ALTUS
ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

June 22, 2020

Juliet T. H. Walker, Planning Director
City of Portsmouth Municipal Complex
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Site Plan Review
St. John's Episcopal Church
Assessor's Map 106, Lot 62
101 and 105 Chapel Street

Dear Juliet,

On behalf of the Applicant, St. John's Episcopal Church, Altus Engineering, Inc. respectfully submits an application for site plan review for the construction of an infill building addition on Chapel Street. Located between the existing Church and Parish Hall buildings, the approximately 1,043 sf addition will serve to connect both structures, enhance handicap access to the church itself, and provide small additional lobby and patio spaces for use by the existing congregation.

No new parking or accessways are proposed and the existing church parking lot on the abutting parcels will remain unchanged. Likewise, no traffic is expected to be generated by the proposal. Similarly, no new municipal utility demand is being created. However, the project is anticipating potential future needs by extending a new fire water service to the building which will ultimately be connected to the new watermain included in the City's shovel-ready but currently unfunded Chapel Street improvement project. The site's stormwater system will be similarly configured for future extension to the City's proposed drainage. Unfortunately, LID stormwater practices were not able to be incorporated into the design due the restricted nature and limited space on the project site. Luckily, site-generated runoff will be from roofs and pedestrian areas, not parking lots and roadways where pollutant loading would be significantly higher.

We are requesting three waivers for this application. The first is from Site Plan Review Section 6.2, Landscaping Plan. Given that the project is a simple connector between two existing buildings in a previously developed urban setting, there is little space for landscaping. Furthermore, there are no proposed parking areas or other site elements that would benefit from screening. There are areas of the parcel outside the project limits featuring landscaping that is to remain. Along with the retaining walls along Bow Street, this exiting landscaping provides more than adequate buffering of the site.

The second waiver is from Site Plan Review Section 10.3, Lighting Plan. Given the limited nature of the project, new lighting will consist of a few wall sconces at the back of the proposed addition as called for in Note #22 on Site Plan Sheet C-3. All other lighting on the Church and Parish hall buildings is existing and will remain as is. Because of this, we feel that preparation of a full lighting plan is not necessary.

The third and final waiver involves a stormwater management provision in Site Plan Review Section 7.4.2.8. This section requires the post-development peak rates of runoff to not exceed the pre-development. As designed, our calculations show a minor increase at one of three points of analysis in several of the modeled storm events. These increases are resultant of 964 sf of new impervious surfaces and amount to only 0.2 cfs in the 10- and 25-year storms which is partially offset by decreases at other areas of the site. While we would normally do our best to mitigate even insignificant increases such as these, this particular site does not afford an appropriate area for stormwater detention or infiltration. Furthermore, the proposal anticipates future connection to the City's planned drainage system to be constructed in Chapel Street. Once installed, this system will provide stormwater capacity where none currently exists and will be more than adequate to handle the project's minor increase in peak runoff.

Please call me if you have any questions or need any additional information.

Sincerely,

ALTUS ENGINEERING, INC.

Erik Saari
Vice President

ebs/5072-APP-PB-CovLtr-062220

Encl.: Site Plan Application Checklist
Green Statement
Plan Set
Drainage Assessment
Letter of Authorization
Site Cost Estimate

eCopy: St. John's Episcopal Church
W. Michael Campbell, AIA

Letter of Authorization

I, Rev. Rob Stevens, of St. John's Church, 100 Chapel Street, Portsmouth, NH, hereby authorize Altus Engineering, Inc. of Portsmouth, New Hampshire to represent the Church in all matters concerning engineering and related permitting for the St. John's Church property in Portsmouth, NH. The property is identified as Assessor Map 106, Lot 62 and is located at 101 and 105 Chapel Street. This authorization shall include any signatures required for State and Municipal permit applications.

Signature	Robert Stevens Print Name	5/28/20 Date
Witness	BUPMOORE Print Name	5/28/20 Date

City of Portsmouth, New Hampshire

Site Plan Application Checklist

This site plan application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all site plan review requirements. Please refer to the Site Plan review regulations for full details.

Applicant Responsibilities (Section 2.5.2): Applicable fees are due upon application submittal along with required attachments. The application shall be complete as submitted and provide adequate information for evaluation of the proposed site development. Waiver requests must be submitted in writing with appropriate justification.

Name of Owner/Applicant: St. John's Episcopal Church Date Submitted: June 22, 2020

Phone Number: (603) 436-8283 E-mail: rectorsjc@gmail.com

Site Address: 101 and 105 Chapel Street Map: 106 Lot: 62

Zoning District: Civic Lot area: +/-27,062 sq. ft.

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☒	Fully executed and signed Application form. **(2.5.2.3)**	Viewpoint	N/A
☒	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF). **(2.5.2.8)**	Attached/Viewpoint	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Statement that lists and describes "green" building components and systems. **(2.5.3.1A)**	Attached/ Viewpoint	
☒	Gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1B)**	Floor Plan & C-1, C-3, C-4 (bldg. text)	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1C)**	Cover Sheet, title blocks, C-3 Note 3	N/A
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1D)**	Cover Sheet left	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1E)**	C-1 bottom right	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1F)**	Cover Sheet left	N/A
☒	List of reference plans. **(2.5.3.1G)**	1 of 1 top right	N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1H)**	C-2 Notes 10-14	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director. Submittals shall be a minimum of 11 inches by 17 inches as specified by Planning Dept. staff. **(2.5.4.1A)**	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	1 of 1 Note 6	N/A
☒	Plans shall be drawn to scale. **(2.5.4.1D)**	Required on all plan sheets	N/A
☒	Plans shall be prepared and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	All applicable sheets	N/A
☐	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	N/A (no wetlands)	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	All applicable sheets	N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	All applicable sheets	N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☒	Source and date of data displayed on the plan. **(2.5.4.2D)**	1 of 1, C-1 Note #1	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	C-3 Note 7	N/A
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	C-3 Notes 12 and 13	N/A
☐	Plan sheets showing landscaping and screening shall also include the following additional notes: a. "The property owner and all future property owners shall be responsible for the maintenance, repair and replacement of all required screening and landscape materials." b. "All required plant materials shall be tended and maintained in a healthy growing condition, replaced when necessary, and kept free of refuse and debris. All required fences and walls shall be maintained in good repair." c. "The property owner shall be responsible to remove and replace dead or diseased plant materials immediately with the same type, size and quantity of plant materials as originally installed, unless alternative plantings are requested, justified and approved by the Planning Board or Planning Director." **(2.13.4)**	N/A (waiver requested for landscape plan, Sec. 6.2)	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
	1. Existing Conditions: (2.5.4.3A)		
☒	a. Surveyed plan of site showing existing natural and built features;	1 of 1	
☒	b. Zoning boundaries;	C-1 top left	
☒	c. Dimensional Regulations;	C-3 Note 3	
☐	d. Wetland delineation, wetland function and value assessment;	N/A (no wetlands)	
☒	e. SFHA, 100-year flood elevation line and BFE data.	C-3 Note 21	
	2. Buildings and Structures: (2.5.4.3B)		
☒	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;	Floor Plan	
☒	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;	Exterior Perspective	
☒	c. Total Floor Area;	C-1, C-3, C-4	
☒	d. Number of Usable Floors;	C-1, C-3, C-4	
☒	e. Gross floor area by floor and use.	C-1, C-3, C-4	
	3. Access and Circulation: (2.5.4.3C)		
☐	a. Location/width of access ways within site;	N/A	
☒	b. Location of curbing, right of ways, edge of pavement and sidewalks;	C-1, C-3, C-4	
☐	c. Location, type, size and design of traffic signing (pavement markings);	N/A	
☒	d. Names/layout of existing abutting streets;	C-1	
☐	e. Driveway curb cuts for abutting prop. and public roads;	N/A	
☐	f. If subdivision; Names of all roads, right of way lines and easements noted;	N/A	
☐	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	N/A	
	4. Parking and Loading: (2.5.4.3D)		
☒	a. Location of off street parking/loading areas, landscaped areas/buffers;	C-1	
☐	b. Parking Calculations (# required and the # provided).	N/A	
	5. Water Infrastructure: (2.5.4.3E)		
☒	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;	1 of 1, C-4	
☐	b. Location of wells and monitoring wells (include protective radii).	N/A	
	6. Sewer Infrastructure: (2.5.4.3F)		
☒	a. Size, type and location of sanitary sewage facilities & Engineering data.	1 of 1, C-4	
	7. Utilities: (2.5.4.3G)		
☒	a. The size, type and location of all above & below ground utilities;	1 of 1, C-1, C-4	
☐	b. Size type and location of generator pads, transformers and other fixtures.	N/A	

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	**8. Solid Waste Facilities: (2.5.4.3H)**		
☐	a. The size, type and location of solid waste facilities.	N/A	
	9. Storm water Management: (2.5.4.3I)		
☒	a. The location, elevation and layout of all storm-water drainage.	C-4	Sec. 7.4.2.8
	10. Outdoor Lighting: (2.5.4.3J)		
☐	a. Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and; b. photometric plan.		Sec. 10.3
☒	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Sheet C-3 Note 22	
	12. Landscaping: (2.5.4.3K)		
☒	a. Identify all undisturbed area, existing vegetation and that which is to be retained;	C-1, limits of construction	
☐	**b.** Location of any irrigation system and water source.	N/A	
	13. Contours and Elevation: (2.5.4.3L)		
☒	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.	C-4	
	14. Open Space: (2.5.4.3M)		
☒	a. Type, extent and location of all existing/proposed open space.	C-1	
☐	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	N/A	
☐	**16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)**	N/A	
☐	**17. Character/Civic District (All following information shall be included): (2.5.4.3Q)**		
	a. Applicable Building Height (10.5A21.20 & 10.5A43.30);	N/A	
	b. Applicable Special Requirements (10.5A21.30);	N/A	
	c. Proposed building form/type (10.5A43);	N/A	
	d. Proposed community space (10.5A46).	N/A	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	Traffic Impact Study or Trip Generation Report, as required. (*Four (4) hardcopies of the full study/report and Six (6) summaries to be submitted with the Site Plan Application*) **(3.2.1-2)**	N/A	
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Cover Letter	
☒	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	C-2 Note 19	
☐	Indicate where measures to minimize impervious surfaces have been implemented. **(7.4.3)**	N/A	
☒	Calculation of the maximum effective impervious surface as a percentage of the site. **(7.4.3.2)**	C-3 Note 4	
☒	Stormwater Management and Erosion Control Plan. (*Four (4) hardcopies of the full plan/report and Six (6) summaries to be submitted with the Site Plan Application*) **(7.4.4.1)**	C-4, Drainage Assessment	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	All local approvals, permits, easements and licenses required, including but not limited to: a. Waivers; b. Driveway permits; c. Special exceptions; d. Variances granted; e. Easements; f. Licenses. **(2.5.3.2A)**	a. Waiver request included/Viewpoint b. N/A c. N/A d. N/A e. N/A f. N/A	
☐	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: a. Calculations relating to stormwater runoff; b. Information on composition and quantity of water demand and wastewater generated; c. Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; d. Estimates of traffic generation and counts pre- and post-construction; e. Estimates of noise generation; f. A Stormwater Management and Erosion Control Plan; g. Endangered species and archaeological / historical studies; h. Wetland and water body (coastal and inland) delineations; i. Environmental impact studies. **(2.5.3.2B)**	a. Drainage attached/ Viewpoint b. N/A, no new demands c. N/A d. N/A, no new trip generation e. N/A f. Sheet C4, Drainage attached/Viewpoint g. N/A h. N/A i. N/A	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**	N/A (site already provided with utility services)	
☐	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	N/A	

Applicant's Signature: _____ Date: June 22, 2020

Erik Saari (Agent)

"Green" Statement
Assessor's Map 106 Lot 62
St. John's Episcopal Church
101 & 105 Chapel Street
Altus Project P5072

Pursuant to Section 2.5.3.1(a) of the Site Plan Review Regulations, Altus Engineering, Inc. (Altus) respectfully submits the following list of the project's "green" components for the infill building addition to St. John's Church on Chapel Street:

- The addition will meet or exceed all applicable current energy codes.
- New ADA-accessibility features are a major driver of the design.
- Existing brick walkways will be salvaged for re-use in sidewalk and patio areas to the maximum extent possible.
- All new lighting, while minimal, will be downcast dark-sky compliant fixtures.

ebs/5072-App-PB-GreenStatment-062220

ALTUS
ENGINEERING, INC.

THIS DRAWING SET HAS NOT BEEN RELEASED FOR CONSTRUCTION

ST. JOHN'S EPISCOPAL CHURCH BUILDING ADDITION

101 and 105 Chapel Street
Portsmouth, New Hampshire

Assessor's Parcel 106, Lot 62

ISSUED FOR PLANNING BOARD

Plan Issue Date:

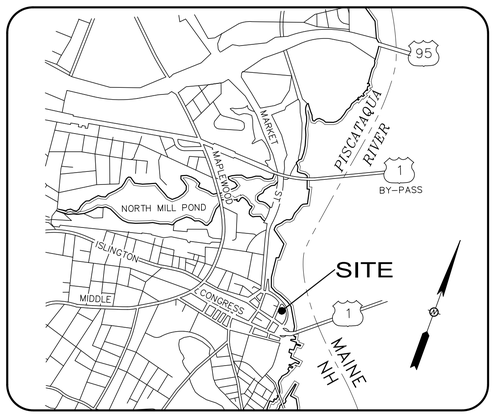
JULY 17, 2020

Owner/Applicant:
St. John's
Episcopal Church
100 Chapel Street
Portsmouth, NH 03801
(603) 436-8283

Architect:
W. Michael Campbell, AIA
369 West Farms Road
Farmingdale, NJ 07727
(732) 919-2750

Civil Engineer:
ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

Surveyor:
James Verra
& Associates Inc.
LAND SURVEYORS
101 SHATTUCK WAY, SUITE 8
Newington, New Hampshire
03801-7876
Tel 603-436-3557



LOCUS MAP
Not to Scale

Sheet Index Title	*Sheet No.:*	*Rev.*	*Date*
Exterior Perspective 3	0	0	Undated
Floor Plan	0	0	Undated
Limited Topographic Plan	1 of 1	2	04/22/20
Overall Site Plan	C-1	1	07/17/20
Demolition Plan	C-2	1	06/22/20
Site Plan	C-3	1	07/17/20
Grading, Drainage and Utility Plan	C-4	1	07/17/20
Details Sheet	D-1	0	07/17/20
Details Sheet	D-2	0	07/17/20

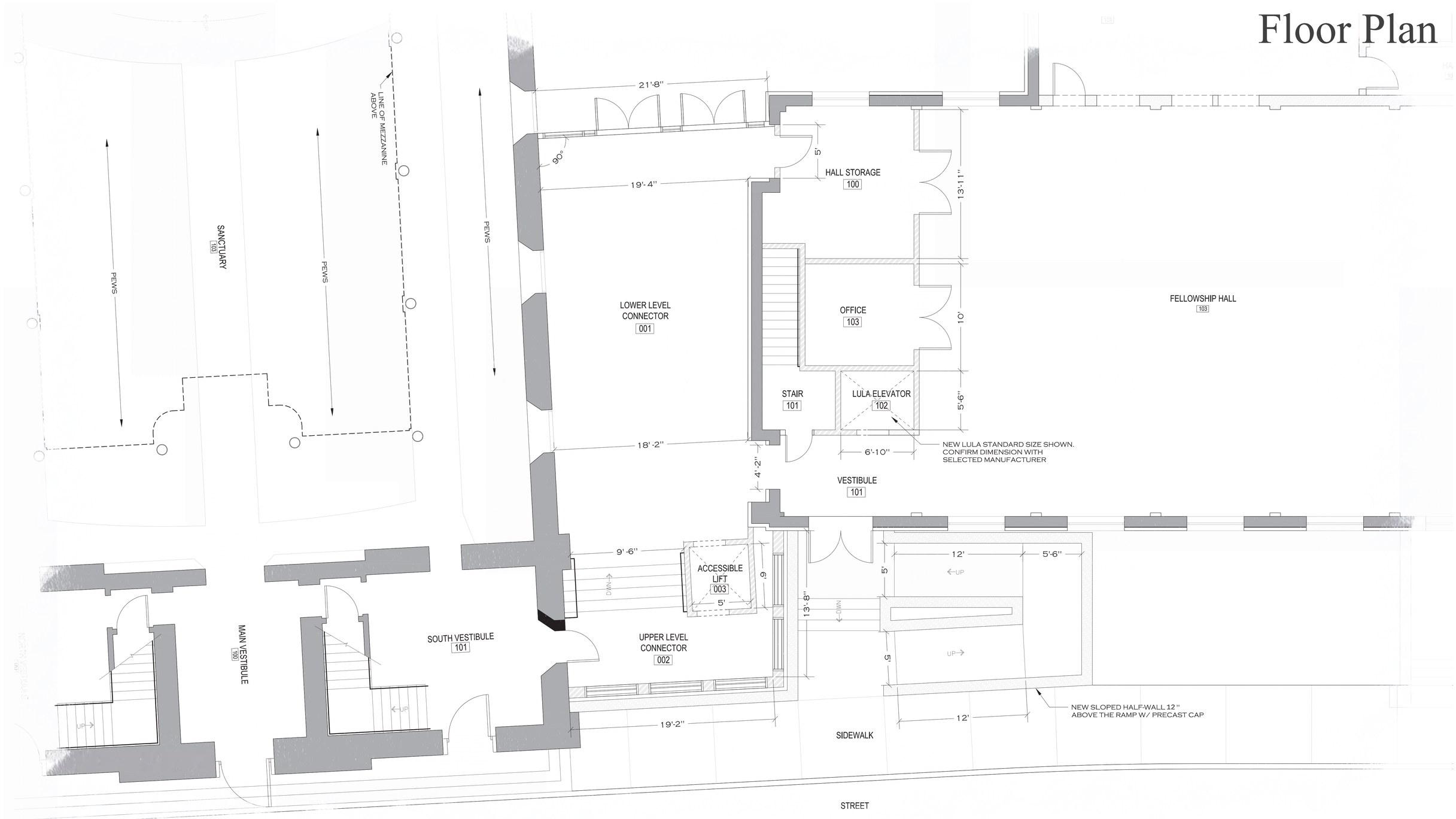
P5042

Exterior Perspective 3

St John's Episcopal Church
Portsmouth, New Hampshire

W. Michael Campbell
369 West Farms Road
Farmingdale, NJ 07727
www.religiousarchitecture.com

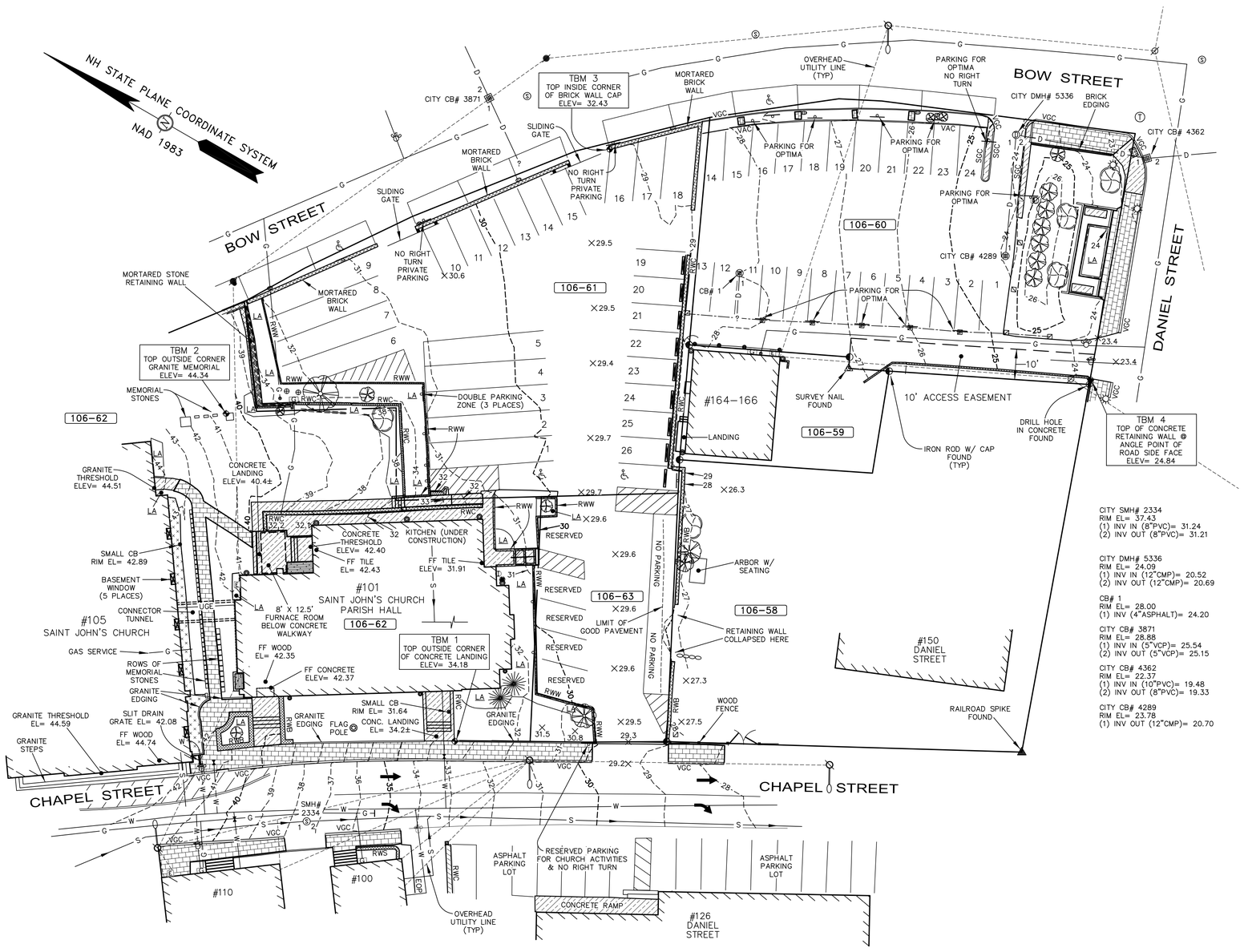
Floor Plan



St. John's Episcopal Church

St John's Episcopal Church
Portsmouth, New Hampshire

W. Michael Campbell
369 West Farms Road
Farmingdale, NJ 07727
www.religiousarchitecture.com



CITY SMH# 2334
RIM EL= 37.43
(1) INV IN (8"PVC)= 31.24
(2) INV OUT (8"PVC)= 31.21

CITY DMH# 5336
RIM EL= 24.09
(1) INV IN (12"CMP)= 20.52
(2) INV OUT (12"CMP)= 20.69

CB# 1
RIM EL= 28.00
(1) INV (4"ASPHALT)= 24.20

CITY CB# 3871
RIM EL= 28.88
(1) INV IN (5"VCP)= 25.54
(2) INV OUT (5"VCP)= 25.15

CITY CB# 4362
RIM EL= 22.37
(1) INV IN (10"PVC)= 19.48
(2) INV OUT (8"PVC)= 19.33

CITY CB# 4289
RIM EL= 23.78
(1) INV OUT (12"CMP)= 20.70

ABUTTERS LIST

MAP-LOT	OWNER	DEED REF.
106-58	THE WARNER HOUSE ASSOCIATION PO BOX 895, PORTSMOUTH, NH 03802	879/372
106-59	THOMAS B. GRIFFIN REV. LIVING TRUST u/d/t 11/9/2000 THOMAS B. GRIFFIN, TRUSTEE 164 DANIEL ST, PORTSMOUTH, NH 03801	5531/572

NOTES:

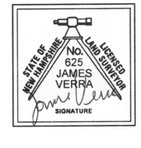
1. OWNER OF RECORD.....SAINT JOHN'S CHURCH
   ADDRESS.....100 CHAPEL STREET, PORTSMOUTH, NH 03801
   DEED REFERENCE.....
   TAX SHEET / LOT.....106-60,106-61,106-62 & 106-63
2. THE RELATIVE ERROR OF CLOSURE WAS LESS THAN 1 FOOT IN 15,000 FEET.
3. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.
4. CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE SETTING OR ESTABLISHMENT OF ANY GRADES/ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOC., INC.
5. THIS PLAN IS BASED ON A FIELD SURVEY 7/2015 BY JAMES VERRA AND ASSOC., INC.
6. HORIZONTAL DATUM: NAD 1983 (2011) (EPOCH: 2010.0000)
   VERTICAL DAUM: NAVD 1988
   PRIMARY BM: CITY CONTROL POINT "ALBA"
7. PARCEL LINES ARE APPROXIMATE ONLY. NO BOUNDARY RESEARCH OR BOUNDARY SURVEY WERE PERFORMED.

REFERENCE PLANS:

1. PLAN OF LAND, PORTSMOUTH, N.H., THE WARNER HOUSE ASSOCIATION, DATED 8/1982, FILE NO. 1394, PLAN NO. 50067, BY JOHN W. DURGIN ASSOCIATES, INC.
2. PLAN OF LOT, BADGER FARMS' CREAMERIES, BOW ST., PORTSMOUTH, N.H., DATED 7/1944, FILE NO. 317, PLAN NO. 8174, BY JOHN W. DURGIN CE.

LEGEND:

- STONE WALL
- CHAIN LINK FENCE
- WOOD FENCE
- Ø.....WOOD FENCE POST
- 110-5.....TAX SHEET - LOT NUMBER
- RCRD.....ROCKINGHAM COUNTY REGISTRY OF DEEDS
- EOP.....EDGE OF PAVEMENT
- SGC.....SLOPED FACED GRANITE CURB
- VAC.....VERTICAL FACED ASPHALT CURB
- VGC.....VERTICAL FACED GRANITE CURB
- RWC.....CONCRETE RETAINING WALL
- RWW.....WOOD RETAINING WALL
- RWB.....MODULAR BLOCK RETAINING WALL
- .....PARKING METER
- .....BOLLARD
- .....SIGN
- .....HANDICAP SPACE
- .....UTILITY POLE
- .....UTILITY POLE W/TRANSFORMER
- .....LIGHT POLE
- .....UTILITY POLE WITH ARM & LIGHT
- .....ELECTRICAL CONDUIT
- E.....ELECTRIC METER
- G.....GAS METER
- .....GAS SHUT OFF
- .....WATER GATE VALVE
- .....WATER SHUT OFF VALVE
- .....CATCH BASIN
- .....CATCH BASIN
- .....DRAIN MANHOLE
- .....GUTTER DOWNSPOUT
- S.....SEWER MANHOLE
- .....DECIDUOUS TREE
- .....CONIFEROUS SHRUB
- .....DECIDUOUS SHRUB
- — W — .....WATER LINE
- — S — .....SEWER LINE
- — D — .....DRAIN LINE
- — G — .....GAS LINE
- .....CEMENT CONCRETE
- .....BRICK PAVERS
- .....CRUSHED STONE
- ×12.5.....SPOT GRADE



P4706

SURVEYOR:
James Verra and Associates, Inc.
LAND SURVEYORS
101 SHATTUCK WAY - SUITE 8
NEWINGTON, N.H. 03801- 7876
603-436-3557
JOB NO: 23609

ENGINEER:
ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR:
ENGINEERING DESIGN

ISSUE DATE:
AUGUST 11, 2015

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	ENGINEERING DESIGN	JV	8-11-15
2	ADDITIONAL INFO. AS REQUESTED BY ENGINEER	JV	4-22-20

DRAWN BY: JCS
APPROVED BY: JV
DRAWING FILE: 23609.DWG

SCALE:
22" x 34" - 1" = 20'
11" x 17" - 1" = 40'

OWNER/APPLICANT:
SAINT JOHN'S CHURCH
100 CHAPEL STREET
PORTSMOUTH, N.H. 03801

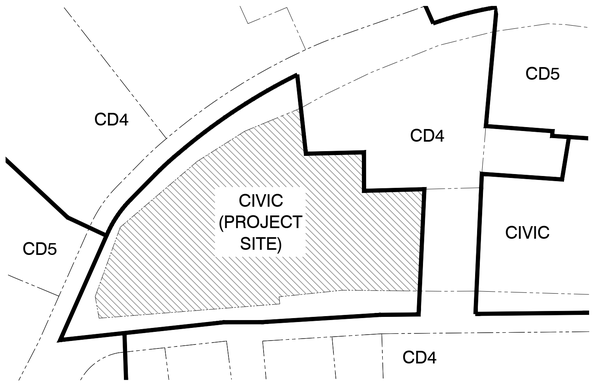
ASSESSOR'S PARCELS
MAP 106
LOTS 60-63

PROJECT:
PROPOSED SITE IMPROVEMENT PLANS
101 & 105 CHAPEL STREET
BOW & DANIEL STREETS
PORTSMOUTH, N.H.

ASSESSOR'S PARCELS
MAP 106
LOTS 60-63

TITLE:
LIMITED TOPOGRAPHIC PLAN

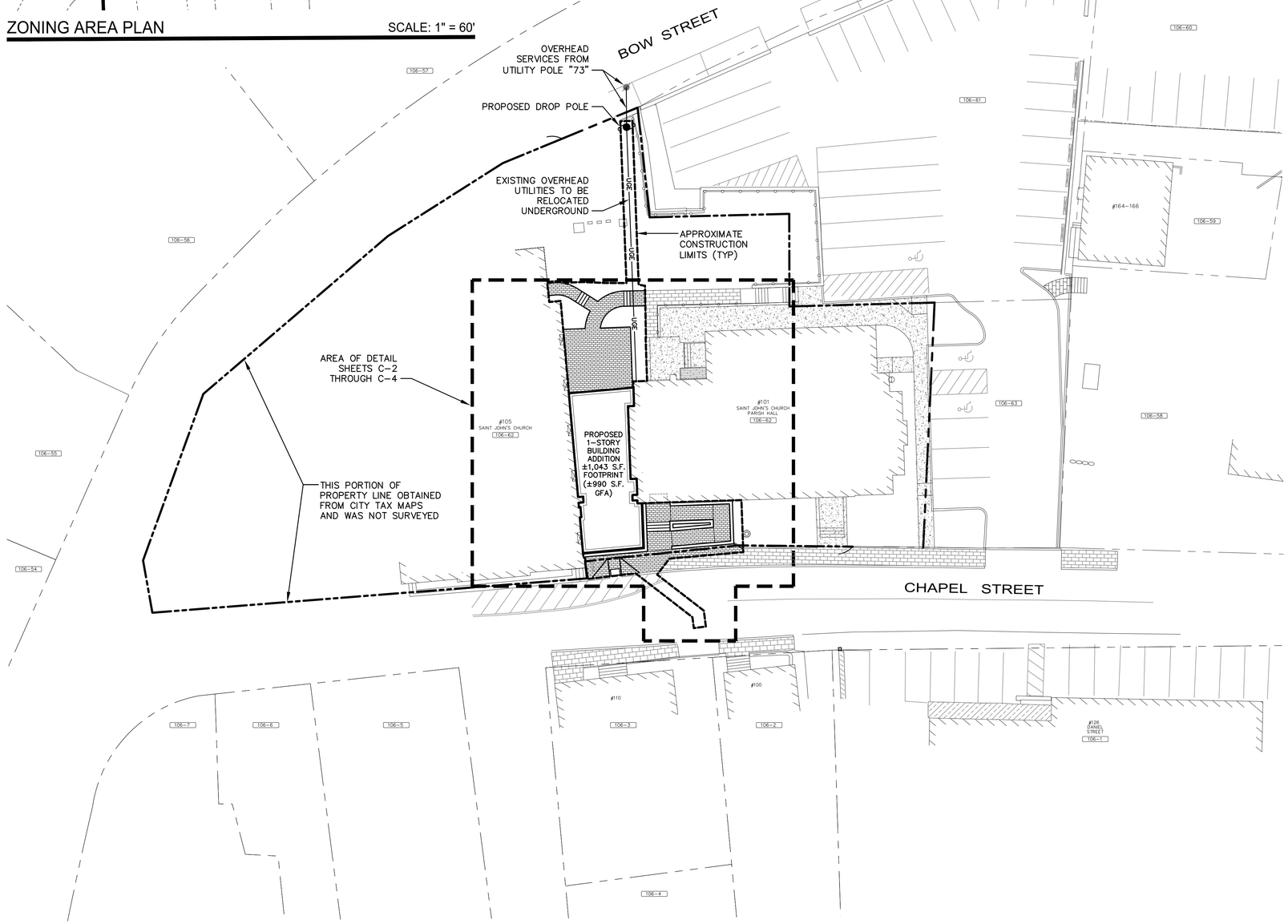
SHEET NUMBER:
1 OF 1



ZONING AREA PLAN SCALE: 1" = 60'

NH STATE PLANE COORDINATE SYSTEM
NAD 1983

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)



OVERALL SITE NOTES

1. THE BASE PLAN USED HERE WAS DEVELOPED FROM "LIMITED TOPOGRAPHIC PLAN, 101 & 105 CHAPEL STREET, BOW & DANIEL STREETS, PORTSMOUTH, NH" BY JAMES VERRA AND ASSOCIATES, INC., DATED APRIL 2, 2020. A FULL BOUNDARY SURVEY WAS NOT CONDUCTED AS A PART OF THIS SURVEY. A PORTION OF THE BOUNDARY SHOWN HEREON WAS DERIVED FROM CITY TAX MAPS. OTHER SITE FEATURES WERE ADDED TO THIS PLAN BASED ON SITE OBSERVATIONS BY ALTUS ENGINEERING.

LEGEND

- PROPERTY LINE
- EXISTING PAVEMENT/CURB
- VGC SGC — PROP. PAVEMENT/VERTICAL OR SLOPED GRANITE CURB
- PROPOSED HAND RAIL
- EXISTING FENCE/RAIL
- 60 — EXISTING CONTOUR
- 60 — PROPOSED CONTOUR
- 100.00 / 104.00TW 100.00BW — PROPOSED SPOT GRADE/TOP & BOTTOM OF WALL
- PROPOSED RETAINING WALL
- EXISTING WATER/CURB STOP/VALVE/HYDRANT
- EXISTING SEWER/MANHOLE
- EXISTING GAS/VALVE
- EXISTING OVERHEAD/UNDERGROUND UTILITIES/POLE
- EXISTING DRAINAGE/CB/DMH
- PROP. THRUST BLOCK/WATER/CURB STOP/VALVE/HYDRANT
- PROPOSED OVERHEAD/UNDERGROUND UTILITIES/POLE
- PROPOSED DRAINAGE (HARD PIPE)/CB/DCB/DMH/FES
- PROPOSED DRAINAGE (PERFORATED PIPE)/CLEANOUT
- CPP — PROP. GROUND SLOPE/CORRUGATED PLASTIC PIPE
- PROPOSED LIMIT OF DISTURBANCE
- EXISTING BRICK SIDEWALK/PATIO
- PROPOSED BRICK SIDEWALK/PATIO
- EXISTING CONCRETE SURFACE
- PROPOSED STONE DRIPEDGE

ABUTTERS LIST

ABUTTER'S LIST INFORMATION WAS OBTAINED FROM CITY GIS SYSTEM AND SHOULD NOT BE CONSIDERED COMPLETELY ACCURATE.

106-62 (PROJECT SITE)
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

106-1
OLD CITY HALL, LP
126 DANIEL ST., STE. 200
PORTSMOUTH, NH 03801

106-2
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

106-3
ROXYJAMES REALTY, LLC
20 WHITEHORSE DRIVE
RYE, NH 03870

106-5
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

106-6
132 CHAPEL STREET, LLC
P.O. BOX 489
N. BERWICK, ME 03906

106-7
HARBORPLACE PROPERTIES
P.O. BOX 4365
PORTSMOUTH, NH 03801

106-54
MARTINGALE, LLC
30 PENHALLOW ST., STE. 300 EAST
PORTSMOUTH, NH 03801

106-55
109-111 BOW STREET CONDOS
MASTERCARD
PORTSMOUTH, NH 03801

106-56
ONE HUNDRED THIRTEEN CONDO
MASTERCARD

106-57
RIVERSEDGE CONDOS
MASTERCARD
PORTSMOUTH, NH 03801

106-61
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

106-62
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

P5072

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 – LICENSED PROFESSIONAL ENGINEER
7/17/20

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JULY 17, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EBS	06/02/20
1	TAC / PLANNING BOARD	EBS	06/22/20
2	PLANNING BOARD	EBS	07/17/20

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5072-SITE.dwg

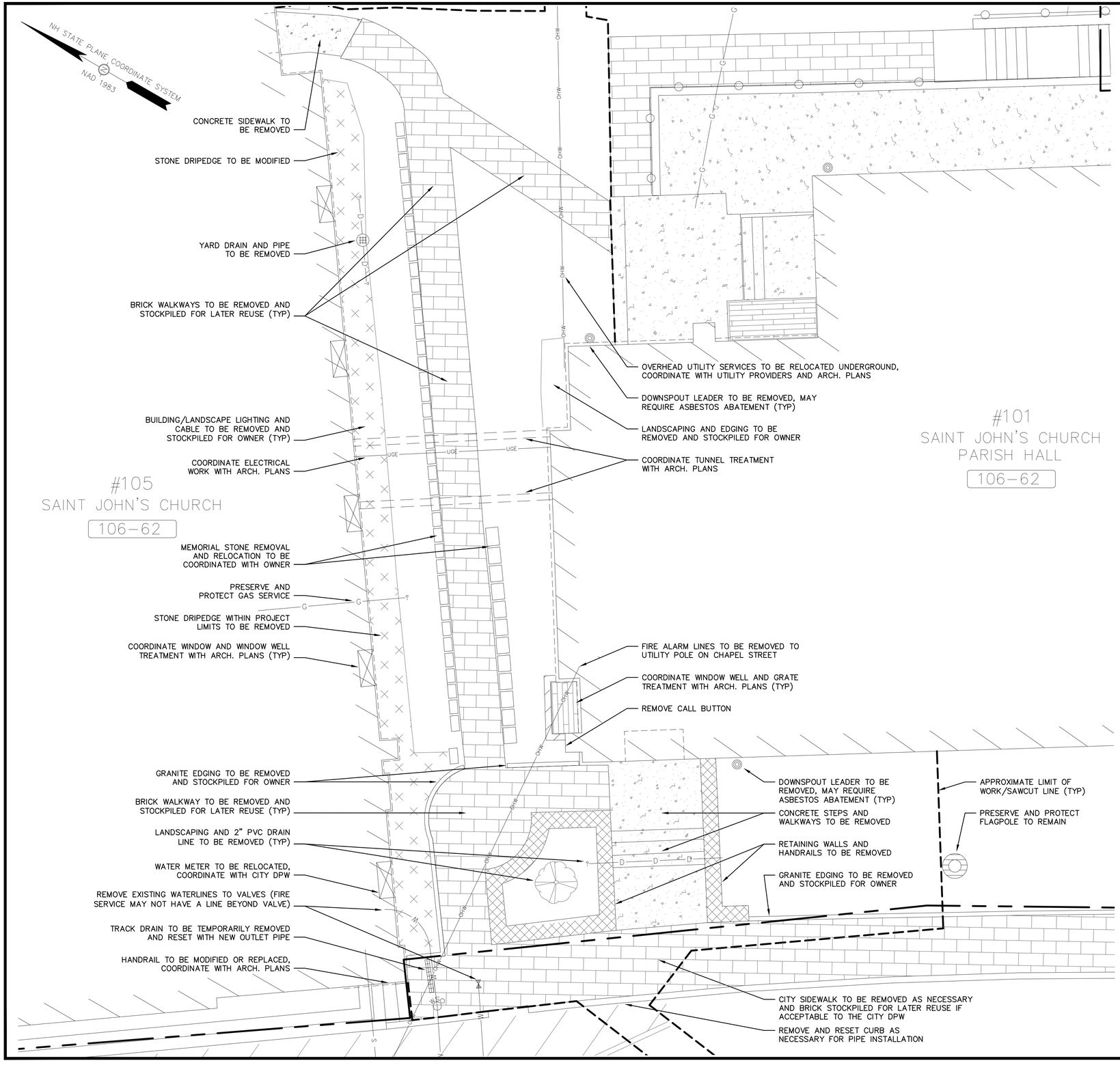
SCALE: 22"x34" 1" = 20'
11"x17" 1" = 40'

OWNER/APPLICANT:
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

PROJECT:
ST. JOHN'S EPISCOPAL CHURCH
TAX MAP 106 LOT 62
101 & 105 CHAPEL STREET
PORTSMOUTH, NH 03801

TITLE:
OVERALL SITE PLAN

SHEET NUMBER:
C-1



DEMOLITION NOTES

1. CONTRACTOR SHALL SAFELY SECURE THE SITE AND WORK LIMITS WITH SECURITY FENCING WHICH SHALL BE LOCKED DURING NON-WORK HOURS.
2. CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES AND STRUCTURES SCHEDULED TO REMAIN.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY NOTIFICATION OF ALL PARTIES, CORPORATIONS, COMPANIES, INDIVIDUALS AND STATE AND LOCAL AUTHORITIES OWNING AND/OR HAVING JURISDICTION OVER ANY UTILITIES RUNNING TO, THROUGH OR ACROSS AREAS TO BE DISTURBED BY DEMOLITION AND/OR CONSTRUCTION ACTIVITIES WHETHER OR NOT SAID UTILITIES ARE SUBJECT TO DEMOLITION, RELOCATION, MODIFICATION AND/OR CONSTRUCTION.
4. ALL UTILITY DISCONNECTIONS/DEMOLITIONS/RELOCATIONS SHALL BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES, PORTSMOUTH DPW AND ABUTTING PROPERTY OWNERS. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELATED EXCAVATION, TRENCHING AND BACKFILLING.
5. WHERE SPECIFIED TO REMAIN, MANHOLE RIMS, CATHC BASIN GRATES, VALVE COVERS, HANDHOLES, ETC. SHALL BE ADJUSTED TO FINISH GRADE UNLESS OTHERWISE SPECIFIED.
6. CONTRACTOR SHALL OBTAIN AN ENCUMBRANCE PERMIT FROM THE CITY OF PORTSMOUTH TO USE PORTIONS OF THE CHAPEL STREET SIDEWALK AS STAGING AND CONSTRUCTION AREAS. ANY DAMAGE TO SIDEWALK OUTSIDE LIMITS OF WORK SHALL BE REPAIRED AT NO ADDITIONAL EXPENSE TO THE OWNER.
7. SEE EROSION CONTROL PLANS FOR EROSION AND SEDIMENT CONTROL MEASURES THAT SHALL BE IN PLACE PRIOR TO DEMOLITION ACTIVITIES.
8. ALL MATERIALS SCHEDULED FOR DEMOLITION OR REMOVAL ON PRIVATE PROPERTY SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. GRANITE CURBING AND BRICK SCHEDULED TO BE REMOVED FROM PUBLIC PROPERTY SHALL BE SALVAGED TO PORTSMOUTH DPW.
9. ALL MATERIAL SCHEDULED TO BE REMOVED SHALL BE LEGALLY DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS/CODES.
10. WATER: PORTSMOUTH DPW, JIM TOW, (603) 427-1530.
11. TELECOMMUNICATIONS: FAIRPOINT, JOE CONSIDINE, (603) 427-5525.
12. CABLE: COMCAST, MIKE COLLINS, (603) 679-5695, EXT. 1037.
13. ELECTRICAL: EVERSOURCE, MICHAEL BUSBY, (603) 332-4227, EXT. 5555334.
14. GAS: UNITIL, DAVID BEAULIEU, (603) 294-5144.
15. NO BURNING SHALL BE PERMITTED PER LOCAL REGULATIONS.
16. HAZARDOUS MATERIALS ENCOUNTERED DURING DEMOLITION AND CONSTRUCTION ACTIVITIES SHALL BE ABATED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL REGULATIONS.
17. AT NO TIME SHALL ANY UTILITY SERVICE OR VEHICULAR ACCESS TO ABUTTING PROPERTIES BE COMPLETELY INTERRUPTED UNLESS A FULL SHUTDOWN IS COORDINATED WITH ALL AFFECTED PARTIES AND UTILITY PROVIDER(S).
18. SHOULD GROUNDWATER BE ENCOUNTERED DURING EXCAVATION, APPROPRIATE BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED TO ENSURE SEDMIENT LADEN WATER IS NOT DISCHARGED INTO THE CITY DRAINAGE SYSTEM. A DISCHARGE PERMIT SHALL BE OBTAINED PRIOR TO DISCHARGING GROUNDWATER.
19. PROJECT SITE IS NOT WITHIN A GROUNDWATER OR WELLHEAD PROTECTION AREA.
20. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR THE DEMOLITION OF EXISTING SITE FEATURES. UNLESS OTHERWISE NOTED TO REMAIN, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL BUILDINGS, PAVEMENT, CONCRETE, CURBING, SIGNS, POLES, UTILITIES, FENCES, VEGETATION AND OTHER EXISTING FEATURES AS NECESSARY TO FULLY CONSTRUCT THE PROJECT.

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7636 LICENSED PROFESSIONAL ENGINEER - 6/22/20

NOT FOR CONSTRUCTION

ISSUED FOR: TAC / PLANNING BOARD

ISSUE DATE: JUNE 22, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EBS	06/02/20
1	TAC / PLANNING BOARD	EBS	06/22/20

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5072-SITE.dwg

SCALE: 22"x34" 1" = 5'
11"x17" 1" = 10'

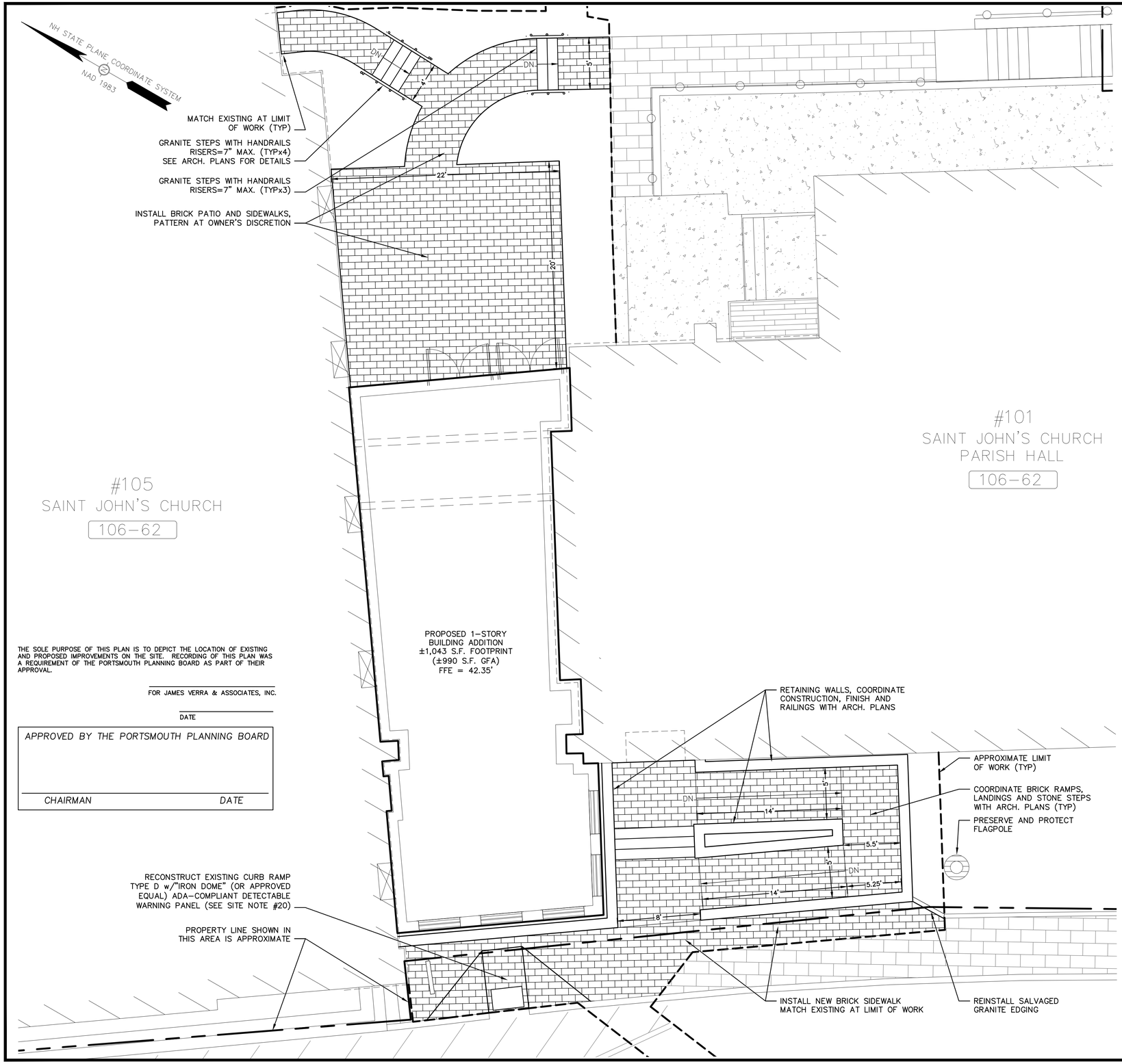
OWNER/APPLICANT:
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

PROJECT:
ST. JOHN'S EPISCOPAL CHURCH
TAX MAP 106 LOT 62
101 & 105 CHAPEL STREET
PORTSMOUTH, NH 03801

TITLE:
DEMOLITION PLAN

SHEET NUMBER:
C-2

P5072



THE SOLE PURPOSE OF THIS PLAN IS TO DEPICT THE LOCATION OF EXISTING AND PROPOSED IMPROVEMENTS ON THE SITE. RECORDING OF THIS PLAN WAS A REQUIREMENT OF THE PORTSMOUTH PLANNING BOARD AS PART OF THEIR APPROVAL.

FOR JAMES VERRA & ASSOCIATES, INC.

DATE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

SITE NOTES

1. DESIGN INTENT – THIS PLAN IS INTENDED TO DEPICT THE CONSTRUCTION OF AN INFILL CONNECTOR BETWEEN THE EXISTING ST. JOHN'S CHURCH AND PARISH HALL BUILDINGS TOGETHER WITH ASSOCIATED SITE IMPROVEMENTS.
2. THE BASE PLAN USED HERE WAS DEVELOPED FROM "LIMITED TOPOGRAPHIC PLAN, 101 & 105 CHAPEL STREET, BOW & DANIEL STREETS, PORTSMOUTH, NH" BY JAMES VERRA AND ASSOCIATES, INC., DATED APRIL 2, 2020. A FULL BOUNDARY SURVEY WAS NOT CONDUCTED AS A PART OF THIS SURVEY. A PORTION OF THE BOUNDARY SHOWN HEREON WAS DERIVED FROM CITY TAX MAPS. OTHER SITE FEATURES WERE ADDED TO THIS PLAN BASED ON SITE OBSERVATIONS BY ALTUS ENGINEERING.
3. ZONE: CIVIC
   OVERLAY: DOWNTOWN OVERLAY DISTRICT
   HISTORIC OVERLAY DISTRICT
4. DIMENSIONAL REQUIREMENTS:

		EXISTING	PROPOSED
LOT AREA	NR	±27,062 S.F.	(0.62 ACRES)
FRONT YARD:	NR	±0'	SAME
SIDE YARD:	NR	±6.6'	SAME
REAR YARD:	NR	±6.5'	SAME
MAX. BUILDING COVERAGE:	NR	±40.7%	±44.6%
MAX. BUILDING FOOTPRINT:	NR	±11,017 S.F.	±12,057 S.F.
MIN. OPEN SPACE:	NR	±48.7% ±13,175 S.F.	±44.3% ±12,211 S.F.
MAX. BUILDING HEIGHT:	NR	UNKNOWN	SAME
IMPERVIOUS SURFACES:	NR	±13,887 S.F.	±14,851 S.F.

   (ALL IMPERVIOUS SURFACES CONSIDERED EFFECTIVE)
5. PARKING REQUIREMENTS: NR (NO REQUIREMENT)
6. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
7. ALL CONDITIONS ON THIS SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
8. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
9. THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
10. AREA OF DISTURBANCE IS UNDER 43,560 SF, COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT IS NOT REQUIRED.
11. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS PRIOR TO CONSTRUCTION. ANY AND ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF BOTH THE ARCHITECT AND CIVIL ENGINEER FOR RESOLUTION.
12. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR
13. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
14. SITEWORK CONTRACTOR SHALL PREPARE A LICENSED LAND SURVEYOR (LLS) STAMPED AS-BUILT SITE PLAN & PROVIDE A DIGITAL (CAD FORMAT) COPY FOR THE CITY'S G.I.S. DATA BASE.
15. UNLESS OTHERWISE NOTED, ALL SIDEWALKS TO BE CONSTRUCTED WITHIN THE CHAPEL ST. RIGHT OF WAY SHALL BE BRICK. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING PORTSMOUTH DPW TO CONFIRM BRICK SPECIFICATIONS.
16. TRASH AND RECYCLING SHALL BE STORED INSIDE BUILDING.
17. ALL ROAD/LANE CLOSURES OR OTHER TRAFFIC INTERRUPTIONS ON CITY ROADS SHALL BE COORDINATED WITH THE PORTSMOUTH POLICE DEPARTMENT AND PORTSMOUTH DPW.
18. ALL WATER MAIN INSTALLATIONS AND SERVICE CONNECTIONS SHALL CONFORM TO PORTSMOUTH WATER DEPARTMENT STANDARDS. WATER MAIN SHALL BE WRAPPED WITH A WATER TIGHT POLYETHYLENE WRAPPING. ALL JOINTS SHALL HAVE THREE (3) WEDGES PER JOINT.
19. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATION DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE APPLICANT SHALL BE REQUIRED TO PAY FOR THE SITE SURVEY WHETHER OR NOT THE SURVEY INDICATES A REPEATER IS NECESSARY. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY. THE SURVEY SHALL BE COMPLETED AND THE REPEATER, IF DETERMINED IT IS REQUIRED, SHALL BE INSTALLED PRIOR TO THE ISSUANCE OF CERTIFICATE OF OCCUPANCY.
20. EXISTING CURB RAMP DOES NOT MEET ADA REGULATIONS AND IS NOT PART OF AN EXISTING OR PROPOSED ADA ACCESSIBLE ROUTE. RECONSTRUCTION OF RAMP SHALL BE TO THE APPROXIMATE LINES AND GRADES OF THE EXISTING RAMP. ALTHOUGH THE RECONSTRUCTED RAMP WILL NOT MEET ADA REGULATIONS DUE TO THE PRE-EXISTING CONDITIONS OF THE SURROUNDING AREA, THE CONTRACTOR IS DIRECTED TO MAKE WHATEVER MODIFICATIONS ARE NECESSARY TO BRING THE RECONSTRUCTED RAMP INTO CONFORMITY WITH ADA REGULATIONS AS CLOSELY AS POSSIBLE.
21. SITE IS NOT IN A FLOOD HAZARD ZONE.
22. ALL PROPOSED LIGHTING TO BE DOWNCAST BUILDING-MOUNTED WALL SCONES.

GRAPHIC SCALE

5 0 2.5 5 10 20

(IN FEET)

P5072

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
7/17/20

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JULY 17, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EBS	06/02/20
1	TAC / PLANNING BOARD	EBS	06/22/20
2	PLANNING BOARD	EBS	07/17/20

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5072-SITE.dwg

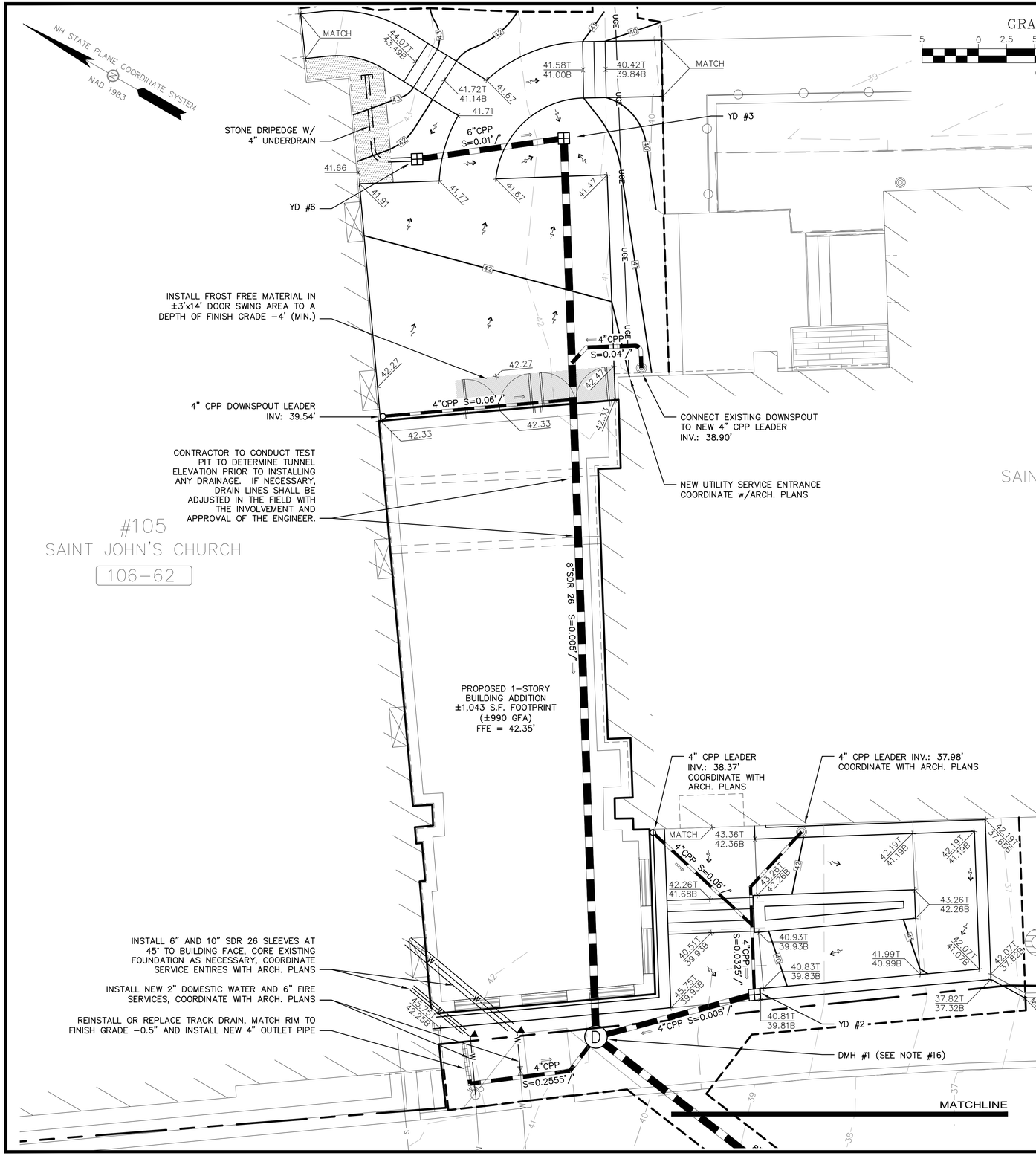
SCALE: 22"x34" 1" = 5'
11"x17" 1" = 10'

OWNER/APPLICANT:
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

PROJECT:
ST. JOHN'S EPISCOPAL CHURCH
TAX MAP 106 LOT 62
101 & 105 CHAPEL STREET
PORTSMOUTH, NH 03801

TITLE:
SITE PLAN

SHEET NUMBER:
C-3



DRAINAGE SCHEDULE

DMH #1
2' I.D.
RIM=±40.65'
IN: 38.27' (4")
IN: 37.22' (6")
IN: 37.94' (8")
OUT: 37.05' (TO SMH #2334)
8" SDR 35 w/90° ELBOW
L=±32' S=0.12'/'

YD #2
RIM=39.80'
IN: 37.46' (4")
OUT: 37.29' (TO DMH #1)
6" CPP
L=±13' S=0.005'/'

YD #3
RIM=41.00'
IN: 38.50' (6")
OUT: 38.33' (TO DMH #1)
8" SDR 26
L=±79' S=0.005'/'

YD #4
RIM=41.50'
IN: 38.79' (4")
OUT: 38.62' (TO YD #2)
6" CPP
L=±12' S=0.01'/'

#101
SAINT JOHN'S CHURCH
PARISH HALL
106−62

GRADING AND DRAINAGE NOTES

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
4. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
5. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBMS) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
6. PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
7. TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED IN ALL CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
8. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
9. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
10. ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED.
11. ALL SPOT GRADES ARE AT FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
12. ALL CPP DRAINAGE PIPE SHALL BE ADS N−12 OR APPROVED EQUAL.
13. ALL YARD DRAIN GRATES SHALL BE PEDESTRIAN RATED.
14. CONTRACTOR SHALL PREVENT TRACKING OF DIRT ONTO ANY PUBLIC OR PRIVATE ROADWAYS. IF TRACKING OF DIRT FROM CONSTRUCTION VEHICLES IS PRESENT ON THE OPEN STREETS, CONTRACTOR WILL BE REQUIRED TO SWEEP THE ROADWAY AT NO ADDITIONAL EXPENSE TO THE OWNER.
15. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
16. AS SHOWN ON DETAIL SHEET D−1, DMH #1 SHALL BE EQUIPPED WITH AN 8", 90° ELBOW ON IT'S OUTLET PIPE WHICH SHALL BE REMOVED UPON CONSTRUCTION OF THE FUTURE CITY DRAINAGE SYSTEM IN CHAPEL STREET.

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
7/17/20

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JULY 17, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EBS	06/02/20
1	TAC / PLANNING BOARD	EBS	06/22/20
2	PLANNING BOARD	EBS	07/17/20

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5072−SITE.dwg

SCALE: 22"x34" 1" = 5'
11"x17" 1" = 10'

OWNER/APPLICANT:
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

PROJECT:
ST. JOHN'S EPISCOPAL CHURCH
TAX MAP 106 LOT 62
101 & 105 CHAPEL STREET
PORTSMOUTH, NH 03801

TITLE:
GRADING, DRAINAGE AND UTILITY PLAN

SHEET NUMBER:
C-4

P5072

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

101 AND 105 CHAPEL STREET
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP 106 LOT 62

LATITUDE: 43.079° N
LONGITUDE: 70.755° W

OWNER/APPLICANT:

ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

DESCRIPTION

The project consists of the construction of an infill building connector along with associated site improvements.

DISTURBED AREA

The total area to be disturbed for the redevelopment is approximately ±3,100 S.F. (±0.07 acres). USEPA NPDES Phase II compliance not required.

PROJECT PHASING

The proposed project will be completed in one phase.

NAME OF RECEIVING WATER

The site drains to the municipal sewer and existing closed drainage systems.

SEQUENCE OF MAJOR ACTIVITIES

1. Install temporary erosion control measures including perimeter controls, stabilized construction entrance and inlet sediment filters as noted on the plan. All temporary erosion control measures shall be maintained in good working condition for the duration of the project.
2. Remove landscaping, strip loam and stockpile.
3. Demolish existing site features, utilities, etc. as shown on Demolition Plan.
4. Rough grade site including placement of borrow materials.
5. Construct buildings and associated improvements.
6. Construct drainage structures, culverts, utilities & sidewalk base course materials.
7. Install base course paving & curbing.
8. Install top course paving and sidewalks.
9. Loam (6" min) and seed all disturbed areas not paved or otherwise stabilized.
10. When all construction activity is complete and site is stabilized, remove all temporary erosion control measures and any sediment that has been trapped by these devices.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 – 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, perimeter controls shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area and permanent measures are established, perimeter controls shall be removed.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through appropriate perimeter controls. All storm drain inlets shall be provided with inlet protection measures.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.5 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built-up sediment shall be removed from perimeter barriers when it has reached one-third the height of the barrier or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. An area shall be considered stable if one of the following has occurred:
   a. Base coarse gravels have been installed in areas to be paved;
   b. A minimum of 85% vegetated growth as been established;
   c. A minimum of 3 inches of non-erosive material such as stone of riprap has been installed; – or –
   d. Erosion control blankets have been properly installed.
9. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
   a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
   b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.

2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrub plantings.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CONTINUED)

Jute and Fibrous Matting (Erosion Blanket	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1–1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100%, dry weight basis. * Particle size by weight is 100% passing a 6"screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen. *The organic portion needs to be fibrous and elongated. *Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. *The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. PERMANENT SEEDING –

1. Bedding – stones larger than 1 1/2", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 5" to prepare a seedbed and mix fertilizer into the soil.

2. Fertilizer – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

   Agricultural Limestone @ 100 lbs. per 1,000 s.f.
   10–20–20 fertilizer @ 12 lbs. per 1,000 s.f.

3. Seed Mixture (recommended):

Type	Lbs. / Acre	Lbs. / 1,000 sf
Tall Fescue	24	0.55
Creeping Red Fescue	24	0.55
Total	48	1.10

Seed Mixture (For slope embankments):
Grass Seed: Provide fresh, clean, new–crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified:

Type	Min. Purity (%)	Min. Germination (%)	Kg./Hectare (Lbs/Acre)
Creeping Red Fescue (c)	96	85	45 (40)
Perennial Rye Grass (a)	98	90	35 (30)
Redtop	95	80	5 (5)
Alsike Clover	97	90(e)	5 (5)
		Total	90 (80)

a. Ryegrass shall be a certified fine–textured variety such as Pennfine, Fiesta, Yorktown, Diplomat, or equal.
b. Fescue varieties shall include – Creeping Red and/or Hard Reliant, Scaldis, Koket, or Jamestown.

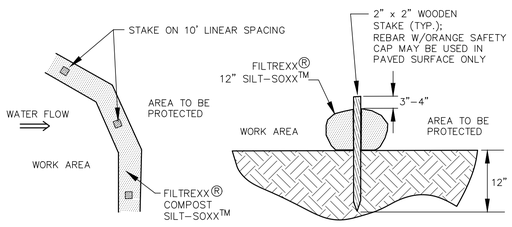
4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;

2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and

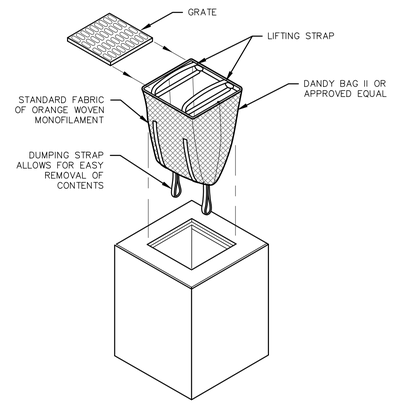
3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.



PLAN VIEW SECTION

NOTES:
1. SILTSOXX MAY BY USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
3. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY SILTSOXX SHALL BE DISPOSED OF PROPERLY.

TUBULAR SEDIMENT BARRIER NOT TO SCALE



INSTALLATION AND MAINTENANCE:

INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

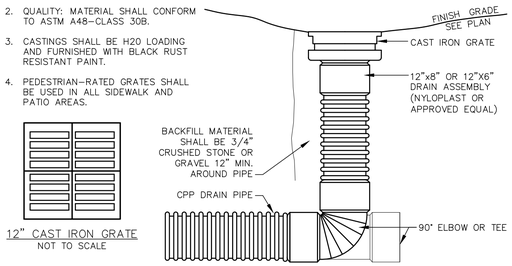
MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

UNACCEPTABLE INLET PROTECTION METHOD;

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

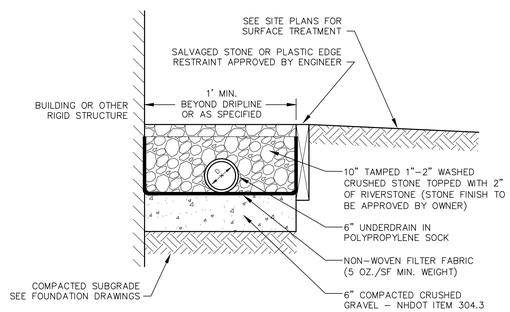
STORM DRAIN INLET PROTECTION NOT TO SCALE

NOTES:
1. YARD DRAINS TO BE NYLOPLAST USA, INC., AND SUPPLIED BY ADS, INC., OR APPROVED EQUAL.
2. QUALITY: MATERIAL SHALL CONFORM TO ASTM A48–CLASS 30B.
3. CASTINGS SHALL BE H20 LOADING AND FURNISHED WITH BLACK RUST RESISTANT PAINT.
4. PEDESTRIAN–RATED GRATES SHALL BE USED IN ALL SIDEWALK AND PATIO AREAS.

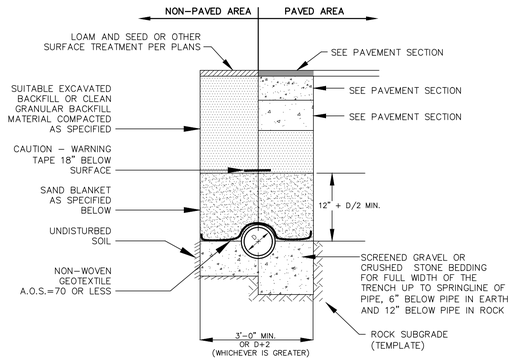


12" CAST IRON GRATE
NOT TO SCALE

YARD DRAIN (YD) NOT TO SCALE



STONE DRIP EDGE NOT TO SCALE



BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

SAND BLANKET/BARRIER

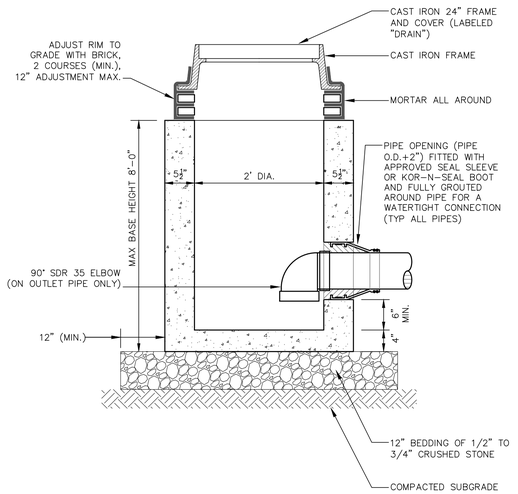
SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*

SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

DRAINAGE TRENCH SECTION NOT TO SCALE



NOTES
1. GENEST PRECAST (1–800–477–8177) 'TYPE F' OR "MINI" CATCH BASIN OR APPROVED EQUAL.
2. ALL CONCRETE SECTIONS SHALL BE 5,000 PSI AFTER 28 DAYS
3. ALL MANHOLE STRUCTURES AND CASTINGS SHALL BE DESIGNED FOR H20 LOADING.
4. MANHOLE STEPS ARE NOT PERMITTED.

DRAIN MANHOLE (2' I.D.) NOT TO SCALE

P5072

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
7/17/20

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JULY 17, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC / PLANNING BOARD	EBS	06/22/20
1	PLANNING BOARD	EBS	07/17/20

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5072–DETAILS.dwg

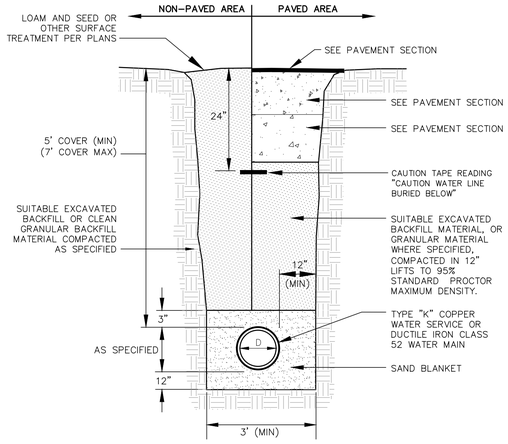
SCALE: 22"x34" 1" = 5'
11"x17" 1" = 10'

OWNER/APPLICANT:
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

PROJECT:
ST. JOHN'S EPISCOPAL CHURCH
TAX MAP 106 LOT 62
101 & 105 CHAPEL STREET
PORTSMOUTH, NH 03801

TITLE:
PRELIMINARY DETAIL SHEET

SHEET NUMBER:
D-1



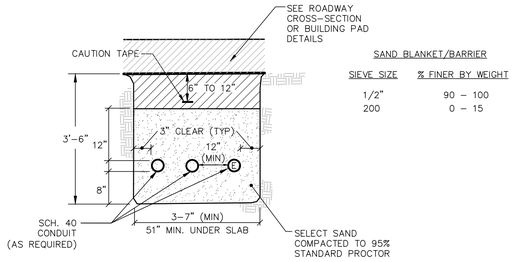
SAND BLANKET/BARRIER	
SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

WATER MAIN TRENCH

NOT TO SCALE



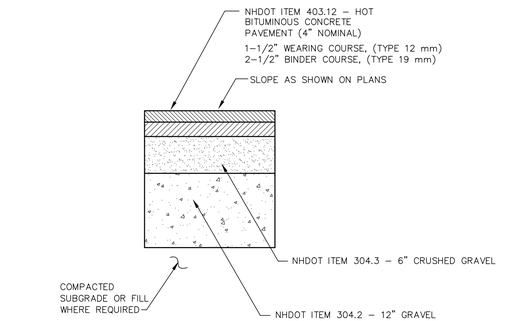
SAND BLANKET/BARRIER	
SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. ALL CONDUIT IS TO BE SCHEDULE 40 PVC, ELECTRICAL GRADE, GRAY IN COLOR AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. A 10-FOOT HORIZONTAL SECTION OF RIGID GALVANIZED STEEL CONDUIT WILL BE REQUIRED AT EACH SWEEP, UNLESS IN THE OPINION OF THE SERVICE PROVIDER DESIGNER, THE SWEEP-PVC JOINT IS NOT SUBJECT TO FAILURE DURING PULLING OF THE CABLE. ALL JOINTS ARE TO BE WATERTIGHT.
2. ALL 90 DEGREE SWEEPS WILL BE MADE WITH RIGID GALVANIZED STEEL WITH A MINIMUM RADIUS OF 36 INCHES FOR PRIMARY CABLES AND 24 INCHES FOR SECONDARY CABLES.
3. BACKFILL MAY BE MADE WITH EXCAVATED MATERIAL OR COMPARABLE, UNLESS MATERIAL IS DEEMED UNSUITABLE BY SERVICE PROVIDER. BACKFILL SHALL BE FREE OF FROZEN LUMPS, ROCKS, DEBRIS, AND RUBBISH. ORGANIC MATERIAL SHALL NOT BE USED AS BACKFILL. BACKFILL SHALL BE IN 6-INCH LAYERS AND THOROUGHLY COMPACTED.
4. A SUITABLE PULLING STRING, CAPABLE OF 300 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE SERVICE PROVIDER IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT. A MINIMUM OF TWENTY-FOUR (24") INCHES OF ROPE SLACK SHALL REMAIN AT THE END OF EACH DUCT. PULL ROPE SHALL BE INSTALLED IN ALL CONDUIT FOR FUTURE PULLS. PULL ROPE SHALL BE NYLON ROPE HAVING A MINIMUM TENSILE STRENGTH OF THREE HUNDRED (300#) LBS.
5. SERVICE PROVIDER SHALL BE GIVEN THE OPPORTUNITY TO INSPECT ALL CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD SERVICE PROVIDER BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. TYPICAL CONDUIT SIZES ARE 3-INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4-INCH FOR THREE PHASE SECONDARY, AND 5-INCH FOR THREE PHASE PRIMARY. HOWEVER, SERVICE PROVIDERS MAY REQUIRE DIFFERENT NUMBERS, TYPES AND SIZES OF CONDUIT THAN THOSE SHOWN HERE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL CONDUIT SIZES, TYPES AND NUMBERS WITH EACH SERVICE PROVIDER PRIOR TO ORDERING THEM.
7. ROUTING OF CONDUIT, LOCATION OF MANHOLES, TRANSFORMERS, CABINETS, HANDHOLES, ETC., SHALL BE DETERMINED BY SERVICE PROVIDER DESIGN PERSONNEL. THE CONTRACTOR SHALL COORDINATE WITH ALL SERVICE PROVIDERS PRIOR TO THE INSTALLATION OF ANY CONDUIT.
8. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE. WHERE REQUIRED BY UTILITY PROVIDER, CONDUIT SHALL BE SUPPORTED IN PLACE USING PIPE STANCHIONS PLACED EVERY FIVE (5') FEET ALONG THE CONDUIT RUN.
9. UNDER A BUILDING SLAB THE CONDUIT SHALL BE ENCASED IN 8" OF CONCRETE ON ALL SIDES.
10. ALL CONDUIT TERMINATIONS SHALL BE CAPPED TO PREVENT DEBRIS FROM ENTERING CONDUIT.

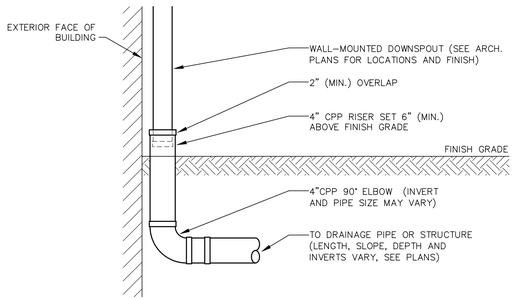
ELECTRIC / COMMUNICATION TRENCH

NOT TO SCALE



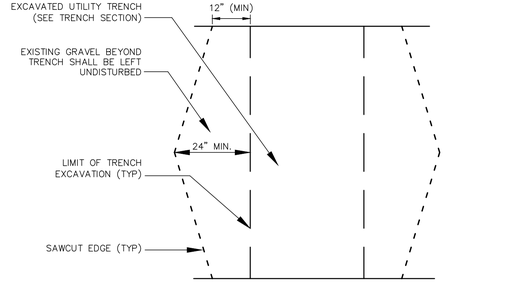
PAVEMENT CROSS SECTION

NOT TO SCALE

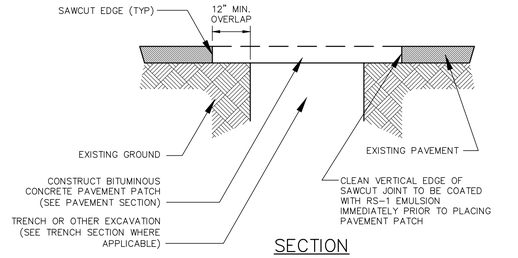


EXTERIOR ROOF DRAIN CONNECTION

NOT TO SCALE



PLAN



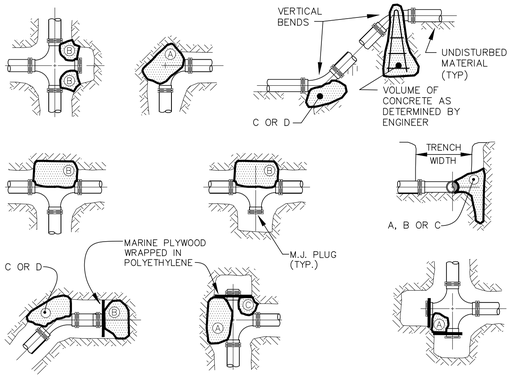
SECTION

NOTES

1. MACHINE CUT EXISTING PAVEMENT.
2. ALL TEMPORARY, DAMAGED OR DEFECTIVE PAVEMENT SHALL BE REMOVED PRIOR TO PLACEMENT OF PERMANENT TRENCH REPAIRS.
3. DIAMOND PATCHES, SHALL BE REQUIRED FOR ALL TRENCHES CROSSING ROADWAY. DIAMOND PATCHES SHALL MEET NHDOT REQUIREMENTS.

TYPICAL TRENCH PATCH

NOT TO SCALE



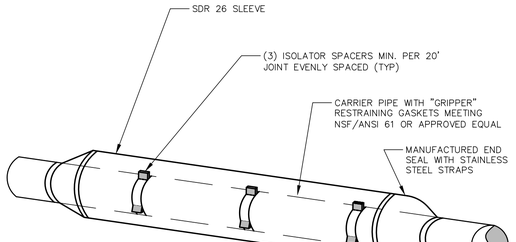
TEST PRESSURE = 150 psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL					
	REACTION TYPE		PIPE SIZE			
			4"	6"	8"	10"	12"
	A	90°	0.89	2.19	3.82	11.14	17.24
	B	180°	0.65	1.55	2.78	8.38	12.00
	C	45°	0.48	1.19	2.12	6.02	9.32
	D	22-1/2°	0.25	0.60	1.06	3.08	4.74
	E	11-1/4°	0.13	0.30	0.54	1.54	2.38

NOTES

1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL.
2. NO JOINTS SHALL BE COVERED WITH CONCRETE. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND FITTINGS PRIOR TO CONCRETE PLACEMENT.
3. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
4. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.

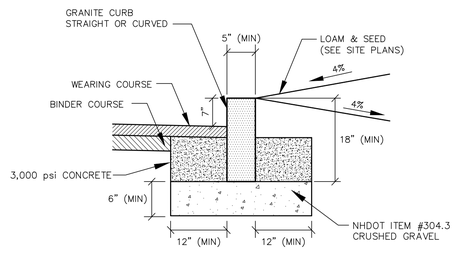
THRUST BLOCKING

NOT TO SCALE



WATER SLEEVE DETAIL

NOT TO SCALE

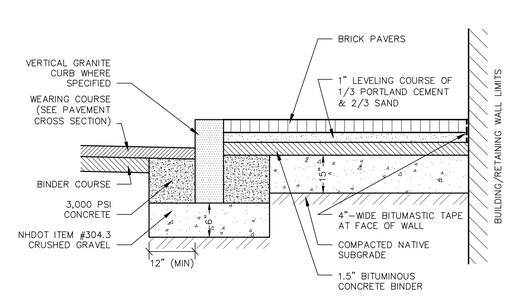


NOTES

1. SEE PLANS FOR PAVEMENT CROSS SECTION.
2. CURB SHALL BE INSTALLED PRIOR TO PLACEMENT OF TOP PAVEMENT COURSE.
3. JOINTS BETWEEN CURB STONES SHALL BE MORTARED.

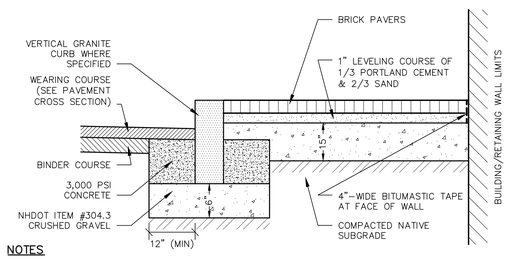
VERTICAL GRANITE CURB

NOT TO SCALE



BRICK SIDEWALK (IN CITY ROW)

NOT TO SCALE

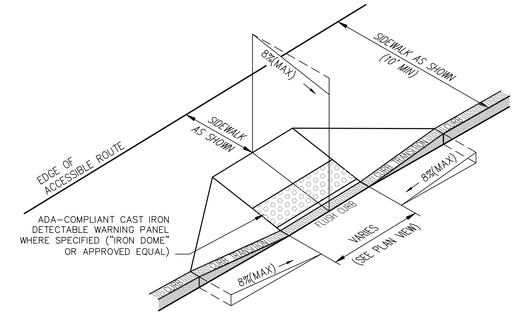


NOTES

1. PLASTIC EDGE RESTRAINTS SHALL BE USED FOR ALL BRICK PAVEMENT EDGES THAT DO NOT ABUT A BUILDING, RETAINING WALL, CURB OR OTHER UNYIELDING SITE ELEMENT. IN THESE AREAS, THE CRUSHED GRAVEL SUBBASE SHALL BE EXTENDED 6" (MIN.) BEYOND THE BRICK LIMITS.
2. 4' (MIN.) OF FROST FREE MATERIAL SHALL BE INSTALLED IN ALL DOOR SWING AREAS.

BRICK SIDEWALK / PATIO (PRIVATE)

NOT TO SCALE



CURB RAMP (TYPE 'D')

NOTES APPLICABLE TO ALL CURB RAMPS AND SIDEWALKS:

1. THE MAXIMUM ALLOWABLE CROSS SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 2%.
2. THE MAXIMUM ALLOWABLE SLOPE OF AN ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) CURB RAMP SHALL BE 8%.
4. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
5. BASE OF RAMP SHALL BE GRADED TO PREVENT THE PONDING OF WATER.
6. SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.
7. ALL CURB RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH AMERICANS WITH DISABILITIES ACT (ADA) AND ALL APPLICABLE CODES.
8. FLUSH CURB SECTIONS SHALL HAVE A MAXIMUM LIP REVEAL OF 1/2" AT THE EDGE OF PAVEMENT.
9. EDGES OF SIDEWALK FOOTINGS ALONG FLUSH CURBS SHALL BE HAUNCHED SO AS TO EXTEND TO A MINIMUM DEPTH OF 1' BELOW FINISH GRADE.
10. NO RAMP SHALL BE LESS THAN 4' IN WIDTH.

CURB RAMP & SIDEWALK NOTES

NOT TO SCALE

P5072

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
7/17/20

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JULY 17, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC / PLANNING BOARD	EBS	06/22/20
1	PLANNING BOARD	EBS	07/17/20

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5072-DETAILS.dwg

SCALE: 22"x34" 1" = 5'
11"x17" 1" = 10'

OWNER/APPLICANT:
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET PORTSMOUTH, NH 03801

PROJECT:
ST. JOHN'S EPISCOPAL CHURCH
TAX MAP 106 LOT 62
101 & 105 CHAPEL STREET PORTSMOUTH, NH 03801

TITLE:
PRELIMINARY DETAIL SHEET

SHEET NUMBER:
D-2

ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

Drainage Assessment

St. John's Episcopal Church
Tax Map 106, Lot 62
101 & 105 Chapel Street, Portsmouth, NH
Altus Project #5072

June 22, 2020

St. John's Episcopal Church is proposing to construct a ±1,043 sf infill building addition and associated improvements on its previously developed site on Chapel Street in Portsmouth, NH. Currently comprised of the historical Church building and adjacent Parish Hall, the site also includes a graveyard and various pedestrian accessways. Abutting parcels owned by the church feature paved parking areas with driveways off Chapel and Bow Streets. Currently, stormwater runoff from the two buildings is directed to the City sanitary sewer system by way of downspout leaders, yard drains, a track drain and an underdrained stone drip strip. Surrounding areas drain to Chapel Street and a catch basin located in the Church's parking lot that is tributary to the City's closed drainage system in Bow Street.

Together with the building addition, the project entails of the reconfiguration of existing sidewalks, installation of a new handicap ramp and the construction of an outdoor patio area, which taken together result in a net increase of 964 sf of impervious surface. In total, the project contemplates only 3,100 sf of land disturbance.

In order to accommodate the reconfigured stormwater characteristics of the site, a closed drainage system comprised of yard drains, roof leaders and a drainage trunk line is proposed. Given the current absence of a City storm drain in Chapel Street, this new system, like the existing piping, is being temporarily directed to the sanitary sewer. However, the new design has been arranged for easy extension and connection to a proposed drainage system that is to be built as part of the City's plans for reconstruction of Chapel Street. This shovel-ready project, while not yet funded, will install new utilities including separated sanitary and stormwater sewers.

For the purposes of this analysis, it was assumed that all the roof drains for the Parish Hall are directed to the Chapel Street sanitary sewer. This serves to create a conservative modelling scenario for the site's contribution to the sewer, identified as Point of Analysis (POA) #100. POA #200 is surface drainage along Chapel Street and POA #300 is a catch basin in the Church's rear parking lot along Bow Street. Together, these three POA's collect runoff from 0.53 acres of area as shown on the attached Pre- and Post-Development Drainage Area Plans.

The drainage study was completed using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. Reservoir routing was performed with the Dynamic Storage Indication method with automated calculation of tailwater conditions. A Type III 24-hour rainfall distribution was utilized in analyzing the data for the 2, 10, 25 and 50 year - 24-hour storm events

(this page left intentionally blank)

using rainfall data provided by the Northeast Regional Climate Center (NRCC). All rainfall amounts have been increased by 15%. Based on NRCS soils maps which indicated the site is comprised of Urban Land (699), in situ soils were modeled as Hydrologic Soil Group (HSG) C.

Drainage Analysis

A complete summary of the drainage model is included later in this report. The following table compares pre- and post-development peak rates of runoff for all analyzed storm events:

Stormwater Modeling Summary

Peak Rate (Q) in Cubic Feet per Second (cfs) for Type III 24-Hour Storm Events

Storm Event: / Rainfall:	2-Year Storm (3.68 inches)	10-Year Storm (5.59 inches)	25-Year Storm (7.08 inches)	50-Year Storm (8.48 inches)
POA#100 Sanitary Sewer				
Pre	0.7	1.0	1.3	1.5
Post	0.8	1.2	1.5	1.5
Net Change	**0.1**	**0.2**	**0.2**	**-**
POA #200 Chapel Street				
Pre	0.6	1.0	1.3	1.6
Post	0.6	0.9	1.2	1.4
Net Change	**-**	**-0.1**	**-0.1**	**-0.2**
POA #300 Catch Basin				
Pre	0.5	0.8	1.1	1.3
Post	0.5	0.8	1.0	1.2
Net Change	**-**	**-**	**-0.1**	**-0.1**

As the above table demonstrates, the post-development peak rates of runoff will match or be decreased from the existing conditions of the site for all analyzed storm events with the exception of POA #100 in the 2, 10 and 25-year events where the minor increases shown have been determined to be acceptable.

ATTACHMENTS

1. USGS Map and Aerial Photograph
2. Pre-Development Drainage Analysis
3. Post-Development Drainage Analysis
4. NRCC Extreme Precipitation Table
5. NRCS Soils Report
6. Plans (Pre- Development Drainage Area Plan, Post- Development Drainage Area Plan)

(this page left intentionally blank)

Section 1

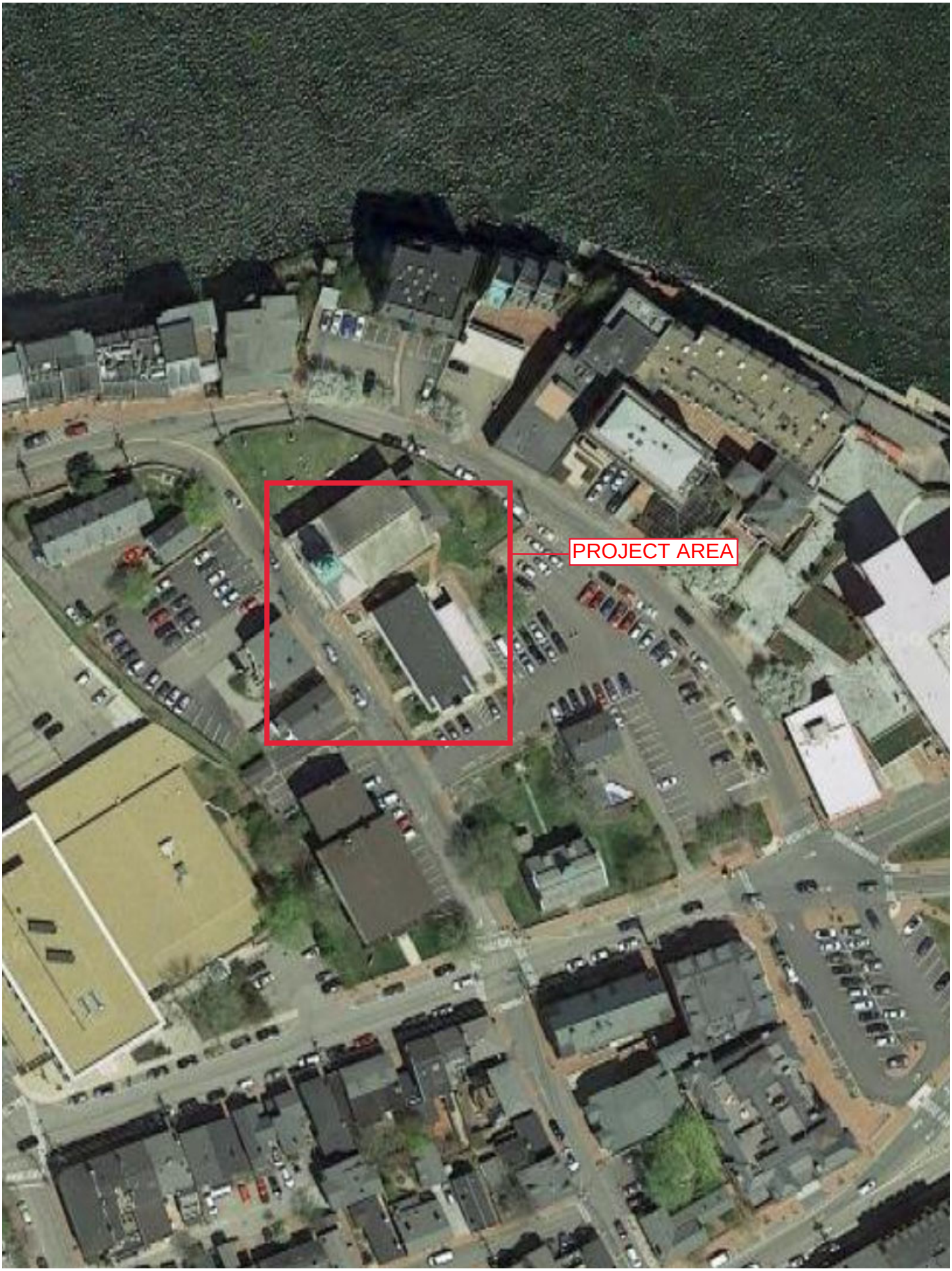
USGS Map and Aerial Photo

ALTUS
ENGINEERING, INC.

(this page left intentionally blank)


SITE
Atlantic Heights
Nicholas Spinney Lot
Keen Lot
Oak Terrace
Rice Lot
Christian Shore
Freemans Point
Maine-New Hampshire Bridge
Wentworth Acres
Bersum Gardens
Nobles Island
Willey Lot
Badgers Island
Memorial Bridge
Old Harbour
North Cem
Union Cem
Paul Mitchell, the School
Point of Grave Burial Ground
South Mill Pond
Creek Area
Meadowbrook
PORTSMOUTH
Portsmouth Plains
Saint Marys Cem
Calvary Cem
Proprietors Cem
Sagamore Hill
Sagamore Creek
GOSLING RD
ORIENTAL GDNS
COMMERCE WAY
SHEARWATER DR
OSPREY DR
BLUE HERON DR
KEARSARGE WAY
DURGIN LN
ARTHUR F BRADY DR
ECHO AVE
MARKET ST
MAPLEWOOD AVE
EDMOND AVE
CENTRAL AVE
MEADOW RD
CORPORATE DR
SPAULDING TPKE
OAK AVE
ASHLAND RD
THORNTON ST
BARTLETT ST
STATE ST
COURT ST
CABOT ST
MIDDLE ST
RICHARDS AVE
BROAD ST
SOUTH ST
CLOUGH DR
LINCOLN AVE
UNION ST
WIBIRD ST
ALDRICH RD
THAXTER RD
COAKLEY RD
BORTHWICK AVE
ISLINGTON ST
SPINNEY RD
ESSEX AVE
LAFAYETTE RD
JONES AVE
GREENLEAF AVE
95
Byp 1
1
1A
4
33
PO
F
H

(this page left intentionally blank)


PROJECT AREA

(this page left intentionally blank)

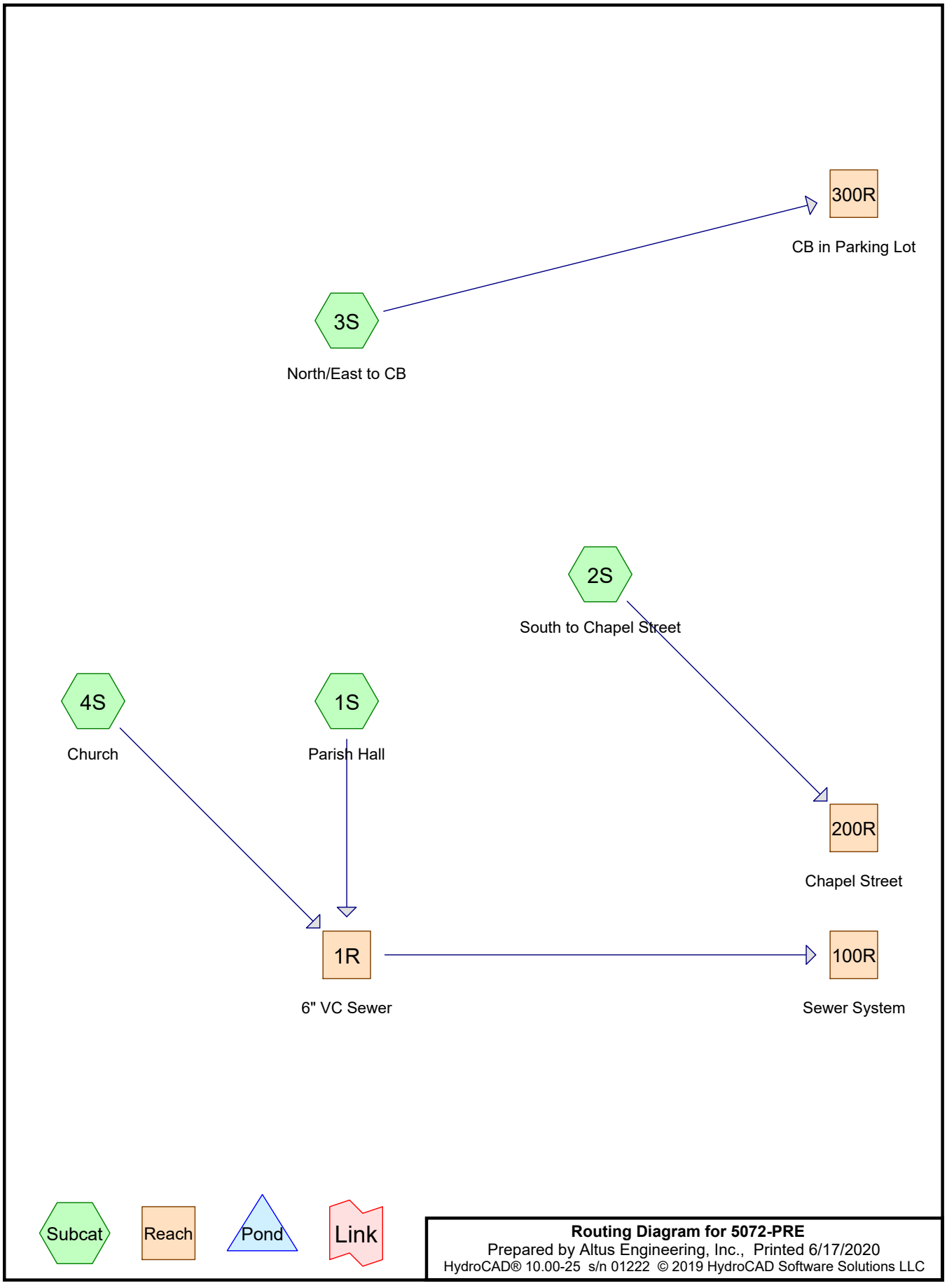
Section 2

Drainage Calculations

Pre-Development
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary
50-Year, 24-Hour Summary

ALTUS
ENGINEERING, INC.

(this page left intentionally blank)



Routing Diagram for 5072-PRE
Prepared by Altus Engineering, Inc., Printed 6/17/2020

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Parish Hall Runoff Area=4,617 sf 100.00% Impervious Runoff Depth>3.44"
Tc=5.0 min CN=98 Runoff=0.39 cfs 0.030 af

Subcatchment 2S: South to Chapel Street Runoff Area=8,233 sf 76.93% Impervious Runoff Depth>2.81"
Flow Length=197' Tc=5.0 min CN=92 Runoff=0.62 cfs 0.044 af

Subcatchment 3S: North/East to CB Runoff Area=6,740 sf 78.89% Impervious Runoff Depth>2.91"
Flow Length=162' Tc=5.0 min CN=93 Runoff=0.52 cfs 0.037 af

Subcatchment 4S: Church Runoff Area=3,376 sf 94.88% Impervious Runoff Depth>3.33"
Tc=5.0 min CN=97 Runoff=0.28 cfs 0.022 af

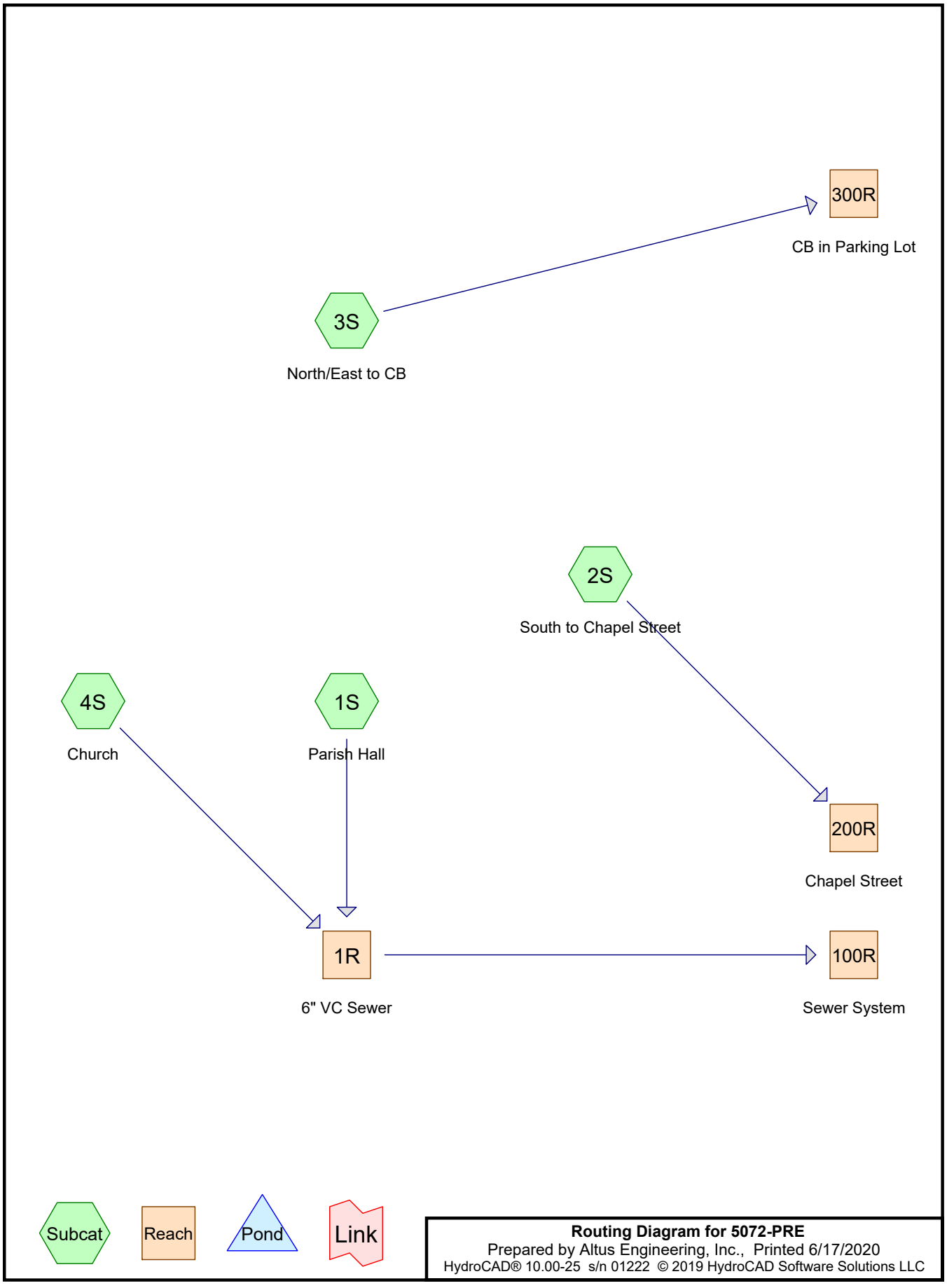
Reach 1R: 6" VC Sewer Avg. Flow Depth=0.24' Max Vel=7.10 fps Inflow=0.68 cfs 0.052 af
6.0" Round Pipe n=0.011 L=260.0' S=0.0453 '/' Capacity=1.41 cfs Outflow=0.67 cfs 0.052 af

Reach 100R: Sewer System Inflow=0.67 cfs 0.052 af
Outflow=0.67 cfs 0.052 af

Reach 200R: Chapel Street Inflow=0.62 cfs 0.044 af
Outflow=0.62 cfs 0.044 af

Reach 300R: CB in Parking Lot Inflow=0.52 cfs 0.037 af
Outflow=0.52 cfs 0.037 af

Total Runoff Area = 0.527 ac Runoff Volume = 0.134 af Average Runoff Depth = 3.04"
15.22% Pervious = 0.080 ac 84.78% Impervious = 0.447 ac



Routing Diagram for 5072-PRE
Prepared by Altus Engineering, Inc., Printed 6/17/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.080	74	>75% Grass cover, Good, HSG C (2S, 3S, 4S)
0.447	98	Impervious (1S, 2S, 3S, 4S)
0.527	**94**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.080	HSG C	2S, 3S, 4S
0.000	HSG D	
0.447	Other	1S, 2S, 3S, 4S
0.527		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Parish Hall Runoff Area=4,617 sf 100.00% Impervious Runoff Depth>5.35"
Tc=5.0 min CN=98 Runoff=0.60 cfs 0.047 af

Subcatchment 2S: South to Chapel Street Runoff Area=8,233 sf 76.93% Impervious Runoff Depth>4.66"
Flow Length=197' Tc=5.0 min CN=92 Runoff=1.01 cfs 0.073 af

Subcatchment 3S: North/East to CB Runoff Area=6,740 sf 78.89% Impervious Runoff Depth>4.77"
Flow Length=162' Tc=5.0 min CN=93 Runoff=0.84 cfs 0.062 af

Subcatchment 4S: Church Runoff Area=3,376 sf 94.88% Impervious Runoff Depth>5.23"
Tc=5.0 min CN=97 Runoff=0.44 cfs 0.034 af

Reach 1R: 6" VC Sewer Avg. Flow Depth=0.32' Max Vel=7.85 fps Inflow=1.04 cfs 0.081 af
6.0" Round Pipe n=0.011 L=260.0' S=0.0453 '/' Capacity=1.41 cfs Outflow=1.03 cfs 0.081 af

Reach 100R: Sewer System Inflow=1.03 cfs 0.081 af
Outflow=1.03 cfs 0.081 af

Reach 200R: Chapel Street Inflow=1.01 cfs 0.073 af
Outflow=1.01 cfs 0.073 af

Reach 300R: CB in Parking Lot Inflow=0.84 cfs 0.062 af
Outflow=0.84 cfs 0.062 af

Total Runoff Area = 0.527 ac Runoff Volume = 0.216 af Average Runoff Depth = 4.92"
15.22% Pervious = 0.080 ac 84.78% Impervious = 0.447 ac

Summary for Subcatchment 1S: Parish Hall

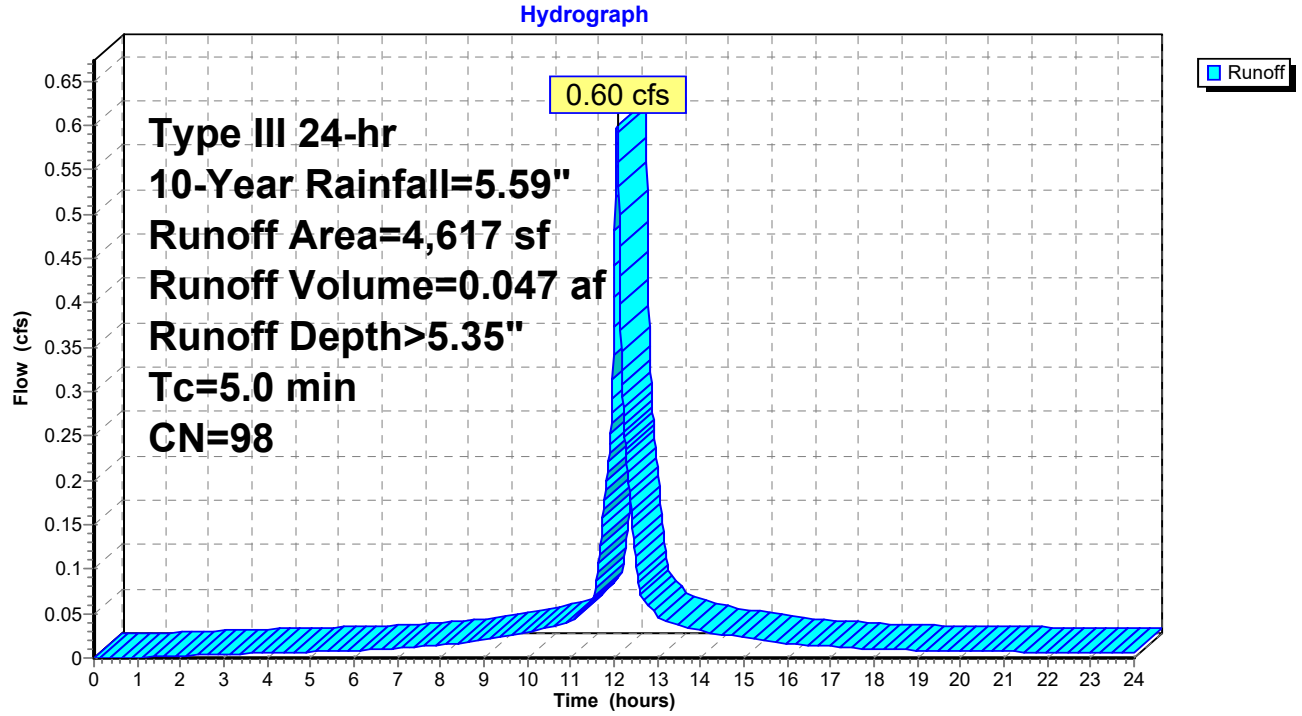
Runoff = 0.60 cfs @ 12.07 hrs, Volume= 0.047 af, Depth> 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	4,617	98	Impervious
	4,617		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: Parish Hall



Summary for Subcatchment 2S: South to Chapel Street

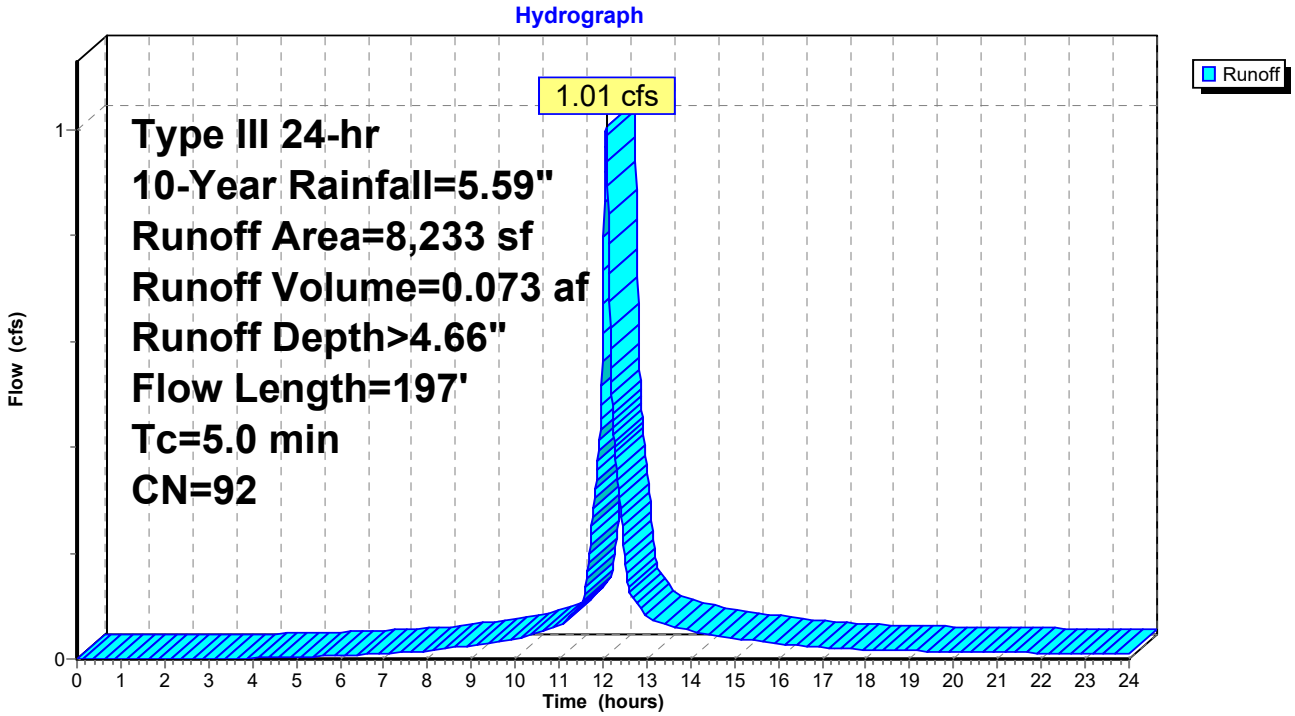
Runoff = 1.01 cfs @ 12.07 hrs, Volume= 0.073 af, Depth> 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	6,334	98	Impervious
	1,899	74	>75% Grass cover, Good, HSG C
	8,233	92	Weighted Average
	1,899		23.07% Pervious Area
	6,334		76.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0400	1.43		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.1	27	0.0833	5.86		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	69	0.1072	6.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	71	0.0626	5.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	197	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 2S: South to Chapel Street



Summary for Subcatchment 3S: North/East to CB

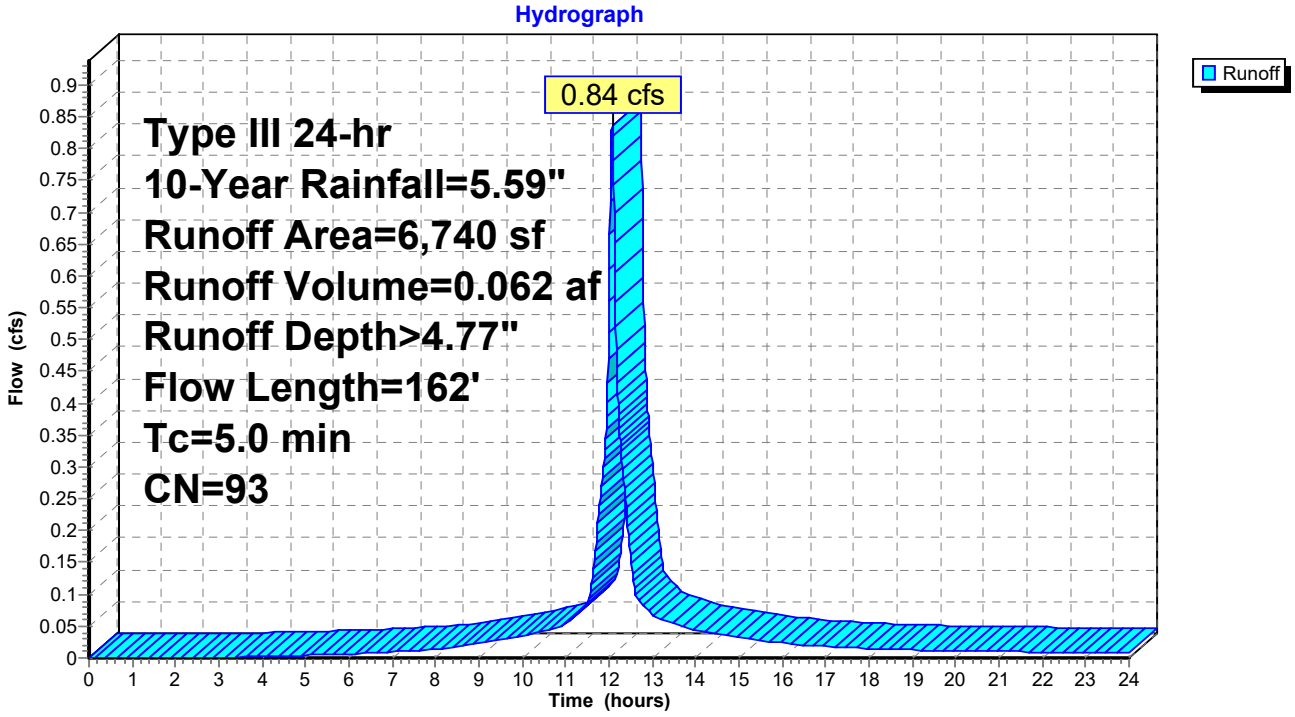
Runoff = 0.84 cfs @ 12.07 hrs, Volume= 0.062 af, Depth> 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	5,317	98	Impervious
	1,423	74	>75% Grass cover, Good, HSG C
	6,740	93	Weighted Average
	1,423		21.11% Pervious Area
	5,317		78.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	33	0.1500	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
0.3	59	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	70	0.0325	3.66		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	162	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 3S: North/East to CB



Summary for Subcatchment 4S: Church

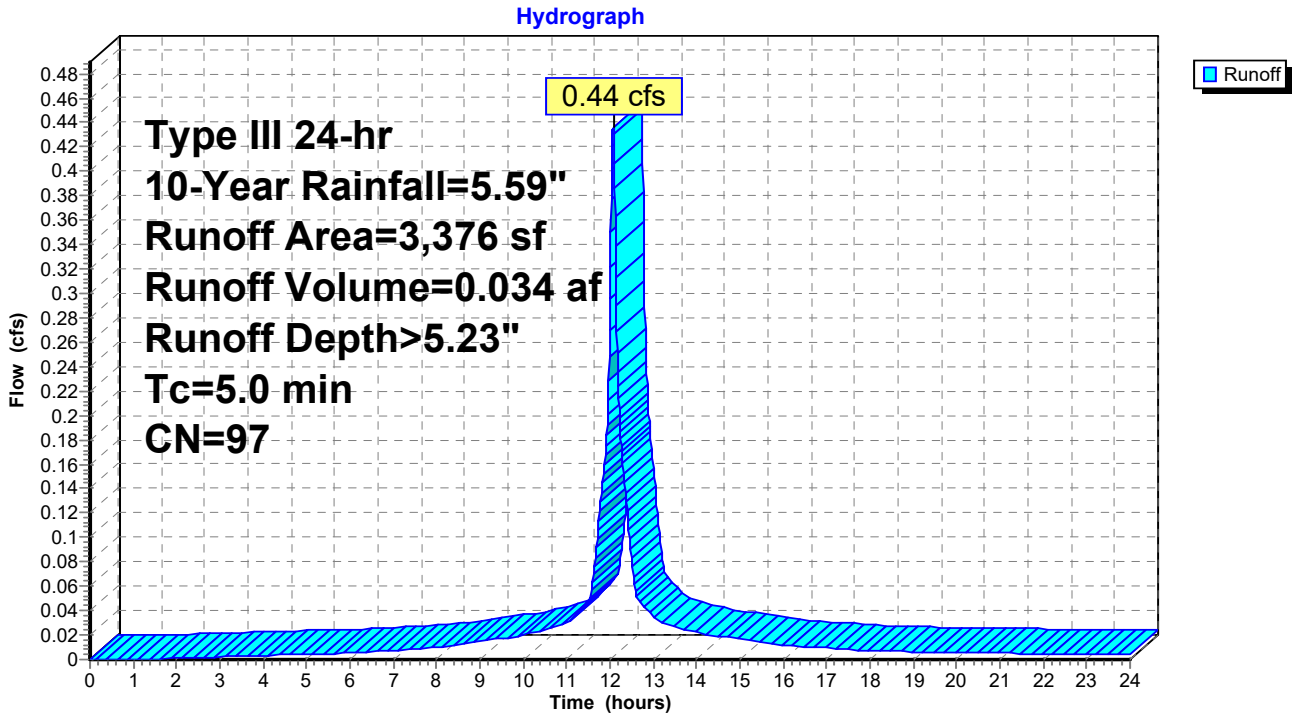
Runoff = 0.44 cfs @ 12.07 hrs, Volume= 0.034 af, Depth> 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	3,203	98	Impervious
	173	74	>75% Grass cover, Good, HSG C
	3,376	97	Weighted Average
	173		5.12% Pervious Area
	3,203		94.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 4S: Church



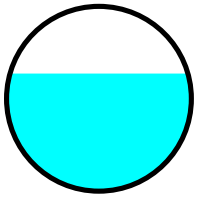
Summary for Reach 1R: 6" VC Sewer

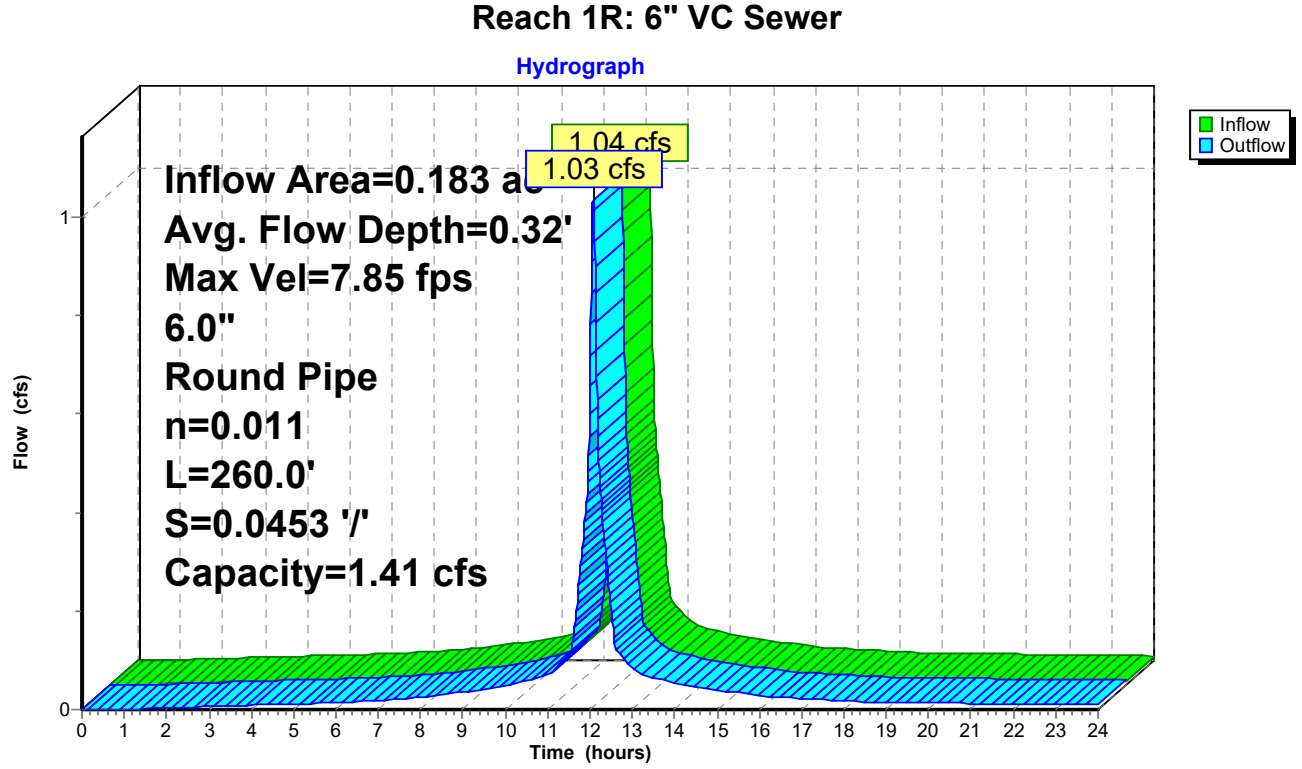
Inflow Area = 0.183 ac, 97.84% Impervious, Inflow Depth > 5.30" for 10-Year event
Inflow = 1.04 cfs @ 12.07 hrs, Volume= 0.081 af
Outflow = 1.03 cfs @ 12.08 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.85 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.71 fps, Avg. Travel Time= 1.6 min

Peak Storage= 34 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 1.41 cfs

6.0" Round Pipe
n= 0.011 Clay tile
Length= 260.0' Slope= 0.0453 '/'
Inlet Invert= 31.21', Outlet Invert= 19.44'



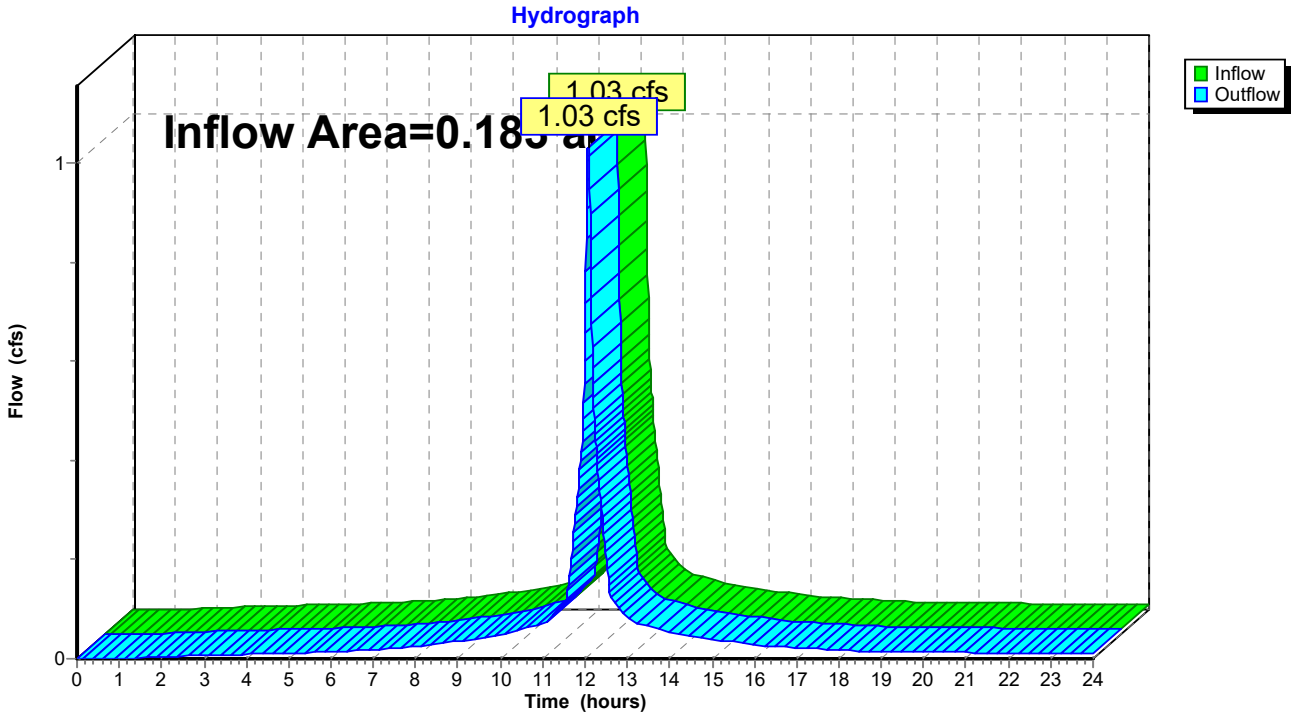


Summary for Reach 100R: Sewer System

Inflow Area = 0.183 ac, 97.84% Impervious, Inflow Depth > 5.30" for 10-Year event
Inflow = 1.03 cfs @ 12.08 hrs, Volume= 0.081 af
Outflow = 1.03 cfs @ 12.08 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 100R: Sewer System

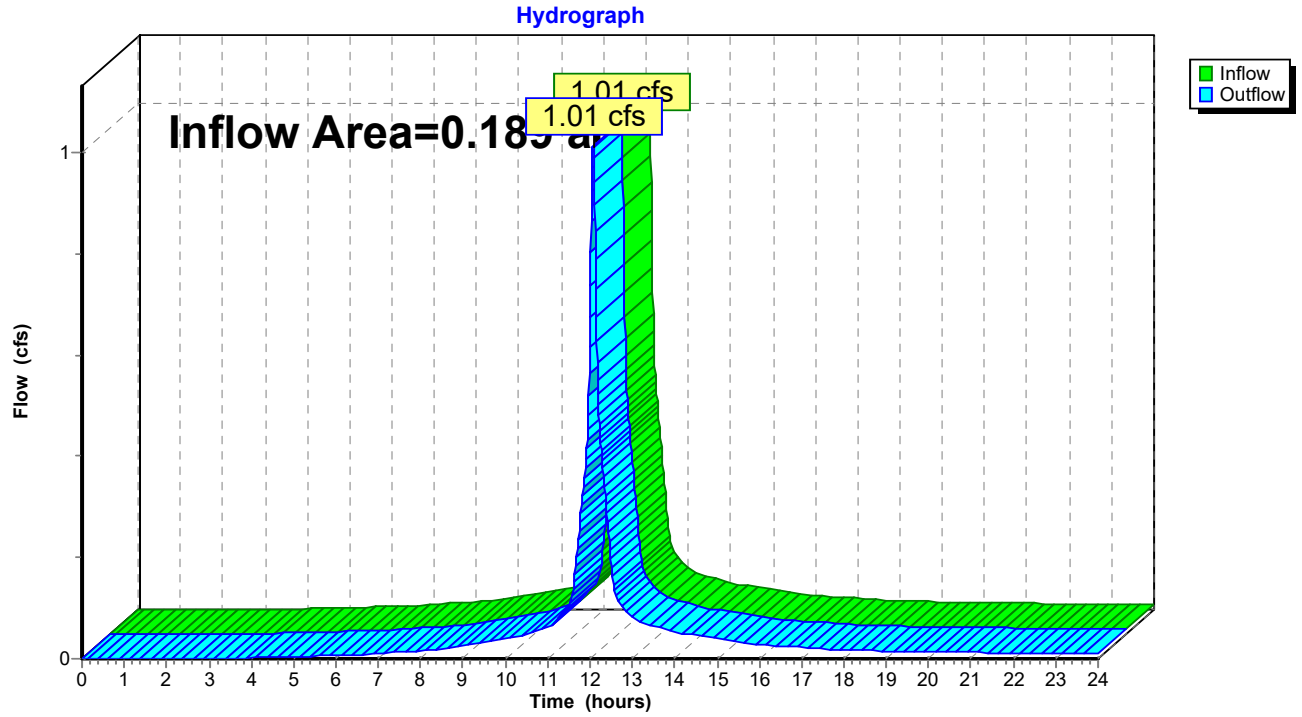


Summary for Reach 200R: Chapel Street

Inflow Area = 0.189 ac, 76.93% Impervious, Inflow Depth > 4.66" for 10-Year event
Inflow = 1.01 cfs @ 12.07 hrs, Volume= 0.073 af
Outflow = 1.01 cfs @ 12.07 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 200R: Chapel Street

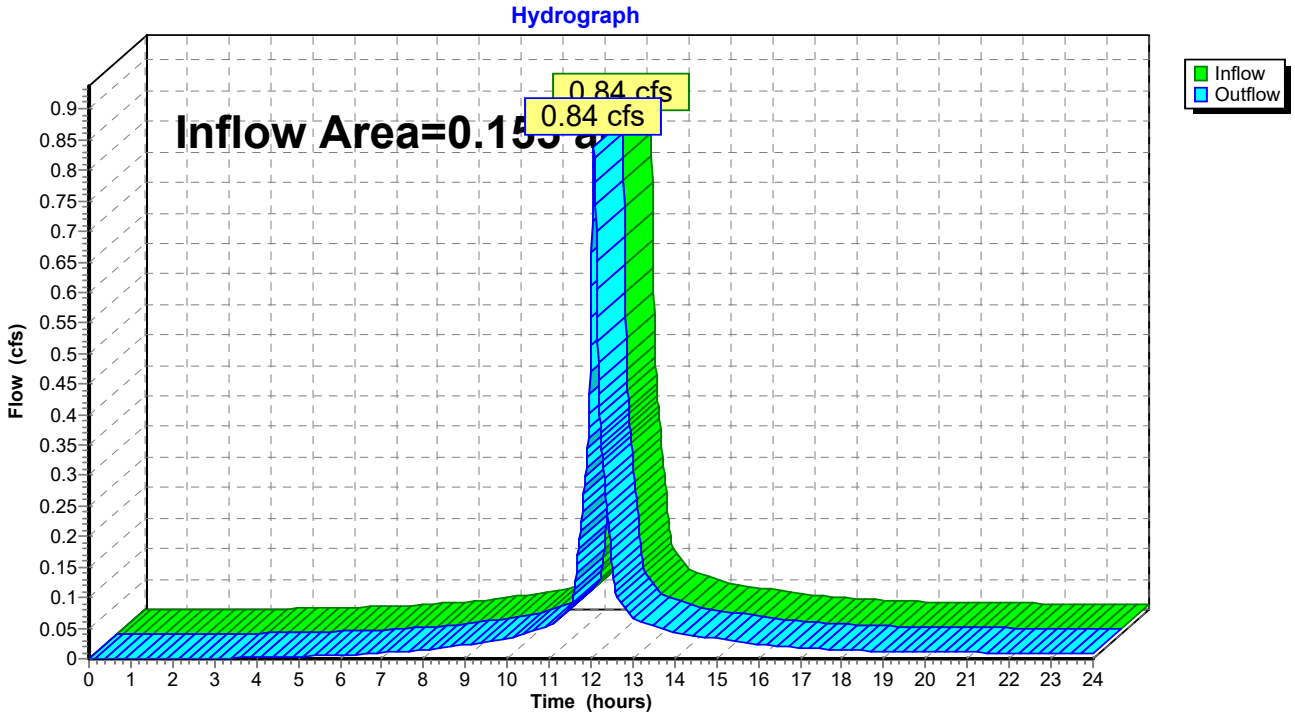


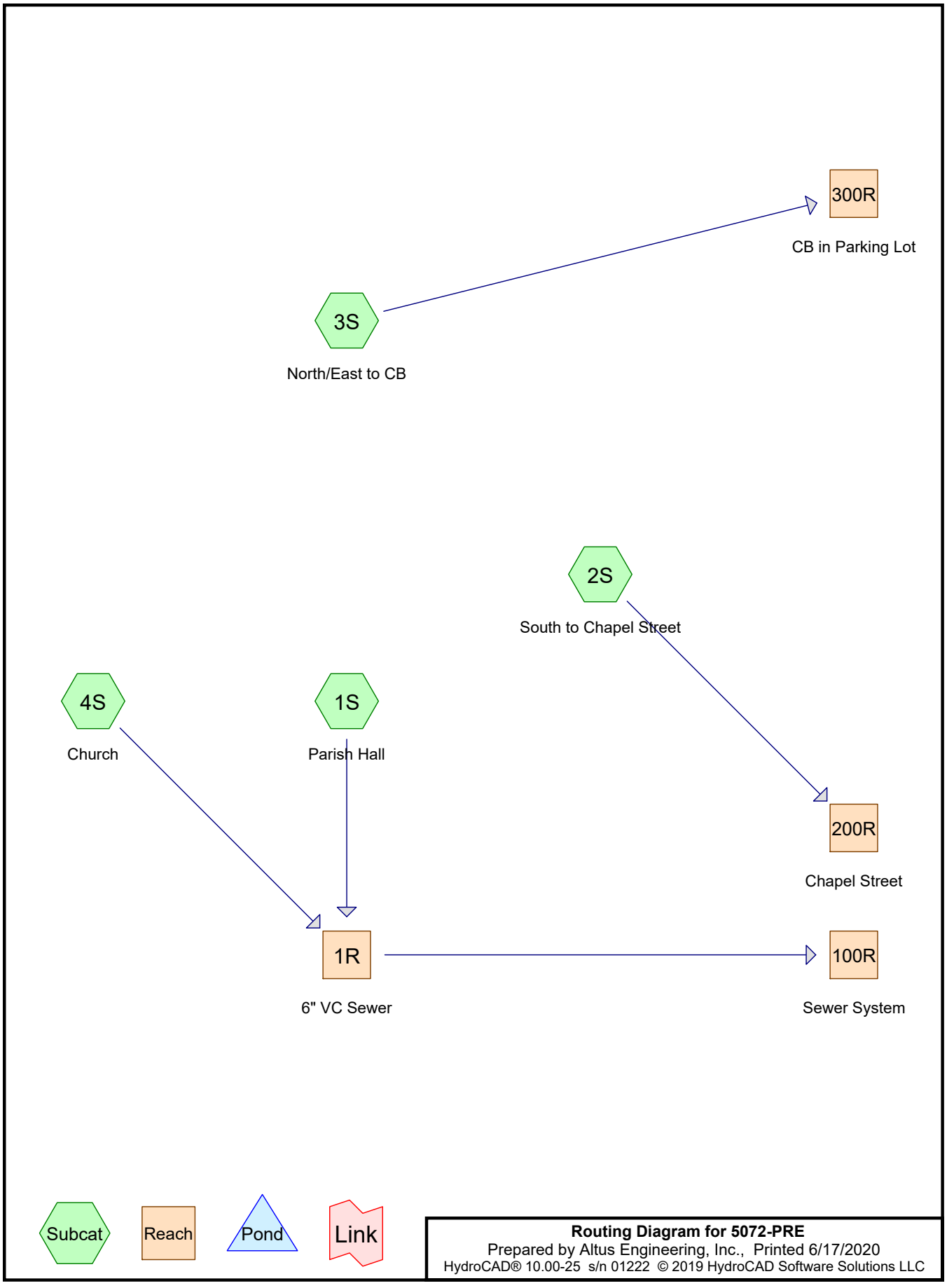
Summary for Reach 300R: CB in Parking Lot

Inflow Area = 0.155 ac, 78.89% Impervious, Inflow Depth > 4.77" for 10-Year event
Inflow = 0.84 cfs @ 12.07 hrs, Volume= 0.062 af
Outflow = 0.84 cfs @ 12.07 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 300R: CB in Parking Lot





Routing Diagram for 5072-PRE
Prepared by Altus Engineering, Inc., Printed 6/17/2020

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Parish Hall Runoff Area=4,617 sf 100.00% Impervious Runoff Depth>6.84"
Tc=5.0 min CN=98 Runoff=0.76 cfs 0.060 af

Subcatchment 2S: South to Chapel Street Runoff Area=8,233 sf 76.93% Impervious Runoff Depth>6.13"
Flow Length=197' Tc=5.0 min CN=92 Runoff=1.31 cfs 0.097 af

Subcatchment 3S: North/East to CB Runoff Area=6,740 sf 78.89% Impervious Runoff Depth>6.25"
Flow Length=162' Tc=5.0 min CN=93 Runoff=1.08 cfs 0.081 af

Subcatchment 4S: Church Runoff Area=3,376 sf 94.88% Impervious Runoff Depth>6.72"
Tc=5.0 min CN=97 Runoff=0.56 cfs 0.043 af

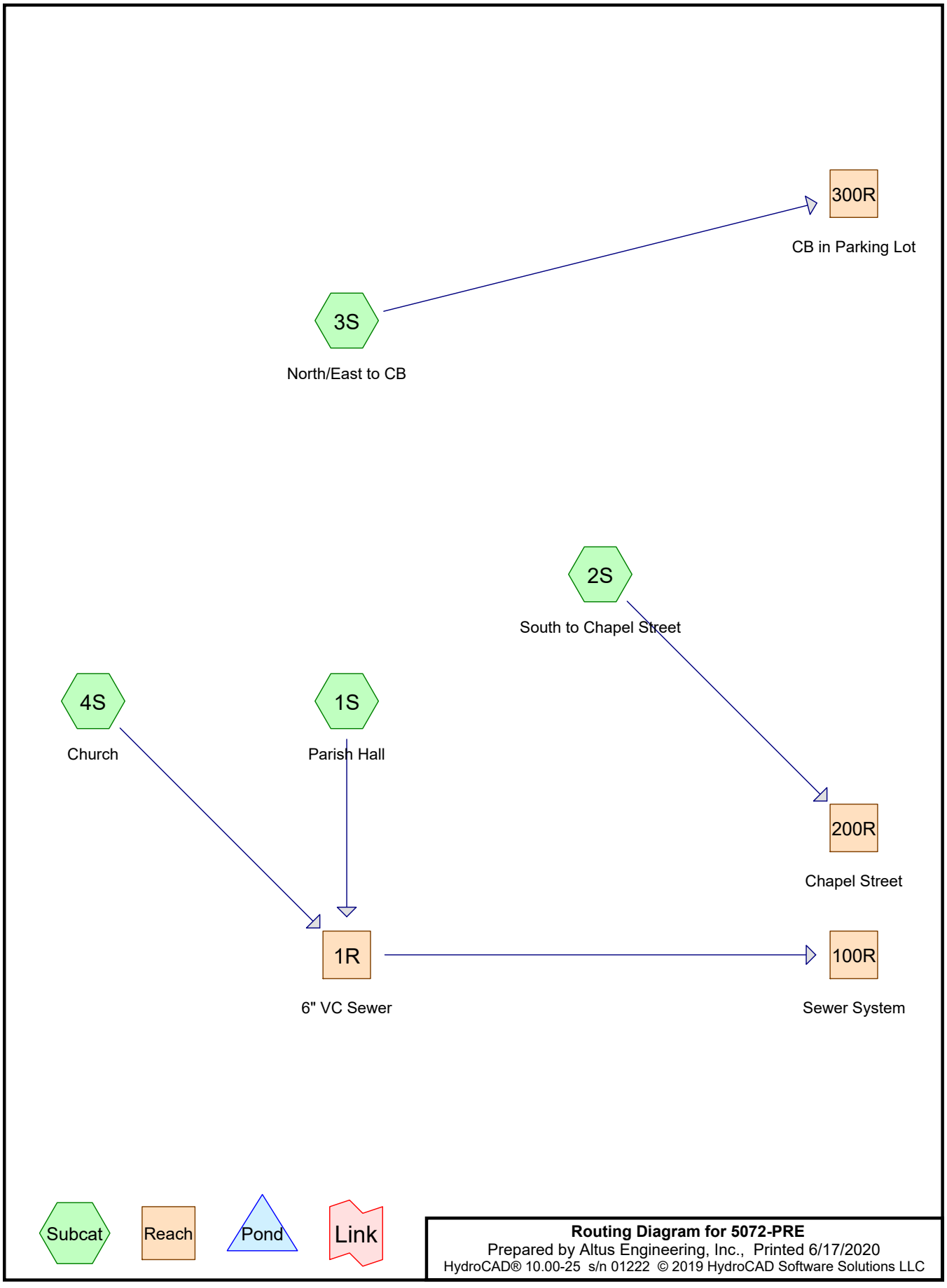
Reach 1R: 6" VC Sewer Avg. Flow Depth=0.38' Max Vel=8.16 fps Inflow=1.32 cfs 0.104 af
6.0" Round Pipe n=0.011 L=260.0' S=0.0453 '/' Capacity=1.41 cfs Outflow=1.31 cfs 0.104 af

Reach 100R: Sewer System Inflow=1.31 cfs 0.104 af
Outflow=1.31 cfs 0.104 af

Reach 200R: Chapel Street Inflow=1.31 cfs 0.097 af
Outflow=1.31 cfs 0.097 af

Reach 300R: CB in Parking Lot Inflow=1.08 cfs 0.081 af
Outflow=1.08 cfs 0.081 af

Total Runoff Area = 0.527 ac Runoff Volume = 0.281 af Average Runoff Depth = 6.39"
15.22% Pervious = 0.080 ac 84.78% Impervious = 0.447 ac



Routing Diagram for 5072-PRE
Prepared by Altus Engineering, Inc., Printed 6/17/2020

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Parish Hall Runoff Area=4,617 sf 100.00% Impervious Runoff Depth>8.23"
Tc=5.0 min CN=98 Runoff=0.91 cfs 0.073 af

Subcatchment 2S: South to Chapel Street Runoff Area=8,233 sf 76.93% Impervious Runoff Depth>7.51"
Flow Length=197' Tc=5.0 min CN=92 Runoff=1.58 cfs 0.118 af

Subcatchment 3S: North/East to CB Runoff Area=6,740 sf 78.89% Impervious Runoff Depth>7.63"
Flow Length=162' Tc=5.0 min CN=93 Runoff=1.30 cfs 0.098 af

Subcatchment 4S: Church Runoff Area=3,376 sf 94.88% Impervious Runoff Depth>8.11"
Tc=5.0 min CN=97 Runoff=0.67 cfs 0.052 af

Reach 1R: 6" VC Sewer Avg. Flow Depth=0.50' Max Vel=8.19 fps Inflow=1.58 cfs 0.125 af
6.0" Round Pipe n=0.011 L=260.0' S=0.0453 '/' Capacity=1.41 cfs Outflow=1.51 cfs 0.125 af

Reach 100R: Sewer System Inflow=1.51 cfs 0.125 af
Outflow=1.51 cfs 0.125 af

Reach 200R: Chapel Street Inflow=1.58 cfs 0.118 af
Outflow=1.58 cfs 0.118 af

Reach 300R: CB in Parking Lot Inflow=1.30 cfs 0.098 af
Outflow=1.30 cfs 0.098 af

Total Runoff Area = 0.527 ac Runoff Volume = 0.342 af Average Runoff Depth = 7.78"
15.22% Pervious = 0.080 ac 84.78% Impervious = 0.447 ac

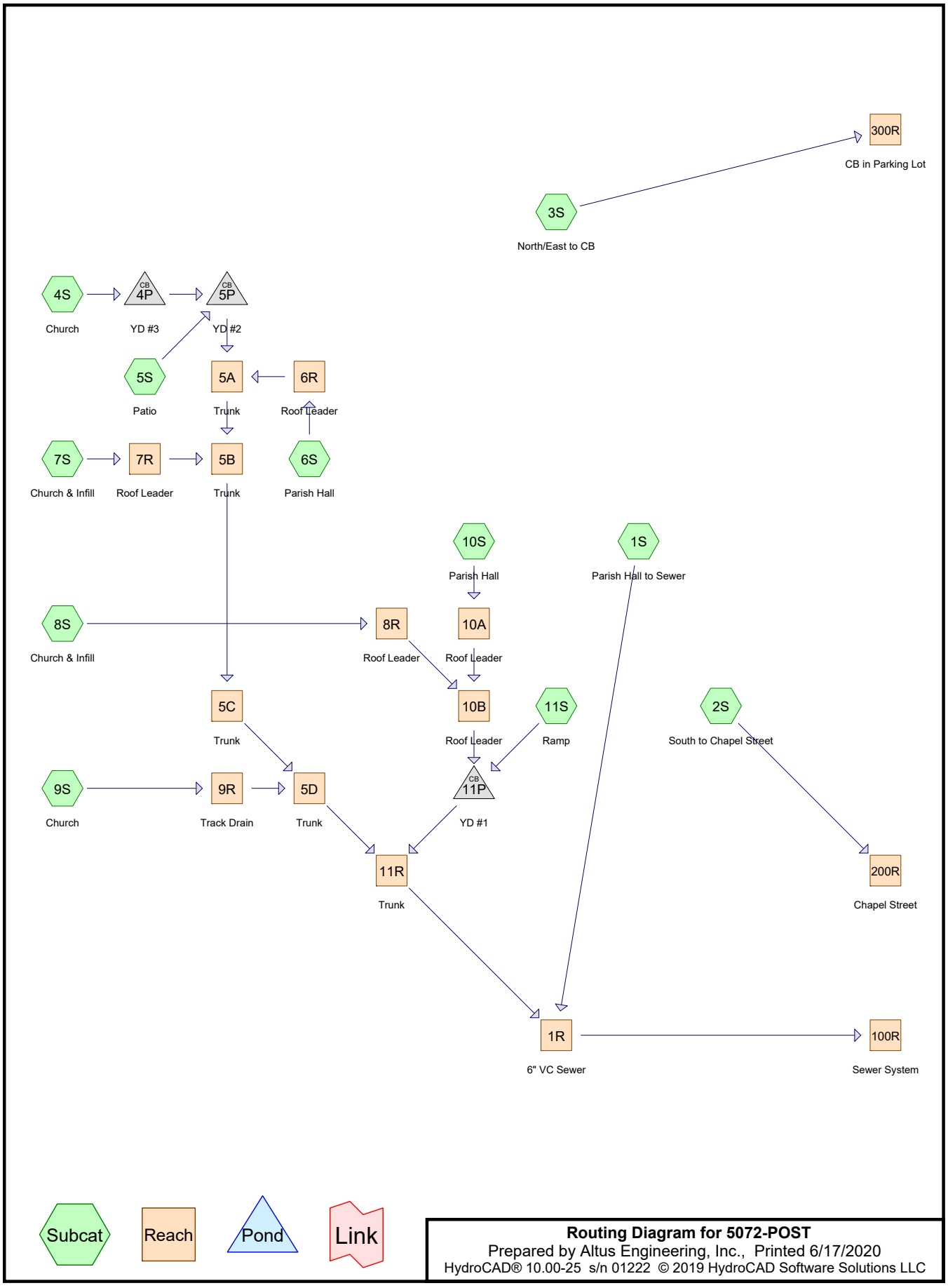
Section 3

Drainage Calculations

Post-Development
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary
50-Year, 24-Hour Summary

ALTUS
ENGINEERING, INC.

(this page left intentionally blank)



Routing Diagram for 5072-POST
Prepared by Altus Engineering, Inc., Printed 6/17/2020
HydroCAD® 10.00-25 s/n 01222 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Parish Hall to Sewer Runoff Area=3,589 sf 100.00% Impervious Runoff Depth>3.44"
Tc=5.0 min CN=98 Runoff=0.31 cfs 0.024 af

Subcatchment 2S: South to Chapel Street Runoff Area=7,269 sf 81.33% Impervious Runoff Depth>3.01"
Flow Length=154' Tc=5.0 min CN=94 Runoff=0.58 cfs 0.042 af

Subcatchment 3S: North/East to CB Runoff Area=6,105 sf 83.18% Impervious Runoff Depth>3.01"
Flow Length=142' Tc=5.0 min CN=94 Runoff=0.49 cfs 0.035 af

Subcatchment 4S: Church Runoff Area=1,162 sf 96.39% Impervious Runoff Depth>3.33"
Tc=5.0 min CN=97 Runoff=0.10 cfs 0.007 af

Subcatchment 5S: Patio Runoff Area=640 sf 85.62% Impervious Runoff Depth>3.11"
Tc=5.0 min CN=95 Runoff=0.05 cfs 0.004 af

Subcatchment 6S: Parish Hall Runoff Area=267 sf 100.00% Impervious Runoff Depth>3.44"
Tc=5.0 min CN=98 Runoff=0.02 cfs 0.002 af

Subcatchment 7S: Church & Infill Runoff Area=1,303 sf 100.00% Impervious Runoff Depth>3.44"
Tc=5.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment 8S: Church & Infill Runoff Area=1,319 sf 100.00% Impervious Runoff Depth>3.44"
Tc=5.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment 9S: Church Runoff Area=184 sf 100.00% Impervious Runoff Depth>3.44"
Tc=5.0 min CN=98 Runoff=0.02 cfs 0.001 af

Subcatchment 10S: Parish Hall Runoff Area=761 sf 100.00% Impervious Runoff Depth>3.44"
Tc=5.0 min CN=98 Runoff=0.06 cfs 0.005 af

Subcatchment 11S: Ramp Runoff Area=343 sf 96.79% Impervious Runoff Depth>3.33"
Tc=5.0 min CN=97 Runoff=0.03 cfs 0.002 af

Reach 1R: 6" VC Sewer Avg. Flow Depth=0.27' Max Vel=7.42 fps Inflow=0.81 cfs 0.062 af
6.0" Round Pipe n=0.011 L=260.0' S=0.0453 '/' Capacity=1.41 cfs Outflow=0.81 cfs 0.062 af

Reach 5A: Trunk Avg. Flow Depth=0.20' Max Vel=2.03 fps Inflow=0.17 cfs 0.013 af
8.0" Round Pipe n=0.012 L=2.0' S=0.0050 '/' Capacity=0.93 cfs Outflow=0.17 cfs 0.013 af

Reach 5B: Trunk Avg. Flow Depth=0.25' Max Vel=2.33 fps Inflow=0.28 cfs 0.022 af
8.0" Round Pipe n=0.012 L=58.0' S=0.0050 '/' Capacity=0.93 cfs Outflow=0.28 cfs 0.022 af

Reach 5C: Trunk Avg. Flow Depth=0.11' Max Vel=7.57 fps Inflow=0.28 cfs 0.022 af
8.0" Round Pipe n=0.012 L=3.8' S=0.1368 '/' Capacity=4.84 cfs Outflow=0.28 cfs 0.022 af

Reach 5D: Trunk Avg. Flow Depth=0.11' Max Vel=7.69 fps Inflow=0.30 cfs 0.023 af
8.0" Round Pipe n=0.012 L=6.0' S=0.1367 '/' Capacity=4.84 cfs Outflow=0.30 cfs 0.023 af

Reach 6R: Roof Leader Avg. Flow Depth=0.05' Max Vel=2.54 fps Inflow=0.02 cfs 0.002 af
4.0" Round Pipe n=0.012 L=9.0' S=0.0400 '/' Capacity=0.41 cfs Outflow=0.02 cfs 0.002 af

Reach 7R: Roof Leader Avg. Flow Depth=0.11' Max Vel=4.64 fps Inflow=0.11 cfs 0.009 af
4.0" Round Pipe n=0.012 L=17.0' S=0.0600 '/' Capacity=0.51 cfs Outflow=0.11 cfs 0.009 af

Reach 8R: Roof Leader Avg. Flow Depth=0.10' Max Vel=5.38 fps Inflow=0.11 cfs 0.009 af
4.0" Round Pipe n=0.012 L=11.7' S=0.0897 '/' Capacity=0.62 cfs Outflow=0.11 cfs 0.009 af

Reach 9R: Track Drain Avg. Flow Depth=0.03' Max Vel=4.46 fps Inflow=0.02 cfs 0.001 af
4.0" Round Pipe n=0.012 L=15.0' S=0.2747 '/' Capacity=1.08 cfs Outflow=0.02 cfs 0.001 af

Reach 10A: Roof Leader Avg. Flow Depth=0.08' Max Vel=4.20 fps Inflow=0.06 cfs 0.005 af
4.0" Round Pipe n=0.012 L=10.0' S=0.0700 '/' Capacity=0.55 cfs Outflow=0.06 cfs 0.005 af

Reach 10B: Roof Leader Avg. Flow Depth=0.13' Max Vel=5.59 fps Inflow=0.18 cfs 0.014 af
4.0" Round Pipe n=0.012 L=5.7' S=0.0702 '/' Capacity=0.55 cfs Outflow=0.18 cfs 0.014 af

Reach 11R: Trunk Avg. Flow Depth=0.15' Max Vel=8.96 fps Inflow=0.50 cfs 0.039 af
8.0" Round Pipe n=0.012 L=23.0' S=0.1361 '/' Capacity=4.83 cfs Outflow=0.50 cfs 0.039 af

Reach 100R: Sewer System Inflow=0.81 cfs 0.062 af
Outflow=0.81 cfs 0.062 af

Reach 200R: Chapel Street Inflow=0.58 cfs 0.042 af
Outflow=0.58 cfs 0.042 af

Reach 300R: CB in Parking Lot Inflow=0.49 cfs 0.035 af
Outflow=0.49 cfs 0.035 af

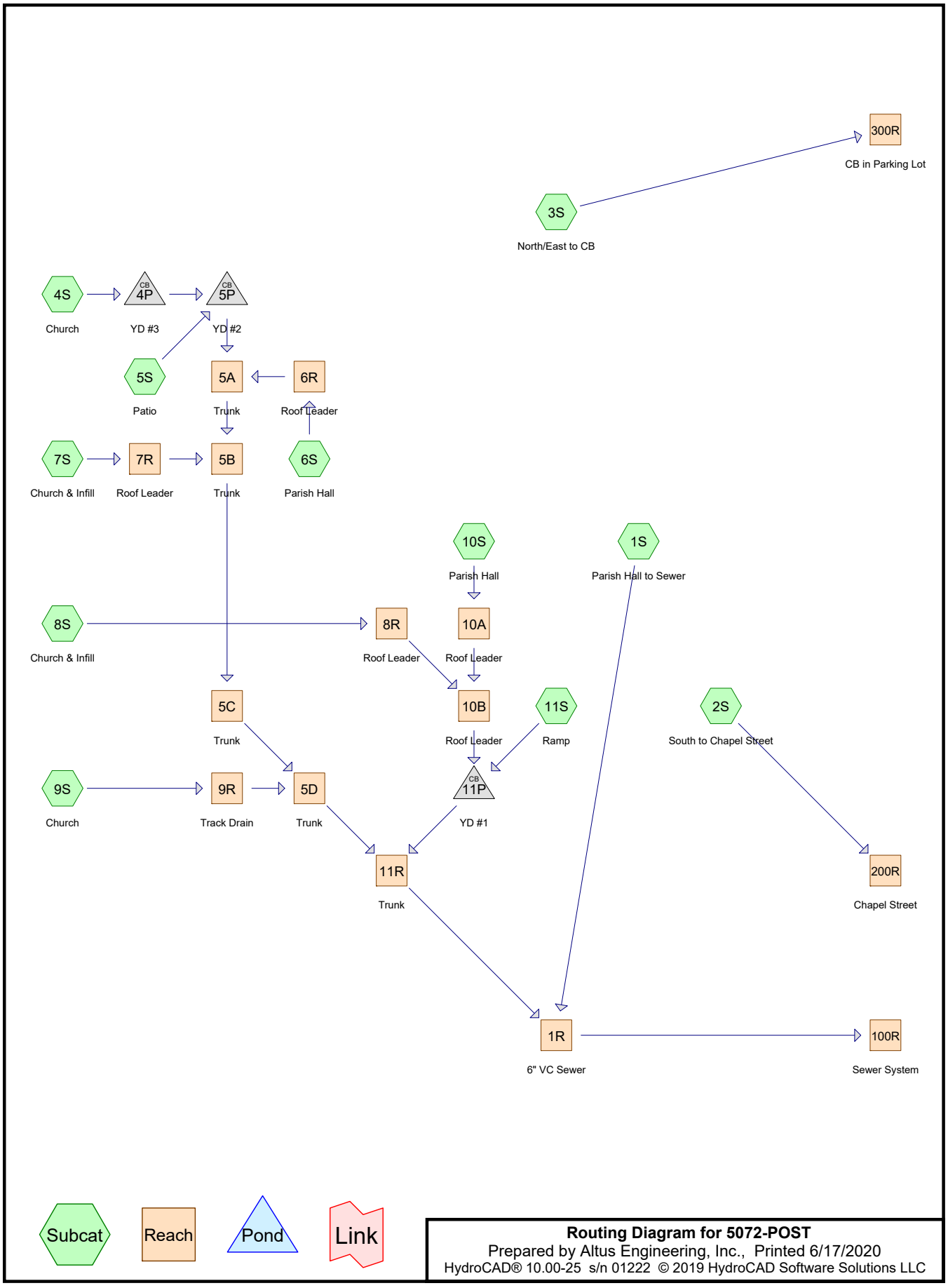
Pond 4P: YD #3 Peak Elev=38.71' Inflow=0.10 cfs 0.007 af
6.0" Round Culvert n=0.012 L=12.0' S=0.0100 '/' Outflow=0.10 cfs 0.007 af

Pond 5P: YD #2 Peak Elev=38.47' Inflow=0.15 cfs 0.011 af
8.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.15 cfs 0.011 af

Pond 11P: YD #1 Peak Elev=36.98' Inflow=0.21 cfs 0.016 af
6.0" Round Culvert n=0.012 L=11.0' S=0.0100 '/' Outflow=0.21 cfs 0.016 af

Total Runoff Area = 0.527 ac Runoff Volume = 0.139 af Average Runoff Depth = 3.17"
11.02% Pervious = 0.058 ac 88.98% Impervious = 0.469 ac

(this page left intentionally blank)



Routing Diagram for 5072-POST
Prepared by Altus Engineering, Inc., Printed 6/17/2020
HydroCAD® 10.00-25 s/n 01222 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.058	74	>75% Grass cover, Good, HSG C (2S, 3S, 4S, 5S, 11S)
0.469	98	Impervious (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S)
0.527	**95**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.058	HSG C	2S, 3S, 4S, 5S, 11S
0.000	HSG D	
0.469	Other	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S
0.527		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Parish Hall to Sewer Runoff Area=3,589 sf 100.00% Impervious Runoff Depth>5.35"
Tc=5.0 min CN=98 Runoff=0.47 cfs 0.037 af

Subcatchment 2S: South to Chapel Street Runoff Area=7,269 sf 81.33% Impervious Runoff Depth>4.89"
Flow Length=154' Tc=5.0 min CN=94 Runoff=0.92 cfs 0.068 af

Subcatchment 3S: North/East to CB Runoff Area=6,105 sf 83.18% Impervious Runoff Depth>4.89"
Flow Length=142' Tc=5.0 min CN=94 Runoff=0.77 cfs 0.057 af

Subcatchment 4S: Church Runoff Area=1,162 sf 96.39% Impervious Runoff Depth>5.23"
Tc=5.0 min CN=97 Runoff=0.15 cfs 0.012 af

Subcatchment 5S: Patio Runoff Area=640 sf 85.62% Impervious Runoff Depth>5.00"
Tc=5.0 min CN=95 Runoff=0.08 cfs 0.006 af

Subcatchment 6S: Parish Hall Runoff Area=267 sf 100.00% Impervious Runoff Depth>5.35"
Tc=5.0 min CN=98 Runoff=0.03 cfs 0.003 af

Subcatchment 7S: Church & Infill Runoff Area=1,303 sf 100.00% Impervious Runoff Depth>5.35"
Tc=5.0 min CN=98 Runoff=0.17 cfs 0.013 af

Subcatchment 8S: Church & Infill Runoff Area=1,319 sf 100.00% Impervious Runoff Depth>5.35"
Tc=5.0 min CN=98 Runoff=0.17 cfs 0.013 af

Subcatchment 9S: Church Runoff Area=184 sf 100.00% Impervious Runoff Depth>5.35"
Tc=5.0 min CN=98 Runoff=0.02 cfs 0.002 af

Subcatchment 10S: Parish Hall Runoff Area=761 sf 100.00% Impervious Runoff Depth>5.35"
Tc=5.0 min CN=98 Runoff=0.10 cfs 0.008 af

Subcatchment 11S: Ramp Runoff Area=343 sf 96.79% Impervious Runoff Depth>5.23"
Tc=5.0 min CN=97 Runoff=0.04 cfs 0.003 af

Reach 1R: 6" VC Sewer Avg. Flow Depth=0.36' Max Vel=8.10 fps Inflow=1.24 cfs 0.097 af
6.0" Round Pipe n=0.011 L=260.0' S=0.0453 '/' Capacity=1.41 cfs Outflow=1.23 cfs 0.097 af

Reach 5A: Trunk Avg. Flow Depth=0.24' Max Vel=2.29 fps Inflow=0.27 cfs 0.020 af
8.0" Round Pipe n=0.012 L=2.0' S=0.0050 '/' Capacity=0.93 cfs Outflow=0.27 cfs 0.020 af

Reach 5B: Trunk Avg. Flow Depth=0.32' Max Vel=2.61 fps Inflow=0.44 cfs 0.034 af
8.0" Round Pipe n=0.012 L=58.0' S=0.0050 '/' Capacity=0.93 cfs Outflow=0.44 cfs 0.034 af

Reach 5C: Trunk Avg. Flow Depth=0.14' Max Vel=8.60 fps Inflow=0.44 cfs 0.034 af
8.0" Round Pipe n=0.012 L=3.8' S=0.1368 '/' Capacity=4.84 cfs Outflow=0.44 cfs 0.034 af

Reach 5D: Trunk Avg. Flow Depth=0.14' Max Vel=8.73 fps Inflow=0.46 cfs 0.036 af
8.0" Round Pipe n=0.012 L=6.0' S=0.1367 '/' Capacity=4.84 cfs Outflow=0.46 cfs 0.036 af

Reach 6R: Roof Leader Avg. Flow Depth=0.07' Max Vel=2.87 fps Inflow=0.03 cfs 0.003 af
4.0" Round Pipe n=0.012 L=9.0' S=0.0400 '/' Capacity=0.41 cfs Outflow=0.03 cfs 0.003 af

Reach 7R: Roof Leader Avg. Flow Depth=0.13' Max Vel=5.22 fps Inflow=0.17 cfs 0.013 af
4.0" Round Pipe n=0.012 L=17.0' S=0.0600 '/' Capacity=0.51 cfs Outflow=0.17 cfs 0.013 af

Reach 8R: Roof Leader Avg. Flow Depth=0.12' Max Vel=6.06 fps Inflow=0.17 cfs 0.013 af
4.0" Round Pipe n=0.012 L=11.7' S=0.0897 '/' Capacity=0.62 cfs Outflow=0.17 cfs 0.013 af

Reach 9R: Track Drain Avg. Flow Depth=0.03' Max Vel=5.06 fps Inflow=0.02 cfs 0.002 af
4.0" Round Pipe n=0.012 L=15.0' S=0.2747 '/' Capacity=1.08 cfs Outflow=0.02 cfs 0.002 af

Reach 10A: Roof Leader Avg. Flow Depth=0.10' Max Vel=4.75 fps Inflow=0.10 cfs 0.008 af
4.0" Round Pipe n=0.012 L=10.0' S=0.0700 '/' Capacity=0.55 cfs Outflow=0.10 cfs 0.008 af

Reach 10B: Roof Leader Avg. Flow Depth=0.17' Max Vel=6.25 fps Inflow=0.27 cfs 0.021 af
4.0" Round Pipe n=0.012 L=5.7' S=0.0702 '/' Capacity=0.55 cfs Outflow=0.27 cfs 0.021 af

Reach 11R: Trunk Avg. Flow Depth=0.18' Max Vel=10.14 fps Inflow=0.77 cfs 0.060 af
8.0" Round Pipe n=0.012 L=23.0' S=0.1361 '/' Capacity=4.83 cfs Outflow=0.77 cfs 0.060 af

Reach 100R: Sewer System Inflow=1.23 cfs 0.097 af
Outflow=1.23 cfs 0.097 af

Reach 200R: Chapel Street Inflow=0.92 cfs 0.068 af
Outflow=0.92 cfs 0.068 af

Reach 300R: CB in Parking Lot Inflow=0.77 cfs 0.057 af
Outflow=0.77 cfs 0.057 af

Pond 4P: YD #3 Peak Elev=38.77' Inflow=0.15 cfs 0.012 af
6.0" Round Culvert n=0.012 L=12.0' S=0.0100 '/' Outflow=0.15 cfs 0.012 af

Pond 5P: YD #2 Peak Elev=38.54' Inflow=0.23 cfs 0.018 af
8.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.23 cfs 0.018 af

Pond 11P: YD #1 Peak Elev=37.08' Inflow=0.32 cfs 0.025 af
6.0" Round Culvert n=0.012 L=11.0' S=0.0100 '/' Outflow=0.32 cfs 0.025 af

Total Runoff Area = 0.527 ac Runoff Volume = 0.222 af Average Runoff Depth = 5.06"
11.02% Pervious = 0.058 ac 88.98% Impervious = 0.469 ac

Summary for Subcatchment 1S: Parish Hall to Sewer

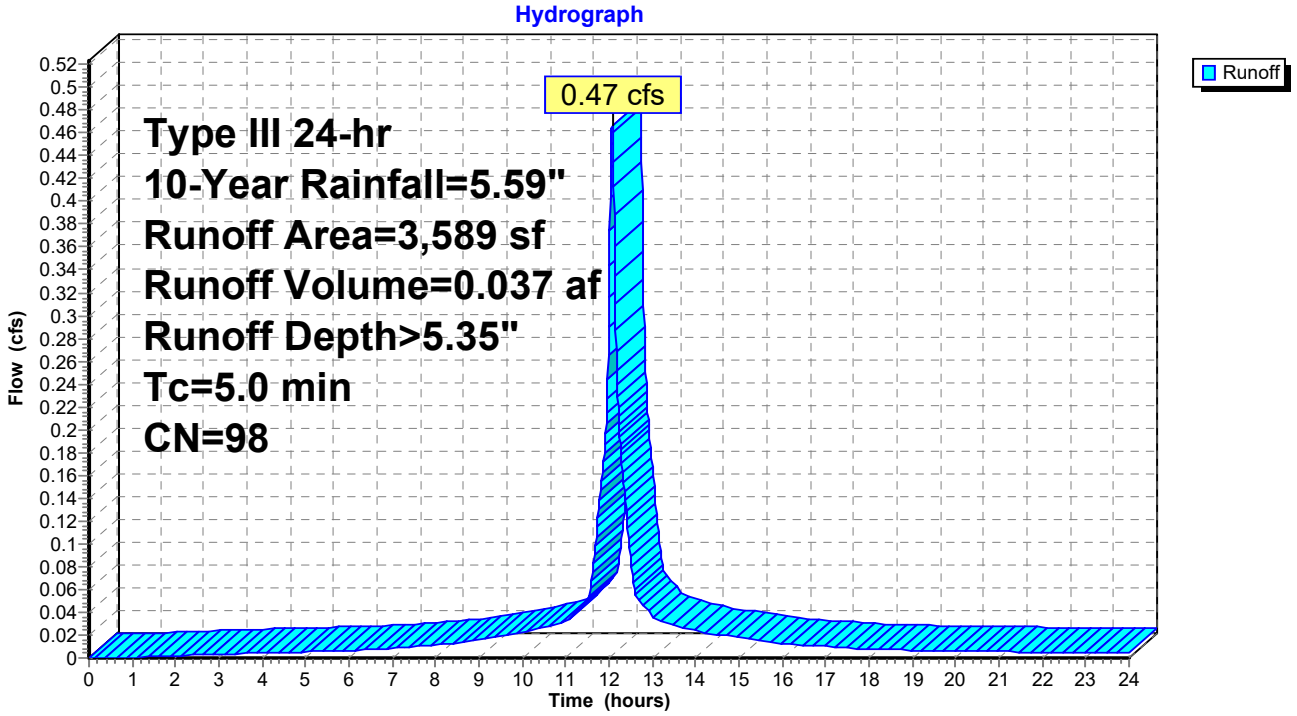
Runoff = 0.47 cfs @ 12.07 hrs, Volume= 0.037 af, Depth> 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	3,589	98	Impervious
	3,589		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: Parish Hall to Sewer



Summary for Subcatchment 2S: South to Chapel Street

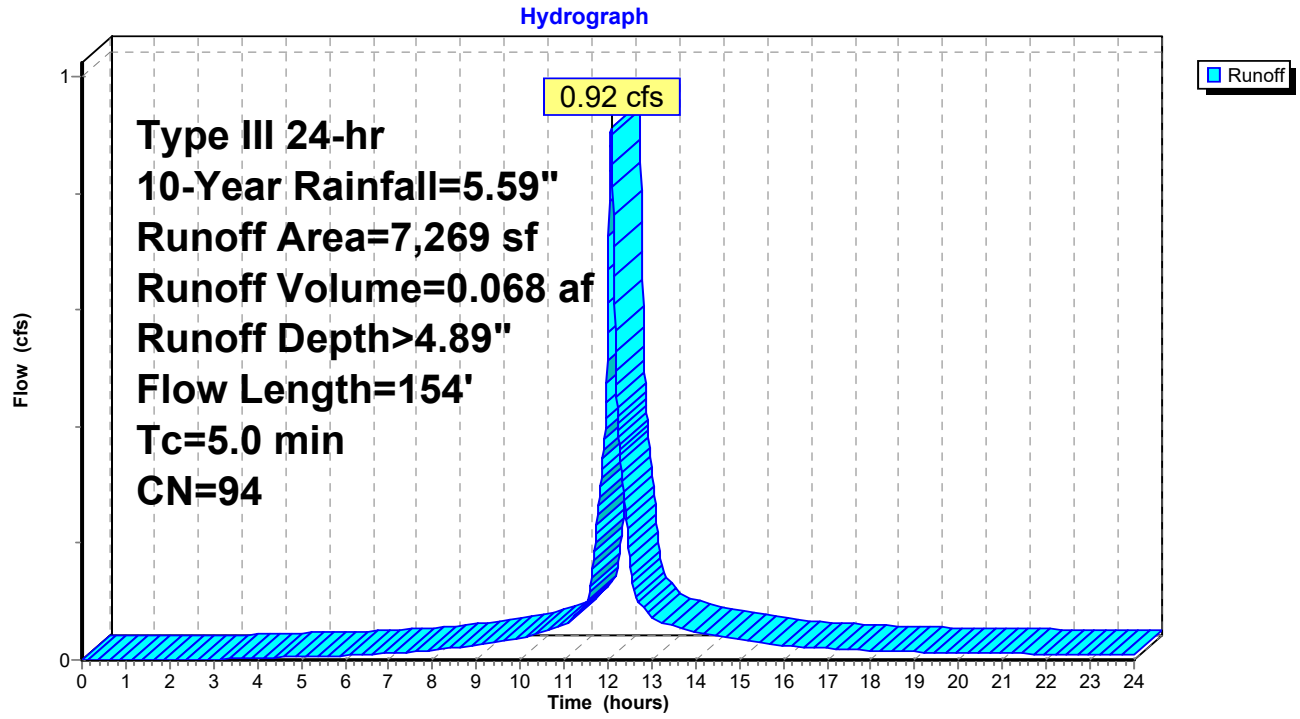
Runoff = 0.92 cfs @ 12.07 hrs, Volume= 0.068 af, Depth> 4.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	5,912	98	Impervious
	1,357	74	>75% Grass cover, Good, HSG C
	7,269	94	Weighted Average
	1,357		18.67% Pervious Area
	5,912		81.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	11	0.0833	1.57		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.2	72	0.1072	6.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	71	0.0626	5.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	154	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 2S: South to Chapel Street



Summary for Subcatchment 3S: North/East to CB

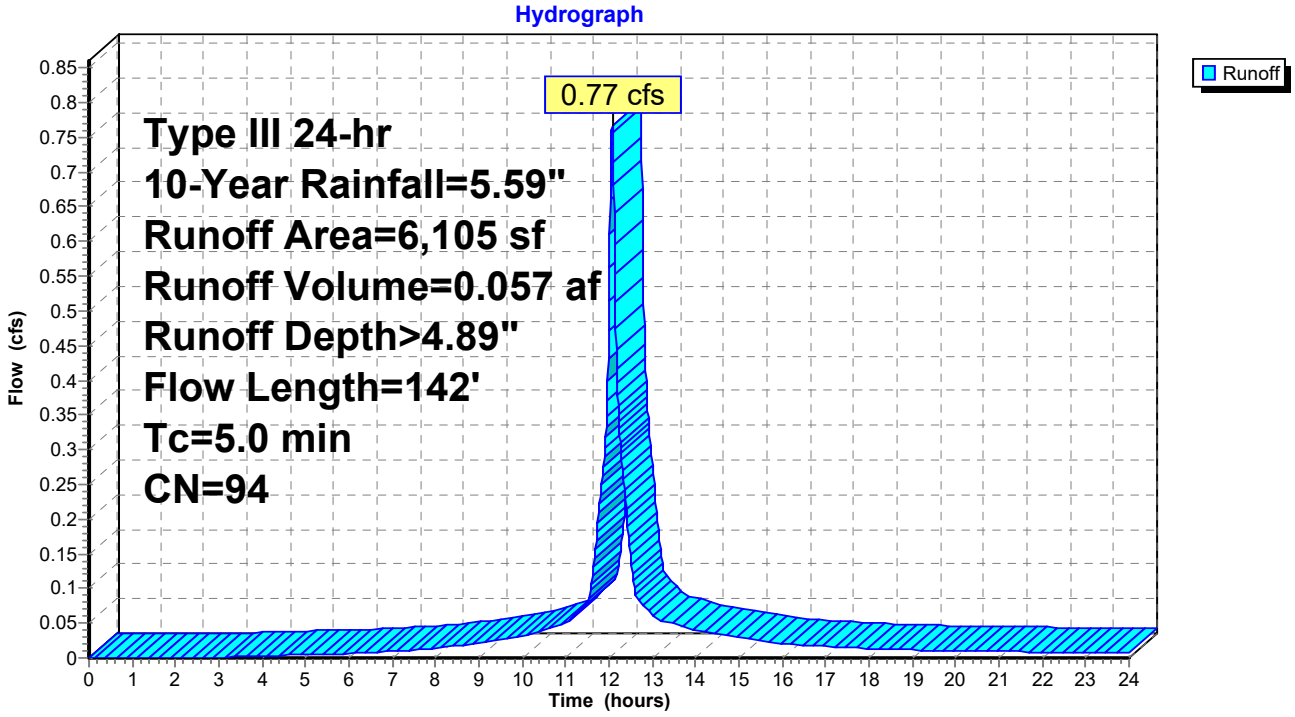
Runoff = 0.77 cfs @ 12.07 hrs, Volume= 0.057 af, Depth> 4.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	5,078	98	Impervious
	1,027	74	>75% Grass cover, Good, HSG C
	6,105	94	Weighted Average
	1,027		16.82% Pervious Area
	5,078		83.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	13	0.1500	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
0.3	59	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	70	0.0325	3.66		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	142	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 3S: North/East to CB



Summary for Subcatchment 4S: Church

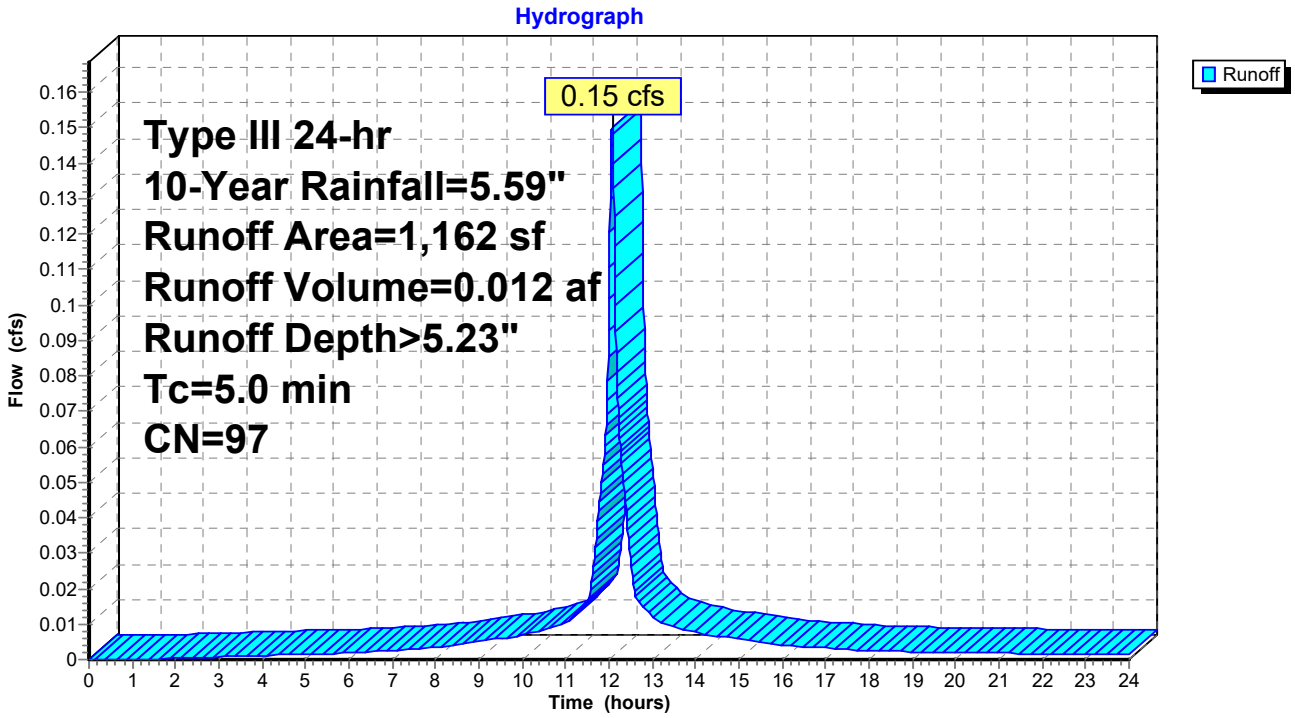
Runoff = 0.15 cfs @ 12.07 hrs, Volume= 0.012 af, Depth> 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	1,120	98	Impervious
	42	74	>75% Grass cover, Good, HSG C
	1,162	97	Weighted Average
	42		3.61% Pervious Area
	1,120		96.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 4S: Church



Summary for Subcatchment 5S: Patio

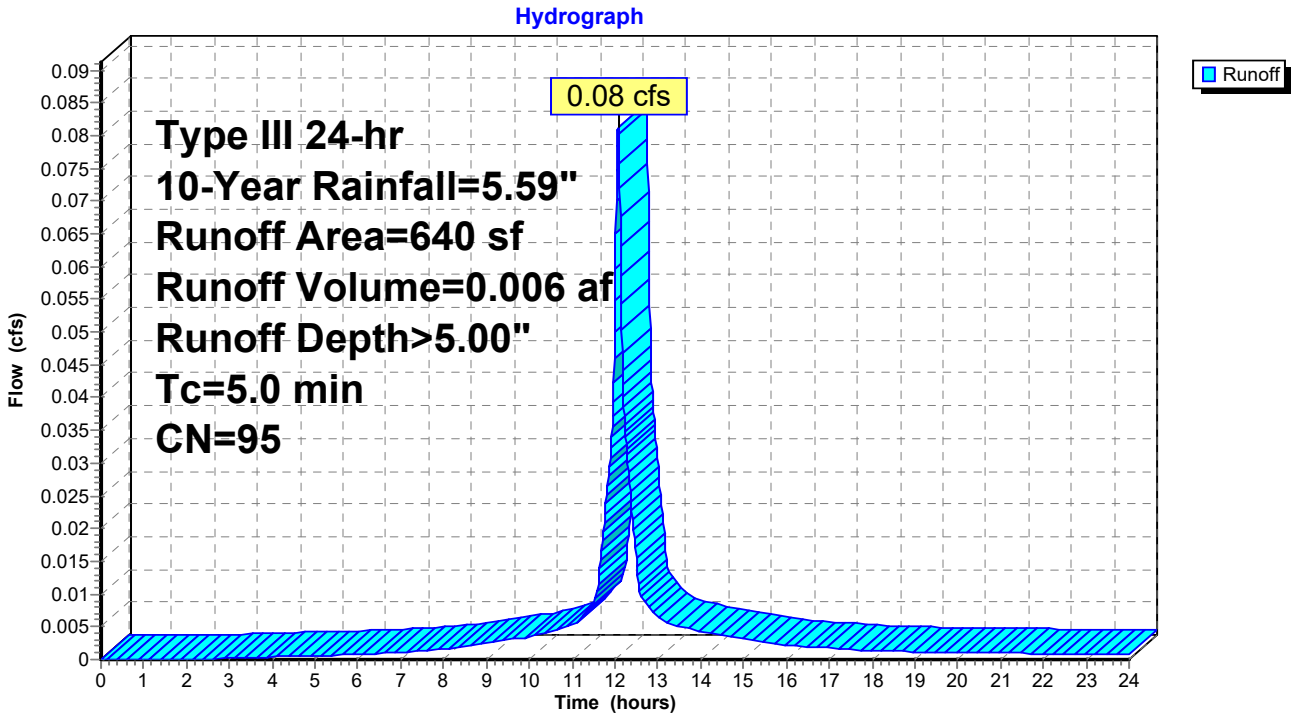
Runoff = 0.08 cfs @ 12.07 hrs, Volume= 0.006 af, Depth> 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	548	98	Impervious
	92	74	>75% Grass cover, Good, HSG C
	640	95	Weighted Average
	92		14.37% Pervious Area
	548		85.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 5S: Patio



Summary for Subcatchment 6S: Parish Hall

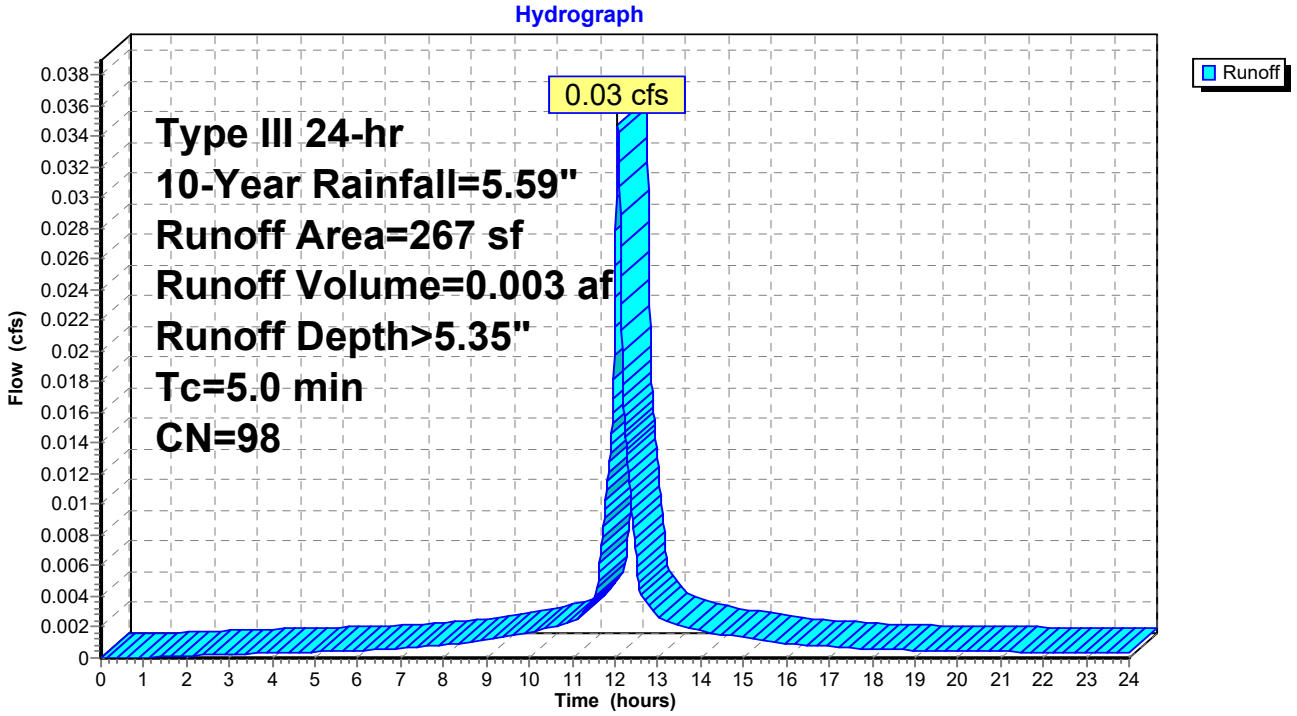
Runoff = 0.03 cfs @ 12.07 hrs, Volume= 0.003 af, Depth> 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	267	98	Impervious
	267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: Parish Hall



Summary for Subcatchment 7S: Church & Infill

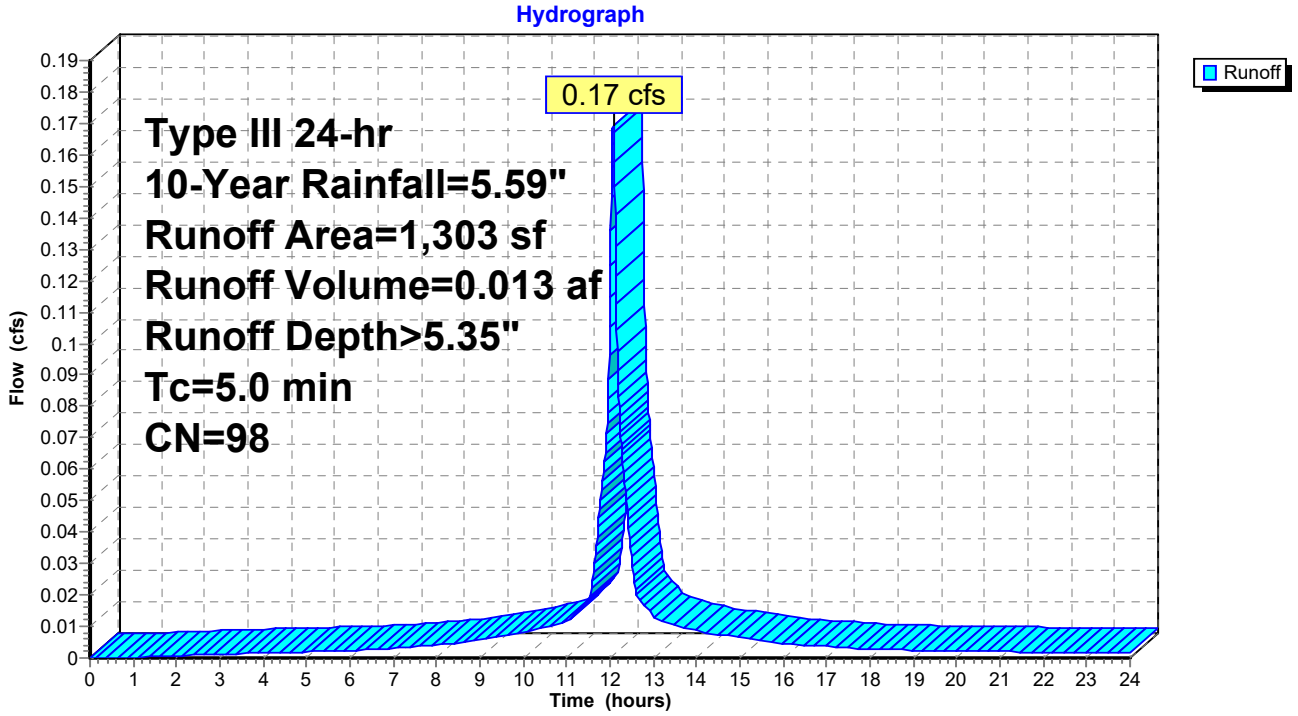
Runoff = 0.17 cfs @ 12.07 hrs, Volume= 0.013 af, Depth> 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	1,303	98	Impervious
	1,303		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 7S: Church & Infill



Summary for Subcatchment 8S: Church & Infill

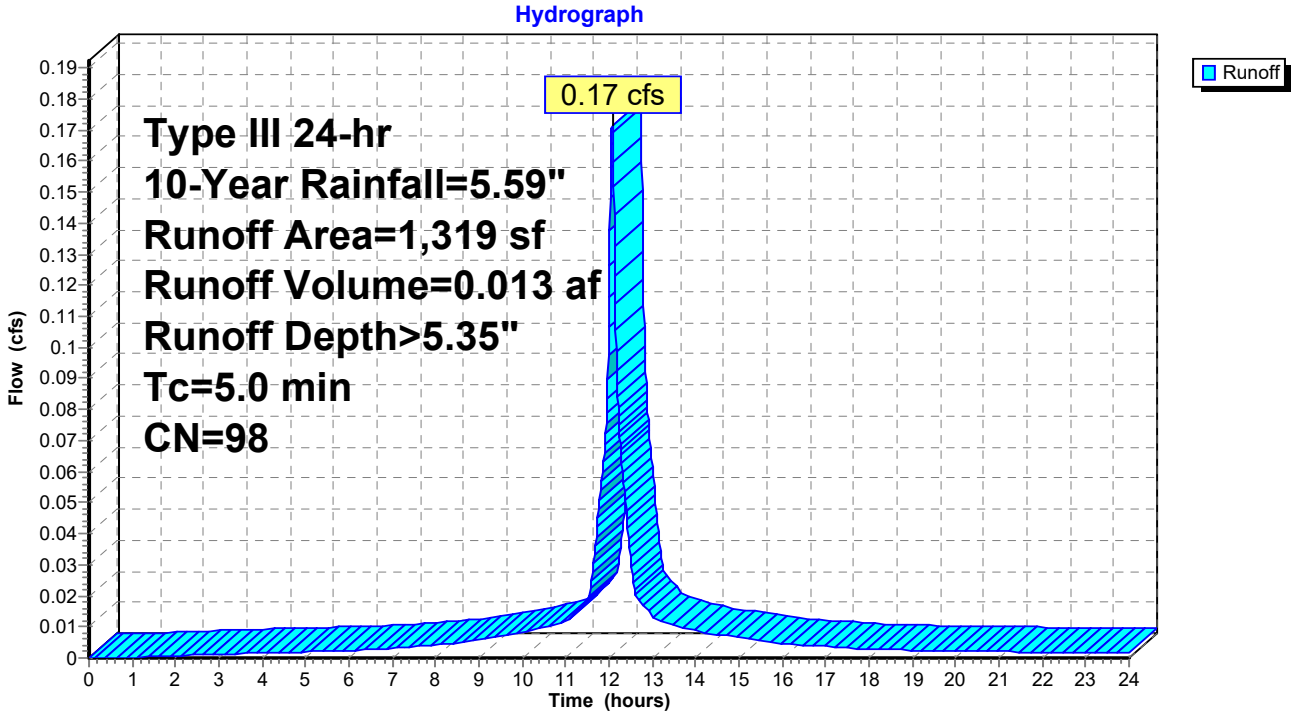
Runoff = 0.17 cfs @ 12.07 hrs, Volume= 0.013 af, Depth> 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	1,319	98	Impervious
	1,319		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: Church & Infill



Summary for Subcatchment 9S: Church

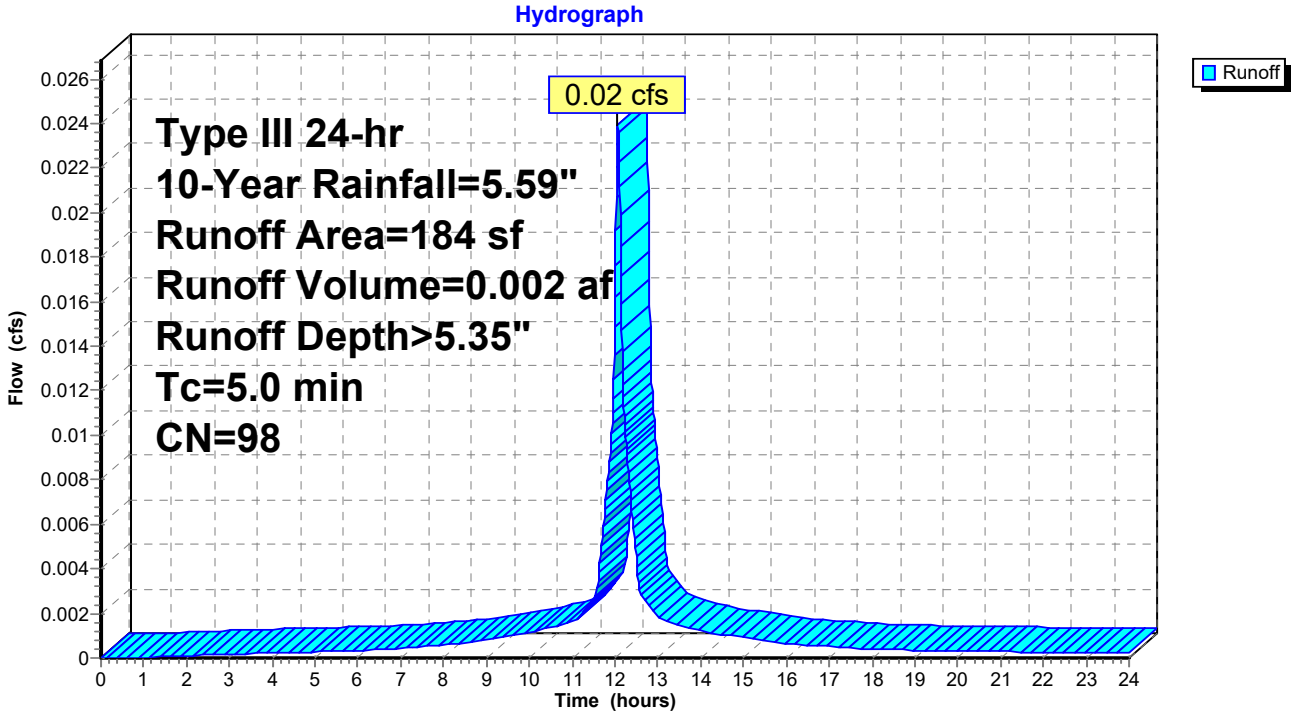
Runoff = 0.02 cfs @ 12.07 hrs, Volume= 0.002 af, Depth> 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	184	98	Impervious
	184		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 9S: Church



Summary for Subcatchment 10S: Parish Hall

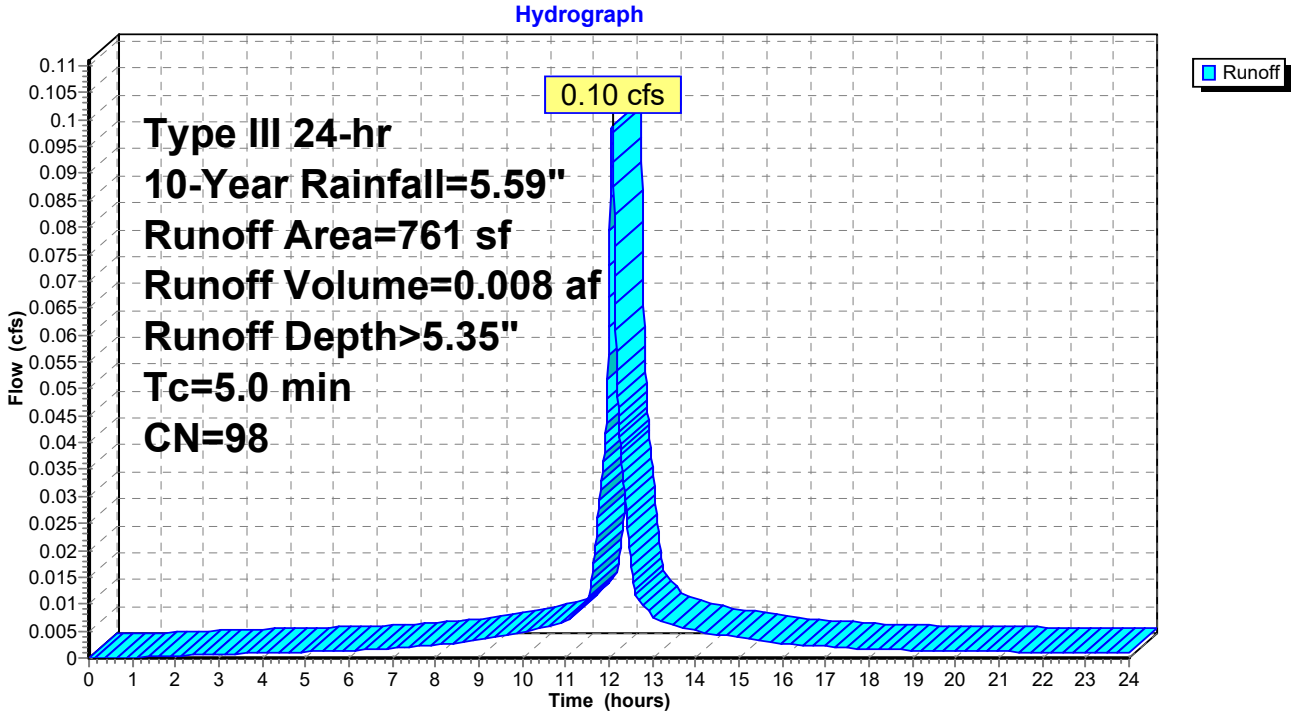
Runoff = 0.10 cfs @ 12.07 hrs, Volume= 0.008 af, Depth> 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	761	98	Impervious
	761		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 10S: Parish Hall



Summary for Subcatchment 11S: Ramp

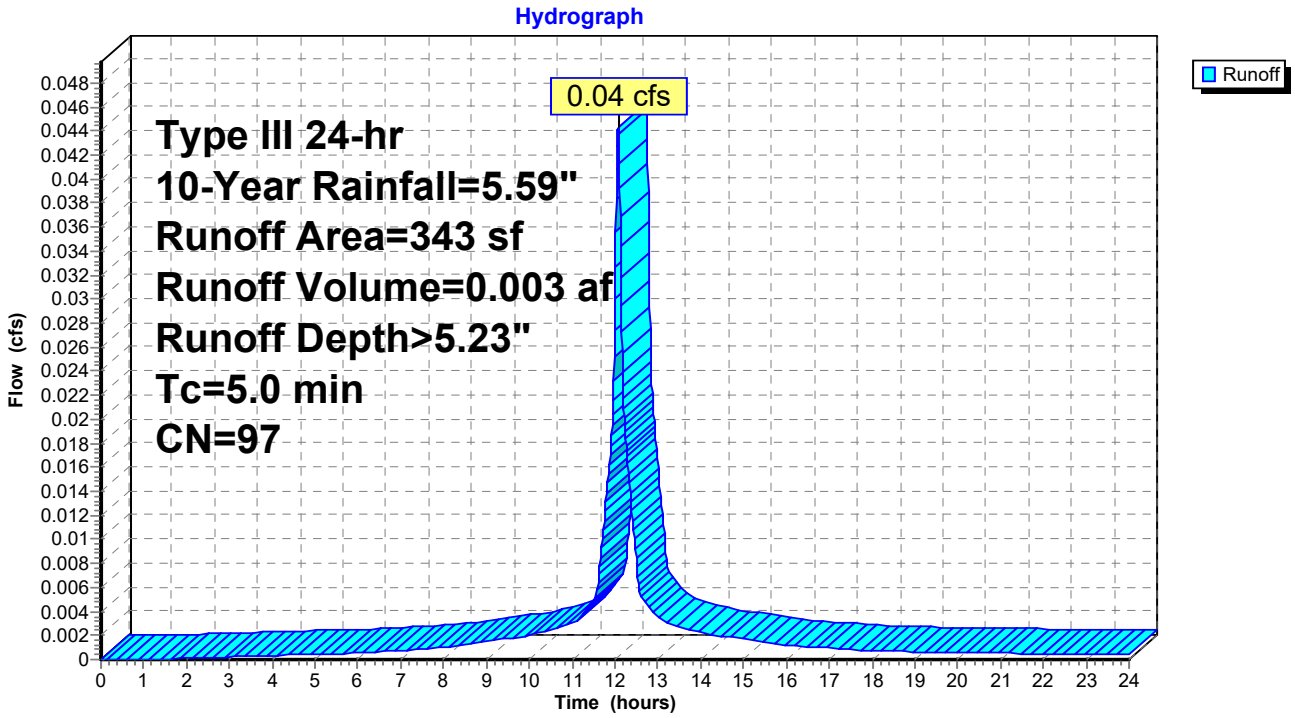
Runoff = 0.04 cfs @ 12.07 hrs, Volume= 0.003 af, Depth> 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.59"

	Area (sf)	CN	Description
*	332	98	Impervious
	11	74	>75% Grass cover, Good, HSG C
	343	97	Weighted Average
	11		3.21% Pervious Area
	332		96.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: Ramp



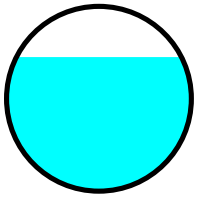
Summary for Reach 1R: 6" VC Sewer

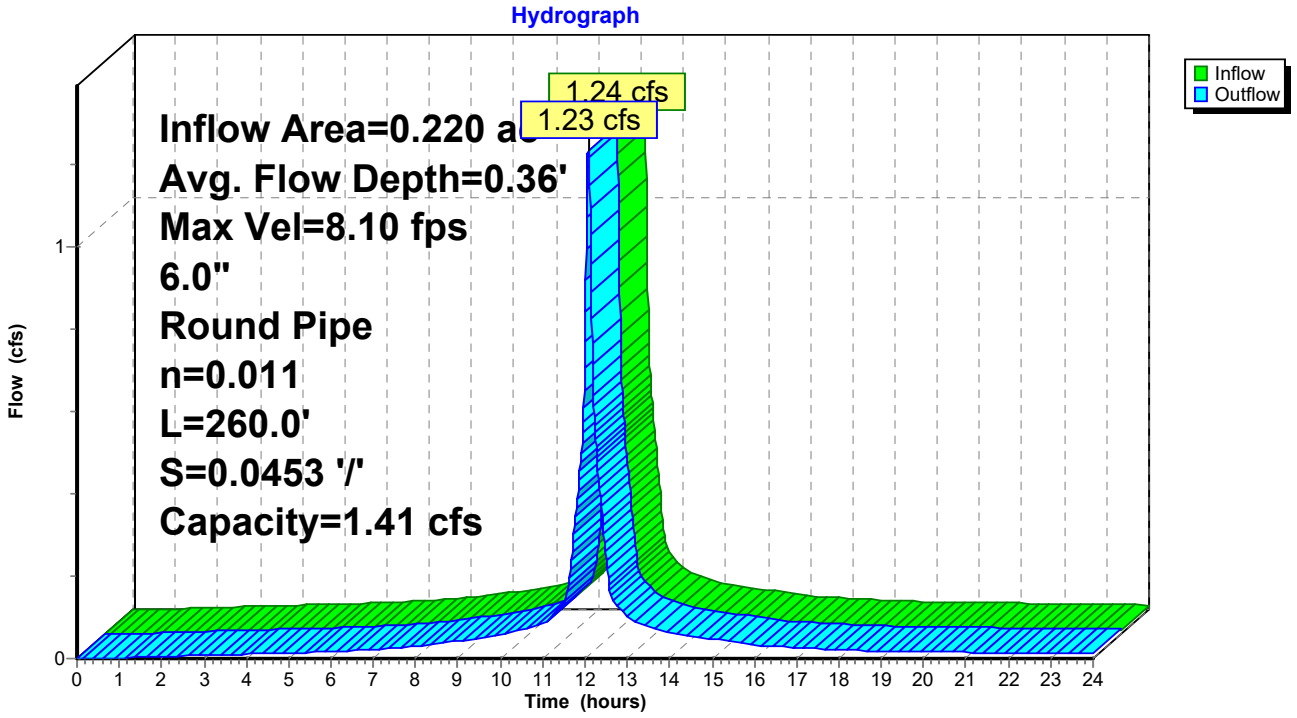
Inflow Area = 0.220 ac, 98.48% Impervious, Inflow Depth > 5.31" for 10-Year event
Inflow = 1.24 cfs @ 12.07 hrs, Volume= 0.097 af
Outflow = 1.23 cfs @ 12.08 hrs, Volume= 0.097 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.10 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.86 fps, Avg. Travel Time= 1.5 min

Peak Storage= 40 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 1.41 cfs

6.0" Round Pipe
n= 0.011 Clay tile
Length= 260.0' Slope= 0.0453 '/'
Inlet Invert= 31.21', Outlet Invert= 19.44'





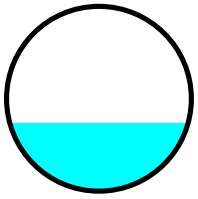
Summary for Reach 5A: Trunk

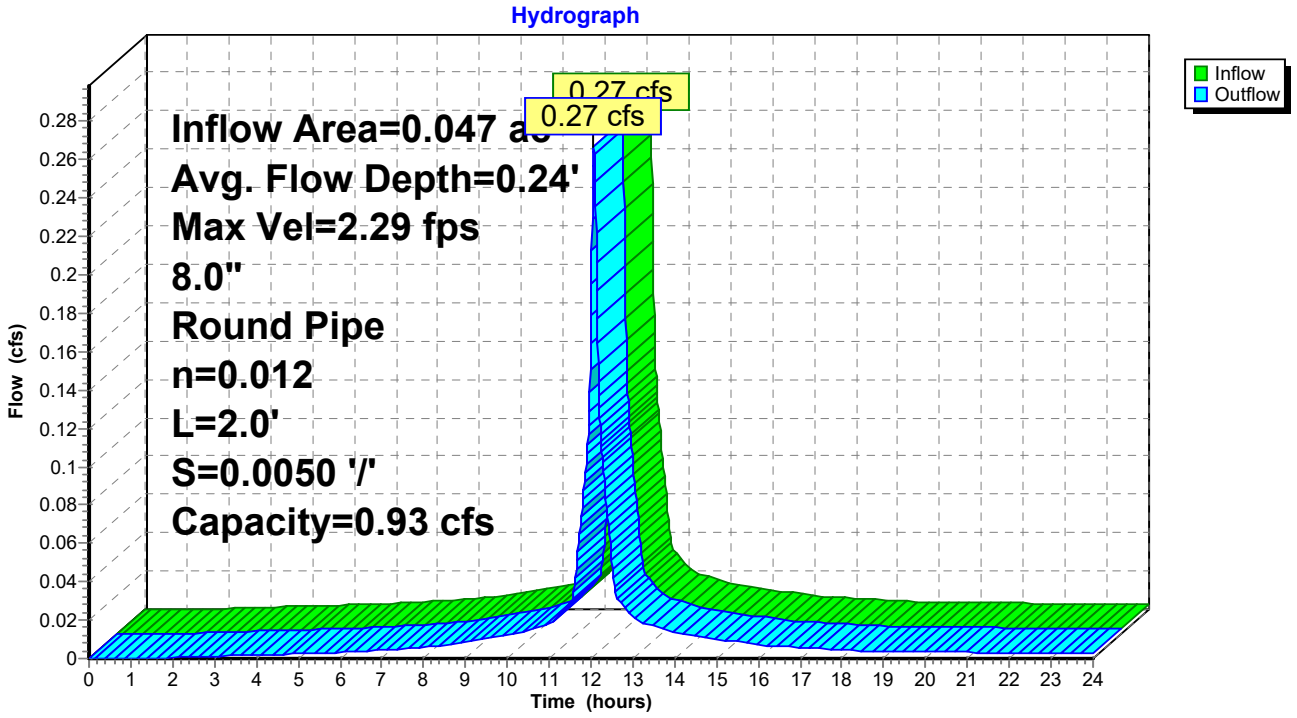
Inflow Area = 0.047 ac, 93.52% Impervious, Inflow Depth > 5.18" for 10-Year event
Inflow = 0.27 cfs @ 12.07 hrs, Volume= 0.020 af
Outflow = 0.27 cfs @ 12.07 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.29 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.74 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 0.93 cfs

8.0" Round Pipe
n= 0.012
Length= 2.0' Slope= 0.0050 '/'
Inlet Invert= 38.12', Outlet Invert= 38.11'





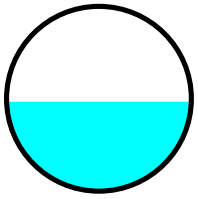
Summary for Reach 5B: Trunk

Inflow Area = 0.077 ac, 96.03% Impervious, Inflow Depth > 5.24" for 10-Year event
Inflow = 0.44 cfs @ 12.07 hrs, Volume= 0.034 af
Outflow = 0.44 cfs @ 12.08 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.3 min

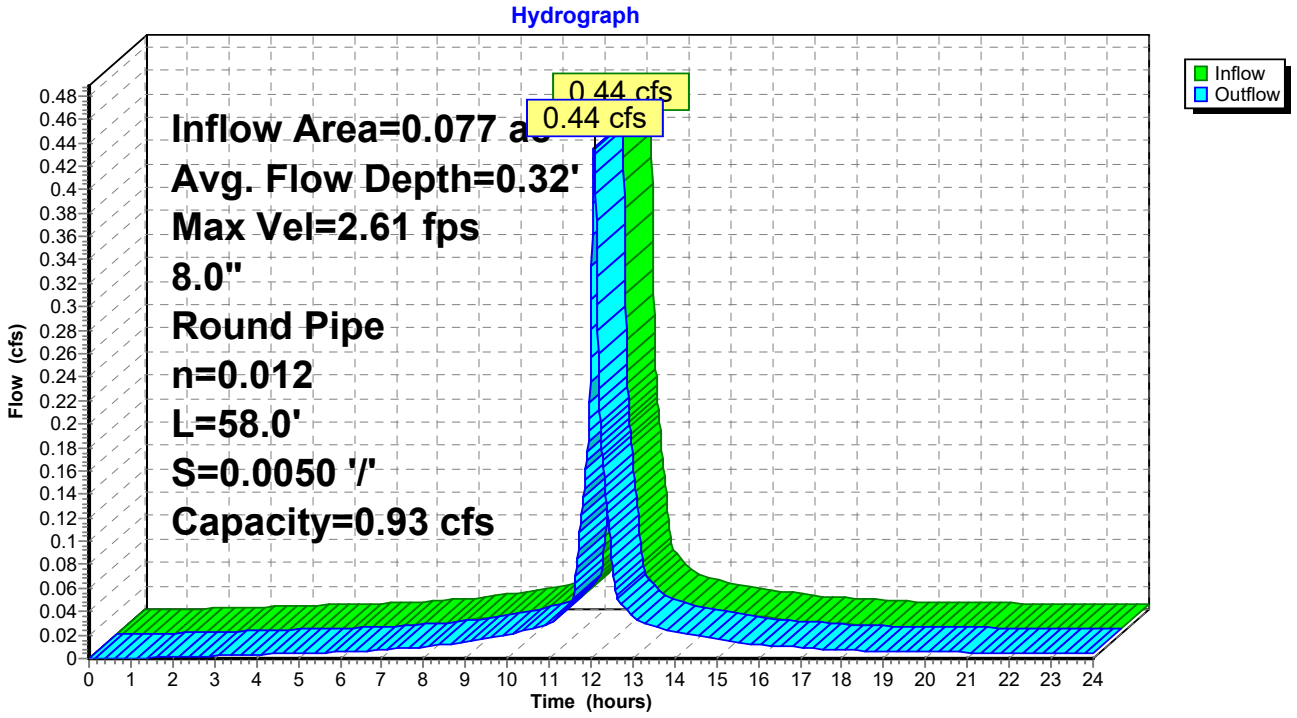
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.61 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 1.1 min

Peak Storage= 10 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 0.93 cfs

8.0" Round Pipe
n= 0.012
Length= 58.0' Slope= 0.0050 '/'
Inlet Invert= 38.11', Outlet Invert= 37.82'



Reach 5B: Trunk



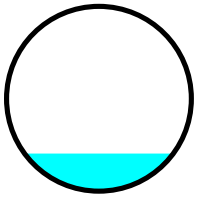
Summary for Reach 5C: Trunk

Inflow Area = 0.077 ac, 96.03% Impervious, Inflow Depth > 5.24" for 10-Year event
Inflow = 0.44 cfs @ 12.08 hrs, Volume= 0.034 af
Outflow = 0.44 cfs @ 12.08 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min

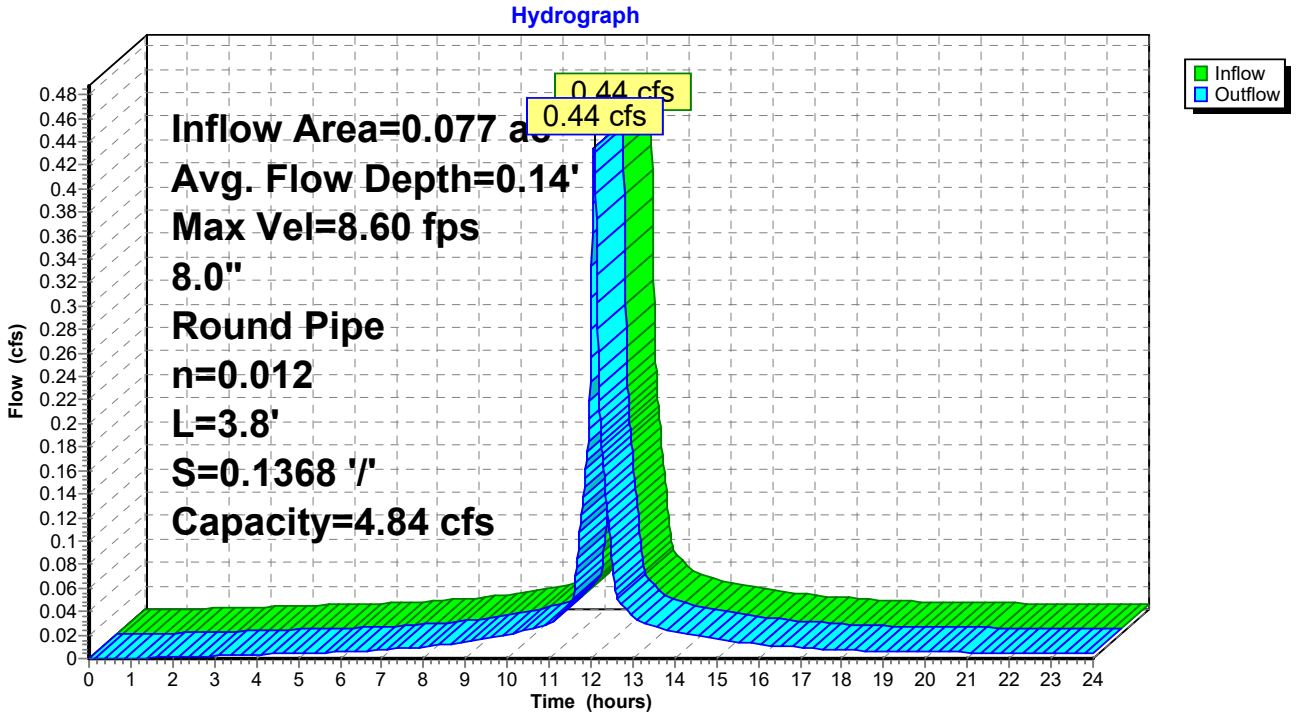
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.60 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.79 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 4.84 cfs

8.0" Round Pipe
n= 0.012
Length= 3.8' Slope= 0.1368 '/'
Inlet Invert= 37.82', Outlet Invert= 37.30'



Reach 5C: Trunk



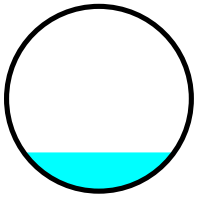
Summary for Reach 5D: Trunk

Inflow Area = 0.082 ac, 96.23% Impervious, Inflow Depth > 5.25" for 10-Year event
Inflow = 0.46 cfs @ 12.07 hrs, Volume= 0.036 af
Outflow = 0.46 cfs @ 12.08 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

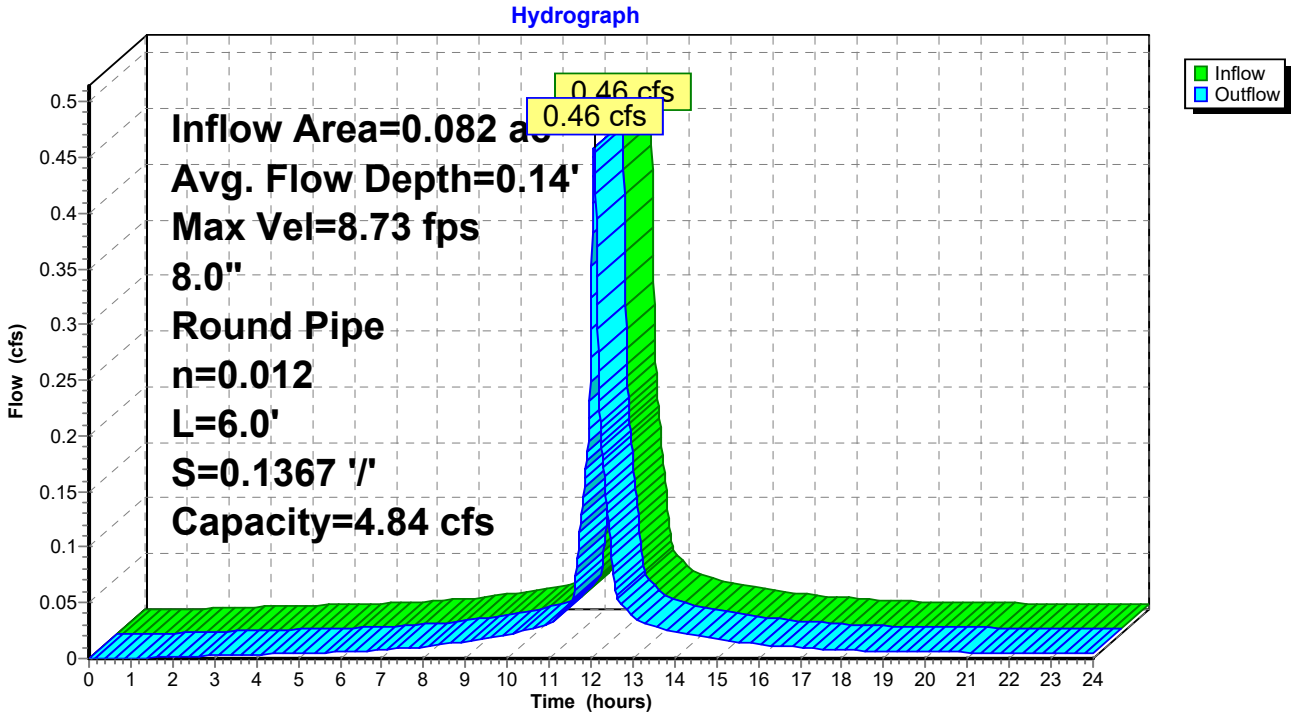
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.73 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.83 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 4.84 cfs

8.0" Round Pipe
n= 0.012
Length= 6.0' Slope= 0.1367 '/'
Inlet Invert= 37.30', Outlet Invert= 36.48'



Reach 5D: Trunk



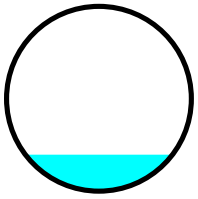
Summary for Reach 6R: Roof Leader

Inflow Area = 0.006 ac,100.00% Impervious, Inflow Depth > 5.35" for 10-Year event
Inflow = 0.03 cfs @ 12.07 hrs, Volume= 0.003 af
Outflow = 0.03 cfs @ 12.07 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

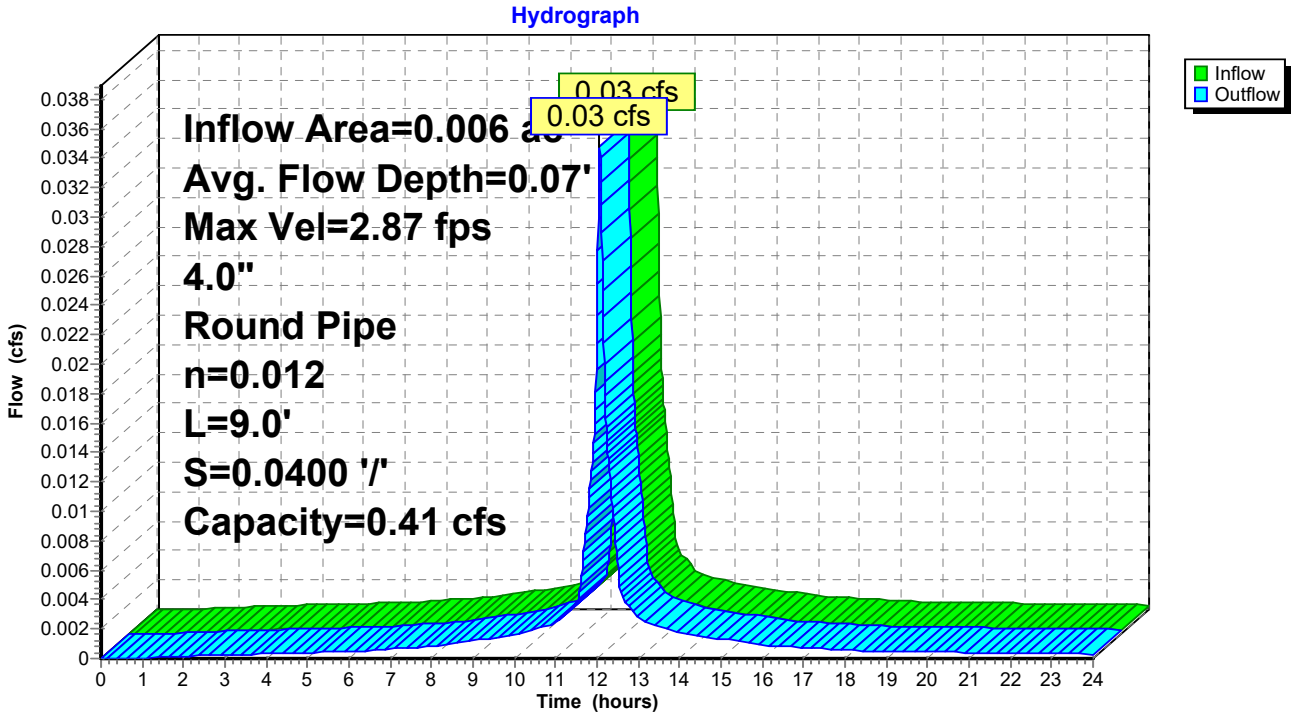
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.87 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 0.94 fps, Avg. Travel Time= 0.2 min

Peak Storage= 0 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 0.33' Flow Area= 0.1 sf, Capacity= 0.41 cfs

4.0" Round Pipe
n= 0.012
Length= 9.0' Slope= 0.0400 '/'
Inlet Invert= 38.65', Outlet Invert= 38.29'



Reach 6R: Roof Leader



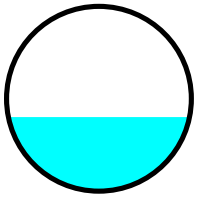
Summary for Reach 7R: Roof Leader

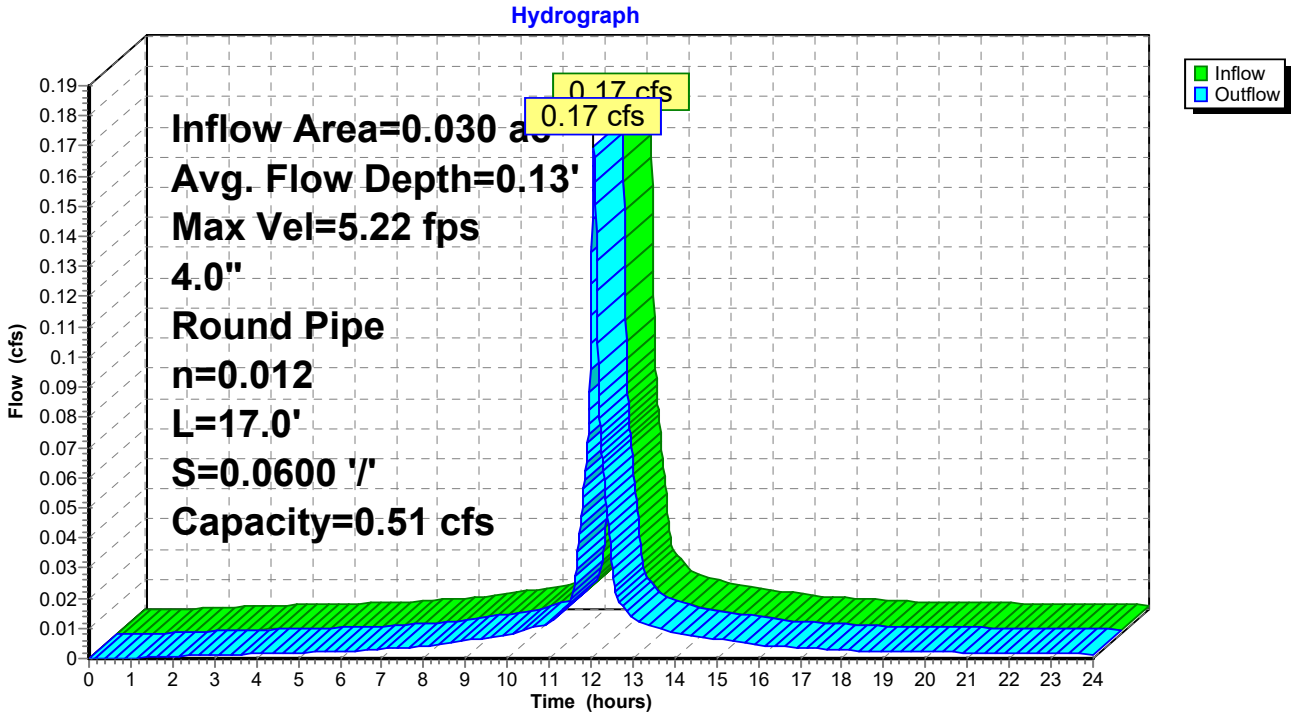
Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 5.35" for 10-Year event
Inflow = 0.17 cfs @ 12.07 hrs, Volume= 0.013 af
Outflow = 0.17 cfs @ 12.07 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.22 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 0.2 min

Peak Storage= 1 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.33' Flow Area= 0.1 sf, Capacity= 0.51 cfs

4.0" Round Pipe
n= 0.012
Length= 17.0' Slope= 0.0600 '/'
Inlet Invert= 39.30', Outlet Invert= 38.28'





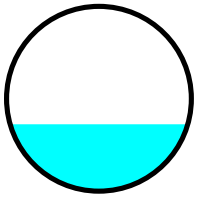
Summary for Reach 8R: Roof Leader

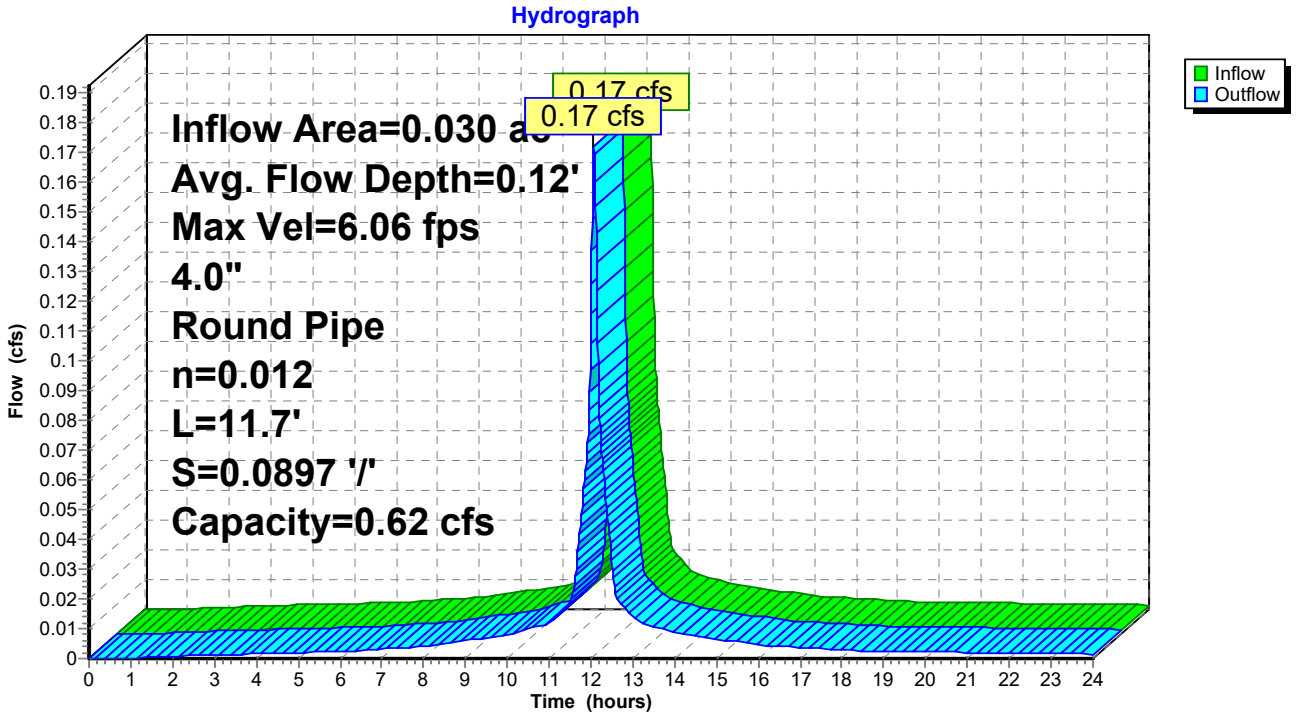
Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 5.35" for 10-Year event
Inflow = 0.17 cfs @ 12.07 hrs, Volume= 0.013 af
Outflow = 0.17 cfs @ 12.07 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.06 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.01 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 0.33' Flow Area= 0.1 sf, Capacity= 0.62 cfs

4.0" Round Pipe
n= 0.012
Length= 11.7' Slope= 0.0897 '/'
Inlet Invert= 38.30', Outlet Invert= 37.25'





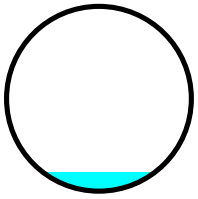
Summary for Reach 9R: Track Drain

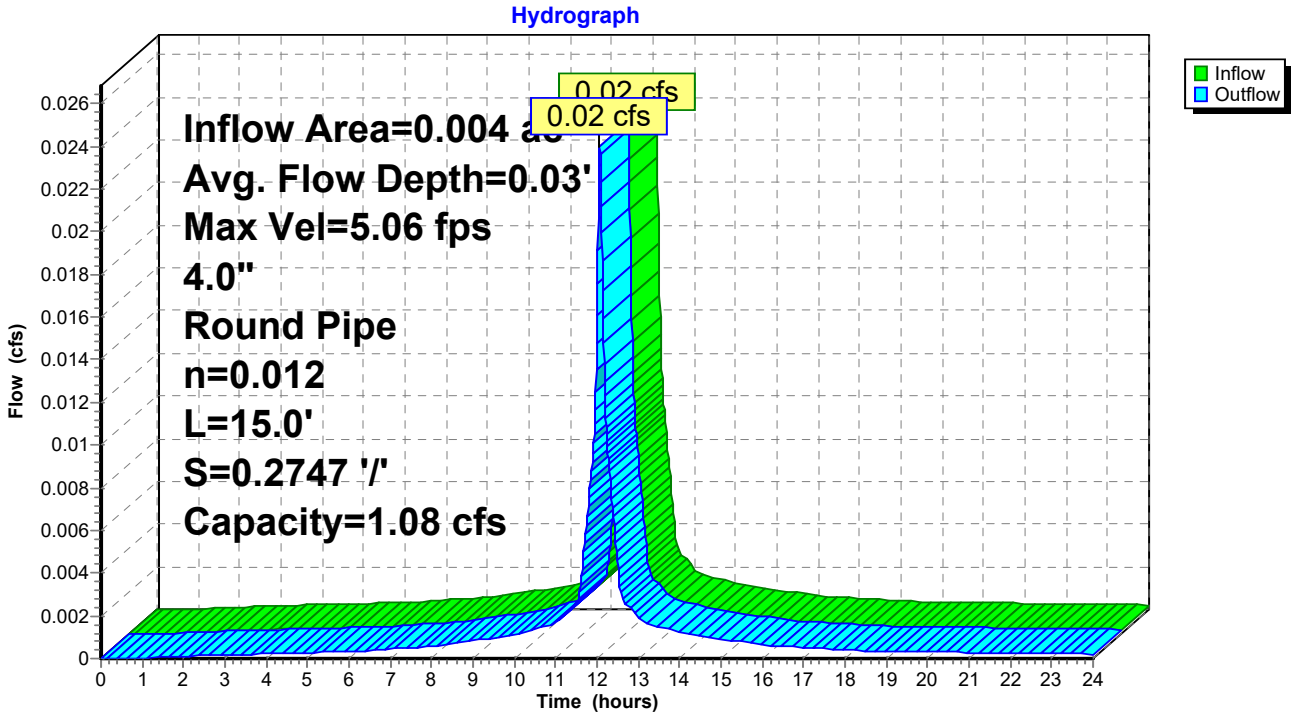
Inflow Area = 0.004 ac,100.00% Impervious, Inflow Depth > 5.35" for 10-Year event
Inflow = 0.02 cfs @ 12.07 hrs, Volume= 0.002 af
Outflow = 0.02 cfs @ 12.07 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.06 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.72 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 0.33' Flow Area= 0.1 sf, Capacity= 1.08 cfs

4.0" Round Pipe
n= 0.012
Length= 15.0' Slope= 0.2747 '/'
Inlet Invert= 41.59', Outlet Invert= 37.47'





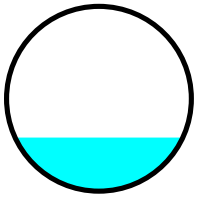
Summary for Reach 10A: Roof Leader

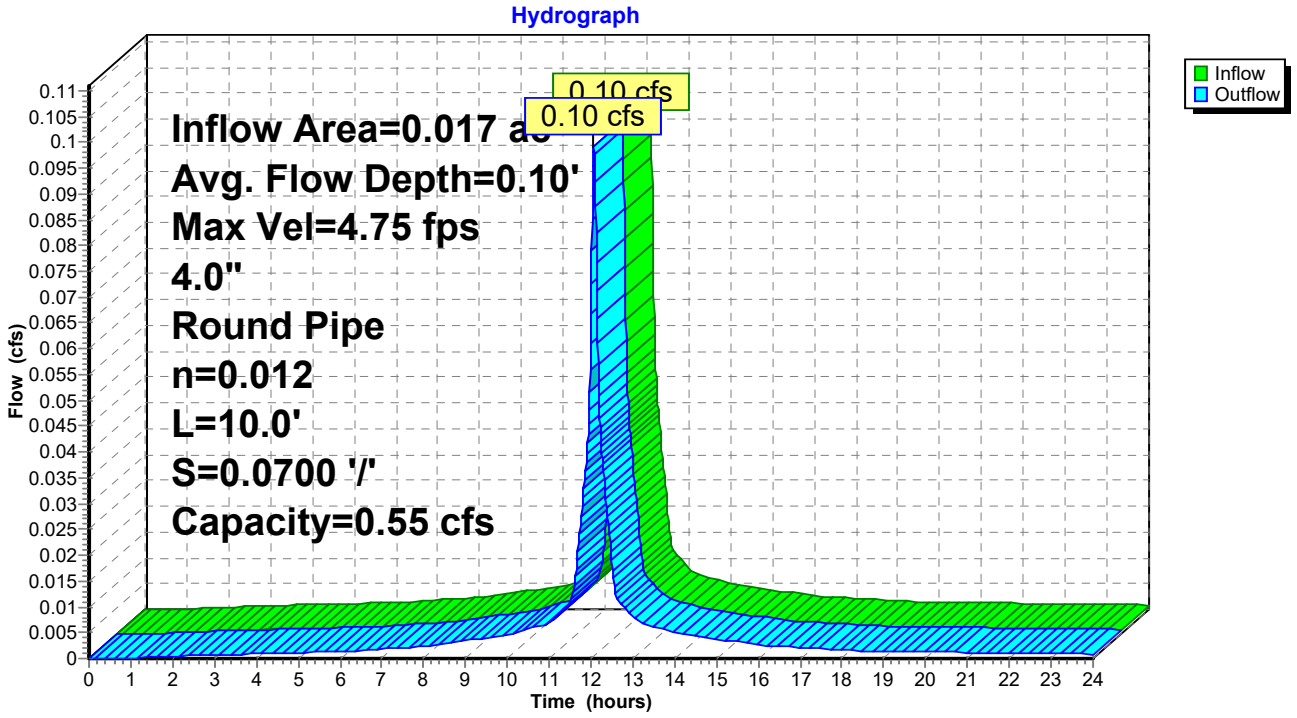
Inflow Area = 0.017 ac,100.00% Impervious, Inflow Depth > 5.35" for 10-Year event
Inflow = 0.10 cfs @ 12.07 hrs, Volume= 0.008 af
Outflow = 0.10 cfs @ 12.07 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.75 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 0.33' Flow Area= 0.1 sf, Capacity= 0.55 cfs

4.0" Round Pipe
n= 0.012
Length= 10.0' Slope= 0.0700 '/'
Inlet Invert= 37.94', Outlet Invert= 37.24'





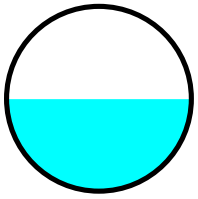
Summary for Reach 10B: Roof Leader

Inflow Area = 0.048 ac,100.00% Impervious, Inflow Depth > 5.35" for 10-Year event
Inflow = 0.27 cfs @ 12.07 hrs, Volume= 0.021 af
Outflow = 0.27 cfs @ 12.07 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

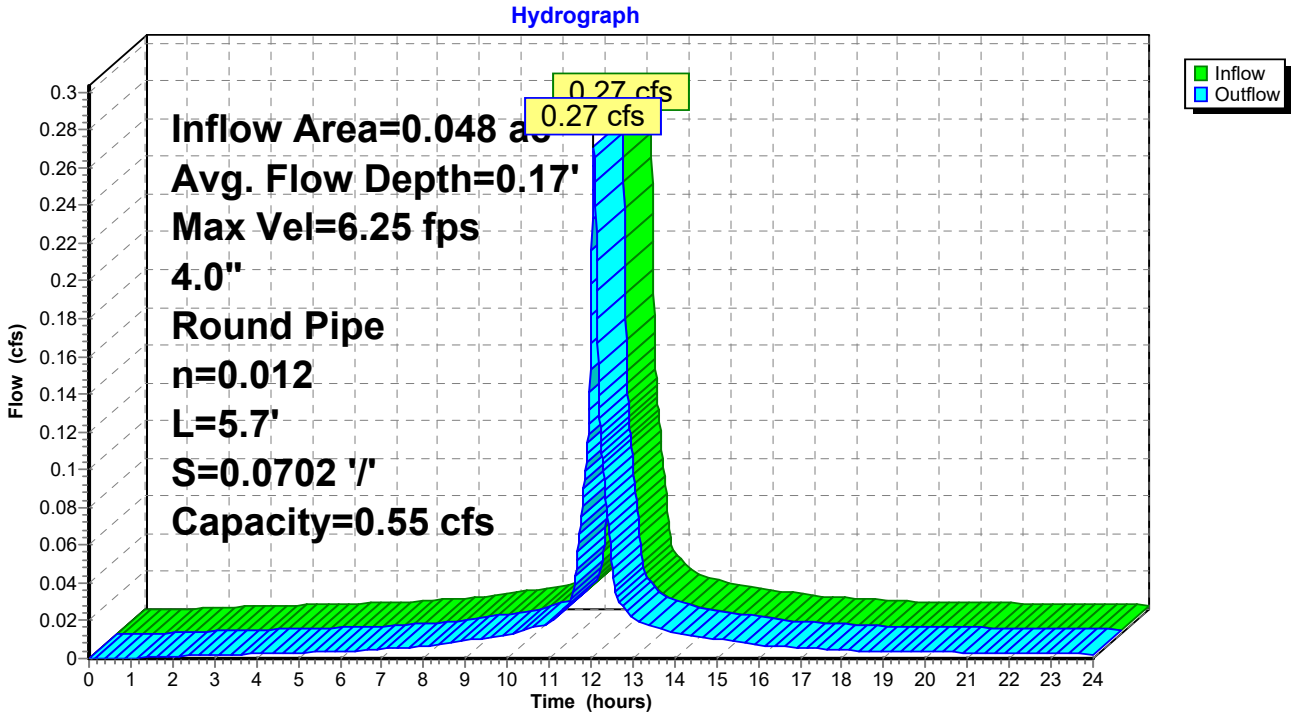
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.25 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.11 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 0.33' Flow Area= 0.1 sf, Capacity= 0.55 cfs

4.0" Round Pipe
n= 0.012
Length= 5.7' Slope= 0.0702 '/'
Inlet Invert= 37.24', Outlet Invert= 36.84'



Reach 10B: Roof Leader



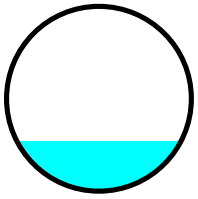
Summary for Reach 11R: Trunk

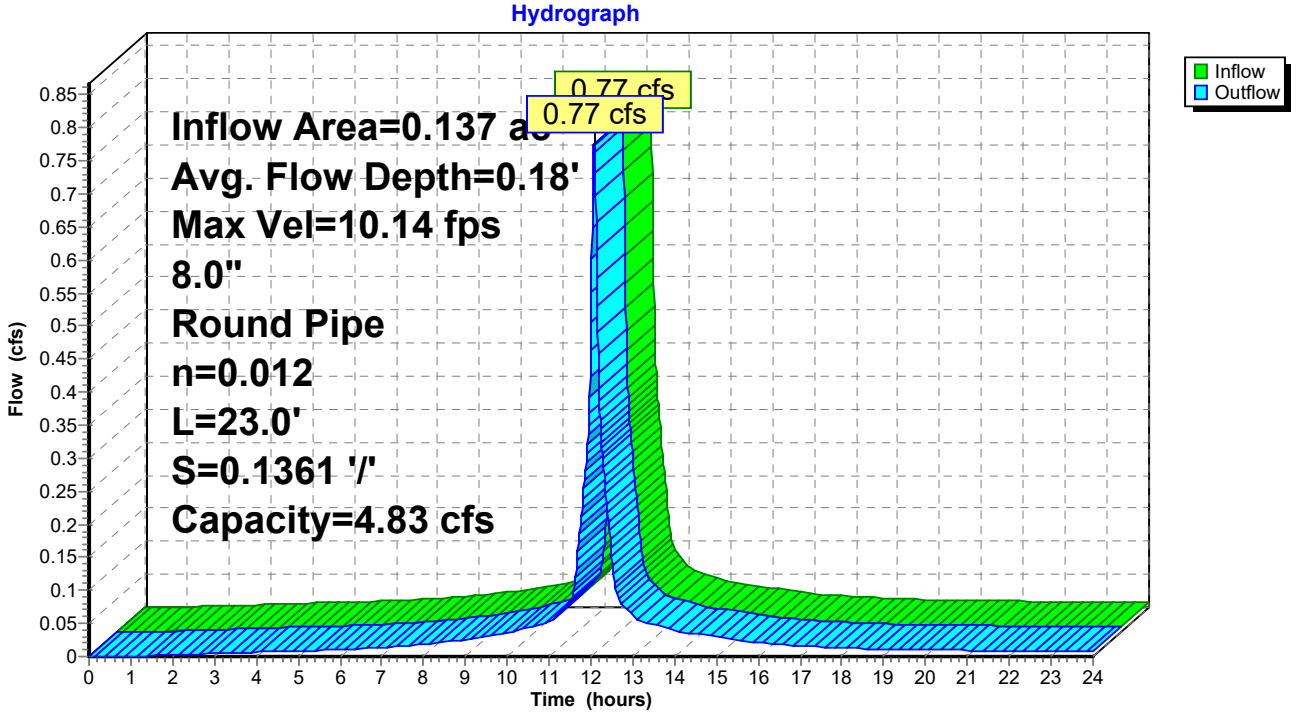
Inflow Area = 0.137 ac, 97.57% Impervious, Inflow Depth > 5.28" for 10-Year event
Inflow = 0.77 cfs @ 12.07 hrs, Volume= 0.060 af
Outflow = 0.77 cfs @ 12.07 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.14 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.30 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 4.83 cfs

8.0" Round Pipe
n= 0.012
Length= 23.0' Slope= 0.1361 '/'
Inlet Invert= 36.48', Outlet Invert= 33.35'



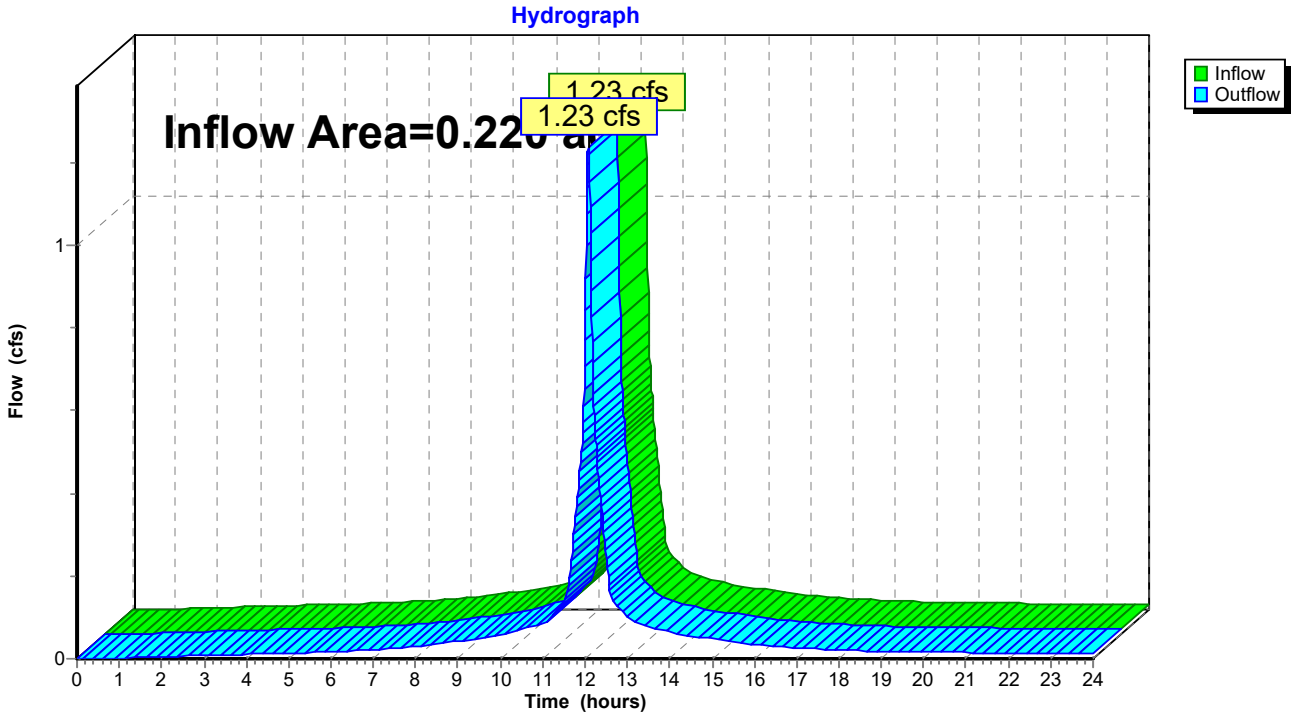


Summary for Reach 100R: Sewer System

Inflow Area = 0.220 ac, 98.48% Impervious, Inflow Depth > 5.30" for 10-Year event
Inflow = 1.23 cfs @ 12.08 hrs, Volume= 0.097 af
Outflow = 1.23 cfs @ 12.08 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 100R: Sewer System

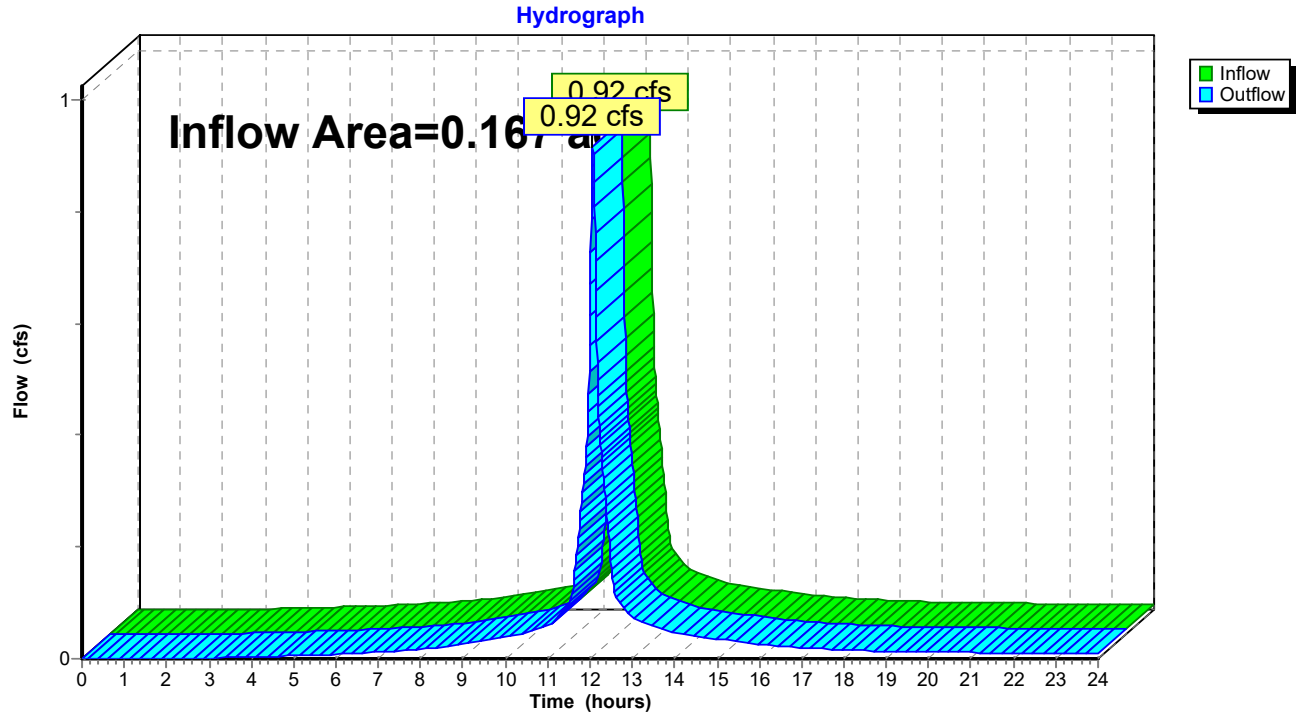


Summary for Reach 200R: Chapel Street

Inflow Area = 0.167 ac, 81.33% Impervious, Inflow Depth > 4.89" for 10-Year event
Inflow = 0.92 cfs @ 12.07 hrs, Volume= 0.068 af
Outflow = 0.92 cfs @ 12.07 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 200R: Chapel Street

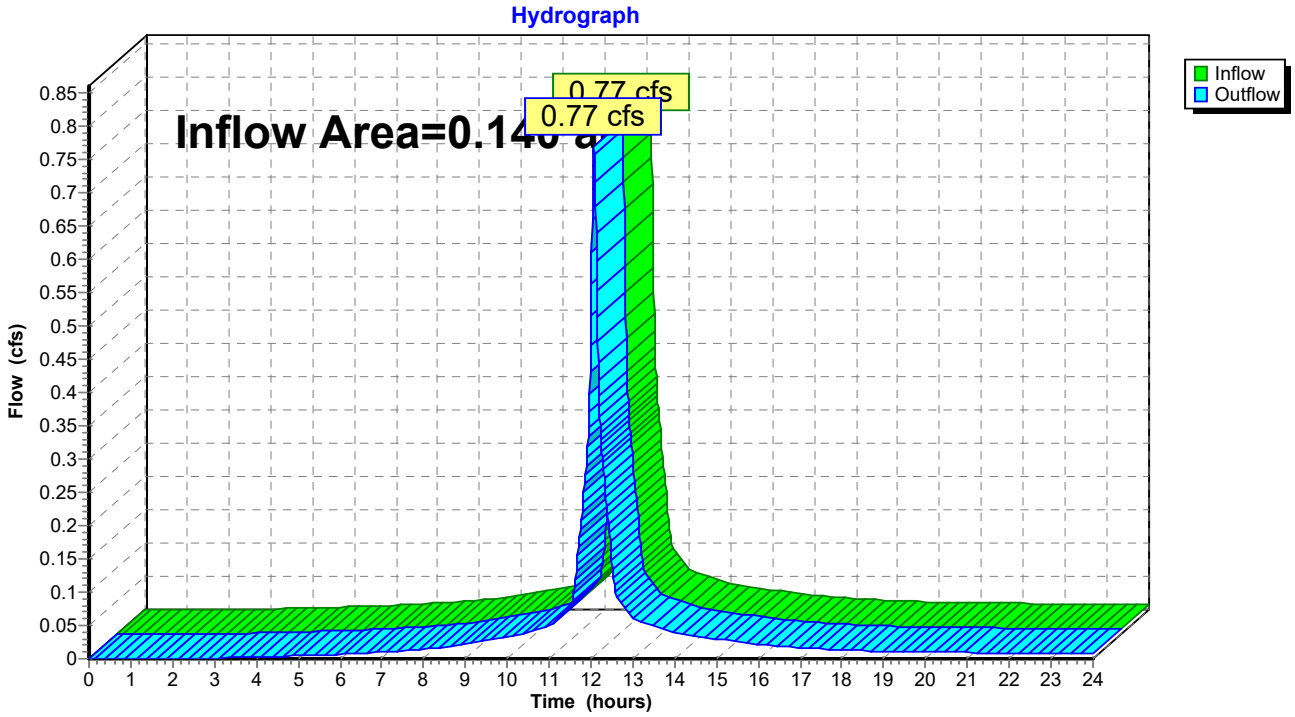


Summary for Reach 300R: CB in Parking Lot

Inflow Area = 0.140 ac, 83.18% Impervious, Inflow Depth > 4.89" for 10-Year event
Inflow = 0.77 cfs @ 12.07 hrs, Volume= 0.057 af
Outflow = 0.77 cfs @ 12.07 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 300R: CB in Parking Lot



Summary for Pond 4P: YD #3

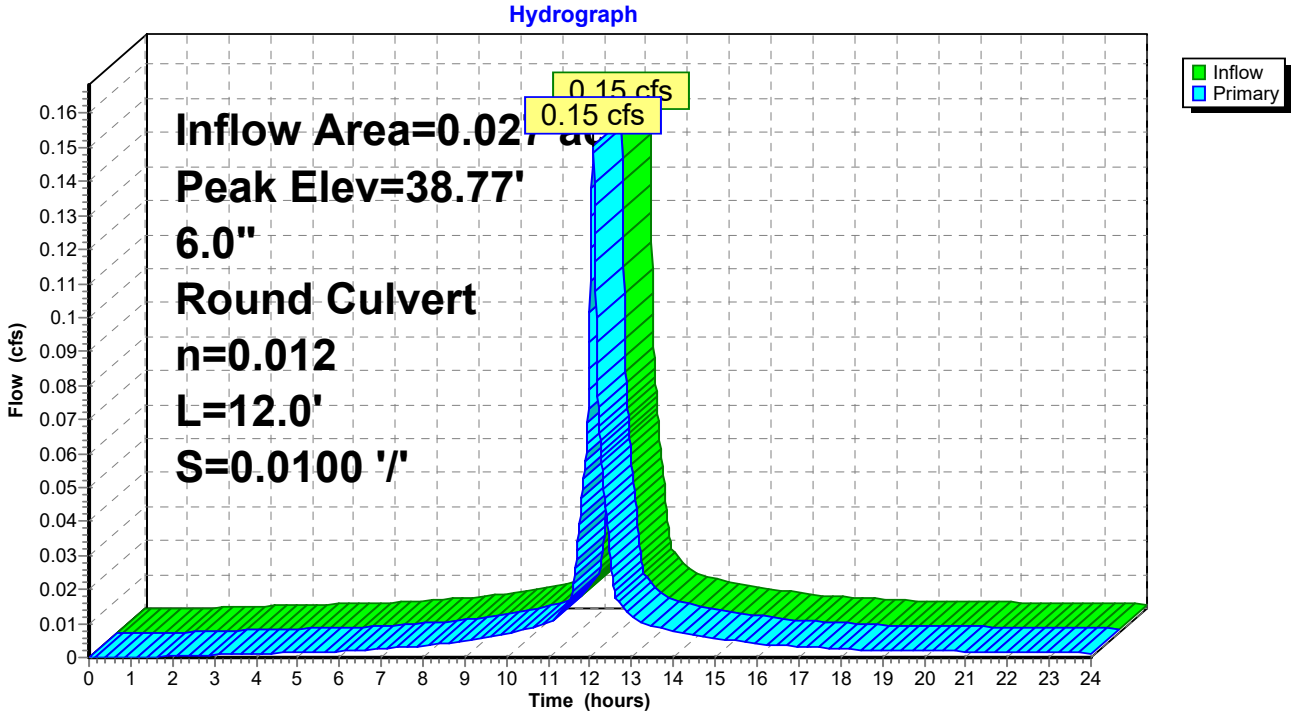
Inflow Area = 0.027 ac, 96.39% Impervious, Inflow Depth > 5.23" for 10-Year event
Inflow = 0.15 cfs @ 12.07 hrs, Volume= 0.012 af
Outflow = 0.15 cfs @ 12.07 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
Primary = 0.15 cfs @ 12.07 hrs, Volume= 0.012 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 38.77' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	38.51'	**6.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.51' / 38.39' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.15 cfs @ 12.07 hrs HW=38.77' TW=38.54' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.15 cfs @ 2.16 fps)

Pond 4P: YD #3



Summary for Pond 5P: YD #2

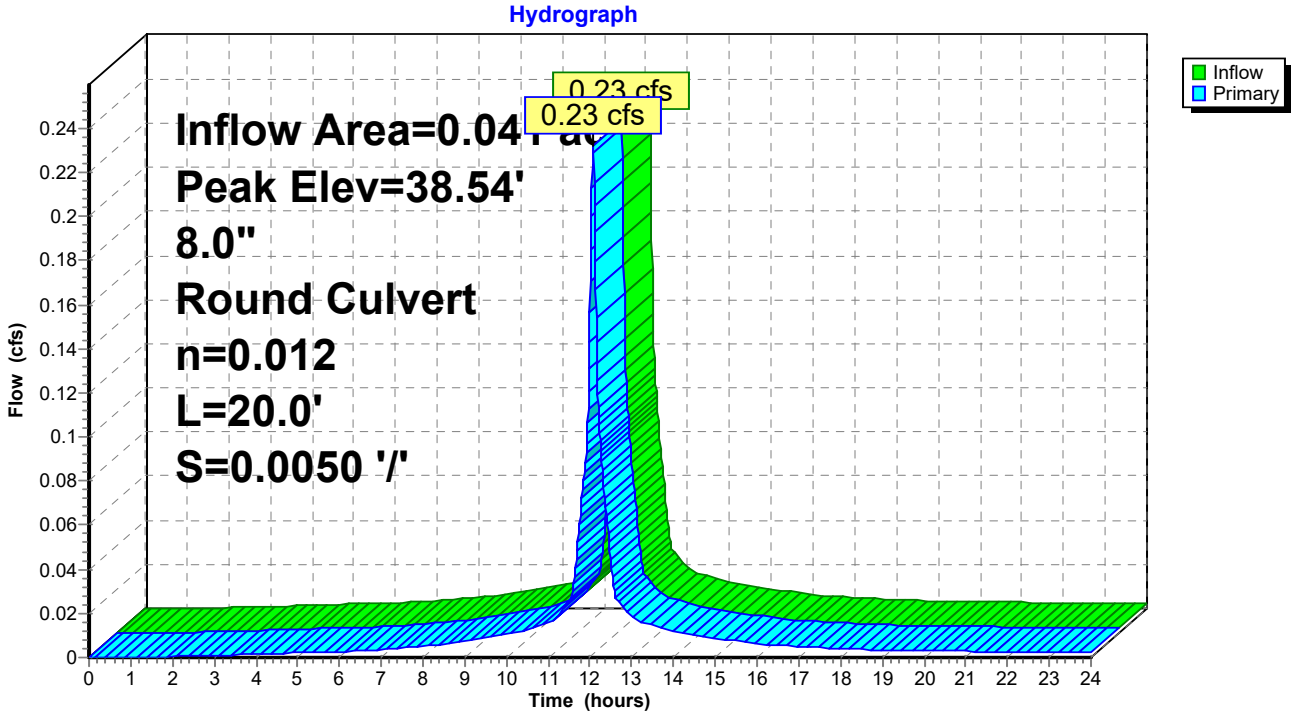
Inflow Area = 0.041 ac, 92.56% Impervious, Inflow Depth > 5.15" for 10-Year event
Inflow = 0.23 cfs @ 12.07 hrs, Volume= 0.018 af
Outflow = 0.23 cfs @ 12.07 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min
Primary = 0.23 cfs @ 12.07 hrs, Volume= 0.018 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 38.54' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	38.22'	**8.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.22' / 38.12' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.23 cfs @ 12.07 hrs HW=38.54' TW=38.36' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.23 cfs @ 2.03 fps)

Pond 5P: YD #2



Summary for Pond 11P: YD #1

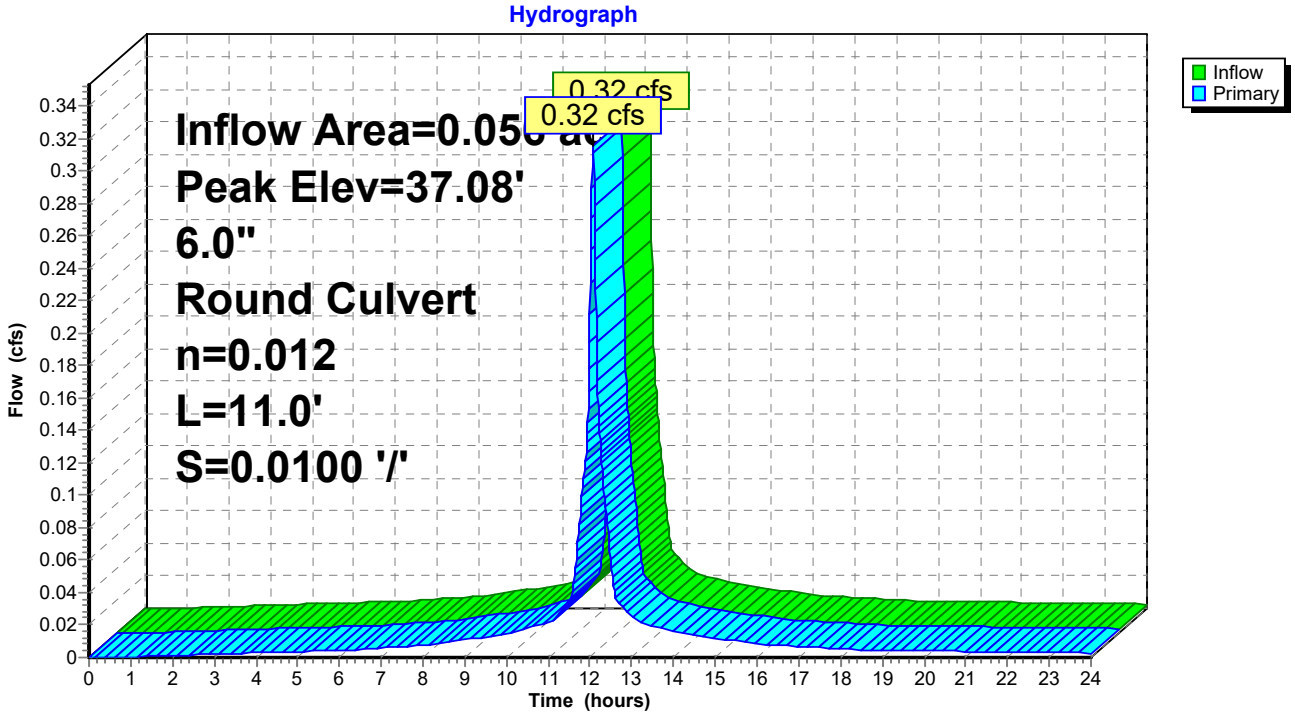
Inflow Area = 0.056 ac, 99.55% Impervious, Inflow Depth > 5.33" for 10-Year event
Inflow = 0.32 cfs @ 12.07 hrs, Volume= 0.025 af
Outflow = 0.32 cfs @ 12.07 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min
Primary = 0.32 cfs @ 12.07 hrs, Volume= 0.025 af

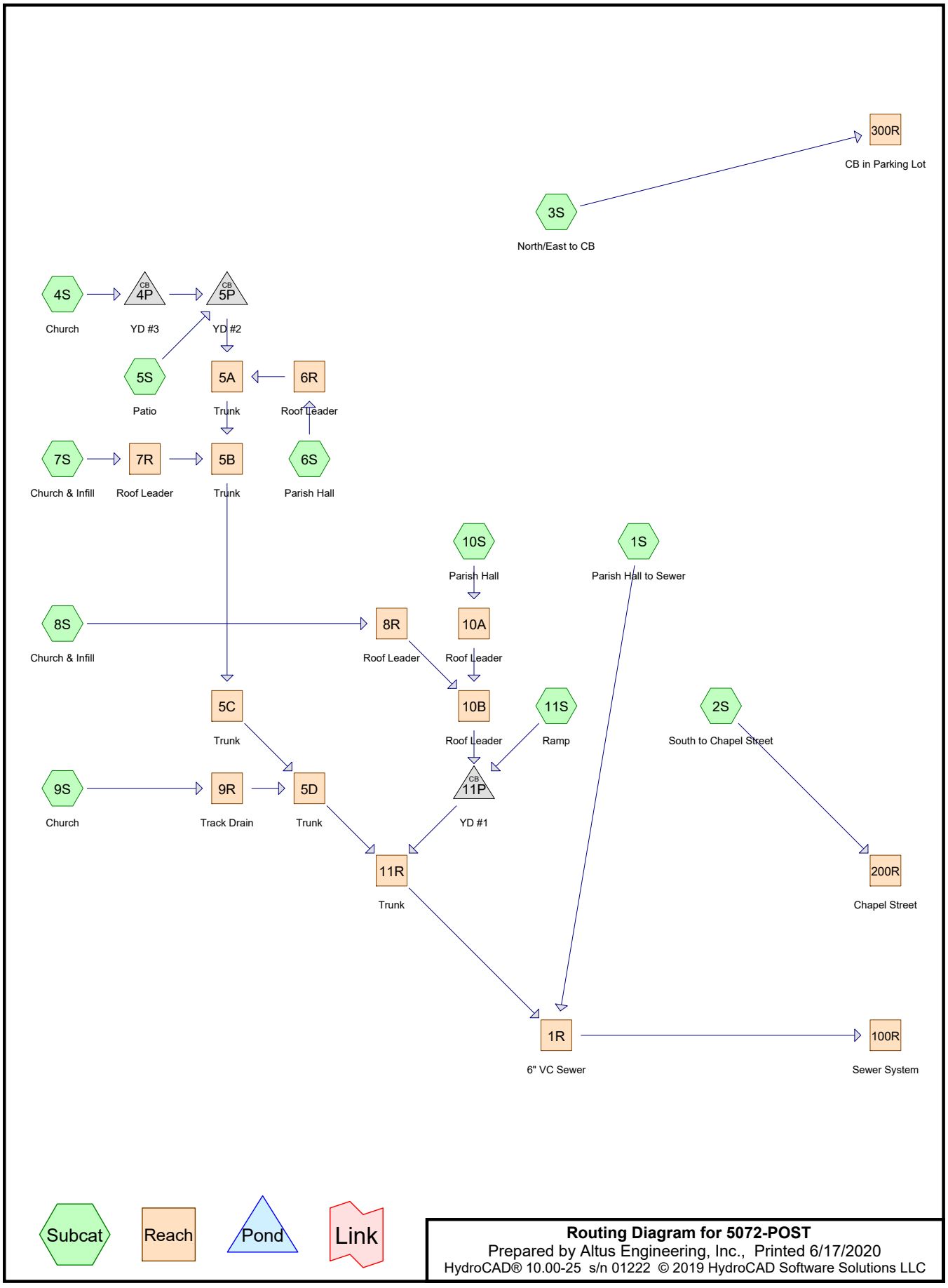
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 37.08' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	36.67'	**6.0" Round Culvert** L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.67' / 36.56' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.32 cfs @ 12.07 hrs HW=37.08' TW=36.66' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.32 cfs @ 2.52 fps)

Pond 11P: YD #1





Routing Diagram for 5072-POST
Prepared by Altus Engineering, Inc., Printed 6/17/2020
HydroCAD® 10.00-25 s/n 01222 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Parish Hall to Sewer Runoff Area=3,589 sf 100.00% Impervious Runoff Depth>6.84"
Tc=5.0 min CN=98 Runoff=0.59 cfs 0.047 af

Subcatchment 2S: South to Chapel Street Runoff Area=7,269 sf 81.33% Impervious Runoff Depth>6.36"
Flow Length=154' Tc=5.0 min CN=94 Runoff=1.17 cfs 0.088 af

Subcatchment 3S: North/East to CB Runoff Area=6,105 sf 83.18% Impervious Runoff Depth>6.36"
Flow Length=142' Tc=5.0 min CN=94 Runoff=0.99 cfs 0.074 af

Subcatchment 4S: Church Runoff Area=1,162 sf 96.39% Impervious Runoff Depth>6.72"
Tc=5.0 min CN=97 Runoff=0.19 cfs 0.015 af

Subcatchment 5S: Patio Runoff Area=640 sf 85.62% Impervious Runoff Depth>6.48"
Tc=5.0 min CN=95 Runoff=0.10 cfs 0.008 af

Subcatchment 6S: Parish Hall Runoff Area=267 sf 100.00% Impervious Runoff Depth>6.84"
Tc=5.0 min CN=98 Runoff=0.04 cfs 0.003 af

Subcatchment 7S: Church & Infill Runoff Area=1,303 sf 100.00% Impervious Runoff Depth>6.84"
Tc=5.0 min CN=98 Runoff=0.22 cfs 0.017 af

Subcatchment 8S: Church & Infill Runoff Area=1,319 sf 100.00% Impervious Runoff Depth>6.84"
Tc=5.0 min CN=98 Runoff=0.22 cfs 0.017 af

Subcatchment 9S: Church Runoff Area=184 sf 100.00% Impervious Runoff Depth>6.84"
Tc=5.0 min CN=98 Runoff=0.03 cfs 0.002 af

Subcatchment 10S: Parish Hall Runoff Area=761 sf 100.00% Impervious Runoff Depth>6.84"
Tc=5.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 11S: Ramp Runoff Area=343 sf 96.79% Impervious Runoff Depth>6.72"
Tc=5.0 min CN=97 Runoff=0.06 cfs 0.004 af

Reach 1R: 6" VC Sewer Avg. Flow Depth=0.50' Max Vel=8.18 fps Inflow=1.58 cfs 0.124 af
6.0" Round Pipe n=0.011 L=260.0' S=0.0453 '/' Capacity=1.41 cfs Outflow=1.52 cfs 0.124 af

Reach 5A: Trunk Avg. Flow Depth=0.28' Max Vel=2.45 fps Inflow=0.34 cfs 0.026 af
8.0" Round Pipe n=0.012 L=2.0' S=0.0050 '/' Capacity=0.93 cfs Outflow=0.34 cfs 0.026 af

Reach 5B: Trunk Avg. Flow Depth=0.37' Max Vel=2.77 fps Inflow=0.55 cfs 0.043 af
8.0" Round Pipe n=0.012 L=58.0' S=0.0050 '/' Capacity=0.93 cfs Outflow=0.55 cfs 0.043 af

Reach 5C: Trunk Avg. Flow Depth=0.15' Max Vel=9.22 fps Inflow=0.55 cfs 0.043 af
8.0" Round Pipe n=0.012 L=3.8' S=0.1368 '/' Capacity=4.84 cfs Outflow=0.55 cfs 0.043 af

Reach 5D: Trunk Avg. Flow Depth=0.16' Max Vel=9.36 fps Inflow=0.58 cfs 0.046 af
8.0" Round Pipe n=0.012 L=6.0' S=0.1367 '/' Capacity=4.84 cfs Outflow=0.58 cfs 0.046 af

Reach 6R: Roof Leader Avg. Flow Depth=0.07' Max Vel=3.08 fps Inflow=0.04 cfs 0.003 af
4.0" Round Pipe n=0.012 L=9.0' S=0.0400 '/' Capacity=0.41 cfs Outflow=0.04 cfs 0.003 af

Reach 7R: Roof Leader Avg. Flow Depth=0.15' Max Vel=5.56 fps Inflow=0.22 cfs 0.017 af
4.0" Round Pipe n=0.012 L=17.0' S=0.0600 '/' Capacity=0.51 cfs Outflow=0.22 cfs 0.017 af

Reach 8R: Roof Leader Avg. Flow Depth=0.14' Max Vel=6.46 fps Inflow=0.22 cfs 0.017 af
4.0" Round Pipe n=0.012 L=11.7' S=0.0897 '/' Capacity=0.62 cfs Outflow=0.22 cfs 0.017 af

Reach 9R: Track Drain Avg. Flow Depth=0.04' Max Vel=5.44 fps Inflow=0.03 cfs 0.002 af
4.0" Round Pipe n=0.012 L=15.0' S=0.2747 '/' Capacity=1.08 cfs Outflow=0.03 cfs 0.002 af

Reach 10A: Roof Leader Avg. Flow Depth=0.11' Max Vel=5.08 fps Inflow=0.13 cfs 0.010 af
4.0" Round Pipe n=0.012 L=10.0' S=0.0700 '/' Capacity=0.55 cfs Outflow=0.13 cfs 0.010 af

Reach 10B: Roof Leader Avg. Flow Depth=0.19' Max Vel=6.61 fps Inflow=0.34 cfs 0.027 af
4.0" Round Pipe n=0.012 L=5.7' S=0.0702 '/' Capacity=0.55 cfs Outflow=0.34 cfs 0.027 af

Reach 11R: Trunk Avg. Flow Depth=0.20' Max Vel=10.86 fps Inflow=0.98 cfs 0.077 af
8.0" Round Pipe n=0.012 L=23.0' S=0.1361 '/' Capacity=4.83 cfs Outflow=0.98 cfs 0.077 af

Reach 100R: Sewer System Inflow=1.52 cfs 0.124 af
Outflow=1.52 cfs 0.124 af

Reach 200R: Chapel Street Inflow=1.17 cfs 0.088 af
Outflow=1.17 cfs 0.088 af

Reach 300R: CB in Parking Lot Inflow=0.99 cfs 0.074 af
Outflow=0.99 cfs 0.074 af

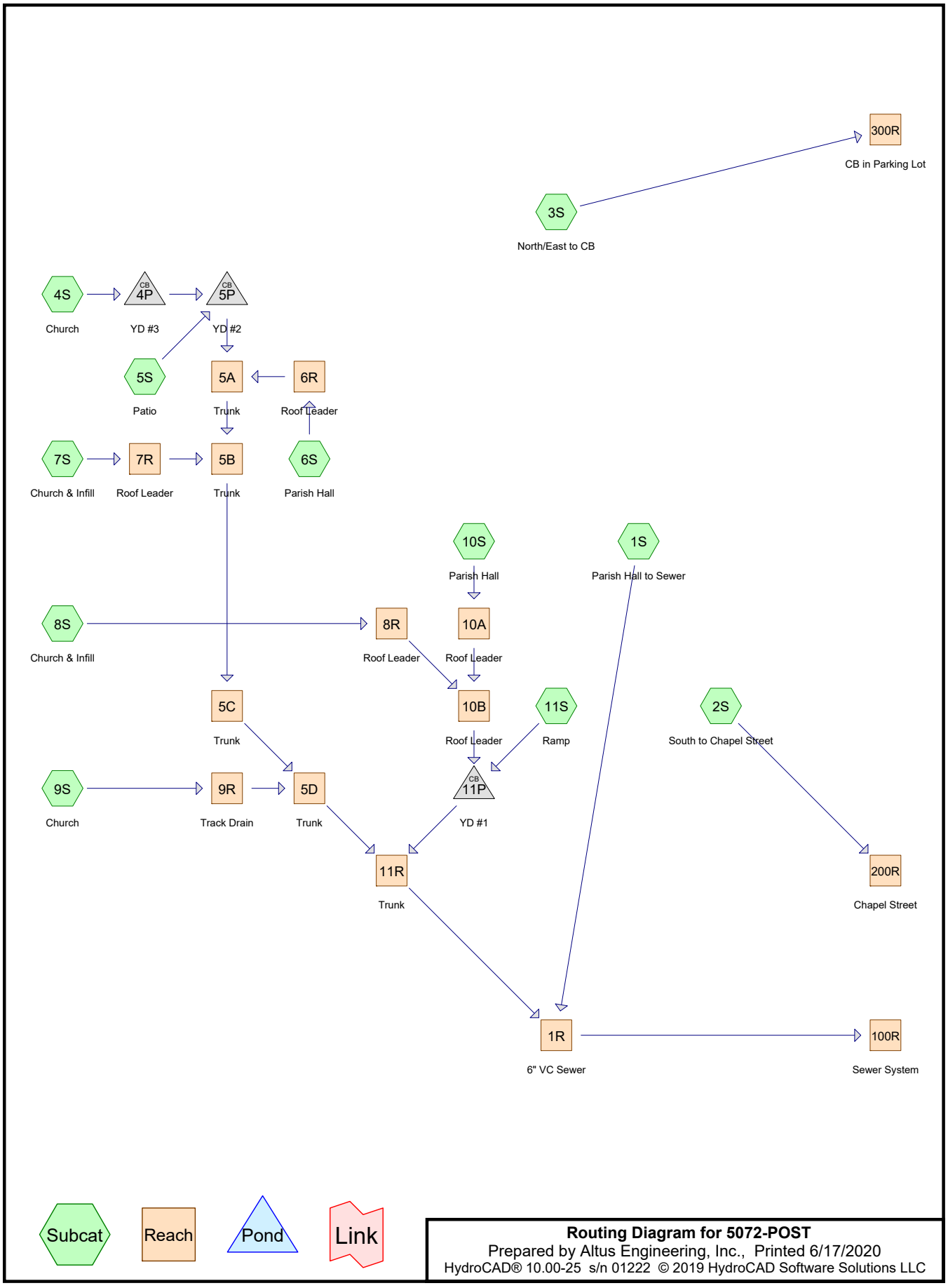
Pond 4P: YD #3 Peak Elev=38.81' Inflow=0.19 cfs 0.015 af
6.0" Round Culvert n=0.012 L=12.0' S=0.0100 '/' Outflow=0.19 cfs 0.015 af

Pond 5P: YD #2 Peak Elev=38.59' Inflow=0.30 cfs 0.023 af
8.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.30 cfs 0.023 af

Pond 11P: YD #1 Peak Elev=37.15' Inflow=0.40 cfs 0.032 af
6.0" Round Culvert n=0.012 L=11.0' S=0.0100 '/' Outflow=0.40 cfs 0.032 af

Total Runoff Area = 0.527 ac Runoff Volume = 0.287 af Average Runoff Depth = 6.54"
11.02% Pervious = 0.058 ac 88.98% Impervious = 0.469 ac

(this page left intentionally blank)



Routing Diagram for 5072-POST
Prepared by Altus Engineering, Inc., Printed 6/17/2020
HydroCAD® 10.00-25 s/n 01222 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Parish Hall to Sewer Runoff Area=3,589 sf 100.00% Impervious Runoff Depth>8.23"
Tc=5.0 min CN=98 Runoff=0.71 cfs 0.057 af

Subcatchment 2S: South to Chapel Street Runoff Area=7,269 sf 81.33% Impervious Runoff Depth>7.75"
Flow Length=154' Tc=5.0 min CN=94 Runoff=1.42 cfs 0.108 af

Subcatchment 3S: North/East to CB Runoff Area=6,105 sf 83.18% Impervious Runoff Depth>7.75"
Flow Length=142' Tc=5.0 min CN=94 Runoff=1.19 cfs 0.091 af

Subcatchment 4S: Church Runoff Area=1,162 sf 96.39% Impervious Runoff Depth>8.11"
Tc=5.0 min CN=97 Runoff=0.23 cfs 0.018 af

Subcatchment 5S: Patio Runoff Area=640 sf 85.62% Impervious Runoff Depth>7.87"
Tc=5.0 min CN=95 Runoff=0.13 cfs 0.010 af

Subcatchment 6S: Parish Hall Runoff Area=267 sf 100.00% Impervious Runoff Depth>8.23"
Tc=5.0 min CN=98 Runoff=0.05 cfs 0.004 af

Subcatchment 7S: Church & Infill Runoff Area=1,303 sf 100.00% Impervious Runoff Depth>8.23"
Tc=5.0 min CN=98 Runoff=0.26 cfs 0.021 af

Subcatchment 8S: Church & Infill Runoff Area=1,319 sf 100.00% Impervious Runoff Depth>8.23"
Tc=5.0 min CN=98 Runoff=0.26 cfs 0.021 af

Subcatchment 9S: Church Runoff Area=184 sf 100.00% Impervious Runoff Depth>8.23"
Tc=5.0 min CN=98 Runoff=0.04 cfs 0.003 af

Subcatchment 10S: Parish Hall Runoff Area=761 sf 100.00% Impervious Runoff Depth>8.23"
Tc=5.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment 11S: Ramp Runoff Area=343 sf 96.79% Impervious Runoff Depth>8.11"
Tc=5.0 min CN=97 Runoff=0.07 cfs 0.005 af

Reach 1R: 6" VC Sewer Avg. Flow Depth=0.50' Max Vel=8.19 fps Inflow=1.89 cfs 0.150 af
6.0" Round Pipe n=0.011 L=260.0' S=0.0453 '/' Capacity=1.41 cfs Outflow=1.50 cfs 0.150 af

Reach 5A: Trunk Avg. Flow Depth=0.31' Max Vel=2.57 fps Inflow=0.41 cfs 0.032 af
8.0" Round Pipe n=0.012 L=2.0' S=0.0050 '/' Capacity=0.93 cfs Outflow=0.41 cfs 0.032 af

Reach 5B: Trunk Avg. Flow Depth=0.42' Max Vel=2.88 fps Inflow=0.67 cfs 0.052 af
8.0" Round Pipe n=0.012 L=58.0' S=0.0050 '/' Capacity=0.93 cfs Outflow=0.66 cfs 0.052 af

Reach 5C: Trunk Avg. Flow Depth=0.17' Max Vel=9.72 fps Inflow=0.66 cfs 0.052 af
8.0" Round Pipe n=0.012 L=3.8' S=0.1368 '/' Capacity=4.84 cfs Outflow=0.66 cfs 0.052 af

Reach 5D: Trunk Avg. Flow Depth=0.17' Max Vel=9.87 fps Inflow=0.70 cfs 0.055 af
8.0" Round Pipe n=0.012 L=6.0' S=0.1367 '/' Capacity=4.84 cfs Outflow=0.70 cfs 0.055 af

Reach 6R: Roof Leader Avg. Flow Depth=0.08' Max Vel=3.25 fps Inflow=0.05 cfs 0.004 af
4.0" Round Pipe n=0.012 L=9.0' S=0.0400 '/' Capacity=0.41 cfs Outflow=0.05 cfs 0.004 af

Reach 7R: Roof Leader Avg. Flow Depth=0.17' Max Vel=5.82 fps Inflow=0.26 cfs 0.021 af
4.0" Round Pipe n=0.012 L=17.0' S=0.0600 '/' Capacity=0.51 cfs Outflow=0.26 cfs 0.021 af

Reach 8R: Roof Leader Avg. Flow Depth=0.15' Max Vel=6.78 fps Inflow=0.26 cfs 0.021 af
4.0" Round Pipe n=0.012 L=11.7' S=0.0897 '/' Capacity=0.62 cfs Outflow=0.26 cfs 0.021 af

Reach 9R: Track Drain Avg. Flow Depth=0.04' Max Vel=5.74 fps Inflow=0.04 cfs 0.003 af
4.0" Round Pipe n=0.012 L=15.0' S=0.2747 '/' Capacity=1.08 cfs Outflow=0.04 cfs 0.003 af

Reach 10A: Roof Leader Avg. Flow Depth=0.12' Max Vel=5.34 fps Inflow=0.15 cfs 0.012 af
4.0" Round Pipe n=0.012 L=10.0' S=0.0700 '/' Capacity=0.55 cfs Outflow=0.15 cfs 0.012 af

Reach 10B: Roof Leader Avg. Flow Depth=0.22' Max Vel=6.88 fps Inflow=0.41 cfs 0.033 af
4.0" Round Pipe n=0.012 L=5.7' S=0.0702 '/' Capacity=0.55 cfs Outflow=0.41 cfs 0.033 af

Reach 11R: Trunk Avg. Flow Depth=0.22' Max Vel=11.43 fps Inflow=1.18 cfs 0.093 af
8.0" Round Pipe n=0.012 L=23.0' S=0.1361 '/' Capacity=4.83 cfs Outflow=1.18 cfs 0.093 af

Reach 100R: Sewer System Inflow=1.50 cfs 0.150 af
Outflow=1.50 cfs 0.150 af

Reach 200R: Chapel Street Inflow=1.42 cfs 0.108 af
Outflow=1.42 cfs 0.108 af

Reach 300R: CB in Parking Lot Inflow=1.19 cfs 0.091 af
Outflow=1.19 cfs 0.091 af

Pond 4P: YD #3 Peak Elev=38.84' Inflow=0.23 cfs 0.018 af
6.0" Round Culvert n=0.012 L=12.0' S=0.0100 '/' Outflow=0.23 cfs 0.018 af

Pond 5P: YD #2 Peak Elev=38.63' Inflow=0.35 cfs 0.028 af
8.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.35 cfs 0.028 af

Pond 11P: YD #1 Peak Elev=37.22' Inflow=0.48 cfs 0.038 af
6.0" Round Culvert n=0.012 L=11.0' S=0.0100 '/' Outflow=0.48 cfs 0.038 af

Total Runoff Area = 0.527 ac Runoff Volume = 0.348 af Average Runoff Depth = 7.94"
11.02% Pervious = 0.058 ac 88.98% Impervious = 0.469 ac

(this page left intentionally blank)

Section 4

NRCC Extreme Precipitation Table

ALTUS
ENGINEERING, INC.

(this page left intentionally blank)

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.755 degrees West
Latitude	43.079 degrees North
Elevation	0 feet
Date/Time	Tue, 16 Jun 2020 17:31:51 -0400

Base rainfall amounts increased by 15% for modelling purposes

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.65	2.92	**1yr**	2.35	2.81	3.22	3.94	4.54	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.48	3.20	3.57	**2yr**	2.84	3.43	3.93	4.67	5.32	**2yr**
5yr	0.37	0.58	0.73	0.97	1.25	1.61	**5yr**	1.08	1.47	1.89	2.43	3.14	4.06	4.57	**5yr**	3.59	4.40	5.03	5.93	6.69	**5yr**
10yr	0.41	0.65	0.82	1.11	1.45	1.89	**10yr**	1.25	1.73	2.23	2.89	3.74	4.86	5.52	**10yr**	4.30	5.31	6.07	7.09	7.96	**10yr**
25yr	0.48	0.76	0.97	1.34	1.77	2.34	**25yr**	1.53	2.14	2.78	3.63	4.73	6.16	7.09	**25yr**	5.45	6.81	7.79	9.00	10.03	**25yr**
50yr	0.54	0.86	1.10	1.54	2.07	2.76	**50yr**	1.79	2.53	3.29	4.32	5.65	7.37	8.57	**50yr**	6.52	8.24	9.40	10.79	11.95	**50yr**
100yr	0.60	0.97	1.25	1.77	2.42	3.26	**100yr**	2.09	2.98	3.90	5.15	6.76	8.83	0.36	**100yr**	7.81	9.96	11.35	12.93	14.24	**100yr**
200yr	0.67	1.10	1.43	2.05	2.82	3.83	**200yr**	2.44	3.51	4.61	6.12	8.07	10.58	2.52	**200yr**	9.36	12.04	13.72	15.50	16.97	**200yr**
500yr	0.80	1.31	1.71	2.48	3.48	4.76	**500yr**	3.00	4.38	5.76	7.70	10.20	13.44	6.10	**500yr**	11.90	15.48	17.62	19.72	21.43	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.88	**1yr**	0.63	0.86	0.93	1.33	1.68	2.23	2.47	**1yr**	1.98	2.38	2.86	3.19	3.89	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.05	3.44	**2yr**	2.70	3.31	3.82	4.54	5.08	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.73	3.78	4.17	**5yr**	3.34	4.01	4.71	5.52	6.22	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.80	2.39	3.06	4.36	4.84	**10yr**	3.86	4.65	5.42	6.39	7.17	**10yr**
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.35	1.86	2.10	2.75	3.53	4.71	5.86	**25yr**	4.17	5.63	6.61	7.75	8.64	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.16	**50yr**	1.52	2.12	2.34	3.07	3.92	5.32	6.75	**50yr**	4.71	6.50	7.67	8.99	9.97	**50yr**
100yr	0.53	0.81	1.01	1.46	2.00	2.47	**100yr**	1.73	2.41	2.62	3.41	4.34	5.98	7.79	**100yr**	5.30	7.49	8.89	10.43	11.50	**100yr**
200yr	0.59	0.89	1.12	1.63	2.27	2.81	**200yr**	1.96	2.75	2.93	3.78	4.78	6.71	8.97	**200yr**	5.93	8.63	10.30	12.13	13.29	**200yr**
500yr	0.68	1.01	1.31	1.90	2.70	3.36	**500yr**	2.33	3.28	3.41	4.31	5.43	7.80	10.82	**500yr**	6.90	10.41	12.52	14.82	16.09	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.20	2.98	3.16	**1yr**	2.63	3.04	3.57	4.37	5.03	**1yr**
2yr	0.34	0.52	0.64	0.86	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.52	3.42	3.70	**2yr**	3.02	3.56	4.09	4.84	5.62	**2yr**
5yr	0.40	0.62	0.76	1.05	1.34	1.62	**5yr**	1.15	1.58	1.88	2.54	3.25	4.33	4.96	**5yr**	3.84	4.77	5.37	6.37	7.15	**5yr**
10yr	0.47	0.72	0.89	1.24	1.61	1.98	**10yr**	1.39	1.93	2.28	3.11	3.96	5.33	6.21	**10yr**	4.72	5.97	6.83	7.84	8.75	**10yr**
25yr	0.58	0.88	1.09	1.56	2.05	2.57	**25yr**	1.77	2.51	2.96	4.07	5.16	7.76	8.35	**25yr**	6.87	8.03	9.17	10.34	11.41	**25yr**
50yr	0.67	1.02	1.27	1.83	2.46	3.13	**50yr**	2.12	3.06	3.60	5.00	6.33	9.71	10.48	**50yr**	8.60	10.08	11.48	12.73	13.97	**50yr**
100yr	0.79	1.19	1.50	2.16	2.96	3.81	**100yr**	2.56	3.73	4.38	6.16	7.78	12.15	13.14	**100yr**	10.75	12.64	14.37	15.71	17.10	**100yr**
200yr	0.92	1.39	1.76	2.55	3.56	4.65	**200yr**	3.07	4.55	5.34	7.59	9.56	15.24	16.50	**200yr**	13.49	15.86	18.02	19.37	20.93	**200yr**
500yr	1.15	1.71	2.20	3.19	4.54	6.04	**500yr**	3.92	5.90	6.94	10.03	12.60	20.59	22.29	**500yr**	18.23	21.44	24.31	25.55	27.36	**500yr**

Powered by ACIS Northeast Regional Climate Center

(this page left intentionally blank)

Section 5

NRCS Soils Report

ALTUS
ENGINEERING, INC.

(this page left intentionally blank)

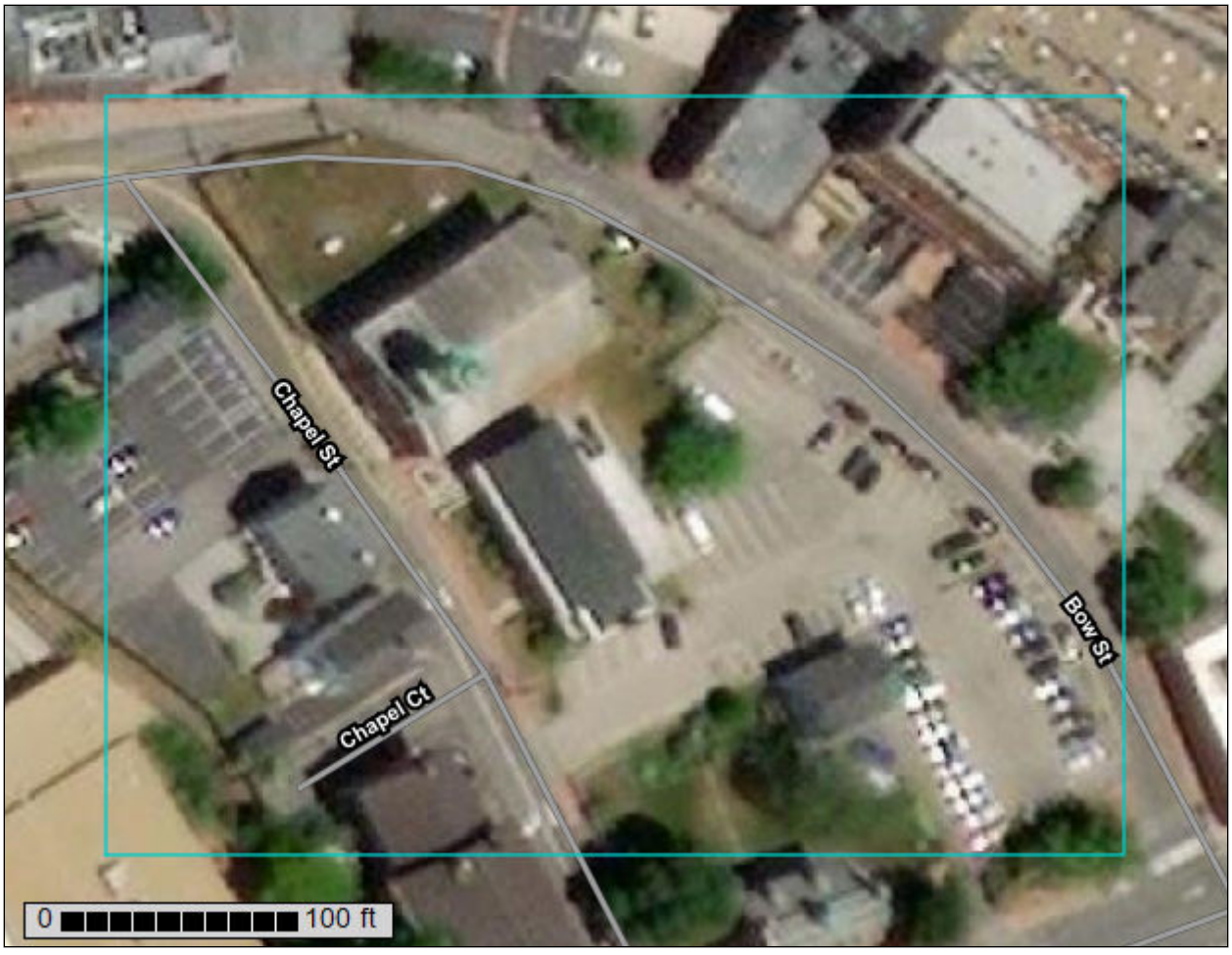
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Rockingham County, New Hampshire



June 16, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:822 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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: Rockingham County, New Hampshire
Survey Area Data: Version 21, Sep 16, 2019

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

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
699	Urban land	3.1	100.0%
Totals for Area of Interest		**3.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

699—Urban land

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Not named

Percent of map unit: 15 percent
Hydric soil rating: No

Section 6

Plans

Pre-Development Drainage Area Plan
Post-Development Drainage Area Plan

ALTUS
ENGINEERING, INC.

(this page left intentionally blank)

NH STATE PLANE COORDINATE SYSTEM
NAD 1983

POA 300

POA 200

POA 100

#164–166

#101
SAINT JOHN'S CHURCH
PARISH HALL

#105
SAINT JOHN'S CHURCH

#110

#100

#126

CHAPEL STREET

LEGEND

- PROPERTY LINE
- 60 EXISTING CONTOUR
- VGC EXISTING PAVEMENT/CURB
- EXISTING TREELINE
- WATERSHED BOUNDARY
- 1 1 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)

P5072

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER – 6/22/20

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JUNE 22, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PLANNING BOARD	EBS	06/22/20

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5072–SITE.dwg

SCALE: 22"x34" 1" = 10'
11"x17" 1" = 20'

OWNER/APPLICANT:
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

PROJECT:
ST. JOHN'S EPISCOPAL CHURCH
TAX MAP 106 LOT 62
101 & 105 CHAPEL STREET
PORTSMOUTH, NH 03801

TITLE:
PRE-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS-1

NH STATE PLANE COORDINATE SYSTEM
NAD 1983

POA 300

POA 200

POA 100

FUTURE DRAINAGE SYSTEM

#101
SAINT JOHN'S CHURCH
PARISH HALL

#105
SAINT JOHN'S CHURCH

#164–166

#110

#100

#126

CHAPEL STREET

LEGEND

- PROPERTY LINE
- 60 EXISTING CONTOUR
- VGC EXISTING PAVEMENT/CURB
- EXISTING TREELINE
- WATERSHED BOUNDARY
- 1 1 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)

P5072

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER –
6/22/20

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JUNE 22, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PLANNING BOARD	EBS	06/22/20

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5072–SITE.dwg

SCALE: 22"x34" 1" = 10'
11"x17" 1" = 20'

OWNER/APPLICANT:
ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL STREET
PORTSMOUTH, NH 03801

PROJECT:
ST. JOHN'S EPISCOPAL CHURCH
TAX MAP 106 LOT 62
101 & 105 CHAPEL STREET
PORTSMOUTH, NH 03801

TITLE:
POST-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS-2

ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
(603) 433-2335

St. John's Episcopal Church
Building Infill Addition

101 & 105 Chapel Street
Portsmouth, NH
Cost Estimate - Site Work

DATE: June 18, 2020
PROJECT: 5072

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL COST
SITEWORK DEMOLITION				
SITE FEATURES (ALLOWANCE)	1	LS	$8,000.00	$8,000.00
UTILITIES (ALLOWANCE)	1	LS	$2,500.00	$2,500.00
PAVEMENT SAWCUT	60	LF	$5.00	$300.00
CLEARING AND GRUBBING				
VEGETATION REMOVAL AND LOAM STRIPPING	1	LS	$1,500.00	$1,500.00
WATER SUPPLY				
2" DOMESTIC WATER SERVICE	12	LF	$75.00	$900
6" SDR 26 SLEEVE	6	LF	$65.00	$390
6" DI CL 52 FIRE SERVICE	16	LF	$95.00	$1,520
10" SDR 26 SLEEVE	12	LF	$85.00	$1,020
ELECTRIC/PHONE/CABLE SERVICES				
SCH 40 CONDUIT (x4 PER TRENCH)	90	LF	$60.00	$5,400
STORM DRAINAGE SYSTEM				
CONNECTION TO ROOF DRAINS	1	LS	$3,000.00	$3,000
YARD DRAINS	3	EA	$1,000.00	$3,000
4" CPP PERFORATED DRAINAGE PIPE	10	LF	$15.00	$150
4" CPP DRAINAGE PIPE	90	LF	$25.00	$2,250
6" CPP DRAINAGE PIPE	25	LF	$40.00	$1,000
8" CPP DRANAGE PIPE	80	LF	$65.00	$5,200
8" SDR 26 DRAINAGE PIPE	35	LF	$75.00	$2,625
CORE EXISTING MANHOLE	1	EA	$1,500.00	$1,500
RIP RAP/STONE DRIP EDGE	1	LS	$1,000.00	$1,000
FITTINGS	1	LS	$2,500.00	$2,500
SEDIMENT AND EROSION CONTROL				
TEMPORARY EROSION CONTROL	1	LS	$500.00	$500
CONCRETE FLATWORK				
CONCRETE SIDEWALKS	35	SY	$28.00	$980
SIDEWALKS				
BRICK	95	SY	$35.00	$3,325
GRANITE STEPS AND RAILINGS	1	LS	$3,000.00	$3,000
RETAINING WALLS				
CONCRETE RETAINING WALL	400	SF	$25.00	$10,000
AGGREGATE BASE COURSES				
3:1 SAND/CEMENT MIX	1	CY	$400.00	$400
CRUSHED GRAVEL (NHDOT 304.3)	50	CY	$50.00	$2,500

HOT BITUMINOUS PAVEMENT				
3.5" TRENCH PATCH	3	TON	$125.00	$375
1.5" WEARING COURSE, HAND METHOD (SIDEWALKS)	3	TON	$125.00	$375
LANDSCAPING				
LOAM AND SEED	1	LS	$500.00	$500
LANDSCAPING (ALLOWANCE)	1	LS	$2,500.00	$2,500

SUBTOTAL **$68,210**

TOTAL: $68,210

EXCLUSIONS:

ITEMS EXCLUDED FROM THIS ESTIMATE INCLUDE, BUT ARE NOT LIMITED TO, THOSE ITEMS SPECIFIED ABOVE AS BEING NOT INCLUDED IN THIS ESTIMATE AND THE FOLLOWING:

INSPECTION FEES, MONUMENTATION, HVAC PADS, TEMPORARY FENCING AND BARRICADES, TRAFFIC CONTROL, MATERIALS AND COMPACTION TESTING, BUILDING FOUNDATION, BUILDING FOUNDATION EXCAVATION, BUILDING MOUNTED EXTERIOR LIGHTING, BUILDINGS (INCLUDING MODIFICATIONS TO EXISTING BUILDINGS), TEMPORARY STABILIZATION, STAGING, MOBILIZATION, TEMPORARY CONSTRUCTION FACILITIES, SWPPP REQUIREMENTS, UNFORESEEN CONDITIONS, PRICE ESCALATION, ETC.

THIS ESTIMATE IS FOR PERMIT APPLICATION PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION, CONSTRUCTION BIDDING, CONTRACTING OR SUBCONTRACTING.

St. John's
EPISCOPAL CHURCH

2/24/2020

Historical District Commission
1 Junkins Ave., 3rd Floor
Portsmouth, NH 03801

Dear Members of the Historical District Commission,

I am writing to inform you that St. John's Episcopal Church has authorized Michael Campbell, Architect, to submit an application for a building permit on our behalf and to represent St. John's in conversations with the Historical District Commission. He has been authorized to submit plans and drawings for a proposed handicap-accessible addition between St. John's Church and Thaxter Hall—the St. John's Parish Hall (101 Chapel St.).

Thank you for considering our application. We look forward to working with you on this project.

Respectfully Submitted,

Nathaniel Bourne

The Rev. Nathaniel Bourne
Associate Rector
St. John's Episcopal Church