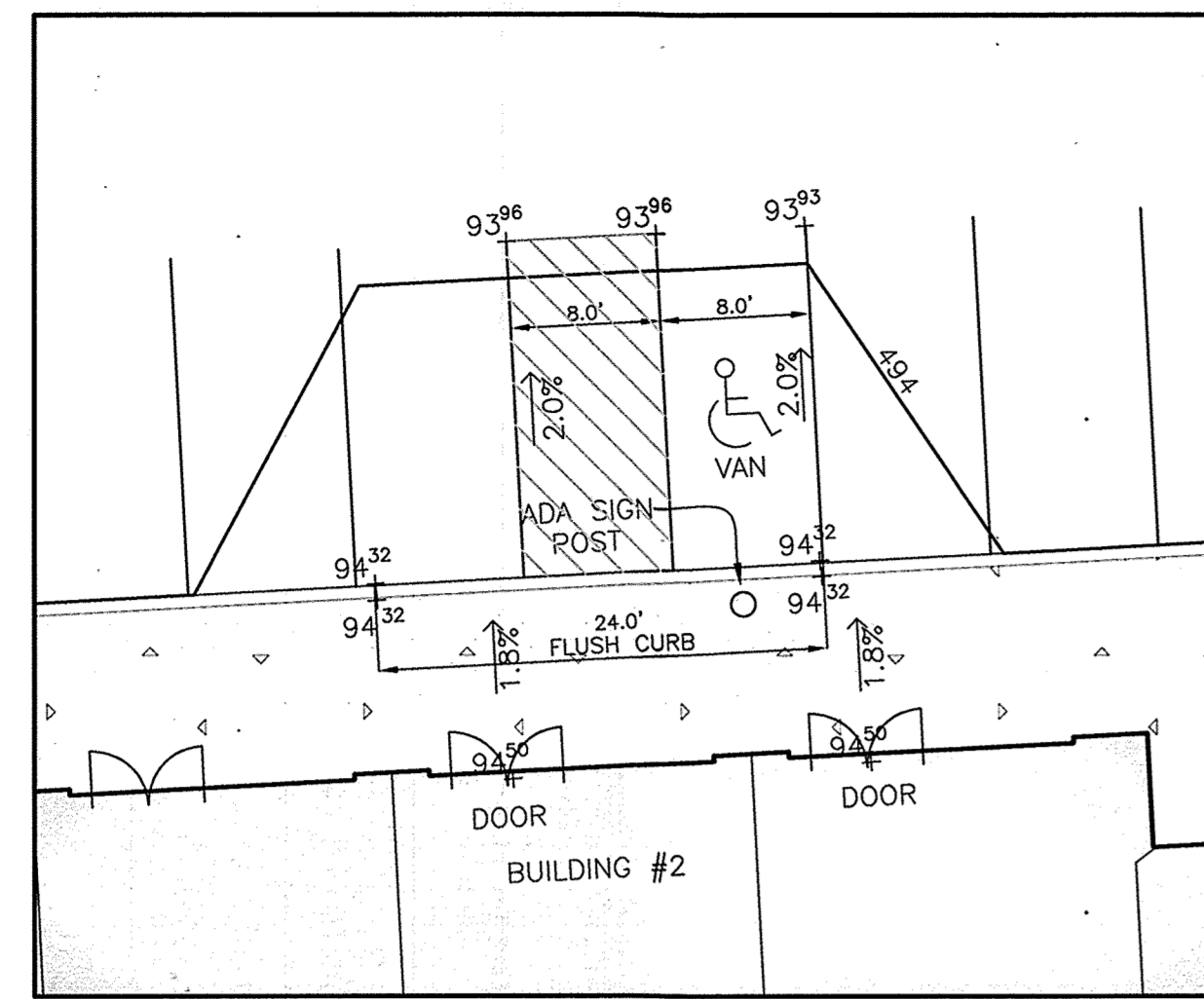
DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN SHEET 4 OF 25

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

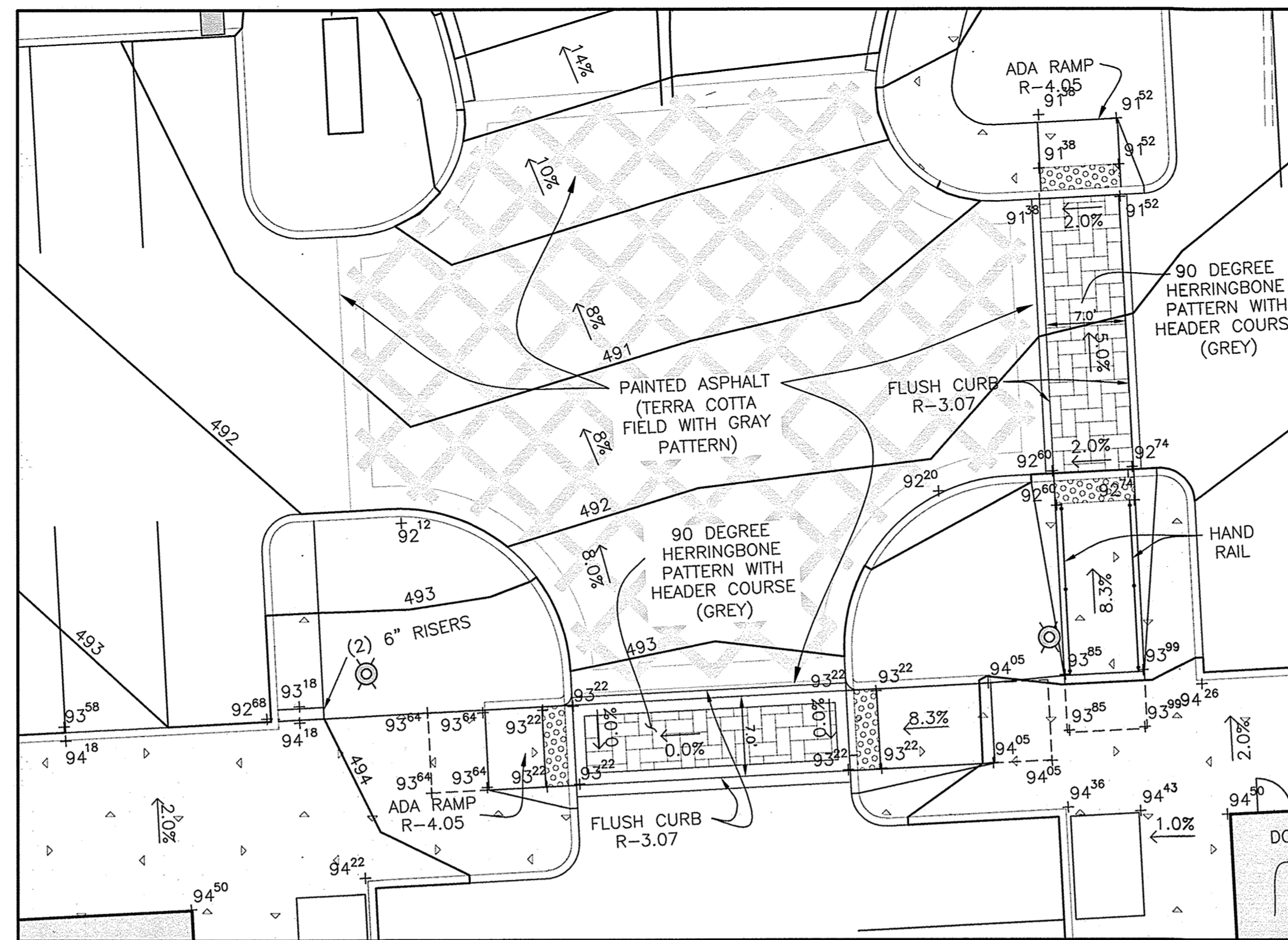
Chieh 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Veronica 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

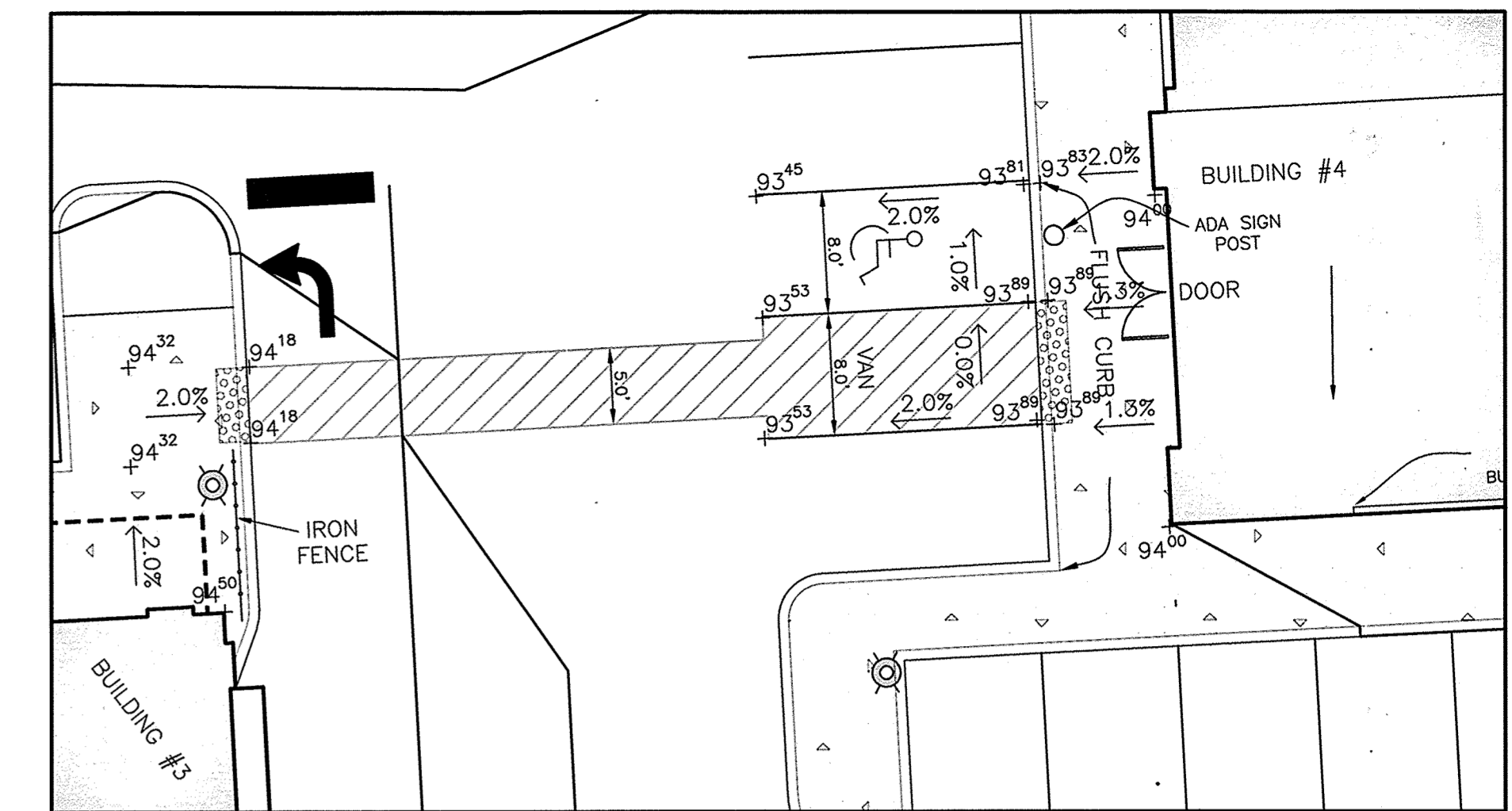
Natalia 4-4-19
DIRECTOR DATE



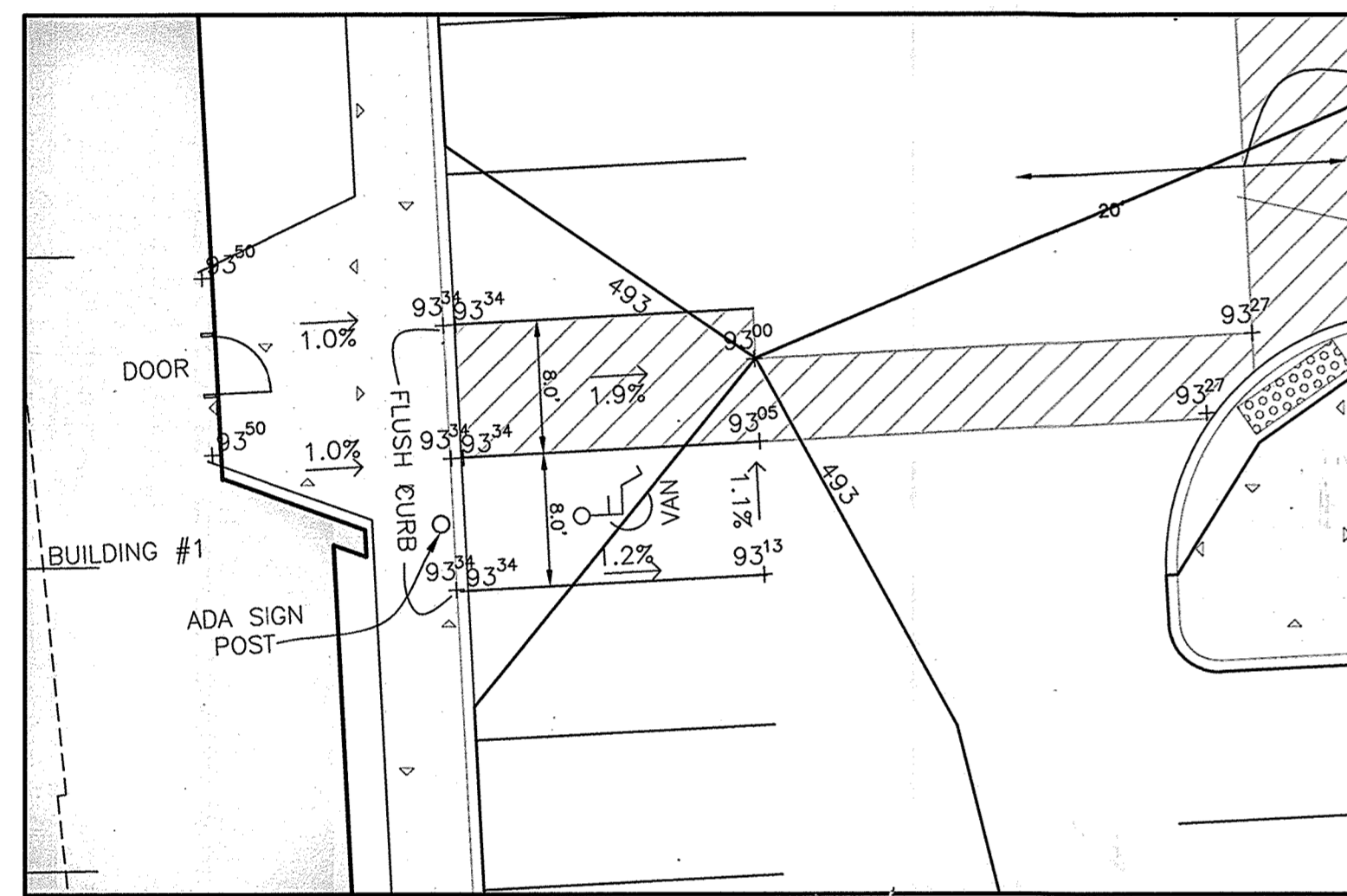
BUILDING #2



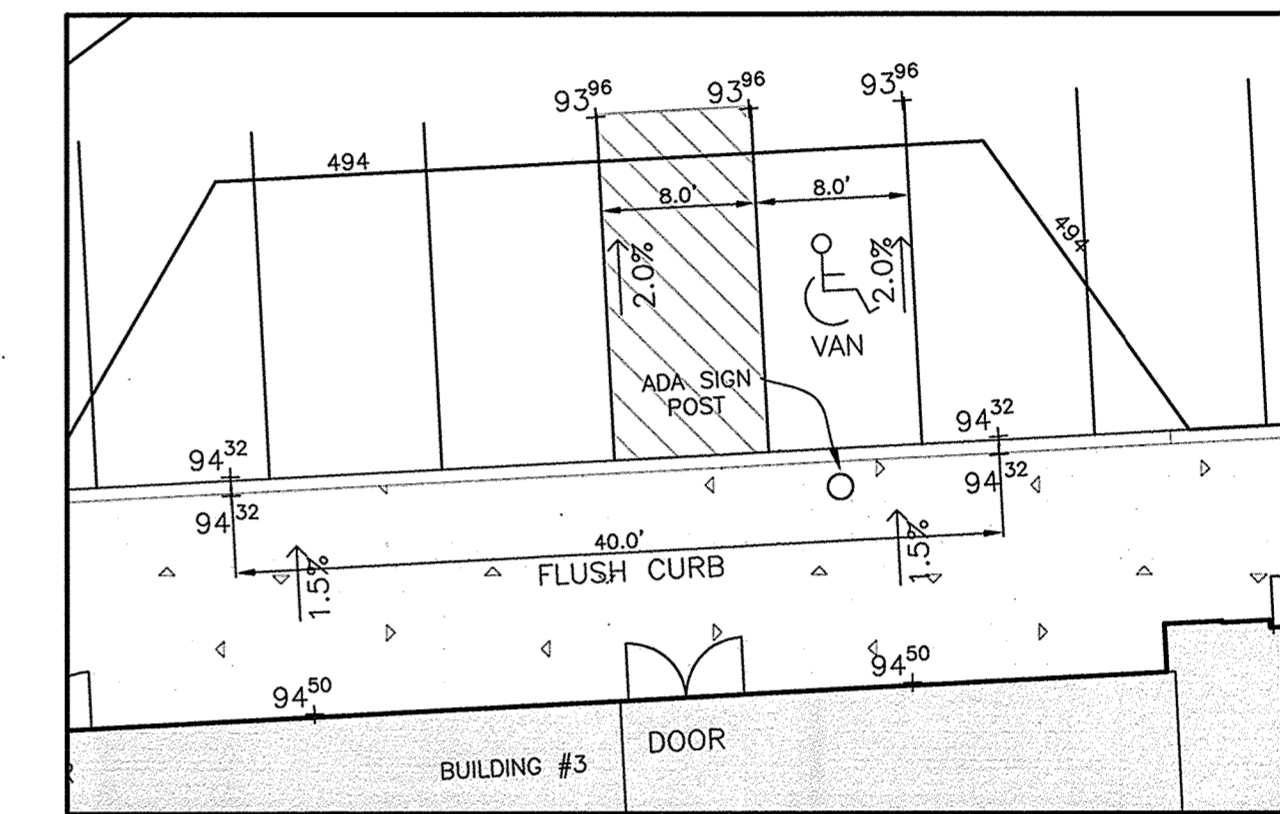
MAIN INTERSECTION AT RIGHT-IN/RIGHT-OUT



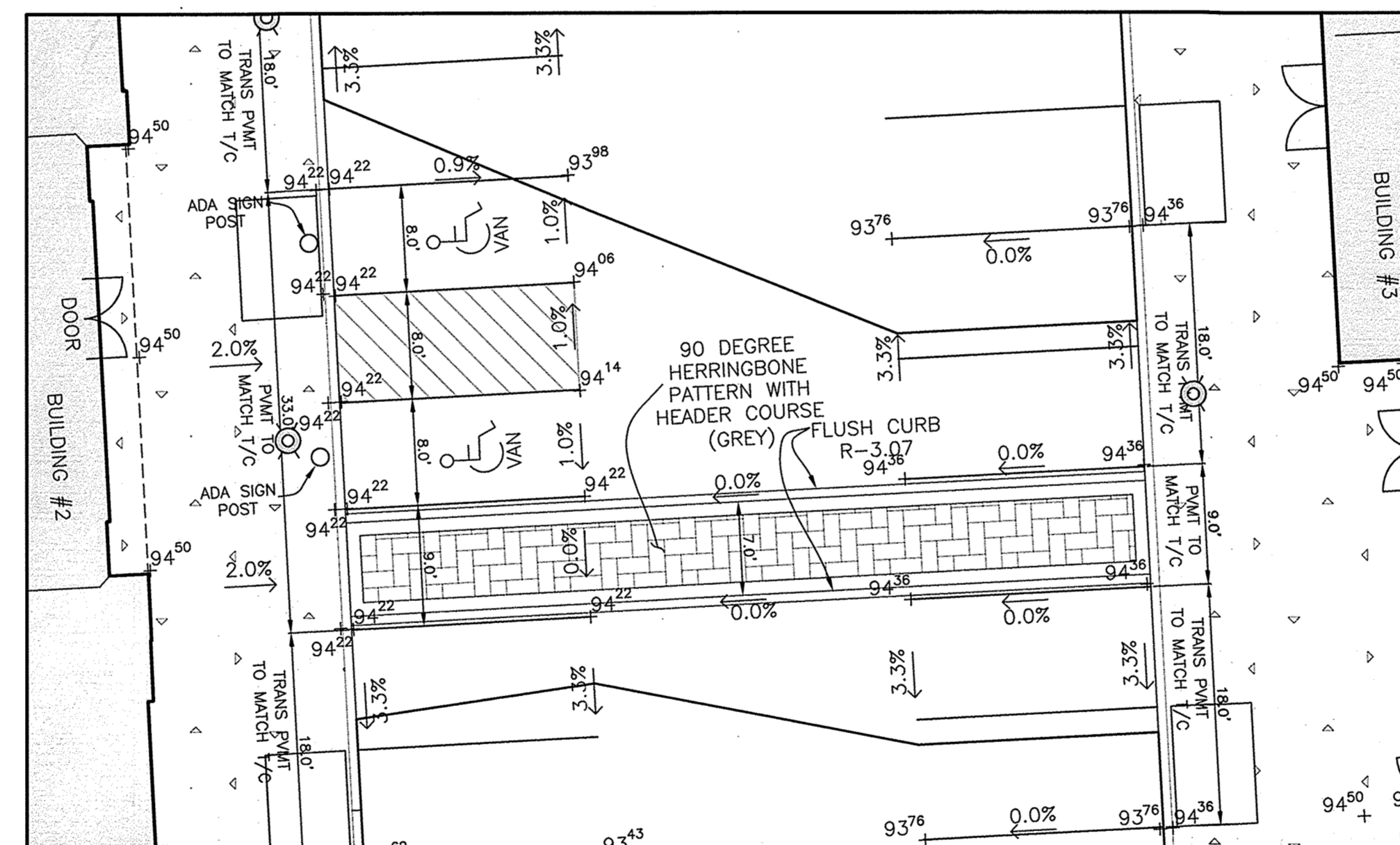
BUILDING #4



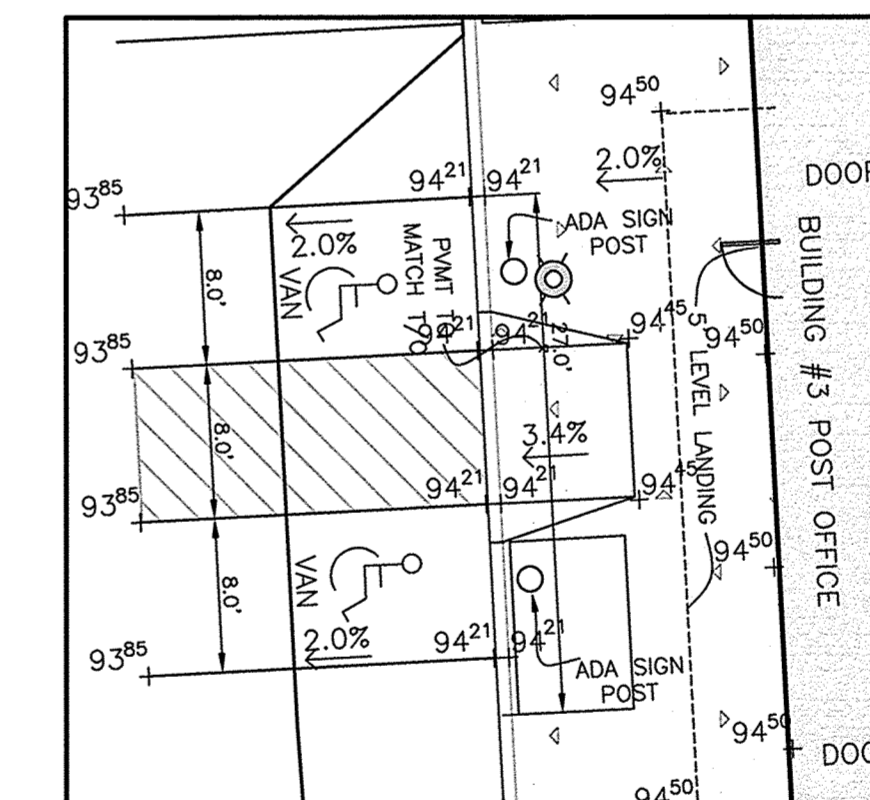
BUILDING #1



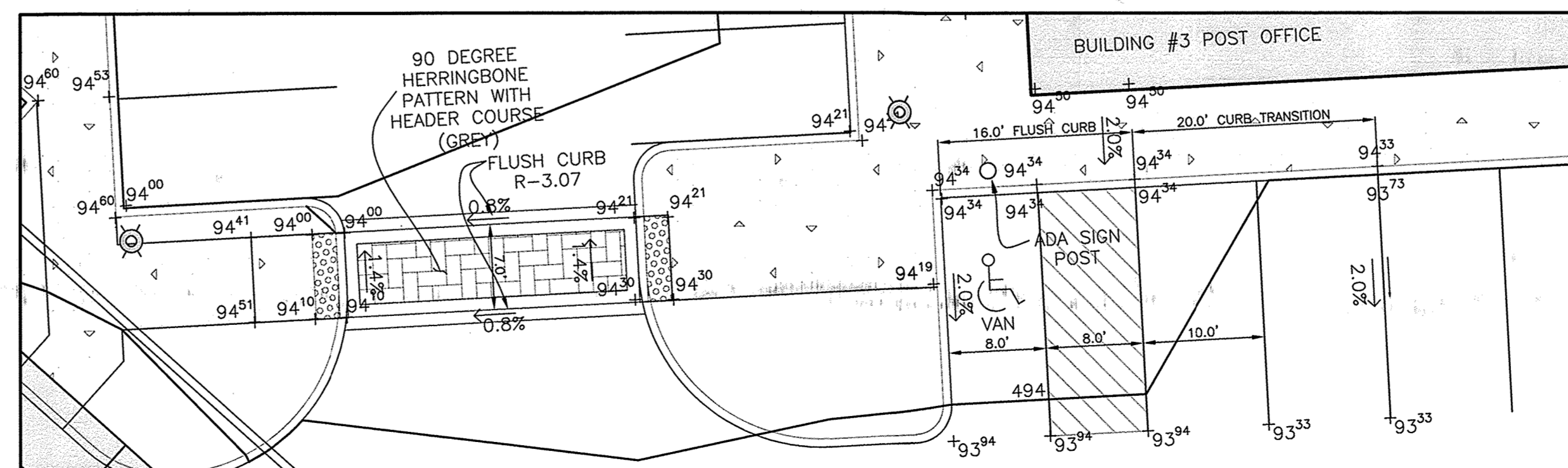
BUILDING #3



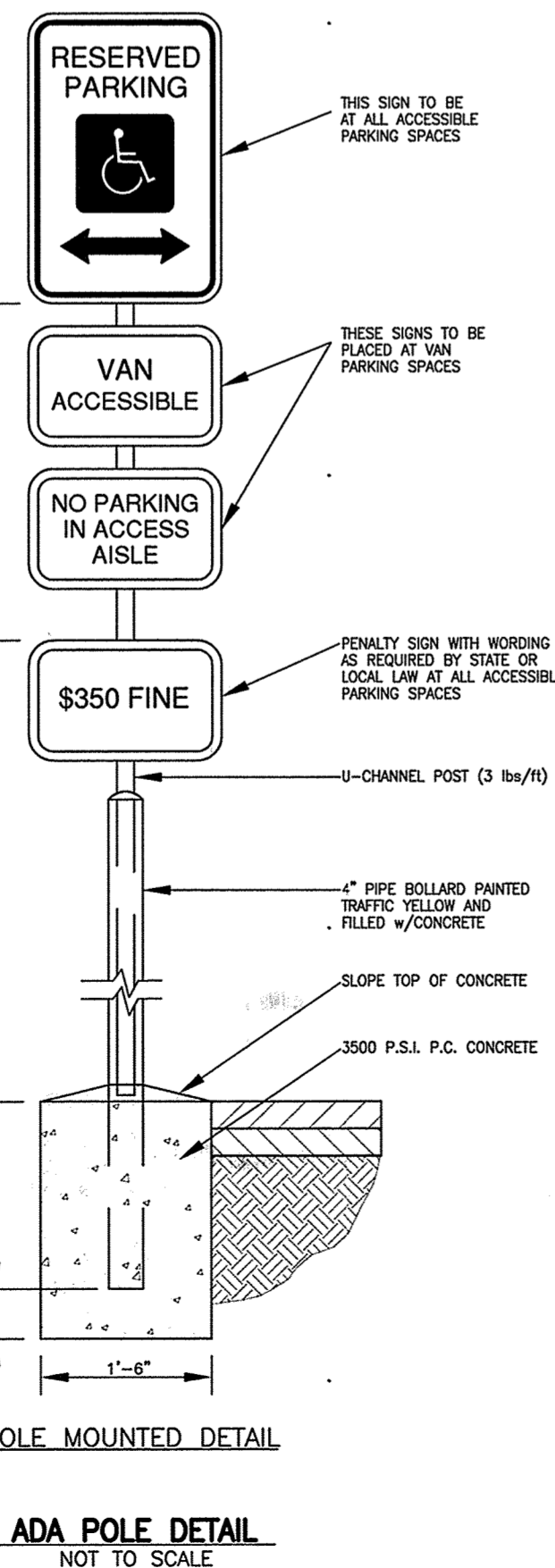
CROSSWALK MID-BUILDING BUILDINGS #2 AND #3



CROSSWALK REAR OF SITE BUILDINGS #2 AND #3



POST OFFICE



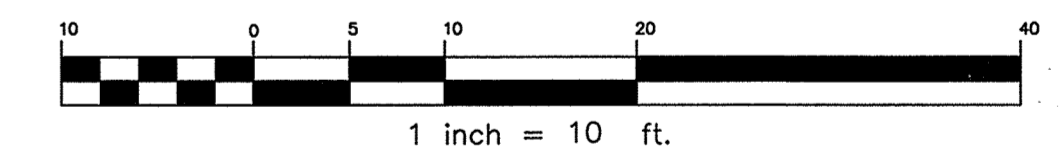
POLE MOUNTED DETAIL

ADA POLE DETAIL NOT TO SCALE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443 Expiration Date: 12/21/22

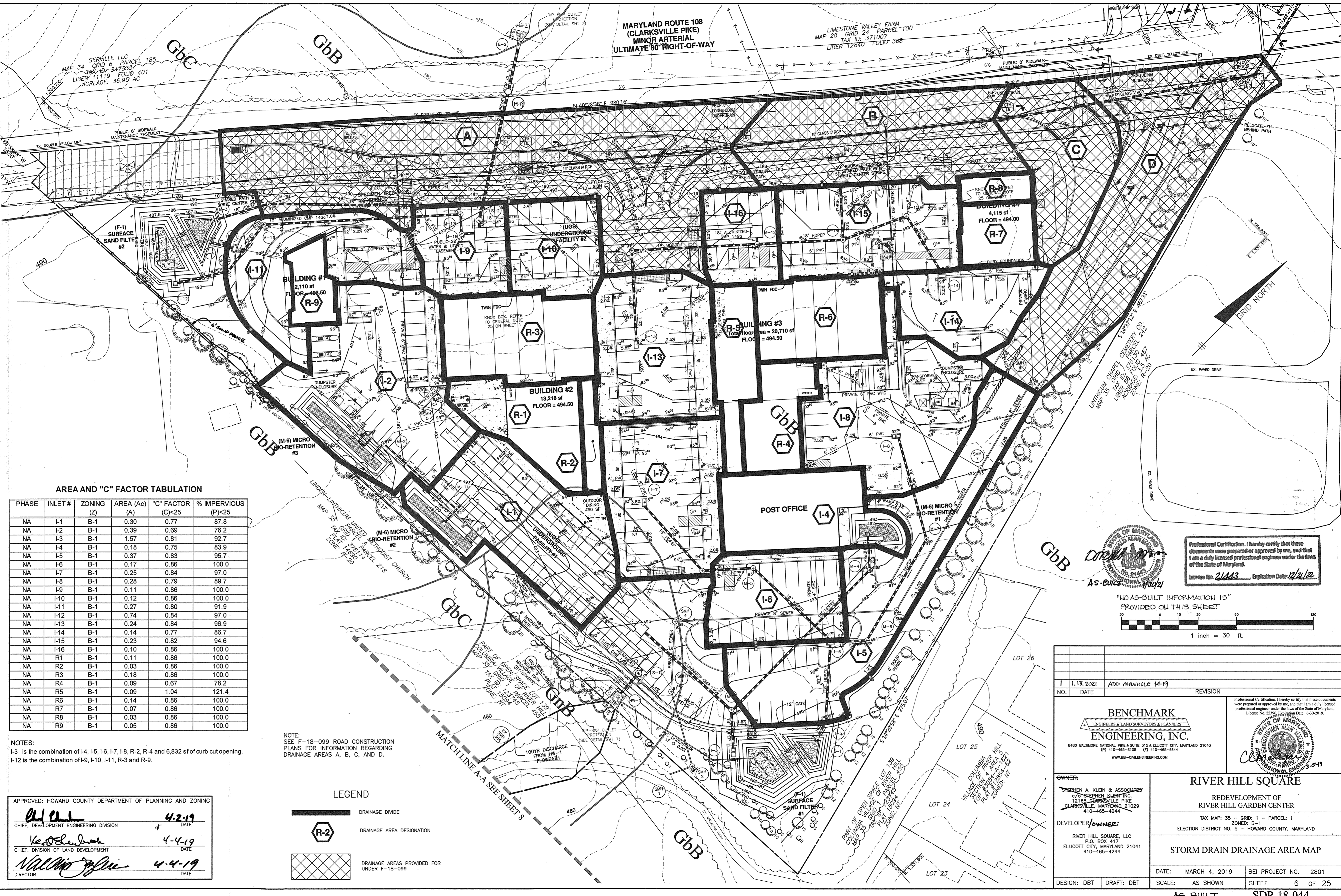


"NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET"



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division: 12-11-19
 Chief, Division of Land Development: 12-16-19
 Director: 12-13-19

1 11.12.2019 REMOVE ONE ADA PARKING SPACE IN FRONT OF BLDG 2 AND TWO SPACES IN FRONT OF BLDG 3	
NO.	DATE REVISION
BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043 (P) 410-465-8105 (F) 410-465-6944 WWW.BE-CMLEENGINEERING.COM	
OWNER/DEVELOPER:	RIVER HILL SQUARE
RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244	REDEVELOPMENT OF RIVER HILL GARDEN CENTER
TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND	
ADA COMPLIANCE PLAN	
DATE: NOVEMBER 12, 2019	BEI PROJECT NO. 2801
DESIGN: DBT	DRAFT: DBT
SCALE: AS SHOWN	SHEET 5 OF 25

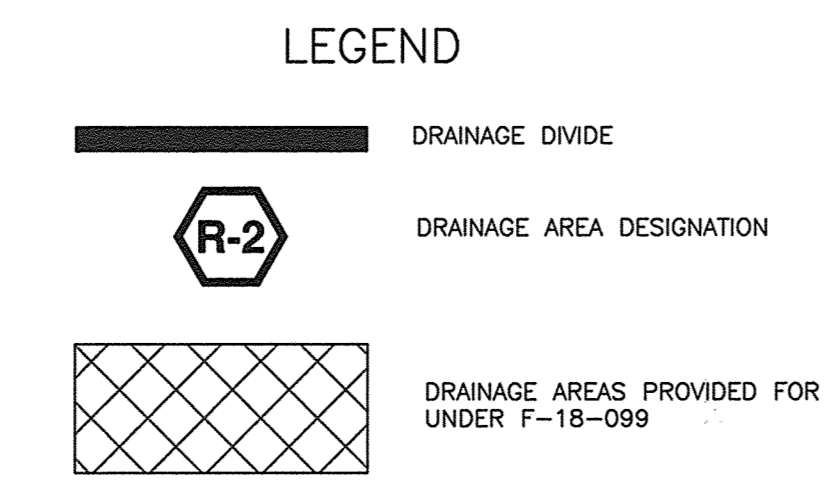


AREA AND "C" FACTOR TABULATION

PHASE	INLET #	ZONING (Z)	AREA (Ac) (A)	"C" FACTOR (C)<25	% IMPERVIOUS (P)<25
NA	I-1	B-1	0.30	0.77	87.8
NA	I-2	B-1	0.39	0.69	76.2
NA	I-3	B-1	1.57	0.81	92.7
NA	I-4	B-1	0.18	0.75	83.9
NA	I-5	B-1	0.37	0.83	95.7
NA	I-6	B-1	0.17	0.86	100.0
NA	I-7	B-1	0.25	0.84	97.0
NA	I-8	B-1	0.28	0.79	89.7
NA	I-9	B-1	0.11	0.86	100.0
NA	I-10	B-1	0.12	0.86	100.0
NA	I-11	B-1	0.27	0.80	91.9
NA	I-12	B-1	0.74	0.84	97.0
NA	I-13	B-1	0.24	0.84	96.9
NA	I-14	B-1	0.14	0.77	86.7
NA	I-15	B-1	0.23	0.82	94.6
NA	I-16	B-1	0.10	0.86	100.0
NA	R1	B-1	0.11	0.86	100.0
NA	R2	B-1	0.03	0.86	100.0
NA	R3	B-1	0.18	0.86	100.0
NA	R4	B-1	0.09	0.67	78.2
NA	R5	B-1	0.09	1.04	121.4
NA	R6	B-1	0.14	0.86	100.0
NA	R7	B-1	0.07	0.86	100.0
NA	R8	B-1	0.03	0.86	100.0
NA	R9	B-1	0.05	0.86	100.0

NOTES:
 I-3 is the combination of I-4, I-5, I-6, I-7, I-8, R-2, R-4 and 6,832 sf of curb cut opening.
 I-12 is the combination of I-9, I-10, I-11, R-3 and R-9.

NOTE:
 SEE F-18-099 ROAD CONSTRUCTION PLANS FOR INFORMATION REGARDING DRAINAGE AREAS A, B, C, AND D.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

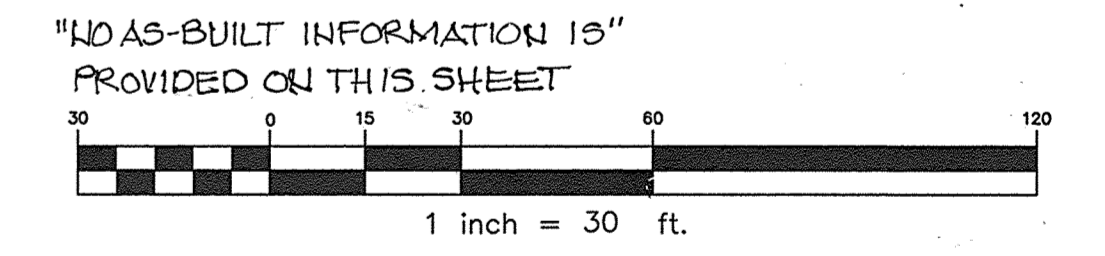
[Signature] 4-2-19
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 4-4-19
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 4-4-19
 DIRECTOR DATE



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12/21/22



NO.	DATE	REVISION
1	1.13.2021	ADD MANHOLE M-19

BENCHMARK ENGINEERS & PLANNERS, INC.
 8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043
 (P) 410-465-6108 (F) 410-465-6444
 WWW.BEI-CALENGINEERING.COM

OWNER: STEPHEN A. KLEIN & ASSOCIATES
 C/O STEPHEN KLEIN, INC.
 12165 CLARKSVILLE PIKE
 CLARKSVILLE, MARYLAND 21029
 410-465-4244

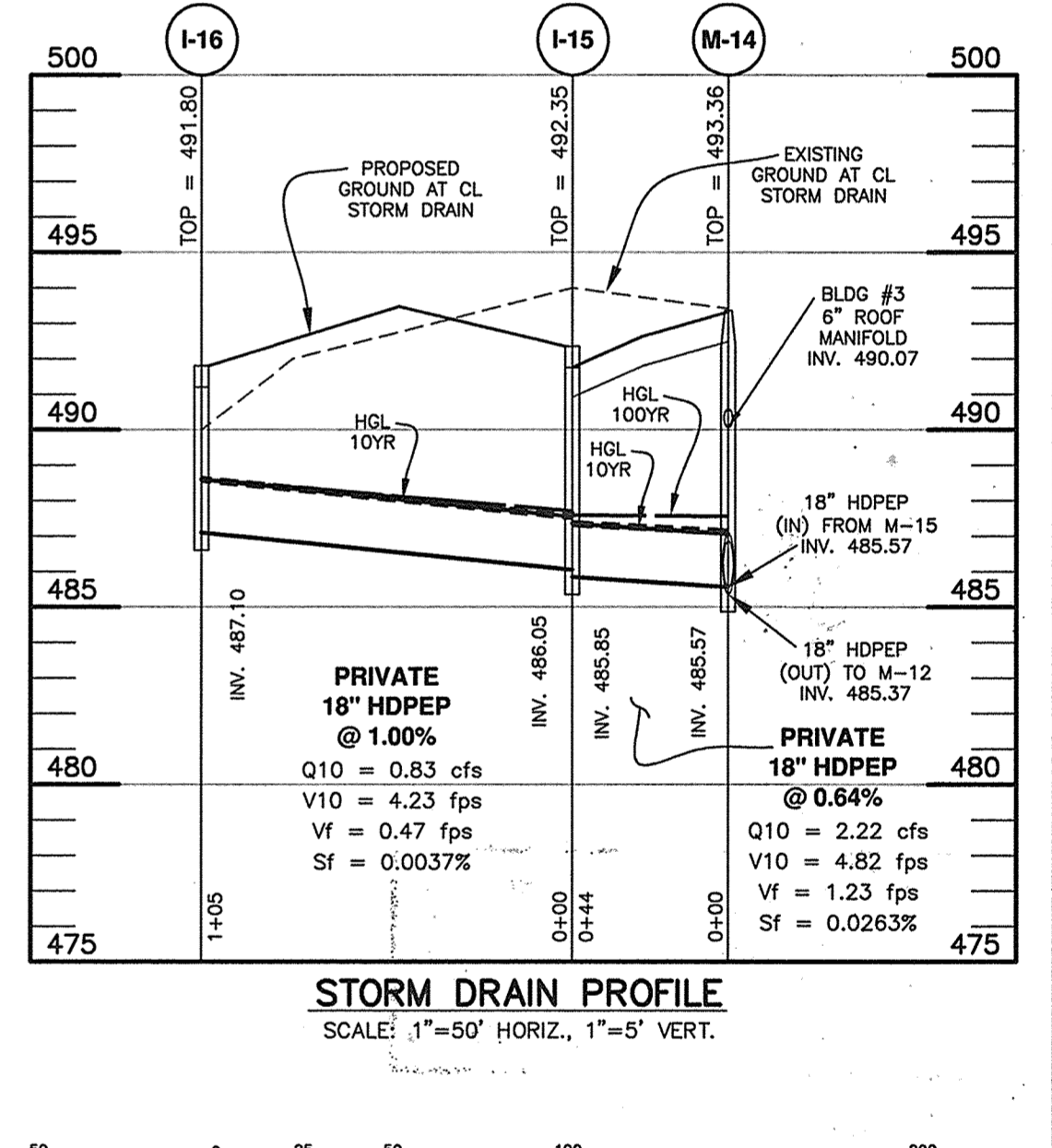
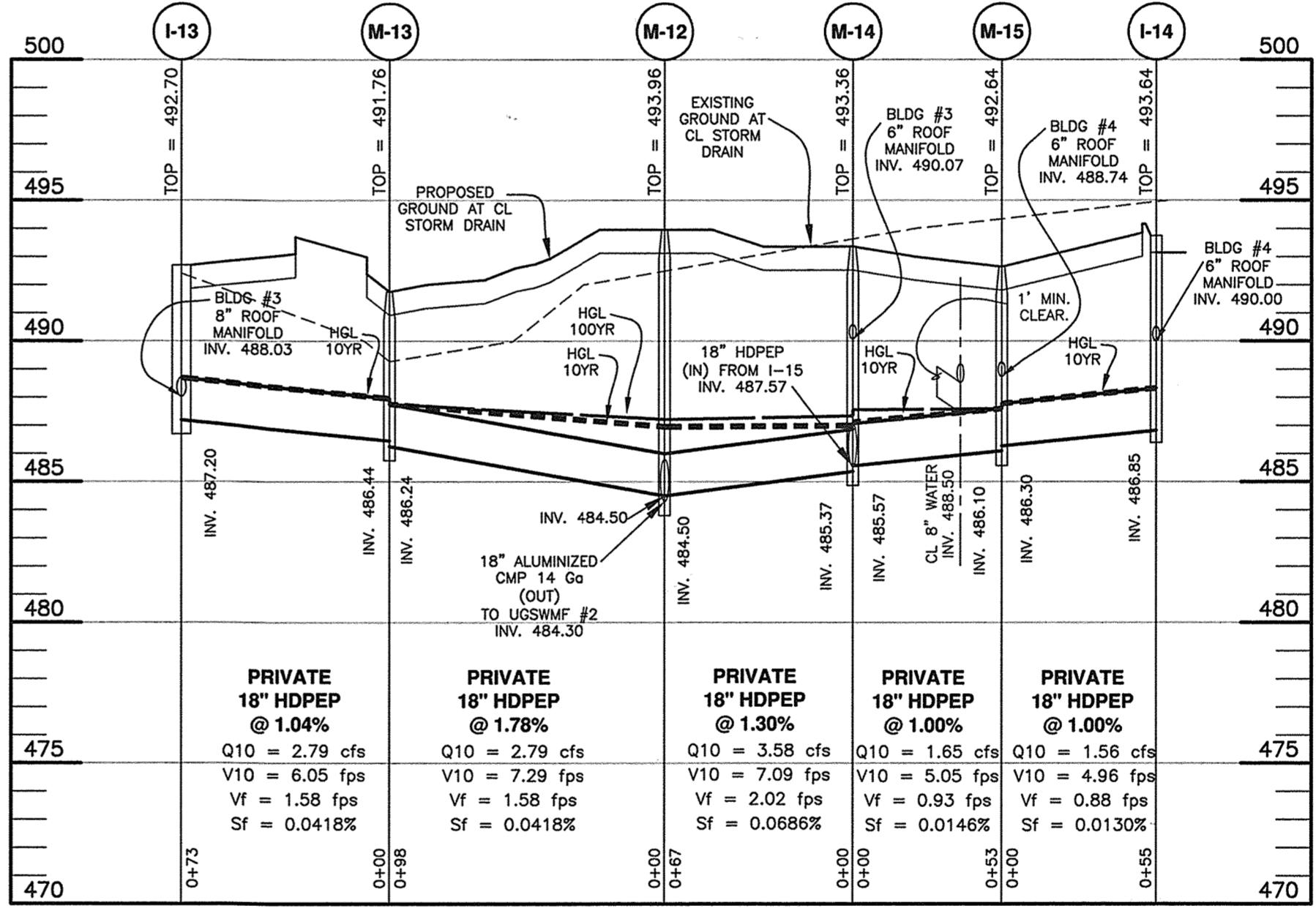
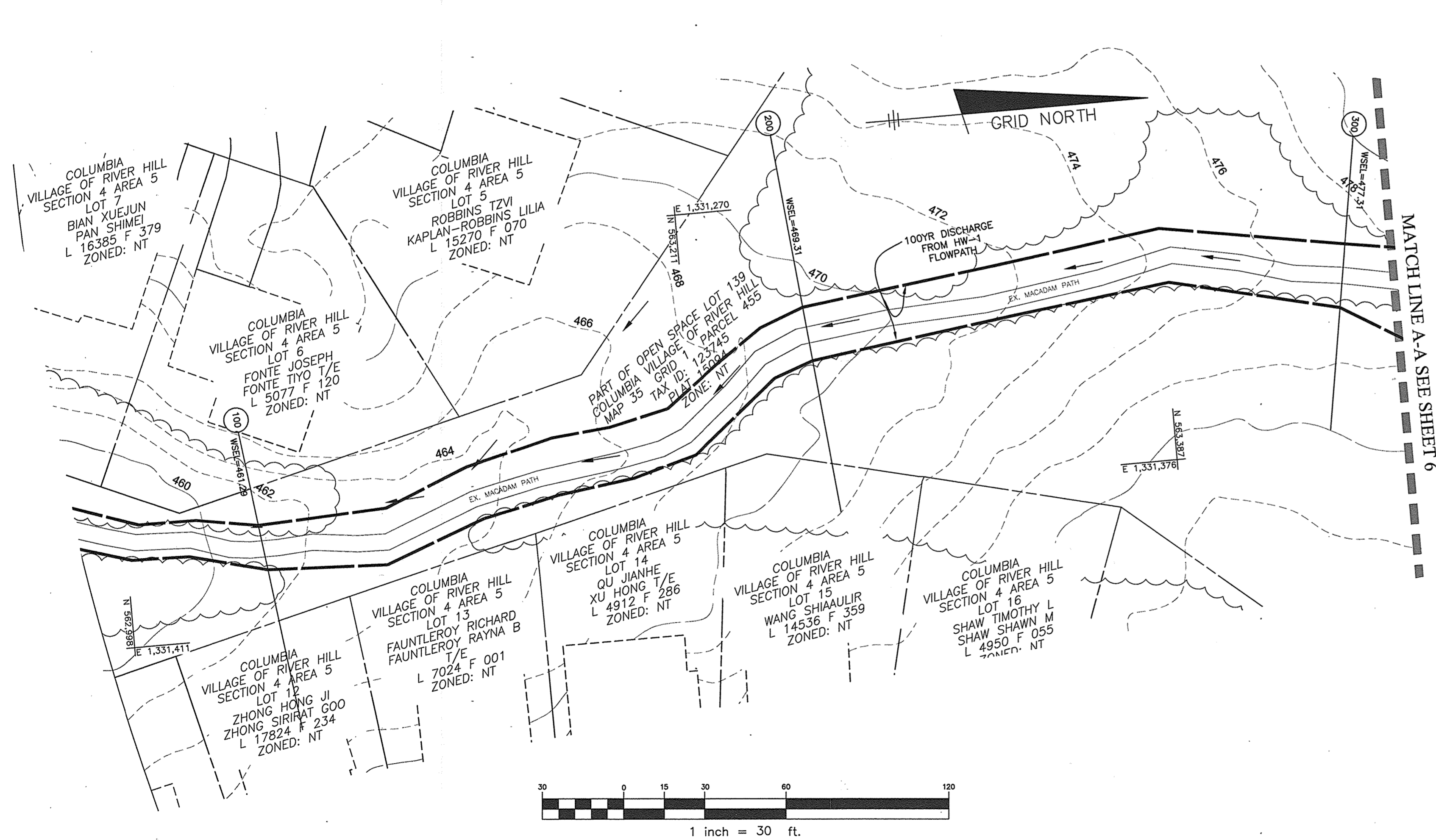
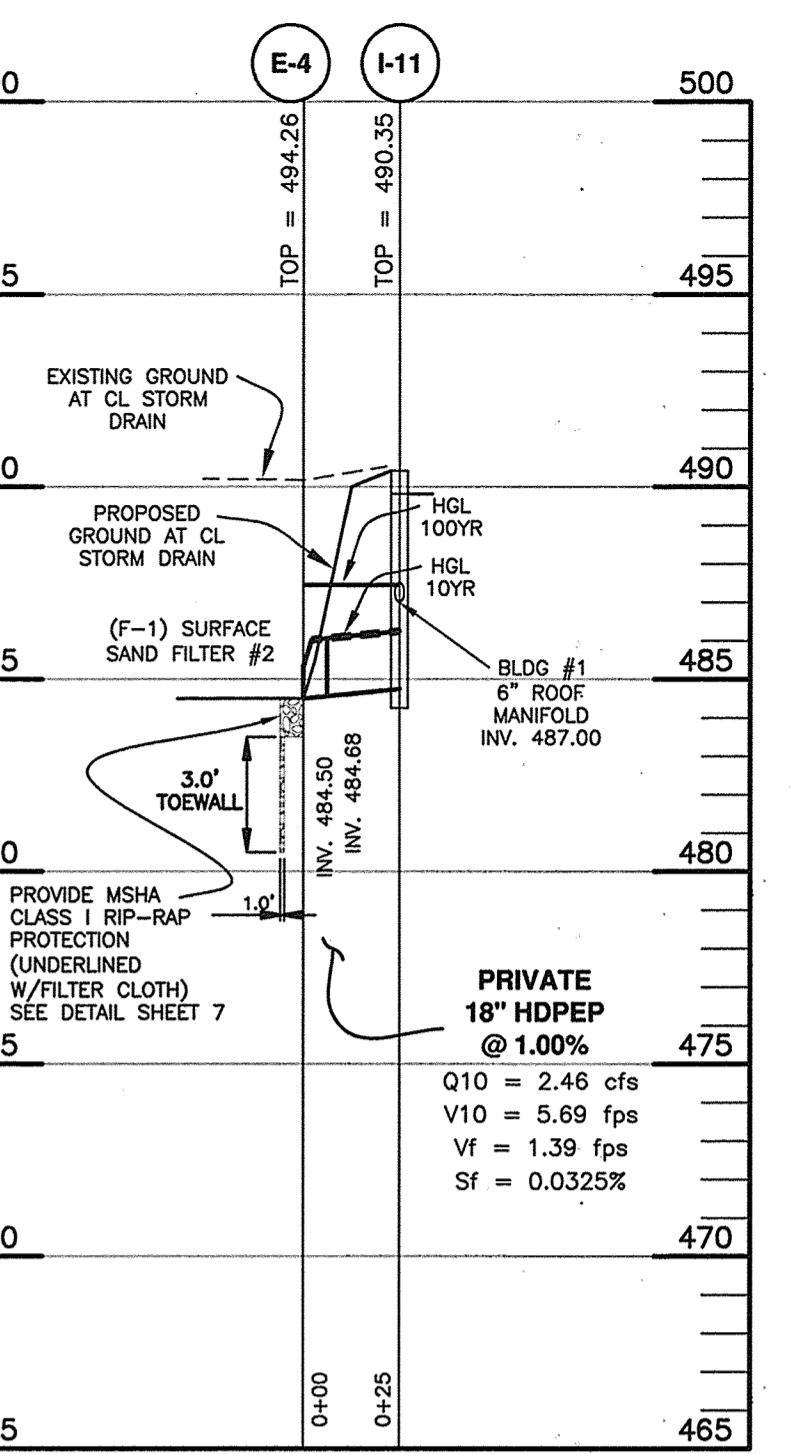
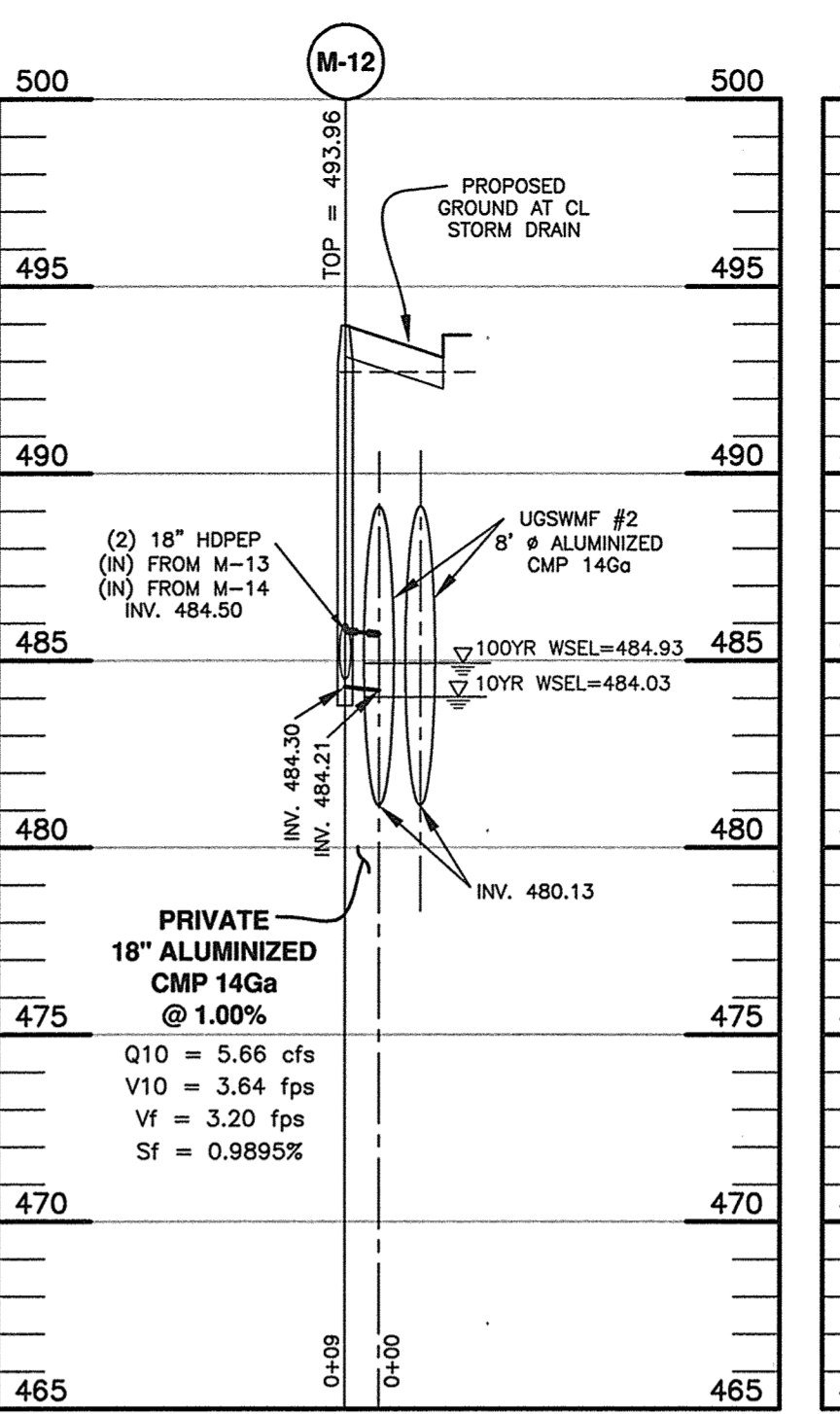
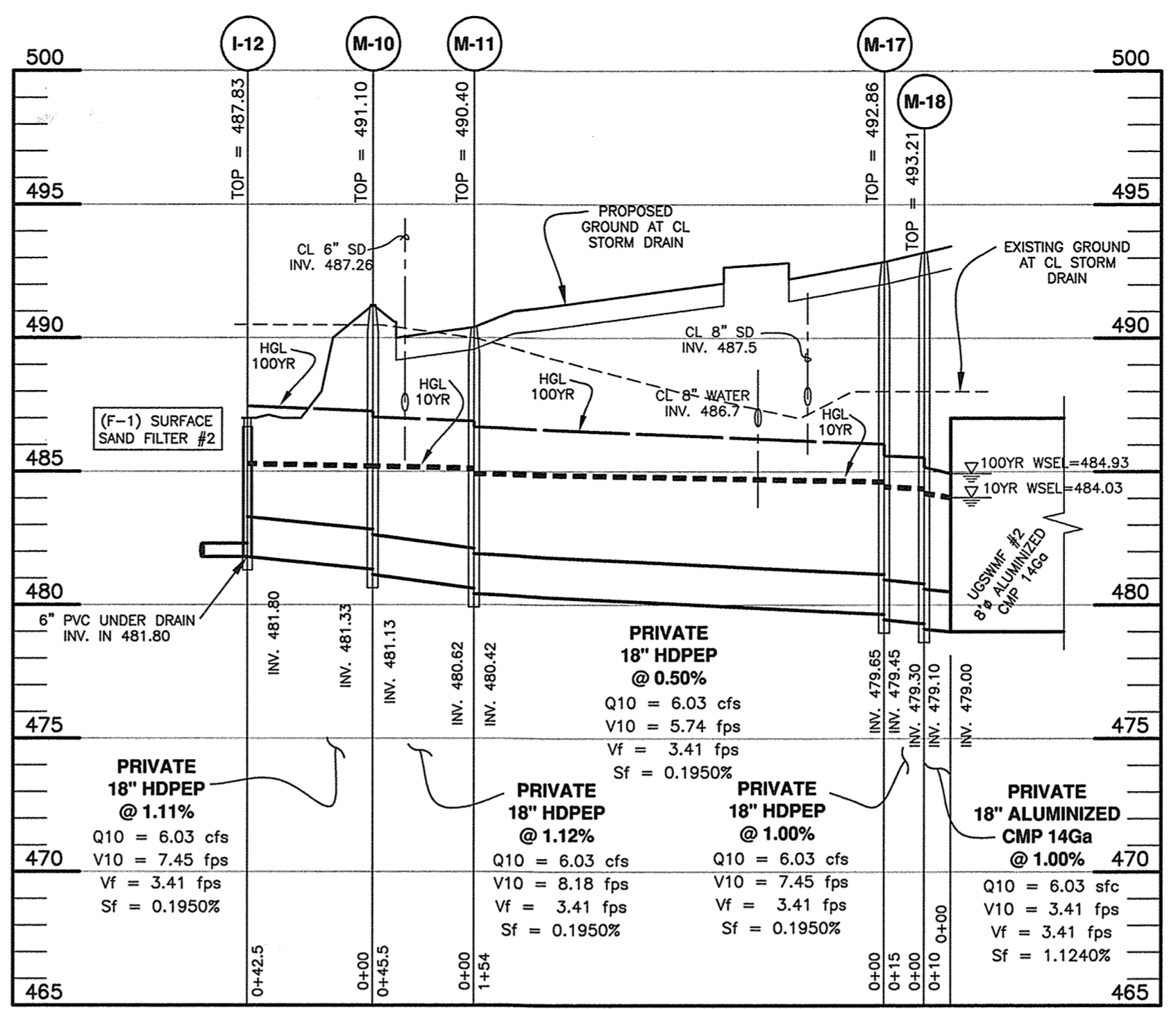
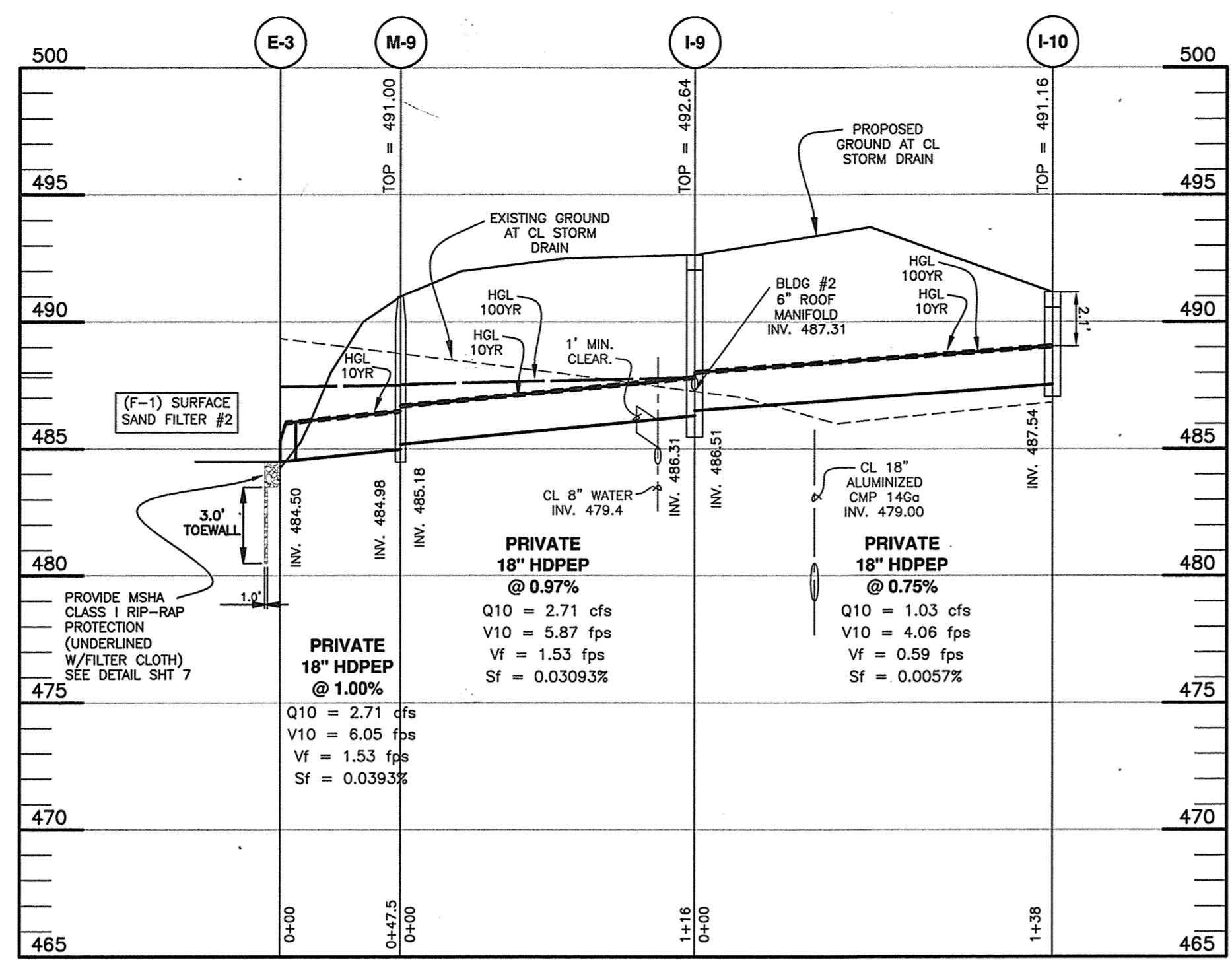
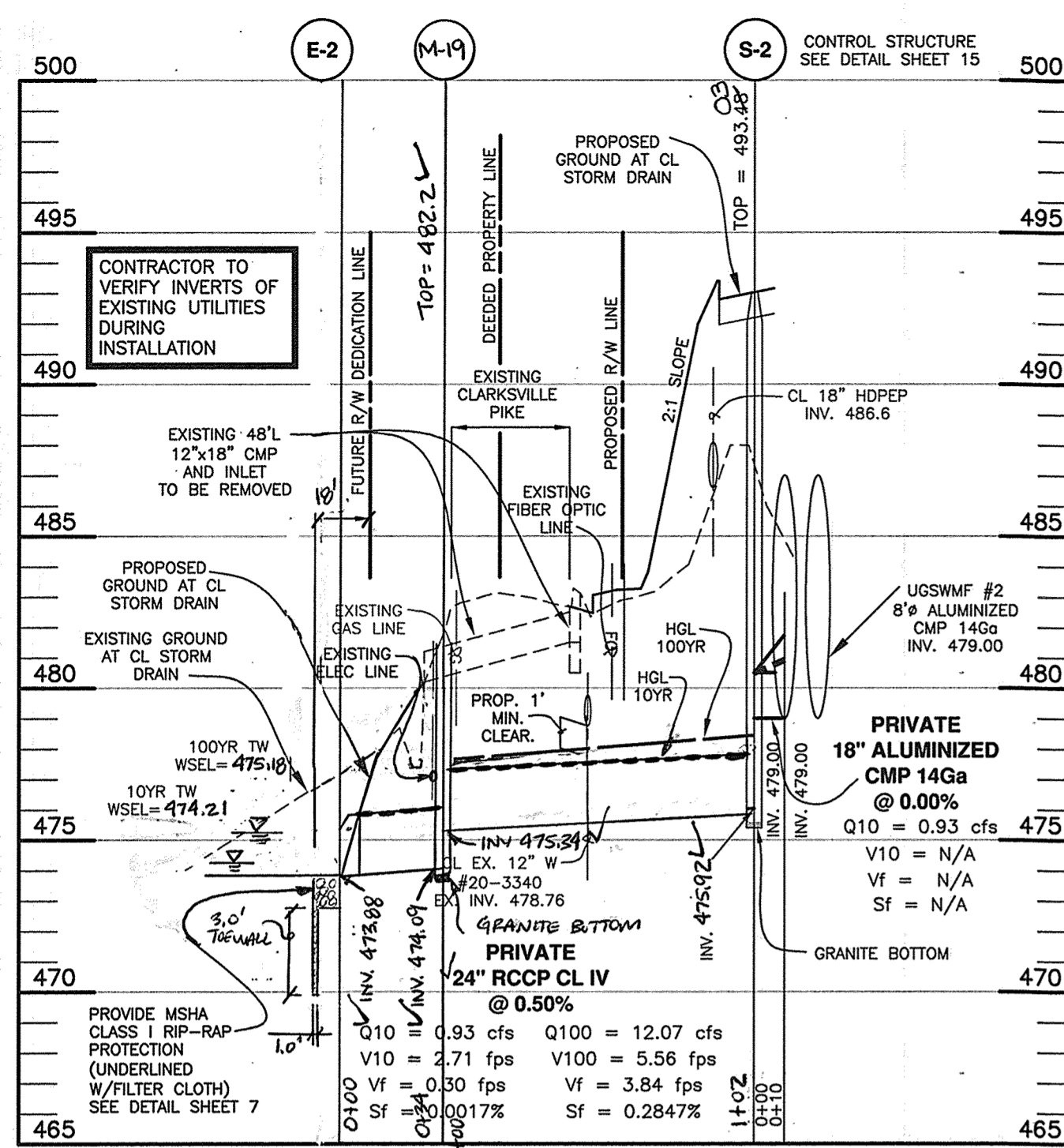
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC
 P.O. BOX 417
 ELLICOTT CITY, MARYLAND 21041
 410-465-4244

RIVER HILL SQUARE
 REDEVELOPMENT OF RIVER HILL GARDEN CENTER
 TAX MAP: 35 - GRID: 1 - PARCEL: 1
 ZONED: B-1
 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

STORM DRAIN DRAINAGE AREA MAP

DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
 SCALE: AS SHOWN SHEET 6 OF 25

DESIGN: DBT DRAFT: DBT



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

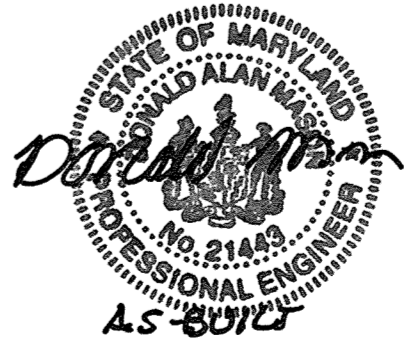
[Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 4-4-19
DIRECTOR DATE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

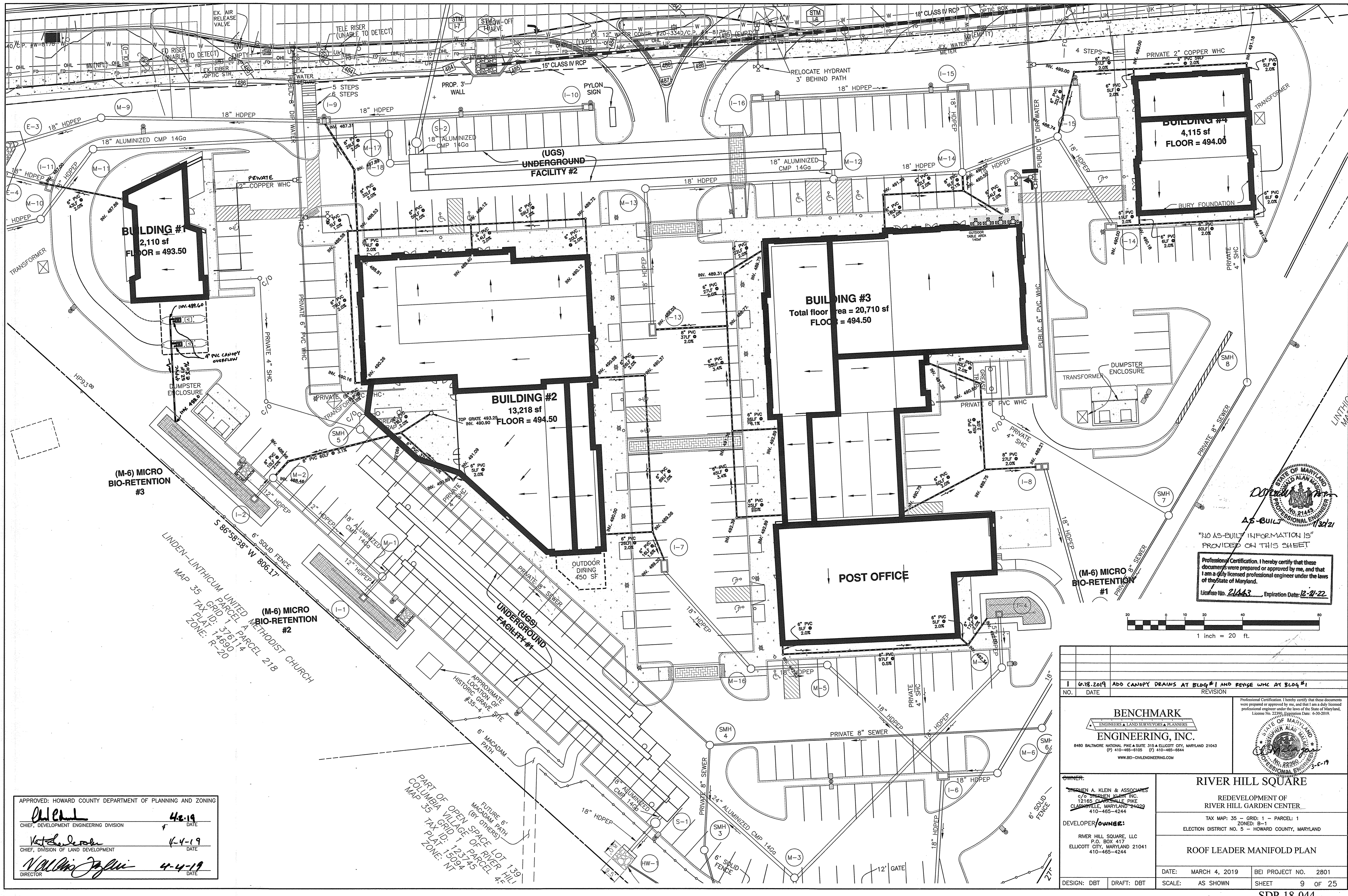
License No. 21443 Expiration Date: 12-2-22



AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

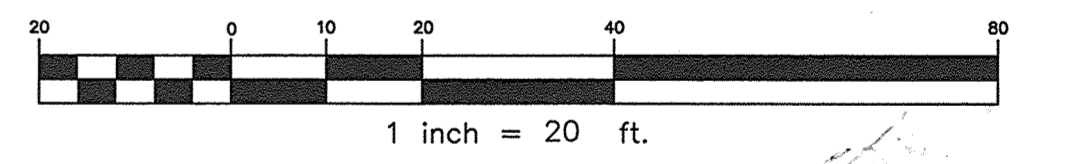
Donald Mason, P.E. Date: 11/30/21

NO. DATE REVISION		REVISION	
1 1.13.2021		REVISE PROFILE FROM E-2 TO S-2 TO ADD MANHOLE M-19	
 8400 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043 (P) 410-465-1105 (F) 410-465-6844 WWW.BE-CVLENGINEERING.COM			
OWNER:		RIVER HILL SQUARE	
STEPHEN A. KLEIN & ASSOCIATES C/O BREKID REIT INC. 12155 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244		REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND	
DEVELOPER/OWNER:		STORM DRAIN PROFILES	
RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244		DATE: MARCH 4, 2019 BEI PROJECT NO. 2801 SCALE: AS SHOWN SHEET 8 OF 25 AS-BUILT SDP-18-044	



"NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET"

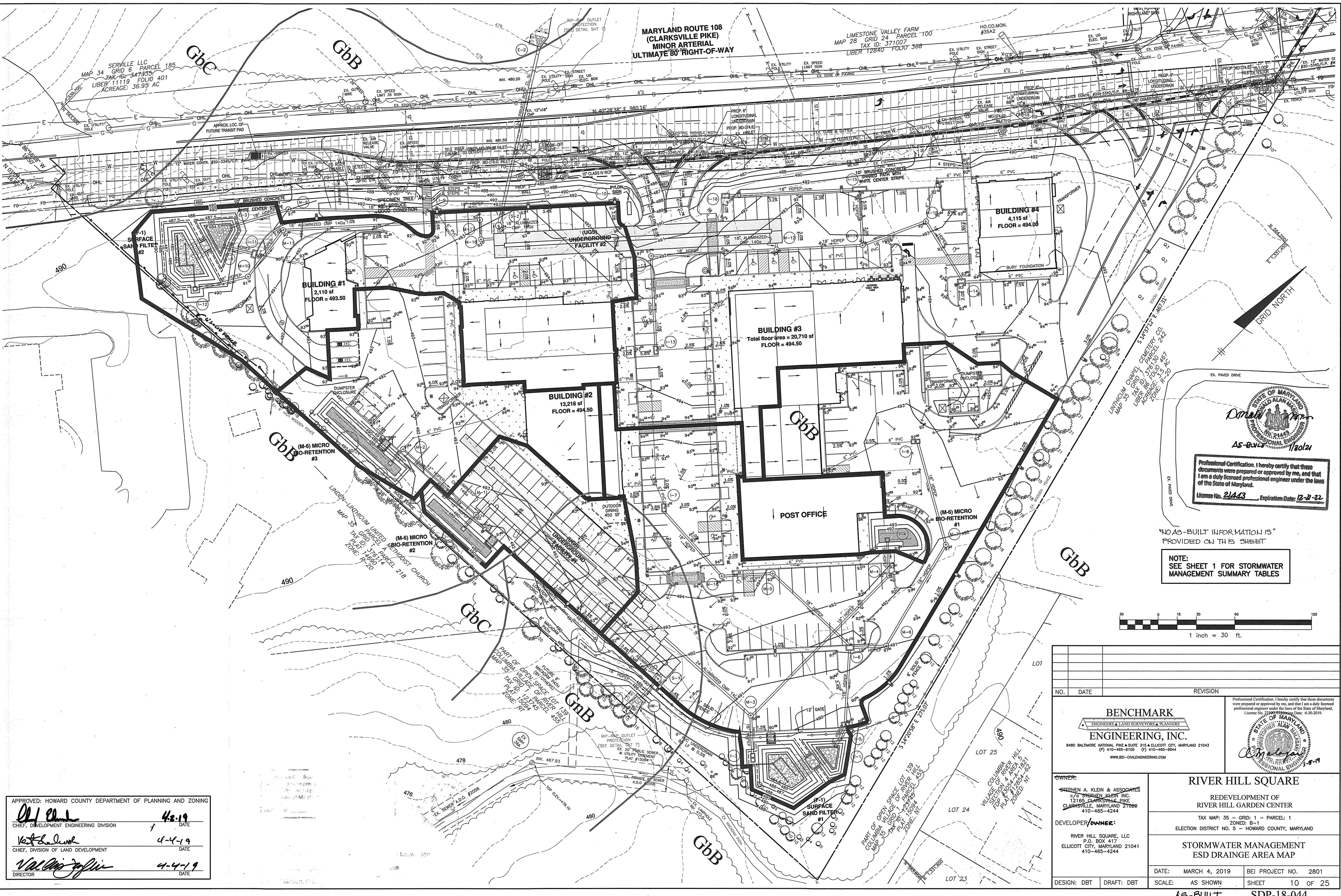
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12-21-22



1 0-18-2019 ADD CANOPY DRAINS AT BLDG #1 AND REVEGE WHC AT BLDG #1 NO. DATE REVISION		Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 21443, Expiration Date: 12-21-22
 BENCHMARK ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043 (P) 410-485-6105 (F) 410-485-6644 WWW.BEI-CVLENGINEERING.COM		
OWNER: STEPHEN A. KLEIN & ASSOCIATES c/o STEPHEN KLEIN, INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-485-4244		RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-485-4244		
DATE: MARCH 4, 2019 BEI PROJECT NO. 2801		SHEET 9 OF 25 SDP-18-044
DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN		

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	
 CHIEF, DEVELOPMENT ENGINEERING DIVISION	4-2-19 DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT	4-4-19 DATE
 DIRECTOR	4-4-19 DATE

PART OF OPEN SPACE LOT 139
 COLUMBIA VILLAGE OF RIVER HILL
 TAX ID: 15294
 PLAT: 15294
 ZONE: NT
 FUTURE 6' MACADAM PATH (BY OTHERS)
 REDEVELOPMENT OF RIVER HILL



MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 100
TAX ID: 371007
LIBER 12840 FOLIO 368

SERVILLE LLC
GRID 6
MAP 34 PARCEL 185
TAX ID: 347325
LIBER 11119 FOLIO 401
ACREAGE: 36.95 AC

BUILDING #4
4,115 sf
FLOOR = 494.00

BUILDING #1
2,110 sf
FLOOR = 493.50

BUILDING #3
Total floor area = 20,710 sf
FLOOR = 494.50

BUILDING #2
13,218 sf
FLOOR = 494.50

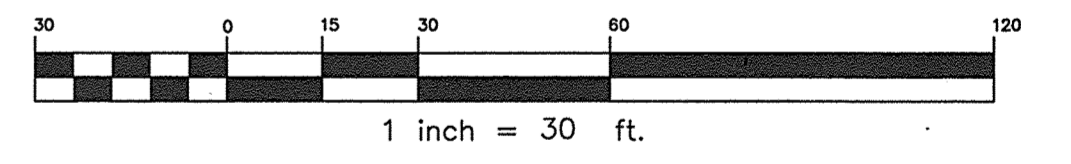
POST OFFICE



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21A43 Expiration Date: 12-2-22

"NO AS-BUILT INFORMATION IS" PROVIDED ON THIS SHEET

NOTE:
SEE SHEET 1 FOR STORMWATER MANAGEMENT SUMMARY TABLES



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	
<i>Howard</i>	4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE
<i>W. S. ...</i>	4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
<i>N. ...</i>	4-4-19
DIRECTOR	DATE

NO.	DATE	REVISION

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043
(7) 410-465-6105 (7) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

OWNER:
STEPHEN A. KLEIN & ASSOCIATES
C/O STEPHEN KLEIN, INC.
12165 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21029
410-465-4244

DEVELOPER/OWNER:
RIVER HILL SQUARE, LLC
P.O. BOX 417
ELLICOTT CITY, MARYLAND 21041
410-465-4244

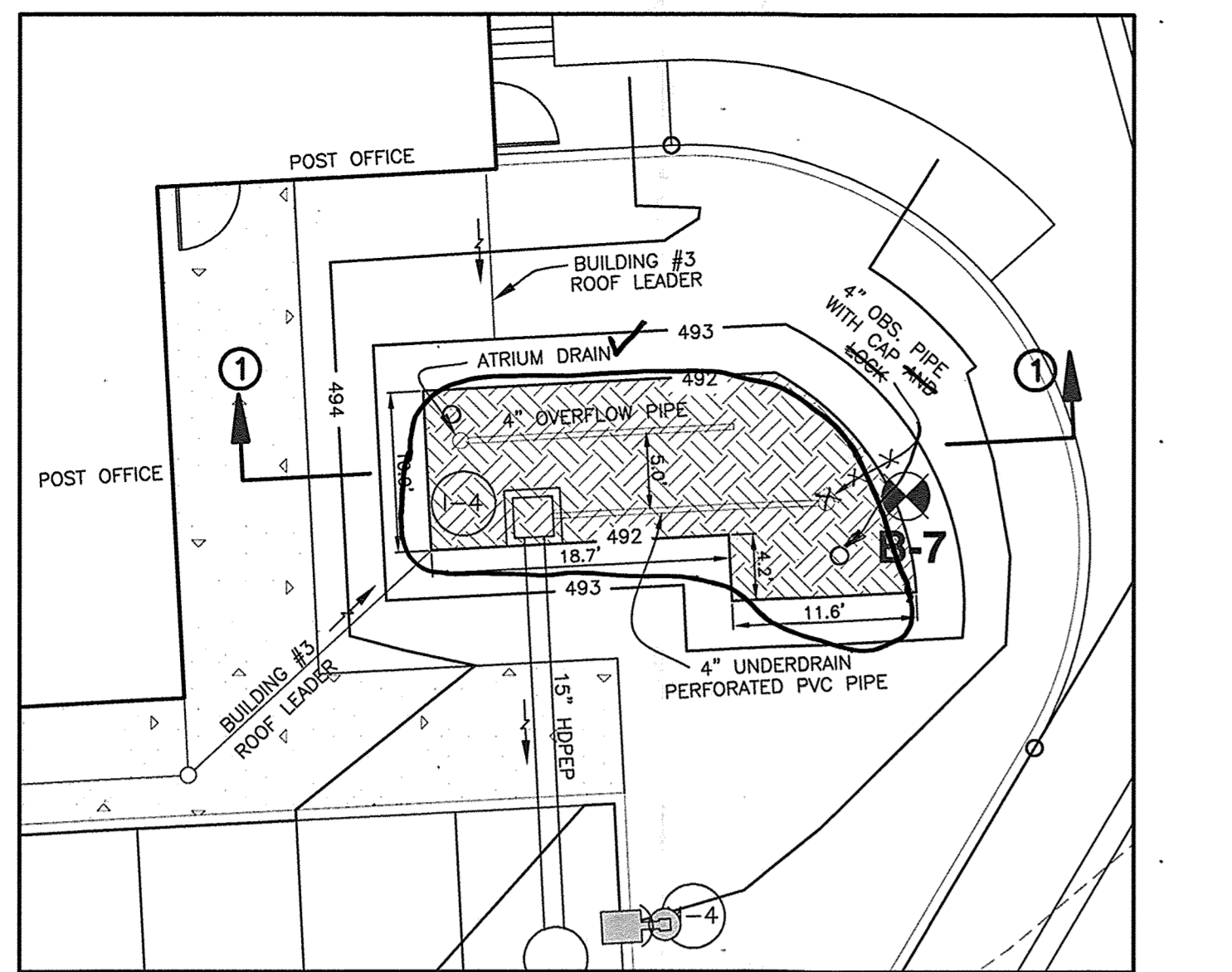
RIVER HILL SQUARE
REDEVELOPMENT OF
RIVER HILL GARDEN CENTER

TAX MAP: 35 - GRID: 1 - PARCEL: 1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

**STORMWATER MANAGEMENT
ESD DRAINAGE AREA MAP**

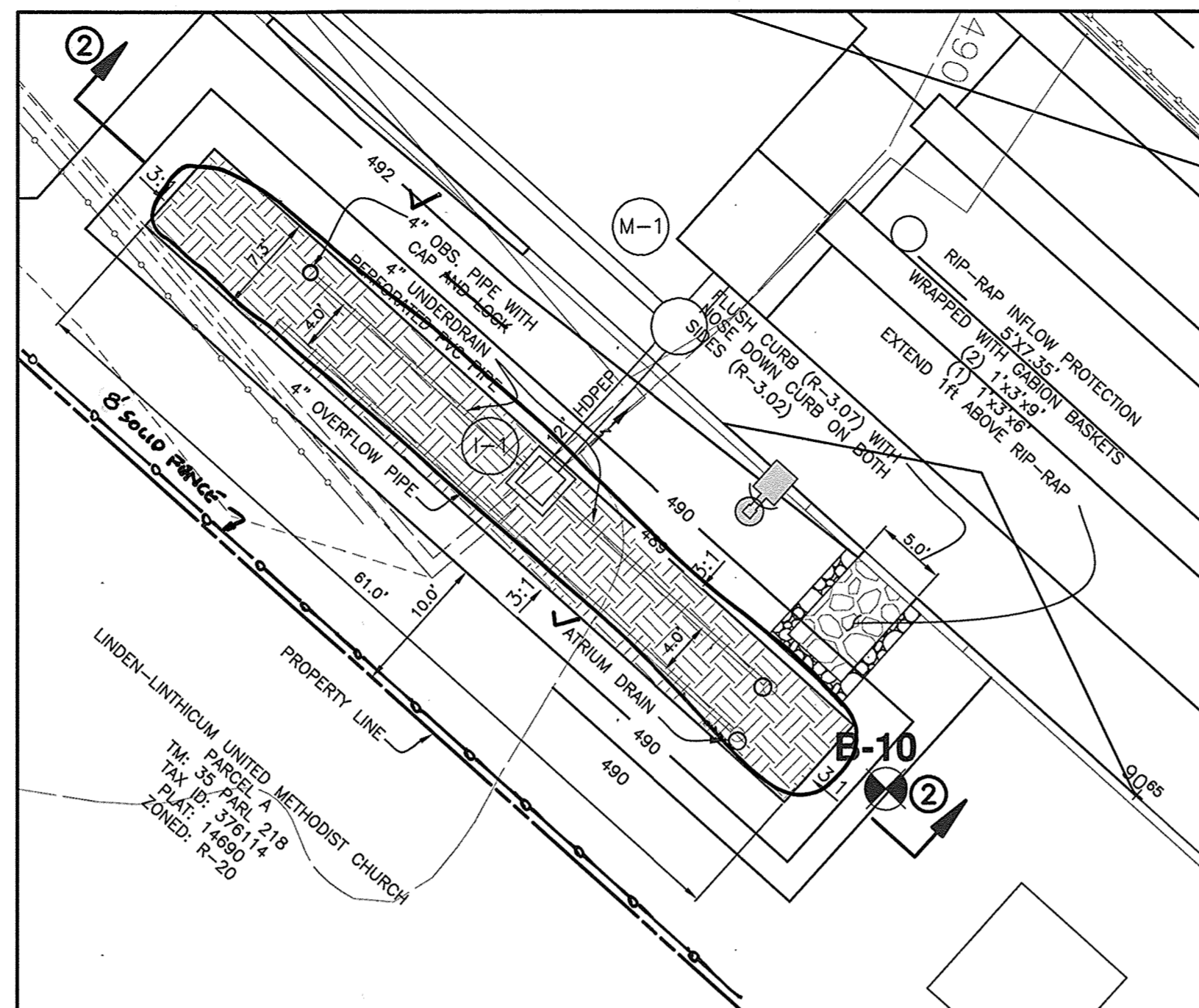
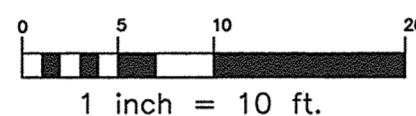
DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
SCALE: AS SHOWN SHEET 10 OF 25

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21A43 Expiration Date: 12-2-22



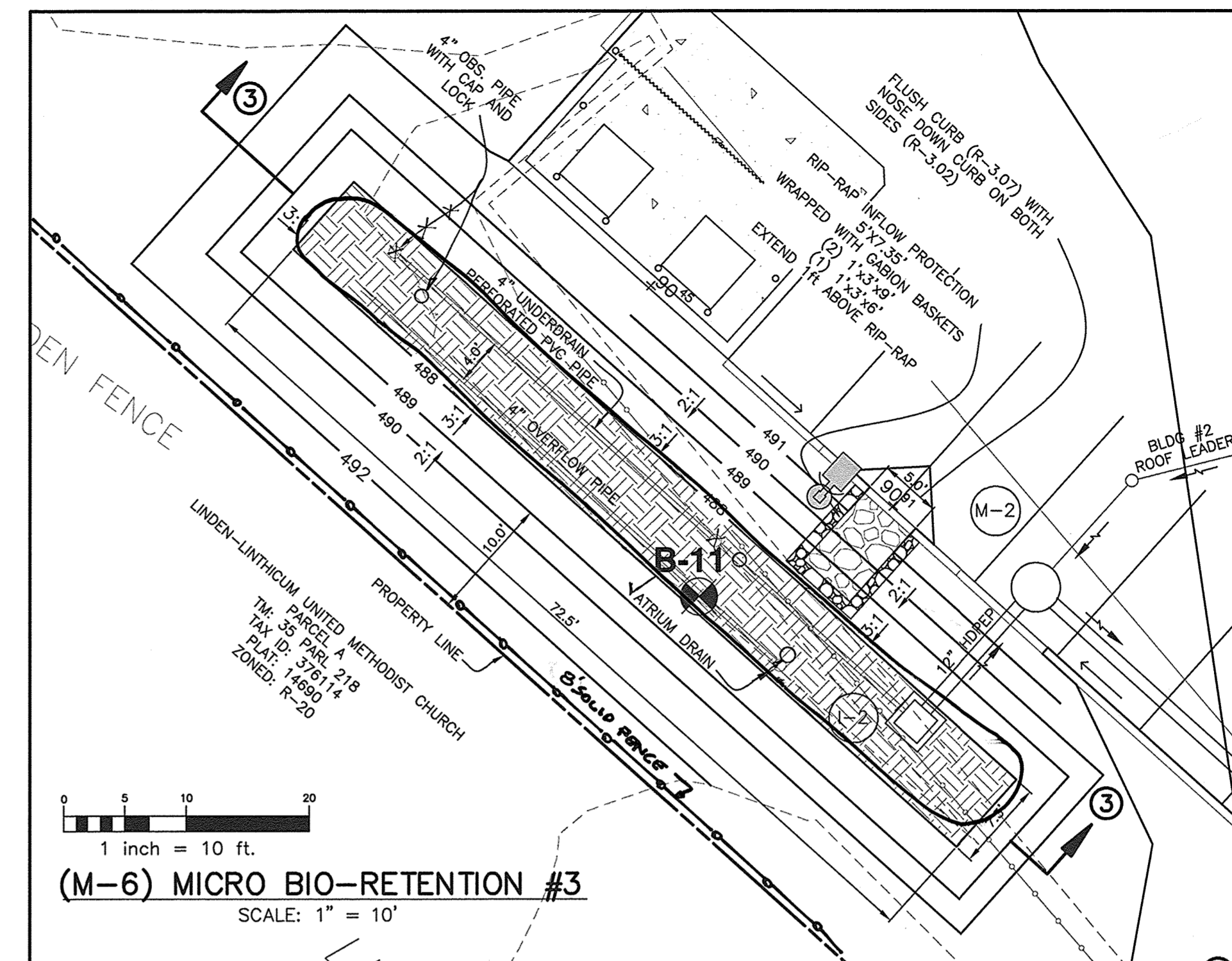
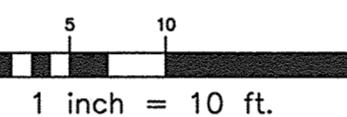
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SCALE: 1" = 10'



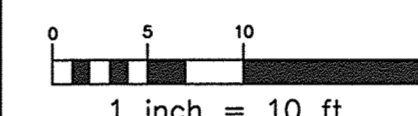
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SCALE: 1" = 10'

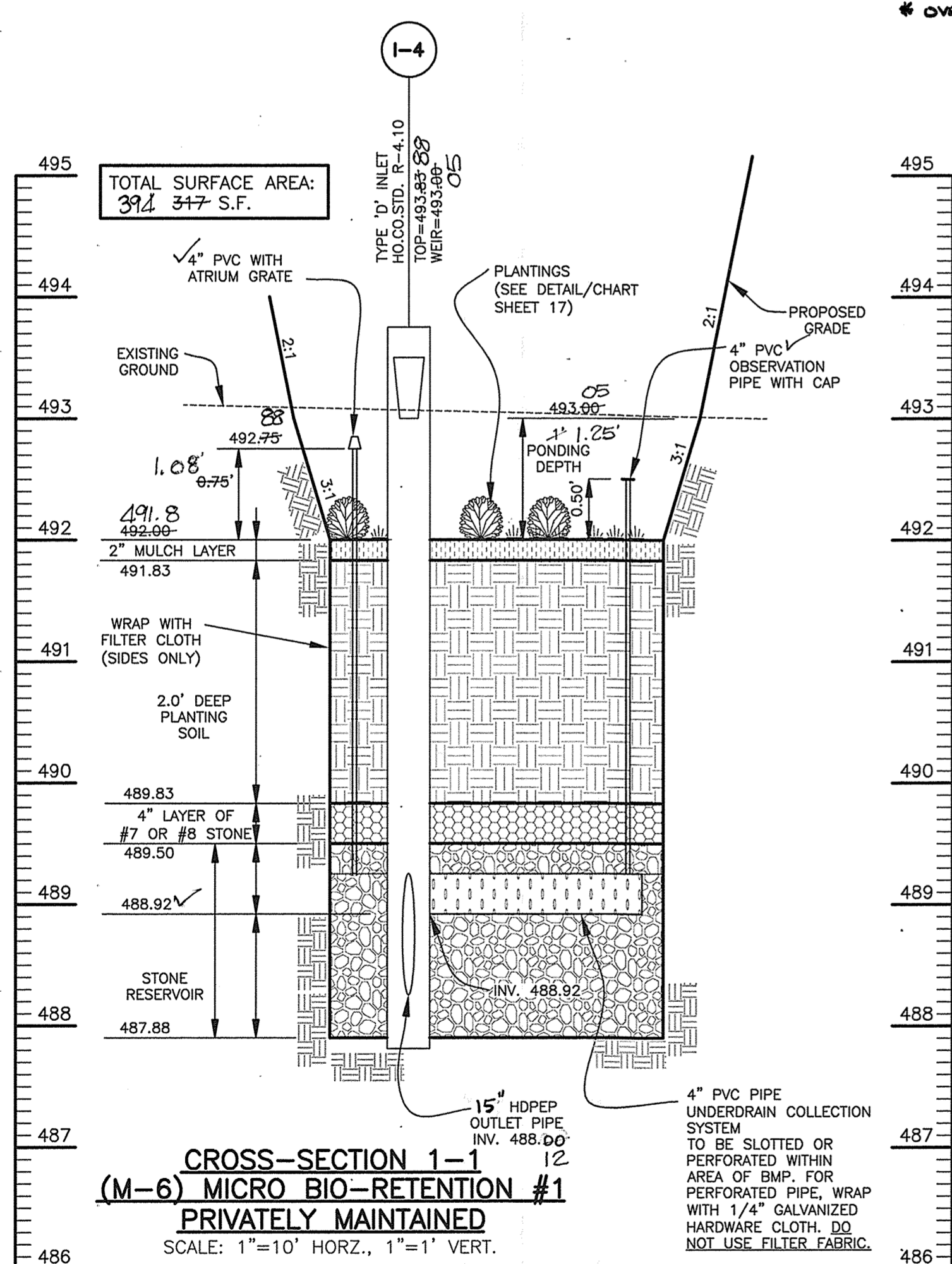


(M-6) MICRO BIO-RETENTION #3

SCALE: 1" = 10'

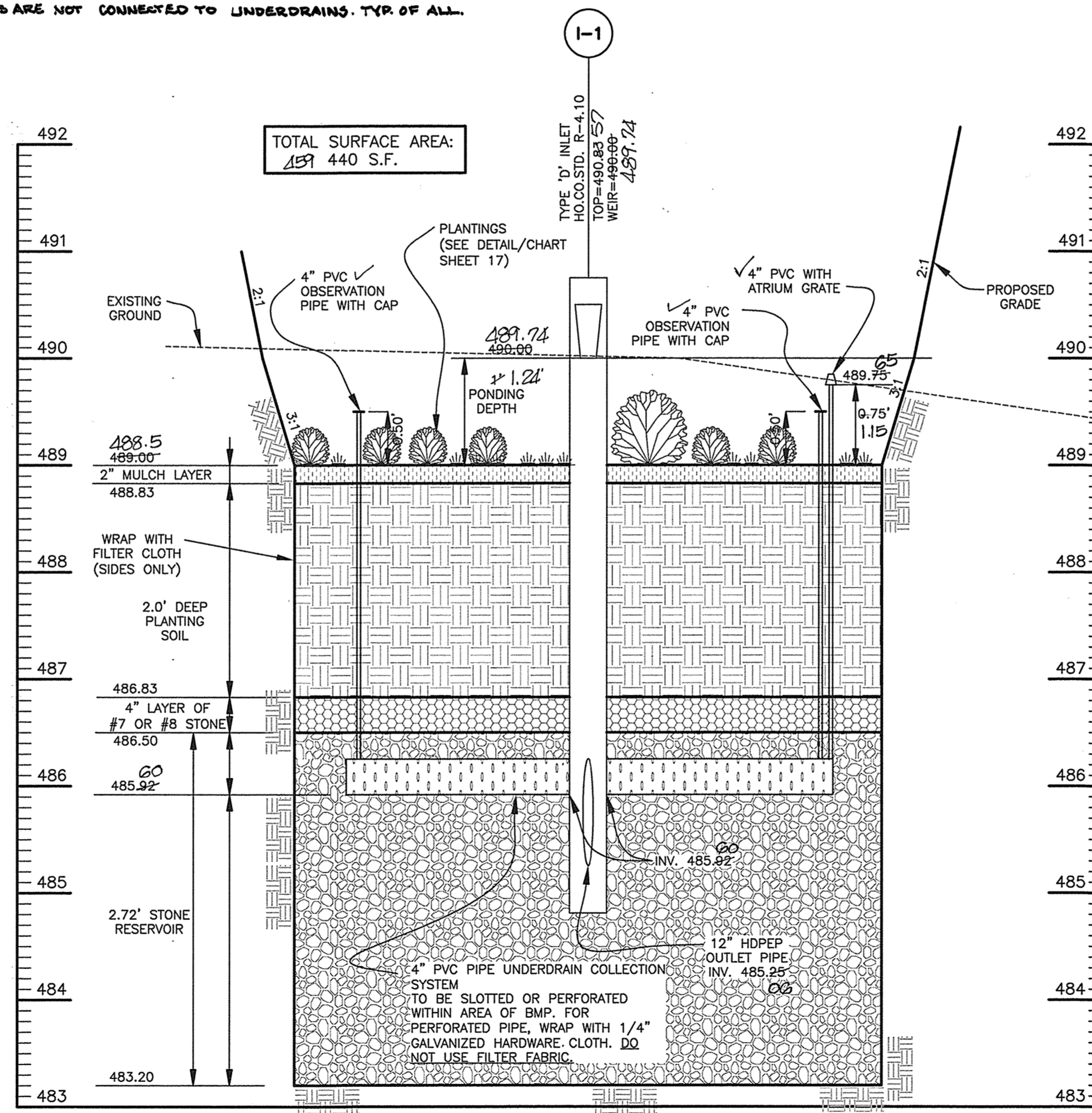


* OVERFLOW DRAINS ARE NOT CONNECTED TO UNDERDRAINS. TYP. OF ALL.



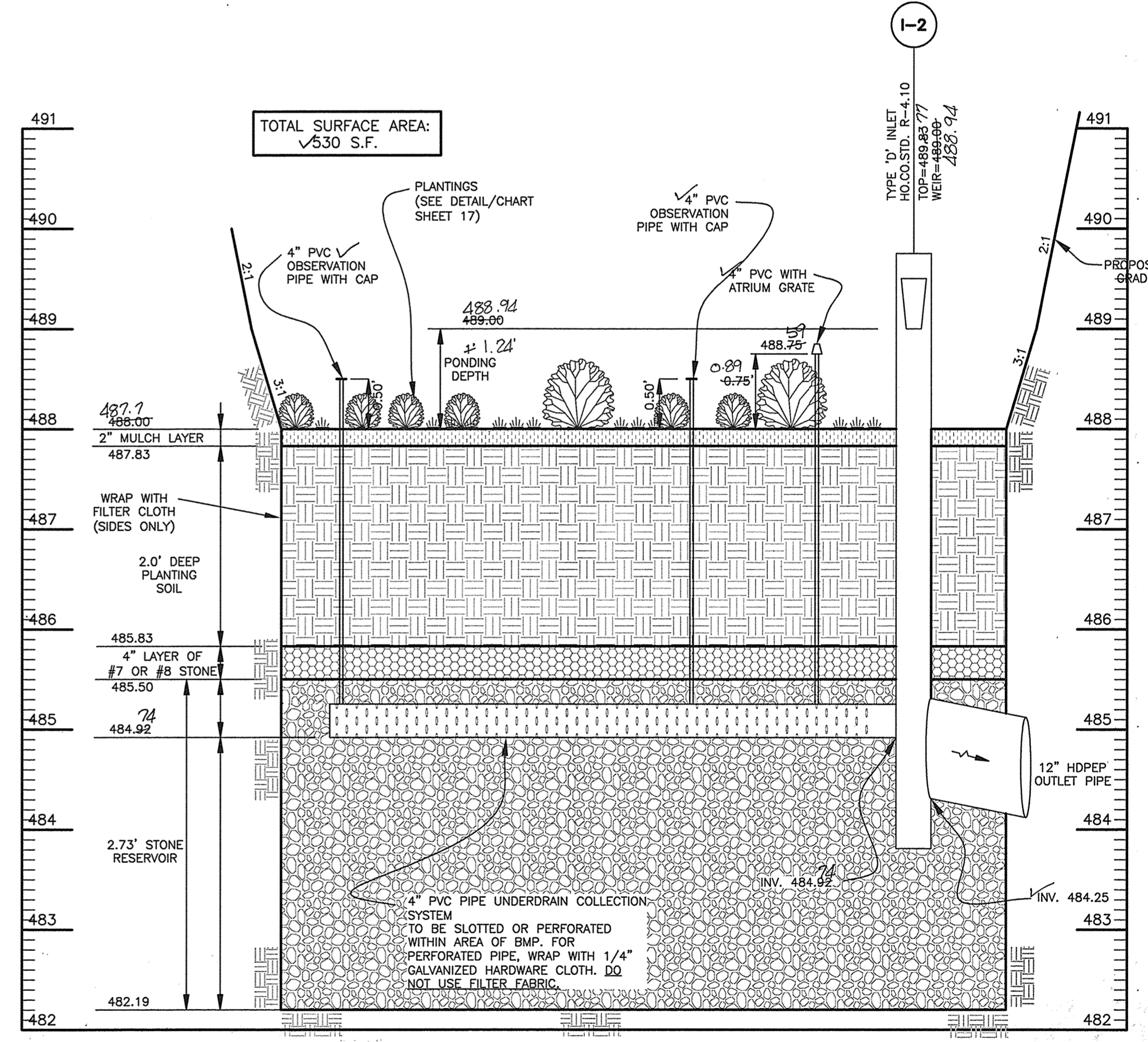
CROSS-SECTION 1-1
(M-6) MICRO BIO-RETENTION #1
PRIVATELY MAINTAINED

SCALE: 1" = 10' HORZ., 1" = 1' VERT.



CROSS-SECTION 2-2
(M-6) MICRO BIO-RETENTION #2
PRIVATELY MAINTAINED

SCALE: 1" = 10' HORZ., 1" = 1' VERT.



CROSS-SECTION 3-3
(M-6) MICRO BIO-RETENTION #3
PRIVATELY MAINTAINED

SCALE: 1" = 10' HORZ., 1" = 1' VERT.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 21443 Expiration Date: 12-21-22



AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E.

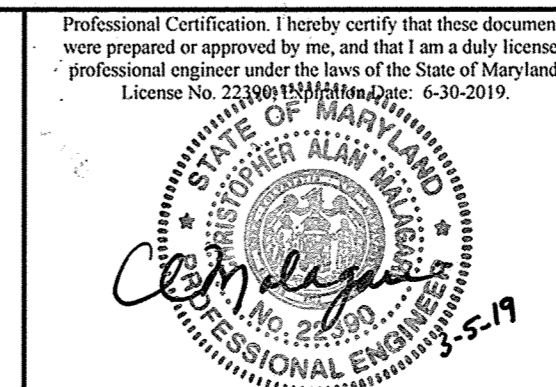
Date: 1/30/21

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION
CHIEF, DIVISION OF LAND DEVELOPMENT
DIRECTOR

NO.	DATE	REVISION
1	3.31.2020	REVISE FENCE TO BE 8' TALL PER BA-19-022V IN MB#2 AND MB#3 DETAIL CORRECT SIZE AND INVERT OF PIPE & I-4 IN MB#1 CROSS-SECTION

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE & SUITE 315 A ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6109 (F) 410-465-6944
WWW.BC-ENL.ENGINEERING.COM



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

OWNER:
STEPHEN A. KLEIN & ASSOCIATES
c/o STEPHEN ALLEN, INC.
12165 CLARKSTONE PIKE
CLARKSVILLE, MARYLAND 21030
410-465-4244

DEVELOPER/OWNER:
RIVER HILL SQUARE, LLC
P.O. BOX 417
ELLICOTT CITY, MARYLAND 21041
410-465-4244

RIVER HILL SQUARE

REDEVELOPMENT OF
RIVER HILL GARDEN CENTER

TAX MAP: 35 - GRID: 1 - PARCEL: 1
ZONED: B-1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

SWM DETAILS
(M-6) MICRO BIO-RETENTION

DATE: MARCH 4, 2019 BEI PROJECT NO. 2801

SCALE: AS SHOWN SHEET 11 OF 25

AS-BUILT SDP-18-044

Table B.4.1 Materials Specifications for Micro-Bioretenion, 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 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; $f_c = 3500$ psi @ 28 days, normal weight, air-entrained; 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) <i>not using previously approved State or local standards</i> requires design drawings sealed and approved by a professional structural 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 pressures); 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.

B.4.7

Supp. 1

OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6)

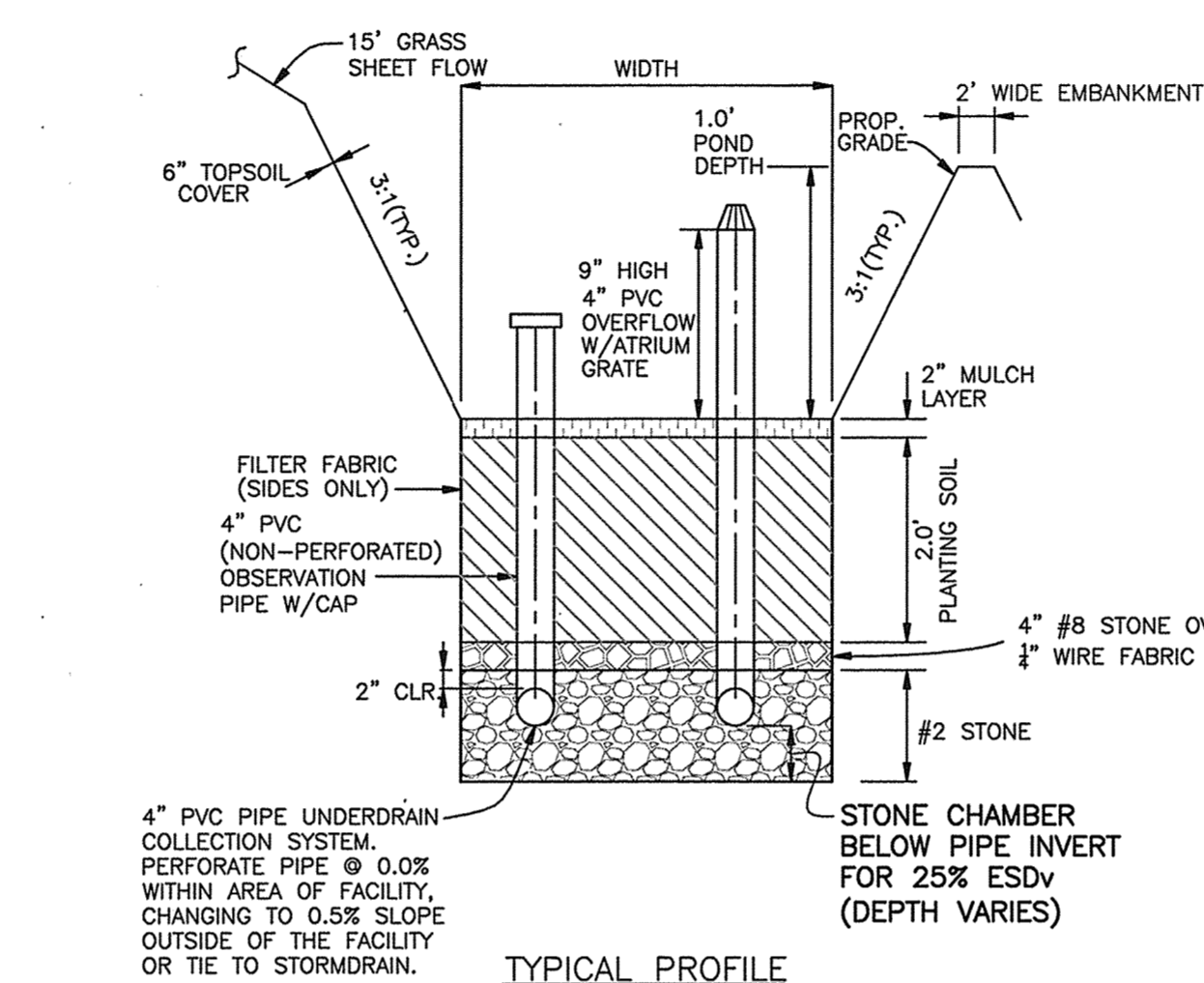
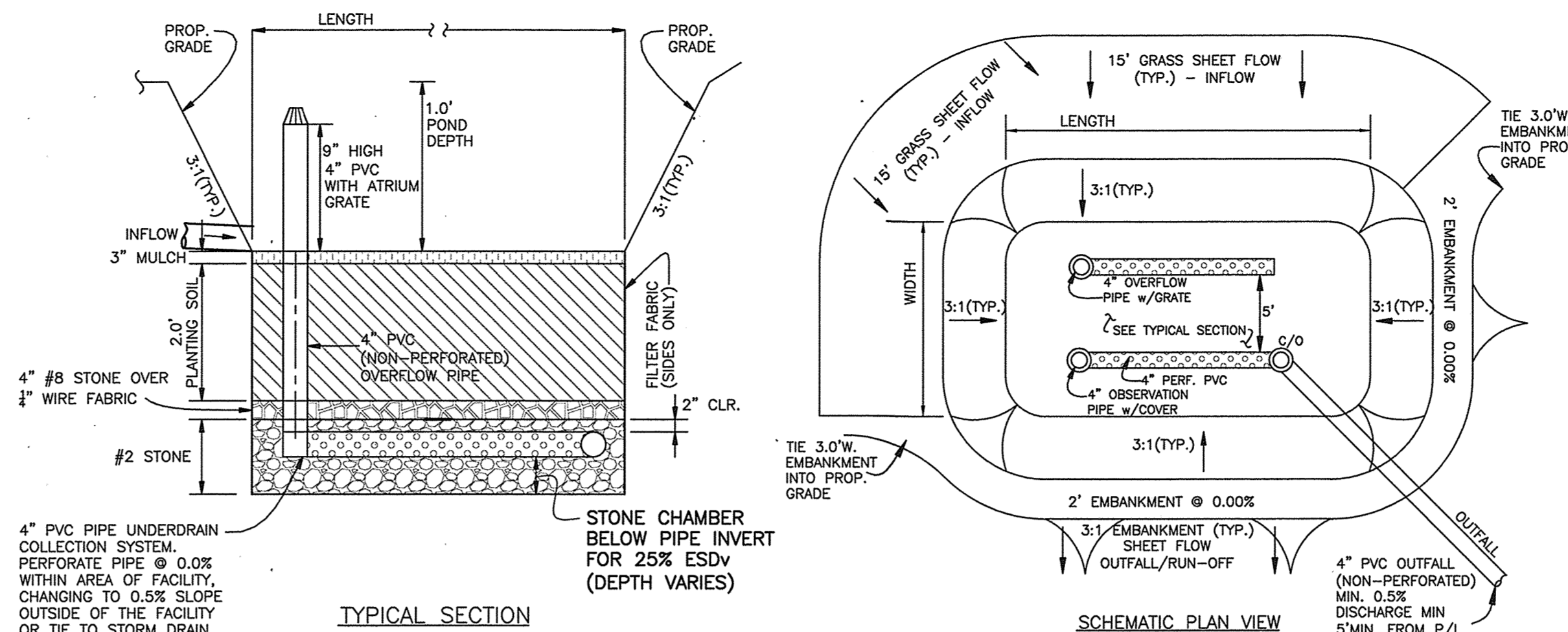
- The Owner shall maintain the plant material, mulch layer and soil layer annually. Maintenance of mulch and soil is limited to correcting areas of erosion or wash out. Any mulch replacement shall be done in the spring. Plant material shall be checked for disease and insect infestation and maintenance will address dead material and pruning. Acceptable replacement plant material is limited to the following: 2000 Maryland Stormwater Design Manual Volume II, Table A.4.1 and 2.
- The Owner shall perform a plant inspection in the spring and in the fall of each year. During the inspection, the Owner shall remove dead and diseased vegetation considered beyond treatment, replace dead plant material with acceptable replacement plant material, treat diseased trees and shrubs, and replace all deficient stakes and wires.
- The Owner shall inspect the mulch each spring. The mulch shall be replaced every two to three years. The previous mulch layer shall be removed the new layer is applied.
- The Owner shall correct soil erosion on an as needed basis, with a minimum of once per month and after each heavy storm.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4-4-19
DIRECTOR



STANDARD MICRO-BIORETENTION DETAILS
NOT TO SCALE

UNDERDRAIN, OVERFLOW AND OUTFALL NOTES

- THE LAST CLEAN-OUT LOCATION WITHIN EACH MICRO-BIORETENTION FACILITY SHALL BE FITTED WITH A NON-CLOGGING SURFACE DRAIN (EXAMPLE: 4" PVC ATRIUM GRATE).
- THE PVC UNDER-DRAINS WITHIN THE FACILITY SHALL BE PERFORATED.
- THE UNDER-DRAIN AND PIPE TO OUTFALL SHALL BE INSTALLED TO A MINIMUM DEPTH OF 2' BELOW FINISHED GRADE AND SHALL MAINTAIN A MINIMUM 1% SLOPE AND MAINTAIN A MINIMUM OF 1' OF SEPARATION AT ALL CROSSINGS.

CONSTRUCTION SPECIFICATIONS

B.4.C Specifications for Micro-Bioretenion, Rain Gardens, Landscape Infiltration & Infiltration Berms

- Material Specifications:**
The allowable materials to be used in these practices are detailed in Table B.4.1.
- 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-bioretenion 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 D 2974). In general, this can be met with a mixture of loamy and (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-bioretenion 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 urea 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 (ASTM F 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 3/4" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a 1/4" (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 1,000 square feet) to provide a clean-out port and monitor performance of the filter.
- A 4" layer of pea gravel (1/4" 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).

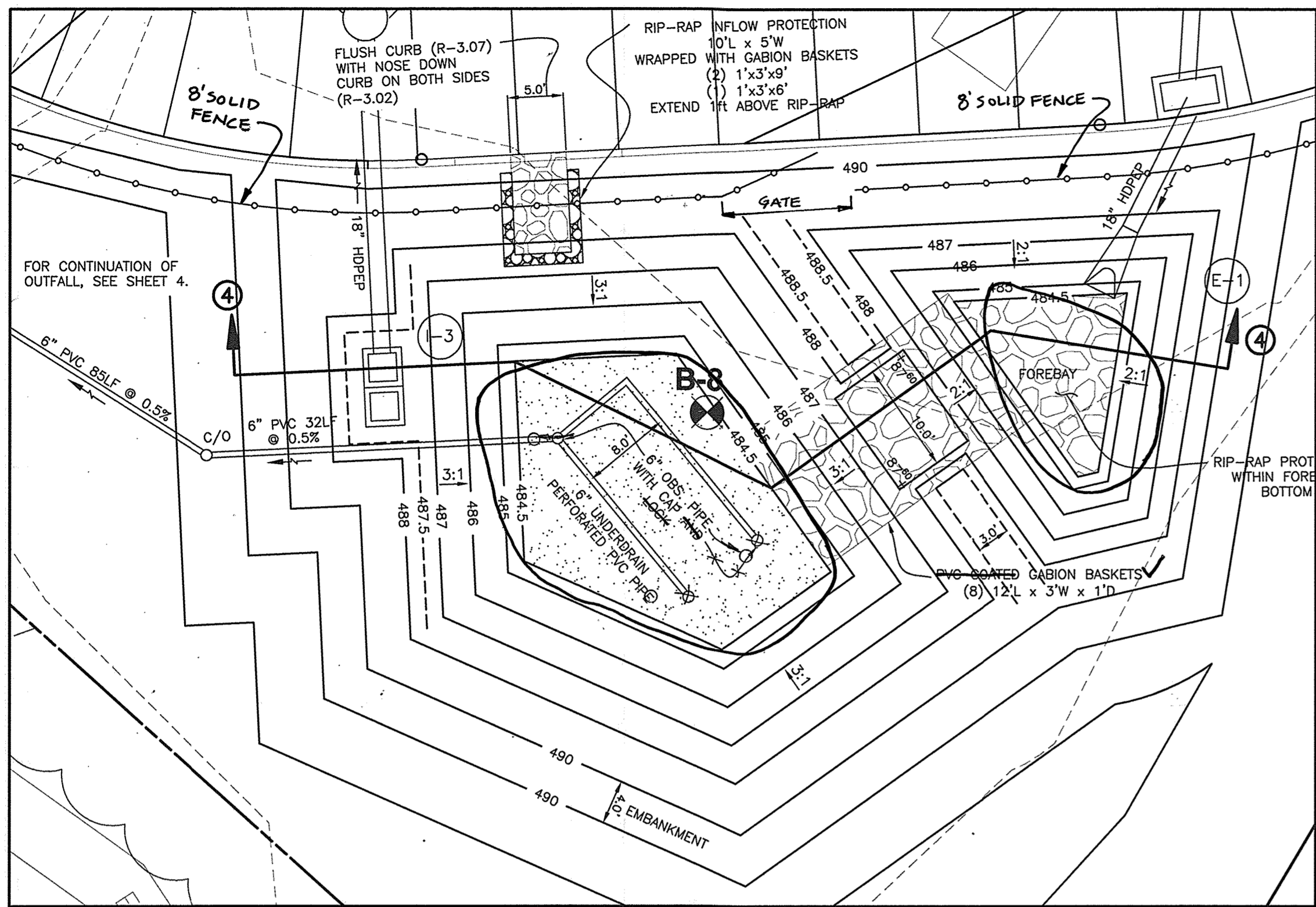
7. Miscellaneous:
These practices may not be constructed until all contributing drainage area has been stabilized

"NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET"

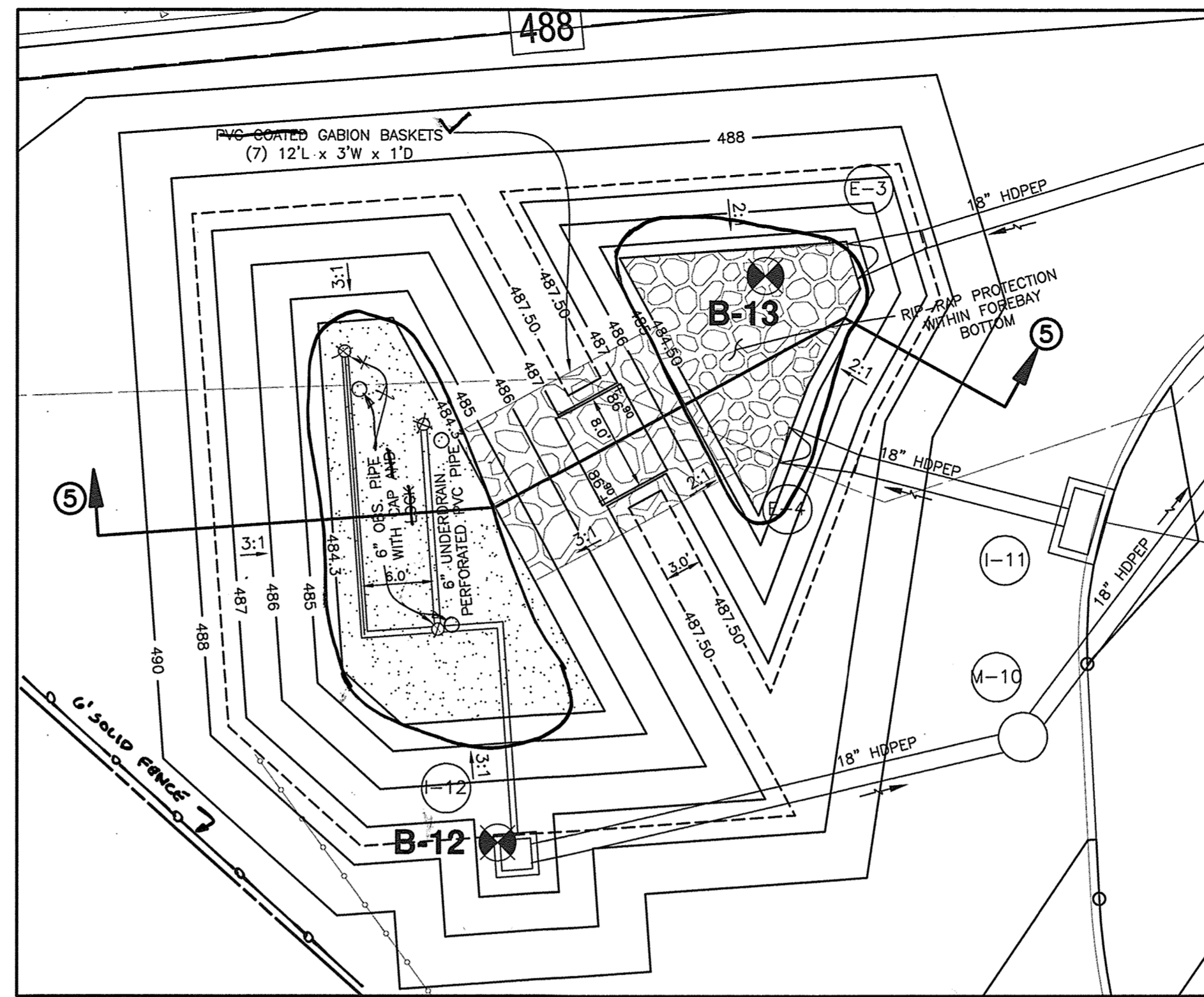
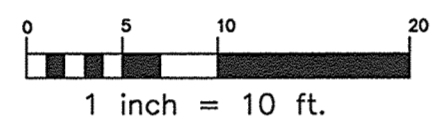
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-22

Professional Engineer Seal for Donald Alan Moore, License No. 21443, State of Maryland, expires 12/30/21.

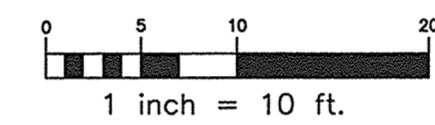
NO. DATE REVISION		Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22394 Expiration Date: 6-30-2019.	
<p>BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315A ELLICOTT CITY, MARYLAND 21043 (P) 410-465-8100 (F) 410-465-8644 WWW.BE-CVLENGINEERING.COM</p>		<p>STATE OF MARYLAND PROFESSIONAL ENGINEER Seal for Donald Alan Moore, License No. 21443, expires 12/30/21.</p>	
<p>OWNER: STEPHEN A. KLEIN & ASSOCIATES c/o STEPHEN KLEIN INC. 12155 CLARKVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244</p>		<p>RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>	
<p>DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244</p>		<p>SWM DETAILS (M-6) MICRO BIO-RETENTION DATE: MARCH 4, 2019 BEI PROJECT NO. 2801 DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN SHEET 12 OF 25</p>	



(F-1) SURFACE SAND FILTER #1
SCALE: 1" = 10'



(F-1) SURFACE SAND FILTER #2
SCALE: 1" = 10'

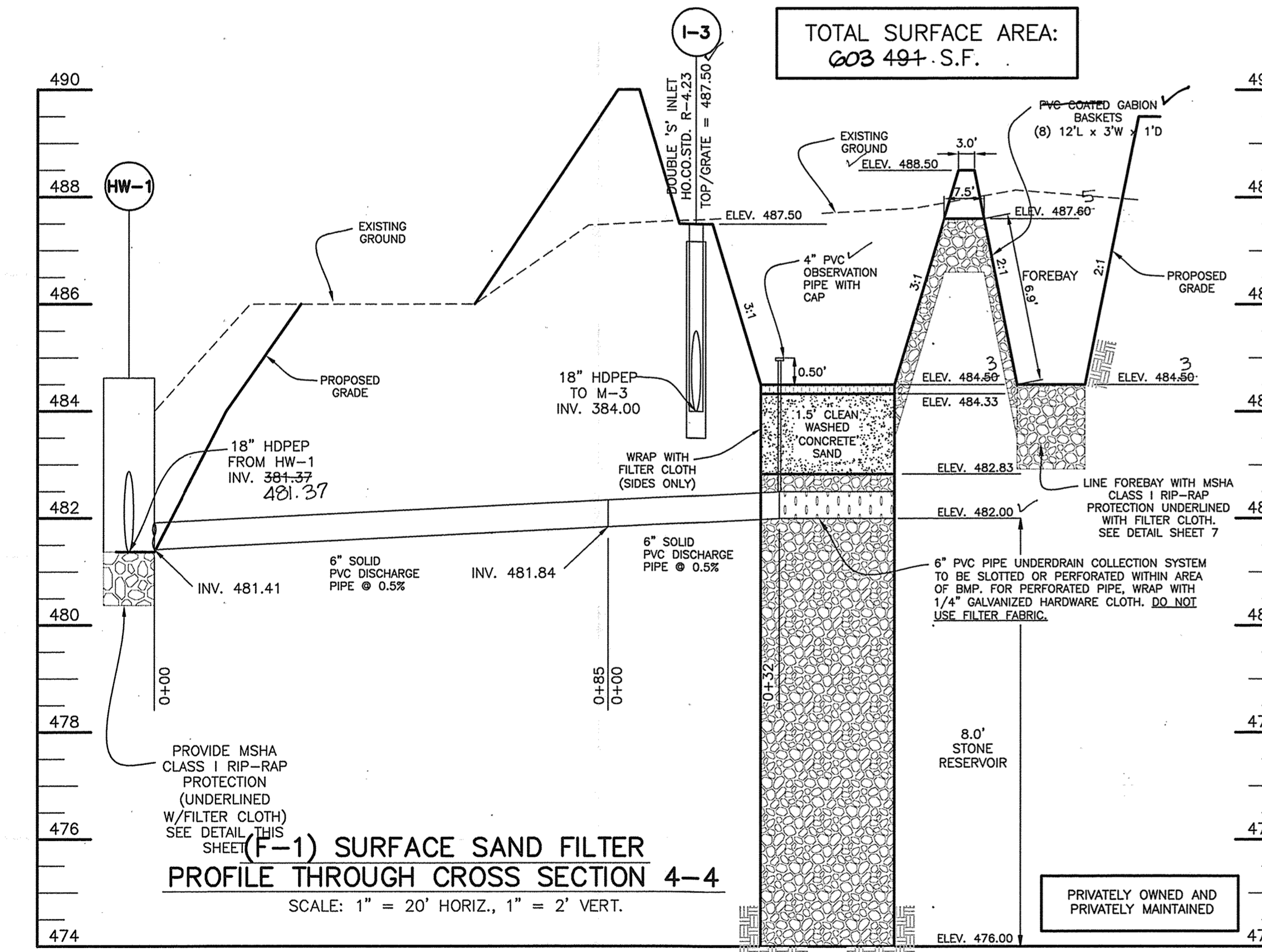


Material	Specification/Test Method	Size	Notes
sand	clean AASHTO-M-6 or ASTM-C-33 concrete sand	0.075" to 0.425"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonate or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.
peat	ash content: < 15% pH range: 5.2 to 4.5 lime bulk density 0.12 to 0.15 g/cc	n/a	The material must be reed-seed hemic peat, shredded, uncompacted, uniform, and clean.
leaf compost	AASHTO-M-43	0.375" to 0.75"	n/a
underdrain gravel	ASTM-D-4833 (puncture strength - 125 lb.) ASTM-D-4832 (Tensile Strength - 300 lb.)	0.08" thick equivalent opening size of #80 sieve	Must maintain 125 gms per sq. ft. flow rate. Note: a 4" pea gravel layer may be substituted for geotextiles meant to "trap" sand filter layers.
geotextile fabric (if required)	ASTM-D-4833 (thickness) ASTM-D-412 (tensile strength 1,100 lb., elongation 200%) ASTM-D-624 (Tear resistance - 150 lb./in.) ASTM-D-471 (water adsorption: +8 to -2% mass)	30 mil thickness	Liner to be ultraviolet resistant. A geotextile fabric should be used to protect the liner from puncture.
impermeable liner (if required)	MSHA Standards and Specs. Section 902, Min. No. 3, F _c = 3500 psi, normal weight, air-entrained; re-inforcing 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 structural engineer licensed in the State of Maryland
underdrain piping	758, Type P8 28 or AASHTO-M-278	4" - 6" rigid schedule 40 PVC or SDR35	3/8" part. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
concrete (cast-in-place)	per pre-cast manufacturer	n/a	SEB ABOVE NOTE
concrete (pre-cast)	ASTM A-36	n/a	structural steel to be hot-dipped galvanized ASTM-A-123

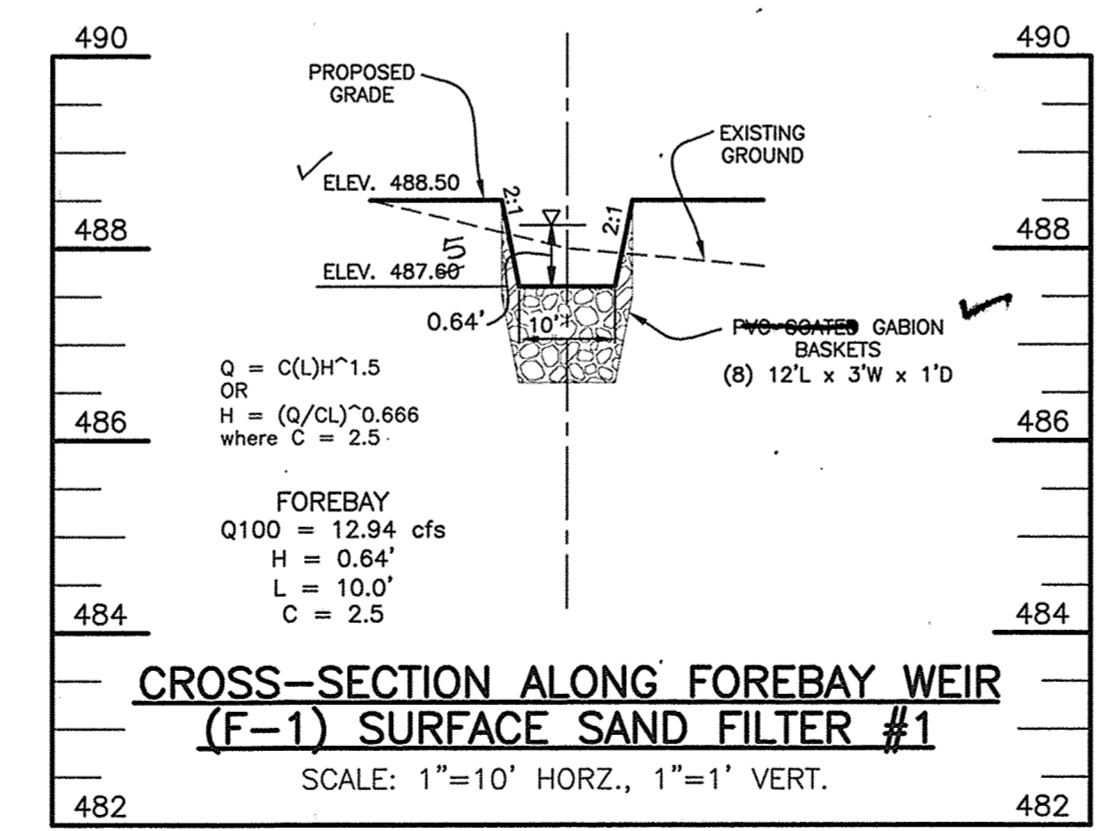
OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND PRIVATELY MAINTAINED (F-1) SURFACE SAND FILTER

- ROUTINE MAINTENANCE**
- THE STORMWATER WETLAND FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE FACILITY IS FUNCTIONING PROPERLY.
 - THE TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF ONCE PER YEAR, WHEN VEGETATION REACHES 18" IN HEIGHT OR AS NEEDED.
 - FILTERS THAT HAVE A GRASS COVER SHALL BE MOWED A MINIMUM OF THREE (3) TIMES PER GROWING SEASON TO MAINTAIN A MAXIMUM GRASS HEIGHT OF LESS THAN 12 INCHES.
 - DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
 - VISIBLE SIGNS OF EROSION IN THE FACILITY SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
 - REMOVE SILT WHEN IT EXCEEDS FOUR (4) INCHES DEEP IN THE FOREBAY, IF APPLICABLE.
 - WHEN WATER PONDS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 72 HOURS, THE TOP FEW INCHES OF DISCOLORED MATERIAL SHALL BE REPLACED WITH FRESH MATERIAL. PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIALS AND LIQUID MUST BE FOLLOWED BY THE OWNER.
 - A LOGBOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
 - THE MAINTENANCE LOGBOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
 - ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION SYSTEM HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

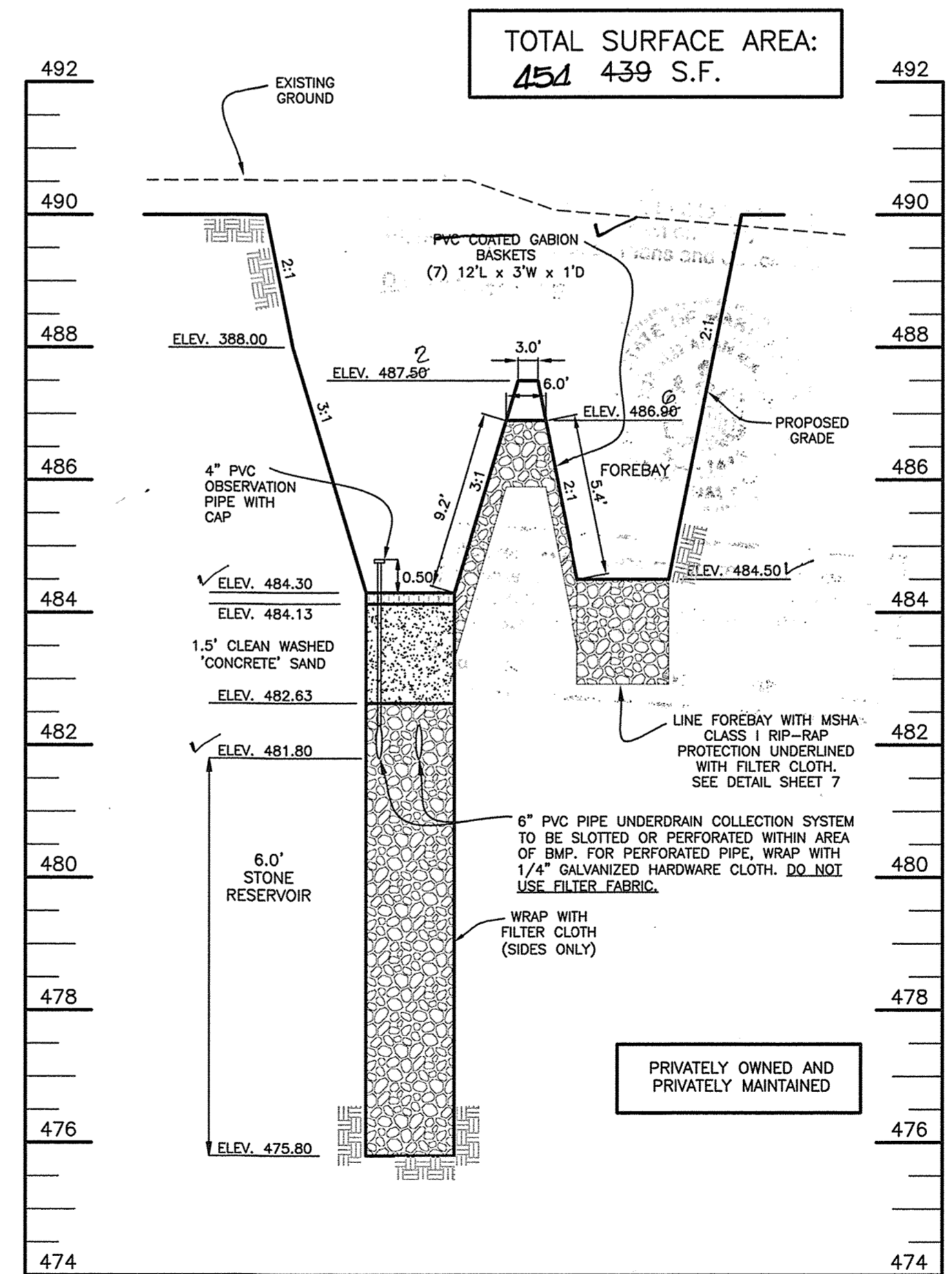
- NON-ROUTINE MAINTENANCE**
- STRUCTURAL COMPONENTS OF THE POND SUCH AS THE EMBANKMENT, THE RISER STRUCTURE AND TRASH RACK, AND PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THESE COMPONENTS SHALL BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.



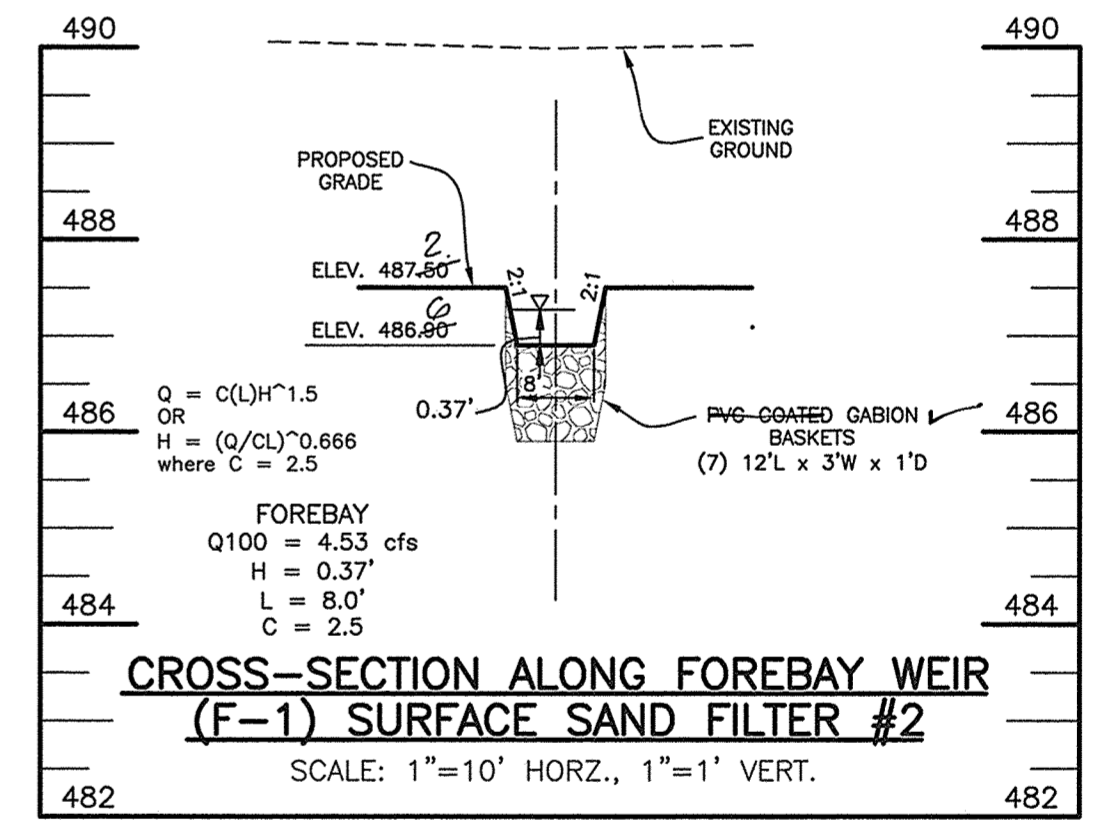
(F-1) SURFACE SAND FILTER PROFILE THROUGH CROSS SECTION 4-4
SCALE: 1" = 20' HORIZ., 1" = 2' VERT.



(F-1) SURFACE SAND FILTER PROFILE THROUGH CROSS SECTION 5-5
SCALE: 1" = 10' HORIZ., 1" = 1' VERT.



(F-1) SURFACE SAND FILTER PROFILE THROUGH CROSS SECTION 5-5
SCALE: 1" = 20' HORIZ., 1" = 2' VERT.



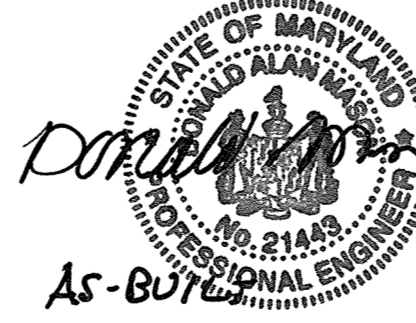
CROSS-SECTION ALONG FOREBAY WEIR (F-1) SURFACE SAND FILTER #2
SCALE: 1" = 10' HORIZ., 1" = 1' VERT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Howard County Seal
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE: 4-2-19

Kevin Schaefer
CHIEF, DIVISION OF LAND DEVELOPMENT
DATE: 4-4-19

Nancy J. Jaffe
DIRECTOR
DATE: 4-7-19



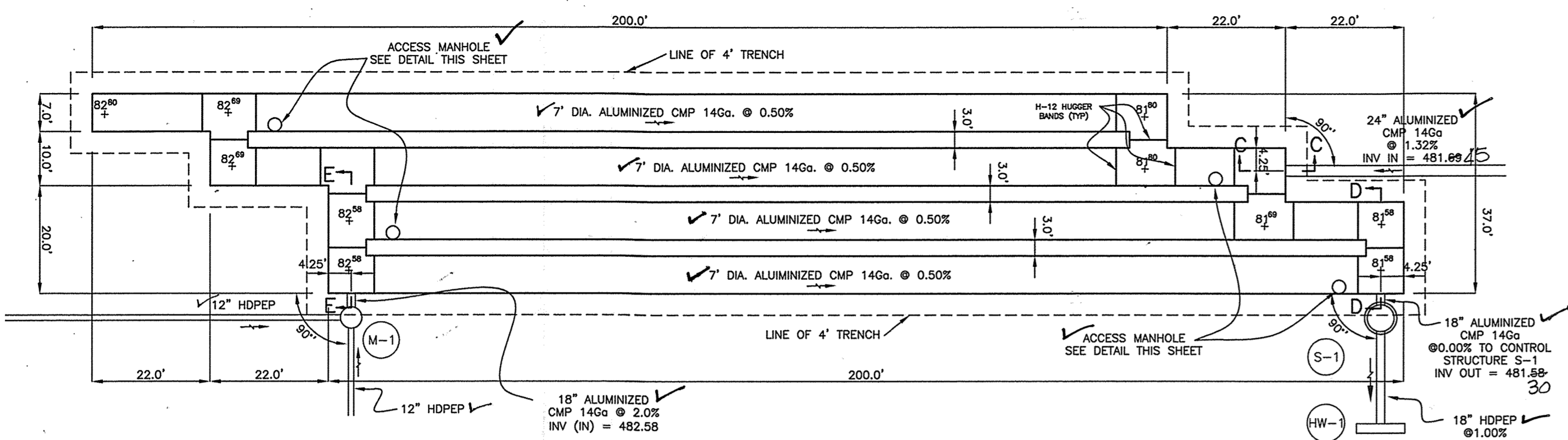
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-22

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Donald Mason, P.E. Date: 1/30/21

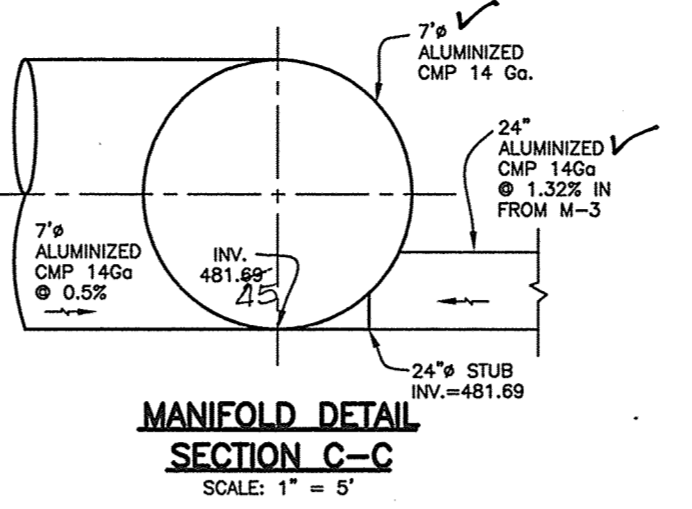
<p>REVISION</p> <p>1 3.31.2020 LABEL B' SOLID FENCE IN SURFACE SAND FILTER #1</p>		<p>Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22394, Expiration Date: 6-30-2019.</p> <p>BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 A ELLICOTT CITY, MARYLAND 21043 (P) 410-465-1100 (F) 410-465-6644 WWW.BE-CVLENGINEERING.COM</p>
OWNER:	<p>STEVEN A. KLEIN & ASSOCIATES C/O STEVEN KLEIN, INC. 12165 CHARTERS PIKE CLARKSVILLE, MARYLAND 21034 410-465-4244</p>	
DEVELOPER/OWNER:	<p>RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244</p>	<p>RIVER HILL SQUARE</p> <p>REDEVELOPMENT OF RIVER HILL GARDEN CENTER</p> <p>TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>
<p>SWM DETAILS (F-1) SURFACE SAND FILTERS</p>		<p>DATE: MARCH 4, 2019 BEI PROJECT NO. 2801</p> <p>SCALE: AS SHOWN SHEET 13 OF 25</p> <p>AS-BUILT SDP-18-044</p>

OPERATION AND MAINTENANCE SCHEDULE FOR UNDERGROUND STORMWATER MANAGEMENT FACILITIES

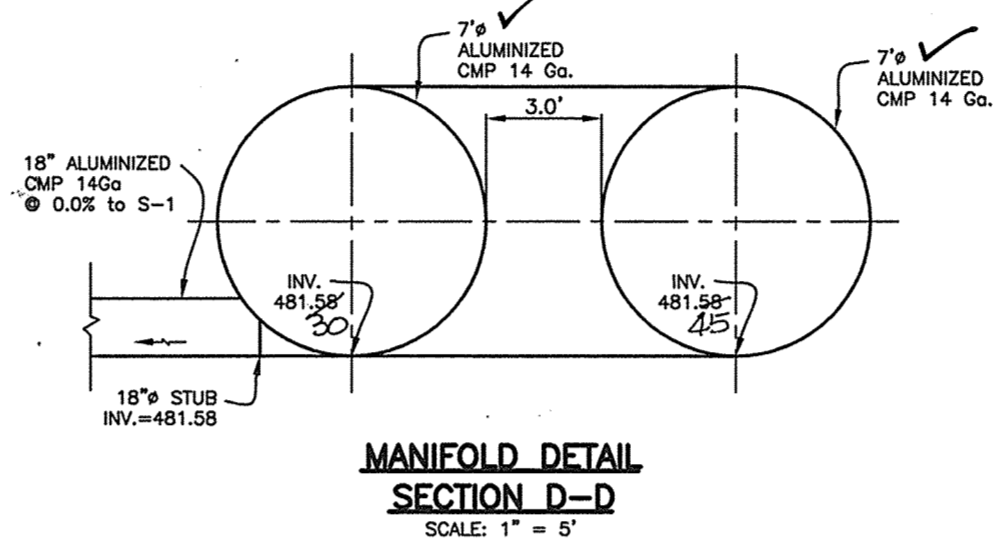
1. THE UNDERGROUND STORM WATER MANAGEMENT FACILITY IS PRIVATELY OWNED AND IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO PERIODICALLY INSPECT AND CLEAN THE FACILITY TO MAINTAIN ITS OPERATION AND FUNCTION.
2. THE UNDERGROUND STORM WATER MANAGEMENT FACILITY SHALL BE INSPECTED YEARLY AT A MINIMUM AND AFTER ESPECIALLY SEVERE STORM EVENTS.
3. WHEN SEDIMENT ACCUMULATION OF MORE THAN 2" IS OBSERVED OR ANY DEBRIS THAT MIGHT OBSTRUCT THE OUTFALL IS OBSERVED, THE FACILITY SHALL BE CLEANED.
4. THE FACILITY SHALL BE CLEANED IMMEDIATELY AFTER PETROLEUM SPILLS. THE OWNER SHALL CONTACT THE APPROPRIATE REGULATORY AGENCIES NOTIFYING THEM OF THE SPILL AND CLEAN-UP OPERATION.
5. THE SEDIMENT AND DEBRIS SHALL BE REMOVED FROM THE UNDERGROUND STORM WATER MANAGEMENT FACILITY BY VACUUM TRUCK OR OTHER MANUAL MEANS. THE OWNER SHALL FOLLOW PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIAL AND LIQUID.
6. THE INLET AND OUTLET PIPES SHALL BE CHECKED FOR ANY OBSTRUCTIONS AT LEAST ONCE EVERY SIX (6) MONTHS. IF OBSTRUCTIONS ARE FOUND, THE OWNER SHALL HAVE THEM REMOVED AND PROPERLY DISPOSED OF.



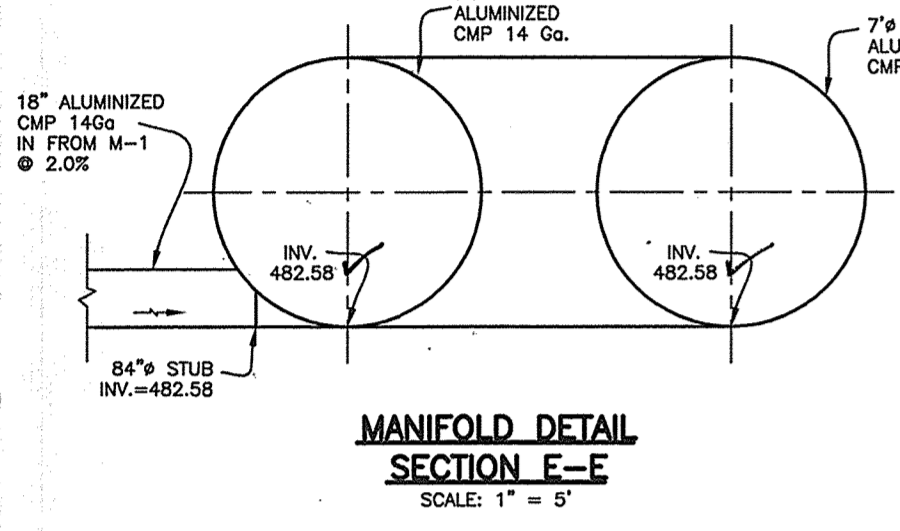
**(UGS) UNDERGROUND FACILITY #1
PIPE LAYOUT PLAN**
SCALE: 1" = 20'



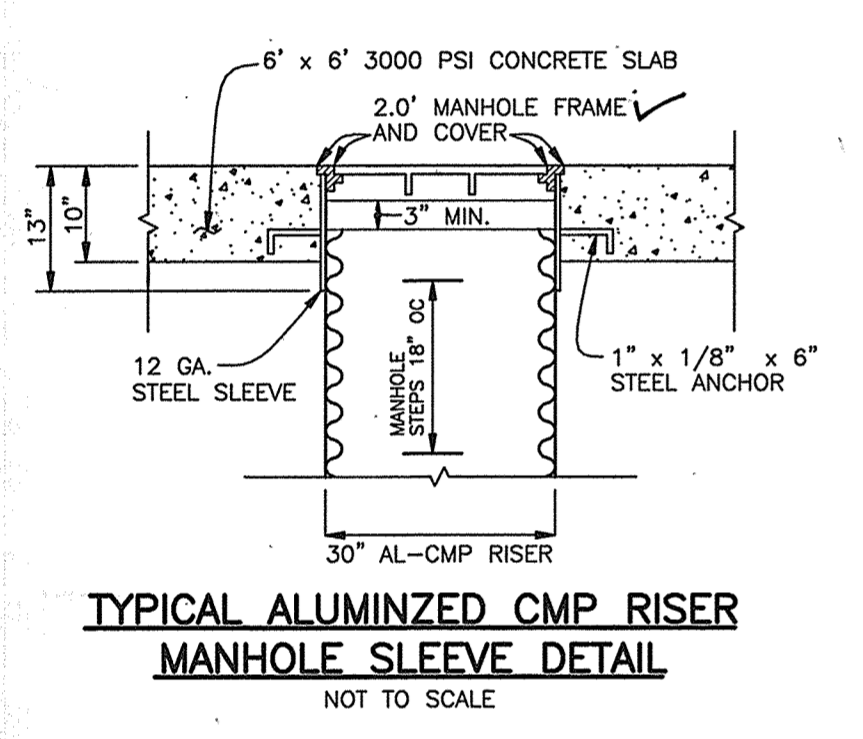
**MANIFOLD DETAIL
SECTION C-C**
SCALE: 1" = 5'



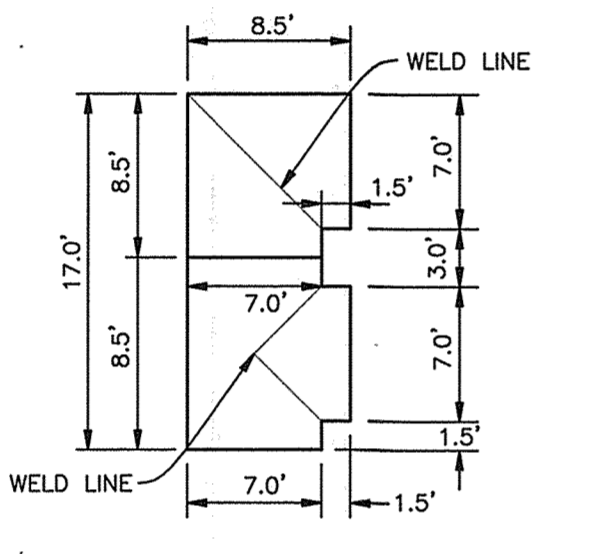
**MANIFOLD DETAIL
SECTION D-D**
SCALE: 1" = 5'



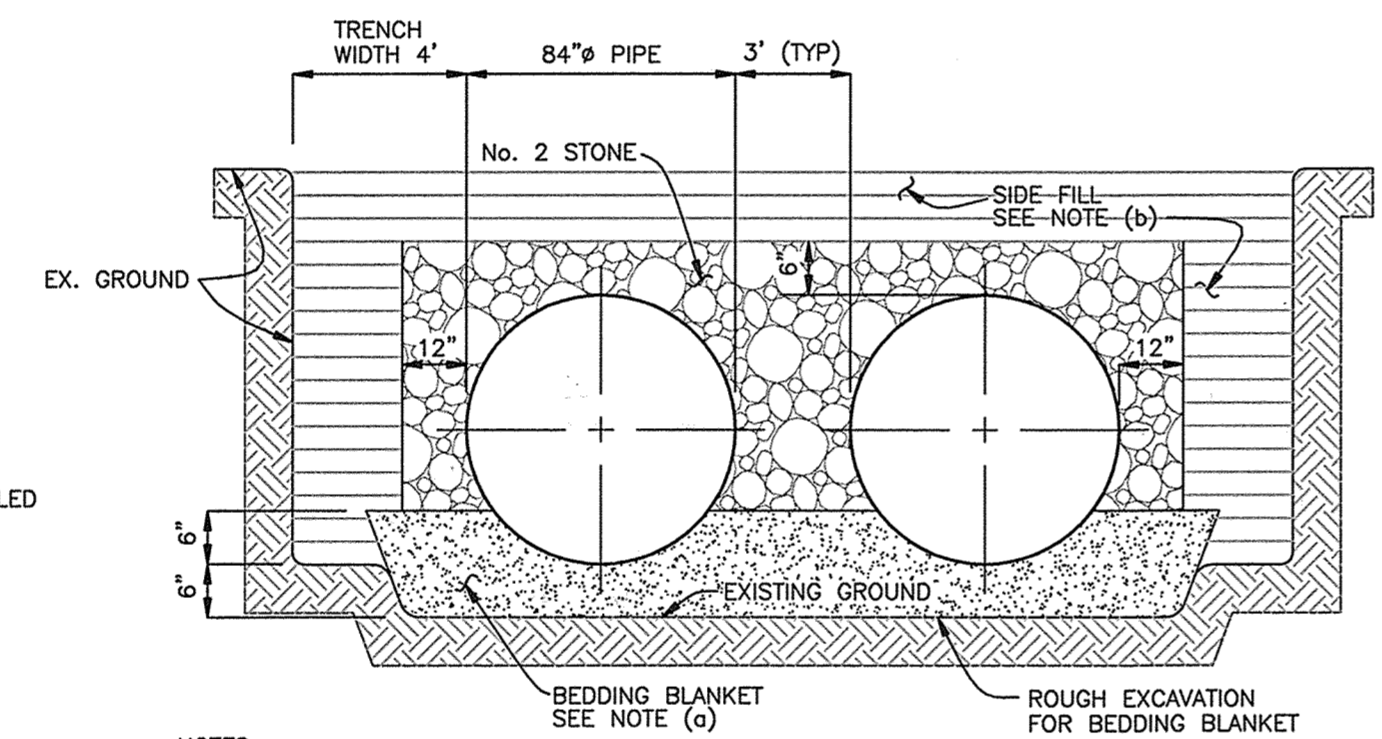
**MANIFOLD DETAIL
SECTION E-E**
SCALE: 1" = 5'



**TYPICAL ALUMINIZED CMP RISER
MANHOLE SLEEVE DETAIL**
NOT TO SCALE



TYPICAL ELBOW/TEE DETAIL
NOT TO SCALE

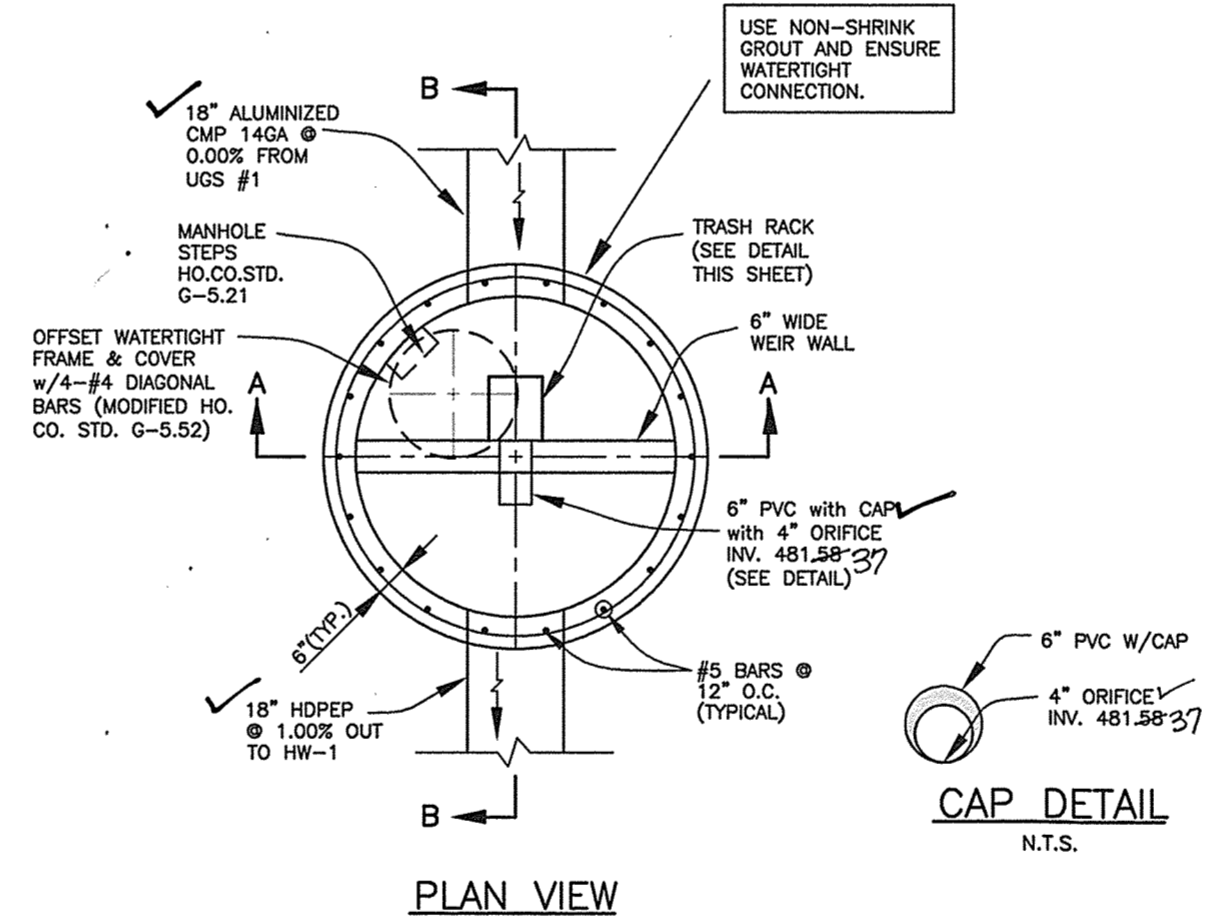


TYPICAL BEDDING AND BACKFILL DETAIL
NOT TO SCALE

- NOTES**
- (a) BEDDING BLANKET OF LOOSE GRANULAR FILL ROUGHLY SHAPED TO FIT BOTTOM OF PIPE. MINIMUM THICKNESS BEFORE PLACING PIPE SHALL BE SIX INCHES.
 - (b) SIDE FILL TO BE COMPACTED IN 6 TO 8 INCHES OF COMPACTED LAYERS. COMPACTION SHALL NOT BE LESS THAN 90% STANDARD PROCTOR DENSITY (AASHTO 199).

CONSTRUCTION SPECIFICATIONS

- A. BEDDING**
1. THE BED SHALL BE PLACED TO UNIFORM GRADE AND LINE TO ENSURE GOOD VERTICAL ALIGNMENT AND TO AVOID EXCESSIVE STRESSES AT PIPE JOINTS. THE BEDDING SHALL BE FREE OF ROCK FORMATIONS, PROTRUDING STONES, FROZEN LUMPS, ROOTS, AND FOREIGN MATERIAL. THE BEDDING FOUNDATION MUST BE A STABLE, WELL GRADED GRANULAR MATERIAL. ANY MATERIAL THAT HAS INADEQUATE BEARING CAPACITY MUST BE REMOVED AND REPLACED WITH A COMPACTED SELECT FILL APPROVED BY THE GEO-TECHNICAL ENGINEER.
- B. BACKFILL**
1. THE FILL MATERIAL SHALL BE FREE OF ROCKS, FROZEN LUMPS, AND FOREIGN MATTER THAT COULD CAUSE HARD SPOTS IN BACKFILL OR THAT COULD DECOMPOSE AND CREATE VOIDS.
 2. BACKFILL MATERIAL SHALL BE A WELL GRADED GRANULAR MATERIAL.
 3. HIGHLY PLASTIC SILTS, HIGHLY PLASTIC CLAYS, ORGANIC SILTS, ORGANIC CLAYS AND PEATS SHALL NOT BE USED AS BACKFILL MATERIAL.
 4. BACKFILL SHALL BE PLACED SYMMETRICALLY ON EACH SIDE OF THE STRUCTURE IN SIX-INCH TO EIGHT-INCH LOOSE LAYERS TO ONE FOOT ABOVE THE TOP OF THE PIPE. EACH LAYER IS TO BE COMPACTED TO THE SPECIFIED DENSITY (MINIMUM 80%) BEFORE PLACING THE NEXT LAYER. REFERENCE ASTM A798.
- C. PIPE**
1. THE PIPE FABRICATOR SHALL PROVIDE SPECIFICATIONS OF ALL MATERIALS (BASED ON HS25 LOADING).
 2. SHOP DRAWINGS ARE TO BE PROVIDED BY FABRICATOR. APPROVAL BY ENGINEER IS REQUIRED PRIOR TO CONSTRUCTION.
 3. CONTRACTOR IS REQUIRED TO COORDINATE APPROVAL OF SHOP DRAWINGS AND SPECIFICATIONS AND SHALL BE OBLIGATED FOR ANY COST THEREOF.
- D. GENERAL**
1. DEBRIS IS TO BE KEPT OUT OF THE FACILITY DURING AND AFTER CONSTRUCTION.

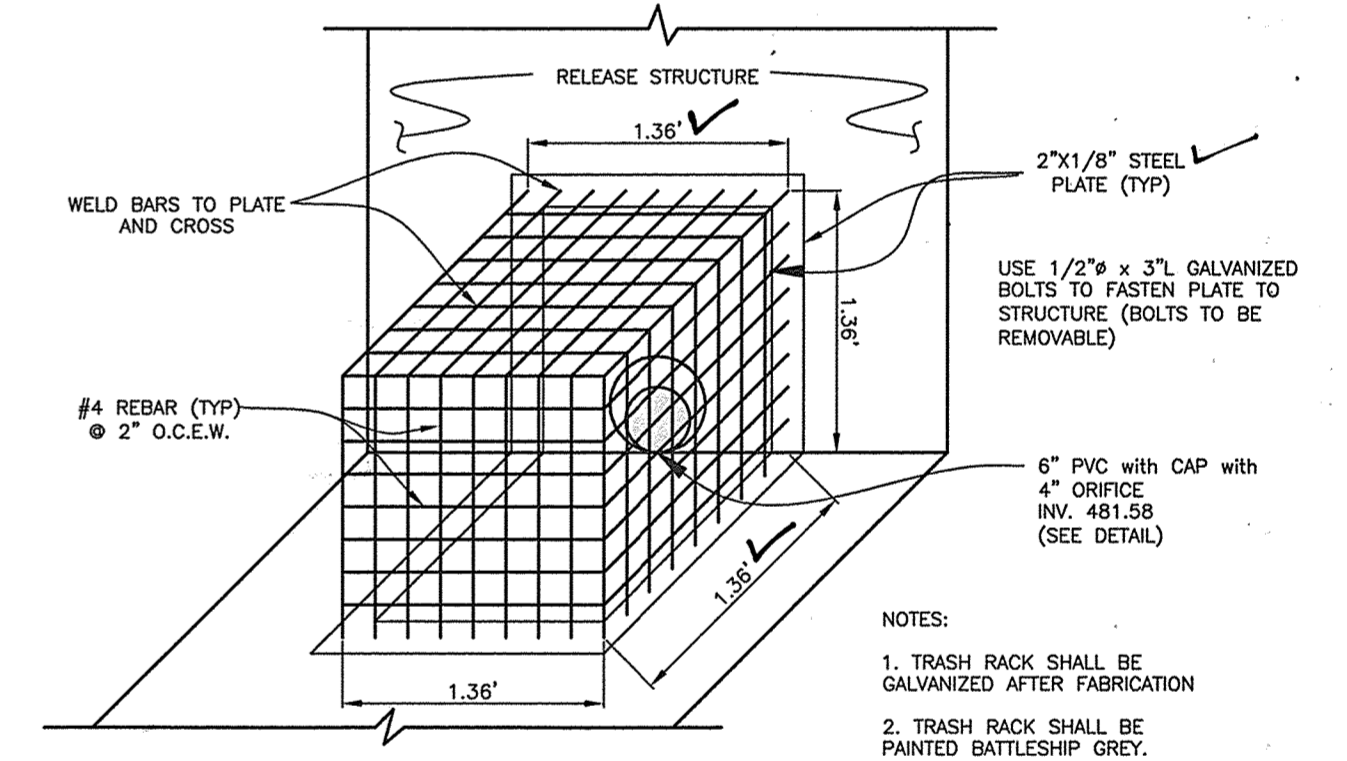


PLAN VIEW

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Donald Mason, P.E. Date: 1/30/21

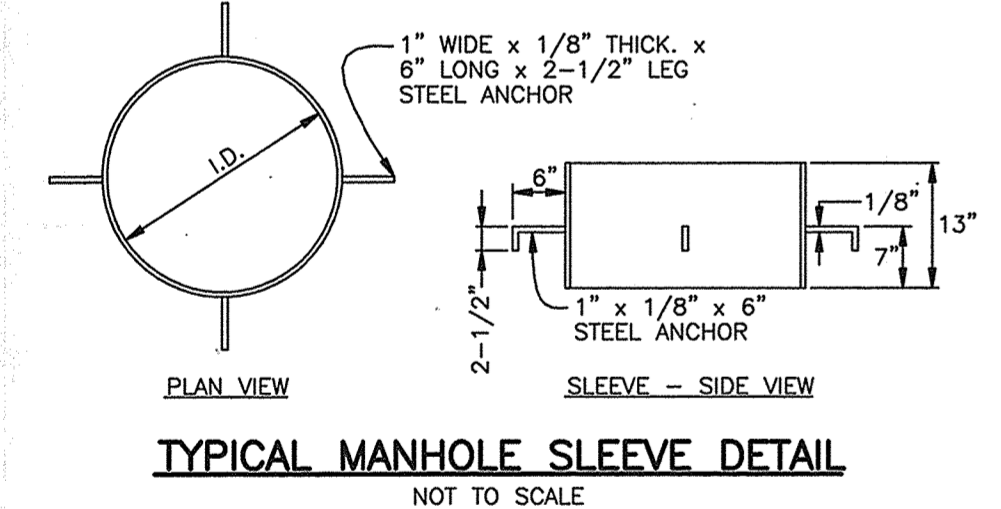


Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-22

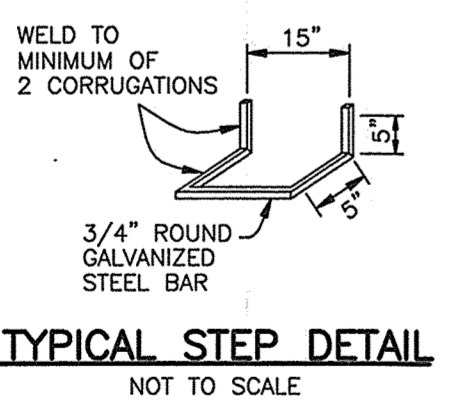


TRASH RACK DETAIL @ S-1
SCALE: 1" = 1'-0"

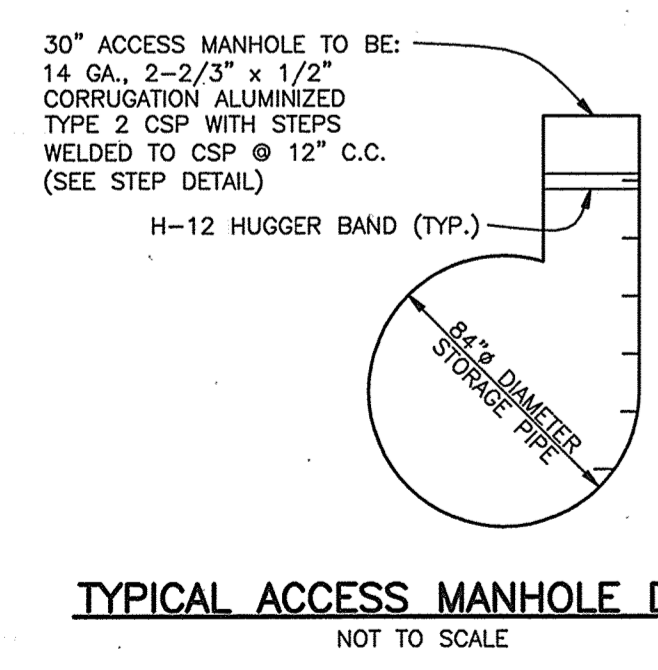
- NOTES:**
1. TRASH RACK SHALL BE GALVANIZED AFTER FABRICATION
 2. TRASH RACK SHALL BE PAINTED BATTLESHIP GREY.



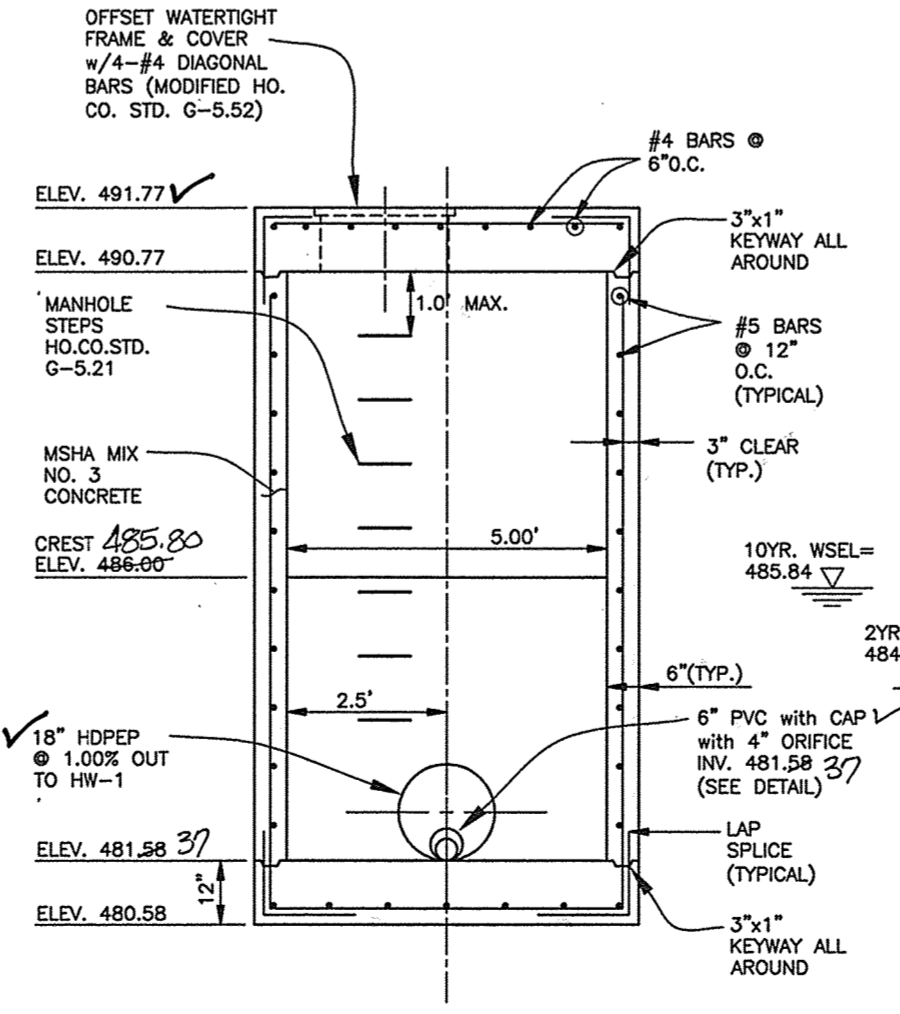
TYPICAL MANHOLE SLEEVE DETAIL
NOT TO SCALE



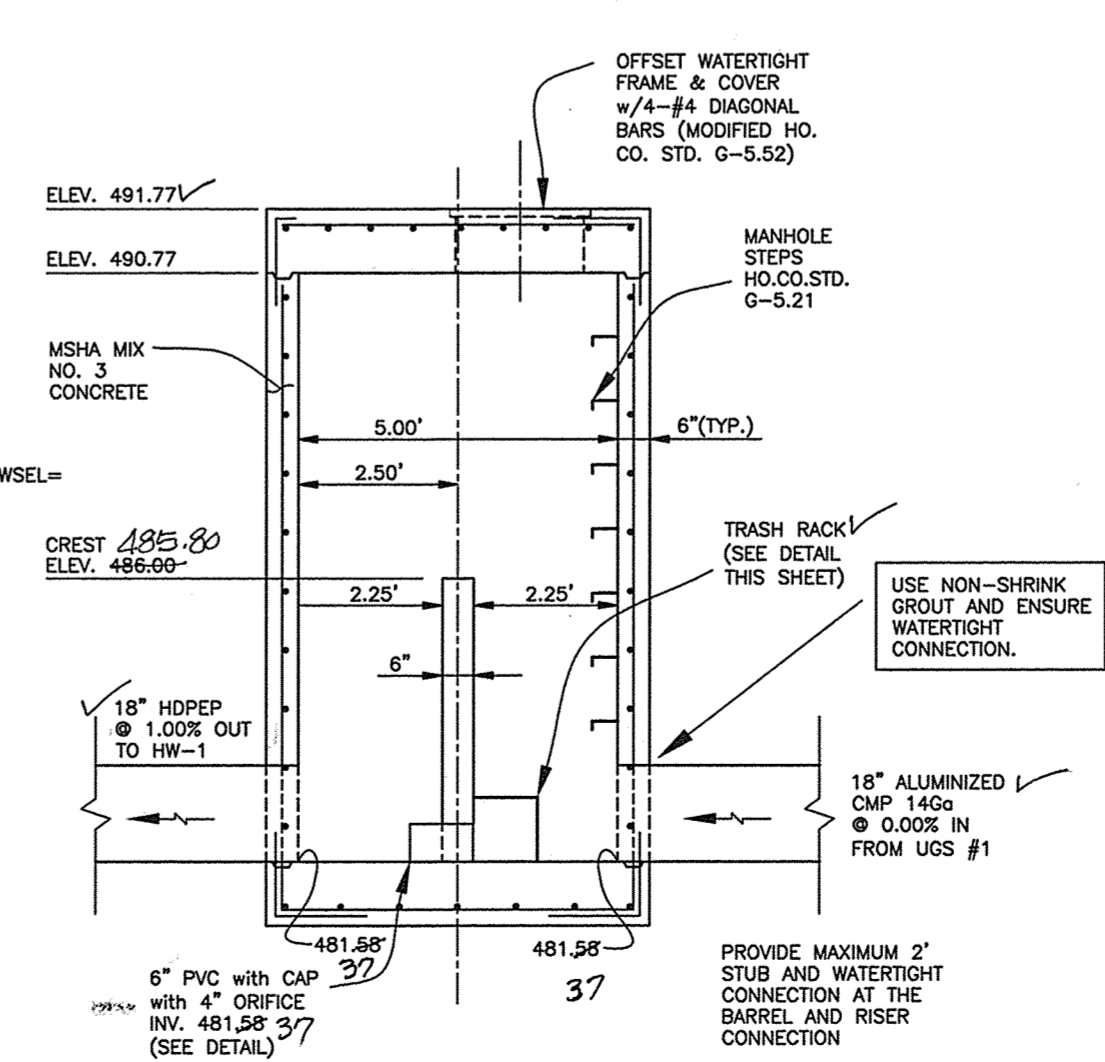
TYPICAL STEP DETAIL
NOT TO SCALE



TYPICAL ACCESS MANHOLE DETAIL
NOT TO SCALE



**SECTION A-A
FRONT VIEW**



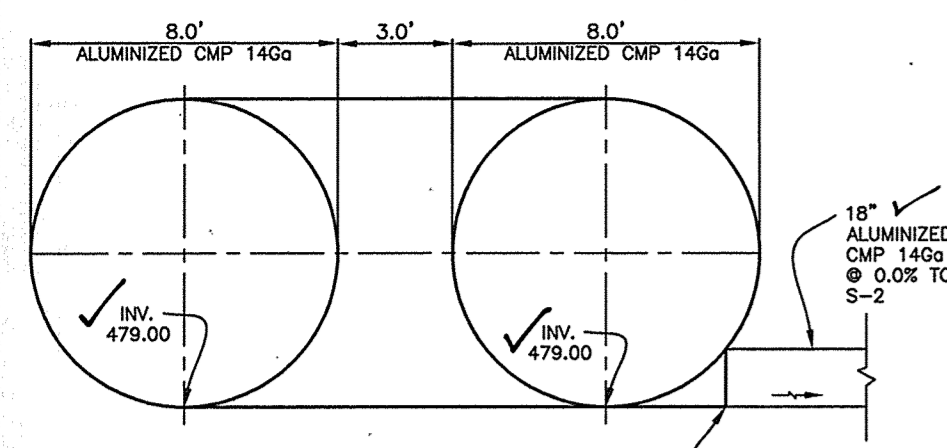
**SECTION B-B
SIDE VIEW**

S-1 DETAIL
SCALE: 1" = 3'

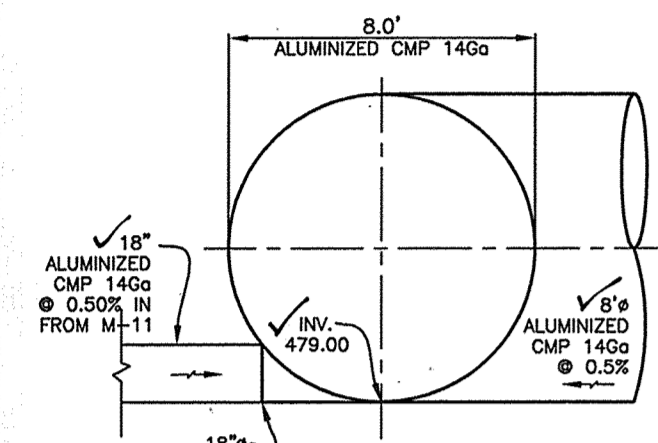
NOTE: SEE GENERAL NOTE 34 ON SHEET 1 FOR DESIGN MANUAL WAIVER INFORMATION REGARDING THIS STRUCTURE.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE
4-4-19	DATE
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
4-4-19	DATE
DIRECTOR	DATE

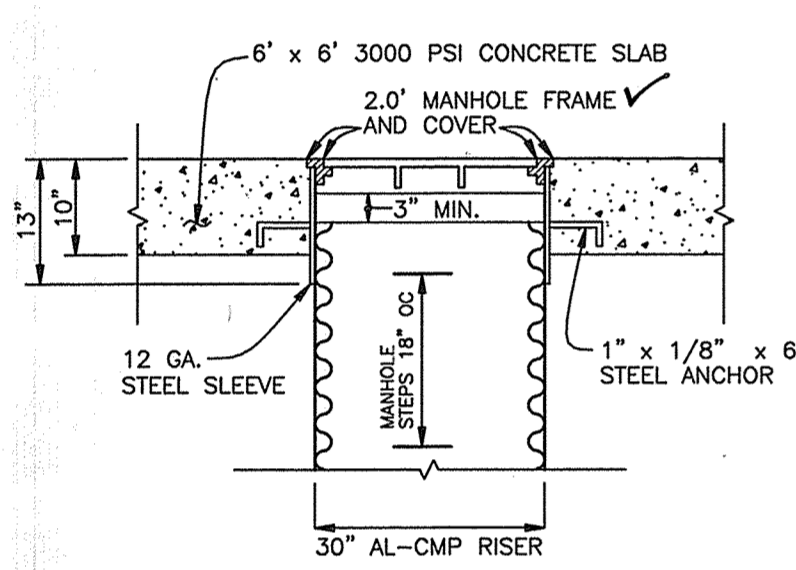
<p>BENCHMARK ENGINEERS, INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21043 410-465-6100 (F) 410-465-6844 WWW.BE-CIVILENGINEERING.COM</p>		<p>Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22019 Expiration Date: 6-30-2019</p>						
<p>OWNER: STEPHEN A. KLEIN & ASSOCIATES c/o STEPHEN KLEIN, INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21043 410-465-4244</p>		<p>REVISION</p> <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>REVISION</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DATE	REVISION			
NO.	DATE	REVISION						
<p>DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLCOTT CITY, MARYLAND 21041 410-465-4244</p>		<p>RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>						
<p>SWM DETAILS (UGS) UNDERGROUND FACILITY #1</p>		<p>DATE: MARCH 4, 2019 BEI PROJECT NO. 2801 SCALE: AS SHOWN SHEET 14 OF 25</p>						



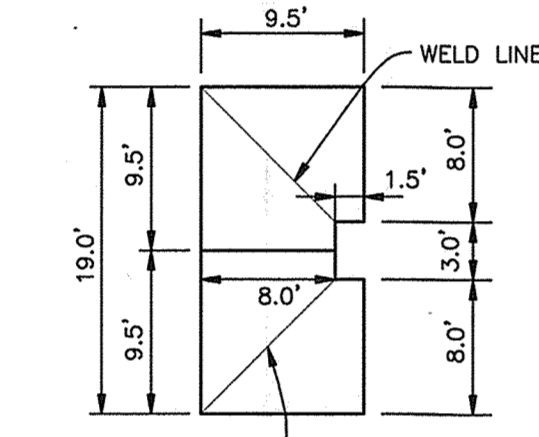
MANIFOLD DETAIL
SECTION E-E
SCALE: 1" = 5"



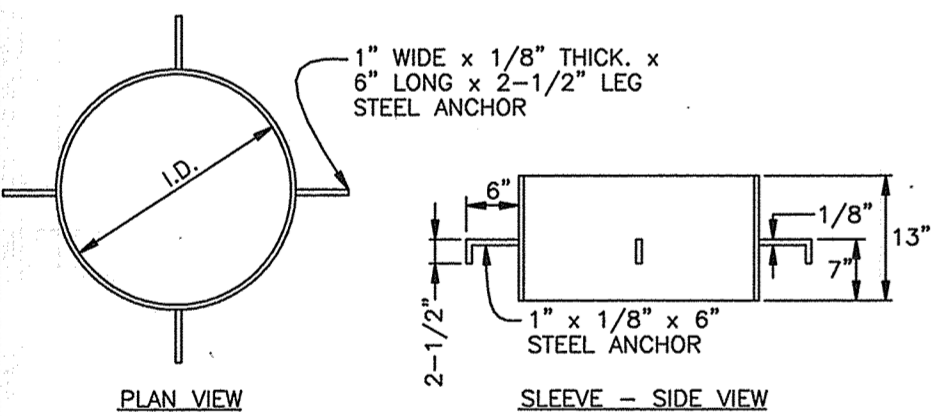
MANIFOLD DETAIL
SECTION C-C
SCALE: 1" = 5"



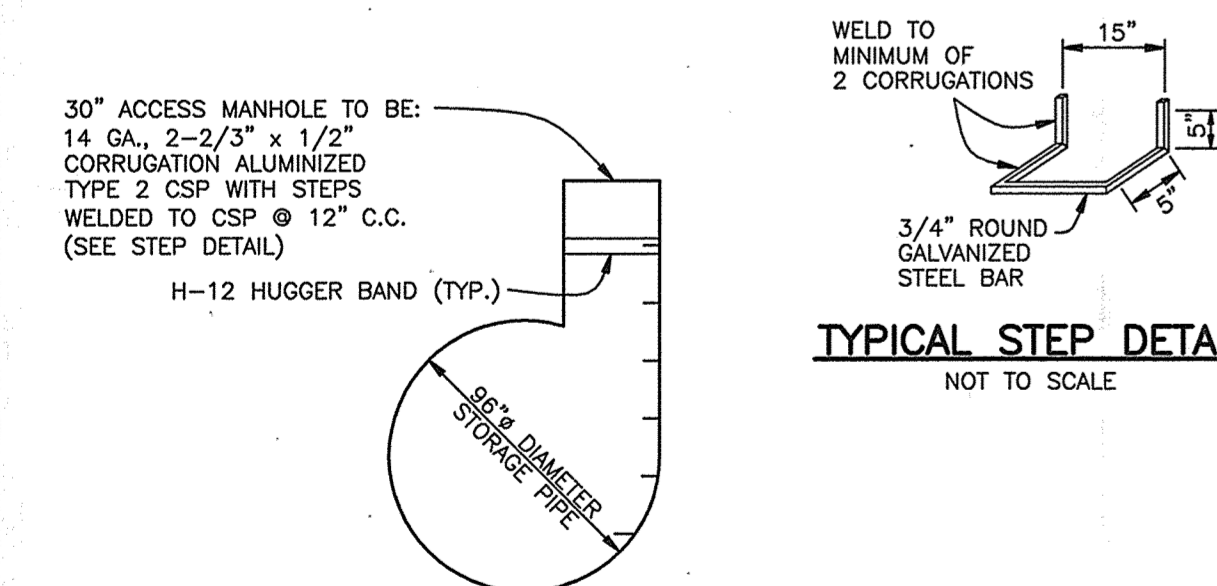
TYPICAL ALUMINIZED CMP RISER
MANHOLE SLEEVE DETAIL
NOT TO SCALE



TYPICAL ELBOW/TEE DETAIL
NOT TO SCALE



TYPICAL MANHOLE SLEEVE DETAIL
NOT TO SCALE



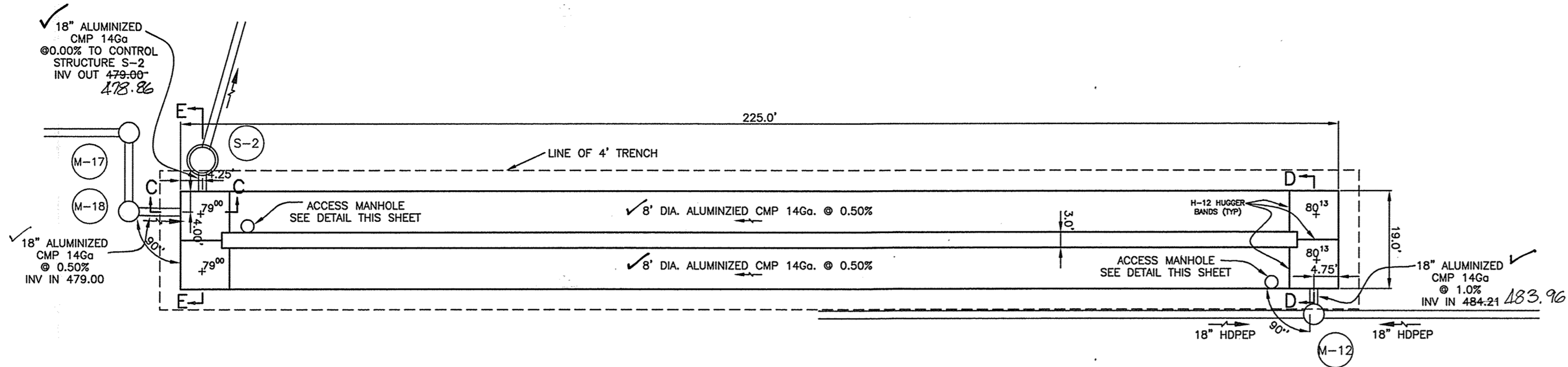
TYPICAL ACCESS MANHOLE DETAIL
NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

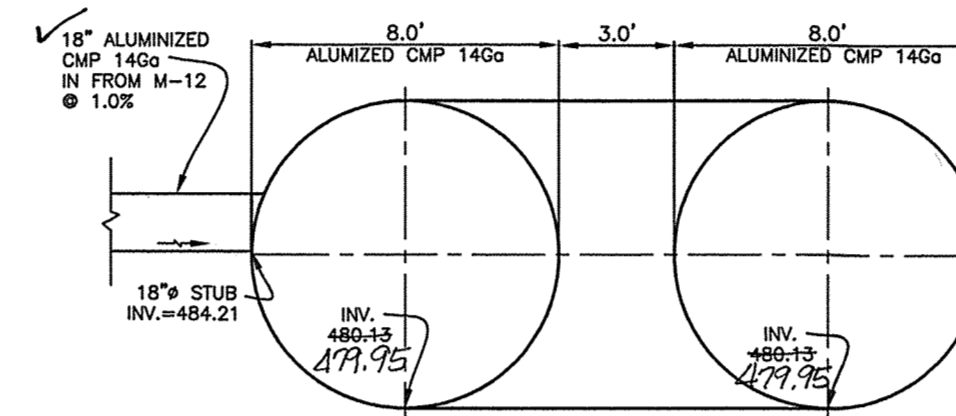
Howard County 4-2-19 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION

Stephen A. Klein 4-4-19 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT

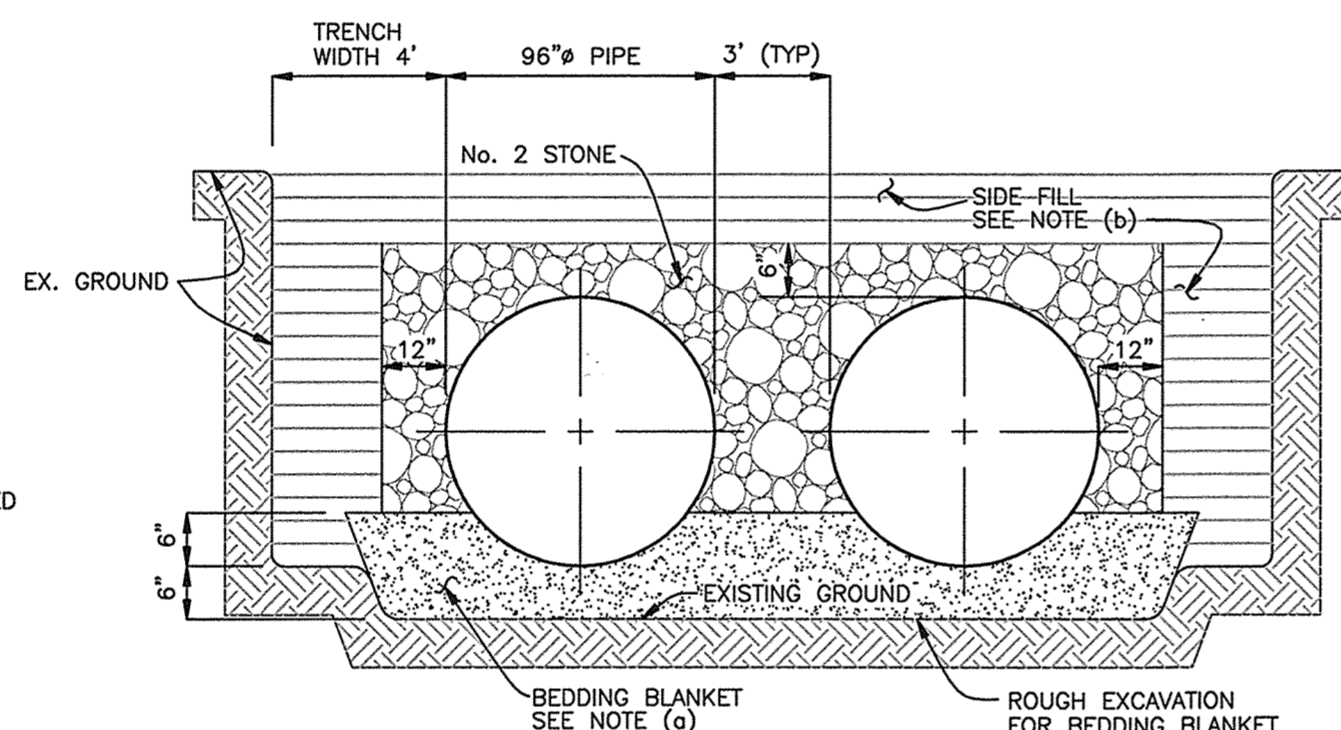
Valerie J. J. J. 4-4-19 DATE
DIRECTOR



(UGS) UNDERGROUND FACILITY #2
PIPE LAYOUT PLAN
SCALE: 1" = 20"



MANIFOLD DETAIL
SECTION D-D
SCALE: 1" = 5"

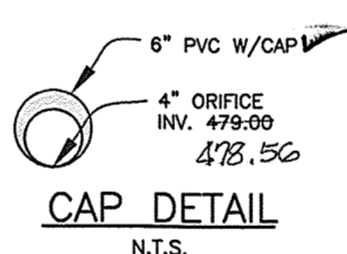
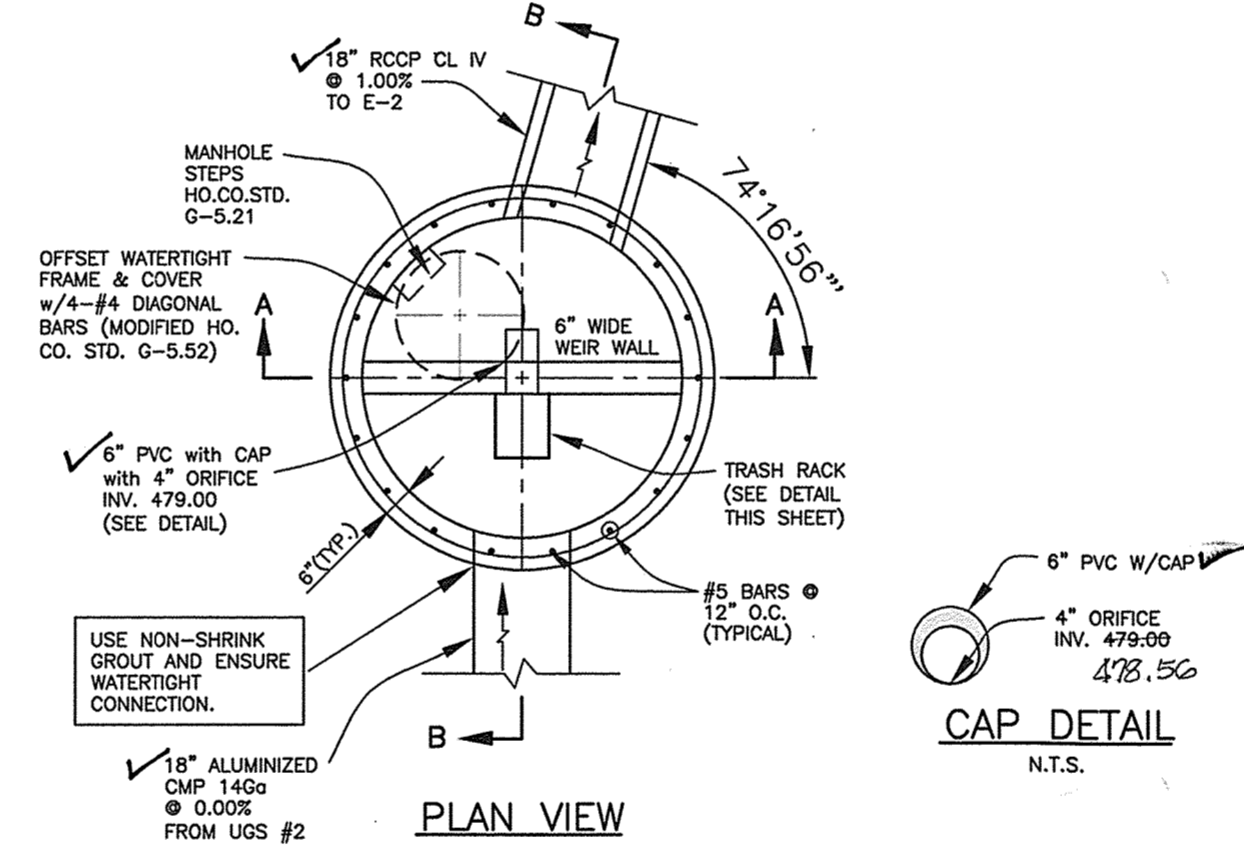


- NOTES
- BEDDING BLANKET OF LOOSE GRANULAR FILL ROUGHLY SHAPED TO FIT BOTTOM OF PIPE. MINIMUM THICKNESS BEFORE PLACING PIPE SHALL BE SIX INCHES.
 - SIDE FILL TO BE COMPACTED IN 6 TO 8 INCHES OF COMPACTED LAYERS. COMPACTION SHALL NOT BE LESS THAN 90% STANDARD PROCTOR DENSITY (AASHTO T99).

TYPICAL BEDDING AND BACKFILL DETAIL
NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

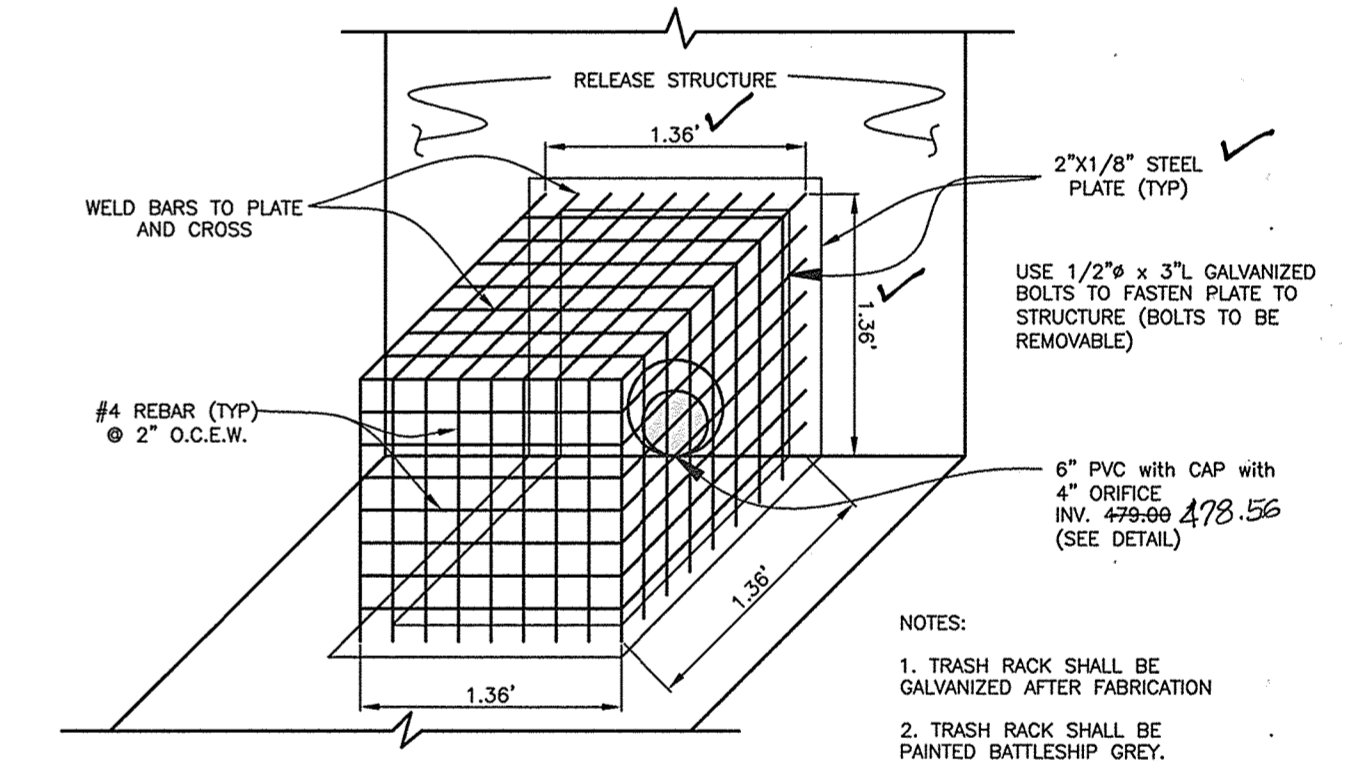
- BEDDING**
 - THE BED SHALL BE PLACED TO UNIFORM GRADE AND LINE TO ENSURE GOOD VERTICAL ALIGNMENT AND TO AVOID EXCESSIVE STRESSES AT PIPE JOINTS. THE BEDDING SHALL BE FREE OF ROCK FORMATIONS, PROTRUDING STONES, FROZEN LUMPS, ROOTS, AND FOREIGN MATERIAL. THE BEDDING FOUNDATION MUST BE A STABLE, WELL GRADED GRANULAR MATERIAL. ANY MATERIAL THAT HAS INADEQUATE BEARING CAPACITY MUST BE REMOVED AND REPLACED WITH A COMPACTED SELECT FILL APPROVED BY THE GEO-TECHNICAL ENGINEER.
- BACKFILL**
 - THE FILL MATERIAL SHALL BE FREE OF ROCKS, FROZEN LUMPS, AND FOREIGN MATTER THAT COULD CAUSE HARD SPOTS IN BACKFILL OR THAT COULD DECOMPOSE AND CREATE VOIDS.
 - BACKFILL MATERIAL SHALL BE A WELL GRADED GRANULAR MATERIAL.
 - HIGHLY PLASTIC SILTS, HIGHLY PLASTIC CLAYS, ORGANIC SILTS, ORGANIC CLAYS AND PEATS SHALL NOT BE USED AS BACKFILL MATERIAL.
 - BACKFILL SHALL BE PLACED SYMMETRICALLY ON EACH SIDE OF THE STRUCTURE IN SIX-INCH TO EIGHT-INCH LOOSE LAYERS TO ONE FOOT ABOVE THE TOP OF THE PIPE. EACH LAYER IS TO BE COMPACTED TO THE SPECIFIED DENSITY (MINIMUM 90%) BEFORE PLACING THE NEXT LAYER. REFERENCE ASTM A798.
- PIPE**
 - THE PIPE FABRICATOR SHALL PROVIDE SPECIFICATIONS OF ALL MATERIALS (BASED ON HS25 LOADING).
 - SHOP DRAWINGS ARE TO BE PROVIDED BY FABRICATOR. APPROVAL BY ENGINEER IS REQUIRED PRIOR TO CONSTRUCTION.
 - CONTRACTOR IS REQUIRED TO COORDINATE APPROVAL OF SHOP DRAWINGS AND SPECIFICATIONS AND SHALL BE OBLIGATED FOR ANY COST THEREOF.
- GENERAL**
 - DEBRIS IS TO BE KEPT OUT OF THE FACILITY DURING AND AFTER CONSTRUCTION.



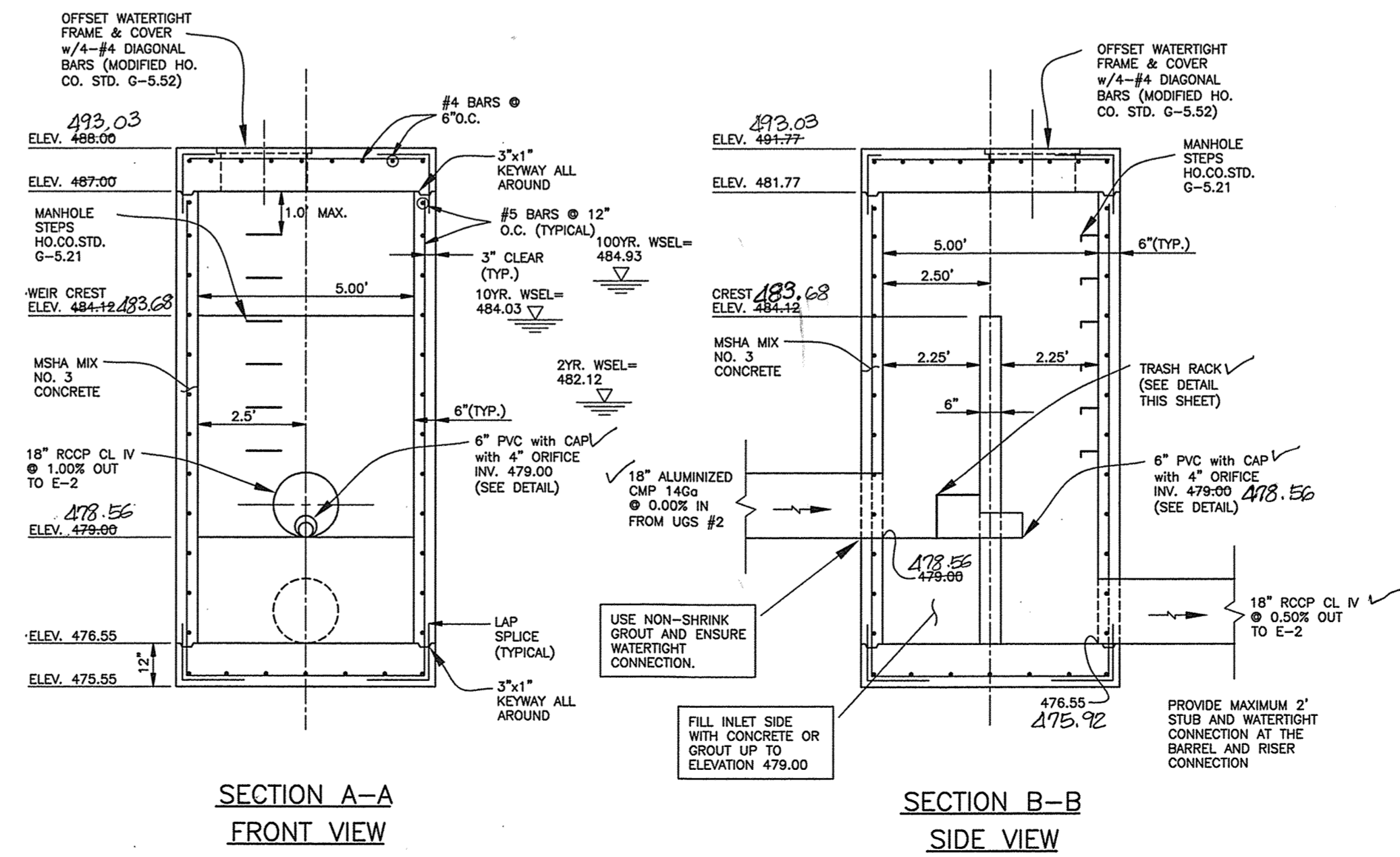
AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Donald Mason, P.E. Date: 1/30/21



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-31-22



TRASH RACK DETAIL @ S-1
SCALE: 1" = 1'-0"



SECTION A-A
FRONT VIEW

SECTION B-B
SIDE VIEW

S-2 DETAIL
SCALE: 1" = 3"

NOTE: SEE GENERAL NOTE 34 ON SHEET 1 FOR DESIGN MANUAL WAIVER INFORMATION REGARDING THIS STRUCTURE.

NO.	DATE	REVISION

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043
(P) 410-465-8100 (F) 410-465-6644
WWW.BED-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 22390, Expiration Date: 6-30-2019.

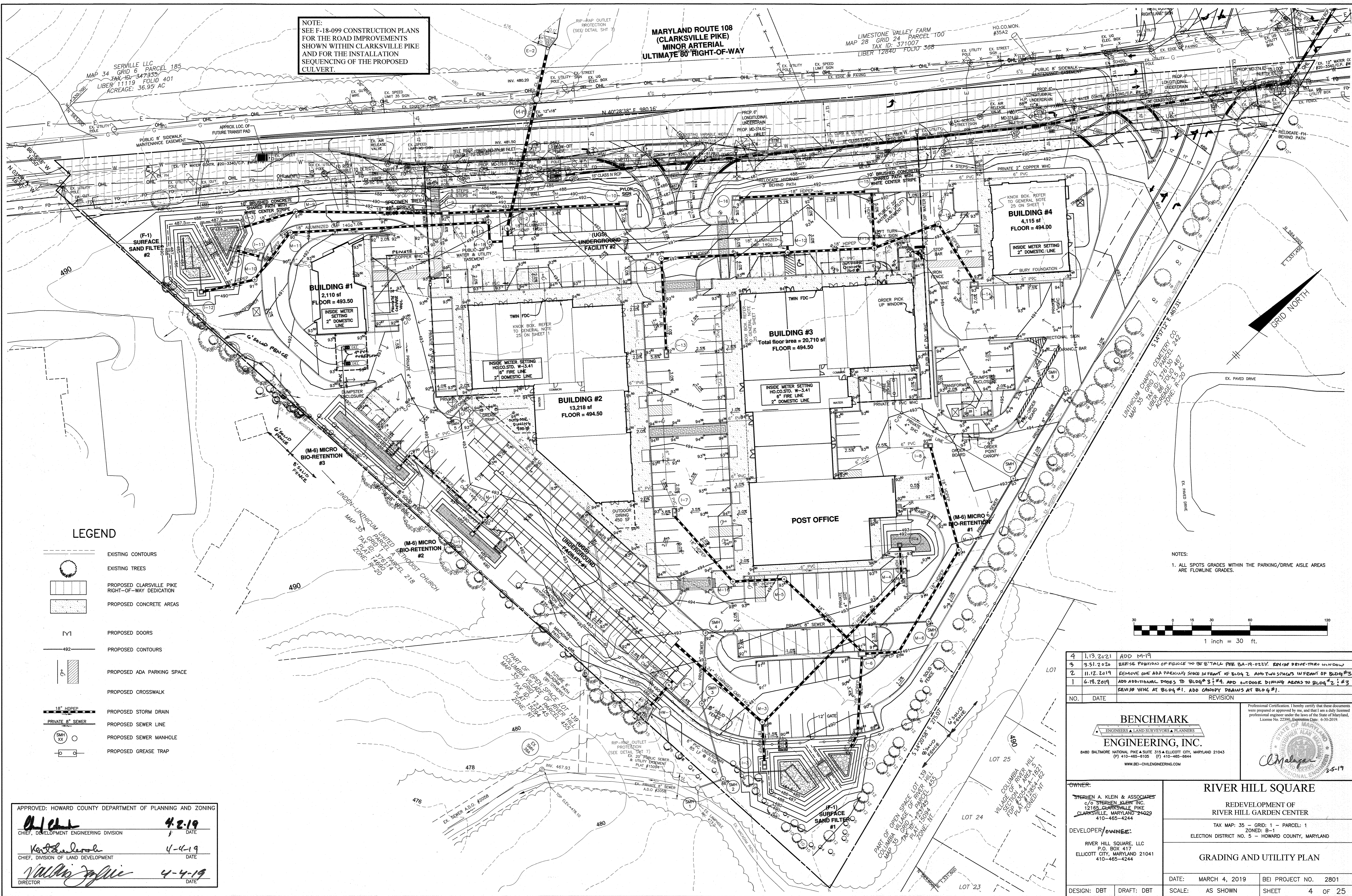
<p>OWNER: STEPHEN A. KLEIN & ASSOCIATES c/o STEPHEN A. KLEIN, INC. 12165 CHARTERS PIKE CLARKESVILLE, MARYLAND 21029 410-465-4244</p>	<p>RIVER HILL SQUARE</p> <p>REDEVELOPMENT OF RIVER HILL GARDEN CENTER</p> <p>TAX MAP: 35 - GRID: 1 - PARCEL: 1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>
<p>DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244</p>	<p>SWM DETAILS (UGS) UNDERGROUND FACILITY #2</p>
<p>DATE: MARCH 4, 2019</p>	<p>BEI PROJECT NO.: 2801</p>
<p>DESIGN: DBT DRAFT: DBT</p>	<p>SCALE: AS SHOWN SHEET 15 OF 25</p>

NOTE:
SEE F-18-099 CONSTRUCTION PLANS
FOR THE ROAD IMPROVEMENTS
SHOWN WITHIN CLARKSVILLE PIKE
AND FOR THE INSTALLATION
SEQUENCING OF THE PROPOSED
CULVERT.

MARYLAND ROUTE 108
(CLARKSVILLE PIKE)
MINOR ARTERIAL
ULTIMATE 80' RIGHT-OF-WAY

LIMESTONE VALLEY FARM
MAP 28 GRID 24 PARCEL 700
TAX ID: 371007
LIBER 12840 FOLIO 388

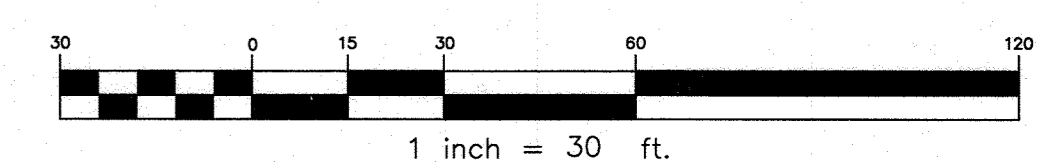
SERVILLE LLC
GRID 6 PARCEL 185
TAX ID: 347335
LIBER 11119 FOLIO 401
ACREAGE: 36.95 AC



LEGEND

- EXISTING CONTOURS
- EXISTING TREES
- PROPOSED CLARKSVILLE PIKE RIGHT-OF-WAY DEDICATION
- PROPOSED CONCRETE AREAS
- PROPOSED DOORS
- PROPOSED CONTOURS
- PROPOSED ADA PARKING SPACE
- PROPOSED CROSSWALK
- PROPOSED STORM DRAIN
- PROPOSED SEWER LINE
- PROPOSED SEWER MANHOLE
- PROPOSED GREASE TRAP

NOTES:
1. ALL SPOTS GRADES WITHIN THE PARKING/DRIVE AISLE AREAS ARE FLOWLINE GRADES.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Howard 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Kent 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Val 4-4-19
DIRECTOR DATE

NO.	DATE	REVISION
4	1.13.2021	ADD M-19
3	9.31.2020	REVISE POSITION OF PEOPLE TO BE 8" TALL PER BA-19-022Y. REVISE DRIVE-THRU WINDOW
2	11.12.2019	REMOVE ONE ADA PARKING SPACE IN FRONT OF BLDG 2 AND TWO SPACES IN FRONT OF BLDG #3
1	4.18.2019	ADD ADDITIONAL DOORS TO BLDG #3 & #4. ADD OUTDOOR DINING AREAS TO BLDG #2 & #3. REVISE WHC AT BLDG #1. ADD CANOPY DECKS AT BLDG #1.

BENCHMARK ENGINEERING, INC.
ENGINEERS & LAND SURVEYORS & PLANNERS
8480 BALTIMORE NATIONAL PIKE SUITE 315 & ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BE-CVLENGINEERING.COM

Professional Certification I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22390, Expiration Date: 6-30-2019.

Almalagan 3-5-19

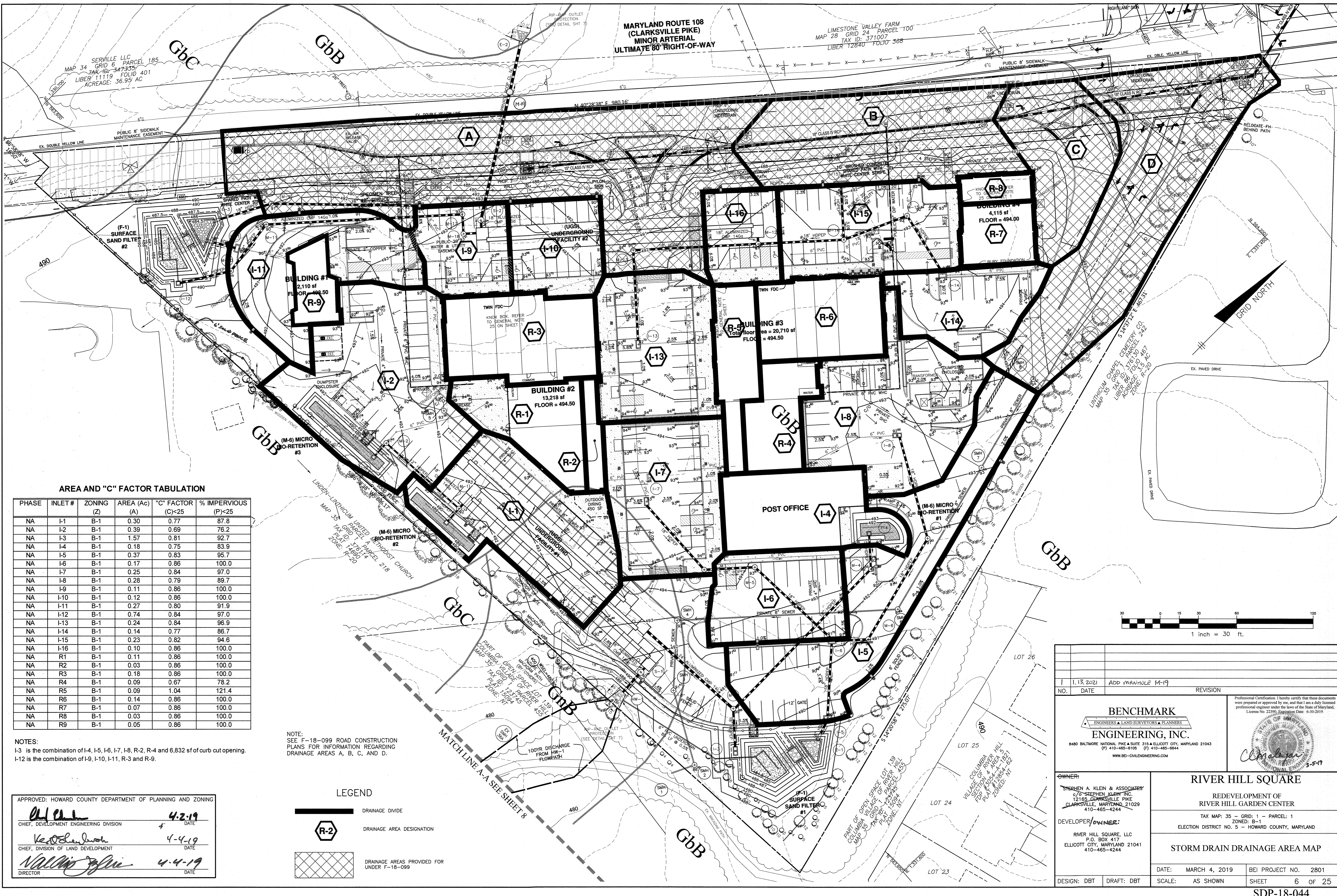
RIVER HILL SQUARE
REDEVELOPMENT OF RIVER HILL GARDEN CENTER
TAX MAP: 35 - GRID: 1 - PARCEL: 1
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

GRADING AND UTILITY PLAN

OWNER: **STEBEN A. KLEIN & ASSOCIATES**
C/O STERGEN KLEIN, INC.
12185 CLARKSVILLE PIKE
CLARKSVILLE, MARYLAND 21029
410-465-4244

DEVELOPER/OWNER: **RIVER HILL SQUARE, LLC**
P.O. BOX 417
ELLICOTT CITY, MARYLAND 21041
410-465-4244

DATE: MARCH 4, 2019 | SHEET PROJECT NO. 2801
DESIGN: DBT | DRAFT: DBT | SCALE: AS SHOWN | SHEET 4 OF 25



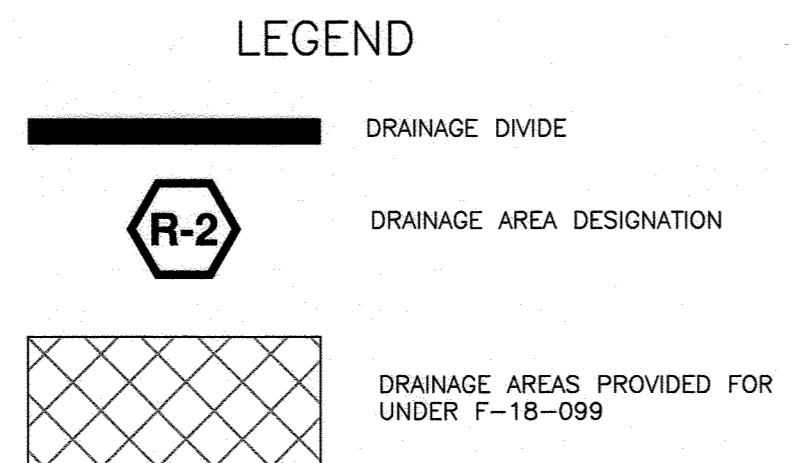
AREA AND "C" FACTOR TABULATION

PHASE	INLET #	ZONING (Z)	AREA (Ac) (A)	"C" FACTOR (C)<25	% IMPERVIOUS (P)<25
NA	I-1	B-1	0.30	0.77	87.8
NA	I-2	B-1	0.39	0.69	76.2
NA	I-3	B-1	1.57	0.81	92.7
NA	I-4	B-1	0.18	0.75	83.9
NA	I-5	B-1	0.37	0.83	95.7
NA	I-6	B-1	0.17	0.86	100.0
NA	I-7	B-1	0.25	0.84	97.0
NA	I-8	B-1	0.28	0.79	89.7
NA	I-9	B-1	0.11	0.86	100.0
NA	I-10	B-1	0.12	0.86	100.0
NA	I-11	B-1	0.27	0.80	91.9
NA	I-12	B-1	0.74	0.84	97.0
NA	I-13	B-1	0.24	0.84	96.9
NA	I-14	B-1	0.14	0.77	86.7
NA	I-15	B-1	0.23	0.82	94.6
NA	I-16	B-1	0.10	0.86	100.0
NA	R1	B-1	0.11	0.86	100.0
NA	R2	B-1	0.03	0.86	100.0
NA	R3	B-1	0.18	0.86	100.0
NA	R4	B-1	0.09	0.67	78.2
NA	R5	B-1	0.09	1.04	121.4
NA	R6	B-1	0.14	0.86	100.0
NA	R7	B-1	0.07	0.86	100.0
NA	R8	B-1	0.03	0.86	100.0
NA	R9	B-1	0.05	0.86	100.0

NOTES:
 I-3 is the combination of I-4, I-5, I-6, I-7, I-8, R-2, R-4 and 6,832 sf of curb cut opening.
 I-12 is the combination of I-9, I-10, I-11, R-3 and R-9.

NOTE:
 SEE F-18-099 ROAD CONSTRUCTION PLANS FOR INFORMATION REGARDING DRAINAGE AREAS A, B, C, AND D.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4-2-19
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 [Signature] 4-4-19
 CHIEF, DIVISION OF LAND DEVELOPMENT
 [Signature] 4-4-19
 DIRECTOR



1, 13, 2021 ADD MANHOLE M-19
 NO. DATE REVISION

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE SUITE 315 & ELLICOTT CITY, MARYLAND 21043
 (P) 410-465-6105 (F) 410-465-6644
 WWW.BEI-CIVILENGINEERING.COM

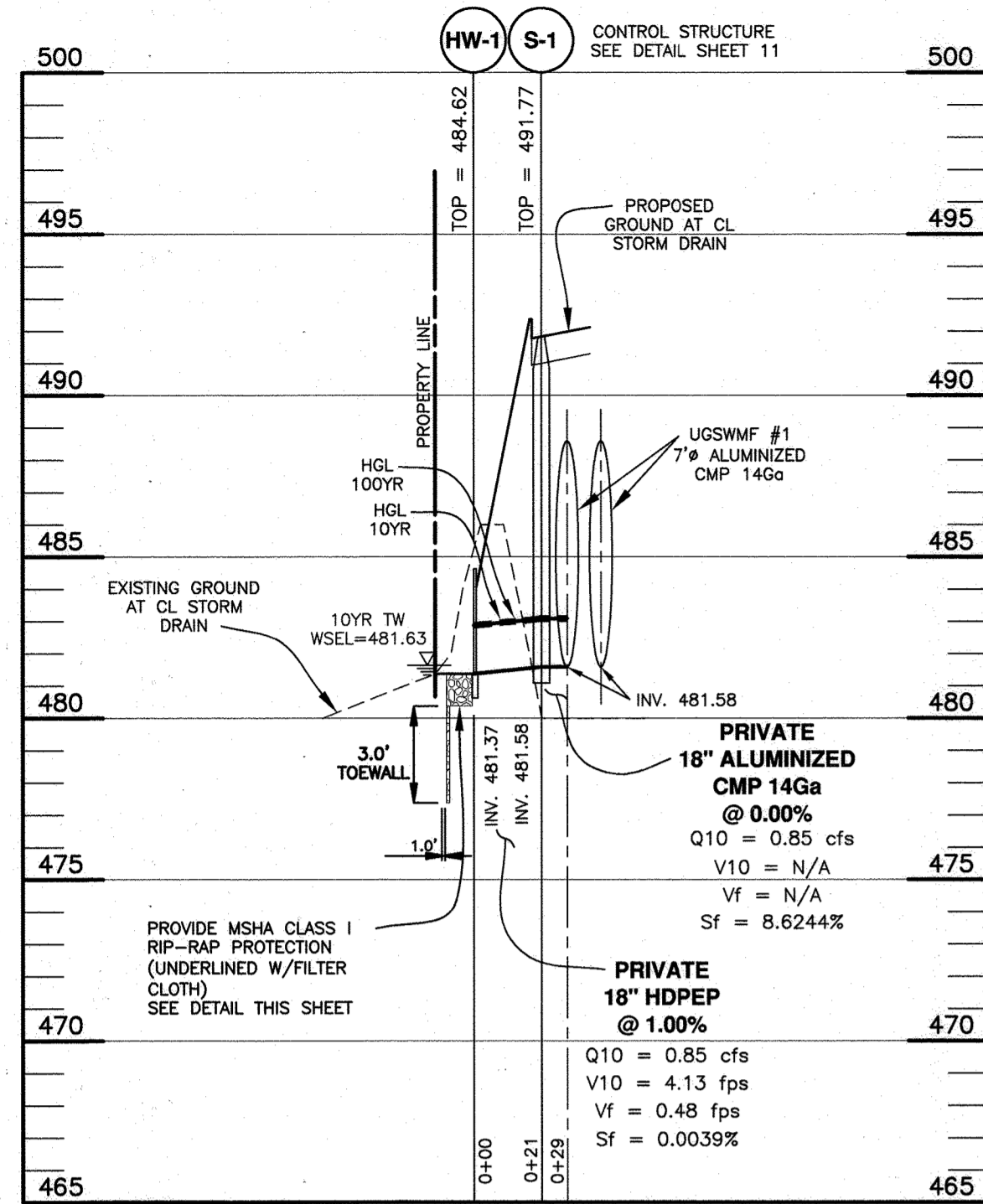
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22390, Expiration Date: 6-30-2019.

RIVER HILL SQUARE
 REDEVELOPMENT OF RIVER HILL GARDEN CENTER
 TAX MAP: 35 - GRID: 1 - PARCEL: 1
 ZONED: B-1
 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

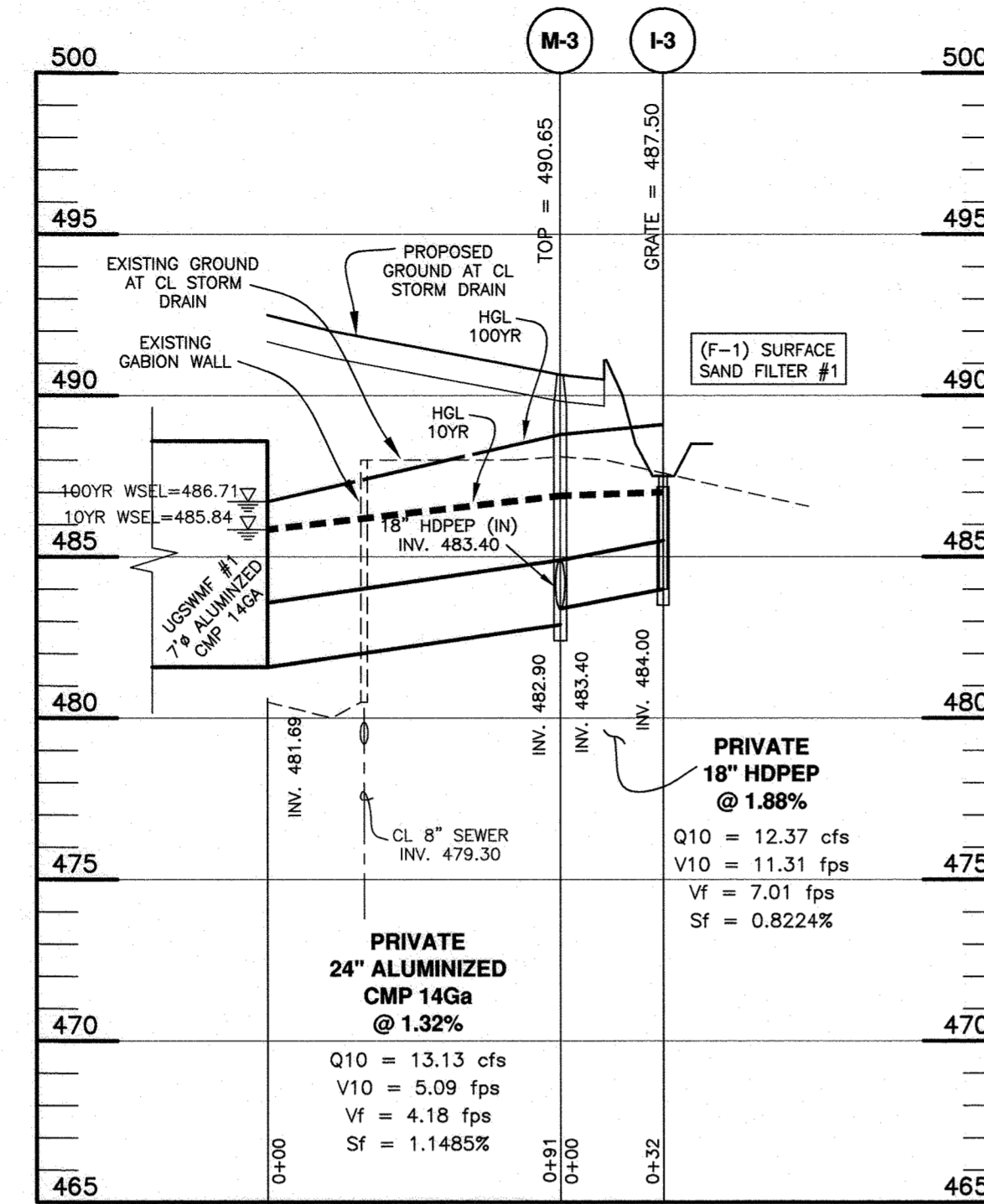
DEVELOPER/OWNER:
 RIVER HILL SQUARE, LLC
 P.O. BOX 417
 ELLICOTT CITY, MARYLAND 21041
 410-465-4244

DATE: MARCH 4, 2019 SHEET PROJECT NO. 2801
 SCALE: AS SHOWN SHEET 6 OF 25

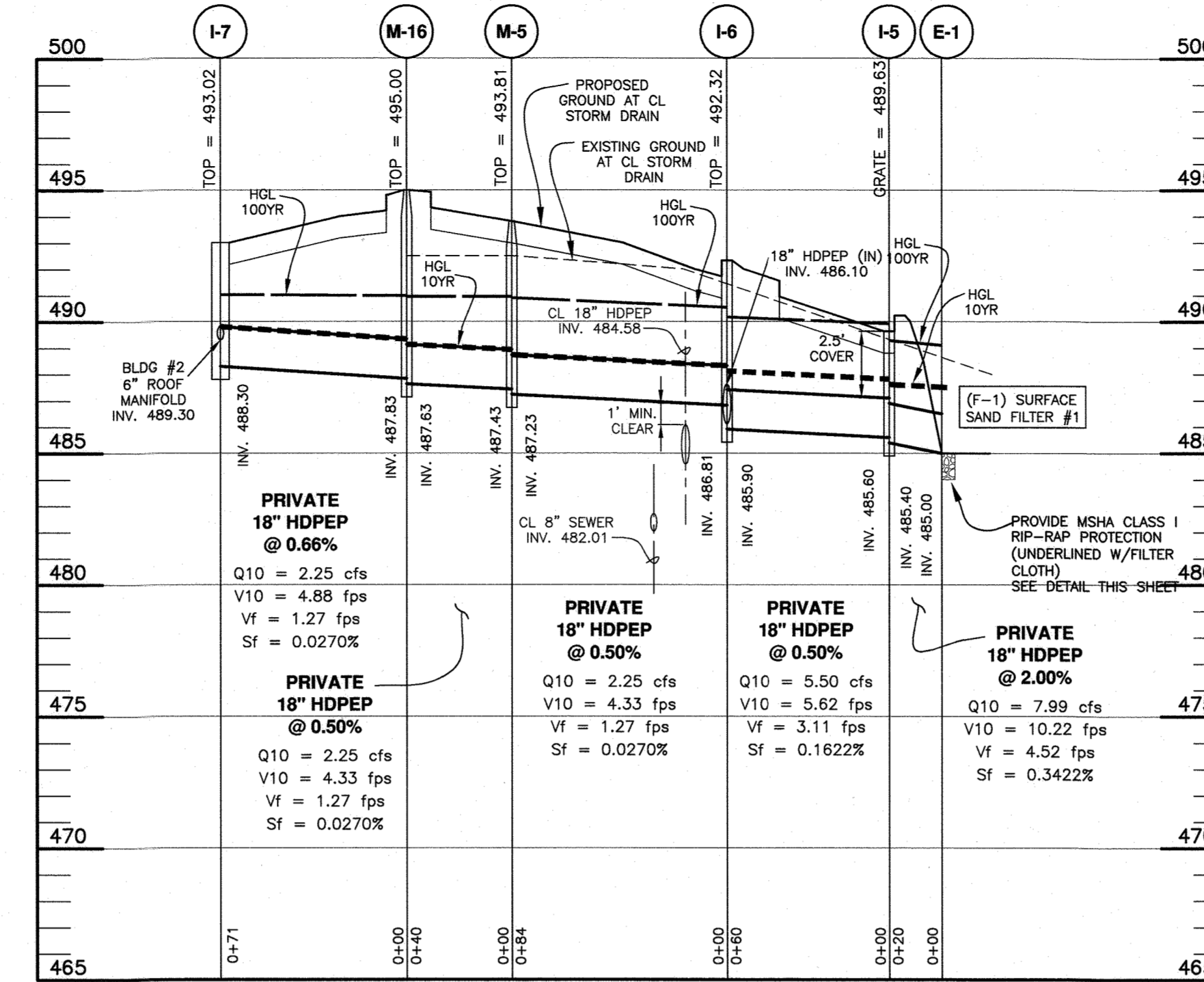
DESIGN: DBT DRAFT: DBT



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



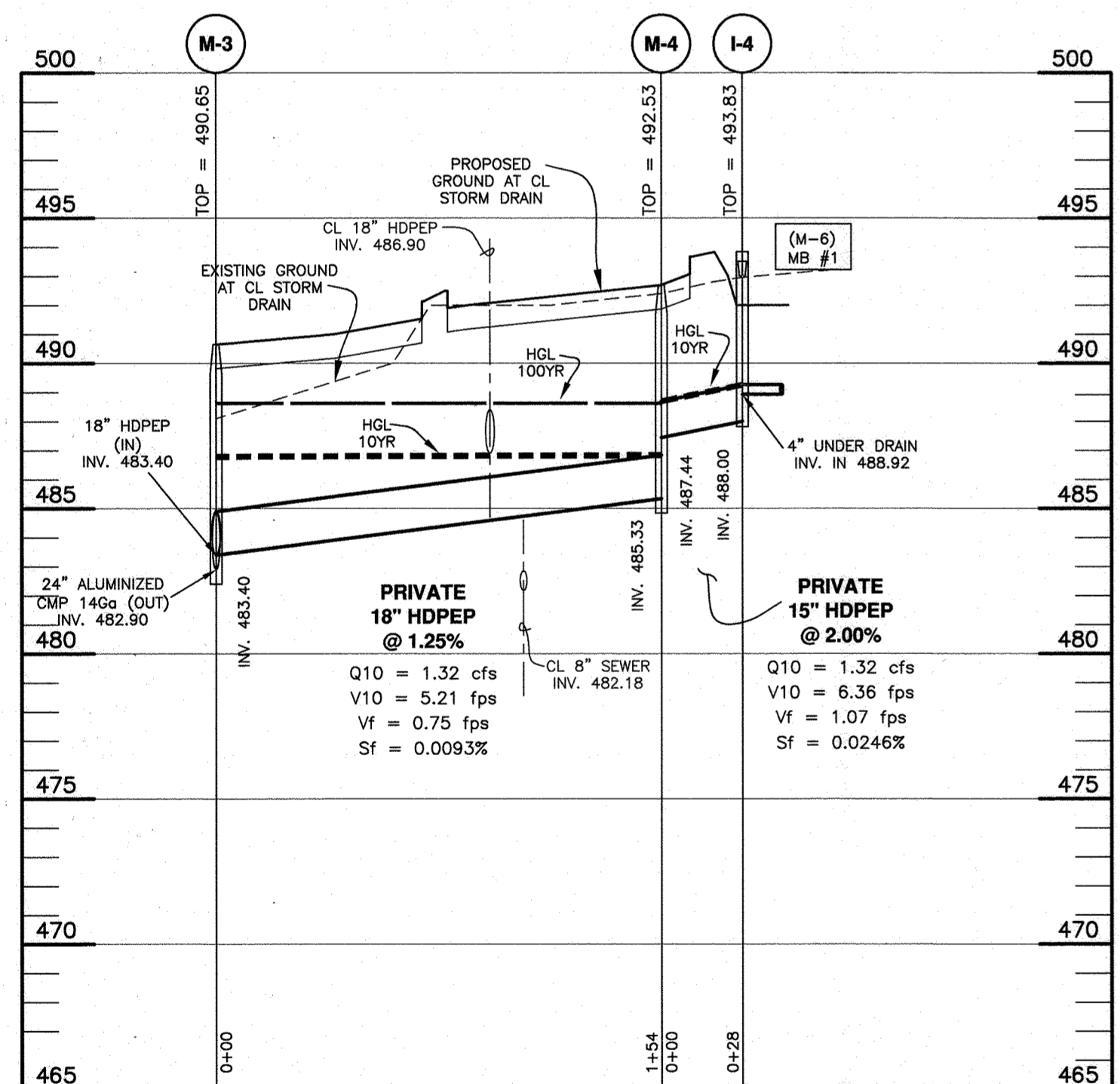
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



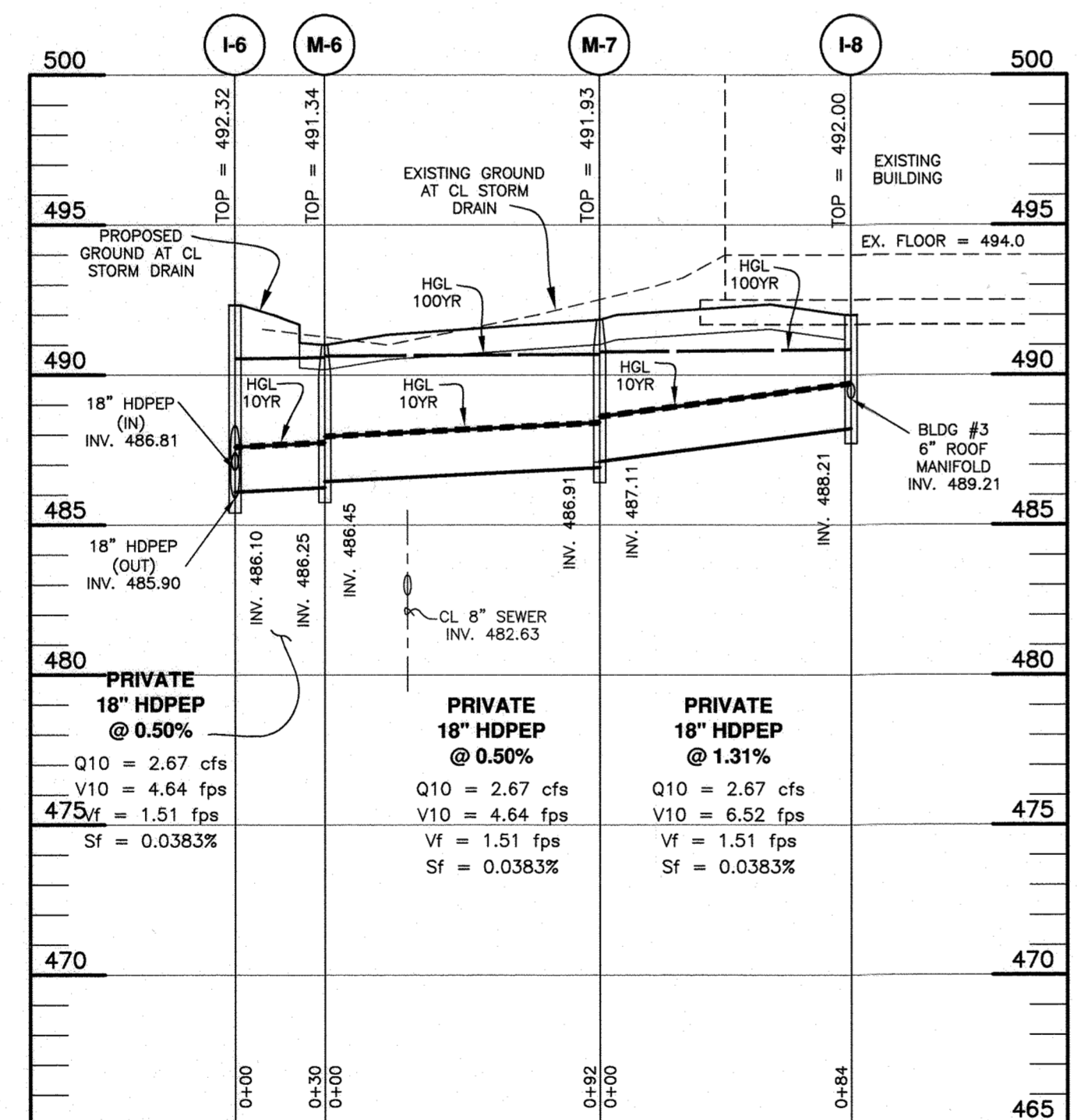
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

STORM DRAIN STRUCTURE SCHEDULE										
STRUCT NO.	TYPE	HO.CO. STD. DETAIL	LOCATION	INVERT IN	INVERT OUT	TOP ELEVATION	THROAT ELEVATION	MAINTENANCE		
INLETS										
I-1	D inlet (open on 2 sides)	D-4.10	N 563568.61 E 1331154.10	485.92 (4")	485.25 (12")	490.83	490.00	PRIVATE		
I-2	D inlet (open on 2 sides)	D-4.10	N 563584.34 E 1331077.58	484.92 (4")	484.25 (12")	488.83	488.00	PRIVATE		
I-3	double S inlet	D-4.23	N 563623.22 E 1331439.21	-	484.00 (18")	487.50	NA	PRIVATE		
I-4	D inlet (open on 2 sides)	D-4.10	N 563816.37 E 1331394.34	488.92 (4")	488.00 (15")	493.83	493.00	PRIVATE		
I-5	S comb	D-4.32	N 563691.81 E 1331472.99	485.60 (18")	485.40 (18")	489.63	NA	PRIVATE		
I-6	A-5 (3.0' wide)	D-4.01	N 563737.86 E 1331431.56	488.81 (18")	486.10 (18")	492.32	491.72	PRIVATE		
I-7	double S inlet	D-4.23	N 563710.72 E 1331253.38	489.30 (6")	488.30 (6")	493.02	NA	PRIVATE		
I-8	double S inlet	D-4.23	N 563888.30 E 1331555.69	489.21 (6")	488.21 (18")	492.00	NA	PRIVATE		
I-9	A-5 (3.0' wide)	D-4.01	N 563747.62 E 1330965.54	487.31 (6")	486.51 (18")	492.64	492.04	PRIVATE		
I-10	A-5 (3.0' wide)	D-4.01	N 563849.87 E 1331056.71	-	487.54 (18")	491.16	490.56	PRIVATE		
I-11	A-5 (2.5' wide)	D-4.01	N 563624.94 E 1330888.51	487.00 (6")	484.75 (18")	490.35	489.75	PRIVATE		
I-12	S inlet	D-4.22	N 563572.21 E 1330873.42	-	481.80 (6")	481.80	NA	PRIVATE		
I-13	double S inlet	D-4.23	N 563733.08 E 1331429.51	488.03 (8")	487.20 (18")	492.70	NA	PRIVATE		
I-14	A-5 (2.5' wide)	D-4.01	N 563568.60 E 1331294.10	490.00 (6")	486.85 (18")	493.64	493.04	PRIVATE		
I-15	A-10 (3.0' wide)	D-4.03	N 563593.16 E 1331186.67	-	496.05 (18")	495.85 (18")	492.35	PRIVATE		
I-16	A-5 (3.0' wide)	D-4.01	N 563915.29 E 1331116.68	-	487.10 (18")	491.80	491.20	PRIVATE		
MANHOLES										
M-1	See detail sheet 14	NA	N 563613.12 E 1331344.57	-	481.58 (18")	481.58	491.77	PRIVATE		
M-2	See detail sheet 15	NA	N 563774.84 E 1331006.15	-	479.00 (18")	476.05 (24")	483.33	PRIVATE		
M-3	4" Diameter Pre-Cast	G-5.12	N 563503.02 E 1331153.34	483.24 (12")	483.24 (12")	482.74 (18")	482.13	PRIVATE		
M-4	4" Diameter Pre-Cast	G-5.12	N 563598.96 E 1331076.81	-	484.16 (12")	483.96 (12")	491.43	PRIVATE		
M-5	4" Diameter Pre-Cast	G-5.12	N 563644.18 E 1331415.97	483.40 (18")	483.40 (18")	482.90 (24")	490.65	PRIVATE		
M-6	4" Diameter Pre-Cast	G-5.12	N 563797.81 E 1331414.94	-	487.44 (18")	486.33 (18")	492.53	PRIVATE		
M-7	4" Diameter Pre-Cast	G-5.12	N 563734.48 E 1331349.66	-	487.43 (18")	487.23 (18")	493.81	PRIVATE		
M-8	4" Diameter Pre-Cast	G-5.12	N 563757.43 E 1331452.17	-	486.45 (18")	486.25 (18")	491.00	PRIVATE		
M-9	4" Diameter Pre-Cast	G-5.12	N 563533.08 E 1331429.51	-	487.11 (18")	487.11 (18")	492.70	PRIVATE		
M-10	4" Diameter Pre-Cast	G-5.12	N 563667.63 E 1330880.94	-	485.18 (18")	484.98 (18")	491.00	PRIVATE		
M-11	4" Diameter Pre-Cast	G-5.12	N 563608.23 E 1330895.99	-	481.33 (18")	481.13 (18")	491.10	PRIVATE		
M-12	4" Diameter Pre-Cast	G-5.12	N 563653.22 E 1330889.53	-	480.62 (18")	480.42 (18")	490.40	PRIVATE		
M-13	4" Diameter Pre-Cast	G-5.12	N 563915.15 E 1331173.10	484.50 (18")	484.50 (18")	484.30 (18")	493.96	PRIVATE		
M-14	4" Diameter Pre-Cast	G-5.12	N 563842.29 E 1331107.42	-	486.44 (18")	486.24 (18")	491.76	PRIVATE		
M-15	4" Diameter Pre-Cast	G-5.12	N 563565.03 E 1331216.07	490.07 (8"x18.5" (18")	485.57 (18")	485.57 (18")	493.36	PRIVATE		
M-16	4" Diameter Pre-Cast	G-5.12	N 564013.27 E 1331240.01	486.00 (8")	486.00 (18")	486.10 (18")	492.64	PRIVATE		
M-17	4" Diameter Pre-Cast	G-5.12	N 563704.93 E 1331323.03	-	487.83 (18")	487.63 (18")	495.00	PRIVATE		
M-18	4" Diameter Pre-Cast	G-5.12	N 563767.73 E 1330992.75	-	479.65 (18")	479.45 (18")	492.86	PRIVATE		
M-19	4" Diameter Pre-Cast	G-5.12	N 563757.52 E 1331004.08	-	479.30 (18")	479.10 (18")	483.21	PRIVATE		
M-19	4" DIAMETER PRECAST	G-5.12	N 563926.10 E 1331091.72	475.34 (24")	474.09 (24")	482.2	PRIVATE			
END SECTIONS										
E-1	18" HDPE	NA	N 563673.60 E 1331479.79	-	-	485.00 (18")	-	PRIVATE		
E-2	24" Concrete	D-5.51	N 563895.80 E 1330929.83	-	-	475.33 (24")	-	PRIVATE		
E-3	18" HDPE	NA	N 563625.73 E 1330858.60	-	-	484.50 (18")	-	PRIVATE		
E-4	18" HDPE	NA	N 563611.26 E 1330865.25	-	-	484.50 (18")	-	PRIVATE		
HW-1	Type C 18" Concrete	D-5.21	N 563592.15 E 1331345.68	-	-	481.37 (18")	484.62	PRIVATE		

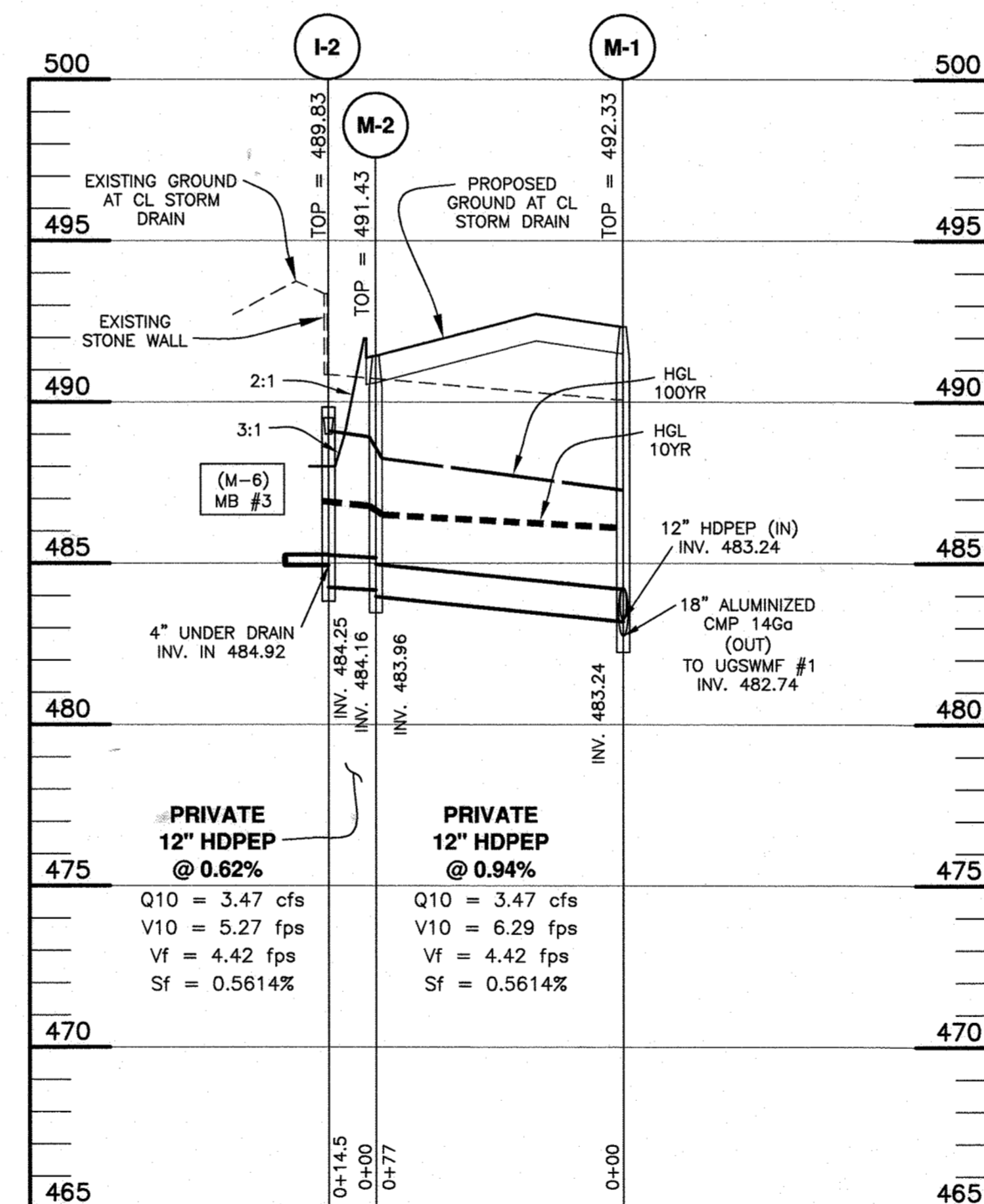
STRUCTURE LOCATION FOR MANHOLES IS AT THE CENTER OF THE MANHOLE
STRUCTURE LOCATION FOR TYPE 'A' INLETS IS AT THE MIDPOINT ALONG THE GUTTER PAN
STRUCTURE LOCATION FOR TYPE 'S' INLETS IS AT THE CENTER OF THE GRADE
STRUCTURE LOCATION FOR END SECTIONS IS AT THE MIDPOINT OF THE END OF THE STRUCTURE
PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.



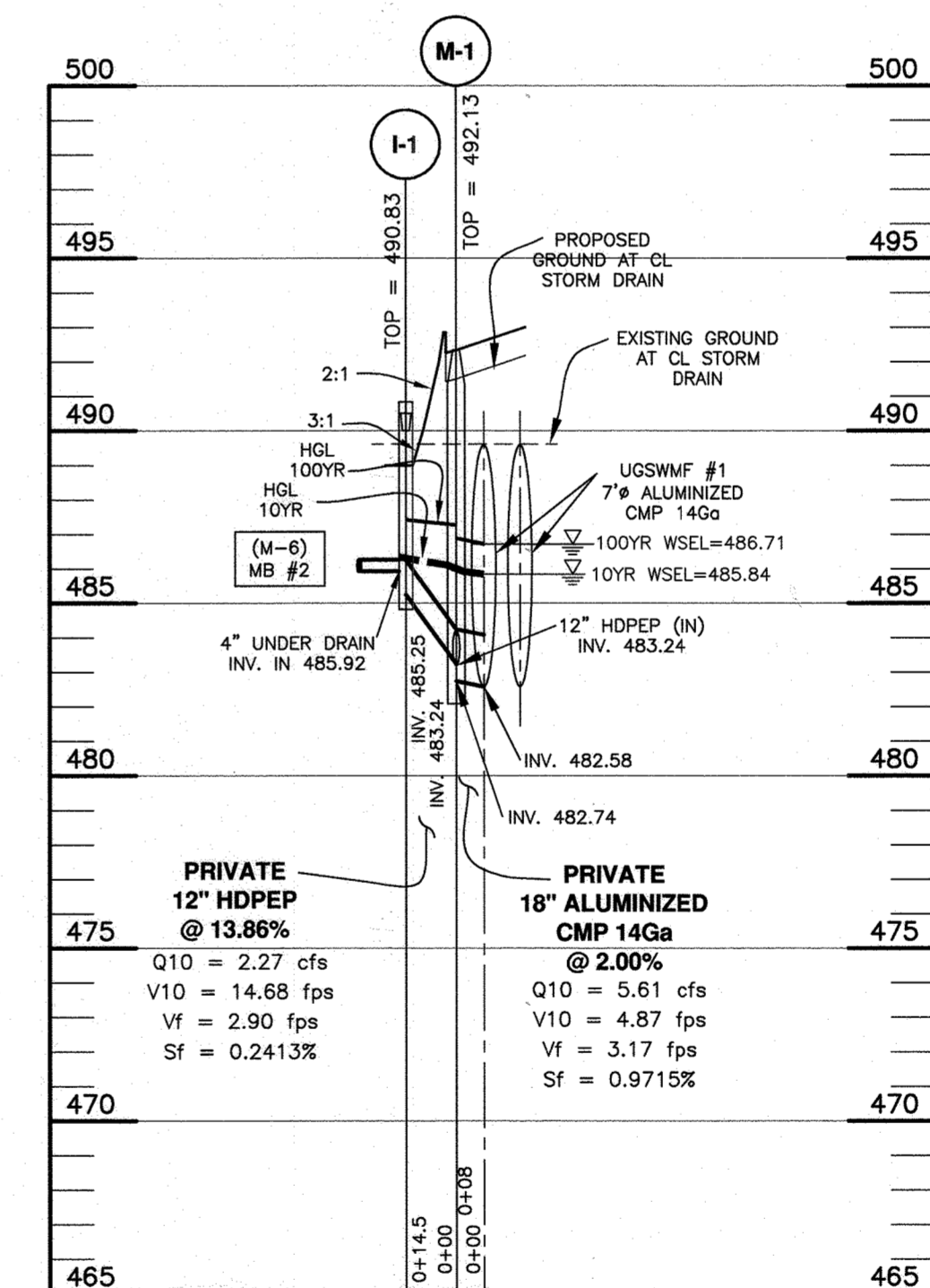
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



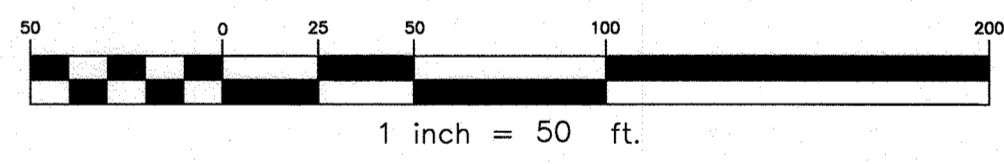
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

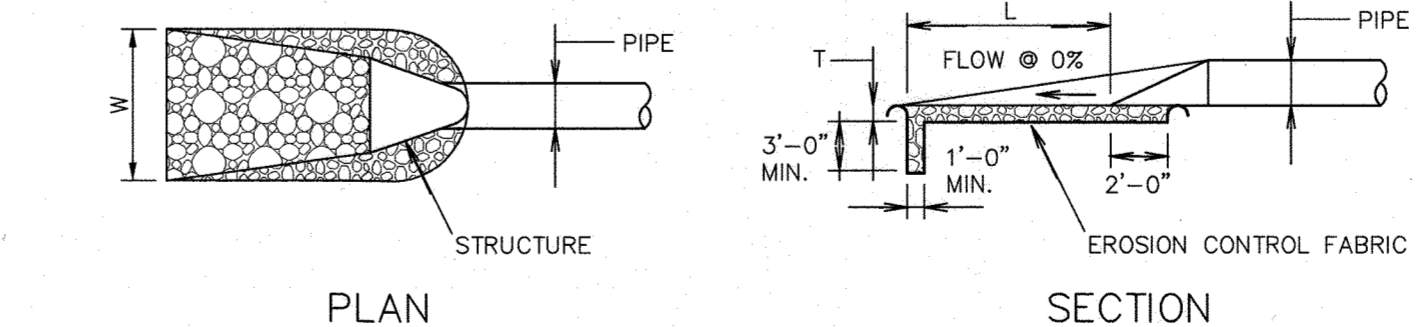
STORM DRAIN PIPE SCHEDULE			
SIZE	TYPE	LENGTH (L.F.)	MAINTENANCE
6"	PVC (ROOF DRAIN MANIFOLD)	1378	PRIVATE
8"	PVC (ROOF DRAIN MANIFOLD)	204	PRIVATE
12"	HDPEP	106	PRIVATE
15"	HDPEP	28	PRIVATE
18"	HDPEP	1783	PRIVATE
18"	ALUMINIZED CMP 14Ga	72	PRIVATE
24"	ALUMINIZED CMP 14Ga	91	PRIVATE
24"	RCCP CL IV	138	PRIVATE

All HDPE pipes shall have smooth interior. No interior corrugations.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division: *[Signature]* 4.2.19
 Chief, Division of Land Development: *[Signature]* 4-4-19
 Director: *[Signature]* 4-4-19

- CONSTRUCTION SPECIFICATIONS
- THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
 - THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.
 - GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE PREPARED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.
 - STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR THE RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.
 - THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.



STRUCTURE	Q ₂ (cfs)	V ₂ (fps)	d ₂ (ft)	Q ₁₀ (cfs)	V ₁₀ (fps)	d ₁₀ (ft)	d ₅₀	LENGTH (L)	WIDTH (W)	THICK (T)	SHA CLASS
HW-1	0.67	3.90	0.23	0.85	4.13	0.26	9.5"	8'	9.5'	19"	I
E-1	-	-	-	7.99	14.94	0.51	9.5"	FOREBAY	FOREBAY	19"	I
E-2	0.72	2.58	0.23	0.93	2.71	0.33	9.5"	8'	10'	19"	I
E-3	-	-	-	2.71	6.05	0.50	9.5"	FOREBAY	FOREBAY	19"	I
E-4	-	-	-	2.46	5.69	0.30	9.5"	FOREBAY	FOREBAY	19"	I

OUTLET PROTECTION DETAIL
NOT TO SCALE

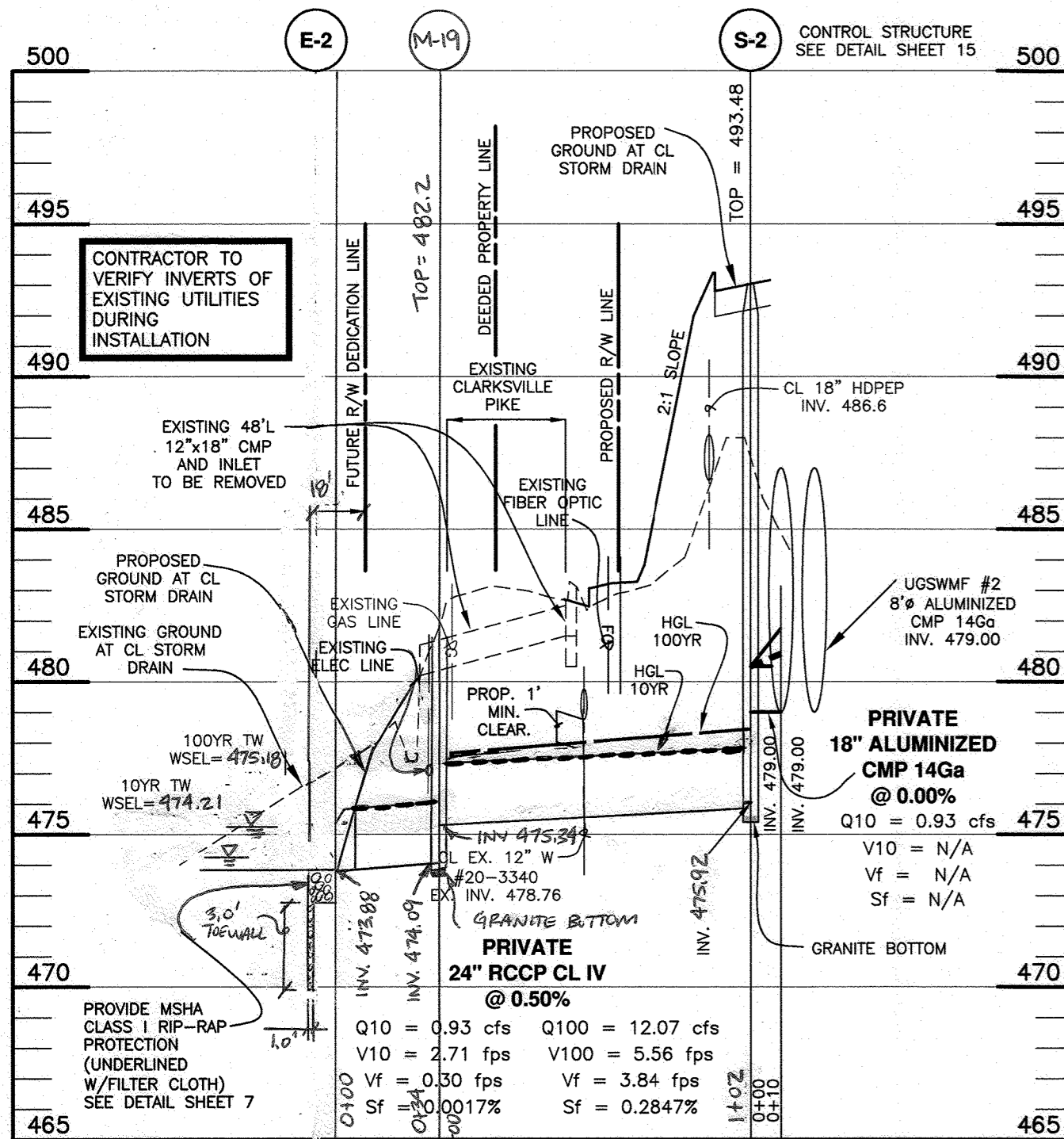
BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE SUITE 315 & ELLICOTT CITY, MARYLAND 21043
 (P) 410-465-6105 (F) 410-465-6644
 WWW.BEI-CIVILENGINEERING.COM

OWNER: STEPHEN A. KLEIN & ASSOCIATES
 12165 CLARKSVILLE PIKE
 CLARKSVILLE, MARYLAND 21029
 410-465-4244

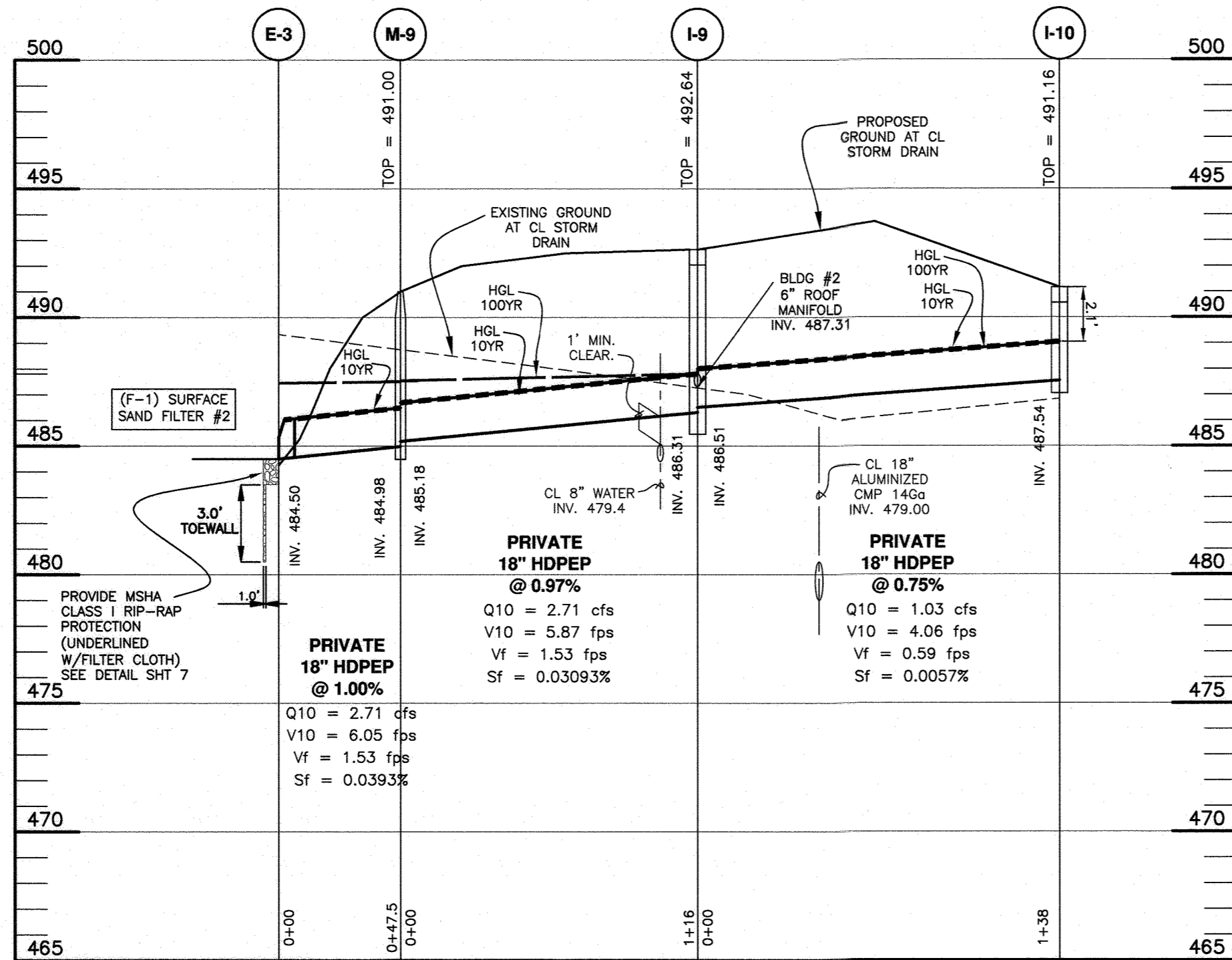
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC
 P.O. BOX 417
 ELLICOTT CITY, MARYLAND 21041
 410-465-4244

RIVER HILL SQUARE
 REDEVELOPMENT OF RIVER HILL GARDEN CENTER
 TAX MAP: 35 - GRID: 1 - PARCEL: 1
 ZONED: B-1
 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

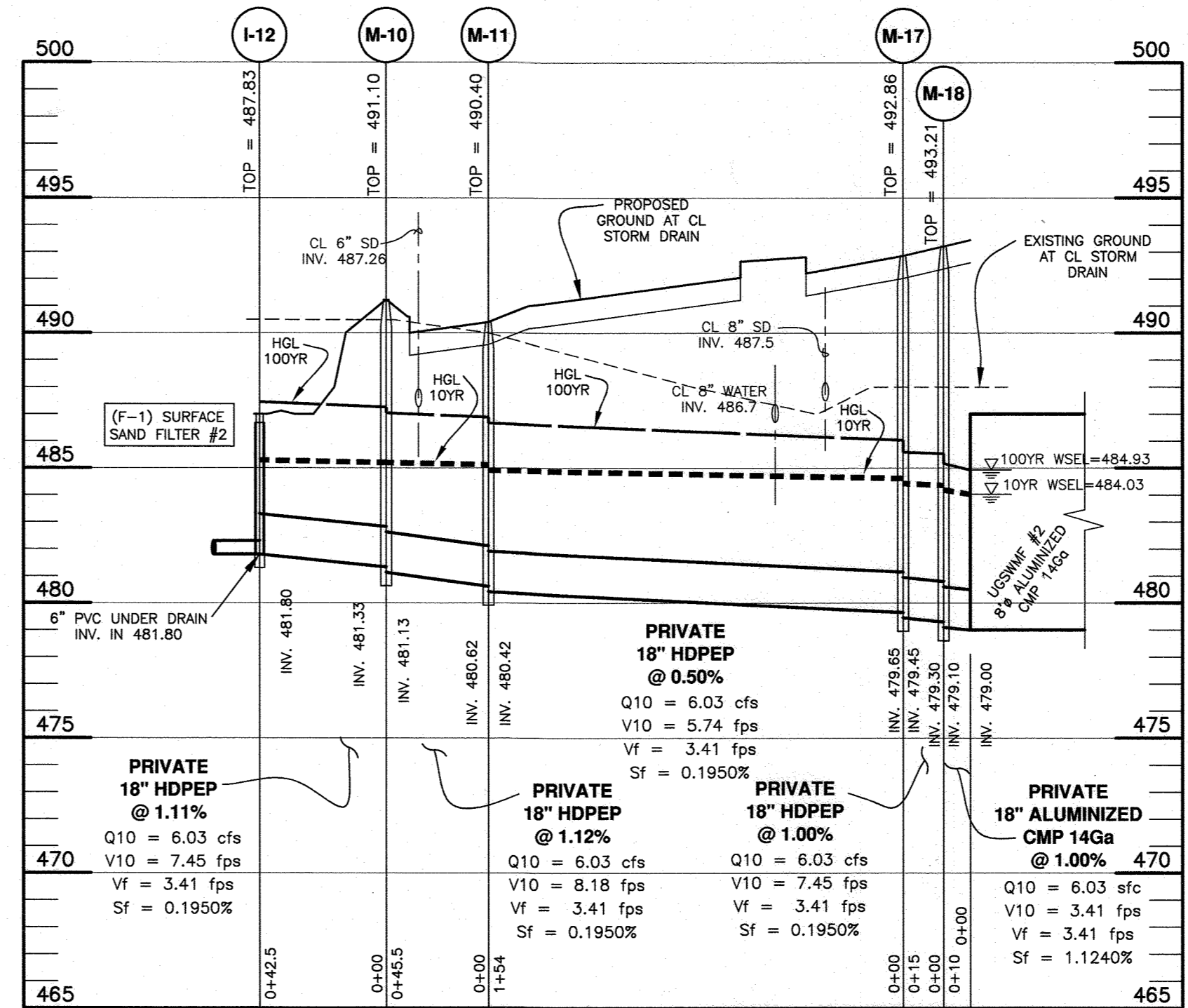
STORM DRAIN PROFILES & DETAILS
 DATE: MARCH 4, 2019 BEI PROJECT NO. 2801
 DESIGN: DBT DRAFT: DBT SCALE: AS SHOWN SHEET 7 OF 25



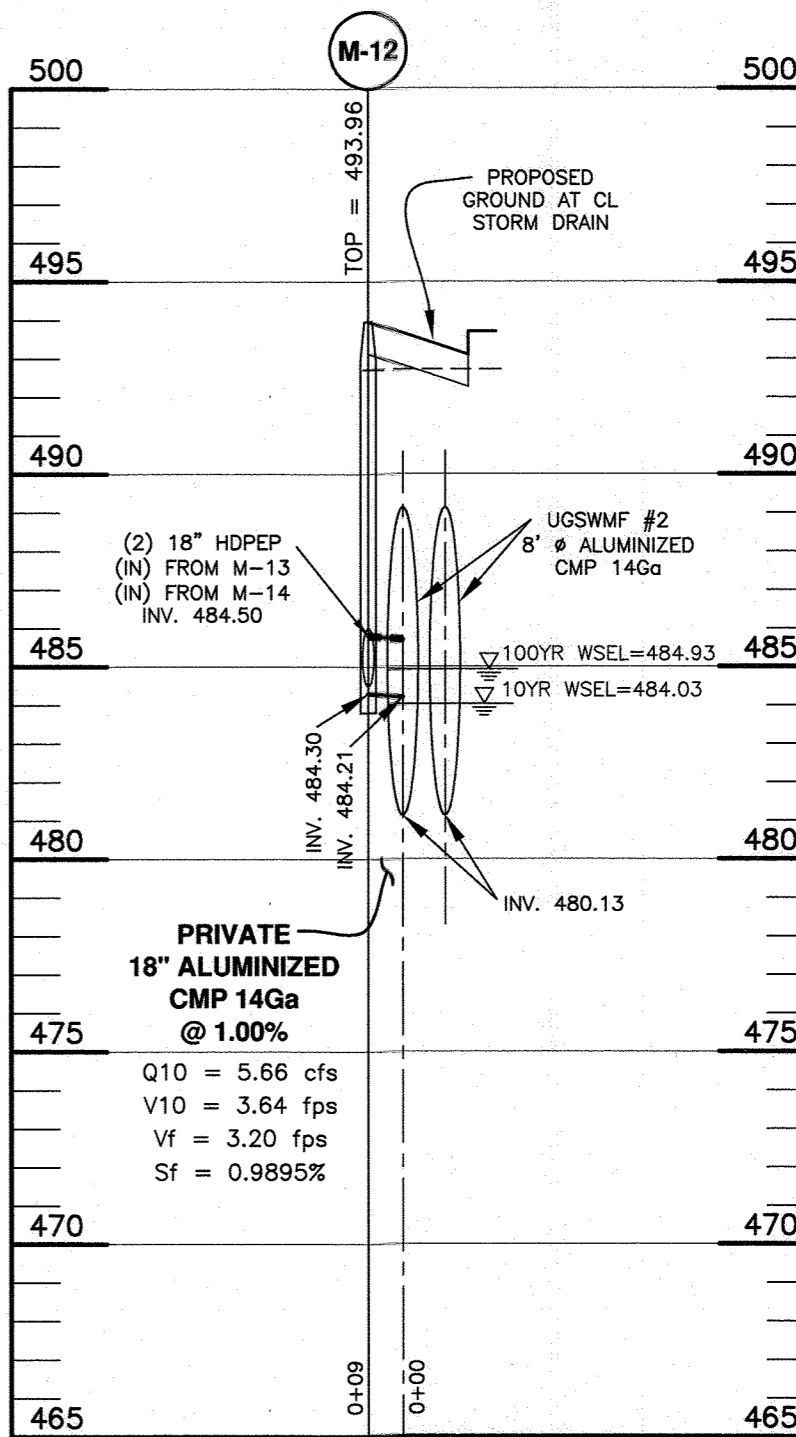
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



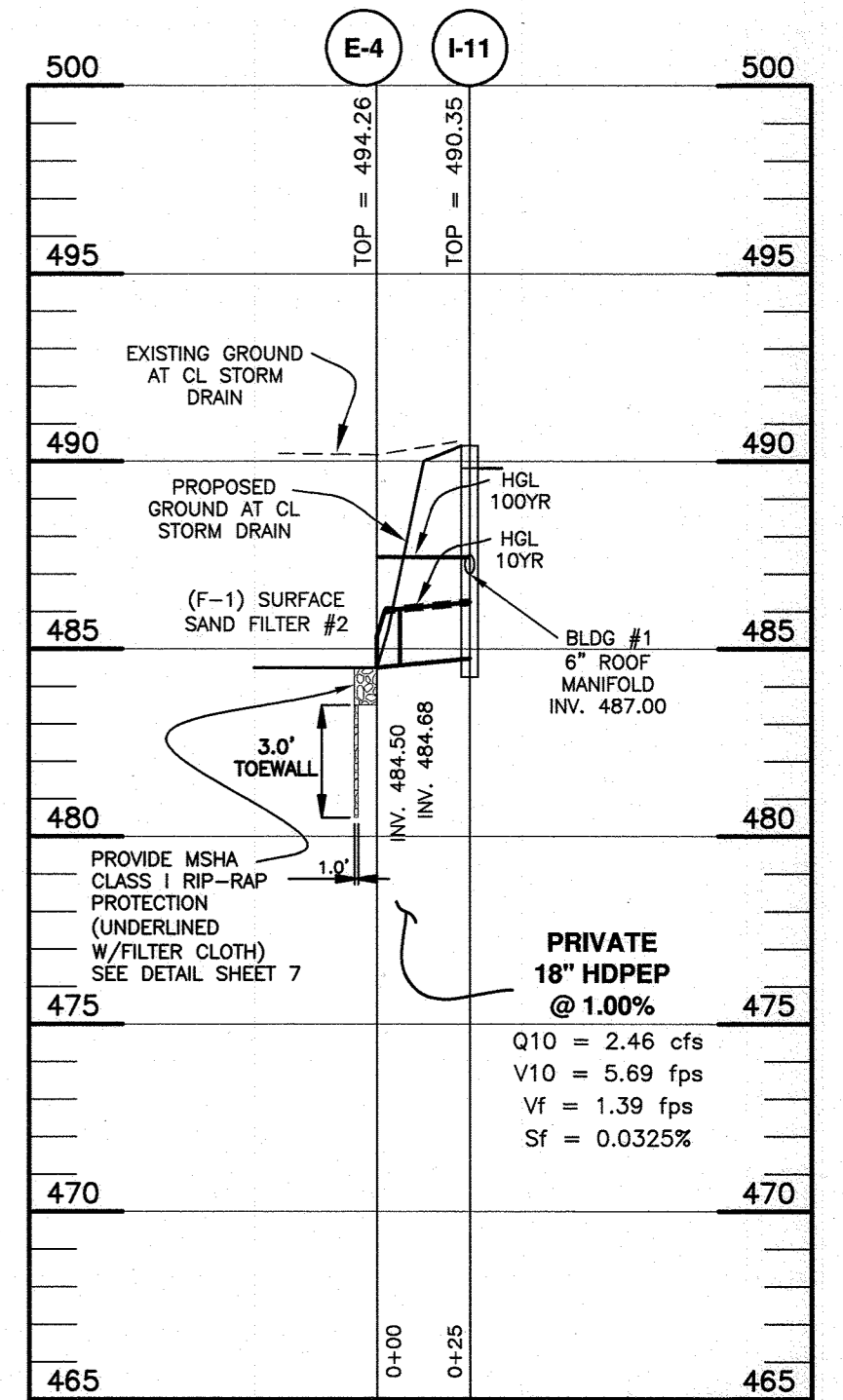
STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



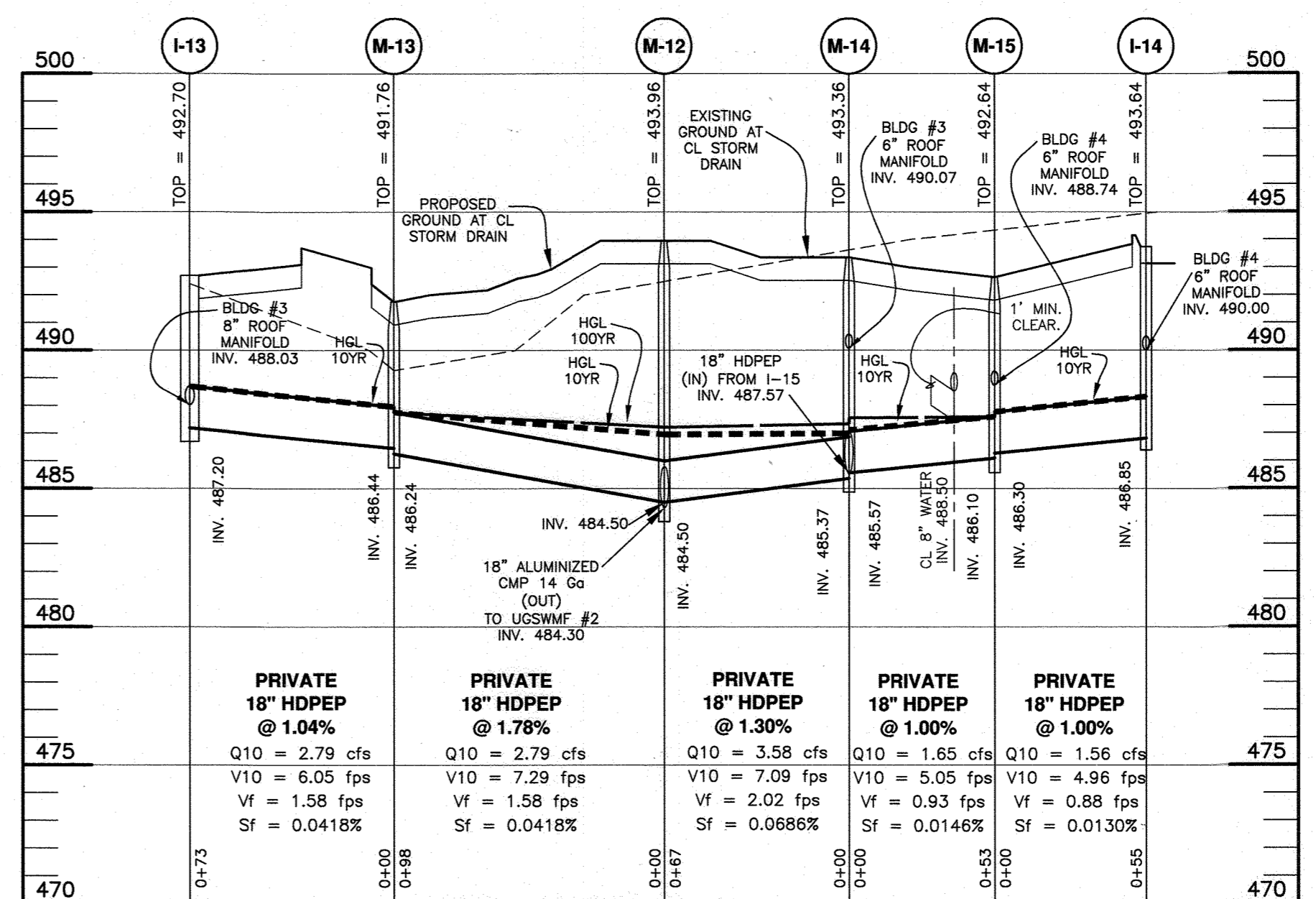
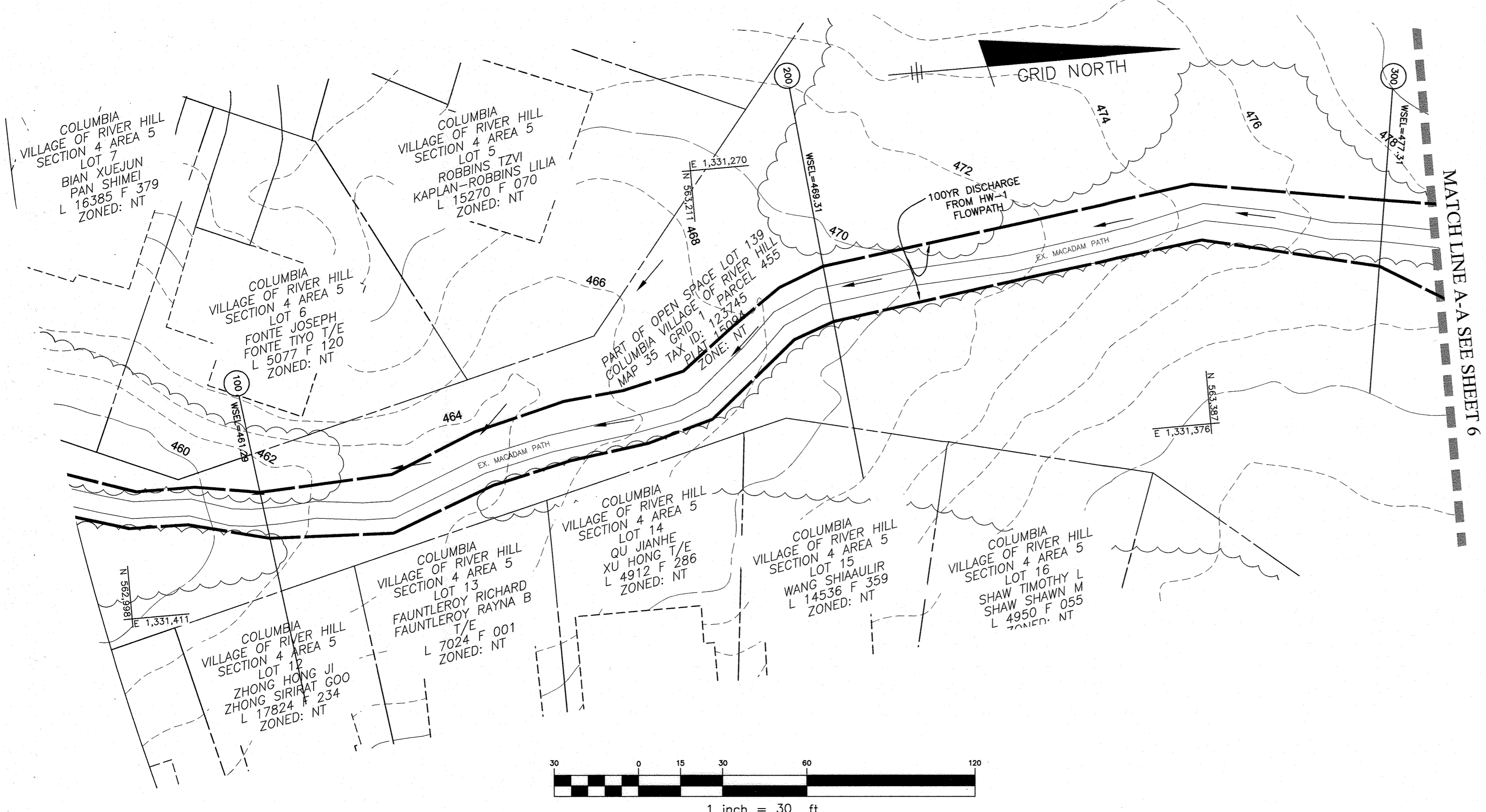
STORM DRAIN PROFILE
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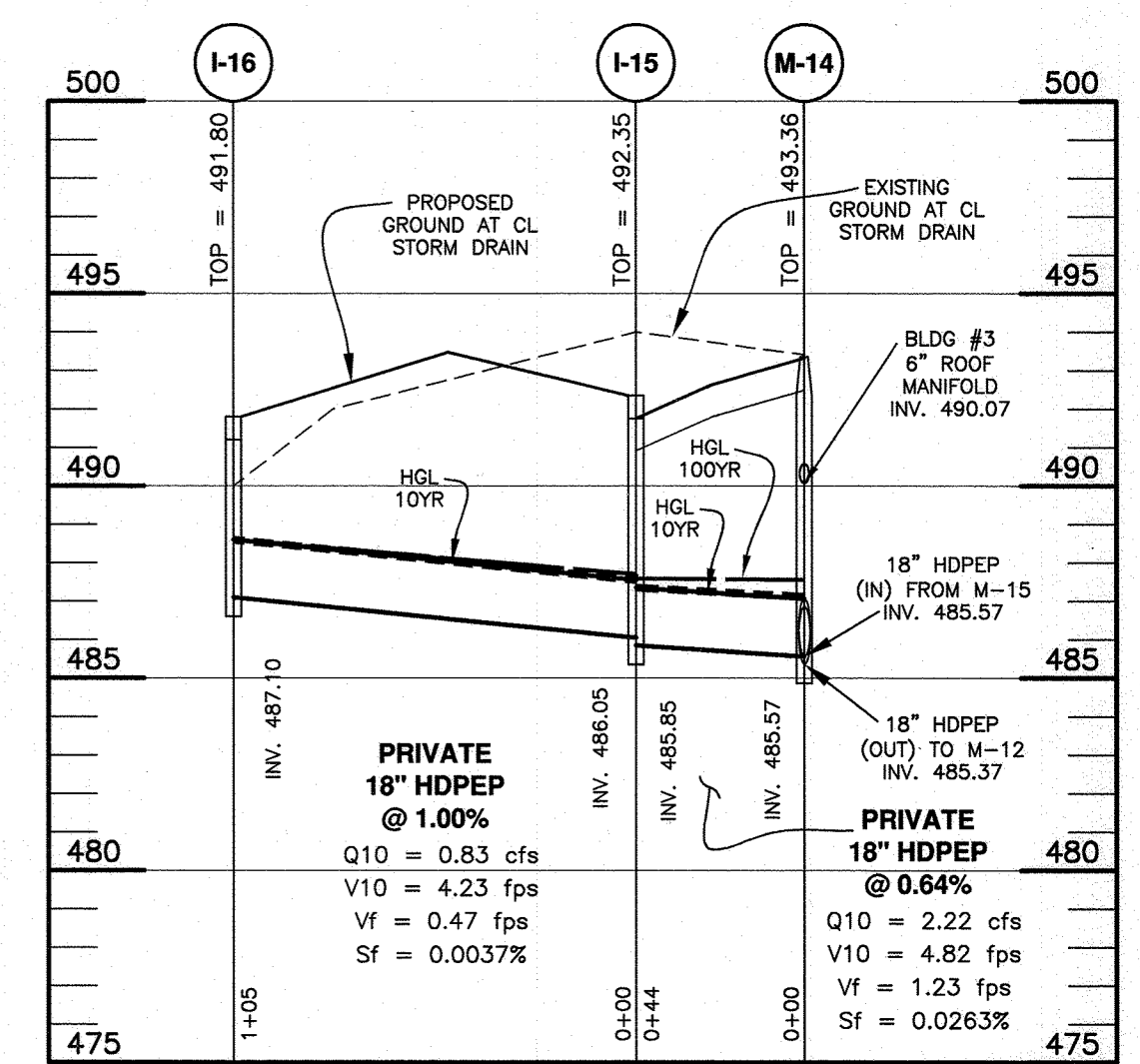
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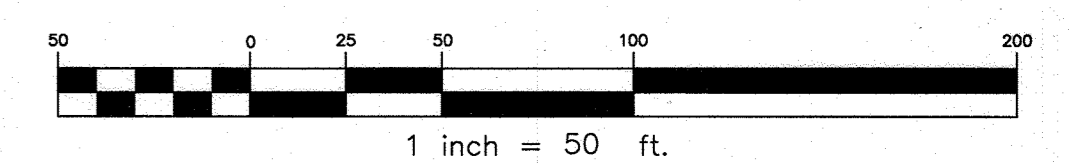
STORM DRAIN PROFILE
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STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 4-2-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 4-4-19
CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4-4-19
DIRECTOR

1 1.12.2021 REVISE PROFILE FROM E-2 TO S-2 TO ADD MANHOLE M-19 NO. DATE REVISION	
BENCHMARK ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BEI-CIVILENGINEERING.COM	
PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22399, Expiration Date: 6-30-2019.	
OWNER: STEPHEN A. KLEIN & ASSOCIATES c/o STEPHEN KLEIN, INC. 12165 CLARKSVILLE PIKE CLARKSVILLE, MARYLAND 21029 410-465-4244	
DEVELOPER/OWNER: RIVER HILL SQUARE, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244	
RIVER HILL SQUARE REDEVELOPMENT OF RIVER HILL GARDEN CENTER TAX MAP: 35 - GRID: 1 - PARCEL: 1 ZONED: B-1 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND	
STORM DRAIN PROFILES	
DESIGN: DBT	DRAFT: DBT
DATE: MARCH 4, 2019	BEI PROJECT NO. 2801
SCALE: AS SHOWN	SHEET 8 OF 25