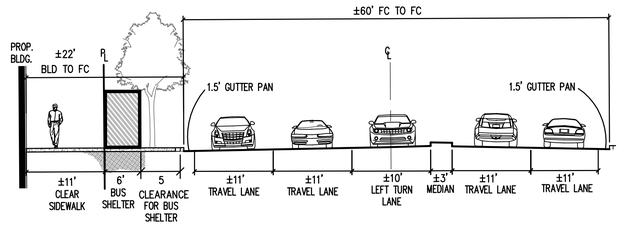
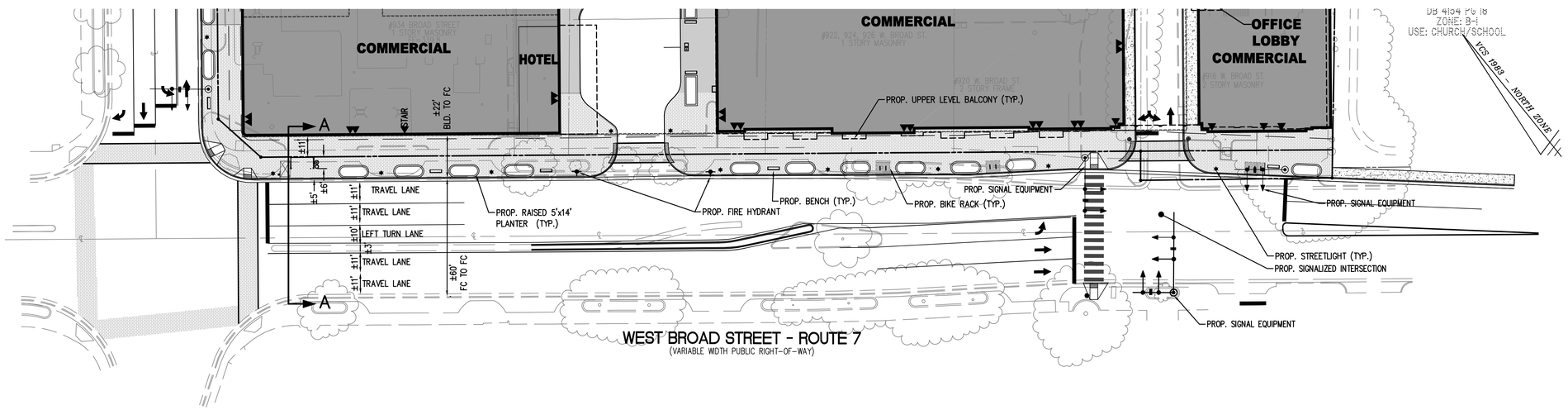
NOTES:

1. SEE SHEET C-0406 FOR TRAVEL LANE DIMENSIONS.



PROPOSED STREET SECTION A-A

NOT TO SCALE



30 0 15 30 60

1 INCH = 30'

File No. CC-8 Tax Map No. 40-4 Job No. 07-023 Cadd Dwg. File: Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023C-0403.dwg Xref: DIR\Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023B-0001

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DRAWN: CHECKED:

SCALE: 1" = 30' DATE: 9/23/2016

COMMONWEALTH OF VIRGINIA KAREN L. S. WHITE Lic. No.041850 9/23/16 PROFESSIONAL ENGINEER

NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

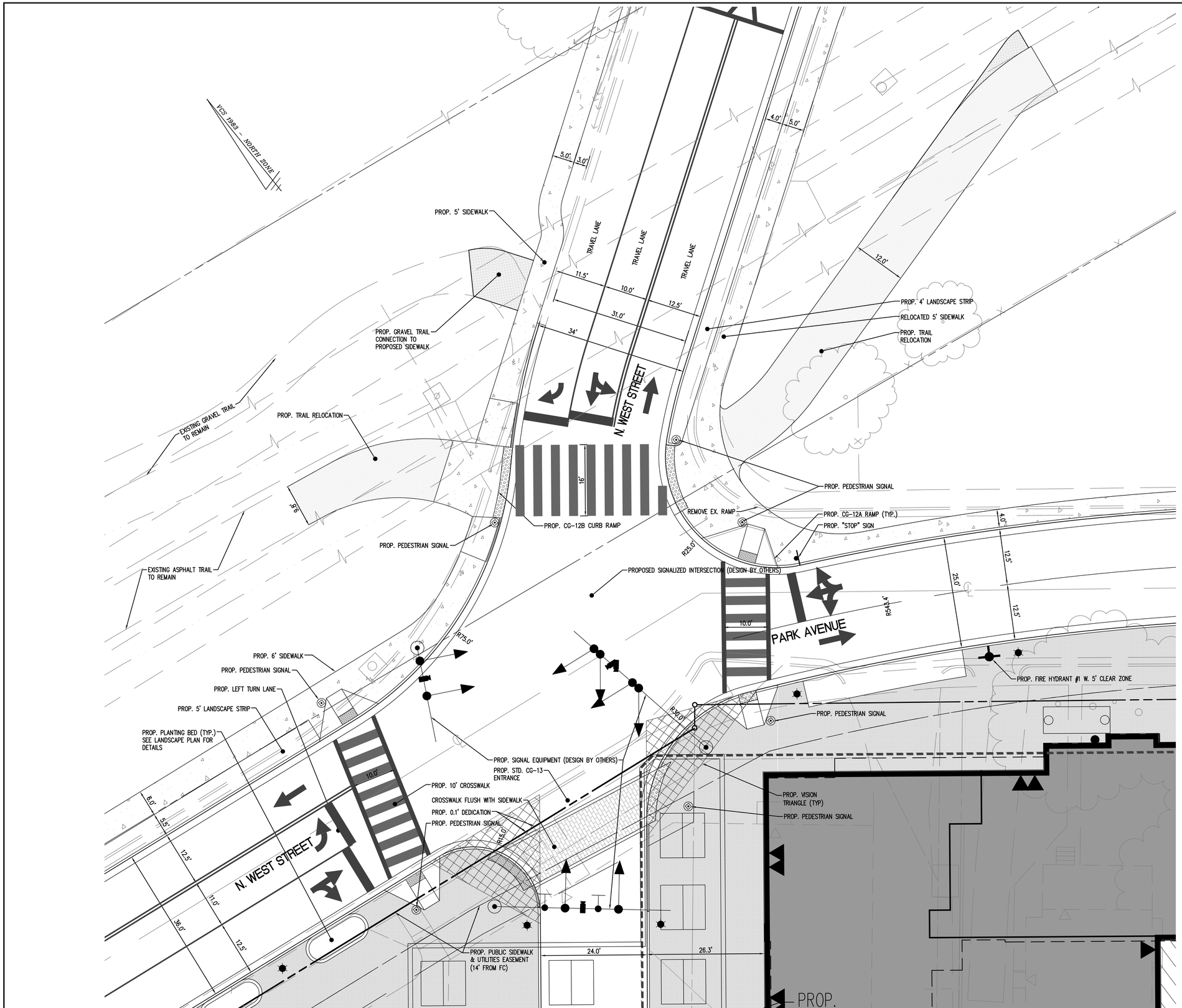
REVISION APPROVED BY

WEST BROAD STREETSCAPE PLAN

MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0403



LEGEND

PROPOSED	DESCRIPTION	EXISTING
EP	EDGE OF PAVEMENT	EP.
MH	MANHOLE	MH
WV	WATER VALVE	WV
WM	WATER METER	WM
GM	GAS METER	GM
TCB	TRAFFIC CONTROL BOX	TCB
LP	LIGHT POLE	LP
LP/S	LIGHT POLE WITH SIGNALS	LP/S
	CURB & GUTTER CG-2	
CG-6R CG-6	TRANSITION FROM CG-6 TO CG-6R	CG-6 CG-6R
S	SANITARY SEWER	S
SL	SANITARY LATERAL	SL
C.O.	CLEAN OUT	C.O.
	STORM SEWER	
W	WATER MAIN	W
	FIRE HYDRANT	
E	PLUG	E
	OVERHEAD WIRES	
	UTILITY POLE	
UE	UNDERGROUND ELECTRIC	UE
T	TELEPHONE	T
G	GAS MAIN	G
E	ELECTRICAL	E
	TRANSFORMER	
	HANDICAP RAMP (CG-12)	
	GUARDRAIL	
	FENCE	
	TRAFFIC FLOW	
	LIGHT	
	DOOR	
	TREES	
	LIMITS OF CLEARING AND GRADING	
	TEST PIT	

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DRAWN:
DATE: 9/23/2016
SCALE: 1" = 10'

COMMONWEALTH OF VIRGINIA
KAREN L. S. WHITE
Lic. No.041850
9/23/16
PROFESSIONAL ENGINEER

NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

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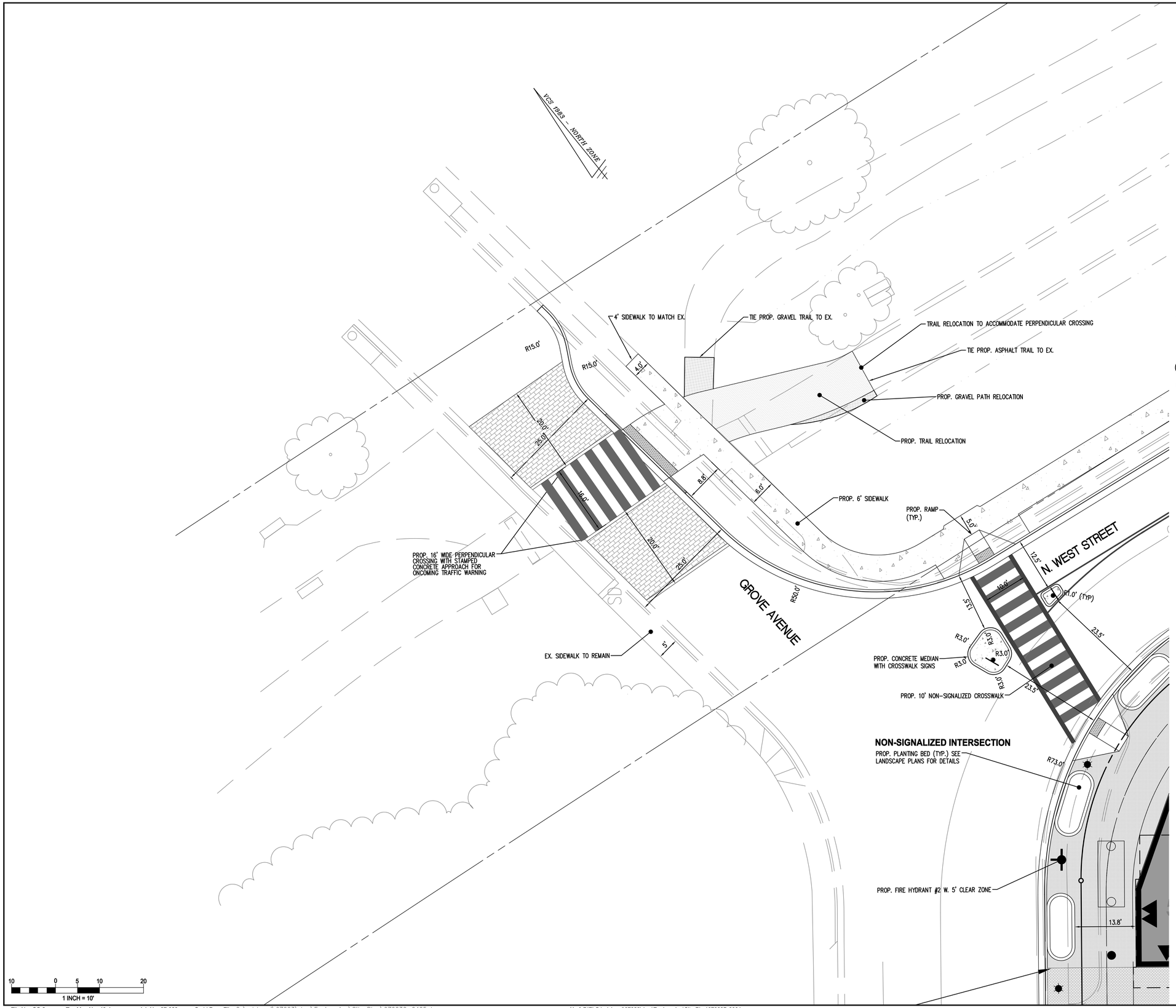
NORTH WEST STREET ENLARGMENT PLAN

MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET,
NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0404



LEGEND

PROPOSED	DESCRIPTION	EXISTING
EP	EDGE OF PAVEMENT	EP.
MH	MANHOLE	MH
WV	WATER VALVE	WV
WM	WATER METER	WM
GM	GAS METER	GM
TCB	TRAFFIC CONTROL BOX	TCB
LP	LIGHT POLE	LP
LP/S	LIGHT POLE WITH SIGNALS	LP/S
	CURB & GUTTER CG-2	
CG-6R CG-6	TRANSITION FROM CG-6 TO CG-6R	CG-6 CG-6R
S	SANITARY SEWER	S
SL	SANITARY LATERAL	SL
C.O.	CLEAN OUT	C.O.
	STORM SEWER	
W	WATER MAIN	W
	FIRE HYDRANT	
	PLUG	
	OVERHEAD WIRES	
	UTILITY POLE	
UE	UNDERGROUND ELECTRIC	UE
T	TELEPHONE	T
G	GAS MAIN	G
E	ELECTRICAL	E
	TRANSFORMER	
	HANDICAP RAMP (CG-12)	
	GUARDRAIL	
X X X	FENCE	X X X
	TRAFFIC FLOW	
	LIGHT	
	DOOR	
	TREES	
	LIMITS OF CLEARING AND GRADING	
	TEST PIT	

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NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

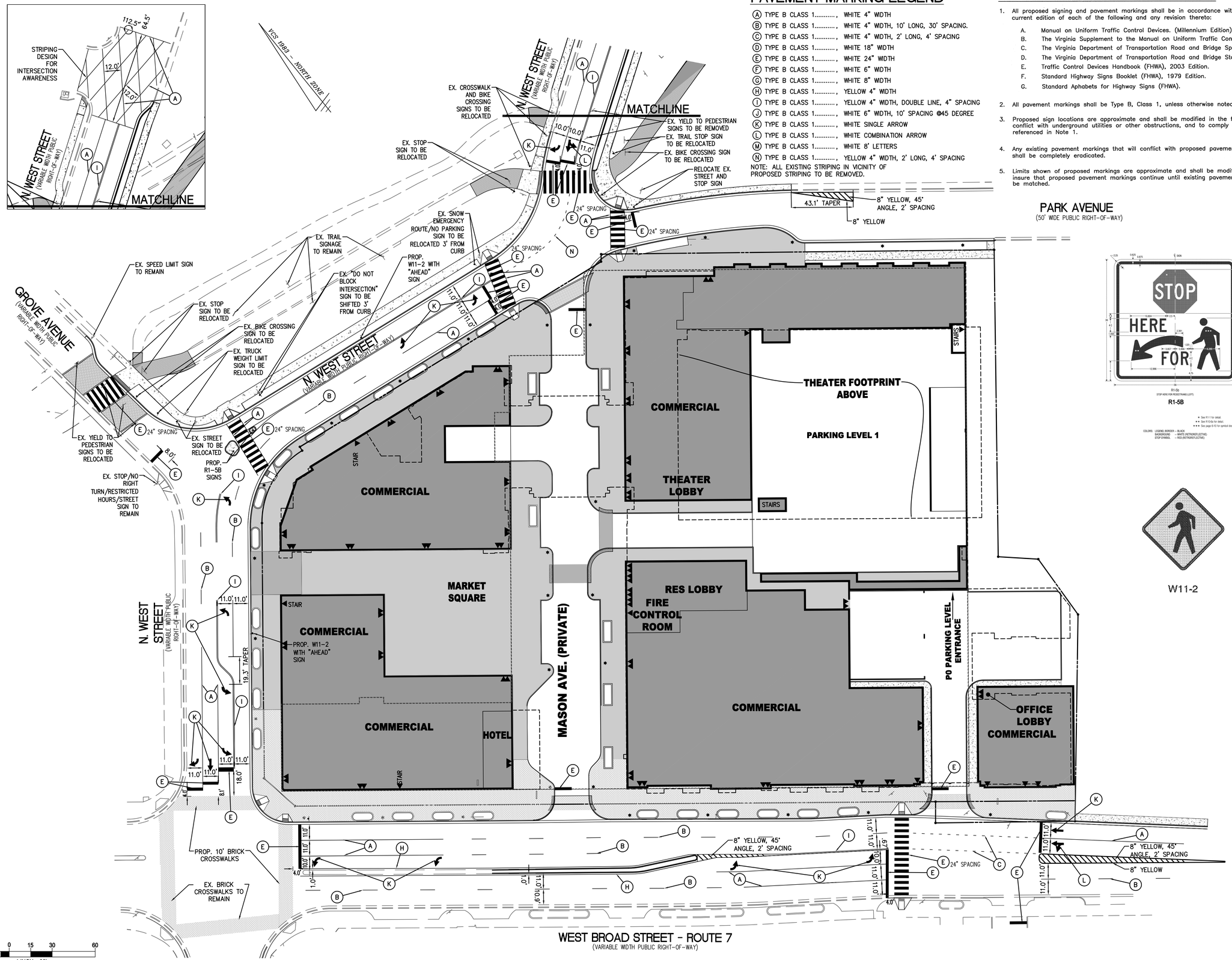
GROVE AVENUE ENLARGEMENT PLAN

MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH. VIRGINIA

SHEET: C-0405

File No. CC-8 Tax Map No. 40-4 Job No. 07-023 Cadd Dwg. File: Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023C-0405.dwg Xref: DIR\Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023B-0001



PAVEMENT MARKING LEGEND

- (A) TYPE B CLASS 1....., WHITE 4" WIDTH
- (B) TYPE B CLASS 1....., WHITE 4" WIDTH, 10' LONG, 30' SPACING.
- (C) TYPE B CLASS 1....., WHITE 4" WIDTH, 2' LONG, 4' SPACING
- (D) TYPE B CLASS 1....., WHITE 18" WIDTH
- (E) TYPE B CLASS 1....., WHITE 24" WIDTH
- (F) TYPE B CLASS 1....., WHITE 6" WIDTH
- (G) TYPE B CLASS 1....., WHITE 8" WIDTH
- (H) TYPE B CLASS 1....., YELLOW 4" WIDTH
- (I) TYPE B CLASS 1....., YELLOW 4" WIDTH, DOUBLE LINE, 4" SPACING
- (J) TYPE B CLASS 1....., WHITE 6" WIDTH, 10' SPACING @45 DEGREE
- (K) TYPE B CLASS 1....., WHITE SINGLE ARROW
- (L) TYPE B CLASS 1....., WHITE COMBINATION ARROW
- (M) TYPE B CLASS 1....., WHITE 8' LETTERS
- (N) TYPE B CLASS 1....., YELLOW 4" WIDTH, 2' LONG, 4' SPACING

NOTE: ALL EXISTING STRIPING IN VICINITY OF PROPOSED STRIPING TO BE REMOVED.

SIGNING AND PAVEMENT MARKING NOTES

1. All proposed signing and pavement markings shall be in accordance with the most current edition of each of the following and any revision thereto:
   - A. Manual on Uniform Traffic Control Devices. (Millennium Edition)
   - B. The Virginia Supplement to the Manual on Uniform Traffic Control Devices.
   - C. The Virginia Department of Transportation Road and Bridge Specifications.
   - D. The Virginia Department of Transportation Road and Bridge Standards.
   - E. Traffic Control Devices Handbook (FHWA), 2003 Edition.
   - F. Standard Highway Signs Booklet (FHWA), 1979 Edition.
   - G. Standard Aphabets for Highway Signs (FHWA).
2. All pavement markings shall be Type B, Class 1, unless otherwise noted.
3. Proposed sign locations are approximate and shall be modified in the field to avoid conflict with underground utilities or other obstructions, and to comply with standard referenced in Note 1.
4. Any existing pavement markings that will conflict with proposed pavement markings shall be completely eradicated.
5. Limits shown of proposed markings are approximate and shall be modified in the field to insure that proposed pavement markings continue until existing pavement markings can be matched.

R1-5b
STOP HERE FOR PEDESTRIANS (LEFT)
R1-5B

W11-2

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KAREN L. S. WHITE
Lic. No.041650
9/23/16
PROFESSIONAL ENGINEER

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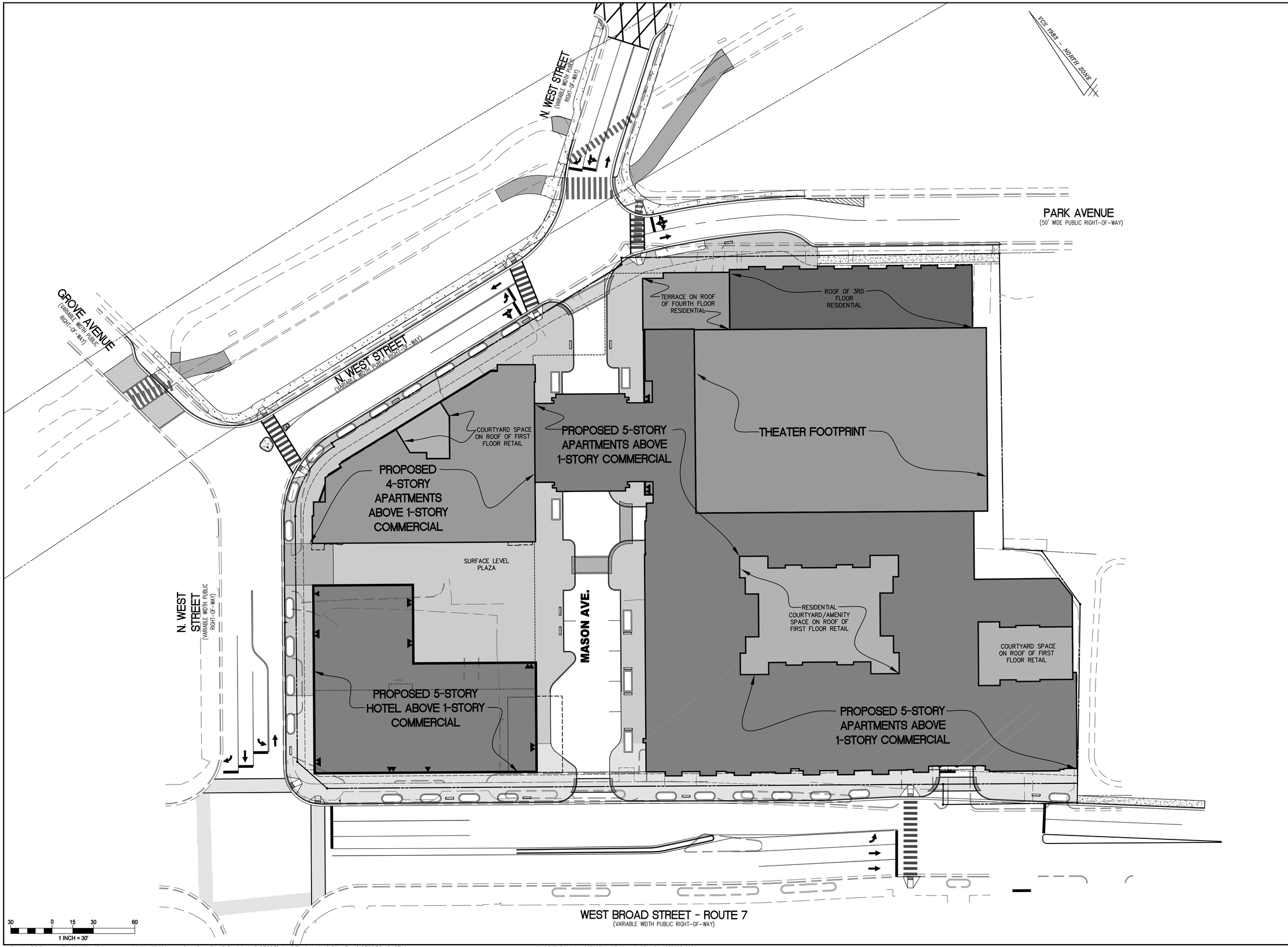
STREET STRIPING & SIGNAGE PLAN

MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0406

File No. CC-8 Tax Map No. 40-4 Job No. 07-023 Cadd Dwg. File: Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023C-0406.dwg Xref: DIR\Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023B-0001



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9/23/16
PROFESSIONAL ENGINEER

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AERIAL VIEW BUILDING SCHEMATIC

MASON ROW

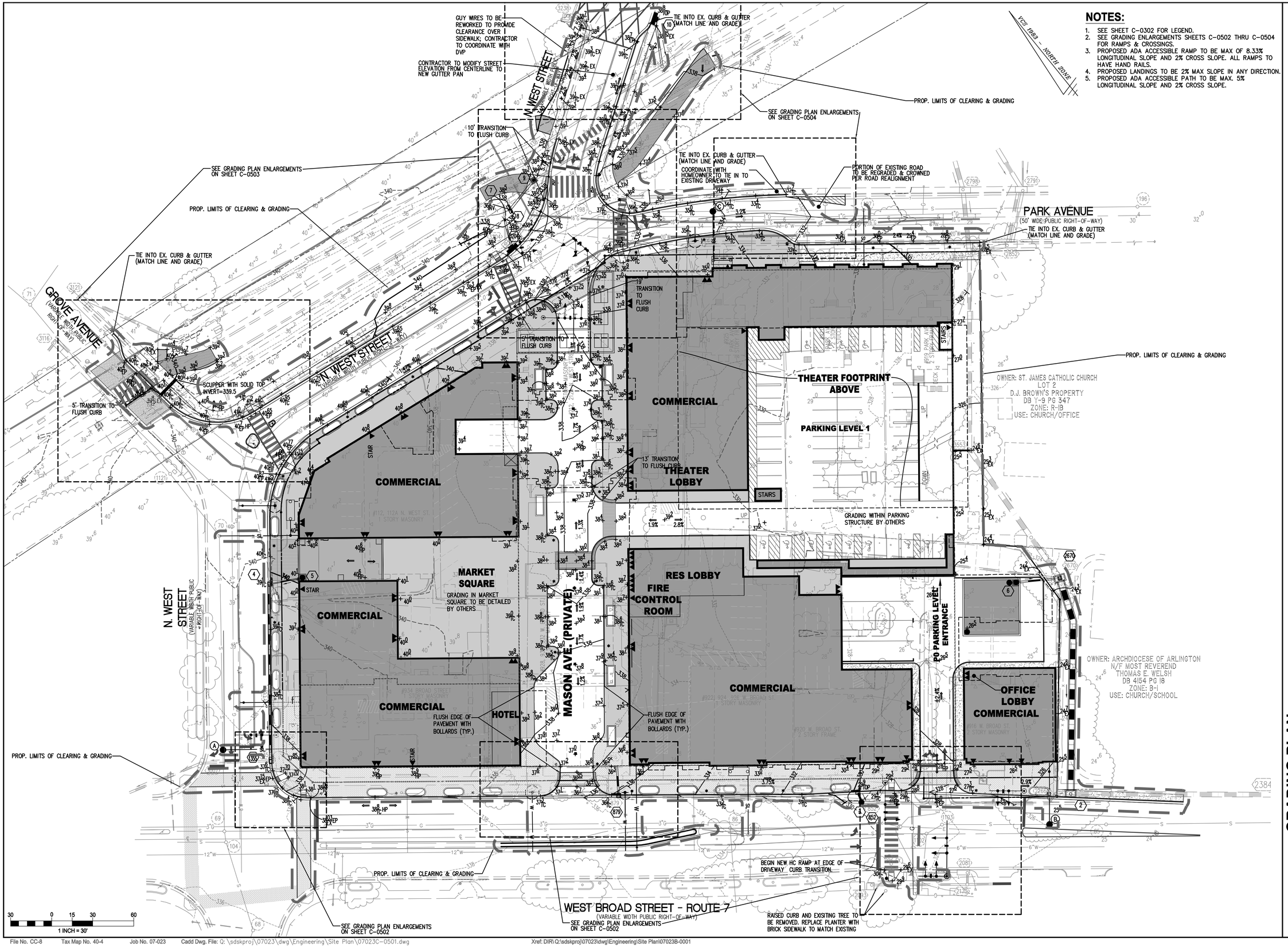
AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0407

File No. CC-8 Tax Map No. 40-4 Job No. 07-023 Cadd Dwg. File: Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023C-0407.dwg Xref: DIR\Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023B-0001

NOTES:

1. SEE SHEET C-0302 FOR LEGEND.
2. SEE GRADING ENLARGEMENTS SHEETS C-0502 THRU C-0504 FOR RAMPS & CROSSINGS.
3. PROPOSED ADA ACCESSIBLE RAMP TO BE MAX OF 8.33% LONGITUDINAL SLOPE AND 2% CROSS SLOPE. ALL RAMPS TO HAVE HAND RAILS.
4. PROPOSED LANDINGS TO BE 2% MAX SLOPE IN ANY DIRECTION.
5. PROPOSED ADA ACCESSIBLE PATH TO BE MAX. 5% LONGITUDINAL SLOPE AND 2% CROSS SLOPE.



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GRADING PLAN

MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0501

File No. CC-8 Tax Map No. 40-4 Job No. 07-023 Cadd Dwg. File: Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023C-0501.dwg

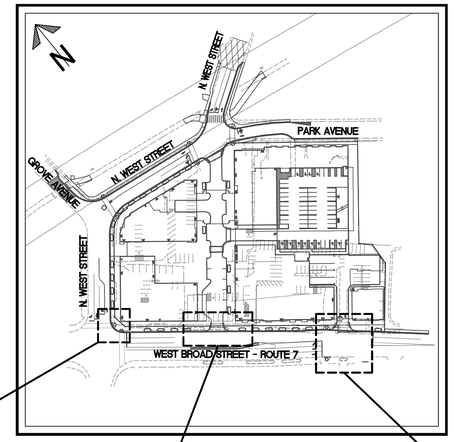
Xref: DIR\Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023B-0001

LEGEND

PROPOSED	DESCRIPTION	EXISTING	PROPOSED	DESCRIPTION	EXISTING
	CURB & GUTTER CG-2			HANDICAP RAMP (CG-12)	
CG-6R CG-6	TRANSITION FROM CG-6 TO CG-6R	CG-6 CG-6R		GUARDRAIL	
	SANITARY SEWER	S		FENCE	
SL	SANITARY LATERAL	SL		TRAFFIC FLOW	
C.O.	CLEAN OUT	C.O.		LIGHT	
	STORM SEWER			DOOR	
	WATER MAIN	W		TREES	
	FIRE HYDRANT		260 264	CONTOURS	260 264
c	PLUG	c			
	OVERHEAD WIRES		+264 50	SPOT ELEVATION	+264 50
	UTILITY POLE			DRAINAGE FLOW DIRECTION	
UE	UNDERGROUND ELECTRIC	UE	TC	TOP OF CURB	TC
T	TELEPHONE	T	BC	BOTTOM OF CURB	BC
G	GAS MAIN	G	TW	TOP OF WALL	TW
E	ELECTRICAL	E	BW	BOTTOM OF WALL	BW
	TRANSFORMER		HP	HIGH POINT	H.P.
				LIMITS OF CLEARING AND GRADING	

KEY MAP

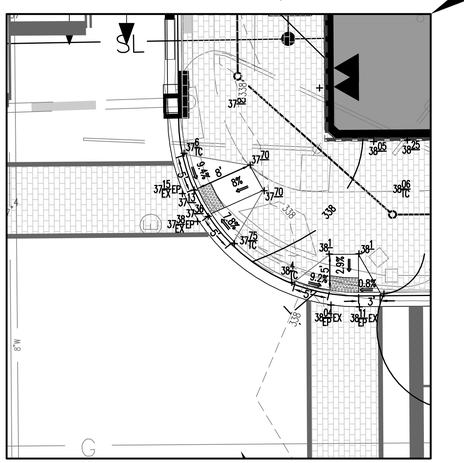
NOT TO SCALE



NOTES

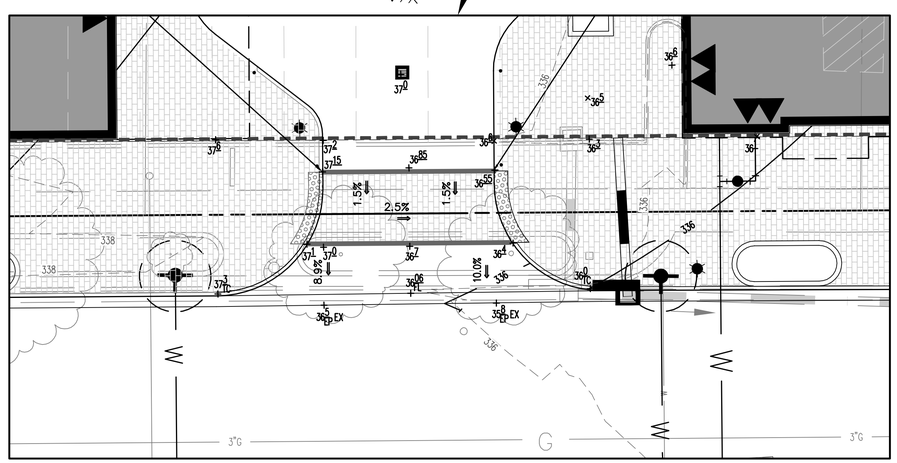
1. PROPOSED ADA ACCESSIBLE RAMP TO BE MAX OF 8.33% LONGITUDINAL SLOPE AND 2% CROSS SLOPE. ALL RAMPS TO HAVE HAND RAILS.
2. PROPOSED LANDINGS TO BE 2% MAX SLOPE IN ANY DIRECTION.
3. PROPOSED ADA ACCESSIBLE PATH TO BE MAX. 5% LONGITUDINAL SLOPE AND 2% CROSS SLOPE.

VCS 1983 - NORTH ZONE



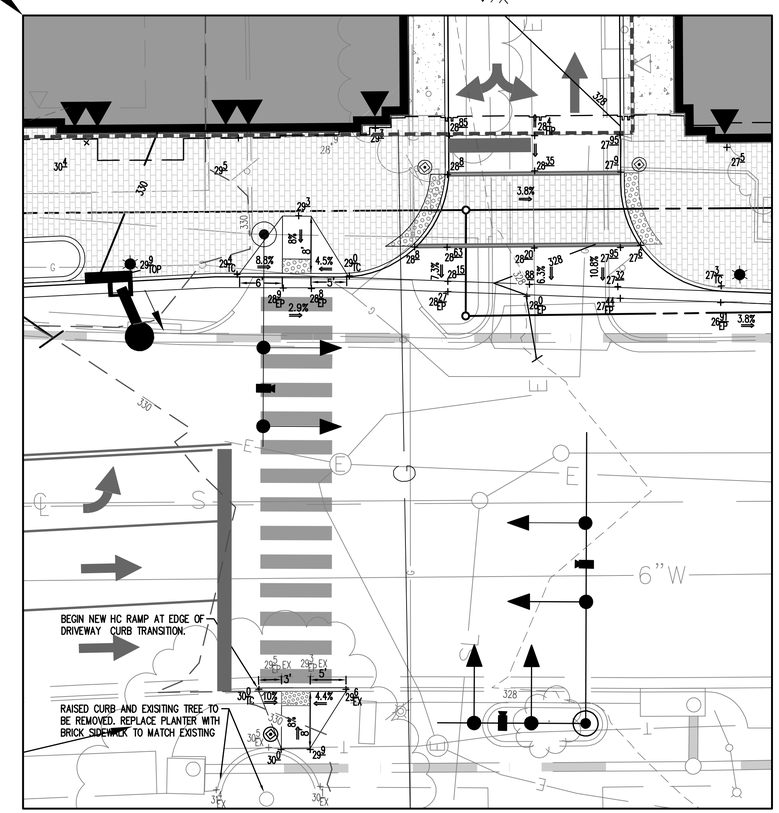
NORTH WEST STREET AND WEST BROAD STREET INTERSECTION

VCS 1983 - NORTH ZONE



MASON AVENUE AND WEST BROAD STREET INTERSECTION

VCS 1983 - NORTH ZONE



PROPOSED SIGNALIZED INTERSECTION ON WEST BROAD STREET

10 0 5 10 20
1 INCH = 10'

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9/23/16

SCALE: 1" = 10'
DATE: 9/23/2016

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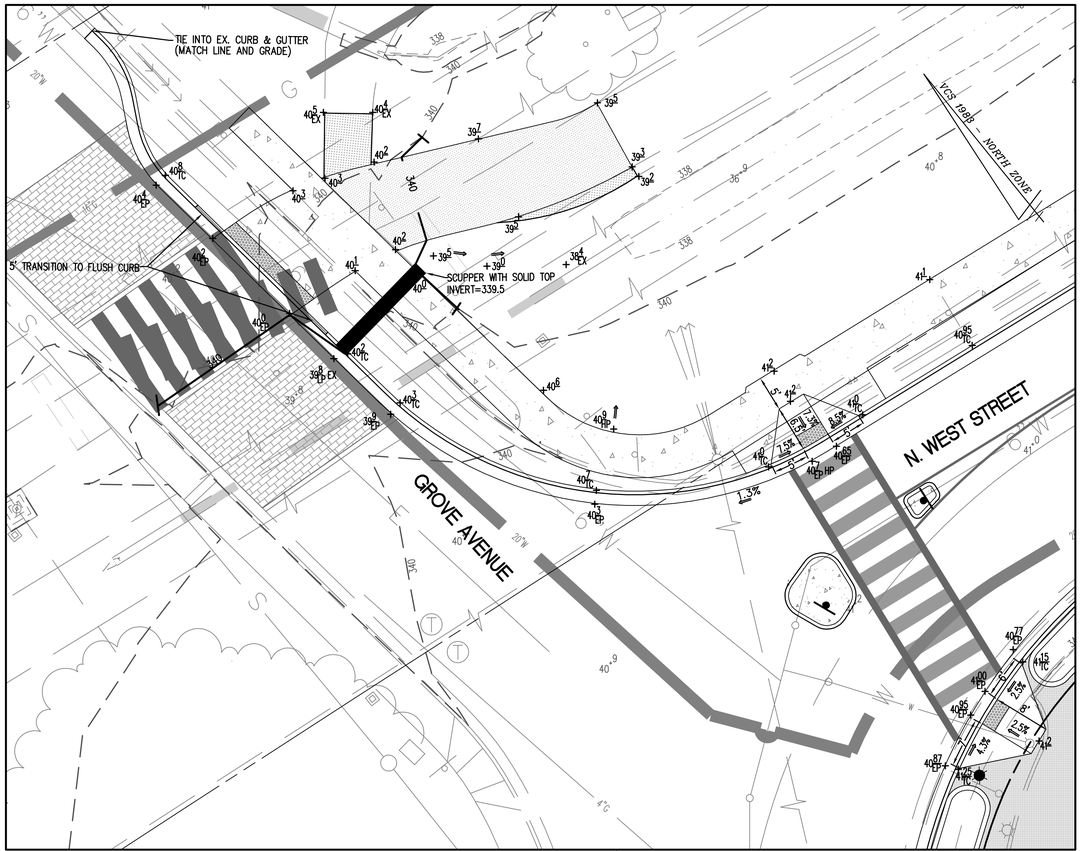
GRADING ENLARGEMENT

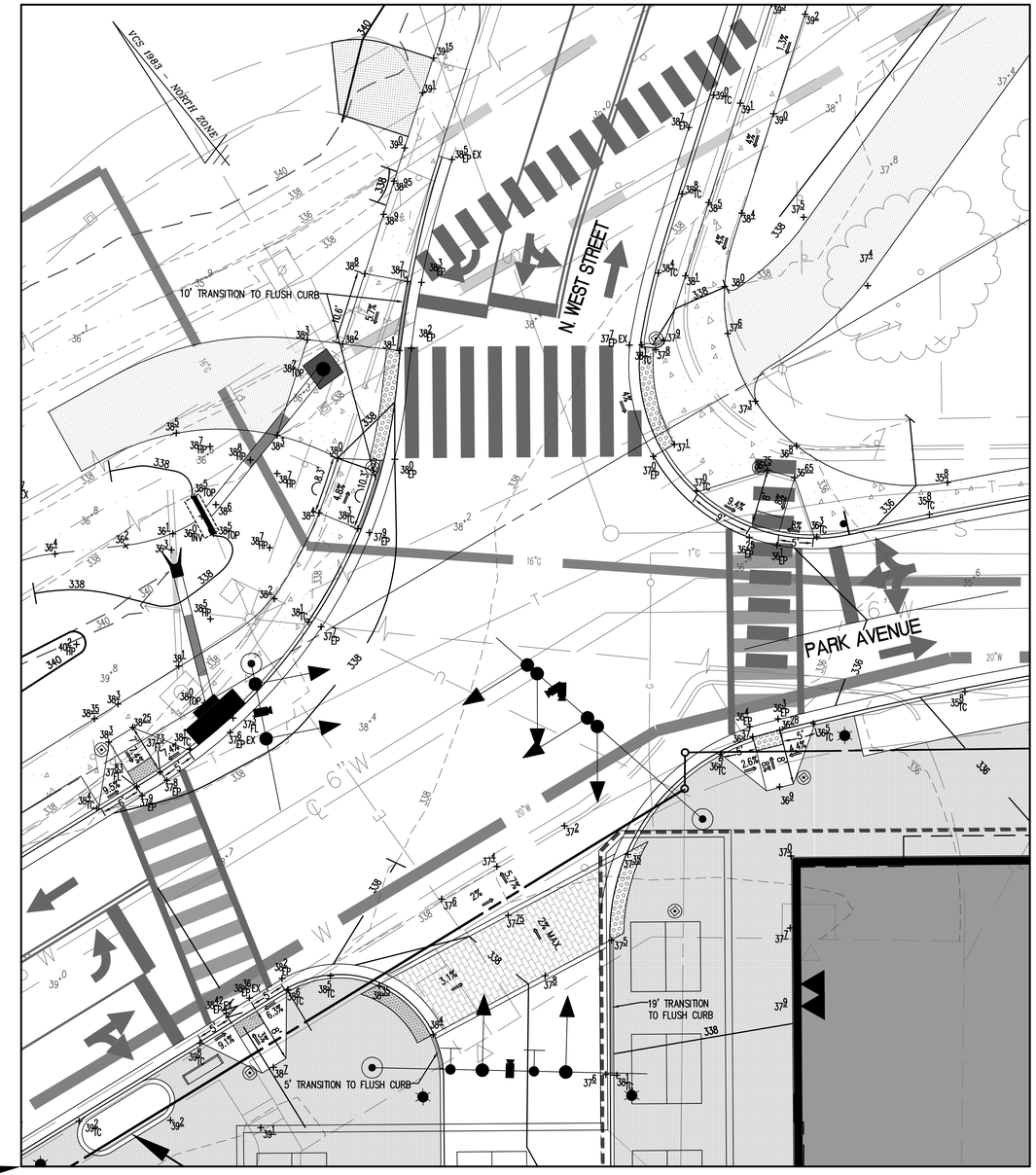
MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE CITY OF FALLS CHURCH, VIRGINIA

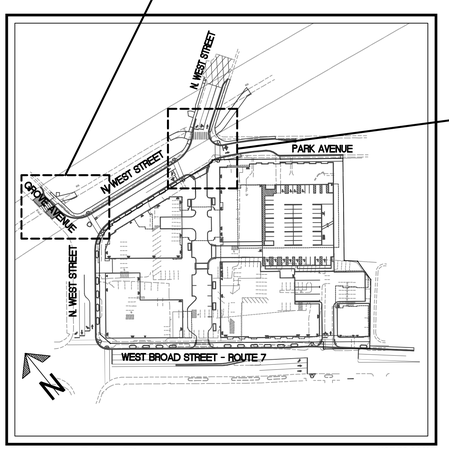
SHEET: C-0502



GROVE AVENUE AND NORTH WEST STREET INTERSECTION



PARK AVENUE AND
NORTH WEST STREET
INTERSECTION



KEY MAP

NOT TO SCALE

10 0 5 10 20
1 INCH = 10'

NOTES

1. PROPOSED ADA ACCESSIBLE RAMP TO BE MAX OF 8.33% LONGITUDINAL SLOPE AND 2% CROSS SLOPE. ALL RAMPS TO HAVE HAND RAILS.
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3. PROPOSED ADA ACCESSIBLE PATH TO BE MAX. 5% LONGITUDINAL SLOPE AND 2% CROSS SLOPE.

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9/23/16
PROFESSIONAL ENGINEER

SCALE: 1" = 30' | DATE: 9/23/2016 | DRAWN: | CHECKED:

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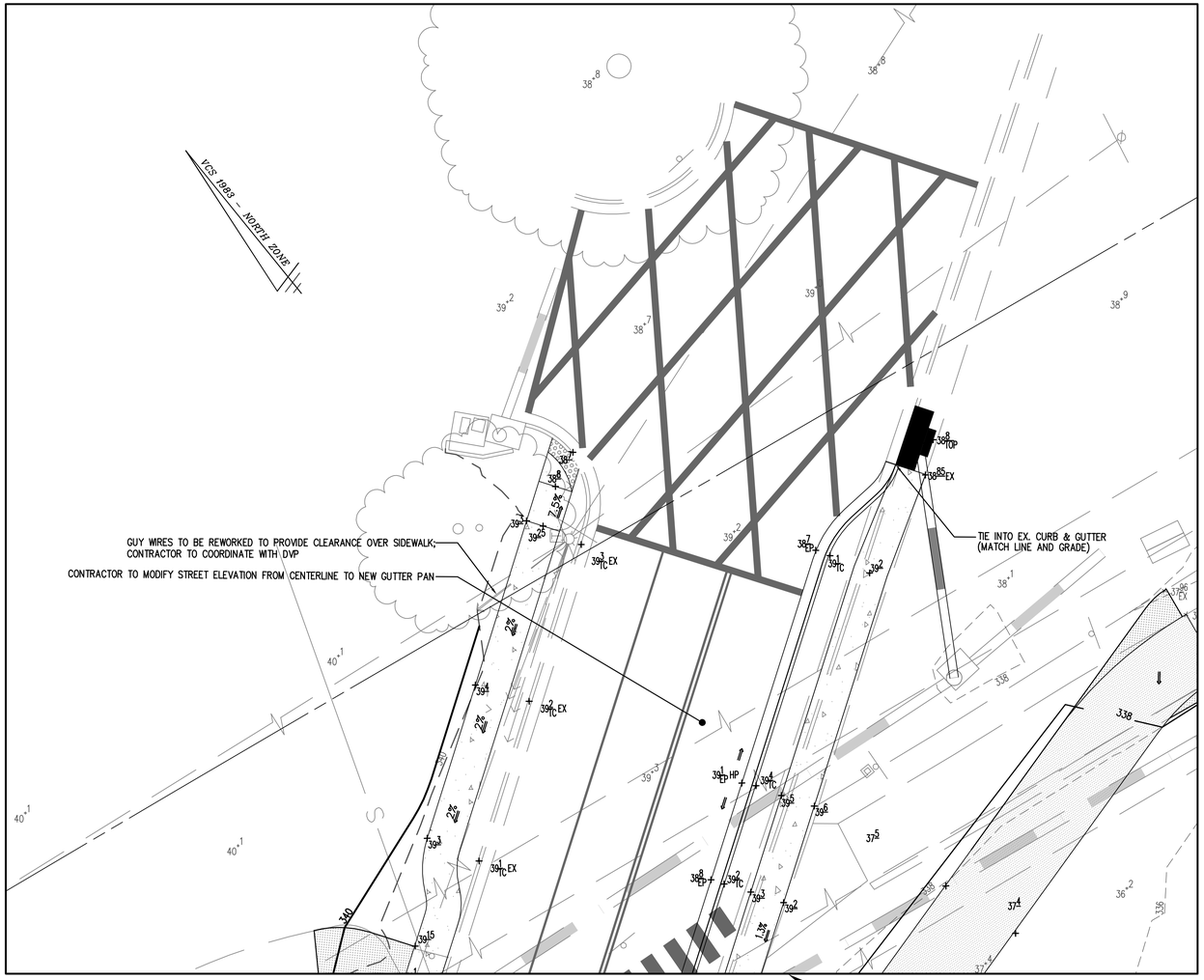
NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

GRADING ENLARGEMENT

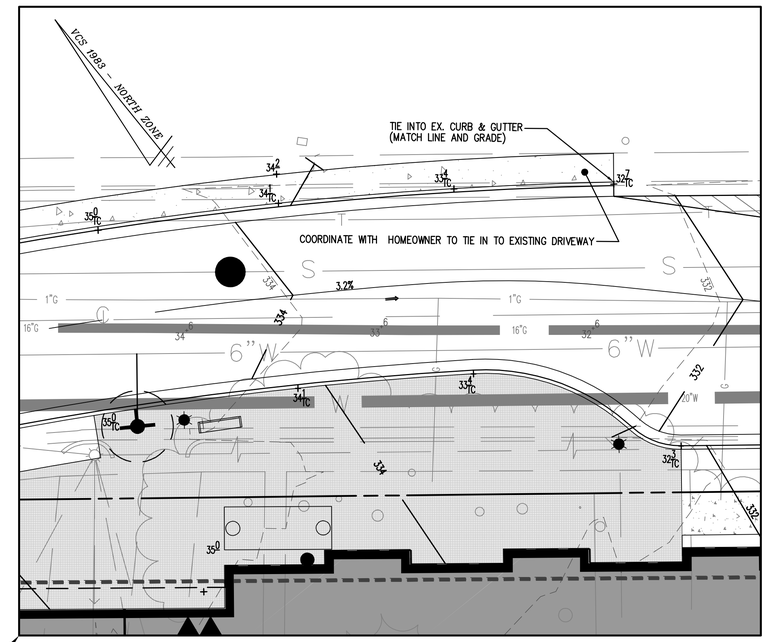
MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

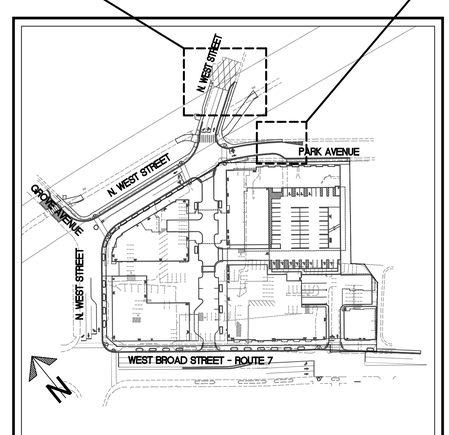
SHEET: C-0503



NORTH WEST STREET



PARK AVENUE



KEY MAP

NOT TO SCALE

10 0 5 10 20
1 INCH = 10'

NOTES

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SCALE: 1" = 30' DATE: 9/23/2016

COMMONWEALTH OF VIRGINIA BUSINESS PROFESSIONAL REGISTRATION
KAREN L. S. WHITE
Lic. No.041850
9/23/16

REVISION APPROVED BY

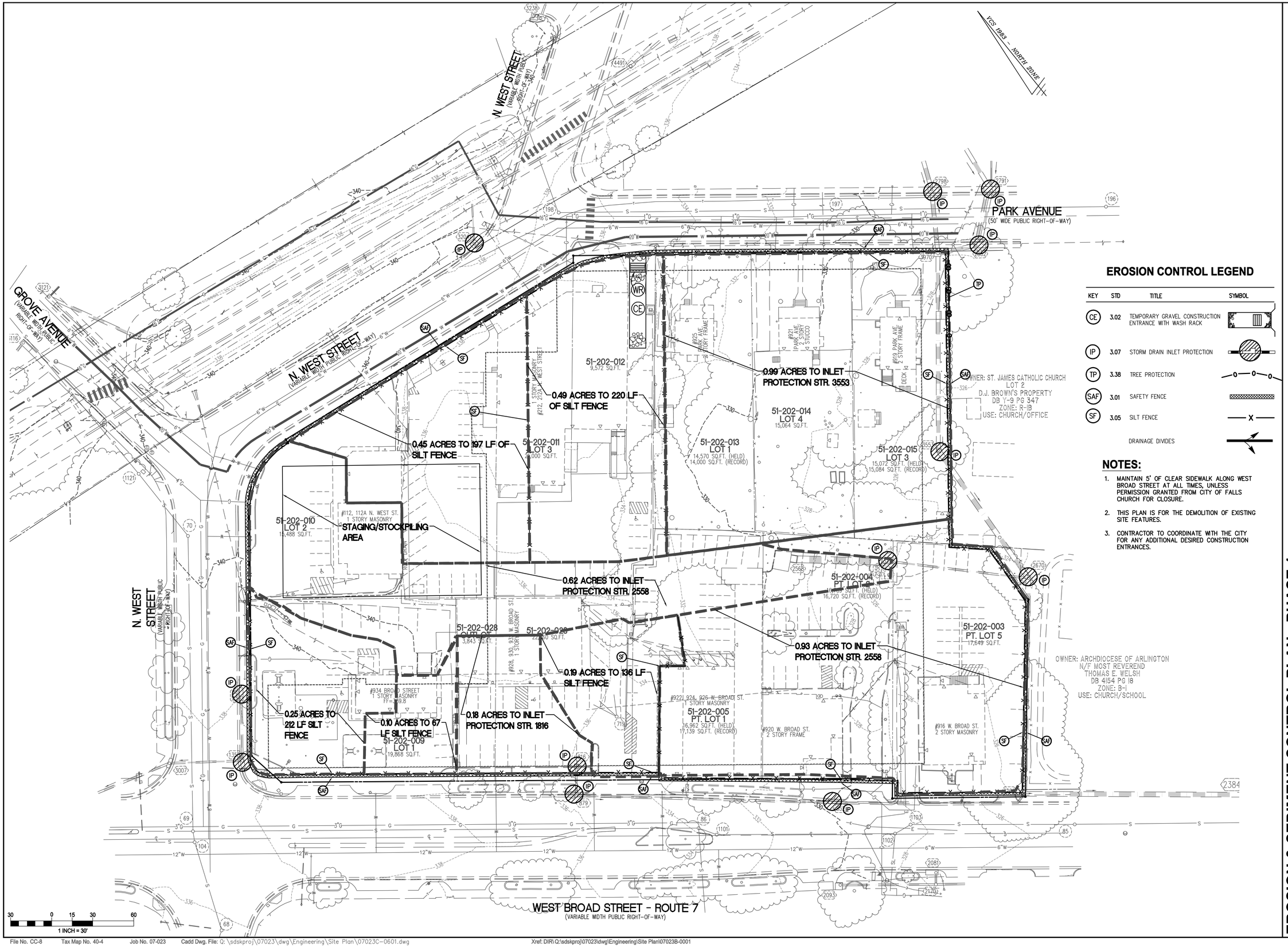
NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

GRADING ENLARGMENT

MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0504



EROSION CONTROL LEGEND

KEY	STD	TITLE	SYMBOL
CE	3.02	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE WITH WASH RACK	
IP	3.07	STORM DRAIN INLET PROTECTION	
TP	3.38	TREE PROTECTION	
SAF	3.01	SAFETY FENCE	
SF	3.05	SILT FENCE	
		DRAINAGE DIVIDES	

NOTES:

1. MAINTAIN 5' OF CLEAR SIDEWALK ALONG WEST BROAD STREET AT ALL TIMES, UNLESS PERMISSION GRANTED FROM CITY OF FALLS CHURCH FOR CLOSURE.
2. THIS PLAN IS FOR THE DEMOLITION OF EXISTING SITE FEATURES.
3. CONTRACTOR TO COORDINATE WITH THE CITY FOR ANY ADDITIONAL DESIRED CONSTRUCTION ENTRANCES.

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PROFESSIONAL ENGINEER

CHECKED:
DRAWN:
DATE: 9/23/2016
SCALE: 1" = 30'

NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

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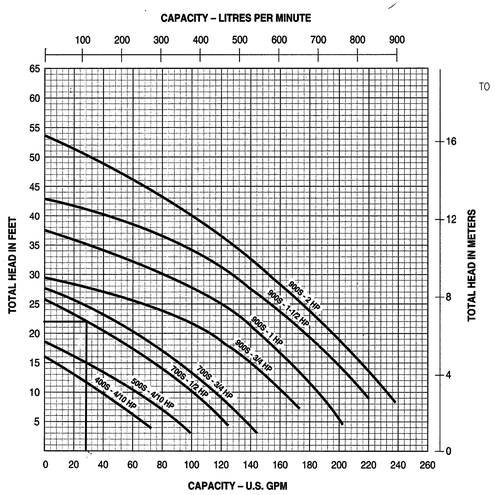
EROSION & SEDIMENT CONTROL PLAN - PHASE 1

MASON ROW

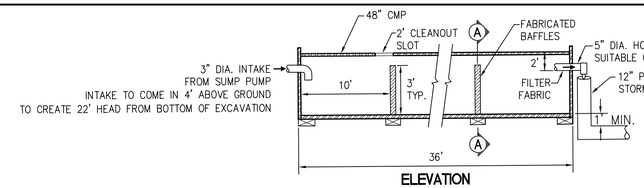
AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0601



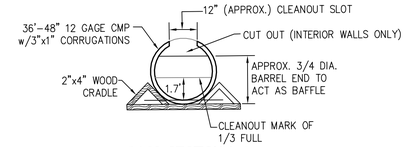
CONTRACTOR TO USE 700S–1/2 HP PUMP

PUMP SELECTION CHART



ELEVATION

NOTE: TANK TO BE CLEANED OF ALL SEDIMENT WHEN 1/3 FULL. SEDIMENT TO BE PLACED AND STABILIZED ON SITE OR HAULED OFFSITE. SEDIMENT NOT TO BE INTRODUCED TO DRAINAGE OUTFALL SYSTEM.



CROSS-SECTION A-A

CONTRACTOR TO USE 700S–1/2 HP PUMP

VOLUME COMPUTATIONS:

REQUIRED: 16 x PUMP RATE IN GPM = 16 x 28 = 448 CF

* PUMP DISCHARGE RATE @ 22' HEAD = 28 GPM

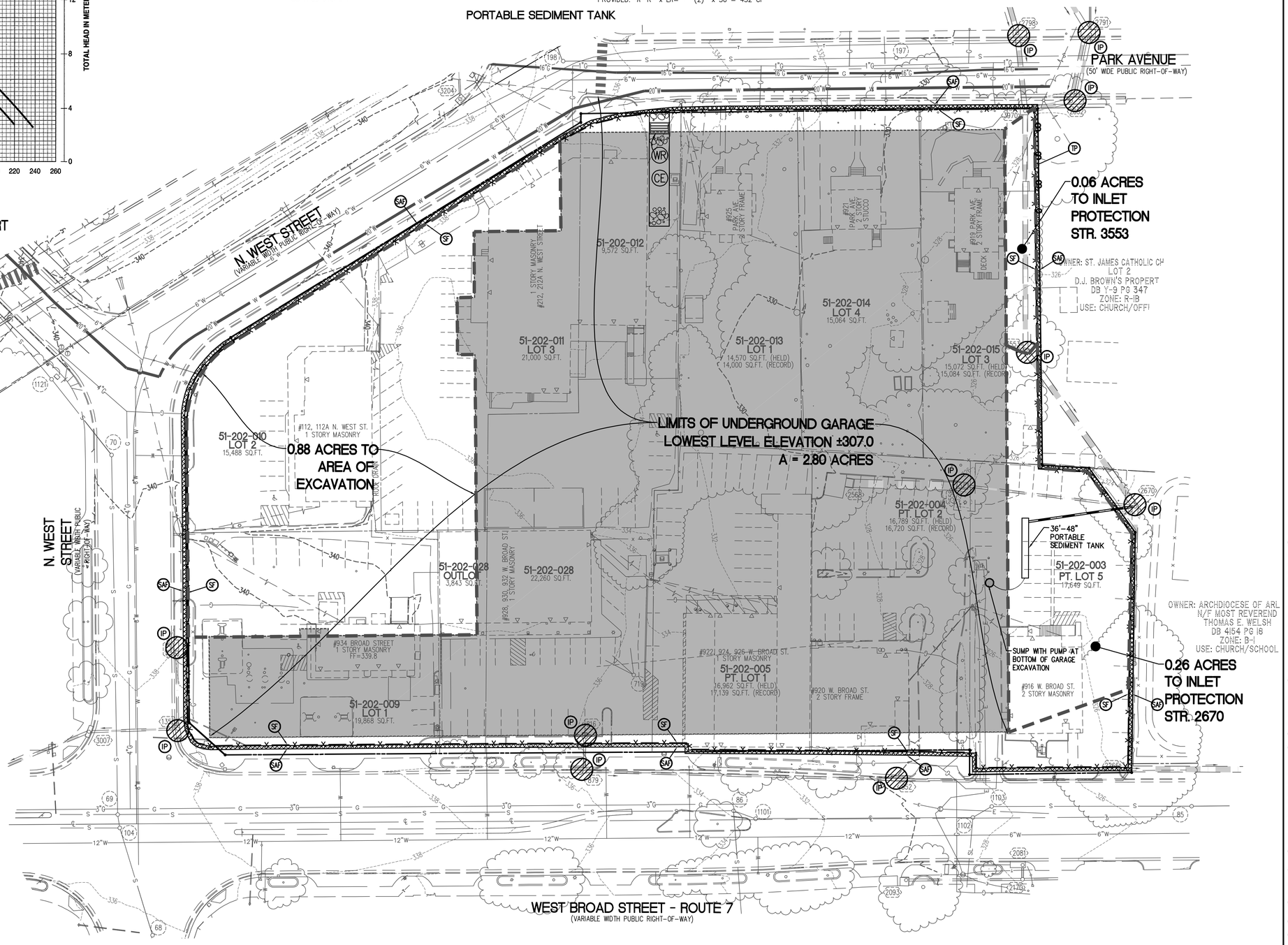
PROVIDED: $\pi^2 R \times L\pi = {}^2 (2) \times 36 = 452$ CF

PORTABLE SEDIMENT TANK

VCS 1983 – NORTH ZONE

NOTES:

1. MAINTAIN 5' OF CLEAR SIDEWALK ALONG WEST BROAD STREET AT ALL TIMES, UNLESS PERMISSION GRANTED FROM CITY OF FALLS CHURCH FOR CLOSURE.
2. CONTRACTOR TO COORDINATE WITH THE CITY FOR ANY ADDITIONAL DESIRED CONSTRUCTION ENTRANCES.



EROSION CONTROL LEGEND

KEY	STD	TITLE	SYMBOL
CE	3.02	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE WITH WASH RACK	
IP	3.07	STORM DRAIN INLET PROTECTION	
TP	3.38	TREE PROTECTION	
SAF	3.01	SAFETY FENCE	
SF	3.05	SILT FENCE	
		DRAINAGE DIVIDES	

30 0 15 30 60

1 INCH = 30'

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Landscape Architects • Arborists
207 PARK AVENUE
FALLS CHURCH, VIRGINIA 22046
(703) 532-6163 Fax (703) 533-1301
www.WLPINC.com
ESTABLISHED 1945

CHECKED:

DRAWN:

SCALE: 1" = 30'

DATE: 9/23/16

COMMONWEALTH OF VIRGINIA KAREN L. S. WHITE Lic. No.041850 9/23/16 PROFESSIONAL ENGINEER

REVISION APPROVED BY

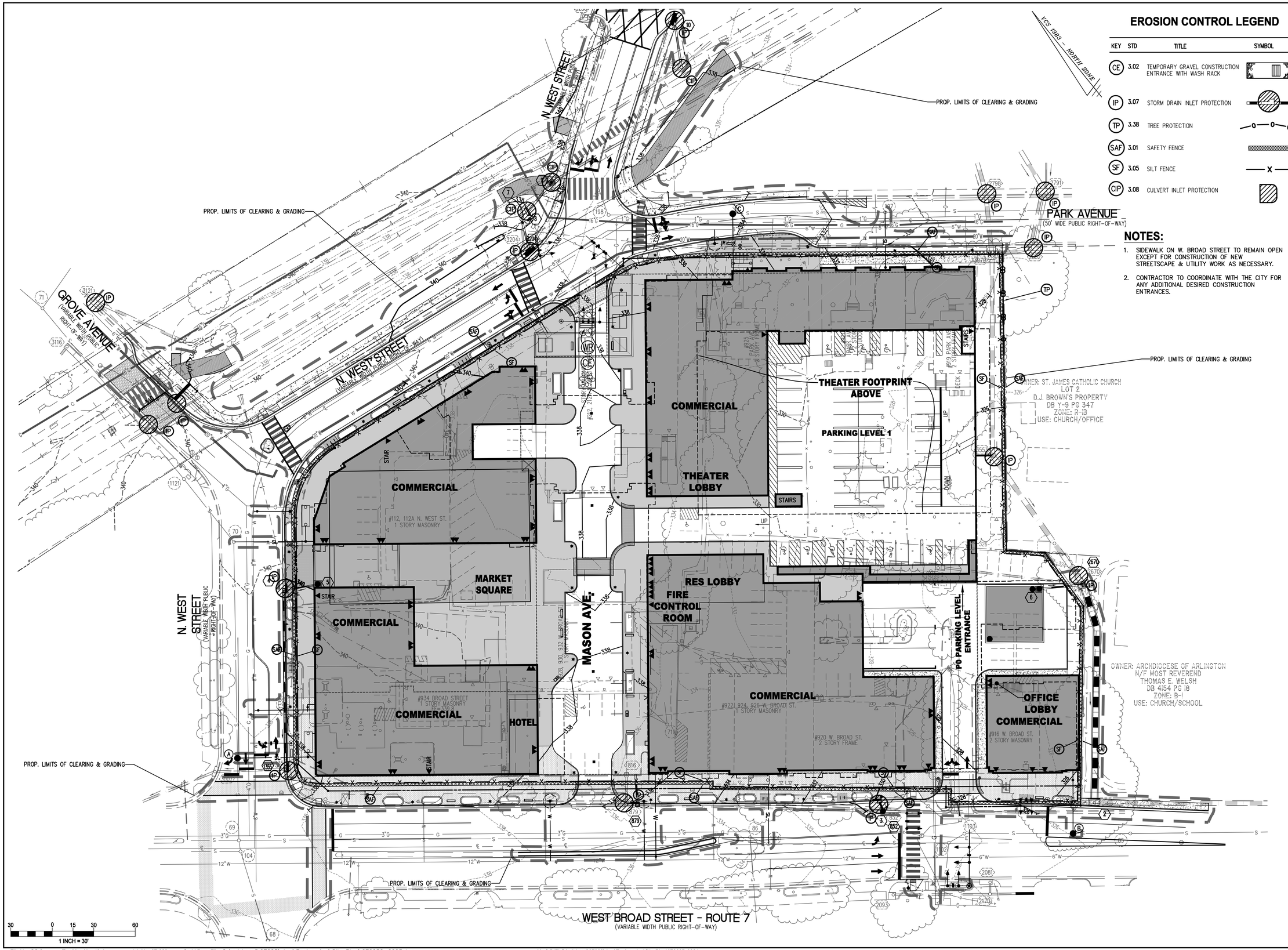
NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

EROSION & SEDIMENT CONTROL PLAN - PHASE 2

MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0602



EROSION CONTROL LEGEND

KEY	STD	TITLE	SYMBOL
CE	3.02	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE WITH WASH RACK	
IP	3.07	STORM DRAIN INLET PROTECTION	
TP	3.38	TREE PROTECTION	
SAF	3.01	SAFETY FENCE	
SF	3.05	SILT FENCE	X
CIP	3.08	CULVERT INLET PROTECTION	

NOTES:

1. SIDEWALK ON W. BROAD STREET TO REMAIN OPEN EXCEPT FOR CONSTRUCTION OF NEW STREETSCAPE & UTILITY WORK AS NECESSARY.
2. CONTRACTOR TO COORDINATE WITH THE CITY FOR ANY ADDITIONAL DESIRED CONSTRUCTION ENTRANCES.

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COMMONWEALTH OF VIRGINIA
KAREN L. S. WHITE
Lic. No.041850
9/23/16
PROFESSIONAL ENGINEER

CHECKED:
DRAWN:
SCALE: 1" = 30'
DATE: 9/23/2016

REVISION APPROVED BY				
NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

EROSION & SEDIMENT CONTROL PLAN - PHASE 3

MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0603

File No. CC-8 Tax Map No. 40-4 Job No. 07-023 Cadd Dwg. File: Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023C-0603.dwg Xref: DIR\Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023B-0001

EROSION CONTROL NARRATIVE

PROJECT DESCRIPTION:
THE PURPOSE OF THIS PROJECT IS TO CONSTRUCT A MIXED USE RETAIL/COMMERCIAL/RESIDENTIAL BUILDING WITH TWO LEVELS OF UNDERGROUND GARAGE. CONSTRUCTION WILL ENTAIL APPROXIMATELY 52,440 SF OF DISTURBED AREA. OFFSITE CONSTRUCTION INCLUDES ROAD, SIDEWALK AND STREETSCAPE CONSTRUCTION, AND INSTALLATION OF UTILITY CONNECTIONS AND NEW UTILITY LINES IN WEST BROAD STREET, N. WEST STREET, AND PARK AVENUE. ADDITION OFFSITE WORK INCLUDES CONSTRUCTION OF IMPROVEMENTS FOR THE W&OD TRAIL CROSSINGS AT GROVE AVENUE AND NORTH WEST STREET. ALL EXISTING SITE CONDITIONS WILL BE DEMOLISHED, THEN EXCAVATION OF THE UNDERGROUND GARAGE WILL BEGIN, AND CONSTRUCTION IN A COUNTER-CLOCKWISE DIRECTION FROM THE LOW END OF THE SITE WILL RESUME FOOTING-TO-GRADE, AND THEN ABOVE GRADE CONSTRUCTION.

EXISTING SITE CONDITIONS:
THE EXISTING SITE IS CURRENTLY DEVELOPED WITH SEVERAL COMMERCIAL BUILDINGS, (3) SINGLE-FAMILY HOMES, AND A GAS STATION.

ADJACENT PROPERTIES:
NORTH: NORTH WEST STREET
WEST: N. WEST STREET
SOUTH: WEST BROAD STREET
EAST: ST. JAMES CHURCH PROPERTIES AND VARIOUS USES

SOILS:
SEE THIS SHEET FOR SOILS MAP

CRITICAL EROSION AREAS:
NO PART OF THE SITE IS CONSIDERED A CRITICAL EROSION HAZARD.

PHASING NARRATIVE:
THE FOLLOWING EROSION AND SEDIMENT CONTROL MEASURES WILL BE ACCOMPLISHED IN TWO PHASES. PHASE I SHALL BE IN PLACE PRIOR TO CLEARING AND SHALL REMAIN IN PLACE THROUGHOUT THE CLEARING AND LAND DISTURBING PROCESS. THE GENERAL CONTRACTOR IS TO PROVIDE DUST CONTROL THROUGHOUT LAND DISTURBING ACTIVITIES IN ACCORDANCE WITH VESCH STANDARD 3.39. STAGING AND STOCKPILING SHALL OCCUR ON THE HIGH SIDE OF THE SITE, IN THE NORTHERN CORNER.

PHASE 1:
AS THE FIRST ITEM OF CONSTRUCTION, THE CONTRACTOR IS TO PLACE THE SILT FENCE, SAFETY FENCE PERIMETER CONTROL AROUND THE SITE, AND INLET PROTECTION. REFER TO EROSION AND SEDIMENT CONTROL PLAN – PHASE 1 FOR LOCATION OF THESE MEASURES. THIS ACTIVITY IS TO BE FOLLOWED BY THE PLACEMENT OF THE CONSTRUCTION ENTRANCE AND TEMPORARY WATER SERVICE AS COORDINATED WITH CFC PUBLIC UTILITIES AND FAIRFAX WATER. CONSTRUCTION VEHICLES TO LEAVE THE SITE VIA PARK AVENUE BUT MUST TURN LEFT ONLY AND CANNOT TRAVERSE THE RESIDENTIAL EASTERN PORTION OF PARK AVENUE. A SPRAY NOZZLE IS TO BE PROVIDED ADJACENT TO THE CONSTRUCTION ENTRANCE TO CLEAN CONSTRUCTION VEHICLES BEFORE THEY ENTER THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR IS TO MAINTAIN ADJACENT ROADWAYS AND PARKING AREAS IN A MUD AND DUST FREE CONDITION. FOLLOWING INSTALLATION OF PHASE 1 CONTROLS, THE CONTRACTOR IS TO SCHEDULE CITY INSPECTION. FOLLOWING INSPECTOR APPROVAL, SITE DEMOLITION, CLEARING AND GRADING MAY PROCEED. AS BUILDINGS ARE REMOVED, ADDITIONAL MID-SITE SILT FENCE TO BE INSTALLED TO CONTROL SURFACE RUNOFF TO INLET STRUCTURES.

EXISTING IMPROVEMENTS WITHIN EROSION CONTROL PHASE 1 LIMITS OF DISTURBANCE TO BE CLEARED AS FOLLOWS:
1. EXISTING BUILDINGS AND UTILITY SERVICES TO BE REMOVED PER DEMOLITION PLAN.
2. TREES TO BE CLEARED PER DEMOLITION AND LANDSCAPE CONSERVATION PLANS.

PHASE 2:
INLET PROTECTION FROM PHASE 1 SHALL REMAIN AS SHOWN ON THE PHASE 2 E&S PLAN. INLET PROTECTION SHALL BE REMOVED FROM EXISTING STRUCTURES ONLY AS STRUCTURES ARE REMOVED. THE STRUCTURES SHALL REMAIN IN PLACE UNTIL THE GARAGE EXCAVATION BEGINS AND THE PORTABLE SEDIMENT TANK WITH PUMP IS INSTALLED. THE SAFETY FENCE SHALL REMAIN IN PLACE AROUND THE SITE PERIMETER AS SHOWN ON THE PHASE 2 E&S PLAN.

PHASE 3:
PHASE 3 IS FOR THE CONSTRUCTION ABOVE GRADE AFTER FOOTING-TO-GRADE CONSTRUCTION IS COMPLETED. THE CONSTRUCTION SHALL BE MOVED TO THE NEW MASON AVENUE ENTRANCE AT THE INTERSECTION WITH PARK AVENUE AND NORTH WEST STREET. AS NEW SIDEWALK IS INSTALLED, THE SAFETY FENCE SHALL BE MOVED BEHIND THE SIDEWALK. UTILITY IMPROVEMENTS WILL TAKE PLACE IN N. WEST STREET AND WEST BROAD ST. AND EROSION AND SEDIMENT CONTROLS ARE TO BE ADJUSTED AS REQUIRED BY THE SITE CONSTRUCTION OR AS DIRECTED BY THE INSPECTOR.

INLET PROTECTION SHALL BE PROVIDED IN VICINITY OF W&OD TRAIL IMPROVEMENTS AS SOON AS WORK TAKES PLACE. INLET PROTECTION SHALL BE ADDED TO THE NEW STORM SEWER STRUCTURES AS THEY ARE BROUGHT ONLINE.

PERMANENT STABILIZATION:
PERMANENT SOIL STABILIZATION SHALL BE IN ACCORDANCE TO VESCH SECTIONS 3.29 TO 3.36. ANY SOIL NOT TO BE BROUGHT TO FINAL GRADE FOR MORE THAN 30 DAYS IS TO BE SEEDED AND MULCHED. THIS IS TO INCLUDE ANY DENUDED AREAS OR STOCKPILES. AND AREAS LEFT DORMANT OR NOT BROUGHT TO FINAL GRADE SHALL BE PERMANENTLY SEEDED AND MULCHED.

ALL STORM AND SANITARY LINES NOT IN THE STREET SHALL BE MULCHED AND SEEDED WITHIN 7 DAYS AFTER BACKFILL, NO MORE THAN 500 FEET SHALL BE OPEN AT ANY ONE TIME. ELECTRIC, TELEPHONE, CABLE, AND GAS UTILITY TRENCHES SHALL BE COMPACTED, SEEDED, MULCHED WITHIN FIVE DAYS AFTER BACKFILL.

NO DISTURBED AREA WILL BE DENUDED FOR MORE THAN 7 CALENDAR DAYS UNLESS IT IS AN ACTIVE WORK AREA OR OTHERWISE AUTHORIZED BY THE ARLINGTON CO. INSPECTOR.

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

DEWATERING NOTE:
RAINWATER/GROUNDWATER ACCUMULATION FROM WITHIN THE EXCAVATION IS TO BE PUMPED OUT, AS NECESSARY. DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.

MAINTENANCE PROGRAM:
THE SITE SUPERINTENDENT, OR HIS/HER REPRESENTATIVE, SHALL MAKE A VISUAL INSPECTION OF ALL MECHANICAL CONTROLS AND NEWLY STABILIZED AREAS (I.E. SEEDED AND MULCHED AREAS) ON A DAILY BASIS, ESPECIALLY AFTER A HEAVY RAINFALL EVENT TO INSURE THAT ALL CONTROLS ARE MAINTAINED AND PROPERLY FUNCTIONING. ANY DAMAGED CONTROLS SHALL BE REPAIRED PRIOR TO THE END OF THE WORK DAY INCLUDING RE-SEEDING AND MULCHING IF NECESSARY.

EROSION AND SEDIMENT CONTROL MEASURES:

1. ALL EROSION AND SILTATION CONTROL MEASURES ARE TO BE PLACED PRIOR TO LAND DISTURBANCE ACTIVITY, FOLLOWING THE IMPLEMENTATION OF TREE PRESERVATION MEASURES.
2. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL ALL GROUND DISTURBING ACTIVITY CEASES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS IS COMPLETE.
3. ALL STANDARDS AND SPECIFICATIONS REFER TO THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND THE FAIRFAX COUNTY CHECKLIST.
4. A CONSTRUCTION ENTRANCE SHALL BE INSTALLED AND MAINTAINED FOR THE DURATION OF ALL DISTURBING ACTIVITIES AS SHOWN ON THE PLAN PER STD. AND SPEC. NO. 3.02 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK. NO CONSTRUCTION TRAFFIC SHALL BE PERMITTED TO ENTER THE SITE OTHER THAN THIS ENTRANCE UNTIL PARKING LOT IS PAVED.
5. ALL AREAS DISTURBED BY CONSTRUCTION THAT ARE NOT TO BE CONSTRUCTED UPON SHALL BE PERMANENTLY STABILIZED IMMEDIATELY FOLLOWING FINISH GRADING BY SEEDING AND MULCHING PER STD. AND SPEC. NO. 3.31 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
6. BARE SOIL SURFACES NOT AT FINISH GRADE, WHICH WILL BE EXPOSED MORE THAN 7 DAYS, SHALL BE STABILIZED WITH TEMPORARY SEEDING AND MULCHING PER STD. AND SPEC. NO. 3.32 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.

GENERAL LAND CONSERVATION NOTES

1. NO DISTURBED AREA WILL BE DENUDED FOR MORE THAN 7 CALENDAR DAYS UNLESS OTHERWISE AUTHORIZED BY THE DIRECTOR OR HIS AGENT.
2. ALL EROSION AND SILTATION CONTROL MEASURES ARE TO BE PLACED PRIOR TO CLEARING AND GRADING.
3. ALL STORM AND SANITARY LINES NOT IN STREETS ARE TO BE MULCHED AND SEEDED WITHIN 5 DAYS AFTER BACKFILL. NO MORE THAN 500 FEET ARE TO BE OPEN AT ANY ONE TIME.
4. ELECTRIC POWER, TELEPHONE, AND GAS SUPPLY TRENCHES AREA TO BE COMPACTED, SEEDED, AND MULCHED WITHIN 5 DAYS AFTER BACKFILL.
5. DURING CONSTRUCTION, MONITOR NEAREST INLETS TO ENSURE NO CONSTRUCTION SEDIMENT ENTERS THE INLETS. PROVIDE INLET PROTECTION AND MONITOR THE SEDIMENT LEAVING THE SITE.
6. ANY DISTURBED AREA NOT COVERED BY NOTE #1 ABOVE AND NOT PAVED, SODDED OR BUILT UPON BY NOVEMBER 1ST, OR DISTURBED AFTER THAT DATE, IS TO BE MULCHED WITH HAY OR STRAW MULCH AT THE RATE OF TWO TONS PER ACRE AND OVER-SEEDED NO LATER THAN MARCH 15TH.
7. AT THE COMPLETION OF CONSTRUCTION PROJECTS, AND PRIOR TO THE RELEASE OF THE BOND, ALL TEMPORARY SILTATION AND EROSION CONTROLS SHALL BE REMOVED AND DISTURBED AREAS SHALL BE STABILIZED.
8. IF THE MAXIMUM PERIOD FOR DENUDATION IS EXCEEDED AND ANY AREAS REMAIN EXPOSED WITHOUT COVER OR SURFACE, THE CITY MAY (IN THE EVENT THE DEVELOPER DOES NOT) INSTALL SUCH GROUND COVER OR OTHER STABILIZING DEVICES AND/OR MATERIAL TO THE MINIMUM EXTENT NECESSARY TO ACHIEVE EROSION AND SEDIMENT CONTROL EQUAL TO THAT WHICH WOULD HAVE BEEN FURNISHED BY THE PERMANENT COVER SHOWN ON THE APPROVED PLANS. THE COST OF ANY SUCH TEMPORARY MEASURES TAKEN BY THE CITY SHALL BE BORNE BY THE DEVELOPER AND SHALL BE A CHARGE AGAINST THE CONSERVATION DEPOSIT.
9. WHERE CONSISTENT WITH JOB SAFETY REQUIREMENTS, ALL EXCAVATED MATERIAL IS TO BE PLACED ON THE UPHILL SIDE OF TRENCHES. NO MATERIAL IS TO BE PLACED IN STREAMBEDS. NO STOCKPILE IS PERMITTED. WHERE SOIL IS PLACED ON DOWNHILL SIDE OF TRENCHES, IT IS TO BE BACK-SLOPED TO DRAIN TOWARD THE TRENCH. WHEN NECESSARY TO DEWATER THE TRENCHES, THE PUMP DISCHARGE HOSES MUST OUTLET IN A STABILIZED AREA TO AN EXISTING STORM INLET.

MAINTENANCE NOTES

1. MAINTENANCE OF THE TEMPORARY CONSTRUCTION ENTRANCE SHALL BE REQUIRED TO PREVENT MUD DEPOSITS IN THE RIGHT-OF-WAY.
2. INLET PROTECTION SHALL BE INSPECTED AT THE END OF EACH DAY AND AFTER EACH RAINFALL AND REQUIRED REPAIRS MADE IMMEDIATELY.
3. EROSION AND SEDIMENT CONTROL DEVICES SHALL BE MAINTAINED IN PLACE UNTIL GROUND DISTURBING CONSTRUCTION AND PERMANENT STABILIZATION IS COMPLETE AND SHALL BE REMOVED BY PERMISSION OF THE COUNTY INSPECTOR.
4. FILTER STONE SHALL BE REGULARLY CHECKED TO ENSURE THAT FILTRATION PERFORMANCE IS MAINTAINED. STONE CHOKED WITH SEDIMENT SHALL BE REMOVED AND CLEANED OR REPLACED.

GENERAL EROSION AND SEDIMENT NOTES

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 VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS EROSION AND SEDIMENT CONTROL REGULATIONS.
2. THE PLAN APPROVING AUTHORITY MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRE-CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO FINAL INSPECTION.
3. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.
4. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
5. PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BOTTOM 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. 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. 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. DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO ON APPROVED FILTERING DEVICE.
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 EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.
10. CONTRACTOR IS TO REMOVE MUD/SWEEP STREET AS NEEDED OR DAILY TO KEEP NORTH LEE STREET FREE OF SEDIMENT.

SOIL MAP

SOIL INFORMATION

SOIL ID NUMBERS	SOIL SERIES NAME	FOUNDATION SUPPORT	SOIL DRAINAGE	EROSION POTENTIAL	PROBLEM CLASS
95	URBAN LAND	N/A	N/A	N/A	N/A

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COMMONWEALTH OF VIRGINIA
KAREN L. S. WHITE
Lic. No.041850
9/23/16
PROFESSIONAL ENGINEER

SCALE: NONE | DATE: 9/23/2016 | DRAWN: | CHECKED:

REVISION APPROVED BY

NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

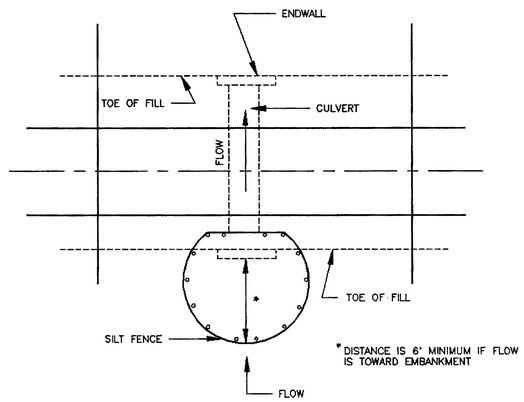
EROSION & SEDIMENT CONTROL NARRATIVE

MASON ROW

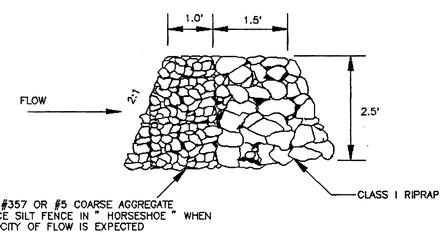
AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

1992 3.08

SILT FENCE CULVERT INLET PROTECTION

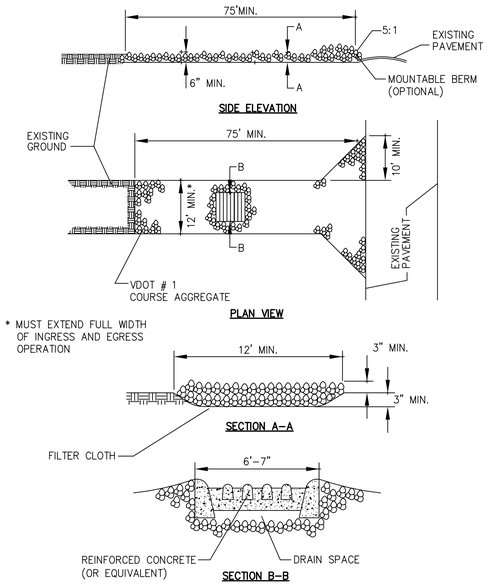


OPTIONAL STONE COMBINATION**



Source: Adapted from VDOT Standard Sheets and Va. DSWC

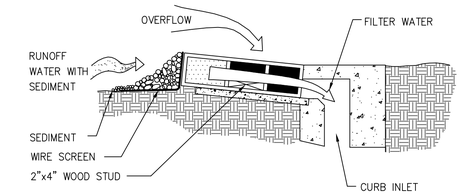
Plate 3.08-1



CONSTRUCTION ENTRANCE

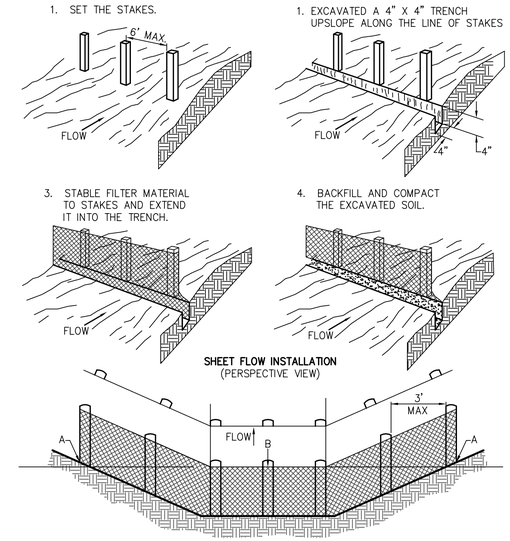
NOT TO SCALE

NOTE: CONSTRUCTION ENTRANCE MAY NEED MAINTENANCE OVER TIME BY WAY OF REMOVAL AND REPLACEMENT OF STONE AND/OR REMOVAL OF ACCUMULATED SEDIMENT, BACK FLUSHING ENTRANCE, ETC.



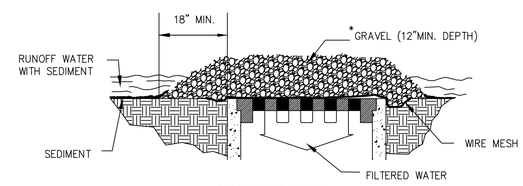
BLOCK AND GRAVEL CURB INLET SEDIMENT FILTER

NOT TO SCALE



CONSTRUCTION OF SILT FENCE (WITHOUT WIRE SUPPORT)

NOT TO SCALE



SPECIFIC APPLICATION

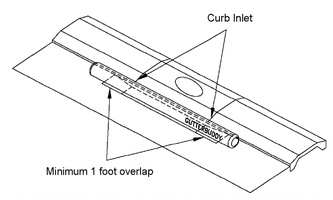
THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCENTRATED FLOWS ARE EXPECTED, BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

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

GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

NOT TO SCALE

NOTE: INLET PROTECTION MAY NEED MAINTENANCE OVER TIME BY WAY OF REMOVAL OF ACCUMULATED SEDIMENT.



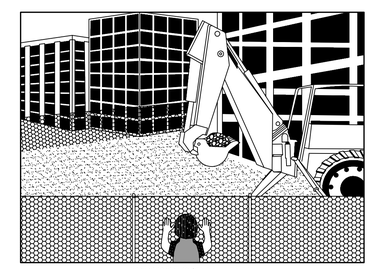
GUTTERBUDDY CURB INLET PROTECTION

PRODUCED BY ACF ENVIRONMENTAL

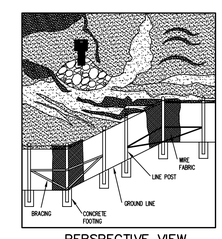
TO BE USED ON EXISTING STORM STRUCTURES ON WEST BROAD STREET

NOT TO SCALE

1992 3.01



PERSPECTIVE VIEW



NOTE:
CONTRACTOR TO ATTACH A DUST CONTROL BARRIER TO THE SAFETY FENCE TO CONTROL DUST DURING CONSTRUCTION ACTIVITIES.

PERSPECTIVE VIEW
METAL FENCE

SAFETY FENCE
(METAL FENCE IS REQUIRED)

SOURCE: ADAPTED FROM CONWED PLASTICS AND VDOT ROAD AND BRIDGE STANDARDS

PLATE 3.01-1

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Landscape Architects • Arborists
207 PARK AVENUE
FALLS CHURCH, VIRGINIA 22046
(703) 532-6163 Fax (703) 533-1301
www.WLPINC.com
ESTABLISHED 1945

DRAWN: CHECKED:
DATE: 9/23/2016
SCALE: NONE

COMMONWEALTH OF VIRGINIA
KAREN L. S. WHITE
Lic. No.041850
9/23/16
PROFESSIONAL ENGINEER

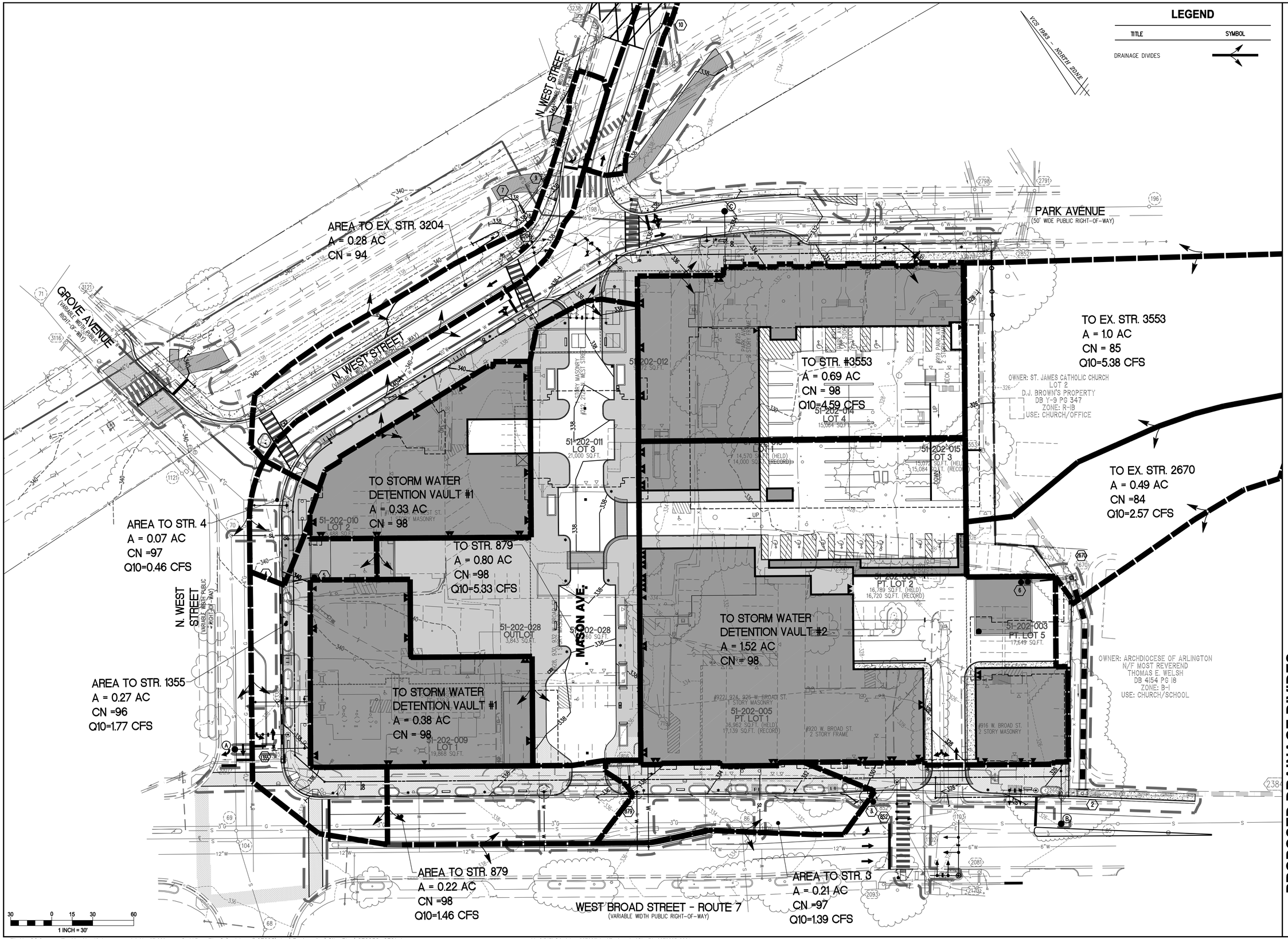
REVISION APPROVED BY					
NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

EROSION & SEDIMENT CONTROL DETAILS

MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0605



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(703) 532-6163 Fax (703) 533-1301
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SCALE: 1" = 30'
DATE: 9/23/2016
DRAWN:
CHECKED:

COMMONWEALTH OF VIRGINIA
KAREN L. S. WHITE
Lic. No.041850
9/23/16
PROFESSIONAL ENGINEER

REVISION APPROVED BY

NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

PROPOSED DRAINAGE DIVIDES

MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET,
NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0701

File No. CC-8 Tax Map No. 40-4 Job No. 07-023 Cadd Dwg. File: Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023C-0701.dwg Xref: DIR\Q:\sdskproj\07023\dwg\Engineering\Site Plan\07023B-0001

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

○ 2011 BMP Standards and Specifications ◉ 2013 Draft BMP Standards and Specifications

Project Name:	MASON ROW
Date:	9/23/2016
Linear Development Project?	No

CLEAR ALL

data input cells
constant values
calculation cells
final results

Site Information

Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area *(acres)* → 4.32

Maximum reduction required:	*20%*
The site's net increase in impervious cover (acres) is:	*1.002089073*
Post-Development TP Load Reduction for Site (lb/yr):	*3.17*

Check:

BMP Design Specifications List:	2013 Draft Stds & Specs
Linear project?	No
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, protected forest/open space or reforested land					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed				1.10	1.10
Impervious Cover (acres)				3.22	3.22
					4.32

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 land					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed				0.10	0.10
Impervious Cover (acres)				4.22	4.22
Area Check	OK.	OK.	OK.	OK.	4.32

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)	1.10	0.10
Weighted Rv(turf)	0.25	0.25
% Managed Turf	26%	3%
Impervious Cover (acres)	3.22	3.22
Rv(impervious)	0.95	0.95
% Impervious	74%	97%
Total Site Area (acres)	4.32	3.32
Site Rv	0.77	0.93

Treatment Volume and Nutrient Load

Pre-ReDevelopment Treatment Volume (acre-ft)	0.2776	0.2568
Pre-ReDevelopment Treatment Volume (cubic feet)	12,094	11,184
Pre-ReDevelopment TP Load (lb/yr)	7.60	7.03
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	1.76	2.12
Baseline TP Load (lb/yr) (0.41 lbs/acre/yr applied to pre-redevelopment area excluding pervious land proposed for new impervious cover)		*1.36*

[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 requriement for new impervious cover (based on new development load limit, 0.41 lbs/acre/year).

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)	0.10
Weighted Rv (turf)	0.25
% Managed Turf	2%
Impervious Cover (acres)	4.22
Rv(impervious)	0.95
% Impervious	98%
Final Site Area (acres)	4.32
Final Post Dev Site Rv	0.93

Land Cover Summary-Post

Post-ReDevelopment	
Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	0.10
Weighted Rv (turf)	0.25
% Managed Turf	3%
ReDev. Impervious Cover (acres)	3.22
Rv(impervious)	0.95
% Impervious	97%
Total ReDev. Site Area (acres)	3.32
ReDev Site Rv	0.93

Land Cover Summary-Post

Post-Development New Impervious	
New Impervious Cover (acres)	1.00
Rv(impervious)	0.95

Treatment Volume and Nutrient Load

Final Post-Development Treatment Volume (acre-ft)	0.3361	Post-ReDevelopment Treatment Volume (acre-ft)	0.2568	Post-Development Treatment Volume (acre-ft)	0.0793
Final Post-Development Treatment Volume (cubic feet)	14,640	Post-ReDevelopment Treatment Volume (cubic feet)	11,184	Post-Development Treatment Volume (cubic feet)	3,456
Final Post-Development TP Load (lb/yr)	9.20	Post-ReDevelopment Load (TP) (lb/yr)*	7.03	Post-Development TP Load (lb/yr)	2.17
Final Post-Development TP Load per acre (lb/acre/yr)	2.13	Post-ReDevelopment TP Load per acre (lb/acre/yr)	2.12		
		Max. Reduction Required (Below Pre-ReDevelopment Load)	20%		
		TP Load Reduction Required for Redeveloped Area (lb/yr)	1.41	TP Load Reduction Required for New Impervious Area (lb/yr)	1.76

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	3.17

Nitrogen Loads (Informational Purposes Only)

Pre-ReDevelopment TN Load (lb/yr)	54.36	Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr)	65.80

Runoff Volume and Curve Number Calculations

Enter design storm rainfall depths (in):

1-year storm	2-year storm	10-year storm
2.64	3.19	4.90

Use NOAA Atlas 14 (http://hdsc.nws.noaa.gov/hdsc/pfds/)

*Notes (see below):

[1] The curve numbers and runoff volumes computed in this spreadsheet for each drainage area are limited in their applicability for determining and demonstrating compliance with water quantity requirements. See VRRM User's Guide and Documentation for additional information.

[2] Runoff Volume (RV) for pre- and post-development drainage areas must be in volumetric units (e.g., acre-feet or cubic feet) when using the Energy Balance Equation. Runoff measured in watershed-inches and shown in the spreadsheet as RV(watershed-inch) can only be used in the Energy Balance Equation when the pre- and post-development drainage areas are equal. Otherwise RV(watershed-inch) must be multiplied by the drainage area.

[3] Adjusted CNs are based on runoff reduction volumes as calculated in D.A. tabs. An alternative CN adjustment calculation for Vegetated Roofs is included in BMP specification No. 5.

Drainage Area Curve Numbers and Runoff Depths*

Curve numbers (CN, CNadj) and runoff depths ($RV_{Developed}$) are computed with and without reduction practices.

Drainage Area A		A Soils	B Soils	C Soils	D Soils
Forest/Open Space -- undisturbed, protected forest/open space or reforested land	Area (acres)	0.00	0.00	0.00	0.00
	CN	30	55	70	77
Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed	Area (acres)	0.00	0.00	0.00	0.10
	CN	39	61	74	80
Impervious Cover	Area (acres)	0.00	0.00	0.00	4.22
	CN	98	98	98	98

Total Area (acres):	4.32
Runoff Reduction Volume (ft^3):	0

$CN_{(D.A. A)}$
98

	1-year storm	2-year storm	10-year storm
$RV_{Developed}$ *(watershed-inch)* with no Runoff Reduction*	2.41	2.96	4.66
$RV_{Developed}$ *(watershed-inch)* with Runoff Reduction*	2.41	2.96	4.66
Adjusted CN*	98	98	98

*See Notes above

WATER QUANTITY BALANCE EQUATION

1 YR STORMWATER COMPUTATIONS BALANCE EQUATION

Qdeveloped ≤ I.F. * (Qpre-developed * RVpre-developed) / RVdeveloped

I.F. = 0.9 (less than 1 acre) I.F. = 0.8 (greater than 1 acre)

Qdeveloped = Qundetained (7.268 CFS) + Qdetained (1.24 CFS)= 8.508 CFS

I.F. * (Qpre-developed * RVpre-developed) / RVdeveloped =

(Rv developed = Rv undetained + RV detained)

0.8* (13.35 * 28102) / 34662 = 8.659 CFS

8.508 CFS < 8.659 CFS

Q1 (UNDETAINED) = 7.28 CFS
Q1 (DETAINED VAULT #1) = 0.677 CFS (0.71 ACRES)
Q1 (DETAINED VAULT #2) = 0.563 CFS (1.52 ACRES)

10 YR STORMWATER COMPUTATIONS

Qdeveloped (detained & undetained) ≤ Qpre-developed

9.081 CFS (detained) + 13.82 CFS (undetained) = 22.901 CFS

22.901 CFS < 27.3 CFS pre-development

SEE HYDROGRAPHS ON SHEET C-0703.

Q10 (UNDETAINED) = 13.82 CFS
Q10 (DETAINED VAULT #1) = 1.102 CFS (0.71 ACRES)
Q10 (DETAINED VAULT #2) = 7.979 CFS (1.52 ACRES)

OUTFALL NARRATIVE

UNDER EXISTING CONDITIONS, APPROXIMATELY HALF AN ACRE OF THE SITE OUTFALLS TO NORTH WEST STREET INTO A PIPED STORM SEWER SYSTEM, WHICH REACHES PEARSON BRANCH, AND THE REMAINDER OF THE SITE OUTFALLS TOWARDS ADJACENT PROPERTIES TO THE EAST, INTO THE PIPED STORM SEWER SYSTEM THAT EVENTUALLY REACHES ELLISON BRANCH. BOTH OUTFALL PATHS TIE RUN IN TOGETHER AT SPRING STREET AND EVENTUALLY OUTFALLS TO THE TRIPPS RUN WATERSHED.

THE BMP ON THE SITE IS BEING MET WITH THE PURCHASE OF NUTRIENT CREDITS FROM RESOURCE ENVIRONMENTAL SOLUTIONS FOR 3.17 LBS OF PHOSPHORUS REMOVAL WITHIN THE POTOMAC WATERSHED. SEE SHEET C-0704 FOR THE AVAILABILITY LETTER.

FOR QUANTITY CONTROL, TWO DETENTION VAULTS ARE PROPOSED, ONE ON THE EAST END OF THE SITE, AND ONE AT THE WEST END. THE VAULT AT THE WEST END WILL CAPTURE AND DETAIN APPROXIMATELY 0.71 ACRES OF ROOF RUNOFF, AND TIE INTO THE EXISTING STORM SEWER SYSTEM THAT OUTFALLS TO PEARSON BRANCH. THE VAULT AT THE EAST END WILL CAPTURE AND DETAIN 1.52 ACRES OF ROOF RUNOFF AND TIE INTO THE EXISTING STORM SEWER SYSTEM THAT OUTFALLS TO ELLISON BRANCH. THE OVERALL RUNOFF RATE FROM THE SITE IS DECREASED WITH DETENTION AND THE SITE MEETS THE WATER QUANTITY BALANCE EQUATION, AS DEMONSTRATED ABOVE.

DUE TO THE RESULTS OF THIS ANALYSIS AND THE FACT THAT THE PROJECT WILL RESULT IN THE REDUCTION OF THE EXISTING RUNOFF RATE, IT IS THE OPINION OF THE SUBMITTING ENGINEER THAT THIS OUTFALL IS ADEQUATE, AND THAT IMPACT ONTO THE ADJACENT PROPERTIES ARE IMPROVED FROM EXISTING CONDITIONS BY REDUCING RUNOFF ONTO THEIR SITE.

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9/23/16

NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

REVISION APPROVED BY

STORMWATER MANAGEMENT AND BMP CALCULATIONS

MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0702

PRE-DEVELOPMENT 1-YEAR

Hydrograph Report

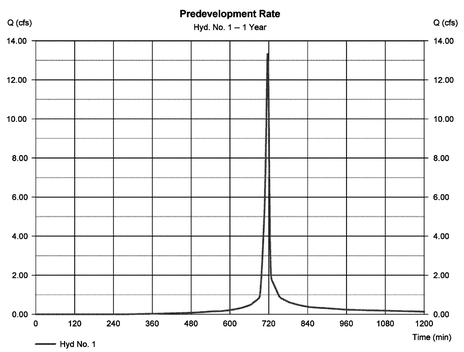
1

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 — Sunday, 09 / 18 / 2016

Hyd. No. 1

Predevelopment Rate

Hydrograph type	= SCS Runoff	Peak discharge	= 13.35 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 28,102 cuft
Drainage area	= 4.320 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.64 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



PRE-DEVELOPMENT 10-YEAR

Hydrograph Report

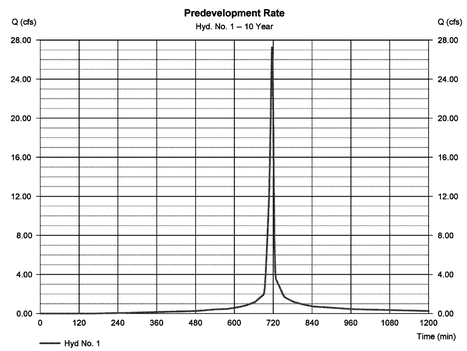
2

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 — Sunday, 09 / 18 / 2016

Hyd. No. 1

Predevelopment Rate

Hydrograph type	= SCS Runoff	Peak discharge	= 27.30 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 60,272 cuft
Drainage area	= 4.320 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



DETENTION VAULT #1 ROUTING 1-YEAR

Hydrograph Report

1

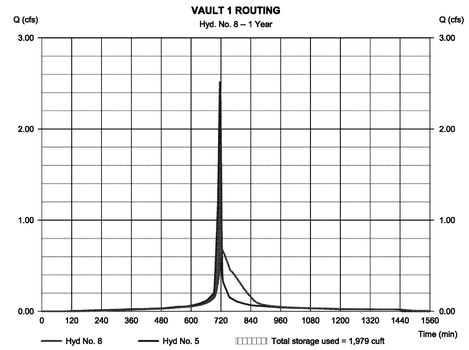
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 — Tuesday, 09 / 20 / 2016

Hyd. No. 8

VAULT 1 ROUTING

Hydrograph type	= Reservoir	Peak discharge	= 0.677 cfs
Storm frequency	= 1 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 5,810 cuft
Inflow hyd. No.	= 5 - DET. VAULT 1	Max. Elevation	= 336.85 ft
Reservoir name	= VAULT #1	Max. Storage	= 1,979 cuft

Storage Indication method used.



DETENTION VAULT #1 ROUTING 10-YEAR

Hydrograph Report

2

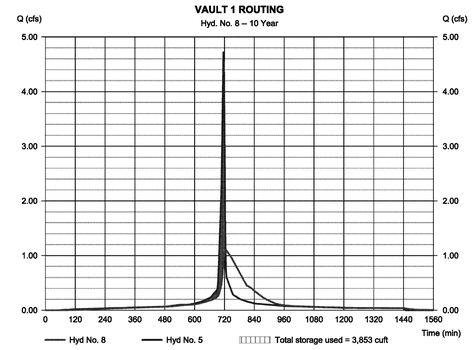
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 — Tuesday, 09 / 20 / 2016

Hyd. No. 8

VAULT 1 ROUTING

Hydrograph type	= Reservoir	Peak discharge	= 1.102 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 11,255 cuft
Inflow hyd. No.	= 5 - DET. VAULT 1	Max. Elevation	= 337.89 ft
Reservoir name	= VAULT #1	Max. Storage	= 3,853 cuft

Storage Indication method used.



POST-DEVELOPMENT UNDETAINED 1-YEAR

Hydrograph Report

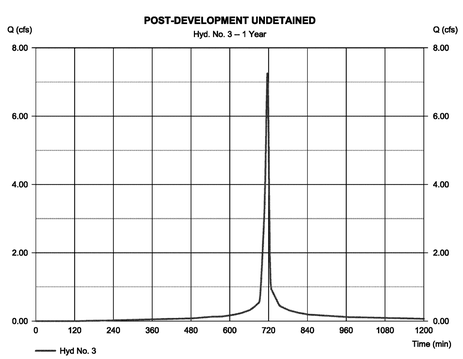
1

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 — Sunday, 09 / 18 / 2016

Hyd. No. 3

POST-DEVELOPMENT UNDETAINED

Hydrograph type	= SCS Runoff	Peak discharge	= 7.268 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 16,373 cuft
Drainage area	= 2.090 ac	Curve number	= 97
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.64 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



POST-DEVELOPMENT UNDETAINED 10-YEAR

Hydrograph Report

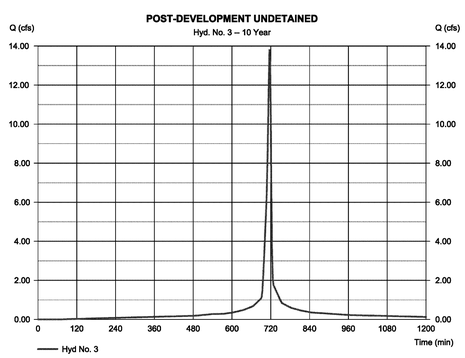
2

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 — Sunday, 09 / 18 / 2016

Hyd. No. 3

POST-DEVELOPMENT UNDETAINED

Hydrograph type	= SCS Runoff	Peak discharge	= 13.82 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 32,344 cuft
Drainage area	= 2.090 ac	Curve number	= 97
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



DETENTION VAULT #2 ROUTING 1-YEAR

Hydrograph Report

1

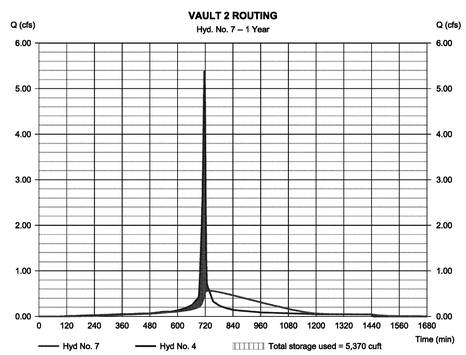
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 — Tuesday, 09 / 20 / 2016

Hyd. No. 7

VAULT 2 ROUTING

Hydrograph type	= Reservoir	Peak discharge	= 0.563 cfs
Storm frequency	= 1 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 12,455 cuft
Inflow hyd. No.	= 4 - DET. VAULT 2	Max. Elevation	= 322.64 ft
Reservoir name	= VAULT #2	Max. Storage	= 5,370 cuft

Storage Indication method used.



DETENTION VAULT #2 ROUTING 10-YEAR

Hydrograph Report

2

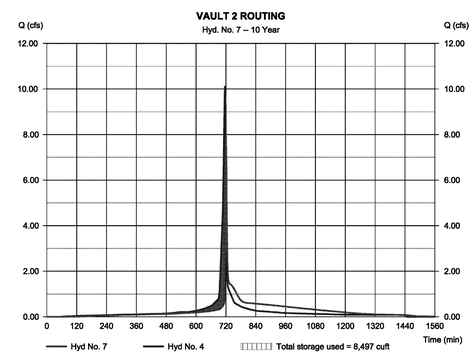
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 — Tuesday, 09 / 20 / 2016

Hyd. No. 7

VAULT 2 ROUTING

Hydrograph type	= Reservoir	Peak discharge	= 7.979 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 24,111 cuft
Inflow hyd. No.	= 4 - DET. VAULT 2	Max. Elevation	= 324.60 ft
Reservoir name	= VAULT #2	Max. Storage	= 8,497 cuft

Storage Indication method used.



SEE WATER QUANTITY BALANCE EQUATION ON SHEET C-0702 FOR STORMWATER COMPLIANCE.

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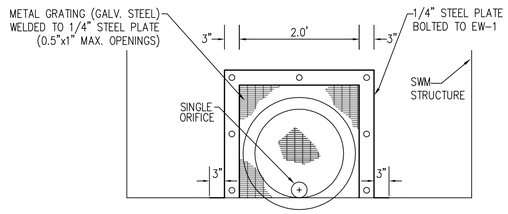
STORMWATER HYDROGRAPHS

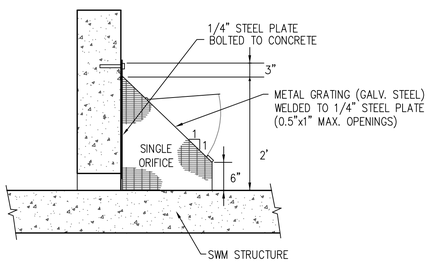
MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0703



ELEVATION



SECTION

NOTES:

1. THIS DETAIL (METAL GRATING AND STEEL PLATE) MAY BE APPLIED DIRECTLY AGAINST CONCRETE.
2. A 1.5'x2' HINGED GATE WITH LOCKING MECHANISM SHALL BE INSTALLED ON THE FRONT FACE OF THE CAGE.

SWM TRASH RACK

N.T.S.

Pond Report

2

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 — Sunday, 09 / 18 / 2016

Pond No. 4 - VAULT #1

Pond Data

UG Chambers -Invert elev. = 335.60 ft, Rise x Span = 3.00 x 30.00 ft, Barrel Len = 60.00 ft, No. Barrels = 1, Slope = 0.50%, Headers = No

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	335.60	n/a	0	0
0.33	335.93	n/a	324	324
0.66	336.26	n/a	594	918
0.99	336.59	n/a	594	1,512
1.32	336.92	n/a	594	2,106
1.65	337.25	n/a	594	2,701
1.98	337.58	n/a	594	3,295
2.31	337.91	n/a	594	3,889
2.64	338.24	n/a	594	4,483
2.97	338.57	n/a	594	5,077
3.30	338.90	n/a	324	5,401

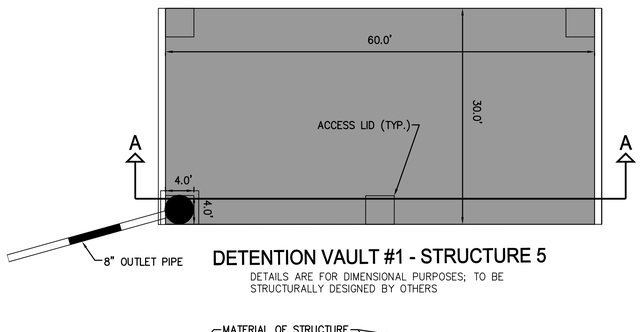
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 8.00	6.00	0.00	0.00
Span (in)	= 8.00	6.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 335.60	335.60	0.00	0.00
Length (ft)	= 10.00	0.67	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

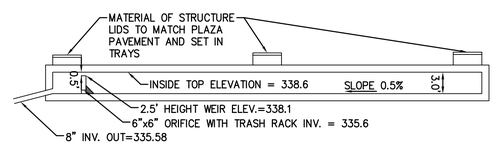
	[A]	[B]	[C]	[D]
Crest Len (ft)	= 9.34	0.00	0.00	0.00
Crest El. (ft)	= 338.10	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)
TW Elev. (ft) = 0.00



DETENTION VAULT #1 - STRUCTURE 5

DETAILS ARE FOR DIMENSIONAL PURPOSES; TO BE STRUCTURALLY DESIGNED BY OTHERS



SECTION A-A

Pond Report

2

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 — Sunday, 09 / 18 / 2016

Pond No. 3 - VAULT #2

Pond Data

UG Chambers -Invert elev. = 319.20 ft, Rise x Span = 6.00 x 40.00 ft, Barrel Len = 40.25 ft, No. Barrels = 1, Slope = 0.50%, Headers = No

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	319.20	n/a	0	0
0.62	319.82	n/a	837	837
1.24	320.44	n/a	999	1,835
1.86	321.06	n/a	999	2,834
2.48	321.68	n/a	999	3,832
3.10	322.30	n/a	999	4,831
3.72	322.92	n/a	999	5,830
4.34	323.54	n/a	999	6,828
4.96	324.16	n/a	999	7,827
5.58	324.78	n/a	999	8,825
6.20	325.40	n/a	837	9,662

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	3.50	6.00	0.00
Span (in)	= 12.00	3.50	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 319.20	319.20	323.20	0.00
Length (ft)	= 32.00	4.00	0.67	0.00
Slope (%)	= 1.00	0.50	0.50	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

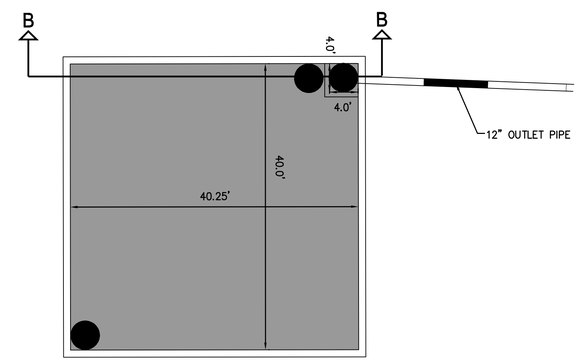
	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 324.20	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

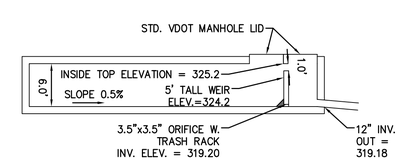
Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	319.20	0.00	0.00	0.00	---	0.00	---	---	---	---	---	0.000
0.62	837	319.82	0.21 ic	0.20 ic	0.00	---	0.00	---	---	---	---	---	0.204
1.24	1,835	320.44	0.32 ic	0.32 ic	0.00	---	0.00	---	---	---	---	---	0.316
1.86	2,834	321.06	0.40 ic	0.40 ic	0.00	---	0.00	---	---	---	---	---	0.401
2.48	3,832	321.68	0.48 ic	0.47 ic	0.00	---	0.00	---	---	---	---	---	0.471
3.10	4,831	322.30	0.54 ic	0.53 ic	0.00	---	0.00	---	---	---	---	---	0.532
3.72	5,830	322.92	0.60 ic	0.59 ic	0.00	---	0.00	---	---	---	---	---	0.588
4.34	6,828	323.54	0.92 ic	0.63 ic	0.28 ic	---	0.00	---	---	---	---	---	0.916
4.96	7,827	324.16	1.47 ic	0.67 ic	0.80 ic	---	0.00	---	---	---	---	---	1.466
5.58	8,825	324.78	8.45 ic	0.09 ic	0.27 ic	---	8.08 s	---	---	---	---	---	8.449
6.20	9,662	325.40	9.02 ic	0.04 ic	0.11 ic	---	8.86 s	---	---	---	---	---	9.004



DETENTION VAULT #2 - STRUCTURE 6

DETAILS ARE FOR DIMENSIONAL PURPOSES; TO BE STRUCTURALLY DESIGNED BY OTHERS



SECTION B-B

res

Date: September 2, 2016

To: MillCreek Residential
c/o Amirali Nasserian
6701 Democracy Boulevard, Suite 500
Bethesda, MD 20817

From: Claire Wolanski
Credit Sales Coordinator
Resource Environmental Solutions

Subject: Potomac Watershed – Nutrient Credit Availability

Project Reference: 930 West Broad Street; 3.17 Credits Requested; HUC 02070010

This letter is to confirm the availability of 3.17 authorized nutrient credits ("Nutrient Credits") from one or more of Resource Environmental Solutions' ("RES") Potomac nutrient bank facilities for use by permit applicants within the Potomac watershed, including HUC 02070010, to compensate for nutrient loadings in excess of state or local regulations, as per Virginia Code § 62.1-44.15:35 and § 62.1-44.19:14 and Virginia Administrative Code 9 VAC 25-820-10 et seq. These Nutrient Credits are generated and managed under the terms of the Banking Instruments known as the Owl Run Nutrient Reduction Implementation Plan ("NRIP") and/or the Edgecliff NRIP.

Please feel free to contact me if you have any questions.

Sincerely,

Claire E. Wolanski
Resource Environmental Solutions
804-591-4060

10055 Red Run Blvd.
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Owings Mills, MD
21117

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70802

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Suite 306
Charleston, SC
29403

5020 Montrose Blvd.
Suite 650
Houston, TX
77006

1200 Camellia Blvd.
Suite 220
Lafayette, LA
70508

137½ East Main St.
Suite 210
Oak Hill, WV
25901

33 Terminal Way
Suite 431
Pittsburgh, PA
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1521 W. Main
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COMMONWEALTH OF VIRGINIA — KAREN L. S. WHITE — Lic. No.041850 — 9/23/16 — PROFESSIONAL ENGINEER

SCALE: NONE | DATE: 9/23/2016 | DRAWN: | CHECKED:

REVISION APPROVED BY

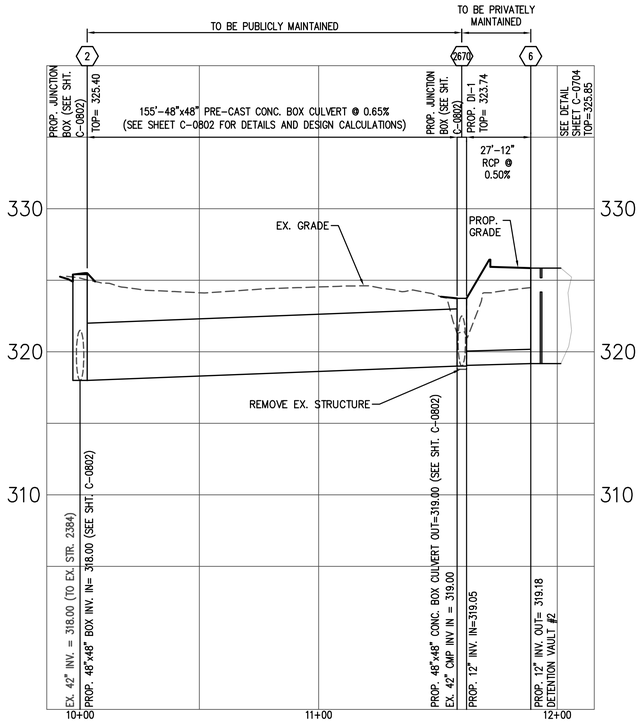
NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

STORMWATER MANAGEMENT DETAILS

MASON ROW

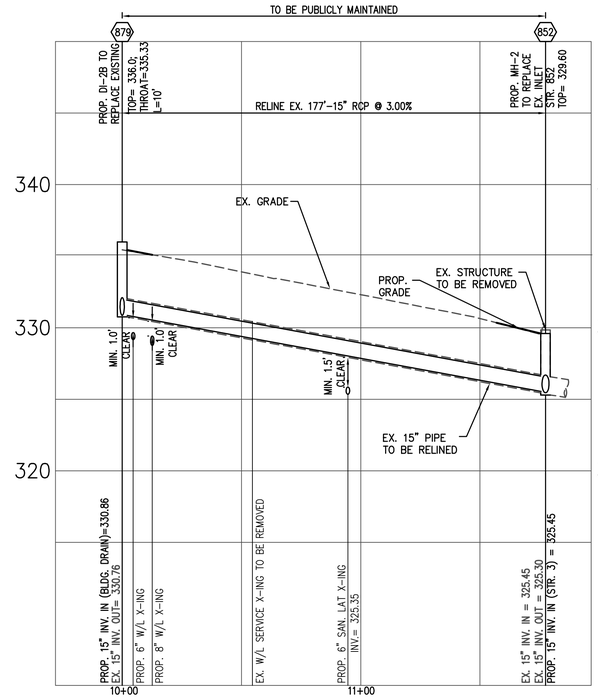
AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0704



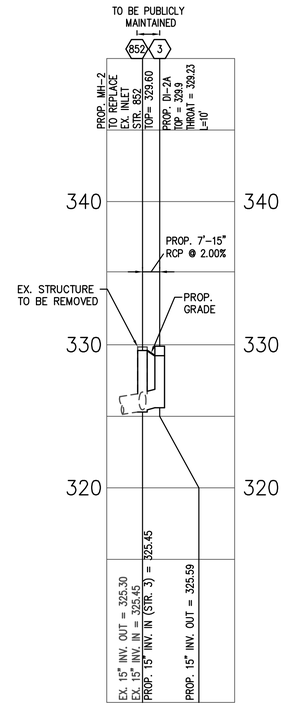
STORM STRUCTURE 2 TO SWM VAULT #2

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=5'



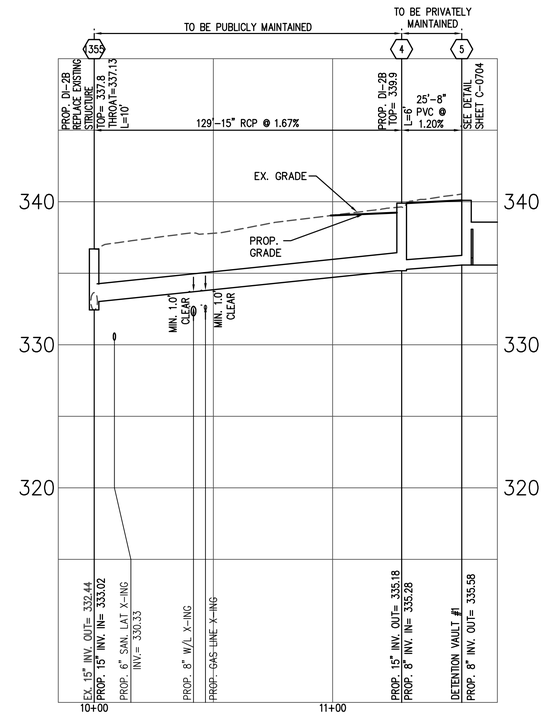
STORM STRUCTURE 879 TO STRUCTURE 852

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=5'



STORM STRUCTURE 852 TO STRUCTURE 3

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=5'



STORM STRUCTURE 1355 TO SWM VAULT #1

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=5'

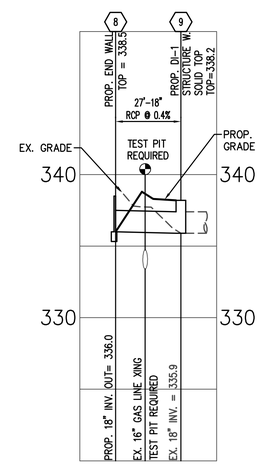
STORM SEWER COMPUTATIONS

FROM POINT	TO POINT	AREA "A" ACRES	CURVE NUMBER CN	RUNOFF Q INCRE-MENT C.F.S.	RUNOFF Q10 C.F.S.	INVERT ELEV'S UPPER END	INVERT ELEV'S LOWER END	LENGTH FT.	SLOPE FT./FT.	MANNING'S 'n'	DIA. IN.	CAPA-CITY C.F.S.	VEL. F.P.S.	FLOW TIME SEC.	NORMAL DEPTH IN.
5	4	0.71	98	1.10*	1.10	335.58	335.28	25	0.0120	0.011	8	1.55	4.86	5.14	4.94
4	1355	0.07	97	0.46	1.56	335.18	333.02	129	0.0167	0.013	15	8.32	5.23	24.69	4.38
1355	3007	0.27	96	1.77	3.33	332.44	331.87	52	0.0110	0.013	15	6.73	5.50	9.45	7.42
879	852	1.02	98	6.79	6.79	330.76	325.45	177	0.0300	0.013	15	11.14	9.57	18.49	8.42
3	852	0.21	97	1.39	1.39	325.59	325.45	7	0.0200	0.013	15	9.09	5.39	1.30	3.95
852	2266	0.00	0.00	0.00	8.18	325.30	317.99	145	0.0504	0.013	15	14.44	12.20	11.89	8.05

*CONTROLLED BY DETENTION STRUCTURE

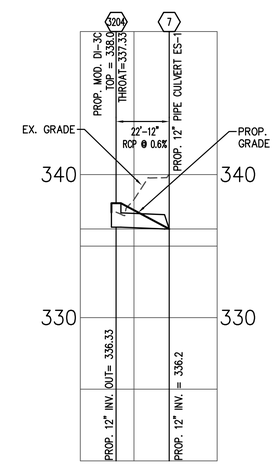
INLET COMPUTATIONS

INLET NUMBER	TYPE	LENGTH (FT.)	STATION	DRAINAGE AREA (AC.)	CN	Q INCR. (CFS)	Q_b, CARRYOVER (CFS)	Q_t, GUTTERFLOW	S_o, GUTTER SLOPE (FT/FT)	S_x, CROSS SLOPE (FT/FT)	T, (SPREAD)	W (FT)	W/T	Sw (FT/FT)	Sw/Sx	Eo (App. 9C-8)	a = 12W(SW-SX) + LOCAL DEPRESSION	S' w= a/(12W)	S_e= Sx + S' w(Eo) (FT/FT)	COMPUTED LENGTH, Li, (FT) (App. 9C-17)	L, SPECIFIED LENGTH (FT)	L/L_i	E (App. 9C-18)	Q_i, INTERCEPTED (CFS)	Q_b, CARRYOVER (CFS)
1	2	3	4	5	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
879	DI-3B	10	0+00	0.22	98	1.46	0.00	1.46	0.03	0.02	5.23	1.50	0.29	0.08	4.00	0.77	3.13	0.17	0.15	10.10	10	0.99	0.9997647	1.46	0.00
3	DI-3B	10	0+00	0.21	97	1.39	0.02	1.41	0.03	0.02	5.11	1.50	0.29	0.08	4.00	0.77	3.13	0.17	0.15	10.05	10	0.99	0.9999223	1.41	0.00
1355	DI-3C	10	0+00	0.27	96	1.77	0.00	1.77	0.02	0.02	4.42	1.50	0.34	0.08	4.00	-	-	-	-	-	10	-	-	1.77	0.00
4	DI-3B	6	0+00	0.07	97	0.46	0.00	0.46	0.02	0.02	2.78	1.50	0.54	0.08	4.00	0.97	3.13	0.17	0.19	4.92	6	1.22	1	0.46	0.00



STORM STRUCTURE 8 TO STRUCTURE 9 (W&OD TRAIL)

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=5'



STORM STRUCTURE 3204 TO STRUCTURE 7 (W&OD TRAIL)

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=5'

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ESTABLISHED 1945

COMMONWEALTH OF VIRGINIA
KAREN L. S. WHITE
Lic. No.041850
PROFESSIONAL ENGINEER
9/23/16

DRAWN: CHECKED:
SCALE: HOR. 1"=30' VERT. 1"=5'
DATE: 9/23/2016

REVISION APPROVED BY

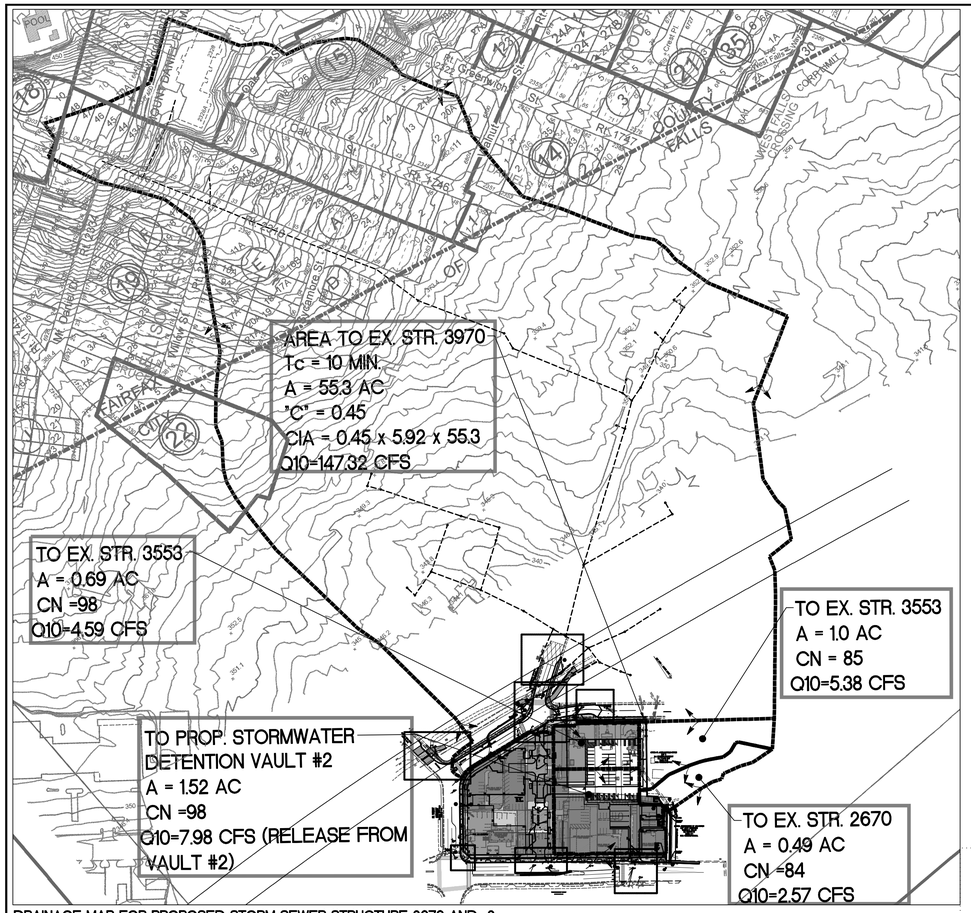
NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

STORM SEWER PROFILES

MASON ROW

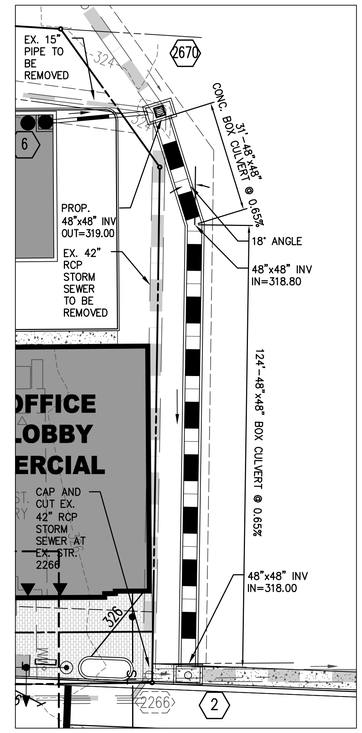
AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0801



DRAINAGE MAP FOR PROPOSED STORM SEWER STRUCTURE 2670 AND 2
SCALE: 1"=200'

PLAN VIEW STRUCTURE #2670 TO #2
1"=20'

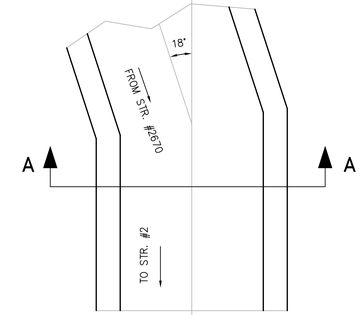


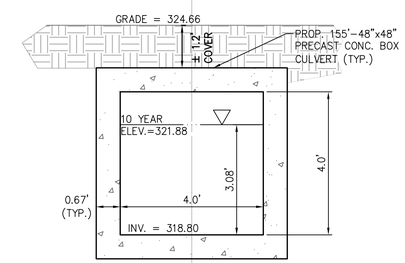
NOTE:

JUNCTION BOXES & BOX CULVERT TO BE STRUCTURALLY DESIGNED BY OTHERS

48'x48' CONCRETE BOX CULVER BEND SECTION DETAIL

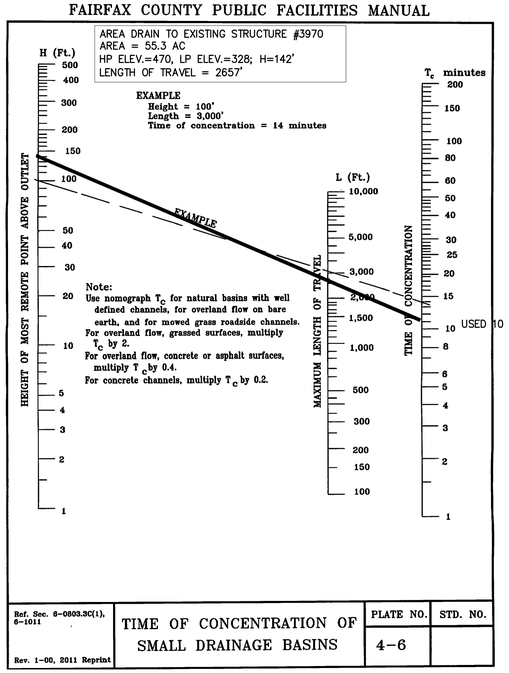
PLAN VIEW
SCALE: 1"=20'





SECTION A-A

FAIRFAX COUNTY PUBLIC FACILITIES MANUAL



ANALYSIS RUNOFF TO STORM SEWER STRCTURE #2670 TO #2

STRUCTURE	AREA (AC)	CN or "C"	Q10 (cfs)
TO 3970	55.3	0.45 *	147.32
ROOF TO 3553	0.69	98	4.59
EXISTING TO 3553	1.00	85	5.38
EXISTING TO 2670	0.49	84	2.57
ROOF TO 2670	1.52	98	7.98
			167.84

* C VALUE IN RATIONAL METHOD WERE USED FOR THE OFFISTE DRAINAGE AREA TO UTILIZE TIME OF CONCENTRATION

48'x48' CONCRETE BOX CULVERT CALCULATION

Project Description	
Worksheet	str. 2670 AND 2
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data

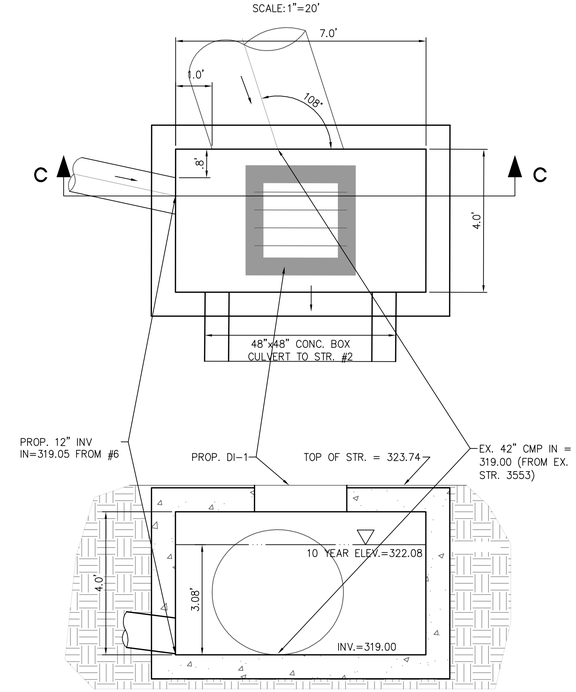
Mannings Coefficient	0.010
Slope	0.0065 ft/ft
Bottom Width	4.00 ft
Discharge	167.84 cfs

Results

Depth	3.08 ft
Flow Area	12.3 ft²
Wetted Perimeter	10.16 ft
Top Width	4.00 ft
Velocity	13.62 ft/s

STORM STRUCTURE 2670 JUNCTION BOX DETAIL

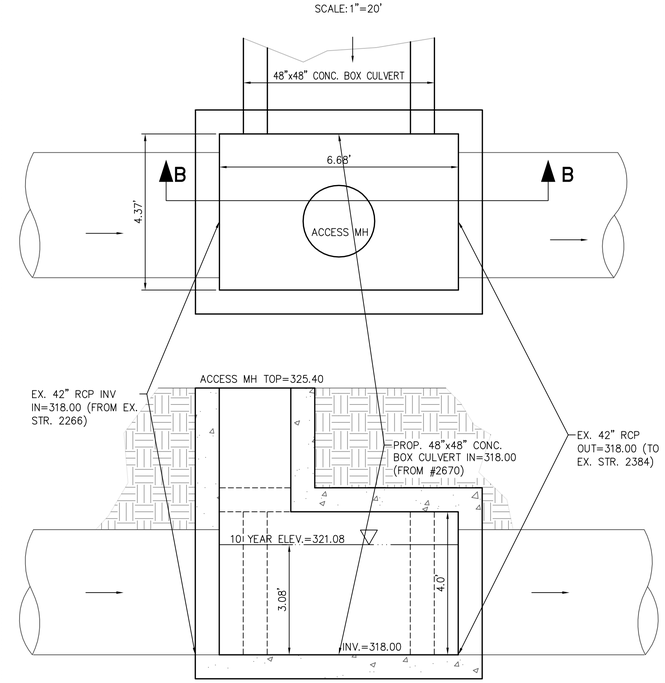
PLAN VIEW
SCALE: 1"=20'



C-C SECTION

STORM STRUCTURE #2 JUNCTION BOX DETAIL

PLAN VIEW
SCALE: 1"=20'



B-B SECTION

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www.WLPINC.com

CHECKED:
DRAWN:
DATE: 9/23/2016
SCALE: 1" = 10'

COMMONWEALTH OF VIRGINIA
KAREN L. S. WHITE
Lic. No.041850
9/23/16
PROFESSIONAL ENGINEER

NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

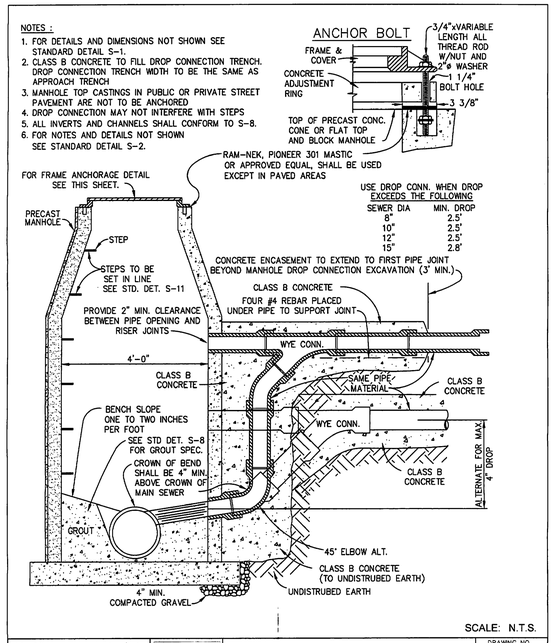
REVISION APPROVED BY

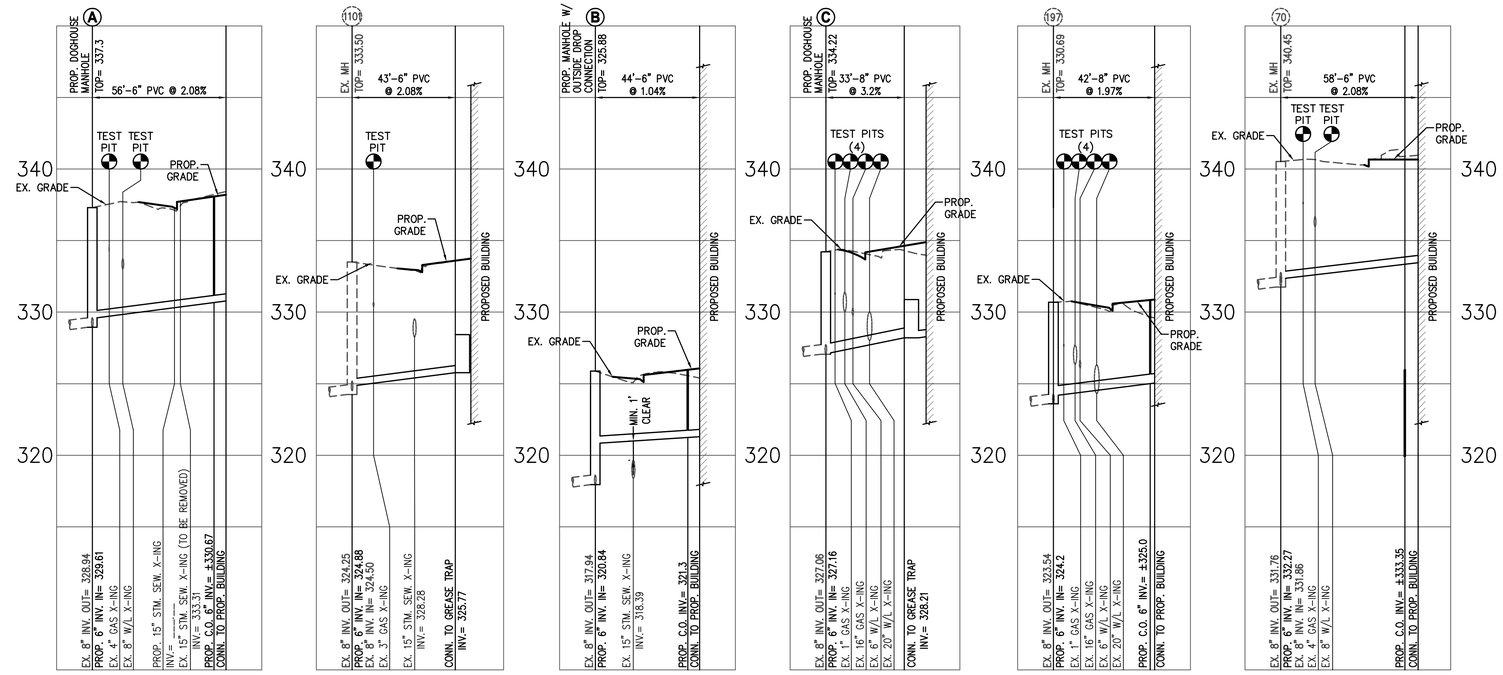
STORM SEWER PROFILE & DETAILS

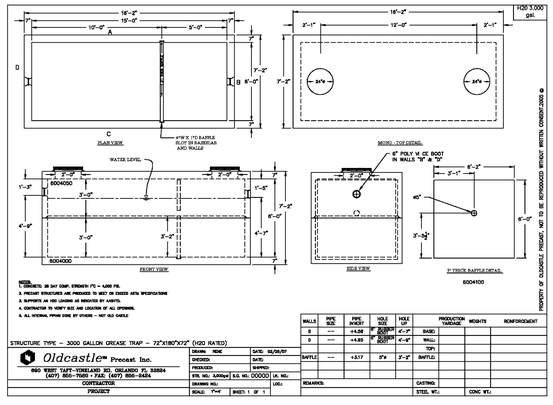
MASON ROW

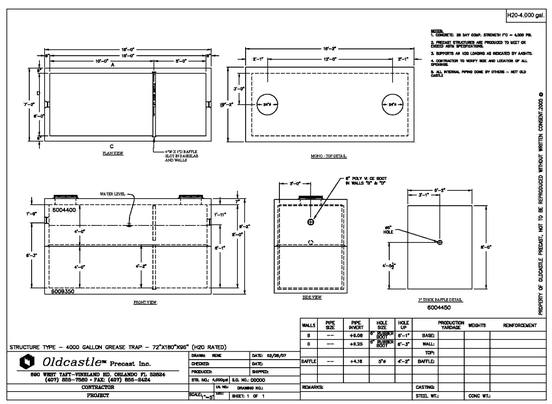
AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

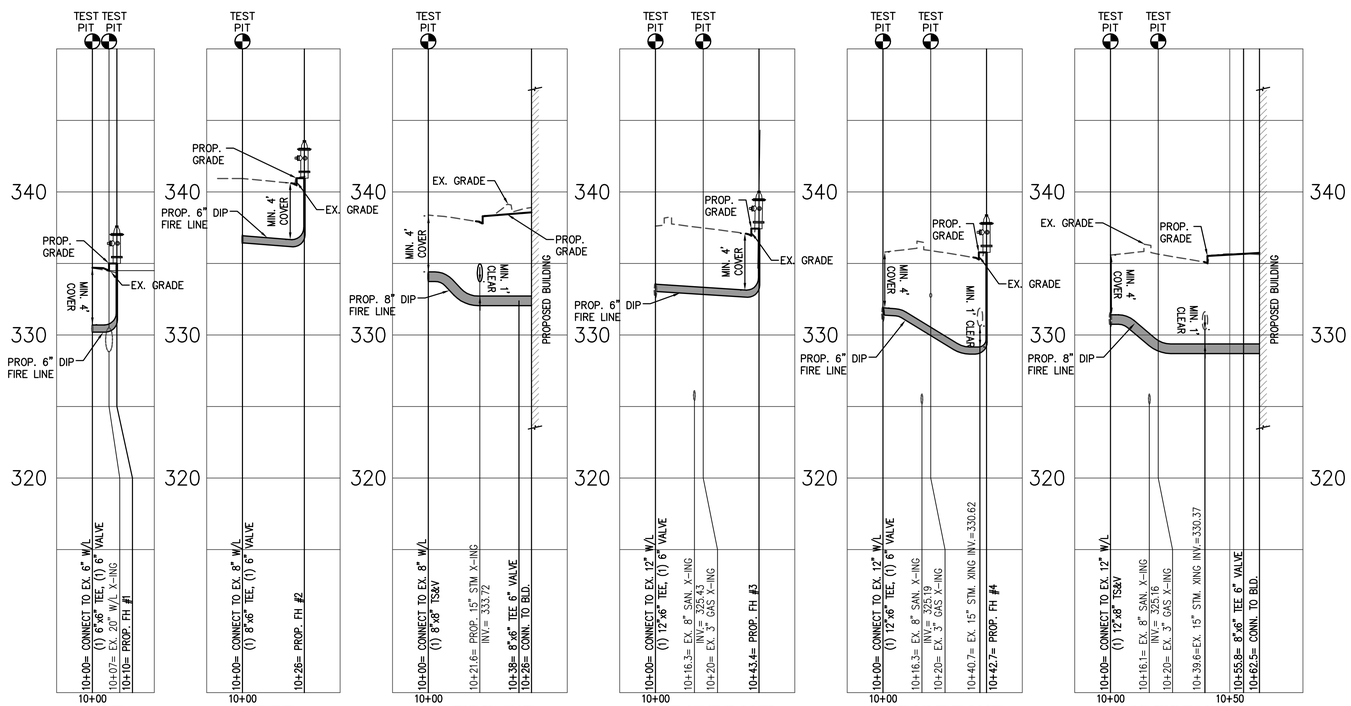
SHEET: C-0802











NOTE:
TEST PITS TO BE PREFORMED 90 DAYS PRIOR TO CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF CONFLICTS.

WALTER L. PHILLIPS INCORPORATED
Engineers • Surveyors • Planners
Landscape Architects • Arborists
207 PARK AVENUE
FALLS CHURCH, VIRGINIA 22046
(703) 532-6163 Fax (703) 533-1301
www.WLPINC.com
ESTABLISHED 1945

DRAWN: CHECKED:
SCALE: HOR. 1"=20' VERT. 1"=5'
DATE: 9/23/2016

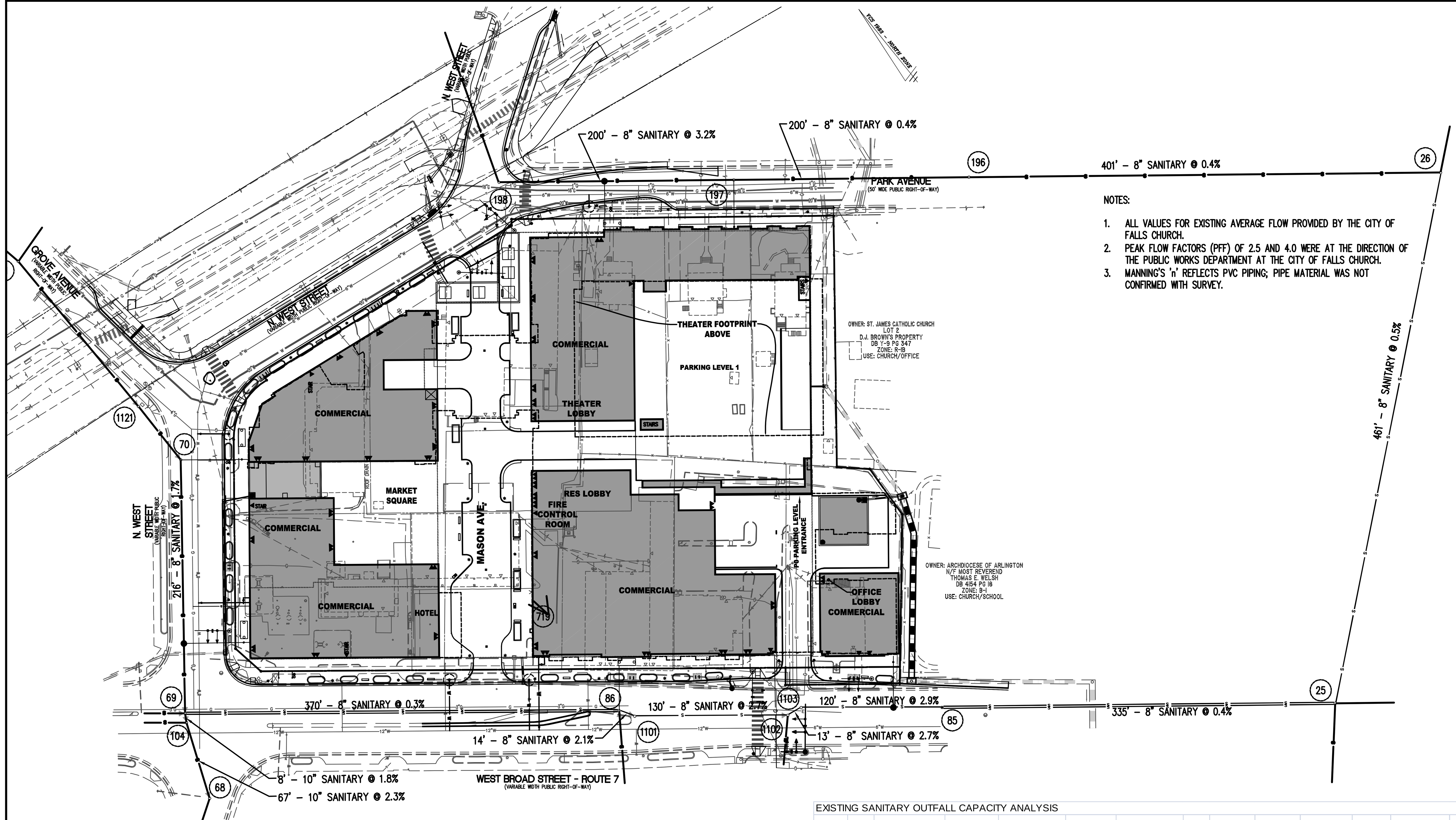
COMMONWEALTH OF VIRGINIA
KAREN L.S. WHITE
Lic. No.041850
9/23/16
PROFESSIONAL ENGINEER

NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

REVISION APPROVED BY

UTILITY PROFILES
MASON ROW
AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE
CITY OF FALLS CHURCH, VIRGINIA

SHEET: C-0901



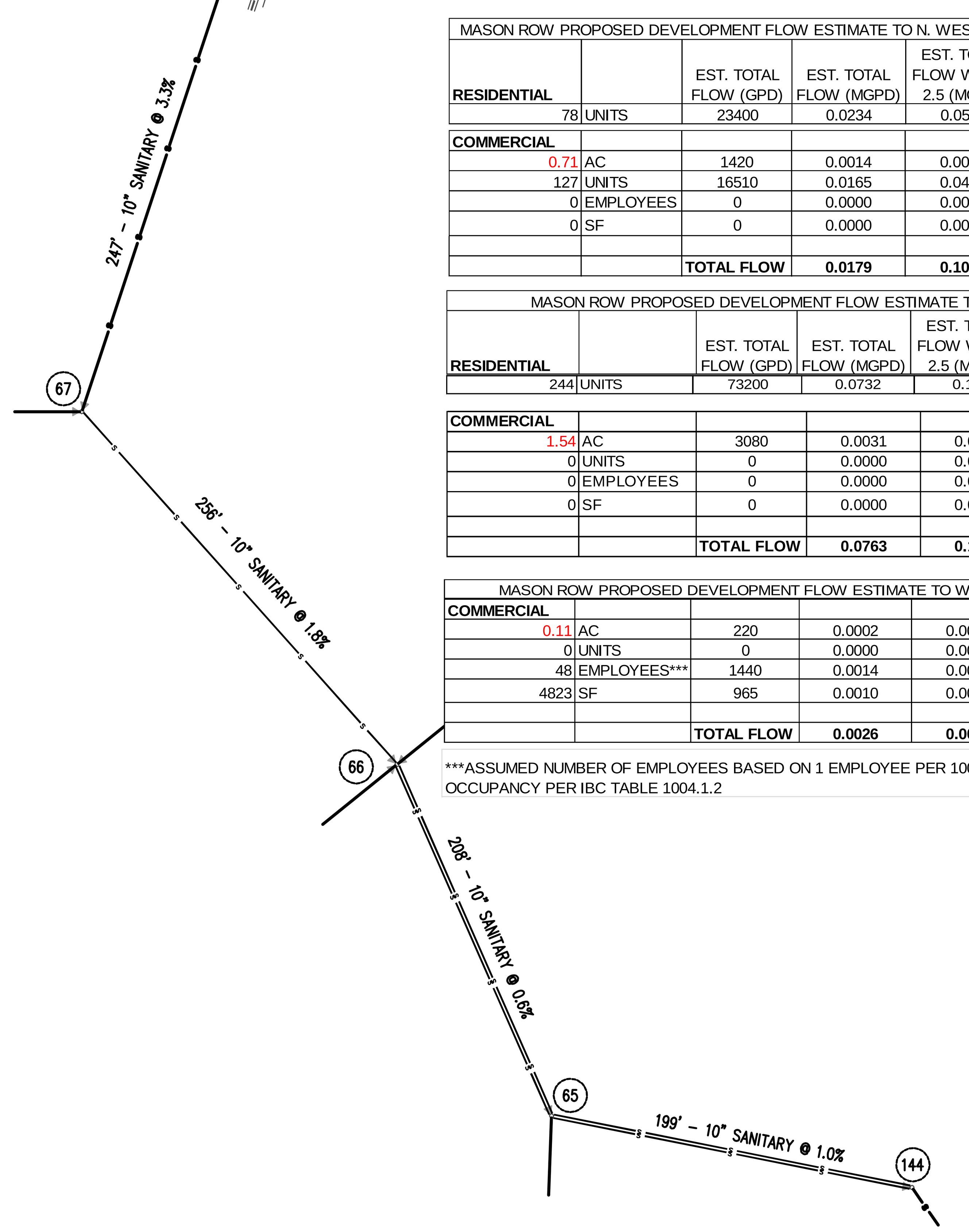
NOTES:

1. ALL VALUES FOR EXISTING AVERAGE FLOW PROVIDED BY THE CITY OF FALLS CHURCH.
2. PEAK FLOW FACTORS (PFF) OF 2.5 AND 4.0 WERE AT THE DIRECTION OF THE PUBLIC WORKS DEPARTMENT AT THE CITY OF FALLS CHURCH.
3. MANNING'S 'n' REFLECTS PVC PIPING; PIPE MATERIAL WAS NOT CONFIRMED WITH SURVEY.

SMH 70		
MANHOLE TOP =		340.45
8"INV IN	(SMH 1121)	331.75
8"INV OUT	(SMH 69)	331.60
SMH 69		
MANHOLE TOP =		337.53
8"INV IN	(SMH 70)	327.93
8"INV IN	(N.WEST)	326.15
8"INV OUT	(SMH 86)	326.10
10"INV OUT	(SMH 104)	326.05
SMH 104		
MANHOLE TOP =		337.55
8"INV IN	(SMH 87)	326.00
10"INV IN	(SMH 69)	325.90
10"INV OUT	(SMH 68)	325.80
SMH 68		
MANHOLE TOP =		335.83
10"INV IN	(SMH 104)	324.23
10"INV OUT	(SMH 67)	323.98
SMH 67		
MANHOLE TOP =		325.86
10"INV IN	(SMH 68)	315.86
8"INV IN	(N.WEST)	315.81
10"INV OUT	(SMH 66)	315.56
SMH 66		
MANHOLE TOP =		326.55
8"INV IN	(N.EAST)	311.50
8"INV IN	(SMH 287)	311.10
10"INV IN	(SMH 67)	310.85
10"INV OUT	(SMH 65)	310.75
SMH 65		
MANHOLE TOP =		317.78
10"INV IN	(SMH 66)	309.51
10"INV OUT	(SMH 64)	309.48
10"INV OUT	(SMH 144)	309.33
SMH 144		
MANHOLE TOP =		316.10
10"INV IN	(SMH 65)	307.30
10"INV OUT	(SMH 388)	307.00

SMH 86		
MANHOLE TOP =		333.90
8"INV IN	(S.WEST)	325.15
8"INV IN	(SMH 69)	324.90
8"INV OUT	(SMH 1101)	324.80
SMH 1101		
MANHOLE TOP =		333.50
8"INV IN	(SMH 86)	324.50
8"INV OUT	(SMH 1102)	324.25
SMH 1102		
MANHOLE TOP =		328.81
LATERAL IN	(S.WEST)	321.71
8"INV IN	(SMH 1101)	320.77
8"INV OUT	(SMH 1103)	320.54
SMH 1103		
MANHOLE TOP =		328.39
8"INV IN	(SMH 1102)	320.19
8"INV OUT	(SMH 85)	320.15
SMH 85		
MANHOLE TOP =		325.03
8"INV IN	(SMH 1102)	316.73
8"INV OUT	(SMH 25)	315.69
SMH 25		
MANHOLE TOP =		324.92
8"INV IN	(SMH 26)	318.82
DROP INVERT =		314.47
8"INV IN	(SMH 195)	316.14
8"INV IN	(SMH 85)	314.32
8"INV OUT	(SMH 24)	314.29

SMH 198		
MANHOLE TOP =		337.17
8"INV IN	(NORTH)	331.82
8"INV OUT	(SMH 197)	329.92
SMH 197		
MANHOLE TOP =		330.79
8"INV IN	(SMH 198)	323.56
8"INV OUT	(SMH 196)	323.54
SMH 196		
MANHOLE TOP =		330.39
8"INV IN	(SMH 197)	322.69
8"INV OUT	(SMH 26)	322.68
SMH 26		
MANHOLE TOP =		333.44
8"INV IN	(SMH 27)	321.34
8"INV IN	(SMH 196)	321.04
8"INV OUT	(SMH 25)	320.94
SMH 719		
MANHOLE TOP =		335.14
4"INV IN	(NORTH)	331.96
4"INV IN (X2)	(NORTH)	331.98
4"INV OUT	(WEST)	331.94



MASON ROW PROPOSED DEVELOPMENT FLOW ESTIMATE TO N. WEST STREET (STR. 70-69)

RESIDENTIAL		EST. TOTAL FLOW (GPD)	EST. TOTAL FLOW (MGPD)	EST. TOTAL FLOW W. PFF 2.5 (MGPD)	EST. TOTAL FLOW W. PFF 4.0 (MGPD)
78	UNITS	23400	0.0234	0.0585	0.0936
COMMERCIAL					
0.71	AC	1420	0.0014	0.0036	0.0057
127	UNITS	16510	0.0165	0.0413	0.0660
0	EMPLOYEES	0	0.0000	0.0000	0.0000
0	SF	0	0.0000	0.0000	0.0000
		TOTAL FLOW	**0.0179**	**0.1033**	**0.1653**

MASON ROW PROPOSED DEVELOPMENT FLOW ESTIMATE TO PARK AVE.

RESIDENTIAL		EST. TOTAL FLOW (GPD)	EST. TOTAL FLOW (MGPD)	EST. TOTAL FLOW W. PFF 2.5 (MGPD)	EST. TOTAL FLOW W. PFF 4.0 (MGPD)
244	UNITS	73200	0.0732	0.183	0.2928
COMMERCIAL					
1.54	AC	3080	0.0031	0.0077	0.0123
0	UNITS	0	0.0000	0.0000	0.0000
0	EMPLOYEES	0	0.0000	0.0000	0.0000
0	SF	0	0.0000	0.0000	0.0000
		TOTAL FLOW	**0.0763**	**0.1907**	**0.3051**

MASON ROW PROPOSED DEVELOPMENT FLOW ESTIMATE TO W. BROAD STREET

COMMERCIAL					
0.11	AC	220	0.0002	0.0006	0.0009
0	UNITS	0	0.0000	0.0000	0.0000
48	EMPLOYEES***	1440	0.0014	0.0036	0.0058
4823	SF	965	0.0010	0.0024	0.0039
		TOTAL FLOW	**0.0026**	**0.0066**	**0.0105**

***ASSUMED NUMBER OF EMPLOYEES BASED ON 1 EMPLOYEE PER 100 SF OF OFFICE OCCUPANCY PER IBC TABLE 1004.1.2

EXISTING SANITARY OUTFALL CAPACITY ANALYSIS

FROM	TO	AVERAGE FLOW (MGPD)	PEAK FLOW FACTOR	PEAK FLOW W. 2.5 PFF (MGPD)	PEAK FLOW FACTOR	PEAK FLOW W. 4.0 PFF (MGPD)	SIZE (IN.)	LENGTH (FT.)	INV. OUT (UPPER)	INV. IN (LOWER)	SLOPE (%)	MANNING'S n	CAPACITY (CFS)	CAPACITY (GPD)	CAPACITY (MGPD)	REMAINING CAPACITY (BASED ON 2.5 PFF) (MGPD)	CAPACITY (BASED ON 4.0 PFF) (MGPD)
70	69	0.247	2.5	0.618	4.0	0.988	8	216	331.60	327.93	1.7%	0.011	1.85	1195686.23	1.20	0.58	0.21
69	104	0.551	2.5	1.378	4.0	2.204	10	8	326.05	325.90	1.8%	0.011	3.53	2281498.60	2.28	0.90	0.08
104	68	0.551	2.5	1.378	4.0	2.204	10	67	325.80	324.23	2.3%	0.011	3.94	2546488.52	2.55	1.17	0.34
68	67	0.582	2.5	1.455	4.0	2.328	10	247	323.98	315.86	3.3%	0.011	4.67	3018299.84	3.02	1.56	0.69
67	66	0.613	2.5	1.533	4.0	2.452	10	256	315.56	310.85	1.8%	0.011	3.49	2255645.92	2.26	0.72	-0.20
66	65	1.228	2.5	3.070	4.0	4.912	10	208	310.75	309.51	0.6%	0.011	1.99	1286170.60	1.29	-1.78	-3.63
65	144	1.228	2.5	3.070	4.0	4.912	10	199	309.33	307.30	1.0%	0.011	2.60	1680423.90	1.68	-1.39	-3.23
198	197	0.011	2.5	0.028	4.0	0.044	8	200	329.92	323.56	3.2%	0.011	2.53	1635181.71	1.64	1.61	1.59
197	196	0.021	2.5	0.053	4.0	0.084	8	200	323.54	322.69	0.4%	0.011	0.92	594611.53	0.59	0.54	0.51
196	26	0.032	2.5	0.080	4.0	0.128	8	401	322.68	321.04	0.4%	0.011	2.85	1842003.12	0.91	0.83	0.78
26	25	0.224	2.5	0.560	4.0	0.896	8	461	320.94	318.82	0.5%	0.011	0.96	620464.21	0.62	0.06	-0.28
69	86	0.428	2.5	1.070	4.0	1.712	8	370	326.10	324.90	0.3%	0.011	0.81	523516.68	0.52	-0.55	-1.19
86	1101	0.454	2.5	1.135	4.0	1.816	8	14	324.80	324.50	2.1%	0.011	2.07	1337875.95	1.34	0.20	-0.48
1101	1102	0.454	2.5	1.135	4.0	1.816	8	130	324.25	320.77	2.7%	0.011	2.32	1499455.17	1.50	0.36	-0.32
1102	1103	0.454	2.5	1.135	4.0	1.816	8	13	320.54	320.19	2.7%	0.011	2.32	1499455.17	1.50	0.36	-0.32
1103	85	0.457	2.5	1.143	4.0	1.828	8	120	320.15	316.73	2.9%	0.011	2.40	1551160.52	1.55	0.41	-0.28
85	25	0.465	2.5	1.163	4.0	1.860	8	335	315.69	314.32	0.4%	0.011	0.91	588148.36	0.59	-0.57	-1.27

PROPOSED SANITARY OUTFALL CAPACITY ANALYSIS

FROM	TO	AVERAGE FLOW	PEAK FLOW	PEAK FLOW W. 2.5 PFF	PEAK FLOW	PEAK FLOW W. 4.0 PFF	SIZE (IN.)	LENGTH (FT.)	INV. OUT (UPPER)	INV. IN (LOWER)	SLOPE (%)	MANNING'S n	CAPACITY (CFS)	CAPACITY (GPD)	CAPACITY (MGPD)	REMAINING CAPACITY	REMAINING CAPACITY
70	69	0.265	2.5	0.662	4.0	1.060	8	216	331.60	327.93	1.7%	0.011	1.85	1195686.23	1.20	0.53	0.14
69	104	0.569	2.5	1.422	4.0	2.276	10	8	326.05	325.90	1.8%	0.011	3.53	2281498.60	2.28	0.86	0.01
104	68	0.569	2.5	1.422	4.0	2.276	10	67	325.80	324.23	2.3%	0.011	3.94	2546488.52	2.55	1.12	0.27
68	67	0.600	2.5	1.500	4.0	2.400	10	247	323.98	315.86	3.3%	0.011	4.67	3018299.84	3.02	1.52	0.62
67	66	0.631	2.5	1.577	4.0	2.524	10	256	315.56	310.85	1.8%	0.011	3.49	2255645.92	2.26	0.68	-0.27
66	65	1.246	2.5	3.115	4.0	4.984	10	208	310.75	309.51	0.6%	0.011	1.99	1286170.60	1.29	-1.83	-3.70
65	144	1.246	2.5	3.115	4.0	4.984	10	199	309.33	307.30	1.0%	0.011	2.60	1680423.90	1.68	-1.43	-3.30
198	197	0.087	2.5	0.218	4.0	0.349	8	200	329.92	323.56	3.2%	0.011	2.53	1635181.71	1.64	1.42	1.29
197	196	0.097	2.5	0.243	4.0	0.389	8	200	323.54	322.69	0.4%	0.011	0.92	594611.53	0.59	0.35	0.21
196	26	0.108	2.5	0.271	4.0	0.433	8	401	322.68	321.04	0.4%	0.011	2.85	1842003.12	0.91	0.64	0.48
26	25	0.300	2.5	0.751	4.0	1.201	8	461	320.94	318.82	0.5%	0.011	0.96	620464.21	0.62	-0.13	-0.58
69	86	0.428	2.5	1.070	4.0	1.712	8	370	326.10	324.90	0.3%	0.011	0.81	523516.68	0.52	-0.55	-1.19
86	1101	0.454	2.5	1.135	4.0	1.816	8	14	324.80	324.50	2.1%	0.011	2.07	1337875.95	1.34	0.20	-0.48
1101	1102	0.454	2.5	1.135	4.0	1.816	8	130	324.25	320.77	2.7%	0.011	2.32	1499455.17	1.50	0.36	-0.32
1102	1103	0.454	2.5	1.135	4.0	1.816	8	13	320.54	320.19	2.7%	0.011	2.32	1499455.17	1.50	0.36	-0.32
1103	85	0.460	2.5	1.149	4.0	1.838	8	120	320.15	316.73	2.9%	0.011	2.40	1551160.52	1.55	0.40	-0.29
85	25	0.468	2.5	1.169	4.0	1.870	8	335	315.69	314.32	0.4%	0.011	0.91	588148.36	0.59	-0.58	-1.28

1. LINE ITEMS HIGHLIGHTED IN GRAY ARE SANITARY NETWORKS WITH ADDITIONAL FLOW FROM PROPOSED DEVELOPMENT.
2. NETWORKS 69-->104 AND 69-->86 WERE NOTED AS "PRESSURIZED FLOW TYPE" FROM CITY OF FALLS CHURCH INFORMATION.

DESIGN FLOWS:

RESIDENTIAL:	GPD	
GENERAL	100	/PER PERSON
SINGLE-FAMILY	370	/PER RESIDENCE
TOWNHOUSE UNIT	300	/UNIT
APARTMENT UNIT	300	/UNIT
COMMERCIAL:		
GENERAL	2000	/ACRE
MOTEL	130	/UNIT
OFFICE	30	/EMPLOYEE
	0.2	/NET FT2

SANITARY CAPACITY STUDY

MASON ROW

AT THE INTER SECTION OF WEST BROAD STREET, NORTH WEST STREET & PARK AVENUE CITY OF FALLS CHURCH, VIRGINIA

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SCALE: HOR. 1" = 30' VERT. 1" = 5'
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REVISION APPROVED BY

NO.	DESCRIPTION	DATE	REV. BY	APPROVED	DATE

SHEET: C-0902