CITY OF RICHMOND, VIRGINIA

DEPARTMENT OF PUBLIC WORKS

ENGINEERING & TECHNICAL SERVICES

FHWA DATA NUMBER	FHWA REGION	STATE	FEDERAL PROJECT NUMBER	STATE PROJECT NUMBER
43121	1	VA	PE:	FO U000-127-972
			CN:	

REVISIONS

NO.	DATE	COMMENTS

SHOCKOE VALLEY STREET IMPROVEMENTS
(FROM EAST GRACE STREET TO BALDING STREET)

UPC: 109310

CITY OF RICHMOND PROJECT: 104857

FEDERAL AID PROJECT NUMBER: NHFP-5A27(488)

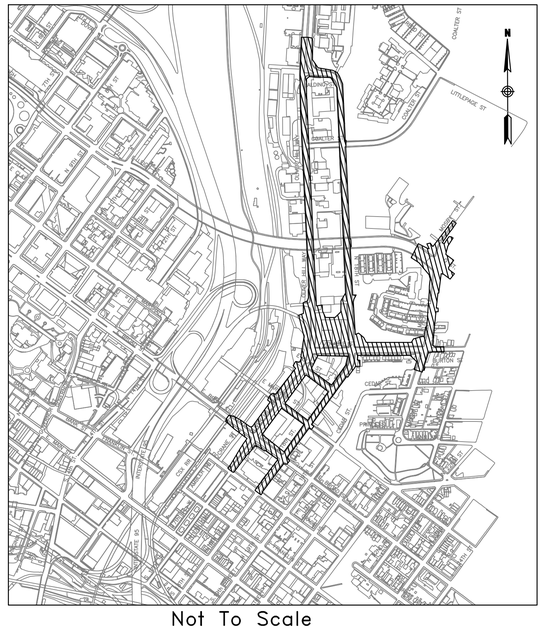
CITY OF RICHMOND

APPROVED FOR CONSTRUCTION

DATE	SURVEYS SUPERINTENDENT
DATE	PROJECT MANAGER
DATE	MAINTENANCE ENGINEER
DATE	CITY TRANSPORTATION ENGINEER
DATE	CAPITAL PROJECTS ADMINISTRATOR
DATE	CITY ENGINEER
DATE	DIRECTOR OF PUBLIC WORKS

INDEX OF SHEETS

LOCATION MAP



Not To Scale

REQUIRED PERMITS

CONTRACTOR SHALL OBTAIN THE FOLLOWING:

- LAND DISTURBANCE (W) PERMIT
- DESIGNATION OF "RESPONSIBLE LAND DISTURBER" FORM

70% SUBMITTAL- NOT FOR CONSTRUCTION

OWNER: CITY OF RICHMOND, DEPARTMENT OF PUBLIC WORKS
CONTACT: ADEL EDWARD P.E., PROJECT MANAGER
CITY OF RICHMOND
900 E. BROAD STREET, SUITE 603
RICHMOND, VA 23219
804-646-6584

DRAWING NO.: O-28633

PROJECT AREA

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE CITY OF RICHMOND. THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE 2020 VDOT ROAD AND BRIDGE SPECIFICATIONS, 2016 VDOT ROAD AND BRIDGE STANDARDS, 2009 FHWA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) WITH REVISIONS 1 AND 2 DATED MAY 2012, 2011 VIRGINIA SUPPLEMENT TO THE MUTCD (REVISION 1, DATED SEPTEMBER 30, 2013), 2011 VIRGINIA WORK AREA PROTECTION MANUAL (REVISION 2, DATED SEPTEMBER 1, 2019), APPLICABLE CITY OF RICHMOND STANDARDS AND SPECIFICATIONS, AND AS AMENDED BY CONTRACT PROVISIONS AND THE COMPLETE ELECTRONIC VERSION OF THE PLAN ASSEMBLY.

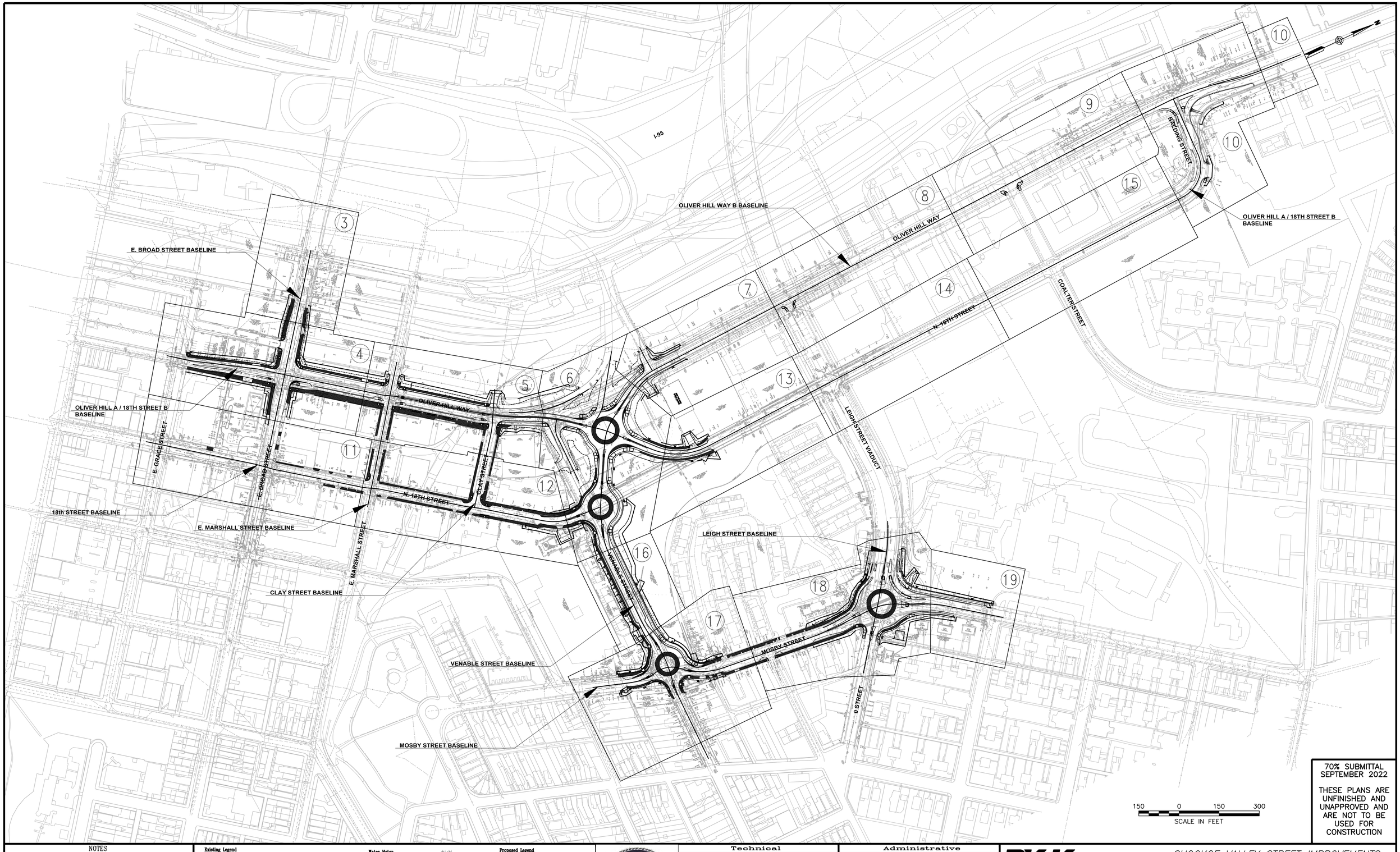
RIGHT OF WAY IS REQUIRED FOR THIS PROJECT.

SEPTEMBER 2022

RK&K
Responsive People · Creative Solutions

2100 EAST CARY STREET, SUITE 309
RICHMOND, VIRGINIA 23223
(P) 804 782-1903 (F) 804 782-2142

RUMMEL, KLEPPER & KAHL, LLP



70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH • WV
Water Meter • WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM • • GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET LAYOUT

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE 1"=150'	DATE SEPTEMBER 2022	PROJECT SHEET 1A	DRAWING NO. 0-28633

RIGHT OF WAY DATA SHEET

ROUTE: SHOCKOE STREETS IMPROVEMENTS		STATE PROJECT:	U000-127-972
COUNTY/CITY: CITY OF RICHMOND		UPC:	109310
FEDERAL PROJECT NO:		RICHMOND PROJECT:	104857
COMPILED BY: RUMMEL, KLEPPER & KAHL, L.L.P.		DATE:	
REVISED BY:		DATE:	
REVISED BY:		DATE:	

PARCEL NO.	LANDOWNER	SHEET NO.	AREA																		
			TOTAL	FEE TAKING		FEE REMAINDER		EASEMENTS													PROFFERS
								PERMANENT		TEMPORARY		UTILITY									
												VERIZON		VA. DOMINION PWR.		COMCAST		CITY OF RICHHMOND DPU			
			ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	YE S/ NO
001	NOT USED	-	-																		
002	CITY OF RICHMOND PUBLIC WORKS	3	7.373	0.000	0.000		7.373			416.583	0.010										
003	CITY OF RICHMOND PUBLIC WORKS	3, 4	.5424	663.790	0.015		0.527			1672.345	0.038										
004	CITY OF RICHMOND PUBLIC WORKS	4	.097	1608.742	0.037		0.060	461.595	0.011	756.367	0.017										
005	LOVING PRODUCE LLC	4	.191	2036.031	0.047		0.144			1293.271	0.030										
006	LOVING PRODUCE LLC	4	.048	435.062	0.010		0.038			339.412	0.008										
007	LOVING PRODUCE LLC	4	.096	726.336	0.017		0.079			631.447	0.014										
008	LOVING PRODUCE LLC	4	.048	305.042	0.007		0.041			301.408	0.007										
009	LOVING PRODUCE LLC	4	.096	493.729	0.011		0.085			574.185	0.013										
010	MACS RETAIL,LLC	4, 11	1.008	494.172	0.011		0.997	163.433	0.004	2906.216	0.067										
011	1710 EAST BROAD EQUITIES LLC	4	.301	906.780	0.021		0.280			1080.308	0.025										
012	NOT USED	-	-																		
013	C S X TRANSPORTATION INC	3	.5025	0.000	0.000		0.503			102.424	0.002										
014	LOVING PRODUCE LLC	3, 4, 5	.956	12483.400	0.287		0.669	685.470	0.016	8681.020	0.199										
015	LOVING PRODUCE LLC	5	2.35	11538.570	0.265		2.085	1183.210	0.027	7051.740	0.162										
016	LOVING PRODUCE LLC	5, 6	1.07	0.000	0.000		1.070			3420.410	0.079										
017	DPC LLC	6, 7, 13	2.058	89651.031	2.058					0.000	0.000										
018	GENESIS HOMES MANAGER LLC	6, 13, 16, 17	3.627	10415.205	0.239		3.388	1783.500	0.041	16082.060	0.369										
019	JEFFERSON TOWNHOUSES LLC	17, 18	11.184	6165.094	0.142		11.042	1174.761	0.027	6327.898	0.145										
020	CITY OF RICHMOND	14,15,18,19	29.313	8244.497	0.189		29.124	263.770	0.006	6671.549	0.153										
021	RICHMOND DEVELOPMENT AND HOUSING AUTHORITY	18, 19	15.2	4642.568	0.107		15.093			9282.369	0.213										
022	NOT USED	-	-																		
023	MAGDY DAWOD	17	.194	0.000	0.000		0.194			66.025	0.002										
024	CEDAR STREET GENESIS LLC	12, 17	3.480	1944.460	0.045		3.435	19.467	0.000	3377.330	0.078										
025	JEFFERSON TOWNHOUSES LLC	6, 12, 16, 17	1.178	1775.656	0.041		1.137	4012.468	0.092	4751.430	0.109										
026	CLAY STREET PARKING GP LLC	6, 12	.859	544.148	0.012		0.847			598.746	0.014										
027	ROWVA PROPERTIES LLC	5,6,12	.852	0.000	0.000		0.852			2071.860	0.048										
028	NOT USED	-	-																		
029	NOT USED	-	-																		
030	NOT USED	-	-																		
031	CITY OF RICHMOND PUBLIC WORKS	10	11.172	0.000	0.000		11.172	1242.100	0.029	1263.382	0.029										
032	FAIR HILLS APARTMENTS LLC	10, 15	13.503	0.000	0.000		13.503			314.658	0.007										
033	DOMESTIC LINEN SUPPLY CO INC OF VIRGINIA	9, 10, 15	2.161	0.000	0.000		2.161			234.871	0.005										
034	NOT USED	-	-																		
035	NOT USED	-	-																		
036	NOT USED	-	-																		
037	NOT USED	-	-																		
038	NOT USED	-	-																		
039	NOT USED	-	-																		
040	OHW LC	6, 7, 13	2.062	1994.472	0.046		2.016			6050.183	0.139										
041	C S X TRANSPORTATION INC TAX DEPARTMENT J910	7	0.402	105.940	0.002		0.400			1322.464	0.030										
042	NOT USED	-	-																		

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
RIGHT OF WAY DATA SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE NO SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 1B(1)	DRAWING NO. 0-28633

RIGHT OF WAY DATA SHEET

ROUTE: SHOCKOE STREETS IMPROVEMENTS		STATE PROJECT:	U000-127-972
COUNTY/CITY: CITY OF RICHMOND		UPC:	109310
FEDERAL PROJECT NO:		RICHMOND PROJECT:	104857
COMPILED BY: RUMMEL, KLEPPER & KAHL, L.L.P.		DATE:	
REVISED BY:		DATE:	
REVISED BY:		DATE:	

PARCEL NO.	LANDOWNER	SHEET NO.	AREA					EASEMENTS													
			TOTAL	FEE TAKING		FEE REMAINDER		PERMANENT		TEMPORARY		UTILITY								PROFFERS
												VERIZON		VA. DOMINION PWR.		COMCAST		CITY OF RICHHMOND DPU		YE S/ NO
			ACRES OR SQUARE FEET	SQ. FEET	ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	SQ. FEET	ACRES	
043	NOT USED	-	-																	
044	NOT USED	-	-																	
045	NOT USED	-	-																	
046	NOT USED	-	-																	
047	NOT USED	-	-																	
048	NOT USED	-	-																	
049	NOT USED	-	-																	
050	NOT USED	-	-																	
051	NOT USED	-	-																	
052	NOT USED	-	-																	
053	NOT USED	-	-																	
054	NOT USED	-	-																	
055	LAFFOON WILLIAM P AND SUSAN W	18	.165	0.000	0.000		0.165			200.187	0.005									
056	PENDLETON APARTMENTS LLC	18	.154	0.000	0.000		0.154			451.469	0.010									
057	CAVA CAPITAL LLC	18	.055	0.000	0.000		0.055			430.223	0.010									
058	CAVA CAPITAL LLC	18	.055	0.000	0.000		0.055			220.375	0.005									
059	CAVA CAPITAL LLC	18	.135	0.000	0.000		0.135			180.818	0.004									
060	SULTANY MOHAMMED HUMANY AND GULMAKE	18	.058	0.000	0.000		0.058			5.706	0.000									
061	NOT USED	-	-																	
062	NOT USED	-	-																	
063	NOT USED	-	-																	
064	NOT USED	-	-																	
065	NOT USED	-	-																	
066	NOT USED	-	-																	
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078	NOT USED	-	-																	
079	NOT USED	-	-																	
080	NOT USED	-	-																	
081	NOT USED	-	-																	
082	DANIEL J & MARY L KLINE	17	0.074	0.000	0.000		0.074			349.771	0.008									
083	LOVINGS PRODUCE LLC C/O HARRY W LOVING	4	0.145	483.498	0.011		0.134			798.142	0.018									
084	CITY OF RICHMOND RECREATION & PARKS	4	1	0.000	0.000		1.000			1632.063	0.037									

70% SUBMITTAL
SEPTEMBER 2022

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5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve; Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

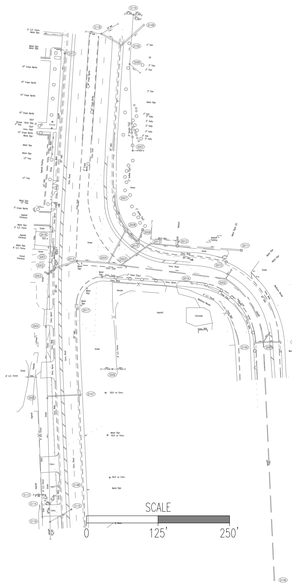
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

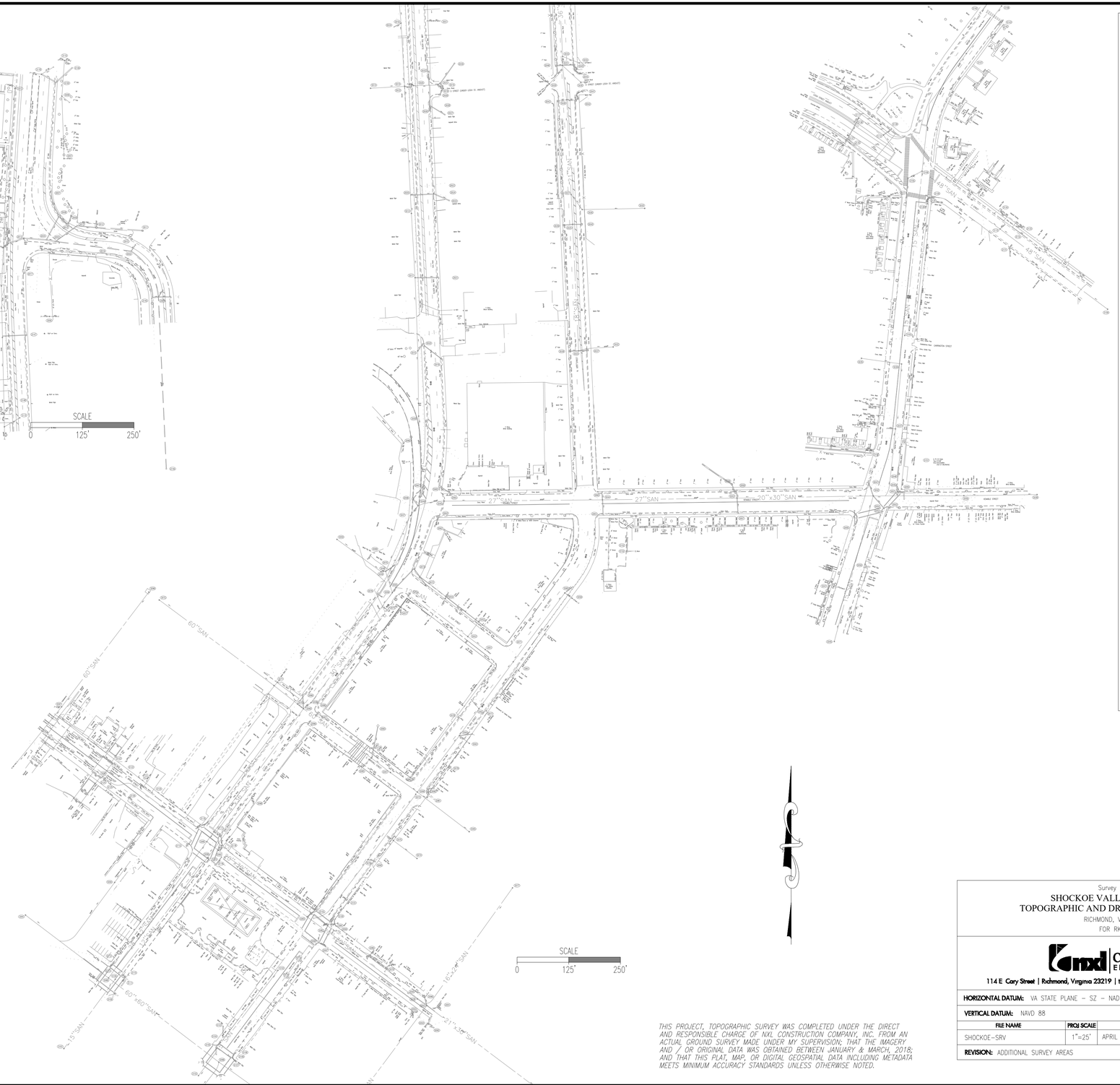
RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
RIGHT OF WAY DATA SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
			NO SCALE	SEPTEMBER 2022	SHEET 1B(2)	0-28633





LEGEND
(AS APPLICABLE)

SYMBOL	ABBR.	DESCRIPTION
△	Tr. Trav.	Traverse Point
▢	Mon.	Control Monument
▲	BM	Benchmark
△	FLY	Traverse Fly Point
⊙	REF	Control Reference Point
	AT, PIC	Aerial Target, Picture Point
N90°00'00"W	SBL	Survey Baseline
		Bridge
	EP	Edge of Pavement
		Edge of Driveway
	C&G	Curb / Curb and Gutter
		Shoulder of Road
Solid White Line		Pavement Striping / Marking
		Public Sidewalks
		Private Walks
		Steps
	Bldg.	Building, Roof line, Porch
	SAT	Satellite Dish
W		Well
		Fence
		Cemetery Boundary with Grave Markers
		Woods Line
		Shrub Line
		Brush Line
		Tree, Shrub
		Miscellaneous Landscape Features
		Walls
		Signs
	BP	Bollard Posts, Posts
	YLT, GLT	Yard Lights, Ground Lights
MB	MB	Mail Box
		Flag
	GR	Guardrail
	JB	Jersey Barrier
		Hydrology Features
		Conc. V-Ditch, Paved Ditches
	MH, DI	Storm Manhole, Drop Inlet
	RCP,CMP,CPP, DIP, TCP	Reinforced Concrete Pipe, Corrugated Metal Pipe, Corrugated Plastic Pipe, Ductile Iron Pipe, Terra Cotta Pipe
	FES	Flared End Section
		Drain Field
		Railroad Tracks
	RRMP	Railroad Mile Post
	RRSP, RRP	Railroad Signal Pole, Railroad Utility Pole
	RRSW	Railroad Switch
Existing R/W	R/W	Right of Way Line
	R/W MON	Right of Way Pin, Monument & Center Monument
	PL, P/L	Property Line
		Connected Property Symbol
	IRF, PKF CSF, CMF	Iron Rod Found, PK Nail Found, Granite Stone Fd., Conc. Mon. Fd.
		State Boundary
		County Boundary
		City Boundary
	L/A	Limited Access Easement
	PERM ESMT	Permanent Easement
	TEMP ESMT	Temporary Easement
	DRAIN ESMT	Drainage Easement
	UTIL ESMT	Utility Easement
100		5' Index Contour
99		1' Interval Contour
× 101.5		Spot Shot
— WL—		Wetland Boundary
AB200		Wetland Flagging
	TH, BH, BORE	Test Hole, Bore Hole, Boring

UTILITY LEGEND
(AS APPLICABLE)

SYMBOL	ABBR.	DESCRIPTION
W	WV	Water Line
W Duct		Water Line Duct
	WV	Water Valve
	WM	Water Meter
W	WMH	Water Manhole
	FH	Fire Hydrant
CATV		Underground Television Cable
CTV Duct		Underground Television Cable Duct
CTV FO		Fiber Optic Cable Television
	TVHH	Television Hand Hole
V	TVPED	Television Pedestal
TV	TVMH	TV Manhole
Tele		Underground Telephone Cable
Tele Duct		Underground Telephone Cable Duct
Tel FO		Telephone Fiber Optic
FO		Underground Fiber Optic
FO Duct		Underground Fiber Optic Duct
	FOHH	Fiber Optic Handhole
		Fiber Optic Marker
T	TPED	Telephone Pedestal
T	TMH	Telephone Manhole
	TP	Telephone Pole
T	THH	Telephone Hand Hole
	TCAB	Telephone Cabinet
	TMP	Telephone Marker
TB	TB	Telephone Booth
Traf		Underground Traffic Control
Tr Duct		Underground Traffic Control Duct
Tr FO		Traffic Control Fiber Optic
	TCHH	Traffic Control Hand Hole
TC	TCMH	Traffic Control Manhole
	TCSP	Traffic Signal Pole
E	Elec	Underground Power Cable
E Duct		Underground Power Cable Duct
PP	PP	Power Pole
	GUY	Guy Wire
E	EPED, EBOX	Electric Pedestal or Box
E	EMH	Electric Manhole
	LP	Light Pole
	EM	Electric Meter
E	EHH	Electric Hand Hole
X	TRANS	Electric Transformer
	EMP	Electric Marker
G		Gas Line
G Duct		Gas Line Duct
G	GMH	Gas Manhole
	GV	Gas Valve
	GM	Gas Meter
GT	GT	Gas Test
	GW	Gas Well
	GD	Gas Drip
	GMP	Gas Marker
SFM		Sanitary Force Main
SAN		Gravity Sewer
SBP		Sanitary by Paint Markings
S	SMH	Sanitary Manhole
	SCO	Sewer Clean Out
	SFM	Sanitary Force Main
	SPRK, ICV	Irrigation Sprinkler, Control Valve
		Spigot
		Utility Continues
DE E EOI	DE, EOI	Utility Dead End, End of Information
U Link	UMH, UNK	Unknown Manhole, Utility Line
(DATUR)		Depicted According To Utility Records
(AATUR)		Abandoned According To Utility Records
(AATFI)		Abandoned According To Field Inspection

NOTE:
ALL SUBSURFACE UTILITIES WERE LOCATED AS DESIGNATED BY MISS UTILITY.
NXL IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE SUBSURFACE UTILITY DESIGNATION AS PERFORMED BY MISS UTILITY.

THIS PROJECT, TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF NXL CONSTRUCTION COMPANY, INC. FROM AN ACTUAL GROUND SURVEY MADE UNDER MY SUPERVISION; THAT THE IMAGERY AND / OR ORIGINAL DATA WAS OBTAINED BETWEEN JANUARY & MARCH, 2018; AND THAT THIS PLAT, MAP, OR DIGITAL GEOSPATIAL DATA INCLUDING METADATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.

Survey of
SHOCKOE VALLEY STREETS
TOPOGRAPHIC AND DRAINAGE FEATURES
RICHMOND, VIRGINIA
FOR RKK

CENTURY ENGINEERING
114 E Cary Street | Richmond, Virginia 23219 | t 804 644 4600 | nxl com / centuryeng com

HORIZONTAL DATUM: VA STATE PLANE – SZ – NAD 83 – US SURVEY FOOT

VERTICAL DATUM: NAVD 88

FILE NAME	PROJ SCALE	DATE	JOB NO.	PM/CAD
SHOCKOE-SRV	1"=25'	APRIL 9, 2018	16066-001	NXL/NXL

REVISION: ADDITIONAL SURVEY AREAS **DATE:** MAY 13, 2020

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES

REVISIONS

Existing Legend
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Sanitary Sewer (Gravity)
Gas Line
Electric Line
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Water Line
Property Line
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Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
SURVEY DATA SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 1C	DRAWING NO. 0-28633

CONSTRUCTION ALIGNMENT DATA SHEET

OLIVER HILL A / 18TH STREET B:

Begin Oliver HillA_18th StreetB
N 3,720,152.51 E 11,794,039.53 100+00.00

Line (1)
N37°02'02"E 92.39'
N 3,720,226.26 E 11,794,095.17 100+92.39
Line (1)

Line (2)
N32°00'16"E 250.79'
N 3,720,438.93 E 11,794,228.09 103+43.18
Line (2)

Line (3)
N37°01'16"E 60.82'
N 3,720,487.49 E 11,794,264.71 104+04.01
Line (3)

Line (4)
N37°08'54"E 82.79'
N 3,720,553.48 E 11,794,314.71 104+86.80
Line (4)

Line (5)
N36°38'40"E 333.72'
N 3,720,821.24 E 11,794,513.89 108+20.52
Line (5)

Line (6)
N30°47'59"E 54.49'
N 3,720,868.05 E 11,794,541.79 108+75.00
Line (6)

Line (7)
N36°38'46"E 268.82'
N 3,721,083.73 E 11,794,702.24 111+43.82
Line (7)

Curve (8)
BC N 3,721,083.73 E 11,794,702.24 111+43.82
CTR N 3,721,724.17 E 11,793,841.33
PI N 3,721,173.38 E 11,794,768.93

Direction Back N36°38'46"E
Radius 1,073.00'
Delta 11°53'23"(LT)
Length 222.66'
Tangent 111.73'
Chord Direction N30°42'04"E Distance 222.26'
Direction Ahead N24°45'23"E

EC N 3,721,274.84 E 11,794,815.71 113+66.48
Curve (8)

Reversing Curve

Curve (9)
BC N 3,721,274.84 E 11,794,815.71 113+66.48
CTR N 3,720,987.99 E 11,795,437.76
PI N 3,721,349.57 E 11,794,850.18

Direction Back N24°45'23"E
Radius 685.00'
Delta 13°42'02"(RT)
Length 163.80'
Tangent 82.29'
Chord Direction N31°36'24"E Distance 163.41'
Direction Ahead N38°27'25"E

EC N 3,721,414.01 E 11,794,901.35 115+30.28
Curve (9)

Line (10)
N38°27'25"E 103.47'
N 3,721,495.03 E 11,794,965.70 116+33.75
Line (10)

Curve (11)
BC N 3,721,495.03 E 11,794,965.70 116+33.75
CTR N 3,721,277.36 E 11,795,239.78
PI N 3,721,515.96 E 11,794,982.32

Direction Back N38°27'25"E
Radius 350.00'
Delta 8°43'56"(RT)
Length 53.34'
Tangent 26.72'
Chord Direction N42°49'23"E Distance 53.29'
Direction Ahead N47°11'21"E

EC N 3,721,534.12 E 11,795,001.93 116+87.09
Curve (11)

Line (12)
N47°11'21"E 161.65'
N 3,721,643.98 E 11,795,120.52 118+48.74
Line (12)

Curve (13)
BC N 3,721,643.98 E 11,795,120.52 118+48.74
CTR N 3,721,827.38 E 11,794,950.62
PI N 3,721,723.00 E 11,795,205.82

Direction Back N47°11'21"E
Radius 250.00'
Delta 49°53'13"(LT)
Length 217.67'
Tangent 116.28'
Chord Direction N22°14'44"E Distance 210.86'
Direction Ahead N2°41'52"W

EC N 3,721,839.14 E 11,795,200.34 120+66.42
Curve (13)

Line (14)
N2°41'52"W 475.67'
N 3,722,314.28 E 11,795,177.95 125+42.08
Line (14)

Line (15)
Non-Tangent Radial Bearing N87°18'08"E
N2°35'03"W 79.68'
N 3,722,393.88 E 11,795,174.36 126+21.76
Line (15)

Line (16)
Non-Tangent Radial Bearing N87°18'08"E
N2°41'23"W 200.41'
N 3,722,594.07 E 11,795,164.96 128+22.17
Line (16)

Line (17)
Non-Tangent Radial Bearing N87°18'08"E
N2°41'01"W 1,247.81'
N 3,723,840.51 E 11,795,106.53 140+69.98
Line (17)

Curve (18)
BC N 3,723,840.51 E 11,795,106.53 140+69.98
CTR N 3,723,834.66 E 11,794,981.67
PI N 3,723,957.65 E 11,795,101.04

Direction Back N2°41'01"W
Radius 125.00'
Delta 86°20'36"(LT)
Length 188.37'
Tangent 117.27'
Chord Direction N45°51'19"W Distance 171.05'
Direction Ahead N89°01'37"W

EC N 3,723,959.64 E 11,794,983.79 142+58.35
Curve (18)

Line (19)
N89°01'37"W 224.83'
N 3,723,963.46 E 11,794,759.00 144+83.18
Line (19)

N 3,723,963.46 E 11,794,759.00 144+83.18
End Oliver HillA_18th StreetB

****
Alignment Length: 4,483.18'
****

18TH STREET A:

Begin 18th StreetA
N 3,719,946.47 E 11,794,298.04 200+00.00

Line (1)
N36°40'09"E 416.62'
N 3,720,280.64 E 11,794,546.84 204+16.62
Line (1)

Line (2)
N40°33'34"E 71.67'
N 3,720,335.08 E 11,794,593.44 204+88.28
Line (2)

Line (3)
N36°27'02"E 342.12'
N 3,720,610.28 E 11,794,796.71 208+30.41
Line (3)

Line (4)
N30°08'05"E 54.54'
N 3,720,657.45 E 11,794,824.09 208+84.95
Line (4)

Line (5)
N36°27'02"E 332.94'
N 3,720,925.25 E 11,795,021.90 212+17.89
Line (5)

Line (6)
N32°10'57"E 49.78'
N 3,720,967.39 E 11,795,048.41 212+67.67
Line (6)

Line (7)
N36°03'50"E 243.39'
N 3,721,164.13 E 11,795,191.69 215+11.06
Line (7)

Curve (8)
BC N 3,721,164.13 E 11,795,191.69 215+11.06
CTR N 3,721,281.87 E 11,795,030.02
PI N 3,721,211.82 E 11,795,226.42

Direction Back N36°03'50"E
Radius 200.00'
Delta 32°52'15"(LT)
Length 114.74'
Tangent 59.00'
Chord Direction N19°37'42"E Distance 113.17'
Direction Ahead N3°11'35"E

EC N 3,721,270.73 E 11,795,229.71 216+25.80
Curve (8)

Line (9)
Non-Tangent Radial Bearing S86°48'25"E
N3°11'35"E 110.19'
N 3,721,380.75 E 11,795,235.85 217+35.99
Line (9)

N 3,721,380.75 E 11,795,235.85 217+35.99
End 18th StreetA

****
Alignment Length: 1,735.99'
****

VENABLE STREET:

Begin Venable Street
N 3,721,522.4107 E 11,794,989.8811 300+00.00

Curve (1)
BC N 3,721,522.4107 E 11,794,989.8811 300+00.00
CTR N 3,721,668.7045 E 11,795,126.2561
PI N 3,721,505.3476 E 11,795,008.1853

Direction Back S47° 00' 35"E
Radius 200.000'
Delta 14°15'49"(LT)
Length 49.789'
Tangent 25.024'
Chord Direction S54° 08' 29"E Distance 49.661'
Direction Ahead S61° 16' 23"E

EC N 3,721,493.3202 E 11,795,030.1293 300+49.79
Curve (1)

Line (2)
S61° 16' 23"E 225.465'
N 3,721,384.9542 E 11,795,227.8441 302+75.25
Line (2)

Curve (3)
BC N 3,721,384.9542 E 11,795,227.8441 302+75.25
CTR N 3,721,604.1845 E 11,795,348.0026
PI N 3,721,373.7922 E 11,795,248.2093

Direction Back S61° 16' 23"E
Radius 250.000'
Delta 10°36'52"(LT)
Length 46.314'
Tangent 23.224'
Chord Direction S66° 34' 49"E Distance 46.248'
Direction Ahead S71° 53' 15"E

EC N 3,721,366.5724 E 11,795,270.2821 303+21.57
Curve (3)

Line (4)
S71° 53' 15"E 61.721'
N 3,721,347.3844 E 11,795,328.9448 303+83.29
Line (4)

Curve (5)
BC N 3,721,347.3844 E 11,795,328.9448 303+83.29
CTR N 3,721,584.9965 E 11,795,406.6653
PI N 3,721,334.4989 E 11,795,368.3392

Direction Back S71° 53' 15"E
Radius 250.000'
Delta 18°49'38"(LT)
Length 82.149'
Tangent 41.448'
Chord Direction S81° 18' 04"E Distance 81.780'
Direction Ahead N89° 17' 07"E

EC N 3,721,335.0160 E 11,795,409.7843 304+65.44
Curve (5)

Line (6)
N89° 17' 07"E 267.201'
N 3,721,338.3496 E 11,795,676.9641 307+32.64
Line (6)

Curve (7)
BC N 3,721,338.3496 E 11,795,676.9641 307+32.64
CTR N 3,721,738.3185 E 11,795,671.9737
PI N 3,721,338.8825 E 11,795,719.6721

Direction Back N89° 17' 07"E
Radius 400.000'
Delta 12°11'23"(LT)
Length 85.100'
Tangent 42.711'
Chord Direction N83° 11' 25"E Distance 84.940'
Direction Ahead N77° 05' 44"E

EC N 3,721,348.4211 E 11,795,761.3046 308+17.74
Curve (7)

Reversing Curve

Curve (8)
BC N 3,721,348.4211 E 11,795,761.3046 308+17.74
CTR N 3,720,958.5237 E 11,795,850.6356
PI N 3,721,367.5176 E 11,795,844.6538

Direction Back N77° 05' 44"E
Radius 400.000'
Delta 24°08'00"(RT)
Length 168.482'
Tangent 85.509'
Chord Direction N89° 09' 43"E Distance 167.239'
Direction Ahead S78° 46' 17"E

EC N 3,721,350.8668 E 11,795,928.5259 309+86.22
Curve (8)

Reversing Curve

Curve (9)
BC N 3,721,350.8668 E 11,795,928.5259 309+86.22
CTR N 3,721,645.1242 E 11,795,986.9435
PI N 3,721,344.7560 E 11,795,959.3070

Direction Back S78° 46' 17"E
Radius 300.000'
Delta 11°56'37"(LT)
Length 62.536'
Tangent 31.382'
Chord Direction S84° 44' 35"E Distance 62.423'
Direction Ahead N89° 17' 07"E

EC N 3,721,345.1475 E 11,795,990.6864 310+48.76
Curve (9)

Line (10)
Non-Tangent Radial Bearing S0° 42' 53"E
N89° 17' 07"E 267.625'
N 3,721,348.4864 E 11,796,258.2910 313+16.38
Line (10)

N 3,721,348.4864 E 11,796,258.2910 313+16.38
End Venable Street

****
Alignment Length: 1,316.383'
****

OLIVER HILL WAY_B:

Begin Oliver Hill Way_B
N 3,721,522.4107 E 11,794,989.8811 900+00.00

Curve (1)
BC N 3,721,522.4107 E 11,794,989.8811 900+00.00
CTR N 3,721,668.7045 E 11,795,126.2561
PI N 3,721,540.0695 E 11,794,970.9380

Direction Back N47° 00' 35"W
Radius 200.000'
Delta 14°45'22"(RT)
Length 51.508'
Tangent 25.897'
Chord Direction N39° 37' 54"W Distance 51.366'
Direction Ahead N32° 15' 13"W

EC N 3,721,561.9707 E 11,794,957.1174 900+51.51
Curve (1)

Line (2)
N32° 15' 13"W 116.719'
N 3,721,660.6793 E 11,794,894.8281 901+68.23
Line (2)

Curve (3)
BC N 3,721,660.6793 E 11,794,894.8281 901+68.23
CTR N 3,721,794.0965 E 11,795,106.2515
PI N 3,721,716.4769 E 11,794,859.6173

Direction Back N32° 15' 13"W
Radius 250.000'
Delta 29°34'05"(RT)
Length 129.016'
Tangent 65.979'
Chord Direction N17° 28' 11"W Distance 127.589'
Direction Ahead N2° 41' 08"W

EC N 3,721,782.3831 E 11,794,856.5260 902+97.24
Curve (3)

Line (4)
N2° 41' 08"W 1,992.556'
N 3,723,772.7512 E 11,794,763.1676 922+89.80
Line (4)

Curve (5)
BC N 3,723,772.7512 E 11,794,763.1676 922+89.80
CTR N 3,723,782.1220 E 11,794,962.9480
PI N 3,723,775.1967 E 11,794,763.0529

Direction Back N2° 41' 08"W
Radius 200.000'
Delta 1°24'09"(RT)
Length 4.896'
Tangent 2.448'
Chord Direction N1° 59' 03"W Distance 4.896'
Direction Ahead N1° 16' 58"W

EC N 3,723,777.6442 E 11,794,762.9981 922+94.70
Curve (5)

Line (6)
N1° 16' 58"W 178.169'
N 3,723,955.7688 E 11,794,759.0091 924+72.86
Line (6)

Curve (7)
BC N 3,723,955.7688 E 11,794,759.0091 924+72.86
CTR N 3,723,959.8629 E 11,794,941.8271
PI N 3,723,963.1774 E 11,794,758.8432

Direction Back N1° 16' 58"W
Radius 182.864'
Delta 4°38'28"(RT)
Length 14.813'
Tangent 7.410'
Chord Direction N1° 02' 16"E Distance 14.809'
Direction Ahead N3° 21' 30"E

EC N 3,723,970.5752 E 11,794,759.2773 924+87.68
Curve (7)

Line (8)
N3° 21' 30"E 11.116'
N 3,723,981.6718 E 11,794,759.9284 924+98.79
Line (8)

Curve (9)
BC N 3,723,981.6718 E 11,794,759.9284 924+98.79
CTR N 3,723,887.9433 E 11,796,357.1808
PI N 3,724,073.8969 E 11,794,765.3403

Direction Back N3° 21' 30"E
Radius 1,600.000'
Delta 6°36'33"(RT)
Length 184.563'
Tangent 92.384'
Chord Direction N6° 39' 46"E Distance 184.460'
Direction Ahead N9° 58' 03"E

EC N 3,724,164.8863 E 11,794,781.3310 926+83.36
Curve (9)

Line (10)
N9° 58' 03"E 40.384'
N 3,724,204.6611 E 11,794,788.3211 927+23.74
Line (10)

Curve (11)
BC N 3,724,204.6611 E 11,794,788.3211 927+23.74
CTR N 3,724,377.7505 E 11,793,803.4150
PI N 3,724,261.8567 E 11,794,798.3728

Direction Back N9° 58' 03"E
Radius 1,000.000'
Delta 6°38'50"(LT)
Length 116.014'
Tangent 58.072'
Chord Direction N6° 38' 38"E Distance 115.949'
Direction Ahead N3° 19' 13"E

EC N 3,724,319.8314 E 11,794,801.7362 928+39.75
Curve (11)

Line (12)
N3° 19' 13"E 143.855'
N 3,724,463.4449 E 11,794,810.0682 929+83.61
Line (12)

N 3,724,463.4449 E 11,794,810.0682 929+83.61
End Oliver Hill Way_B

****
Alignment Length: 2,983.609'
****

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
CONSTRUCTION ALIGNMENT DATA SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE NO SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 1D(1)	DRAWING NO. 0-28633

CONSTRUCTION ALIGNMENT DATA SHEET

MOSBY STREET:

Begin Mosby Street
N 3,721,069.80 E 11,795,835.16 400+00.00

Line (1)
N17°42'29"E 141.71'
N 3,721,204.79 E 11,795,878.27 401+41.71
Line (1)

Curve (2)
BC N 3,721,204.79 E 11,795,878.27 401+41.71
CTR N 3,721,265.62 E 11,795,687.74
PI N 3,721,254.86 E 11,795,894.25

Direction Back N17°42'29"E
Radius 200.00'
Delta 29°26'54"(LT)
Length 102.79'
Tangent 52.56'
Chord Direction N2°59'02"E Distance 101.67'
Direction Ahead N11°44'25"W

EC N 3,721,306.32 E 11,795,883.56 402+44.50
Curve (2)

Reversing Curve

Curve (3)
BC N 3,721,306.32 E 11,795,883.56 402+44.50
CTR N 3,721,326.67 E 11,795,981.47
PI N 3,721,356.94 E 11,795,873.04

Direction Back N11°44'25"W
Radius 100.00'
Delta 54°40'49"(RT)
Length 95.44'
Tangent 51.70'
Chord Direction N15°35'59"E Distance 91.85'
Direction Ahead N42°56'24"E

EC N 3,721,394.79 E 11,795,908.26 403+39.93
Curve (3)

Reversing Curve

Curve (4)
BC N 3,721,394.79 E 11,795,908.26 403+39.93
CTR N 3,721,565.10 E 11,795,725.24
PI N 3,721,456.00 E 11,795,965.22

Direction Back N42°56'24"E
Radius 250.00'
Delta 36°59'10"(LT)
Length 161.38'
Tangent 83.61'
Chord Direction N24°26'49"E Distance 158.59'
Direction Ahead N5°57'14"E

EC N 3,721,539.16 E 11,795,973.89 405+01.32
Curve (4)

Line (5)
N5°57'14"E 334.03'
N 3,721,871.39 E 11,796,008.54 408+35.35
Line (5)

Curve (6)
BC N 3,721,871.39 E 11,796,008.54 408+35.35
CTR N 3,721,975.12 E 11,795,013.94
PI N 3,721,935.99 E 11,796,015.28

Direction Back N5°57'14"E
Radius 1,000.00'
Delta 7°25'56"(LT)
Length 129.72'
Tangent 64.95'
Chord Direction N2°14'16"E Distance 129.63'
Direction Ahead N1°28'42"W

EC N 3,722,000.92 E 11,796,013.60 409+65.06
Curve (6)

Line (7)
N1°28'42"W 132.45'
N 3,722,133.33 E 11,796,010.19 410+97.51
Line (7)

Curve (8)
BC N 3,722,133.33 E 11,796,010.19 410+97.51
CTR N 3,722,138.49 E 11,796,210.12
PI N 3,722,191.14 E 11,796,008.69

Direction Back N1°28'42"W
Radius 200.00'
Delta 32°15'32"(RT)
Length 112.60'
Tangent 57.84'
Chord Direction N14°39'04"E Distance 111.12'
Direction Ahead N30°46'50"E

EC N 3,722,240.84 E 11,796,038.29 412+10.12
Curve (8)

Reversing Curve

Curve (9)
BC N 3,722,240.84 E 11,796,038.29 412+10.12
CTR N 3,722,394.36 E 11,795,780.55
PI N 3,722,264.15 E 11,796,052.18

Direction Back N30°46'50"E
Radius 300.00'
Delta 10°20'21"(LT)
Length 54.14'
Tangent 27.14'
Chord Direction N25°36'40"E Distance 54.06'
Direction Ahead N20°26'29"E

EC N 3,722,289.59 E 11,796,061.66 412+64.25
Curve (9)

Reversing Curve

Curve (10)
BC N 3,722,289.59 E 11,796,061.66 412+64.25
CTR N 3,722,132.42 E 11,796,483.32
PI N 3,722,348.99 E 11,796,083.80

Direction Back N20°26'29"E
Radius 450.00'
Delta 16°02'18"(RT)
Length 125.97'
Tangent 63.40'
Chord Direction N28°27'39"E Distance 125.55'
Direction Ahead N36°28'48"E

EC N 3,722,399.97 E 11,796,121.50 413+90.22
Curve (10)

Line (11)
N36°28'48"E 209.78'
N 3,722,568.64 E 11,796,246.22 416+00.00
Line (11)

N 3,722,568.64 E 11,796,246.22 416+00.00
End Mosby Street

****
Alignment Length: 1,600.00'
****

E BROAD STREET:

Begin E Broad Street
N 3,720,805.29 E 11,793,910.64 500+00.00

Line (1)
S53°06'20"E 950.00'
N 3,720,234.97 E 11,794,670.39 509+50.00
Line (1)

N 3,720,234.97 E 11,794,670.39 509+50.00
End E Broad Street

****
Alignment Length: 950.00'
****

E MARSHALL STREET

Begin E Marshall Street
N 3,720,919.23 E 11,794,424.90 600+00.00

Line (1)
S53°36'28"E 550.00'
N 3,720,592.91 E 11,794,867.63 605+50.00
Line (1)

N 3,720,592.91 E 11,794,867.63 605+50.00
End E Marshall Street

****
Alignment Length: 550.00'
****

E CLAY STREET

Begin E Clay Street
N 3,721,208.32 E 11,794,671.11 700+00.00

Line (1)
S60°55'14"E 126.98'
N 3,721,146.61 E 11,794,782.08 701+26.98
Line (1)

Curve (2)
BC N 3,721,146.61 E 11,794,782.08 701+26.98
CTR N 3,720,840.72 E 11,794,611.97
PI N 3,721,133.82 E 11,794,805.06

Direction Back S60°55'14"E
Radius 350.00'
Delta 8°35'45"(RT)
Length 52.51'
Tangent 26.30'
Chord Direction S56°37'22"E Distance 52.46'
Direction Ahead S52°19'29"E

EC N 3,721,117.75 E 11,794,825.88 701+79.48
Curve (2)

Line (3)
S52°19'29"E 269.66'
N 3,720,952.93 E 11,795,039.32 704+49.15
Line (3)

N 3,720,952.93 E 11,795,039.32 704+49.15
End E Clay Street

****
Alignment Length: 449.15'
****

LEIGH STREET

Begin Leigh Street
N 3,722,329.58 E 11,795,738.00 800+00.00

Curve (1)
BC N 3,722,329.58 E 11,795,738.00 800+00.00
CTR N 3,721,707.97 E 11,795,488.01
PI N 3,722,301.60 E 11,795,807.58

Direction Back S68°05'30"E
Radius 670.00'
Delta 12°46'25"(RT)
Length 149.37'
Tangent 75.00'
Chord Direction S61°42'18"E Distance 149.06'
Direction Ahead S55°19'05"E

EC N 3,722,258.93 E 11,795,869.25 801+49.37
Curve (1)

Line (2)
S55°19'05"E 134.92'
N 3,722,182.15 E 11,795,980.20 802+84.29
Line (2)

Curve (3)
BC N 3,722,182.15 E 11,795,980.20 802+84.29
CTR N 3,721,359.83 E 11,795,411.18
PI N 3,722,169.97 E 11,795,997.81

Direction Back S55°19'05"E
Radius 1,000.00'
Delta 2°27'10"(RT)
Length 42.81'
Tangent 21.41'
Chord Direction S54°05'30"E Distance 42.81'
Direction Ahead S52°51'55"E

EC N 3,722,157.05 E 11,796,014.87 803+27.10
Curve (3)

Line (4)
S52°51'55"E 165.91'
N 3,722,056.89 E 11,796,147.14 804+93.01
Line (4)

Curve (5)
BC N 3,722,056.89 E 11,796,147.14 804+93.01
CTR N 3,723,651.33 E 11,797,354.52
PI N 3,722,046.85 E 11,796,160.39

Direction Back S52°51'55"E
Radius 2,000.00'
Delta 0°57'10"(LT)
Length 33.26'
Tangent 16.63'
Chord Direction S53°20'30"E Distance 33.26'
Direction Ahead S53°49'05"E

EC N 3,722,037.04 E 11,796,173.81 805+26.26
Curve (5)

Line (6)
S53°49'05"E 48.74'
N 3,722,008.26 E 11,796,213.15 805+75.00
Line (6)

N 3,722,008.26 E 11,796,213.15 805+75.00
End Leigh Street

****
Alignment Length: 575.00'
****

I-95 OFF RAMP:

Begin I-95 Off Ramp
N 3,721,663.17 E 11,794,727.61 10+00.00

Line (1)
S55°46'46"E 192.78'
N 3,721,554.75 E 11,794,887.02 11+92.78
Line (1)

Curve (2)
BC N 3,721,554.75 E 11,794,887.02 11+92.78
CTR N 3,721,430.72 E 11,794,802.66
PI N 3,721,532.06 E 11,794,920.39

Direction Back S55°46'46"E
Radius 150.00'
Delta 30°07'07"(RT)
Length 78.85'
Tangent 40.36'
Chord Direction S40°43'13"E Distance 77.95'
Direction Ahead S25°39'39"E

EC N 3,721,495.68 E 11,794,937.87 12+71.63
Curve (2)

N 3,721,495.68 E 11,794,937.87 12+71.63
End I-95 Off Ramp

****
Alignment Length: 271.63'
****

I-95 RAMP ONTO BROAD ST

Begin I-95 Ramp onto Broad
N 3,721,220.61 E 11,794,771.62 20+00.00

Curve (1)
BC N 3,721,220.61 E 11,794,771.62 20+00.00
CTR N 3,721,428.94 E 11,794,395.46
PI N 3,721,329.48 E 11,794,831.91

Direction Back N28°58'43"E
Radius 430.00'
Delta 32°16'56"(LT)
Length 242.27'
Tangent 124.45'
Chord Direction N12°50'15"E Distance 239.08'
Direction Ahead N3°18'13"W

EC N 3,721,453.72 E 11,794,824.74 22+42.27
Curve (1)

Line (2)
N3°18'13"W 35.14'
N 3,721,488.80 E 11,794,822.72 22+77.42
Line (2)

Curve (3)
BC N 3,721,488.80 E 11,794,822.72 22+77.42
CTR N 3,721,470.82 E 11,794,511.24
PI N 3,721,507.46 E 11,794,821.64

Direction Back N3°18'13"W
Radius 312.00'
Delta 6°51'20"(LT)
Length 37.33'
Tangent 18.69'
Chord Direction N6°43'53"W Distance 37.31'
Direction Ahead N10°09'34"W

EC N 3,721,525.86 E 11,794,818.34 23+14.75
Curve (3)

N 3,721,525.86 E 11,794,818.34 23+14.75
End I-95 Ramp onto Broad

****
Alignment Length: 314.75'
****

EXISTING VENABLE STREET:

Begin Existing Venable BL
N 3,721,371.70 E 11,794,869.19 10+00.00

Line (1)
S54°47'48"E 22.04'
N 3,721,359.00 E 11,794,887.20 10+22.04
Line (1)

Curve (2)
BC N 3,721,359.00 E 11,794,887.20 10+22.04
CTR N 3,721,420.28 E 11,794,930.43
PI N 3,721,344.98 E 11,794,907.06

Direction Back S54°47'48"E
Radius 75.00'
Delta 35°55'23"(LT)
Length 47.02'
Tangent 24.31'
Chord Direction S72°45'30"E Distance 46.26'
Direction Ahead N89°16'49"E

EC N 3,721,345.29 E 11,794,931.37 10+69.06
Curve (2)

Line (3)
N89°16'49"E 180.94'
N 3,721,347.56 E 11,795,112.30 12+50.00
Line (3)

N 3,721,347.56 E 11,795,112.30 12+50.00
End Existing Venable BL

****
Alignment Length: 250.00'
****

BROWN STREET

Begin Brown Street
N 3,721,771.3319 E 11,794,857.2901 30+00.00

Line (1)
S84° 46' 32"W 44.978'
N 3,721,767.2363 E 11,794,812.4991 30+44.98
Line (1)

Curve (2)
BC N 3,721,767.2363 E 11,794,812.4991 30+44.98
CTR N 3,721,966.4054 E 11,794,794.2875
PI N 3,721,766.6271 E 11,794,805.8364

Direction Back S84° 46' 32"W
Radius 200.000'
Delta 3°49'55"(RT)
Length 13.376'
Tangent 6.691'
Chord Direction S86° 41' 29"W Distance 13.374'
Direction Ahead S88° 36' 27"W

EC N 3,721,766.4645 E 11,794,799.1478 30+58.35
Curve (2)

Line (3)
S88° 36' 27"W 41.646'
N 3,721,765.4524 E 11,794,757.5140 31+00.00
Line (3)

N 3,721,765.4524 E 11,794,757.5140 31+00.00
End Brown Street

****
Alignment Length: 100.000'
****

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH WV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical
Surveys Superintendent
Project Manager
Maintenance Engineer
City Traffic Engineer

Administrative
Capital Project Administrator
City Engineer
Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS
CONSTRUCTION ALIGNMENT DATA SHEET

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander			NO SCALE	SEPTEMBER 2022	SHEET 1D(2)	0-28633
CHECKED BY: ASamberg						

CONSTRUCTION NOTES

ATTENTION: UTILITY "WORK IN THE STREETS" PERMITS
FROM: DEPARTMENT OF PUBLIC WORKS–DIVISION OF RIGHT OF WAY MANAGEMENT – OFFICE OF THE PERMITS ENGINEER

1. ALL CUTS IN THE STREETS AND SIDEWALKS SHALL BE PERFORMED UNDER A PERMIT AND MONITORED BY THE PERMIT INSPECTOR. CONTRACTOR SHALL VERIFY SIZE, LOCATION AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY UTILITY DAMAGED DURING WORK.
2. WORK SHALL NOT COMMENCE UNTIL THE PERMIT INSPECTOR HAS BEEN NOTIFIED, A PRE–CONSTRUCTION CONFERENCE HELD AND MISS UTILITY CLEARS.
3. CUTS SHALL BE AS CLEAN AND STRAIGHT AS POSSIBLE, WITH NO OUTLINE DIMENSIONS LESS THAN 3 FEET WITHOUT SPECIAL APPROVAL OF THE DEPARTMENT'S INSPECTOR.
4. THE DETAILS OF TRENCHING CUTS FOR UTILITY STRIPS MUST BE SHOWN IN A TYPICAL SECTION ON THE DRAWINGS OR PROVIDED IN A SUBMITTAL WITH CONSTRUCTION NOTES SPECIFYING WIDTHS, DEPTHS, METHODS, MATERIALS, COMPACTION REQUIREMENTS AND PAVEMENT RESTORATION OF ABIDING BY THE DPW ATTACHMENT STANDARD.
5. ALL ASPHALT PAVEMENT RESTORATION THICKNESS SHALL BE 1 1/2 TIMES THE EXISTING SECTION OR A MINIMUM OF 8 INCHES WHICHEVER IS GREATER. SEE THE DPW TRENCH RESTORATION ILLUSTRATION FOR THE TYPICAL CONFORMANCE STANDARDS.
6. THE FINAL RESTORATION ON OPEN TRENCH CUTS REQUIRES THE DISTURBED ASPHALT PAVEMENT ZONE TO BE A SQUARE POINTED OFF AND STRAIGHT LINE. THE AREA OF PAVEMENT RESTORATION IS TO BE FULLY ENVELOPED BY THE FINAL SURFACE COURSE REPAIRS. THE ADJOINING SURFACE/TOP COURSE LAYER IS TO BE OVER–MILLED A MINIMUM DEPTH OF 1.25 INCHES OR MORE, A MINIMUM DISTANCE OF ONE FOOT BEYOND EACH SIDE OF THE TRENCH WALL. THIS STEP OUT IS TO OCCUR ALONG THE ENTIRE TRENCH LINE RUN AND/OR SQUARED POINTED AREA. CUTS INVOLVING CONTINUOUS NETWORK RUNS, WHICH EXCEED 350 FEET IN LENGTH OR TYPICALLY OVER ONE FULL CITY BLOCK, WILL BE CONSIDERED MULTIPLE BLOCK CUTS. ON MULTIPLE BLOCK CUT ZONES, THE OVER MILLING OF THE TRENCH LINE AND ADJOINING SURFACE COURSE LAYER MUST BE DONE WITH TYPICAL HIGH PRODUCTION ROADWAY COLD PLANNING EQUIPMENT. IN MULTIPLE BLOCK RESTORATION CASES, WHERE THE HIGH PRODUCTION COLD PLANNER IS REQUIRED, FINAL PAVING SHALL BE DONE BY A HIGH PRODUCTION HIGHWAY PAVER.
7. CONTRACTOR SHALL PROVIDE AND COORDINATE THE NECESSARY GEOTECHNICAL SERVICES FROM A QUALIFIED FIRM TO INSURE COMPACTION APPROVAL. APPROVAL OF IN–PLACE MATERIAL MUST BE FOLLOWED UP WITH A WRITTEN SUMMARY REPORT. COMPACTION REQUIREMENTS WILL BE REVIEWED FOR APPROVAL BY THE PERMITS ENGINEER OR HIS RESPRESENTATIVE.
8. ALL DISTURBED SIDEWALK AND CURB SHALL BE REPAIRED AND REPLACED IN ACCORDANCE WITH CITY STANDARDS.
9. ALL UTILITY CUTS ARE TO BE EXAMINED AND APPROVED BY THE APPROPRIATE UTILITY INSPECTOR/REPRESENTATIVE.
10. CONTRACTOR SHALL COORDINATE WITH THE CITY OF RICHMOND DPW 48 HOURS IN ADVANCE OF CLOSING TRAVELWAYS TO GENERAL VEHICULAR TRAFFIC. ALL TRAFFIC CLOSURES SHALL BE IN COMPLIANCE WITH THE 2011 VIRGINIA WORK AREA PROTECTION MANUAL (REVISION 2, DATED SEPTEMBER 1, 2019).
11. ENSURE STRUCTURE TOPS IN STREET AND SIDEWALK ARE ADJUSTED TO FINAL FINISHED GRADE.
12. CG–9D ENTRANCE APRONS SHALL INCLUDE GUTTER PAN ONLY IN AREAS WHERE SHOWN ON PLAN SHEETS. SEVERAL LOCATIONS MAY CONSIST CURB ONLY.

ROAD SUBGRADE

1. INSPECTION AND APPROVAL OF THE SUBGRADE WILL BE REQUIRED PRIOR TO THE PLACEMENT OF THE APPROVED PAVEMENT SECTION MATERIAL.
2. ANY CLAY DEPOSITS IN THE TOP TWO FEET OF THE SUBGRADE MUST BE REMOVED OR ADDRESSED AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
3. SUBGRADE APPROVAL SHALL BE ACCOMPANIED BY THE SUPPORTING DOCUMENTATION VERIFYING DENSITY TEST RESULTS OF 92% OR GREATER.

THE ENTIRE SUBGRADE WILL HAVE BEEN PROOF ROLLED IN THE PRESENCE OF THE SITE INSPECTOR AND GEOTECHNICAL REPRESENTATIVE. PROOF ROLLING SHALL BE A RUBBER TIRE VEHICLE SUCH AS A LOADED TEN (10) TON TRUCK OR APPROVAL COMPACTION EQUIPMENT.

THE FINAL SUBGRADE SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER AND SITE INSPECTOR BEFORE PLACEMENT OF PAVEMENT SECTION MATERIALS.

DPU UTILITY NOTES

1. PRIOR TO CONSTRUCTION OR EXCAVATION, THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY OF LOCATING ANY UNDERGROUND UTILITIES (PUBLIC OR PRIVATE) THAT MAY EXIST OR CROSS THROUGH THE AREA OF CONSTRUCTION. BEFORE YOU DIG, CALL "MISS UTILITY" OF VIRGINIA AT 1–800–552–7001. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING, AT THEIR EXPENSE, ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE CITY DEPARTMENT PRIOR TO MAKING ANY UTILITY ADJUSTMENTS OR PERFORMING OTHER WORK WITHIN THE RIGHT–OF–WAY.
3. THE SEQUENCE OF UTILITY CONSTRUCTION SHALL BE DEVELOPED IN SUCH A MANNER THAT WATER AND SANITARY SEWER SERVICE IS MAINTAINED AT ALL TIMES DURING CONSTRUCTION EXCEPT DURING TIE–INS AND CONNECTIONS. WHEN SERVICE IS INTERRUPTED, THE CONTRACTOR SHALL PROVIDE THE CITY WITH 72 HOURS NOTICE PRIOR TO THE INTERRUPTION. THE AFFECTED PROPERTY OWNER WILL BE NOTIFIED 48 HOURS PRIOR TO SERVICE INTERRUPTIONS. CONTRACTOR SHALL PROVIDE THE CITY WITH A DETAILED PLAN AND SCHEDULE FIVE (5) WORKING DAYS IN ADVANCE TO PERFORMING WORK, WHICH REQUIRES INTERRUPTION TO CUSTOMER UTILITY SERVICE. SERVICE INTERRUPTIONS SHALL BE KEPT TO A MINIMUM.
4. UNLESS OTHERWISE NOTED, ALL GAS AND WATER UTILITY MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE STANDARDS SPECIFICATION FOR GAS AND WATER SYSTEMS CONSTRUCTION AND MAINTENANCE DPU NO. 1–92, LATEST EDITION. THE CITY OF RICHMOND'S SEWER SPECIFICATIONS AND THE LATEST EDITIONS OF THE VIRGINIA DEPARTMENT OF HEALTH WATERWORKS REGULATIONS, AND PROPOSED SEWAGE COLLECTION AND TREATMENT REGULATION.
5. LOCATIONS OF EXISTING UTILITIES ACROSS OR ALONG THE LINE OF THE PROPOSED WORK ARE SHOWN ONLY IN AN APPROXIMATE LOCATION ON THE PLANS. CONTRACTOR SHALL LOCATE ALL UNDERGROUND LINES AND STRUCTURES AS NECESSARY. CONTRACTOR SHALL CALL "MISS UTILITY" @ 1–800–522–7001 PRIOR TO CONSTRUCTION AND IS RESPONSIBLE FOR ANY DAMAGE TO UNDERGROUND LINES OR STRUCTURES. CITY DPU TO BE NOTIFIED OF ANY INCONSISTENCIES BY CONTRACTOR.
6. GATE VALVES SHALL BE U.S. PIPE, METROSEAL 250, OPEN RIGHT (CLOCKWISE), WITH MECHANICAL JOINT END FITTINGS, NON–RISING SYSTEM.
7. FIRE HYDRANTS SHALL BE U.S. PIPE, METROPOLITAN 250, OPEN RIGHT (CLOCKWISE) WITH 4 1/2" VALVE OPENING.
8. ALL FIRE HYDRANTS AND VALVES BOXES DESIGNATED TO BE REMOVED SHALL BE SALVAGED AND DELIVERED TO THE DEPARTMENT OF UTILITIES AT 400 JEFFERSON DAVIS HIGHWAY.
9. ALL GAS AND WATER SERVICES AND SEWER CONNECTIONS SHALL BE RENEWED AS DIRECTED BY THE CITY OF RICHMOND, DEPARTMENT OF PUBLIC UTILITIES ENGINEER.
10. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS.
11. DATUM FOR ALL ELEVATIONS SHOWN IS REAL TIME KINEMATIC (RTK) GPS, DATED OCTOBER 13, 2015.
12. MINIMUM DEPTH OF COVER FOR GAS AND WATER MAINS IS 42 INCHES.
13. WATER MAINS SHALL BE DUCTILE IRON, DOUBLE COAT CEMENT LINED AS MANUFACTURED BY U.S. PIPE, OR EQUAL. PIPE CLASS SHALL BE AS FOLLOWS:

DIA. (INCHES)	SPECIAL CLASS
3	52
4	53
6	52
8	52
10	52
12 AND LARGER	51

14. THE CITY WILL INSPECT ALL GAS, WATER AND SANITARY SEWER MAINS, CONNECTIONS AND APPURTENANCE TO INSURE THAT THE MATERIALS AND CONSTRUCTION METHODS ARE IN ACCORDANCE WITH THE APPROVED PLANS, SPECIFICATION AND STANDARDS. ALL OTHER LINES AND CONNECTION WILL BE INSPECTED AND APPROVED BY CITY INSPECTORS OR APPROVED ALTERNATE.
15. THE CONTRACTOR SHALL REQUEST VALVE OPERATION BY THE OWNER'S FORCE NO LESS THAN 48 HOURS IN ADVANCE. THE CONTRACTOR SHALL NOT OPERATE ANY EXISTING VALVES UNLESS DIRECTED BY OWNER.
16. THE CITY DOES NOT GUARANTEE A 100% PERCENT SHUTDOWN OF ITS EXISTING WATER MAINS. THE CONTRACTOR SHALL PROVIDE ALL PLUGS AND DEWATERING EQUIPMENT NECESSARY TO PERFORM THE WORK.
17. MECHANICAL JOINT LONG SOLID SLEEVES SHALL BE USED FOR ALL CONNECTIONS TO EXISTING WATER MAINS.
18. COUPLINGS FOR CONNECTIONS TO EXISTING SANITARY SEWER LATERALS SHALL BE FERNCO OR EQUAL.
19. BASED ON CITY RECORDS, EXISTING SANITARY SEWER LATERALS ARE ASSUMED TO BE 6 INCH WITHIN THE RIGHT–OF–WAY AND 4 INCH ON PRIVATE PROPERTY.
20. THE CONTRACTOR SHALL PROVIDE ACCESS THROUGH THE SITE AS DIRECTED BY THE TRANSPORTATION ENGINEERING DIVISION AT ALL TIMES DURING CONSTRUCTION AND SHALL ENSURE THE SAFETY OF PEDESTRIANS FROM TRAFFIC AND CONSTRUCTION HAZARDS.
21. QUANTITIES AS SHOWN ARE APPROXIMATE ONLY. CONTRACTORS ARE RESPONSIBLE FOR MAKING THEIR OWN TAKE–OFFS AND COMPLETING THE PROJECT TO THE FULL INTENT OF THE PLAN.

ELECTRIC

1. CONDUIT IS TO BE 2" (INCH) SCHEDULE 40 PVC.
2. ALL STREET AND ALLEY CROSSINGS ARE TO BE CONCRETE ENCASED, WITH A MINIMUM OF 4" OF ENCASEMENT ON TOP, AND 2" ON THE SIDES, AND BOTTOM.
3. SINGLE RUNS OF 2" SCHEDULE 40 PVC FROM POLE BASE TO POLE BASE UNLESS OTHERWISE NOTED.
4. NO RUNS OVER 300' (FT) WITHOUT A SECONDARY ENCLOSURE.
5. CONDUIT MINIMUM DEPTH OF 36".
6. NO ONE SHALL ENTER DPU MANHOLE / SECONDARY ENCLOSURE WITHOUT A DPU INSPECTOR PRESENT.

ASPHALT SAWCUTTING NOTE:

1. ATTENTION: CONTRACTOR TO SAWCUT ALONG PROPOSED CURB AND GUTTER LINE TO AVOID DAMAGE TO NEW ASPHALT ROADWAY. IF DAMAGE OCCURS, CONTRACTOR IS RESPONSIBLE TO RESTORE ASPHALT PAVEMENT PER CITY OF RICHMOND STANDARDS OR AS DIRECTED BY THE CITY PAVEMENT MANAGER. THIS MAY OR MAY NOT REQUIRE A CHANGE ORDER, SOLELY AT THE DISCRETION OF THE CITY ENGINEER. PRIOR TO PAVING WORK, SITE VISIT REQUIRED BY CITY.

FIRE HYDRANT AND PUBLIC WATER USE NOTES

1. DPU MAINTENANCE PERSONNEL LARRY GRANT, (804) 646–8316, WILL PERFORM FIRE HYDRANT RELOCATIONS AND MUST BE INCLUDED IN THE PRE–CONSTRUCTION MEETING FOR SCHEDULING AND COORDINATION OF THE FIRE HYDRANT RELOCATIONS.
2. WATER FOR USE BY THE CONTRACTOR FROM A PUBLIC WATER MAIN OR HYDRANT WITHIN THE CITY OF RICHMOND SHALL REQUIRE A CITY ISSUED PORTABLE WATER METER WITH BACKFLOW DEVICE. THE CONTRACTOR SHALL CONTACT THE UTILITY CROSS CONNECTION SPECIALIST LOCATED AT 400 JEFFERSON DAVIS HIGHWAY (RM. 143), TUESDAY THROUGH FRIDAY (9 A.M. TO 11 A.M.) TO MAKE AN APPLICATION. THE CONTRACTOR MAY CALL (804) 646–8502 FOR ANY QUESTIONS RELATED TO THIS PROGRAM.

TYPICAL CLEARANCES / SEPARATION NOTES

1. IF TYPICALLY REQUIRED CLEARANCES AND/OR SEPARATION WITH EXISTING DPU INFRASTRUCTURE CANNOT BE ACCOMPLISHED PLEASE CONTRACT THE APPROPRIATE DPU SEECTION TO REACH AN ACCEPTABLE RESOLUTION:
   1.1. WATER: 804.646.8316 / 804.646.8346 / 804.646.8327
   1.2. SEWER: 804.646.8247 / 804.646.8463
   1.3. GAS: 804.646.8342
   1.4. STREETLIGHTS: 804.646.8568 / 804.646.8565

GRADING

G–1 The grade line denotes top of finished pavement unless shown otherwise on typical sections or plans.

G–2 Earthwork quantities on this project are based on anticipated settlement and may require adjusting during construction.

G–4 The cost of removal of all existing concrete items located in the area to be graded, including, but not limited to the following, shall be included in the price bid for regular excavation: Sidewalk, walls, medians, light pole bases and curb ramps.

G–5 The excavation of unsuitable material as specified on these plans is based on previously conducted subsurface soil investigation. If, during construction, it is deemed necessary to change the depth more than one foot, or the limits of such excavation, such change is to be made at the direction of the Engineer and measurement and payment shall be made in accordance with Section 303 of the applicable VDOT Road and Bridge Specifications.

G–6 The borrow material for this project shall be a minimum CBR 10 or as approved by the Materials Engineer.

G–7 Material from regular excavation which is suitable for stabilization with hydraulic cement (lime) shall be placed in the top portion of the subgrade.

DRAINAGE

D–1 The horizontal location of all drainage structures shown on these plans is approximate only, with the exception of structures showing specific stations, special design bridges and storm sewer systems.

D–2 The horizontal location and invert elevations shown for proposed culverts and storm sewer outfall pipes are based on existing survey data and required design criteria. If during construction, it is found that the horizontal location or invert elevations shown on the plans differ significantly from the horizontal location or elevations of the stream or swale in which the culvert or storm sewer outfall pipe is to be placed, the Engineer shall confer with, and get approval from, the applicable District Drainage Engineer before installing the culvert or storm sewer outfall pipe.

D–3 The "H" dimensions shown on plans for drop inlets and junction boxes and the "L.F." dimensions shown for manholes are for estimating purposes and are based on the proposed invert elevations shown for the structure and the anticipated top (rim) elevation based on existing or proposed finished grade. The actual "H" or "L.F." dimensions are to be determined by the contractor from field conditions.

D–6 Pipes shall conform to any of the allowable types shown on sheet number (specify sheet number), within the applicable height of cover limitations. For strength, sheet thickness, or class designation; available sizes; height of cover limitations; and other restrictions for a particular pipe type or height of cover, see the VDOT Road and Bridge Standard PC–1. Structural plate pipe may be substituted for corrugated pipe of the same size, provided the substitution complies with the applicable sections of the VDOT Road and Bridge Standards PC–1.

D–12 All existing drainage facilities labeled "To Be Abandoned" shall be left in place, backfilled and plugged in accordance with the VDOT Road and Bridge Standard PP–1. Basis of Payment will be C.Y. of Flowable Backfill.

D–13 Existing drainage facilities being utilized as a part of the drainage system, and designated on the plans "To Be Cleaned Out" shall be cleaned as directed by the Engineer. The cost incidental to this shall be included in the contract price for other items.

D–14 Proposed drop inlets with a height (H) less than the standard minimum shown in the VDOT Road and Bridge Standards shall be considered and paid for as Standard Drop Inlets for the type specified. Pipes with less than standard minimum finished height of cover shall be noted as such in the drainage description for the pipe. Specific pipe bedding and cover requirements are provided in the applicable PB–1 and PC–1 standard drawings of the VDOT Road and Bridge Standards.

D–15 Where the plans specify the installation of standard curb drop inlets adjacent to the City of Richmond Standard Curb and Gutter, the Standard Drop Inlets (as shown in the VDOT Road and Bridge Standards) shall be modified in accordance with details shown on sheet number (specify sheet number). These drop inlets shall be considered and paid for as Standard Drop Inlets for the type specified.

D–16 When CG–6 or CG–7 is specified on a radius (such as at a street intersection), the Engineer may approve a decrease in the cross slope of the gutter to facilitate proper drainage.

D–17 St'd SL–1 Safety slab locations are based on the assumed use of precast structures. If cast–in–place structures are utilized, and the interior chamber dimensions (length and width, or diameter) are less than 4 feet, the safety slabs shall not be installed.

PAVEMENT

P–1 If any settlement occurs in concrete pavement adjacent to bridges prior to acceptance of the project by the Department, the contractor shall restore the pavement to the original grade either by the mud jack method or by replacing the pavement. In the event the pavement cracks or becomes damaged, it shall be replaced, if directed by the Engineer.

P–2 The pavement materials on this project will be paid for on a tonnage basis. The weight will vary in accordance with the specific gravity of the aggregates and the asphaltic content of the mix actually used to secure the design depth. The weight of the asphalt concrete is based on 95% of the theoretical maximum density.

INCIDENTALS

I–3 Service Roads are to be constructed, and private entrances connected thereto prior to the permanent severing of private entrances by other phases of the proposed construction.

I–6 Certain trees shall be preserved as noted on plans or as directed by the Engineer.

I–7 Where Standard slope roundoffs would damage trees, bushes or other desirable vegetation, they shall be omitted when so ordered by the Engineer.

I–8A Clearing and grubbing shall be confined to those areas needed for construction. No trees or shrubs in ungraded areas shall be cut without the permission of the Engineer.

I–9 When no centerline alignment is shown for a proposed entrance, the entrance shall be constructed in the same location as the existing entrance.

I–10 St'd. RM–1 Right of Way monuments shall be set by the Contractor.

I–13 Salvaged guardrail materials not used in the new construction shall become the property of the Department and the Contractor shall deliver and store, at no additional cost to the Department, the unused materials at the Department's maintenance yard at 400 Jefferson Davis Highway during the Department's normal working hours.

I–14 Salvaged guardrail materials not used in the new construction shall become the property of the Contractor and shall be disposed of at a licensed landfill, recycled or be retained by the Contractor.

I–15 Where Guardrail GR–2 or GR–8 is shown on the plans and in the summaries, either new guardrail or reused guardrail shown shall be used as provided elsewhere in these plans. The total quantities have been proportioned between new and reuse guardrail based on an estimate of the amount of existing beam that is reuseable. The Contractor will be paid for the actual quantities of Guardrail, St'd. GR–2 or St'd. GR–8 or Reuse Guardrail, St'd. GR–2 or St'd. GR–8 as determined by the Engineer.

I–16 The "underground utilities" survey data on this project has been provided by consultant and copies are available from the Department.

I–17 For method of constructing Straight–Line Taper Lanes in curb and/or curb and gutter sections, see typical details on Sheet 2B(2).

I–18 All pavement markings and traffic flow arrows shown on the roadway construction plans are schematic only. The actual location and application of pavement markings shall be in accordance with Section 704 of the applicable VDOT Road and Bridge Specifications, MUTCD, sequence of construction/traffic control plans, pavement marking plan sheets 22(1) thru 22(19) and as directed by the Engineer.

I–19 The following outside sources, under contract with VDOT, have provided information on this project.

Hydraulic Design	–	RK&K
Roadway Design	–	RK&K
Utility Design	–	RK&K
Utility Designation	–	Inframap
Utility Location	–	Inframap
Survey	–	Century Engineering (Previously NXL)
Bridge Design	–	N/A
Traffic Design	–	VHB
Landscape Design	–	VHB

If questions or problems arise during construction, please contact the Project Manager. DO NOT CONTACT THE OUTSIDE SOURCES.

I–20 The Official Electronic PDF Version of the plans will override the paper copies or prints of specific layers.

Portions of this plan assembly have been CADD generated. To assist in the preparation of the bid and construction of the project, AutoCAD format (.dwg) files will be made available to the prime contractor during bids and after award of the contract.

I–21 All electronic plan assemblies will include the construction plans in two formats: PDF files and AutoCAD format (.dwg) files. Only the PDF files will be considered as part of the official plan assembly.

The AutoCAD format (.dwg) files are furnished only as information for the contractor. These plans are developed in layers (levels) to aid in readability. (See the VDOT CADD Manual for CADD Level Structure). However, the construction items may or may not be in the proper layering scheme as described in the VDOT CADD Manual. The AutoCAD files will only match the scanned files if all required levels are turned on. A AutoCAD Software license is required to be able to read these files.

STORMWATER MANAGEMENT

S–4 The SWM–1 Drainage Structure (or other control structure) shall have 4" high numbers and 1" wide stripes painted at 1' intervals as shown on the Standard Drawings or detail sheets. The numbers and stripes are to be installed at the time of the initial installation of the SWM–1 Drainage Structure (or other control structure). Paint and application shall be in accordance with Section 231 and 411 of the applicable VDOT Road and Bridge Specifications and the cost is to be included in the price bid for the applicable structure.

70% SUBMITTAL SEPTEMBER 2022

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NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

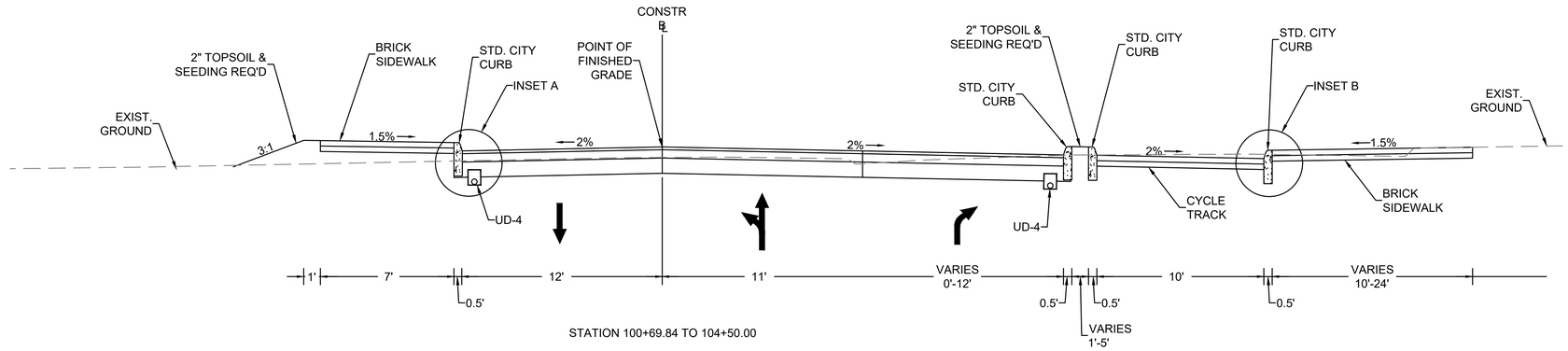
SHOCKOE VALLEY STREET IMPROVEMENTS
GENERAL NOTES

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander			NO SCALE	SEPTEMBER 2022	SHEET 2	0–28633
CHECKED BY: ASamberg						

TYPICAL SECTIONS

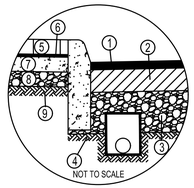
N.T.S.

OLIVER HILL WAY_A



STATION 100+69.84 TO 104+50.00

INSET A



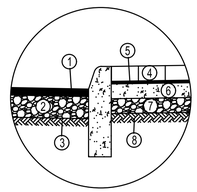
PAVEMENT DESIGN (ROADWAY)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

BRICK SIDEWALK DESIGN

5. CITY STD BRICK IN HERRING-BONE PATTERN. SWEEP 1:3 DRY CEMENT SAND MIXTURE INTO JOINTS.
6. 1:2 DRY CEMENT MIXTURE SETTING BED
7. 4" CLASS A3 CONCRETE
8. 4" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
9. COMPACTED SUBGRADE

INSET B



PAVEMENT DESIGN (CYCLE TRACK)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-12.5A
2. 6" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
3. COMPACTED SUBGRADE

BRICK SIDEWALK DESIGN

4. CITY STD BRICK IN HERRING-BONE PATTERN. SWEEP 1:3 DRY CEMENT SAND MIXTURE INTO JOINTS.
5. 1:2 DRY CEMENT MIXTURE SETTING BED
6. 4" CLASS A3 CONCRETE
7. 4" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
8. COMPACTED SUBGRADE

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

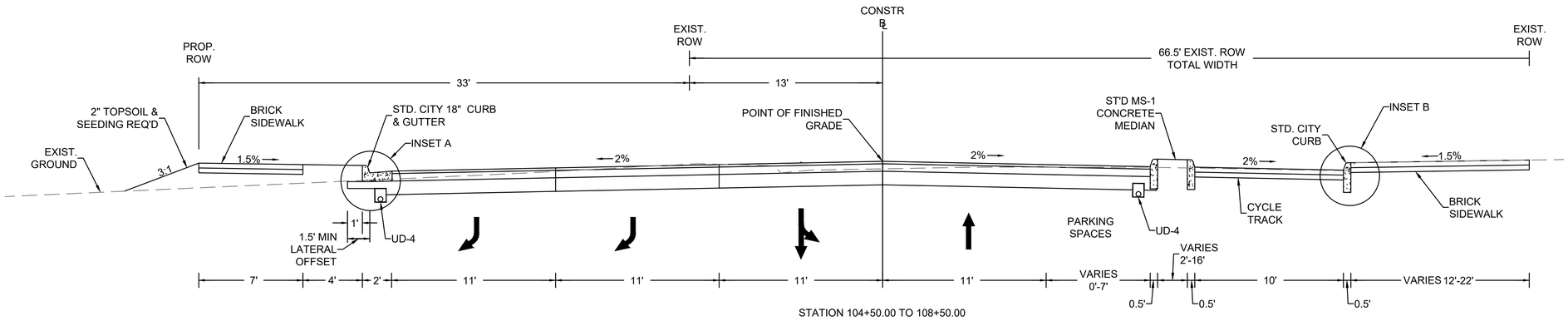
SHOCKOE VALLEY STREET IMPROVEMENTS
TYPICAL SECTIONS

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2A(1)	DRAWING NO. 0-28633

TYPICAL SECTIONS

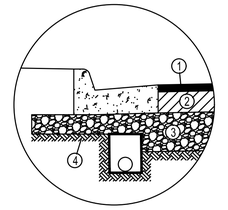
N.T.S.

OLIVER HILL WAY_A



STATION 104+50.00 TO 108+50.00

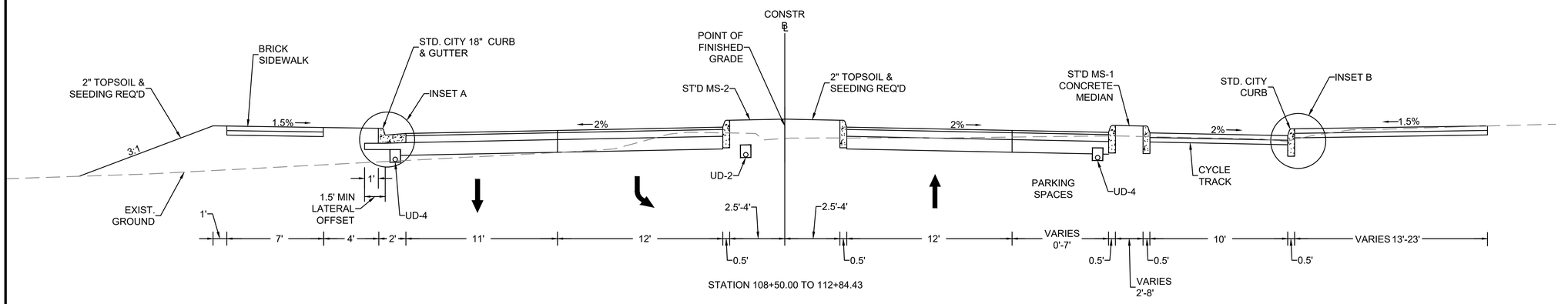
INSET A



PAVEMENT DESIGN (ROADWAY)

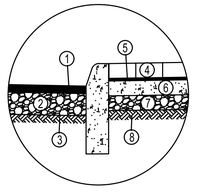
1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

OLIVER HILL WAY_A



STATION 108+50.00 TO 112+84.43

INSET B



PAVEMENT DESIGN (CYCLE TRACK)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-12.5A
2. 6" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
3. COMPACTED SUBGRADE

BRICK SIDEWALK DESIGN

4. CITY STD BRICK IN HERRING-BONE PATTERN. SWEEP 1:3 DRY CEMENT SAND MIXTURE INTO JOINTS.
5. 1:2 DRY CEMENT MIXTURE SETTING BED
6. 4" CLASS A3 CONCRETE
7. 4" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
8. COMPACTED SUBGRADE

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (Ø or ⓢ)
Fire Hydrant / Valve (FH, WV)

Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole (SDMH, (SMH))
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

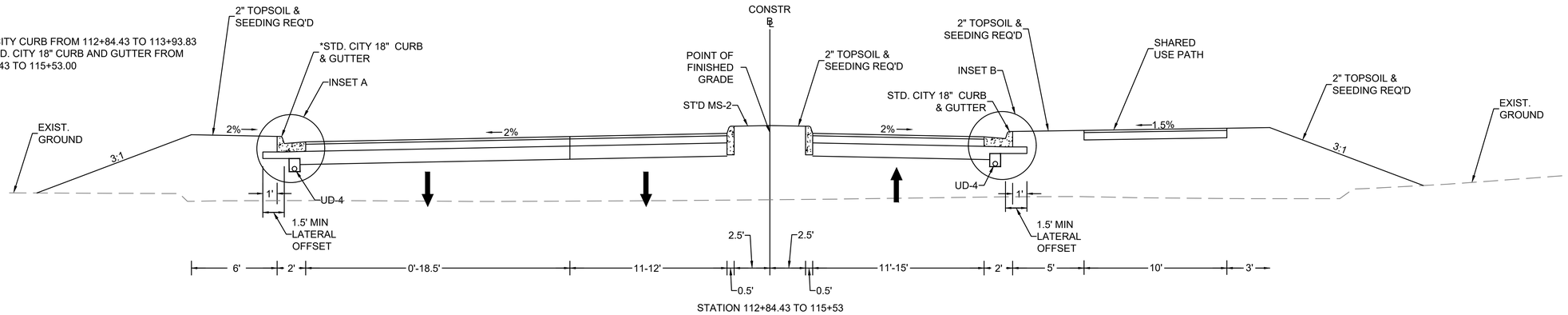
SHOCKOE VALLEY STREET IMPROVEMENTS
TYPICAL SECTIONS

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2A(2)	DRAWING NO. 0-28633

TYPICAL SECTIONS

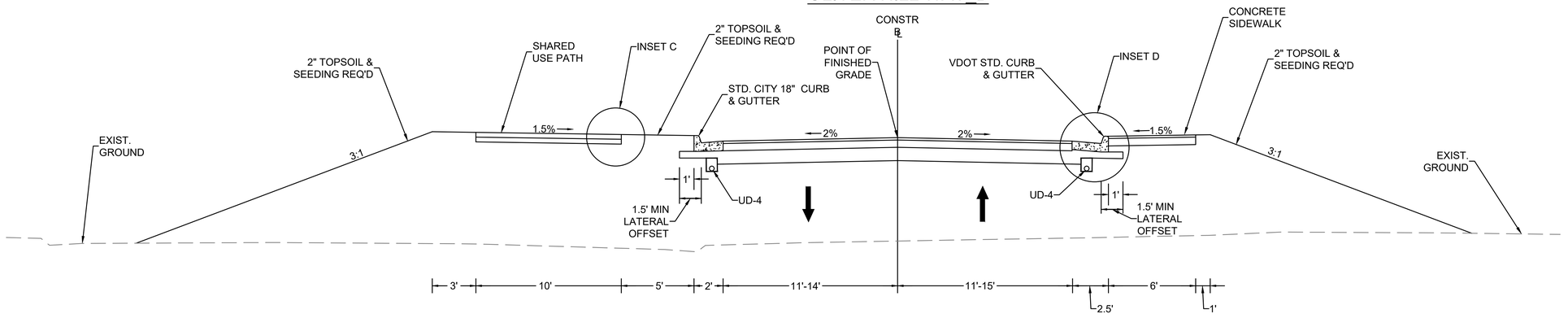
N.T.S.

OLIVER HILL WAY_A



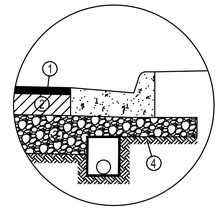
STATION 112+84.43 TO 115+53

OLIVER HILL WAY_B



STATION 901+71.00 TO 902+85.00

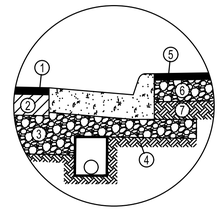
INSET B



PAVEMENT DESIGN (ROADWAY)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

INSET D



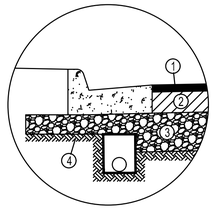
PAVEMENT DESIGN (ROADWAY)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

SHARED USE PATH

5. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-12.5A
6. 6" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
7. COMPACTED SUBGRADE

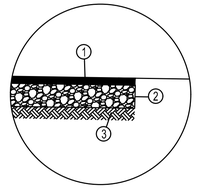
INSET A



PAVEMENT DESIGN (ROADWAY)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

INSET C



SHARED USE PATH

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-12.5A
2. 6" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
3. COMPACTED SUBGRADE

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH ◇ ●WV
Water Meter ●WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ● ●GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

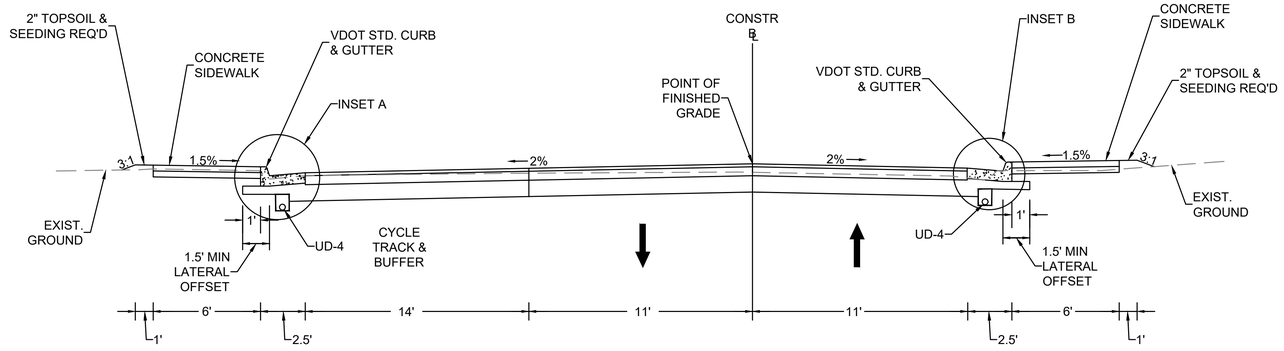
SHOCKOE VALLEY STREET IMPROVEMENTS
TYPICAL SECTIONS

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2A(3)	DRAWING NO. 0-28633

TYPICAL SECTIONS

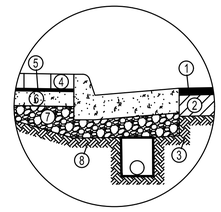
N.T.S.

OLIVER HILL WAY_B



STATION 902+85.00 TO 904+16.30

INSET A



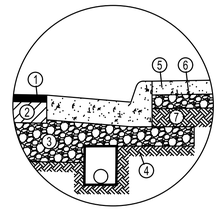
PAVEMENT DESIGN (CYCLE TRACK)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-12.5A
2. 6" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
3. COMPACTED SUBGRADE

BRICK SIDEWALK DESIGN

4. CITY STD BRICK IN HERRING-BONE PATTERN. SWEEP 1:3 DRY CEMENT SAND MIXTURE INTO JOINTS.
5. 1:2 DRY CEMENT MIXTURE SETTING BED
6. 4" CLASS A3 CONCRETE
7. 4" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
8. COMPACTED SUBGRADE

INSET B



PAVEMENT DESIGN (ROADWAY)

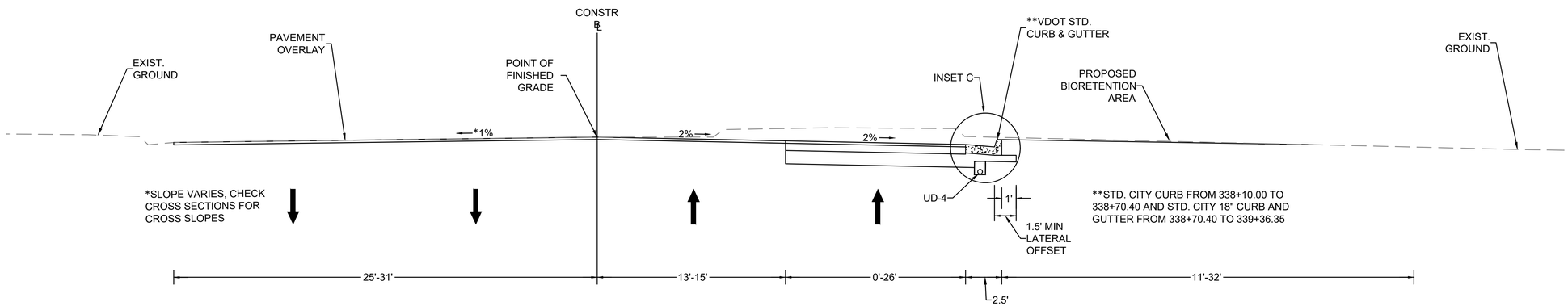
1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

CONCRETE SIDEWALK DESIGN

5. 4" CLASS A3 CONCRETE, BROOM FINISHED
6. 4" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
7. COMPACTED SUBGRADE

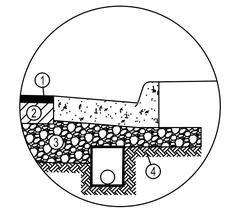
NOTE:
PROVIDE TRANSVERSE CONTRACTION JOINTS EVERY 5' AND EXPANSION JOINTS AT NO MORE THAN 20' INTERVALS.

OLIVER HILL WAY_B



STATION 924+93.61 TO 926+19.93

INSET C



PAVEMENT DESIGN (ROADWAY)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

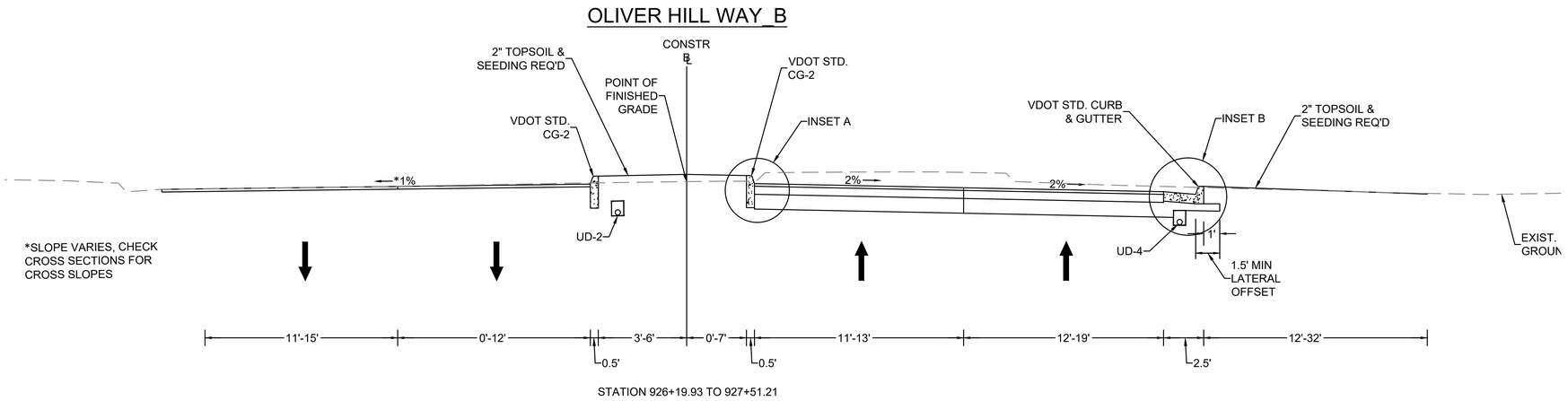
SHOCKOE VALLEY STREET IMPROVEMENTS
TYPICAL SECTIONS

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2A(4)	DRAWING NO. 0-28633

TYPICAL SECTIONS

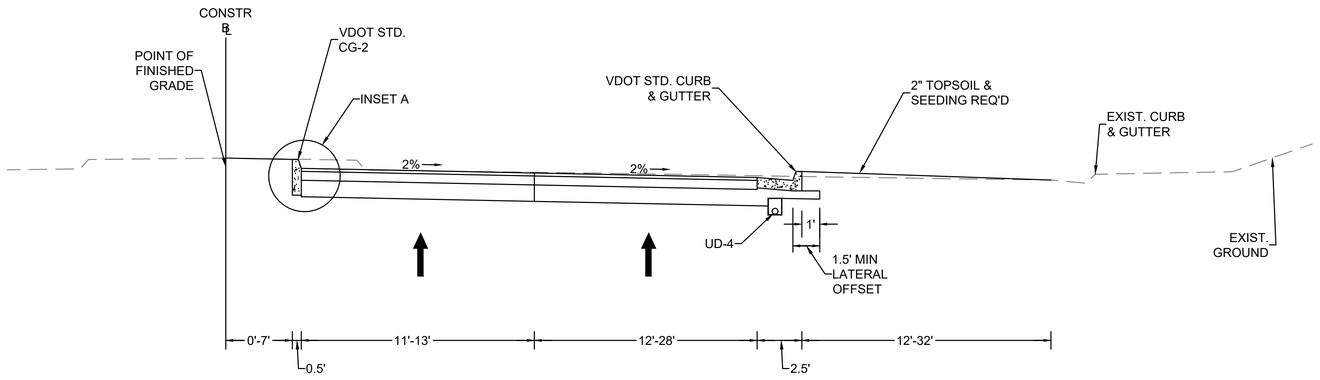
N.T.S.

OLIVER HILL WAY_B



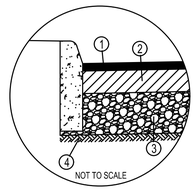
STATION 926+19.93 TO 927+51.21

OLIVER HILL WAY_B



STATION 927+51.21 TO 927+74.10

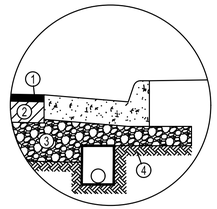
INSET A



PAVEMENT DESIGN (ROADWAY)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

INSET B



PAVEMENT DESIGN (ROADWAY)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

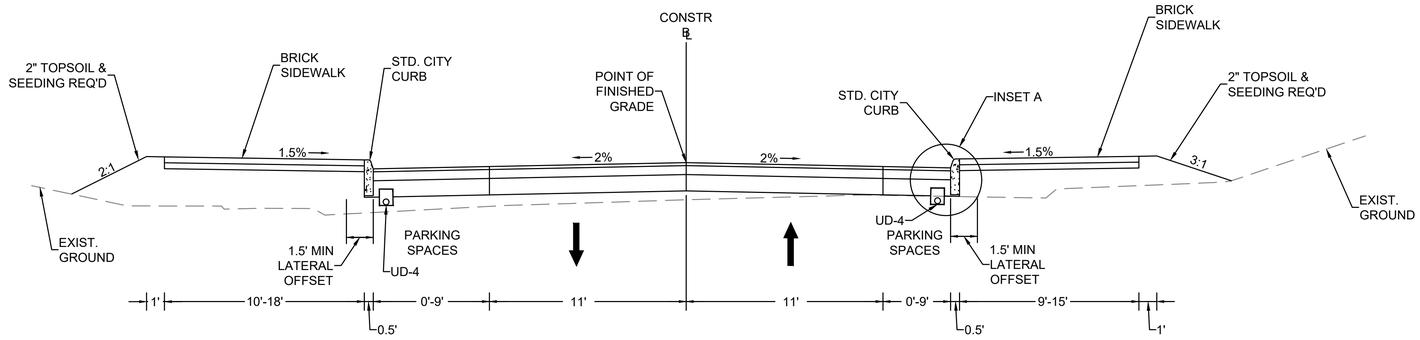
SHOCKOE VALLEY STREET IMPROVEMENTS
TYPICAL SECTIONS

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2A(5)	DRAWING NO. 0-28633

TYPICAL SECTIONS

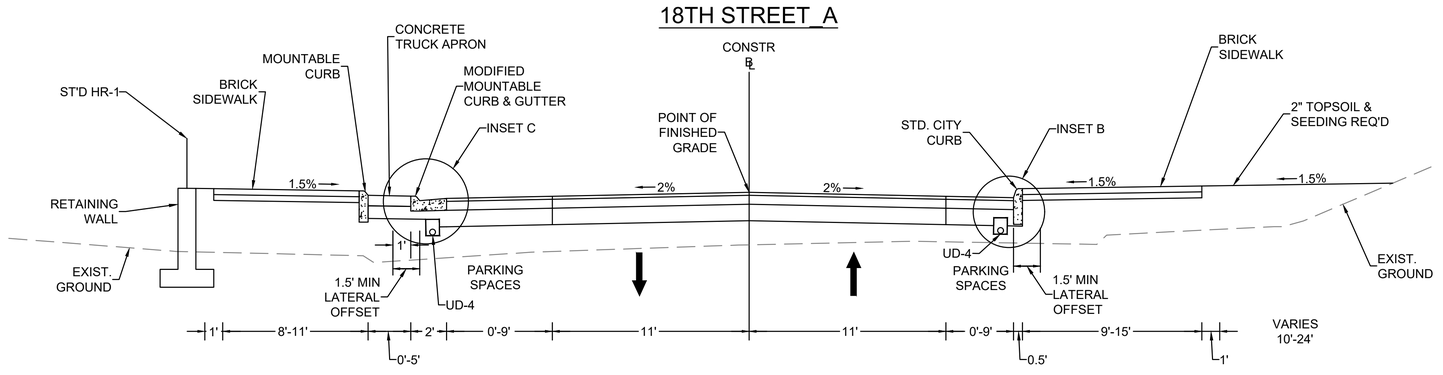
N.T.S.

18TH STREET_A



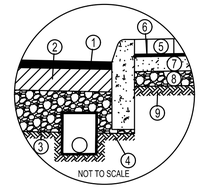
STATION 214+50.00 TO 215+52.06

18TH STREET_A



STATION 215+52.06 TO 215+95.00

INSET A



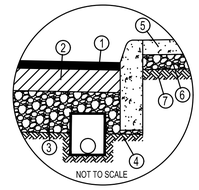
PAVEMENT DESIGN (ROADWAY)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

BRICK SIDEWALK DESIGN

5. CITY STD BRICK IN HERRING-BONE PATTERN. SWEEP 1:3 DRY CEMENT SAND MIXTURE INTO JOINTS.
6. 1:2 DRY CEMENT MIXTURE SETTING BED
7. 4" CLASS A3 CONCRETE
8. 4" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
9. COMPACTED SUBGRADE

INSET B



PAVEMENT DESIGN (ROADWAY)

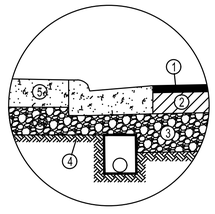
1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

CONCRETE SIDEWALK DESIGN

5. 4" CLASS A3 CONCRETE, BROOM FINISHED
6. 4" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
7. COMPACTED SUBGRADE

NOTE:
PROVIDE TRANSVERSE CONTRACTION JOINTS EVERY 5' AND EXPANSION JOINTS AT NO MORE THAN 20' INTERVALS.

INSET C



PAVEMENT DESIGN (ROADWAY)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

CONCRETE APRON DESIGN

5. 6" CLASS A3 CONCRETE, BROOM FINISHED
6. 8" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

NOTE:
PROVIDE TRANSVERSE CONTRACTION JOINTS EVERY 5' AND EXPANSION JOINTS AT NO MORE THAN 20' INTERVALS.

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

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REFERENCES

REVISIONS

Existing Legend

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Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
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Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

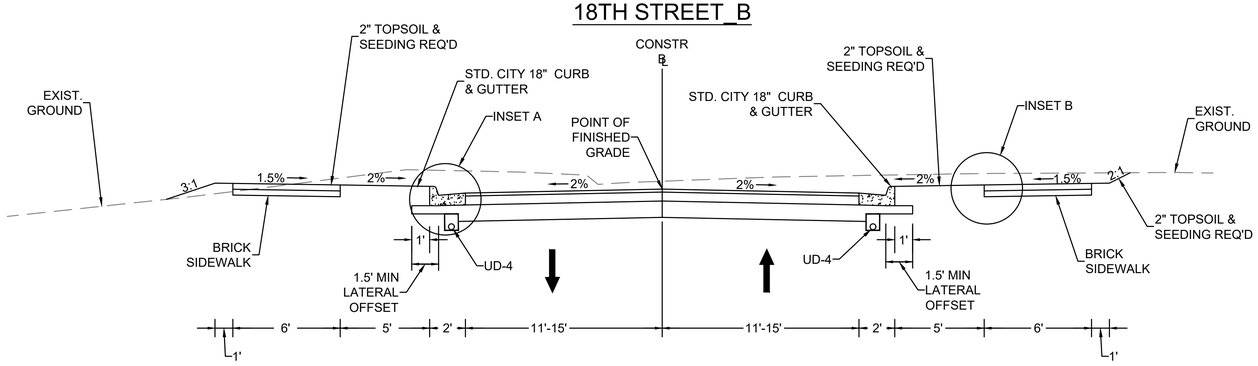
SHOCKOE VALLEY STREET IMPROVEMENTS
TYPICAL SECTIONS

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2A(6)	0-28633
CHECKED BY: ASamberg						

TYPICAL SECTIONS

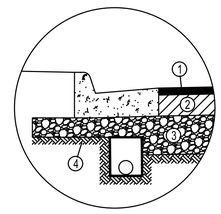
N.T.S.

18TH STREET_B



STATION 118+33.65 TO 120+80.00

INSET A



PAVEMENT DESIGN (ROADWAY)

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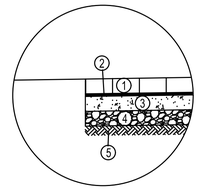
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

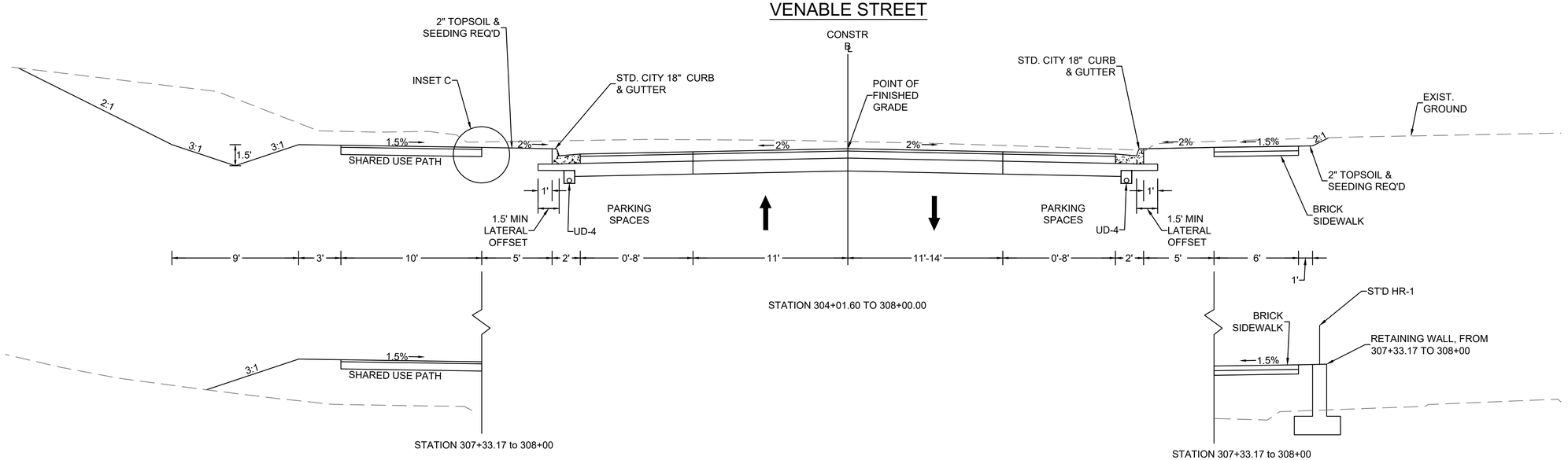
INSET B



BRICK SIDEWALK DESIGN

1. CITY STD BRICK IN HERRING-BONE PATTERN. SWEEP 1:3 DRY CEMENT SAND MIXTURE INTO JOINTS.
2. 1:2 DRY CEMENT MIXTURE SETTING BED
3. 4" CLASS A3 CONCRETE
4. 4" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
5. COMPACTED SUBGRADE

VENABLE STREET

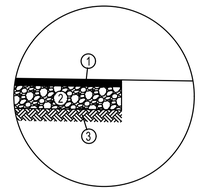


STATION 304+01.60 TO 308+00.00

STATION 307+33.17 to 308+00

STATION 307+33.17 to 308+00

INSET C



SHARED USE PATH

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-12.5A
2. 6" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
3. COMPACTED SUBGRADE

70% SUBMITTAL
SEPTEMBER 2022

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

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Sanitary Sewer (Gravity)
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Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

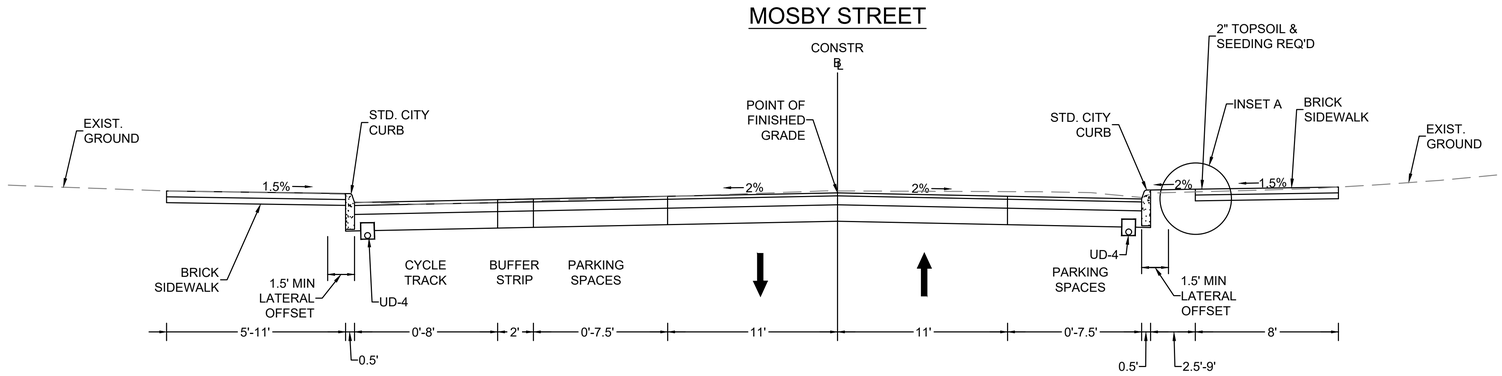
SHOCKOE VALLEY STREET IMPROVEMENTS
TYPICAL SECTIONS

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2A(7)	DRAWING NO. 0-28633

TYPICAL SECTIONS

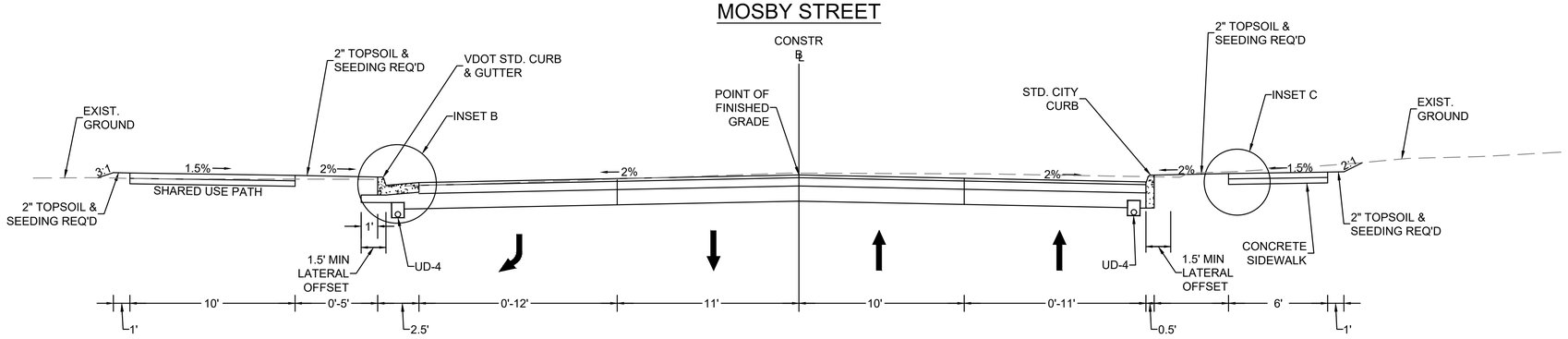
N.T.S.

MOSBY STREET



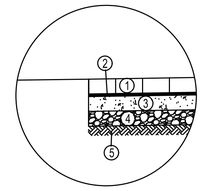
STATION 401+00.00 TO 411+25.00

MOSBY STREET



STATION 413+03.52 TO 415+33.25

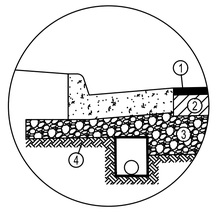
INSET A



BRICK SIDEWALK DESIGN

1. CITY STD BRICK IN HERRING-BONE PATTERN. SWEEP 1:3 DRY CEMENT SAND MIXTURE INTO JOINTS.
2. 1:2 DRY CEMENT MIXTURE SETTING BED
3. 4" CLASS A3 CONCRETE
4. 4" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
5. COMPACTED SUBGRADE

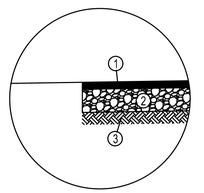
INSET B



PAVEMENT DESIGN (ROADWAY)

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-9.5A
2. 6" ASPHALT CONCRETE BASE COURSE TYPE BM-25.0A
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

INSET C



SHARED USE PATH

1. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SM-12.5A
2. 6" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
3. COMPACTED SUBGRADE

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

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REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (S) or (S)
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
TYPICAL SECTIONS

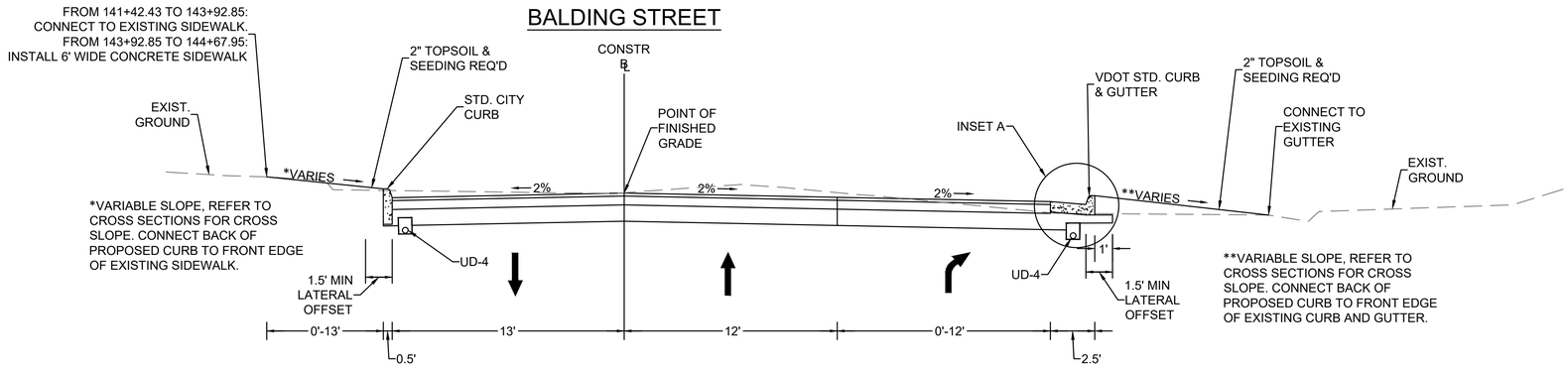
AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2A(8)	0-28633
CHECKED BY: ASamberg						

TYPICAL SECTIONS

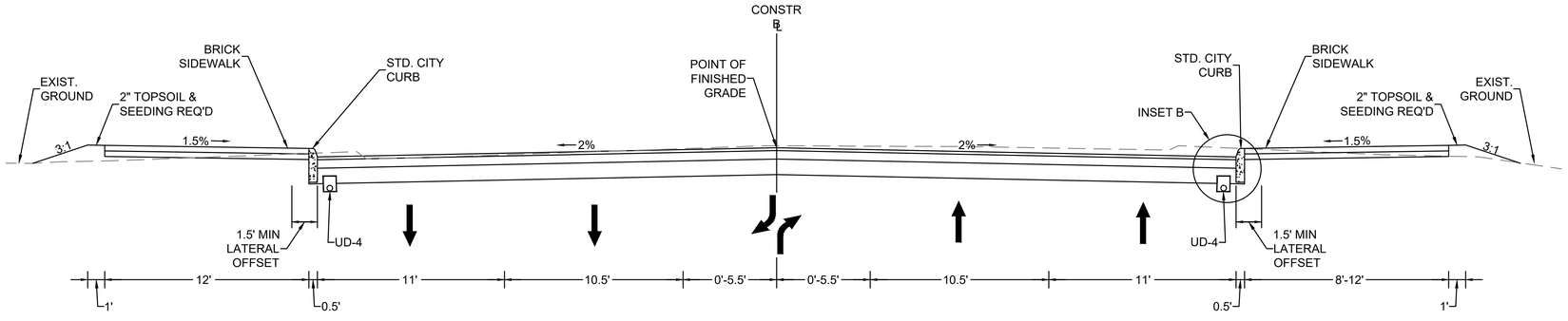
N.T.S.

BALDING STREET



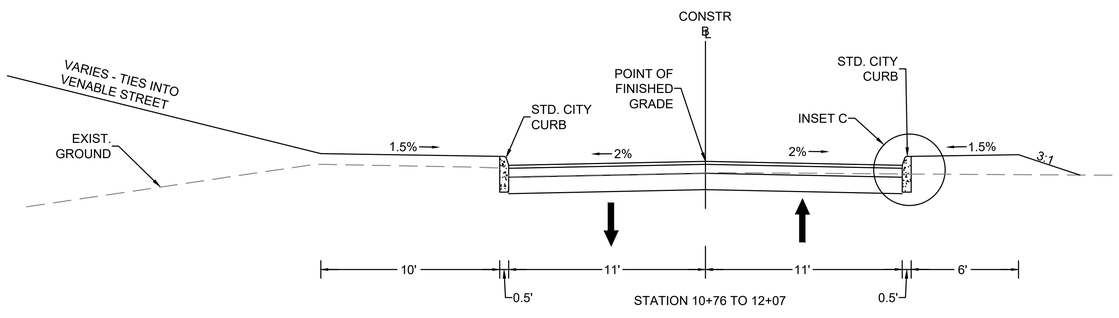
STATION 141+42.43 TO 144+83.59

E. BROAD STREET



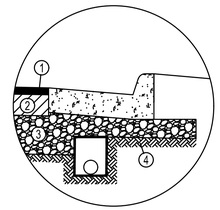
STATION 501+92.75 TO 506+72.60

EXISTING VENABLE



STATION 10+76 TO 12+07

INSET A



PAVEMENT DESIGN (ROADWAY)

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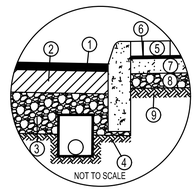
3. 12" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
4. COMPACTED SUBGRADE

INSET B



PAVEMENT DESIGN (ROADWAY)

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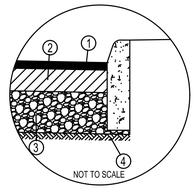
4. COMPACTED SUBGRADE

BRICK SIDEWALK DESIGN

5. CITY STD BRICK IN HERRING-BONE PATTERN. SWEEP 1:3 DRY CEMENT SAND MIXTURE INTO JOINTS.
6. 1:2 DRY CEMENT MIXTURE SETTING BED
7. 4" CLASS A3 CONCRETE
8. 4" AGGREGATE BASE MATERIAL TYPE I, NO. 21B
9. COMPACTED SUBGRADE

INSET C



PAVEMENT DESIGN (ROADWAY)

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4. COMPACTED SUBGRADE

70% SUBMITTAL
SEPTEMBER 2022

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Existing Curb Cut Ramp
Gas Meter / Valve
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Power/Light Pole
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Basin
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Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

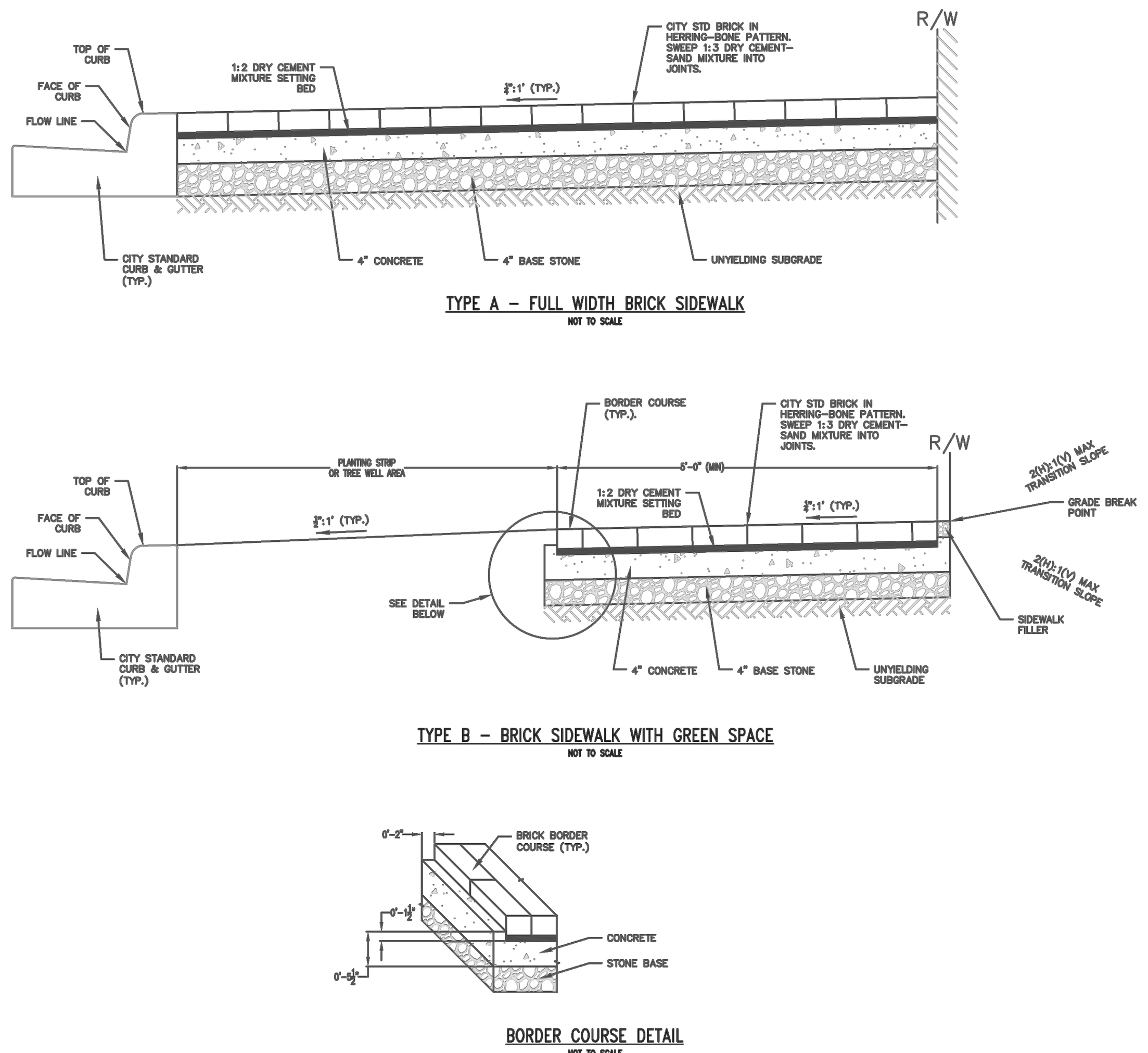
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
TYPICAL SECTIONS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2A(9)	0-28633
CHECKED BY: ASamberg						



TYPE A – FULL WIDTH BRICK SIDEWALK
NOT TO SCALE

TYPE B – BRICK SIDEWALK WITH GREEN SPACE

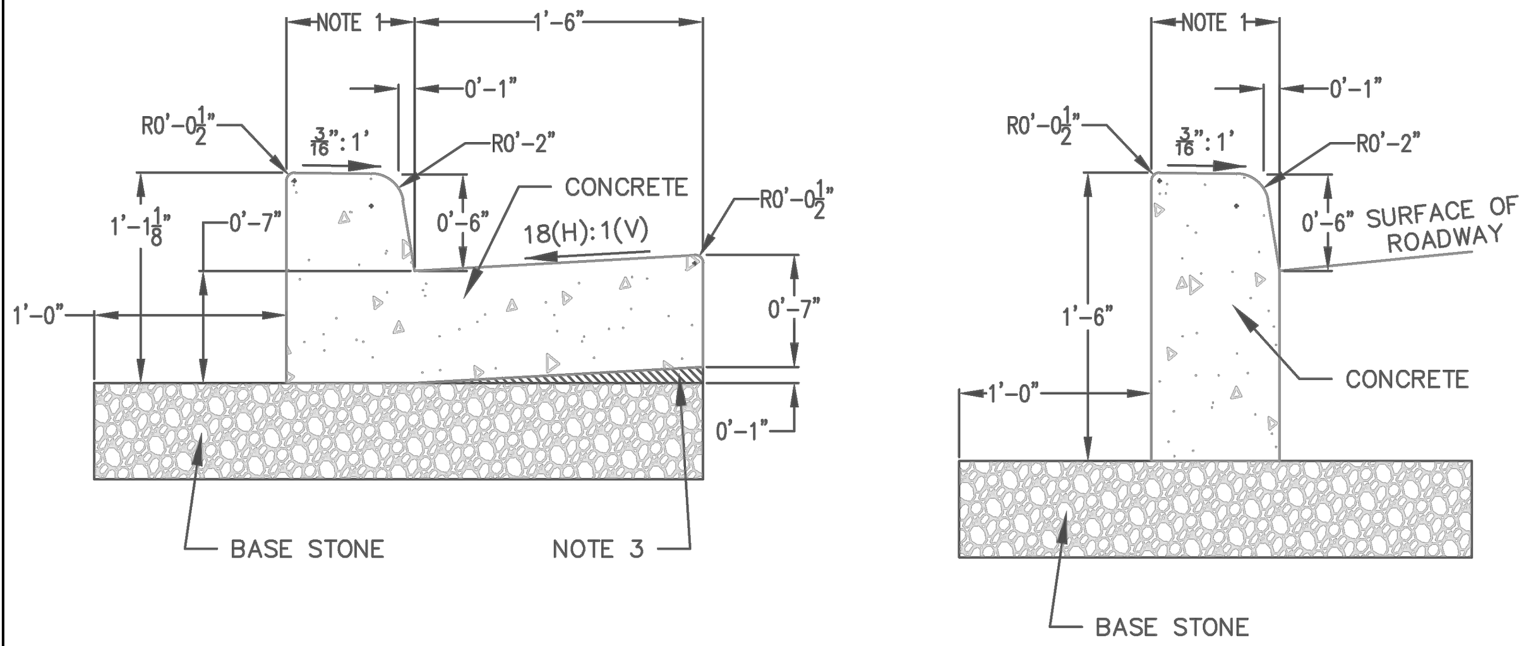
BORDER COURSE DETAIL
NOT TO SCALE

NOTES:
1. FULL WIDTH BRICK SIDEWALK SHALL BE USED CITYWIDE, DOWNTOWN OR IN COMMERCIAL ZONES.
2. ACCESSIBLE PATH SHALL CONFORM WITH ADA (MAXIMUM CROSS SLOPE OF ¼":1').
3. PLANTING STRIPS, WHERE USED, SHALL BE A MINIMUM OF 3'.
4. TREE WELL DIMENSIONS ARE TYPICALLY 5'X5'. TREE WELL DIMENSIONS MAY VARY CONTINGENT ON AVAILABLE SPACE AND SELECTED TREE SPECIES.
5. PREFABRICATED EDGE RESTRAINT MAY BE USED ON A CASE BY CASE BASIS WHERE APPROVED THE (CITY) ENGINEER.
6. SIDEWALK FILLER MAY BE TOPSOIL, CONCRETE, OR OTHER APPROVED MATERIALS DEPENDING ON ADJACENT USE.
7. BRICK HERRING BONE PATTERN SHALL BE ORIENTED 45° TO THE PEDESTRIAN TRAVEL PATH.
8. CONCRETE SHALL BE AIR ENTRAINED CLASS A3 (MIN.), PER VDOT SPECIFICATIONS.
9. BASE STONE SHALL CONSIST OF AGGREGATE BASE MATERIAL 21A OR 21B. ALTERNATE BASE STONE MAY BE USED WITH APPROVAL OF THE ENGINEER.
10. SUBGRADE SHALL BE SHAPED TO ±½" TOLERANCE OF FINISHED CROSS SECTION.

NOTES: 1. SUPERSEDES ALL PREVIOUS VERSIONS.

ROADWAY GEOMETRIC DETAILS
BRICK SIDEWALK (NEW CONSTRUCTION)

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-05



MONOLITHIC CONCRETE CURB & GUTTER

CONCRETE CURB

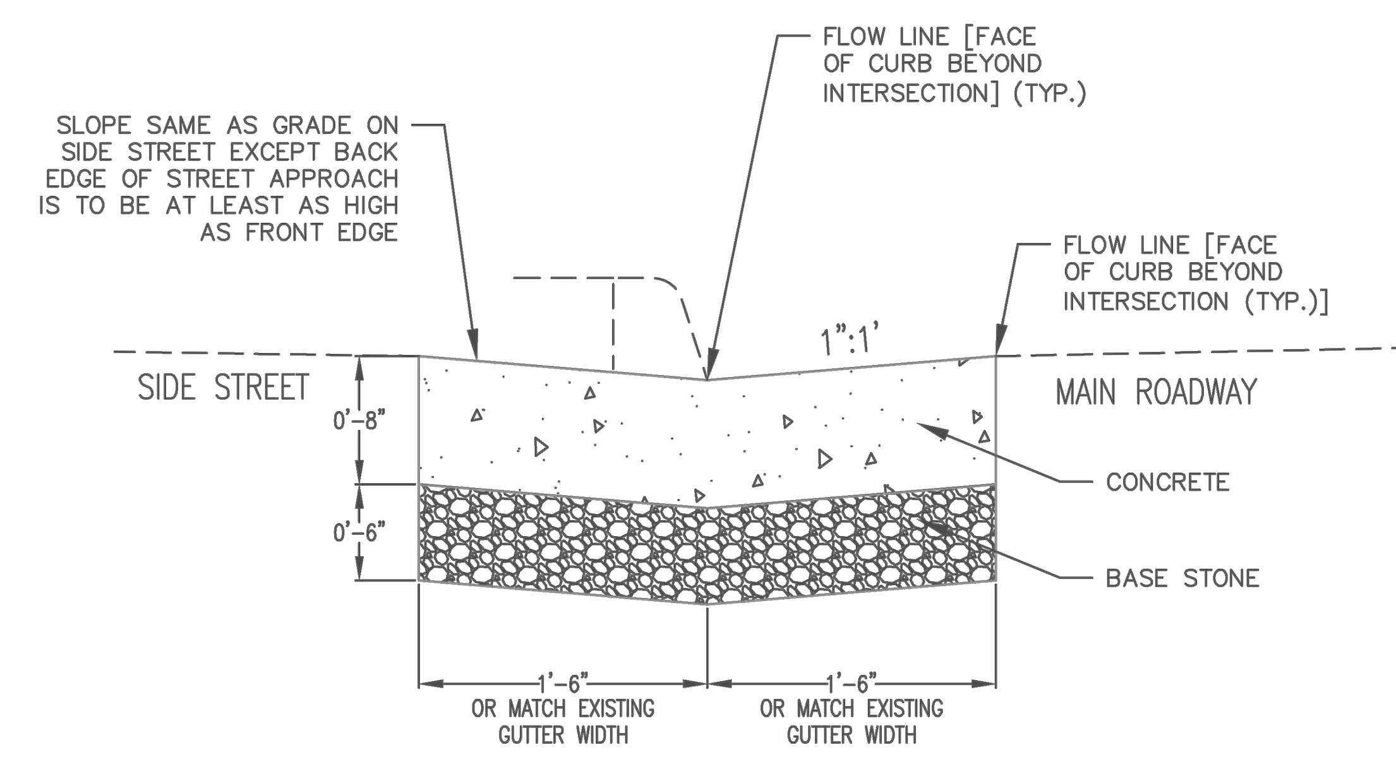
NOTES:
1. CURB THICKNESS SHALL BE 8" IN COMMERCIAL, CENTRAL BUSINESS DISTRICT, INDUSTRIAL, THE FAN, HIGH DENSITY AND MULTI-FAMILY AREAS. CURB THICKNESS SHALL BE 6" IN SINGLE-FAMILY RESIDENTIAL AREAS.
2. BASE STONE SHALL MATCH ROADWAY PAVEMENT SECTION OR BE 6" COMPACTED THICKNESS, WHICHEVER IS THICKER. BASE STONE SHALL CONSIST OF AGGREGATE BASE MATERIAL 21A OR 21B.
3. THE BOTTOM OF THE CURB AND GUTTER MAY BE CONSTRUCTED PARALLEL TO THE SLOPE OF SUB-BASE COURSE, PROVIDED A MINIMUM DEPTH OF 7" IS MAINTAINED.
4. CONCRETE SHALL BE CLASS A3 (MIN.).

NOTES: 1. SUPERSEDES ALL PREVIOUS VERSIONS.

ROADWAY GEOMETRIC DETAILS
MONOLITHIC CURB AND CURB & GUTTER

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-01

STANDARD VALLEY GUTTER



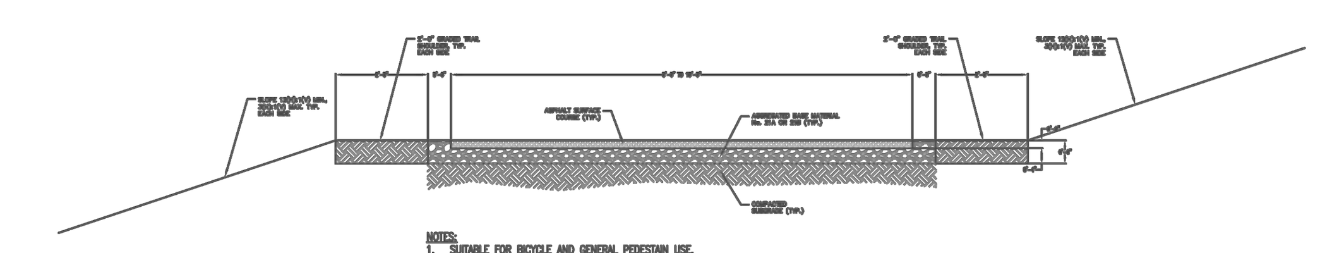
NOTES:
1. CONCRETE SHALL BE CLASS A3 (MIN.)
2. BASE STONE SHALL BE 6" (MIN.) COMPACTED THICKNESS 21A OR 21B

NOTES: 1. SUPERSEDES ALL PREVIOUS VERSIONS.

ROADWAY GEOMETRIC DETAILS
MONOLITHIC CURB AND CURB & GUTTER

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-03

PATHWAY
CROSS SECTION
(TYPE I)

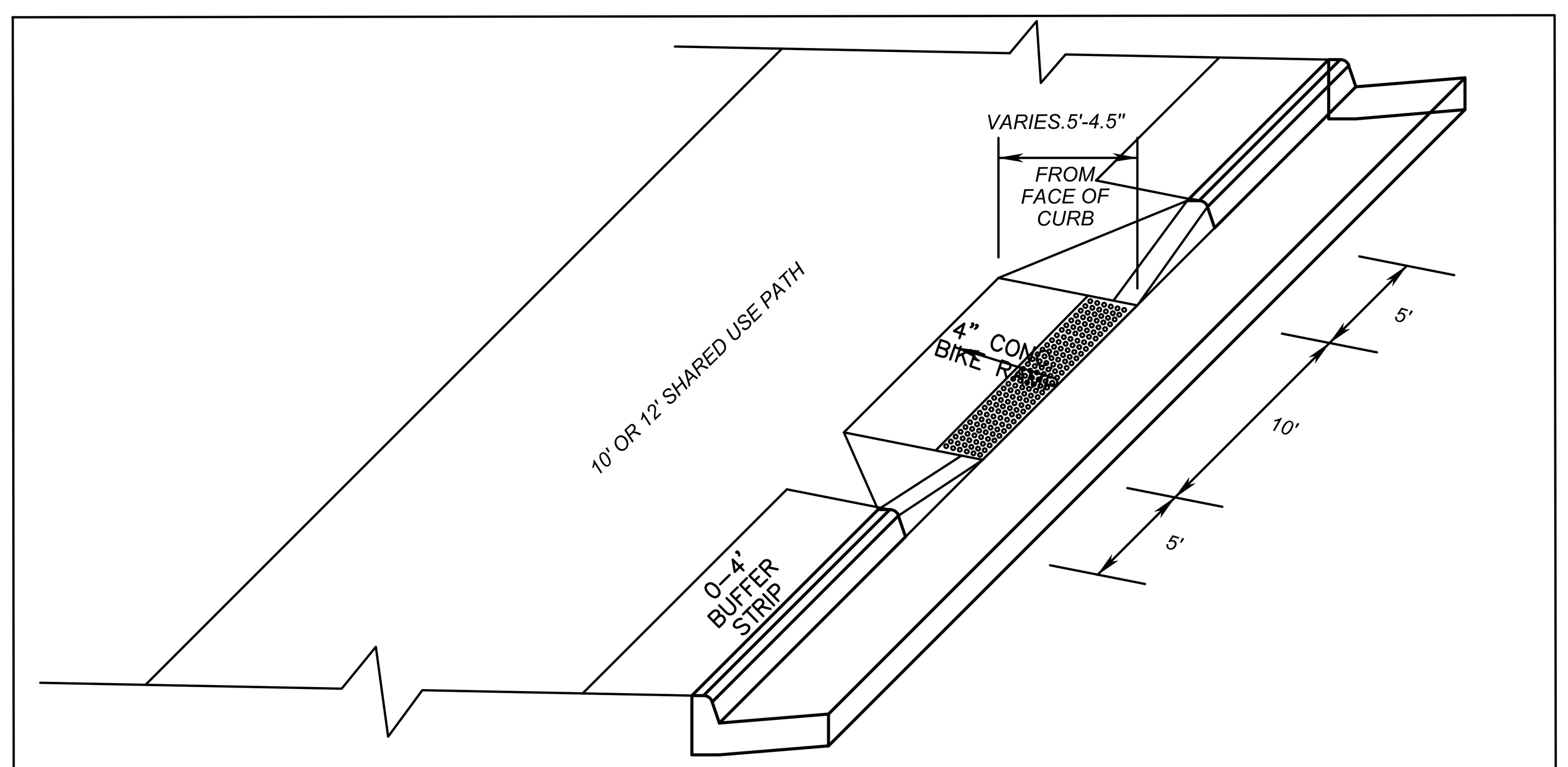


NOTES:
1. SUITABLE FOR BICYCLE AND GENERAL PEDESTAIN USE.
2. MINIMUM TRAIL WIDTH SHALL BE 10'-0' FOR SHARED USE AND/OR BIKEWAYS. MINIMUM TRAIL WIDTH SHALL BE 5'-0" FOR WALKWAYS. FOR HEAVILY TRAVELED AREAS, TRAIL WIDTH MAY BE WIDER THAN THE MINIMUMS STATED.
3. TRAIL CROSS SLOPE SHALL BE GRADED TO DRAIN. THE MAXIMUM CROSS SLOPE FOR IMPROVED TRAIL SHALL NOT EXCEED 2% NOR LESS THAN 1%.
4. ASPHALT SURFACE COURSE SHALL BE SM-9.5A OR SM=12.5A; PLACED IN ACCORDANCE WITH THE PLACEMENT LIMITATIONS PER VDOT SPECIFICATIONS.

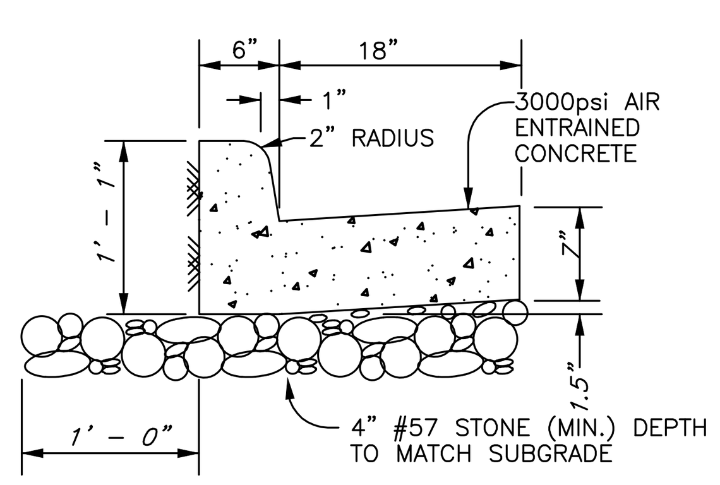
NOTES: 1. SUPERSEDES ALL PREVIOUS VERSIONS.

ROADWAY GEOMETRIC DETAILS
CITY STD PATH – ASPHALT

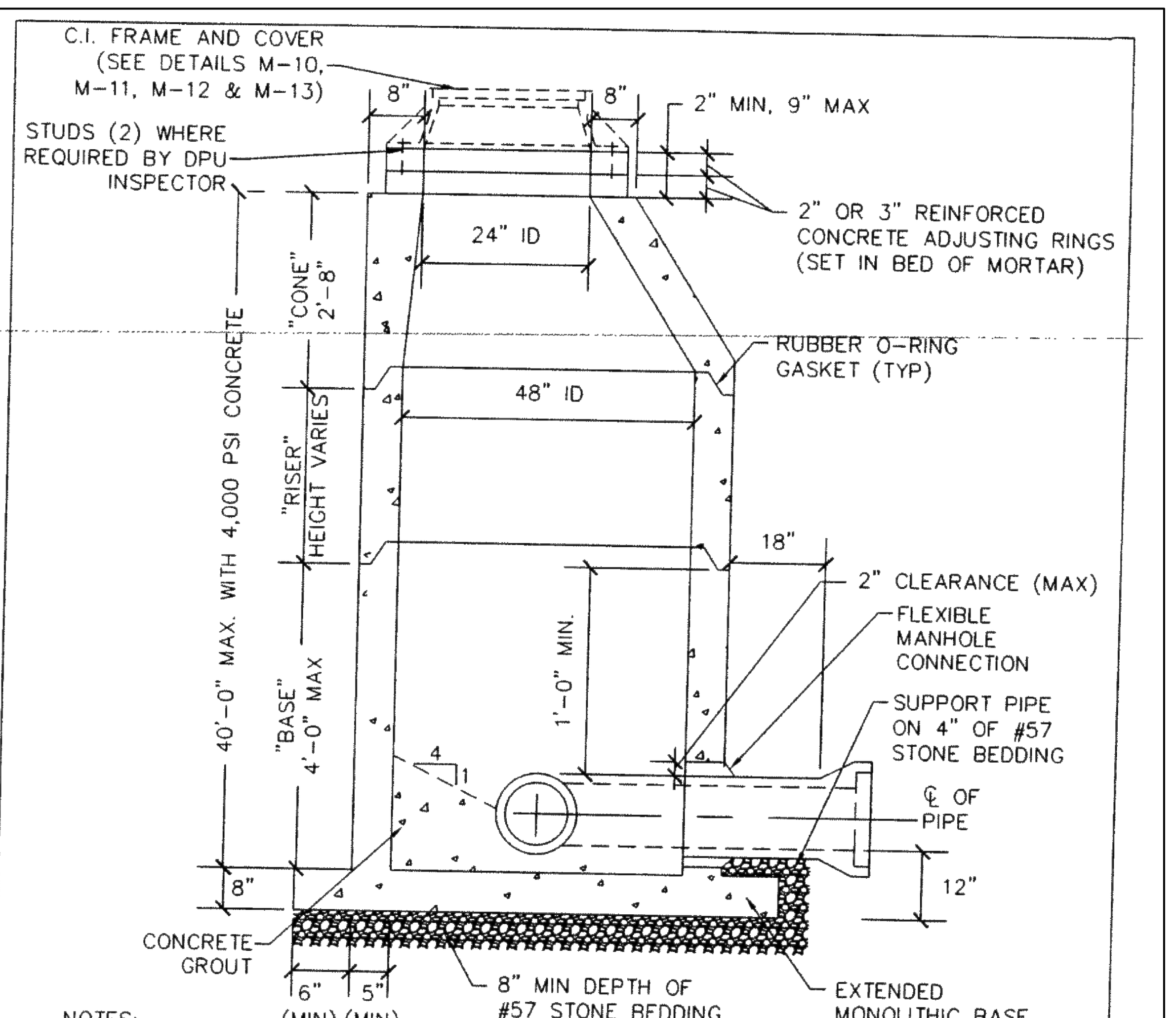
REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-TS-07



BIKE RAMP DETAIL
(Not to Scale)

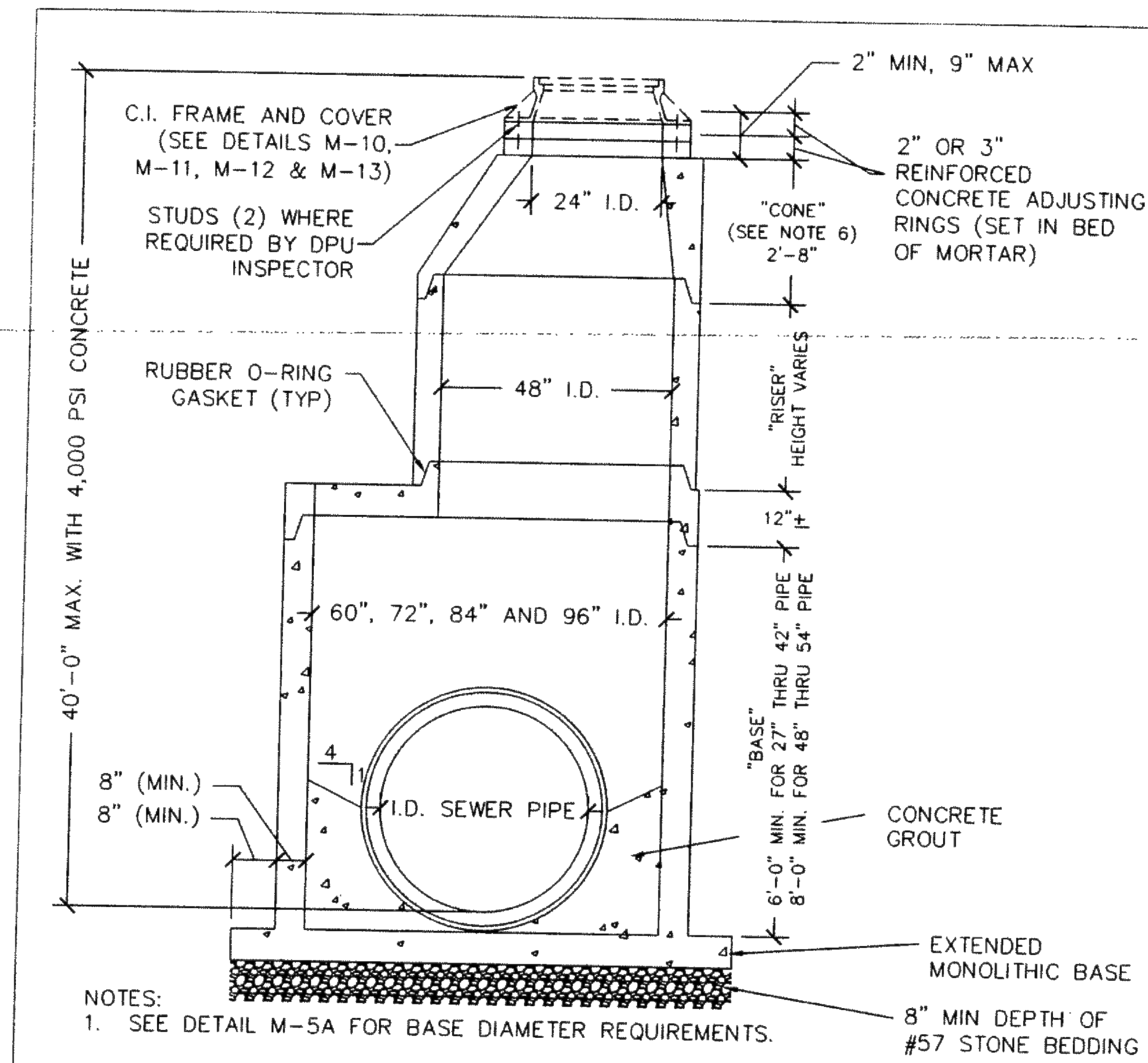


RICHMOND STANDARD CONCRETE CURB & GUTTER DETAIL
NOT TO SCALE



NOTES:
1. STONE BEDDING SHALL EXTEND TO THE OUTER BOUNDARY OF ALL UNDISTURBED AREAS SURROUNDING THE MANHOLE.
2. FOR SEWERS GREATER THAN 24" SEE DETAIL M-2.
3. EXCAVATION PAYLINE EXTENDS 6" OUTSIDE THE LARGEST DIAMETER OF THE MANHOLE, ALL AROUND.
4. CONTACT MANHOLE MANUFACTURER FOR ADDITIONAL WALL THICKNESS REQUIRED AT MANHOLE DEPTHS GREATER THAN 15'-0".
5. MANHOLE SHALL BE RATED FOR H20 LOADING IN PAVEMENT OR AREAS SUBJECT TO VEHICULAR TRAFFIC.
6. LATERAL INVERTS SHALL BE NO MORE THAN 2'-0" ABOVE INVERT OUT. NO MORE THAN 3 LATERALS PER MANHOLE.

DEPARTMENT OF PUBLIC UTILITIES	CITY OF RICHMOND, VIRGINIA STANDARD PRECAST CONCRETE MANHOLE SEWERS 8" TO 24" NOT TO SCALE	REV. 12/09 M-1



NOTES:
1. SEE DETAIL M-5A FOR BASE DIAMETER REQUIREMENTS.
2. FOR SEWERS GREATER THAN 54", CONTACT DPU TECHNICAL SERVICES DIVISION FOR DETAIL.
3. EXCAVATION PAYLINE EXTENDS 6" OUTSIDE THE LARGEST DIAMETER OF THE MANHOLE, ALL AROUND.
4. CONTACT MANHOLE MANUFACTURER FOR ADDITIONAL WALL THICKNESS REQUIRED AT MANHOLE DEPTHS GREATER THAN 15'-0".
5. MANHOLE SHALL BE RATED FOR H20 LOADING IN PAVEMENT OR AREAS SUBJECT TO VEHICULAR TRAFFIC.
6. FLAT TOP CAN BE USED WHERE APPROVED BY DPU DEPUTY DIRECTOR OR DESIGNEE.
7. LATERAL INVERTS SHALL BE NO MORE THAN 2'-0" ABOVE INVERT OUT. NO MORE THAN 3 LATERALS PER MANHOLE.

DEPARTMENT OF PUBLIC UTILITIES	CITY OF RICHMOND, VIRGINIA STANDARD PRECAST CONCRETE MANHOLE SEWERS 27" TO 54" NOT TO SCALE	REV. 12/09 M-2

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________ 20__
3. Ordinance Number__________
4. Adopted__________
5. Accepted__________

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve FH ✧ •WV

Water Meter •WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM • •GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical		Administrative	
Surveys Superintendent			
Project Manager		Capital Project Administrator	
Maintenance Engineer		City Engineer	
City Traffic Engineer		Director of Public Works	

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

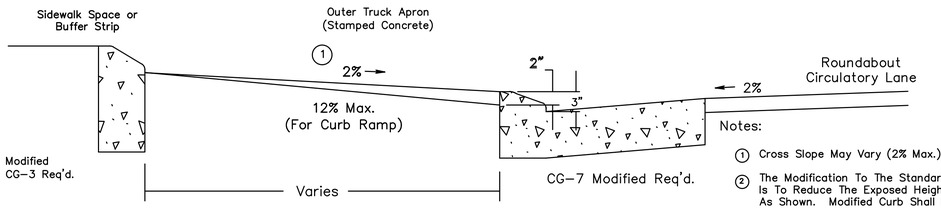
RK&K
Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
DETAIL SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE NO SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2B(1)	DRAWING NO. 0-28633

OUTER TRUCK APRON DETAIL



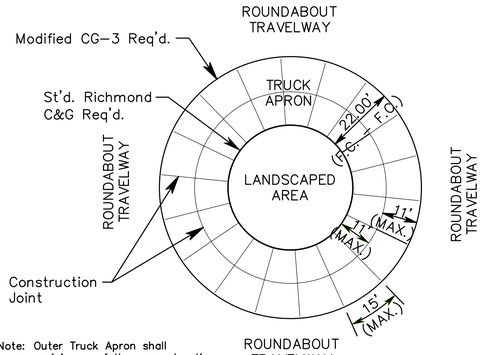
Outer Truck Apron Detail

(Not to Scale)

Notes:

1. Cross Slope May Vary (2% Max.)
2. The Modification To The Standard CG-7 Is To Reduce The Exposed Height of The Curb As Shown. Modified Curb Shall Be Paid For As Standard CG-7.
3. Outer Truck Apron shall have the same pavement design as Truck Apron at roundabout. See Typical Section at roundabout for Apron Pavement Design.

TRUCK APRON JOINT DETAIL

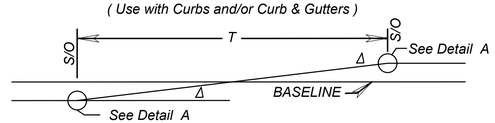


Note: Outer Truck Apron shall have a minimum of three construction joints evenly spaced. Detail for construction joints at Outer Truck Apron not shown.

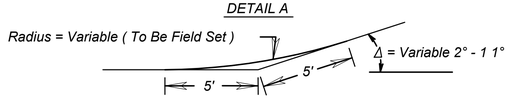
(Not To Scale)

TYPICAL STRAIGHT - LINE TAPER LANE

(Use with Curbs and/or Curb & Gutters)

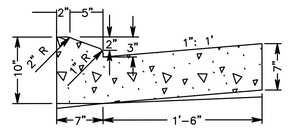


DETAIL A



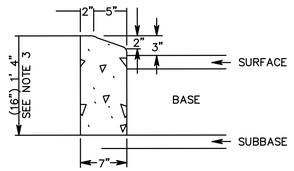
T - See plans for Length of T.

S/O - See plans for Stations and Offsets.



CG-7 Modified

(Not to Scale)



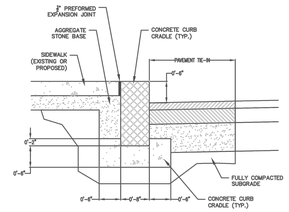
CG-3 Modified

(Not to Scale)

Notes:

1. This item may be precast or cast in place
2. Concrete to be Class A3 if cast in place, 4000psi if precast.
3. The depth of curb maybe reduced as much as 3" (13" depth) or increased as much as 3" (19" depth) in order that the bottom of the curb will coincide with the top of a course of the pavement substructure. Otherwise, the depth is to be 16" as shown. No adjustment in the price bid is to be made for a decrease or an increase in depth.
4. The Modification To The Standard CG-7/CG-3 Is To Reduce The Exposed Height of The Curb As Shown. Modified Curb Shall Be Paid For As Standard CG-7/CG-3 respectively.

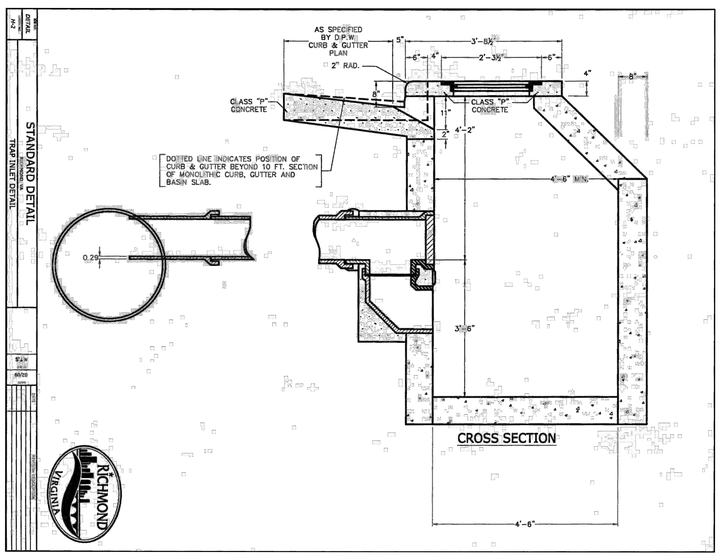
STANDARD GRAINTE CURB



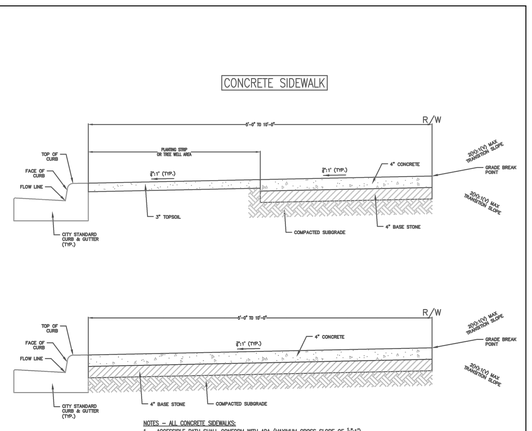
NOTES:
1. BRACE AND SUPPORT GRANITE CURB ON FINAL GRADE PRIOR TO POURING OF GRANITE CURB CRADLE.
2. GRANITE CURB REVEAL TO BE 6" OR TO MATCH ADJACENT EXISTING REVEAL.
3. GRANITE CURB WIDTH MAY VARY. GRANITE CURB TO MATCH ADJACENT EXISTING GRANITE CURB TO THE EXTENT PRACTICABLE. CONTRACTOR SHALL PROVIDE A SAMPLE FOR CITY REVIEW AND APPROVAL PRIOR TO INSTALLATION.
4. CONCRETE CURB CRADLE SHALL NOT EXCEED 2" UP THE SIDES OF THE GRANITE CURB.
5. CONCRETE SHALL CLASS A3 (MIN.), PER VDOT SPECIFICATIONS.
6. BASE STONE SHALL CONSIST OF AGGREGATE BASE MATERIAL 21A OR 21B. ALTERNATE BASE STONE MAY BE USED WITH APPROVAL OF THE ENGINEER.
7. PAVEMENT TIE-IN SHALL TO MEET MINIMUM CITY STANDARDS OR EXISTING PAVEMENT SECTION.

NOTES: 1. SUPERCEDES ALL PREVIOUS VERSIONS.		RICHMOND VIRGINIA	ROADWAY GEOMETRIC DETAILS GRANITE CURB DETAIL					
REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-07

STANDARD DETAIL TRAP INLET DETAIL

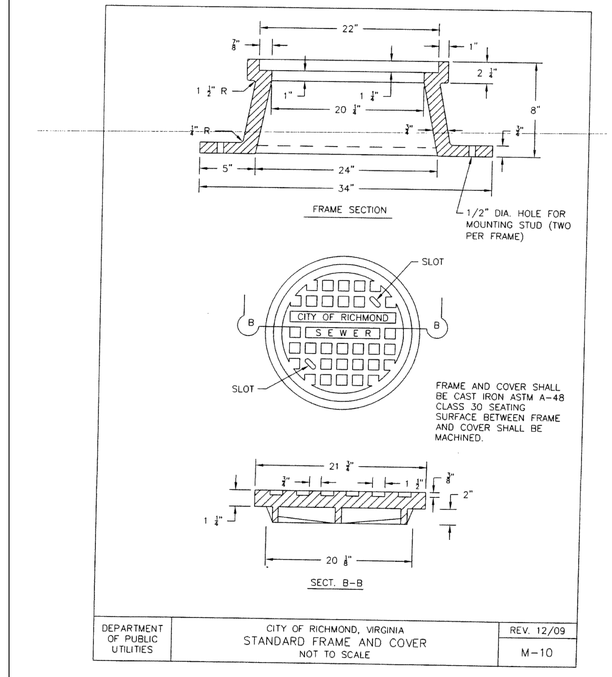


CONCRETE SIDEWALK



NOTES – ALL CONCRETE SIDEWALKS:
1. ACCESSIBLE PATH SHALL CONFORM WITH ADA (MAXIMUM CROSS SLOPE OF 2%↓).
2. PLANTING STRIPS, WHERE USED, SHALL BE A MINIMUM OF 3'.
3. TREE WELL DIMENSIONS ARE TYPICALLY 3'X5'. TREE WELL DIMENSIONS MAY VARY CONTINGENT ON AVAILABLE SPACE AND SELECTED TREE SPECIES.
4. SCORING PATTERN SHALL BE 5'X5' TYPICAL. 5'X5' ALTERNATE POUR PLACEMENT METHOD IS PERMISSIBLE. ALIGN ANY SCORING AND/OR JOINT PATTERNS WITH EXISTING ADJACENT CONCRETE SIDEWALK.
5. WELDED WIRE FABRIC OR STEEL REINFORCEMENT IS PROHIBITED UNLESS BY SPECIAL DESIGN AND CITY APPROVAL.
6. CONCRETE SHALL BE AIR ENTRAINED CLASS A3 (MIN.), PER VDOT SPECIFICATIONS.
7. BASE STONE SHALL CONSIST OF AGGREGATE BASE MATERIAL 21A OR 21B. ALTERNATE BASE STONE MAY BE USED WITH APPROVAL OF THE ENGINEER.

REFERENCES:	REVISIONS	NOTES: 1. SUPERCEDES ALL PREVIOUS VERSIONS.	ROADWAY GEOMETRIC DETAILS CONCRETE SIDEWALK					
		DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-04



DEPARTMENT OF PUBLIC UTILITIES	CITY OF RICHMOND, VIRGINIA STANDARD FRAME AND COVER NOT TO SCALE	REV. 12/09 M-10

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH ⊹ WV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

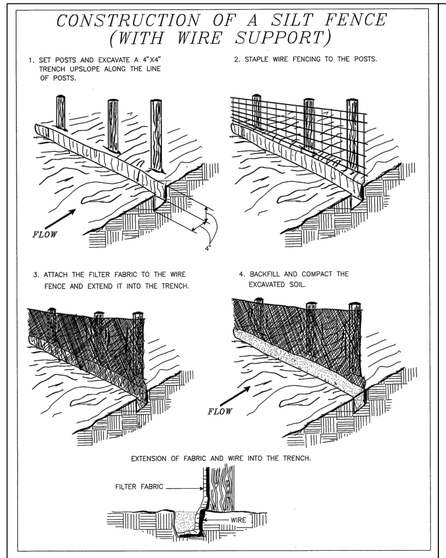
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

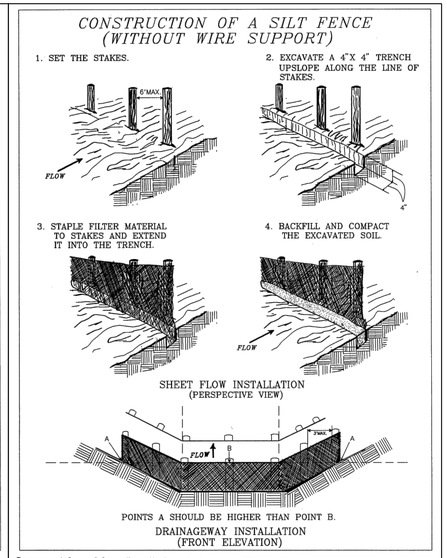
RK&K Responsive People • Creative Solutions

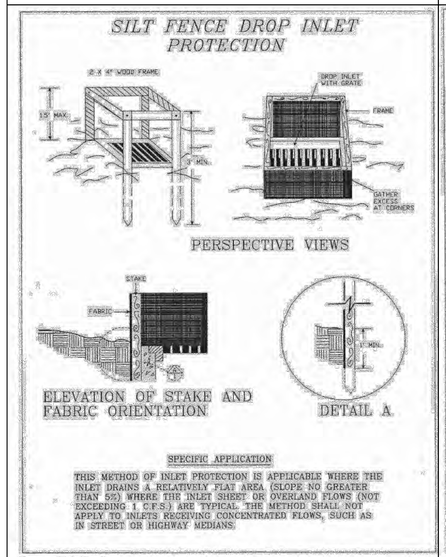
SHOCKOE VALLEY STREET IMPROVEMENTS
DETAIL SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: SEPTEMBER 2022	PROJECT SHEET 2B(2)	DRAWING NO. 0-28633







EROSION CONTROL NARRATIVE:

-SITE DESCRIPTION:
THE PROJECT IS LOCATED IN THE CITY OF RICHMOND. THIS PROJECT CONSISTS OF ROADWAY IMPROVEMENTS IN THE SHOCKOE BOTTOM AREA OF THE CITY ALONG OLIVER HILL WAY, E.BROAD STREET, VENABLE STREET, 18TH STREET AND MOSBY STREET. THE IMPROVEMENTS INCLUDE WIDENING, THE ADDITION OF BIKE LANES AND PARKING SPACES ALONG THE SIDE OF THE ROAD, AND FOUR ROUNDABOUTS TO IMPROVE TRAFFIC FLOW.

-EXISTING SITE CONDITIONS:
THE EXISTING SURFACE RUNOFF IN THE SITE AREA IS CONVEYED BY AN URBAN DRAINAGE SYSTEM TO A COMBINED SEWER SYSTEM.

- ADJACENT AREAS: THE SITE AREA IS LOCATED IN AN URBAN AREA IN SHOCKOE BOTTOM. MUCH OF THE ADJACENT OFFSITE AREAS FLOW INTO THE PROPOSED DRAINAGE SYSTEM. THE ULTIMATE OUTFALL OF THIS DRAINAGE SYSTEM IS THE EXISTING COMBINED SEWER SYSTEM.
NO ADJACENT AREAS DOWNSTREAM OF THE PROJECT ARE ANTICIPATED TO BE AFFECTED BY THE LAND DISTURBANCE.

-OFF-SITE AREAS:
NO OFF-SITE LAND DISTURBING ACTIVITIES ARE PROPOSED.

-SITE SOILS:
THE SITE AREA IS COMPRISED OF:

	ERODIBILITY	
- APPLING-URBAN LAND COMPLEX, 0 TO 4% SLOPES	HIGH	
- WATEREE-WEDOWEE COMPLEX, 20 TO 45% SLOPES	MED →	HIGH
- UDORTHENTS-DUMPS COMPLEX, PITS	MED →	HIGH
- URBAN LAND	LOW	

-CRITICAL AREAS:
PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION.THE EXISTING SOILS IN THE WORK AREAS ARE OF MODERATE TO HIGH ERODIBILITY.CONTRACTOR SHALL HAVE READY SEEDING AND EC-2 LINING MATERIAL FOR IMMEDIATE APPLICATION UPON COMPLETION OF DISTURBANCE ACTIVITIES.CONTRACTOR MUST ALSO MAINTAIN / INSPECT REGULARLY PERIMETER SILT FENCING IN ORDER TO PREVENT SILT / SEDIMENT FROM WASHING DOWNSTREAM DURING LAND DISTURBANCE.

-EROSION AND SEDIMENT CONTROL MEASURES:
SEE EROSION CONTROL PLAN SHEETS 2C(3)-2C(19) AND 2D(3)-2D(19) FOR LEGEND FOR SYMBOLS USED AND LOCATION OF PROPOSED E&S MEASURES.

-PERMANENT STABILIZATION:
THE SITE WILL BE PERMANENTLY STABILIZED UTILIZING SEEDING IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENTATION CONTROL HANDBOOK ONCE STORM DRAIN INSTALLATION IS COMPLETE (SEE SEEDING TABLES ON THIS SHEET). SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED PER MS-7.

-STORMWATER RUN-OFF CONTROL:
THE OVERALL DRAINAGE PATTERN OF THE SITE WILL REMAIN MOSTLY UNCHANGED FROM PRE- TO POST-CONDITIONS. DISTURB APPROXIMATELY 0.84 ACRES AND IS PARTIALLY LOCATED WITHIN A CBPA AREA. NO WATER QUALITY MEASURES ARE REQUIRED (SEE CBPA SHEET 2J(1)-2J(3)).

-CALCULATIONS:
CLOSED SYSTEM PROFILES AND CALCULATIONS CAN BE FOUND ON SHEET 2F(1)-2F(7) AND 2G(1)-2G(4).

-MAINTENANCE
IN GENERAL, ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH SIGNIFICANT RAINFALL. THE FOLLOWING ITEMS WILL BE CHECKED IN PARTICULAR:
1. INLET PROTECTION & GRAVEL OUTLETS WILL BE CHECKED REGULARLY FOR SEDIMENT BUILDUP WHICH WILL PREVENT DRAINAGE. IF INLET PROTECTION FABRIC IS CLOGGED BY SEDIMENT, IT SHALL BE REMOVED AND CLEANED OR REPLACED. IF GRAVEL OUTLET IS CLOGGED BY SEDIMENT, IT SHALL BE REMOVED AND CLEANED OR REPLACED.
2. THE SILT FENCE BARRIER WILL BE CHECKED REGULARLY FOR UNDERMINING OR DETERIORATION OF THE FABRIC. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL OF SEDIMENT DEPOSITION REACHES HALF WAY TO THE TOP OF THE BARRIER
3. THE SEEDED AREAS WILL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED AND RESEEDED AS NEEDED.

EROSION CONTROL SEQUENCE

1. ONCE RELEASED BY THE CITY OF RICHMOND FOR LAND DISTURBANCE PERMITS ISSUED TO PROJECT, CONTRACTOR SHALL INSTALL PERIMETER SILT FENCING ALONG DOWNSTREAM SIDE OF STORM DRAIN TRENCH AREA.
2. PROJECT PERMITS MUST BE STRICTLY COORDINATED WITH CITY OF RICHMOND DEPARTMENT OF PUBLIC UTILITIES.
3. DRAINAGE INLET PROTECTION AT EXISTING INLETS TO BE INSTALLED PER MS-10.
4. COMMENCE STORM DRAIN INSTALLATION WITH APPROPRIATE INLET PROTECTION.
5. THE STAGING AREAS SHALL BE WITHIN THE RIGHT-OF-WAY WITH NO SOIL STOCKPILING PROPOSED.
6. IF DUST BECOMES A PROBLEM DURING CONSTRUCTION, A WATER TRUCK WILL BE REQUIRED ON-SITE AT ALL TIMES. DUST MUST BE CONTROLLED IN ACCORDANCE WITH STD. & SPEC. DUST CONTROL, IN THE LATEST VERSION OF THE VA EROSION AND SEDIMENT CONTROL HANDBOOK.
7. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN 7 DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN 7 DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.
8. ON-SITE STORM SYSTEM TO BE CLEANED.
9. ALL EROSION CONTROL MEASURES MUST BE INSTALLED AND MAINTAINED PER THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL MANUAL.
10. EROSION & SEDIMENT CONTROL MEASURES MAY BE REMOVED ONLY UPON THE APPROVAL OF THE CITY'S E&S INSPECTOR.

<u>MINIMUM STANDARDS (9VAC25-840-40)</u>

MS-1: PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.

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

MS-3: A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION.

MS-4: SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.

MS-5: STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.

MS-6: SEDIMENT TRAPS AND SEDIMENT BASINS SHALL BE DESIGNED AND CONSTRUCTED BASED UPON THE TOTAL DRAINAGE AREA TO BE SERVED BY THE TRAP OR BASIN.
- a. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT TRAP SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA AND THE TRAP SHALL ONLY CONTROL DRAINAGE AREAS LESS THAN THREE ACRES.
- b. SURFACE RUNOFF FROM DISTURBED AREAS THAT IS COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO THREE ACRES SHALL BE CONTROLLED BY A SEDIMENT BASIN. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT BASIN SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA. THE OUTFALL SYSTEM SHALL, AT A MINIMUM, MAINTAIN THE STRUCTURAL INTEGRITY OF THE BASIN DURING A 25-YEAR STORM OF 24-HOUR DURATION. RUNOFF COEFFICIENTS USED IN RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.

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

MS-8: CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.
- c. MS-9: WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.

MS-10: ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.

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

MS-12: WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NONERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS.

MS-13: WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY SIX-MONTH PERIOD, A TEMPORARY VEHICULAR STREAM CROSSING CONSTRUCTED OF NONERODIBLE MATERIAL SHALL BE PROVIDED.

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

MS-15: THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.

MS-16: UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:
- a. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
- b. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
- c. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY.
- d. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.
- e. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THIS CHAPTER.
- f. APPLICABLE SAFETY REQUIREMENTS SHALL BE COMPLIED WITH.

MS-17: WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED OR PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL DEVELOPMENT LOTS AS WELL AS TO LARGER LAND-DISTURBING ACTIVITIES.

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

MS-19: PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY AND PEAK FLOW RATE OF STORMWATER RUNOFF FOR THE STATED FREQUENCY STORM OF 24-HOUR DURATION IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CRITERIA. STREAM RESTORATION AND RELOCATION PROJECTS THAT INCORPORATE NATURAL CHANNEL DESIGN CONCEPTS ARE NOT MAN-MADE CHANNELS AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS:

CITY OF RICHMOND - STANDARD EROSION CONTROL NOTES

1. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.
2. EXCESS EXCAVATION DISPOSED OF OFF THE SITE SHALL BE DISPOSED OF IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
3. EROSION AND SEDIMENT CONTROLS SHALL BE INSTALLED IN ACCORDANCE WITH VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND SHALL BE PLACED PRIOR TO OR AS THE FIRST STEP OF THE LAND DISTURBING ACTIVITY.
4. EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED SO THAT THE SEDIMENT CARRYING RUNOFF FROM THE SITE WILL NOT ENTER STORM DRAINAGE FACILITIES.
5. EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED UNTIL THE DISTURBED AREA IS STABILIZED.
6. PROPERTIES ADJOINING THE SITE SHALL BE KEPT CLEAN OF MUD OR SILT CARRIED FROM THE SITE BY VEHICULAR TRAFFIC OR RUNOFF.
7. THE DISPOSAL OF WASTE MATERIALS REMOVED FROM EROSION AND SEDIMENT CONTROL FACILITIES AND THE DISPOSAL OF THESE FACILITIES SHALL BE IN ACCORDANCE WITH THE VIRGINIA EROSION SEDIMENT CONTROL HANDBOOK.
8. STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.
9. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.

GENERAL E&S CONTROL NOTES

1. ES-1: UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE <u>VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK</u> AND THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS 9VAC25-840.
2. ES-2: THE PLAN APPROVING AUTHORITY MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRE-CONSTURCTION CONFERENCE, ON WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.
3. ES-3: ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.
4. ES-4: A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
5. ES-5: PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICTED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.
6. ES-6: THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE PLAN APPROVING AUTHORITY.
7. ES-7: ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
8. ES-8: DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.
9. ES-9: THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

a. CONCENTRATED STORMWATER RUNOFF LEAVING A DEVELOPMENT SITE SHALL BE DISCHARGED DIRECTLY INTO AN ADEQUATE NATURAL OR MAN-MADE RECEIVING CHANNEL, PIPE OR STORM SEWER SYSTEM. FOR THOSE SITES WHERE RUNOFF IS DISCHARGED INTO A PIPE OR PIPE SYSTEM, DOWNSTREAM STABILITY ANALYSES AT THE OUTFALL OF THE PIPE OR PIPE SYSTEM SHALL BE PERFORMED.

b. ADEQUACY OF ALL CHANNELS AND PIPES SHALL BE VERIFIED IN THE FOLLOWING MANNER:
- 1) THE APPLICANT SHALL DEMONSTRATE THAT THE TOTAL DRAINAGE AREA TO THE POINT OF ANALYSIS WITHIN THE CHANNEL IS 100 TIMES GREATER THAN THE CONTRIBUTING DRAINAGE AREA OF THE PROJECT IN QUESTION; OR
- 2) (a) NATURAL CHANNELS SHALL BE ANALYZED BY THE USE OF A TWO-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP CHANNEL BANKS NOR CAUSE EROSION OF CHANNEL BED OR BANKS.
  - (b) ALL PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS SHALL BE ANALYZED BY THE USE OF A 10-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP ITS BANKS AND BY THE USE OF A TWO-YEAR STORM TO DEMONSTRATE THAT STORMWATER WILL NOT CAUSE EROSION OF CHANNEL BED OR BANKS; AND
  - (c) PIPES AND STORM SEWER SYSTEMS SHALL BE ANALYZED BY THE USE OF A 10-YEAR STORM TO VERIFY THAT STORMWATER WILL BE CONTAINED WITHIN THE PIPE OR SYSTEM.

c. IF EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL:
- 1) IMPROVE THE CHANNELS TO A CONDITION WHERE A 10-YEAR STORM WILL NOT OVERTOP THE BANKS AND A TWO-YEAR STORM WILL NOT CAUSE EROSION TO THE CHANNEL, THE BED, OR THE BANKS; OR
- 2) IMPROVE THE PIPE OR PIPE SYSTEM TO A CONDITION WHERE THE 10-YEAR STORM IS CONTAINED WITHIN THE APPURTENANCES;
- 3) DEVELOP A SITE DESIGN THAT WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TWO-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A NATURAL CHANNEL OR WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A 10-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A MAN-MADE CHANNEL; OR
- 4) PROVIDE A COMBINATION OF CHANNEL IMPROVEMENT, STORMWATER DETENTION OR OTHER MEASURES WHICH IS SATISFACTORY TO THE VESCP AUTHORITY TO PREVENT DOWNSTREAM EROSION.

d. THE APPLICANT SHALL PROVIDE EVIDENCE OF PERMISSION TO MAKE THE IMPROVEMENTS.

e. ALL HYDROLOGIC ANALYSES SHALL BE BASED ON THE EXISTING WATERSHED CHARACTERISTICS AND THE ULTIMATE DEVELOPMENT CONDITION OF THE SUBJECT PROJECT.

f. IF THE APPLICANT CHOOSES AN OPTION THAT INCLUDES STORMWATER DETENTION, HE SHALL OBTAIN APPROVAL FROM THE VESCP OF A PLAN FOR MAINTENANCE OF THE DETENTION FACILITIES. THE PLAN SHALL SET FORTH THE MAINTENANCE REQUIREMENTS OF THE FACILITY AND THE PERSON RESPONSIBLE FOR PERFORMING THE MAINTENANCE.

g. OUTFALL FROM A DETENTION FACILITY SHALL BE DISCHARGED TO A RECEIVING CHANNEL, AND ENERGY DISSIPATORS SHALL BE PLACED AT THE OUTFALL OF ALL DETENTION FACILITIES AS NECESSARY TO PROVIDE A STABILIZED TRANSITION FROM THE FACILITY TO THE RECEIVING CHANNEL.

h. ALL ON-SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE.

i. INCREASED VOLUMES OF SHEET FLOWS THAT MAY CAUSE EROSION OR SEDIMENTATION ON ADJACENT PROPERTY SHALL BE DIVERTED TO A STABLE OUTLET, ADEQUATE CHANNEL, PIPE OR PIPE SYSTEM, OR TO A DETENTION FACILITY.

j. IN APPLYING THESE STORMWATER MANAGEMENT CRITERIA, INDIVIDUAL LOTS OR PARCELS IN A RESIDENTIAL, COMMERCIAL OR INDUSTRIAL DEVELOPMENT SHALL NOT BE CONSIDERED TO BE SEPARATE DEVELOPMENT PROJECTS. INSTEAD, THE DEVELOPMENT, AS A WHOLE, SHALL BE CONSIDERED TO BE A SINGLE DEVELOPMENT PROJECT. HYDROLOGIC PARAMETERS THAT REFLECT THE ULTIMATE DEVELOPMENT CONDITION SHALL BE USED IN ALL ENGINEERING CALCULATIONS.

k. ALL MEASURES USED TO PROTECT PROPERTIES AND WATERWAYS SHALL BE EMPLOYED IN A MANNER WHICH MINIMIZES IMPACTS ON THE PHYSICAL, CHEMICAL AND BIOLOGICAL INTEGRITY OF RIVERS, STREAMS AND OTHER WATERS OF THE STATE.

l. ANY PLAN APPROVED PRIOR TO JULY 1, 2014, THAT PROVIDES FOR STORMWATER MANAGEMENT THAT ADDRESSES ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS SHALL SATISFY THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS IF THE PRACTICES ARE DESIGNED TO (I) DETAIN THE WATER QUALITY VOLUME AND TO RELEASE IT OVER 48 HOURS; (II) DETAIN AND RELEASE OVER A 24-HOUR PERIOD THE EXPECTED RAINFALL RESULTING FROM THE ONE YEAR, 24-HOUR STORM; AND (III) REDUCE THE ALLOWABLE PEAK FLOW RATE RESULTING FROM THE 1.5, 2, AND 10-YEAR, 24-HOUR STORMS TO A LEVEL THAT IS LESS THAN OR EQUAL TO THE PEAK FLOW RATE FROM THE SITE ASSUMING IT WAS IN A GOOD FORESTED CONDITION, ACHIEVED THROUGH MULTIPLICATION OF THE FORESTED PEAK FLOW RATE BY A REDUCTION FACTOR THAT IS EQUAL TO THE RUNOFF VOLUME FROM THE SITE WHEN IT WAS IN A GOOD FORESTED CONDITION DIVIDED BY THE RUNOFF VOLUME FROM THE SITE IN ITS PROPOSED CONDITION, AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS AS DEFINED IN ANY REGULATIONS PROMULGATED PURSUANT TO § 62.1-44.15:54 OR 62.1-44.15:65 OF THE ACT.

m. FOR PLANS APPROVED ON AND AFTER JULY 1, 2014, THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS OF § 62.1-44.15:52 A OF THE ACT AND THIS SUBSECTION SHALL BE SATISFIED BY COMPLIANCE WITH WATER QUANTITY REQUIREMENTS IN THE STORMWATER MANAGEMENT ACT (§ 62.1-44.15:24 ET SEQ. OF THE CODE OF VIRGINIA) AND ATTENDANT REGULATIONS, UNLESS SUCH LAND-DISTURBING ACTIVITIES (I) ARE IN ACCORDANCE WITH PROVISIONS FOR TIME LIMITS ON APPLICABILITY OF APPROVED DESIGN CRITERIA IN 9VAC25-870-47 OR GRANDFATHERING IN 9VAC25-870-48 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) REGULATION, IN WHICH CASE THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS OF § 62.1-44.15:52 A OF THE ACT SHALL APPLY, OR (II) ARE EXEMPT PURSUANT TO § 62.1-44.15:34 C 7 OF THE ACT.

n. COMPLIANCE WITH THE WATER QUANTITY MINIMUM STANDARDS SET OUT IN 9VAC25-870-66 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) REGULATION SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF THIS SUBDIVISION 19.

SILT FENCE NOTES

SILT FENCE AND FILTER FABRIC MUST BE ENTRENCHED.

POSTS FOR SILT FENCES SHALL BE EITHER 2 INCH DIAMETER OAK, 4 INCH DIAMETER PINE OR 1.33 POUNDS PER LINEAR FOOT STEEL. POSTS WILL BE A MINIMUM OF 5 FEET IN LENGTH. STEEL POSTS SHALL HAVE PROJECTIONS FOR FASTENING WIRE TO THEM. WIRE FENCE REINFORCEMENT FOR SILT FENCES USING STANDARD STRENGTH FILTER CLOTH SHALL BE A MINIMUM OF 42 INCHES IN HEIGHT, A MINIMUM OF 14 GAUGE AND SHALL HAVE A MAXIMUM MESH SPACING OF 6 INCHES. POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MIN. OF 12 INCHES WHEN EXTRA STRENGTH FABRIC IS USED. WITHOUT THE WIRE SUPPORT FENCE, POST SHALL NOT EXCEED 6 FEET. WHEN EXTRA STRENGTH FILTER FABRIC AND CLOSER POST SPACING ARE USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POST. SEDIMENT MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED. UNDER NO CIRCUMSTANCES SHOULD SILT FENCE BE INSTALLED IN LIVE STREAMS.
SILT FENCE SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.

CONSTRUCTION OF A SILT FENCE (WITH WIRE SUPPORT)

Source: Adapted from <u>Installation of Straw and Fabric Filter Barriers for Sediment Control</u>, Sherwood and Wyant
Plate 3.05-1

CONSTRUCTION OF A SILT FENCE (WITHOUT WIRE SUPPORT)

Source: Adapted from <u>Installation of Straw and Fabric Filter Barriers for Sediment Control</u>, Sherwood and Wyant
Plate 3.05-2

SILT FENCE DROP INLET PROTECTION

SPECIFIC APPLICATION

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

Source: N.C. <u>Erosion and Sediment Control Planning and Design Manual</u>, 1988
Plate 3.07-1

GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCENTRATED FLOWS ARE EXPECTED, BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

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

Source: Va. DSWC
Plate 3.07-2

LANDSCAPING:
LANDSCAPING SHALL BE SHOWN ON FUTURE SUBMISSIONS

TREE PROTECTION

CONSTRUCTION OPERATIONS RELATIVE TO THE LOCATION OF PROTECTED TREES

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number__________
4. Adopted__________
5. Accepted__________

REFERENCES
REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve FH WV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
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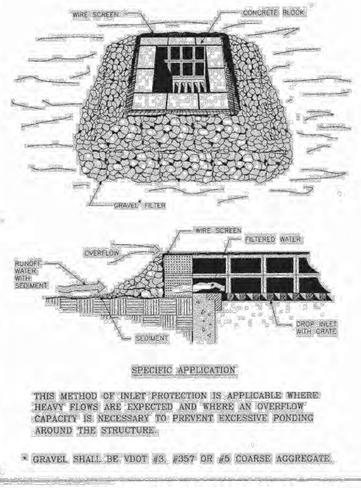
SHOCKOE VALLEY STREET IMPROVEMENTS
EROSION & SEDIMENT CONTROL PLAN NOTES

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2C(1)	DRAWING NO. 0-28633

BLOCK AND GRAVEL DROP INLET SEDIMENT FILTER



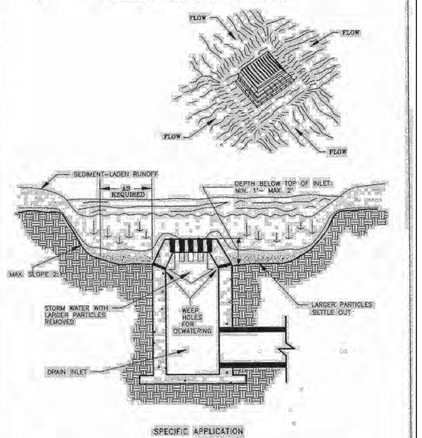
SPECIFIC APPLICATION

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

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

Source: Va. DSWC — Plate 3.07-3

EXCAVATED DROP INLET SEDIMENT TRAP



SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPABILITY AND EASE OF MAINTENANCE ARE DESIRABLE.

Source: Michigan Soil Erosion and Sediment Control Guidebook, 1975, and USDA-SCS — Plate 3.07-4

LIME AND FERTILIZER

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

UNDER UNUSUAL CONDITIONS WHERE IT IS NOT POSSIBLE TO OBTAIN A SOIL TEST, THE FOLLOWING SOIL AMENDMENTS WILL BE APPLIED:

LIME:
COASTAL PLAIN:
2 TONS/ACRE PULVERIZED AGRICULTURAL GRADE LIMESTONE (90 LBS./1000SQ.FT.)

PIEDMONT AND APPALACHIAN REGION:
2 TONS/ACRE PULVERIZED AGRICULTURAL GRADE LIMESTONE (90 LBS./1000 SQ.FT.)

NOTE: AN AGRICULTURAL GRADE OF LIMESTONE SHOULD ALWAYS BE USED.

FERTILIZER:
MIXED GRASSES AND LEGUMES:
500 LBS/ACRE 10-20-10 (12 LBS./1000 SQ. FT.)

GRASS STANDS ONLY:
500 LBS/ACRE 10-20-10 (12 LBS./1000 SQ. FT.)

OTHER FERTILIZER FORMULATIONS, INCLUDING SLOW-RELEASE SOURCES OF NITROGEN (PREFERRED FROM A WATER QUALITY STANDPOINT), MAY BE USED PROVIDED THEY CAN SUPPLY THE SAME AMOUNTS AND PROPORTIONS OF PLANT NUTRIENTS.

INCORPORATION: LIME AND FERTILIZER SHALL BE INCORPORATED INTO THE TOP 4-6 INCHES OF THE SOIL BY DISCING OR OTHER MEANS WHENEVER POSSIBLE. FOR EROSION CONTROL, WHEN APPLYING LIME AND FERTILIZER WITH A HYDROSEEDER, APPLY TO A ROUGH, LOOSE SURFACE.
NOTE:
SEEDING, MULCHING, LIMING, AND FERTILIZER PER VIRGINIA EROSION AND SEDIMENT MANUAL. FINAL DETAILS FOR FINISHED LANDSCAPING SPECIFICATIONS TO APPLY IF EQUAL OR GREATER.

LIMING REQUIREMENTS FOR TEMPORARY SITES

Agricultural Limestone	Recommended Application of Agricultural Limestone
Below 4.2	3 tons per acre
4.2 to 5.2	2 tons per acre
5.2 to 6	1 ton per acre

Source: VA SWCC

TABLE 3.32-D
(Revised June 2003)
PERMANENT SEEDING SPECIFICATIONS FOR PIEDMONT AREA

LAND USE	SEED[1] SPECIES	APPLICATION PER ACRE
Minimum Care Lawn (Commercial or Residential)	Tall Fescue[1] Perennial Ryegrass Kentucky Bluegrass[1]	95-100% 0-5% 0-5% TOTAL: 175-200 lbs.
High-Maintenance Lawn	Tall Fescue[1]	TOTAL: 200-250 lbs.
General Slope (3:1 or less)	Tall Fescue[1] Red Top Grass or Creeping Red Fescue Seasonal Nurse Crop[2]	128 lbs. 2 lbs. 20 lbs. TOTAL: 150 lbs.
Low-Maintenance Slope (Steeper than 3:1)	Tall Fescue[1] Red Top Grass or Creeping Red Fescue Seasonal Nurse Crop[2] Crownvetch[3]	108 lbs. 2 lbs. 20 lbs. 20 lbs. TOTAL: 150 lbs.

1 - When selecting varieties of turfgrass, use the Virginia Crop Improvement Association (VCIA) recommended turfgrass variety list. Quality seed will bear a label indicating that they are approved by VCIA. A current turfgrass variety list is available at the local County Extension office or through VCIA at 804-746-4884 or at http://sudan.cses.vt.edu/html/Turf/turf/publications/publications2.html

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

February 16th - April	Annual Rye
May 1st - August 15th	Foxtail Millet
August 16th - October	Annual Rye
November - February 15th	Winter Rye

3 - Substitute Sericea lespedeza for Crownvetch east of Farmville, VA (May through September use hulled seed, all other periods, use unhulled Sericea). If Flatpea is used, increase rate to 30 lbs./acre. If Weeping Lovegrass is used, include in any slope or low maintenance mixture during warmer seeding periods, increase to 30 -40

FERTILIZER & LIME

- Apply 10-20-10 **fertilizer** at a rate of **500** lbs. / acre (or 12 lbs. / 1,000 sq. ft.)
- Apply **Pulverized Agricultural Limestone** at a rate of 2 tons/acre (or 90 lbs. / 1,000 sq. ft.)

NOTE:
- A soil test is necessary to determine the actual amount of lime required to adjust the soil pH of site.
- Incorporate the lime and fertilizer into the top 4 – 6 inches of the soil by disking or by other means.
- When applying Slowly Available Nitrogen, use rates available in Erosion & Sediment Control Technical Bulletin # 4, 2003 Nutrient Management for Development Sites at http://www.dcr.state.va.us/sw/e&s.htm#pubs

TABLE 3.31-B
(Revised June 2003)
TEMPORARY SEEDING SPECIFICATIONS
QUICK REFERENCE FOR ALL REGIONS

APPLICATION DATES	SEED SPECIES	APPLICATION RATES
Sept. 1 - Feb. 15	50/50 Mix of Annual Ryegrass (lolium multi-florum) & Cereal (Winter) Rye (Secale cereale)	50 -100 (lbs/acre)
Feb. 16 - Apr. 30	Annual Ryegrass (lolium multi-florum)	60 - 100 (lbs/acre)
May 1 - Aug. 31	German Millet	50 (lbs/acre)

FERTILIZER & LIME

- Apply 10-10-10 **fertilizer** at a rate of 450 lbs. / acre (or 10 lbs. / 1,000 sq. ft.)
- Apply **Pulverized Agricultural Limestone** at a rate of 2 tons/acre (or 90 lbs. / 1,000 sq. ft.)

NOTE:
1 - A soil test is necessary to determine the actual amount of lime required to adjust the soil pH of site.
2 - Incorporate the lime and fertilizer into the top 4 – 6 inches of the soil by disking or by other means.
3 - When applying Slowly Available Nitrogen, use rates available in Erosion & Sediment Control Technical Bulletin # 4, 2003 Nutrient Management for Development Sites at http://www.dcr.state.va.us/sw/e&s.htm#pubs

SEEDING NOTES

All stabilization/seeding will be accomplished in accordance with the Virginia Erosion and Sedimentation Control Handbook.

Any disturbed area not paved, sodded, or built upon, will have a vegetative cover prior to final inspection, and in the opion of the Environmental Engineer, will be mature enough to control soil erosion satisfactorily and survive severe weather conditions.

Stream diversion areas, waterways, banks and related areas will be seeded and mulched immediately after work in watercourse is completed. In no case shall wetland areas be reseeded with any species of fescue.

Winterization - any disturbed area not paved, sodded or built upon by October 15 is to be seeded and mulched on that date unless waived by the Environmental Engineer.

Temporary seeding will be applied within 7 days to denuded areas which may not be at final grade but will remain dormant (undisturbed) for longer than 30 days. For temporary seeding use 50% of the recommended rates of fertilizer, lime and full amount of seed and mulch required for regular seeding.

Electric power, telephone, and gas supply trenches are to be compacted, seed and mulched within 7 days after backfill.

All temporary earth berms, diversions, and silt dams are to be mulched and seeded for vegetative cover immediately after grading. Straw or hay mulch is required. The same applies to all stockpiles, on site as well as soil (intentionally) transported from the project site.

TEMPORARY SEEDING PLANT MATERIALS, SEEDING RATES, AND DATES

SPECIES	SEEDING RATE		NORTH |Sa			SOUTH |Sb			PLANT CHARACTERISTICS
			3/1 to 4/30	5/1 to 8/15	8/15 to 11/1	2/15 to 4/30	5/1 to 9/1	9/1 to 11/15	
OATS (Avena sativa)	3 bu. (up to 100 lbs. not less than 50 lbs.)	2 lbs.	X	–	–	X	–	–	Use spring varieties (e.g., Noble).
RYE|Sd (Secale cereale)	2 bu. (up to 110 lbs. not less than 50 lbs.)	2.5 lbs	X	–	X	X	–	X	Use for late fall seedings, winter cover. Tolerates cold and low moisture.
GERMAN MILLET (Setaria italica)	50 lbs.	approx. 1 lb.	–	X	–	–	X	–	May be added in mixes. Will mow out of most stands.
ANNUAL RYEGRASS|sc (Lolium multi–florum)	60 lbs.	1½ lbs.	X	–	X	X	–	X	ANNUAL RYEGRASS|sc (Lolium multi–florum)
WEEPING LOVEGRASS (Eragrostis curvula)	15 lbs.	5½ ozs.	–	X	–	–	X	–	Warm–season perennial. May bunch. Tolerates hot, dry slopes and acid, infertile soils. May be added to mixes.
KOREAN LESPEDEZA|Sc (Lespedeza stipulacea)	25 lbs.	approx. ½ lbs.	X	X	–	X	X	–	Warm season annual legume. Tolerates acid soils. May be added to mixes.

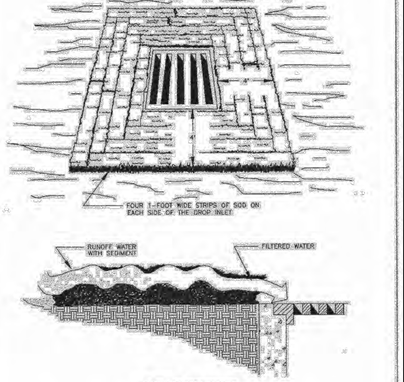
a Northern Piedmont and Mountain region. See Plates 3.22–1 and 3.22–2.
b Southern Piemond and Coastal Plain.
c May be used as a cover crop with spring seeding.
d May be Used as a cover crop with fall seeding.
X May be planted between these dates.
– May not be planeted between these dates.

ORGANIC MULCH MATERIALS AND APPLICATION RATES

MULCHES	RATES Per Acre	Per 1000 sq.ft.	NOTES
Straw or Hay	1½ – 2 tons (Minimum 2 tons for over winter cover)	70–90 lbs.	Free from weeds and coarse matter. Must be anchored. Spread with mulch blower or by hand.
Fiber Mulch	Minimum 1500 lbs	35 lbs.	Do not use as mulch for winter cover or during hot, dry periods. * Apply as slurry
Corn Stalks	4–6 tons	185–275 lbs.	Cut or shedded in 4–6" lengths. Air–dried. Do not use in fine turf areas. Apply with mulch blower or by hand.
Wood Chips	4–6 tons	185–275 lbs.	Free of coarse matter. Air–dried. Treat with 12 lbs nitrogen per ton. Do not use in fine turf areas. Apply with mulch blower, chip handler, or by hand.
Bark Chips Or Shredded Bark	50–70 cu. Yds.	1–2 cu. Yds.	Free of coarse matter. Air–dried. Do not use in fine turf areas. Apply with mulch blower, chip handler, or by hand.

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

SOD DROP INLET SEDIMENT FILTER

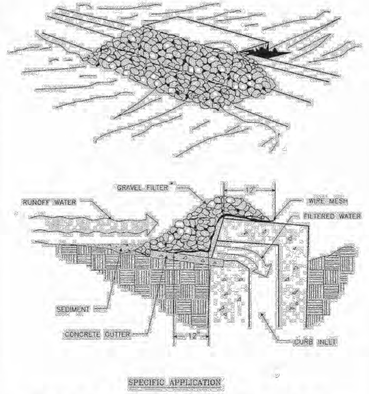


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE ONLY AT THE TIME OF PERMANENT SEEDING, TO PROTECT THE INLET FROM SEDIMENT AND MULCH MATERIAL UNTIL PERMANENT VEGETATION HAS BECOME ESTABLISHED.

Source: Va. DSWC — Plate 3.07-5

GRAVEL CURB INLET SEDIMENT FILTER



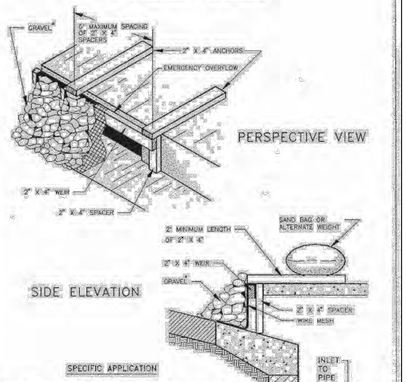
SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE PONDING IN FRONT OF THE STRUCTURE IS NOT LIKELY TO CAUSE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

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

Source: Va. DSWC — Plate 3.07-6

CURB INLET PROTECTION WITH 2-INCH X 4-INCH WOODEN WEIR



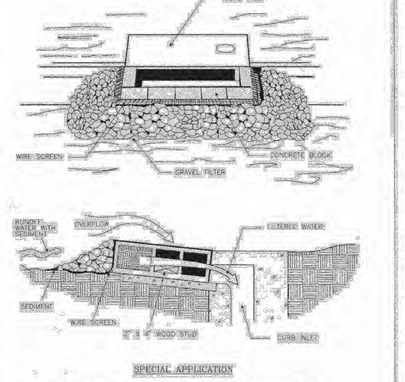
SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE TO CURB INLETS WHERE A STURDY, COMPACT INSTALLATION IS DESIRED. EMERGENCY OVERFLOW CAPABILITIES ARE MINIMAL, SO EXPECT SIGNIFICANT PONDING WITH THIS MEASURE.

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

Source: 1983 Maryland Standards and Specifications for Soil Erosion and Sediment Control, and USDA-SCS — Plate 3.07-7

BLOCK & GRAVEL CURB INLET SEDIMENT FILTER



SPECIAL APPLICATION

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

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

Source: Va. DSWC — Plate 3.07-8

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

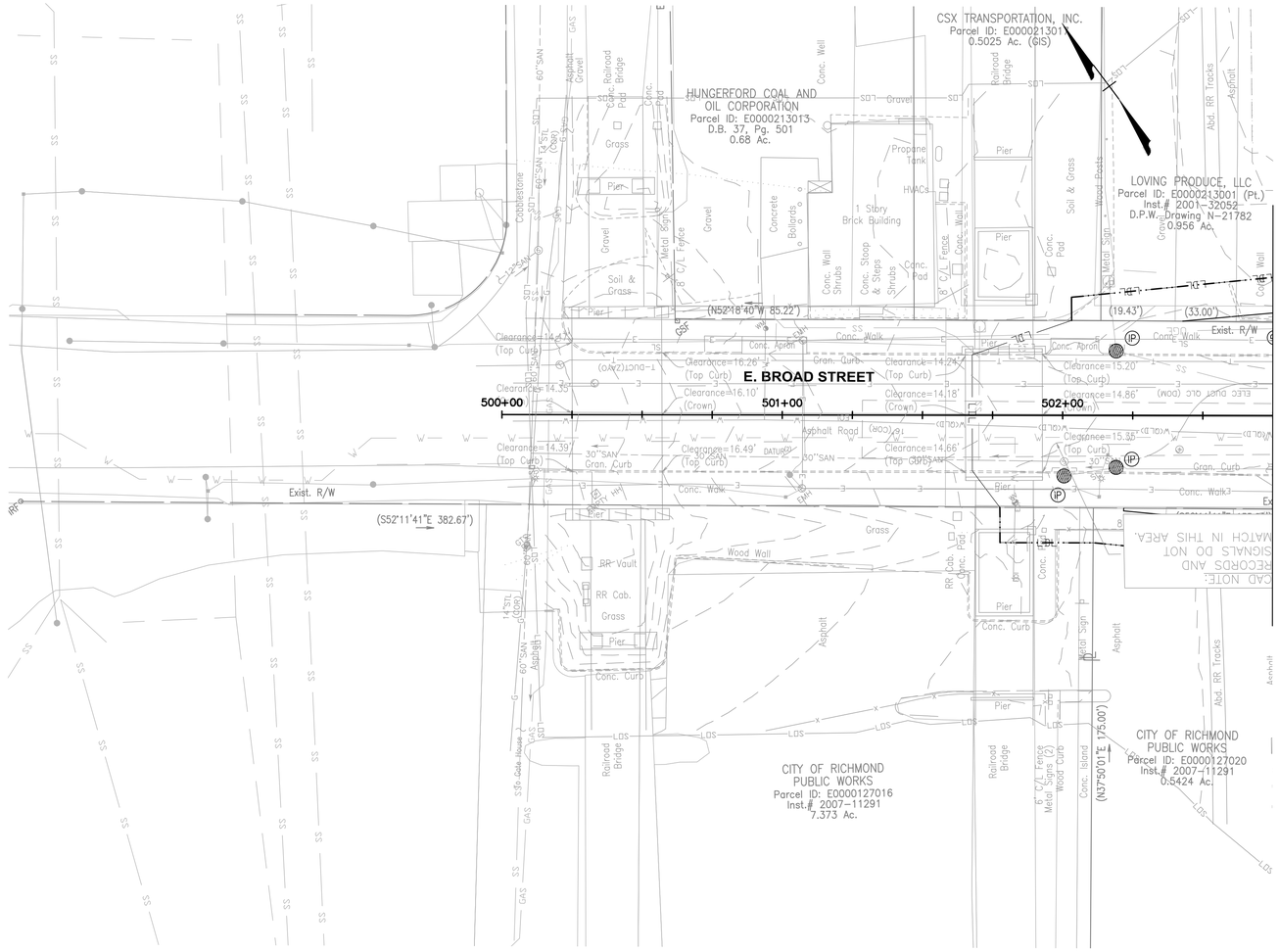
RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
EROSION & SEDIMENT CONTROL PLAN DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		0-28633
CHECKED BY: ASamberg					SHEET 2C(2)	

EROSION & SEDIMENT CONTROL PLAN – PHASE I



EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL — LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)
- (MU) TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992.[3]

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (S) or (S)
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

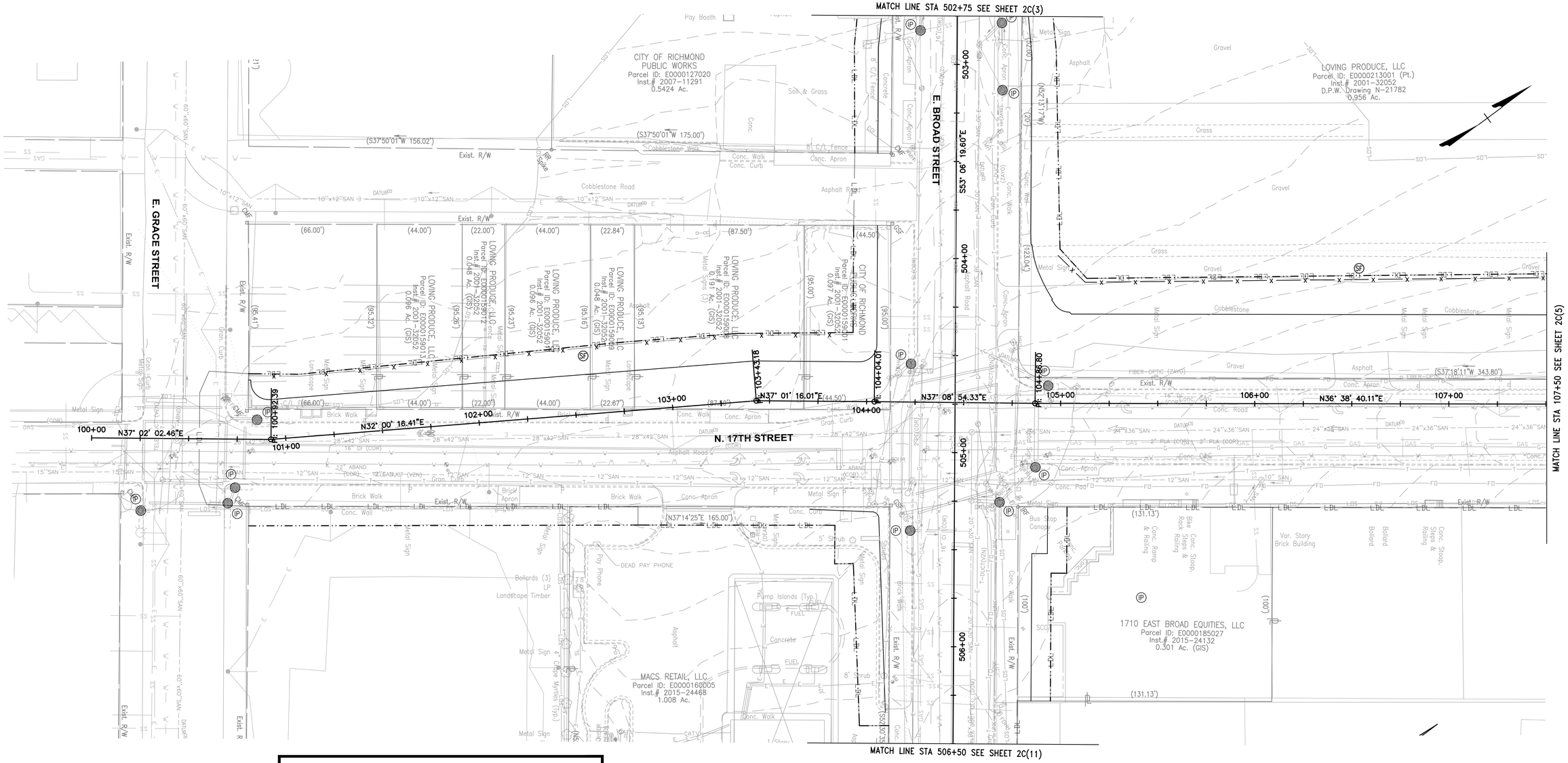
RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
EROSION & SEDIMENT CONTROL PLAN

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2C(3)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I



EROSION CONTROL LEGEND:

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- LDL — LIMITS OF DISTRUBANCE LINE
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FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992.

E & S QUANTITIES*:

EA	INLET PROTECTION	SY	TEMPORARY SEEDING
LF	SILT FENCE	SY	MULCHING
SY	PERMANENT SEEDING	TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer, Sanitary Sewer (Gravity), Gas Line, Electric Line, Overhead Utility, Telephone/Telegraph, Water Line, Property Line, Storm Basin, Storm or Sanitary Manhole, Fire Hydrant / Valve

Proposed Legend
Sanitary Sewer, Storm Sewer, Storm/(San) Manhole, Basin, Curb Cut Ramp, Decorative Light, Conduit, Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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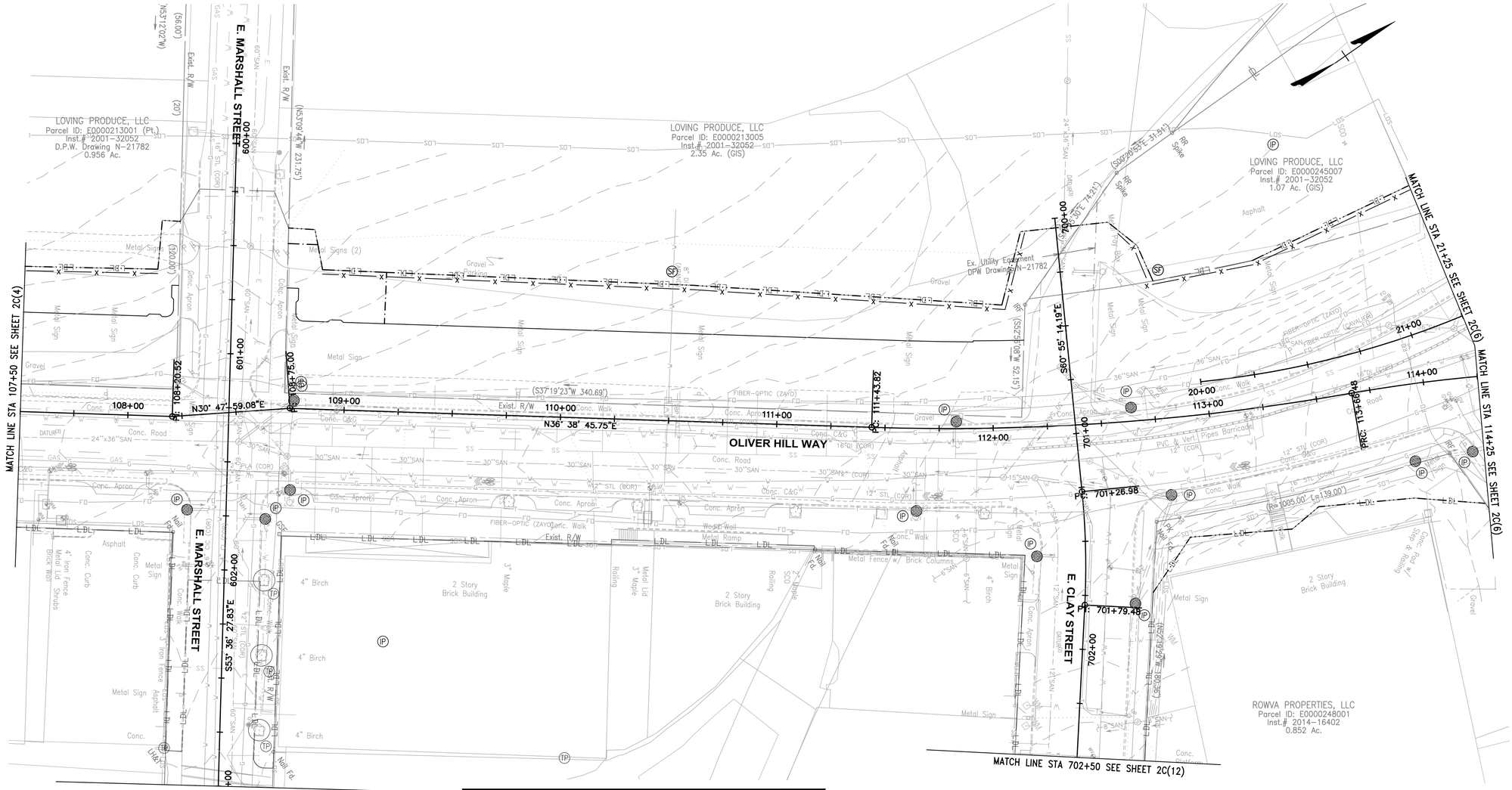
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2C(4)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I



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- (ML) MULCHING (STD. & SPEC. 3.35)
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SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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Property Line
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Storm or Sanitary Manhole (S) or (S)
Fire Hydrant / Valve FH WV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

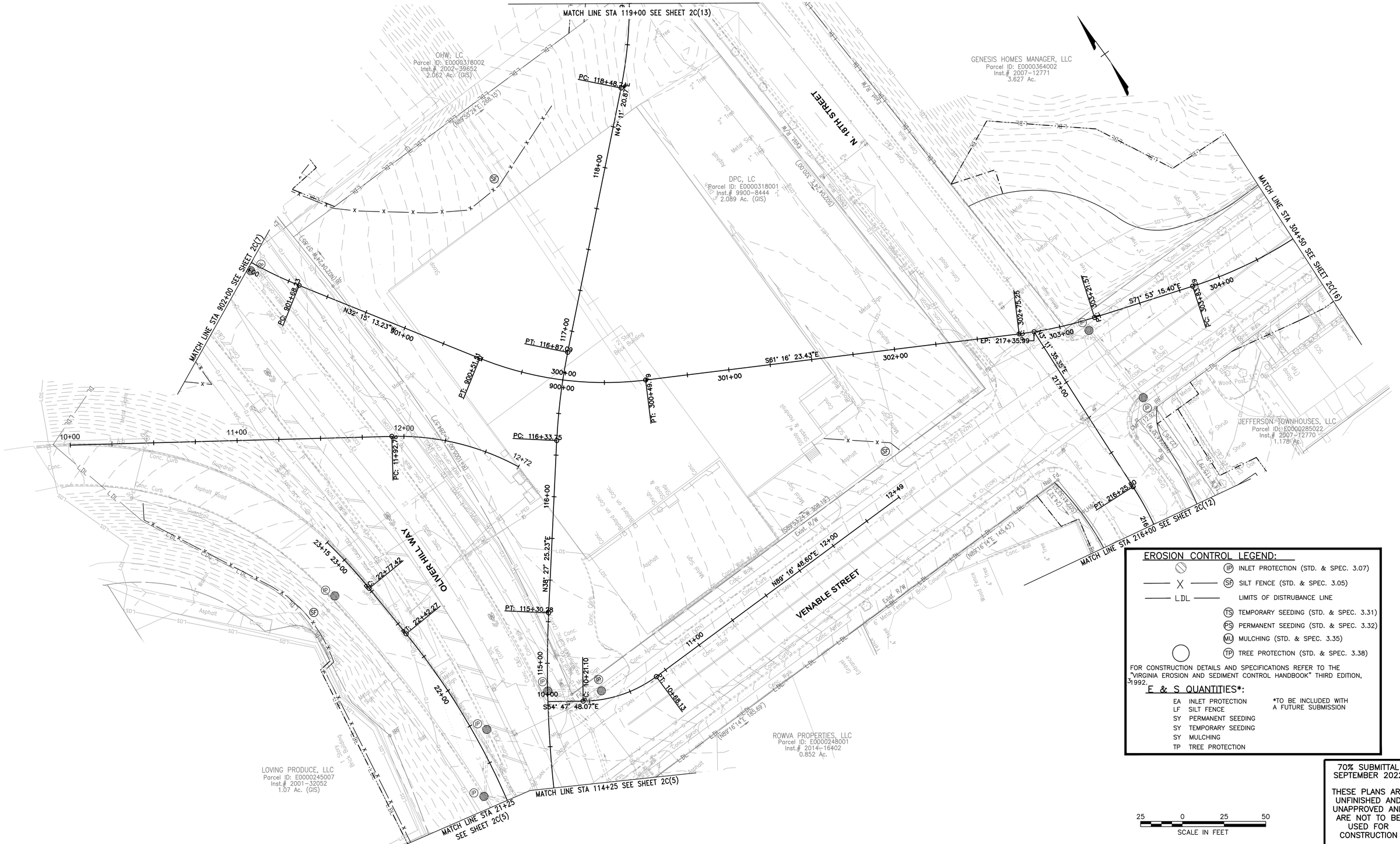
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2C(5)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I



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- (SF) SILT FENCE (STD. & SPEC. 3.05)
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- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)
- (TP) TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992.

E & S QUANTITIES*:

EA	INLET PROTECTION	*TO BE INCLUDED WITH A FUTURE SUBMISSION
LF	SILT FENCE	
SY	PERMANENT SEEDING	
SY	TEMPORARY SEEDING	
SY	MULCHING	
TP	TREE PROTECTION	

25 0 25 50
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

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Sanitary Sewer (Gravity)
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Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2C(6)	0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I

EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- X (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)
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FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

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4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2C(7)	0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I

EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL — LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)
- (TP) TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992.

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

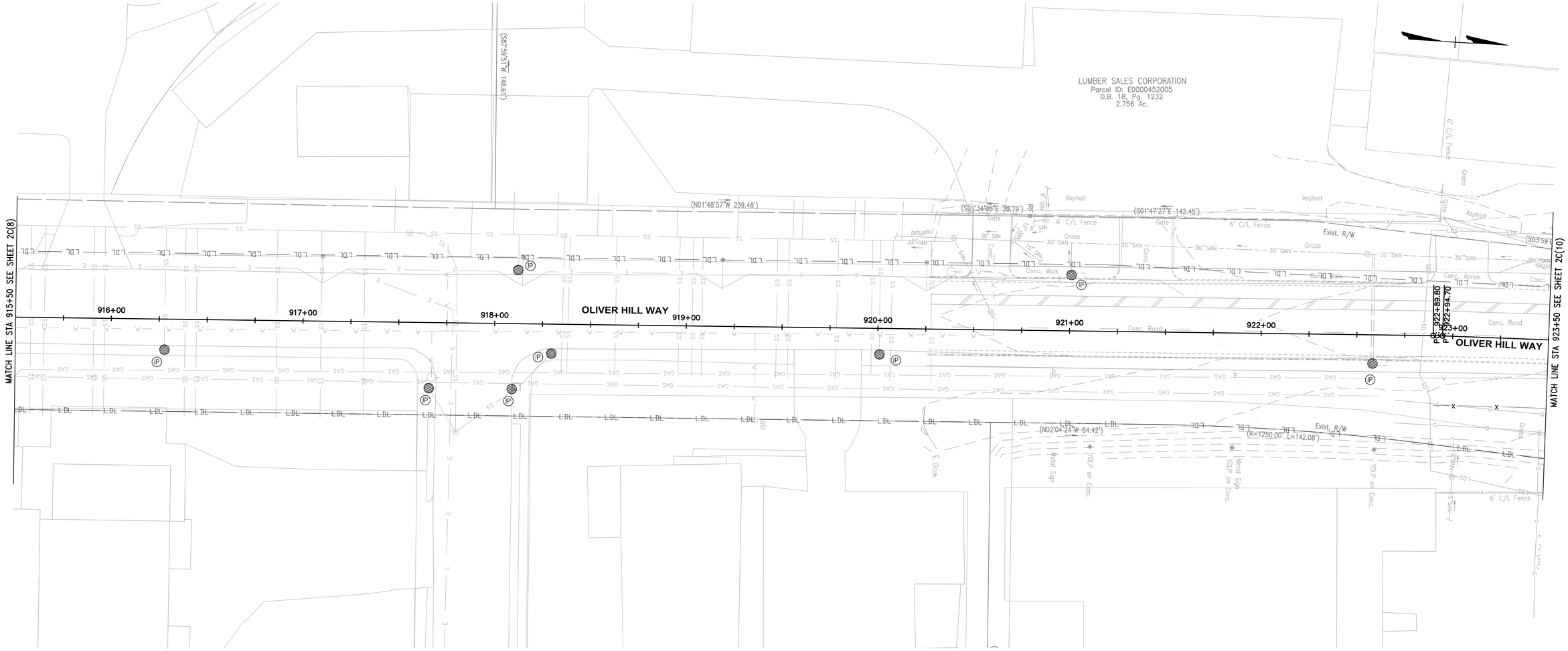
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2C(8)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I



EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL — LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)
- (TP) TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992.

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

NOTE:

SURVEYED TREE LOCATIONS NOT PROVIDED IN THIS AREA. ADDITIONAL TREE PROTECTION TO BE PLACED AS NECESSARY.

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)

Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2C(9)	0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I

EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)
- (TP) TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992.

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (ⓢ or Ⓢ)
Fire Hydrant / Valve (FH ✧ ●WV)

Water Meter ●WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ● ●GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

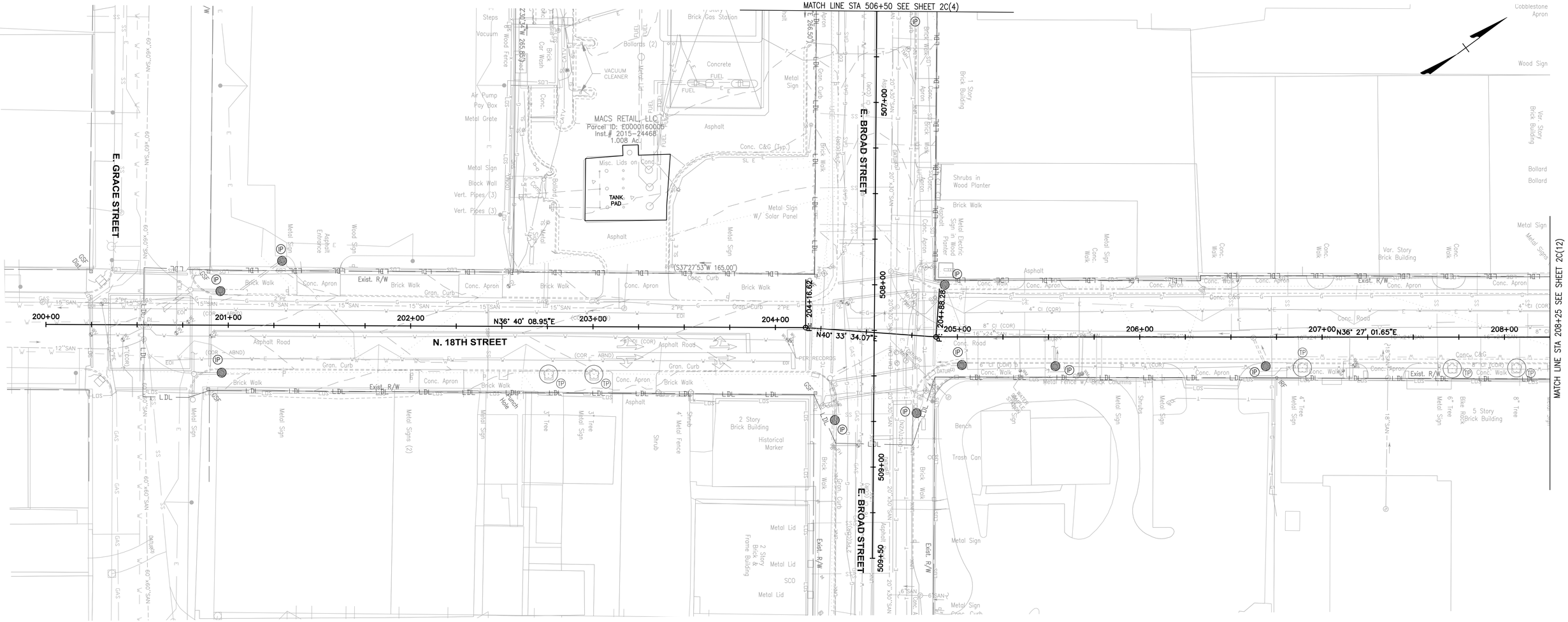
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2C(10)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I



EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- L.DL — LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)
- (TP) TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992.

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

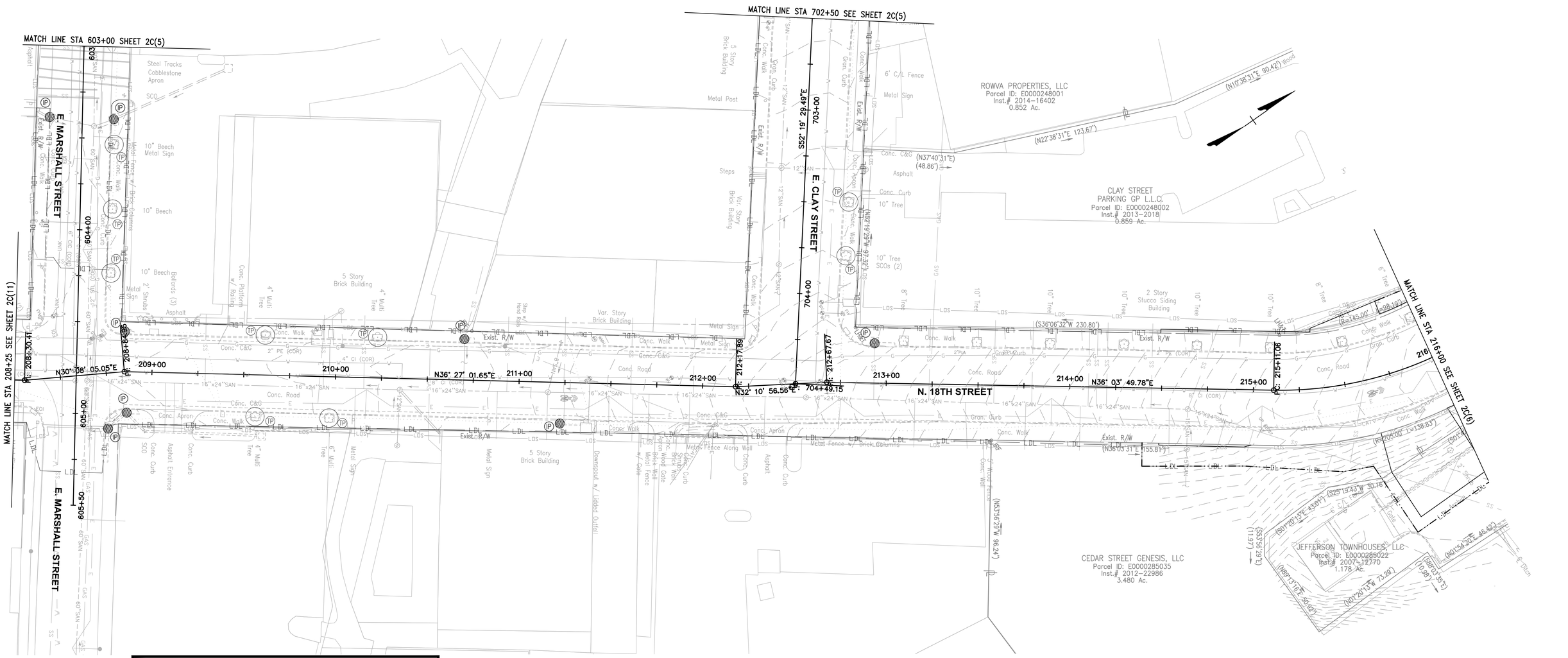
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2C(11)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I



EROSION CONTROL LEGEND:

⊘	IP	INLET PROTECTION (STD. & SPEC. 3.07)
—— X ——	SF	SILT FENCE (STD. & SPEC. 3.05)
—— LDL ——		LIMITS OF DISTRUBANCE LINE
	TS	TEMPORARY SEEDING (STD. & SPEC. 3.31)
	PS	PERMANENT SEEDING (STD. & SPEC. 3.32)
	MU	MULCHING (STD. & SPEC. 3.35)
○	TP	TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number__________
4. Adopted__________
5. Accepted______________________________

REFERENCES

REVISIONS

Existing Legend

Storm Sewer	━━
Sanitary Sewer (Gravity)	━━
Gas Line	——
Electric Line	——
Overhead Utility	——
Telephone/Telegraph	——
Water Line	——
Property Line	——
Storm Basin	
Storm or Sanitary Manhole	D or S
Fire Hydrant / Valve	FH ⌖ ● WV
Water Meter	● WM
Existing Curb Cut Ramp	HCR
Gas Meter / Valve	GM ● ● GV
Fence	——
Power/Light Pole	PP LP
Guy Anchor	<
Tree	

Proposed Legend

Sanitary Sewer	━━
Storm Sewer	━━
Storm/(San) Manhole	SDMH ● (SMH)
Basin	■
Curb Cut Ramp	
Decorative Light	
Conduit	——
Conduit (Encased)	══

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

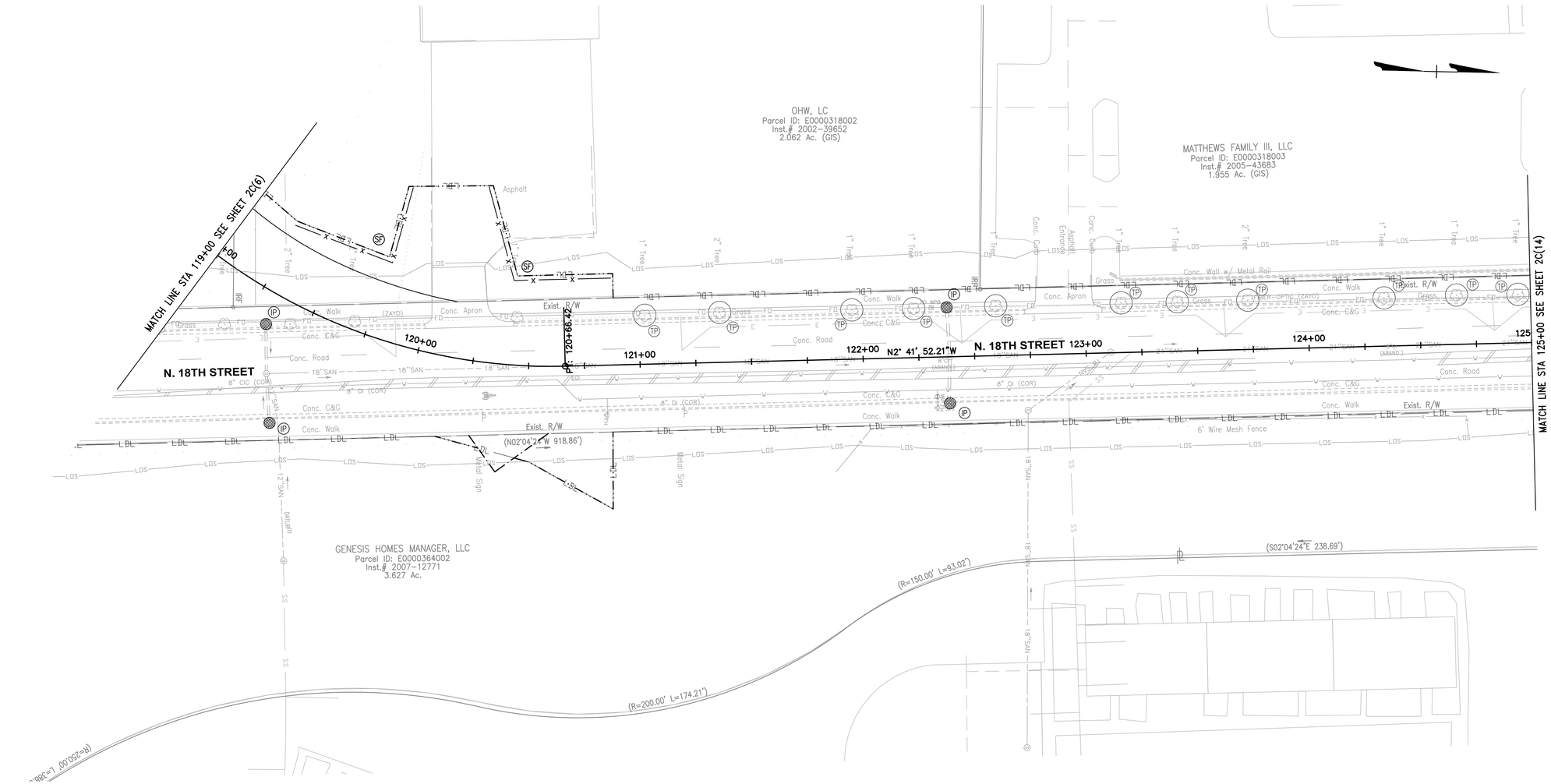
RK&K
Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY / DRAWN BY / CHECKED BY	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg				SEPTEMBER 2022	SHEET 2C(12)	0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I



EROSION CONTROL LEGEND:

(IP)	INLET PROTECTION (STD. & SPEC. 3.07)
(SF)	SILT FENCE (STD. & SPEC. 3.05)
LDL	LIMITS OF DISTRUBANCE LINE
(TS)	TEMPORARY SEEDING (STD. & SPEC. 3.31)
(PS)	PERMANENT SEEDING (STD. & SPEC. 3.32)
(ML)	MULCHING (STD. & SPEC. 3.35)
(TP)	TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION	*TO BE INCLUDED WITH A FUTURE SUBMISSION
LF	SILT FENCE	
SY	PERMANENT SEEDING	
SY	TEMPORARY SEEDING	
SY	MULCHING	
TP	TREE PROTECTION	

25 0 25 50
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

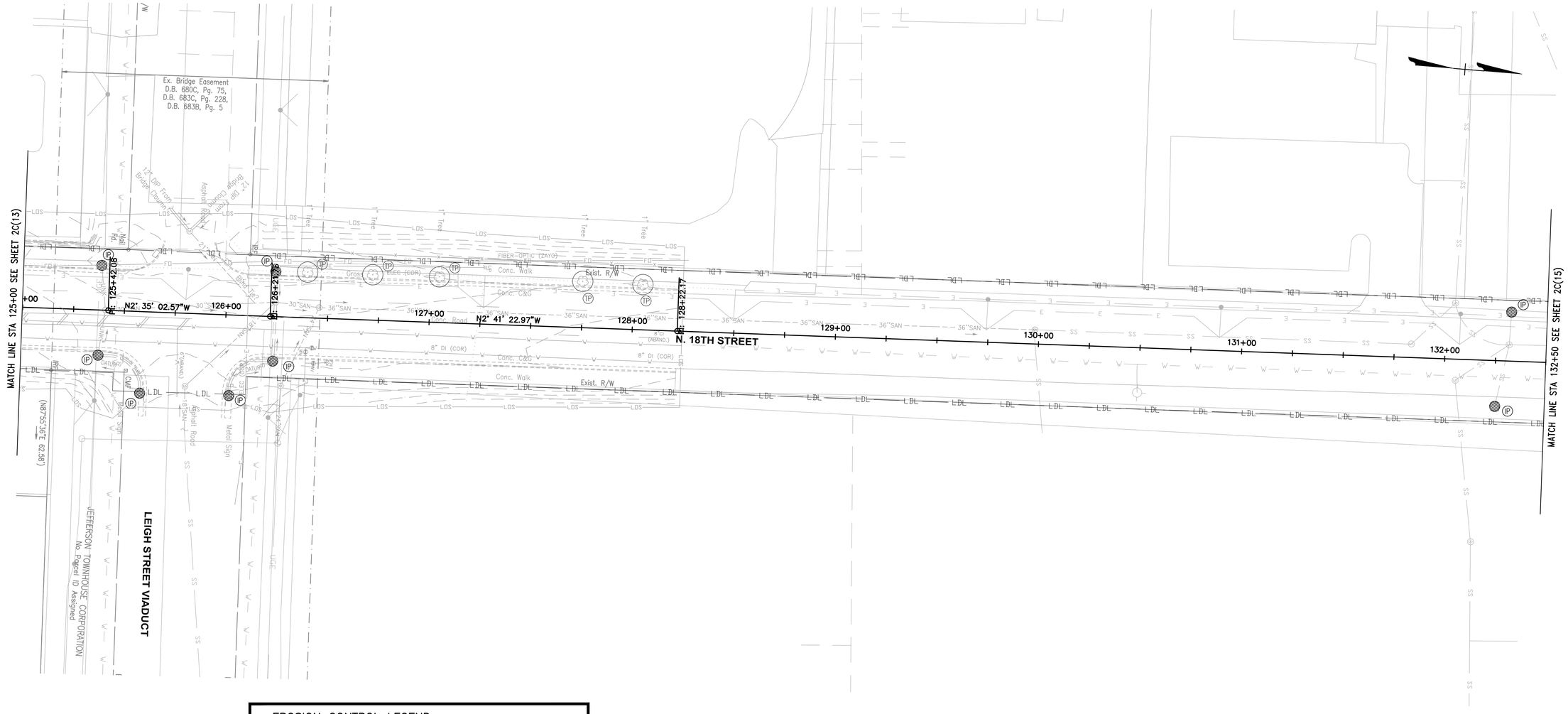
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2C(13)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I



EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL — LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)
- (TP) TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

NOTE:

SURVEYED TREE LOCATIONS NOT PROVIDED IN THIS AREA. ADDITIONAL TREE PROTECTION TO BE PLACED AS NECESSARY.

SCALE IN FEET: 25 0 25 50

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

RK&K Responsive People • Creative Solutions

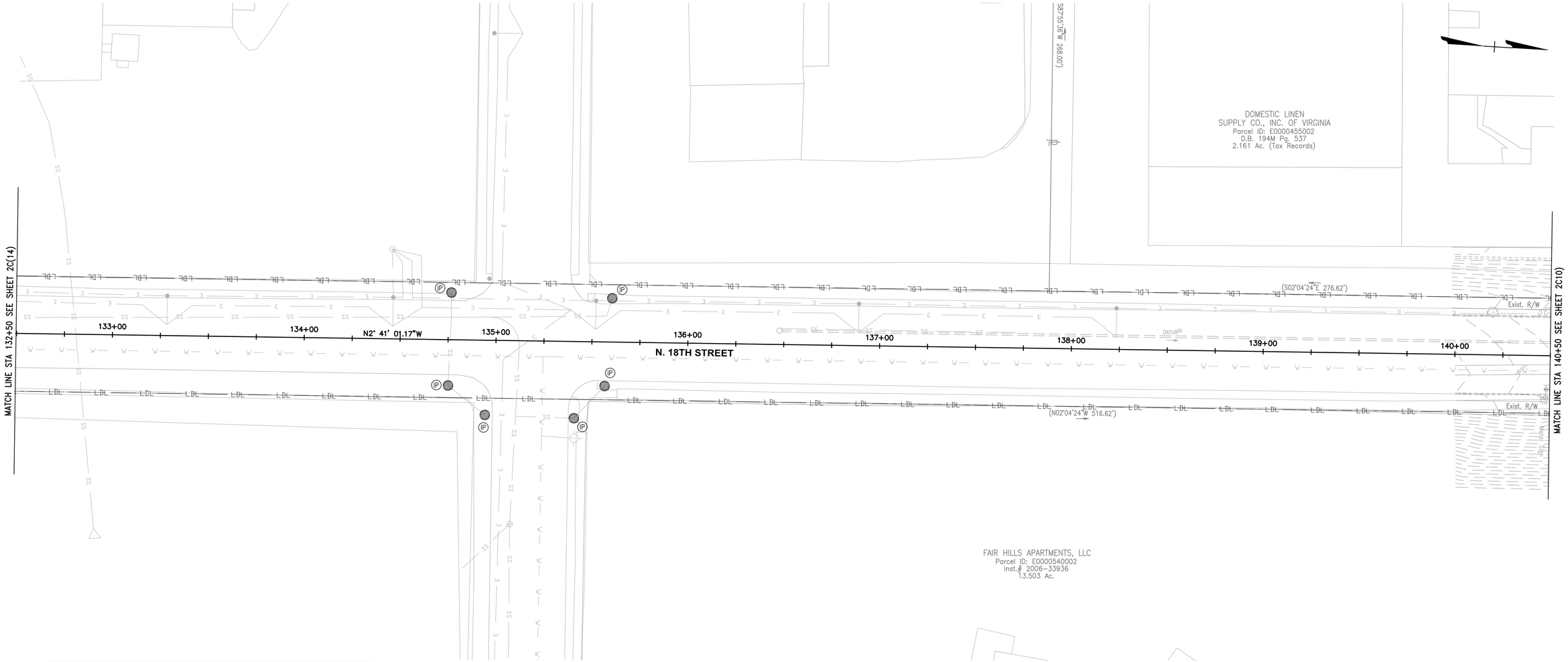
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2C(14)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I



EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (ML) MULCHING (STD. & SPEC. 3.35)
- (TP) TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION	*TO BE INCLUDED WITH A FUTURE SUBMISSION
LF	SILT FENCE	
SY	PERMANENT SEEDING	
SY	TEMPORARY SEEDING	
SY	MULCHING	
TP	TREE PROTECTION	

NOTE:

SURVEYED TREE LOCATIONS NOT PROVIDED IN THIS AREA. ADDITIONAL TREE PROTECTION TO BE PLACED AS NECESSARY.

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (S) or (S)
Fire Hydrant / Valve FH VV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1731

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

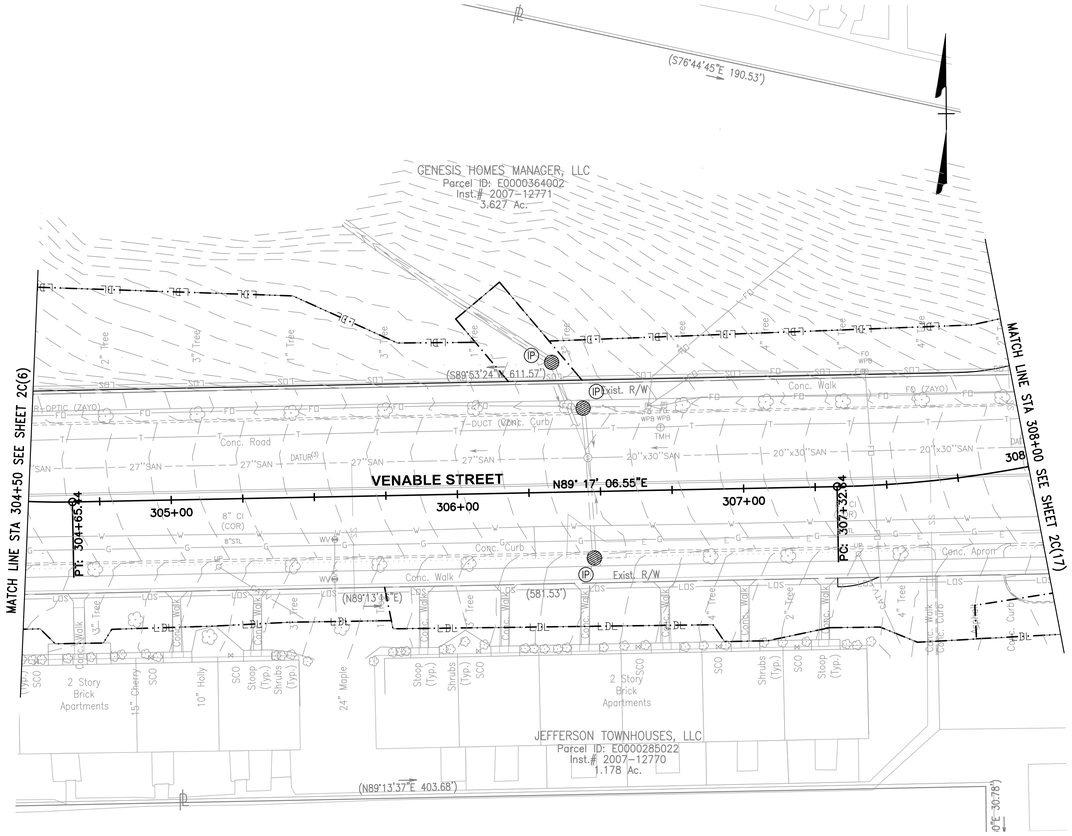
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2C(15)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I



EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (ML) MULCHING (STD. & SPEC. 3.35)
- (TP) TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (S) or (S)
Fire Hydrant / Valve FH VV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

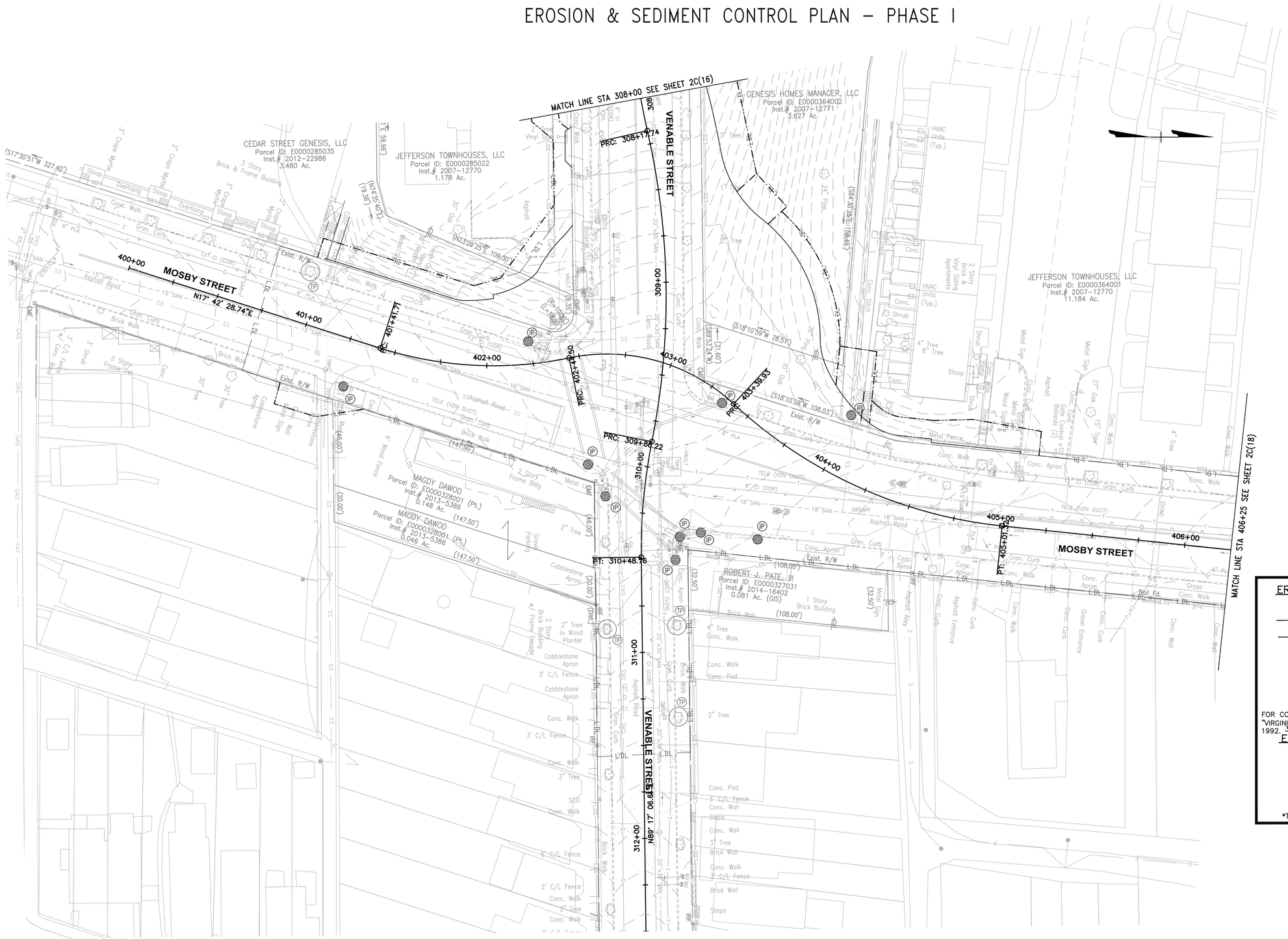
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2C(16)	0-28633
CHECKED BY: ASamberg						

EROSION & SEDIMENT CONTROL PLAN – PHASE I



EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)
- (TP) TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

SCALE IN FEET: 25 0 25 50

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

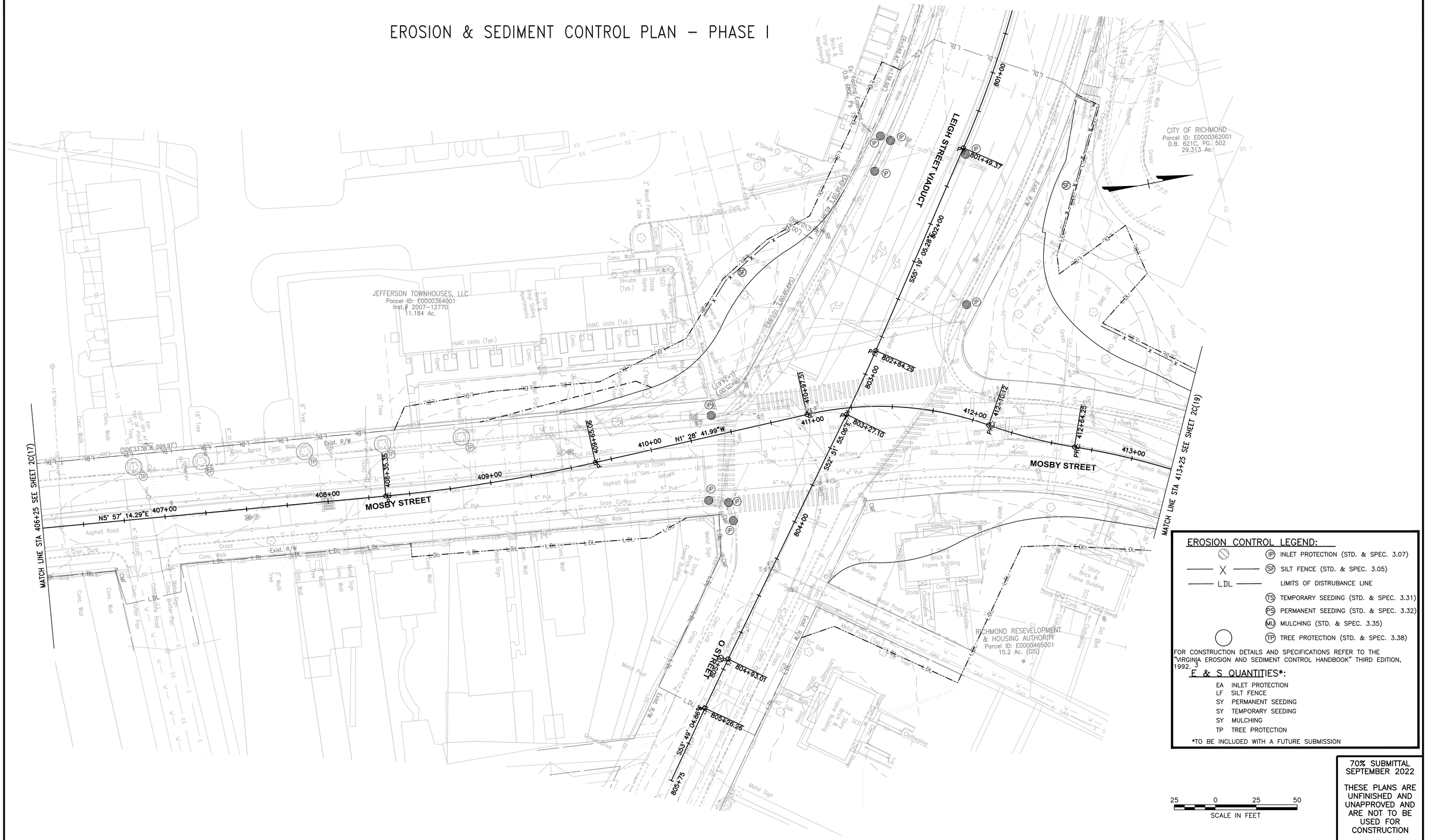
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2C(17)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE I



EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL LIMITS OF DISTRUBANCE LINE
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- (MU) MULCHING (STD. & SPEC. 3.35)
- (TP) TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

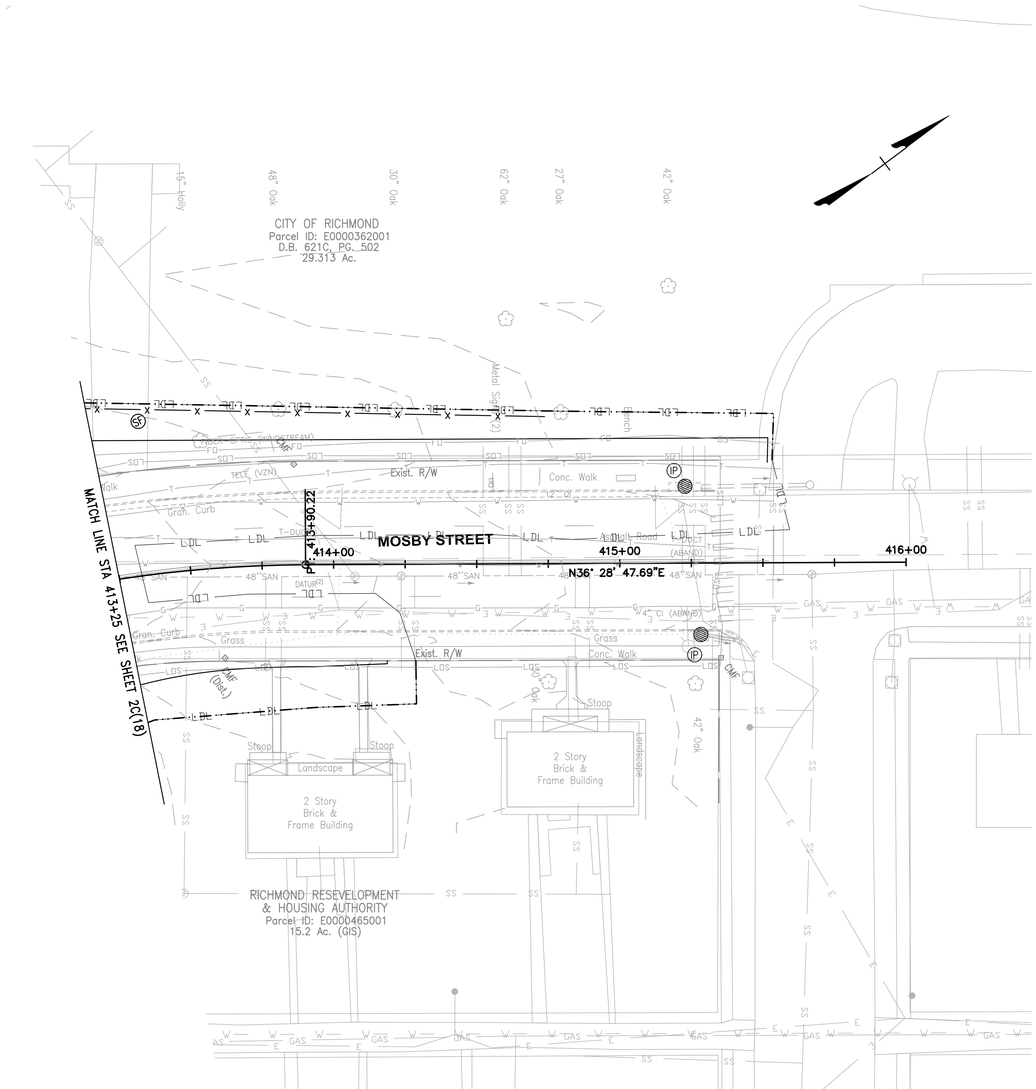
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2C(18)	0-28633
CHECKED BY: ASamberg						

EROSION & SEDIMENT CONTROL PLAN – PHASE I



EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL — LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)
- (TP) TREE PROTECTION (STD. & SPEC. 3.38)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING
TP	TREE PROTECTION

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25 0 25 50
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

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REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

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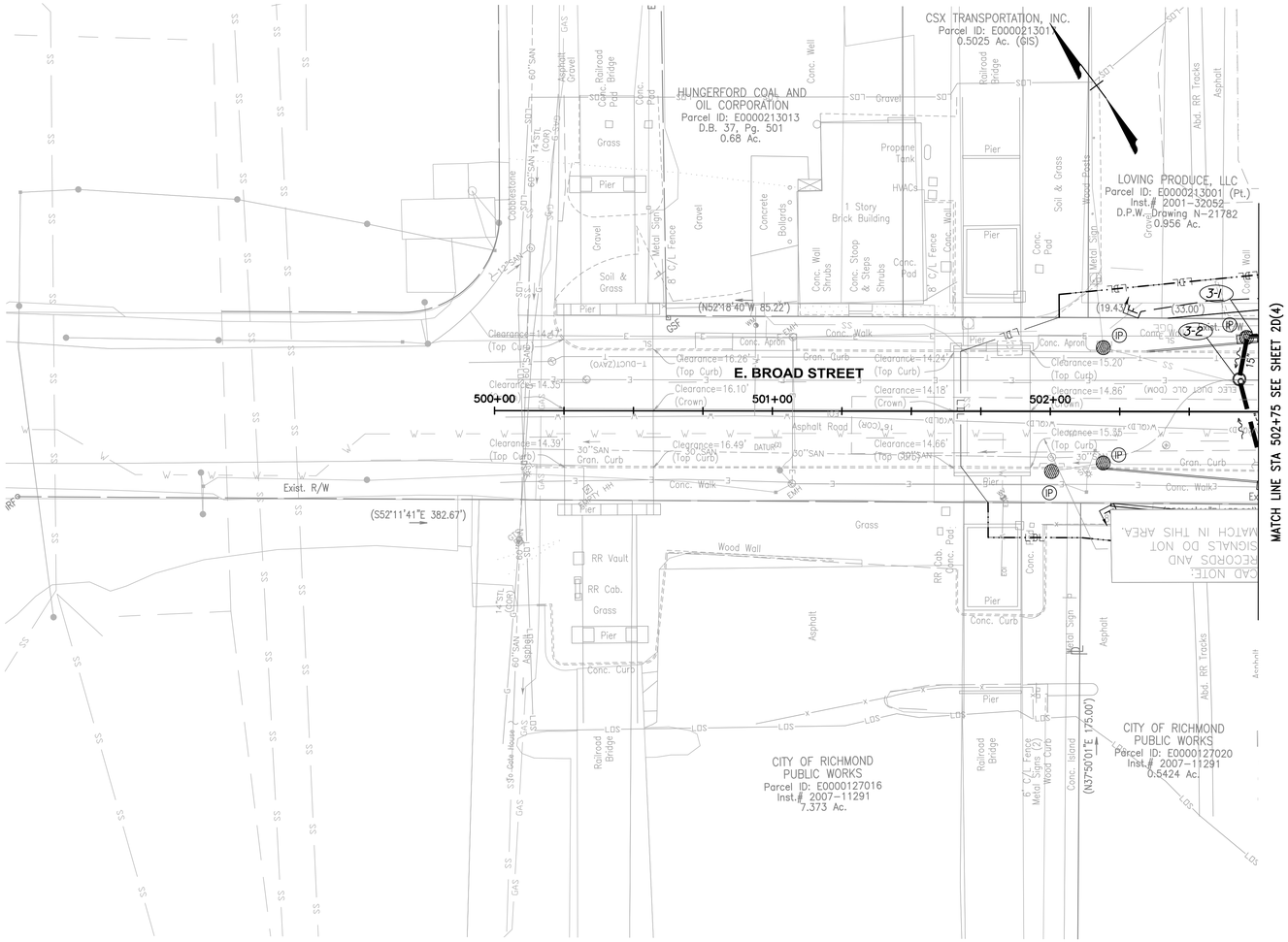
SHOCKOE VALLEY STREET IMPROVEMENTS
EROSION & SEDIMENT CONTROL PLAN – PHASE I

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2C(19)	0-28633
CHECKED BY: ASamberg						

EROSION & SEDIMENT CONTROL PLAN – PHASE II



EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL — LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (ML) MULCHING (STD. & SPEC. 3.35)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION	*TO BE INCLUDED WITH A FUTURE SUBMISSION
LF	SILT FENCE	
SY	PERMANENT SEEDING	
SY	TEMPORARY SEEDING	
SY	MULCHING	

Note: Figures in brackets and dot – dashed lines denote permanent easements

Note: Figures in parenthesis and dot – dot dashed lines denote temporary easements

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

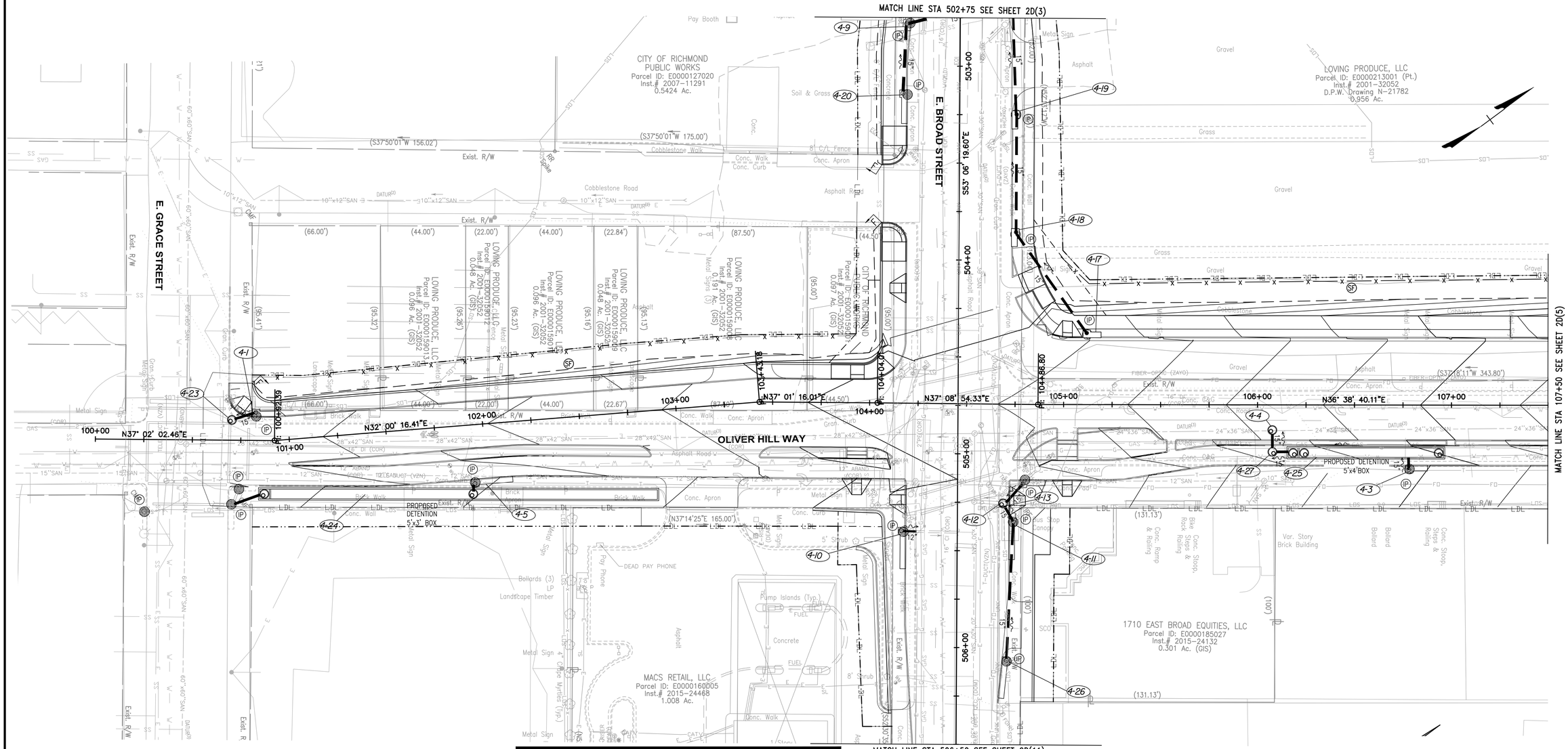
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2D(03)	0-28633
CHECKED BY: ASamberg						

EROSION & SEDIMENT CONTROL PLAN – PHASE II



EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL — LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING

*TO BE INCLUDED WITH A FUTURE SUBMISSION

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Note: Figures in parenthesis and dot – dot dashed lines denote temporary easements

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

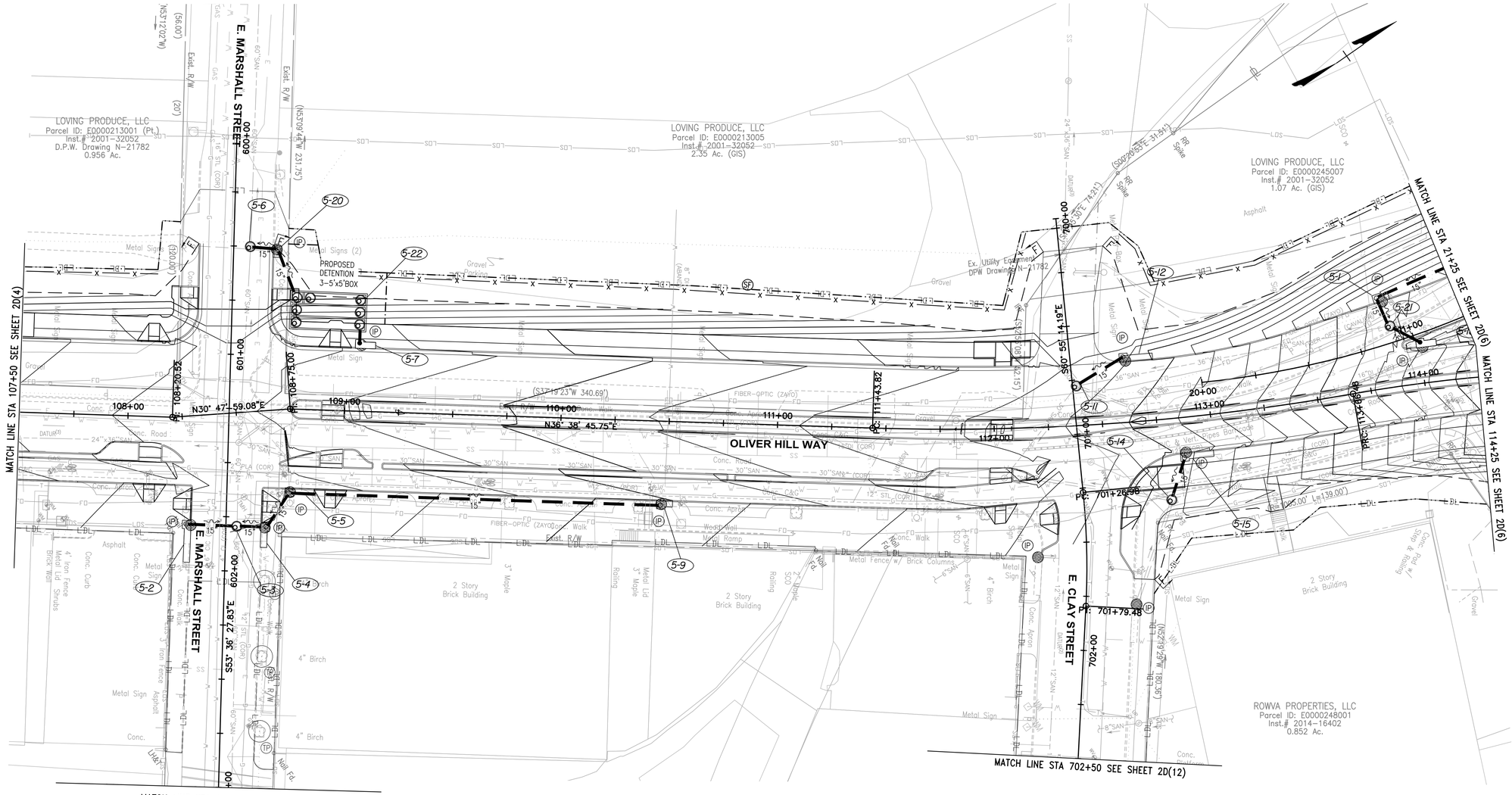
RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2D(4)	0-28633
CHECKED BY: ASamberg						

EROSION & SEDIMENT CONTROL PLAN – PHASE II



Note: Figures in brackets and dot – dashed lines denote permanent easements

Note: Figures in parenthesis and dot – dot dashed lines denote temporary easements

EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL — LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (ML) MULCHING (STD. & SPEC. 3.35)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992.

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

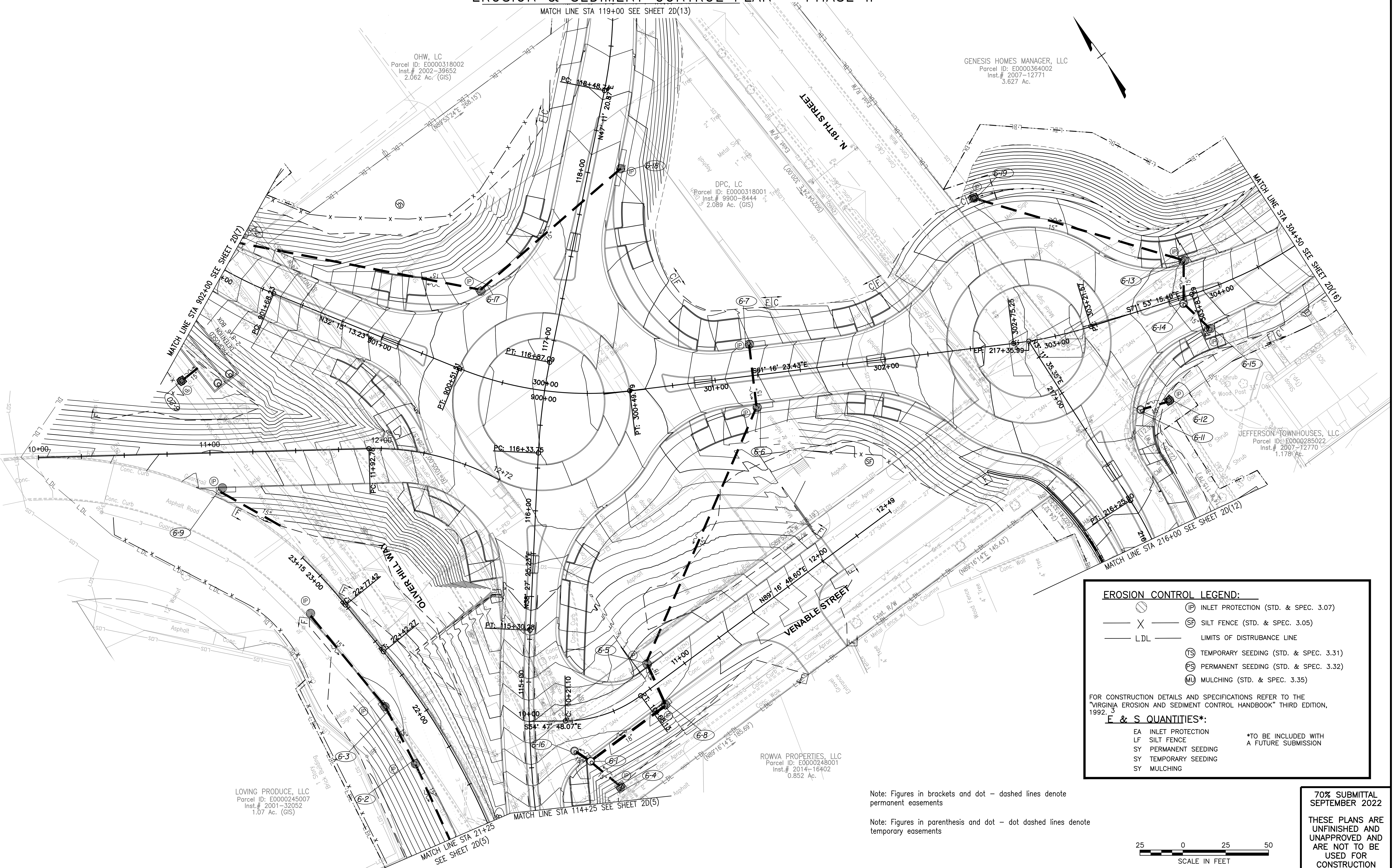
RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2D(5)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE II



EROSION CONTROL LEGEND:

	(IP)	INLET PROTECTION (STD. & SPEC. 3.07)
—— X ——	(SF)	SILT FENCE (STD. & SPEC. 3.05)
—— LDL ——		LIMITS OF DISTRUBANCE LINE
	(TS)	TEMPORARY SEEDING (STD. & SPEC. 3.31)
	(PS)	PERMANENT SEEDING (STD. & SPEC. 3.32)
	(MU)	MULCHING (STD. & SPEC. 3.35)

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E & S QUANTITIES*:

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LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING

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25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number__________
4. Adopted__________
5. Accepted______________________________

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole (D) or (S); Fire Hydrant / Valve FH WV

Water Meter WM; Existing Curb Cut Ramp HCR; Gas Meter / Valve GM GV; Fence; Power/Light Pole PP LP; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole SDMH (SMH); Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

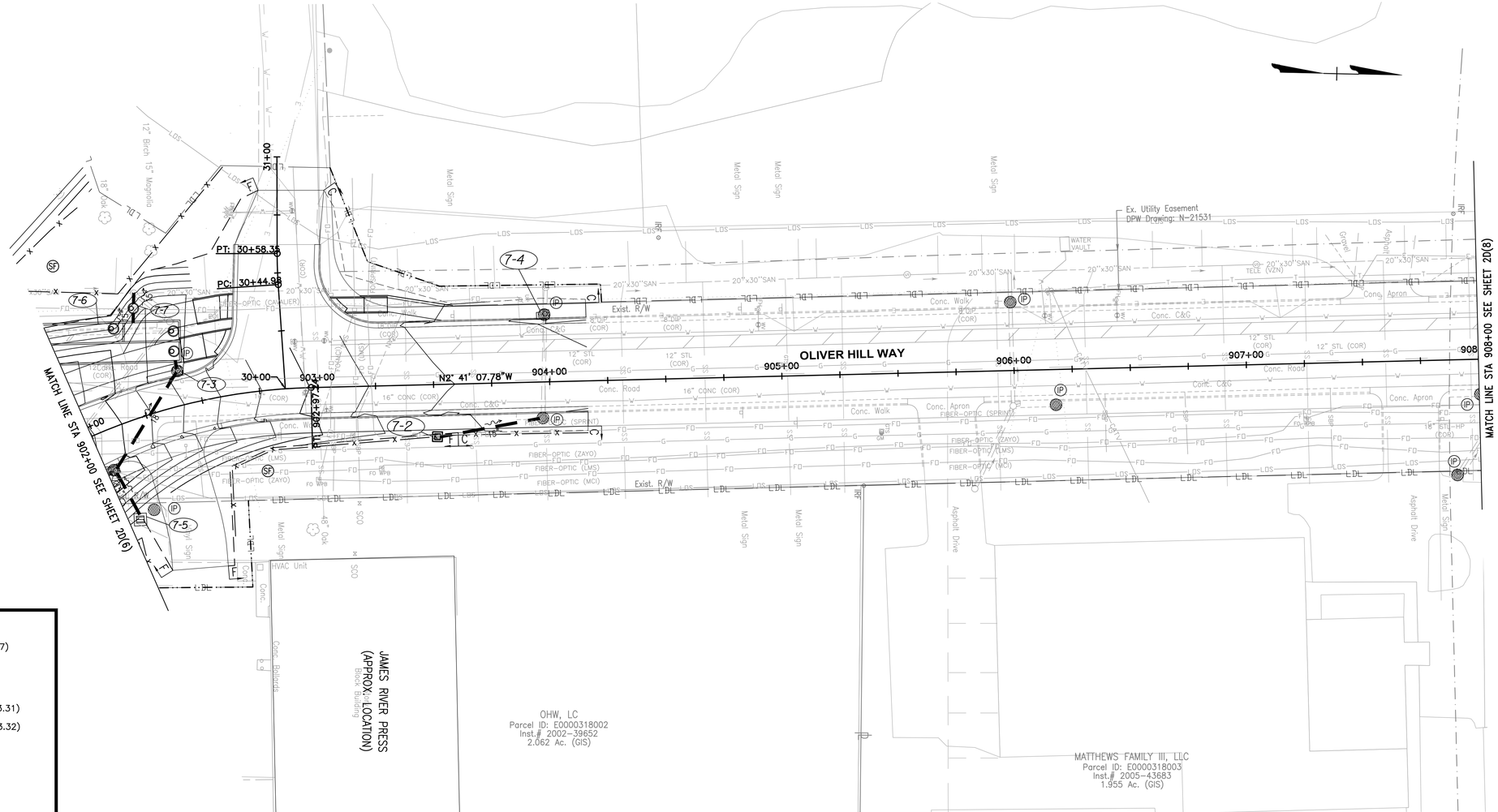
RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale / DRAWN BY: JAlexander / CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
				SEPTEMBER 2022	SHEET 2D(6)	0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE II



EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL — LIMITS OF DISTRUBANCE LINE
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- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
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E & S QUANTITIES*:

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LF	SILT FENCE
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SY	MULCHING

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Note: Figures in brackets and dot – dashed lines denote permanent easements

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25 0 25 50
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH ⊹ WV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

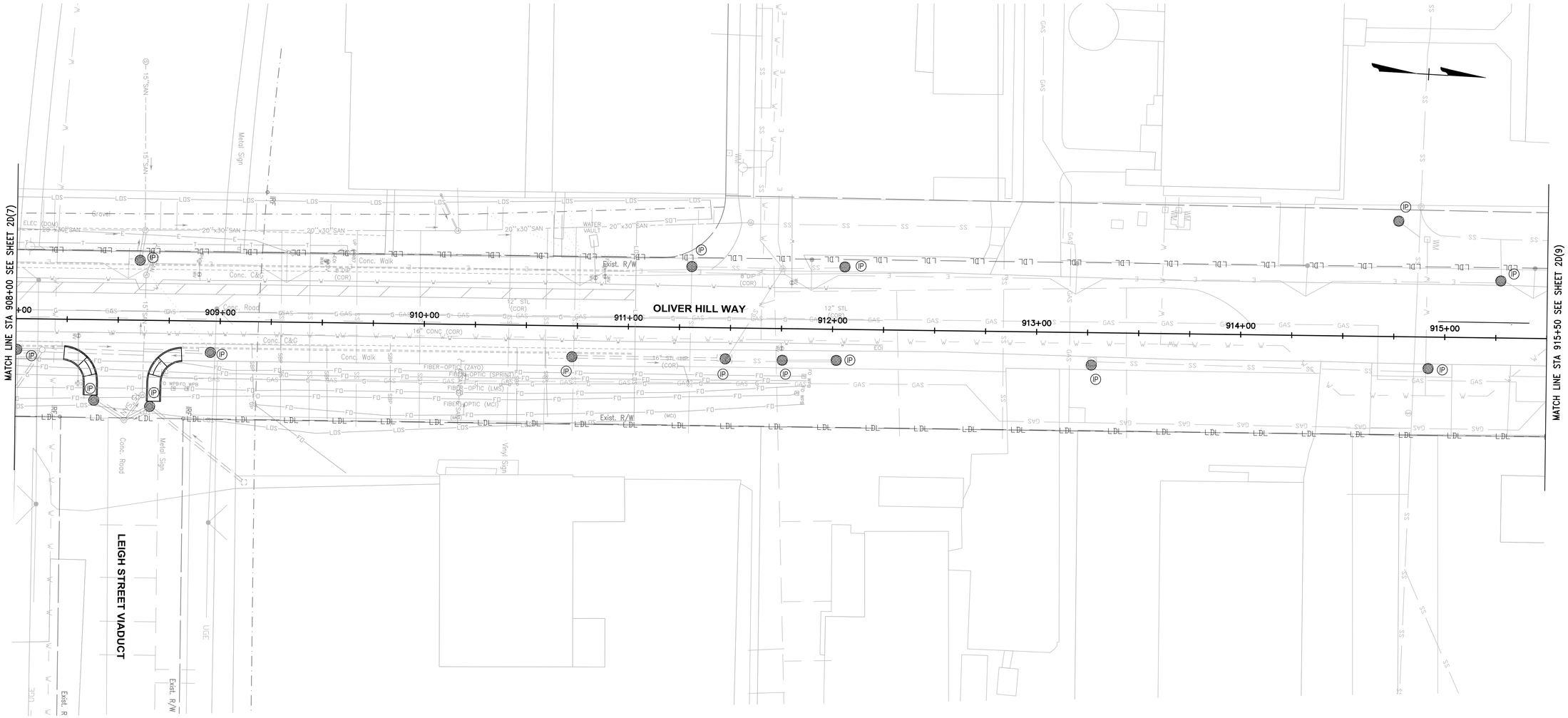
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2D(7)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE II



Note: Figures in brackets and dot – dashed lines denote permanent easements

Note: Figures in parenthesis and dot – dot dashed lines denote temporary easements

EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (ML) MULCHING (STD. & SPEC. 3.35)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

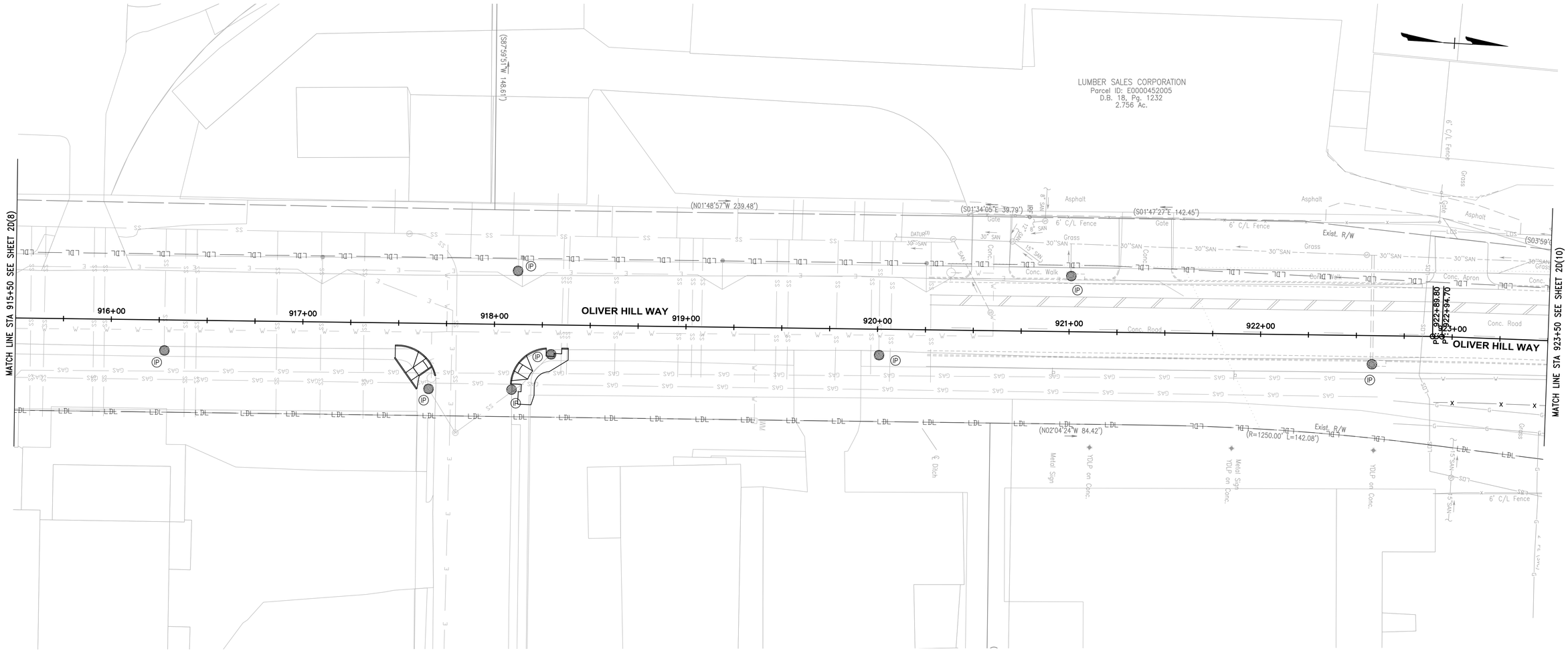
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2D(8)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE II



Note: Figures in brackets and dot – dashed lines denote permanent easements

Note: Figures in parenthesis and dot – dot dashed lines denote temporary easements

EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL — LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING

*TO BE INCLUDED WITH A FUTURE SUBMISSION

SCALE IN FEET: 25 0 25 50

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2D(9)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE II

EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992.

E & S QUANTITIES*:

EA	INLET PROTECTION	*TO BE INCLUDED WITH A FUTURE SUBMISSION
LF	SILT FENCE	
SY	PERMANENT SEEDING	
SY	TEMPORARY SEEDING	
SY	MULCHING	

Note: Figures in brackets and dot – dashed lines denote permanent easements

Note: Figures in parenthesis and dot – dot dashed lines denote temporary easements

25 0 25 50
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

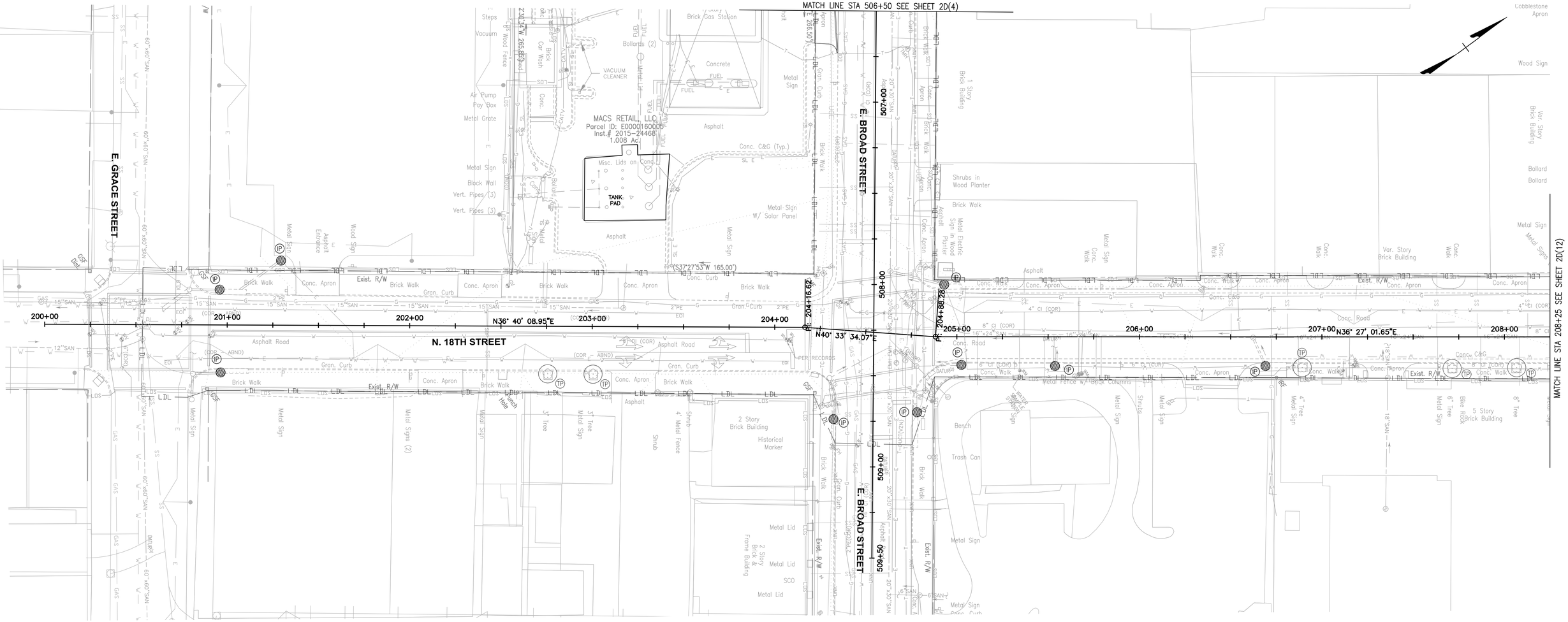
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2D(10)	0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE II



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Note: Figures in parenthesis and dot – dot dashed lines denote temporary easements

EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL — LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (ML) MULCHING (STD. & SPEC. 3.35)

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E & S QUANTITIES*:

EA	INLET PROTECTION	*TO BE INCLUDED WITH A FUTURE SUBMISSION
LF	SILT FENCE	
SY	PERMANENT SEEDING	
SY	TEMPORARY SEEDING	
SY	MULCHING	

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

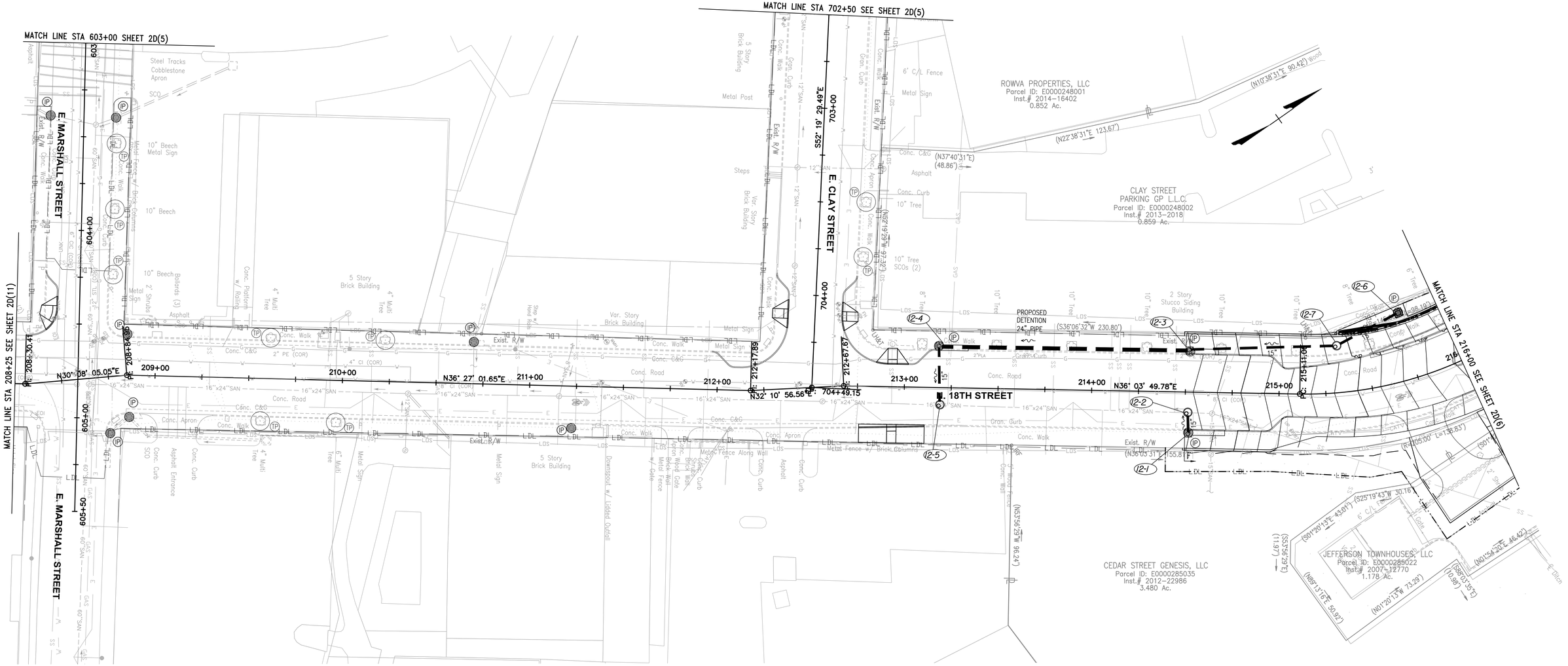
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2D(11)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE II



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EROSION CONTROL LEGEND:

	(IP)	INLET PROTECTION (STD. & SPEC. 3.07)
—— X ——	(SF)	SILT FENCE (STD. & SPEC. 3.05)
—— LDL ——		LIMITS OF DISTRUBANCE LINE
	(TS)	TEMPORARY SEEDING (STD. & SPEC. 3.31)
	(PS)	PERMANENT SEEDING (STD. & SPEC. 3.32)
	(MU)	MULCHING (STD. & SPEC. 3.35)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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3. Ordinance Number__________
4. Adopted_________
5. Accepted_____________________________

REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH WV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
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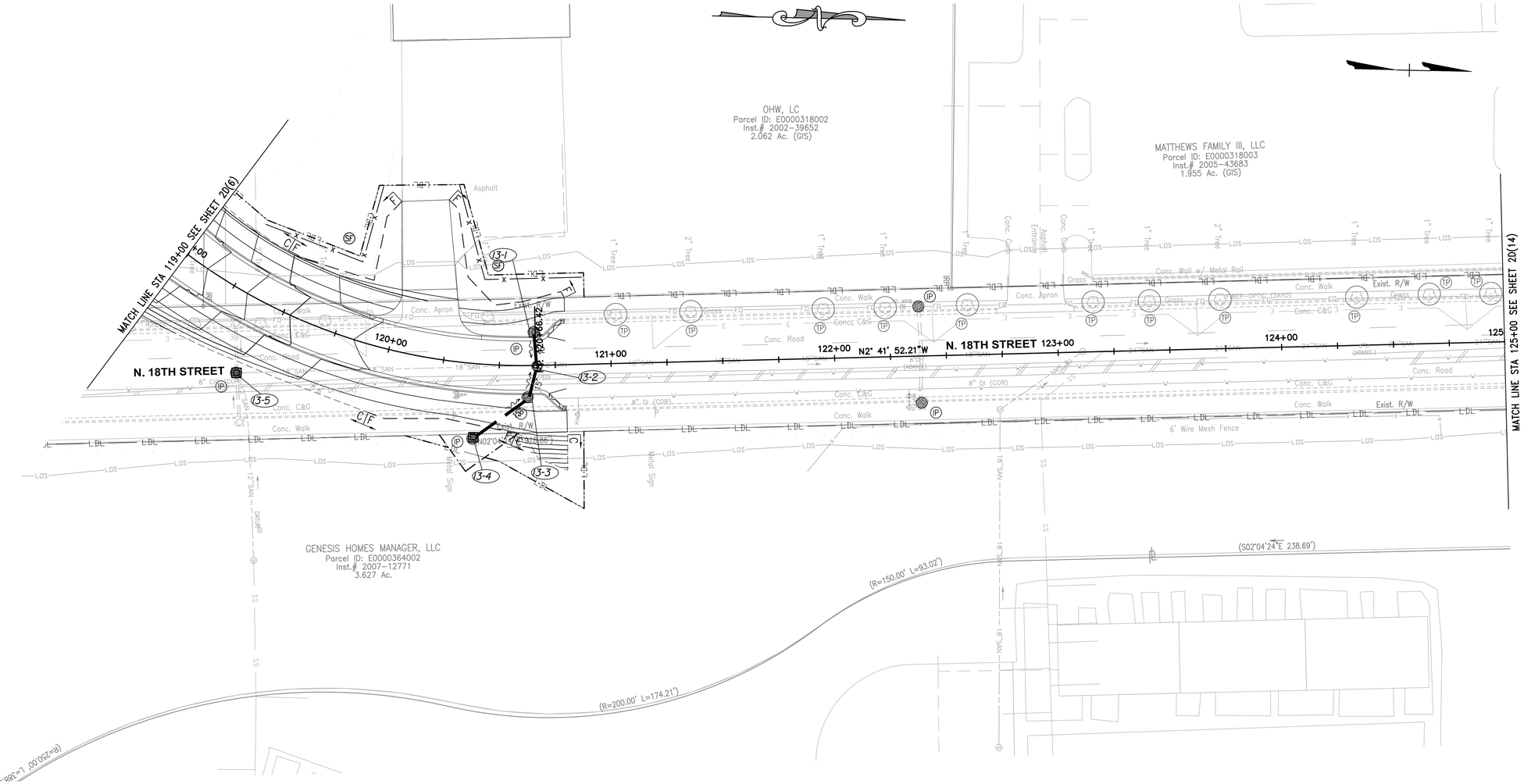
SHOCKOE VALLEY STREET IMPROVEMENTS
EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY / DRAWN BY / CHECKED BY	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg				SEPTEMBER 2022	SHEET 2D(12)	0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE II



Note: Figures in brackets and dot – dashed lines denote permanent easements

Note: Figures in parenthesis and dot – dot dashed lines denote temporary easements

EROSION CONTROL LEGEND:

(IP)	INLET PROTECTION (STD. & SPEC. 3.07)
(SF)	SILT FENCE (STD. & SPEC. 3.05)
L.D.L.	LIMITS OF DISTRUBANCE LINE
(TS)	TEMPORARY SEEDING (STD. & SPEC. 3.31)
(PS)	PERMANENT SEEDING (STD. & SPEC. 3.32)
(MU)	MULCHING (STD. & SPEC. 3.35)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION	*TO BE INCLUDED WITH A FUTURE SUBMISSION
LF	SILT FENCE	
SY	PERMANENT SEEDING	
SY	TEMPORARY SEEDING	
SY	MULCHING	

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

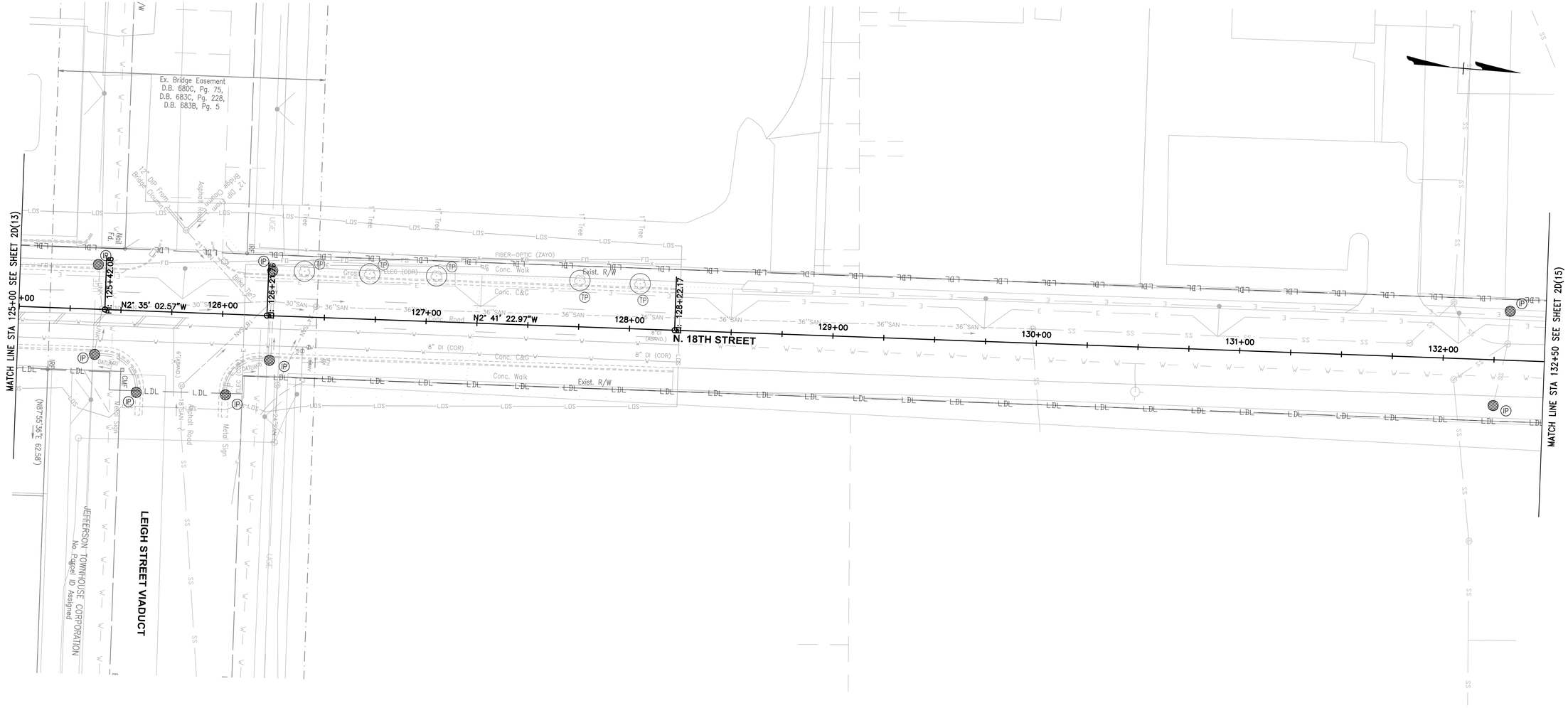
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2D(13)	0-28633
CHECKED BY: ASamberg						

EROSION & SEDIMENT CONTROL PLAN – PHASE II



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EROSION CONTROL LEGEND:

- ⊘ (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- —— X —— (SF) SILT FENCE (STD. & SPEC. 3.05)
- —— LDL —— LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992. 3

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

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2. Property owners correct as of ________, 20__
3. Ordinance Number__________
4. Adopted__________
5. Accepted______________________________

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH ●WV
Water Meter ●WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ● ●GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

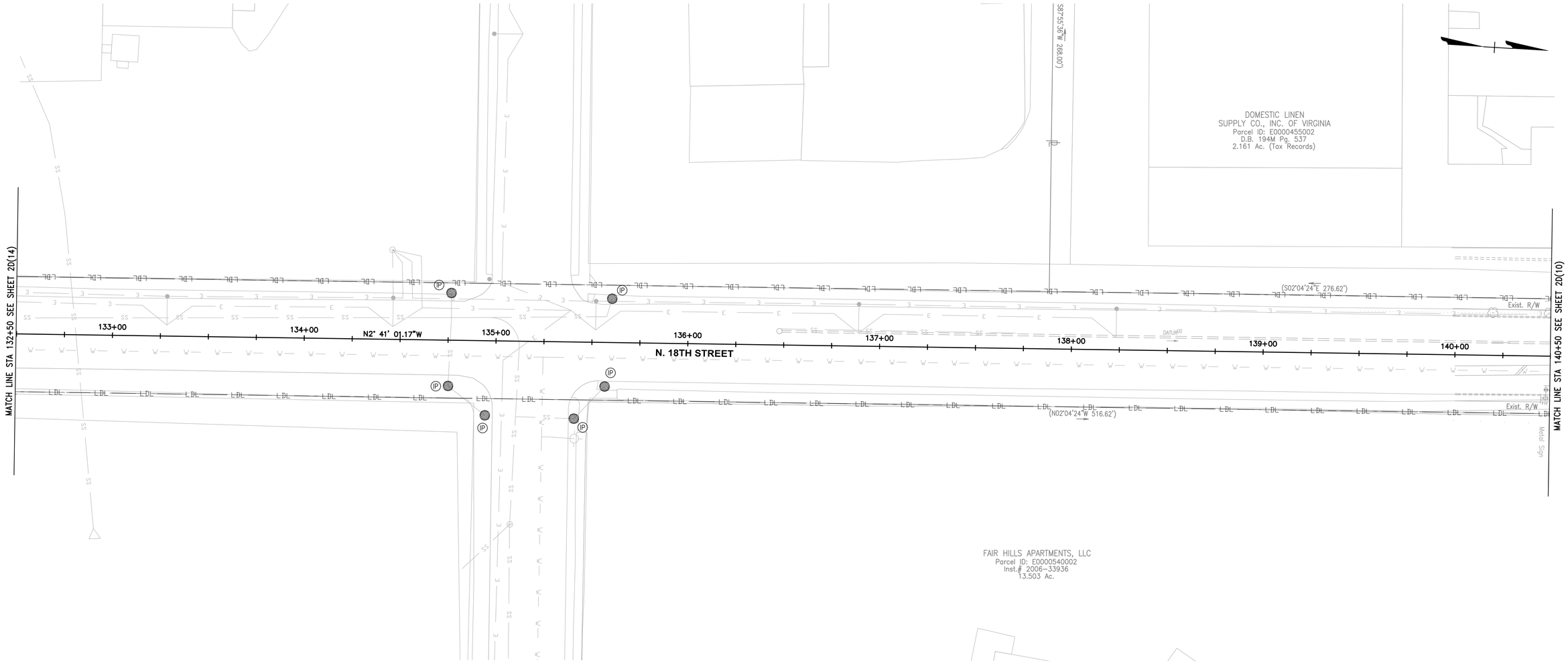
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
				SEPTEMBER 2022	SHEET 2D(14)	0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE II



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EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)

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E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

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4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
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Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

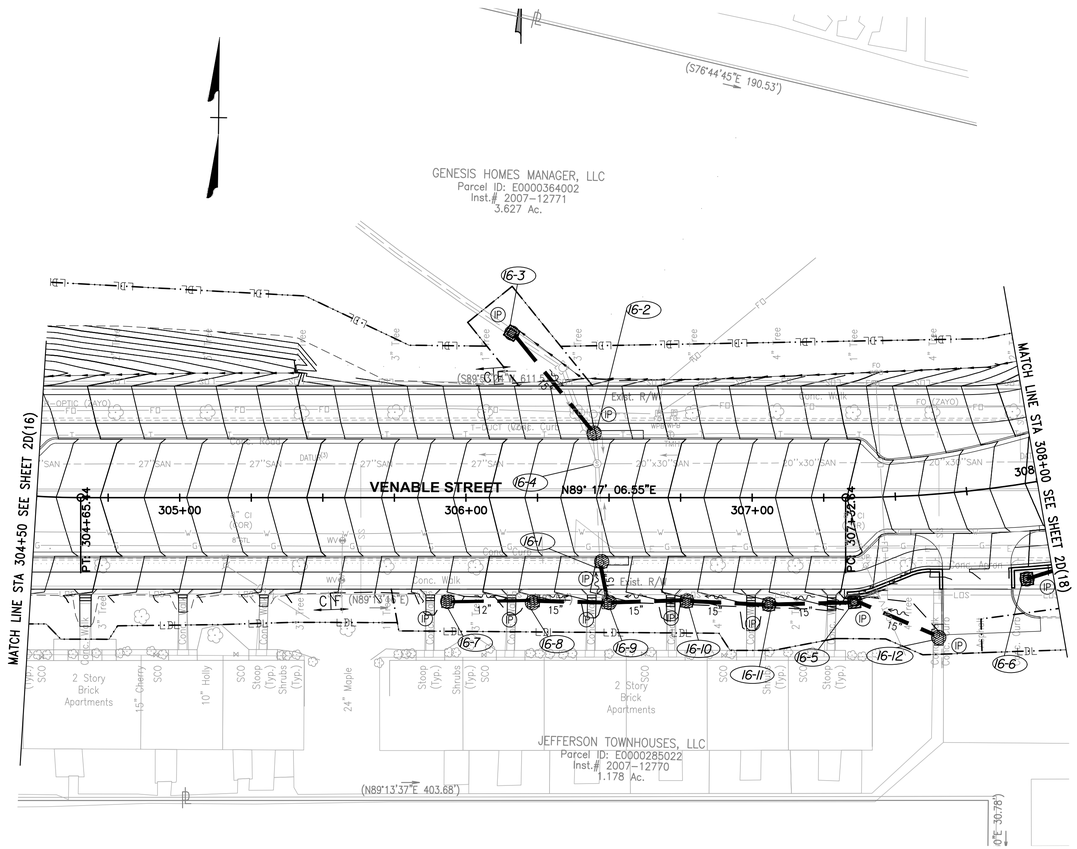
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2D(15)	DRAWING NO. 0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE II



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EROSION CONTROL LEGEND:

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E & S QUANTITIES*:

EA	INLET PROTECTION	*TO BE INCLUDED WITH A FUTURE SUBMISSION
LF	SILT FENCE	
SY	PERMANENT SEEDING	
SY	TEMPORARY SEEDING	
SY	MULCHING	

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
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Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH WV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2D(16)	0-28633
CHECKED BY: ASamberg						

EROSION & SEDIMENT CONTROL PLAN – PHASE II

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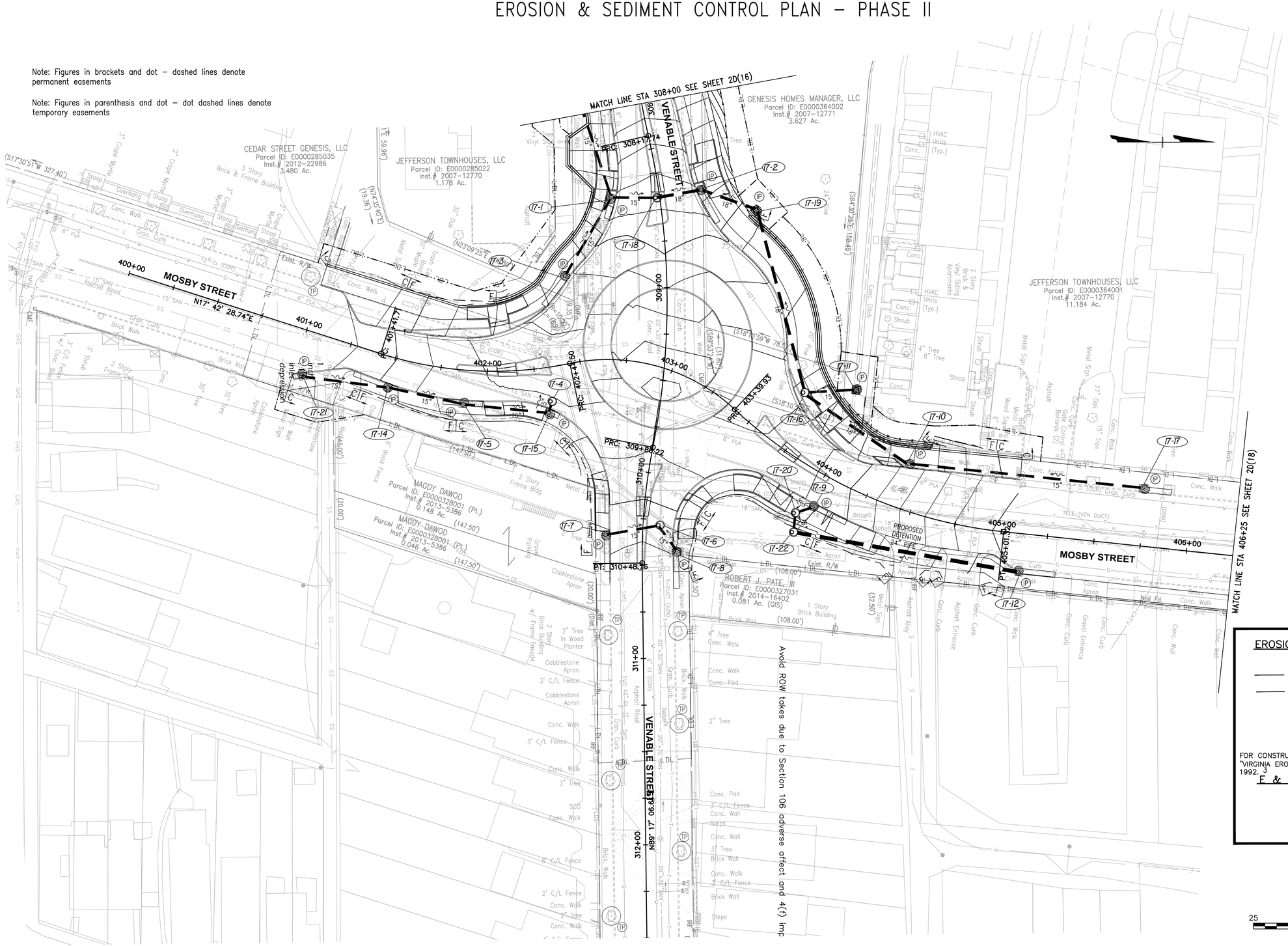

EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
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E & S QUANTITIES*:

EA	INLET PROTECTION	*TO BE INCLUDED WITH A FUTURE SUBMISSION
LF	SILT FENCE	
SY	PERMANENT SEEDING	
SY	TEMPORARY SEEDING	
SY	MULCHING	

25 0 25 50
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

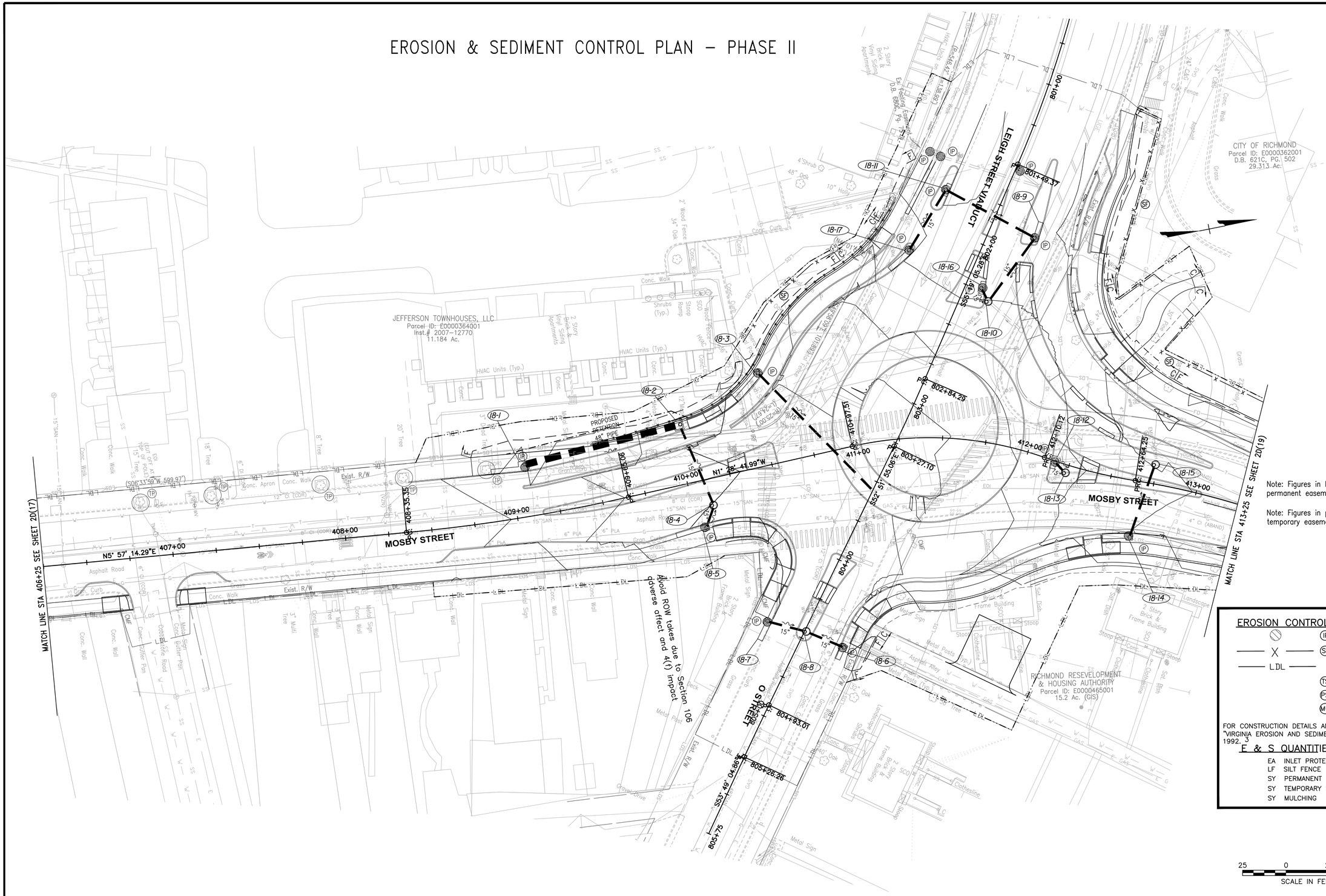
RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2D(17)	0-28633
CHECKED BY: ASamberg						

EROSION & SEDIMENT CONTROL PLAN – PHASE II



Note: Figures in brackets and dot – dashed lines denote permanent easements

Note: Figures in parenthesis and dot – dot dashed lines denote temporary easements

EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (MU) MULCHING (STD. & SPEC. 3.35)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992.

E & S QUANTITIES*:

EA	INLET PROTECTION	*TO BE INCLUDED WITH A FUTURE SUBMISSION
LF	SILT FENCE	
SY	PERMANENT SEEDING	
SY	TEMPORARY SEEDING	
SY	MULCHING	

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (S) or (S)
Fire Hydrant / Valve FH WV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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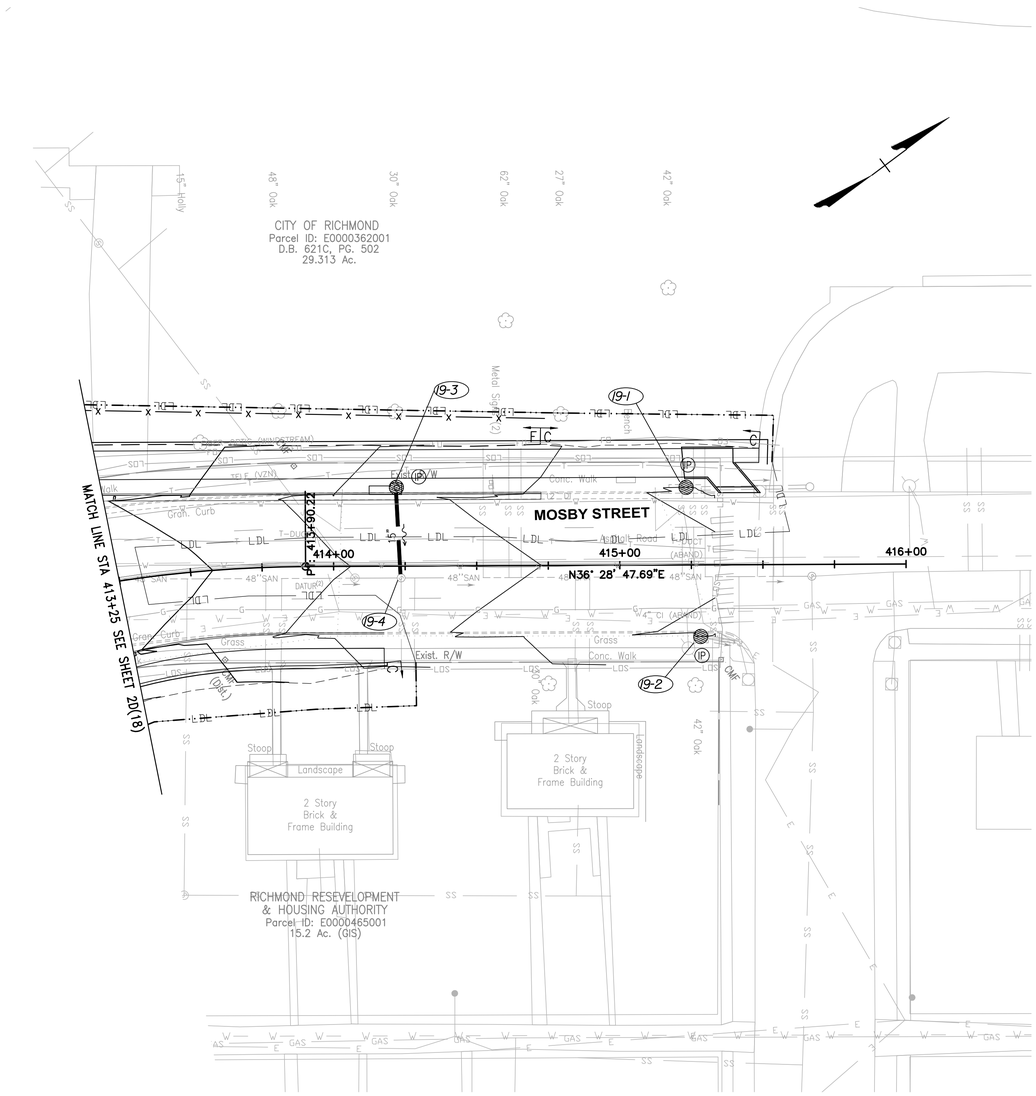
SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2D(18)	0-28633

EROSION & SEDIMENT CONTROL PLAN – PHASE II



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EROSION CONTROL LEGEND:

- (IP) INLET PROTECTION (STD. & SPEC. 3.07)
- (SF) SILT FENCE (STD. & SPEC. 3.05)
- LDL LIMITS OF DISTRUBANCE LINE
- (TS) TEMPORARY SEEDING (STD. & SPEC. 3.31)
- (PS) PERMANENT SEEDING (STD. & SPEC. 3.32)
- (ML) MULCHING (STD. & SPEC. 3.35)

FOR CONSTRUCTION DETAILS AND SPECIFICATIONS REFER TO THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" THIRD EDITION, 1992.

E & S QUANTITIES*:

EA	INLET PROTECTION
LF	SILT FENCE
SY	PERMANENT SEEDING
SY	TEMPORARY SEEDING
SY	MULCHING

*TO BE INCLUDED WITH A FUTURE SUBMISSION

25 0 25 50
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

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NOTES

1. Lot dimensions in parentheses are from deed.
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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
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SHOCKOE VALLEY STREET IMPROVEMENTS

EROSION & SEDIMENT CONTROL PLAN – PHASE II

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2D(19)	0-28633

SHEET 3

3-1# — 1 ST'D DI-3C REQ'D
H=4.5' L=10' INV=25.50
ST'D IS-1 REQ'D
CONNECT UD-4 & CD-2 TO STRUCTURE

3-1 — 3-2 — 13 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=25.50 INV(OUT)=25.30

3-2 — 9.0 L.F OF CITY ST'D M-2 REQ'D
1 CITY ST'D FRAME & COVER M-10 REQ'D
INV=20.50
CONNECT TO EXISTING 30" CSS PIPE, MAINTAIN EXISTING PIPE INVERTS

SHEET 4

4-1# — 1 ST'D DI-3B REQ'D
H=4.0' L=12' INV=28.80
CONNECT UD-4 TO STRUCTURE

4-1 — 4-23 — 11 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (2' COVER)
INV(IN)=28.80 INV(OUT)=28.70

4-23 — 1 ST'D FRAME & COVER REQ'D
MODIFY EXISTING DRAINAGE MANHOLE TO-
ACCEPT PROPOSED 15" RCP
MAINTAIN EXISTING OUTFLOW PIPE CONNECTION AND INVERTS
CAP INCOMING EXISTING PIPE CONNECTION

D111 — CONNECT UD-4 TO STRUCTURE

4-3 — 1 ST'D DI-3B REQ'D
H=4.2' L=10' INV=36.00
CONNECT UD-4 TO STRUCTURE

4-3 — 4-25 — 7 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (2' COVER)
INV(IN)=36.00 INV(OUT)=35.80

4-25 — PROPOSED DETENTION BOX
190 CY MINOR STRUCTURE EXCAVATION REQ'D
SEE SHEET 2L(2) FOR DETAILS

4-4 — 11.1 L.F OF CITY ST'D M-2 REQ'D
1 CITY ST'D FRAME & COVER M-10 REQ'D
CONNECT TO EXISTING 24"x36" CSS PIPE, MAINTAIN EXISTING
PIPE INVERTS
INV=27.10

4-25 — 4-27 — 7 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (2' COVER)
INV(IN)=31.50 INV(OUT)=31.40

4-27# — 6.4 L.F OF ST'D MH-2 REQ'D
1 ST'D FRAME & COVER REQ'D
INV=31.30

4-27 — 4-4 — 7 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (2' COVER)
INV(IN)=31.30 INV(OUT)=31.20

4-5# — 1 ST'D DI-3B REQ'D
H=5.0' L=20' INV=29.20
CONNECT UD-4 TO STRUCTURE

4-5 — 4-24 — 4 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=29.20 INV(OUT)=29.10

4-24 — PROPOSED DETENTION BOX
425 CY MINOR STRUCTURE EXCAVATION REQ'D
SEE SHEET 2L(3) FOR DETAILS

4-24 — D111 — 13 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=27.60 INV(OUT)=27.37

4-9# — 1 ST'D DI-3C REQ'D
H=5.1' L=12' INV=25.45
ST'D IS-1 REQ'D
CONNECT UD-4 & CD-2 TO STRUCTURE

4-9 — 3-2 — 38 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=25.45 INV(OUT)=25.20

4-10# — 1 ST'D DI-3B REQ'D
H=5.5' L=20' INV=31.00
CONNECT UD-4 TO STRUCTURE

4-10 — D116 — 7 L.F-12" PVC PIPE REQ'D (4' COVER)
INV(IN)=31.00 INV(OUT)=30.45
CONNECT TO EXISTING STORM SEWER PIPE

4-11 — 1 ST'D DI-3B REQ'D
H=4.2' L=10' INV=32.80
ST'D IS-1 REQ'D
CONNECT UD-4 TO STRUCTURE

4-11 — 4-12 — 9 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=32.80 INV(OUT)=32.40

4-26 — 1 ST'D DI-3B REQ'D
H=4.7' L=20' INV=33.30
CONNECT UD-4 TO STRUCTURE

4-26 — 4-11 — 70 L.F-18" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=33.30 INV(OUT)=32.90

4-12# — 5.5 L.F OF ST'D MH-2 REQ'D
1 ST'D FRAME & COVER REQ'D
CONNECT TO EXISTING 12" PIPE, MAINTAIN EXISTING PIPE INVERTS
INV=30.69

4-13 — 1 ST'D DI-3B REQ'D
H=4.9' L=12' INV=32.10
CONNECT UD-4 TO STRUCTURE

4-13 — 4-12 — 13 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=32.10 INV(OUT)=31.90

4-17 — 1 ST'D DI-3BB REQ'D
H=8.7' L=8' INV=28.34
ST'D IS-1 REQ'D
CONNECT UD-4 TO STRUCTURE

4-17 — 4-18 — 62 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (7' COVER)
INV(IN)=28.34 INV(OUT)=28.00

4-18 — 1 ST'D DI-3B REQ'D
H=6.5' L=4' INV=27.00
ST'D IS-1 REQ'D
CONNECT UD-4 TO STRUCTURE

4-18 — 4-19 — 59 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=27.00 INV(OUT)=26.40

4-19 — 1 ST'D DI-3B REQ'D
H=4.7' L=4' INV=26.30
ST'D IS-1 REQ'D
CONNECT UD-4 TO STRUCTURE

4-19 — 3-1 — 53 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=26.30 INV(OUT)=25.60

4-20 — 4-9 — 34 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=25.75 INV(OUT)=25.55

4-20# — 1 ST'D DI-3B REQ'D
H=5.0' L=16' INV=25.75
CONNECT UD-4 TO STRUCTURE

D111 — MODIFY EXISTING DRAINAGE INLET TO ACCEPT PROPOSED 15" RCP

S084 — LOWER TOP ELEVATION TO 35.66'

S099 — LOWER TOP ELEVATION TO 34.82'

S085 — LOWER TOP ELEVATION TO 35.56'

S098 — LOWER TOP ELEVATION TO 38.41'

SHEET 5

5-1# — 1 ST'D DI-3B REQ'D
H=8.1' L=6' INV=49.20
ST'D IS-1 REQ'D
CONNECT UD-4 TO STRUCTURE

5-1 — 5-21 — 12 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (7' COVER)
INV(IN)=49.20 INV(OUT)=48.70

5-2# — 1 ST'D DI-3B REQ'D
H=4.5' L=18' INV=38.80
CONNECT UD-4 TO STRUCTURE

5-2 — 5-3 — 21 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=38.80 INV(OUT)=38.30

5-3 — 15.00 L.F OF CITY ST'D M-2 REQ'D
1 CITY ST'D FRAME & COVER M-10 REQ'D
CONNECT TO EXISTING 60" CSS PIPE, MAINTAIN EXISTING PIPE INVERTS
INV=27.55

5-4# — 1 ST'D DI-3B REQ'D
H=4.8' L=10' INV=38.70
ST'D IS-1 REQ'D
CONNECT UD-4 TO STRUCTURE

5-4 — 5-3 — 10 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=38.70 INV(OUT)=38.50

5-5 — 1 ST'D DI-3B REQ'D
H=5.0' L=12' INV=39.00
ST'D IS-1 REQ'D
CONNECT UD-4 TO STRUCTURE

5-5 — 5-4 — 17 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=39.00 INV(OUT)=38.80

5-9 — 1 ST'D DI-3B REQ'D
H=5.0' L=8' INV=41.00
CONNECT UD-4 TO STRUCTURE

5-9 — 5-5 — 170 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=41.00 INV(OUT)=39.10

5-6 — 1 CITY ST'D M-11 FRAME & COVER REQ'D
MODIFY EXISTING CSS MANHOLE-
TO ACCEPT PROPOSED 15" PIPE
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS
INV.=23.95

5-7 — 1 ST'D DI-3BB REQ'D
H=8.2' L=8' INV=36.00
CONNECT UD-4 TO STRUCTURE

5-7 — 5-22 — 5 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (7' COVER)
INV(IN)=36.00 INV(OUT)=35.75

5-22 — PROPOSED DETENTION BOX
272 CY MINOR STRUCTURE EXCAVATION REQ'D
SEE SHEET 2L(3) FOR DETAILS

5-22 — 5-20 — 20 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=32.00 INV(OUT)=31.60

5-11 — 1 CITY ST'D M-11 FRAME & COVER REQ'D
MODIFY EXISTING CSS MANHOLE-
TO ACCEPT PROPOSED 15" PIPE
RAISE TOP ELEVATION TO 48.50'
CAP PIPE COMING FROM EXISTING INLET
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS
INV=36.09

5-12 — 5-11 — 23 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (2' COVER)
INV(IN)=45.60 INV(OUT)=45.10

5-12# — 1 ST'D DI-3B REQ'D
H=5.4' L=14' INV=45.60
CONNECT UD-4 TO STRUCTURE

S046 — RAISE TOP ELEVATION TO 59.00'

S049 — RAISE TOP ELEVATION TO 48.00'

S055 — RAISE TOP ELEVATION TO 48.16

S056 — RAISE TOP ELEVATION TO 47.87'

S058 — RAISE TOP ELEVATION TO 43.10'

S069 — RAISE TOP ELEVATION TO 42.59'

S070 — RAISE TOP ELEVATION TO 42.83'

5-14 — 1 ST'D MH-2 FRAME & COVER REQ'D
MODIFY EXISTING INLET TOP TO MANHOLE
MODIFY EXISTING STRUCTURE TO -
ACCEPT PROPOSED 15" PIPE
RAISE TOP ELEVATION TO 50.75'
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS
INV.=43.74

5-15# — 1 ST'D DI-3B REQ'D
H=5.0' L=14' INV=46.50
CONNECT UD-4 TO STRUCTURE

5-15 — 5-14 — 18 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=46.50 INV(OUT)=46.00

5-18# — 1 ST'D DI-3BB REQ'D
H=9.1' L=10' INV=49.90
CONNECT UD-4 TO STRUCTURE

NOTE
# DENOTES PROPOSED INLET SHALL BE MODIFIED AND CONSTRUCTED IN ACCORDANCE WITH STANDARD CITY OF RICHMOND TRAP INLET DETAIL AS SHOWN ON PLAN SHEET 2B(2). THE COST FOR ALL MODIFICATIONS AND MATERIALS SHALL BE INCLUDED IN THE UNIT PRICE FOR THE STANDARD INLET.

ALL EXISTING AND PROPOSED STRUCTURE RIMS SHALL BE ADJUSTED TO MEET FINISHED GRADE.

70% SUBMITTAL SEPTEMBER 2022

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NOTES
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REFERENCES | REVISIONS

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Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
DRAINAGE DESCRIPTION SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2E(1)	0-28633
CHECKED BY: ASamberg						

SHEET 5 CONT.

5-18 — 5-21: 14 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (7' COVER)
INV(IN)=49.90 INV(OUT)=49.50

5-20# : 1 ST'D DI–3B REQ'D
H=7.5' L=4' INV=31.50
ST'D IS–1 REQ'D
CONNECT UD–4 TO STRUCTURE

5-20 — 5-6: 11 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=31.50 INV(OUT)=31.10

5-21 : 1 CITY ST'D M–10 FRAME & COVER REQ'D
MODIFY EXISTING CSS MANHOLE–
TO ACCEPT PROPOSED 15" PIPE
RAISE TOP ELEVATION TO 56.78'
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS
INV=41.35

SHEET 6

6-1# : 9.8 L.F OF ST'D MH–2 REQ'D
1 ST'D FRAME & COVER REQ'D
ST'D IS–1 REQ'D
INV=52.80

6-1 — 6-16: 9 L.F–18" CONC. STORM SEWER PIPE CLASS III REQ'D (9' COVER)
INV(IN)=52.80 INV(OUT)=52.60

6-2 : 1 ST'D DI–3B REQ'D
H=7.7' L=8' INV=50.50
ST'D IS–1 REQ'D
CONNECT UD–4 TO STRUCTURE

6-2 — 5-1: 81 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (7' COVER)
INV(IN)=50.50 INV(OUT)=49.30

6-3 : 1 ST'D DI–2C REQ'D
H=6.5' L=6' INV=51.00
ST'D IS–1 REQ'D
CONNECT UD–4 & CD–2 TO STRUCTURE

6-3 — 6-2: 35 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=51.00 INV(OUT)=50.60

D066 : MODIFY EXISTING DI–2C
TO ACCEPT PROPOSED 15" PIPE

D066 — 6-3: 67 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=51.73 INV(OUT)=51.21

6-4 : 1 ST'D DI–5 REQ'D
TYPE E COVER REQ'D
TYPE III GRATE REQ'D
H=4.4' INV=53.10

6-4 — 6-1: 20 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (8' COVER)
INV(IN)=53.10 INV(OUT)=52.90

6-5 — 6-8: 25 L.F–18" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=57.40 INV(OUT)=57.10

6-5 : 1 ST'D DI–3C REQ'D
H=7.5' L=20' INV=57.40
ST'D IS–1 REQ'D
CONNECT UD–4 & CD–2 TO STRUCTURE

6-6 : 1 ST'D DI–3BB REQ'D
H=15.5' L=20' INV=63.50
ST'D IS–1 REQ'D
CONNECT UD–4 TO STRUCTURE

6-6 — 6-5: 160 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (14' COVER)
INV(IN)=63.50 INV(OUT)=57.50

6-7 : 1 ST'D DI–3BB REQ'D
H=9.3' L=8' INV=69.75
CONNECT UD–4 TO STRUCTURE

6-7 — 6-6: 36 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (7' COVER)
INV(IN)=69.75 INV(OUT)=69.25

6-8 : 1 ST'D DI–3C REQ'D
H=8.0' L=10' INV=57.00
ST'D IS–1 REQ'D
CONNECT UD–4 & CD–2 TO STRUCTURE

6-8 — 6-1: 53 L.F–18" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=57.00 INV(OUT)=56.40

6-9# : 1 ST'D DI–3B REQ'D
H=7.5' L=10' INV=58.50
CONNECT UD–4 TO STRUCTURE

6-9 — S009: 40 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=58.50 INV(OUT)=57.50

S009 : 1 CITY ST'D M–10 FRAME & COVER REQ'D
MODIFY EXISTING CSS MANHOLE–
TO ACCEPT PROPOSED 15" PIPE
RAISE TOP ELEVATION TO 61.00'
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS

6-11 : 1 ST'D MH–2 FRAME & COVER REQ'D
MODIFY EXISTING INLET TOP TO MANHOLE
MODIFY EXISTING STRUCTURE TO –
ACCEPT PROPOSED 15" PIPE
RAISE TOP ELEVATION TO 87.10'
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS

6-12# : 1 ST'D DI–5 REQ'D
TYPE E COVER REQ'D
TYPE III GRATE REQ'D
H=3.9' INV=84.20

6-12 — 6-11: 15 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (2' COVER)
INV(IN)=84.20 INV(OUT)=84.00

6-13# : 1 ST'D DI–3B REQ'D
H=10.3' L=20' INV=80.20
I ST'D SL–1 REQ'D
CONNECT UD–4 TO STRUCTURE

6-13 — 6-14: 23 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (9' COVER)
INV(IN)=80.20 INV(OUT)=80.00

6-14 : 8.6 L.F OF CITY ST'D M–2 REQ'D
1 CITY ST'D FRAME & COVER M–10 REQ'D
CONNECT TO EXISTING 27" SAN. SEWER, MAINTAIN EXISTING
PIPE INVERTS
INV=80.00

6-15# : 1 ST'D DI–3B REQ'D
H=4.3' L=12' INV=86.20
CONNECT UD–4 TO STRUCTURE

6-15 — 6-14: 20 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=86.20 INV(OUT)=85.30

6-16 : 1 CITY ST'D M–10 FRAME & COVER REQ'D
MODIFY EXISTING CSS MANHOLE–
TO ACCEPT PROPOSED 18" PIPE
RAISE TOP ELEVATION TO 62.15'
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS

6-17 : 1 ST'D DI–3BB REQ'D
H=14.5' L=6' INV=58.00
ST'D IS–1 REQ'D
1 ST'D SL–1 REQ'D
CONNECT UD–4 TO STRUCTURE

6-17 — 7-1: 144 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (12' COVER)
INV(IN)=58.00 INV(OUT)=51.40

6-18 : 1 ST'D DI–3CC REQ'D
H=9.0' L=14' INV=66.00
CONNECT UD–4 & CD–2 TO STRUCTURE

6-18 — 6-17: 103 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (7' COVER)
INV(IN)=66.00 INV(OUT)=63.50

6-19 : 1 ST'D DI–5 REQ'D
TYPE A2 COVER REQ'D
TYPE III GRATE REQ'D
H=3.6' INV=81.60

6-19 — 6-13: 124 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (8' COVER)
INV(IN)=81.60 INV(OUT)=80.30

6-20 : 1 ST'D DI–5 REQ'D
TYPE E COVER REQ'D
TYPE III GRATE REQ'D
H=4.5' INV=52.00

6-20 — 7-6: 11 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=52.00 INV(OUT)=51.00

S044 : RAISE TOP ELEVATION TO 87.00'

SHEET 7

7-1 : 1 ST'D DI–3BB REQ'D
H=10.7' L=6' INV=51.30
ST'D IS–1 REQ'D
CONNECT UD–4 TO STRUCTURE

7-1 — 7-3: 49 L.F–18" CONC. STORM SEWER PIPE CLASS III REQ'D (7' COVER)
INV(IN)=51.30 INV(OUT)=51.00

7-3 : 1 ST'D DI–3BB REQ'D
H=8.1' L=14' INV=50.90
ST'D IS–1 REQ'D
CONNECT UD–4 TO STRUCTURE

7-3 — 7-6: 4 L.F–18" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=50.90 INV(OUT)=50.80

7-4# : 1 ST'D DI–3BB REQ'D
H=7.8' L=4' INV=44.17
ST'D IS–1 REQ'D
CONNECT UD–4 TO STRUCTURE
CONNECT TO EXISTING 18" RCP, MAINTAIN EXISTING PIPE INVERTS

7-6 : PROPOSED DETENTION BOX
733 CY MINOR STRUCTURE EXCAVATION REQ'D
SEE SHEET 2L(4) FOR DETAILS

7-6 — 7-7: 5 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (10' COVER)
INV(IN)=48.00 INV(OUT)=47.80

7-7# : 9.3 L.F OF ST'D MH–2 REQ'D
1 ST'D FRAME & COVER REQ'D
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS
INV=47.70

7-7 — S010: 5 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (7' COVER)
INV(IN)=47.70 INV(OUT)=47.50

S010 : 1 CITY ST'D M–10 FRAME & COVER REQ'D
MODIFY EXISTING CSS MANHOLE–
TO ACCEPT PROPOSED 15" PIPE
RAISE TOP ELEVATION TO 55.03'
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS
PLUG EXISTING PIPE FROM D020 TO S010

7-2 : 1 ST'D DI–5 REQ'D
TYPE E COVER REQ'D
TYPE III GRATE REQ'D
H=7.5' INV=47.3

7-2 — D021: 48 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=47.30 INV(OUT)=47.00

D021 : MODIFY EXISTING INLET–
TO ACCEPT PROPOSED 15" PIPE
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS

7-5 : 1 ST'D DI–5 REQ'D
TYPE E COVER REQ'D
TYPE III GRATE REQ'D
H=4.4' INV=51.60

7-5 — 7-1: 21 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (8' COVER)
INV(IN)=51.60 INV(OUT)=51.40

SHEET 10

10-1 : 1 ST'D DI–3B REQ'D
H=4.4' L=20' INV=49.60
CONNECT UD–4 TO STRUCTURE

10-1 — D004: 25 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (2' COVER)
INV(IN)=49.60 INV(OUT)=49.30

10-2 : 1 ST'D DI–3B REQ'D
H=4.9' L=4' INV=49.00
CONNECT UD–4 TO STRUCTURE

10-2 — D014: 12 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=49.00 INV(OUT)=48.50

10-3 : 1 ST'D DI–3B REQ'D
H=4.4' L=20' INV=55.50
CONNECT UD–4 TO STRUCTURE

10-3 — 10-4: 6 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=55.50 INV(OUT)=55.30

10-4 : 9.2 L.F OF ST'D MH–2 REQ'D
1 ST'D FRAME & COVER REQ'D
CONNECT TO EXISTING 24" RCP
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS
INV=51.00

D004 : MODIFY EXISTING STRUCTURE–
TO ACCEPT PROPOSED 15" PIPE
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS
LOWER TOP ELEVATION TO 52.83

D014 : MODIFY EXISTING STRUCTURE–
TO ACCEPT PROPOSED 15" PIPE
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS
LOWER TOP ELEVATION TO 52.38

NOTE
# DENOTES PROPOSED INLET SHALL BE MODIFIED AND CONSTRUCTED IN ACCORDANCE WITH STANDARD CITY OF RICHMOND TRAP INLET DETAIL AS SHOWN ON PLAN SHEET 2B(2). THE COST FOR ALL MODIFICATIONS AND MATERIALS SHALL BE INCLUDED IN THE UNIT PRICE FOR THE STANDARD INLET.

ALL EXISTING AND PROPOSED STRUCTURE RIMS SHALL BE ADJUSTED TO MEET FINISHED GRADE.

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve; Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
DRAINAGE DESCRIPTION SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2E(2)	0-28633
CHECKED BY: ASamberg						

SHEET 10 CONT.

10-5 — 1 ST'D DI-7 REQ'D
H=4.5' INV=46.50'
CONNECT UD-4 TO STRUCTURE

10-5 — 10-6 — 8 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=46.50 INV(OUT)=46.30
ST'D SWM-1 CONCRETE CRADLE REQ'D
0.9 CY CLASS A3 CONC. REQ'D

10-6 — PROPOSED DETENTION BOX
462 CY MINOR STRUCTURE EXCAVATION REQ'D
SEE SHEET 2L(1) FOR DETAILS

10-7 — 1 ST'D DI-3B REQ'D
H=5.8' L=6' INV=61.50
CONNECT UD-4 TO STRUCTURE

10-7 — 10-8 — 23 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=61.50 INV(OUT)=61.00

10-8 — 9.8 L.F OF ST'D MH-2 REQ'D
1 ST'D FRAME & COVER REQ'D
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS
INV=55.18

10-6 — D004 — 31 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=45.50 INV(OUT)=45.10

D002 — RAISE TOP ELEVATION TO 62.92

D003 — LOWER TOP ELEVATION TO 53.43

D010 — 1 ST'D MH-2 FRAME & COVER REQ'D
MODIFY EXISTING INLET TOP TO MANHOLE
MODIFY EXISTING STRUCTURE-
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS

SHEET 12

12-1# — 1 ST'D DI-3B REQ'D
H=5.0' L=20' INV=69.00
CONNECT UD-4 TO STRUCTURE

12-1 — 12-2 — 9 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=69.00 INV(OUT)=68.80

12-2 — 17.5 L.F OF CITY ST'D M-1 REQ'D
1 CITY ST'D FRAME & COVER M-10 REQ'D
CONNECT TO EXISTING 16"x24" SAN SEWER, MAINTAIN EXISTING PIPE INVERTS
1 ST'D SL-1 REQ'D
INV=55.04

12-3 — 1 ST'D DI-3BB REQ'D
H=15.30' L=16' INV=58.70
ST'D IS-1 REQ'D
1 ST'D SL-1 REQ'D
CONNECT UD-4 TO STRUCTURE

12-3 — 12-4 — 130 L.F. -24"CONC. STORM SEWER PIPE CLASS III REQ'D (12'COVER)
INV(IN) = 59.09 INV(OUT) = 58.70
OUTFALL WEIR ELEV. = 60.20
5"OUTFALL ORIFICE ELEV. = 58.70
SEE DETAILS ON SHEET 2(L)2

12-4# — 1 ST'D DI-3B REQ'D
H=4.9' L=16' INV=58.60
ST'D IS-1 REQ'D
CONNECT UD-4 TO STRUCTURE

12-4 — 12-5 — 29 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=58.60 INV(OUT)=58.30

12-5 — 11.2 L.F OF CITY ST'D M-1 REQ'D
1 CITY ST'D FRAME & COVER M-10 REQ'D
CONNECT TO EXISTING 16"x24" SAN SEWER, MAINTAIN EXISTING PIPE INVERTS
INV=52.40

12-6 — 1 ST'D DI-5 REQ'D
TYPE E COVER REQ'D
TYPE III GRATE REQ'D
H=5.0' INV=75.60

12-6 — 12-7 — 34 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=75.60 INV(OUT)=74.30

12-7 — 5.4 L.F OF ST'D MH-1 OR MH-2 REQ'D
1 ST'D FRAME & COVER REQ'D
ST'D IS-1 REQ'D
INV=74.20

12-7 — 12-3 — 76 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=74.20 INV(OUT)=69.10

SHEET 13

13-1# — 1 ST'D DI-3A REQ'D
H=8.2' INV=73.95
CONNECT UD-4 TO STRUCTURE

13-1 — 13-2 — 13 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=73.95 INV(OUT)=73.60

13-2 — 9.4 L.F OF CITY ST'D M-2 REQ'D
1 CITY ST'D FRAME & COVER M-10 REQ'D
CONNECT TO EXISTING 18" CSS PIPE, MAINTAIN EXISTING PIPE INVERTS
INV=72.00

13-3# — 1 ST'D DI-3A REQ'D
H=4.3' INV=77.70
CONNECT UD-4 TO STRUCTURE

13-3 — 13-2 — 13 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=77.70 INV(OUT)=77.40

13-4 — 1 ST'D DI-5 REQ'D
TYPE E COVER REQ'D
TYPE III GRATE REQ'D
H=6.5' INV=78.00

13-5 — 1 ST'D DI-5 REQ'D
TYPE E COVER REQ'D
TYPE III GRATE REQ'D
H=10.5' INV=72.61
CONNECT TO EXISTING 18" SAN. SEWER, MAINTAIN EXISTING PIPE INVERTS

13-4 — 13-3 — 27 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=78.00 INV(OUT)=77.80

SHEET 16

16-1# — 1 ST'D DI-3BB REQ'D
CONNECT TO EXISTING 15" RCP
H=9.0' L=10' INV=100.00
ST'D IS-1 REQ'D
CONNECT UD-4 TO STRUCTURE

16-2# — 1 ST'D DI-3BB REQ'D
CONNECT TO EXISTING 15" RCP
H=9.3' L=18' INV=99.67
ST'D IS-1 REQ'D
CONNECT UD-4 TO STRUCTURE

16-3 — 1 ST'D DI-5 REQ'D
TYPE E COVER REQ'D
TYPE III GRATE REQ'D
H=5.7' INV=101.50

16-3 — 16-2 — 43 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (7' COVER)
INV(IN)=101.50 INV(OUT)=99.80

16-4 — 1 ST'D MH-2 FRAME & COVER REQ'D
MODIFY EXISTING CSS MANHOLE-
RAISE TOP ELEVATION TO 107.78'
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS

16-5 — 1 ST'D DI-5 REQ'D
TYPE E COVER REQ'D
TYPE III GRATE REQ'D
ST'D IS-1 REQ'D
H=5.4' INV=108.90

16-5 — 16-11 — 28 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=108.90 INV(OUT)=107.00

16-6 — 1 ST'D DI-5 REQ'D
TYPE A2 COVER REQ'D
TYPE III GRATE REQ'D
H=6.0' INV=111.80

16-6 — 17-1 — 56 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (11' COVER)
INV(IN)=111.80 INV(OUT)=111.30

16-7 — 1 ST'D DI-1 REQ'D
H=3.5' INV=101.00

16-7 — 16-8 — 28 L.F-12" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=101.00 INV(OUT)=100.80

16-8 — 1 ST'D DI-1 REQ'D
H=5.8' INV=100.70
ST'D IS-1 REQ'D
ST-1 REQ'D

16-8 — 16-9 — 24 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=100.70 INV(OUT)=100.50

16-9 — 1 ST'D DI-1 REQ'D
H=8.1' INV=100.40
ST'D IS-1 REQ'D
ST-1 REQ'D

16-9 — 16-1 — 12 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (7' COVER)
INV(IN)=100.40 INV(OUT)=100.30

16-10 — 1 ST'D DI-1 REQ'D
H=5.8' INV=104.70
ST'D IS-1 REQ'D
ST-1 REQ'D

16-10 — 16-9 — 25 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=104.70 INV(OUT)=102.90

16-11 — 1 ST'D DI-1 REQ'D
H=5.1' INV=106.90
ST'D IS-1 REQ'D
ST-1 REQ'D

16-11 — 16-10 — 27 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=106.90 INV(OUT)=104.80

16-12 — 1 ST'D DI-3C REQ'D
H=5.5' L=4' INV=111.00
ST-1 REQ'D
CONNECT UD-4 & CD-2 TO STRUCTURE

16-12 — 16-5 — 29 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=111.00 INV(OUT)=109.00

SHEET 17

17-1# — 1 ST'D DI-3BB REQ'D
H=13.1' L=12' INV=111.20
ST'D SL-1 REQ'D
ST'D IS-1 REQ'D
CONNECT UD-4 TO STRUCTURE

17-1 — 17-18 — 22 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (12' COVER)
INV(IN)=111.20 INV(OUT)=110.70

17-2# — 1 ST'D DI-3B REQ'D
H=6.4' L=20' INV=117.90
ST'D IS-1 REQ'D
CONNECT UD-4 TO STRUCTURE

17-2 — 17-18 — 23 L.F-18" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=117.90 INV(OUT)=117.00

17-3 — 1 ST'D DI-3B REQ'D
H=4.2' L=20' INV=122.30
CONNECT UD-4 TO STRUCTURE

17-3 — 17-1 — 47 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=122.30 INV(OUT)=119.00

17-4 — 7.3 L.F OF CITY ST'D M-1 REQ'D
1 CITY ST'D FRAME & COVER M-10 REQ'D
CONNECT TO EXISTING 15" CSS, MAINTAIN EXISTING PIPE INVERTS
INV=MATCH INVERT OF EXISTING CSS, APPROX. 120.77'

17-5 — 1 ST'D DI-3C REQ'D
H=5.2' L=20' INV=123.90
ST'D IS-1 REQ'D
CONNECT UD-4 & CD-2 TO STRUCTURE

17-5 — 17-15 — 44 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=123.90 INV(OUT)=122.50

17-6 — 10.8 L.F OF CITY ST'D M-2 REQ'D
1 CITY ST'D FRAME & COVER M-10 REQ'D
CONNECT TO EXISTING 20"' X 30" CSS, MAINTAIN EXISTING PIPE INVERTS
INV= MATCH INVERT OF EXISTING CSS, APPROX. 119.69'

17-7# — 1 ST'D DI-3BB REQ'D
H=10.5' L=20' INV=121.50
CONNECT UD-4 TO STRUCTURE

17-7 — 17-6 — 27 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (9' COVER)
INV(IN)=121.50 INV(OUT)=120.50

17-8# — 1 ST'D DI-3B REQ'D
H=7.0' L=20' INV=125.00
CONNECT UD-4 TO STRUCTURE

17-8 — 17-6 — 16 L.F-15" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=125.00 INV(OUT)=124.50

17-9# — 1 ST'D DI-3B REQ'D
H=5.0' L=20' INV=126.00
CONNECT UD-4 TO STRUCTURE

NOTE
# DENOTES PROPOSED INLET SHALL BE MODIFIED AND CONSTRUCTED IN ACCORDANCE WITH STANDARD CITY OF RICHMOND TRAP INLET DETAIL AS SHOWN ON PLAN SHEET 2B(2). THE COST FOR ALL MODIFICATIONS AND MATERIALS SHALL BE INCLUDED IN THE UNIT PRICE FOR THE STANDARD INLET.

ALL EXISTING AND PROPOSED STRUCTURE RIMS SHALL BE ADJUSTED TO MEET FINISHED GRADE.

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH or WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole (SDMH, (SMH))
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
DRAINAGE DESCRIPTION SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		0-28633
CHECKED BY: ASamberg					SHEET 2E(3)	

SHEET 17 CONT.

17-9 — 17-20 7 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=126.00 INV(OUT)=125.90

17-10 1 ST'D DI–3B REQ'D
H=8.1' L=20' INV=124.40
ST'D IS–1 REQ'D
CONNECT UD–4 TO STRUCTURE

17-10 — 17-16 31 L.F–18" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=124.40 INV(OUT)=124.00

17-11 1 ST'D DI–5 REQ'D
TYPE E COVER REQ'D
TYPE III GRATE REQ'D
H=12.9' INV=124.40

17-11 — 17-16 25 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (11' COVER)
INV(IN)=122.90 INV(OUT)=122.75

17-12 — 17-22 120 L.F. –18"CONC. STORM SEWER PIPE CLASS III REQ'D (7'COVER)
INV(IN) = 128.36 INV(OUT) = 128.00
OUTFALL WEIR ELEV. = 129.00
10"OUTFALL ORIFICE ELEV. = 128.00
SEE DETAILS ON SHEET 2(L)2

17-12# 1 ST'D DI–3B REQ'D
H=6.9' L=20' INV=128.36
CONNECT UD–4 TO STRUCTURE

17-14 1 ST'D DI–3B REQ'D
H=5.5' L=20' INV=125.50
ST'D IS–1 REQ'D
CONNECT UD–4 TO STRUCTURE

17-14 — 17-5 40 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=125.50 INV(OUT)=124.00

17-15# 1 ST'D DI–3B REQ'D
H=6.8' L=6' INV=122.40
ST'D IS–1 REQ'D
CONNECT UD–4 TO STRUCTURE

17-15 — 17-4 4 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=122.40 INV(OUT)=122.20

17-16 6.6 L.F OF ST'D MH–1 OR MH–2 REQ'D
1 ST'D FRAME & COVER REQ'D
ST'D IS–1 REQ'D
INV=121.00

17-16 — 17-19 98 L.F–18" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=121.00 INV(OUT)=120.00

17-17 1 ST'D DI–3BB REQ'D
H=11.6' L=16' INV=126.00
CONNECT UD–4 TO STRUCTURE

17-17 — 17-10 125 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (9' COVER)
INV(IN)=126.00 INV(OUT)=124.50

17-18 13.1 L.F OF CITY ST'D M–1 REQ'D
1 CITY ST'D FRAME & COVER M–10 REQ'D
CONNECT TO EXISTING 20" X 30" CSS, MAINTAIN EXISTING PIPE INVERTS
INV=MATCH INVERT OF EXISTING CSS, APPROX. 110.58
1 ST'D SL–1 REQ'D

17-19 1 ST'D DI–3A REQ'D
H=8.0' INV=119.00
ST'D IS–1 REQ'D
CONNECT UD–4 TO STRUCTURE

17-19 — 17-2 30 L.F–18" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=119.00 INV(OUT)=118.00

17-20 6.7 L.F OF CITY ST'D M–1 REQ'D
1 CITY ST'D FRAME & COVER M–10 REQ'D
CONNECT TO EXISTING 18" CSS, MAINTAIN EXISTING PIPE INVERTS
INV=MATCH INVERT OF EXISTING CSS, APPROX. 122.89

17-22 3.5 L.F OF ST'D MH–1 OR MH–2 REQ'D
1 ST'D FRAME & COVER REQ'D
INV=128.00

17-22 — 17-20 7 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (2' COVER)
INV(IN)=128.00 INV(OUT)=127.50

17-21 1 ST'D DI–3BB REQ'D
H=10.6' L=6' INV=127.00
CONNECT UD–4 TO STRUCTURE

17-21 — 17-14 44 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=127.00 INV(OUT)=125.60

S037 LOWER TOP ELEVATION TO 134.17'

S042 RAISE TOP ELEVATION TO 128.57'

SHEET 18

18-1 1 ST'D DI–4B REQ'D
H=7.8' L=20' INV=129.45
CONNECT UD–4 TO STRUCTURE

18-1 — 18-2 89 L.F. –48"CONC. STORM SEWER PIPE CLASS III REQ'D (2'COVER)
INV(IN) = 129.45 INV(OUT) = 129.00
SEE DETAILS ON SHEET 2(L)2

18-2# 1 MOD. JB–1 REQ.
H=7.9, W=4', D=4'
TYPE A TOWER REQ.
1 STC. MH–1 FRAME AND COVER REQ.
INV=127.58
OUTFALL WEIR ELEV. = 131.75
7.5"OUTFALL ORIFICE ELEV. = 129.0
ST'D IS–1 REQ'D
CONNECT UD–4 TO STRUCTURE
1 STD. SL–1 REQ.

18-2 — 18-4 46 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (7' COVER)
INV(IN)=127.58 INV(OUT)=127.28

18-3# 1 ST'D DI–3BB REQ'D
H=11.0' L=20' INV=124.50
CONNECT UD–4 TO STRUCTURE

18-3 — S106 93 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (10' COVER)
INV(IN)=124.50 INV(OUT)=123.50

S106 1 ST'D MH–2 FRAME & COVER REQ'D
MODIFY EXISTING CSS MANHOLE–
TO ACCEPT PROPOSED 15" PIPE
RAISE TOP ELEVATION TO 134.30'
MAINTAIN EXISTING PIPE CONNECTION AND INVERTS

18-4 APPROX. 13.50 L.F OF CITY ST'D M–1 REQ'D
1 CITY ST'D FRAME & COVER M–10 REQ'D
CONNECT TO EXISTING 15" CSS, MAINTAIN EXISTING PIPE INVERTS
INV=MATCH INVERT OF EXISTING CSS, APPROX. 121.50'
1 ST'D SL–1 REQ'D
CONNECT UD–4 TO STRUCTURE

18-5# 1 ST'D DI–3B REQ'D
H=5.5' L=18' INV=130.50
CONNECT UD–4 TO STRUCTURE

18-5 — 18-4 12 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=130.50 INV(OUT)=130.00

18-6# 1 ST'D DI–3B REQ'D
H=7.0' L=8' INV=129.00
CONNECT UD–4 TO STRUCTURE

18-6 — 18-8 21 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=129.00 INV(OUT)=128.50

18-7# 1 ST'D DI–3BB REQ'D
H=10.8' L=12' INV=124.68
CONNECT UD–4 TO STRUCTURE

18-7 — 18-8 21 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (10' COVER)
INV(IN)=124.68 INV(OUT)=123.68

18-8 APPROX. 12.4 L.F OF CITY ST'D M–2 REQ'D
1 CITY ST'D FRAME & COVER M–10 REQ'D
CONNECT TO EXISTING 48" CSS, MAINTAIN EXISTING PIPE INVERTS
INV=MATCH INVERT OF EXISTING CSS, APPROX. 123.59'
CONNECT UD–4 TO STRUCTURE

18-9# 1 ST'D DI–3B REQ'D
H=6.8' L=10' INV=125.90
ST'D IS–1 REQ'D
CONNECT UD–4 TO STRUCTURE

18-9 — 18-10 43 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=125.90 INV(OUT)=124.50

18-10 8.4 L.F OF CITY ST'D M–1 REQ'D
1 CITY ST'D FRAME & COVER M–10 REQ'D
CONNECT TO EXISTING 18" CSS, MAINTAIN EXSISTING PIPE INVERT OUT
INV=MATCH INVERT OF EXISTING CSS, APPROX. 123.59'

18-11 1 ST'D DI–3C REQ'D
H=5.6' L=6' INV=126.40
ST'D IS–1 REQ'D
CONNECT UD–4 & CD–2 TO STRUCTURE

18-11 — 18-9 57 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=126.40 INV(OUT)=126.00

18-12# 1 ST'D DI–3C REQ'D
H=4.9' L=6' INV=128.00
CONNECT UD–4 & CD–2 TO STRUCTURE

18-12 — 18-13 6 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (3' COVER)
INV(IN)=128.00 INV(OUT)=127.50

18-13 12.4 L.F OF CITY ST'D M–2 REQ'D
1 CITY ST'D FRAME & COVER M–10 REQ'D
CONNECT TO EXISTING 48" CSS, MAINTAIN EXSISTING PIPE INVERT OUT
1 ST'D SL–1 REQ'D
INV=MATCH INVERT OF EXISTING CSS, APPROX. 119.8'

18-14# 1 ST'D DI–3B REQ'D
H=6.5' L=16' INV=125.50
CONNECT UD–4 TO STRUCTURE

18-14 — 18-15 42 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (5' COVER)
INV(IN)=125.50 INV(OUT)=125.00

18-15 11.8 L.F OF CITY ST'D M–2 REQ'D
1 CITY ST'D FRAME & COVER M–10 REQ'D
CONNECT TO EXISTING 48" CSS, MAINTAIN EXSISTING PIPE INVERT OUT
1 ST'D SL–1 REQ'D
INV=MATCH INVERT OF EXISTING CSS, APPROX. 119.20'

18-16# 1 ST'D DI–3C REQ'D
H=7.4' L=8' INV=125.50
CONNECT UD–4 & CD–2 TO STRUCTURE

18-16 — 18-10 6 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=125.50 INV(OUT)=125.00

18-17 1 ST'D DI–3B REQ'D
H=5.6' L=16' INV=126.90
CONNECT UD–4 TO STRUCTURE

18-17 — 18-11 39 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (4' COVER)
INV(IN)=126.90 INV(OUT)=126.50

S106 RAISE TOP ELEVATION TO 134.38'
MODIFY TO ACCEPT PROPOSED 15" PIPE

S111 RAISE TOP ELEVATION TO 131.57'

D135 RAISE TOP ELEVATION TO 131.60'

D136 RAISE TOP ELEVATION TO 131.42'

D137 RAISE TOP ELEVATION TO 131.32'

D138 RAISE TOP ELEVATION TO 131.29

NOTE
# DENOTES PROPOSED INLET SHALL BE MODIFIED AND CONSTRUCTED IN ACCORDANCE WITH STANDARD CITY OF RICHMOND TRAP INLET DETAIL AS SHOWN ON PLAN SHEET 2B(2). THE COST FOR ALL MODIFICATIONS AND MATERIALS SHALL BE INCLUDED IN THE UNIT PRICE FOR THE STANDARD INLET.

ALL EXISTING AND PROPOSED STRUCTURE RIMS SHALL BE ADJUSTED TO MEET FINISHED GRADE.

SHEET 19

19-3# 1 ST'D DI–3B REQ'D
H=5.8' L=10' INV=123.50
CONNECT UD–4 TO STRUCTURE

19-3 — 19-4 29 L.F–15" CONC. STORM SEWER PIPE CLASS III REQ'D (6' COVER)
INV(IN)=123.50 INV(OUT)=122.00

19-4 10.8 L.F OF CITY ST'D M–2 REQ'D
1 CITY ST'D FRAME & COVER M–10 REQ'D
CONNECT TO EXISTING 48" CSS, MAINTAIN EXSISTING PIPE INVERT OUT
INV=MATCH INVERT OF EXISTING CSS, APPROX. 117.7'

70% SUBMITTAL SEPTEMBER 2022

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REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (County); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manholes; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

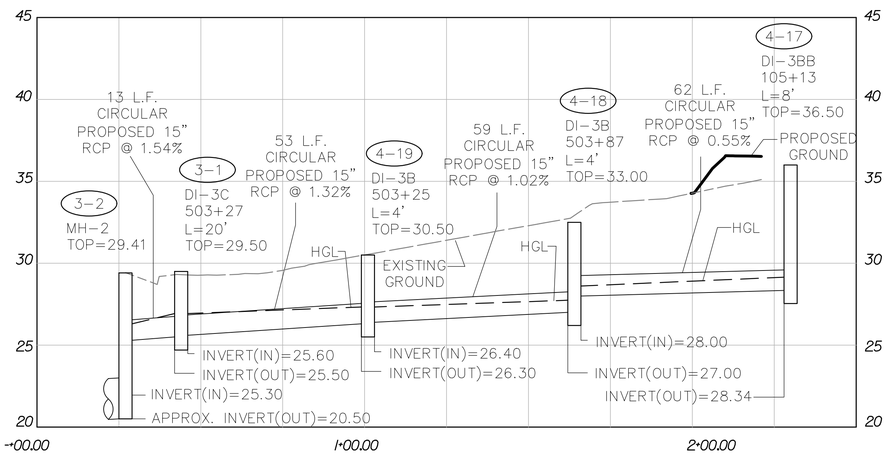
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

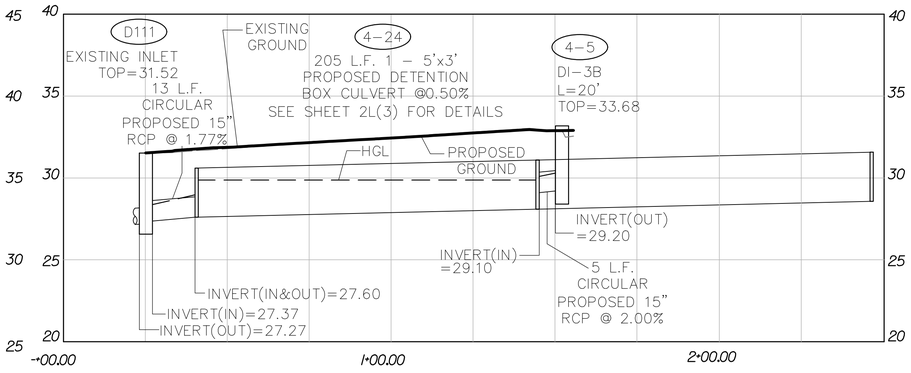
RK&K Responsive People - Creative Solutions

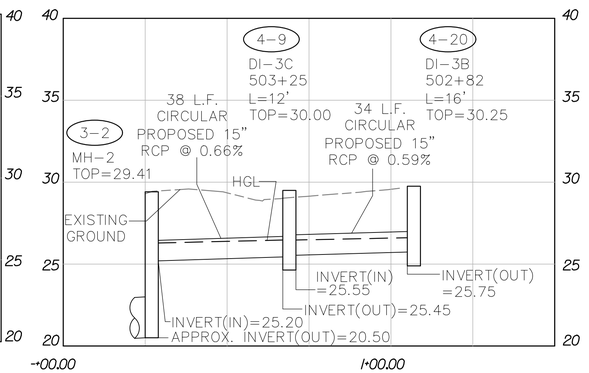
SHOCKOE VALLEY STREET IMPROVEMENTS
DRAINAGE DESCRIPTION SHEET

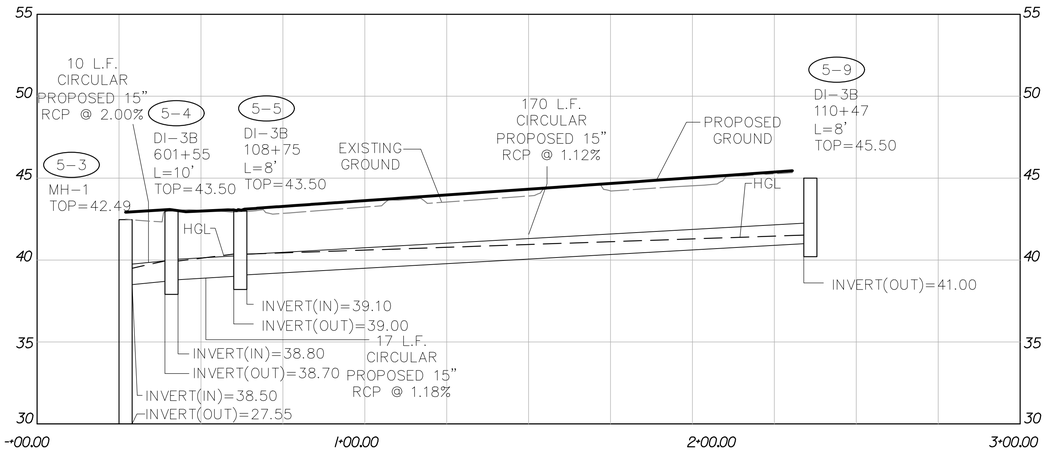
AUTHORITY: CITY OF RICHMOND, DPW

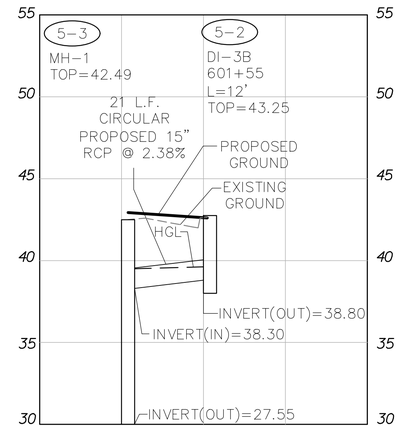
DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2E(4)	0-28633

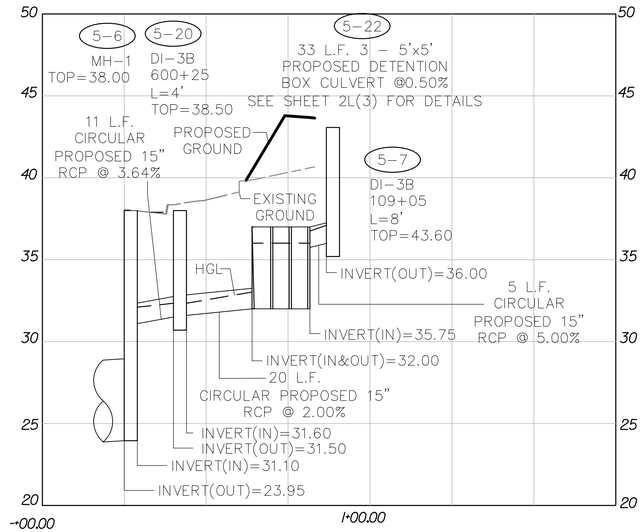






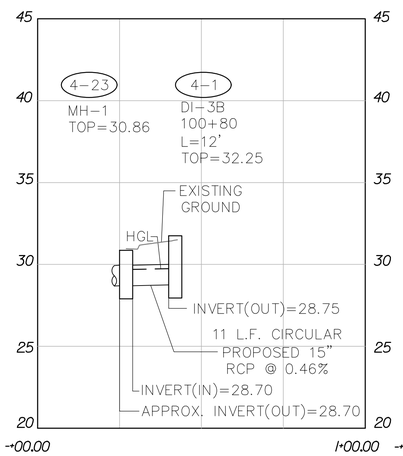


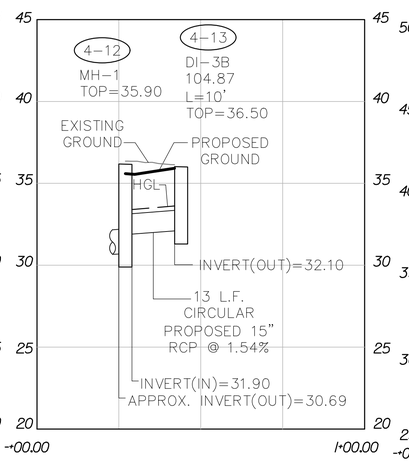


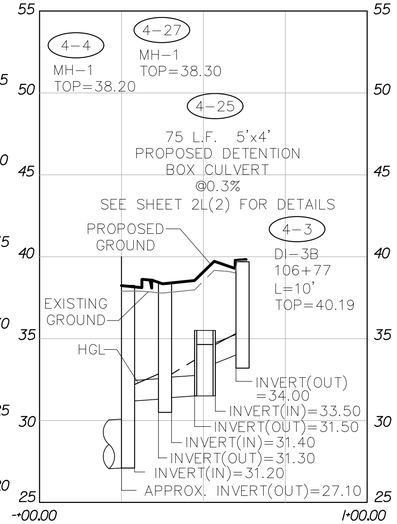


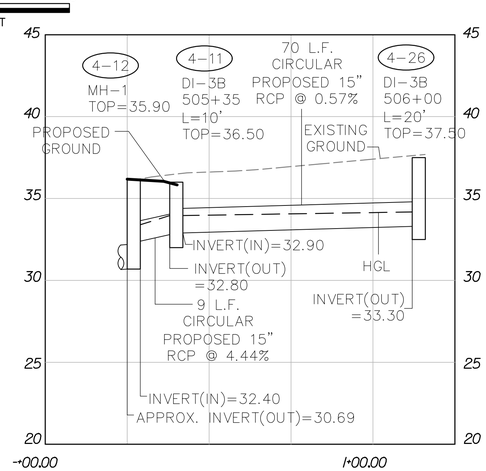
5 0 5 10
VERTICAL SCALE IN FEET

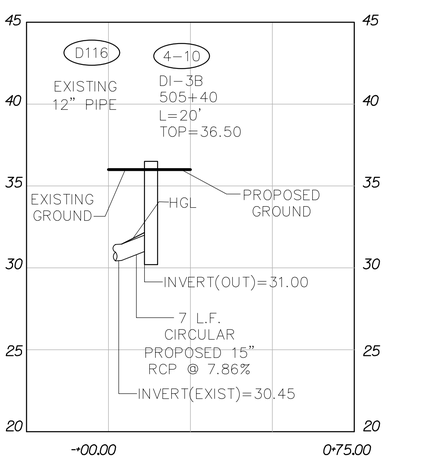
25 0 25 50
HORIZONTAL SCALE IN FEET











70% SUBMITTAL
SEPTEMBER 2022

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NOTES

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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

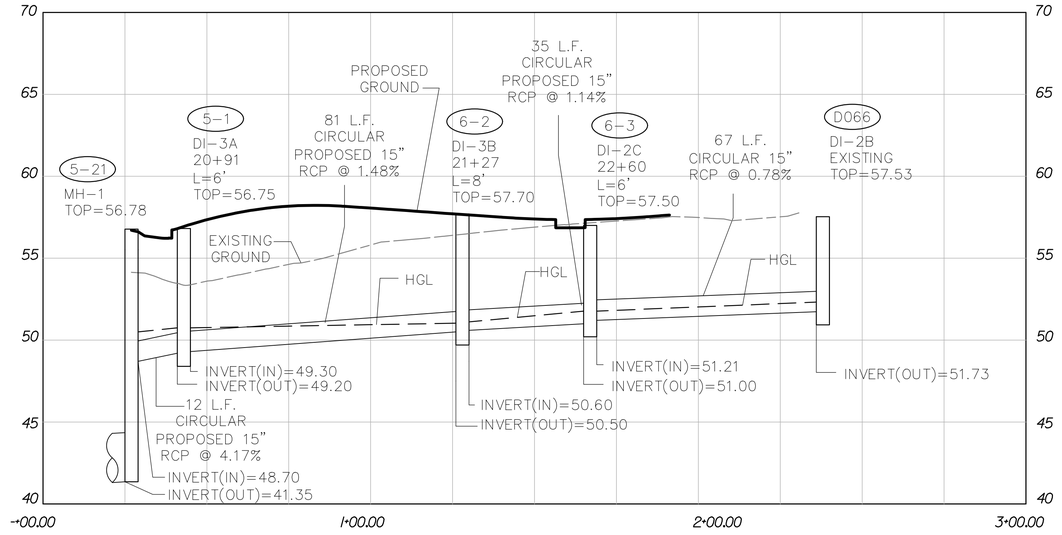
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

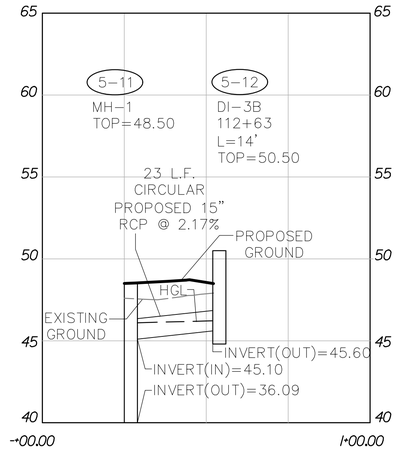
RK&K
Responsive People - Creative Solutions

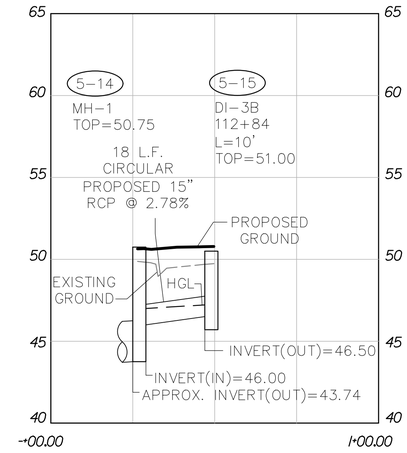
SHOCKOE VALLEY STREET IMPROVEMENTS
STORM SEWER PROFILES

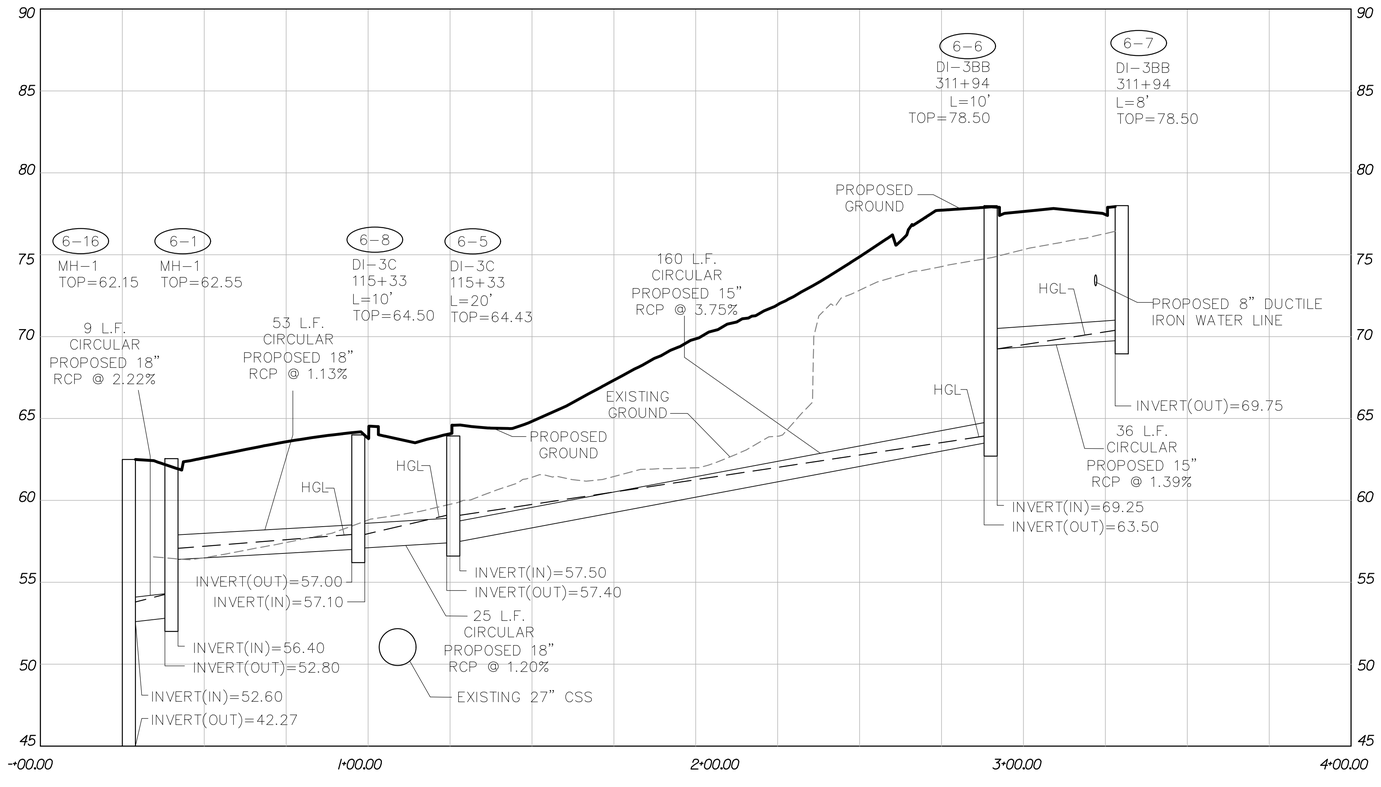
AUTHORITY: CITY OF RICHMOND, DPW

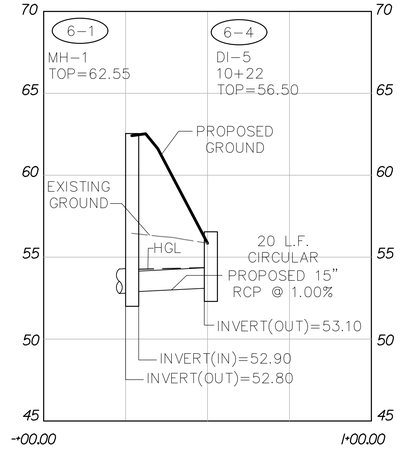
DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2F(1)	DRAWING NO. 0-28633

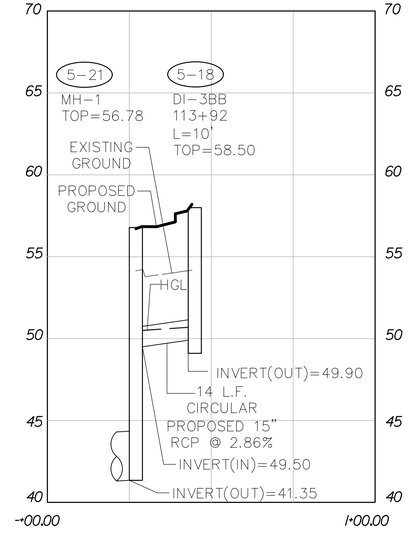












5 0 5 10
VERTICAL SCALE IN FEET

25 0 25 50
HORIZONTAL SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

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Existing Legend
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Sanitary Sewer (Gravity)
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Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole Basin (SDMH, (SMH))
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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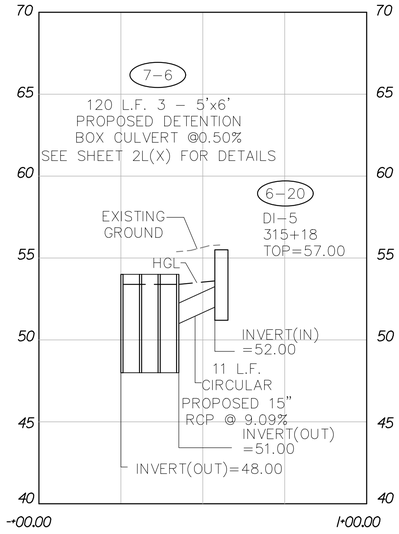
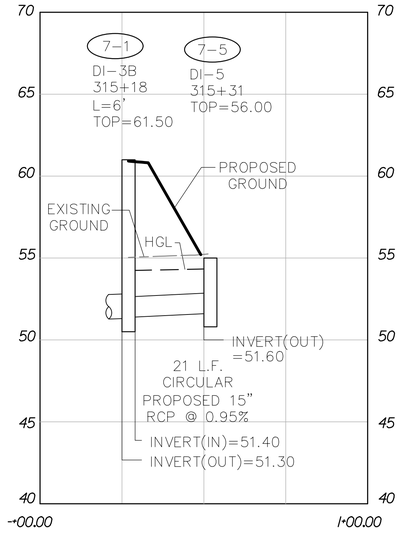
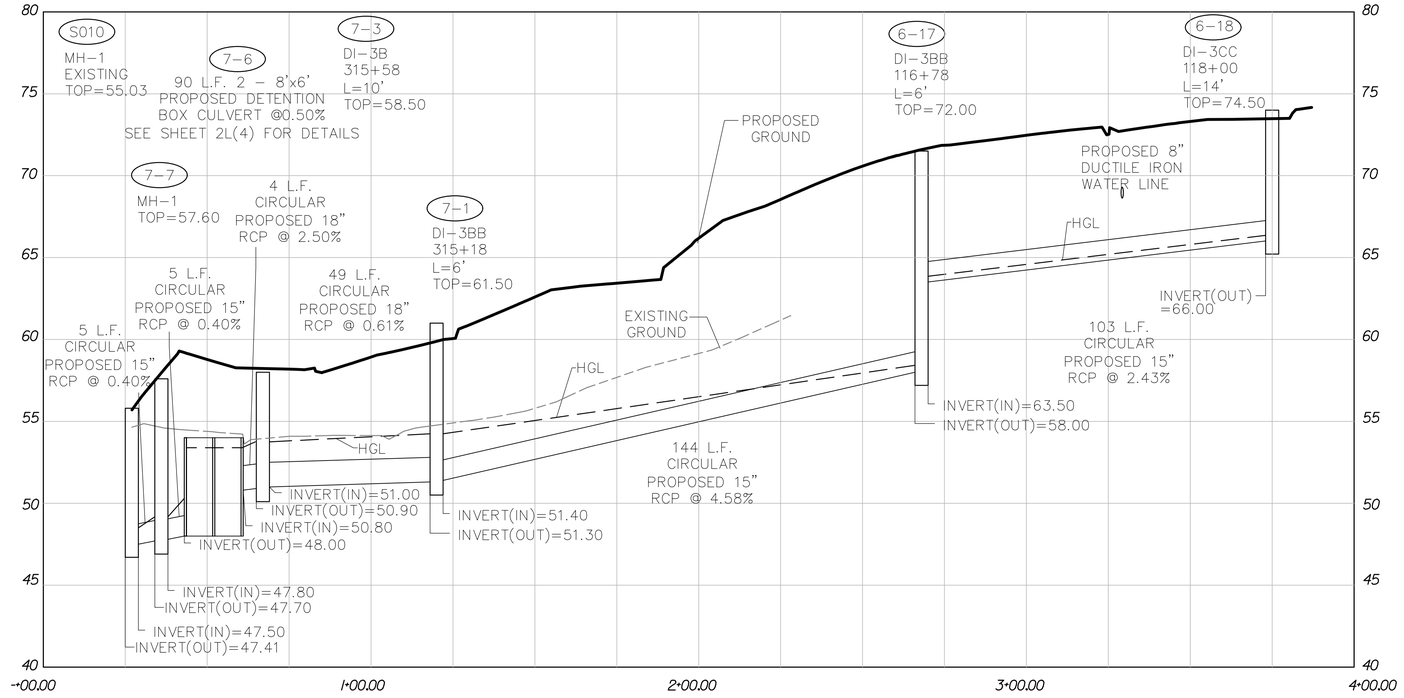
SHOCKOE VALLEY STREET IMPROVEMENTS
STORM SEWER PROFILES

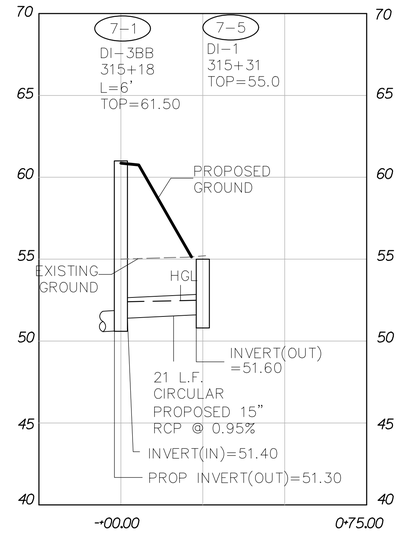
AUTHORITY: CITY OF RICHMOND, DPW

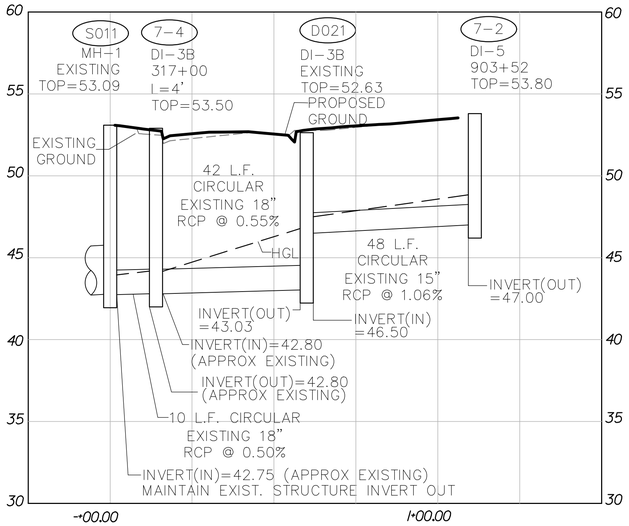
DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2F(2)	DRAWING NO. 0-28633

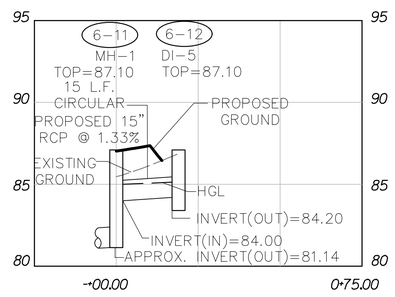


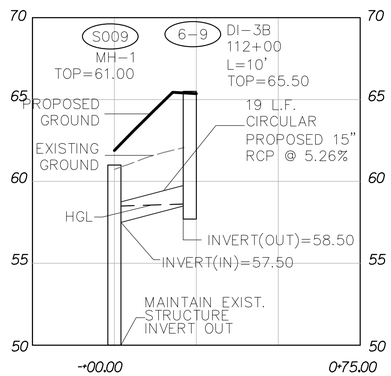












5 0 5 10
VERTICAL SCALE IN FEET

25 0 25 50
HORIZONTAL SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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Existing Curb Cut Ramp (HCR)
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Curb Cut Ramp
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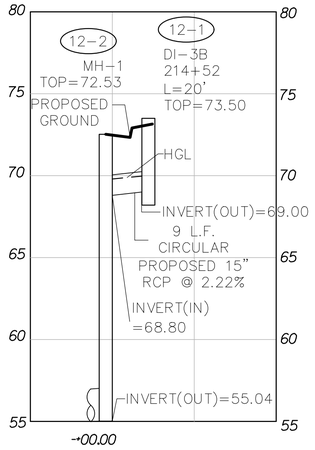
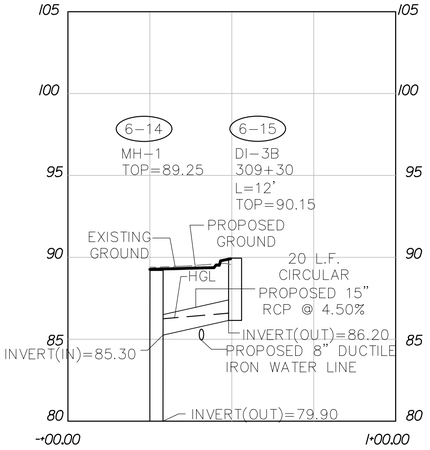
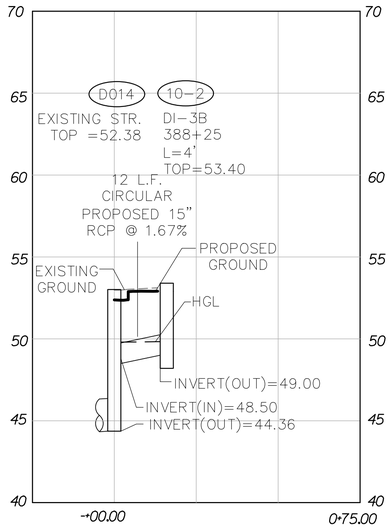
SHOCKOE VALLEY STREET IMPROVEMENTS
STORM SEWER PROFILES

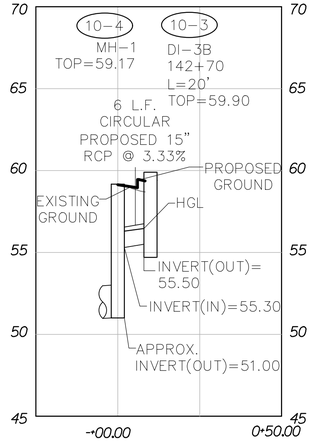
AUTHORITY: CITY OF RICHMOND, DPW

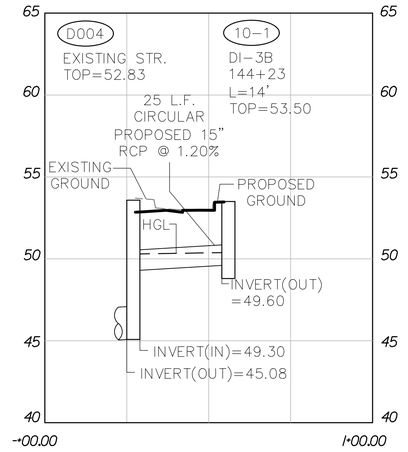
DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2F(3)	0-28633

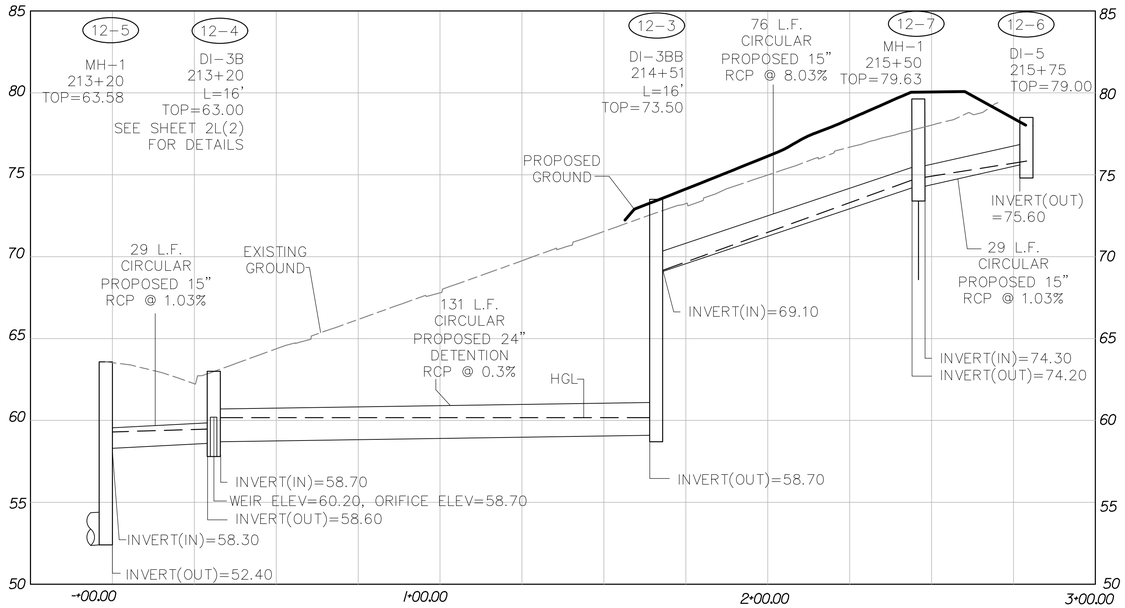


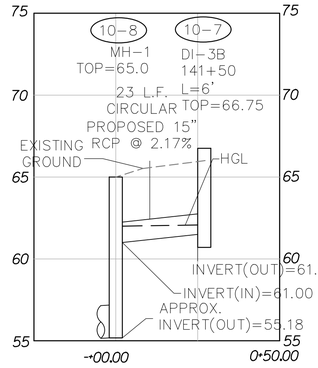


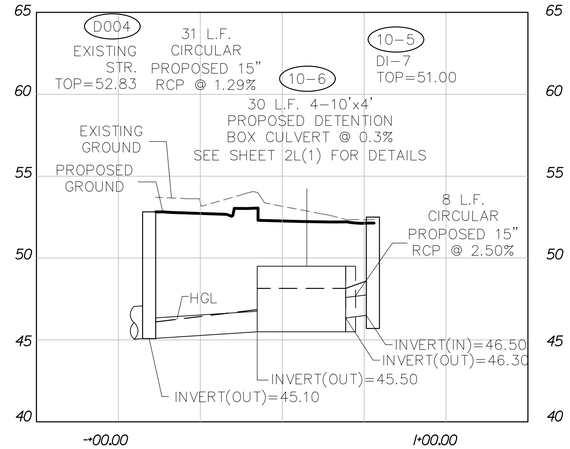


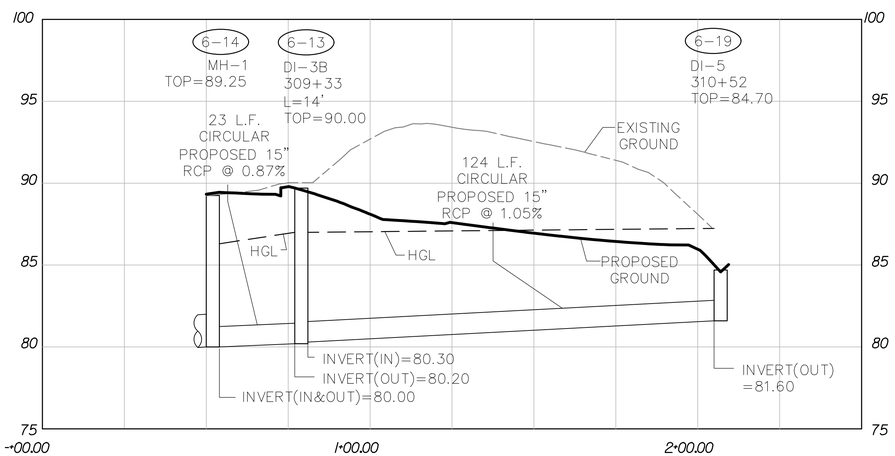












5 0 5 10
VERTICAL SCALE IN FEET

25 0 25 50
HORIZONTAL SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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Storm Sewer
Sanitary Sewer (Gravity)
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Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH • • VV
Water Meter • WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM • • GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

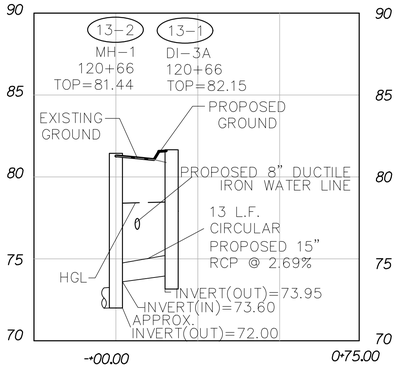
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

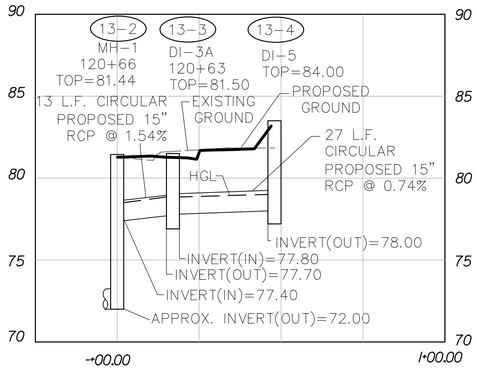
RK&K Responsive People - Creative Solutions

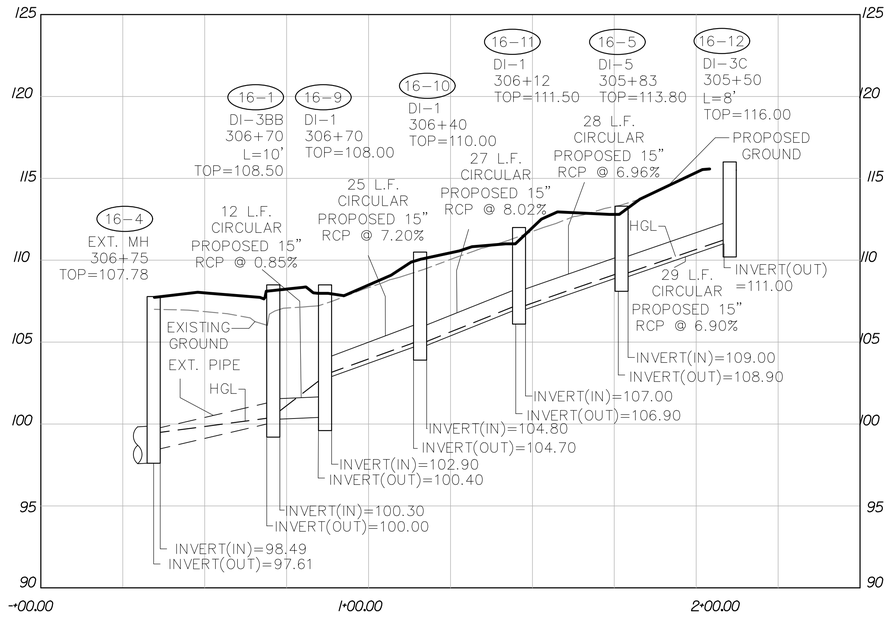
SHOCKOE VALLEY STREET IMPROVEMENTS
STORM SEWER PROFILES

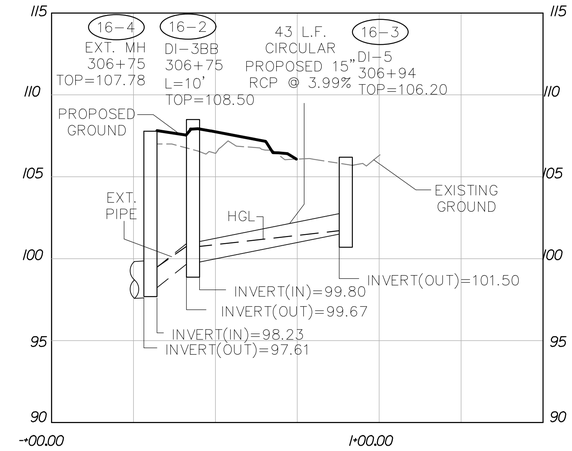
AUTHORITY: CITY OF RICHMOND, DPW

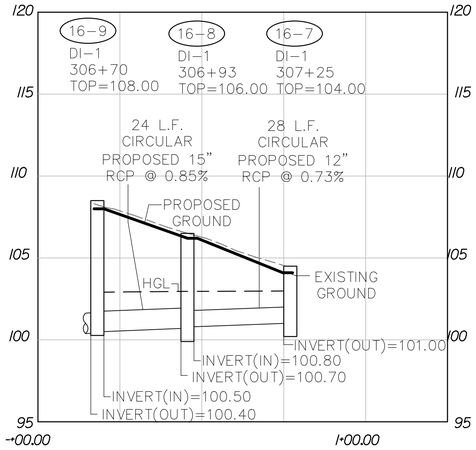
DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2F(4)	DRAWING NO. 0-28633

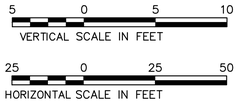


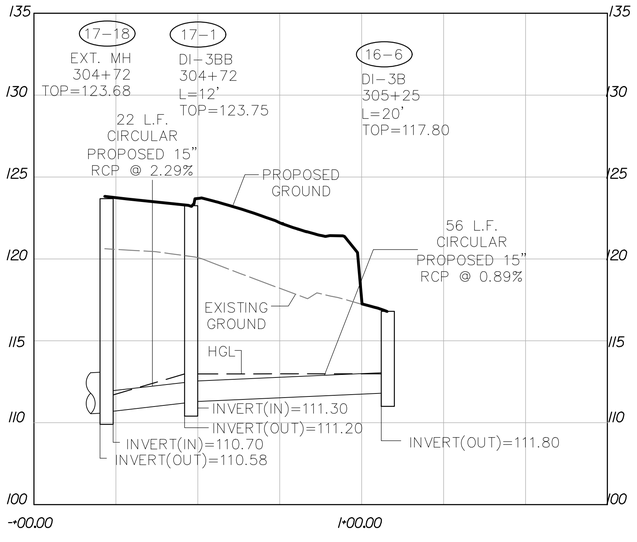


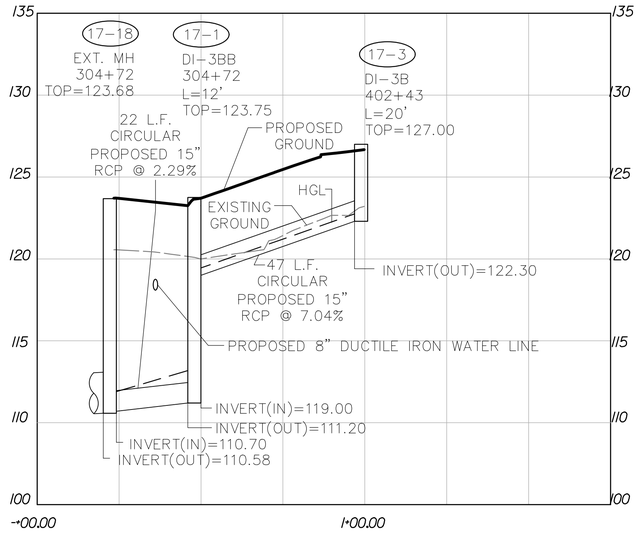


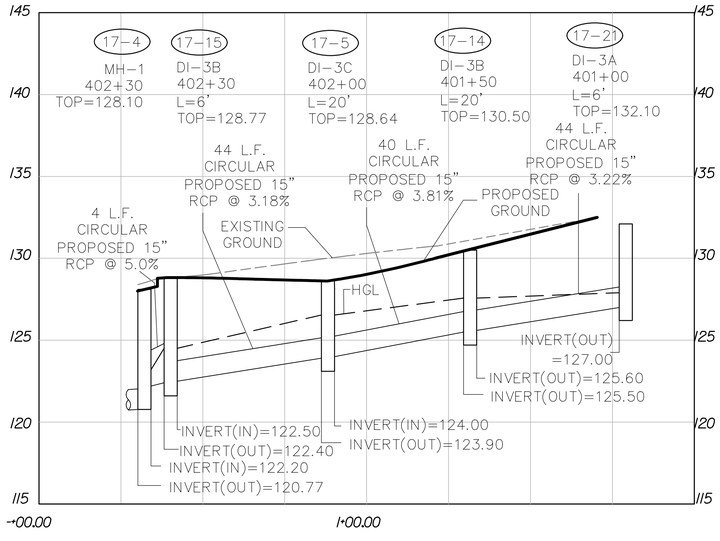












70% SUBMITTAL
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Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH ◇ WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
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Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

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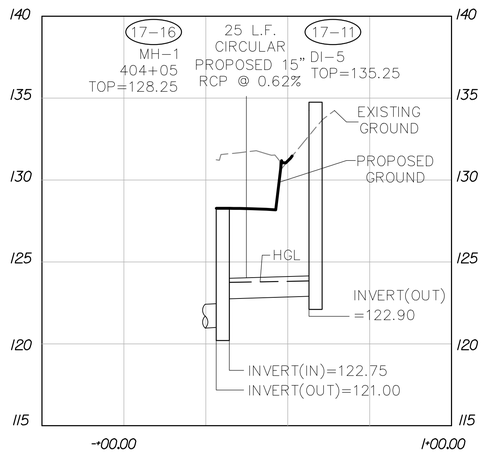
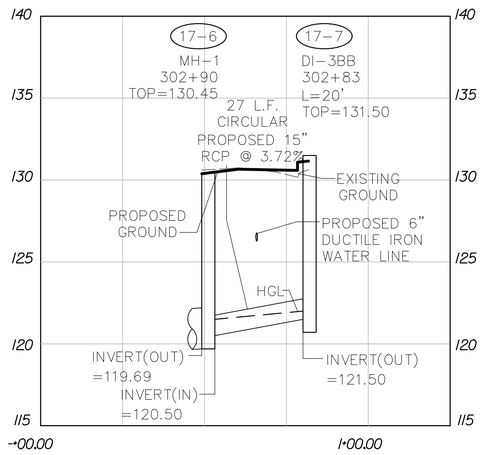
SHOCKOE VALLEY STREET IMPROVEMENTS

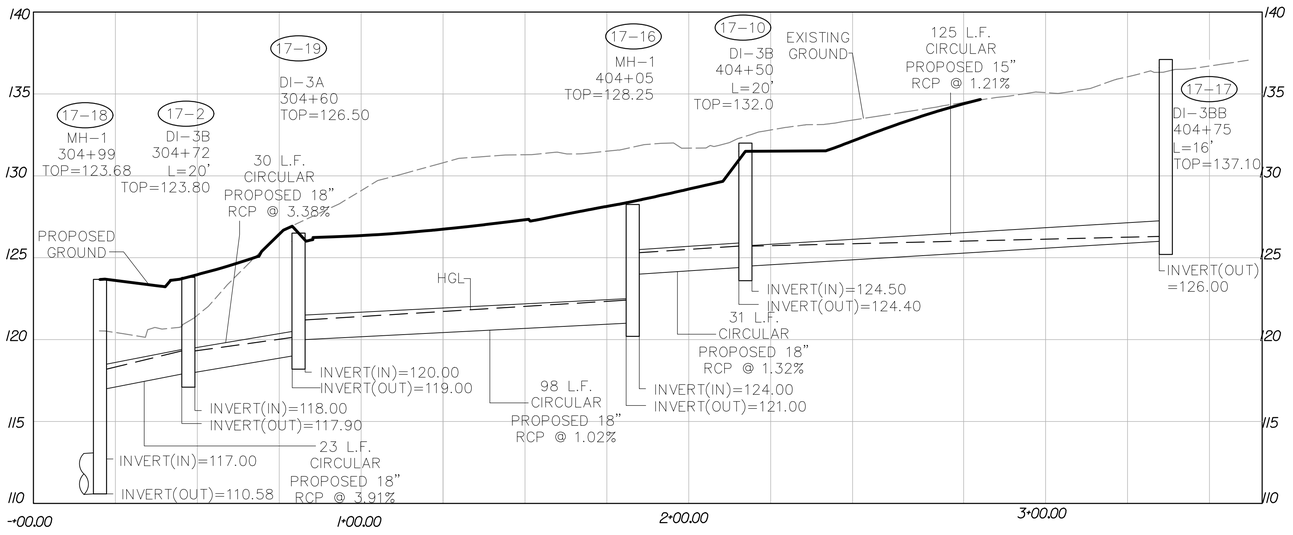
STORM SEWER PROFILES

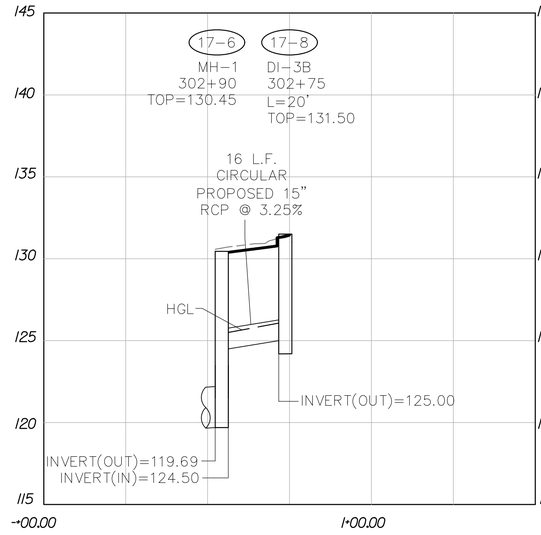
AUTHORITY: CITY OF RICHMOND, DPW

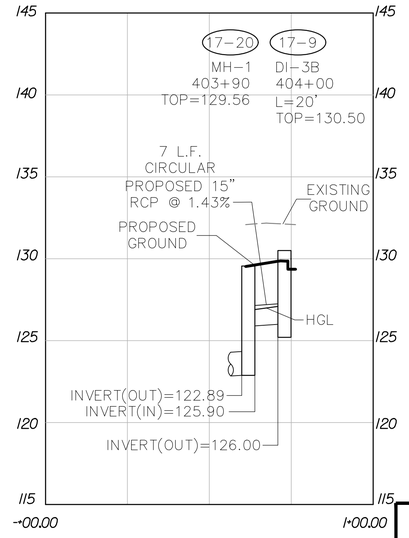
DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2F(5)	DRAWING NO. 0-28633











5 0 5 10
VERTICAL SCALE IN FEET

25 0 25 50
HORIZONTAL SCALE IN FEET

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Water Meter
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Power/Light Pole
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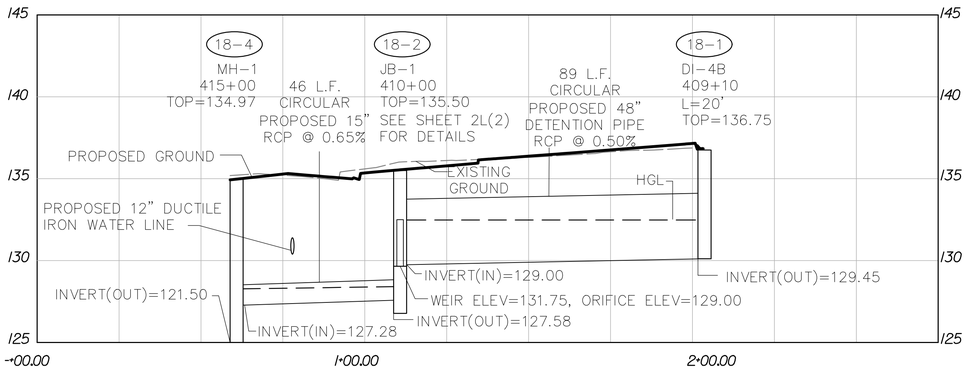
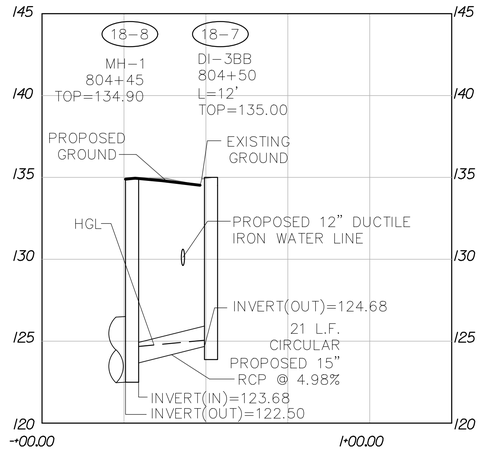
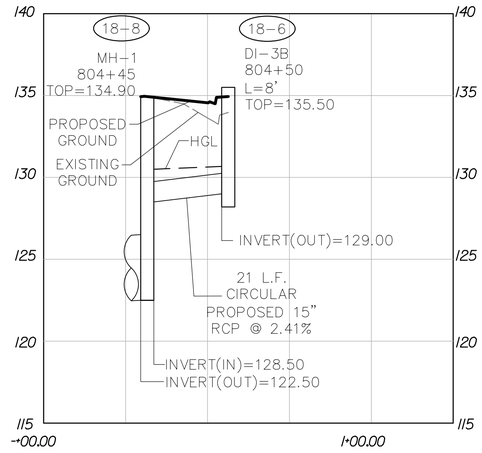
STORM SEWER PROFILES

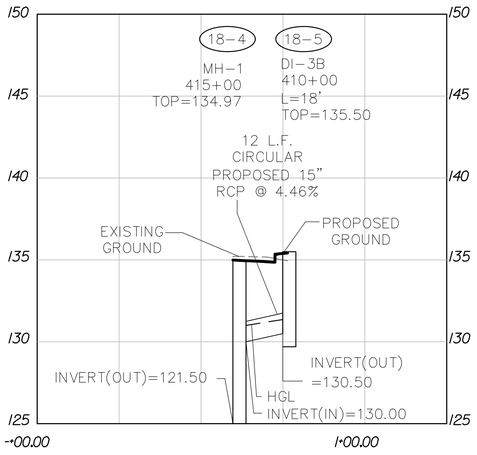
AUTHORITY: CITY OF RICHMOND, DPW

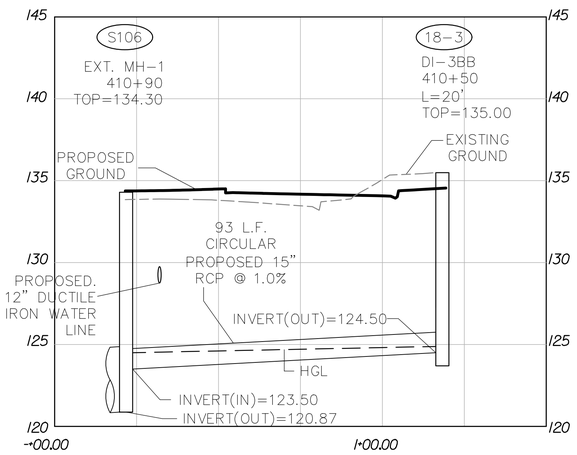
DESIGN BY: BSeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2F(6)	DRAWING NO. 0-28633

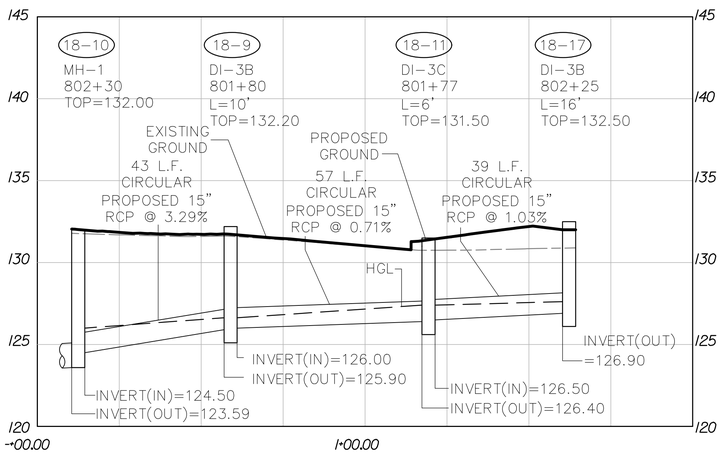


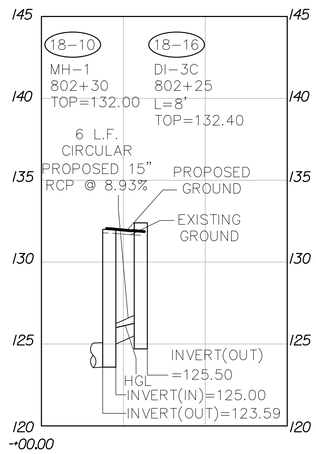


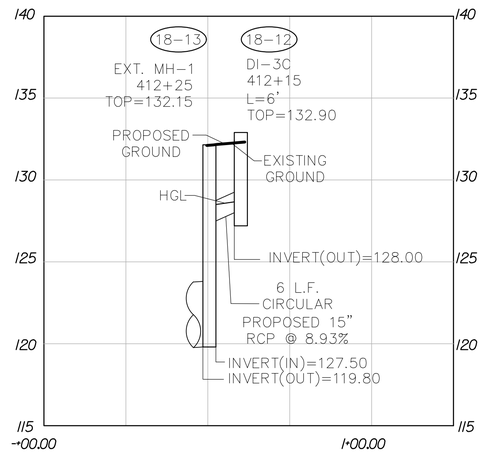


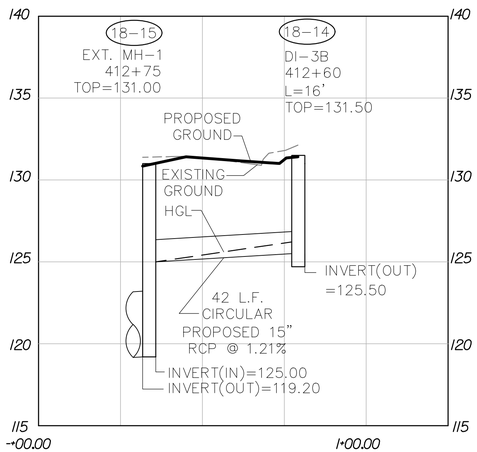


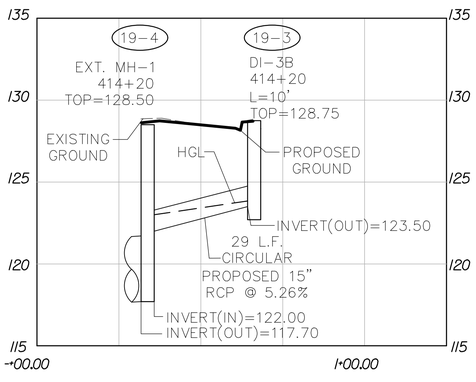












5 0 5 10
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STORM SEWER PROFILES

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2F(7)	0-28633
CHECKED BY: ASamberg						

FORM LD 204 STORMWATER INLET COMPUTATIONS SHEET 1 OF 6

ROUTE PROJECT Shockoe Street DESIGNER: KRL CHECKED: DATE 9/27/2022 UNITS :NGLISH

INLET																														Sag Inlets Only					
NUMBER	TYPE	LENGTH (FT; M)	STATION	DRAINAGE AREA (AC; HA)	C	CA	ΣCA	I (IN/HR; mm/HR)	Q INCR. (CFS; CMS)	Qc CARRYOVER (CFS; CMS)	QT GUTTER FLOW (CFS; CMS)	S GUTTER SLOPE (FT/FT; M/M)	Sx CROSS SLOPE (FT/FT; M/M)	T (SPREAD) (FT; M)	W (GUTTER WIDTH) (FT; M)	W/T	Sw (GUTTER SLOPE) (FT/FT; M/M)	Sw/Sx	Eo (App. 9C-8)	a	S'w	Se	COMPUTED LENGTH L_T (FT; M)	L, SPECIFIED LENGTH (FT; M)	L/LT	E (App. 9C-18)	Q INTERCEPTED (CFS; CMS) or d/h	Qb CARRYOVER (CFS; CMS)	Depth at Curb (IN; MM)	Allowable Ponding Depth d (FT; M)	Height of Curb Opening h (FT; M)	d/h	Depth at Inlet (IN; MM)	T SPREAD @ SAG (FT; M)	REMARKS
10-1	DI-3B	20.000	144+22	0.119	0.90	0.1071																													
			-15.700'LEF	0.042	0.35	0.0147																													
							0.122	4	0.488	0.022	0.510	0.0200	0.0200	4.814	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	18.171	20.000	1.101	1.000	0.510	0.000	1.155						
10-2	DI-3B	4.000	925+08	0.015	0.90	0.0135																													
			15.500'RIGH	0.007	0.35	0.0025																													
							0.016	4	0.064	0	0.064	0.0050	0.0200	2.868	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	5.014	4.000	0.798	0.944	0.060	0.004	0.688						
10-3	DI-3B	20.000	142+75	0.134	0.90	0.1206																													
			-15.400'LEF	0.005	0.35	0.0018																													
							0.122	4	0.488	0.117	0.605	0.0560	0.0200	3.905	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	24.292	20.000	0.823	0.956	0.466	0.022	0.937						
10-7	DI-3B	6.000	141+48	0.044	0.90	0.0396																													
			17.500'RIGH	0.816	0.35	0.2856																													
							0.325	4	1.3	0	1.300	0.0400	0.0833	2.459	2.000	0.8133	0.0833	1	0.000	0.00	0.0000	0.0833	14.079	6.000	0.426	0.632	0.822	0.478	2.458						
12-1	DI-3B	20.000	214+52	0.193	0.90	0.1737																													
			22.000'RIGH	0.130	0.35	0.0455																													
							0.219	4	0.876	0.06	0.936	0.0700	0.0200	4.779	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	34.146	20.000	0.586	0.795	0.744	0.192	1.147						
12-3	DI-3BB	16.000	214+52	0.138	0.90	0.1242																													
			-22.100'LEF	0.006	0.35	0.0021																													
							0.126	4	0.504	0	0.504	0.0700	0.0200	3.790	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	26.329	16.000	0.608	0.814	0.410	0.094	0.910						
12-4	DI-3B	16.000	213+18	0.131	0.90	0.1179																													
			-22.200'LEF	0.002	0.35	0.0007																													
							0.119	4	0.476	0.094	0.570	0.0700	0.0200	3.969	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	27.725	16.000	0.577	0.788	0.449	0.121	0.953						
12-6	DI-5	3.330	215+69	0.014	0.90	0.0126																													
			-35.600'LEFT				0.013	4	0.052	0	0.052	0.0100			3.000									3.330		1.000	0.052	0.000	0.1114						BHt.=0.012'
13-1	DI-3A	2.500	120+66	0.032	0.90	0.0288																													
			-14.500'LEF	0.004	0.35	0.0014																													
							0.03	4	0.12	0	0.120	0.0100	0.0200	1.306	1.500	1.1485	0.0833	4.165	1.000	2.64	0.1466	0.1666	2.253	2.500	1.110	1.000	0.120	0.000	1.306						
13-3	DI-3A	2.500	120+63	0.028	0.90	0.0252																													
			14.500'RIGHT				0.025	4	0.1	0	0.100	0.0100	0.0208	1.220	2.000	1.6393	0.0833	4.0048	1.000	3.00	0.1250	0.1458	2.261	2.500	1.106	1.000	0.100	0.000	1.219						
13-4	DI-5	3.330	140+41	0.028	0.90	0.0252																													
			32.900'RIGH	1.322	0.35	0.4627																													
							0.488	4	1.952	0	1.952	0.0100			3.000									3.330		1.000	1.952	0.000	0.2303						BHt.=0.137'
13-5	DI-5	3.330	119+43	0.237	0.35	0.083																													
			33.700'RIGHT				0.083	4	0.332	0	0.332	0.0100			3.000									3.330		1.000	0.332	0.000	0.0839						BHt.=0.042'

INLETSOFT BY ENSOFTEC DATE: 9/27/2022

FORM LD 204 STORMWATER INLET COMPUTATIONS SHEET 2 OF 6

ROUTE PROJECT Shockoe Street DESIGNER: KRL CHECKED: DATE 9/27/2022 UNITS :NGLISH

INLET																														Sag Inlets Only					
NUMBER	TYPE	LENGTH (FT; M)	STATION	DRAINAGE AREA (AC; HA)	C	CA	ΣCA	I (IN/HR; mm/HR)	Q INCR. (CFS; CMS)	Qc CARRYOVER (CFS; CMS)	QT GUTTER FLOW (CFS; CMS)	S GUTTER SLOPE (FT/FT; M/M)	Sx CROSS SLOPE (FT/FT; M/M)	T (SPREAD) (FT; M)	W (GUTTER WIDTH) (FT; M)	W/T	Sw (GUTTER SLOPE) (FT/FT; M/M)	Sw/Sx	Eo (App. 9C-8)	a	S'w	Se	COMPUTED LENGTH L_T (FT; M)	L, SPECIFIED LENGTH (FT; M)	L/LT	E (App. 9C-18)	Q INTERCEPTED (CFS; CMS) or d/h	Qb CARRYOVER (CFS; CMS)	Depth at Curb (IN; MM)	Allowable Ponding Depth d (FT; M)	Height of Curb Opening h (FT; M)	d/h	Depth at Inlet (IN; MM)	T SPREAD @ SAG (FT; M)	REMARKS
3-1	DI-3C	10.000	502+71	0.067	0.90	0.0603																													Back/Lt.
			-27.000'LEFT				0.06	4	0.24	0.031																									Back/Lt.
				0.200	0.90	0.18																													Ahead/Rt.
							0.18	4	0.72	0		0.001	0.0200	9.598	0.001	0.0001	0.0200	1		0.00															Ahead/Rt.
											0.991	0.001												10			0.991		1.473	0.130	0.333	0.39039	1.473	6.139	T > 6.5 ft
4-1	DI-3B	12.000	100+83	0.159	0.90	0.1431																													
			-14.000'LEFT				0.143	4	0.572	0	0.572	0.0100	0.0200	5.722	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	15.488	12.000	0.775	0.932	0.533	0.039	1.373						
4-10	DI-3B	20.000	505+40	0.214	0.90	0.1926																													
			28.500'RIGH	0.019	0.35	0.0067																													
							0.199	4	0.796	0	0.796	0.0200	0.0200	5.687	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	21.906	20.000	0.913	0.988	0.786	0.010	1.365						
4-11	DI-3B	10.000	505+35	0.077	0.90	0.0693																													
			-28.800'LEFT				0.069	4	0.276	0.032	0.308	0.0180	0.0200	4.065	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	14.245	10.000	0.702	0.887	0.273	0.035	0.976						
4-13	DI-3B	12.000	104+79	0.495	0.90	0.4455																													
			40.900'RIGH	0.024	0.35	0.0084																													
							0.454	4	1.816	0.335	2.151	0.0170	0.0200	7.076	2.000	0.2826	0.0833	4.165	0.748	3.52	0.1466	0.1297	10.318	12.000	1.163	1.000	2.151	0.000	3.218						
4-17	DI-3BB	8.000	105+12	0.347	0.90	0.3123																													
			-36.900'LEF	0.026	0.35	0.0091																													
							0.321	4	1.284	0	1.284	0.0170	0.0200	6.052	1.500	0.2479	0.0833	4.165	0.685	2.64	0.1466	0.1204	8.687	8.000	0.921	0.990	1.271	0.013	2.592						
4-18	DI-3B	4.000	503+86	0.120	0.90	0.108																													
			-29.400'LEF	0.002	0.35	0.0007																													
							0.109	4	0.436	0.013	0.449	0.0100	0.0200	3.857	1.500	0.3889	0.0833	4.165	0.881	2.64	0.1466	0.1491	4.191	4.000	0.954	0.996	0.447	0.002	2.065						
4-19	DI-3B	4.000	503+25	0.112	0.90	0.1008																													
			-29.400'LEFT				0.101	4	0.404	0.002	0.406	0.0300	0.0200	2.223	1.500	0.6748	0.0833	4.165	0.990	2.64	0.1466	0.1652	5.253	4.000	0.761	0.924	0.375	0.031	1.673						
4-20	DI-3B	16.000	503+14	0.193	0.90	0.1737																													
			29.300'RIGHT				0.174	4	0.696	0	0.696	0.0400	0.0200	4.750	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	25.491	16.000	0.628	0.831	0.578	0.118	1.140						
4-26	DI-3B	20.000	506+06	0.249	0.90	0.2241																													
			-25.700'LEFT				0.224	4	0.896	0	0.896	0.0220	0.0200	5.840	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	23.691	20.000	0.844	0.965	0.864	0.032	1.402						
4-3	DI-3B	10.000	106+78	0.533	0.90	0.4797																													
			33.300'RIGH	0.006	0.35	0.0021																													
							0.482	4	1.928	0.06	1.988	0.0200	0.0200	8.013	0.000	0	0.0200	1	0.535	2.00	0.0833	0.0646	15.919	10.000	0.628	0.832	1.653	0.335	1.923						
4-5	DI-3B	20.000	101+94	0.312	0.90	0.2808																													
			30.400'RIGH	0.080	0.35	0.028																													
							0.309	4	1.236	0.035	1.271	0.0110	0.0200	7.579	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	22.286	20.000	0.897	0.983	1.250	0.021	1.819						
4-9	DI-3C	6.000	502+78	0.041	0.90	0.0369																													Back/Lt.

INLETSOFT BY ENSOFTEC DATE: 9/27/2022

FORM LD 204 STORMWATER INLET COMPUTATIONS SHEET 3 OF 6

ROUTE PROJECT Shockoe Street DESIGNER: KRL CHECKED: DATE 9/27/2022 UNITS :NGLISH

INLET																														Sag Inlets Only					
NUMBER	TYPE	LENGTH (FT; M)	STATION	DRAINAGE AREA (AC; HA)	C	CA	ΣCA	I (IN/HR; mm/HR)	Q INCR. (CFS; CMS)	Qc CARRYOVER (CFS; CMS)	QT GUTTER FLOW (CFS; CMS)	S GUTTER SLOPE (FT/FT; M/M)	Sx CROSS SLOPE (FT/FT; M/M)	T (SPREAD) (FT; M)	W (GUTTER WIDTH) (FT; M)	W/T	Sw (GUTTER SLOPE) (FT/FT; M/M)	Sw/Sx	Eo (App. 9C-8)	a	S'w	Se	COMPUTED LENGTH L_T (FT; M)	L, SPECIFIED LENGTH (FT; M)	L/LT	E (App. 9C-18)	Q INTERCEPTED (CFS; CMS) or d/h	Qb CARRYOVER (CFS; CMS)	Depth at Curb (IN; MM)	Allowable Ponding Depth d (FT; M)	Height of Curb Opening h (FT; M)	d/h	Depth at Inlet (IN; MM)	T SPREAD @ SAG (FT; M)	REMARKS
			27.700'RIGHT				0.037	4	0.148	0.118		0.001	0.0200	6.611	0.001	0.0002	0.02	1		0.00															Back/Lt.
				0.067	0.90	0.0603																													Ahead/Rt.
							0.06	4	0.24	0																									Ahead/Rt.
											0.506	0.001												6			0.506		1.323	0.130	0.333	0.39039	1.323	5.512	T > 6.5 ft
5-1	DI-3B	6.000	20+89	0.018	0.90	0.0162																													
			-21.800'LEF	0.009	0.35	0.0032																													
							0.019	4	0.076	0	0.076	0.0300	0.0200	2.187	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	9.225	6.000	0.650	0.849	0.065	0.011	0.525						
5-12	DI-3B	14.000	112+62	0.100	0.90	0.09																													
			-30.200'LEF	0.021	0.35	0.0074																													
							0.097	4	0.388	0.011	0.399	0.0350	0.0200	3.954	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	19.387	14.000	0.722	0.900	0.359	0.040	0.949						
5-15	DI-3B	14.000	112+86	0.231	0.90	0.2079																													
			18.300'RIGH	0.080	0.35	0.028																													
							0.236	4	0.944	0	0.944	0.0500	0.0200	3.698	1.500	0.4056	0.0833	4.165	0.895	1.14	0.0633	0.0766	13.836	14.000	1.012	1.000	0.944	0.000	2.027						
5-18	DI-3BB	10.000	114+00	0.191	0.90	0.1719																													
			-18.900'LEF	0.068	0.35	0.0238																													
							0.196	4	0.784	0	0.784	0.0830	0.0200	2.591	1.500	0.5789	0.0833	4.165	0.975	1.14	0.0633	0.0817	14.338	10.000	0.697	0.884	0.693	0.091	1.761						
5-2	DI-3B	18.000	601+79	0.125	0.90	0.1125																													
			18.500'RIGHT				0.113	4	0.452	0	0.452	0.0200	0.0200	4.601	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	17.272	18.000	1.042	1.000	0.452	0.000	1.104						
5-20	DI-3B	4.000	600+51	0.056	0.90	0.0504																													
			-20.500'LEF	0.003	0.35	0.0011																													
							0.051	4	0.204	0	0.204	0.0400	0.0200	1.229	1.500	1.2205	0.0833	4.165	1.000	2.64	0.1466	0.1666	4.267	4.000	0.937	0.993	0.203	0.001	1.228						
5-4	DI-3B	10.000	601+79	0.101	0.90	0.0909																													
			-18.200'LEFT				0.091	4	0.364	0	0.364	0.0200	0.0200	4.243	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	15.771	10.000	0.634	0.836	0.304	0.060	1.018						
5-5	DI-3B	12.000	108+72	0.345	0.90	0.3105																													
			38.700'RIGH	0.024	0.35	0.0084																													
							0.319	4	1.276	0.194	1.470	0.0120	0.0208	7.684	0.000	0	0.0208	1	0.553	2.00	0.0833	0.0669	11.786	12.000	1.018	1.000	1.470	0.000	1.918						
5-7	DI-3B	8.000	109+06	0.299	0.90	0.2691																													
			-31.400'LEF	0.037	0.35	0.013																													
							0.282	4	1.128	0	1.128	0.0140	0.0200	5.953	1.500	0.252	0.0833	4.165	0.693	2.64	0.1466	0.1216	7.716	8.000	1.037	1.000	1.128	0.000	2.568						
5-9	DI-3B	8.000	110+47	0.368	0.90	0.3312																													
			38.800'RIGH	0.044	0.35	0.0154																													
							0.347	4	1.388	0	1.388	0.0140	0.0200	7.488	0.000	0	0.0200	1	0.564	2.00	0.0833	0.0670	12.038	8.000	0.665	0.860	1.194	0.194	1.797						
6-12	DI-5	3.330	216+63	0.138	0.90	0.1242																													
			50.600'RIGH	0.279	0.35	0.0977																													
							0.222	4	0.888	0	0.888	0.0100			3.000									3.330		1.000	0.888	0.000	0.1481						BHt.=0.081'

INLETSOFT BY ENSOFTEC DATE: 9/27/2022

FORM LD 204 STORMWATER INLET COMPUTATIONS SHEET 4 OF 6

ROUTE PROJECT Shockoe Street DESIGNER: KRL CHECKED: DATE 9/27/2022 UNITS :NGLISH

INLET																														Sag Inlets Only					
NUMBER	TYPE	LENGTH (FT; M)	STATION	DRAINAGE AREA (AC; HA)	C	CA	ΣCA	I (IN/HR; mm/HR)	Q INCR. (CFS; CMS)	Qc CARRYOVER (CFS; CMS)	QT GUTTER FLOW (CFS; CMS)	S GUTTER SLOPE (FT/FT; M/M)	Sx CROSS SLOPE (FT/FT; M/M)	T (SPREAD) (FT; M)	W (GUTTER WIDTH) (FT; M)	W/T	Sw (GUTTER SLOPE) (FT/FT; M/M)	Sw/Sx	Eo (App. 9C-8)	a	S'w	Se	COMPUTED LENGTH L_T (FT; M)	L, SPECIFIED LENGTH (FT; M)	L/LT	E (App. 9C-18)	Q INTERCEPTED (CFS; CMS) or d/h	Qb CARRYOVER (CFS; CMS)	Depth at Curb (IN; MM)	Allowable Ponding Depth d (FT; M)	Height of Curb Opening h (FT; M)	d/h	Depth at Inlet (IN; MM)	T SPREAD @ SAG (FT; M)	REMARKS
6-13	DI-3B	20.000	303+85	0.205	0.90	0.1845																													
			-20.400'LEF	0.620	0.35	0.217																													
							0.402	4	1.608	0	1.608	0.0600	0.0200	4.875	1.500	0.3077	0.0833	4.165	0.787	1.14	0.0633	0.0698	19.327	20.000	1.035	1.000	1.608	0.000	2.309						
6-15	DI-3B	12.000	303+87	0.257	0.90	0.2313																													
			22.400'RIGH	0.146	0.35	0.0511																													
							0.282	4	1.128	0	1.128	0.0460	0.0200	4.273	1.500	0.351	0.0833	4.165	0.843	1.14	0.0633	0.0733	14.930	12.000	0.804	0.947	1.068	0.060	2.165						
6-17	DI-3BB	6.000	117+20	0.221	0.90	0.1989																													
			-48.100'LEF	0.048	0.35	0.0168																													
							0.216	4	0.864	0	0.864	0.0270	0.0200	4.272	1.500	0.3511	0.0833	4.165	0.843	2.64	0.1466	0.1436	7.603	6.000	0.789	0.939	0.812	0.052	2.165						
6-18	DI-3CC	7.000	118+07	0.115	0.90	0.1035																													Back/Lt.
			18.800'RIGH	0.065	0.35	0.0228																													Back/Lt.
							0.126	4	0.504	0.091		0.0030	0.0200	6.355	1.500	0.236	0.0833	4.165		2.64															Back/Lt.
				0.077	0.90	0.0693																													Ahead/Rt.
				0.175	0.35	0.0613																													Ahead/Rt.
							0.131	4	0.524	0																									Ahead/Rt.
											1.119	0.0030												7			1.119		1.630	0.160	0.333	0.48048	3.130	6.793	Weir Flow
6-19	DI-5	3.300	302+75				0	4	0	0																									Back/Lt.
			-87.000'LEF	0.770	0.35	0.2695																													Ahead/Rt.
							0.27	4	1.08	0																									Ahead/Rt.
											1.094	0.001			3.000									3.3			1.094						1.777		T > 8.0 ft
6-2	DI-3B	8.000	21+77	0.020	0.90	0.018																													
			-22.000'LEF	0.021	0.35	0.0074																													
							0.025	4	0.1	0	0.100	0.0250	0.0200	2.508	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	9.801	8.000	0.816	0.953	0.095	0.005	0.602						
6-20	DI-5	3.330	901+92	0.138	0.35	0.0483																													
			-68.900'LEFT				0.048	4	0.192	0	0.192	0.0100			3.000									3.330		1.000	0.192	0.000	0.0608						BHt.=0.029'
6-3	DI-2C	3.000	22+16	0.020	0.90	0.018																													Back/Lt.
			-19.200'LEF	0.043	0.35	0.0151																													Back/Lt.
							0.033	4	0.132	0.293		0.0010	0.0200	7.879	0.000	0	0.0200	1		0.00															Back/Lt.
				0.038	0.90	0.0342																													Ahead/Rt.
				0.173	0.35	0.0606																													Ahead/Rt.
							0.095	4	0.38	0.005																									Ahead/Rt.
											0.810	0.0010			1.670									3			0.810		2.410	0.200	0.333	0.6006	2.410	10.041	T > 10.0 ft
6-4	DI-5	3.330	10+42	0.149	0.90	0.1341																													
			43.200'RIGH	0.200	0.35	0.07																													
							0.204	4	0.816	0	0.816	0.0500			3.000									3.330		1.000	0.816	0.000	0.2314						BHt.=0.076'
6-5	DI-3C	10.000	10+82	0.120	0.90	0.108																													Back/Lt.
			-13.500'LEF	0.397	0.35	0.139																													Back/Lt.
							0.247	4	0.988	0.116		0.0200	0.0200	6.428	0.001	0.0002	0.0200	1		0.00															Back/Lt.

INLETSOFT BY ENSOFTEC DATE: 9/27/2022

FORM LD 204 STORMWATER INLET COMPUTATIONS SHEET 5 OF 6

ROUTE PROJECT Shockoe Street DESIGNER: KRL CHECKED: DATE 9/27/2022 UNITS :NGLISH

INLET																														Sag Inlets Only					
NUMBER	TYPE	LENGTH (FT; M)	STATION	DRAINAGE AREA (AC; HA)	C	CA	ΣCA	I (IN/HR; mm/HR)	Q INCR. (CFS; CMS)	Qc CARRYOVER (CFS; CMS)	QT GUTTER FLOW (CFS; CMS)	S GUTTER SLOPE (FT/FT; M/M)	Sx CROSS SLOPE (FT/FT; M/M)	T (SPREAD) (FT; M)	W (GUTTER WIDTH) (FT; M)	W/T	Sw (GUTTER SLOPE) (FT/FT; M/M)	Sw/Sx	Eo (App. 9C-8)	a	S'w	Se	COMPUTED LENGTH L_T (FT; M)	L, SPECIFIED LENGTH (FT; M)	L/LT	E (App. 9C-18)	Q INTERCEPTED (CFS; CMS) or d/h	Qb CARRYOVER (CFS; CMS)	Depth at Curb (IN; MM)	Allowable Ponding Depth d (FT; M)	Height of Curb Opening h (FT; M)	d/h	Depth at Inlet (IN; MM)	T SPREAD @ SAG (FT; M)	REMARKS
							0	4	0	0																									Ahead/Rt.
											1.104	0.0200												10			1.104		1.583	0.120	0.333	0.36036	1.583	6.597	T > 6.0 ft
6-6	DI-3BB	10.000	301+22	0.219	0.90	0.1971																													
			18.800'RIGH	0.068	0.35	0.0238																													
							0.221	4	0.884	0	0.975	0.0550	0.0200	3.659	1.500	0.4099	0.0833	4.165	0.898	1.14	0.0633	0.0768	14.408	10.000	0.694	0.881	0.859	0.116	2.017						
6-7	DI-3BB	8.000	301+22	0.288	0.90	0.2592																													
			-18.500'LEF	0.100	0.35	0.035																													
							0.294	4	1.176	0	1.176	0.0530	0.0200	4.196	1.500	0.3575	0.0833	4.165	0.850	2.64	0.1466	0.1446	10.549	8.000	0.758	0.922	1.085	0.091	2.146						
6-8	DI-3C	5.000	10+77	0.038	0.90	0.0342																													Back/Lt.
			13.300'RIGH	0.049	0.35	0.0172																													Back/Lt.
							0.051	4	0.204	0		0.0020	0.0200	3.899	1.500	0.3847	0.0833	4.165		1.14															Back/Lt.
				0.034	0.90	0.0306																													Ahead/Rt.
				0.008	0.35	0.0028																													Ahead/Rt.
							0.033	4	0.132	0																									Ahead/Rt.
											0.336	0.0020												5			0.336		1.137	0.110	0.333	0.33033	1.137	4.738	Weir Flow
6-9	DI-3B	10.000	11+19	0.072	0.90	0.0648																													
			19.900'RIGH	0.008	0.35	0.0028																													
							0.068	4	0.272	0	0.272	0.0450	0.0200	3.268	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	17.798	10.000	0.562	0.774	0.210	0.062	0.784						
7-1	DI-3BB	6.000	902+04	0.107	0.90	0.0963																													
			17.600'RIGH	0.017	0.35	0.006																													
							0.102	4	0.408	0.052	0.460	0.0800	0.0200	1.464	1.500	1.0246	0.0833	4.165	1.000	2.64	0.1466	0.1666	7.391	6.000	0.812	0.951	0.437	0.023	1.463						
7-2	DI-5	3.330	903+52	0.500	0.90	0.45																													
			21.000'RIGH	0.323	0.35	0.1131																													
							0.563	4	2.252	0	2.252	0.0111			3.000									3.330		1.000	2.252	0.000	0.4491						BHt.=0.151'
7-3	DI-3B	14.000	902+43	0.216	0.90	0.1944																													
			-15.000'LEF	0.092	0.35	0.0322																													
							0.227	4	0.908	0	0.908	0.0520	0.0200	3.548	1.500	0.4228	0.0833	4.165	0.908	1.14	0.0633	0.0774	13.686	14.000	1.023	1.000	0.908	0.000	1.991						
7-4	DI-3BB	4.000	903+98	0.071	0.90	0.0639																													
			-29.000'LEF	0.001	0.35	0.0004																													
							0.064	4	0.256	0	0.256	0.0100	0.0200	1.735	2.000	1.1527	0.0833	4.165	1.000	1.52	0.0633	0.0833	4.694	4.000	0.852	0.968	0.248	0.008	1.734						
7-5	DI-5	3.330	902+14	0.033	0.90	0.0297																													
			39.500'RIGH	0.448	0.35	0.1568																													
							0.187	4	0.748	0	0.748	0.0100			3.000									3.330		1.000	0.748	0.000	0.3928						BHt.=0.072'
Curb_Cu		4.000	105+55	0.100	0.90	0.09																													
			19.000'RIGHT				0.09	4	0.36	0.208	0.568	0.0180	0.0200	5.112	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	18.420	4.000	0.217	0.356	0.202	0.366	1.227						
Curb_Cu		4.000	107+00	0.100	0.90	0.09																													

FORM LD 204 STORMWATER INLET COMPUTATIONS SHEET 6 OF 6

ROUTE PROJECT Shockoe Street DESIGNER: KRL CHECKED: DATE 9/27/2022 UNITS :NGLISH

INLET																														Sag Inlets Only					
NUMBER	TYPE	LENGTH (FT; M)	STATION	DRAINAGE AREA (AC; HA)	C	CA	ΣCA	I (IN/HR; mm/HR)	Q INCR. (CFS; CMS)	Qc CARRYOVER (CFS; CMS)	QT GUTTER FLOW (CFS; CMS)	S GUTTER SLOPE (FT/FT; M/M)	Sx CROSS SLOPE (FT/FT; M/M)	T (SPREAD) (FT; M)	W (GUTTER WIDTH) (FT; M)	W/T	Sw (GUTTER SLOPE) (FT/FT; M/M)	Sw/Sx	Eo (App. 9C-8)	a	S'w	Se	COMPUTED LENGTH L_T (FT; M)	L, SPECIFIED LENGTH (FT; M)	L/LT	E (App. 9C-18)	Q INTERCEPTED (CFS; CMS) or d/h	Qb CARRYOVER (CFS; CMS)	Depth at Curb (IN; MM)	Allowable Ponding Depth d (FT; M)	Height of Curb Opening h (FT; M)	d/h	Depth at Inlet (IN; MM)	T SPREAD @ SAG (FT; M)	REMARKS
			19.000'RIGHT				0.09	4	0.36	0	0.360	0.0180	0.0200	4.309	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	15.209	4.000	0.263	0.423	0.152	0.208	1.034						
Curb_Cu		4.000	109+15	0.095	0.90	0.0855																													
			24.500'RIGHT				0.086	4	0.344	0.208	0.552	0.0140	0.0200	4.441	0.000	0	0.02	1	0.000	0.00	0.0000	0.0200	13.838	4.000	0.289	0.459	0.158	0.186	1.066						
Curb_Cu		4.000	110+75	0.100	0.90	0.09																													
			25.000'RIGHT				0.09	4	0.36	0	0.360	0.0180	0.0200	4.309	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	15.209	4.000	0.263	0.423	0.152	0.208	1.034						
D021	DI-3B	10.000	317+00	0.094	0.90	0.0846																													
			14.000'RIGH	0.205	0.35	0.0718																													
							0.156	4	0.624	0.023	0.647	0.0165	0.0200	2.953	2.000	0.6773	0.0833	4.165	0.991	1.52	0.0633	0.0827	8.088	10.000	1.236	1.000	0.647	0.000	2.228						
D066	DI-2A	3		0.144	0.90	0.1296																													
			0.000'RIGH	0.041	0.35	0.0144																													
							0.144	4	0.576	0.062	0.638	0.0190	0.0200	5.285	0.000	0	0.02	1	0.719	1.50	0.0833	0.0799	8.562	3.000	0.350	0.540	0.345	0.293	1.269						
D072	DI-3B	18.000	701+79	0.898	0.90	0.8082																													
			21.380'RIGH	0.044	0.35	0.0154																													
							0.824	4	3.296	0	3.296	0.0200	0.0200	9.683	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	39.787	18.000	0.452	0.662	2.181	1.115	2.324						T > 5.5 ft
D110	DI-3B	20.000	100+22	0.386	0.90	0.3474																													
			22.730'RIGH	0.139	0.35	0.0487																													
							0.396	4	1.584	0.021	1.605	0.0144	0.0200	7.865	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	26.649	20.000	0.750	0.918	1.473	0.132	1.888						

LD-229
STORM SEWER DESIGN COMPUTATIONS

PROJECT: Shockoe Street
LOCATION: Richmond City
COUNTY: Richmond WB City

Designed by: MLR TJA
Checked by:

STORM FREQUENCY 10
UNITS ENGLISH

PIPE NO.	FROM POINT REFERENCE (1)	FROM POINT STA.	TO POINT REFERENCE (2)	TO POINT STA.	DRAIN. AREA "A" Acre (3)	RUNOFF COEFF. "C" (4)	CA INCREMENT (5)	CA ACCUMULATED (6)	INLET TIME Minutes (7)	RAIN FALL In/Hr (8)	RUNOFF Lateral CFS	RUNOFF Total Q CFS (9)	INVERT ELEVATIONS UPPER END (10)	INVERT ELEVATIONS LOWER END (11)	LENGTH of Pipe Ft. (12)	SLOPE Ft./Ft. (13)	SIZE (Dia. Or Span/Rise) In. (14)	SHAPE	Number of Pipes	Capacity CFS (15)	Friction Slope Ft./Ft.	NORMAL FLOW Depth of Flow, dn Ft.	NORMAL FLOW Area of Flow, An SqFt	NORMAL FLOW Hrn Ft.	NORMAL FLOW Vn Ft/Sec (16)	NORMAL FLOW En Ft.	FLOW TIME INCREMENT Minutes (17)	FLOW TIME ACCUMULATED Minutes (17)	REMARKS (18)
0301/0302	3-1	502+71	3-2		0.27	0.90	0.24	0.77	5.60	6.85	0.00	5.36	25.50	25.30	13.00	0.01538	15	Circular	1	8.01	0.00720	0.75	0.77	0.35	6.99	1.51	0.03	5.64	
0401/0423	4-1	100+83	4-23	100+70	0.16	0.90	0.14	0.14	5.00	7.05	0.00	1.01	28.80	28.70	11.00	0.00909	15	Circular	1	6.16	0.00030	0.34	0.27	0.20	3.70	0.56	0.05	5.05	
0403/0425	4-3	106+78	4-25		0.54	0.89	0.48	0.48	5.00	7.05	0.00	3.40	34.00	33.50	6.25	0.08000	15	Circular	1	18.27	0.00290	0.37	0.30	0.21	11.39	2.38	0.01	5.01	
0405/0424	4-5	101+94	4-24		0.39	0.79	0.31	0.31	5.00	7.05	0.00	2.18	29.20	29.10	4.00	0.02500	15	Circular	1	10.21	0.00120	0.39	0.33	0.22	6.62	1.07	0.01	5.01	
0409/0302	4-9	502+78	3-2		0.11	0.90	0.10	0.27	5.17	6.99	0.00	1.90	25.45	25.20	38.00	0.00658	15	Circular	1	5.24	0.00090	0.52	0.48	0.28	3.93	0.76	0.16	5.33	
0410/D116	4-10	505+40	D116	505+40	0.23	0.85	0.20	0.20	5.00	7.05	0.00	1.40	31.00	30.45	7.00	0.07857	12	Circular	1	14.43	0.00080	0.21	0.12	0.13	11.65	2.32	0.01	5.01	
0411/0412	4-11	505+35	4-12	505+25	0.08	0.90	0.07	0.29	5.33	6.93	0.00	2.06	32.80	32.40	9.00	0.04444	15	Circular	1	13.62	0.00110	0.33	0.26	0.19	8.00	1.32	0.02	5.35	
0413/0412	4-13	104+79	4-12	505+25	0.52	0.88	0.45	0.45	5.00	7.05	0.00	3.20	32.10	31.90	13.00	0.01538	15	Circular	1	8.01	0.00260	0.55	0.52	0.29	6.16	1.14	0.04	5.04	
0417/0418	4-17	105+12	4-18	503+86	0.37	0.86	0.32	0.32	5.00	7.05	0.00	2.26	28.34	28.00	62.00	0.00548	15	Circular	1	4.78	0.00130	0.61	0.59	0.31	3.84	0.83	0.27	5.27	
0418/0419	4-18	503+86	4-19	503+25	0.12	0.89	0.11	0.43	5.27	6.96	0.00	3.02	27.00	26.40	59.00	0.01017	15	Circular	1	6.51	0.00230	0.60	0.58	0.30	5.21	1.02	0.19	5.46	
0419/0301	4-19	503+25	3-1	502+71	0.11	0.90	0.10	0.53	5.46	6.89	0.00	3.72	26.30	25.60	53.00	0.01321	15	Circular	1	7.43	0.00350	0.63	0.61	0.31	6.05	1.19	0.15	5.60	
0420/0409	4-20	503+14	4-9	502+78	0.19	0.90	0.17	0.17	5.00	7.05	0.00	1.23	25.75	25.55	34.00	0.00588	15	Circular	1	4.95	0.00040	0.42	0.37	0.24	3.35	0.60	0.17	5.17	
0424/D111	4-24		D111		0.00		0.00	0.00	5.00	0.00		0.61	27.60	27.37	13.00	0.01769	15	Circular	1	8.59	0.00010	0.23	0.15	0.14	4.05	0.48	0.05	5.05	
0425/0427	4-25		4-27		0.00		0.00	0.00	5.00	0.00	0.00	2.81	31.50	31.40	7.00	0.01429	15	Circular	1	7.72	0.00200	0.52	0.49	0.28	5.80	1.04	0.02	5.02	
0426/0411	4-26	506+06	4-11	505+35	0.25	0.90	0.22	0.22	5.00	7.05	0.00	1.58	33.30	32.90	70.00	0.00571	18	Circular	1	7.94	0.00020	0.45	0.45	0.26	3.50	0.64	0.33	5.33	
0427/0404	4-27		4-4		0.00		0.00	0.00	5.02	7.04	0.00	2.81	31.30	31.20	7.25	0.01379	15	Circular	1	25.16	0.00200	0.28	0.21	0.17	13.54	3.13	0.01	5.03	
0501/0521	5-1	20+89	5-21		0.03	0.70	0.02	0.32	5.69	6.82	0.00	2.20	49.20	48.70	12.00	0.04167	15	Circular	1	13.19	0.00120	0.35	0.28	0.20	7.97	1.33	0.03	5.72	
0502/0503	5-2	601+79	5-3		0.13	0.90	0.11	0.11	5.00	7.05	0.00	0.80	38.80	38.30	21.00	0.02381	15	Circular	1	9.97	0.00020	0.24	0.16	0.15	4.87	0.61	0.07	5.07	
0504/0503	5-4	601+55	5-3		0.10	0.90	0.09	0.76	5.60	6.85	0.00	0.00	38.70	38.50	10.00	0.02000	15	Circular	1	9.14	0.00690	0.68	0.68	0.33	7.71	1.60	0.02	5.62	
0505/0504	5-5	108+72	5-4	601+79	0.37	0.86	0.32	0.67	5.56	6.86	0.00	4.63	39.00	38.80	17.00	0.01176	15	Circular	1	7.01	0.00540	0.74	0.76	0.35	6.10	1.32	0.05	5.60	
0507/0522	5-7	109+06	5-22		0.34	0.84	0.28	0.28	5.00	7.05	0.00	1.99	36.00	35.75	5.00	0.05000	15	Circular	1	14.45	0.00100	0.31	0.24	0.18	8.26	1.37	0.01	5.01	
0509/0505	5-9	110+47	5-5	108+72	0.41	0.84	0.35	0.35	5.00	7.05	0.00	2.45	41.00	39.10	170.00	0.01118	15	Circular	1	6.83	0.00150	0.52	0.48	0.27	5.10	0.92	0.56	5.56	
0512/0511	5-12	112+62	5-11		0.12	0.80	0.10	0.10	5.00	7.05	0.00	0.68	45.60	45.10	23.00	0.02174	15	Circular	1	9.53	0.00010	0.23	0.15	0.14	4.50	0.54	0.09	5.09	
0515/0514	5-15	112+86	5-14		0.31	0.76	0.24	0.24	5.00	7.05	0.00	1.66	46.50	46.00	18.00	0.02778	15	Circular	1	10.77	0.00070	0.33	0.26	0.19	6.37	0.96	0.05	5.05	
0518/0521	5-18	114+00	5-21		0.26	0.76	0.20	0.20	5.00	7.05	0.00	1.38	49.90	49.50	14.00	0.02857	15	Circular	1	10.92	0.00050	0.30	0.23	0.18	6.10	0.88	0.04	5.04	
0520/0506	5-20	600+51	5-6		0.06	0.86	0.05	0.05	5.09	7.02	0.00	0.83	31.50	31.10	11.00	0.03636	15	Circular	1	12.32	0.00020	0.22	0.15	0.13	5.71	0.73	0.03	5.12	
0522/0520	5-22		5-20	600+51	0.00		0.00	0.00	5.00	0.00		0.47	32.00	31.60	20.00	0.02000	15	Circular	1	9.14	0.00010	0.19	0.12	0.12	3.92	0.43	0.09	5.09	
0601/0616	6-1	10+22	6-16		0.00		0.00	1.05	5.62	6.84	0.00	7.18	52.80	52.60	9.00	0.02222	18	Circular	1	15.66	0.00490	0.71	0.83	0.36	8.67	1.88	0.02	5.64	
0602/0501	6-2	21+77	5-1	20+89	0.04	0.61	0.03	0.30	5.44	6.90	0.00	2.07	50.50	49.30	81.00	0.01481	15	Circular	1	7.86	0.00110	0.44	0.38	0.24	5.41	0.89	0.25	5.69	
0603/0602	6-3	22+16	6-2	21+77	0.27	0.47	0.13	0.27	5.32	6.94	0.00	1.90	51.00	50.60	35.00	0.01143	15	Circular	1	6.91	0.00090	0.45	0.40	0.25	4.81	0.81	0.12	5.44	
0604/0601	6-4	10+42	6-1	10+22	0.35	0.59	0.20	0.20	5.00	7.05	0.00	1.44	53.10	52.90	20.00	0.01000	15	Circular	1	6.46	0.00050	0.40	0.34	0.23	4.24	0.68	0.08	5.08	
0605/0608	6-5	10+82	6-8	10+77	0.52	0.48	0.25	0.76	5.42	6.91	0.00	5.33	57.40	57.10	25.00	0.01200	18	Circular	1	11.51	0.00270	0.72	0.83	0.36	6.39	1.35	0.07	5.48	
0606/0605	6-6	301+22	6-5	10+82	0.29	0.77	0.22	0.52	5.11	7.01	0.00	3.62	63.50	57.50	160.00	0.03750	15	Circular	1	12.51	0.00330	0.46	0.41	0.25	8.82	1.67	0.30	5.42	
0607/0606	6-7	301+22	6-6	301+22	0.39	0.76	0.29	0.29	5.00	7.05	0.00	2.07	69.75	69.25	36.00	0.01389	15	Circular	1	7.61	0.00110	0.45	0.39	0.25	5.28	0.88	0.11	5.11	
0608/0601	6-8	10+77	6-1	10+22	0.13	0.65	0.08	0.85	5.48	6.89	0.00	5.90	57.00	56.40	53.00	0.01132	18	Circular	1	11.18	0.00330	0.78	0.92	0.38	6.41	1.41	0.14	5.62	
0609/S009	6-9	11+19	S009		0.08	0.85	0.07	0.07	5.00	7.05	0.00	0.48	58.50	57.50	40.00	0.02500	15	Circular	1	10.21	0.00010	0.18	0.11	0.11	4.26	0.47	0.16	5.16	
0612/0611	6-12	216+63	6-11		0.42	0.53	0.22	0.22	5.00	7.05	0.00	1.56	84.20	84.00	15.00	0.01333	15	Circular	1	7.46	0.00060	0.39	0.33	0.22	4.81	0.75	0.05	5.05	
0613/0614	6-13	303+85	6-14		0.83	0.49	0.40	0.67	5.44	6.90	0.00	4.68	80.20	80.00	23.00	0.00870	15	Circular	1	6.03	0.00550	0.83	0.86	0.36	5.42	1.28	0.07	5.52	
0615/0614	6-15	303+87	6-14		0.40	0.70	0.28	0.28	5.00	7.05	0.00	1.99	86.20	85.30	20.00	0.04500	15	Circular	1	13.70	0.00100	0.32	0.25	0.19	7.95	1.30	0.04	5.04	
0617/0701	6-17	117+20	7-1	902+04	0.27	0.80	0.22	0.47	5.28	6.95	0.00	3.31	58.00	51.40	144.00	0.04583	15	Circular	1	13.83	0.00270	0.42	0.36	0.23	9.26	1.75	0.26	5.54	
0618/0617	6-18	118+07	6-17	117+20	0.43	0.60	0.26	0.26	5.00	7.05	0.00	1.81	66.00	63.50	103.00	0.02427	15	Circular	1	10.06	0.00080	0.36	0.29	0.21	6.21	0.96	0.28	5.28	
0619/0613	6-19	302+75	6-13	303+85	0.77	0.35	0.27	0.27	5.00	7.05	0.00	1.90	81.60	80.30	124.00	0.01048	15	Circular	1	6.61	0.00090	0.46	0.41	0.25	4.66	0.80	0.44	5.44	
0620/0706	6-20	901+92	7-6		0.14	0.35	0.05	0.05	5.00	7.05	0.00	0.34	52.00	51.00	11.00	0.09091	15	Circular	1	19.48	0.00000	0.11	0.06	0.07	6.03	0.68	0.03	5.03	
0701/0703	7-1	902+04	7-3	902+43	0.12	0.82	0.10	0.76	5.54	6.87	0.00	5.23	51.30	51.00	49.00	0.00612	18	Circular	1	8.22	0.00260	0.87	1.06	0.41	4.93	1.25	0.17	5.70	
0702/D021	7-2	903+52	D021	317+00	0.82	0.68	0.56	0.56	5.00	7.05	0.00	3.97	44.30	44.00	44.00	0.00682	15	Circular	1	5.34	0.00390	0.80	0.83	0.36	4.76	1.16	0.15	5.15	
0703/0706	7-3	902+43	7-6		0.31	0.74	0.23	0.99	5.70	6.82	0.00	6.78	50.90	50.80	4.00	0.02500	18	Circular	1	16.61	0.00430	0.67	0.76	0.35	8.92	1.90	0.01	5.71	
0704/S011	7-4	317+00	S011	317+00	0.07	0.89	0.06	0.78	5.25	6.96	0.00	5.50	44.17	44.00	10.00	0.01700	18	Circular	1	13.70	0.00290	0.66	0.75	0.35	7.33	1.50	0.02	5.28	
0705/0701	7-5	902+14	7-1	902+04	0.48	0.39	0.19	0.19	5.00	7.05	0.00	1.32	51.60	51.40	21.00	0.00952	15	Circular	1	6.30	0.00040	0.39	0.32	0.22	4.06	0.64	0.09	5.09	

LD-229
STORM SEWER DESIGN COMPUTATIONS

PROJECT: Shockoe Street
LOCATION: Richmond City
COUNTY: Richmond WB City

Designed by: MLR TJA
Checked by:

STORM FREQUENCY 10
UNITS ENGLISH

PIPE NO.	FROM POINT REFERENCE (1)	FROM POINT STA.	TO POINT REFERENCE (2)	TO POINT STA.	DRAIN. AREA "A" Acre (3)	RUNOFF COEFF. "C" (4)	CA INCREMENT (5)	CA ACCUMULATED (6)	INLET TIME Minutes (7)	RAIN FALL In/Hr (8)	RUNOFF Lateral CFS	RUNOFF Total Q CFS (9)	INVERT ELEVATIONS UPPER END (10)	INVERT ELEVATIONS LOWER END (11)	LENGTH of Pipe Ft. (12)	SLOPE Ft./Ft. (13)	SIZE (Dia. Or Span/Rise) In. (14)	SHAPE	Number of Pipes	Capacity CFS (15)	Friction Slope Ft./Ft.	NORMAL FLOW Depth of Flow, dn Ft.	NORMAL FLOW Area of Flow, An SqFt	NORMAL FLOW Hrn Ft.	NORMAL FLOW Vn Ft/Sec (16)	NORMAL FLOW En Ft.	FLOW TIME INCREMENT Minutes (17)	FLOW TIME ACCUMULATED Minutes (17)	REMARKS (18)
0706/0707	7-6		7-7		0.00		0.00	0.00	5.00	0.00	0.00	2.91	48.00	47.80	5.00	0.04000	15	Circular	1	12.92	0.00210	0.40	0.34	0.23	8.50	1.53	0.01	5.01	
0707/S010	7-7		S010		0.00		0.00	0.00	5.01	7.05	0.00	2.91	47.70	47.50	5.00	0.04000	15	Circular	1	12.92	0.00210	0.40	0.34	0.23	8.50	1.53	0.01	5.02	
1001/D004	10-1	144+22	D004		0.16	0.76	0.12	0.12	5.00	7.05	0.00	0.86	49.60	49.30	25.00	0.01200	15	Circular	1	7.08	0.00020	0.29	0.22	0.17	3.90	0.53	0.11	5.11	
1002/D014	10-2	925+08	D014		0.02	0.73	0.02	0.02	5.00	7.05	0.00	0.11	49.00	48.50	12.00	0.04167	15	Circular	1	13.19	0.00000	0.08	0.03	0.05	3.31	0.25	0.06	5.06	
1003/1004	10-3	142+75	10-4		0.14	0.88	0.12	0.12	5.00	0.00	0.00	0.66	55.50	55.30	6.00	0.03333	15	Circular	1	11.79	0.00010	0.20	0.13	0.12	5.17	0.62	0.02	5.02	
1005/1006	10-5		10-6		0.00		0.00	0.00	5.00	0.00	0.00	7.75	46.50	46.30	8.00	0.02500	15	Circular	1	10.21	0.01500	0.81	0.85	0.36	9.16	2.12	0.02	5.02	
1006/D004	10-6		D004		0.00		0.00	0.00	5.00	0.00	0.00	4.31	45.50	45.10	34.00	0.01176	15	Circular	1	7.01	0.00460	0.71	0.72	0.34	6.00	1.27	0.09	5.09	
1007/1008	10-7	141+48	10-8	141+50	0.86	0.38	0.33	0.33	5.00	7.05	0.00	2.29	61.50	61.00	23.00	0.02174	15	Circular	1	9.53	0.00130	0.42	0.36	0.23	6.38	1.05	0.06	5.06	
1201/1202	12-1	214+52	12-2		0.32	0.68	0.22	0.22	5.00	7.05	0.00	1.54	69.00	68.80	9.00	0.02222	15	Circular	1	9.63	0.00060	0.34	0.27	0.20	5.75	0.85	0.03	5.03	
1204/1205	12-4	213+18	12-5		0.13	0.90	0.12	0.12	5.00	0.00	0.00	0.74	58.60	58.30	29.00	0.01034	15	Circular	1	6.57	0.00010	0.28	0.21	0.17	3.55	0.48	0.14	5.14	
1206/1207	12-6	215+69	12-7		0.01	0.93	0.01	0.01	5.00	7.05	0.00	0.09	75.60	74.30	34.00	0.03824	15	Circular	1	12.63	0.00000	0.08	0.03	0.05	3.02	0.22	0.19	5.19	
1207/1203	12-7		12-3	214+52	0.00		0.00	0.01	5.19	6.98	0.00	0.09	74.20	69.10	76.00	0.06711	15	Circular	1	16.73	0.00000	0.07	0.03	0.04	3.67	0.28	0.35	5.53	
1301/1302	13-1	120+66	13-2		0.04	0.83	0.03	0.03	5.00	7.05	0.00	0.21	73.95	73.60	13.00	0.02692	15	Circular	1	10.60	0.00000	0.12	0.06	0.08	3.42	0.30	0.06	5.06	
1303/1302	13-3	120+63	13-2		0.03	0.89	0.03	0.51	5.09	7.01	0.00	3.61	77.70	77.40	13.00	0.02308	15	Circular	1	9.81	0.00330	0.53	0.49	0.28	7.39	1.37	0.03	5.12	
1304/1303	13-4	140+41	13-3	120+63	1.35	0.36	0.49	0.49	5.00	7.05	0.00	3.44	78.00	77.80	27.00	0.00741	15	Circular	1	5.56	0.00300	0.71	0.72	0.34	4.77	1.06	0.09	5.09	
D021/0704	D021	317+00	7-4	317+00	0.30	0.52	0.16	0.72	5.15	6.99	0.00	5.06	44.87	44.17	42.00	0.01667	18	Circular	1	13.56	0.00240	0.63	0.71	0.34	7.11	1.42	0.10	5.25	
D066/0603	D066		6-3	20+35	0.19	0.78	0.14	0.14	5.00	7.05	0.00	1.01	51.73	51.21	67.00	0.00776	15	Circular	1	5.69	0.00030	0.36	0.29	0.21	3.51	0.55	0.32	5.32	

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number__________
4. Adopted_________
5. Accepted____________________________

REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS
STORM SEWER CALCULATIONS

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
				SEPTEMBER 2022	SHEET 2G(1)	0-28633

FORM LD 204

STORMWATER INLET COMPUTATIONS

SHEET 1 OF 11

ROUTE Venable Street **PROJECT** Shockoe Streets **DESIGNER:** MLR **CHECKED:** **DATE** 9/6/2022 **UNITS** ENGLISH

INLET																														Sag Inlets Only					
NUMBER	TYPE	LENGTH (FT; M)	STATION	DRAINAGE AREA (AC; HA)	C	CA	ΣCA	I (IN/HR; mm/HR)	Q INCR. (CFS; CMS)	Qc CARRYOVER (CFS; CMS)	QT GUTTER FLOW (CFS; CMS)	S GUTTER SLOPE (FT/FT; M/M)	Sx CROSS SLOPE (FT/FT; M/M)	T (SPREAD) (FT; M)	W (GUTTER WIDTH) (FT; M)	W/T	Sw (GUTTER SLOPE) (FT/FT; M/M)	Sw/Sx	Eo (App. 9C-8)	a	S'w	Se	COMPUTED LENGTH L_T (FT; M)	L, SPECIFIED LENGTH (FT; M)	L/LT	E (App. 9C-18)	Q INTERCEPTED (CFS; CMS) or d/h	Qb CARRYOVER (CFS; CMS)	Depth at Curb (IN; MM)	Allowable Ponding Depth d (FT; M)	Height of Curb Opening h (FT; M)	d/h	Depth at Inlet (IN; MM)	T SPREAD @ SAG (FT; M)	REMARKS
16-1	DI-3BB	10.000	306+47	0.110	0.90	0.099																													
			22.800'RIGH	0.033	0.35	0.0116																													
							0.111	4	0.444	0	0.444	0.0800	0.0200	1.444	1.500	1.0388	0.0833	4.165	1.000	1.14	0.0633	0.0833	11.039	10.000	0.906	0.986	0.438	0.006	1.444						
16-10	DI-1	2.000	306+77	0.013	0.90	0.0117																													
			36.200'RIGH	0.013	0.35	0.0046																													
							0.016	4	0.064	0	0.064	0.0100	0.0208	1.032	2.000	1.938	0.0833	4.0048	1.000	3.50	0.1458	0.1666	1.730	2.000	1.156	1.000	0.064	0.000	1.032						
16-11	DI-1	2.000	307+06	0.013	0.90	0.0117																													
			37.400'RIGH	0.013	0.35	0.0046																													
							0.016	4	0.064	0	0.064	0.0100	0.0208	1.032	2.000	1.938	0.0833	4.0048	1.000	3.50	0.1458	0.1666	1.730	2.000	1.156	1.000	0.064	0.000	1.032						
16-12	DI-3C	2.000	307+61	0.110	0.90	0.099																													Back/Lt.
			49.300'RIGH	0.212	0.35	0.0742																													Back/Lt.
							0.173	4	0.692	0		0.001	0.0208	8.004	2.000	0.2499	0.0833	4.0048		3.50															Back/Lt.
							0	4	0	0																									Ahead/Rt.
											0.692	0.001												2			0.692		1.707	0.166	0.333	0.4985	3.707	6.839	T > 8.0 ft
16-2	DI-3BB	18.000	306+44	0.140	0.90	0.126																													
			-22.800'LEF	0.060	0.35	0.021																													
							0.147	4	0.588	0.55	1.138	0.0800	0.0250	3.200	1.500	0.4688	0.0833	3.332	0.919	1.05	0.0583	0.0786	16.974	18.000	1.060	1.000	1.138	0.000	2.010						
16-3	DI-5	2.000	306+16	0.329	0.35	0.1152																													Back/Lt.
			-57.700'LEFT				0.115	4	0.46	0																									Back/Lt.
							0	4	0	0																									Ahead/Rt.
											0.460	0.001			2.000									2			0.460						1.041		T > 8.0 ft
16-5	DI-5	3.330	307+35	0.018	0.90	0.0162																													
			36.200'RIGH	0.033	0.35	0.0116																													
							0.028	4	0.112	0	0.112	0.0500			3.000									3.330		1.000	0.112	0.000	0.0274						BHt.=0.020'
16-6	DI-5	3.330	307+91	0.002	0.90	0.0018																													
			33.100'RIGH	0.024	0.35	0.0084																													
							0.01	4	0.04	0	0.040	0.0100			3.000									3.330		1.000	0.040	0.000	0.0189						BHt.=0.010'
16-7	DI-1	2.000	305+94	0.014	0.90	0.0126																													
			36.400'RIGH	0.014	0.35	0.0049																													
							0.018	4	0.072	0	0.072	0.0100	0.0208	1.079	2.000	1.8536	0.0833	4.0048	1.000	3.50	0.1458	0.1666	1.818	2.000	1.100	1.000	0.072	0.000	1.078						
16-8	DI-1	2.000	306+24	0.014	0.90	0.0126																													
			36.100'RIGH	0.014	0.35	0.0049																													
							0.018	4	0.072	0	0.072	0.0100	0.0208	1.079	2.000	1.8536	0.0833	4.0048	1.000	3.50	0.1458	0.1666	1.818	2.000	1.100	1.000	0.072	0.000	1.078						
16-9	DI-1	2.000	306+50	0.014	0.90	0.0126																													
			36.700'RIGH	0.014	0.35	0.0049																													
							0.018	4	0.072	0	0.072	0.0100	0.0208	1.079	2.000	1.8536	0.0833	4.0048	1.000	3.50	0.1458	0.1666	1.818	2.000	1.100	1.000	0.072	0.000	1.078						

INLETSOFT BY ENSOFTEC

DATE: 9/6/2022

FORM LD 204

STORMWATER INLET COMPUTATIONS

SHEET 2 OF 11

ROUTE Venable Street **PROJECT** Shockoe Streets **DESIGNER:** MLR **CHECKED:** **DATE** 9/6/2022 **UNITS** ENGLISH

INLET																														Sag Inlets Only					
NUMBER	TYPE	LENGTH (FT; M)	STATION	DRAINAGE AREA (AC; HA)	C	CA	ΣCA	I (IN/HR; mm/HR)	Q INCR. (CFS; CMS)	Qc CARRYOVER (CFS; CMS)	QT GUTTER FLOW (CFS; CMS)	S GUTTER SLOPE (FT/FT; M/M)	Sx CROSS SLOPE (FT/FT; M/M)	T (SPREAD) (FT; M)	W (GUTTER WIDTH) (FT; M)	W/T	Sw (GUTTER SLOPE) (FT/FT; M/M)	Sw/Sx	Eo (App. 9C-8)	a	S'w	Se	COMPUTED LENGTH L_T (FT; M)	L, SPECIFIED LENGTH (FT; M)	L/LT	E (App. 9C-18)	Q INTERCEPTED (CFS; CMS) or d/h	Qb CARRYOVER (CFS; CMS)	Depth at Curb (IN; MM)	Allowable Ponding Depth d (FT; M)	Height of Curb Opening h (FT; M)	d/h	Depth at Inlet (IN; MM)	T SPREAD @ SAG (FT; M)	REMARKS
17-1	DI-3BB	12.000	308.47	0.036	0.90	0.0324																													
			25.700'RIGH	0.013	0.35	0.0046																													
							0.037	4	0.148	0.041	0.189	0.0530	0.0290	1.133	1.500	1.3239	0.0833	2.8724	1.000	0.98	0.0543	0.0833	6.816	12.000	1.761	1.000	0.189	0.000	1.133						
17-10	DI-3B	20.000	404+40	0.949	0.90	0.8541																													
			-24.300'LEF	0.320	0.35	0.112																													
							0.966	4	3.864	0.016	3.880	0.0600	0.0200	8.379	0.000	0	0.02	1	0.000	0.00	0.0000	0.0200	59.242	20.000	0.338	0.524	2.031	1.849	2.011						
17-11	DI-5	3.330	403+91	0.202	0.90	0.1818																													
			-48.100'LEF	0.201	0.35	0.0704																													
							0.252	7.045	1.775	0	1.775	0.1400			3.300									3.330		1.000	1.775	0.000	0.0913						BHt.=0.125'
17-12	DI-3B	20.000	405+11	0.127	0.90	0.1143																													
			21.000'RIGH	0.155	0.35	0.0543																													
							0.169	4	0.676	0	0.676	0.0250	0.0175	5.578	0.000	0	0.0175	1	0.000	0.00	0.0000	0.0175	23.694	20.000	0.844	0.965	0.652	0.024	1.171						
17-14	DI-3B	20.000	401+50	0.509	0.90	0.4581																													
			16.400'RIGH	0.711	0.35	0.2489																													
							0.707	4	2.828	0.207	3.035	0.0475	0.0200	7.984	0.000	0	0.0200	1	0.000	0.00	0.0000	0.0200	49.819	20.000	0.401	0.603	1.830	1.205	1.916						T > 6.0 ft
17-15	DI-3B	6.000	402+30				0	4	0	0.365	0.365	0.0100	0.0010	31.492	0.000	0	0.0010	1	0.083	1.00	0.0833	0.0079	22.427	6.000	0.268	0.429	0.157	0.208	0.378						T > 8.0 ft
			20.000'RIGHT																																
17-17	DI-3BB	16.000	405+73	0.115	0.90	0.1035																													
			-31.100'LEF	0.069	0.35	0.0242																													
							0.128	4	0.512	0	0.512	0.0290	0.0230	4.120	0.000	0	0.0230	1	0.000	0.00	0.0000	0.0230	18.710	16.000	0.855	0.969	0.496	0.016	1.137						T > 4.0 ft
17-19	DI-3A	3.330	308+64	0.077	0.90	0.0693																													
			-50.700'LEFT				0.069	4	0.276	0	0.276	0.0100			3.000									3.330		1.000	0.276	0.000	0.0753						BHt.=0.037'
17-2	DI-3B	20.000	308+51				0	0	4.305	0	4.305	0.0530	0.0350	5.858	1.500	0.2561	0.0833	2.38	0.624	0.87	0.0483	0.0651	29.365	20.000	0.681	0.872	3.755	0.550	3.330						
			-22.500'LEFT																																
17-21	DI-3B	6.000	401+06	0.348	0.90	0.3132																													
			24.400'RIGH	0.024	0.35	0.0084																													
							0.322	4	1.288	0	1.288	0.0070	0.0350	5.842	0.000	0	0.0350	1	0.394	1.00	0.0833	0.0679	9.402	6.000	0.638	0.840	1.081	0.207	2.454						
17-3	DI-3B	20.000	308+91	0.726	0.90	0.6534																													
			54.500'RIGH	0.082	0.35	0.0287																													
							0.682	4	2.728	0	2.728	0.0316	0.0220	7.066	1.500	0.2123	0.0833	3.7864	0.594	1.10	0.0613	0.0584	22.160	20.000	0.903	0.985	2.687	0.041	2.969						
17-5	DI-3C	10.000	401+88	0.152	0.90	0.1368																													Back/Lt.
			18.300'RIGH	0.090	0.35	0.0315																													Back/Lt.
							0.168	4	0.672	0.208																									Back/Lt.
				0.174	0.90	0.1566																													Ahead/Rt.
				0.500	0.35	0.175																													Ahead/Rt.
							0.332	4	1.328	1.205		0.0010	0.0200	15.375	0.000	0	0.02	1		2.00															Ahead/Rt.

INLETSOFT BY ENSOFTEC

DATE: 9/6/2022

FORM LD 204

STORMWATER INLET COMPUTATIONS

SHEET 3 OF 11

ROUTE Venable Street **PROJECT** Shockoe Streets **DESIGNER:** MLR **CHECKED:** **DATE** 9/6/2022 **UNITS** ENGLISH

INLETSOFT BY ENSOFTEC

DATE: 9/6/2022

FORM LD 204

STORMWATER INLET COMPUTATIONS

SHEET 4 OF 11

ROUTE Venable Street **PROJECT** Shockoe Streets **DESIGNER:** MLR **CHECKED:** **DATE** 9/6/2022 **UNITS** ENGLISH

INLETSOFT BY ENSOFTEC

DATE: 9/6/2022

LD-229
STORM SEWER DESIGN COMPUTATIONS

STORM FREQUENCY 10

PROJECT: Shockoe Streets
LOCATION: Richmond VA
COUNTY: Richmond WB City

Designed by: MLR
Checked by:

UNITS ENGLISH

PIPE NO.	FROM POINT		TO POINT		DRAIN. AREA "A" Acre (3)	RUNOFF COEFF. "C" (4)	CA		INLET TIME Minutes (7)	RAIN FALL In/Hr (8)	RUNOFF		INVERT ELEVATIONS		LENGTH of Pipe Ft. (12)	SLOPE Ft./Ft. (13)	SIZE (Dia. Or Span/Rise) In. (14)	SHAPE	Number of Pipes	Capacity CFS (15)	Friction Slope Ft./Ft.	NORMAL FLOW					FLOW TIME		REMARKS (18)
	REFERENCE (1)	STA.	REFERENCE (2)	STA.			INCRE-MENT (5)	ACCUM-ULATED (6)			Lateral CFS	Total Q CFS (9)	UPPER END (10)	LOWER END (11)								Depth of Flow, dn Ft.	Area of Flow, An SqFt	Hrn Ft.	Vn Ft/Sec (16)	En Ft.	INCRE-MENT Minutes (17)	ACCUMU-LATED Minutes (17)	
161/164	16-1	306+47	16-4	306+70	0.14	0.78	0.11	0.40	5.44	6.90	0.00	2.77	100.00	98.49	32.50	0.04646	15	Circular	1	13.92	0.00190	0.38	0.31	0.22	8.84	1.59	0.06	5.51	
1610/169	16-10	306+77	16-9	306+50	0.03	0.62	0.02	0.23	5.16	6.99	0.00	1.64	104.70	102.90	25.00	0.07200	15	Circular	1	17.33	0.00070	0.26	0.18	0.16	8.89	1.49	0.05	5.21	
1611/1610	16-11	307+06	16-10	306+77	0.03	0.62	0.02	0.22	5.11	7.01	0.00	1.53	106.90	104.80	26.20	0.08015	15	Circular	1	18.29	0.00060	0.24	0.17	0.15	9.04	1.51	0.05	5.16	
1612/165	16-12	307+61	16-5	307+35	0.32	0.54	0.17	0.17	5.00	7.05	0.00	1.22	111.00	109.00	29.00	0.06897	15	Circular	1	16.97	0.00040	0.23	0.15	0.14	8.02	1.23	0.06	5.06	
162/164	16-2	306+44	16-4	306+75	0.20	0.74	0.15	0.26	5.12	7.00	0.00	1.84	99.67	98.23	9.00	0.16000	15	Circular	1	25.84	0.00080	0.23	0.15	0.14	12.19	2.53	0.01	5.13	
163/162	16-3	306+16	16-2	306+44	0.33	0.35	0.12	0.12	5.00	7.05	0.00	0.81	101.50	99.80	42.60	0.03991	15	Circular	1	12.91	0.00020	0.21	0.14	0.13	5.87	0.75	0.12	5.12	
165/1611	16-5	307+35	16-11	307+06	0.05	0.55	0.03	0.20	5.06	7.03	0.00	1.42	108.90	107.00	27.30	0.06960	15	Circular	1	17.04	0.00050	0.24	0.17	0.15	8.41	1.34	0.05	5.11	
166/171	16-6	307+91	17-1	308.47	0.03	0.39	0.01	0.01	5.00	7.05	0.00	0.07	111.80	111.30	56.00	0.00893	15	Circular	1	6.10	0.00000	0.09	0.04	0.06	1.68	0.14	0.56	5.56	
167/168	16-7	305+94	16-8	306+24	0.03	0.64	0.02	0.02	5.00	7.05	0.00	0.13	101.00	100.80	27.40	0.00730	12	Circular	1	3.04	0.00000	0.14	0.07	0.09	1.92	0.20	0.24	5.24	
168/169	16-8	306+24	16-9	306+50	0.03	0.64	0.02	0.04	5.24	6.97	0.00	0.25	100.70	100.50	23.50	0.00851	15	Circular	1	5.96	0.00000	0.18	0.10	0.11	2.41	0.27	0.16	5.40	
169/161	16-9	306+50	16-1	306+47	0.03	0.64	0.02	0.29	5.40	6.91	0.00	2.00	100.40	100.30	11.80	0.00847	15	Circular	1	5.95	0.00100	0.50	0.46	0.27	4.37	0.80	0.05	5.44	
171/1718	17-1	308.47	17-18	304+72	0.05	0.76	0.04	0.73	5.56	6.86	0.00	5.11	111.20	110.70	21.80	0.02294	15	Circular	1	9.78	0.00650	0.64	0.63	0.32	8.06	1.65	0.05	5.60	
1710/1716	17-10	404+40	17-16	404+05	1.27	0.76	0.97	1.09	5.52	6.87	0.00	7.62	124.40	124.00	30.40	0.01316	18	Circular	1	12.05	0.00550	0.87	1.06	0.41	7.22	1.67	0.07	5.59	
1711/1716	17-11	403+91	17-16	404+05	0.40	0.63	0.25	0.25	5.00	7.05	0.00	1.78	122.90	122.75	24.33	0.00617	15	Circular	1	5.07	0.00080	0.51	0.47	0.27	3.77	0.73	0.11	5.11	
1714/175	17-14	401+50	17-5	401+88	1.22	0.58	0.71	1.03	5.10	7.01	0.00	7.23	125.50	124.00	39.40	0.03807	15	Circular	1	12.60	0.01310	0.68	0.68	0.33	10.62	2.43	0.06	5.16	
1715/1704	17-15	402+30	17-4	402+30	0.00		0.00	1.53	5.23	6.97	0.00	10.72	122.40	122.20	4.00	0.05000	15	Circular	1	14.45	0.02880	0.80	0.83	0.36	12.89	3.38	0.01	5.24	
1716/1719	17-16	404+05	17-19	308+64	0.00		0.00	1.35	5.59	6.85	0.00	9.35	121.00	120.00	98.00	0.01020	18	Circular	1	10.61	0.00830	1.09	1.38	0.45	6.78	1.81	0.24	5.83	
1717/1710	17-17	405+73	17-10	404+40	0.18	0.70	0.13	0.13	5.00	7.05	0.00	0.90	126.00	124.50	124.30	0.01207	15	Circular	1	7.10	0.00020	0.30	0.23	0.18	3.97	0.55	0.52	5.52	
1719/172	17-19	308+64	17-2	308+51	0.08	0.90	0.07	1.42	5.83	6.77	0.00	9.82	119.00	118.00	29.60	0.03378	18	Circular	1	19.31	0.00910	0.76	0.90	0.38	10.97	2.63	0.05	5.88	
172/1718	17-2	308+51	17-18	304+72	0.00		0.00	1.42	5.88	6.76	0.00	9.82	117.90	117.00	23.00	0.03913	18	Circular	1	20.78	0.00910	0.73	0.85	0.37	11.59	2.81	0.03	5.91	
1721/1714	17-21	401+06	17-14	401+50	0.37	0.87	0.32	0.32	5.00	7.05	0.00	2.27	127.00	125.60	43.50	0.03218	15	Circular	1	11.59	0.00130	0.38	0.31	0.21	7.33	1.21	0.10	5.10	
1722/1720	17-22	404+00	17-20	403+90	0.00		0.00	0.00	5.00	0.00	0.00	1.58	128.00	127.50	6.50	0.07692	15	Circular	1	17.92	0.00060	0.25	0.18	0.15	9.00	1.51	0.01	5.01	
173/171	17-3	308+91	17-1	308.47	0.81	0.84	0.68	0.68	5.00	7.05	0.00	4.81	122.30	119.00	46.90	0.07036	15	Circular	1	17.14	0.00580	0.45	0.40	0.25	11.98	2.68	0.07	5.07	
175/1715	17-5	401+88	17-15	402+30	0.92	0.55	0.50	1.53	5.16	6.99	0.00	10.72	123.90	122.50	44.00	0.03182	15	Circular	1	11.52	0.02880	0.95	1.01	0.38	10.67	2.72	0.07	5.23	
177/176	17-7	310+35	17-6	302+90	0.49	0.79	0.39	0.39	5.00	7.05	0.00	2.76	121.50	120.50	26.90	0.03717	15	Circular	1	12.45	0.00190	0.40	0.34	0.23	8.16	1.43	0.06	5.06	
178/176	17-8	310+42	17-6	302+90	1.12	0.72	0.81	0.81	5.00	7.05	0.00	5.67	125.00	124.50	15.40	0.03247	15	Circular	1	11.64	0.00800	0.62	0.60	0.31	9.43	2.00	0.03	5.03	
179/1720	17-9	404+02	17-20	403+90	0.71	0.59	0.42	0.42	5.00	7.05	0.00	2.94	126.00	125.90	7.00	0.01429	15	Circular	1	7.72	0.00220	0.54	0.50	0.28	5.86	1.07	0.02	5.02	
1811/189	18-11	801+79	18-9	801+85	0.03	0.86	0.03	0.23	5.15	6.99	0.00	1.61	126.40	126.00	56.40	0.00709	15	Circular	1	5.44	0.00070	0.47	0.42	0.25	3.86	0.70	0.24	5.40	
1812/1813	18-12	412+17	18-13	412+25	0.07	0.62	0.04	0.04	5.00	7.05	0.00	0.28	128.00	127.50	5.60	0.08929	15	Circular	1	19.30	0.00000	0.11	0.05	0.07	5.67	0.61	0.02	5.02	
1814/1815	18-14	412+66	18-15	412+75	0.48	0.71	0.34	0.34	5.00	7.05	0.00	2.37	125.50	125.00	41.50	0.01205	15	Circular	1	7.09	0.00140	0.50	0.46	0.27	5.21	0.92	0.13	5.13	
1816/1810	18-16	802+23	18-10	802+30	0.13	0.67	0.09	0.09	5.00	7.05	0.00	0.61	125.50	125.00	5.60	0.08929	15	Circular	1	19.30	0.00010	0.15	0.09	0.10	7.16	0.95	0.01	5.01	
1817/1811	18-17	802+20	18-11	801+79	0.24	0.84	0.20	0.20	5.00	7.05	0.00	1.44	126.90	126.50	38.90	0.01028	15	Circular	1	6.55	0.00050	0.40	0.34	0.22	4.28	0.68	0.15	5.15	
182/184	18-2	410+00	18-4	415+00	0.00		0.00	0.00	5.00	0.00	0.00	2.30	127.58	127.28	45.90	0.00654	15	Circular	1	5.22	0.00130	0.58	0.56	0.30	4.12	0.84	0.19	5.19	
183/S106	18-3	410+54	S106	410+90	0.27	0.70	0.19	0.19	5.00	7.05	0.00	1.33	124.50	123.50	92.50	0.01081	15	Circular	1	6.72	0.00040	0.38	0.31	0.22	4.26	0.66	0.36	5.36	
185/184	18-5	410+05	18-4	415+00	0.48	0.69	0.33	0.33	5.00	7.05	0.00	2.33	130.50	130.00	11.20	0.04464	15	Circular	1	13.65	0.00140	0.35	0.28	0.20	8.30	1.42	0.02	5.02	
186/188	18-6	804+44	18-8	804+45	0.26	0.68	0.17	0.17	5.00	7.05	0.00	1.22	129.00	128.50	20.70	0.02415	15	Circular	1	10.04	0.00040	0.29	0.22	0.17	5.54	0.77	0.06	5.06	
187/188	18-7	804+50	18-8	804+45	0.54	0.60	0.32	0.32	5.00	7.05	0.00	2.27	124.68	123.68	20.10	0.04975	15	Circular	1	14.41	0.00130	0.34	0.27	0.20	8.56	1.47	0.04	5.04	
189/1810	18-9	801+85	18-10	802+30	0.11	0.83	0.09	0.32	5.40	6.91	0.00	2.22	125.90	124.50	42.50	0.03294	15	Circular	1	11.72	0.00120	0.37	0.30	0.21	7.35	1.21	0.10	5.49	
193/194	19-3	414+22	19-4	414+20	0.54	0.65	0.35	0.35	5.00	7.05	0.00	2.43	123.50	122.00	28.50	0.05263	15	Circular	1	14.82	0.00150	0.34	0.27	0.20	8.91	1.58	0.05	5.05	

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number___________
4. Adopted__________
5. Accepted________________________________

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS
STORM SEWER CALCULATIONS

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2G(2)	DRAWING NO. 0-28633

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Street
DESIGNED BY: MLR TJA
Checked:
INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
3-2																								26.300		
4-9	502+78	25.200	1.25	26.300	15	1.904	38.00	0.00091	0.035	3.932	0.060	3.347	0.174	0.061	73.0	0.62	0.107	0.228	0.678	0.296	YES	0.148	0.183	26.483	30.000	O.K.
4-20	503+14	25.550	1.25	26.550	15	1.226	34.00	0.00038	0.013	3.347	0.043	0.000	0.000	0.000	0.0	0.00	0.000	0.043	1.226	0.057	NO	0.057	0.069	26.619	30.250	O.K.
3-1	502+71	25.300	1.25	26.300	15	5.358	13.00	0.00719	0.093	6.994	0.190	6.052	0.569	0.199	77.0	0.63	0.358	0.747	1.643	0.971	YES	0.486	0.579	26.879	29.500	O.K.
4-19	503+25	25.600	1.25	26.879	15	3.715	53.00	0.00346	0.183	6.052	0.142	5.209	0.421	0.147	3.0	0.05	0.019	0.309	0.696	0.309	YES	0.154	0.338	27.217	30.500	O.K.
4-18	503+86	26.400	1.25	27.400	15	3.019	59.00	0.00228	0.135	5.209	0.105	3.843	0.229	0.080	36.0	0.39	0.089	0.274	0.758	0.357	YES	0.178	0.313	27.713	33.000	O.K.
4-17	105+12	28.000	1.25	29.000	15	2.261	62.00	0.00128	0.079	3.843	0.057	0.000	0.000	0.000	0.0	0.00	0.000	0.057	2.261	0.075	NO	0.075	0.154	29.154	36.500	O.K.

LD-347
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										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
4-4																								31.200		
4-27		30.200	1.25	31.200	15	2.810	7.25	0.00198	0.014	5.720	0.127	5.796	0.522	0.183	90.0	0.70	0.365	0.675	0.000	0.675	YES	0.337	0.352	31.552	38.300	O.K.

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INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
4-12																								33.400		
4-13	104+79	31.900	1.25	33.400	15	3.198	13.00	0.00256	0.033	6.162	0.147	0.000	0.000	0.000	0.0	0.00	0.000	0.147	3.198	0.192	NO	0.192	0.225	33.625	36.500	O.K.
4-11	505+35	32.400	1.25	33.400	15	2.057	9.00	0.00106	0.010	7.999	0.248	3.502	0.190	0.067	0.0	0.00	0.000	0.315	0.478	0.410	NO	0.410	0.419	33.819	36.500	O.K.
4-26	506+06	32.900	1.50	34.100	18	1.578	70.00	0.00024	0.017	3.502	0.048	0.000	0.000	0.000	0.0	0.00	0.000	0.048	1.578	0.062	NO	0.062	0.078	34.178	37.500	O.K.

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INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
4-23																								29.700		
4-1	100+83	28.700	1.25	29.700	15	1.007	11.00	0.00025	0.003	2.889	0.032	0.000	0.000	0.000	0.0	0.00	0.000	0.032	1.007	0.042	NO	0.042	0.045	29.745	32.250	O.K.

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HYDRAULIC GRADE LINE ANALYSIS
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INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
4-24																								29.950		
4-5	101+94	29.100	1.25	30.100	15	2.177	4.00	0.00119	0.005	6.617	0.170	0.000	0.000	0.000	0.0	0.00	0.000	0.170	2.177	0.221	NO	0.221	0.226	30.326	33.680	O.K.

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PROJECT: Shockoe Street
DESIGNED BY: MLR TJA
Checked:
INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
4-25																								34.640		
4-3	106+78	33.500	1.25	34.640	15	3.396	6.25	0.00289	0.018	11.387	0.503	0.000	0.000	0.000	0.0	0.00	0.000	0.503	3.396	0.654	NO	0.654	0.672	35.312	39.690	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Street
DESIGNED BY: MLR TJA
Checked:
INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
5-3																								39.500		
5-4	601+55	38.500	1.25	39.500	15	0.000	10.00	0.00000	0.000	7.705	0.230	6.101	0.578	0.202	59.0	0.55	0.317	0.750	0.623	0.975	YES	0.487	0.487	39.987	43.000	O.K.
5-5	108+72	38.800	1.25	39.987	15	4.633	17.00	0.00538	0.091	6.101	0.144	5.104	0.405	0.142	59.0	0.55	0.222	0.508	2.189	0.660	YES	0.330	0.422	40.409	43.500	O.K.
5-9	110+47	39.100	1.25	40.409	15	2.445	170.00	0.00150	0.255	5.104	0.101	0.000	0.000	0.000	0.0	0.00	0.000	0.101	2.445	0.131	NO	0.131	0.386	41.517	45.500	O.K.
5-2	601+79	38.300	1.25	39.500	15	0.796	21.00	0.00016	0.003	4.865	0.092	0.000	0.000	0.000	0.0	0.00	0.000	0.092	0.796	0.119	NO	0.119	0.123	39.623	42.750	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
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INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
5-6																								32.100		
5-20	600+51	31.100	1.25	32.100	15	0.828	11.00	0.00017	0.002	5.712	0.127	3.916	0.238	0.083	65.0	0.58	0.138	0.348	0.358	0.452	YES	0.226	0.228	32.328	38.500	O.K.
5-22		31.600	1.25	32.600	15	0.470	20.00	0.00006	0.001	3.916	0.060	8.260	1.059	0.371	0.0	0.00	0.000	0.430	0.000	0.430	NO	0.430	0.431	33.031	43.700	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Street
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INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
5-11																								46.100		
5-12	112+62	45.100	1.25	46.100	15	0.683	23.00	0.00012	0.003	4.504	0.079	0.000	0.000	0.000	0.0	0.00	0.000	0.079	0.683	0.102	NO	0.102	0.105	46.205	50.500	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
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INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
5-14																								47.000		
5-15	112+86	46.000	1.25	47.000	15	1.663	18.00	0.00069	0.012	6.366	0.157	0.000	0.000	0.000	0.0	0.00	0.000	0.157	1.663	0.205	NO	0.205	0.217	47.217	51.000	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
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INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
5-21																								50.500		
5-1	20+89	48.700	1.25	50.500	15	2.204	12.00	0.00122	0.015	7.972	0.247	5.406	0.454	0.159	0.0	0.00	0.000	0.406	0.130	0.406	YES	0.203	0.217	50.717	56.750	O.K.
6-2	21+77	49.300	1.25	50.717	15	2.074	81.00	0.00108	0.087	5.406	0.113	4.807	0.359	0.126	0.0	0.00	0.000	0.239	0.172	0.239	YES	0.120	0.207	50.938	57.700	O.K.
6-3	22+16	50.600	1.25	51.600	15	1.902	35.00	0.00091	0.032	4.807	0.090	3.505	0.191	0.067	0.0	0.00	0.000	0.156	0.888	0.203	YES	0.102	0.133	51.733	57.000	O.K.
D066		51.210	1.25	52.210	15	1.014	67.00	0.00026	0.017	3.505	0.048	0.000	0.000	0.000	0.0	0.00	0.000	0.048	1.014	0.062	NO	0.062	0.079	52.289	57.530	O.K.
5-18	114+00	49.500	1.25	50.500	15	1.381	14.00	0.00048	0.007	6.095	0.144	0.000	0.000	0.000	0.0	0.00	0.000	0.144	1.381	0.187	NO	0.187	0.194	50.694	58.500	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Street
DESIGNED BY: MLR TJA
Checked:
INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
6-11																								85.000		
6-12	216+63	84.000	1.25	85.000	15	1.564	15.00	0.00061	0.009	4.810	0.090	0.000	0.000	0.000	0.0	0.00	0.000	0.090	1.564	0.117	NO	0.117	0.126	85.126	87.100	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
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INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
6-14																								86.300		
6-15	303+87	85.300	1.25	86.300	15	1.987	20.00	0.00099	0.020	7.954	0.246	0.000	0.000	0.000	0.0	0.00	0.000	0.246	1.987	0.319	NO	0.319	0.339	86.639	90.000	O.K.
6-13	303+85	80.000	1.25	81.000	15	4.675	23.00	0.00548	0.126	5.424	0.114	4.658	0.337	0.118	74.0	0.62	0.209	0.441	2.773	0.573	NO	0.573	0.699	81.699	90.000	O.K.
6-19	302+75	80.300	1.25	81.699	15	1.902	124.00	0.00091	0.112	4.658	0.084	0.000	0.000	0.000	0.0	0.00	0.000	0.084	1.902	0.109	NO	0.109	0.222	82.059	84.700	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Street
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INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
6-16																								53.800		
6-1	10+22	52.600	1.50	53.800	18	7.183	9.00	0.00489	0.044	8.669	0.292	6.412	0.638	0.223	70.0	0.60	0.385	0.900	0.000	0.900	YES	0.450	0.494	54.294	62.550	O.K.
6-8	10+77	56.400	1.50	57.600	18	5.904	53.00	0.00330	0.175	6.412	0.160	6.387	0.633	0.222	0.0	0.00	0.000	0.381	0.578	0.381	YES	0.191	0.366	57.966	64.500	O.K.
6-5	10+82	57.100	1.50	58.300	18	5.326	25.00	0.00269	0.067	6.387	0.158	8.824	1.209	0.423	60.0	0.55	0.670	1.251	1.706	1.626	YES	0.813	0.880	59.180	64.430	O.K.
6-6	301+22	57.500	1.25	59.180	15	3.620	160.00	0.00328	0.525	8.824	0.302	5.280	0.433	0.152	30.0	0.33	0.145	0.599	1.549	0.778	YES	0.389	0.914	63.960	78.500	O.K.
6-7	301+22	69.250	1.25	70.250	15	2.071	36.00	0.00107	0.039	5.280	0.108	0.000	0.000	0.000	0.0	0.00	0.000	0.108	2.071	0.141	NO	0.141	0.179	70.429	78.500	O.K.
6-4	10+42	52.900	1.25	54.294	15	1.437	20.00	0.00052	0.010	4.236	0.070	0.000	0.000	0.000	0.0	0.00	0.000	0.070	1.437	0.091	NO	0.091	0.101	54.395	56.500	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Street
DESIGNED BY: MLR TJA
Checked:
INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
7-6																								53.390		
7-3	902+43	50.800	1.50	53.390	18	6.780	4.00	0.00435	0.017	8.922	0.309	4.928	0.377	0.132	16.5	0.20	0.076	0.517	1.547	0.672	YES	0.336	0.353	53.743	58.500	O.K.
7-1	902+04	51.000	1.50	53.743	18	5.233	49.00	0.00259	0.127	4.928	0.094	9.257	1.331	0.466	77.5	0.63	0.162	0.722	0.701	0.722	YES	0.361	0.488	54.231	61.500	O.K.
6-17	117+20	51.400	1.25	54.231	15	3.312	144.00	0.00275	0.396	9.257	0.333	6.214	0.600	0.210	52.0	0.51	0.303	0.846	1.502	1.100	YES	0.550	0.946	58.416	72.000	O.K.
6-18	118+07	63.500	1.25	64.500	15	1.811	103.00	0.00082	0.085	6.214	0.150	0.000	0.000	0.000	0.0	0.00	0.000	0.150	1.811	0.195	NO	0.195	0.279	66.359	74.500	O.K.
6-20	901+92	51.000	1.25	53.390	15	0.338	11.00	0.00003	0.000	6.028	0.141	0.000	0.000	0.000	0.0	0.00	0.000	0.141	0.338	0.183	NO	0.183	0.184	53.574	55.500	O.K.
7-5	902+14	51.400	1.25	54.231	15	1.317	21.00	0.00043	0.009	4.062	0.064	0.000	0.000	0.000	0.0	0.00	0.000	0.064	1.317	0.083	NO	0.083	0.092	54.324	55.000	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Street
DESIGNED BY: MLR TJA
Checked:
INCIDENCE PROBABILITY 2 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
10-4																								56.300		
10-3	142+75	55.300	1.25	56.300	15	0.656	6.00	0.00011	0.001	5.172	0.104	0.000	0.000	0.000	0.0	0.00	0.000	0.104	0.000	0.104	NO	0.104	0.104	56.404	59.400	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
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INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
10-6																								48.150		
10-5		46.300	1.25	48.150	15	7.750	8.00	0.01505	0.120	9.155	0.325	0.000	0.000	0.000	0.0	0.00	0.000	0.325	0.000	0.325	NO	0.325	0.446	48.596	54.000	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Street
DESIGNED BY: MLR TJA
Checked:
INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
10-8																								62.000		
10-7	141+48	61.000	1.25	62.000	15	2.290	23.00	0.00131	0.030	6.382	0.158	0.000	0.000	0.000	0.0	0.00	0.000	0.158	2.290	0.206	NO	0.206	0.236	62.236	66.750	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Street
DESIGNED BY: MLR TJA
Checked:
INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
12-2																								69.800		
12-1	214+52	68.800	1.25	69.800	15	1.543	9.00	0.00060	0.005	5.753	0.128	0.000	0.000	0.000	0.0	0.00	0.000	0.128	1.543	0.167	NO	0.167	0.172	69.972	73.500	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
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INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
12-3																								70.100		
12-7		69.100	1.25	70.100	15	0.092	76.00	0.00000	0.000	3.674	0.052	3.024	0.142	0.050	0.0	0.00	0.000	0.102	0.000	0.102	YES	0.051	0.051	74.266	79.630	O.K.
12-6	215+69	74.300	1.25	75.300	15	0.092	34.00	0.00000	0.000	3.024	0.035	0.000	0.000	0.000	0.0	0.00	0.000	0.035	0.092	0.046	NO	0.046	0.046	75.676	79.590	O.K.

LD-347
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INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
12-5																								59.300		
12-4	213+18	58.300	1.25	59.300	15	0.838	29.00	0.00018	0.005	3.676	0.052	0.000	0.000	0.000	0.0	0.00	0.000	0.052	0.000	0.052	YES	0.026	0.031	59.331	63.000	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
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INCIDENCE PROBABILITY 10 Year

										JUNCTION LOSS																
INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
13-2																								78.400		
13-3	120+63	77.400	1.25	78.400	15	3.613	13.00	0.00327	0.043	7.388	0.212	4.770	0.353	0.124	40.0	0.42	0.148	0.484	0.175	0.484	NO	0.484	0.526	78.926	81.500	O.K.
13-4	140+41	77.800	1.25	78.926	15	3.438	27.00	0.00296	0.080	4.770	0.088	0.000	0.000	0.000	0.0	0.00	0.000	0.088	3.438	0.115	NO	0.115	0.195	79.121	83.500	O.K.
13-1	120+66	73.600	1.25	78.400	15	0.211	13.00	0.00001	0.000	3.424	0.046	0.000	0.000	0.000	0.0	0.00	0.000	0.046	0.211	0.059	NO	0.059	0.059	78.459	81.650	O.K.

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number___________
4. Adopted__________
5. Accepted_________________________________

REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH ● WV
Water Meter ●WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ● ●GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
STORM SEWER CALCULATIONS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2G(3)	DRAWING NO. 0-28633

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Streets
DESIGNED BY: MLR
Checked:
INCIDENCE PROBABILITY 10 Year

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
16-4																								99.490		
16-1	306+47	98.490	1.25	99.490	15	2.769	32.50	0.00192	0.062	8.844	0.304	4.371	0.297	0.104	0.0	0.00	0.000	0.407	0.766	0.530	NO	0.530	0.592	100.378	108.500	O.K.
16-9	306+50	100.300	1.25	101.300	15	2.003	11.80	0.00101	0.012	4.371	0.074	8.889	1.227	0.429	85.0	0.65	0.802	1.306	0.124	1.306	NO	1.306	1.318	102.618	108.500	O.K.
16-10	306+77	102.900	1.25	103.900	15	1.640	25.00	0.00067	0.017	8.889	0.307	9.044	1.270	0.445	0.0	0.00	0.000	0.751	0.112	0.751	NO	0.751	0.768	104.960	110.500	O.K.
16-11	307+06	104.800	1.25	105.800	15	1.528	26.20	0.00058	0.015	9.044	0.318	8.411	1.099	0.384	0.0	0.00	0.000	0.702	0.112	0.702	NO	0.702	0.717	107.144	112.000	O.K.
16-5	307+35	107.000	1.25	108.000	15	1.416	27.30	0.00050	0.014	8.411	0.275	8.023	1.000	0.350	25.0	0.29	0.288	0.912	0.197	0.912	NO	0.912	0.926	109.144	113.300	O.K.
16-12	307+61	109.000	1.25	110.000	15	1.219	29.00	0.00037	0.011	8.023	0.250	0.000	0.000	0.000	0.0	0.00	0.000	0.250	1.219	0.325	NO	0.325	0.336	111.227	116.000	O.K.
16-2	306+44	98.230	1.25	99.490	15	1.840	9.00	0.00085	0.008	12.187	0.577	5.867	0.534	0.187	35.0	0.38	0.202	0.966	1.030	1.256	NO	1.256	1.264	100.754	108.500	O.K.
16-3	306+16	99.800	1.25	100.800	15	0.810	42.60	0.00016	0.007	5.867	0.134	0.000	0.000	0.000	0.0	0.00	0.000	0.134	0.810	0.174	NO	0.174	0.181	101.712	106.200	O.K.
16-8	306+24	100.500	1.25	102.618	15	0.252	23.50	0.00002	0.000	2.413	0.023	1.924	0.057	0.020	0.0	0.00	0.000	0.043	0.125	0.056	NO	0.056	0.056	102.674	106.500	O.K.
16-7	305+94	100.800	1.00	102.674	12	0.127	27.40	0.00001	0.000	1.924	0.014	0.000	0.000	0.000	0.0	0.00	0.000	0.014	0.127	0.019	NO	0.019	0.019	102.693	104.500	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Streets
DESIGNED BY: MLR
Checked:
INCIDENCE PROBABILITY 10 Year

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
17-4																								123.200		
17-15	402+30	122.200	1.25	123.200	15	10.721	4.00	0.02879	0.115	12.890	0.645	10.667	1.767	0.618	80.0	0.64	1.130	2.394	0.000	2.394	YES	1.197	1.312	124.512	128.750	O.K.
17-5	401+88	122.500	1.25	124.512	15	10.721	44.00	0.02879	1.267	10.667	0.442	10.621	1.752	0.613	5.0	0.07	0.122	1.177	3.496	1.530	YES	0.765	2.032	126.544	128.640	O.K.
17-14	401+50	124.000	1.25	126.544	15	7.225	39.40	0.01308	0.515	10.621	0.438	7.327	0.834	0.292	5.0	0.07	0.058	0.788	4.957	1.024	YES	0.512	1.027	127.571	130.500	O.K.
17-21	401+06	125.600	1.25	127.571	15	2.268	43.50	0.00129	0.056	7.327	0.208	0.000	0.000	0.000	0.0	0.00	0.000	0.208	2.268	0.271	NO	0.271	0.327	127.898	137.100	O.K.

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Checked:
INCIDENCE PROBABILITY 10 Year

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
17-6																								125.500		
17-8	310+42	124.500	1.25	125.500	15	5.671	15.40	0.00806	0.124	9.425	0.345	0.000	0.000	0.000	0.0	0.00	0.000	0.345	5.671	0.448	NO	0.448	0.572	126.072	131.500	O.K.
17-7	310+35	120.500	1.25	125.500	15	2.762	26.90	0.00191	0.051	8.159	0.258	0.000	0.000	0.000	0.0	0.00	0.000	0.258	2.762	0.336	NO	0.336	0.387	125.887	131.500	O.K.

LD-347
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INCIDENCE PROBABILITY 10 Year

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
17-18																								118.2/111.7		
17-1	308.47	110.700	1.25	111.700	15	5.106	21.80	0.00653	0.142	8.059	0.252	11.980	2.229	0.780	60.0	0.55	1.234	2.266	0.254	2.266	YES	1.133	1.276	112.976	123.750	O.K.
17-3	308+91	119.000	1.25	120.000	15	4.805	46.90	0.00578	0.271	11.980	0.557	0.000	0.000	0.000	0.0	0.00	0.000	0.557	4.805	0.724	NO	0.724	0.996	122.753	126.000	O.K.
17-2	308+51	117.000	1.50	118.200	18	9.815	23.00	0.00913	0.210	11.590	0.521	10.970	1.869	0.654	30.0	0.33	0.626	1.801	0.000	1.801	YES	0.901	1.110	119.310	123.800	O.K.
17-19	308+64	118.000	1.50	119.310	18	9.815	29.60	0.00913	0.270	10.970	0.467	6.776	0.713	0.250	56.0	0.53	0.378	1.095	0.467	1.095	YES	0.548	0.818	120.128	126.500	O.K.
17-16	404+05	120.000	1.50	121.200	18	9.348	98.00	0.00828	0.811	6.776	0.178	7.215	0.808	0.283	41.0	0.43	0.346	0.807	0.000	0.807	YES	0.403	1.215	122.415	128.250	O.K.
17-10	404+40	124.000	1.50	125.200	18	7.622	30.40	0.00550	0.167	7.215	0.202	3.968	0.244	0.086	28.0	0.32	0.077	0.365	6.638	0.474	YES	0.237	0.405	125.605	132.000	O.K.
17-17	405+73	124.500	1.25	125.605	15	0.902	124.30	0.00020	0.025	3.968	0.061	0.000	0.000	0.000	0.0	0.00	0.000	0.061	0.902	0.079	NO	0.079	0.105	126.301	137.100	O.K.
16-6	307+91	111.300	1.25	112.976	15	0.070	56.00	0.00000	0.000	1.681	0.011	0.000	0.000	0.000	0.0	0.00	0.000	0.011	0.070	0.014	NO	0.014	0.014	112.990	117.300	O.K.
17-11	403+91	122.750	1.25	123.750	15	1.775	24.33	0.00079	0.019	3.769	0.055	0.000	0.000	0.000	0.0	0.00	0.000	0.055	1.775	0.072	NO	0.072	0.091	123.841	134.750	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Streets
DESIGNED BY: MLR
Checked:
INCIDENCE PROBABILITY 10 Year

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
17-20																								126.900		
17-9	404+02	125.900	1.25	126.900	15	2.938	7.00	0.00216	0.015	5.864	0.133	0.000	0.000	0.000	0.0	0.00	0.000	0.133	2.938	0.174	NO	0.174	0.189	127.089	130.500	O.K.

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INCIDENCE PROBABILITY 10 Year

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
18-4																								128.280		
18-2	410+00	127.280	1.25	128.280	15	2.300	45.90	0.00133	0.061	4.123	0.066	0.000	0.000	0.000	0.0	0.00	0.000	0.066	0.000	0.066	NO	0.066	0.127	128.407	135.500	O.K.
18-5	410+05	130.000	1.25	131.000	15	2.332	11.20	0.00136	0.015	8.304	0.268	0.000	0.000	0.000	0.0	0.00	0.000	0.268	2.332	0.348	NO	0.348	0.363	131.363	135.500	O.K.

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INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
18-8																								129.500		
18-7	804+50	123.680	1.25	129.500	15	2.268	20.10	0.00129	0.026	8.562	0.285	0.000	0.000	0.000	0.0	0.00	0.000	0.285	2.268	0.370	NO	0.370	0.396	129.896	135.000	O.K.
18-6	804+44	128.500	1.25	129.500	15	1.219	20.70	0.00037	0.008	5.536	0.119	0.000	0.000	0.000	0.0	0.00	0.000	0.119	1.219	0.155	NO	0.155	0.162	129.662	135.500	O.K.

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HYDRAULIC GRADE LINE ANALYSIS
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INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
18-10																								126.000		
18-9	801+85	124.500	1.25	126.000	15	2.220	42.50	0.00123	0.052	7.346	0.209	3.862	0.232	0.081	95.0	0.67	0.156	0.446	0.608	0.580	NO	0.580	0.633	126.633	132.200	O.K.
18-11	801+79	126.000	1.25	127.000	15	1.612	56.40	0.00065	0.037	3.862	0.058	4.279	0.284	0.100	90.0	0.70	0.199	0.356	0.175	0.356	NO	0.356	0.393	127.393	131.500	O.K.
18-17	802+20	126.500	1.25	127.500	15	1.437	38.90	0.00052	0.020	4.279	0.071	0.000	0.000	0.000	0.0	0.00	0.000	0.071	1.437	0.092	NO	0.092	0.113	127.613	132.000	O.K.
18-16	802+23	125.000	1.25	126.000	15	0.613	5.60	0.00009	0.001	7.160	0.199	0.000	0.000	0.000	0.0	0.00	0.000	0.199	0.613	0.259	NO	0.259	0.259	126.259	132.400	O.K.

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INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
18-13																								128.500		
18-12	412+17	127.500	1.25	128.500	15	0.282	5.60	0.00002	0.000	5.674	0.125	0.000	0.000	0.000	0.0	0.00	0.000	0.125	0.282	0.162	NO	0.162	0.163	128.663	132.400	O.K.

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INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
18-15																								126.000		
18-14	412+66	125.000	1.25	126.000	15	2.374	41.50	0.00141	0.059	5.205	0.105	0.000	0.000	0.000	0.0	0.00	0.000	0.105	2.374	0.137	NO	0.137	0.195	126.195	131.500	O.K.

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HYDRAULIC GRADE LINE ANALYSIS
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INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
19-4																								123.000		
19-3	414+22	122.000	1.25	123.000	15	2.431	28.50	0.00148	0.042	8.912	0.308	0.000	0.000	0.000	0.0	0.00	0.000	0.308	2.431	0.401	NO	0.401	0.443	123.842	128.750	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
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INCIDENCE PROBABILITY 10 Year

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
S011																								43.950		
7-4	317+00	42.750	1.50	43.950	18	5.503	10.00	0.00287	0.029	4.602	0.082	4.686	0.341	0.119	0.0	0.00	0.000	0.202	0.446	0.202	NO	0.202	0.230	44.180	52.000	O.K.
D021	317+00	42.800	1.50	44.180	18	5.057	42.00	0.00242	0.102	4.686	0.085	5.651	0.496	0.174	79.0	0.64	0.316	0.574	1.091	0.747	NO	0.747	0.849	45.029	52.000	O.K.
7-2	903+52	46.500	1.25	47.500	15	3.966	47.30	0.00394	0.186	5.651	0.124	0.000	0.000	0.000	0.0	0.00	0.000	0.124	3.966	0.161	NO	0.161	0.348	47.848	53.800	O.K.

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INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
D004																								46.1/50.3		
10-1	144+22	49.300	1.25	50.300	15	0.859	25.00	0.00018	0.005	3.903	0.059	0.000	0.000	0.000	0.0	0.00	0.000	0.059	0.859	0.077	NO	0.077	0.081	50.381	53.500	O.K.
10-6		45.100	1.25	46.100	15	4.310	34.00	0.00465	0.158	6.003	0.140	9.155	1.301	0.456	0.0	0.00	0.000	0.595	0.000	0.595	NO	0.595	0.754	46.854	54.000	O.K.

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INCIDENCE PROBABILITY 10 Year

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
D014																								49.500		
10-2	925+08	48.500	1.25	49.500	15	0.113	12.00	0.00000	0.000	3.312	0.043	0.000	0.000	0.000	0.0	0.00	0.000	0.043	0.113	0.055	NO	0.055	0.055	49.555	53.400	O.K.

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INCIDENCE PROBABILITY 10 Year

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
D111																								28.370		
4-24		27.370	1.25	28.370	15	0.610	13.00	0.00009	0.001	4.051	0.064	6.617	0.680	0.238	90.0	0.70	0.476	0.778	0.000	0.778	NO	0.778	0.779	29.149	31.640	O.K.

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INCIDENCE PROBABILITY 10 Year

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
D116																								31.450		
4-10	505+40	30.450	1.00	31.450	12	1.402	7.00	0.00078	0.005	11.646	0.527	0.000	0.000	0.000	0.0	0.00	0.000	0.527	1.402	0.684	NO	0.684	0.690	32.140	36.000	O.K.

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INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
S009																								58.500		
6-9	11+19	57.500	1.25	58.500	15	0.479	40.00	0.00006	0.002	4.261	0.070	0.000	0.000	0.000	0.0	0.00	0.000	0.070	0.479	0.092	NO	0.092	0.094	58.684	65.500	O.K.

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Checked:
INCIDENCE PROBABILITY 10 Year

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
S010																								48.500		
7-7		47.500	1.25	48.500	15	2.910	5.00	0.00212	0.011	8.502	0.281	8.502	1.122	0.393	0.0	0.00	0.000	0.673	0.000	0.673	NO	0.673	0.684	49.184	57.600	O.K.
7-6		47.800	1.25	49.184	15	2.910	5.00	0.00212	0.011	8.502	0.281	8.922	1.236	0.433	90.0	0.70	0.395	1.108	0.000	1.108	NO	1.108	1.119	50.303	52.800	O.K.

LD-347
HYDRAULIC GRADE LINE ANALYSIS
PROJECT: Shockoe Streets
DESIGNED BY: MLR
Checked:
INCIDENCE PROBABILITY 10 Year

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
S106																								124.500		
18-3	410+54	123.500	1.25	124.500	15	1.332	92.50	0.00044	0.041	4.264	0.071	0.000	0.000	0.000	0.0	0.00	0.000	0.071	1.332	0.092	NO	0.092	0.133	124.877	135.000	O.K.

APPENDIX 7 B-1. LD-268S Roadside and Median Ditch Design Form

PROJECT: Shockoe Street
LOCATION: Richmond City
ROAD: Venable
COUNTY: Richmond (city)
NOAA STATION: Richmond WB City
COMMENTS:

UNITS: ENGLISH
DESIGNER: MLR
DATE: 9/6/2022
CHECKED:

Ditch Number	Section Number	From Station	To Station	Width of Strip (Ft)	Drainage Area(Ac)	C	CA	ΣCA	Tc (Min.)	Section Shape	Section Height (Ft)	Section Length (Ft)	Bottom of Section Elev. (U/S)	Bottom of Section Elev. (D/S)	Section Long. Slope (Ft/Ft)	Rainfall Intensity I-2 (In/Hr)	Discharge Q-2 (CFS)	Shear 2-Yr (lb/st)	Velocity 2-Yr (FPS)	Flow Depth - 2-Yr (In)	Rainfall Intensity I-10 (In/Hr)	Discharge Q-10 (CMS)	Shear 10-Yr (lb/st)	Velocity 10-Yr (FPS)	Flow Depth - 10-Yr (In)	PROTECTIVE LINING PROVIDED	REMARKS
1	1	0	161		0.25	0.35	0.09																				
								0.09	5.00	V	1.50	161.00	99.00	86.50	0.078	5.38	0.48	1.40	1.90	0.29	7.05	0.63	1.55	2.05	0.32	Vegetated Lining	FREEBOARD O.K.
	2	161	265		0.52	0.35	0.18																				
								0.27	5.91	V	1.50	104.00	86.50	84.70	0.017	5.14	1.39	0.68	1.17	0.63	6.75	1.83	0.76	1.24	0.70	Vegetated Lining	FREEBOARD O.K.

70% SUBMITTAL
SEPTEMBER 2022
THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number___________
4. Adopted_________
5. Accepted_________

REFERENCES
REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical
Surveys Superintendent
Project Manager
Maintenance Engineer
City Traffic Engineer

Administrative
Capital Project Administrator
City Engineer
Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
STORM SEWER CALCULATIONS

AUTHORITY: CITY OF RICHMOND, DPW
DESIGN BY: DBeale
DRAWN BY: JAlexander
CHECKED BY: ASamberg
REVIEWED BY:
FIELD NOTES
SCALE
DATE SEPTEMBER 2022
PROJECT
SHEET 2G(4)
DRAWING NO. 0-28633

STR. 4–9
DA = 0.11 AC
C = 0.90

STR. 3–1
DA = 0.27 AC
C = 0.90

STR. 4–19
DA = 0.11 AC
C = 0.90

STR. 4–20
DA = 0.19 AC
C = 0.90

STR. 4–18
DA = 0.12 AC
C = 0.89

STR. 4–17
DA = 0.37 AC
C = 0.86

STR. 5–20
DA = 0.06 AC
C = 0.86

STR. 5–7
DA = 0.34 AC
C = 0.84

STR. 4–1
DA = 0.16 AC
C = 0.90

MATCH LINE - SEE SHEET 2H(2)

STR. 4–5
DA = 0.39 AC
C = 0.79

STR. 4–13
DA = 0.52 AC
C = 0.87

STR. 5–5
DA = 0.37 AC
C = 0.86

STR. 5–9
DA = 0.41 AC
C = 0.84

STR. 4–2 (FX D110)
DA = 0.53 AC
C = 0.75

STR. 4–11
DA = 0.08 AC
C = 0.90

STR. 5–4
DA = 0.10 AC
C = 0.90

STR. 4–10
DA = 0.23 AC
C = 0.85

STR. 4–3
DA = 0.54 AC
C = 0.89

STR. 5–2
DA = 0.13 AC
C = 0.90

STR. 4–26
DA = 0.25 AC
C = 0.90

E. BROAD STREET

E. CLAY STREET

MARSHALL STREET

N. 18TH STREET

OLIVER HILL WAY

PROPOSED DETENTION 5'x4' BOX

PROPOSED DETENTION 5'x5'BOX

PROPOSED DETENTION 5'x4' BOX

TRANS. PAD

40 0 40 80
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓢ or Ⓢ
Fire Hydrant / Valve FH ◇ ◦WV

Water Meter ◦WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ◦ ◦GV
Fence
Power/Light Pole PP ☼ LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

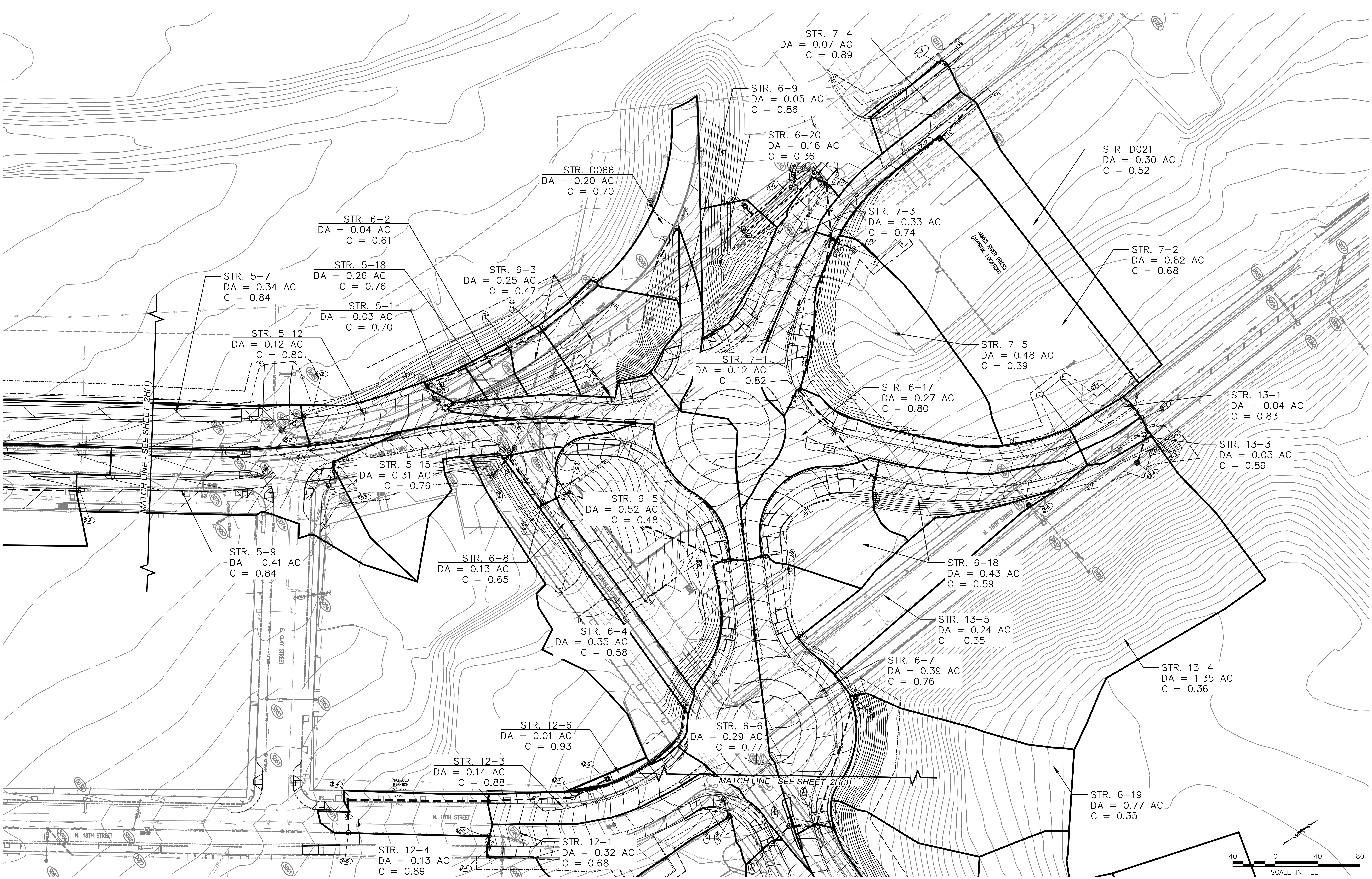
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
DRAINAGE AREA MAP

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE 1"=40'	DATE SEPTEMBER 2022	PROJECT SHEET 2H(1)	DRAWING NO. 0-28633



70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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2. Property owners correct as of ________, 20__
3. Ordinance Number__________
4. Adopted__________
5. Accepted______________________________

REFERENCES

REVISIONS

Existing Legend	
Storm Sewer	
Sanitary Sewer (Gravity)	
Gas Line	
Electric Line	
Overhead Utility	
Telephone/Telegraph	
Water Line	
Property Line	
Storm Basin	
Storm or Sanitary Manhole	(D) or (S)
Fire Hydrant / Valve	FH WV
Water Meter	WM
Existing Curb Cut Ramp	HCR
Gas Meter / Valve	GM GV
Fence	
Power/Light Pole	PP LP
Guy Anchor	
Tree	

Proposed Legend	
Sanitary Sewer	
Storm Sewer	
Storm/(San) Manhole	SDMH (SMH)
Basin	
Curb Cut Ramp	
Decorative Light	
Conduit	
Conduit (Encased)	

CITY OF RICHMOND
ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
DRAINAGE AREA MAP

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
			1"=40'	SEPTEMBER 2022	SHEET 2H(2)	0-28633

STR. 17–10
DA= 1.27 AC
C = 0.76

STR. 17–12
DA = 0.28 AC
C = 0.60

STR. 17–11
DA = 0.40 AC
C = 0.63

STR. 17–9
DA = 0.71 AC
C = 0.59

STR. 13–5
DA = 0.24 AC
C = 0.35

STR. 16–3
DA = 0.33 AC
C = 0.35

MATCH LINE - SEE SHEET 2H(4)

STR. 6–19
DA = 0.77 AC
C = 0.35

STR. 17–19
DA= 0.08 AC
C = 0.90

STR. 17–8
DA = 1.12 AC
C = 0.72

STR. 16–2
DA =0.20 AC
C = 0.74

STR. 17–2
DA = 0.44 AC
C = 0.78

STR. 16–1
DA = 0.14 AC
C = 0.78

STR. 6–13
DA = 0.83 AC
C = 0.49

STR. 17–1
DA = 0.05 AC
C = 0.76

STR. 17–7
DA = 0.49 AC
C = 0.79

MATCH LINE - SEE SHEET 2H(2)

STR. 6–15
DA = 0.40 AC
C = 0.70

STR. 16–6
DA = 0.03 AC
C = 0.38

STR. 17–5
DA = 0.92 AC
C = 0.55

STR. 16–7
DA = 0.03 AC
C = 0.64

STR. 16–8
DA = 0.03 AC
C = 0.64

STR. 16–5
DA = 0.05 AC
C = 0.55

STR. 16–9
DA = 0.03 AC
C = 0.64

STR. 16–12
DA = 0.32 AC
C = 0.54

STR. 16–10
DA = 0.03 AC
C = 0.62

STR. 16–11
DA = 0.03 AC
C = 0.62

STR. 17–14
DA = 1.22 AC
C = 0.58

STR. 12–1
DA = 0.32 AC
C = 0.68

STR. D152
DA = 1.11 AC
C = 0.44

STR. 6–12
DA = 0.42 AC
C = 0.53

STR. 17–3
DA = 0.81 AC
C = 0.84

STR. 17–21
DA = 0.37 AC
C = 0.87

40 0 40 80
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH WV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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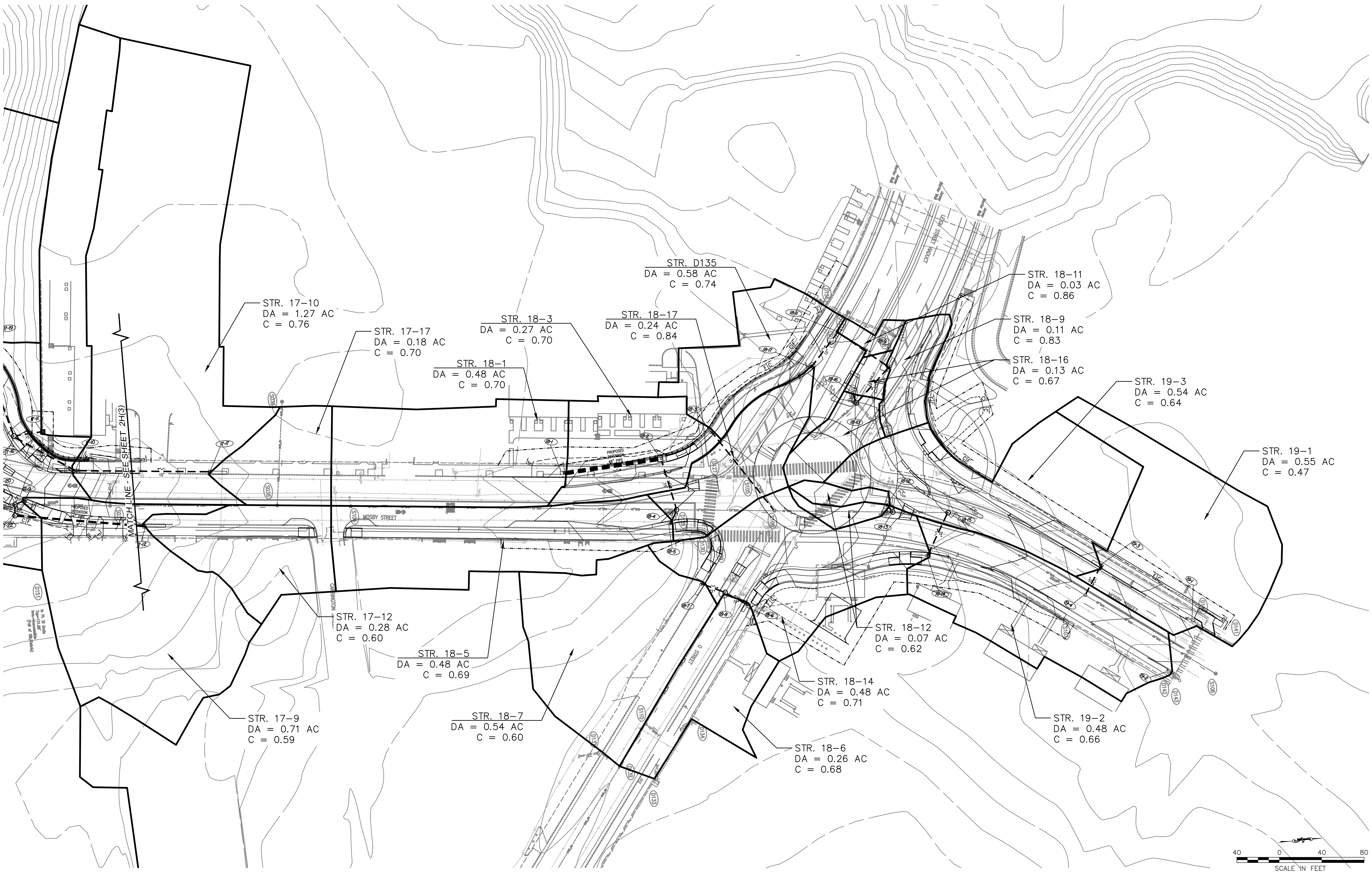
SHOCKOE VALLEY STREET IMPROVEMENTS
DRAINAGE AREA MAP

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE 1"=40'	DATE SEPTEMBER 2022	PROJECT SHEET 2H(3)	DRAWING NO. 0-28633



70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number__________
4. Adopted__________
5. Accepted______________________________

REFERENCES

REVISIONS

Existing Legend	
Storm Sewer	
Sanitary Sewer (Gravity)	
Gas Line	
Electric Line	
Overhead Utility	
Telephone/Telegraph	
Water Line	
Property Line	
Storm Basin	
Storm or Sanitary Manhole	(D) or (S)
Fire Hydrant / Valve	FH WV
Water Meter	WM
Existing Curb Cut Ramp	HCR
Gas Meter / Valve	GM GV
Fence	
Power/Light Pole	PP LP
Guy Anchor	
Tree	

Proposed Legend	
Sanitary Sewer	
Storm Sewer	
Storm/(San) Manhole	SDMH (SMH)
Basin	
Curb Cut Ramp	
Decorative Light	
Conduit	
Conduit (Encased)	

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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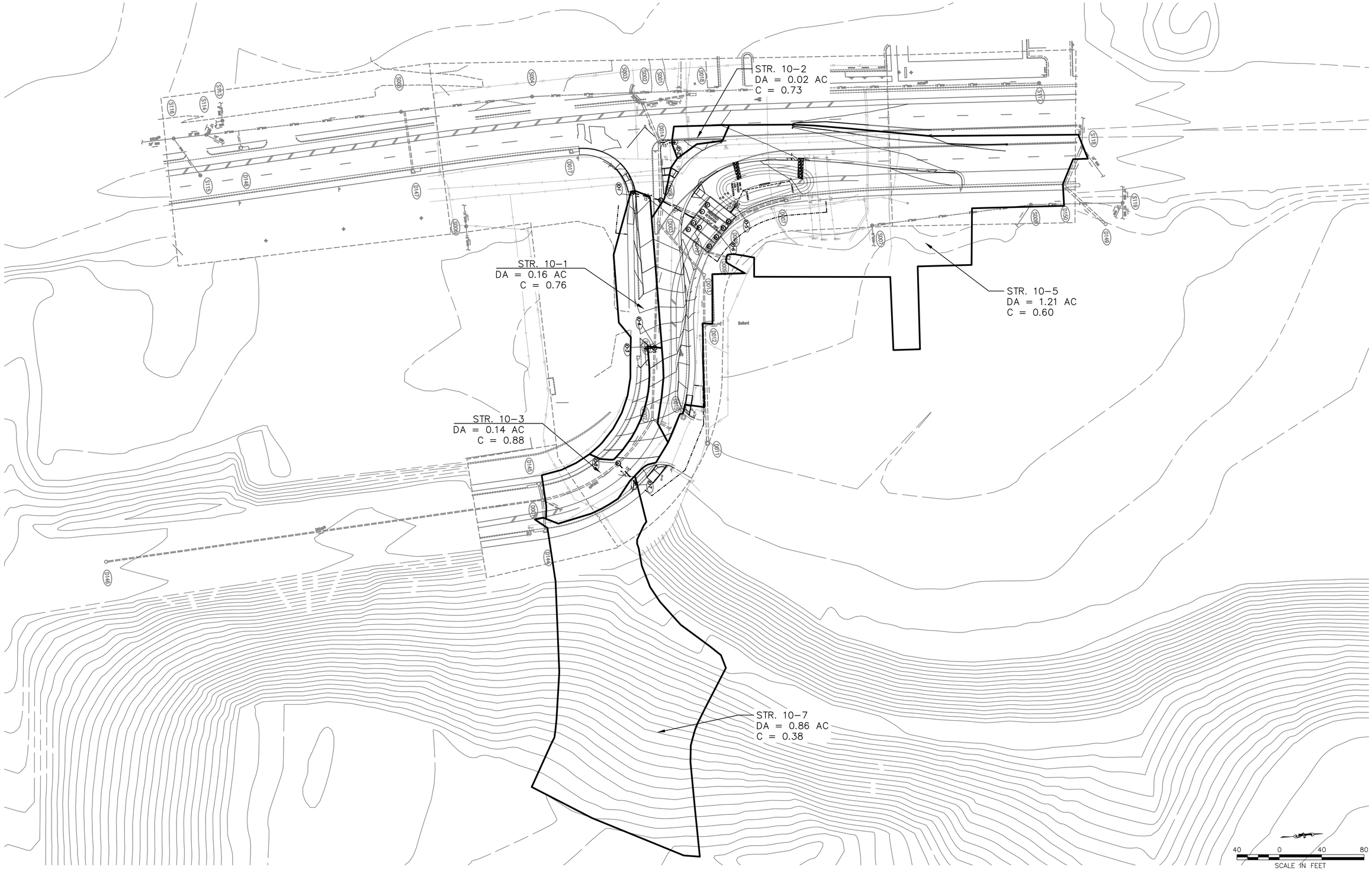
SHOCKOE VALLEY STREET IMPROVEMENTS
DRAINAGE AREA MAP

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
			1"=40'	SEPTEMBER 2022	SHEET 2H(4)	0-28633



70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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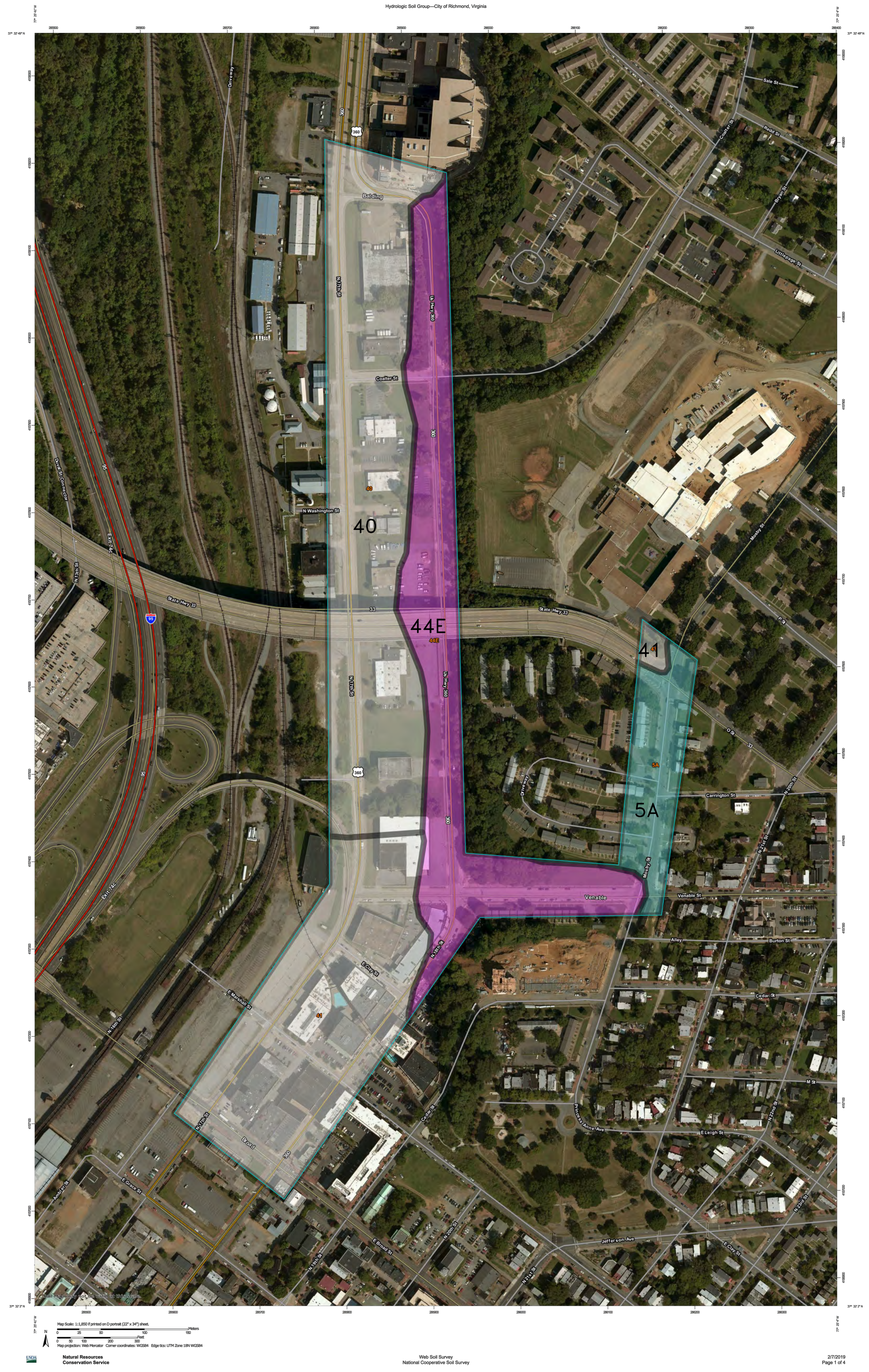
SHOCKOE VALLEY STREET IMPROVEMENTS
DRAINAGE AREA MAP

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE 1"=40'	DATE SEPTEMBER 2022	PROJECT SHEET 2H(5)	DRAWING NO. 0-28633



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: City of Richmond, Virginia
Survey Area Data: Version 14, Aug 29, 2018

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

Date(s) aerial images were photographed: Jul 25, 2010—Oct 1, 2013

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
5A	Atlee-Urban land complex, 0 to 4 percent slopes	C	4.2	7.8%
40	Udorthents-Dumps complex, pits		19.4	36.5%
41	Urban land		15.4	28.9%
44E	Wateree-Wedowee complex, 20 to 45 percent slopes	A	14.2	26.8%
Totals for Area of Interest			**53.2**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
- Storm Sewer
- Sanitary Sewer (Gravity)
- Gas Line
- Electric Line
- Overhead Utility
- Telephone/Telegraph
- Water Line
- Property Line
- Storm Basin
- Storm or Sanitary Manhole (D or S)
- Fire Hydrant / Valve (FH, WV)
- Water Meter (WM)
- Existing Curb Cut Ramp (HCR)
- Gas Meter / Valve (GM, GV)
- Fence
- Power/Light Pole (PP, LP)
- Guy Anchor
- Tree

Proposed Legend
- Sanitary Sewer
- Storm Sewer
- Storm/(San) Manhole (SDMH, (SMH))
- Basin
- Curb Cut Ramp
- Decorative Light
- Conduit
- Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

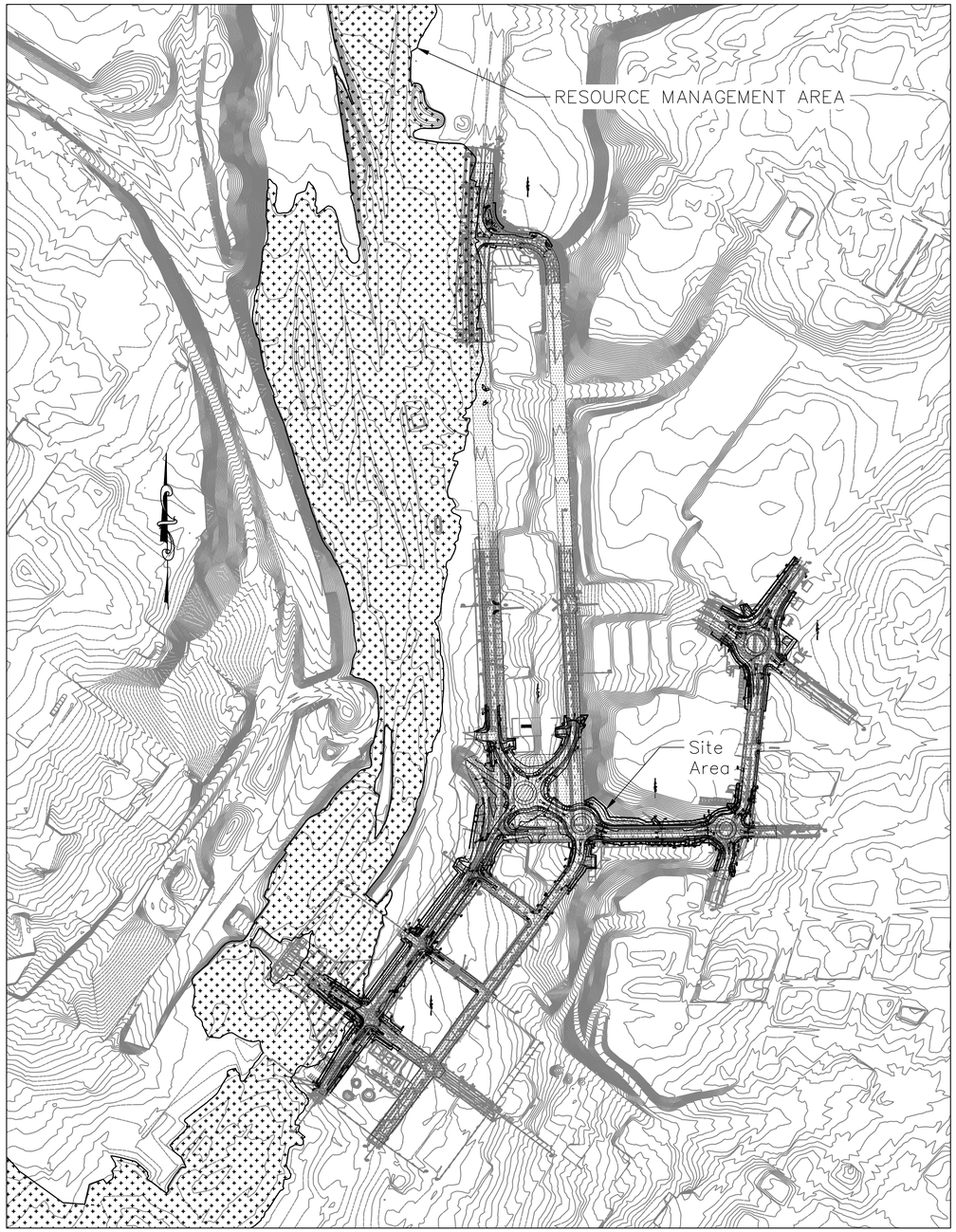
RK&K Responsive People -Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
CBPA/WATER QUALITY IMPACT ASSESSMENT

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE NO SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2J(1)	DRAWING NO. 0-28633

CHESAPEAKE BAY PRESERVATION AREA MAP



WATER QUALITY IMPACT ASSESSMENT

WQIA CHECKLIST:

1. THERE ARE NO DESIGNATED WETLAND AREAS OR IMPACTS WITHIN THE PROJECT LIMITS.

2. THERE WILL BE NO DISRUPTION IN SUPPLY OF WATER TO WETLANDS.

3. THIS PROJECT WILL NOT DISRUPT THE EXISTING HYDROLOGY.

4. THERE WILL BE NO DREDGING MATERIAL ASSOCIATED WITH THIS PROJECT.

5. THERE WILL BE NO IMPACTS ON SHELLFISH BEDS, SUBMERGED AQUATIC VEGETATION, OR FISH SPAWNING AREAS.

6. ROADWAY PROFILES WERE DESIGNED TO MINIMIZE OFFSITE CUT/FILL IMPACTS. WHERE PROFILE ADJUSTMENTS WERE UNABLE TO PREVENT LARGE CUT/FILL SLOPES, RETAINING WALLS WILL BE USED WHEN REASONABLE.

SEE PLANS FOR DEPICTION OF DESIGN AND E&S MEASURES USED TO MINIMIZE HYDROLOGICAL IMPACTS.

WQIA: HYDROLOGICAL ELEMENT

TOPOGRAPHY:
THE EXISTING TOPOGRAPHY ON SITE CONSISTS OF DEVELOPED URBAN STREETS. THE STREETS AND ADJACENT PROPERTIES RANGE FROM ROLLING TERRAIN WITH SOME FLAT AREAS TO STEEP SLOPES. THE EXISTING URBAN DRAINAGE SYSTEM PRIMARILY DRAINS TO AN EXISTING COMBINED SEWER SYSTEM.

HYDROLOGY:
SURFACE RUNOFF IN THE AREA IS CONVEYED BY A SYSTEM OF STORM DRAINS AND COMBINED SEWER SYSTEMS,

SOILS AND GEOLOGY:
THE SITE AREA IS COMPRISED OF:

- APPLING-WEDOWEE-URBAN LAND COMPLEX, 0 TO 4% SLOPES
- WATEREE-WEDOWEE COMPLEX, 20 TO 45% SLOPES
- UDORTHENTS-DUMPS COMPLEX, PITS
- URBAN LAND

PROPOSED DEVELOPMENT IMPACTS:
THE PROJECT IS LOCATED IN THE CITY OF RICHMOND. THIS PROJECT CONSISTS OF ROADWAY IMPROVEMENTS IN THE SHOCKOE BOTTOM AREA OF THE CITY ALONG OLIVER HILL WAY, E. BROAD STREET, VENABLE STREET, 18TH STREET AND MOSBY STREET. THE IMPROVEMENTS INCLUDE WIDENING, THE ADDITION OF BIKE LANES AND PARKING SPACES ALONG THE SIDE OF THE ROAD, AND FOUR ROUNDABOUTS TO IMPROVE TRAFFIC FLOW. THE PROPOSED DRAINAGE SYSTEM OUTFALLS TO THE EXISTING COMBINED SEWER SYSTEM. FLOWS INTO THE EXISTING SYSTEM WERE ANALYZED TO ASSURE THAT PROPOSED FLOWS REMAIN EQUAL OR LESS THAN EXISTING FLOWS.

Project Name: Shockoe Valley Street Improvements RMA Area
Date: 9/22/2022
Linear Development Project? Yes

CLEAR ALL (Ctrl+Shift+R)

data input cells | constant values | calculation cells | final results

Site Information

Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area *(acres)* → 1.60

Maximum reduction required:	*20%*
The site's net increase in impervious cover (acres) is:	*0*
Post-Development TP Load Reduction for Site (lb/yr):	*0.67*

Check:
BMP Design Specifications List: 2011 Stds & Specs
Linear project? Yes
Land cover areas entered correctly? ✓
Total disturbed area entered? ✓

Pre-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) – undisturbed forest/open space					0.00
Managed Turf (acres) – disturbed, graded for yards or other turf to be				0.08	0.08
Impervious Cover (acres)				1.52	1.52
					1.60

Post-Development Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) – undisturbed, protected forest/open space or reforested					0.00
Managed Turf (acres) – disturbed, graded for yards or other turf to be				0.08	0.08
Impervious Cover (acres)				1.52	1.52
Area Check	OK.	OK.	OK.	OK.	1.60

Constants

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

Runoff Coefficients (Rv)

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

LAND COVER SUMMARY -- PRE-REDEVELOPMENT

Land Cover Summary-Pre		
Pre-ReDevelopment	**Listed**	**Adjusted[1]**
Forest/Open Space Cover (acres)	0.00	0.00
Weighted Rv(forest)	0.00	0.00
% Forest	0%	0%
Managed Turf Cover (acres)	0.08	0.08
Weighted Rv(turf)	0.25	0.25
% Managed Turf	5%	5%
Impervious Cover (acres)	1.52	1.52
Rv(impervious)	0.95	0.95
% Impervious	95%	95%
Total Site Area (acres)	**1.60**	**1.60**
Site Rv	**0.92**	**0.92**

Treatment Volume and Nutrient Load

Pre-ReDevelopment Treatment Volume (acre-ft)	0.1220	0.1220
Pre-ReDevelopment Treatment Volume (cubic feet)	5,314	5,314
Pre-ReDevelopment TP Load (lb/yr)	**3.34**	**3.34**
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	2.09	2.09
Baseline TP Load (lb/yr) (0.41 lbs/acre/yr applied to pre-redevelopment area excluding pervious land proposed for new impervious cover)		0.66

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary-Post (Final)	
Post-ReDev. & New Impervious	
Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	0.08
Weighted Rv (turf)	0.25
% Managed Turf	5%
Impervious Cover (acres)	1.52
Rv(impervious)	0.95
% Impervious	95%
Final Site Area (acres)	**1.60**
Final Post Dev Site Rv	**0.92**

Land Cover Summary-Post	
Post-ReDevelopment	
Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	0.08
Weighted Rv (turf)	0.25
% Managed Turf	5%
ReDev. Impervious Cover (acres)	1.52
Rv(impervious)	0.95
% Impervious	95%
Total ReDev. Site Area (acres)	**1.60**
ReDev Site Rv	**0.92**

Land Cover Summary-Post	
Post-Development New Impervious	
New Impervious Cover (acres)	0.00
Rv(impervious)	--

Treatment Volume and Nutrient Load

Final Post-Development Treatment Volume (acre-ft)	0.1220	**Post-ReDevelopment Treatment Volume (acre-ft)**	0.1220	**Post-Development Treatment Volume (acre-ft)**	--
Final Post-Development Treatment Volume (cubic feet)	5,314	**Post-ReDevelopment Treatment Volume (cubic feet)**	5,314	**Post-Development Treatment Volume (cubic feet)**	--
Final Post-Development TP Load (lb/yr)	**3.34**	**Post-ReDevelopment Load (TP) (lb/yr)***	**3.34**	**Post-Development TP Load (lb/yr)**	--
Final Post-Development TP Load per acre (lb/acre/yr)	2.09	Post-ReDevelopment TP Load per acre (lb/acre/yr)	2.09		
		Max. Reduction Required (Below Pre-ReDevelopment Load)	**20%**		
		TP Load Reduction Required for Redeveloped Area (lb/yr)	**0.67**	**TP Load Reduction Required for New Impervious Area (lb/yr)**	**0**

[1] *Adjusted Land Cover Summary: Pre-ReDevelopment land cover minus pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover.*

Adjusted total acreage is consistent with Post-ReDevelopment acreage (minus acreage of new impervious cover).

Column I shows load reduction requirement for new impervious cover (based on new development load limit, 0.41 lbs/acre/year).

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	**0.67**
Linear Project TP Load Reduction Required (lb/yr):	**0.67**

Nitrogen Loads (Informational Purposes Only)

Pre-ReDevelopment TN Load (lb/yr)	23.89	Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr)	23.89

CHESAPEAKE BAY DRAINAGE NARRATIVE

BACKGROUND:
THE PROJECT IS LOCATED IN THE CITY OF RICHMOND. THIS PROJECT CONSISTS OF ROADWAY IMPROVEMENTS IN THE SHOCKOE BOTTOM AREA OF THE CITY ALONG OLIVER HILL WAY, E. BROAD STREET, VENABLE STREET, 18TH STREET AND MOSBY STREET. THE IMPROVEMENTS INCLUDE WIDENING, THE ADDITION OF BIKE LANES AND PARKING SPACES ALONG THE SIDE OF THE ROAD, AND FOUR ROUNDABOUTS TO IMPROVE TRAFFIC FLOW.

WATER QUALITY:
THE MAJORITY OF THE PROJECT DRAINS TO AN EXISTING COMBINED SEWER SYSTEM AND FLOWS TO A WASTEWATER TREATMENT PLANT. THIS PART OF THE PROJECT IS EXCLUDED FROM WATER QUALITY REQUIREMENTS. A SMALLER PORTION OF THE PROJECT IS LOCATED WITHIN THE CBPA RMA AND IS SUBJECT TO WATER QUALITY REQUIREMENTS. NUTRIENT CREDIT REQUIREMENTS FOR THIS PORTION OF THE PROJECT ARE PROVIDED BY ONSITE BMP TREATMENT.

A LEVEL 1 BIORETENTION FACILITY IS PROPOSED AT THE INTERSECTION OF OLIVER HILL WAY AND BALDING STREET. THIS FACILITY IS DESIGNED TO TREAT 0.75 AC AND PROVIDE 0.65 LB/YR OF PHOSPHORUS TREATMENT FOR THE PROJECT. THE FULL DA TO THIS FACILITY IS 1.21 AC (0.75 AC LIES WITHIN THE ROW) AND THE FACILITY IS DESIGNED TO HANDLE THE 10 YEAR STORM EVENT FROM THE FULL DRAINAGE AREA.

WATER QUANTITY:
THE EXISTING SURFACE RUNOFF IN THE AREA IS CONVEYED BY AN URBAN DRAINAGE SYSTEM TO A COMBINED SEWER SYSTEM.

THE PROPOSED SURFACE RUNOFF IN THE AREA IS CONVEYED BY A PROPOSED STORM SEWER SYSTEM WHICH DRAINS TO THE EXISTING COMBINED SEWER SYSTEM. QUANTITY CHECKS WERE DONE ALONG THE SYSTEM TO MAKE SURE THAT APPROPRIATE DETENTION WAS PROVIDED TO ENSURE THAT PROPOSED FLOW TO THE CSS DID NOT INCREASE FROM EXISTING CONDITIONS.

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole (SDMH, (SMH))
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
CBPA/WATER QUALITY ASSESSMENT

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2J(2)	DRAWING NO. 0-28633

Drainage Area A

Drainage Area A Land Cover (acres) *Check Site Tab land cover areas!*

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)				0.65	0.65	0.25
Impervious Cover (acres)				0.56	0.56	0.95
Total					1.21	

CLEAR BMP AREAS

Total Phosphorus Available for Removal in D.A. A (lb/yr): 1.58
Post Development Treatment Volume in D.A. A (ft³): 2,521

Stormwater Best Management Practices (RR = Runoff Reduction)

--Select from dropdown lists--

Practice	Runoff Reduction Credit (%)	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	Volume from Upstream Practice (ft³)	Runoff Reduction (ft³)	Remaining Runoff Volume (ft³)	Total BMP Treatment Volume (ft³)	Phosphorus Removal Efficiency (%)	Phosphorus Load from Upstream Practices (lb)	Untreated Phosphorus Load to Practice (lb)	Phosphorus Removed By Practice (lb)	Remaining Phosphorus Load (lb)	Downstream Practice to be Employed
1. Vegetated Roof (RR)													
1.a. Vegetated Roof #1 (Spec #6)	45				0	0	0	0		0.00	0.00	0.00	
1.b. Vegetated Roof #2 (Spec #6)	60				0	0	0	0		0.00	0.00	0.00	
2. Rooftop Disconnection (RR)													
2.a. Simple Disconnection to A/B Soils (Spec #2)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.b. Simple Disconnection to C/D Soils (Spec #2)	28			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.c. To Soil Amended Filter Path as per specifications (existing C/D soils) (Spec #2)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.d. To Dry Well or French Drain #1, Micro-Infiltration #1 (Spec #8)	50			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.e. To Dry Well or French Drain #2, Micro-Infiltration #2 (Spec #8)	90			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.f. To Rain Garden #1, Micro-Bioretention #1 (Spec #9)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.g. To Rain Garden #2, Micro-Bioretention #2 (Spec #9)	80			0	0	0	0	50	0.00	0.00	0.00	0.00	
2.h. To Rainwater Harvesting (Spec #6)	0			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.i. To Stormwater Planter, Urban Bioretention (Spec #5, Appendix A)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
3. Permeable Pavement (RR)													
3.a. Permeable Pavement #1 (Spec #7)	45			0	0	0	0	25	0.00	0.00	0.00	0.00	
3.b. Permeable Pavement #2 (Spec #7)	75				0	0	0	25		0.00	0.00	0.00	
4. Grass Channel (RR)													
4.a. Grass Channel A/B Soils (Spec #3)	20			0	0	0	0	15	0.00	0.00	0.00	0.00	
4.b. Grass Channel C/D Soils (Spec #3)	10			0	0	0	0	15	0.00	0.00	0.00	0.00	
4.c. Grass Channel with Compost Amended Soils as per specs (see Spec #6)	30			0	0	0	0	15	0.00	0.00	0.00	0.00	
5. Dry Swale (RR)													
5.a. Dry Swale #1 (Spec #10)	40			0	0	0	0	20	0.00	0.00	0.00	0.00	
5.b. Dry Swale #2 (Spec #10)	60			0	0	0	0	40	0.00	0.00	0.00	0.00	
6. Bioretention (RR)													
6.a. Bioretention #1 or Micro-Bioretention #1 or Urban Bioretention (Spec #9)	40	0.26	0.49	0	770	1,155	1,926	25	0.00	1.21	0.66	0.54	
6.b. Bioretention #2 or Micro-Bioretention #2 (Spec #9)	80			0	0	0	0	50	0.00	0.00	0.00	0.00	
7. Infiltration (RR)													
7.a. Infiltration #1 (Spec #8)	50			0	0	0	0	25	0.00	0.00	0.00	0.00	
7.b. Infiltration #2 (Spec #8)	90			0	0	0	0	25	0.00	0.00	0.00	0.00	
8. Extended Detention Pond (RR)													
8.a. ED #1 (Spec #15)	0			0	0	0	0	15	0.00	0.00	0.00	0.00	
8.b. ED #2 (Spec #15)	15			0	0	0	0	15	0.00	0.00	0.00	0.00	
9. Sheetflow to Filter/Open Space (RR)													
9.a. Sheetflow to Conservation Area, A/B Soils (Spec #2)	75			0	0	0	0	0	0.00	0.00	0.00	0.00	
9.b. Sheetflow to Conservation Area, C/D Soils (Spec #2)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
9.c. Sheetflow to Vegetated Filter Strip, A Soils or Compost Amended B/C/D Soils (Spec #2 & #3)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	

Practice	Nitrogen Removal Efficiency (%)	Nitrogen Load from Upstream Practices (lbs)	Untreated Nitrogen Load to Practice (lbs)	Nitrogen Removed By Practice (lbs)	Remaining Nitrogen Load (lbs)
1. Vegetated Roof (RR)					
	0		0.00	0.00	0.00
	0		0.00	0.00	0.00
2. Rooftop Disconnection (RR)					
	0	0.00	0.00	0.00	0.00
	0	0.00	0.00	0.00	0.00
	0	0.00	0.00	0.00	0.00
	15	0.00	0.00	0.00	0.00
	15	0.00	0.00	0.00	0.00
	40	0.00	0.00	0.00	0.00
	40	0.00	0.00	0.00	0.00
	0	0.00	0.00	0.00	0.00
	40	0.00	0.00	0.00	0.00
3. Permeable Pavement (RR)					
	25	0.00	0.00	0.00	0.00
	25		0.00	0.00	0.00
4. Grass Channel (RR)					
	25	0.00	0.00	0.00	0.00
	20	0.00	0.00	0.00	0.00
	20	0.00	0.00	0.00	0.00
5. Dry Swale (RR)					
	25	0.00	0.00	0.00	0.00
	35	0.00	0.00	0.00	0.00
6. Bioretention (RR)					
	40	0.00	8.66	5.53	3.11
	60	0.00	0.00	0.00	0.00
7. Infiltration (RR)					
	15	0.00	0.00	0.00	0.00
	15	0.00	0.00	0.00	0.00
8. Extended Detention Pond (RR)					
	15	0.00	0.00	0.00	0.00
	10	0.00	0.00	0.00	0.00
9. Sheetflow to Filter/Open Space (RR)					
	0	0.00	0.00	0.00	0.00
	0	0.00	0.00	0.00	0.00
	0	0.00	0.00	0.00	0.00

TOTAL IMPERVIOUS COVER TREATED (ac): 0.49 AREA CHECK: OK.
TOTAL MANAGED TURF AREA TREATED (ac): 0.26 AREA CHECK: OK.
TOTAL RUNOFF REDUCTION IN D.A. A (ft³): 770

TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr): 1.58
TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr): 0.66
TOTAL PHOSPHORUS REMAINING AFTER APPLYING RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr): 0.92

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

TOTAL RUNOFF REDUCTION IN D.A. A (ft³): 770
NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr): 5.53

SEE WATER QUALITY COMPLIANCE TAB FOR SITE CALCULATIONS (Information Only)

10. Wet Swale (no RR)													
10.a. Wet Swale #1 (Spec #11)	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
10.b. Wet Swale #1 (Spec #11)	0			0	0	0	0	40	0.00	0.00	0.00	0.00	
11. Filtering Practices (no RR)													
11.a Filtering Practice #1 (Spec #12)	0			0	0	0	0	60	0.00	0.00	0.00	0.00	
11.b. Filtering Practice #2 (Spec #12)	0			0	0	0	0	65	0.00	0.00	0.00	0.00	
12. Constructed Wetland (no RR)													
12.a Constructed Wetland #1 (Spec #13)	0			0	0	0	0	50	0.00	0.00	0.00	0.00	
12.b. Constructed Wetland #2 (Spec #13)	0			0	0	0	0	75	0.00	0.00	0.00	0.00	
13. Wet Ponds (no RR)													
13.a. Wet Pond #1 (Spec #14)	0			0	0	0	0	50	0.00	0.00	0.00	0.00	
13.b. Wet Pond #1 (Coastal Plain) (Spec #14)	0			0	0	0	0	65	0.00	0.00	0.00	0.00	
13.c. Wet Pond #2 (Spec #14)	0			0	0	0	0	75	0.00	0.00	0.00	0.00	
13.d. Wet Pond #2 (Coastal Plain) (Spec #14)	0			0	0	0	0	85	0.00	0.00	0.00	0.00	
14. Manufactured Treatment Devices (no RR)													
14.a. Manufactured Treatment Device Hydrodynamic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
14.b. Manufactured Treatment Device-Filtering	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
14.c. Manufactured Treatment Device-Generic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	

10. Wet Swale (Coastal Plain) (no RR)					
	25	0.00	0.00	0.00	0.00
	35	0.00	0.00	0.00	0.00
11. Filtering Practices (no RR)					
	30	0.00	0.00	0.00	0.00
	45	0.00	0.00	0.00	0.00
12. Constructed Wetland (no RR)					
	25	0.00	0.00	0.00	0.00
	55	0.00	0.00	0.00	0.00
13. Wet Ponds (no RR)					
	30	0.00	0.00	0.00	0.00
	20	0.00	0.00	0.00	0.00
	40	0.00	0.00	0.00	0.00
	30	0.00	0.00	0.00	0.00
14. Manufactured BMP (no RR)					
	0	0.00	0.00	0.00	0.00
	0	0.00	0.00	0.00	0.00
	0	0.00	0.00	0.00	0.00

TOTAL IMPERVIOUS COVER TREATED (ac): 0.49 AREA CHECK: OK.
TOTAL MANAGED TURF AREA TREATED (ac): 0.26 AREA CHECK: OK.

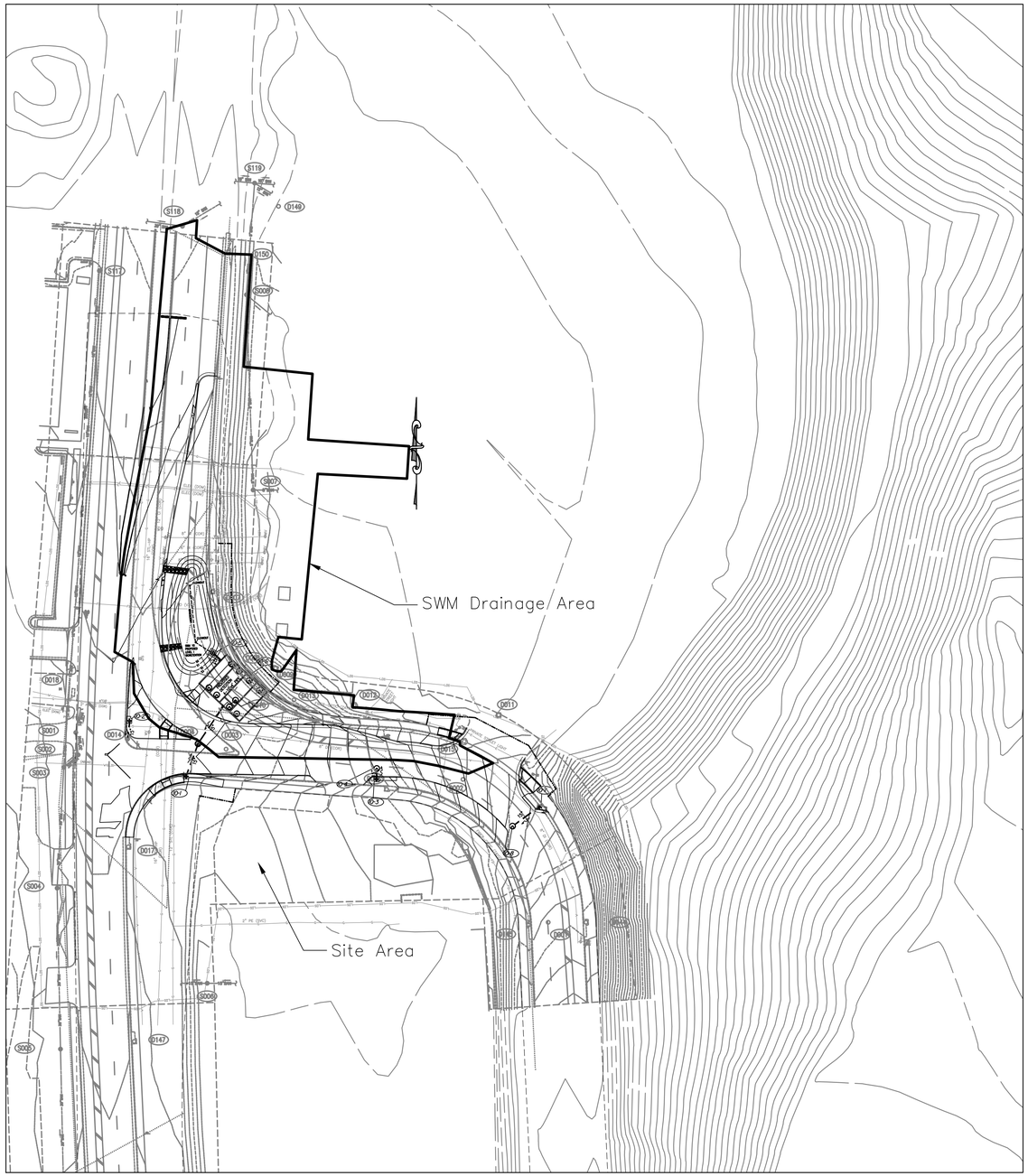
TOTAL PHOSPHORUS REMOVAL REQUIRED ON SITE (lb/yr): 0.67

TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr): 1.58
TOTAL PHOSPHORUS REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr): 0.00
TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr): 0.66
TOTAL PHOSPHORUS LOAD REDUCTION ACHIEVED IN D.A. A (lb/yr): 0.66
TOTAL PHOSPHORUS REMAINING AFTER APPLYING BMP LOAD REDUCTIONS IN D.A. A (lb/yr): 0.92

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr): 5.53
NITROGEN REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr): 0.00
TOTAL NITROGEN REMOVED IN D.A. A (lb/yr): 5.53

NOTE:
The achieved phosphorus removal for the bioretention accounts for impervious and turf ground cover draining to the BMP that are within public R/W. This approach allows for maximum treatment by the BMP. As a result of treating areas beyond the LOD, the VRRM spreadsheet has a note stating "Check Site Tap land cover areas" and another stating "AREA EXCEEDED". The default DEQ VRRM spreadsheet does not allow for the computation of the TP LOAD REDUCTION ACHIEVED or REMAINING if the land cover in the DA tabs to the BMP's exceeds the Site Area of the Site Area tab. Due to the pond treating R/W area outside of the SWM site area being the cause of these messages, these warning messages may be ignored.



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SEPTEMBER 2022

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4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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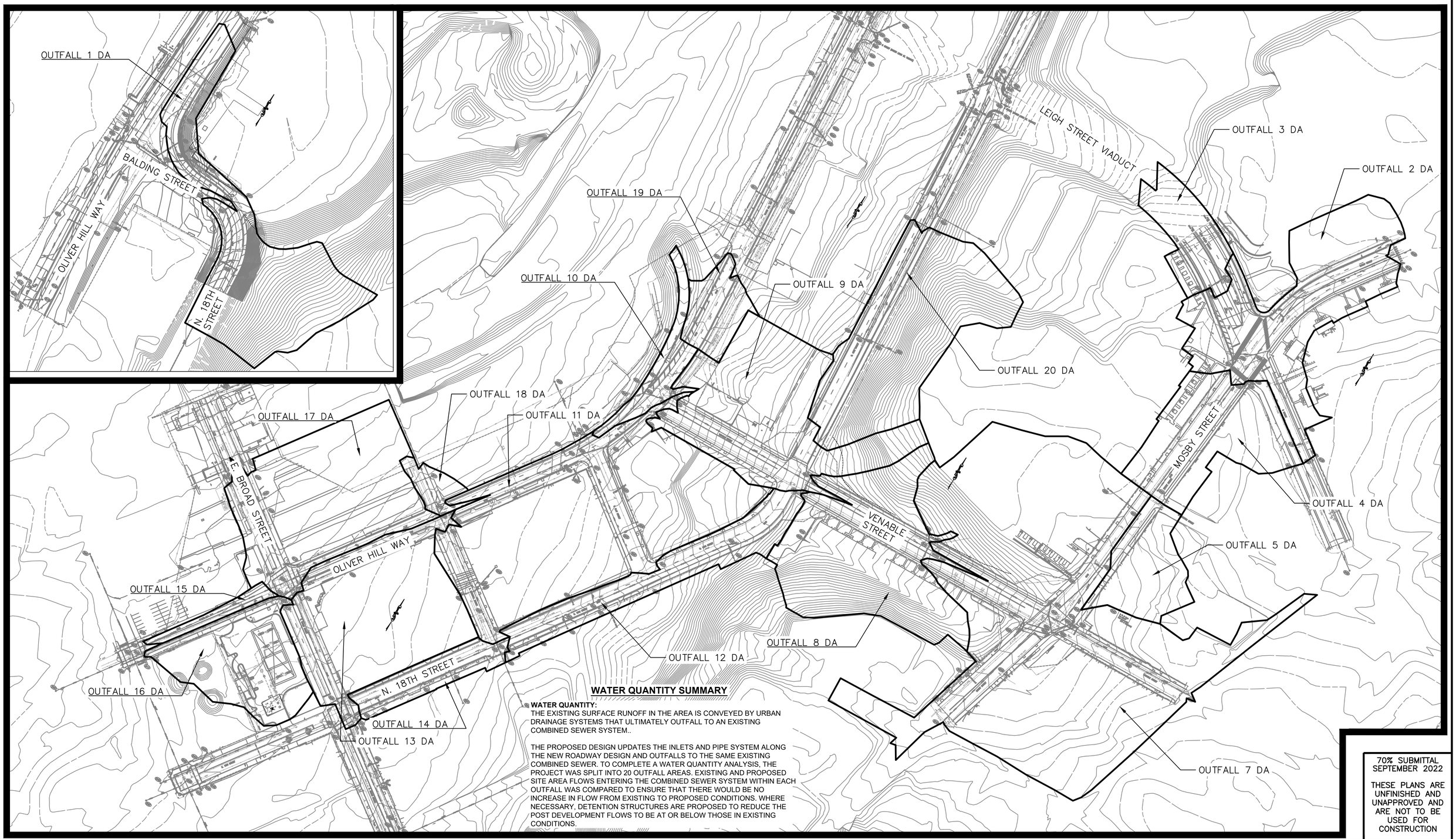
SHOCKOE VALLEY STREET IMPROVEMENTS
CBPA/WATER QUALITY IMPACT ASSESSMENT

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2J(3)	0-28633
CHECKED BY: ASamberg						

WATER QUANTITY EXISTING OUTFALL MAP



WATER QUANTITY SUMMARY

WATER QUANTITY:
THE EXISTING SURFACE RUNOFF IN THE AREA IS CONVEYED BY URBAN DRAINAGE SYSTEMS THAT ULTIMATELY OUTFALL TO AN EXISTING COMBINED SEWER SYSTEM..

THE PROPOSED DESIGN UPDATES THE INLETS AND PIPE SYSTEM ALONG THE NEW ROADWAY DESIGN AND OUTFALLS TO THE SAME EXISTING COMBINED SEWER. TO COMPLETE A WATER QUANTITY ANALYSIS, THE PROJECT WAS SPLIT INTO 20 OUTFALL AREAS. EXISTING AND PROPOSED SITE AREA FLOWS ENTERING THE COMBINED SEWER SYSTEM WITHIN EACH OUTFALL WAS COMPARED TO ENSURE THAT THERE WOULD BE NO INCREASE IN FLOW FROM EXISTING TO PROPOSED CONDITIONS. WHERE NECESSARY, DETENTION STRUCTURES ARE PROPOSED TO REDUCE THE POST DEVELOPMENT FLOWS TO BE AT OR BELOW THOSE IN EXISTING CONDITIONS.

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SEPTEMBER 2022

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REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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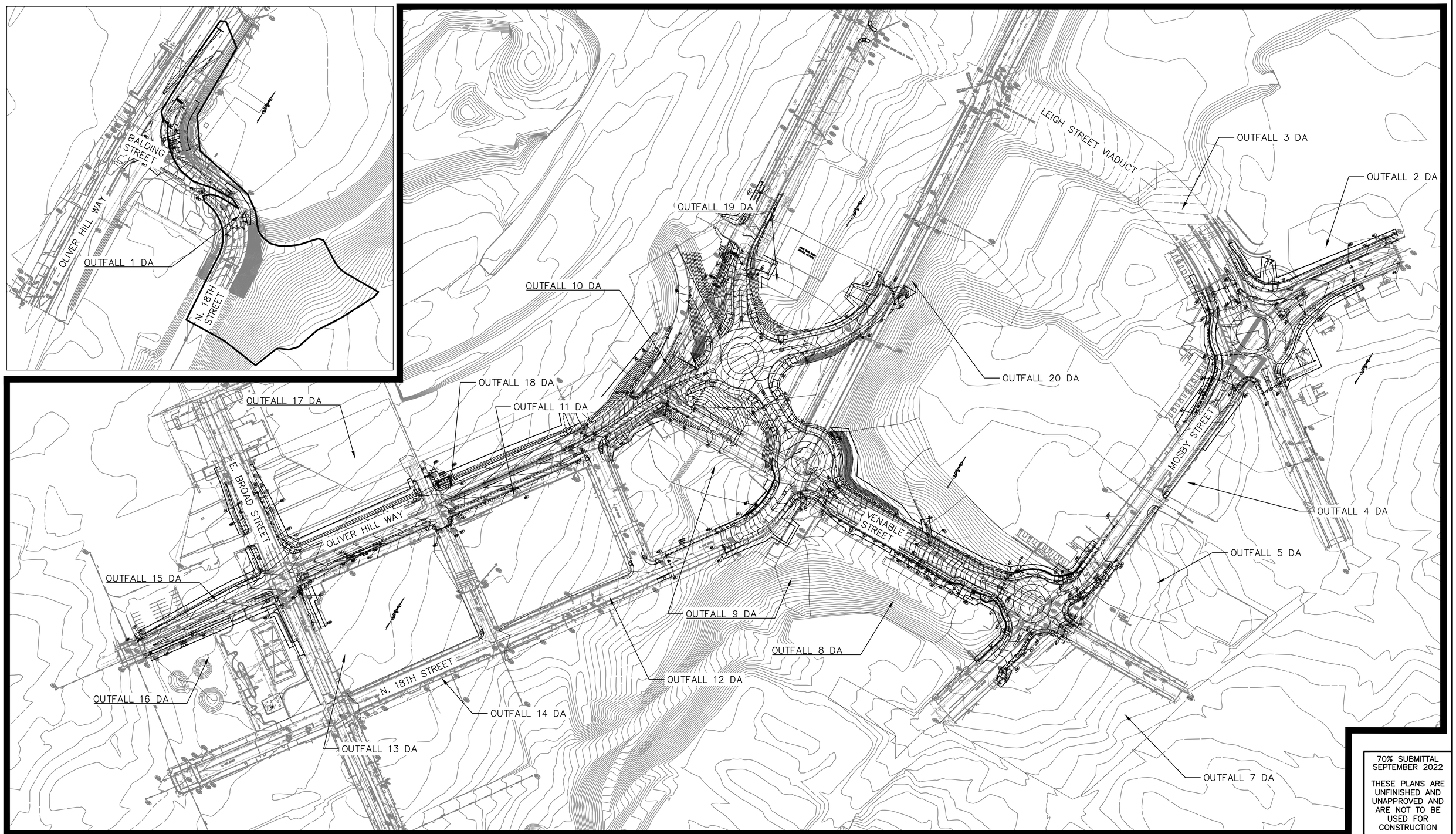
SHOCKOE VALLEY STREET IMPROVEMENTS
WATER QUANTITY SUMMARY

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2K(1)	DRAWING NO. 0-28633

WATER QUANTITY PROPOSED OUTFALL MAP



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5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

- Storm Sewer
- Sanitary Sewer (Gravity)
- Gas Line
- Electric Line
- Overhead Utility
- Telephone/Telegraph
- Water Line
- Property Line
- Storm Basin
- Storm or Sanitary Manhole (D or S)
- Fire Hydrant / Valve (FH, WV)
- Water Meter (WM)
- Existing Curb Cut Ramp (HCR)
- Gas Meter / Valve (GM, GV)
- Fence
- Power/Light Pole (PP, LP)
- Guy Anchor
- Tree

Proposed Legend

- Sanitary Sewer
- Storm Sewer
- Storm/(San) Manhole (SDMH, (SMH))
- Basin
- Curb Cut Ramp
- Decorative Light
- Conduit
- Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS

WATER QUANTITY SUMMARY

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2K(2)	DRAWING NO. 0-28633

Land Use Summary

Existing Conditions Land Use				
DA	Area (ac)	Impervious (ac)	Managed Turf (ac)	Forest (ac)
1	2.86	0.99	1.87	0.00
2	3.00	1.61	1.39	0.00
3	0.83	0.81	0.02	0.00
4	1.80	1.05	0.75	0.00
5	0.98	0.51	0.47	0.00
7	9.34	5.41	3.91	0.02
8	2.99	1.02	1.94	0.03
9	2.95	2.33	0.58	0.04
10	0.51	0.48	0.03	0.00
11	5.17	4.80	0.37	0.00
12	1.34	1.12	0.22	0.00
13	2.91	2.89	0.02	0.00
14	0.63	0.61	0.02	0.00
15	0.20	0.20	0.00	0.00
16	1.55	1.14	0.41	0.00
17	3.03	2.84	0.19	0.00
18	0.25	0.24	0.01	0.00
19	0.58	0.26	0.31	0.01
20	3.01	0.84	2.12	0.05

Proposed Conditions Land Use			
DA	Area (ac)	Impervious (ac)	Managed Turf (ac)
1	3.42	1.14	2.28
2	3.72	1.99	1.73
3	0.83	0.80	0.03
4	1.23	0.77	0.46
5	1.00	0.52	0.48
7	9.12	5.41	3.71
8	3.11	0.65	2.46
9	2.66	1.43	1.23
10	0.95	0.56	0.39
11	4.68	4.33	0.35
12	1.38	1.15	0.23
13	3.07	3.02	0.05
14	0.63	0.61	0.02
15	0.16	0.16	0.00
16	1.83	1.41	0.42
17	2.84	2.62	0.22
18	0.51	0.46	0.05
19	1.79	0.79	1.00
20	2.84	0.38	2.46

Flow Summary
10-Year Storm

Outfall	Existing Flow (cfs)	Proposed Flow (cfs)	Combined Existing Flow (cfs)	Combined Proposed Flow (cfs)	Detention Required	Detention Provided By SWM	Adequate Detention?
1	17.92	21.43	17.92	21.43	3.51	3.59	YES
2	20.33	25.21	38.92	39.84	0.92	1.01	YES
3	6.18	6.15	6.18	6.15	--		YES
4	12.41	8.48	12.41	8.48	--		YES
5	6.52	6.66	6.52	6.66	0.14	0.24	YES
7	63.31	62.86	69.83	69.52	--	0.24	YES
8	18.73	18.98	88.56	88.5	--	0.24	YES
9	21.22	18.03	109.78	106.53	--	0.24	YES
10	3.78	6.82	113.56	113.35	--	0.24	YES
11	38.29	34.51	151.85	147.86	--	0.24	YES
12	9.75	10.04	9.75	10.04	0.29	0.37	YES
13	21.68	23.02	21.68	23.02	1.34	1.36	YES
14	4.67	4.67	4.67	4.67	--		YES
15	1.49	1.19	1.49	1.19	--		YES
16	11.01	13.16	11.01	13.16	2.15	2.19	YES
17	22.44	21.03	22.44	21.03	--		YES
18	1.85	3.75	1.85	3.75	1.9	2.03	YES
19	3.79	11.43	3.79	11.43	7.64	8.52	YES
20	18.44	16.18	18.44	16.18	--		YES

Outfall Calculations

Routing Diagram for Outfalls
Prepared by RKK, Printed 9/26/2022
HydroCAD® 10.10-6a s/n 10322 © 2020 HydroCAD Software Solutions LLC

Summary for Subcatchment 1a: Existing DA 1

Runoff = 17.92 cfs @ 11.96 hrs, Volume= 0.842 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.990	98	
* 1.870	80	
2.860	86	Weighted Average
1.870		65.38% Pervious Area
0.990		34.62% Impervious Area

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

Summary for Subcatchment 1b: Proposed DA 1

Runoff = 21.43 cfs @ 11.96 hrs, Volume= 1.007 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 1.140	98	
* 2.280	80	
3.420	86	Weighted Average
2.280		66.67% Pervious Area
1.140		33.33% Impervious Area

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

Summary for Subcatchment 2a: Existing DA 2

Runoff = 20.33 cfs @ 11.96 hrs, Volume= 0.986 af, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 1.610	98	
* 1.390	80	
3.000	90	Weighted Average
1.390		46.33% Pervious Area
1.610		53.67% Impervious Area

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

Summary for Subcatchment 2b: Proposed DA 2

Runoff = 25.21 cfs @ 11.96 hrs, Volume= 1.223 af, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 1.990	98	
* 1.730	80	
3.720	90	Weighted Average
1.730		46.51% Pervious Area
1.990		53.49% Impervious Area

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

Summary for Subcatchment 3a: Existing DA 3

Runoff = 6.18 cfs @ 11.96 hrs, Volume= 0.334 af, Depth= 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.810	98	
* 0.020	80	
0.830	98	Weighted Average
0.020		2.41% Pervious Area
0.810		97.59% Impervious Area

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

Summary for Subcatchment 3b: Proposed DA 3

Runoff = 6.15 cfs @ 11.96 hrs, Volume= 0.326 af, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.800	98	
* 0.030	80	
0.830	97	Weighted Average
0.030		3.61% Pervious Area
0.800		96.39% Impervious Area

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

Summary for Subcatchment 4a: Existing DA 4

Runoff = 12.41 cfs @ 11.96 hrs, Volume= 0.608 af, Depth= 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 1.050	98	
* 0.750	80	
1.800	91	Weighted Average
0.750		41.67% Pervious Area
1.050		58.33% Impervious Area

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

Summary for Subcatchment 4b: Proposed DA 4

Runoff = 8.48 cfs @ 11.96 hrs, Volume= 0.415 af, Depth= 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.770	98	
* 0.460	80	
1.230	91	Weighted Average
0.460		37.40% Pervious Area
0.770		62.60% Impervious Area

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

Summary for Subcatchment 5a: Existing DA 5

Runoff = 6.52 cfs @ 11.96 hrs, Volume= 0.314 af, Depth= 3.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.510	98	
* 0.470	80	
0.980	89	Weighted Average
0.470		47.96% Pervious Area
0.510		52.04% Impervious Area

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

Summary for Subcatchment 5b: Proposed DA 5

Runoff = 6.66 cfs @ 11.96 hrs, Volume= 0.320 af, Depth= 3.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.520	98	
* 0.480	80	
1.000	89	Weighted Average
0.480		48.00% Pervious Area
0.520		52.00% Impervious Area

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

Summary for Subcatchment 7a: Existing DA 7

Runoff = 63.31 cfs @ 11.96 hrs, Volume= 3.070 af, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.020	77	
* 5.410	98	
* 3.910	80	
9.340	90	Weighted Average
3.930		42.08% Pervious Area
5.410		57.92% Impervious Area

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

Summary for Subcatchment 7b: Proposed DA 7

Runoff = 62.87 cfs @ 11.96 hrs, Volume= 3.078 af, Depth= 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 5.410	98	
* 3.710	80	
9.120	91	Weighted Average
3.710		40.68% Pervious Area
5.410		59.32% Impervious Area

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

Summary for Subcatchment 8a: Existing DA 8

Runoff = 18.73 cfs @ 11.96 hrs, Volume= 0.880 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.030	77	
* 1.020	98	
* 1.940	80	
2.990	86	Weighted Average
1.970		65.89% Pervious Area
1.020		34.11% Impervious Area

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

Summary for Subcatchment 8b: Proposed DA 8

Runoff = 18.98 cfs @ 11.96 hrs, Volume= 0.881 af, Depth= 3.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.650	98	
* 2.520	80	
3.170	84	Weighted Average
2.520		79.50% Pervious Area
0.650		20.50% Impervious Area

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

Summary for Subcatchment 9a: Existing DA 9

Runoff = 21.22 cfs @ 11.96 hrs, Volume= 1.076 af, Depth= 4.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.040	77	
* 2.330	98	
* 0.580	80	
2.950	94	Weighted Average
0.620		21.02% Pervious Area
2.330		78.98% Impervious Area

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

Summary for Subcatchment 9b: Proposed DA 9

Runoff = 18.03 cfs @ 11.96 hrs, Volume= 0.874 af, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 1.430	98	
* 1.230	80	
2.660	90	Weighted Average
1.230		46.24% Pervious Area
1.430		53.76% Impervious Area

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

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
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CITY OF RICHMOND ESTABLISHED 1737

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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
WATER QUANTITY CALCULATIONS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2K(3)	0-28633

Summary for Subcatchment 10a: Existing DA 10

Runoff = 3.78 cfs @ 11.96 hrs, Volume= 0.200 af, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.480	98	
* 0.030	80	
0.510	97	Weighted Average
0.030		5.88% Pervious Area
0.480		94.12% Impervious Area

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

Summary for Subcatchment 10b: Proposed DA 10

Runoff = 6.82 cfs @ 11.96 hrs, Volume= 0.334 af, Depth= 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.600	98	
* 0.390	80	
0.990	91	Weighted Average
0.390		39.39% Pervious Area
0.600		60.61% Impervious Area

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

Summary for Subcatchment 11a: Existing DA 11

Runoff = 38.29 cfs @ 11.96 hrs, Volume= 2.032 af, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 4.800	98	
* 0.370	80	
5.170	97	Weighted Average
0.370		7.16% Pervious Area
4.800		92.84% Impervious Area

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

Summary for Subcatchment 11b: Proposed DA 11

Runoff = 34.51 cfs @ 11.96 hrs, Volume= 1.832 af, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 4.310	98	
* 0.350	80	
4.660	97	Weighted Average
0.350		7.51% Pervious Area
4.310		92.49% Impervious Area

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

Summary for Subcatchment 12a: Existing DA 12

Runoff = 9.75 cfs @ 11.96 hrs, Volume= 0.501 af, Depth= 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 1.120	98	
* 0.220	80	
1.340	95	Weighted Average
0.220		16.42% Pervious Area
1.120		83.58% Impervious Area

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

Summary for Subcatchment 12b: Proposed DA 12

Runoff = 10.04 cfs @ 11.96 hrs, Volume= 0.516 af, Depth= 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 1.150	98	
* 0.230	80	
1.380	95	Weighted Average
0.230		16.67% Pervious Area
1.150		83.33% Impervious Area

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

Summary for Subcatchment 13a: Existing DA 13

Runoff = 21.68 cfs @ 11.96 hrs, Volume= 1.172 af, Depth= 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 2.890	98	
* 0.020	80	
2.910	98	Weighted Average
0.020		0.69% Pervious Area
2.890		99.31% Impervious Area

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

Summary for Subcatchment 13b: Proposed DA 13

Runoff = 23.02 cfs @ 11.96 hrs, Volume= 1.245 af, Depth= 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 3.040	98	
* 0.050	80	
3.090	98	Weighted Average
0.050		1.62% Pervious Area
3.040		98.38% Impervious Area

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

Summary for Subcatchment 14a: Existing DA 14

Runoff = 4.67 cfs @ 11.96 hrs, Volume= 0.248 af, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.610	98	
* 0.020	80	
0.630	97	Weighted Average
0.020		3.17% Pervious Area
0.610		96.83% Impervious Area

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

Summary for Subcatchment 14b: Proposed DA 14

Runoff = 4.67 cfs @ 11.96 hrs, Volume= 0.248 af, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.610	98	
* 0.020	80	
0.630	97	Weighted Average
0.020		3.17% Pervious Area
0.610		96.83% Impervious Area

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

Summary for Subcatchment 15a: Existing DA 15

Runoff = 1.49 cfs @ 11.96 hrs, Volume= 0.081 af, Depth= 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.200	98	
0.200		100.00% Impervious Area

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

Summary for Subcatchment 15b: Proposed DA 15

Runoff = 1.19 cfs @ 11.96 hrs, Volume= 0.064 af, Depth= 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.160	98	
0.160		100.00% Impervious Area

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

Summary for Subcatchment 16a: Existing DA 16

Runoff = 11.01 cfs @ 11.96 hrs, Volume= 0.551 af, Depth= 4.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 1.140	98	
* 0.410	80	
1.550	93	Weighted Average
0.410		26.45% Pervious Area
1.140		73.55% Impervious Area

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

Summary for Subcatchment 16b: Proposed DA 16

Runoff = 13.16 cfs @ 11.96 hrs, Volume= 0.668 af, Depth= 4.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 1.410	98	
* 0.420	80	
1.830	94	Weighted Average
0.420		22.95% Pervious Area
1.410		77.05% Impervious Area

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

Summary for Subcatchment 17a: Existing DA 17

Runoff = 22.44 cfs @ 11.96 hrs, Volume= 1.191 af, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 2.840	98	
* 0.190	80	
3.030	97	Weighted Average
0.190		6.27% Pervious Area
2.840		93.73% Impervious Area

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

Summary for Subcatchment 17b: Proposed DA 17

Runoff = 21.03 cfs @ 11.96 hrs, Volume= 1.116 af, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 2.620	98	
* 0.220	80	
2.840	97	Weighted Average
0.220		7.75% Pervious Area
2.620		92.25% Impervious Area

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

Summary for Subcatchment 18a: Existing DA 18

Runoff = 1.85 cfs @ 11.96 hrs, Volume= 0.098 af, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

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

Summary for Subcatchment 15b: Proposed DA 15

Runoff = 1.19 cfs @ 11.96 hrs, Volume= 0.064 af, Depth= 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.160	98	
0.160		100.00% Impervious Area

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

Summary for Subcatchment 16a: Existing DA 16

Runoff = 11.01 cfs @ 11.96 hrs, Volume= 0.551 af, Depth= 4.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 1.140	98	
* 0.410	80	
1.550	93	Weighted Average
0.410		26.45% Pervious Area
1.140		73.55% Impervious Area

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

Summary for Subcatchment 16b: Proposed DA 16

Runoff = 13.16 cfs @ 11.96 hrs, Volume= 0.668 af, Depth= 4.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 1.410	98	
* 0.420	80	
1.830	94	Weighted Average
0.420		22.95% Pervious Area
1.410		77.05% Impervious Area

Area (ac)	CN	Description
* 0.240	98	
* 0.010	80	
0.250	97	Weighted Average
0.010		4.00% Pervious Area
0.240		96.00% Impervious Area

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

Summary for Subcatchment 18b: Proposed DA 18

Runoff = 3.75 cfs @ 11.96 hrs, Volume= 0.196 af, Depth= 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.460	98	
* 0.050	80	
0.510	96	Weighted Average
0.050		9.80% Pervious Area
0.460		90.20% Impervious Area

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

Summary for Subcatchment 19a: Existing DA 19

Runoff = 3.79 cfs @ 11.96 hrs, Volume= 0.181 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.010	77	
* 0.260	98	
* 0.310	80	
0.580	88	Weighted Average
0.320		55.17% Pervious Area
0.260		44.83% Impervious Area

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

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
WATER QUANTITY CALCULATIONS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		0-28633
CHECKED BY: ASamberg					SHEET 2K(4)	

Summary for Subcatchment 19b: Proposed DA 19

Runoff = 11.43 cfs @ 11.96 hrs, Volume= 0.545 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.770	98	
* 0.980	80	
1.750	88	Weighted Average
0.980		56.00% Pervious Area
0.770		44.00% Impervious Area

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

Summary for Subcatchment 20a: Existing DA 20

Runoff = 18.44 cfs @ 11.96 hrs, Volume= 0.861 af, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.050	77	
* 0.840	98	
* 2.120	80	
3.010	85	Weighted Average
2.170		72.09% Pervious Area
0.840		27.91% Impervious Area

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

Summary for Subcatchment 20b: Proposed DA 20

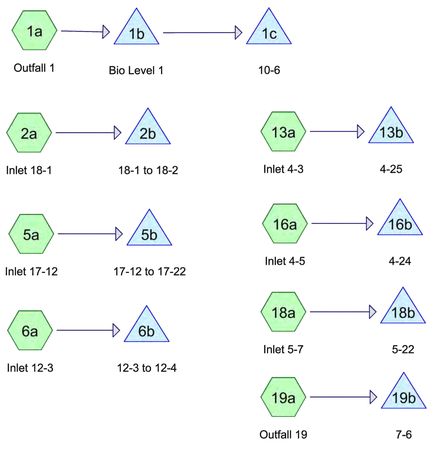
Runoff = 16.18 cfs @ 11.96 hrs, Volume= 0.744 af, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.380	98	
* 2.460	80	
2.840	82	Weighted Average
2.460		86.62% Pervious Area
0.380		13.38% Impervious Area

Detention Summary

Outfall	Reduction Needed (cfs)	Detention Provided (cfs)	Detention Facility	Detention Details
1	3.51	0.21	Bioretention Level 1	Bioretention Level 1
		3.38	10-6	6- 5'x4' Box
2	0.92	1.01	18-1 to 18-2	48" Detention Pipe
5	0.14	0.24	17-12 to 17-20	18" Detention Pipe
12	0.29	0.37	12-3 to 12-4	24" Detention Pipe
13	1.34	1.36	4-25	5'x4' Box
16	2.15	2.19	4-24	Double 4'x3' Box
18	1.9	2.03	5-22	Triple 5'x5' Box
19	7.64	8.52	7-6	Triple 5'x6' Box



Summary for Subcatchment 1a: Outfall 1

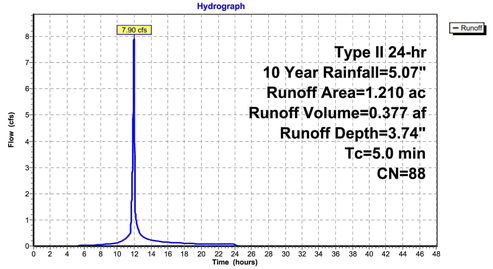
Runoff = 7.90 cfs @ 11.96 hrs, Volume= 0.377 af, Depth= 3.74"
Routed to Pond 1b : Bio Level 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.560	98	
* 0.650	80	
1.210	88	Weighted Average
0.650		53.72% Pervious Area
0.560		46.28% Impervious Area

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

Subcatchment 1a: Outfall 1



Summary for Pond 1b: Bio Level 1

Inflow Area = 1.210 ac, 46.28% Impervious, Inflow Depth = 3.74" for 10 Year event
Inflow = 7.90 cfs @ 11.96 hrs, Volume= 0.377 af
Outflow = 7.69 cfs @ 11.97 hrs, Volume= 0.323 af, Atten= 3%, Lag= 1.0 min
Primary = 7.69 cfs @ 11.97 hrs, Volume= 0.323 af
Routed to Pond 1c : 10-6

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 51.38' @ 11.97 hrs Surf.Area= 1,973 sf Storage= 3,068 cf

Plug-Flow detention time= 101.1 min calculated for 0.322 af (86% of inflow)
Center-of-Mass det. time= 35.1 min (828.4 - 793.3)

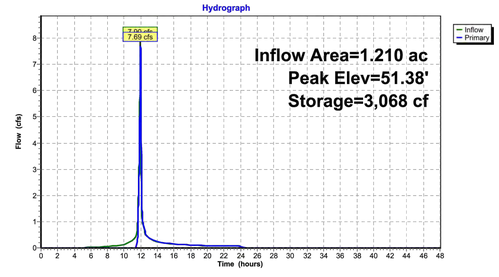
Volume	Invert	Avail.Storage	Storage Description
#1	48.25'	7,046 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
48.25	1,234	0.0	0	0
50.00	1,234	40.0	864	864
51.00	1,754	100.0	1,494	2,358
52.00	2,330	100.0	2,042	4,400
53.00	2,963	100.0	2,647	7,046

Device	Routing	Invert	Outlet Devices
#1	Primary	46.50'	**15.0" Round Culvert** L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 46.50' / 46.40' S= 0.0048 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	51.00'	**30.0" x 30.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=7.67 cfs @ 11.97 hrs HW=51.38' (Free Discharge)
└**1=Culvert** (Passes 7.67 cfs of 12.19 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 7.67 cfs @ 2.02 fps)

Pond 1b: Bio Level 1



Summary for Pond 1c: 10-6

Inflow Area = 1.210 ac, 46.28% Impervious, Inflow Depth = 3.20" for 10 Year event
Inflow = 7.69 cfs @ 11.97 hrs, Volume= 0.323 af
Outflow = 4.31 cfs @ 12.06 hrs, Volume= 0.323 af, Atten= 44%, Lag= 4.9 min
Primary = 4.31 cfs @ 12.06 hrs, Volume= 0.323 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 48.15' @ 12.06 hrs Surf.Area= 0.028 ac Storage= 0.072 af

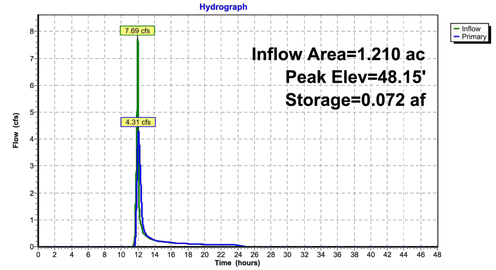
Plug-Flow detention time= 14.1 min calculated for 0.322 af (100% of inflow)
Center-of-Mass det. time= 14.2 min (842.6 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1	45.50'	0.110 af	**120.0" W x 48.0" H Box Pipe Storage** x 4 L= 30.0' S= 0.0030 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.50'	**15.0" Round Culvert** L= 31.0' Ke= 0.500 Inlet / Outlet Invert= 45.50' / 45.20' S= 0.0097 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	45.50'	**10.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	48.50'	**10.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=4.31 cfs @ 12.06 hrs HW=48.15' (Free Discharge)
└**1=Culvert** (Passes 4.31 cfs of 8.41 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 4.31 cfs @ 7.16 fps)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1c: 10-6



Stage-Area-Storage for Pond 1b: Bio Level 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
48.25	1,234	0	50.85	1,676	2,101
48.30	1,234	25	50.90	1,702	2,185
48.35	1,234	49	50.95	1,728	2,271
48.40	1,234	74	51.00	1,754	2,358
48.45	1,234	99	51.05	1,783	2,446
48.50	1,234	123	51.10	1,812	2,536
48.55	1,234	148	51.15	1,840	2,627
48.60	1,234	173	51.20	1,869	2,720
48.65	1,234	197	51.25	1,898	2,814
48.70	1,234	222	51.30	1,927	2,910
48.75	1,234	247	51.35	1,956	3,007
48.80	1,234	271	51.40	1,984	3,105
48.85	1,234	296	51.45	2,013	3,205
48.90	1,234	321	51.50	2,042	3,307
48.95	1,234	346	51.55	2,071	3,410
49.00	1,234	370	51.60	2,100	3,514
49.05	1,234	395	51.65	2,128	3,620
49.10	1,234	420	51.70	2,157	3,727
49.15	1,234	444	51.75	2,186	3,835
49.20	1,234	469	51.80	2,215	3,945
49.25	1,234	494	51.85	2,244	4,057
49.30	1,234	518	51.90	2,272	4,170
49.35	1,234	543	51.95	2,301	4,284
49.40	1,234	568	52.00	2,330	4,400
49.45	1,234	592	52.05	2,362	4,517
49.50	1,234	617	52.10	2,393	4,636
49.55	1,234	642	52.15	2,425	4,756
49.60	1,234	666	52.20	2,457	4,878
49.65	1,234	691	52.25	2,488	5,002
49.70	1,234	716	52.30	2,520	5,127
49.75	1,234	740	52.35	2,552	5,254
49.80	1,234	765	52.40	2,583	5,382
49.85	1,234	790	52.45	2,615	5,512
49.90	1,234	814	52.50	2,647	5,644
49.95	1,234	839	52.55	2,678	5,777
50.00	1,234	864	52.60	2,710	5,912
50.05	1,260	926	52.65	2,741	6,048
50.10	1,286	990	52.70	2,773	6,186
50.15	1,312	1,055	52.75	2,805	6,325
50.20	1,338	1,121	52.80	2,836	6,466
50.25	1,364	1,189	52.85	2,868	6,609
50.30	1,390	1,257	52.90	2,900	6,753
50.35	1,416	1,328	52.95	2,931	6,899
50.40	1,442	1,399	53.00	**2,963**	**7,046**
50.45	1,468	1,472			
50.50	1,494	1,546			
50.55	1,520	1,621			
50.60	1,546	1,698			
50.65	1,572	1,776			
50.70	1,598	1,855			
50.75	1,624	1,936			
50.80	1,650	2,017			

Stage-Discharge for Pond 1b: Bio Level 1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
48.25	0.00	50.85	0.00
48.30	0.00	50.90	0.00
48.35	0.00	50.95	0.00
48.40	0.00	51.00	0.00
48.45	0.00	51.05	0.37
48.50	0.00	51.10	1.03
48.55	0.00	51.15	1.90
48.60	0.00	51.20	2.92
48.65	0.00	51.25	4.09
48.70	0.00	51.30	5.37
48.75	0.00	51.35	6.77
48.80	0.00	51.40	8.27
48.85	0.00	51.45	9.87
48.90	0.00	51.50	11.56
48.95	0.00	51.55	12.43
49.00	0.00	51.60	12.50
49.05	0.00	51.65	12.57
49.10	0.00	51.70	12.64
49.15	0.00	51.75	12.71
49.20	0.00	51.80	12.78
49.25	0.00	51.85	12.84
49.30	0.00	51.90	12.91
49.35	0.00	51.95	12.98
49.40	0.00	52.00	13.05
49.45	0.00	52.05	13.11
49.50	0.00	52.10	13.18
49.55	0.00	52.15	13.25
49.60	0.00	52.20	13.31
49.65	0.00	52.25	13.38
49.70	0.00	52.30	13.44
49.75	0.00	52.35	13.51
49.80	0.00	52.40	13.57
49.85	0.00	52.45	13.64
49.90	0.00	52.50	13.70
49.95	0.00	52.55	13.76
50.00	0.00	52.60	13.83
50.05	0.00	52.65	13.89
50.10	0.00	52.70	13.95
50.15	0.00	52.75	14.01
50.20	0.00	52.80	14.08
50.25	0.00	52.85	14.14
50.30	0.00	52.90	14.20
50.35	0.00	52.95	14.26
50.40	0.00	53.00	**14.32**
50.45	0.00		
50.50	0.00		
50.55	0.00		
50.60	0.00		
50.65	0.00		
50.70	0.00		
50.75	0.00		
50.80	0.00		

Stage-Area-Storage for Pond 1c: 10-6

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
45.50	0.000	48.10	0.070
45.55	0.000	48.15	0.072
45.60	0.002	48.20	0.073
45.65	0.003	48.25	0.075
45.70	0.004	48.30	0.076
45.75	0.006	48.35	0.077
45.80	0.007	48.40	0.079
45.85	0.008	48.45	0.080
45.90	0.010	48.50	0.081
45.95	0.011	48.55	0.083
46.00	0.013	48.60	0.084
46.05	0.014	48.65	0.086
46.10	0.015	48.70	0.087
46.15	0.017	48.75	0.088
46.20	0.018	48.80	0.090
46.25	0.019	48.85	0.091
46.30	0.021	48.90	0.092
46.35	0.022	48.95	0.094
46.40	0.024	49.00	0.095
46.45	0.025	49.05	0.097
46.50	0.026	49.10	0.098
46.55	0.028	49.15	0.099
46.60	0.029	49.20	0.101
46.65	0.030	49.25	0.102
46.70	0.032	49.30	0.103
46.75	0.033	49.35	0.105
46.80	0.035	49.40	0.106
46.85	0.036	49.45	0.108
46.90	0.037	49.50	0.109
46.95	0.039	49.55	**0.110**
47.00	0.040		
47.05	0.041		
47.10	0.043		
47.15	0.044		
47.20	0.046		
47.25	0.047		
47.30	0.048		
47.35	0.050		
47.40	0.051		
47.45	0.052		
47.50	0.054		
47.55	0.055		
47.60	0.057		
47.65	0.058		
47.70	0.059		
47.75	0.061		
47.80	0.062		
47.85	0.063		
47.90	0.065		
47.95	0.066		
48.00	0.068		
48.05	0.069		

Stage-Discharge for Pond 1c: 10-6

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
45.50	0.00	46.54	2.25	47.58	3.71	48.62	6.10
45.52	0.00	46.56	2.28	47.60	3.73	48.64	6.47
45.54	0.01	46.58	2.32	47.62	3.76	48.66	6.86
45.56	0.01	46.60	2.36	47.64	3.78	48.68	7.28
45.58	0.03	46.62	2.39	47.66	3.80	48.70	7.73
45.60	0.04	46.64	2.43	47.68	3.82	48.72	8.19
45.62	0.06	46.66	2.46	47.70	3.84	48.74	8.67
45.64	0.08	46.68	2.49	47.72	3.87	48.76	9.18
45.66	0.10	46.70	2.53	47.74	3.89	48.78	9.63
45.68	0.13	46.72	2.56	47.76	3.91	48.80	9.66
45.70	0.16	46.74	2.59	47.78	3.93	48.82	9.70
45.72	0.19	46.76	2.63	47.80	3.95	48.84	9.74
45.74	0.22	46.78	2.66	47.82	3.97	48.86	9.77
45.76	0.26	46.80	2.69	47.84	3.99	48.88	9.81
45.78	0.30	46.82	2.72	47.86	4.01	48.90	9.84
45.80	0.34	46.84	2.75	47.88	4.04	48.92	9.88
45.82	0.38	46.86	2.78	47.90	4.06	48.94	9.91
45.84	0.43	46.88	2.81	47.92	4.08	48.96	9.95
45.86	0.48	46.90	2.84	47.94	4.10	48.98	9.98
45.88	0.53	46.92	2.87	47.96	4.12	49.00	10.02
45.90	0.58	46.94	2.90	47.98	4.14	49.02	10.05
45.92	0.63	46.96	2.93	48.00	4.16	49.04	10.09
45.94	0.68	46.98	2.96	48.02	4.18	49.06	10.12
45.96	0.74	47.00	2.98	48.04	4.20	49.08	10.16
45.98	0.80	47.02	3.01	48.06	4.22	49.10	10.19
46.00	0.86	47.04	3.04	48.08	4.24	49.12	10.23
46.02	0.91	47.06	3.07	48.10	4.26	49.14	10.26
46.04	0.97	47.08	3.09	48.12	4.28	49.16	10.29
46.06	1.04	47.10	3.12	48.14	4.30	49.18	10.33
46.08	1.10	47.12	3.15	48.16	4.32	49.20	10.36
46.10	1.16	47.14	3.17	48.18	4.34	49.22	10.40
46.12	1.22	47.16	3.20	48.20	4.36	49.24	10.43
46.14	1.28	47.18	3.23	48.22	4.37	49.26	10.46
46.16	1.35	47.20	3.25	48.24	4.39	49.28	10.50
46.18	1.41	47.22	3.28	48.26	4.41	49.30	10.53
46.20	1.47	47.24	3.30	48.28	4.43	49.32	10.56
46.22	1.53	47.26	3.33	48.30	4.45	49.34	10.59
46.24	1.59	47.28	3.35	48.32	4.47	49.36	10.63
46.26	1.65	47.30	3.38	48.34	4.49	49.38	10.66
46.28	1.70	47.32	3.40	48.36	4.51	49.40	10.69
46.30	1.76	47.34	3.43	48.38	4.52	49.42	10.73
46.32	1.81	47.36	3.45	48.40	4.54	49.44	10.76
46.34	1.85	47.38	3.48	48.42	4.56	49.46	10.79
46.36	1.89	47.40	3.50	48.44	4.58	49.48	10.82
46.38	1.93	47.42	3.53	48.46	4.60	49.50	10.86
46.40	1.97	47.44	3.55	48.48	4.62	49.52	10.89
46.42	2.01	47.46	3.57	48.50	4.63	49.54	10.92
46.44	2.05	47.48	3.60	48.52	4.75	49.56	10.96
46.46	2.09	47.50	3.62	48.54	4.93	49.58	10.99
46.48	2.13	47.52	3.64	48.56	5.17		
46.50	2.17	47.54	3.67	48.58	5.45		
46.52	2.21	47.56	3.69	48.60	5.76		

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH ◇ ●WV

Water Meter ●WM
Existing Curb Cut Ramp ◇HCR
Gas Meter / Valve GM ● ●GV
Fence
Power/Light Pole PP ☼ LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
WATER QUANTITY CALCULATIONS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2K(5)	DRAWING NO. 0-28633

Summary for Pond 1b: Bio Level 1

Inflow Area = 1.210 ac, 46.28% Impervious, Inflow Depth = 1.61" for 1 Year event
Inflow = 3.56 cfs @ 11.96 hrs, Volume= 0.162 af
Outflow = 2.83 cfs @ 12.01 hrs, Volume= 0.108 af, Atten= 20%, Lag= 2.9 min
Primary = 2.83 cfs @ 12.01 hrs, Volume= 0.108 af
Routed to Pond 1c : 10-6

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 51.20' @ 12.01 hrs Surf.Area= 1,867 sf Storage= 2,712 cf

Plug-Flow detention time= 173.1 min calculated for 0.108 af (67% of inflow)
Center-of-Mass det. time= 67.7 min (884.9 - 817.3)

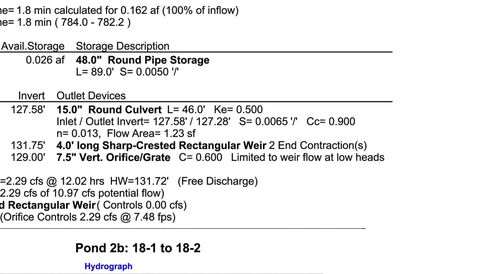
Volume	Invert	Avail.Storage	Storage Description
#1	48.25'	7,046 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
48.25	1,234	0.0	0	0
50.00	1,234	40.0	864	864
51.00	1,754	100.0	1,494	2,358
52.00	2,330	100.0	2,042	4,400
53.00	2,963	100.0	2,647	7,046

Device	Routing	Invert	Outlet Devices
#1	Primary	46.50'	**15.0" Round Culvert** L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 46.50' / 46.40' S= 0.0048 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	51.00'	**30.0" x 30.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.82 cfs @ 12.01 hrs HW=51.20' (Free Discharge)
└**1=Culvert** (Passes 2.82 cfs of 11.92 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 2.82 cfs @ 1.45 fps)

Pond 1b: Bio Level 1



Summary for Pond 1b: Bio Level 1

Inflow Area = 1.210 ac, 46.28% Impervious, Inflow Depth = 6.96" for 100 Year event
Inflow = 14.12 cfs @ 11.96 hrs, Volume= 0.702 af
Outflow = 12.56 cfs @ 11.99 hrs, Volume= 0.648 af, Atten= 11%, Lag= 2.0 min
Primary = 12.56 cfs @ 11.99 hrs, Volume= 0.648 af
Routed to Pond 1c : 10-6

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 51.65' @ 11.99 hrs Surf.Area= 2,126 sf Storage= 3,611 cf

Plug-Flow detention time= 70.7 min calculated for 0.648 af (92% of inflow)
Center-of-Mass det. time= 28.6 min (804.8 - 776.3)

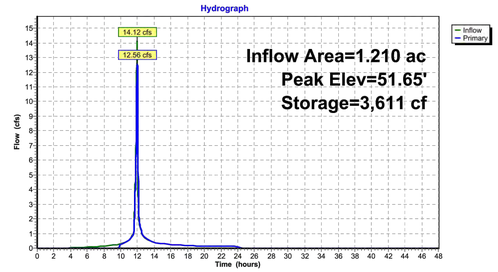
Volume	Invert	Avail.Storage	Storage Description
#1	48.25'	7,046 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
48.25	1,234	0.0	0	0
50.00	1,234	40.0	864	864
51.00	1,754	100.0	1,494	2,358
52.00	2,330	100.0	2,042	4,400
53.00	2,963	100.0	2,647	7,046

Device	Routing	Invert	Outlet Devices
#1	Primary	46.50'	**15.0" Round Culvert** L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 46.50' / 46.40' S= 0.0048 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	51.00'	**30.0" x 30.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=12.56 cfs @ 11.99 hrs HW=51.65' (Free Discharge)
└**1=Culvert** (Inlet Controls 12.56 cfs @ 10.24 fps)
└**2=Orifice/Grate** (Passes 12.56 cfs of 16.96 cfs potential flow)

Pond 1b: Bio Level 1



Summary for Subcatchment 2a: Inlet 18-1

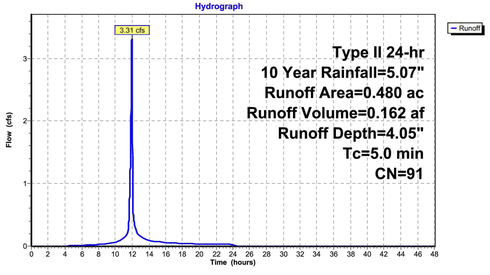
Runoff = 3.31 cfs @ 11.96 hrs, Volume= 0.162 af, Depth= 4.05"
Routed to Pond 2b : 18-1 to 18-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

Area (ac)	CN	Description
* 0.300	98	
* 0.180	80	
0.480	91	Weighted Average
0.180		37.50% Pervious Area
0.300		62.50% Impervious Area

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

Subcatchment 2a: Inlet 18-1



Summary for Pond 2b: 18-1 to 18-2

Inflow Area = 0.480 ac, 62.50% Impervious, Inflow Depth = 4.05" for 10 Year event
Inflow = 3.31 cfs @ 11.96 hrs, Volume= 0.162 af
Outflow = 2.30 cfs @ 12.02 hrs, Volume= 0.162 af, Atten= 31%, Lag= 3.6 min
Primary = 2.30 cfs @ 12.02 hrs, Volume= 0.162 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 131.73' @ 12.02 hrs Surf.Area= 0.008 ac Storage= 0.017 af

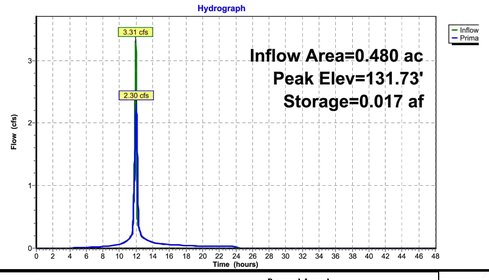
Plug-Flow detention time= 1.8 min calculated for 0.162 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (784.0 - 782.2)

Volume	Invert	Avail.Storage	Storage Description
#1	129.00'	0.026 af	**48.0" Round Pipe Storage** L= 89.0' S= 0.0050 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	127.58'	**15.0" Round Culvert** L= 46.0' Ke= 0.500 Inlet / Outlet Invert= 127.58' / 127.28' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	131.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	129.00'	**7.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.29 cfs @ 12.02 hrs HW=131.72' (Free Discharge)
└**1=Culvert** (Passes 2.29 cfs of 10.97 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Orifice Controls 2.29 cfs @ 7.48 fps)

Pond 2b: 18-1 to 18-2



Stage-Area-Storage for Pond 2b: 18-1 to 18-2

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
129.00	0.000	131.60	0.016
129.05	0.000	131.65	0.016
129.10	0.000	131.70	0.017
129.15	0.000	131.75	0.017
129.20	0.000	131.80	0.017
129.25	0.000	131.85	0.018
129.30	0.000	131.90	0.018
129.35	0.000	131.95	0.019
129.40	0.000	132.00	0.019
129.45	0.001	132.05	0.019
129.50	0.001	132.10	0.020
129.55	0.001	132.15	0.020
129.60	0.001	132.20	0.020
129.65	0.002	132.25	0.021
129.70	0.002	132.30	0.021
129.75	0.002	132.35	0.022
129.80	0.002	132.40	0.022
129.85	0.003	132.45	0.022
129.90	0.003	132.50	0.022
129.95	0.003	132.55	0.023
130.00	0.004	132.60	0.023
130.05	0.004	132.65	0.023
130.10	0.004	132.70	0.024
130.15	0.005	132.75	0.024
130.20	0.005	132.80	0.024
130.25	0.005	132.85	0.024
130.30	0.006	132.90	0.025
130.35	0.006	132.95	0.025
130.40	0.006	133.00	0.025
130.45	0.007	133.05	0.025
130.50	0.007	133.10	0.025
130.55	0.007	133.15	0.025
130.60	0.008	133.20	0.026
130.65	0.008	133.25	0.026
130.70	0.009	133.30	0.026
130.75	0.009	133.35	0.026
130.80	0.009	133.40	**0.026**
130.85	0.010		
130.90	0.010		
130.95	0.011		
131.00	0.011		
131.05	0.011		
131.10	0.012		
131.15	0.012		
131.20	0.013		
131.25	0.013		
131.30	0.013		
131.35	0.014		
131.40	0.014		
131.45	0.015		
131.50	0.015		
131.55	0.015		

Stage-Discharge for Pond 2b: 18-1 to 18-2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
129.00	0.00	131.60	2.23
129.05	0.01	131.65	2.26
129.10	0.03	131.70	2.28
129.15	0.07	131.75	2.31
129.20	0.13	131.80	2.48
129.25	0.20	131.85	2.76
129.30	0.27	131.90	3.13
129.35	0.36	131.95	3.56
129.40	0.45	132.00	4.04
129.45	0.54	132.05	4.56
129.50	0.63	132.10	5.13
129.55	0.72	132.15	5.73
129.60	0.80	132.20	6.37
129.65	0.86	132.25	7.04
129.70	0.92	132.30	7.74
129.75	0.98	132.35	8.47
129.80	1.03	132.40	9.23
129.85	1.08	132.45	10.01
129.90	1.13	132.50	10.81
129.95	1.18	132.55	11.64
130.00	1.22	132.60	12.39
130.05	1.27	132.65	12.46
130.10	1.31	132.70	12.53
130.15	1.35	132.75	12.60
130.20	1.39	132.80	12.67
130.25	1.43	132.85	12.73
130.30	1.47	132.90	12.80
130.35	1.50	132.95	12.87
130.40	1.54	133.00	12.94
130.45	1.58	133.05	13.01
130.50	1.61	133.10	13.07
130.55	1.64	133.15	13.14
130.60	1.68	133.20	13.21
130.65	1.71	133.25	13.27
130.70	1.74	133.30	13.34
130.75	1.77	133.35	13.40
130.80	1.80	133.40	**13.47**
130.85	1.83		
130.90	1.86		
130.95	1.89		
131.00	1.92		
131.05	1.95		
131.10	1.98		
131.15	2.00		
131.20	2.03		
131.25	2.06		
131.30	2.08		
131.35	2.11		
131.40	2.13		
131.45	2.16		
131.50	2.18		
131.55	2.21		

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve; Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
WATER QUANTITY CALCULATIONS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2K(6)	DRAWING NO. 0-28633

Summary for Subcatchment 5a: Inlet 17-12

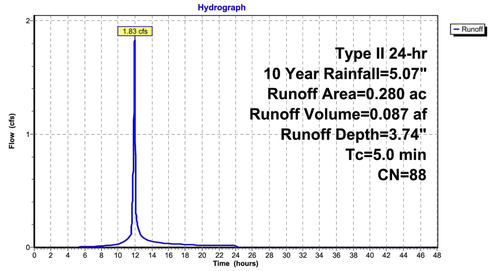
Runoff = 1.83 cfs @ 11.96 hrs, Volume= 0.087 af, Depth= 3.74"
Routed to Pond 5b : 17-12 to 17-22

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

	Area (ac)	CN	Description
*	0.130	98	
*	0.150	80	
	0.280	88	Weighted Average
	0.150		53.57% Pervious Area
	0.130		46.43% Impervious Area

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

Subcatchment 5a: Inlet 17-12



Summary for Pond 5b: 17-12 to 17-22

Inflow Area = 0.280 ac, 46.43% Impervious, Inflow Depth = 3.74" for 10 Year event
Inflow = 1.83 cfs @ 11.96 hrs, Volume= 0.087 af
Outflow = 1.59 cfs @ 12.00 hrs, Volume= 0.087 af, Atten= 13%, Lag= 2.2 min
Primary = 1.59 cfs @ 12.00 hrs, Volume= 0.087 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 129.23' @ 12.00 hrs Surf.Area= 0.005 ac Storage= 0.005 af

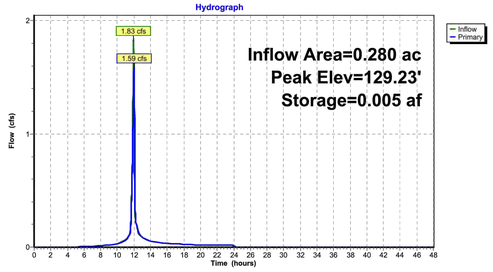
Plug-Flow detention time= 0.9 min calculated for 0.087 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (794.2 - 793.3)

Volume	Invert	Avail.Storage	Storage Description
#1	128.00'	0.009 af	**24.0" Round Pipe Storage** L= 120.0' S= 0.0030 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	128.00'	**15.0" Round Culvert** L= 6.5' Ke= 0.500 Inlet / Outlet Invert= 128.00' / 127.50' S= 0.0769 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	129.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	128.00'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.59 cfs @ 12.00 hrs HW=129.22' (Free Discharge)
1=**Culvert** (Passes 1.59 cfs of 4.60 cfs potential flow)
2=**Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
3=**Orifice/Grate** (Orifice Controls 1.59 cfs @ 4.55 fps)

Pond 5b: 17-12 to 17-22



Stage-Area-Storage for Pond 5b: 17-12 to 17-22

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
128.00	0.000	129.04	0.004	130.08	0.008
128.02	0.000	129.06	0.004	130.10	0.008
128.04	0.000	129.08	0.004	130.12	0.008
128.06	0.000	129.10	0.004	130.14	0.009
128.08	0.000	129.12	0.004	130.16	0.009
128.10	0.000	129.14	0.004	130.18	0.009
128.12	0.000	129.16	0.004	130.20	0.009
128.14	0.000	129.18	0.004	130.22	0.009
128.16	0.000	129.20	0.004	130.24	0.009
128.18	0.000	129.22	0.005	130.26	0.009
128.20	0.000	129.24	0.005	130.28	0.009
128.22	0.000	129.26	0.005	130.30	0.009
128.24	0.000	129.28	0.005	130.32	0.009
128.26	0.000	129.30	0.005	130.34	0.009
128.28	0.000	129.32	0.005	130.36	**0.009**
128.30	0.000	129.34	0.005		
128.32	0.000	129.36	0.005		
128.34	0.000	129.38	0.005		
128.36	0.000	129.40	0.006		
128.38	0.000	129.42	0.006		
128.40	0.001	129.44	0.006		
128.42	0.001	129.46	0.006		
128.44	0.001	129.48	0.006		
128.46	0.001	129.50	0.006		
128.48	0.001	129.52	0.006		
128.50	0.001	129.54	0.006		
128.52	0.001	129.56	0.006		
128.54	0.001	129.58	0.006		
128.56	0.001	129.60	0.007		
128.58	0.001	129.62	0.007		
128.60	0.001	129.64	0.007		
128.62	0.001	129.66	0.007		
128.64	0.002	129.68	0.007		
128.66	0.002	129.70	0.007		
128.68	0.002	129.72	0.007		
128.70	0.002	129.74	0.007		
128.72	0.002	129.76	0.007		
128.74	0.002	129.78	0.007		
128.76	0.002	129.80	0.007		
128.78	0.002	129.82	0.008		
128.80	0.002	129.84	0.008		
128.82	0.002	129.86	0.008		
128.84	0.003	129.88	0.008		
128.86	0.003	129.90	0.008		
128.88	0.003	129.92	0.008		
128.90	0.003	129.94	0.008		
128.92	0.003	129.96	0.008		
128.94	0.003	129.98	0.008		
128.96	0.003	130.00	0.008		
128.98	0.003	130.02	0.008		
129.00	0.003	130.04	0.008		
129.02	0.003	130.06	0.008		

Stage-Discharge for Pond 5b: 17-12 to 17-22

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
128.00	0.00	129.04	1.41	130.08	7.13
128.02	0.00	129.06	1.43	130.10	7.18
128.04	0.01	129.08	1.45	130.12	7.22
128.06	0.01	129.10	1.47	130.14	7.27
128.08	0.02	129.12	1.49	130.16	7.32
128.10	0.04	129.14	1.51	130.18	7.37
128.12	0.05	129.16	1.53	130.20	7.42
128.14	0.07	129.18	1.55	130.22	7.46
128.16	0.09	129.20	1.56	130.24	7.51
128.18	0.11	129.22	1.58	130.26	7.56
128.20	0.13	129.24	1.60	130.28	7.60
128.22	0.16	129.26	1.62	130.30	7.65
128.24	0.19	129.28	1.64	130.32	7.69
128.26	0.22	129.30	1.65	130.34	7.74
128.28	0.25	129.32	1.67	130.36	**7.78**
128.30	0.28	129.34	1.69		
128.32	0.32	129.36	1.70		
128.34	0.36	129.38	1.72		
128.36	0.39	129.40	1.74		
128.38	0.43	129.42	1.75		
128.40	0.47	129.44	1.77		
128.42	0.51	129.46	1.78		
128.44	0.55	129.48	1.80		
128.46	0.59	129.50	1.82		
128.48	0.63	129.52	1.87		
128.50	0.68	129.54	1.95		
128.52	0.72	129.56	2.05		
128.54	0.76	129.58	2.17		
128.56	0.80	129.60	2.30		
128.58	0.84	129.62	2.45		
128.60	0.87	129.64	2.60		
128.62	0.91	129.66	2.77		
128.64	0.94	129.68	2.94		
128.66	0.96	129.70	3.12		
128.68	0.99	129.72	3.31		
128.70	1.02	129.74	3.51		
128.72	1.05	129.76	3.72		
128.74	1.07	129.78	3.93		
128.76	1.10	129.80	4.15		
128.78	1.12	129.82	4.38		
128.80	1.15	129.84	4.61		
128.82	1.17	129.86	4.85		
128.84	1.20	129.88	5.10		
128.86	1.22	129.90	5.35		
128.88	1.24	129.92	5.60		
128.90	1.27	129.94	5.86		
128.92	1.29	129.96	6.13		
128.94	1.31	129.98	6.40		
128.96	1.33	130.00	6.68		
128.98	1.35	130.02	6.96		
129.00	1.37	130.04	7.03		
129.02	1.39	130.06	7.08		

Summary for Subcatchment 6a: Inlet 12-3

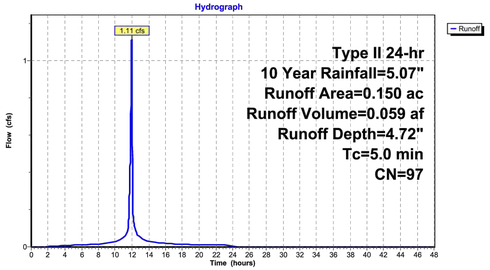
Runoff = 1.11 cfs @ 11.96 hrs, Volume= 0.059 af, Depth= 4.72"
Routed to Pond 6b : 12-3 to 12-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

	Area (ac)	CN	Description
*	0.140	98	
*	0.010	80	
	0.150	97	Weighted Average
	0.010		6.67% Pervious Area
	0.140		93.33% Impervious Area

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

Subcatchment 6a: Inlet 12-3



Summary for Pond 6b: 12-3 to 12-4

Inflow Area = 0.150 ac, 93.33% Impervious, Inflow Depth = 4.72" for 10 Year event
Inflow = 1.11 cfs @ 11.96 hrs, Volume= 0.059 af
Outflow = 0.74 cfs @ 12.02 hrs, Volume= 0.059 af, Atten= 33%, Lag= 3.9 min
Primary = 0.74 cfs @ 12.02 hrs, Volume= 0.059 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 60.17' @ 12.02 hrs Surf.Area= 0.006 ac Storage= 0.006 af

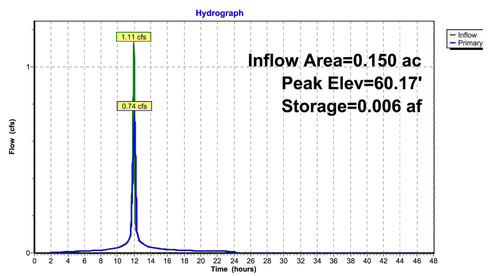
Plug-Flow detention time= 2.0 min calculated for 0.059 af (100% of inflow)
Center-of-Mass det. time= 2.0 min (752.6 - 750.6)

Volume	Invert	Avail.Storage	Storage Description
#1	58.70'	0.009 af	**24.0" Round Pipe Storage** L= 130.0' S= 0.0030 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	58.60'	**15.0" Round Culvert** L= 29.0' Ke= 0.500 Inlet / Outlet Invert= 58.60' / 58.30' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	58.70'	**5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	60.20'	**3.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.74 cfs @ 12.02 hrs HW=60.17' (Free Discharge)
1=**Culvert** (Passes 0.74 cfs of 5.59 cfs potential flow)
2=**Orifice/Grate** (Orifice Controls 0.74 cfs @ 5.42 fps)
3=**Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6b: 12-3 to 12-4



Stage-Area-Storage for Pond 6b: 12-3 to 12-4

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
58.70	0.000	59.74	0.004	60.78	0.009
58.72	0.000	59.76	0.004	60.80	0.009
58.74	0.000	59.78	0.004	60.82	0.009
58.76	0.000	59.80	0.004	60.84	0.009
58.78	0.000	59.82	0.004	60.86	0.009
58.80	0.000	59.84	0.004	60.88	0.009
58.82	0.000	59.86	0.004	60.90	0.009
58.84	0.000	59.88	0.005	60.92	0.009
58.86	0.000	59.90	0.005	60.94	0.009
58.88	0.000	59.92	0.005	60.96	0.009
58.90	0.000	59.94	0.005	60.98	0.009
58.92	0.000	59.96	0.005	61.00	0.009
58.94	0.000	59.98	0.005	61.02	0.009
58.96	0.000	60.00	0.005	61.04	0.009
58.98	0.000	60.02	0.005	61.06	0.009
59.00	0.000	60.04	0.006	61.08	**0.009**
59.02	0.000	60.06	0.006		
59.04	0.000	60.08	0.006		
59.06	0.000	60.10	0.006		
59.08	0.000	60.12	0.006		
59.10	0.001	60.14	0.006		
59.12	0.001	60.16	0.006		
59.14	0.001	60.18	0.006		
59.16	0.001	60.20	0.006		
59.18	0.001	60.22	0.007		
59.20	0.001	60.24	0.007		
59.22	0.001	60.26	0.007		
59.24	0.001	60.28	0.007		
59.26	0.001	60.30	0.007		
59.28	0.001	60.32	0.007		
59.30	0.001	60.34	0.007		
59.32	0.001	60.36	0.007		
59.34	0.002	60.38	0.007		
59.36	0.002	60.40	0.008		
59.38	0.002	60.42	0.008		
59.40	0.002	60.44	0.008		
59.42	0.002	60.46	0.008		
59.44	0.002	60.48	0.008		
59.46	0.002	60.50	0.008		
59.48	0.002	60.52	0.008		
59.50	0.002	60.54	0.008		
59.52	0.003	60.56	0.008		
59.54	0.003	60.58	0.008		
59.56	0.003	60.60	0.008		
59.58	0.003	60.62	0.009		
59.60	0.003	60.64	0.009		
59.62	0.003	60.66	0.009		
59.64	0.003	60.68	0.009		
59.66	0.003	60.70	0.009		
59.68	0.003	60.72	0.009		
59.70	0.004	60.74	0.009		
59.72	0.004	60.76	0.009		

Stage-Discharge for Pond 6b: 12-3 to 12-4

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
58.70	0.00	59.74	0.60	60.78	5.79
58.72	0.00	59.76	0.61	60.80	6.04
58.74	0.00	59.78	0.61	60.82	6.30
58.76	0.01	59.80	0.62	60.84	6.56
58.78	0.02	59.82	0.63	60.86	6.82
58.80	0.03	59.84	0.63	60.88	7.09
58.82	0.04	59.86	0.64	60.90	7.36
58.84	0.05	59.88	0.65	60.92	7.64
58.86	0.07	59.90	0.65	60.94	7.74
58.88	0.08	59.92	0.66	60.96	7.78
58.90	0.10	59.94	0.67	60.98	7.83
58.92	0.12	59.96	0.67	61.00	7.87
58.94	0.14	59.98	0.68	61.02	7.92
58.96	0.16	60.00	0.69	61.04	7.96
58.98	0.18	60.02	0.69	61.06	8.00
59.00	0.20	60.04	0.70	61.08	**8.05**
59.02	0.22	60.06	0.70		
59.04	0.24	60.08	0.71		
59.06	0.26	60.10	0.72		
59.08	0.27	60.12	0.72		
59.10	0.29	60.14	0.73		
59.12	0.30	60.16	0.73		
59.14	0.32	60.18	0.74		
59.16	0.33	60.20	0.75		
59.18	0.34	60.22	0.78		
59.20	0.35	60.24	0.85		
59.22	0.37	60.26	0.93		
59.24	0.38	60.28	1.03		
59.26	0.39	60.30	1.13		
59.28	0.40	60.32	1.25		
59.30	0.41	60.34	1.38		
59.32	0.42	60.36	1.52		
59.34	0.43	60.38	1.66		
59.36	0.44	60.40	1.81		
59.38	0.45	60.42	1.97		
59.40	0.46	60.44	2.14		
59.42	0.47	60.46	2.31		
59.44	0.48	60.48	2.49		
59.46	0.49	60.50	2.68		
59.48	0.50	60.52	2.87		
59.50	0.51	60.54	3.06		
59.52	0.51	60.56	3.27		
59.54	0.52	60.58	3.47		
59.56	0.53	60.60	3.68		
59.58	0.54	60.62	3.90		
59.60	0.55	60.64	4.12		
59.62	0.55	60.66	4.35		
59.64	0.56	60.68	4.58		
59.66	0.57	60.70	4.81		
59.68	0.58	60.72	5.05		
59.70	0.58	60.74	5.29		
59.72	0.59	60.76	5.54		

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
WATER QUANTITY CALCULATIONS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2K(7)	0-28633

Summary for Subcatchment 13a: Inlet 4-3

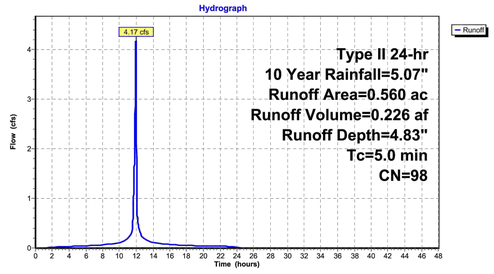
Runoff = 4.17 cfs @ 11.96 hrs, Volume= 0.226 af, Depth= 4.83"
Routed to Pond 13b : 4-25

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

	Area (ac)	CN	Description
*	0.550	98	
*	0.010	80	
	0.560	98	Weighted Average
	0.010		1.79% Pervious Area
	0.550		98.21% Impervious Area

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

Subcatchment 13a: Inlet 4-3



Summary for Subcatchment 16a: Inlet 4-5

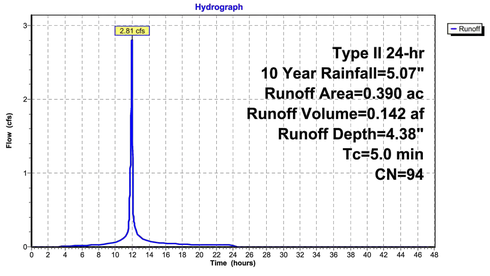
Runoff = 2.81 cfs @ 11.96 hrs, Volume= 0.142 af, Depth= 4.38"
Routed to Pond 16b : 4-24

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

	Area (ac)	CN	Description
*	0.310	98	
*	0.080	80	
	0.390	94	Weighted Average
	0.080		20.51% Pervious Area
	0.310		79.49% Impervious Area

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

Subcatchment 16a: Inlet 4-5



Summary for Pond 13b: 4-25

Inflow Area = 0.560 ac, 98.21% Impervious, Inflow Depth = 4.83" for 10 Year event
Inflow = 4.17 cfs @ 11.96 hrs, Volume= 0.226 af
Outflow = 2.81 cfs @ 12.02 hrs, Volume= 0.226 af, Atten= 33%, Lag= 3.8 min
Primary = 2.81 cfs @ 12.02 hrs, Volume= 0.226 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 34.64' @ 12.02 hrs Surf.Area= 0.009 ac Storage= 0.028 af

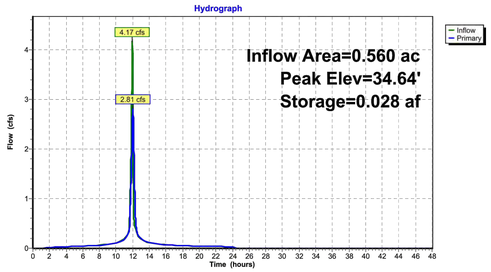
Plug-Flow detention time= 4.7 min calculated for 0.225 af (100% of inflow)
Center-of-Mass det. time= 4.7 min (747.4 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1	31.50'	0.037 af	**60.0" W x 48.0" H Box Pipe Storage** L= 80.0' S= 0.0030 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.50'	**15.0" Round Culvert** L= 7.0' Ke= 0.500 Inlet / Outlet Invert= 31.50' / 31.40' S= 0.0143 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	35.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	31.50'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.81 cfs @ 12.02 hrs HW=34.63' (Free Discharge)
└**1=Culvert** (Passes 2.81 cfs of 9.36 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Orifice Controls 2.81 cfs @ 8.06 fps)

Pond 13b: 4-25



Summary for Pond 16b: 4-24

Inflow Area = 0.390 ac, 79.49% Impervious, Inflow Depth = 4.38" for 10 Year event
Inflow = 2.81 cfs @ 11.96 hrs, Volume= 0.142 af
Outflow = 0.62 cfs @ 12.09 hrs, Volume= 0.142 af, Atten= 78%, Lag= 8.2 min
Primary = 0.62 cfs @ 12.09 hrs, Volume= 0.142 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 29.95' @ 12.09 hrs Surf.Area= 1,025 sf Storage= 1,880 cf

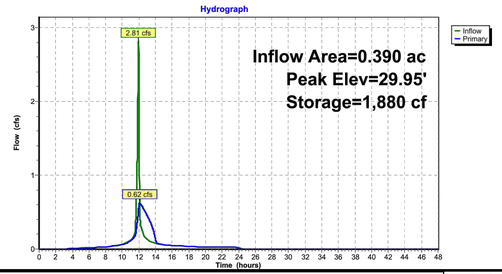
Plug-Flow detention time= 21.1 min calculated for 0.142 af (100% of inflow)
Center-of-Mass det. time= 21.1 min (789.7 - 768.6)

Volume	Invert	Avail.Storage	Storage Description
#1	27.60'	3,075 cf	**60.0" W x 36.0" H Box Pipe Storage** L= 205.0' S= 0.0050 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	27.60'	**15.0" Round Culvert** L= 13.0' Ke= 0.500 Inlet / Outlet Invert= 27.60' / 27.30' S= 0.0231 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	30.10'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	27.60'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.62 cfs @ 12.09 hrs HW=29.95' (Free Discharge)
└**1=Culvert** (Passes 0.62 cfs of 7.75 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)
└**3=Orifice/Grate** (Orifice Controls 0.62 cfs @ 7.11 fps)

Pond 16b: 4-24



Stage-Area-Storage for Pond 13b: 4-25

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
31.50	0.000	34.10	0.023
31.55	0.000	34.15	0.023
31.60	0.000	34.20	0.024
31.65	0.000	34.25	0.024
31.70	0.001	34.30	0.025
31.75	0.001	34.35	0.025
31.80	0.002	34.40	0.026
31.85	0.002	34.45	0.026
31.90	0.003	34.50	0.026
31.95	0.003	34.55	0.027
32.00	0.003	34.60	0.027
32.05	0.004	34.65	0.028
32.10	0.004	34.70	0.028
32.15	0.005	34.75	0.029
32.20	0.005	34.80	0.029
32.25	0.006	34.85	0.030
32.30	0.006	34.90	0.030
32.35	0.007	34.95	0.031
32.40	0.007	35.00	0.031
32.45	0.008	35.05	0.031
32.50	0.008	35.10	0.032
32.55	0.009	35.15	0.032
32.60	0.009	35.20	0.033
32.65	0.009	35.25	0.033
32.70	0.010	35.30	0.034
32.75	0.010	35.35	0.034
32.80	0.011	35.40	0.035
32.85	0.011	35.45	0.035
32.90	0.012	35.50	0.036
32.95	0.012	35.55	0.036
33.00	0.013	35.60	0.036
33.05	0.013	35.65	0.037
33.10	0.014	35.70	**0.037**
33.15	0.014		
33.20	0.015		
33.25	0.015		
33.30	0.015		
33.35	0.016		
33.40	0.016		
33.45	0.017		
33.50	0.017		
33.55	0.018		
33.60	0.018		
33.65	0.019		
33.70	0.019		
33.75	0.020		
33.80	0.020		
33.85	0.020		
33.90	0.021		
33.95	0.021		
34.00	0.022		
34.05	0.022		

Stage-Discharge for Pond 13b: 4-25

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
31.50	0.00	34.10	2.53		
31.55	0.01	34.15	2.56		
31.60	0.04	34.20	2.59		
31.65	0.08	34.25	2.61		
31.70	0.13	34.30	2.64		
31.75	0.20	34.35	2.67		
31.80	0.28	34.40	2.69		
31.85	0.37	34.45	2.72		
31.90	0.47	34.50	2.74		
31.95	0.57	34.55	2.77		
32.00	0.68	34.60	2.80		
32.05	0.78	34.65	2.82		
32.10	0.87	34.70	2.85		
32.15	0.95	34.75	2.87		
32.20	1.02	34.80	2.89		
32.25	1.08	34.85	2.92		
32.30	1.15	34.90	2.94		
32.35	1.21	34.95	2.97		
32.40	1.27	35.00	2.99		
32.45	1.32	35.05	3.20		
32.50	1.37	35.10	3.55		
32.55	1.42	35.15	4.01		
32.60	1.47	35.20	4.53		
32.65	1.52	35.25	5.13		
32.70	1.56	35.30	5.78		
32.75	1.61	35.35	6.49		
32.80	1.65	35.40	7.24		
32.85	1.69	35.45	8.04		
32.90	1.74	35.50	8.88		
32.95	1.78	35.55	9.76		
33.00	1.82	35.60	10.68		
33.05	1.85	35.65	11.09		
33.10	1.89	35.70	**11.17**		
33.15	1.93				
33.20	1.96				
33.25	2.00				
33.30	2.04				
33.35	2.07				
33.40	2.10				
33.45	2.14				
33.50	2.17				
33.55	2.20				
33.60	2.23				
33.65	2.27				
33.70	2.30				
33.75	2.33				
33.80	2.36				
33.85	2.39				
33.90	2.42				
33.95	2.45				
34.00	2.47				
34.05	2.50				

Stage-Area-Storage for Pond 16b: 4-24

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
27.60	0	30.20	2,140
27.65	1	30.25	2,191
27.70	5	30.30	2,242
27.75	11	30.35	2,293
27.80	20	30.40	2,345
27.85	31	30.45	2,396
27.90	45	30.50	2,447
27.95	61	30.55	2,498
28.00	80	30.60	2,550
28.05	101	30.65	2,600
28.10	125	30.70	2,647
28.15	151	30.75	2,692
28.20	180	30.80	2,735
28.25	211	30.85	2,775
28.30	245	30.90	2,812
28.35	281	30.95	2,847
28.40	320	31.00	2,880
28.45	361	31.05	2,910
28.50	405	31.10	2,937
28.55	451	31.15	2,962
28.60	500	31.20	2,985
28.65	551	31.25	3,005
28.70	602	31.30	3,022
28.75	653	31.35	3,037
28.80	705	31.40	3,050
28.85	756	31.45	3,060
28.90	807	31.50	3,067
28.95	858	31.55	3,072
29.00	910	31.60	**3,075**
29.05	961		
29.10	1,012		
29.15	1,063		
29.20	1,115		
29.25	1,166		
29.30	1,217		
29.35	1,268		
29.40	1,320		
29.45	1,371		
29.50	1,422		
29.55	1,473		
29.60	1,525		
29.65	1,576		
29.70	1,627		
29.75	1,678		
29.80	1,730		
29.85	1,781		
29.90	1,832		
29.95	1,883		
30.00	1,935		
30.05	1,986		
30.10	2,037		
30.15	2,088		

Stage-Discharge for Pond 16b: 4-24

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
27.60	0.00	28.64	0.39	29.68	0.58	30.72	6.91
27.62	0.00	28.66	0.40	29.70	0.58	30.74	7.21
27.64	0.00	28.68	0.40	29.72	0.59	30.76	7.51
27.66	0.01	28.70	0.41	29.74	0.59	30.78	7.81
27.68	0.02	28.72	0.41	29.76	0.59	30.80	8.12
27.70	0.02	28.74	0.41	29.78	0.60	30.82	8.44
27.72	0.03	28.76	0.42	29.80	0.60	30.84	8.75
27.74	0.04	28.78	0.42	29.82	0.60	30.86	9.08
27.76	0.06	28.80	0.43	29.84	0.61	30.88	9.40
27.78	0.07	28.82	0.43	29.86	0.61	30.90	9.66
27.80	0.08	28.84	0.44	29.88	0.61	30.92	9.70
27.82	0.10	28.86	0.44	29.90	0.61	30.94	9.74
27.84	0.11	28.88	0.44	29.92	0.62	30.96	9.77
27.86	0.13	28.90	0.45	29.94	0.62	30.98	9.81
27.88	0.14	28.92	0.45	29.96	0.62	31.00	9.84
27.90	0.15	28.94	0.46	29.98	0.63	31.02	9.88
27.92	0.17	28.96	0.46	30.00	0.63	31.04	9.91
27.94	0.17	28.98	0.46	30.02	0.63	31.06	9.95
27.96	0.18	29.00	0.47	30.04	0.63	31.08	9.98
27.98	0.19	29.02	0.47	30.06	0.64	31.10	10.02
28.00	0.20	29.04	0.47	30.08	0.64	31.12	10.05
28.02	0.21	29.06	0.48	30.10	0.64	31.14	10.09
28.04	0.22	29.08	0.48	30.12	0.68	31.16	10.12
28.06	0.23	29.10	0.49	30.14	0.75	31.18	10.16
28.08	0.24	29.12	0.49	30.16	0.84	31.20	10.19
28.10	0.24	29.14	0.49	30.18	0.95	31.22	10.23
28.12	0.25	29.16	0.50	30.20	1.07	31.24	10.26
28.14	0.26	29.18	0.50	30.22	1.20	31.26	10.29
28.16	0.26	29.20	0.50	30.24	1.34	31.28	10.33
28.18	0.27	29.22	0.51	30.26	1.49	31.30	10.36
28.20	0.28	29.24	0.51	30.28	1.66	31.32	10.40
28.22	0.28	29.26	0.51	30.30	1.83	31.34	10.43
28.24	0.29	29.28	0.52	30.32	2.01	31.36	10.46
28.26	0.30	29.30	0.52	30.34	2.19	31.38	10.50
28.28	0.30	29.32	0.52	30.36	2.39	31.40	10.53
28.30	0.31	29.34	0.53	30.38	2.59	31.42	10.56
28.32	0.31	29.36	0.53	30.40	2.80	31.44	10.59
28.34	0.32	29.38	0.53	30.42	3.01	31.46	10.63
28.36	0.32	29.40	0.54	30.44	3.24	31.48	10.66
28.38	0.33	29.42	0.54	30.46	3.46	31.50	10.69
28.40	0.33	29.44	0.54	30.48	3.70	31.52	10.73
28.42	0.34	29.46	0.55	30.50	3.94	31.54	10.76
28.44	0.34	29.48	0.55	30.52	4.18	31.56	10.79
28.46	0.35	29.50	0.55	30.54	4.43	31.58	10.83
28.48	0.35	29.52	0.56	30.56	4.69	31.60	10.86
28.50	0.36	29.54	0.56	30.58	4.95	31.62	**10.89**
28.52	0.36	29.56	0.56	30.60	5.22		
28.54	0.37	29.58	0.57	30.62	5.49		
28.56	0.37	29.60	0.57	30.64	5.76		
28.58	0.38	29.62	0.57	30.66	6.04		
28.60	0.38	29.64	0.58	30.68	6.33		
28.62	0.39	29.66	0.58	30.70	6.62		

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
WATER QUANTITY CALCULATIONS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2K(8)	0-28633
CHECKED BY: ASamberg						

Summary for Subcatchment 18a: Inlet 5-7

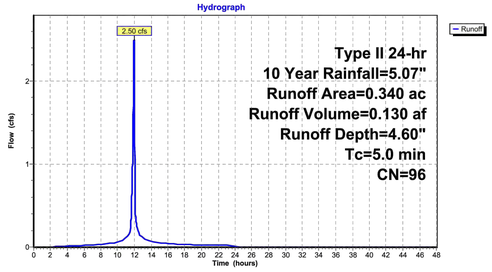
Runoff = 2.50 cfs @ 11.96 hrs, Volume= 0.130 af, Depth= 4.60"
Routed to Pond 18b : 5-22

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

	Area (ac)	CN	Description
*	0.300	98	
*	0.040	80	
	0.340	96	Weighted Average
	0.040		11.76% Pervious Area
	0.300		88.24% Impervious Area

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

Subcatchment 18a: Inlet 5-7



Summary for Pond 18b: 5-22

Inflow Area = 0.340 ac, 88.24% Impervious, Inflow Depth = 4.60" for 10 Year event
Inflow = 2.50 cfs @ 11.96 hrs, Volume= 0.130 af
Outflow = 0.47 cfs @ 12.11 hrs, Volume= 0.130 af, Atten= 81%, Lag= 9.1 min
Primary = 0.47 cfs @ 12.11 hrs, Volume= 0.130 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 36.02' @ 12.11 hrs Surf.Area= 495 sf Storage= 1,949 cf

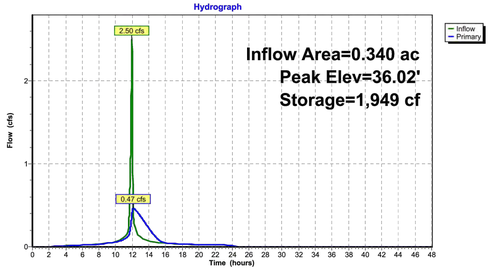
Plug-Flow detention time= 37.0 min calculated for 0.130 af (100% of inflow)
Center-of-Mass det. time= 37.0 min (794.4 - 757.4)

Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	2,475 cf	**60.0" W x 60.0" H Box Pipe Storage** x 3 L= 33.0' S= 0.0050 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.00'	**15.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 32.00' / 31.60' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	36.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	32.00'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.47 cfs @ 12.11 hrs HW=36.02' (Free Discharge)
└**1=Culvert** (Passes 0.47 cfs of 10.89 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Orifice Controls 0.47 cfs @ 9.50 fps)

Pond 18b: 5-22



Stage-Area-Storage for Pond 18b: 5-22

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
32.00	0	34.60	1,246
32.05	4	34.65	1,271
32.10	15	34.70	1,296
32.15	34	34.75	1,320
32.20	58	34.80	1,345
32.25	83	34.85	1,370
32.30	108	34.90	1,395
32.35	132	34.95	1,419
32.40	157	35.00	1,444
32.45	182	35.05	1,469
32.50	207	35.10	1,494
32.55	231	35.15	1,518
32.60	256	35.20	1,543
32.65	281	35.25	1,568
32.70	306	35.30	1,593
32.75	330	35.35	1,617
32.80	355	35.40	1,642
32.85	380	35.45	1,667
32.90	405	35.50	1,692
32.95	429	35.55	1,716
33.00	454	35.60	1,741
33.05	479	35.65	1,766
33.10	504	35.70	1,791
33.15	528	35.75	1,815
33.20	553	35.80	1,840
33.25	578	35.85	1,865
33.30	603	35.90	1,890
33.35	627	35.95	1,914
33.40	652	36.00	1,939
33.45	677	36.05	1,964
33.50	702	36.10	1,989
33.55	726	36.15	2,013
33.60	751	36.20	2,038
33.65	776	36.25	2,063
33.70	801	36.30	2,088
33.75	825	36.35	2,112
33.80	850	36.40	2,137
33.85	875	36.45	2,162
33.90	900	36.50	2,187
33.95	924	36.55	2,211
34.00	949	36.60	2,236
34.05	974	36.65	2,261
34.10	999	36.70	2,286
34.15	1,023	36.75	2,310
34.20	1,048	36.80	2,335
34.25	1,073	36.85	2,360
34.30	1,098	36.90	2,385
34.35	1,122	36.95	2,409
34.40	1,147	37.00	2,434
34.45	1,172	37.05	2,455
34.50	1,197	37.10	2,469
34.55	1,221	37.15	**2,475**

Stage-Discharge for Pond 18b: 5-22

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
32.00	0.00	34.60	0.37
32.05	0.01	34.65	0.38
32.10	0.02	34.70	0.38
32.15	0.04	34.75	0.38
32.20	0.06	34.80	0.39
32.25	0.08	34.85	0.39
32.30	0.10	34.90	0.39
32.35	0.11	34.95	0.40
32.40	0.12	35.00	0.40
32.45	0.13	35.05	0.40
32.50	0.14	35.10	0.41
32.55	0.15	35.15	0.41
32.60	0.16	35.20	0.41
32.65	0.17	35.25	0.42
32.70	0.18	35.30	0.42
32.75	0.19	35.35	0.42
32.80	0.19	35.40	0.43
32.85	0.20	35.45	0.43
32.90	0.21	35.50	0.43
32.95	0.21	35.55	0.44
33.00	0.22	35.60	0.44
33.05	0.23	35.65	0.44
33.10	0.23	35.70	0.45
33.15	0.24	35.75	0.45
33.20	0.25	35.80	0.45
33.25	0.25	35.85	0.46
33.30	0.26	35.90	0.46
33.35	0.26	35.95	0.46
33.40	0.27	36.00	0.47
33.45	0.27	36.05	0.47
33.50	0.28	36.10	0.47
33.55	0.28	36.15	0.47
33.60	0.29	36.20	0.48
33.65	0.29	36.25	0.48
33.70	0.30	36.30	0.48
33.75	0.30	36.35	0.49
33.80	0.31	36.40	0.49
33.85	0.31	36.45	0.49
33.90	0.31	36.50	0.49
33.95	0.32	36.55	0.68
34.00	0.32	36.60	1.01
34.05	0.33	36.65	1.45
34.10	0.33	36.70	1.96
34.15	0.34	36.75	2.53
34.20	0.34	36.80	3.17
34.25	0.34	36.85	3.85
34.30	0.35	36.90	4.59
34.35	0.35	36.95	5.37
34.40	0.36	37.00	6.19
34.45	0.36	37.05	7.05
34.50	0.36	37.10	7.94
34.55	0.37	37.15	**8.88**

Summary for Subcatchment 19a: Outfall 19

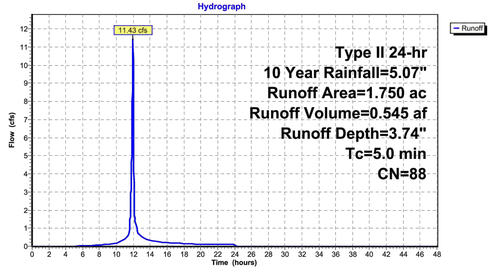
Runoff = 11.43 cfs @ 11.96 hrs, Volume= 0.545 af, Depth= 3.74"
Routed to Pond 19b : 7-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Year Rainfall=5.07"

	Area (ac)	CN	Description
*	0.770	98	
*	0.980	80	
	1.750	88	Weighted Average
	0.980		56.00% Pervious Area
	0.770		44.00% Impervious Area

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

Subcatchment 19a: Outfall 19



Summary for Pond 19b: 7-6

Inflow Area = 1.750 ac, 44.00% Impervious, Inflow Depth = 3.74" for 10 Year event
Inflow = 11.43 cfs @ 11.96 hrs, Volume= 0.545 af
Outflow = 2.91 cfs @ 12.08 hrs, Volume= 0.545 af, Atten= 75%, Lag= 7.5 min
Primary = 2.91 cfs @ 12.08 hrs, Volume= 0.545 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 53.39' @ 12.08 hrs Surf.Area= 0.033 ac Storage= 0.171 af

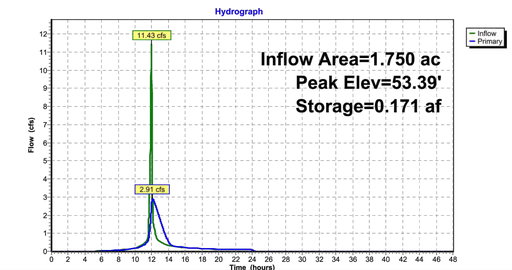
Plug-Flow detention time= 22.4 min calculated for 0.545 af (100% of inflow)
Center-of-Mass det. time= 22.4 min (815.7 - 793.3)

Volume	Invert	Avail.Storage	Storage Description
#1	48.00'	0.198 af	**96.0" W x 72.0" H Box Pipe Storage** x 2 L= 90.0' S= 0.0050 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**15.0" Round Culvert** L= 13.0' Ke= 0.500 Inlet / Outlet Invert= 48.00' / 47.50' S= 0.0385 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	53.50'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	48.00'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.91 cfs @ 12.08 hrs HW=53.39' (Free Discharge)
└**1=Culvert** (Passes 2.91 cfs of 12.90 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Orifice Controls 2.91 cfs @ 10.87 fps)

Pond 19b: 7-6



Stage-Area-Storage for Pond 19b: 7-6

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
48.00	0.000	50.60	0.079	53.20	0.164
48.05	0.000	50.65	0.080	53.25	0.166
48.10	0.000	50.70	0.082	53.30	0.168
48.15	0.001	50.75	0.083	53.35	0.169
48.20	0.001	50.80	0.085	53.40	0.171
48.25	0.002	50.85	0.087	53.45	0.173
48.30	0.003	50.90	0.088	53.50	0.174
48.35	0.004	50.95	0.090	53.55	0.176
48.40	0.006	51.00	0.092	53.60	0.178
48.45	0.007	51.05	0.093	53.65	0.179
48.50	0.009	51.10	0.095	53.70	0.181
48.55	0.011	51.15	0.097	53.75	0.183
48.60	0.012	51.20	0.098	53.80	0.184
48.65	0.014	51.25	0.100	53.85	0.186
48.70	0.016	51.30	0.102	53.90	0.188
48.75	0.017	51.35	0.103	53.95	0.189
48.80	0.019	51.40	0.105	54.00	0.191
48.85	0.021	51.45	0.107	54.05	0.192
48.90	0.022	51.50	0.108	54.10	0.194
48.95	0.024	51.55	0.110	54.15	0.195
49.00	0.026	51.60	0.112	54.20	0.196
49.05	0.027	51.65	0.113	54.25	0.197
49.10	0.029	51.70	0.115	54.30	0.198
49.15	0.031	51.75	0.117	54.35	0.198
49.20	0.032	51.80	0.118	54.40	0.198
49.25	0.034	51.85	0.120	54.45	**0.198**
49.30	0.036	51.90	0.121		
49.35	0.037	51.95	0.123		
49.40	0.039	52.00	0.125		
49.45	0.040	52.05	0.126		
49.50	0.042	52.10	0.128		
49.55	0.044	52.15	0.130		
49.60	0.045	52.20	0.131		
49.65	0.047	52.25	0.133		
49.70	0.049	52.30	0.135		
49.75	0.050	52.35	0.136		
49.80	0.052	52.40	0.138		
49.85	0.054	52.45	0.140		
49.90	0.055	52.50	0.141		
49.95	0.057	52.55	0.143		
50.00	0.059	52.60	0.145		
50.05	0.060	52.65	0.146		
50.10	0.062	52.70	0.148		
50.15	0.064	52.75	0.150		
50.20	0.065	52.80	0.151		
50.25	0.067	52.85	0.153		
50.30	0.069	52.90	0.155		
50.35	0.070	52.95	0.156		
50.40	0.072	53.00	0.158		
50.45	0.074	53.05	0.160		
50.50	0.075	53.10	0.161		
50.55	0.077	53.15	0.163		

Stage-Discharge for Pond 19b: 7-6

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
48.00	0.00	50.60	1.96	53.20	2.85
48.05	0.01	50.65	1.98	53.25	2.87
48.10	0.03	50.70	2.00	53.30	2.88
48.15	0.07	50.75	2.02	53.35	2.89
48.20	0.12	50.80	2.04	53.40	2.91
48.25	0.19	50.85	2.06	53.45	2.92
48.30	0.26	50.90	2.08	53.50	2.94
48.35	0.34	50.95	2.10	53.55	3.24
48.40	0.42	51.00	2.12	53.60	3.79
48.45	0.51	51.05	2.14	53.65	4.49
48.50	0.59	51.10	2.16	53.70	5.32
48.55	0.66	51.15	2.18	53.75	6.26
48.60	0.71	51.20	2.19	53.80	7.29
48.65	0.77	51.25	2.21	53.85	8.40
48.70	0.82	51.30	2.23	53.90	9.60
48.75	0.87	51.35	2.25	53.95	10.87
48.80	0.92	51.40	2.27	54.00	12.21
48.85	0.96	51.45	2.29	54.05	13.61
48.90	1.00	51.50	2.30	54.10	13.83
48.95	1.04	51.55	2.32	54.15	13.89
49.00	1.08	51.60	2.34	54.20	13.95
49.05	1.12	51.65	2.36	54.25	14.01
49.10	1.16	51.70	2.38	54.30	14.08
49.15	1.19	51.75	2.39	54.35	14.14
49.20	1.23	51.80	2.41	54.40	14.20
49.25	1.26	51.85	2.43	54.45	**14.26**
49.30	1.29	51.90	2.44		
49.35	1.32	51.95	2.46		
49.40	1.35	52.00	2.48		
49.45	1.38	52.05	2.49		
49.50	1.41	52.10	2.51		
49.55	1.44	52.15	2.53		
49.60	1.47	52.20	2.54		
49.65	1.50	52.25	2.56		
49.70	1.53	52.30	2.58		
49.75	1.55	52.35	2.59		
49.80	1.58	52.40	2.61		
49.85	1.61	52.45	2.62		
49.90	1.63	52.50	2.64		
49.95	1.66	52.55	2.66		
50.00	1.68	52.60	2.67		
50.05	1.71	52.65	2.69		
50.10	1.73	52.70	2.70		
50.15	1.75	52.75	2.72		
50.20	1.78	52.80	2.73		
50.25	1.80	52.85	2.75		
50.30	1.82	52.90	2.76		
50.35	1.85	52.95	2.78		
50.40	1.87	53.00	2.79		
50.45	1.89	53.05	2.81		
50.50	1.91	53.10	2.82		
50.55	1.93	53.15	2.84		

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

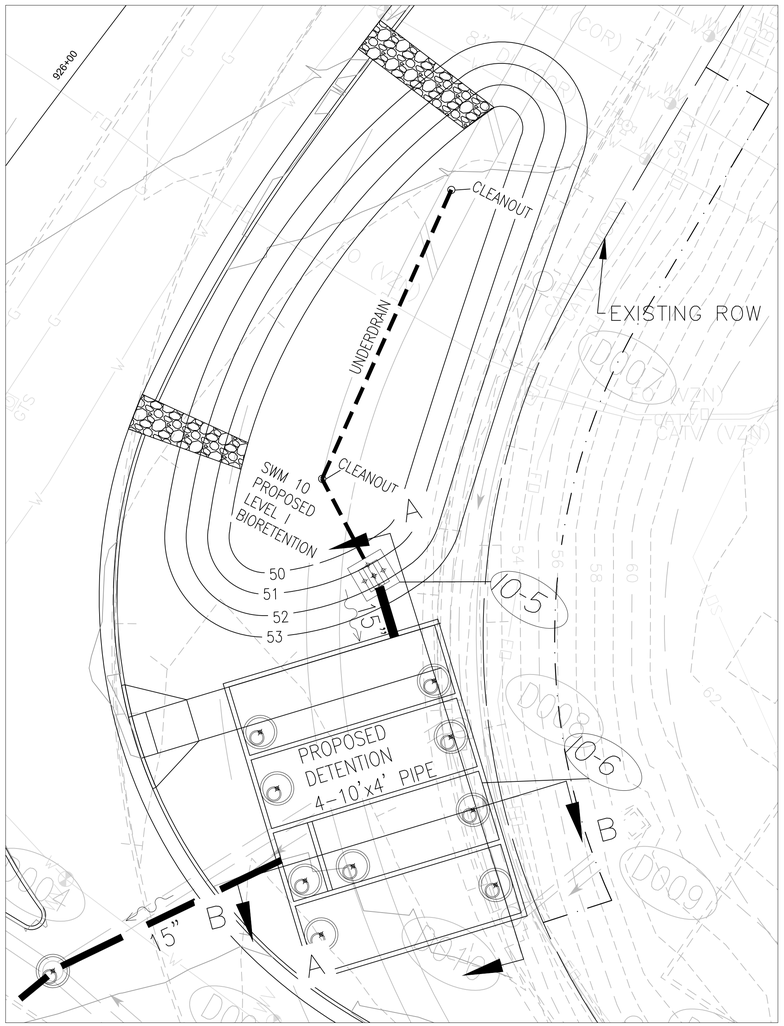
RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
WATER QUANTITY CALCULATIONS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2K(9)	0-28633
CHECKED BY: ASamberg						

SWM 1 - BIORETENTION LEVEL 1 & UNDERGROUND DETENTION 10-6



Drainage Area A

Drainage Area A Land Cover (acres) *Check Site Tab land cover areas!*

CLEAR BMP AREAS

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)				0.65	0.65	0.25
Impervious Cover (acres)				0.56	0.56	0.95
				Total	1.21	

Total Phosphorus Available for Removal in D.A. A (lb/yr)	1.58
Post Development Treatment Volume in D.A. A (ft^3)	2,521

6. Bioretention (RR)												
6.a. Bioretention #1 or Micro-Bioretention #1 or Urban Bioretention (Spec #9)	40	0.26	0.49	0	770	1,155	1,926	25	0.00	1.21	0.66	0.54
6.b. Bioretention #2 or Micro-Bioretention #2 (Spec #9)	80			0	0	0	0	50	0.00	0.00	0.00	0.00

Required Volume = 1926 cf

Water Quality Volume Provided = 2358 cf

Detention *Type II 24-hr 10 Year Rainfall=5.07"*
Prepared by RKK Printed 6/14/2022
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Stage-Area-Storage for Pond 1b: Bio Level 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
48.25	1,234	0	50.85	1,676	2,101
48.30	1,234	25	50.90	1,702	2,185
48.35	1,234	49	50.95	1,728	2,271
48.40	1,234	74	51.00	1,754	2,358
48.45	1,234	99	51.05	1,783	2,446
48.50	1,234	123	51.10	1,812	2,536
48.55	1,234	148	51.15	1,840	2,627
48.60	1,234	173	51.20	1,869	2,720
48.65	1,234	197	51.25	1,898	2,814
48.70	1,234	222	51.30	1,927	2,910
48.75	1,234	247	51.35	1,956	3,007
48.80	1,234	271	51.40	1,984	3,105
48.85	1,234	296	51.45	2,013	3,205
48.90	1,234	321	51.50	2,042	3,307
48.95	1,234	346	51.55	2,071	3,410
49.00	1,234	370	51.60	2,100	3,514
49.05	1,234	395	51.65	2,128	3,620
49.10	1,234	420	51.70	2,157	3,727
49.15	1,234	444	51.75	2,186	3,835
49.20	1,234	469	51.80	2,215	3,945
49.25	1,234	494	51.85	2,244	4,057
49.30	1,234	518	51.90	2,272	4,170
49.35	1,234	543	51.95	2,301	4,284
49.40	1,234	568	52.00	2,330	4,400
49.45	1,234	592	52.05	2,362	4,517
49.50	1,234	617	52.10	2,393	4,636
49.55	1,234	642	52.15	2,425	4,756
49.60	1,234	666	52.20	2,457	4,878
49.65	1,234	691	52.25	2,488	5,002
49.70	1,234	716	52.30	2,520	5,127
49.75	1,234	740	52.35	2,552	5,254
49.80	1,234	765	52.40	2,583	5,382
49.85	1,234	790	52.45	2,615	5,512
49.90	1,234	814	52.50	2,647	5,644
49.95	1,234	839	52.55	2,678	5,777
50.00	1,234	864	52.60	2,710	5,912
50.05	1,260	926	52.65	2,741	6,048
50.10	1,286	990	52.70	2,773	6,186
50.15	1,312	1,055	52.75	2,805	6,325
50.20	1,338	1,121	52.80	2,836	6,466
50.25	1,364	1,189	52.85	2,868	6,609
50.30	1,390	1,257	52.90	2,900	6,753
50.35	1,416	1,328	52.95	2,931	6,899
50.40	1,442	1,399	53.00	**2,963**	**7,046**
50.45	1,468	1,472			
50.50	1,494	1,546			
50.55	1,520	1,621			
50.60	1,546	1,698			
50.65	1,572	1,776			
50.70	1,598	1,855			
50.75	1,624	1,936			
50.80	1,650	2,017			

Detention *Type II 24-hr 10 Year Rainfall=5.07"*
Prepared by RKK Printed 6/14/2022
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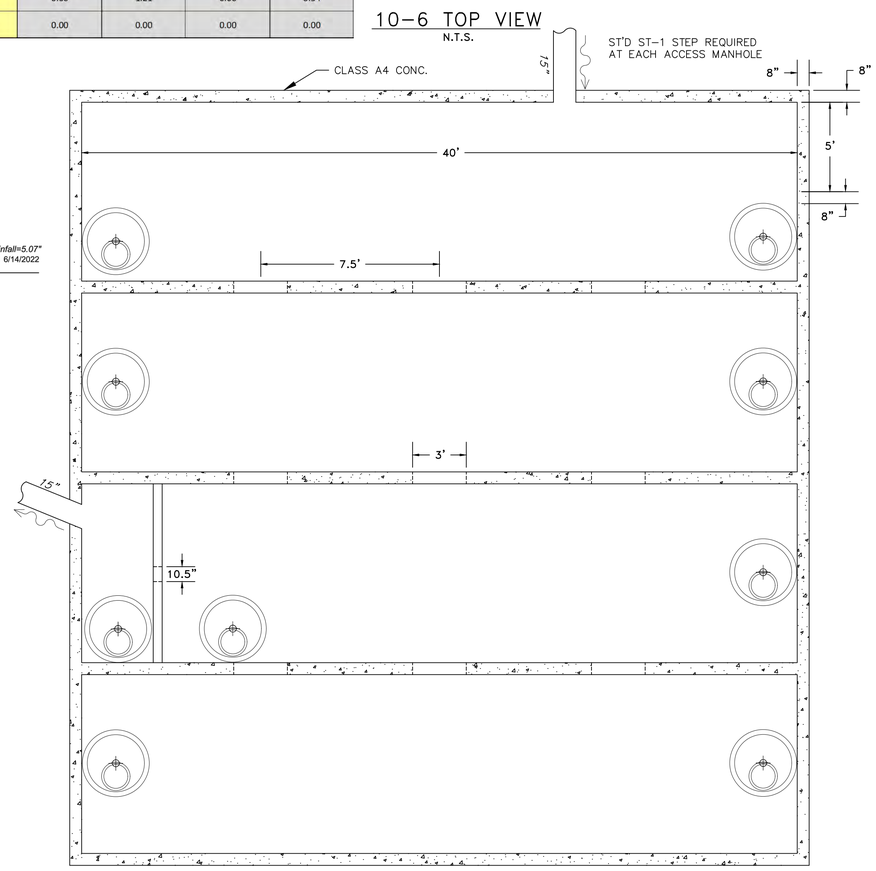
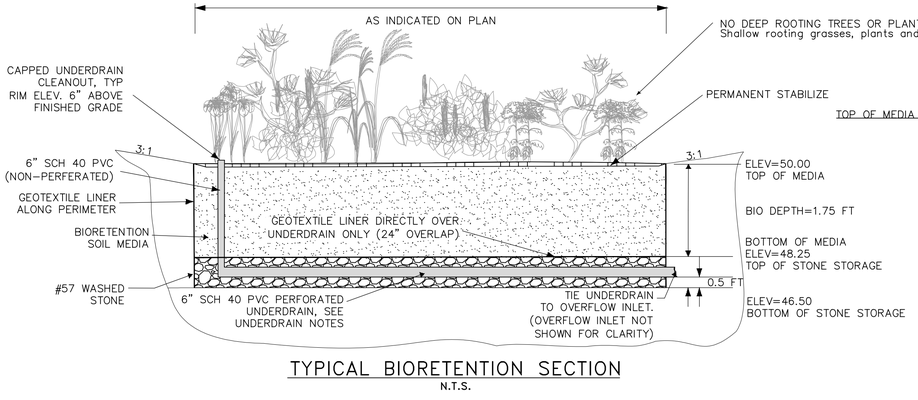
Stage-Discharge for Pond 1b: Bio Level 1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
48.25	0.00	50.85	0.00
48.30	0.00	50.90	0.00
48.35	0.00	50.95	0.00
48.40	0.00	51.00	0.00
48.45	0.00	51.05	0.37
48.50	0.00	51.10	1.03
48.55	0.00	51.15	1.90
48.60	0.00	51.20	2.92
48.65	0.00	51.25	4.09
48.70	0.00	51.30	5.37
48.75	0.00	51.35	6.77
48.80	0.00	51.40	8.27
48.85	0.00	51.45	9.87
48.90	0.00	51.50	11.56
48.95	0.00	51.55	12.43
49.00	0.00	51.60	12.50
49.05	0.00	51.65	12.57
49.10	0.00	51.70	12.64
49.15	0.00	51.75	12.71
49.20	0.00	51.80	12.78
49.25	0.00	51.85	12.84
49.30	0.00	51.90	12.91
49.35	0.00	51.95	12.98
49.40	0.00	52.00	13.05
49.45	0.00	52.05	13.11
49.50	0.00	52.10	13.18
49.55	0.00	52.15	13.25
49.60	0.00	52.20	13.31
49.65	0.00	52.25	13.38
49.70	0.00	52.30	13.44
49.75	0.00	52.35	13.51
49.80	0.00	52.40	13.57
49.85	0.00	52.45	13.64
49.90	0.00	52.50	13.70
49.95	0.00	52.55	13.76
50.00	0.00	52.60	13.83
50.05	0.00	52.65	13.89
50.10	0.00	52.70	13.95
50.15	0.00	52.75	14.01
50.20	0.00	52.80	14.08
50.25	0.00	52.85	14.14
50.30	0.00	52.90	14.20
50.35	0.00	52.95	14.26
50.40	0.00	53.00	**14.32**
50.45	0.00		
50.50	0.00		
50.55	0.00		
50.60	0.00		
50.65	0.00		
50.70	0.00		
50.75	0.00		
50.80	0.00		

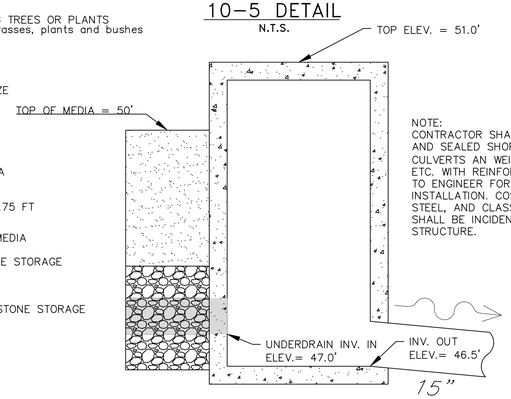
10-6 TOP VIEW
N.T.S.





TYPICAL BIORETENTION SECTION
N.T.S.

10-5 DETAIL
N.T.S.



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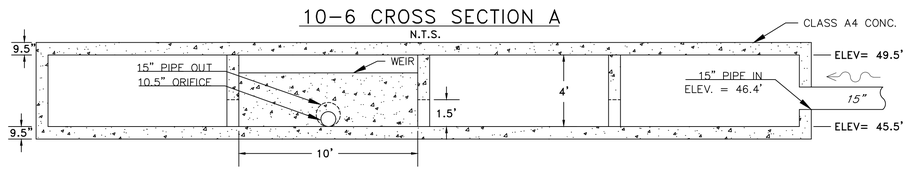
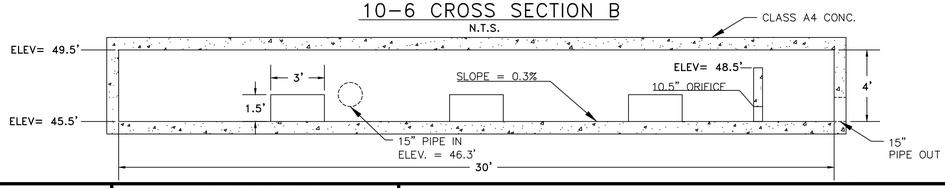
10-6 CROSS SECTION A
N.T.S.



10-6 CROSS SECTION B
N.T.S.



70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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REFERENCES	REVISIONS

Existing Legend
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Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH WV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

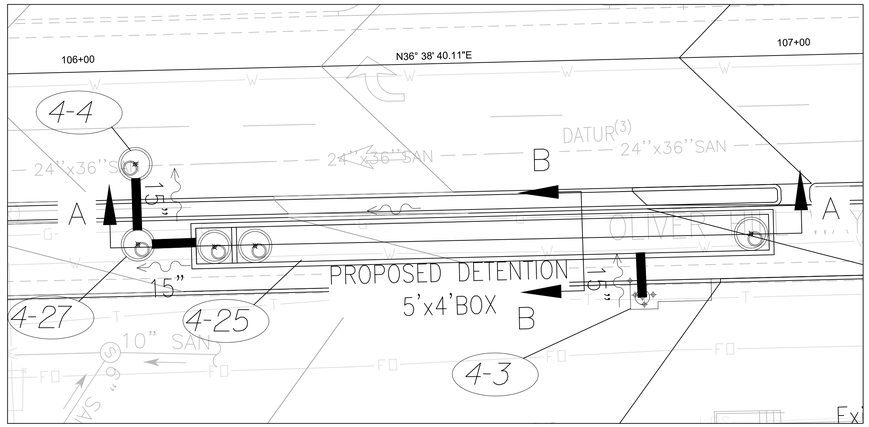
RKK Responsive People - Creative Solutions

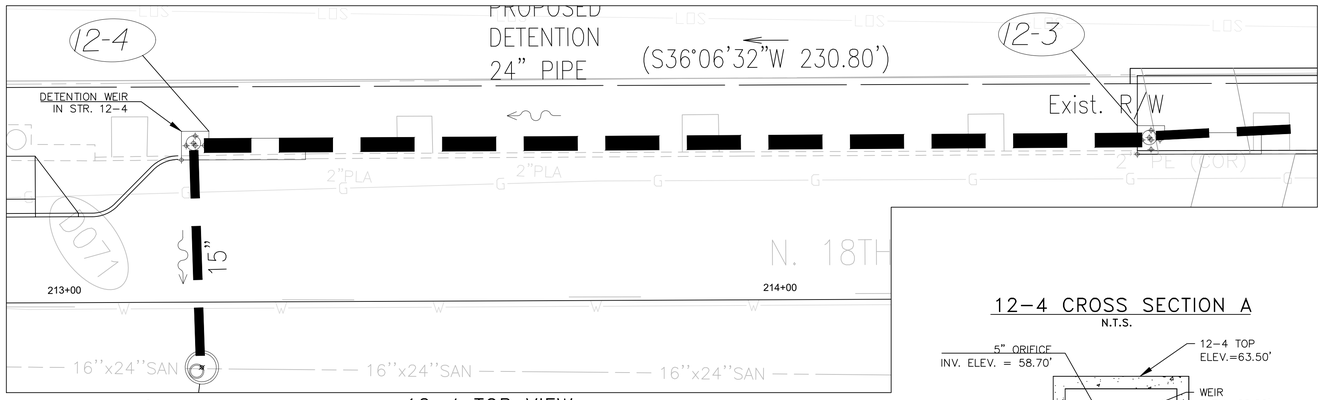
SHOCKOE VALLEY STREET IMPROVEMENTS
STORMWATER DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

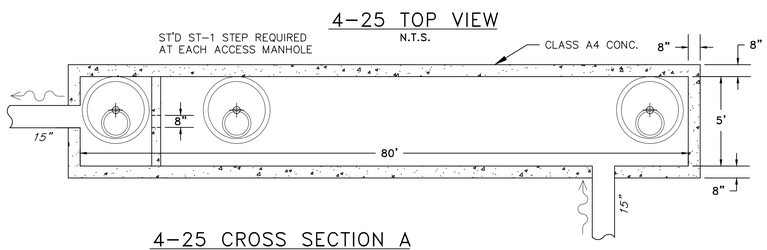
DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2L(1)	DRAWING NO. 0-28633

DETENTION PIPES (4-25, 12-3 TO 12-4, 18-1 TO 18-2)





4-25 TOP VIEW
N.T.S.



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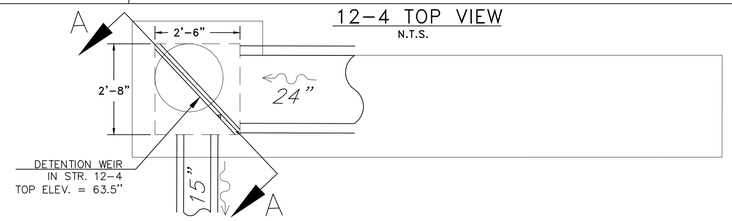
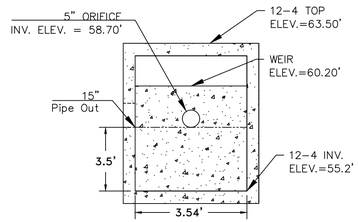
12-4 TOP VIEW
N.T.S.



12-4 CROSS SECTION A
N.T.S.



4-25 CROSS SECTION A
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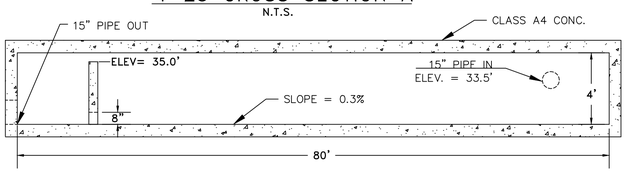
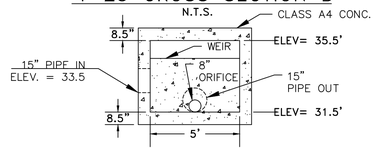
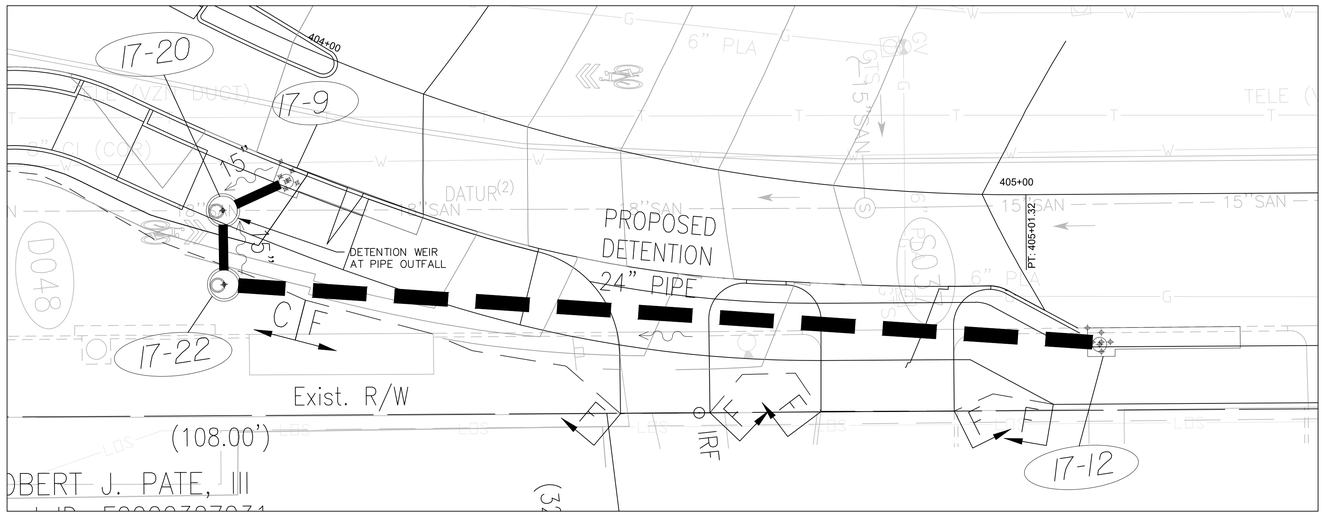
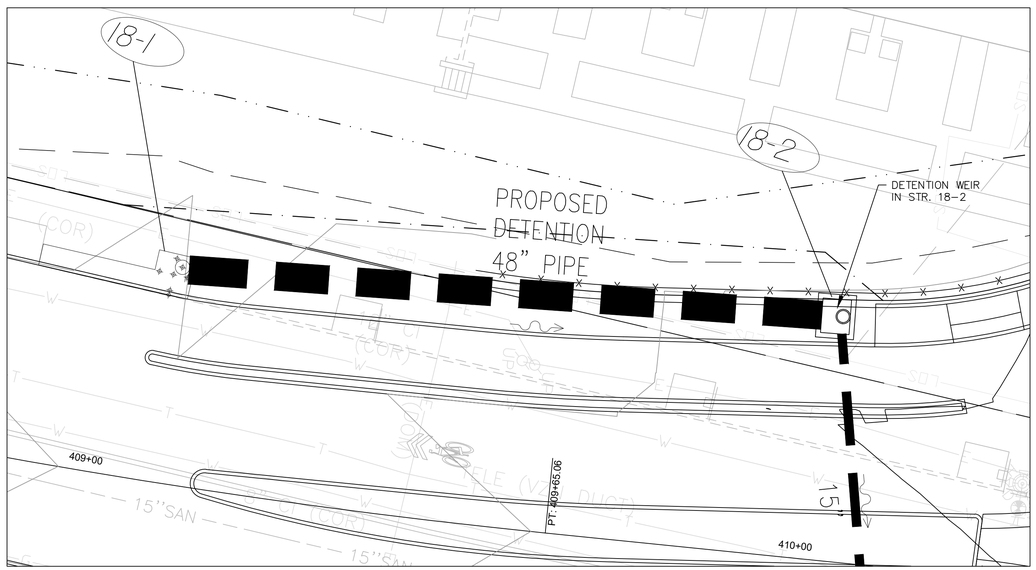


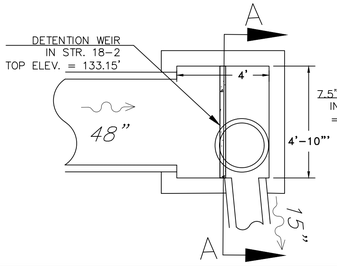
4-25 CROSS SECTION B
N.T.S.







18-2 TOP VIEW
N.T.S.



18-2 CROSS SECTION A
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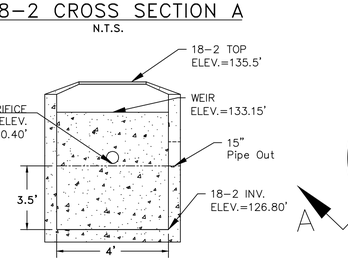
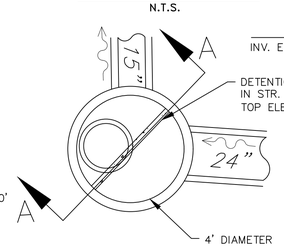
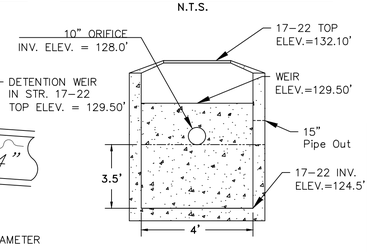


17-22 TOP VIEW
N.T.S.



17-22 CROSS SECTION A
N.T.S.



70% SUBMITTAL
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Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH or VV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SBMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

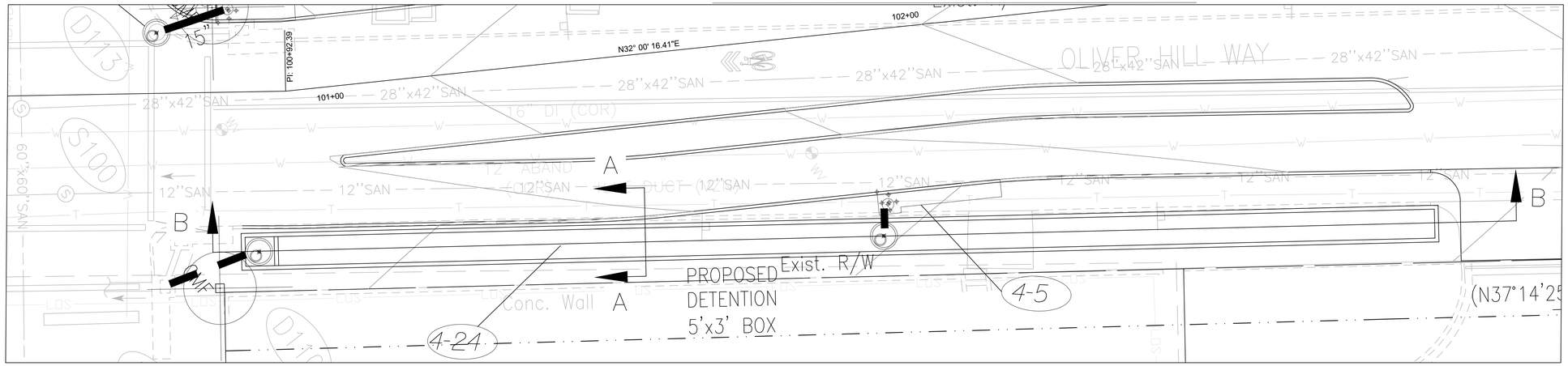
RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
STORMWATER DETAILS

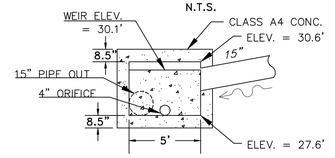
AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2L(2)	0-28633
CHECKED BY: ASamberg						

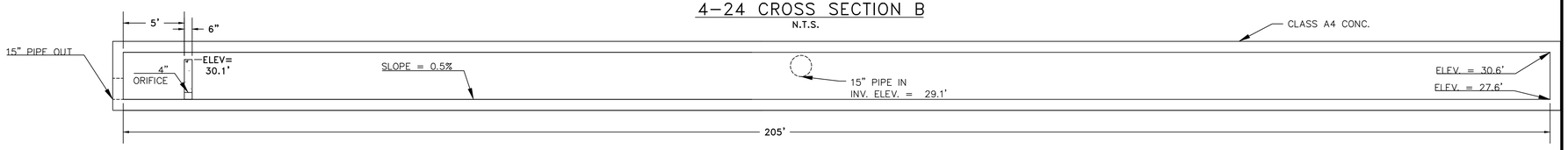
UNDERGROUND DETENTION 4-24 & 5-22



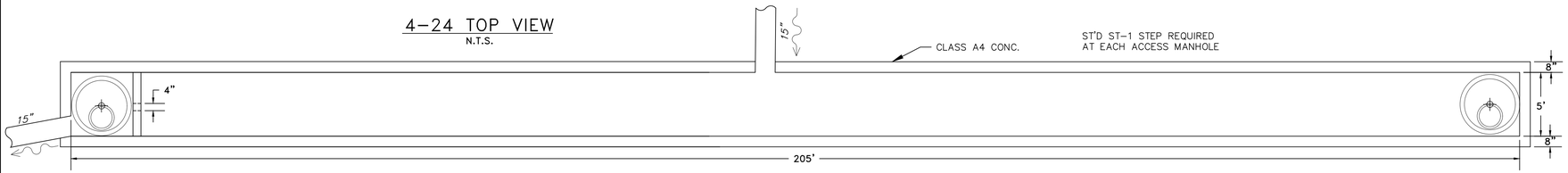
4-24 CROSS SECTION A
N.T.S.

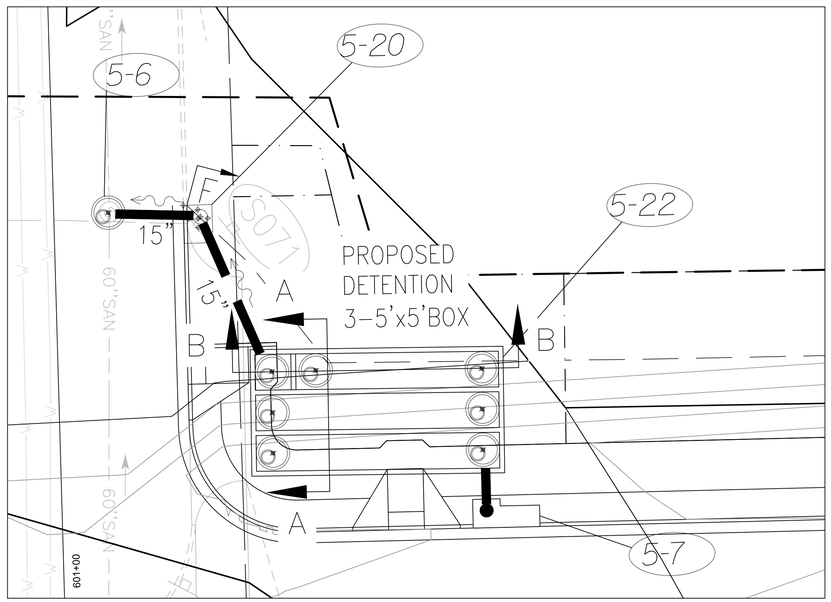


4-24 CROSS SECTION B
N.T.S.

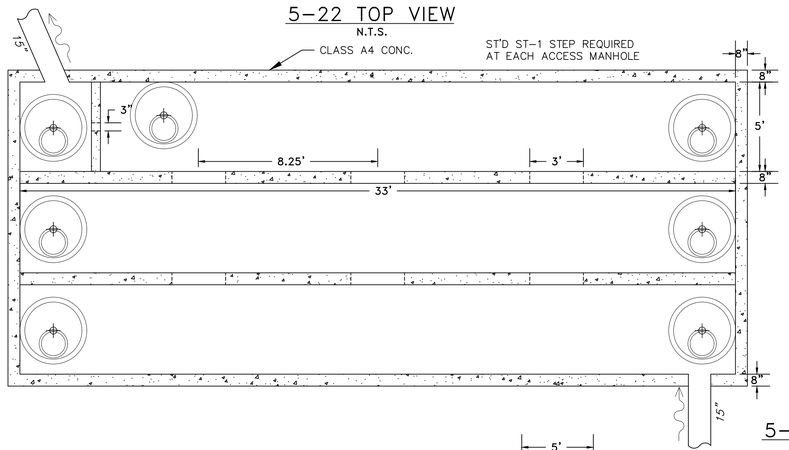


4-24 TOP VIEW
N.T.S.

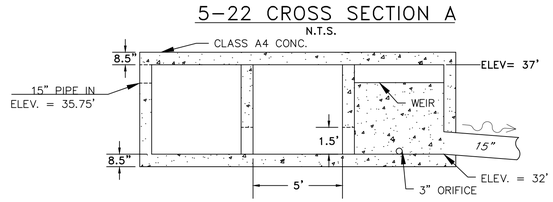




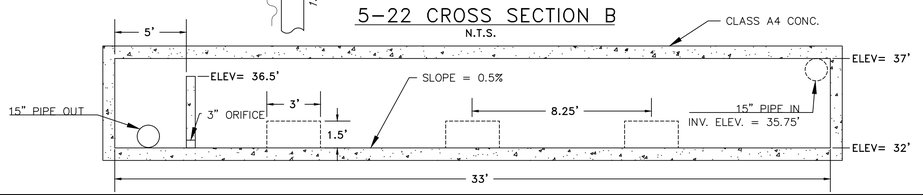
5-22 TOP VIEW
N.T.S.



5-22 CROSS SECTION A
N.T.S.



5-22 CROSS SECTION B
N.T.S.



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Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

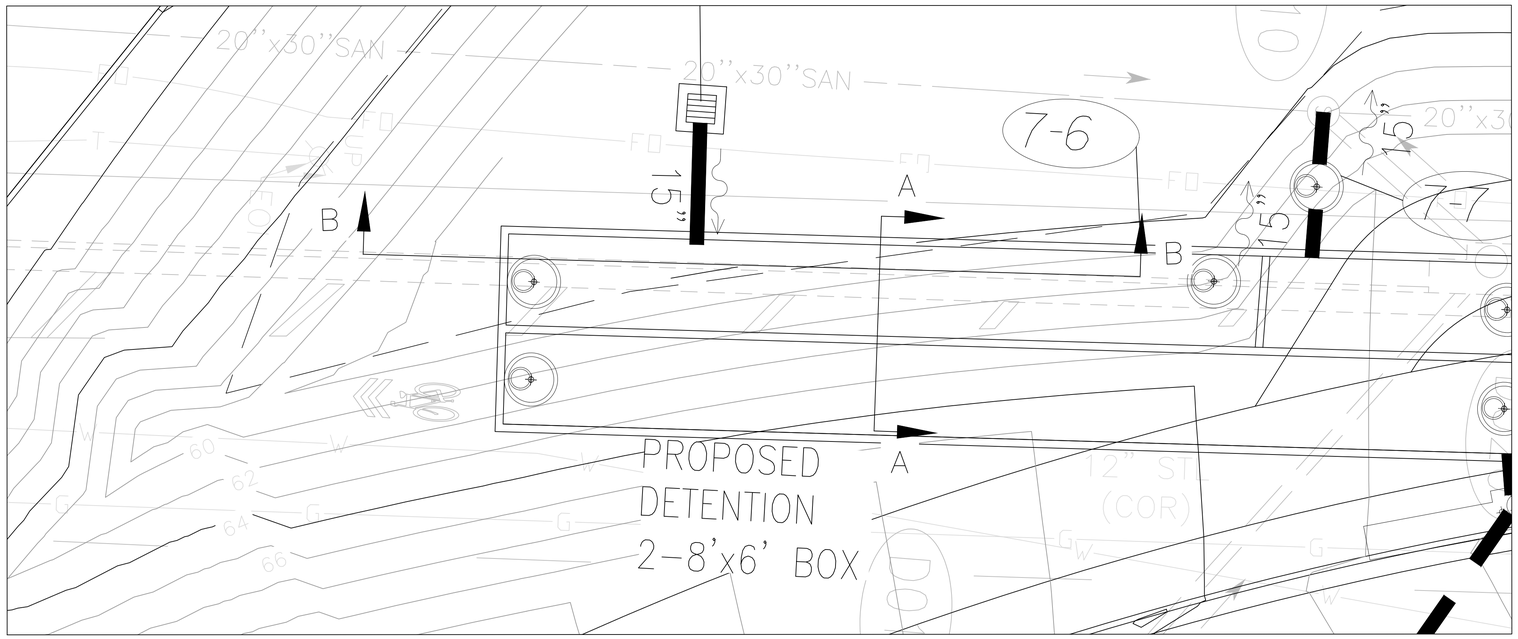
RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
STORMWATER DETAILS

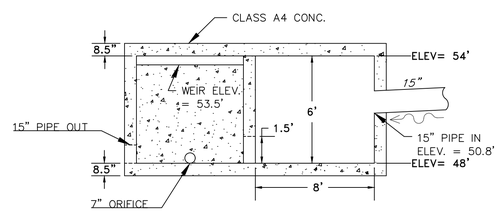
AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2L(3)	DRAWING NO. 0-28633

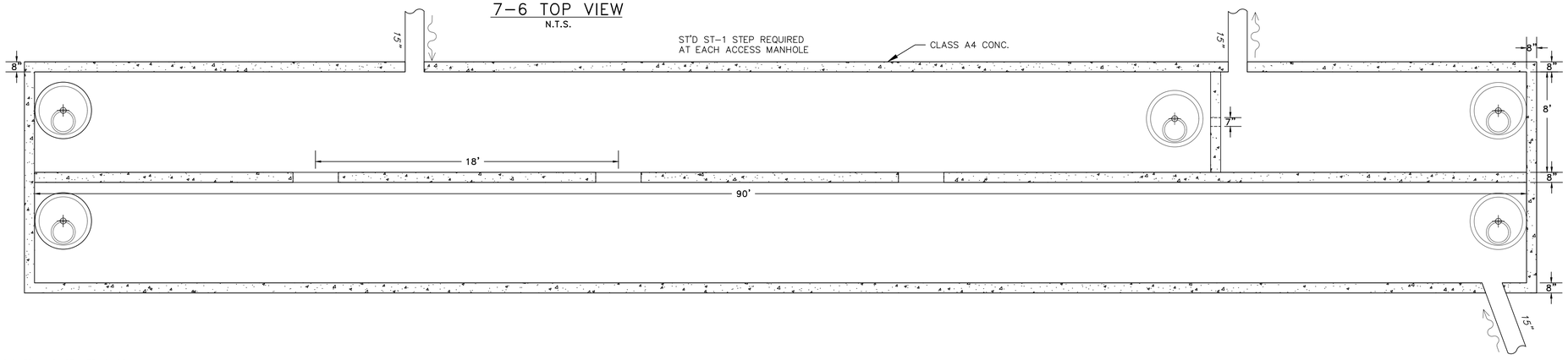
UNDERGROUND DETENTION 7-6



7-6 CROSS SECTION A
N.T.S.



7-6 TOP VIEW
N.T.S.



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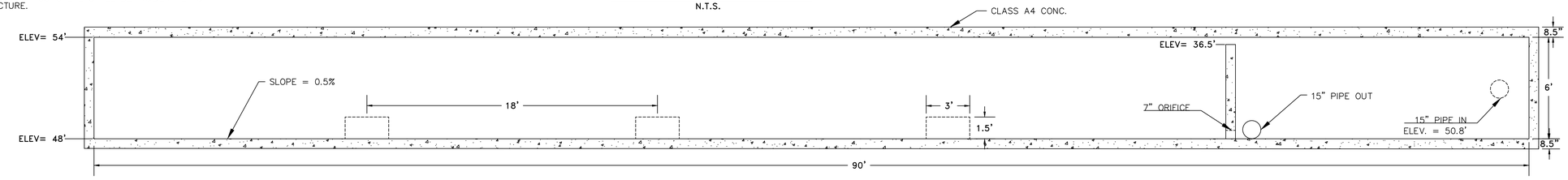
7-6 CROSS SECTION B
N.T.S.



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Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

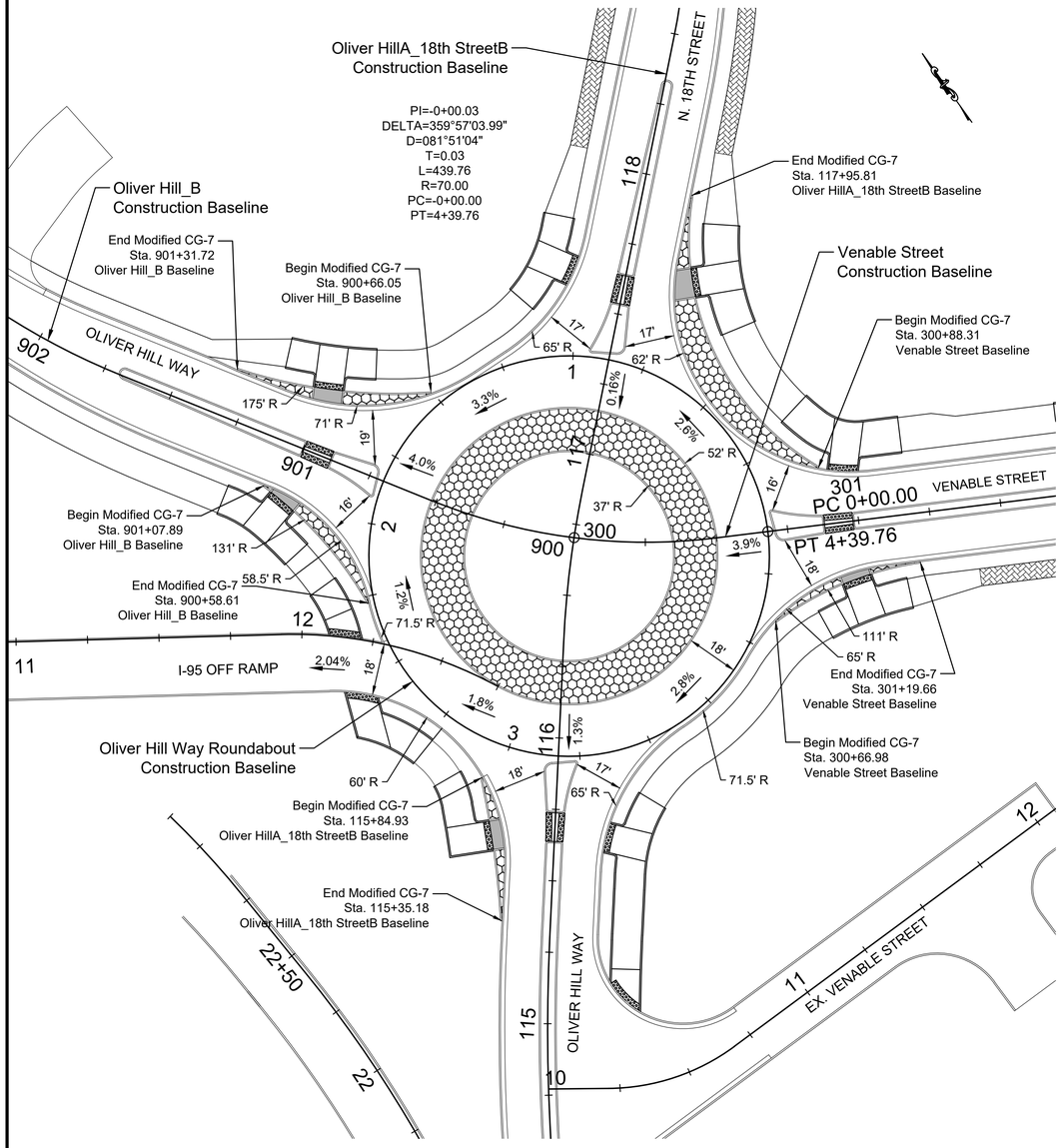
RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
STORMWATER DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

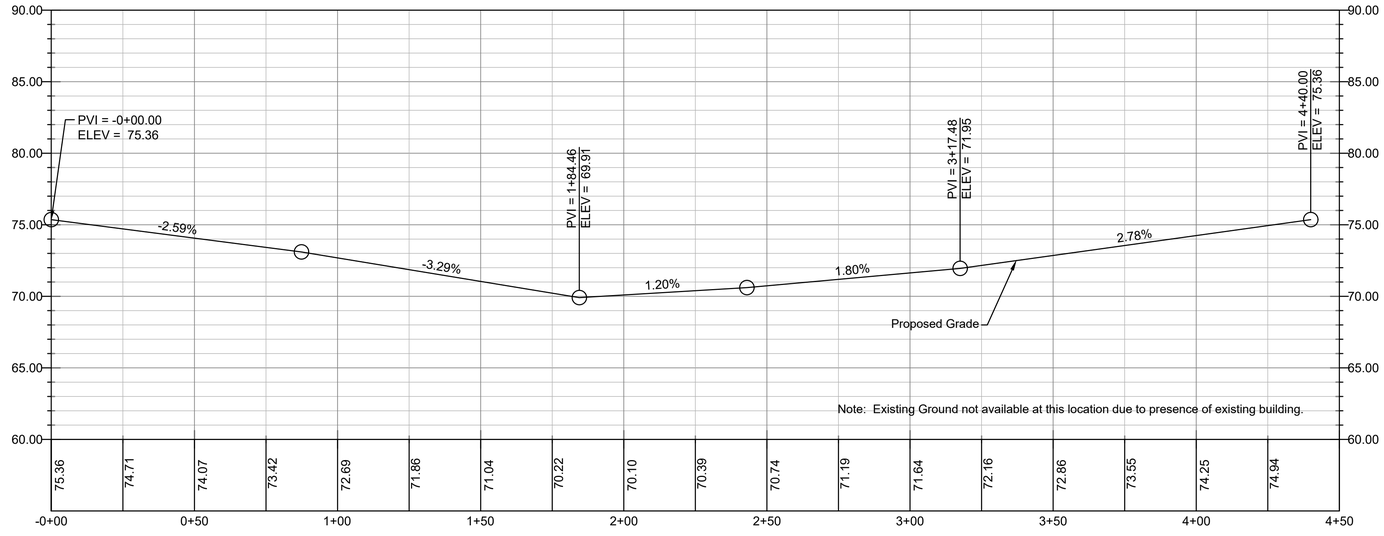
DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2L(4)	0-28633

ROUNDABOUT DETAIL SHEET



POC STA 116+70.29 OLIVER HILLA/18TH STREET B BASELINE =
POC STA 900+00.00 OLIVER HILL_B BASELINE
Δ = 88° 42' 21" LT

PC STA 0+00.00 OLIVER HILL WAY ROUNDABOUT CONSTRUCTION BASELINE =
POT STA 300+68.03 VENABLE STREET CONSTRUCTION BASELINE
Δ = 89° 57' 43" LT



Oliver Hill Roundabout

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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Sanitary Sewer (Gravity)
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Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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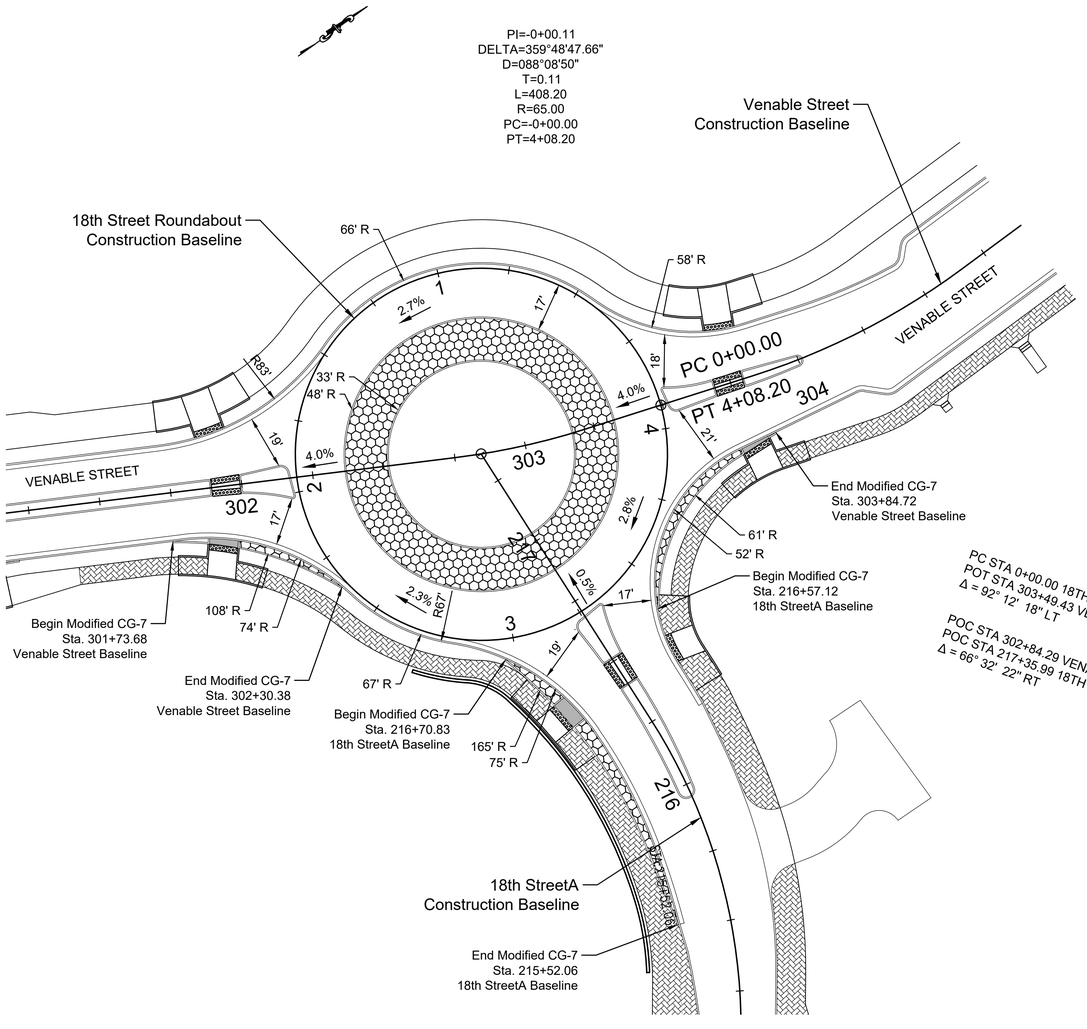
SHOCKOE VALLEY STREET IMPROVEMENTS
OLIVER HILL WAY & 18TH STREET ROUNDABOUT

AUTHORITY: CITY OF RICHMOND, DPW

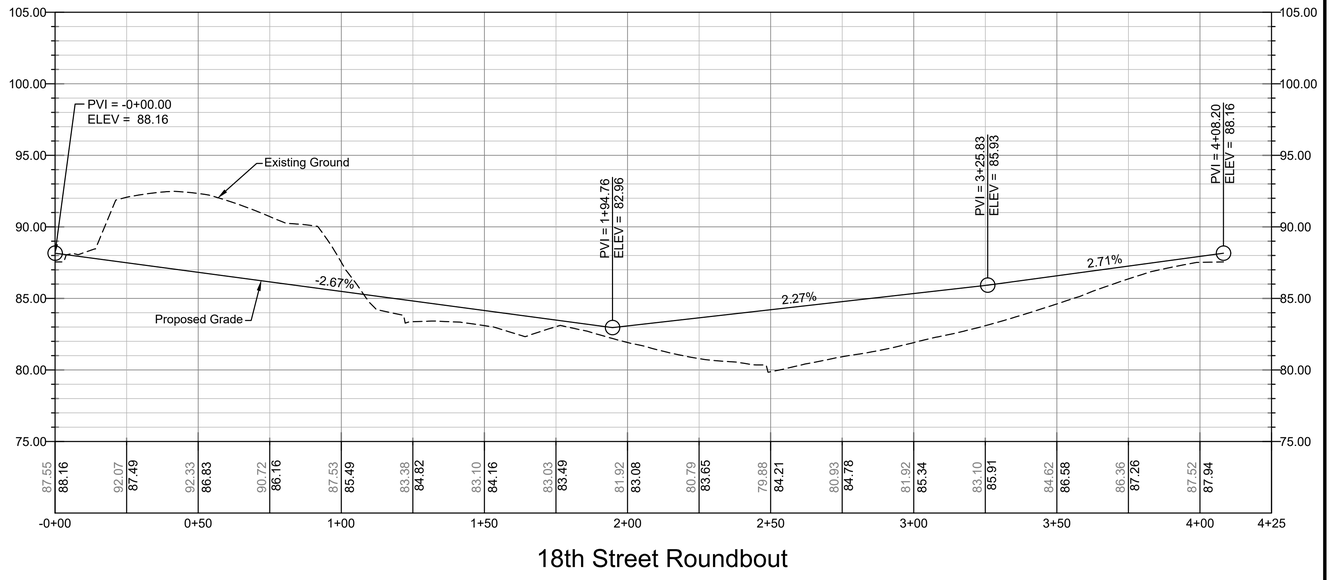
DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2M(1)	DRAWING NO. 0-28633

ROUNDABOUT DETAIL SHEET



PC STA 0+00.00 18TH STREET ROUNDABOUT CONSTRUCTION BASELINE =
POT STA 303+49.43 VENABLE STREET CONSTRUCTION BASELINE
Δ = 92° 12' 18" LT

POC STA 302+84.29 VENABLE STREET CONSTRUCTION BASELINE =
POC STA 217+35.99 18TH STREET A CONSTRUCTION BASELINE
Δ = 66° 32' 22" RT



18th Street Roundbout

25 0 25 50
SCALE IN FEET

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SEPTEMBER 2022

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Existing Curb Cut Ramp
Gas Meter / Valve
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Proposed Legend

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Storm Sewer
Storm/(San) Manhole
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CITY OF RICHMOND ESTABLISHED 1737

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

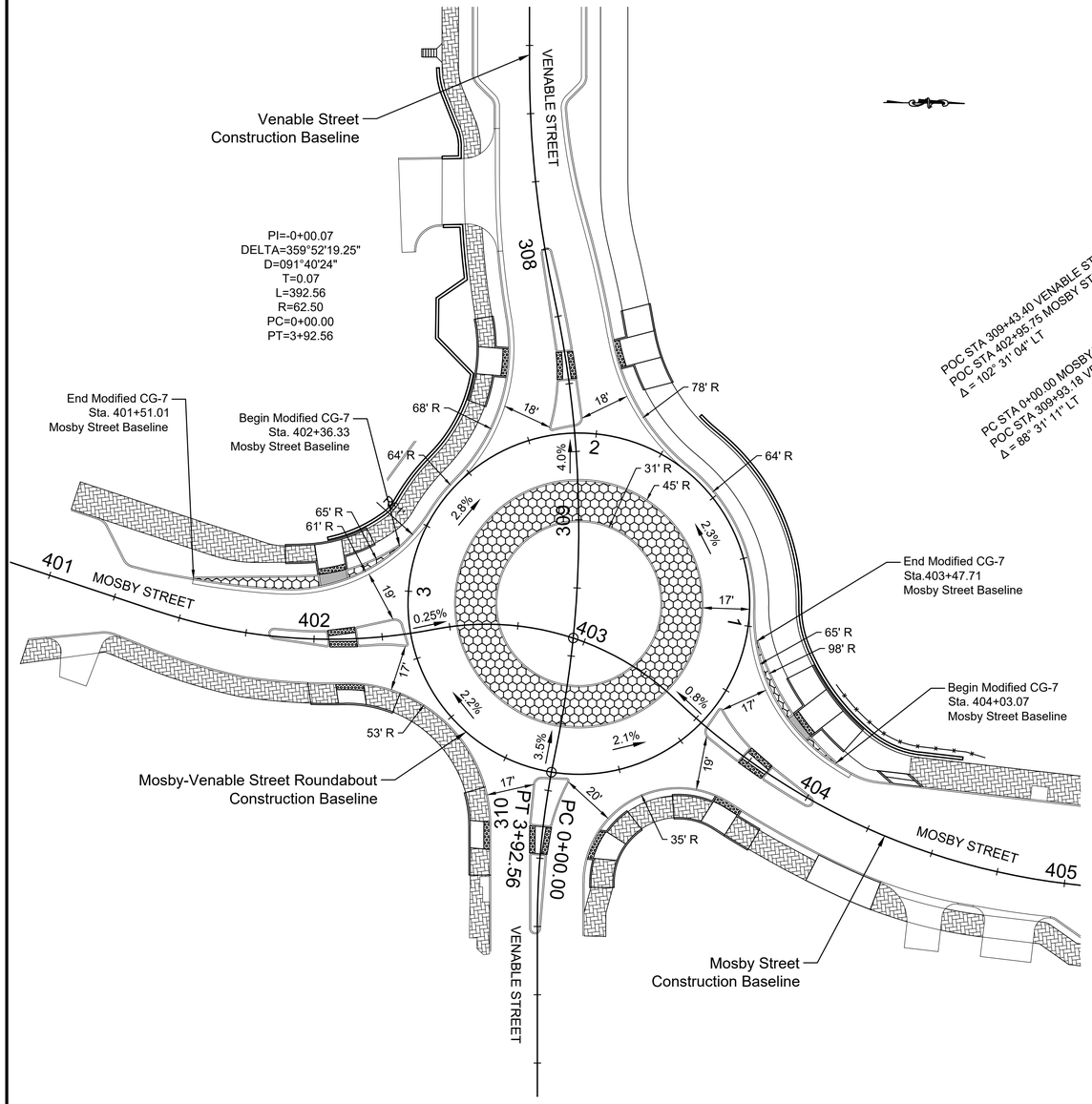
RK&K
Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
18TH STREET AND VENABLE STREET ROUNDABOUT

AUTHORITY: CITY OF RICHMOND, DPW

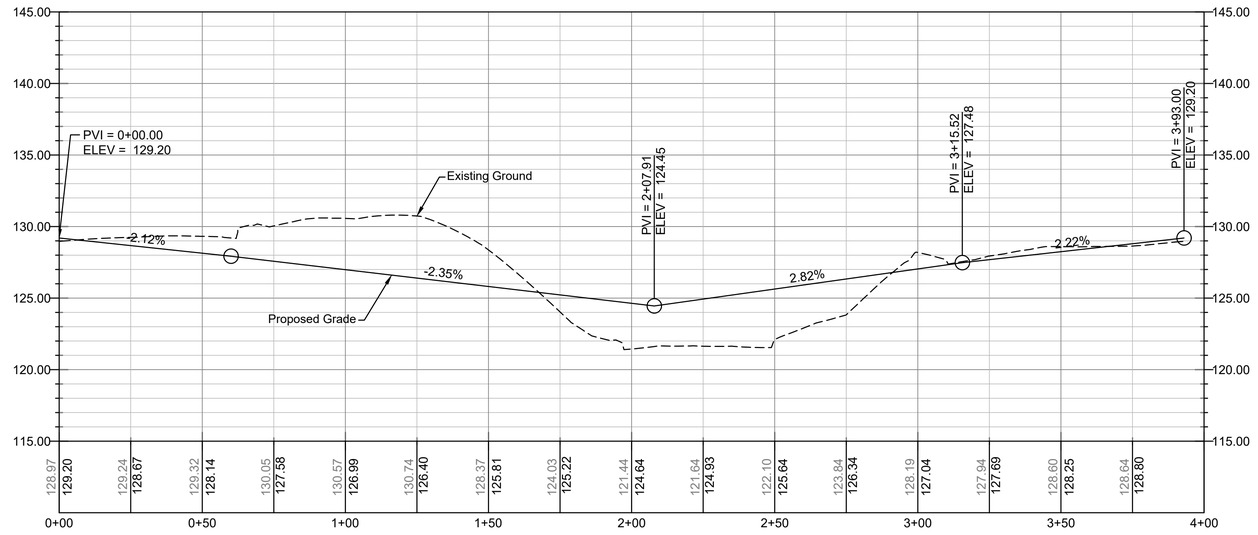
DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2M(2)	DRAWING NO. 0-28633

ROUNDABOUT DETAIL SHEET



POC STA 309+43.40 VENABLE STREET CONSTRUCTION BASELINE =
POC STA 402+95.75 MOSBY STREET CONSTRUCTION BASELINE
Δ = 102° 31' 04" LT

PC STA 0+00.00 MOSBY/VENABLE STREET ROUNDABOUT CONSTRUCTION BASELINE =
POC STA 309+93.18 VENABLE STREET CONSTRUCTION BASELINE
Δ = 88° 31' 11" LT



Mosby-Venable Roundabout

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

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Surveys Superintendent	
Project Manager	Capital Project Administrator
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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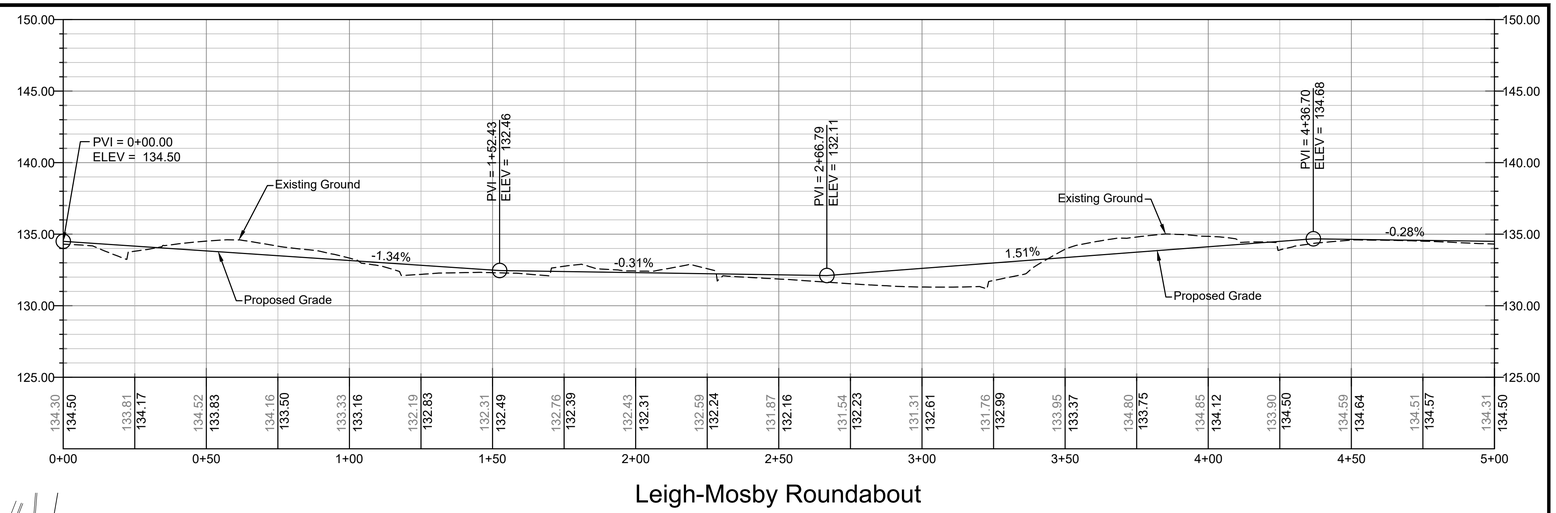
SHOCKOE VALLEY STREET IMPROVEMENTS
MOSBY STREET AND VENABLE STREET ROUNDABOUT

AUTHORITY: CITY OF RICHMOND, DPW

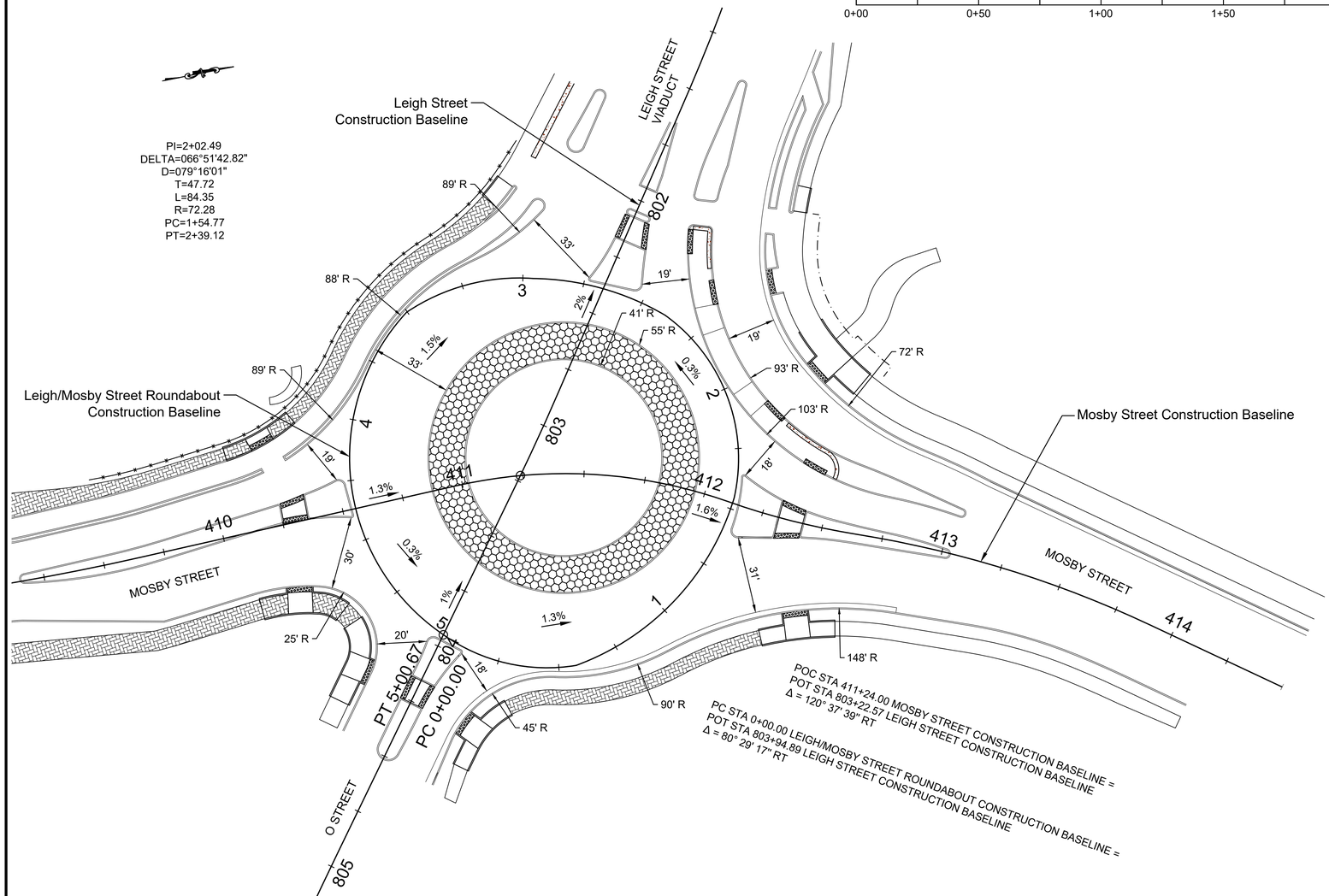
DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2M(3)	0-28633
CHECKED BY: ASamberg						

ROUNDABOUT DETAIL SHEET



Leigh-Mosby Roundabout

PI=2+02.49
DELTA=066°51'42.82"
D=079°16'01"
T=47.72
L=84.35
R=72.28
PC=1+54.77
PT=2+39.12



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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Sanitary Sewer (Gravity)
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Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
MOSBY STREET AND LEIGH STREET ROUNDABOUT

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2M(4)	DRAWING NO. 0-28633

GENERAL NOTES FOR RETAINING WALLS:

Specifications:

Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.

Design: AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; and VDOT Modifications, and City of Charlottesville Standards and Design Manual.

Standards: Virginia Department of Transportation Road and Bridge Standards, 2016; including all current revisions.

These plans are incomplete unless accompanied by the Supplemental Specifications and Special Provisions included in the contract documents.

Class I CRR steel shall be used in all wall panels and coping.

SEGMENTAL PRECAST FACING MECHANICALLY STABILIZED EARTH (MSE) WALLS:

The minimum design life of MSE wall shall be 75 years.

For bearing resistance requirements, see the MSE Wall Bearing Resistance Data Table.

For settlement requirements, see the Estimated Wall Settlement Table.

Prior to wall construction, the foundation shall be compacted with a smooth wheel vibratory roller weighing 10 tons minimum. The drums of the roller should be ballasted, and each pass of the roller should overlap one half the width of the previous pass. The roller shall make at least ten passes over the proposed wall foundation zone. No density test will be required. Any foundation soils found to be unsuitable and/or unstable shall be removed and replaced with select material Type I minimum CBR of 30. Compact the foundation area according to the VDOT Specifications.

Architectural treatment shall be _____.

Concrete surface coating shall be _____, similar to Federal Standard Color No. _____.

An impervious membrane shall be placed below the pavement and just above the first row of reinforcement. The membrane shall be sloped to drain away from the facing to an intercepting longitudinal drain outlet beyond the reinforced zone.

A non-woven geotextile shall be used as a separator between the mechanically stabilized earth mass and the subbase.

The selected wall supplier will submit a detailed design and shop drawings for approval.

Provide drainage details such as perforated pipe underdrain and/or drainage blanket based upon field conditions.

All block types and other related elements shall be detailed on shop drawings.

Approved list for VDOT Category C Retaining Wall Systems:

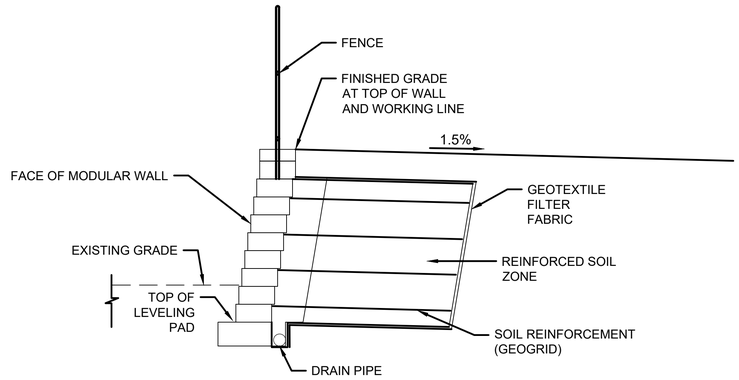
LOCK+LOAD™ Retaining Wall System
Mid-Atlantic LOCK+LOAD, LLC
11111 Industrial Road, Suite 201
Manassas, VA 20109
(703) 330-6535 http://www.lock-load.com

Redi-Rock PC Retaining Wall System with Mirafi's Miragrid Reinforcement
Allied Concrete Company
1000 Harris Street
Charlottesville, VA 22902
(434) 296-7181

KEYSYSTEM II Retaining Wall with Mirafi's Miragrid Reinforcement
Keystone Retaining Wall Systems, LLC
4444 West 78th Street
Minneapolis, MN 55435
(952) 897-1040
www.keystonewalls.com

Anchor Vertica Wall System with Mirafi's Miragrid Reinforcement
Eagle Bay
1231 Willis Road,
Richmond, VA 23237
(800) 321-9141
www.eaglebayusa.com

ReCon MSE Wall with Strata SG Geogrid Reinforcement
Boxley Materials Company
15418 West Lynchburg Salem Turnpike
Blue Ridge, VA 24064
(800) 422-2565
www.reconwalls.com



MODULAR BLOCK MSE WALL
TYPICAL SECTION

MSE WALL BEARING RESISTANCE DATA TABLE

Wall Location	Load and Resistance Factor Design (LRFD)	
	Service Applied Base Pressure (ksf)	Strength Factored Bearing Resistance ϕ_b = 0.65 (ksf)

The wall design shall be based on the lower of the values (either Service Limit or Strength Limit States) given for each wall in the table above. The Nominal Bearing Resistance will be verified by the engineer prior to construction of wall.

ESTIMATED WALL SETTLEMENT TABLE FOR STRUCTURE UNIT

Wall Location	Monitoring Location	Estimated intermediate settlement at the end of wall construction (inches)	Estimated total settlement over the life of the wall (inches)	Estimated time for percent settlement to occur (days)				Required Waiting Period (from wall completion) (days)
				25%	50%	75%	95%	

Total settlement is the settlement that occurs due to the placement of the wall between the beginning of wall construction and the end of design wall life. Total settlement also includes secondary consolidation till the end of design wall life.

Intermediate settlement is the settlement that occurs between the beginning of wall construction and the completion of the wall.

The "waiting" period starts when the survey readings at the completion of the wall construction are obtained and shall continue until the required waiting period has been completed and the Geotechnical Engineer of Record reviews the data and confirms that the rate of settlement has stabilized, primary consolidation or elastic settlement is complete and that the remaining long-term settlement will not exceed the allowable amount.

Survey readings shall be taken weekly during wall construction and until the waiting period is complete.

The elevations for all pins shall be taken when all project construction is completed and results placed in the as built plans.

Note: Refer to the wall sheet for layout points.
Station shown are in reference to the _____ Base Line.

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer, Sanitary Sewer (Gravity), Gas Line, Electric Line, Overhead Utility, Telephone/Telegraph, Water Line, Property Line, Storm Basin, Storm or Sanitary Manhole, Fire Hydrant / Valve, Water Meter, Existing Curb Cut Ramp, Gas Meter / Valve, Fence, Power/Light Pole, Guy Anchor, Tree

Proposed Legend: Sanitary Sewer, Storm Sewer, Storm/(San) Manhole, Basin, Curb Cut Ramp, Decorative Light, Conduit, Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
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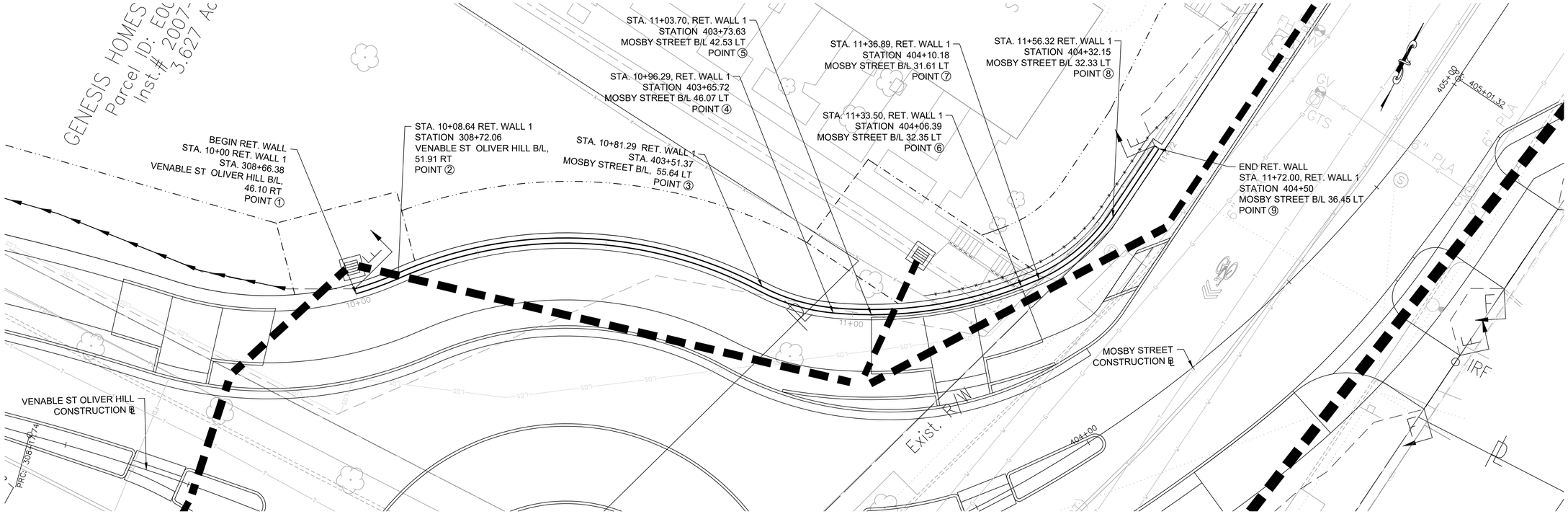
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

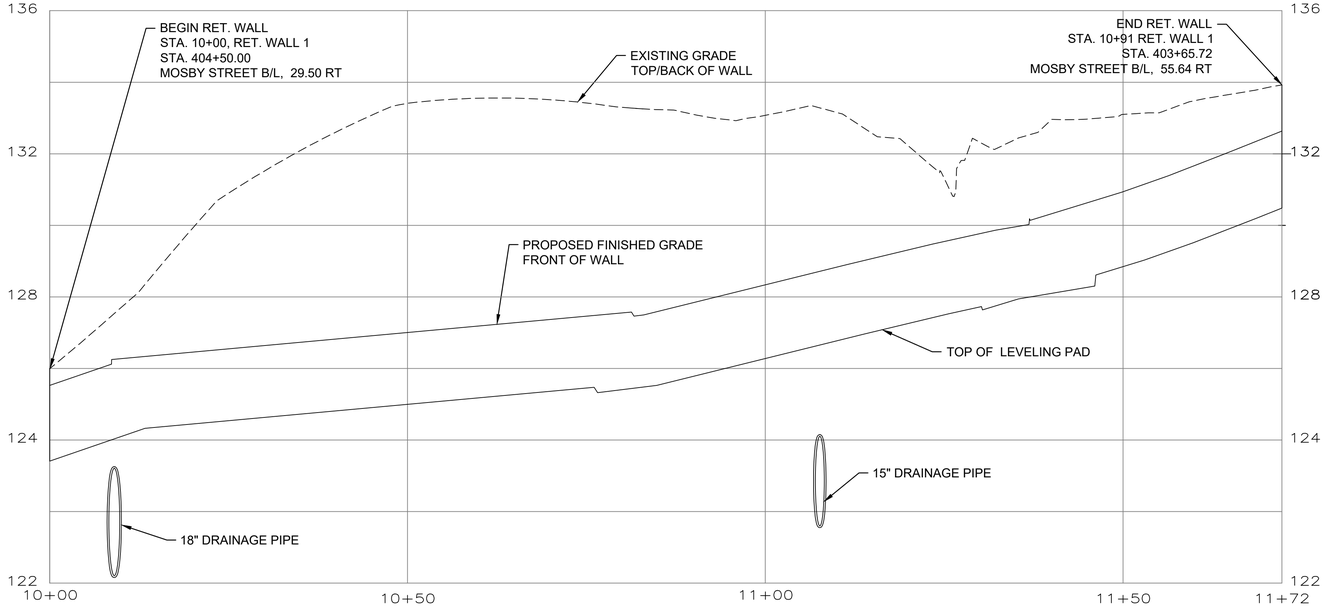
SHOCKOE VALLEY STREET IMPROVEMENTS
SOLDIER PILE RETAINING WALL DETAIL SHEET

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 2N(1)	0-28633
CHECKED BY: ASamberg						



RETAINING WALLS 1 PLAN

SCALE: 1"=10'



RETAINING WALL 1 PROFILE

SCALE: 1"=2' (VERTICAL)
1"=10' (HORIZONTAL)

Note: Refer to Sheet 1 for Wall Layout Data

RETAINING WALL 6 LAYOUT DATA

Point	Station	Offset
1	308+66.38	46.10
2	308+72.06	51.91
3	403+51.37	55.64
4	403+65.72	46.08
5	403+73.63	42.54
6	404+06.39	32.35
7	404+10.18	31.62
8	404+32.15	32.33
9	404+50.00	36.15

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES | REVISIONS

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Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

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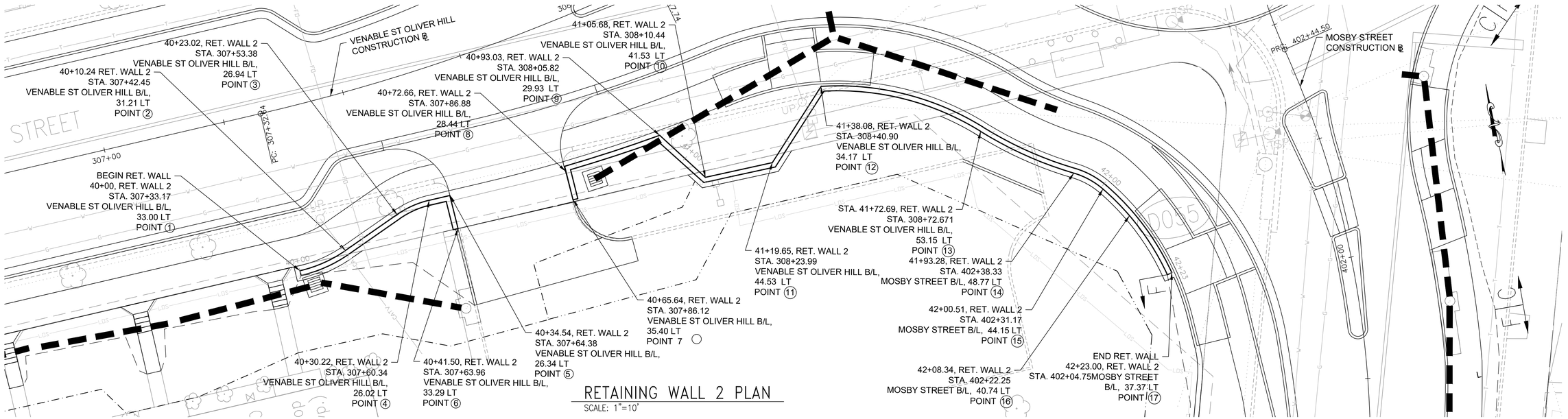
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

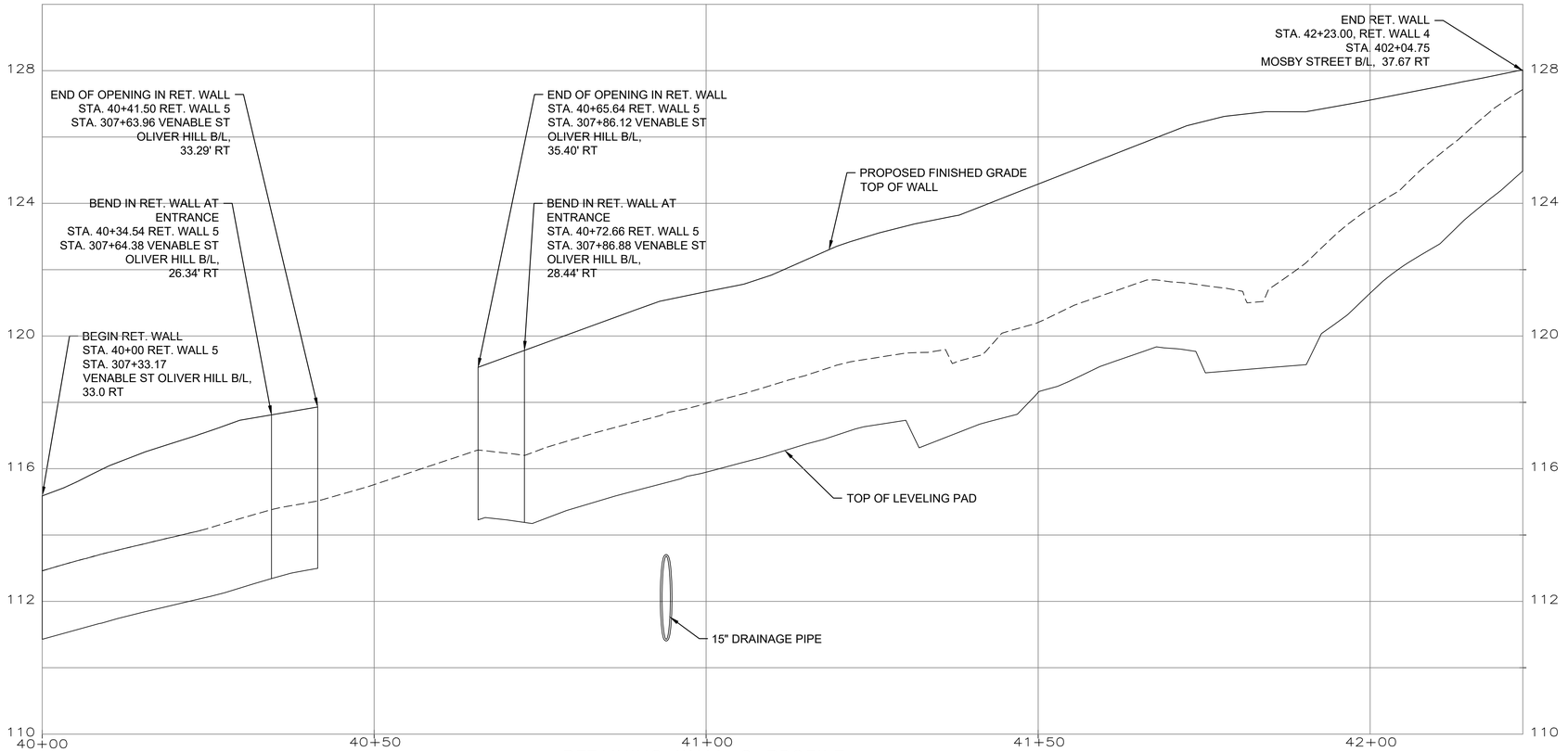
DESIGN BY: DBeale
DRAWN BY: JAlexander
CHECKED BY: ASamberg
REVIEWED BY:
FIELD NOTES
SCALE
DATE: SEPTEMBER 2022
PROJECT SHEET 2N(2)
DRAWING NO. 0-28633

SHOCKOE VALLEY STREET IMPROVEMENTS
RETAINING WALL 1
PLAN & PROFILE



RETAINING WALL 2 PLAN

SCALE: 1"=10'



RETAINING WALL 2 PROFILE

SCALE: 1"=2' (VERTICAL)
1"=10' (HORIZONTAL)

RETAINING WALL 2 LAYOUT DATA

Point	Station	Offset
1	307+33.17	33.00
2	307+42.46	31.21
3	307+53.68	26.94
4	307+60.34	26.02
5	307+64.38	26.34
6	307+63.96	33.29
7	307+86.12	35.40
8	307+86.88	28.44
9	308+05.82	29.93
10	308+10.44	41.53
11	308+23.99	44.53
12	308+40.90	34.17
13	308+72.67	53.15
14	402+38.33	48.78
15	402+31.17	44.16
16	402+22.25	40.74
17	404+04.75	37.37

Note: Refer to the wall sheet for layout points.
Station shown are in reference to the Mosby Street Base Line and the Venable Street OLIVER Hill Base Line.

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES | REVISIONS

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Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

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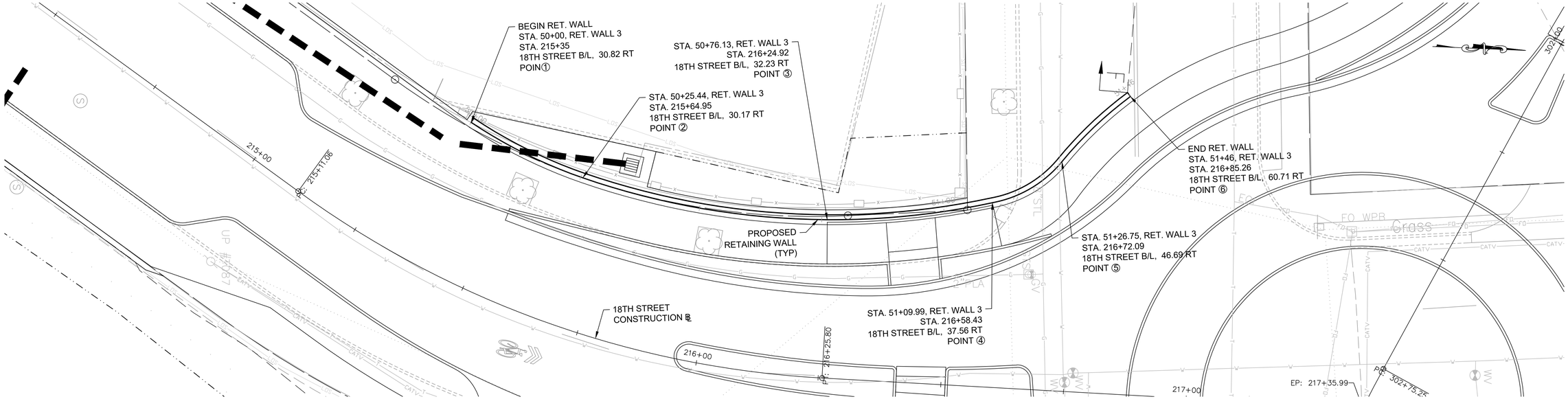
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RKK Responsive People - Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

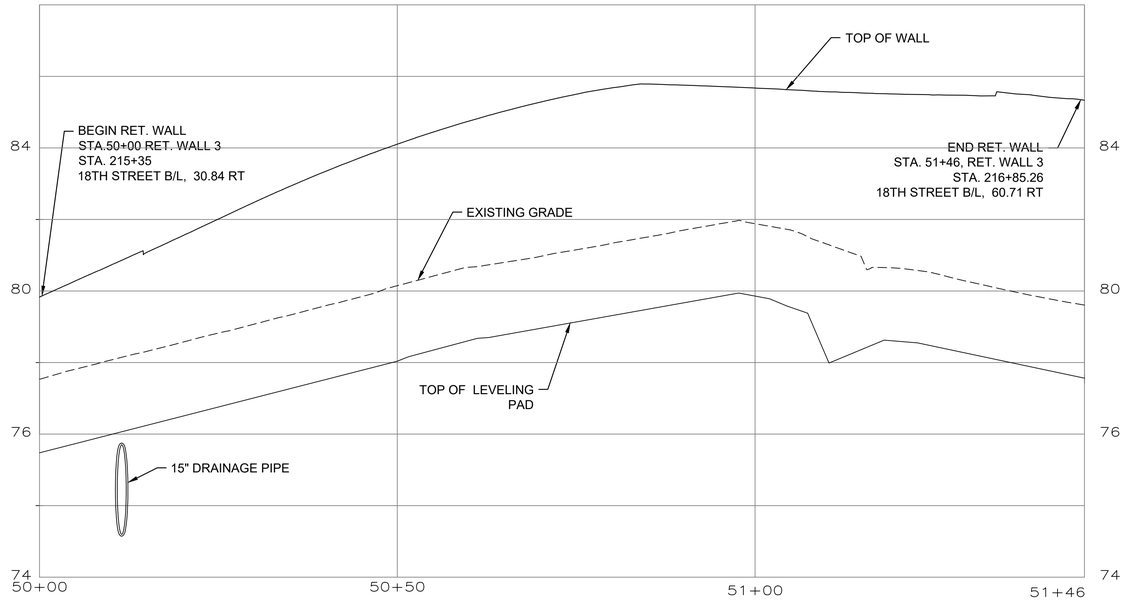
SHOCKOE VALLEY STREET IMPROVEMENTS
RETAINING WALL 2 PLAN & PROFILE

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2N(3)	DRAWING NO. 0-28633



RETAINING WALL 3 PLAN

SCALE: 1"=10'



RETAINING WALL 3 PROFILE

SCALE: 1"=2' (VERTICAL)
1"=10' (HORIZONTAL)

RETAINING WALL 3 LAYOUT DATA

Point	Station	Offset
1	215+35.00	30.82
2	215+64.95	30.17
3	216+24.92	32.23
4	216+58.43	37.56
5	216+72.09	46.69
6	216+85.26	60.71

Note: Refer to the wall sheet for layout points.
Station shown are in reference to the 18th Street Base Line.

70% SUBMITTAL
SEPTEMBER 2022

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Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS
RETAINING WALL 3 PLAN & PROFILE

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2N(4)	DRAWING NO. 0-28633

GENERAL NOTES

UNLESS OTHERWISE APPROVED OR DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL PLAN AND PROSECUTE THE WORK IN ACCORDANCE WITH THE FOLLOWING:

1. THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE VIRGINIA DEPARTMENT OF TRANSPORTATION 2020 ROAD AND BRIDGE SPECIFICATIONS, 2016 ROAD AND BRIDGE STANDARDS, 2009 MUTCD (REVISION 2), 2011 (REVISED APRIL 2019) VIRGINIA WORK AREA PROTECTION MANUAL AND AS AMENDED BY CONTRACT PROVISIONS, THE CONTRACTOR SHALL ADHERE TO THE VIRGINIA WORK AREA PROTECTION MANUAL AND THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES AND AS DIRECTED BY THE ENGINEER.

2. ALL TRAFFIC CONTROL DEVICES AND SIGNS NECESSARY FOR MAINTENANCE OF TRAFFIC ARE TO BE PROVIDED, INSTALLED, MAINTAINED AND REMOVED BY THE CONTRACTOR. POLICE ASSISTANCE IS TO BE PROVIDED IF DEEMED NECESSARY, AS APPROVED BY THE ENGINEER, AS DEFINED IN THE VIRGINIA WORK AREA PROTECTION MANUAL (2011), (REVISED APRIL 2019), APPENDIX C, AND PAID FOR BY THE CONTRACTOR.

LANE CLOSURE TIME RESTRICTIONS

3. LONG TERM FULL INTERSECTION CLOSURES OF THE INTERSECTIONS OF VENABLE STREET AND N. 18TH STREET AND VENABLE STREET AND MOSBY STREET AND PARTIAL INTERSECTION CLOSURE OF THE INTERSECTION OF MOSBY STREET AND O STREET WILL BE PERMITTED.

4. LONG TERM FULL CLOSURES OF N. 17TH STREET BETWEEN E. BROAD STREET AND E. GRACE STREET WILL BE PERMITTED

5. APART FROM THOSE LISTED IN NOTES 3 AND 4, LANE CLOSURES WILL BE PERMITTED BETWEEN THE HOURS OF 9:00 AM AND 3:00 PM MONDAY THRU FRIDAY, AND BETWEEN THE HOURS OF 9:00 PM AND 5:30 AM ANY DAY OF THE WEEK.

6. LANE CLOSURES WILL NOT BE PERMITTED ON HOLIDAYS AS FOLLOWS:

HOLIDAY RESTRICTIONS:

THE CONTRACTOR SHALL NOT CLOSE A LANE OF TRAFFIC, DETAIN AND/OR AFTER THE TRAFFIC DURING HOLIDAY WEEKENDS, SPECIAL EVENTS, OR ANY OTHER TIME WHEN TRAFFIC IS USUALLY HEAVY. INCLUDING THE FOLLOWING SCHEDULES:

- FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 THE DAY BEFORE CHRISTMAS DAY, AND 9:00 PM THE DAY AFTER CHRISTMAS.

- FOR NEW YEARS DAY, BETWEEN THE HOURS OF 6:00 AM DECEMBER 31ST TO 9:00 PM JANUARY 2ND.

- FOR EASTER, BETWEEN THE HOURS OF 6:00 AM THURSDAY UNTIL 9:00 PM TUESDAY.

- FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 AM FRIDAY TO 9:00 PM TUESDAY.

- FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 AM FRIDAY JULY 2, 2021 TO 9:00 PM TUESDAY JULY 6, 2021.

- FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 AM FRIDAY TO 9:00 PM TUESDAY.

- FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 AM WEDNESDAY TO 9:00 PM MONDAY,

7. TRAFFIC SHALL BE STOPPED FOR NO LONGER THAN 3 MINUTES IN ONE DIRECTION, AT ANY TIME UNLESS APPROVED BY THE ENGINEER.

CONSTRUCTION RELATED

8. ALL LANES OF TRAFFIC MUST OPERATE ON AN ASPHALT SURFACE, UNLESS OTHERWISE ALLOWED BY THE ENGINEER.

9. THE CONTRACTOR SHALL PROTECT PEDESTRIAN TRAFFIC AT ALL TIMES FROM CONSTRUCTION AREAS BY MEANS OF A TEMPORARY PEDESTRIAN SAFETY FENCE. THE COST OF TEMPORARY PEDESTRIAN SAFETY FENCE SHALL BE INCLUDED IN THE COST OF OTHER PROJECT ITEMS. AND THIS SAFETY FENCE SHALL NOT BE MEASURED FOR SEPARATE PAYMENT.

10. TRENCHES SHALL BE BACKFILLED AS SOON AS IS PRACTICABLE OR AS DIRECTED BY THE ENGINEER. OPEN EXCAVATION FOR TRENCHES SHALL NOT EXCEED 70 LF WITHOUT BACKFILLING OR INSTALLING STEEL PLATES.

11. IN THOSE AREAS WHERE VEHICULAR OR PEDESTRIAN TRAFFIC SHALL NEED TO CROSS PARTIALLY COMPLETE WATERLINE OR SANITARY SEWER INSTALLATIONS, OTHER UTILITY EXCAVATIONS OR IN ANY OTHER AREA DESIGNATED BY THE ENGINEER, STEEL PLATES SHALL BE INSTALLED BY THE CONTRACTOR TO ALLOW PEDESTRIAN AND VEHICULAR TRAFFIC TO PROCEED. THE CONTRACTOR SHALL DESIGN AND PROVIDE DETAILS FOR THESE STEEL PLATES. AND THESE STEEL PLATE DESIGNS SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. THE COST FOR DESIGN, INSTALLATION, AND REMOVAL OF THE STEEL PLATES AND ANY ADDITIONAL CONSTRUCTION SIGNING RELATING TO THE USE OF STEEL PLATES SHALL BE INCIDENTAL TO THE COST OF ASSOCIATED INSTALLATION.

12. ANY TEMPORARY REMOVAL AND RESETTING OF EXISTING TRAFFIC SIGNS ALONG THE PROJECT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND AS DIRECTED BY THE ENGINEER, AND SUCH WORK SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.

13. ALL PRIVATE ENTRANCES AND COMMERCIAL ENTRANCES SHALL BE MAINTAINED DURING CONSTRUCTION. NOTIFICATION IS TO BE PROVIDED TO AFFECTED RESIDENTS A MINIMUM OF 24 HOURS IN ADVANCE PRIOR TO THE CLOSURE OF A RESIDENTIAL DRIVEWAY. ALL RESIDENTIAL DRIVEWAY WORK MUST BE COMPLETED, WITH THE DRIVEWAY OPEN FOR USE BY THE END OF THE WORKDAY. IF TWO DRIVEWAYS SERVE ONE RESIDENTIAL PROPERTY, THEN ONE OF THE DRIVEWAYS MUST BE OPEN FOR USE AT ALL TIMES. ADDITIONALLY, RESIDENTIAL DRIVEWAYS SHALL BE CONSTRUCTED TO MAINTAIN ACCESS DURING CONSTRUCTION.

14. THE CONTRACTOR SHALL RESTRICT VEHICLES FROM OPERATING ON ANY PIPE LESS THAN 3 FEET OF COVER.

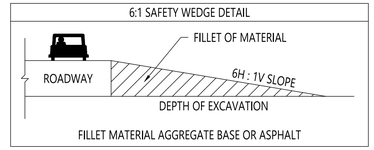
15. DURING NON-WORKING HOURS ANY SIGNS THAT ARE NOT APPLICABLE TO THE EXISTING CONDITIONS SHALL BE COVERED FROM VIEW OF TRAFFIC OR REMOVED. ANY SIGNS THAT ARE NOT APPLICABLE TO THE EXISTING TRAFFIC PATTERN IN PLACE SHALL BE COVERED FROM VIEW OF TRAFFIC OR REMOVED.

16. IDLE OR PARKED CONSTRUCTION VEHICLES AND EQUIPMENT MUST NOT IMPACT SIGHT DISTANCE FOR MOTORISTS.

17. TRAVEL LANES THROUGH THE CONSTRUCTION AREA SHALL BE A MINIMUM OF 10 FEET.

18. ALL AREAS EXCAVATED BELOW EXISTING PAVEMENT SURFACES AND WITHIN THE CLEAR ZONE OF ANY PUBLIC ROADWAY SHALL AT THE CONCLUSION OF EACH WORK DAY SHALL BE BACK FILLED WITH AGGREGATE MATERIAL SLOPING AT 6:1 SO AS TO FORM A TRAVERSABLE SLOPE FOR THE SAFETY AND PROTECTION OF THE TRAFFIC. SAFETY WEDGE, AT CONTRACTOR'S OPTION, CAN BE CONSTRUCTED USING PROPOSED PROJECT ASPHALT MATERIAL IF APPLIED IN ST'D LIFTS TO COMPACTION REQUIREMENTS AS APPROVED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH INSTALLATION AND REMOVAL OF SAFETY WEDGE ASPHALT OR AGGREGATE MATERIAL SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO SEPARATE MEASUREMENT OR PAVEMENT WILL BE MADE FOR THIS WORK.

6:1 SAFETY WEDGE DETAIL



19. IN ALL STAGES OF CONSTRUCTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL DRAINAGE ITEMS (TEMPORARY OR PROPOSED) NECESSARY TO PROVIDE POSITIVE DRAINAGE DURING THE CONSTRUCTION ARE INSTALLED PRIOR TO OTHER CONSTRUCTION ACTIVITIES.

20. THE CONTRACTOR SHALL PROVIDE FOR MAINTENANCE OF EXISTING SIGNALIZATION AND ASSOCIATED DETECTION EQUIPMENT AT NO ADDITIONAL COST TO THE CITY AT ALL SIGNALIZED INTERSECTION. VEHICLE DETECTION SHALL BE MAINTAINED AT ALL SIGNALIZED INTERSECTIONS AT NO ADDITIONAL COST TO THE CITY.

TRANSPORTATION OPERATIONS PLAN

21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND PROVIDING THE FOLLOWING:

A. IMMEDIATELY REPORT ANY TRAFFIC INCIDENTS THAT MAY OCCUR IN THE WORK ZONE. FOR LOCAL EMERGENCY RESPONSE CALL 911.

B. NOTIFY THE ENGINEER AND EMERGENCY SERVICES IN RESPONSE TO ANY TRAFFIC INCIDENTS IN THE WORK ZONE.

C. NOTIFY THE RICHMOND TRAFFIC OPERATIONS CENTER (TOC) 48 HOURS PRIOR TO BEGINNING WORK AND PRIOR TO ANY TRAFFIC PATTERN CHANGES IN ORDER TO PLACE LANE CLOSURE INFORMATION ON THE 511 SYSTEM AND VA. TRAFFIC.

D. POST A LIST OF LOCAL EMERGENCY RESPONSE AGENCIES INSIDE THE PROJECT OFFICE TRAILER.

PUBLIC INFORMATION PLAN

20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND PROVIDING THE FOLLOWING:

A. NOTIFYING THE ENGINEER TWO WEEKS IN ADVANCE OF ANY SCHEDULED WORK PLANS AND TRAFFIC DELAYS.

B. NOTIFYING THE ENGINEER OF ANY UNSCHEDULED TRAFFIC DELAYS.

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions
vhb

SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
GENERAL NOTES

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(1)	DRAWING NO. 0-28633

Typical Traffic Control
Short Duration Operation on a Multi-Lane Roadway
(Figure TTC-15.2)
NOTES

Standard:

1. **This typical traffic control layout shall be used only during non-peak travel periods with the approval of the District[2] Traffic Engineer. This typical traffic control layout shall not be used for Limited Access highways or two-lane roadways.**
2. **Each vehicle involved in the operation shall have an arrow board, and at least one high-intensity amber rotating, flashing or[1] oscillating light. Vehicle hazard warning signals shall not be used instead of rotating, flashing, or oscillating[1] lights, but as a supplement.**
3. **Vehicle-mounted signs shall be mounted with the bottom of the sign at a minimum height of 48 inches above the pavement.**

Guidance:

4. *The minimum distance between the sign/shadow vehicle and the truck-mounted attenuator (TMA) vehicle should be 500'-800' where the posted speed limit is greater than 45 mph, and 350'-500' where the posted speed limit is 45 mph or less.*

Option:

5. The static warning sign and arrow board may be replaced with a vehicle-mounted CMS with a minimum character height of 10".
6. *When closing a lane, a PCMS may be used in advance of the first warning signs.*[2]

Standard:

7. **If Shadow Vehicle 1 occupies any part of the travel lane, it shall be equipped with a TMA. A truck-mounted attenuator (TMA) shall be used on Shadow Vehicle 2 in the travelway regardless of the posted speed limit.**

Guidance:

8. *When using a vehicle-mounted CMS to replace the arrow board, each word message phase should be followed by the Type B arrow display.*

Support:

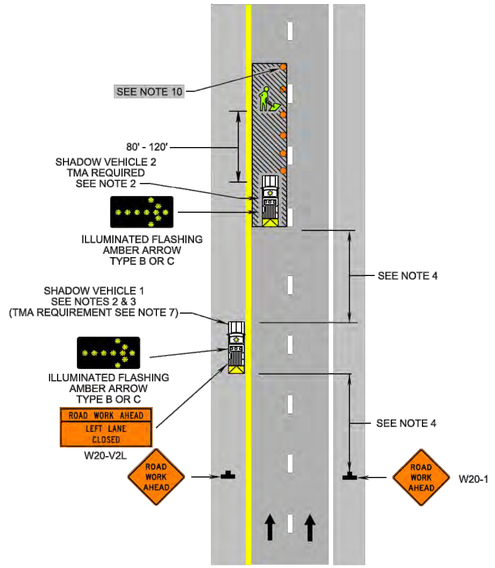
9. *A short duration operation is defined as an operation that requires 16 minutes to 60 minutes to perform in the immediate area. (The immediate area is defined as a 1000' ± linear distance.)*

Option:

10. *The work area may be delineated by installing channelizing devices. The channelizing devices would start at the front of the shadow vehicle and extend through the work area. The spacing between channelizing devices may be reduced in the travelway to prevent motorists from entering the work area.*[1]

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Short Duration Operation on a Multi-Lane Roadway
(Figure TTC-15.2)



1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Typical Traffic Control
Outside Lane Closure Operation on a Four-Lane Roadway
(Figure TTC-16.2)
NOTES

Standard:

1. **On divided highways having a median wider than 8', right and left sign assemblies shall be required.**

Guidance:

2. *Sign spacing should be 1300'-1500' for Limited Access highways. For all other roadways, the sign spacing should be 500'-800' where the posted speed limit is greater than 45 mph, and 350'-500' where the posted speed limit is 45 mph or less.*
3. *When closing a lane, a PCMS should be used in advance of the first warning sign if all of the left side signs cannot be installed.*[2]
4. *Care should be exercised when establishing the limits of the work zone to insure maximum possible sight distance in advance of the transition, based on the posted speed limit and at least equal to or greater than the values in Table 6H-3. For Limited Access highways a minimum of 1000' is desired.*
5. *All vehicles, equipment, workers, and their activities should be restricted to one side of the pavement.*

Standard:

6. **Taper length (L) and channelizing device spacing shall be at the following:**

Taper Length L

Speed Limit (mph)	Lane Width (Feet) 9	10	11	12	Remarks	Speed Limit (mph)	Lane Width (Feet) 9	10	11	12	Remarks
25	95	105	115	125	L=S²W/60	50	450	500	550	600	L=SW
30	135	150	165	180	L=S²W/60	55	495	550	605	660	L= SW
35	185	205	225	245	L=S²W/60	60	540	600	660	720	L=SW
40	240	270	295	320	L=S²W/60	65	585	650	715	780	L=SW
45	405	450	495	540	L=SW	70	630	700	770	840	L=SW
Limited Access highways shall use a 1000' merging taper regardless of the posted speed.											
Shifting Tapers see Table 6H-2.[2]						Shoulder Taper = ½ L Minimum					

7. **Channelizing device spacing shall be at the following:**

Channelizing Device Spacing								
Location Spacing	Speed Limit (mph) 0 -35	36 +	Location Spacing	Speed Limit (mph) 0 -35	36 +	Location Spacing	Speed Limit (mph) 0 -35	36 +
Transition	20'	40'	Travelway	40'	80'	* Construction Access	80'	120'

*Construction access spacing may be increased to this distance, but shall not exceed one access per ¼ mile.

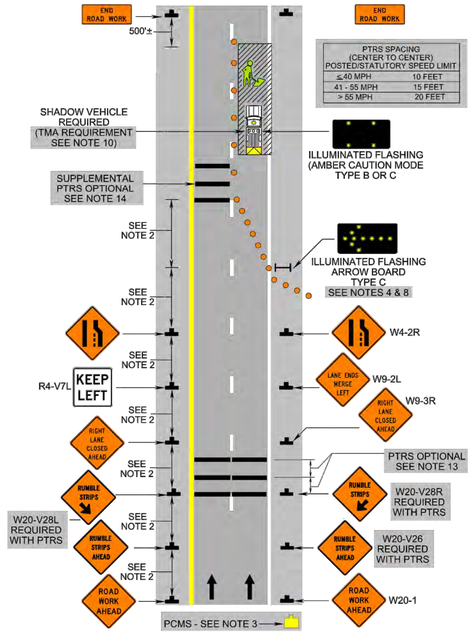
8. **An arrow board shall be used when a lane is closed. When more than one lane is closed, a separate arrow board shall be used for each closed lane (see Figure TTC-18).**
9. **The buffer space length shall be shown in Table 6H-3 on Page 6H-5 for the posted speed limit.**
10. **A shadow vehicle with either a Type B or C arrow board operating in the caution mode, or at least one high intensity amber rotating, flashing, or[1] oscillating light shall be parked 80'-120' in advance of the first work crew. When the posted speed limit is 45 mph or greater, a truck-mounted attenuator shall be used.**
11. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity amber rotating, flashing, or[1] oscillating lights but can be used to supplement the amber rotating, flashing, or[1] oscillating lights.**
12. **When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed as needed.**

Option:[2]

13. PTRS and their supporting signs may be used, see Sections 6F.99 and 6G.25. Long-term transverse rumble strips may be used in long-term situations, see Section 6F.99 and TTC-20.[2]
14. The supplemental PTRS may be eliminated.[2]

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Outside Lane Closure Operation on a Four-Lane Roadway
(Figure TTC-16.2)



2: Revision 2 – 9/1/2019

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(2)	DRAWING NO. 0-28633

Typical Traffic Control
Inside Lane Closure Operation on a Four-Lane Roadway
(Figure TTC-17.2)
NOTES

Standard:

1. **On divided highways having a median wider than 8', right and left sign assemblies shall be required.**

Guidance:

2. *Sign spacing should be 1300'-1500' for Limited Access highways. For all other roadways, the sign spacing should be 500'-800' where the posted speed limit is greater than 45 mph, and 350'-500' where the posted speed limit is 45 mph or less.*
3. *When closing a lane, a PCMS should be used in advance of the first warning sign if all of the left side signs cannot be installed.*[2]
4. *Care should be exercised when establishing the limits of the work zone to insure maximum possible sight distance in advance of the transition, based on the posted speed limit and at least equal to or greater than the values in Table 6H-3. For Limited Access highways a minimum of 1000' is desired.*
5. *All vehicles, equipment, workers, and their activities should be restricted to one side of the pavement.*

Standard:

6. **Taper length (L) and channelizing device spacing shall be at the following:**

Taper Length L

Speed Limit (mph)	Lane Width (Feet) 9	10	11	12	Remarks	Speed Limit (mph)	Lane Width (Feet) 9	10	11	12	Remarks
25	95	105	115	125	L=S²W/60	50	450	500	550	600	L=SW
30	135	150	165	180	L=S²W/60	55	495	550	605	660	L= SW
35	185	205	225	245	L=S²W/60	60	540	600	660	720	L=SW
40	240	270	295	320	L=S²W/60	65	585	650	715	780	L=SW
45	405	450	495	540	L=SW	70	630	700	770	840	L=SW

Limited Access highways shall use a 1000' merging taper regardless of the posted speed.

Shifting Tapers see Table 6H-2.[2] **Shoulder Taper = ⅓ L Minimum**

7. **Channelizing device spacing shall be at the following:**

Location Spacing	Speed Limit (mph) 0 -35	36 +	Location Spacing	Speed Limit (mph) 0 -35	36 +	Location Spacing	Speed Limit (mph) 0 -35	36 +
Transition	20'	40'	Travelway	40'	80'	*Construction Access	80'	120'

*Construction access spacing may be increased to this distance, but shall not exceed one access per ¼ mile.

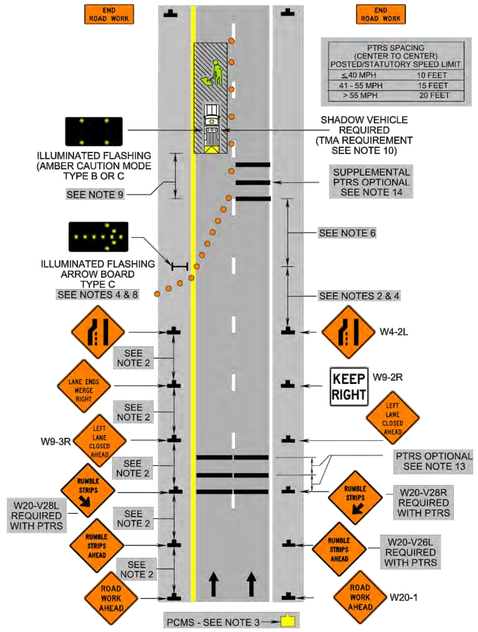
8. **An arrow board shall be used when a lane is closed. When more than one lane is closed, a separate arrow board shall be used for each closed lane (see Figure TTC-18).**
9. **The buffer space length shall be shown in Table 6H-3 on Page 6H-5 for the posted speed limit.**
10. **A shadow vehicle with either a Type B or C arrow board operating in the caution mode, or at least one high intensity amber rotating, flashing, or[1] oscillating light shall be parked 80'-120' in advance of the first work crew. When the posted speed limit is 45 mph or greater, a truck-mounted attenuator shall be used.**
11. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity amber rotating, flashing, or[1] oscillating lights but can be used to supplement the amber rotating, flashing, or[1] oscillating lights.**
12. **When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed as needed.**

Option:[2]

13. PTRS and their supporting signs may be used, see sections 6F.99 and 6G.25. Long-term transverse rumble strips may be used in long-term situations, see Section 6F.99 and TTC-20.[2]
14. The supplemental PTRS may be eliminated.

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Inside Lane Closure Operation on a Four-Lane Roadway
(Figure TTC-17.2)



Typical Traffic Control
Lane Closure on a Two-Lane Roadway Using Flaggers
(Figure TTC-23.2)
NOTES

Guidance:

1. *Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, and 500'-800' where the posted speed limit is greater than 45 mph.*
2. *Care should be exercised when establishing the limits of the work zone to insure maximum possible sight distance in advance of the flagger station and transition, based on the posted speed limit and at least equal to or greater than the values in Table 6H-3. Generally speaking, motorists should have a clear line of sight from the graphic flagger symbol sign to the flagger.*
3. *To maintain efficient traffic flow in a flagging operation on a two-lane roadway, the maximum time motorists should be stopped at a flagger station is 8 minutes for high volume roadways (average daily traffic of 500 or more vehicles per day) to a maximum of 12 minutes for low volume roadways (less than 500 vehicles per day). For additional information see Section 6E.07.*[1]

Standard:

4. **Portable Temporary Rumle Strips (PTRS) shall be used as noted in Section 6F.99.**[2]
5. **Flagging stations shall be located far enough in advance of the work space to permit approaching traffic to reduce speed and/or stop before passing the work space and allow sufficient distance for departing traffic in the left lane to return to the right lane before reaching opposing traffic (see Table 6H-3 on Page 6H-5).**
6. **All flaggers shall be state certified and have their certification card in their possession when performing flagging duties (see Section 6E.01, Qualifications for Flaggers).**
7. **Cone spacing shall be based on the posted speed and the values in Table 6H-4 on Page 6H-6.**[1]
8. **A shadow vehicle with at least one high intensity amber rotating, flashing, or[1] oscillating light shall be parked 80'-120' in advance of the first work crew.**

Option:

8. A SLOW (W21-V10) sign[2] may be required in this area to give advance warning of the operation ahead by slowing approaching traffic prior to reaching the flagger station or queued traffic.

Guidance:

9. *If the queue of traffic reaches the BE PREPARED TO STOP (W3-4) sign then the signs, and if used the PTRS[1] should be readjusted at greater distances.*
10. *When a highway-rail crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the highway-rail grade crossing, the temporary traffic control zone should be extended so that the transition area precedes the highway-rail crossing (see Figure TTC-56 for additional information on highway-rail crossings).*

Standard:

11. **At night, flagger stations shall be illuminated, except in emergencies (see Section 6E.08).**

Option:

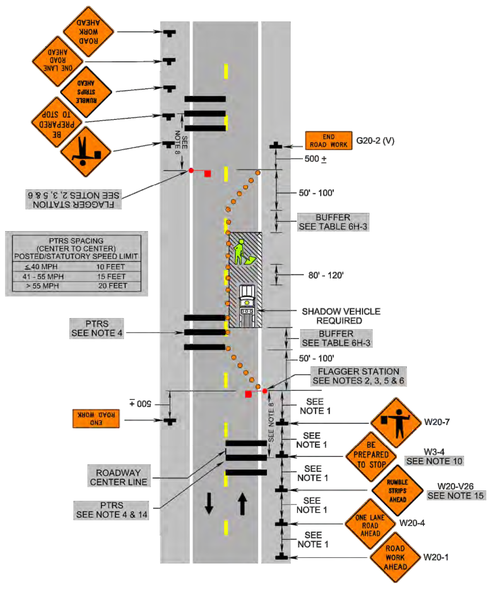
12. Cones may be eliminated when using a pilot vehicle operation or when the total roadway width is 20 feet or less.
13. For low-volume situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used (see Chapter 6E).

Standard:[1]

14. **When used[2], three portable temporary rumble (PTRS) strips shall be installed across the entire travel lane adjacent to the BE PREPARED TO STOP (W3-4) sign. The portable temporary rumble strips shall be monitored and adjusted as necessary during the work shift to ensure proper placement on the roadway. When the PTRS are installed, the RUMBLE STRIPS AHEAD (W20-V26) sign shall also be utilized.**

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Lane Closure on a Two-Lane Roadway Using Flaggers
(Figure TTC-23.2)



70% SUBMITTAL
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REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓢ or Ⓢ
Fire Hydrant / Valve FH ⊹ ⊹WV
Water Meter ⊹WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ⊹ ⊹GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
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City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
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vhb

SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(3)	DRAWING NO. 0-28633

Typical Traffic Control
Inside Lane Closure Operation on a Multi-Lane Roundabout
(Figure TTC-32.2)
NOTES

Support:

1. Each roundabout is unique and the traffic control must be developed to meet the specific conditions of the location and the work operation. A detour could possibly better serve traffic movement and must be consider as an alternative to the flagger operation. This traffic control layout can be used on a traffic circle.

Standard:

2. **On divided highways having a median wider than 8', right and left sign assemblies shall be required.**
3. **A shadow vehicle with either a Type B or C arrow board operating in the caution mode, or at least one amber[1] high intensity rotating, oscillating, or flashing[1] light shall be parked 80'-120' in advance of the first work crew. When the posted speed limit is 45 mph or greater, a truck- mounted attenuator shall be used.**
4. **Taper length (L) shall be at the following:**

Taper Length L											
Speed Limit (mph)	Lane Width (Feet)				Remarks	Speed Limit (mph)	Lane Width (Feet)				Remarks
	9	10	11	12			9	10	11	12	
25	95	105	115	125	L=S*W/60	50	450	500	550	600	L=SW
30	135	150	165	180	L=S*W/60	55	495	550	605	660	L= SW
35	185	205	225	245	L=S*W/60	60	540	600	660	720	L=SW
40	240	270	295	320	L=S*W/60	65	585	650	715	780	L=SW
45	405	450	495	540	L=SW	70	630	700	770	840	L=SW
Shoulder Taper = ½ L Minimum											

5. **Channelizing device spacing shall be at the following:**

Channelizing Device Spacing								
Location Spacing	Speed Limit (mph)		Location Spacing	Speed Limit (mph)		Location Spacing	Speed Limit (mph)	
	0 -35	36 +		0 -35	36 +		0 -35	36 +
Transition	20'	40'	Travelway	40'	80'	*Construction Access	80'	120'
*Construction access spacing may be increased to this distance, but shall not exceed one access per ¼ mile.								

6. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity amber rotating, flashing, or[1] oscillating lights. Vehicle hazard warning signals can be used to supplement high-intensity amber rotating, flashing, or[1] oscillating lights.**
7. **On long-term projects where the central island of a roundabout allows for the installation of signs, the Roundabout Directional Arrow (R6-4) shall be used and mounted at least 4 feet, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way otherwise the R6-4 sign can be installed in the approached islands, see the MUTCD Sections 2B-40 and 2B-48.[2]**

Guidance:

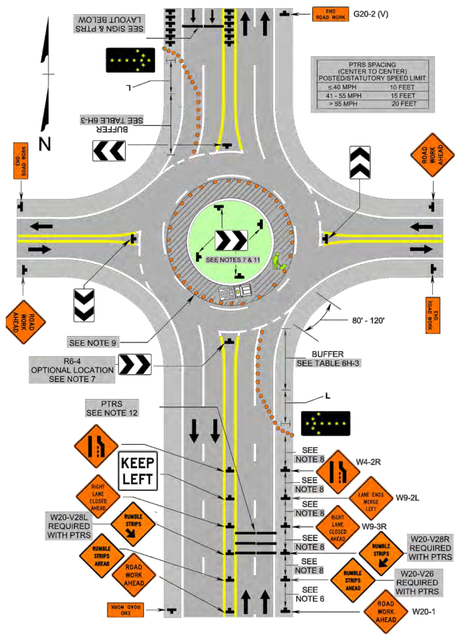
8. *Sign spacing distance should be 350'- 500' where the posted speed limit is 45 mph or less, and 500'-800' where the posted speed limit is greater than 45 mph.*
9. *When designing the traffic control and installing the channelizing devices for work activities at roundabouts, accommodations for the turning radius of tractor trailer vehicles and other large vehicles should be considered and the work zone designed accordingly.*

Option:

10. Periodic adjustments to the channelizing devices may be allowed in an active work zone to accommodate the turning movements of tractor trailer vehicles and other large vehicles.
11. The ONEWAY (R6-1R) sign may be installed underneath the R6-4 sign as a supplement.[2]
12. PTRS may be use to enhance the work zone, see Section 6F.99 and TTC-16. Long-term transverse rumble strips may be used to enhance the work zone, see TTC-20 (note 13 and figure).[2]

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Inside Lane Closure Operation on a Multi-Lane Roundabout
(Figure TTC-32.2)



2: Revision 2 – 9/1/2019

Typical Traffic Control
Street Closure Operation with Detour
(Figure TTC-34.2)
NOTES

Guidance:

1. *This plan should be used for streets without posted route numbers.*
2. *On multi-lane streets, Detour signs with an Advance Turn Arrow should be used in advance of a turn.*
3. *Sign spacing distance should be 225'-275' where the posted speed limit is 30 to 35 mph, and 100'-200' where the posted speed is 25 mph or less.*
4. *If the road is opened for a significant distance beyond the intersection and/or there are significant origin/destination points beyond the intersection, the ROAD CLOSED (R11-2) and Detour Arrow (M4-10) signs on Type 3 Barricades should be located at the corners of intersecting closed roadway or the traveled way.*
5. *In urban areas, signs on an eight foot Type 3 barricade, should not cover more than half of the top two rails. On a four foot Type 3 barricade, a sign should not cover more than the top rail. When used alone on a four foot Type 3 barricade, the ROAD CLOSED (R11-1) sign or the ROAD CLOSED TO THRU TRAFFIC (R11-4) sign should be installed above the Type 3 barricade.[2]*

Option:

6. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
7. Flashing warning lights may be used on Type 3 Barricades.
8. Detour signs may be located on the far side of intersections. A Detour sign with an advance arrow may be used in advance of a turn.
9. A Street Name (M4-VP1a) plaque may be mounted with the Detour sign. The Street Name plaque may be either white on green or black on orange.

Standard:

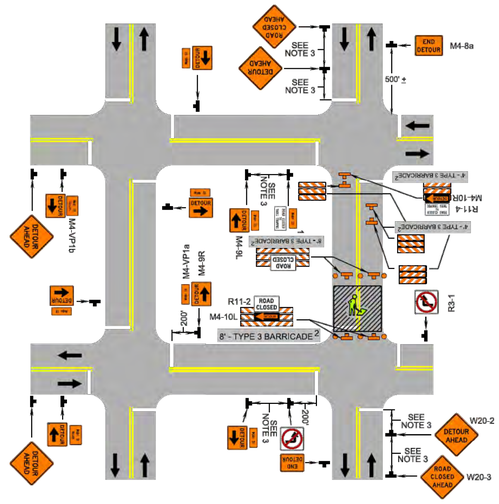
10. **When used, the Street Name plaque shall be placed above the Detour sign.**

Support:

11. See Chapter 6I for additional information on incident management traffic control.

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Street Closure Operation with Detour
(Figure TTC-34.2)



1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(4)	DRAWING NO. 0-28633

Typical Traffic Control

Sidewalk Closure and Bypass Sidewalk Operation

(Figure TTC-35.1)

NOTES

Standard:

1. **When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.**

Guidance:

2. *Where high speeds are anticipated, a temporary traffic barrier and, if necessary, a crash cushion should be used to separate the temporary sidewalks from vehicular traffic.*
3. *Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.*
4. *Temporary markings should be considered for operations exceeding three days in duration.*

Option:

5. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS (W5-1) signs, may be used to control vehicular traffic.
6. For nighttime closures, Type A Flashing warning lights may be used on barricades that support signs and close sidewalks.
7. Signs, such as KEEP RIGHT (R4-V7R) and KEEP LEFT (R4-V7L), may be placed along a temporary sidewalk to guide or direct pedestrians.

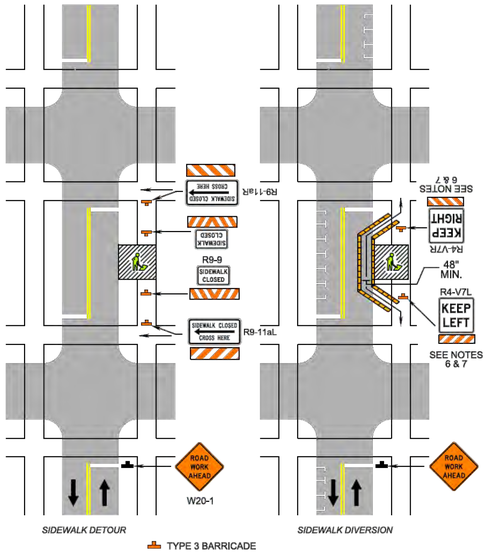
Standard:

8. **All sidewalk closures shall be closed with Type 3 Barricades. The SIDEWALK CLOSED (R9-9) sign and the SIDEWALK CROSS HERE (R9-11) sign shall be installed above the Type 3 barricade. The KEEP RIGHT sign can cover the top rail of the Type 3 Barricade.[2]**

2: Revision 2 – 9/1/2019

Sidewalk Closure and Bypass Sidewalk Operation

(Figure TTC-35.1)



2: Revision 2 – 9/1/2019

Typical Traffic Control

Crosswalk Closure and Pedestrian Detour Operation

(Figure TTC-36.2)

NOTES

Standard:

1. **When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.**
2. **Curb parking shall be prohibited for at least 50 feet in advance of the midblock crosswalk.**

Guidance:

3. *Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.*
4. *Pedestrian traffic signal displays controlling closed crosswalks should be covered or deactivated.*
5. *Temporary markings should be considered for operations exceeding three days in duration.*

Option:

6. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS (W5-1) signs, may be used to control vehicular traffic.
7. For nighttime closures, Type A Flashing warning lights may be used on barricades supporting signs and closing sidewalks.

Standard:

8. **In order to maintain the systematic use of the fluorescent yellow-green background for school warning signs in a jurisdiction, the fluorescent yellow-green background for school warning signs shall be used in TTC zones.[2]**
9. **All sidewalk closures shall be closed with Type 3 Barricades. The SIDEWALK CLOSED (R9-9) sign and the SIDEWALK CROSS HERE (R9-11) sign shall be installed above the Type 3 Barricade. The KEEP RIGHT sign can cover the top rail of the Type 3 Barricade.[2]**

Support:

10. Refer to Sections 3B-16 through 3B-18 of the 2009 MUTCD and the Virginia Supplement to the MUTCD[1] for crosswalk[1] lines, yield lines and other related TTC devices that may be used to control vehicular traffic at midblock crosswalks.

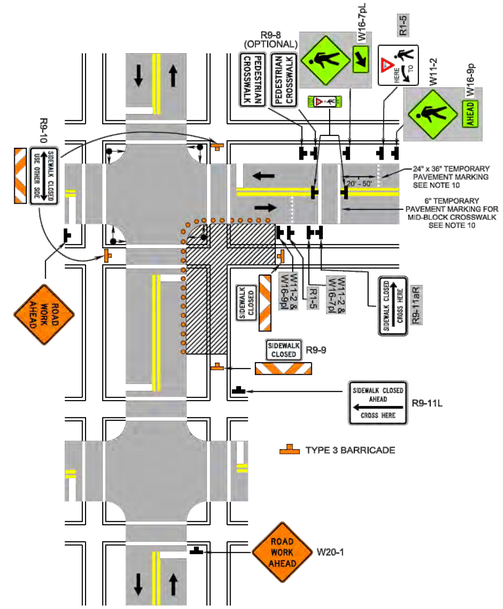
Standard:[2]

11. **The YIELD HERE TO PEDESTRIANS (R1-5) sign shall be placed at the Yield Line.**
12. **Fluorescent yellow-green PEDESTRIAN TRAFFIC (W11-2) symbol sign, AHEAD (W16-9p) plaque and ARROW (W16-7p) plaque shall be used to identify the work zone crosswalk.**

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Crosswalk Closure and Pedestrian Detour Operation

(Figure TTC-36.2)



1: Revision 1 – 4/1/2015
2: Revision 2 – 7/1/2018

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (County)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓢ or Ⓢ
Fire Hydrant / Valve FH ✧ ●WV
Water Meter ●WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ● ● GV
Fence
Power/Light Pole PP ☼ LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● CSMH
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(5)	DRAWING NO. 0-28633

Typical Traffic Control
Multi-Lane Shift Operation
(Figure TTC-40.2)
NOTES

Guidance:

1. *The lane shift should be used when the work area extends into either the right or left lane of a divided highway and it is not practical, for capacity reasons, to reduce the number of available lanes.*
2. *Sign spacing distance should be 1300'-1500' for Limited Access highways, and on all other roadways 500'-800' where the posted speed limit is greater than 45 mph, and 350'-500' where the posted speed limit is 45 mph or less.*
3. *If the STAY IN LANE (R4-9) sign is used, then solid 4 inch wide minimum white lines should be used.*

Standard:

4. **On divided highways having a median wider than 8', right and left sign assemblies shall be required.**
5. **Shoulder and shifting taper lengths shall be as shown in Table 6H-25 Page 6H-5.[2]**
6. **Taper length (L) shall be at the following:**

Taper Length L											
Speed Limit (mph)	Lane Width (Feet) 9	10	11	12	Remarks	Speed Limit (mph)	Lane Width (Feet) 9	10	11	12	Remarks
25	95	105	115	125	L=S*W/60	50	450	500	550	600	L=SW
30	135	150	165	180	L=S*W/60	55	495	550	605	660	L= SW
35	185	205	225	245	L=S*W/60	60	540	600	660	720	L=SW
40	240	270	295	320	L=S*W/60	65	585	650	715	780	L=SW
45	405	450	495	540	L=SW	70	630	700	770	840	L=SW
Shifting Tapers - full lane width shifts on Limited Access Highways shall use a 750' shifting taper for posted speeds less than 65 mph and a 1000' shifting taper for posted speeds equal to or greater than 65 mph. For all other roadways ¾ L should be used.[2]											
Shoulder Taper = ⅓ L Minimum											

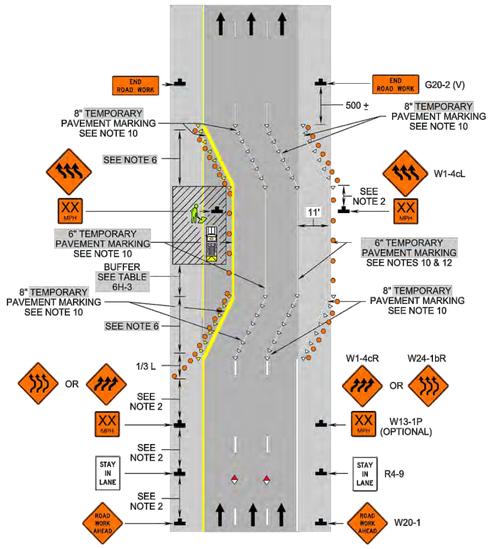
7. **The minimum width of the shoulder lane shall be 11'.**
8. **The buffer space length shall be as shown in Table 6H-3 on Page 6H-5 for the posted speed limit.**
9. **A shadow vehicle with either a Type B or C arrow board operating in the caution mode, or at least one high intensity amber rotating, oscillating, or flashing[1] light shall be parked 80'-120' in advance of the first work crew. When the posted speed limit is 45 mph or greater, a truck-mounted attenuator shall be used.**
10. **For long-term work zones existing conflicting pavement markings and markers shall be removed and temporary pavement markings and markers shall be installed per Figure TTC-60.**

Option:

11. For short-term stationary work (less than 3 days duration), lanes may be delineated by channelizing devices or removable pavement markings instead of temporary pavement markings.
12. Temporary pavement markers, on a 40' center to center spacing, may be added to the tangent section between lane shifts as directed by the engineer.
13. Lane shift (W1-4 series) signs may be eliminated when geometric conditions straighten a curve or when full L is used.[2]

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Multi-Lane Shift Operation
(Figure TTC-40.2)



2: Revision 2 – 9/1/2019

Typical Traffic Control
Signing for Project Limits
(Figure TTC-53.0)
NOTES

Support:

1. This layout depicts signing requirements for notifying motorist when they are entering and exiting a potential construction/maintenance area with a duration equal to or greater than 60 days.

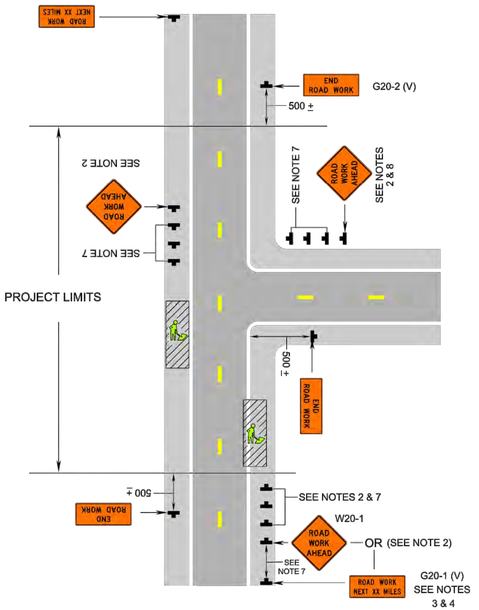
Standard:

2. **The ROAD WORK AHEAD (W20-1) sign or the ROAD WORK NEXT XX MILES (G20-1 (V)) sign shall be placed far enough in advance of the project limits so that other warning signs in a series may be adequately placed prior to the condition they are warning about.**
3. **The ROAD WORK NEXT XX MILES sign shall be used for projects with activity areas greater than 2 miles in length, or when multiple work activities (such as pavement patching, guardrail installations, shoulder restoration, etc.) occur along a highway.**
4. **The distance displayed on the ROAD WORK NEXT XX MILES sign shall be stated to the nearest whole mile from the point of installation to the END ROAD WORK (G20-2 (V)) sign.**
5. **On divided highways having a median wider than 8', right and left sign assemblies shall be required.**

Guidance:

6. *For projects with activity areas 2 miles or less in length, the ROAD WORK AHEAD sign should be the first sign motorist encounter.*
7. *Sign spacing should be 1300'-1500' for Limited Access highways. For all other roadways, the sign spacing should be 500'-800' where the posted speed limit is greater than 45 mph, and 350'-500' where the posted speed limit is 45 mph or less.*
8. *All connections within the project limits should be identified with signs indicating to motorist they are entering or exiting a potential construction/maintenance area.*

Signing for Project Limits
(Figure TTC-53.0)



70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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2. Property owners correct as of _____, 20__
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4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(6)	DRAWING NO. 0-28633

Typical Traffic Control
Lane Closure Operation through a Unsignalized[2] Intersection [1]
(Figure TTC-67.1)

NOTES

Guidance:

1. *Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, 500'-800' where the posted speed limit is greater than 45 mph.*
2. *To maintain efficient traffic flow in a flagging operation on a two-lane roadway, the maximum time motorists should be stopped at a flagger station is 8 minutes for high volume roadways (average daily traffic of 500 or more vehicles per day) to a maximum of 12 minutes for low volume roadways (less than 500 vehicles per day). For additional information see Section 6E.07.*[2]

Standard:

3. **PTRS shall be used as per Section 6F.99.**[2]
4. **Channelizing device spacing shall be on 20' centers or less 100 feet in advance of the intersection.**

Guidance:

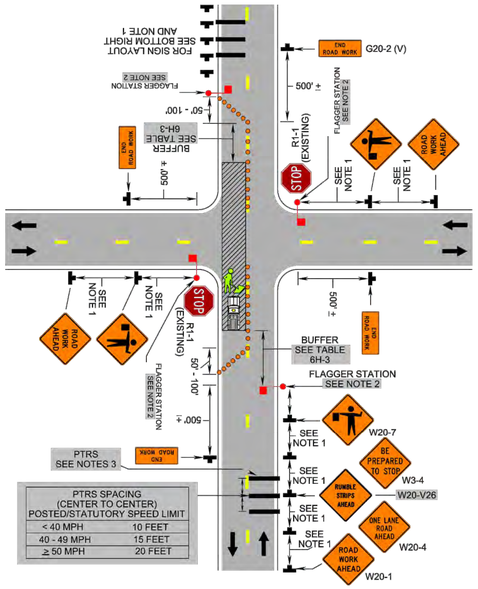
5. *If room permits, a shadow vehicle with at least one rotating amber light or high intensity amber strobe light should be parked 80'-120' in advance of the first work crew.*
6. *If the posted speed limit is 45 mph or greater, the shadow vehicle should have a truck-mounted attenuator.*
7. *If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure TTC-36.*

Option

8. At the stop condition intersecting roadway, additional flagger sign may be used (BE PREPARED TO STOP (W3-4)) between the ROAD WORK AHEAD and the flagger station in the proper sequence, as directed by the District[2] Traffic Engineer.
9. PTRS may be used on the intersecting roadway to enhance the work zone at the approaching intersection.[2]

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Lane Closure Operation through a Unsignalized[2] Intersection [1]
(Figure TTC-67.1)



1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

NOTES
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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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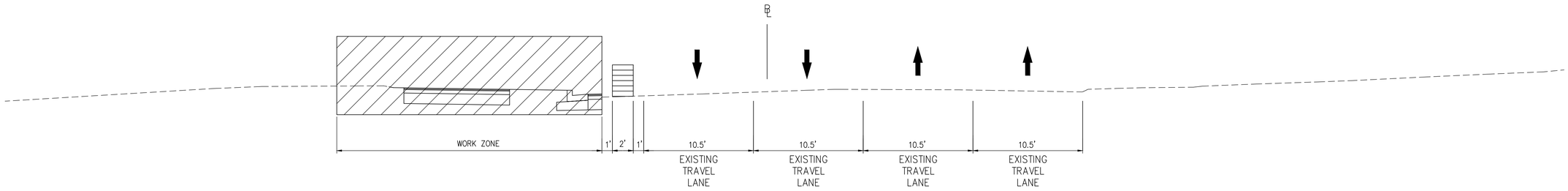
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(7)	DRAWING NO. 0-28633

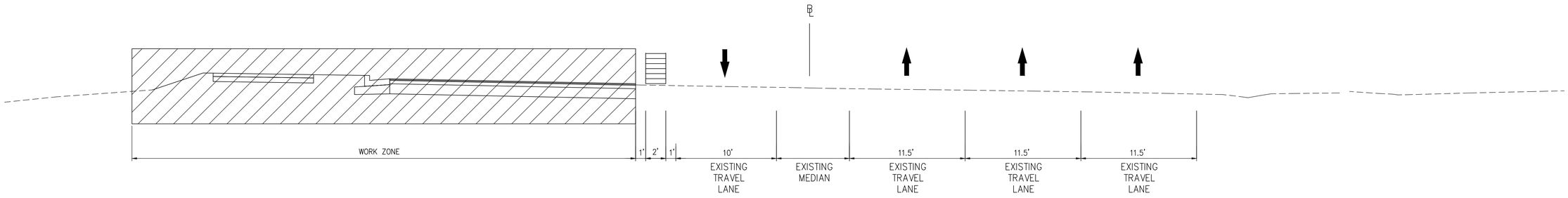
70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION



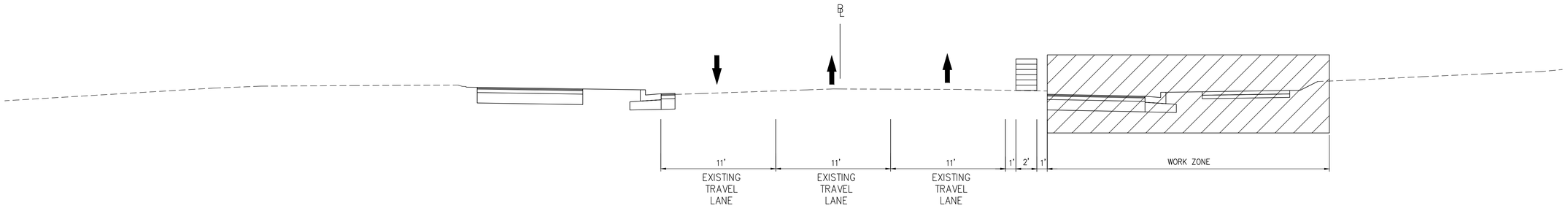
PHASE 1A

Mosby Street



PHASE 1A

Leigh Street Viaduct



PHASE 1B

Mosby Street

70% SUBMITTAL
SEPTEMBER 2022

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4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole (SDMH, (SMH))
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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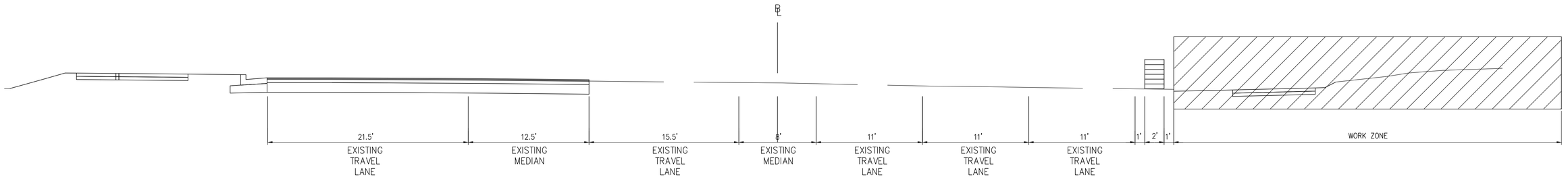
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASED TYPICALS

AUTHORITY: CITY OF RICHMOND, DPW

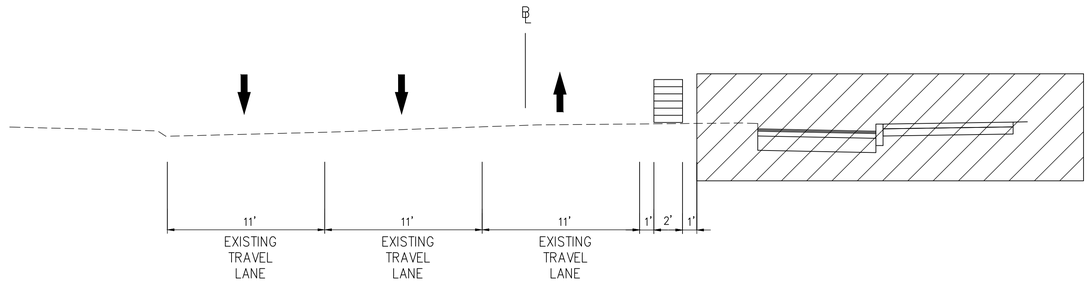
DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(8)	DRAWING NO. 0-28633



PHASE 1B

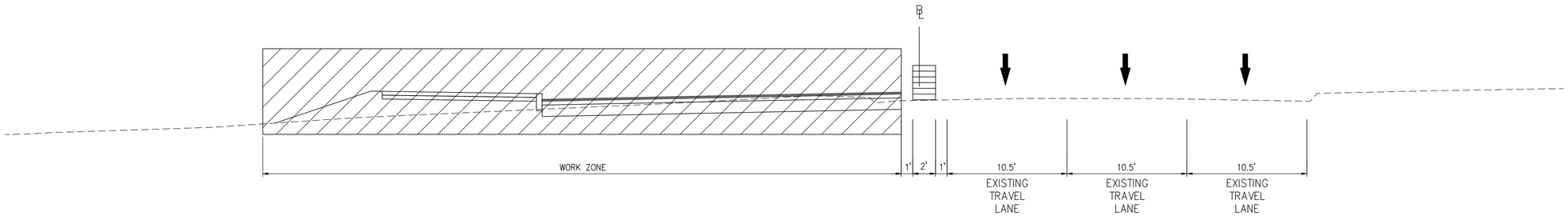
Leigh Street Viaduct

No Typical Section for Phase 1C and 1D



PHASE 3A

E. Broad Street



PHASE 3B

Oliver Hill Way

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

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REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH ⊹ ●WV
Water Meter ●WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ● ● GV
Fence
Power/Light Pole PP ☼ LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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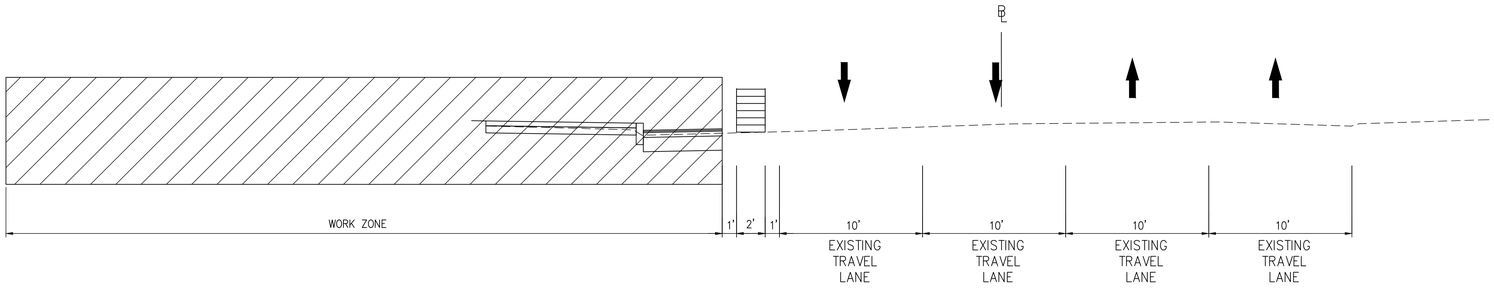
SHOCKOE VALLEY STREET IMPROVEMENTS

MAINTENANCE OF TRAFFIC PLAN

PHASED TYPICALS

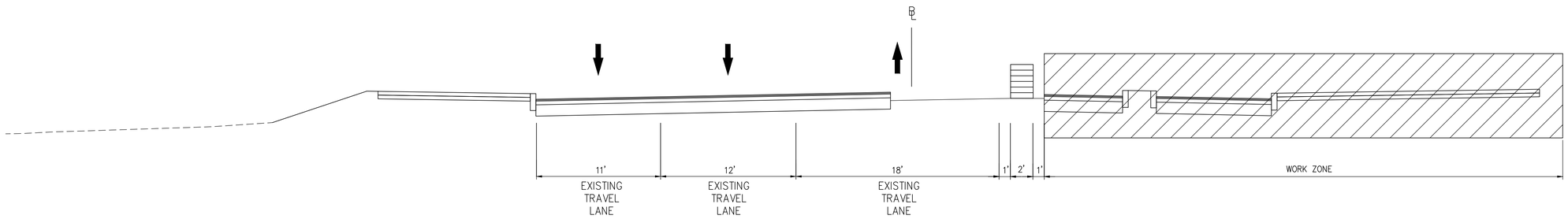
AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(9)	DRAWING NO. 0-28633



PHASE 3B

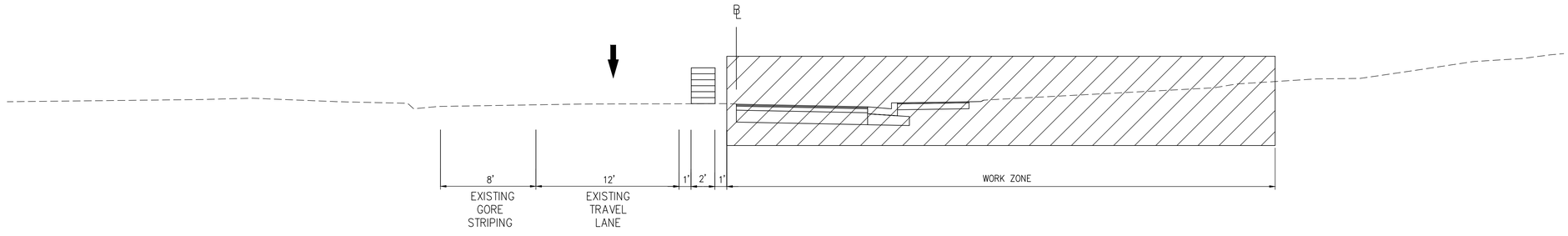
E. Broad Street



PHASE 3C

Oliver Hill Way

No Typical Section for Phase 3D



PHASE 4A

Oliver Hill Way

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH / WV)

Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM / GV)
Fence
Power/Light Pole (PP / LP)
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

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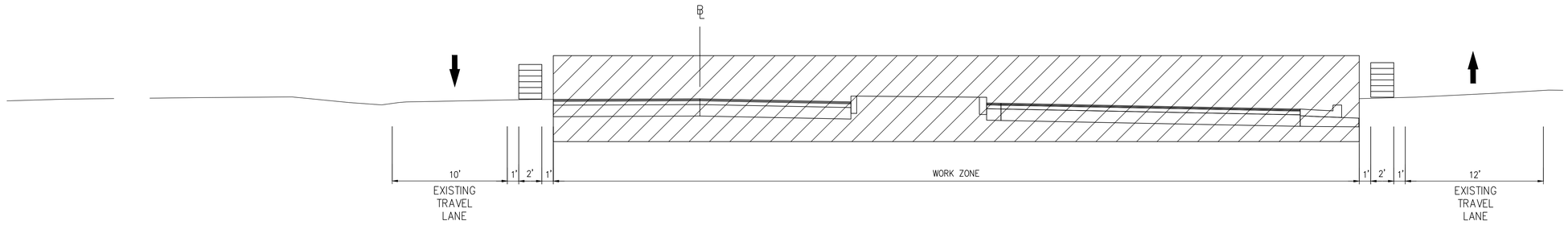
SHOCKOE VALLEY STREET IMPROVEMENTS

MAINTENANCE OF TRAFFIC PLAN

PHASED TYPICALS

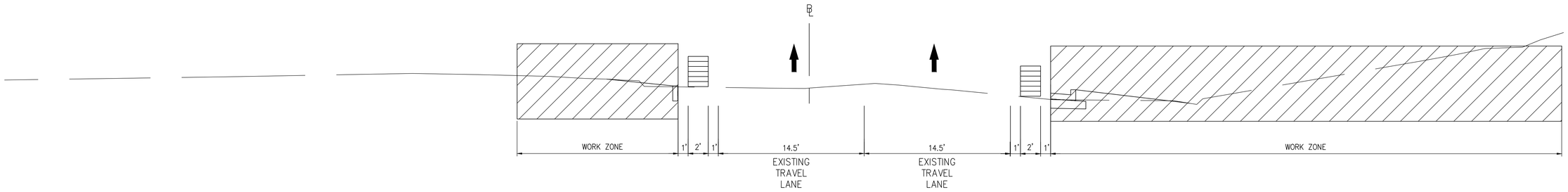
AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(10)	DRAWING NO. 0-28633



PHASE 4A

Oliver Hill Way



PHASE 4B

Balding Street

No Typical Section for Phases 5, 6, or 7

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole (SDMH, (SMH))
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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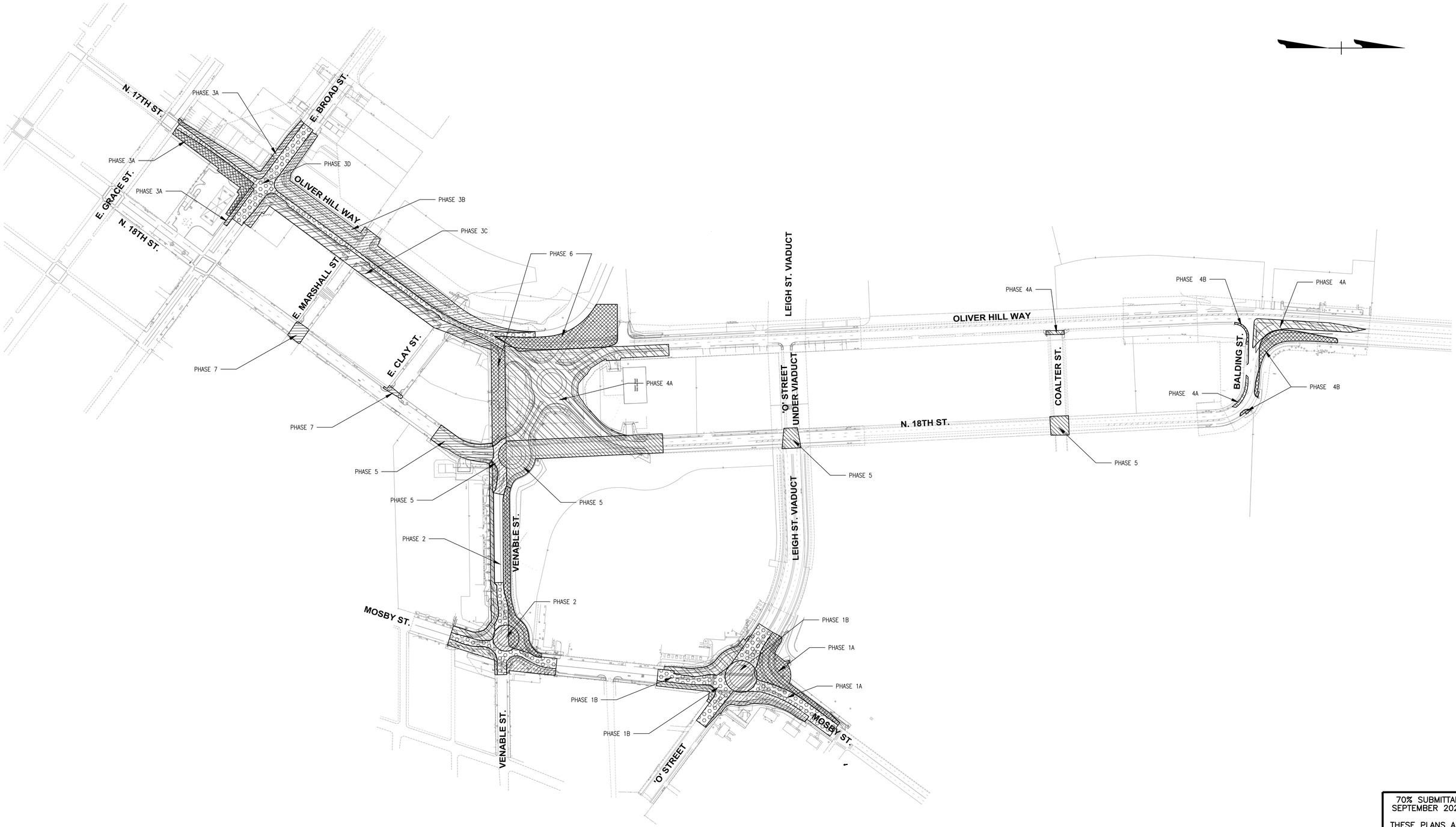
AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS

MAINTENANCE OF TRAFFIC PLAN

PHASED TYPICALS

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(11)	DRAWING NO. 0-28633



150 0 150 300
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

- Storm Sewer
- Sanitary Sewer (County)
- Gas Line
- Electric Line
- Overhead Utility
- Telephone/Telegraph
- Water Line
- Property Line
- Storm Basin
- Storm or Sanitary Manhole (D) or (S)
- Fire Hydrant / Valve FH WV
- Water Meter WM
- Existing Curb Cut Ramp HCR
- Gas Meter / Valve GM GV
- Fence
- Power/Light Pole PP LP
- Guy Anchor
- Tree

Proposed Legend

- Sanitary Sewer
- Storm Sewer
- Storm/(San) Manhole SDMH (SMH)
- Basin
- Curb Cut Ramp
- Decorative Light
- Conduit
- Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

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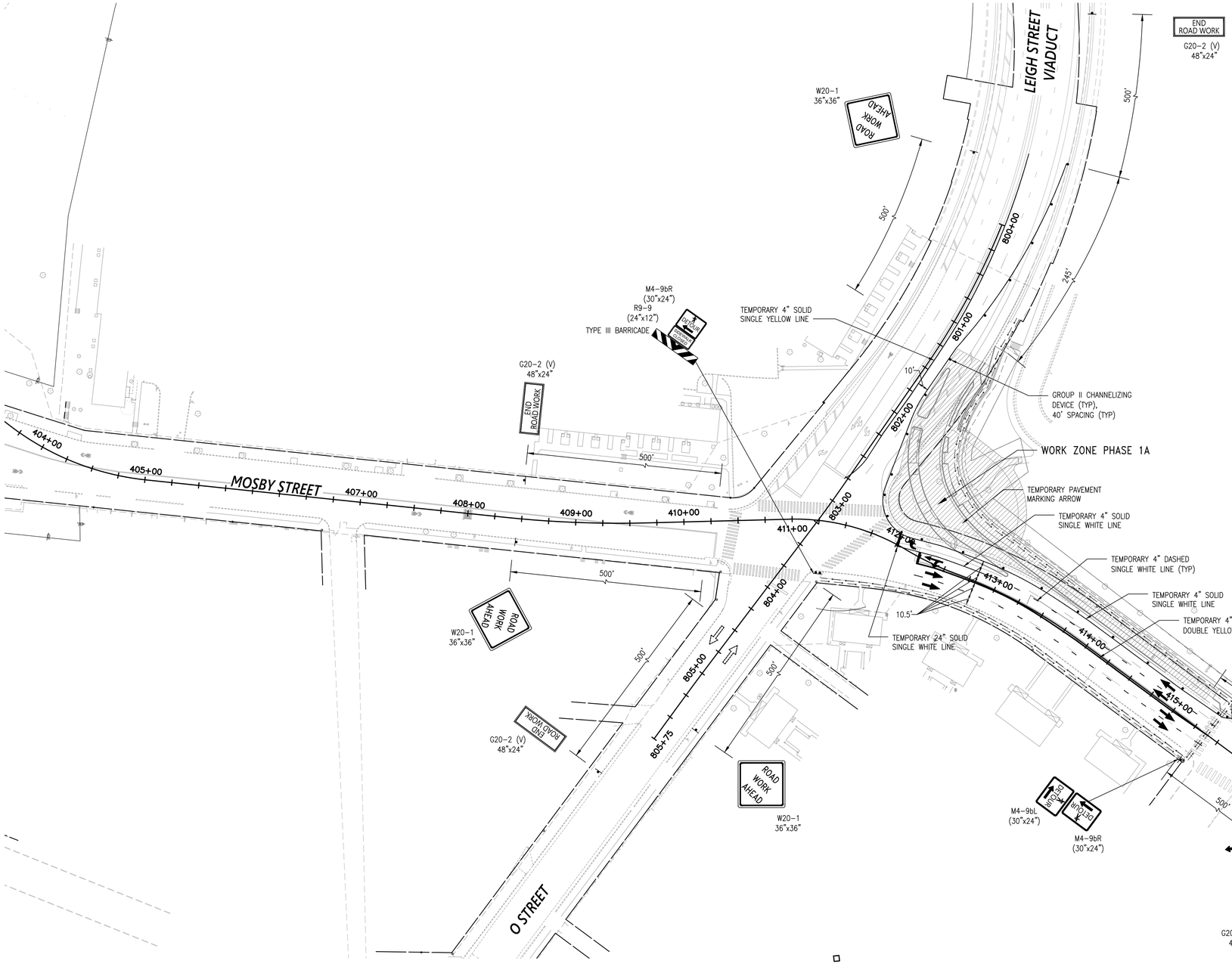
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
OVERALL PHASING PLAN

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(12)	DRAWING NO. 0-28633



PHASE 1A MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE EXISTING PAVEMENT MARKINGS AND MARKERS THAT ARE IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.
4. ADJUST LOCATIONS OF EXISTING SIGNAL HEADS ON SPAN WIRE.
5. MAINTAIN TWO-WAY TRAFFIC AND LANE CONFIGURATION INCLUDING TURN LANES AT MOSBY STREET AND O STREET INTERSECTION.
6. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
7. CONSTRUCT PROPOSED SIDEWALK AND ACCESSIBLE RAMPS.
8. DIVERT PEDESTRIANS TO NEW SIDEWALK IN ACCORDANCE WITH TTC-35.1. EXISTING CROSSWALK AT INTERSECTION OF MOSBY STREET AND DRIVEWAY TO MARTIN LUTHER KING JR. PRESCHOOL LEARNING CENTER SHALL BE UTILIZED TO CROSS MOSBY STREET.
9. MAINTAIN PEDESTRIAN ACCESS THROUGHOUT CONSTRUCTION.
10. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
11. INSTALL PROPOSED STORM DRAINAGE SYSTEM WITHIN CONSTRUCTION LIMITS.
12. CONSTRUCT PROPOSED CURBING AS SHOWN ON THE PLANS.
13. CONSTRUCT PROPOSED PAVEMENT UP TO INTERMEDIATE COURSE. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.

Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

50 0 50 100
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole Ⓢ or Ⓢ; Fire Hydrant / Valve FH ⊹ WV
Water Meter WM; Existing Curb Cut Ramp HCR; Gas Meter / Valve GM GV; Fence; Power/Light Pole PP LP; Guy Anchor; Tree

Proposed Legend
Sanitary Sewer; Storm Sewer; Storm/(San) Manhole SDMH (SMH); Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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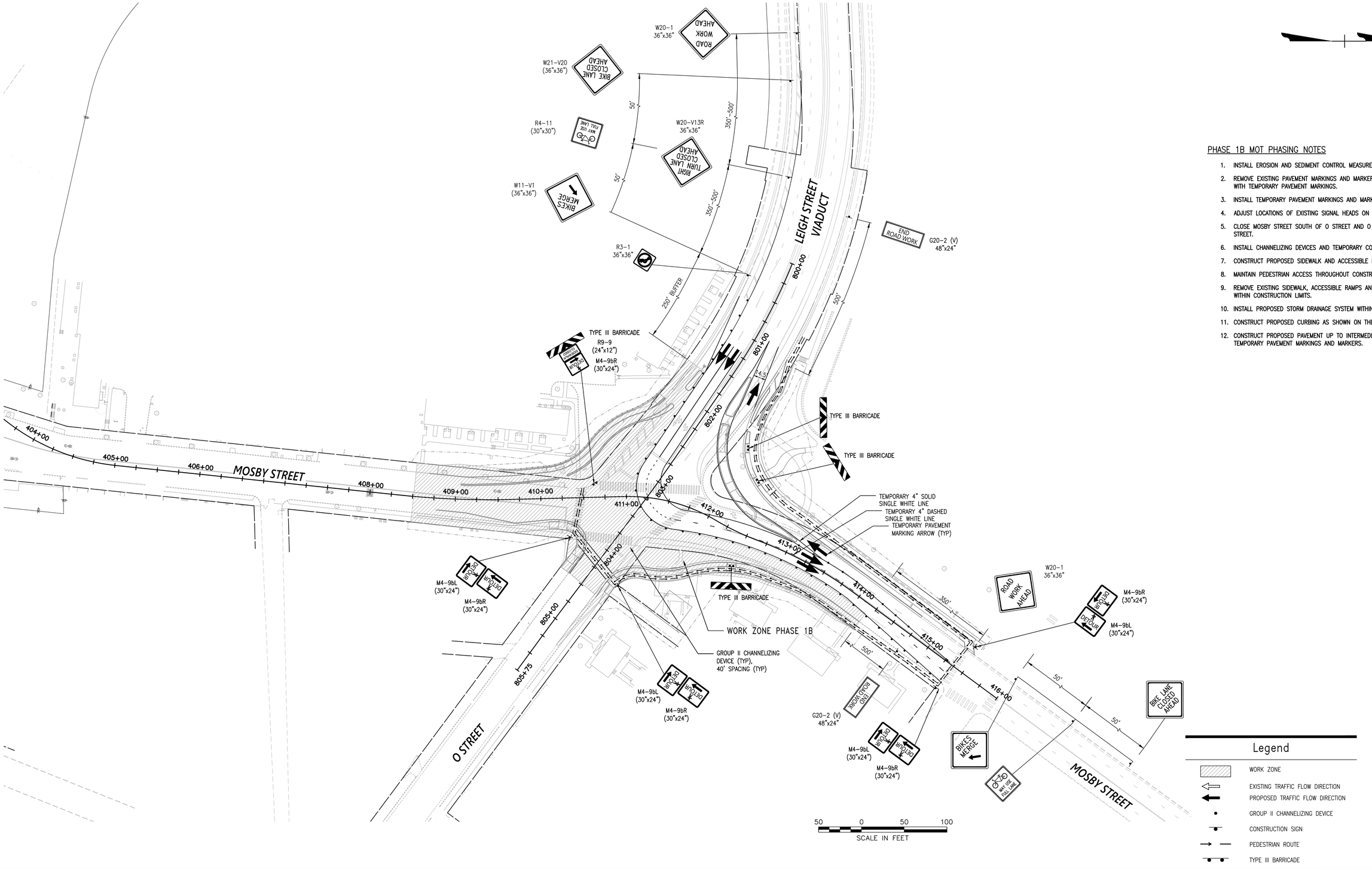
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 1A

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(13)	DRAWING NO. 0-28633



PHASE 1B MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE EXISTING PAVEMENT MARKINGS AND MARKERS THAT ARE IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.
4. ADJUST LOCATIONS OF EXISTING SIGNAL HEADS ON SPAN WIRE.
5. CLOSE MOSBY STREET SOUTH OF O STREET AND O STREET EAST OF MOSBY STREET.
6. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
7. CONSTRUCT PROPOSED SIDEWALK AND ACCESSIBLE RAMPS.
8. MAINTAIN PEDESTRIAN ACCESS THROUGHOUT CONSTRUCTION.
9. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
10. INSTALL PROPOSED STORM DRAINAGE SYSTEM WITHIN CONSTRUCTION LIMITS.
11. CONSTRUCT PROPOSED CURBING AS SHOWN ON THE PLANS.
12. CONSTRUCT PROPOSED PAVEMENT UP TO INTERMEDIATE COURSE. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.

Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole (SDMH, (SMH))
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 1B

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(14)	DRAWING NO. 0-28633

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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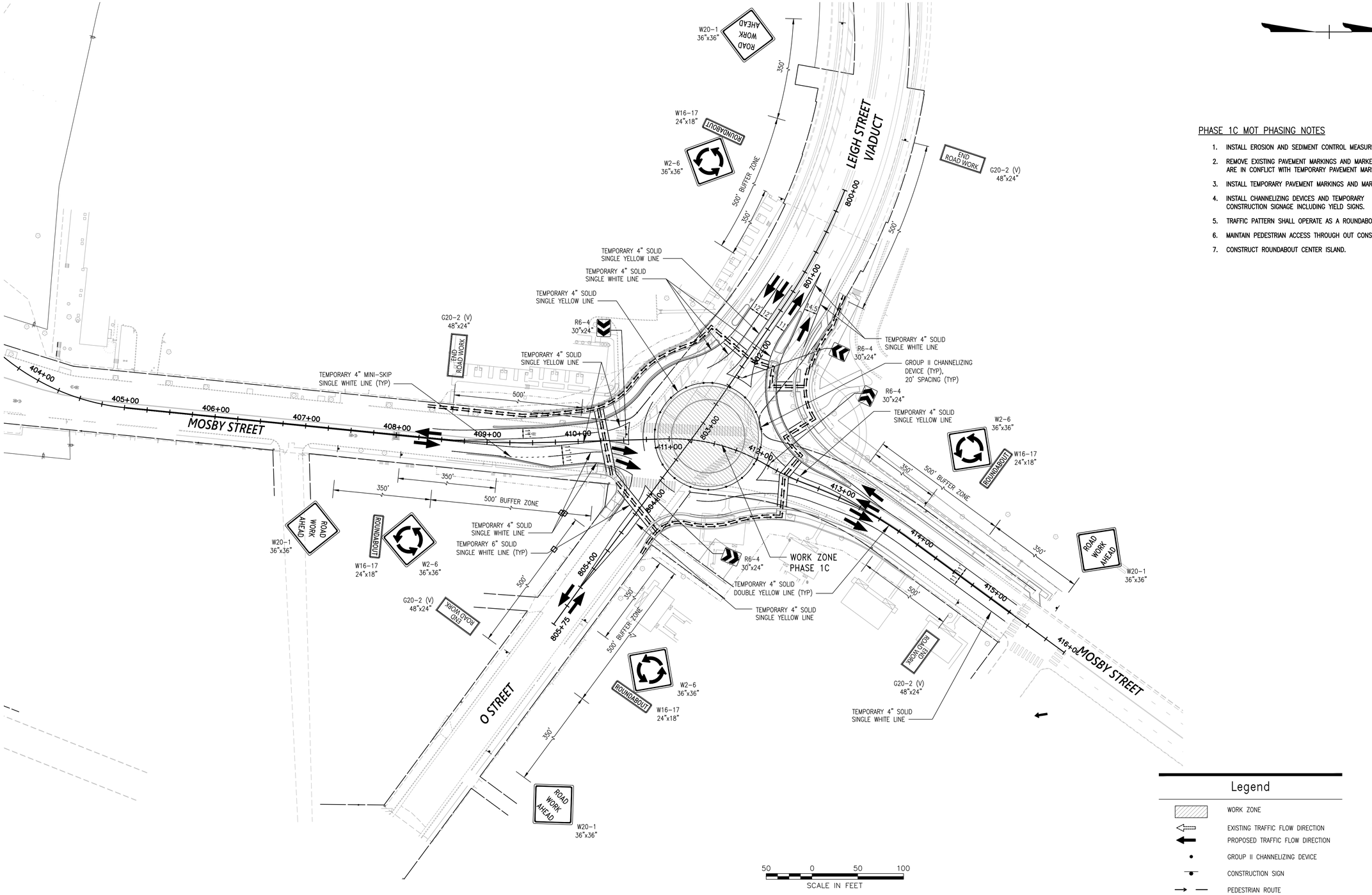
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 1B DETOUR PLAN

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: EMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(15)	DRAWING NO. 0-28633



PHASE 1C MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE EXISTING PAVEMENT MARKINGS AND MARKERS THAT ARE IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.
4. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE INCLUDING YIELD SIGNS.
5. TRAFFIC PATTERN SHALL OPERATE AS A ROUNDABOUT.
6. MAINTAIN PEDESTRIAN ACCESS THROUGH OUT CONSTRUCTION.
7. CONSTRUCT ROUNDABOUT CENTER ISLAND.

Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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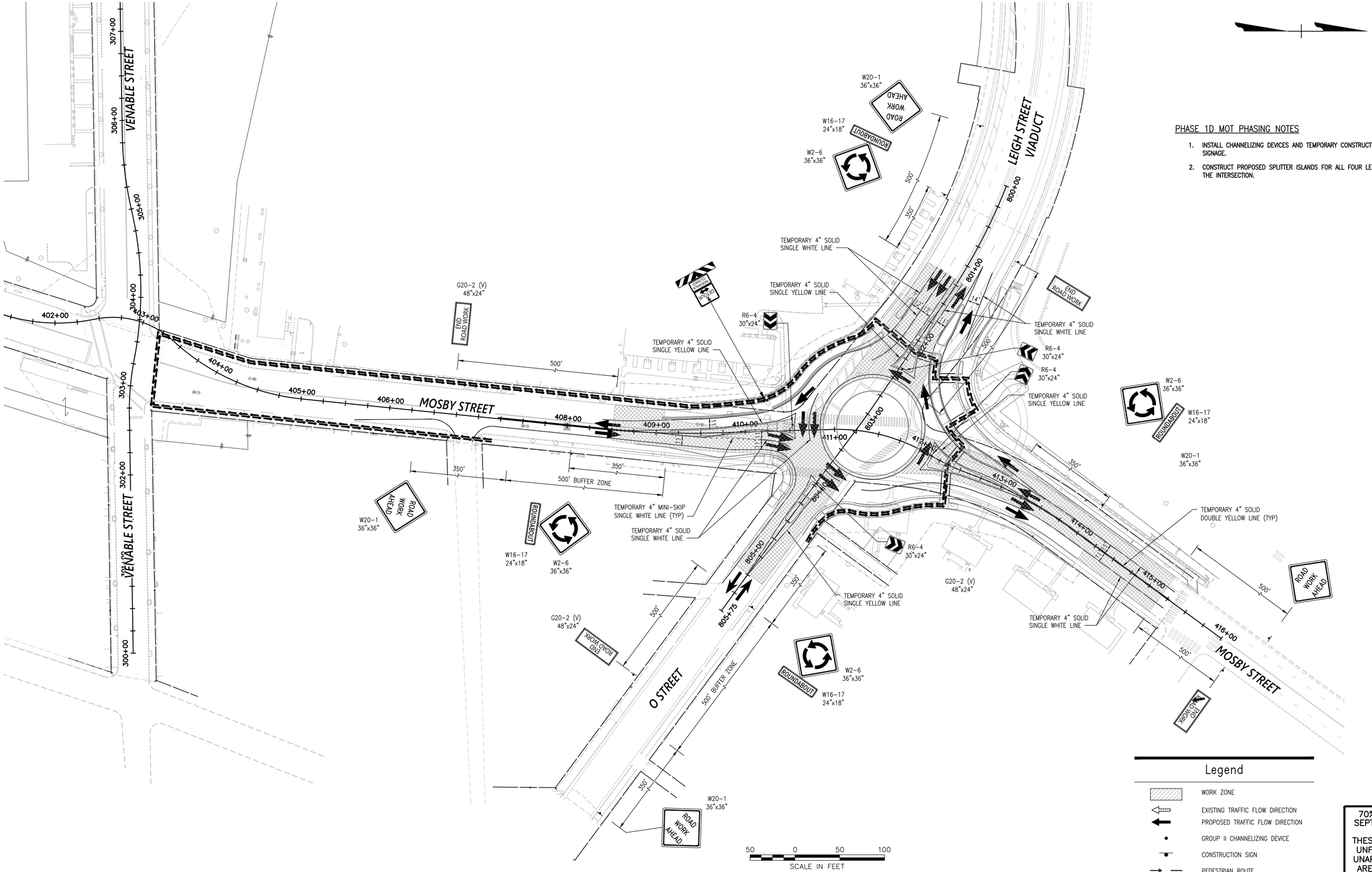
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 1C

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(16)	DRAWING NO. 0-28633



PHASE 1D MOT PHASING NOTES

1. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
2. CONSTRUCT PROPOSED SPLITTER ISLANDS FOR ALL FOUR LEGS OF THE INTERSECTION.

Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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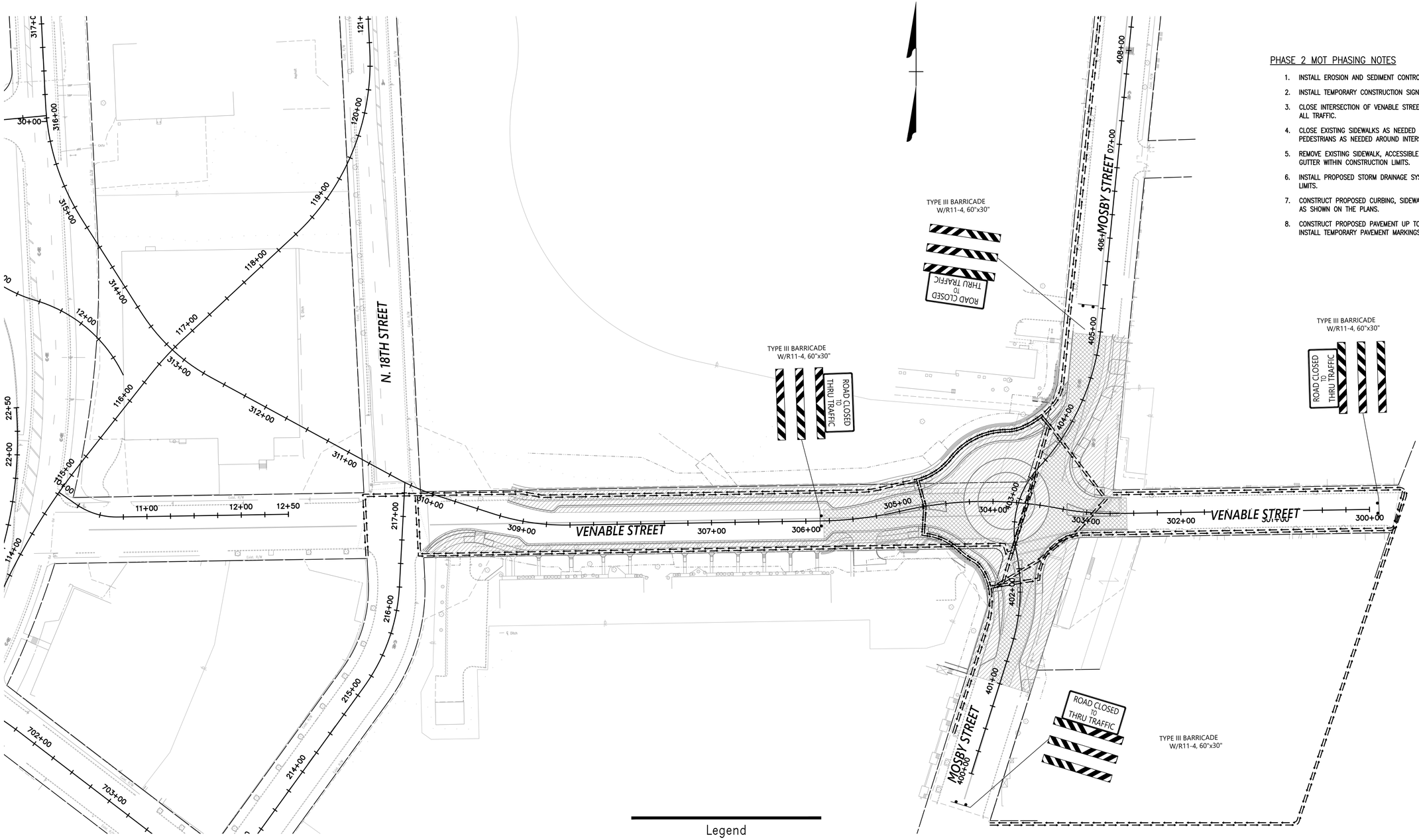
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 1D

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(17)	DRAWING NO. 0-28633



PHASE 2 MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. INSTALL TEMPORARY CONSTRUCTION SIGNAGE.
3. CLOSE INTERSECTION OF VENABLE STREET AND MOSBY STREET TO ALL TRAFFIC.
4. CLOSE EXISTING SIDEWALKS AS NEEDED AT WORK ZONE. DETOUR PEDESTRIANS AS NEEDED AROUND INTERSECTION UTILIZING TTC 36.2.
5. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
6. INSTALL PROPOSED STORM DRAINAGE SYSTEM WITHIN CONSTRUCTION LIMITS.
7. CONSTRUCT PROPOSED CURBING, SIDEWALK AND ACCESSIBLE RAMPS AS SHOWN ON THE PLANS.
8. CONSTRUCT PROPOSED PAVEMENT UP TO INTERMEDIATE COURSE. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 2

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(18)	DRAWING NO. 0-28633

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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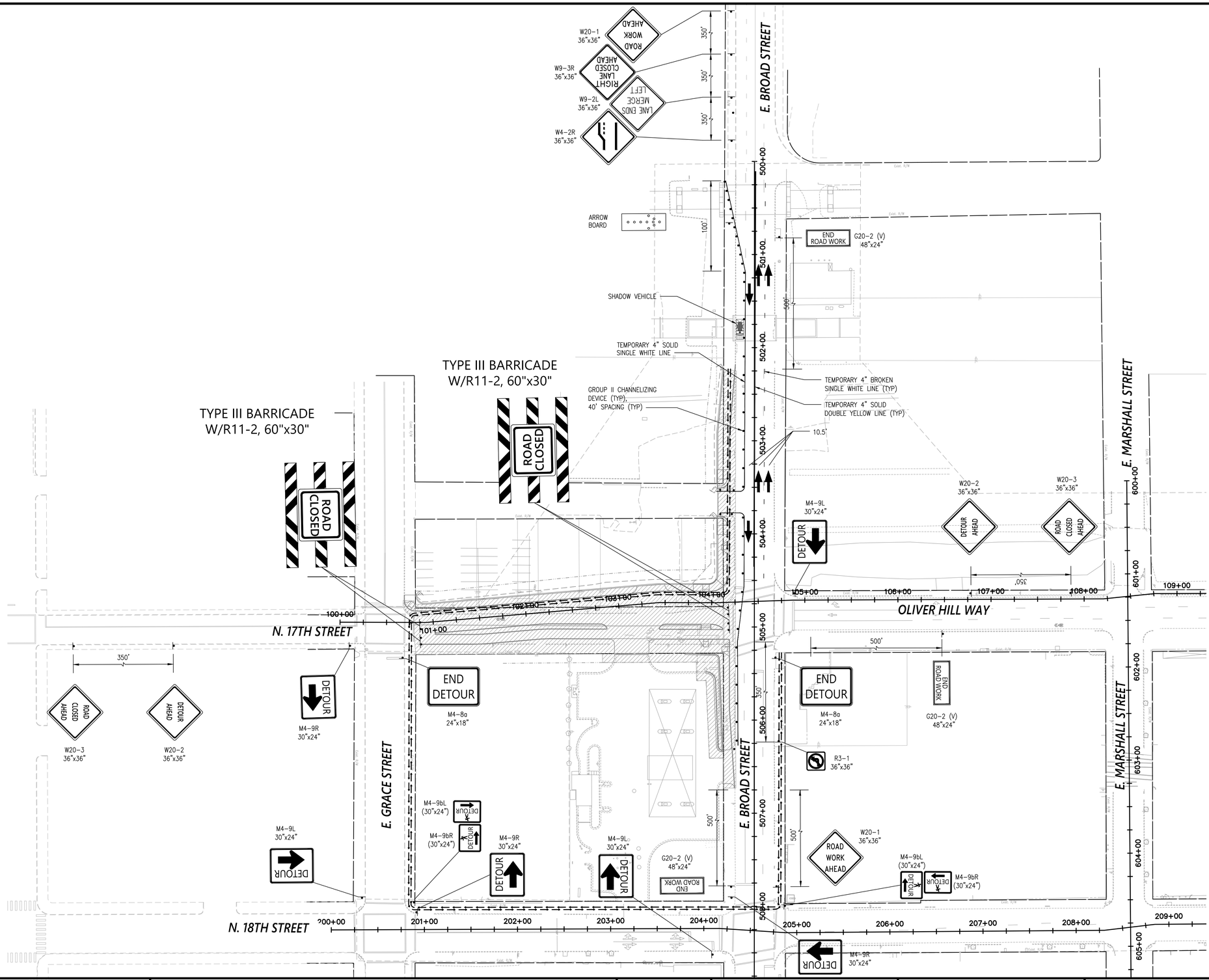
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 2 DETOUR PLAN

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(19)	DRAWING NO. 0-28633



PHASE 3A MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. DURING NIGHT TIME HOURS, CLOSE OUTSIDE SOUTHBOUND LANE ON E. BROAD STREET UTILIZING TTC-16.2.
3. CLOSE N. 17TH STREET BETWEEN E. GRACE STREET AND E. BROAD STREET TO ALL TRAFFIC.
4. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
5. MAINTAIN ONE SOUTHBOUND AND TWO NORTHBOUND LANES ON E. BROAD STREET DURING NIGHT TIME HOURS.
6. CLOSE EXISTING SIDEWALK ALONG E. BROAD STREET AND N. 17TH STREET. MAINTAIN PEDESTRIAN ACCESS THROUGH OUT CONSTRUCTION.
7. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
8. INSTALL PROPOSED STORM DRAINAGE SYSTEM WITHIN CONSTRUCTION LIMITS.
9. CONSTRUCT PROPOSED CURBING, SIDEWALK AND ACCESSIBLE RAMPS AS SHOWN ON THE PLANS.
10. CONSTRUCT PROPOSED PAVEMENT UP TO INTERMEDIATE COURSE. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.
11. RE-OPEN OUTSIDE SOUTHBOUND LANE ON E. BROAD STREET AT THE END OF EACH NIGHT CLOSURE.

Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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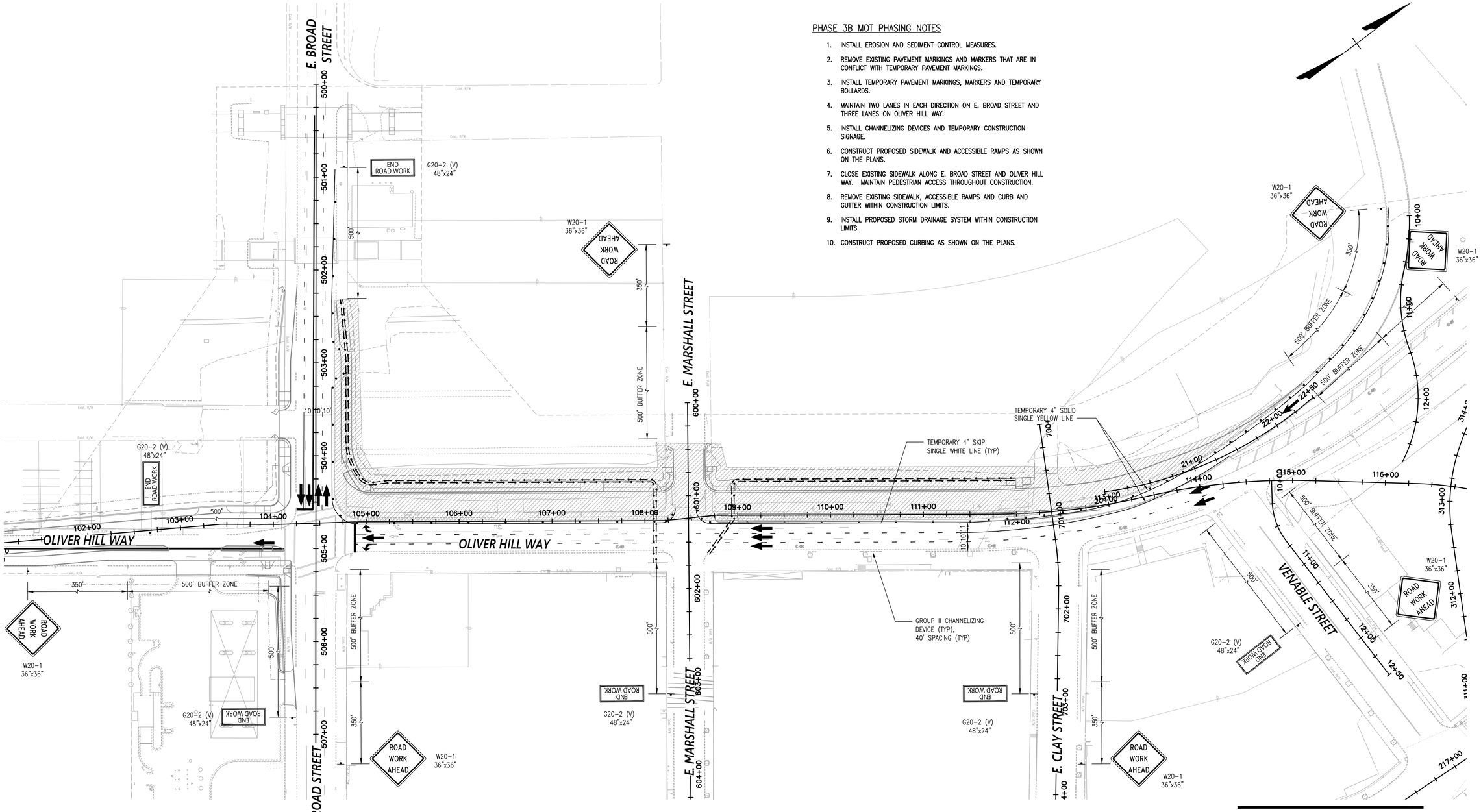
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 3A

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(20)	DRAWING NO. 0-28633

PHASE 3B MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE EXISTING PAVEMENT MARKINGS AND MARKERS THAT ARE IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. INSTALL TEMPORARY PAVEMENT MARKINGS, MARKERS AND TEMPORARY BOLLARDS.
4. MAINTAIN TWO LANES IN EACH DIRECTION ON E. BROAD STREET AND THREE LANES ON OLIVER HILL WAY.
5. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
6. CONSTRUCT PROPOSED SIDEWALK AND ACCESSIBLE RAMPS AS SHOWN ON THE PLANS.
7. CLOSE EXISTING SIDEWALK ALONG E. BROAD STREET AND OLIVER HILL WAY. MAINTAIN PEDESTRIAN ACCESS THROUGHOUT CONSTRUCTION.
8. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
9. INSTALL PROPOSED STORM DRAINAGE SYSTEM WITHIN CONSTRUCTION LIMITS.
10. CONSTRUCT PROPOSED CURBING AS SHOWN ON THE PLANS.



50 0 50 100
SCALE IN FEET

Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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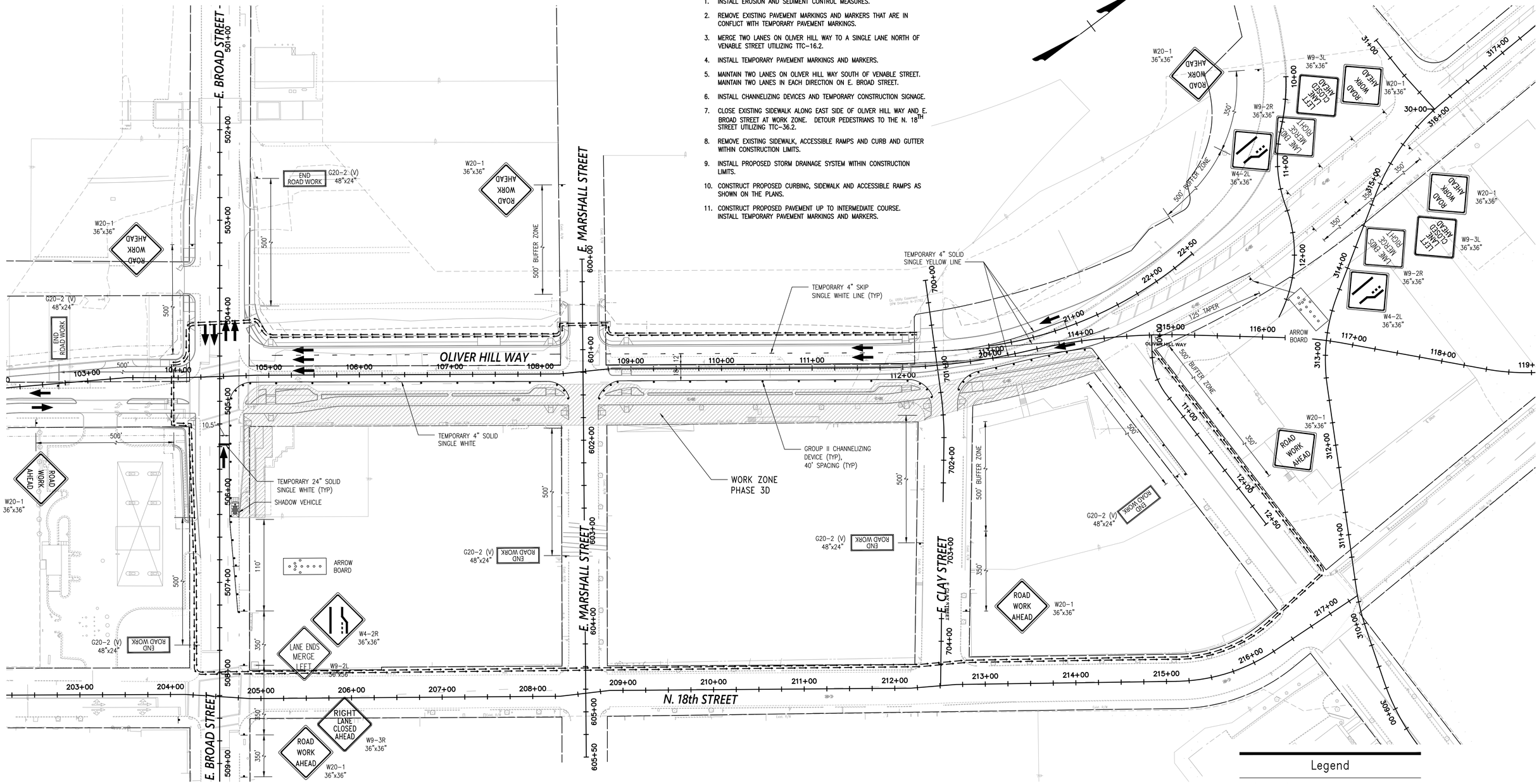
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 3B

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(21)	DRAWING NO. 0-28633

PHASE 3C MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE EXISTING PAVEMENT MARKINGS AND MARKERS THAT ARE IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. MERGE TWO LANES ON OLIVER HILL WAY TO A SINGLE LANE NORTH OF VENABLE STREET UTILIZING TTC-16.2.
4. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.
5. MAINTAIN TWO LANES ON OLIVER HILL WAY SOUTH OF VENABLE STREET. MAINTAIN TWO LANES IN EACH DIRECTION ON E. BROAD STREET.
6. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
7. CLOSE EXISTING SIDEWALK ALONG EAST SIDE OF OLIVER HILL WAY AND E. BROAD STREET AT WORK ZONE. DETOUR PEDESTRIANS TO THE N. 18TH STREET UTILIZING TTC-36.2.
8. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
9. INSTALL PROPOSED STORM DRAINAGE SYSTEM WITHIN CONSTRUCTION LIMITS.
10. CONSTRUCT PROPOSED CURBING, SIDEWALK AND ACCESSIBLE RAMPS AS SHOWN ON THE PLANS.
11. CONSTRUCT PROPOSED PAVEMENT UP TO INTERMEDIATE COURSE. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.



Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

50 0 50 100
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓢ or Ⓢ
Fire Hydrant / Valve FH ◇ WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ◇ GV
Fence
Power/Light Pole PP ☼ LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● CSMH
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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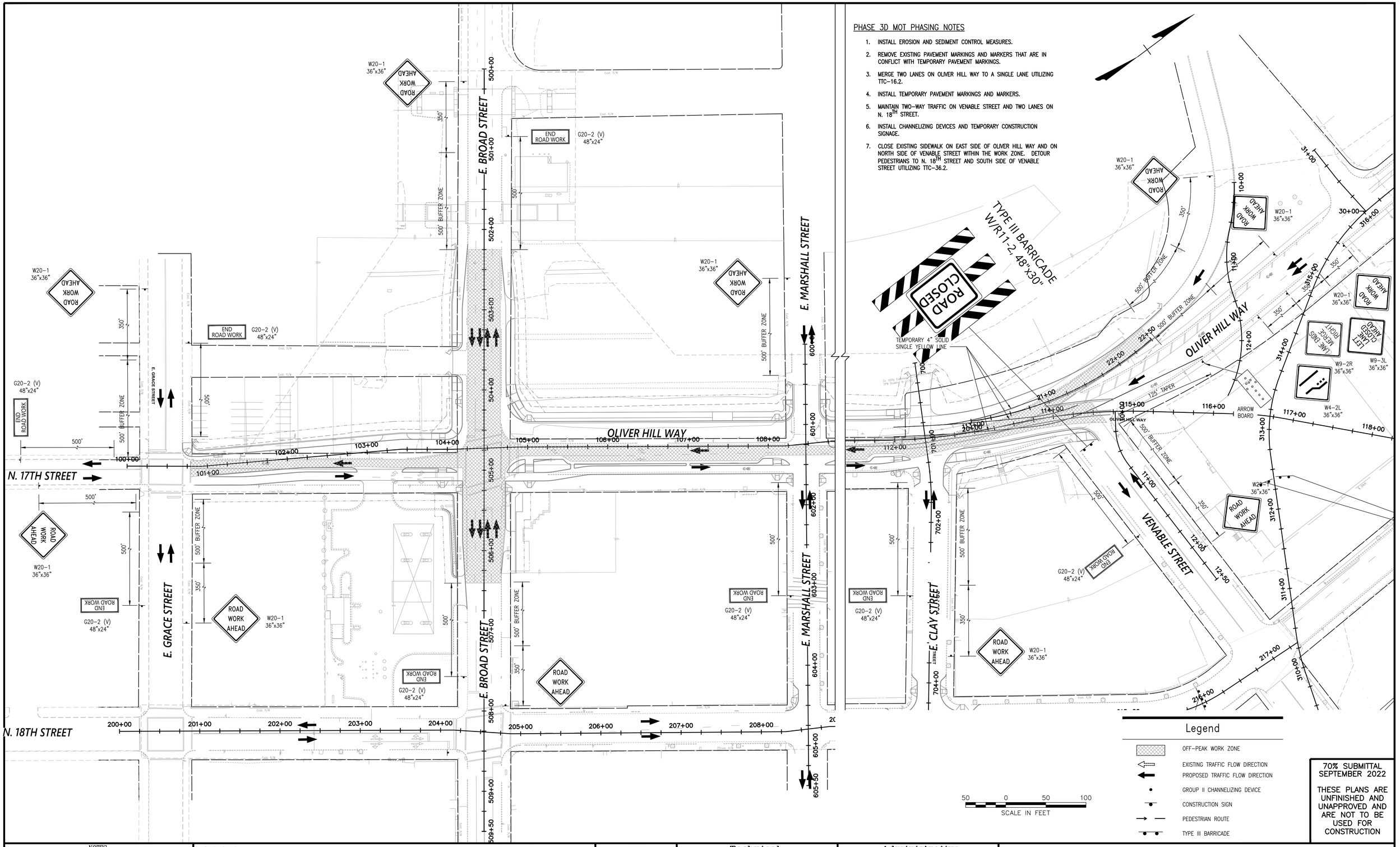
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 3C

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(22)	DRAWING NO. 0-28633

PHASE 3D MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE EXISTING PAVEMENT MARKINGS AND MARKERS THAT ARE IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. MERGE TWO LANES ON OLIVER HILL WAY TO A SINGLE LANE UTILIZING TTC-16.2.
4. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.
5. MAINTAIN TWO-WAY TRAFFIC ON VENABLE STREET AND TWO LANES ON N. 18TH STREET.
6. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
7. CLOSE EXISTING SIDEWALK ON EAST SIDE OF OLIVER HILL WAY AND ON NORTH SIDE OF VENABLE STREET WITHIN THE WORK ZONE. DETOUR PEDESTRIANS TO N. 18TH STREET AND SOUTH SIDE OF VENABLE STREET UTILIZING TTC-36.2.



70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH ⊹ ● WV
Water Meter ● WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ● ● GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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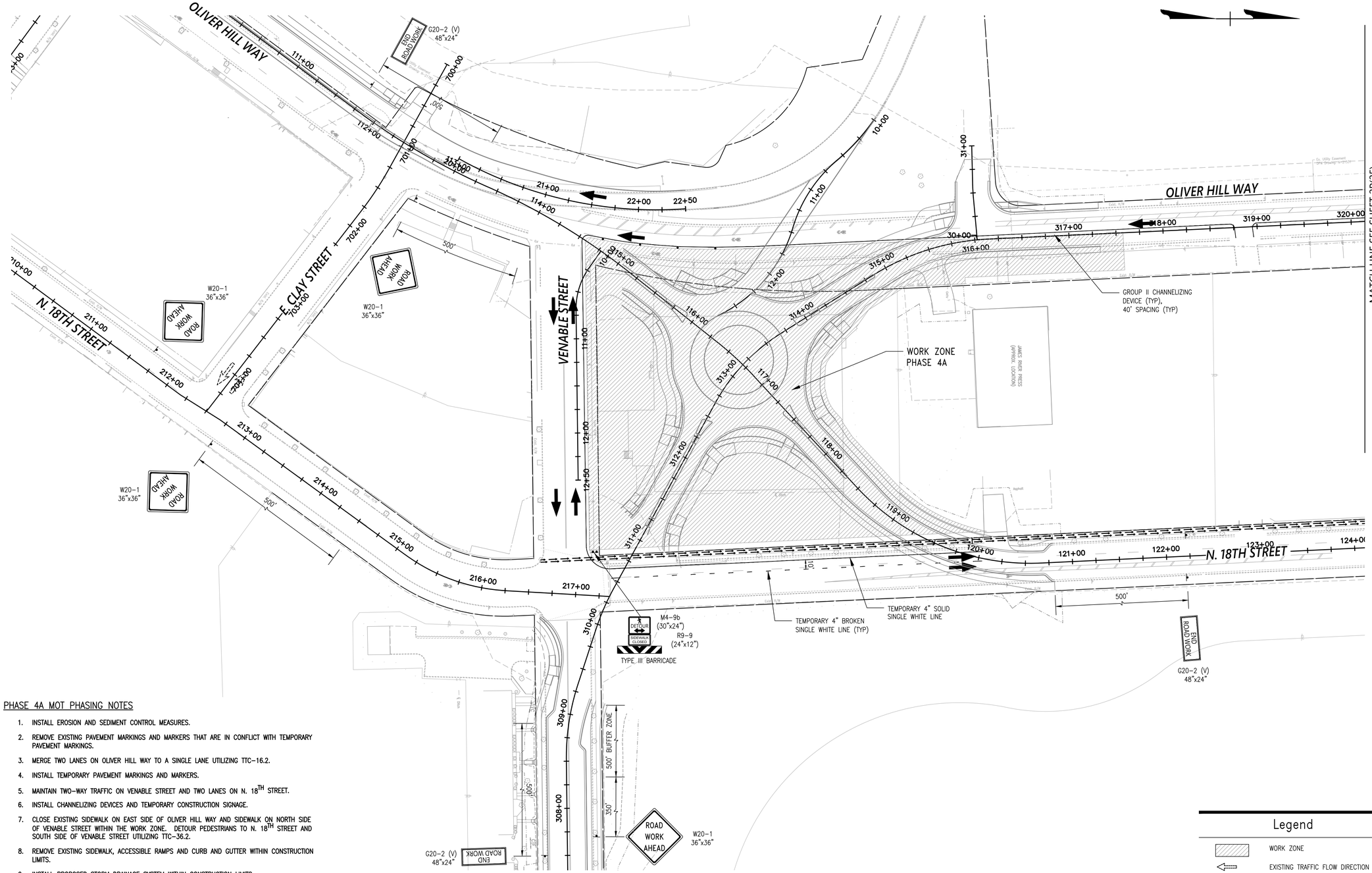
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 3D

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(23)	DRAWING NO. 0-28633



PHASE 4A MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE EXISTING PAVEMENT MARKINGS AND MARKERS THAT ARE IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. MERGE TWO LANES ON OLIVER HILL WAY TO A SINGLE LANE UTILIZING TTC-16.2.
4. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.
5. MAINTAIN TWO-WAY TRAFFIC ON VENABLE STREET AND TWO LANES ON N. 18TH STREET.
6. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
7. CLOSE EXISTING SIDEWALK ON EAST SIDE OF OLIVER HILL WAY AND SIDEWALK ON NORTH SIDE OF VENABLE STREET WITHIN THE WORK ZONE. DETOUR PEDESTRIANS TO N. 18TH STREET AND SOUTH SIDE OF VENABLE STREET UTILIZING TTC-36.2.
8. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
9. INSTALL PROPOSED STORM DRAINAGE SYSTEM WITHIN CONSTRUCTION LIMITS.
10. CONSTRUCT PROPOSED CURBING, SIDEWALK AND ACCESSIBLE RAMPS AS SHOWN ON THE PLANS.
11. CONSTRUCT PROPOSED PAVEMENT UP TO INTERMEDIATE COURSE. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.

Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

50 0 50 100
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (County)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH ◇ WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ◇ GV
Fence
Power/Light Pole PP ☼ LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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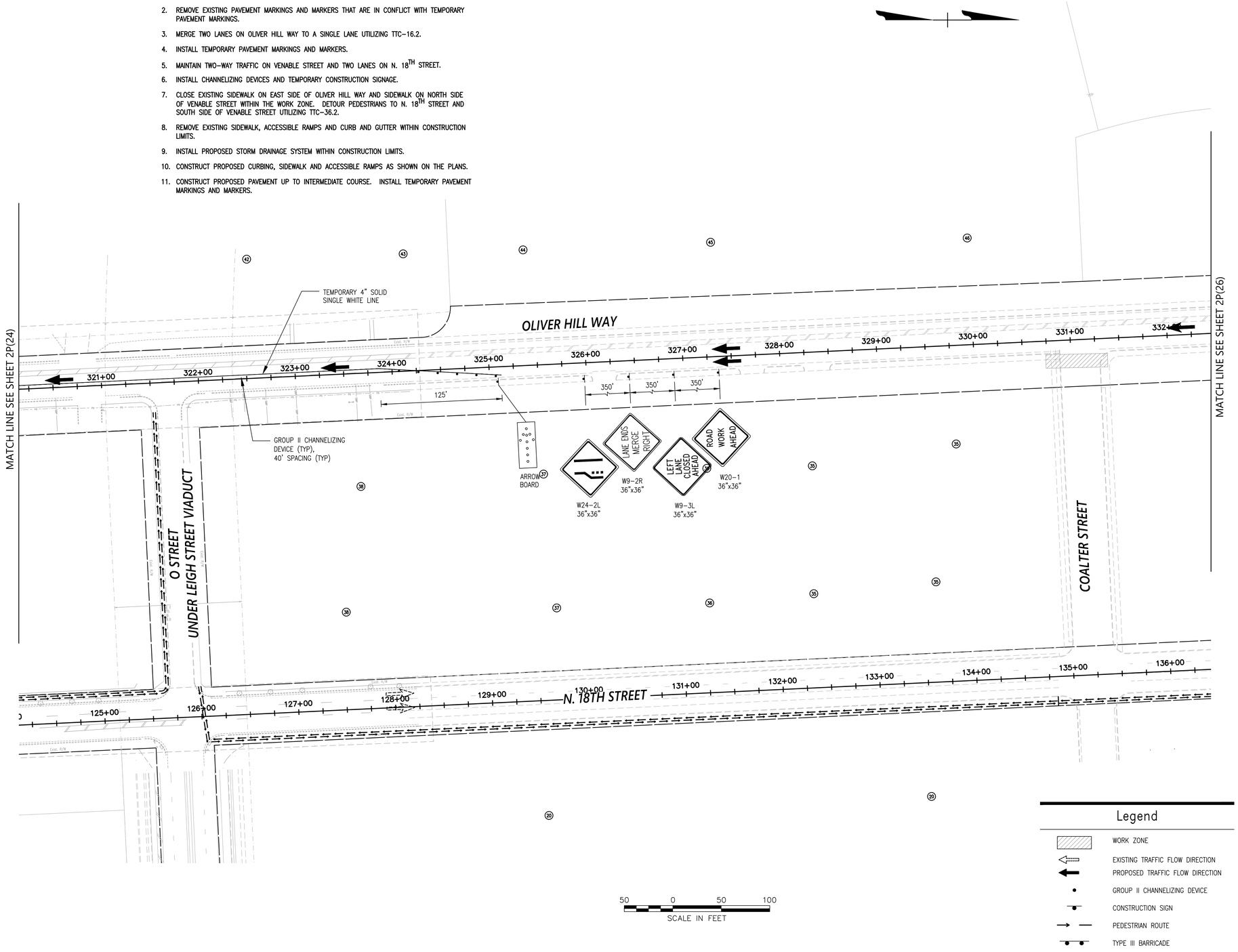
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 4A

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(24)	DRAWING NO. 0-28633

PHASE 4A MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE EXISTING PAVEMENT MARKINGS AND MARKERS THAT ARE IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. MERGE TWO LANES ON OLIVER HILL WAY TO A SINGLE LANE UTILIZING TTC-16.2.
4. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.
5. MAINTAIN TWO-WAY TRAFFIC ON VENABLE STREET AND TWO LANES ON N. 18TH STREET.
6. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
7. CLOSE EXISTING SIDEWALK ON EAST SIDE OF OLIVER HILL WAY AND SIDEWALK ON NORTH SIDE OF VENABLE STREET WITHIN THE WORK ZONE. DETOUR PEDESTRIANS TO N. 18TH STREET AND SOUTH SIDE OF VENABLE STREET UTILIZING TTC-36.2.
8. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
9. INSTALL PROPOSED STORM DRAINAGE SYSTEM WITHIN CONSTRUCTION LIMITS.
10. CONSTRUCT PROPOSED CURBING, SIDEWALK AND ACCESSIBLE RAMPS AS SHOWN ON THE PLANS.
11. CONSTRUCT PROPOSED PAVEMENT UP TO INTERMEDIATE COURSE. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.



50 0 50 100
SCALE IN FEET

Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH / WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM / GV)
Fence
Power/Light Pole (PP / LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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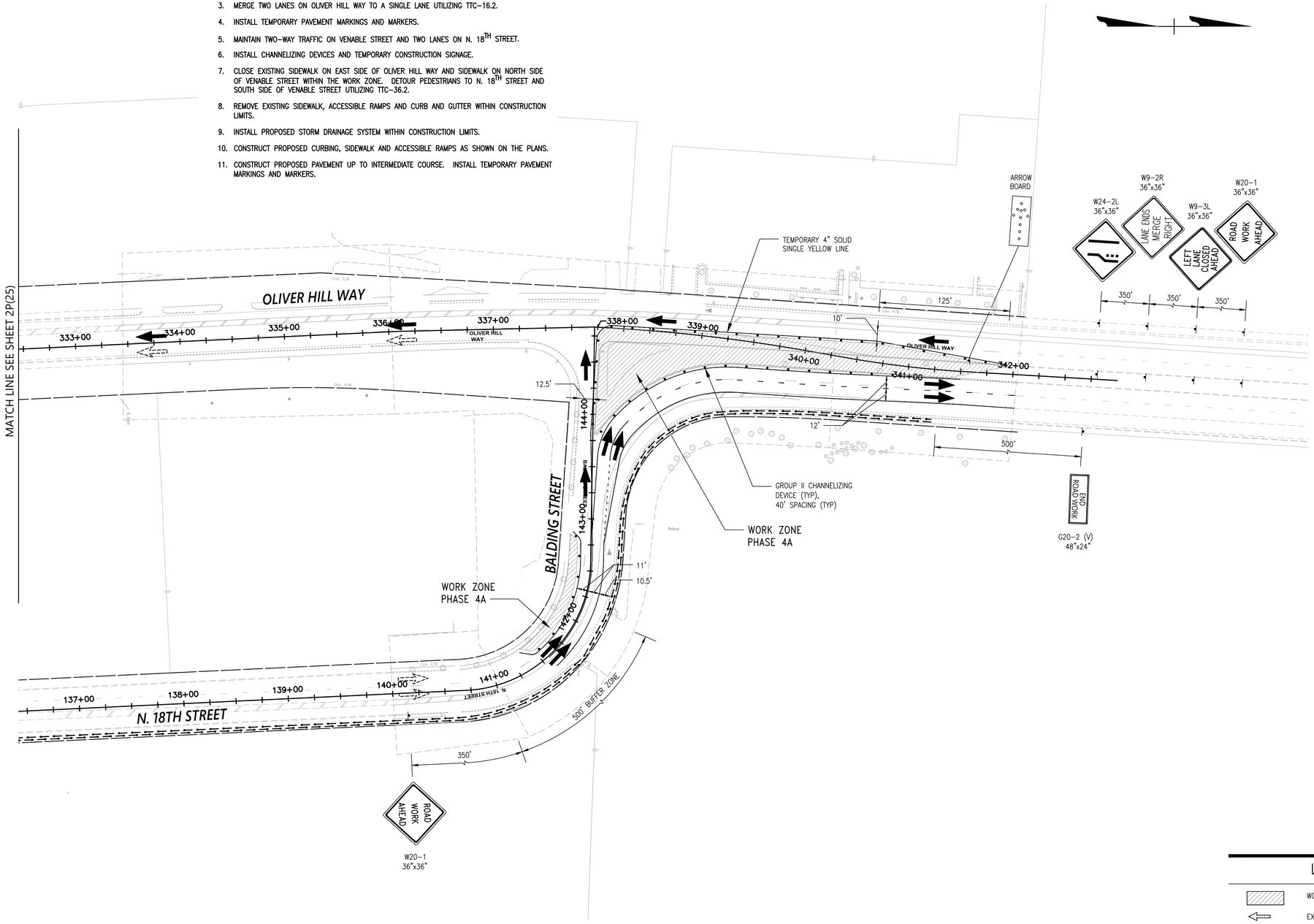
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 4A

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(25)	DRAWING NO. 0-28633

PHASE 4A MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE EXISTING PAVEMENT MARKINGS AND MARKERS THAT ARE IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. MERGE TWO LANES ON OLIVER HILL WAY TO A SINGLE LANE UTILIZING TTC-16.2.
4. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.
5. MAINTAIN TWO-WAY TRAFFIC ON VENABLE STREET AND TWO LANES ON N. 18TH STREET.
6. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
7. CLOSE EXISTING SIDEWALK ON EAST SIDE OF OLIVER HILL WAY AND SIDEWALK ON NORTH SIDE OF VENABLE STREET WITHIN THE WORK ZONE. DETOUR PEDESTRIANS TO N. 18TH STREET AND SOUTH SIDE OF VENABLE STREET UTILIZING TTC-36.2.
8. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
9. INSTALL PROPOSED STORM DRAINAGE SYSTEM WITHIN CONSTRUCTION LIMITS.
10. CONSTRUCT PROPOSED CURBING, SIDEWALK AND ACCESSIBLE RAMPS AS SHOWN ON THE PLANS.
11. CONSTRUCT PROPOSED PAVEMENT UP TO INTERMEDIATE COURSE. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.



50 0 50 100
SCALE IN FEET

Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole / Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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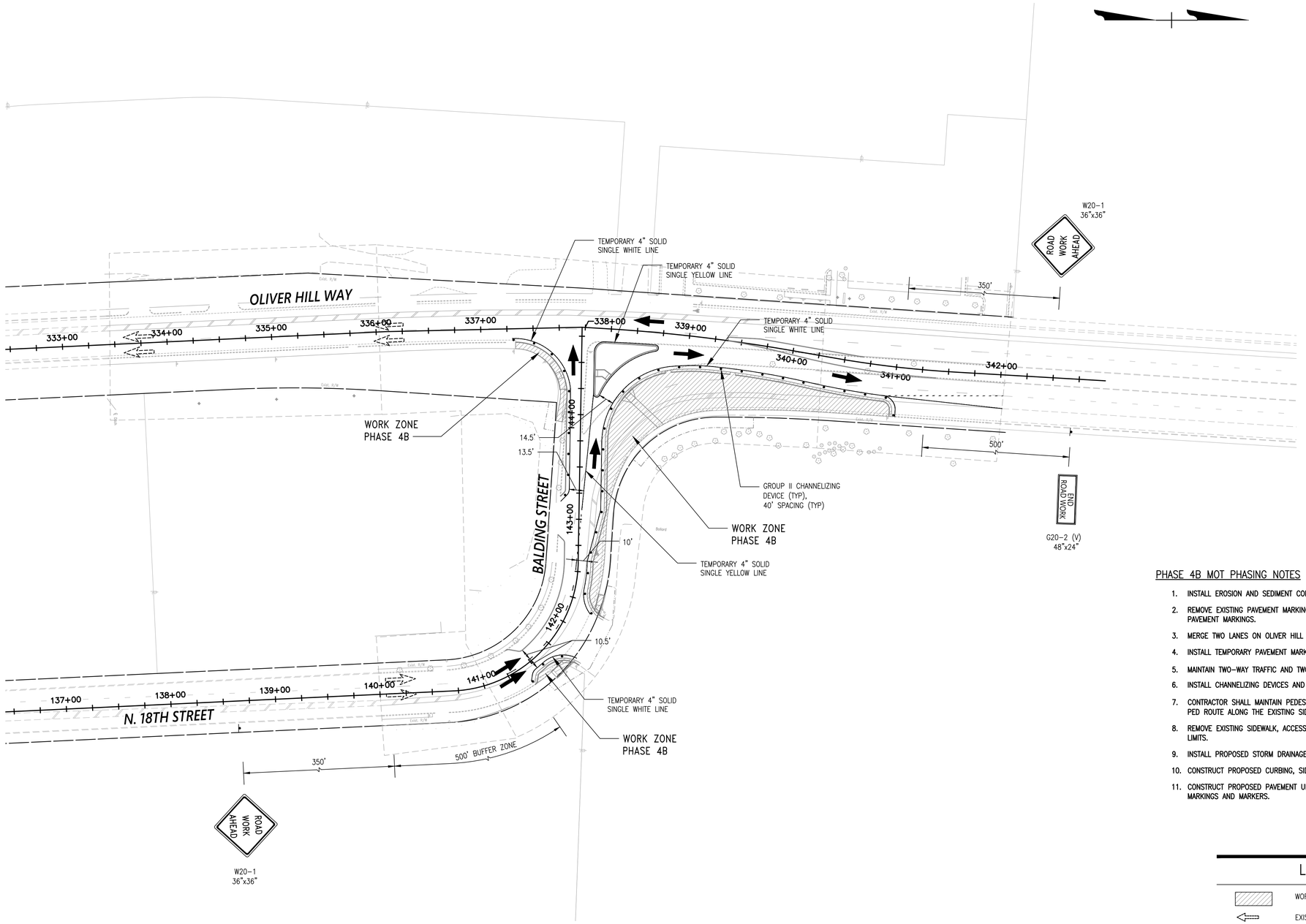
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 4A

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(26)	DRAWING NO. 0-28633



50 0 50 100
SCALE IN FEET

PHASE 4B MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE EXISTING PAVEMENT MARKINGS AND MARKERS THAT ARE IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. MERGE TWO LANES ON OLIVER HILL WAY TO A SINGLE LANE UTILIZING TTC-16.2.
4. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.
5. MAINTAIN TWO-WAY TRAFFIC AND TWO LANES ON N. 18TH STREET.
6. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
7. CONTRACTOR SHALL MAINTAIN PEDESTRIAN ACCESS THROUGHOUT CONSTRUCTION." SHOW THE PED ROUTE ALONG THE EXISTING SIDEWALK ON THE OUTSIDE OF N.18TH AND BALDING.
8. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
9. INSTALL PROPOSED STORM DRAINAGE SYSTEM WITHIN CONSTRUCTION LIMITS.
10. CONSTRUCT PROPOSED CURBING, SIDEWALK AND ACCESSIBLE RAMPS AS SHOWN ON THE PLANS.
11. CONSTRUCT PROPOSED PAVEMENT UP TO INTERMEDIATE COURSE. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.

Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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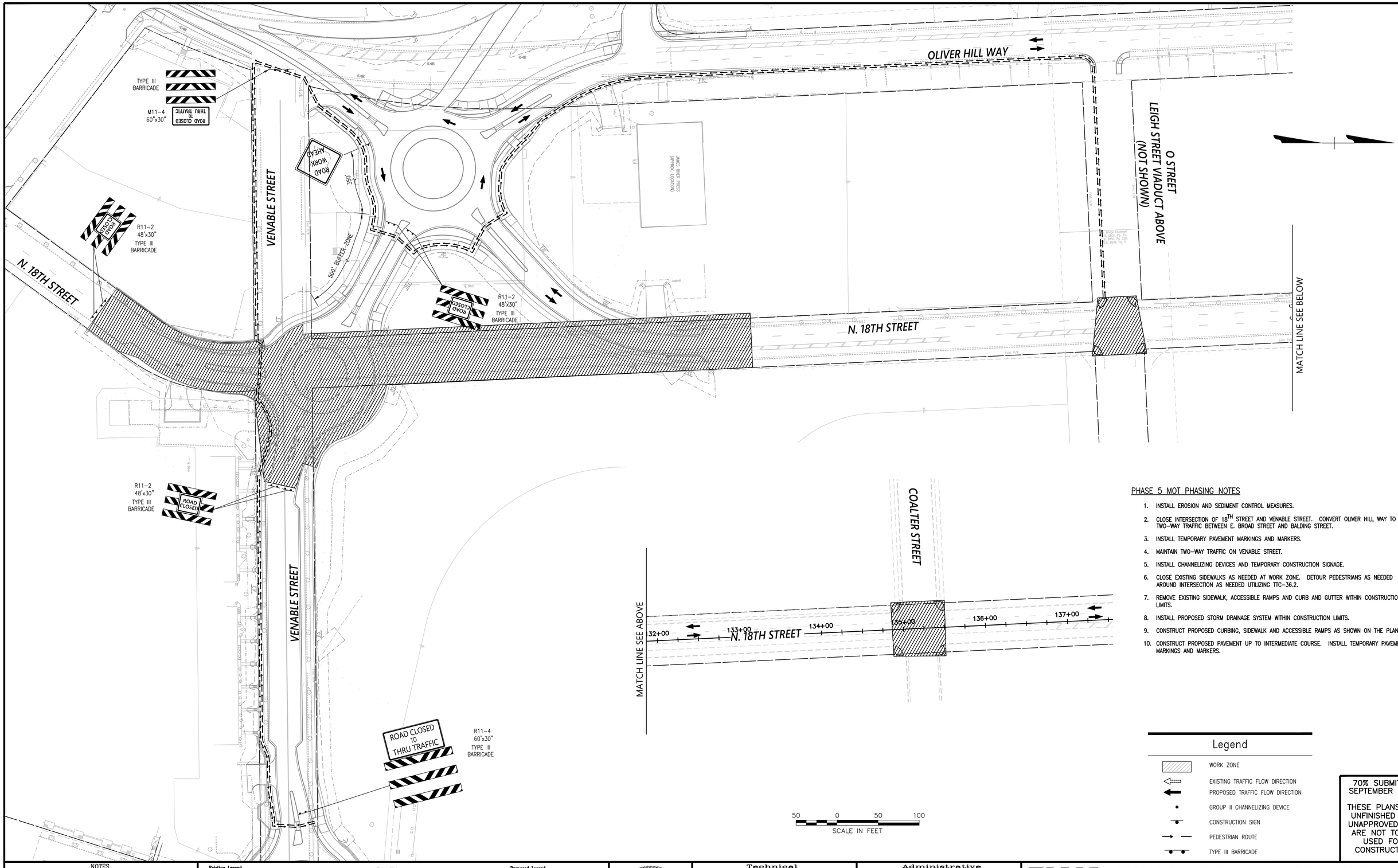
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 4B

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: HMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(27)	DRAWING NO. 0-28633



PHASE 5 MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. CLOSE INTERSECTION OF 18TH STREET AND VENABLE STREET. CONVERT OLIVER HILL WAY TO TWO-WAY TRAFFIC BETWEEN E. BROAD STREET AND BALDING STREET.
3. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.
4. MAINTAIN TWO-WAY TRAFFIC ON VENABLE STREET.
5. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
6. CLOSE EXISTING SIDEWALKS AS NEEDED AT WORK ZONE. DETOUR PEDESTRIANS AS NEEDED AROUND INTERSECTION AS NEEDED UTILIZING TTC-36.2.
7. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
8. INSTALL PROPOSED STORM DRAINAGE SYSTEM WITHIN CONSTRUCTION LIMITS.
9. CONSTRUCT PROPOSED CURBING, SIDEWALK AND ACCESSIBLE RAMPS AS SHOWN ON THE PLANS.
10. CONSTRUCT PROPOSED PAVEMENT UP TO INTERMEDIATE COURSE. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.

Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH *WV
Water Meter *WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM * * GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 5

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(28)	DRAWING NO. 0-28633

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

- Storm Sewer
- Sanitary Sewer (Gravity)
- Gas Line
- Electric Line
- Overhead Utility
- Telephone/Telegraph
- Water Line
- Property Line
- Storm Basin
- Storm or Sanitary Manhole (D or S)
- Fire Hydrant / Valve (FH, WV)
- Water Meter (WM)
- Existing Curb Cut Ramp (HCR)
- Gas Meter / Valve (GM, GV)
- Fence
- Power/Light Pole (PP, LP)
- Guy Anchor
- Tree

Proposed Legend

- Sanitary Sewer
- Storm Sewer
- Storm/(San) Manhole (SDMH, (SMH))
- Basin
- Curb Cut Ramp
- Decorative Light
- Conduit
- Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 5 DETOUR PLAN

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(29)	DRAWING NO. 0-28633

PHASE 6 MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE EXISTING PAVEMENT MARKINGS AND MARKERS THAT ARE IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. CLOSE VENABLE STREET BETWEEN N. 18TH STREET AND OLIVER HILL WAY. CLOSE OLIVER HILL WAY BETWEEN VENABLE STREET AND BROWN STREET.
4. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.
5. SHIFT TRAFFIC TO ROUNDABOUTS CONSTRUCTED IN PREVIOUS PHASES
6. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
7. CLOSE EXISTING SIDEWALK ON VENABLE STREET. DETOUR PEDESTRIANS TO E. CLAY STREET UTILIZING TTC-36.2. CLOSE EXISTING SIDEWALKS ALONG 18TH STREET AND DETOUR PEDESTRIANS TO OLIVER HILL WAY UTILIZING TTC-36.2.
8. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
9. INSTALL PROPOSED STORM DRAINAGE SYSTEM WITHIN CONSTRUCTION LIMITS.
10. CONSTRUCT PROPOSED CURBING, SIDEWALK AND ACCESSIBLE RAMPS AS SHOWN ON THE PLANS.
11. CONSTRUCT PROPOSED PAVEMENT UP TO INTERMEDIATE COURSE. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.

OLIVER HILL WAY
E. CLAY STREET
N. 18TH STREET
VENABLE STREET
W20-1 36"x36" ROAD WORK AHEAD
G20-2 (V) 48"x24" END ROAD WORK
G20-2 (V) 48"x24" ROAD WORK END
M11-4 60"x30" ROAD CLOSED TO THRU TRAFFIC
TYPE III BARRICADE
GROUP II CHANNELIZING DEVICE (TYP), 40' SPACING (TYP)
TEMPORARY 4" SOLID SINGLE WHITE LINE
WORK ZONE PHASE 6
350'
500' BUFFER ZONE
500'

SCALE IN FEET: 50 0 50 100

Legend

- WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend

Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve; Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend

Sanitary Sewer; Storm Sewer; Storm/(San) Manhole SDMH (SMH); Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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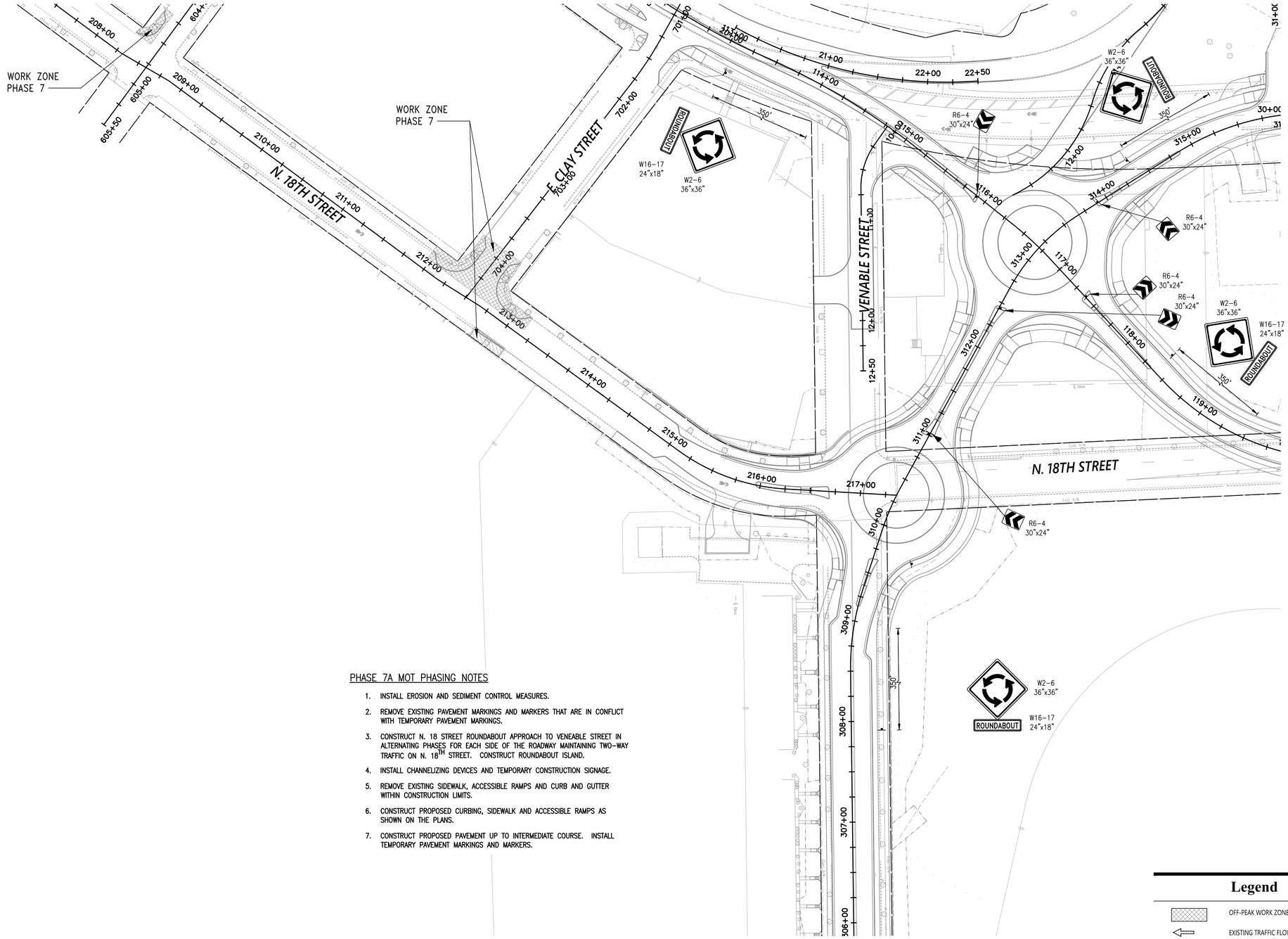
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 6

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: DPickens				SEPTEMBER 2022	SHEET 2P(30)	0-28633
CHECKED BY: VHB						



PHASE 7A MOT PHASING NOTES

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE EXISTING PAVEMENT MARKINGS AND MARKERS THAT ARE IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. CONSTRUCT N. 18 STREET ROUNDABOUT APPROACH TO VENEABLE STREET IN ALTERNATING PHASES FOR EACH SIDE OF THE ROADWAY MAINTAINING TWO-WAY TRAFFIC ON N. 18TH STREET. CONSTRUCT ROUNDABOUT ISLAND.
4. INSTALL CHANNELIZING DEVICES AND TEMPORARY CONSTRUCTION SIGNAGE.
5. REMOVE EXISTING SIDEWALK, ACCESSIBLE RAMPS AND CURB AND GUTTER WITHIN CONSTRUCTION LIMITS.
6. CONSTRUCT PROPOSED CURBING, SIDEWALK AND ACCESSIBLE RAMPS AS SHOWN ON THE PLANS.
7. CONSTRUCT PROPOSED PAVEMENT UP TO INTERMEDIATE COURSE. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS.

W2-6
36"x36"
ROUNDABOUT
W16-17
24"x18"
350'

50 0 50 100
SCALE IN FEET

Legend

- OFF-PEAK WORK ZONE
- EXISTING TRAFFIC FLOW DIRECTION
- PROPOSED TRAFFIC FLOW DIRECTION
- GROUP II CHANNELIZING DEVICE
- CONSTRUCTION SIGN
- PEDESTRIAN ROUTE
- TYPE III BARRICADE

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH or WV)

Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM / GV)
Fence
Power/Light Pole (PP / LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole (SDMH / (SMH))
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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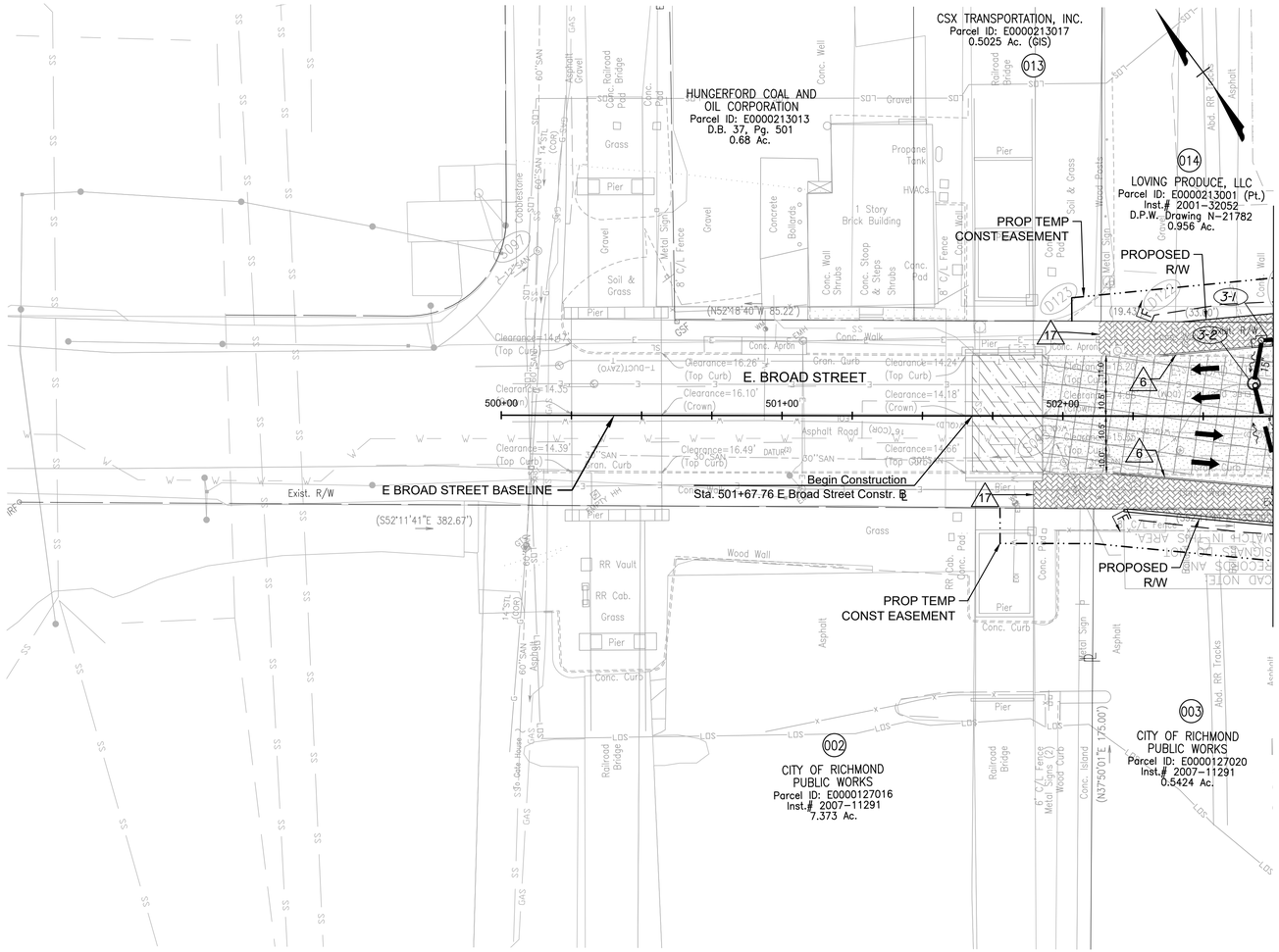
SHOCKOE VALLEY STREET IMPROVEMENTS
MAINTENANCE OF TRAFFIC PLAN
PHASE 7

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BMcAdams DRAWN BY: DPickens CHECKED BY: VHB	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2P(31)	DRAWING NO. 0-28633



INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
4. MODIFIED VDOT CG-7 REQ'D
5. VDOT ST'D CG-6 CURB AND GUTTER REQ'D
6. GRANITE CURB
7. VDOT ST'D CG-12 TYPE A REQ'D
8. VDOT ST'D CG-12 TYPE B REQ'D
9. VDOT MODIFIED CG-12 TYPE B REQ'D
10. ST'D MS-1 CONCRETE MEDIAN STRIP
11. ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

Denotes Pavement Mill and Overlay

Denotes Pavement Overlay

Denotes Demolition of Pavement

Denotes Proposed Pavement

Denotes Truck Apron

Denotes Flush ADA Crossing At Truck Apron

Denotes Brick Sidewalk

Note: Dot – dashed lines denote permanent easements

Note: Dot – dot dashed lines denote temporary easements

C ____ Denotes Construction Limits in Cuts

F ____ Denotes Construction Limits in Fills

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

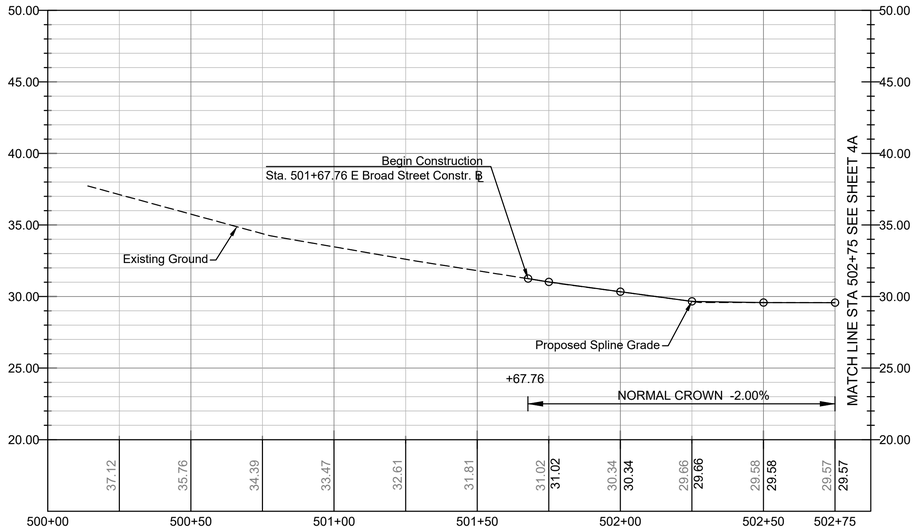
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 3	DRAWING NO. 0-28633



E Broad Street

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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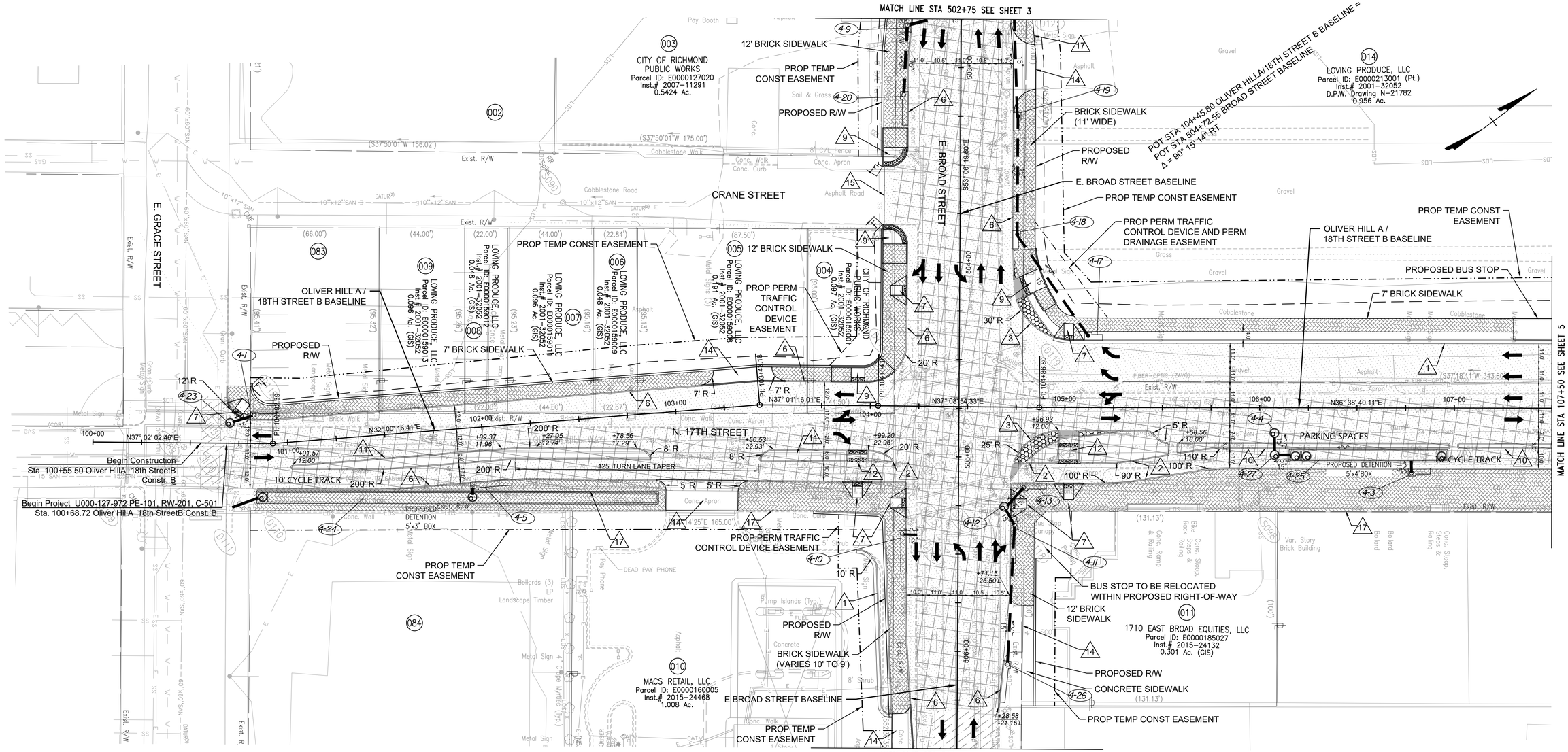
SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 3A	DRAWING NO. 0-28633



INCIDENTAL LEGEND

1	ST'D RICHMOND CITY CURB & GUTTER REQ'D	12	MEDIAN REFUGE ISLAND TYPE M2
2	ST'D RICHMOND CITY CURB REQ'D	13	NS BIKE RAMP
3	MODIFIED VDOT CG-3 REQ'D	14	VDOT ST'D CG-9D ENTRANCE GUTTER
4	MODIFIED VDOT CG-7 REQ'D	15	VDOT ST'D CG-11 COMMERCIAL ENTRANCE
5	VDOT ST'D CG-6 CURB AND GUTTER REQ'D	16	VDOT ST'D S-2 CONCRETE STEPS
6	GRANITE CURB	17	REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK
7	VDOT ST'D CG-12 TYPE A REQ'D		
8	VDOT ST'D CG-12 TYPE B REQ'D		
9	VDOT MODIFIED CG-12 TYPE B REQ'D		
10	ST'D MS-1 CONCRETE MEDIAN STRIP		
11	ST'D MS-2 RAISED GRASS MEDIAN STRIPS		

Denotes Pavement Mill and Overlay

Denotes Pavement Overlay

Denotes Demolition of Pavement

Denotes Proposed Pavement

Denotes Truck Apron

Denotes Flush ADA Crossing At Truck Apron

Denotes Brick Sidewalk

Note: Dot – dashed lines denote permanent easements

Note: Dot – dot dashed lines denote temporary easements

C — Denotes Construction Limits in Cuts

F — Denotes Construction Limits in Fills

SCALE IN FEET: 25 0 25 50

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light Conduit; Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

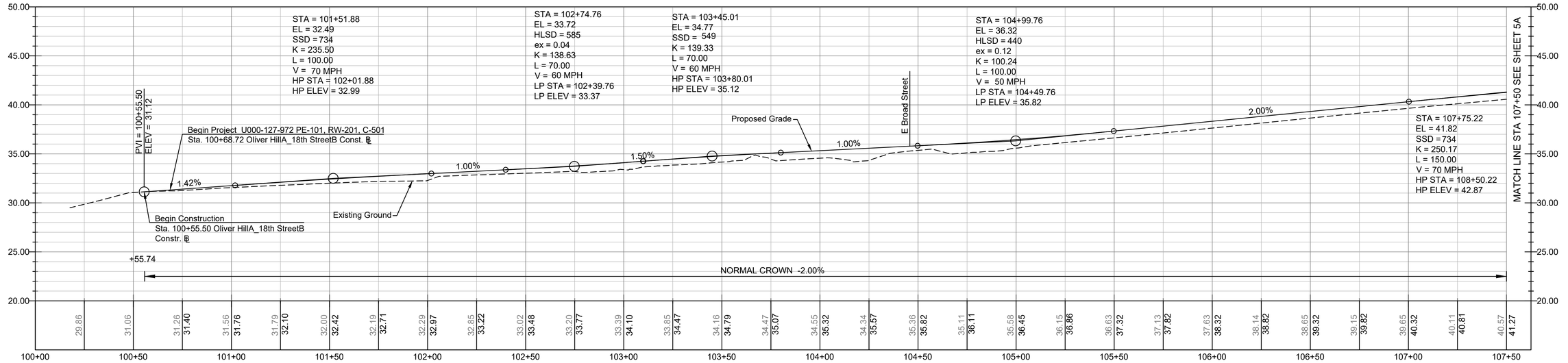
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

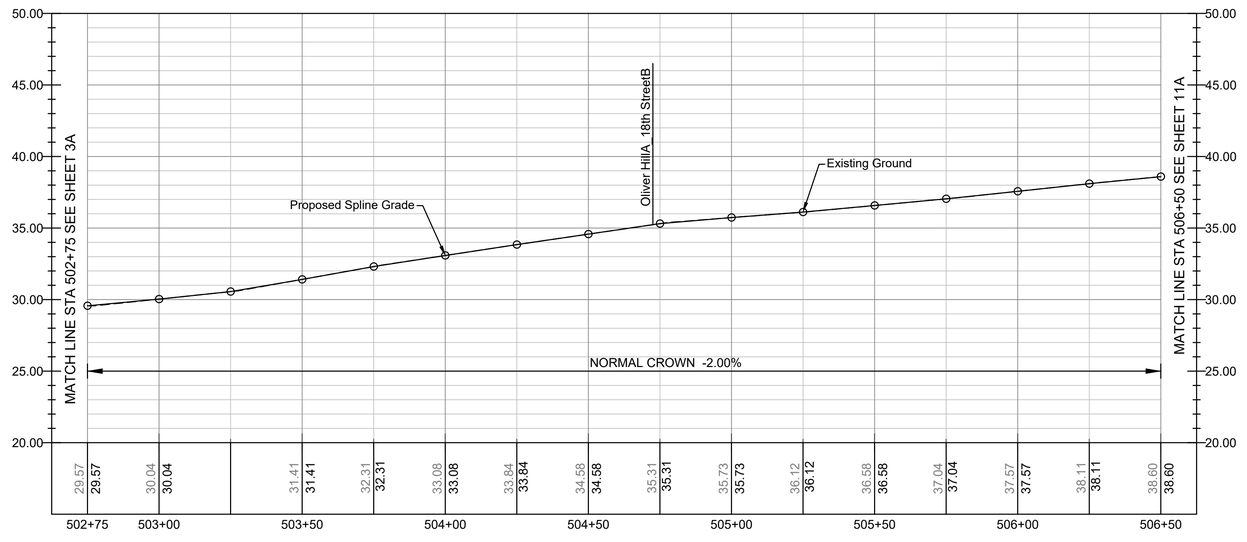
SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 4	DRAWING NO. 0-28633



Oliver HillA_18th StreetB



E Broad Street

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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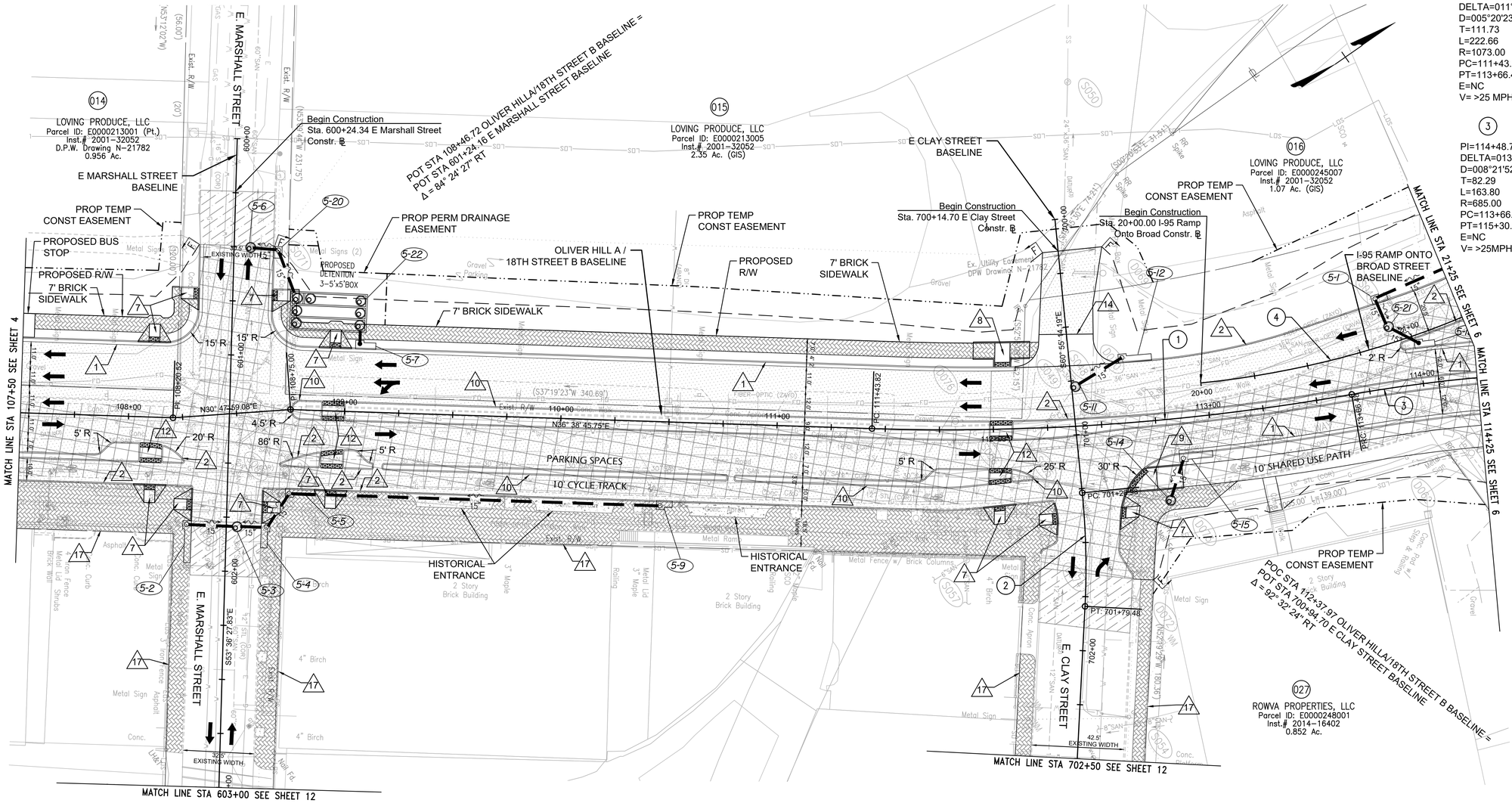
SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 4A	DRAWING NO. 0-28633



1
PI=112+55.55
DELTA=011°53'22.82"
D=005°20'23"
T=111.73
L=222.66
R=1073.00
PC=111+43.82
PT=113+66.48
E=NC
V= >25 MPH

2
PI=701+53.28
DELTA=008°35'44.69"
D=016°22'13"
T=26.30
L=52.51
R=350.00
PC=701+26.98
PT=701+79.48
E=NC
V= >25 MPH

3
PI=114+48.77
DELTA=013°42'02.30"
D=008°21'52"
T=82.29
L=163.80
R=685.00
PC=113+66.48
PT=115+30.28
E=NC
V= >25MPH

4
PI=21+24.45
DELTA=032°16'55.72"
D=013°19'29"
T=124.45
L=242.27
R=430.00
PC=20+00.00
PT=22+42.27
E= -2.00%
V= >25 MPH

INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
4. MODIFIED VDOT CG-7 REQ'D
5. VDOT ST'D CG-6 CURB AND GUTTER REQ'D
6. GRANITE CURB
7. VDOT ST'D CG-12 TYPE A REQ'D
8. VDOT ST'D CG-12 TYPE B REQ'D
9. VDOT MODIFIED CG-12 TYPE B REQ'D
10. ST'D MS-1 CONCRETE MEDIAN STRIP
11. ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

Denotes Pavement Mill and Overlay
Denotes Pavement Overlay
Denotes Demolition of Pavement
Denotes Proposed Pavement
Denotes Truck Apron
Denotes Flush ADA Crossing At Truck Apron
Denotes Brick Sidewalk

Note: Dot – dashed lines denote permanent easements

Note: Dot – dot dashed lines denote temporary easements

C Denotes Construction Limits in Cuts

F Denotes Construction Limits in Fills

25 0 25 50
SCALE IN FEET

DRAFT
AUGUST 2022
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NOTES
1. Lot dimensions in parentheses are from deed.
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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

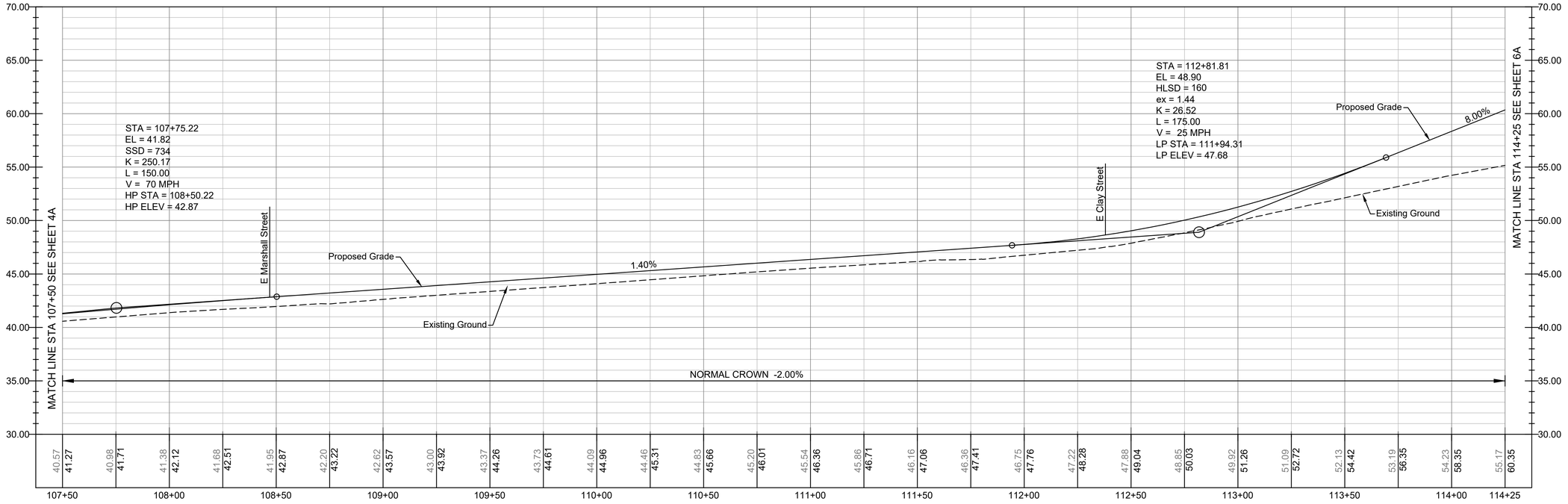
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

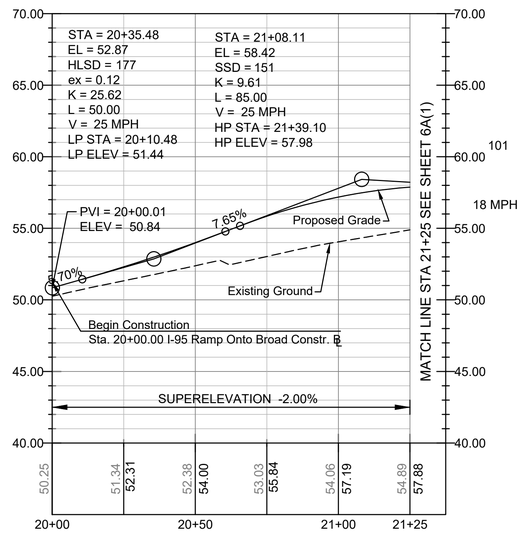
SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 5	0-28633



Oliver HillA_18th StreetB



I-95 Ramp onto Broad

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 5A	DRAWING NO. 0-28633

MATCH LINE STA 119+00 SEE SHEET 13

MATCH LINE STA 902+00 SEE SHEET 7

MATCH LINE STA 304+50 SEE SHEET 16

MATCH LINE STA 216+00 SEE SHEET 12

MATCH LINE STA 21+25 SEE SHEET 5

MATCH LINE STA 114+25 SEE SHEET 5

POC STA 116+70.29 OLIVER HILLA/18TH STREET B BASELINE =
POC STA 900+00.00 OLIVER HILL_B BASELINE
Δ = 88° 42' 21" LT

POC STA 114+77.14 OLIVER HILLA/18TH STREET B BASELINE =
POT STA 10+00 EXISTING VENABLE STREET BASELINE
Δ = 88° 48' 25" RT

POC STA 302+84.29 VENABLE STREET BASELINE =
POC STA 217+35.99 18TH STREET A BASELINE
Δ = 66° 32' 22" RT

(8)
PI=119+65.02
DELTA=049°53'13.08"
D=022°55'06"
T=116.28
L=217.67
R=250.00
PC=118+48.74
PT=120+66.42
E=NC
R=25 MPH

(9)
PI=300+25.02
DELTA=014°15'48.64"
D=028°38'52"
T=25.02
L=49.79
R=200.00
PC=300+00.00
PT=300+49.79
E=NC
R=25MPH

(10)
PI=302+98.48
DELTA=010°36'51.97"
D=022°55'06"
T=23.22
L=46.31
R=250.00
PC=302+75.25
PT=303+21.57
E=NC
R=25MPH

(11)
PI=304+24.74
DELTA=018°49'38.05"
D=022°55'06"
T=41.45
L=82.15
R=250.00
PC=303+83.29
PT=304+65.44
E=NC
R=25 MPH

(12)
PI=900+25.90
DELTA=014°45'21.56"
D=028°38'52"
T=25.90
L=51.51
R=200.00
PC=900+00.00
PT=900+51.51
E=NC
R=25MPH

(13)
PI=902+34.21
DELTA=029°34'05.45"
D=022°55'06"
T=65.98
L=129.02
R=250.00
PC=901+68.23
PT=902+97.24
E=NC
R=25MPH

(14)
PI=215+70.06
DELTA=032°52'14.80"LT
D=028°38'53"
T=59.00
L=114.74
R=200.00
PC=215+11.06
PT=216+25.80
E=NC
R=25MPH

(3)
PI=114+48.77
DELTA=013°42'02.30"
D=008°21'52"
T=82.29
L=163.80
R=685.00
PC=113+66.48
PT=115+30.28
E=NC
V= >25MPH

(4)
PI=21+24.90
DELTA=032°23'35.95"LT
D=013°19'29"
T=124.90
L=243.11
R=430.00
PC=20+00.00
PT=22+43.11
E= -2.00%
R= >25MPH

(5)
PI=10+46.35
DELTA=035°55'23.34"LT
D=076°23'40"
T=24.31
L=47.02
R=75.00
PC=10+22.04
PT=10+69.06
E=NC
R= <20MPH

(6)
PI=116+60.47
DELTA=008°43'55.64"
D=016°22'13"
T=26.72
L=53.34
R=350.00
PC=116+33.75
PT=116+87.09
E=NC
R= >25MPH

(31)
PI=22+96.10
DELTA=006°51'20.41"
D=018°21'51"
T=18.69
L=37.33
R=312.00
PC=22+77.42
PT=23+14.75
E= -2.00%
R= >25MPH

(7)
PI=12+33.14
DELTA=030°07'06.58"
D=038°11'50"
T=40.36
L=78.85
R=150.00
PC=11+92.78
PT=12+71.63
E=NC
R=25 MPH

(040) OHW, LC
Parcel ID: E0000318002
Inst.# 2002-39652
2.062 Ac. (GIS)

(017) DPC, LC
Parcel ID: E0000318001
Inst.# 9900-8444
2.089 Ac. (GIS)

(018) GENESIS HOMES MANAGER, LLC
Parcel ID: E0000364002
Inst.# 2007-12771
3.627 Ac.

(025) JEFFERSON TOWNHOUSES, LLC
Parcel ID: E0000285022
Inst.# 2007-12770
1.178 Ac.

(016) LOVING PRODUCE, LLC
Parcel ID: E0000245007
Inst.# 2001-32052
1.07 Ac. (GIS)

(027) ROWVA PROPERTIES, LLC
Parcel ID: E0000248001
Inst.# 2014-16402
0.852 Ac.

(026)

PROPOSED R/W
PROP TEMP CONST EASEMENT
6' BRICK SIDEWALK
OLIVER HILL A / 18TH STREET B BASELINE
N. 18TH STREET
EX. N. 18TH STREET
PROP PERM DRAINAGE EASEMENT
PROP TEMP CONST EASEMENT
EC-2 TYPE I
PROPOSED R/W
VENABLE STREET BASELINE
10' SHARED USE PATH
VENABLE STREET
OLIVER HILL_B BASELINE
OLIVER HILL WAY
10' SHARED USE PATH
SHARED USE PATH VARIES 12' TO 10'
End Construction
Sta. 217+35.81 18th StreetB Constr. B
D-1 (BY OTHERS)
I-95 OFF-RAMP BASELINE
I-95 OFF RAMP
Begin Construction
Sta. 10+00.00 I-95 Off Ramp
Constr. B
End Construction
Sta. 12+71.63 I-95 Off Ramp
Constr. B
10' SHARED USE PATH
EX. I-95 OFF RAMP
End Construction
Sta. 22+85.30 I-95 Ramp
Onto Broad Constr. B
EX. OLIVER HILL WAY
OLIVER HILL A / 18TH STREET B BASELINE
OLIVER HILL WAY
Begin Construction
Sta.10+00.00
Existing Venable
Constr. B
I-95 RAMP ONTO BROAD STREET BASELINE
EXISTING VENABLE STREET BASELINE
End Construction
Sta. 12+08.68 Existing
Venable Constr. B
BRICK SIDEWALK (VARIES 6' TO 8')
BEGIN RETAINING WALL
STA. 216+85.26
18TH STREETA
EX. VENABLE STREET
18TH STREET A BASELINE

INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
4. MODIFIED VDOT CG-7 REQ'D
5. VDOT ST'D CG-6 CURB AND GUTTER REQ'D
6. GRANITE CURB
7. VDOT ST'D CG-12 TYPE A REQ'D
8. VDOT ST'D CG-12 TYPE B REQ'D
9. VDOT MODIFIED CG-12 TYPE B REQ'D
10. ST'D MS-1 CONCRETE MEDIAN STRIP
11. ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

Denotes Pavement Mill and Overlay
Denotes Pavement Overlay
Denotes Demolition of Pavement
Denotes Proposed Pavement
Denotes Truck Apron
Denotes Flush ADA Crossing At Truck Apron
Denotes Brick Sidewalk

Note: Dot – dashed lines denote permanent easements

Note: Dot – dot dashed lines denote temporary easements

C Denotes Construction Limits in Cuts

F Denotes Construction Limits in Fills

25 0 25 50
SCALE IN FEET

DRAFT
AUGUST 2022
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NOTES
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4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
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Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

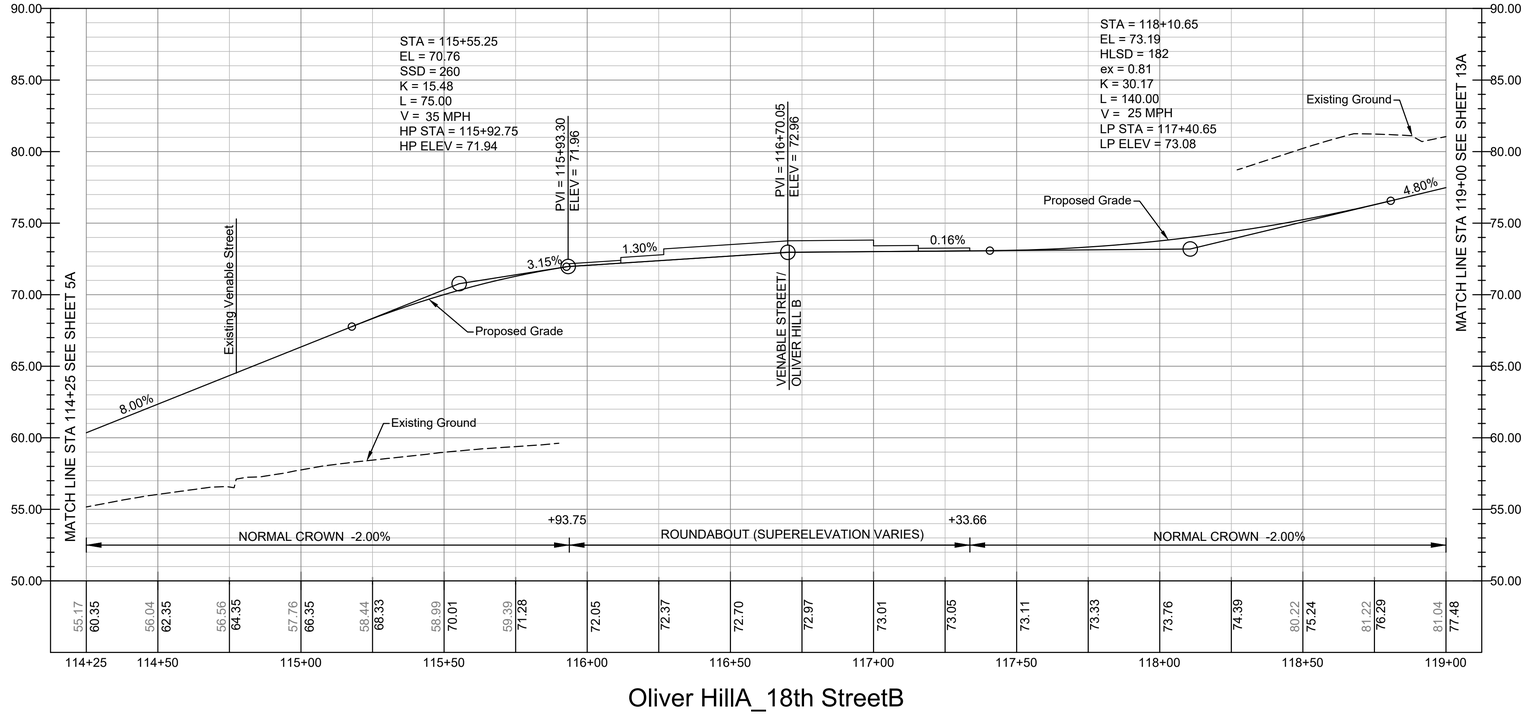
RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS

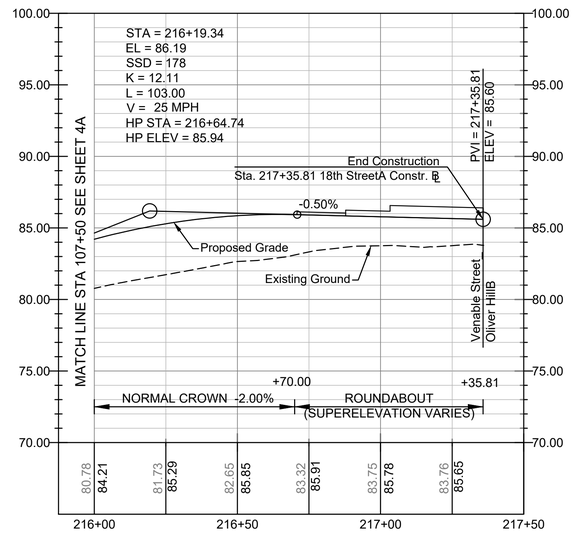
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

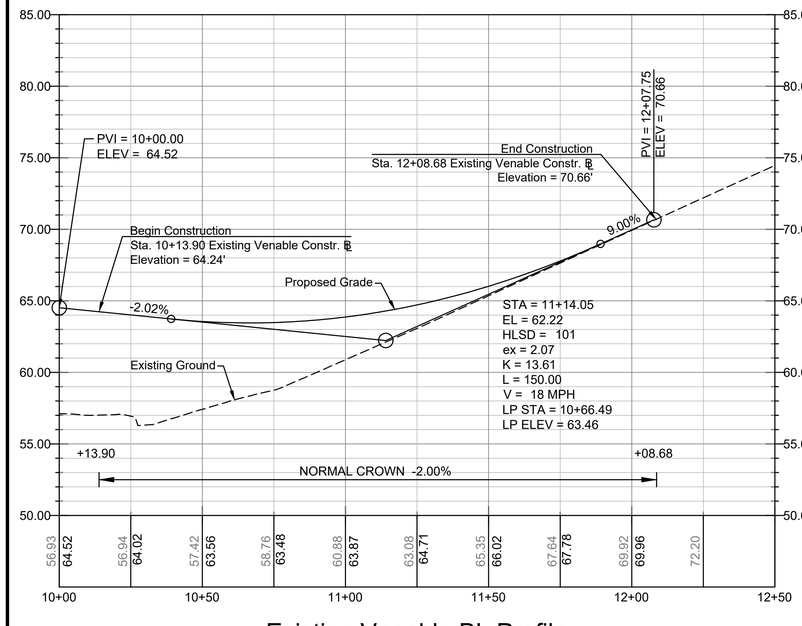
DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 6	0-28633



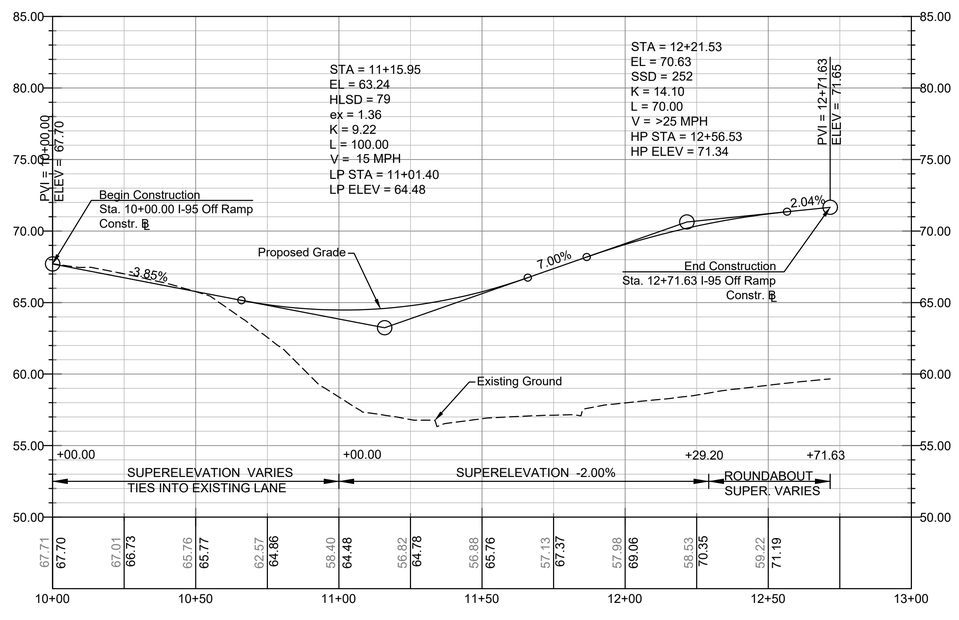
Oliver HillA_18th StreetB



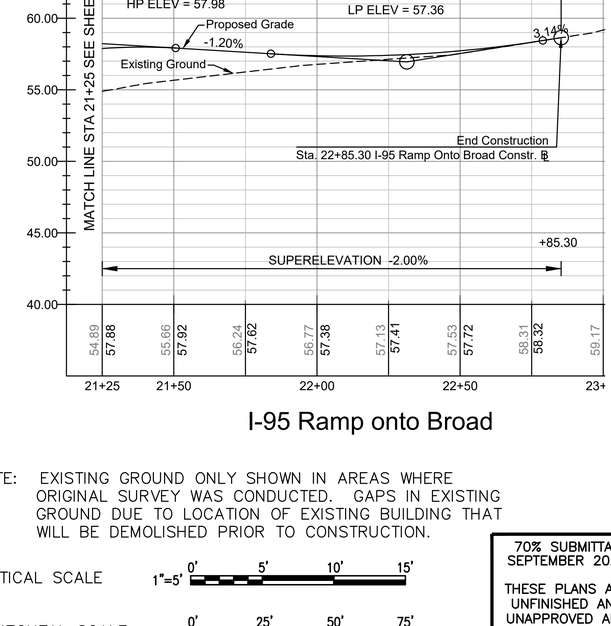
18th StreetA



Existing Venable BL Profile



I-95 Off Ramp Profile



I-95 Ramp onto Broad

NOTE: EXISTING GROUND ONLY SHOWN IN AREAS WHERE ORIGINAL SURVEY WAS CONDUCTED. GAPS IN EXISTING GROUND DUE TO LOCATION OF EXISTING BUILDING THAT WILL BE DEMOLISHED PRIOR TO CONSTRUCTION.

VERTICAL SCALE 1"=5' (0' 5' 10' 15')

HORIZONTAL SCALE 1"=25' (0' 25' 50' 75')

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES | REVISIONS

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Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
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Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

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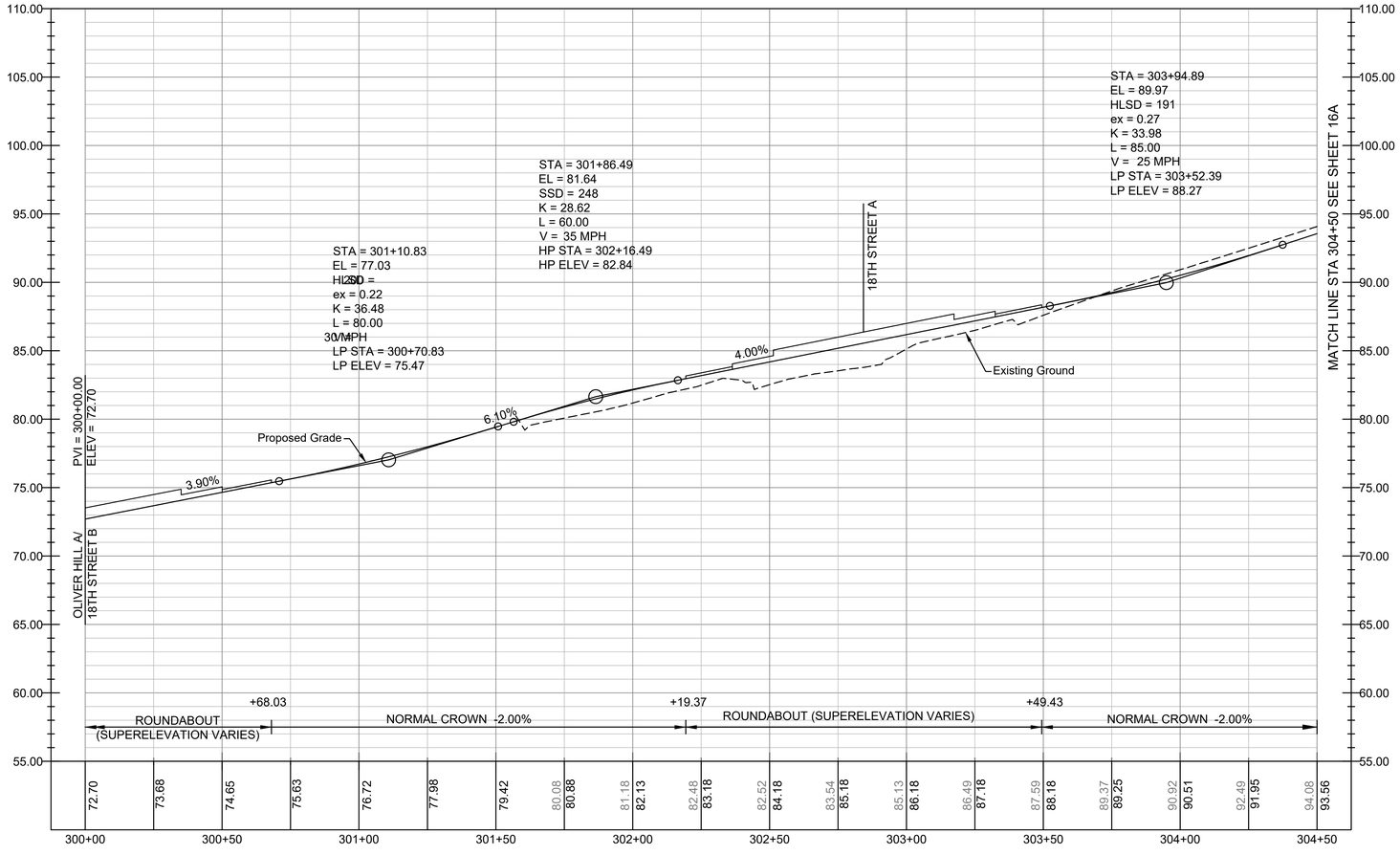
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

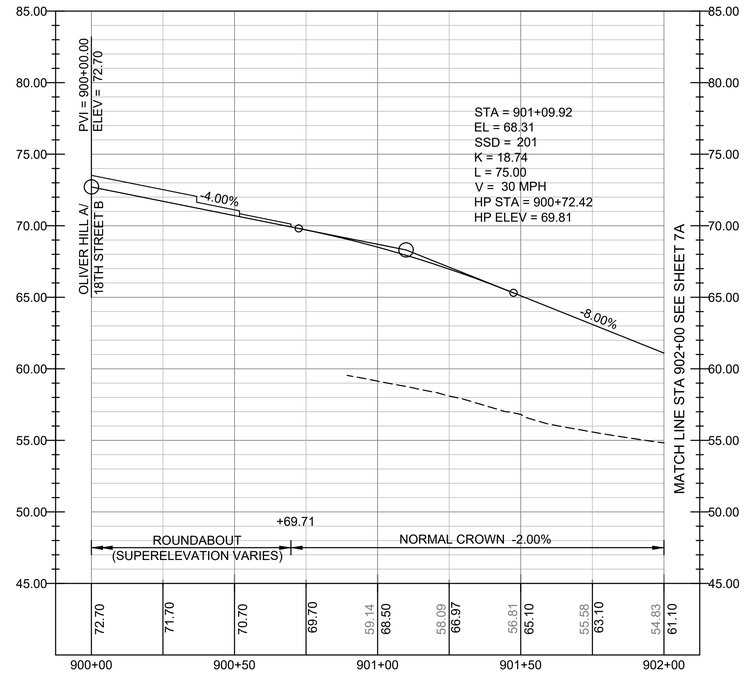
SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 6A(1)	DRAWING NO. 0-28633



Venable Street



Oliver Hill Way_B

NOTE: EXISTING GROUND ONLY SHOWN IN AREAS WHERE ORIGINAL SURVEY WAS CONDUCTED. GAPS IN EXISTING GROUND DUE TO LOCATION OF EXISTING BUILDING THAT WILL BE DEMOLISHED PRIOR TO CONSTRUCTION.

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70% SUBMITTAL
SEPTEMBER 2022

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Sanitary Sewer (Gravity)
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Overhead Utility
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Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 6A(2)	0-28633

INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
4. MODIFIED VDOT CG-7 REQ'D
5. VDOT ST'D CG-6 CURB AND GUTTER REQ'D
6. GRANITE CURB
7. VDOT ST'D CG-12 TYPE A REQ'D
8. VDOT ST'D CG-12 TYPE B REQ'D
9. VDOT MODIFIED CG-12 TYPE B REQ'D
10. ST'D MS-1 CONCRETE MEDIAN STRIP
11. ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

Denotes Pavement Mill and Overlay

Denotes Pavement Overlay

Denotes Demolition of Pavement

Denotes Proposed Pavement

Denotes Truck Apron

Denotes Flush ADA Crossing At Truck Apron

Denotes Brick Sidewalk

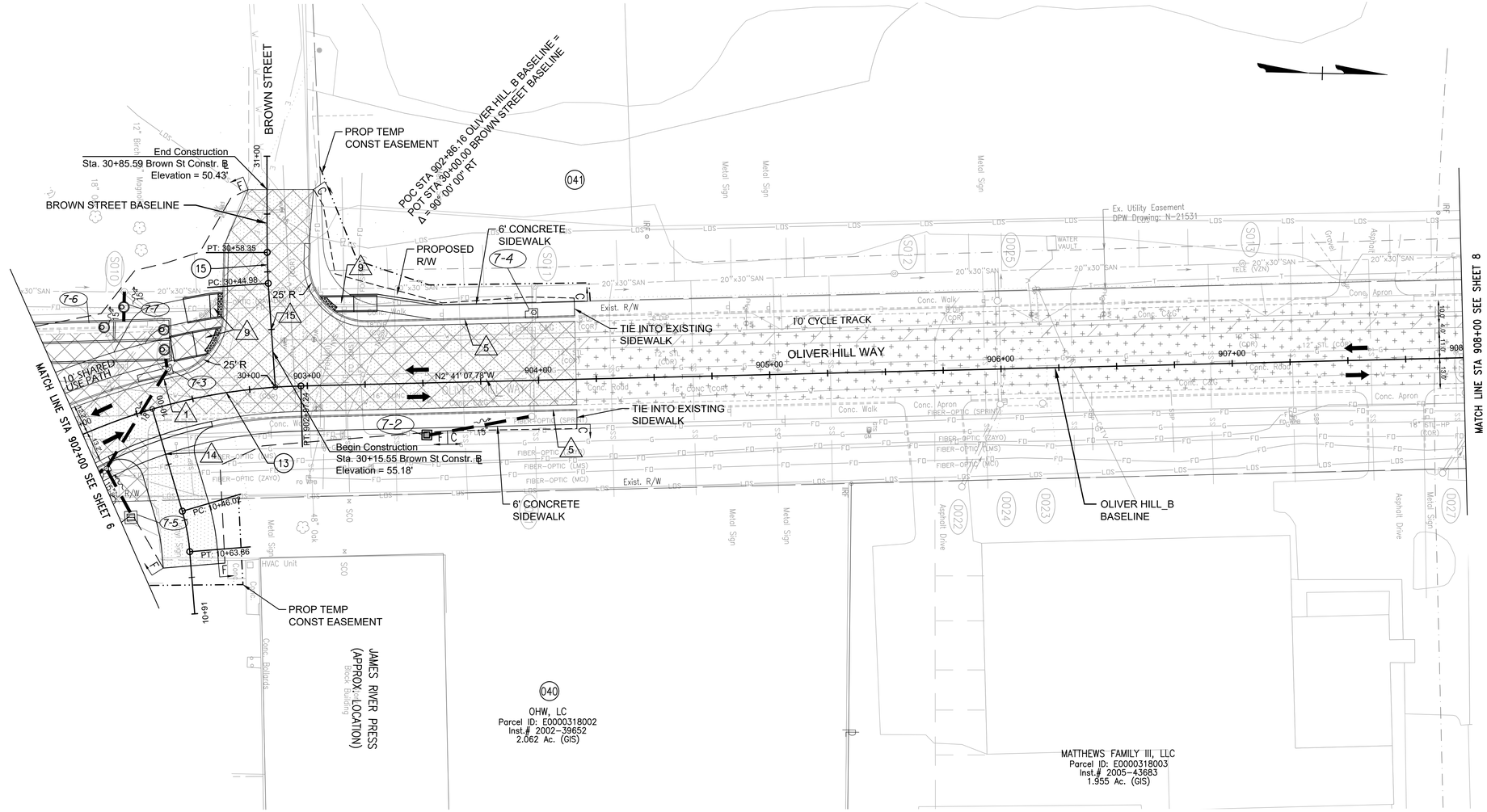
Note: Dot – dashed lines denote permanent easements

Note: Dot – dot dashed lines denote temporary easements

C
Denotes Construction Limits in Cuts

F
Denotes Construction Limits in Fills

NOTE: LIMITS AND LOCATIONS OF FULL DEPTH CONCRETE PAVEMENT PATCHING PRIOR TO OVERLAY TO BE DETERMINED.



13
PI=902+34.21
DELTA=029°34'05.45"
D=022°55'06"
T=65.98
L=129.02
R=250.00
PC=901+68.23
PT=902+97.24
E=NC
R=25MPH

15
PI=30+51.67
DELTA=003°49'55.11"RT
D=028°38'52"
T=6.69
L=13.38
R=200.00
PC=30+44.98
PT=30+58.35
E=NC
R=25MPH

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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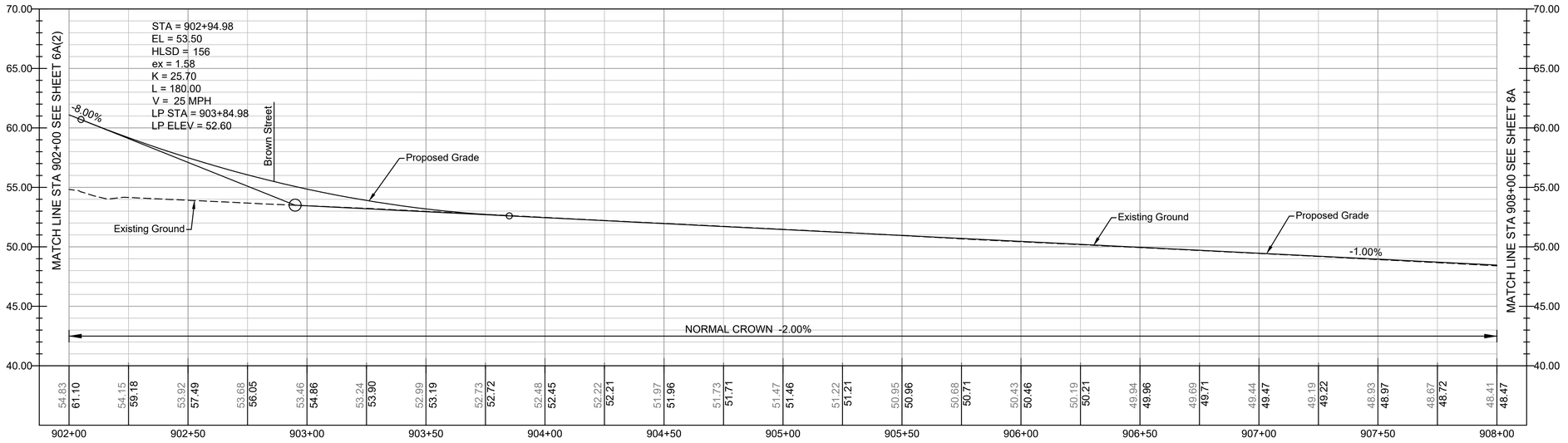
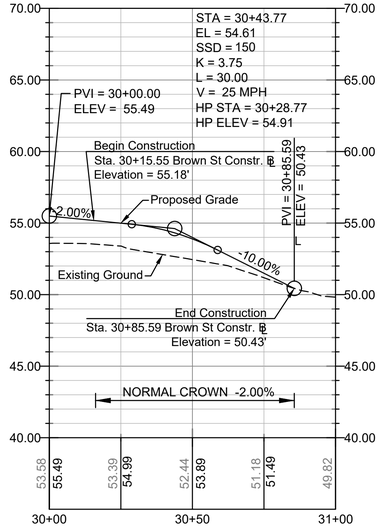
SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 7	0-28633



Oliver Hill Way_B



Brown Street Profile

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH WV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

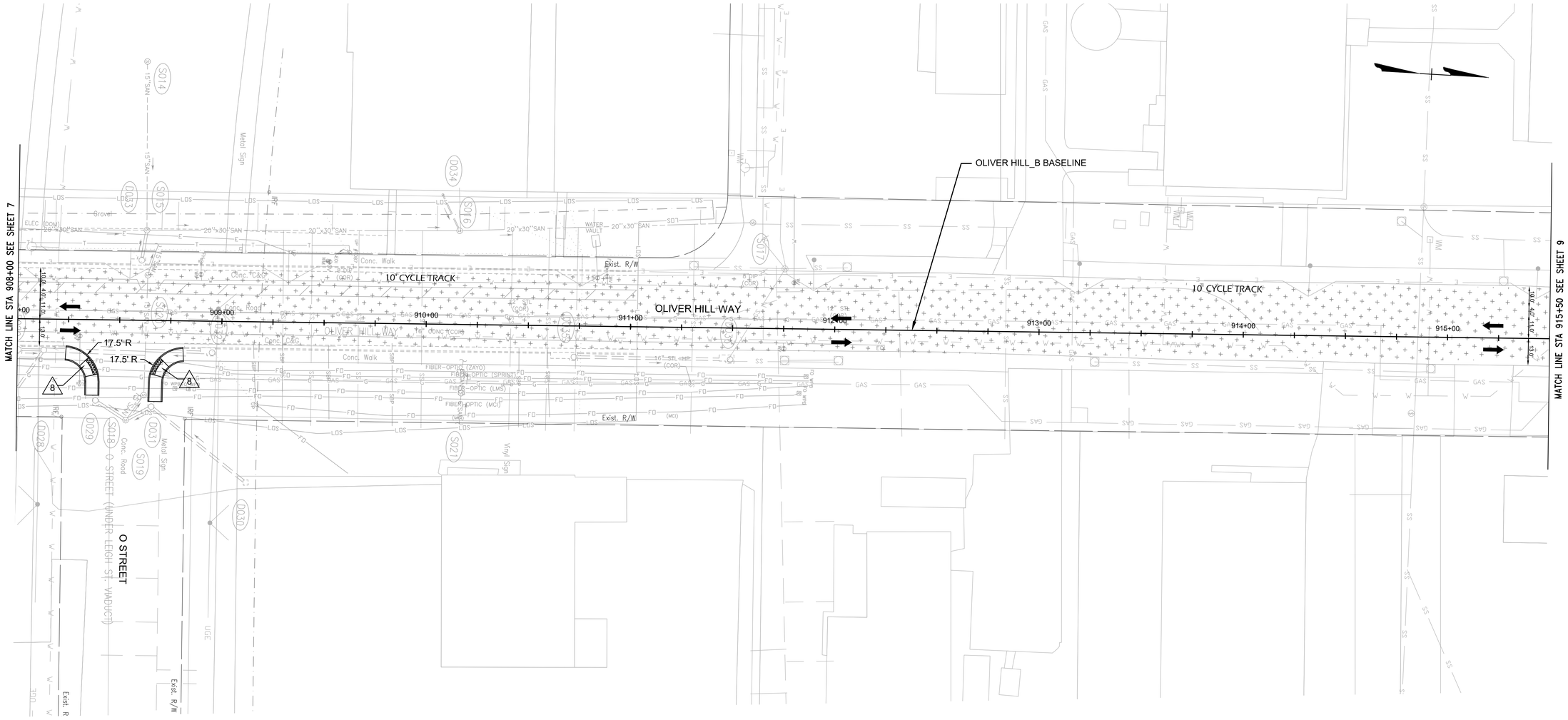
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 7A	DRAWING NO. 0-28633



INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
4. MODIFIED VDOT CG-7 REQ'D
5. VDOT ST'D CG-6 CURB AND GUTTER REQ'D
6. GRANITE CURB
7. VDOT ST'D CG-12 TYPE A REQ'D
8. VDOT ST'D CG-12 TYPE B REQ'D
9. VDOT MODIFIED CG-12 TYPE B REQ'D
10. ST'D MS-1 CONCRETE MEDIAN STRIP
11. ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

Denotes Pavement Mill and Overlay

Denotes Pavement Overlay

Denotes Demolition of Pavement

Denotes Proposed Pavement

Denotes Truck Apron

Denotes Flush ADA Crossing At Truck Apron

Denotes Brick Sidewalk

Note: Dot – dashed lines denote permanent easements

Note: Dot – dot dashed lines denote temporary easements

NOTE: LIMITS AND LOCATIONS OF FULL DEPTH CONCRETE PAVEMENT PATCHING PRIOR TO OVERLAY TO BE DETERMINED.

C ____ Denotes Construction Limits in Cuts

F ____ Denotes Construction Limits in Fills

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

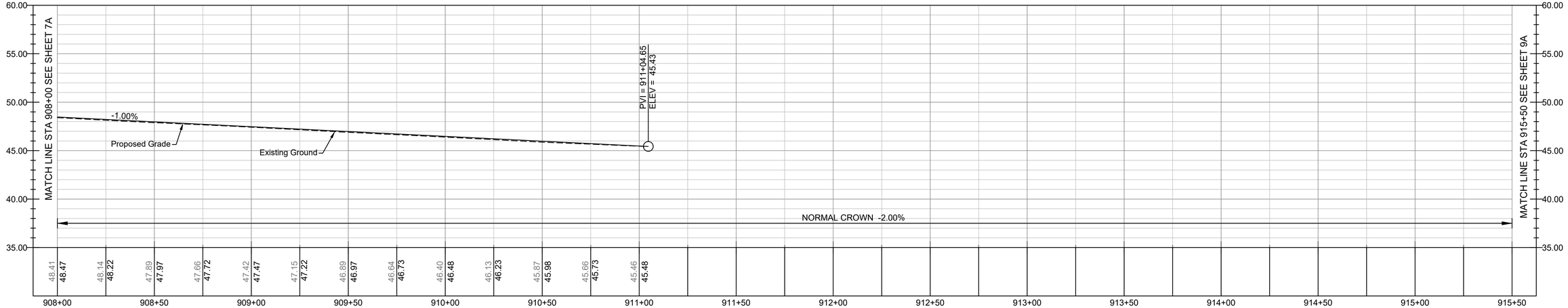
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 8	DRAWING NO. 0-28633



Oliver Hill Way_B

NOTE: EXISTING GROUND ONLY SHOWN IN AREAS WHERE ORIGINAL SURVEY WAS CONDUCTED.

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

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Existing Legend

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Sanitary Sewer (Gravity)
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Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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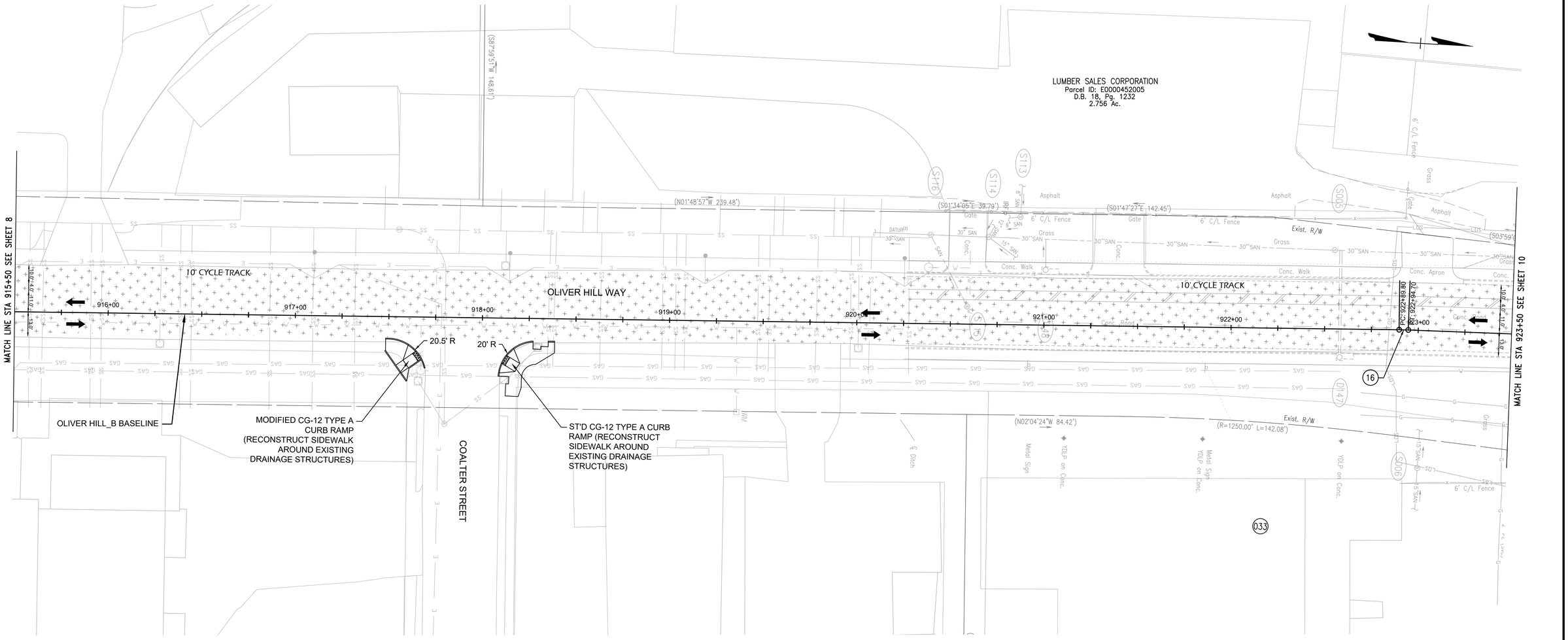
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 8A	DRAWING NO. 0-28633



INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
4. MODIFIED VDOT CG-7 REQ'D
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6. GRANITE CURB
7. VDOT ST'D CG-12 TYPE A REQ'D
8. VDOT ST'D CG-12 TYPE B REQ'D
9. VDOT MODIFIED CG-12 TYPE B REQ'D
10. ST'D MS-1 CONCRETE MEDIAN STRIP
11. ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

- Denotes Pavement Mill and Overlay
- Denotes Pavement Overlay
- Denotes Demolition of Pavement
- Denotes Proposed Pavement
- Denotes Truck Apron
- Denotes Flush ADA Crossing At Truck Apron
- Denotes Brick Sidewalk

Note: Dot – dashed lines denote permanent easements

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NOTE: LIMITS AND LOCATIONS OF FULL DEPTH CONCRETE PAVEMENT PATCHING PRIOR TO OVERLAY TO BE DETERMINED.

C ___ Denotes Construction Limits in Cuts

F ___ Denotes Construction Limits in Fills

16
PI=922+92.25
DELTA=001°24'09.37"
D=028°38'52"
T=2.45
L=4.90
R=200.00
PC=922+89.80
PT=922+94.70
E=NC
R=25 MPH

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Drain; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

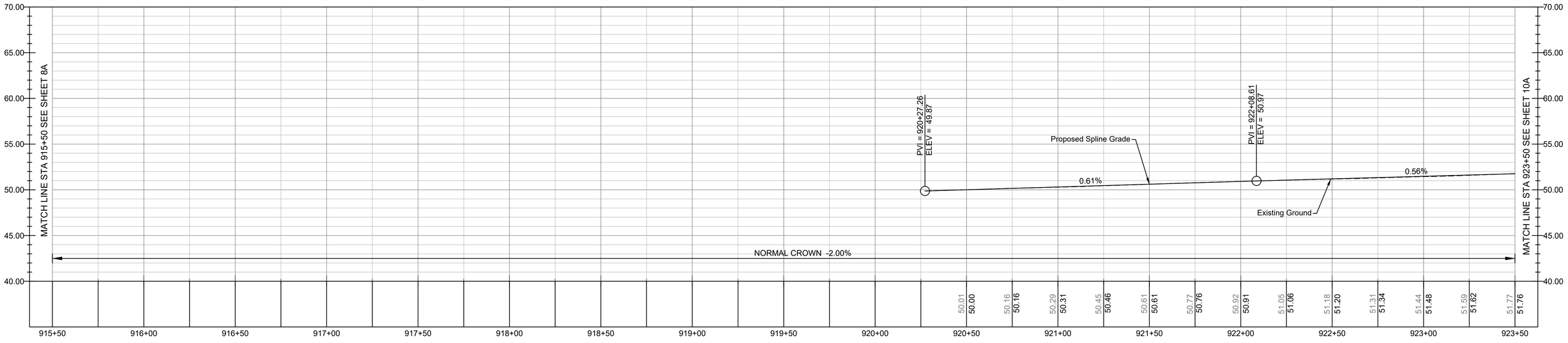
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 9	DRAWING NO. 0-28633



Oliver Hill Way_B

NOTE: EXISTING GROUND ONLY SHOWN IN AREAS WHERE ORIGINAL SURVEY WAS CONDUCTED.

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

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2. Property owners correct as of _____, 20__
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4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

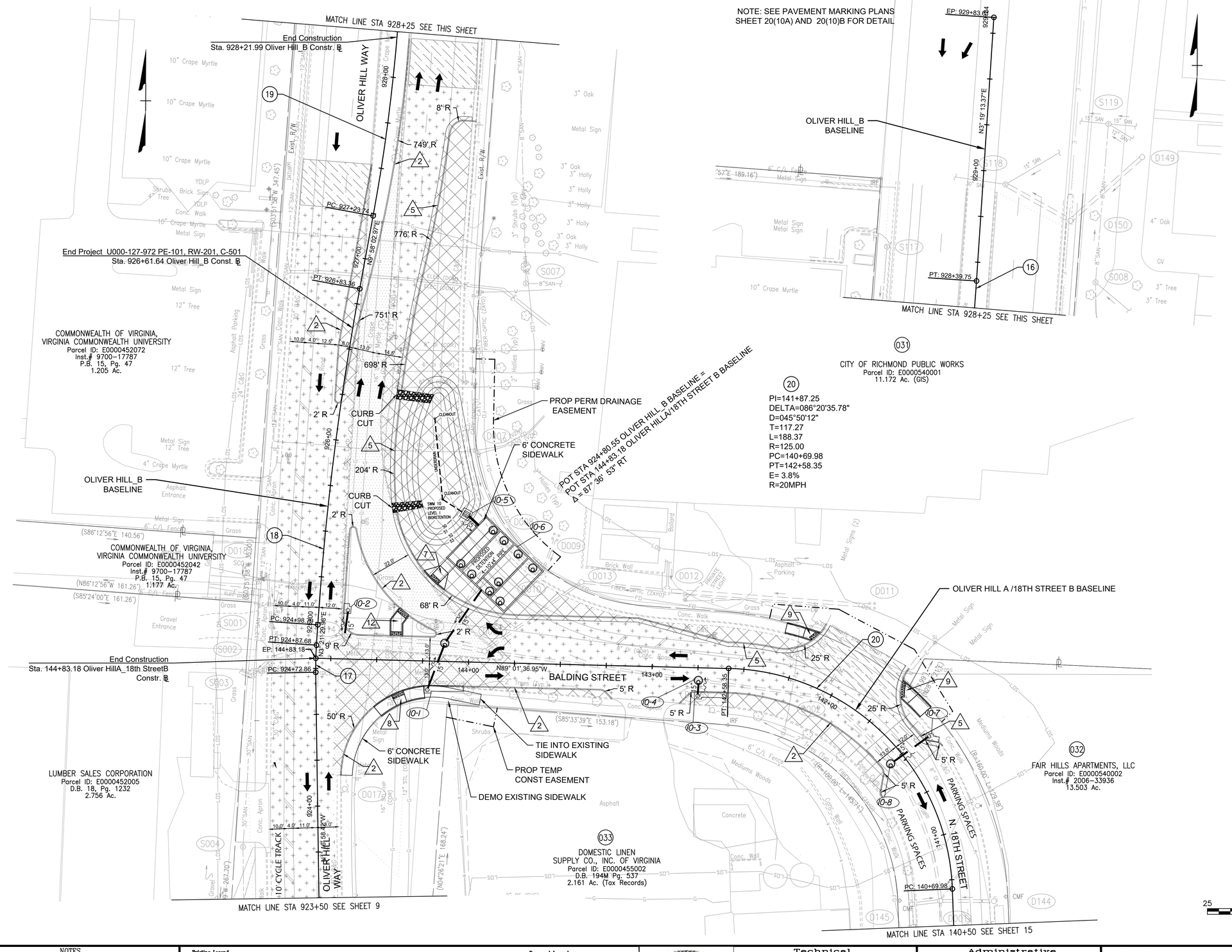
Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 9A	DRAWING NO. 0-28633



(17)
PI=924+80.27
DELTA=004°38'28.39"
D=031°19'57"
T=7.41
L=14.81
R=182.86
PC=924+72.86
PT=924+87.68
E=NC
R=25MPH

(18)
PI=925+91.18
DELTA=006°36'33.00"
D=003°34'52"
T=92.38
L=184.56
R=1600.00
PC=924+98.79
PT=926+83.36
E=NC
R= >25MPH

(19)
PI=927+81.81
DELTA=006°38'49.60"
D=005°43'46"
T=58.07
L=116.01
R=1000.00
PC=927+23.74
PT=928+39.75
E=NC
R= >25MPH

(20)
PI=141+87.25
DELTA=086°20'35.78"
D=045°50'12"
T=117.27
L=188.37
R=125.00
PC=140+69.98
PT=142+58.35
E= 3.8%
R=20MPH

INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
4. MODIFIED VDOT CG-7 REQ'D
5. VDOT ST'D CG-6 CURB AND GUTTER REQ'D
6. GRANITE CURB
7. VDOT ST'D CG-12 TYPE A REQ'D
8. VDOT ST'D CG-12 TYPE B REQ'D
9. VDOT MODIFIED CG-12 TYPE B REQ'D
10. ST'D MS-1 CONCRETE MEDIAN STRIP
11. ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

Denotes Pavement Mill and Overlay
Denotes Pavement Overlay
Denotes Demolition of Pavement
Denotes Proposed Pavement
Denotes Truck Apron
Denotes Flush ADA Crossing At Truck Apron
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Note: Dot – dashed lines denote permanent easements

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C Denotes Construction Limits in Cuts

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NOTE: LIMITS AND LOCATIONS OF FULL DEPTH CONCRETE PAVEMENT PATCHING PRIOR TO OVERLAY TO BE DETERMINED.

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

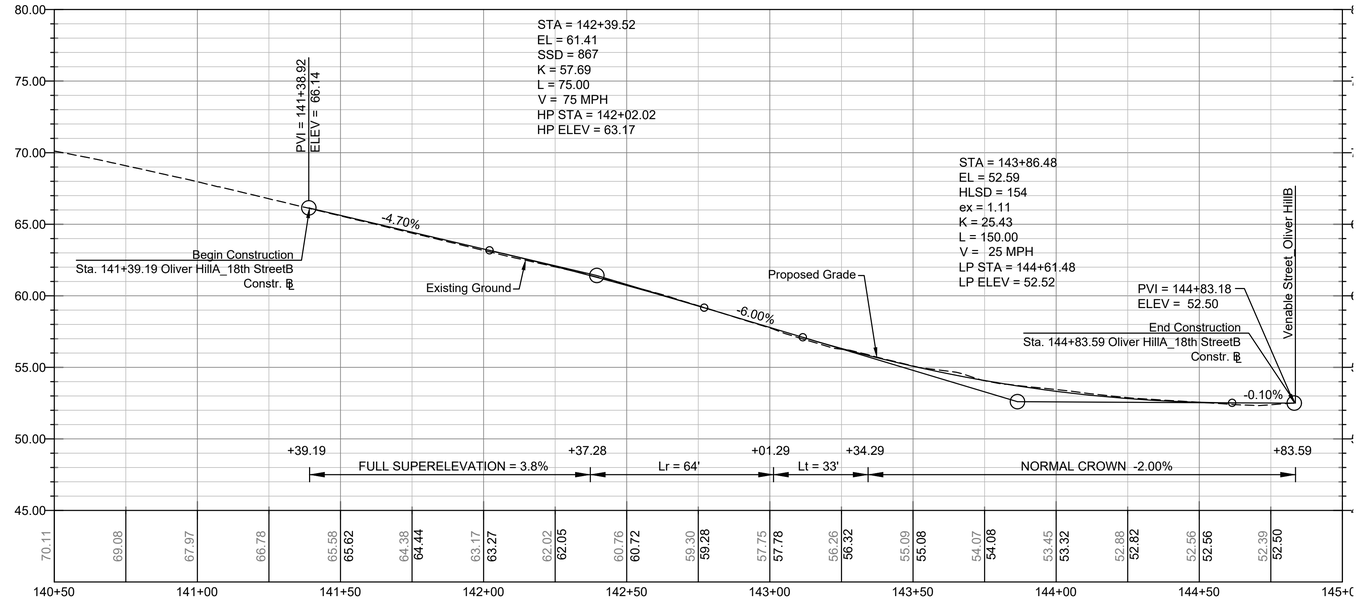
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

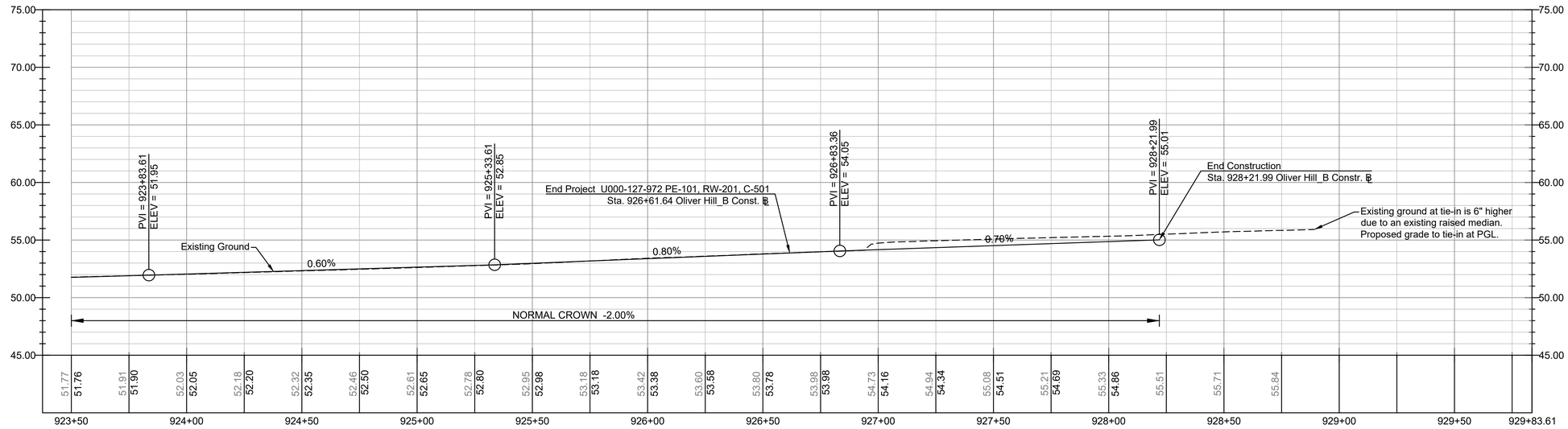
SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 10	0-28633
CHECKED BY: ASamberg						



Oliver HillA_18th StreetB Profile



Oliver Hill Way_B

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES	REVISIONS

Existing Legend
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Sanitary Sewer (Gravity)
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Property Line
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Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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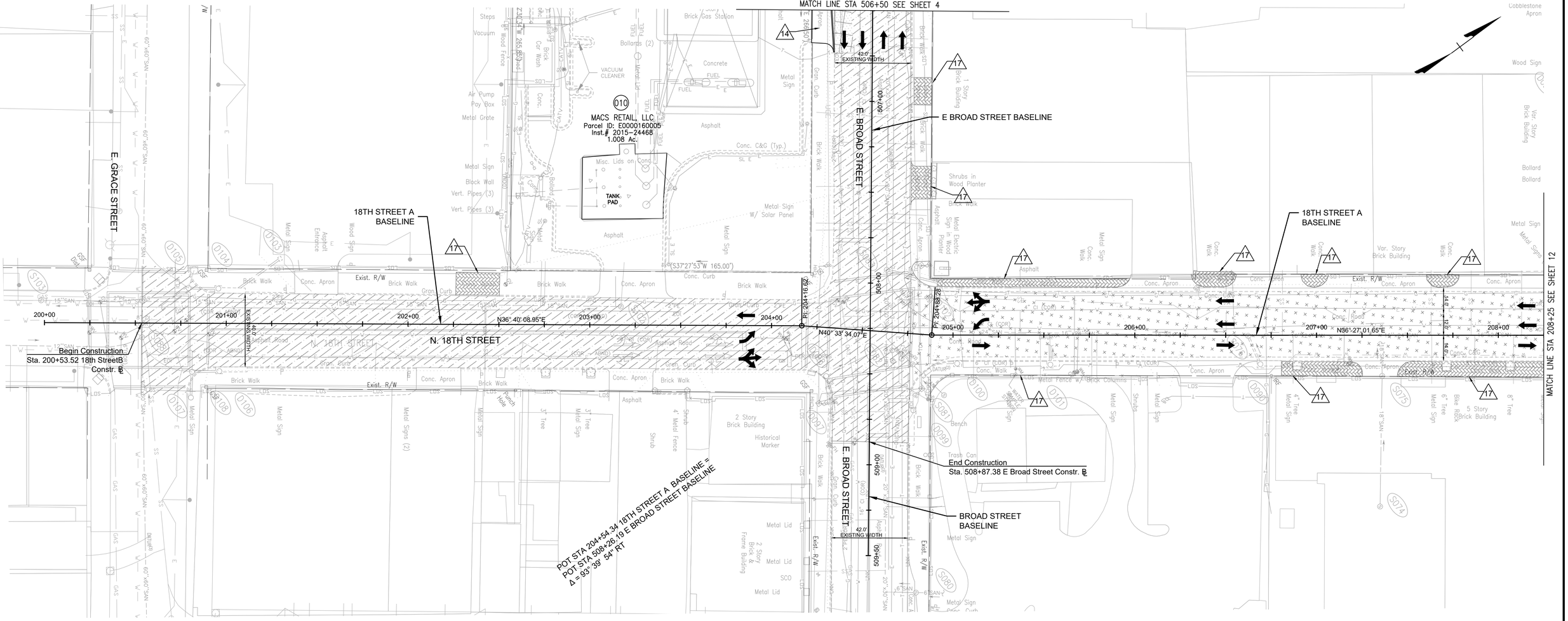
SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 10A	0-28633
CHECKED BY: ASamberg						



INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
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6. GRANITE CURB
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16. VDOT ST'D S-2 CONCRETE STEPS
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Denotes Pavement Mill and Overlay

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C ___ Denotes Construction Limits in Cuts

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25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
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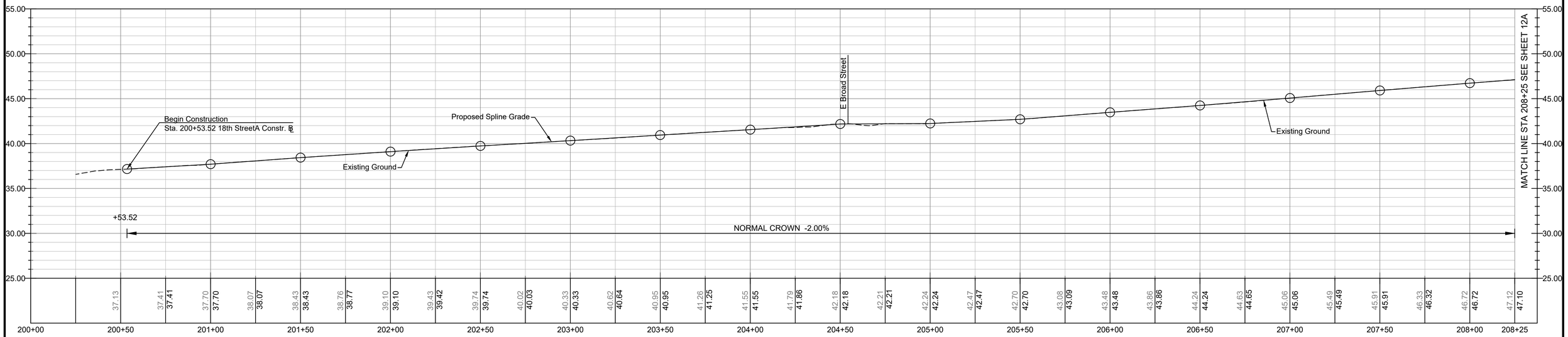
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

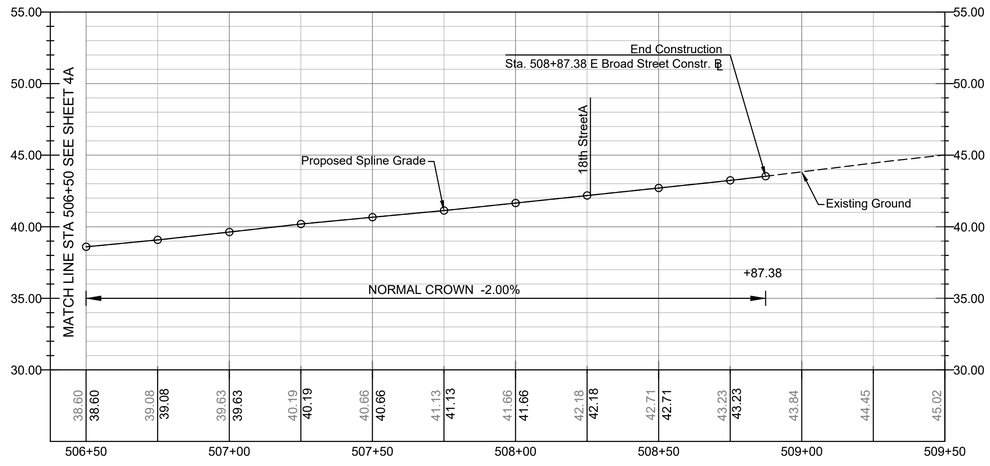
SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 11	DRAWING NO. 0-28633



18th StreetA



E Broad Street

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES

REVISIONS

Existing Legend

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Sanitary Sewer (Gravity)
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Fire Hydrant / Valve
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Storm/(San) Manhole
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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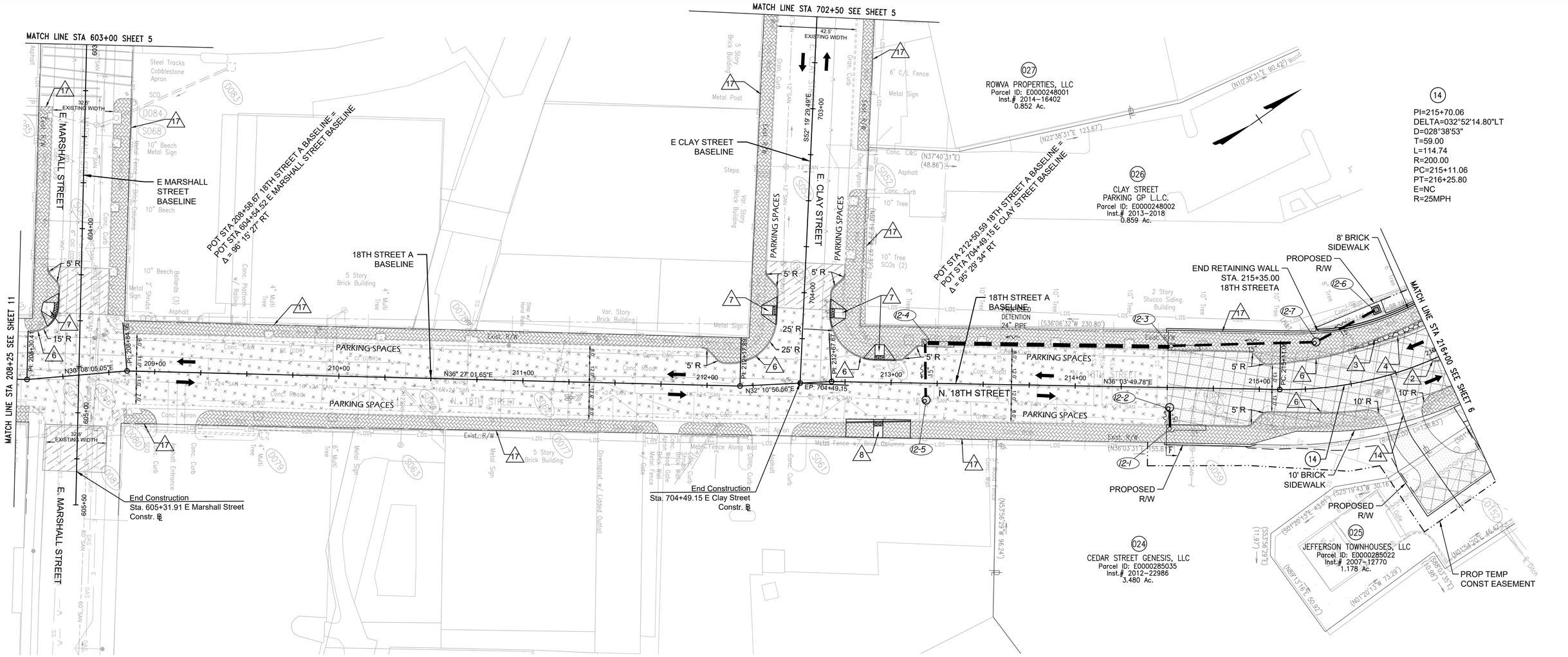
SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 11A	DRAWING NO. 0-28633



INCIDENTAL LEGEND

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2. ST'D RICHMOND CITY CURB REQ'D
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12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

Denotes Pavement Mill and Overlay

Denotes Pavement Overlay

Denotes Demolition of Pavement

Denotes Proposed Pavement

Denotes Truck Apron

Denotes Flush ADA Crossing At Truck Apron

Denotes Brick Sidewalk

Note: Dot – dashed lines denote permanent easements

Note: Dot – dot dashed lines denote temporary easements

NOTE: LIMITS AND LOCATIONS OF FULL DEPTH CONCRETE PAVEMENT PATCHING PRIOR TO OVERLAY TO BE DETERMINED.

C ___ Denotes Construction Limits in Cuts

F ___ Denotes Construction Limits in Fills

25 0 25 50
SCALE IN FEET

70% SUBMITTAL SEPTEMBER 2022

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NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

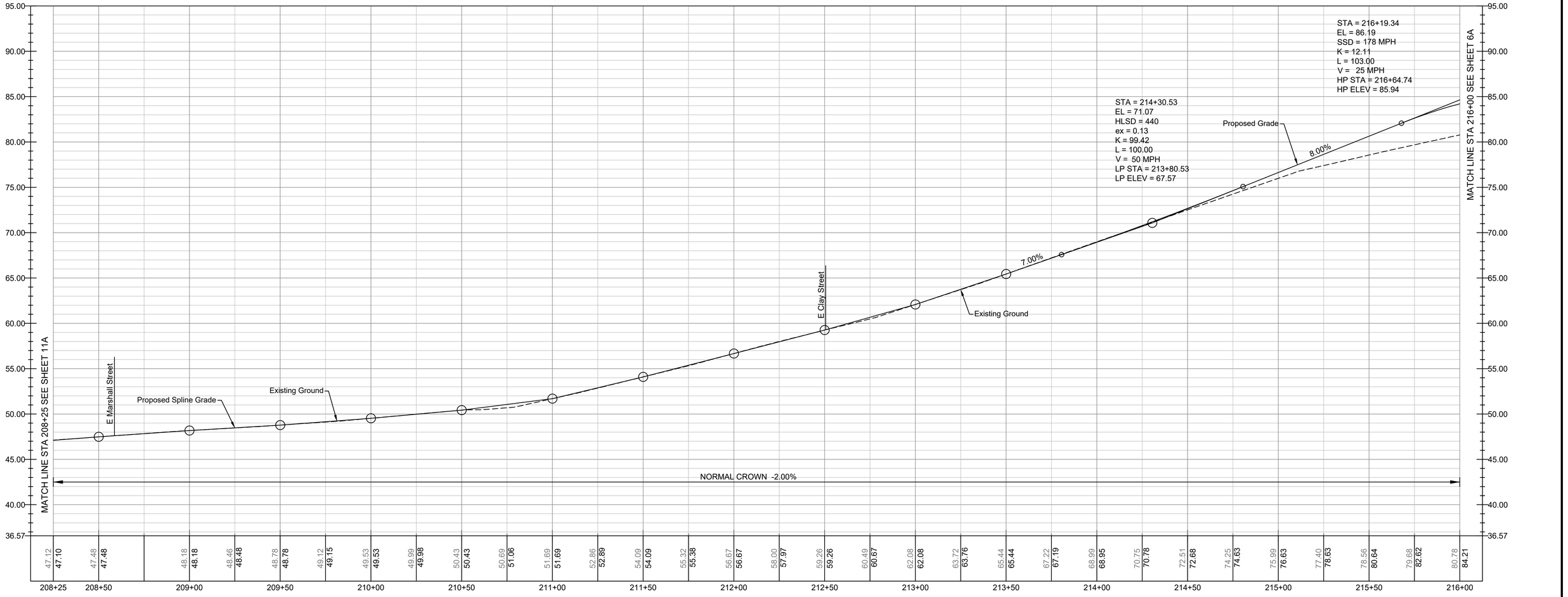
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 12	0-28633



18th StreetA

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

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Property Line
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Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
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Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

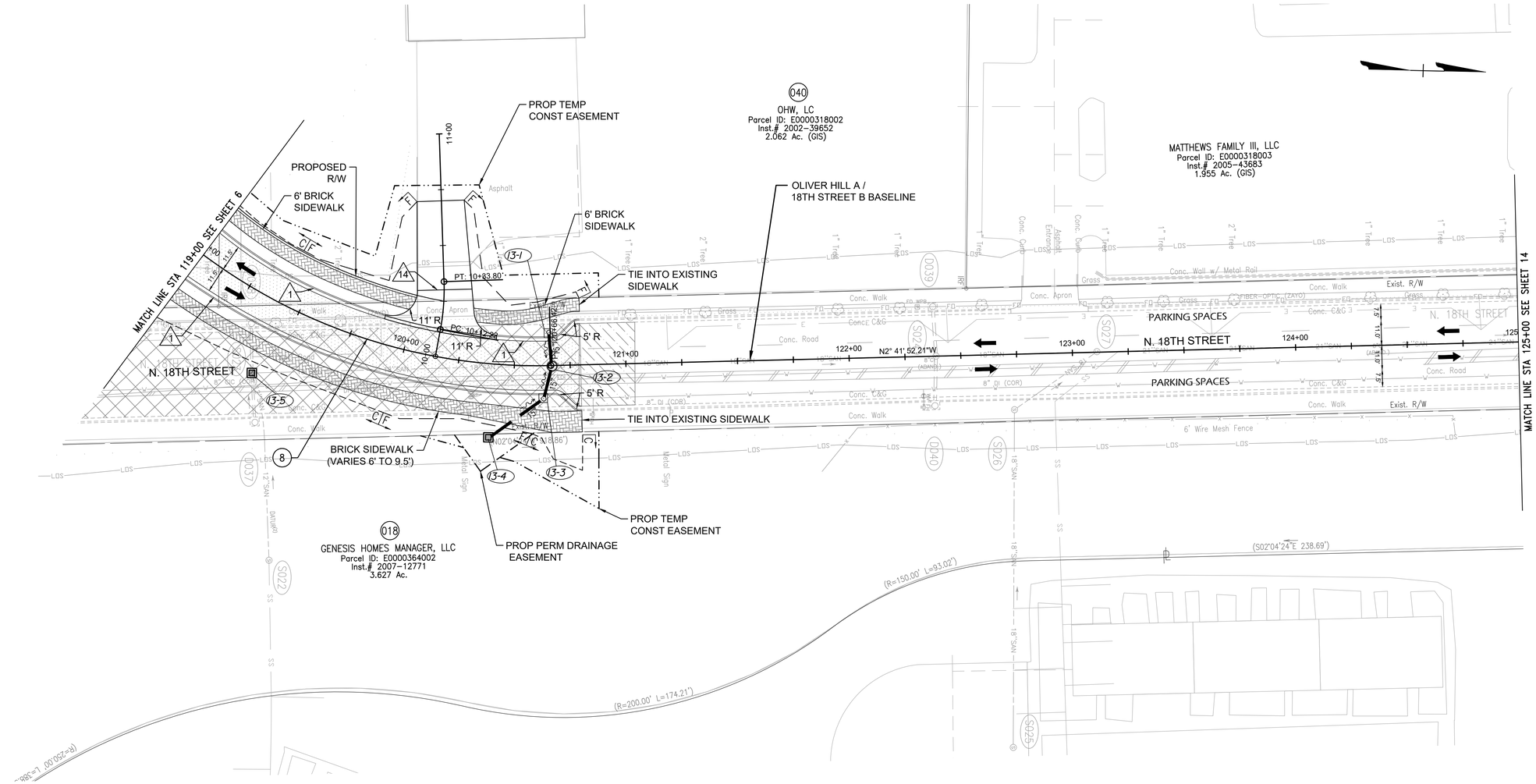
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 12A	DRAWING NO. 0-28633



INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
4. MODIFIED VDOT CG-7 REQ'D
5. VDOT ST'D CG-6 CURB AND GUTTER REQ'D
6. GRANITE CURB
7. VDOT ST'D CG-12 TYPE A REQ'D
8. VDOT ST'D CG-12 TYPE B REQ'D
9. VDOT MODIFIED CG-12 TYPE B REQ'D
10. ST'D MS-1 CONCRETE MEDIAN STRIP
11. ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

- Denotes Pavement Mill and Overlay
- Denotes Pavement Overlay
- Denotes Demolition of Pavement
- Denotes Proposed Pavement
- Denotes Truck Apron
- Denotes Flush ADA Crossing At Truck Apron
- Denotes Brick Sidewalk

Note: Dot – dashed lines denote permanent easements

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C — Denotes Construction Limits in Cuts

F — Denotes Construction Limits in Fills

SCALE IN FEET: 25 0 25 50

70% SUBMITTAL SEPTEMBER 2022

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NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

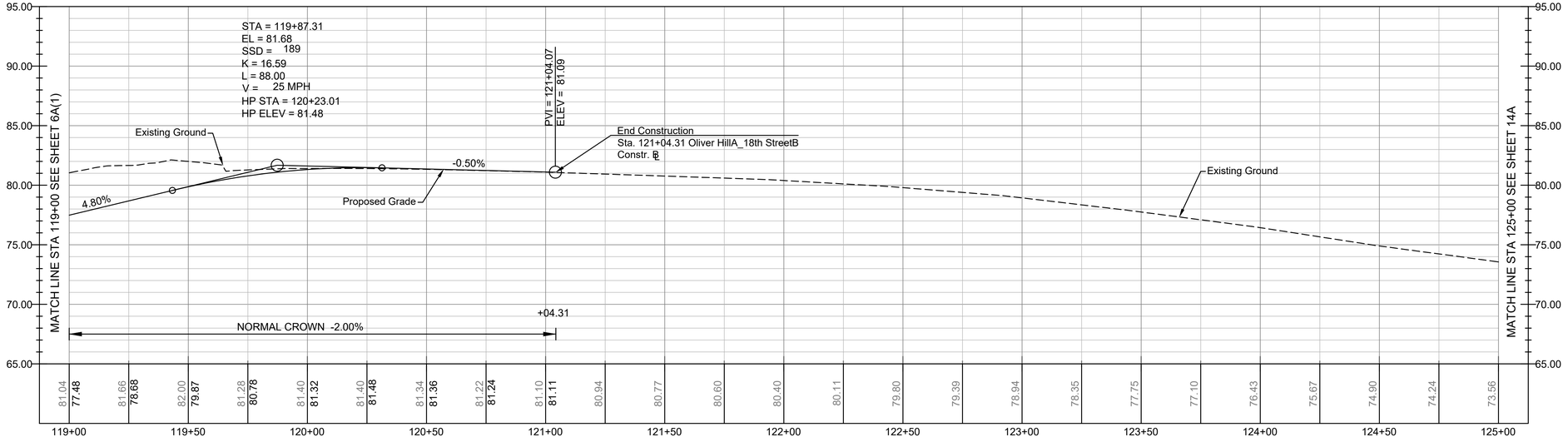
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 13	0-28633



Oliver HillA_18th StreetB

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

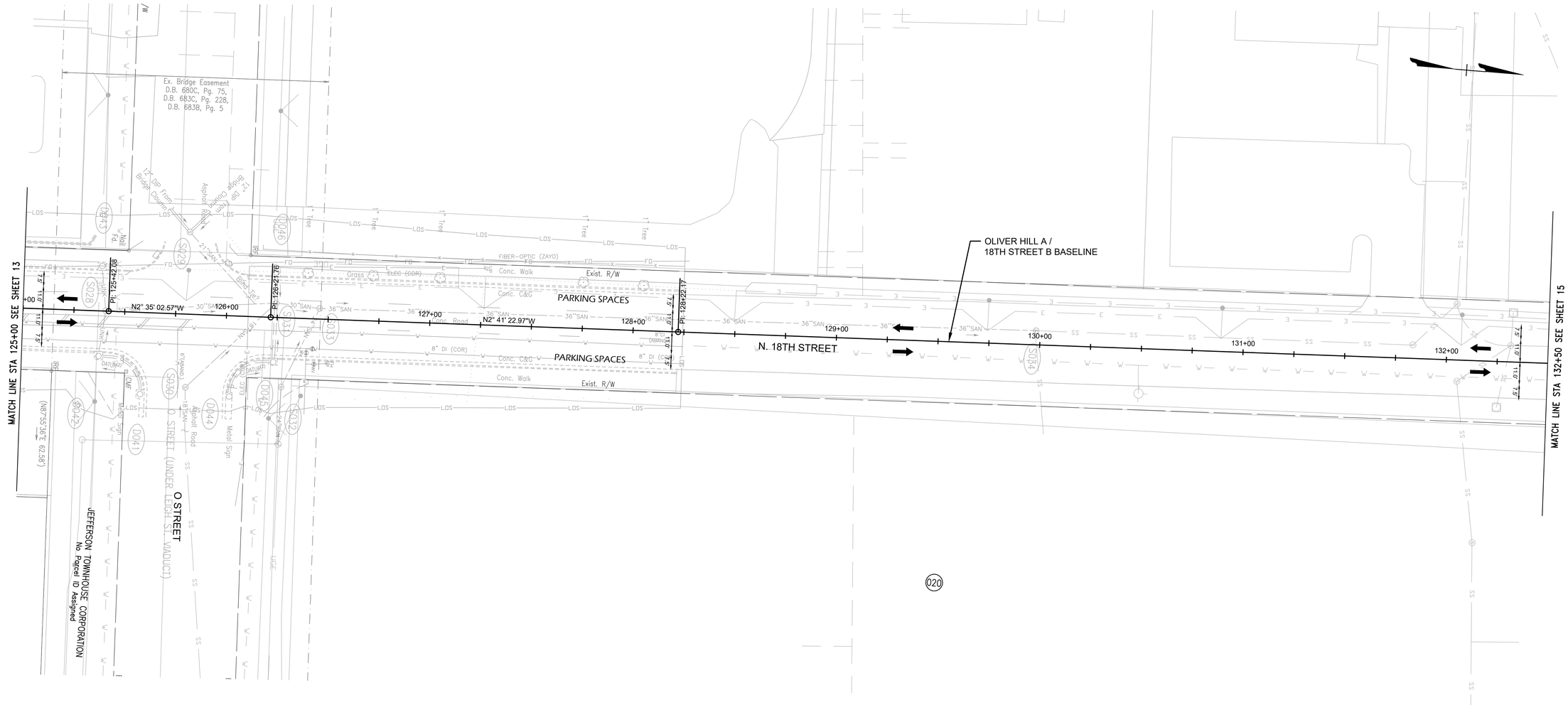
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 13A	DRAWING NO. 0-28633



INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
4. MODIFIED VDOT CG-7 REQ'D
5. VDOT ST'D CG-6 CURB AND GUTTER REQ'D
6. GRANITE CURB
7. VDOT ST'D CG-12 TYPE A REQ'D
8. VDOT ST'D CG-12 TYPE B REQ'D
9. VDOT MODIFIED CG-12 TYPE B REQ'D
10. ST'D MS-1 CONCRETE MEDIAN STRIP
11. ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

- Denotes Pavement Mill and Overlay
- Denotes Pavement Overlay
- Denotes Demolition of Pavement
- Denotes Proposed Pavement
- Denotes Truck Apron
- Denotes Flush ADA Crossing At Truck Apron
- Denotes Brick Sidewalk

Note: Dot – dashed lines denote permanent easements

Note: Dot – dot dashed lines denote temporary easements

C — Denotes Construction Limits in Cuts

F — Denotes Construction Limits in Fills

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

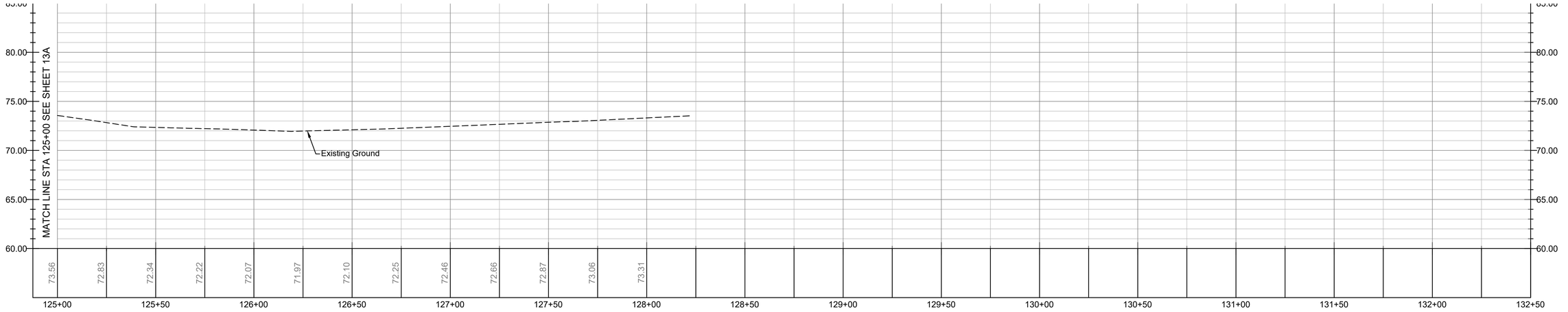
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 14	DRAWING NO. 0-28633



Oliver HillA_18th StreetB

NOTE: EXISTING GROUND ONLY SHOWN IN AREAS WHERE ORIGINAL SURVEY WAS CONDUCTED.

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
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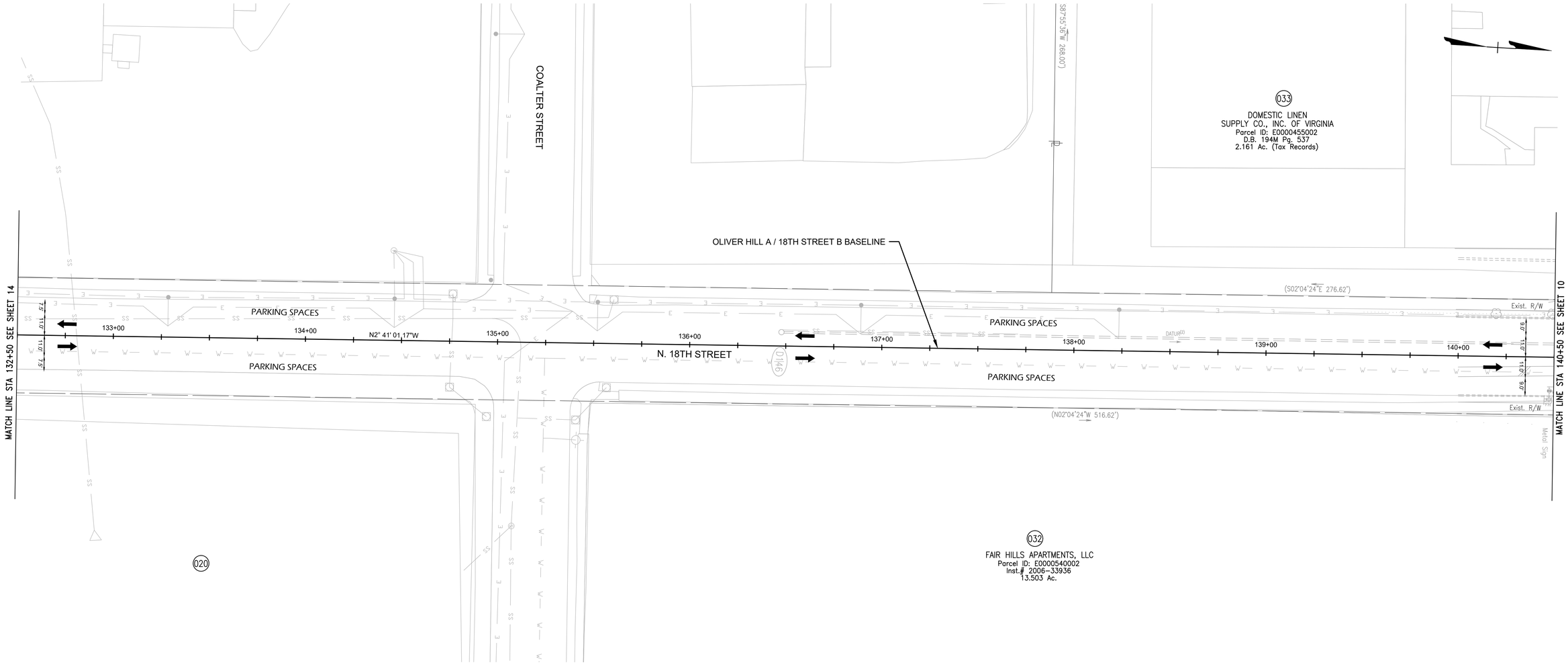
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 14A	DRAWING NO. 0-28633



INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
4. MODIFIED VDOT CG-7 REQ'D
5. VDOT ST'D CG-6 CURB AND GUTTER REQ'D
6. GRANITE CURB
7. VDOT ST'D CG-12 TYPE A REQ'D
8. VDOT ST'D CG-12 TYPE B REQ'D
9. VDOT MODIFIED CG-12 TYPE B REQ'D
10. ST'D MS-1 CONCRETE MEDIAN STRIP
11. ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

Denotes Pavement Mill and Overlay

Denotes Pavement Overlay

Denotes Demolition of Pavement

Denotes Proposed Pavement

Denotes Truck Apron

Denotes Flush ADA Crossing At Truck Apron

Denotes Brick Sidewalk

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C Denotes Construction Limits in Cuts

F Denotes Construction Limits in Fills

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People -Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

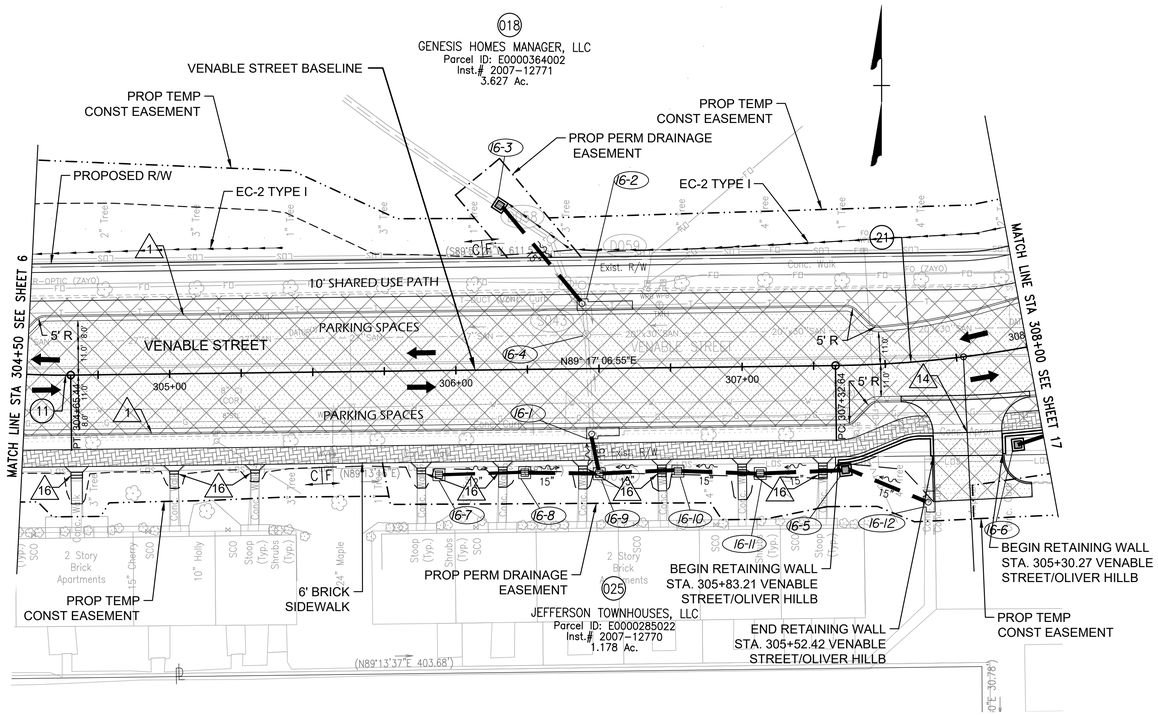
DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 15	0-28633

(11)

PI=304+24.74
DELTA=018°49'38.05"
D=022°55'06"
T=41.45
L=82.15
R=250.00
PC=303+83.29
PT=304+65.44
E=NC
R=25 MPH

(21)

PI=307+75.35
DELTA=012°11'22.92"
D=014°19'26"
T=42.71
L=85.10
R=400.00
PC=307+32.64
PT=308+17.74
E=NC
R= >25 MPH



INCIDENTAL LEGEND

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2. ST'D RICHMOND CITY CURB REQ'D
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4. MODIFIED VDOT CG-7 REQ'D
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Storm or Sanitary Manhole
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Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
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Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

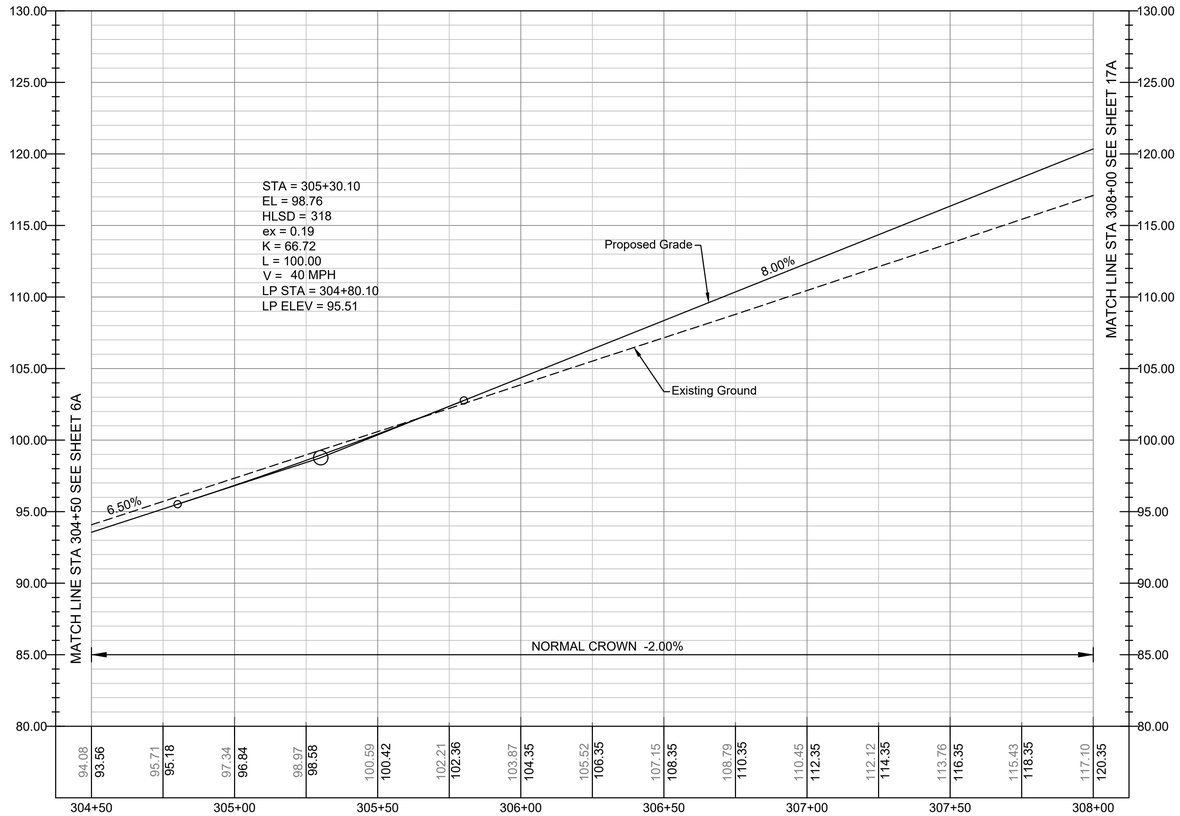
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 16	0-28633



Venable Street

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES

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Gas Meter / Valve
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Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
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Technical	Administrative
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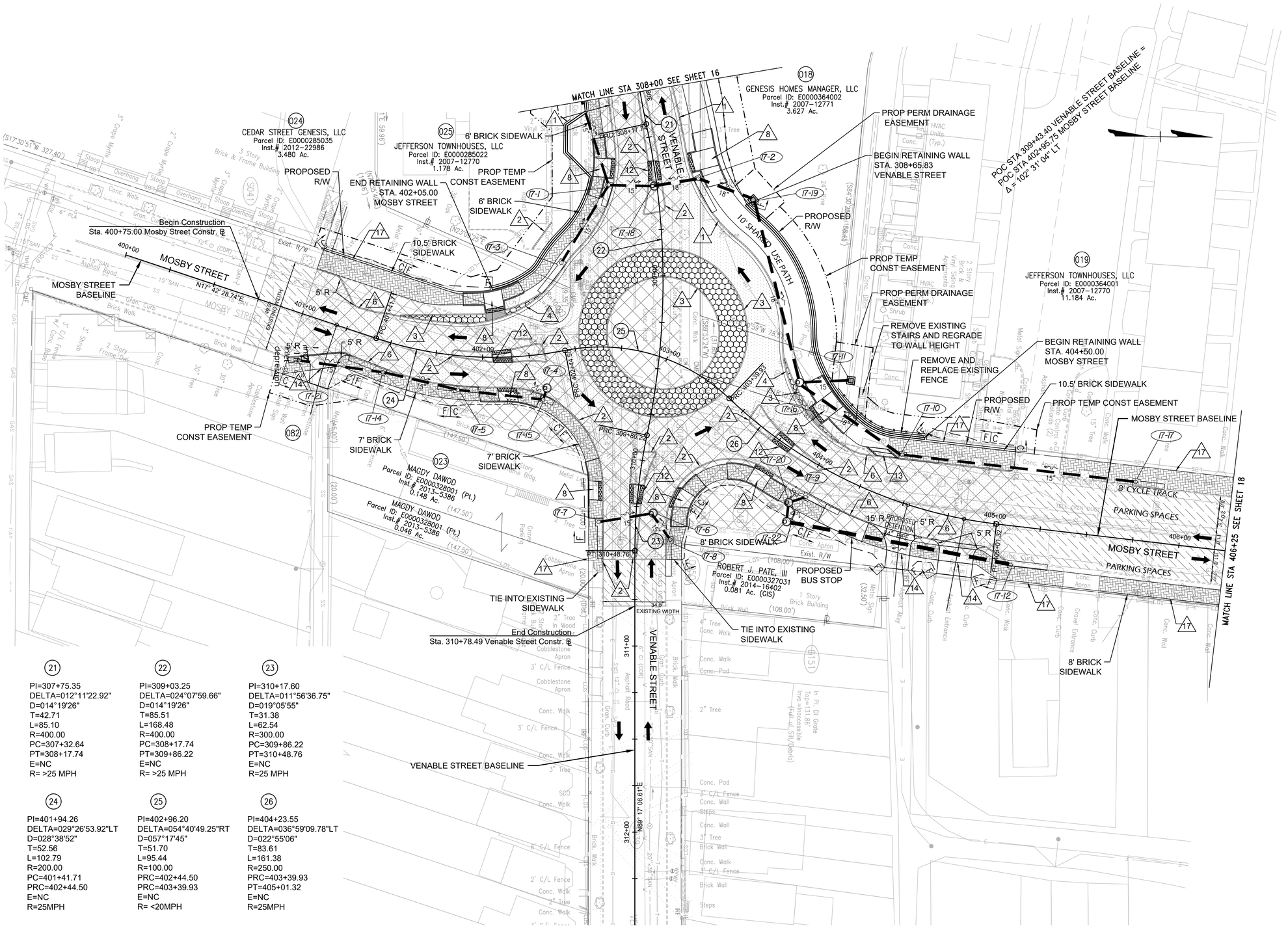
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People -Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 16A	DRAWING NO. 0-28633



(21)	(22)	(23)
PI=307+75.35	PI=309+03.25	PI=310+17.60
DELTA=012°11'22.92"	DELTA=024°07'59.66"	DELTA=011°56'36.75"
D=014°19'26"	D=014°19'26"	D=019°05'55"
T=42.71	T=85.51	T=31.38
L=85.10	L=168.48	L=62.54
R=400.00	R=400.00	R=300.00
PC=307+32.64	PC=308+17.74	PC=309+86.22
PT=308+17.74	PT=309+86.22	PT=310+48.76
E=NC	E=NC	E=NC
R= >25 MPH	R= >25 MPH	R=25 MPH

(24)	(25)	(26)
PI=401+94.26	PI=402+96.20	PI=404+23.55
DELTA=029°26'53.92"LT	DELTA=054°40'49.25"RT	DELTA=036°59'09.78"LT
D=028°38'52"	D=057°17'45"	D=022°55'06"
T=52.56	T=51.70	T=83.61
L=102.79	L=95.44	L=161.38
R=200.00	R=100.00	R=250.00
PC=401+41.71	PRC=402+44.50	PRC=403+39.93
PRC=402+44.50	PRC=403+39.93	PT=405+01.32
E=NC	E=NC	E=NC
R=25MPH	R= <20MPH	R=25MPH

INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
4. MODIFIED VDOT CG-7 REQ'D
5. VDOT ST'D CG-6 CURB AND GUTTER REQ'D
6. GRANITE CURB
7. VDOT ST'D CG-12 TYPE A REQ'D
8. VDOT ST'D CG-12 TYPE B REQ'D
9. VDOT MODIFIED CG-12 TYPE B REQ'D
10. ST'D MS-1 CONCRETE MEDIAN STRIP
11. ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

Denotes Pavement Mill and Overlay
Denotes Pavement Overlay
Denotes Demolition of Pavement
Denotes Proposed Pavement
Denotes Truck Apron
Denotes Flush ADA Crossing At Truck Apron
Denotes Brick Sidewalk

Note: Dot – dashed lines denote permanent easements

Note: Dot – dot dashed lines denote temporary easements

C Denotes Construction Limits in Cuts

F Denotes Construction Limits in Fills

SCALE IN FEET 25 0 25 50

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

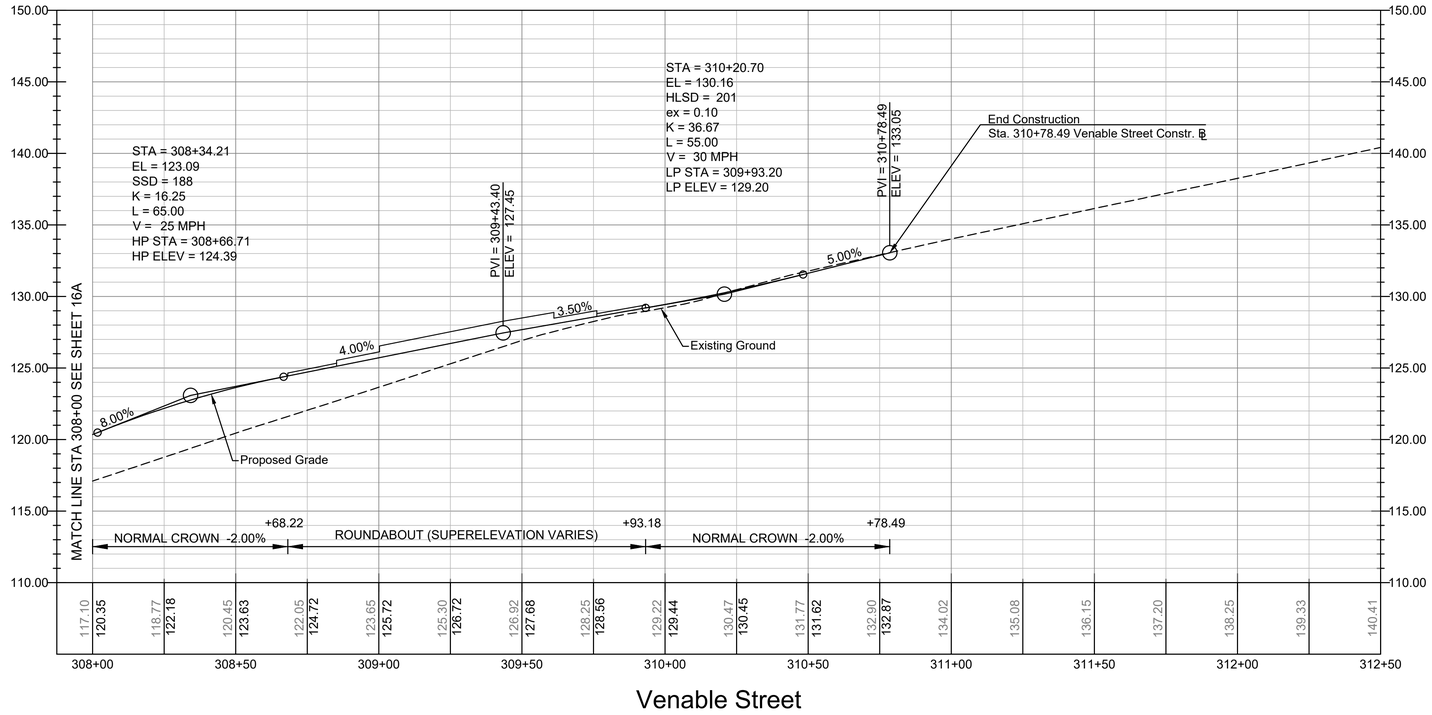
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

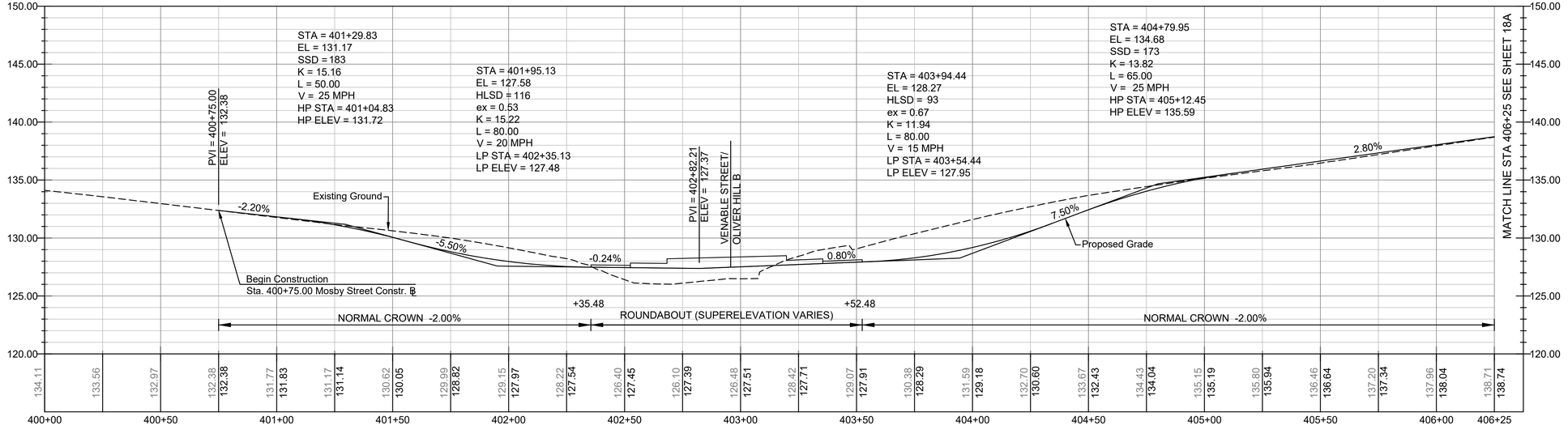
SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 17	0-28633
CHECKED BY: ASamberg						



Venable Street



Mosby Street

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 17A	DRAWING NO. 0-28633

(27)
PI=409+00.30
DELTA=007°25'56.27"LT
D=005°43'46"
T=64.95
L=129.72
R=1000.00
PC=408+35.35
PT=409+65.06
E=NC
R= >25MPH

(28)
PI=411+55.35
DELTA=032°15'31.97"RT
D=028°38'52"
T=57.84
L=112.60
R=200.00
PC=410+97.51
PRC=412+10.12
E=NC
R=25MPH

(29)
PI=412+37.26
DELTA=010°20'20.54"LT
D=019°05'55"
T=27.14
L=54.14
R=300.00
PRC=412+10.12
PRC=412+64.25
E=NC
R=25MPH

(30)
PI=413+27.65
DELTA=016°02'18.25"RT
D=012°43'57"
T=63.40
L=125.97
R=450.00
PRC=412+64.25
PT=413+90.22
E=NC
R= >25MPH

(31)
PI=800+75.00
DELTA=012°46'24.72"RT
D=008°33'06"
T=75.00
L=149.37
R=670.00
PC=800+00.00
PT=801+49.37
E=NC
R= >25MPH

(32)
PI=803+05.70
DELTA=002°27'10.23"RT
D=005°43'46"
T=21.41
L=42.81
R=1000.00
PC=802+84.29
PT=803+27.10
E=NC
R= >25MPH

(33)
PI=805+09.64
DELTA=000°57'09.81"LT
D=002°51'53"
T=16.63
L=33.26
R=2000.00
PC=804+93.01
PT=805+26.26
E=NC
R= >25MPH

LEIGH STREET BASELINE
Begin Construction
Sta. 804+92.22 Leigh Street Constr. ℄
LEIGH STREET VIADUCT
TIE INTO EXISTING SIDEWALK
CONCRETE SIDEWALK VARIES 5' TO 8'
CONCRETE BARRIER
TIE INTO EXISTING CONCRETE MEDIAN
CITY OF RICHMOND
Parcel ID: E0000362001
D.B. 621C, PG. 502
29.313 Ac.
020
PROPOSED R/W
PROP TEMP CONST EASEMENT
PROP TEMP CONST EASEMENT
5' BRICK SIDEWALK
PROPOSED R/W
REMOVE AND REPLACE 7' METAL FENCE
CONCRETE BARRIER
TIE INTO EXIST SIDEWALK
CONC. SIDEWALK VARIES 10' TO 5.5'
PROP PERM TRAFFIC CONTROL DEVICE EASEMENT
CONCRETE BARRIER
019
JEFFERSON TOWNHOUSES, LLC
Parcel ID: E0000364001
Inst.# 2007-12770
11.184 Ac.
CONCRETE SIDEWALK (MATCH EXISTING)
PROP TEMP CONST EASEMENT
BRICK SIDEWALK (VARIES 10.5' TO 5")
PROPOSED R/W
PROP PERM DRAIN EASEMENT
MOSBY STREET BASELINE
10' SHARED USE PATH
8' CYCLE TRACK
PARKING SPACES
MOSBY STREET
6' CONCRETE SIDEWALK
MATCH LINE STA 406+25 SEE SHEET 17
MATCH LINE STA 413+25 SEE SHEET 19
BRICK SIDEWALK (VARIES 8' TO 9.5')
TIE INTO EXISTING SIDEWALK
D-2 (BY OTHERS)
6' BRICK SIDEWALK
PROPOSED R/W
RICHMOND RESEVELOPMENT & HOUSING AUTHORITY
Parcel ID: E0000465001
15.2 Ac. (GIS)
TIE INTO EXISTING SIDEWALK
ASPHALT TURNAROUND AREA
TRANSITION GUTTER PAN TO MATCH EXISTING AT TIE-IN
PROP TEMP CONST EASEMENT
End Construction
Sta. 804+73.00 Leigh Street Constr. ℄
POC STA 411+24.00 MOSBY STREET BASELINE =
POT STA 803+22.57 LEIGH STREET BASELINE
Δ = 120° 44' 55" RT
O STREET
LEIGH STREET BASELINE
CARRINGTON STREET

Denotes Pavement Mill and Overlay
Denotes Pavement Overlay
Denotes Demolition of Pavement
Denotes Proposed Pavement
Denotes Truck Apron
Denotes Flush ADA Crossing At Truck Apron
Denotes Brick Sidewalk

INCIDENTAL LEGEND
1 ST'D RICHMOND CITY CURB & GUTTER REQ'D
2 ST'D RICHMOND CITY CURB REQ'D
3 MODIFIED VDOT CG-3 REQ'D
4 MODIFIED VDOT CG-7 REQ'D
5 VDOT ST'D CG-6 CURB AND GUTTER REQ'D
6 GRANITE CURB
7 VDOT ST'D CG-12 TYPE A REQ'D
8 VDOT ST'D CG-12 TYPE B REQ'D
9 VDOT MODIFIED CG-12 TYPE B REQ'D
10 ST'D MS-1 CONCRETE MEDIAN STRIP
11 ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12 MEDIAN REFUGE ISLAND TYPE M2
13 NS BIKE RAMP
14 VDOT ST'D CG-9D ENTRANCE GUTTER
15 VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16 VDOT ST'D S-2 CONCRETE STEPS
17 REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

C Denotes Construction Limits in Cuts
F Denotes Construction Limits in Fills

Note: Dot – dashed lines denote permanent easements
Note: Dot – dot dashed lines denote temporary easements

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022
THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

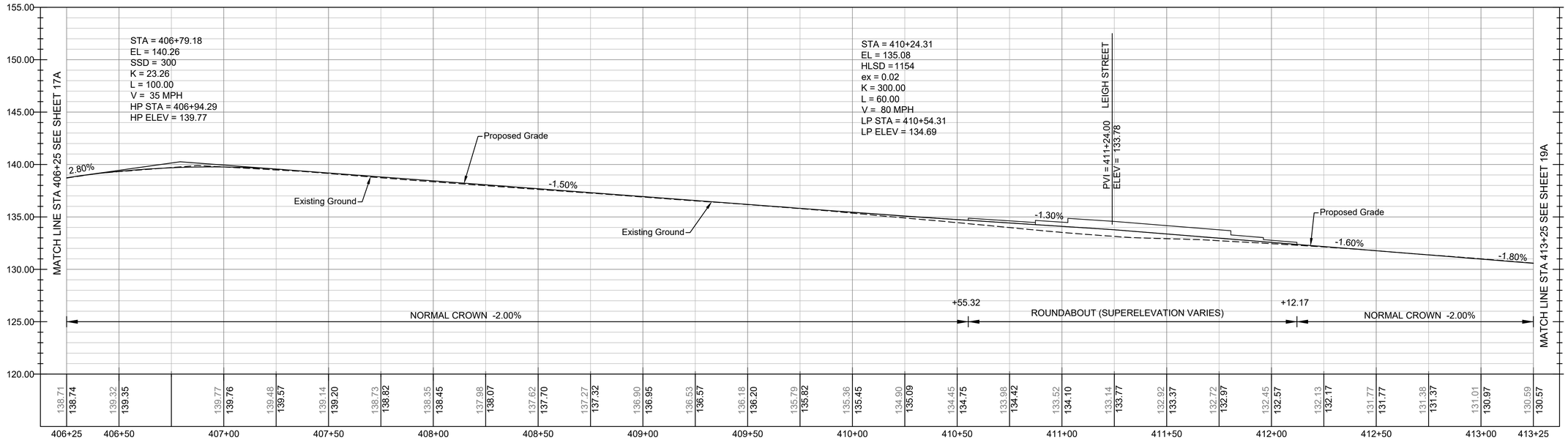
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

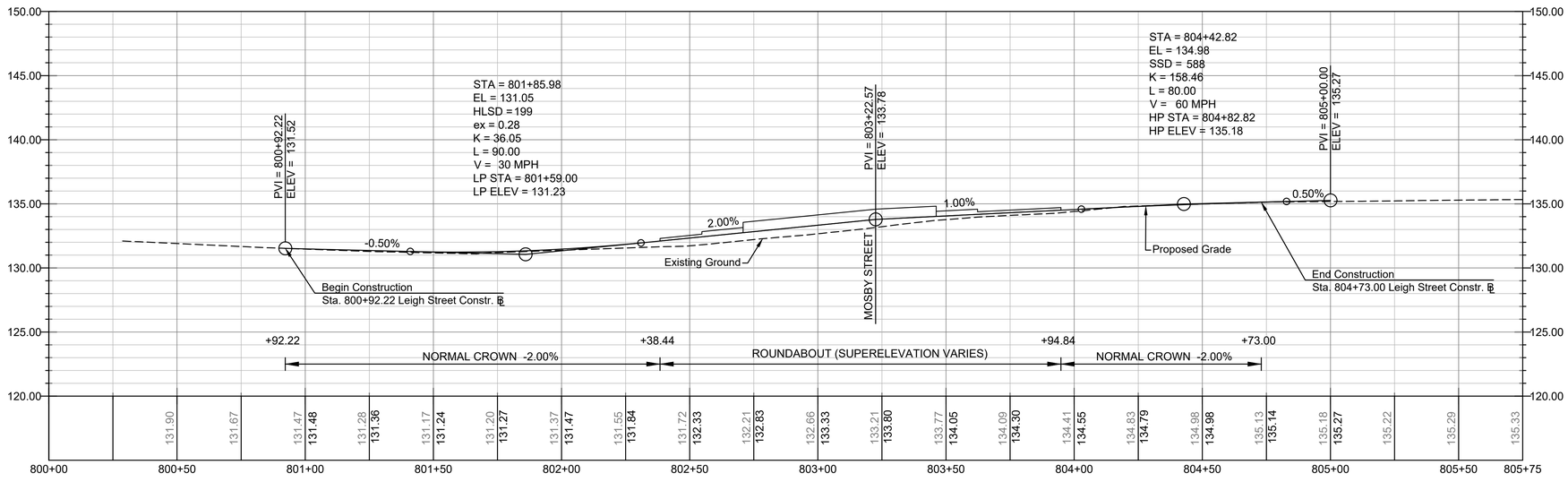
SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 18	0-28633



Mosby Street



Leigh Street Profile

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve; Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

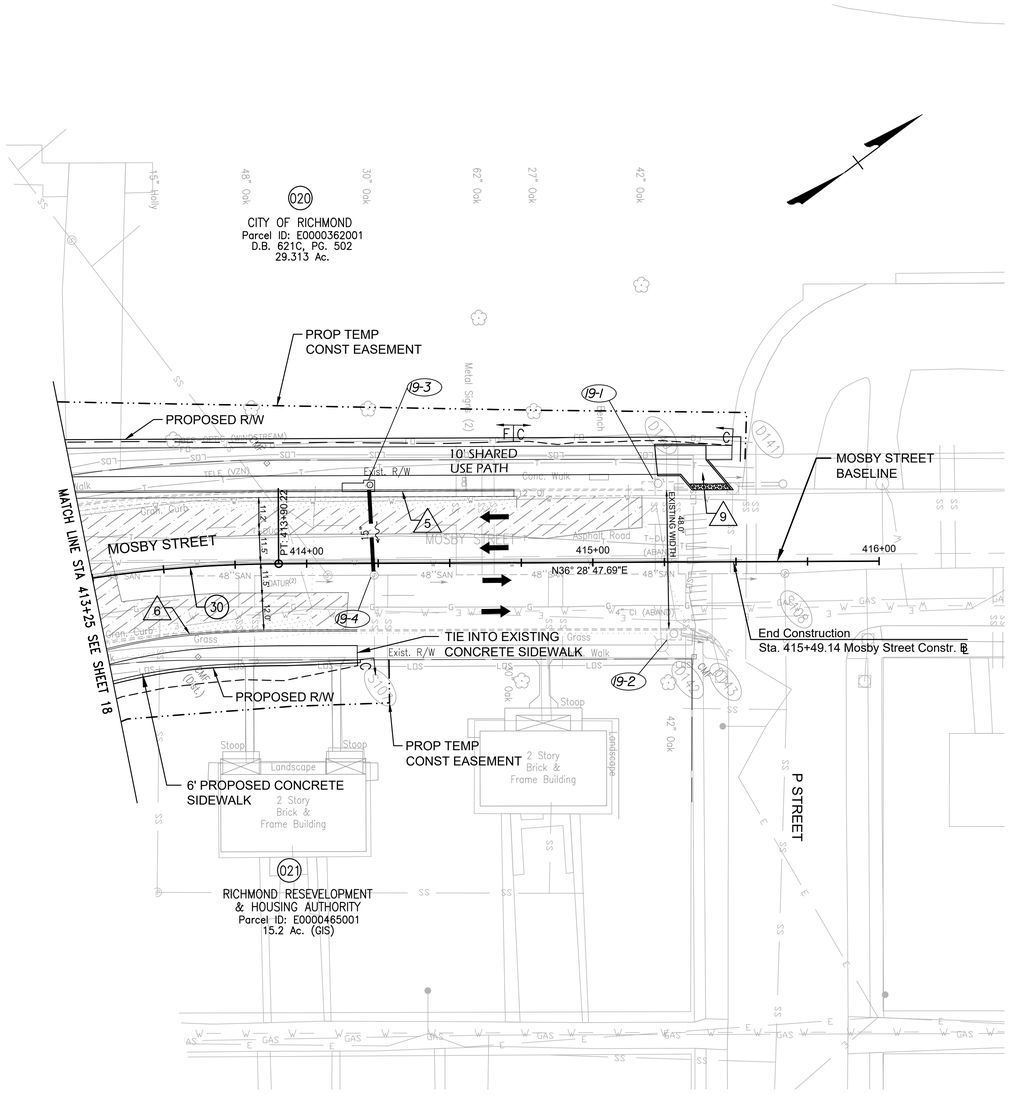
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 18A	0-28633
CHECKED BY: ASamberg						



INCIDENTAL LEGEND

1. ST'D RICHMOND CITY CURB & GUTTER REQ'D
2. ST'D RICHMOND CITY CURB REQ'D
3. MODIFIED VDOT CG-3 REQ'D
4. MODIFIED VDOT CG-7 REQ'D
5. VDOT ST'D CG-6 CURB AND GUTTER REQ'D
6. GRANITE CURB
7. VDOT ST'D CG-12 TYPE A REQ'D
8. VDOT ST'D CG-12 TYPE B REQ'D
9. VDOT MODIFIED CG-12 TYPE B REQ'D
10. ST'D MS-1 CONCRETE MEDIAN STRIP
11. ST'D MS-2 RAISED GRASS MEDIAN STRIPS
12. MEDIAN REFUGE ISLAND TYPE M2
13. NS BIKE RAMP
14. VDOT ST'D CG-9D ENTRANCE GUTTER
15. VDOT ST'D CG-11 COMMERCIAL ENTRANCE
16. VDOT ST'D S-2 CONCRETE STEPS
17. REPLACE EXISTING CONCRETE SIDEWALK WITH BRICK SIDEWALK

Denotes Pavement Mill and Overlay

Denotes Pavement Overlay

Denotes Demolition of Pavement

Denotes Proposed Pavement

Denotes Truck Apron

Denotes Flush ADA Crossing At Truck Apron

Denotes Brick Sidewalk

Note: Dot – dashed lines denote permanent easements

Note: Dot – dot dashed lines denote temporary easements

C — Denotes Construction Limits in Cuts

F — Denotes Construction Limits in Fills

(30)

PI=413+27.65
DELTA=016°02'18.25"RT
D=012°43'57"
T=63.40
L=125.97
R=450.00
PC=412+64.25
PT=413+90.22
E=NC
R= >25MPH

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

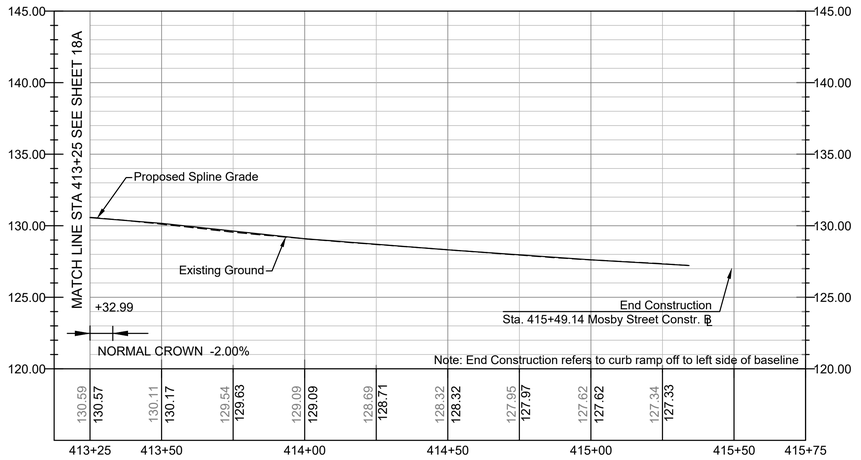
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 19	0-28633



Mosby Street

VERTICAL SCALE 1"=5' 0' 5' 10' 15'

HORIZONTAL SCALE 1"=25' 0' 25' 50' 75'

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

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5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

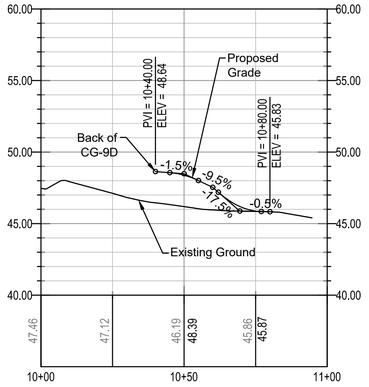
RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
PROFILE SHEET

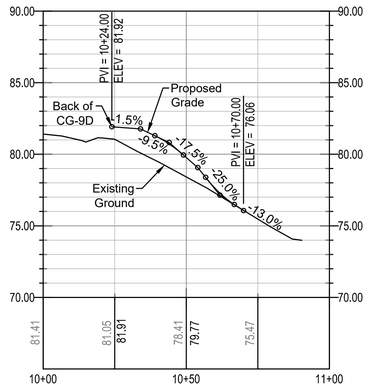
AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 19A	DRAWING NO. 0-28633

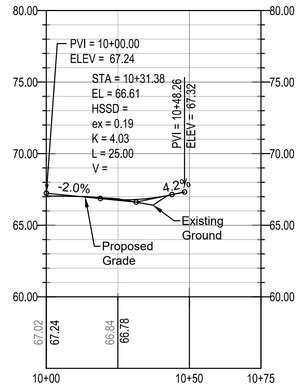
ENTRANCE PROFILES



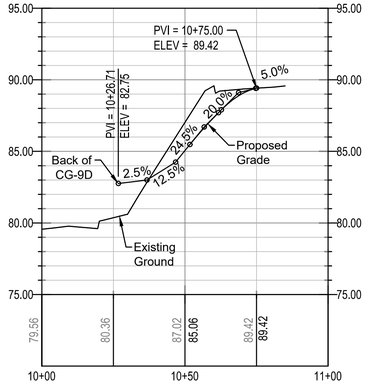
Ent 112+40 LT



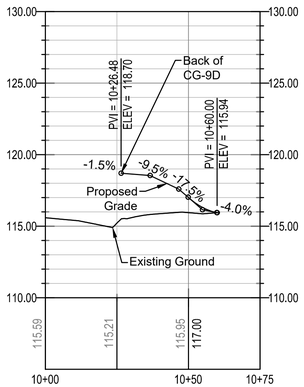
Ent 120+15 Lt



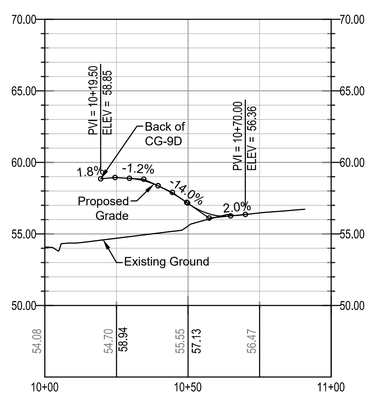
Venable Access Entrance



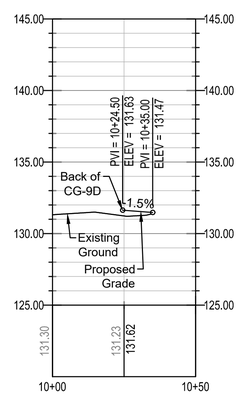
Ent 215+70 RT



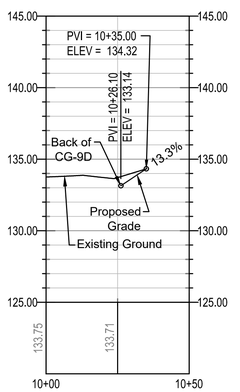
ENT 307+75 RT



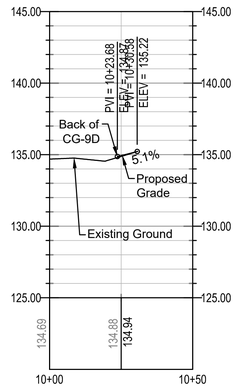
Ent 902+30 Rt



Ent 401+20 RT



Ent 404+50 RT



Ent 405+80 RT

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
ENTRANCE PROFILE SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 20	DRAWING NO. 0-28633

NOTES:
1. CONTRACTOR TO COORDINATE WITH OWNER OF POWER POLES, EFFECTED BY ROADWAY DESIGN, TO RELOCATE THEM
2. NEW SERVICE CONNECTIONS SHALL BE ACHIEVED BY CORP. STOPS AT THE MAIN. SERVICE LINES SHALL BE DETERMINED BY CITY RECORDS TO MIMIC THE EXISTING SERVICE.

MATCH LINE STA 21+50 SEE SHEET 13

(40) OHW, LC
Parcel ID: E0000318002
Inst.# 2002-39652
2.062 Ac. (GIS)

FOR UTILITY PROFILE SEE SHEET 13(A)

N. 18TH STREET

STA. 20+55,
8x6" TEE,
N = 3721609.3208
E = 11795066.0663
6" GATE VALVE,
FIRE HYD. ASSEMBLY

STA. 11+60,
8" - 45.00° Bend,
N = 3721583.6286
E = 11795014.5395

OLIVER HILL WAY

(17) DPC, LC
Parcel ID: E0000318001
Inst.# 9900-8444
2.089 Ac. (GIS)

STA. 11+76 / 20+00,
8" TEE,
3 - 8" GATE VALVES
N = 3721571.7290
E = 11795025.5216

STA. 12+91
4 - 8" 45° VERT. BEND
PER CITY DETAIL M-13

STA. 12+00,
8" - 22.50° Bend,
N = 3721553.9857
E = 11795041.8967

STA. 12+68,
8" - 45.00° Bend,
N = 3721489.2465
E = 11795062.5288

LIGHTWEIGHT FILL OVER EXISTING 20" x 30" SEWER

I-95 OFF RAMP

EXISTING WATER SERVICE LINE TO BE CAPPED AT THE EXISTING 16" W/L

EX. OLIVER HILL WAY

EX. I-95 OFF RAMP

STA. 10+00,
16x8" TAPPING SLEEVE AND VALVE,
N = 3721586.5330
E = 11794854.5463

EXISTING 6" DIC W/L TO BE CAPPED WITH 6" M.J. PLUG. EXISTING FIRE HYDRANT TO BE RETURNED TO DPU. ABANDON 6" DIC

(16) LOVING PRODUCE, LLC
Parcel ID: E0000245007
Inst.# 2001-32052
1.07 Ac. (GIS)

INSTALL 8" SOLID SLEEVE, 8x6" REDUCER, FIRE HYDRANT ASSEMBLY, CAP AND PLUG (M.J.) EXISTING 8" WATER LINE

EXISTING 8" DIC W/L TO BE ABANDONED IN PLACE

EXISTING WATER SERVICE LINE TO BE CAPPED AT THE EXISTING 8" W/L

(18) GENESIS HOMES MANAGER, LLC
Parcel ID: E0000364002
Inst.# 2007-12771
3.627 Ac.

EX. N. 18TH STREET

EXISTING 6" DIC W/L TO BE CAPPED WITH 6" M.J. PLUG. EXISTING FIRE HYDRANT TO BE RETURNED TO DPU. ABANDON 6" DIC

STA. 15+68,
8" - 45.00° Bend,
N = 3721332.2315
E = 11795315.3421

STA. 15+18,
8" - 22.50° Bend,
N = 3721369.0996
E = 11795281.7379

STA. 14+50 / 30+00,
8" TEE,
3 - 8" GATE VALVES
N = 3721401.8137
E = 11795222.0508

VENABLE STREET

MATCH LINE STA 16+50 SEE SHEET 17

EXISTING 8" DIC W/L TO BE ABANDONED IN PLACE

STA. 15+94,
8x6" TEE,
N = 3721332.5629
E = 11795341.5112
6" GATE VALVE,
FIRE HYD. ASSEMBLY

(25) JEFFERSON TOWNHOUSES, LLC
Parcel ID: E0000285022
Inst.# 2007-12777
1.178 Ac.

PROP. METER TO BE LOCATED WITHIN THE NEW R/W. 1" COPPER SERVICE LINE FROM THE PROP. 8" DIC TO TIE-IN POINT ON PROPERTY. PROVIDE TEMP. CONSTRUCTIN EASEMENT

STA. 30+18,
8" - 22.50° Bend,
N = 3721386.1779
E = 11795213.4809

STA. 30+23,
8" - 11.25° Bend,
N = 3721381.2074
E = 11795212.9386

FOR UTILITY PROFILE, SEE SHEET 12(A)

STA. 31+31,
8" - 11.25° Bend,
N = 3721273.0633
E = 11795216.5990

MATCH LINE STA 31+50 SEE SHEET 12

(26)

EX. VENABLE STREET

ABANDON EXISTING 8" W/L IN PLACE

ROWVA PROPERTIES, LLC
Parcel ID: E0000248001
Inst.# 2014-16402
0.852 Ac.

LEGEND

EXISTING UTILITY POLE TO BE RELOCATED PRIOR TO CONSTRUCTION (BY OTHERS)

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

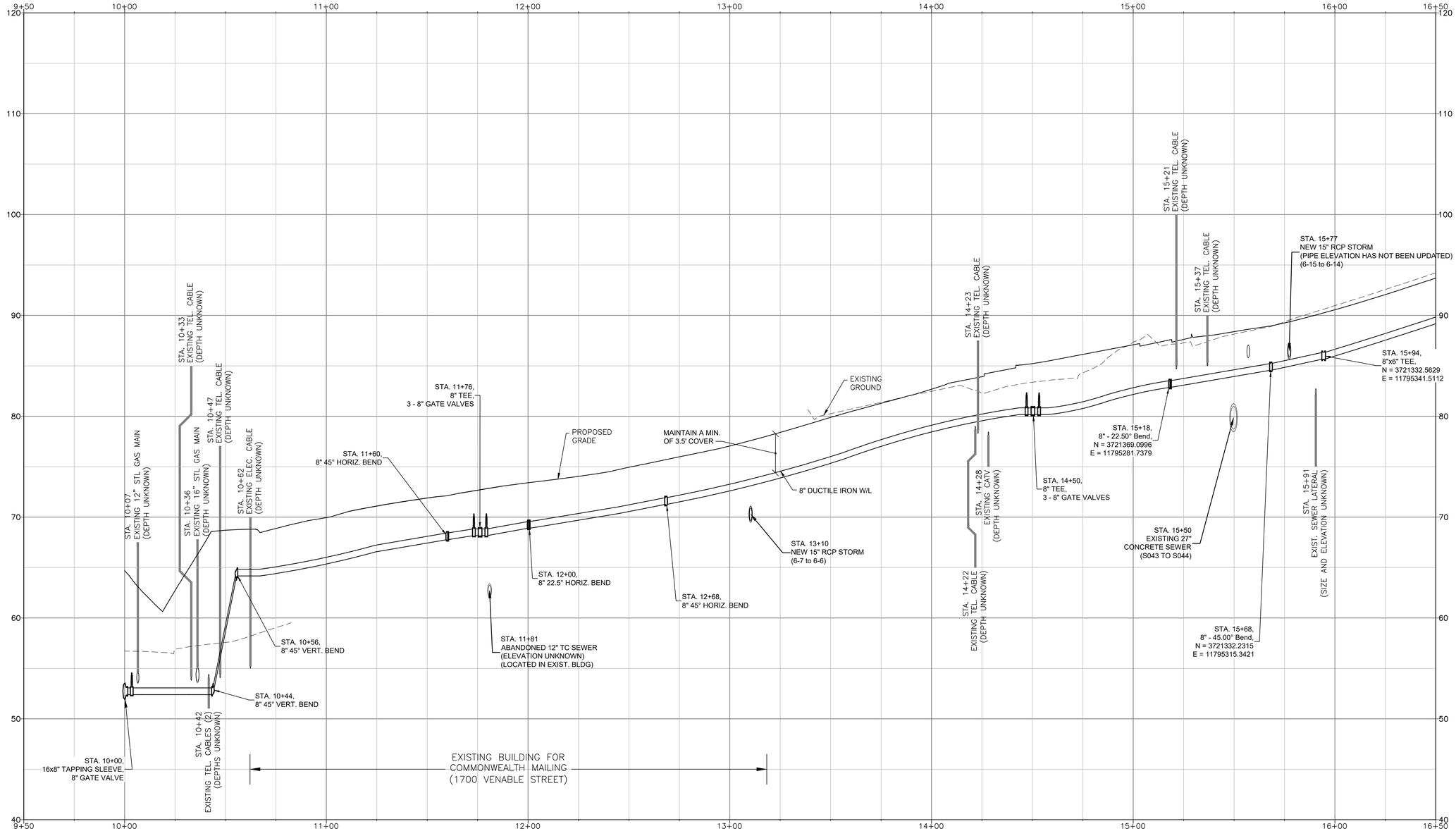
RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY PLAN – VENABLE STREET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(6)	DRAWING NO. 0-28633

NOTE:
1. SEWER LATERAL STATIONING WAS ESTIMATED USING CITY GIS.
2. SEWER LATERAL ELEVATION WAS ESTIMATED BY ASSUMING A SLOPE OF 2.08%.
3. ELEVATION OF NEW RCP STORM PIPE FROM 6-15 TO 6-14 WILL BE UPDATED AFTER RETAINING WALL DESIGN IS FINALIZED.



5 0 5 10
SCALE IN FEET VERT

25 0 25 50
SCALE IN FEET HORIZ.

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (S) or (D)
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

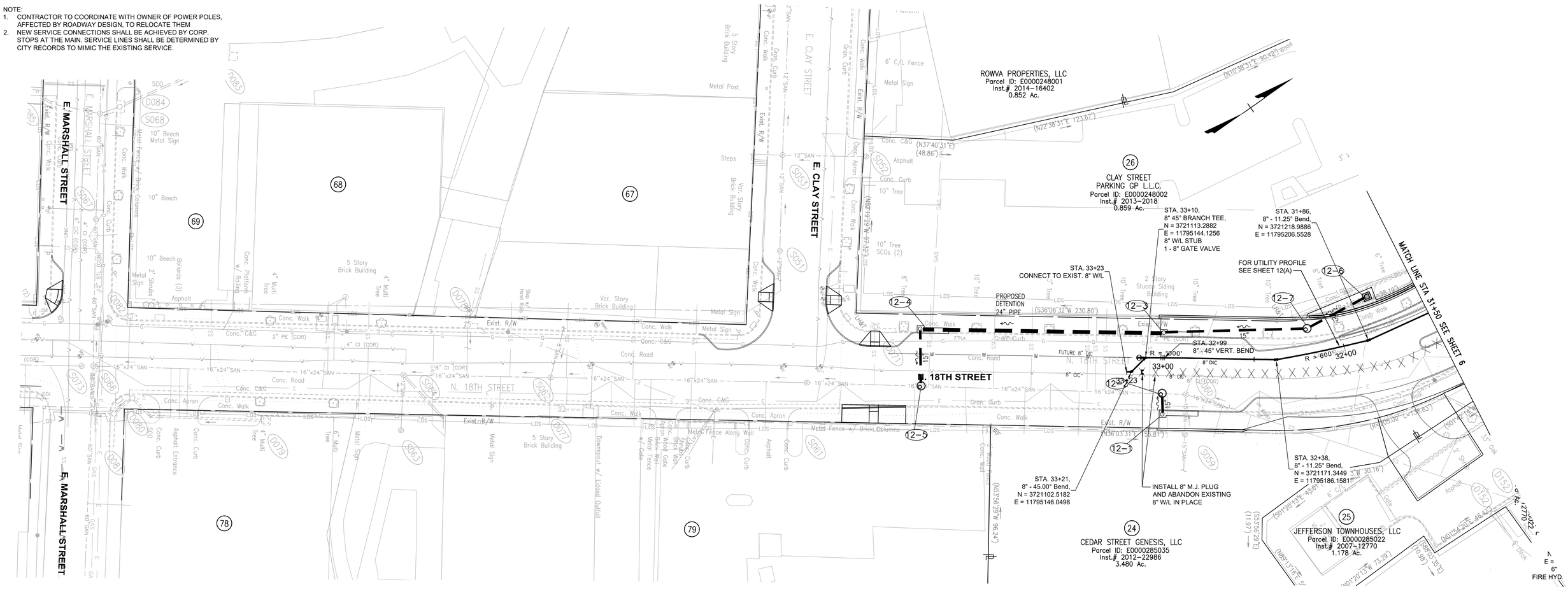
RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY PROFILE – VENABLE STREET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(6A)	DRAWING NO. 0-28633

NOTE:
1. CONTRACTOR TO COORDINATE WITH OWNER OF POWER POLES, AFFECTED BY ROADWAY DESIGN, TO RELOCATE THEM
2. NEW SERVICE CONNECTIONS SHALL BE ACHIEVED BY CORP. STOPS AT THE MAIN. SERVICE LINES SHALL BE DETERMINED BY CITY RECORDS TO MIMIC THE EXISTING SERVICE.



LEGEND

● EXISTING UTILITY POLE TO BE RELOCATED PRIOR TO CONSTRUCTION (BY OTHERS)

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number__________
4. Adopted__________
5. Accepted______________________________

REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH ⌖ ●WV
Water Meter ●WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ● ●GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

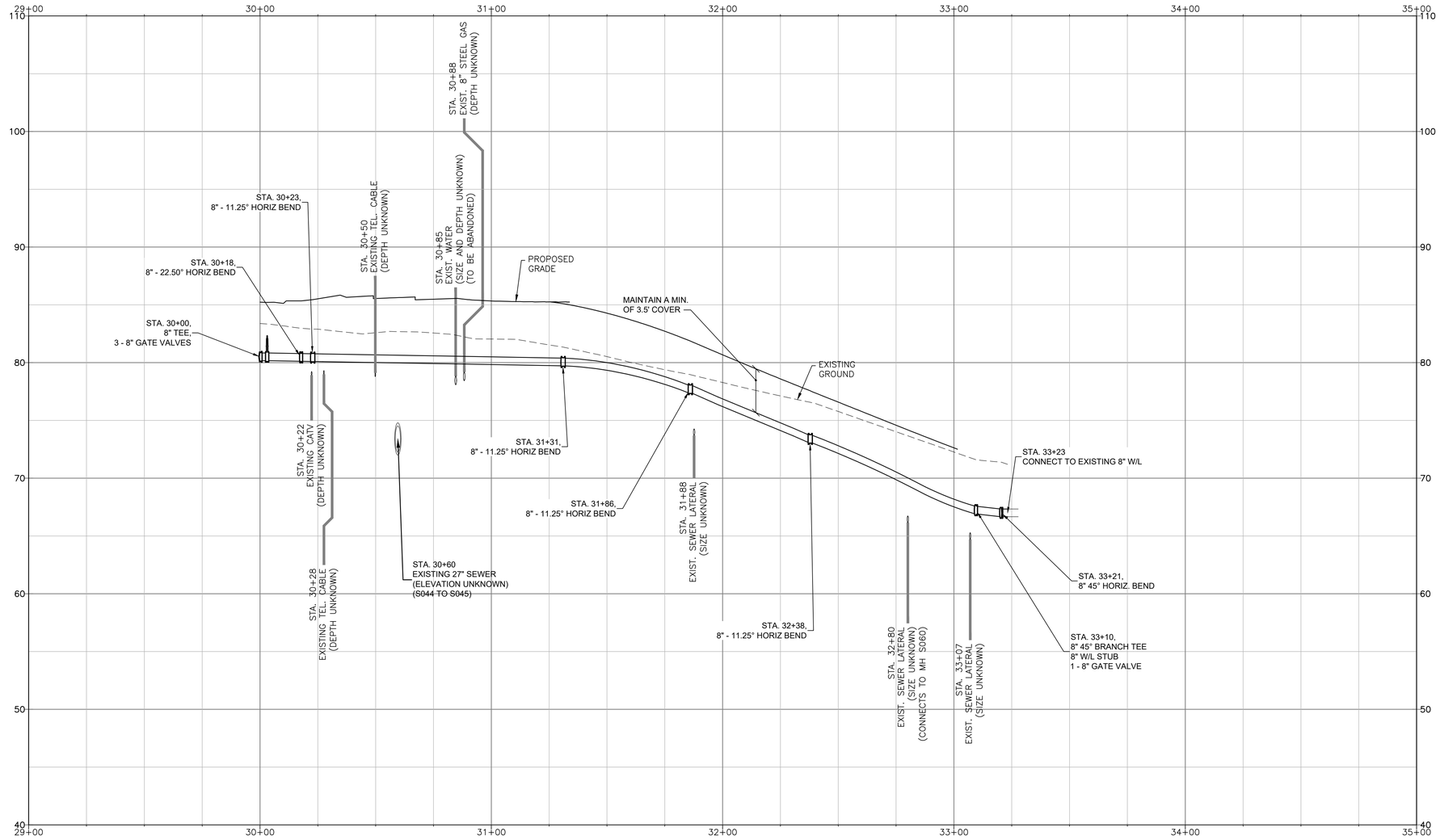
RK&K
Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY PLAN – N. 18th STREET

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
				SEPTEMBER 2022	SHEET 21(12)	0–28633

NOTE:
1. SEWER LATERAL STATIONING WAS ESTIMATED USING CITY GIS.
2. SEWER LATERAL ELEVATIONS WERE ESTIMATED BY ASSUMING A SLOPE OF 2.08%.
3. ELEVATION OF SEWER LATERAL THAT CONNECTS TO MH S060 WAS ESTIMATED ASSUMING THAT INVERT IN AT MH IS 65.79. (INVERT OUT AT MH IS 65.29.)



5 0 5 10
SCALE IN FEET VERT

25 0 25 50
SCALE IN FEET HORIZ.

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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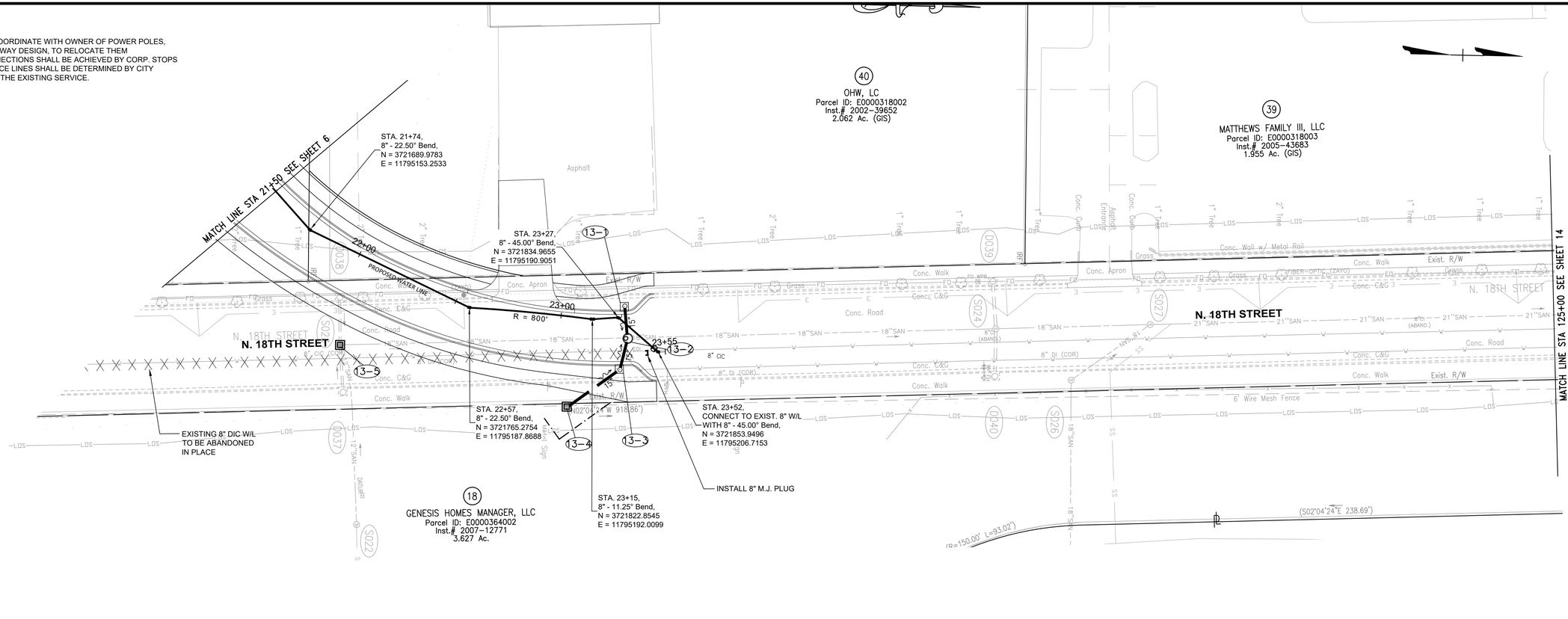
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY PROFILE – 18TH STREET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(12A)	DRAWING NO. 0-28633

NOTE:
1. CONTRACTOR TO COORDINATE WITH OWNER OF POWER POLES, EFFECTED BY ROADWAY DESIGN, TO RELOCATE THEM
2. NEW SERVICE CONNECTIONS SHALL BE ACHIEVED BY CORP. STOPS AT THE MAIN. SERVICE LINES SHALL BE DETERMINED BY CITY RECORDS TO MIMIC THE EXISTING SERVICE.



LEGEND

EXISTING UTILITY POLE TO BE RELOCATED PRIOR TO CONSTRUCTION (BY OTHERS)

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

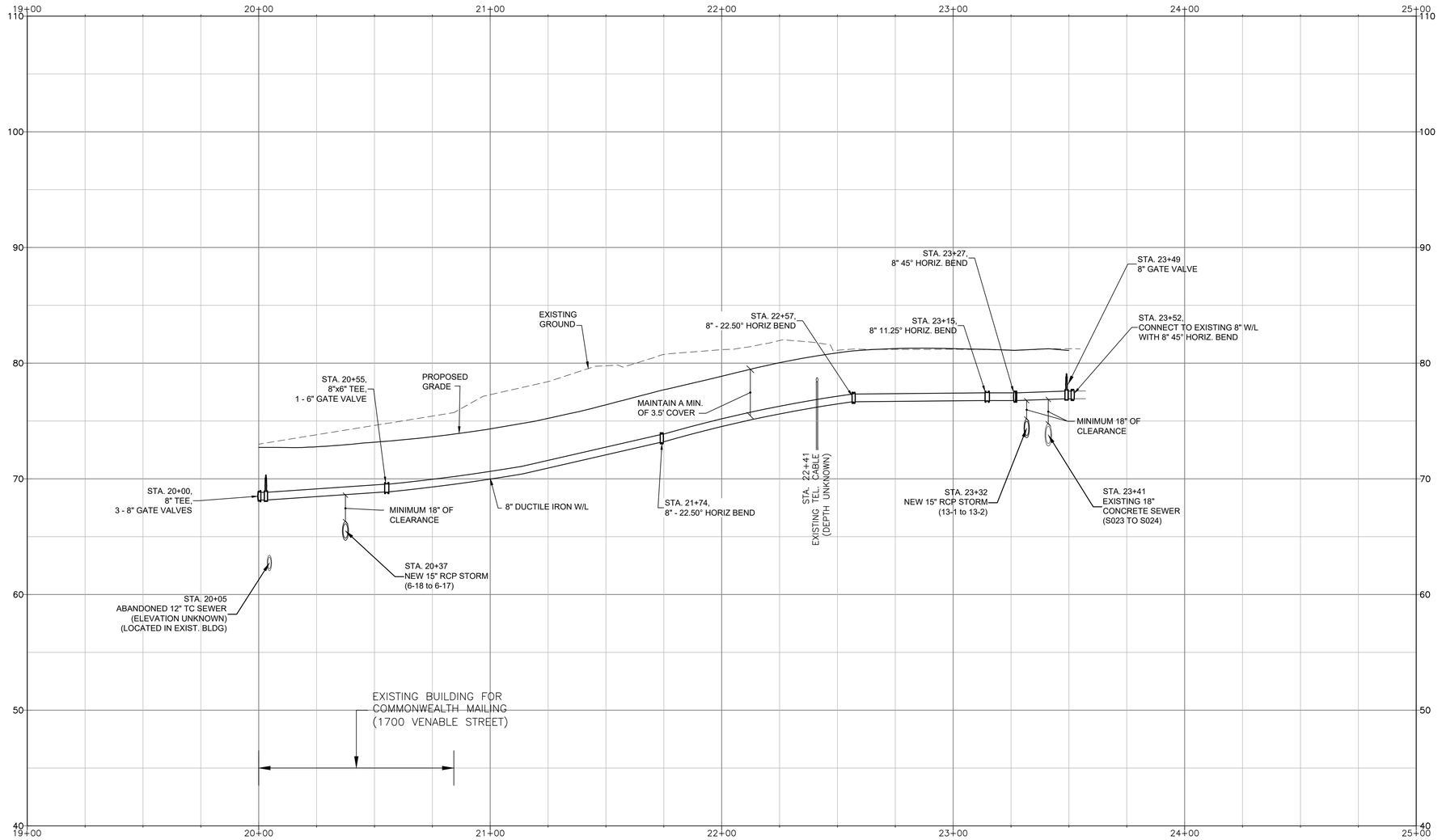
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY PLAN – N. 18th STREET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(13)	DRAWING NO. 0-28633



5 0 5 10
SCALE IN FEET VERT

25 0 25 50
SCALE IN FEET HORIZ.

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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Responsive People - Creative Solutions

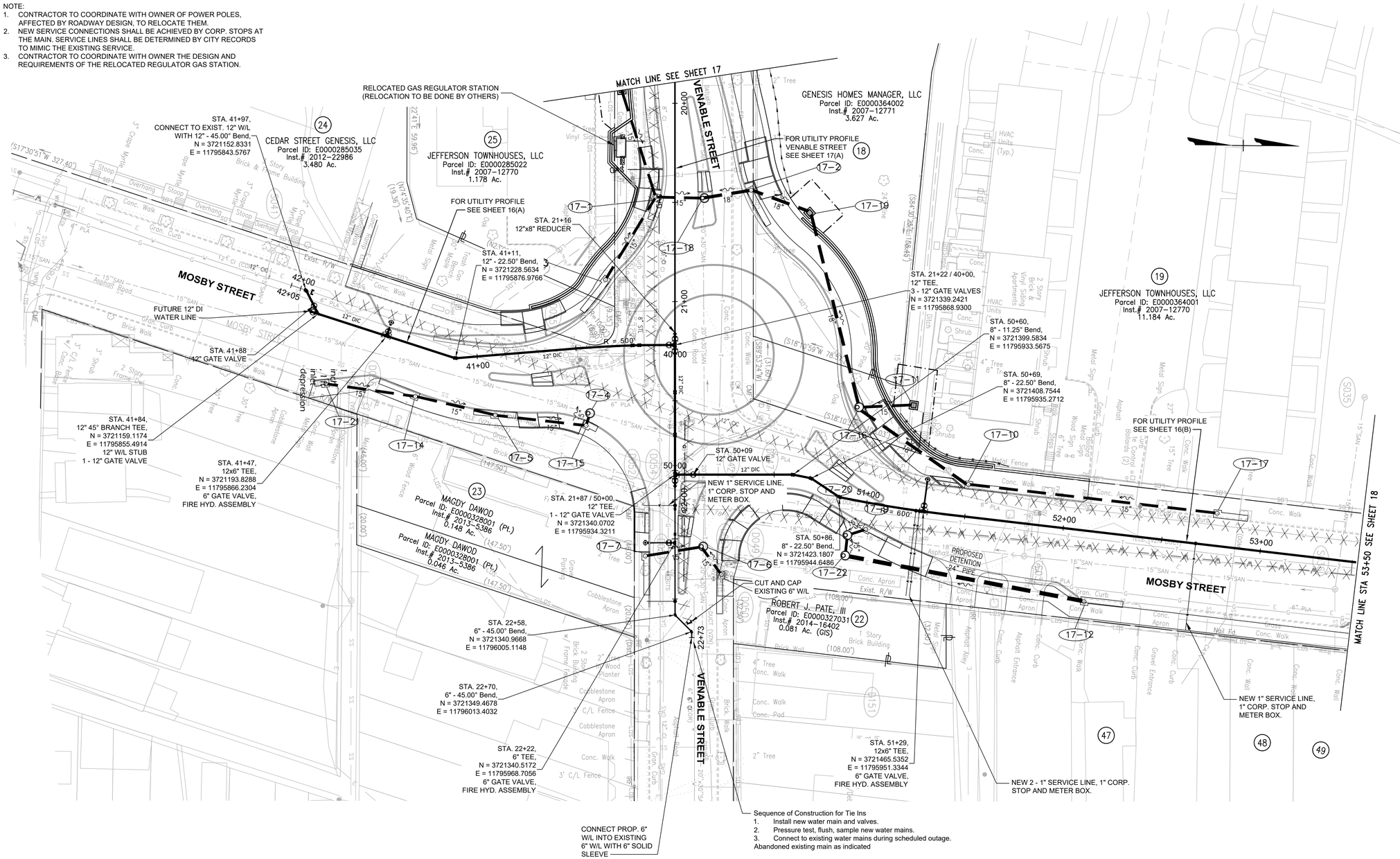
SHOCKOE VALLEY STREET IMPROVEMENTS

UTILITY PROFILE – OLIVER HILL NORTH

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(13A)	DRAWING NO. 0-28633

NOTE:
1. CONTRACTOR TO COORDINATE WITH OWNER OF POWER POLES, AFFECTED BY ROADWAY DESIGN, TO RELOCATE THEM.
2. NEW SERVICE CONNECTIONS SHALL BE ACHIEVED BY CORP. STOPS AT THE MAIN. SERVICE LINES SHALL BE DETERMINED BY CITY RECORDS TO MIMIC THE EXISTING SERVICE.
3. CONTRACTOR TO COORDINATE WITH OWNER THE DESIGN AND REQUIREMENTS OF THE RELOCATED REGULATOR GAS STATION.



LEGEND

EXISTING UTILITY POLE TO BE RELOCATED PRIOR TO CONSTRUCTION (BY OTHERS)

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

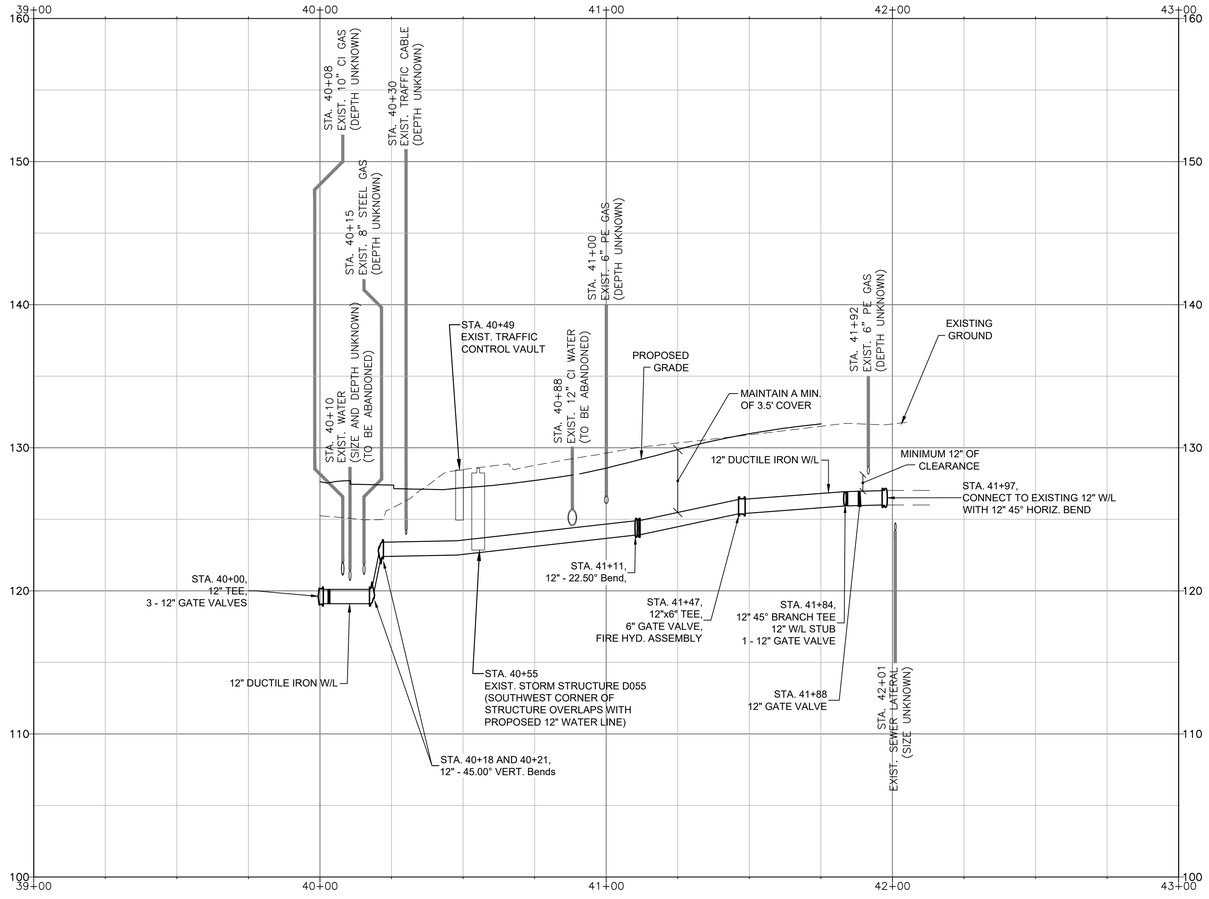
RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY PLAN – MOSBY STREET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 21(16)	0-28633

NOTE:
1. SEWER LATERAL STATIONING WAS ESTIMATED USING CITY GIS.
2. SEWER LATERAL ELEVATION WAS ESTIMATED BY ASSUMING A SLOPE OF 2.08%.



5 0 5 10
SCALE IN FEET VERT

25 0 25 50
SCALE IN FEET HORIZ.

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

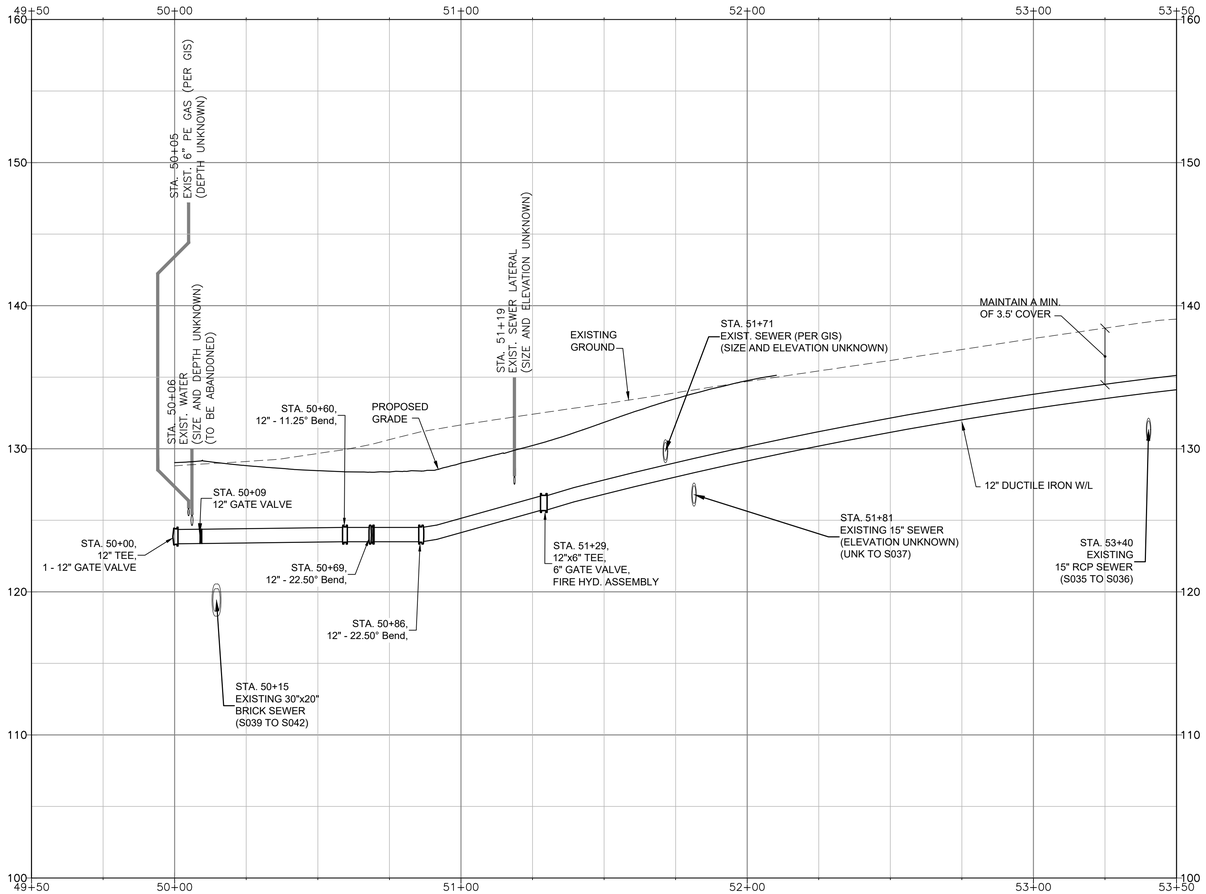
RK&K
Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS

UTILITY PROFILE – MOSBY ROAD SOUTH

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(16A)	DRAWING NO. 0-28633



NOTE:
1. SEWER LATERAL STATIONING WAS ESTIMATED USING CITY GIS.
2. SEWER LATERAL ELEVATION WAS ESTIMATED BY ASSUMING A SLOPE OF 2.08%.

5 0 5 10
SCALE IN FEET VERT

25 0 25 50
SCALE IN FEET HORIZ.

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

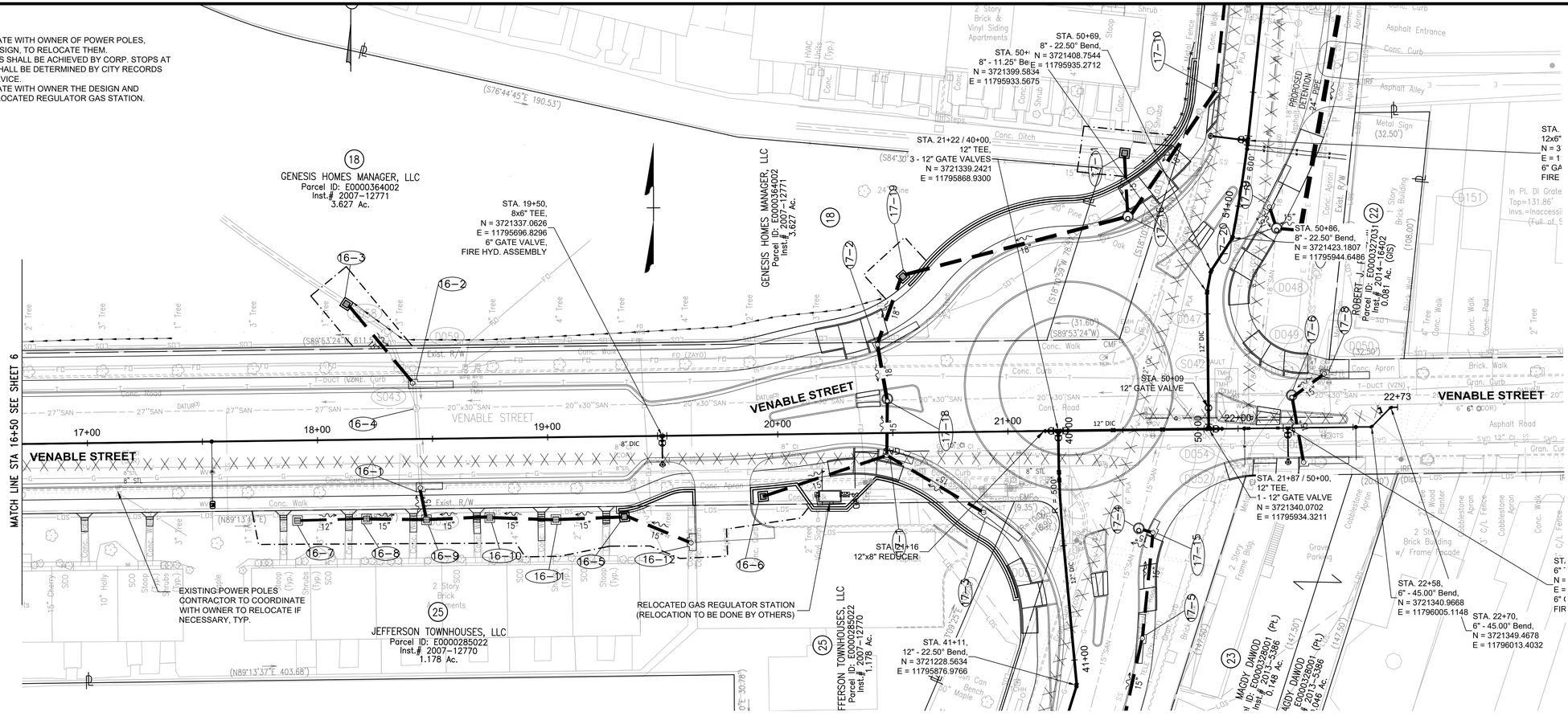
RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY PROFILE – MOSBY ROAD NORTH

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(16B)	DRAWING NO. 0-28633

NOTE:
1. CONTRACTOR TO COORDINATE WITH OWNER OF POWER POLES, AFFECTED BY ROADWAY DESIGN, TO RELOCATE THEM.
2. NEW SERVICE CONNECTIONS SHALL BE ACHIEVED BY CORP. STOPS AT THE MAIN. SERVICE LINES SHALL BE DETERMINED BY CITY RECORDS TO MIMIC THE EXISTING SERVICE.
3. CONTRACTOR TO COORDINATE WITH OWNER THE DESIGN AND REQUIREMENTS OF THE RELOCATED REGULATOR GAS STATION.



LEGEND

● EXISTING UTILITY POLE TO BE RELOCATED PRIOR TO CONSTRUCTION (BY OTHERS)

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number__________
4. Adopted__________
5. Accepted______________________________

REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

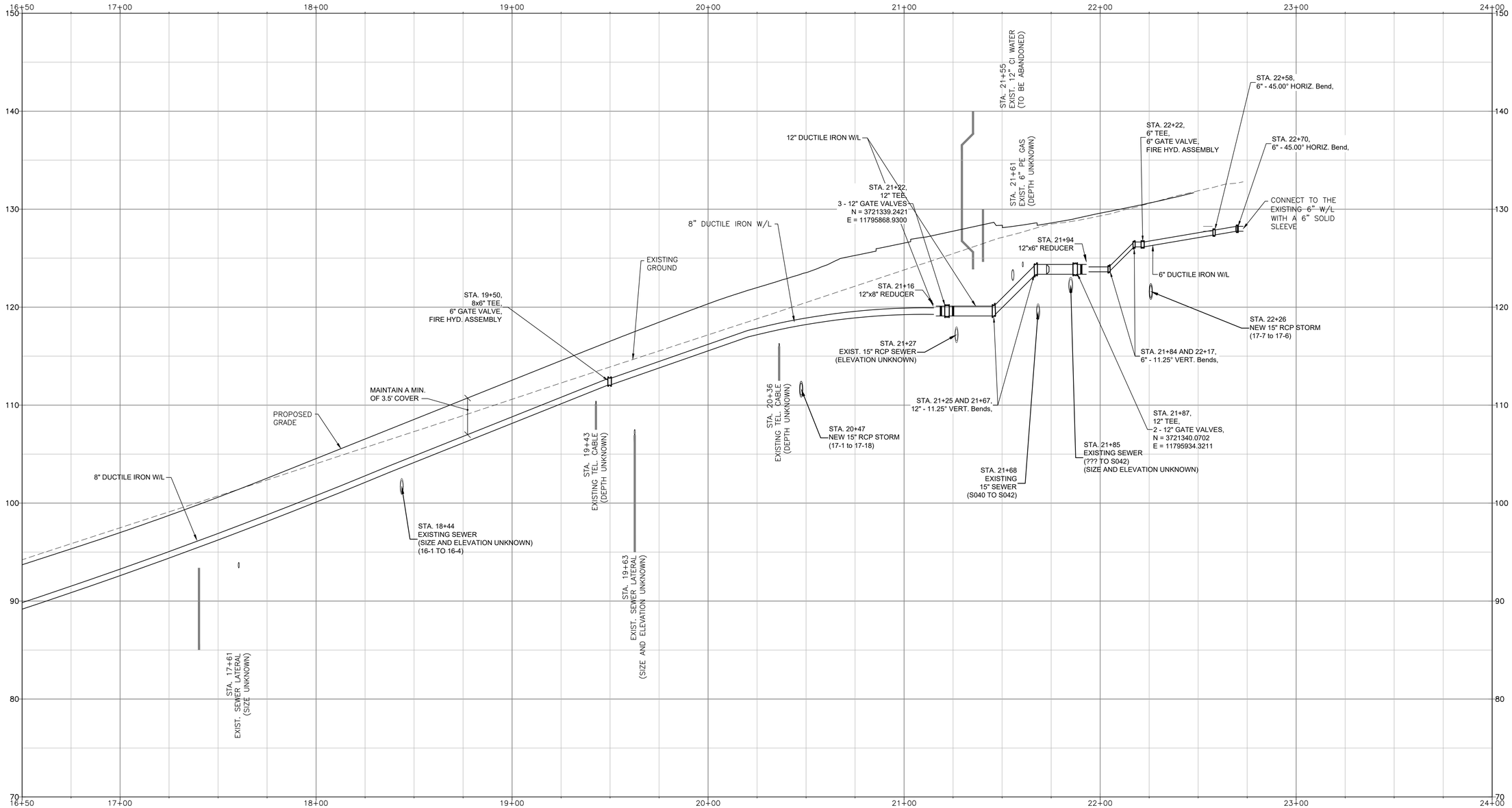
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY PLAN – VENABLE STREET

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
				SEPTEMBER 2022	SHEET 21(17)	0-28633



NOTE:
1. SEWER LATERAL STATIONING WAS ESTIMATED USING CITY GIS.
2. SEWER LATERAL ELEVATIONS WERE ESTIMATED BY ASSUMING A SLOPE OF 2.08%.

5 0 5 10
SCALE IN FEET VERT

25 0 25 50
SCALE IN FEET HORIZ.

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole (SDMH, (SMH))
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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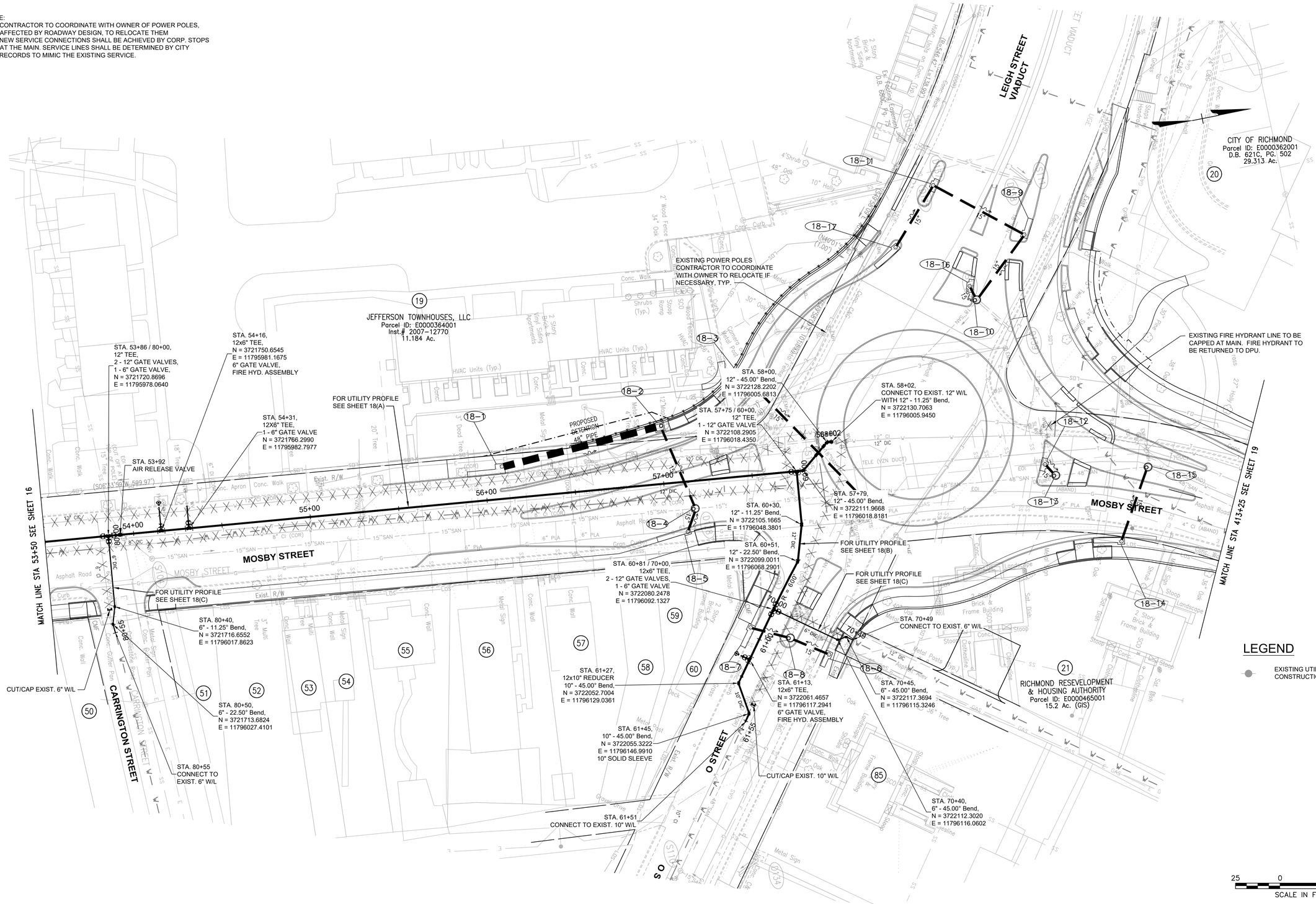
SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY PROFILE – VENABLE STREET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(17A)	DRAWING NO. 0-28633

NOTE:
1. CONTRACTOR TO COORDINATE WITH OWNER OF POWER POLES, AFFECTED BY ROADWAY DESIGN, TO RELOCATE THEM
2. NEW SERVICE CONNECTIONS SHALL BE ACHIEVED BY CORP. STOPS AT THE MAIN. SERVICE LINES SHALL BE DETERMINED BY CITY RECORDS TO MIMIC THE EXISTING SERVICE.



LEGEND

EXISTING UTILITY POLE TO BE RELOCATED PRIOR TO CONSTRUCTION (BY OTHERS)

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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3. Ordinance Number_____
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REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH ◆ WV
Water Meter ◆WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ● ◆GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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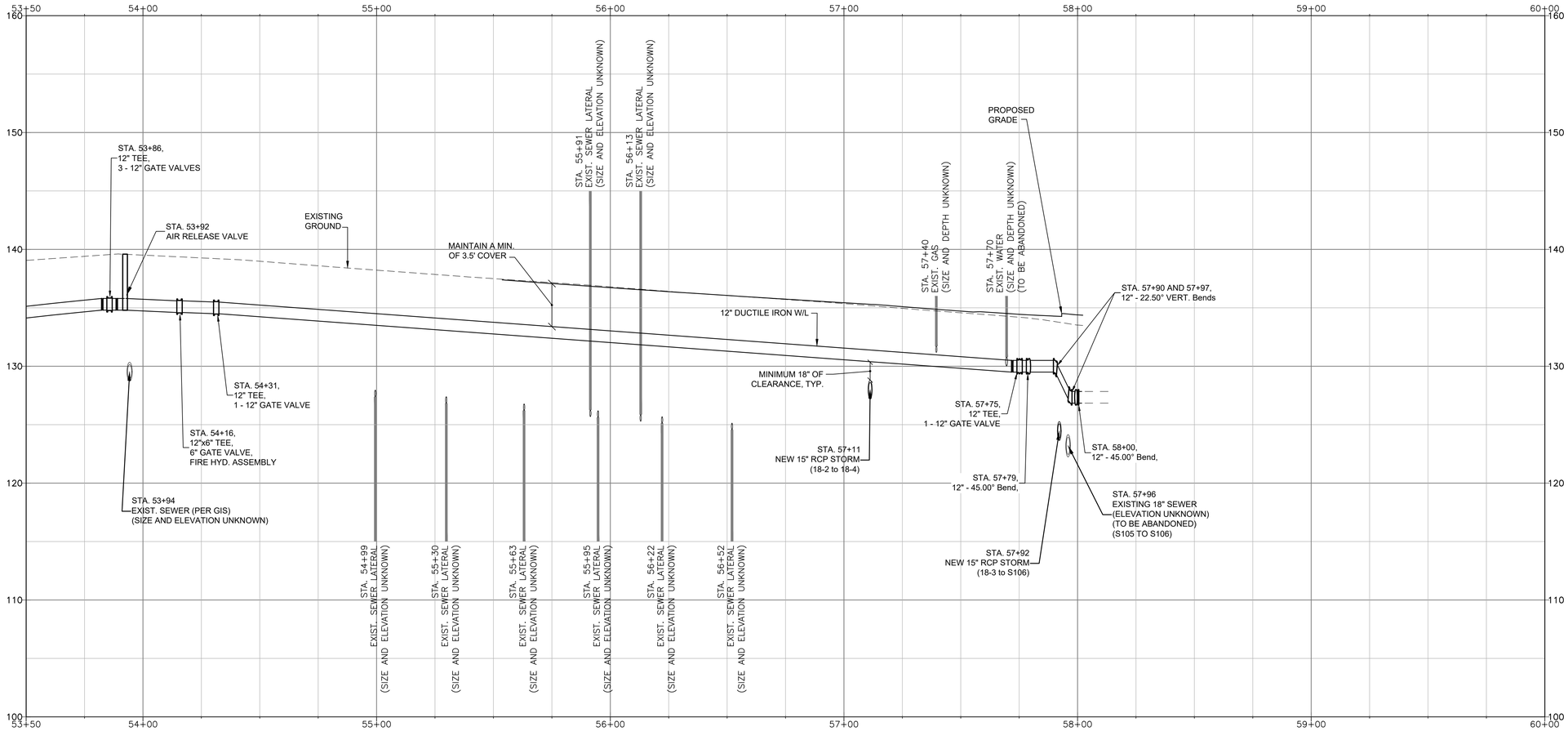
SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(18)	DRAWING NO. 0-28633



NOTE:
1. SEWER LATERAL STATIONING WAS ESTIMATED USING CITY GIS.
2. SEWER LATERAL ELEVATIONS WERE ESTIMATED BY ASSUMING A LATERAL SLOPE OF 2.08% AND BY ASSUMING THAT CENTERLINE ELEVATIONS OF LATERAL AND SEWER MAIN MATCH AT THE CONNECTION POINT.

5 0 5 10
SCALE IN FEET VERT

25 0 25 50
SCALE IN FEET HORIZ.

70% SUBMITTAL
SEPTEMBER 2022

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Existing Legend
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Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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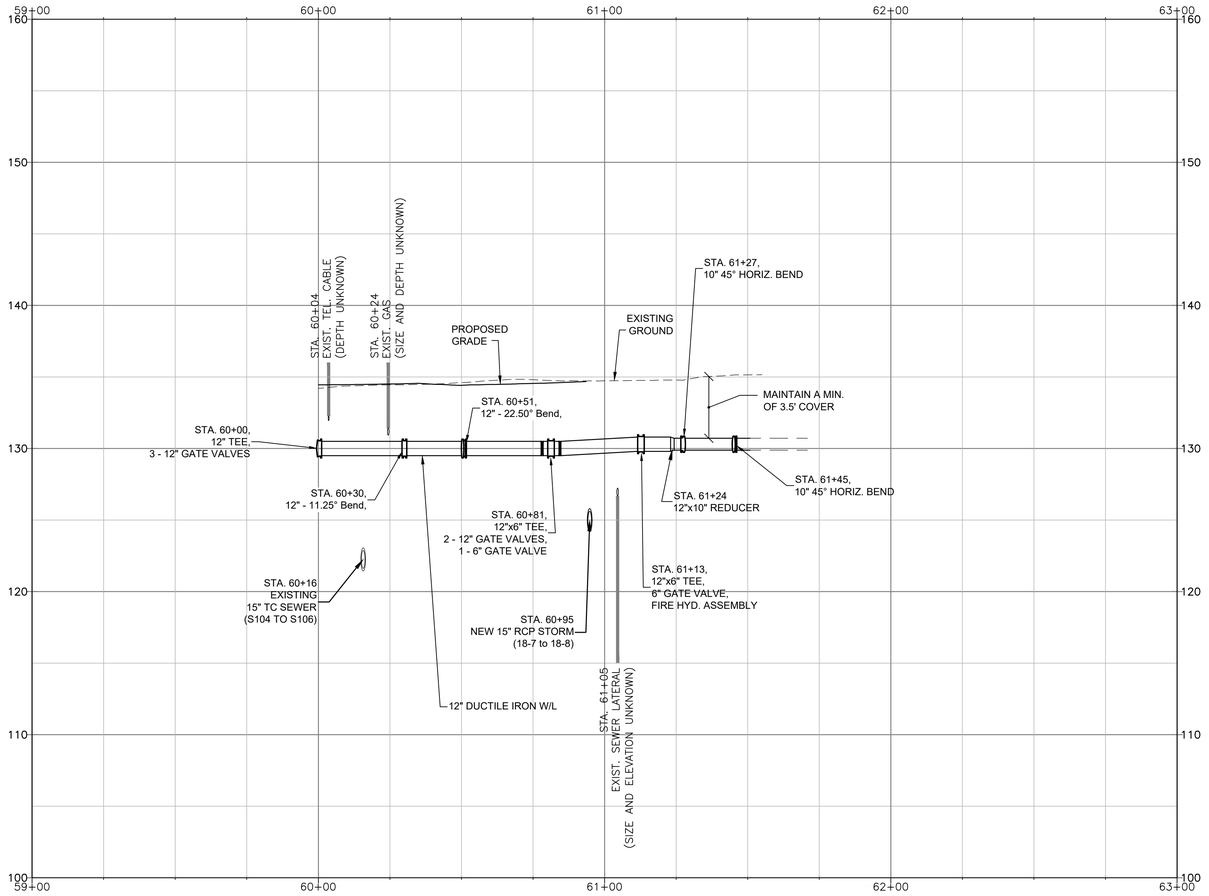
SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY PROFILE – MOSBY STREET NORTH

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(18A)	DRAWING NO. 0-28633



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SCALE IN FEET HORIZ.

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SEPTEMBER 2022

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REFERENCES

REVISIONS

Existing Legend
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Sanitary Sewer (Gravity)
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Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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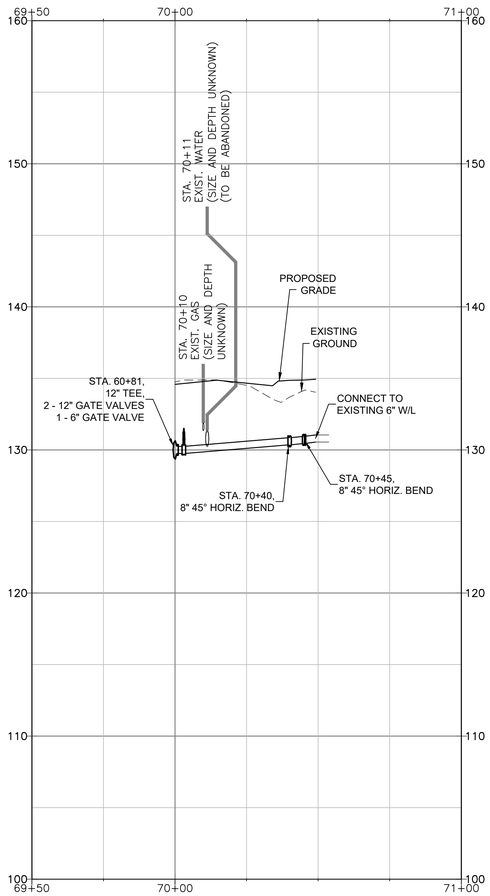
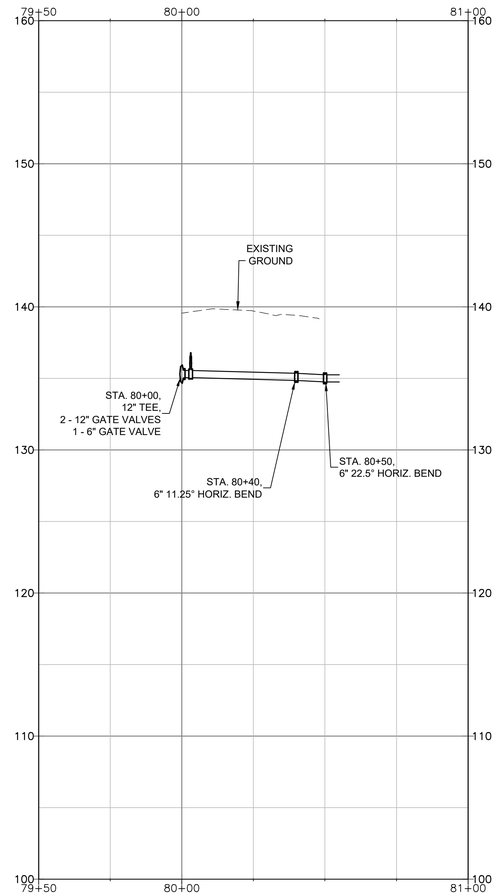
SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY PROFILE – O STREET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(18B)	DRAWING NO. 0-28633





5 0 5 10
SCALE IN FEET VERT

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SCALE IN FEET HORIZ.

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES	REVISIONS

Existing Legend

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Sanitary Sewer (Gravity)
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Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
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Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS

UTILITY PROFILE – O STREET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(18C)	DRAWING NO. 0-28633

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES

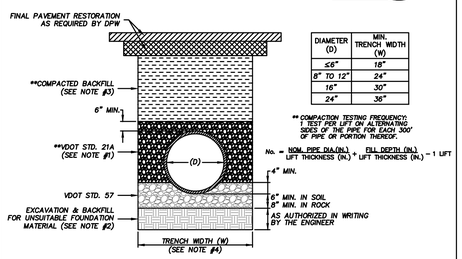
1. ALL WATER CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CITY OF RICHMOND WATER DISTRIBUTION SYSTEM DESIGN GUIDELINES AND STANDARD SPECIFICATIONS AND DETAILS.
2. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS FOR THE WORK. WATER UTILITY PERMITS MAY BE OBTAINED THROUGH THE DEPARTMENT OF PUBLIC UTILITIES DEVELOPMENT SERVICES OFFICE LOCATED IN ROOM 115 IN CITY HALL.
3. ONCE ALL PERMITS AND FEES HAVE BEEN SUBMITTED AND APPROVED THROUGH THE DPU DEVELOPMENT SERVICES DEPARTMENT, THE CONTRACTOR SHALL CONTACT THE DPU CONSTRUCTION INSPECTOR AT (804) 646-8337 TO SCHEDULE A PRE-CONSTRUCTION MEETING AT LEAST 72 HOURS PRIOR TO BEGINNING ANY WATER RELATED CONSTRUCTION ACTIVITY.
4. FINAL ACCEPTANCE OF THE WATER UTILITY IMPROVEMENTS BY THE CITY OF RICHMOND DEPARTMENT OF PUBLIC UTILITIES SHALL NOT BE MADE UNTIL ALL WORK SHOWN ON THE APPROVED UTILITY PLANS IS COMPLETE, INCLUDING ALL PIPELINE WORK, PAVING, GRADING, AND ANY NECESSARY ADJUSTMENTS.
5. THE CONTRACTOR MUST PROVIDE AS-BUILTS WITH REQUISITE INFORMATION DEPICTING THE HORIZONTAL AND VERTICAL LOCATION OF ALL PROPOSED MAINS, SERVICES, AND APPURTENANCES WITH TIES TO RIGHT-OF-WAY, CURB\PAVEMENT LINES, OR ALTERNATE OBJECTS AS NEEDED TO LOCATE THE MAINS IN THE FIELD. THE IMPROVEMENTS WILL NOT BE ACCEPTED UNTIL THE AS-BUILT INFORMATION HAS BEEN REVIEWED AND ACCEPTED BY THE CITY WATER UTILITY INSPECTOR.
6. THE CONTRACTOR SHALL NOT OPERATE ANY EXISTING VALVES AND MUST REQUEST VALVE OPERATION BY CITY FORCES NO LESS THAN 48 HOURS IN ADVANCE OF ANY PLANNED WORK.
7. UNLESS OTHERWISE NOTED ON THE PLANS, THE MINIMUM COVER FOR WATER MAINS IS 42 INCHES.
8. WATER FOR USE BY THE CONTRACTOR FROM A PUBLIC WATER MAIN OR HYDRANT WITHIN THE CITY OF RICHMOND SHALL REQUIRE A CITY ISSUED PORTABLE WATER METER WITH BACKFLOW DEVICE. THE CONTRACTOR SHOULD CONTACT THE UTILITY CROSS CONNECTION SPECIALIST LOCATED AT 400 JEFFERSON DAVIS HIGHWAY (RM. 143), TUESDAY THROUGH FRIDAY (9 A.M. TO 11 A.M.) TO MAKE AN APPLICATION. THE CONTRACTOR MAY CALL (804) 646-8502 FOR ANY QUESTIONS RELATED TO THIS PROGRAM.
9. ALL WATER PIPE USED WITHIN THE CITY'S DISTRIBUTION SYSTEM SHALL BE DUCTILE-IRON, MEETING THE REQUIREMENTS OF AWWA C151 – LATEST REVISION WITH MECHANICAL OR PUSH-ON JOINTS. THE PIPE SHALL BE ASPHALTIC COAT OUTSIDE AND CEMENT-LINED AND SEAL-COATED INSIDE IN ACCORDANCE WITH AWWA C104. PIPES SHALL BE FURNISHED IN NOMINAL LENGTHS OF 18 OR 20 FEET AND SHALL INCLUDE ALL JOINTING MATERIALS. ALL PIPE MUST MEET THE MINIMUM THICKNESS CLASS AS NOTED BELOW:

DIAMETER (IN)	MIN. THICKNESS CLASS
3	54
4	53
6	54
8	54
12 & LARGER	51

REVISION	GENERAL WATER CONSTRUCTION NOTES	DPU DWG. NO.
03/18/2020		W-4

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-4 – GENERAL CONSTRUCTION NOTES.DWG

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



DIAMETER (D)	MIN. TRENCH WIDTH (W)
≤6"	18"
8" TO 12"	24"
16"	30"
24"	36"

** COMPACTION TESTING FREQUENCY:
1 TEST PER LIFT ON ALTERNATING SIDES OF THE PIPE FOR EACH 300' OF PIPE OR PORTION THEREOF.

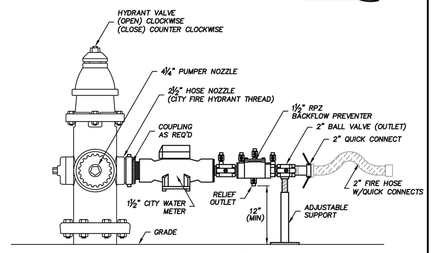
No. = NOM. PIPE DIA.(IN.) / LIFT THICKNESS (IN.) + FILL DEPTH (IN.) / LIFT THICKNESS (IN.) = 1 LIFT

NOTES:
1. COMPACTED GRANULAR MATERIAL IN MAXIMUM 8" LIFTS (APPROX. 95% STD. PROCTOR, AASHTO T-99).
2. WHEN STANDING WATER IS IN PIPE FOUNDATION AREA, VDOT STD. #57 TO BE USED (COMPACTION TESTING NOT REQUIRED WHEN #57 STONE IS USED)
3. BACKFILL SHALL BE IN ACCORDANCE WITH THE CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS STANDARD REQUIREMENTS FOR TRENCH RESTORATION, GENERALLY DESCRIBED AS FOLLOWS:
   a) PAVED AREAS: VDOT STD. 21A IN MAXIMUM 8" LIFTS (COMPACTED TO 95% STD. PROCTOR) TO PAVEMENT SECTION.
   b) OPEN AREAS: COMPACTED GRANULAR OR SELECT MATERIALS (COMPACTED TO 90% STD. PROCTOR). SELECT MATERIAL SHALL BE NATIVE SOIL EXCAVATED FROM THE TRENCH, FREE OF ROCKS OR DELETERIOUS MATERIAL. GRANULAR MATERIAL AS DEFINED BY AASHTO SOIL CLASSIFICATION SYSTEM.
4. THE MINIMUM TRENCH WIDTH IN SOIL FOR WATER PIPE SHALL BE THE NOMINAL PIPE DIAMETER PLUS 12". PROVIDED THAT IF THE SUM IS NOT A WHOLE MULTIPLE OF SIX (6") INCHES, THE TRENCH WIDTH SHALL BE INCREASED TO THE NEXT GREATER WHOLE MULTIPLE OF SIX INCHES ABOVE THE SUM.
5. FOR PIPE 30" DIAMETER AND GREATER OR OF A MATERIAL OTHER THAN DUCTILE IRON, TRENCH SPECIFICATIONS SHALL BE MADE ON A PROJECT SPECIFIC BASIS.

REVISION	TRENCH & PIPE BEDDING	DPU DWG. NO.
04/02/2020		W-6

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-6 – TRENCH & PIPE BEDDING.DWG

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



PORTABLE HYDRANT ASSEMBLY

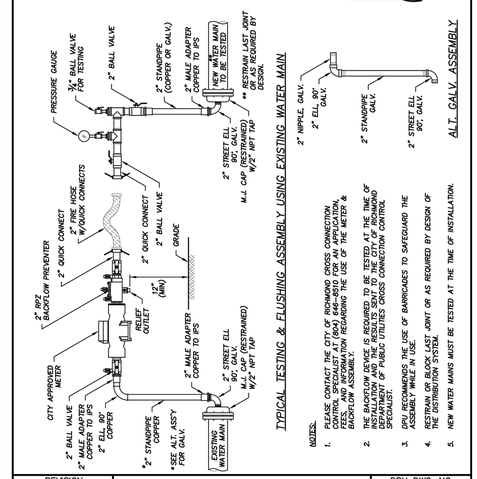
NOTES:
1. PLEASE CONTACT THE CITY OF RICHMOND CROSS CONNECTION CONTROL SPECIALIST AT (804) 646-8510 FOR AN APPLICATION, FEES, AND INFORMATION REGARDING THE USE OF THE ASSEMBLY.
2. THE BACKFLOW DEVICE IS REQUIRED TO BE TESTED AT THE TIME OF INSTALLATION.
3. DPU RECOMMENDS THE USE OF BARRICADES TO SAFEGUARD THE ASSEMBLY WHILE IN USE.
4. DO NOT OPEN THE HYDRANT INTO A STREET WHEN THE TEMPERATURE IS BELOW 32°.
5. DO NOT STAND IN FRONT OF THE ASSEMBLY WHEN OPENING THE HYDRANT VALVE.
6. DO NOT SIT ON THE ASSEMBLY.
7. DO NOT USE A DAMAGED OR DEFECTIVE ASSEMBLY.
8. DO NOT DISCONNECT OR REMOVE THE METER FROM THE BACKFLOW DEVICE.

INSTALLATION INSTRUCTIONS:
1. REMOVE THE 2½" HOSE NOZZLE CAP FROM THE HYDRANT USING A SPANNER WRENCH.
2. USING A SPANNER WRENCH CHECK THE REMAINING 2½" & 4¼" CAPS TO ENSURE THEY ARE TIGHT. THE CAPS SHOULD BE SNUG, DO NOT OVER TIGHTEN.
3. USING A SPANNER WRENCH TURN THE HYDRANT VALVE SLOWLY IN A CLOCKWISE DIRECTION TO FLUSH THE HYDRANT. ONCE CLEAR WATER IS FLOWING FROM THE HYDRANT, SLOWLY TURN THE HYDRANT VALVE IN A COUNTER CLOCKWISE DIRECTION TO CLOSE THE HYDRANT.
4. INSTALL THE HYDRANT ASSEMBLY ON THE 2½" HOSE NOZZLE BY TURNING THE CONNECTOR NUT CLOCKWISE UNTIL SNUG.
5. ENSURE THE OUTLET VALVE IS IN THE CLOSED POSITION.
6. SLOWLY TURN HYDRANT VALVE CLOCKWISE UNTIL FULLY OPEN. WHEN READY FOR USE, OPEN THE OUTLET BALL VALVE ON THE DISCHARGE SIDE OF THE BACKFLOW DEVICE.

REVISION	PORTABLE HYDRANT ASSEMBLY	DPU DWG. NO.
04/02/2020		W-7

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-7 – PORTABLE HYDRANT ASSEMBLY.DWG

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



NOTES:
1. PLEASE CONTACT THE CITY OF RICHMOND CROSS CONNECTION CONTROL SPECIALIST AT (804) 646-8510 FOR AN APPLICATION, FEES, AND INFORMATION REGARDING THE USE OF THE METER & BACKFLOW DEVICE.
2. THE BACKFLOW DEVICE IS REQUIRED TO BE TESTED AT THE TIME OF INSTALLATION AND THE RESULTS SENT TO THE CITY OF RICHMOND SPECIALIST OF PUBLIC UTILITIES CROSS CONNECTION CONTROL DEPARTMENT.
3. DPU RECOMMENDS THE USE OF BARRICADES TO SAFEGUARD THE ASSEMBLY WHILE IN USE.
4. RESTRAIN OR BLOCK LAST JOINT OR AS REQUIRED BY DESIGN OF THE DISTRIBUTION SYSTEM.
5. NEW WATER MAINS MUST BE TESTED AT THE TIME OF INSTALLATION.

REVISION	SMALL TESTING & FLUSHING ASSEMBLY ON EXISTING MAIN	DPU DWG. NO.
04/02/2020		W-8

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-8 – SMALL TESTING & FLUSHING ASSEMBLY.DWG

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES

HORIZ. BENDS

PIPE DIAMETER	RESTRAINED LENGTH 11¼°	22½°	45°	90°
3" OR 4"	2'	4'	8'	19'
6"	3'	6'	11'	27'
8"	4'	7'	15'	35'
12"	5'	10'	21'	50'
16"	7'	13'	27'	70'
24"	10'	18'	42'	91'

DEAD ENDS

PIPE DIAMETER	RESTRAINED LENGTH
3" OR 4"	42'
6"	59'
8"	79'
12"	113'
16"	147'
24"	213'

TEES, WYES, CROSSES

BRANCH DIAMETER	*RESTRAINED LENGTH EACH BRANCH
3" OR 4"	42'
6"	59'
8"	79'
12"	113'
16"	147'
24"	213'

VERT. BENDS (DOWN)

PIPE DIAMETER	RESTRAINED LENGTH 11¼°	22½°	45°	90°
3" OR 4"	6'	12'	25'	61'
6"	9'	17'	36'	86'
8"	12'	23'	47'	113'
12"	16'	32'	67'	161'
16"	21'	42'	87'	209'
24"	30'	60'	125'	301'

VERT. BENDS (UP)

PIPE DIAMETER	RESTRAINED LENGTH 11¼°	22½°	45°	90°
3" OR 4"	2'	4'	8'	19'
6"	3'	6'	11'	27'
8"	4'	7'	15'	35'
12"	5'	10'	21'	50'
16"	7'	13'	27'	64'
24"	9'	18'	38'	91'

REDUCERS

PIPE DIAMETER LARGE END	SMALL END	RESTRAINED LENGTH*
4"	3"	14'
6"	3" OR 4"	40'
8"	3" OR 4"	64'
8"	6"	33'
12"	3" OR 4"	103'
12"	6"	82'
12"	8"	60'
16"	3" OR 4"	139'
16"	6"	124'
16"	8"	107'
16"	12"	63'
24"	3" OR 4"	208'
24"	6"	198'
24"	8"	187'
24"	12"	157'
24"	16"	116'

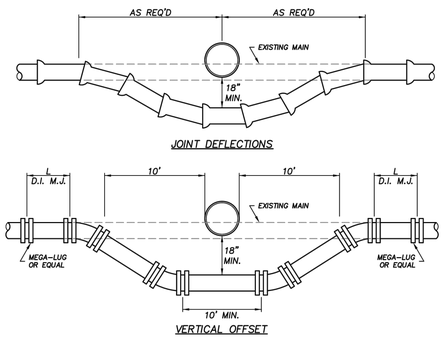
*RESTRAINED LENGTH ALONG LARGER PIPE.

NOTES:
1. RESTRAINED JOINT LENGTHS BASED ON THE FOLLOWING CONDITIONS: (LAYING CONDITION BASED ON DPU STD. TRENCH & PIPE BEDDING DETAIL, DEVIATION FROM THIS STANDARD MAY REQUIRE ADDITIONAL JOINT RESTRAINT)
   LAYING CONDITION: TYPE 5
   SOIL DESIGNATION: COH-GRAN
   DEPTH OF COVER: 3.5 FT.
   DESIGN PRESSURE: 250 PSI
   SAFETY FACTOR: 1.5
2. RESTRAINED JOINT LENGTHS MUST BE VERIFIED BY A LICENSED ENGINEER BASED ON SPECIFIC PROJECT CONDITIONS.
3. FOR PIPE 30" DIAMETER AND GREATER OR OF A MATERIAL OTHER THAN DUCTILE IRON, RESTRAINED JOINT LENGTHS SHALL BE MADE ON A PROJECT SPECIFIC BASIS.
4. LIMITS OF JOINT RESTRAINT SHALL BE SHOWN IN PROFILE FOR ALL PROPOSED WATER MAIN PROJECTS.
5. THE MINIMUM RESTRAINED LENGTH BASED ON A DEAD END CONFIGURATION ASSUMING EACH BRANCH HAS A VALVE RESTRAINED TO THE FITTING.
6. IF SUFFICIENT PIPE LENGTH IS NOT AVAILABLE FOR JOINT RESTRAINT, THRUST BLOCKING MUST BE PROVIDED.

REVISION	JOINT RESTRAINT TABLES	DPU DWG. NO.
04/02/20		W-10

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-10 – JOINT RESTRAINT TABLES.DWG

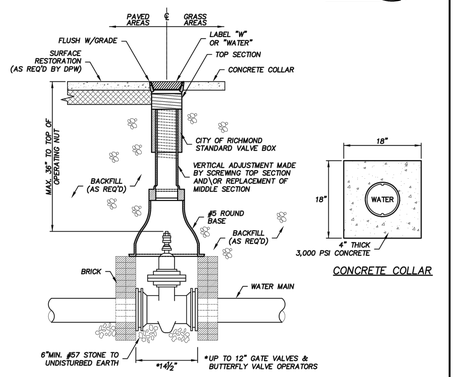
CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



REVISION	LOWERING WATER MAIN EXISTING OR NEW INSTALLATION	DPU DWG. NO.
06/06/2020		W-19

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-19 – LOWERING WATERMAIN.DWG

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES

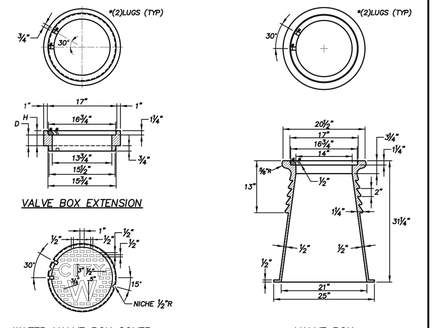


NOTES:
1. PROVIDE EXTENSION STEM IF TOP OF VALVE OPERATING NUT IS GREATER THAN 36" BELOW GROUND SURFACE.
2. PROVIDE MIDDLE SECTION TO EXTEND FOR DEEP BOXES.
3. ADJUST BOX TOP FOR STREET PAVEMENT OVERLAY, IF OVERLAY IS PERFORMED.
4. IN GRASS AREAS PROVIDE 18"x18"x4" CONCRETE COLLAR AROUND TOP OF VALVE BOX.

REVISION	SMALL VALVE BOX INSTALLATION	DPU DWG. NO.
04/29/2020		W-24

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-24 – SMALL VALVE BOX INSTALLATION.DWG

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



NOTES:
1. VALVE BOX EXTENSION FITS INTO TOP OF STANDARD LARGE VALVE BOX IN PLACE OF COVER.
2. SLOTS MUST BE PROVIDED AT BOTTOM OF ALL EXTENSIONS TO ADMIT LUGS IN VALVE BOX. WATER AT 30', UNLESS ORDERED WITHOUT SLOTS.
3. VALVE BOX COVERS MUST FIT FRAME WITHOUT TILTING OR BINDING.
4. VALVE BOX, EXTENSION, AND COVER MUST BE OF GOOD GRADE CAST IRON WITH UNIFORM TEXTURE SUITABLE FOR USE IN POTABLE WATER DISTRIBUTION SYSTEMS.

EXTENSION HEIGHT	D
H	
2"	⅞"
2½"	1⅛"
3"	1¾"

REVISION	LARGE VALVE BOX INSTALLATION	DPU DWG. NO.
06/12/2018		W-25

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-25 – LARGE VALVE BOX INSTALLATION.DWG

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole (SDMH, (SMH))
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

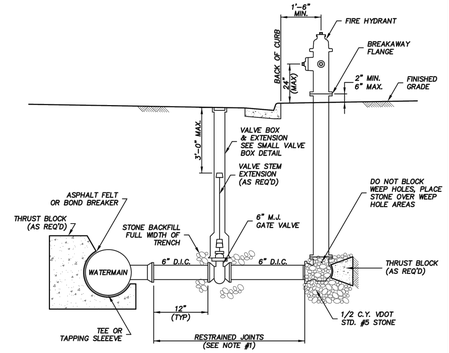
RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY DETAIL SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 21(20)	0-28633

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



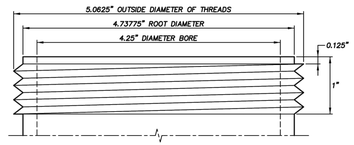
NOTES:

1. ALL JOINTS MUST BE RESTRAINED.
2. IN GRASS AREAS PROVIDE AN 18"x18"x4" THICK CONCRETE PAD AROUND THE TOP OF THE VALVE BOX (SEE SMALL VALVE BOX DETAIL).
3. FIRE HYDRANTS CONNECTED TO WATERMAINS 10" AND LARGER SHALL HAVE YELLOW CAPS.
4. THE MAXIMUM DISTANCE BETWEEN THE HYDRANT AND A FIRE DEPARTMENT APPROVED TRAVELWAY SHALL BE 10'

REVISION		DPU DWG. NO.
04/15/2020	FIRE HYDRANT DETAIL	W-27

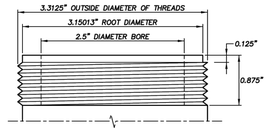
A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-27 – FIRE HYDRANT DETAIL.DWG

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



4 1/4" PUMPER NOZZLE
(1 PER HYDRANT)

THREAD INFO:
4 THREADS PER INCH
0.250" PITCH RIGHT-HAND
A.N. FORM



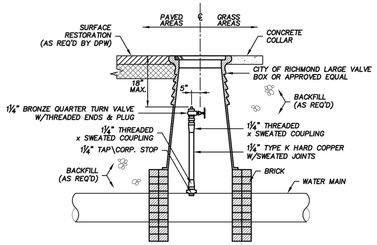
2 1/2" HOSE NOZZLE
(2 PER HYDRANT)

THREAD INFO:
8 THREADS PER INCH
0.125" PITCH RIGHT-HAND
A.N. FORM

REVISION		DPU DWG. NO.
06/12/2018	CITY OF RICHMOND FIRE HYDRANT NOZZLE THREADS	W-28

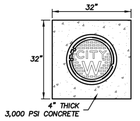
A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-28 – COR-FIRE HYDRANT THREADS.DWG

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



NOTES:

1. IN GRASS AREAS PROVIDE AN 32"x32"x4" THICK CONCRETE PAD AROUND THE TOP OF THE VALVE BOX.
2. FINAL SURFACE RESTORATION IN PAVED AREAS SHALL BE IN ACCORDANCE WITH DPW PAVEMENT RESTORATION REQUIREMENTS.

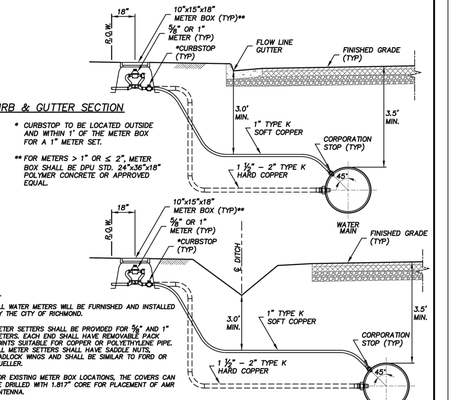


CONCRETE COLLAR

REVISION		DPU DWG. NO.
06/18/2018	MANUAL AIR RELEASE VALVE AND PITOT TAP	W-33

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-33 – MANUAL AIR RELEASE VALVE-PITOT TAP.DWG

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



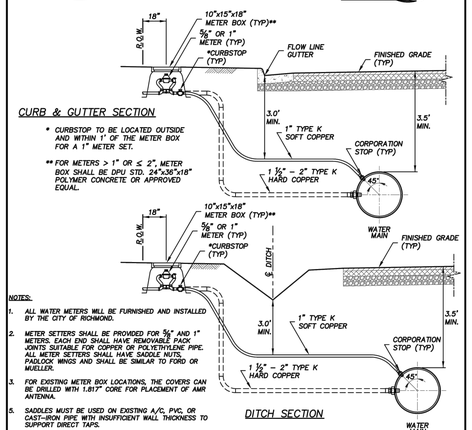
NOTES:

1. ALL WATER METERS WILL BE FURNISHED AND INSTALLED BY THE CITY OF RICHMOND.
2. METER SETTERS SHALL BE PROVIDED FOR ⅝" AND 1" METERS. EACH END SHALL HAVE REMOVABLE PACK JOINTS SUITABLE FOR COPPER OR POLYETHYLENE PIPE. ALL METER SETTERS SHALL HAVE SADDLE NUTS, PADLOCK WINGS AND SHALL BE SIMILAR TO FORD OR MUELLER.
3. FOR EXISTING METER BOX LOCATIONS, THE COVERS CAN BE DRILLED WITH 1.817" CORE FOR PLACEMENT OF AMR ANTENNA.
5. SADDLES MUST BE USED ON EXISTING A/C, PVC, OR CAST-IRON PIPE WITH INSUFFICIENT WALL THICKNESS TO SUPPORT DIRECT TAPS.
6. ½" & 2" TAPS SHOULD BE MADE AT THE SPRING LINE OF THE MAIN. PLEASE NOTE THE MINIMUM REQUIRED PIPE SIZE FOR DIRECT TAPS, TEES WITH GATE VALVES, AND TAPPED CAPS ARE REQUIRED FOR SERVICES GREATER THAN 1½" ON PIPE SIZES 6" AND SMALLER.

REVISION		DPU DWG. NO.
05/26/2020	SMALL WATER SERVICE CONNECTION	W-36

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-36 – SMALL WATER SERVICE CONNECTION.DWG

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



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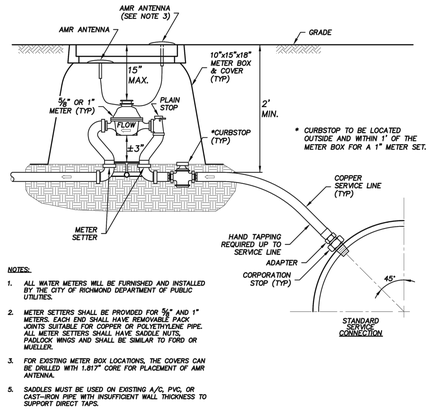
REVISION		DPU DWG. NO.
05/26/2020	SMALL WATER SERVICE CONNECTION	W-36

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-36 – SMALL WATER SERVICE CONNECTION.DWG

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



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3. FOR EXISTING METER BOX LOCATIONS, THE COVERS CAN BE DRILLED WITH 1.817" CORE FOR PLACEMENT OF AMR ANTENNA.
5. SADDLES MUST BE USED ON EXISTING A/C, PVC, OR CAST-IRON PIPE WITH INSUFFICIENT WALL THICKNESS TO SUPPORT DIRECT TAPS.
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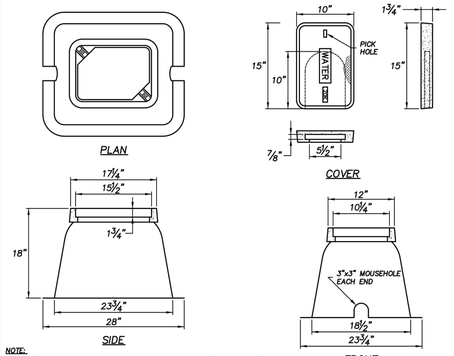
REVISION		DPU DWG. NO.
05/26/2020	SMALL METER BOX INSTALLATION	W-37

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-37 – SMALL METER BOX INSTALLATION.DWG

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



NOTE:

1. METER BOXES SHALL BE ARMORCAST 10"x15"x18" FIBERGLASS WATER METER BOX W/POLYMER REINFORCED CONCRETE FRAMES AND COVERS OR APPROVED EQUAL.
2. COVERS SHALL BE FLUSH WITH THE FRAME AND EITHER POLYMER CONCRETE OR HDPE.
3. COVERS SHALL HAVE A RECESS OR BRACKET FOR ATTACHING AN AMR ANTENNA.
4. BOXES SHALL ONLY BE USED IN AREAS NOT NORMALLY SUBJECT VENICULAR TRAFFIC.

REVISION		DPU DWG. NO.
03/10/2020	SMALL METER BOX (10"X15"X18") FIBERGLASS	W-38

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-38 – SMALL METER BOX – FIBERGLASS.DWG

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH ⊹ ●WV
Water Meter ●WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ● ● GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
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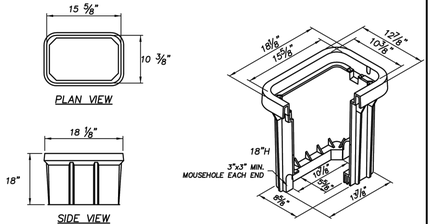
SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY DETAIL SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(21)	DRAWING NO. 0-28633

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES

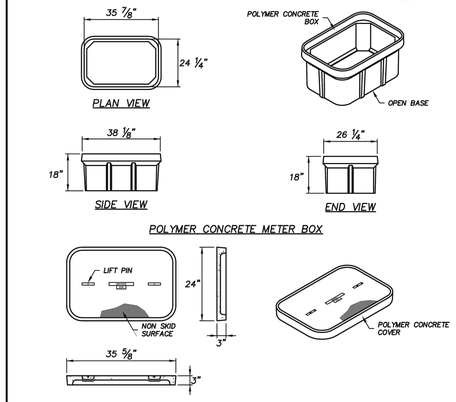


NOTE:
1. METER BOXES SHALL BE OLDCASTLE\CARSON 1015 BCF HEAVYWALL POLYETHYLENE OR APPROVED EQUAL.
2. COVERS SHALL BE FLUSH WITH THE FRAME AND EITHER POLYMER CONCRETE OR HDPE.
3. COVERS SHALL HAVE A RECESS OR BRACKET FOR ATTACHING AN AMR ANTENNA.
4. BOXES SHALL ONLY BE USED IN AREAS NOT NORMALLY SUBJECT VEHICULAR TRAFFIC.

REVISION	SMALL METER BOX (10"X15"X18") HDPE	DPU DWG. NO.
03/10/2020		W-39

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-39 – SMALL METER BOX – HDPE.DWG

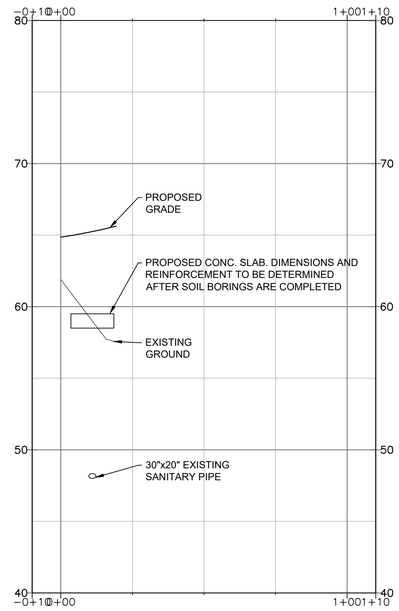
CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES



NOTES:
1. METER BOXES SHALL BE ARMORCAST POLYMER REINFORCED CONCRETE OR APPROVED EQUAL.
2. METER BOXES SHALL NOT BE LOCATED IN AREAS NORMALLY SUBJECT TO VEHICULAR TRAFFIC.

REVISION	LARGE METER BOX (24"X36"X18") POLYMER CONCRETE	DPU DWG. NO.
05/27/2020		W-40

A:\WATER DISTRIBUTION STANDARDS UPDATE\DETAILS – 2016\W-40 – LARGE METER BOX – POLYMER CONCRETE.DWG



CONCRETE SLAB DETAIL

5 0 5 10
SCALE IN FEET VERT

25 0 25 50
SCALE IN FEET HORIZ.

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES	REVISIONS

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Sanitary Sewer (Gravity)
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Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
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Storm Sewer
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Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
UTILITY DETAIL SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 21(22)	DRAWING NO. 0-28633

SIGNING AND PAVEMENT MARKING PLAN

STANDARD SIGN LEGEND

PLAN ITEM	PLAN SYMBOL	
	PROPOSED	EXISTING
Single Post Sign Support		
Double Post Sign Support		
Triple Post Sign Support		
Flashing Beacon		
O/H Cantilever Sign Support		
O/H Span Sign Support		

SIGN CALL–OUTS

Existing Sign to Remain or to be Relocated

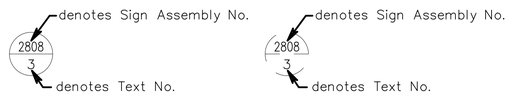
Existing Sign to be Removed

Proposed Sign Panel

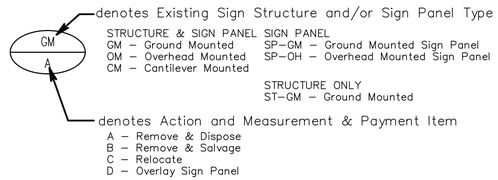
SIGN LABELS

Proposed Sign Assemblies

Relocated Sign Assemblies



Sign Relocation or Payable Sign Disposal/Salvage



Signs noted on plans to be removed that do not have an accompanying sign label shall not be measured separately for payment. Removal and disposal for such signs shall be incidental to other contract items.

GENERAL NOTES – PAVEMENT MARKING

1. All proposed pavement markings shall be in accordance with the current edition of each of the following and any revision thereof at the time the contract was ratified:
   - 1.1. Manual on Uniform Traffic Control Devices (MUTCD)
   - 1.2. The Virginia Supplement to the Manual on Uniform Traffic Control Devices
   - 1.3. The Virginia Department of Transportation Road and Bridge Specifications
   - 1.4. The Virginia Department of Transportation Road and Bridge Standards
2. Existing pavement markings that conflict with the proposed pavement markings shall be removed via roadway overlay or completely eradicated.
3. Limits of proposed pavement markings are approximate and shall be modified in the field to ensure that proposed pavement markings continue until existing pavement markings can be matched.
4. Elongated arrows shall be in accordance with MUTCD and VDOT Road and Bridge Specifications.
5. Dimensions are from the face of curb and to the centerline of the pavement markings, unless otherwise noted.

GENERAL NOTES – SIGNING

1. Unless otherwise approved by the engineer, existing traffic signs, which are to be remove, shall remain in place until the new sign structure and critical message are in place.
2. Proposed signs and sign structures shall not impact underground existing utilities. Contractor is responsible for any distribution in Utility Service due to digging for sign structures. If Proposed sign location will cause impact to existing Utility Service, sign location shall be relocated at the approval of the engineer, at no additional cost.
3. All underground and overhead utilities shown on these plans are approximate only and may not be complete. At least 72 hours prior to beginning signing work, Contractor shall contact "Miss Utility of Virginia" at 1–800–552–7001 in order to determine the extent, location, and identify all of the utilities within the work area. If the Contractor perceives a conflict between utilities and the proposed signs, the Contractor shall notify the Engineer immediately so the conflict may be reviewed. The Contractor shall be responsible for repairing or replacing, at their own expense, any existing utilities, pavement, concrete items, ect. that are damaged during construction.
4. The removal or modification of existing sign panels, structures, or foundations shall conform to Section 510 of the VDOT Road and Bridge Specifications.
5. Unless otherwise indicated on the plans, all breakaway sign structures shall be located with 25' of the sign's indicated location or as is directed by the Engineer, and within the Existing or proposed Right of Way.
6. All existing and proposed sign locations are approximate and should be field verified by the contractor. All proposed sign locations may be staked by the contractor and approved by the engineer prior to the installation.
7. The proposed signs located adjacent to pedestrian walkways and paths shall be mounted such that a minimum of 7 ft clearance exists from the walking surface to the bottom of the lowest sign panel.
8. When necessary, existing sidewalk shall be saw cut leaving a smooth squared opening for the installation of proposed sign structures. Upon completion of a sign structure installation, the existing sidewalk shall be patched/repaired with a minimum of 3000 psi concrete. Any incidental concrete for repair or replacement of existing conditions shall be a minimum of 3000 psi.

INDEX OF SHEETS

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve; Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN
GENERAL NOTES

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 22(01)	0-28633
CHECKED BY: ASamberg						

SIGN DETAIL

1:100

SIGN NUMBER	name
WIDTH x HGHT.	15'-6" x 10'-0"
BORDER WIDTH	2"
CORNER RADIUS	12"
MOUNTING	Overhead
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND&BORDER	TYPE: Reflective
	COLOR: WhiteWhite

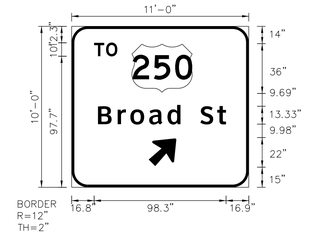
SYMBOL	ROT	X	Y	WID	HT
M1_4	0	70	66	45	36
AR_Type B	45	82	12	23	27

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES-SIZE
O	l	i	v	e	r		H	i	l	l		W	a	y								Clearview-5WR
12.3	28.6	35.8	41.2	53.5	67.1	73.2	86.4	100.8	107.9	115.3	119.5	131.5	151.5	163.2							161.3	13.3/10.8

SIGN DETAIL

1:100



SIGN NUMBER	name
WIDTH x HGHT.	11'-0" x 10'-0"
BORDER WIDTH	2"
CORNER RADIUS	12"
MOUNTING	Overhead
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND&BORDER	TYPE: Reflective
	COLOR: WhiteWhite

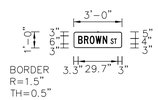
SYMBOL	ROT	X	Y	WID	HT
M1_4	0	44	71	45	36
AR_Type B	315	57	16	23	26

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES-SIZE
T	O																					E 2000
16.8	25.7																				18.2	10
B	r	o	a	d		S	t															Clearview-5W
19.7	34.3	43.8	57.8	71.5	81.1	95.9	108.5														95.4	13.3/10.8

SIGN DETAIL

1:100



SIGN NUMBER	name
WIDTH x HGHT.	3'-0" x 1'-0"
BORDER WIDTH	0.5"
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND&BORDER	TYPE: Reflective
	COLOR: WhiteWhite

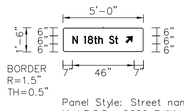
SYMBOL	ROT	X	Y	WID	HT

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES-SIZE
B	R	O	W	N		S	T															C 2000
4.3	8.6	12.9	17.2	22.6	25.9	28.4	31														29.7	6,4

SIGN DETAIL

1:100



Panel Style: Street name 12-6D.ssi
M.U.T.C.D.: 2009 Edition

SIGN NUMBER	name
WIDTH x HGHT.	5'-0" x 1'-6"
BORDER WIDTH	0.5"
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND&BORDER	TYPE: Reflective
	COLOR: WhiteWhite

SYMBOL	ROT	X	Y	WID	HT
AR_Type B	315	47	6	7	8

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES-SIZE
N		1	8	t	h		S	t														D 2000
8	12.1	16.6	19.4	24.1	27.2	30.7	35.2	39.7													35	6/4.5

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20_
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity) — S
Gas Line — G — G
Electric Line — E — E
Overhead Utility — OHU —
Telephone/Telegraph — T-Duct —
Water Line — W — W
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH / WV

Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM / GV
Fence — X —
Power/Light Pole PP / LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

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SHOCKOE VALLEY STREET IMPROVEMENTS

SIGNING AND PAVEMENT MARKING PLAN
SIGN FABRICATION DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: [illegible]	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: [illegible] Alexander				SEPTEMBER 2022	SHEET 22(2A)1	0-28633
CHECKED BY: [illegible] Bahlberg						

SIGN DETAIL

1:100

SIGN NUMBER	name
WIDTH x HGHT.	5'-0" x 1'-0"
BORDER WIDTH	0.5"
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND&BORDER	TYPE: Reflective
	COLOR: White&White

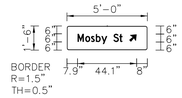
SYMBOL	ROT	X	Y	WID	HT

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES-SIZE
O	L	I	V	E	R		H	I	L	L		W	A	Y								C 2000
4.2	9	12.9	14.6	19.1	23.2	26.6	31.1	35.7	37.9	41.8	44.9	48.9	52.1	54.9							53.8	6,4

SIGN DETAIL

1:100



SIGN NUMBER	name
WIDTH x HGHT.	5'-0" x 1'-0"
BORDER WIDTH	0.5"
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND&BORDER	TYPE: Reflective
	COLOR: White&White

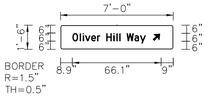
SYMBOL	ROT	X	Y	WID	HT
AR_Type B	315	47	7	7	7

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES-SIZE
M	o	s	b	y		S	t															D 2000
8.9	14.7	19	22.6	26.6	31.1	35.6	40.1														34.1	6/4.5

SIGN DETAIL

1:100



SIGN NUMBER	name
WIDTH x HGHT.	7'-0" x 1'-6"
BORDER WIDTH	0.5"
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND&BORDER	TYPE: Reflective
	COLOR: White&White

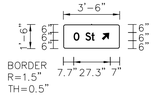
SYMBOL	ROT	X	Y	WID	HT
AR_Type B	315	69	6	7	8

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES-SIZE
O	l	i	v	e	r		H	i	l	l		W	a	y								D 2000
9.8	15.2	17.4	19.1	23.8	28.2	30.5	35	40.4	42.5	44.7	45.7	50.2	56	60.1							55.2	6/4.5

SIGN DETAIL

1:100



SIGN NUMBER	name
WIDTH x HGHT.	3'-6" x 1'-6"
BORDER WIDTH	0.5"
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND&BORDER	TYPE: Reflective
	COLOR: White&White

SYMBOL	ROT	X	Y	WID	HT
AR_Type B	315	29	7	7	8

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES-SIZE
O		S	t																			D 2000
8.7	12.9	17.4	21.9																		16.3	6/4.5

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20_
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS

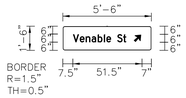
SIGNING AND PAVEMENT MARKING PLAN
SIGN FABRICATION DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY:	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY:				SEPTEMBER 2022	SHEET 22(2A)2	0-28633
CHECKED BY:						

SIGN DETAIL

1:100



SIGN NUMBER	name
WIDTH x HGHT.	5'-6" x 1'-6"
BORDER WIDTH	0.5"
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

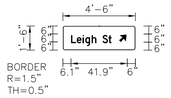
SYMBOL	ROT	X	Y	WID	HT
AR_Type B	315	53	6	7	7

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES/SIZE
V	e	n	a	b	l	e		S	t													D 2000
7.9	13	17.4	21.8	26.4	30.9	32.8	36.4	40.9	45.3												40.1	6/4.5

SIGN DETAIL

1:100



SIGN NUMBER	name
WIDTH x HGHT.	4'-6" x 1'-6"
BORDER WIDTH	0.5"
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

SYMBOL	ROT	X	Y	WID	HT
AR_Type B	315	41	6	7	8

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES/SIZE
L	e	i	g	h		S	t															D 2000
6.1	10.3	14.7	16.6	21.4	25	29.5	33.9														30.9	6/4.5

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20_
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS

SIGNING AND PAVEMENT MARKING PLAN

SIGN FABRICATION DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: [illegible]	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: [illegible]Alexander				SEPTEMBER 2022	SHEET 22(2A)3	0-28633
CHECKED BY: [illegible]Bairberg						

SIGN SCHEDULE

TEXT NO(s)	SIGN ASSEMBLY NO(s).	TEXT	SIGN ASSEMBLY COMPONENTS: MUTCD ST'D.	PANEL SIZE W	PANEL SIZE H	QTY.	SIGN PANEL AREA (S.F.): per Sign	per Assembly	SIGN STRUCTURE ST'D.	REMARKS
01	502,505,507,517, 520,523,602,606, 609,613,617,620, 624,625,630,633, 637,638,642,643, 648,1005,1201, 1215,1216,1217, 1402,1405,1503, 1505,1701,1703, 1707,1712,1717, 1721,1723,1728, 1804,1808,1813, 1819,1821,1827, 1829,1832,1844		W11-2 W16-7 PL	36" 24"	36" 12"	47 47	9.0 2.0	11.0	STP-1, 2 ½" - 12 GA	FOUNDATION - TYPE E
02	504,508,524,525, 1810,1822,1833		W11-2 W16-7 PR	36" 24"	36" 12"	7 7	9.0 2.0	11.0	STP-1, 2 ½" - 12 GA	FOUNDATION - TYPE E
03	604,605,610, 611,615,616, 622,623,628, 629,635,636, 640,641,646, 647,1705,1706, 1710,1711,1719, 1720,1726,1727, 1806,1807,1814, 1815,1824,1825, 1830,1831		R1-2	48"	48"	32	6.9	6.9	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
04	521,608,618,631, 1209,1702,1713, 1718,1729,1816, 1817,1834		R4-7	24"	30"	14	5.0	5.0	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
05	614,621,627, 649,650,651, 652,653,1709, 1725,1731,1732, 1842,1843		R6-4	30"	24"	14	5.0	5.0	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
06	1840,1841		R6-4A	48"	24"	2	8.0	8.0	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
07	515,518,522, 1007,1202,1204, 1206,1211,1302, 1403,1406,1502, 1506,1601,1604, 1802,1836,1839		R7-1L (MOD)	12"	18"	18	1.5	1.5	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
08	1213		R7-1L (MOD)	12"	18"	1	1.5	1.5	Existing UTILITY POLE	ATTACH TO EXISTING UTILITY POLE

SIGN SCHEDULE

TEXT NO(s)	SIGN ASSEMBLY NO(s).	TEXT	SIGN ASSEMBLY COMPONENTS: MUTCD ST'D.	PANEL SIZE W	PANEL SIZE H	QTY.	SIGN PANEL AREA (S.F.): per Sign	per Assembly	SIGN STRUCTURE ST'D.	REMARKS
09	409,516,519, 632,1203,1208, 1212,1307,1401, 1404,1501,1504, 1602,1715,1801, 1803,1838		R7-1R (MOD)	12"	18"	17	1.5	1.5	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
10	1008,1205,1214		R7-1R (MOD)	12"	18"	3	1.5	1.5	Existing UTILITY POLE	ATTACH TO EXISTING UTILITY POLE
11	403,411,506, 705,801,901, 902,903,1101, 1103,1305		R8-3	30"	30"	11	6.25	6.25	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
12	513,601,654, 701,1210,1301, 1603,1716,1730, 1826,1837		W2-6	30"	30"	11	6.25	6.25	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
13	526,703,1207, 1303,1844		R2-1	30"	36"	5	7.5	7.5	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
14	706,1306		R2-1	30"	36"	2	7.5	7.5	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
15	501,644		R1-1	36"	36"	2	7.0	7.0	STP-1, 2" - 14 GA	FOUNDATION - TYPE D

NOTES:

1) ALL SIGNS SHALL BE ORIENTATED AS SHOWN ON THE PLANS.

2) SIGN COLOR COMBINATIONS SHALL BE IN ACCORDANCE WITH THE FHWA STANDARD HIGHWAY SIGNS BOOK AND THE 2011 VIRGINIA STANDARD HIGHWAY SIGNS BOOK OR AS NOTED IN THE PLANS.

3) ALL ST'D. STP-1 STRUCTURES TO BE SINGLE POST UNLESS OTHERWISE NOTED.

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve; Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN
SIGN SCHEDULE

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASlamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE: SEPTEMBER 2022	PROJECT SHEET: 22(2B)1	DRAWING NO.: 0-28633

SIGN SCHEDULE

TEXT NO(s)	SIGN ASSEMBLY NO(s).	TEXT	SIGN ASSEMBLY COMPONENTS: MUTCD ST'D.	PANEL SIZE: W	PANEL SIZE: H	QTY.	SIGN PANEL AREA (S.F.): per Sign	SIGN PANEL AREA (S.F.): per Assembly	SIGN STRUCTURE ST'D.	REMARKS
16	704,1304		W3-5	36"	36"	2	9.0	9.0	STP-1, 2 1/2" - 12 GA	FOUNDATION - TYPE E
17	1002,1003		W4-2L	36"	36"	2	9.0	9.0	STP-1, 2 1/2" - 12 GA	FOUNDATION - TYPE E
18	512,1812		W4-3R	36"	36"	2	9.0	9.0	STP-1, 2 1/2" - 12 GA	FOUNDATION - TYPE E
19	1004		W4-6	36"	36"	1	9.0	9.0	STP-1, 2 1/2" - 12 GA	FOUNDATION - TYPE E
20	503,1001		W6-1	36"	36"	2	9.0	9.0	STP-1, 2 1/2" - 12 GA	FOUNDATION - TYPE E
21	1835		R3-8 (MOD)	30"	30"	1	6.25	6.25	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
22	405		R3-8A (MOD)	48"	30"	1	10.0	10.0	STP-1, 2 1/2" - 12 GA	FOUNDATION - TYPE E
23	511		R3-2	36"	36"	1	9.0	9.0	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
24	514		R3-2	36"	36"	1	9.0	9.0	EXISTING UTILITY POLE	ATTACH TO EXISTING UTILITY POLE

SIGN SCHEDULE

TEXT NO(s)	SIGN ASSEMBLY NO(s).	TEXT	SIGN ASSEMBLY COMPONENTS: MUTCD ST'D.	PANEL SIZE: W	PANEL SIZE: H	QTY.	SIGN PANEL AREA (S.F.): per Sign	SIGN PANEL AREA (S.F.): per Assembly	SIGN STRUCTURE ST'D.	REMARKS
25	607		R3-1	36"	36"	1	9.0	9.0	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
26	1845		R3-7L	36"	36"	1	9.0	9.0	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
27	1811		R3-8 (MOD)	30"	30"	1	6.25	6.25	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
28	1901		R3-7R M3-2 M1-V1A M5-1R	36" 24" 36" 21"	36" 12" 36" 15"	1 1 1 1	9.0 2.0 9.0 2.2	22.2	STP-1, 2 1/2" - 10 GA WITH 2 1/2" - 10 GA INNER POST	FOUNDATION - TYPE B
29	401		D11-1 M6-1L	EXIS. EXIS.	EXIS. EXIS.	1 1	3.0 0.75	3.75	STP-1, 2" - 14 GA	FOUNDATION - TYPE D
30	412		M4-14 R3-17	24" 24"	12" 18"	1 1	2.0 3.0	5.0	STP-1, 2" - 14 GA	FOUNDATION - TYPE D

NOTES:

1) ALL SIGNS SHALL BE ORIENTATED AS SHOWN ON THE PLANS.

2) SIGN COLOR COMBINATIONS SHALL BE IN ACCORDANCE WITH THE FHWA STANDARD HIGHWAY SIGNS BOOK AND THE 2011 VIRGINIA STANDARD HIGHWAY SIGNS BOOK OR AS NOTED IN THE PLANS.

3) ALL ST'D. STP-1 STRUCTURES TO BE SINGLE POST UNLESS OTHERWISE NOTED.

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions
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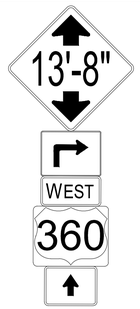
SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN
SIGN SCHEDULE

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 22(2B)2	0-28633

SIGN SCHEDULE

TEXT NO(s)	SIGN ASSEMBLY NO(s).	TEXT	SIGN ASSEMBLY COMPONENTS: MUTCD ST'D.	PANEL SIZE: W	PANEL SIZE: H	QTY.	SIGN PANEL AREA (S.F.): per Sign	SIGN PANEL AREA (S.F.): per Assembly	SIGN STRUCTURE ST'D.	REMARKS
31	402		I-7	EXIS.	EXIS.	1	4.0	20.4	STP-1, 2 1/2" - 10 GA WITH 2 1/2" - 10 GA INNER POST	FOUNDATION - TYPE B
			I-7A (MOD)	EXIS.	EXIS.	1	4.0			
			I-7 (MOD)	EXIS.	EXIS.	1	4.0			
			M6-1	EXIS.	EXIS.	1	2.2			
			R8-3	EXIS.	EXIS.	1	6.25			
32	406		W12-2	36"	36"	1	9.0	21.2	STP-1, 2 1/2" - 10 GA WITH 2 1/2" - 10 GA INNER POST	FOUNDATION - TYPE B
			W16-6 PR	24"	18"	1	3.0			
			M3-4	24"	12"	1	2.0			
			M1-4	30"	24"	1	5.0			
			M6-3	21"	15"	1	2.2			
33	510		R5-1	36"	36"	1	9.0	18.75	STP-1, 2 1/2" - 10 GA	FOUNDATION - TYPE B
			R5-1A	42"	30"	1	8.75			
34	603		D1-1D	84"	18"	1	10.5	19.7	STP-1, 2 1/2" - 10 GA	FOUNDATION - TYPE B
			M3-4	24"	12"	1	2.0			
			M1-4	30"	24"	1	5.0			
			M6-2R	21"	15"	1	2.2			

SIGN SCHEDULE

TEXT NO(s)	SIGN ASSEMBLY NO(s).	TEXT	SIGN ASSEMBLY COMPONENTS: MUTCD ST'D.	PANEL SIZE: W	PANEL SIZE: H	QTY.	SIGN PANEL AREA (S.F.): per Sign	SIGN PANEL AREA (S.F.): per Assembly	SIGN STRUCTURE ST'D.	REMARKS
35	612		D1-1D	84"	18"	1	10.5	19.7	STP-1, 2 1/2" - 10 GA	FOUNDATION - TYPE B
			M3-2	24"	12"	1	2.0			
			M1-4	30"	24"	1	5.0			
			M6-2R	21"	15"	1	2.2			
36	702		D3-1	60"	12"	1	6.5	17.5	STP-1, 2 1/2" - 10 GA	FOUNDATION - TYPE B
			D3-1	36"	12"	1	4.0			
			R1-1	36"	36"	2	7.0			
37	1006		R1-1	36"	36"	1	7.0	16.0	STP-1, 2 1/2" - 10 GA	FOUNDATION - TYPE B
			R3-1	36"	36"	1	9.0			
38	1102		R3-7L	36"	36"	1	9.0	15.25	STP-1, 2 1/2" - 10 GA	FOUNDATION - TYPE B
			R8-3	30"	30"	12	6.25			
39	1714		W2-6	30"	30"	1	6.25	15.25	STP-1, 2 1/2" - 10 GA	FOUNDATION - TYPE B
			R7-1L (MOD)	12"	18"	1	1.5			

NOTES:

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25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions
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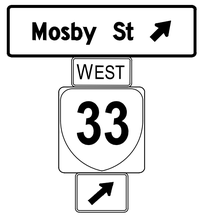
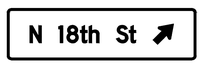
SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN
SIGN SCHEDULE

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 22(28)3	0-28633
CHECKED BY: ASamberg						

SIGN SCHEDULE

TEXT NO(s)	SIGN ASSEMBLY NO(s).	TEXT	SIGN ASSEMBLY COMPONENTS: MUTCD ST'D.	PANEL SIZE W	PANEL SIZE H	QTY.	SIGN PANEL AREA (S.F.): per Sign	per Assembly	SIGN STRUCTURE ST'D.	REMARKS
40	1809		M1–8	18"	24"	1	3.0	3.75	STP–1, 2" – 14 GA	FOUNDATION – TYPE D
			M6–1R	12"	9"	1	0.75			
41	1818		D1–1D	54"	18"	1	6.75	19.95	STP–1, 2 2" – 10 GA WITH 2 3" – 10 GA INNER POST	FOUNDATION – TYPE B
			M3–4	24"	12"	1	2.0			
			M1–V1A	36"	36"	1	9.0			
			M6–2R	21"	15"	1	2.2			
42	1822		D1–1D	60"	18"	1	7.5	20.7	STP–1, 2 2" – 10 GA WITH 2 3" – 10 GA INNER POST	FOUNDATION – TYPE B
			M3–4	24"	12"	1	2.0			
			M1–V1A	36"	36"	1	9.0			
			M6–2R	21"	15"	1	2.2			
43	626,634,645, 1708,1724		D1–1D	66"	18"	5	8.25	8.25	STP–1, 2" – 14 GA	FOUNDATION – TYPE D
44	1704,1722,1805,		D1–1D	60"	18"	3	7.5	7.5	STP–1, 2" – 14 GA	FOUNDATION – TYPE D
45	619,639		D1–1D	60"	18"	2	7.5	7.5	STP–1, 2" – 14 GA	FOUNDATION – TYPE D
46	1828		D1–1D	42"	18"	1	5.25	5.25	STP–1, 2" – 14 GA	FOUNDATION – TYPE D

SIGN SCHEDULE

TEXT NO(s)	SIGN ASSEMBLY NO(s).	TEXT	SIGN ASSEMBLY COMPONENTS: MUTCD ST'D.	PANEL SIZE W	PANEL SIZE H	QTY.	SIGN PANEL AREA (S.F.): per Sign	per Assembly	SIGN STRUCTURE ST'D.	REMARKS
47	408		I–6 (MOD)	18"	24"	1	3.0	3.0	STP–1, 2" – 14 GA	FOUNDATION – TYPE D
48	410		I–6 (MOD)	18"	24"	1	3.0	3.0	STP–1, 2" – 14 GA	FOUNDATION – TYPE D
49	655		--	132"	120"	1	110.0	110.0	--	SEE SHEET 22(2C)1 FOR SIGN DETAILS
50	656		--	186"	120"	1	155.0	155.0	--	SEE SHEET 22(2C)1 FOR SIGN DETAILS

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25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions | vhb

SHOCKOE VALLEY STREET IMPROVEMENTS

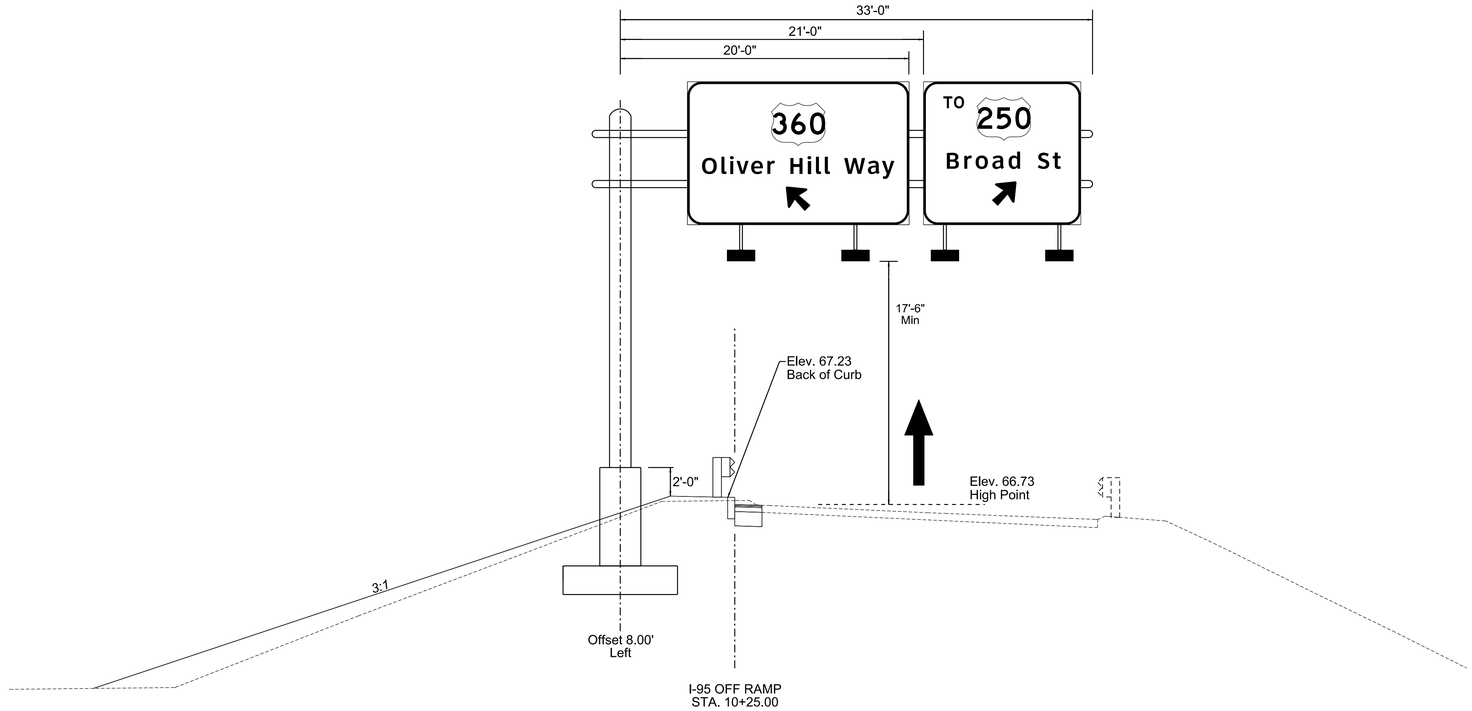
SIGNING AND PAVEMENT MARKING PLAN
SIGN SCHEDULE

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 22(2B)4	DRAWING NO. 0-28633

NOTES

1. Double chord cantilever shown for illustrative purposes only. Final design of structure shall be prepared by contractor and/or fabricator and submitted to the City for shop drawing review and approval prior to fabrication.
2. Span length and mounting height shall be verified in the field prior to fabrication.
3. Structure and foundation shall be designed in accordance with VDOT Road & Bridge standard OSS-1.
4. Refer to Lighting Plan for additional details on sign lighting luminaires.
5. Sign Panel Design shall be in accordance with VDOT Road and Bridge Standard SPD-1. Sign panel bracing and attachment details to be determined by contractor and/or fabricator and submitted to City for shop drawing review and approval prior to fabrication.
6. Vertical clearance for overhead sign structures shall be no less than 19'-0"and no more than 21'-0"from the bottom of the lowest mounted sign panel to the highest point of the roadway beneath the signs. Luminaire assemblies shall have a vertical clearance of no less than !7'-6' from the bottom of the assembly to the highest point of the roadway beneath the assembly.



70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES | REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
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Property Line
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Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
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Proposed Legend

Sanitary Sewer
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Basin
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Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

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Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

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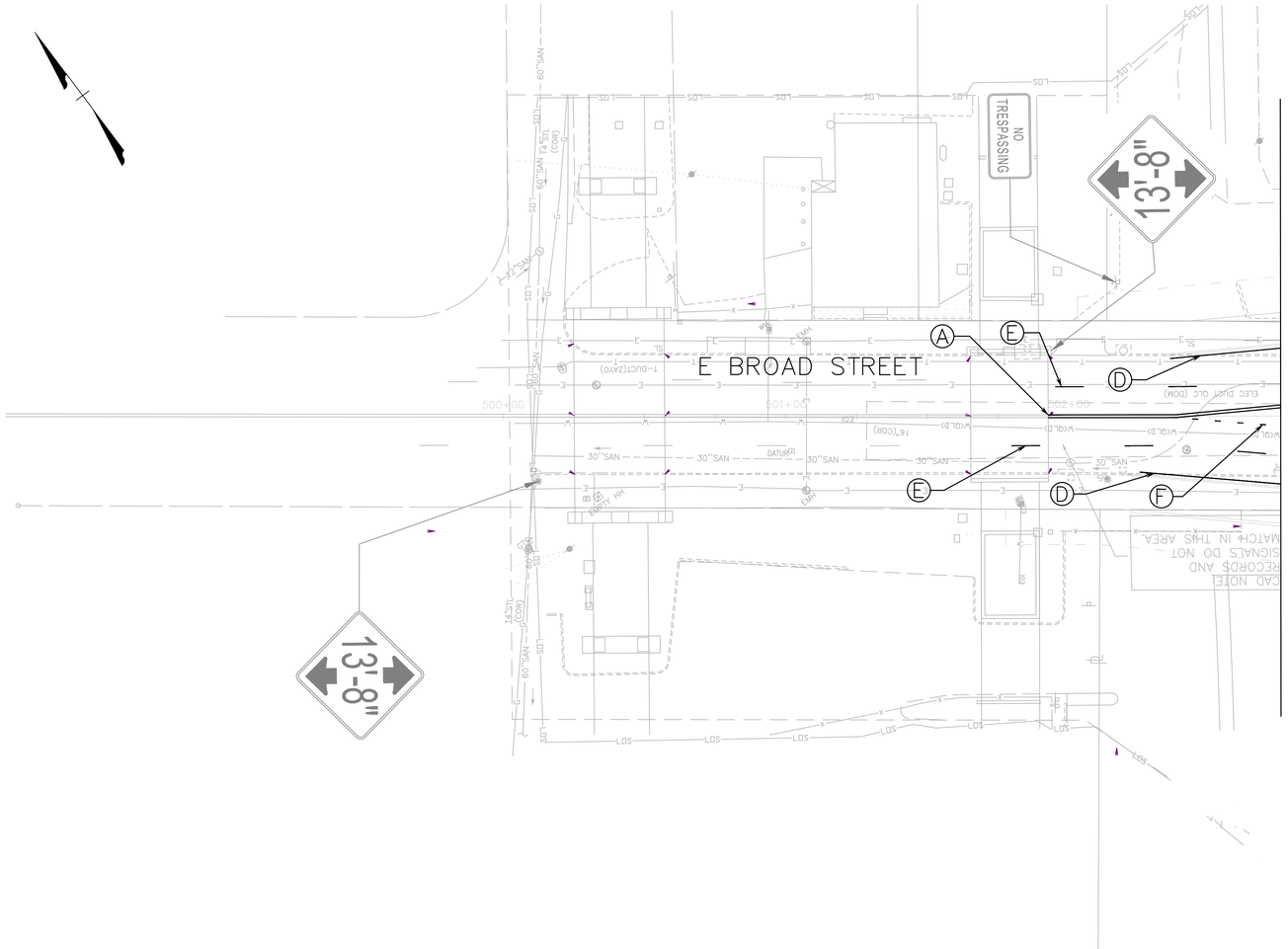
SHOCKOE VALLEY STREET IMPROVEMENTS

SIGNING AND PAVEMENT MARKING PLAN

OVERHEAD SIGN DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY:	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY:				SEPTEMBER 2022	SHEET 22(2C)1	0-28633
CHECKED BY:						



PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
- Ⓓ TYPE B, CLASS I, 4" SOLID WHITE
- Ⓔ TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- Ⓕ TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- Ⓖ TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
- Ⓗ TYPE B, CLASS I, 6" WHITE, 3' LONG, 9' SPACE
- Ⓘ TYPE B, CLASS I, 12" WHITE, 2' LONG, 2' SPACE
- Ⓙ TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- Ⓚ TYPE B, CLASS I, 4" SOLID YELLOW
- Ⓛ TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- Ⓝ TYPE B, CLASS I, 6" WHITE, 30' SPACING

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

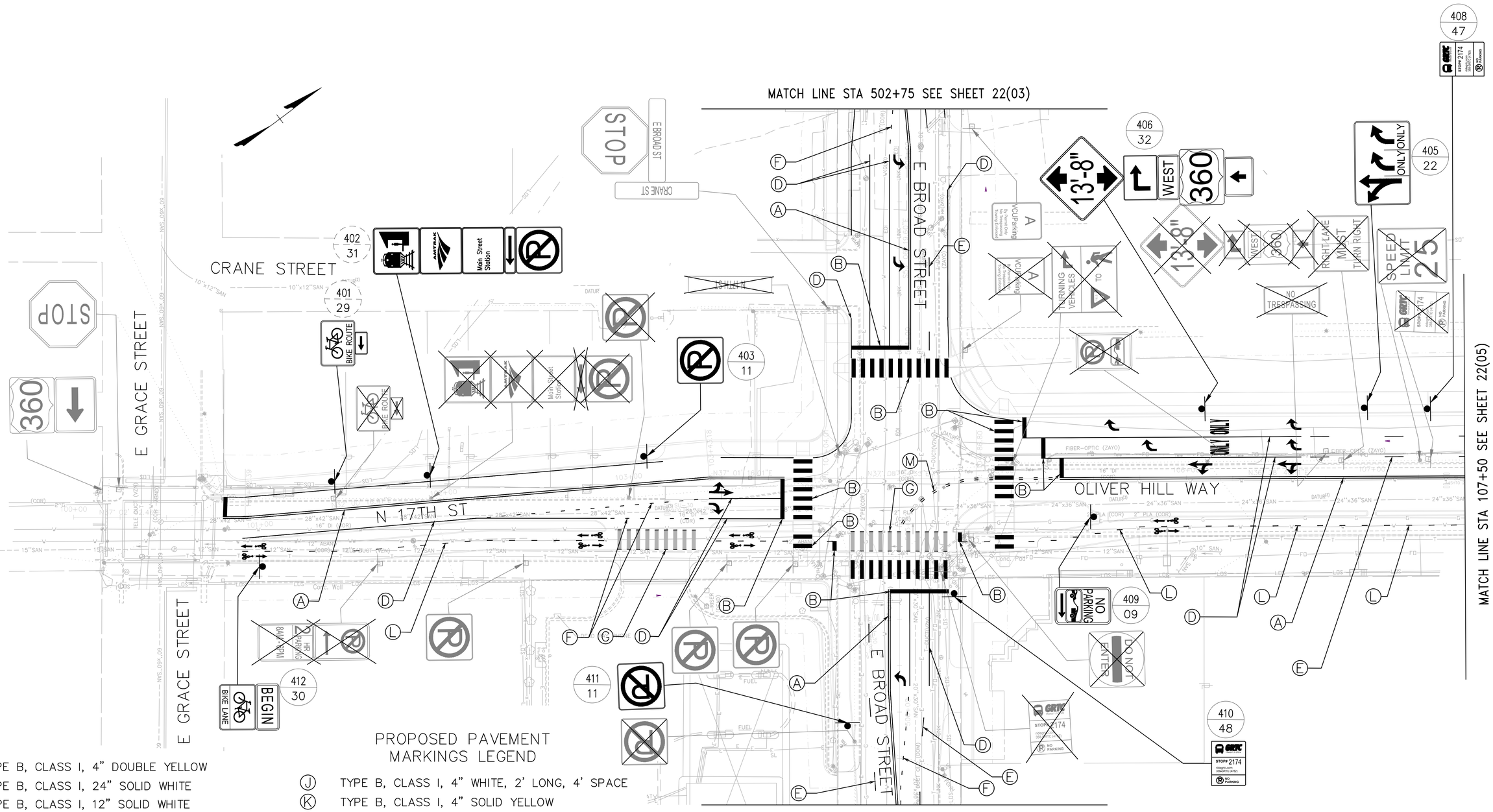
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions
vhb

SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 22(03)	DRAWING NO. 0-28633



PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
- Ⓓ TYPE B, CLASS I, 4" SOLID WHITE
- Ⓔ TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- Ⓕ TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- Ⓖ TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
- Ⓗ TYPE B, CLASS I, 6" WHITE, 3' LONG, 9' SPACE
- Ⓘ TYPE B, CLASS I, 12" WHITE, 2' LONG, 2' SPACE
- Ⓙ TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- Ⓚ TYPE B, CLASS I, 4" SOLID YELLOW
- Ⓛ TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- Ⓝ TYPE B, CLASS I, 6" WHITE, 30' SPACING
- TYPE B, CLASS II, PREFORMED PAVEMENT MARKING BICYCLE LANE ARROW (THRU) AND HELMETED BICYCLIST
- TYPE B, CLASS II, PREFORMED PAVEMENT MARKING ELONGATED ARROW, SINGLE (LEFT)
- TYPE B, CLASS II, PREFORMED PAVEMENT MARKING ELONGATED ARROW, DOUBLE (THRU–LEFT)
- TYPE B, CLASS II, PREFORMED PAVEMENT MARKING ELONGATED ARROW, SINGLE (RIGHT)
- ONLY TYPE B, CLASS II, PREFORMED PAVEMENT MARKING MESSAGE, ONLY

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

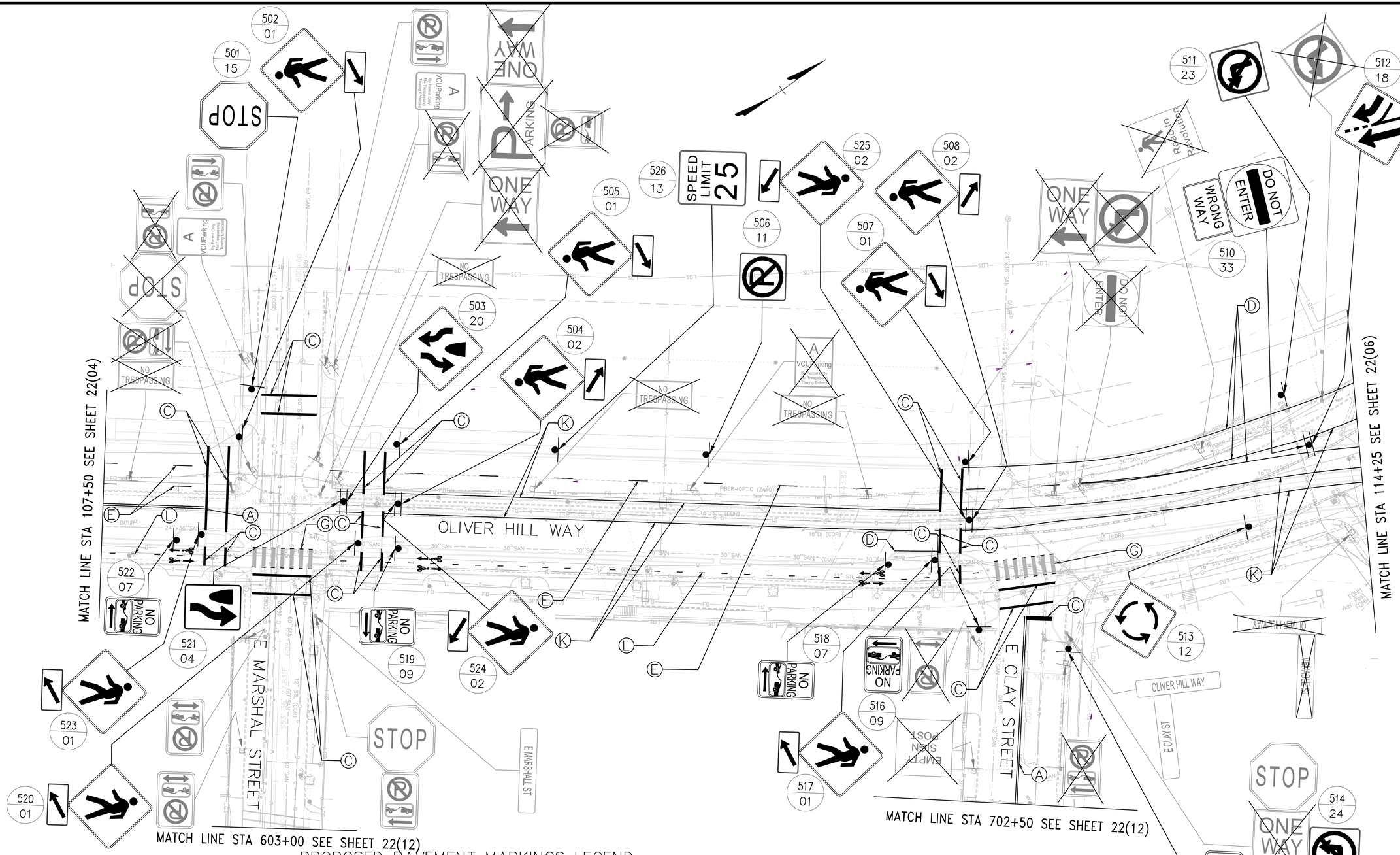
RK&K Responsive People • Creative Solutions | vhb

SHOCKOE VALLEY STREET IMPROVEMENTS

SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 22(04)	0-28633
CHECKED BY: ASlemberg						



PROPOSED PAVEMENT MARKINGS LEGEND

- (A) TYPE B, CLASS I, 4" DOUBLE YELLOW
- (B) TYPE B, CLASS I, 24" SOLID WHITE
- (C) TYPE B, CLASS I, 12" SOLID WHITE
- (D) TYPE B, CLASS I, 4" SOLID WHITE
- (E) TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- (F) TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- (G) TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
- (H) TYPE B, CLASS I, 6" WHITE, 3' LONG, 9' SPACE
- (I) TYPE B, CLASS I, 12" WHITE, 2' LONG, 2' SPACE
- (J) TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- (K) TYPE B, CLASS I, 4" SOLID YELLOW
- (L) TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- (M) TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- (N) TYPE B, CLASS I, 6" WHITE, 30' SPACING
- TYPE B, CLASS II, PREFORMED PAVEMENT MARKING BICYCLE LANE ARROW (THRU) AND HELMETED BICYCLIST

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

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Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS

SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 22(05)	0-28633
CHECKED BY: ASamberg						

PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
- Ⓓ TYPE B, CLASS I, 4" SOLID WHITE
- Ⓔ TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- Ⓕ TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- Ⓖ TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
- Ⓗ TYPE B, CLASS I, 6" WHITE, 3' LONG, 9' SPACE
- Ⓘ TYPE B, CLASS I, 12" WHITE, 2' LONG, 2' SPACE
- Ⓙ TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- Ⓚ TYPE B, CLASS I, 4" SOLID YELLOW
- Ⓛ TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- Ⓝ TYPE B, CLASS I, 6" WHITE, 30' SPACING
- ▼ TYPE B, CLASS I, 12" WHITE, YIELD LINE, 6" SPACING

MATCH LINE STA 119+00 SEE SHEET 22(13)

MATCH LINE STA 901+75 SEE SHEET 22(07)

MATCH LINE STA 304+50 SEE SHEET 22(16)

MATCH LINE STA 216+00 SEE SHEET 22(12)

MATCH LINE STA 114+25 SEE SHEET 22(05)

N. 18TH STREET

OLIVER HILL WAY

I-95 OFF RAMP

VENABLE ST

Venable St

N 18th St

Oliver Hill Way

SCALE IN FEET: 25 0 25 50

PROPOSED PAVEMENT MARKINGS LEGEND (CONT'D)

- TYPE B, CLASS II, PREFORMED PAVEMENT MARKING FISH-HOOK ARROW, MULTIPLE (LEFT-THRU-RIGHT)
- TYPE B, CLASS II, PREFORMED PAVEMENT MARKING FISH-HOOK ARROW, MULTIPLE (THRU-LEFT)
- TYPE B, CLASS II, PREFORMED PAVEMENT MARKING FISH-HOOK ARROW, MULTIPLE (THRU-RIGHT)
- TYPE B, CLASS II, PREFORMED PAVEMENT MARKING FISH-HOOK ARROW, MULTIPLE (LEFT-RIGHT)

70% SUBMITTAL SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend

Sanitary Sewer; Storm Sewer; Storm/(San) Manhole SDMH (SMH); Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

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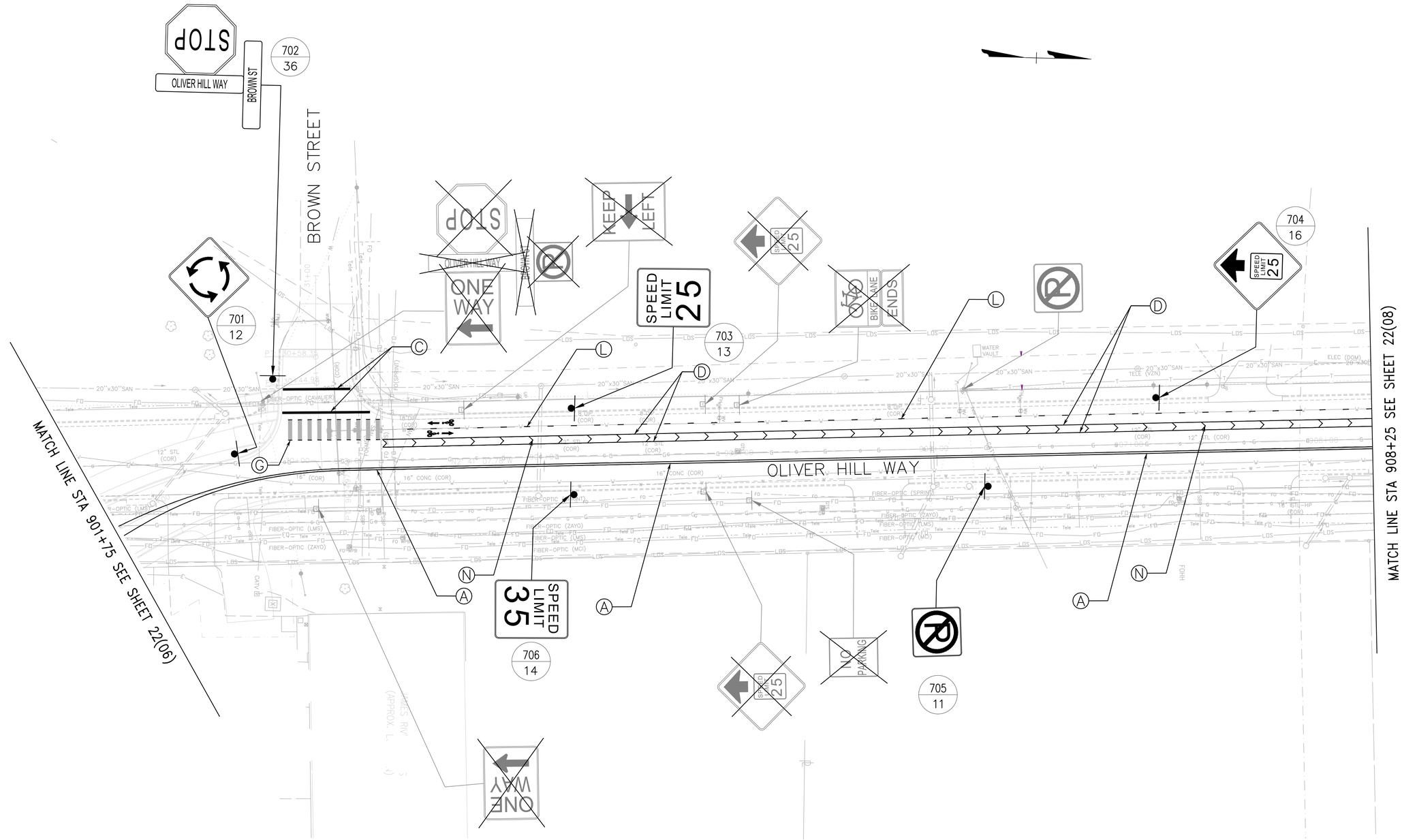
SHOCKOE VALLEY STREET IMPROVEMENTS

SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 22(06)	0-28633
CHECKED BY: ASamberg						



PROPOSED PAVEMENT MARKINGS LEGEND

- (A) TYPE B, CLASS I, 4" DOUBLE YELLOW
- (B) TYPE B, CLASS I, 24" SOLID WHITE
- (C) TYPE B, CLASS I, 12" SOLID WHITE
- (D) TYPE B, CLASS I, 4" SOLID WHITE
- (E) TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- (F) TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- (G) TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
- (H) TYPE B, CLASS I, 6" WHITE, 3' LONG, 9' SPACE
- (I) TYPE B, CLASS I, 12" WHITE, 2' LONG, 2' SPACE
- (J) TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- (K) TYPE B, CLASS I, 4" SOLID YELLOW
- (L) TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- (M) TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- (N) TYPE B, CLASS I, 6" WHITE, 30' SPACING

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING
BICYCLE LANE ARROW (THRU) AND HELMETED BICYCLIST

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions
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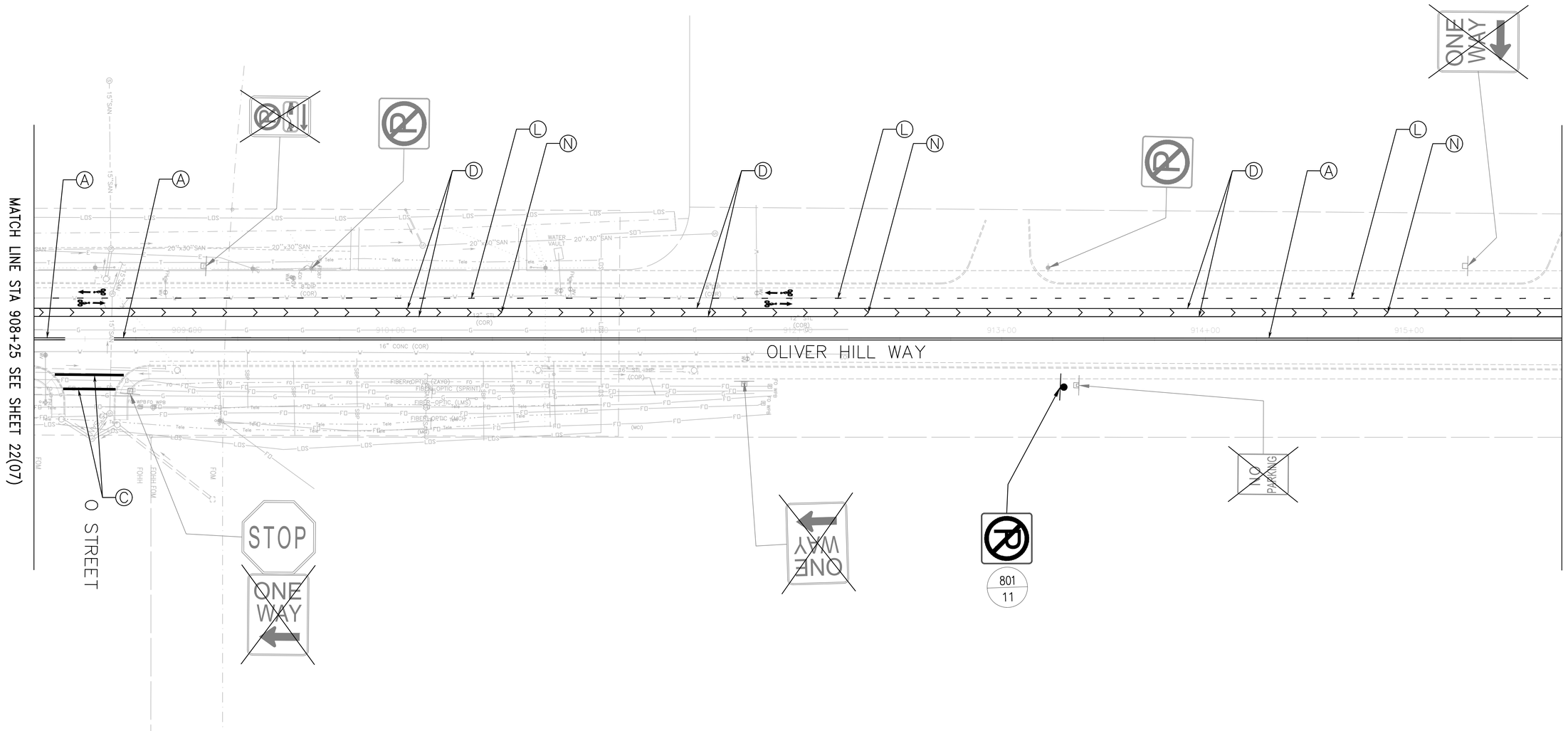
SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 22(07)	DRAWING NO. 0-28633



PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
- Ⓓ TYPE B, CLASS I, 4" SOLID WHITE
- Ⓔ TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- Ⓕ TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- Ⓖ TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
- Ⓗ TYPE B, CLASS I, 6" WHITE, 3' LONG, 9' SPACE
- Ⓘ TYPE B, CLASS I, 12" WHITE, 2' LONG, 2' SPACE
- Ⓙ TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- Ⓚ TYPE B, CLASS I, 4" SOLID YELLOW
- Ⓛ TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- Ⓝ TYPE B, CLASS I, 6" WHITE, 30' SPACING

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING
BICYCLE LANE ARROW (THRU) AND HELMETED BICYCLIST

SCALE IN FEET: 25 0 25 50

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions
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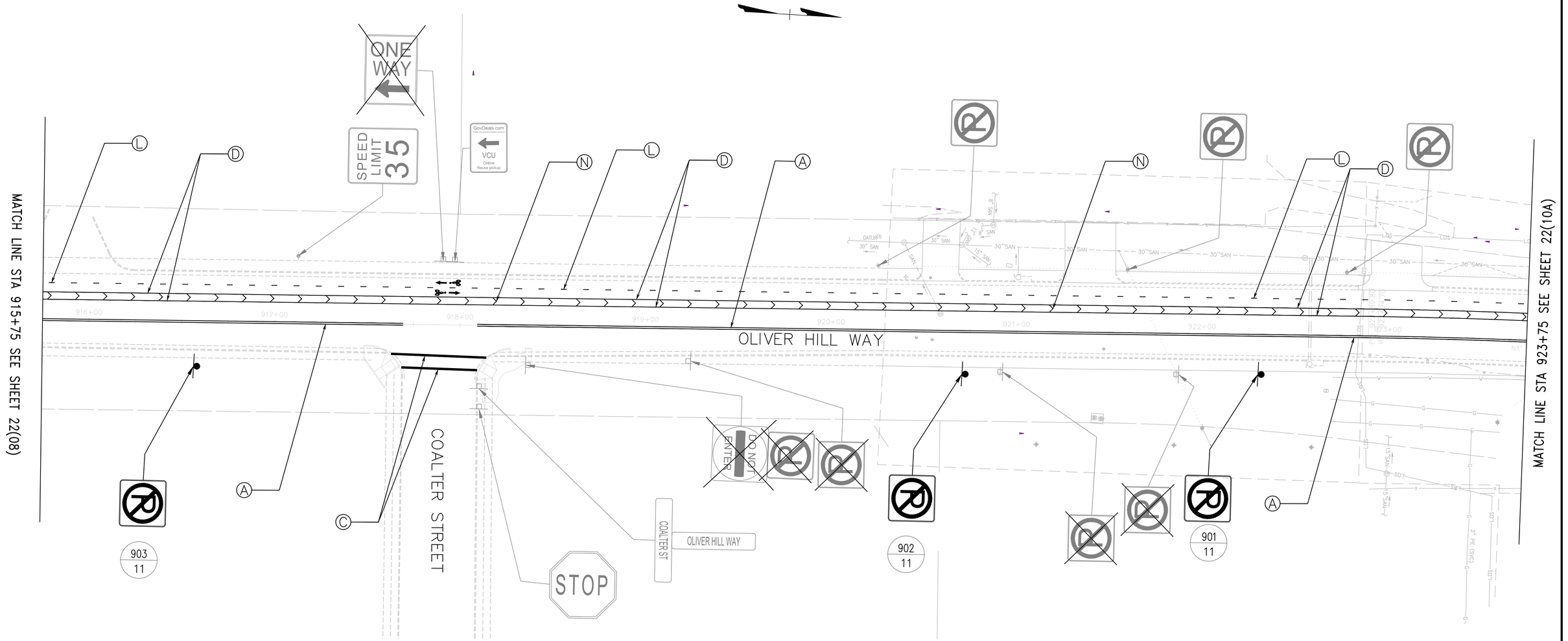
SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 22(08)	DRAWING NO. 0-28633



PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
- Ⓓ TYPE B, CLASS I, 4" SOLID WHITE
- Ⓔ TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- Ⓕ TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- Ⓖ TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
- Ⓗ TYPE B, CLASS I, 6" WHITE, 3' LONG, 9' SPACE
- Ⓘ TYPE B, CLASS I, 12" WHITE, 2' LONG, 2' SPACE
- Ⓙ TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- Ⓚ TYPE B, CLASS I, 4" SOLID YELLOW
- Ⓛ TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- Ⓝ TYPE B, CLASS I, 6" WHITE, 30' SPACING

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING
BICYCLE LANE ARROW (THRU) AND HELMETED BICYCLIST

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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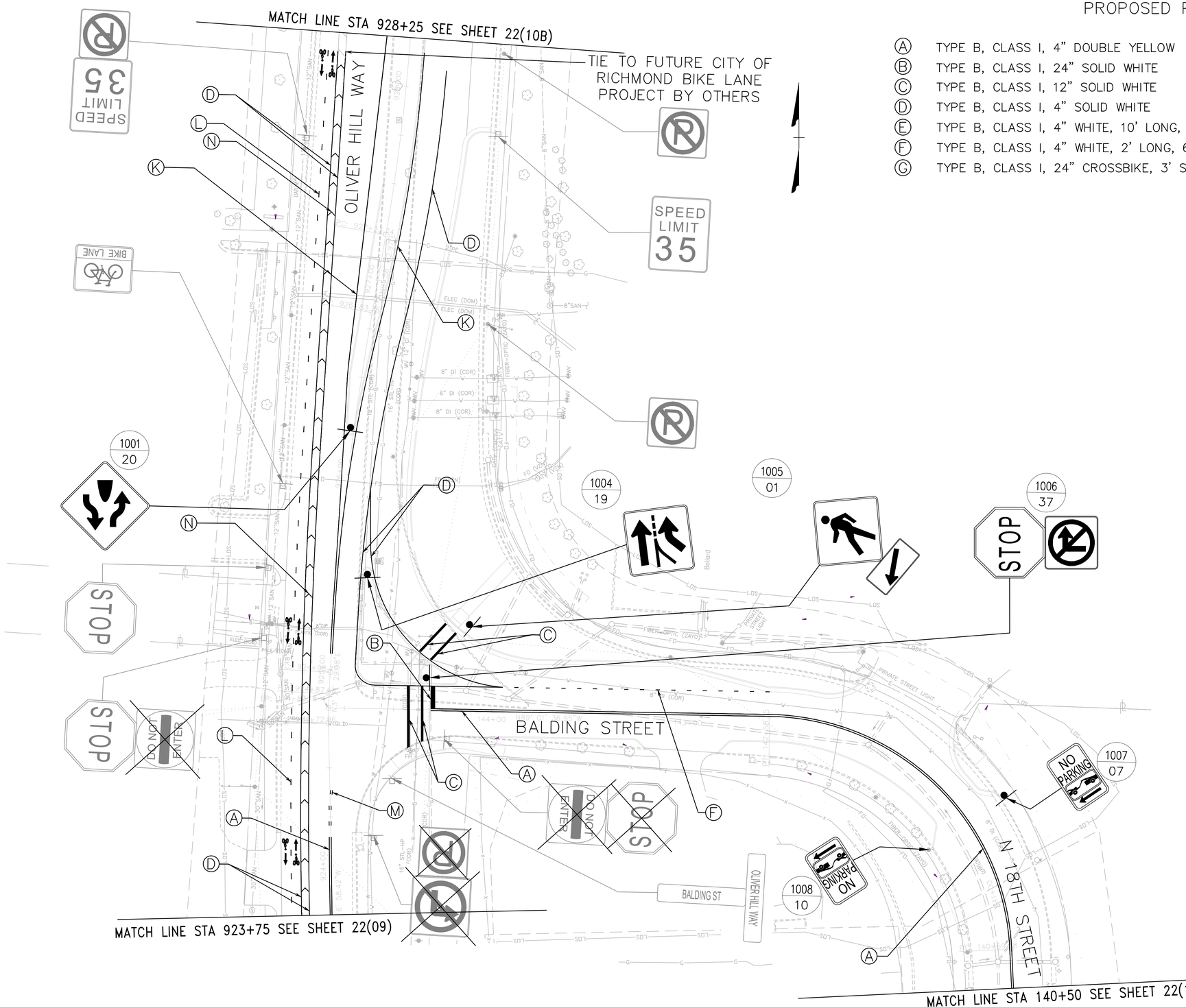
SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 22(09)	DRAWING NO. 0-28633



PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
- Ⓓ TYPE B, CLASS I, 4" SOLID WHITE
- Ⓔ TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- Ⓕ TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- Ⓖ TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
- Ⓗ TYPE B, CLASS I, 6" WHITE, 3' LONG, 9' SPACE
- Ⓘ TYPE B, CLASS I, 12" WHITE, 2' LONG, 2' SPACE
- Ⓙ TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- Ⓚ TYPE B, CLASS I, 4" SOLID YELLOW
- Ⓛ TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- Ⓝ TYPE B, CLASS I, 6" WHITE, 30' SPACING

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING BICYCLE LANE ARROW (THRU) AND HELMETED BICYCLIST

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions
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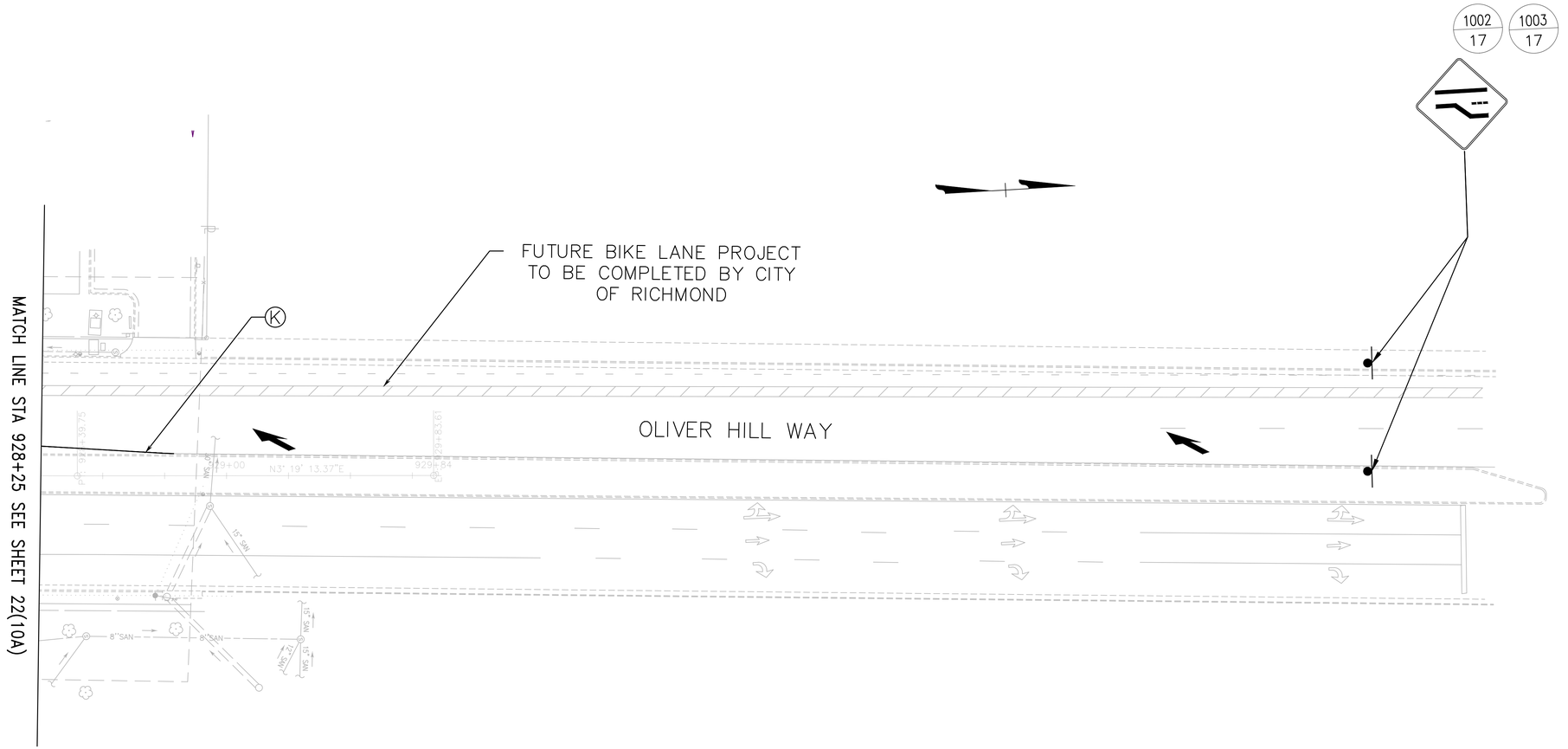
SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 22(10A)	0-28633
CHECKED BY: ASamberg						



PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
- Ⓓ TYPE B, CLASS I, 4" SOLID WHITE
- Ⓔ TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- Ⓕ TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- Ⓖ TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
- Ⓗ TYPE B, CLASS I, 6" WHITE, 3' LONG, 9' SPACE
- Ⓘ TYPE B, CLASS I, 12" WHITE, 2' LONG, 2' SPACE
- Ⓙ TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- Ⓚ TYPE B, CLASS I, 4" SOLID YELLOW
- Ⓛ TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- Ⓝ TYPE B, CLASS I, 6" WHITE, 30' SPACING
- 1 TYPE B, CLASS II, PREFORMED PAVEMENT MARKING ELONGATED ARROW, SINGLE (LANE REDUCTION)

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH SSMH
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions
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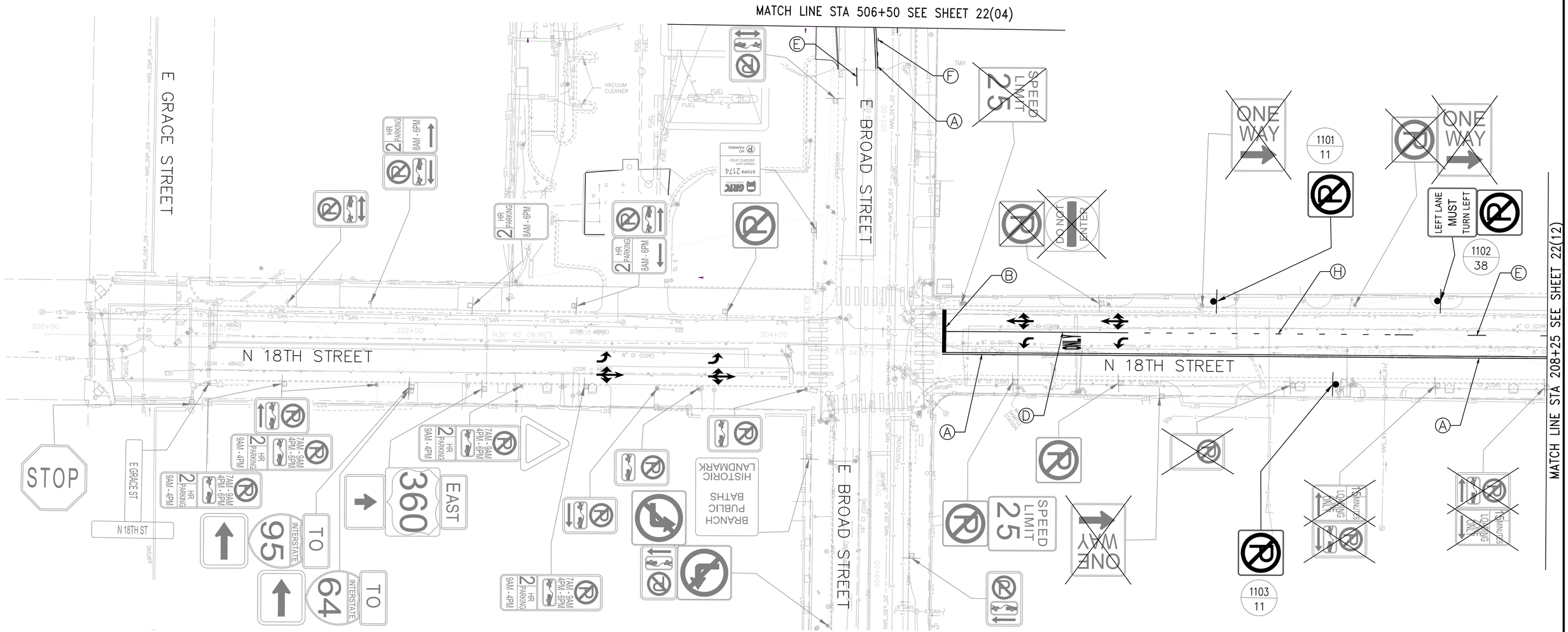
SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 22(10B)	DRAWING NO. 0-28633



PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
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- Ⓛ TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- Ⓝ TYPE B, CLASS I, 6" WHITE, 30' SPACING

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING ELONGATED ARROW, SINGLE (LEFT)

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING ELONGATED ARROW, TRIPLE (LEFT–THRU–RIGHT)

ONLY — TYPE B, CLASS II, PREFORMED PAVEMENT MARKING MESSAGE, ONLY

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

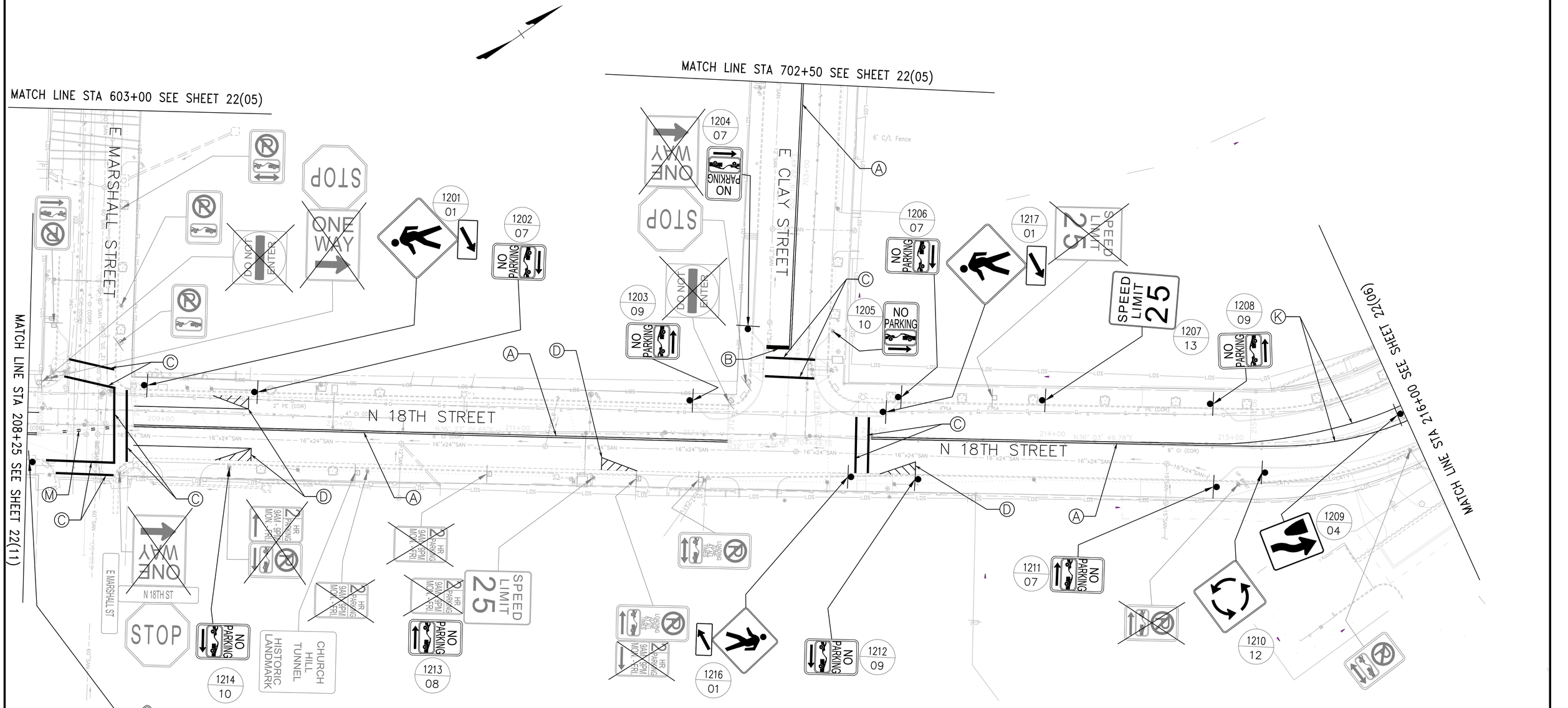
RK&K Responsive People • Creative Solutions — vhb

SHOCKOE VALLEY STREET IMPROVEMENTS

SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASlamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 22(11)	DRAWING NO. 0-28633



PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
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- Ⓙ TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- Ⓚ TYPE B, CLASS I, 4" SOLID YELLOW
- Ⓛ TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- Ⓝ TYPE B, CLASS I, 6" WHITE, 30' SPACING

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
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4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions
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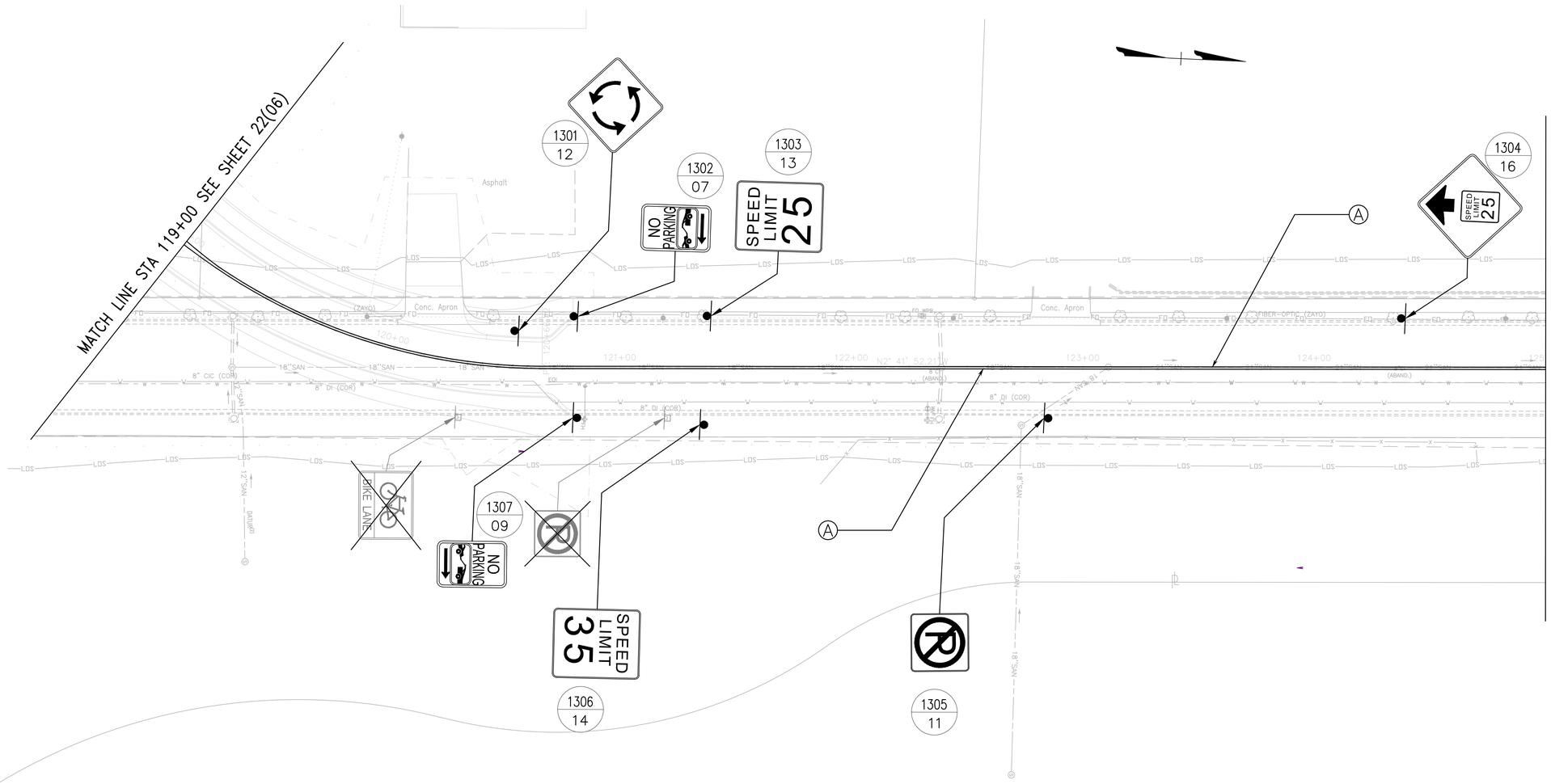
SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 22(12)	0-28633
CHECKED BY: ASamberg						



PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
- Ⓓ TYPE B, CLASS I, 4" SOLID WHITE
- Ⓔ TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- Ⓕ TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- Ⓖ TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
- Ⓗ TYPE B, CLASS I, 6" WHITE, 3' LONG, 9' SPACE
- Ⓘ TYPE B, CLASS I, 12" WHITE, 2' LONG, 2' SPACE
- Ⓙ TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- Ⓚ TYPE B, CLASS I, 4" SOLID YELLOW
- Ⓛ TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- Ⓝ TYPE B, CLASS I, 6" WHITE, 30' SPACING

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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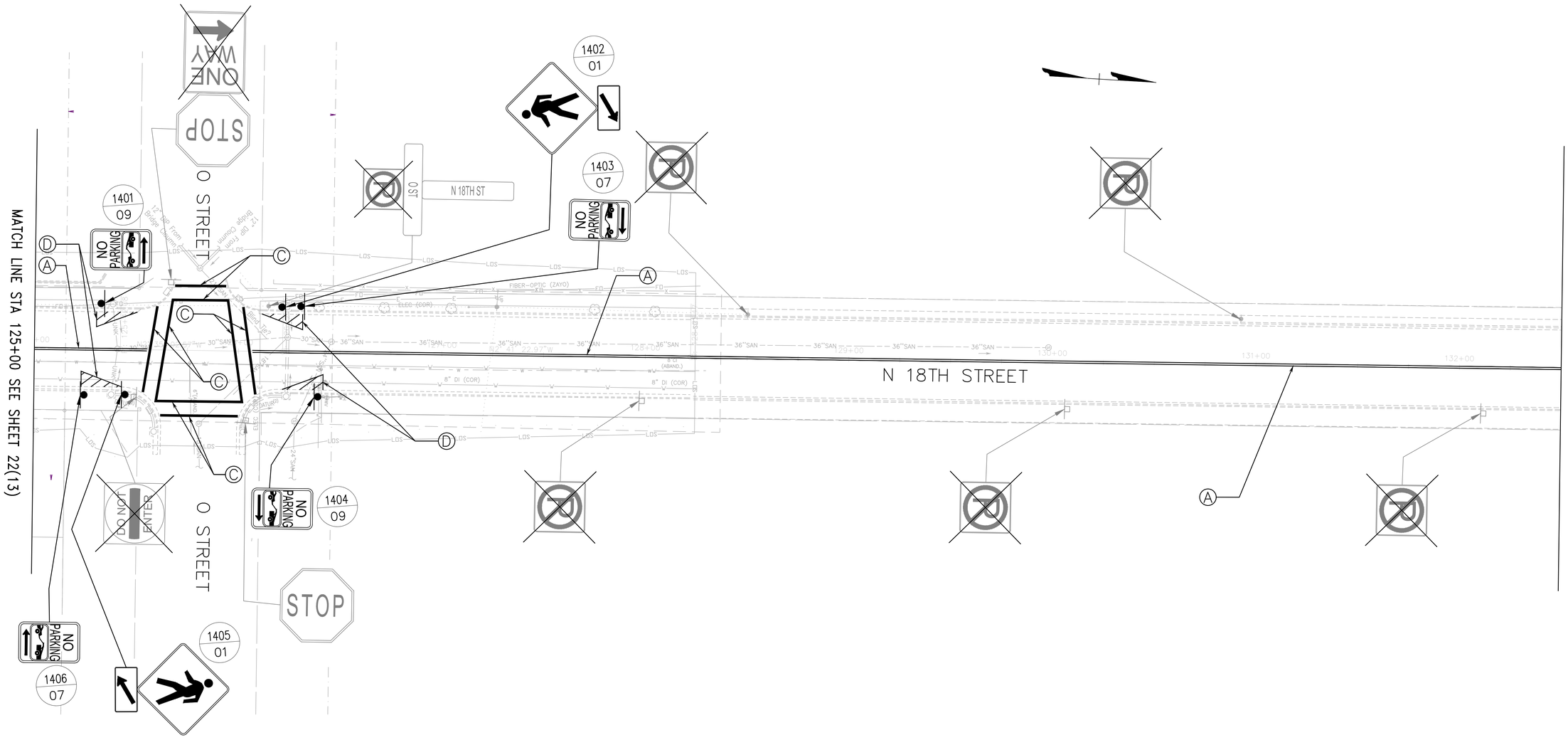
SHOCKOE VALLEY STREET IMPROVEMENTS

SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 22(13)	DRAWING NO. 0-28633



PROPOSED PAVEMENT MARKINGS LEGEND

- (A) TYPE B, CLASS I, 4" DOUBLE YELLOW
- (B) TYPE B, CLASS I, 24" SOLID WHITE
- (C) TYPE B, CLASS I, 12" SOLID WHITE
- (D) TYPE B, CLASS I, 4" SOLID WHITE
- (E) TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- (F) TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- (G) TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
- (H) TYPE B, CLASS I, 6" WHITE, 3' LONG, 9' SPACE
- (I) TYPE B, CLASS I, 12" WHITE, 2' LONG, 2' SPACE
- (J) TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- (K) TYPE B, CLASS I, 4" SOLID YELLOW
- (L) TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- (M) TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- (N) TYPE B, CLASS I, 6" WHITE, 30' SPACING

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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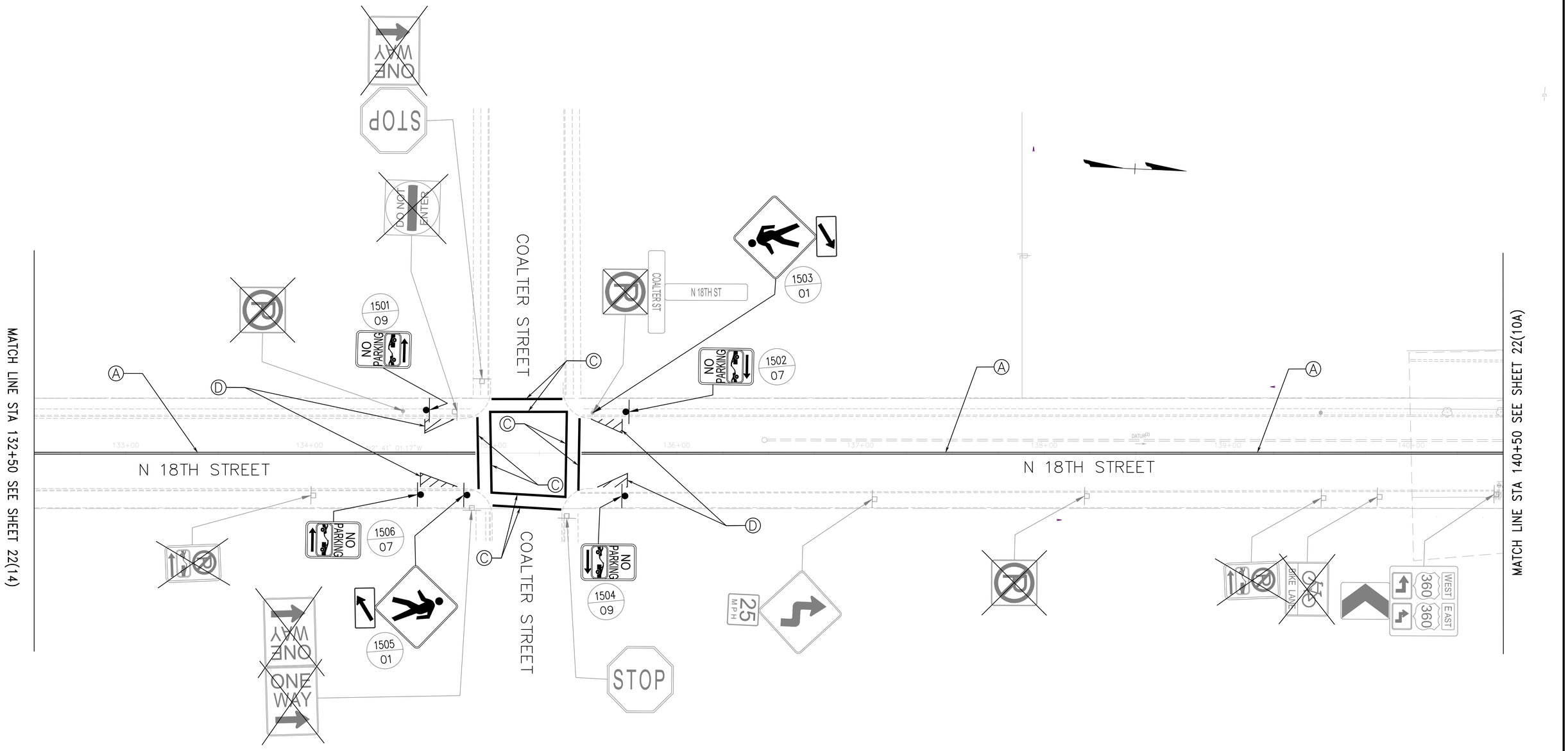
SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 22(14)	0-28633
CHECKED BY: ASamberg						



PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
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- Ⓔ TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- Ⓕ TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
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- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
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SCALE IN FEET: 25 0 25 50

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
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REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve; Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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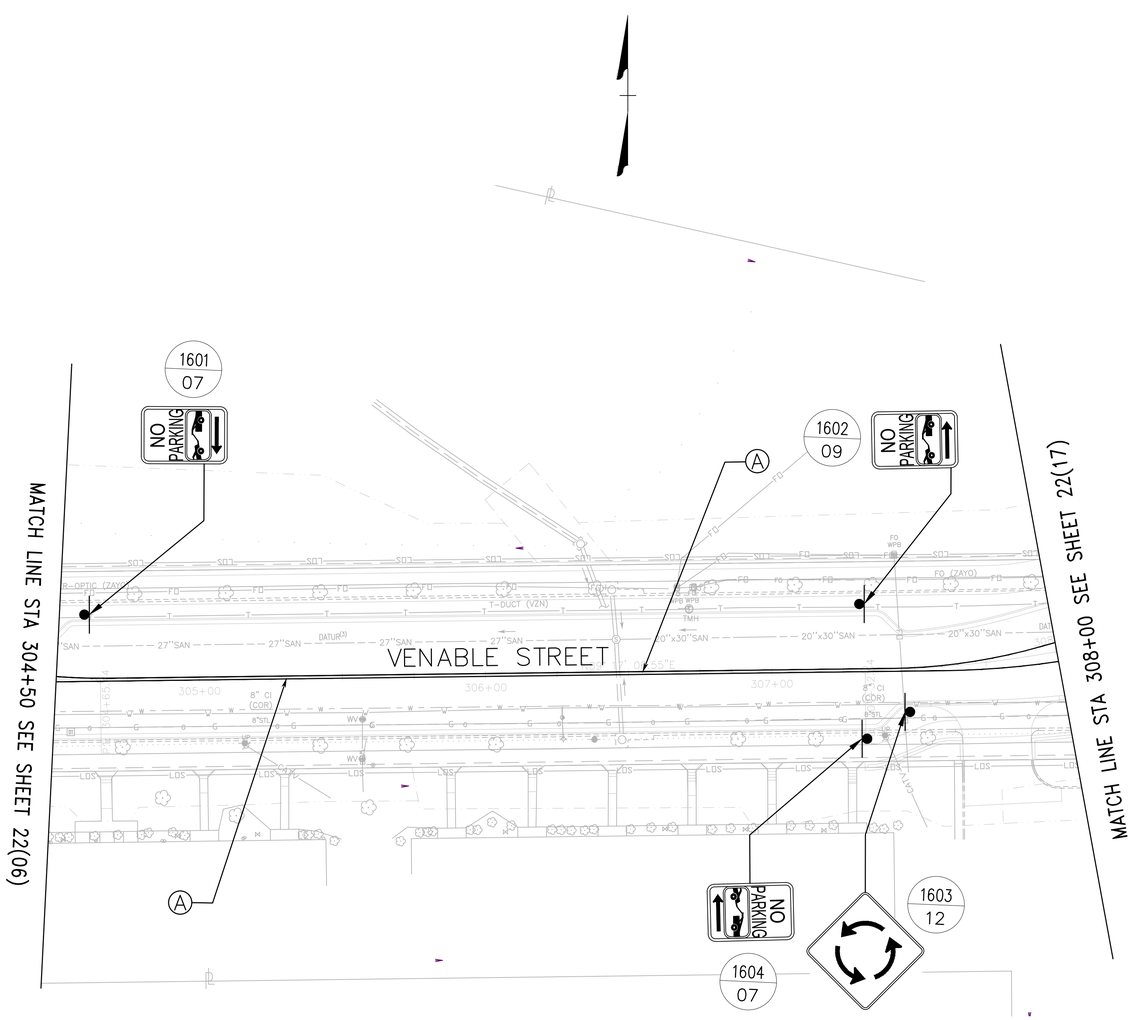
SHOCKOE VALLEY STREET IMPROVEMENTS

SIGNING AND PAVEMENT MARKING PLAN
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 22(15)	0-28633
CHECKED BY: ASamberg						



PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
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25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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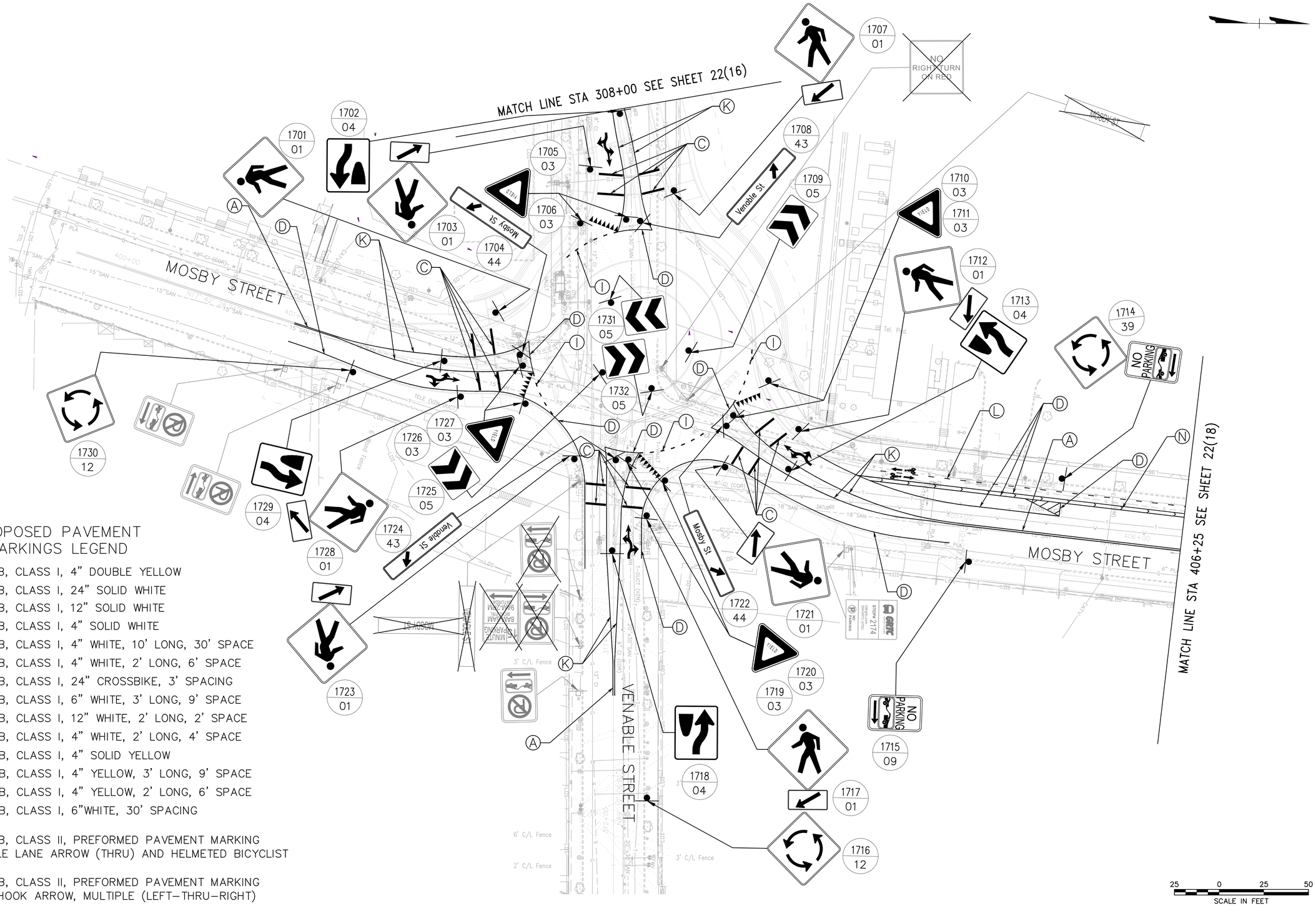
SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN
PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 22(16)	0-28633
CHECKED BY: ASamberg						



PROPOSED PAVEMENT MARKINGS LEGEND

- (A) TYPE B, CLASS I, 4" DOUBLE YELLOW
- (B) TYPE B, CLASS I, 24" SOLID WHITE
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- (F) TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- (G) TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
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- (K) TYPE B, CLASS I, 4" SOLID YELLOW
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- (M) TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- (N) TYPE B, CLASS I, 6"WHITE, 30' SPACING

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING
BICYCLE LANE ARROW (THRU) AND HELMETED BICYCLIST

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING
FISH-HOOK ARROW, MULTIPLE (LEFT-THRU-RIGHT)

TYPE B, CLASS I, 24" WHITE, YIELD LINE, 6" SPACING

70% SUBMITTAL
SEPTEMBER 2022

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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DDeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 22(17)	0-28633

PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
- Ⓓ TYPE B, CLASS I, 4" SOLID WHITE
- Ⓔ TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
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- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- Ⓝ TYPE B, CLASS I, 6" WHITE, 30' SPACING

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING BICYCLE LANE ARROW (THRU) AND HELMETED BICYCLIST

TYPE B, CLASS I, 24" WHITE, YIELD LINE, 6" SPACING

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING MESSAGE, SCHOOL

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING ELONGATED ARROW, SINGLE (RIGHT)

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING ELONGATED ARROW, SINGLE (LEFT)

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING ELONGATED ARROW, MULTIPLE (THRU–LEFT)

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING ELONGATED ARROW, MULTIPLE (THRU–RIGHT)

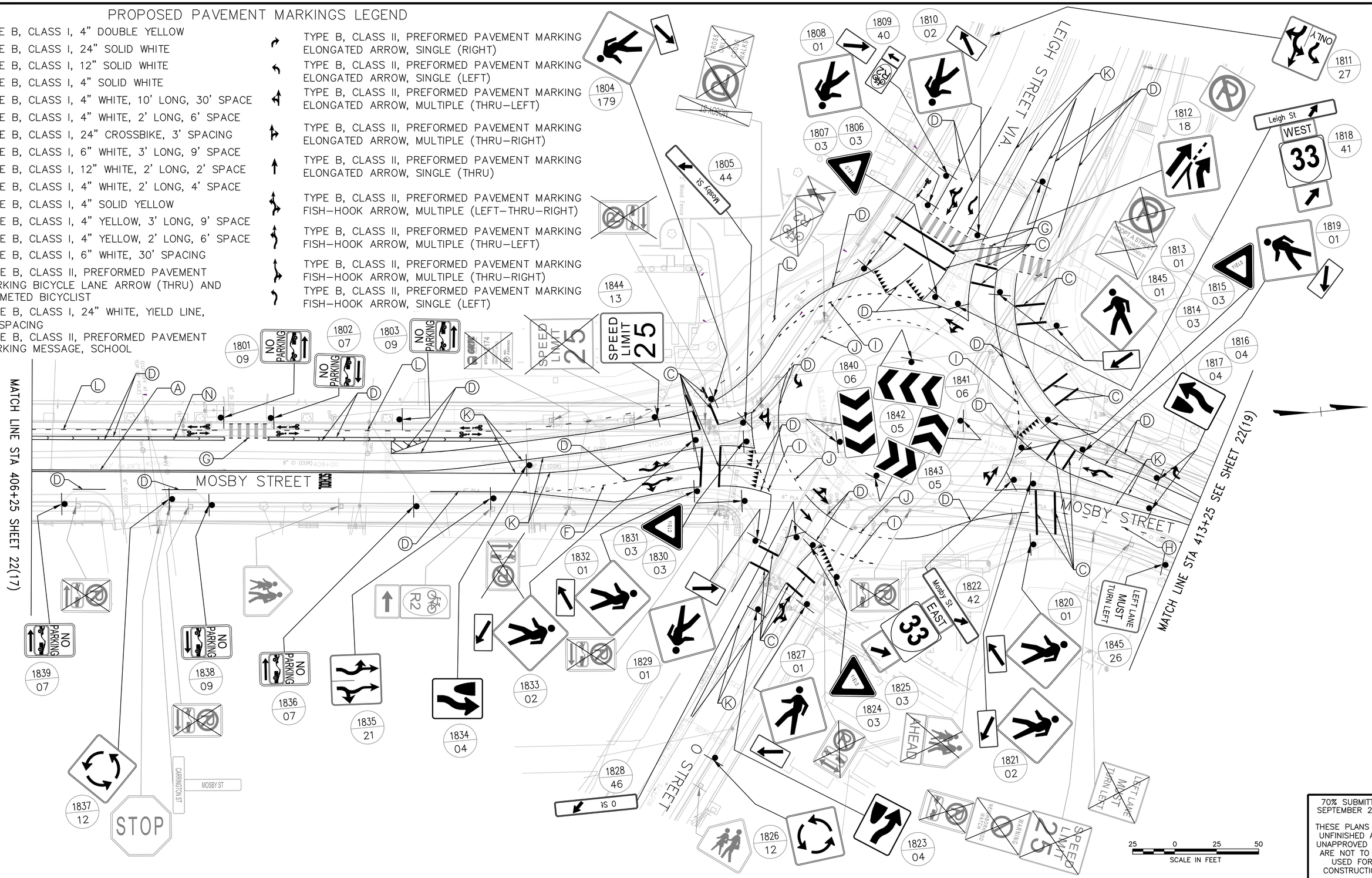
TYPE B, CLASS II, PREFORMED PAVEMENT MARKING ELONGATED ARROW, SINGLE (THRU)

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING FISH–HOOK ARROW, MULTIPLE (LEFT–THRU–RIGHT)

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING FISH–HOOK ARROW, MULTIPLE (THRU–LEFT)

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING FISH–HOOK ARROW, MULTIPLE (THRU–RIGHT)

TYPE B, CLASS II, PREFORMED PAVEMENT MARKING FISH–HOOK ARROW, SINGLE (LEFT)



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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4. Adopted_____
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REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
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Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions
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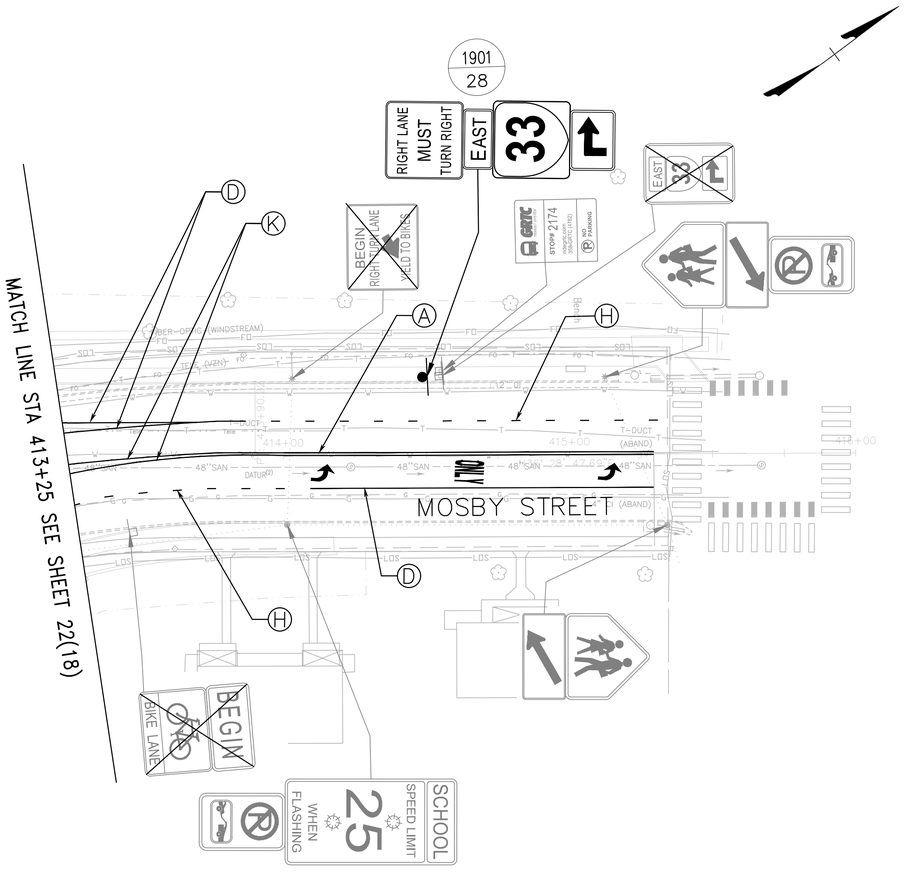
SHOCKOE VALLEY STREET IMPROVEMENTS

SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 22(18)	DRAWING NO. 0-28633



PROPOSED PAVEMENT MARKINGS LEGEND

- Ⓐ TYPE B, CLASS I, 4" DOUBLE YELLOW
- Ⓑ TYPE B, CLASS I, 24" SOLID WHITE
- Ⓒ TYPE B, CLASS I, 12" SOLID WHITE
- Ⓓ TYPE B, CLASS I, 4" SOLID WHITE
- Ⓔ TYPE B, CLASS I, 4" WHITE, 10' LONG, 30' SPACE
- Ⓕ TYPE B, CLASS I, 4" WHITE, 2' LONG, 6' SPACE
- Ⓖ TYPE B, CLASS I, 24" CROSSBIKE, 3' SPACING
- Ⓗ TYPE B, CLASS I, 6" WHITE, 3' LONG, 9' SPACE
- Ⓘ TYPE B, CLASS I, 12" WHITE, 2' LONG, 2' SPACE
- Ⓙ TYPE B, CLASS I, 4" WHITE, 2' LONG, 4' SPACE
- Ⓚ TYPE B, CLASS I, 4" SOLID YELLOW
- Ⓛ TYPE B, CLASS I, 4" YELLOW, 3' LONG, 9' SPACE
- Ⓜ TYPE B, CLASS I, 4" YELLOW, 2' LONG, 6' SPACE
- Ⓝ TYPE B, CLASS I, 6" WHITE, 30' SPACING
- ONLY — TYPE B, CLASS II, PREFORMED PAVEMENT MARKING MESSAGE, ONLY
- TYPE B, CLASS II, PREFORMED PAVEMENT MARKING ELONGATED ARROW, SINGLE (LEFT)

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

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REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve; Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions — vhb

SHOCKOE VALLEY STREET IMPROVEMENTS

SIGNING AND PAVEMENT MARKING PLAN PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 22(19)	DRAWING NO. 0-28633

GENERAL NOTES - TRAFFIC SIGNALS

1. All signing, striping and signalization shall be installed and constructed in accordance with the Virginia Department of Transportation (VDOT) Road and Bridge Standards and Specifications, applicable City of Richmond Standards, FHWA Manual on Uniform Traffic Control Devices (MUTCD), The Virginia Supplement to the MUTCD, and the Virginia Work Area Protection Manual. The contractor shall adhere to VDOT maintenance of traf'f'ic standards.

2. The following items and operations shall conform to the standard listed below:

   Signal Pole Foundation..... PF-8
   Pedestrian Pole Foundation..... PF-2
   Pedestrian Activation..... PA-2
   Pedestrian Signal Indications.....SP-8
   Conduit Installation..... ECI-1 or Bored
   Signal Head Hangers..... SM-3
   Ped Head Mounting..... SMB-3
   Sign Hanger..... SMD-2
   Junction Box..... JB-S1, JB-S2, JB-S3
   Electrical Service..... SE-3

3. The location of all field equipment including junction boxes, controller cabinets, poles, and termination cabinets, shall be located in the field and approved by the City of Richmond, Transportation Engineering Division prior to their installation.

4. The contractor shall be responsible f'or maintaining, adjusting and aligning equipment, including signal heads, during each stage of construction until the permanent traff'ic signal is constructed and placed in permanent operation.

5. All catalog cuts/shop drawings for equipment and materials shall be submitted to the City of Richmond, Transportation Engineering Division for review and approval.

6. Conatractor shall maintain signal until both the final inspection of work performed and the (30) day test period have been satisfied for each intersection. Once inspection and 30 day test has been completed, the city will assume maintenance.

7. All utility clearances are the responsibility of the contractor and shall be obtained prior to construction. Excavation within 2 feet of either gas or electric lines shall be performed by hand.

8. Installation dimensions shown within the plans are typical, field modifications may be made as required upon approval from the City Transportation Engineering Division.

9. All proposed conduits shall be installed in a common trench. standard manufacturer's conduit spacers shall be used to provide adequate separation.

10. The contractor shall adequately support, and be responsible for, all utility lines exposed as a result of construction activity shown on the plans.

11. The contractor shall provide access through the intersection at all times during construction and shall ensure the safety of pedestrians from both traffic and construction hazards.

12. All street name signs shall be green background, with white lettering and in accordance with city specifications, unless otherwise indicated. Street name signs shall be fabricated in accordance with the current editions of the VA supplement to the MUTCD.

13. All mast arm mounted signs (including mast arm street name signs) shall be an aluminum composite sign material and shall be installed in accordance with VDOT st'd SMD-2.

14. All stop lines, crosswalk, arrows, messages and lane lines shall be thermoplastic, VDOT Type B, Class I.

16. The contractor is responsible for verifying their own quantity take-offs and completing the project to the full intent of the plan.

17. Project activies will occur within existing City of Richmond right-of-way. the contractor shall notify the Surveys Division of the City of Richmond's Department of Public Works (804)646-0436 or (804)646-5404 at least 48 hours prior to any activities which may disturb the location or the stability of any right-of-way cornerstone or marker. The contractor will coordinate his work with the surveys division representative regarding the placement or replacement of right-of-way cornerstones or markers in any areas being affected by construction. All placement or replacement of right-of-way cornerstones or markers will be performed by the city's Surveys Division. The contractor will be responsible for reimbursing the city for any costs associated with replacing any right-of-way cornerstones or markers that are disturbed without giving proper notification.

18. Concrete sidewalk repairs or replacements shall have a rough broom finish.

19. The traf'fic signal controller must provide all features and functions of existing controllers in the City of Richmond's Signal System. The contractor shall provide evidence of compatiblity between the proposed traffic signal controller and the City of Richmond's control system before final acceptance.

20. The contractor shall deliver any existing traffic signs and traffic signal equipment removed to the City of Richmond at 3522 N. Hopkins Road Richmond, VA. 23224. The contractor will be responsible for the disposal of any existing traffic signal equipment that the city of richmond refuses at delivery. It is the contractor's responsibility to coordinate 48 hours prior to delivery by calling (804) 646-1065.

21. Any pavement markings that will conflict with the proposed pavement markings shall be completely eradicated.

22. Contractor shall make necessary construction notifications and apply for and obtain all necessary permits and post any bonds associated with the work indicated on these plans. Contractor shall not close or obstruct any existing roadways, sidewalks, or fire hydrants without obtaining the appropriate permit from the City.

23. Areas outside the limits of the proposed work, which are disturbed by the Contractor's activities, shall be restored back to their original condition by the contractor at the contractor's expense.

24. Symbols and legends of project features are graphic representations and are not necessarily scaled to their actual dimensions or exact locations on the drawings. The contractor shall refer to the detail sheet dimensions, the manufacturer's literature, shop drawings and field measurements of the supplied products for layout and installation of the project features.

25. Following implementation of new traffic signal timings the Contractor shall have a qualified representative present to monitor traffic flow and adjust timings as directed by the City of Richmond Traffic Engineering staff as necessary.

26. Traffic signal foundation depths and above ground foundation projection/reveal shall be field verifed by the Contractor in accordance with PF-8 standards upon completion of the soil test bores. Signal poles and foundations shall be in accordance with Geotechnical design recommendations including maximum loading conditions. The pole supplier shall provide shop drawings that are signed and sealed by a Professional Engineer licensed in Virginia. The Geotechnical Engineer shall provide shop drawings for the design of all PF-8 foundations that are signed and sealed by a Professional Engineer licensed in Virginia. The top of all signal pole foundations shall be installed a minimum of 12" above finished grade. Signal pole and foundation heights shall allow for required signal head to pavement distances per VDOT Standards.

27. Utilities shown on the plans are not guaranteed to be complete or accurate. The Contractor shall be responsible for ensuring that all utilities within the project limits are identified and located before beginning work. The Contractor shall contact Miss Utility of Virginia at 1-800-522-7001, 48 hours prior to any construction activities. Contractor shall coordinate with utility companies as to the location of existing and approved plans of future utility lines. Any disruption of any utility service is the responsibility and solely the cost of the Contractor.

28. New LED traffic signal heads and overhead traffic signal signage shall be covered with a durable non-transparent cover upon installation. The Contractor shall maintain covers until the new traffic signal system is operational, unless directed by the City's Traffic Engineer.

29. All unused wires in the signal heads shall be capped individually with crimp type caps.

30. The Contractor shall label all spare wires in the controller cabinet, in accordance with section 700.04(g) of the VDOT Road and Bridge Specifications.

31. The cost of Equipment Grounding Conductor (#8 AWG EGC) shall be included in the cost of conduits.

32. Conduit systems shall be bonded in accordance with Section 700 of the Road & Bridge Specifications.

33. All signal heads shall have retroreflective backplates. Backplate hardware shall be stainless steel.

34. The Contractor shall be responsible for providing and maintaining electrical service to the signal controller at all times. The Contractor shall be responsible for all costs associated with providing/continuing electrical service to the traffic signal until City accpetance of the signal.

35. Hanger assembly brackets for angled traffic signal heads shall be installed such that backplates can be installed without alteration or modification.

36. No junction boxes shall be installed in roadway surface, paved shoulders, or in multi-purpose trails/paths.

37. Junction box covers shall have the letters "TRAF" cast in the top surface depression for all traffic signal related junction boxes containing cable with less than 50 volts. All other junction box covers shall have "ELEC" cast in the top surface depression.

38. All breakaway poles shall have breakaway fuses.

39. Dimensions used for locating equipment (such as signal head assemblies, signs, etc.) on mast arms are measured to the center of the symbols used to indicate the equipment.

40. The Contractor shall verify mast arms lengths and signal head lane coverage prior to the installation of signal pole foundations.

41. In accordance with VDOT IIM TE-388, pedestrian signal equipment shall be APS (accessible pedestrian signal) compliant and communicate information about pedestrian signal timing in non-visual format such as audible tones, speech messages, and/or vibrating surfaces,

42. All existing traffic control devices including signs, signal heads, brackets, push buttons, and pedestrian signal heads that are removed from a project are to be returned to the City's traffic engineering shop at 3522 Hopkins Road, Richmond VA.

INDEX OF SHEETS

STANDARD TRAFFIC SIGNAL LEGEND

PLAN ITEM	PLAN SYMBOL PROPOSED	PLAN SYMBOL EXISTING
Metal Signal Pole & Foundation and Mast Arm (As noted in Signal Pole Legend)		
Pedestal Pole and Foundation (St'd.PF-2)		
Pedestal Pole and Foundation (St'd.PA-3)		
Traffic Signal Head w/ Backplate		
Traffic Signal Head w/o Backplate		
Pedestrian Signal Head		
Pedestrian Pushbutton & Sign	PB	PB
Traffic Signal Sign Mast Arm or Span Wire Mt'd.		
Traffic Signal Sign Pole Mounted		
Emergency Vehicle Pre-emption (EVP) Sensor w/ Conf.Light		
Emergency Vehicle Pre-emption (EVP) Sensor w/o Conf.Light		
Video Detection Camera		
Junction Box (St'd.as noted on plans)	J	J
Signal Luminaire (250 W) and Arm		
Signal Luminaire (400 W) and Arm		
Loop Detector (Size as noted on plans)	6' x 20'	6' x 20'
Video Detection Zone (Size as noted on plans)	VDZ 6' x 20'	VDZ 6' x 20'
Conduit		

PLAN ITEM		PLAN SYMBOL PROPOSED	PLAN SYMBOL EXISTING
Electrical Service Meter		SM	SM
Electrical Service Safety Switch (Disconnect)		SD	SD
Controller Cabinet	Ground Mounted	CC	CC
Controller Cabinet	Pole Mounted	PC	PC
Master Controller Cabinet	Ground Mounted	MC	MC
Master Controller Cabinet	Pole Mounted	PMC	PMC
Controller Cabinet & Foundation	Std.CF-1	1	1
Controller Cabinet & Foundation	Std.CF-3	CC 3	CC 3
Controller Cabinet & Foundation	Std.CF-4	CC 4	CC 4
Master Controller Cabinet & Foundation	Std.CF-1	MC 1	MC 1
Master Controller Cabinet & Foundation	Std.CF-3	MC 3	MC 3
Master Controller Cabinet & Foundation	Std.CF-4	MC 4	MC 4
Uninterruptible Power Supply Cabinet		UPS	UPS

LABELS

Signal Pole or Controller	A	Proposed Signal Head	2	Signal Phasing	Ø2
Cable and Conduit	A	Existing Signal Head	2	Pedestrian Phasing	P2
Junction Box	S3	Proposed Pedestrian Signal Head	P2		
		Existing Pedestrian Signal Head	P2		

Sign	S-1
Video Detection Camera	VDC-1
Emergency Preemption Detector	EVP-1

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES | REVISIONS

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Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole (SMH); Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS

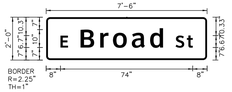
TRAFFIC SIGNAL PLAN

GENERAL NOTES AND LEGEND

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 23(1)	0-28633
CHECKED BY: ASamberg						

SIGN DETAIL

1:50



SIGN NUMBER	name
WIDTH x HGHT.	7'-6" x 2'-0"
BORDER WIDTH	1"
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

SYMBOL	ROT	X	Y	WID	HT

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES/SIZE
E	B	r	o	a	d	S	t															Clearview-5W
8	19.3	30.3	37.4	47.9	58.1	72.4	78.7														74	6.7,10/8.1,6.7/5.4

SIGN DETAIL

1:50

SIGN NUMBER	name
WIDTH x HGHT.	11'-0" x 2'-6"
BORDER WIDTH	1"
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

SYMBOL	ROT	X	Y	WID	HT
AR_Type D	90	5	17	9	13
AR_Type D	270	114	3	9	13

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES/SIZE
O	l	i	v	e	r		H	i	l	l		W	a	y								Clearview-5W
23	33.3	38.1	41.8	49.7	58.3	62	70.8	79.9	84.6	89.6	92.1	100.2	112.6	120.2							103.4	8/6.5
N		1	7	t	h	S	t															Clearview-5W
55.6	59.9	67	73	80.2	86.5	99.7	104.7														51.8	5.3,8/6.5,5.3/4.3

SIGN DETAIL

1:50

SIGN NUMBER	name
WIDTH x HGHT.	11'-1" x 2'-7"
BORDER WIDTH	1"
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

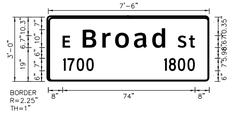
SYMBOL	ROT	X	Y	WID	HT
AR_Type D	90	5	18	9	13
AR_Type D	270	114	4	9	13

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES/SIZE
N		1	7	t	h	S	t															Clearview-5W
23.9	28.2	35.3	41.3	48.5	54.8	68	73														51.8	5.3,8/6.5,5.3/4.3
O	l	i	v	e	r		H	i	l	l		W	a	y								Clearview-5W
7.2	17.5	22.2	26	33.9	42.5	46.2	55	64.1	68.8	73.7	76.3	84.4	96.8	104.3							103.4	8/6.5

SIGN DETAIL

1:50



SIGN NUMBER	name
WIDTH x HGHT.	7'-7" x 3'-1"
BORDER WIDTH	1"
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

SYMBOL	ROT	X	Y	WID	HT

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																					LENGTH	SERIES/SIZE
E	B	r	o	a	d	S	t															ClearviewHwy-5-W
8	19.3	30.3	37.4	47.9	58.1	72.4	78.7														74	6.7,10/8.1,6.7/5.4
1	7	0	0																			C 2000
8.3	10.7	15.9	21.3																		17.7	7
1	8	0	0																			C 2000
64.8	67.5	72.4	77.8																		17.2	7

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Pence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS

TRAFFIC SIGNAL PLAN

TRAFFIC SIGNAL SIGN FIGURE DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 23(2A)	0-28633

SIGNAL POLE FOUNDATION NOTES:

1. FOUNDATIONS

   A. FOUNDATIONS SHALL BE CONTRACTOR DESIGNED AND CONSTRUCTED ACCORDING TO SECTION 700.04 OF THE 2020 VDOT ROAD AND BRIDGE SPECIFICATIONS. THE CONTRACTOR SHALL PROVIDE WORKING DRAWINGS AND DESIGN CALCULATIONS PER SECTION 700.04 STAMPED AND SEALED BY A PROFESSIONAL ENGINEER (PE) LICENSED TO PRACTICE IN THE COMMONWEALTH OF VIRGINIA, FOR APPROVAL.
   B. FOOTINGS SHALL BE CIRCULAR BELOW GROUND AND SQUARE ABOVE GROUND.
   C. FOR BIDDING PURPOSES ONLY, CONTRACTOR SHALL ASSUME A POLE FOUNDATION DIAMETER OF 4' AND A DEPTH OF 22' FOR EACH SIGNAL POLE.
   D. FOR BIDDING PURPOSES ONLY, CONTRACTOR SHALL ASSUME 20-#10 VERTICAL REINFORCING STEEL TIED WITH #4 HOOP BARS AT 6" ON CENTER. THE #4 HOOP BARS SHALL HAVE A 1'-0" MINIMUM OVERLAP.

2. MATERIALS

   A. ALL EXPOSED CONCRETE SHALL HAVE A NORMAL FINISH.
   B. CONCRETE SHALL BE RODDED OR VIBRATED WHILE POURING.
   C. REINFORCING STEEL SHALL CONFORM TO THE 2020 VDOT ROAD AND BRIDGE SPECIFICATIONS.
   D. REINFORCING STEEL SHALL NOT BE CLOSER THAN 3" TO THE OUTSIDE SURFACE OF THE FOOTING AND SHALL BE TIED.
   E. PROVIDE 60" ANCHOR BOLTS. PROVIDE #4 MINIMUM REINFORCING STEEL TIED TO ANCHOR BOLTS AT 18" INTERVALS.

3. FORMS

   A. NO FORMS MAY EXTEND TO A DEPTH GREATER THAN 12" UNLESS APPROVED BY THE CITY TRAFFIC ENGINEER.

4. CABINET INSTALLATION

   A. TRAFFIC SIGNAL CONTROLLER CABINET FOUNDATIONS SHALL BE LOCATED AS INDICATED ON INTERSECTION PLAN SHEET.
   B. CONTROLLER CABINET ANCHOR BOLTS SHALL BE GROUNDED TO METAL CONDUIT OR A GROUNDING WIRE.
   C. CABINET AND FOUNDATION SHALL BE CONSTRUCTED PER VDOT STANDARDS.

5. NOTES TO CONTRACTOR FOR POLE FOUNDATIONS

   A. FOUNDATION TO BE CAST AGAINST UNDISTURBED SOIL.
   B. FOR ADDITIONAL CONDUIT LAYOUT NOT SHOWN, SEE VDOT ROAD AND BRIDGE STANDARDS.
   C. REFER TO VDOT ROAD AND BRIDGE STANDARDS FOR CONSTRUCTION DETAILS AND ADDITIONAL INFORMATION.
   D. MARK TOP OF FOUNDATION WITH A TROWEL TO INDICATE TYPE AND DEPTH.
   E. PROVIDE 1/4" THICK STEEL TEMPLATE WITH BOLT DIA. + 1/16" DIA. HOLE FOR INSTALLATION.
   F. ALL UNDERGROUND UTILITIES SHALL BE MAINTAINED IN OPERATION BY THE CONTRACTOR DURING THE ENTIRE CONSTRUCTION PERIOD. ANY DAMAGE TO THE EXISTING UTILITIES BY THE CONTRACTOR SHALL BE REPAIRED/REPLACED AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
   G. FOUNDATION TO EXTEND MIN. 1'-0" ABOVE GROUND IN NON PEDESTRIAN AREAS, AND SHALL BE INSTALLED FLUSH IN PEDESTRIAN AREAS.

SPECIFICATIONS:

THE DESIGN AND INSTALLATION SHALL CONFORM TO THE FOLLOWING STANDARDS AND SPECIFICATIONS:

CONSTRUCTION: VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS.

DESIGN: AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, AND VDOT MODIFICATIONS. AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES, AND TRAFFIC SIGNALS SIXTH EDITION AND LATEST REVISIONS.

STANDARDS: VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS.

THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE VIRGINIA DEPARTMENT OF TRANSPORTATION WORK AREA PROTECTION MANUAL AND LATEST REVISIONS.

CONCRETE SHALL BE CLASS A3 (F'c = 3000 PSI) AIR ENTRAINED. CONCRETE PLACED IN WATER SHALL BE CLASS T3. DEFORMED REINFORCING BARS SHALL CONFORM TO ASTM A615 GRADE 60. MINIMUM COVER FOR ANY BAR SHALL BE (4") UNLESS OTHERWISE NOTED. REINFORCING BAR DIMENSIONS ON THE DETAILED DRAWINGS ARE TO CENTER OF BARS EXCEPT WHERE OTHERWISE NOTED AND ARE SUBJECT TO FABRICATION AND CONSTRUCTION TOLERANCES. ALL EXPOSED CONCRETE EGRESS SHALL BE CHAMFERED 3/4" X 3/4" UNLESS OTHERWISE NOTED.

ALL ANCHOR BOLTS SHALL BE PLUMB.

NO MORTAR, GROUT OR CONCRETE SHALL BE PLACED BETWEEN BOTTOM OF BASE PLATE AND TOP OF THE FOUNDATION PER VDOT ROAD & BRIDGE STANDARD 1310.11.

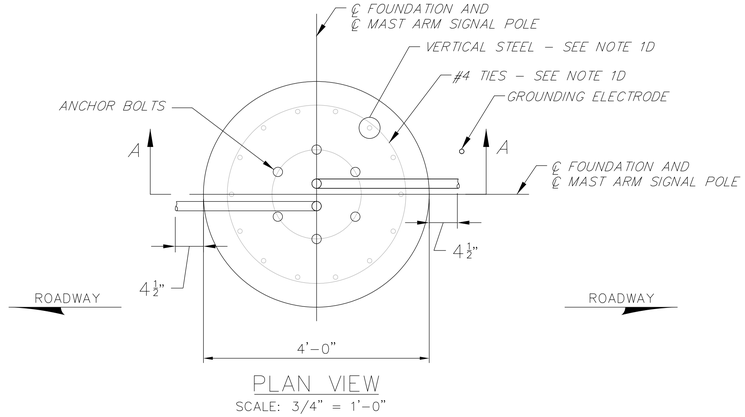
IF GROUND WATER WAS ENCOUNTERED IN THE DRILLED SHAFT, THEN CONCRETE IS TO BE PLACED BELOW THE WATER TABLE. CONTRACTOR TO USE TREMIE OR OTHER VDOT APPROVED METHODS.

SHOP DRAWINGS:

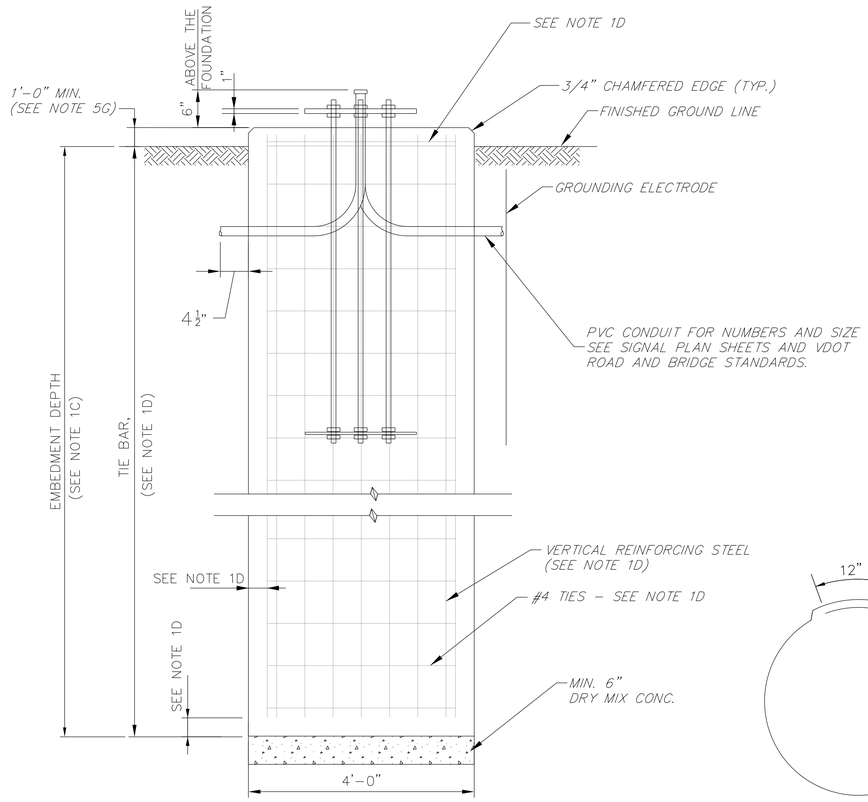
CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR THE REINFORCING STEEL FOR APPROVAL BEFORE ANY MATERIAL IS ORDERED OR FABRICATED.

REFERENCE NOTES:

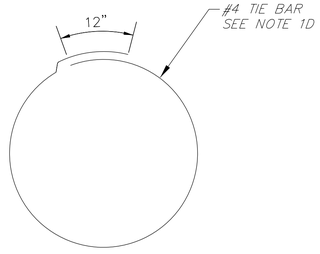
FOR LOCATION OF THE TRAFFIC SIGNAL POLE FOUNDATIONS SEE SIGNAL PLAN.



PLAN VIEW
SCALE: 3/4" = 1'–0"



SECTION A–A
SCALE: 3/4" = 1'–0"



TIE BAR DETAIL
SCALE: 3/4" = 1'–0"

70% SUBMITTAL
SEPTEMBER 2022

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Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

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Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS

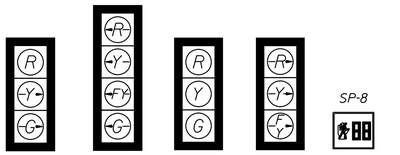
TRAFFIC SIGNAL PLAN

TRAFFIC SIGNAL POLE FOUNDATION DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	23(28)	0-28633
CHECKED BY: ASamberg					SHEET	

Proposed Signals



(Signal Heads shall be 12" LED with retroreflective backplates))

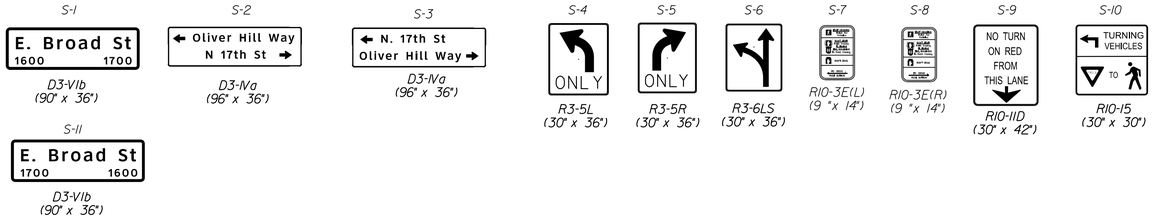
SPECIFICATIONS FOR CONTROLLER CABIENTS

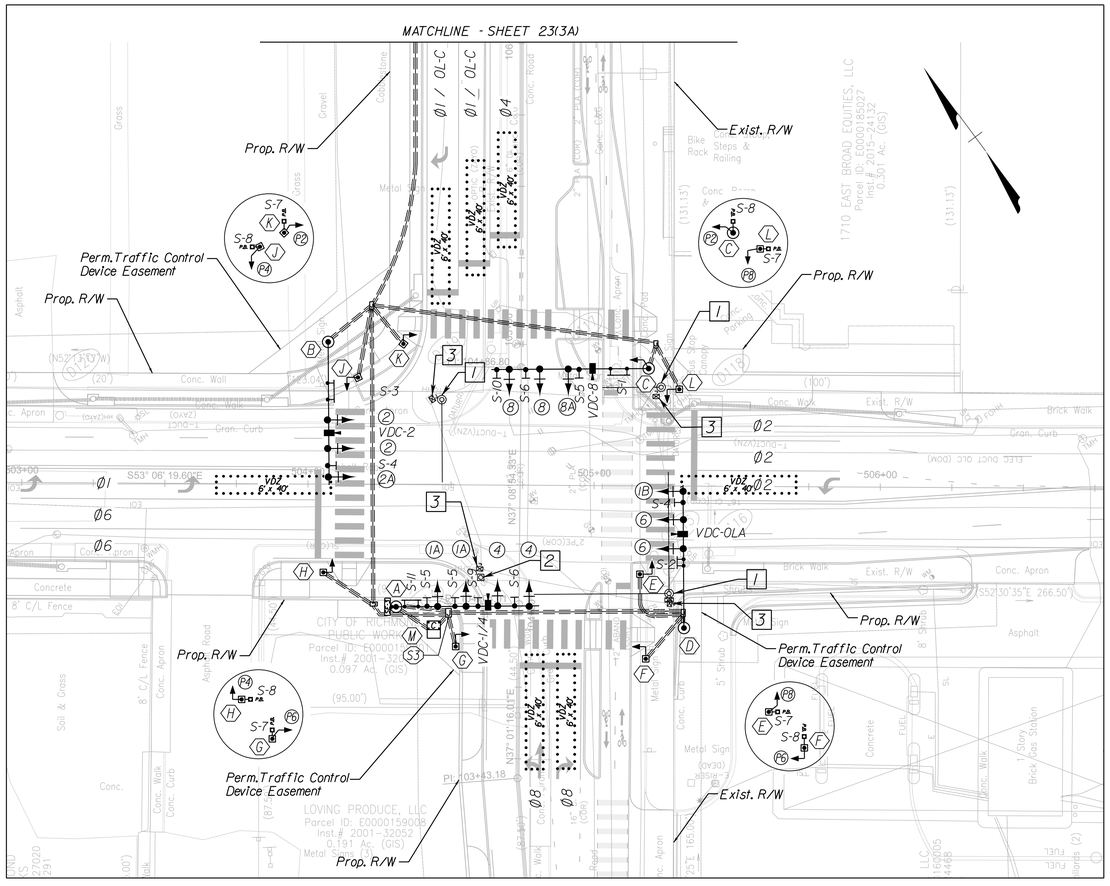
CONTROLLER CABINETS SHALL BE GROUIND MOUNTED ON VDOT STANDARD CF-1 FOUNDATIONS.CONCRETE WORK PADS IN FRONT OF CONTROLLER CABINETS MAY BE OMITTED WHERE CABINET IS TO BE INSTALLED IN AREAS SURROUNDED BY CONCRETE SIDEWALK OR BRICK PAVER SIDEWALKS.CABINETS SHALL CONFORM TO NEMA TS-2 STANDARDS AND SHALL BE POWDER COATED FEDERAL GREEN (COLOR 14077).

SPECIFICATIONS FOR RICHMOND HISTORIC SIGNAL POLES

POLE,STEEL ANCHOR BASE,AND MAST ARM: SIGNAL POLE SHALL BE 16 POINT FLUTED.MAST ARM TO BE SMOOTH SURFACE AND CURVED WITH A 5 FOOT RISE.MAST ARM TO BE MOUNTED WITH CENTER LINE OF MAST ARM AT 20'-0" FROM THE BOTTOM OF SIGNAL POLE BASE PLATE. MAST ARM BRACKET SHALL BE MOUNTED ON POLE PERPENDICULAR (90 DEGREES) TO THE CURB LINE.NO WIRE OUTLET HOLES SHALL BE PRE-DRILLED IN MAST ARM. RUBBER GROMEMETS SHALL BE PROVIDED.MAST ARM END CAP SHALL BE PROVIDED.SIGNAL POLE ANCHOR RODS SHALL BE PROVDED WITH DOUBLE NUTS AND DECORATIVE NUT COVERS. SIGNAL POLE SHALL HAVE HANDHOLE 18" ABOVE BASEPLATE WITH HANDHOLE COVER.AND A POLE TOP CAP SHALL BE PROVIDED. ALL EQUIPMENT INCLUDING POLE,MAST ARM,BASE PLATES, COVERS,END CAPS,TOP CAPS,AND FASTENING HARDWARE SHALL BE POWER COATED FEDERAL GREEN. CONTRACTOR TO PREPARE AND PROVIDE POLE FOUNDATION DESIGN AND DETAILS TO THE CITY FOR REVIEW AND APPROVAL. MAST ARMS,SIGNAL POLES,AND FOUNDATIONS SHALL BE DESIGNED TO WITHSTAND LOADINGS AS SPECIFIED IN THE 2016 VDOT ROAD AND BRIDGE STANDARD MP-3 "MAXIMUM LOADING STANDARDS" FOR THE MAST ARM LENGTH SPECIFIED OR THE PROJECT SPECIFIED LOADING,WHICH EVER IS GREATER. TRAFFIC SIGNAL STRUCTURES SHALL BE DESIGNED IN ACCORDANCE WITH SECTION 700 OF THE 2016 VDOT SPECIFICATION.VDOT S&B IIM 90.2,AND THE 2013 AASHTO STANDARDS.USING A WIND LOADING OF 80MPH.

Proposed Signs





Signal Pole & Controller Legend

(A) PROP. RICHMOND HISTROIC MAST ARM POLE & FOUNDATION
Install SE-3, Type-A, Electrical Service
42.7' Right of Rte.250 (Broad St) Sta.504+31.00
50' Mast Arm Perpendicular to Rte 250
Signal Placement: 14.5', 24.5', 34.5', 44.5'
Sign Placement: 5', 11', 21', 29', 41'
Video Dect. Placement: 32'

(B) PROP. RICHMOND HISTROIC MAST ARM POLE & FOUNDATION
49.0' Left of Rte.250 (Broad St) Sta.504+06.80
50' Mast Arm Perpendicular to Rte 250
Signal Placement: 27', 37', 47'
Sign Placement: 17', 43'
Video Dect. Placement: 32'

(C) PROP. RICHMOND HISTROIC MAST ARM POLE & FOUNDATION
41.0' Left of Rte.250 (Broad St) Sta.505+18.80
55' Mast Arm Parallel to Rte 250
Signal Placement: 28.5', 38.5', 48.5'
Sign Placement: 11', 24', 43', 53'
Video Dect. Placement: 20'

(D) PROP. RICHMOND HISTROIC MAST ARM POLE & FOUNDATION
49.6' Right of Rte.250 (Broad St) Sta.505+31.10
50' Mast Arm Perpendicular to Rte 250
Signal Placement: 11', 20', 29'
Sign Placement: 23', 44'
Video Dect. Placement: 33'

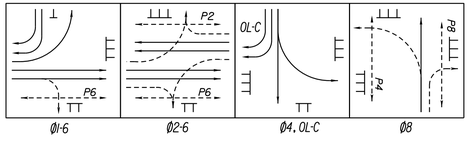
(E) PEDESTRIAN PEDESTAL,PF-2.12'
(F) PEDESTRIAN PEDESTAL,PF-2.12'
(G) PEDESTRIAN PEDESTAL,PF-2.12'
(H) PEDESTRIAN PEDESTAL,PF-2.12'
(J) PEDESTRIAN PEDESTAL,PF-2.12'
(K) PEDESTRIAN PEDESTAL,PF-2.12'
(L) PEDESTRIAN PEDESTAL,PF-2.12'
(M) CONTROLLER CABINET & FOUNDATION (CF-1)

Color Sequence Chart

SIGNALS	SIGNAL	PHASES 1	2	4	6	8	OL-C	COMBINATIONS 1-6	2-6	FLASH
	1A	-G-			-G-		-G-	-G-		R
	1B	-G-			-G-			-G-	-FY-	-Y-
	2		G					G	G	Y
	2A		-G-						-FY-	-Y-
	4			G						R
	6				G				G	Y
	8					G				R
	8A					-FY-				-R-
	P2	DW	Walk	DW	DW	DW	DW	DW	Walk	Blank
	P4	DW	DW	DW	DW	Walk	DW	DW	DW	Blank
	P6	DW	DW	DW	Walk	DW	DW	Walk	Walk	Blank
	P8	DW	DW	DW	DW	Walk	DW	DW	DW	Blank

EMPTY BOX DENOTES RED INDICATION.

Phasing Diagram



CABLE AND CONDUIT LEGEND

To be included in next submission

Clearance Chart

R/W	CLEARANCE 1	2	NEXT Ø
G	Y	R	R
-G-	-Y-	-R-	-R-
-G-	-Y-	R	R
-FY-	-Y-	-R-	-R-
W	CD	DW	DW

W - Walk
CD - Countdown (Flashing Don't Walk)
DW - Don't Walk

CONSTRUCTION NOTES

1. Remove existing mast arm pole and remove founadtion to 2' below finished grade.
2. Remove existing pedestrian pole and remove founadtion to 2' below finished grade.
3. Remove existing junction box and existing wiring, cap and abandon conduits.

JUNCTION BOX LEGEND

All Junction Boxes shall conform to St'd.JB-S2 unless otherwise noted on the plans.

(S1) Denotes St'd.JB-S1
(S3) Denotes St'd.JB-S3

SCALE
0 25' 50'

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20_
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Water Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions
vhb

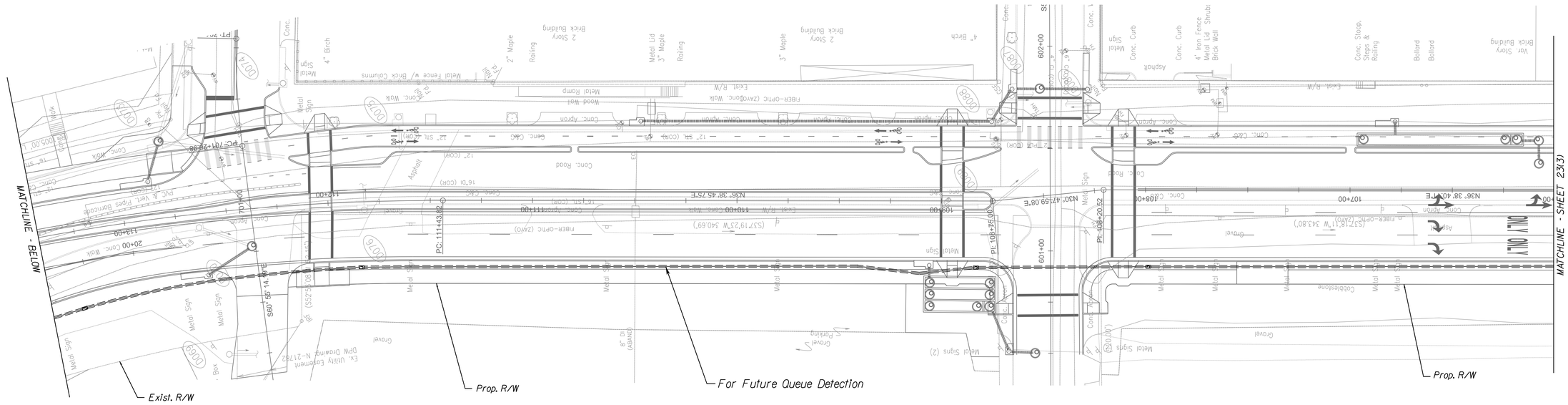
SHOCKOE VALLEY STREET IMPROVEMENTS

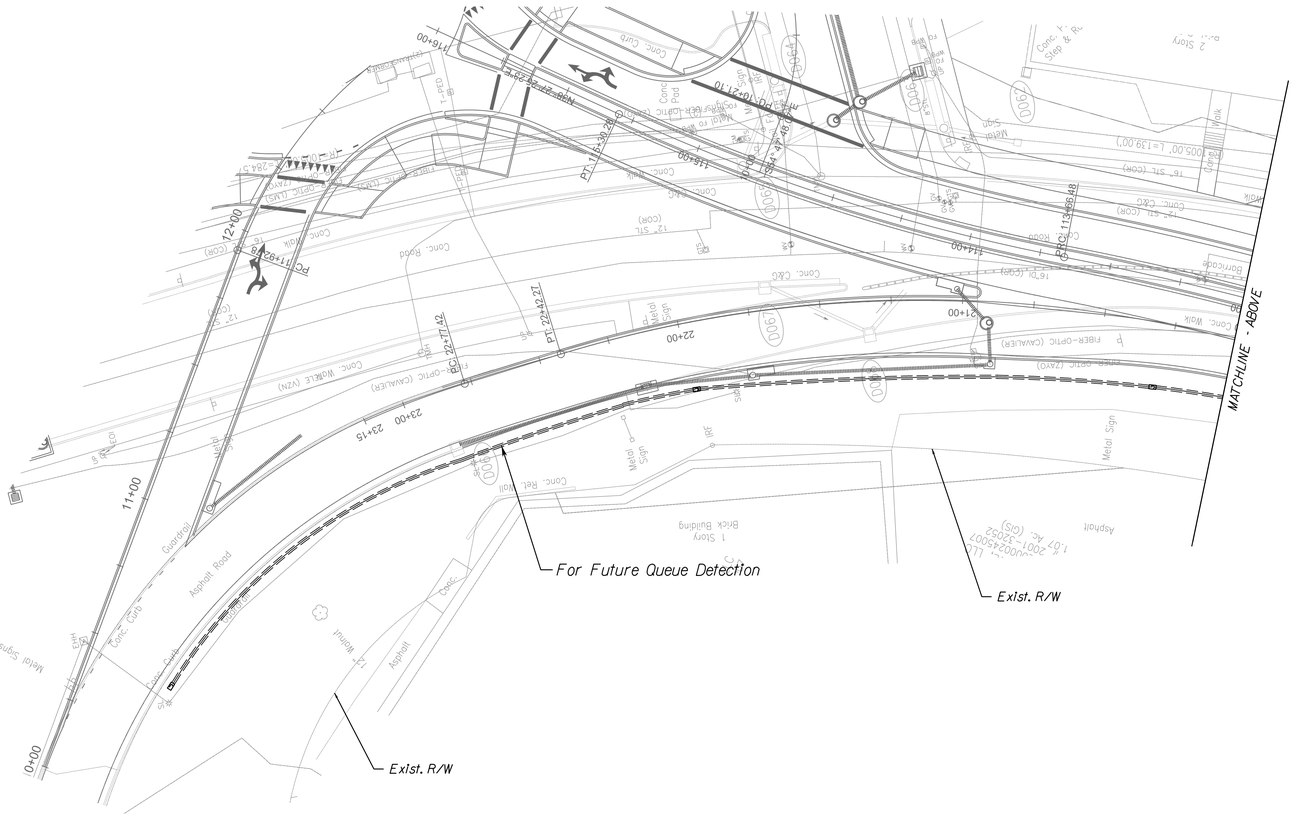
TRAFFIC SIGNAL PLAN

(E. BROAD ST AND 17TH ST)

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 23(3)	0-28633
CHECKED BY: ASamberg						





70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

SCALE
0 25' 50'

NOTES

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2. Property owners correct as of _____, 20_
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions
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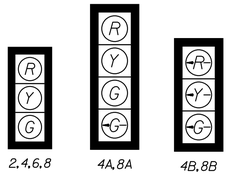
SHOCKOE VALLEY STREET IMPROVEMENTS

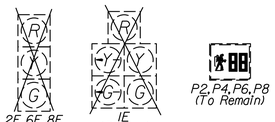
TRAFFIC SIGNAL PLAN

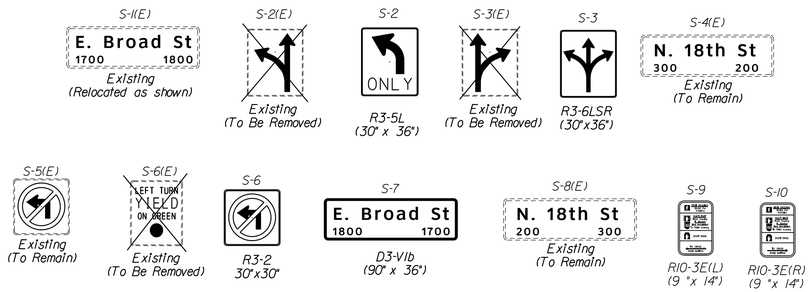
(E. BROAD ST AND 17TH ST)

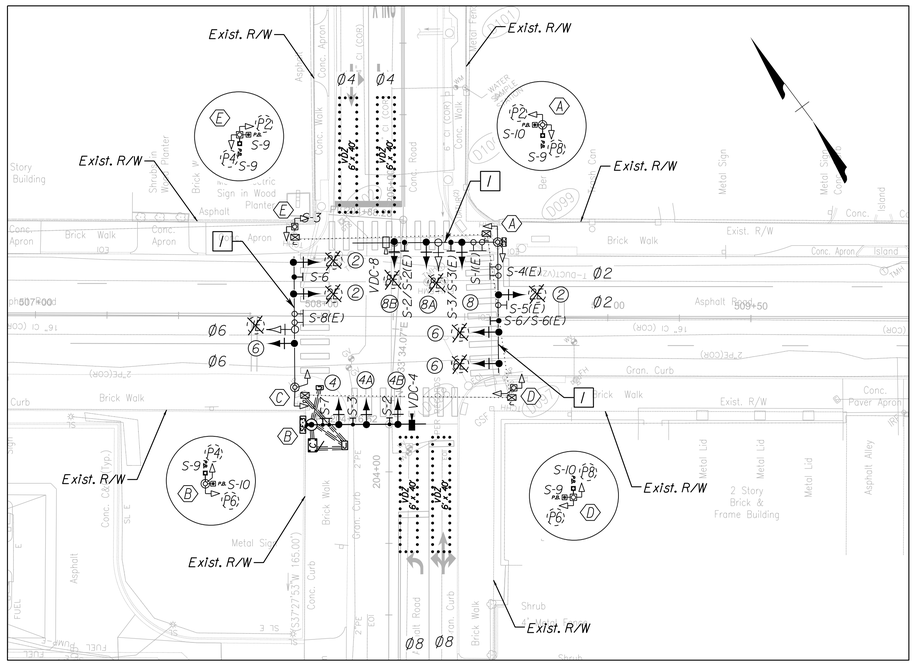
AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 23(3A)	0-28633
CHECKED BY: ASamberg						









Proposed Signals

(Signal Heads shall be 12" LED with retroreflective backplates)

Existing Signals

(Existing Signal Heads to be removed and replaced as shown)

Signs

Signal Pole & Controller Legend

Ⓐ EXIST. RICHMOND HISTORIC MAST ARM POLE & FOUNDATION
Exist. Pole Mounted Controller
Exist. 8' Luminaire
Exist. 45' Mast Arm Perpendicular to Rte 250 (Broad St)
Signal Placement: 18', 31', 42'
Sign Placement: 10', 22', 27'

Exist. 50' Mast Arm Parallel to Rte 250 (Broad St)
Signal Placement: 13', 25', 36'
Sign Placement: 7', 16', 32'
Video Dect. Placement: 39'

Ⓑ PROP. RICHMOND HISTROIC MAST ARM POLE & FOUNDATION
37.9' Right of Rte. 250 (Broad St) Sta. 507+96.66
40' Mast Arm Parallel to Rte 250 (Broad St)
Signal Placement: 9', 20', 31'
Sign Placement: 5', 15', 27'
Video Dect. Placement: 40'

Ⓒ EXIST. RICHMOND HISTORIC MAST ARM POLE & FOUNDATION
Exist. 8' Luminaire
Exist. 45' Mast Arm Perpendicular to Rte 250 (Broad St)
Signal Placement: 15', 32', 43'
Sign Placement: 10', 22', 27'

Ⓓ EXIST. PEDESTRIAN PEDESTAL, PF-2, 10'

Ⓔ EXIST. PEDESTRIAN PEDESTAL, PF-2, 10'

SPECIFICATIONS FOR RICHMOND HISTORIC SIGNAL POLES

POLE, STEEL ANCHOR BASE, AND MAST ARM: SIGNAL POLE SHALL BE 16 POINT FLUTED. MAST ARM TO BE SMOOTH SURFACE AND CURVED WITH A 5 FOOT RISE. MAST ARM TO BE MOUNTED WITH CENTER LINE OF MAST ARM AT 20'-0" FROM THE BOTTOM OF SIGNAL POLE BASE PLATE. MAST ARM BRACKET SHALLBE MOUNTED ON POLE PERPENDICULAR (90 DEGREES) TO THE CURB LINE. NO WIRE OUTLET HOLES SHALL BE PRE-DRILLED IN MAST ARM. THREE (3) RUBBER GROMEMETS SHALL BE PROVIDED. MAST ARM END CAP SHALL BE PROVIDED. SIGNAL POLE ANCHOR RODS SHALL BE PROVDED WITH DOUBLE NUTS AND DECORATIVE NUT COVERS. SIGNAL POLE SHALL HAVE HANDHOLE 18" ABOVE BASEPLATE WITH HANDHOLE COVER, AND A POLE TOP CAP SHALL BE PROVIDED. ALL EQUIPMENT INCLUDING POLE, MAST ARM, BASE PLATES, COVERS, END CAPS, TOP CAPS, AND FASTENING HARDWARE SHALL BE POWER COATED FEDERAL GREEN. CONTRACTOR TO PREPARE AND PROVIDE POLE FOUNDATION DESIGN AND DETAILS TO THE CITY FOR REVIEW AND APPROVAL. MAST ARMS, SIGNAL POLES, AND FOUNDATIONS SHALL BE DESIGNED TO WITHSTAND LOADINGS AS SPECIFIED IN THE 2016 VDOT ROAD AND BRIDGE STANDARD MP-3 "MAXIMUM LOADING STANDARDS" FOR THE MAST ARM LENGTH SPECIFIED OR THE PROJECT SPECIFIED LOADING, WHICH EVER IS GREATER. TRAFFIC SIGNAL STRUCTURES SHALL BE DESIGNED IN ACCORDANCE WITH SECTION 700 OF THE 2016 VDOT SPECIFICATION, VDOT S&B IIM 90.2, AND THE 2013 AASHTO STANDARDS, USING A WIND LOADING OF 80MPH.

CONSTRUCTION NOTES

1 Remove all existing signal heads and relocate or replace mast signs as indicated. Install proposed signal heads as indicated.

CABLE AND CONDUIT LEGEND

To be included in next submission

Phasing Diagram

Color Sequence Chart

	SIGNAL	PHASES				COMBINATIONS	FLASH
		2	4	6	8	2-6	
SIGNALS	2	G				G	Y
	4		G				R
	4A		G/-G→				R
	5						←Y-
	6			G		G	Y
	8				G		R
	P2	Walk	DW	DW	DW	Walk	Blank
	P4	DW	Walk	DW	DW	DW	Blank
	P6	DW	DW	Walk	DW	Walk	Blank
	P8	DW	DW	DW	Walk	DW	Blank

EMPTY BOX DENOTES RED INDICATION.

Clearance Chart

R/W	CLEARANCE		NEXT Ø
	1	2	
G	Y	R	R
←G-	←Y-	R	R
←G-	←Y-	G	G
-G→	-Y→	R	R
-G→	-Y→	G	G
W	CD	DW	DW

W - Walk
CD - Countdown (Flashing Don't Walk)
DW = Don't Walk

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

SCALE
0 25' 50'

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20_
3. Ordinance Number__________
4. Adopted_________
5. Accepted________________________________

REFERENCES
REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
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Tree

Proposed Legend
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Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS
TRAFFIC SIGNAL PLAN
(E. BROAD ST AND 18TH ST)

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
				SEPTEMBER 2022	SHEET 23(4)	0-28633

Proposed Signals

2

SP-8

P4

(Signal Heads shall be 12" LED with aluminum backplates)

Proposed Signs

S-1

R10-23A (24 "x 30")

S-2

R10-6AL (24 "x 30")

S-3

R10-3E(L) (9 "x 14")

S-4

R10-3E(R) (9 "x 14")

SPECIFICATIONS FOR RICHMOND HISTORIC SIGNAL POLES

POLE, STEEL ANCHOR BASE, AND MAST ARM:
SIGNAL POLE SHALL BE 16 POINT FLUTED. MAST ARM TO BE SMOOTH SURFACE AND CURVED WITH A 5 FOOT RISE. MAST ARM TO BE MOUNTED WITH CENTER LINE OF MAST ARM AT 20'-0" FROM THE BOTTOM OF SIGNAL POLE BASE PLATE. MAST ARM BRACKET SHALLBE MOUNTED ON POLE PERPENDICULAR (90 DEGREES) TO THE CURB LINE. NO WIRE OUTLET HOLES SHALL BE PRE-DRILLED IN MAST ARM. THREE (3) RUBBER GROMEMETS SHALL BE PROVIDED. MAST ARM END CAP SHALL BE PROVIDED. SIGNAL POLE ANCHOR RODS SHALL BE PROVDED WITH DOUBLE NUTS AND DECORATIVE NUT COVERS. SIGNAL POLE SHALL HAVE HANDHOLE 18" ABOVE BASEPLATE WITH HANDHOLE COVER, AND A POLE TOP CAP SHALL BE PROVIDED. ALL EQUIPMENT INCLUDING POLE, MAST ARM, BASE PLATES, COVERS, END CAPS, TOP CAPS, AND FASTENING HARDWARE SHALL BE POWER COATED FEDERAL GREEN. CONTRACTOR TO PREPARE AND PROVIDE POLE FOUNDATION DESIGN AND DETAILS TO THE CITY FOR REVIEW AND APPROVAL. MAST ARMS, SIGNAL POLES, AND FOUNDATIONS SHALL BE DESIGNED TO WITHSTAND LOADINGS AS SPECIFIED IN THE 2016 VDOT ROAD AND BRIDGE STANDARD MP-3 "MAXIMUM LOADING STANDARDS" FOR THE MAST ARM LENGTH SPECIFIED OR THE PROJECT SPECIFIED LOADING, WHICH EVER IS GREATER. TRAFFIC SIGNAL STRUCTURES SHALL BE DESIGNED IN ACCORDANCE WITH SECTION 700 OF THE 2016 VDOT SPECIFICATION. VDOT S&B IIM 90.2, AND THE 2013 AASHTO STANDARDS, USING A WIND LOADING OF 80MPH.

NOTES

1. PEDESTRIAN HYBRID BEACON INDICATIONS SHALL BE DARK (NOT ILLUMINATED) DURING PERIODS BETWEEN PEDESTRIAN ACTUATIONS.
2. UPON ACTUATION BY A PEDESTRIAN, THE PEDESTRIAN HYBRID BEACON FACE SHALL DISPLAY A FLASHING CIRCULAR YELLOW SIGNAL INDICATION, FOLLOWED BY A STEADY CIRCULAR YELLOW SIGNAL INDICATION, FOLLOWED BY DUAL STEADY CIRCULAR RED SIGNAL INDICATIONS DURING THE PEDESTRIAN WALK INTERVAL, FOLLOWED BY ALTERNATING FLASHING CIRCULAR RED SIGNAL INDICATIONS DURING THE PEDESTRIAN CLEARANCE INTERVAL (SEE COLOR SEQUENCE CHART). UPON TERMINATION OF THE PEDESTRIAN CLEARANCE INTERVAL, THE PEDESTRIAN HYBRID BEACON SHALL REVERT TO A DARK (NOT LLUMINATED) CONDITION.
3. THE PEDESTRIAN SIGNAL HEADS SHALL CONTINUE TO DISPLAY A STEADY UPRAISED HAND (DON'T WALK SYMBOL) SIGNAL INDICATION WHEN THE PEDESTRIAN HYBRID BEACON FACES ARE EITHER DARK OR DISPLAYING FLASHING OR STEADY CIRCULAR YELLOW SIGNAL INDICATIONS. THE PEDESTRIAN SIGNAL HEADS SHALL DISPLAY A WALK SIGNAL INDICATION WHEN THE PEDESTRIAN HYBRID BEACON FACES ARE DISPLAYING STEADY CIRCULAR RED SIGNAL INDICATIONS. THE PEDESTRIAN SIGNAL HEADS SHALL DISPLAY A FLASHING UPRAISED HAND (DON'T WALK SYMBOL) INDICATION WHEN THE PEDESTRIAN HYBRID BEACON FACES ARE DISPLAYING ALTERNATING FLASHING CIRCULAR RED INDICATIONS. UPON TERMINATION OF THE PEDESTRIAN CLEARANCE INTERVAL, THE PEDESTRIAN SIGNAL HEADS SHALL REVERT TO A STEADY UPRAISED HAND (DON'T WALK SYMBOL) INDICATION.

Signal Pole & Controller Legend

(A) PROP. RICHMOND HISTROIC MAST ARM POLE & FOUNDATION
Install Electrical Service SE-3, Type B

71.67' Left of Mosby St Sta. 412+51.48
40' Mast Arm Perpendicular to Slip Ramp
Signal Placement: 26', 36'
Sign Placement: 31'

(B) PEDESTRIAN PEDESTAL, PF-2.12'
(C) PEDESTRIAN PEDESTAL, PF-2.12'
(D) PEDESTRIAN PEDESTAL, PF-2.12'
(E) PEDESTRIAN PEDESTAL, PF-2.12'
(F) PROP. CONTROLLER CABINET AND FOUNDATION

JUNCTION BOX LEGEND

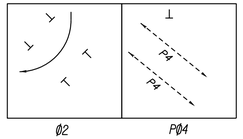
All Junction Boxes shall conform to Std. JB-S2 unless otherwise noted on the plans.

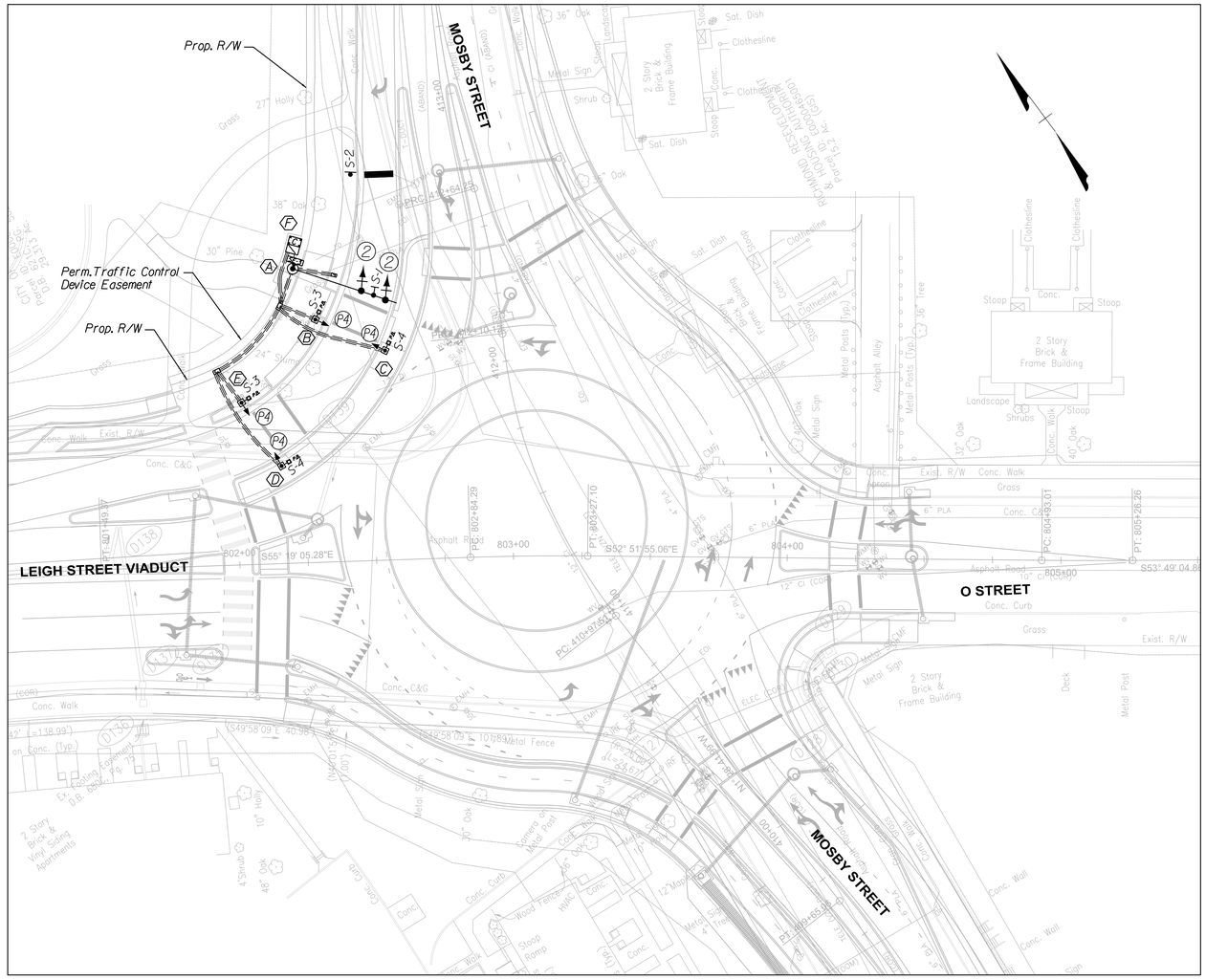
(S1) Denotes Std. JB-S1

CABLE AND CONDUIT LEGEND

To be included in next submission

Phasing Diagram





Color Sequence Chart

SIGNALS	SIGNAL	PHASE 2	UPON PEDESTRIAN ACTIVATION			PHASE P4	
	2	DARK	FY	Y	R/R	R/R	ALT. FLASH RED
	P4	DW	DW	DW	DW	WALK	FDW

SCALE
0 25' 50'

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
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2. Property owners correct as of _____, 20_
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole (D or S); Fire Hydrant / Valve (FH, WV); Water Meter (WM); Existing Curb Cut Ramp (HCR); Gas Meter / Valve (GM, GV); Fence; Power/Light Pole (PP, LP); Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole (SDMH, (SMH)); Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions
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SHOCKOE VALLEY STREET IMPROVEMENTS

TRAFFIC SIGNAL PLAN

PEDESTRIAN HYBRID BEACON – (MOSBY ST)

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 23(5)	0-28633
CHECKED BY: ASamberg						

LIGHTING GENERAL NOTES:

1. STREET LIGHTS AND CONDUIT SHALL BE INSTALLED AS DESIGNATED ON THE PLANS. ORNAMENTAL POLES, LIGHTS, AND BASES SHALL BE FURNISHED BY NOLAND COMPANY OR APPROVED EQUAL, 2101 STAPLES MILL ROAD, RICHMOND VA, 23230. FOUNDATIONS SHALL BE HANOVER POLE FOUNDATION, PER DETAIL SHEET. PEDESTRIAN LUMINAIRES SHALL BE 150 WATT EQUIVALENT LIGHT EMITTING DIODE (LED) WITH 6-IN. TYPE V OPTICS. LUMINAIRE MODEL SHALL BE PHILIPS LIGHTING CHARLESTON (1229) BLACK FINISH, CLEAR ACRYLIC PANEL/GLOBE, MEDIUM SOCKET, 240 V, OR APPROVED EQUAL.

2. PEDESTRIAN LUMINAIRES SHALL BE MOUNTED TO 14' DECORATIVE BLACK POLE. POLE MODEL SHALL BE PHILIPS LIGHTING ANCHOR BASE POST (316-) OR APPROVED EQUAL.

3. THE CITY OF RICHMOND DEPARTMENT OF PUBLIC UTILITIES (DPU) SHALL FINISH AND INSTALL ELECTRICAL SERVICE AND ALL WIRING FOR LIGHTING CIRCUITS TO PEDESTRIAN LUMINAIRES. CONTRACTOR SHALL COORDINATE WITH GARRICK BAYTON (804-646-7690, 804-317-2816, OR GARRICK.BAYTON@RICHMONDGOV.COM)

4. JUNCTION BOXES SHALL BE NEW BASIS MODEL #PW 1324/12, OR APPROVED EQUAL. JUNCTION BOX COVERS SHALL BE MARKED "LIGHTING".

5. CONDUITS SHOWN ON THESE PLANS ARE DIAGRAMMATIC. ACTUAL CONDUIT RUNS SHALL CONFORM TO FIELD CONDITIONS. CONDUIT SHALL BE INSTALLED ACCORDING TO DETAIL SHEETS. A NYLON PULL-CORD MUST BE PROVIDED IN ALL CONDUIT. CONTRACTOR SHALL BACKFILL TRENCH WITH NO. 21B AGGREGATE AND ASPHALT IN ACCORDANCE WITH TYPICAL PAVEMENT SECTION. CABLES INSIDE OF CONDUIT SHALL BE INSTALLED BY DPU FORCES. CONTRACTOR MUST CONTACT MR. RICHARD MOORE (TEL. # 646-8568) OR MR. KENNY DAVIS (PAGER NO. 783-4855) PRIOR TO INSTALLATION OF STREET LIGHTING ITEMS.

6. CONTRACTOR SHALL CONTACT GARRICK BAYTON (804-646-7690) OR MS. TRACY WRIGHT (804-363-5601) PRIOR TO INSTALLATION OF LIGHTING EQUIPMENT. CERTAIN UTILITIES WITHIN THE VICINITY OF THIS PROJECT AREA ARE SHOWN ON THE PLANS. THE UTILITIES SHOWN ARE NOT GUARANTEED TO BE COMPLETE OR ACCURATELY LOCATED. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES BEFORE PROCEEDING WITH THE WORK.

7. ALL LIGHTING CONDUITS SHALL BE INSTALLED WITH A MINIMUM DEPTH OF 36".

8. ALL UNDERGROUND CONDUITS SHALL BE SLOPED TO DRAIN TO THE NEAREST JUNCTION BOX. IF THIS CANNOT BE ACCOMPLISHED, DRAINAGE TEES SHALL BE PROVIDED AT THE LOW POINT OF THE CONDUIT RUN. DRAINAGE TEES SHALL BE INCIDENTAL TO CONDUIT.

9. AREAS AROUND THE PROPOSED LIGHTING EQUIPMENT SHALL BE GRADED AS APPROVED BY THE ENGINEER.

10. CONDUITS SHALL BE INSTALLED WITH LARGE RADIUS OFFSETS (5' MINIMUM RADIUS) TO BYPASS DRAINAGE INLETS, MANHOLES, AND OTHER OBSTRUCTIONS. GROUND RODS SHALL BE INSTALLED AT ALL LIGHT POLE FOUNDATIONS, JUNCTION BOXES, ELECTRICAL SERVICES AND CONTROL CABINETS.

11. ALL ELECTRICAL WORK SHALL BE PERFORMED AND ALL MATERIAL PROVIDED SHALL BE IN ACCORDANCE WITH VDOT STANDARDS AND SPECIFICATIONS, UNLESS OTHERWISE NOTED.

12. THE ELECTRICAL/LIGHTING CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL THE CONTRACTORS INVOLVED ON THIS PROJECT. THE ELECTRICAL/LIGHTING CONTRACTOR SHALL COORDINATE WITH THE ENGINEER AND GENERAL SUPERINTENDENT THE LOCATIONS OF ALL CONDUIT AND POLE BASES TO ELIMINATE CONSTRUCTION CONFLICTS.

13. ALL FIELD CHANGES MUST BE APPROVED BY DPU STREETLIGHT ENGINEER.

14. ALL ELECTRICAL WORK SHALL BE PERFORMED AND ALL MATERIAL PROVIDED SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE OF THE NATIONAL FIRE PROTECTION ASSOCIATION, TO ALL LOCAL AND SPECIAL LAWS, AND/OR TO ORDINANCES GOVERNING SUCH MATERIAL. CODE SHALL BE CONSIDERED THE MINIMUM REQUIREMENTS FOR THE ELECTRICAL WORK AND IF THERE IS A CONFLICT BETWEEN THE REQUIREMENTS SPECIFIED IN THE CONTRACT DOCUMENTS AND THE CODE, THE MORE STRINGENT REQUIREMENT WILL APPLY AS DETERMINED AND APPROVED BY THE ENGINEER. WHEN THESE REQUIREMENTS DO NOT GOVERN, AND WHERE NOT OTHERWISE SPECIFIED, ELECTRICAL MATERIALS SHALL CONFORM TO THE STANDARDIZATION RULES OF THE INSTITUTE OF ELECTRICAL ENGINEERS.

15. CONDUIT IS TO BE 2" (INCH) SCHEDULE 40 PVC. NO MORE THAN TWO 90° BENDS IN A SINGLE CONDUIT RUN.

16. ALL STREET, DRIVEWAY AND ALLEY CROSSINGS ARE TO BE 2-2" CONDUITS CONCRETE ENCASED, WITH A MINIMUM OF 4" OF ENCASEMENT ON TOP, AND 2" ON THE SIDES AND BOTTOM. HANDHOLE REQUIRED ON BOTH ENDS OF CROSSING.

17. ELECTRICAL WARNING TAPE PLACED ON TOP OF ENCASEMENT AND AGAIN AT LEAST 12" ABOVE ENCASEMENT. FOR NON-ENCASED CONDUIT, WARNING TAPE SHOULD BE PLACED AS LEAST 12" ABOVE CONDUIT.

18. SINGLE RUNS OF 2" SCHEDULE 40 PVC FROM POLE BASE TO POLE BASE UNLESS OTHERWISE NOTED.

19. NO RUNS OVER 300' (FT) WITHOUT A SECONDARY ENCLOSURE.

20. ALL CONNECTIONS TO CITY GRID MUST BE PERFORMED BY DPU STREETLIGHTS.

21. NO ONE SHALL ENTER DPU MANHOLE/SECONDARY ENCLOSURE WITHOUT DPU INSPECTOR PRESENT.

22. INSPECTIONS FOR ALL STAGES OF CONSTRUCTIONS OF POLE BASE MUST BE SCHEDULED 48 HRS PRIOR TO BACKFILL AND/OR CONCRETE POUR. CONTACT DPU STREETLIGHT INSPECTOR, ROBERT PARHAM AT 804-363-3437.

23. ALL FIELD CHANGES MUST BE APPROVED BY DPU STREETLIGHT ENGINEER.

24. HORIZONTAL AND VERTICAL CRITERIA BASED ON IES RP-08-18 CRITERIA FOR LOW AND MEDIUM PEDESTRIAN WALKWAYS (TABLES 12-1, 12-4, 16-2 & 16-3).

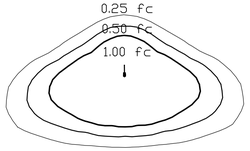
25. UNIFORMITY (AVG/MIN) IS A "NOT TO EXCEED" CRITERIA.

26. AVERAGE VALUES SHOULD BE EQUAL TO OR GREATER THAN CRITERIA IN TABLE.

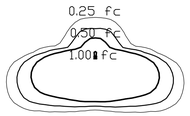
27. MINIMUM VERTICAL ILLUMINATION POINT, TAKE 5 TH ABOVE GRADE, FOR PEDESTRIANS/CYCLISTS TRAVELING IN LISTED DIRECTION AND ROTATED 90 DEGREES. VERTICAL ILLUMINATION POINT CALCULATED FOR FACIAL RECOGNITION PURPOSES. MINIMUM VERTICAL VALUES SHOULD BE GREATER THAN OR EQUAL TO CRITERIA IN TABLE.

28. EXISTING COBRAHEAD LIGHTING ASSUMED TO BE MOUNTED AT 26 FT ABOVE THE ROADWAY.

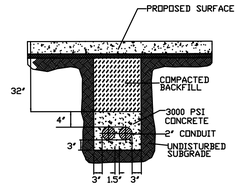
EXISTING LUMINAIRE ISO LEGEND



PROPOSED LUMINAIRE ISO LEGEND



Type	Manufacturer	Catalog Number and IES File	Wattage and Type	Initial Lamp Lumens (Lumens)	Mounting Height	Classification
Architectural	Philips Hadco (Baltimore Lantern)	VX68164 - Clear (vx68164-g2-c-3-w5-h.ies)	103W LED	8,462	13	Type III, Cutoff Reflector



**BACKFILL MATERIAL BELOW THIS LEVEL SHALL BE SANDY FILL (FREE OF ANY STONES, CINDERS, WOOD, ROOTS, DEBRIS, ETC.)

STREET LIGHT CONDUIT TRENCH DETAIL (2-2")

NOT TO SCALE

INDEX OF SHEETS:

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole Ⓓ or Ⓢ; Fire Hydrant / Valve FH; Water Meter WM; Existing Curb Cut Ramp HCR; Gas Meter / Valve GM GV; Fence; Power/Light Pole PP LP; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole SDMH (SMH); Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

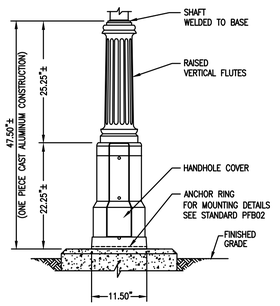
RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS

GENERAL LIGHTING NOTES SHEET & LEGEND

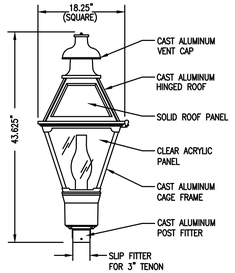
AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(1)	DRAWING NO. 0-28633



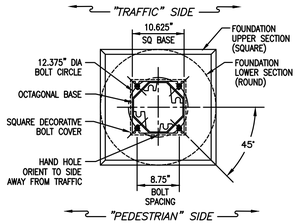
POST LIGHT BASE DETAILS

(PHILIPS HANOVER LANTERN POST STYLE #316)

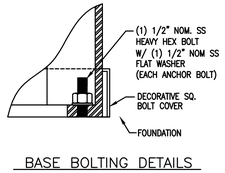


LUMINAIRE DETAILS

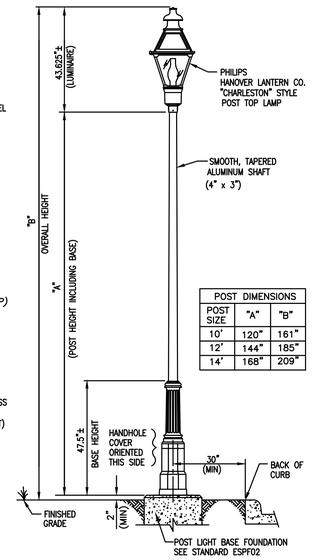
(PHILIPS HANOVER LANTERN "CHARLESTON" LAMP)



POST LIGHT BASE MOUNTING DETAIL



BASE BOLTING DETAILS



POST DIMENSIONS		
POST SIZE	"A"	"B"
10'	120"	161"
12'	144"	185"
14'	168"	209"

POST LIGHT ASSEMBLY DETAILS

SPECIFICATIONS:

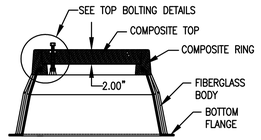
1. LUMINAIRE: SEALED OPTICAL ASSEMBLY, GLASS OPTICS, TOOL-LESS MAINTENANCE, SWING OPEN HINGED UTILITY POD ROOF WITH MOISTURE PROOF BALLAST COMPARTMENT AND SLIDE -OUT BALLAST TRAY. CLEAR ACRYLIC PANELS AND GLOBE, PHILIPS HANOVER LANTERN "CHARLESTON" SERIES (1237) OR EQUAL.
2. OPTICS: GLASS REFRACTOR, 6" TYPE III (ASYMETRIC) LIGHT DISTRIBUTION.
3. LAMP HOLDERS:
   HPS: MEDIUM BASE PORCELAIN.
   LED: POLARIZED PLUG/RECEPTACLE COMBINATION.
4. LAMPS:
   HPS: 100W OR 150W
   LED: 3000 CCT
5. BALLAST/DRIVER:
   HPS: ELECTRONIC BALLAST, PEAK LEAD, AUTOTRANSFORMER TYPE, MULTI-TAP VOLTAGE WIRED FOR 240V.
   LED: STD 0-10V DIMMING CAPABILITY, HIGH POWER FACTOR OF 95%. ELECTRONIC DRIVER OPERATING RANGE 50/60 Hz. AUTO-ADJUSTING VOLTAGE INPUT 120-277 VAC.
6. SHAFT: SMOOTH, TAPERED 4"-3" DIA., .125 WALL (MIN) ALLOY ALUMINUM. SHAFT HEAT TREATED TO PRODUCE A T6 TEMPER. SHAFT IS CIRCUMFERENTIALLY WELDED TO BASE. WIRE CLAMPS PROVIDED INSIDE PRE-WIRED POLE ASSEMBLY.
7. BASE: ONE PIECE CORROSION RESISTANT, DURABLE CAST ALUMINUM CONSTRUCTION. MINIMUM .125 WALL THICKNESS. BASE CONSISTS OF SMOOTH, STEPPED BOTTOM SECTION WITH FLUSH HAND HOLE, AND A DECORATIVE TAPERED FLUTED SECTION CONSISTING OF EVENLY SPACED, HIGHLY DETAILED RAISED VERTICAL FLUTES. GROUNDING LUG TO BE PROVIDED INSIDE BASE OPPOSITE THE HAND-HOLE CAST ALUMINUM ACCESS DOOR PROVIDED WITH AN 18" PLASTIC SHEATHED KEEPER CHAIN AND TAMPER RESISTANT HARDWARE. (PHILIPS HANOVER LANTERN POST STYLE 316, OR EQUAL).
8. WIRING: 2'-0" (24") MIN. BEYOND BASE, 14/2, WITH GROUND, (TYPE UF-B) WIRE LEADS TO BE PROVIDED, POLE AND LUMINAIRE TO BE WIRED.
9. ANCHORING: FOUR (4) 1/2"(NOM) X 18" LG x 3" "L" TYPE (MIN) HOT-DIPPED, FULLY GALVANIZED, ANCHOR BOLTS, EACH SUPPLIED WITH (1) NUT AND (1) WASHER.
10. FINISH: RESILIENT TGIC THERMOSET POLYESTER POWDERCOAT, ELECTROSTATICALLY APPLIED. PHILIPS BLACK (BLK), OR EQUAL.

MATERIAL LIST	
QTY	DESCRIPTION
1	LUMINAIRE, CHARLESTON STYLE, HPS OR LED, PHILIPS
1	POLE, TAPERED, 10 FT, ALUM., STYLE 316, PAINTED
1	POLE, TAPERED, 12 FT, ALUM., STYLE 316, PAINTED
1	POLE, TAPERED, 14 FT, ALUM., STYLE 316, PAINTED
1	BASE, 11.5" SQ. PED. OCT. BASE, STYLE 316
4	NUT, 1/2" NOM., HEX, HEAVY, HRS, GALV.
4	FLATWASHER, 1/2" NOM, SS
A/N	WIRE, 14/2 TYPE UF-B, COPPER, WITH NEUTRAL

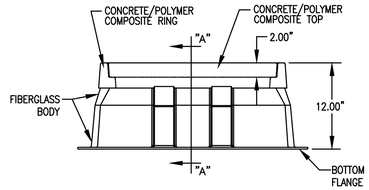
REVIEWED & APPROVED
ENGINEERING: SIGNED COPY ON FILE
REFERENCES: ESMA01; ESMA04; ESPF02

STANDARD FIXTURE ASSEMBLY DETAILS
THE HANOVER STYLE LIGHTING FIXTURE
HIGH PRESSURE SODIUM & LED TYPE LUMINAIRES

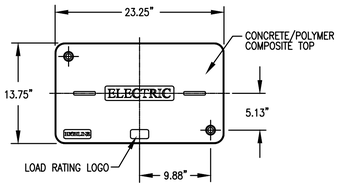
CITY OF RICHMOND PUBLIC UTILITIES
STREET LIGHT STANDARDS
REVISION DATE 04/2019 | SHEET 1 OF 1 | ESFA02



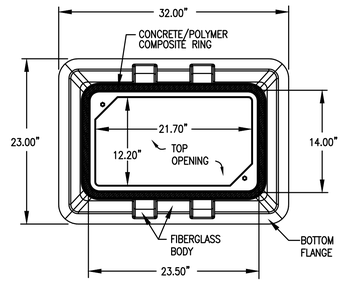
SECTION "A-A"



BOX DETAILS - SIDE VIEW

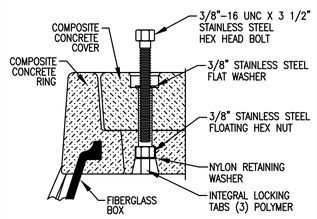


TOP DETAILS



BOX DETAILS - TOP VIEW

SEE SHEET 2 OF 2 FOR INSTALLATION DETAILS



TOP BOLTING DETAILS

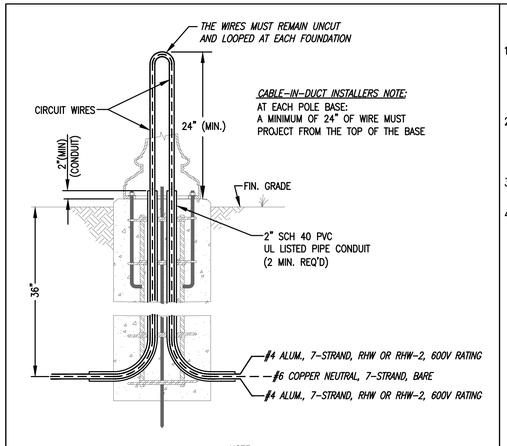
SPECIFICATIONS:

1. BOX IS TO BE DESIGNED AND RATED FOR TIER 15 (22,500 LBS).
2. PULL BOX BASE SHALL BE OF THE DIMENSIONS 23" WIDTH BY 32" LENGTH BY 12" DEPTH.
3. BOX MUST BE NON-CONDUCTIVE AND CONSTRUCTED OF FIRE RETARDANT MATERIALS.
4. BOX TO BE CONSTRUCTED OF FIBERGLASS
5. BOX RING AND COVER TO BE CONSTRUCTED OF COMPOSITE POLYMER CONCRETE.
6. BOX COVER SHALL BE FACTORY EMBOSSED WITH "ELECTRIC".
7. COVER SHALL BE SECURED WITH (2) 3/8-16 BOLTS.
8. NUTS IN BOX COVER MUST BE FIELD REPLACEABLE.
9. CURRENT STANDARD IS: HIGHLINE PRODUCTS MODEL CHA132412, OR EQUAL.

REVIEWED & APPROVED
ENGINEERING:
REFERENCES: N/A

MISCELLANEOUS ASSEMBLIES & DETAILS
STANDARD HAND HOLE BOX SPECIFICATIONS AND INSTALLATION DETAILS
FOR UNDERGROUND STREET LIGHT POWER DISTRIBUTION

CITY OF RICHMOND PUBLIC UTILITIES
STREET LIGHT STANDARDS
REVISION DATE 09/2017 | SHEET 1 OF 2 | ESMA07



CABLE-IN-DUCT INSTALLERS NOTE:
AT EACH POLE BASE:
A MINIMUM OF 24" OF WIRE MUST PROJECT FROM THE TOP OF THE BASE

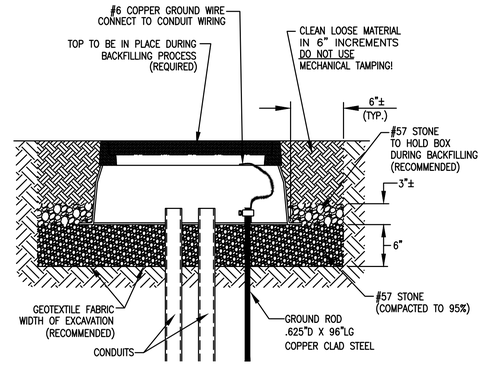
NOTE:
INSULATION MUST BE AN ABRASION, MOISTURE, HEAT, AND SUNLIGHT RESISTANT, BLACK CROSS-LINKED POLYETHYLENE.

GENERAL NOTES:

1. EACH LIGHT BASE WILL HAVE A MINIMUM OF TWO (2) #4 ALUMINUM, 7-STRAND, RHW OR RHW-2, 600V RATED, BUS WIRES AND ONE (1) #6 BARE SOFT COPPER, 7-STRAND, NEUTRAL WIRE AS SHOWN IN THE DETAIL.
2. THE UNDERGROUND CABLE-IN-DUCT ASSEMBLY MUST BE LOOPED AS SHOWN AT EACH LIGHT BASE. THE LOOP SHALL PROJECT AT LEAST TWO (2) FEET ABOVE THE TOP OF EACH LIGHT BASE.
3. THE UNDERGROUND CABLE-IN-DUCT LOOP, AT EACH BASE, MUST REMAIN UN-CUT.
4. UNDER NO CIRCUMSTANCES SHALL THE CABLE BE CUT OR BE ALLOWED TO BECOME SUBMERGED IN WATER. OBSERVATION OF EITHER CONDITION, BY THE INSPECTOR, SHALL CONSTITUTE SIFFICIENT GROUNDS FOR REJECTION OF THE ENTIRE LENGTH OF CABLE.

MISCELLANEOUS DETAILS AND ASSEMBLIES
WIRE/CABLE MINIMUM REQUIREMENTS
FOR ORNAMENTAL LIGHTING INSTALLATIONS

CITY OF RICHMOND PUBLIC UTILITIES
STREET LIGHT STANDARDS
REVISION DATE 05/2019 | SHEET 1 OF 1 | ESMA19



TYPICAL HAND HOLE INSTALLATION DETAILS

GENERAL NOTES -INSTALLATION:

1. IT IS RECOMMENDED THAT THE EXCAVATION FOR THE HAND HOLE BE 6" LARGER ON ALL SIDES THAN THE BASE DIMENSIONS.
2. GEOTEXTILE FABRIC IS RECOMMENDED UNDER BASE STONE TO MINIMIZE STONE LOSS TO THE SUBGRADE.
3. A MINIMUM OF 6" OF #57 STONE LEVELED AND COMPACTED TO 95% PROCTOR SHALL BE PLACED BELOW THE BASE.
4. A SINGLE GROUND ROD IS REQUIRED.
5. GROUND ROD SHALL BE COPPER CLAD STEEL, .625" DIA X 96" LG.
6. GROUND ROD IS TO BE DRIVEN INTO UNDISTURBED EARTH AND SHALL BE A MINIMUM OF 92" IN THE GROUND.
7. BACKFILL AND COMPACTION WILL BE DONE AS PRESCRIBED.
8. SURFACE RESTORATION WILL BE AS PRESCRIBED, BUT MAY BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS STANDARDS FOR TRENCH AND SURFACE RESTORATION WHEN APPLICABLE.
9. IT IS REQUIRED TO HAVE THE COVER IN PLACE DURING INSTALLATION TO MINIMIZE COLLAPSE DUE TO COMPACTION.

MATERIAL LIST	
QTY	DESCRIPTION
1 EA	HAND HOLE, COMPOSITE, 23 X 32 X 12
1 EA	GROUND ROD, 0.625" X 96", SOLID STEEL, COPPER CLAD
1 EA	GROUNDING CLAMP, COMPRESSION BOLT STYLE
1 EA	WIRE, #6 COPPER X 18"
1 EA	STONE, 21A, X 8 CU. FT.
1 EA	GEOTEXTILE FABRIC X 11 SQ. FT. (OPTIONAL)

REVIEWED & APPROVED
ENGINEERING:
REFERENCES: N/A

MISCELLANEOUS ASSEMBLIES & DETAILS
STANDARD HAND HOLE BOX SPECIFICATIONS AND INSTALLATION DETAILS
FOR UNDERGROUND STREET LIGHT POWER DISTRIBUTION

CITY OF RICHMOND PUBLIC UTILITIES
STREET LIGHT STANDARDS
REVISION DATE 09/2017 | SHEET 2 OF 2 | ESMA07

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve; Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

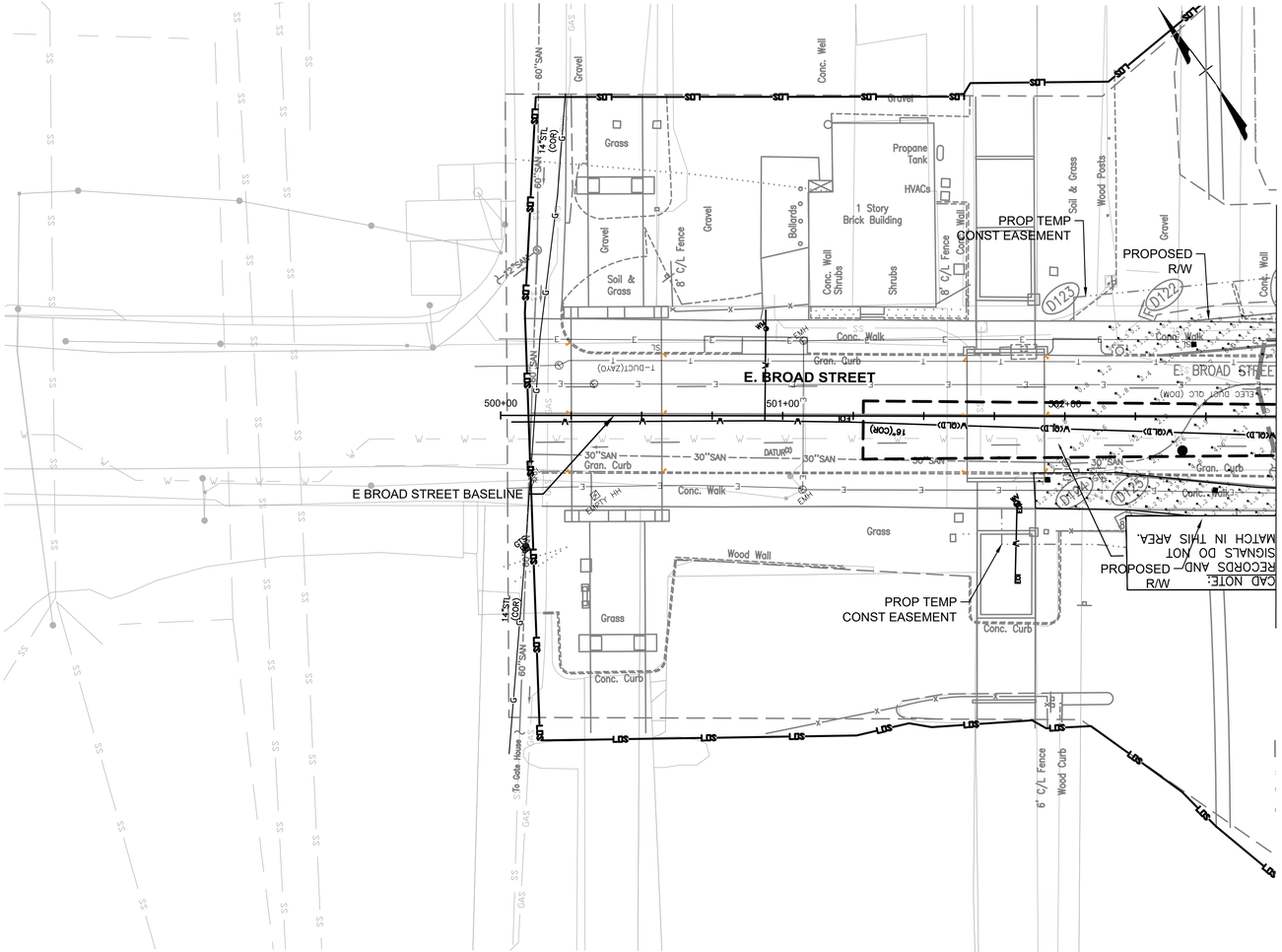
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING DETAILS SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 24(2)	0-28633
CHECKED BY: ASamberg						



Broad Street (From N 16th Street to N 17th Street)						
Photometric Analysis Results						
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (EB)	Min. Vertical Illuminance (WB)	Avg./Min.
Roadway/Intersections Criteria	1.5					4.0
Broad St. EB (Western Project Limits to Crane St.)	2.6	7.7	0.7	-	-	3.7
Broad St. WB (Western Project Limits to N 17th St.)	3.0	7.7	0.8	-	-	3.8
Pedestrian Facilities Criteria	0.5			0.2	0.2	4.0
Broad St. EB Sidewalk (Western Project Limits to Crane St.)	1.6	6.7	0.2	0.1	0.1	8.0
Broad St. WB Sidewalk (Western Project Limits to N 17th St.)	1.6	6.5	0.1	0.1	0.0	16.0
END OF PROJECT LIMITS / NO ADJACENT LIGHTING						

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

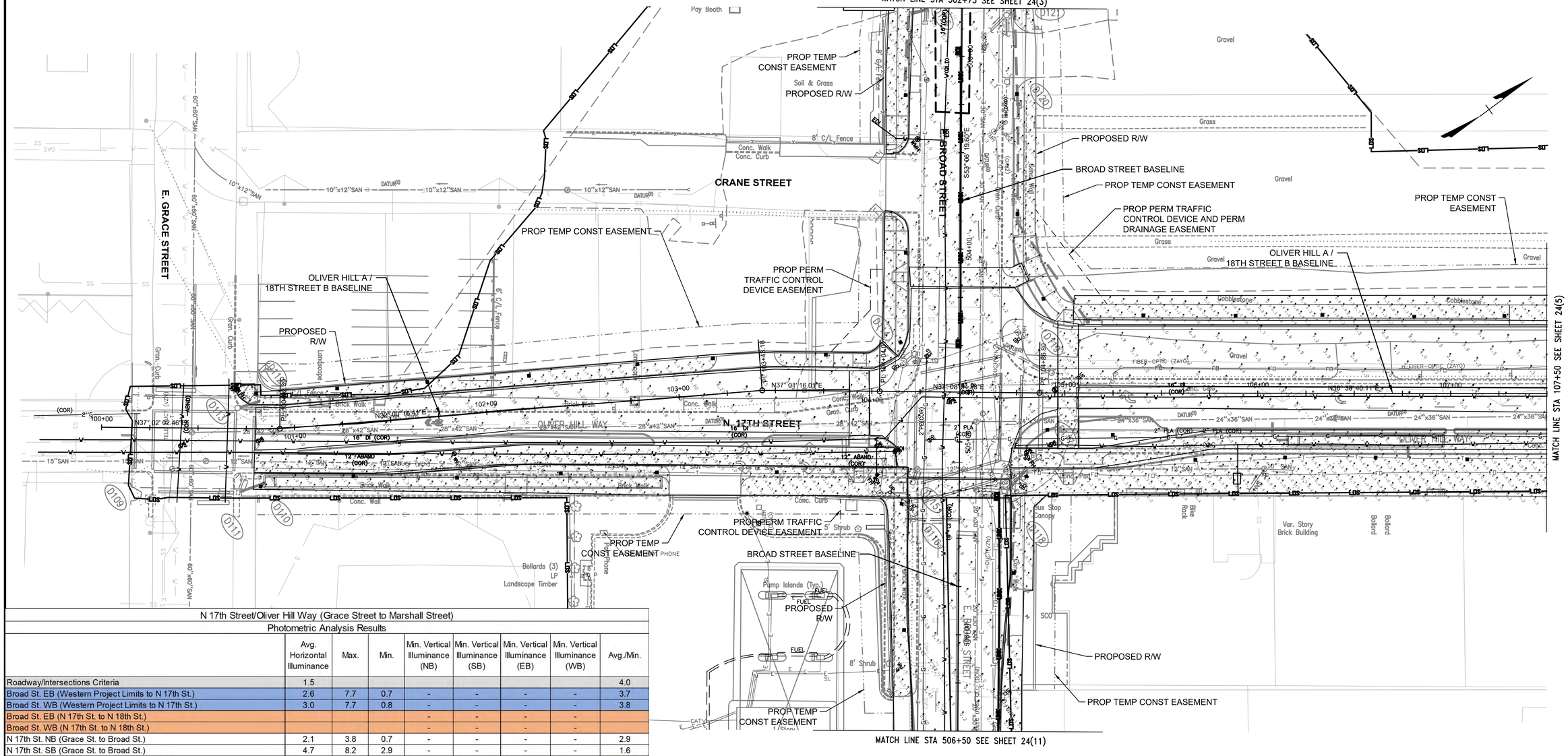
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(3)	DRAWING NO. 0-28633



N 17th Street/Oliver Hill Way (Grace Street to Marshall Street) Photometric Analysis Results								
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Min. Vertical Illuminance (EB)	Min. Vertical Illuminance (WB)	Avg./Min.
Roadway/Intersections Criteria	1.5							4.0
Broad St. EB (Western Project Limits to N 17th St.)	2.6	7.7	0.7	-	-	-	-	3.7
Broad St. WB (Western Project Limits to N 17th St.)	3.0	7.7	0.8	-	-	-	-	3.8
Broad St. EB (N 17th St. to N 18th St.)				-	-	-	-	
Broad St. WB (N 17th St. to N 18th St.)				-	-	-	-	
N 17th St. NB (Grace St. to Broad St.)	2.1	3.8	0.7	-	-	-	-	2.9
N 17th St. SB (Grace St. to Broad St.)	4.7	8.2	2.9	-	-	-	-	1.6
Oliver Hill Way NB (Broad St. to Marshall St.)	0.8	3.7	0.3	-	-	-	-	2.5
Oliver Hill Way SB (Broad St. to Marshall St.)	2.7	8.2	0.3	-	-	-	-	9.0
Intersection of N 17th St./Oliver Hill Way/Broad St.	2.0	6.9	0.7	-	-	-	-	2.9
Intersection of N 17th St./Oliver Hill Way/Broad St. - North Leg Crosswalk	2.0	4.4	0.8	-	-	-	-	2.5
Intersection of N 17th St./Oliver Hill Way/Broad St. - East Leg Crosswalk	3.4	8.7	0.7	-	-	-	-	4.9
Intersection of N 17th St./Oliver Hill Way/Broad St. - South Leg Crosswalk	1.9	3.7	1.0	-	-	-	-	1.9
Intersection of N 17th St./Oliver Hill Way/Broad St. - West Leg Crosswalk	1.9	6.2	0.8	-	-	-	-	2.4
Pedestrian Facilities Criteria	0.5			0.2	0.2	0.2	0.2	4.0
Broad St. EB Sidewalk (Western Project Limits to Crane St.)	1.6	6.7	0.2	-	-	0.1	0.1	8.0
Broad St. EB Sidewalk (Crane St. to N 17th St.)				-	-			
Broad St. WB Sidewalk (Western Project Limits to N 17th St.)	1.6	6.5	0.1	-	-	0.1	0.0	16.0
Broad St. EB Sidewalk (N 17th St. to N 18th St.)				-	-			
Broad St. WB Sidewalk (N 17th St. to N 18th St.)				-	-			
N 17th St. NB Sidewalk (Grace St. to Broad St.)	2.6	7.2	0.3			-	-	8.7
N 17th St. SB Sidewalk (Grace St. to Broad St.)	4.5	8.1	1.1			-	-	4.1
Oliver Hill Way NB Sidewalk (Broad St. to Marshall St.)	1.5	8.2	0.2			-	-	7.5
Oliver Hill Way SB Sidewalk (Broad St. to Marshall St.)	2.2	7.2	0.4			-	-	5.5
N 17th St. NB Bike Path (Grace St. to Broad St.)	4.4	8.5	0.3			-	-	14.7
Oliver Hill Way NB Bike Path (Broad St. to Marshall St.)	4.7	8.0	1.0			-	-	4.7
NO SIDEWALK IMPROVEMENTS AT THIS LOCATION								
END OF PROJECT LIMITS / NO ADJACENT LIGHTING								

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

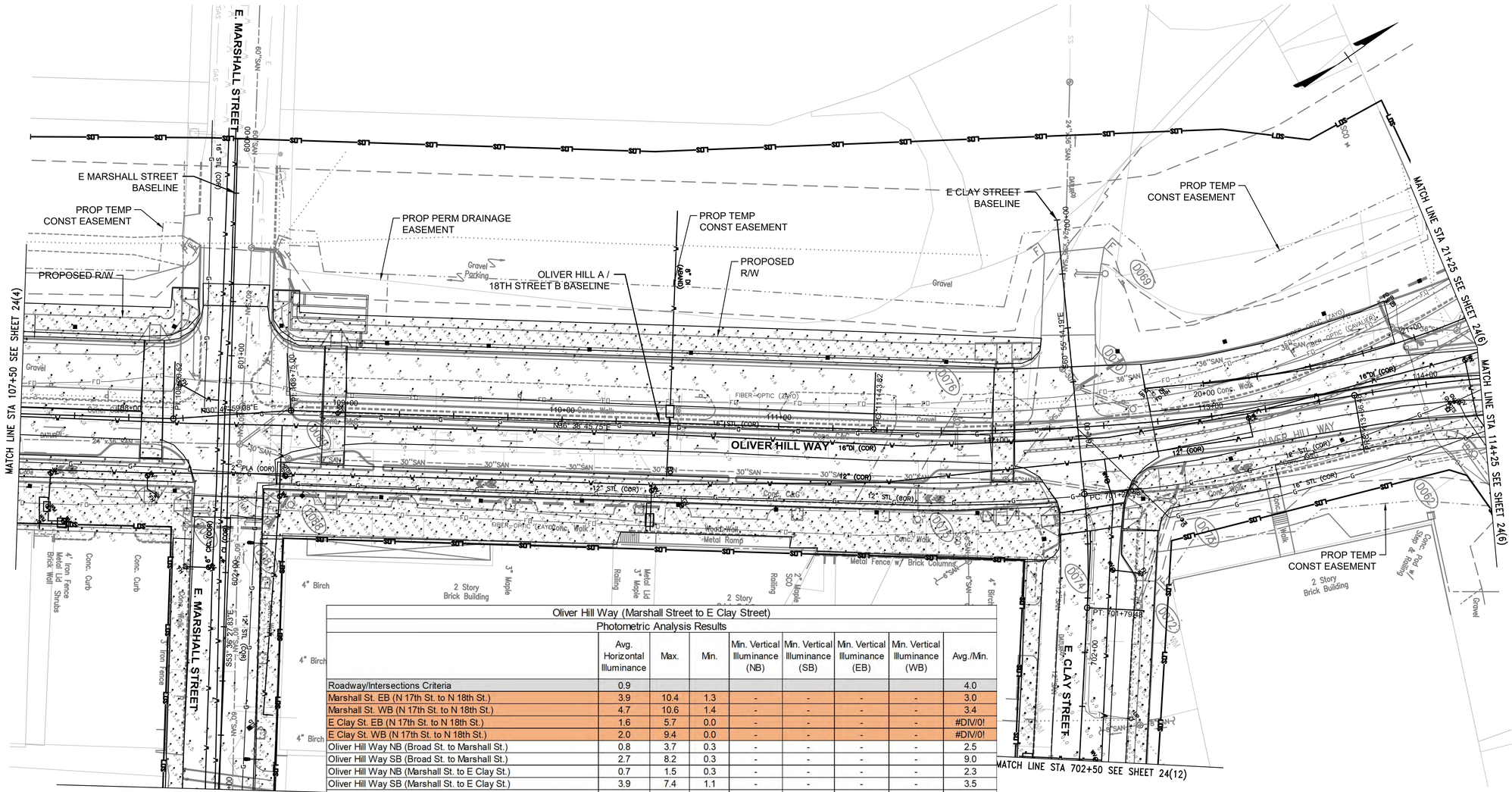
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(4)	DRAWING NO. 0-28633



Oliver Hill Way (Marshall Street to E Clay Street) Photometric Analysis Results								
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Min. Vertical Illuminance (EB)	Min. Vertical Illuminance (WB)	Avg./Min.
Roadway/Intersections Criteria	0.9							4.0
Marshall St. EB (N 17th St. to N 18th St.)	3.9	10.4	1.3	-	-	-	-	3.0
Marshall St. WB (N 17th St. to N 18th St.)	4.7	10.6	1.4	-	-	-	-	3.4
E Clay St. EB (N 17th St. to N 18th St.)	1.6	5.7	0.0	-	-	-	-	#DIV/0!
E Clay St. WB (N 17th St. to N 18th St.)	2.0	9.4	0.0	-	-	-	-	#DIV/0!
Oliver Hill Way NB (Broad St. to Marshall St.)	0.8	3.7	0.3	-	-	-	-	2.5
Oliver Hill Way SB (Broad St. to Marshall St.)	2.7	8.2	0.3	-	-	-	-	9.0
Oliver Hill Way NB (Marshall St. to E Clay St.)	0.7	1.5	0.3	-	-	-	-	2.3
Oliver Hill Way SB (Marshall St. to E Clay St.)	3.9	7.4	1.1	-	-	-	-	3.5
Oliver Hill Way NB (E Clay St. to Venable St.)	2.7	5.9	1.2	-	-	-	-	2.3
Oliver Hill Way SB (E Clay St. to Venable St.)	2.9	6.2	0.8	-	-	-	-	3.6
I-95 Off-Ramp	4.4	7.1	2.7	-	-	-	-	1.6
Intersection of Oliver Hill Way/Marshall St.	3.0	8.1	0.7	-	-	-	-	4.2
Intersection of Oliver Hill Way/Marshall St. - North Leg Crosswalk	2.5	4.4	1.1	-	-	-	-	2.3
Intersection of Oliver Hill Way/Marshall St. - East Leg Crosswalk	7.1	9.7	4.4	-	-	-	-	1.6
Intersection of Oliver Hill Way/Marshall St. - South Leg Crosswalk	2.0	4.3	0.8	-	-	-	-	2.5
Intersection ofOliver Hill Way/Marshall St. - West Leg Crosswalk	1.6	3.1	0.7	-	-	-	-	2.3
Intersection of Oliver Hill Way/E Clay St.	2.2	6.2	0.6	-	-	-	-	3.6
Intersection of Oliver Hill Way/E Clay St. - East Leg Crosswalk	4.0	7.9	1.7	-	-	-	-	2.4
Intersection of Oliver Hill Way/E Clay St. - South Leg Crosswalk	1.4	3.4	0.3	-	-	-	-	4.7
Pedestrian Facilities Criteria	0.4			0.1	0.1	0.1	0.1	4.0
Marshall St. EB Sidewalk (N 17th St. to N 18th St.)	1.8	3.6	0.9	-	-			2.0
Marshall St. WB Sidewalk (N 17th St. to N 18th St.)	2.5	6.4	0.8	-	-			3.1
E Clay St. EB Sidewalk (N 17th St. to N 18th St.)	0.4	1.3	0.0	-	-			#DIV/0!
E Clay St. WB Sidewalk (N 17th St. to N 18th St.)	1.0	5.3	0.0	-	-			#DIV/0!
Oliver Hill Way NB Sidewalk (Broad St. to Marshall St.)	1.5	8.2	0.4			-	-	3.8
Oliver Hill Way SB Sidewalk (Broad St. to Marshall St.)	2.2	7.2	0.2			-	-	11.0
Oliver Hill Way NB Sidewalk (Marshall St. to E Clay St.)	1.8	8.2	0.2			-	-	9.0
Oliver Hill Way SB Sidewalk (Marshall St. to E Clay St.)	1.4	6.4	0.1			-	-	14.0
Oliver Hill Way NB SUP (E Clay St. to Venable St.)	2.2	7.8	0.4			-	-	5.5
Oliver Hill Way NB Bike Path (Broad St. to Marshall St.)	4.4	8.5	0.3			-	-	14.7
Oliver Hill Way NB Bike Path (Marshall St. to E Clay St.)	5.4	8.8	2.6			-	-	2.1
NO SIDEWALK IMPROVEMENTS AT THIS LOCATION								

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve; Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

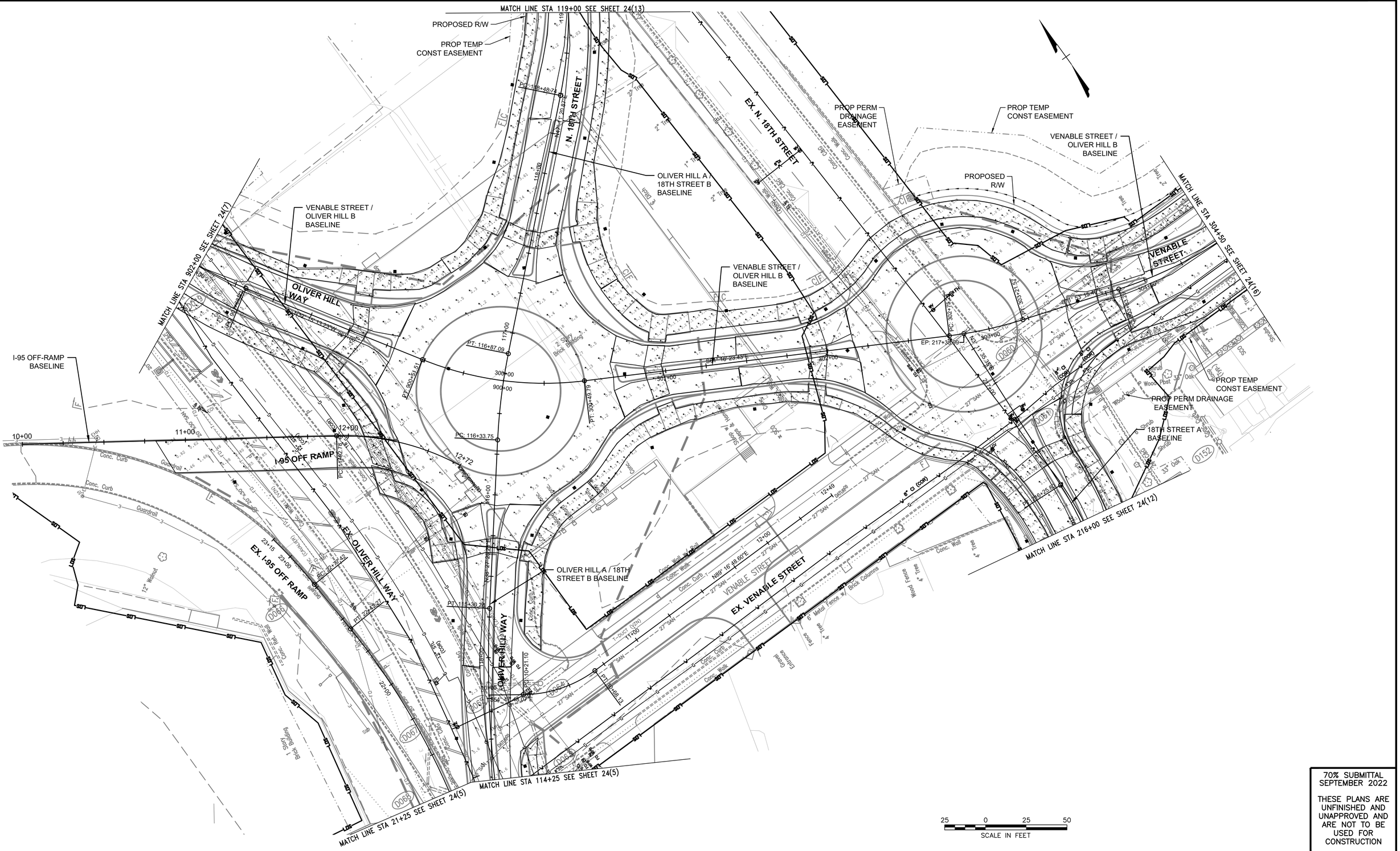
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 24(5)	0-28633



70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(6)	DRAWING NO. 0-28633

Oliver Hill Way (E Clay St. to Venable Street) & Venable St. (Oliver Hill Way to N 18th St.)								
Photometric Analysis Results								
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Min. Vertical Illuminance (EB)	Min. Vertical Illuminance (WB)	Avg./Min.
Roadway/Intersections Criteria	0.9							4.0
Oliver Hill Way A/18th St. B NB (E Clay St. to Venable St.)	2.7	5.9	1.2	-	-	-	-	2.3
Oliver Hill Way A/18th St. B SB (E Clay St. to Venable St.)	2.9	6.2	0.8	-	-	-	-	3.6
Oliver Hill Way A/18th St. B NB (Venable St. to O St.)	6.4	9.9	3.7	-	-	-	-	1.7
Oliver Hill Way A/18th St. B SB (Venable St. to O St.)	5.4	9.6	2.0	-	-	-	-	2.7
Oliver Hill Way B NB (Venable St. to Brown St.)	2.4	5.3	0.6	-	-	-	-	4.0
Oliver Hill Way B SB (Venable St. to Brown St.)	2.9	7.0	0.5	-	-	-	-	5.8
Venable St. EB (18th St. A to Mosby St.)	2.1	4.4	0.7	-	-	-	-	3.0
Venable St. WB (18th St. A to Mosby St.)	2.0	6.4	0.8	-	-	-	-	2.5
Intersection of Mosby St./Carrington St. - Crosswalk	0.7	1.2	0.4	-	-	-	-	1.8
Roundabout Criteria	0.9							4.0
Oliver Hill Way/Venable St. - North Leg Entrance (Oliver Hill A)	3.7	8.4	1.7	-	-	-	-	2.2
Oliver Hill Way/Venable St. - North Leg Departure (Oliver Hill A)	3.6	5.8	1.9	-	-	-	-	1.9
Oliver Hill Way/Venable St. - North Leg Crosswalk (Oliver Hill A)	4.2	6.7	1.9	-	-	-	-	2.2
Oliver Hill Way/Venable St. - East Leg Entrance	2.2	4.8	0.7	-	-	-	-	3.1
Oliver Hill Way/Venable St. - East Leg Departure	2.4	5.4	0.7	-	-	-	-	3.4
Oliver Hill Way/Venable St. - East Leg Crosswalk	2.9	4.9	1.5	-	-	-	-	1.9
Oliver Hill Way/Venable St. - South Leg Entrance	4.7	8.0	2.3	-	-	-	-	2.0
Oliver Hill Way/Venable St. - South Leg Departure	4.6	6.1	3.3	-	-	-	-	1.4
Oliver Hill Way/Venable St. - South Leg Crosswalk	4.2	7.8	2.6	-	-	-	-	1.6
Oliver Hill Way/Venable St. - West Leg Entrance (Oliver Hill B)	3.5	6.6	0.7	-	-	-	-	5.0
Oliver Hill Way/Venable St. - West Leg Departure (Oliver Hill B)	2.4	6.2	0.3	-	-	-	-	8.0
Oliver Hill Way/Venable St. - West Leg Crosswalk (Oliver Hill B)	2.2	3.7	1.0	-	-	-	-	2.2
Oliver Hill Way/Venable St. - West Leg Entrance (I-95 Off-Ramp)	2.9	6.9	0.2	-	-	-	-	14.5
Oliver Hill Way/Venable St. - West Leg Crosswalk (I-95 Off-Ramp)	2.6	3.2	1.9	-	-	-	-	1.4
Oliver Hill Way/Venable St. - Roundabout	2.2	7.6	0.3	-	-	-	-	7.3
Venable St./N 18th St. - East Leg Entrance	1.7	2.2	0.9	-	-	-	-	1.9
Venable St./N 18th St. - East Leg Departure	3.4	5.6	1.0	-	-	-	-	3.4
Venable St./N 18th St. - East Leg Crosswalk	1.8	5.0	0.8	-	-	-	-	2.3
Venable St./N 18th St. - South Leg Entrance	3.1	5.2	1.5	-	-	-	-	2.1
Venable St./N 18th St. - South Leg Departure	2.0	4.7	0.5	-	-	-	-	4.0
Venable St./N 18th St. - South Leg Crosswalk	1.9	3.4	0.9	-	-	-	-	2.1
Venable St./N 18th St. - West Leg Entrance	2.8	5.9	0.9	-	-	-	-	3.1
Venable St./N 18th St. - West Leg Departure	1.6	2.2	0.7	-	-	-	-	2.3
Venable St./N 18th St. - West Leg Crosswalk	1.3	2.9	0.7	-	-	-	-	1.9
Venable St./N 18th St. - Roundabout	3.4	9.5	1.1	-	-	-	-	3.1
Pedestrian Facilities Criteria	0.4							4.0
Oliver Hill Way A/18th St. B NB SUP (E Clay St. to Venable St.)	2.2	7.8	0.4	-	-	-	-	5.5
Oliver Hill Way A/18th St. B NB SUP (Venable St. to O St.)	3.9	6.4	3.3					1.2
Oliver Hill Way A/18th St. B SB SUP (Venable St. to O St.)	4.1	6.7	2.4					1.7
Venable St./Oliver Hill Way B NB SUP (Brown St. to Oliver Hill Way A)	2.6	8.2	0.2	-	-	-	-	13.0
Venable St./Oliver Hill Way B SB SUP (Brown St. to Oliver Hill Way A)	2.5	8.2	0.3	-	-	-	-	8.3
I-95 Off-Ramp/Oliver Hill Way A/18th Street B SB SUP	1.3	5.8	0.4	-	-	-	-	3.3
Venable St. EB SUP (Between Roundabouts)	2.5	7.9	0.4	-	-	-	-	6.3
Venable St. WB SUP (Between Roundabouts)	3.3	8.3	0.3	-	-	-	-	11.0
Venable St. WB SUP (18th St. to Mosby St.)	2.9	8.3	0.8	-	-	-	-	3.6
Venable St. EB Sidwalk (18th St. to Mosby St.)	3.4	9.1	0.6	-	-	-	-	5.7
18 St. A NB Sidewalk (E Clay St. to Venable St.)	2.8	9.5	0.7	-	-	-	-	4.0
18 St. A SB Sidewalk (E Clay St. to Venable St.)	2.1	7.3	0.6	-	-	-	-	3.5
NO SIDEWALK IMPROVEMENTS AT THIS LOCATION								
END OF PROJECT LIMITS / NO ADJACENT LIGHTING								

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH ◇ ●WV
Water Meter ●WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ● ●GV
Fence
Power/Light Pole PP ☼ LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

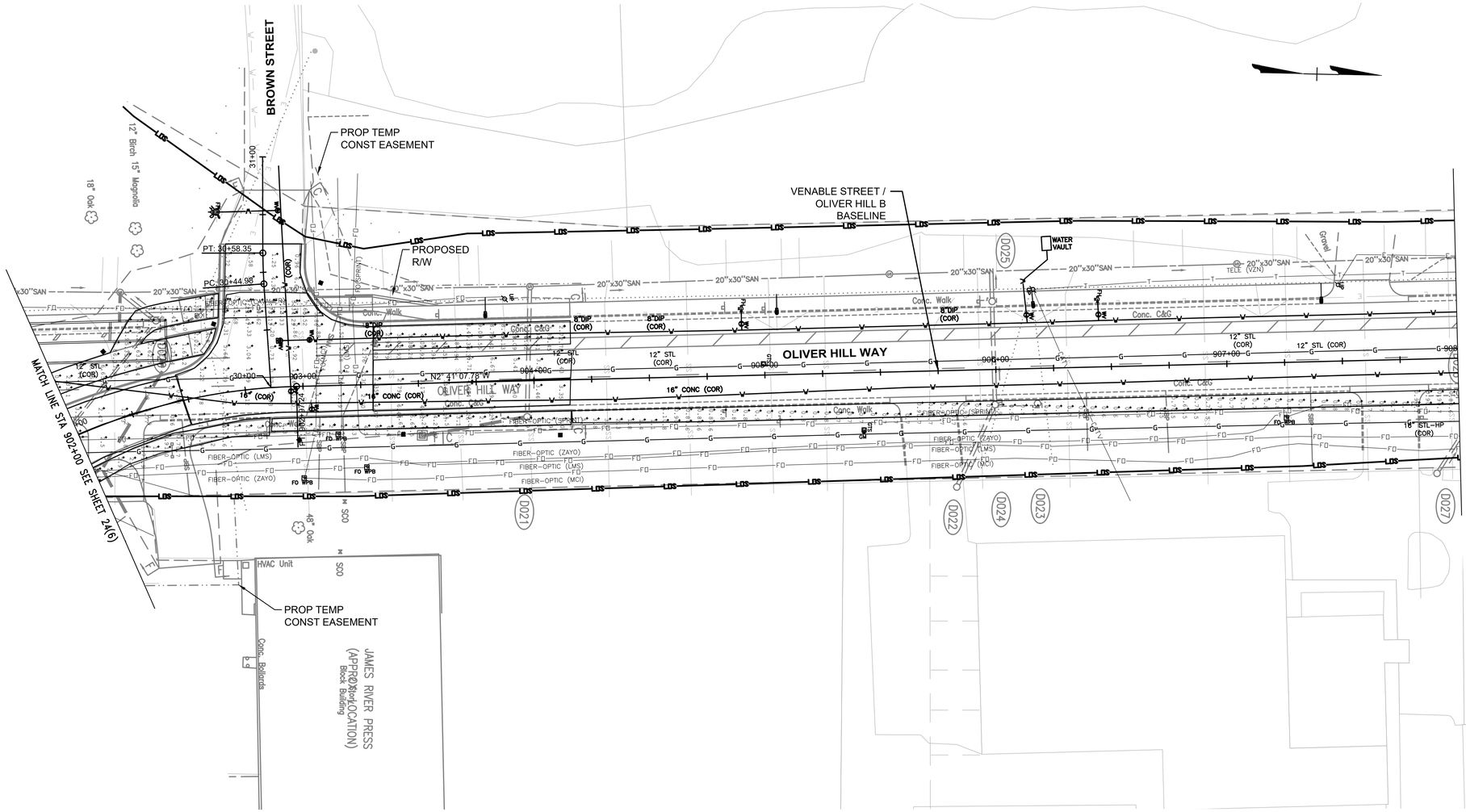
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(6A)	DRAWING NO. 0-28633



Oliver Hill Way (Venable St. to O St.) Photometric Analysis Results	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Avg./Min.
Roadway/Intersections Criteria	0.9					4.0
Oliver Hill Way B NB (Venable St. to Brown St.)	3.9	6.4	3.3	-	-	1.2
Oliver Hill Way B SB (Venable St. to Brown St.)	4.1	6.7	2.4	-	-	1.7
Oliver Hill Way B NB (Brown St. to O St.)	5.1	8.6	2.1	-	-	2.4
Oliver Hill Way B SB (Brown St. to O St.)	0.9	6.3	0.4	-	-	2.3
Intersection of Olivery Hill Way/Brown St.	2.8	7.3	0.6	-	-	4.7
Intersection of Olivery Hill Way/Brown St. - Crosswalk	4.9	7.7	3.1	-	-	1.6
Pedestrian Facilities Criteria	0.4			0.1	0.1	4.0
Venable St./Oliver Hill Way B NB SUP (Brown St. to Oliver Hill Way A)	2.6	8.2	0.2			13.0
Venable St./Oliver Hill Way B SB SUP (Brown St. to Oliver Hill Way A)	2.5	8.2	0.3			8.3
NO SIDEWALK IMPROVEMENTS AT THIS LOCATION						

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

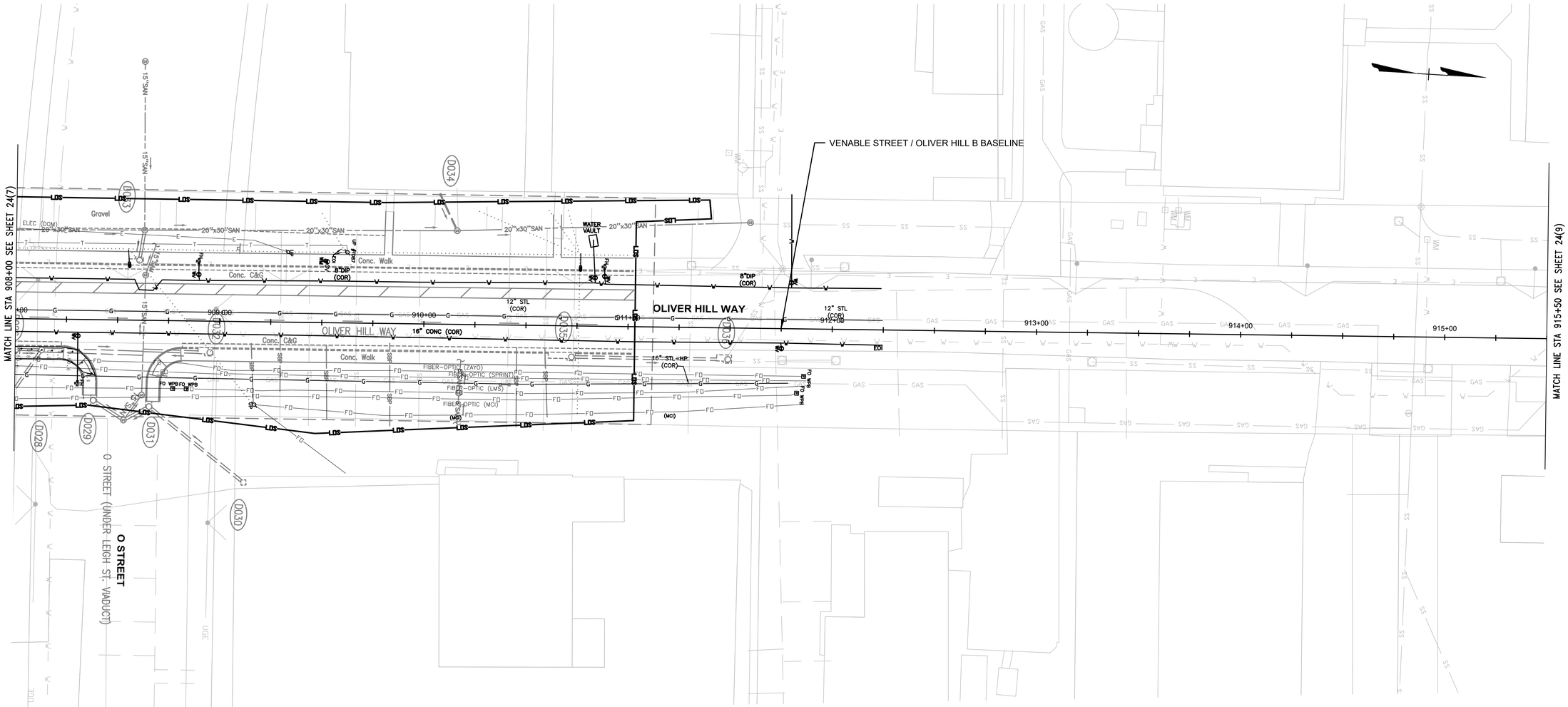
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(7)	DRAWING NO. 0-28633



Oliver Hill Way (O St. to Coalter St.) Photometric Analysis Results						
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Avg./Min.
Roadway/Intersections Criteria	0.9					4.0
Oliver Hill Way NB (Brown St. to O St.)	5.1	8.6	2.1	-	-	2.4
Oliver Hill Way SB (Brown St. to O St.)	0.9	6.3	0.4	-	-	2.3
Oliver Hill Way NB (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way SB (O St. to Coalter St.)	-	-	-	-	-	-
Intersection of O St.	-	-	-	-	-	-
Intersection of O St. - Crosswalk	-	-	-	-	-	-
Pedestrian Facilities Criteria	0.5			0.2	0.2	4.0
Oliver Hill Way NB Sidewalk (Brown St. to O St.)	5.1	8.6	2.1	-	-	2.4
Oliver Hill Way SB Sidewalk (Brown St. to O St.)	-	-	-	-	-	-
Oliver Hill Way NB Sidewalk (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way SB Sidewalk (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way SB Bike Path (Brown St. to O St.)	-	-	-	-	-	-
Oliver Hill Way SB Bike Path (O St. to Coalter St.)	-	-	-	-	-	-
NO SIDEWALK IMPROVEMENTS AT THIS LOCATION						

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

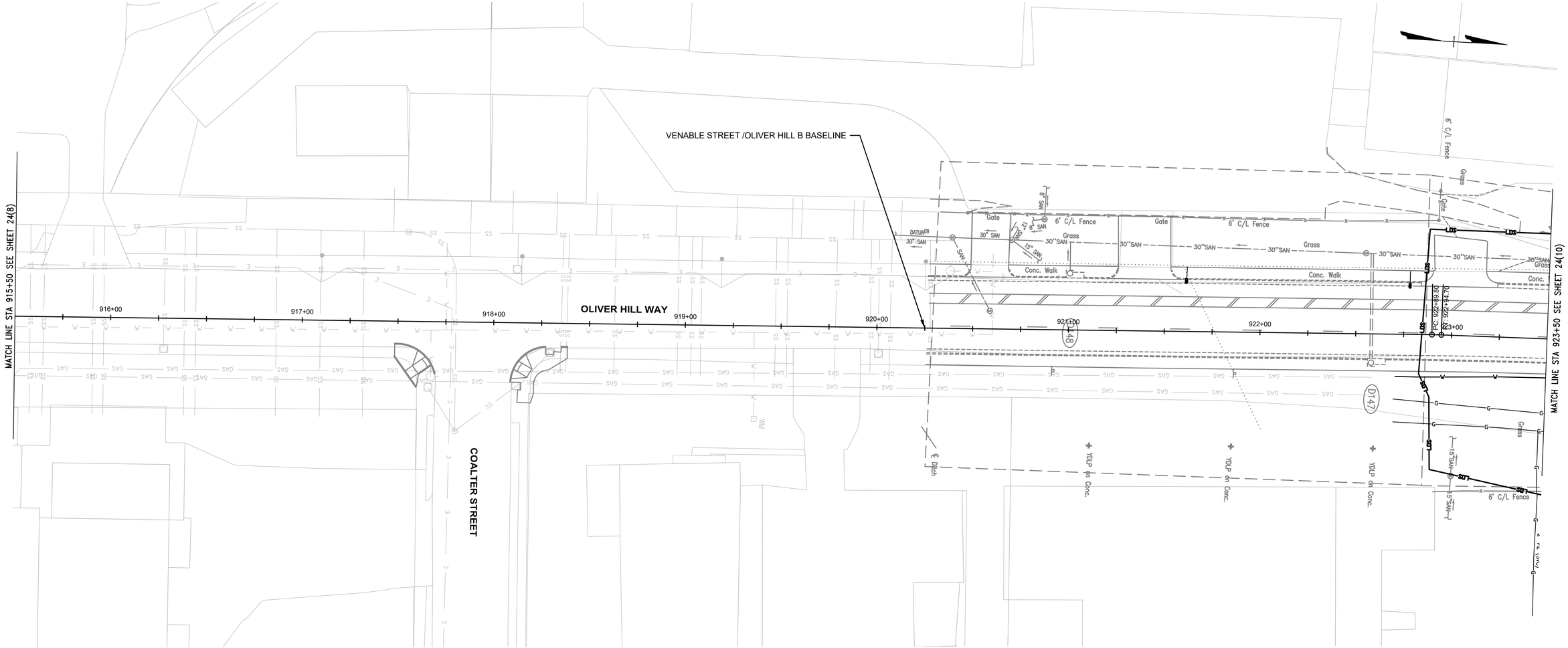
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(8)	DRAWING NO. 0-28633



Oliver Hill Way (Coalter St. to Balding St.)						
Photometric Analysis Results						
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Avg./Min.
Roadway/Intersections Criteria	0.90					4.00
Oliver Hill Way NB (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way SB (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way NB (Coalter St. to Balding St.)	-	-	-	-	-	-
Oliver Hill Way SB (Coalter St. to Balding St.)	-	-	-	-	-	-
Intersection of Coalter St.	-	-	-	-	-	-
Intersection of Coalter St. - Crosswalk	-	-	-	-	-	-
Pedestrian Facilities Criteria	0.4			0.1	0.1	4.0
Oliver Hill Way NB Sidewalk (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way SB Sidewalk (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way NB Sidewalk (Coalter St. to Balding St.)	-	-	-	-	-	-
Oliver Hill Way SB Sidewalk (Coalter St. to Balding St.)	-	-	-	-	-	-
Oliver Hill Way SB Bike Path (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way SB Bike Path (Coalter St. to Balding St.)	-	-	-	-	-	-
NO SIDEWALK IMPROVEMENTS AT THIS LOCATION						

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D) or (S)
Fire Hydrant / Valve FH *WV
Water Meter *WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM * * GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

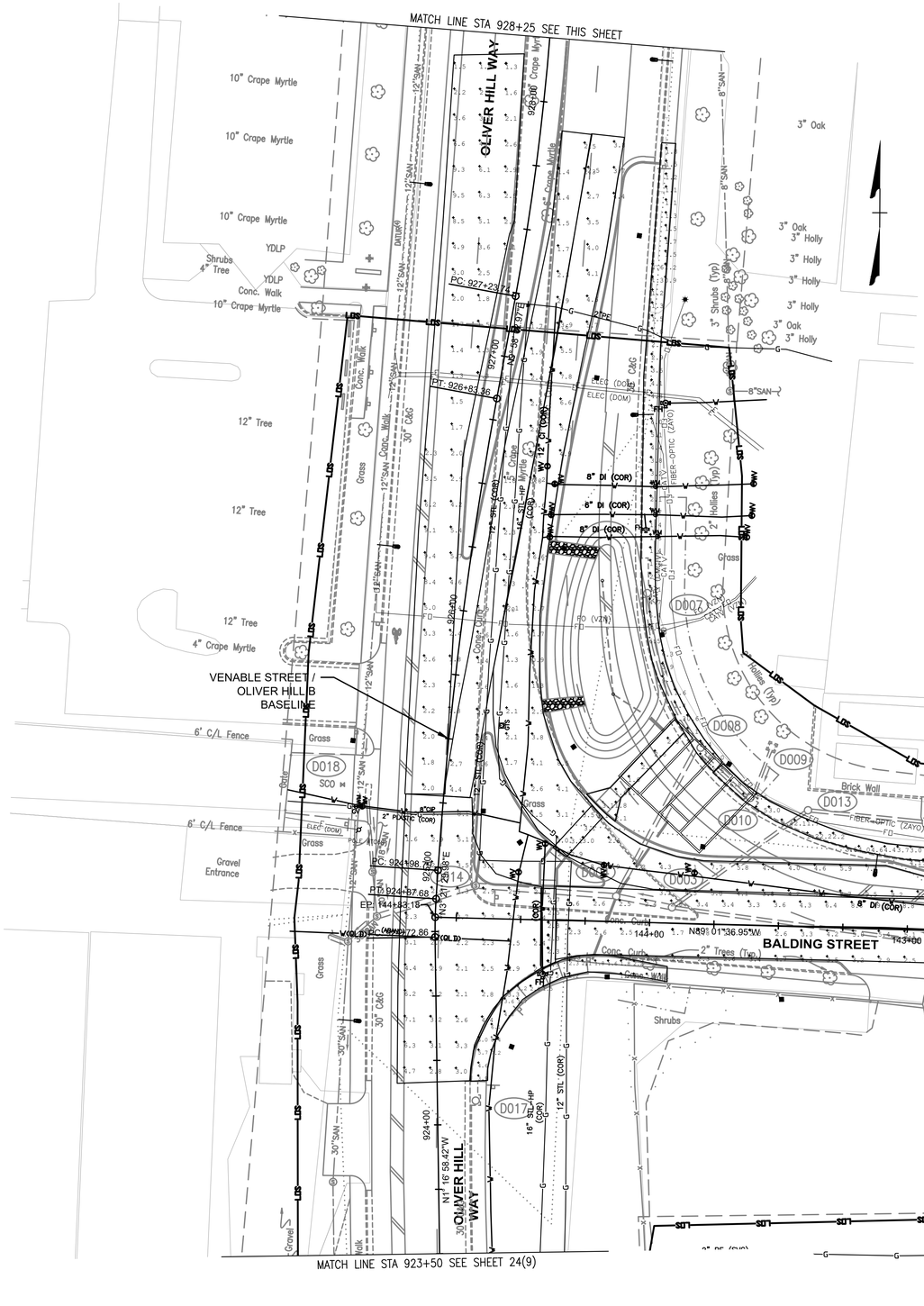
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(9)	DRAWING NO. 0-28633



Oliver Hill Way (Balding St. Project Limits)								
Photometric Analysis Results								
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Min. Vertical Illuminance (EB)	Min. Vertical Illuminance (WB)	Avg./Min.
Roadway/Intersections Criteria	0.9							4.0
Oliver Hill Way NB (Balding St. to Project Limits)	2.3	4.4	1.4	-	-	-	-	1.6
Oliver Hill Way SB (Balding St. to Project Limits)	3.5	9.5	1.3	-	-	-	-	2.7
Oliver Hill Way Slip Ramp	4.2	9.5	0.9	-	-	-	-	4.7
Oliver Hill Way Slip Ramp - Crosswalk	3.0	3.1	2.8	-	-	-	-	1.1
Blading St. EB	3.8	9.3	1.7	-	-	-	-	2.3
Balding St. WB	4.0	9.5	2.4	-	-	-	-	1.7
Intersection of Balding St.	3.3	8.1	1.5					2.2
Intersection of Balding St. - Crosswalk	2.4	2.7	2.3	-	-	-	-	1.0
Pedestrian Facilities Criteria	0.4			0.1	0.1	0.1	0.1	4.0
Oliver Hill Way NB Sidewalk (Balding St. to Project Limits)	2.9	6.5	0.6	-	-	-	-	4.8
Balding St. Sidewalk (Oliver Hill Way to N 18th St.)	3.9	8.5	1.7	-	-	-	-	2.3
Balding St. Sidewalk (SE Corner of Oliver Hill Way Intersection)	3.4	8.4	1.2	-	-	-	-	2.8
Island Sidewalk	2.1	3.9	1.3	-	-	-	-	1.6
NO SIDEWALK IMPROVEMENTS AT THIS LOCATION								
END OF PROJECT LIMITS / NO ADJACENT LIGHTING								

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number__________
4. Adopted__________
5. Accepted______________________________

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓓ or Ⓢ
Fire Hydrant / Valve FH WV
Water Meter WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

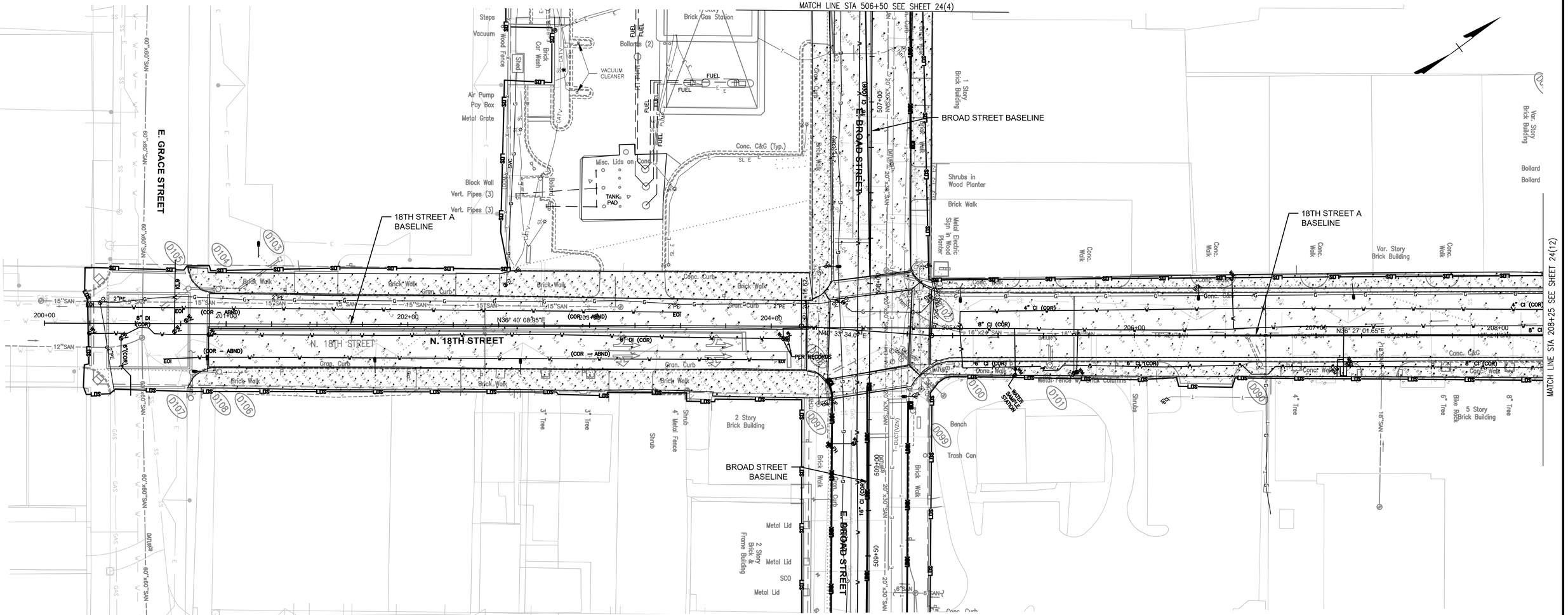
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

AUTHORITY: CITY OF RICHMOND, DPW

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
				SEPTEMBER 2022	SHEET 24(10)	0-28633



N 18th Street (Grace Street to Marshall Street)								
Photometric Analysis Results								
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Min. Vertical Illuminance (EB)	Min. Vertical Illuminance (WB)	Avg./Min.
Roadway/Intersections Criteria	0.9							4.0
Broad St. EB (N 17th St. to N 18th St.)	2.6	9.7	0.1	-	-	-	-	26.0
Broad St. WB (N 17th St. to N 18th St.)	1.4	7.2	0.1	-	-	-	-	14.0
N 18th St. NB (Grace St. to Broad St.)	4.0	11.3	0.2	-	-	-	-	20.0
N 18th St. SB (Grace St. to Broad St.)	2.5	7.6	0.2	-	-	-	-	12.5
N 18th St. NB (Broad St. to Marshall St.)	2.3	5.7	0.8	-	-	-	-	2.9
N 18th St. SB (Broad St. to Marshall St.)	4.2	9.7	0.7	-	-	-	-	5.9
Intersection of N 18th St./Broad St.	5.3	7.8	2.9	-	-	-	-	1.8
Intersection of N 18th St./Broad St. - North Leg Crosswalk	5.2	6.8	3.7	-	-	-	-	1.4
Intersection of N 18th St./Broad St. - East Leg Crosswalk	6.2	10.2	1.8	-	-	-	-	3.4
Intersection of N 18th St./Broad St. - South Leg Crosswalk	2.1	4.3	1.0	-	-	-	-	2.1
Intersection of N 18th St./Broad St. - West Leg Crosswalk	6.2	10.2	2.8	-	-	-	-	2.2
Pedestrian Facilities Criteria	0.5			0.2	0.2	0.2	0.2	4.0
Broad St. EB Sidewalk (N 17th St. to N 18th St.)	2.0	6.4	0.1	-	-	-	-	19.5
Broad St. WB Sidewalk (N 17th St. to N 18th St.)	1.1	6.2	0.1	-	-	-	-	11.0
N 18th St. NB Sidewalk (Grace St. to Broad St.)	2.1	10.4	0.1	-	-	-	-	21.0
N 18th St. SB Sidewalk (Grace St. to Broad St.)	1.1	4.0	0.2	-	-	-	-	5.5
N 18th St. NB Sidewalk (Broad St. to Marshall St.)	1.2	6.0	0.5	-	-	-	-	2.4
N 18th St. SB Sidewalk (Broad St. to Marshall St.)	2.3	6.1	0.5	-	-	-	-	4.5
NO SIDEWALK IMPROVEMENTS AT THIS LOCATION								

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve; Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

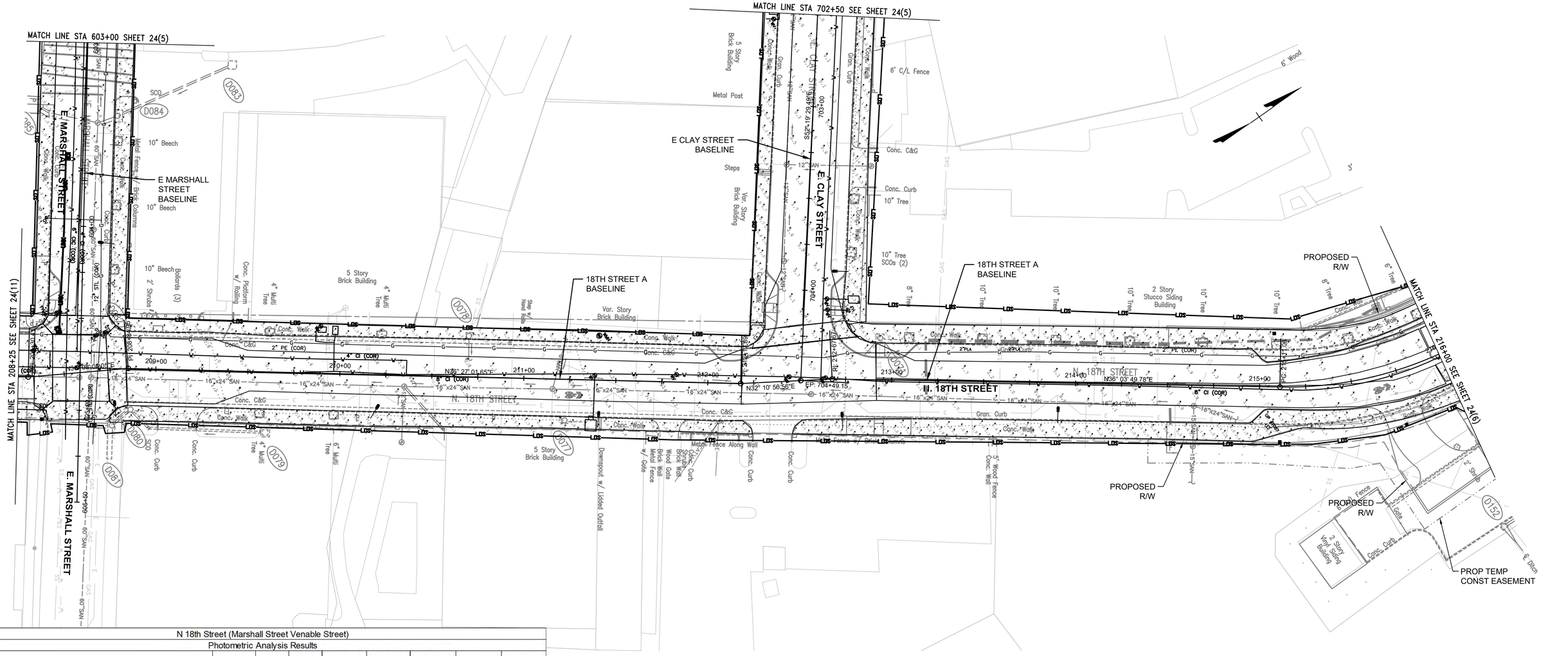
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022	SHEET 24(11)	0-28633
CHECKED BY: ASamberg						



N 18th Street (Marshall Street Venable Street)

Photometric Analysis Results

	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Min. Vertical Illuminance (EB)	Min. Vertical Illuminance (WB)	Avg./Min.
Roadway/Intersections Criteria	0.9							4.0
Marshall St. EB (N 17th St. to N 18th St.)	3.9	10.4	1.3		-	-	-	3.0
Marshall St. WB (N 17th St. to N 18th St.)	4.7	10.6	1.4		-	-	-	3.4
E Clay St. EB (N 17th St. to N 18th St.)	1.6	5.7	0.0		-	-	-	#DIV/0!
E Clay St. WB (N 17th St. to N 18th St.)	2.0	9.4	0.0		-	-	-	#DIV/0!
N 18th St. NB (Marshall St. to E Clay St.)	3.5	9.4	0.6		-	-	-	5.8
N 18th St. SB (Marshall St. to E Clay St.)	2.3	6.1	0.7		-	-	-	3.3
N 18th St. NB (E Clay St. to Venable St.)	2.8	9.5	0.7		-	-	-	4.0
N 18th St. SB (E Clay St. to Venable St.)	2.1	7.3	0.6		-	-	-	3.5
Intersection of N 18th St./Marshall St.	5.8	9.3	2.4		-	-	-	2.4
Intersection of N 18th St./Marshall St. - North Leg Crosswalk	5.7	9.7	1.5		-	-	-	3.8
Intersection of N 18th St./Marshall St. - East Leg Crosswalk	7.2	9.3	4.9		-	-	-	1.5
Intersection of N 18th St./Marshall St. - South Leg Crosswalk	4.2	8.5	1.7		-	-	-	2.5
Intersection of N 18th St./Marshall St. - West Leg Crosswalk	2.1	2.5	1.6		-	-	-	1.3
Intersection of N 18th St./E Clay St.	4.1	9.5	1.4		-	-	-	2.9
Intersection of N 18th St./E Clay St. - West Leg Crosswalk	2.5	3.6	1.3		-	-	-	1.9
Pedestrian Facilities Criteria	0.4			0.1	0.1	0.1	0.1	4.0
Marshall St. EB Sidewalk (N 17th St. to N 18th St.)	1.8	3.6	0.9					2.0
Marshall St. WB Sidewalk (N 17th St. to N 18th St.)	2.5	6.4	0.8					3.1
E Clay St. EB Sidewalk (N 17th St. to N 18th St.)	0.4	1.3	0.0					#DIV/0!
E Clay St. WB Sidewalk (N 17th St. to N 18th St.)	1.0	5.3	0.0					#DIV/0!
N 18th St. NB Sidewalk (Marshall St. to E Clay St.)	2.5	7.4	0.2					12.5
N 18th St. SB Sidewalk (Marshall St. to E Clay St.)	0.9	1.8	0.4					2.1
N 18th St. NB Sidewalk (E Clay St. to Venable St.)	3.2	8.1	0.3					10.7
N 18th St. SB Sidewalk (E Clay St. to Venable St.)	2.0	7.6	0.3					6.5
NO SIDEWALK IMPROVEMENTS AT THIS LOCATION								

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

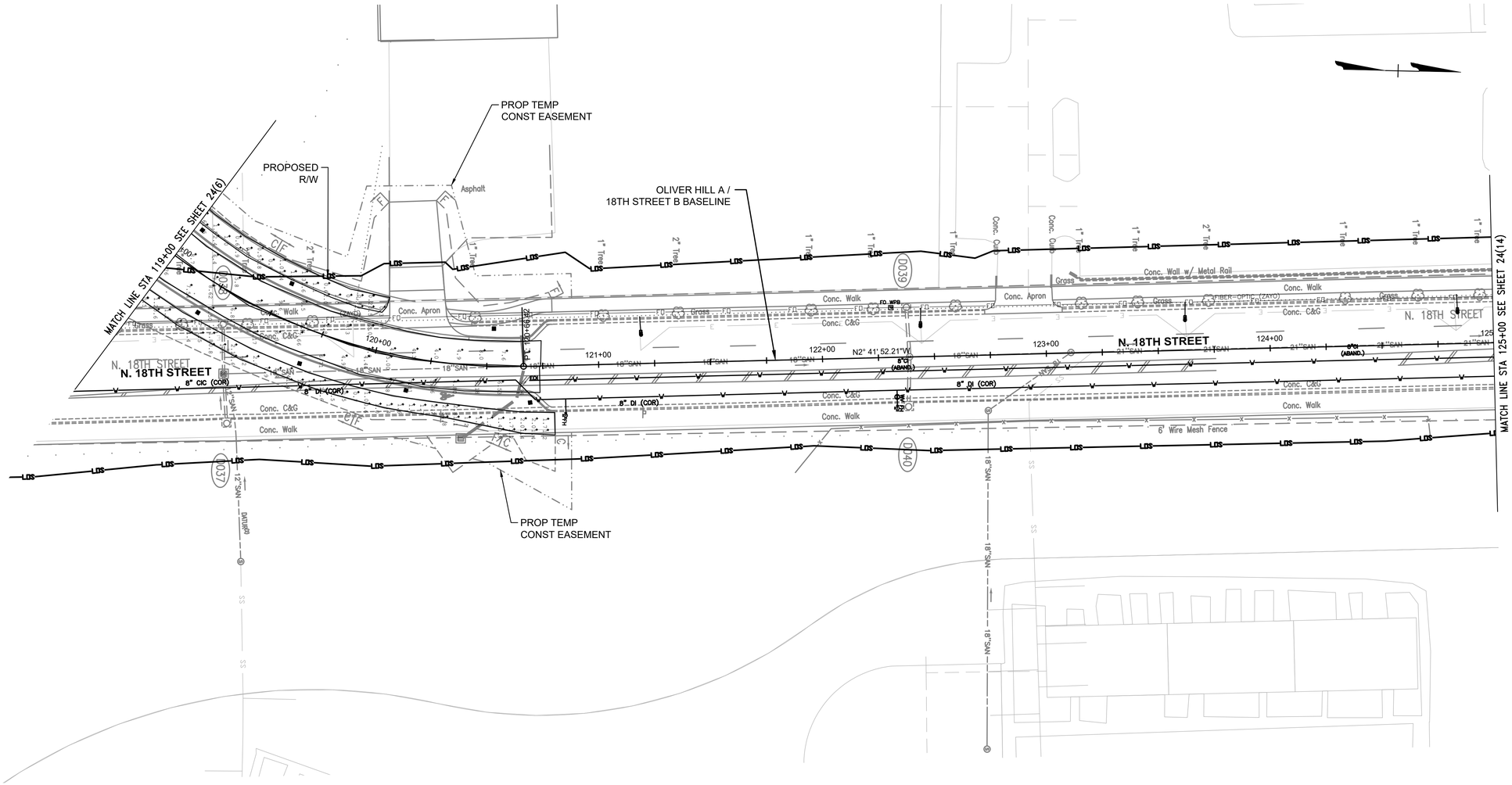
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 24(12)	0-28633



Oliver Hill Way (Venable St. to O St.) Photometric Analysis Results						
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Avg./Min.
Roadway/Intersections Criteria	0.9					4.0
Oliver Hill Way A NB (Venable St. to O St.)	6.4	9.9	3.7	-	-	1.7
Oliver Hill Way A SB (Venable St. to O St.)	5.4	9.6	2.0	-	-	2.7
Pedestrian Facilities Criteria	0.4			0.1	0.1	4.0
Oliver Hill Way A NB Sidewalk (Venable St. to O St.)	3.9	6.4	3.3	-	-	1.2
Oliver Hill Way A SB Sidewalk (Venable St. to O St.)	4.1	6.7	2.4	-	-	1.7
NO SIDEWALK IMPROVEMENTS AT THIS LOCATION						

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓢ or Ⓢ
Fire Hydrant / Valve FH ✧ ● WV
Water Meter ● WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM ● ● GV
Fence
Power/Light Pole PP ☼ LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH ● (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

SCALE IN FEET: 25 0 25 50

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

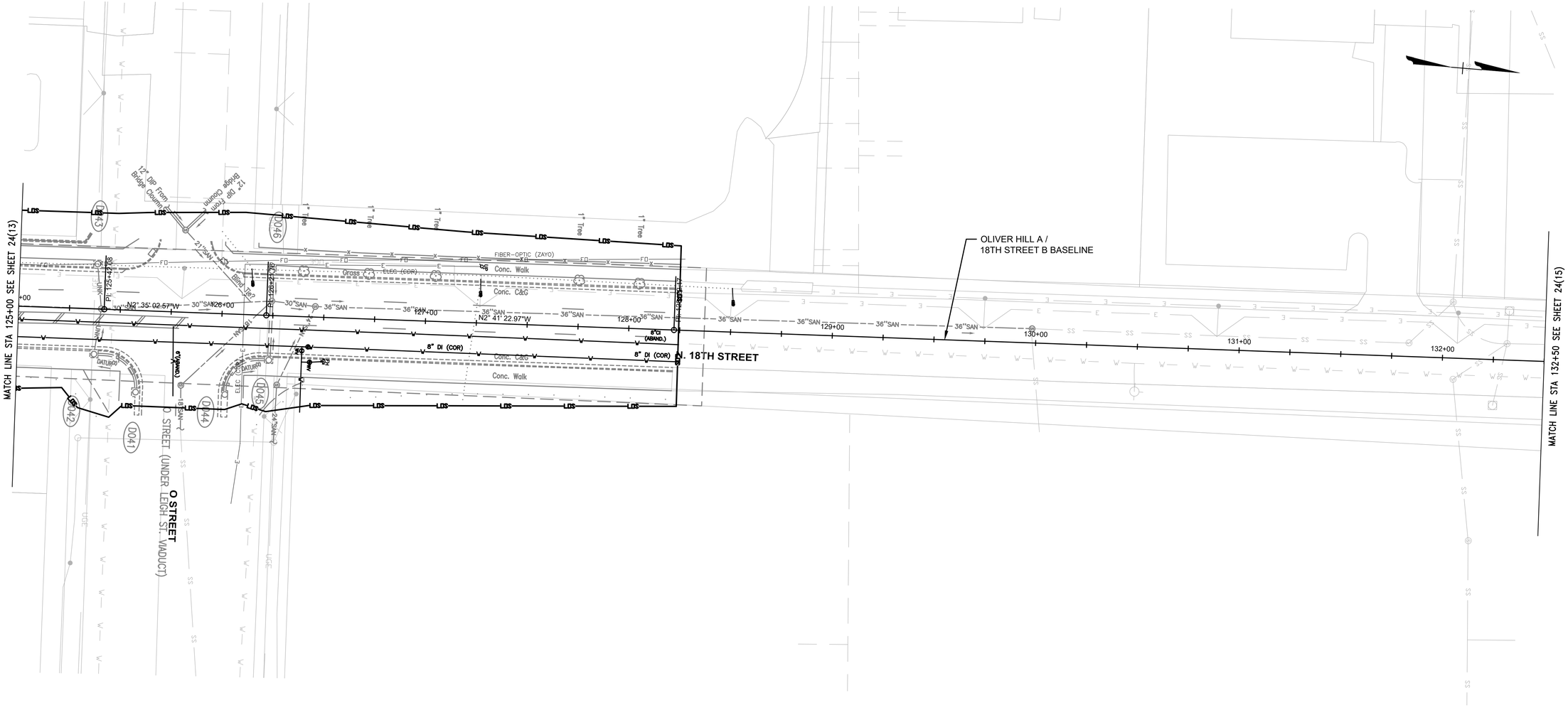
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People • Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(13)	DRAWING NO. 0-28633



Oliver Hill Way (O St. to Coalter St.) Photometric Analysis Results	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Avg./Min.
Roadway/Intersections Criteria	0.9					6.0
Oliver Hill Way A NB (Venable St. to O St.)	-	-	-	-	-	-
Oliver Hill Way A SB (Venable St. to O St.)	-	-	-	-	-	-
Oliver Hill Way A NB (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way A SB (O St. to Coalter St.)	-	-	-	-	-	-
Intersection of Oliver Hill Way A/O St.	-	-	-	-	-	-
Intersection of Oliver Hill Way A/O St. - North Leg Crosswalk	-	-	-	-	-	-
Intersection of Oliver Hill Way A/O St. - East Leg Crosswalk	-	-	-	-	-	-
Intersection of Oliver Hill Way A/O St. - South Leg Crosswalk	-	-	-	-	-	-
Intersection of Oliver Hill Way A/O St. - West Leg Crosswalk	-	-	-	-	-	-
Pedestrian Facilities Criteria	0.4			0.1	0.1	4.0
Oliver Hill Way A NB Sidewalk (Venable St. to O St.)	-	-	-	-	-	-
Oliver Hill Way A SB Sidewalk (Venable St. to O St.)	-	-	-	-	-	-
Oliver Hill Way A NB Sidewalk (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way A SB Sidewalk (O St. to Coalter St.)	-	-	-	-	-	-
NO SIDEWALK IMPROVEMENTS AT THIS LOCATION						

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve (FH, WV)
Water Meter (WM)
Existing Curb Cut Ramp (HCR)
Gas Meter / Valve (GM, GV)
Fence
Power/Light Pole (PP, LP)
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

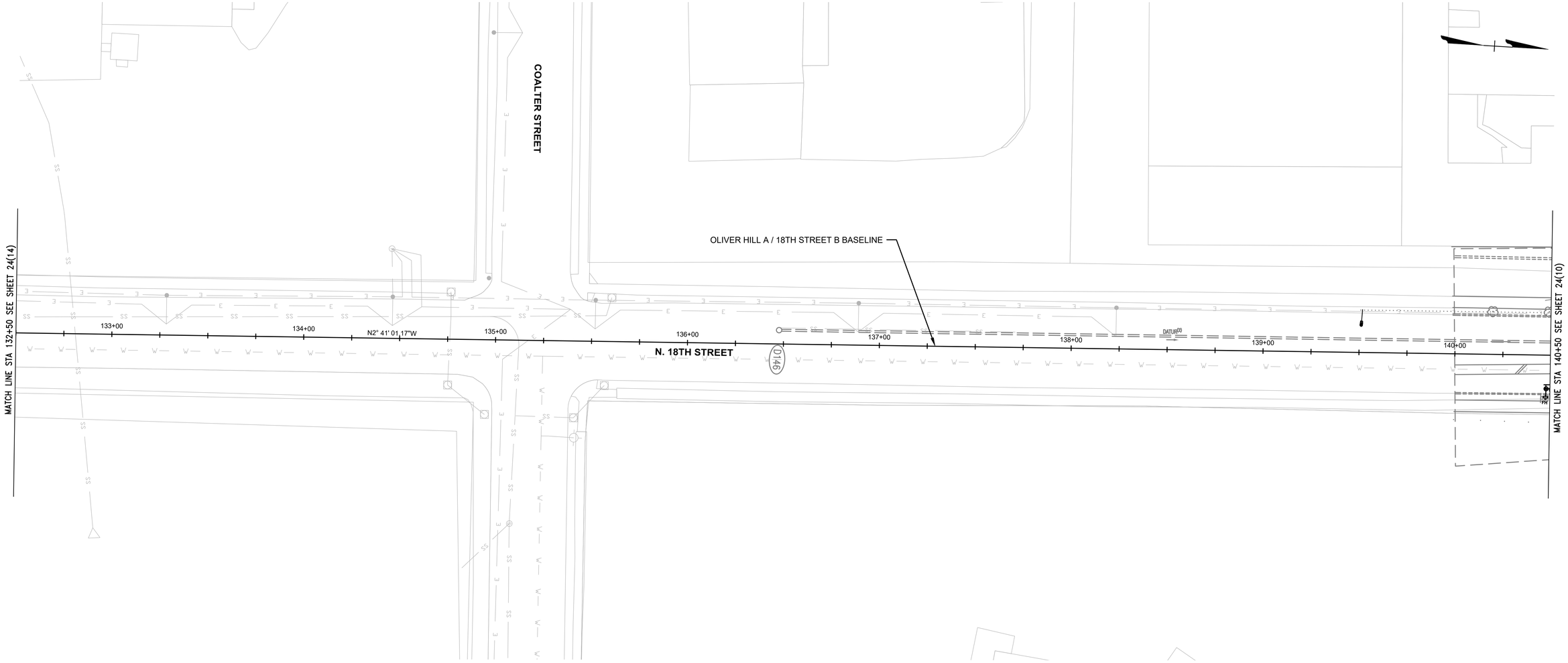
Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

RK&K Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(14)	DRAWING NO. 0-28633



Oliver Hill Way (Coalter St. to Balding St.)

Photometric Analysis Results

	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Avg./Min.
Roadway/Intersections Criteria	0.7					6.0
Oliver Hill Way A NB (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way A SB (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way A NB (Coalter St. to Balding St.)	-	-	-	-	-	-
Oliver Hill Way A SB (Coalter St. to Balding St.)	-	-	-	-	-	-
Intersection of Oliver Hill Way A/Coalter St.	-	-	-	-	-	-
Intersection of Oliver Hill Way A/Coalter St. - North Leg Crosswalk	-	-	-	-	-	-
Intersection of Oliver Hill Way A/Coalter St. - East Leg Crosswalk	-	-	-	-	-	-
Intersection of Oliver Hill Way A/Coalter St. - South Leg Crosswalk	-	-	-	-	-	-
Intersection of Oliver Hill Way A/Coalter St. - West Leg Crosswalk	-	-	-	-	-	-
Pedestrian Facilities Criteria	0.4			0.1	0.1	4.0
Oliver Hill Way A NB Sidewalk (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way A SB Sidewalk (O St. to Coalter St.)	-	-	-	-	-	-
Oliver Hill Way A NB Sidewalk (Coalter St. to Balding St.)	-	-	-	-	-	-
Oliver Hill Way A SB Sidewalk (Coalter St. to Balding St.)	-	-	-	-	-	-
NO SIDEWALK IMPROVEMENTS AT THIS LOCATION						

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

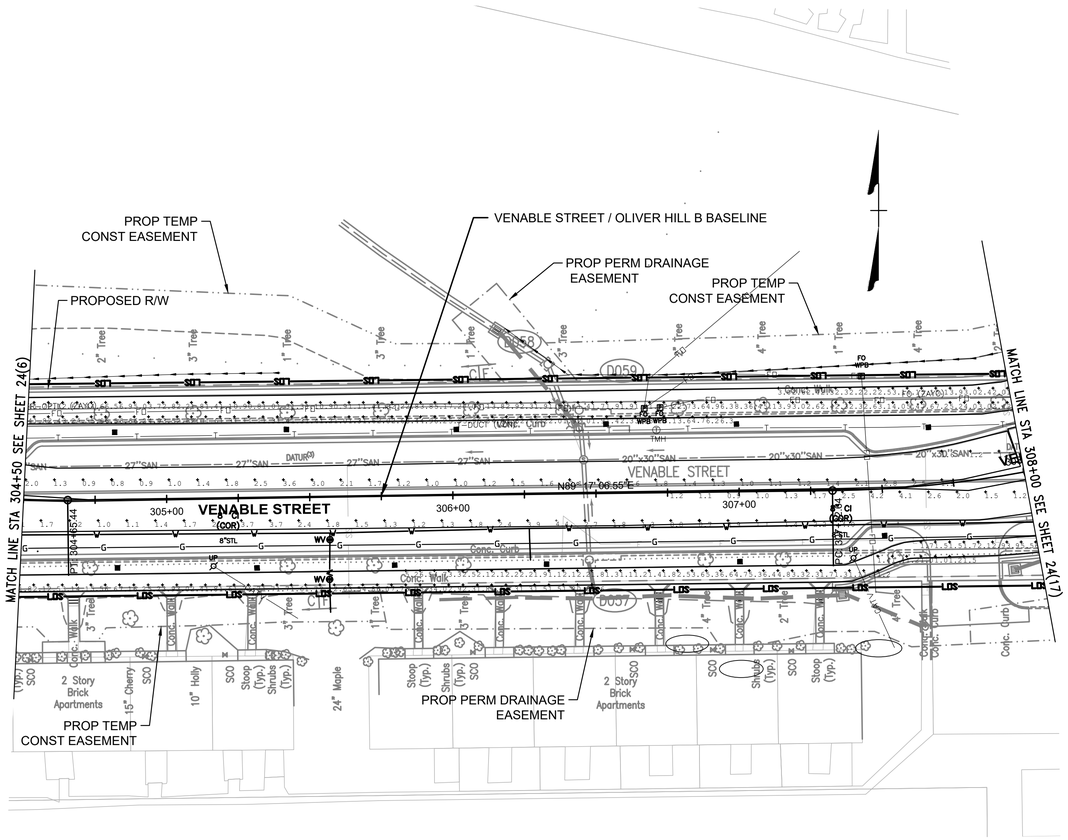
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(15)	DRAWING NO. 0-28633



Mosby Street (From Venable to Carrington Street)						
Photometric Analysis Results						
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Avg./Min.
Roadway/Intersections Criteria	0.7					6.0
Venable St. WB (18th St. to Mosby St.)	2.1	4.4	0.7	-	-	3.0
Venable St. EB (18th St. to Mosby St.)	2.0	6.4	0.8	-	-	2.5
Pedestrian Facilities Criteria	0.4			0.1	0.1	4.0
Venable St. WB SUP (18th St. to Mosby St.)	2.9	8.3	0.8	-	-	3.6
Venable St. EB Sidwalk (18th St. to Mosby St.)	3.4	9.1	0.6	-	-	5.7

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

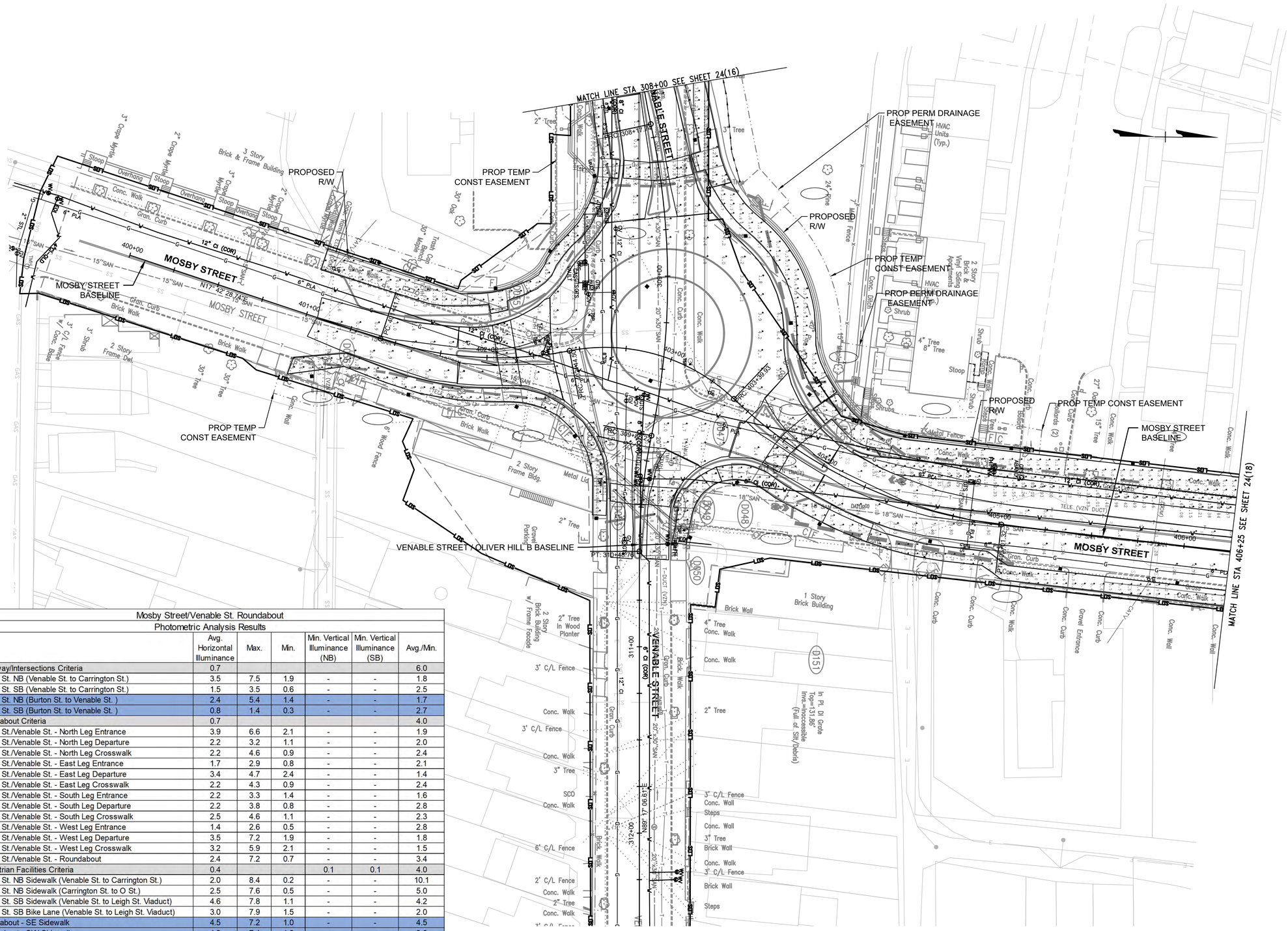
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BSeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(16)	DRAWING NO. 0-28633



Mosby Street/Venable St. Roundabout Photometric Analysis Results						
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Avg./Min.
Roadway/Intersections Criteria	0.7					6.0
Mosby St. NB (Venable St. to Carrington St.)	3.5	7.5	1.9	-	-	1.8
Mosby St. SB (Venable St. to Carrington St.)	1.5	3.5	0.6	-	-	2.5
Mosby St. NB (Burton St. to Venable St.)	2.4	5.4	1.4	-	-	1.7
Mosby St. SB (Burton St. to Venable St.)	0.8	1.4	0.3	-	-	2.7
Roundabout Criteria	0.7					4.0
Mosby St./Venable St. - North Leg Entrance	3.9	6.6	2.1	-	-	1.9
Mosby St./Venable St. - North Leg Departure	2.2	3.2	1.1	-	-	2.0
Mosby St./Venable St. - North Leg Crosswalk	2.2	4.6	0.9	-	-	2.4
Mosby St./Venable St. - East Leg Entrance	1.7	2.9	0.8	-	-	2.1
Mosby St./Venable St. - East Leg Departure	3.4	4.7	2.4	-	-	1.4
Mosby St./Venable St. - East Leg Crosswalk	2.2	4.3	0.9	-	-	2.4
Mosby St./Venable St. - South Leg Entrance	2.2	3.3	1.4	-	-	1.6
Mosby St./Venable St. - South Leg Departure	2.2	3.8	0.8	-	-	2.8
Mosby St./Venable St. - South Leg Crosswalk	2.5	4.6	1.1	-	-	2.3
Mosby St./Venable St. - West Leg Entrance	1.4	2.6	0.5	-	-	2.8
Mosby St./Venable St. - West Leg Departure	3.5	7.2	1.9	-	-	1.8
Mosby St./Venable St. - West Leg Crosswalk	3.2	5.9	2.1	-	-	1.5
Mosby St./Venable St. - Roundabout	2.4	7.2	0.7	-	-	3.4
Pedestrian Facilities Criteria	0.4			0.1	0.1	4.0
Mosby St. NB Sidewalk (Venable St. to Carrington St.)	2.0	8.4	0.2	-	-	10.1
Mosby St. NB Sidewalk (Carrington St. to O St.)	2.5	7.6	0.5	-	-	5.0
Mosby St. SB Sidewalk (Venable St. to Leigh St. Viaduct)	4.6	7.8	1.1	-	-	4.2
Mosby St. SB Bike Lane (Venable St. to Leigh St. Viaduct)	3.0	7.9	1.5	-	-	2.0
Roundabout - SE Sidewalk	4.5	7.2	1.0	-	-	4.5
Roundabout - SW Sidewalk	4.3	7.4	1.2	-	-	3.6
Roundabout - NW Sidewalk	4.1	8.2	0.4	-	-	10.3
END OF PROJECT LIMITS / NO ADJACENT LIGHTING						

NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

SCALE IN FEET: 25 0 25 50

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

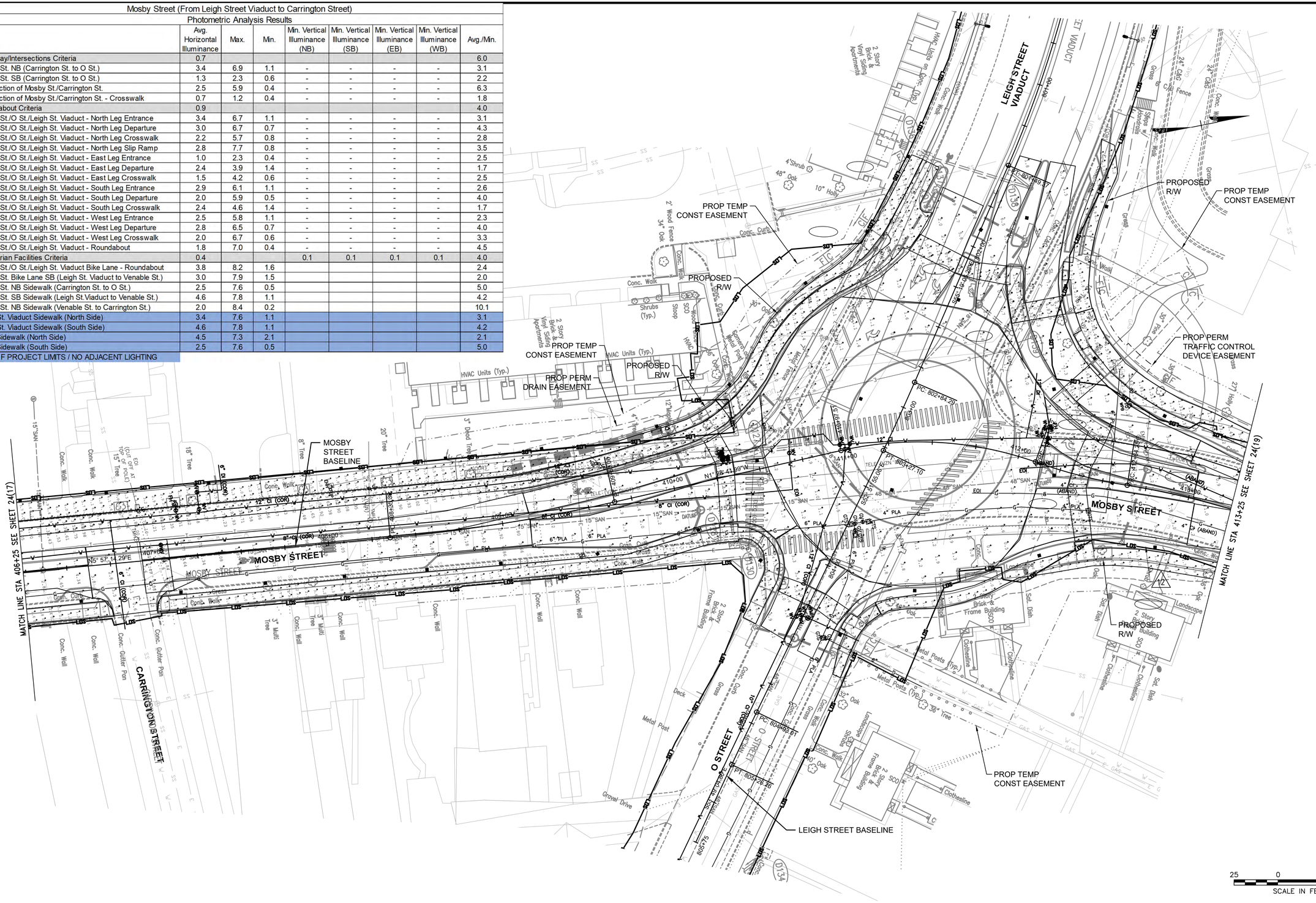
RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(17)	DRAWING NO. 0-28633

Mosby Street (From Leigh Street Viaduct to Carrington Street)								
Photometric Analysis Results								
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Min. Vertical Illuminance (EB)	Min. Vertical Illuminance (WB)	Avg./Min.
Roadway/Intersections Criteria	0.7							6.0
Mosby St. NB (Carrington St. to O St.)	3.4	6.9	1.1	-	-	-	-	3.1
Mosby St. SB (Carrington St. to O St.)	1.3	2.3	0.6	-	-	-	-	2.2
Intersection of Mosby St./Carrington St.	2.5	5.9	0.4	-	-	-	-	6.3
Intersection of Mosby St./Carrington St. - Crosswalk	0.7	1.2	0.4	-	-	-	-	1.8
Roundabout Criteria	0.9							4.0
Mosby St./O St./Leigh St. Viaduct - North Leg Entrance	3.4	6.7	1.1	-	-	-	-	3.1
Mosby St./O St./Leigh St. Viaduct - North Leg Departure	3.0	6.7	0.7	-	-	-	-	4.3
Mosby St./O St./Leigh St. Viaduct - North Leg Crosswalk	2.2	5.7	0.8	-	-	-	-	2.8
Mosby St./O St./Leigh St. Viaduct - North Leg Slip Ramp	2.8	7.7	0.8	-	-	-	-	3.5
Mosby St./O St./Leigh St. Viaduct - East Leg Entrance	1.0	2.3	0.4	-	-	-	-	2.5
Mosby St./O St./Leigh St. Viaduct - East Leg Departure	2.4	3.9	1.4	-	-	-	-	1.7
Mosby St./O St./Leigh St. Viaduct - East Leg Crosswalk	1.5	4.2	0.6	-	-	-	-	2.5
Mosby St./O St./Leigh St. Viaduct - South Leg Entrance	2.9	6.1	1.1	-	-	-	-	2.6
Mosby St./O St./Leigh St. Viaduct - South Leg Departure	2.0	5.9	0.5	-	-	-	-	4.0
Mosby St./O St./Leigh St. Viaduct - South Leg Crosswalk	2.4	4.6	1.4	-	-	-	-	1.7
Mosby St./O St./Leigh St. Viaduct - West Leg Entrance	2.5	5.8	1.1	-	-	-	-	2.3
Mosby St./O St./Leigh St. Viaduct - West Leg Departure	2.8	6.5	0.7	-	-	-	-	4.0
Mosby St./O St./Leigh St. Viaduct - West Leg Crosswalk	2.0	6.7	0.6	-	-	-	-	3.3
Mosby St./O St./Leigh St. Viaduct - Roundabout	1.8	7.0	0.4	-	-	-	-	4.5
Pedestrian Facilities Criteria	0.4			0.1	0.1	0.1	0.1	4.0
Mosby St./O St./Leigh St. Viaduct Bike Lane - Roundabout	3.8	8.2	1.6					2.4
Mosby St. Bike Lane SB (Leigh St. Viaduct to Venable St.)	3.0	7.9	1.5					2.0
Mosby St. NB Sidewalk (Carrington St. to O St.)	2.5	7.6	0.5					5.0
Mosby St. SB Sidewalk (Leigh St.Viaduct to Venable St.)	4.6	7.8	1.1					4.2
Mosby St. NB Sidewalk (Venable St. to Carrington St.)	2.0	8.4	0.2					10.1
Leigh St. Viaduct Sidewalk (North Side)	3.4	7.6	1.1					3.1
Leigh St. Viaduct Sidewalk (South Side)	4.6	7.8	1.1					4.2
O St. Sidewalk (North Side)	4.5	7.3	2.1					2.1
O St. Sidewalk (South Side)	2.5	7.6	0.5					5.0
END OF PROJECT LIMITS / NO ADJACENT LIGHTING								



70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole Ⓢ or Ⓢ
Fire Hydrant / Valve FH • • VV

Water Meter • WM
Existing Curb Cut Ramp HCR
Gas Meter / Valve GM • • GV
Fence
Power/Light Pole PP LP
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH • (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

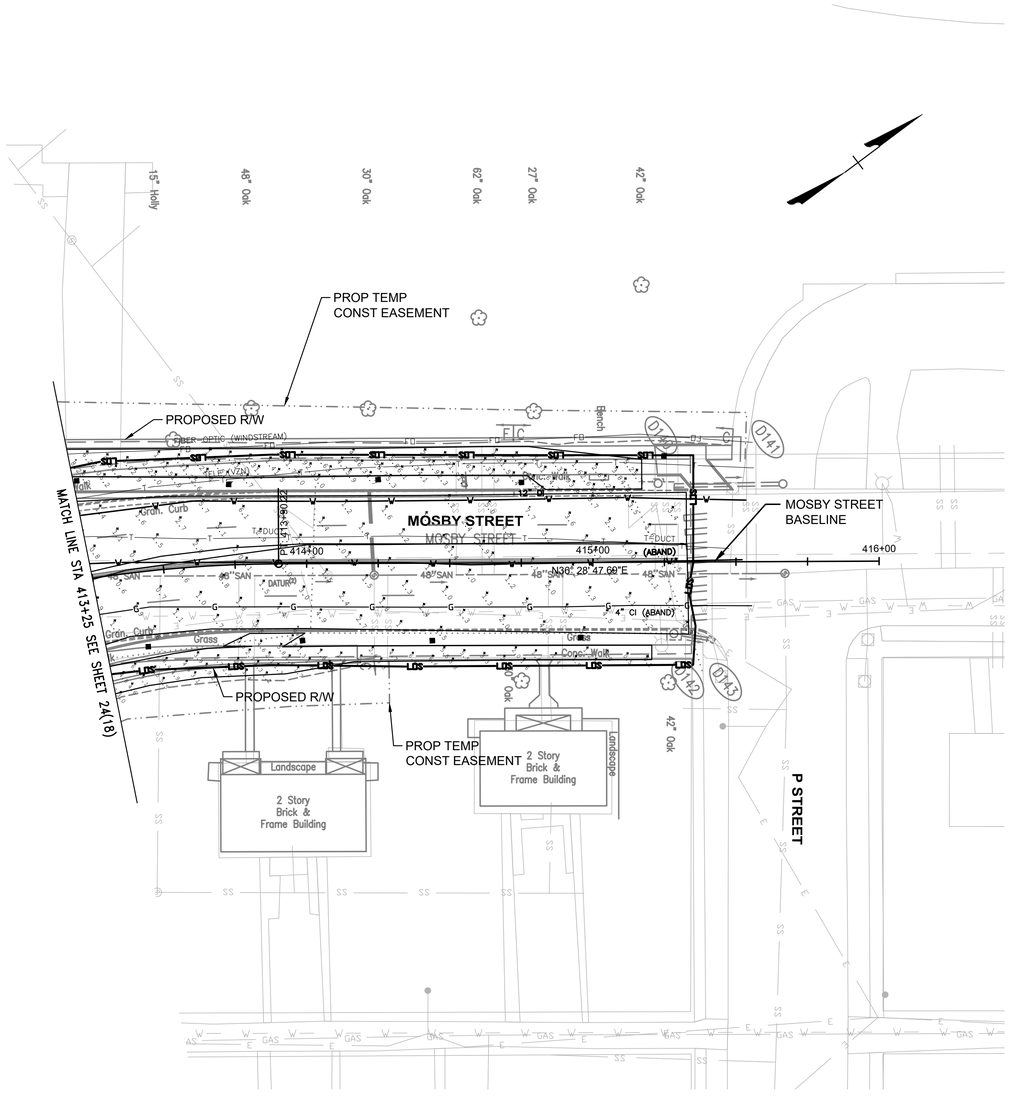
Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

RK&K
Responsive People - Creative Solutions

SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 24(18)	0-28633



Mosby Street (From Leigh Street Viaduct/O Street to P Street)						
Photometric Analysis Results						
	Avg. Horizontal Illuminance	Max.	Min.	Min. Vertical Illuminance (NB)	Min. Vertical Illuminance (SB)	Avg./Min.
Roadway/Intersections Criteria	0.7					6.0
Mosby St. NB	1.9	6.3	0.5	-	-	3.8
Mosby St. SB	2.3	7.7	0.7	-	-	3.3
Pedestrian Facilities Criteria	0.4			0.1	0.1	4.0
Mosby St. NB Sidewalk	2.7	8.0	0.2	-	-	13.5
Mosby St. SB Sidewalk	3.1	8.2	1.1	-	-	2.8
END OF PROJECT LIMITS / NO ADJACENT LIGHTING						

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K
Responsive People - Creative Solutions

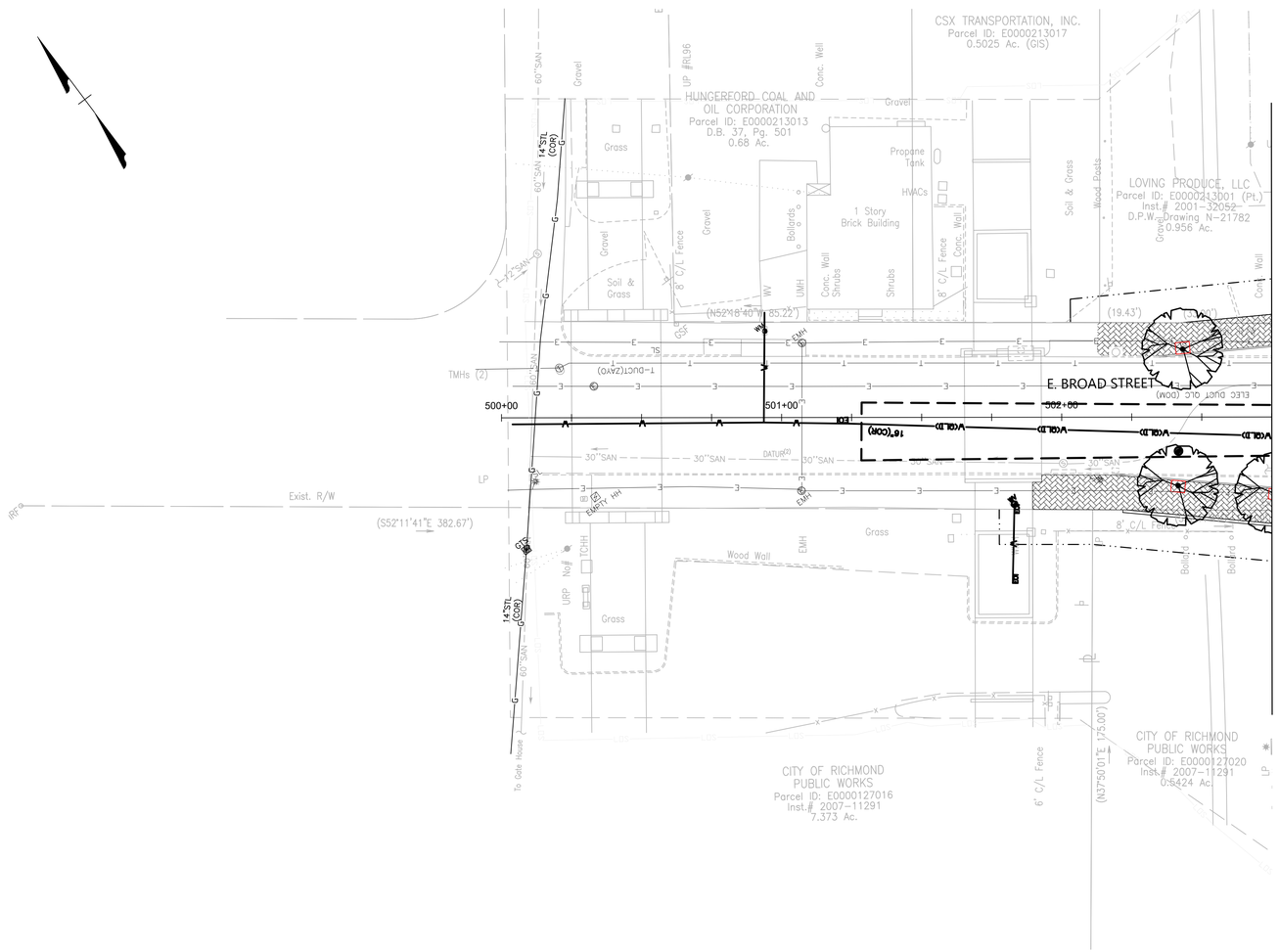
SHOCKOE VALLEY STREET IMPROVEMENTS
LIGHTING PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 24(19)	DRAWING NO. 0-28633

CONCEPT PLANT SCHEDULE

- LARGE DECIDUOUS TREE — 2.5" caliper at planting — -
- LARGE EVERGREEN TREE — 6' high at planting — -
- SMALL DECIDUOUS TREE — 1.5" caliper at planting — -
- SMALL EVERGREEN TREE — 6' high at planting — -
- DECIDUOUS SHRUB — 2' high at planting — -
- EVERGREEN SHRUB — 2' high at planting — -
- PERENNIAL — 1 Gallon- 18" o.c. — -
- NATIVE GRASS — 1 Gallon -18" o.c. — -



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions
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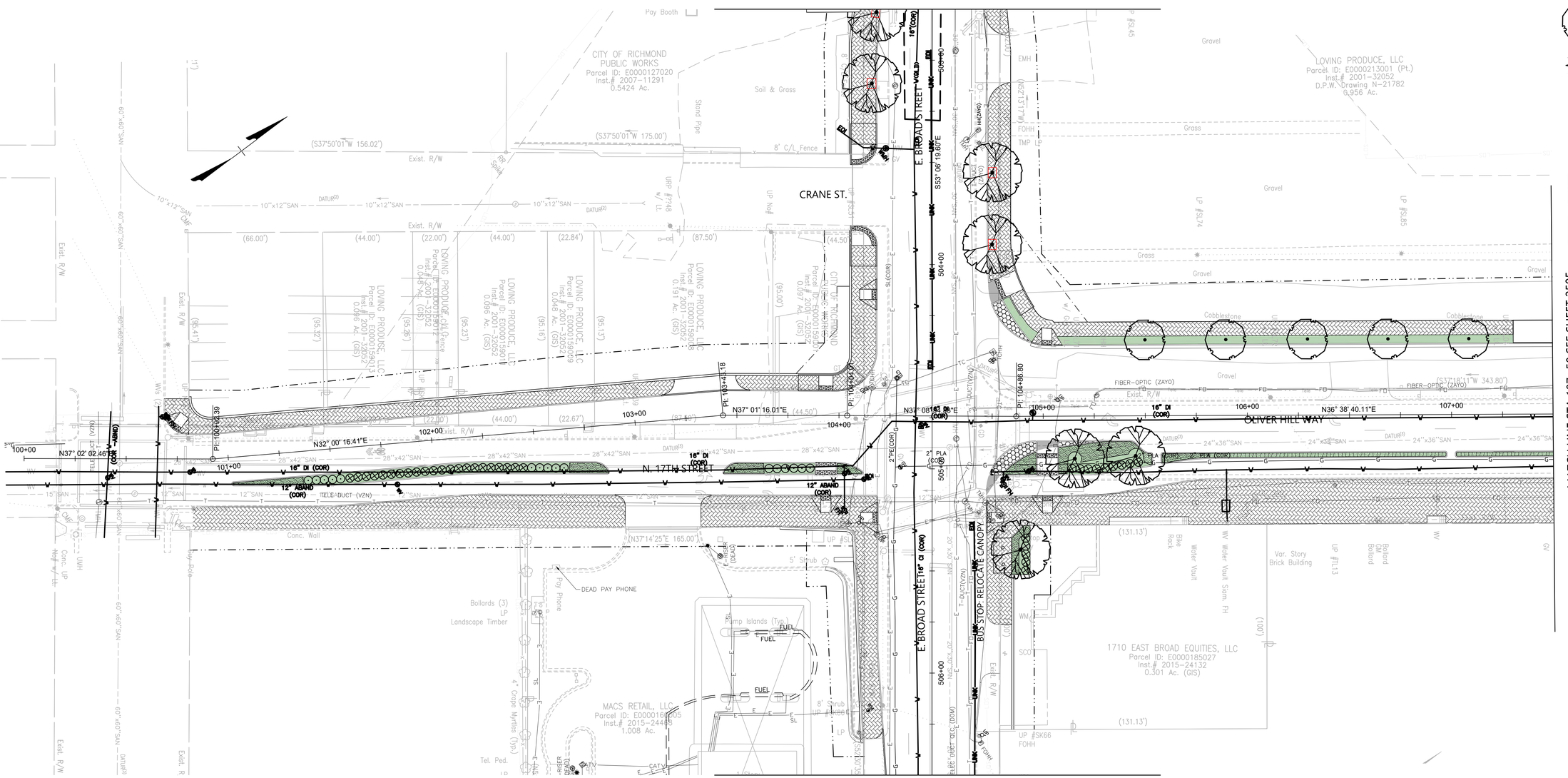
SHOCKOE VALLEY STREET IMPROVEMENTS
LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2503	0-28633

MATCH LINE STA 502+75 SEE SHEET 2503



MATCH LINE STA 506+50 SEE SHEET 2511

MATCH LINE STA 107+50 SEE SHEET 2505

CONCEPT PLANT SCHEDULE

- LARGE DECIDUOUS TREE — 2.5" caliper at planting
- LARGE EVERGREEN TREE — 6' high at planting
- SMALL DECIDUOUS TREE — 1.5" caliper at planting
- SMALL EVERGREEN TREE — 6' high at planting
- DECIDUOUS SHRUB — 2' high at planting
- EVERGREEN SHRUB — 2' high at planting
- PERENNIAL — 1 Gallon- 18" o.c.
- NATIVE GRASS — 1 Gallon -18" o.c.

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (County)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions
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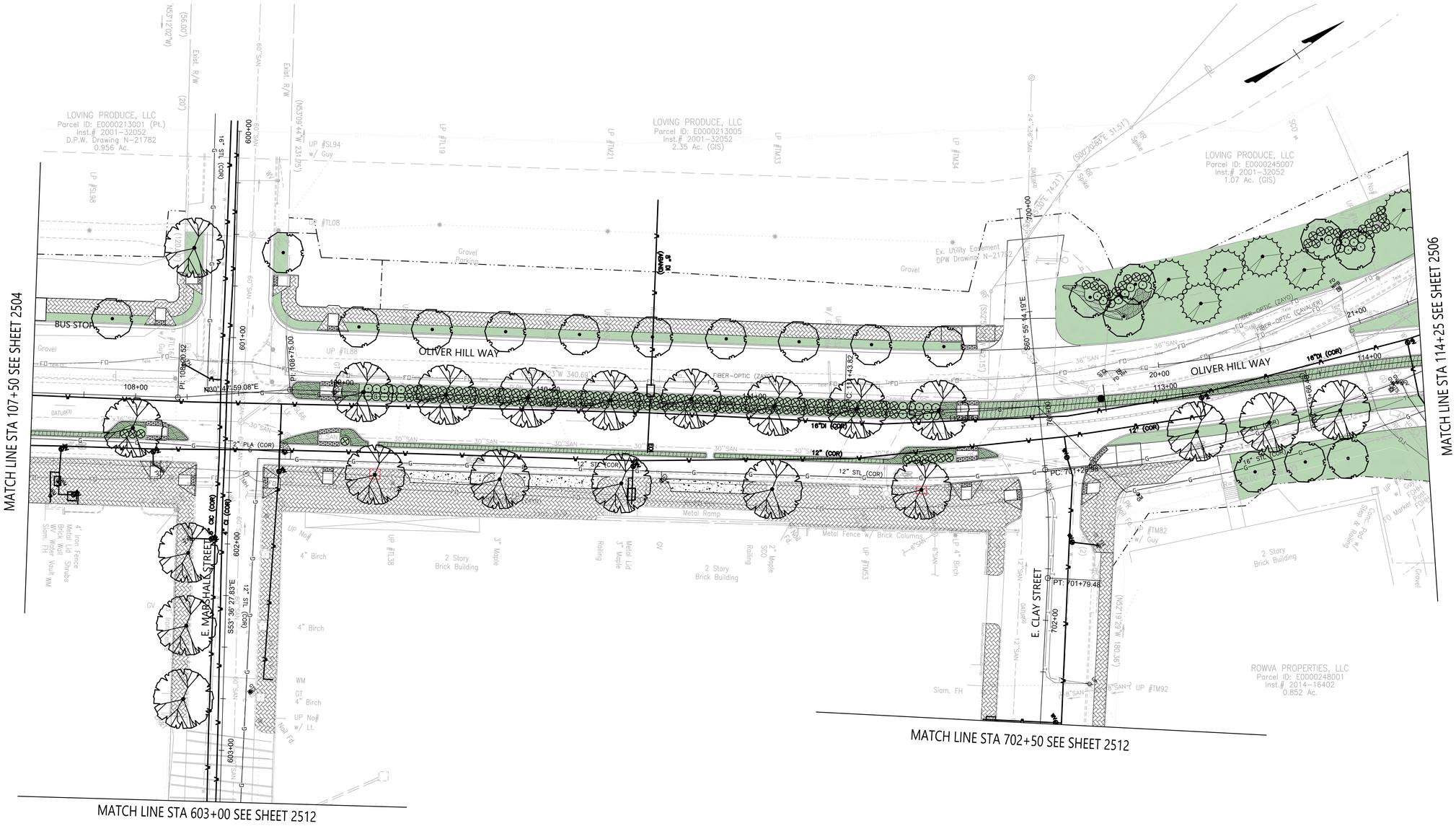
SHOCKOE VALLEY STREET IMPROVEMENTS
LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2504	DRAWING NO. 0-28633

CONCEPT PLANT SCHEDULE

- LARGE DECIDUOUS TREE — 2.5" caliper at planting
- LARGE EVERGREEN TREE — 6' high at planting
- SMALL DECIDUOUS TREE — 1.5" caliper at planting
- SMALL EVERGREEN TREE — 6' high at planting
- DECIDUOUS SHRUB — 2' high at planting
- EVERGREEN SHRUB — 2' high at planting
- PERENNIAL — 1 Gallon- 18" o.c.
- NATIVE GRASS — 1 Gallon -18" o.c.



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions

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SHOCKOE VALLEY STREET IMPROVEMENTS

LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DDeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2505	0-28633

MATCH LINE STA 119+00 SEE SHEET 2513

MATCH LINE STA 315+00 SEE SHEET 2507

MATCH LINE STA 308+75 SEE SHEET 2516

MATCH LINE STA 216+00 SEE SHEET 2512

MATCH LINE STA 114+25 SEE SHEET 2505

OHW, LC
Parcel ID: E0000318002
Inst.# 2002-39652
2.062 Ac. (GIS)

DPC, LC
Parcel ID: E0000318001
Inst.# 9900-8444
2.089 Ac. (GIS)

GENESIS HOMES MANAGER, LLC
Parcel ID: E0000364002
Inst.# 2007-12771
3.627 Ac.

JEFFERSON TOWNHOUSES, LLC
Parcel ID: E0000285022
Inst.# 2007-12770
1.178 Ac.

LOVING PRODUCE, LLC
Parcel ID: E0000245007
Inst.# 2001-32052
1.07 Ac. (GIS)

DETENTION POND

OLIVER HILL WAY

VENABLE STREET

N 18TH STREET

I-95 EXIT RAMP 74C
TOWARDS BROAD ST.

CONCEPT PLANT SCHEDULE

- LARGE DECIDUOUS TREE — 2.5" caliper at planting —
- LARGE EVERGREEN TREE — 6' high at planting —
- SMALL DECIDUOUS TREE — 1.5" caliper at planting —
- SMALL EVERGREEN TREE — 6' high at planting —
- DECIDUOUS SHRUB — 2' high at planting —
- EVERGREEN SHRUB — 2' high at planting —
- PERENNIAL — 1 Gallon- 18" o.c. —
- NATIVE GRASS — 1 Gallon -18" o.c. —

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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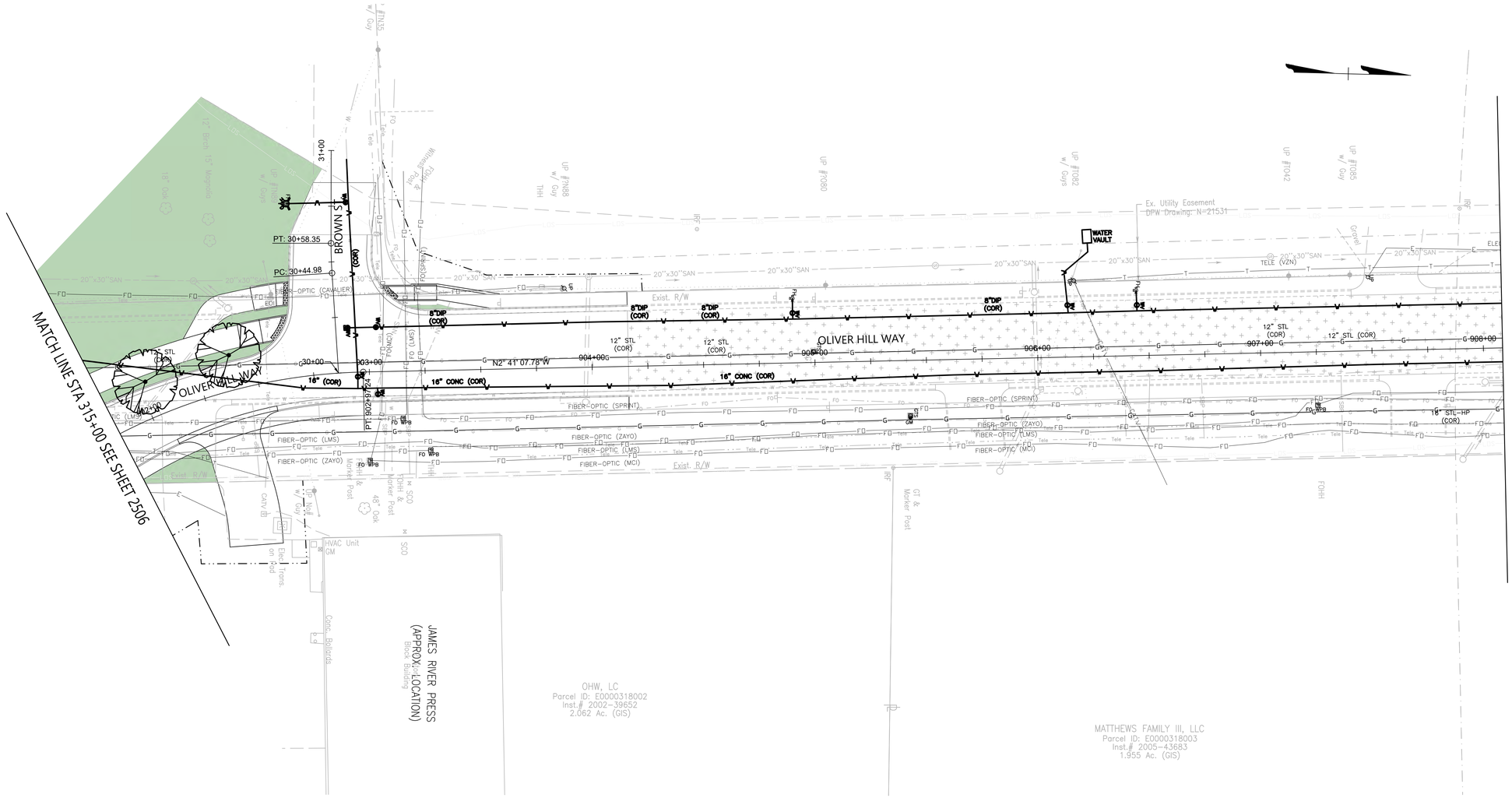
SHOCKOE VALLEY STREET IMPROVEMENTS
LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2506	DRAWING NO. 0-28633

CONCEPT PLANT SCHEDULE

- **LARGE DECIDUOUS TREE** — 2.5" caliper at planting
- **LARGE EVERGREEN TREE** — 6` high at planting
- **SMALL DECIDUOUS TREE** — 1.5" caliper at planting
- **SMALL EVERGREEN TREE** — 6` high at planting
- **DECIDUOUS SHRUB** — 2` high at planting
- **EVERGREEN SHRUB** — 2` high at planting
- **PERENNIAL** — 1 Gallon- 18" o.c.
- **NATIVE GRASS** — 1 Gallon -18" o.c.



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend
Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND — ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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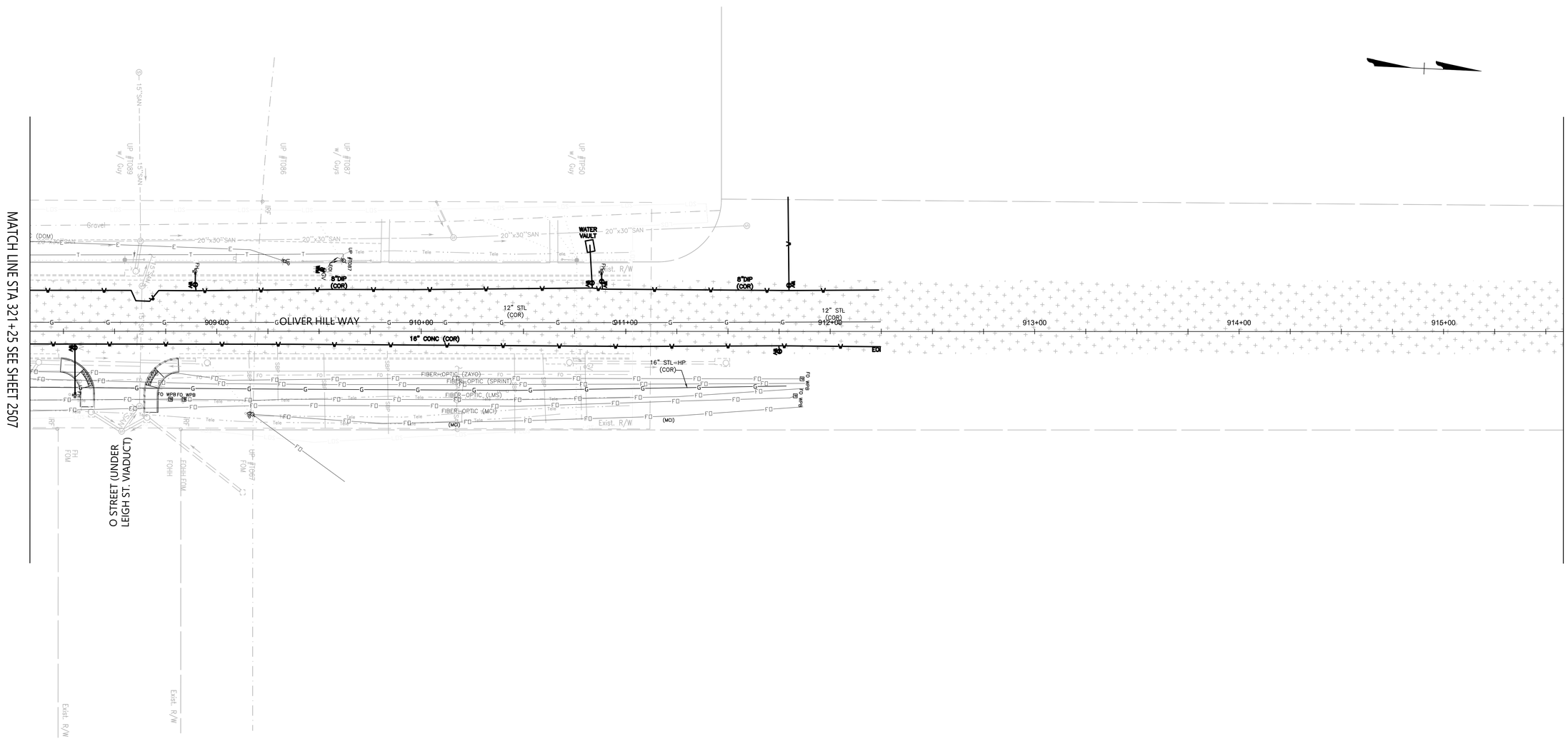
SHOCKOE VALLEY STREET IMPROVEMENTS
LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2507	DRAWING NO. 0-28633



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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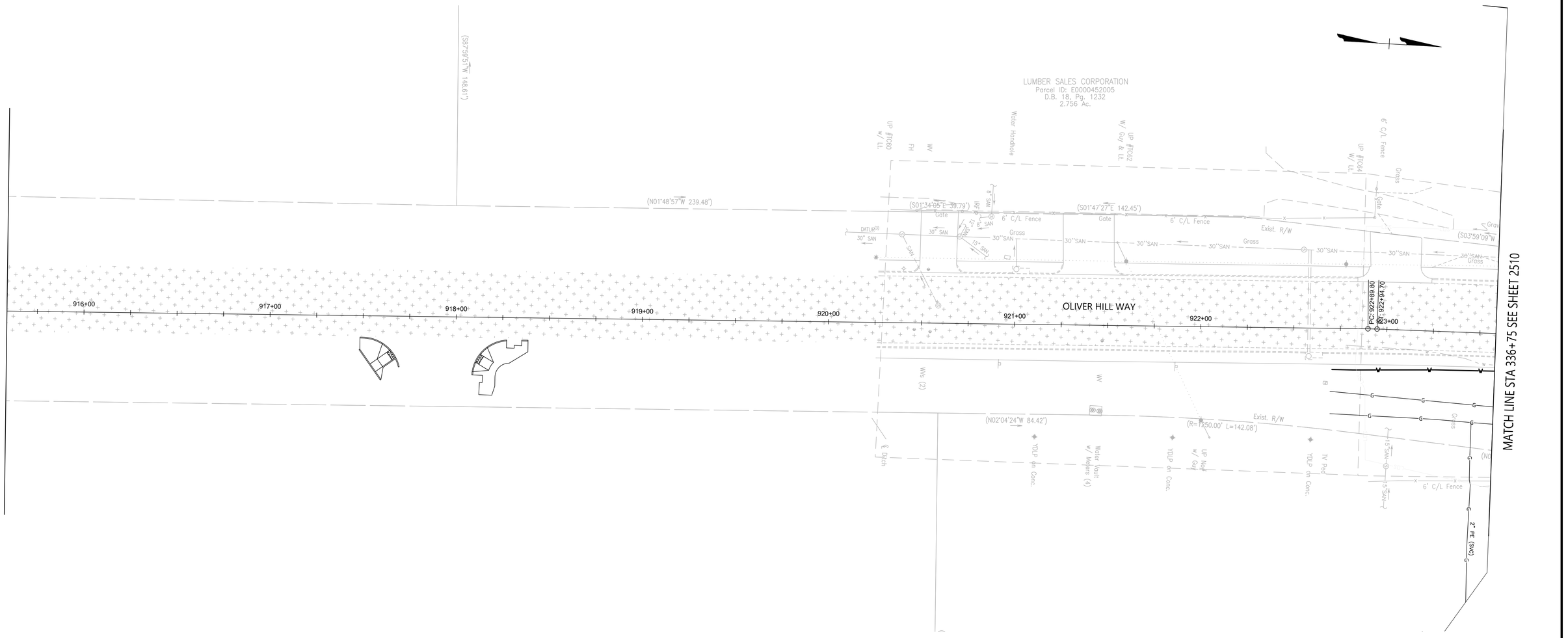
SHOCKOE VALLEY STREET IMPROVEMENTS

LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2508	DRAWING NO. 0-28633



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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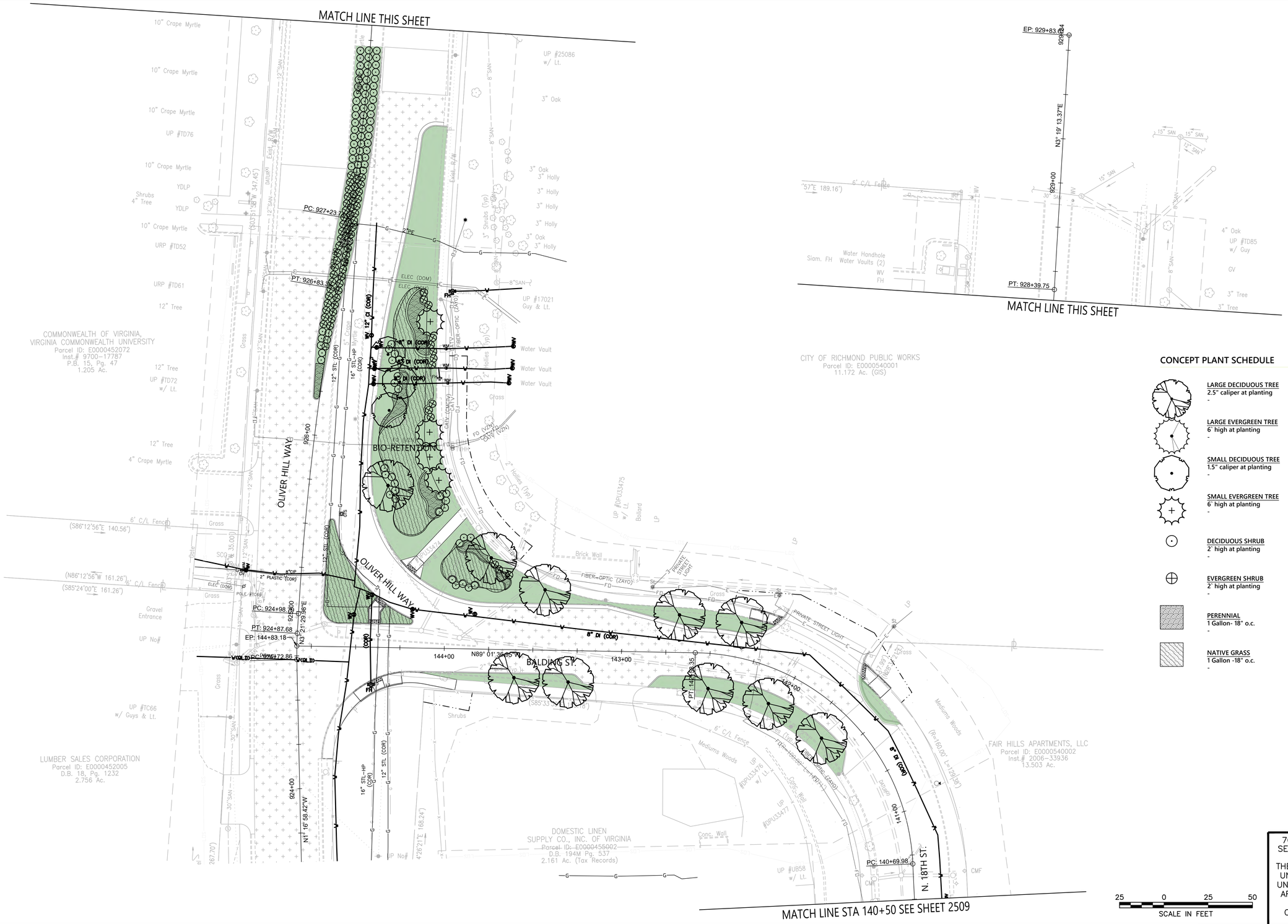
SHOCKOE VALLEY STREET IMPROVEMENTS

LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2509	DRAWING NO. 0-28633



CONCEPT PLANT SCHEDULE

- LARGE DECIDUOUS TREE — 2.5" caliper at planting — -
- LARGE EVERGREEN TREE — 6' high at planting — -
- SMALL DECIDUOUS TREE — 1.5" caliper at planting — -
- SMALL EVERGREEN TREE — 6' high at planting — -
- DECIDUOUS SHRUB — 2' high at planting — -
- EVERGREEN SHRUB — 2' high at planting — -
- PERENNIAL — 1 Gallon- 18" o.c. — -
- NATIVE GRASS — 1 Gallon -18" o.c. — -

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend
Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend
Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS
LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2510	0-28633

CONCEPT PLANT SCHEDULE

- LARGE DECIDUOUS TREE — 2.5" caliper at planting
- LARGE EVERGREEN TREE — 6' high at planting
- SMALL DECIDUOUS TREE — 1.5" caliper at planting
- SMALL EVERGREEN TREE — 6' high at planting
- DECIDUOUS SHRUB — 2' high at planting
- EVERGREEN SHRUB — 2' high at planting
- PERENNIAL — 1 Gallon- 18" o.c.
- NATIVE GRASS — 1 Gallon -18" o.c.

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number__________
4. Adopted__________
5. Accepted______________________

REFERENCES | REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve
Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND — ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

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RICHMOND, VIRGINIA

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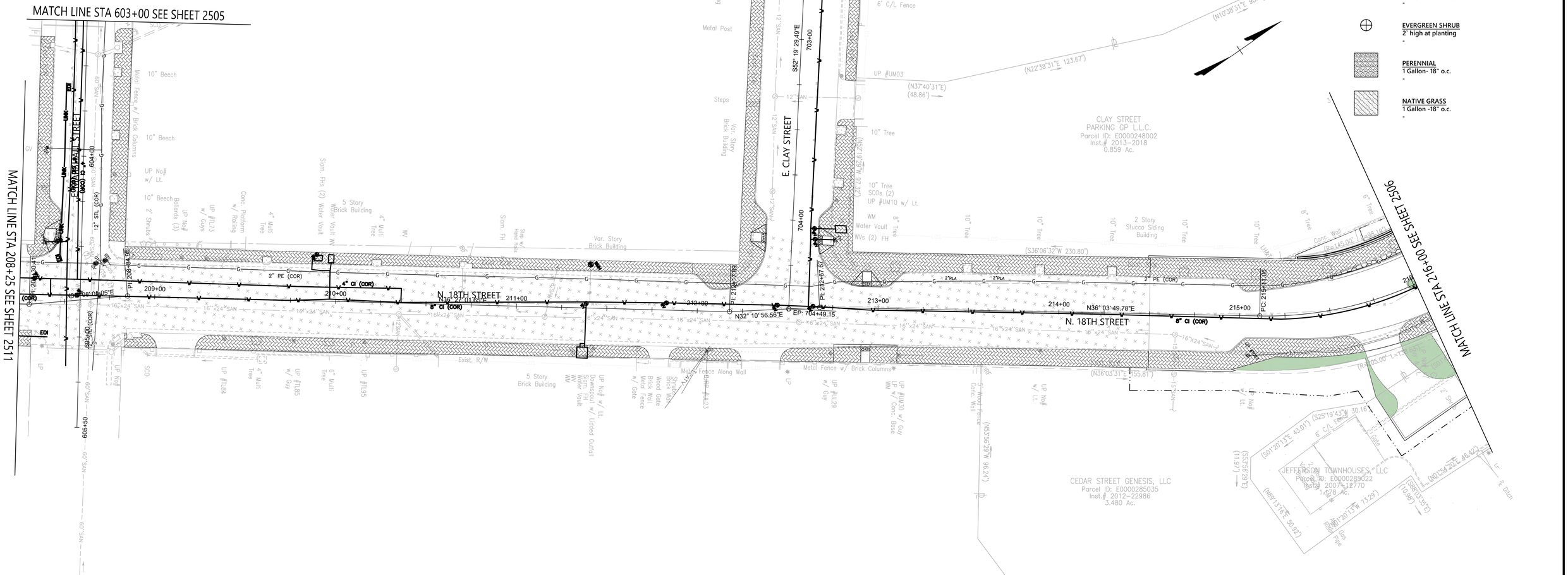
SHOCKOE VALLEY STREET IMPROVEMENTS
LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2511	DRAWING NO. 0-28633

CONCEPT PLANT SCHEDULE

LARGE DECIDUOUS TREE	2.5" caliper at planting -
LARGE EVERGREEN TREE	6' high at planting -
SMALL DECIDUOUS TREE	1.5" caliper at planting -
SMALL EVERGREEN TREE	6' high at planting -
DECIDUOUS SHRUB	2' high at planting -
EVERGREEN SHRUB	2' high at planting -
PERENNIAL	1 Gallon- 18" o.c. -
NATIVE GRASS	1 Gallon -18" o.c. -



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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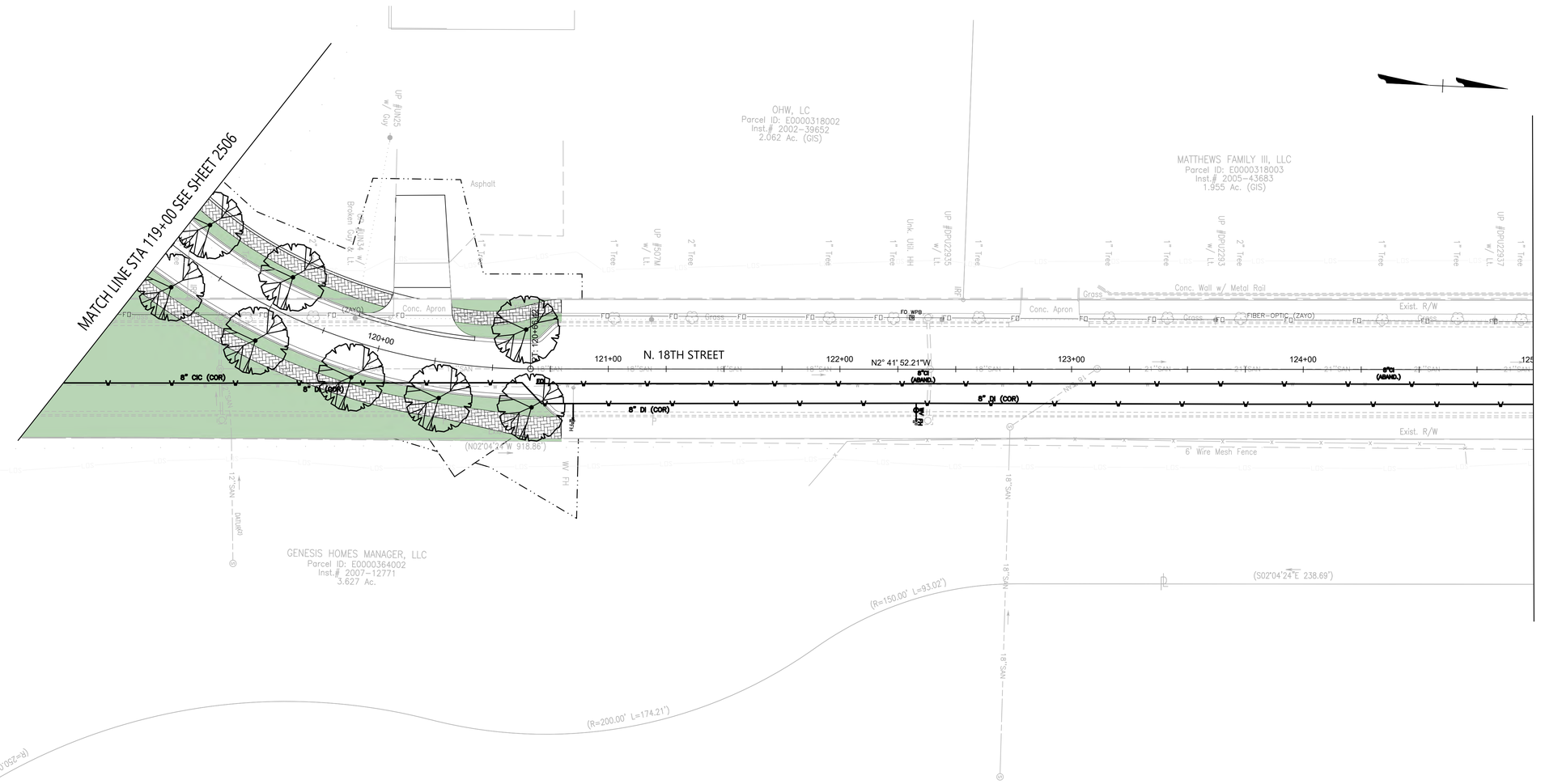
SHOCKOE VALLEY STREET IMPROVEMENTS
LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2512	DRAWING NO. 0-28633

CONCEPT PLANT SCHEDULE

- **LARGE DECIDUOUS TREE** — 2.5" caliper at planting — -
- **LARGE EVERGREEN TREE** — 6` high at planting — -
- **SMALL DECIDUOUS TREE** — 1.5" caliper at planting — -
- **SMALL EVERGREEN TREE** — 6` high at planting — -
- **DECIDUOUS SHRUB** — 2` high at planting — -
- **EVERGREEN SHRUB** — 2` high at planting — -
- **PERENNIAL** — 1 Gallon- 18" o.c. — -
- **NATIVE GRASS** — 1 Gallon -18" o.c. — -



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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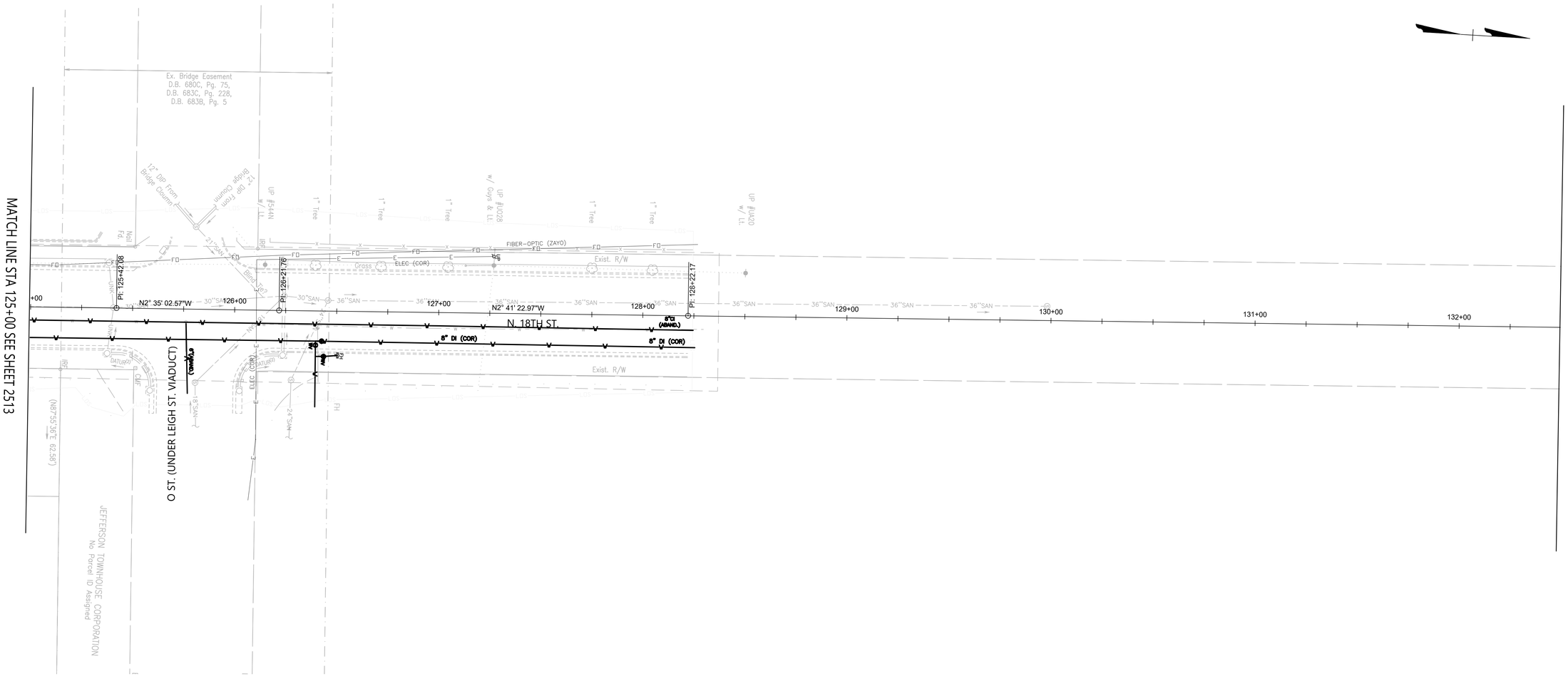
SHOCKOE VALLEY STREET IMPROVEMENTS
LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2513	DRAWING NO. 0-28633



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

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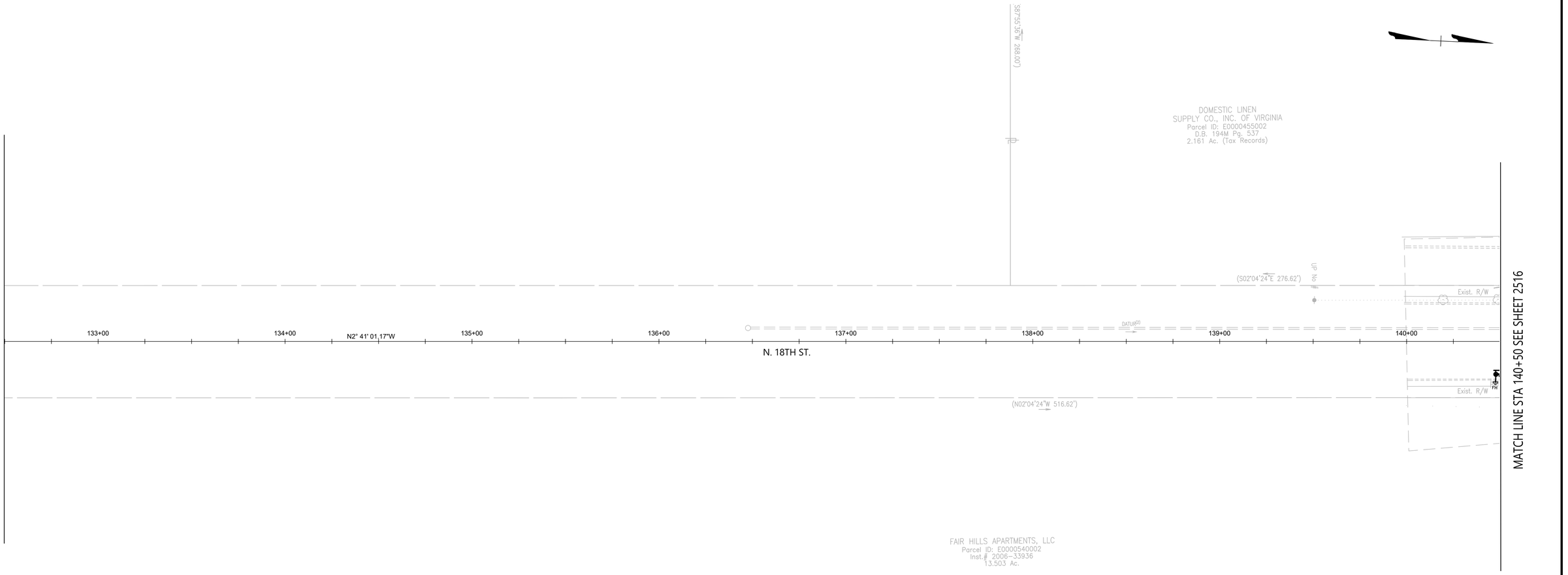
SHOCKOE VALLEY STREET IMPROVEMENTS

LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2514	DRAWING NO. 0-28633



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

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2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES	REVISIONS

Existing Legend

Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend

Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS

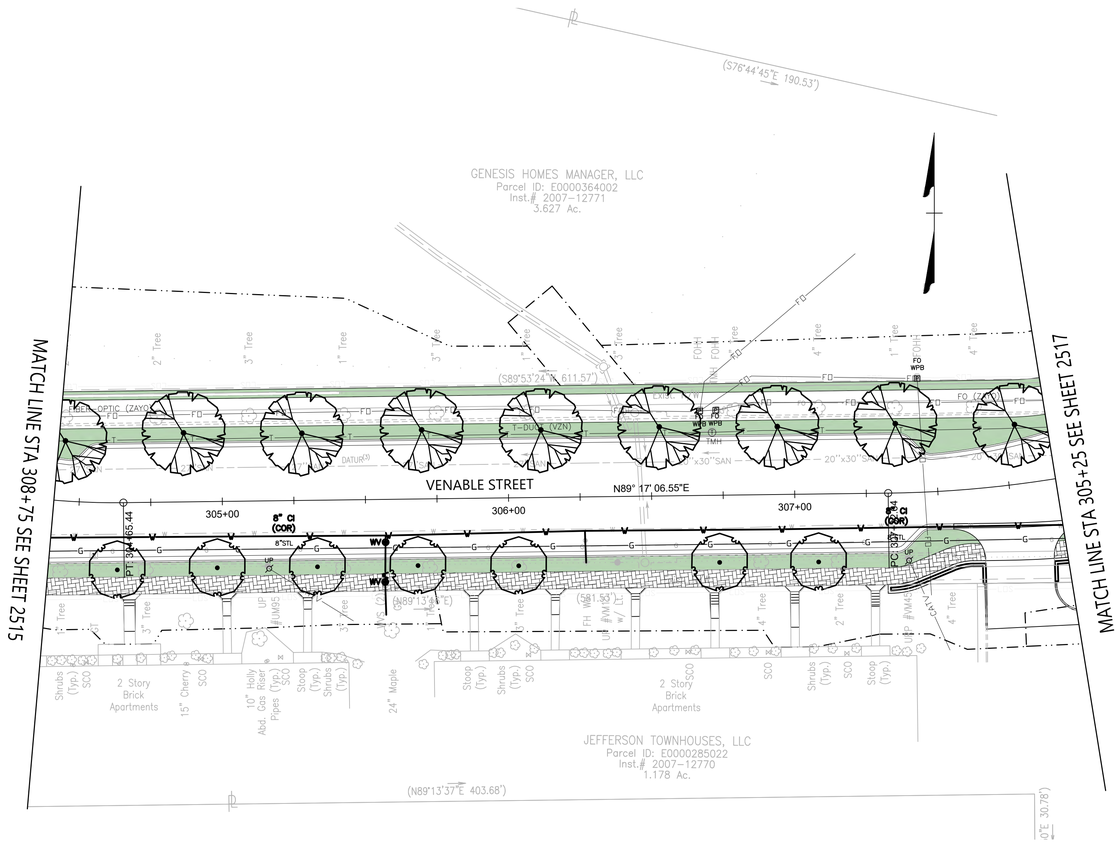
LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2515	DRAWING NO. 0-28633

CONCEPT PLANT SCHEDULE

- **LARGE DECIDUOUS TREE** — 2.5" caliper at planting
- **LARGE EVERGREEN TREE** — 6` high at planting
- **SMALL DECIDUOUS TREE** — 1.5" caliper at planting
- **SMALL EVERGREEN TREE** — 6` high at planting
- **DECIDUOUS SHRUB** — 2` high at planting
- **EVERGREEN SHRUB** — 2` high at planting
- **PERENNIAL** — 1 Gallon- 18" o.c.
- **NATIVE GRASS** — 1 Gallon -18" o.c.



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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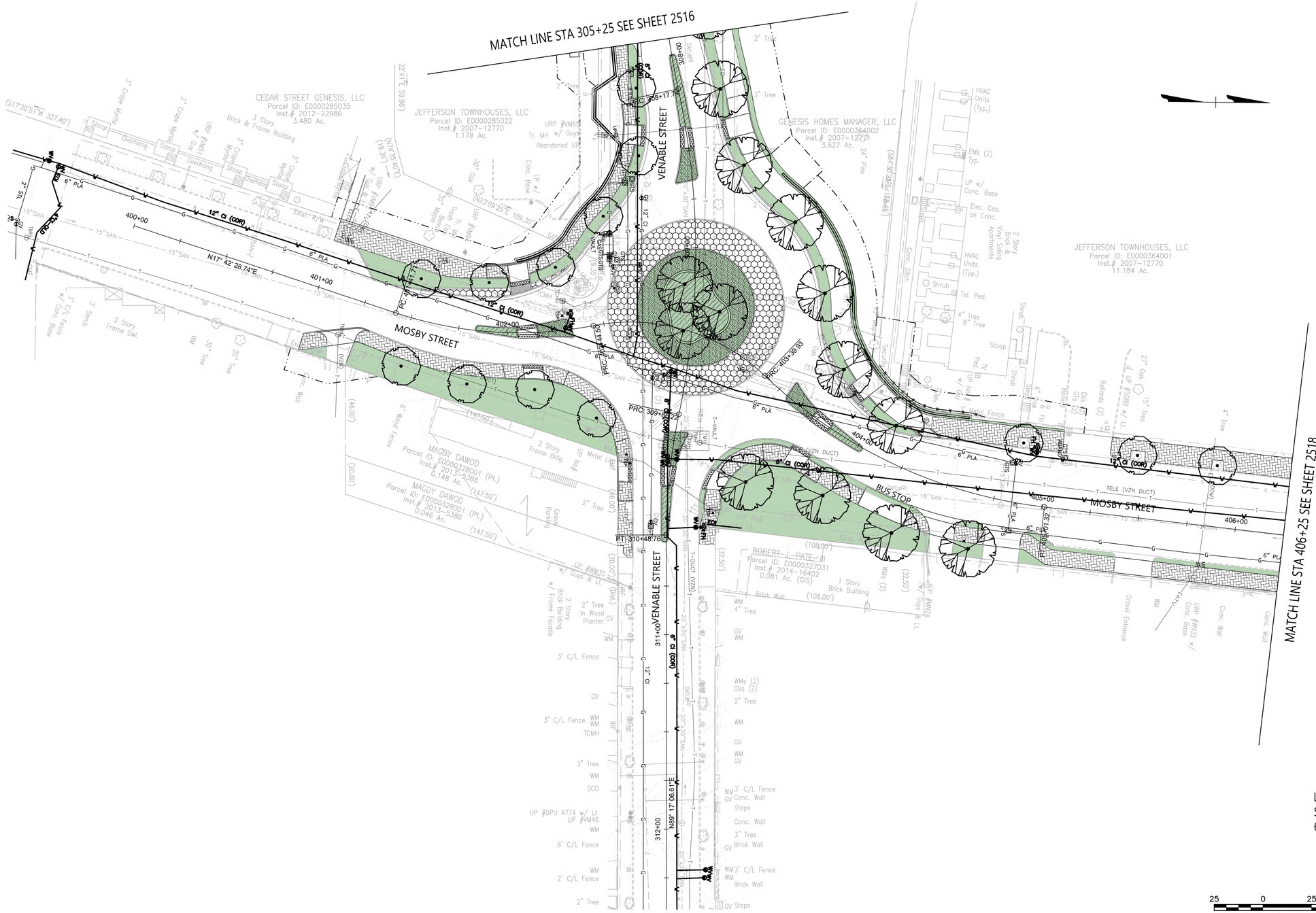
SHOCKOE VALLEY STREET IMPROVEMENTS
LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2516	DRAWING NO. 0-28633



CONCEPT PLANT SCHEDULE

- LARGE DECIDUOUS TREE — 2.5" caliper at planting — -
- LARGE EVERGREEN TREE — 6' high at planting — -
- SMALL DECIDUOUS TREE — 1.5" caliper at planting — -
- SMALL EVERGREEN TREE — 6' high at planting — -
- DECIDUOUS SHRUB — 2' high at planting — -
- EVERGREEN SHRUB — 2' high at planting — -
- PERENNIAL — 1 Gallon- 18" o.c. — -
- NATIVE GRASS — 1 Gallon -18" o.c. — -

LANDSCAPE ARCHITECTURE SHEETS ARE SHOWN AS CONCEPTUAL LEVEL ONLY - 60% PLANS TO BE SUBMITTED SEPARATELY.

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES

REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
Sanitary Sewer
Storm Sewer
Storm/(San) Manhole SDMH (SMH)
Basin
Curb Cut Ramp
Decorative Light
Conduit
Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

RK&K Responsive People • Creative Solutions
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SHOCKOE VALLEY STREET IMPROVEMENTS
LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: BBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2517	DRAWING NO. 0-28633

MATCH LINE STA 406+25 SEE SHEET 2517

MATCH LINE STA 413+25 SEE SHEET 2519

CARRINGTON STREET

MOSBY STREET

O STREET

LEIGH STREET VIADUCT

JEFFERSON TOWNHOUSES, LLC
Parcel ID: E0000364001
Inst.# 2007-12770
11.184 Ac.

CITY OF RICHMOND
Parcel ID: E0000362001
D.B. 621C Pg. 502
29.313 Ac.

RICHMOND RESEVELOPMENT & HOUSING AUTHORITY
Parcel ID: E0000465001
15.2 Ac. (GIS)

BUS STOP

CONCEPT PLANT SCHEDULE

- LARGE DECIDUOUS TREE — 2.5" caliper at planting
- LARGE EVERGREEN TREE — 6' high at planting
- SMALL DECIDUOUS TREE — 1.5" caliper at planting
- SMALL EVERGREEN TREE — 6' high at planting
- DECIDUOUS SHRUB — 2' high at planting
- EVERGREEN SHRUB — 2' high at planting
- PERENNIAL — 1 Gallon- 18" o.c.
- NATIVE GRASS — 1 Gallon -18" o.c.

25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES

1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of _____, 20__
3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
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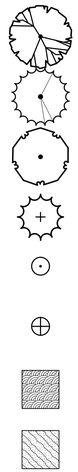
SHOCKOE VALLEY STREET IMPROVEMENTS

LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale	REVIEWED BY:	FIELD NOTES	SCALE	DATE	PROJECT	DRAWING NO.
DRAWN BY: JAlexander				SEPTEMBER 2022		
CHECKED BY: ASamberg					SHEET 2518	0-28633

CONCEPT PLANT SCHEDULE



LARGE DECIDUOUS TREE
2.5" caliper at planting
-

LARGE EVERGREEN TREE
6` high at planting
-

SMALL DECIDUOUS TREE
1.5" caliper at planting
-

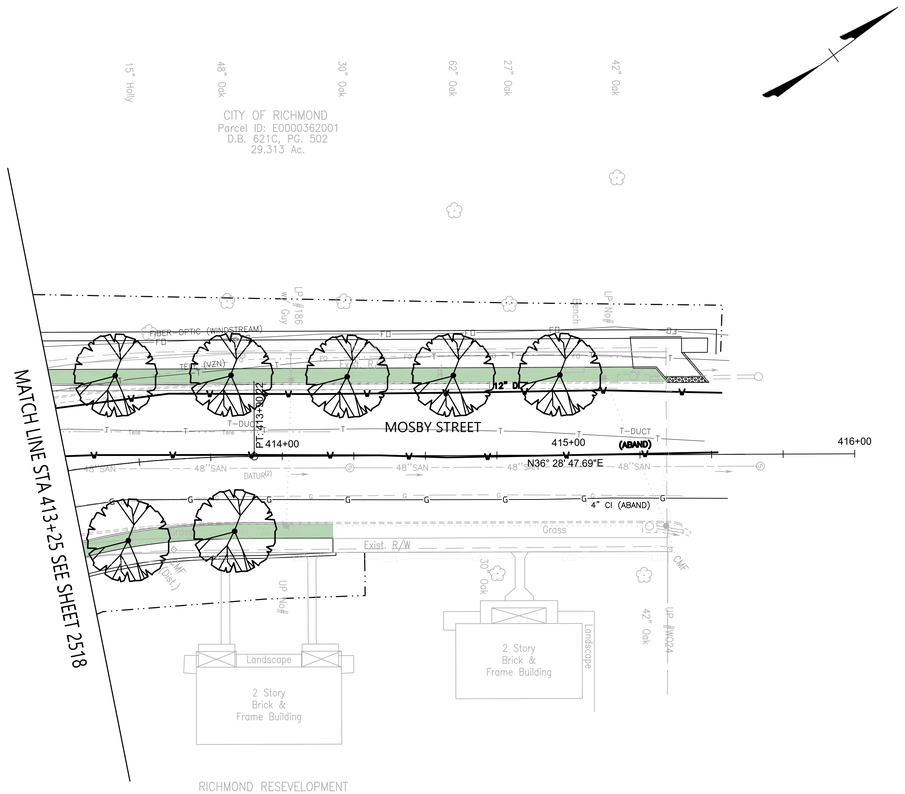
SMALL EVERGREEN TREE
6` high at planting
-

DECIDUOUS SHRUB
2` high at planting
-

EVERGREEN SHRUB
2` high at planting
-

PERENNIAL
1 Gallon- 18" o.c.
-

NATIVE GRASS
1 Gallon -18" o.c.
-



25 0 25 50
SCALE IN FEET

70% SUBMITTAL
SEPTEMBER 2022

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REFERENCES	REVISIONS

Existing Legend
Storm Sewer
Sanitary Sewer (Gravity)
Gas Line
Electric Line
Overhead Utility
Telephone/Telegraph
Water Line
Property Line
Storm Basin
Storm or Sanitary Manhole (D or S)
Fire Hydrant / Valve

Water Meter
Existing Curb Cut Ramp
Gas Meter / Valve
Fence
Power/Light Pole
Guy Anchor
Tree

Proposed Legend
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RICHMOND, VIRGINIA

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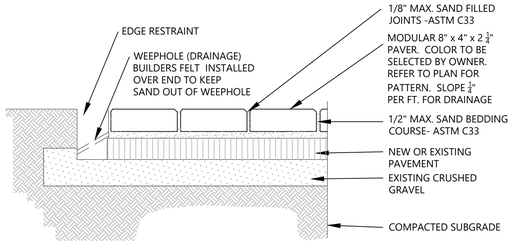
SHOCKOE VALLEY STREET IMPROVEMENTS
LANDSCAPE ARCHITECTURE PLAN SHEET

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2519	DRAWING NO. 0-28633



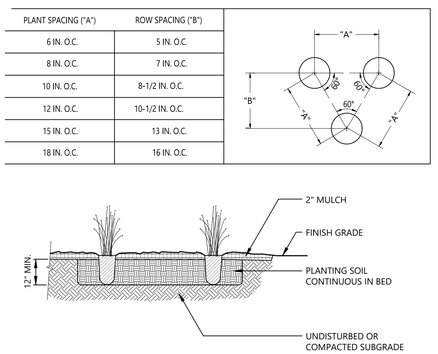
Notes:

1. PAVER TO EXCEED ASTM STANDARDS FOR PEDESTRIAN / LIGHT TRAFFIC APPLICATIONS WITH 10,000 PSI STRENGTH AND LOW WATER ABSORPTION (5-6%)

Pavers Over Sub-Slab/Pavement

N.T.S.

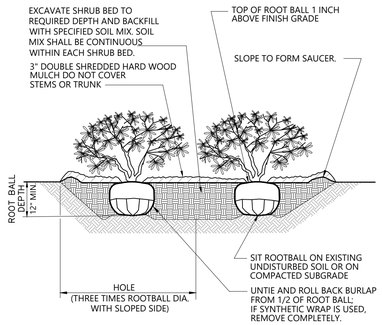
PLANT SPACING ("A")	ROW SPACING ("B")
6 IN. O.C.	5 IN. O.C.
8 IN. O.C.	7 IN. O.C.
10 IN. O.C.	8-1/2 IN. O.C.
12 IN. O.C.	10-1/2 IN. O.C.
15 IN. O.C.	13 IN. O.C.
18 IN. O.C.	16 IN. O.C.



Perennial Planting

11/09

N.T.S. Source: VHB LD_618



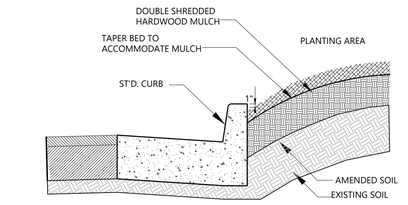
Notes:

1. LOOSEN ROOTS AT THE OUTER EDGE OF ROOTBALL OF CONTAINER GROWN SHRUBS.

Shrub Bed Planting

6/08

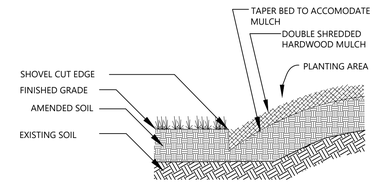
N.T.S. Source: VHB LD_601



Curb-Bed Edging Detail

7/15

N.T.S. Source: VHB



Shovel Cut Edging Detail

7/15

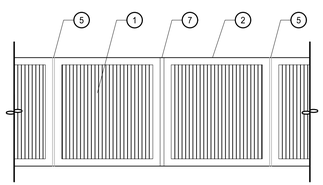
N.T.S. Source: VHB

KEY

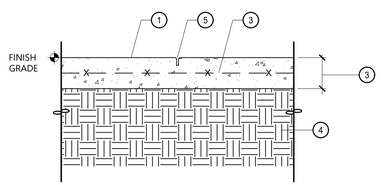
1. POURED CONCRETE. REFER TO HARDSCAPE PLAN FOR NOTES, COLOR AND FINISH.
2. 1/4" RADIUS TROWELED EDGE
3. REFER TO CIVIL PLANS FOR WALK THICKNESS & CONCRETE REINFORCING
4. COMPACTED SUB-GRADE
5. 1/4" TOOLED RADIUS
6. APPLY BOND BREAKER TO CURED / EXISTING SURFACE
7. 1/2" FULL DEPTH EXPANSION JOINT WITH BACKER ROD AND SEALANT, JOINT SEALANT COLOR TO MATCH ADJ. PAVING
8. VERTICAL ELEMENT (CONTRACTOR IS RESPONSIBLE FOR PROTECTING ADJACENT SURFACES)
9. 3/8" FULL DEPTH EXPANSION JOINT WITH BACKER ROD AND SEALANT, JOINT SEALANT COLOR TO MATCH ADJ. PAVING
10. ADJACENT PLANTING AREA, HOLD GRADE 2" BELOW FINISH ELEVATION OF PAVING, SLOPE AWAY FROM PAVING.

Notes:

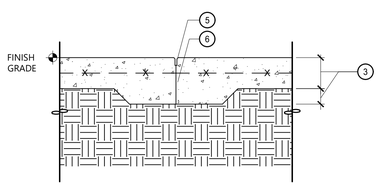
1. CONTRACTOR IS REQUIRED TO PROVIDE A 48"x48" CONCRETE AND PAVER MOCK-UP PANELS FOR OWNER APPROVAL.
2. REFER TO PAVING SCHEDULE ON HARDSCAPE SHEETS FOR ADDITIONAL INFORMATION ON CONCRETE PAVING COLOR AND FINISH.
3. CONTRACTOR SHALL PROVIDE ISOLATION JOINTS BETWEEN CONCRETE PAVEMENT AND ALL FIXED VERTICAL SITE ELEMENTS, INCLUDING BUT NOT LIMITED TO, BUILDINGS, WALLS, CURBS, STEPS AND CHEEK WALLS, LIGHT POLE FOUNDATIONS, GRAPHIC ELEMENT FOUNDATIONS, ETC.



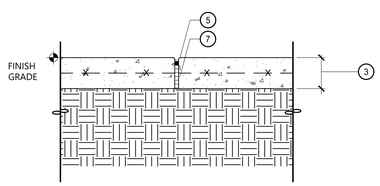
A CONCRETE FINISH (N.T.S.)



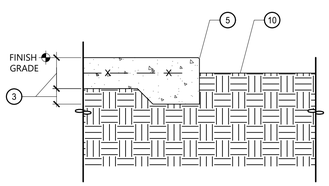
B TOOLED CONTROL JOINT



C TOOLED CONSTRUCTION JOINT



D TOOLED EXPANSION JOINT



E TOOLED EDGE CONDITION

DIAGRAM A

TREES WHICH ARE 2"-3" CAL. MUST HAVE TWO (2) 36" STAKES.

TREES WHICH ARE 1"-1 1/2" MUST HAVE TWO (2) 24" STAKES.

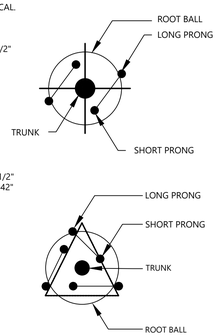


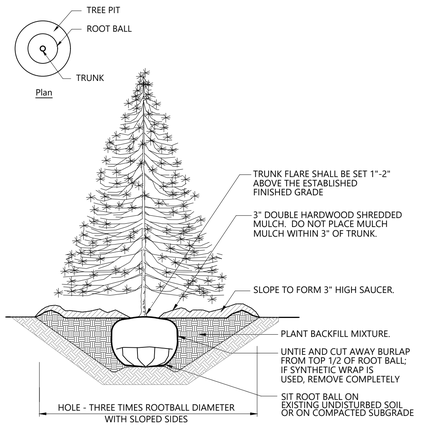
DIAGRAM B

TREES WHICH ARE 3 1/2"-4 1/2" CAL. MUST HAVE THREE (3) 42" STAKES.

Below-Grade Tree Stabilizing System Detail

11/12

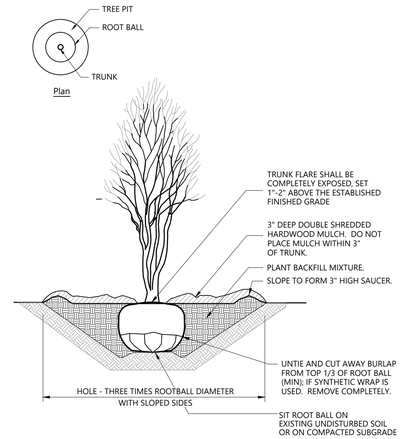
N.T.S. Source: VHB



Evergreen Tree Planting

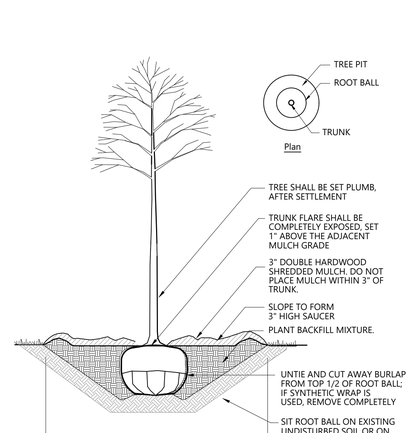
6/08

N.T.S. Source: VHB REV LD_604



Multistem Tree Planting

N.T.S. VBR



Tree Planting

1/10

N.T.S. Source: VHB LD_602

70% SUBMITTAL
SEPTEMBER 2022

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NOTES

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3. Ordinance Number_____
4. Adopted_____
5. Accepted_____

REFERENCES | REVISIONS

Existing Legend: Storm Sewer; Sanitary Sewer (Gravity); Gas Line; Electric Line; Overhead Utility; Telephone/Telegraph; Water Line; Property Line; Storm Basin; Storm or Sanitary Manhole; Fire Hydrant / Valve

Water Meter; Existing Curb Cut Ramp; Gas Meter / Valve; Fence; Power/Light Pole; Guy Anchor; Tree

Proposed Legend: Sanitary Sewer; Storm Sewer; Storm/(San) Manhole; Basin; Curb Cut Ramp; Decorative Light; Conduit; Conduit (Encased)

CITY OF RICHMOND ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
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DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

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SHOCKOE VALLEY STREET IMPROVEMENTS

LANDSCAPE ARCHITECTURE DETAILS

AUTHORITY: CITY OF RICHMOND, DPW

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2520	DRAWING NO. 0-28633

GENERAL NOTES

1. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL BELOW GRADE AND ABOVE GROUND UTILITIES AND NOTIFY OWNERS REPRESENTATIVE OF CONFLICTS.
2. NO PLANT MATERIALS SHALL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
3. FINAL QUANTITY FOR EACH PLANT TYPE SHALL BE AS GRAPHICALLY SHOWN ON THE PLAN. THIS NUMBER SHALL TAKE PRECEDENCE IN CASE OF ANY DISCREPANCY BETWEEN QUANTITIES SHOWN ON THE PLANT LIST AND ON THE PLAN. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES BETWEEN THE NUMBER OF PLANTS SHOWN ON THE PLANT LIST AND PLANT LABELS PRIOR TO BIDDING.
4. ALL DISTURBED AREAS NOT OTHERWISE NOTED ON CONTRACT DOCUMENTS SHALL BE SEEDED WITH PERMANENT SEED MIX AS SPECIFIED.

TREE PROTECTION

1. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TREE PROTECTION FENCE. ERECT FENCE AS SHOWN ON PLANS PRIOR TO BRINGING EQUIPMENT OR MATERIALS ON SITE OR STARTING CONSTRUCTION.
2. CONTRACTOR SHALL NOT OPERATE VEHICLES WITHIN THE TREE PROTECTION AREA. CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS, OR DISPOSE OF ANY WASTE MATERIALS, WITHIN THE TREE PROTECTION AREA.
3. DAMAGE TO EXISTING TREES CAUSED BY THE CONTRACTOR SHALL BE REPAIRED BY A CERTIFIED ARBORIST AT THE CONTRACTOR'S EXPENSE.

PERMANENT SEEDING SCHEDULE

RATE: 2 LBS/1000 SF SOWING DATES:
5/15-7/15

BOTANICAL NAME COMMON NAME	% BY DESCRIPTION	% PURITY	RATE
Cynodon dactylon 'Yukon' Yukon Bermudagrass (hulled)	100%	98%	85%

TOPSOIL NOTES

1) SOIL TESTING

(1.1) THE CONTRACTOR IS RESPONSIBLE FOR SOILS TESTING AND ANALYSIS FOR SUITABILITY FOR PLANTING AND LANDSCAPE TREATMENTS REQUIRED IN THIS CONTRACT. EXISTING OR IMPORT TOPSOIL SHALL BE PROVIDED THAT MEETS THE REQUIREMENTS BELOW OR WILL MEET THE REQUIREMENTS AFTER AMENDMENTS ARE MADE. A MINIMUM OF 3 SOIL SAMPLES SHALL BE TAKEN TO REPRESENT THE FULL RANGE OF TOPSOIL.

(1.2) SOIL ANALYSIS SHALL BE BY AN INDEPENDENT CERTIFIED LABORATORY AND SHALL INCLUDE SOIL TEXTURE, COMPOSITION, ORGANIC MATTER CONTENT, pH, SALINITY, AND FERTILITY (AVAILABLE NUTRIENTS). FOR SOILS NOT MEETING TOPSOIL SPECIFICATIONS BELOW, THE REPORT SHALL INCLUDE RECOMMENDATIONS FOR AMENDING THE SOILS TO BRING THEM INTO COMPLIANCE WITH THESE SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR THE COSTS OF SOILS TESTING AND AMENDMENTS, AND SHALL SUBMIT A COPY OF THE SOILS REPORT TO THE OWNER OR OWNER'S REPRESENTATIVE MINIMUM OF ONE MONTH PRIOR TO IMPORT OR RESPREAD OF TOPSOIL.

(2) TOPSOIL

(2.1) NECESSARY QUANTITIES OF TOPSOIL SHALL BE SUPPLIED BY THE CONTRACTOR AND APPROVED BY THE OWNER OR HIS REPRESENTATIVE. THE CONTRACTOR SHALL APPLY TOPSOIL ONLY AFTER SECURING SOIL TEST, AS SPECIFIED ABOVE, APPLYING RECOMMENDED TREATMENT THEREOF, AND RECEIVING APPROVAL.

(2.2) TOPSOIL REQUIREMENTS WILL BE MET AS FOLLOWS:

(A) ON-SITE OR OFF-SITE TOPSOIL MEETING SPECIFICATIONS PROVIDED FROM AN APPROVED SOURCE.

(2.3) TOPSOIL SHALL BE THE ORIGINAL TOP LAYER OF A SOIL PROFILE FORMED UNDER NATURAL CONDITIONS, TECHNICALLY DEFINED AS THE "A" HORIZON BY THE SOIL SOCIETY OF AMERICA. IT SHALL CONSIST OF NATURAL, FRIABLE, LOAMY SOIL WITHOUT ADMIXTURES OF SUBSOIL. OR OTHER FOREIGN MATERIALS, AND SHALL BE REASONABLY FREE FROM STUMPS, ROOTS, HARD LUMPS, STIFF CLAY, NOXIOUS WEEDS, BRUSH, OR OTHER LITTER. STONES SHALL NOT BE LARGER THAN 1" IN DIAMETER. IT SHALL HAVE DEMONSTRATED BY EVIDENCE OF HEALTHY VEGETATION GROWING, OR HAVING GROWN ON IT PRIOR TO STRIPPING, THAT IT IS REASONABLY WELL DRAINED AND DOES NOT CONTAIN SUBSTANCES TOXIC TO PLANTS.

(A) "A" HORIZON: "A" HORIZONS SHALL BE MINERAL HORIZONS CONSISTING OF:

- (1) HORIZONS OR ORGANIC MATTER ACCUMULATION FORMED OR FORMING AT OR ADJACENT TO THE SURFACE;
- (2) HORIZONS THAT HAVE LOST CLAY, IRON, OR ALUMINUM, WITH RESULTANT CONCENTRATIONS OF QUARTZ OR OTHER RESISTANT MINERALS OF SAND OR SILT SIZE; OR
- (3) HORIZONS DOMINATED BY 1 OR 2 ABOVE BUT TRANSITIONAL TO AN UNDERLYING B OR C.

(B) HORIZON SUBDIVISIONS: "A1" HORIZONS SHALL BE MINERAL HORIZONS, FORMED OR FORMING AT OR ADJACENT TO THE HUMIDIFIED ORGANIC MATTER INTIMATELY ASSOCIATED WITH THE MINERAL FRACTION. THE SOIL IS A DARK OR DARKER THAN UNDERLYING HORIZONS BECAUSE OF THE PRESENCE OF ORGANIC MATTER. THE ORGANIC MATERIAL IS ASSUMED TO BE DERIVED FROM PLANT AND ANIMAL REMAINS DEPOSITED ON THE SURFACE OF THE SOIL OR DEPOSITED WITHIN THE HORIZON WITHOUT APPRECIABLE TRANSLOCATION.

(C) A2 HORIZONS SHALL BE MINERAL HORIZONS IN WHICH THE FEATURE EMPHASIZED IS LOSS OF CLAY, IRON OR ALUMINUM, WITH RESULTANT SIZES.

(D) TOPSOIL SHALL ACHIEVE OR BE AMENDED TO ACHIEVE THE FOLLOWING:

- 1) TEXTURE: SANDY LOAM, LOAM, OR SANDY CLAY LOAM.
- 2) TOPSOIL SHALL HAVE A pH IN THE RANGE OF 5.5 TO 7.0 PRIOR TO MIXING WITH AMENDMENTS. REFER TO SEEDING NOTE 5.3 AND PLANTING NOTE 4.5 FOR pH RANGE AFTER AMENDMENT. REPORT FROM INDEPENDENT TEST LAB IS TO INCLUDE RECOMMENDATION TO BRING pH TO LEVELS AS NOTED IN SEEDING AND PLANTING NOTES.
- 3) SOLUBLE SALT LEVEL: LESS THAN 844 PPM.
- 4) ORGANIC MATTER: 3-5%.

SEEDING NOTES

THIS SECTION INCLUDES, BUT IS NOT LIMITED TO: TILLAGE, PH BALANCING, FERTILIZING, WATERING, SEEDING, MAINTENANCE MOWING, AND MULCHING OF ALL DISTURBED AREAS WITHIN THE CONTRACT LIMIT LINES NOT OCCUPIED BY STRUCTURES, PAVEMENT, OR PLANTING BEDS.

(1) QUALITY ASSURANCE

(1.1) QUALITY ASSURANCE: SEEDING WORK SHALL BE PERFORMED BY A SINGLE FIRM SPECIALIZING AND EXPERIENCED IN LANDSCAPE WORK.

(1.2) SHIP MATERIALS WITH CERTIFICATES OF INSPECTION REQUIRED BY GOVERNING AUTHORITIES. COMPLY WITH REGULATIONS APPLICABLE TO LANDSCAPE MATERIALS.

(2) SUBMITTALS

(2.1) SEED VENDOR'S CERTIFIED BLUE TAG AND INVOICE SHOWING QUANTITY FOR EACH GRASS SEED MIXTURE REQUIRED, STATING BOTANICAL AND COMMON NAME, PERCENTAGE BY WEIGHT, AND PERCENTAGES OF PURITY, GERMINATION, AND WEED SEED FOR EACH GRASS SEED SPECIES.

(2.2) TOPSOIL ANALYSIS: PROVIDE FOR THE SERVICES OF AN INDEPENDENT SOIL TESTING LABORATORY TO PERFORM AN ANALYSIS OF TOPSOIL TO BE USED, AND A DETERMINATION OF NUTRITIONAL REQUIREMENTS OF SOIL FOR ESTABLISHMENT OF LAWNS AS SPECIFIED BELOW. INCLUDE RECOMMENDATION FOR SOIL AMENDMENTS.

(2.3) SOIL AMENDMENTS AND MULCH: PROVIDE MANUFACTURER'S DATA.

(3) JOB CONDITIONS

(3.1) PRIOR TO BEGINNING THE WORK OF THIS SECTION, VERIFY THAT THE SITE WORK CONTRACTOR HAS COMPLETED THE FINISH GRADING. AT THIS POINT, MINIMUM 4" (MAX 9") OF TOPSOIL SHALL BE IN PLACE AT THE FINISH GRADE LEVEL, IN ALL LANDSCAPE AREAS, INCLUDING AREAS TO BE ESTABLISHED IN TURF.

(3.2) THE LANDSCAPE CONTRACTOR SHALL CAREFULLY CORRELATE HIS WORK WITH THAT OF OTHER SITE DEVELOPERS. THE LANDSCAPE CONTRACTOR IS REQUIRED TO INSTALL AND MAINTAIN HIS FINISHED WORK AT HIS EXPENSE.

(3.3) PRIOR TO TOPSOIL PLACEMENT ALL AREAS TO RECEIVE TOPSOIL SHALL BE CLEARED OF ALL DEBRIS. ANY DEBRIS SHALL BE REMOVED FROM THE SITE. TO CREATE A TRANSITION ZONE BETWEEN UNDERLYING SOIL AND NEW SOIL, TOPSOIL SHALL BE PLACED IN 2-3 INCH LAYERS. THE FIRST LAYER SHALL BE PLACED AND THOROUGHLY TILLED IN PRIOR TO PLACEMENT OF SECOND LAYER.

(3.4) DETERMINE LOCATIONS OF ALL UNDERGROUND UTILITIES AND PERFORM WORK IN A MANNER WHICH WILL AVOID DAMAGE. ALL UTILITIES ARE NOT NECESSARILY SHOWN ON DRAWINGS AND CONTRACTOR SHALL ASSUME RESPONSIBILITY OF DETERMINING EXISTENCE OR NON-EXISTENCE OF ALL UTILITIES. MAINTAIN GRADE STAKES SET BY OTHERS UNTIL REMOVAL IS MUTUALLY AGREED UPON BY PARTIES CONCERNED.

(3.5) WHEN CONDITIONS DETRIMENTAL TO LAWN ESTABLISHMENT, GROWTH AND MAINTENANCE ARE ENCOUNTERED, SUCH AS RUBBLE FILL, ADVERSE DRAINAGE CONDITIONS OR OBSTRUCTIONS, NOTIFY THE OWNER'S REPRESENTATIVE BEFORE BEGINNING WORK.

(3.6) DELIVERY, STORAGE, AND HANDLING: FERTILIZER, SOIL AMENDMENTS, AND SEED SHALL BE DELIVERED TO THE SITE IN THE ORIGINAL, UNOPENED CONTAINERS BEARING THE MANUFACTURER'S GUARANTEED ANALYSIS, NAME, TRADEMARK, AND STATEMENT OF CONFORMANCE TO STATE AND FEDERAL LAWS. IN LIEU OF CONTAINERS, FERTILIZER AND SOIL AMENDMENTS MAY BE FURNISHED IN BULK WITH A MANUFACTURER'S CERTIFICATE INDICATING THE ABOVE INFORMATION ACCOMPANYING EACH DELIVERY. DURING DELIVERY, SEED, FERTILIZER AND SOIL AMENDMENTS SHALL BE KEPT IN DRY STORAGE AWAY FROM CONTAMINANTS. PRECAUTIONS SHALL BE TAKEN TO PROTECT CONTAINERS FROM RUPTURE PRIOR TO USE.

(4) SOIL AMENDMENTS

(4.1) LIME: TO PH BALANCE SOIL, NATURAL DOLOMITIC LIMESTONE CONTAINING NOT LESS THAN 95% OF TOTAL CARBONATES WITH A MINIMUM OF 30% MAGNESIUM CARBONATES AND 65% CALCIUM CARBONATE IN A PELLETIZED FORM.

(4.2) ALUMINUM SULFATE: TO PH BALANCE SOIL, COMMERCIAL GRADE IN DRY POWDER FORM.

(4.3) SUPER PHOSPHATE: SOLUBLE MIXTURE OF TREATED MINERALS; 20% PHOSPHORIC ACID.

(4.4) STARTER FERTILIZER: GRANULAR OR PELLETIZED FERTILIZER CONSISTING OF 30% SLOW-RELEASE NITROGEN, PHOSPHORUS, AND POTASSIUM IN THE FOLLOWING COMPOSITION:

(4.4.1) COMPOSITION: AS RECOMMENDED BY SOIL TESTING AGENCY.

(4.5) SEED: STATE-CERTIFIED SEED OF THE LATEST SEASON'S CROP COMMON TO THE SITE LOCATION. PROVIDE FRESH, CLEAN, NEW CROP SEED COMPLYING WITH ESTABLISHED TOLERANCES FOR GERMINATION AND PURITY IN ACCORDANCE WITH THE U.S. DEPARTMENT OF AGRICULTURE RULES AND REGULATIONS UNDER THE LATEST EDITION OF THE FEDERAL SEED ACT. SEED SHALL BE MIXED BY THE DEALER AND SHALL BE DELIVERED TO THE SITE IN SEALED CONTAINERS WHICH SHALL BEAR THE DEALER'S GUARANTEED ANALYSIS. SEED THAT HAS BECOME WET, MOLDY, OR OTHERWISE DAMAGED WILL NOT BE ACCEPTABLE.

(5) SEED PREPARATION

(5.1) SEEDING SHALL NOT BE DONE WHEN THE GROUND IS FROZEN, SNOW COVERED, SATURATED, OR IN ANY OTHER CONDITION WHICH WOULD MAKE ESTABLISHMENT AND SURVIVAL OF LAWNS UNLIKELY.

(5.2) AT THE TIME OF BEGINNING SEED BED PREPARATION, TOPSOIL SHALL BE IN A LOOSE, FRIABLE CONDITION, FREE FROM STONES LARGER THAN ONE INCH, STICKS, ROOTS AND OTHER EXTRANEOUS MATTER. IF TOPSOIL HAS BECOME CRUSTY, HARDENED OR ERODED SINCE BEING SPREAD, IT SHALL BE A PART OF THIS WORK TO RESTORE THE SOIL TO THE LOOSE CONDITION DESCRIBED ABOVE.

(5.3) SPREAD FERTILIZER AND pH BALANCING AGENTS AT RATES RECOMMENDED BY THE SOIL TEST REPORT TO ACHIEVE A pH OF 5.5 TO 6.8. BLEND ADDITIVES THOROUGHLY INTO UPPER 4" OF TOPSOIL. REMOVE ANY ROCKS OR OTHER DEBRIS WHICH MAY SURFACE. TILL AREAS UNTIL SOIL IS LOOSE AND FRIABLE, AND ALL SOIL AMENDMENTS ARE UNIFORMLY DISTRIBUTED.

(5.4) WORK ALL AREAS TO A SMOOTH EVEN SURFACE FREE FROM IRREGULARITIES, RIDGES, OR DEPRESSIONS. PREPARED AREAS SHALL MEET REQUIRED FINISH GRADE ELEVATIONS AND SHALL DRAIN ADEQUATELY. REPAIR ALL WASHED AND ERODED PORTIONS.
(5.5) MOISTEN PREPARED AREAS IF SOIL IS DRY. WATER THOROUGHLY, THEN ALLOW SURFACE MOISTURE TO EVAPORATE. DO NOT CREATE MUDDY SOIL CONDITIONS.

(5.5) SOW SEED USING A SPREADER OR SEEDING MACHINE. DO NOT SEED WHEN WIND VELOCITY EXCEEDS 5 MILES PER HOUR. DISTRIBUTE SEED EVENLY OVER ENTIRE AREA BY SOWING EQUAL QUANTITY IN 2 DIRECTIONS AT RIGHT ANGLES TO EACH OTHER.

(5.6) RAKE SEED LIGHTLY INTO TOP 1/4" OF SOIL, FIRM ENTIRE AREA WITH A ROLLER NOT EXCEEDING 90 LBS. PER FOOT OF ROLLER WIDTH, AND WATER WITH A FINE SPRAY.

(5.7) UNLESS INDICATED OTHERWISE ON THE DRAWINGS, PROTECT NEWLY SEEDED AREAS BY SPREADING MULCH TO A UNIFORM AND CONTINUOUS DEPTH OF 1-1/2" LOOSE MEASUREMENT (70-90 LBS/1000 SF.)

(5.7.1) STRAW MULCH: STRAW SHALL BE STALKS FROM OATS, WHEAT, RYE, BARLEY OR RICE THAT ARE FREE FROM NOXIOUS WEEDS, CHEMICALS, MOLD OR OTHER OBJECTIONABLE MATERIALS WITH A NONASPHALTIC MULCH TACKIER. STRAW SHALL BE IN AN AIR-DRY CONDITION SUITABLE FOR PLACING. STRAW SUPPLIED FOR MECHANICAL APPLICATION SHALL BE CHOPPED.

(6) HYDROSEEDING

(6.1) MULCH SUPPLIED FOR USE WITH HYDRAULIC APPLICATION OF GRASS SEED AND FERTILIZER SHALL CONSIST OF FUTERRA F4 NETLESS BY PROFILE PRODUCTS LLC (800-726-6371). INSTALL PER MANUFACTURER'S RECOMMENDATIONS USING MANUFACTURER'S BIODEGRADABLE STAPLES.

(6.2) NONASPHALTIC TACKIFIER: COLLOIDAL TACKIFIER RECOMMENDED BY FIBER-MULCH MANUFACTURER FOR SLURRY APPLICATION; NONTOXIC AND FREE OF PLANT-GROWTH OR GERMINATION INHIBITORS.

(6.3) HYDROSEEDING: MIX SPECIFIED SEED, STARTER FERTILIZER, AND FIBER MULCH IN WATER, USING EQUIPMENT SPECIFICALLY DESIGNED FOR HYDROSEED APPLICATION. CONTINUE MIXING UNTIL UNIFORMLY BLENDED INTO HOMOGENEOUS SLURRY SUITABLE FOR HYDRAULIC APPLICATION.

(6.3.1) APPLY SLURRY UNIFORMLY TO ALL AREAS TO BE SEEDED IN A TWO-STEP PROCESS. APPLY FIRST SLURRY COAT AT A RATE SO THAT MULCH COMPONENT IS DEPOSITED AT NOT LESS THAN 500 LB/ACRE DRY WEIGHT, AND SEED COMPONENT IS DEPOSITED AT NOT LESS THAN THE SPECIFIED SEED-SOWING RATE. APPLY SLURRY COVER COAT OF FIBER MULCH AT THE RATE RECOMMENDED BY THE MANUFACTURER FOR THE STEEPEST AREA OF SLOPE.

(6.4) THE LANDSCAPE CONTRACTOR SHALL CAREFULLY CORRELATE HIS WORK WITH THAT OF OTHER SITE DEVELOPERS. THE LANDSCAPE CONTRACTOR IS REQUIRED TO INSTALL AND MAINTAIN HIS FINISHED WORK AT HIS EXPENSE.

(7) MAINTENANCE DURING ESTABLISHMENT

(7.1) IT IS THE LANDSCAPE CONTRACTOR'S RESPONSIBILITY TO DETERMINE WATER APPLICATION RATES.

(7.2) THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MAINTENANCE DURING THE ESTABLISHMENT PERIOD AND UNTIL FINAL ACCEPTANCE. MAINTENANCE SHALL BEGIN IMMEDIATELY AFTER SEEDING AND SHALL INCLUDE WATERING, FERTILIZING, REMOVAL OF STRAW MULCH, WEED ERADICATION, MOWING, TRIMMING, CLIPPING REMOVAL, AND THE RECONSTRUCTION OF ALL AREAS DAMAGED BY EROSION OR OTHER OCCURRENCE.

(7.3) STANDS IN LAWN AREAS SHALL BE MOWED WHENEVER THE AVERAGE HEIGHT REACHES 1-1/2 INCH.

(7.4) WASTE MATERIAL SHALL BE REMOVED FROM THE SITE DAILY.

(7.5) WARRANTY: THE ESTABLISHMENT PERIOD FOR LAWN AREAS SHALL BE FROM THE TIME OF INSTALLATION UNTIL THE THIRD CUTTING OF AN ESTABLISHED LAWN. AN ESTABLISHED STAND SHALL BE UNIFORM IN COVERAGE AND OF THE SPECIFIED MIXTURE. NO INDIVIDUAL LAWN AREA SHALL HAVE BARE SPOTS IN EXCESS OF 3 INCHES IN DIAMETER AND BARE SPOTS SHALL COMPRISE NO MORE THAN TWO PERCENT OF THE TOTAL LAWN AREA. ALL REPLACEMENTS SHALL BE SUBJECT TO THE WARRANTY REQUIREMENTS AS THE ORIGINAL STOCK. ANY DAMAGE DONE DURING REPLACEMENT OPERATIONS SHALL BE THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR.

(8) CLEAN-UP AND PROTECTION

(8.1) KEEP PAVEMENTS AND WORK AREA IN A CLEAN AND ORDERLY CONDITION.

(8.2) PROTECT SEEDED AREAS AND MATERIALS FROM DAMAGE DUE TO OPERATIONS BY OTHER CONTRACTORS, TRADES, AND TRESPASSERS. MAINTAIN PROTECTION DURING INSTALLATION AND UNTIL FINAL ACCEPTANCE. TREAT REPAIR OR REPLACE DAMAGED SEEDED AREAS AS DIRECTED.

(9) COMPLETION AND ACCEPTANCE

(9.1) THE COMPLETION OF THE CONTRACT WILL BE ACCEPTED AND NOTICE OF COMPLETION RECORDED ONLY WHEN THE ENTIRE CONTRACT IS COMPLETED TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.

(9.2) WITHIN TEN (10) DAYS OF THE GENERAL CONTRACTOR'S NOTIFICATION THAT THE INSTALLATION IS COMPLETE, THE OWNER'S REPRESENTATIVE WILL INSPECT THE INSTALLATION AND, IF FINAL ACCEPTANCE IS NOT GIVEN, WILL PREPARE A "PUNCH LIST".

(9.3) FINAL ACCEPTANCE WILL BE GIVEN BY THE OWNER'S REPRESENTATIVE UPON SATISFACTORY COMPLETION OF ALL WORK INCLUDING "PUNCH LIST" ITEMS.

PLANTING NOTES

THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, ETC. NECESSARY TO COMPLETE ALL PLANTING AS SHOWN ON THIS DRAWING, AS SPECIFIED HEREIN OR IN SUPPLEMENTAL SPECIFICATIONS, AND/OR AS REQUIRED BY JOB CONDITIONS. THE WORK IN GENERAL INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

- (1) SOIL TESTING OF AMENDED PLANT BACKFILL MIXTURE;
- (2) TOPSOIL;
- (3) PLANTING AREA PREPARATION;
- (4) PLANTING PIT EXCAVATION AND SOIL AMENDMENT;
- (5) PLANT MATERIAL AND MULCH;
- (6) FERTILIZING;
- (7) ANCHORING; (WHEN REQUIRED)
- (8) CHEMICAL APPLICATION; (WHEN REQUIRED)
- (9) MAINTENANCE AND GUARANTEE;
- (10) ALL OTHER ITEMS NECESSARY TO MAKE WORK COMPLETE;

THE PLANTING CONTRACTOR IS RESPONSIBLE FOR COORDINATING WORK WITH THE OTHER CONTRACTORS. THIS PLAN DOES NOT GUARANTEE THE EXISTENCE OR NON-EXISTENCE OF ANY UTILITIES. PRIOR TO ANY CONSTRUCTION, EXCAVATION, OR ROTO-TILLING THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY OF VERIFYING THE LOCATIONS OF ALL UTILITIES, ABOVE AND/OR BELOW GROUND, PUBLIC AND/OR PRIVATE THAT MAY EXIST AND CROSS THROUGH THE AREAS OF CONSTRUCTION.

(1) QUALITY ASSURANCE

(1.1) QUALITY ASSURANCE: PLANTING SHALL BE PERFORMED BY A SINGLE FIRM SPECIALIZING AND EXPERIENCED IN LANDSCAPE WORK.

(2) SUBMITTALS

(2.1) TOPSOIL ANALYSIS: PROVIDE FOR THE SERVICES OF AN INDEPENDENT SOIL TESTING LABORATORY TO PERFORM ANALYSIS OF TOPSOIL TO BE USED, AND A DETERMINATION OF NUTRITIONAL REQUIREMENTS OF SOIL FOR ESTABLISHMENT OF PLANT MATERIAL BY LAB FOR SOIL AMENDMENTS.

(2.2) SOIL AMENDMENTS: PROVIDE MANUFACTURERS DATA ON AMENDMENTS AS RECOMMENDED IN TOPSOIL ANALYSIS AND AS NOTED BELOW.

(2.3) PLANT BACKFILL MIXTURE ANALYSIS: AFTER SOIL AMENDMENTS ARE ADDED TO SAMPLE SECONDARY TESTING IS TO BE PROVIDED TO PROVE AMENDED SOIL MEETS REQUIREMENTS.

(3) PLANTING AREA PREPARATION

(3.1) PLANTING AREAS. BECAUSE OF SOIL COMPACTION DURING CONSTRUCTION, ALL PLANTING AREAS SHALL BE LOOSENED BY ROTO-TILLING AS SPECIFIED BELOW. AREAS UNDER THE DRIP LINE OF TREES OR SHRUBS TO REMAIN IN PLACE SHALL NOT BE ROTO-TILLED. A PLANTING AREA IS ANY AREA IN WHICH NEW PLANTING OCCURS.

(3.2) PRIOR TO EXCAVATION OF INDIVIDUAL TREE AND SHRUB PITS, A DIAMETER EQUAL TO TEN TIMES THE DIAMETER OF THE ROOT BALL SHALL BE ROTO-TILLED TO A DEPTH 6". UNDER NO CIRCUMSTANCES SHALL THE ROTO-TILLED DEPTH BE GREATER THAN THE DEPTH OF THE ROOT BALL.

(4) PLANTING PIT EXCAVATION AND SOIL AMENDMENT OF BACKFILL MIXTURE

(4.1) TREE AND SHRUB PITS SHALL BE 3 TIMES THE WIDTH OF THE ROOTBALL, AND SHALL BE DUG SO THAT THE BOTTOM OF THE ROOT BALL WILL REST ON UNDISTURBED SOIL, AND THE TOP OF THE ROOT BALL WILL BE 1" ABOVE FINISH GRADE.

(4.2) TOPSOIL PROVIDED SHALL BE AMENDED AS RECOMMENDED WITHIN THE SOILS REPORT TO PROVIDE SUITABLE TEXTURE AND TO MEET ALL NUTRIENT AND ORGANIC LEVEL REQUIREMENTS.

(4.3) WHERE SOILS TESTS INDICATE THAT THE pH, SALINITY OR CHEMICAL COMPOSITION IS UNDESIRABLE FOR THE PLANT SPECIES BEING PLANTED, A DIFFERENT SOIL SOURCE SHALL BE PROVIDED THAT WILL MEET THE REQUIREMENTS. IF TOPSOIL IS TO BE AMENDED AS RECOMMENDED WITHIN THE SOILS REPORT IT MUST BE ABLE TO ACHIEVE SPECIFIED REQUIREMENTS. AFTER AMENDING, PLANT BACKFILL MIXTURE FOR DECIDUOUS PLANTS SHALL HAVE A pH VALUE BETWEEN 6.0 AND 6.5, AND FOR EVERGREEN OR SEMI-EVERGREEN PLANTS SHALL HAVE A pH VALUE BETWEEN 5.0 AND 6.0. A REPRESENTATIVE SAMPLE FROM THE EXCAVATED SOIL SHALL BE FIELD TESTED FOR pH UTILIZING A RELIABLE SOIL pH METER OR SOIL pH TEST KIT. THE pH VALUE OF THE NATURAL SOIL BACKFILL MIXTURE MAY BE AMENDED BY ADDING LIMESTONE OR ALUMINUM SULFATE AS NEEDED.

(4.4) WHERE EXCAVATION INDICATES THE EXISTING SUBSOIL HAS DEBRIS OR OTHER DELETERIOUS MATERIAL, REMOVE DEBRIS AND UNSUITABLE MATERIALS BEFORE PLACING TOPSOIL/ PLANT BACKFILL MIXTURE AS DEFINED ABOVE.

(4.5) AMENDED BACKFILL SOIL SHALL BE PROVIDED IN THE TREE AND SHRUB PIT (3 TIMES THE WIDTH OF THE ROOT BALL), NOT THE ENTIRE ROTO-TILLED AREA.

(4.8) FOR TREES IN POORLY DRAINED SOILS, A VERTICAL PIPE SHALL BE INSTALLED AT THE EDGE OF THE PLANT PIT EXCAVATION, EXTENDING TO A LEVEL EQUAL TO THE TOP OF THE MULCH. THE PIPE END SHALL BE THREADED AND FITTED WITH A THREADED CAP.

(5) PLANT MATERIAL AND MULCH

(5.1) THE NAMES OF PLANTS REQUIRED UNDER THIS CONTRACT CONFORM TO THOSE GIVEN IN L.H. BAILEY'S HORTUS THIRD, 1976 EDITION. NAMES OF VARIETIES NOT INCLUDED THEREIN CONFORM GENERALLY WITH NAMES ACCEPTED IN THE NURSERY TRADE. ALL PLANTS SHALL HAVE A HABIT OF GROWTH THAT IS NORMAL FOR THEIR SPECIES AND THEY SHALL BE SOUND, HEALTHY AND VIGOROUS, WITH WELL DEVELOPED ROOT SYSTEMS. ALL PLANT MATERIAL SHALL BE FREE FROM INSECT PESTS, PLANT DISEASES, AND INJURIES. ALL PLANTS SHALL EQUAL OR EXCEED THE MEASUREMENTS SPECIFIED IN THE PLANT LIST, WHICH ARE MINIMUM ACCEPTABLE SIZES. TREES SHALL HAVE SINGLE TRUNKS EXCEPT AS NOTED. ALL SHRUBS SHALL BE HEALTHY, VIGOROUS, AND OF GOOD COLOR. ONLY DAMAGED OR BROKEN BRANCHES OF PLANT MATERIAL MAY BE PRUNED AND ANY NECESSARY PRUNING SHALL BE DONE AT THE TIME OF PLANTING. HOWEVER, UNDER NO CIRCUMSTANCES SHALL THE CENTRAL LEADER OF A PLANT BE PRUNED. BALLING AND BURLAPPING OF PLANTS SHALL FOLLOW THE CODE OF STANDARDS CURRENTLY RECOMMENDED BY THE AMERICAN STANDARD FOR NURSERY STOCK.

(5.2) ALL TAGS, STRINGS OR ANY OTHER MATERIAL ATTACHED TO THE PLANTS SHALL BE REMOVED AT THE TIME OF PLANTING. LABEL AT LEAST ONE TREE, SHRUB AND GROUNDCOVER OF EACH VARIETY WITH A SECURELY ATTACHED WATERPROOF TAG BEARING LEGIBLE DESIGNATION OF BOTANICAL NAME AND THE SIZE AS SPECIFIED IN THE PLANT LIST OF REQUIRED PLANTS. LABELS SHALL BE SECURELY ATTACHED TO PLANTS AND SHALL BE LEGIBLE FOR 60 DAYS AFTER DELIVERY TO THE PLANTING SITE. WIRE IDENTIFICATION TAGS SHALL NOT BE USED.

(5.3) SUBSTITUTIONS WILL BE PERMITTED ONLY UPON SUBMISSION OF PROOF THAT ANY PLANT IS NOT OBTAINABLE. ALL SUBSTITUTIONS MUST BE AUTHORIZED BY THE OWNER OR THE OWNER'S REPRESENTATIVE IN WRITING PROVIDING FOR USE OF THE NEAREST EQUIVALENT OBTAINABLE SIZE AND VARIETY OF PLANT HAVING THE SAME ESSENTIAL CHARACTERISTICS AS THE SPECIFIED VARIETY WITH AN EQUITABLE ADJUSTMENT OF CONTRACT PRICE.

(5.4) BALLED AND BURLAPPED PLANTS (B&B) SHALL BE DUG WITH FIRM, NATURAL BALLS OF EARTH OF SUFFICIENT DIAMETER AND DEPTH TO ENCOMPASS THE FIBROUS AND FEEDING ROOT SYSTEM NECESSARY FOR FULL RECOVERY OF THE PLANT. BALLS SHALL BE FIRMLY WRAPPED WITH BURLAP OR SIMILAR MATERIAL AND BOUND WITH TWINE OR CORD. BURLAP SHALL NOT BE PULLED OUT FROM UNDER BALLS DURING PLANTING OPERATIONS. B&B PLANTS WHICH CANNOT BE PLANTED IMMEDIATELY ON DELIVERY SHALL BE COVERED WITH MOIST SOIL, MULCH, OR OTHER MATERIAL TO PROVIDE PROTECTION FROM DRYING WINDS AND SUN.

(5.5) PLANTS NOTED WITH A CONTAINER SIZE ON THE PLANT LIST MUST BE CONTAINER GROWN WITH WELL ESTABLISHED ROOT SYSTEMS. LOOSE CONTAINERIZED PLANT MATERIAL WILL NOT BE ACCEPTED. ALL PLANTS INJURED AND PLANTS WITH ROOT BALLS BROKEN DURING TRANSPORT OR PLANTING OPERATIONS WILL BE REJECTED. BARE-ROOTED PLANTS (BR) SHALL BE PLANTED OR HEELED-IN IMMEDIATELY UPON DELIVERY. ALL PLANTS SHALL BE WATERED AS NECESSARY UNTIL PLANTED.

(5.6) NEW PLANTINGS SHALL BE LOCATED WHERE SHOWN ON THE PLAN EXCEPT WHERE OBSTRUCTIONS BELOW GROUND ARE ENCOUNTERED OR WHERE CHANGES HAVE BEEN MADE IN THE PROPOSED CONSTRUCTION. NECESSARY ADJUSTMENTS SHALL BE MADE ONLY AFTER APPROVAL BY THE OWNER OR THE OWNER'S REPRESENTATIVE. REASONABLE CARE SHALL BE EXERCISED TO HAVE PLANTING PITS DUG AND SOIL PREPARED PRIOR TO MOVING PLANTS TO THEIR RESPECTIVE LOCATIONS TO ENSURE THAT THEY WILL NOT BE UNNECESSARILY EXPOSED TO DRYING OR PHYSICAL DAMAGE.

(5.7) A LIST OF PLANTS, INCLUDING SIZES, QUANTITIES AND OTHER REQUIREMENTS, IS SHOWN ON THE DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE QUANTITIES AS SHOWN ON THE DRAWINGS. IF DISCREPANCIES OCCUR IN THE QUANTITIES SHOWN, THE PLANTING PLANS SHALL GOVERN.

(5.8) THE PLANTING CONTRACTOR WILL BE NOTIFIED BY THE GENERAL CONTRACTOR WHEN OTHER DIVISIONS OF THE WORK HAVE PROGRESSED SUFFICIENTLY TO COMMENCE WORK ON THE PLANTING OPERATION. THEREAFTER, PLANTING OPERATIONS SHALL BE CONDUCTED UNDER FAVORABLE WEATHER CONDITIONS DURING THE NEXT SEASON OR SEASONS WHICH ARE NORMAL FOR SUCH WORK. REMOVAL OF ROCK OR OTHER UNDERGROUND OBSTRUCTIONS, RELOCATIONS TO AVOID OBSTRUCTIONS, AND PROVISION OF DRAINAGE FOR PLANTING AREAS SHALL BE DONE ONLY AS APPROVED BY THE OWNER OR THE OWNER'S REPRESENTATIVE.

(5.9) ALL PLANTS SHALL BE PLANTED UPRIGHT AND FACED TO GIVE THE BEST APPEARANCE OR RELATIONSHIP TO ADJACENT STRUCTURES. ROOTS SHALL BE SPREAD IN THEIR NORMAL POSITION. ALL BROKEN OR FRAYED ROOTS SHALL BE CUT OFF CLEANLY. PLANTS WITH CIRCLING ROOTS SHALL NOT BE ACCEPTED. BURLAP TWINE AND OTHER FASTENING MATERIAL SHALL BE CUT AND PUSHED TO THE BOTTOM OF THE PLANT PIT PRIOR TO BACKFILL MATERIAL BEING PLACED. THE PLANT SHALL NOT BE ROCKED BACK AND FORTH TO ENTIRELY REMOVE THE WRAPPING MATERIAL NOR SHALL ANY OTHER PRACTICE BE PERFORMED WHICH COULD CAUSE THE ROOT BALL TO BREAK APART. WHEN WIRE BASKETS ARE USED ON THE ROOT BALL OF PLANTS THE WIRE SHALL BE REMOVED FROM THE SIDES OF THE ROOT BALL.

(5.10) AT THE TIME OF PLANTING, AND AS MANY TIMES LATER AS SEASONAL CONDITIONS REQUIRE, EACH PLANT AND THE SOIL AROUND IT SHALL BE THOROUGHLY WATERED. CARE SHOULD BE EXERCISED WHEN WATERING TO AVOID FLOODING OF PLANTS AND BEDS, DISPLACEMENT OF MULCH MATERIAL AND EROSION OF SOIL. AVOID USE OF HIGH PRESSURE HOSES. THE CONTRACTOR SHALL MAKE, AT HIS EXPENSE, WHATEVER ARRANGEMENTS MAY BE NECESSARY TO ENSURE AN ADEQUATE SUPPLY OF WATER TO MEET THE NEEDS OF THIS CONTRACT DURING INSTALLATION. THE CONTRACTOR SHALL ALSO FURNISH ALL NECESSARY HOSE, EQUIPMENT ATTACHMENTS AND ACCESSORIES FOR THE ADEQUATE WATERING OF PLANTED AREAS AS MAY BE REQUIRED UNTIL ACCEPTANCE BY THE OWNER OR THE OWNER'S REPRESENTATIVE.

(5.11) MULCH SHALL BE CLEAN, SHREDDED HARDWOOD MULCH. IN PLANTING AREAS WHERE SLOPES EXCEED 3:1 AND AT DRAINAGE DISPERSION POINTS OR ALONG NATURAL WATER WAYS WHERE CONCENTRATIONS OF SURFACE WATER EMPTY FROM CULVERTS OR PAVED DITCHES, HEAVY JUTE MESH SHALL BE INSTALLED. SHREDDED HARDWOOD SHALL HAVE BEEN COMPOSTED FOR AT LEAST TWO MONTHS PRIOR TO APPLICATION. FRESHLY GROUND MULCH WILL NOT BE ACCEPTED. FINELY GROUND MULCH, WHICH INHIBITS DRAINAGE, ENCOURAGES WEED GROWTH OR BECOMES WATERLOGGED WILL NOT BE ACCEPTED. MULCH SHALL BE COMPOSED OF SIMILAR SIZED FRAGMENTS AND SHALL NOT CONTAIN STICKS, CONES, LEAVES, SHREDDED PIECES, OR OTHER DELETERIOUS MATTER.

(5.12) ALL PLANTS SHALL BE MULCHED IMMEDIATELY AFTER PLANTING. GROUND COVERS SHALL BE MULCHED WITH A 3" LAYER OF SHREDDED HARDWOOD. ALL OTHER PLANTING BEDS, SHRUBS AND TREE PLANTINGS SHALL BE MULCHED WITH A 3" MINIMUM LAYER OF MULCH. THIS MULCH SHALL ENTIRELY COVER THE AREA OF THE PLANTING PIT, BED, OR EARTH BERM AROUND EACH PLANT WITH THE EXCEPTION OF THE AREA IMMEDIATELY ADJACENT TO THE PLANT TRUNK OR TRUNKS. THE AREA IMMEDIATELY ADJACENT TO THE PLANT TRUNK OR TRUNKS SHALL BE LEFT FREE OF ANY MULCH.

(5.13) INSPECT ROOT SYSTEM FOR POTENTIAL STEM GIRDLING ROOTS. DEFECTIVE ROOTS (J ROOTS, DIVING OR CIRCLING) SHALL BE PRUNED AWAY BACK TO LIVE TISSUE BEFORE/AHEAD OF THE ROOT DEFECT. IF 30% OR MORE OF ROOT SYSTEM IS DEFECTIVE (AS DETERMINED BY INDEPENDENT VNLA CERTIFIED HORTICULTURIST OR LANDSCAPE ARCHITECT) OR IF GIRDLING ROOTS ARE NOTED AFTER PLANTING, THE ENTIRE TREE SHALL BE REJECTED.

(5.14) SOIL COVERING ROOT STOCK GRAFT OR ON TOP OF THE ROOTBALL SHALL BE REMOVED SO THAT THE TRUNK FLARE AND THE TOP OF THE ROOT SYSTEM ARE CLEARLY VISIBLE. IF MORE THAN 2" OF SOIL WOULD NEED TO BE REMOVED TO EXPOSE TRUNK FLARE, TREE SHALL BE REJECTED. SET THE BASE OF THE TRUNK FLARE 1" HIGHER THAN FINAL GRADE, PARTICULARLY IN SLOWLY DRAINING SOILS.

(6) FERTILIZING

(6.1) THE FERTILIZER SHOULD BE A DRY SLOW RELEASE FORM OF FERTILIZER. IT SHOULD CONTAIN AT LEAST 25-50% WATER INSOLUBLE NITROGEN. THE FERTILIZER SELECTED SHOULD ALSO HAVE A LOW ADJUSTED SALT INDEX TO PREVENT BURNING. THE N-P-K RATIO SHOULD NOT EXCEED 3-1-2 UNLESS THE SOIL TEST REVEALS THAT ADDITIONAL LEVELS OF P AND K ARE NECESSARY.

(6.2) FOR DECIDUOUS TREES, USE AMENDMENTS AS RECOMMENDED BY SOIL TESTING LABORATORY.

(6.3) MIX THE FERTILIZER INTO THE BACKFILL SOIL OF THE TREE PITS. FOR SHRUB BEDS, MIX THE FERTILIZER INTO THE AREA THAT HAS BEEN ROTO-TILLED FOR THE PLANTS.

(6.4) THE FERTILIZER RATE FOR CONTINUOUS GROUND COVER AND SHRUB BEDS SHOULD BE DERIVED BY CALCULATING THE ENTIRE ROOT ZONE AREA. THE ROOT ZONE AREA IS FOUND BY MEASURING THE AREA CONTAINING THE MULTIPLE PLANT ROOTS. FERTILIZER SHALL BE AS RECOMMENDED BY SOIL TESTING LAB REPORT. THE FERTILIZER SHOULD BE EVENLY DISTRIBUTED WITHIN THE SHRUB BED SOIL.

(6.5) ALWAYS BE SURE THAT ADEQUATE MOISTURE IS AVAILABLE WHEN FERTILIZING SO THAT THE FERTILIZER WILL BE DISSOLVED INTO THE SOIL SOLUTION FOR ROOT UPTAKE AND TO AVOID BURNING THE ROOTS.

(7) STAKING

(7.1) STAKE TREES, AS REQUIRED BY SITE CONDITIONS ONLY, TO MAINTAIN TRUNKS PLUMB AND UNTIL THE TREES ARE ROOTED AND SELF SUPPORTING. ALL TREES REQUIRING SUPPORT SHALL BE STAKED ACCORDING TO THE NOTES BELOW.

(7.2) TWO TO THREE STAKES SHALL BE PROVIDED PER TREE. INSTALL IN SUCH A MANNER AS NOT TO INJURE THE ROOT BALL OR ROOTS.

(7.3) ALL STAKING MATERIAL SHALL BE REMOVED AS SOON AS THE TREE HAS SUFFICIENT ROOTS TO NO LONGER REQUIRE STAKES. TREES THAT REMAIN UNSTABLE WITHOUT STAKING AFTER ONE YEAR SHALL BE REJECTED AND REPLACED.

(8) CHEMICAL APPLICATION

(8.1) PESTICIDES SHOULD BE USED ONLY WHEN NECESSARY TO TREAT AN OUTBREAK OF A HARMFUL PEST OR DISEASE PROBLEM. THE OWNER OR THE OWNER'S REPRESENTATIVE SHALL BE NOTIFIED 24 HOURS PRIOR TO THE APPLICATION OF ANY PESTICIDE.

(8.2) ALL PESTICIDES SHALL BE PRODUCTS OF RECOGNIZED COMMERCIAL MANUFACTURERS, AND SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE, AND LOCAL PESTICIDE LAWS. PESTICIDES SHALL BE APPLIED WITH CALIBRATED EQUIPMENT ACCORDING TO EPA LABEL RESTRICTIONS AND REGULATIONS BY A CERTIFIED APPLICATOR. ANY DAMAGE INCURRED TO THE SITE, ADJACENT PROPERTIES, OR APPLICATOR DURING PESTICIDE APPLICATIONS WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

(9) MAINTENANCE AND GUARANTEE

(9.1) THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING HIS WORK UNTIL FINAL ACCEPTANCE BY THE OWNER OR THE OWNER'S REPRESENTATIVE. MAINTENANCE SHALL INCLUDE MOWING, WATERING, WEEDING, CULTIVATING, MULCHING, REMOVAL OF DEAD MATERIALS, RESETTING OF PLANTS TO PROPER GRADES OR UPRIGHT POSITIONS, RESTORATION OF EARTH BERMS, AND OTHER NECESSARY OPERATIONS. ADEQUATE PROTECTION FOR LAWN AREAS AGAINST TRESPASSING DURING PLANTING OPERATIONS AND AGAINST DAMAGE OF ANY KIND SHALL BE PROVIDED. NOTHING IN THESE NOTES IS INTENDED TO RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO REPAIR EXISTING LAWN AREAS DAMAGED BY WORKMEN ENGAGED IN THE COMPLETION OF THIS PROJECT.

(9.2) INSPECTION OF THE WORK TO DETERMINE COMPLETION OF THE CONTRACT EXCLUSIVE OF THE POSSIBLE REPLACEMENT OF PLANTINGS, WILL BE MADE BY THE OWNER OR THE OWNER'S REPRESENTATIVE AT THE CONCLUSION OF THE INSTALLATION PERIOD UPON WRITTEN NOTICE REQUESTING SUCH INSPECTION. REQUEST SHALL BE SUBMITTED BY CONTRACTOR AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED DATE FOR INSPECTION. AFTER INSPECTION, THE CONTRACTOR WILL BE NOTIFIED IN WRITING BY THE OWNER OR THE OWNER'S REPRESENTATIVE OF ACCEPTANCE OF THE WORK, EXCLUSIVE OF THE POSSIBLE REPLACEMENT OF PLANTS SUBJECT TO GUARANTEE; OR, IF THERE ARE ANY DEFICIENCIES, THE CONTRACTOR WILL BE NOTIFIED OF THE REQUIREMENTS NECESSARY FOR COMPLETION OF THE WORK. PLANTINGS SHALL NOT BE CONSIDERED ACCEPTED UNTIL ALL DEFICIENCIES HAVE BEEN CORRECTED AND APPROVED IN WRITING.

(9.3) NURSERY STOCK SHALL BE FULLY GUARANTEED FOR ONE FULL YEAR AFTER DATE OF FINAL ACCEPTANCE. ALL PLANTS THAT FAIL TO MAKE NEW GROWTH FROM A DORMANT CONDITION OR THAT DIE DURING THE FIRST YEAR AFTER PLANTING SHALL BE REPLACED. ALL REPLACEMENTS SHALL CONFORM WITH THE ORIGINAL SPECIFICATIONS AS TO SIZE AND TYPE. ALL COSTS OF REPLACEMENTS SHALL BE BORNE BY THE CONTRACTOR.

(10) ALL OTHER ITEMS NECESSARY TO MAKE WORK COMPLETE

(10.1) ANY PLANT MATERIAL NOT PLANTED SHALL BE REMOVED FROM THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL UNUSED MATERIALS, RUBBISH AND DEBRIS FROM THE SITE UPON COMPLETION OF HIS WORK.

(10.2) WASTE MATERIAL SHALL BE REMOVED FROM THE SITE DAILY.

(10.3) KEEP PAVEMENTS CLEAN AND WORK AREA IN AN ORDERLY CONDITION AT ALL TIMES.

(10.4) FINAL ACCEPTANCE WILL BE GIVEN BY THE OWNER OR THE OWNER'S REPRESENTATIVE UPON SATISFACTORY COMPLETION OF ALL WORK INCLUDING "PUNCH LIST" ITEMS.

70% SUBMITTAL
SEPTEMBER 2022

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR CONSTRUCTION

NOTES
1. Lot dimensions in parentheses are from deed.
2. Property owners correct as of ________, 20__
3. Ordinance Number___________
4. Adopted__________
5. Accepted________________________________

REFERENCES

REVISIONS

Existing Legend

Storm Sewer	
Sanitary Sewer (Gravity)	SS
Gas Line	4"G
Electric Line	E
Overhead Utility	OHU
Telephone/Telegraph	T-Duct
Water Line	4"W
Property Line	
Storm Basin	
Storm or Sanitary Manhole	Ⓓ or Ⓢ
Fire Hydrant / Valve	FH ● WV
Water Meter	● WM
Existing Curb Cut Ramp	HCR
Gas Meter / Valve	GM ● ● GV
Fence	X
Power/Light Pole	PP LP
Guy Anchor	<
Tree	

Proposed Legend

Sanitary Sewer	
Storm Sewer	
Storm/(San) Manhole	SDMH ● (SMH)
Basin	
Curb Cut Ramp	
Decorative Light	
Conduit	
Conduit (Encased)	

ESTABLISHED 1737

Technical	Administrative
Surveys Superintendent	
Project Manager	Capital Project Administrator
Maintenance Engineer	City Engineer
City Traffic Engineer	Director of Public Works

SHOCKOE VALLEY STREET IMPROVEMENTS
LANDSCAPE ARCHITECTURE NOTES

AUTHORITY: CITY OF RICHMOND, DPW

DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA

DESIGN BY: DBeale DRAWN BY: JAlexander CHECKED BY: ASamberg	REVIEWED BY:	FIELD NOTES	SCALE	DATE SEPTEMBER 2022	PROJECT SHEET 2521	DRAWING NO. 0-28633