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: Cate Street Development, LLC c/o Jay Bisognano Date Submitted: 06-26-19

Phone Number: 987.490.5278 E-mail: jb@torprops.com

Site Address: 428 US Route 1 BYP Map: see below, pg. 7 Lot: _____

Zoning District: G1 Lot area: 13.3 Ac+/- 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)**		N/A
☑	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF). **(2.5.2.8)**		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)**	Submitted with TAC documents 3.18.19	
☑	Gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1B)**	Breakdown MEMORANDUM_rev1.pdf submittes 3.18.19 CS-201 to 203	N/A
☑	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1C)**	Application, Narrative CN-001 site notes, CS-001 site notes Plan of Land, Topo Plans	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)**	Application, Cover Sheet GI-001, GI-002	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)**	Plan of Land sheet 3 of 3,	N/A
☑	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1F)**	Cover Sheets, GI-001, GI-002	N/A
☑	List of reference plans. **(2.5.3.1G)**	Plan of Land sheet 3 of 3,	N/A
☐	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1H)**	List of Utilities to be added to CN-001 and CU sheets prior to next sub-mission	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)**	Plan of Land sheet 3 of 3 note 9 Topographic Plans sheet 1 of 5 note 5	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 C sheets	N/A
☑	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	Topographic plans	N/A
☑	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Title block all sheets	N/A
☑	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	Revision note #1 all C 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)**	Plan of Land sheet 3 of 3 Topographic Plans sheet 1 of 5	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)**	Note to be added to CN-001 prior to next plan submission	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)**	Upoon decisionof sheets to be recorded, notes a and b will be added	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)**	Notes a-c **have been** added to the landscaping plans Refer to sheet L1.06	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;	Topographic Plans 1 thru 5 `	
☑	b. Zoning boundaries;	Topographic Plans 1 thru 5	
☑	c. Dimensional Regulations;	Topographic Plans 1 thru 5 CN-001 site notes	
☑	d. Wetland delineation, wetland function and value assessment;	Topographic Plans 1 thru 5	
☑	e. SFHA, 100-year flood elevation line and BFE data.	Plan of Land Sheet 3 of 3 note 7	
	2. Buildings and Structures: (2.5.4.3B)		
☑	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;	CS sheets, CG sheets, CU sheets	
☑	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;	A2.11 to A2.15, A3.11 to A3.12	
☑	c. Total Floor Area;	A1.11 to A1.16, CS-201-203	
☑	d. Number of Usable Floors;	A1.11 to A1.16, CS-201-203	
☑	e. Gross floor area by floor and use.	A1.11 to A1.16, CS-201-203	
	3. Access and Circulation: (2.5.4.3C)		
☑	a. Location/width of access ways within site;	CS-101 to 104, CS-201 to 203	
☑	b. Location of curbing, right of ways, edge of pavement and sidewalks;	CS-101 to 104, CS-201 to 203	
☑	c. Location, type, size and design of traffic signing (pavement markings);	CS-101 to 104, CS-201 to 203	
☑	d. Names/layout of existing abutting streets;	CS-101 to 104, CS-201 to 203	
☑	e. Driveway curb cuts for abutting prop. and public roads;	CS-101 to 104, CS-201 to 203	
☐	f. If subdivision; Names of all roads, right of way lines and easements noted;	Easements will be added to appropriate C sheets prior to next submission	
☑	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	CT Sheets	
	4. Parking and Loading: (2.5.4.3D)		
☑	a. Location of off street parking/loading areas, landscaped areas/buffers;	CS-201 to CS-203	
☑	b. Parking Calculations (# required and the # provided).	CN-001, CS-001	
	5. Water Infrastructure: (2.5.4.3E)		
☑	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;	CU Sheets	
☐	b. Location of wells and monitoring wells (include protective radii).	monitoring wells to be added to plans prior to next submission	
	6. Sewer Infrastructure: (2.5.4.3F)		
☑	a. Size, type and location of sanitary sewage facilities & Engineering data.	CU Sheets	
	7. Utilities: (2.5.4.3G)		
☑	a. The size, type and location of all above & below ground utilities;	CG Sheets Drainage CU Sheets	
☑	b. Size type and location of generator pads, transformers and other fixtures.	CU Sheets, CD-540	

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.	Commercial and Apartments have internal dumpster areas, Townhouses have private curbside pickup Commercial will have a compactor exterior added prior to next submission	
	9. Storm water Management: (2.5.4.3I)		
☑	a. The location, elevation and layout of all storm-water drainage.	CG Sheets	
	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.	Sheet LS1	
☑	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Sheet LS1, all cutoff	
	12. Landscaping: (2.5.4.3K)		
☑	a. Identify all undisturbed area, existing vegetation and that which is to be retained;	CS, CG and CU Sheets L1. sheets	
☑	**b.** Location of any irrigation system and water source.	Sheet IRI.01	
	13. Contours and Elevation: (2.5.4.3L)		
☑	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.	CG sheets	
	14. Open Space: (2.5.4.3M)		
☑	a. Type, extent and location of all existing/proposed open space.	CS-001 (West End Yards set)	
☑	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Plan of Land Sheet 3 of 3	
☑	**16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)**	CS Sheets, CN-001 notes (notes will be expanded prior to next sumbission	
☐	**17. Character/Civic District (All following information shall be included): (2.5.4.3Q)**	N/A	
	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)**		
☑	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	CG-103 bioretention basins CG-201-203 CD-511 to 512	CD-511 to 513
☑	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)**	it is not	
☑	Indicate where measures to minimize impervious surfaces have been implemented. **(7.4.3)**	CS, CG and CU sheets, the site reduces existing impervious by over 1 Ac.	
☑	Calculation of the maximum effective impervious surface as a percentage of the site. **(7.4.3.2)**	CS-001 (West End Yard site plans)	
☐	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)**	Written Stormwater Management and Erosion Control Plan to be submitted with next submission	

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)**	Easements to be granted to City for utilities will be finalized as part of this process	
☑	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)**		

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)**	Letters from the private utilities will be provided prior to the next submission	
☐	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	A list of required permits will be added to the plans prior to the next submission. NHDES Wetlands, AOT, Sewer and Water Connection permits, EPANPDES CGP	

Applicant's Signature: _____ **Date:** 06/02/19

Agent for Applicant Richard R. Lundborn, PE, Fuss & O'Neill

Redevelopment of Tax Maps & Lots, 163-33&34, 163-37, 165-2, 172-1 & 173-2

TABLE 1

RESOLUTION SUMMARY of AUGUST 30, 2019 CATE STREET WEY PORTSMOUTH STAFF REVIEW

Color Code:		Addressed/ Corrected
		Change in progress or confirmation needed

Comment #	Comment	Status	Response
1	The crosswalk across Bartlett Street is very long and has very limited sight lines as it is close to the RR bridge abutment. Move back if possible.	Addressed	Cross walk shifted to use cobblestone island as a refuge
2	The ped crossing signs at station 4+40 and 6+50 are not needed, as the flashing beacons are only 100 feet further ahead and in plain sight. Likewise with the sings at station 13+60.	Addressed	Removed
3	Stop signs on the multi-use path at the old Cate Street intersection will be needed, unless the vegetation can be trimmed back to provide adequate sight lines.	Addressed	Stop signs added
4	NO MOTOR VEHICLES signs should be posted on the MUP at its intersection with old Cate Street.	Addressed	Signs Added
5	The Advisory 25 mph signs are not needed with the Reverse curve signs, if the curves are designed for 25 mph.	Addressed	Signs Removed
6	The crosswalks at the intersection of Cate and Bartlett need rapid flashing beacons due to the curves and limited sight lines.	Addressed	Beacons Added
7	The stop sign on Bartlett should be removed back to 30 feet from the stop line for better visibility. The stop ahead sign should also be moved back to about station 20+50.	Addressed	Revised per comment
8	Any W3-1a signs should be W3-1 instead.	Addressed	Revised Accordingly

TABLE 1

RESOLUTION SUMMARY of AUGUST 30, 2019 CATE STREET WEY PORTSMOUTH STAFF REVIEW

Color Code:		Addressed/ Corrected
		Change in progress or confirmation needed

Comment #	Comment	Status	Response
9	What is the 12" square LED module on the flashing beacon detail?	Addressed	Detail revised to meet City Standard
10	CS-201 shows a crosswalk leading into parking spaces about 160 feet from the Bypass. That is not allowed per ADA.	Addressed	revised accordingly
11	Stop signs should be placed at the crosswalks near the Pet Zone.	Addressed	Signs added
12	Water easement to 172/2 must be through the lot to the source of the water in the City ROW.	Addressed	Added to the Easement Plans
13	ROW easement for same property should match proposed driveway configuration.	Addressed	Added to the Easement Plans
14	Sewer connection for the same lot needs a formal easement.	Addressed	Added to the Easement Plans
15	Lot 165/1 needs ROW and water easements from lot line to Cate St.	Addressed	Added to the Easement Plans
16	All gas lines must be at least 3' from the other utilities (except crossings).	Addressed	Gas line spacing has been checked and revised as necessary

TABLE 1

RESOLUTION SUMMARY of AUGUST 30, 2019 CATE STREET WEY PORTSMOUTH STAFF REVIEW

Color Code:		Addressed/ Corrected
		Change in progress or confirmation needed

Comment #	Comment	Status	Response
17	In the provided inspection and maintenance plan Appendix A "Invasive Plant Control" it calls out the use of herbicides to control vegetation. Please remove this section or clarify. Article 10 section 10.1018.25 of our Zoning Ordinance states the following: The use of pesticides or herbicides is prohibited in a wetland or wetland buffer, except that application of pesticides by a public agency for public health purposes is permitted.	Addressed	the note has been deleted
18	The community space exhibits should be updated as the wide pedestrian sidewalk included does not meet the definition for location between the building façade and public right of way. The area of "Park/common" designated for snow storage should also be removed from the community space calculations.	Addressed	The Wide Pedestrian Sidewalk as depicted does meet the requirement as per review with Staff on 9/10/19 Apprporiate connectivity easements will be granted as well The Snow Storage area has been removed from the calculation of the community space
19	The applicant shall work with DPW to satisfactorily address any forthcoming comments from the Water System Analysis Report and Flow Assessment Report expected in the next week for final water and sewer sizes.	Addressed	Understood

WEST END YARDS

CATE STREET · PORTSMOUTH · NEW HAMPSHIRE

SITE PLANS

AUGUST, 2019

PREPARED FOR

CATE STREET DEVELOPMENT, LLC
11 ELKINS STREET, SUITE 420
BOSTON, MA 02127
987.490.5278

PREPARED BY

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
207.363.0669
www.fando.com

SHEET INDEX

SHEET No.	SHEET TITLE
GI-002	COVER SHEET
A1.11-A1.16	FLOOR PLANS
A2.11-A2.15	ELEVATIONS
A2.11-A3.12	RENDERINGS
CN-001-CN-002	GENERAL NOTES & LEGEND
CP-200-CP-204	SITE PREPARATION PLANS
CS-002	DEVELOPMENT STANDARDS SITE PLAN
CS-003	OPEN SPACE PLAN
CS-200-CS-203	SITE PLANS
CG-001	SITE DRAINAGE STRUCTURE TABLE
CG-200-CG-203	GRADING, DRAINAGE & EROSION CONTROL PLAN
CG-210	SUBSURFACE EXPORATION PLAN
CU-001	SITE SEWER STRUCTURE TABLE
CU-200-CU-203	UTILITY PLANS
CD-510-CD-512	DRAINAGE DETAILS
CD-520	WATER & MISC. DETAILS
CD-530-CD-531	SEWER DETAILS
CD-540	UTILITY DETAILS
CD-550-CD-552	SITE DETAILS
CD-560-CD-562	EROSION CONTROL DETAILS
CT-201-CT-204	TURNING MOVEMENTS
L1.00-IRI.01	LANDSCAPE PLANS
LS1	LIGHTING PLANS
SURVEY PLANS	SUBDIVISION & EASEMENT PLANS
SURVEY PLANS	TOPOGRAPHICAL PLANS

PROJECT TEAM

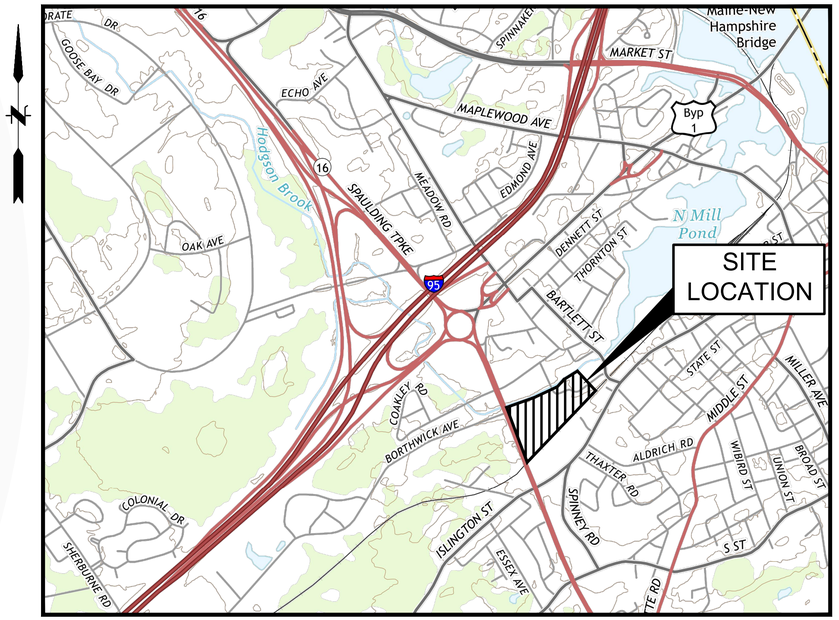
ARCHITECT
PRELLWITZ CHILINSKI ASSOCIATES
221 HAMPSHIRE STREET
CAMBRIDGE, MA. 02139
617.547.8120

LANDSCAPE ARCHITECTS
SITE SOLUTIONS, LLC
3715 NORTHSIDE PARKWAY
300 NORTH CREEK, SUITE 720
ATLANTA, GA. 303227
404.705.9411

NATURAL RESOURCES CONSULTANT
GOVE ENVIRONMENTAL SERVICES, INC
8 CONTINENTAL DRIVE
BUILDING 2, SUITE H
EXETER, NH. 03833-7507
603.778.0644

GEOTECHNICAL ENGINEERS
McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA. 02140
617.868.1420

LAND SURVEYOR
DOUCET SURVEY, INC
102 KENT PLACE
NEWMARKET, NH. 03857
603.659.6560



LOCATION MAP
SCALE: 1" = 1200'

STATE AND FEDERAL PERMITS REQUIRED:		
PERMIT	REQUIRED / NOT REQURED	STATUS / PERMIT NO.
NHDES WETLANDS BUREAU STANDARD DREDGE AND FILL	REQUIRED	2019-00523
NHDES ALTERATION OF TERRAIN	REQUIRED	PENDING
NHDES WATER MAIN EXTENSION	REQUIRED	PENDING
NHDES SEWER MAIN EXTENSION	REQUIRED	PENDING
NHDOT ENTRANCE PERMIT	REQUIRED	PENDING
EPA, NPDES CONSTRUCTION GENERAL PERMIT (CGP)	REQUIRED	PENDING

811 DigSafe MA·ME·NH·RI·VT

CONTACT DIG SAFE 72 HOURS PRIOR TO CONSTRUCTION

THE LOCATION OF ANY UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. CLD CONSULTING ENG. INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. 72 HOURS PRIOR TO ANY EXCAVATION ON SITE, THE CONTRACTOR SHALL CONTACT DIG-SAFE AT 1-888-DIG-SAFE.

STATE OF NEW HAMPSHIRE
RICHARD R. LUNDBORN
No. 10943
LICENSED PROFESSIONAL ENGINEER

PROJ. No.: 20170317.A10
DATE: AUG 2019

GI-002

0' 10' 20' 40'

SCALE: 1" =20'

PRINTED: 7/8/2019 1:48:44 PM

PCA
PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors

ARCHITECT:
PRELLWITZ CHILINSKI ASSOCIATES, INC.
221 Hampshire Street
Cambridge, MA 02139
617-547-8120

OWNER:
TORRINGTON PROPERTIES + WATERSTONE PROPERTIES GROUP

CONTRACTOR:
CONTRACTOR FIRM
Address
City, State ZIP
###-###-####

WEST END YARDS - PORTSMOUTH

428 RT. 1 BYPASS - PORTSMOUTH

REVISIONS:

ORIGINAL ISSUE:
05/10/19

SCALE: 1" = 20'-0"

GROUND FLOOR PLAN - AB

A1.11

0' 10' 20' 40'

SCALE: 1" =20'

PCA
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WEST END YARDS - PORTSMOUTH

428 RT. 1 BYPASS - PORTSMOUTH

REVISIONS:

ORIGINAL ISSUE:
05/10/19

SCALE: 1" = 20'-0"

SECOND FLOOR - AB

A1.12

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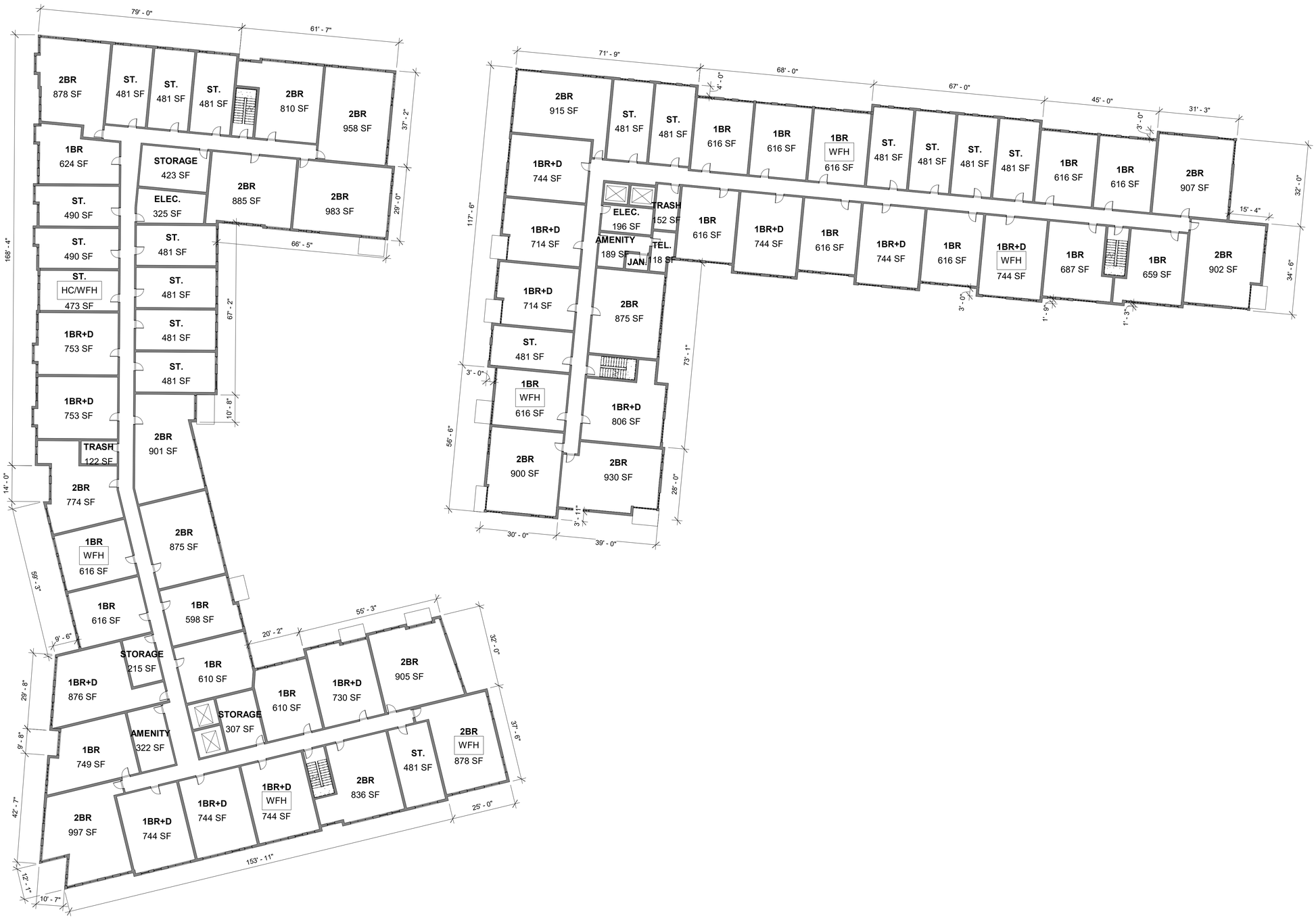

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OWNER:
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Address
City, State ZIP
###-###-####

WEST END YARDS - PORTSMOUTH

428 RT. 1 BYPASS - PORTSMOUTH

REVISIONS:

ORIGINAL ISSUE:
05/10/19

SCALE: 1" = 20'-0"

THIRD FLOOR PLAN - AB

A1.13

0' 10' 20' 40'
SCALE: 1" =20'

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PCA
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Architecture Planning Interiors

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617-547-8120

OWNER:
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CONTRACTOR:
CONTRACTOR FIRM
Address
City, State ZIP
###-###-####

WEST END YARDS - PORTSMOUTH

428 RT. 1 BYPASS - PORTSMOUTH

REVISIONS:

ORIGINAL ISSUE:
05/10/19

SCALE: 1" = 20'-0"

FOURTH FLOOR PLAN - AB

A1.14

0' 10' 20' 40'
SCALE: 1" =20'

0' 10' 20' 40'

SCALE: 1" =20'

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PCA
PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors

ARCHITECT:
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617-547-8120

OWNER:
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CONTRACTOR:
CONTRACTOR FIRM
Address
City, State ZIP
###-###-####

WEST END YARDS - PORTSMOUTH

428 RT. 1 BYPASS - PORTSMOUTH

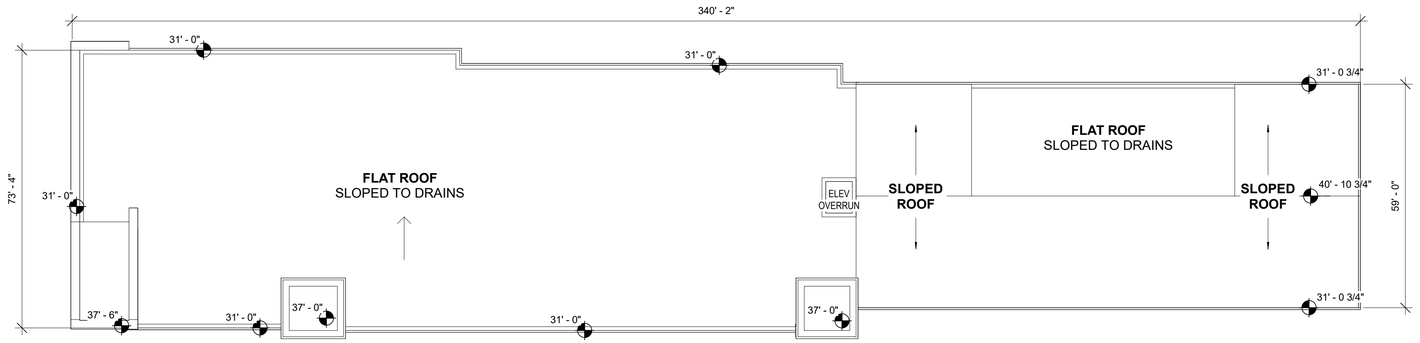
REVISIONS:

ORIGINAL ISSUE:
05/10/19

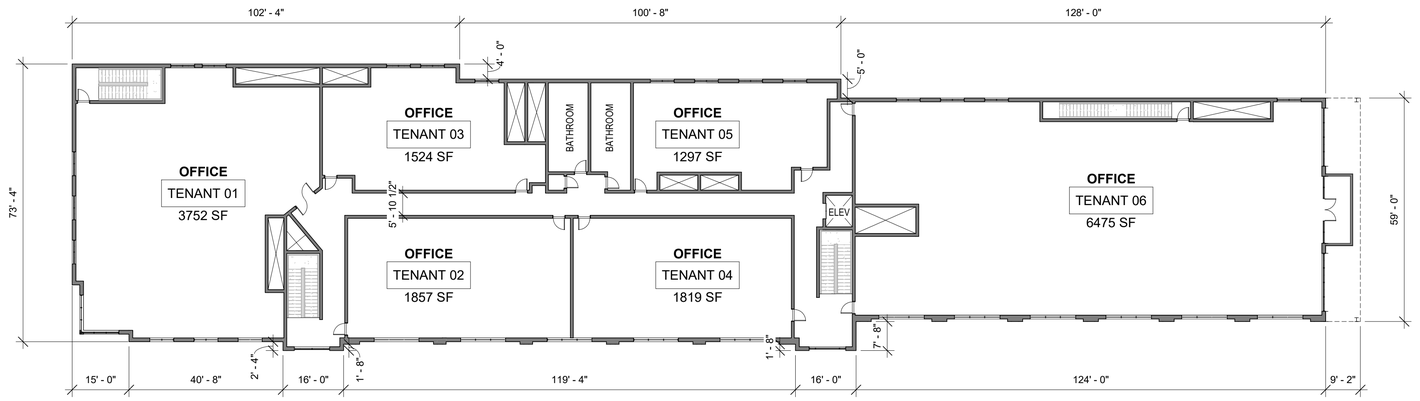
SCALE: 1" = 20'-0"

ROOF PLAN - AB

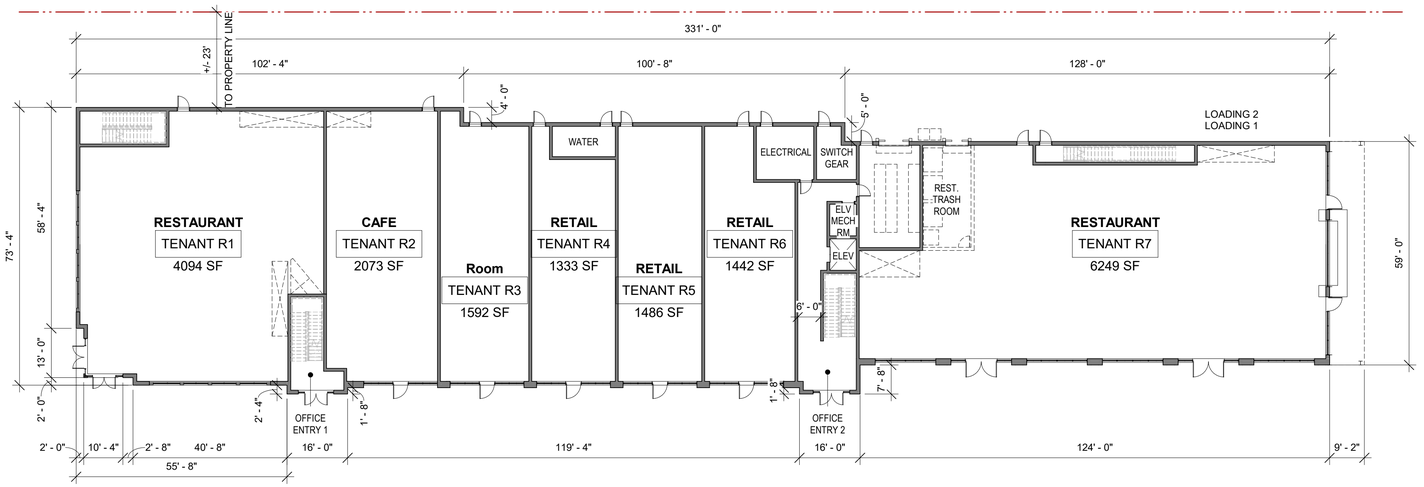
A1.15



3 ROOF
1" = 20'-0"



2 SECOND FLOOR
1" = 20'-0"



1 GROUND FLOOR
1" = 20'-0"

0' 10' 20' 40'
SCALE: 1" =20'

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221 Hampshire Street
Cambridge, MA 02139
617-547-8120

OWNER:
TORRINGTON PROPERTIES
11 Elkins St. #420
Boston, MA 02127
857-264-1210

CONTRACTOR:
ECKMAN CONSTRUCTION
84 Palomino Lane
Bedford, NH 03110
603-623-1713

WEST END YARDS - COMMERCIAL BLDG.

428 RT. 1 BYPASS - PORTSMOUTH

REVISIONS:

ORIGINAL ISSUE:
05/10/19

SCALE: 1" = 20'-0"

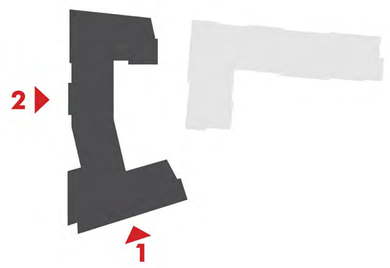
TAC RETAIL BUILDING PLANS

A1.16

EXTERIOR MATERIALS LEGEND	
MARK	MATERIAL
1	METAL PANEL
2	SHINGLES
3	RIBBED PANEL
4	CLAPBOARD
5	FAUX WOOD PANEL
6	FIBER CEMENT PANEL

1 SOUTH ELEVATION
1/16" = 1'-0"

2 WEST ELEVATION
1/16" = 1'-0"



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OWNER:
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CONTRACTOR:
CONTRACTOR FIRM
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City, State ZIP
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WEST END YARDS - PORTSMOUTH

428 RT. 1 BYPASS - PORTSMOUTH

REVISIONS:

ORIGINAL ISSUE:
05/10/19

SCALE:As indicated

Building A Elevations

A2.11

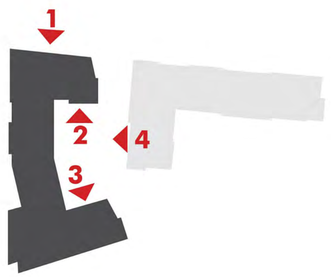
EXTERIOR MATERIALS LEGEND	
MARK	MATERIAL
1	METAL PANEL
2	SHINGLES
3	RIBBED PANEL
4	CLAPBOARD
5	FAUX WOOD PANEL
6	FIBER CEMENT PANEL

1 NORTH ELEVATION
1/16" = 1'-0"

2 NORTH ELEV. COURTYARD
1/16" = 1'-0"

3 SOUTH ELEV. COURTYARD
1/16" = 1'-0"

4 EAST ELEVATION
1/16" = 1'-0"



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WEST END YARDS - PORTSMOUTH

428 RT. 1 BYPASS - PORTSMOUTH

REVISIONS:

ORIGINAL ISSUE:
05/10/19

SCALE:As indicated

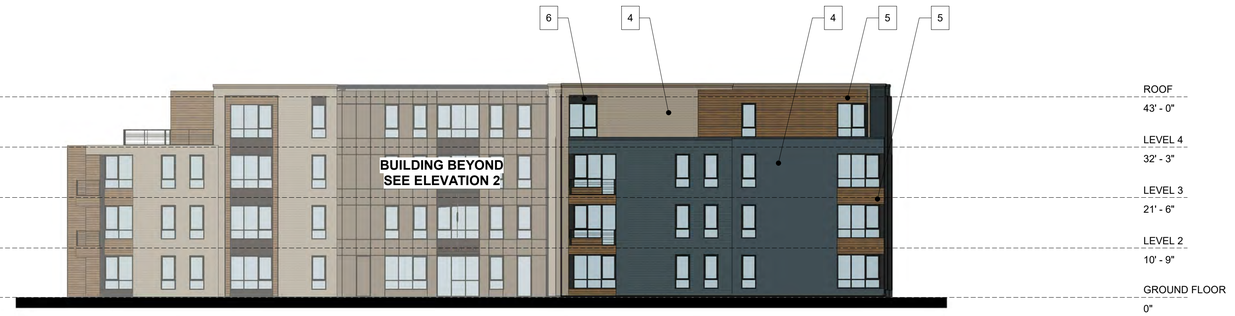
Building A Elevations

A2.12

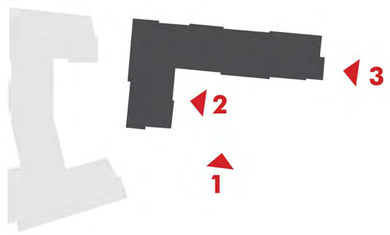
EXTERIOR MATERIALS LEGEND	
MARK	MATERIAL
1	METAL PANEL
2	SHINGLES
3	RIBBED PANEL
4	CLAPBOARD
5	FAUX WOOD PANEL
6	FIBER CEMENT PANEL

1 SOUTH ELEVATION
1/16" = 1'-0"

2 EAST ELEVATION
1/16" = 1'-0"



3 EAST ELEVATION
1/16" = 1'-0"



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WEST END YARDS - PORTSMOUTH

428 RT. 1 BYPASS - PORTSMOUTH

REVISIONS:

ORIGINAL ISSUE:
05/10/19

SCALE:As indicated

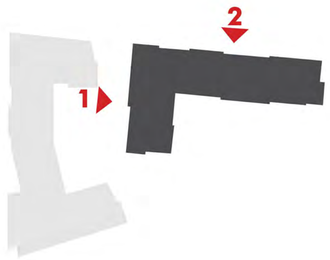
Building B Elevations

A2.13

EXTERIOR MATERIALS LEGEND	
MARK	MATERIAL
1	METAL PANEL
2	SHINGLES
3	RIBBED PANEL
4	CLAPBOARD
5	FAUX WOOD PANEL
6	FIBER CEMENT PANEL

1 WEST ELEVATION
1/16" = 1'-0"

2 NORTH ELEVATION
1/16" = 1'-0"



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WEST END YARDS - PORTSMOUTH

428 RT. 1 BYPASS - PORTSMOUTH

REVISIONS:

ORIGINAL ISSUE:
05/10/19

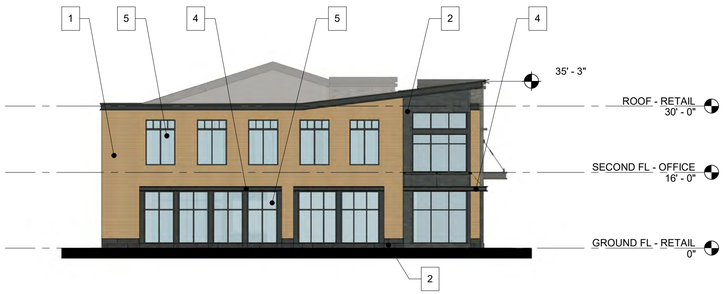
SCALE:As indicated

Building B Elevations

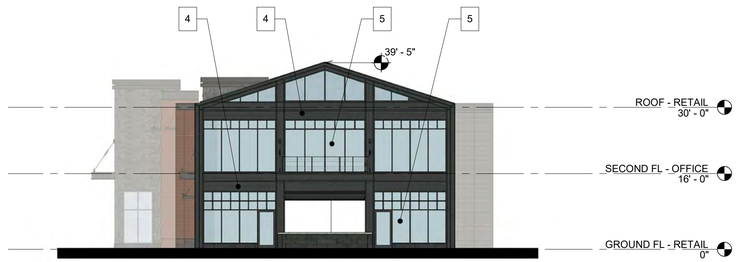
A2.14

EXTERIOR MATERIALS LEGEND	
MARK	MATERIAL
1	RIBBED PANEL
2	CMU
3	BRICK
4	METAL PANEL
5	STOREFRONT

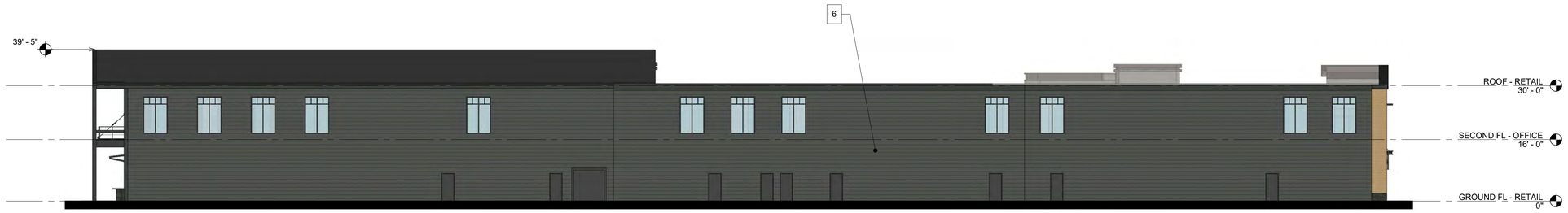
1 SOUTH ELEVATION
1/16" = 1'-0"



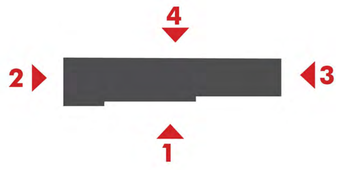
2 WEST ELEVATION
1/16" = 1'-0"



3 EAST ELEVATION
1/16" = 1'-0"



4 NORTH ELEVATION
1/16" = 1'-0"



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WEST END YARDS - PORTSMOUTH

428 RT. 1 BYPASS - PORTSMOUTH

REVISIONS:

ORIGINAL ISSUE:
05/10/19

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Retail Building Elevations

A2.15

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WEST END YARDS - PORTSMOUTH

428 RT. 1 BYPASS - PORTSMOUTH

REVISIONS:

ORIGINAL ISSUE:
05/10/19

SCALE:

VIEW OF RETAIL

A3.11

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WEST END YARDS - PORTSMOUTH

428 RT. 1 BYPASS - PORTSMOUTH

REVISIONS:

ORIGINAL ISSUE:
05/10/19

SCALE:

VIEW OF RESI

A3.12

SURVEY NOTES

1. FIELD SURVEY PERFORMED BY P.J.S. & J.C.M. DURING NOVEMBER 2016 USING A TRIMBLE S6 TOTAL STATION, A TRIMBLE R8 SURVEY GRADE GPS UNIT, A TRIMBLE TSC3 DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL, BY L.P.S. & S.N.F. DURING JULY 2018 AND T.M.M. & J.C.M. IN SEPTEMBER & OCTOBER 2018 USING A TRIMBLE S6 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS. ADDITONAL FIELD SURVEY PERFORMED BY M.C. DURING NOVEMBER 2016 AND OCTOBER 2018 USING A LEICA HDS SCANNER.

2. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY MARC JACOBS IN NOVEMBER OF 2016 AND REVIEWED BY GOVE ENVIRONMENTAL SERVICES, INC. DURING APRIL 2018 IN ACCORDANCE WITH THE US ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y-87-1, JANUARY 1987 AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL; NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0 JANUARY 2012 AND FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, MAY 2017, NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE.

3. FLOOD HAZARD ZONE: "X", PER FIRM MAP #33015C0259E, DATED 5/17/05.

4. VERTICAL DATUM IS BASED ON NGVD29 PER DISK V 28 1942 ELEV. 25.59.

5. HORIZONTAL DATUM BASED ON NEW HAMPSHIRE STATE PLANE(2800) NAD83(2011) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.

6. REFERENCE PLANS:
REFER TO THE PLAN OF LAND AT THE END OF THIS PACKAGE FOR ALL REFERENCE PLANS AND EASEMENTS THAT THE PARCELS ARE SUBJECT TO.

GENERAL

1. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSION OR LOCATION. COORDINATE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.

2. DO NOT RELY SOLELY ON ELECTRONIC VERSIONS OF DRAWINGS, SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.

3. PERFORM NECESSARY CONSTRUCTION NOTIFICATIONS, APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK AS REQUIRED BY THE CONTRACT DOCUMENTS.

4. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS OF BUILDINGS AND ADJACENT SITE ELEMENTS INCLUDING SIDEWALKS, RAMPS, BUILDING ENTRANCES, STAIRWAYS, UTILITY PENETRATIONS, CONCRETE DOOR PADS, COMPACTOR PAD, LOADING DOCKS, BOLLARDS, ETC.

5. PLEASE READ ALL OTHER NOTES ON THIS PAGE. THEY CONTAIN INFORMATION RELATED TO AND ASSOCIATED WITH THIS PROJECT AND DESIGN.

6. IF, DURING CONSTRUCTION, IT BECOMES APPARENT THAT DEFICIENCIES EXIST IN THE APPROVED DRAWINGS, THE OWNER SHALL BE REQUIRED TO CORRECT THE DEFICIENCIES TO MEET THE REQUIREMENTS OF THE REGULATIONS AT NO EXPENSE TO THE CITY.

7. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE SITE AND EXISTING CONDITIONS SURROUNDING IT AND THEREON. THE CONTRACTOR SHALL ADVISE THE APPROPRIATE AUTHORITY OF HIS INTENTIONS AT LEAST 48 HOURS IN ADVANCE.

8. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO THE CITY OF PORTSMOUTH SITE PLAN REGULATIONS, CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS, AND THE LATEST EDITION OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ALL CONSTRUCTION DETAILS SHALL BE IN ACCORDANCE WITH THE CITY OF PORTSMOUTH.

9. THE CONTRACTOR SHALL BID AND PERFORM THE WORK IN ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES, SPECIFICATIONS, REGULATIONS, AND STANDARDS.

10. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY FUSS & O'NEILL DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE SURVEYOR OR ENGINEER HERE ON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND/OR LOCAL REGULATIONS.

WORK RESTRICTIONS

16. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, FIRE HYDRANTS, AND UTILITIES WITHOUT APPROPRIATE PERMITS.

2. WORK IS RESTRICTED TO THE HOURS OF TO THE HOURS (TIME) TO (TIME) ON (DAY) THROUGH (DAY)

REGULATORY REQUIREMENTS

1. WITHIN LOCAL RIGHTS-OF-WAY, PERFORM THE WORK IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS.

2. WITHIN STATE RIGHTS-OF-WAY, PERFORM THE WORK IN ACCORDANCE WITH THE LATEST EDITION OF THE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS AND ISSUED REVISIONS/SUPPLEMENTS.

3. PROVIDE TRAFFIC SIGNAGE AND PAVEMENT MARKINGS IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

4. BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. PERFORM CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.

5. DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.

6. THIS PROJECT DISTURBS MORE THAN ONE ACRE OF LAND AND FALLS WITHIN THE NEW HAMPSHIRE DEP STORMWATER AND DEWATERING WASTEWATER FROM CONSTRUCTION ACTIVITIES GENERAL PERMIT PROCESS. (NAME OF APPLICANT) HAS SUBMITTED INFORMATION TO THE DEP TO SATISFY THIS GENERAL PERMIT. THE CONTRACTOR MUST HAVE A COPY OF THIS GENERAL PERMIT ON SITE AT ALL TIMES.

EROSION AND SEDIMENT CONTROL

1. INSTALL EROSION CONTROL MEASURES PRIOR TO STARTING ANY WORK ON THE SITE. REFER TO THE EROSION AND SEDIMENT CONTROL DRAWINGS.

2. IMPLEMENT ALL NECESSARY MEASURES REQUIRED TO CONTROL STORMWATER RUNOFF, DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE. PERFORM CORRECTIVE ACTION AS NEEDED FOR EROSION CLEANUP AND REPAIRS TO OFF SITE AREAS, IF ANY, AT NO COST TO OWNER.

3. INSPECT AND MAINTAIN EROSION CONTROL MEASURES PER THE SCHEDULE IN THE EROSION AND SEDIMENT CONTROL DRAWINGS. DISPOSE OF SEDIMENT IN AN UPLAND AREA. DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.

4. PERFORM CONSTRUCTION SEQUENCING IN SUCH A MANNER TO CONTROL EROSION AND TO MINIMIZE THE TIME THAT EARTH MATERIALS ARE EXPOSED BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED.

5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROL MEASURES. CLEAN SEDIMENT AND DEBRIS FROM TEMPORARY MEASURES AND FROM PERMANENT STORM DRAIN AND SANITARY SEWER SYSTEMS.

DEMOLITION

1. REMOVE AND DISPOSE OF EXISTING UTILITIES, FOUNDATIONS AND UNSUITABLE MATERIAL BENEATH AND FOR A DISTANCE OF 10 FEET BEYOND THE PROPOSED BUILDING FOOTPRINT INCLUDING EXTERIOR COLUMNS, UNLESS OTHERWISE NOTED.

CONSTRUCTION LAYOUT

1. PROVIDE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED SITE IMPROVEMENTS. FIELD VERIFY EXISTING PAVEMENT AND GROUND ELEVATIONS AT THE INTERFACE WITH PROPOSED PAVEMENTS AND DRAINAGE STRUCTURES BEFORE START OF CONSTRUCTION.

2. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, FIELD VERIFY PROPOSED UTILITY ROUTES AND IDENTIFY ANY INTERFERENCES OR OBSTRUCTIONS WITH EXISTING UTILITIES OR PUBLIC RIGHTS-OF-WAY.

3. IMMEDIATELY INFORM THE ENGINEER IN WRITING IF EXISTING UTILITY CONDITIONS CONFLICT OR DIFFER FROM THAT INDICATED AND IF THE WORK CANNOT BE COMPLETED AS INDICATED.

4. DIMENSIONS ARE FROM FACE OF CURB, FACE OF BUILDING, FACE OF WALL, AND CENTER LINE OF PAVEMENT MARKINGS, UNLESS NOTED OTHERWISE.

5. BOUNDS OR MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.

EARTHWORK

1. NOTIFY UTILITY LOCATOR SERVICE AT LEAST 72 HOURS BEFORE STARTING EXCAVATION.

CALL DIGSAFE: 1-888-DIG-SAFE

2. STOP WORK IN THE VICINITY OF SUSPECTED CONTAMINATED SOIL, GROUNDWATER OR OTHER MEDIA. IMMEDIATELY NOTIFY THE OWNER SO THAT APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN. RESUME WORK IN THE IMMEDIATE VICINITY ONLY UPON DIRECTION BY THE OWNER.

3. WITHIN THE LIMITS OF THE BUILDING FOOTPRINT, PERFORM EARTHWORK OPERATIONS TO SUBGRADE ELEVATIONS. SEE DRAWINGS BY OTHERS FOR WORK ABOVE SUBGRADE.

PAVEMENT

1. AT A MINIMUM, CONSTRUCT ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS AND WALKWAYS IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT AND WITH STATE AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).

GENERAL SITE RESTORATION

1. PROVIDE 6 INCHES OF TOPSOIL AND SEED TO AREAS DISTURBED DURING CONSTRUCTION AND NOT DESIGNATED TO BE RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) UNLESS OTHERWISE NOTED.

2. REPAIR DAMAGES RESULTING FROM CONSTRUCTION LOADS, AT NO ADDITIONAL COST TO OWNER.

3. RESTORE AREAS DISTURBED BY CONSTRUCTION OPERATIONS TO THEIR ORIGINAL CONDITION OR BETTER, AT NO ADDITIONAL COST TO OWNER.

UTILITIES

1. TERMINATE EXISTING UTILITIES IN CONFORMANCE WITH LOCAL, STATE AND INDIVIDUAL UTILITY COMPANY STANDARD SPECIFICATIONS AND DETAILS. COORDINATE UTILITY SERVICE DISCONNECTS WITH UTILITY REPRESENTATIVES.

2. THE TYPE, SIZE AND LOCATION OF DEPICTED UNDERGROUND UTILITIES ARE APPROXIMATE REPRESENTATIONS OF INFORMATION OBTAINED FROM FIELD LOCATIONS OF VISIBLE FEATURES, EXISTING MAPS AND PLANS OF RECORD, UTILITY MAPPING, AND OTHER SOURCES OF INFORMATION OBTAINED BY THE ENGINEER. ASSUME NO GUARANTEE AS TO THE COMPLETENESS, SERVICEABILITY, EXISTENCE, OR ACCURACY OF UNDERGROUND FACILITIES. FIELD VERIFY THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES.

3. PAY ALL FEES AND COSTS ASSOCIATED WITH UTILITY MODIFICATIONS AND CONNECTIONS, REGARDLESS OF THE ENTITY THAT PERFORMS THE WORK.

4. COORDINATE THE WORK AND WORK SCHEDULE WITH UTILITY COMPANIES. PROVIDE ADEQUATE NOTICE TO UTILITIES TO PREVENT DELAYS IN CONSTRUCTION.

5. INTERIOR DIAMETERS OF STORM DRAIN AND SANITARY SEWER STRUCTURES SHALL BE DETERMINED BY THE PRECAST MANUFACTURER, BASED ON THE INDICATED PIPE SYSTEM LAYOUT AND LOCAL MUNICIPAL STANDARDS.

MINIMUM INTERIOR DIAMETERS:
0 TO 20 FEET DEEP; 4 FEET.
20 FEET OR GREATER; 5 FEET.

5. RIM ELEVATIONS FOR MANHOLES, VALVE COVERS, GATE AND PULL BOXES, AND OTHER STRUCTURES ARE APPROXIMATE. SET OR RESET RIM ELEVATIONS AS FOLLOWS:

IN PAVEMENTS AND CONCRETE SURFACES: FLUSH
IN SURFACES ALONG ACCESSIBLE ROUTES: FLUSH
IN LANDSCAPE, SEEDED, AND OTHER EARTH SURFACE AREAS:
1 INCH ABOVE SURROUNDING AREA; TAPER EARTH TO RIM ELEVATION.

6. INSTALL PROPOSED PRIVATE UTILITY SERVICES ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY THE AUTHORITY HAVING JURISDICTION (WATER, SEWER, GAS, TELEPHONE, ELECTRIC, FIRE ALARM, ETC.). COORDINATE FINAL DESIGN LOADS AND LOCATIONS WITH OWNER AND ARCHITECT.

PORTSMOUTH UTILITY CONTACT INFORMATION:

WATER/SEWER:
JIM TOW
GENERAL FOREMAN
PORTSMOUTH DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
603.766.1426
JVTOW@CITYOFPORTSMOUT.COM

ELECTRIC:
NICKOLAI KOSKO
FIELD SERVICE REPRESENTATIVE
EVERSOURCE ENERGY
74 OLD DOVER ROAD
ROCHESTER, NH 03867
603.332.4227 EXT. 5555334
NICKOLAI.KOSKO@EVERSOURCE.COM

NATURAL GAS:
DAVID BEAULIEU
SR. BUSINESS DEVELOPMENT REPRESENTATIVE
UNITIL SERVICE CORP.
325 WEST ROAD
PORTSMOUTH, NH 03801
603.294.5144
BEAULIEU@UNITIL.COM

TRAFFIC:
ERIC EBY
PARKING AND TRANSPORTATION ENGINEER
DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
603.766.1415

CABLE:
MIKE COLLINS
COMCAST
334 CALEF HIGHWAY
EPPING, NH 03042
603.679.5695
MIKECOLLINS@COMCAST.COM

TELEPHONE:
JOSEPH CONSIDINE
ENGINEER
CONSOLIDATED COMMUNICATIONS
1575 GREENLAND ROAD
GREENLAND, NH 03840
603.427.5525
JOSEPH.CONSIDINE@CONSOLIDATED.COM

ROAD, MATERIALS AND SIGNAL:
DAVE DEFOSSES
PROJECT MANAGER
PORTSMOUTH DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
603.766.1411
DJDEFOSSES@CITYOFPORTSMOUT.COM

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER
RICHARD R. LUNDBORN No. 10943 LICENSED

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NGVD29

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
207.363.0669
www.fando.com

CATE STREET DEVELOPMENT, LLC

GENERAL NOTES

CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CN-001

BOUNDARIES

EXISTING		PROPOSED
BEARING DISTANCE	PROPERTY LINE	BEARING DISTANCE
	APPROXIMATE LOT LINE	
	INTERIOR LOT LINE	
	APPROXIMATE ABUTTER LOT LINE	
	EASEMENT LINE	
BOW CONCORD	TOWN LINE	
COOS GRAFTON	COUNTY LINE	
MAINE NEW HAMPSHIRE	STATE LINE	
	BOUND FOUND	
R.R.S.F.	RAILROAD SPIKE FOUND	
	IRON PIPE/ROD FOUND	
	4"X4" GRANITE BOUND TO BE SET	
	5/8" REBAR W/ID CAP TO BE SET	
	CONCRETE	
	BOUND FOUND	
	IRON PIPE FOUND	
	CONCRETE	
	DRILL HOLE	

NATURAL RESOURCES

EXISTING		PROPOSED
20	MAJOR CONTOUR LINE	20
22	MINOR CONTOUR LINE	22
+ 201.0	SPOT ELEVATION	+ 201.0
	EDGE OF WETLAND	
	WETLAND AREA	
	CONIFEROUS TREE	
	DECIDUOUS TREE	
	MONITORING WELL	
TP	TEST PIT	TP
	TREE LINE	
	SHRUB LINE	
	EDGE OF WATER	
	BORING	
	BORING	
	ROCK PROBE	
	TEST PIT	
	LEDGE	

GENERAL

EXISTING		PROPOSED
	STOCKADE FENCE	
	CHAIN LINK FENCE	
X	BARBED WIRE FENCE	X
	STONE WALL	
	RETAINING WALL	
	GUARDRAIL	
	SIGN	
	SIGN (TWO POSTS)	
	FENCE POST	
	POST	
	POST	
	BOLLARD	
	FLAG POLE	
	CONCRETE	
	CRUSHED STONE	
	LEDGE OUTCROP	
LEACH FIELD	LEACH FIELD	
	GAS PUMPS	
	STORAGE TANKS	
	CEMETERY	
	INTERMITTENT WATER COURSE	
RIVER (STREAM)	SHORE LINE	
POND	SHORE LINE	

DRAINAGE

EXISTING		PROPOSED
	DRAINAGE NOTE	D
SD	DRAIN LINE	D
XD	DRAIN LINE (SEE NOTE 20)	
	CATCH BASIN	
	DRAIN MANHOLE	
RD	ROOF DRAIN	
R	ROOF DRAIN LINE	R
UD	STORM UNDERDRAIN	UD
	DRAINAGE FLOW DIRECTION ARROW	
	PROPOSED REINFORCED CONCRETE CULVERT END	
	PROPOSED TYPE "C-L" CATCH BASIN	
	PROPOSED TYPE "C" CATCH BASIN	
	PROPOSED HEAD WALL	

WATER

EXISTING		PROPOSED
	WATER NOTE	W
W	WATER LINE	W
XW	WATER LINE (SEE NOTE 20)	
	FIRE HYDRANT	
	PROPOSED HYDRANT AND GATE VALVE	
	WATER GATE VALVE	
	SPIGOT	
W	WELL	

SEWER

EXISTING		PROPOSED
	SEWER NOTE	S
SS	SEWER LINE	S
XS	SEWER LINE (SEE NOTE 20)	
FM	SEWER FORCE MAIN	FM
S	SANITARY SEWER MANHOLE	
	CLEANOUT	

GAS

EXISTING		PROPOSED
	GAS NOTE	G
G	GAS MAIN	G
	GAS GATE VALVE	
O.F.C.	OIL FILL CAP	

ELECTRIC

EXISTING		PROPOSED
	ELECTRIC NOTE	E
OHW	OVERHEAD WIRES	OHW
	UTILITY POLE	
	UTILITY POLE & GUY WIRE	
	UTILITY POLE W/ LIGHT	
	LIGHT POLES	SINGLE DOUBLE
	BUILDING LIGHTS	
E	ELECTRICAL SERVICE	E
	ELECTRIC BOX	
	PROPOSED ELECTRICAL MANHOLE	
M	MANHOLE	M
	HAND HOLE	
	PROPOSED LIGHT	

TELEPHONE

EXISTING		PROPOSED
T	TELEPHONE LINE	T
	TELEPHONE MANHOLE	

CATV

EXISTING		PROPOSED
C	CABLE LINE	C

STRIPING

EXISTING		PROPOSED
SWL	SINGLE SOLID LINE WHITE	SSLW
	SINGLE SOLID LINE WHITE (T) (THERMOPLASTIC)	SSLW (T)
	DOUBLE SOLID LINE (WHITE)	DSLW
SYL	SINGLE SOLID LINE (YELLOW)	SSLY
	SINGLE BROKEN LINE (YELLOW)	SBLY
DYL	DOUBLE SOLID LINE (YELLOW)	DSLY
	STOP BAR = 12" SSLW (THERMOPLASTIC)	12"SSLW (T)

GENERAL PAVEMENT MARKING NOTE:
PLACEMENT AND COLOR OF PAVMENT MARKING LINES, SYMBOLS AND WORDS SHALL CONFORM TO THE (MUTCD) SECTION 632 OF NHDOT STANDARD SPECIFICATION BOOK, CONTRACT SUPPLEMENTAL SPECIFICATIONS, THE STATE OF NEW HAMPSHIRE PAVEMENT MARKING STANDARD DETAIL SHEETS, AND STANDARD PLAN SHEETS.

RETROREFLECTIVE PAINT PAVMENT MARKING KEY:
THE FOLLOWING PAVEMENT MARKINGS SHALL BE RETROREFLECTIVE THERMOPLASTIC UNLESS OTHERWISE NOTIFIED BY THE STATE STANDARD SYMBOLS AND WORDS

←—WORDS ONLY — WORDS
(A) = STOP BARS = 12" SSL (WHITE)(T)

	ACCESSIBLE PARKING SPACE	
	PAINTED ISLAND	
10	PARKING SPACE COUNT	(10)

CURB

EXISTING		PROPOSED
VGC	VERTICAL GRANITE CURB	VGC
SGC	SLOPED GRANITE CURB	SGC
SBB	SLOPED BITUMINOUS BERM	SBB
CC	CONCRETE CURB	CC
BCC	BITUMINOUS CURB	BCC
	TIPDOWN	TD

TRAFFIC UTILITIES

SIGNAL CONDUIT (EXISTING)			
SIGNAL CONDUIT (PROPOSED)			
MAGNETIC DETECTOR SLEEVE			
LOOP DETECTOR	8'X10'	(LABEL SIZE)	8'X10'
PULLBOX	P.B.	EXISTING	P.B.
HANDHOLE	H.H.		H.H.
CONTROLLER CABINET	C.C.		C.C.
SPREAD FOOTING	10'	8'(LABEL SIZE)	
CYLINDRICAL FOUNDATION			
MAST ARM POLE (WITH SIGNAL HEADS)			
STEEL SPAN WIRE POLES			
PEDESTRIAN SIGNAL POLE			
TRAFFIC SIGNAL (EXISTING)			
STREET LIGHT CONDUIT			

PROPOSED: P.B., H.H., C.C.

NOTE ANGLE FROM TO ARM

EROSION CONTROL

PROPOSED SILT FENCE	SF
PROPOSED HAY BALES	HB
PROPOSED HAYBALE CHECK DAM	
PROPOSED SILT SOCKS	
PROPOSED EROSION CONTROL MAT	
PROPOSED INLET PROTECTION	
PROPOSED OUTLET PROTECTION	
PROPOSED STONE CHECK DAM	
PROPOSED LIMIT OF DISTURBANCE	LOD

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STATE OF NEW HAMPSHIRE – LICENSED PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943

SCALE: HORZ.: VERT.:
DATUM: HORZ.: NAD83 VERT.: NGVD29

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CATE STREET DEVELOPMENT, LLC

LEGEND

CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CN-002

File Path: F:\P2018\03\7A10\Civil\3Dwg\20180317A10_COV01.dwg Layout: CN-002 (S) Plotted: Mon, August 19, 2019 - 11:43 AM User: ddugal
Plotter: DWG TO PDF.PC3 CTB File: FO.STB
MS VIEW: LAYER STATE:

CP-201

CP-202

(100' ROW PER REFERENCE PLAN 1)

(100' ROW PER REFERENCE PLAN 1)

BLDG

HOUSE

SHED

GARAGE

HODGSON BROOK

WOOD SHED

YARD WASTE PILE

LOAM PILE

~LOAM & DEBRIS PILE~

~SAND PILE~

GRAVEL PILE

8" STOCKADE FENCE IN DISREPAIR

6' STOCKADE FENCE IN DISREPAIR

5' STOCKADE FENCE

6' STOCKADE FENCE

GATE

FF=19.7

FF=25.1

20" APPLE

~LOAM PILE~

11" PINE

22" OAK

20" OAK

~W/CONDUIT

WOOD & GRANITE PILE

BOULDER PILE

JERSEY BARRIER PILE

SAND & GRAVEL PILE

EDGE OF APPARENT RIGHT OF WAY (PER REF. PLAN #3)

EDGE OF APPARENT RIGHT OF WAY (PER REF. PLAN #31)

UNDERSIDE OF BRIDGE ELEV.=22.6'

EDGE OF APPAR
RIGHT OF
(PER TAX MAPS,
BETTER BOUND
EVIDENCE FOU

REMOVE SEWER LINES AND STRUCTURE

REMOVE SEWER LINE

OUT BUILDING

HANDICAP PARKING

TRAILER

BOSTON & MAINE RAILROAD

(SEE REFERENCE PLAN 22)

(SEE REFERENCE PLAN 22)

PSNH/179/5A

GREENLEAF

LEGEND

AREA OF CONCRETE AND PAVEMENT REMOVAL

REMOVE ALL CONCRETE, PAVEMENT, CURBING, BUILDINGS WITHIN THE DEMOLITION BOUNDARY LINE NOTED ON THE PLANS.

LIMITS OF UTILITY LINES TO BE REMOVED

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1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER
RICHARD R. LUNDBORN NO. 10843 LICENSED

SCALE: HORZ.: 1"=60'
VERT.: 1"=60'
DATUM: HORZ.: NAD83
VERT.: NGVD29
60 30 0 60
GRAPHIC SCALE

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
207.363.0669
www.fando.com

CATE STREET DEVELOPMENT, LLC

OVERALL SITE PREPARATION PLAN
CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CP-200

File Path: F:\P20180317\A10\Civil3Dwg\20180317A10_DMO01.dwg Layout: CP-200 Plotted: Mon, August 19, 2019 - 10:21 AM User: jandretta
Plotter: DWG TO PDF.PC3 CTB File: FO.STB
LAYER STATE:
MS VIEW:

LEGEND

AREA OF CONCRETE AND PAVEMENT REMOVAL

REMOVE ALL CONCRETE, PAVEMENT, CURBING, BUILDINGS WITHIN THE DEMOLITION BOUNDARY LINE NOTED ON THE PLANS.

LIMITS OF UTILITY LINES TO BE REMOVED

OUTLET NOT FOUND

BLDG

HOUSE

SHED

GARAGE

DEMOLITION BOUNDARY

REMOVE GUARDRAIL

REMOVE DRAINAGE PIPE AND STRUCTURE

REMOVE FENCE

REMOVE GUARDRAIL

GUARDRAIL TO REMAIN

HODGSON BROOK

15" CMP INV.=14.6'

RCP INV.=14.7'

10" (ML)

4"

12"

18"

72"

8"

TREES TO REMAIN

REMOVE CATCH BASIN AND PIPE

CB #1213

CB #1340

CATCH BASIN, PIPE AND OUTLET STRUCTURE TO REMAIN

REMOVE ENTIRE ISLAND

CB #1742

CB #1743

CB #1201

REMOVE WATER LINE FROM HERE TOWARD BARLETT STREET (SEE NOTE SHEET CP-102)

8' STOCKADE FENCE IN DISREPAIR

6' STOCKADE FENCE IN DISREPAIR

REMOVE UTILITY POLE AND ATTACHED OVERHEAD WIRES

CATE STREET

GRAPHIC SCALE

SEE SHEET CP-202

SEE SHEET CP-203

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
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1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: 1"=30' VERT.: 1"=30'

DATUM: HORZ.: NAD83 VERT.: NGVD29

30 15 0 30

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CATE STREET DEVELOPMENT, LLC

SITE PREPARATION PLAN

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

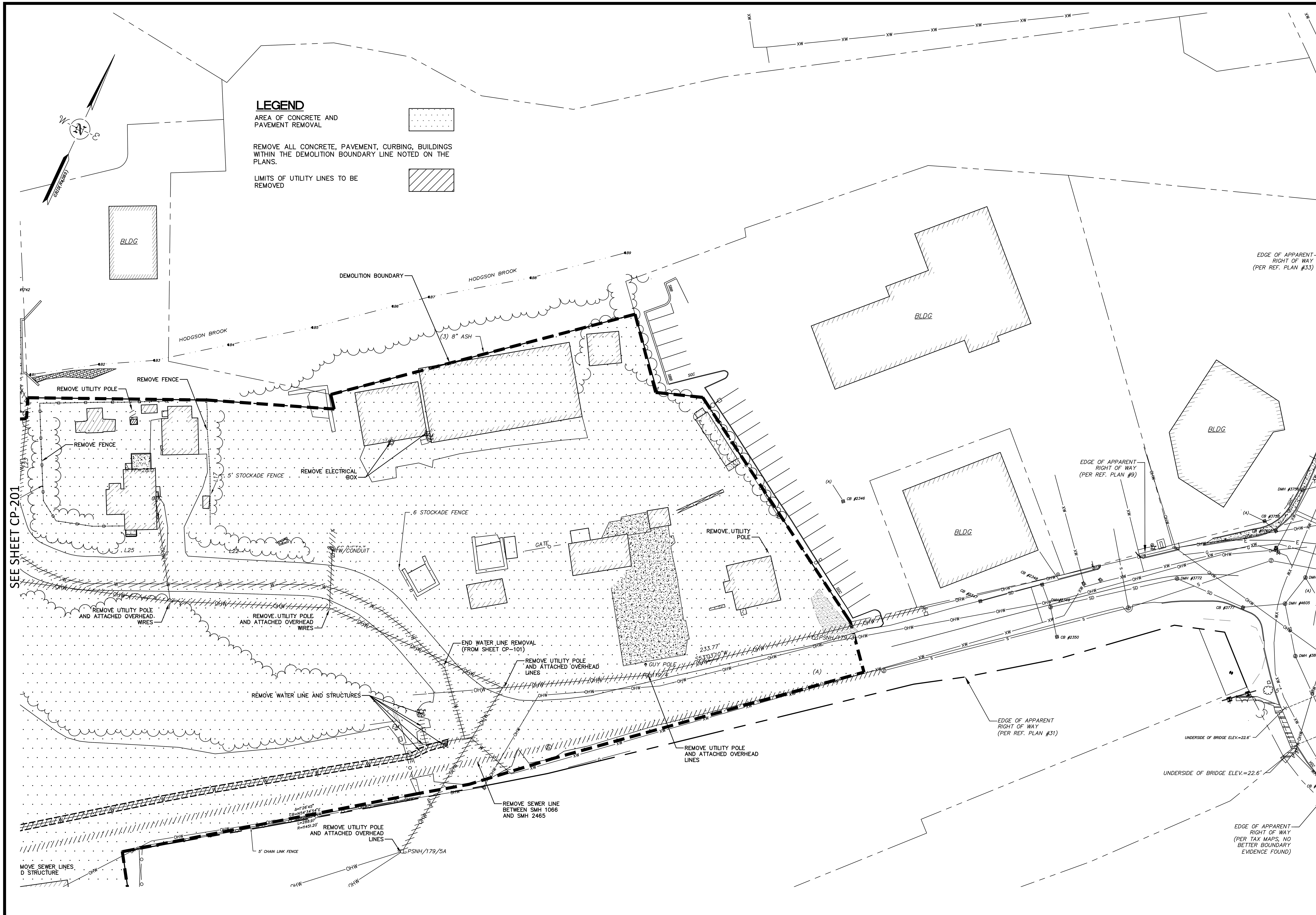
PROJ. No.: 20180317.A10

DATE: 08/19/2019

CP-201

File Path: F:\P20180317\A10\Civil\Dwg\20180317A10_DMO01.dwg Layout: CP-201 Plotted: Mon, August 19, 2019 - 10:22 AM User: jandretta

MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB


LEGEND
AREA OF CONCRETE AND PAVEMENT REMOVAL
REMOVE ALL CONCRETE, PAVEMENT, CURBING, BUILDINGS WITHIN THE DEMOLITION BOUNDARY LINE NOTED ON THE PLANS.
LIMITS OF UTILITY LINES TO BE REMOVED
BLDG
HODGSON BROOK
DEMOLITION BOUNDARY
(3) 8" ASH
REMOVE FENCE
REMOVE UTILITY POLE
REMOVE ELECTRICAL BOX
5' STOCKADE FENCE
6' STOCKADE FENCE
GATE
REMOVE UTILITY POLE
SEE SHEET CP-201
REMOVE UTILITY POLE AND ATTACHED OVERHEAD WIRES
END WATER LINE REMOVAL (FROM SHEET CP-101)
REMOVE UTILITY POLE AND ATTACHED OVERHEAD LINES
REMOVE WATER LINE AND STRUCTURES
GUY POLE
REMOVE SEWER LINE BETWEEN SMH 1066 AND SMH 2465
5' CHAIN LINK FENCE
MOVE SEWER LINES D STRUCTURE
EDGE OF APPARENT RIGHT OF WAY (PER REF. PLAN #33)
EDGE OF APPARENT RIGHT OF WAY (PER REF. PLAN #9)
EDGE OF APPARENT RIGHT OF WAY (PER REF. PLAN #31)
UNDERSIDE OF BRIDGE ELEV.=22.6'
EDGE OF APPARENT RIGHT OF WAY (PER TAX MAPS, NO BETTER BOUNDARY EVIDENCE FOUND)

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
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2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10643 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: 1"=30' VERT.: 1"=30'
DATUM: HORZ.: NAD83 VERT.: NGVD29
GRAPHIC SCALE 30 15 0 30

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CATE STREET DEVELOPMENT, LLC
SITE PREPARATION PLAN
CATE STREET
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CP-202

File Path: F:\P2018\0317\A10\Civil3\Dwg\20180317A10_DMO01.dwg Layout: CP-202 Plotted: Mon, August 19, 2019 - 10:22 AM User: jandretta
Plotter: DWG TO PDF.PC3 CTB File: FO.STB
MS VIEW: LAYER STATE:

SEE SHEET CP-201

SEE SHEET CP-204

US ROUTE 1 BYPASS

(100' ROW PER REFERENCE PLAN 1)

DEMOLITION BOUNDARY

SEWER MANHOLE AND SEWER LINE TO REMAIN

REMOVE STORM DRAIN LINES

REMOVE WATER LINE

REMOVE STORM DRAIN AND LINES

REMOVE SEWER LINE

REMOVE UTILITY POLE AND ATTACHED OVERHEAD LINES

REMOVE STORM DRAIN

BLDG

BOSTON & MAINE RAILROAD

(SEE REFERENCE PLAN 22)

CB #1348

CB #1347

CB #1071

PSNH/264/5

PSNH/242/5X

PSNH/242/A

4/NETT

PSNH/242

PSNH/242/5 W/POWER DOWN

LEGEND

AREA OF CONCRETE AND PAVEMENT REMOVAL

REMOVE ALL CONCRETE, PAVEMENT, CURBING, BUILDINGS WITHIN THE DEMOLITION BOUNDARY LINE NOTED ON THE PLANS.

LIMITS OF UTILITY LINES TO BE REMOVED

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STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10843 LICENSED

SCALE:
HORZ.: 1"=30'
VERT.: 1"=30'

DATUM:
HORZ.: NAD83
VERT.: NGVD29

GRAPHIC SCALE 30 15 0 30

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SITE PREPARATION PLAN

CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
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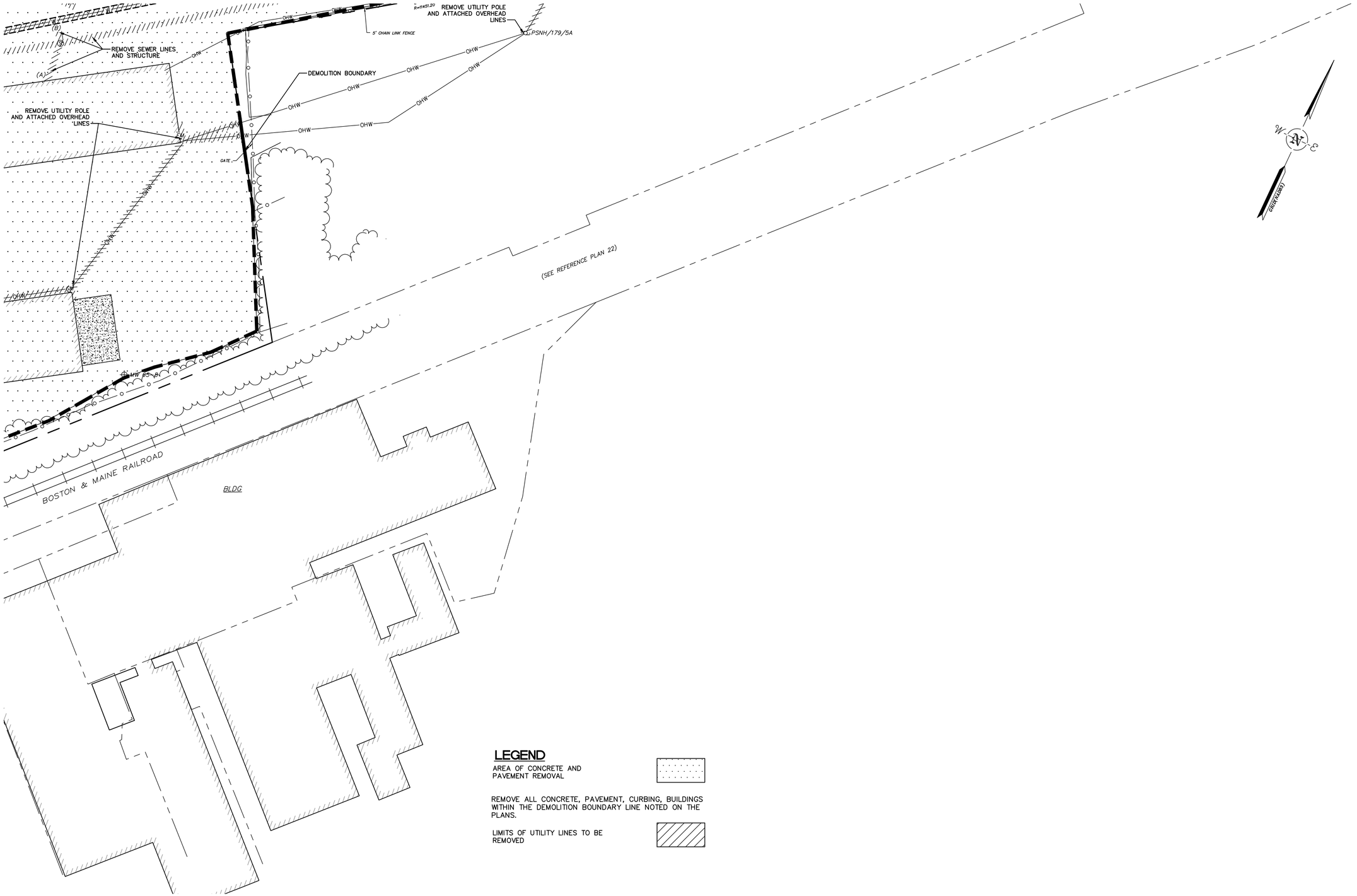
CP-203

File Path: F:\P2018\03317A10\Civil3\Dwg\20180317A10_DMO01.dwg Layout: CP-203 Plotted: Mon, August 19, 2019 - 10:22 AM User: jandretta
MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB

SEE SHEET CP-202

SEE SHEET CP203



LEGEND

AREA OF CONCRETE AND PAVEMENT REMOVAL

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STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R LUNDBORN No. 10943 LICENSED

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DATUM:
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30 15 0 30
GRAPHIC SCALE

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SITE PREPARATION PLAN

CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
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CP-204

File Path: F:\P2018\0317A10\Civil3Dwg\20180317A10_DMO01.dwg Layout: CP-204 Plotted: Mon, August 19, 2019 - 10:22 AM User: jandretta
MS VIEW: | LAYER STATE: | Plotter: DWG TO PDF.PC3 CTB File: FO.STB

SITE NOTES:

1. TOTAL PARCEL AREA:
   TAX MAP 163, LOT 33-12,230 SF (0.28 AC.)
   TAX MAP 163, LOT 34-64,109 SF (1.47 AC.)
   COMBINED AREA-451,572 SF (10.37 AC.)
   TAX MAP 165, LOT 2
   TAX MAP 172, LOT 1
   TAX MAP 173, LOT 2

   OWNER OF RECORD:
   CATE STREET DEVELOPMENT, LLC
   60 K STREET
   BOSTON, MA 02127
   RCRD BOOK5929, PAGE 109

2. ZONES: G-1-GATEWAY NEIGHBORHOOD MIXED USE

3. DIMENSIONAL REQUIREMENTS, DEVELOPMENT SITE STANDARDS:

	REQUIRED	PROPOSED
MIN. DEVELOPMENT AREA	20,000 sq.ft.	579,856 SF
MIN. SITE WIDTH	100 ft.	VARIES > 100 ft.
MIN. LOT DEPTH	100 ft.	VARIES > 100 ft.
MIN. PERIMETER BUFFER	75 ft. FROM RES. DIST., MIXED RES., OR CD4-L1 DIST.	N/A
MAX. DEV. BLOCK	800 ft. LENGTH, 2,200 LINEAR ft.	610 ft.
MIN. FRONTAGE	50 ft.	227 ft.
MAX. BUILDING HEIGHT 25-FT STEP BACK	45 ft.	45 ft.
MAX. BUILDING COVERAGE	70 %	18.6 %
MIN. OPEN SPACE	20 %	41 %
COMMUNITY SPACE	ALL TYPES	SEE NOTE #6
WETLAND SETBACKS	100 ft.	104 ft.
IMPERVIOUS COVER		390,471 sq. ft. (67.3%)

ZONING INFORMATION LISTED HEREON IS BASED ON THE CITY OF PORTSMOUTH ZONING ORDINANCE DATED MARCH 4, 2019 AS AVAILABLE ON THE CITY WEBSITE. ADDITIONAL REGULATIONS APPLY, AND REFERENCE IS HEREBY MADE TO THE EFFECTIVE ZONING ORDINANCE. THE LAND OWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE MUNICIPAL, STATE AND FEDERAL REGULATIONS.

4. PARKING CALCULATIONS PER 10.1112.30:

COMMERCIAL BUILDING	AREA	REQUIREMENT	REQUIRED	PROVIDED
EATING AND DRINKING	13,600SF	1/100 SF	136	--
RETAIL	5800SF	1/300 SF	20	--
OFFICE	15900SF	1/350 SF	46	--
SUB-TOTAL			202	170
RESIDENTIAL A AND B:	UNITS	REQUIREMENT	REQUIRED	PROVIDED
UNITS <500 SQ. FT.	71	0.5 SPACE/UNIT	36	--
UNITS 500-750 SQ. FT.	107	1 SPACE/UNIT	107	--
UNITS >750 SQ. FT.	72	1.3/UNIT	94	--
VISITOR	250	1 SPACE/5 UNITS	50	--
SUB-TOTAL			287	292
TOWNHOMES:	UNITS	REQUIREMENT	REQUIRED	PROVIDED
UNITS >750 SQ. FT.	23	1.3/UNIT	30	46
VISITOR	23	1/5 UNITS	5	5
SUB-TOTAL			35	51

(EACH TOWNHOME HAS A 2 CAR GARAGE)

5. SHARED PARKING CALCULATIONS: COLUMN C WEEKDAY EVENINGS, PER 10.1112.60:

COMMERCIAL BUILDING	REQUIRED	SHARED %	SHARED REQUIRED	PROVIDED
EATING AND DRINKING	136	100%	136	--
RETAIL	20	90%	18	--
OFFICE	46	20%	10	--
SUB-TOTAL			164	170
BICYCLE PARKING	1/10 PARKING		17	17
HANDICAP ACCESSIBLE = 6				
RESIDENTIAL A AND B:	REQUIRED	SHARED %	SHARED REQUIRED	PROVIDED
UNITS <500 SQ. FT.	71	0.5 SPACE/UNIT	36	--
UNITS 500-750 SQ. FT.	107	1 SPACE/UNIT	107	--
UNITS >750 SQ. FT.	72	1.3/UNIT	94	--
VISITOR	250	1 SPACE/5 UNITS	50	--
SUB-TOTAL			287	292
BICYCLE PARKING IS INTERNAL				
HANDICAP ACCESSIBLE = 8				
TOWNHOMES:	REQUIRED	SHARED %	SHARED REQUIRED	PROVIDED
UNITS >750 SQ. FT.	36	100%	30	46
VISITOR	5	100%	5	5
SUB-TOTAL			35	51
BICYCLE PARKING IS INTERNAL				

DEVELOPMENT SITE TOTAL:	REQUIRED	PROVIDED
	524	529

6. COMMUNITY SPACE CALCULATION:

	REQUIRED	PROVIDED
TOTAL DEVELOPMENT SITE	--	579,818 SF
GREENWAY	--	58,086 SF (10%)
PARK/COMMON	--	10,480 SF (2%)
POCKET PARK	--	2,648 SF (1%)
WIDE PEDESTRIAN SIDEWALK	--	20,234 SF (3%)
TOTAL	57,982 SF (10%)	91,448 SF (16%)

7. PUBLIC REALM IMPROVEMENTS ARE BEING PROVIDED AS A PART OF THIS PROJECT. A CONNECTOR ROAD CONNECTING ROUTE 1 BYPASS TO BARTLETT STREET AND THE WEST END OF PORTSMOUTH, AS WELL AS A BICYCLE/MULTI-USE TRAIL ALONG HODGSON BROOK ARE BOTH BEING PROVIDED. PUBLIC REALM SPACE CANNOT COUNT TOWARD COMMUNITY SPACE. AS SUCH THE AREA OF THE LAND OCCUPIED BY THE MULTI-USE TRAIL TO THE SIDEWALK ON THE SOUTH SIDE OF THE CONNECTOR ROAD IS EXCLUDED FROM THE CALCULATION IN NOTE #6 COMMUNITY SPACE CALCULATIONS.

PUBLIC REAL SPACE:	REQUIRED	PROVIDED
TOTAL DEVELOPMENT SITE	--	579,818 SF
PUBLIC REALM	OPTIONAL	81,879 SF (14%)

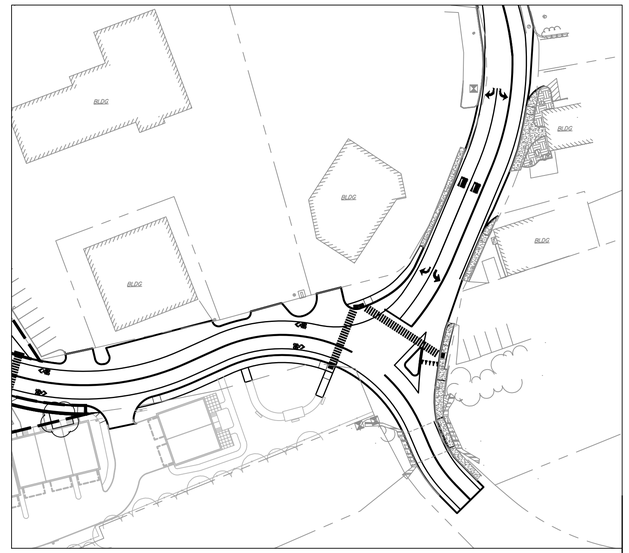
8. IF, DURING CONSTRUCTION, IT BECOMES APPARENT THAT ADDITIONAL EROSION CONTROL MEASURES ARE REQUIRED TO STOP ANY EROSION ON THE CONSTRUCTION SITE, THE PROPERTY OWNER SHALL BE REQUIRED TO INSTALL THE NECESSARY EROSION PROTECTION AT NO EXPENSE TO THE CITY.

9. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REGULATIONS.

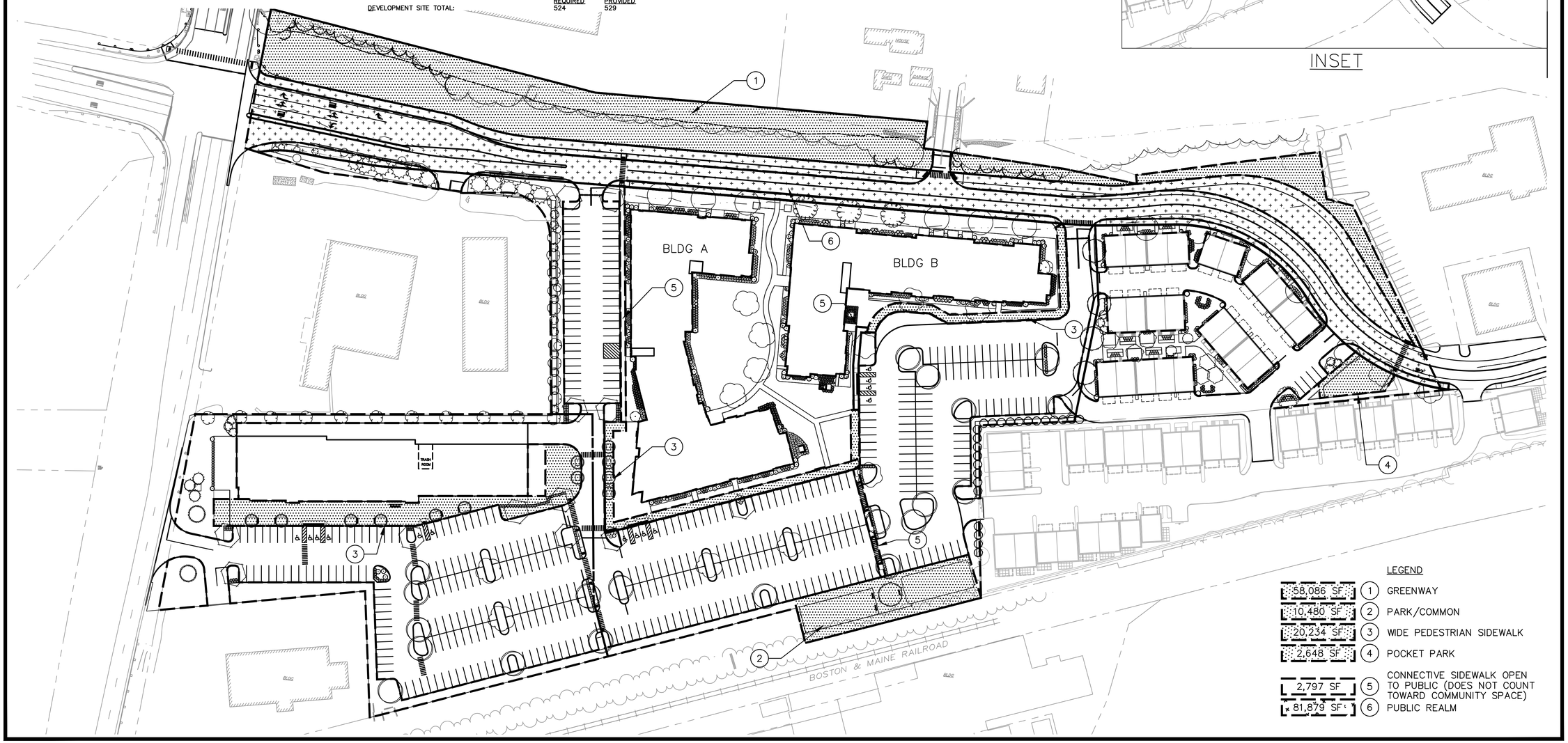
10. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.

11. ALL IMPROVEMENTS SHOWN ON THE SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.

12. SNOW SHALL BE STORED ON SITE IN DESIGNATED AREAS AS SHOWN ON CS-201 THRU CS-202. WHEN ON SITE STORAGE AREAS ARE EXCEEDED, SNOW SHALL BE DISPOSED OF OFF SITE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.



INSET



LEGEND

58,086 SF	1	GREENWAY
10,480 SF	2	PARK/COMMON
20,234 SF	3	WIDE PEDESTRIAN SIDEWALK
2,648 SF	4	POCKET PARK
2,797 SF	5	CONNECTIVE SIDEWALK OPEN TO PUBLIC (DOES NOT COUNT TOWARD COMMUNITY SPACE)
81,879 SF	6	PUBLIC REALM

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER - RICHARD LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: 1"=60'
VERT.: 1"=60'
DATUM: HORZ.: NAD83
VERT.: NAVD88
60 30 0 60
GRAPHIC SCALE

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
207.363.0669
www.fando.com

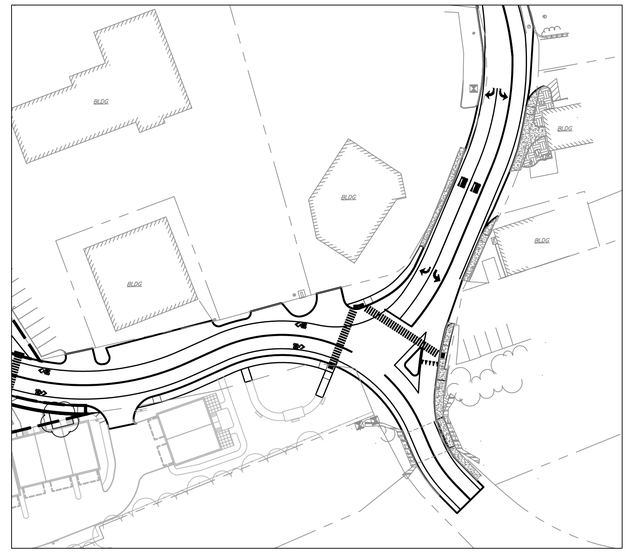
CATE STREET DEVELOPMENT, LLC
DEVELOPMENT STANDARDS SITE PLAN
CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CS-002

OPEN SPACE CALCULATION:

	LOT AREA	REQUIRED	PROVIDED
TOTAL DEVELOPMENT SITE		--	579,818 SF
APARTMENT LOT	260,857 SF	--	93,594 SF (36% LOT/16% TOTAL)
COMMERCIAL LOT	126,500 SF	--	35,376 SF (28% LOT/6% TOTAL)
TOWNHOUSE LOT	56,154 SF	--	18,892 SF (34% LOT/4% TOTAL)
CATE ST ROW	--	--	91,645 SF (15% OF TOTAL)
TOTAL		115,964 SF (20%)	239,507 SF (41%)



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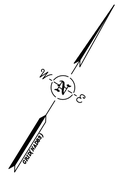

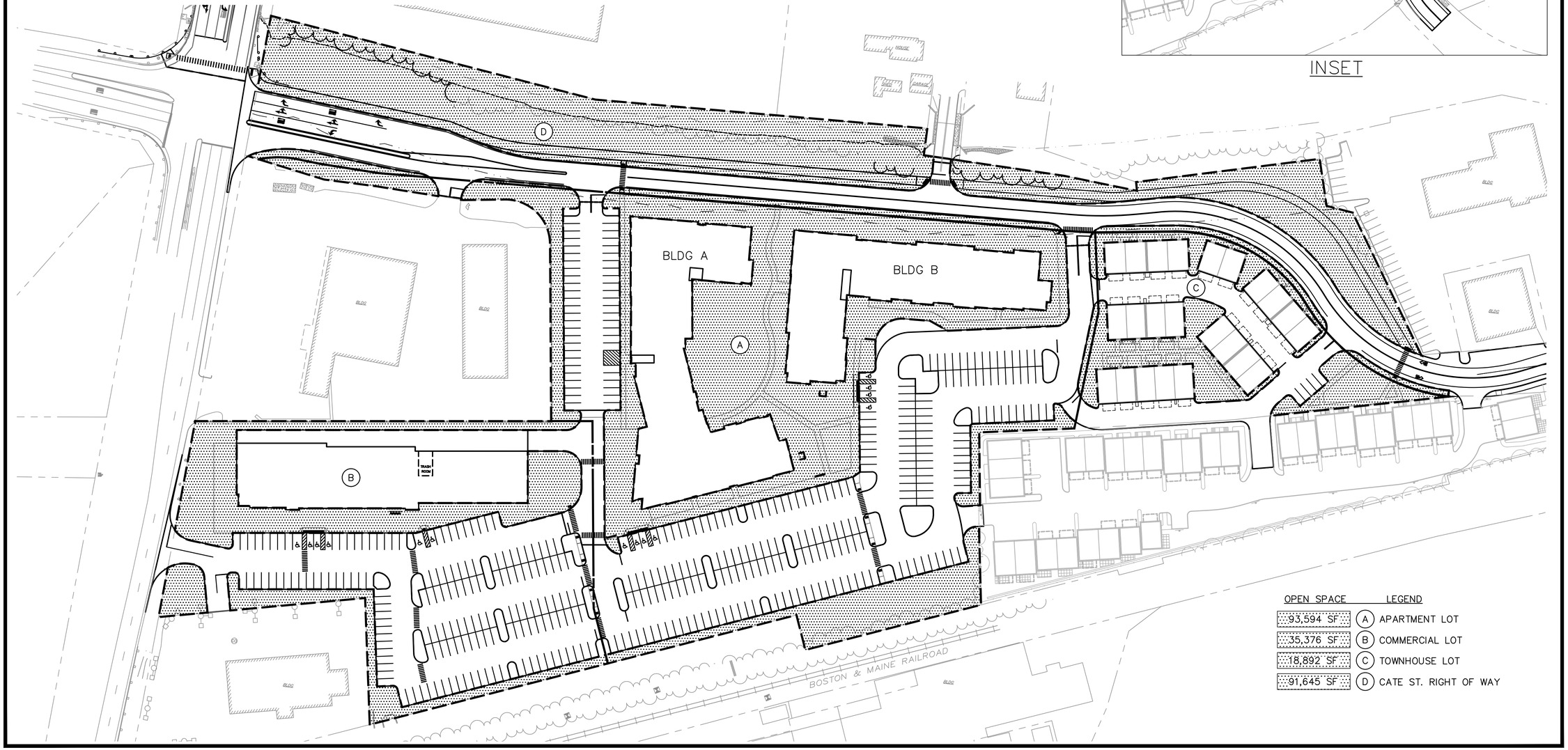

OPEN SPACE LEGEND

93,594 SF	A	APARTMENT LOT
35,376 SF	B	COMMERCIAL LOT
18,892 SF	C	TOWNHOUSE LOT
91,645 SF	D	CATE ST. RIGHT OF WAY

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: 1"=60'
VERT.: 1"=60'
DATUM: HORZ.: NAD83
VERT.: NAVD88
60 30 0 60
GRAPHIC SCALE

FUSS&O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
207.363.0669
www.fando.com

CATE STREET DEVELOPMENT, LLC

OPEN SPACE SITE PLAN

CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CS-003

File Path: F:\P2018\0317A10\Civil\3Dwg\20180317A10_STP01 - EXHIBIT PLANS.dwg Layout: CS-003 OPEN SPACE Plotted: Mon, August 19, 2019 - 12:21 PM User: mtavares
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File Path: F:\P2018\0317\A10\Civil3\Dwg\20180317A10_STP01.DWG Layout: CS-200(S) Plotted: Mon, August 19, 2019 - 11:24 AM User: ddugal
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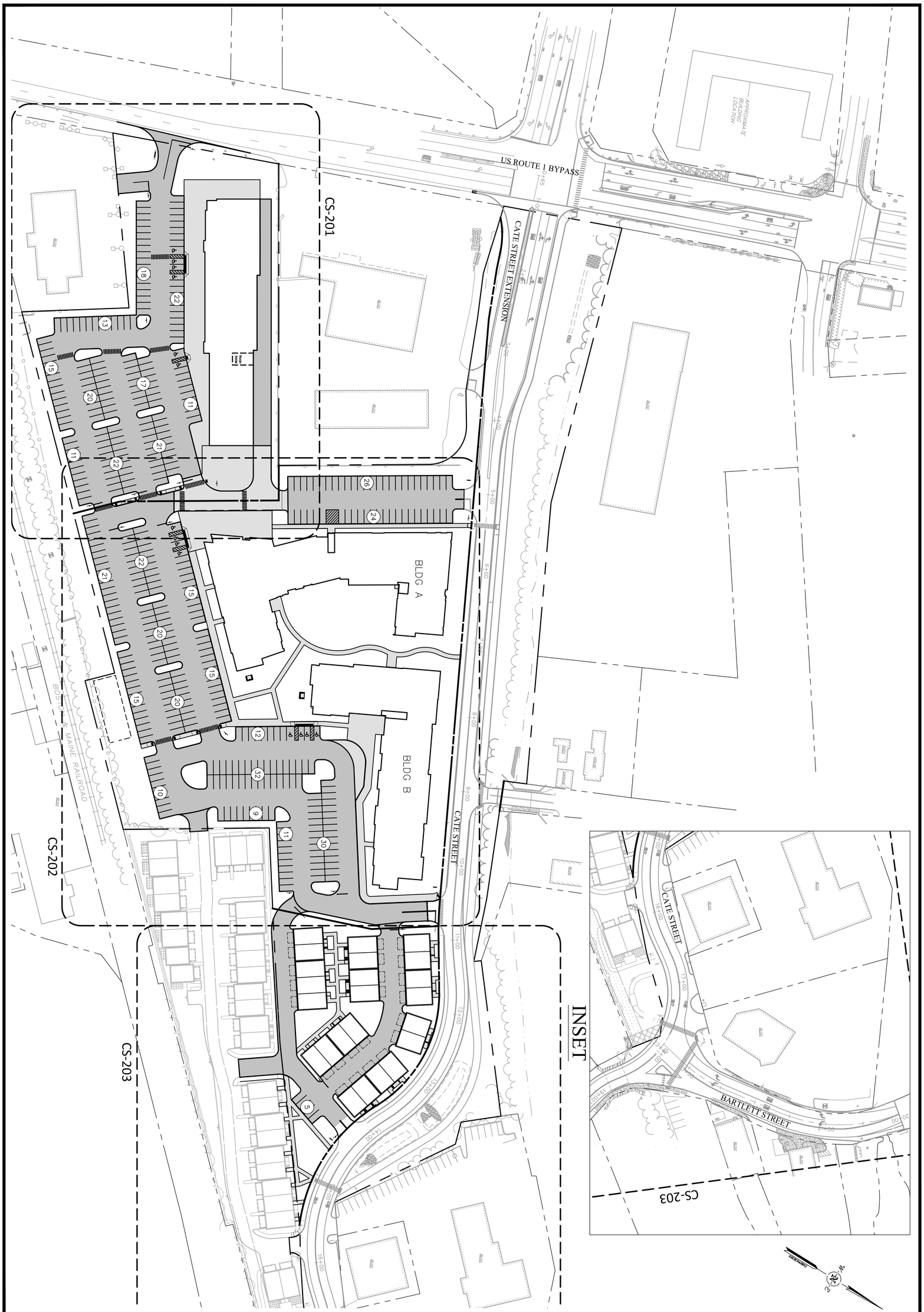

CS-200

PROJ. No: 20180317A10
DATE: 08/19/2019

CATE STREET DEVELOPMENT, LLC

OVERALL SITE PLAN

CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

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SCALE:
HORZ.: 1"=60'
VERT.: 1"=60'
DATUM:
HORZ.: NAD83
VERT.: NAVD88
60 30 0 60
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
RICHARD R. LUNDBORN No. 10943
LICENSED PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

XX PARKING COUNT

TD PROPOSED TIPDOWN RAMP

VGC PROPOSED VERTICAL GRANITE CURB
SGC PROPOSED SLOPED GRANITE CURB
CC PROPOSED CONCRETE CURB
MGC MOUNTABLE GRANITE CURB
SSL SINGLE SOLID LINE (WHITE)
DSL DOUBLE SOLID LINE (YELLOW)
DETECTABLE WARNING PANEL

SEE SHEET CS-202

US ROUTE 1 BYPASS

PROPOSED/COMMERCIAL BUILDING
1ST FLOOR: 21,980 GSF, 4 RETAIL SPACES, 3 RESTAURANTS
2ND FLOOR: 21,980 GSF, 60 OFFICE SPACES
F.F.EL. 26.00

BLDG A

TRASH ENCLOSURE
COMPOSTER ENCLOSURE
TRASH COMPACTOR
TRASH ROOM
LOADING AREA
SNOW STORAGE
BIKE RACK
PROPOSED CONCRETE SIDEWALK (TYP.)
START/CONTINUE SGC
NEW STOP SIGN R1-1
START SGC
END SGC
BEGIN SGC
END SGC BEGIN CC
BEGIN SGC END CC
END SGC BEGIN FLUSH CONCRETE
END CCC BEGIN SGC
INTERNAL DIRECTIONAL SIGN
EXISTING PAVEMENT TO BE CUT BACK TO PROPERTY LINE
EX. SIGN (TO REMAIN OR NEW FREESTANDING)
BLDG
BOSTON & MAINE RAILROAD

5.	8/19/2019	TAC SUBMITTAL	JVA/DAD RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD RRL
	DATE	DESCRIPTION	DESIGNER REVIEWER

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: 1"=30' VERT.: 1"=30'
DATUM: HORZ.: NAD83 VERT.: NGVD29
GRAPHIC SCALE 30 15 0 30

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CATE STREET DEVELOPMENT, LLC

SITE PLAN

CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CS-201

File Path: F:\P2018\0317A10\Civil3D\dwg\20180317A10_STP01.DWG Layout: CS-201(S) Plotted: Mon, August 19, 2019 - 11:24 AM User: ddugal
MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB

CATE STREET EXTENSION

SEE SHEET CS-201

SEE SHEET CS-203

BLDG A

BLDG B

RESIDENTIAL BUILDING A
4 STORIES, 355'X70'
129,215 GSF, 132 UNITS,
1ST FLOOR: 33,615 SF
2ND FLOOR: 33,565 SF
3RD FLOOR: 33,565 SF
4TH FLOOR: 28,470 SF
F.F.EL. = 26.75

RESIDENTIAL BUILDING B
4 STORIES, 305'X70'
104,415 GSF, 118 UNITS,
1ST FLOOR: 26,791 SF
2ND FLOOR: 26,736 SF
3RD FLOOR: 26,736 SF
4TH FLOOR: 24,152 SF
F.F.EL. = 27.75

NEW FREESTANDING SIGN (PERMIT REQUIRED)

NEW STOP SIGN R1-1

LIMIT OF SITE CONSTRUCTION

FIRE PUMP ROOM

5'x5' CONCRETE PAD

TRASH ROOM

LOADING AREA

SNOW STORAGE

BIKE RACK

INTERNAL DIRECTIONAL SIGN

INSTALL VG BACKCURB

END SGC BEGIN CC

END CC BEGIN VGC

END VGC BEGIN CC

END CC BEGIN SGC

END SGC BEGIN FLUSH CONCRETE

BEGIN SGC

END SGC

PET ZONE

DRY WELL

BOSTON & MAINE RAILROAD

BLDG

NEW "STOP" AND "BUMP" R1-1 AND W8-1

XX PARKING COUNT

TD PROPOSED TIPDOWN RAMP

VGC PROPOSED VERTICAL GRANITE CURB
SGC PROPOSED SLOPED GRANITE CURB
CC PROPOSED CONCRETE CURB
MGC MOUNTABLE GRANITE CURB
SSL SINGLE SOLID LINE (WHITE)
DSL DOUBLE SOLID LINE (YELLOW)
SITE LIMIT
DETECTABLE WARNING PANEL

NO.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
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3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD J. LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: 1"=30' VERT.: 1"=30'
DATUM: HORZ.: NAD83 VERT.: NGVD29
GRAPHIC SCALE 30 0 15 30

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CATE STREET DEVELOPMENT, LLC

SITE PLAN

CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CS-202

File Path: F:\P2018\0317A10\Civil\3Dwg\20180317A10_STP01.DWG Layout: CS-202(S) Plotted: Mon, August 19, 2019 - 11:25 AM User: ddugal
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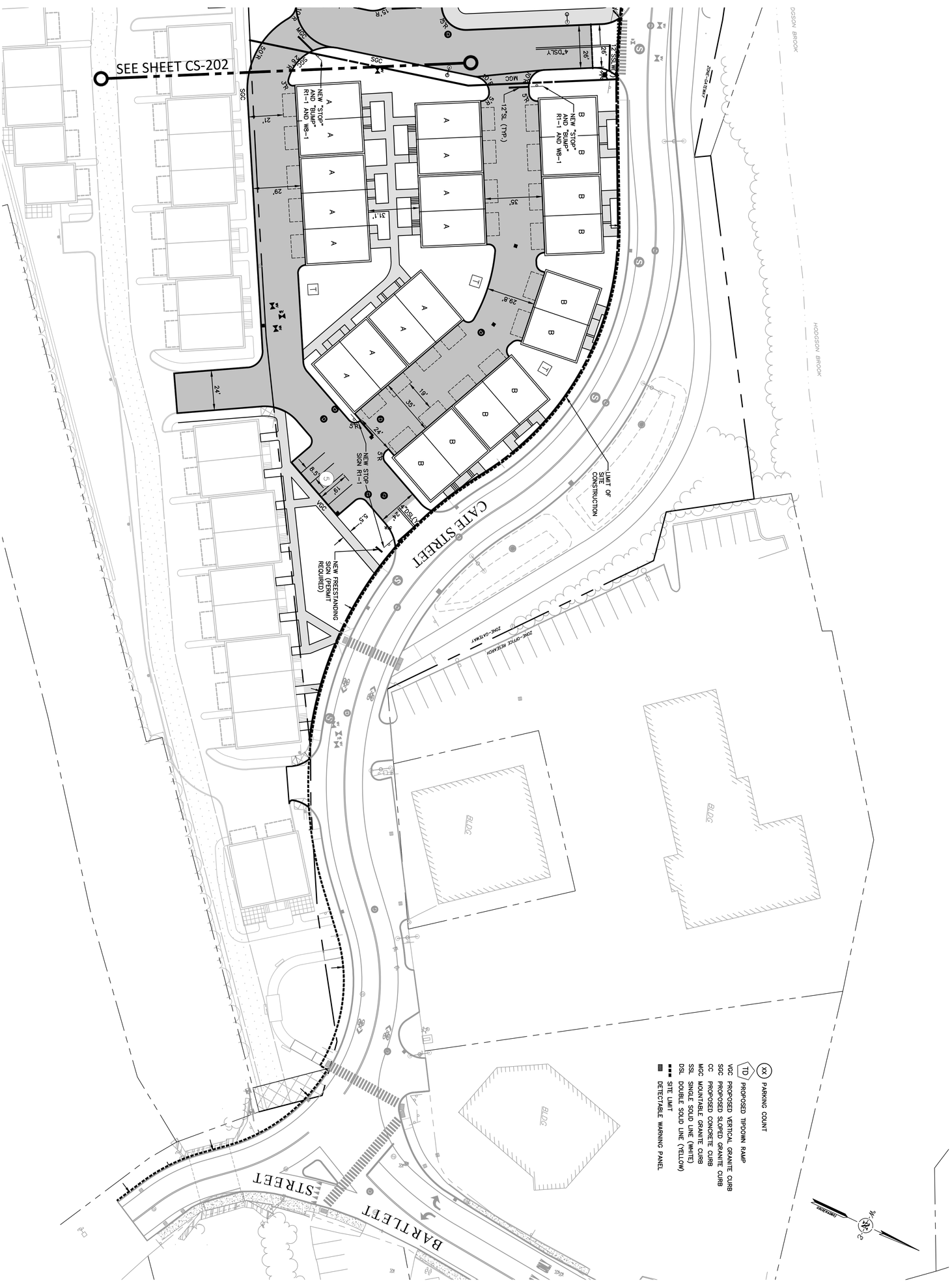

CS-203

PROJ. No: 20180317A10
DATE: 08/19/2019

CATE STREET DEVELOPMENT, LLC

SITE PLAN

CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

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5 FLETCHER STREET, SUITE 1
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SCALE:
HORZ.: 1"=30'
VERT.: 1"=30'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
30 15 0 30
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
RICHARD R. LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

DRAINAGE STRUCTURES 14–20	
STRUCTURE	STRUCTURE DETAILS
14	PROPOSED 4' DIA. DMH CATE STREET STA. 7+06.64, 0.00' RIM = 25.12 (15) 18" HDPE INV IN = 19.77 (11) 18" HDPE INV OUT = 19.27 CONSTRUCT 160 LF x 18" HDPE S = 0.50%
15	PROPOSED 4' DIA. DMH CATE STREET STA. 7+19.11, R 153.40' RIM = 27.20 (17) 12" HDPE INV IN = 20.64 (16) 12" HDPE INV IN = 20.64 (14) 18" HDPE INV OUT = 20.54 CONSTRUCT 150 LF x 18" HDPE S = 0.51%
16	PROPOSED 4' DIA. CB CATE STREET STA. 6+56.24, R 158.50' RIM = 25.50 (15) 12" HDPE INV OUT = 20.94 CONSTRUCT 60 LF x 12" HDPE S = 0.50%
17	PROPOSED 4' DIA. DMH CATE STREET STA. 7+24.26, R 216.88' RIM = 26.87 (18) 12" HDPE INV IN = 21.04 (15) 12" HDPE INV OUT = 20.94 CONSTRUCT 60 LF x 12" HDPE S = 0.50%
18	INFILTRATION BASIN #1 CATE STREET STA. 7+20.48, R 218.18' RIM = 26.83 (17) 12" HDPE INV OUT = 21.10 CONSTRUCT 3 LF x 12" HDPE S = 3.00%
19	PROPOSED 4' DIA. DMH CATE STREET STA. 6+77.32, R 263.18' RIM = 26.45 (20) 6" HDPE INV IN = 22.70 (18) 6" HDPE INV OUT = 22.60 CONSTRUCT 3 LF x 6" HDPE S = 3.00%
20	BUILDING A ROOF DRAIN CATE STREET STA. 6+61.12, R 268.76' RIM = 26.75 (19) 6" HDPE INV OUT = 22.78 CONSTRUCT 14 LF x 6" HDPE S = 0.50%

DRAINAGE STRUCTURES 21–60	
STRUCTURE	STRUCTURE DETAILS
21	PROPOSED 4' DIA. DMH CATE STREET STA. 15+33.70, R 3.16' RIM = 15.22 (22) 24" HDPE INV IN = 9.89 (E2349) 24" HDPE INV OUT = 9.79 CONSTRUCT 117 LF x 24" HDPE S = 4.94%
22	PROPOSED 4' DIA. DMH CATE STREET STA. 14+62.85, 0.00' RIM = 16.85 (23) 12" HDPE INV IN = 12.23 (25) 24" HDPE INV IN = 10.83 (24) 12" HDPE INV IN = 12.23 (21) 24" HDPE INV OUT = 10.73 CONSTRUCT 68 LF x 24" HDPE S = 1.25%
23	PROPOSED 4' DIA. CB CATE STREET STA. 14+72.18, R 15.00' RIM = 16.16 (22) 12" HDPE INV OUT = 12.37 CONSTRUCT 14 LF x 12" HDPE S = 1.00%
24	PROPOSED 4' DIA. CB CATE STREET STA. 14+41.44, R 63.16' RIM = 18.20 (22) 12" HDPE INV OUT = 13.51 CONSTRUCT 64 LF x 12" HDPE S = 2.00%
25	PROPOSED 4' DIA. DMH CATE STREET STA. 14+05.84, 0.00' RIM = 18.56 (26) 12" HDPE INV IN = 13.29 (40) 24" HDPE INV IN = 11.19 (27) 12" HDPE INV IN = 12.09 (28) 18" HDPE INV IN = 12.33 (22) 24" HDPE INV OUT = 11.09 CONSTRUCT 53 LF x 24" HDPE S = 0.50%
26	PROPOSED 4' DIA. CB CATE STREET STA. 13+95.87, R 15.00' RIM = 18.43 (25) 12" HDPE INV OUT = 14.00 CONSTRUCT 15 LF x 12" HDPE S = 5.00%
27	RG #1 OVERFLOW CATE STREET STA. 13+82.53, L 25.26' RIM = 0.00 (25) 12" HDPE INV OUT = 12.43 CONSTRUCT 30 LF x 12" HDPE S = 1.16%
28	PROPOSED 4' DIA. DMH CATE STREET STA. 14+20.46, R 49.41' RIM = 18.61 (29) 12" HDPE INV IN = 12.67 (35) 12" HDPE INV IN = 15.94 (25) 18" HDPE INV OUT = 12.57 CONSTRUCT 49 LF x 18" HDPE S = 0.50%
29	PROPOSED 4' DIA. DMH CATE STREET STA. 14+25.44, R 56.84' RIM = 18.57 (30) 12" HDPE INV IN = 14.30 (28) 12" HDPE INV OUT = 12.70 CONSTRUCT 6 LF x 12" HDPE S = 0.50%
30	DETENSION BASIN #1 CATE STREET STA. 14+25.15, R 60.82' RIM = 18.63 (29) 12" HDPE INV OUT = 14.34 CONSTRUCT 3 LF x 12" HDPE S = 2.00%
31	PROPOSED 4' DIA. DMH CATE STREET STA. 14+16.17, R 108.40' RIM = 19.61 (32) 12" HDPE INV IN = 14.50 (30) 12" HDPE INV OUT = 14.40 CONSTRUCT 3 LF x 12" HDPE S = 3.00%
32	PROPOSED 4' DIA. DMH CATE STREET STA. 14+10.35, R 108.11' RIM = 19.78 (34) 12" HDPE INV IN = 15.15 (33) 12" HDPE INV IN = 14.65 (31) 12" HDPE INV OUT = 14.55 CONSTRUCT 6 LF x 12" HDPE S = 1.00%

DRAINAGE STRUCTURES 21–60	
STRUCTURE	STRUCTURE DETAILS
33	PROPOSED 4' DIA. CB CATE STREET STA. 14+09.74, R 175.18' RIM = 19.32 (32) 12" HDPE INV OUT = 15.00 CONSTRUCT 64 LF x 12" HDPE S = 0.55%
34	PROPOSED 4' DIA. CB CATE STREET STA. 14+06.65, R 80.71' RIM = 20.03 (32) 12" HDPE INV OUT = 15.50 CONSTRUCT 24 LF x 12" HDPE S = 1.46%
35	PROPOSED 4' DIA. DMH CATE STREET STA. 13+98.74, R 85.71' RIM = 21.14 (36) 12" HDPE INV IN = 17.75 (28) 12" HDPE INV OUT = 16.15 CONSTRUCT 43 LF x 12" HDPE S = 0.50%
36	DETENTION BASIN #2 CATE STREET STA. 13+95.96, R 85.90' RIM = 20.55 (35) 12" HDPE INV OUT = 17.79 CONSTRUCT 3 LF x 12" HDPE S = 2.00%
37	PROPOSED 4' DIA. DMH CATE STREET STA. 12+91.07, R 86.88' RIM = 21.91 (39) 12" HDPE INV IN = 18.74 (38) 12" HDPE INV IN = 17.95 (36) 12" HDPE INV OUT = 17.85 CONSTRUCT 3 LF x 12" HDPE S = 3.00%
38	PROPOSED 4' DIA. CB CATE STREET STA. 12+76.81, R 83.04' RIM = 22.06 (37) 12" HDPE INV OUT = 18.00 CONSTRUCT 6 LF x 12" HDPE S = 1.00%
39	PROPOSED 4' DIA. CB CATE STREET STA. 11+90.18, R 84.80' RIM = 23.06 (37) 12" HDPE INV OUT = 19.00 CONSTRUCT 53 LF x 12" HDPE S = 0.50%
40	PROPOSED 4' DIA. DMH CATE STREET STA. 12+83.70, 0.00' RIM = 21.69 (41) 12" HDPE INV IN = 13.35 (42) 24" HDPE INV IN = 11.88 (25) 24" HDPE INV OUT = 11.78 CONSTRUCT 118 LF x 24" HDPE S = 0.50%
41	RG #2 OVERFLOW CATE STREET STA. 12+83.42, L 25.41' RIM = 17.89 (40) 12" HDPE INV OUT = 14.43 CONSTRUCT 22 LF x 12" HDPE S = 5.00%
42	PROPOSED 4' DIA. DMH CATE STREET STA. 11+85.44, 0.00' RIM = 22.86 (44) 24" HDPE INV IN = 12.45 (43) 12" HDPE INV IN = 13.35 (41) 24" HDPE INV OUT = 12.35 CONSTRUCT 94 LF x 24" HDPE S = 0.50%
43	PROPOSED 4' DIA. CB CATE STREET STA. 11+86.51, R 15.00' RIM = 22.42 (42) 12" HDPE INV OUT = 13.46 CONSTRUCT 12 LF x 12" HDPE S = 1.00%
44	PROPOSED 4' DIA. DMH CATE STREET STA. 10+48.39, 0.00' RIM = 24.89 (45) 12" HDPE INV IN = 18.50 (46) 12" HDPE INV IN = 18.50 (47) 18" HDPE INV IN = 13.61 (42) 24" HDPE INV OUT = 13.11 CONSTRUCT 133 LF x 24" HDPE S = 0.50%

DRAINAGE STRUCTURES 21–60	
STRUCTURE	STRUCTURE DETAILS
45	PROPOSED 4' DIA. CB CATE STREET STA. 10+33.32, R 11.00' RIM = 24.90 (44) 12" HDPE INV OUT = 19.50 CONSTRUCT 15 LF x 12" HDPE S = 6.82%
46	PROPOSED 4' DIA. CB CATE STREET STA. 10+33.32, L 11.00' RIM = 24.90 (44) 12" HDPE INV OUT = 19.50 CONSTRUCT 15 LF x 12" HDPE S = 6.82%
47	PROPOSED 4' DIA. DMH CATE STREET STA. 10+61.58, R 122.45' RIM = 25.92 (48) 18" HDPE INV IN = 14.31 (44) 18" HDPE INV OUT = 14.21 CONSTRUCT 120 LF x 18" HDPE S = 0.50%
48	PROPOSED 4' DIA. DMH CATE STREET STA. 10+25.80, R 127.22' RIM = 27.00 (57) 12" HDPE INV IN = 15.00 (49) 12" HDPE INV IN = 15.00 (47) 18" HDPE INV OUT = 14.48 CONSTRUCT 35 LF x 18" HDPE S = 0.50%
49	PROPOSED 4' DIA. DMH CATE STREET STA. 10+27.11, R 137.45' RIM = 26.25 (50) 12" HDPE INV IN = 18.55 (48) 12" HDPE INV OUT = 15.10 CONSTRUCT 7 LF x 12" HDPE S = 1.58%
50	INFILLTRATION BASIN #2 CATE STREET STA. 10+27.61, R 141.41' RIM = 26.15 (49) 12" HDPE INV OUT = 18.60 CONSTRUCT 3 LF x 12" HDPE S = 2.50%
51	PROPOSED 4' DIA. DMH CATE STREET STA. 9+62.84, R 234.29' RIM = 25.42 (52) 18" HDPE INV IN = 18.92 (50) 18" HDPE INV OUT = 18.92 CONSTRUCT 3 LF x 18" HDPE S = 0.00%
52	PROPOSED 4' DIA. DMH CATE STREET STA. 9+63.98, R 243.22' RIM = 25.49 (54) 18" HDPE INV IN = 19.07 (53) 12" HDPE INV IN = 19.95 (51) 18" HDPE INV OUT = 18.97 CONSTRUCT 6 LF x 18" HDPE S = 1.00%
53	PROPOSED 4' DIA. CB CATE STREET STA. 10+53.01, R 233.88' RIM = 23.88 (52) 12" HDPE INV OUT = 20.38 CONSTRUCT 86 LF x 12" HDPE S = 0.50%
54	PROPOSED 4' DIA. DMH CATE STREET STA. 9+36.44, R 333.81' RIM = 24.55 (55) 12" HDPE INV IN = 20.02 (56) 12" HDPE INV IN = 20.02 (52) 18" HDPE INV OUT = 19.52 CONSTRUCT 91 LF x 18" HDPE S = 0.50%
55	PROPOSED 4' DIA. CB CATE STREET STA. 9+38.27, R 381.51' RIM = 23.74 (54) 12" HDPE INV OUT = 20.24 CONSTRUCT 44 LF x 12" HDPE S = 0.50%
56	PROPOSED 4' DIA. CB CATE STREET STA. 8+64.09, R 340.65' RIM = 25.36 (54) 12" HDPE INV OUT = 20.86 CONSTRUCT 69 LF x 12" HDPE S = 1.22%

DRAINAGE STRUCTURES 21–60	
STRUCTURE	STRUCTURE DETAILS
57	PROPOSED 4' DIA. DMH CATE STREET STA. 8+63.04, R 147.97' RIM = 26.47 (58) 12" HDPE INV IN = 18.55 (48) 12" HDPE INV OUT = 15.80 CONSTRUCT 161 LF x 12" HDPE S = 0.50%
58	INFILLTRATION BASIN #3 CATE STREET STA. 8+63.54, R 151.94' RIM = 26.46 (57) 12" HDPE INV OUT = 18.60 CONSTRUCT 3 LF x 12" HDPE S = 2.50%
59	PROPOSED 4' DIA. DMH CATE STREET STA. 8+63.63, R 265.26' RIM = 25.90 (60) 6" HDPE INV IN = 20.20 (58) 6" HDPE INV OUT = 20.10 CONSTRUCT 3 LF x 6" HDPE S = 3.00%
60	BUILDING B ROOF DRAIN CATE STREET STA. 7+56.79, R 220.50' RIM = 27.25 (59) 6" HDPE INV OUT = 20.78 CONSTRUCT 112 LF x 6" HDPE S = 0.51%

DRAINAGE STRUCTURES 64–73	
STRUCTURE	STRUCTURE DETAILS
E1071	EXISTING CB RIM = 22.29 (62) 12" HDPE INV IN = 17.60 (E1072) 12" HDPE INV OUT = 17.50 EXISTING 28 LF x 12" HDPE S=0.72%
E1072	EXISTING DMH RIM = 23.71 (E1071) 12" HDPE INV IN = 17.30 (64) 12" HDPE INV IN = 17.60
64	COMMERCIAL BULDING ROOF DRAIN RIM = 19.05 (E1072) 12" HDPE INV OUT = 17.94 CONSTRUCT 69 LF x 12" HDPE S=0.50%
65	PROPOSED 4' DIA. DMH RIM = 25.40 (66) 12" HDPE INV IN = 18.24 (E1071) 12" HDPE INV OUT = 18.14 CONSTRUCT 104 LF x 12" HDPE S=0.52%
66	WATER QUALITY STRUCTURE RIM = 19.59 (67) 12" HDPE INV IN = 18.48 (65) 12" HDPE INV OUT = 18.38 CONSTRUCT 28 LF x 12" HDPE S=0.50%
67	PROPOSED 4' DIA. DMH RIM = 24.59 (69) 12" HDPE INV IN = 19.12 (65) 12" HDPE INV IN = 19.12 (66) 12" HDPE INV OUT = 19.02 CONSTRUCT 109 LF x 12" HDPE S=0.50%
68	PROPOSED 4' DIA. CB RIM = 23.22 (67) 12" HDPE INV OUT = 19.37 CONSTRUCT 49 LF x 12" HDPE S=0.50%
69	PROPOSED 4' DIA. DMH RIM = 24.32 (68) 12" HDPE INV IN = 20.57 (70) 12" HDPE INV IN = 20.57 (67) 12" HDPE INV OUT = 20.47 CONSTRUCT 270 LF x 12" HDPE S=0.50%
70	PROPOSED 4' DIA. CB RIM = 24.24 (69) 12" HDPE INV OUT = 20.60 CONSTRUCT 4 LF x 12" HDPE S=1.02%
71	PROPOSED 4' DIA. DMH RIM = 25.15 (72) 12" HDPE INV IN = 20.89 (73) 12" HDPE INV IN = 20.89 (69) 12" HDPE INV OUT = 20.79 CONSTRUCT 45 LF x 12" HDPE S=0.50%
72	PROPOSED 4' DIA. CB RIM = 25.12 (71) 12" HDPE INV OUT = 20.93 CONSTRUCT 8 LF x 12" HDPE S=0.50%
73	PROPOSED 4' DIA. CB RIM = 25.17 (71) 12" HDPE INV OUT = 21.15 CONSTRUCT 52 LF x 12" HDPE S=0.50%

LIGHT TABLE ENTRIES FROM ROADWAY PLAN PROVIDED FOR REFERENCE ONLY

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

SCALE: HORZ.: VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC

SITE DRAINAGE STRUCTURE TABLE

CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CG-001

File Path: F:\P2018\0317\A10\Civil\Dwg\Structure Tables.dwg Layout: CG-001 (DRAINAGE TABLE) (S) Plotted: Mon, August 19, 2019 - 9:56 AM User: jandretta
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No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE — PROFESSIONAL ENGINEER — RICHARD R. LINDBORN No. 10943 LICENSED

SCALE: HORZ.: 1"=60'
VERT.: 1"=60'
DATUM: HORZ.: NAD83
VERT.: NGVD29
60 30 0 60
GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC

GRADING, DRAINAGE & EROSION CONTROL PLAN
CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CG-200

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CG-201

PROJ. No.: 20180317A10
DATE: 08/19/2019

CATE STREET DEVELOPMENT, LLC

GRADING, DRAINAGE & EROSION CONTROL PLAN
CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

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SCALE:
HORZ.: 1"=30'
VERT.: 1"=30'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
30 15 0 30
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
RICHARD R. LUNDBORN
No. 10943
LICENSED PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

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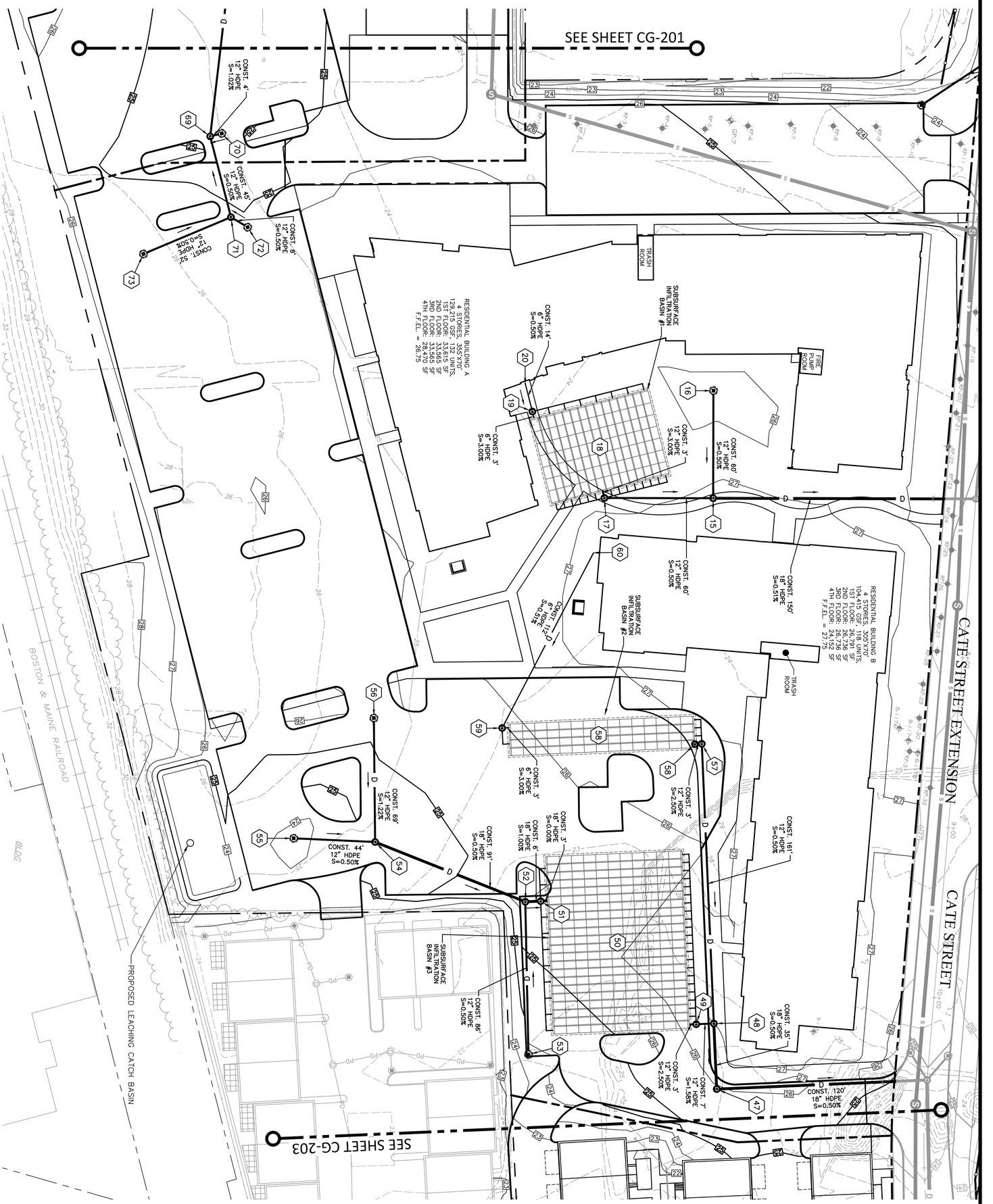

CG-202	PROJ. No: 20180317A10 DATE: 08/19/2019

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GRADING, DRAINAGE & EROSION CONTROL PLAN
CATE STREET/ WEST END YARDS

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VERT.: 1"=30'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
30 15 0 30
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE — RICHARD R. LUNDBORN No. 10943 — LICENSED PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

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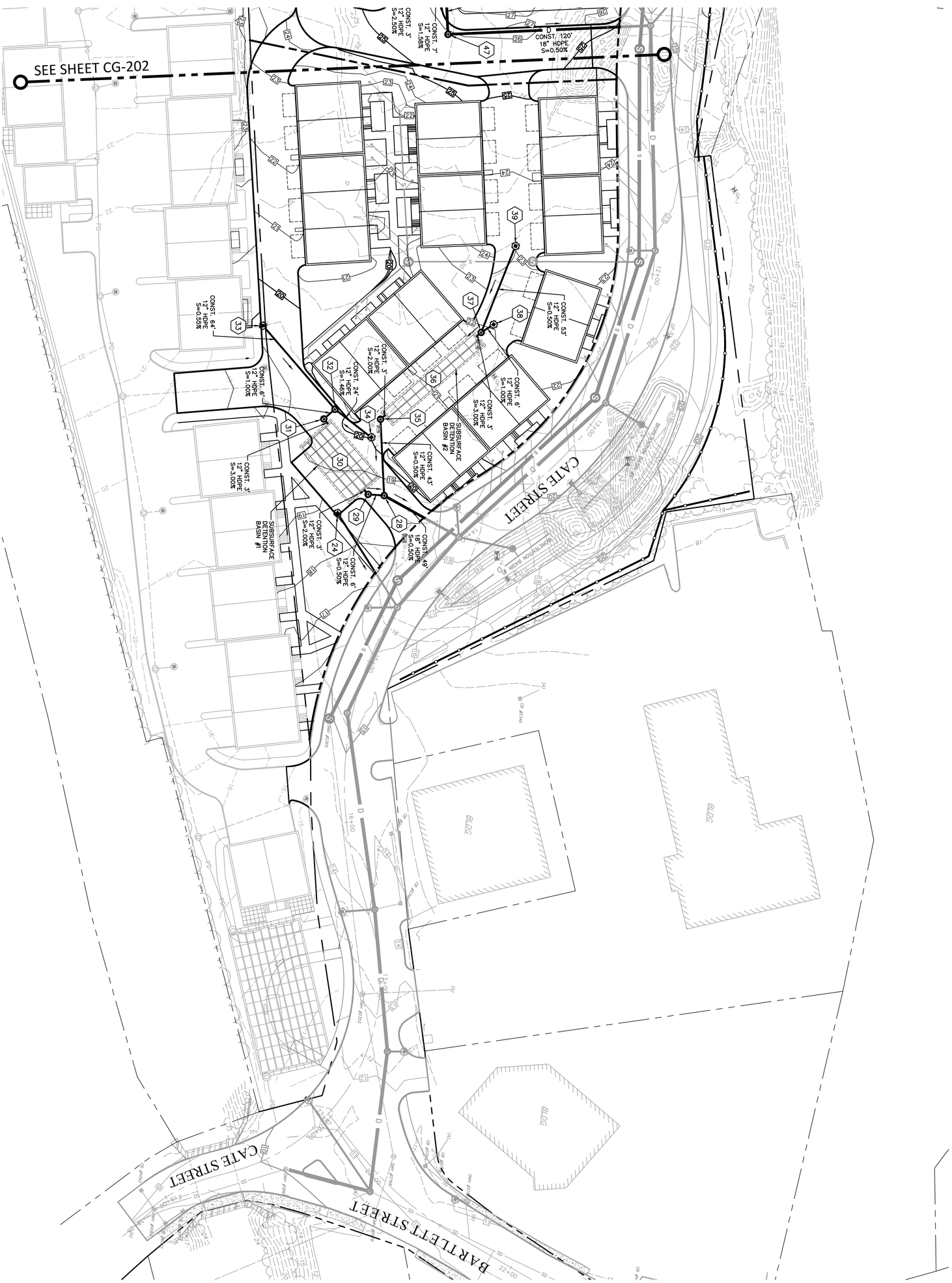

CG-203

PROJ. No: 20180317A10
DATE: 08/19/2019

CATE STREET DEVELOPMENT, LLC

GRADING, DRAINAGE & EROSION CONTROL PLAN
CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

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VERT.: 1"=30'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
30 15 0 30
GRAPHIC SCALE

RICHARD R. LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
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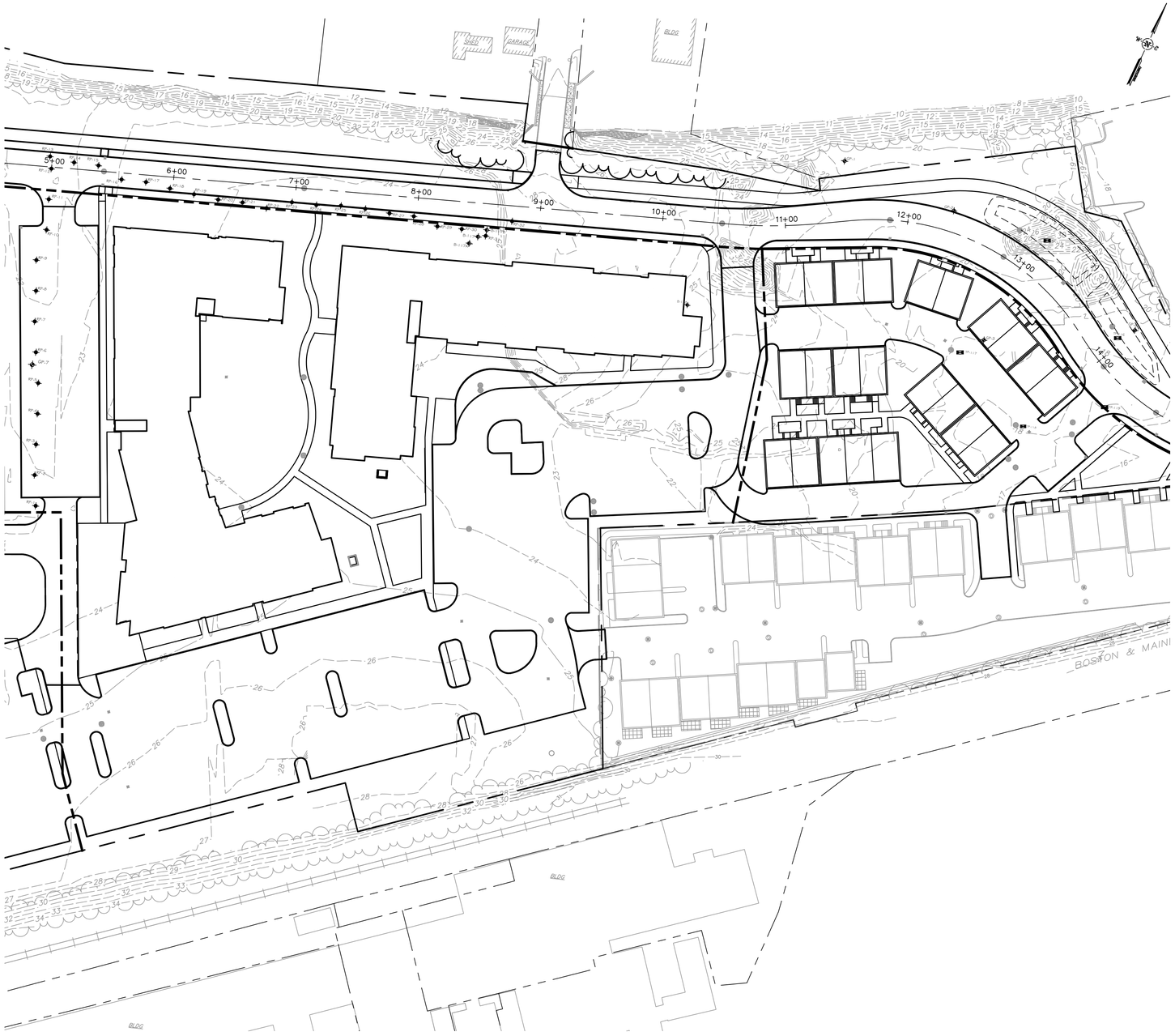
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL



LEGEND

— APPROXIMATE LOCATION OF TEST PIT PERFORMED BY P.K. BROWN CONSTRUCTION OF PORTSMOUTH, NH UNDER CONTRACT TO McPHAIL ASSOCIATES, LLC ON MARCH 1 AND MARCH 5, 2019

— APPROXIMATE LOCATION OF ROCK PROBE PERFORMED BY MAINE DRILLING AND BLASTING, INC. ON JULY 9, 2019 FOR McPHAIL ASSOCIATES, LLC

— APPROXIMATE LOCATION OF BORING PERFORMED BY CARR-DEE CORP. FROM MARCH 11 TO MARCH 18, 2019 FOR McPHAIL ASSOCIATES, LLC

— APPROXIMATE LOCATION OF BOREHOLE PERFORMED BY TECHNICAL DRILLING SERVICES, INC. ON JANUARY 19 & 22, 2018 FOR McPHAIL ASSOCIATES, LLC

REFERENCE: THIS PLAN WAS PREPARED FROM A 50-SCALE DRAWING ENTITLED, "PLAN OF LAND" DATED DECEMBER 2016 PREPARED BY DOUCET SURVEY INC.
THIS PLAN WAS PREPARED BY MCPHAIL ASSOCIATES, LLC.

Table
Summary of Explorations
Cate Street
Portsmouth, New Hampshire

Exploration No.	Ground Surface Elevation [Feet]	Total Depth of Exploration [Feet]	Depth to Top of Bedrock [Feet]	Elevation of Bottom of Exploartion [Feet]	Elevation of Refusal on Bedrock [Feet]
RP-1	+22.8	20.0	NE	+2.8	NE
RP-2	+22.4	20.0	NE	+2.4	NE
RP-3	+22.1	20.0	NE	+2.1	NE
RP-4	+21.9	20.0	NE	+1.9	NE
RP-5	+21.8	20.0	NE	+1.8	NE
RP-6	+21.6	20.0	NE	+1.6	NE
RP-7	+21.5	20.0	NE	+1.5	NE
RP-8	+21.5	20.0	NE	+1.5	NE
RP-9	+21.3	20.0	NE	+1.3	NE
RP-10	+21.3	20.0	NE	+1.3	NE
RP-11	+20.9	20.0	NE	+0.9	NE
RP-12	+21.8	20.0	NE	+1.8	NE
RP-13	+22.7	20.0	NE	+2.7	NE
RP-14	+22.9	20.0	NE	+2.9	NE
RP-15	+23.3	20.0	NE	+3.3	NE
RP-16	+23.6	20.0	NE	+3.6	NE
RP-17	+23.6	20.0	NE	+3.6	NE
RP-18	+23.7	23.0	18.0	+0.7	+5.7
RP-19	+23.8	23.0	18.0	+0.8	+5.8
RP-20	+23.9	19.0	14.0	+4.9	+9.9
RP-21	+24.0	15.0	10.0	+9.0	+14.0
RP-22	+23.9	13.0	8.0	+10.9	+15.9
RP-23	+23.8	12.0	7.0	+11.8	+16.8
RP-24	+23.9	9.0	4.0	+14.9	+19.9
RP-25	+23.9	7.0	2.0	+16.9	+21.9
RP-26	+23.9	9.0	4.0	+14.9	+19.9
RP-27	+24.1	8.0	3.0	+16.1	+21.1
RP-28	+24.1	13.0	8.0	+11.1	+16.1
RP-29	+24.0	12.0	7.0	+12.0	+17.0
RP-30	+24.0	12.0	7.0	+12.0	+17.0
RP-31	+24.0	10.0	5.0	+14.0	+19.0
RP-32	+24.0	11.0	6.0	+13.0	+18.0
B-117	+23.6	5.2	5.1	+18.4	+18.5
B-117A	+23.6	4.2	5.2	+19.4	+18.4
B-117B	+23.6	5.2	4.2	+18.4	+19.4
B-118	+27.9	12.0	12.0	+15.9	+15.9
GP-1	+21.6	10.0	11.6	+11.6	+10.0
GP-2	+20.4	14.0	14.0	+6.4	+6.4
GP-3	+19.5	16.5	16.5	+3.0	+3.0
GP-4	+19.7	14.0	14.0	+5.7	+5.7
TP-115	+22.9	5.0	NE	+17.9	NE
TP-116	+18.4	6.0	NE	+12.4	NE
TP-117	+18.8	6.5	NE	+12.3	NE
TP-118	+18.4	6.0	NE	+12.4	NE
TP-119	+17.2	6.0	NE	+11.2	NE

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3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE — RICHARD R. LINDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: 1"=50' VERT.: 1"=50'
DATUM: HORZ.: NAD83 VERT.: NGVD29
GRAPHIC SCALE 50 0 25 50

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CATE STREET DEVELOPMENT, LLC

SUBSURFACE EXPLORATION PLAN
CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CG-210

SEWER SYSTEM	
STRUCTURE	STRUCTURE DETAILS
4	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 11+93.37, R 9.16' RIM = 22.57 (5) 24" PVC INV IN = 9.87 (12) 8" PVC INV IN = 11.10 (3) 24" PVC INV OUT = 9.77 CONSTRUCT 83 LF x 24" PVC S=0.0008
12	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 12+03.73, R 73.29' RIM = 23.20 (13) 8" PVC INV IN = 11.50 (4) 8" PVC INV OUT = 11.40 CONSTRUCT 61 LF x 8" PVC S=0.0050
13	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 12+50.11, R 146.52' RIM = 20.95 (12) 8" PVC INV OUT = 11.86 CONSTRUCT 72 LF x 8" PVC S=0.0050

LIGHT TABLE ENTRIES FROM ROADWAY
PLAN PROVIDED FOR REFERENCE ONLY

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – LICENSED PROFESSIONAL ENGINEER – RICHARD R LUNDBORN No. 10943

SCALE: HORZ.: VERT.:
DATUM: HORZ.: VERT.:
0
GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC
SITE SEWER
STRUCTURE TABLE
CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CU-001

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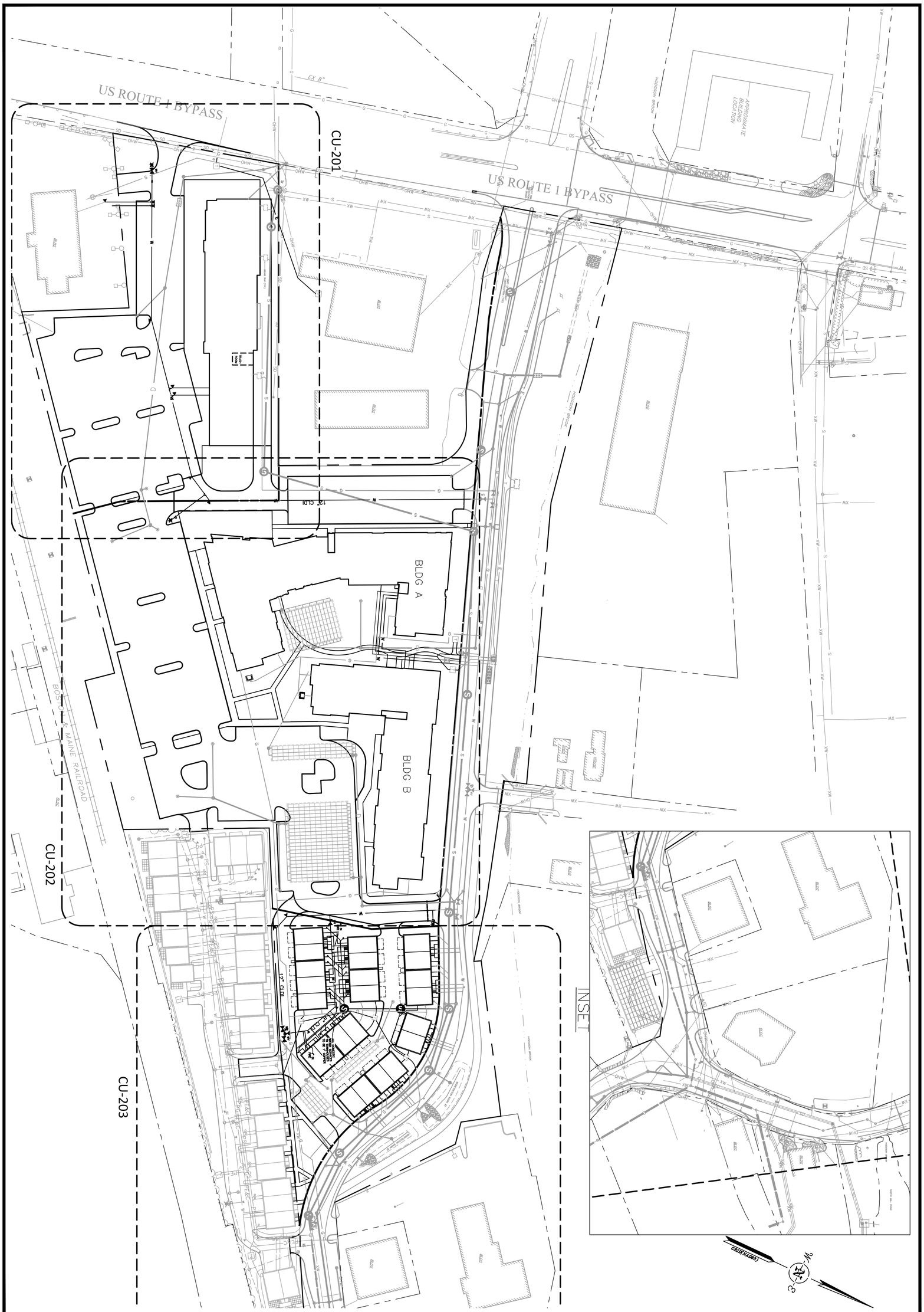

CU-200

PROJ. No: 20180317A10
DATE: 08/19/2019

CATE STREET DEVELOPMENT, LLC

OVERALL UTILITY PLAN

CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
207.363.0669
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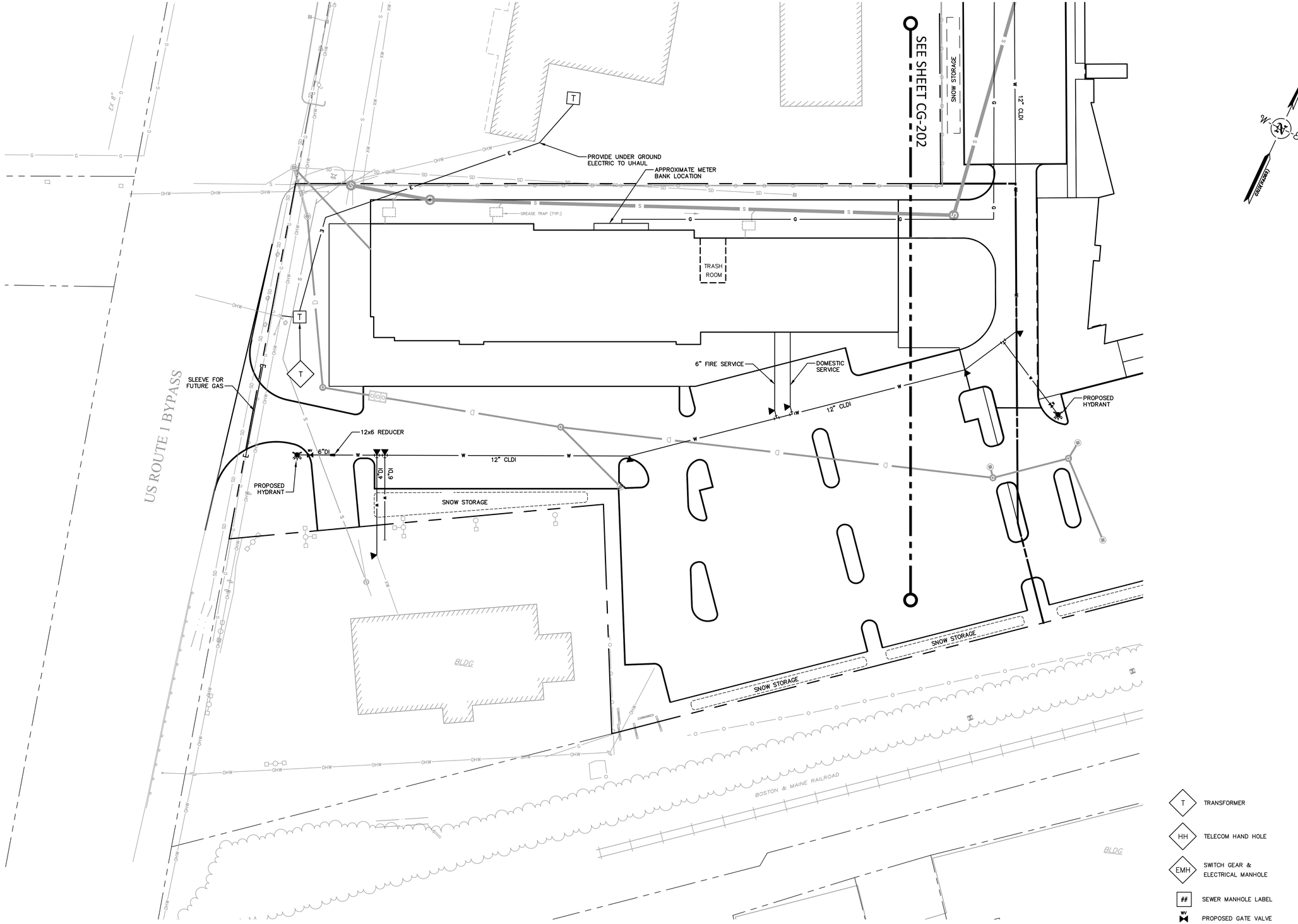
SCALE:
HORZ.: 1"=60'
VERT.: 1"=60'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
60 30 0 60
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
RICHARD R. LUNDBORN No. 10943 LICENSED
PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL



No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: 1" = 30'
VERT.: 1" = 30'
DATUM: HORZ.: NAD83
VERT.: NGVD29
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GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC

UTILITY PLAN

CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CU-201

File Path: F:\P2018\0317A10\Civil\3Dwg\20180317A10_UTL01.dwg Layout: CU-201 (S) Plotted: Mon, August 19, 2019 - 12:13 PM User: ddugal
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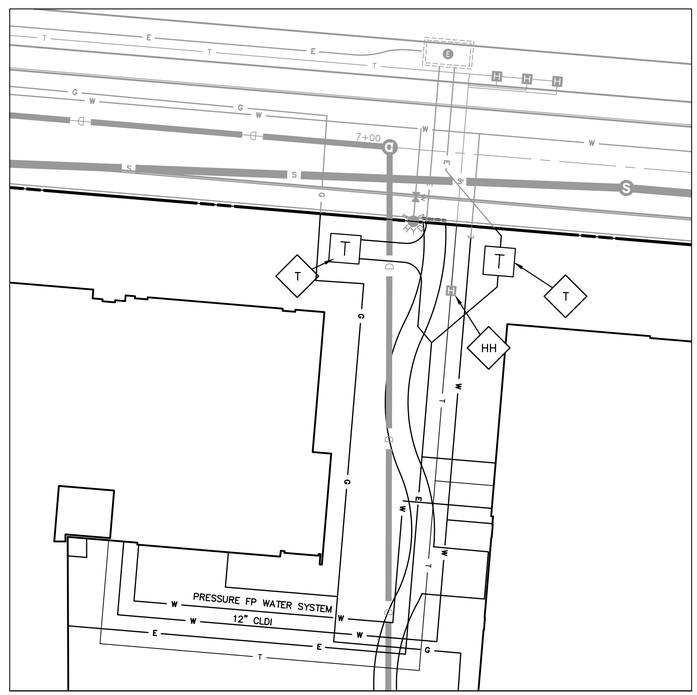
PLAN

SCALE: 1 INCH = 30 FT.



INSET SHEET CU-202

SCALE: 1 INCH = 20 FT.

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4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: AS NOTED VERT.: AS NOTED
DATUM: HORZ.: NAD83 VERT.: NGVD29
GRAPHIC SCALE 30 0 30 60

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CATE STREET DEVELOPMENT, LLC

UTILITY PLAN

CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CU-202

File Path: F:\P2018\03317A10\Civil\3Dwg\20180317A10_UTL01.dwg Layout: CU-202 (S) Plotted: Mon, August 19, 2019 - 12:14 PM User: ddugal
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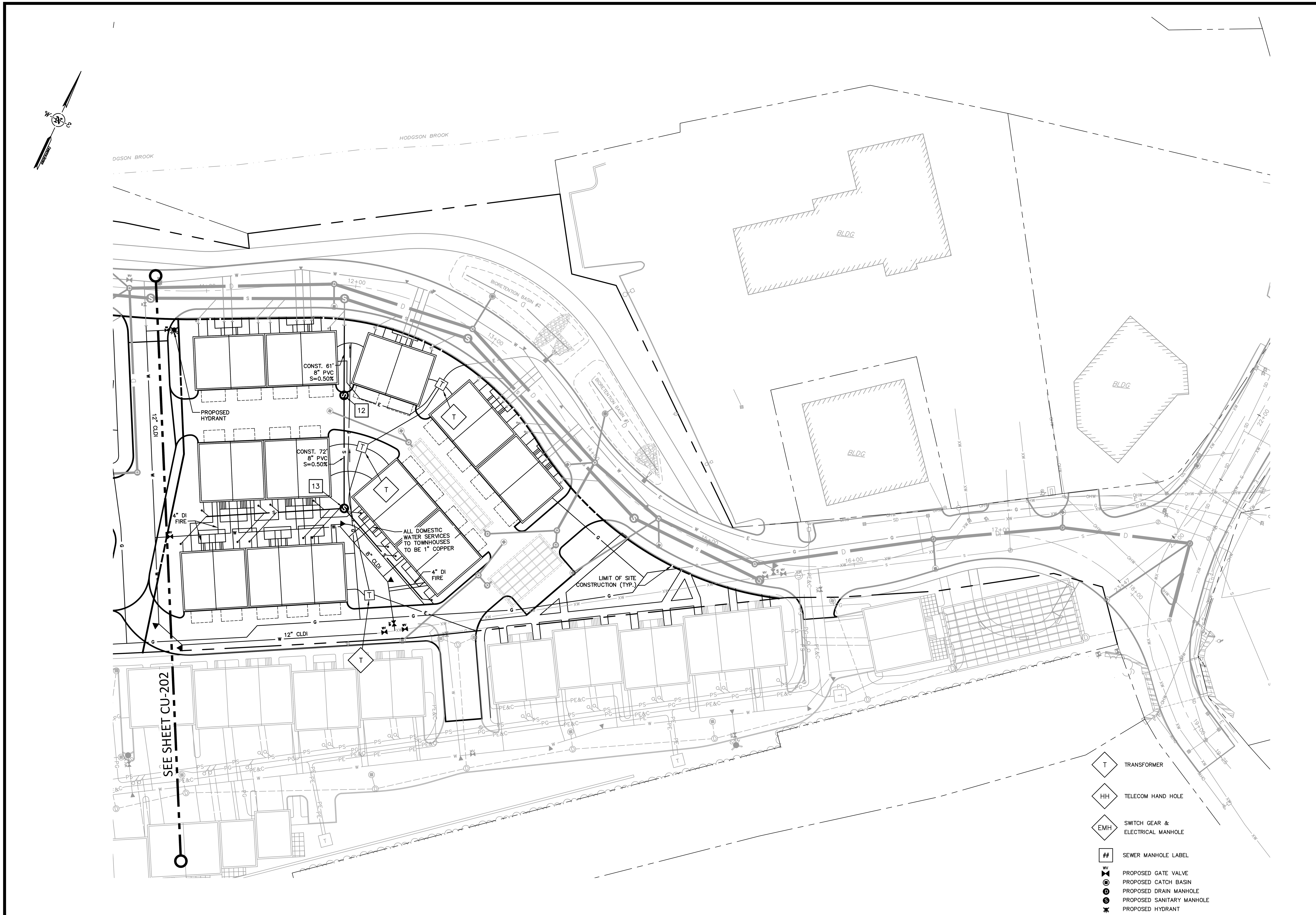

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4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE:
HORZ.: 1"=30'
VERT.: 1"=30'

DATUM:
HORZ.: NAD83
VERT.: NGVD29

30 15 0 30
GRAPHIC SCALE

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UTILITY PLAN

CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CU-203

File Path: F:\P2018\0317\A10\Civil3\Dwg\20180317A10_UTL01.dwg Layout: CU-203 (S) Plotted: Mon, August 19, 2019 - 12:14 PM User: ddugal
Plotter: DWG TO PDF.PC3 CTB File: FO.STB
MS VIEW: LAYER STATE:

1. ALL SECTIONS SHALL BE CONCRETE, CLASS AA (4,000 PSI)
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER L.F. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER L.F.
4. RISERS OF 1'–4" MAY BE USED TO REACH THE DESIRED ELEVATION.
5. THE STRUCTURES SHALL BE DESIGNED FOR H–20 LOADING.
6. ADJUSTING THE FRAME TO GRADE MAY BE DONE WITH PRECAST CONCRETE GRADE RINGS OR CLAY BRICKS (2 COURSES MAX.) FRAME TO BE SET IN A FULL BED OF MORTAR.
8. SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
9. PIPE ELEVATIONS SHOWN ON THE PLAN SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
10. PIPE ENDS SHALL PROJECT NO MORE THAN 3–INCHES BEYOND THE INSIDE WALL OF THE STRUCTURE.
11. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4–INCHES HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING ONE STRIP OF BUTYL RUBBER SEALANT OR APPROVED FLEXIBLE SEALANT.
12. STEPS ARE NOT ALLOWED.

CATCH BASIN SPECIFIC NOTES:

13. CONE SECTIONS MAY BE CONCENTRIC OR ECCENTRIC FOR CATCH BASINS.
14. "ELIMINATOR" OIL/WATER SEPARATORS SHALL BE INSTALLED TIGHT TO THE INSIDE OF THE CATCH BASINS ON THE OUTLET PIPE.

DRAIN MANHOLE SPECIFIC NOTES:

15. ALL STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 12–INCHES OF INSIDE SURFACE BETWEEN THE HOLES, NO MORE THAN 75% OF A HORIZONTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3–INCHES TO ANY JOINT.

PRECAST DRAINAGE STRUCTURE NOTES

NOT TO SCALE

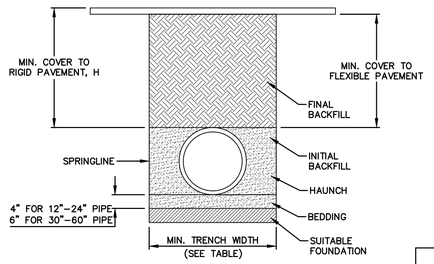


TABLE 1, RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
12" (300mm)	30" (762mm)
15" (375mm)	34" (864mm)
18" (450mm)	39" (991mm)
24" (600mm)	48" (1219mm)
30" (750mm)	56" (1422mm)
36" (900mm)	64" (1626mm)
42" (1050mm)	72" (1829mm)
48" (1200mm)	80" (2032mm)
60" (1500mm)	96" (2438mm)

TABLE 2, MINIMUM RECOMMENDED COVER BASED ON VEHICLE LOADING CONDITIONS

PIPE DIAM.	SURFACE LIVE LOAD CONDITION	
	H–25	HEAVY CONSTRUCTION (75T AXLE LOAD)*
12"–48" (300mm–1200mm)	12" (305mm)	12" (305mm)
60" (1500mm)	24" (610mm)	60" (1524mm)

*VEHICLE IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER

TABLE 3, MAXIMUM COVER FOR ADS HP STORM PIPE, FT.

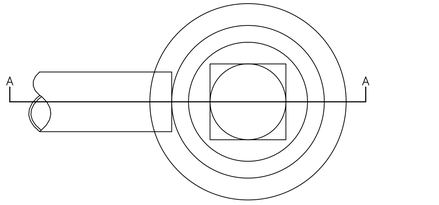
	CLASS I	CLASS II			CLASS III		CLASS IV
PIPE DIA.	COMPACTED	95%	90%	85%	95%	90%	95%
12" (305mm)	41" (12.5m)	28" (8.5m)	21" (6.4m)	16" (4.9m)	20" (6.4m)	16" (4.9m)	16" (4.9m)
15" (375mm)	42" (12.8m)	29" (8.8m)	24" (6.4m)	16" (4.9m)	21" (6.4m)	16" (4.9m)	16" (4.9m)
18" (450mm)	44" (13.4m)	30" (9.1m)	24" (6.4m)	16" (4.9m)	22" (6.7m)	17" (5.2m)	16" (4.9m)
24" (600mm)	37" (11.3m)	26" (7.9m)	18" (5.5m)	14" (4.3m)	19" (5.8m)	14" (4.3m)	14" (4.3m)
30" (750mm)	39" (11.9m)	27" (8.2m)	19" (5.8m)	14" (4.3m)	19" (5.8m)	15" (4.6m)	14" (4.3m)
36" (900mm)	28" (8.5m)	20" (6.1m)	14" (4.3m)	10" (3.0m)	28" (8.5m)	11" (3.4m)	10" (3.0m)
42" (1050mm)	30" (9.1m)	21" (6.4m)	14" (4.3m)	10" (3.0m)	15" (4.6m)	11" (3.4m)	10" (3.0m)
48" (1200mm)	29" (8.8m)	20" (6.1m)	14" (4.3m)	9" (2.7m)	14" (4.3m)	10 (3.0m)	10" (3.0m)
60" (1500mm)	29" (8.8m)	20" (6.1m)	14" (4.3m)	9" (2.7m)	14" (4.3m)	10" (3.0m)	9" (2.7m)

FILL HEIGHT TABLE GENERATED USING AASHTO SECTION 12, LOAD RESISTANCE FACTOR DESIGN (LRFD) PROCEDURE WITH THE FOLLOWING ASSUMPTIONS:
NO HYDROSTATIC PRESSURE
UNIT WEIGHT OF SOIL (γs) = PCF

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D3221, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION WITH THE EXCEPTION THAT THE INITIAL BACKFILL MAY EXTEND TO THE CROWN OF THE PIPE. SOIL CLASSIFICATIONS ARE PER THE LATEST VERSION OF ASTM D2321. CLASS IVB MATERIALS (MH, CH) AS DEFINED IN PREVOUS VERSIONS OF ASTM D2321 ARE NOT APPROPRIATE BACKFILL MATERIALS.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND PLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II, III OR IV. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. COMPACTION SHALL BE SPECIFIED BY THE ENGINEER IN ACCORDANCE WITH TABLE 3 FOR THE APPLICABLE FILL HEIGHTS LISTED, UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 12"–24" (300mm–600mm) DIAMETER PIPE; 6" (150mm) FOR 30"–60" (750mm–1500mm) DIAMETER PIPE. THE MIDDLE 1/3 BENEATH THE PIPE INVERT SHALL BE LOOSELY PLACED.
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II, III OR IV IN THE PIPE ZONE EXTENDING TO THE CROWN OF THE PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION. COMPACTION SHALL BE SPECIFIED BY THE ENGINEER IN ACCORDANCE WITH TABLE 3 FOR THE APPLICATION FILL HEIGHTS LISTED. PLEASE NOTE, CLASS IV MATERIAL HAS LIMITED APPLICATION AND CAN BE DIFFICULT TO PLACE AND COMPACT; USE ONLY WITH THE APPROVAL OF A SOIL EXPERT.
6. MINIMUM COVER: MINIMUM COVER, H, IN NON–TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" (300mm) FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOTATION. FOR TRAFFIC APPLICATIONS; CLASS I OR II MATERIAL COMPACTED TO 90% SPD AND CLASS III COMPACTED TO 95% SPD IS REQUIRED. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" (300mm) UP TO 48" (1200mm) DIAMETER PIPE AND 24" (600mm) OF COVER FOR 60" (1500mm) DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.
7. FOR ADDITIONAL INFORMATION SEE TECHNICAL NOTE 2.04.

HP STORM TRENCH INSTALLATION DETAIL

NOT TO SCALE



PLAN

SECTION A–A

PRECAST CATCH BASIN/DRAINAGE MANHOLE

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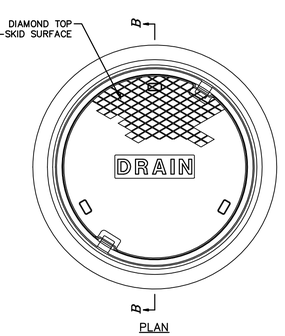
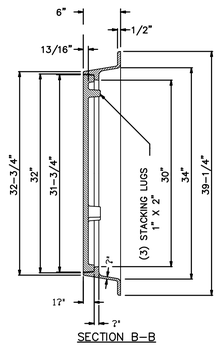


PLAN

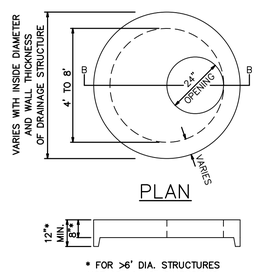


SECTION B–B

NOTES:
1. ALL DIMENSIONS ARE NOMINAL.
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
3. LABEL TYPE OF MANHOLE WITH 3" HIGH LETTERS IN THE CENTER OF THE COVER.

DRAIN MANHOLE FRAME AND COVER

NOT TO SCALE

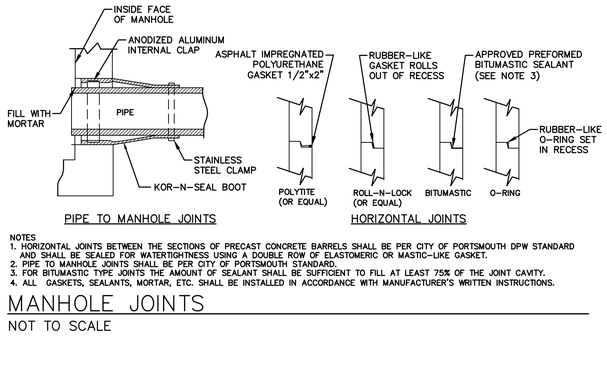


PLAN

* FOR >6' DIA. STRUCTURES USE 16" & 12" DIMENSIONS

SECTION B–B

FLAT SLAB TOP



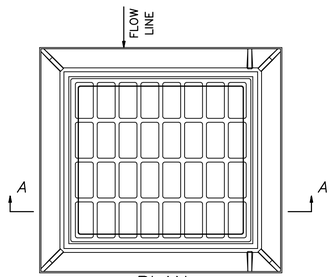
PIPE TO MANHOLE JOINTS

HORIZONTAL JOINTS

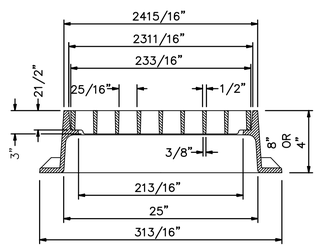
NOTES
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW OF ELASTOMERIC OR MASTIC–LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.
4. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.

MANHOLE JOINTS

NOT TO SCALE



PLAN



SECTION A–A

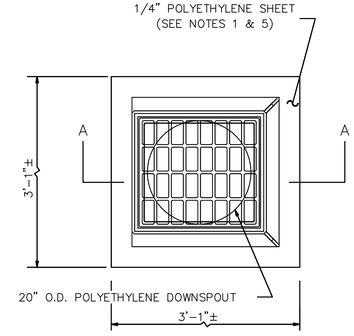
CATCH BASIN FRAME & GRATE (TYPE B)

SCALE: N.T.S.

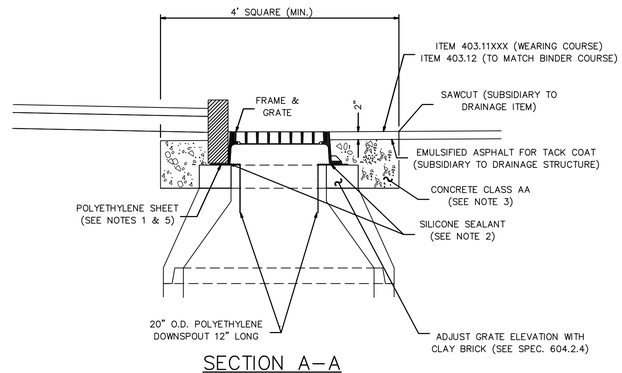
1. POLYETHYLENE LINER (ITEM 604.0007) SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
2. PLACE A CONTINUOUS BEAD OF AN APPROVED SILICONE SEALANT (SUBSIDIARY TO ITEM 604.0007) BETWEEN FRAME AND POLYETHYLENE SHEET.
3. PLACE CLASS AA CONCRETE TO 2" BELOW THE TOP OF THE GRATE ELEVATION (SUBSIDIARY TO DRAINAGE STRUCTURES)
4. USE ON DRAINAGE STRUCTURES 4' MIN. DIAMETER ONLY.
5. TRIM POLYETHYLENE SHEET A MAXIMUM OF 4" OUTSIDE THE FLANGE ON THE FRAME FOR THE CATCH BASIN BEFORE PLACING CONCRETE (EXCEPT AS SHOWN WHEN USED WITH 3–FLANGE FRAME AND CURB).
6. THE CENTER OF THE GRATE & FRAME MAY BE SHIFTED A MAXIMUM OF 6" FROM THE CENTER OF THE DOWNSPOUT IN ANY DIRECTION.
7. PLACED ONLY IN DRAINAGE STRUCTURES IN PAVEMENT.
8. SEE NHDOT DR–04, "DI–DB, UNDERDRAIN FLUSHING BASIN AND POLYETHYLENE LINER DETAILS", FOR ADDITIONAL INFORMATION.

POLYETHYLENE LINER NOTES

NOT TO SCALE



PLAN



SECTION A–A

POLYETHYLENE LINER

SCALE: N.T.S.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 – REGISTERED PROFESSIONAL ENGINEER

SCALE: HORZ.: NTS VERT.:
DATUM: HORZ.: VERT.:
0
GRAPHIC SCALE

FUSS & O'NEILL

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CATE STREET DEVELOPMENT, LLC

DRAINAGE DETAILS

CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CD-510

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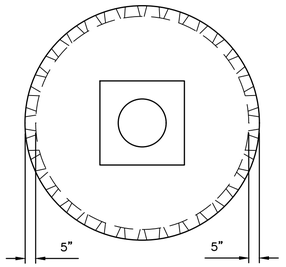
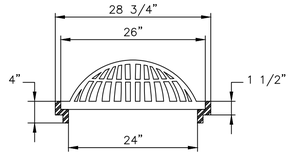


PLAN VIEW



ATRIUM TYPE GRATE
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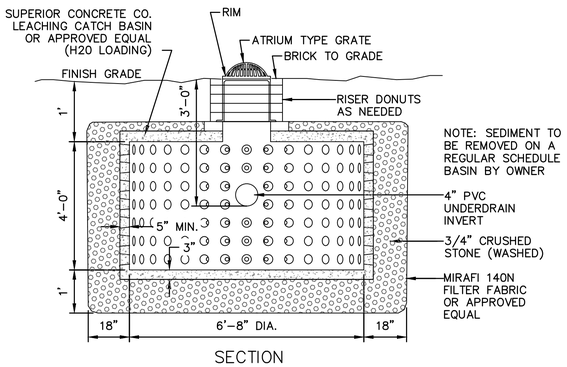
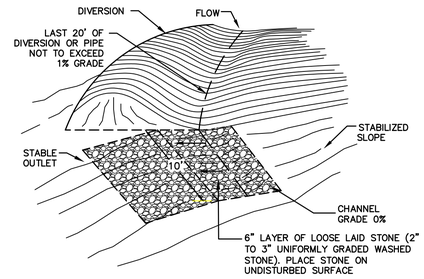


SECTION

LEACHING CATCH BASIN
N.T.S.



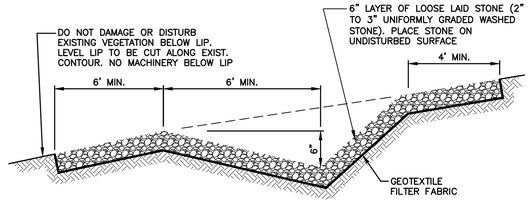
PLAN VIEW

CONSTRUCTION SPECIFICATIONS

1. SPREADERS SHALL BE INSTALLED WITH LEVEL INSTRUMENT, CONSTRUCT LEVEL LIP TO 0% GRADE TO ENSURE UNIFORM SHEET FLOW. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL (NOT FILL).
2. SELECT GEOTEXTILE FABRIC BASED ON UNDISTURBED SOILS (SAND, SILTS, CLAY, ETC.)
3. PLACE 6" LAYER OF UNIFORMLY GRADED STONE 2" TO 3" IN DIAMETER. TAKE TO FORM SMOOTH UNIFORM SURFACE. DO NOT FILL VOIDS IN STONE.
4. THE INLET DITCH SHALL NOT EXCEED A 1% GRADE FOR AT LEAST 20 FEET BEFORE ENTERING THE SPREADER.
5. STORM RUN-OFF CONVERTED TO SHEET FLOW ACROSS OUTLET APRON SHALL FLOW ONTO STABILIZED AREA. RUN-OFF SHALL NOT BE RECONCENTRATED IMMEDIATELY BELOW THE POINT OF DISCHARGE.
6. CONSTRUCTION OF LEVEL LIP SPREADER SHALL BE UPHILL SIDE ONLY. LEVEL LIP AND AREA BELOW SPREADER SHALL BE AT EXISTING GRADE AND UNDISTURBED BY EARTHWORK OR EQUIPMENT.
7. CONSTRUCT SPREADER WITH LIP AT EXISTING ELEVATION AS SPECIFIED.
8. DOWN GRADIENT RECEIVING AREA MUST BE NATURALLY WELL VEGETATED.

MAINTENANCE NOTES:

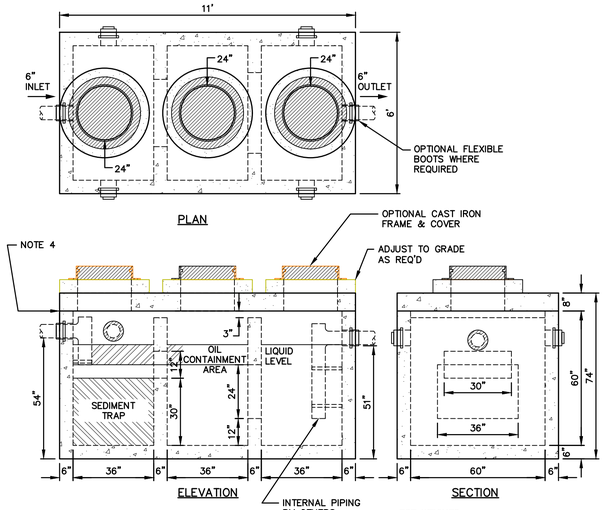
1. THE LEVEL SPREADER SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE IF THE LIP HAS BEEN DAMAGED AND TO DETERMINE THAT THE DESIGN CONDITIONS HAVE NOT CHANGED.
2. ANY DETRIMENTAL ACCUMULATION OF SEDIMENTS SHOULD BE REMOVED.
3. IF RILLING HAS TAKEN PLACE ON THE LIP, THEN THE DAMAGE SHOULD BE REPAIRED AND RE-VEGETATED.
4. THE VEGETATION SHOULD BE MOWED OCCASIONALLY TO CONTROL WEEDS AND THE ENCROACHMENT OF WOODY VEGETATION. CLIPPINGS SHOULD BE REMOVED AND DISPOSED OF OUTSIDE THE SPREADER AND AWAY FROM THE OUTLET AREA.



CROSS SECTION

STONE LINED LEVEL SPREADER

NOT TO SCALE



GENERAL NOTES

1. CONCRETE: FC = 5,000 PSI @ 28 DAYS MINIMUM TYPE III CEMENT
2. STEEL REINFORCEMENT CONFORMS TO LATEST ASTM SPECIFICATIONS: ASTM-A615 GRADE 60 BLACK DEFORMED BARS
3. DESIGN LOADING: AASHTO-HS20-44 DESIGN SPECIFIED AS ACI 318-08, AASHTO-1992
4. BUTYL RUBBER JOINT SEALANT PROVIDED
5. FLEXIBLE SLEEVES PROVIDED ALL PIPE CONNECTIONS
6. PIPE SIZES AND COMPARTMENT CONFIGURATIONS PER JOB SPECIFICATIONS

EST WEIGHTS:
TOP SLAB - 6,500 LBS
BASE - 20,500 LBS
TOTAL: 27,000 LBS

1,500 GALLON 3-COMPARTMENT HS-20 OIL & SEDIMENT SEPARATOR (PHOENIX PRECAST PRODUCTS)

NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER - RICHARD R LUNDBORN NO. 10943 LICENSED

SCALE: HORZ.: NTS VERT.:
DATUM: HORZ.: VERT.:
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DRAINAGE DETAILS

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PORTSMOUTH NEW HAMPSHIRE

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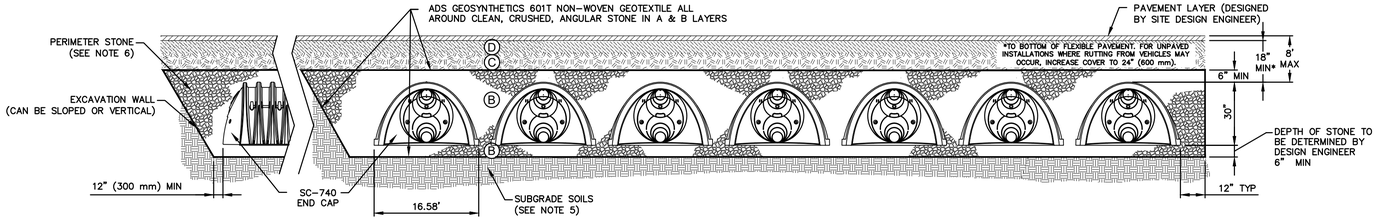
DATE: 08/19/2019

CD-511

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DESIGN REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2,3]

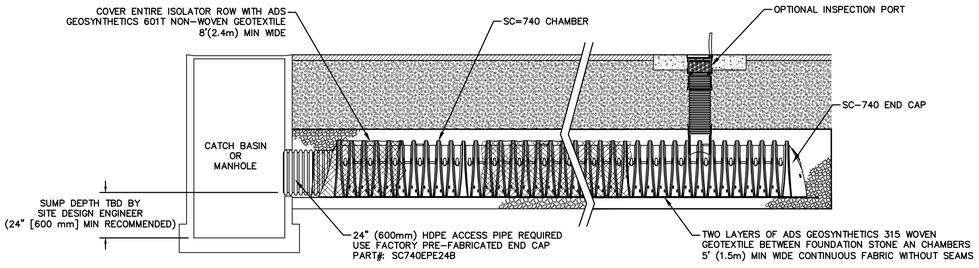
PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



SC-740 SECTION VIEW

NOTES:

1. SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
5. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
6. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
7. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



SC-740 ISOLATOR ROW DETAIL

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - II) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

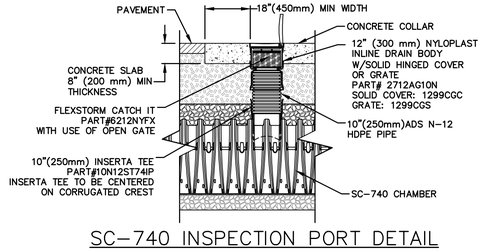
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

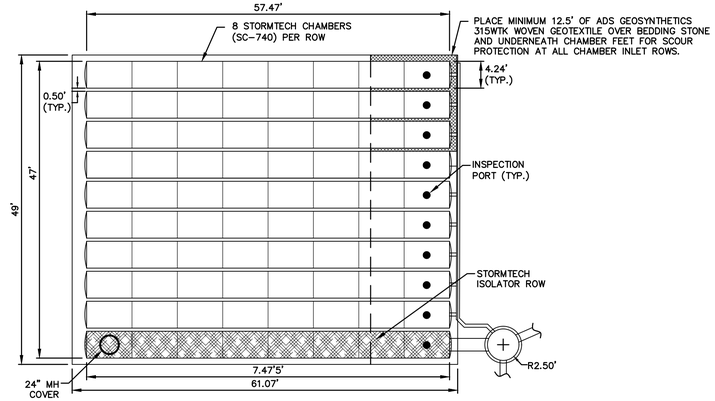
STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

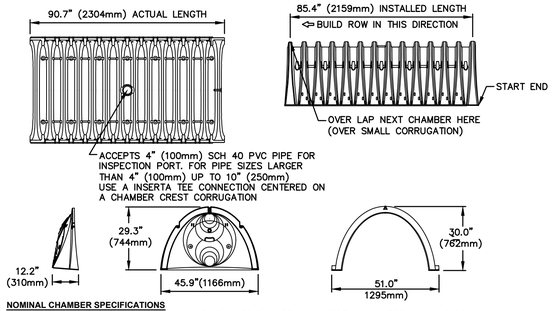


SC-740 INSPECTION PORT DETAIL



SC-740 PLAN VIEW

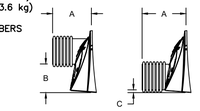
SC-740 TECHNICAL SPECIFICATON



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS



STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T / SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC			---	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC74OEPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R LUNDBORN No. 10843 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: NTS VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC

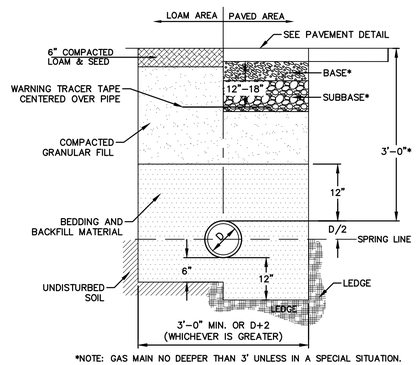
DRAINAGE DETAILS

CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

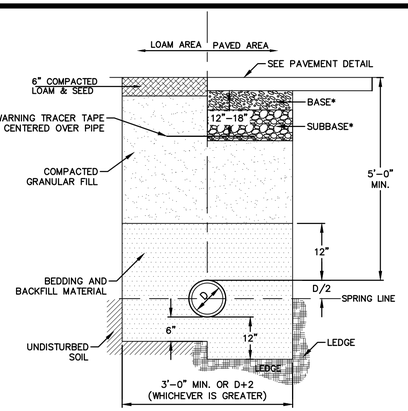
PROJ. No.: 20180317.A10
DATE: 08/19/2019

CD-512



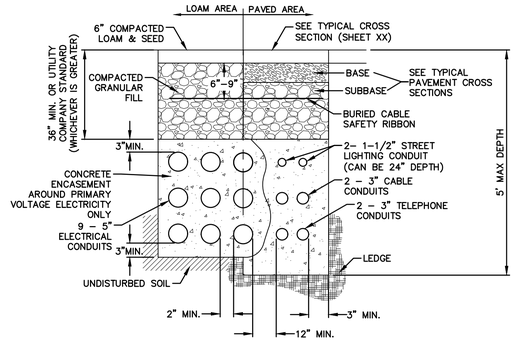
*NOTE: GAS MAIN NO DEEPER THAN 3' UNLESS IN A SPECIAL SITUATION.

GAS TRENCH
NOT TO SCALE



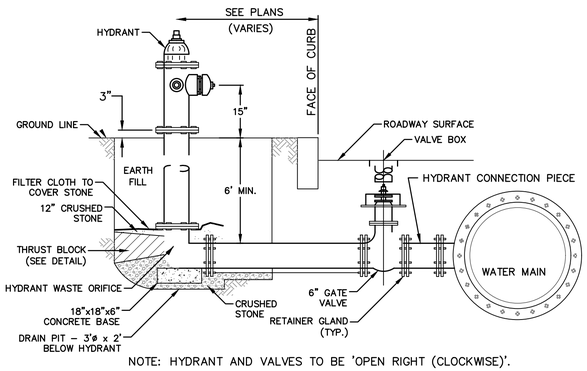
WATER TRENCH SECTION
NOT TO SCALE

NOTES:
1. WATER MAINS SHALL BE CONSTRUCTED USING CITY OF PORTSMOUTH STANDARDS.
2. ANY WATER LINES INSTALLED UNDER GUARD RAIL SHALL BE 3' DEEPER THAN POST DEPTH.



ELECTRICAL AND COMMUNICATION CONDUIT
NOT TO SCALE

1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL OR AS SHOWN ON CONDUIT PLAN.
2. DIMENSIONS SHOWN REPRESENTS OWNER'S MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT MAY NOT BE LESS THAN SHOWN.
3. NO CONDUIT SHALL EXCEED 360 DEGREES IN TOTAL BENDS.
4. A SUITABLE PULLING STRING, CAPABLE OF 200 POUNDS OF PULL MUST BE INSTALLED IN THE CONDUIT BEFORE UTILITY COMPANY 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.
5. UTILITY COMPANY MUST BE GIVEN THE OPPORTUNITY TO INSPECT THE CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD THE UTILITY COMPANY BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. 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.
7. ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 35" TO 48" RADIUS.?????



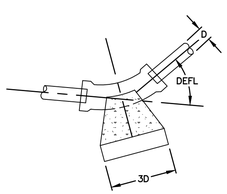
NOTE: HYDRANT AND VALVES TO BE 'OPEN RIGHT (CLOCKWISE)'.

FIRE HYDRANT
NOT TO SCALE

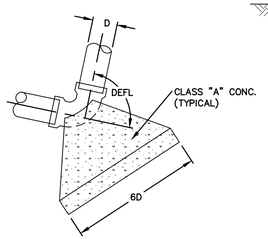
NOTE: HYDRANT INSTALLATION AND OPERATION, MANUFACTURE AND MODEL, AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT AND FIRE DEPARTMENT.

PPE DIA. (INCHES)	MINIMUM THRUST BLOCK VOLUME (CUBIC YARDS)
4	0.2
6	0.25
8	0.3
10	0.35
12	0.4
16	0.7

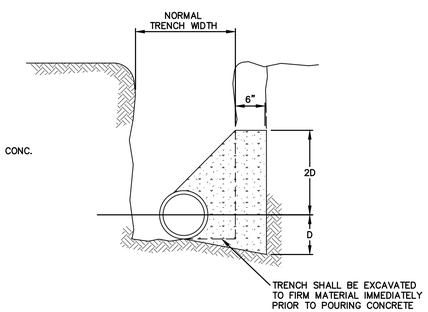
PPE DIA. (INCHES)	MINIMUM THRUST BLOCK VOLUME (CUBIC YARDS)
4	0.25
6	0.3
8	0.5
10	0.7
12	1.0
16	1.6



PLAN ELBOW – DEFL. LESS THAN 50



PLAN ELBOW – DEFL. MORE THAN 50



SECTION

CONCRETE THRUST BLOCKS
NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
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STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

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CATE STREET DEVELOPMENT, LLC

WATER & UTILITY DETAILS

CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

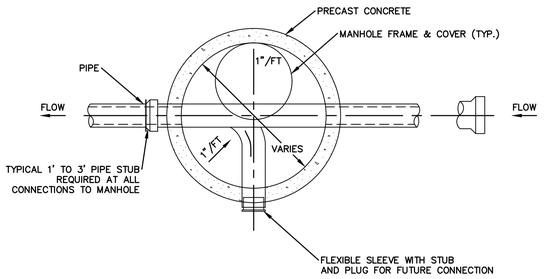
PROJ. No.: 20180317.A10
DATE: 08/19/2019

CD-520

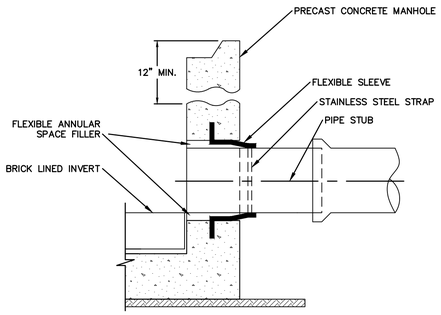
MANHOLE NOTES:

1. INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO ENSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICK SHALL BE LAID ON EDGE
4. BITUMINOUS WATERPROOF COATING TO BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
5. MANHOLE FRAME AND COVER SHALL BE JORDAN IRONWORKS HINGE COVER PER CITY OF PORTSMOUTH STANDARD.
6. HORIZONTAL JOINTS SHALL BE SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF ELASTOMERIC PR MASTIC-LIKE SEALANT.
7. BARREL AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE DESIGNED FOR H20 LOADING, AND CONFORMING TO ASTM C478-06.
8. INTERIOR OF SEWER MANHOLES SHALL BE LINED IN ACCORDANCE WITH SECTION 33 01 30.63.

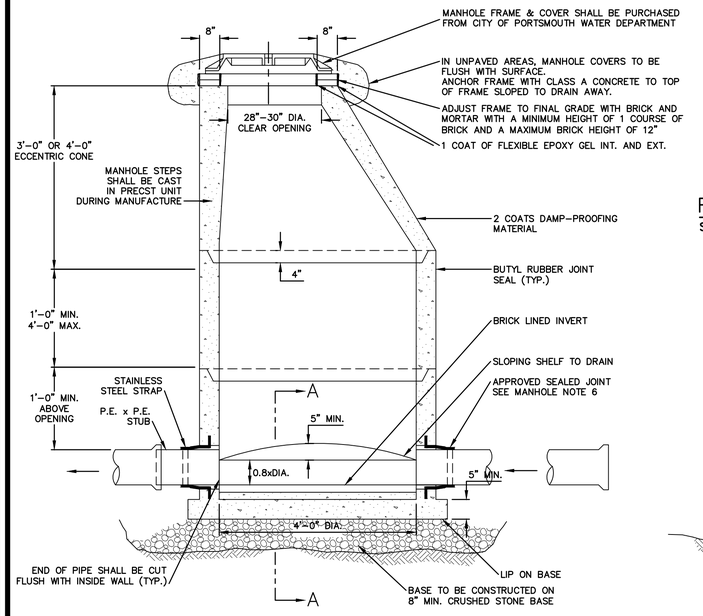
MANHOLE NOTES
SCALE: N.T.S.

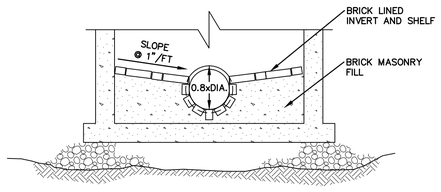


MANHOLE PLAN VIEW
SCALE: N.T.S.



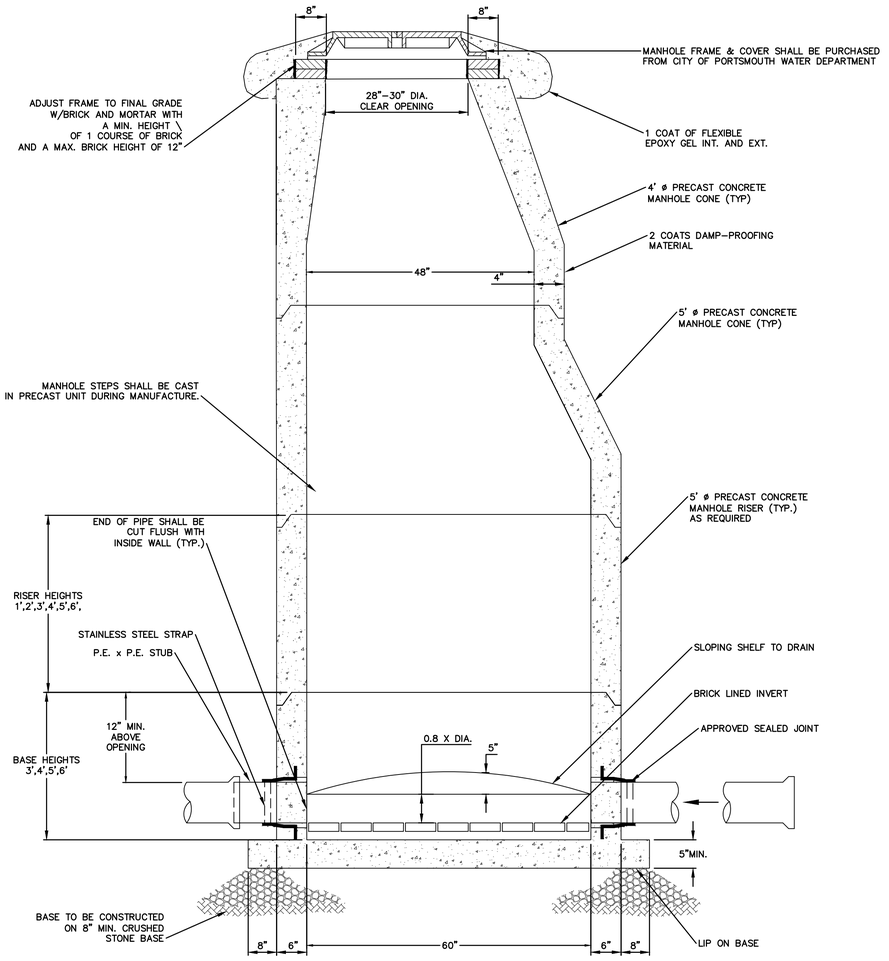
FLEXIBLE SLEEVE
SCALE: N.T.S.





SECTION A-A

4' PRECAST MANHOLE
SCALE: N.T.S.



5' PRECAST MANHOLE
SCALE: N.T.S.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER - RICHARD R. LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: NTS VERT.:
DATUM: HORZ.: VERT.:
0 GRAPHIC SCALE

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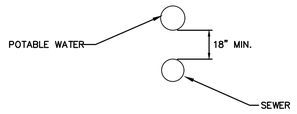
207.363.0669
www.fando.com

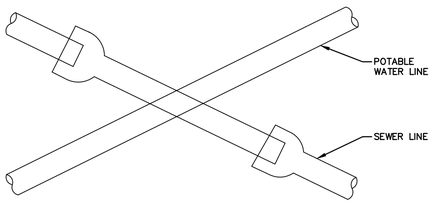
CATE STREET DEVELOPMENT, LLC
SEWER DETAILS
CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CD-530



SECTION VIEW

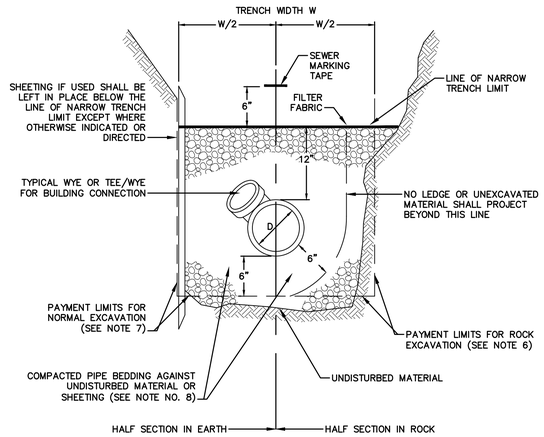


PLAN VIEW

SEWER AND WATER CROSSING NOTES

1. SEWER JOINTS SHALL BE EQUIDISTANT FROM AND LOCATED AS FAR AS POSSIBLE AWAY FROM THE WATER LINE
2. IF THE VERTICAL SEPARATION BETWEEN THE BOTTOM OF THE WATER MAIN AND THE TOP OF THE SEWER IS LESS THAN 18 INCHES (WATER MAIN IS ABOVE SEWER), USE ONE OF THE FOLLOWING PROCEDURES: A) THE WATER MAIN SHALL BE RECONSTRUCTED FOR A DISTANCE OF 10 FEET ON EACH SIDE OF SEWER WITH RUBBER-GASKETED MECHANICAL JOINT PIPE ONE FULL LENGTH WATER MAIN SHOULD BE CENTERED OVER SEWER, B) CONSTRUCT BOTH THE WATER & SEWER PIPE OF RUBBER-GASKETED, CEMENT-LINED DUCTILE IRON PIPE OR EQUIVALENT AND PRESSURE TEST BOTH PIPES, OR C) ENCASE BOTH PIPES IN CONCRETE.

CROSSING OF SEWER & POTABLE WATER LINES
NOT TO SCALE



TYPICAL SEWER TRENCH
NOT TO SCALE

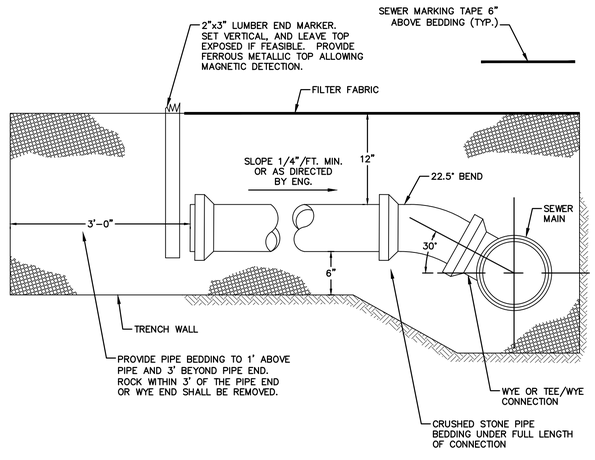
SANITARY SEWER PIPE TRENCH NOTES

1. DEPTH OF SEWER SHALL BE AS SHOWN ON DRAWINGS.
2. SEWER TRENCHES MAY BE EXCAVATED WIDER THAN TRENCH WIDTH W ABOVE THE "LINE OF NARROW TRENCH LIMIT." AT THE CONTRACTORS EXPENSE.
3. BELOW THE "LINE OF NARROW TRENCH LIMIT" THE TRENCH SHALL NOT BE EXCAVATED BEYOND THE TRENCH WIDTH W.
4. IF EXCAVATION AND BACKFILL BELOW NORMAL DEPTH IS REQUIRED, SHEETING MAY BE ORDERED.
5. SHEETING, IF USED, IN ALL CASES SHALL BE LEFT IN PLACE BELOW A LINE 1'-0" ABOVE THE TOP OF THE SEWER PIPE, UNLESS OTHERWISE INDICATED OR DIRECTED BY THE ENGINEER.
6. ALL ROCK WITHIN 3'-0" HORIZONTALLY OF THE ENDS OF BUILDING CONNECTIONS, BRANCHES AND STUBS, AND DOWN TO A HORIZONTAL PLANE 6" BELOW THE BOTTOMS OF SUCH ITEMS SHALL BE REMOVED.
7. TRENCH WIDTHS AND PAYMENT LIMIT SHALL BE AS FOLLOWS:

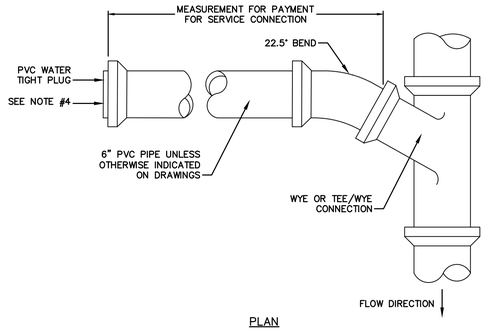
NUMBER OF PIPE IN TRENCH	DIAMETER PIPE "D"	TRENCH WIDTH "W"	PAYMENT LIMIT
ONE	12" AND SMALLER	4'-0"	4'-0"
TWO	12" AND SMALLER	7'-0"	7'-0"

8. WHERE CONCRETE ENCASEMENT IS CALLED FOR BY THE PLANS, OR WHEN DIRECTED BY THE ENGINEER, REPLACE BEDDING AND BACKFILL BELOW THE "LINE OF NARROW TRENCH LIMIT" WITH CLASS "A" CONCRETE.
9. SEWER MARKING TAPE SHALL BE INSTALLED A MINIMUM OF 18" ABOVE THE SANITARY SEWER, FORCE MAIN AND SERVICE CONNECTION PIPE.
10. SANITARY SEWER PIPE AND SERVICE CONNECTION PIPE SHALL HAVE FILTER FABRIC INSTALLED ON TOP OF THE PIPE BEDDING AS SHOWN ON THE DETAILS.

SANITARY SEWER PIPE TRENCH NOTES
SCALE: N.T.S.



ELEVATION

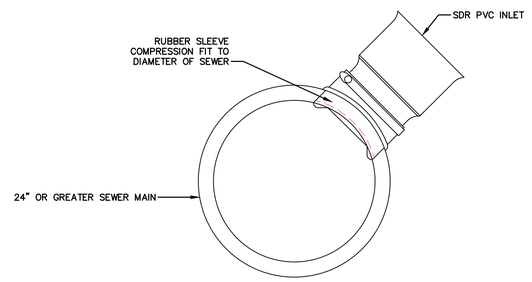


PLAN

SERVICE CONNECTION NOTES

1. NO LEDGE OR UNEXCAVATED MATERIAL SHALL PROJECT WITHIN 6" OF THE PIPE IN ANY DIRECTION
2. EXACT LOCATION AND ELEVATION OF SERVICE CONNECTIONS TO BE DETERMINED AND SET IN THE FIELD DURING CONSTRUCTION
3. EXACT LOCATION OF WYES/TEES, WHERE DIRECTED TO BE INSTALLED, SHALL BE SET IN THE FIELD DURING CONSTRUCTION
4. PROVIDE DI TO PVC TRANSITION COUPLING AT END OF DI SERVICE CONNECTION

SERVICE CONNECTIONS
NOT TO SCALE



INSERTA TEE – SERVICE CONNECTION 24" MAIN & LARGER
N.T.S.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: NTS VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

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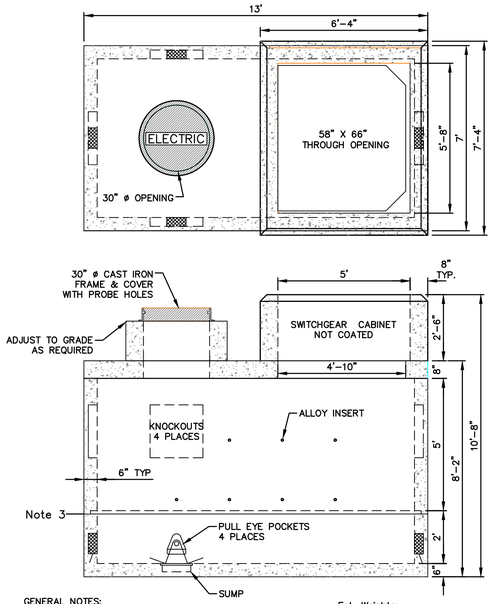
CATE STREET DEVELOPMENT, LLC
SEWER DETAILS
CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

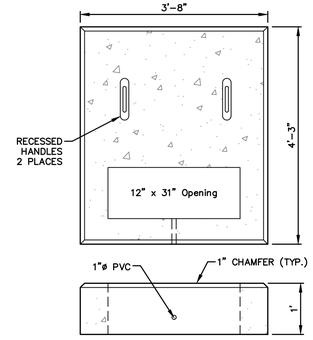
CD-531



GENERAL NOTES:
1. STEEL REINFORCEMENT CONFORMS TO LATEST ASTM SPECIFICATIONS: ASTM-A615 GRADE 60 REBAR
2. CONCRETE: FC = 5,000 PSI @ 28 DAYS MINIMUM
3. BUTYL RUBBER JOINT SEALANT PROVIDED
4. DESIGN LOADING: AASHTO-HS20-44, ASTM C-890-06
5. DESIGN SPECIFIED AS: ASTM C-1227-08, ASTM C-913-08
6. EXTERIOR COATING PROVIDED EXCEPT SWITCHGEAR CABINET
7. MEETS OR EXCEEDS PSNH DWG # R-10001-2 REV 1

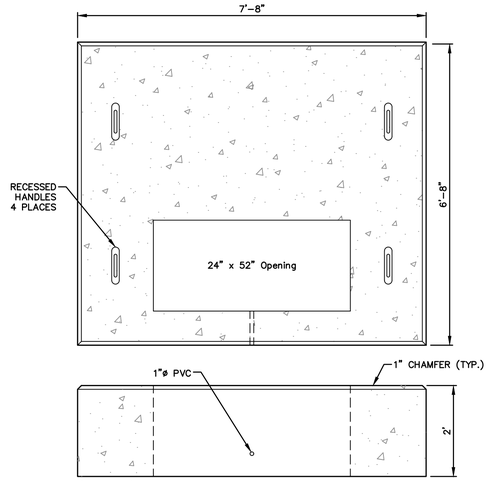
Est. Weights:	
Top Slab:	5,600 Lbs
Riser:	14,080 Lbs
Switchgear Cabinet:	6,750 Lbs
Base:	12,450 Lbs
Total:	32,130 Lbs

EVERSOURCE SWITCHGEAR CABINET ASSEMBLY
NOT TO SCALE



General Notes
1.) Reinforcement Steel Conforms To ASTM A615 Grade 60 #6 Rebar
2.) Concrete: fc = 4,000 psi @ 28 Days Minimum
3.) Meets or Exceeds PSNH Specifications
4.) Est. Weight: 1,950 Lbs

SINGLE-PHASE TRANSFORMER PAD
NOT TO SCALE 25-75 KVA

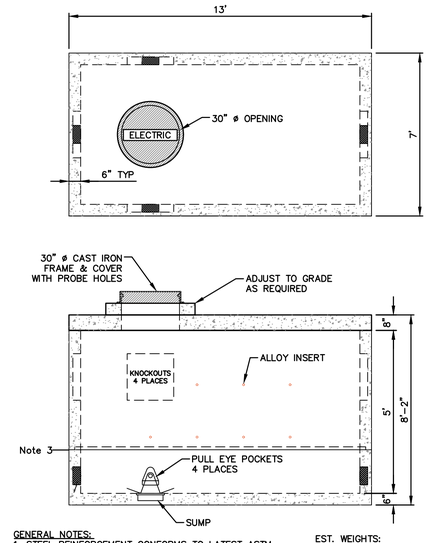


General Notes
1.) Reinforcement Steel Conforms To ASTM A615 Grade 60 #6 Rebar
2.) Concrete: fc = 4,500 psi @ 28 Days Minimum
3.) Meets or Exceeds PSNH Specifications
4.) Est. Weight: 12,600 Lbs

3 PHASE TRANSFORMER PAD
NOT TO SCALE 75-500 KVA

NOTES:
1. ALL PRECAST CONCRETE STRUCTURES TO BE PHOENIX PRECAST PRODUCTS OR EQUAL.

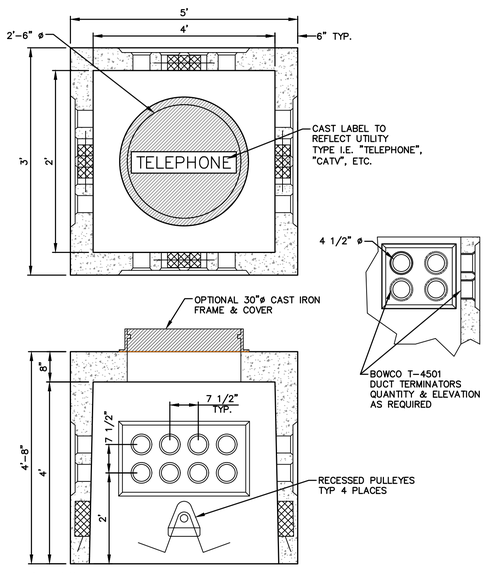
PHOENIX PRECAST PRODUCTS
77 REGIONAL DRIVE
CONCORD, NH 03301
1.800.639.2199
info@phoenixprecast.com



GENERAL NOTES:
1. STEEL REINFORCEMENT CONFORMS TO LATEST ASTM SPECIFICATIONS: ASTM-A615 GRADE 60 REBAR
2. CONCRETE: FC = 5,000 PSI @ 28 DAYS MINIMUM
3. BUTYL RUBBER JOINT SEALANT PROVIDED
4. DESIGN LOADING: AASHTO-HS20-44, ASTM C-890-06
5. DESIGN SPECIFIED AS: ASTM C-1227-08, ASTM C-913-08
6. EXTERIOR COATING PROVIDED
7. MEETS OR EXCEEDS PSNH DWG # R-10001-1

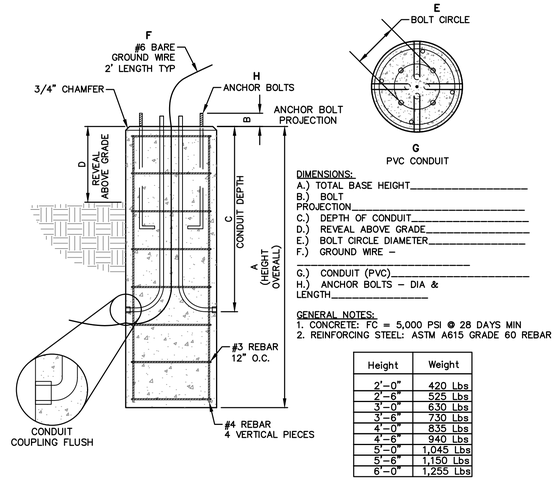
EST. WEIGHTS:	
Top Slab:	8,500 Lbs
Riser:	13,300 Lbs
Base:	12,100 Lbs
Total:	33,900 Lbs

EVERSOURCE MANHOLE ASSEMBLY
NOT TO SCALE



General Notes
1. Concrete: fc = 5,000 psi @ 28 Days Minimum
2. Reinforcing Steel: ASTM-A615 Grade #60
3. Design Loading: AASHTO-HS20-44

4'x4'x4' HANDHOLE
NOT TO SCALE



DIMENSIONS:
A.) TOTAL BASE HEIGHT_____
B.) BOLT PROJECTION_____
C.) DEPTH OF CONDUIT_____
D.) REVEAL ABOVE GRADE_____
E.) BOLT CIRCLE DIAMETER_____
F.) GROUND WIRE – _____
G.) CONDUIT (PVC)_____
H.) ANCHOR BOLTS – DIA & LENGTH_____

GENERAL NOTES:
1. CONCRETE: FC = 5,000 PSI @ 28 DAYS MIN
2. REINFORCING STEEL: ASTM A615 GRADE 60 REBAR

Height	Weight
2'-0"	420 Lbs
2'-6"	525 Lbs
3'-0"	630 Lbs
3'-6"	730 Lbs
4'-0"	835 Lbs
4'-6"	940 Lbs
5'-0"	1,045 Lbs
5'-6"	1,150 Lbs
6'-0"	1,255 Lbs

16" ø LIGHT POLE BASE
NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10843 LICENSED

SCALE: HORZ.: NTS VERT.:
DATUM: HORZ.: VERT.:
0 GRAPHIC SCALE

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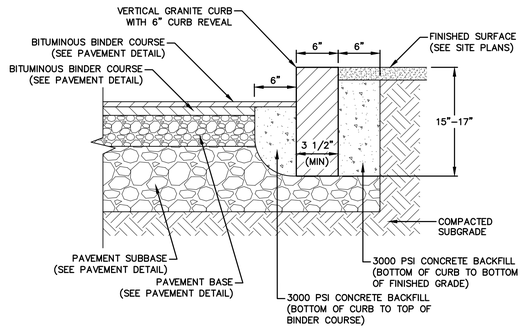
CATE STREET DEVELOPMENT, LLC

UTILITY DETAILS

CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

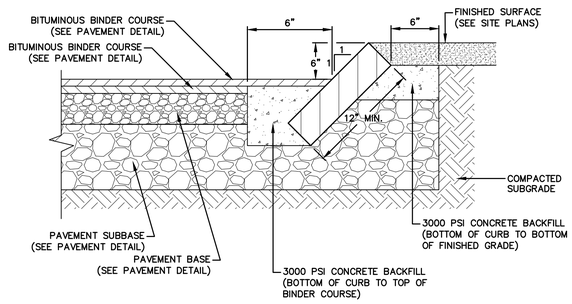
PROJ. No.: 20180317.A10
DATE: 08/19/2019

CD-540



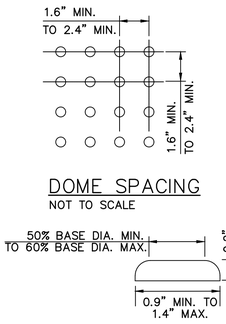
VERTICAL GRANITE CURB INSTALLED

SCALE: NOT TO SCALE



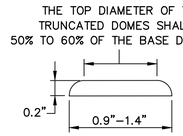
SLOPED GRANITE CURB INSTALLED

SCALE: NOT TO SCALE

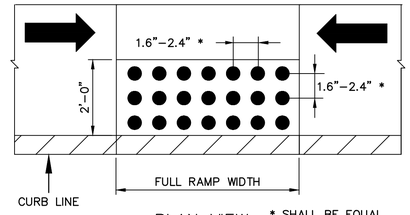


DOME SPACING

NOT TO SCALE

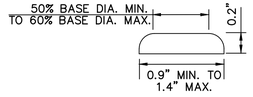


ELEVATION VIEW



PLAN VIEW

* SHALL BE EQUAL IN BOTH DIRECTIONS



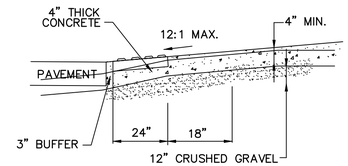
DOME SECTION

NOT TO SCALE

NOTE:
TRUNCATED DOMES SHALL BE CAST IRON. CONFIGURATION SHALL BE APPROVED BY DEPARTMENT OF PUBLIC WORKS.

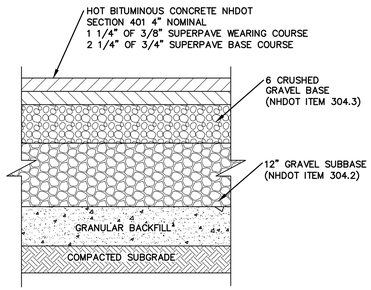
DOME AND DETECTABLE WARNING DETAILS

NOT TO SCALE — TO BE INSTALLED AT ADA WALKWAY TIPDOWNS.



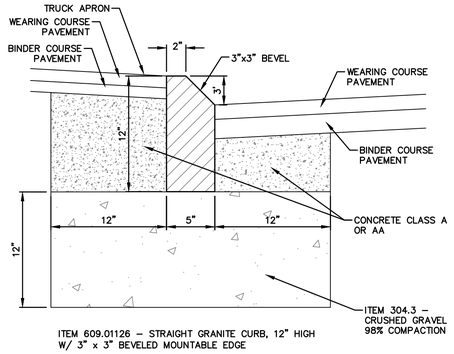
SECTION A–A

NOT TO SCALE



TYPICAL SITE PAVEMENT SECTION

SCALE: NOT TO SCALE

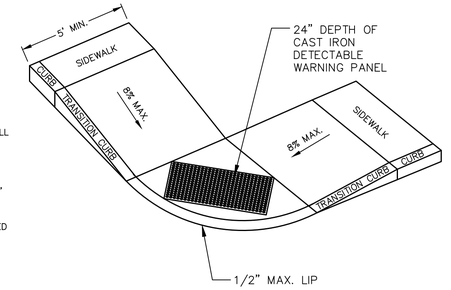


ITEM 609.01126 – STRAIGHT GRANITE CURB, 12" HIGH W/ 3" x 3" BEVELED MOUNTABLE EDGE

MOUNTABLE GRANITE CURB INSTALLED

NOT TO SCALE

NOTES:
1. MAXIMUM ALLOWABLE ROUTE (SIDEWALK) AND CURB RAMP CROSS SLOPE SHALL BE 1.5%.
2. MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE CURB RAMPS SHALL BE 8%.
4. MINIMUM OF 4' CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E. HYDRANTS, UTILITY POLES, TREE WELL, SIGNS, ETC.)
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. BASE OF RAMP SHALL BE GRADED TO PREVENT POUNDING.
7. SEE CONCRETE SIDEWALK DETAIL FOR RAMP CONSTRUCTION.

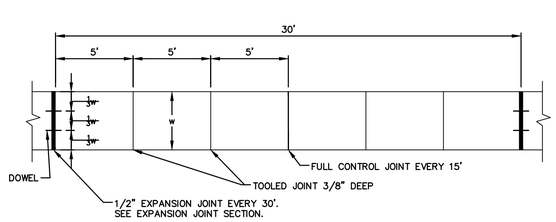


NOTE:

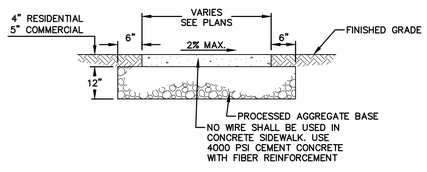
INSTALL DETECTABLE WARNING PANEL ON ALL ACCESSIBLE CURB RAMPS.

ACCESSIBLE CURB RAMP–TYPE C

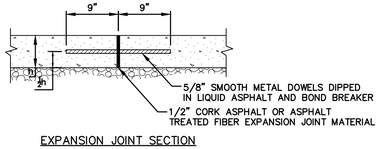
NOT TO SCALE



PLAN



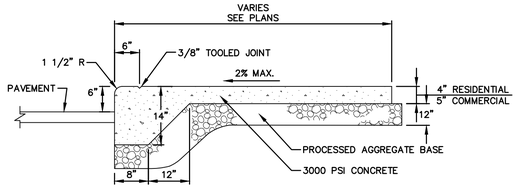
SIDEWALK SECTION



EXPANSION JOINT SECTION

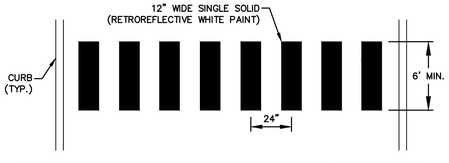
CONCRETE SIDEWALK

SCALE: NOT TO SCALE



MONOLITHIC CONCRETE CURB AND WALK

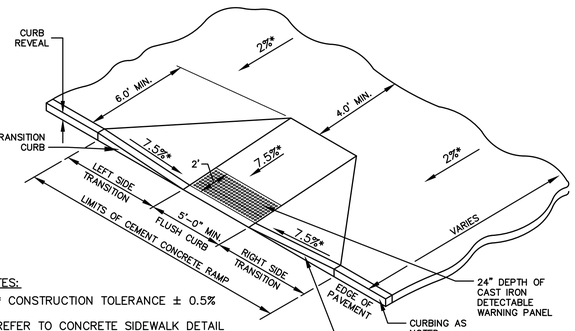
NOT TO SCALE



NOTE: EXISTING CROSSWALK MARKING SHALL BE OBLITERATED IN ACCORDANCE WITH SECTION 632/3.6 'OBLITERATION OF PAVEMENT MARKING' OF NHDOT STANDARD SPECIFICATIONS AND SHALL BE CONSIDERED SUBSIDIARY.

CROSS–WALK MARKING DETAIL

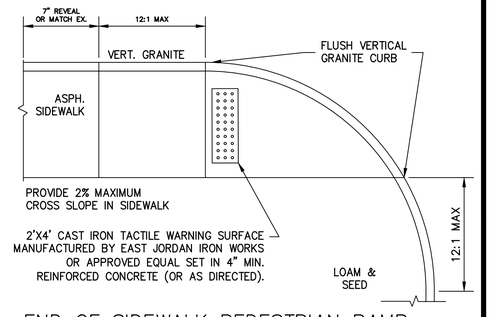
NOT TO SCALE



NOTES:
– * CONSTRUCTION TOLERANCE ± 0.5%
– REFER TO CONCRETE SIDEWALK DETAIL FOR REINFORCEMENT & JOINT DETAILS.

SIDEWALK RAMP D

NOT TO SCALE



END OF SIDEWALK PEDESTRIAN RAMP

NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10843 LICENSED

SCALE: HORZ.: NTS VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC

SITE DETAILS

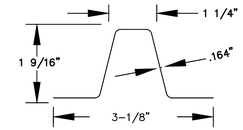
CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

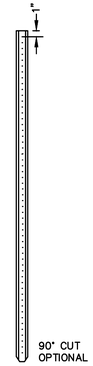
CD-550

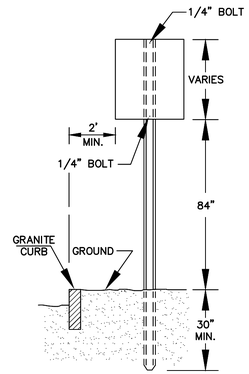
CP	IDENT#	SIZE OF SIGN		TEXT	TEXT DIMENSIONS			SHIELD SIZE (INCH)	AROW (INCH)	NUMERAL (INCH)	# SIGNS REQ'D	SIGN AREA (SQ. FT.)		POSTS PER SIGN					REMARKS
		WIDTH (INCHES)	HEIGHT (INCHES)		LETTER HEIGHT (INCH)									BREAKAWAY	STEEL BEAM	CONCRETE BASE	4" OD ALUMINUM	U-CHANNEL GALV	
					UC	LC	CAPS					NOM AREA	TOTAL AREA						
	R1-1	30	30	STOP			10C				14	6.25	12.50				14		RED/WHITE
	W8-1	30	30	BUMP							1	6.25	6.25				1		BLACK/RED/ YELLOW

LENGTH: P-12, 12'-0"; P-14, 14'-0"; P-16, 16'-0".
WEIGHT PER LINEAR FOOT: 2.50 LBS. (MIN.)
HOLES: 3/8" DIA. 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070-1080).
FINISH: SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN, BAKED ON OR AIR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.



DIMENSIONS SHOWN ARE NOMINAL
ALTERNATE SECTIONS MUST BE APPROVED PRIOR
ALTERNATE SECTIONS MUST BE APPROVED PRIOR TO USE.





NOTES
1. POSTS SHALL BE PLUMB; ANY POST BENT OR OTHERWISE DAMAGED SHALL BE REMOVED AND PROPERLY REPLACED.
2. POSTS MAY BE SET OF DRIVEN. WHEN POSTS ARE SET, HOLES SHALL BE DUG TO THE PROPER DEPTH; AFTER INSERTING POSTS, THE HOLES SHALL BE BACK FILLED WITH SUITABLE MATERIAL IN LAYERS NOT TO EXCEED A 6" DEPTH, THOROUGHLY COMPACTED.
3. CARE SHALL BE TAKEN TO PRESERVE THE ALIGNMENT OF THE POST. WHEN POSTS ARE DRIVEN, A SUITABLE DRIVING CAP SHALL BE USED AND AFTER DRIVING THE TOP OF THE POST SHALL HAVE SUBSTANTIALLY THE SAME CROSS-SECTIONAL DIMENSION AS THE BODY OF THE POST; BATTERED HEADS WILL NOT BE ACCEPTED.
4. POSTS SHALL NOT BE DRIVEN WITH THE SIGN ATTACHED TO THE POST.
5. SIGNS SHALL BE ERECTED IN CONFORMANCE WITH THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
6. WHEN SIGN IS IN PLACE NO PART OF POST SHALL EXTEND ABOVE THE SIGN.

SIGN POST
NOT TO SCALE

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2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER - RICHARD R LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: NTS VERT.:
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GRAPHIC SCALE

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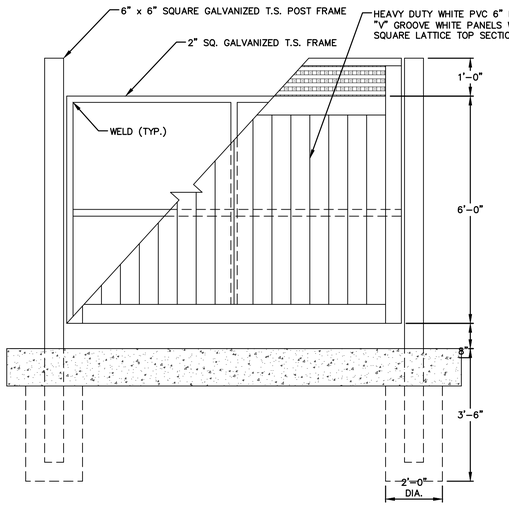
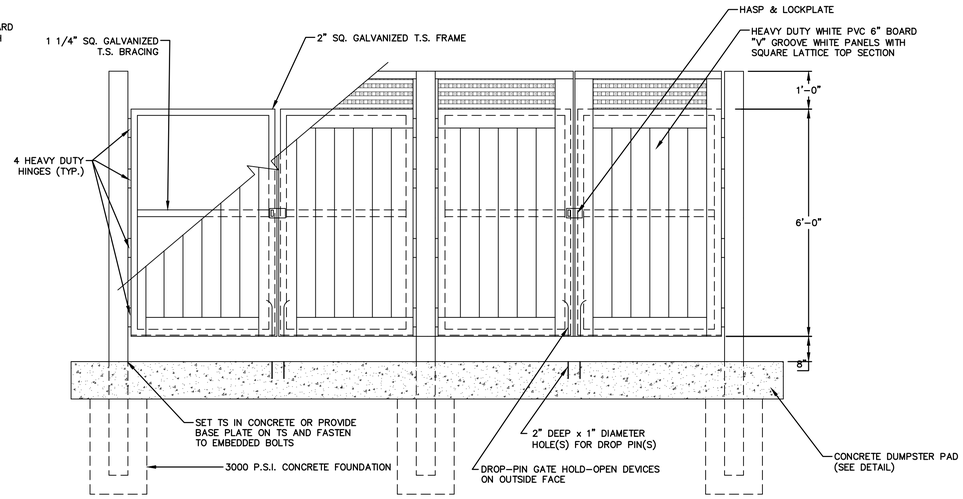
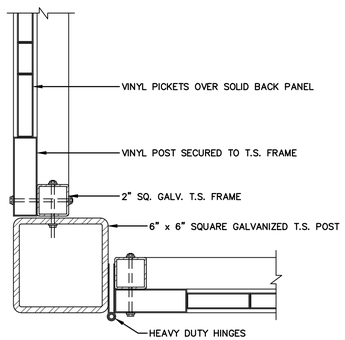
CD-551



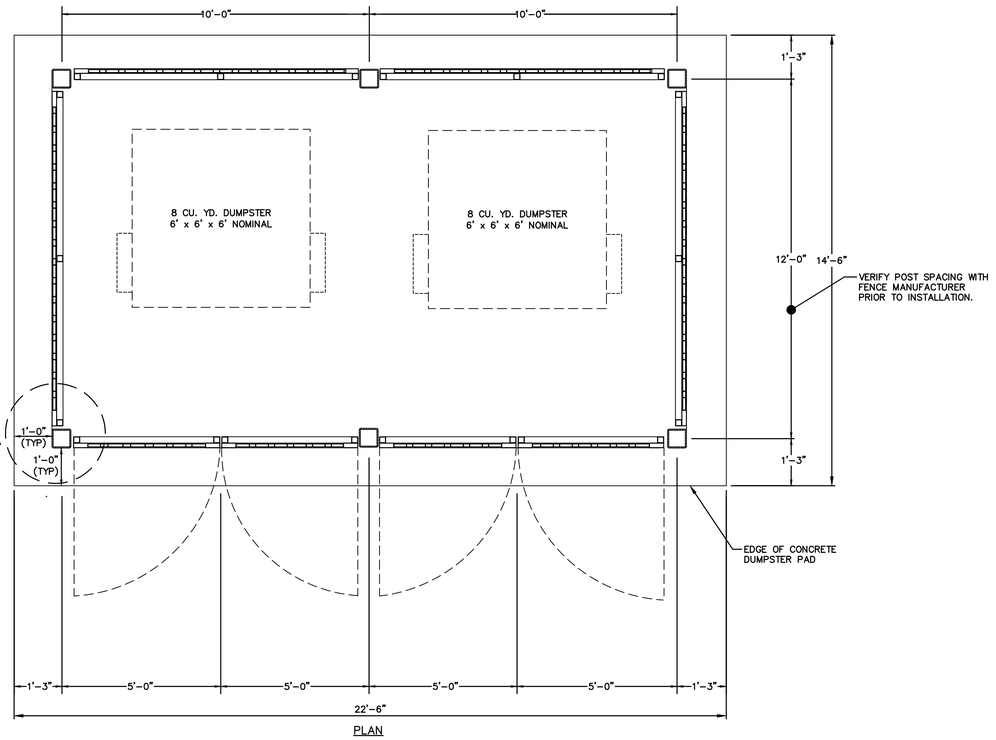
SIDE ELEVATION



FRONT ELEVATION



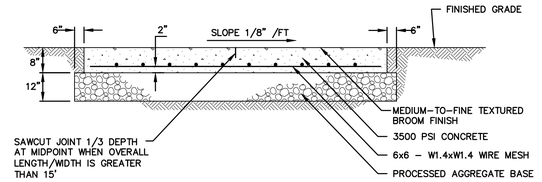
DETAIL A



PLAN

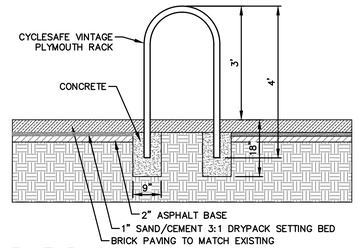
DOUBLE DUMPSTER ENCLOSURE

SCALE: N.T.S.



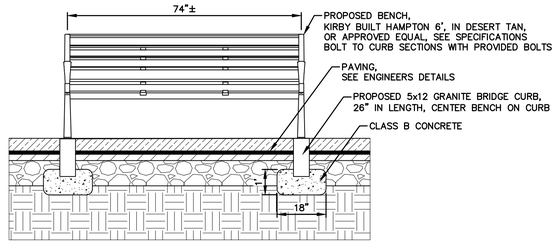
CONCRETE DUMPSTER PAD

NOT TO SCALE



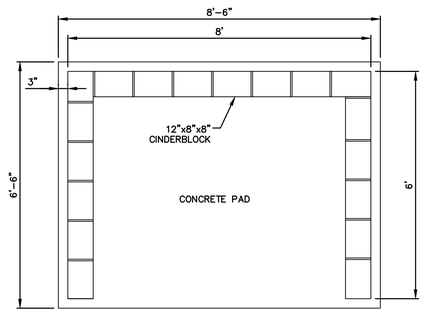
BIKE RACK

NOT TO SCALE

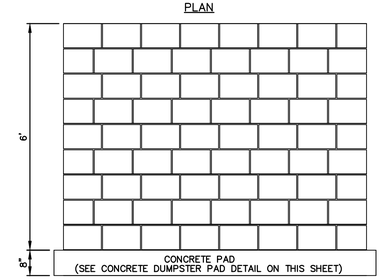


BENCH

NOT TO SCALE



PLAN



NOTE: MORTAR JOINTS ARE 3/8", BUT CAN VARY 1/4" TO 1/2". JOINTS ARE FINISHED USING A TOOL OR TROWEL.

ELEVATION

GAS METER ENCLOSURE

NOT TO SCALE

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2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10843 LICENSED

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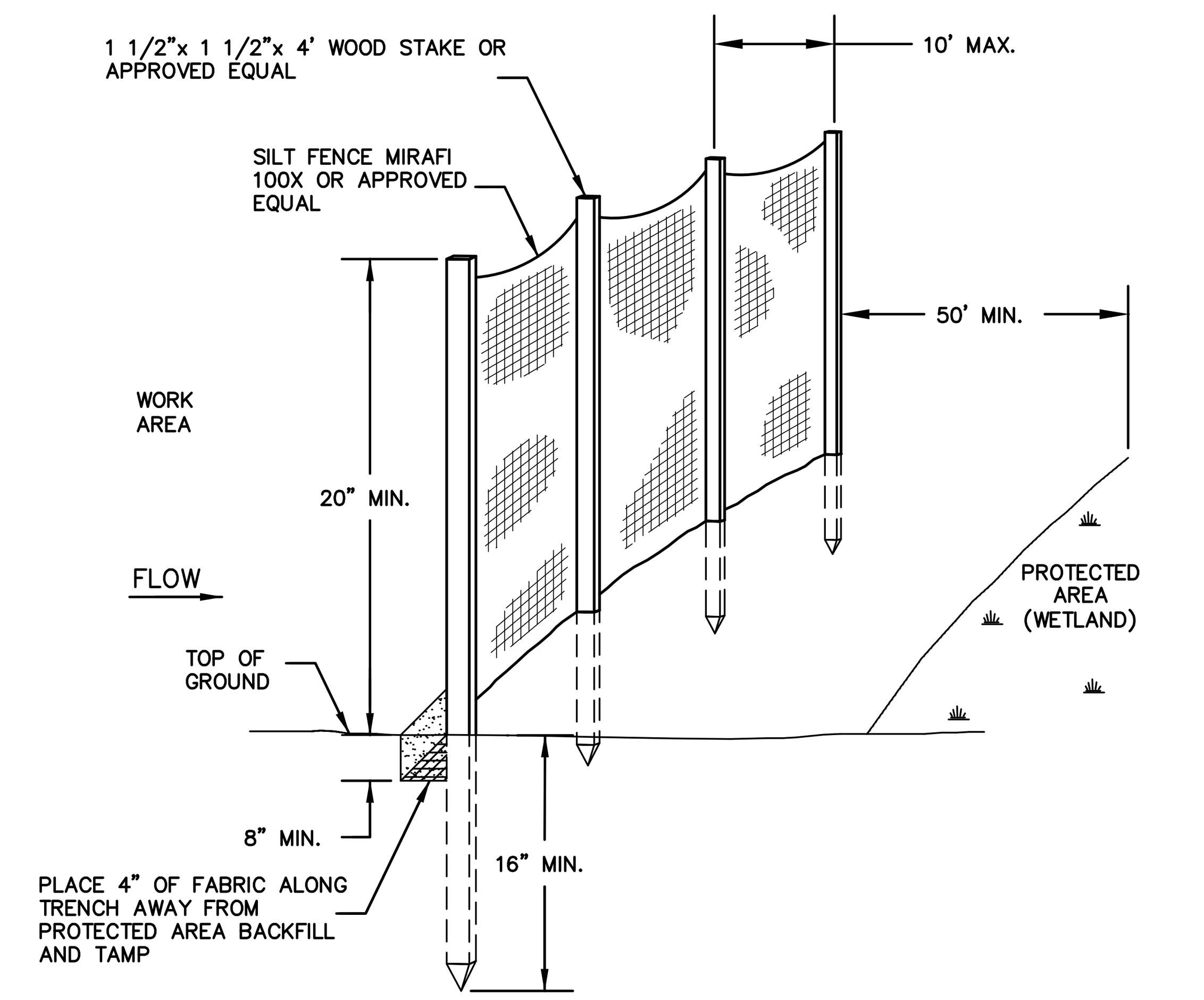


MAINTENANCE REQUIREMENTS:

1. FENCES SHOULD BE INSPECTED AND MAINTAINED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALLS;

2. SEDIMENT DEPOSITION SHOULD BE REMOVED, AT A MINIMUM, WHEN DEPOSITION ACCUMULATES TO ONE-HALF THE HEIGHT OF THE FENCE, AND MOVED TO AN APPROPRIATE LOCATION SO THE SEDIMENT IS NOT READILY TRANSPORTED BACK TOWARD THE SILT FENCE.

3. SILT FENCES SHOULD BE REPAIRED IMMEDIATELY IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THEM. IF THERE ARE SIGNS OF UNDERCUTTING AT THE CENTER OR THE EDGES OF THE BARRIER, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THEM, SEDIMENT BARRIERS SHOULD BE REPLACED WITH A TEMPORARY CHECK DAM.

4. SHOULD THE FABRIC ON A SILT FENCE DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY; THE FABRIC SHOULD BE REPLACED PROMPTLY.

5. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHOULD BE DRESSED TO CONFORM TO THE EXISTING GRADE PREPARED AND SEEDED.

6. IF THERE IS EVIDENCE OF END FLOW ON PROPERLY INSTALLED BARRIERS, EXTEND BARRIERS UPHILL OR CONSIDER REPLACING THEM WITH OTHER MEASURES, SUCH AS TEMPORARY DIVERSIONS AND SEDIMENT TRAPS.

7. SILT FENCES HAVE A USEFUL LIFE OF ONE SEASON. ON LONGER CONSTRUCTION PROJECTS, SILT FENCE SHOULD BE REPAIRED PERIODICALLY AS REQUIRED TO MAINTAIN EFFECTIVENESS.

CONSTRUCTION SPECIFICATIONS:

1. FENCES SHOULD BE USED IN AREAS WHERE EROSION WILL OCCUR ONLY IN THE FORM OF SHEET EROSION AND THERE IS NO CONCENTRATION OF WATER IN A CHANNEL OR DRAINAGE WAY ABOVE THE FENCE. SEDIMENT BARRIERS SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM.

2. THE MAXIMUM CONTRIBUTING DRAINAGE AREA ABOVE THE FENCE SHOULD BE LESS THAN 1A ACRE PER 100 LINEAR FEET OF FENCE;

3. THE MAXIMUM LENGTH OF SLOPE ABOVE THE FENCE SHOULD BE 100 FEET;

4. THE MAXIMUM SLOPE ABOVE THE FENCE SHOULD BE 2:1;

5. FENCES SHOULD BE INSTALLED FOLLOWING THE CONTOUR OF THE LAND AS CLOSELY AS POSSIBLE, AND
   A. THE ENDS OF THE FENCE SHOULD BE FLARED UPSLOPE;
   B. THE FABRIC SHOULD BE EMBEDDED A MINIMUM OF 8 INCHES IN DEPTH AND 4 INCHES IN WIDTH IN A TRENCH EXCAVATED INTO THE GROUND, OR IF SITE CONDITIONS INCLUDE FROZEN GROUND, LEDGE, OR THE PRESENCE OF HEAVY ROOTS, THE BASE OF THE FABRIC SHOULD BE EMBEDDED WITH A MINIMUM THICKNESS OF 8 INCHES OF 3/4-INCH STONE;
   C. THE SOIL SHOULD BE COMPACTED OVER THE EMBEDDED FABRIC;
   D. SUPPORT POSTS SHOULD BE SIZED AND ANCHORED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS WITH MAXIMUM POST SPACING OF 6 FEET;
   E. ADJOINING SECTIONS OF THE FENCE SHOULD BE OVERLAPPED BY A MINIMUM OF 6 INCHES (24 INCHES IS PREFERRED), FOLDED AND STAPLED TO A SUPPORT POST. IF METAL POSTS ARE USED, FABRIC SHOULD BE WIRE-TIED DIRECTLY TO THE POSTS WITH THREE DIAGONAL TIES.

6. SILT FENCING SHOULD NOT BE STAPLED OR NAILED TO TREES.

7. THE FILTER FABRIC SHOULD BE A PERVIOUS SHEET OF PROPYLENE, NYLON, POLYESTER OR ETHYLENE YARN AND SHOULD BE CERTIFIED BY THE MANUFACTURER OR SUPPLIER.

8. THE FILTER FABRIC SHOULD CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 6 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 DEGREES FAHRENHEIT TO 120 DEGREES FAHRENHEIT.

9. POSTS FOR SILT FENCES SHOULD BE EITHER 4-INCH DIAMETER WOOD OR 1.33 POUNDS PER LINEAR FOOT STEEL WITH A MINIMUM LENGTH OF 5 FEET. STEEL POSTS SHOULD HAVE, PROJECTIONS FOR FASTENING WIRE TO THEM. POSTS SHOULD BE PLACED ON THE DOWN SLOPE SIDE OF THE FABRIC.

10. THE HEIGHT OF A SILT FENCE SHOULD NOT EXCEED 36 INCHES AS HIGHER FENCES MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE.

11. THE FILTER FABRIC SHOULD BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE NECESSARY; FILTER CLOTH SHOULD BE SPLICED TOGETHER ONLY AT SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED.

12. A MANUFACTURED SILT FENCE SYSTEM WITH INTEGRAL POSTS MAY BE USED.

13. POST SPACING SHOULD NOT EXCEED 6 FEET.

14. A TRENCH SHOULD BE EXCAVATED APPROXIMATELY 4 INCHES WIDE AND 4 INCHES DEEP ALONG THE LINE OF POSTS AND UP GRADIENT FROM THE BARRIER.

15. THE STANDARD STRENGTH OF FILTER FABRIC SHOULD BE STAPLED OR WIRED TO THE POST, AND 8 INCHES OF THE FABRIC SHOULD BE EXTENDED INTO THE TRENCH. THE FABRIC SHOULD NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.

16. THE TRENCH SHOULD BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.

17. SILT FENCE MAY BE INSTALLED BY "SLICING" USING MECHANICAL EQUIPMENT SPECIFICALLY DESIGNED FOR THIS PROCEDURE. THE SLICING METHOD USES AN IMPLEMENT TOWED BEHIND A TRACTOR TO "PLOW" OR SLICE THE SILT FENCE MATERIAL INTO THE SOIL. THE SLICING METHOD MINIMALLY DISRUPTS THE SOIL UPWARD AND SLIGHTLY DISPLACES THE SOIL, MAINTAINING THE SOIL'S PROFILE AND CREATING AN OPTIMAL CONDITION FOR SUBSEQUENT MECHANICAL COMPACTION.

18. SILT FENCES SHOULD BE INSTALLED WITH "SMILES" OR "J-HOOKS" TO REDUCE THE DRAINAGE AREA THAT ANY SEGMENT WILL IMPOUND.

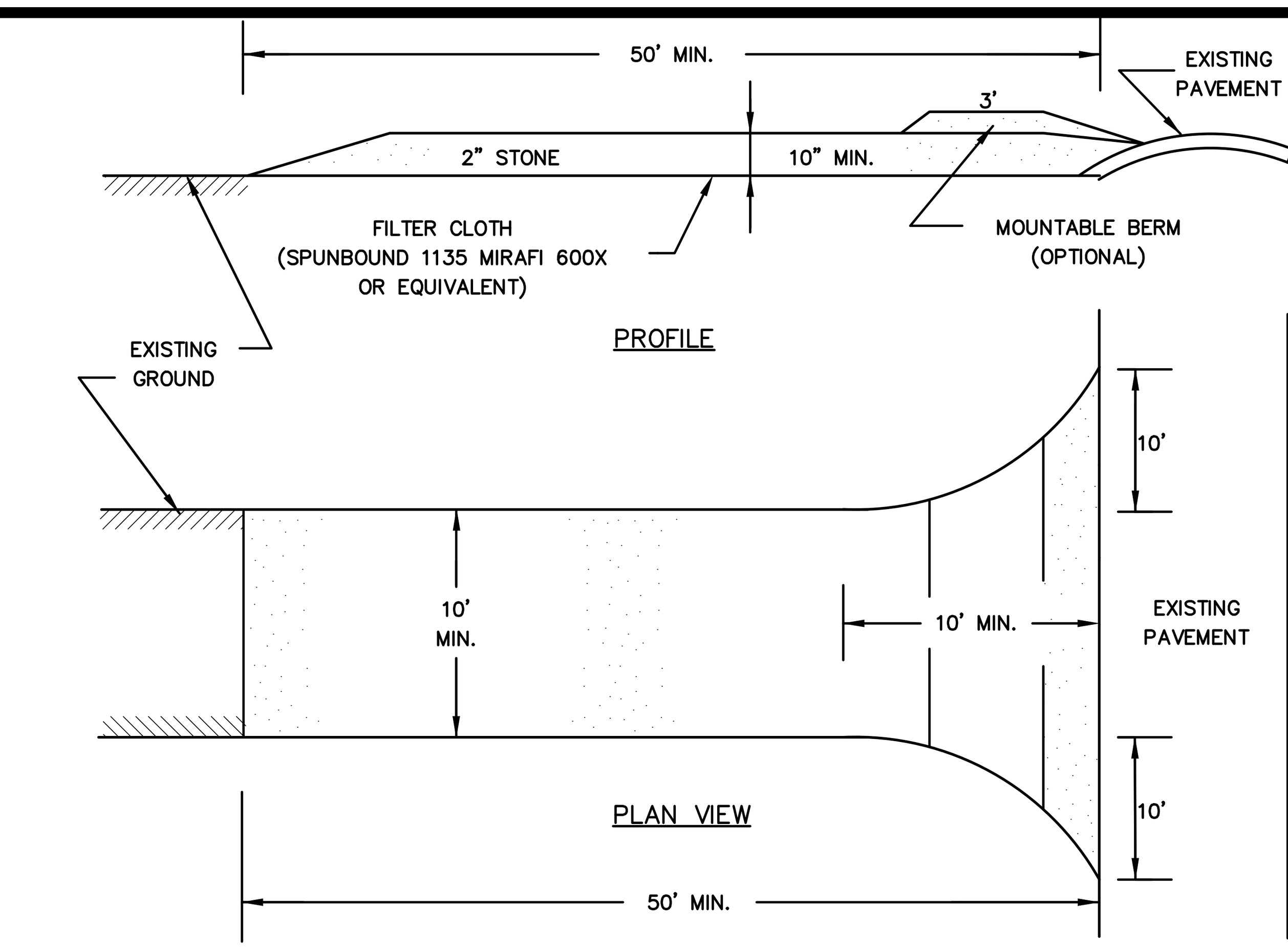
19. THE ENDS OF THE FENCE SHOULD BE TURNED UPHILL.

20. SILT FENCES PLACED AT THE TOE OF A SLOPE SHOULD BE SET AT LEAST 6 FEET FROM THE TOE M ALLOW SPACE FOR SHALLOW PONDING AND TO ALLOW FOR MAINTENANCE ACCESS WITHOUT DISTURBING THE SLOPE.

21. SILT FENCES SHOULD BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

SILT FENCE BARRIER

NOT TO SCALE



MAINTENANCE REQUIREMENTS:

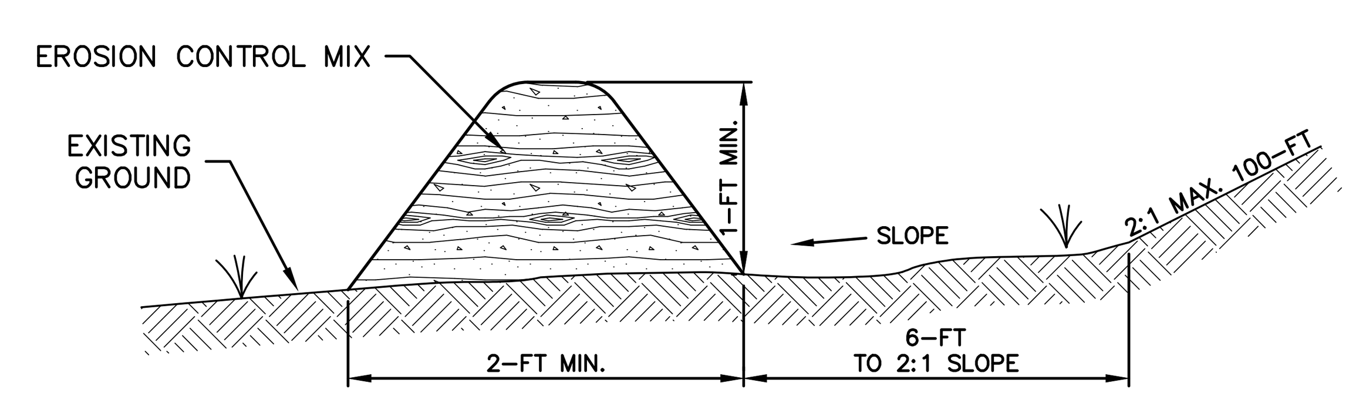
1. WHEN THE CONTROL PAD BECOMES INEFFECTIVE, THE STONE SHOULD BE REMOVED ALONG WITH THE COLLECTED SOIL MATERIAL, REGRADED ON SITE, AND STABILIZED. THE ENTRANCE SHOULD TEN BE RECONSTRUCTED.
2. THE CONTRACTOR SHOULD SWEEP THE PAVEMENT AT EXITS WHENEVER SOIL MATERIALS ARE TRACKED ONTO THE ADJACENT PAVEMENT OR TRAVELED WAY.
3. WHEN WHEEL WASHING IS REQUIRED, IT SHOULD BE CONDUCTED ON AN AREA STABILIZED WITH AGGREGATE, WHICH DRAINS INTO AN APPROVED SEDIMENT-TRAPPING DEVICE. ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS.

CONSTRUCTION SPECIFICATIONS:

1. THE MINIMUM STONE USED SHOULD BE 3-INCH CRUSHED STONE.
2. THE MINIMUM LENGTH OF THE PAD SHOULD BE 75 FEET, EXCEPT THAT THE MINIMUM LENGTH MAY BE REDUCED TO 50 FEET IF A 3-INCH TO 6-INCH BERM IS INSTALLED AT THE ENTRANCE OF THE PROJECT SITE.
3. THE PAD SHOULD BE THE FULL WIDTH OF CONSTRUCTION ACCESS ROAD OR 10 FEET, WHICHEVER IS GREATER.
4. THE PAD SHOULD SLOPE AWAY FROM THE EXISTING ROADWAY.
5. THE PAD SHOULD BE AT LEAST 6 INCHES THICK.
6. THE GEOTEXTILE FILTER FABRIC SHOULD BE PLACED BETWEEN THE STONE PAD AND THE EARTH SURFACE BELOW THE PAD.
7. THE PAD SHOULD BE MAINTAINED OR REPLACED WHEN MUD AND SOIL PARTICLES CLOG THE VOIDS IN THE STONE SUCH THAT MUD AND SOIL PARTICLES ARE TRACKED OFF-SITE.
8. NATURAL DRAINAGE THAT CROSSES THE LOCATION OF THE STONE PAD SHOULD BE INTERCEPTED AND PIPED BENEATH THE PAD, AS NECESSARY, WITH SUITABLE OUTLET PROTECTION.

USDA-SCS STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE



EROSION CONTROL MIX BERM CROSS SECTION

NOT TO SCALE

MAINTENANCE REQUIREMENTS:

1. EROSION CONTROL MIX BERMS SHOULD BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
2. EROSION CONTROL MIX BERMS SHOULD BE REPAIRED IMMEDIATELY IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THEM.
3. IF THERE ARE SIGNS OF BREACHING OF THE BARRIER, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THEM, THE EROSION CONTROL MIX BERMS SHOULD BE REPLACED WITH OTHER MEASURES TO INTERCEPT AND TRAP SEDIMENT (SUCH AS A DIVERSION BERM DIRECTING RUNOFF TO A SEDIMENT TRAP OR BASIN).
4. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT.
5. SEDIMENT DEPOSITS MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE THIRD (1/3) OF THE HEIGHT OF THE BARRIER.
6. EROSION CONTROL MIX BERMS SHOULD BE RESHAPED OR REAPPLIED AS NEEDED.
7. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE BARRIER IS NO LONGER REQUIRED SHOULD BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

CONSTRUCTION SPECIFICATIONS:

1. EROSION CONTROL MIX CAN BE MANUFACTURED ON OR OFF OF THE PROJECT SITE.
2. EROSION CONTROL MIX MUST CONSIST PRIMARILY OF ORGANIC MATERIAL, SEPARATED AT THE POINT OF GENERATION, AND MAY INCLUDE SHREDDED BARK, STUMP GRINDINGS, COMPOSTED BARK, OR ACCEPTABLE MANUFACTURED PRODUCTS.
3. WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS OR REPROCESSED WOOD PRODUCTS WILL NOT BE ACCEPTABLE AS THE ORGANIC COMPONENT OF THE MIX.
4. COMPOSITION OF THE EROSION CONTROL MIX SHOULD BE AS FOLLOWS:
   A. EROSION CONTROL MIX SHALL BE A WELL GRADED MIXTURE OF PARTICLE SIZES FREE OF REFUSE, PHYSICAL CONTAMINANTS, MATERIAL TOXIC TO PLANT GROWTH AND MAY NOT CONTAIN ROCKS LESS THAN 4-INCHES IN DIAMETER;
   B. ORGANIC MATTER = 25-65% DRY WEIGHT BASIS
   C. PARTICLES PASSING BY WEIGHT:

SCREEN:	PASSING BY WEIGHT:
3-INCH	100%
1-INCH	90-100%
3/4-INCH	70-100%
1/4-INCH	30-75%

   D. THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
   E. THE MIX SHOULD CONTAIN NO SILTS, CLAYS OR FINE SANDS.
   F. SOLUBLE SALTS CONTENT < 4.0 mmhos/cm
   G. pH OF THE MIX SHOULD BE BETWEEN 5.0 AND 8.0
5. THE BARRIER MUST BE PLACED ALONG A RELATIVELY LEVEL CONTOUR.
6. IT MAY BE NECESSARY TO CUT TALL GRASSES AND WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES IN THE BARRIER THAT WOULD ENABLE FINES TO WASH UNDER THE BARRIER THROUGH THE GRASS BLADES OR PLANT STEMS.
7. THE BARRIER MUST BE A MINIMUM OF 12-INCHES TALL AS MEASURED ON THE UPHILL SIDE OF THE BARRIER.
8. THE BARRIER MUST BE A MINIMUM OF 2-FT WIDE.

CONTINUOUS CONTAINED BERM (ALTERNATIVE):

1. AN ALTERNATIVE PRODUCT, THE CONTINUOUS CONTAINED BERM (OR "FILTER SOCK") CAN BE AN EFFECTIVE SEDIMENT BARRIER AS IT ADDS CONTAINMENT AND STABILITY TO A BERM OF EROSION CONTROL MIX.
2. IN THE EVENT THAT USE OF CONTINUOUS CONTAINED BERM IS DESIRED, THE PRODUCT SELECTED SHOULD BE REVIEWED AND APPROVED BY THE DESIGN ENGINEER.
3. INSTALLATION OF CONTINUOUS CONTAINED BERMS SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE MANUFACTURER.

EROSION CONTROL MIX BERM DETAIL

WINTER STABILIZATION & CONSTRUCTION PRACTICES:

MAINTENANCE REQUIREMENTS:

1. MAINTENANCE MEASURES SHOULD BE PERFORMED THROUGHOUT CONSTRUCTION, INCLUDING OVER THE WINTER PERIOD. AFTER EACH RAINFALL, SNOWSTORM, OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHOULD CONDUCT INSPECTION OF ALL INSTALLED EROSION CONTROL PRACTICES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUED FUNCTION.

2. FOR ANY AREA STABILIZED BY TEMPORARY OR PERMANENT SEEDING PRIOR TO THE ONSET OF THE WINTER SEASON, THE CONTRACTOR SHOULD CONDUCT AN INSPECTION IN THE SPRING TO ASCERTAIN THE CONDITION OF THE VEGETATION AND REPAIR ANY DAMAGED AREAS OR BARE SPOTS AND RESEED AS REQUIRED TO ACHIEVE AN ESTABLISHED VEGETATIVE COVER (AT LEAST 85% OF AREA VEGETATED WITH HEALTHY, VIGOROUS GROWTH.)

SPECIFICATIONS:

THE FOLLOWING STABILIZATION TECHNIQUES SHOULD BE EMPLOYED DURING THE PERIOD FROM OCTOBER 15 THROUGH MAY 15.

1. THE AREA OF EXPOSED, UNSTABILIZED SOIL SHOULD BE LIMITED TO 1-ACRE AND SHOULD BE PROTECTED AGAINST EROSION BY THE METHODS DISCUSSED IN NHSMM, VOL. 3 AND ELSEWHERE IN THIS PLAN SET, PRIOR TO ANY THAW OR SPRING MELT EVENT. STABILIZATION AS FOLLOWS SHOULD BE COMPLETED WITHIN A DAY OF ESTABLISHING THE GRADE THAT IS FINAL OR THAT OTHERWISE WILL EXIST FOR MORE THAN 5 DAYS:
2. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF LESS THAN 15% WHICH DO NOT EXHIBIT A MINIMUM 85% VEGETATIVE GROWTH BY OR ARE DISTURBED AFTER OCTOBER 15, SHOULD BE SEEDED AND COVERED WITH 3 TO 4 TONS OF HAY OR STRAW MULCH PER ACRE SECURED WITH ANCHORED NETTING, OR 2 INCHES OF EROSION CONTROL MIX (REFER TO NHSMM, VOL. 3 FOR SPECIFICATION).

3. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF GREATER THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OR ARE DISTURBED AFTER OCTOBER 15 SHOULD BE SEEDED AND COVERED WITH A PROPERLY INSTALLED EROSION CONTROL BLANKET OR WITH A MINIMUM OF 4 INCHES OF EROSION CONTROL MIX, UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER. NOTE THAT COMPOST BLANKETS SHOULD NOT EXCEED 2 INCHES IN THICKNESS OR THEY MAY OVERHEAT.
4. ALL STONE COVERED SLOPES MUST BE CONSTRUCTED AND STABILIZED BY OCTOBER 15.

5. INSTALLATION OF ANCHORED HAY MULCH OR EROSION CONTROL MIX SHOULD NOT OCCUR OVER SNOW OF GREATER THAN 1 INCH IN DEPTH.

6. ALL MULCH APPLIED DURING WINTER SHOULD BE ANCHORED (I.E. BY NETTING, TRACKING, WOOD CELLULOSE FIBER).

7. WITHIN 24 HOURS OF STOCKPILING SOIL MATERIALS SHOULD BE MULCHED FOR OVER WINTER PROTECTION WITH HAY OR STRAW AT TWICE THE NORMAL RATE OR WITH A 4 INCH LAYER OF EROSION CONTROL MIX. MULCH SHOULD BE RE-ESTABLISHED PRIOR TO ANY RAIN OR SNOWFALL. NO SOIL STOCKPILE SHOULD BE PLACED (EVEN COVERED WITH MULCH) WITHIN 100-FT OF ANY WETLAND OR OTHER WATER RESOURCE AREA.

8. FROZEN MATERIAL (I.E. FROST LAYER REMOVED DURING WINTER CONSTRUCTION) SHOULD BE STOCKPILED SEPARATELY AND IN A LOCATION AWAY FROM ANY AREA NEEDING PROTECTION. FROZEN MATERIAL STOCKPILES CAN MELT IN SPRING AND BECOME UNWORKABLE AND DIFFICULT TO TRANSPORT DUE TO HIGH SOIL MOISTURE CONTENT.

9. INSTALLATION OF EROSION CONTROL BLANKETS SHOULD NOT OCCUR OVER SNOW OF GREATER THAN 1 INCH IN DEPTH OR ON FROZEN GROUND.

10. ALL GRASS-LINED DITCHES AND CHANNELS SHOULD BE CONSTRUCTED BY SEPTEMBER 1. ALL DITCHES AND SWALES WHICH DO NOT EXHIBIT 85% VEGETATIVE GROWTH BY OR ARE DISTURBED AFTER OCTOBER 15, SHOULD BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS AS DETERMINED BY A PROFESSIONAL ENGINEER. IF STONE LINING IS NECESSARY, THE CONTRACTOR MAY NEED TO RE-GRADE THE DITCH AS REQUIRED TO PROVIDE ADEQUATE CROSS-SECTION AFTER ALLOWING FOR PLACEMENT OF THE STONE.

11. ALL STONE LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY OCTOBER 15.

12. AFTER NOVEMBER 15, INCOMPLETE ROAD OR PARKING AREAS WHERE ACTIVE CONSTRUCTION HAS STOPPED FOR THE WINTER SHOULD BE PROTECTED WITH A MINIMUM 3 INCH LAYER OF SAND AND GRAVEL WITH A GRADATION THAT IS LESS THAN 12% OF THE SAND PORTION, OR MATERIAL PASSING THE NUMBER 4 SIEVE, BY WEIGHT, PASSES THE NUMBER 200 SIEVE.

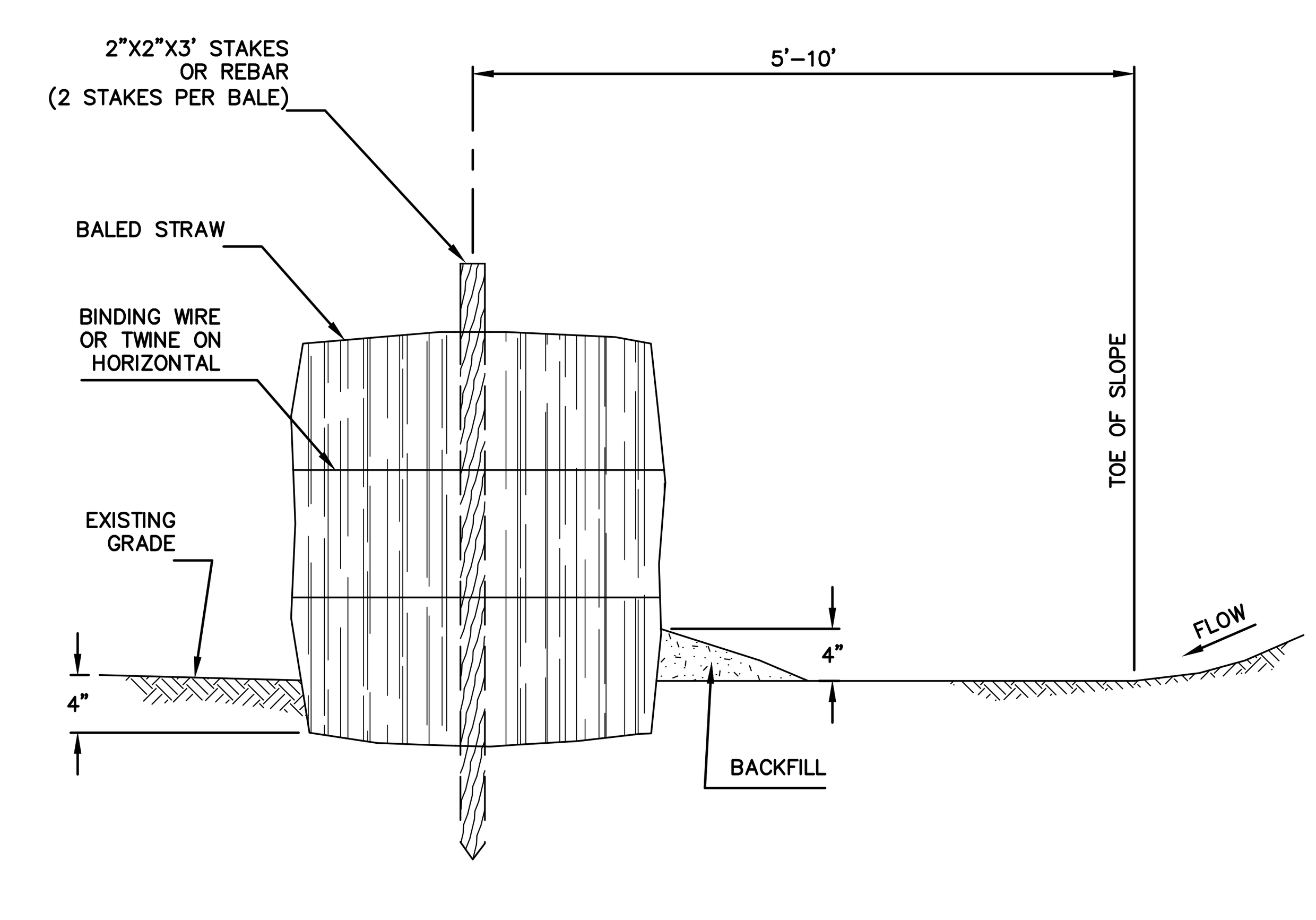
13. SEDIMENT BARRIERS THAT ARE INSTALLED DURING FROZEN CONDITIONS SHOULD CONSIST OF EROSION CONTROL MIX BERMS, OR CONTINUOUS CONTAINED BERMS. SILT FENCES AND HAY BALES SHOULD NOT BE INSTALLED WHEN FROZEN CONDITIONS PREVENT PROPER EMBEDMENT OF THESE BARRIERS.

DUST CONTROL PRACTICES:

1. APPLY DUST CONTROL MEASURES AS NECESSARY TO MAINTAIN CONTROL OF DUST ON SITE.
2. WATER APPLICATION:
   A) MOISTEN EXPOSED SOIL SURFACES PERIODICALLY WITH ADEQUATE WATER TO CONTROL DUST.
   B) AVOID EXCESSIVE APPLICATION OF WATER THAT WOULD RESULT IN MOBILIZING SEDIMENT AND SUBSEQUENT DEPOSITION IN NATURAL WATERBODIES.
3. STONE APPLICATION:
   A) COVER SURFACE WITH CRUSHED OR COARSE GRAVEL.
   B) IN AREAS NEAR WATERWAYS USE ONLY CHEMICALLY STABILIZED OR WASHED AGGREGATE.
4. REFER TO "NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3 CONSTRUCTION PHASE EROSION AND SEDIMENT CONTROLS, DECEMBER 2008" FOR OTHER ALLOWABLE DUST CONTROL PRACTICES (I.E. COMMERCIAL TACKIFIERS OR CHEMICAL TREATMENTS SUCH AS CALCIUM CHLORIDE, ETC.)

INVASIVE SPECIES NOTE:

THE CONTRACTOR SHALL TAKE STEPS TO PREVENT THE SPREAD OF INVASIVE PLANT, INSECT, AND FUNGAL SPECIES BY MEETING THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES. http://gencourt.state.nh.us/rules/state_agencies/agr3800.html



TOE OF SLOPE STRAW BALE BARRIER

NOT TO SCALE

GENERAL CONSTRUCTION PHASING:

1. STABILIZATION:
   A SITE IS DEEMED STABILIZED WHEN IT IS IN A CONDITION IN WHICH THE SOIL ON SITE WILL NOT EXPERIENCE ACCELERATED OR UNNATURAL EROSION UNDER THE CONDITIONS OF A 10-YEAR STORM EVENT, SUCH AS BUT NOT LIMITED TO:

A) IN AREAS THAT WILL NOT BE PAVED:
   i) A MINIMUM OF 85% VEGETATIVE COVER HAS BEEN ESTABLISHED;
   ii) A MINIMUM OF 3-INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR A CERTIFIED COMPOST BLANKET HAS BEEN INSTALLED, OR;
   iii) EROSION CONTROL BLANKETS HAVE BEEN INSTALLED.

B) IN AREAS TO BE PAVED:
   i) BASE COURSE GRAVELS HAVE BEEN INSTALLED.

2. TEMPORARY STABILIZATION:
   ALL AREAS OF EXPOSED OR DISTURBED SOIL SHOULD BE TEMPORARILY STABILIZED AS SOON AS PRACTICABLE BUT NO LATER THAN 45 DAYS FROM THE TIME OF INITIAL DISTURBANCE, UNLESS A SHORTER TIME IS SPECIFIED BY LOCAL AUTHORITIES, THE CONSTRUCTION SEQUENCE APPROVED AS PART OF THE ISSUED PERMIT OR AN INDEPENDENT MONITOR.

3. PERMANENT STABILIZATION:
   ALL AREAS OF EXPOSED OR DISTURBED SOIL SHOULD BE PERMANENTLY STABILIZED AS SOON AS PRACTICABLE BUT NO LATER THAN 3 DAYS FOLLOWING FINAL GRADING.

4. MAXIMUM AREA OF DISTURBANCE:
   THE AREA OF UNSTABILIZED SOIL SHOULD NOT EXCEED 5 ACRES AT ANY TIME.

5. ONLY DISTURB, CLEAR, OR GRADE AREAS NECESSARY FOR CONSTRUCTION.
   A) FLAG OR OTHERWISE DELINEATE AREAS NOT TO BE DISTURBED.
   B) EXCLUDE VEHICLES AND CONSTRUCTION EQUIPMENT FROM THESE AREAS TO PRESERVE NATURAL VEGETATION.

6. ALL GRADED OR DISTURBED AREAS INCLUDING SLOPES SHOULD BE PROTECTED DURING CLEARING AND CONSTRUCTION IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN DEPICTED ON SHEET CE-101.

7. ALL EROSION AND SEDIMENT CONTROL PRACTICES AND MEASURES SHOULD BE CONSTRUCTED, APPLIED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN DEPICTED ON SHEET CE-101.

8. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHOULD BE STOCKPILED IN THE AMOUNT NECESSARY TO COMPLETE FINISHED GRADING AND BE PROTECTED FROM EROSION.

9. STOCKPILES, BORROW AREAS AND SPOILS SHALL BE STABILIZED AS DESCRIBED UNDER "SOIL STOCKPILE PRACTICES".

10. SLOPES SHOULD NOT BE CREATED SO CLOSE TO PROPERTY LINES AS TO ENDANGER ADJOINING PROPERTIES WITHOUT ADEQUATE PROTECTION AGAINST SEDIMENTATION, EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED DAMAGE.

11. AREAS TO BE FILLED SHOULD BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND/OR OTHER OBJECTIONABLE MATERIALS.

12. AREAS SHOULD BE SCARIFIED TO A MINIMUM DEPTH OF 3-INCHES PRIOR TO PLACEMENT OF TOPSOIL. TOPSOIL SHOULD BE PLACED WITHOUT SIGNIFICANT COMPACTION TO PROVIDE A LOOSE BEDDING FOR PLACEMENT OF SEED.

13. ALL FILLS SHOULD BE COMPACTED IN ACCORDANCE WITH PROJECT SPECIFICATIONS TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES, SITE UTILITIES, CONDUITS AND OTHER FACILITIES, SHOULD BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.

14. IN GENERAL, FILLS SHOULD BE COMPACTED IN LAYERS RANGING FROM 6 TO 24 INCHES IN THICKNESS. THE CONTRACTOR SHOULD REVIEW THE PROJECT GEOTECHNICAL REPORT AND/OR THE "PROJECT SPECIFIC PHASING NOTES" FOR SPECIFIC GUIDANCE.

15. ANY AND ALL FILL MATERIAL SHOULD BE FREE OF BRUSH, RUBBISH, ROCKS (LARGER THAN 3/4 THE DEPTH OF THE LIFT BEING INSTALLED), LOGS, STUMPS, BUILDING DEBRIS, FROZEN MATERIAL AND OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY LIFTS.

16. FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE (I.E. CLAY, SILT) MATERIALS ARE SUSCEPTIBLE TO ACCELERATED SETTLEMENT AND POTENTIAL ACCELERATED EROSION. WORK IN AREAS OF THESE MATERIALS SHOULD BE PERFORMED UNDER THE DIRECTION OF A PROFESSIONAL ENGINEER.

17. THE OUTER FACE OF THE FILL SLOPE SHOULD BE ALLOWED TO STAY LOOSE, NOT ROLLED OR COMPACTED, OR BLADE SMOOTHED. A BULLDOZER MAY RUN UP AND DOWN THE FILL SLOPE SO THE DOZER TREADS (CLEAT TRACKS) CREATE GROOVES PERPENDICULAR TO THE SLOPE. IF THE SOIL IS NOT TOO MOIST, EXCESSIVE COMPACTION WILL NOT OCCUR. SEE "SURFACE ROUGHENING" IN THE NHSMM, VOL.3.

18. ROUGHEN THE SURFACE OF ALL SLOPES DURING THE CONSTRUCTION OPERATION TO RETAIN WATER, INCREASE INFILTRATION AND FACILITATE VEGETATION ESTABLISHMENT.

19. USE SLOPE BREAKS, SUCH AS DIVERSIONS, BENCHES, OR CONTOUR FURROWS AS APPROPRIATE TO REDUCE THE LENGTH OF CUT-FILL SLOPES TO LIMIT SHEET AND RILL EROSION AND PREVENT GULLY EROSION. ALL BENCHES SHOULD BE KEPT FREE OF SEDIMENT DURING ALL PHASES OF CONSTRUCTION.

20. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHOULD BE EVALUATED BY A PROFESSIONAL ENGINEER (PREFERABLY THE DESIGN ENGINEER) TO DETERMINE IF THE PROPOSED DESIGN SHOULD BE REVISED TO PROPERLY MANAGE THE CONDITION.

21. STABILIZE ALL GRADED AREAS (AS ABOVE) WITH VEGETATION, CRUSHED STONE, COMPOST BLANKET, OR OTHER GROUND COVER AS SOON AS GRADING IS COMPLETE OR IF WORK IS INTERRUPTED FOR 21 WORKING DAYS OR MORE. USE MULCH OR OTHER APPROVED METHODS TO STABILIZE AREAS TEMPORARILY WHERE FINAL GRADING MUST BE DELAYED.

22. ALL GRADED AREAS SHOULD BE PERMANENTLY STABILIZED IMMEDIATELY FOLLOWING FINISHED GRADING.

ABOVE NOTES EXCERPTED, ADAPTED AND REFERENCED FROM "NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3 CONSTRUCTION PHASE EROSION AND SEDIMENT CONTROLS, DECEMBER 2008" (NHSMM, VOL. 3)

SOIL STOCKPILE PRACTICES:

1. LOCATE STOCKPILES A MINIMUM OF 50-FT. AWAY FROM CONCENTRATED FLOWS OF STORMWATER, DRAINAGE COURSES OR INLETS.

2. PROTECT ALL STOCKPILES FROM STORMWATER RUN-ON USING TEMPORARY PERIMETER MEASURES SUCH AS DIVERSIONS, BERMS, SANDBAGS OR OTHER APPROVED PRACTICES.

3. STOCKPILES SHOULD BE SURROUNDED BY SEDIMENT BARRIERS AS DESCRIBED ON THE PLANS AND IN NHSMM VOL. 3. TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILE.

4. IMPLEMENT WIND EROSION CONTROL PRACTICES AS APPROPRIATE ON ALL STOCKPILED MATERIAL.

5. PLACE BAGGED MATERIALS ON PALLETS OR UNDERCOVER.

PROTECTION OF INACTIVE STOCKPILES:

6. INACTIVE SOIL STOCKPILES SHOULD BE COVERED WITH ANCHORED TARPS OR PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY SEED AND MULCH OR OTHER TEMPORARY STABILIZATION PRACTICE) AND TEMPORARY PERIMETER SEDIMENT BARRIERS (I.E. SILT FENCE, ETC.) AT ALL TIMES.

7. INACTIVE STOCKPILES OF CONCRETE RUBBLE, ASPHALT CONCRETE RUBBLE, AGGREGATE MATERIALS, AND SIMILAR MATERIALS SHOULD BE PROTECTED WITH TEMPORARY SEDIMENT PERIMETER BARRIERS (I.E. SILT FENCE, ETC.) AT ALL TIMES. IF THE MATERIALS ARE A SOURCE OF DUST, THEY SHOULD ALSO BE COVERED.

PROTECTION OF ACTIVE STOCKPILES:

8. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY LINEAR SEDIMENT BARRIERS (I.E. SILT FENCE, ETC.) PRIOR TO THE ONSET OF PRECIPITATION. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIAL FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.

9. WHEN A STORM IS PREDICTED, STOCKPILES SHOULD BE PROTECTED WITH AN ANCHORED PROTECTIVE COVERING.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 – LICENSED – PROFESSIONAL ENGINEER

SCALE: HORZ.: NTS VERT.:
DATUM: HORZ.: VERT.:
0
GRAPHIC SCALE

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
207.363.0669
www.fando.com

CATE STREET DEVELOPMENT, LLC

EROSION CONTROL DETAILS

CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

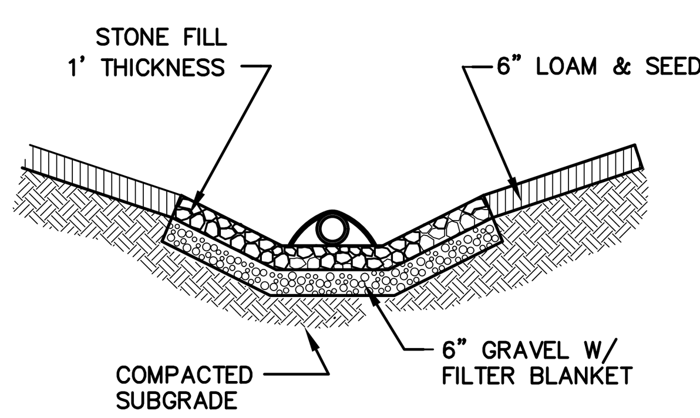
CD-560

D10=10" RIP-RAP GRADATION

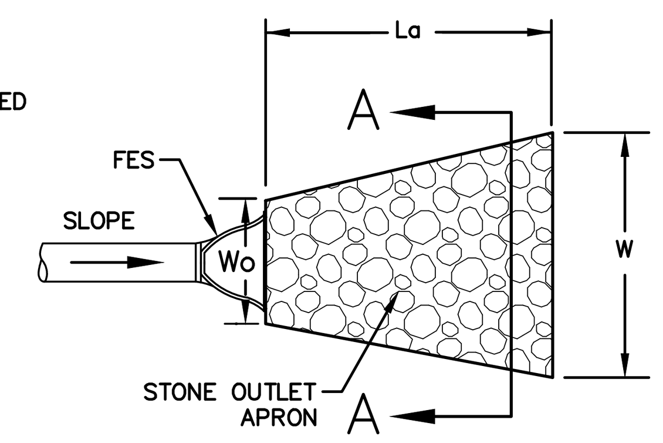
% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)		
100	15	TO	20
85	13	TO	18
50	10	TO	15
15	3	TO	5

APRON DIMENSION TABLE

PIPE OUTLET	Wo	W	La	T	d50
24" SWALE	6.0'	4'	23.5'	16"	7"
12" BRB #1	3.0'	11.5'	8.5'	16"	3"
12" BRB #2	3.0'	13.5'	10.5'	16"	3"



SECTION A-A



PLAN VIEW

STONE: D50 = 6"
WELL GRADED WITH SUFFICIENT SAND AND GRAVEL TO FILL THE VOIDS

THE HEIGHT OF THE STRUCTURAL LINING ALONG THE CHANNEL SIDES SHALL BEGIN AT THE ELEVATION EQUAL TO THE TOP OF THE CONDUIT AND TAPER DOWN TO THE CHANNEL BOTTOM THROUGH THE LENGTH OF THE APRON.

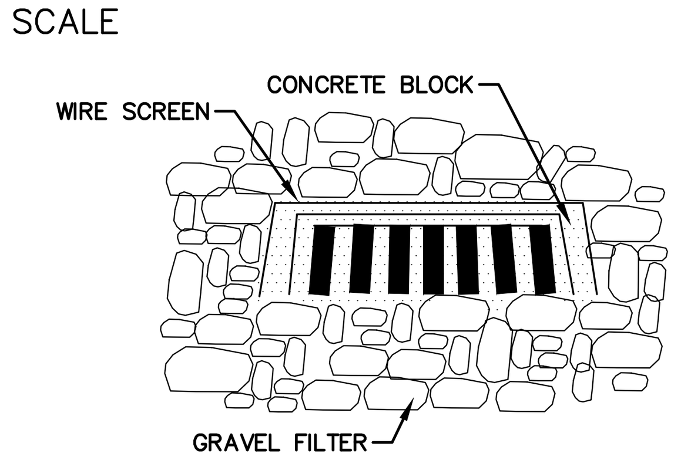
NOTES:
1. ALL PIPE CULVERTS SHALL HAVE END SECTIONS OR HEADWALLS. END SECTION MATERIAL AND MANUFACTURER SHALL MATCH THAT OF THE PIPE CULVERT.
2. THE LARGEST RIP-RAP SIZE DETERMINED DURING HYDROLOGIC ANALYSIS HAS BEEN USED FOR ALL OUTLETS FOR ECONOMY AND SIMPLICITY.
3. APRON LENGTHS, WIDTHS AND THICKNESSES HAVE BEEN ROUNDED UP TO WHOLE NUMBERS FOR EASE OF CONSTRUCTION.

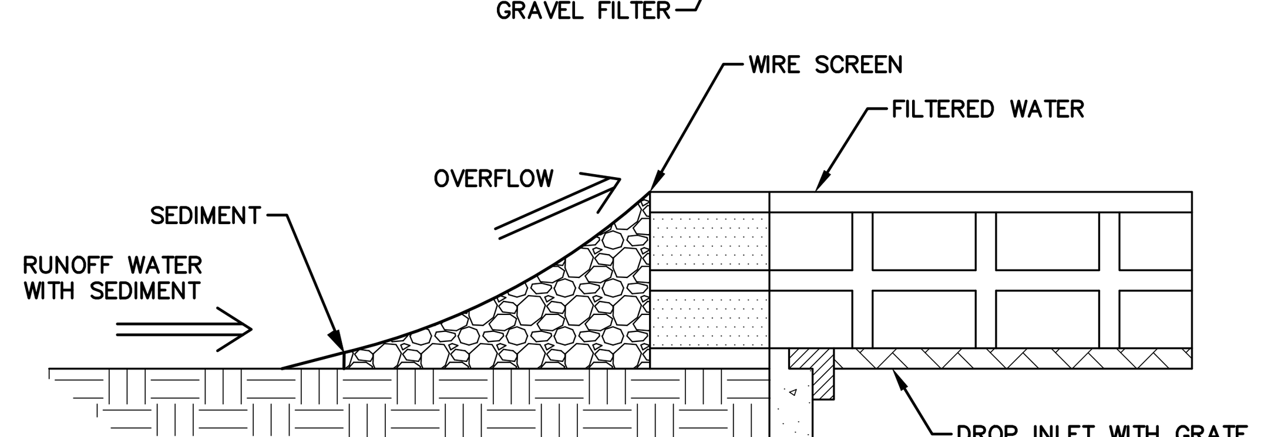
CONSTRUCTION SPECIFICATIONS:
1. PREPARE THE SUB-GRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP-RAP TO THE GRADES SHOWN ON THE PLANS.
2. MINIMUM 6" SAND/GRAVEL BEDDING OR GEOTEXTILE FABRIC REQUIRED UNDER ALL ROCK RIP-RAP.
3. THE ROCK OR GRAVEL USED FOR FILTER OR RIP-RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF ROCK RIP-RAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO (2) PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
5. STONE FOR THE RIP-RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
6. RIP-RAP SIZE CHOSEN FOR THE WORST CASE OF ALL OUTLETS. ALL RIP-RAP USED FOR PIPE OUTLET PROTECTION WILL HAVE THE SAME GRADATION AND THICKNESS.

MAINTENANCE NOTES:
1. OUTLETS SHALL BE INSPECTED AND CLEANED ANNUALLY AND AFTER ANY MAJOR STORM EVENT. ANY EROSION OR DAMAGE TO THE RIP-RAP SHALL BE REPAIRED IMMEDIATELY.
2. THE CHANNEL IMMEDIATELY DOWNSTREAM FROM THE OUTLET SHOULD BE CHECKED TO SEE THAT NO EROSION IS OCCURRING.
3. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

RIP RAP APRON OUTLET PROTECTION

NOT TO SCALE





BLOCK AND GRAVEL INLET SEDIMENT FILTER

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS:
1. PLACE CONCRETE BLOCKS LENGTHWISE ON THEIR SIDE IN A SINGLE ROW AROUND THE PERIMETER OF THE INLET, WITH THE ENDS OF ADJACENT BLOCKS ABUTTING. THE HEIGHT OF THE BARRIER CAN BE VARIED, DEPENDING ON DESIGN NEEDS, BY STACKING COMBINATIONS OF 4-INCH, 8-INCH AND 12-INCH WIDE BLOCKS. THE BARRIER OF BLOCKS SHALL BE AT LEAST 12 INCHES HIGH AND NO GREATER THAN 24 INCHES HIGH
2. WIRE MESH SHALL BE PLACED OVER THE OUTSIDE VERTICAL FACE (WEBBING) OF THE CONCRETE BLOCKS TO PREVENT STONE FROM BEING WASHED THROUGH THE HOLES IN THE BLOCKS. HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2-INCH OPENINGS SHALL BE USED.
3. STONE SHALL BE PILED AGAINST THE WIRE TO THE TOP OF THE BLOCK BARRIER, AS SHOWN ABOVE. STONE GRADATION SHALL BE WELL GRADED WITH THE MAXIMUM STONE SIZE OF 6 INCHES AND MINIMUM STONE SIZE OF 1 INCH.
4. IF THE STONE FILTER BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PERFORMS ITS FUNCTION, THE STONE MUST BE PULLED AWAY FROM THE BLOCKS, CLEANED AND REPLACED.

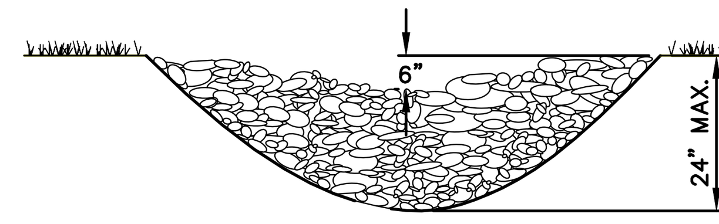
MAINTENANCE NOTES:
1. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
2. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
3. STRUCTURES SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

SEDIMENTATION CONTROL AT CATCH BASINS

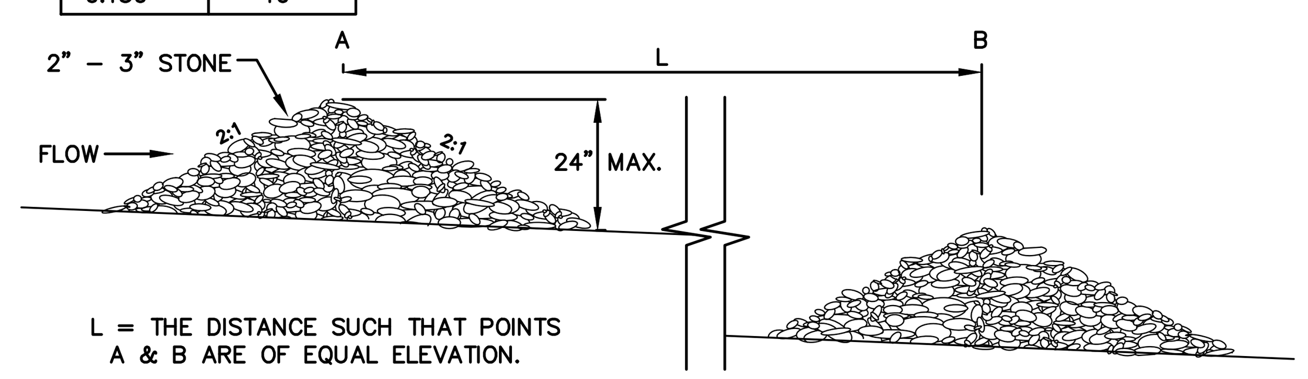
NOT TO SCALE

SPACING BETWEEN CHECK DAMS

SLOPE (FT/FT)	LENGTH (FT)
0.020	75
0.030	50
0.040	37
0.050	30
0.080	19
0.100	15
0.120	13
0.150	10



DRAINAGEWAY CROSS-SECTION



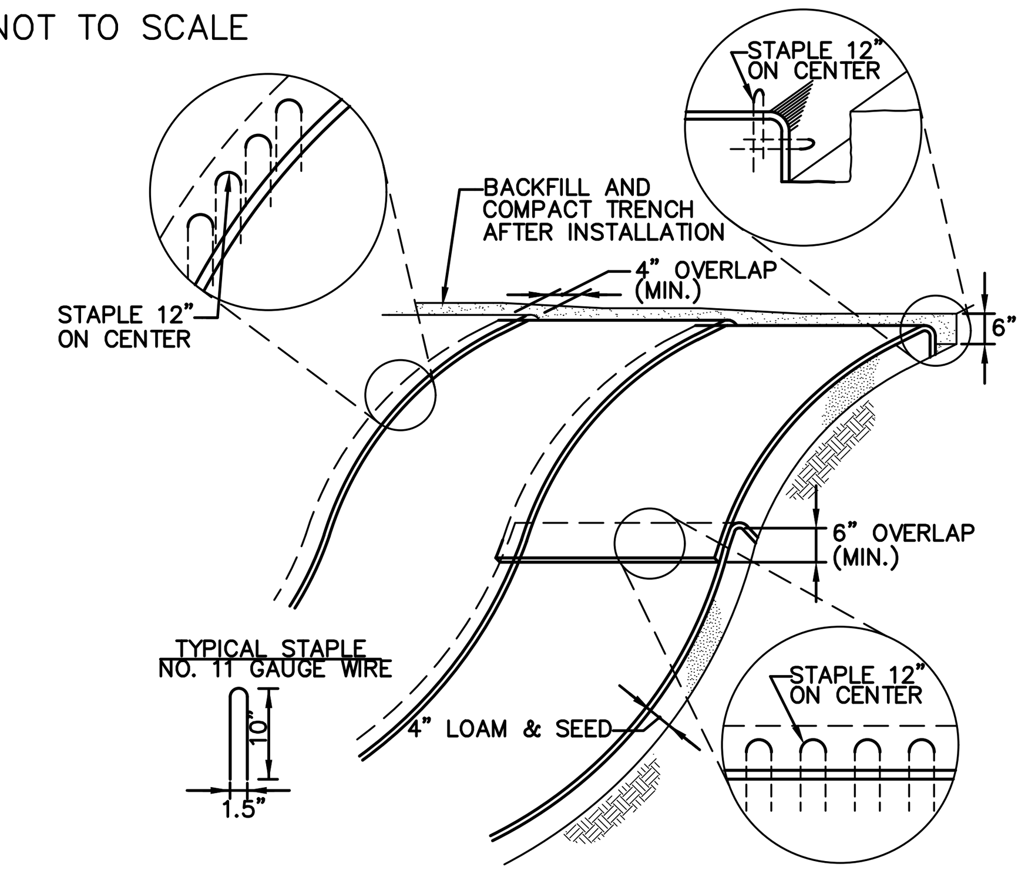
SPACING BETWEEN STONE CHECK DAMS

CONSTRUCTION SPECIFICATIONS:
1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION, AIR AND WATER POLLUTION WILL BE MINIMIZED.
3. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.

MAINTENANCE NOTES:
1. TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE INSPECTED AFTER EACH STORM AND DAILY DURING PROLONGED STORM EVENTS. ANY DAMAGE TO THE STRUCTURES SHALL BE REPAIRED IMMEDIATELY.
2. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE.
3. WHEN REMOVING THE STRUCTURES, THE DISTURBED AREAS SHALL BE BROUGHT UP TO EXISTING CHANNEL GRADE AND THE AREAS PREPARED, SEEDED AND MULCHED
4. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT REACHES 1/2 THE ORIGINAL HEIGHT OF THE STRUCTURE.

STONE CHECK DAM INSTALLATION DETAIL

NOT TO SCALE



SLOPE INSTALLATION

MAINTENANCE REQUIREMENTS:
1. ALL BLANKET AND MATS SHOULD BE INSPECTED WEEKLY DURING THE CONSTRUCTION PERIOD, AND AFTER ANY RAINFALL EVENT EXCEEDING 1/2 INCH IN A 24-HOUR PERIOD.
2. ANY FAILURE SHOULD BE REPAIRED IMMEDIATELY. IF WASHOUT OF THE SLOPE, DISPLACEMENT OF THE MAT, OR DAMAGE TO THE MAT OCCURS, THE AFFECTED SLOPE SHALL BE REPAIRED AND RESEEDED, AND THE AFFECTED AREA OF MAT SHALL BE RE-INSTALLED.

CONSTRUCTION SPECIFICATIONS:
1. MANUFACTURE'S INSTALLATION INSTRUCTIONS:
   A. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
   B. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM)PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
   C. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
   D. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
   E. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH. NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.
2. SITE PREPARATION:
   A. PROPER SITE PREPARATION IS ESSENTIAL TO ENSURE COMPLETE CONTACT OF THE PROTECTION MATTING WITH THE SOIL.
   B. GRADE AND SHAPE AREA IF INSTALLATION.
   C. REMOVE ALL ROCKS, CLODS, TRASH, VEGETATIVE OR OTHER OBSTRUCTIONS SO THAT THE INSTALLED BLANKETS WILL HAVE DIRECT CONTACT WITH THE SOIL.
   D. PREPARE SEEDBED BY LOOSENING 2-3 INCHES OF TOPSOIL ABOVE FINAL GRADE.
   E. INCORPORATE AMENDMENTS, SUCH AS LIME AND FERTILIZER, INTO SOIL ACCORDING TO SOIL TEST AND THE SEEDING PLAN.
3. SEEDING:
   A. SEED AREA BEFORE BLANKET INSTALLATION FOR EROSION CONTROL AND REVEGETATION. SEEDING AFTER MAT INSTALLATION IS OFTEN SPECIFIED FOR TURF REINFORCEMENT APPLICATIONS. WHEN SEEDING PRIOR TO BLANKET INSTALLATION, ALL CHECK SLOTS AND OTHER AREAS DISTURBED DURING INSTALLATION MUST BE RESEEDED.
   B. WHEN SOIL FILLING IS SPECIFIED, SEED THE MATTING AND THE ENTIRE DISTURBED AREA AFTER INSTALLATION AND PRIOR TO FILLING THE MAT WITH SOIL.

EROSION CONTROL - BLANKET SLOPE PROTECTION

NOT TO SCALE

PERMANENT VEGETATION:

SPECIFICATIONS:

SITE PREPARATION:
1. INSTALL NEEDED EROSION AND SEDIMENT CONTROL MEASURES SUCH AS SILTATION BARRIERS, DIVERSIONS, AND SEDIMENT TRAPS.
2. GRADE AS NEEDED FOR THE ACCESS OF EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, AND MULCH ANCHORING.
3. RUNOFF SHOULD BE DIVERTED FROM THE SEEDBED AREA.
4. ON SLOPES 4:1 OR STEEPER, THE FINAL PREPARATION SHOULD INCLUDE CREATING HORIZONTAL GROOVES PERPENDICULAR O THE DIRECTION OF THE SLOPE TO CATCH SEED AND REDUCE RUNOFF.

SEEDBED PREPARATION:
1. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRING TOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY AND SILT SOILS SHOULD BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE.
2. REMOVE FROM THE SURFACE ALL STONES 2INCHES OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, CONCRETE CLODS, LUMPS, TRASH OR OTHER UNSUITABLE MATERIAL.
3. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED; THE AREA MUST BE TILLED AND FIRMED AS ABOVE.
4. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
5. IF APPLICABLE, FERTILIZER AND ORGANIC SOIL AMENDMENTS SHOULD BE APPLIED DURING THE GROWING SEASON.
6. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL FERTILIZER AND LIMESTONE MAY BE APPLIED AT THE FOLLOWING RATES:

   LIMESTONE APPLICATION RATE = 3 TONS/ACRE (138 LB./1,000-SF)*

   *EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE

   FERTILIZER APPLICATION RATE = 600 LB./ACRE (13.8 LB./1,000-SF)*

   *LOW PHOSPHATE FERTILIZER (N-P205-K20) OR EQUIVALENT
7. FERTILIZER SHOULD BE RESTRICTED TO LOW PHOSPHATE, SLOW RELEASE NITROGEN FERTILIZER WHEN APPLIED TO AREAS BETWEEN 25 AND 250-FT FROM A SURFACE WATER BODY. NO FERTILIZER EXCEPT LIMESTONE SHOULD BE APPLIED WITHIN 25-FT OF A SURFACE WATER BODY. THESE ARE THE REQUIREMENTS FOR ANY WATER BODY PROTECTED BY THE COMPREHENSIVE SHORELAND PROTECTION ACT.

SEEDING:
1. INOCULATE ALL LEGUME SEED WITH THE CORRECT TYPE OF INOCULANT.
2. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM 1/4 TO 1/2 INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE.
3. WHERE FEASIBLE EXCEPT WHERE EITHER CULTIPACKER TYPE SEEDER OR HYDROSEEDER IS USED, THE SEEDBED SHOULD BE FIRMED FOLLOWING SEEDING OPERATIONS WITH A ROLLER, OR LIGHT DRAG.
4. SPRING SEEDING USUALLY GIVES THE BEST RESULTS FOR ALL SEED MIXES OR WITH LEGUMES. PERMANENT SEEDING SHOULD BE COMPLETED 45 DAYS PRIOR TO FIRST KILLING FROST. WHEN CROWN VETCH IS SEEDED IN LATE SUMMER AT LEAST 35% OF THE SEED SHOULD BE HARD SEED (UNSCARIFIED). IF SEEDING CANNOT BE DONE WITHIN THE SPECIFIED SEEDING DATES, MULCH ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE DESCRIBED IN THE NHSSM, VOL 3. AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
5. AREAS SEEDED BETWEEN MAY 15 AND AUGUST 15 SHOULD BE COVERED WITH HAY OR STRAW MULCH, ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE DESCRIBED IN THE NHSSM, VOL 3.
6. VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA SHOULD BE ACHIEVED PRIOR TO OCTOBER 15. IF THIS CONDITION IS NOT ACHIEVED, IMPLEMENT OTHER TEMPORARY STABILIZATION MEASURES FOR OVERWINTER PROTECTION.

HYDROSEEDING:
1. WHEN HYDROSEEDING (HYDRAULIC APPLICATION), PREPARE THE SEEDBED AS SPECIFIED ABOVE OR BY HAND RAKING TO LOOSEN AND SMOOTH THE SOIL AND REMOVE SURFACE STONES LARGER THAN 2 INCHES IN DIAMETER.
2. SLOPES BUST BE NO STEEPER THAN 2:1 (2 FEET HORIZONTALLY BY 1 FOOT VERTICALLY.
3. LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. THE USE OF FIBER MULCH ON CRITICAL AREAS IS NOT RECOMMENDED (UNLESS IT IS USED TO HOLD STRAW OR HAY). BETTER PROTECTION IS GAINED BY USING STRAW MULCH AND HOLDING IT WITH ADHESIVE MATERIALS OR 500 POUNDS PER ACRE OF WOOD FIBER MULCH.
4. SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.

MAINTENANCE REQUIREMENTS:
1. PERMANENT SEEDED AREAS SHOULD BE INSPECTED AT LEAST MONTHLY DURING THE COURSE OF CONSTRUCTION. INSPECTION, MAINTENANCE AND CORRECTIVE ACTIONS SHOULD CONTINUE UNTIL THE OWNER ASSUMES PERMANENT OPERATION OF THE SITE.
2. SEEDED AREAS SHOULD BE MOWED AS REQUIRED TO MAINTAIN A HEALTHY STAND OF VEGETATION. MOWING HEIGHT AND FREQUENCY DEPEND OF TYPE OF GRASS COVER.
3. BASED ON INSPECTION, AREAS SHOULD BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS.
4. AT A MINIMUM 85% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION.
5. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHOULD BE MADE AND AREAS SHOULD BE RESEEDED, WITH OTHER TEMPORARY MEASURES (I.E. MULCH, ETC.) USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.

PERMANENT VEGETATION SEEDING RECOMMENDATIONS

USE	MIXTURE	SPECIES	LBS./ACRE	LBS./ 1,000-SF
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL	20 20 2 42	0.45 0.45 0.05 0.95
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER	A	TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL	20 20 2 42	0.45 0.45 0.05 0.95
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY RECREATION SITES	A	TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL	20 20 2 42	0.45 0.45 0.05 0.95
PLAY AREAS AND ATHLETIC FIELDS (TOPSOIL ESSENTIAL FOR GOOD TURF)	F	CREEPING RED FESCUE KENTUCKY BLUEGRASS TOTAL	50 50 100	1.15 1.15 2.30

SOURCES:
1. NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3, TABLES 4-2 AND 4-3
2. MINNICK, E.L. AND H.T. MARSHALL, (AUGUST 1992)

TEMPORARY VEGETATION:

SPECIFICATIONS:

SITE PREPARATION:
1. INSTALL NEEDED EROSION AND SEDIMENT CONTROL MEASURES SUCH AS SILTATION BARRIERS, DIVERSIONS, AND SEDIMENT TRAPS.
2. GRADE AS NEEDED FOR THE ACCESS OF EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, AND MULCH ANCHORING.
3. RUNOFF SHOULD BE DIVERTED FROM THE SEEDBED AREA.
4. ON SLOPES 4:1 OR STEEPER, THE FINAL PREPARATION SHOULD INCLUDE CREATING HORIZONTAL GROOVES PERPENDICULAR O THE DIRECTION OF THE SLOPE TO CATCH SEED AND REDUCE RUNOFF.

SEEDBED PREPARATION:
1. STONES AND TRASH SHOULD BE REMOVED SO AS NOT TO INTERFERE WITH THE SEEDING AREA.
2. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
3. IF APPLICABLE, FERTILIZER AND ORGANIC SOIL AMENDMENTS SHOULD BE APPLIED DURING THE GROWING SEASON.
4. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL FERTILIZER AND LIMESTONE MAY BE APPLIED AT THE FOLLOWING RATES:

   LIMESTONE APPLICATION RATE = 3 TONS/ACRE (138 LB./1,000-SF)*

   *EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE

   FERTILIZER APPLICATION RATE = 600 LB./ACRE (13.8 LB./1,000-SF)*

   *LOW PHOSPHATE FERTILIZER (N-P205-K20) OR EQUIVALENT
5. FERTILIZER SHOULD BE RESTRICTED TO LOW PHOSPHATE, SLOW RELEASE NITROGEN FERTILIZER WHEN APPLIED TO AREAS BETWEEN 25 AND 250-FT FROM A SURFACE WATER BODY. NO FERTILIZER EXCEPT LIMESTONE SHOULD BE APPLIED WITHIN 25-FT OF A SURFACE WATER BODY. THESE ARE THE REQUIREMENTS FOR ANY WATER BODY PROTECTED BY THE COMPREHENSIVE SHORELAND PROTECTION ACT.

SEEDING:
1. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL CULTIPACKER TYPE SEEDER OR HYDRO SEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM 1/4 TO 1/2 INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.
2. TEMPORARY SEED SHOULD TYPICALLY OCCUR PRIOR TO SEPTEMBER 15.
3. AREAS SEEDED BETWEEN MAY 15 AND AUGUST 15 SHOULD BE COVERED WITH HAY OR STRAW MULCH, ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE DESCRIBED IN THE NHSSM, VOL 3.
4. VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA SHOULD BE ACHIEVED PRIOR TO OCTOBER 15. IF THIS CONDITION IS NOT ACHIEVED, IMPLEMENT OTHER TEMPORARY STABILIZATION MEASURES FOR OVERWINTER PROTECTION.

MAINTENANCE REQUIREMENTS:
1. TEMPORARY SEEDING SHOULD BE INSPECTED WEEKLY AFTER ANY RAINFALL EXCEEDING 1/2 INCH IN 24 HOURS ON ACTIVE CONSTRUCTION SITES. TEMPORARY SEEDING SHOULD BE INSPECTED JUST PRIOR TO SEPTEMBER 15, TO ASCERTAIN WHETHER ADDITIONAL SEEDING IS REQUIRED TO PROVIDE STABILIZATION OVER THE WINTER PERIOD.
2. BASED ON INSPECTION, AREAS SHOULD BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS. IF IT IS TOO LATE IN THE PLANTING SEASON TO APPLY ADDITIONAL SEED, THEN OTHER TEMPORARY STABILIZATION MEASURES SHOULD BE IMPLEMENTED.
3. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHOULD BE MADE AND AREAS SHOULD BE RESEEDED, WITH OTHER TEMPORARY MEASURES (I.E. MULCH, ETC.) USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.

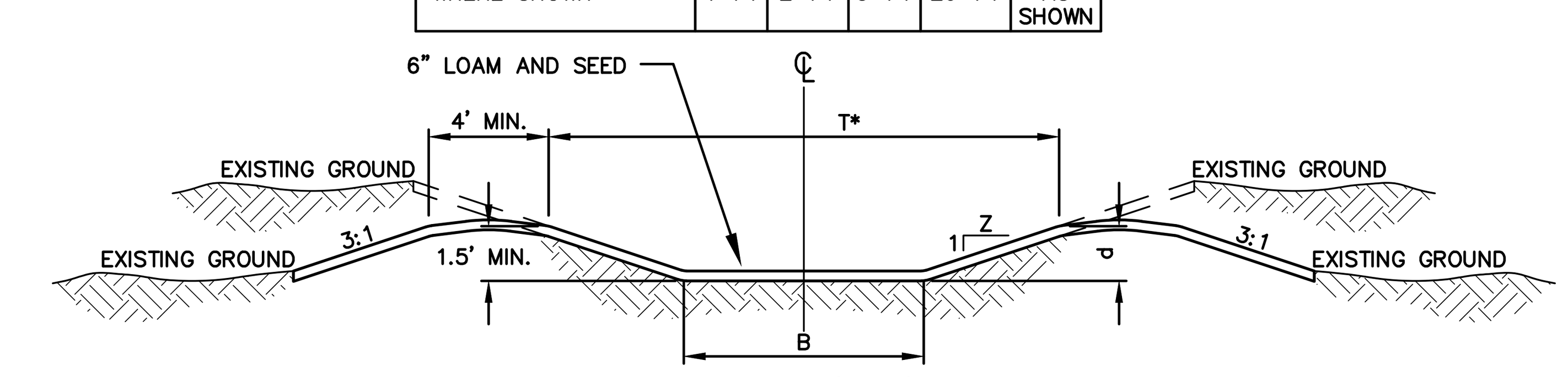
TEMPORARY VEGETATION SEEDING RECOMMENDATIONS

SPECIES	PER ACRE BUSHELS (BU) OR POUNDS (LBS.)	PER 1,000-SF	REMARKS
WINTER RYE	2.5 BU OR 112 LBS.	2.5 LBS.	BEST FOR FALL SEEDING. SEED FROM AUGUST 15 TO SEPTEMBER 15 FOR BEST COVER. SEED TO A DEPTH OF 1 INCH.
OATS	2.5 BU OR 80 LBS.	2.0 LBS.	BEST FOR SPRING SEEDING. SEED NO LATER THAN MAY 15 FOR SUMMER PROTECTION. SEED TO A DEPTH OF 1 INCH.
ANNUAL RYEGRASS	40 LBS.	1.0 LB.	GROWS QUICKLY, BUT IS OF SHORT DURATION. USE WHERE APPEARANCES ARE IMPORTANT. SEED EARLY SPRING AND/OR BETWEEN AUGUST 15 AND SEPTEMBER 15. COVER THE SEED WITH NO MORE THAN 0.25 INCH OF SOIL.
PERENNIAL RYEGRASS	30 LBS.	0.7 LBS.	BEST FOR FALL SEEDING. SEED FROM AUGUST 15 TO SEPTEMBER 15 FOR BEST COVER. SEED TO A DEPTH OF 1 INCH.

SOURCES:
1. NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3, TABLE 4-1
2. MINNICK, E.L. AND H.T. MARSHALL, (AUGUST 1992)

SWALE DIMENSION TABLE

LOCATION	B	d	Z	T	LENGTH
WHERE SHOWN	4-FT	2-FT	3-FT	20-FT	AS SHOWN



MAINTENANCE NOTES:
1. THE SWALE(S) SHALL BE MOWED WITH THE REST OF THE SITES LAWN AREAS TO PROMOTE HEALTHY GROWTH AND PREVENT THE ENCROACHMENT OF WEEDS AND WOODY VEGETATION. DO NOT MOW GRASS IN SWALE(S) TOO SHORT. THIS WILL REDUCE THE SWALES FILTERING ABILITY.
2. THE SWALE(S) SHOULD BE FERTILIZED ON AN AS NECESSARY BASIS, TO KEEP THE GRASS HEALTHY. OVER FERTILIZATION COULD RESULT IN THE SWALE(S) BECOMING A SOURCE OF POLLUTION TO THE SURROUNDING WETLAND AREAS.
3. THE SWALE(S) SHOULD BE INSPECTED PERIODICALLY AND AFTER EVERY MAJOR STORM. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND RE-VEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.

VEGETATED SWALE DETAIL

NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN – No. 10843 – LICENSED – PROFESSIONAL ENGINEER

SCALE: HORZ.: NTS VERT.:
DATUM: HORZ.: VERT.:
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GRAPHIC SCALE

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UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
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CATE STREET DEVELOPMENT, LLC
DETAILS
CATE STREET/ WEST END YARDS
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CD-561

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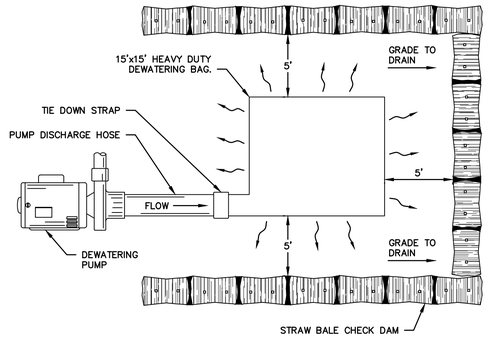

DEWATERING BAG
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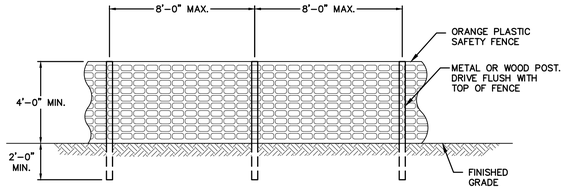
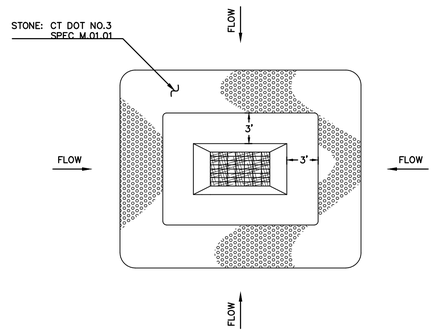
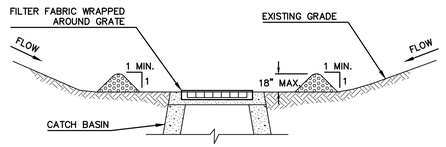


FOR TREE PROTECTION FENCE SHALL BE PLACED AT DRIPLINE OF TREES.

PROTECTIVE SAFETY FENCE
SCALE: N.T.S.



PLAN



SECTION

LOW POINT STONE CHECK DAM
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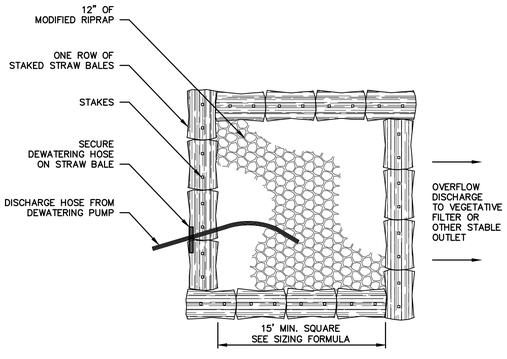
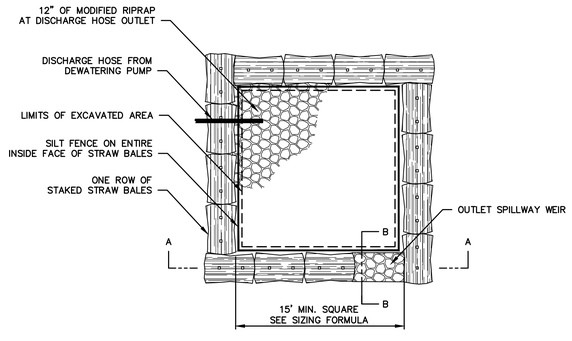


SIZING FORMULA:
CUBIC FT. OF REQUIRED STORAGE = PUMP DISCHARGE RATE (GPM) x 16

PLAN

PUMP SETTLING BASIN TYPE I
NOT TO SCALE



SIZING FORMULA:
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PLAN

PUMP SETTLING BASIN TYPE II
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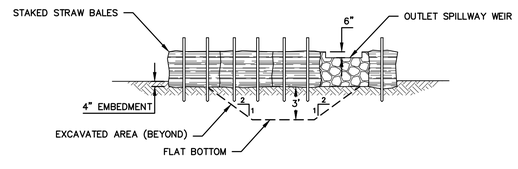
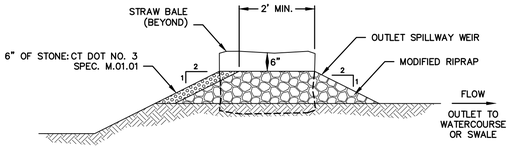


SECTION A–A



SECTION B–B

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10843 LICENSED

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PROJ. No.: 20180317.A10
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CD-562

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CT-201

PROJ. No: 20180317.A10
DATE: 08/19/2019

CATE STREET DEVELOPMENT, LLC

SU-40 BOX TRUCK
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CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

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VERT.: 1"=30'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
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GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
RICHARD R. LUNDBORN No. 10943
LICENSED PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

BLDG A

BLDG

BLDG

SNOW STORAGE

TRASH ROOM

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER
RICHARD R. LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: 1"=30'
VERT.: 1"=30'
DATUM: HORZ.: NAD83
VERT.: NGVD29

GRAPHIC SCALE
30 15 0 30

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
207.363.0669
www.fando.com

CATE STREET DEVELOPMENT, LLC

TOWER 5
TURNING MOVEMENTS
CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 08/19/2019

CT-202

File Path: F:\P2018\0317A10\Civil\3Dwg\20180317.A10_CT01.dwg Layout: CT-202 Plotted: Mon, August 19, 2019 - 1:45 PM User: mtavares
MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB

File Path: F:\P2018\0317\A10\Civil3\Dwg\20180317.A10_CT01.dwg Layout: CT-203 Plotted: Mon, August 19, 2019 - 1:45 PM User: mtavares
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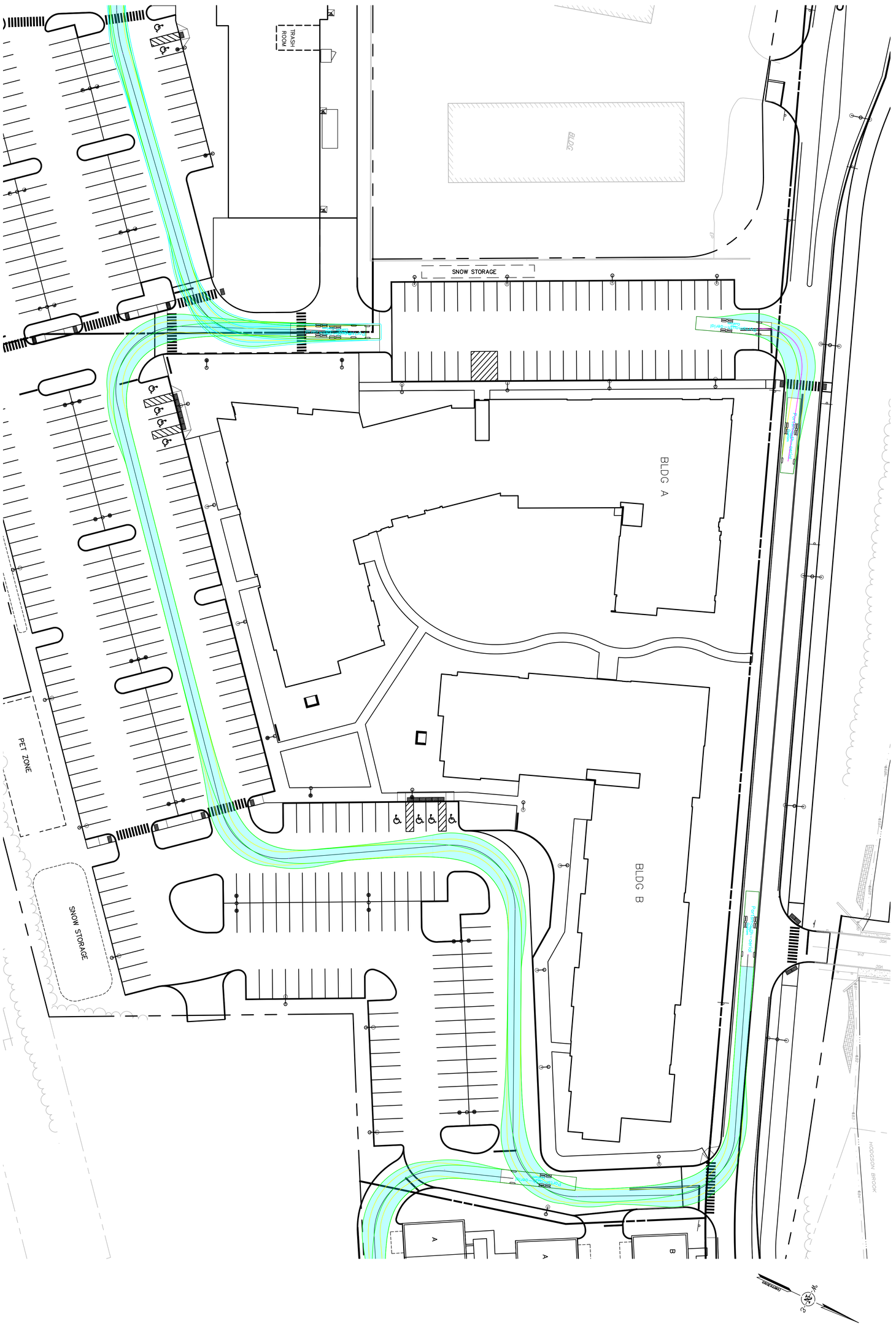

CT-203

PROJ. No: 20180317.A10
DATE: 08/19/2019

CATE STREET DEVELOPMENT, LLC

TOWER 5
TURNING MOVEMENTS
CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
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KENNEBUNK, MAINE 04043
207.363.0669
www.fando.com

SCALE:
HORZ.: 1"=30'
VERT.: 1"=30'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
30 15 0 30
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
RICHARD R. LUNDBORN
No. 10943
LICENSED
PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

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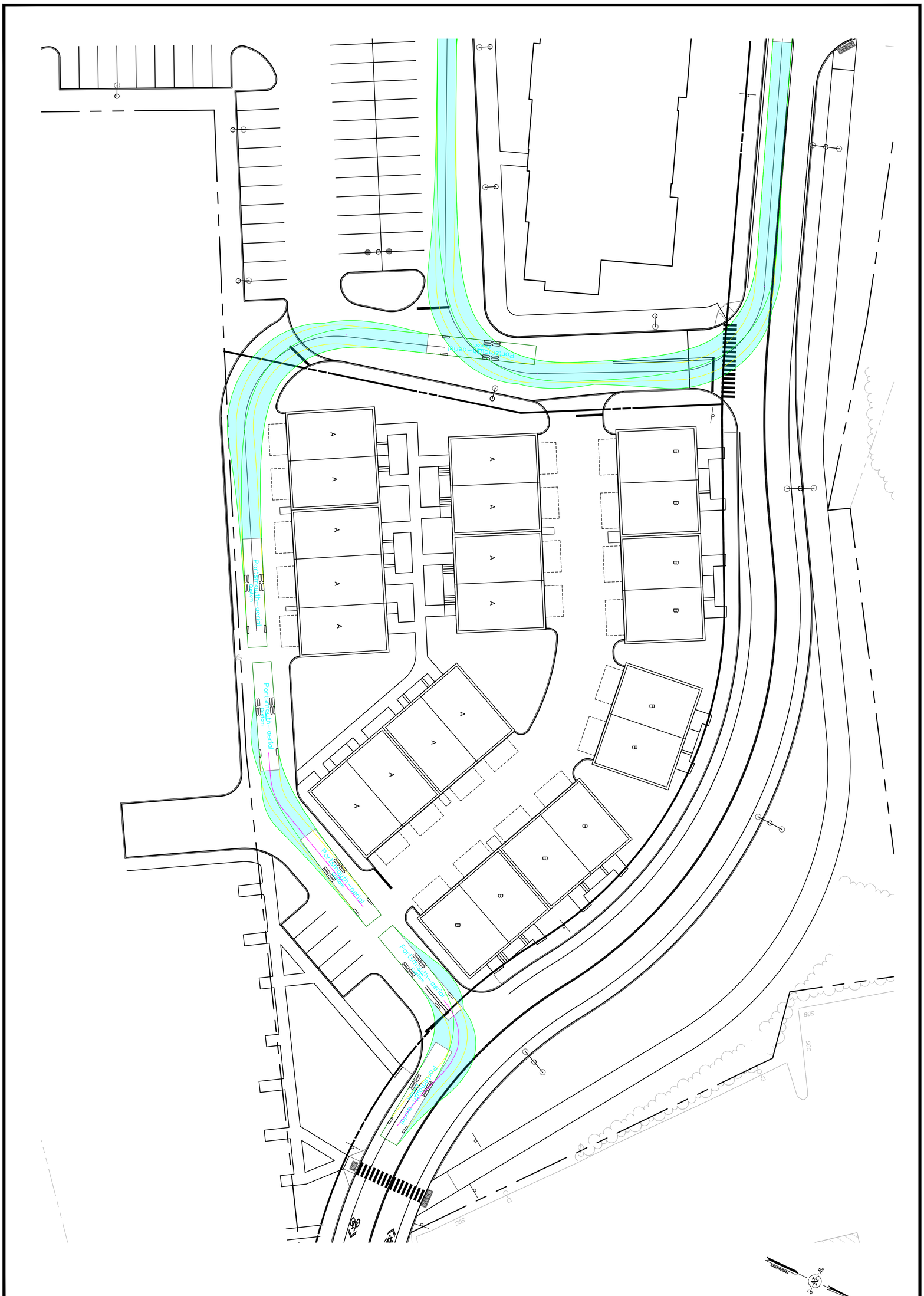

CT-204

PROJ. No: 20180317.A10
DATE: 08/19/2019

CATE STREET DEVELOPMENT, LLC

TOWER 5
TURNING MOVEMENTS
CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
207.363.0669
www.fando.com

SCALE:
HORZ.: 1"=20'
VERT.: 1"=20'
DATUM:
HORZ.: NAD83
VERT.: NGVD29

STATE OF NEW HAMPSHIRE
RICHARD R. LUNDBORN No. 10943
LICENSED PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

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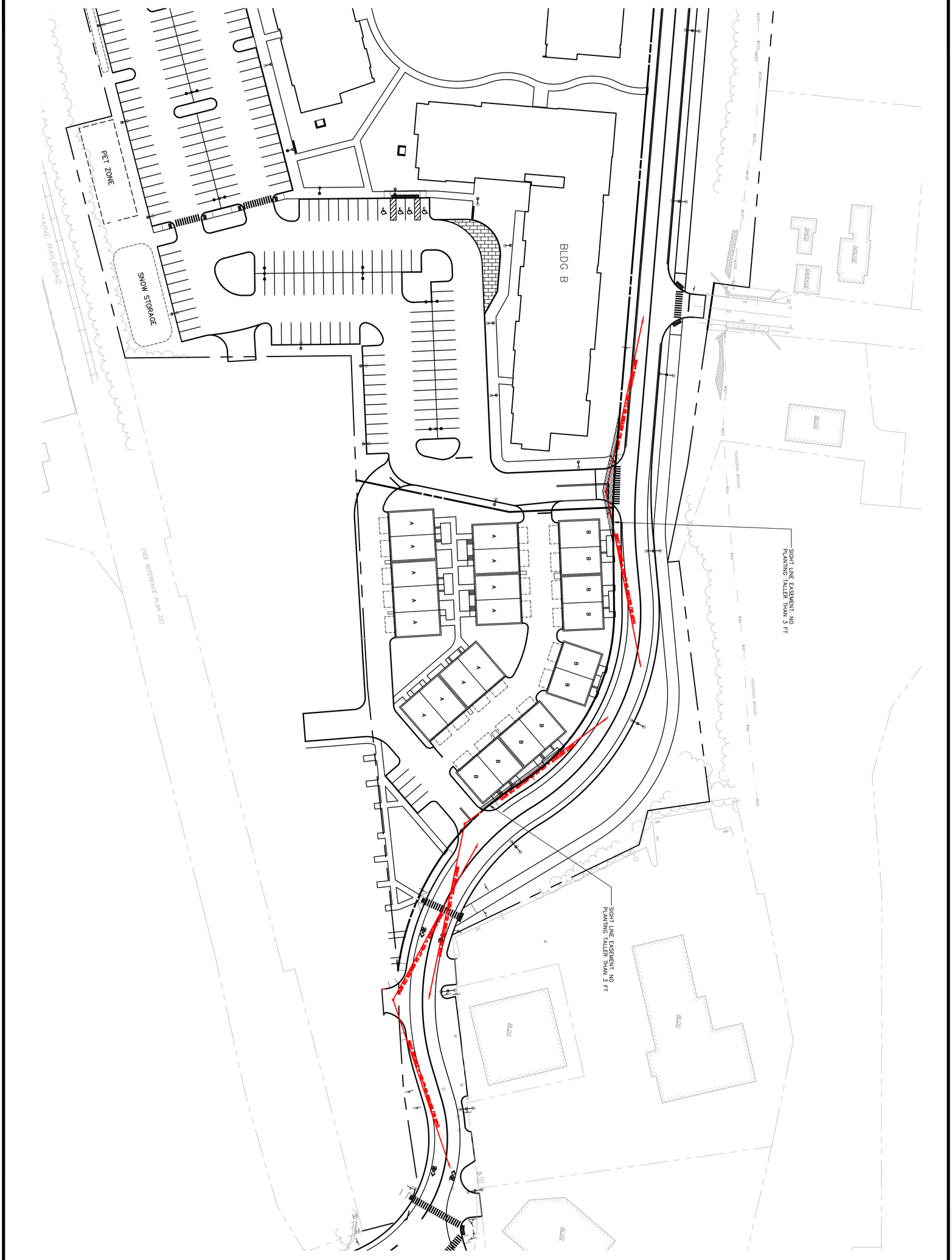


CT-205

PROJ. No: 20180317.A10
DATE: 08/19/2019

CATE STREET DEVELOPMENT, LLC

SIGHT DISTANCE

CATE STREET/ WEST END YARDS

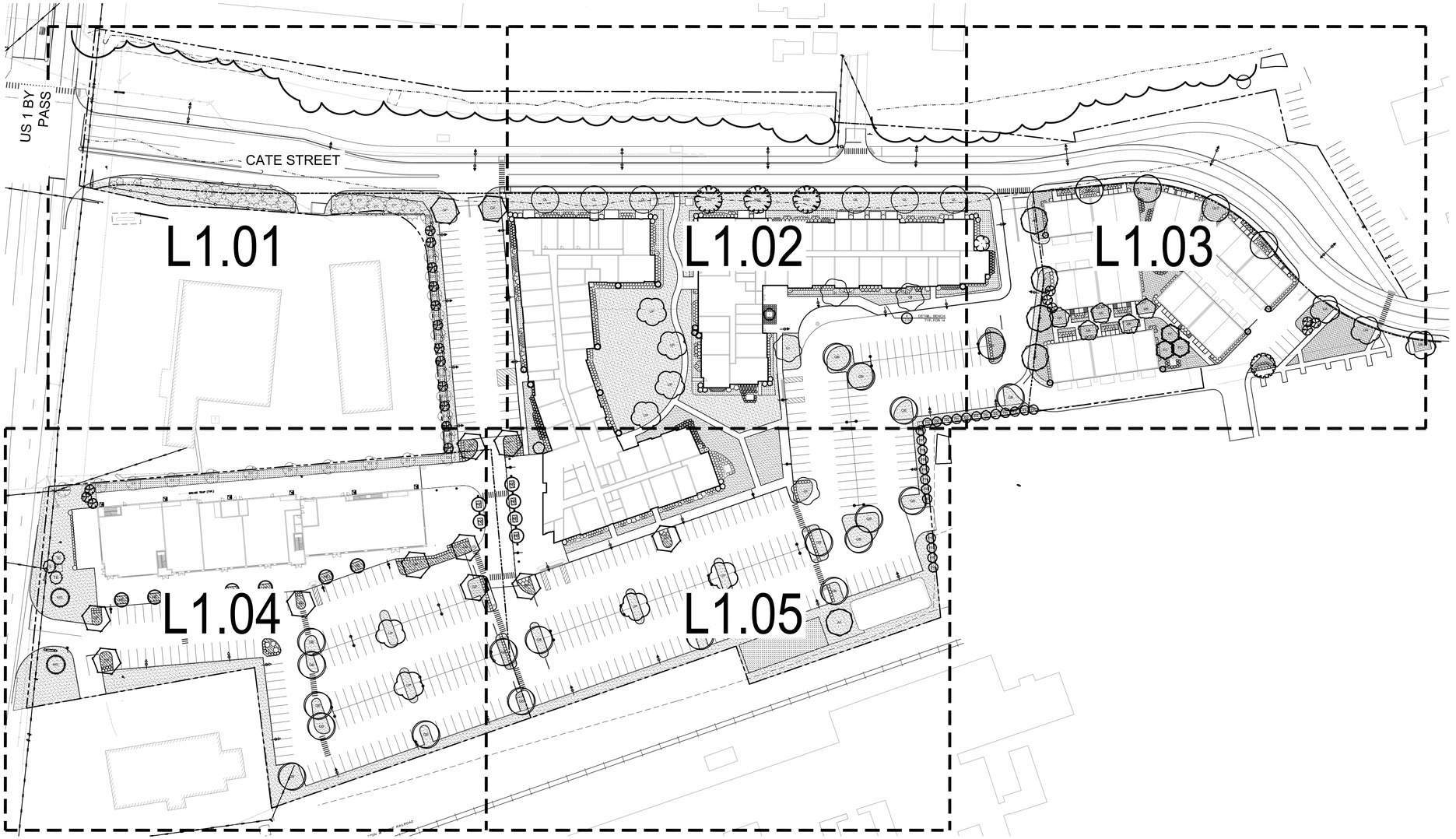
PORTSMOUTH NEW HAMPSHIRE

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
207.363.0669
www.fando.com

SCALE:
HORZ.: 1"=20'
VERT.: 1"=20'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
20 10 0 20
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
RICHARD R. LUNDBORN No. 10943
LICENSED PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL



NOTE:

REFER TO PLANT SCHEDULE ON SHEET L1.06 FOR THE DETAILED PLANT SCHEDULE PER SECTION 6.2-2A OF THE CITY OF PORTSMOUTH SITE PLAN REVIEW REGULATIONS.

SITE PLAN NOTE:

1. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

2. ALL SHRUBS WILL BE MAINTAINED TO A HEIGHT OF NO MORE THAN 36" TO ENSURE SIGHT LINES AT INTERSECTIONS.

60 0 60 120 180

Scale 1" = 60'

SITE solutions
LANDSCAPE ARCHITECTURE+ LAND PLANNING
3715 Northside Parkway T: 404.705.9411
300 Northcreek, Bldg. 300 F: 404.705.9491
Atlanta, Georgia 30327 www.sitesolutionsla.com

PROFESSIONAL STAMP:

WEST END YARDS

PREPARED FOR

CATE STREET DEVELOPMENT LLC

SHEET STATUS

MARK	DATE	BY	RELEASE
A	03/18/2019	SS	TAC SUBMITTAL
B	05/20/2019	SS	TAC RE-SUBMITTAL
C	06/20/2019	SS	TAC RE-SUBMITTAL
D	07/24/2019	JM	TAC RE-SUBMITTAL
E	08/19/2019	SS	TAC RE-SUBMITTAL

SHEET TITLE:

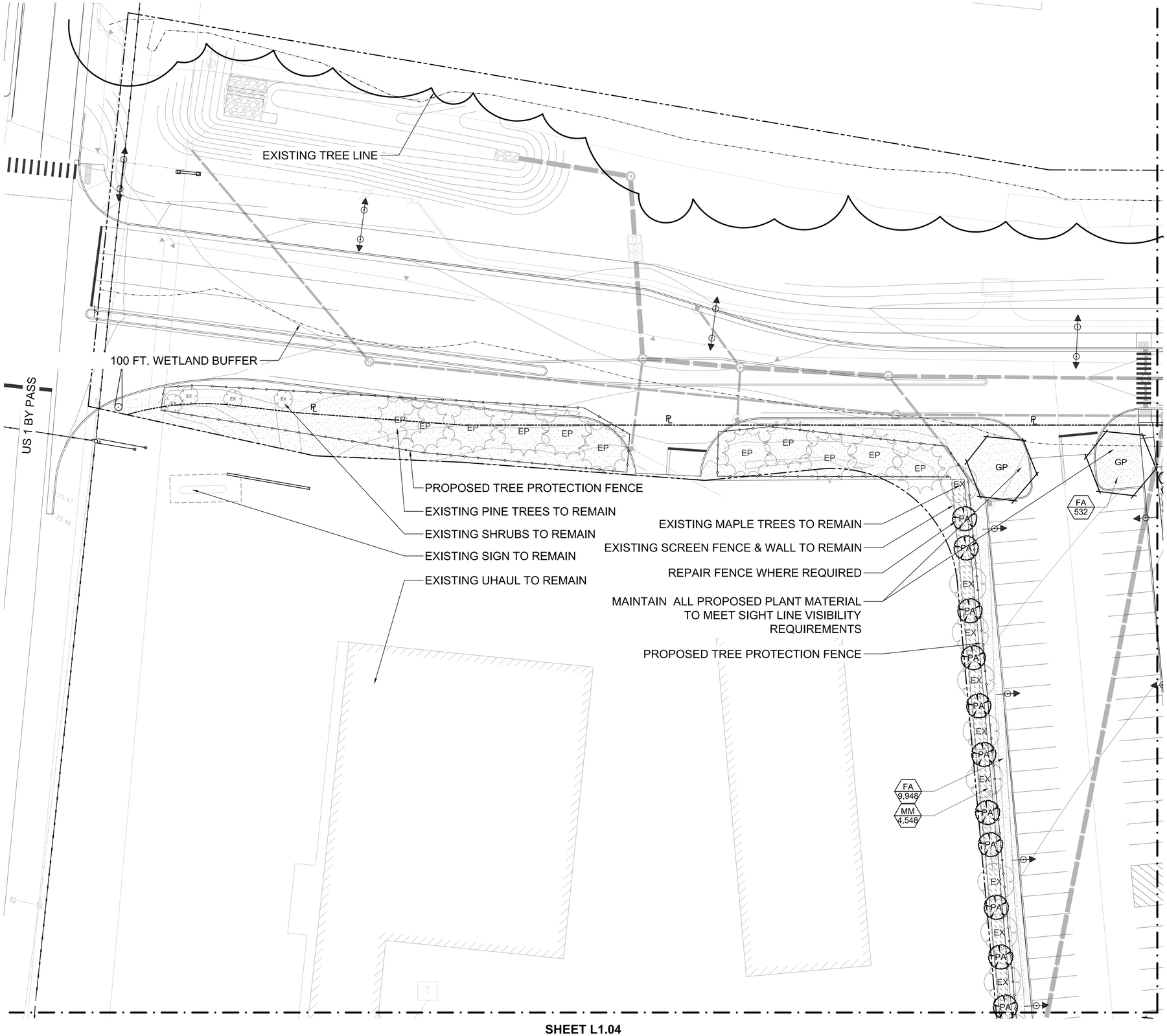
LANDSCAPE PLAN

PROJECT NUMBER:
18041.00

L1.00

DATE: 03.18.2019

PERMIT ISSUE



PLANT SCHEDULE PLANT SCHEDULE	
TREES	BOTANICAL / COMMON NAME
AF	Acer rubrum `Franksred` TM / Red Sunset Maple
GI	Gleditsia triacanthos inermis `Skycole` TM / Skyline Thornless Honey Locust
GP	Ginkgo biloba `Princeton Sentry` / Princeton Sentry Ginkgo
ME	Magnolia x `Elizabeth` / Magnolia
MG	Metasequoia glyptostroboides / Dawn Redwood
NS2	Nyssa sylvatica / Sour Gum
PA	Picea abies / Norway Spruce
PE	Platanus x acerifolia `Exclamation` TM / Exclamation London Plane Tree
PR	Pinus riglda / Pitch Pine
QB	Quercus bicolor / Swamp White Oak
QL	Quercus robur x bicolor `Long` / Regal Prince Oak
SP	Stewartia pseudocamellia / Japanese Stewartia
TE	Thuja occidentalis `Emerald` / Emerald Arborvitae
TH	Thuja occidentalis `Holmstrup` / Holmstrup Cedar
TO	Thuja occidentalis `Smaragd` / Emerald Green Arborvitae
TS	Thuja occidentalis `Smaragd` / Emerald Green Arborvitae
UP	Ulmus americana `Princeton` / American Elm
SHRUBS	BOTANICAL / COMMON NAME
B2	Buxus sempervirens / American Boxwood
BW	Buxus microphylla `Wintergreen` / WIntergreen Boxwood
CH	Clethra alnifolia `Hummingbird` / Summersweet Clethra
CS	Clethra alnifolia `Ruby Spice` / Ruby Spice Clethra
HB	Hibiscus syriacus `Blue Satin` / Rose-of-Sharon
HL	Hydrangea paniculata `Limelight` TM / Limelight Hydrangea
IP	Ilex x meserveae `Blue Prince` TM / Blue Prince Holly
MP	Myrica pensylvanica / Northern Bayberry
PM	Pinus mugo / Mugo Pine
RG	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac
RP	Rhododendron x `P.J.M.` / Rhododendron P.J.M.
SB	Schizachyrium scoparium `Blue Heaven` / Blue Heaven Little Bluestem
SBB	Spiraea x bumalda `Anthony Waterer` / Anthony Waterer Spiraea
SG	Spiraea japonica `Goldmound` / Spirea
SM	Syringa meyeri `Palibin` / Dwarf Korean Lilac
TD	Taxus x media `Densiformis` / Dense Yew
GROUND COVERS	BOTANICAL / COMMON NAME
FA	Festuca arundinacea / Tall Fescue Seed Mix
HO	Hemerocallis x `Stella de Oro` / Stella de Oro Daylily
LC	Liriope spicata / Creeping Lily Turf
MM	Mulch / Hardwood Mulch
PAR	Perovskia atriplicifolia / Russian Sage

SITE PLAN NOTE:

1. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

2. ALL SHRUBS WILL BE MAINTAINED TO A HEIGHT OF NO MORE THAN 36" TO ENSURE SIGHT LINES AT INTERSECTIONS.

20 0 20 40 60
Scale 1" = 20'

SITE solutions
LANDSCAPE ARCHITECTURE+ LAND PLANNING
3715 Northside Parkway T: 404.705.9411
300 Northcreek, Bldg. 300 F: 404.705.9491
Atlanta, Georgia 30327 www.sitesolutionsla.com

PROFESSIONAL STAMP:

WEST END YARDS

PREPARED FOR

CATE STREET DEVELOPMENT LLC

SHEET STATUS			
MARK	DATE	BY	RELEASE
A	03/18/2019	SS	TAC SUBMITTAL
B	05/20/2019	SS	TAC RE-SUBMITTAL
C	06/20/2019	SS	TAC RE-SUBMITTAL
D	07/24/2019	JM	TAC RE-SUBMITTAL
E	08/19/2019	SS	TAC RE-SUBMITTAL

SHEET TITLE:

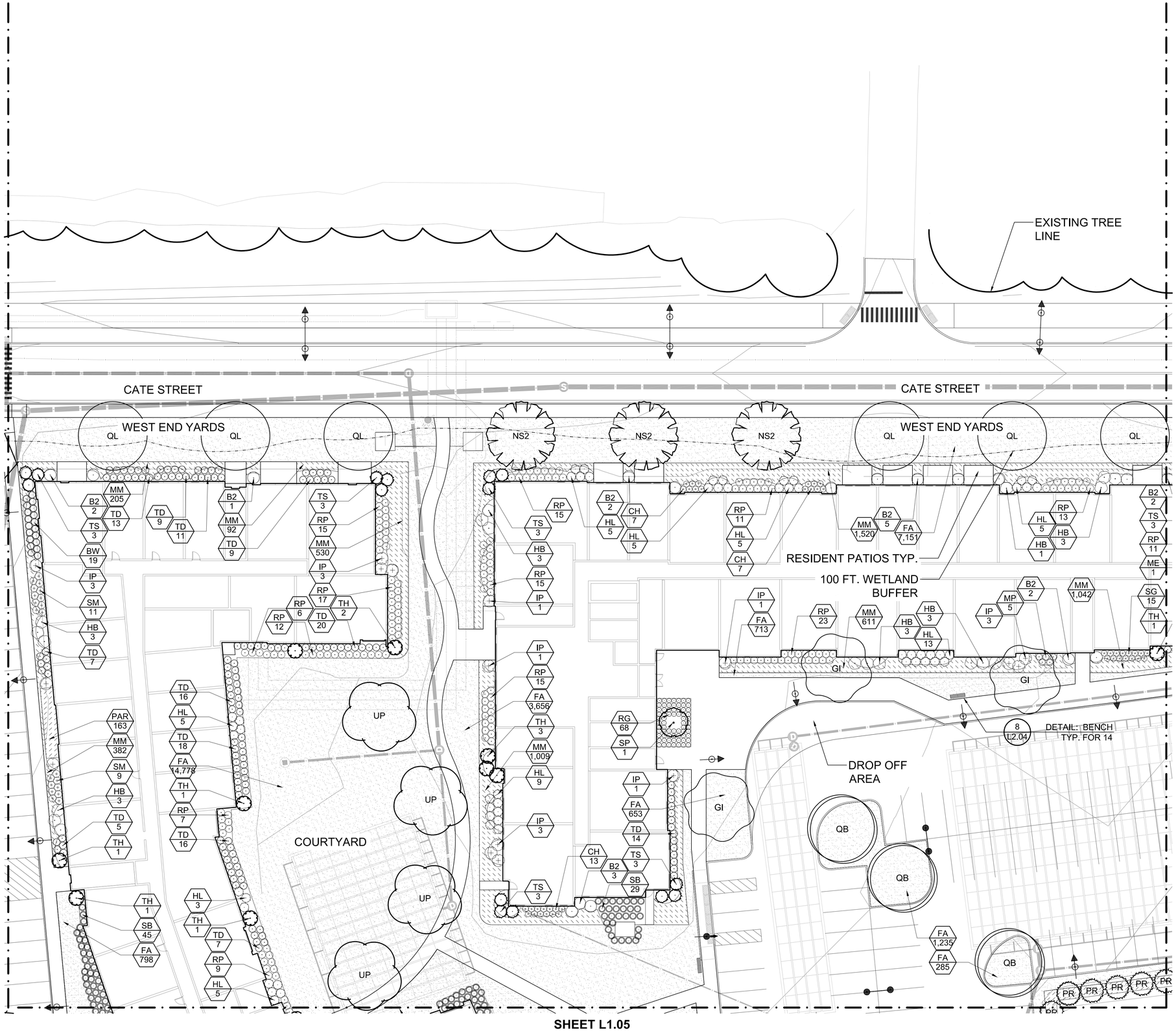
LANDSCAPE PLAN

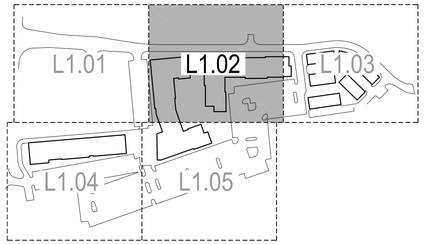
PROJECT NUMBER:
18041.00

L1.01

DATE: 03.18.2019

PERMIT ISSUE





PLANT SCHEDULE PLANT SCHEDULE	
TREES	BOTANICAL / COMMON NAME
AF	Acer rubrum `Franksred` TM / Red Sunset Maple
GI	Gleditsia triacanthos inermis `Skycole` TM / Skyline Thornless Honey Locust
GP	Ginkgo biloba `Princeton Sentry` / Princeton Sentry Ginkgo
ME	Magnolia x `Elizabeth` / Magnolia
MG	Metasequoia glyptostroboides / Dawn Redwood
NS2	Nyssa sylvatica / Sour Gum
PA	Picea abies / Norway Spruce
PE	Platanus x acerifolia `Exclamation` TM / Exclamation London Plane Tree
PR	Pinus rigida / Pitch Pine
QB	Quercus bicolor / Swamp White Oak
QL	Quercus robur x bicolor `Long` / Regal Prince Oak
SP	Stewartia pseudocamellia / Japanese Stewartia
TE	Thuja occidentalis `Emerald` / Emerald Arborvitae
TH	Thuja occidentalis `Holmstrup` / Holmstrup Cedar
TO	Thuja occidentalis `Smaragd` / Emerald Green Arborvitae
TS	Thuja occidentalis `Smaragd` / Emerald Green Arborvitae
UP	Ulmus americana `Princeton` / American Elm
SHRUBS	BOTANICAL / COMMON NAME
B2	Buxus sempervirens / American Boxwood
BW	Buxus microphylla `Wintergreen` / Wintergreen Boxwood
CH	Clethra alnifolia `Hummingbird` / Summersweet Clethra
CS	Clethra alnifolia `Ruby Spice` / Ruby Spice Clethra
HB	Hibiscus syriacus `Blue Satin` / Rose-of-Sharon
HL	Hydrangea paniculata `Limelight` TM / Limelight Hydrangea
IP	Ilex x meserveae `Blue Prince` TM / Blue Prince Holly
MP	Myrica pensylvanica / Northern Bayberry
PM	Pinus mugo / Mugo Pine
RG	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac
RP	Rhododendron x `P.J.M.` / Rhododendron P.J.M.
SB	Schizachyrium scoparium `Blue Heaven` / Blue Heaven Little Bluestem
SBB	Spiraea x bumalda `Anthony Waterer` / Anthony Waterer Spiraea
SG	Spiraea japonica `Goldmound` / Spirea
SM	Syringa meyeri `Palibin` / Dwarf Korean Lilac
TD	Taxus x media `Densiformis` / Dense Yew
GROUND COVERS	BOTANICAL / COMMON NAME
FA	Festuca arundinacea / Tall Fescue Seed Mix
HO	Hemerocallis x `Stella de Oro` / Stella de Oro Daylily
LC	Liriope spicata / Creeping Lily Turf
MM	Mulch / Hardwood Mulch
PAR	Perovskia atriplicifolia / Russian Sage

SITE PLAN NOTE:

1. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

2. ALL SHRUBS WILL BE MAINTAINED TO A HEIGHT OF NO MORE THAN 36" TO ENSURE SIGHT LINES AT INTERSECTIONS.

20 0 20 40 60
Scale 1" = 20'

SITE solutions
LANDSCAPE ARCHITECTURE+ LAND PLANNING
3715 Northside Parkway T: 404.705.9411
300 Northcreek, Bldg. 300 F: 404.705.9491
Atlanta, Georgia 30327 www.sitesolutionsla.com

PROFESSIONAL STAMP:

WEST END YARDS

PREPARED FOR

CATE STREET DEVELOPMENT LLC

SHEET STATUS			
MARK	DATE	BY	RELEASE
A	03/18/2019	SS	TAC SUBMITTAL
B	05/20/2019	SS	TAC RE-SUBMITTAL
C	06/20/2019	SS	TAC RE-SUBMITTAL
D	07/24/2019	JM	TAC RE-SUBMITTAL
E	08/19/2019	SS	TAC RE-SUBMITTAL

SHEET TITLE:

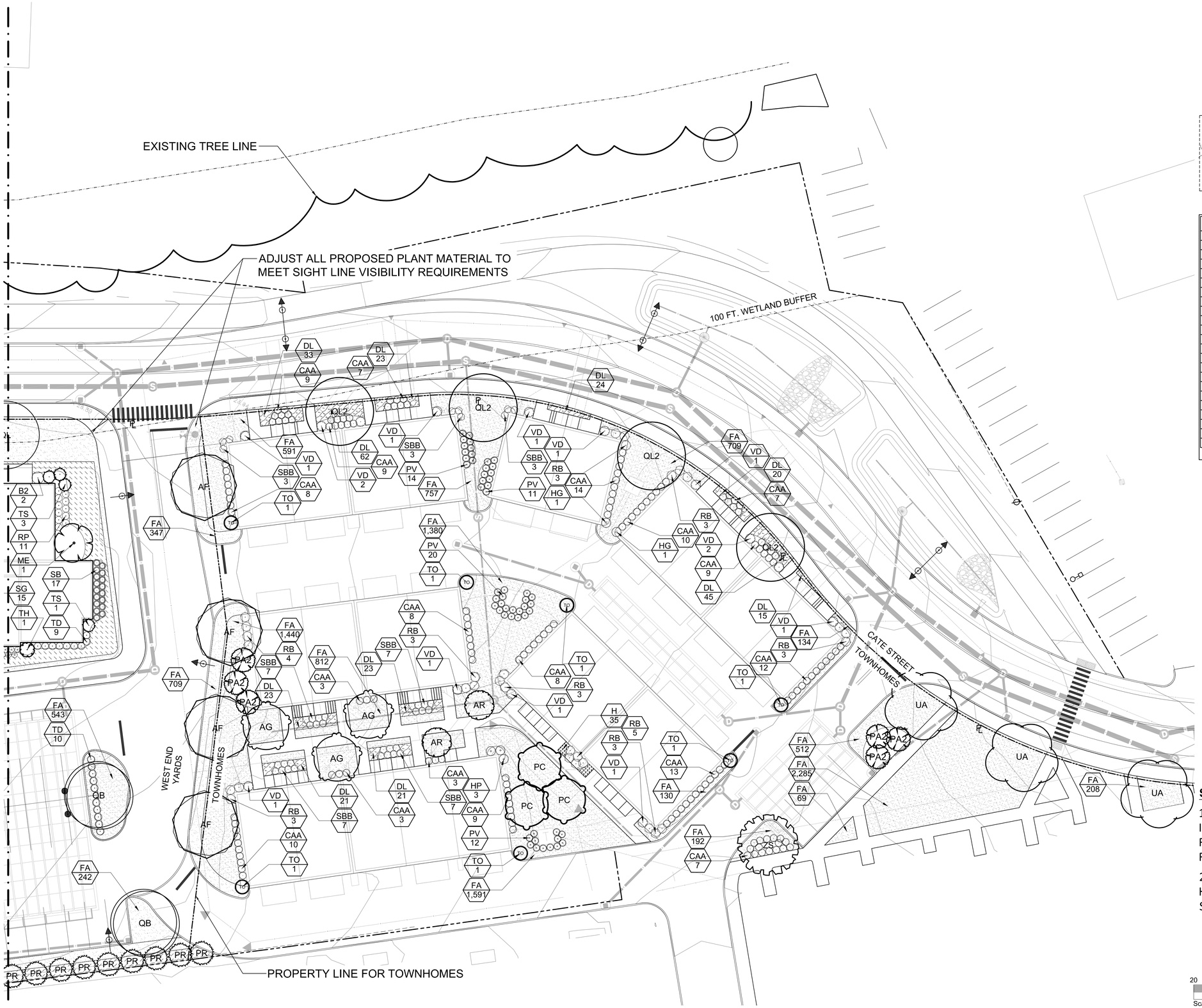
LANDSCAPE PLAN

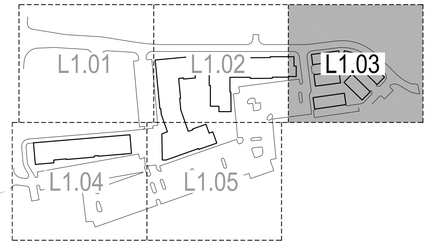
PROJECT NUMBER:
18041.00

L1.02

DATE: 03.18.2019

PERMIT ISSUE





PLANT SCHEDULE TOWNHOMES

TREES	BOTANICAL / COMMON NAME
AG	Amelanchier x grandiflora `Autumn Brilliance` / Autumn Brilliance Serviceberry
AR	Acer rubrum `October Glory` / `October Glory` Maple
PA2	Picea abies / Norway Spruce
PC	Pyrus calleryanna `Chanticleer` / Chanticleer Pear
QL2	Quercus robur x bicolor `Long` / Regal Prince Oak
TO	Thuja occidentalis `Smaragd` / Emerald Green Arborvitae
UA	Ulmus americana `Princeton` / American Elm
ZS	Zelkova serrata `Green Vase` / Green Vase Zelkova
SHRUBS	BOTANICAL / COMMON NAME
CAA	Clethra alnifolia `Ruby Spice` / Ruby Spice Clethra
HG	Hydrangea paniculata `PeeGee Panicle` / PeeGee Panicle` Hydrangea
HP	Hydrangea paniculata `Little Lamb` / Hardy Hydrangea
PV	Panicum virgatum `Shenandoah` / Shenandoah Switch Grass
RB	Rhododendron catawbiense `Boursault` / Boursault Catawba Rhododendron
SBB	Spiraea x bumalda `Anthony Waterer` / Anthony Waterer Spiraea
VD	Viburnum dentatum `Blue Muffin` / Blue Muffin Viburnum
GROUND COVERS	BOTANICAL / COMMON NAME
DL	Hemerocallis x `Stella de Oro` / Stella de Oro Daylily
FA	Festuca arundinacea / Tall Fescue Seed Mix
H	Hosta x `Royal Standard` / Plantain Lily

SITE PLAN NOTE:

1. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

2. ALL SHRUBS WILL BE MAINTAINED TO A HEIGHT OF NO MORE THAN 36" TO ENSURE SIGHT LINES AT INTERSECTIONS.

20 0 20 40 60
Scale 1" = 20'

SITE solutions
LANDSCAPE ARCHITECTURE+ LAND PLANNING
3715 Northside Parkway T: 404.705.9411
300 Northcreek, Bldg. 300 F: 404.705.9491
Atlanta, Georgia 30327 www.sitesolutionsla.com

PROFESSIONAL STAMP:

WEST END YARDS

PREPARED FOR

CATE STREET DEVELOPMENT LLC

SHEET STATUS			
MARK	DATE	BY	RELEASE
A	03/18/2019	SS	TAC SUBMITTAL
B	05/20/2019	SS	TAC RE-SUBMITTAL
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D	07/24/2019	JM	TAC RE-SUBMITTAL
E	08/19/2019	SS	TAC RE-SUBMITTAL

SHEET TITLE:

LANDSCAPE PLAN

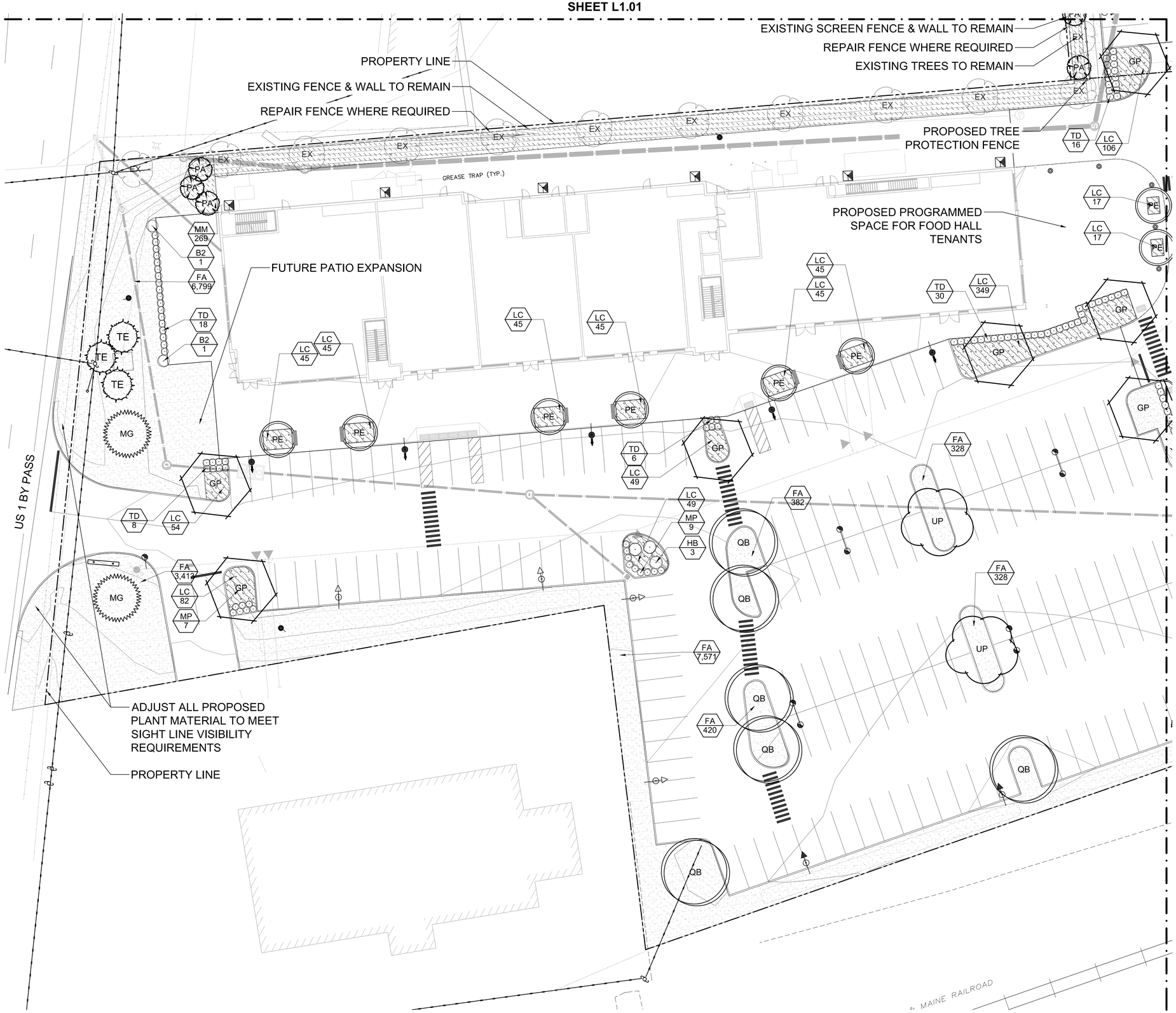
PROJECT NUMBER:
18041.00

L1.03

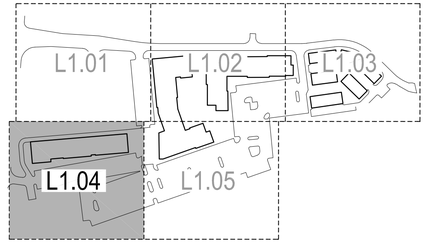
DATE: 03.18.2019

PERMIT ISSUE

SHEET L1.01



SHEET L1.05



PLANT SCHEDULE PLANT SCHEDULE	
TREES	BOTANICAL / COMMON NAME
AF	Acer rubrum `Franksred` TM / Red Sunset Maple
GI	Gleditsia triacanthos inermis `Skycole` TM / Skyline Thornless Honey Locust
GP	Ginkgo biloba `Princeton Sentry` / Princeton Sentry Ginkgo
ME	Magnolia x `Elizabeth` / Magnolia
MG	Metasequoia glyptostroboides / Dawn Redwood
NS2	Nyssa sylvatica / Sour Gum
PA	Picea abies / Norway Spruce
PE	Platanus x acerifolia `Exclamation` TM / Exclamation London Plane Tree
PR	Pinus rigida / Pitch Pine
QB	Quercus bicolor / Swamp White Oak
QL	Quercus robur x bicolor `Long` / Regal Prince Oak
SP	Stewartia pseudocamellia / Japanese Stewartia
TE	Thuja occidentalis `Emerald` / Emerald Arborvitae
TH	Thuja occidentalis `Holmstrup` / Holmstrup Cedar
TO	Thuja occidentalis `Smaragd` / Emerald Green Arborvitae
TS	Thuja occidentalis `Smaragd` / Emerald Green Arborvitae
UP	Ulmus americana `Princeton` / American Elm
SHRUBS	BOTANICAL / COMMON NAME
B2	Buxus sempervirens / American Boxwood
BW	Buxus microphylla `Wintergreen` / Wintergreen Boxwood
CH	Clethra alnifolia `Hummingbird` / Summersweet Clethra
CS	Clethra alnifolia `Ruby Spice` / Ruby Spice Clethra
HB	Hibiscus syriacus `Blue Satin` / Rose-of-Sharon
HL	Hydrangea paniculata `Limelight` TM / Limelight Hydrangea
IP	Ilex x meserveae `Blue Prince` TM / Blue Prince Holly
MP	Myrica pensylvanica / Northern Bayberry
PM	Pinus mugo / Mugo Pine
RG	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac
RP	Rhododendron x `P.J.M.` / Rhododendron P.J.M.
SB	Schizachyrium scoparium `Blue Heaven` / Blue Heaven Little Bluestem
SBB	Spiraea x bumalda `Anthony Waterer` / Anthony Waterer Spiraea
SG	Spiraea japonica `Goldmound` / Spirea
SM	Syringa meyeri `Palibin` / Dwarf Korean Lilac
TD	Taxus x media `Densiformis` / Dense Yew
GROUND COVERS	BOTANICAL / COMMON NAME
FA	Festuca arundinacea / Tall Fescue Seed Mix
HO	Hemerocallis x `Stella de Oro` / Stella de Oro Daylily
LC	Liriope spicata / Creeping Lily Turf
MM	Mulch / Hardwood Mulch
PAR	Perovskia atriplicifolia / Russian Sage

SITE PLAN NOTE:

1. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

2. ALL SHRUBS WILL BE MAINTAINED TO A HEIGHT OF NO MORE THAN 36" TO ENSURE SIGHT LINES AT INTERSECTIONS.

20 0 20 40 60
Scale 1" = 20'

SITE solutions
LANDSCAPE ARCHITECTURE+ LAND PLANNING
3715 Northside Parkway T: 404.705.9411
300 Northcreek, Bldg. 300 F: 404.705.9491
Atlanta, Georgia 30327 www.sitesolutionsla.com

PROFESSIONAL STAMP:

WEST END YARDS

PREPARED FOR

CATE STREET DEVELOPMENT LLC

SHEET STATUS			
MARK	DATE	BY	RELEASE
A	03/18/2019	SS	TAC SUBMITTAL
B	05/20/2019	SS	TAC RE-SUBMITTAL
C	06/20/2019	SS	TAC RE-SUBMITTAL
D	07/24/2019	JM	TAC RE-SUBMITTAL
E	08/19/2019	SS	TAC RE-SUBMITTAL

SHEET TITLE:

LANDSCAPE PLAN

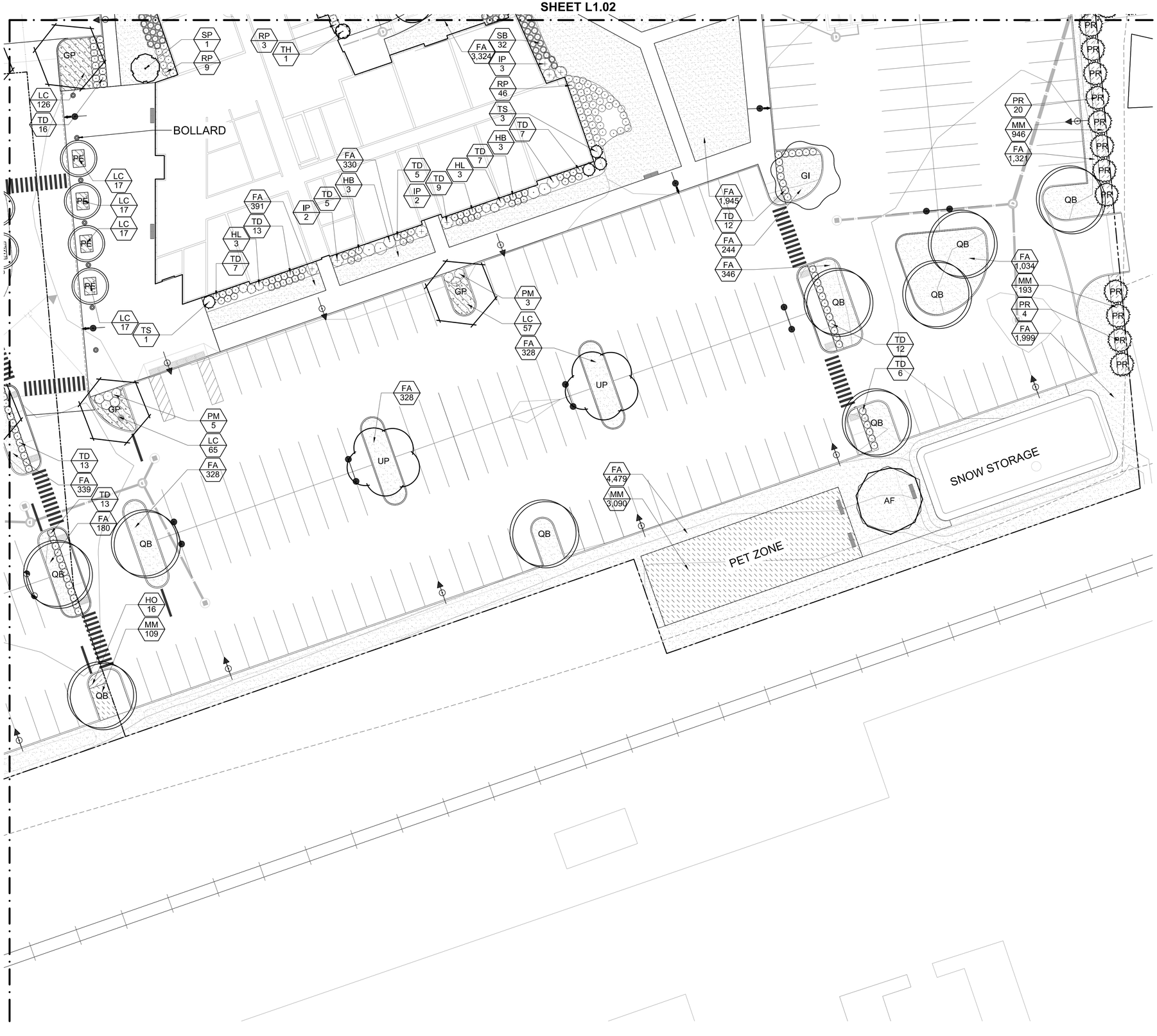
PROJECT NUMBER:
18041.00

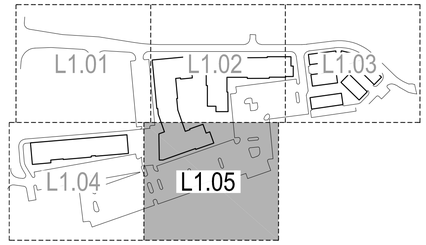
L1.04

DATE: 03.18.2019

PERMIT ISSUE

SHEET L1.02





PLANT SCHEDULE PLANT SCHEDULE

TREES	BOTANICAL / COMMON NAME
AF	Acer rubrum `Franksred` TM / Red Sunset Maple
GI	Gleditsia triacanthos inermis `Skycole` TM / Skyline Thornless Honey Locust
GP	Ginkgo biloba `Princeton Sentry` / Princeton Sentry Ginkgo
ME	Magnolia x `Elizabeth` / Magnolia
MG	Metasequoia glyptostroboides / Dawn Redwood
NS2	Nyssa sylvatica / Sour Gum
PA	Picea abies / Norway Spruce
PE	Platanus x acerifolia `Exclamation` TM / Exclamation London Plane Tree
PR	Pinus rigida / Pitch Pine
QB	Quercus bicolor / Swamp White Oak
QL	Quercus robur x bicolor `Long` / Regal Prince Oak
SP	Stewartia pseudocamellia / Japanese Stewartia
TE	Thuja occidentalis `Emerald` / Emerald Arborvitae
TH	Thuja occidentalis `Holmstrup` / Holmstrup Cedar
TO	Thuja occidentalis `Smaragd` / Emerald Green Arborvitae
TS	Thuja occidentalis `Smaragd` / Emerald Green Arborvitae
UP	Ulmus americana `Princeton` / American Elm
SHRUBS	BOTANICAL / COMMON NAME
B2	Buxus sempervirens / American Boxwood
BW	Buxus microphylla `Wintergreen` / Wintergreen Boxwood
CH	Clethra alnifolia `Hummingbird` / Summersweet Clethra
CS	Clethra alnifolia `Ruby Spice` / Ruby Spice Clethra
HB	Hibiscus syriacus `Blue Satin` / Rose-of-Sharon
HL	Hydrangea paniculata `Limelight` TM / Limelight Hydrangea
IP	Ilex x meserveae `Blue Prince` TM / Blue Prince Holly
MP	Myrica pensylvanica / Northern Bayberry
PM	Pinus mugo / Mugo Pine
RG	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac
RP	Rhododendron x `P.J.M.` / Rhododendron P.J.M.
SB	Schizachyrium scoparium `Blue Heaven` / Blue Heaven Little Bluestem
SBB	Spiraea x bumalda `Anthony Waterer` / Anthony Waterer Spiraea
SG	Spiraea japonica `Goldmound` / Spirea
SM	Syringa meyeri `Palibin` / Dwarf Korean Lilac
TD	Taxus x media `Densiformis` / Dense Yew
GROUND COVERS	BOTANICAL / COMMON NAME
FA	Festuca arundinacea / Tall Fescue Seed Mix
HO	Hemerocallis x `Stella de Oro` / Stella de Oro Daylily
LC	Liriope spicata / Creeping Lily Turf
MM	Mulch / Hardwood Mulch
PAR	Perovskia atriplicifolia / Russian Sage

SITE PLAN NOTE:

1. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

2. ALL SHRUBS WILL BE MAINTAINED TO A HEIGHT OF NO MORE THAN 36" TO ENSURE SIGHT LINES AT INTERSECTIONS.

20 0 20 40 60
Scale 1" = 20'

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Atlanta, Georgia 30327 www.sitesolutionsla.com

PROFESSIONAL STAMP:

WEST END YARDS

PREPARED FOR

CATE STREET DEVELOPMENT LLC

SHEET STATUS

MARK	DATE	BY	RELEASE
A	03/18/2019	SS	TAC SUBMITTAL
B	05/20/2019	SS	TAC RE-SUBMITTAL
C	06/20/2019	SS	TAC RE-SUBMITTAL
D	07/24/2019	JM	TAC RE-SUBMITTAL
E	08/19/2019	SS	TAC RE-SUBMITTAL

SHEET TITLE:

LANDSCAPE PLAN

PROJECT NUMBER:
18041.00

L1.05

DATE: 03.18.2019

PERMIT ISSUE

LANDSCAPE & SCREENING 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.”

CITY OF PORTSMOUTH PLANTING SPECIFICATIONS:

1. ALL PLANTING HOLES SHALL BE HAND DUG- NO MACHINES-NO EXCEPTIONS.
2. ALL WIRE CAGE AND BURLAP SHALL BE REMOVED FROM TREE AND PLANTING HOLE.
3. THE ROOT COLLAR OF THE TREE SHALL BE 2”-3” ABOVE GRADE.
4. ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH **ORGANIC** COMPOST.
5. ALL PLANTINGS SHALL BE BACKFILLED IN LIFTS AND ALL LIFTS SHALL BE WATERED SO THAT THE PLANTING WILL BE SET AND FREE FROM AIR POCKETS.
6. A RING OF SOIL SHALL BE CREATED AROUND THE PERIMETER OF THE HOLE TO CREATE A WELL FOR WATERING.
7. AT THE TIME THE PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE THOROUGH HYDRATION OF THE ROOTS AND BACKFILL MATERIAL.
8. 2”-3” OF **COMPOSTED** WOODCHIPS SHALL BE PLACED OVER THE PLANTING AREA.
9. STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NON-DAMAGING TO THE TREE.

SITE PLAN NOTE:

ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

LANDSCAPE NOTES:

1) ALL SHRUBS ON PARKING LOT ISLANDS SHOULD BE MAINTAINED AT A HEIGHT OF NO MORE THAN 3 FEET, TO ENSURE SIGHT LINES AT INTERSECTIONS.

WEST END YARDS DETAILED PLANT SCHEDULE

Trees	Botanical Name / Common Name	Plant Size at Installation	Plant Size at maturity	Growth Habit	Salt Tolerance (soil)	Notes
5	Acer rubrum `Franksred` TM / Red Sunset Maple	2.5" cal.	45' ht.	Broadly Pyramidal	Low	Native
4	Gleditsia triacanthos inermis `Skycole` TM / Skyline Thornless Honey Locust	3" cal.	40' ht.	Broadly Pyramidal	High	
12	Ginkgo biloba `Princeton Sentry` / Princeton Sentry Ginkgo	2.5" cal.	60' ht.	Narrow Upright	High	Male Species Only
1	Magnolia X `Elizabeth` (M. acuminata X M. denudata) / Elizabeth Magnolia	2" cal	50' ht.	Pyramidal	Low	Very Cold Hardy
2	Metasequoia glyptostroboides / Dawn Redwood	12` ht.	70' ht.	Conically Pyramidal	Low	Hardy to Zone 5-B
3	Nyssa Sylvatica / Sour Gum	3" cal.	40-70' ht.	Pyramidal	Medium	Native
15	Picea abies / Norway Spruce	8` ht.	40' ht.	Pyramidal	Medium	
12	Platanus x acerifolia `Exclamation` TM / Exclamation London Plane Tree	2.5" cal.	75' ht.	Upright spreading	Medium	Hardy to Zone 5-B
24	Pinus rigida / Pitch Pine	5` ht.	30' ht.	Pyramidal	High	Native
20	Quercus bicolor / Swamp White Oak	3" cal.	60' ht.	Spreading	High	Native
6	Quercus robur x bicolor `Long` / Regal Prince Oak	3" cal.	60' ht.	Columnar	Medium	
2	Stewartia pseudocamellia / Japanese Stewartia	2" cal	30' ht.	Pyramidal/Oval	Low	Hardy to Zone 5-B
3	Thujua occidentalis 'Emerald' / Emerald Arborvitae	6' ht.	6' ht.	Narrow Compact	High	Native
11	Thuja occidentalis `Holmstrup` / Holmstrup Cedar	7` ht.	5' ht.	Narrow Compact	High	Native
23	Thuja occidentalis `Smaragd` / Emerald Green Arborvitae	10` ht.	40' ht.	Conically Pyramidal	High	Native
8	Ulmus americana `Princeton` / American Elm	2.5" cal.	60' ht.	Ascending vase shape	High	Native
Shrubs						
19	Buxus sempervirens / American Boxwood	36" ht. x 36" spd.	4' ht. x 4' spd.	Globe shape	Low	
19	Buxus microphylla `Wintergreen` / Wintergreen Boxwood	5 gal.	4' ht. x 4' spd.	Globe shape	High	
27	Clethra alnifolia `Hummingbird` / Summersweet	3 gal	6' ht.	Spreading open	High	Tolerates salt spray
28	Hibiscus syriacus `Blue Satin` / Rose-of-Sharon	4` ht.	8' ht.	Upright Spreading	Low	Tolerates alkaline soil
59	Hydrangea paniculata `Limelight` TM / Limelight Hydrangea	3 gal.	4'-8' ht.	Spreading	High	Long Lived
23	Ilex x meserveae `Blue Prince` TM / Blue Prince Holly	4` ht.	12' ht.	Dense compact	Low	Very Cold Hardy
21	Myrica pensylvanica / Northern Bayberry	3 gal	6'-8' ht.	Rounded	High	Tolerates salt spray
8	Pinus mugo / Mugo Pine	7 gal.	4-10' ht.	Spreading	High	
68	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac	3 gal.	2' ht.	Low Spreading	High	
227	Rhododendron x `P.J.M.` / Rhododendron P.J.M.	3 gal	4-8' ht.	Dense compact	Low	
123	Schizachyrium scoparium `Blue Heaven` / Blue Heaven Little Bluestem	3 gal	3-4' ht.	Upright	Medium	
15	Spiraea japonica `Goldmound` / Spirea	3 gal	4' ht. x 4' spd.	Rounded Bushy	Low	
20	Syringa meyeri `Palibin` / Dwarf Korean Lilac	5 gal.	4-8' ht.	Spreading	Medium	
365	Taxus x media `Densiformis` / Dense Yew	3 gal	4' ht.	Upright	High	
Ground Cover and Lawn						
163	Perovskia atriplicifolia / Russian Sage	1 gal.	3-4' ht.	Upright	High	
1,309	Liriope spicata / Creeping Lily Turf	1 gal.	12" ht.	Spreading	Low	
16	Hemerocallis x `Stella de Oro` / Stella de Oro Daylily	1 gal.	12" ht.	Upright spreading	Medium	
79,950	Festuca arundinacea / Tall Fescue Grass	SF				
14,182	Mulch / Hardwood Mulch	SF				

TOWNHOMES DETAILED PLANT SCHEDULE

Trees	Botanical Name / Common Name	Plant Size at Installation	Plant Size at maturity	Growth Habit	Salt Tolerance (soil)	Notes
3	Amelanchier x grandiflora `Autumn Brilliance` / Autumn Brilliance Serviceberry	2.5" cal.	45' ht.	Pyramidal	Medium	Native
5	Acer rubrum 'October Glory' / October Glory Maple	2.5" cal.	45' ht.	Broadly Pyramidal	Low	Native
6	Picea abies / Norway Spruce	8` ht.	40' ht.	Pyramidal	Medium	
3	Pyrus calleryanna `Chanticleer` / Chanticleer Pear	2.5" cal.	75' ht.	Pyramidal	Medium	Hardy to Zone 5-B
4	Quercus robur x bicolor `Long` / Regal Prince Oak	3" cal.	60' ht.	Columnar	Medium	
7	Thuja occidentalis `Smaragd` / Emerald Green Arborvitae	10` ht.	60' ht.	Ascending vase shape	High	Native
3	Ulmus americana `Princeton` / American Elm	2.5" cal.	60' ht.	Ascending vase shape	High	Native
1	Zelkova serrata `Green Vase` / Green Vase Zelkova	2.5" cal.	60' ht.	Ascending vase shape	High	Native
Shrubs						
154	Clethra alnifolia `Ruby Spice` / Ruby Spice Clethra	3 gal	6' ht.	Spreading open	High	Tolerates salt spray
2	Hydrangea paniculata `PeeGee Panicle` / PeeGee Panicle` Hydrangea	4` ht.	8' ht.	Upright Spreading	Low	Tolerates alkaline soil
3	Hydrangea paniculata `Limelight` TM / Limelight Hydrangea	3 gal.	4'-8' ht.	Spreading	High	Long Lived
54	Panicum virgatum `Shenandoah` / Shenandoah Switch Grass	3 gal.	4'-8' ht.	Spreading	Low	Very Cold Hardy
30	Rhododendron catawbiense `Boursault` / Boursault Catawba Rhododendron	3 gal	4-8' ht.	Dense compact	Low	
37	Spiraea x bumalda `Anthony Waterer` / Anthony Waterer Spiraea	3 gal	4' ht. x 4' spd.	Rounded Bushy	Low	
14	Viburnum dentatum `Blue Muffin` / Blue Muffin Viburnum	3 gal	4' ht.	Rounded Bushy	Medium	
Ground Cover and Lawn						
35	Hosta x `Royal Standard` / Plantain Lily	1 gal.	12" ht.	Spreading	Low	
310	Hemerocallis x `Stella de Oro` / Stella de Oro Daylily	1 gal.	12" ht.	Upright spreading	Medium	
10,810	Festuca arundinacea / Tall Fescue Grass	SF				

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PROFESSIONAL STAMP:

WEST END YARDS

PREPARED FOR

CATE STREET DEVELOPMENT LLC

SHEET STATUS

MARK	DATE	BY	RELEASE
A	03/18/2019	SS	TAC SUBMITTAL
B	05/20/2019	SS	TAC RE-SUBMITTAL
C	06/20/2019	SS	TAC RE-SUBMITTAL
D	07/24/2019	JM	TAC RE-SUBMITTAL
E	08/19/2019	SS	TAC RE-SUBMITTAL

SHEET TITLE:

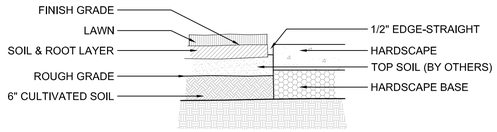
LANDSCAPE NOTES & PLANT SCHDULES

PROJECT NUMBER:
18041.00

L1.06

DATE: 03.18.2019

PERMIT ISSUE

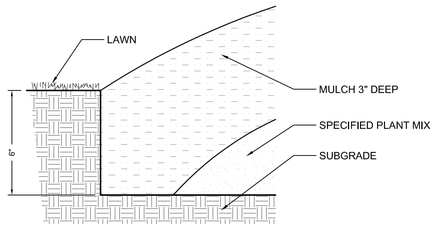


INSTALLATION NOTES:

1. GENERAL CONTRACTOR TO PROVIDE GRADES TO WITHIN TWO TENTH OF A FOOT FOR PROPOSED GRADES.
2. CULTIVATE TO A DEPTH OF 6".
3. FINE GRADE AS REQUIRED TO REACH FINISH GRADE PER CIVIL DRAWINGS.
4. APPLY LIME AND FERTILIZER, AS SPECIFIED.
5. APPLY PRE-EMERGENT HERBICIDE PER MANUFACTURE'S RECOMMENDATION.
6. LAY SOD & ROLL LEVEL.
7. WATER ENTIRE AREA THOROUGHLY.
8. 1. INSTALL SOD SO THAT THE TOP OF SOIL & ROOT LAYER IS LEVEL WITH TOP OF PAVEMENT

1 SECTION: TYP. SOD INSTALLATION

SCALE: N.T.S.

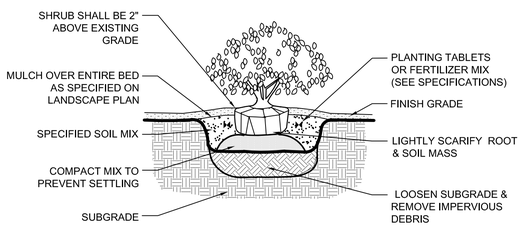


NOTES:

1. TRENCH EDGE IS TO BE LOCATED BETWEEN ALL PLANTING BEDS & LAWN AREAS.

2 SECTION: TRENCH EDGE

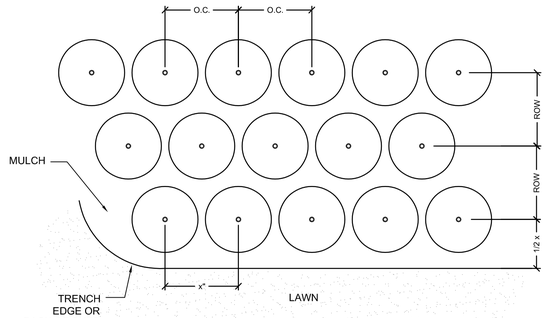
SCALE: NTS



NOTES:
1. IF ROOTBALL IS WRAPPED IN NON-BIODEGRADEABLE BURLAP, REMOVE ENTIRE WRAP AFTER PLACED IN PIT.

3 SECTION: TYP. CONTAINERIZED SHRUB PLANTING

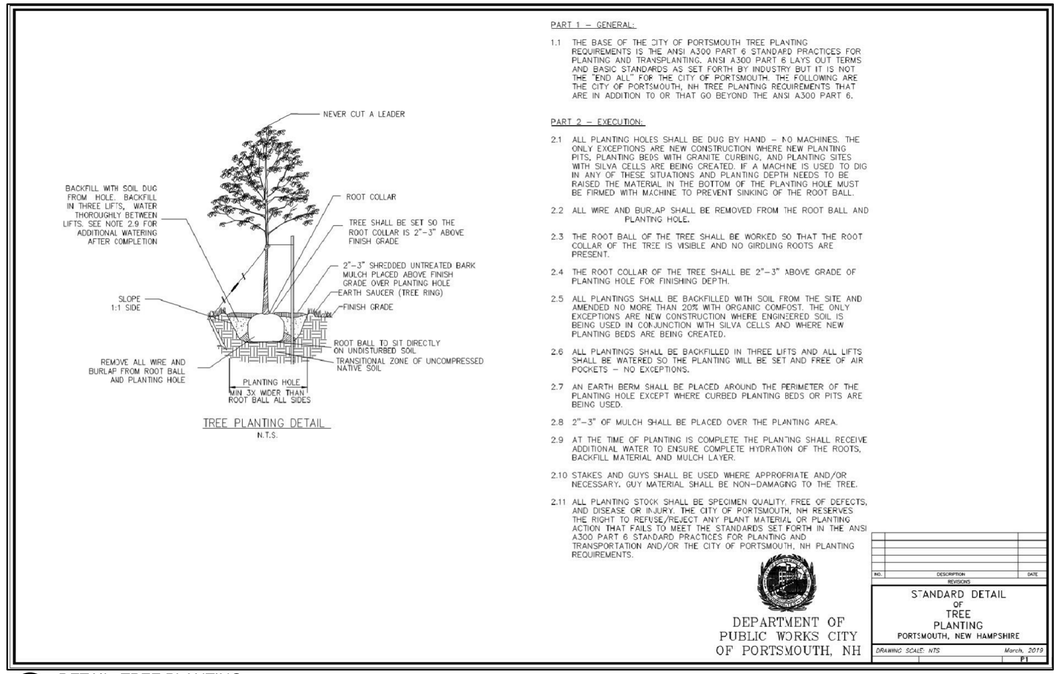
SCALE: NTS



NOTE:
1. IF ROOTBALL IS WRAPPED IN NON-BIODEGRADEABLE BURLAP, REMOVE ENTIRE WRAP AFTER PLACED IN PIT.
2. 'X'= TYP. ON CENTER SPACING AS SHOWN ON PLANT SCHEDULE
3. ALL ROWS TO BE STRAIGHT AND PARALLEL

4 PLAN: TYP. PLAN MASS SPACING

SCALE: NTS



TREE PLANTING DETAIL
N.T.S.

PART 1 – GENERAL:

1.1 THE BASE OF THE CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS IS THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING. ANSI A300 PART 6 LAYS OUT TERMS AND BASIC STANDARDS AS SET FORTH BY INDUSTRY BUT IT IS NOT THE "END ALL" FOR THE CITY OF PORTSMOUTH. THE FOLLOWING ARE THE CITY OF PORTSMOUTH, NH TREE PLANTING REQUIREMENTS THAT ARE IN ADDITION TO OR THAT GO BEYOND THE ANSI A300 PART 6.

PART 2 – EXECUTION:

2.1 ALL PLANTING HOLES SHALL BE DUG BY HAND – NO MACHINES. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE NEW PLANTING PITS, PLANTING BEDS WITH GRANITE CURBING, AND PLANTING SITES WITH SILVA CELLS ARE BEING CREATED. IF A MACHINE IS USED TO DIG IN ANY OF THESE SITUATIONS AND PLANTING DEPTH NEEDS TO BE RAISED THE MATERIAL IN THE BOTTOM OF THE PLANTING HOLE MUST BE FIRMED WITH MACHINE TO PREVENT SINKING OF THE ROOT BALL.

2.2 ALL WIRE AND BURLAP SHALL BE REMOVED FROM THE ROOT BALL AND PLANTING HOLE.

2.3 THE ROOT BALL OF THE TREE SHALL BE WORKED SO THAT THE ROOT COLLAR OF THE TRSE IS VISIBLE AND NO GIRDLING ROOTS ARE PRESENT.

2.4 THE ROOT COLLAR OF THE TREE SHALL BE 2"–3" ABOVE GRADE OF PLANTING HOLE FOR FINISHING DEPTH.

2.5 ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH ORGANIC COMPOST. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE ENGINEERED SOIL IS BEING USED IN CONJUNCTION WITH SILVA CELLS AND WHERE NEW PLANTING BEDS ARE BEING CREATED.

2.6 ALL PLANTINGS SHALL BE BACKFILLED IN THREE LIFTS AND ALL LIFTS SHALL BE WATERED SO THE PLANTING WILL BE SET AND FREE OF AIR POCKETS – NO EXCEPTIONS.

2.7 AN EARTH BERM SHALL BE PLACED AROUND THE PERIMETER OF THE PLANTING HOLE EXCEPT WHERE CURBED PLANTING BEDS OR PITS ARE BEING USED.

2.8 2"–3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.

2.9 AT THE TIME OF PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE COMPLETE HYDRATION OF THE ROOTS, BACKFILL MATERIAL AND MULCH LAYER.

2.10 STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NON–DAMAGING TO THE TREE.

2.11 ALL PLANTING STOCK SHALL BE SPECIMEN QUALITY, FREE OF DEFECTS, AND DISEASE OR INJURY. THE CITY OF PORTSMOUTH, NH RESERVES THE RIGHT TO REFUSE/REJECT ANY PLANT MATERIAL OR PLANTING ACTION THAT FAILS TO MEET THE STANDARDS SET FORTH IN THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPORTATION AND/OR THE CITY OF PORTSMOUTH, NH PLANTING REQUIREMENTS.

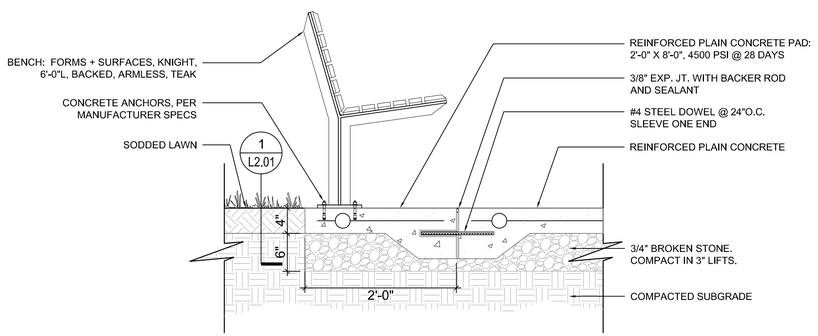
DEPARTMENT OF PUBLIC WORKS CITY OF PORTSMOUTH, NH

NO.	DESCRIPTION	DATE
	REVISIONS	

S"ANDARD DETAIL OF TREE PLANTING
PORTSMOUTH, NEW HAMPSHIRE
DRAWING SCALE: NTS — March, 2019 — P1

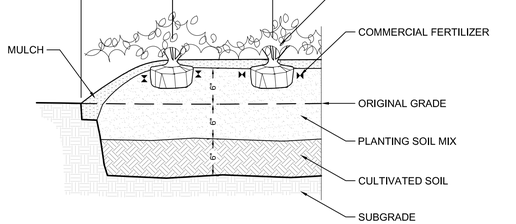
5 DETAIL: TREE PLANTING

SCALE: NTS



8 DETAIL: BENCH

1" = 1'-0"

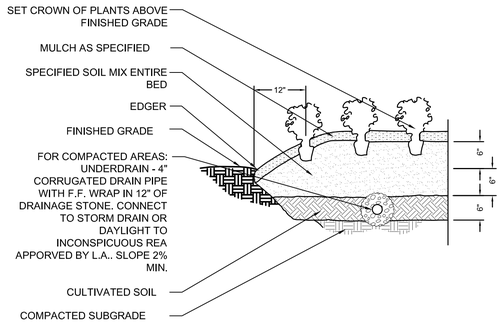


NOTES:

1. IF ROOTBALL IS WRAPPED IN NON-BIODEGRADEABLE BURLAP, REMOVE ENTIRE WRAP AFTER PLACED IN PIT.
2. 'X'= TYP. ON CENTER SPACING AS SHOWN ON PLANT SCHEDULE
3. ALL ROWS TO BE STRAIGHT AND PARALLEL
4. TYP. BED INSTALLATION DETAIL FOR ERICACEOUS PLANT MATERIAL (RHODODENDRON, AZALEAS, PIERIS, ECT.)

6 SECTION: TYP. ERICACEOUS PLANT MATERIAL INSTALL.

SCALE: NTS



NOTES:

1. REFER TO SPECIFICATIONS FOR FERTILIZATION REQUIREMENTS.

7 SECTION: SEASONAL COLOR & PERENNIAL BED PREP.

SCALE: NTS

1. Contractor to carefully examine the contract documents and existing conditions before submitting bid proposal or commencing work.
2. Damage to existing utilities or site improvements caused by the contractor are the full responsibility of contractor.
3. Contractor's base bid to include all materials, labor, permits, equipment, tools, insurance, ETC. to perform the work as described in the contract documents.
4. Contractor to complete work within schedule established by owner.
5. Contractor to provide one year warranty for all material from date of substantial completion.
6. Provide unit price for all materials (installed cost) listed on the plant schedule.
7. Contractor to provide interim maintenance (watering, pruning, fertilizing, guying, mowing, trimming, adequate drainage of ponding areas, edging, weeding, mulching, application of insecticides/herbicides, and general landscape clean-up) until substantial completion notice is provided by the owner or landscape architect.
8. Perform work in compliance with all applicable laws, codes, and regulations required by authorities having jurisdiction over such work and provide for permits required by local authorities.
9. Topsoil shall be natural, fertile, friable, sandy clay loam capable of sustaining plant growth, free of stones, stumps, ETC.
10. For all turf lawn areas spread 2-3" of topsoil into existing soil to a depth of 6" below finish grade. Hand rake finished grades to provide even contours.
11. All planted material shall be equivalent in quality to specimen grade or better, as noted by the American Association of Nurserymen, latest edition. All trees of lesser quality shall be rejected by the city arborist.
12. Plant material to be free of disease, insect pests, eggs, or larvae. Damaged plant material shall be rejected.
13. Mulch to be clean, fresh, new, double shredded bark, 3 inches deep.
14. Test plant beds and plant pits for adequate drainage. Work shall be made by the contractor at no additional cost to owner. Hardpan or moisture barriers shall be broken, or drain pipes to be installed to provide proper drainage of plant areas. Plant pits shall be excavated to the bottom of the pit. Fill each plant pit with water and observe the pit for 2 hours. If the water has not dissipated by 50% within 2 hours, notify the landscape architect of such in writing before installing plants in the questionable area(s), otherwise contractor shall be held liable for the livability of the plant. In hardpan conditions where water does not drain within 2 hours, install drain pipes as per tree planting in compacted soil area detail.
15. Trees shall be Installed 2-3" above finish grade in hardpan areas unless otherwise directed to provide drainage.
16. Plant beds shall be neatly edged using a 3" wide by 6" wide deep trench. Provide 2/1 side slope behind trench edge.
17. Ground cover, shrub mass beds shall be cultivated to a depth of 12 inches below grade to break through compacted or hardpan soil. Remove all stones, roots, and inferior material. Add specified soil amendments and fertilizer. Elevate entire bed 6 inches above original grade. Rake to a consistent smooth surface. Install plants, edge bed area, mulch and water thoroughly.
18. Set all plants plumb and turned so that the most attractive side is viewed.
19. Plants shall be measured to their main structure, not tip to tip of branches.
20. Remove top one-third burlap of B & B wrapping. Remove all binding. If rootball is wrapped in non-biodegradeable burlap, remove entire wrap after placed in pit.
21. Tree pit and shrub pit to be twice the size of the root mass. Fill with plant mix. See details.
22. Broken root balls for trees shall be rejected.
23. Any plant materials shipped to site in uncovered vehicles/ trailer shall be rejected regardless of season.
24. Space shrubs, ground cover, and seasonal color evenly and in straight rows.
25. All tree scars over 1 -1/2" shall be rejected and tree to be replaced.
26. All shrubs to be dense and full. All trees to have a symmetrical growth habit (360 degrees) unless uncharacteristic to plant type.
27. Scarify root mass of shrubs and ground cover before installing.
28. Remove all excess growth of trees and shrubs as directed by landscape architect. Do not cut central leader.
29. Layout all plant material according to landscape drawings. Receive approval of all layouts before installation. Adjustments to the layout shall be made by the landscape architect. Landscape contractor to make adjustments to layout at no additional cost to the owner. Landscape contractor responsible for adjustment of layout in order to avoid utilities. Notify landscape architect of contemplated adjustments to the layout and receive approval before commencing.
30. General contractor to provide grades to two-tenths (.20+) of a foot of proposed finish grades.
31. All shrubs shall be dense and well-branched from bottom to top and all sides. "Leggy" shrubs will be rejected by L.A.
32. Owner or landscape architecture shall review project at completion of installation for substantial completion. Final completion shall be given at the end of the warranty period If all Items are completed to the owner's satisfaction. Contractor shall be notified in writing of substantial and final completion dates.
33. See civil drawings for further information regarding: erosion sediment control information, locations of existing and proposed structures, paving, driveways, cut and fill areas, and retention areas, limits of construction, locations of existing and proposed utilities or easements.
34. Contractor shall collect three (3) soil samples of existing soil from areas on site to receive planting for testing. Each soil sample shall be approximately 1 kg. (1 gal. zip lock bag) In volume and will receive the following tests by A&L Agricultural Labs:
- s1-a
- s3
- texture analysis
- infiltration

34. Sight lines may not be obstructed between a height of 30-inches and 84-inches above the crown of the roadway surface. The property owner must maintain all landscaping according to this requirement at all times.

SITE solutions
LANDSCAPE ARCHITECTURE+ LAND PLANNING
3715 Northside Parkway T: 404.705.9411
300 Northcreek, Bldg. 300 F: 404.705.9491
Atlanta, Georgia 30327 www.sitesolutionsla.com

PROFESSIONAL STAMP:

WEST END YARDS

PREPARED FOR

CATE STREET DEVELOPMENT LLC

SHEET STATUS

MARK	DATE	BY	RELEASE
A	03/18/2019	SS	TAC SUBMITTAL
B	05/20/2019	SS	TAC RE-SUBMITTAL
C	06/20/2019	SS	TAC RE-SUBMITTAL
D	07/24/2019	JM	TAC RE-SUBMITTAL
E	08/19/2019	SS	TAC RE-SUBMITTAL

SHEET TITLE:

LANDSCAPE DETAILS

PROJECT NUMBER:
18041.00

L2.01

DATE: 03.18.2019

PERMIT ISSUE

AREA TO RECEIVE HIGH EFFICIENCY IRRIGATION SYSTEM

50 0 50 100 150

Scale 1" = 50'

SITE solutions

LANDSCAPE ARCHITECTURE+ LAND PLANNING

3715 Northside Parkway T: 404.705.9411
300 Northcreek, Bldg. 300 F: 404.705.9491
Atlanta, Georgia 30327 www.sitesolutionsla.com

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D	07/24/2019	JM	TAC RE-SUBMITTAL
E	08/19/2019	SS	TAC RE-SUBMITTAL

SHEET TITLE:

IRRIGATION LAYOUT PLAN

PROJECT NUMBER:
18041.00

IR1.01

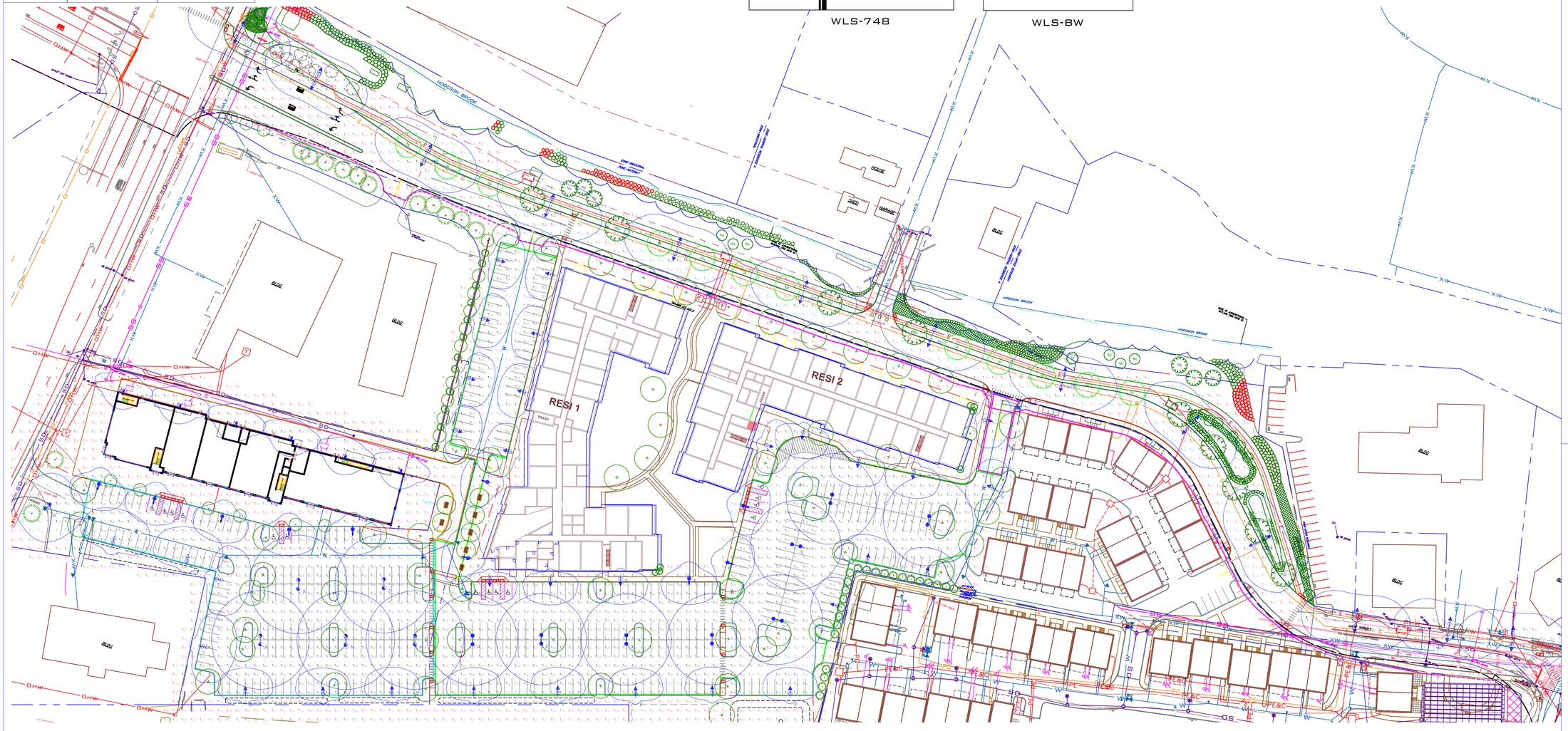
DATE: 03.18.2019

PERMIT ISSUE

REVISIONS					
Rev #	Date	BY:	5	6/20/19	TO
1	12/10/18	TO	6	6/23/19	TO
2	3/17/19	TO	7	7/10/19	TO
3	5/16/19	TO			
4	5/19/19	TO			

WLS-748

WLS-BW



ENERGY SERVICES GROUP OF WLS

1-800-633-8711 - WWW.WLSLIGHTING.COM

Based on the information provided, all dimensions and luminaire locations shown represent recommended positions. The engineer and/or architect must determine applicability of the layout to existing or future field conditions.

This lighting pattern represents illumination levels calculated from laboratory data taken under controlled conditions utilizing current industry standard lamp ratings in accordance with Illuminating Engineering Society approved methods. Actual performance of any manufacturer's luminaire may vary due to variation in electrical voltage, tolerance in lamps and other variable field conditions.

Calculation Summary							
Label	Avg	Max	Min	Avg/Min	Max/Min	PtSpcLr	PtSpcTb
CATE ST ENTRANCE	1.8	4.4	0.9	2.0	4.9	10	10
RESIDENTIAL PARKING	2.8	6.4	0.8	3.5	8.0	10	10
RETAIL PARKING	3.6	7.1	1.1	3.3	6.5	10	10
RETAIL REAR AND SIDE	2.3	4.7	0.3	7.8	15.7	10	10

Luminaire Schedule

WLS14527 WEST END YARDS PORTSMOUTH, NH PM: ROBBY PLEASE EMAIL ROBBY AT RRUDASILL@WLSLIGHTING.COM FOR PRICING.

Symbol	Qty	Label	Lumens	LLF	Description	Lum. Watts
	5	A	N.A.	0.950	WLS-748-135W-5F-4K 20' MOUNTING HEIGHT	135
	1	B	N.A.	0.950	WLS-748-135W-5F-4K 20' MOUNTING HEIGHT	135
	4	C	N.A.	0.950	WLS-748-135W-4F-4K-HS 20' MOUNTING HEIGHT	135
	8	D	N.A.	0.950	WLS-748-110W-5F-4K 20' MOUNTING HEIGHT	110
	10	E	N.A.	0.950	WLS-748-80W-4F-4K 16' MOUNTING HEIGHT	80
	28	F	N.A.	0.950	WLS-748-80W-4F-4K-HS 16' MOUNTING HEIGHT	80
	6	G	N.A.	0.980	WLS-BW-70-2M-4K ASST MOUNTING HEIGHT	70
	13	ST2	9316	0.900	AFFIN-S801-80W-30K-T2-10-M 25' MOUNTING HEIGHT	80

1919 WINDSOR PLACE
FORT WORTH, TX 76110
WWW.WLSLIGHTING.COM

WLS LIGHTING SYSTEMS

Consider the Impact!

WEST END YARDS
PORTSMOUTH, NH

WLS-14527A | DATE - 11/16/18 | SCALE: 1"=60' | PM: ROBBY | BY: TO | 800-633-8711 | SHEET 1 OF 1

ABUTTERS

TAX MAP 158, LOT 13
SLATTERY & DUMONT, LLC
66 OLD CONCORD TURNPIKE #10
BARRINGTON, NH 03825
R.C.R.D. BOOK 3471, PAGE 196

TAX MAP 163, LOT 1
M & B PROPERTIES, LLC
54 BARTLETT STREET
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5794, PAGE 996

TAX MAP 163, LOT 2
INDUSTRIAL RENTS–NH, LLC
6 WAYNE ROAD
WESTFORD, MA 01886
R.C.R.D. BOOK 5606, PAGE 2334

TAX MAP 163, LOT 32
SHARAN R. GROSS REV. TRUST
180 BIRCH HILL RD
YORK, ME 03909
R.C.R.D BOOK 5261 PAGE 2208
R.C.R.D. BOOK 3406 PAGE 1383

TAX MAP 163, LOT 35
ELDREDGE BREWERY REALTY PARTNERSHIP
1 CATE ST
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 2572 PAGE 2635

TAX MAP 163, LOT 36
CST HOLDINGS, LLC
3 CATE ST
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 3923 PAGE 202

TAX MAP 163, LOT 37
CITY OF PORTSMOUTH
PO BOX 628
PORTSMOUTH, NH 03802
R.C.R.D. BOOK 2284 PAGE 812

TAX MAP 164, LOT 1
PORTSMOUTH LUMBER & HARDWARE, LLC
105 BARTLETT STREET
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5372, PAGE 2606

TAX MAP 164, LOT 2
PORTSMOUTH LUMBER & HARDWARE, LLC
105 BARTLETT STREET
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5808, PAGE 1379

TAX MAP 164, LOT 4
BOSTON & MAINE CORP.
IRON HORSE PARK, HIGH STREET
NO. BILLERICA, MA 01862

TAX MAP 164, LOT 5
HOUSTON HOLDINGS, LLC
653 ISLINGTON STREET
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 3558, PAGE 464

TAX MAP 164, LOT 12
JOSEPH GOBBI SUPPLY CORP.
PO BOX 125
PORTSMOUTH, NH 03802
R.C.R.D. BOOK 3233, PAGE 1949

TAX MAP 165, LOT 1
CATE STREET LLC
105 BARTLETT STREET
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5903 PAGE 1436

TAX MAP 165, LOT 14
BOSTON AND MAINE CORP
IRON HORSE PK HIGH ST
NO BILLERICA, MA 01862
R.C.R.D. BOOK PAGE

TAX MAP 172, LOT 2
406 HIGHWAY 1 BYPASS, LLC
549 US HIGHWAY 1 BYPASS
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5671 PAGE 2150

TAX MAP 173, LOT 3
EDGAR W. & JANICE E. ANDERSON
224 CATE ST
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 2956 PAGE 1071

TAX MAP 173, LOT 9
PAUL J. HOLLOWAY
C/O COAST PONTIAC
500 US HYWY 1 BYPASS
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 2821 PAGE 2396

TAX MAP 173, LOT 10
AREC 13, LLC C/O U–HAUL INTERNATIONAL
PO BOX 29046
PHOENIX, AZ 85038
R.C.R.D. BOOK 4575 PAGE 950

TAX MAP 174, LOT 14
AER RE LLC
185 COTTAGE STREET
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5965, PAGE 2216

TAX MAP 233, LOT 145
CITY OF PORTSMOUTH
1 JUNKINS AVENUE
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5127, PAGE 2074

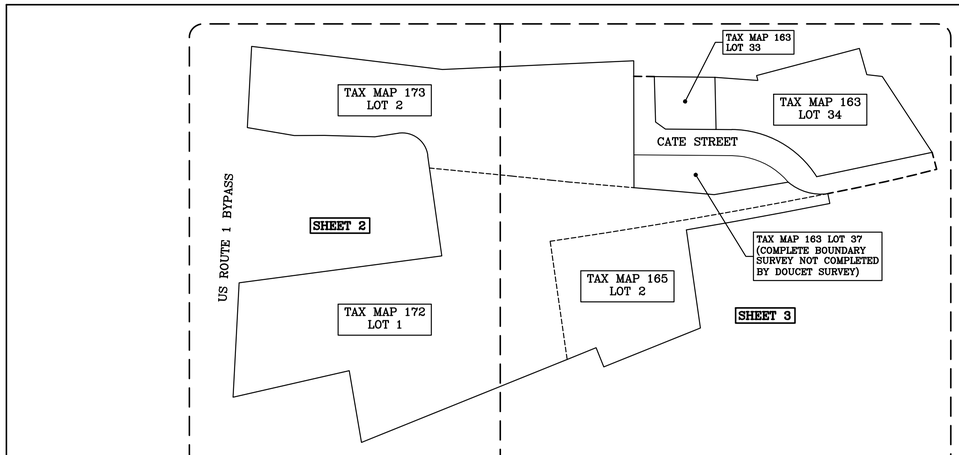
TAX MAP 234, LOT 2A
PUBLIC SERVICE CO. OF NH
PO BOX 270
HARTFORD, CT 06141
R.C.R.D. BOOK 1257, PAGE 324

TAX MAP 234, LOT 3
PUBLIC SERVICE CO. OF NH
PO BOX 270
HARTFORD, CT 06141
R.C.R.D. BOOK 5548, PAGE 738

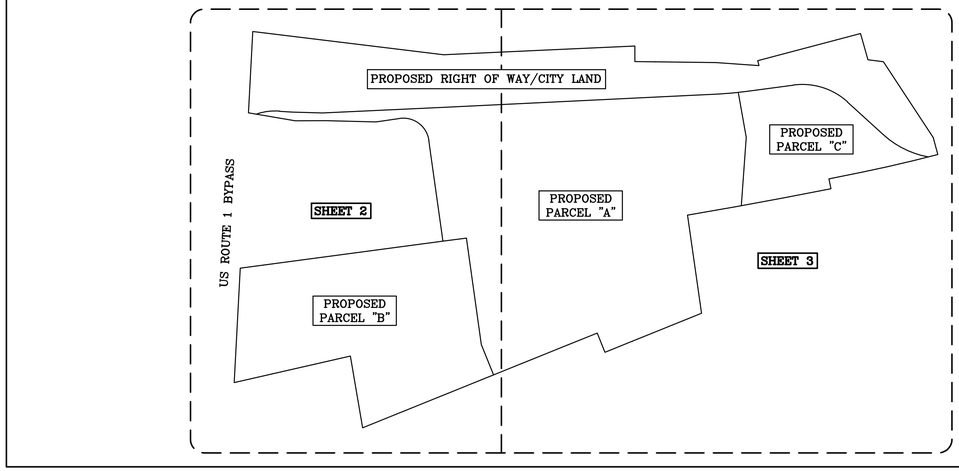
TAX MAP 234, LOT 5
SEACOAST DEVELOPMENT GROUP, LLC
505 US ROUTE 1 BYPASS
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 3107, PAGE 950

TAX MAP 234, LOT 7–6
CREFIII WARAMAUG PORTSMOUTH, LLC
C/O CTMI, LLC
PO BOX 741328
DALLAS, TX 75374
R.C.R.D. BOOK 5620, PAGE 1675

TAX MAP 234, LOT 51
MEADOWBROOK INN CORP.
C/O PORTSMOUTH CHEVROLET
549 ROUTE 1 BYPASS
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 2382, PAGE 1968



EXISTING PARCEL LAYOUT



PROPOSED PARCEL LAYOUT

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR BY THOSE UNDER MY DIRECT SUPERVISION AND FALLS UNDER THE URBAN SURVEY CLASSIFICATION OF THE NH CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS. I CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. RANDOM TRAVERSE SURVEY BY TOTAL STATION, WITH A PRECISION GREATER THAN 1:15,000.

L.L.S. #989

8/19/19
DATE

THE CERTIFICATIONS SHOWN HEREON ARE INTENDED TO MEET REGISTRY OF DEED REQUIREMENTS AND ARE NOT A CERTIFICATION TO TITLE OR OWNERSHIP OF PROPERTY SHOWN. OWNERS OF ADJOINING PROPERTIES ARE ACCORDING TO CURRENT TOWN ASSESSORS RECORDS.

STATE OF NEW HAMPSHIRE — No. 989 — MATTHEW A. FAGGINGER–AUER — LICENSED LAND SURVEYOR

SIGNATURE

NOTES:

1. REFERENCE: TAX MAP 163, LOT 33 – 12,230 SF OR 0.28 AC.
TAX MAP 163, LOT 34 – 64,109 SF OR 1.47 AC.

TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2
COMBINED AREA – 451,572 SF OR 10.37 AC.

2. OWNER OF RECORD: CATE STREET DEVELOPMENT LLC
11 ELKINS STREET, SUITE 420
BOSTON, MA 02127
R.C.R.D. BOOK 5959, PAGE 109

3. ZONES: GW1–GATEWAY NEIGHBORHOOD MIXED USE CORRIDOR (SEE CITY OF PORTSMOUTH ZONING ORDINANCE FOR DIMENSIONAL REQUIREMENTS. SUBJECT LOTS WERE REZONED TO GW1 ON DECEMBER 4, 2017 PER SAID ORDINANCE.)

–SEE SITE PLANS FOR DIMENSIONAL REQUIREMENTS AND DEVELOPMENT SITE STANDARDS.

4. FIELD SURVEY PERFORMED BY P.J.S. & J.C.M. DURING NOVEMBER 2016 USING A TRIMBLE S6 TOTAL STATION, A TRIMBLE R8 SURVEY GRADE GPS UNIT, A TRIMBLE TSC3 DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL, BY L.P.S. & S.N.F. DURING JULY 2018 AND T.M.M. & J.C.M. IN SEPTEMBER & OCTOBER 2018 USING A TRIMBLE S6 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS. ADDITONAL FIELD SURVEY PERFORMED BY M.C. DURING NOVEMBER 2016 AND OCTOBER 2018 USING A LEICA HDS SCANNER.

5. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY MARC JACOBS IN NOVEMBER 2016 AND REVIEWED BY GOVE ENVIRONMENTAL SERVICES, INC. DURING APRIL 2018 IN ACCORDING TO THE US ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y–87–1, JANUARY 1987 AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2102 AND FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, MAY 2017, NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE.

6. FLOOD HAZARD ZONE: "X", PER FIRM MAP #33015C0259E, DATED 5/17/05.

7. VERTICAL DATUM IS BASED ON NGVD29 PER DISK V 28 1942 ELEV. 25.59.

8. HORIZONTAL DATUM BASED ON NEW HAMPSHIRE STATE PLANE(2800) NAD83(2011) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.

9. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH AND IN RELATION TO THE CURRENT LEGAL DESCRIPTION, AND IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.

10. DUE TO THE COMPLEXITY OF RESEARCHING ROAD RECORDS AS A RESULT OF INCOMPLETE, UNORGANIZED, INCONCLUSIVE, OBLITERATED, OR LOST DOCUMENTS, THERE IS AN INHERENT UNCERTAINTY INVOLVED WHEN ATTEMPTING TO DETERMINE THE LOCATION AND WIDTH OF A ROADWAY RIGHT OF WAY. THE EXTENT OF (THE ROAD(S)) AS DEPICTED HEREON IS/ARE BASED ON RESEARCH CONDUCTED AT THE PORTSMOUTH CITY HALL, PORTSMOUTH DEPARTMENT OF ENGINEERING, THE ROCKINGHAM COUNTY REGISTRY OF DEEDS, AND THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION.

11. FINAL MONUMENTATION MAY BE DIFFERENT THAN THE PROPOSED MONUMENTATION SHOWN HEREON, DUE TO THE FACT THAT SITE CONDITIONS WILL DICTATE THE ACTUAL LOCATION AND TYPE OF MONUMENTS INSTALLED IN THE FIELD. PLEASE REFER TO EITHER THE "MONUMENTATION LOCATION PLAN" TO BE RECORDED OR CONTACT DOUCET SURVEY, INC. FOR CLARIFICATION OF MONUMENTS SET. (A RECORDED PLAN WILL BE PRODUCED AT THE DISCRETION OF DOUCET SURVEY, INC.).

–SEE SHEET 4 FOR NOTES 12 & 13 SPECIFIC TO EXISTING AND PROPOSED EASEMENT.
–SEE SHEET 6 FOR NOTES SPECIFIC TO EXISTING CONDITIONS.

REFERENCE PLANS

1. "MAINE–NEW HAMPSHIRE INTERSTATE BRIDGE AUTHORITY, PISCATAQUA RIVER BRIDGE, KITTERY, MAINE–PORTSMOUTH, NEW HAMPSHIRE, RIGHT OF WAY MAPS, N.H. APPROACH,BY ALBERT MOULTON, CE, DATED 1954, ON FILE A THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION.

2. "PLAT OF LAND U.S. ROUTE 1 BY–PASS PORTSMOUTH, NEW HAMPSHIRE FOR GRIFFIN FAMILY CORP.", BY DURGIN, VERRA AND ASSOCIATES, INC., DATED JANUARY 20, 1992, RECEIVED FROM THE OFFICE OF JAMES VERRA.

3. "LOT LINE REVISION U.S. ROUTE ONE BY–PASS, PORTSMOUTH, N.H. FOR WIGGIN, PARSONS, & O'BRIEN, BY JOHN W. DURGIN ASSOCIATES, INC., DATED JANUARY 22, 1982, R.C.R.D. PLAN D–10722.

4. "PLAN OF LAND FOR JOSEPH J. O'BRIEN JR.& SR., CATE STREET/ROUTE 1 BY–PASS, PORTSMOUTH, N.H., BY RICHARD P. MILLETTE AND ASSOCIATES, DATED NOVEMBER 17, 1988, R.C.R.D. PLAN D–19110.

5. "LAND IN PORTSMOUTH, N.H., BOSTON AND MAINE RAILROAD TO ALL STATE REALTY CORPORATION", BY BRENTON V. SCHOFIELD, DATED FEBRUARY 1964, R.C.R.D. PLAN 160.

6. "LOT LINE RELOCATION PLAN FOR U–HAUL REAL ESTATE COMPANY AND FRANCIS J. COSTELLO CATE STREET/ROUTE 1 BY–PASS, PORTSMOUTH, N.H.", BY RICHARD P. MILLETTE AND ASSOCIATES, DATED MAY 25, 1995, R.C.R.D. PLAN D–24912.

7. "SUBDIVISION OF LAND HEIRS OF CORNELUS COAKLEY", BY MCKENNA ASSOCIATES, DATED JULY 26, 1972, R.C.R.D. PLAN D–3790.

8. "LOT LINE REVISION PORTSMOUTH, N.H. FOR MICHAEL A. PAGANO", BY JOHN W. DURGIN ASSOCIATES, DATED JUNE 26, 1981, R.C.R.D. PLAN D–10278.

9. "SITE PLAN OF ELDREDGE PARK WEST PREPARED FOR ELDREDGE BREWERY REALTY PARTNERSHIP", BY KIMBALL CHASE COMPANY, INC., DATED JULY 23, 1987, R.C.R.D. PLAN D–16894.

10. "PLAN OF LAND OF FRANK JONES BREWING CORP. & PAUL C. BADGER & NORMAN E. RAND PORTSMOUTH, N.H.", BY JOHN W. DURGIN, CIVIL ENGINEERS, DATED SEPTEMBER 1950, R.C.R.D. PLAN 01635.

11. "LOT LINE ADJUSTMENT PLAN FOR LAND OWNED BY SHARON R. GROSS REVOCABLE TRUST, KNOWN AS TAX MAP 163, LOT 31 & 32 LOCATED ALONG #201 & 235 CATE STREET", BY KNIGHT HILL LAND SURVEYING SERVICES, INC., DATED JULY 28, 2011, R.C.R.D. PLAN D–37021.

12. "SITE REVIEW PLAN FOR LAND OWNED BY SHARON R. GROSS REVOCABLE TRUST, KNOWN AS TAX MAP 163, LOT 32 LOCATED ALONG #201 & CATE STREET", BY KNIGHT HILL LAND SURVEYING SERVICES, INC., DATED DECEMBER 2002, R.C.R.D. PLAN D–30850.

13. "PLAN SHOWING DIVISION OF ELDREDGE BREWING CO. LOT IN PORTSMOUTH, N.H. OWNED BY ALBERT HISLOP", BY WM A. GROVER, DATED DECEMBER 11, 1918, R.C.R.D. PLAN 18.

14. "PLAN OF LAND PORTSMOUTH, N.H. ATLANTIC REALTY CORP. TO KITTERY LAUNDRY, INC.", BY JOHN W. DURGIN, DATED AUGUST 1964, R.C.R.D. PLAN 300.

15. "CITY OF PORTSMOUTH, N.H. DEFENSE HOMES SEWER LOCATION PLAN", BY JOHN W. DURGIN DATED MAY 1961, R.C.R.D. PLAN 1106.

16. "LAND IN PORTSMOUTH, N.H. BOSTON AND MAINE RAILROAD TO M.H. PARSONS & SONS LUMBER COMPANY, INC.", R.C.R.D. BOOK 1267, PAGE 16.

17. "PLAN OF LAND PORTSMOUTH, N.H. FOR M.H. PARSONS REALTY CORP.", BY JOHN W. DURGIN, DATED DECEMBER 1956, R.C.R.D. BOOK 1431, PAGE 275.

18. "SITE PLAN PORTSMOUTH, N.H. PREPARED FOR U–HAUL OF N.H. AND VT., INC.", BY JOHN W. DURGIN, DATED JUNE 4, 1980, R.C.R.D. PLAN D–9642.

19. "STANDARD PROPERTY SURVEY & PROPOSED SIDEWALK EASEMENT FOR THE CITY OF PORTSMOUTH FOR PROPERTY AT 185 COTTAGE STREET OWNED BY COLMAN C. GARLAND", BY EASTERLY SURVEYING, INC., SATED NOVEMBER 30, 2012, R.C.R.D. PLAN D–38047.

20. "PLOT PLAN FOR MARIAN M. BADGER, PORTSMOUTH, N.H.", BY JOHN W. DURGIN, DATED JULY 1973, RECIEVED FROM THE OFFICE OF JAMES VERRA.

21. "LAND ON CATE STREET, PORTSMOUTH, N.H., BADGER & RAND TO PORTSMOUTH POWER CO.", BY JOHN W. DURGIN, DATED JANUARY 8, 1926, RECEIVED FROM THE OFFICE OF JAMES VERRA.

22. "RIGHT–OF–WAY AND TRACK MAP BOSTON AND MAINE R.R. OPERATED BY THE BOSTON & MAINE R.R., STATION 2928+05 TO 2966+20", DATED JUNE 30, 1914, ON FILE AT THE NH DEPARTMENT OF TRANSPORTATION.

23. "ALTA/ACSM LAND TITLE SURVEY, TAX MAP 234, LOT 51 PROPERTY OF THE MEADOWBROOK INN CORPORATION", BY MSC CIVIL ENGINEERS & LAND SURVEYORS, DATED DECEMBER 2, 2018, R.C.R.D. PLAN D–36980.

24. "LOT LINE REVISION PLAN TAX MAP R–34 LOTS 6 & 7–6, LOCATED ON BORTHWICK AVE., COAKLEY ROAD AND U.S. ROUTE 1 BYPASS IN PORTSMOUTH, NH", BY KIMBALL CHASE, DATED OCTOBER 20, 1993, R.C.R.D. PLAN #D–22686.

25. "PLAN OF LAND FOR SEACOAST DEVELOPMENT GROUP, LLC, US ROUTE 1 BYPASS & COAKLEY ROAD, PORTSMOUTH, NH", BY MILLETTE, SPRAGUE & COLWELL, INC., DATED JUNE 7, 2002, R.C.R.D. PLAN #D–30041.

26. "LOT LINE REVISION PLAN LAND OF SEARAY REALTY, LLC", BY DOUCET SURVEY, INC., DATED MARCH 12, 2014, R.C.R.D. PLAN D–38435.

27. "STANDARD PROPERTY SURVEY & PROPOSED SIDEWALK EASEMENT FOR THE CITY OF PROTSMOUTH FOR PROPERTY AT 185 COTTAGE STREET PORTSMOUTH, NH OWNED BY COLMAN C. GARLAND", BY NORTH EASTERLY SURVEYING, INC., DATED NOVEMBER 30, 2012, R.C.R.D. PLAN #D–38017.

28. "PLAN OF A LOT OF LAND BELONGING TO FRANK JONES", DATED JULY 1901, R.C.R.D. PLAN #223.

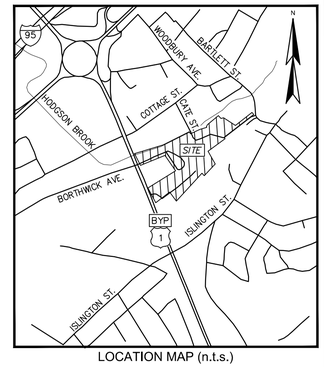
29. "MEADOWBROOK INN CONDOMINIUM SITE PLAN, MAP 234, LOT 51 IN PORTSMOUTH, NH, PREPARED FOR THE MEADOWBROOK INN CORPORATION", BY VANASSE HANGEN BRUSTLIN, INC., DATED SEPTEMBER 25, 2009, R.C.R.D. PLAN #D–36162.

30. "PROPOSED EASEMENTS – BARTLETT STREET, BARTLETT SEWER SEPARATION PROJECT OVER LAND OF PAN AM RAILWAYS, PORTSMOUTH, NH FOR CITY OF PORTSMOUTH", BY JAMES VERRA AND ASSOCIATES, INC., DATED OCTOBER 1, 2007, R.C.R.D. PLAN #D–35477.

31. "EASEMENT PLAN – 653 ISLINGTON STREET, BARTLETT SEWER SEPARATION PROJECT OVER LAND OF HOUSTON HOLDINGS, LLC", BY JAMES VERRA AND ASSOCIATES, INC., DATED JUNE 22, 2009, R.C.R.D. PLAN #D–35957.

32. "LAND TRANSFER AND EASEMENT PLAN, 30 CATE STREET PORTSMOUTH, NH OWNED BY MERTON ALAN INVESTMENTS, LLC.", BY TF MORAN/MSC, DATED OCTOBER 31, 2017, R.C.R.D. PLAN #D–40742.

33. "LAND IN PORTSMOUTH, N.H. BARTLETT & CATE STREET", BY JOHN W. DURGIN CIVIL ENGINEER, DATED JULY 1924, R.C.R.D. PLAN #0133.



LOCATION MAP (n.t.s.)

SUBDIVISION PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34
TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2
CATE STREET & US ROUTE 1 BYPASS
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	8/19/19	ADD ADDITIONAL EASEMENTS	MWF

DRAWN BY: M.W.F.	DATE: JULY 3, 2019
CHECKED BY: W.J.D.	DRAWING NO.: 5517D
JOB NO.: 5517	SHEET 1 OF 10

APPROVED FOR THE RECORD

CHAIRMAN PORTSMOUTH PLANNING BOARD DATE

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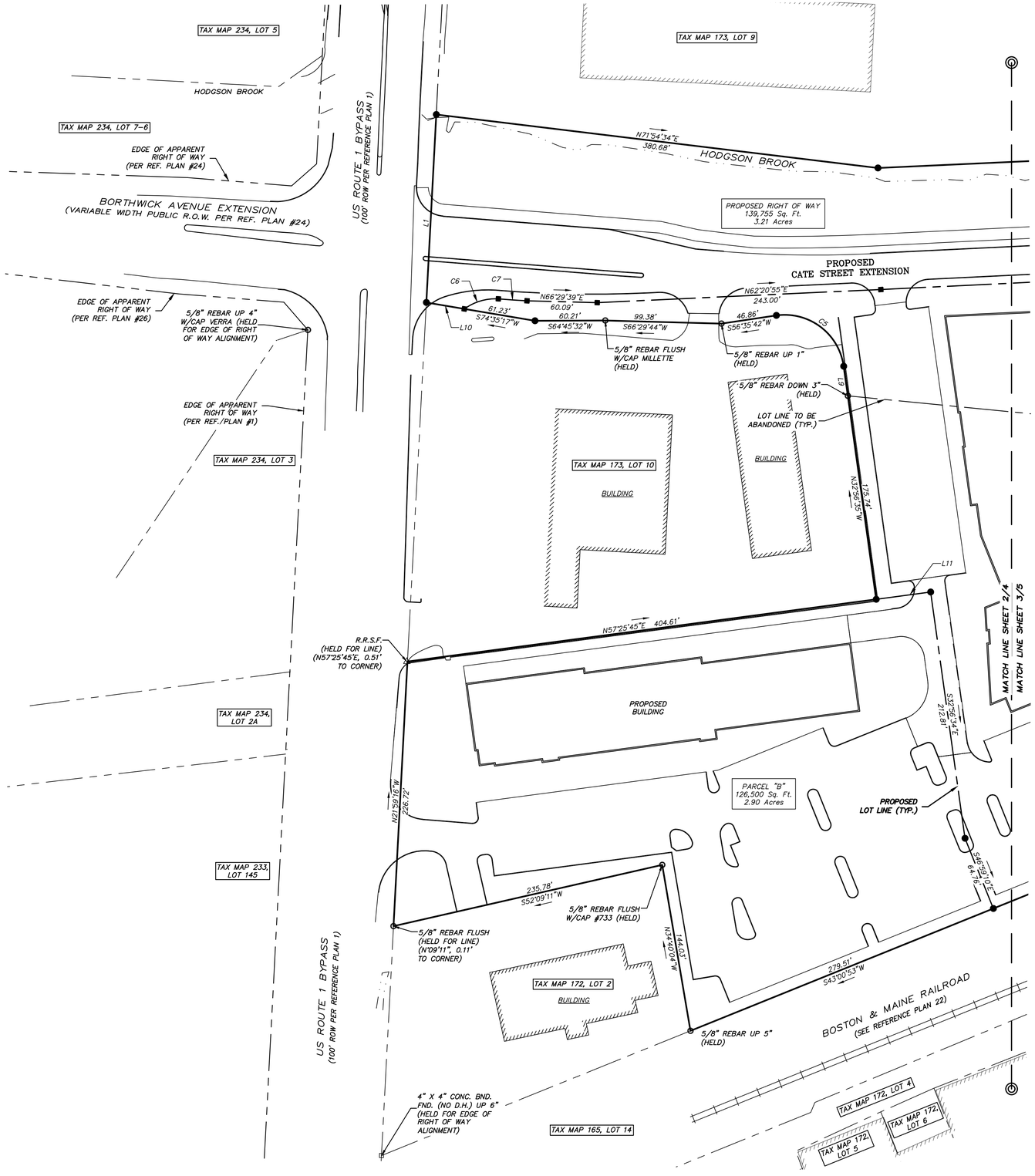
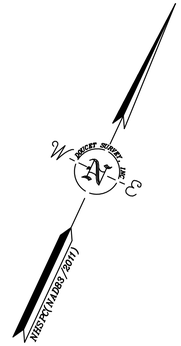


CURVE TABLE					
CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	19.41'	2836.93'	0°23'31"	S50°31'13"W	19.41'
C2	134.92'	2836.93'	2°43'29"	N52°04'44"E	134.90'
C3	180.71'	11451.20'	0°54'15"	N54°18'39"E	180.71'
C4	108.14'	11451.20'	0°32'28"	N55°02'01"E	108.14'
C5	80.85'	51.00'	90°49'33"	S78°21'38"E	72.64'
C6	30.94'	45.00'	39°23'52"	N48°30'09"E	30.34'
C7	24.56'	1008.50'	1°23'42"	N68°53'56"E	24.56'
C8	38.52'	635.87'	3°28'15"	N60°29'39"E	38.51'
C9	15.14'	635.87'	1°21'52"	N58°04'35"E	15.14'
C10	115.78'	133.00'	49°52'37"	N82°19'58"E	112.16'
C11	99.86'	178.00'	32°08'32"	N88°47'59"W	98.55'
C12	181.57'	200.00'	52°00'57"	S83°14'19"E	175.40'
C13	84.14'	100.00'	48°12'27"	N81°13'11"E	81.68'

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N21°59'16"W	161.10'
L2	S25°06'26"E	30.74'
L3	N65°44'42"E	40.75'
L4	N38°11'17"W	10.00'
L5	N71°55'42"E	30.64'
L6	S40°12'57"E	34.79'
L7	S36°26'29"E	20.00'
L8	N46°59'07"W	41.00'
L9	N32°56'35"W	25.61'
L10	S74°35'17"W	32.98'
L11	N57°25'45"E	47.00'
L12	S26°33'24"E	20.39'
L13	S79°44'51"E	24.00'
L14	N65°28'25"E	31.49'
L15	S55°22'43"W	92.06'
L16	S55°22'43"W	56.61'
L17	N20°49'54"W	60.72'
L18	N20°49'54"W	74.81'
L19	N35°02'16"W	44.30'
L20	N35°02'16"W	46.03'



LEGEND

- LOT LINE
- PROPOSED LOT LINE
- APPARENT RIGHT OF WAY LINE
- LOT LINE TO BE ABANDONED
- APPROXIMATE ABUTTER LOT LINE
- EDGE OF WETLAND
- BOUND FOUND
- R.R.S.F. RAILROAD SPIKE FOUND
- IRON PIPE/ROD FOUND
- 4"X4" GRANITE BOUND TO BE SET
- 5/8" REBAR W/ID CAP TO BE SET

BND. FND. BOUND FOUND
I.P.F. IRON PIPE FOUND
CONC. CONCRETE
D.H. DRILL HOLE

APPROVED FOR THE RECORD

CHAIRMAN PORTSMOUTH PLANNING BOARD DATE

STATE OF NEW HAMPSHIRE — No. 989 — MATTHEW A. FAGGINGER-AUER — LICENSED LAND SURVEYOR — SIGNATURE

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR BY THOSE UNDER MY DIRECT SUPERVISION AND FALLS UNDER THE URBAN SURVEY CLASSIFICATION OF THE NH CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS. I CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. RANDOM TRAVERSE SURVEY BY TOTAL STATION, WITH A PRECISION GREATER THAN 1:15,000.

L.L.S. #989

6/19/19 DATE

THE CERTIFICATIONS SHOWN HEREON ARE INTENDED TO MEET REGISTRY OF DEED REQUIREMENTS AND ARE NOT A CERTIFICATION TO TITLE OR OWNERSHIP OF PROPERTY SHOWN. OWNERS OF ADJOINING PROPERTIES ARE ACCORDING TO CURRENT TOWN ASSESSORS RECORDS.

50 0 50 100

SCALE: 1 INCH = 50 FT.

SUBDIVISION PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34

TAX MAP 165, LOT 2

TAX MAP 172, LOT 1

TAX MAP 173, LOT 2

CATE STREET & US ROUTE 1 BYPASS

PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	8/19/19	ADD ADDITIONAL EASEMENTS	MWF

DRAWN BY:	M.W.F.	DATE:	JULY 3, 2019
CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	2 OF 10

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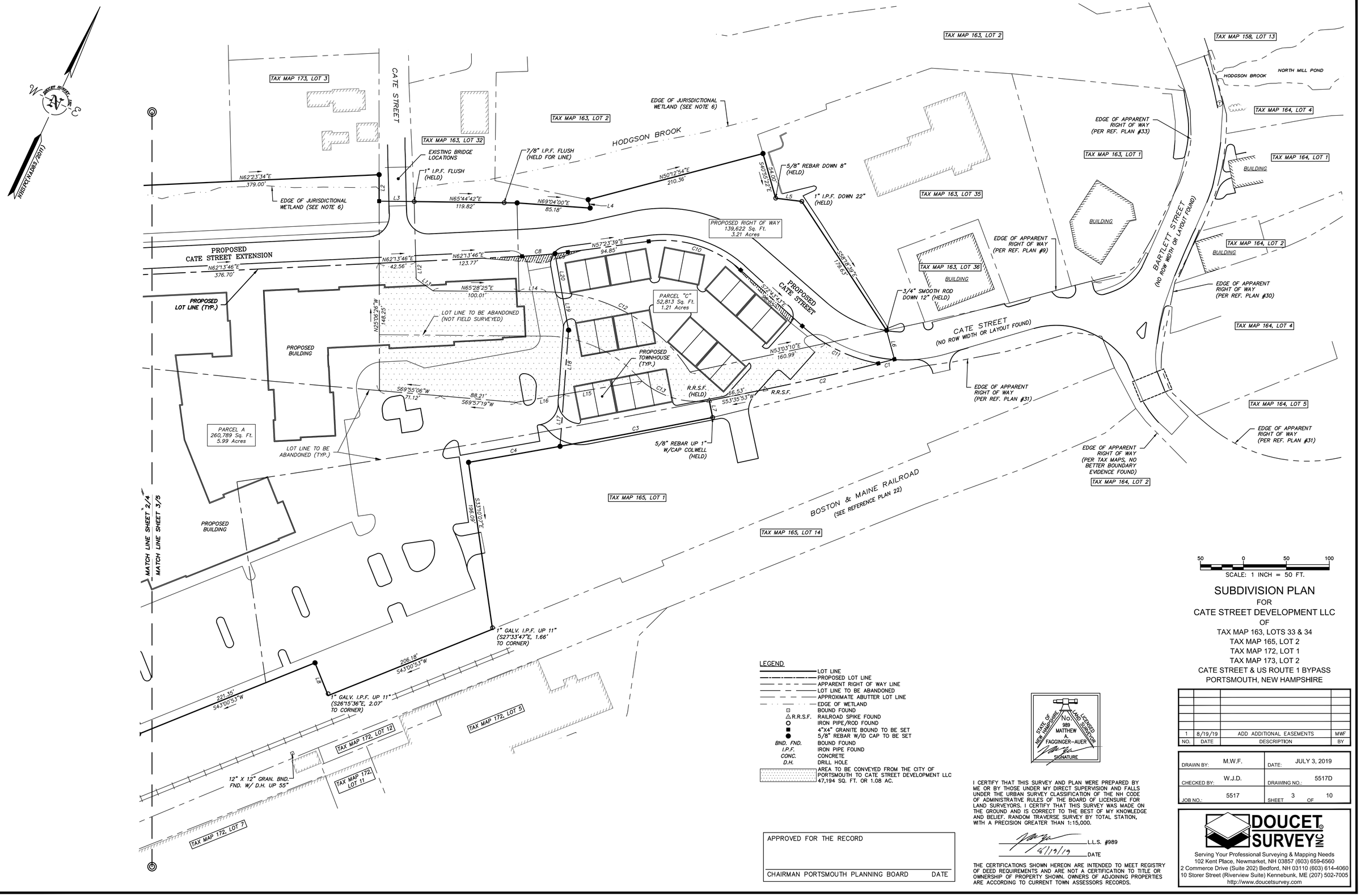

50 0 50 100

SCALE: 1 INCH = 50 FT.

LEGEND

	LOT LINE
	PROPOSED LOT LINE
	APPARENT RIGHT OF WAY LINE
	LOT LINE TO BE ABANDONED
	APPROXIMATE ABUTTER LOT LINE
	EDGE OF WETLAND
⊡	BOUND FOUND
△ R.R.S.F.	RAILROAD SPIKE FOUND
○	IRON PIPE/ROD FOUND
■	4"X4" GRANITE BOUND TO BE SET
●	5/8" REBAR W/ID CAP TO BE SET
BND. FND.	BOUND FOUND
I.P.F.	IRON PIPE FOUND
CONC.	CONCRETE
D.H.	DRILL HOLE
	AREA TO BE CONVEYED FROM THE CITY OF PORTSMOUTH TO CATE STREET DEVELOPMENT LLC 47,194 SQ. FT. OR 1.08 AC.

APPROVED FOR THE RECORD

CHAIRMAN PORTSMOUTH PLANNING BOARD DATE

STATE OF NEW HAMPSHIRE — No. 989 — MATTHEW A. FAGGINGER-AUER — LICENSED LAND SURVEYOR — SIGNATURE

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L.L.S. #989

6/19/19 DATE

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SUBDIVISION PLAN

FOR
CATE STREET DEVELOPMENT LLC
OF
TAX MAP 163, LOTS 33 & 34
TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2
CATE STREET & US ROUTE 1 BYPASS
PORTSMOUTH, NEW HAMPSHIRE

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JOB NO.:	5517	SHEET	3 OF 10

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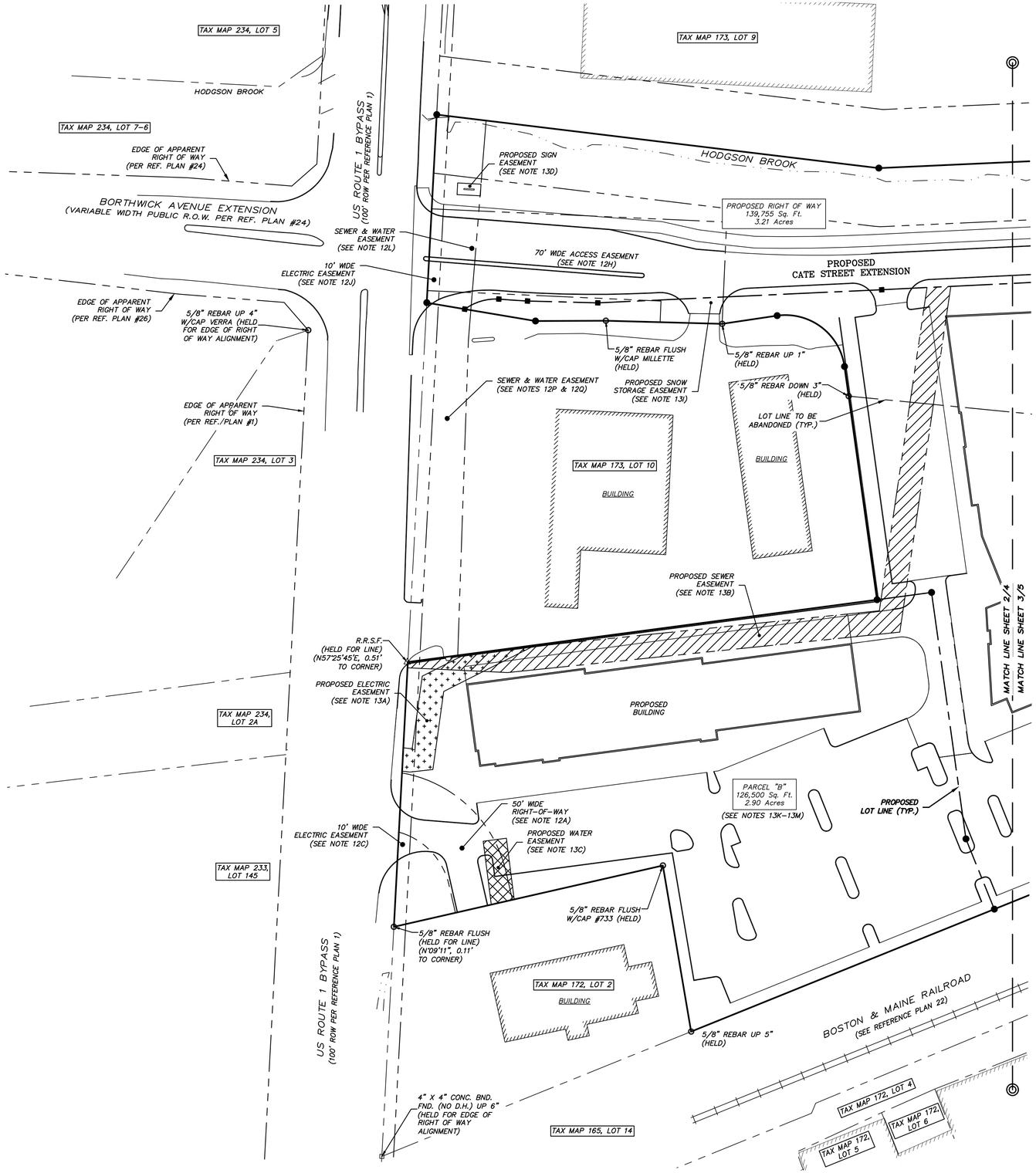

SEE SHEET 1 FOR NOTES 1–11.

12. THE FOLLOWING LOTS ARE EITHER SUBJECT TO OR IN BENEFIT OF, BUT NOT LIMITED TO, THE FOLLOWING EASEMENTS/RIGHTS OF RECORD:

TAX MAP 172, LOT 1
- A. SUBJECT TO A 50' WIDE RIGHT OF WAY FOR THE BENEFIT OF TAX MAP 172, LOT 2 SEE R.C.R.D. BOOK 2411, PAGE 1484 AND R.C.R.D. PLAN D-10722 (TO BE ABANDONED).
- B. EXCEPTING AN 8" WATER PIPE LOCATED UNDER SUBJECT PARCEL, SEE R.C.R.D. BOOK 2783, PAGE 560. LOCATION OF SUBJECT WATER PIPE UNKNOWN.
- C. SUBJECT TO A 10' WIDE ELECTRIC EASEMENT, SEE R.C.R.D. BOOK 1257, PAGE 324 AND R.C.R.D. PLAN D-19110.
- D. SUBJECT TO A WATER LINE EASEMENT, SEE R.C.R.D. BOOK 950, PAGE 174, LOCATION OF SUBJECT WATERLINE UNKNOWN.
- E. SUBJECT TO AN ELECTRIC EASEMENT, SEE R.C.R.D. BOOK 1374, PAGE 97, LOCATION OF SUBJECT EASEMENT UNKNOWN.
- F. SUBJECT TO AN ELECTRIC EASEMENT, SEE R.C.R.D. BOOK 2364, PAGE 397, LOCATION OF SUBJECT EASEMENT UNKNOWN.
- G. SUBJECT TO A 15' DRIVEWAY EASEMENT, SEE R.C.R.D. BOOK 2216, PAGE 18, LOCATION OF SUBJECT EASEMENT UNKNOWN.

TAX MAP 173, LOT 2
- H. SUBJECT TO A 70' WIDE ACCESS EASEMENT IN FAVOR OF TAX MAP 173, LOT 10, SEE R.C.R.D. BOOK 3204, PAGE 87 AND R.C.R.D. PLAN D-24912 (TO BE ABANDONED).
- I. SUBJECT TO A DRAINAGE EASEMENT TO THE UNITED STATES OF AMERICA, SEE R.C.R.D. BOOK 1423, PAGE 240 AND PLAN D-19110.
- J. SUBJECT TO A 10' WIDE ELECTRIC EASEMENT, SEE R.C.R.D. BOOK 1257, PAGE 324. SEE ALSO R.C.R.D. PLAN D-19110.
- K. SUBJECT TO EASEMENTS FOR PASSAGE AND PIPE LINES, SEE R.C.R.D. BOOK 2205, PAGE 646 AND PLAN D-24912. LOCATION OF SUBJECT EASEMENTS UNKNOWN.
- L. SUBJECT TO A SEWER AND WATER EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH, SEE R.C.R.D. BOOK 1476, PAGE 252 (TO BE ABANDONED).

TAX MAP 165, LOT 2
- M. SUBJECT TO A SEWER EASEMENT, SEE R.C.R.D. BOOK 1659, PAGE 273 (TO BE ABANDONED).
- N. DRIVEWAY RIGHTS, SEE R.C.R.D. BOOK 1659, PAGE 273, LOCATION AND STATUS UNKNOWN.
- O. ADDITIONAL COVENANTS AND EXCEPTIONS, SEE R.C.R.D. BOOK 1659, PAGE 273..

TAX MAP 173, LOT 10 (NOT SUBJECT PARCEL)
- P. SUBJECT TO A SEWER EASEMENT, SEE R.C.R.D. BOOK 1270, PAGE 418.
- Q. SUBJECT TO A WATER EASEMENT, SEE R.C.R.D. BOOK 1448, PAGE 465.

13. PROPOSED EASEMENTS **(LOCATION SHOWN ON PLAN, METES AND BOUNDS DESCRIPTION TO BE ADDED ONCE EASEMENT LOCATIONS ARE APPROVED):**
- A. PROPOSED 20' WIDE ELECTRIC EASEMENT IN FAVOR OF EVERSOURCE AND TAX MAP 173, LOT 10.
- B. PROPOSED 20' WIDE SEWER EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH.
- C. PROPOSED 20' WIDE WATER SERVICE EASEMENT IN FAVOR OF TAX MAP 172, LOT 2.
- D. PROPOSED SIGN EASEMENT IN FAVOR OF CATE STREET DEVELOPMENT LLC..

ADDITIONAL PROPOSED EASEMENTS:

PARCEL "A" (RESIDENTIAL LOT)
- E. BLANKET UTILITY EASEMENT IN FAVOR OF EVERSOURCE.
- F. BLANKET WATER SERVICE EASEMENT IN FAVOR OF TAX MAP 172, LOT 2.
- G. BLANKET ACCESS EASEMENT IN FAVOR OF TAX MAP 172, LOT 2 AND PROPOSED PARCELS "B" & "C".
- H. BLANKET WATER EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH TO MAINTAIN VALVES AND HYDRANTS.
- I. 5' WIDE SNOW STORAGE EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH ALONG THE SOUTHERN LINE OF THE PROPOSED RIGHT OF WAY.
- J. BLANKET ACCESS EASEMENT FOR EMERGENCY SERVICES.

PARCEL "B" (COMMERCIAL LOT)
- K. BLANKET ACCESS EASEMENT IN FAVOR OF TAX MAP 172, LOT 2 AND PROPOSED PARCELS "A" & "C".
- L. BLANKET WATER EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH TO MAINTAIN VALVES AND HYDRANTS.
- M. BLANKET ACCESS EASEMENT FOR EMERGENCY SERVICES.

PARCEL "C" (TOWN HOUSE LOT)
- N. BLANKET UTILITY EASEMENT IN FAVOR OF EVERSOURCE.
- O. BLANKET ACCESS EASEMENT IN FAVOR OF TAX MAP 172, LOT 2 AND PROPOSED PARCELS "A" & "B".
- P. BLANKET WATER EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH TO MAINTAIN VALVES AND HYDRANTS.
- Q. 5' WIDE SNOW STORAGE EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH ALONG THE SOUTHERN LINE OF THE PROPOSED RIGHT OF WAY.
- R. BLANKET ACCESS EASEMENT FOR EMERGENCY SERVICES.
- S. SIGHT LINE EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH. NO PLANTINGS OR OBSTRUCTIONS WITHIN THIS EASEMENT TALLER THAN THREE (3) FEET WILL BE ALLOWED IN ORDER TO MAINTAIN SIGHT DISTANCE.

TAX MAP 165, LOT 1 & TAX MAP 172, LOT 2
- T. BLANKET ACCESS EASEMENT IN FAVOR OF TAX MAP 165, LOT 1 AND TAX MAP 172, LOT 2 OVER PROPOSED PARCELS A, B & C.

50 0 50 100
SCALE: 1 INCH = 50 FT.

EASEMENT PLAN
FOR
CATE STREET DEVELOPMENT LLC
OF
TAX MAP 163, LOTS 33 & 34
TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2
CATE STREET & US ROUTE 1 BYPASS
PORTSMOUTH, NEW HAMPSHIRE

LEGEND

———	LOT LINE
——·——·——	PROPOSED LOT LINE
— — — —	APPARENT RIGHT OF WAY LINE
——— ———	LOT LINE TO BE ABANDONED
——— — ———	APPROXIMATE ABUTTER LOT LINE
——— ———	EXISTING EASEMENT LINE (SEE NOTE #12)
——— — ———	PROPOSED EASEMENT LINE (SEE NOTE #13)
—·—·— ·—·—	EDGE OF WETLAND
⊡	BOUND FOUND
△ R.R.S.F.	RAILROAD SPIKE FOUND
○	IRON PIPE/ROD FOUND
■	4"X4" GRANITE BOUND TO BE SET
●	5/8" REBAR W/ID CAP TO BE SET
BND. FND.	BOUND FOUND
I.P.F.	IRON PIPE FOUND
CONC.	CONCRETE
D.H.	DRILL HOLE

APPROVED FOR THE RECORD

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L.L.S. #989

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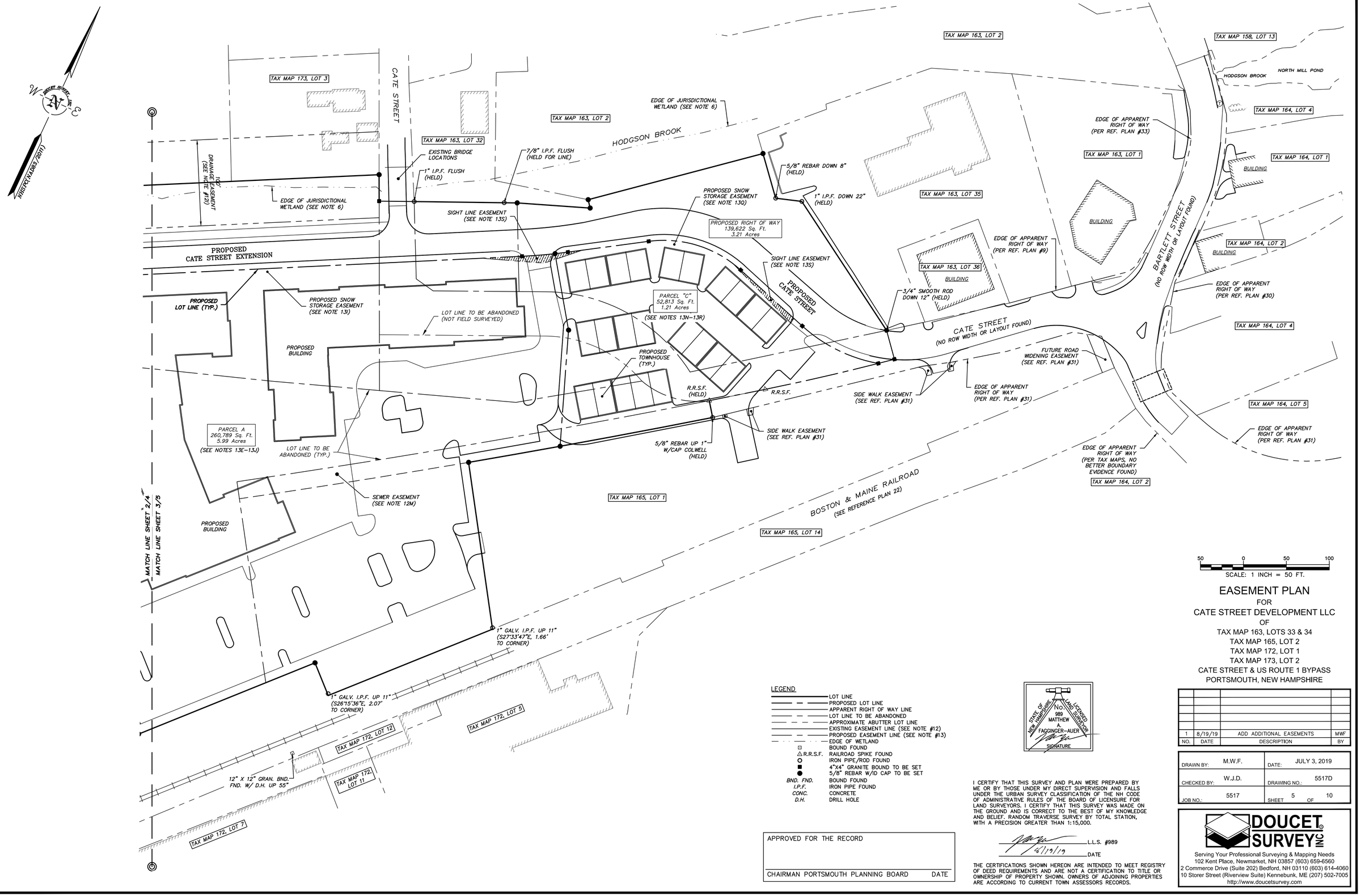

50 0 50 100

SCALE: 1 INCH = 50 FT.

EASEMENT PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34

TAX MAP 165, LOT 2

TAX MAP 172, LOT 1

TAX MAP 173, LOT 2

CATE STREET & US ROUTE 1 BYPASS

PORTSMOUTH, NEW HAMPSHIRE

LEGEND

- LOT LINE
- PROPOSED LOT LINE
- APPARENT RIGHT OF WAY LINE
- LOT LINE TO BE ABANDONED
- APPROXIMATE ABUTTER LOT LINE
- EXISTING EASEMENT LINE (SEE NOTE #12)
- PROPOSED EASEMENT LINE (SEE NOTE #13)
- EDGE OF WETLAND
- ⊡ BOUND FOUND
- △ R.R.S.F. RAILROAD SPIKE FOUND
- ○ IRON PIPE/ROD FOUND
- ■ 4"X4" GRANITE BOUND TO BE SET
- ● 5/8" REBAR W/ID CAP TO BE SET
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DRAWN BY:	M.W.F.	DATE:	JULY 3, 2019
CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	5 OF 10

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SHEET 8 INSET

CONC. BRIDGE ABUTMENT
PIPE GOES UNDERGROUND

HODGSON BROOK

DEPTH AT CENTER OF BROOK = 15.3'

CONC. BRIDGE ABUTMENT

4" PIPE, WRAPPED IN METAL INSULATION

HOSPITAL GAS PIPELINE

PNSH/26/6A

48" UNK. INV.=15.8'

12" CMP INV.=15.0'

CB #4239

PNSH/264/2S

KEEP RIGHT

CB #4181

PSNH/264/3 W/POWER DOWN

264/PNSH/2/7809/11

NETT/7809/12

DO NOT ENTER

OUTLET NOT FOUND

48" CONC. INV.=15.5'

SOUTH BYPASS 1

SMH #4565

SHOT ON TOP OF 8" PIPE WRAPPED IN INSULATION PIPE GOES UNDER GROUND

15" RCP INV.=14.7'

SMH #2789

SMH #1350

"THE FRANK JONES FUNCTION & CONFERENCE CENTER"

10" (ML)

EM

HH

CONC. PAD W/ TRANSFORMER

PAVED ISLAND

SIGN IS MISSING

CB #1345

CB #1346

~GRAVEL~

1/2" DIA. ROD UP 34"

PROPANE TANK

UHAUL SIGN

BUILDING

HODGSON BROOK

15" CMP INV.=14.6'

15" RCP INV.=14.7'

STOP/DO NOT ENTER

~GRASS AREA~

TURN LEFT

TURN RIGHT

STONE HDWL 12" HDPE INV.=19.0'

CB #1213

CB #1251

~PAVED PARKING LOT~

TAX MAP 173, LOT 2

CONCRETE WALL W/CHAINLINK FENCE

BUILDING

TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2
451,599 Sq. Ft.
10.37 Acres

MATCH LINE SHEET 6
MATCH LINE SHEET 7

MATCH LINE SHEET 6
MATCH LINE SHEET 8

MATCH LINE SHEET 6
MATCH LINE SHEET 9

NOTES:

1. REFERENCE: TAX MAP 163, LOT 33
   TAX MAP 163, LOT 34
   TAX MAP 165, LOT 2
   TAX MAP 172, LOT 1
   TAX MAP 173, LOT 2

   OWNER OF RECORD
   CATE STREET DEVELOPMENT, LLC
   11 ELKINS STREET, SUITE 420
   BOSTON, MA 02127
   R.C.R.D. BOOK 5959, PAGE 109

2. FIELD SURVEY PERFORMED BY P.J.S. & J.C.M. DURING NOVEMBER 2016 USING A TRIMBLE S6 TOTAL STATION, A TRIMBLE R8 SURVEY GRADE GPS UNIT, A TRIMBLE TSC3 DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL. BY L.P.S. & S.N.F. DURING JULY 2018 AND T.M.M. & J.C.M. IN SEPTEMBER & OCTOBER 2018 USING A TRIMBLE S6 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS. ADDITONAL FIELD SURVEY PERFORMED BY M.C. DURING NOVEMBER 2016 AND OCTOBER 2018 USING A LEICA HDS SCANNER.

3. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY MARC JACOBS IN NOVEMBER 2016 AND REVIEWED BY GOVE ENVIRONMENTAL SERVICES, INC. DURING APRIL 2018 IN ACCORDING TO THE US ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y-87-1, JANUARY 1987 AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2102 AND FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, MAY 2017, NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE.

4. VERTICAL DATUM IS BASED ON NGVD29 PER DISK V 28 1942 ELEV. 25.59..

5. HORIZONTAL DATUM BASED ON NEW HAMPSHIRE STATE PLANE(2800) NAD83(2011) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.

6. PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT 1' INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA, AND DOUCET SURVEY, INC. WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.

7. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVABLE PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE.

8. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING; THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MANHOLE CONFIGURATION, ETC.

9. ALL ELECTRIC, GAS, TEL. WATER, SEWER AND DRAIN SERVICES ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN ON THIS SITE USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.

10. UNDERGROUND UTILITY DATA WAS PROVIDED TO DOUCET SURVEY, INC. BY THE CITY OF PORTSMOUTH GIS DEPARTMENT ON NOVEMBER 15, 2016. THIS DATA IS FOR PLANNING PURPOSES ONLY AND DOUCET SURVEY DOES NOT GUARANTEE THE ACCURACY OR EXISTENCE OF THE DATA PROVIDED. ON-SITE INSPECTION SHOULD BE CONDUCTED PRIOR FINAL DESIGN AND/OR CONSTRUCTION.

STATE OF NEW HAMPSHIRE — No 989 — MATTHEW A. FAGGINGER-AUER — LICENSED LAND SURVEYOR

SIGNATURE

NAD83(NAD83 2011)

NO.	DATE	DESCRIPTION	BY
1	8/19/19	ADD ADDITIONAL EASEMENTS	MWF

30 0 30 60

SCALE: 1 INCH = 30 FT.

TOPOGRAPHIC PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34
TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2

CATE STREET & US ROUTE 1 BYPASS
PORTSMOUTH, NEW HAMPSHIRE

SHEETS 6-10 NOT FOR RECORDING

DRAWN BY:	M.W.F.	DATE:	JULY 3, 2019
CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	6 OF 10

DOUCET SURVEY INC

Serving Your Professional Surveying & Mapping Needs
102 Kent Place, Newmarket, NH 03857 (603) 659-6560
2 Commerce Drive (Suite 202) Bedford, NH 03110 (603) 614-4060
10 Storer Street (Riverview Suite) Kennebunk, ME (207) 502-7005
http://www.doucetsurvey.com

FILE NAME: T:\PROJECTS\5517 CSI (SE 4'SS)\DWG\5517D SUB PLAN.dwg LAYOUT NAME: TOPO (56) PLOTTED: Monday, August 19, 2019 - 11:05am

MATCH LINE SHEET 6
MATCH LINE SHEET 7

MATCH LINE SHEET 6
MATCH LINE SHEET 8

CB #1348
CB #1347
PSNH/264/5
8" DIA PIPE
POSSIBLE CLEAN OUT,
NO COVER
TBM C
"X" CUT IN BOLT
OVER MAIN OUTLET
ELEV.=24.93'
SMH #1066
CB #1072
CB #1071
TBM 4139B
MAG NAIL FOUND UP 12"
IN POLE PSNH/264/6
ELEV.=25.56'
TBM 4139A
MAG NAIL FOUND UP 6"
IN POLE PSNH/242/3
ELEV.=24.86'
CONCRETE WALL
W/CHAINLINK FENCE
NO PARKING
CB #1148
SMH #1152
CB #1128
STOP
OVERHANG
CB #1147
GRASS AREA
FF=24.2'
FF=24.1'
2" DIA. PIPE
TAX MAP 172, LOT 1
BUILDING
FIRE PULL BOX
FF=24.0'
HANDICAP
PARKING
GRASS AREA
CB #1056
PSNH/242/3A
W/POWER DOWN
BLANK SIGN
PSNH/242/3X
PSNH/242/4
4/NETT
15" RCP INV.=18.4'
~FADED PARKING STRIPING~
BUILDING
TRAILER
CHAIN LINK FENCE
ENCLOSURE
PSNH/242
PSNH/242/5
W/POWER DOWN
30" BRICK INV.=19.9'
US ROUTE 1 BYPASS
BOSTON & MAINE RAILROAD
4"x8" CONCRETE
WHISTLE POST
4"x8" CONCRETE
WHISTLE POST,
MARKED "W"
MATCH LINE SHEET 7
MATCH LINE SHEET 8
FUEL PUMP ISLAND
CB #1186
COVER
COVER
~ROW OF PINE TREES~
STEEL STEPS
179/5E
EM
CONCRETE
RETAINING WALL
CB #1188
RAMP
STACKED STORAGE
CONTAINERS
~FADED PARKING STRIPING~
PATH

NORTH (NAD83 (2011))

30 0 30 60
SCALE: 1 INCH = 30 FT.

TOPOGRAPHIC PLAN

FOR
CATE STREET DEVELOPMENT LLC
OF
TAX MAP 163, LOTS 33 & 34
TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2
CATE STREET & US ROUTE 1 BYPASS
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	8/19/19	ADD ADDITIONAL EASEMENTS	MWF

DRAWN BY:	M.W.F.	DATE:	JULY 3, 2019
CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	7 OF 10

STATE OF NEW HAMPSHIRE — No. 989 — MATTHEW A. FAGGINGER-AUER — LICENSED LAND SURVEYOR
SIGNATURE

SHEETS 6-10 NOT FOR RECORDING

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TOPOGRAPHIC PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34

TAX MAP 165, LOT 2

TAX MAP 172, LOT 1

TAX MAP 173, LOT 2

CATE STREET & US ROUTE 1 BYPASS

PORTSMOUTH, NEW HAMPSHIRE

30 0 30 60

SCALE: 1 INCH = 30 FT.

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DRAWN BY:	M.W.F.	DATE:	JULY 3, 2019
CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	8 OF 10

SHEETS 6-10 NOT FOR RECORDING

NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 989 MATTHEW A. FAGGINGER-AUER SIGNATURE

MATCH LINE SHEET 6
MATCH LINE SHEET 8

FUEL PUMP ISLAND

SMH #2799

(A)

(B)

COVER

COVER

BUILDING

FF=25.3'

FF=25.1'

EM

179/5C

GATE

TAX MAP 165, LOT 2

318B/4/179/5D

GM

STEEL STEPS

179/5E

EM

FF=28.1'

BUILDING

OUT BUILDING

MW 65-8

CONCRETE RETAINING WALL

CB #1188

RAMP

STACKED STORAGE CONTAINERS

SQUARE CONCRETE POST UP 8'

PATH

BOSTON & MAINE RAILROAD

DEBRIS PILE

5' CHAIN LINK FENCE

PSNH/179/5A

2/NET&T

PATH

MATCH LINE SHEET 9
MATCH LINE SHEET 8

MATCH LINE SHEET 7
MATCH LINE SHEET 8

INSET (1"=30')

6" X 6" CONC. BND. FND. W/ D.H. UP 6" ~GRASS~

CONC. PAD W/ TRANSFORMER 3191/319/9 W/ 1 COND. DOWN PNSH 183/9 W/1 COND. DOWN

CB #20001

CB #2993

CB #3065

DOVER CONCORD LEFT LANE

DECK

TH=34.4'

HOUSE

~GRAVEL~ DRIVEWAY

KEEP RIGHT

SIDEWALK MAT

CB #3281

SMH #3280

CB #3019

SMH #1527

1 BLUE PAINT MARK

COAKLEY ROAD

(50' PUBLIC R.O.W. PER REF. PLAN #24)

PORT INN HOTEL

10" X 10" METAL SIGN POST (TYP.)

4" X 4" WOODEN POST

~GRASS~

7803/PNSH/183

PNSH 183/8Y

SMH #1470

PSNH183/8 319/8 NETCO

COTTAGE STREET

(50' PUBLIC R.O.W. PER REF. PLAN #28)

TBM 5652D SPIKE FND. UP 12" IN POLE PSNH183/8-1/2 ELEV.=30.22'

US ROUTE 1 BYPASS

(100' ROW PER REFERENCE PLAN 1)

CB #4545

REFLECTOR

OUTLET NOT FOUND

WOODEN GUARD RAIL

GRAVEL AREA

STOP

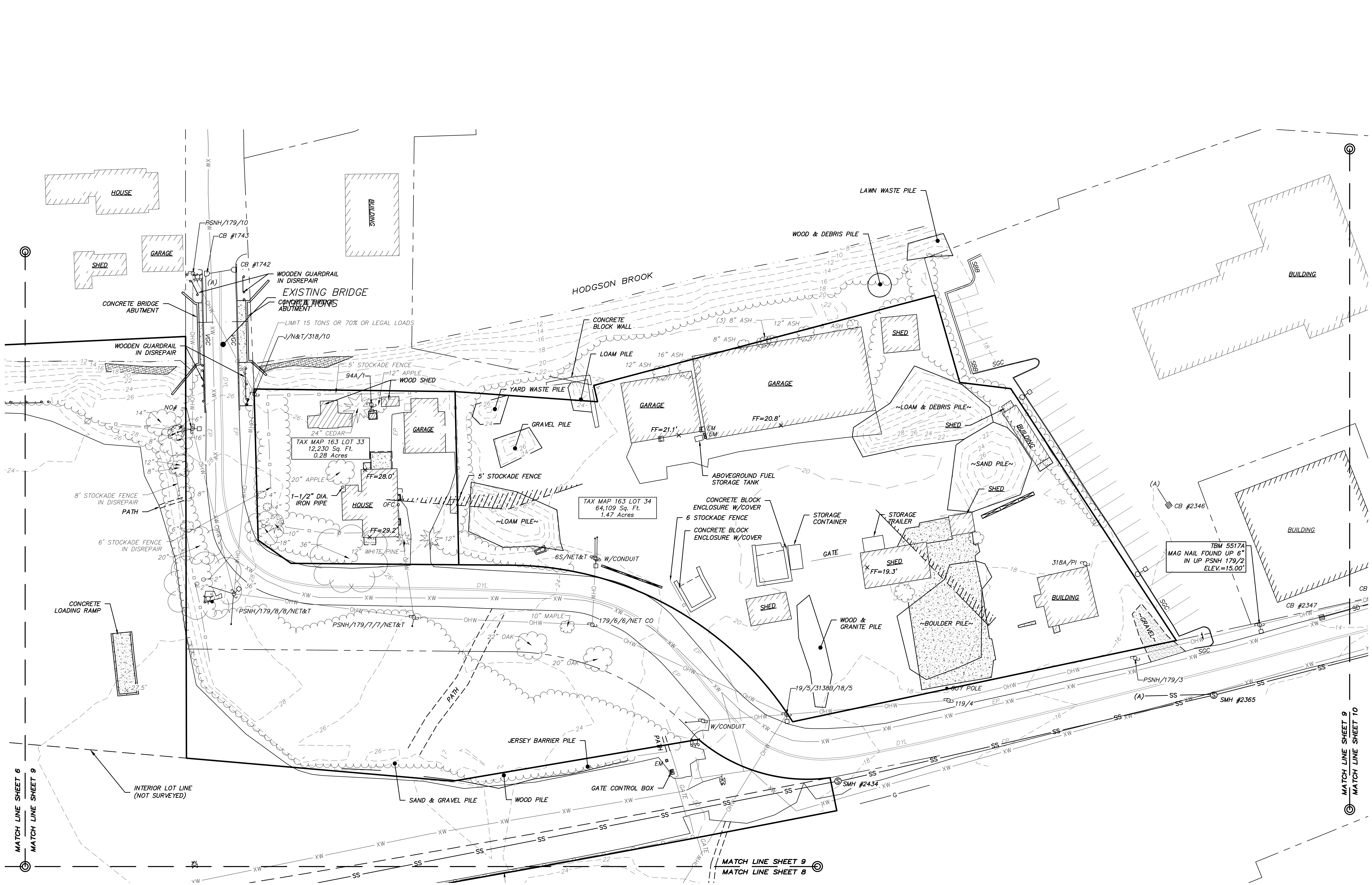
~GRASS~

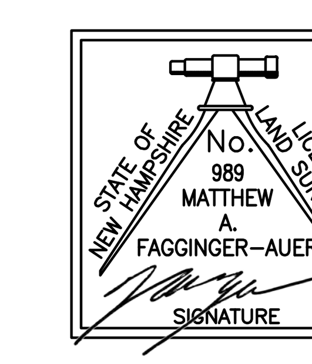
UNDERGROUND GAS, SINGLE PAINT MARK

HODGSON'S BROOK

UNDERGROUND GAS PIPELINE

SHEET 8 INSET





30 0 30 60

SCALE: 1 INCH = 30 FT.

TOPOGRAPHIC PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34

TAX MAP 165, LOT 2

TAX MAP 172, LOT 1

TAX MAP 173, LOT 2

CATE STREET & US ROUTE 1 BYPASS

PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	8/19/19	ADD ADDITIONAL EASEMENTS	MWF

DRAWN BY: M.W.F.	DATE: JULY 3, 2019
CHECKED BY: W.J.D.	DRAWING NO.: 5517D
JOB NO.: 5517	SHEET 9 OF 10

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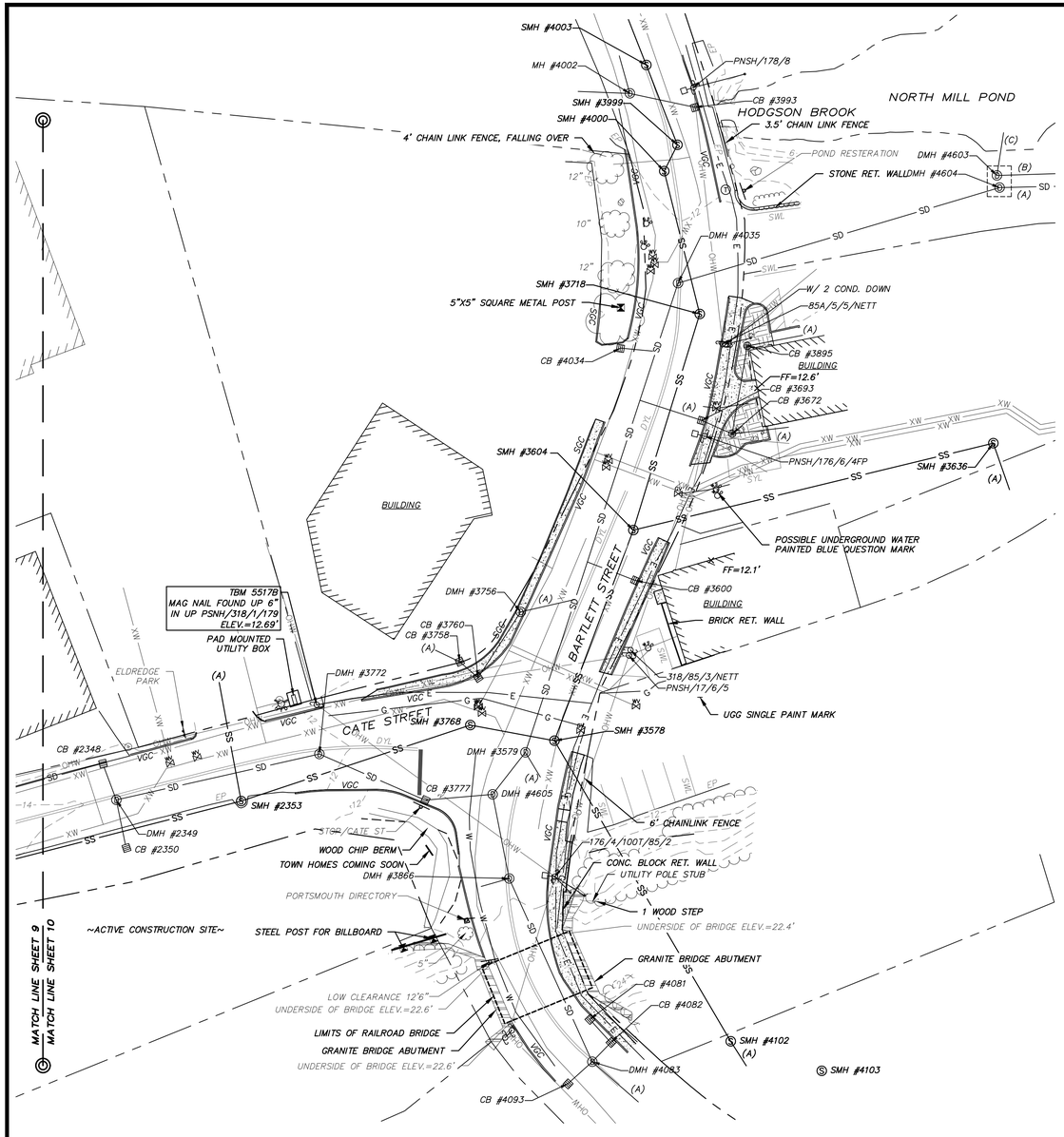
SHEETS 6-10 NOT FOR RECORDING



DRAINAGE STRUCTURES			
CB #1056	CB #1348	CB #3600	CB #4034
RIM ELEV.=23.3'	RIM ELEV.=24.6'	RIM ELEV.=11.1'	RIM ELEV.=10.8'
(A) 4" UNKN. INV.=17.6'	(1347) 12" RCP INV.=19.2'	12" PVC INV.=7.5'	12" PVC INV.=7.5'
(B) 4" UNKN. INV.=17.7'			
	CB #1742	CB #3672	DMH #4035
CB #1071	RIM ELEV.=24.7'	RIM ELEV.=11.9'	RIM ELEV.=11.7'
RIM ELEV.=22.7'	(1743) 12" RCP INV.=19.7'	(3693) 4" PVC INV.=8.2'	(NO VISIBLE PIPES)
(1072) 12" RCP INV.=17.3'		(3895) 4" PVC INV.=8.7'	SUMP=1.3'
	CB #1743	(A) 4" PVC INV.=8.3'	WATER LEVEL=1.8'
CB #1072	RIM ELEV.=24.7'		
RIM ELEV.=23.7'	(1742) 12" RCP INV.=19.5'	CB #3693	CB #4081
(A) 6" CMP INV.=17.6'	(A) 12" RCP INV.=19.5'	RIM ELEV.=11.0'	RIM ELEV.=8.7'
(1071) 12" RCP INV.=17.5'		(3672) 4" PVC INV.=8.2'	(4082) 12" HDPE INV.=5.8'
(1148) 12" CMP INV.=17.5'	CB #1926	(A) 12" PVC INV.=7.9'	
(1347) 15" RCP INV.=17.1'	RIM ELEV.=29.7'		CB #4082
(B) 15" RCP INV.=17.0'	8" PVC INV.=27.9' (OUTFALL)	DMH #3756	RIM ELEV.=8.7'
		RIM ELEV.=11.6'	(4081) 12" HDPE INV.=5.7'
CB #1128	CB #2346	(2360) 12" PVC INV.=7.8'	(4083) 12" HDPE INV.=5.9'
RIM ELEV.=22.7'	RIM ELEV.=15.6'	(A) 12" PVC INV.=7.8'	
(A) 6" PVC INV.=19.4'	(A) 12" RCP INV.=11.3'		DMH #4083
(1186) 12" CMP INV.=18.9'		DMH #3756	RIM ELEV.=8.9'
(1148) 12" CMP INV.=18.8'	CB #2347	RIM ELEV.=11.6'	(3866) 42"WX24H CMP INV.=5.0'
	RIM ELEV.=13.8'	(3760) 12" PVC INV.=7.7'	(4083) 12" HDPE INV.=5.7'
CB #1147	(2348) 15" HDPE INV.=9.7'	(A) 12" PVC INV.=7.8'	(4093) 12" HDPE INV.=5.6'
RIM ELEV.=22.2'			(A) 42"WX24H CMP INV.=5.0'
(A) 6" PVC INV.=18.7'	CB #2348	CB #3758	
(B) 12" CMP INV.=18.3'	RIM ELEV.=13.6'	RIM ELEV.=10.9'	CB #4093
	(2347) 15" HDPE INV.=9.8'	(3760) 12" PVC INV.=8.0'	RIM ELEV.=9.0'
CB #1148	(2349) 15" HDPE INV.=9.8'	(A) 8" PVC INV.=7.9'	(4083) 12" HDPE INV.=5.9'
RIM ELEV.=22.4'			
(A) 6" PVC INV.=18.7'	CB #2349	CB #3760	CB #4181
(1128) 12" CMP INV.=18.1'	RIM ELEV.=13.8'	RIM ELEV.=10.7'	RIM ELEV.=24.7'
(1148) 12" CMP INV.=18.2'	(2348) 15" HDPE INV.=9.1'	(3756) 12" PVC INV.=8.0'	12" CMP INV.=19.7'
	(2350) 15" HDPE INV.=10.3'	(3758) 12" PVC INV.=8.0'	
CB #1186	(3772) 15" HDPE INV.=9.1'		CB #4239
RIM ELEV.=23.5'		DMH #3772	RIM ELEV.=25.0'
(1188) 12" CMP (NOT VISIBLE)	CB #2350	RIM ELEV.=12.2'	12" CMP INV.=20.3'
(1128) 12" CMP INV.=20.0'	RIM ELEV.=12.6'	(2349) 15" HDPE INV.=8.7'	
	(FULL OF SILT & DEBRIS)	(3777) 15" HDPE INV.=8.6'	CB #4545
CB #1188			RIM ELEV.=27.8'
RIM ELEV.=25.7'	CB #2993	CB #3777	(3281) 15" RCP INV.=22.0'
(1186) 8" PVC INV.=22.3'	RIM ELEV.=30.2	RIM ELEV.=10.7'	(A) 18" RCP INV.=21.3'
	(A) 15" RCP INV.=26.2'	(3772) 15" HDPE INV.=7.7'	
CB #1213	(B) 12" UNKN. INV.=26.1'	(4605) 15" HDPE INV.=7.6'	DMH #4603 & 4604
RIM ELEV.=20.3'	(3281) 15" RCP INV.=26.0'		RIM ELEV.=10.3'
(HDWL) 12" HDPE INV.=17.6'		DMH #3866	(4035) 42" RCP INV.=1.0'
	CB #3019	RIM ELEV.=10.2'	(A) 36" RCP INV. (RECESSED)
CB #1251	RIM ELEV.=28.8'	(4083) 42"WX24H CMP INV.=5.3'	(B) UNKN. (RECESSED)
RIM ELEV.=20.9'	(A) 6" PVC INV.=25.4'	(4605) 24" RCP INV.=5.4'	(C) 42" RCP INV.=1.2'
(A) 18" CMP INV.=16.5'		(A) 8" CI INV.=8.0'	
	CB #3065		DMH #4605
CB #1345	RIM ELEV.=31.5'	CB #3895	RIM ELEV.=11.0'
RIM ELEV.=23.3'	WATER ELEV.=27.4'	RIM ELEV.=11.9'	(3579) 24" RCP INV.=4.4'
(1346) 12" RCP INV.=19.1'	(NO PIPES VISIBLE)	(3672) 4" PVC INV.=9.7'	(3777) 15" CMP INV.=7.5'
		(A) 4" PVC INV.=9.9'	(3866) 24" RCP INV.=4.6'
CB #1346	CB #3281		
RIM ELEV.=25'	RIM ELEV.=29.8'	CB #3993	
(1345) 12" RCP INV.=17.4'	(2993) 15" RCP INV.=24.3'	RIM ELEV.=12.6'	
(1347) 15" RCP INV.=15.9'	(4545) 15" RCP INV.=24.2'	(NO VISIBLE PIPES)	
(A) 15" RCP INV.=15.7'		APPEARS TO OPEN TO BROOK	
	DMH #3579	SUMP=1.5'	
CB #1347	RIM ELEV.=11.2'	WATER LEVEL=1.8'	
RIM ELEV.=23.9'	(4035) 36" BRICK TROUGH INV.=2.0'		
(1348) 12" RCP INV.=18.8'	(4605) 24" RCP INV.=4.2'	CB #4002	
(1072) 15" RCP INV.=15.9'	(A) UNKN. INV.=2.0'	RIM ELEV.=12.9'	
(1346) 15" RCP INV.=15.8'		(BOLTED SHUT)	

SEWER STRUCTURES		
SMH #1066	SMH #2434	SMH #3768
RIM ELEV.=23.2'	RIM ELEV.=18.2'	RIM ELEV.=11.4'
(A) 4" PVC INV.=18.5'	(2799) 10" UNKN. INV.=9.7'	(2353) 24" PVC INV.=6.0'
(D) UNKN. INV.=12.3'	(2365) 12" UNKN. INV.=9.7'	(3578) 24" PVC INV.=5.9'
(1152) 10" UNKN. INV.=11.8'		
(C) 4" PVC INV.=16.0'	SMH #2789	SMH #3999
(D) 4" PVC INV.=16.0'	RIM ELEV.=20.1'	RIM ELEV.=12.6'
(1350) UNKN. INV.=11.9'	(SUMP) INV.=9.9'	(4000) 10" PVC INV.=5.9'
(E) UNKN. INV.=11.6'	NO PIPES VISIBLE	(4003) 12" PVC INV.=5.8'
SMH #1152	SMH #2799	SMH #4000
RIM ELEV.=22.6'	RIM ELEV.=23.8'	RIM ELEV.=12.3'
(1066) 10" UNKN. INV.=11.3'	(A) 4" DI INV.=21.1'	(3718) 10" PVC INV.=5.8'
(2799) 10" UNKN. INV.=11.2'	(B) 8" UNKN. INV.=12.1'	(3999) 10" PVC INV.=5.8'
	(1152) 10" UNKN. INV.=10.7'	
SMH #1350	(2434) 10" UNKN. INV.=10.6'	SMH #4003
RIM ELEV.=25.5'		RIM ELEV.=13.3'
(A) 8" CLAY INV.=14.9'	SMH #3280	(3999) 12" PVC INV.=6.5'
(4565) UNKN. INV.=14.7'	RIM ELEV.=29.8'	(A) 10" CI INV.=6.6
(1066) UNKN. INV.=14.4'	(1527) 8" CLAY DROP INLET INV.=21.1'	
	(4565) UNKN. INV.=16.4'	SMH #4102
SMH #1470	(A) 4" CI INV.=23.3'	RIM ELEV.=11.3'
RIM ELEV.=29.4'	(B) UNKN. INV.=16.5'	(3578) 30" PVC INV.=3.7'
FULL OF DEBRIS		(A) 30" PVC INV.=3.6'
	SMH #3578	
SMH #1527	RIM ELEV.=10.9'	SMH #4103
RIM ELEV.=31.6'	(3604) 36" PVC INV.=3.0'	RIM ELEV.=10.5'
(3280) 8" CLAY INV.=24.8'	(3768) 24" PVC INV.=5.8'	(NO VISIBLE PIPES, POSSIBLE
(A) 8" CLAY INV.=25.3'	(4102) 30" PVC INV=3.1'	ELECTRIC MANHOLE)
(B) 8" CLAY INV.=24.7'		
	SMH #3604	SMH #4565
SMH #2353	RIM ELEV.=11.3'	RIM ELEV.=26.4'
RIM ELEV.=12.7'	(3578) 36" PVC INV.=2.5'	PIPES SUBMERGED
(2365) 24" PVC INV.=6.5'	(3636) 36" PVC INV.=2.5'	WATER LEVEL=16.5'
(3768) 24" PVC INV.=6.5'	(3718) 10" PVC INV.=4.7'	SUMP=15.4'
(A) 6" PVC INV.=7.2'		
	SMH #3636	SMH #4607
SMH #2365	RIM ELEV.=10.3'	RIM ELEV.=33.2'
RIM ELEV.=14.4'	(3604) 36" PVC INV.=2.3'	(A) 8" PVC INV.=17.9'
(A) 10" CI INV.=9.3'	(A) 36" PVC INV.=2.2'	(B) 8" PVC INV.=17.7'
(2434) 10" METAL INV.=9.2'		
(2353) 24" METAL INV.=9.2'	SMH #3718	
	RIM ELEV.=11.5'	
	(3604) 10" PVC INV.=5.3'	
	(4000) 10" PVC INV.=5.5'	

LEGEND

- APPROXIMATE LOT LINE
- INTERIOR LOT LINE
- APPROXIMATE ABUTTER LOT LINE
- EASEMENT LINE
- STOCKADE FENCE
- CHAIN LINK FENCE
- GUARDRAIL
- OHW — OVERHEAD WIRES
- SS — SEWER LINE
- SD — DRAIN LINE
- G — GAS LINE
- W — WATER LINE
- 20 — MAJOR CONTOUR LINE
- 22 — MINOR CONTOUR LINE
- TREE LINE
- SHRUB LINE
- EDGE OF WETLAND
- XS — SEWER LINE (SEE NOTE 20)
- XD — DRAIN LINE (SEE NOTE 20)
- XW — WATER LINE (SEE NOTE 20)
- UTILITY POLE
- UTILITY POLE & GUY WIRE
- UTILITY POLE W/ LIGHT
- LIGHT POLE
- SIGN
- SIGN (TWO POSTS)
- FENCE POST
- POST
- POST
- BOLLARD
- FIRE HYDRANT
- WATER GATE VALVE
- SPIGOT
- GAS GATE VALVE
- O.F.C. — OIL FILL CAP
- ELECTRIC BOX
- CATCH BASIN
- DRAIN MANHOLE
- RD — ROOF DRAIN
- MANHOLE
- SEWER MANHOLE
- CLEANOUT
- HAND HOLE
- WETLAND AREA
- FLAG POLE
- CONIFEROUS TREE
- DECIDUOUS TREE
- MONITORING WELL
- DRAINAGE FLOW DIRECTION ARROW
- CONCRETE
- CRUSHED STONE
- LEDGE OUTCROP
- ACCESSIBLE PARKING SPACE
- MAST ARM
- JERSEY BARRIER
- TYP. — TYPICAL
- FF — FINISHED FLOOR
- EM — ELECTRIC METER
- EP — EDGE OF PAVEMENT
- VGC — VERTICAL GRANITE CURB
- SGC — SLOPED GRANITE CURB
- SBB — SLOPED BITUMINOUS BERM
- SWL — SINGLE WHITE LINE
- SYL — SINGLE YELLOW LINE
- DYL — DOUBLE YELLOW LINE

SHEETS 6-10 NOT FOR RECORDING

STATE OF NEW HAMPSHIRE — No. 989 — MATTHEW A. FAGGINGER-AUER — LICENSED LAND SURVEYOR — SIGNATURE

30 0 30 60

SCALE: 1 INCH = 30 FT.

TOPOGRAPHIC PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34

TAX MAP 165, LOT 2

TAX MAP 172, LOT 1

TAX MAP 173, LOT 2

CATE STREET & US ROUTE 1 BYPASS

PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	8/19/19	ADD ADDITIONAL EASEMENTS	MWF

DRAWN BY:	M.W.F.	DATE:	JULY 3, 2019
CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	10 OF 10

DOUCET SURVEY INC
Serving Your Professional Surveying & Mapping Needs
102 Kent Place, Newmarket, NH 03857 (603) 659-6560
2 Commerce Drive (Suite 202) Bedford, NH 03110 (603) 614-4060
10 Storer Street (Riverview Suite) Kennebunk, ME (207) 502-7005
http://www.doucetsurvey.com

CATE STREET

CATE STREET · PORTSMOUTH · NEW HAMPSHIRE

ROADWAY PLANS

SEPTEMBER 10, 2019

PREPARED FOR

CATE STREET DEVELOPMENT, LLC
11 ELKINS STREET, SUITE 420
BOSTON, MA 02127
987.490.5278

PREPARED BY

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
207.363.0669
www.fando.com

SHEET INDEX

PROJECT TEAM

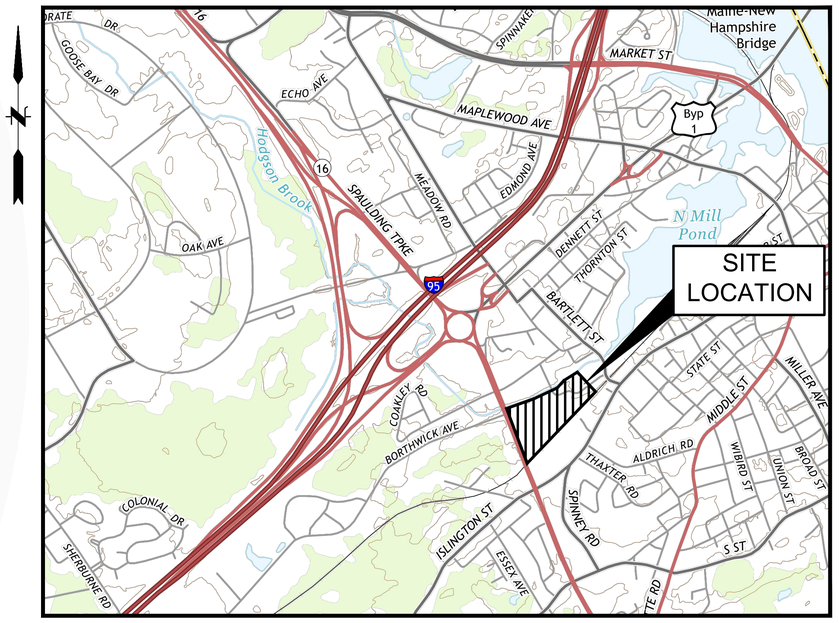
ARCHITECT
PRELLWITZ CHILINSKI ASSOCIATES
221 HAMPSHIRE STREET
CAMBRIDGE, MA. 02139
617.547.8120

LANDSCAPE ARCHITECTS
SITE SOLUTIONS, LLC
3715 NORTHSIDE PARKWAY
300 NORTH CREEK, SUITE 720
ATLANTA, GA. 303227
404.705.9411

NATURAL RESOURCES CONSULTANT
GOVE ENVIRONMENTAL SERVICES, INC
8 CONTINENTAL DRIVE
BUILDING 2, SUITE H
EXETER, NH. 03833-7507
603.778.0644

GEOTECHNICAL ENGINEERS
McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA. 02140
617.868.1420

LAND SURVEYOR
DOUCET SURVEY, INC
102 KENT PLACE
NEWMARKET, NH. 03857
603.659.6560



LOCATION MAP
SCALE: 1" = 1200'

STATE AND FEDERAL PERMITS REQUIRED:		
PERMIT	REQUIRED / NOT REQUIRED	STATUS / PERMIT NO.
NHDES WETLANDS BUREAU STANDARD DREDGE AND FILL	REQUIRED	2019-00523
NHDES ALTERATION OF TERRAIN	REQUIRED	PENDING
NHDES WATER MAIN EXTENSION	REQUIRED	PENDING
NHDES SEWER MAIN EXTENSION	REQUIRED	PENDING
NHDOT EXCAVATION PERMT	REQUIRED	PENDING
NHDOT ENTRANCE PERMIT	REQUIRED	PENDING
EPA, NPDES CONSTRUCTION GENERAL PERMIT (CGP)	REQUIRED	PENDING

811 DigSafe MA·ME·NH·RI·VT

CONTACT DIG SAFE 72 HOURS PRIOR TO CONSTRUCTION

THE LOCATION OF ANY UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. CLD CONSULTING ENG. INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. 72 HOURS PRIOR TO ANY EXCAVATION ON SITE, THE CONTRACTOR SHALL CONTACT DIG-SAFE AT 1-888-DIG-SAFE.

STATE OF NEW HAMPSHIRE
RICHARD R LUNDBORN No. 13933
LICENSED PROFESSIONAL ENGINEER

PROJ. No.: 20180317.A10
DATE: 09/10/2019

GI-001

SURVEY NOTES

1. FIELD SURVEY PERFORMED BY P.J.S. & J.C.M. DURING NOVEMBER 2016 USING A TRIMBLE S6 TOTAL STATION, A TRIMBLE R8 SURVEY GRADE GPS UNIT, A TRIMBLE TSC3 DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL, BY L.P.S. & S.N.F. DURING JULY 2018 AND T.M.M. & J.C.M. IN SEPTEMBER & OCTOBER 2018 USING A TRIMBLE S6 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS. ADDITONAL FIELD SURVEY PERFORMED BY M.C. DURING NOVEMBER 2016 AND OCTOBER 2018 USING A LEICA HDS SCANNER.

2. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY MARC JACOBS IN NOVEMBER OF 2016 AND REVIEWED BY GOVE ENVIRONMENTAL SERVICES, INC. DURING APRIL 2018 IN ACCORDANCE WITH THE US ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y-87-1, JANUARY 1987 AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL; NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0 JANUARY 2012 AND FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, MAY 2017, NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE.

3. FLOOD HAZARD ZONE: "X", PER FIRM MAP #33015C0259E, DATED 5/17/05.

4. VERTICAL DATUM IS BASED ON NGVD29 PER DISK V 28 1942 ELEV. 25.59.

5. HORIZONTAL DATUM BASED ON NEW HAMPSHIRE STATE PLANE(2800) NAD83(2011) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.

6. REFERENCE PLANS:
REFER TO THE PLAN OF LAND AT THE END OF THIS PACKAGE FOR ALL REFERENCE PLANS AND EASEMENTS THAT THE PARCELS ARE SUBJECT TO.

GENERAL

1. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSION OR LOCATION. COORDINATE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.

2. DO NOT RELY SOLELY ON ELECTRONIC VERSIONS OF DRAWINGS, SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.

3. PERFORM NECESSARY CONSTRUCTION NOTIFICATIONS, APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK AS REQUIRED BY THE CONTRACT DOCUMENTS.

4. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS OF BUILDINGS AND ADJACENT SITE ELEMENTS INCLUDING SIDEWALKS, RAMPS, BUILDING ENTRANCES, STAIRWAYS, UTILITY PENETRATIONS, CONCRETE DOOR PADS, COMPACTOR PAD, LOADING DOCKS, BOLLARDS, ETC.

5. PLEASE READ ALL OTHER NOTES ON THIS PAGE. THEY CONTAIN INFORMATION RELATED TO AND ASSOCIATED WITH THIS PROJECT AND DESIGN.

6. IF, DURING CONSTRUCTION, IT BECOMES APPARENT THAT DEFICIENCIES EXIST IN THE APPROVED DRAWINGS, THE OWNER SHALL BE REQUIRED TO CORRECT THE DEFICIENCIES TO MEET THE REQUIREMENTS OF THE REGULATIONS AT NO EXPENSE TO THE CITY.

7. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE SITE AND EXISTING CONDITIONS SURROUNDING IT AND THEREON. THE CONTRACTOR SHALL ADVISE THE APPROPRIATE AUTHORITY OF HIS INTENTIONS AT LEAST 48 HOURS IN ADVANCE.

8. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO THE CITY OF PORTSMOUTH SITE PLAN REGULATIONS, CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS, AND THE LATEST EDITION OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ALL CONSTRUCTION DETAILS SHALL BE IN ACCORDANCE WITH THE CITY OF PORTSMOUTH.

9. THE CONTRACTOR SHALL BID AND PERFORM THE WORK IN ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES, SPECIFICATIONS, REGULATIONS, AND STANDARDS.

10. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY FUSS & O'NEILL DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE SURVEYOR OR ENGINEER HERE ON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND/OR LOCAL REGULATIONS.

WORK RESTRICTIONS

1. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, FIRE HYDRANTS, AND UTILITIES WITHOUT APPROPRIATE PERMITS.

2. WORK IS RESTRICTED TO THE HOURS OF 7AM TO 6PM ON WEEKDAYS AND 7AM TO 6PM ON WEEKENDS.

REGULATORY REQUIREMENTS

1. WITHIN LOCAL RIGHTS-OF-WAY, PERFORM THE WORK IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS.

2. WITHIN STATE RIGHTS-OF-WAY, PERFORM THE WORK IN ACCORDANCE WITH THE LATEST EDITION OF THE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS AND ISSUED REVISIONS/SUPPLEMENTS.

3. PROVIDE TRAFFIC SIGNAGE AND PAVEMENT MARKINGS IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

4. BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. PERFORM CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.

5. DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.

6. THIS PROJECT DISTURBS MORE THAN ONE ACRE OF LAND AND FALLS WITHIN THE NEW HAMPSHIRE DEP STORMWATER AND DEWATERING WASTEWATER FROM CONSTRUCTION ACTIVITIES GENERAL PERMIT PROCESS. CATE STREET DEVELOPMENT, LLC, HAS SUBMITTED INFORMATION TO THE DEP TO SATISFY THIS GENERAL PERMIT. THE CONTRACTOR MUST HAVE A COPY OF THIS GENERAL PERMIT ON SITE AT ALL TIMES.

EROSION AND SEDIMENT CONTROL

1. INSTALL EROSION CONTROL MEASURES PRIOR TO STARTING ANY WORK ON THE SITE. REFER TO THE EROSION AND SEDIMENT CONTROL DRAWINGS.

2. IMPLEMENT ALL NECESSARY MEASURES REQUIRED TO CONTROL STORMWATER RUNOFF, DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE. PERFORM CORRECTIVE ACTION AS NEEDED FOR EROSION CLEANUP AND REPAIRS TO OFF SITE AREAS, IF ANY, AT NO COST TO OWNER.

3. INSPECT AND MAINTAIN EROSION CONTROL MEASURES PER THE SCHEDULE IN THE EROSION AND SEDIMENT CONTROL DRAWINGS. DISPOSE OF SEDIMENT IN AN UPLAND AREA. DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.

4. PERFORM CONSTRUCTION SEQUENCING IN SUCH A MANNER TO CONTROL EROSION AND TO MINIMIZE THE TIME THAT EARTH MATERIALS ARE EXPOSED BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED.

5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROL MEASURES. CLEAN SEDIMENT AND DEBRIS FROM TEMPORARY MEASURES AND FROM PERMANENT STORM DRAIN AND SANITARY SEWER SYSTEMS.

DEMOLITION

1. REMOVE AND DISPOSE OF EXISTING UTILITIES, FOUNDATIONS AND UNSUITABLE MATERIAL BENEATH AND FOR A DISTANCE OF 10 FEET BEYOND THE PROPOSED BUILDING FOOTPRINT INCLUDING EXTERIOR COLUMNS, UNLESS OTHERWISE NOTED.

CONSTRUCTION LAYOUT

1. PROVIDE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED SITE IMPROVEMENTS. FIELD VERIFY EXISTING PAVEMENT AND GROUND ELEVATIONS AT THE INTERFACE WITH PROPOSED PAVEMENTS AND DRAINAGE STRUCTURES BEFORE START OF CONSTRUCTION.

2. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, FIELD VERIFY PROPOSED UTILITY ROUTES AND IDENTIFY ANY INTERFERENCES OR OBSTRUCTIONS WITH EXISTING UTILITIES OR PUBLIC RIGHTS-OF-WAY.

3. IMMEDIATELY INFORM THE ENGINEER IN WRITING IF EXISTING UTILITY CONDITIONS CONFLICT OR DIFFER FROM THAT INDICATED AND IF THE WORK CANNOT BE COMPLETED AS INDICATED.

4. DIMENSIONS ARE FROM FACE OF CURB, FACE OF BUILDING, FACE OF WALL, AND CENTER LINE OF PAVEMENT MARKINGS, UNLESS NOTED OTHERWISE.

5. BOUNDS OR MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.

EARTHWORK

1. NOTIFY UTILITY LOCATOR SERVICE AT LEAST 72 HOURS BEFORE STARTING EXCAVATION.

   CALL DIGSAFE: 1-888-DIG-SAFE

2. STOP WORK IN THE VICINITY OF SUSPECTED CONTAMINATED SOIL, GROUNDWATER OR OTHER MEDIA. IMMEDIATELY NOTIFY THE OWNER SO THAT APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN. RESUME WORK IN THE IMMEDIATE VICINITY ONLY UPON DIRECTION BY THE OWNER.

3. WITHIN THE LIMITS OF THE BUILDING FOOTPRINT, PERFORM EARTHWORK OPERATIONS TO SUBGRADE ELEVATIONS. SEE DRAWINGS BY OTHERS FOR WORK ABOVE SUBGRADE.

PAVEMENT

1. AT A MINIMUM, CONSTRUCT ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS AND WALKWAYS IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT AND WITH STATE AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).

GENERAL SITE RESTORATION

1. PROVIDE 6 INCHES OF TOPSOIL AND SEED TO AREAS DISTURBED DURING CONSTRUCTION AND NOT DESIGNATED TO BE RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) UNLESS OTHERWISE NOTED.

2. REPAIR DAMAGES RESULTING FROM CONSTRUCTION LOADS, AT NO ADDITIONAL COST TO OWNER.

3. RESTORE AREAS DISTURBED BY CONSTRUCTION OPERATIONS TO THEIR ORIGINAL CONDITION OR BETTER, AT NO ADDITIONAL COST TO OWNER.

UTILITIES

1. TERMINATE EXISTING UTILITIES IN CONFORMANCE WITH LOCAL, STATE AND INDIVIDUAL UTILITY COMPANY STANDARD SPECIFICATIONS AND DETAILS. COORDINATE UTILITY SERVICE DISCONNECTS WITH UTILITY REPRESENTATIVES.

2. THE TYPE, SIZE AND LOCATION OF DEPICTED UNDERGROUND UTILITIES ARE APPROXIMATE REPRESENTATIONS OF INFORMATION OBTAINED FROM FIELD LOCATIONS OF VISIBLE FEATURES, EXISTING MAPS AND PLANS OF RECORD, UTILITY MAPPING, AND OTHER SOURCES OF INFORMATION OBTAINED BY THE ENGINEER. ASSUME NO GUARANTEE AS TO THE COMPLETENESS, SERVICEABILITY, EXISTENCE, OR ACCURACY OF UNDERGROUND FACILITIES. FIELD VERIFY THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES.

3. PAY ALL FEES AND COSTS ASSOCIATED WITH UTILITY MODIFICATIONS AND CONNECTIONS, REGARDLESS OF THE ENTITY THAT PERFORMS THE WORK.

4. COORDINATE THE WORK AND WORK SCHEDULE WITH UTILITY COMPANIES. PROVIDE ADEQUATE NOTICE TO UTILITIES TO PREVENT DELAYS IN CONSTRUCTION.

5. INTERIOR DIAMETERS OF STORM DRAIN AND SANITARY SEWER STRUCTURES SHALL BE DETERMINED BY THE PRECAST MANUFACTURER, BASED ON THE INDICATED PIPE SYSTEM LAYOUT AND LOCAL MUNICIPAL STANDARDS.

   MINIMUM INTERIOR DIAMETERS:
   0 TO 20 FEET DEEP; 4 FEET.
   20 FEET OR GREATER; 5 FEET.

6. RIM ELEVATIONS FOR MANHOLES, VALVE COVERS, GATE AND PULL BOXES, AND OTHER STRUCTURES ARE APPROXIMATE. SET OR RESET RIM ELEVATIONS AS FOLLOWS:

   IN PAVEMENTS AND CONCRETE SURFACES: FLUSH
   IN SURFACES ALONG ACCESSIBLE ROUTES: FLUSH
   IN LANDSCAPE, SEEDED, AND OTHER EARTH SURFACE AREAS:
   1 INCH ABOVE SURROUNDING AREA; TAPER EARTH TO RIM ELEVATION.

7. INSTALL PROPOSED PRIVATE UTILITY SERVICES ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY THE AUTHORITY HAVING JURISDICTION (WATER, SEWER, GAS, TELEPHONE, ELECTRIC, FIRE ALARM, ETC.). COORDINATE FINAL DESIGN LOADS AND LOCATIONS WITH OWNER AND ARCHITECT.

PORTSMOUTH UTILITY CONTACT INFORMATION:

WATER/SEWER:
JIM TOW
GENERAL FOREMAN
PORTSMOUTH DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
603.766.1426
JVTOW@CITYOFPORTSMOUTH.COM

ELECTRIC:
NICKOLAI KOSKO
FIELD SERVICE REPRESENTATIVE
EVERSOURCE ENERGY
74 OLD DOVER ROAD
ROCHESTER, NH 03867
603.332.4227 EXT. 5555334
NICKOLAI.KOSKO@EVERSOURCE.COM

NATURAL GAS:
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SR. BUSINESS DEVELOPMENT REPRESENTATIVE
UNITIL SERVICE CORP.
325 WEST ROAD
PORTSMOUTH, NH 03801
603.294.5144
BEAULIEU@UNITIL.COM

TRAFFIC:
ERIC EBY
PARKING AND TRANSPORTATION ENGINEER
DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
603.766.1415

CABLE:
MIKE COLLINS
COMCAST
334 CALEF HIGHWAY
EPPING, NH 03042
603.679.5695
MIKECOLLINS@COMCAST.COM

TELEPHONE:
JOSEPH CONSIDINE
ENGINEER
CONSOLIDATED COMMUNICATIONS
1575 GREENLAND ROAD
GREENLAND, NH 03840
603.427.5525
JOSEPH.CONSIDINE@CONSOLIDATED.COM

ROAD, MATERIALS AND SIGNAL:
DAVE DEFOSSES
PROJECT MANAGER
PORTSMOUTH DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
603.766.1411
DJDEFOSSES@CITYOFPORTSMOUTH.COM

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER
RICHARD A. LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: NTS
VERT.:
DATUM: HORZ.:
VERT.:

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
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CATE STREET DEVELOPMENT, LLC
GENERAL NOTES
CATE STREET
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CN-001

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MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB

STREAM BUFFER RESTORATION SEQUENCE NOTES:

1. EROSION CONTROL WILL BE PLACED AROUND ALL JURISDICTIONAL WETLANDS PRIOR TO THE START OF WORK.

2. INITIAL WORK FOR INVASIVE SPECIES REMOVAL WILL BE PERFORMED WITH GUIDANCE BY STAFF FROM GES INC.

3. INVASIVE SPECIES REMOVAL WILL IDEALLY BE DONE ONCE THE VEGETATION IS MATURE DURING THE LATE SPRING OR EARLY SUMMER TO AID IN IDENTIFICATION. INVASIVE SPECIES VEGETATION WILL INITAILLY BE CUT AS NEEDED TO AVOID THE POTENTIAL SPREAD OF SEEDS. ANY MATERIAL IN "SEED" WILL BE BAGGED AND DISPOSED OF PROPERLY.

4. ALL WORK WILL BE PERFORMED FROM THE UPPER AREA OF THE SITE BY LONG REACH EXCAVATORS. ANY SMALL-SCALE WORK WILL BE DONE BY HAND TO REDUCE BANK IMPACTS AND ELIMINATE ANY UNNEEDED WEEKENING OF THE STABILITY OF THE BANK. NO WORK WILL BE PERFORMED FROM WITHIN THE STREAM.

5. EXCAVATION WORK WILL BEGIN BY REMOVING REMAINING ROOT MATERIAL AND "SEED BANK" FROM THE SLOPE AND ANY DEBRIS.

6. ALL FILL MATERIAL, INCLUDING PAVEMENT, CINDER BLOCKS, CEMENT, TRASH, I.E, BUCKETS, COUCHES, APPLIANCES, EXERCISE EQUIPMENT, ETC., WILL BE REMOVED AND DISPOSED OF PROPERLY.

7. ANY CULVERTS EXISTING IN THE BANK TO BE REMOVED WILL BE SAW CUT OR CRUSHED AND REMOVED. THE REMAINING PORTIONS OF CULVERTS WILL BE LEFT IN PLACE AND WILL BE FILLED WITH CEMENT TO CLOSE THEM OFF. THIS WILL REDUCE THE ADDITIONAL BANK IMPACT RESULTING FROM THEIR REMOVAL ENTIRELY.

8. ANY DEBRIS REMOVAL NEAR MATURE TREE ROOTS WILL BE PERFORMED BY HAND SHOVEL OR SMALL MACHINE TO REDUCE DAMAGE TO ROOT STRUCTURE.

9. CLEAN TOP SOIL WILL BE ADDED TO AREAS OF REMOVED MATERIALS, INCLUDING CULVERT ENDS. THIS MATERIAL WILL BE LEVELED TO CREATE A SMOOTH BANK TO BE PLANTED.

10. THE FOLLOWING SPECIES WILL BE PLANTED IN RANDOM SPACING AT THE SPECIFIED NUMBERS AND SPACING IN EACH RESTORATION AREA BELOW:

    HIGHBUSH BLUEBERRY (VACCINIUM CORYMBOSUM),
    WINTERBERRY (ILEX VERTICILATTA),
    SWEET PEPPER BUSH (CLETHERA ALNIFOLIA).

    ANY EXPOSED AREAS WILL BE SEEDED WITH AN EROSION CONTROL SEED MIX @ 35lbs/ACRE. THIS WORK WILL BE PERFOMRED BY HAND TOOLS. ALL PLANTS ARE TO BE IN 1-2 GALLON POTS AS AVAILABLE AT THE TIME OF THE PLANTING. PLANTS WILL BE LAID OUT PER THE RESTORATION PLAN IN RANDOM ORDER. HOLES WILL BE DUG BY HAND FOR PLANTING. ONCE PLANTED THE HOLES WILL BE BROUGHT LEVEL WITH ADDITIONAL SOIL. THE ENTIRE EXPOSED SLOPES WILL BE SEEDED AS SPECIFIED AND WILL BE COVERED WITH JUTE MATTING AFTER TO ELIMINATE EROSION. SUPPLEMENTAL WATERING WILL OCCUR SHOULD THERE NOT BE SIGNIFICANT RAINFALL.

    IMPACT AREA 1 WILL HAVE 761 SF OF DISTURBANCE. THIS WILL BE PLANTED WITH A TOTAL OF 117 PLANTS AT A SPACING OF 4' OC

    39- HIGHBUSH BLUEBERRY (VACCINIUM CORYMBOSUM),
    39- WINTERBERRY (ILEX VERTICILATTA)
    39- SWEET PEPPER BUSH (CLETHERA ALNIFOLIA),

    IMPACT AREA 2 WILL HAVE 148 SF OF DISTURBANCE. THIS WILL BE PLANTED WITH A TOTAL OF 9 PLANTS AT A SPACING OF 4' OC

    3- HIGHBUSH BLUEBERRY (VACCINIUM CORYMBOSUM),
    3- WINTERBERRY (ILEX VERTICILATTA)
    3- SWEET PEPPER BUSH (CLETHERA ALNIFOLIA),

    IMPACT AREA 3 WILL HAVE 344 SF OF DISTURBANCE. THIS WILL BE PLANTED WITH 21 TOTAL PLANTS AT 4' OC SPACING

    7- HIGHBUSH BLUEBERRY (VACCINIUM CORYMBOSUM),
    7- WINTERBERRY (ILEX VERTICILATTA)
    7- SWEET PEPPER BUSH (CLETHERA ALNIFOLIA),

    IMPACT AREA 4 WILL HAVE 3,412 SF OF DISTURBANCE. THIS WILL BE PLANTED WITH A TOTAL OF 96 PLANTS AT A SPACING OF 6' OC.

    32- HIGHBUSH BLUEBERRY (VACCINIUM CORYMBOSUM),
    32- WINTERBERRY (ILEX VERTICILATTA)
    32- SWEET PEPPER BUSH (CLETHERA ALNIFOLIA),

11. MONITORING OF THE RESTORATION AREAS WILL BE DONE UNDER THE DIRECTION OF THE NHDES WETLANDS BUREAU, AS THESE AREAS FALL UNDER THEIR JURISDICTON.

INVASIVE PLANT DISPOSAL

TO PREVENT SEED FROM SPREADING REMOVE INVASIVE PLANTS BEFORE SEEDS ARE SET (PRODUCED). SOME PLANTS CONTINUE TO GROW, FLOWER AND SET SEED EVEN AFTER PULLING OF CUTTING. SEEDS CAN REMAIN VIABLE IN THE GROUND FOR MANY YEARS. IF THE PLANT HAS FLOWERS OR SEEDS, PLACE THE FLOWERS AND SEEDS IN A HEAVY PLASTIC BAG "HEAD FIRST" AT THE WEEDING SITE AND TRANSPORT TO THE DISPOSAL SITE. THE FOLLOWING ARE GENERAL DESCRIPTIONS OF DISPOSAL METHODS. SEE THE CHART FOR RECOMMENDATIONS BY SPECIES.

BURNING: LARGE WOODY BRANCHES AND TRUNKS CAN BE USED AS FIREWOOD OR BURNED IN PILES. FOR OUTSIDE BURNING, A WRITTEN FIRE PERMIT FROM THE LOCAL FOREST FIRE WARDEN IS REQUIRED UNLESS THE GROUND IS COVERED IN SNOW. BRUSH LARGER THAN 5 INCHES IN DIAMETER CAN'T BE BURNED. INVASIVE PLANTS WITH EASILY AIRBORNE SEEDS LIKE BLACK SWALLOW-WORT WITH MATURE SEED PODS (INDICATED BY THEIR BROWN COLOR) SHOULDN'T BE BURNED AS THE SEEDS MAY DISPERSE BY THE HOT AIR CREATED BY THE FIRE.

BAGGING (SOLARIZATION): USE THIS TECHNIQUE WITH SOFTER-TISSUE PLANTS. USE HEAVY BLACK OR CLEAR PLASTIC BAGS (CONTRACTOR GRADE), MAKING SURE THAT NO PARTS OF THE PLANTS POKE THROUGH. ALLOW THE BAGS TO SIT IN THE SUN FOR SEVERAL WEEKS AND ON DARK PAVEMENT FOR THE BEST EFFECT.

TARPING AND DRYING: PILE MATERIAL ON A SHEET OF PLASTIC AND COVER WITH A TARP, FASTENING THE TARP TO THE GROUND AND MONITORING IT FOR ESCAPES. LET THE MATERIAL DRY FOR SEVERAL WEEKS, OR UNTIL IT IS CLEARLY NONVIABLE.

CHIPPING: USE THIS METHOD FOR WOODY PLANTS THAT DON'T REPRODUCE VEGETATIVELY.

BURYING: THIS IS RISKY, BUT CAN BE DONE WITH WATCHFUL DILIGENCE. LAY THICK PLASTIC IN A DEEP PIT BEFORE PLACING THE CUT UP PLANT MATERIAL IN THE HOLE. PLACE THE MATERIAL AWAY FROM THE EDGE OF THE PLASTIC BEFOR COVERING IT WITH MORE HEAVY PLASTIC. ELIMINATE AS MUCH AIR AS POSSIBLE AND TOSS IN SOIL TO WEIGHT DOWN THE MATERIAL IN THE PIT. NOTE THAT THE TOP OF THE BURIED MATERIAL SHOULD BE AT LEAST THREE FEET UNDERGROUND. JAPANESE KNOTWEED SHOULD BE AT LEAST 5 FEET UNDERGROUND!

DROWNING: FILL A LARGE BARREL WITH WATER AND PLACE SOFT-TISSUE PLANTS IN THE WATER. CHECK AFTER A FEW WEEKS AND LOOK FOR ROTTED PLANT MATERIAL (ROOTS, STEMS, LEAVES, FLOWERS). WELL-ROTTED PLANT MATERIAL MAY BE COMPOSTED. A WORD OF CAUTION- SEEDS MAY STILL BE VIABLE AFTER USING THIS METHOD. DO THIS BEFORE SEEDS ARE SET. THIS METHOD ISN'T USED OFTEN. BE PREPARED FOR AN AWFUL STINK!

COMPOSTING: INVASIVE PLANTS CAN TAKE ROOT IN COMPOST. DON'T COMPOST ANY INVASIVES UNLESS YOU KNOW THERE IS NO VIABLE (LIVING) PLANT MATERIAL LEFT. USE ONE OF THE ABOVE TECHNIQUES (BAGGING, TARPING, DRYING, CHIPPING OR DROWNING) TO RENDER THE PLANTS NON-VIABLE BEFORE COMPOSTING. CLOSELY EXAMINEE THE PLANT BEFORE COMPOSTING AND AVOID COMPOSTING SEEDS.

BE DILIGENT LOOKING FOR SEEDLINGS FOR YEARS IN AREAS WHERE REMOVAL AND DISPOSAL TOOK PLACE.

SUGGESTED DISPOSAL METHODS FOR NON-NATIVE INVASIVE PLANTS

THIS TABLE PROVIDES INFORMATION CONCERNING THE DISPOSAL OF REMOVED INVASIVE PLANT MATERIAL. IF THE INFESTATION IS TREATED WITH HERBICIDE AND LEFT IN PLACE, THESE GUIDELINES DON'T APPLY. DON'T BRIDGE INVASIVES TO A LOCAL TRANSFER STATION, UNLESS THERE IS A DESIGNATED AREA FOR THE DISPOSAL, OR THEY HAVE BEEN RENDERED NON-VIABLE. THIS LISTING INCLUDES WETLAND AND UPLAND PLANTS FROM THE NEW HAMPSHIRE PROHIBITED INVASIVE SPECIES LIST. THE DISPOSAL OF THE AQUATIC PLANTS ISN'T ADDRESSED.

WOODY PLANTS	METHOD OF REPRODUCING	METHOD OF DISPOSAL
NORWAY MAPLE (ACER PALTANOIDES) EUROPEAN BARBERRY (BERBERIS VULGARIS) JAPANESE BAYBERRY (BERBERIS THUNBERGII) AUTUMN OLIVE (ELAEAGNUS EMBELLATA) BURNING BUSH (EUONYMUC ALATUS) MORROW'S HONEYSUCKLE (LONICERA MORROWII) TATARIAN HONEYSUCKLE (LONICERA TATRICA) SHOWY BUSH HONEYSUCKLE (LONCERA X BELLA) COMMMON BUCKTHORN (RHAMNUS CATHARICA) GLOSSY BUCKTHORN (FRANGULA ALNUS)	FRUITS AND SEEDS	PRIOR TO FRUIT/SEED RIPENING SEEDLINGS AND SMALL PLANTS PULL OR CUT AND LEAVE ON SITE WITH ROOTS EXPOSED. NO SPECIAL CARE NEEDED. LARGER PLANTS USE AS FIREWOOD. MAKE A BRUSH PILE. CHIP. BURN. AFTER FRUIT/SEED IS RIPE DON'T REMOVE FROM SITE. BURN. MAKE A COVERED BRUSH PILE. CHIP ONCE ALL FRUIT HAS DROPPED FROM BRANCHES. LEAVE RESULTING CHIPS ON SITE AND MONITOR.
ORIENTAL BITTERSWEET (CELASTRUS ORBICULATUS) MULTIFLORA ROASE (ROSA MULTIFLORA)	FRUITS, SEEDS, PLANT FRAGMENTS	PRIOR TO FRUIT/SEED RIPENING SEEDLINGS AND SMALL PLANTS PULL OR CUT AND LEAVE ON SITE WITH ROOTS EXPOSED. NO SPECIAL CARE NEEDED. LARGER PLANTS MAKE A BRUSH PILE BURN AFTER FRUIT/SEED IS RIPE DON'T REMOVE FROM SITE. BURN. MAKE A COVERED BRUSH PILE. CHIP - ONLY AFTER MATERIAL HAS FULLY DRIED (1-YEAR) AND ALL FRUIT HAS DROPPED FROM BRANCHES. LEAVE RESULTING CHIPS ON SITE AND MONITOR.

NON-WOODY PLANTS	METHOD OF REPRODUCING	METHOD OF DISPOSAL
GARLIC MUSTARD (ALLIARIA PETIOLATA) SPOTTED KNAPWEED (CENTAUREA MACULOSA) SAP OF RELATED KNAPWEED CAN CAUSE SKIN IRRITATION AND TUMORS. WEAR GLOVES WHEN HANDLING. BLACK SWALLOW-WORT (CYNANCHUM NIGRUM) MAY CAUSE SKIN RASH. WEAR GLOVES AND LONG SLEEVES WHEN HANDLING. PALE SWALLOW-WORT (CYNANCHUM ROSSICUM) GIANT HOGWEED (HERACLEAUM ROSSICUM) CAN CAUSE MAJOR SKIN RASH. WEAR GLOVES AND LONG SLEEVES WHEN HANDLING. DAME'S ROCKET (HESPERIS MATRONALIS) PERRENIAL PEPPERWEED (LEPIDIUM LATIFOLIUM) PURPLE LOOSESTRIFE (LYTHRUM SALICARIA) JAPANESE STILT GRASS (MICROSTEGIUM VIMINEUM) MILE-A-MINUTE WEED (POLYGONUM PERFOLIATUM)	FRUITS AND SEEDS	PRIOR TO FLOWERING DEPENDS ON SCALE OF INFESTATION SMALL INFESTATION PULL OR CUT PLANT AND LEAVE ON SITE WITH ROOTS EXPOSED. LARGE INFESTATION PULL OR CUT PLANT AND PILE. (YOU CAN PILE ONTO OR COVER WITH PLASTIC SHEETING). MONITOR. REMOVE ANY RE-SPROUTING MATERIAL. DURING AND FOLLOWING FLOWERING DO NOTHING UNTIL THE FOLLOWING YEAR OR REMOVE FLOWERING HEADS AND BAG AND LET ROT. SMALL INFESTATION PULL OR CUT PLANT AND LEAVE ON SITE WITH ROOTS EXPOSED. LARGE INFESTATION PULL OR CUT PLANT AND PILE REMAINING MATERIAL. (YOU CAN PILE ONTO PLASTIC SHEETING). MONITOR. REMOVE ANY RE-SPROUTING MATERIAL.
COMMON REED (PHRAGMITES AUSTRALIS) JAPANESE KNOTWEED (POLYGONUM X BOHEMICUM)	FRUITS, SEEDS, PLANT FRAGMENTS PRIMARY MEANS OF SPREAD IN THESE SPECIES IS BY PANT PARTS. ALTHOUGH ALL CARE SHOULD BE GIVEN TO PREVENTING THE DISPERSAL OF SEED DURING CONTROL ACTIVI	SMALL INFESTATION BAG ALL PLANT MATERIAL AND LET ROT. NEVER PILE AND USE RESULTING MATERIAL AS COMPOST. BURN LARGE INFESTATION REMOVE MATERIAL TO UNSUITABLE HABITAT (DRY, HOT AND SUNNY OR DRY AND SHADED LOCATION) AND SCATTER OR PILE. MONITOR AND REMOVE ANY SPROUTING MATERIAL. PILE, LET DRY, AND BURN.

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2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE - RICHARD LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

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CATE STREET DEVELOPMENT, LLC
GENERAL NOTES
CATE STREET
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 9/10/2019

CN-002

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BOUNDARIES

EXISTING		PROPOSED
BEARING / DISTANCE	PROPERTY LINE	BEARING / DISTANCE
	APPROXIMATE LOT LINE	
	INTERIOR LOT LINE	
	APPROXIMATE ABUTTER LOT LINE	
	EASEMENT LINE	
BOW / CONCORD	TOWN LINE	
COOS / GRAFTON	COUNTY LINE	
MAINE / NEW HAMPSHIRE	STATE LINE	
	BOUND FOUND	
R.R.S.F.	RAILROAD SPIKE FOUND	
	IRON PIPE/ROD FOUND	
	4"X4" GRANITE BOUND TO BE SET	
	5/8" REBAR W/ID CAP TO BE SET	
	CONCRETE	
	BOUND FOUND	
	IRON PIPE FOUND	
	CONCRETE	
	DRILL HOLE	

NATURAL RESOURCES

EXISTING		PROPOSED
20	MAJOR CONTOUR LINE	20
21	MINOR CONTOUR LINE	21
+ 201.0	SPOT ELEVATION	+ 201.0
	EDGE OF WETLAND	
	WETLAND AREA	
	CONIFEROUS TREE	
	DECIDUOUS TREE	
	MONITORING WELL	
TP	TEST PIT	TP
	TREE LINE	
	SHRUB LINE	
	EDGE OF WATER	
	BORING	
	BORING	
	ROCK PROBE	
	TEST PIT	
	LEDGE	

GENERAL

EXISTING		PROPOSED
	STOCKADE FENCE	
	CHAIN LINK FENCE	
X	BARBED WIRE FENCE	X
	STONE WALL	
	RETAINING WALL	
	GUARDRAIL	
	SIGN	
	SIGN (TWO POSTS)	
	FENCE POST	
	POST	
	POST	
	BOLLARD	
	FLAG POLE	
	CONCRETE	
	CRUSHED STONE	
	LEDGE OUTCROP	
LEACH FIELD	LEACH FIELD	
	GAS PUMPS	
	STORAGE TANKS	
	CEMETERY	
	INTERMITTENT WATER COURSE	
RIVER (STREAM)	SHORE LINE	
POND	SHORE LINE	

DRAINAGE

EXISTING		PROPOSED
	DRAINAGE NOTE	D
SD	DRAIN LINE	D
XD	DRAIN LINE (SEE NOTE 20)	
	CATCH BASIN	
	DRAIN MANHOLE	
RD	ROOF DRAIN	
R	ROOF DRAIN LINE	R
UD	STORM UNDERDRAIN	D
	DRAINAGE FLOW DIRECTION ARROW	
	PROPOSED REINFORCED CONCRETE CULVERT END	
	PROPOSED TYPE "C-L" CATCH BASIN	
	PROPOSED TYPE "C" CATCH BASIN	
	PROPOSED HEAD WALL	

WATER

EXISTING		PROPOSED
	WATER NOTE	W
W	WATER LINE	W
XW	WATER LINE (SEE NOTE 20)	
	FIRE HYDRANT	
	PROPOSED HYDRANT AND GATE VALVE	
	WATER GATE VALVE	
	SPIGOT	
W	WELL	

SEWER

EXISTING		PROPOSED
	SEWER NOTE	S
SS	SEWER LINE	S
XS	SEWER LINE (SEE NOTE 20)	
FM	SEWER FORCE MAIN	FM
S	SANITARY SEWER MANHOLE	S
CO	CLEANOUT	CO

GAS

EXISTING		PROPOSED
	GAS NOTE	G
G	GAS MAIN	G
	GAS GATE VALVE	
O.F.C.	OIL FILL CAP	

ELECTRIC

EXISTING		PROPOSED
	ELECTRIC NOTE	E
OHW	OVERHEAD WIRES	OHW
	UTILITY POLE	
	UTILITY POLE & GUY WIRE	
	UTILITY POLE W/ LIGHT	
	LIGHT POLES	SINGLE DOUBLE
	BUILDING LIGHTS	
E	ELECTRICAL SERVICE	E
	ELECTRIC BOX	
	PROPOSED ELECTRICAL MANHOLE	
M	MANHOLE	M
HH	HAND HOLE	HH

TELEPHONE

EXISTING		PROPOSED
T	TELEPHONE LINE	T
	TELEPHONE MANHOLE	

CATV

EXISTING		PROPOSED
C	CABLE LINE	C

STRIPING

EXISTING		PROPOSED
SWL	SINGLE SOLID LINE WHITE	SSLW
	SINGLE SOLID LINE WHITE (T) (THERMOPLASTIC)	SSLW (T)
	DOUBLE SOLID LINE (WHITE)	DSLW
SYL	SINGLE SOLID LINE (YELLOW)	SSLY
	SINGLE BROKEN LINE (YELLOW)	SBLY
DYL	DOUBLE SOLID LINE (YELLOW)	DSLY
	STOP BAR = 12" SSLW (THERMOPLASTIC)	12"SSLW (T)

GENERAL PAVEMENT MARKING NOTE:
PLACEMENT AND COLOR OF PAVMENT MARKING LINES, SYMBOLS AND WORDS SHALL CONFORM TO THE (MUTCD) SECTION 632 OF NHDOT STANDARD SPECIFICATION BOOK, CONTRACT SUPPLEMENTAL SPECIFICATIONS, THE STATE OF NEW HAMPSHIRE PAVEMENT MARKING STANDARD DETAIL SHEETS, AND STANDARD PLAN SHEETS.

RETROREFLECTIVE PAINT PAVMENT MARKING KEY:
THE FOLLOWING PAVEMENT MARKINGS SHALL BE RETROREFLECTIVE THERMOPLASTIC UNLESS OTHERWISE NOTIFIED BY THE STATE STANDARD SYMBOLS AND WORDS

—WORDS ONLY — WORDS
(A) = STOP BARS = 12" SSL (WHITE)(T)

	ACCESSIBLE PARKING SPACE	
	PAINTED ISLAND	
10	PARKING SPACE COUNT	(10)

CURB

EXISTING		PROPOSED
VGC	VERTICAL GRANITE CURB	VGC
SGC	SLOPED GRANITE CURB	SGC
SBB	SLOPED BITUMINOUS BERM	SBB
CC	CONCRETE CURB	CC
BCC	BITUMINOUS CURB	BCC
	TIPDOWN	TD

TRAFFIC UTILITIES

SIGNAL CONDUIT (EXISTING)			
SIGNAL CONDUIT (PROPOSED)			
MAGNETIC DETECTOR SLEEVE			
LOOP DETECTOR	6'X10'	(LABEL SIZE)	6'X10'
PULLBOX	P.B.	EXISTING	P.B.
HANDHOLE	H.H.		H.H.
CONTROLLER CABINET	C.C.		C.C.
SPREAD FOOTING	10'	8'(LABEL SIZE)	
CYLINDRICAL FOUNDATION			
MAST ARM POLE (WITH SIGNAL HEADS)			
STEEL SPAN WIRE POLES			
PEDESTRIAN SIGNAL POLE			
TRAFFIC SIGNAL (EXISTING)			
STREET LIGHT CONDUIT			

PROPOSED: NOTE ANGLE FROM TO ARM

EROSION CONTROL

PROPOSED SILT FENCE	SF
PROPOSED HAY BALES	HB
PROPOSED HAYBALE CHECK DAM	
PROPOSED SILT SOCKS	
PROPOSED EROSION CONTROL MAT	
PROPOSED INLET PROTECTION	
PROPOSED OUTLET PROTECTION	
PROPOSED STONE CHECK DAM	
PROPOSED LIMIT OF DISTURBANCE	LOD

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2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE — RICHARD A. LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

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207.363.0669
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CATE STREET DEVELOPMENT, LLC

LEGEND

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

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CN-003

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CP-101

CP-102

(100' ROW PER REFERENCE PLAN 1)

(100' ROW PER REFERENCE PLAN 1)

HODGSON BROOK

HOUSE

SHED

GARAGE

BLDG

EDGE OF APPARENT RIGHT OF WAY (PER REF. PLAN #3)

EDGE OF APPARENT RIGHT OF WAY (PER REF. PLAN #31)

EDGE OF APP
RIGHT OF
(PER TAX MAPS,
BETTER BOUND
EVIDENCE FOU

233.77'

(A)

(SEE REFERENCE PLAN 22)

HANDICAP PARKING

BOSTON & MAINE RAILROAD

LEGEND

AREA OF CONCRETE AND PAVEMENT REMOVAL

REMOVE ALL CONCRETE, PAVEMENT, CURBING, BUILDINGS WITHIN THE DEMOLITION BOUNDARY LINE NOTED ON THE PLANS.

LIMITS OF UTILITY LINES TO BE REMOVED

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1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – LICENSED PROFESSIONAL ENGINEER – RICHARD LUNDBORN No. 10943

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DATUM: HORZ.: NAD83
VERT.: NGVD29
60 30 0 60
GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC

OVERALL ROADWAY PREPARATION PLAN
CATE STREET

PORTSMOUTH NEW HAMPSHIRE

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CP-100

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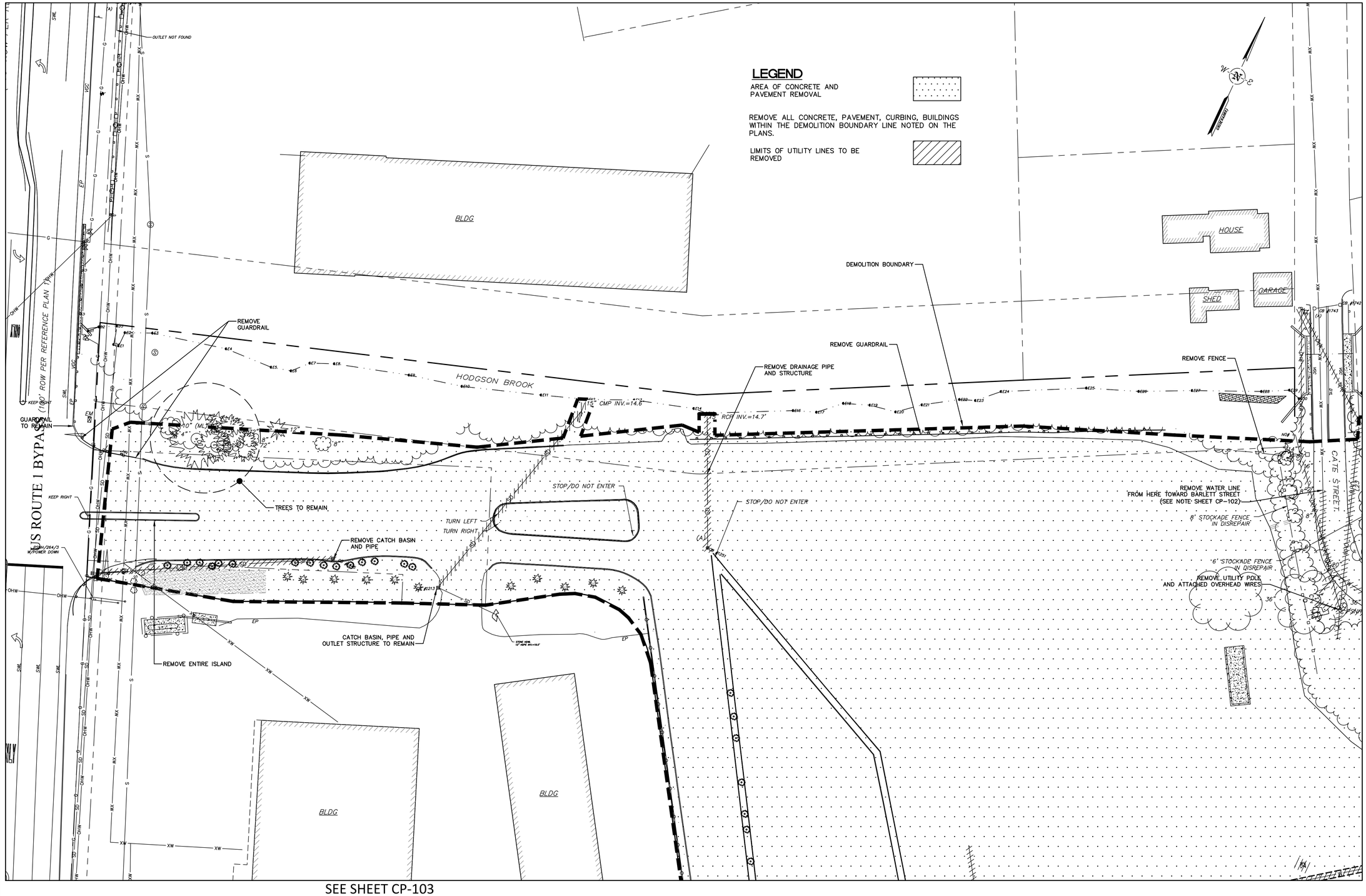

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STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943 LICENSED

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SITE PREPARATION PLAN

CATE STREET

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CP-101

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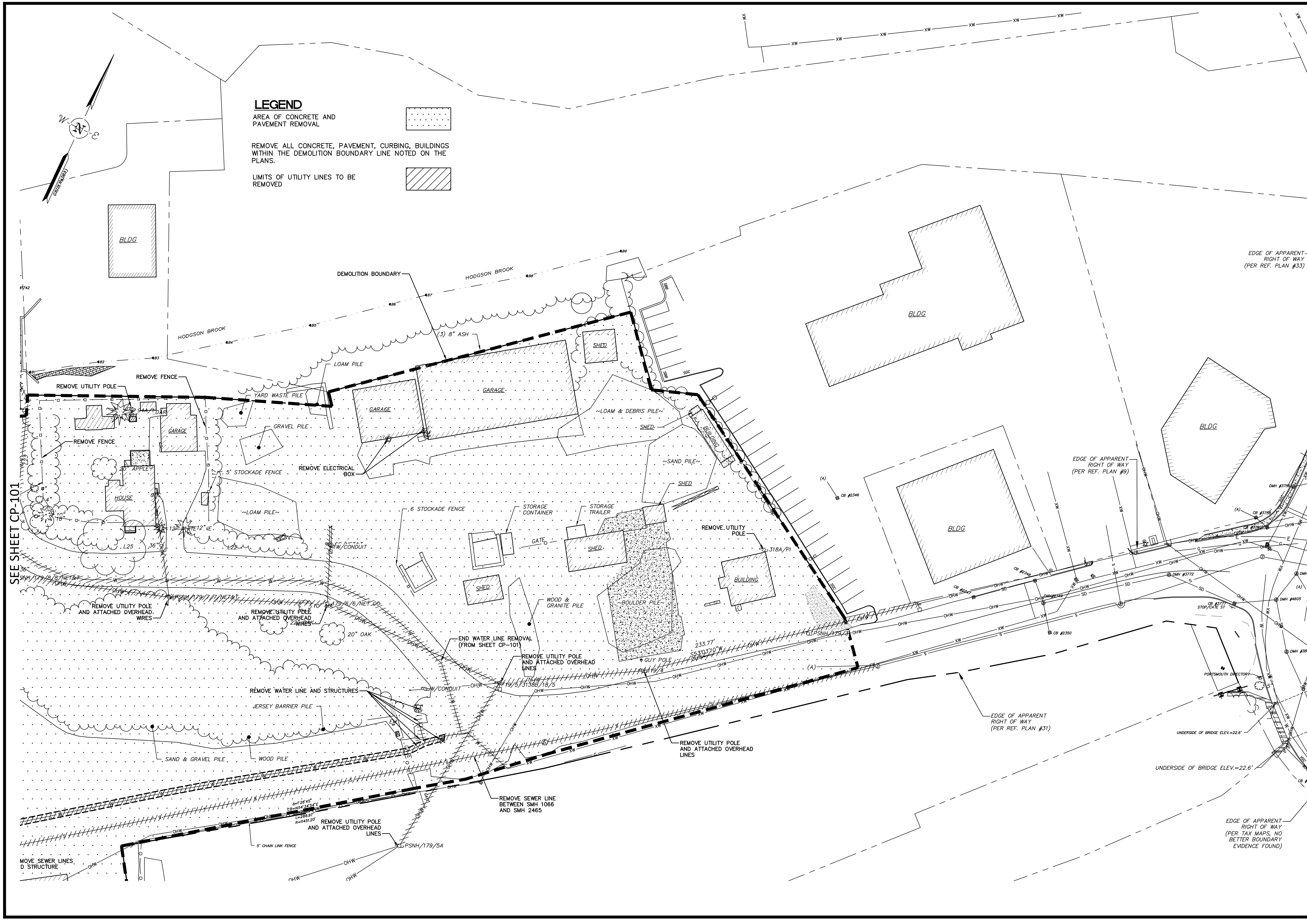
LEGEND
AREA OF CONCRETE AND PAVEMENT REMOVAL
REMOVE ALL CONCRETE, PAVEMENT, CURBING, BUILDINGS WITHIN THE DEMOLITION BOUNDARY LINE NOTED ON THE PLANS.
LIMITS OF UTILITY LINES TO BE REMOVED
BLDG
HODGSON BROOK
DEMOLITION BOUNDARY
(3) 8" ASH
LOAM PILE
SHED
GARAGE
REMOVE UTILITY POLE
REMOVE FENCE
YARD WASTE PILE
GRAVEL PILE
~LOAM & DEBRIS PILE~
BUILDING
~SAND PILE~
REMOVE ELECTRICAL BOX
5' STOCKADE FENCE
HOUSE
~LOAM PILE~
6 STOCKADE FENCE
STORAGE CONTAINER
STORAGE TRAILER
GATE
REMOVE UTILITY POLE
318A/PI
SEE SHEET CP-101
REMOVE UTILITY POLE AND ATTACHED OVERHEAD WIRES
20" OAK
WOOD & GRANITE PILE
BOULDER PILE
END WATER LINE REMOVAL (FROM SHEET CP-101)
REMOVE UTILITY POLE AND ATTACHED OVERHEAD LINES
GUY POLE
REMOVE WATER LINE AND STRUCTURES
JERSEY BARRIER PILE
SAND & GRAVEL PILE
WOOD PILE
REMOVE SEWER LINE BETWEEN SMH 1066 AND SMH 2465
5' CHAIN LINK FENCE
PSNH/179/5A
MOVE SEWER LINES, D STRUCTURE
EDGE OF APPARENT RIGHT OF WAY (PER REF. PLAN #33)
EDGE OF APPARENT RIGHT OF WAY (PER REF. PLAN #9)
EDGE OF APPARENT RIGHT OF WAY (PER REF. PLAN #31)
EDGE OF APPARENT RIGHT OF WAY (PER TAX MAPS, NO BETTER BOUNDARY EVIDENCE FOUND)
PORTSMOUTH DIRECTORY
UNDERSIDE OF BRIDGE ELEV.=22.6'
STOP/CATE ST

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 LICENSED – PROFESSIONAL ENGINEER

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PORTSMOUTH NEW HAMPSHIRE

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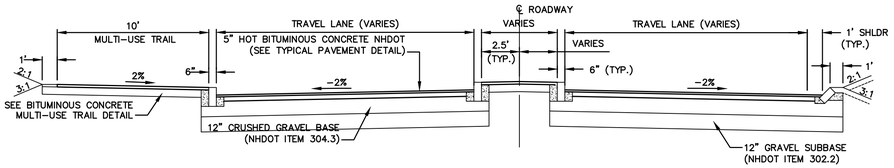
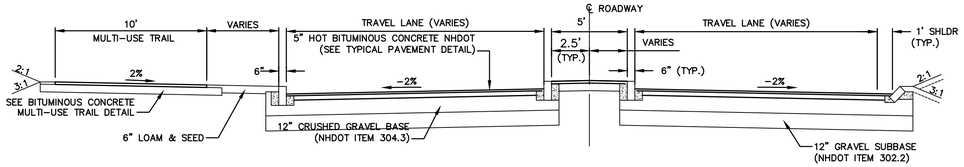
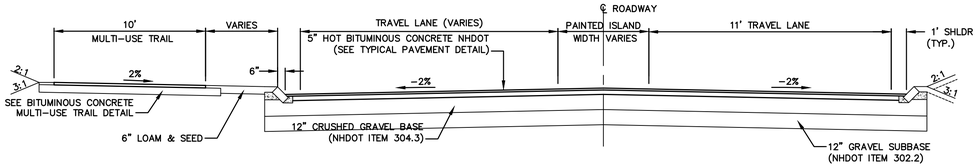


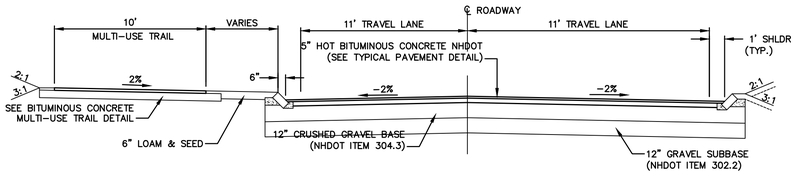
STATION 1+07± TO 2+65±



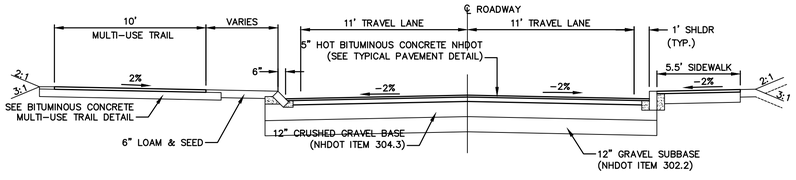
STATION 2+65± TO 2+99±



STATION 2+99± TO 4+68±



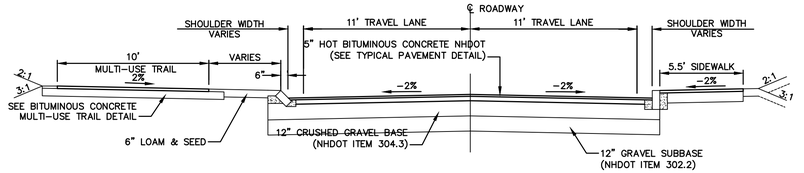
STATION 4+68± TO 5+40±



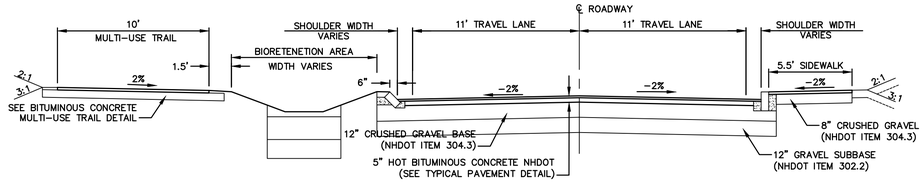
STATION 5+40± TO 10+90±

ROADWAY TYPICAL SECTIONS

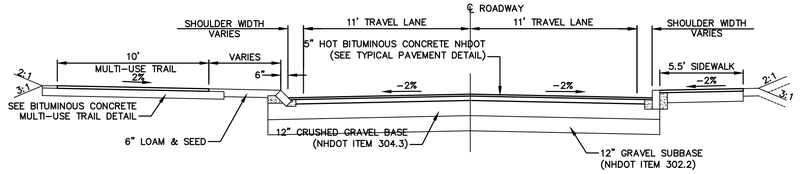
SCALE: 1"=5'



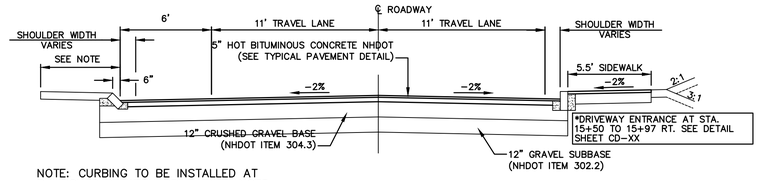
STATION 10+90± TO 12+50±



STATION 12+50± TO 14+40±

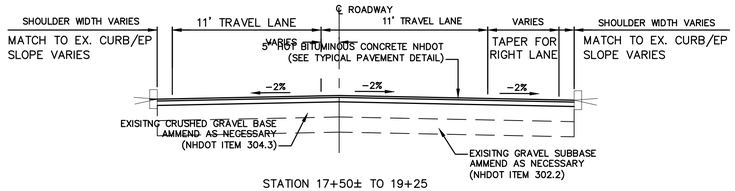


STATION 14+40± TO 15+20±

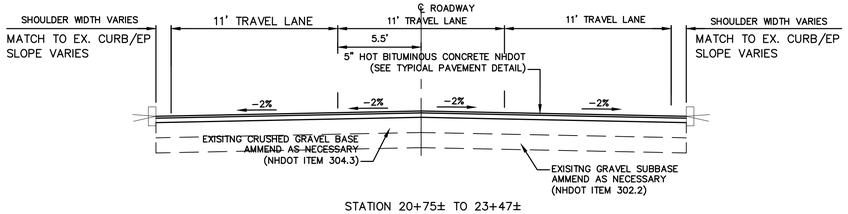


NOTE: CURBING TO BE INSTALLED AT
BUMPOUTS BETWEEN DRIVE ENTRANCES.

STATION 15+20± TO 17+50±



STATION 17+50± TO 19+25
STATION 20+00 TO 20+75±



STATION 20+75± TO 23+47±

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: VERT.:
DATUM: HORZ.: NAD83 VERT.: NAVD88
0 GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC

TYPICAL ROADWAY SECTIONS

CATE STREET

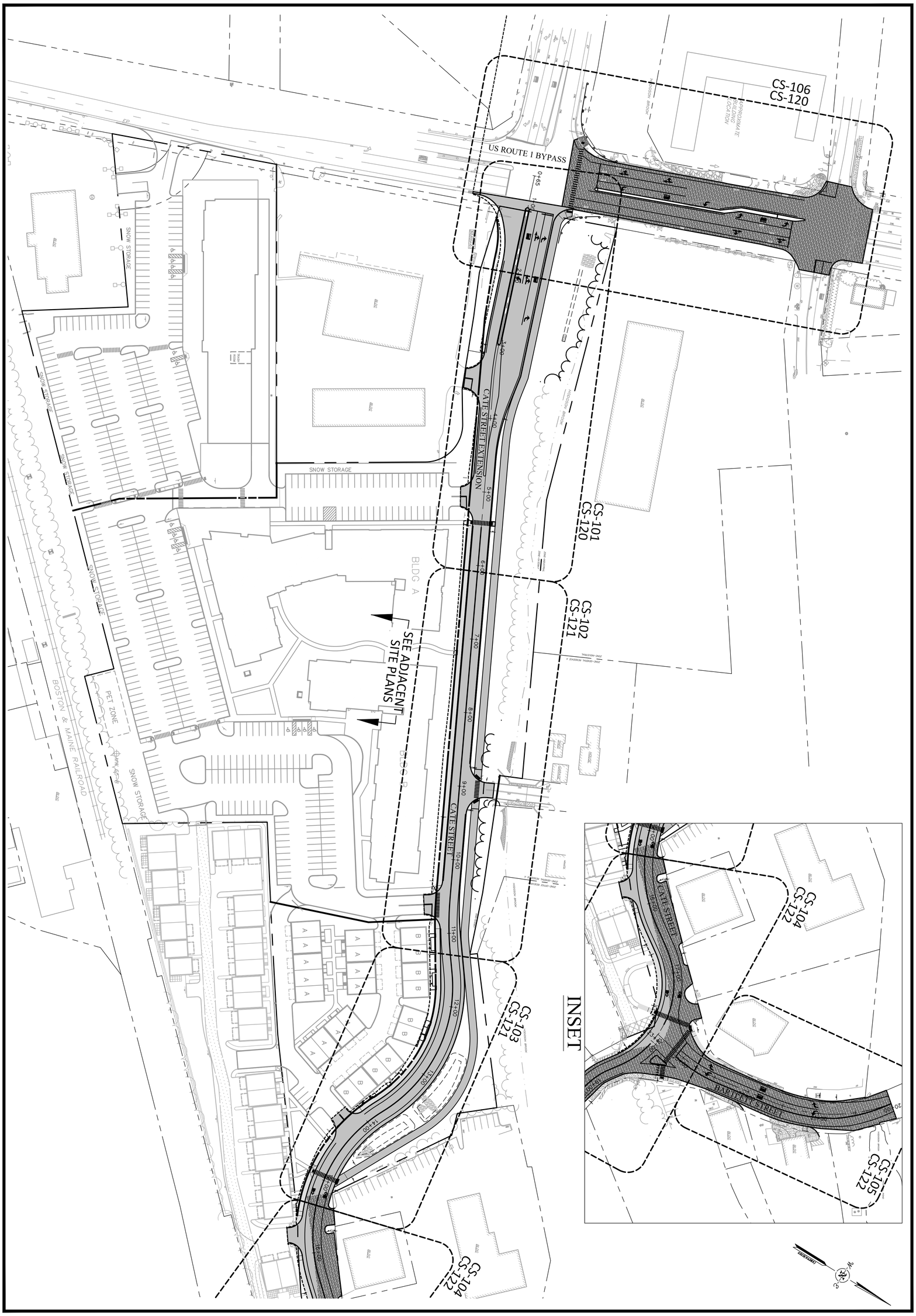
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-001

File Path: F:\P20180317\A10\Civil\Dwg\20180317A10_STP01.DWG Layout: CS-001(R) Plotted: Tue, September 10, 2019 - 11:04 AM User: jandretta
Plotter: DWG TO PDF.PC3 CTB File: FO.STB
MS VIEW: LAYER STATE:

File Path: F:\P2018\0317\A10\Civil3\Dwg\20180317A10_STP01.DWG Layout: CS-100(R) Plotted: Tue, September 10, 2019 - 11:04 AM User: jandretta
MS VIEW: | LAYER STATE: | Plotter: DWG TO PDF.PC3 CTB File: FO.STB



CS-100

DRCL No.: 20180317A10
DATE: 09/10/2019

CATE STREET DEVELOPMENT, LLC

OVERALL ROADWAY PLAN

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

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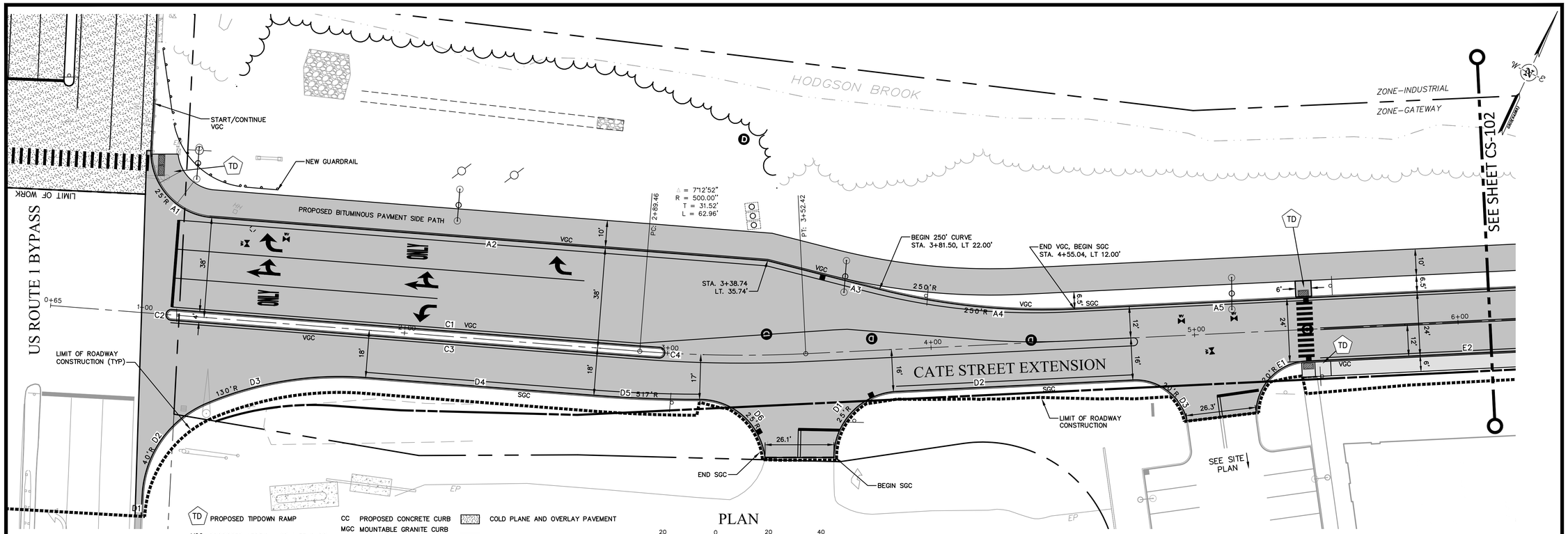
SCALE:
HORZ.: 1"=60'
VERT.: 1"=60'
DATUM:
HORZ.: NAD83
VERT.: NAVD88
60 30 0 60
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE – RICHARD R LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

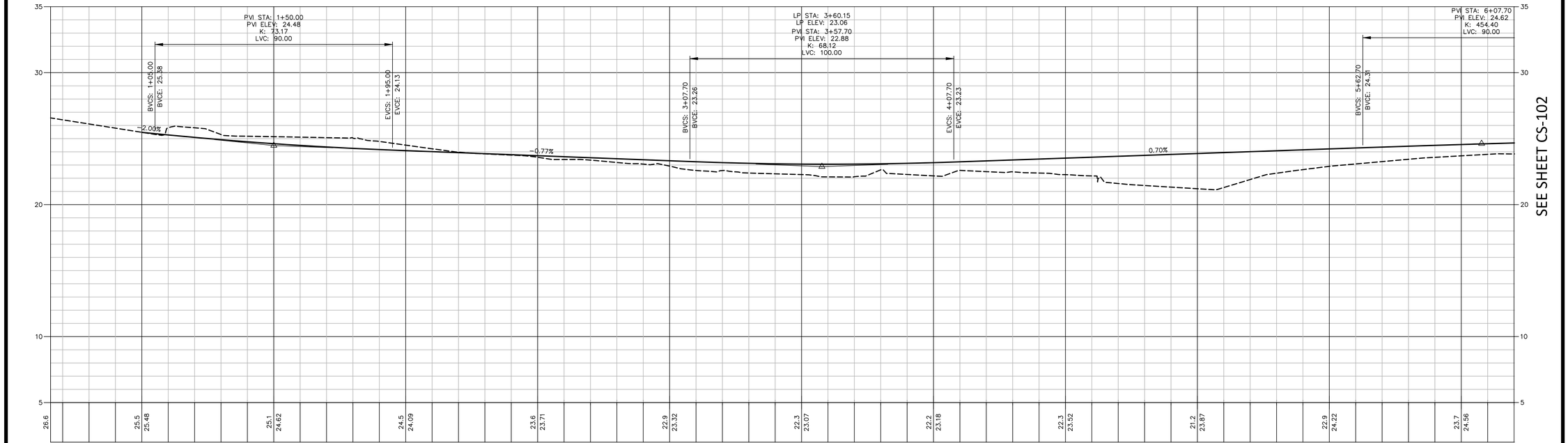
No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL



PLAN

SCALE: 1 INCH = 20 FT.

A1–K6 – SEE SHEET CS–107 FOR CURB LAYOUT INFORMATION.



PROFILE

HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

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MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: VERT.: DATUM: HORZ.: NAD83 VERT.: NGVD29 GRAPHIC SCALE 0

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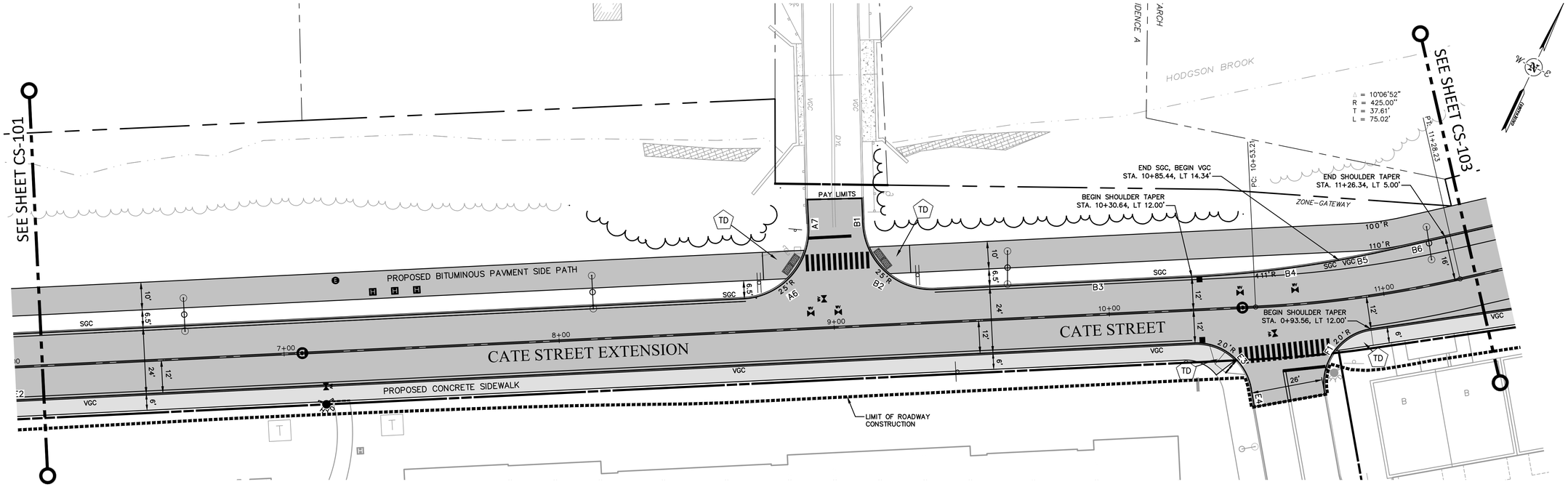
ROADWAY PLAN & PROFILE

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-101

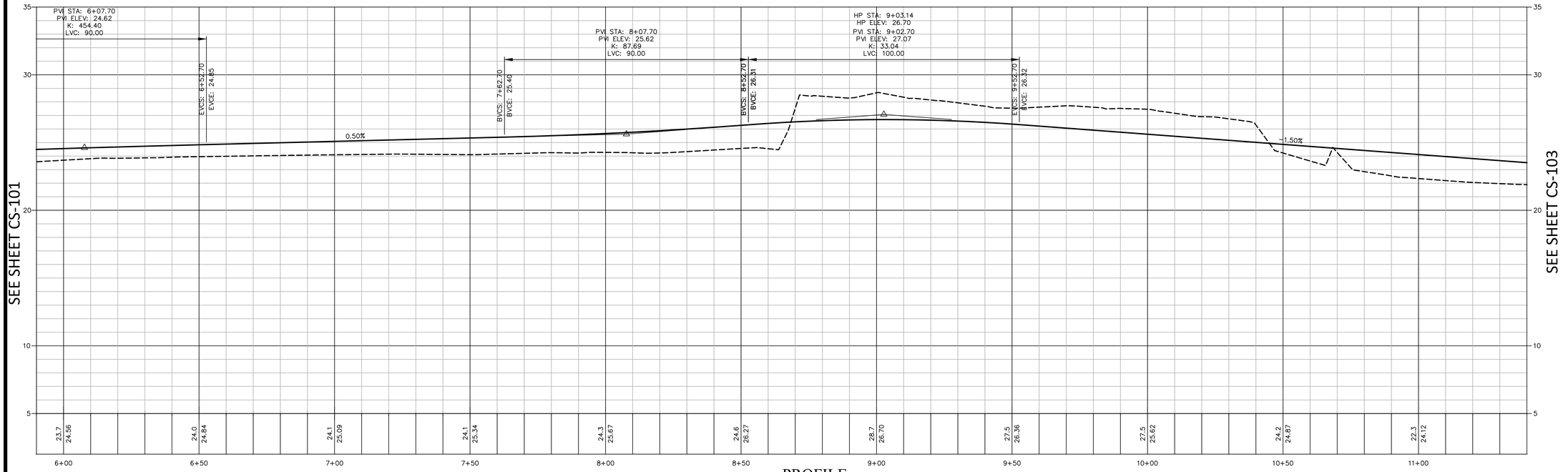


PLAN

SCALE: 1 INCH = 20 FT.

A1–K6 – SEE SHEET CS-107 FOR CURB LAYOUT INFORMATION.

TD PROPOSED TIPDOWN RAMP
VGC PROPOSED VERTICAL GRANITE CURB
SGC PROPOSED SLOPED GRANITE CURB
CC PROPOSED CONCRETE CURB
MGC MOUNTABLE GRANITE CURB
ROADWAY LIMIT
DETECTABLE WARNING PANEL
COLD PLANE AND OVERLAY PAVEMENT
FULL DEPTH ROADWAY PAVEMENT



PROFILE

HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943 LICENSED

SCALE:
HORZ.: 1"=20'
VERT.: 1"=20'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
20 0 20 40
20 10 0 20
GRAPHIC SCALE

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ROADWAY PLAN & PROFILE
CATE STREET
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-102

File Path: F:\P2018\03317A10\Civil\Dwg\20180317A10_STP01.DWG Layout: CS-102(R) Plotted: Tue, September 10, 2019 - 11:04 AM User: jandretta
Plotter: DWG TO PDF.PC3 CTB File: FO.STB
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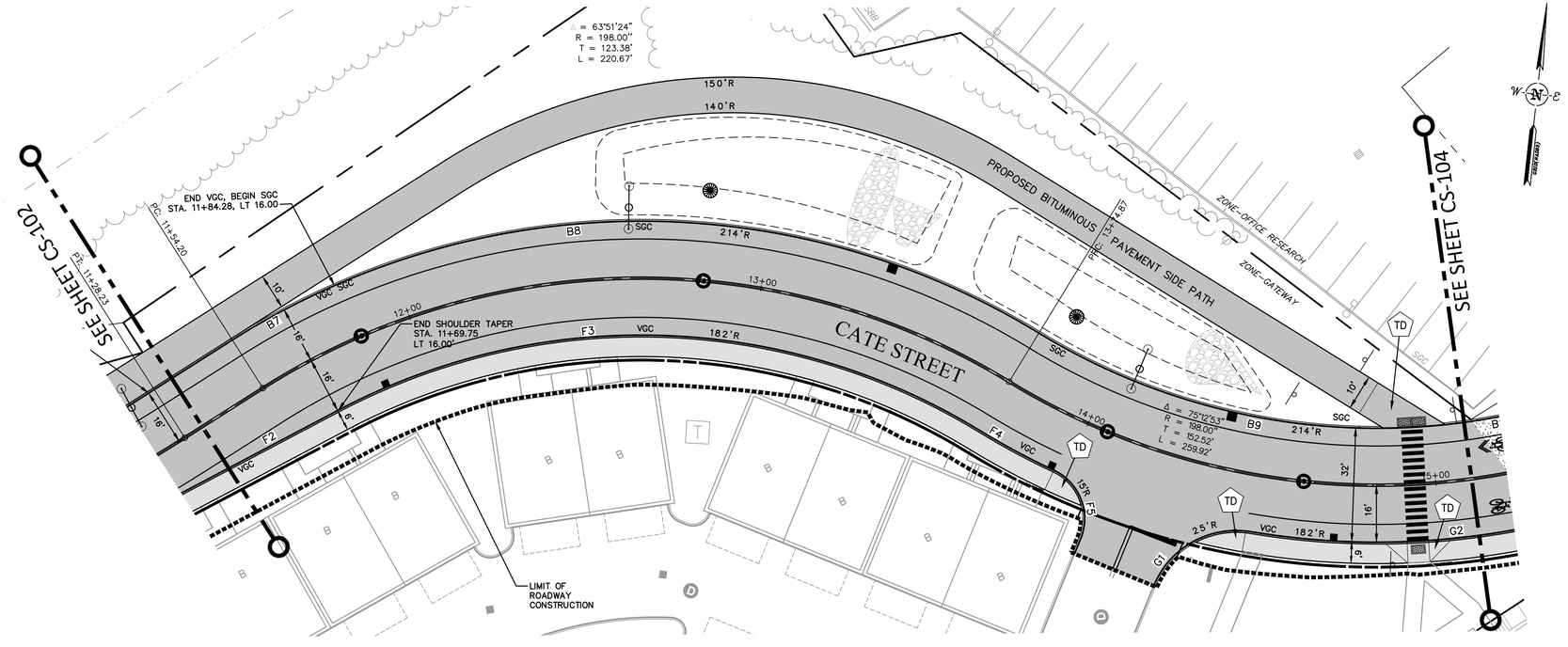
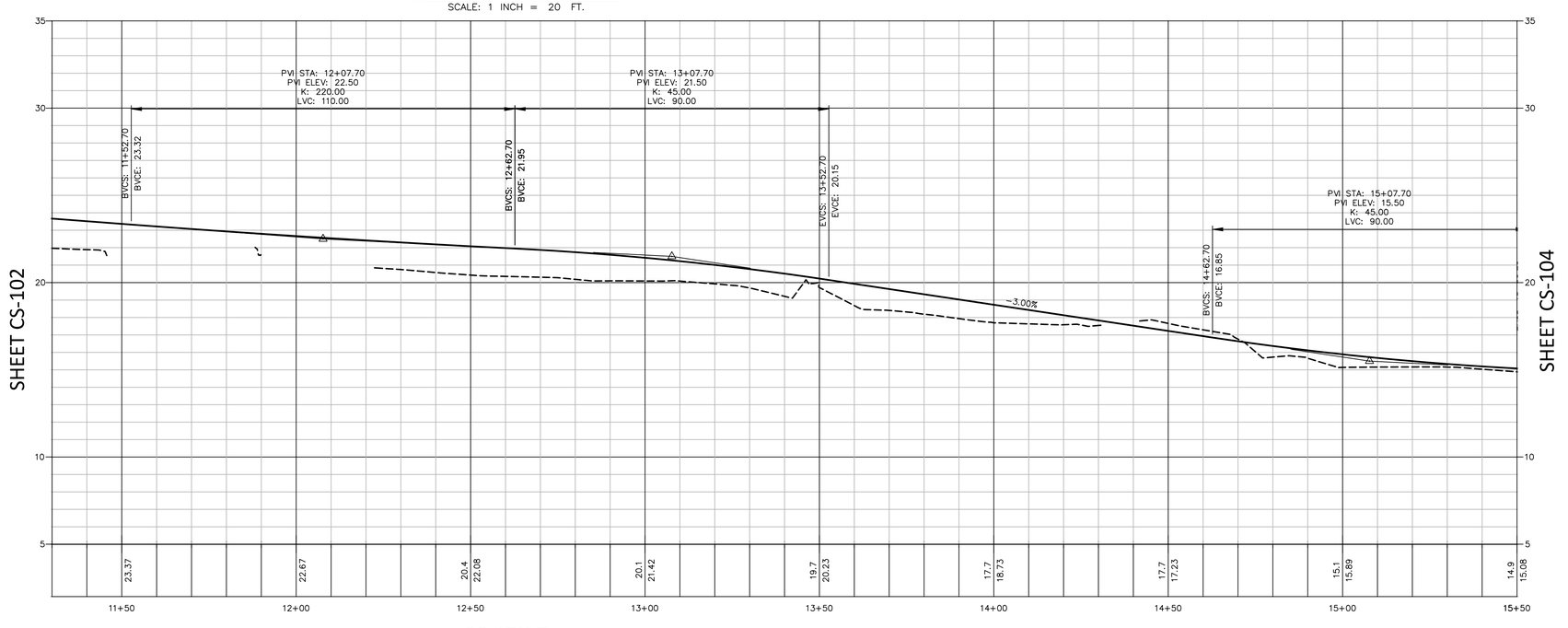


PLAN

SCALE: 1 INCH = 20 FT.

TD PROPOSED TIPDOWN RAMP
VGC PROPOSED VERTICAL GRANITE CURB
SGC PROPOSED SLOPED GRANITE CURB
CC PROPOSED CONCRETE CURB
MGC MOUNTABLE GRANITE CURB
ROADWAY LIMIT
DETECTABLE WARNING PANEL
COLD PLANE AND OVERLAY PAVEMENT
FULL DEPTH ROADWAY PAVEMENT

A1–K6 – SEE SHEET CS–107 FOR CURB LAYOUT INFORMATION.



PROFILE

HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: 1"=20'
VERT.: 1"=20'
DATUM: HORZ.: NAD83
VERT.: NGVD29
GRAPHIC SCALE 20 0 10 20

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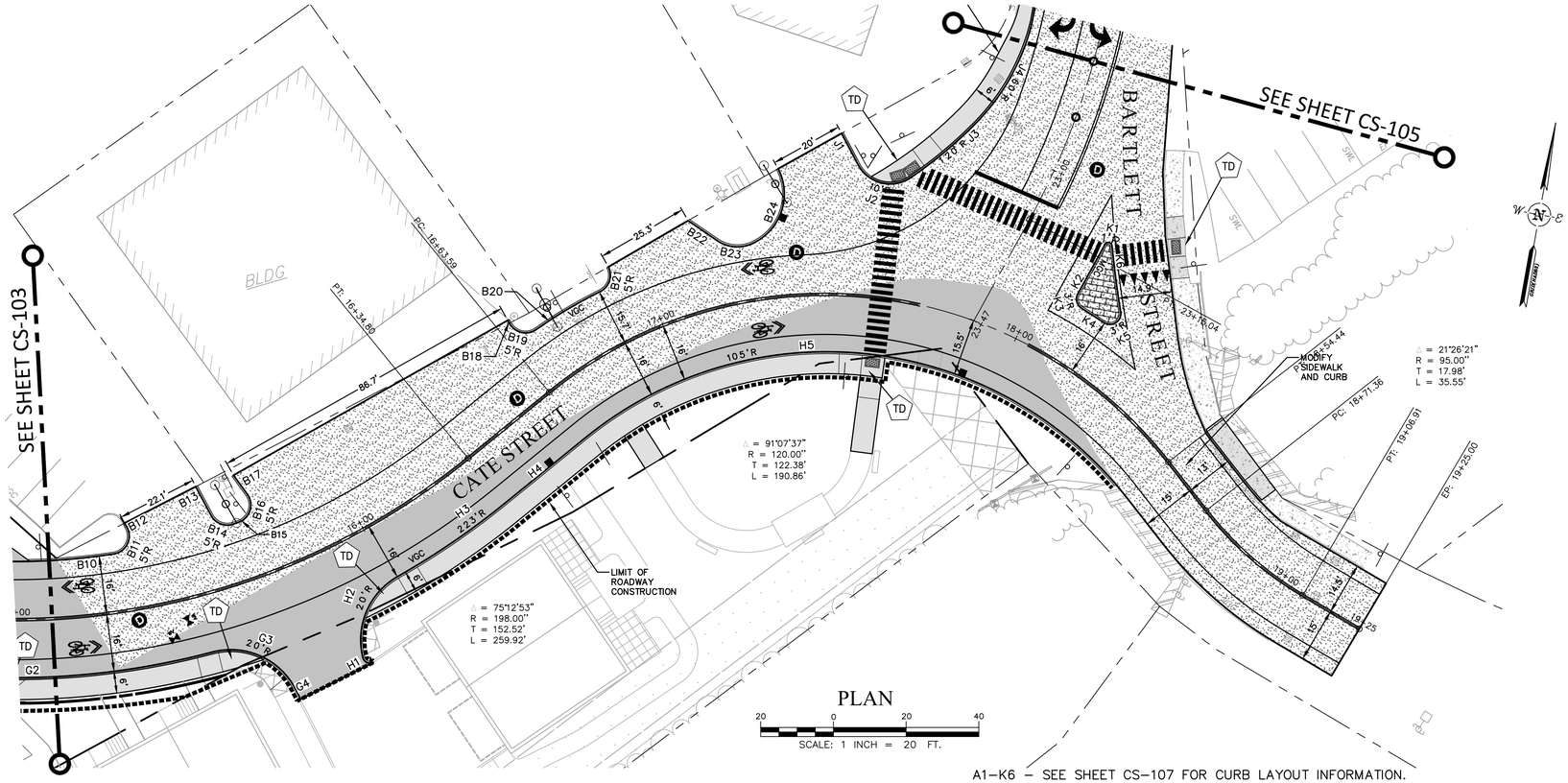
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-103

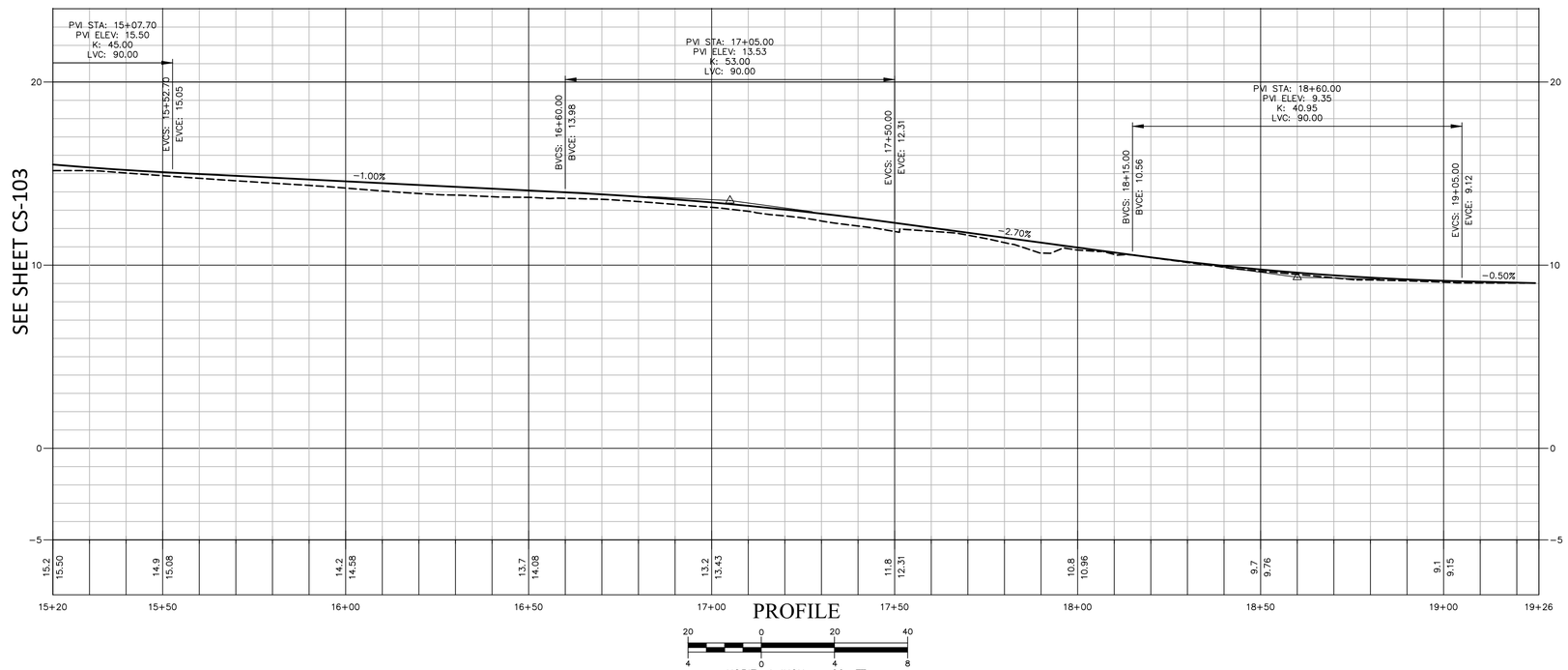
File Path: F:\P2018\0317A10\Civil\3Dwg\20180317A10_STP01.DWG Layout: CS-103(R) Plotted: Tue, September 10, 2019 - 11:05 AM User: jandretta
MS VIEW: LAYER STATE:
Plotter: DWG TO PDF.PC3 CTB File: FO.STB



PLAN

SCALE: 1 INCH = 20 FT.

A1–K6 – SEE SHEET CS–107 FOR CURB LAYOUT INFORMATION.



PROFILE

HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE:
HORZ.: 1"=20'
VERT.: 1"=20'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
20 10 0 20
GRAPHIC SCALE

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ROADWAY PLAN & PROFILE

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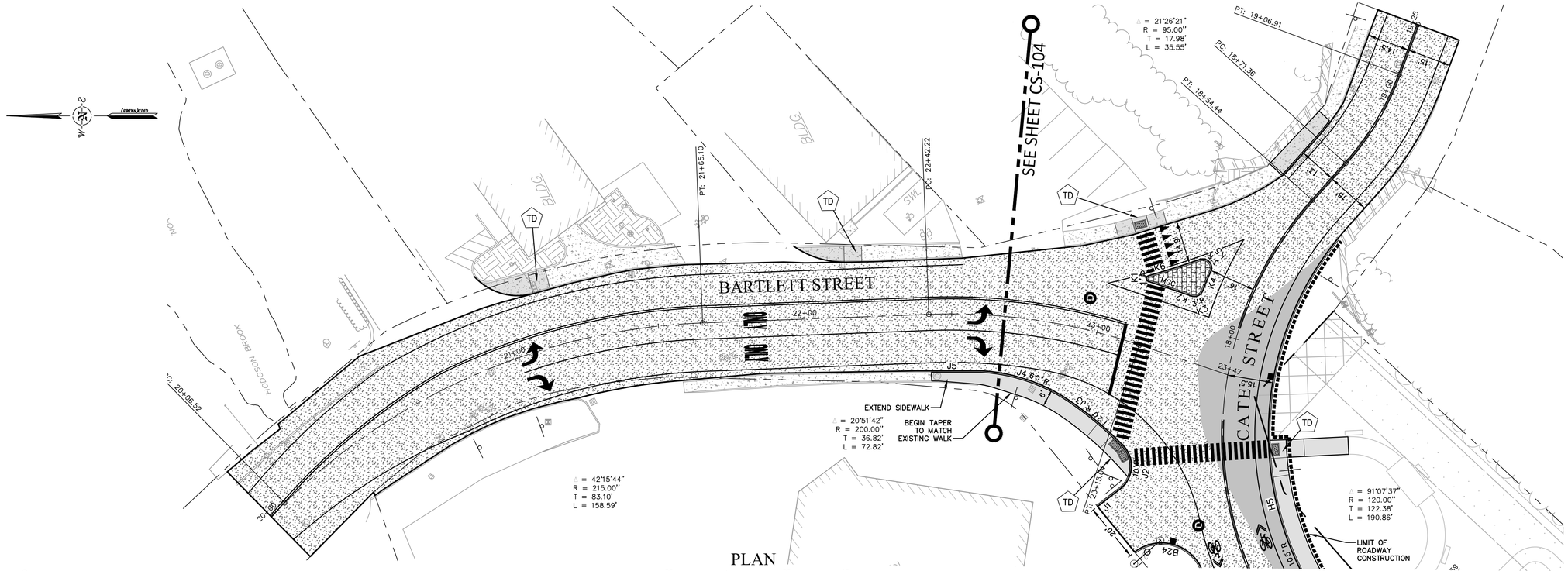
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-104

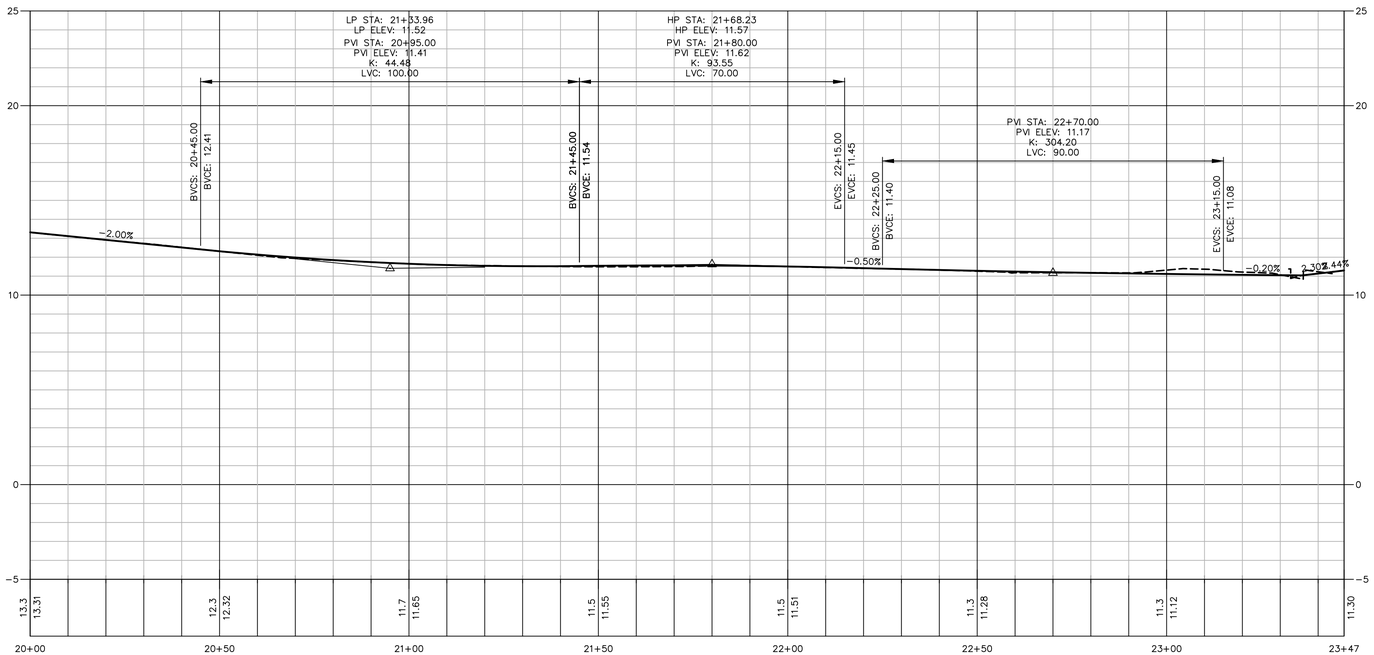


PLAN

SCALE: 1 INCH = 20 FT.

A1–K6 – SEE SHEET CS–107 FOR CURB LAYOUT INFORMATION.

TD PROPOSED TIPDOWN RAMP
VGC PROPOSED VERTICAL GRANITE CURB
SGC PROPOSED SLOPED GRANITE CURB
CC PROPOSED CONCRETE CURB
MGC MOUNTABLE GRANITE CURB
ROADWAY LIMIT
DETECTABLE WARNING PANEL
COLD PLANE AND OVERLAY PAVEMENT
FULL DEPTH ROADWAY PAVEMENT



PROFILE

HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD L. LUNDBORN No. 10943 LICENSED

SCALE:
HORZ.: 1"=20'
VERT.: 1"=20'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
20 10 0 20
GRAPHIC SCALE

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ROADWAY PLAN & PROFILE

CATE STREET

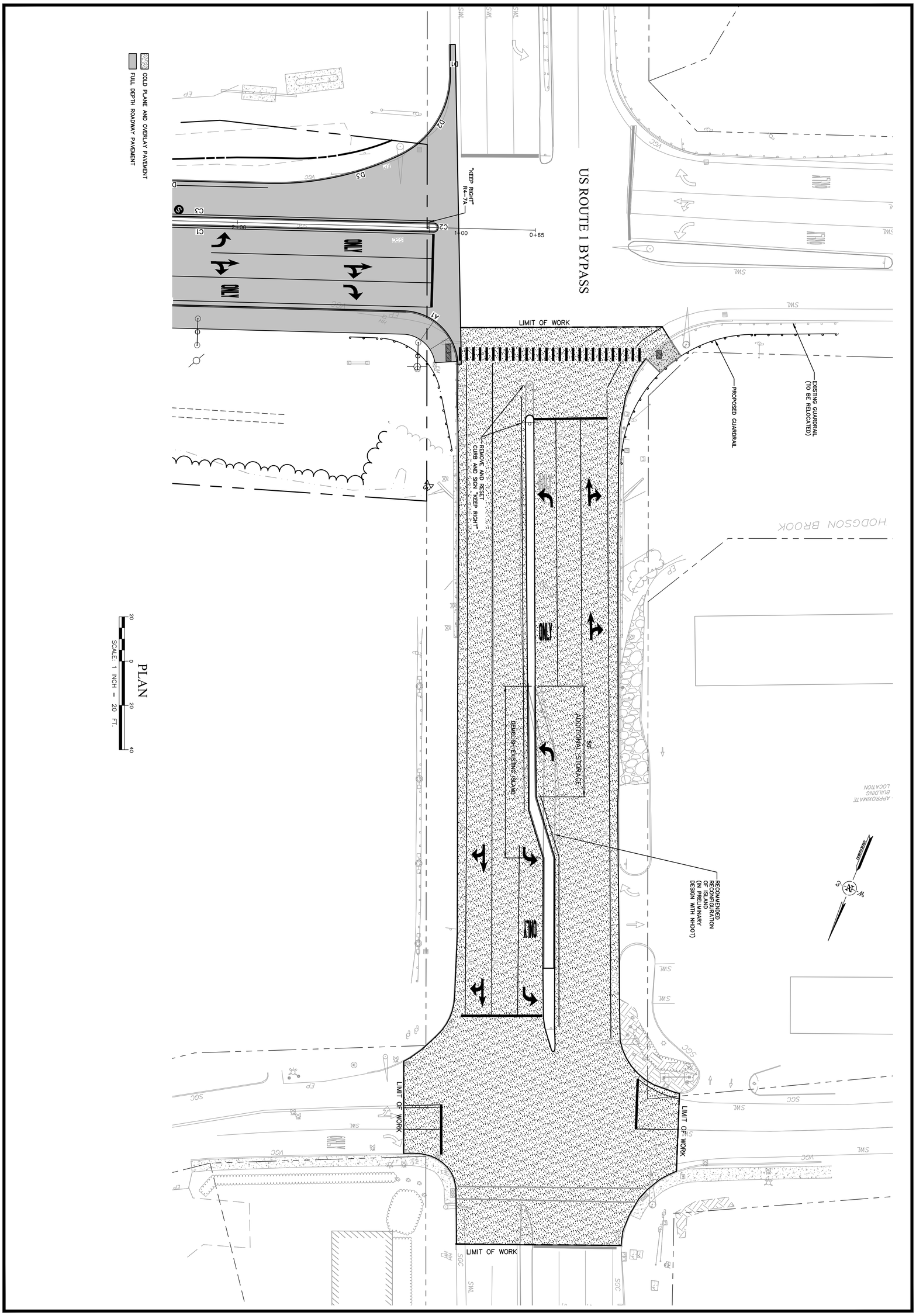
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-105

File Path: F:\P2018\0317\A10\Civil3D\dwg\20180317A10_STP01.DWG Layout: CS-105(R) Plotted: Tue, September 10, 2019 - 11:05 AM User: jandretta
MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB

File Path: F:\P2018\0317\A10\Civil3\Dwg\20180317A10_STP01.DWG Layout: CS-106 (R) Plotted: Tue, September 10, 2019 - 11:05 AM User: jandretta
MS VIEW: | LAYER STATE: | Plotter: DWG TO PDF.PC3 CTB File: FO.STB



CS-106

PROJ. No: 20180317A10
DATE: 09/10/2019

CATE STREET DEVELOPMENT, LLC

RTE 1 BYPASS OFFSITE IMPROVEMENT PLAN
CATE STREET

PORTSMOUTH NEW HAMPSHIRE

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207.363.0669
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SCALE:
HORZ.: 1"=20'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NGVD29
20 10 0 20
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
RICHARD R LUNDBORN No. 10943
LICENSED PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

CURBING

ITEM NO.						
ITEM	MARK NUMBER	RADIUS	VERTICAL GRANITE CURB	CURVED VERTICAL GRANITE CURB	SLANTED GRANITE CURB	CURVED SLANTED GRANITE CURB
UNIT		LF	LF	LF	LF	LF
LOCATION STATION TO STATION						
0+98.77, LT 61.45 – 1+23.75, LT 38.00	A1	25.00	37.62			
1+23.75, LT 38.00 – 3+38.74, LT 35.74	A2		211.40			
3+38.74, LT 35.74 – 3+81.50, LT 23.06	A3		43.71			
3+81.50, LT 23.06 – 4+55.04, LT 12.00	A4	250.00	74.54			
4+55.04, LT 12.00 – 8+67.47, LT 12.00	A5				412.43	
8+67.47, LT 12.00 – 8+92.50, LT 37.53	A6	25.00			37.93	
8+92.50, LT 37.53 – 8+92.50, LT 46.82	A7		2.40			
9+12.31, LT 46.36 – 9+12.21, LT 37.04	B1		1.45			
9+12.21, LT 37.04 – 9+37.20, LT 12.00	B2	25.00			39.50	
9+37.20, LT 12.00 – 10+30.61, LT 12.00	B3				93.40	
10+30.61, LT 12.00 – 10+85.44, LT 14.34	B4	411.00			53.87	
10+85.44, LT 14.34 – 11+04.82, LT 15.34	B5		18.68			
11+04.82, LT 15.34 – 11+54.20, LT 16.00	B6		48.57			
11+54.20, LT 16.00 – 11+84.20, LT 16.00	B7	214.00	32.52			
11+84.20, LT 16.00 – 13+74.87, LT 16.00	B8	214.00			206.00	
13+74.87, LT 16.00 – 14+85.44, LT 16.00	B9	182.00			126.60	
15+04.39, LT 16.00 – 15+29.58, LT 16.00	B10	182.00			16.00	
15+29.58, LT 16.00 – 15+34.78, LT 22.90	B11	5.00				9.86
15+34.78, LT 22.90 – 15+33.59, LT 25.53	B12				1.00	
15+59.12, LT 29.03 – 15+61.00, LT 20.18	B13		9.00			
15+61.00, LT 20.18 – 15+66.51, LT 15.46	B14	5.00		7.10		
15+66.54, LT 15.46 – 15+68.28, LT 16.00	B15		1.63			
15+68.28, LT 16.00 – 15+73.69, LT 22.19	B16	5.00		9.27		
15+73.69, LT 22.19 – 15+71.78, LT 28.58	B17		6.47			
16+66.63, LT 22.59 – 16+66.49, LT 21.20	B18		1.14			
16+66.49, LT 21.20 – 16+70.69, LT 15.90	B19	5.00		8.26		
16+70.69, LT 15.90 – 16+89.28, LT 15.64	B20	134.50	20.56			
16+89.28, LT 15.64 – 16+93.18, LT 20.52	B21	5.00		7.71		
17+14.17, LT 25.21 – 17+19.61, LT 17.91	B22		9.63			
17+19.64, LT 17.91 – 17+27.98, LT 15.66	B23	10.00		10.34		
17+27.98, LT 15.66 – 17+35.76, LT 35.15	B24	15.00		24.22		
1+11.33, LT 2.00 – 2+96.93, LT 2.00	C1		185.57			
1+11.33, LT 2.00 – 1+11.33, RT 2.00	C2	2.00		6.28		
1+11.33, LT 2.00 – 2+96.93, RT 2.00	C3		185.63			
2+96.93, RT 2.00 – 2+96.93, LT 2.00	C4	2.00		6.28		
PROJECT SUBTOTAL			890.52	79.45	986.73	9.86
ROUNDING						
PROJECT TOTAL			890.52	79.45	986.73	9.86

CURBING

ITEM NO.						
ITEM	MARK NUMBER	RADIUS	VERTICAL GRANITE CURB	CURVED VERTICAL GRANITE CURB	SLANTED GRANITE CURB	CURVED SLANTED GRANITE CURB
UNIT		LF	LF	LF	LF	LF
LOCATION STATION TO STATION						
1+06.04, RT 82.87 – 1+05.63, RT 69.16	D1				13.71	
1+05.63, RT 69.16 – 1+27.33, RT 32.36	D2	40.00			45.08	
1+27.33, RT 32.36 – 1+81.75, RT 18.12	D3	130.00			61.68	
1+81.75, RT 18.12 – 2+73.60, RT 18.00	D4				86.88	
2+73.60, RT 18.00 – 3+12.66, RT 17.02	D5	517.00			39.87	
3+12.66, RT 17.02 – 3+35.91, RT 36.07	D6	25.00			33.50	
3+61.19, RT 39.82 – 3+86.15, RT 16.00	D7	25.00			38.09	
3+86.15, RT 16.00 – 4+75.90, RT 16.00	D8				89.75	
4+75.90, RT 16.00 – 4+95.60, RT 32.54	D9	20.00			29.61	
5+21.87, RT 31.59 – 5+42.00, RT 12.00	E1	20.00	33.22			
5+42.00. RT 12.00 – 10+30.30, RT 12.00	E2		488.48			
10+30.30, RT 12.00 – 10+50.13, RT 30.32	E3	20.00	28.88			
10+50.13, RT 30.32 – 10+51.00, RT 36.28	E4		6.79			
10+75.05, RT 30.00 – 10+93.65, RT 12.00	F1	20.00	32.57			
10+93.65, RT 12.00 – 11+70.03, RT 16.00	F2		76.35			
11+70.03, RT 16.00 – 13+74.87, RT 16.00	F3	182.00	188.29			
13+74.87. RT 16.00 – 13+96.83, RT 16.00	F4	214.00	23.70			
13+93.83, RT 16.00 – 14+09.77, RT 30.90	F5	15.00		22.79		
14+29.99, RT 36.80 – 14+50.60, RT 16.00	G1	25.00	33.76			
14+49.24, RT 16.00 – 15+50.64, RT 16.00	G2	214.00	108.12			
15+50.64, RT 16.00 – 15+67.45, RT 32.39	G3	20.00	27.21			
15+67.45, RT 32.39 – 15+67.76, RT 35.59	G4		2.95			
15+86.65, RT 33.94 – 15+85.06, RT 31.52	H1	2.00		3.58		
15+85.06, RT 31.52 – 16+01.72, RT 16.00	H2	20.00	26.06			
16+01.72. RT 16.00 – 16+35.00, RT 16.00	H3	214.00	35.75			
16+35.00, RT 16.00 – 16+63.55, RT 16.00	H4		28.76			
16+63.55, RT 16.00 – 18+50.57, RT. 15.00	H5	105.00	166.94			
23+19.20, RT 56.62 – 23+24.54, RT 48.64	J1		9.68			
23+24.54, RT 48.64 – 23+20.73, RT 34.21	J2	10.00	16.85			
23+20.73, RT 34.21 – 22+96.87. RT 25.04	J3	120.00	22.84			
22+96.87, RT 25.04 – 22+61.03, RT 19.10	J4	60.00	36.42			
22+61.03, RT 19.10 – 22+42.33, RT 19.76	J5		18.97			
23+10.96, LT 23.63 – 23.11.44, LT 21.54	K1	1.00				2.54
23+11.44, LT 21.54 – 23+26.58, LT 21.50	K2				15.52	
23+26.58, LT 21.50 – 23+29.57, LT 24.37	K3	3.00				4.58
23+29.57, LT 24.37 – 23+30.08, LT 31.51	K4	136.00			7.165	
23+30.08, LT 31.51 – 23+25.24, LT 34.17	K5	3.00				7.00
23+25.24, LT 34.17 – 23+10.96, LT 23.63	K6	294.00			18.32	
PROJECT SUBTOTAL			1050.31	26.37	198.45	14.12
ROUNDING						
PROJECT TOTAL			1050.31	26.37	198.45	14.12

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – 10943 – RICHARD LUNDBORN – LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: 1"=20'
VERT.:
DATUM: HORZ.: NAD83
VERT.: NGVD29

GRAPHIC SCALE 20 0 10 20

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
207.363.0669
www.fando.com

CATE STREET DEVELOPMENT, LLC

ROADWAY CURBING CHART

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-107

US ROUTE 1 BYPASS

LIMIT OF WORK

4" SSLW

4" SSLW(T)

4" SSLW(T)

ONLY

4" SSLW(T)

ONLY

4" SSLW(T)

REMOVE AND RESET
CURB AND SIGN "KEEP RIGHT"

4" SSLW

"KEEP RIGHT"
R4–7A

0+65

1+00

12"SSW(T)

1'
1'
11'
11'
11'
2'

LIMIT OF WORK

LIMIT OF WORK

PLAN

20 0 20 40

SCALE: 1 INCH = 20 FT.

SSLW(T) SINGLE SOLID LINE (THERMOPLASTIC)
SSLW SINGLE SOLID LINE (WHITE)
DSLY DOUBLE SOLID LINE (YELLOW)
ROADWAY LIMIT

HODGSON BROOK

ZONE–INDUSTRIAL
ZONE–GATEWAY

SEE SHEET CS-121

REMOVE AND RESET
"KEEP RIGHT"

LIMIT OF WORK

PANTED ISLAND WITH LEFT
TURN LANE NHDOT PM–6

BEGIN PAINTED ISLAND
STA. 2+88.96
LT 3.0'

BEGIN SHOULDER LINE TAPER
STA. 3+77.60, LT 22.17'

STA. 3+68.56
LT 8.5'

NEW "LEFT THRU
RIGHT RIGHT ONLY"
R3–8(145)

END SHOULDER LINE TAPER
STA. 4+51.86, LT 11.00'

END CURVE
STA. 4+51.86
LT 0'

PROPOSED
CROSSWALK

NEW "PEDESTRIAN CROSSING" AND
"DIAGONAL ARROW"
W11–2 AND W16–7P
WITH FLASHING BEACON

12"SSW(T)

11'
11'
11'
2'

4"SSLW

4"SSLW(T)

4"SSW(T)

ONLY

ONLY

4"SSLW

4"SSLY

4"SSLW

4"SSLW

4"SSLY

252'R

263.5'R

4"SSLY

3' TYP.

4"SSLW

12"SSLW(T)

NEW "SPEED LIMIT 25"
R2–1

12"SSLW(T)

NEW STOP SIGN R1–1

LIMIT OF ROADWAY
CONSTRUCTION

4"DSLY

SEE SITE
PLAN

4"SSLW

4"DSLY

4"SSLW

NEW "PEDESTRIAN CROSSING" AND
DIAGONAL ARROW
W11–2 AND W16–7P
WITH FLASHING BEACON

0+65

1+00

2+00

3+00

4+00

5+00

6+00

EP

EP

PLAN

20 0 20 40

SCALE: 1 INCH = 20 FT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER
RICHARD R. LUNDBORN
No. 10943
LICENSED

SCALE:
HORZ.: 1"=20'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NGVD29
20 10 0 20
GRAPHIC SCALE

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KENNEBUNK, MAINE 04043
207.363.0669
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CATE STREET DEVELOPMENT, LLC

ROADWAY SIGNING & MARKING LAYOUT

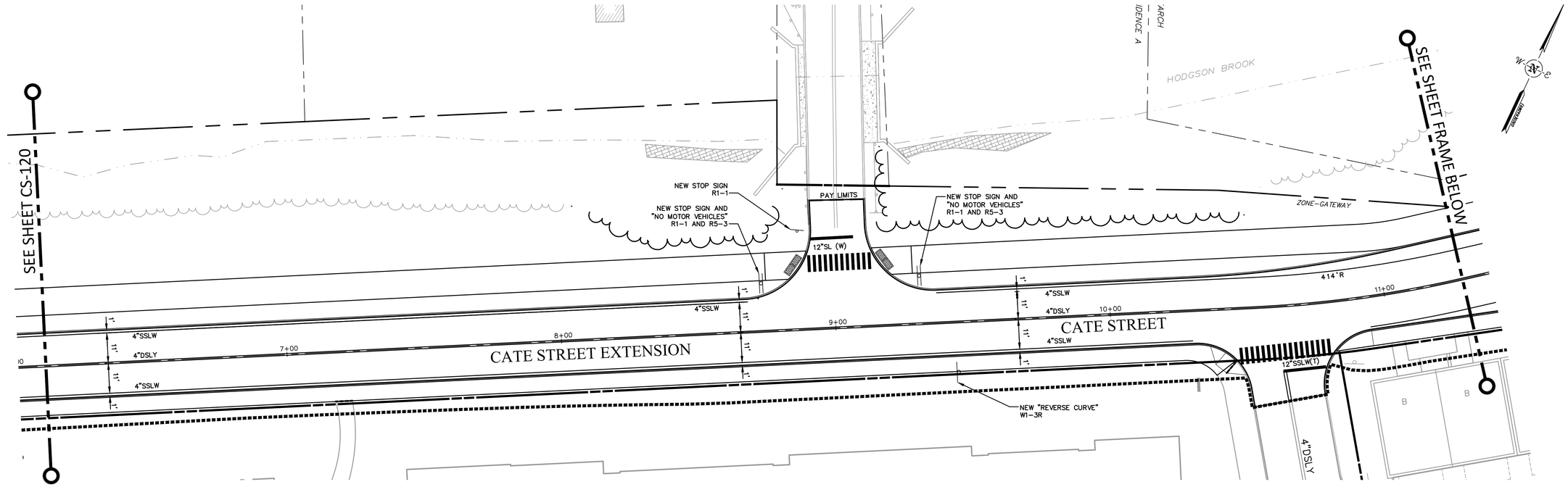
CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-120

File Path: F:\P2018\0317A10\Civil3\Dwg\20180317A10_STP01.DWG Layout: CS-120 Plotted: Tue, September 10, 2019 - 11:06 AM User: jandretta
Plotter: DWG TO PDF.PC3 CTB File: FO.STB
MS VIEW: LAYER STATE:



PLAN

SCALE: 1 INCH = 20 FT.

SSLW(T) SINGLE SOLID LINE (THERMOPLASTIC)
SSLW SINGLE SOLID LINE (WHITE)
DSLY DOUBLE SOLID LINE (YELLOW)
ROADWAY LIMIT

PLAN

SCALE: 1 INCH = 20 FT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: 1"=20' VERT.: 1"=20'
DATUM: HORZ.: NAD83 VERT.: NGVD29
GRAPHIC SCALE 20 10 0 20

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CATE STREET DEVELOPMENT, LLC

ROADWAY SIGNING & MARKING LAYOUT
CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-121

File Path: F:\P2018\0317A10\Civil\3Dwg\20180317A10_STP01.DWG Layout: CS-121 Plotted: Tue, September 10, 2019 - 11:06 AM User: jandretta
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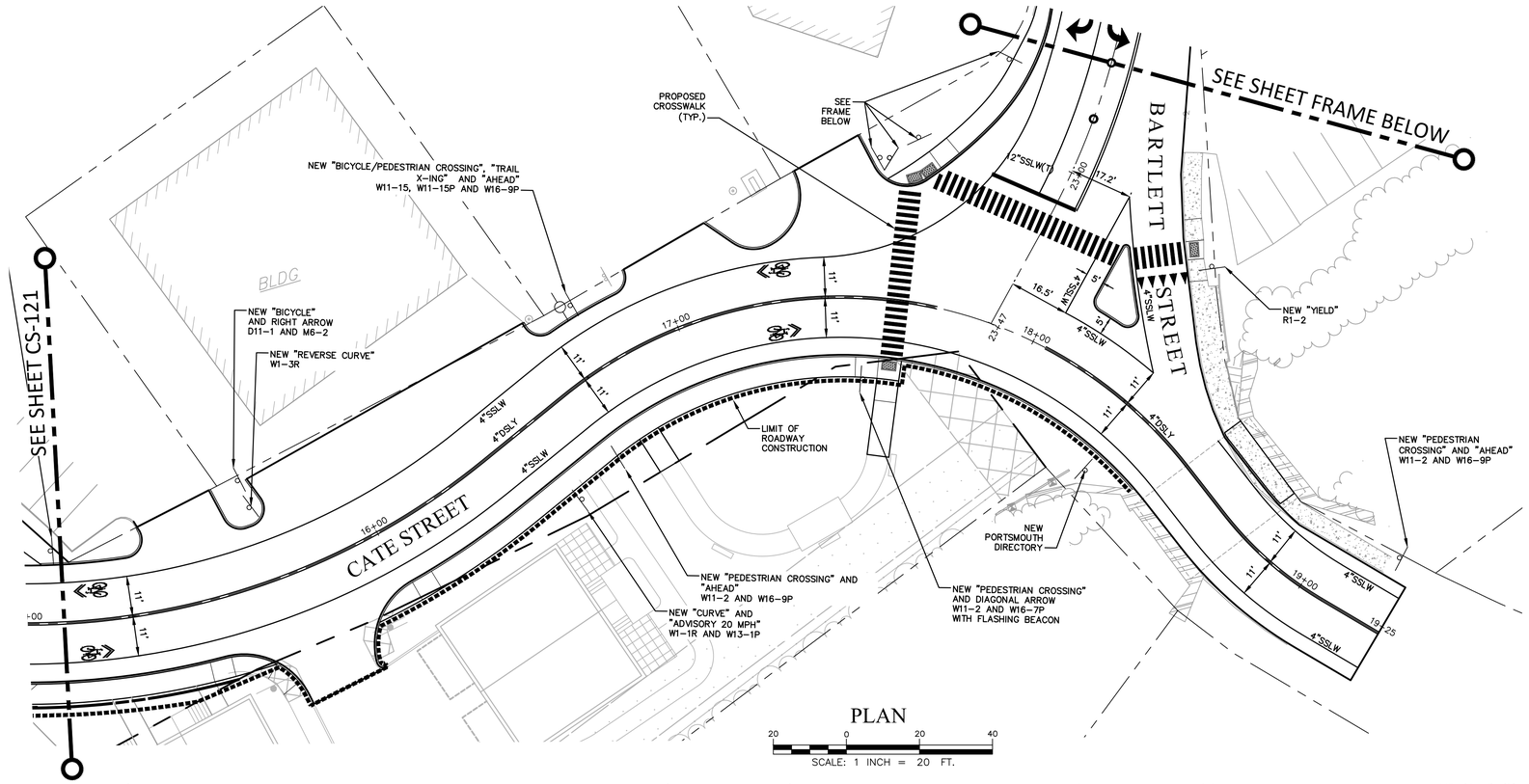
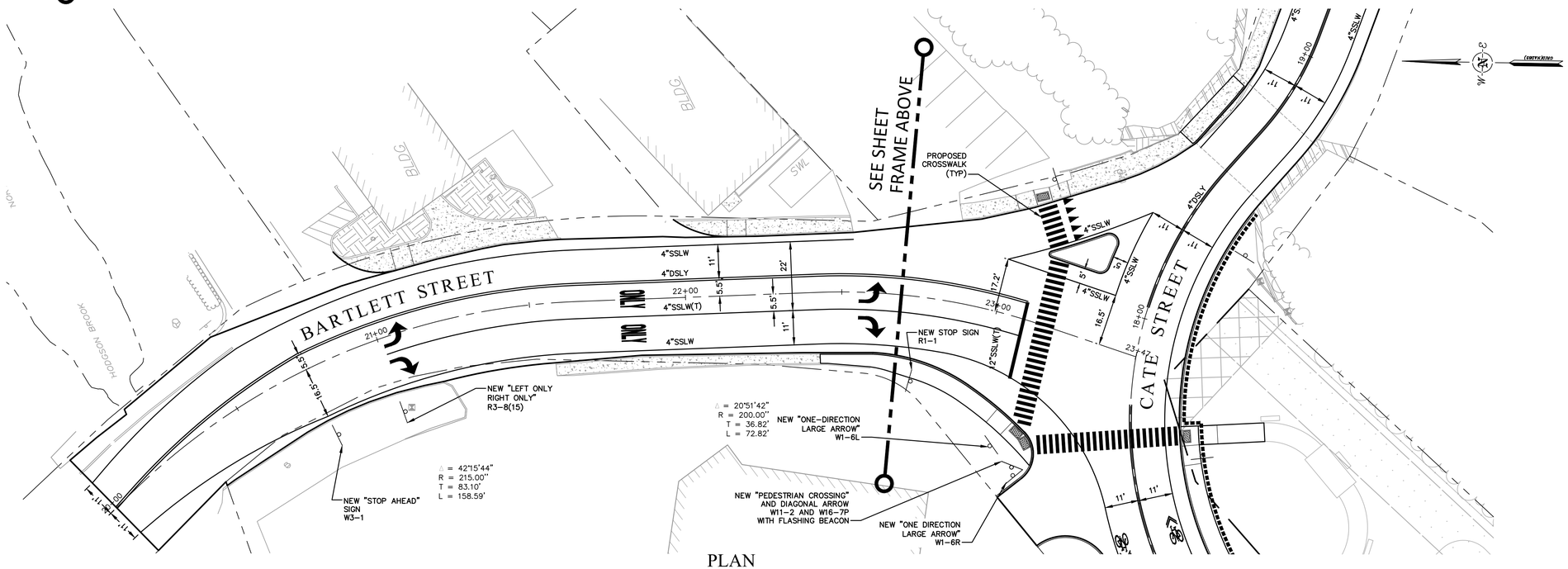


PLAN

20 0 20 40

SCALE: 1 INCH = 20 FT.



PLAN

20 0 20 40

SCALE: 1 INCH = 20 FT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: 1"=20' VERT.: 1"=20'
DATUM: HORZ.: NAD83 VERT.: NGVD29
GRAPHIC SCALE 20 10 0 20

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CATE STREET DEVELOPMENT, LLC

ROADWAY SIGNING & MARKING LAYOUT
CATE STREET
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-122

File Path: F:\P2018\03317A10\Civil3\Dwg\20180317A10_STP01.DWG Layout: CS-122 Plotted: Tue, September 10, 2019 - 11:06 AM User: jandretta
MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB

PAVEMENT MARKINGS			
ITEM NO.	632.3106	632.3016	632.3112
DESCRIPTION	RETROREFLECTIVE PAINT PAVEMENT MARKING, 4" LINE	RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKING, 4" LINE	RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKING, 12" LINE
UNIT	LF		LF
LOCATION			
CATE ST/CATE ST EXTENSION	7813	455	122
PROJECT SUBTOTAL	7813	455	122
ROUNDING	107	15	3
PROJECT TOTAL	7920	470	125

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER
RICHARD R. LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: VERT.:
DATUM: HORZ.: NAD83 VERT.: NGVD29
0
GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC

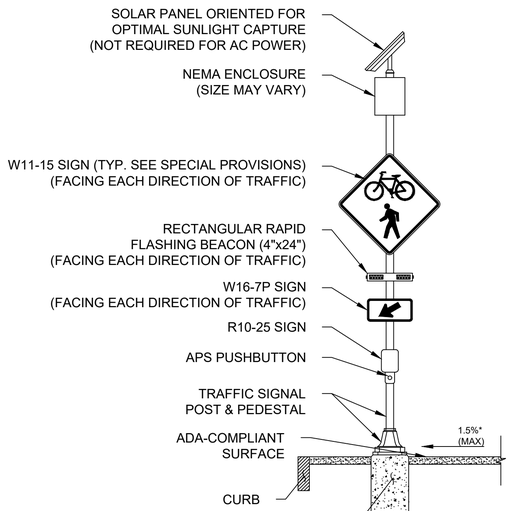
ROADWAY PAVEMENT MARKING SUMMARY
CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-123

CP	IDENT#	SIZE OF SIGN		TEXT	TEXT DIMENSIONS			SHIELD SIZE (INCH)	AROW (INCH)	NUMERAL (INCH)	# SIGNS REQ'D	SIGN AREA (SQ. FT.)		POSTS PER SIGN					REMARKS
		WIDTH (INCHES)	HEIGHT (INCHES)		LETTER HEIGHT (INCH)							NOM AREA	TOTAL AREA	BREAKAWAY	STEEL BEAM	CONCRETE BASE	4" OD ALUMINUM	U-CHANNEL GALV	
					UC	LC	CAPS												
	W1-6L	48	24				3		6.5		1	8.00	24.00				2		BLACK/YELLOW
	W3-1	30	30								1	6.25	6.25				1		BLACK/RED/ YELLOW
	W11-2	30	30								6	6.25	50.00				1		BLACK/ FLUORESCENT/ YELLOW-GREEN
	W11-15	30	30								5	6.25	37.50				1		BLACK/ FLUORESCENT/ YELLOW-GREEN
	W11-15P	24	18				4D 4D				1	3.00	6.00						BLACK/ FLUORESCENT/ YELLOW-GREEN
	W13-1P	18	18				3E			8E	2	2.25	4.50						BLACK/YELLOW MOUNT UNDER W1-5
	W16-7P	24	12						3		8	2.00	16.00						BLACK/YELLOW MOUNT UNDER W11-2
	W16-9P	24	12				5C				3	2.00	12.00						BLACK/YELLOW MOUNT UNDER W11-2
	R3-17BP	24	8								1	1.33	1.33						WHITE/BLACK MOUNT ON W11-15
	D11-1	24	18				4D		2.5		1	3.00	3.00				1		WHITE/GREEN
	M6-2	12	9								1	0.75	0.75				1		WHITE/GREEN



FLASHING BEACON DETAIL
NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: NTS VERT.:
DATUM: HORZ.: VERT.:
GRAPHIC SCALE 0

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CATE STREET DEVELOPMENT, LLC
SIGN DETAILS
CATE STREET
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-124

ITEM #	IDENT #	SIZE OF SIGN		TEXT	TEXT DIMENSIONS			SHIELD SIZE (INCH)	ARROW (INCH)	NUMERAL (INCH)	# SIGNS REQ'D	SIGN AREA (SQ. FT.)		POSTS PER SIGN					REMARKS
		WIDTH (INCH)	HEIGHT (INCH)		LETTER HEIGHT (INCH)							NOM AREA	TOTAL AREA	BREAKAWAY	STEEL I-BEAM	CONCRETE BASE	4" OD ALUMINUM	U-CHANNEL-GALV	
					UC	LC	CAPS												
	R1-1	30	30				10C				5	6.25	12.50				1		RED/WHITE
	R1-2	36	36								1	9.00	9.00				1		RED/WHITE
	R2-1	24	30				4E 4E			10E	1	5.00	5.00				1		BLACK/WHITE
	R3-8(15)	36	30				4D		2.5		1	7.50	7.50				1		WHITE/BLACK
	R3-8(145)	48	30				4D		2.5		1	10.00	10.00				2		BLACK/WHITE
	R4-7A	24	30				5D 5D		4.5		2	5.00	10.00				1		WHITE/BLACK
	R5-3	24	24				4C 4C 4B				3	4.00	4.00				1		WHITE/BLACK
	R10-25	9	12				1C 1C 1C 1C 1C				2	0.75	1.50						WHITE/BLACK MOUNT ON W11-15
	W1-1R/L	30	30								2	6.25	12.50				1		BLACK/YELLOW
	W1-3R	30	30								2	6.25	12.50				1		BLACK/YELLOW
	W1-6R	48	24						6.5		2	8.00	16.00				2		BLACK/YELLOW

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

SCALE: HORZ.: NTS
VERT.:
DATUM: HORZ.:
VERT.:
0
GRAPHIC SCALE

FUSS & O'NEILL
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KENNEBUNK, MAINE 04043
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CATE STREET DEVELOPMENT, LLC

SIGN DETAILS

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-125

File Path: F:\P2018\0317A10\Civil3\Dwg\20180317A10_DET01-RDWY.dwg Layout: CD-125-SIGN SUMMARY Plotted: Tue, September 10, 2019 - 11:18 AM User: jandretta
MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB

DRAINAGE STRUCTURES 1–15	
STRUCTURE	STRUCTURE DETAILS
1	PROPOSED 4' DIA. DMH CATE STREET STA. 3+29.12, L 81.89' RIM = 22.66 (2) 24" HDPE INV IN = 16.31 (SWALE) 24" HDPE INV OUT = 16.21 CONSTRUCT 45 LF x 24" HDPE S = 0.48%
2	WATER QUALITY STRUCTURE CATE STREET STA. 3+32.82, L 52.79' RIM = 23.09 (3) 24" HDPE INV IN = 16.52 (1) 24" HDPE INV OUT = 16.42 CONSTRUCT 22 LF x 24" HDPE S = 0.50%
3	PROPOSED 4' DIA. DMH CATE STREET STA. 3+37.68, L 7.88' RIM = 22.94 (6) 24" HDPE INV IN = 16.81 (5) 12" HDPE INV IN = 17.71 (2) 24" HDPE INV OUT = 16.71 CONSTRUCT 38 LF x 24" HDPE S = 0.50%
5	PROPOSED 4' DIA. CB CATE STREET STA. 3+34.37, R 28.98' RIM = 21.46 (3) 12" HDPE INV OUT = 17.88 CONSTRUCT 34 LF x 12" HDPE S = 0.50%
6	PROPOSED 4' DIA. DMH CATE STREET STA. 3+77.68, L 4.48' RIM = 23.00 (7) 12" HDPE INV IN = 17.99 (8) 12" HDPE INV IN = 17.99 (9) 24" HDPE INV IN = 17.09 (3) 24" HDPE INV OUT = 16.99 CONSTRUCT 36 LF x 24" HDPE S = 0.50%
7	PROPOSED 4' DIA. CB CATE STREET STA. 3+60.15, L 28.58' RIM = 22.46 (6) 12" HDPE INV OUT = 18.25 CONSTRUCT 26 LF x 12" HDPE S = 1.00%
8	PROPOSED 4' DIA. CB CATE STREET STA. 3+76.45, R 16.88' RIM = 22.58 (6) 12" HDPE INV OUT = 18.16 CONSTRUCT 18 LF x 12" HDPE S = 1.00%
9	PROPOSED 4' DIA. DMH CATE STREET STA. 4+38.03, L 1.03' RIM = 23.42 (11) 18" HDPE INV IN = 17.87 (10) 12" HDPE INV IN = 18.37 (6) 24" HDPE INV OUT = 17.37 CONSTRUCT 57 LF x 24" HDPE S = 0.50%
10	PROPOSED 4' DIA. CB CATE STREET STA. 4+79.28, R 51.09' RIM = 23.46 (9) 12" HDPE INV OUT = 18.99 CONSTRUCT 63 LF x 12" HDPE S = 1.00%
11	PROPOSED 4' DIA. DMH CATE STREET STA. 5+42.81, 0.00' RIM = 24.17 (13) 12" HDPE INV IN = 18.87 (12) 12" HDPE INV IN = 18.87 (14) 18" HDPE INV IN = 18.47 (9) 18" HDPE INV OUT = 18.37 CONSTRUCT 101 LF x 18" HDPE S = 0.50%
12	PROPOSED 4' DIA. CB CATE STREET STA. 5+42.81, L 11.00' RIM = 23.95 (11) 12" HDPE INV OUT = 19.30 CONSTRUCT 8 LF x 12" HDPE S = 5.86%
13	PROPOSED 4' DIA. CB CATE STREET STA. 5+42.81, R 11.00' RIM = 23.95 (11) 12" HDPE INV OUT = 19.30 CONSTRUCT 8 LF x 12" HDPE S = 5.93%
14	PROPOSED 4' DIA. DMH CATE STREET STA. 7+06.64, 0.00' RIM = 25.12 (15) 18" HDPE INV IN = 19.77 (11) 18" HDPE INV OUT = 19.27 CONSTRUCT 160 LF x 18" HDPE S = 0.50%
15	PROPOSED 4' DIA. DMH CATE STREET STA. 7+19.11, R 153.40' RIM = 27.20 (17) 12" HDPE INV IN = 20.64 (16) 12" HDPE INV IN = 20.64 (14) 18" HDPE INV OUT = 20.54 CONSTRUCT 150 LF x 18" HDPE S = 0.51%

DRAINAGE STRUCTURES 21–63	
STRUCTURE	STRUCTURE DETAILS
E4082	EXISTING CB CATE STREET STA. 19+09.82, L 12.70' RIM = 8.79 (E4081) 12" HDPE INV IN = 5.70 (E4083) 12" HDPE INV OUT = 5.90 EXISTING 8 LF x 12" HDPE S = 1.79%
E4081	EXISTING CB CATE STREET STA. 18+95.20, L 12.56' RIM = 8.88 (E4082) 12" HDPE INV OUT = 5.80 EXISTING 10 LF x 12" HDPE S = 0.77%
E4093	EXISTING CB CATE STREET STA. 19+09.46, R 12.16' RIM = 9.00 (E4083) 12" HDPE INV OUT = 5.90 EXISTING 10 LF x 12" HDPE S = 2.19%
E4083	EXISTING DMH CATE STREET STA. 19+10.08, L 1.51' RIM = 9.06 (E3866A) 24" RCP INV IN = 5.00 (E4093) 12" HDPE INV IN = 5.60 (E4082) 12" HDPE INV IN = 5.70 (E4083 A) 42"x24" RCP INV OUT = 5.00 EXISTING 24 LFx 42"x24" RCP S = 0.98%
E3866	EXISTING DMH CATE STREET STA. 18+26.90, L 10.71' RIM = 10.04 (RE-CORE E3579) 24" HDPE INV OUT = 5.40 CONSTRUCT 50 LF x 24" HDPE S = 4.90% (E4083) 42"x 24" RCP INV OUT = 5.30 EXISTING 80 LF x 24" RCP S = 0.36%
E4604	EXISTING DMH BARTLETT STREET STA. 20+61.81, L 133.59' RIM = 10.30 (E4604A) 36" RCP INV IN = 1.00 (E4035) 42" RCP INV IN = 1.00
E3579	REPLACED 4' DIA. DMH CATE STREET STA. 17+99.84, L 51.57' RIM = 10.77 (61) 12" HDPE INV IN = 6.38 (RE-CORE E3772) 24" HDPE INV IN = 3.00 (RE-CORE E3866) 24" HDPE INV IN = 3.00 (E4035) 36" RCP INV OUT = 2.00 CONSTRUCT 202 LF x 36" RCP S = 0.10%
E4035	EXISTING DMH BARTLETT STREET STA. 20+90.71, R 1.14' RIM = 11.71 (E3579) 36" RCP INV IN = 1.80 (E4604) 42" RCP INV OUT = 1.80 EXISTING 136 LF x 42" RCP S = 0.57%
E3772	EXISTING DMH CORED FOR 2' PIPE CATE STREET STA. 17+38.49, L 11.79' RIM = 12.38 (RE-CORE E2349) 24" HDPE INV IN = 3.51 (62) 12" HDPE INV IN = 4.41 (RE-CORE E3579) 24" HDPE INV OUT = 3.41 CONSTRUCT 82 LF x 24" HDPE S = 0.50%
E2348	EXISTING CB CATE STREET STA. 16+56.77, L 20.32' RIM = 13.60 (E2347) 15" HDPE INV IN = 9.70 (E2349) 15" HDPE INV OUT = 9.80 EXISTING 13 LF x 15" HDPE S = 4.34%
E2347	EXISTING CB CATE STREET STA. 16+11.37, L 25.97' RIM = 13.80 (E2348) 15" HDPE INV OUT = 9.80 EXISTING 39 LF x 15" HDPE S = 0.26%
E2349	EXISTING DMH CORED FOR 2' PIPE CATE STREET STA. 16+55.67, L 4.23' RIM = 13.94 (21) 24" HDPE INV IN = 4.02 (63) 12" HDPE INV IN = 4.92 (E2348) 15" HDPE INV IN = 9.10 (RE-CORE E3772) 24" HDPE INV OUT = 3.92 CONSTRUCT 83 LF x 24" HDPE S = 0.50%

DRAINAGE STRUCTURES 21–63	
STRUCTURE	STRUCTURE DETAILS
21	PROPOSED 4' DIA. DMH CATE STREET STA. 15+33.70, R 3.16' RIM = 15.22 (22) 24" HDPE INV IN = 9.89 (E2349) 24" HDPE INV OUT = 9.79 CONSTRUCT 117 LF x 24" HDPE S = 4.94%
22	PROPOSED 4' DIA. DMH CATE STREET STA. 14+62.85, 0.00' RIM = 16.85 (23) 12" HDPE INV IN = 12.23 (25) 24" HDPE INV IN = 10.83 (24) 12" HDPE INV IN = 12.23 (21) 24" HDPE INV OUT = 10.73 CONSTRUCT 68 LF x 24" HDPE S = 1.25%
23	PROPOSED 4' DIA. CB CATE STREET STA. 14+72.18, R 15.00' RIM = 16.16 (22) 12" HDPE INV OUT = 12.37 CONSTRUCT 14 LF x 12" HDPE S = 1.00%
24	PROPOSED 4' DIA. CB CATE STREET STA. 14+41.44, R 63.16' RIM = 18.20 (22) 12" HDPE INV OUT = 13.51 CONSTRUCT 64 LF x 12" HDPE S = 2.00%
25	PROPOSED 4' DIA. DMH CATE STREET STA. 14+05.84, 0.00' RIM = 18.56 (26) 12" HDPE INV IN = 13.29 (40) 24" HDPE INV IN = 11.19 (27) 12" HDPE INV IN = 12.09 (28) 18" HDPE INV IN = 12.33 (22) 24" HDPE INV OUT = 11.09 CONSTRUCT 53 LF x 24" HDPE S = 0.50%
26	PROPOSED 4' DIA. CB CATE STREET STA. 13+95.87, R 15.00' RIM = 18.43 (25) 12" HDPE INV OUT = 14.00 CONSTRUCT 15 LF x 12" HDPE S = 5.00%
27	RG #1 OVERFLOW CATE STREET STA. 13+82.53, L 25.26' RIM = 0.00 (25) 12" HDPE INV OUT = 12.43 CONSTRUCT 30 LF x 12" HDPE S = 1.16%
28	PROPOSED 4' DIA. DMH CATE STREET STA. 14+20.46, R 49.41' RIM = 18.61 (29) 12" HDPE INV IN = 12.67 (35) 12" HDPE INV IN = 15.94 (25) 18" HDPE INV OUT = 12.57 CONSTRUCT 49 LF x 18" HDPE S = 0.50%
29	PROPOSED 4' DIA. DMH CATE STREET STA. 14+25.44, R 56.84' RIM = 18.57 (30) 12" HDPE INV IN = 14.30 (28) 12" HDPE INV OUT = 12.70 CONSTRUCT 6 LF x 12" HDPE S = 0.50%
30	DETENSION BASIN #1 CATE STREET STA. 14+25.15, R 60.82' RIM = 18.63 (29) 12" HDPE INV OUT = 14.34 CONSTRUCT 3 LF x 12" HDPE S = 2.00%
31	PROPOSED 4' DIA. DMH CATE STREET STA. 14+16.17, R 108.40' RIM = 19.61 (32) 12" HDPE INV IN = 14.50 (30) 12" HDPE INV OUT = 14.40 CONSTRUCT 3 LF x 12" HDPE S = 3.00%
32	PROPOSED 4' DIA. DMH CATE STREET STA. 14+10.35, R 108.11' RIM = 19.78 (34) 12" HDPE INV IN = 15.15 (33) 12" HDPE INV IN = 14.65 (31) 12" HDPE INV OUT = 14.55 CONSTRUCT 6 LF x 12" HDPE S = 1.00%

DRAINAGE STRUCTURES 21–63	
STRUCTURE	STRUCTURE DETAILS
33	PROPOSED 4' DIA. CB CATE STREET STA. 14+09.74, R 175.18' RIM = 19.32 (32) 12" HDPE INV OUT = 15.00 CONSTRUCT 64 LF x 12" HDPE S = 0.55%
34	PROPOSED 4' DIA. CB CATE STREET STA. 14+06.65, R 80.71' RIM = 20.03 (32) 12" HDPE INV OUT = 15.50 CONSTRUCT 24 LF x 12" HDPE S = 1.46%
35	PROPOSED 4' DIA. DMH CATE STREET STA. 13+98.74, R 85.71' RIM = 21.14 (36) 12" HDPE INV IN = 17.75 (28) 12" HDPE INV OUT = 16.15 CONSTRUCT 43 LF x 12" HDPE S = 0.50%
36	DETENTION BASIN #2 CATE STREET STA. 13+95.96, R 85.90' RIM = 20.55 (35) 12" HDPE INV OUT = 17.79 CONSTRUCT 3 LF x 12" HDPE S = 2.00%
37	PROPOSED 4' DIA. DMH CATE STREET STA. 12+91.07, R 86.88' RIM = 21.91 (39) 12" HDPE INV IN = 18.74 (38) 12" HDPE INV IN = 17.95 (36) 12" HDPE INV OUT = 17.85 CONSTRUCT 3 LF x 12" HDPE S = 3.00%
38	PROPOSED 4' DIA. CB CATE STREET STA. 12+76.81, R 83.04' RIM = 22.06 (37) 12" HDPE INV OUT = 18.00 CONSTRUCT 6 LF x 12" HDPE S = 1.00%
39	PROPOSED 4' DIA. CB CATE STREET STA. 11+90.18, R 84.80' RIM = 23.06 (37) 12" HDPE INV OUT = 19.00 CONSTRUCT 53 LF x 12" HDPE S = 0.50%
40	PROPOSED 4' DIA. DMH CATE STREET STA. 12+83.70, 0.00' RIM = 21.69 (41) 12" HDPE INV IN = 13.35 (42) 24" HDPE INV IN = 11.88 (25) 24" HDPE INV OUT = 11.78 CONSTRUCT 118 LF x 24" HDPE S = 0.50%
41	RG #2 OVERFLOW CATE STREET STA. 12+83.42, L 25.41' RIM = 17.89 (40) 12" HDPE INV OUT = 14.43 CONSTRUCT 22 LF x 12" HDPE S = 5.00%
42	PROPOSED 4' DIA. DMH CATE STREET STA. 11+85.44, 0.00' RIM = 22.86 (44) 24" HDPE INV IN = 12.45 (43) 12" HDPE INV IN = 13.35 (41) 24" HDPE INV OUT = 12.35 CONSTRUCT 94 LF x 24" HDPE S = 0.50%
43	PROPOSED 4' DIA. CB CATE STREET STA. 11+86.51, R 15.00' RIM = 22.42 (42) 12" HDPE INV OUT = 13.46 CONSTRUCT 12 LF x 12" HDPE S = 1.00%
44	PROPOSED 4' DIA. DMH CATE STREET STA. 10+48.39, 0.00' RIM = 24.89 (45) 12" HDPE INV IN = 18.50 (46) 12" HDPE INV IN = 18.50 (47) 18" HDPE INV IN = 13.61 (42) 24" HDPE INV OUT = 13.11 CONSTRUCT 133 LF x 24" HDPE S = 0.50%
45	PROPOSED 4' DIA. CB CATE STREET STA. 10+33.32, R 11.00' RIM = 24.90 (44) 12" HDPE INV OUT = 19.50 CONSTRUCT 15 LF x 12" HDPE S = 6.82%
46	PROPOSED 4' DIA. CB CATE STREET STA. 10+33.32, L 11.00' RIM = 24.90 (44) 12" HDPE INV OUT = 19.50 CONSTRUCT 15 LF x 12" HDPE S = 6.82%
47	PROPOSED 4' DIA. DMH CATE STREET STA. 10+61.58, R 122.45' RIM = 25.92 (48) 18" HDPE INV IN = 14.31 (44) 18" HDPE INV OUT = 14.21 CONSTRUCT 120 LF x 18" HDPE S = 0.50%
48	PROPOSED 4' DIA. DMH CATE STREET STA. 10+25.80, R 127.22' RIM = 27.00 (57) 12" HDPE INV IN = 15.00 (49) 12" HDPE INV IN = 15.00 (47) 18" HDPE INV OUT = 14.48 CONSTRUCT 35 LF x 18" HDPE S = 0.50%

DRAINAGE STRUCTURES 21–63	
STRUCTURE	STRUCTURE DETAILS
49	PROPOSED 4' DIA. DMH CATE STREET STA. 10+27.11, R 137.45' RIM = 26.25 (50) 12" HDPE INV IN = 18.55 (48) 12" HDPE INV OUT = 15.10 CONSTRUCT 7 LF x 12" HDPE S = 1.58%
50	INFILLTRATION BASIN #2 CATE STREET STA. 10+27.61, R 141.41' RIM = 26.15 (49) 12" HDPE INV OUT = 18.60 CONSTRUCT 3 LF x 12" HDPE S = 2.50%
51	PROPOSED 4' DIA. DMH CATE STREET STA. 9+62.84, R 234.29' RIM = 25.42 (52) 18" HDPE INV IN = 18.92 (50) 18" HDPE INV OUT = 18.92 CONSTRUCT 3 LF x 18" HDPE S = 0.00%
52	PROPOSED 4' DIA. DMH CATE STREET STA. 9+63.98, R 243.22' RIM = 25.49 (54) 18" HDPE INV IN = 19.07 (53) 12" HDPE INV IN = 19.95 (51) 18" HDPE INV OUT = 18.97 CONSTRUCT 6 LF x 18" HDPE S = 1.00%
53	PROPOSED 4' DIA. CB CATE STREET STA. 10+53.01, R 233.88' RIM = 23.88 (52) 12" HDPE INV OUT = 20.38 CONSTRUCT 86 LF x 12" HDPE S = 0.50%
54	PROPOSED 4' DIA. DMH CATE STREET STA. 9+36.44, R 333.81' RIM = 24.55 (55) 12" HDPE INV IN = 20.02 (56) 12" HDPE INV IN = 20.02 (52) 18" HDPE INV OUT = 19.52 CONSTRUCT 91 LF x 18" HDPE S = 0.50%
55	PROPOSED 4' DIA. CB CATE STREET STA. 9+38.27, R 381.51' RIM = 23.74 (54) 12" HDPE INV OUT = 20.24 CONSTRUCT 44 LF x 12" HDPE S = 0.50%
56	PROPOSED 4' DIA. CB CATE STREET STA. 8+64.09, R 340.65' RIM = 25.36 (54) 12" HDPE INV OUT = 20.86 CONSTRUCT 69 LF x 12" HDPE S = 1.22%
57	PROPOSED 4' DIA. DMH CATE STREET STA. 8+63.04, R 147.97' RIM = 26.47 (58) 12" HDPE INV IN = 18.55 (48) 12" HDPE INV OUT = 15.80 CONSTRUCT 161 LF x 12" HDPE S = 0.50%
58	INFILLTRATION BASIN #3 CATE STREET STA. 8+63.54, R 151.94' RIM = 26.46 (57) 12" HDPE INV OUT = 18.60 CONSTRUCT 3 LF x 12" HDPE S = 2.50%
59	PROPOSED 4' DIA. DMH CATE STREET STA. 8+63.63, R 265.26' RIM = 25.90 (60) 6" HDPE INV IN = 20.20 (58) 6" HDPE INV OUT = 20.10 CONSTRUCT 3 LF x 6" HDPE S = 3.00%
60	BUILDING B ROOF DRAIN CATE STREET STA. 7+56.79, R 220.50' RIM = 27.25 (59) 6" HDPE INV OUT = 20.78 CONSTRUCT 112 LF x 6" HDPE S = 0.51%
61	PROPOSED 4' DIA. CB CATE STREET STA. 17+89.73, R 14.52' RIM = 10.85 (E3777) 12" HDPE INV OUT = 7.00 CONSTRUCT 64 LF x 12" HDPE S = 0.95%
62	PROPOSED 4' DIA. CB CATE STREET STA. 17+35.79, L 21.55' RIM = 12.22 (E3772) 12" HDPE INV OUT = 4.48 CONSTRUCT 7 LF x 12" HDPE S = 1.00%
63	PROPOSED 4' DIA. CB CATE STREET STA. 16+51.39, R 15.00' RIM = 13.64 (E2349) 12" HDPE INV OUT = 5.08 CONSTRUCT 16 LF x 12" HDPE S = 1.00%
74	PROPOSED 4' DIA. CB BARTLETT STREET STA. 22+50.95, R 18.39' RIM = 10.97 (CORE E3756) 12" HDPE INV OUT = 8.00 CONSTRUCT 3 LF x 12" HDPE S = 4.07%

LIGHT TABLE ENTRIES FROM SITE PLAN
PROVIDED FOR REFERENCE ONLY

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD LUNDBORN No. 10943 – LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

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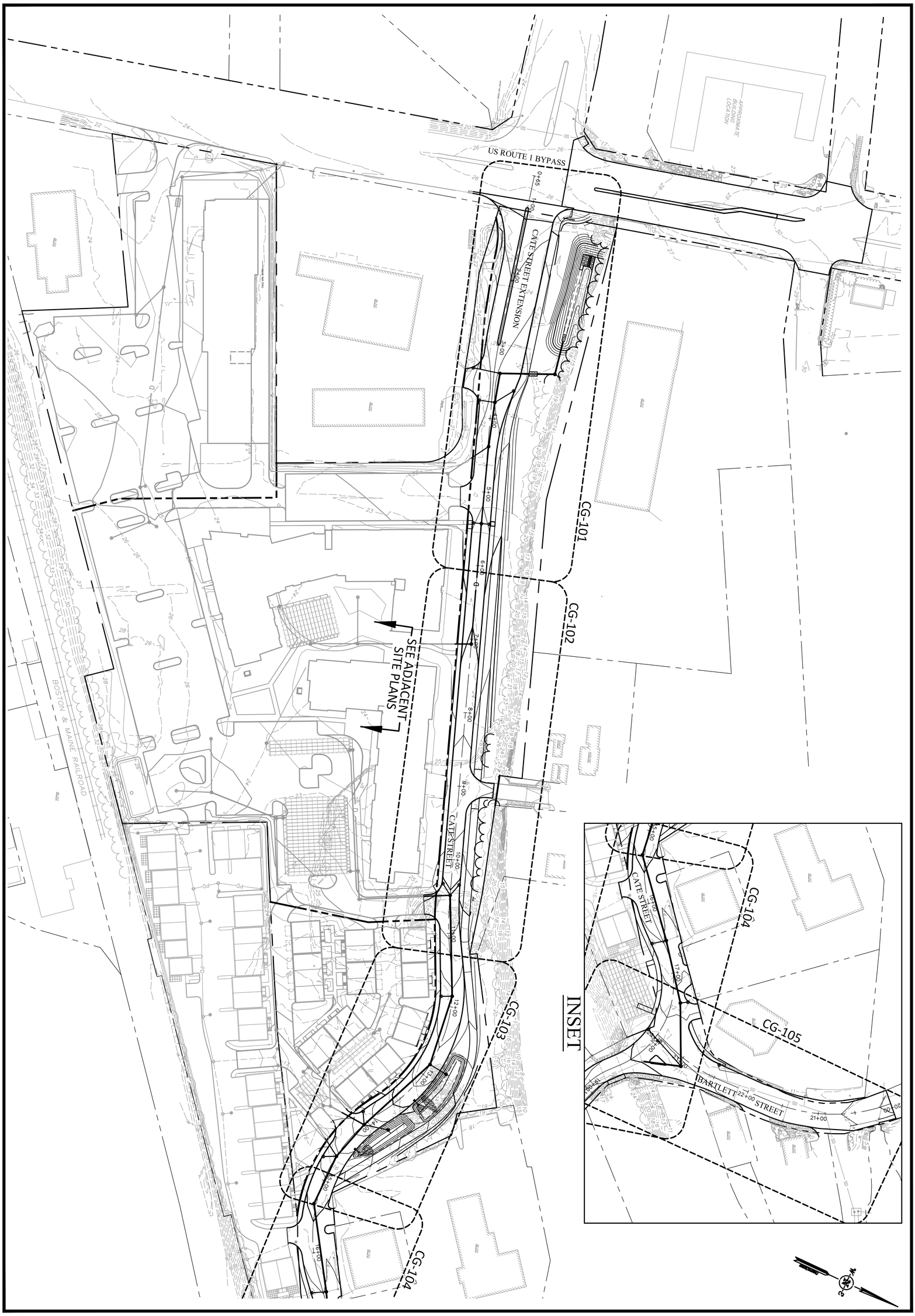
ROADWAY DRAINAGE
STRUCTURE TABLE
CATE STREET
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CG-001

File Path: F:\P2018\03317\A10\Civil\3Dwg\Structure Tables.dwg Layout: CG-001 (DRAINAGE TABLE) (R) Plotted: Tue, September 10, 2019 - 11:15 AM User: jandretta
MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB

File Path: F:\P2018\0317\A10\Civil3\Dwg\20180317A10_GRA01.dwg Layout: CG-100 (R) Plotted: Tue, September 10, 2019 - 10:37 AM User: jandretta
MS VIEW: | LAYER STATE: | Plotter: DWG TO PDF.PC3 CTB File: FO.STB



CG-100

PROJ. No.: 20180317A10
DATE: 09/10/2019

CATE STREET DEVELOPMENT, LLC

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CATE STREET

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SCALE:
HORZ.: 1"=60'
VERT.: 1"=60'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
60 30 0 60
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE – RICHARD R LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
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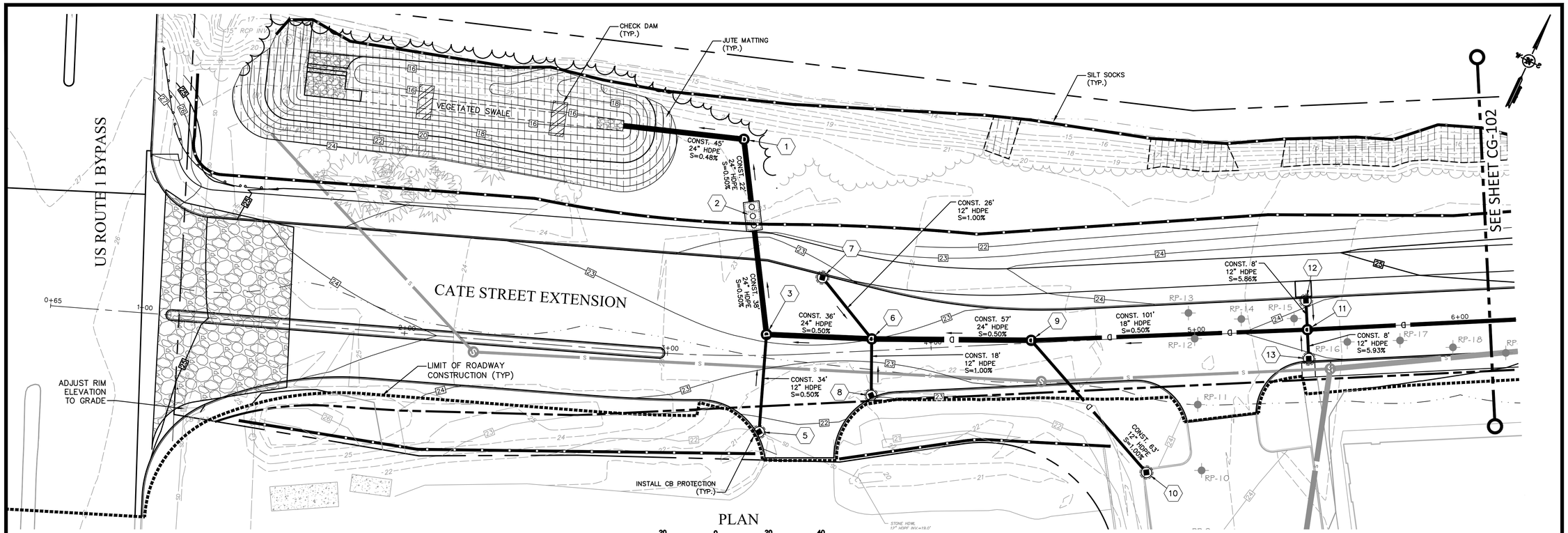

PLAN

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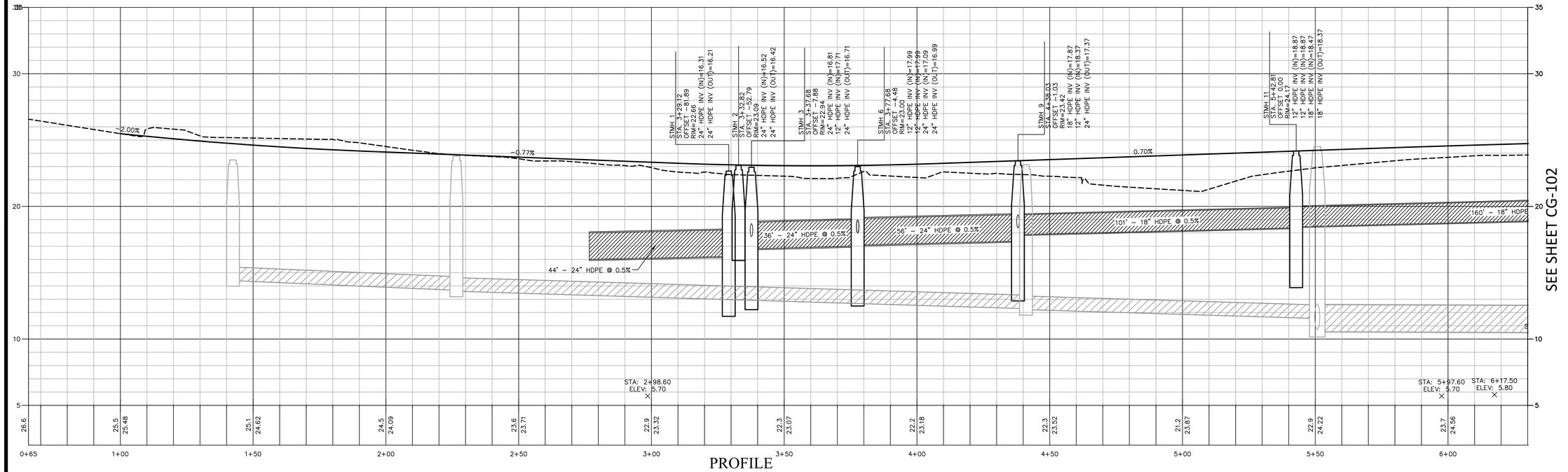

PROFILE

HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

NOTE: PROBES NOT SHOWN ON PROFILE WERE TERMINATED BELOW PROFILE VIEW AND PROBES WITHOUT LEDGE SYMBOL WERE TERMINATED BEFORE REACHING BEDROCK

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – LICENSED PROFESSIONAL ENGINEER – RICHARD LUNDBORN No. 10943

SCALE: HORZ.: 1"=20' VERT.: AS NOTED
DATUM: HORZ.: NAD83 VERT.: NGVD29
GRAPHIC SCALE 20 10 0 20

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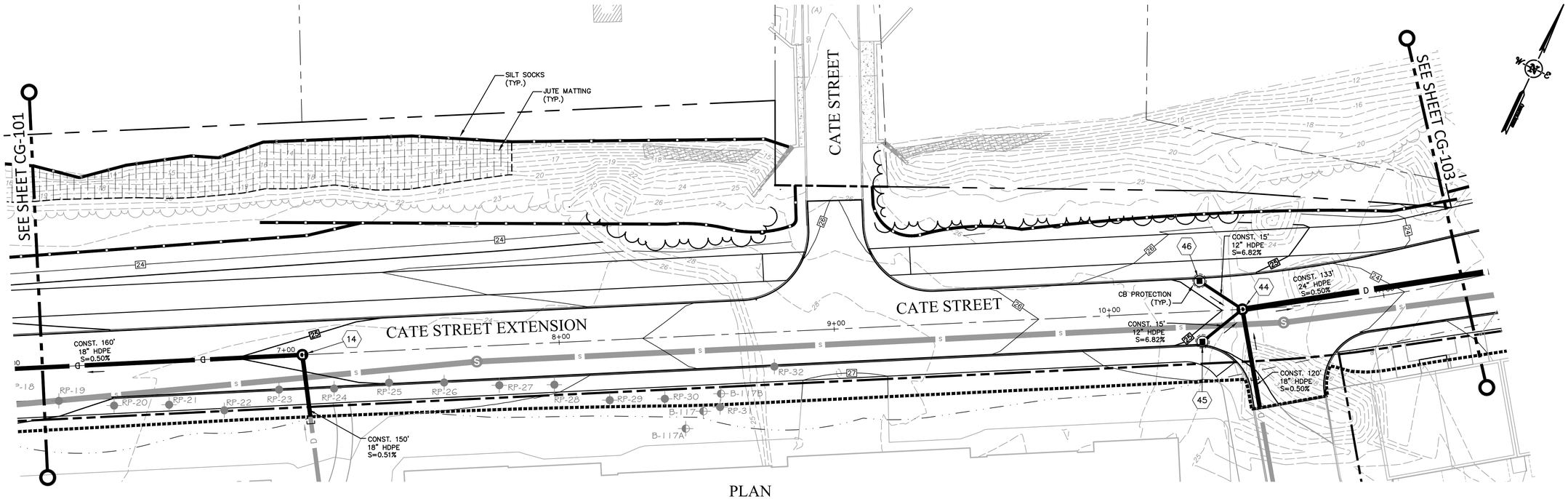
GRADING, DRAINAGE & EROSION CONTROL PLAN
CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CG-101



PLAN

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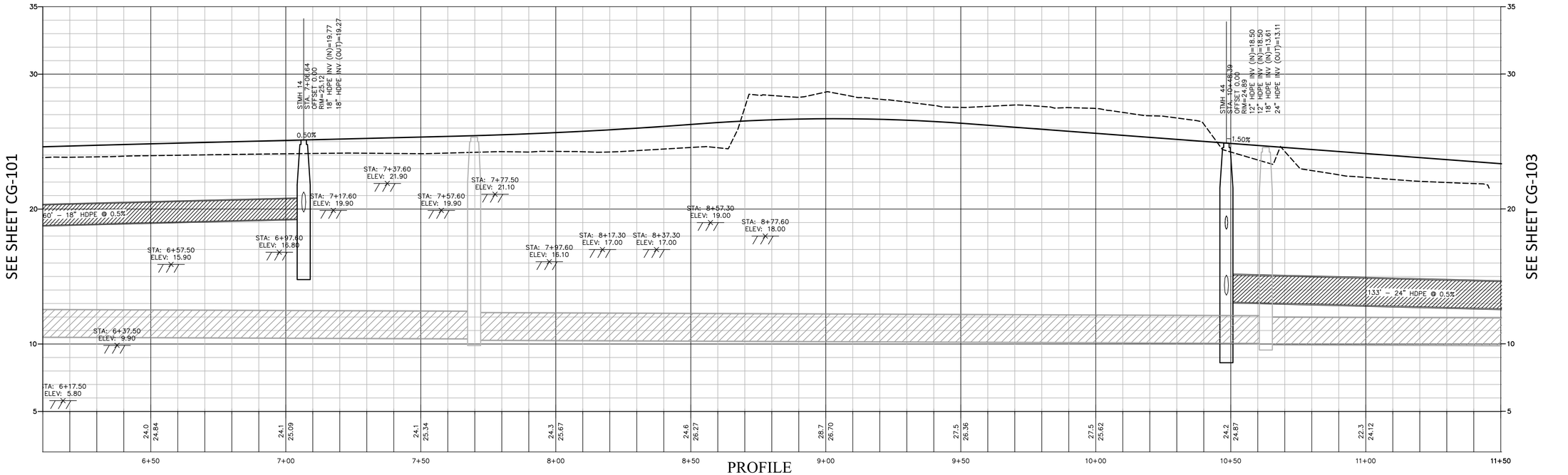

PROFILE

HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD LUNDBORN No. 10943 – LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: 1"=20'
VERT.: AS NOTED
DATUM: HORZ.: NAD83
VERT.: NGVD29
GRAPHIC SCALE 20 0 20 40 / 20 10 0 20

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CATE STREET DEVELOPMENT, LLC
GRADING, DRAINAGE & EROSION CONTROL PLAN
CATE STREET
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CG-102

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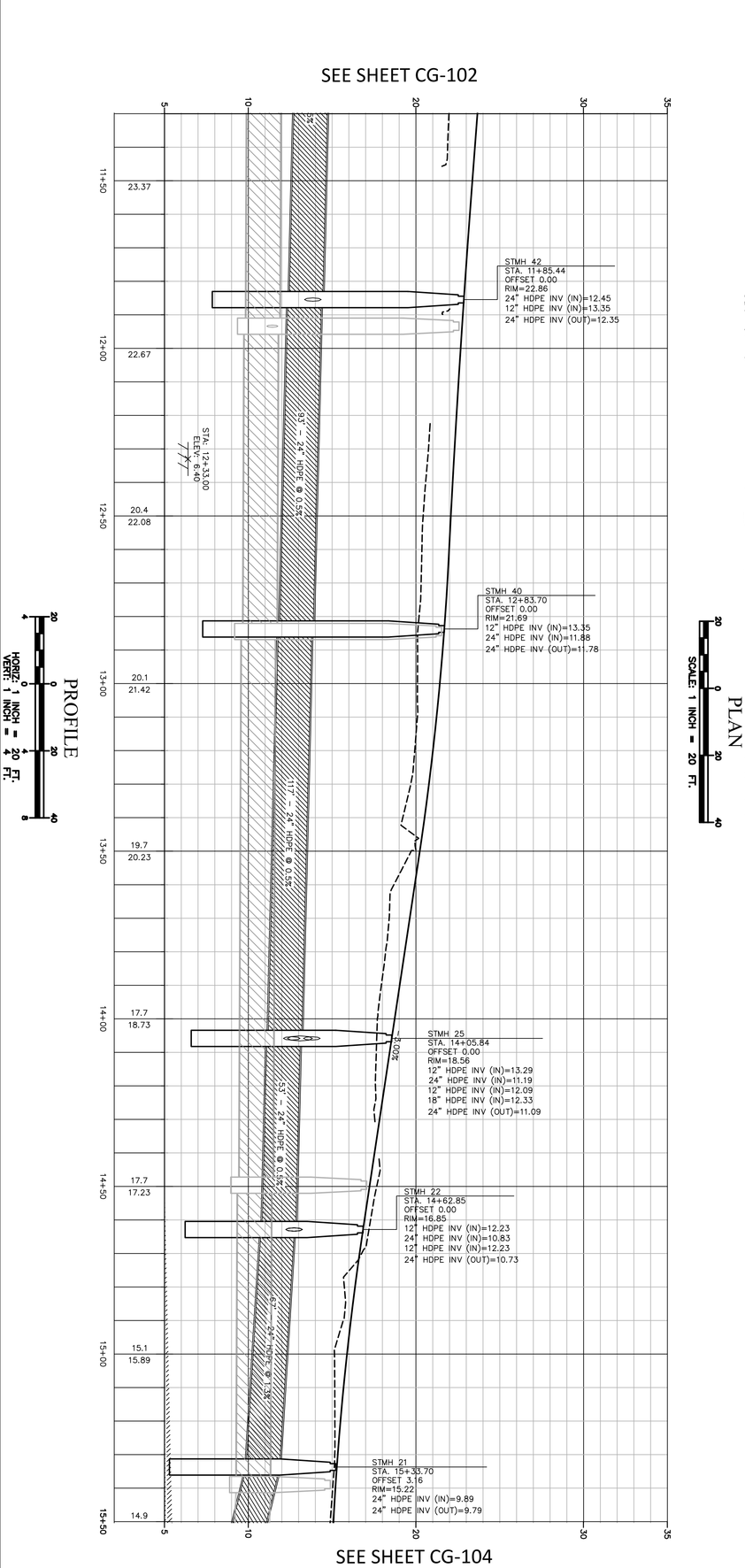

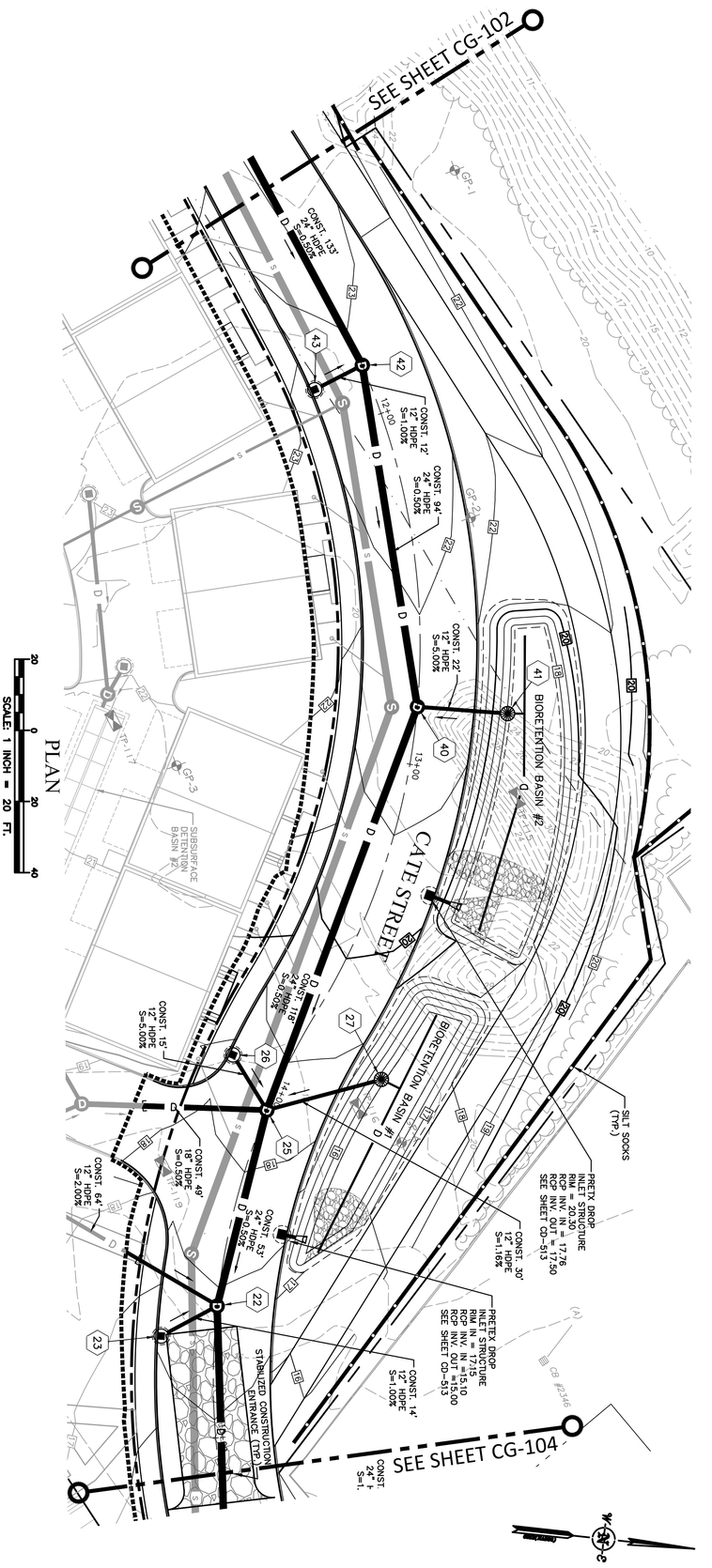

CG-103

PROJ. No.: 20180317.A10
DATE: 09/10/2019

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SCALE:
HORZ.: 1"=20'
VERT.: AS NOTED
DATUM:
HORZ.: NAD83
VERT.: NGVD29
20 10 0 20
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
RICHARD R LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

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5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
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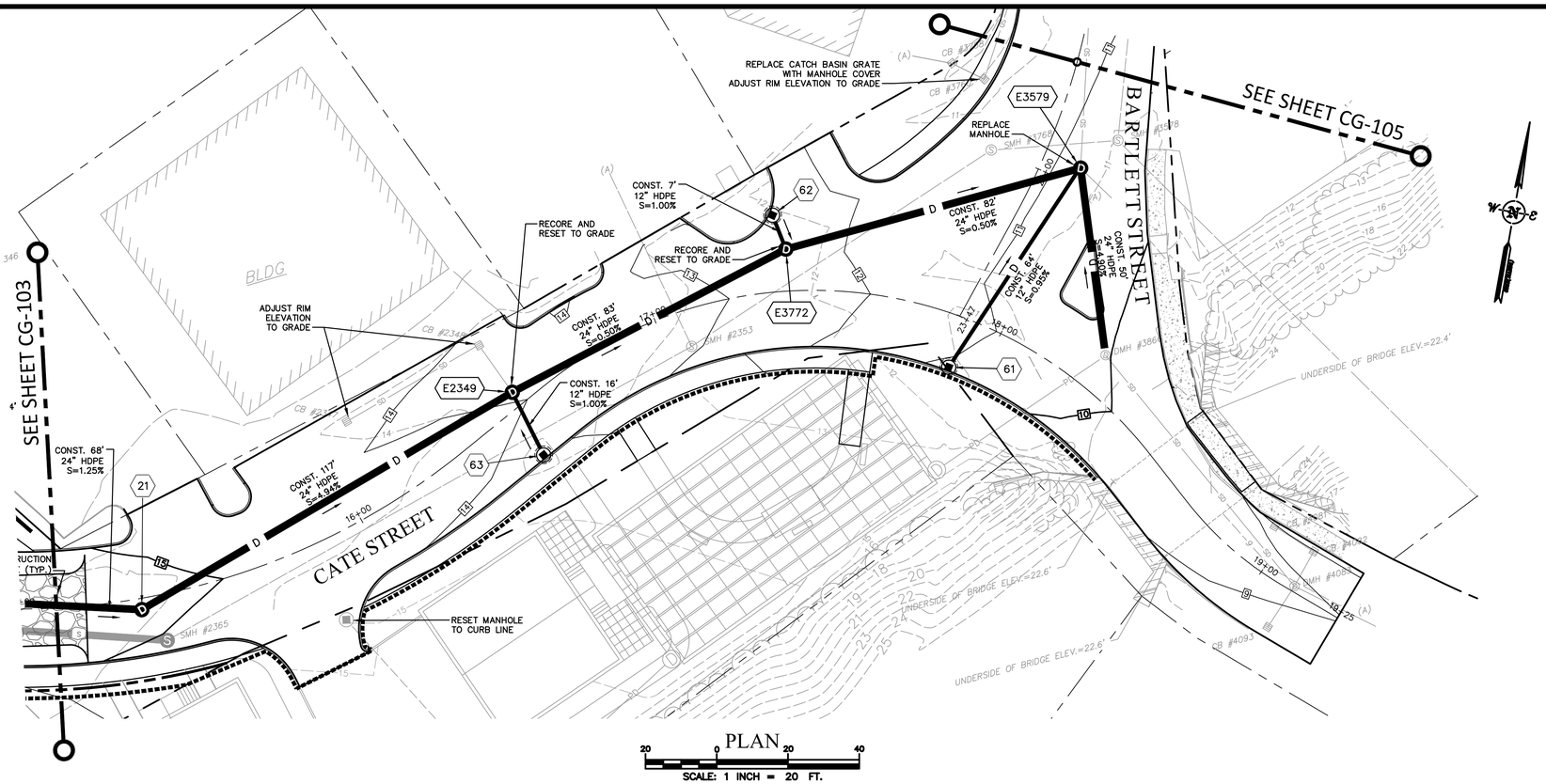
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL



PLAN

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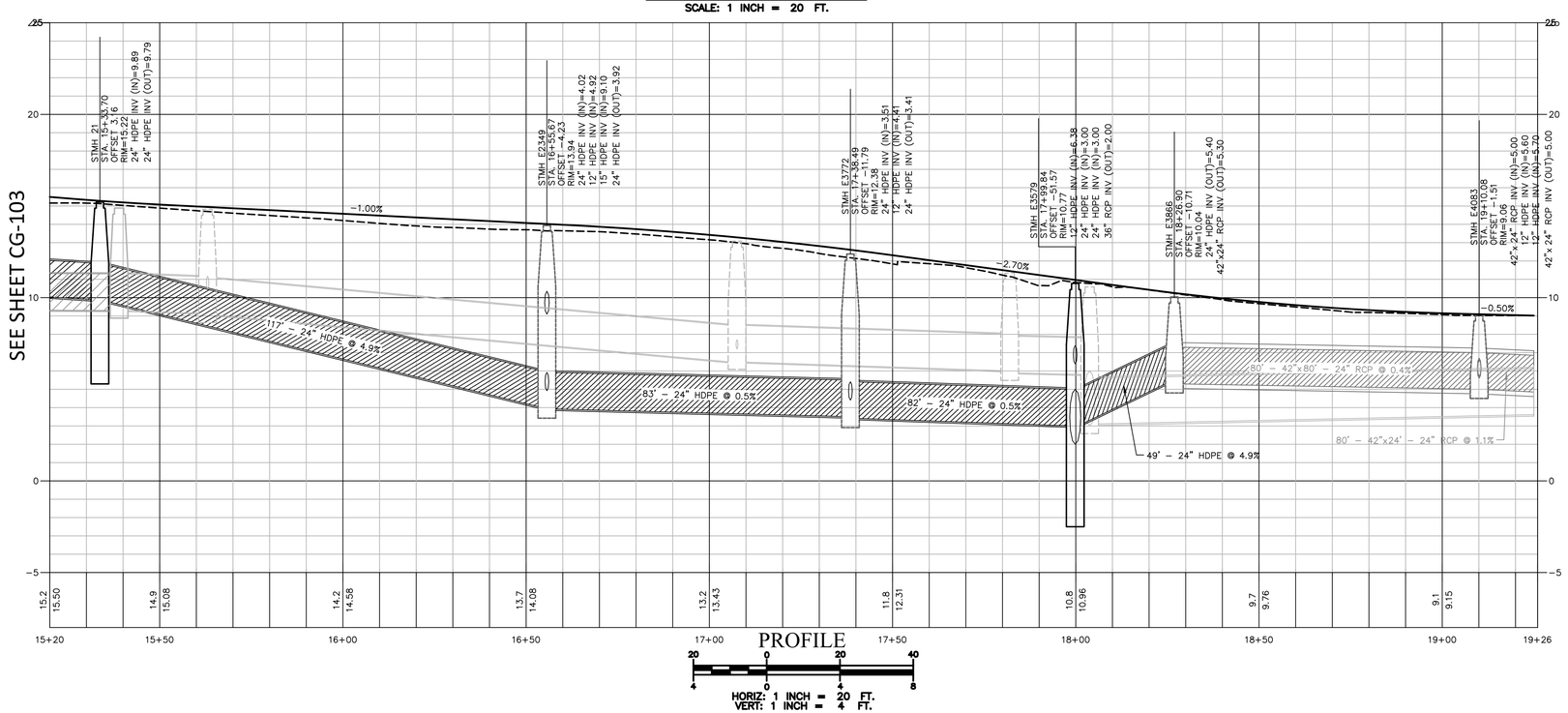

PROFILE

HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

E#### EXISTING DRAINAGE STRUCTURE

PROPOSED DRAINAGE STRUCTURE

PROPOSED STORM MANHOLE

EXISTING STORM MANHOLE

PROPOSED STORM PIPE

EXISTING STORM PIPE

PROPOSED SEWER MANHOLE

EXISTING SEWER MANHOLE

PROPOSED SEWER PIPE

EXISTING SEWER PIPE

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STATE OF NEW HAMPSHIRE – RICHARD LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

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CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
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CG-104

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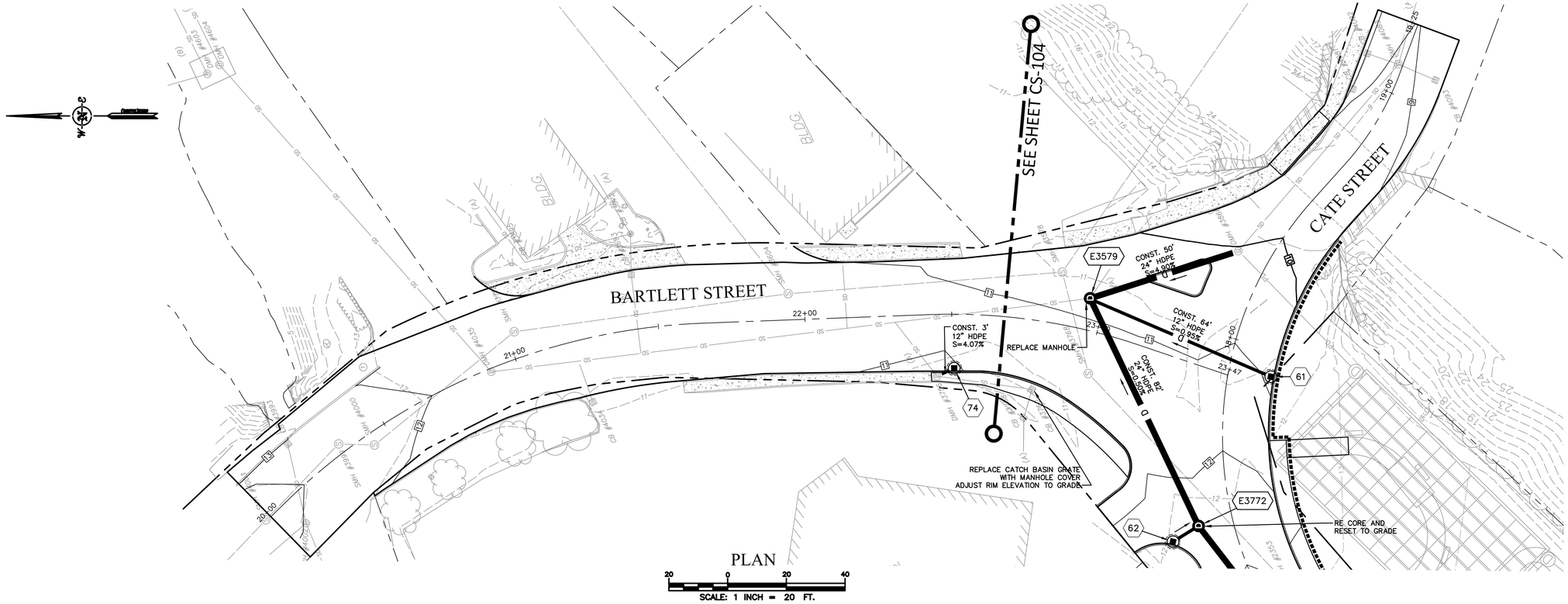

PLAN

20 0 20 40

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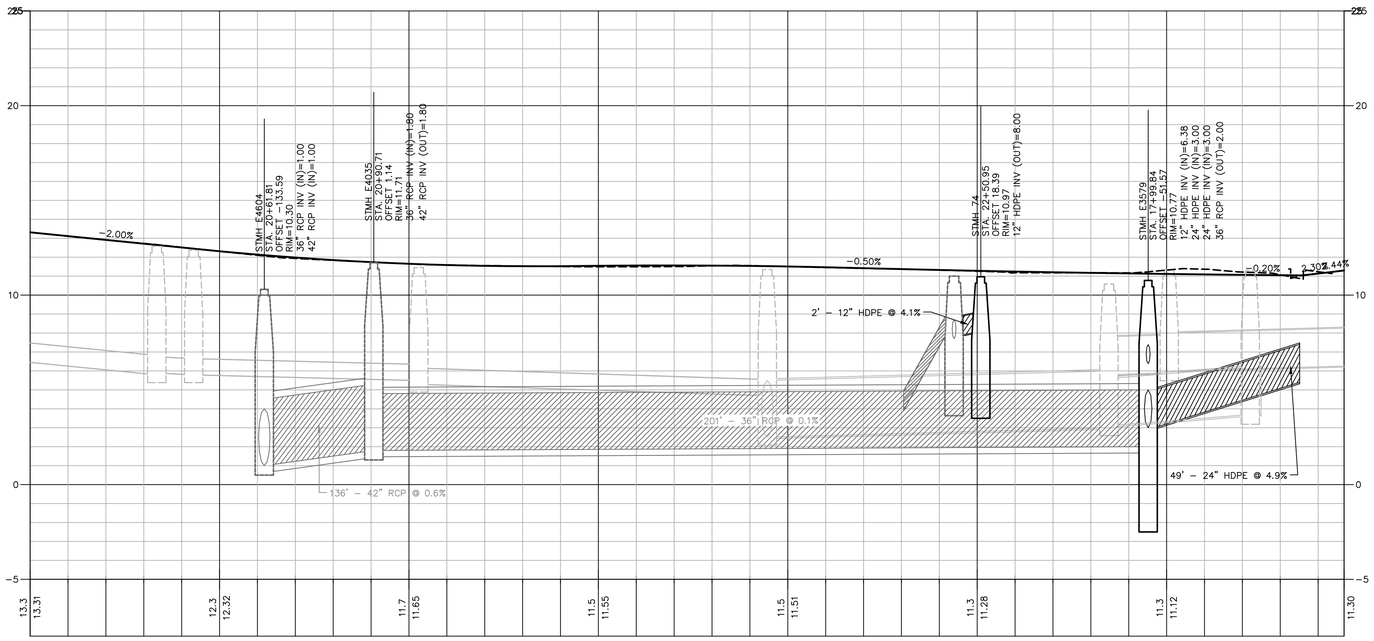

PROFILE

20 0 20 40

4 0 4 8

HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

E#### EXISTING DRAINAGE STRUCTURE

PROPOSED DRAINAGE STRUCTURE

PROPOSED STORM MANHOLE

EXISTING STORM MANHOLE

PROPOSED STORM PIPE

EXISTING STORM PIPE

PROPOSED SEWER MANHOLE

EXISTING SEWER MANHOLE

PROPOSED SEWER PIPE

EXISTING SEWER PIPE

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STATE OF NEW HAMPSHIRE – LICENSED PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943

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VERT.: AS NOTED

DATUM:
HORZ.: NAD83
VERT.: NGVD29

GRAPHIC SCALE
20 10 0 20

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CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CG-105

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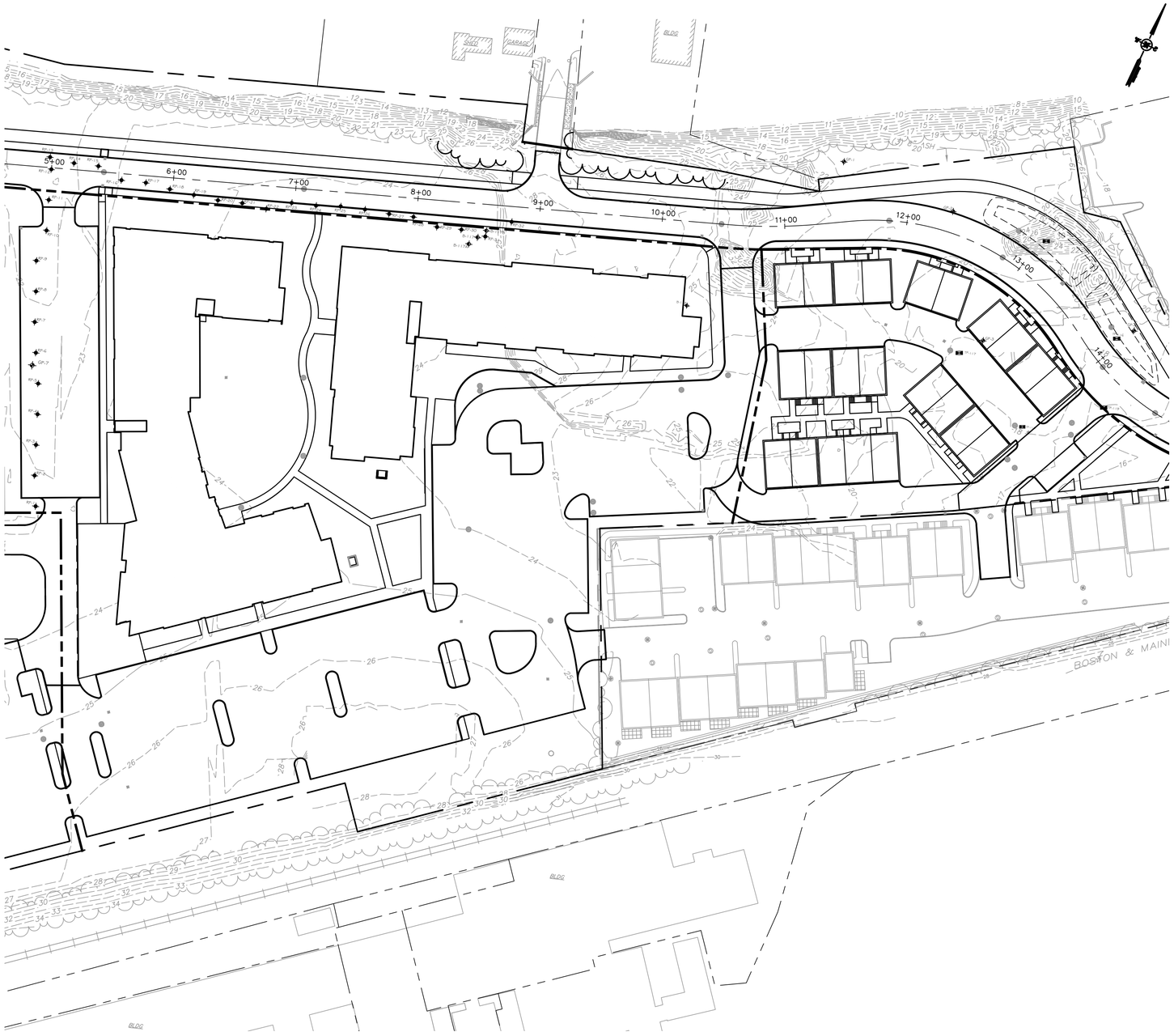

LEGEND

— APPROXIMATE LOCATION OF TEST PIT PERFORMED BY P.K. BROWN CONSTRUCTION OF PORTSMOUTH, NH UNDER CONTRACT TO McPHAIL ASSOCIATES, LLC ON MARCH 1 AND MARCH 5, 2019

— APPROXIMATE LOCATION OF ROCK PROBE PERFORMED BY MAINE DRILLING AND BLASTING, INC. ON JULY 9, 2019 FOR McPHAIL ASSOCIATES, LLC

— APPROXIMATE LOCATION OF BORING PERFORMED BY CARR-DEE CORP. FROM MARCH 11 TO MARCH 18, 2019 FOR McPHAIL ASSOCIATES, LLC

— APPROXIMATE LOCATION OF BOREHOLE PERFORMED BY TECHNICAL DRILLING SERVICES, INC. ON JANUARY 19 & 22, 2018 FOR McPHAIL ASSOCIATES, LLC

REFERENCE: THIS PLAN WAS PREPARED FROM A 50-SCALE DRAWING ENTITLED, "PLAN OF LAND" DATED DECEMBER 2016 PREPARED BY DOUCET SURVEY INC.
THIS PLAN WAS PREPARED BY MCPHAIL ASSOCIATES, LLC.

Table
Summary of Explorations
Cate Street
Portsmouth, New Hampshire

Exploration No.	Ground Surface Elevation [Feet]	Total Depth of Exploration [Feet]	Depth to Top of Bedrock [Feet]	Elevation of Bottom of Exploartion [Feet]	Elevation of Refusal on Bedrock [Feet]
RP-1	+22.8	20.0	NE	+2.8	NE
RP-2	+22.4	20.0	NE	+2.4	NE
RP-3	+22.1	20.0	NE	+2.1	NE
RP-4	+21.9	20.0	NE	+1.9	NE
RP-5	+21.8	20.0	NE	+1.8	NE
RP-6	+21.6	20.0	NE	+1.6	NE
RP-7	+21.5	20.0	NE	+1.5	NE
RP-8	+21.5	20.0	NE	+1.5	NE
RP-9	+21.3	20.0	NE	+1.3	NE
RP-10	+21.3	20.0	NE	+1.3	NE
RP-11	+20.9	20.0	NE	+0.9	NE
RP-12	+21.8	20.0	NE	+1.8	NE
RP-13	+22.7	20.0	NE	+2.7	NE
RP-14	+22.9	20.0	NE	+2.9	NE
RP-15	+23.3	20.0	NE	+3.3	NE
RP-16	+23.6	20.0	NE	+3.6	NE
RP-17	+23.6	20.0	NE	+3.6	NE
RP-18	+23.7	23.0	18.0	+0.7	+5.7
RP-19	+23.8	23.0	18.0	+0.8	+5.8
RP-20	+23.9	19.0	14.0	+4.9	+9.9
RP-21	+24.0	15.0	10.0	+9.0	+14.0
RP-22	+23.9	13.0	8.0	+10.9	+15.9
RP-23	+23.8	12.0	7.0	+11.8	+16.8
RP-24	+23.9	9.0	4.0	+14.9	+19.9
RP-25	+23.9	7.0	2.0	+16.9	+21.9
RP-26	+23.9	9.0	4.0	+14.9	+19.9
RP-27	+24.1	8.0	3.0	+16.1	+21.1
RP-28	+24.1	13.0	8.0	+11.1	+16.1
RP-29	+24.0	12.0	7.0	+12.0	+17.0
RP-30	+24.0	12.0	7.0	+12.0	+17.0
RP-31	+24.0	10.0	5.0	+14.0	+19.0
RP-32	+24.0	11.0	6.0	+13.0	+18.0
B-117	+23.6	5.2	5.1	+18.4	+18.5
B-117A	+23.6	4.2	5.2	+19.4	+18.4
B-117B	+23.6	5.2	4.2	+18.4	+19.4
B-118	+27.9	12.0	12.0	+15.9	+15.9
GP-1	+21.6	10.0	11.6	+11.6	+10.0
GP-2	+20.4	14.0	14.0	+6.4	+6.4
GP-3	+19.5	16.5	16.5	+3.0	+3.0
GP-4	+19.7	14.0	14.0	+5.7	+5.7
TP-115	+22.9	5.0	NE	+17.9	NE
TP-116	+18.4	6.0	NE	+12.4	NE
TP-117	+18.8	6.5	NE	+12.3	NE
TP-118	+18.4	6.0	NE	+12.4	NE
TP-119	+17.2	6.0	NE	+11.2	NE

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1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

RICHARD R. LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE

SCALE: HORZ.: 1"=50' VERT.: 1"=50'
DATUM: HORZ.: NAD83 VERT.: NGVD29
50 25 0 50
GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC

SUBSURFACE EXPLORATION PLAN
CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CG-110

SEWER SYSTEM	
STRUCTURE	STRUCTURE DETAILS
1	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 15+38.93, R 12.95' RIM = 14.89 (2) 24" PVC INV IN = 9.30 (TBP) 24" PVC INV OUT = 9.30 CONSTRUCT 23 LF x 24" PVC S=0.0068
2	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 14+49.64, R 9.17' RIM = 17.06 (3) 24" PVC INV IN = 9.47 (1) 24" PVC INV OUT = 9.37 CONSTRUCT 90 LF x 24" PVC S=0.0008
3	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 12+84.47, R 7.20' RIM = 21.54 (4) 24" PVC INV IN = 9.70 (2) 24" PVC INV OUT = 9.60 CONSTRUCT 160 LF x 24" PVC S=0.0008
4	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 11+93.37, R 9.16' RIM = 22.57 (5) 24" PVC INV IN = 9.87 (12) 8" PVC INV IN = 11.10 (3) 24" PVC INV OUT = 9.77 CONSTRUCT 83 LF x 24" PVC S=0.0008
5	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 10+63.00, R 5.61' RIM = 24.56 (6) 24" PVC INV IN = 10.07 (4) 24" PVC INV OUT = 9.97 CONSTRUCT 126 LF x 24" PVC S=0.0008
6	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 7+69.78, R 5.51' RIM = 25.33 (7) 24" PVC INV IN = 10.40 (5) 24" PVC INV OUT = 10.30 CONSTRUCT 290 LF x 24" PVC S=0.0008
7	PROPOSED 5' DIA. SEWER MANHOLE CATE STREET STA. 5+50.75, R 15.25' RIM = 24.51 (10) 12" PVC INV IN = 11.57 (8) 24" PVC INV IN = 10.67 (6) 24" PVC INV OUT = 10.57 CONSTRUCT 215 LF x 24" PVC S=0.0008
8	PROPOSED 4' DIA. SEWER MANHOLE PROPOSED SEWER STA. 3+78.94, 0.00' RIM = 25.58 (9) 24" PVC INV IN = 11.00 (7) 24" PVC INV OUT = 10.90 CONSTRUCT 289 LF x 24" PVC S=0.0008
9	PROPOSED 4' DIA. SEWER MANHOLE PROPOSED SEWER STA. 0+50.41, 0.00' RIM = 25.61 (E1066) 24" PVC INV IN = 11.36 (8) 24" PVC INV OUT = 11.26 CONSTRUCT 325 LF x 24" PVC S=0.0008
10	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 4+41.06, R 14.75' RIM = 23.14 (11) 12" PVC INV IN = 12.31 (7) 12" PVC INV OUT = 12.21 CONSTRUCT 106 LF x 12" PVC S=0.0061
11	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 2+26.55, R 5.04' RIM = 23.79 (E1350) 12" PVC INV IN = 13.70 (10) 12" PVC INV OUT = 13.60 CONSTRUCT 212 LF x 12" PVC S=0.0061
12	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 12+03.73, R 73.29' RIM = 23.20 (13) 8" PVC INV IN = 11.50 (4) 8" PVC INV OUT = 11.40 CONSTRUCT 61 LF x 8" PVC S=0.0050
13	PROPOSED 4' DIA. SEWER MANHOLE CATE STREET STA. 12+50.11, R 146.52' RIM = 20.95 (12) 8" PVC INV OUT = 11.86 CONSTRUCT 72 LF x 8" PVC S=0.0050
E1066	PROPOSED 4' DIA. SEWER MANHOLE PROPOSED SEWER STA. 0+00.00, 0.00' RIM = 23.34 (9) 24" PVC INV OUT = 11.50 CONSTRUCT 47 LF x 24" PVC S=0.0030
E1350	EXISTING SEWER MANHOLE CATE STREET STA. 1+42.43, L 72.72' RIM = 23.50 (11) 12" PVC INV OUT = 14.40 CONSTRUCT 111 LF x 12" PVC S=0.0063

LIGHT TABLE ENTRIES FROM SITE PLAN
PROVIDED FOR REFERENCE ONLY

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STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER
RICHARD R. LUNDBORN
No. 10943
LICENSED PROFESSIONAL ENGINEER

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.:
VERT.:
0
GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC

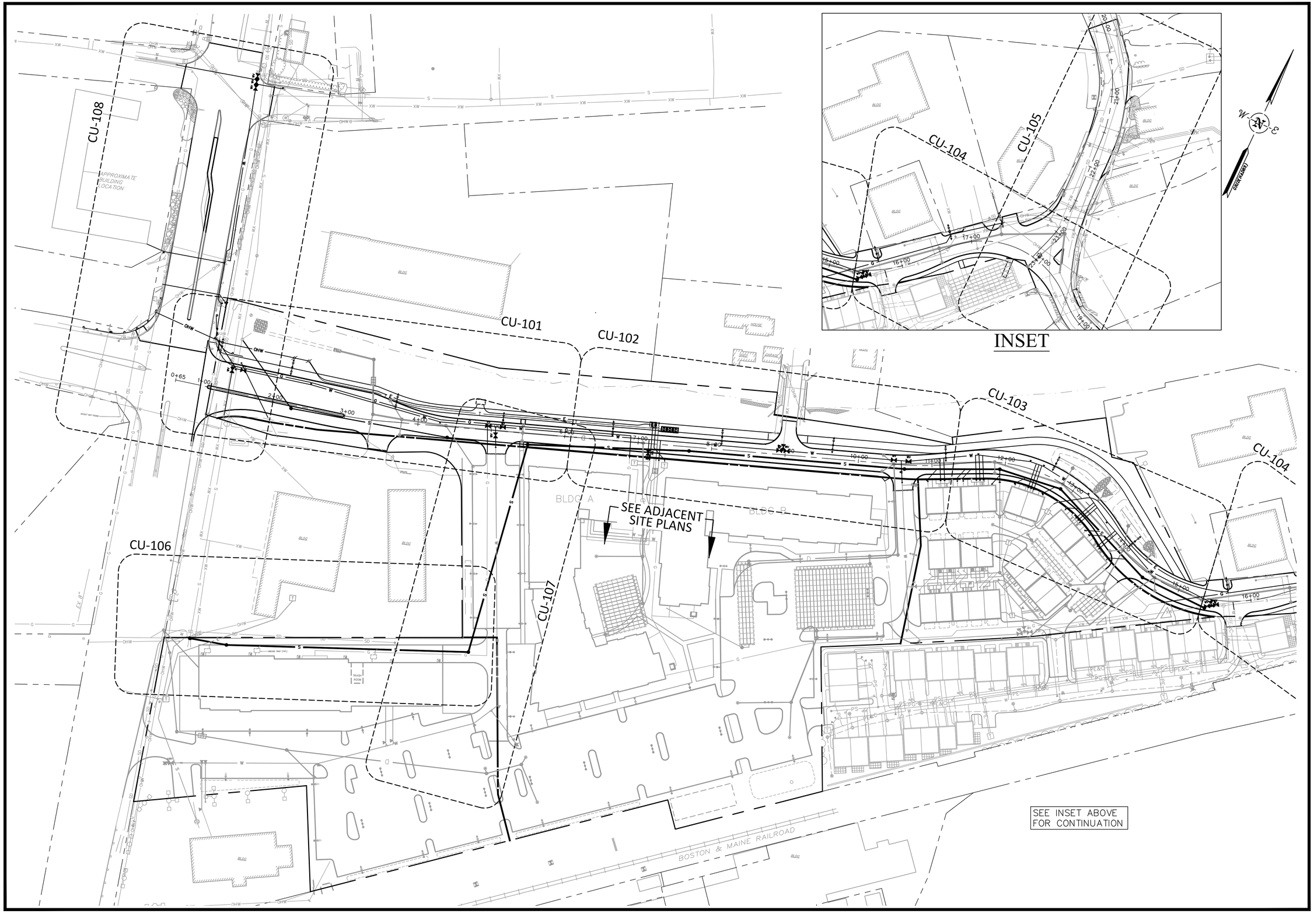
ROADWAY SEWER STRUCTURE TABLE

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CU-001



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STATE OF NEW HAMPSHIRE – RICHARD LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

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CATE STREET DEVELOPMENT, LLC

OVERALL UTILITY PLAN

CATE STREET
PORTSMOUTH NEW HAMPSHIRE

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CU-100

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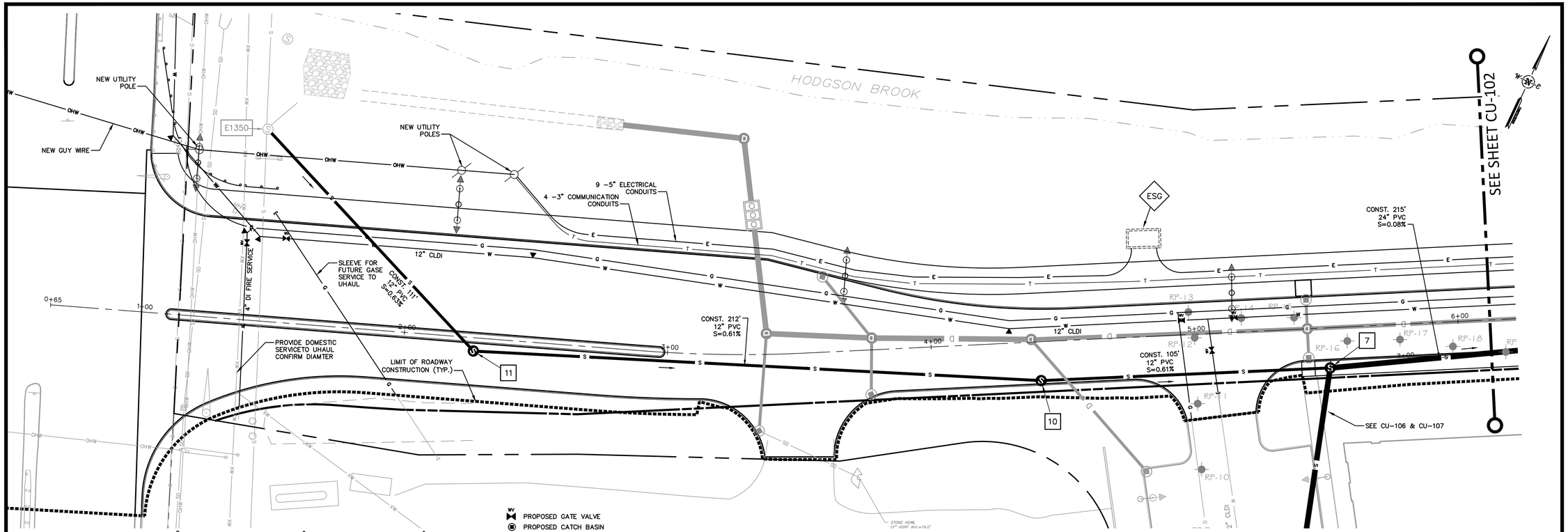

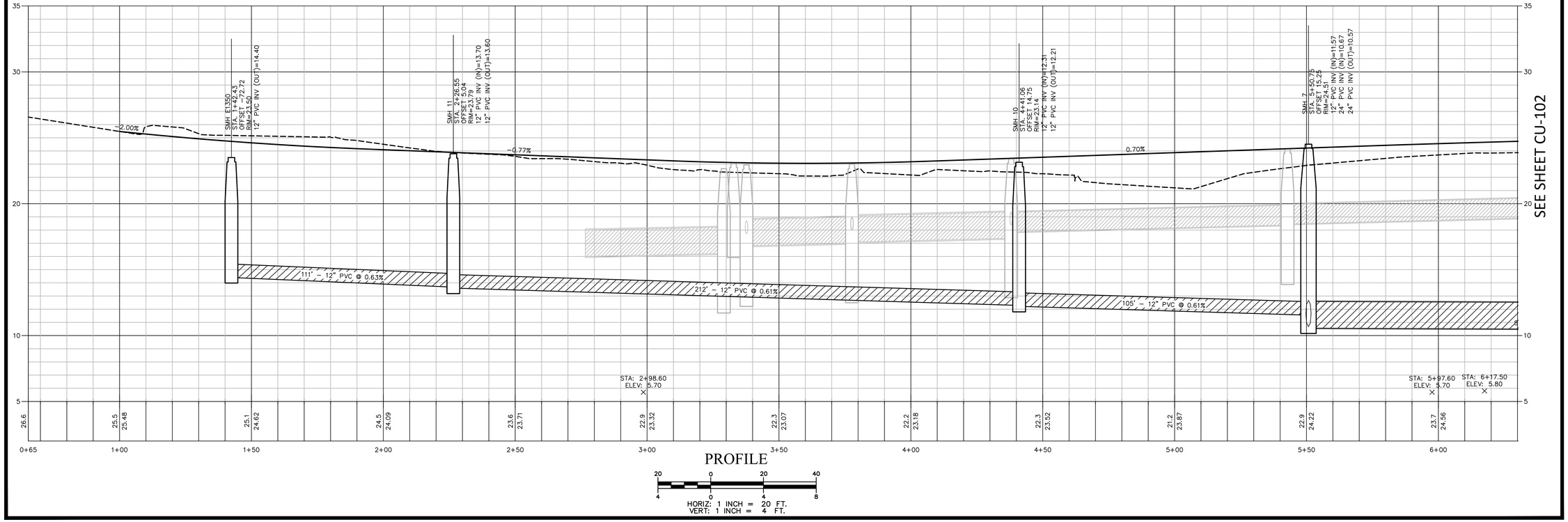

PROFILE

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UTILITY PLAN & PROFILE

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

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DATE: 09/10/2019

CU-101

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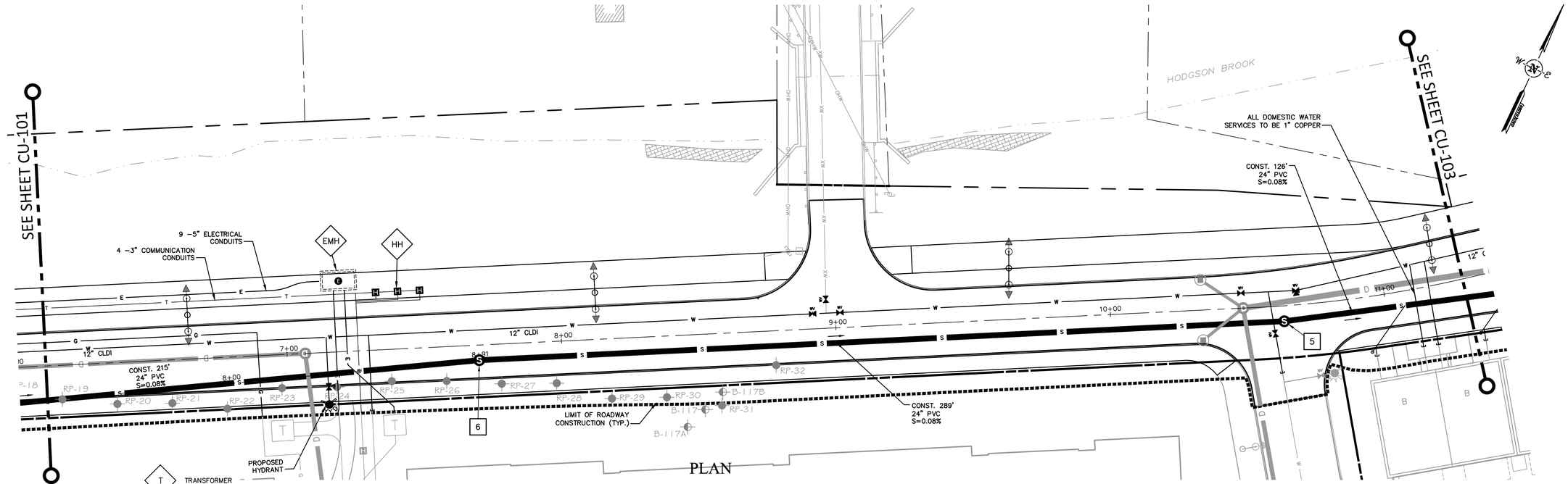
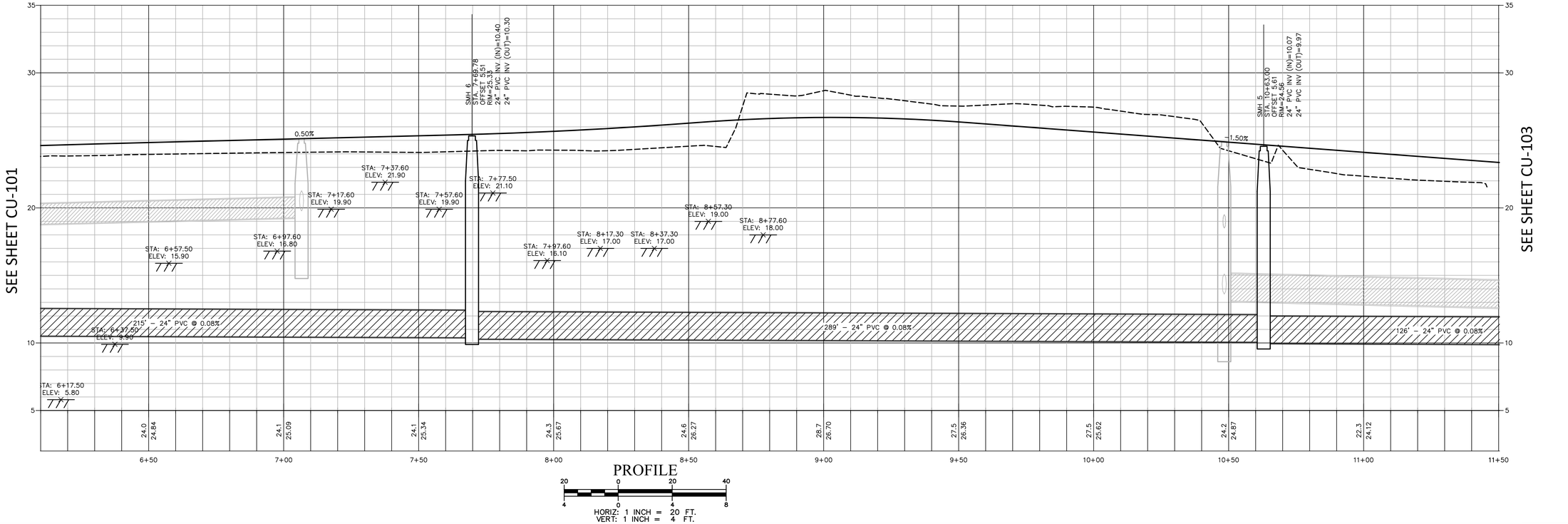


LEGEND

- ## — SEWER MANHOLE LABEL
- WV — PROPOSED GATE VALVE
- PROPOSED CATCH BASIN
- D — PROPOSED DRAIN MANHOLE
- S — PROPOSED SANITARY MANHOLE
- PROPOSED HYDRANT
- T — TRANSFORMER
- HH — TELECOM HAND HOLE
- EMH — SWITCH GEAR & ELECTRICAL MANHOLE



PROFILE

HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: 1" = 20'
VERT.: AS NOTED
DATUM: HORZ.: NAD83
VERT.: NGVD29
0
GRAPHIC SCALE

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UTILITY PLAN & PROFILE

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

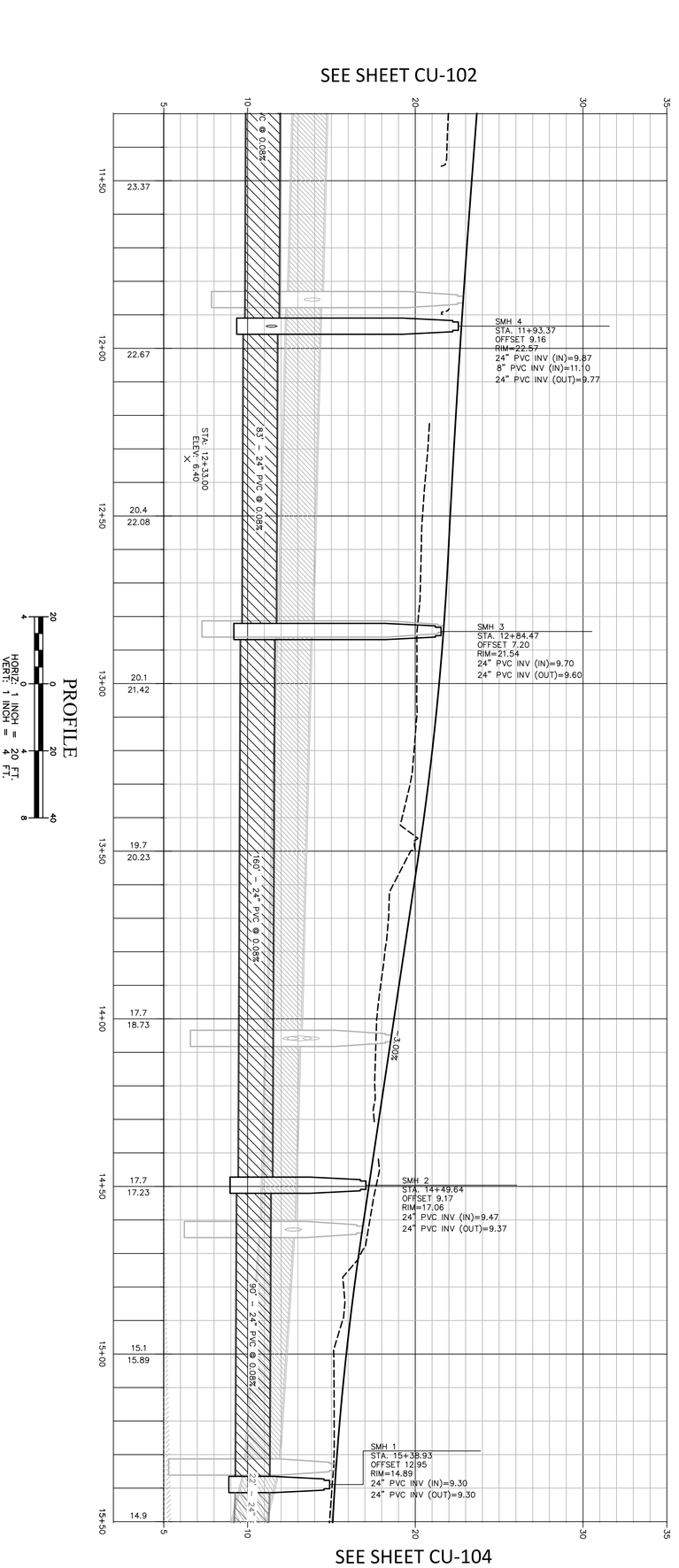
PROJ. No.: 20180317.A10
DATE: 09/10/2019

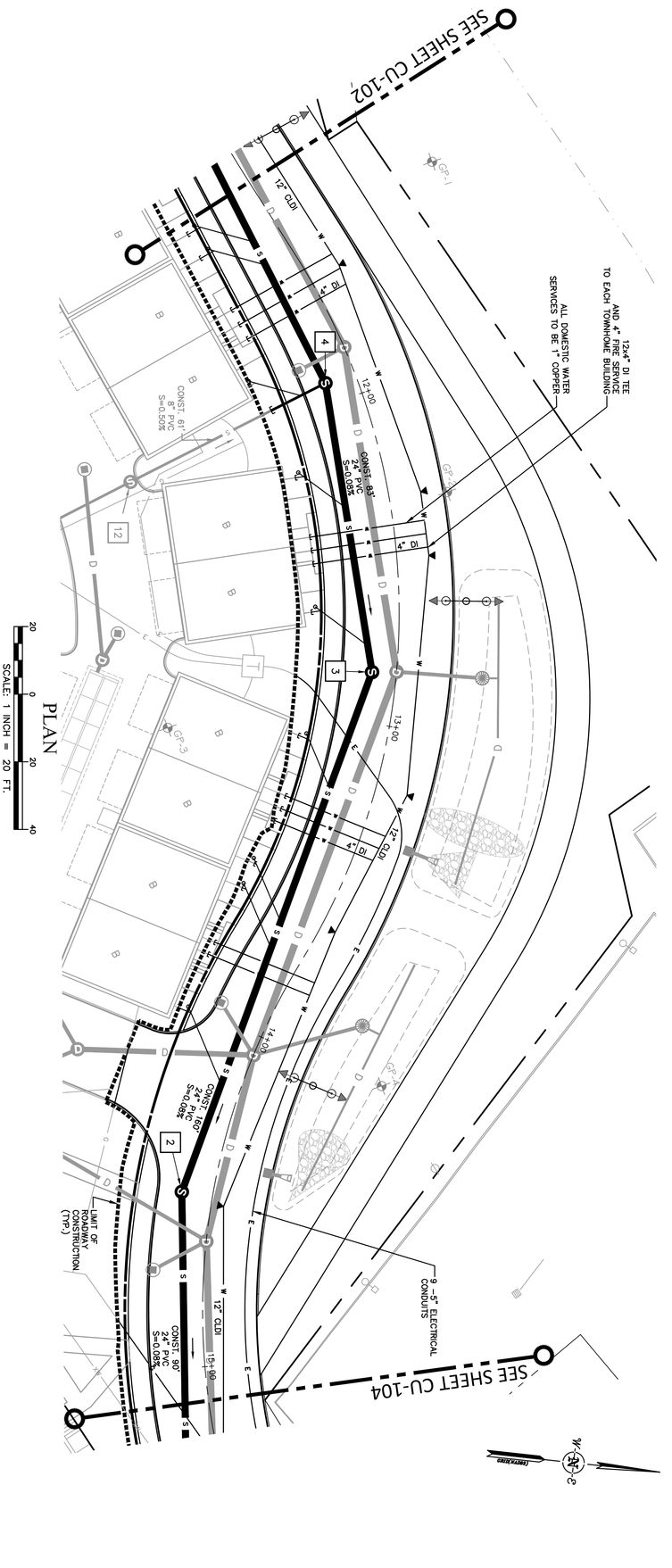
CU-102

File Path: F:\P2018\0317A10\Civil\3Dwgs\20180317A10_UTL01.dwg Layout: CU-102 (R) Plotted: Tue, September 10, 2019 - 11:49 AM User: jandretta
Plotter: DWG TO PDF.PC3 CTB File: FO.STB
MS VIEW: LAYER STATE:

File Path: F:\P2018\0317\A10\Civil3\Dwg\20180317A10_UTL01.dwg Layout: CU-103 (R) Plotted: Tue, September 10, 2019 - 11:50 AM User: jandretta
MS VIEW: | LAYER STATE: | Plotter: DWG TO PDF.PC3 CTB File: FO.STB

PROPOSED HYDRANT
PROPOSED SANITARY MANHOLE
PROPOSED DRAIN MANHOLE
PROPOSED CATCH BASIN
PROPOSED GATE VALVE
SEWER MANHOLE LABEL
SWITCH GEAR & ELECTRICAL MANHOLE
TELECOM HAND HOLE
TRANSFORMER





CU-103

PROJ. No.: 20180317A10
DATE: 09/10/2019

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SCALE:
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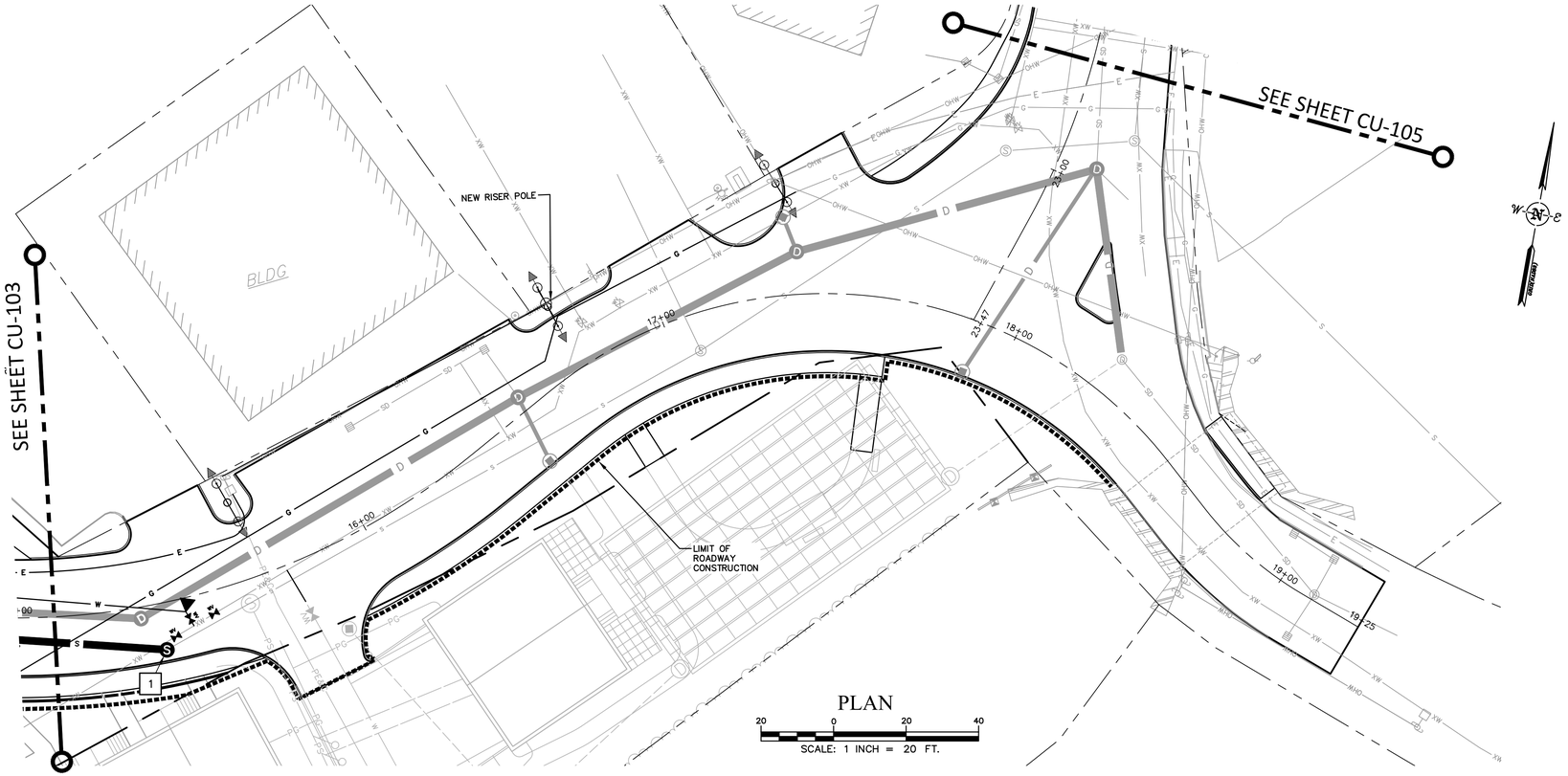
VERT.: AS NOTED
DATUM:
HORZ.: NAD83
VERT.: NGVD29
0
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
RICHARD R LUNDBORN No. 10943
LICENSED PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL



PLAN

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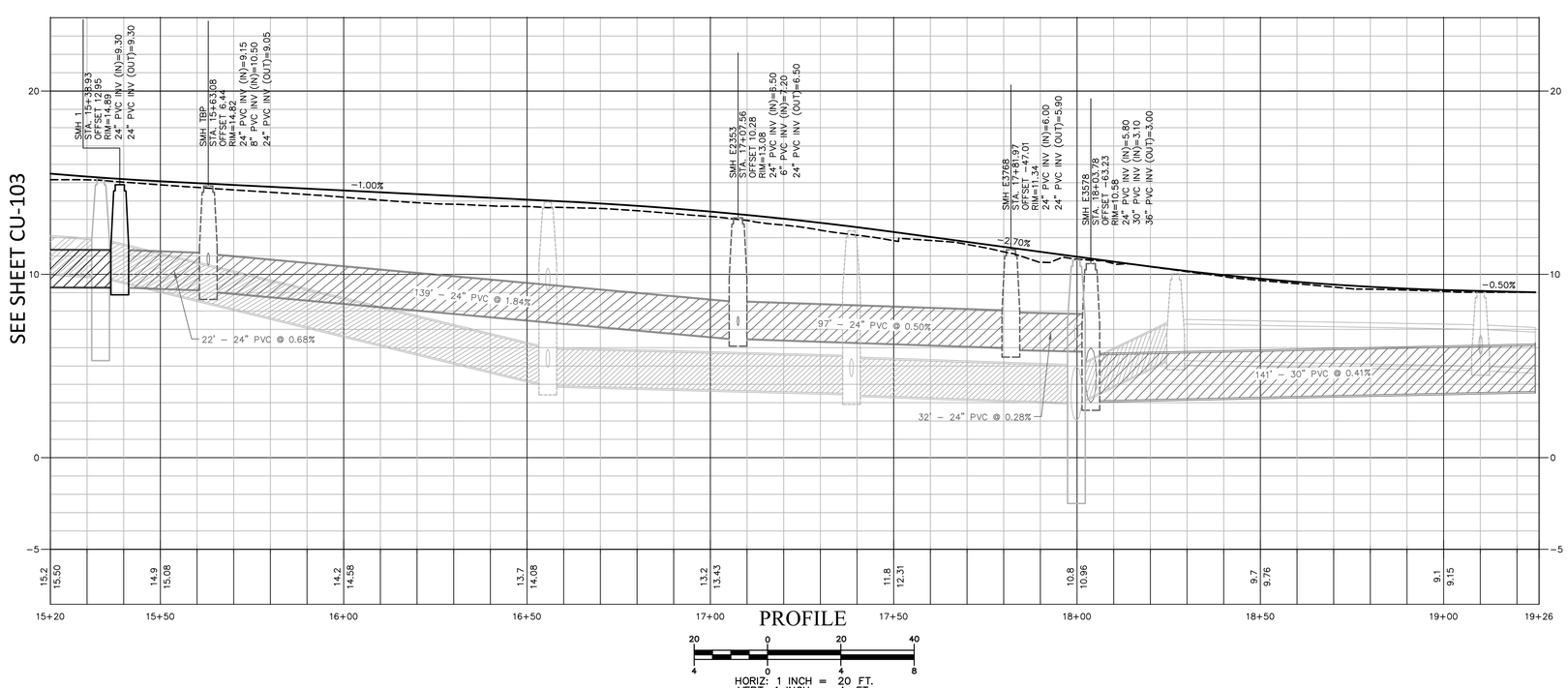
SCALE: 1 INCH = 20 FT.



PROFILE

20 0 20 40

4 0 4 8

HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

T TRANSFORMER

HH TELECOM HAND HOLE

EMH SWITCH GEAR & ELECTRICAL MANHOLE

SEWER MANHOLE LABEL

PROPOSED GATE VALVE
PROPOSED CATCH BASIN
PROPOSED DRAIN MANHOLE
PROPOSED SANITARY MANHOLE
PROPOSED HYDRANT

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – LICENSED PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943

SCALE:
HORZ.: 1" = 20'
VERT.: AS NOTED

DATUM:
HORZ.: NAD83
VERT.: NGVD29

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GRAPHIC SCALE

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CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CU-104

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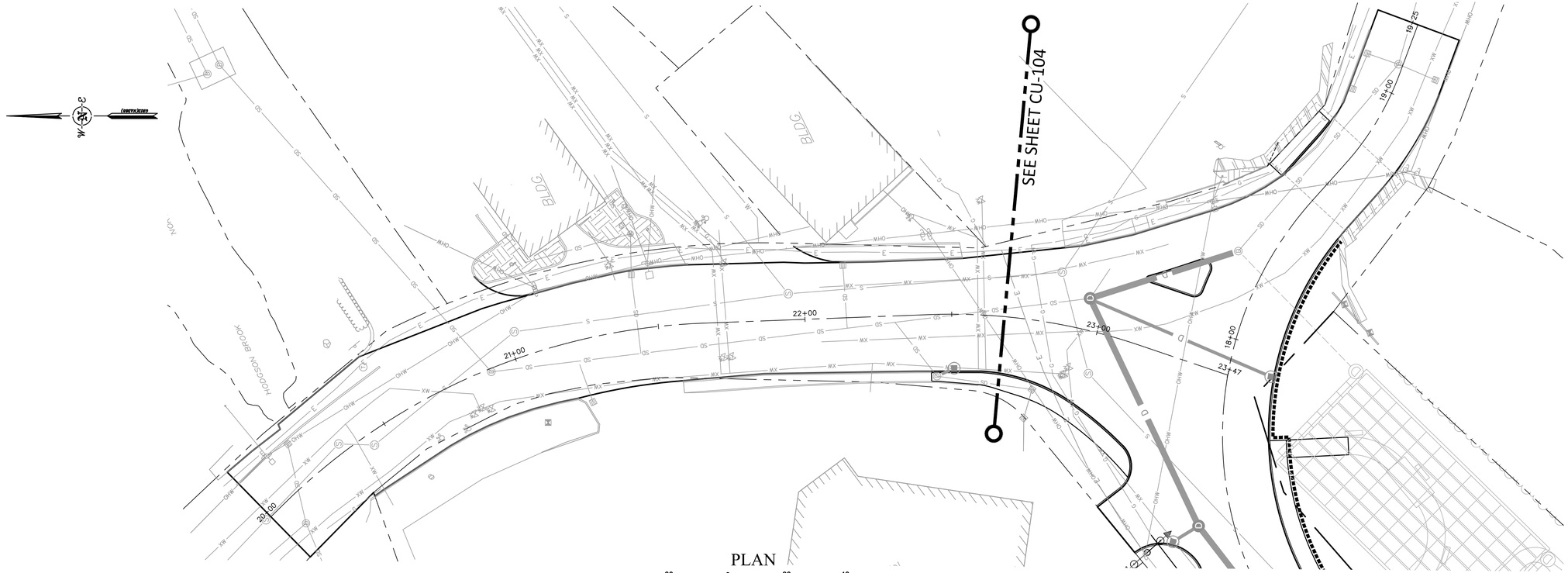
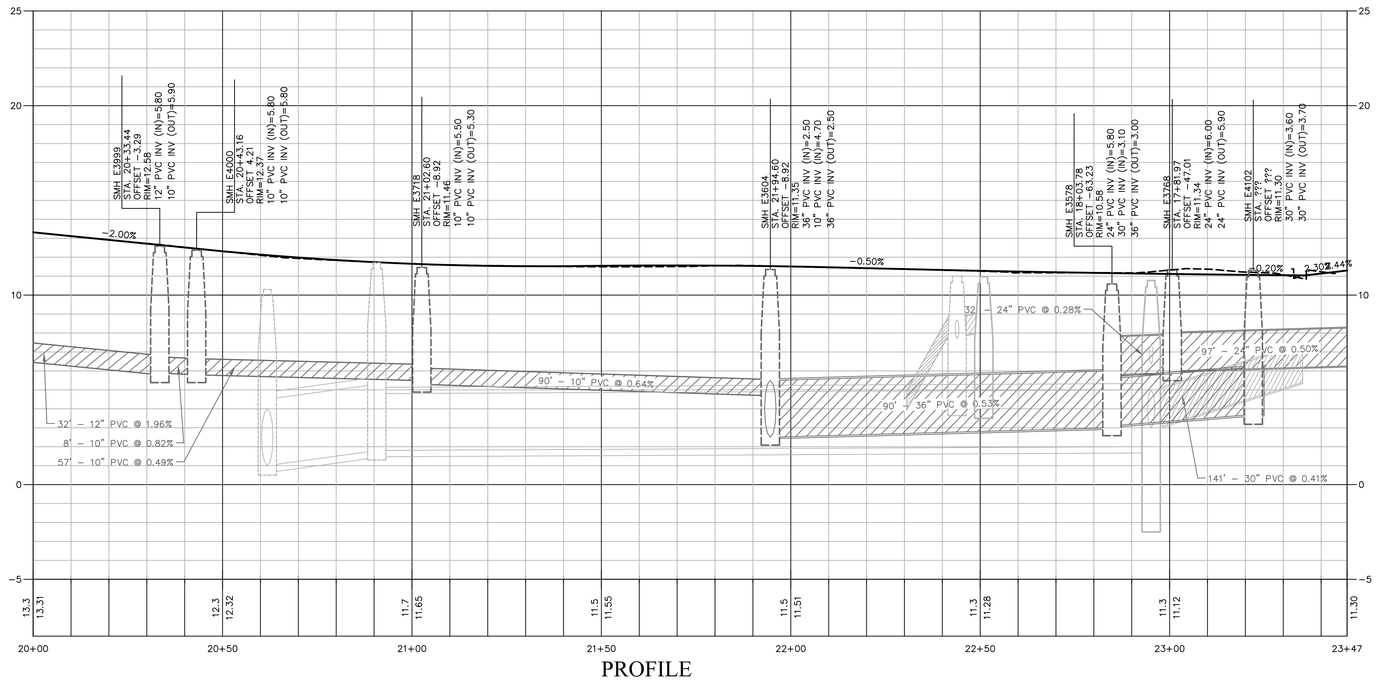


PLAN

20 0 20 40
SCALE: 1 INCH = 20 FT.



PROFILE

20 0 20 40
4 0 4 8
HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

T TRANSFORMER

HH TELECOM HAND HOLE

EMH SWITCH GEAR & ELECTRICAL MANHOLE

SEWER MANHOLE LABEL

W PROPOSED GATE VALVE

PROPOSED CATCH BASIN

PROPOSED DRAIN MANHOLE

PROPOSED SANITARY MANHOLE

PROPOSED HYDRANT

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE:
HORZ.: 1" = 20'
VERT.: AS NOTED
DATUM:
HORZ.: NAD83
VERT.: NGVD29
0
GRAPHIC SCALE

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PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CU-105

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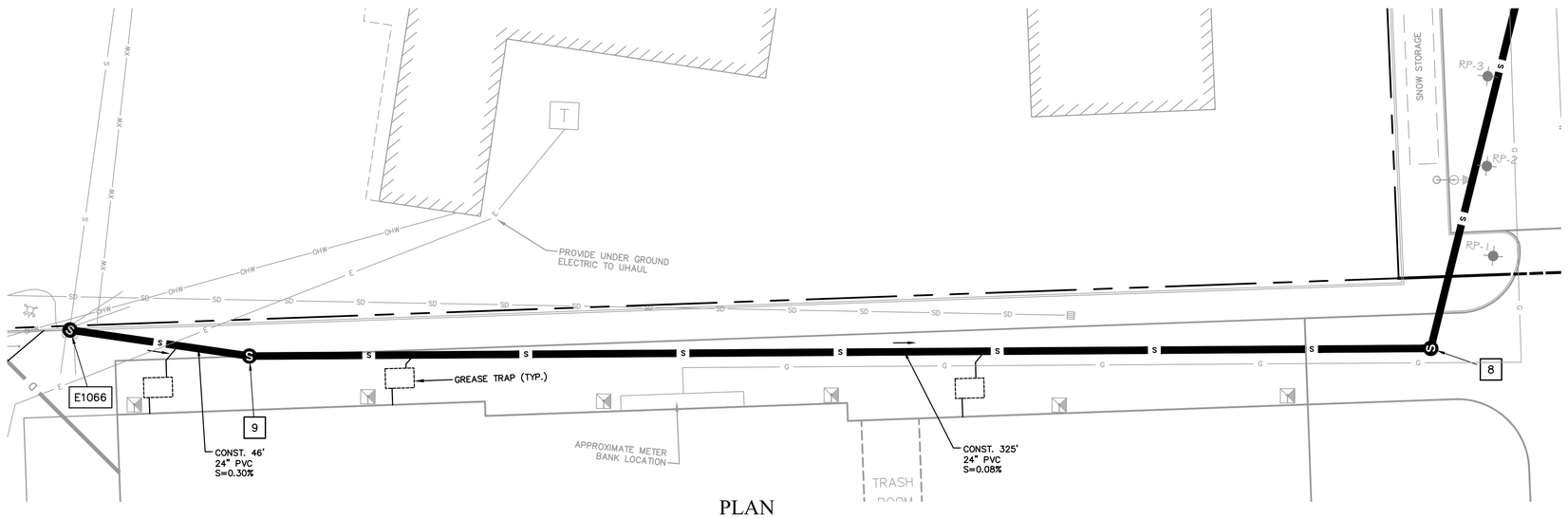


PLAN

20 0 20 40

SCALE: 1 INCH = 20 FT.

T TRANSFORMER

HH TELECOM HAND HOLE

EMH SWITCH GEAR & ELECTRICAL MANHOLE

SEWER MANHOLE LABEL

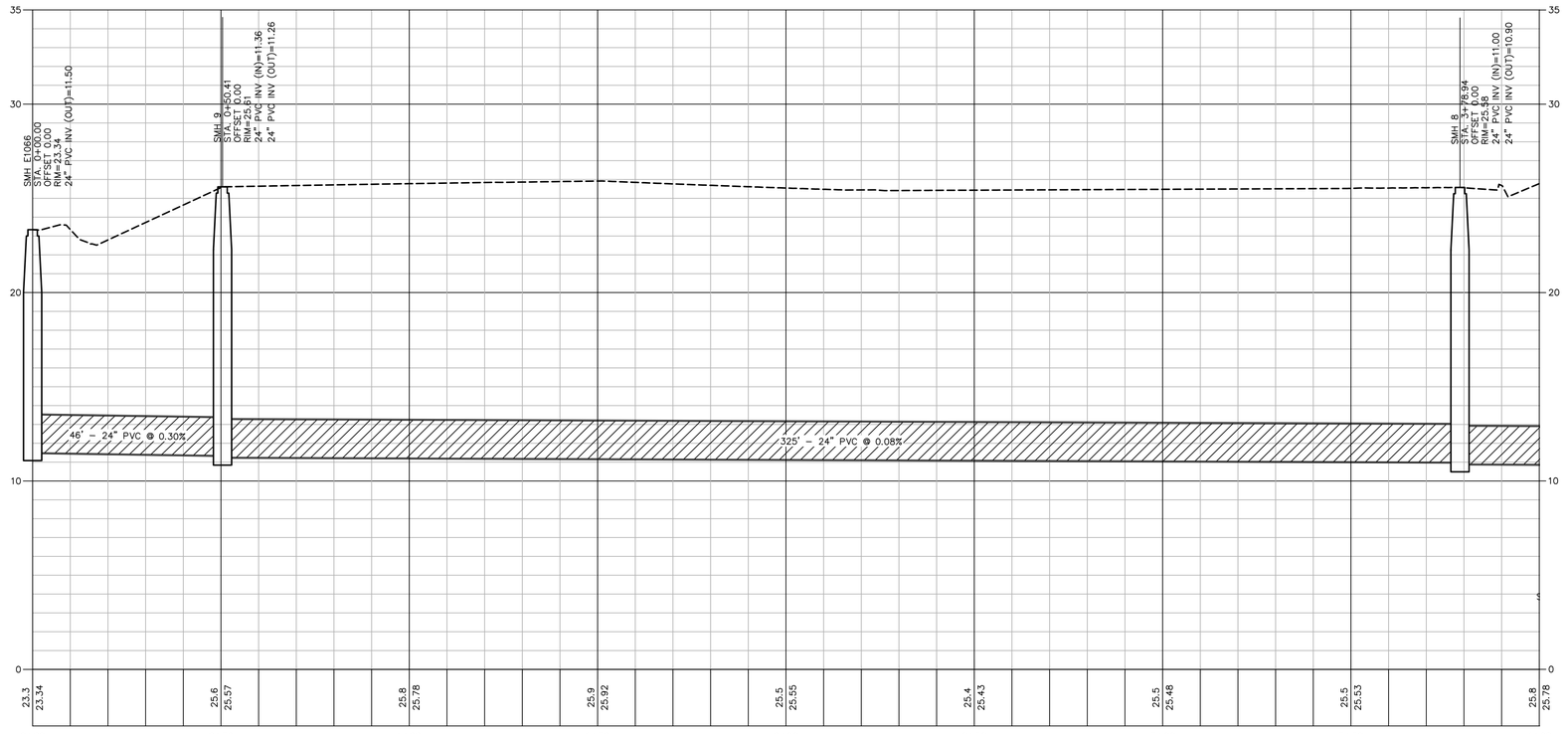
PROPOSED GATE VALVE

PROPOSED CATCH BASIN

PROPOSED DRAIN MANHOLE

PROPOSED SANITARY MANHOLE

PROPOSED HYDRANT



PROFILE

20 0 20 40

4 0 4 8

HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
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2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: 1" = 20'
VERT.: AS NOTED
DATUM: HORZ.: NAD83
VERT.: NGVD29
0
GRAPHIC SCALE

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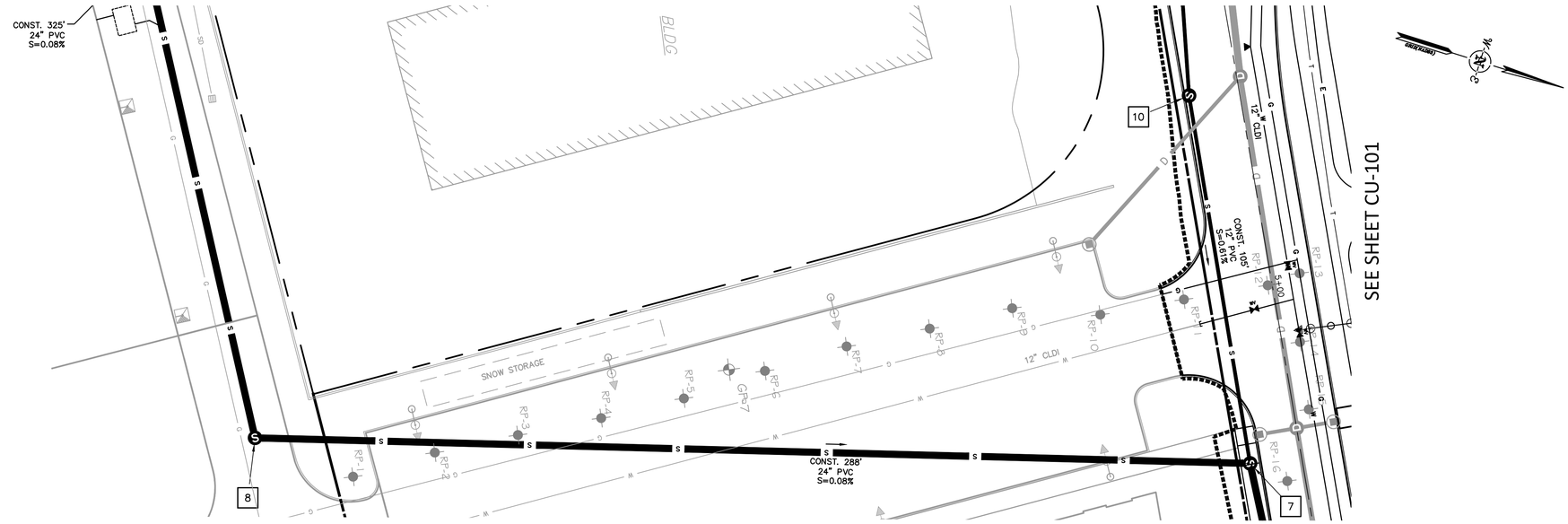
PORTSMOUTH NEW HAMPSHIRE

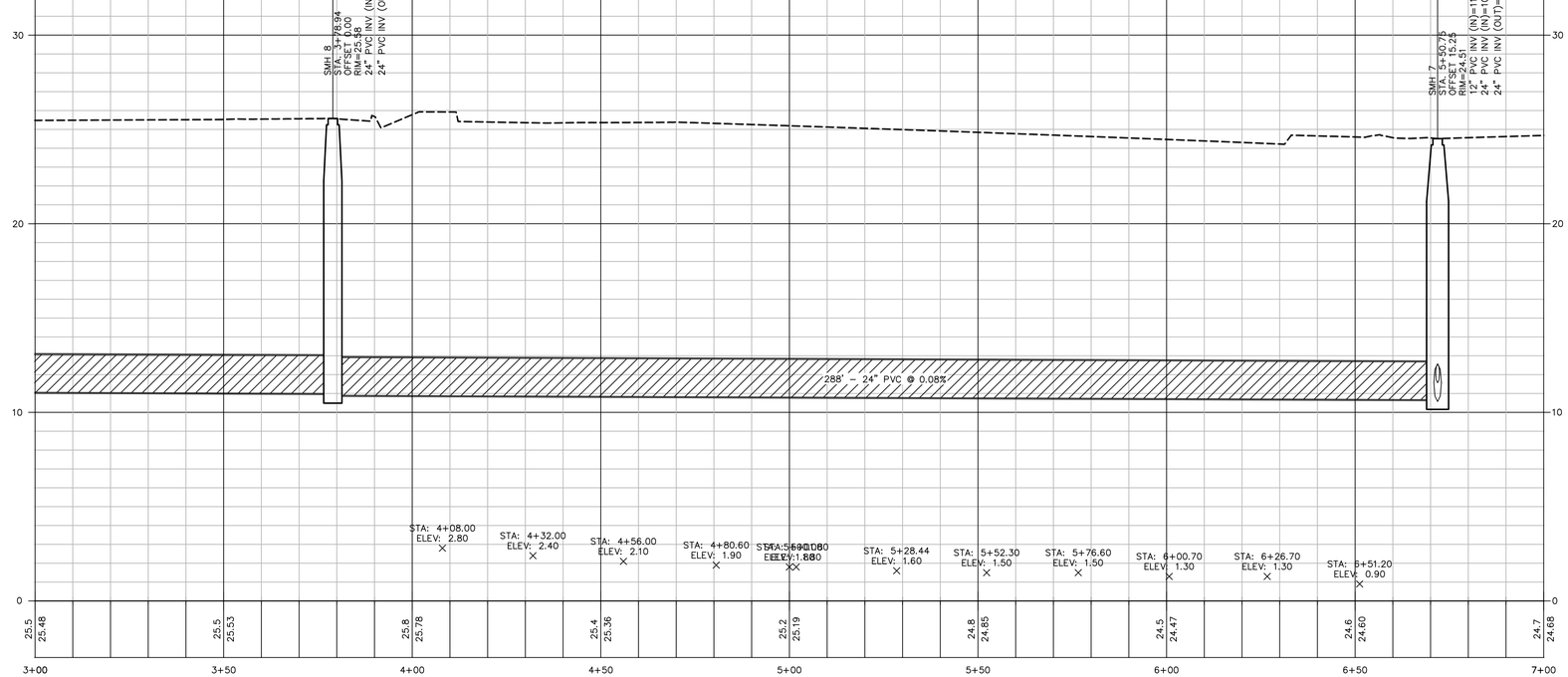
PROJ. No.: 20180317.A10
DATE: 09/10/2019

CU-106



PLAN

SCALE: 1 INCH = 20 FT.



PROFILE

SCALE: HORIZ: 1 INCH = 20 FT.
VERT: 1 INCH = 4 FT.

- T TRANSFORMER
- HH TELECOM HAND HOLE
- EMH SWITCH GEAR & ELECTRICAL MANHOLE
- ## SEWER MANHOLE LABEL
- WV PROPOSED GATE VALVE
- PROPOSED CATCH BASIN
- PROPOSED DRAIN MANHOLE
- S PROPOSED SANITARY MANHOLE
- PROPOSED HYDRANT

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: 1" = 20'
VERT.: AS NOTED
DATUM: HORZ.: NAD83
VERT.: NGVD29
GRAPHIC SCALE 0

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UTILITY PLAN & PROFILE

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CU-107

HODGSON BROOK

OUTLET NOT FOUND

APPROXIMATE BUILDING LOCATION

CONNECT TO 12" MAIN IN COAKLEY AT VALVE

EXISTING 12" DI SERVICE

ANY WATER LINES UNDER GUARDRAIL SHALL BE 3' DEEPER THAN POST DEPTH

NEW GUY WIRE

NEW UTILITY POLE

12" DI TEE HUNG OFF BRIDGE

PROVIDE DOMESTIC SERVICE TO UHAUL CONFIRM DIAMTER

E1350

CONST. 111' 12" PVC S=0.63%

NEW UTILITY POLE

12" CLDI

8" CLDI

ABANDON SERVICE LINE

REMOVE VALVES AS DIRECTED BY PORTSMOUTH DPW

ABANDON SERVICE LINE

CONSULT WITH UNITIL FOR LOCATION OF GAS LINE RELOCATED TO EAST AS NEEDED

ANY EXTRANEOUS SERVICES ARE TO BE PERMANENTLY DISCONTINUED AS DETERMINED BY PORTSMOUTH WATER.

REPLACE SIGNAL LOOPS AS NECESSARY WITHIN ONE WEEK OF DISTURBANCE.

PLAN

SCALE: 1 INCH = 20 FT.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LUNDBORN No. 10943 LICENSED

SCALE: HORZ.: 1"=20' VERT.: 1"=20'

DATUM: HORZ.: NAD83 VERT.: NGVD29

GRAPHIC SCALE 20 10 0 20

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RTE 1 BYPASS OFFSITE IMPROVEMENT PLANS

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CU-108

File Path: F:\P2018\0317A10\Civil\3Dwg\20180317A10_UTL01.dwg Layout: CU-108(R) Plotted: Tue, September 10, 2019 - 11:51 AM User: jandretta
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1. ALL SECTIONS SHALL BE CONCRETE, CLASS AA (4,000 PSI)
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER L.F. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER L.F.
4. RISERS OF 1', 2', 3', & 4' MAY BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H-20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH CLAY BRICKS (2 COURSES MAX.). FRAME TO BE SET IN A FULL BED OF MORTAR.
8. SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
9. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
10. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND THE INSIDE WALL OF THE STRUCTURE.
11. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING ONE STRIP OF BUTYL RUBBER SEALANT OR APPROVED FLEXIBLE SEALANT.
12. STEPS ARE NOT ALLOWED.

CATCH BASIN SPECIFIC NOTES:

13. CONE SECTIONS MAY BE CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
14. "ELIMINATOR" OIL/WATER SEPARATORS SHALL BE INSTALLED TIGHT TO INSIDE OF CATCH BASIN.

DRAIN MANHOLE SPECIFIC NOTES:

15. ALL STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 12" OF INSIDE SURFACE BETWEEN THE HOLES, NO MORE THAN 75% OF A HORIZONTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINT.
16. MANHOLE FRAME & COVER SHALL BE JORDAN IRONWORKS HINGE COVER PER CITY OF PORTSMOUTH STANDARD.

PRECAST DRAINAGE STRUCTURE NOTES

NOT TO SCALE

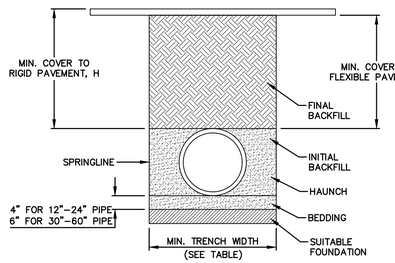


TABLE 1, RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
12" (300mm)	30" (762mm)
15" (375mm)	34" (864mm)
18" (450mm)	39" (991mm)
24" (600mm)	48" (1219mm)
30" (750mm)	56" (1422mm)
36" (900mm)	64" (1626mm)
42" (1050mm)	72" (1829mm)
48" (1200mm)	80" (2032mm)
60" (1500mm)	96" (2438mm)

TABLE 2, MINIMUM RECOMMENDED COVER BASED ON VEHICLE LOADING CONDITIONS

PIPE DIAM.	SURFACE LIVE LOAD CONDITION	
	H-25	HEAVY CONSTRUCTION (75T AXLE LOAD)*
12"–48" (300mm–1200mm)	12" (305mm)	12" (305mm)
60" (1500mm)	24" (610mm)	60" (1524mm)

*VEHICLE IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER

TABLE 3, MAXIMUM COVER FOR ADS HP STORM PIPE, FT.

	CLASS I	CLASS II			CLASS III		CLASS IV
PIPE DIA.	COMPACTED	95%	90%	85%	95%	90%	95%
12" (305mm)	41" (12.5m)	28" (8.5m)	21" (6.4m)	16" (4.9m)	20" (6.4m)	16" (4.9m)	16" (4.9m)
15" (375mm)	42" (12.8m)	29" (8.8m)	24" (6.4m)	16" (4.9m)	21" (6.4m)	16" (4.9m)	16" (4.9m)
18" (450mm)	44" (13.4m)	30" (9.1m)	24" (6.4m)	16" (4.9m)	22" (6.7m)	17" (5.2m)	16" (4.9m)
24" (600mm)	37" (11.3m)	26" (7.9m)	18" (5.5m)	14" (4.3m)	19" (5.8m)	14" (4.3m)	14" (4.3m)
30" (750mm)	39" (11.9m)	27" (8.2m)	19" (5.8m)	14" (4.3m)	19" (5.8m)	15" (4.6m)	14" (4.3m)
36" (900mm)	28" (8.5m)	20" (6.1m)	14" (4.3m)	10" (3.0m)	28" (8.5m)	11" (3.4m)	10" (3.0m)
42" (1050mm)	30" (9.1m)	21" (6.4m)	14" (4.3m)	10" (3.0m)	15" (4.6m)	11" (3.4m)	10" (3.0m)
48" (1200mm)	29" (8.8m)	20" (6.1m)	14" (4.3m)	9" (2.7m)	14" (4.3m)	10 (3.0m)	10" (3.0m)
60" (1500mm)	29" (8.8m)	20" (6.1m)	14" (4.3m)	9" (2.7m)	14" (4.3m)	10" (3.0m)	9" (2.7m)

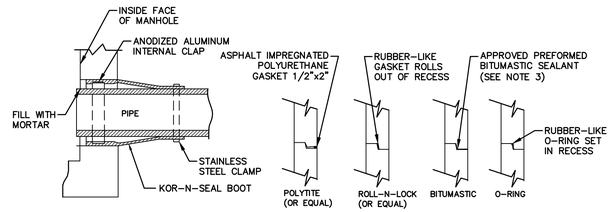
FILL HEIGHT TABLE GENERATED USING AASHTO SECTION 12, LOAD RESISTANCE FACTOR DESIGN (LRFD) PROCEDURE WITH THE FOLLOWING ASSUMPTIONS:
NO HYDROSTATIC PRESSURE
UNIT WEIGHT OF SOIL (γs) = PCF

NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D3221, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION WITH THE EXCEPTION THAT THE INITIAL BACKFILL MAY EXTEND TO THE CROWN OF THE PIPE. SOIL CLASSIFICATIONS ARE PER THE LATEST VERSION OF ASTM D2321. CLASS IVB MATERIALS (MH, CH) AS DEFINED IN PREVOUS VERSIONS OF ASTM D2321 ARE NOT APPROPRIATE BACKFILL MATERIALS.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND PLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II, III OR IV. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. COMPACTION SHALL BE SPECIFIED BY THE ENGINEER IN ACCORDANCE WITH TABLE 3 FOR THE APPLICABLE FILL HEIGHTS LISTED, UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 12"–24" (300mm–600mm) DIAMETER PIPE; 6" (150mm) FOR 30"–60" (750mm–150mm) DIAMETER PIPE. THE MIDDLE 1/3 BENEATH THE PIPE INVERT SHALL BE LOOSELY PLACED.
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II, III OR IV IN THE PIPE ZONE EXTENDING TO THE CROWN OF THE PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION. COMPACTION SHALL BE SPECIFIED BY THE ENGINEER IN ACCORDANCE WITH TABLE 3 FOR THE APPLICATION FILL HEIGHTS LISTED. PLEASE NOTE, CLASS IV MATERIAL HAS LIMITED APPLICATION AND CAN BE DIFFICULT TO PLACE AND COMPACT; USE ONLY WITH THE APPROVAL OF A SOIL EXPERT.
6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" (300mm) FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOTATION. FOR TRAFFIC APPLICATIONS; CLASS I OR II MATERIAL COMPACTED TO 90% SPD AND CLASS III COMPACTED TO 95% SPD IS REQUIRED. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" (300mm) UP TO 48" (1200mm) DIAMETER PIPE AND 24" (600mm) OF COVER FOR 60" (1500mm) DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.
7. FOR ADDITIONAL INFORMATION SEE TECHNICAL NOTE 2.04.

HP STORM TRENCH INSTALLATION DETAIL

NOT TO SCALE



PIPE TO MANHOLE JOINTS

HORIZONTAL JOINTS

NOTES
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW OF ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.
4. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.

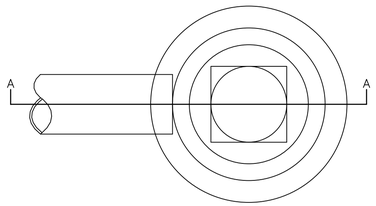
MANHOLE JOINTS

NOT TO SCALE

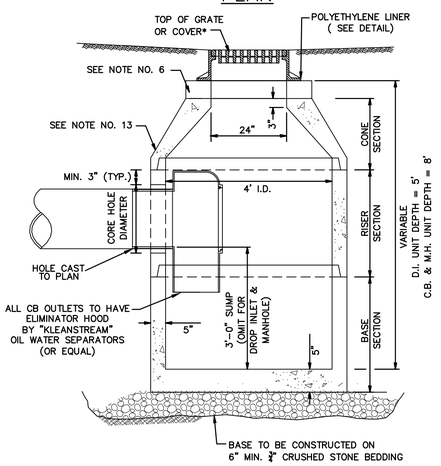
1. POLYETHYLENE LINER (ITEM 604.0007) SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
2. PLACE A CONTINUOUS BEAD OF AN APPROVED SILICONE SEALANT (SUBSIDIARY TO ITEM 604.0007) BETWEEN FRAME AND POLYETHYLENE SHEET.
3. PLACE CLASS AA CONCRETE TO 2" BELOW THE TOP OF THE GRATE ELEVATION (SUBSIDIARY TO DRAINAGE STRUCTURES)
4. USE ON DRAINAGE STRUCTURES 4' MIN. DIAMETER ONLY.
5. TRIM POLYETHYLENE SHEET A MAXIMUM OF 4" OUTSIDE THE FLANGE ON THE FRAME FOR THE CATCH BASIN BEFORE PLACING CONCRETE (EXCEPT AS SHOWN WHEN USED WITH 3-FLANGE FRAME AND CURB).
6. THE CENTER OF THE GRATE & FRAME MAY BE SHIFTED A MAXIMUM OF 6" FROM THE CENTER OF THE DOWNSPOUT IN ANY DIRECTION.
7. PLACED ONLY IN DRAINAGE STRUCTURES IN PAVEMENT.
8. SEE NHDOT DR-04, "DI-DB, UNDERDRAIN FLUSHING BASIN AND POLYETHYLENE LINER DETAILS", FOR ADDITIONAL INFORMATION.

POLYETHYLENE LINER NOTES

NOT TO SCALE



PLAN

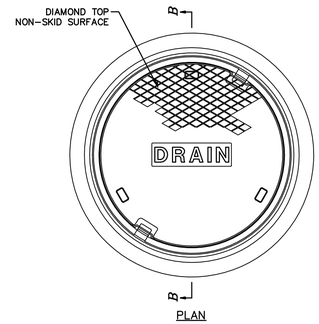


* MANHOLE FRAME & COVER SHALL BE JORDAN IRONWORKS HINGE COVER PER CITY OF PORTSMOUTH STANDARD.

SECTION A–A

PRECAST CATCH BASIN/DRAINAGE MANHOLE

SCALE: N.T.S.



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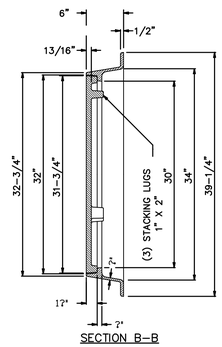
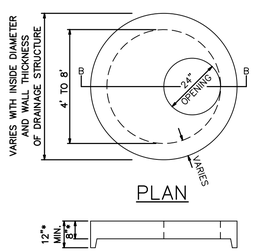


SECTION B–B

NOTES:
1. ALL DIMENSIONS ARE NOMINAL.
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
3. LABEL TYPE OF MANHOLE WITH 3" HIGH LETTERS IN THE CENTER OF THE COVER.

DRAIN MANHOLE FRAME AND COVER

NOT TO SCALE

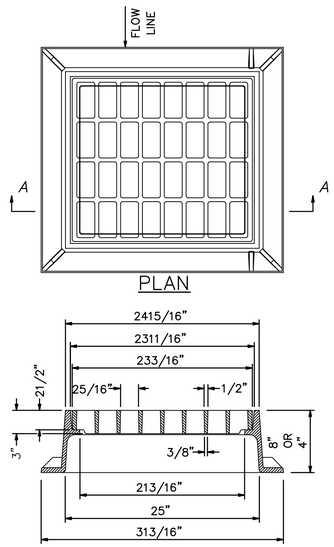


PLAN

* FOR >6' DIA. STRUCTURES USE 16" & 12" DIMENSIONS

SECTION B–B

FLAT SLAB TOP



PLAN

SECTION A–A

CATCH BASIN FRAME & GRATE (TYPE B)

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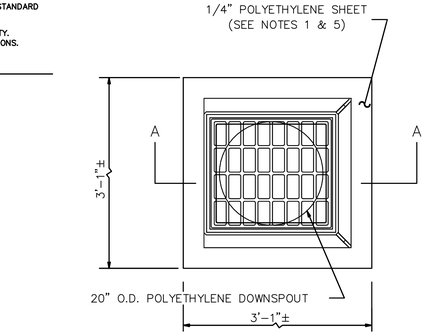

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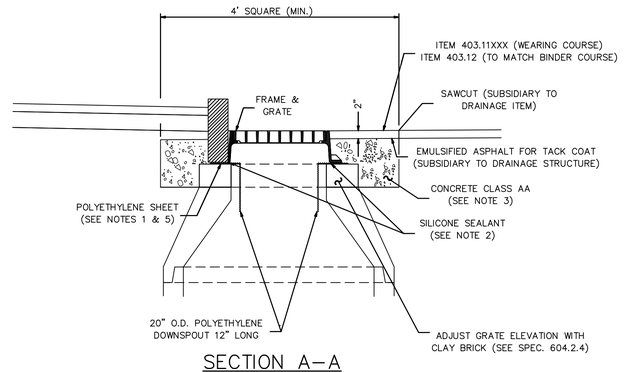

SECTION A–A

POLYETHYLENE LINER

SCALE: N.T.S.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: NTS VERT.: | DATUM: HORZ.: VERT.: | 0 GRAPHIC SCALE

FUSS & O'NEILL
UPPER SQUARE BUSINESS CENTER
5 FLETCHER STREET, SUITE 1
KENNEBUNK, MAINE 04043
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www.fando.com

CATE STREET DEVELOPMENT, LLC

DRAINAGE DETAILS

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CD-511

File Path: F:\P2018\0317\A10\Civil\3Dwg\20180317A10_DET01-RDWY.dwg Layout: CD-511-DRAINAGE Plotted: Tue, September 10, 2019 - 11:18 AM User: jandretta
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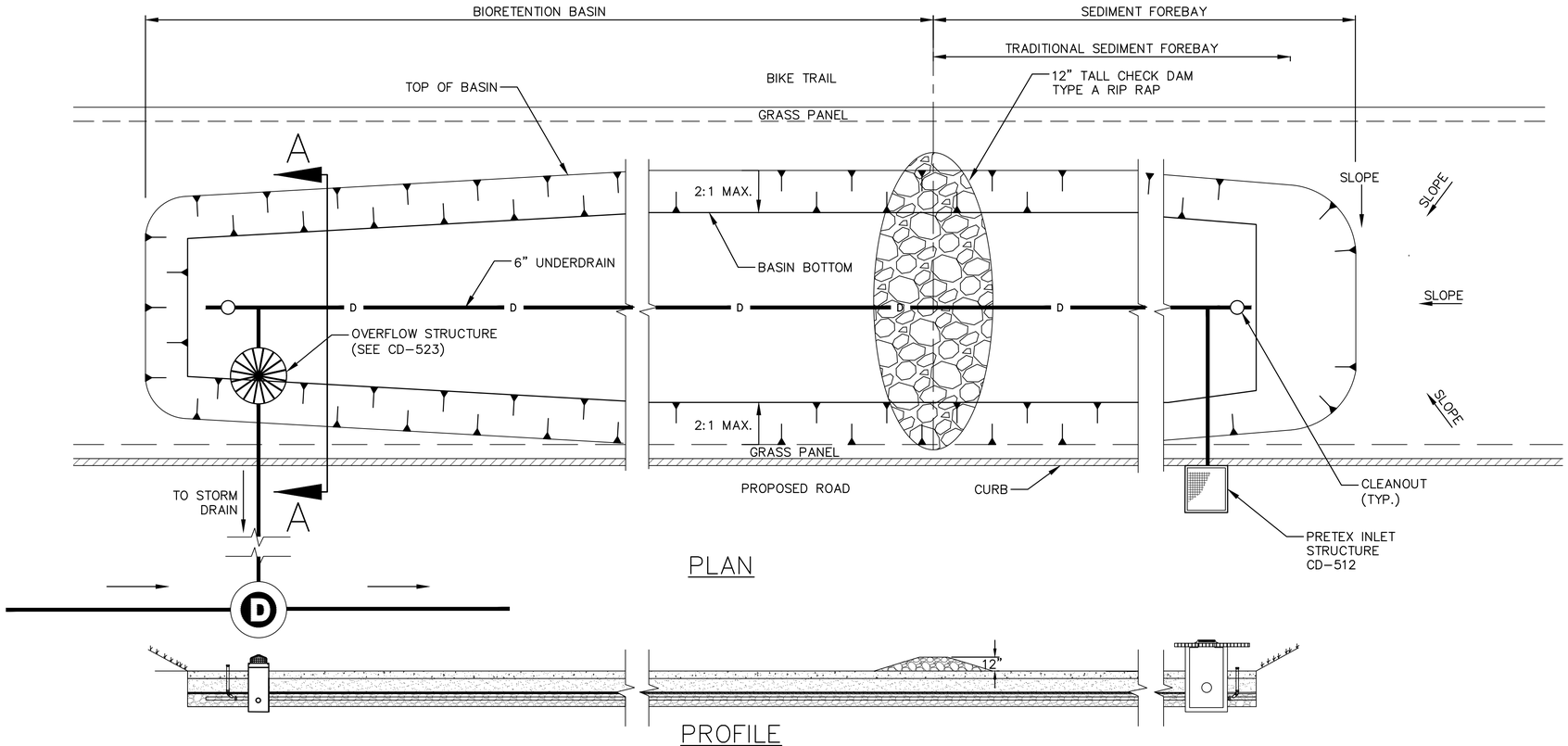
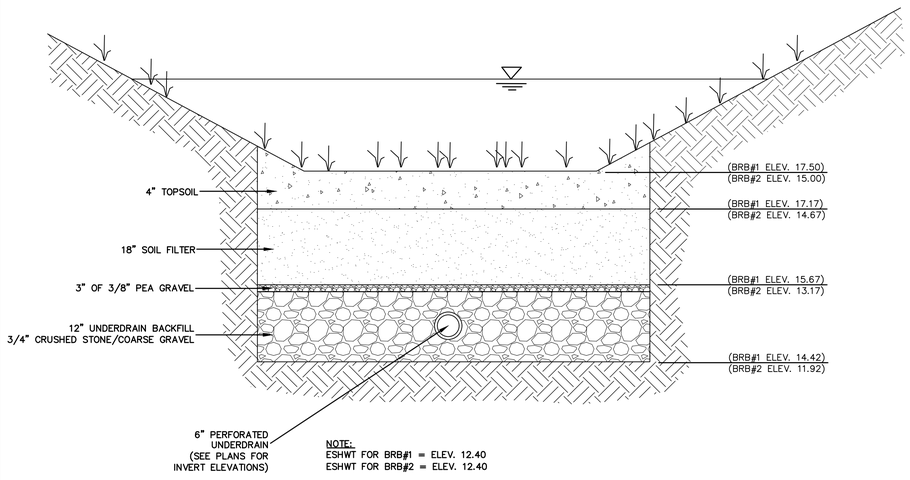


PLAN

PROFILE

BIORETENTION SYSTEM TYPICAL SECTION

NOT TO SCALE



SECTION A–A

SCALE: N.T.S.

CONSTRUCTION NOTES:

1. DO NOT PLACE THE BIORETENTION SYSTEM INTO SERVICE UNTIL THE BMP HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF AND WATER FROM EXCAVATIONS) TO THE BIORETENTION SYSTEM DURING ANY STAGE OF CONSTRUCTION.
3. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.

MAINTENANCE NOTES:

1. SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EVENT EXCEEDING 2.5 INCHES IN A 24 HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS WARRANTED BY SUCH INSPECTION.
2. PRETREATMENT MEASURES SHOULD BE INSPECTED AT LEAST TWCE ANNUALLY, AND CLEANED OF ACCUMULATED SEDIMENT AS WARRANTED BY INSPECTION, BUT NO LESS THAN ONCE ANNUALLY.
3. TRASH AND DEBRIS SHOULD BE REMOVED AT EACH INSPECTION.
4. AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72–HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION OR INFILTRATION FUNCTION (AS APPLICABLE), INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
5. VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING PRUNING, REMOVAL AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.

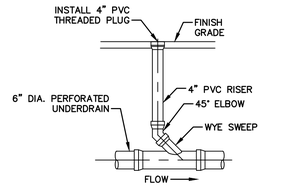
BIORETENTION SYSTEM NOTES

NOT TO SCALE

TABLE 4-3 FILTER MIXTURES			
COMPONENT MATERIAL	PERCENT OF MIXTURE BY VOLUME	GRADATION OF MATERIAL	
		SIEVE NO.	PERCENT BY WEIGHT STANDARD SIEVE
FILTER MEDIA OPTION A			
ASTM C-33 CONCRETE SAND	50 TO 55		
LOAMY SAND TOPSOIL, WITH FINES AS INDICATED	20 TO 30	200	15 TO 25
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20 TO 30	200	<5
FILTER MEDIA OPTION B			
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20 TO 30	200	<5
LOAMY COARSE SAND	70 TO 80	10	85 TO 100
		20	70 TO 100
		50	15 TO 40
		200	8 TO 15

SOIL FILTER MIXTURES

NOT TO SCALE



DRAIN CLEAN–OUT

NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 – REGISTERED PROFESSIONAL ENGINEER

SCALE: HORZ.: NTS
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DATUM: HORZ.:
VERT.:
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CATE STREET DEVELOPMENT, LLC

DRAINAGE DETAILS

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CD-512

PRETX SPECIFICATIONS

A. GENERAL

1. PRETX SYSTEMS ARE A PRE-FILTER AND CRITICAL MAINTENANCE DEVICE THAT EXTENDS THE OPERATING LIFE AND REDUCES THE MAINTENANCE BURDEN OF BIORETENTION SYSTEMS, RAIN GARDENS, BIOSWALES AND OTHER TYPES OF SURFACE BEST MANAGEMENT PRACTICES BY FILTERING OUT SEDIMENT, TRASH AND DEBRIS AT THE INLET.

B. PRODUCTS

1. PRETX IS AVAILABLE IN 3 MODELS THAT MANAGE MOST BIORETENTIOIN INLET CONFIGURATIONS: CURB, DROP, AND INLINE.
2. PRETX-CURB IS FOR EDGE OF PAVEMENT RUNOFF AT A CURB CUT IN LIEU OF A STONE SPREADER.
3. PRETX-DROP IS FOR USE AS A DROP INLET CONFIGURATION ALONG A CURB LINE AND WOULD BE INSTALLED WITH A STANDARD DROP INLET GRATE.
4. PRETX-INLINE IS FOR USE WITH SUBSURFACE INLET AND OUTLET PIPE.
5. PRETX IS SIZED TO PRETREAT WATER QUALITY FLOWS AND BYPASS LARGER FLOWS THAT HAVE MINIMAL TRASH AND DEBRIS. PRETX CAN BE USED BOTH IN RETROFIT OR NEW INSTALLATIONS.
6. ACCEPTABLE SYSTEM SUPPLIER:
   CONVERGENT WATER TECHNOLOGIES, INC. OR ITS AUTHORIZED VALUE-ADDED RESELLER
   (800) 711-5428
   WWW.CONVERGENTWATER.COM

C. SUBMITTALS

1. SUBMIT PROPOSED LAYOUT DRAWINGS. DRAWINGS SHALL INCLUDE TYPICAL SECTION DETAILS ANNOTED WITH SYSTEM ELEVATIONS (E.G., RIM, PIPE INVERTS, OUTSIDE BOTTOM OF STRUCTURE, ETC.).
2. SUBMIT MATERIAL CERTIFICATES FOR FRAMES AND COVERS
3. ANY PROPOSED EQUAL ALTERNATE PRODUCT SUBSTITUION TO THIS SPECIFICATON MUST BE SUBMITTED FOR REVIEW AND APPROVED PRIOR TO BID OPENING.

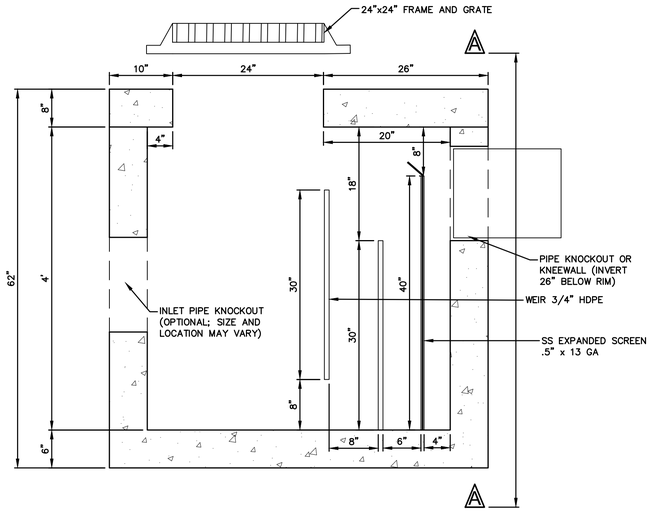
D. EXECUTION

1. All PUBLIC STORM DRAINAGE SYSTEMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS AND ACCORDING TO LOCAL MUNICIPAL REQ UIREME NTS.
2. All STORM DRAINAGE SYSTEM CONSTRUCTION IS SUBJECT TO INSPECTION AND APPROVAL BY THE PROJECT ENGINEER.
3. THE CONTRACTOR SHALL NOTIFYTHE PROJECT ENGINEER A MINIMUM OF TWO FULL BUSINESS DAYS PRIOR TO THE START OF CONSTRUCTIO N.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING AND OBTAINING APPROVAL FROM DIG-SAFE AND DETERMINING THE LOCATION OF All UNDERGROUND UTILITIES PRIOR TO THE START OF CONSTRUCTION/ EXCAVATI ON AND SHALL NOTIFY THE PROJECT ENGINEER OF ANY POTENTIAL CONFLICTS.
5. TO PROTECT STORMWATER FLOW CONTROL AND QUALITY TREATMENT FACILITIES FROM SEDIMENTATION, THEY SHALL BE CONNECTED TO THE STORM CONVEYANCE SYSTEM ONLY AFTER ALL SITE WORK, ROAD CONSTRUCTION, UTILITY WORK AND LANDSCAPING ARE IN PLACE IN ALL AREAS ABOVE AND UPSTREAM OF THE FACILITY.
6. THE EXISTING STORM SEWER SYSTEM SHALL STAY ISOLATED FROM THE NEW SYSTEM UNTIL THE NEW SYSTEM IS CLEANED, AND APPROVED FOR USE. THERE SHALL BE NO DEBRIS IN THE LINES OR FURTHER CLEANING Will BE REQUIRED PRIOR TO ACCEPTANCE.
7. PROVIDE A 1.5" MINIMUM GAP BETWEEN THE KNOCKOUT WALL AND THE OUTSIDE OF THE PIPE. AFTER THE PIPE IS INSTALLED, FILL THE GAP WITH JOINT MORTAR
8. THE OPENING SHALL BE MEASURED ATTHE TOP OF THE PRECAST BASE SECTION.
9. All PICKUP HOLES SHALL BE GROUTED FULL AFTER THE BASIN HAS BEEN PLACED.
10. STANDARD CURB INLETS AND TIPDOWNS SHALL BE PRECAST CONCRETE OR ASPHALT.
11. PIPE ENDS SHALL BE FLUSH WITH THE INNER WALL OR 1" MAXIMUM INTRUSION. MASONRY, CINDER BLOCKS, OR SIMILIAR MATERIALS MA Y BE USED TO ADJUST THE RISERS TO GRADE PRIOR TO GROUTING.
12. GROUTING SHALL BE SUFFICIENTTO PREVENT LEAKS BETWEEN THE PRECAST COMPONENTS OF THE COMPLETED STRUCTURE & SHALL BE PERFORMED INSIDE, BETWEEN & OUTSIDE OF All RISERS, JOINTS & PIPE PENETRATIONS.
13. MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
14. All REINFORCED CAST IN PLACE CONCRETE SHALL BE CLASS 4000. All PRECAST CONCRETE SHALL BE CLASS 4000.
15. RECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM.
16. MATING SURFACES OF MANHOLE RINGS AND COVERSSHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITIONS.

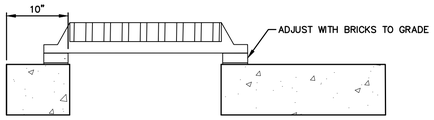
E. CONSTRUCTION AND SEQUENCING

1. EXAMINATION
   A. VERIFY LAYOUT AND ORIENTATION OF PRE-TX SYSTEM AREA INCLUDING EDGE OF PAVEMENT, TIP DOWN, CURBS AND SIDEWALK, BIOFILTRATION SYSTEM, AND CONNECTIONS.
   B. VERIFY EXCAVATION BASE IS READY TO RECEIVE WORK AND EXCAVATIONS, DIMENSIONS, AND ELEVATIONS ARE AS INDICATED ON DRAWINGS.
2. PREPARATION
   A. CALL DIG SAFE AND RECEIVE APPROVAL BEFORE PERFORMING WORK.
   B. REQUEST UNDERGROUND UTILITIES TO BE LOCATED AND MARKED WITHIN AND SURROUNDING CONSTRUCTION AREAS.
   C. IDENTIFY REQUIRED LINES, LEVELS, CONTOURS, AND DATUM.
   D. CLEAR AND GRUB THE PROPOSED PRE-TX SYSTEM AREA.
3. EXCAVATION AND INSTALLATION
   A. THE FOLLOWING CONSTRUCTION SEQUENCE IS TO BE USED AS A GENERAL GUIDELINE. COORDINATE WITH THE OWNER, AND ENGINEERS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
   B. INSTALL TEMPORARY EROSION AND SEDIMENT CONTROLS TO DIVERT STORM WATER AWAY FROM THE PRE-TX SYSTEM AREA.
   C. EXCAVATE TO THE BOTTOM INVERT OF THE SYSTEM.
   D. TO MINIMIZE COMPACTION OF ADJACENT BIOFILTRATION SYSTEMS, WORK EXCAVATORS OR BACKHOES FROM THE SIDES TO EXCAVATE THE PRE-TX SYSTEM AREA TO ITS APPROPRIATE DESIGN DEPTH AND DIMENSIONS.
   E. ROUGH GRADE THE PRE-TX SYSTEM AREA DURING GENERAL CONSTRUCTION. EXCAVATE THE PRE-TX SYSTEM FACILITIES TO WITHIN 1 FOOT OF STRUCTURE BOTTOM .
   F. PLACE 1 FOOT BED OF COARSE STONE TO ELEVATION OF BASE OF STRUCTURE.
   G. ESTABLISH ELEVATIONS FOR ADJACENT CURBS, EDGE OF PAVEMENT AND TIP DOWN, SIDEWALK, PIPE INVERTS FOR INLETS AND OUTLETS AS INDICATED ON DRAWINGS.
4. INSTALLATION
   A. PLACE THE PRECAST SYSTEM TO NECESSARY ELEVATION.
   B. VERIFY ELEVATIONS FOR ADJACENT CURBS, EDGE OF PAVEMENT, PAVEMENT GRADING FOR INLET GRATE FOR PRETX-DROP, SIDEWALK, PIPE INVERTS FOR INLETS AND OUTLETS, OUTLET INVERT FOR KNEE WALL.
   C. FOR PRETX-SURFACE:
      a. VERIFY ELEVATIONS FOR ADJACENT CURBS.
      b. VERIFY EDGE OF PAVEMENT TIP DOWN PAVEMENT GRADING FOR INLET GRATE.
      c. VERIFY CURB ELEVATION IN RELATION TO PAVEMENT AND TIP DOWN.
      d. VERIFY OUTLET INVERT FOR KNEE WALL IN RELATION TO FILTER MEDIA.
   D. FOR PRETX-DROP:
      a. VERIFY ALL INLET PIPES ENTER THE STRUCTURE UPSTREAM OF BAFFLE.
      b. VERIFY FRAME AND GRATE OFFSET ON INLET SIDE AND UPSTREAM OF BAFFLE.
      c. VERIFY CURB LOCATION WITH RESPECT TO FRAME AND GRATE ORIENTATION.
   E. INSTALL BAFFLES, WEIR, AND SCREENS AS INDICATED ON DRAWINGS.
   F. VERIFY MAINTENANCE ACCESS THROUGH GRATE OR COVER AND CLEARANCE FOR VACTOR.
   G. INSTALL TOP OF STRUCTURE LEVEL WITH ADJACENT CURB OR SIDEWALK AS PER MANUFACTURERS SPECIFICATIONS. ENGINEER FIELD VISIT REQUIRED PRIOR TO BACKFILLING.
5. BACKFILLING
   A. BACKFILL WITH APPROVED SOIL AND STONE TO THE DESIGN GRADE AS SPECIFIED IN THE DRAWINGS.
   B. BACKFILL WITH 12" OF NO. 57 STONE AROUND REAR, LEFT, AND RIGHT SIDES TO LEVEL WITH TOP OF HDPE SCREEN.
   C. BACKFILL WITH BIORETENTION SOIL MIX BEYOND STONE BACKFILL TO EQUAL ELEVATION OF THE TOP OF HDPE SCREEN.
   D. DO NOT BACKFILL SOIL OR STONE AGAINST STAINLESS SCREEN.
   E. DO NOT COMPACT ADJACENT FILTRATION SYSTEM SOIL WITH MECHANICAL EQUIPMENT.
   F. STABILIZE All REMAINING DISTURBED AREAS AND SIDE SLOPES WITH SEEDING, HYDROSEEDING, AND/ ORE ROSION CONTROL BLANKETS AS INDICATED ON DRAWINGS.
6. CLEAN UP
   A. AFTER COMPLETION OF THE WORK, REMOVE AND PROPERLY DISPOSE ALL DEBRIS, CONSTRUCTION MATERIA LS, RUBBISH, EXCESS SOIL, ETC., FROM THE PROJECT SITE. REPAIR PROMPTL Y ANY IDENTIFIED DEFICIENCIES AND LEAVE THE PROJECT SITE IN A CLEAN AND SATISFACTORY CONDITION.

PRETX–DROP ELEVATION GUIDE		
POINT	DESCRIPTION	HEIGHT IN REFERENCE TO PT. A
A	OUTSIDE OF TOP SLAB	0"
B	EDGE OF PAVEMENT	5", MIN.
C	PIPE INVERT (12" RCP)	25.5" FOR BRB#2 & 19.5" FOR BRB#1
D	SUMP INVERT	56"
E	OUTSIDE BOTTOM	62"



1 / D1 PRETREATMENT CATCH BASIN CROSS SECTION VIEW
NOT TO SCALE



3 / D1 PRETX DROP SIDE DETAIL
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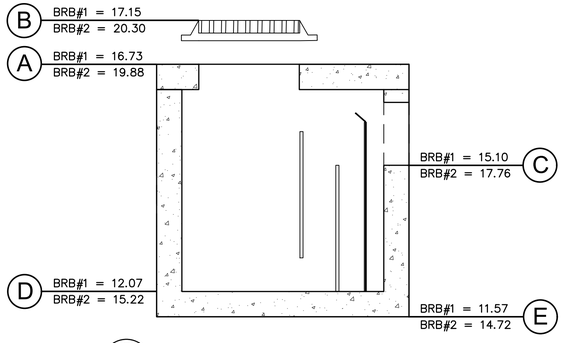
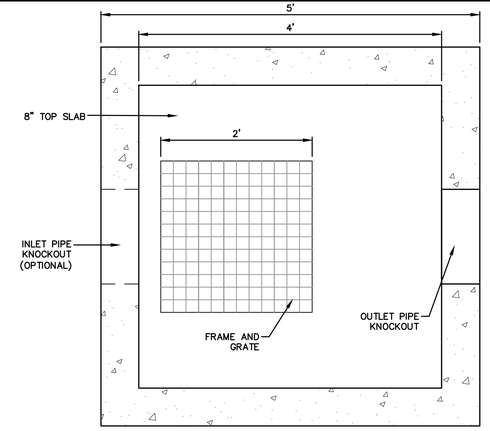
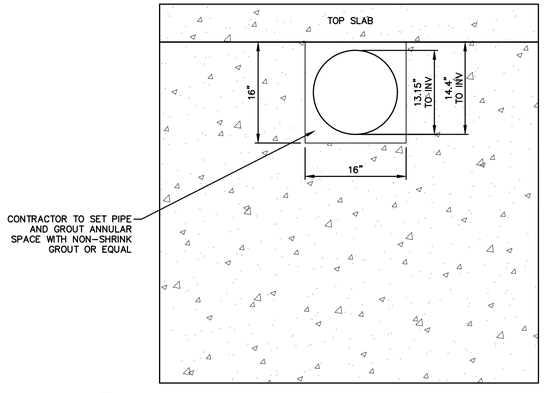


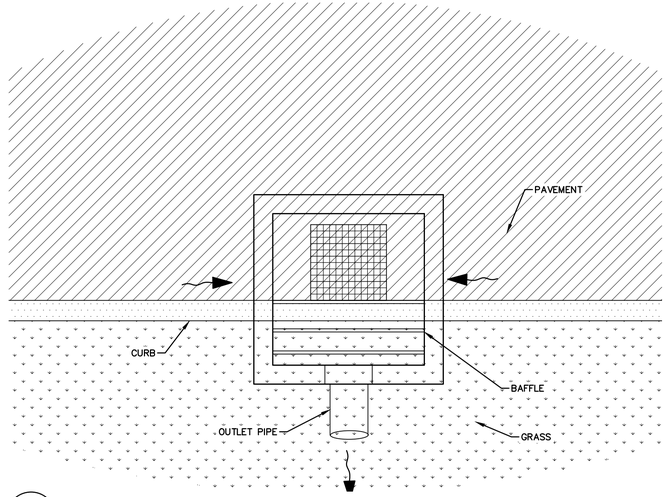
5 / D1 KEY TO ELEVATION GUIDE
NOT TO SCALE



1 / D1 PLAN VIEW DETAIL
NOT TO SCALE



4 / D1 SECTION A–A – PIPE BLOCKOUT DETAILS
NOT TO SCALE



7 / D1 PRETX CURB OUTLET TO BIORETENTION CONFIGURATION
NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
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3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

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CD-513

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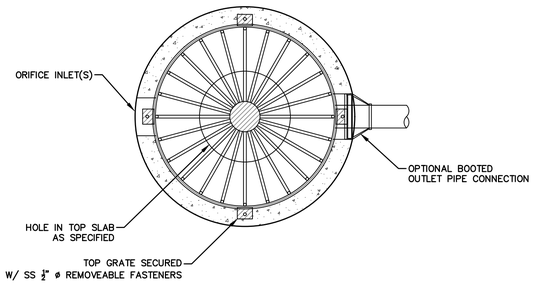
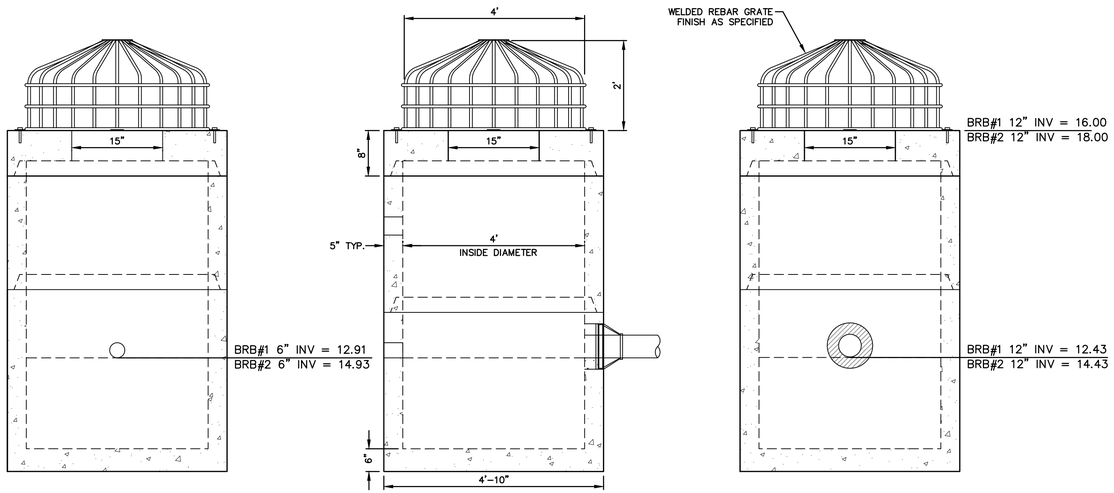


PLAN VIEW

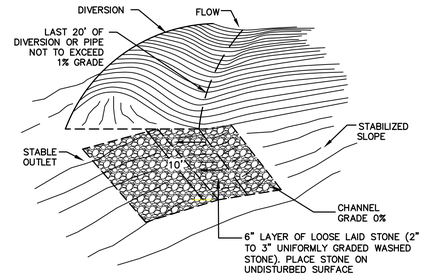


INLET VIEW SIDE VIEW OUTLET VIEW

General Notes
1. Steel Reinforcement Conforms to Latest ASTM Specification:
   ASTM A-615, Grade 60 Black Deformed Bars
   ASTM A-185 Welded Wire Fabric
   0.12 Sq. In./Lineal Ft. And 0.12 Sq. In.(Both Ways) Base Bottom
2. Concrete: fc = 4,000 psi @ 28 Days Minimum, Type III Cement
3. Butyl Rubber Joint Sealant Provided Conforms to ASTM C-990 And Federal Spec SS-S-210A
4. HS-20 Design Loading Conforms to Latest Specifications ASTM C478, AASHTO M199 Precast Reinforced Concrete Manhole Sections
5. One Pour Monolithic Base Section

OVERFLOW OUTLET CONTROL STRUCTURE (4'ø) W/PEAKED TOP GRATE

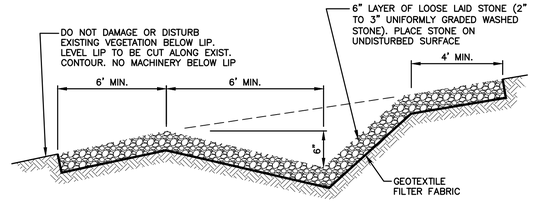
NOT TO SCALE



PLAN VIEW

CONSTRUCTION SPECIFICATIONS
1. SPREADERS SHALL BE INSTALLED WITH LEVEL INSTRUMENT, CONSTRUCT LEVEL LIP TO 0% GRADE TO ENSURE UNIFORM SHEET FLOW. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL (NOT FILL).
2. SELECT GEOTEXTILE FABRIC BASED ON UNDISTURBED SOILS (SAND, SILTS, CLAY, ETC.)
3. PLACE 6" LAYER OF UNIFORMLY GRADED STONE 2" TO 3" IN DIAMETER. TAKE TO FORM SMOOTH UNIFORM SURFACE. DO NOT FILL VOIDS IN STONE.
4. THE INLET DITCH SHALL NOT EXCEED A 1% GRADE FOR AT LEAST 20 FEET BEFORE ENTERING THE SPREADER.
5. STORM RUN-OFF CONVERTED TO SHEET FLOW ACROSS OUTLET APRON SHALL FLOW ONTO STABILIZED AREA. RUN-OFF SHALL NOT BE RECONCENTRATED IMMEDIATELY BELOW THE POINT OF DISCHARGE.
6. CONSTRUCTION OF LEVEL LIP SPREADER SHALL BE UPHILL SIDE ONLY. LEVEL LIP AND AREA BELOW SPREADER SHALL BE AT EXISTING GRADE AND UNDISTURBED BY EARTHWORK OR EQUIPMENT.
7. CONSTRUCT SPREADER WITH LIP AT EXISTING ELEVATION AS SPECIFIED.
8. DOWN GRADIENT RECEIVING AREA MUST BE NATURALLY WELL VEGETATED.

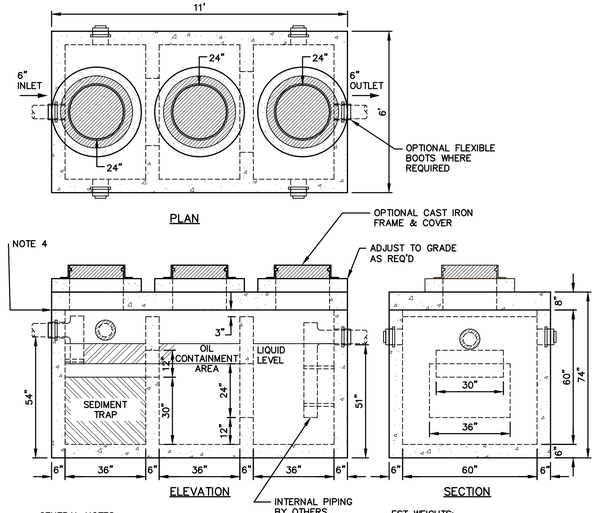
MAINTENANCE NOTES:
1. THE LEVEL SPREADER SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE IF THE LIP HAS BEEN DAMAGED AND TO DETERMINE THAT THE DESIGN CONDITIONS HAVE NOT CHANGED.
2. ANY DETRIMENTAL ACCUMULATION OF SEDIMENTS SHOULD BE REMOVED.
3. IF RILLING HAS TAKEN PLACE ON THE LIP, THEN THE DAMAGE SHOULD BE REPAIRED AND RE-VEGETATED.
4. THE VEGETATION SHOULD BE MOWED OCCASIONALLY TO CONTROL WEEDS AND THE ENCROACHMENT OF WOODY VEGETATION. CLIPPINGS SHOULD BE REMOVED AND DISPOSED OF OUTSIDE THE SPREADER AND AWAY FROM THE OUTLET AREA.



CROSS SECTION

STONE LINED LEVEL SPREADER

NOT TO SCALE



GENERAL NOTES
1. CONCRETE: FC = 5,000 PSI @ 28 DAYS MINIMUM TYPE III CEMENT
2. STEEL REINFORCEMENT CONFORMS TO LATEST ASTM SPECIFICATIONS: ASTM-A615 GRADE 60 BLACK DEFORMED BARS
3. DESIGN LOADING: AASHTO-HS20-44 DESIGN SPECIFIED AS ACI 318-08, AASHTO-1992
4. BUTYL RUBBER JOINT SEALANT PROVIDED
5. FLEXIBLE SLEEVES PROVIDED ALL PIPE CONNECTIONS
6. PIPE SIZES AND COMPARTMENT CONFIGURATIONS PER JOB SPECIFICATIONS

EST WEIGHTS:
TOP SLAB – 6,500 LBS
BASE – 20,500 LBS
TOTAL: 27,000 LBS

1,500 GALLON 3-COMPARTMENT HS-20 OIL & SEDIMENT SEPARATOR (PHOENIX PRECAST PRODUCTS)

NOT TO SCALE

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3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD LUNDBORN No. 10943 – LICENSED PROFESSIONAL ENGINEER

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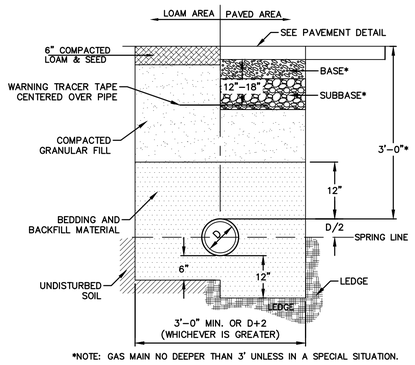
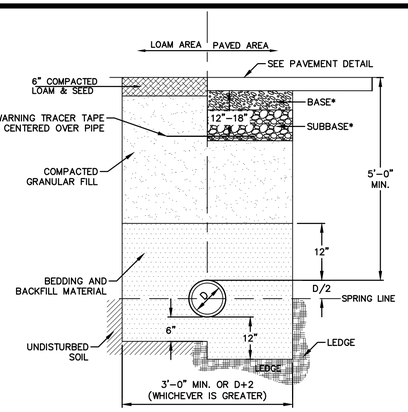
DATE: 09/10/2019

CD-514



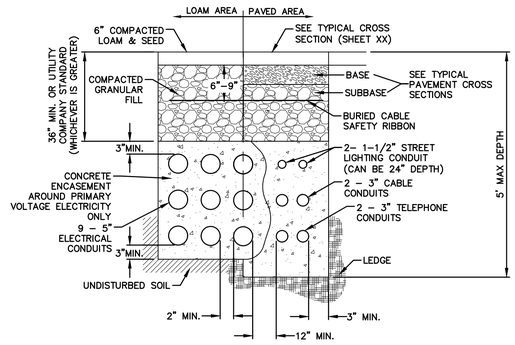
*NOTE: GAS MAIN NO DEEPER THAN 3' UNLESS IN A SPECIAL SITUATION.

GAS TRENCH
NOT TO SCALE



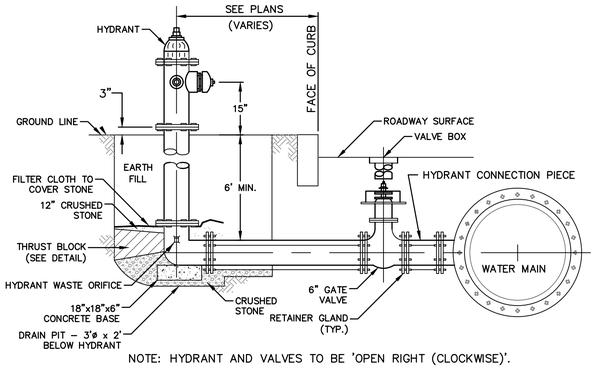
WATER TRENCH SECTION
NOT TO SCALE

NOTES:
1. WATER MAINS SHALL BE CONSTRUCTED USING CITY OF PORTSMOUTH STANDARDS.
2. ANY WATER LINES INSTALLED UNDER GUARD RAIL SHALL BE 3' DEEPER THAN POST DEPTH.



ELECTRICAL AND COMMUNICATION CONDUIT
NOT TO SCALE

1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL OR AS SHOWN ON CONDUIT PLAN.
2. DIMENSIONS SHOWN REPRESENTS OWNER'S MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT MAY NOT BE LESS THAN SHOWN.
3. NO CONDUIT SHALL EXCEED 360 DEGREES IN TOTAL BENDS.
4. A SUITABLE PULLING STRING, CAPABLE OF 200 POUNDS OF PULL MUST BE INSTALLED IN THE CONDUIT BEFORE UTILITY COMPANY 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.
5. UTILITY COMPANY MUST BE GIVEN THE OPPORTUNITY TO INSPECT THE CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD THE UTILITY COMPANY BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. 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.
7. ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 35" TO 48" RADIUS.?????



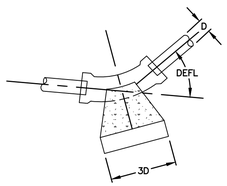
NOTE: HYDRANT AND VALVES TO BE 'OPEN RIGHT (CLOCKWISE)'.

FIRE HYDRANT
NOT TO SCALE

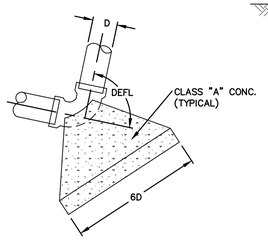
NOTE: HYDRANT INSTALLATION AND OPERATION, MANUFACTURE AND MODEL, AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT AND FIRE DEPARTMENT.

PPE DIA. (INCHES)	MINIMUM THRUST BLOCK VOLUME (CUBIC YARDS)
4	0.2
6	0.25
8	0.3
10	0.35
12	0.4
16	0.7

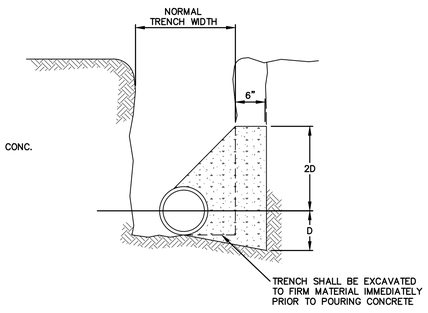
PPE DIA. (INCHES)	MINIMUM THRUST BLOCK VOLUME (CUBIC YARDS)
4	0.25
6	0.3
8	0.5
10	0.7
12	1.0
16	1.6



PLAN ELBOW – DEFL. LESS THAN 50



PLAN ELBOW – DEFL. MORE THAN 50



SECTION

CONCRETE THRUST BLOCKS
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No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
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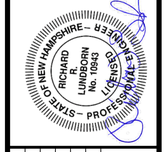
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL



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CATE STREET DEVELOPMENT, LLC

WATER & UTILITY DETAILS

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

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CD-520

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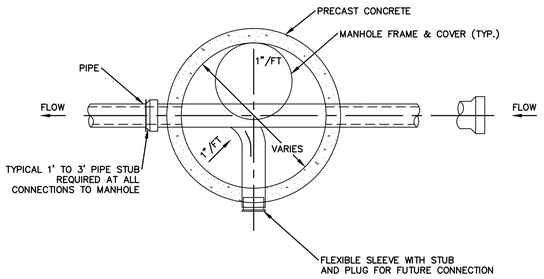
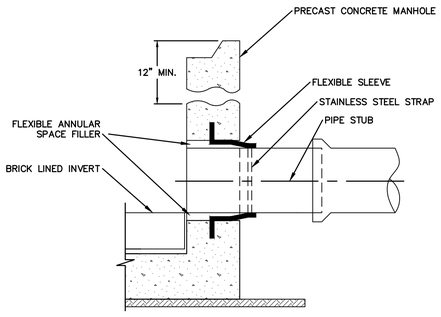
MANHOLE NOTES

1. INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO ENSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICK SHALL BE LAID ON EDGE
4. BITUMINOUS WATERPROOF COATING TO BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
5. MANHOLE FRAME AND COVER SHALL BE JORDAN IRONWORKS HINGE COVER PER CITY OF PORTSMOUTH STANDARD.
6. HORIZONTAL JOINTS SHALL BE SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF ELASTOMERIC PR MASTIC-LIKE SEALANT.
7. BARREL AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE DESIGNED FOR H20 LOADING, AND CONFORMING TO ASTM C478-06.
8. INTERIOR OF SEWER MANHOLES SHALL BE LINED IN ACCORDANCE WITH SECTION 33 01 30.63.

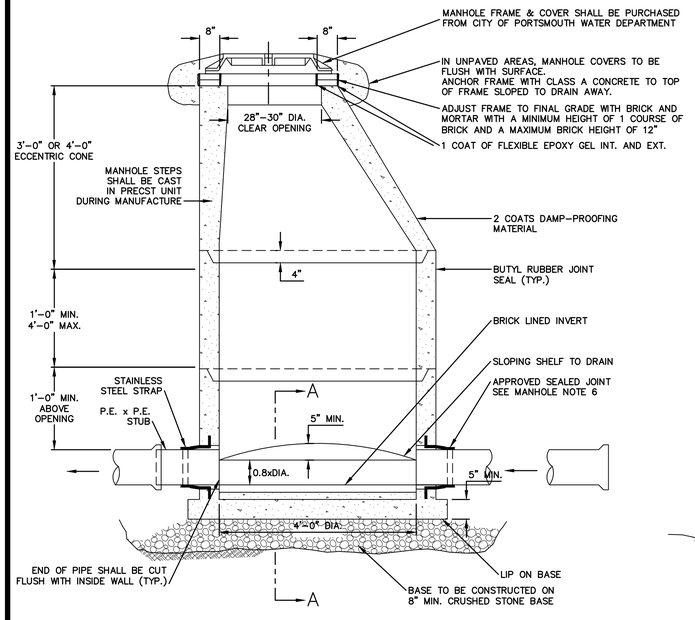
MANHOLE NOTES
SCALE: N.T.S.

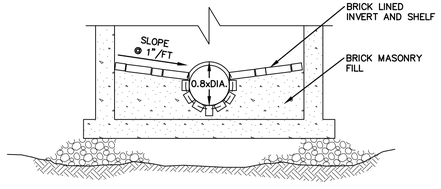


MANHOLE PLAN VIEW
SCALE: N.T.S.



FLEXIBLE SLEEVE
SCALE: N.T.S.





SECTION A-A

4' PRECAST MANHOLE
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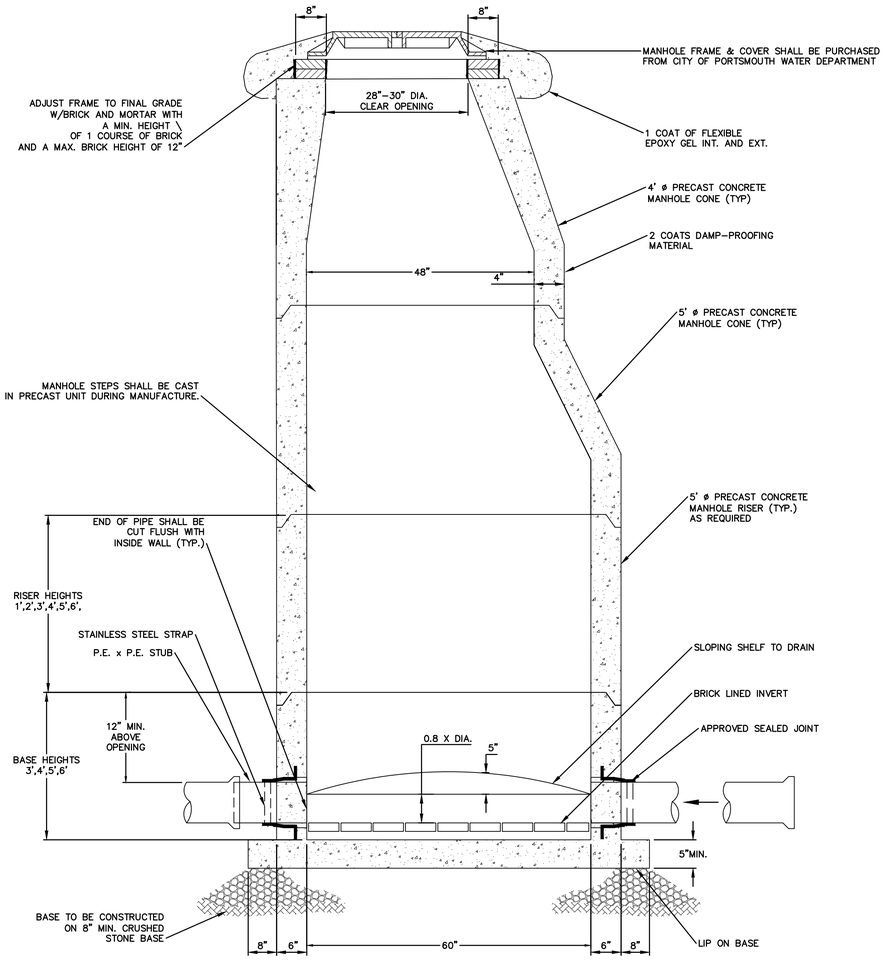

5' PRECAST MANHOLE
SCALE: N.T.S.

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3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

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DATUM: HORZ.:
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CD-530

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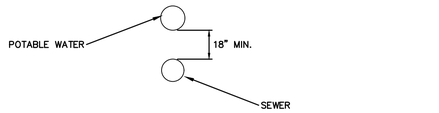
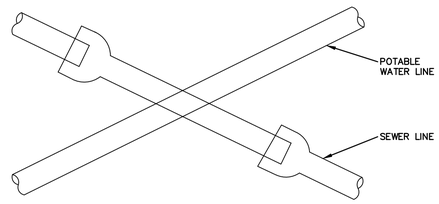


SECTION VIEW

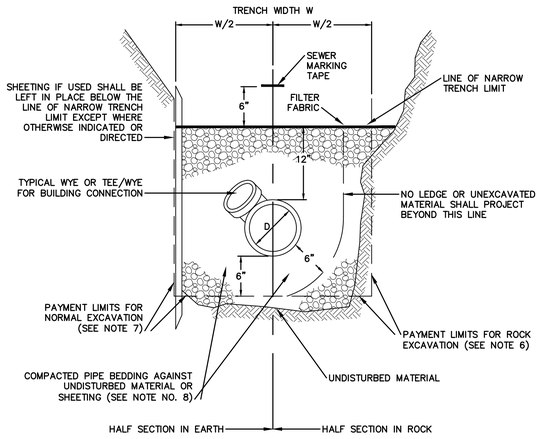


PLAN VIEW

SEWER AND WATER CROSSING NOTES

1. SEWER JOINTS SHALL BE EQUIDISTANT FROM AND LOCATED AS FAR AS POSSIBLE AWAY FROM THE WATER LINE
2. IF THE VERTICAL SEPARATION BETWEEN THE BOTTOM OF THE WATER MAIN AND THE TOP OF THE SEWER IS LESS THAN 18 INCHES (WATER MAIN IS ABOVE SEWER), USE ONE OF THE FOLLOWING PROCEDURES: A) THE WATER MAIN SHALL BE RECONSTRUCTED FOR A DISTANCE OF 10 FEET ON EACH SIDE OF SEWER WITH RUBBER-GASKETED MECHANICAL JOINT PIPE ONE FULL LENGTH WATER MAIN SHOULD BE CENTERED OVER SEWER, B) CONSTRUCT BOTH THE WATER & SEWER PIPE OF RUBBER-GASKETED, CEMENT-LINED DUCTILE IRON PIPE OR EQUIVALENT AND PRESSURE TEST BOTH PIPES, OR C) ENCASE BOTH PIPES IN CONCRETE.

CROSSING OF SEWER & POTABLE WATER LINES
NOT TO SCALE



TYPICAL SEWER TRENCH
NOT TO SCALE

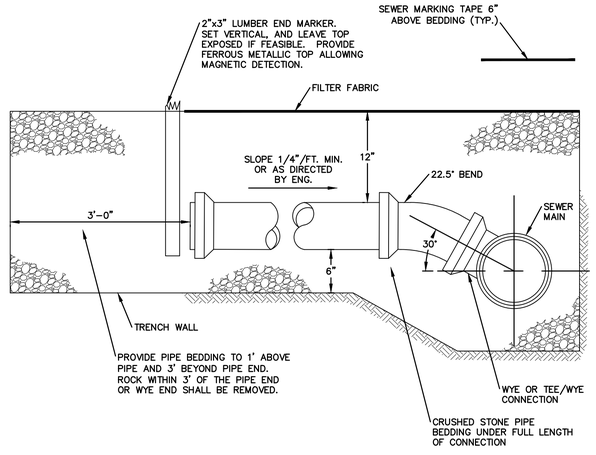
SANITARY SEWER PIPE TRENCH NOTES

1. DEPTH OF SEWER SHALL BE AS SHOWN ON DRAWINGS.
2. SEWER TRENCHES MAY BE EXCAVATED WIDER THAN TRENCH WIDTH W ABOVE THE "LINE OF NARROW TRENCH LIMIT." AT THE CONTRACTORS EXPENSE.
3. BELOW THE "LINE OF NARROW TRENCH LIMIT" THE TRENCH SHALL NOT BE EXCAVATED BEYOND THE TRENCH WIDTH W.
4. IF EXCAVATION AND BACKFILL BELOW NORMAL DEPTH IS REQUIRED, SHEETING MAY BE ORDERED.
5. SHEETING, IF USED, IN ALL CASES SHALL BE LEFT IN PLACE BELOW A LINE 1'-0" ABOVE THE TOP OF THE SEWER PIPE, UNLESS OTHERWISE INDICATED OR DIRECTED BY THE ENGINEER.
6. ALL ROCK WITHIN 3'-0" HORIZONTALLY OF THE ENDS OF BUILDING CONNECTIONS, BRANCHES AND STUBS, AND DOWN TO A HORIZONTAL PLANE 6" BELOW THE BOTTOMS OF SUCH ITEMS SHALL BE REMOVED.
7. TRENCH WIDTHS AND PAYMENT LIMIT SHALL BE AS FOLLOWS:

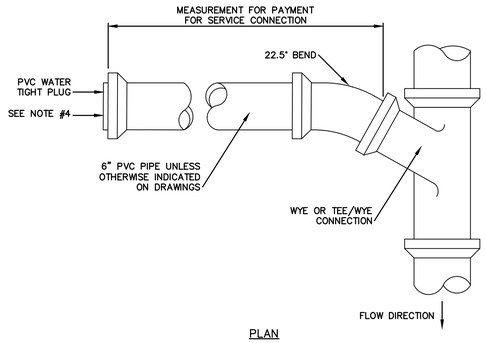
NUMBER OF PIPE IN TRENCH	DIAMETER PIPE "D"	TRENCH WIDTH "W"	PAYMENT LIMIT
ONE	12" AND SMALLER	4'-0"	4'-0"
TWO	12" AND SMALLER	7'-0"	7'-0"

8. WHERE CONCRETE ENCASEMENT IS CALLED FOR BY THE PLANS, OR WHEN DIRECTED BY THE ENGINEER, REPLACE BEDDING AND BACKFILL BELOW THE "LINE OF NARROW TRENCH LIMIT" WITH CLASS "A" CONCRETE.
9. SEWER MARKING TAPE SHALL BE INSTALLED A MINIMUM OF 18" ABOVE THE SANITARY SEWER, FORCE MAIN AND SERVICE CONNECTION PIPE.
10. SANITARY SEWER PIPE AND SERVICE CONNECTION PIPE SHALL HAVE FILTER FABRIC INSTALLED ON TOP OF THE PIPE BEDDING AS SHOWN ON THE DETAILS.

SANITARY SEWER PIPE TRENCH NOTES
SCALE: N.T.S.



ELEVATION

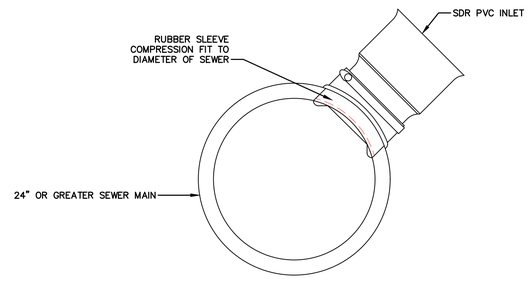


PLAN

SERVICE CONNECTION NOTES

1. NO LEDGE OR UNEXCAVATED MATERIAL SHALL PROJECT WITHIN 6" OF THE PIPE IN ANY DIRECTION
2. EXACT LOCATION AND ELEVATION OF SERVICE CONNECTIONS TO BE DETERMINED AND SET IN THE FIELD DURING CONSTRUCTION
3. EXACT LOCATION OF WYES/TEES, WHERE DIRECTED TO BE INSTALLED, SHALL BE SET IN THE FIELD DURING CONSTRUCTION
4. PROVIDE DI TO PVC TRANSITION COUPLING AT END OF DI SERVICE CONNECTION

SERVICE CONNECTIONS
NOT TO SCALE



INSERTA TEE – SERVICE CONNECTION 24" MAIN & LARGER
N.T.S.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 – LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: NTS VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

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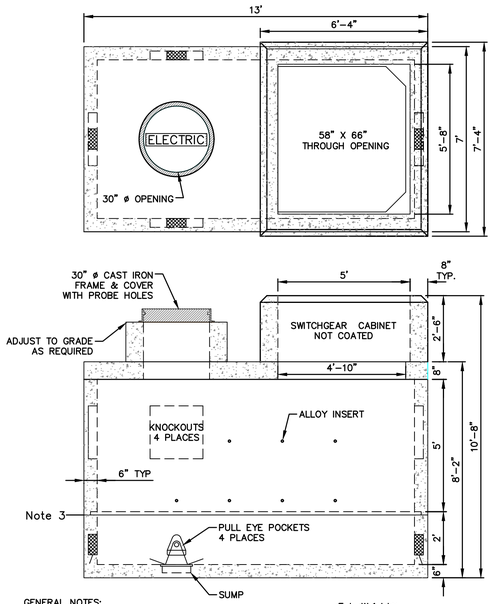
CATE STREET DEVELOPMENT, LLC
SEWER DETAILS
CATE STREET
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

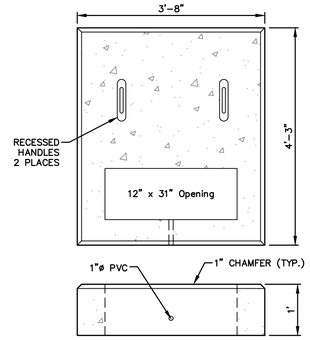
CD-531



GENERAL NOTES:
1. STEEL REINFORCEMENT CONFORMS TO LATEST ASTM SPECIFICATIONS: ASTM-A615 GRADE 60 REBAR
2. CONCRETE: FC = 5,000 PSI @ 28 DAYS MINIMUM
3. BUTYL RUBBER JOINT SEALANT PROVIDED
4. DESIGN LOADING: AASHTO-HS20-44, ASTM C-890-06
5. DESIGN SPECIFIED AS: ASTM C-1227-08, ASTM C-913-08
6. EXTERIOR COATING PROVIDED EXCEPT SWITCHGEAR CABINET
7. MEETS OR EXCEEDS PSNH DWG # R-10001-2 REV 1

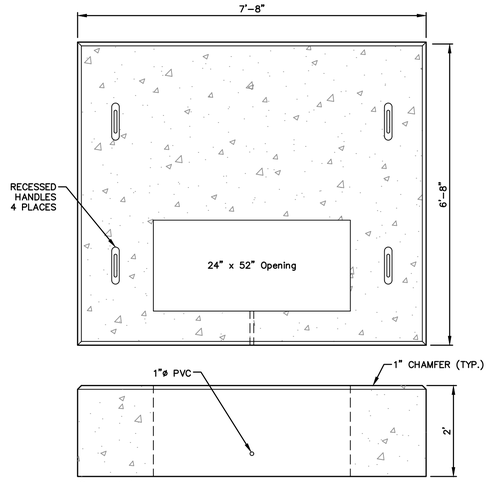
Est. Weights:	
Top Slab:	5,600 Lbs
Riser:	14,080 Lbs
Switchgear Cabinet:	6,750 Lbs
Base:	12,450 Lbs
Total:	32,130 Lbs

EVERSOURCE SWITCHGEAR CABINET ASSEMBLY
NOT TO SCALE



General Notes
1.) Reinforcement Steel Conforms To ASTM A615 Grade 60 #6 Rebar
2.) Concrete: fc = 4,000 psi @ 28 Days Minimum
3.) Meets or Exceeds PSNH Specifications
4.) Est. Weight: 1,950 Lbs

SINGLE-PHASE TRANSFORMER PAD
NOT TO SCALE 25-75 KVA

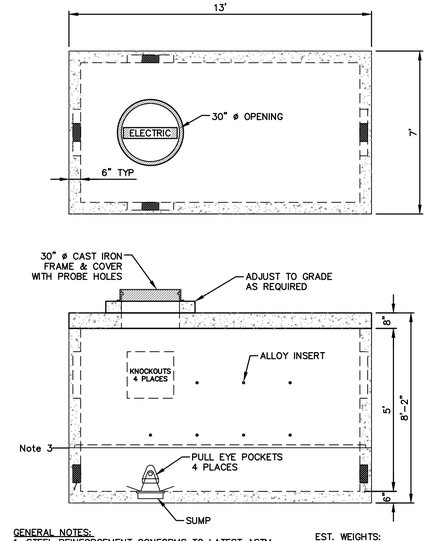


General Notes
1.) Reinforcement Steel Conforms To ASTM A615 Grade 60 #6 Rebar
2.) Concrete: fc = 4,500 psi @ 28 Days Minimum
3.) Meets or Exceeds PSNH Specifications
4.) Est. Weight: 12,600 Lbs

3 PHASE TRANSFORMER PAD
NOT TO SCALE 75-500 KVA

NOTES:
1. ALL PRECAST CONCRETE STRUCTURES TO BE PHOENIX PRECAST PRODUCTS OR EQUAL.

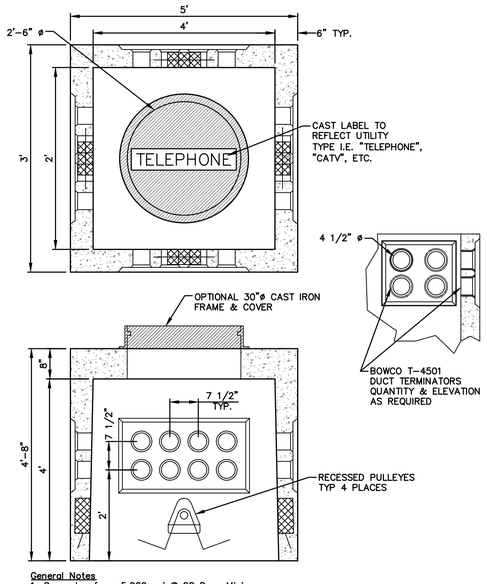
PHOENIX PRECAST PRODUCTS
77 REGIONAL DRIVE
CONCORD, NH 03301
1.800.639.2199
info@phoenixprecast.com



GENERAL NOTES:
1. STEEL REINFORCEMENT CONFORMS TO LATEST ASTM SPECIFICATIONS: ASTM-A615 GRADE 60 REBAR
2. CONCRETE: FC = 5,000 PSI @ 28 DAYS MINIMUM
3. BUTYL RUBBER JOINT SEALANT PROVIDED
4. DESIGN LOADING: AASHTO-HS20-44, ASTM C-890-06
5. DESIGN SPECIFIED AS: ASTM C-1227-08, ASTM C-913-08
6. EXTERIOR COATING PROVIDED
7. MEETS OR EXCEEDS PSNH DWG # R-10001-1

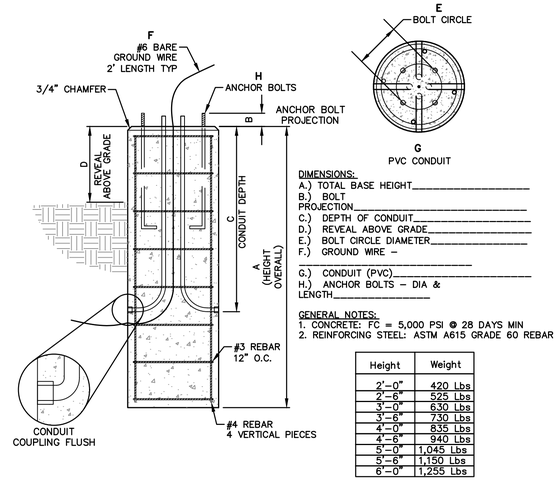
EST. WEIGHTS:	
Top Slab:	8,500 Lbs
Riser:	13,300 Lbs
Base:	12,100 Lbs
Total:	33,900 Lbs

EVERSOURCE MANHOLE ASSEMBLY
NOT TO SCALE



General Notes
1. Concrete: fc = 5,000 psi @ 28 Days Minimum
2. Reinforcing Steel: ASTM-A615 Grade #60
3. Design Loading: AASHTO-HS20-44

4'x4'x4' HANDHOLE
NOT TO SCALE



DIMENSIONS:
A.) TOTAL BASE HEIGHT_____
B.) BOLT PROJECTION_____
C.) DEPTH OF CONDUIT_____
D.) REVEAL ABOVE GRADE_____
E.) BOLT CIRCLE DIAMETER_____
F.) GROUND WIRE - _____
G.) CONDUIT (PVC)_____
H.) ANCHOR BOLTS - DIA & LENGTH_____

GENERAL NOTES:
1. CONCRETE: FC = 5,000 PSI @ 28 DAYS MIN
2. REINFORCING STEEL: ASTM A615 GRADE 60 REBAR

Height	Weight
2'-0"	420 Lbs
2'-6"	525 Lbs
3'-0"	630 Lbs
3'-6"	730 Lbs
4'-0"	835 Lbs
4'-6"	940 Lbs
5'-0"	1,045 Lbs
5'-6"	1,150 Lbs
6'-0"	1,255 Lbs

16" ø LIGHT POLE BASE
NOT TO SCALE

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3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE - RICHARD R. LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: NTS VERT.:
DATUM: HORZ.: VERT.:
0 GRAPHIC SCALE

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CATE STREET
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CD-540

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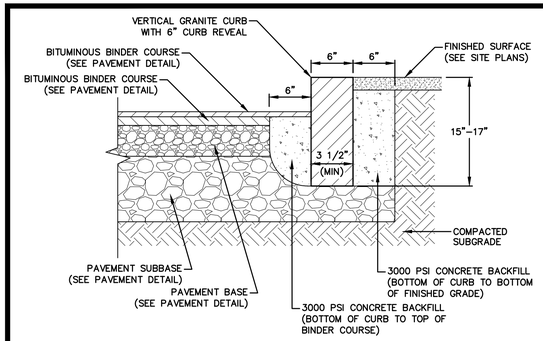
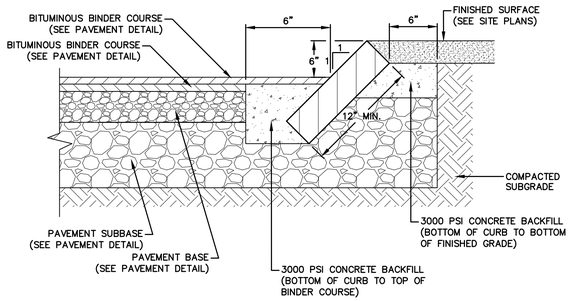


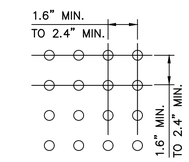
VERTICAL GRANITE CURB INSTALLED

SCALE: NOT TO SCALE



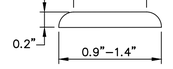
SLOPED GRANITE CURB INSTALLED

SCALE: NOT TO SCALE

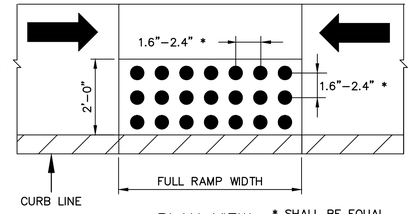


DOME SPACING

NOT TO SCALE

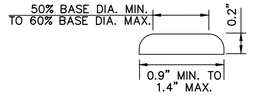


ELEVATION VIEW



PLAN VIEW

* SHALL BE EQUAL IN BOTH DIRECTIONS



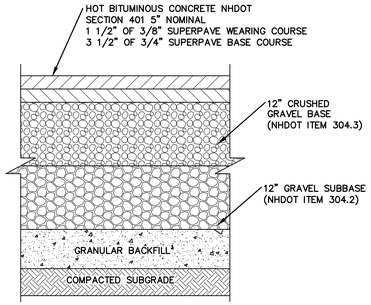
DOME SECTION

NOT TO SCALE

NOTE:
TRUNCATED DOMES SHALL BE CAST IRON. CONFIGURATION SHALL BE APPROVED BY DEPARTMENT OF PUBLIC WORKS.

DOME AND DETECTABLE WARNING DETAILS

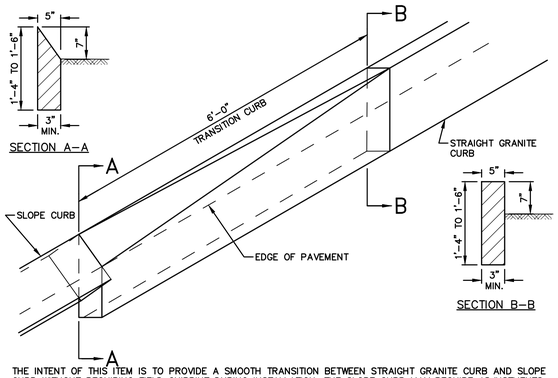
NOT TO SCALE — TO BE INSTALLED AT ADA WALKWAY TIPDOWNS.



TYPICAL ROAD PAVEMENT SECTION

NOT TO SCALE

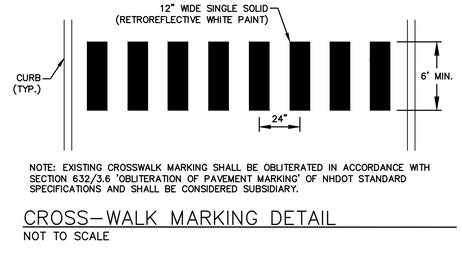
PAVEMENT MIX DESIGNS IN THE R.O.W. TO BE APPROVED BY THE DEPARTMENT OF PUBLIC WORKS.



THE INTENT OF THIS ITEM IS TO PROVIDE A SMOOTH TRANSITION BETWEEN STRAIGHT GRANITE CURB AND SLOPE CURB WITHOUT REQUIRING FIELD CHIPPINT DURING INSTALLATION. THE SLOPE CURB MAY REQUIRE ADJUSTMENTS TO MEET THE TRANSITION PIECE HEIGHT AND BEVEL THAT ARE NOT STANDARD NHDOT PRACTICE. TRANSITION SLOPE TO STANDARD REVEAL AS QUICKLY AS POSSIBLE TO PROVIDE FOR THIS SMOOTH TRANSITION.

STRAIGHT TO SLOPE CURB TRANSITION

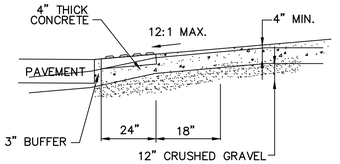
NOT TO SCALE



NOTE: EXISTING CROSSWALK MARKING SHALL BE OBLITERATED IN ACCORDANCE WITH SECTION 632/3.6 'OBLITERATION OF PAVEMENT MARKING' OF NHDOT STANDARD SPECIFICATIONS AND SHALL BE CONSIDERED SUBSIDIARY.

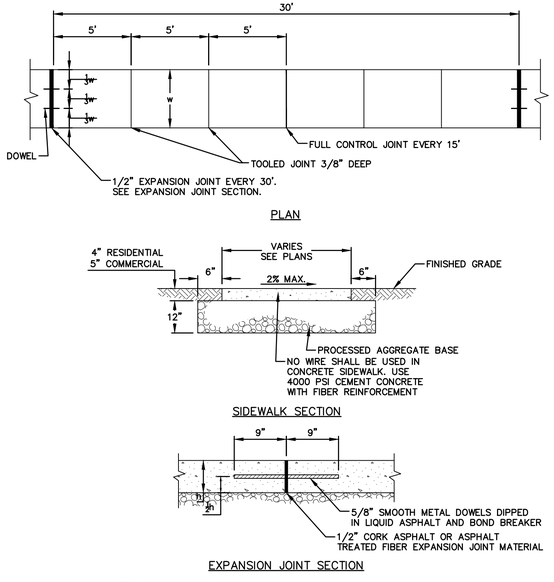
CROSS-WALK MARKING DETAIL

NOT TO SCALE



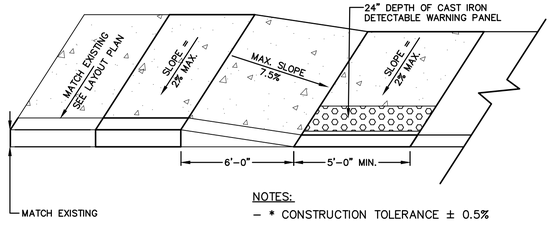
SECTION A-A

NOT TO SCALE



CONCRETE SIDEWALK

SCALE: NOT TO SCALE

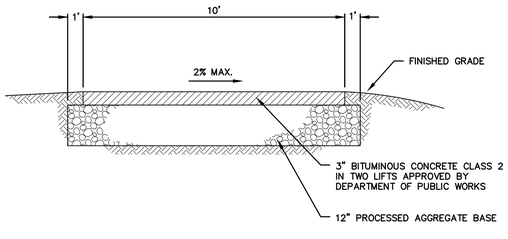


NOTES:

- * CONSTRUCTION TOLERANCE ± 0.5%
- REFER TO CONCRETE SIDEWALK DETAIL FOR REINFORCEMENT & JOINT DETAILS.

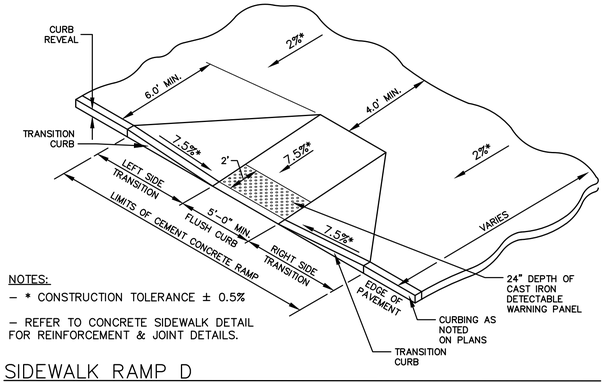
SIDEWALK RAMP A

NOT TO SCALE



BITUMINOUS CONCRETE MULTI-USE TRAIL

NOT TO SCALE

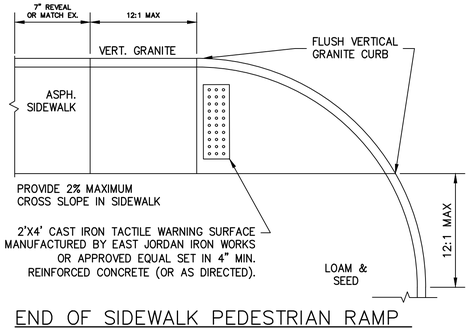


NOTES:

- * CONSTRUCTION TOLERANCE ± 0.5%
- REFER TO CONCRETE SIDEWALK DETAIL FOR REINFORCEMENT & JOINT DETAILS.

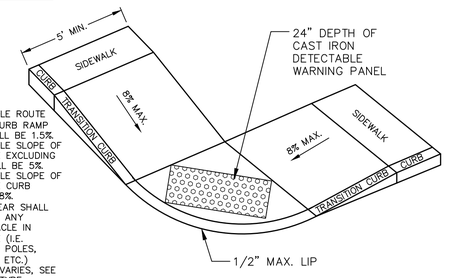
SIDEWALK RAMP D

NOT TO SCALE



END OF SIDEWALK PEDESTRIAN RAMP

NOT TO SCALE



NOTES :

1. MAXIMUM ALLOWABLE ROUTE (SIDEWALK) AND CURB RAMP CROSS SLOPE SHALL BE 1.5%.
2. MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE CURB RAMPS SHALL BE 8%.
4. MINIMUM OF 4' CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E. HYDRANTS, UTILITY POLES, TREE WELL, SIGNS, ETC.)
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. BASE OF RAMP SHALL BE GRADED TO PREVENT POUNDING.
7. SEE CONCRETE SIDEWALK DETAIL FOR RAMP CONSTRUCTION.

NOTE:

INSTALL DETECTABLE WARNING PANEL ON ALL ACCESSIBLE CURB RAMPS.

ACCESSIBLE CURB RAMP-TYPE C

NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
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4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: NTS VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

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www.fando.com

CATE STREET DEVELOPMENT, LLC

SITE DETAILS

CATE STREET

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CD-550

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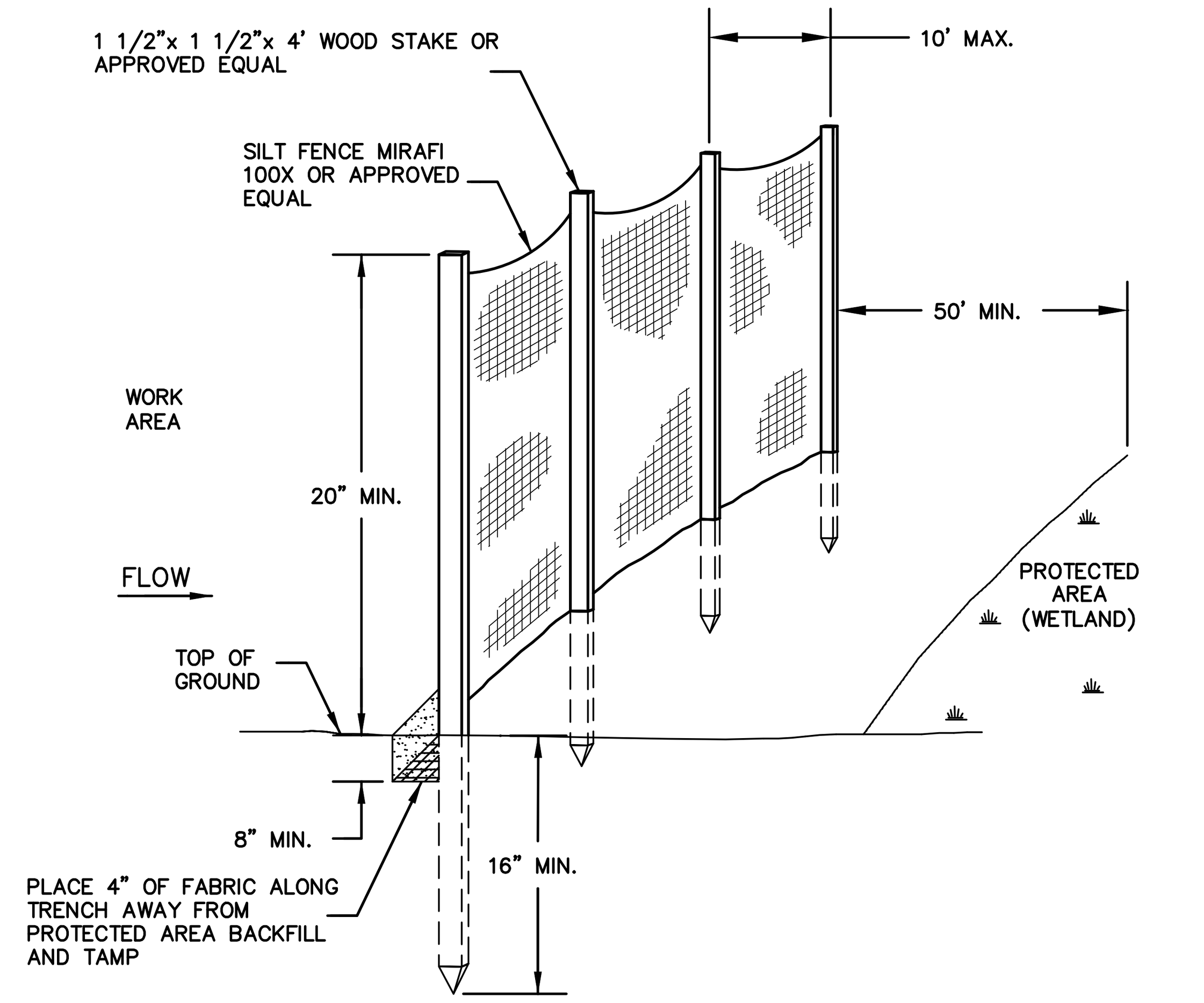
Plotter: DWG TO PDF.PC3 CTB File: FO.STB
MS VIEW: LAYER STATE:



MAINTENANCE REQUIREMENTS:

1. FENCES SHOULD BE INSPECTED AND MAINTAINED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALLS;

2. SEDIMENT DEPOSITION SHOULD BE REMOVED, AT A MINIMUM, WHEN DEPOSITION ACCUMULATES TO ONE-HALF THE HEIGHT OF THE FENCE, AND MOVED TO AN APPROPRIATE LOCATION SO THE SEDIMENT IS NOT READILY TRANSPORTED BACK TOWARD THE SILT FENCE.

3. SILT FENCES SHOULD BE REPAIRED IMMEDIATELY IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THEM. IF THERE ARE SIGNS OF UNDERCUTTING AT THE CENTER OR THE EDGES OF THE BARRIER, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THEM, SEDIMENT BARRIERS SHOULD BE REPLACED WITH A TEMPORARY CHECK DAM.

4. SHOULD THE FABRIC ON A SILT FENCE DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY; THE FABRIC SHOULD BE REPLACED PROMPTLY.

5. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHOULD BE DRESSED TO CONFORM TO THE EXISTING GRADE PREPARED AND SEEDED.

6. IF THERE IS EVIDENCE OF END FLOW ON PROPERLY INSTALLED BARRIERS, EXTEND BARRIERS UPHILL OR CONSIDER REPLACING THEM WITH OTHER MEASURES, SUCH AS TEMPORARY DIVERSIONS AND SEDIMENT TRAPS.

7. SILT FENCES HAVE A USEFUL LIFE OF ONE SEASON. ON LONGER CONSTRUCTION PROJECTS, SILT FENCE SHOULD BE REPAIRED PERIODICALLY AS REQUIRED TO MAINTAIN EFFECTIVENESS.

CONSTRUCTION SPECIFICATIONS:

1. FENCES SHOULD BE USED IN AREAS WHERE EROSION WILL OCCUR ONLY IN THE FORM OF SHEET EROSION AND THERE IS NO CONCENTRATION OF WATER IN A CHANNEL OR DRAINAGE WAY ABOVE THE FENCE. SEDIMENT BARRIERS SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM.

2. THE MAXIMUM CONTRIBUTING DRAINAGE AREA ABOVE THE FENCE SHOULD BE LESS THAN 1A ACRE PER 100 LINEAR FEET OF FENCE;

3. THE MAXIMUM LENGTH OF SLOPE ABOVE THE FENCE SHOULD BE 100 FEET;

4. THE MAXIMUM SLOPE ABOVE THE FENCE SHOULD BE 2:1;

5. FENCES SHOULD BE INSTALLED FOLLOWING THE CONTOUR OF THE LAND AS CLOSELY AS POSSIBLE, AND
   A. THE ENDS OF THE FENCE SHOULD BE FLARED UPSLOPE;
   B. THE FABRIC SHOULD BE EMBEDDED A MINIMUM OF 8 INCHES IN DEPTH AND 4 INCHES IN WIDTH IN A TRENCH EXCAVATED INTO THE GROUND, OR IF SITE CONDITIONS INCLUDE FROZEN GROUND, LEDGE, OR THE PRESENCE OF HEAVY ROOTS, THE BASE OF THE FABRIC SHOULD BE EMBEDDED WITH A MINIMUM THICKNESS OF 8 INCHES OF 3/4-INCH STONE;
   C. THE SOIL SHOULD BE COMPACTED OVER THE EMBEDDED FABRIC;
   D. SUPPORT POSTS SHOULD BE SIZED AND ANCHORED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS WITH MAXIMUM POST SPACING OF 6 FEET;
   E. ADJOINING SECTIONS OF THE FENCE SHOULD BE OVERLAPPED BY A MINIMUM OF 6 INCHES (24 INCHES IS PREFERRED), FOLDED AND STAPLED TO A SUPPORT POST. IF METAL POSTS ARE USED, FABRIC SHOULD BE WIRE-TIED DIRECTLY TO THE POSTS WITH THREE DIAGONAL TIES.

6. SILT FENCING SHOULD NOT BE STAPLED OR NAILED TO TREES.

7. THE FILTER FABRIC SHOULD BE A PERVIOUS SHEET OF PROPYLENE, NYLON, POLYESTER OR ETHYLENE YARN AND SHOULD BE CERTIFIED BY THE MANUFACTURER OR SUPPLIER.

8. THE FILTER FABRIC SHOULD CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 6 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 DEGREES FAHRENHEIT TO 120 DEGREES FAHRENHEIT.

9. POSTS FOR SILT FENCES SHOULD BE EITHER 4-INCH DIAMETER WOOD OR 1.33 POUNDS PER LINEAR FOOT STEEL WITH A MINIMUM LENGTH OF 5 FEET. STEEL POSTS SHOULD HAVE, PROJECTIONS FOR FASTENING WIRE TO THEM. POSTS SHOULD BE PLACED ON THE DOWN SLOPE SIDE OF THE FABRIC.

10. THE HEIGHT OF A SILT FENCE SHOULD NOT EXCEED 36 INCHES AS HIGHER FENCES MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE.

11. THE FILTER FABRIC SHOULD BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE NECESSARY; FILTER CLOTH SHOULD BE SPLICED TOGETHER ONLY AT SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED.

12. A MANUFACTURED SILT FENCE SYSTEM WITH INTEGRAL POSTS MAY BE USED.

13. POST SPACING SHOULD NOT EXCEED 6 FEET.

14. A TRENCH SHOULD BE EXCAVATED APPROXIMATELY 4 INCHES WIDE AND 4 INCHES DEEP ALONG THE LINE OF POSTS AND UP GRADIENT FROM THE BARRIER.

15. THE STANDARD STRENGTH OF FILTER FABRIC SHOULD BE STAPLED OR WIRED TO THE POST, AND 8 INCHES OF THE FABRIC SHOULD BE EXTENDED INTO THE TRENCH. THE FABRIC SHOULD NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.

16. THE TRENCH SHOULD BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.

17. SILT FENCE MAY BE INSTALLED BY "SLICING" USING MECHANICAL EQUIPMENT SPECIFICALLY DESIGNED FOR THIS PROCEDURE. THE SLICING METHOD USES AN IMPLEMENT TOWED BEHIND A TRACTOR TO "PLOW" OR SLICE THE SILT FENCE MATERIAL INTO THE SOIL. THE SLICING METHOD MINIMALLY DISRUPTS THE SOIL UPWARD AND SLIGHTLY DISPLACES THE SOIL, MAINTAINING THE SOIL'S PROFILE AND CREATING AN OPTIMAL CONDITION FOR SUBSEQUENT MECHANICAL COMPACTION.

18. SILT FENCES SHOULD BE INSTALLED WITH "SMILES" OR "J-HOOKS" TO REDUCE THE DRAINAGE AREA THAT ANY SEGMENT WILL IMPOUND.

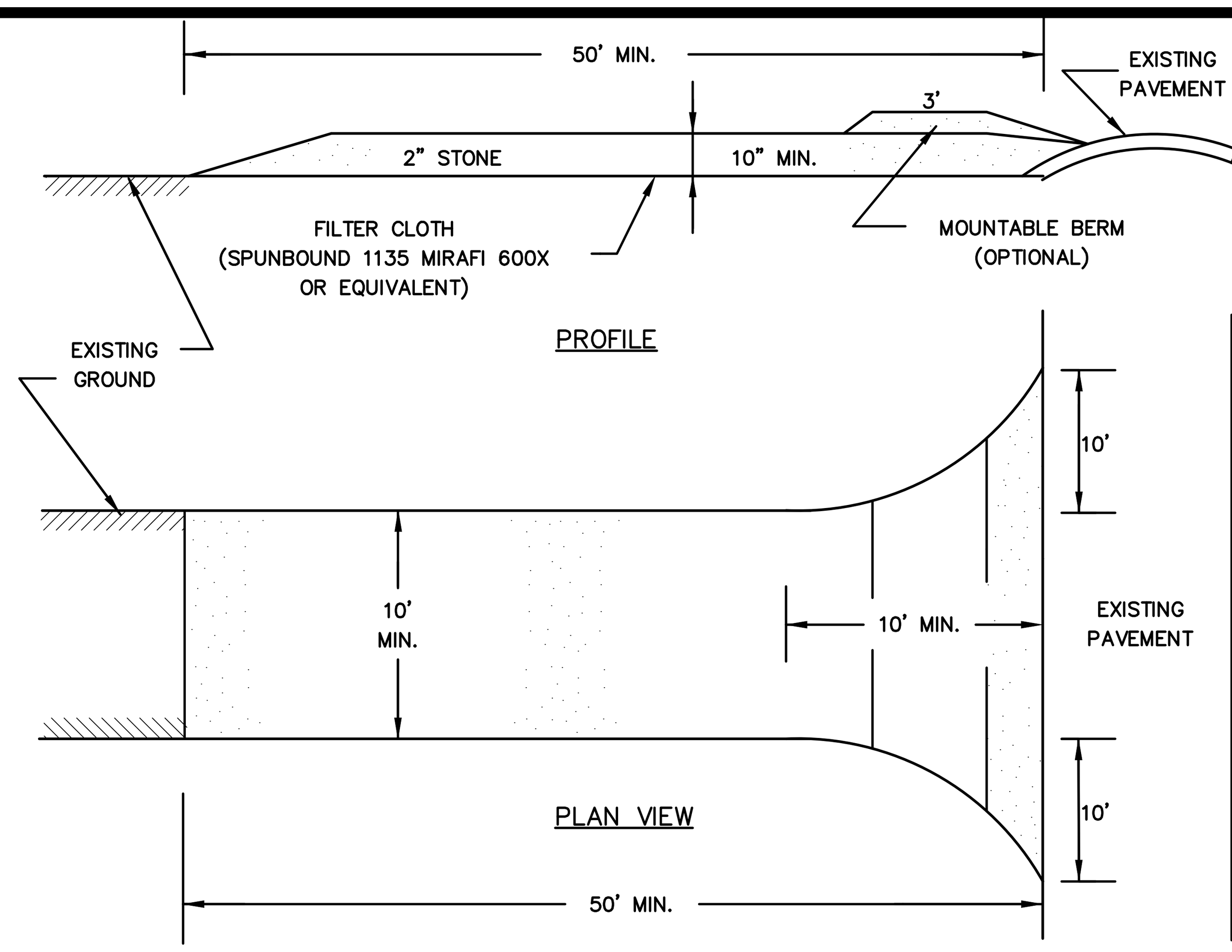
19. THE ENDS OF THE FENCE SHOULD BE TURNED UPHILL.

20. SILT FENCES PLACED AT THE TOE OF A SLOPE SHOULD BE SET AT LEAST 6 FEET FROM THE TOE M ALLOW SPACE FOR SHALLOW PONDING AND TO ALLOW FOR MAINTENANCE ACCESS WITHOUT DISTURBING THE SLOPE.

21. SILT FENCES SHOULD BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

SILT FENCE BARRIER

NOT TO SCALE



MAINTENANCE REQUIREMENTS:

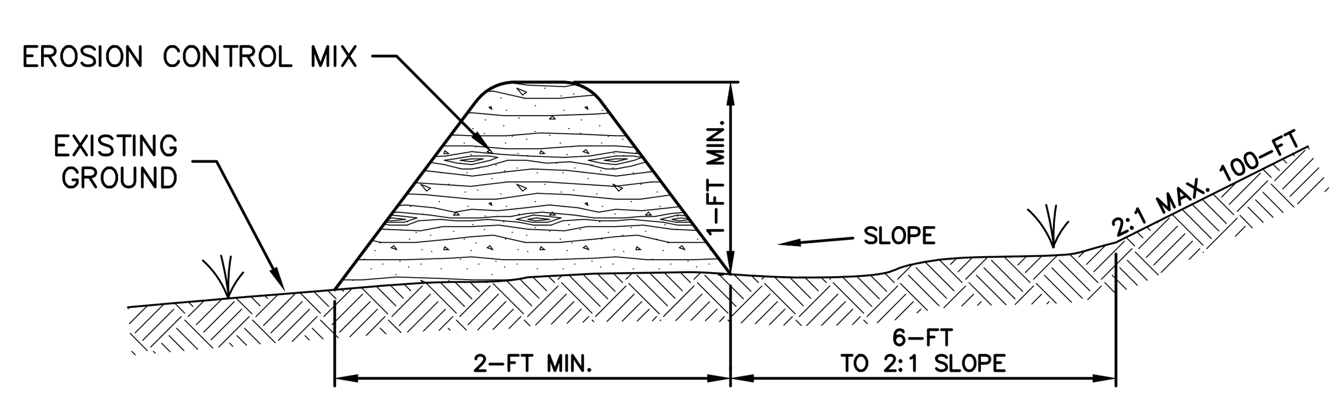
1. WHEN THE CONTROL PAD BECOMES INEFFECTIVE, THE STONE SHOULD BE REMOVED ALONG WITH THE COLLECTED SOIL MATERIAL, REGRADED ON SITE, AND STABILIZED. THE ENTRANCE SHOULD TEN BE RECONSTRUCTED.
2. THE CONTRACTOR SHOULD SWEEP THE PAVEMENT AT EXITS WHENEVER SOIL MATERIALS ARE TRACKED ONTO THE ADJACENT PAVEMENT OR TRAVELED WAY.
3. WHEN WHEEL WASHING IS REQUIRED, IT SHOULD BE CONDUCTED ON AN AREA STABILIZED WITH AGGREGATE, WHICH DRAINS INTO AN APPROVED SEDIMENT-TRAPPING DEVICE. ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS.

CONSTRUCTION SPECIFICATIONS:

1. THE MINIMUM STONE USED SHOULD BE 3-INCH CRUSHED STONE.
2. THE MINIMUM LENGTH OF THE PAD SHOULD BE 75 FEET, EXCEPT THAT THE MINIMUM LENGTH MAY BE REDUCED TO 50 FEET IF A 3-INCH TO 6-INCH BERM IS INSTALLED AT THE ENTRANCE OF THE PROJECT SITE.
3. THE PAD SHOULD BE THE FULL WIDTH OF CONSTRUCTION ACCESS ROAD OR 10 FEET, WHICHEVER IS GREATER.
4. THE PAD SHOULD SLOPE AWAY FROM THE EXISTING ROADWAY.
5. THE PAD SHOULD BE AT LEAST 6 INCHES THICK.
6. THE GEOTEXTILE FILTER FABRIC SHOULD BE PLACED BETWEEN THE STONE PAD AND THE EARTH SURFACE BELOW THE PAD.
7. THE PAD SHOULD BE MAINTAINED OR REPLACED WHEN MUD AND SOIL PARTICLES CLOG THE VOIDS IN THE STONE SUCH THAT MUD AND SOIL PARTICLES ARE TRACKED OFF-SITE.
8. NATURAL DRAINAGE THAT CROSSES THE LOCATION OF THE STONE PAD SHOULD BE INTERCEPTED AND PIPED BENEATH THE PAD, AS NECESSARY, WITH SUITABLE OUTLET PROTECTION.

USDA-SCS STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE



EROSION CONTROL MIX BERM CROSS SECTION

NOT TO SCALE

MAINTENANCE REQUIREMENTS:

1. EROSION CONTROL MIX BERMS SHOULD BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
2. EROSION CONTROL MIX BERMS SHOULD BE REPAIRED IMMEDIATELY IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THEM.
3. IF THERE ARE SIGNS OF BREACHING OF THE BARRIER, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THEM, THE EROSION CONTROL MIX BERMS SHOULD BE REPLACED WITH OTHER MEASURES TO INTERCEPT AND TRAP SEDIMENT (SUCH AS A DIVERSION BERM DIRECTING RUNOFF TO A SEDIMENT TRAP OR BASIN).
4. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT.
5. SEDIMENT DEPOSITS MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE THIRD (1/3) OF THE HEIGHT OF THE BARRIER.
6. EROSION CONTROL MIX BERMS SHOULD BE RESHAPED OR REAPPLIED AS NEEDED.
7. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE BARRIER IS NO LONGER REQUIRED SHOULD BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

CONSTRUCTION SPECIFICATIONS:

1. EROSION CONTROL MIX CAN BE MANUFACTURED ON OR OFF OF THE PROJECT SITE.
2. EROSION CONTROL MIX MUST CONSIST PRIMARILY OF ORGANIC MATERIAL, SEPARATED AT THE POINT OF GENERATION, AND MAY INCLUDE SHREDDED BARK, STUMP GRINDINGS, COMPOSTED BARK, OR ACCEPTABLE MANUFACTURED PRODUCTS.
3. WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS OR REPROCESSED WOOD PRODUCTS WILL NOT BE ACCEPTABLE AS THE ORGANIC COMPONENT OF THE MIX.
4. COMPOSITION OF THE EROSION CONTROL MIX SHOULD BE AS FOLLOWS:
   A. EROSION CONTROL MIX SHALL BE A WELL GRADED MIXTURE OF PARTICLE SIZES FREE OF REFUSE, PHYSICAL CONTAMINANTS, MATERIAL TOXIC TO PLANT GROWTH AND MAY NOT CONTAIN ROCKS LESS THAN 4-INCHES IN DIAMETER;
   B. ORGANIC MATTER = 25-65% DRY WEIGHT BASIS
   C. PARTICLES PASSING BY WEIGHT:

SCREEN:	PASSING BY WEIGHT:
3-INCH	100%
1-INCH	90-100%
3/4-INCH	70-100%
1/4-INCH	30-75%

   D. THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
   E. THE MIX SHOULD CONTAIN NO SILTS, CLAYS OR FINE SANDS.
   F. SOLUBLE SALTS CONTENT < 4.0 mmhos/cm
   G. pH OF THE MIX SHOULD BE BETWEEN 5.0 AND 8.0
5. THE BARRIER MUST BE PLACED ALONG A RELATIVELY LEVEL CONTOUR.
6. IT MAY BE NECESSARY TO CUT TALL GRASSES AND WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES IN THE BARRIER THAT WOULD ENABLE FINES TO WASH UNDER THE BARRIER THROUGH THE GRASS BLADES OR PLANT STEMS.
7. THE BARRIER MUST BE A MINIMUM OF 12-INCHES TALL AS MEASURED ON THE UPHILL SIDE OF THE BARRIER.
8. THE BARRIER MUST BE A MINIMUM OF 2-FT WIDE.

CONTINUOUS CONTAINED BERM (ALTERNATIVE):

1. AN ALTERNATIVE PRODUCT, THE CONTINUOUS CONTAINED BERM (OR "FILTER SOCK") CAN BE AN EFFECTIVE SEDIMENT BARRIER AS IT ADDS CONTAINMENT AND STABILITY TO A BERM OF EROSION CONTROL MIX.
2. IN THE EVENT THAT USE OF CONTINUOUS CONTAINED BERM IS DESIRED, THE PRODUCT SELECTED SHOULD BE REVIEWED AND APPROVED BY THE DESIGN ENGINEER.
3. INSTALLATION OF CONTINUOUS CONTAINED BERMS SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE MANUFACTURER.

EROSION CONTROL MIX BERM DETAIL

WINTER STABILIZATION & CONSTRUCTION PRACTICES:

MAINTENANCE REQUIREMENTS:

1. MAINTENANCE MEASURES SHOULD BE PERFORMED THROUGHOUT CONSTRUCTION, INCLUDING OVER THE WINTER PERIOD. AFTER EACH RAINFALL, SNOWSTORM, OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHOULD CONDUCT INSPECTION OF ALL INSTALLED EROSION CONTROL PRACTICES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUED FUNCTION.

2. FOR ANY AREA STABILIZED BY TEMPORARY OR PERMANENT SEEDING PRIOR TO THE ONSET OF THE WINTER SEASON, THE CONTRACTOR SHOULD CONDUCT AN INSPECTION IN THE SPRING TO ASCERTAIN THE CONDITION OF THE VEGETATION AND REPAIR ANY DAMAGED AREAS OR BARE SPOTS AND RESEED AS REQUIRED TO ACHIEVE AN ESTABLISHED VEGETATIVE COVER (AT LEAST 85% OF AREA VEGETATED WITH HEALTHY, VIGOROUS GROWTH.)

SPECIFICATIONS:

THE FOLLOWING STABILIZATION TECHNIQUES SHOULD BE EMPLOYED DURING THE PERIOD FROM OCTOBER 15 THROUGH MAY 15.

1. THE AREA OF EXPOSED, UNSTABILIZED SOIL SHOULD BE LIMITED TO 1-ACRE AND SHOULD BE PROTECTED AGAINST EROSION BY THE METHODS DISCUSSED IN NHSMM, VOL. 3 AND ELSEWHERE IN THIS PLAN SET, PRIOR TO ANY THAW OR SPRING MELT EVENT. STABILIZATION AS FOLLOWS SHOULD BE COMPLETED WITHIN A DAY OF ESTABLISHING THE GRADE THAT IS FINAL OR THAT OTHERWISE WILL EXIST FOR MORE THAN 5 DAYS:
2. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF LESS THAN 15% WHICH DO NOT EXHIBIT A MINIMUM 85% VEGETATIVE GROWTH BY OR ARE DISTURBED AFTER OCTOBER 15, SHOULD BE SEEDED AND COVERED WITH 3 TO 4 TONS OF HAY OR STRAW MULCH PER ACRE SECURED WITH ANCHORED NETTING, OR 2 INCHES OF EROSION CONTROL MIX (REFER TO NHSMM, VOL. 3 FOR SPECIFICATION).

3. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF GREATER THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OR ARE DISTURBED AFTER OCTOBER 15 SHOULD BE SEEDED AND COVERED WITH A PROPERLY INSTALLED EROSION CONTROL BLANKET OR WITH A MINIMUM OF 4 INCHES OF EROSION CONTROL MIX, UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER. NOTE THAT COMPOST BLANKETS SHOULD NOT EXCEED 2 INCHES IN THICKNESS OR THEY MAY OVERHEAT.
4. ALL STONE COVERED SLOPES MUST BE CONSTRUCTED AND STABILIZED BY OCTOBER 15.

5. INSTALLATION OF ANCHORED HAY MULCH OR EROSION CONTROL MIX SHOULD NOT OCCUR OVER SNOW OF GREATER THAN 1 INCH IN DEPTH.

6. ALL MULCH APPLIED DURING WINTER SHOULD BE ANCHORED (I.E. BY NETTING, TRACKING, WOOD CELLULOSE FIBER).

7. WITHIN 24 HOURS OF STOCKPILING SOIL MATERIALS SHOULD BE MULCHED FOR OVER WINTER PROTECTION WITH HAY OR STRAW AT TWICE THE NORMAL RATE OR WITH A 4 INCH LAYER OF EROSION CONTROL MIX. MULCH SHOULD BE RE-ESTABLISHED PRIOR TO ANY RAIN OR SNOWFALL. NO SOIL STOCKPILE SHOULD BE PLACED (EVEN COVERED WITH MULCH) WITHIN 100-FT OF ANY WETLAND OR OTHER WATER RESOURCE AREA.

8. FROZEN MATERIAL (I.E. FROST LAYER REMOVED DURING WINTER CONSTRUCTION) SHOULD BE STOCKPILED SEPARATELY AND IN A LOCATION AWAY FROM ANY AREA NEEDING PROTECTION. FROZEN MATERIAL STOCKPILES CAN MELT IN SPRING AND BECOME UNWORKABLE AND DIFFICULT TO TRANSPORT DUE TO HIGH SOIL MOISTURE CONTENT.

9. INSTALLATION OF EROSION CONTROL BLANKETS SHOULD NOT OCCUR OVER SNOW OF GREATER THAN 1 INCH IN DEPTH OR ON FROZEN GROUND.

10. ALL GRASS-LINED DITCHES AND CHANNELS SHOULD BE CONSTRUCTED BY SEPTEMBER 1. ALL DITCHES AND SWALES WHICH DO NOT EXHIBIT 85% VEGETATIVE GROWTH BY OR ARE DISTURBED AFTER OCTOBER 15, SHOULD BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS AS DETERMINED BY A PROFESSIONAL ENGINEER. IF STONE LINING IS NECESSARY, THE CONTRACTOR MAY NEED TO RE-GRADE THE DITCH AS REQUIRED TO PROVIDE ADEQUATE CROSS-SECTION AFTER ALLOWING FOR PLACEMENT OF THE STONE.

11. ALL STONE LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY OCTOBER 15.

12. AFTER NOVEMBER 15, INCOMPLETE ROAD OR PARKING AREAS WHERE ACTIVE CONSTRUCTION HAS STOPPED FOR THE WINTER SHOULD BE PROTECTED WITH A MINIMUM 3 INCH LAYER OF SAND AND GRAVEL WITH A GRADATION THAT IS LESS THAN 12% OF THE SAND PORTION, OR MATERIAL PASSING THE NUMBER 4 SIEVE, BY WEIGHT, PASSES THE NUMBER 200 SIEVE.

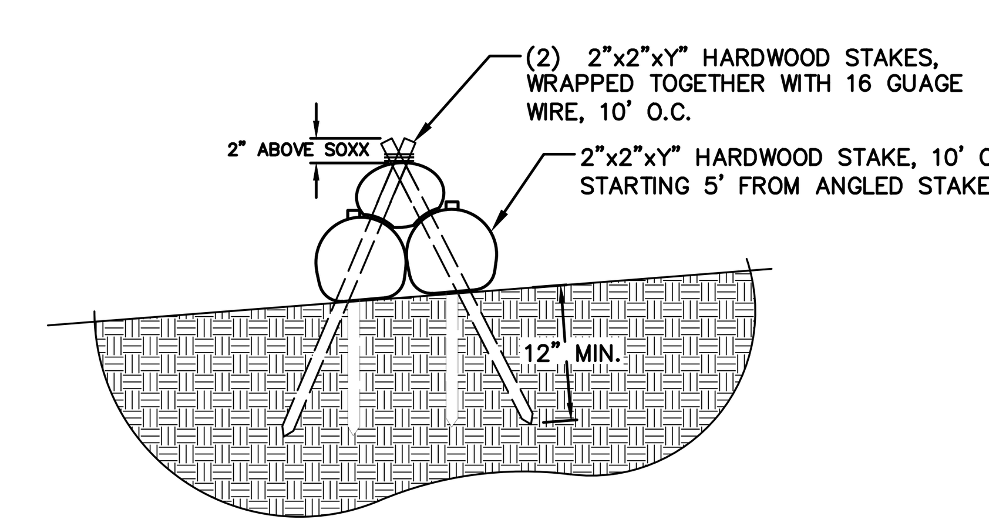
13. SEDIMENT BARRIERS THAT ARE INSTALLED DURING FROZEN CONDITIONS SHOULD CONSIST OF EROSION CONTROL MIX BERMS, OR CONTINUOUS CONTAINED BERMS. SILT FENCES AND HAY BALES SHOULD NOT BE INSTALLED WHEN FROZEN CONDITIONS PREVENT PROPER EMBEDMENT OF THESE BARRIERS.

DUST CONTROL PRACTICES:

1. APPLY DUST CONTROL MEASURES AS NECESSARY TO MAINTAIN CONTROL OF DUST ON SITE.
2. WATER APPLICATION:
   A) MOISTEN EXPOSED SOIL SURFACES PERIODICALLY WITH ADEQUATE WATER TO CONTROL DUST.
   B) AVOID EXCESSIVE APPLICATION OF WATER THAT WOULD RESULT IN MOBILIZING SEDIMENT AND SUBSEQUENT DEPOSITION IN NATURAL WATERBODIES.
3. STONE APPLICATION:
   A) COVER SURFACE WITH CRUSHED OR COARSE GRAVEL.
   B) IN AREAS NEAR WATERWAYS USE ONLY CHEMICALLY STABILIZED OR WASHED AGGREGATE.
4. REFER TO "NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3 CONSTRUCTION PHASE EROSION AND SEDIMENT CONTROLS, DECEMBER 2008" FOR OTHER ALLOWABLE DUST CONTROL PRACTICES (I.E. COMMERCIAL TACKIFIERS OR CHEMICAL TREATMENTS SUCH AS CALCIUM CHLORIDE, ETC.)

INVASIVE SPECIES NOTE:

THE CONTRACTOR SHALL TAKE STEPS TO PREVENT THE SPREAD OF INVASIVE PLANT, INSECT, AND FUNGAL SPECIES BY MEETING THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES. http://gencourt.state.nh.us/rules/state_agencies/agr3800.html



SILT SOCK PYRAMIND STACK DETAIL

NOT TO SCALE

GENERAL CONSTRUCTION PHASING:

1. STABILIZATION:
   A SITE IS DEEMED STABILIZED WHEN IT IS IN A CONDITION IN WHICH THE SOIL ON SITE WILL NOT EXPERIENCE ACCELERATED OR UNNATURAL EROSION UNDER THE CONDITIONS OF A 10-YEAR STORM EVENT, SUCH AS BUT NOT LIMITED TO:

A) IN AREAS THAT WILL NOT BE PAVED:
   i) A MINIMUM OF 85% VEGETATIVE COVER HAS BEEN ESTABLISHED;
   ii) A MINIMUM OF 3-INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR A CERTIFIED COMPOST BLANKET HAS BEEN INSTALLED, OR;
   iii) EROSION CONTROL BLANKETS HAVE BEEN INSTALLED.

B) IN AREAS TO BE PAVED:
   i) BASE COURSE GRAVELS HAVE BEEN INSTALLED.

2. TEMPORARY STABILIZATION:
   ALL AREAS OF EXPOSED OR DISTURBED SOIL SHOULD BE TEMPORARILY STABILIZED AS SOON AS PRACTICABLE BUT NO LATER THAN 45 DAYS FROM THE TIME OF INITIAL DISTURBANCE, UNLESS A SHORTER TIME IS SPECIFIED BY LOCAL AUTHORITIES, THE CONSTRUCTION SEQUENCE APPROVED AS PART OF THE ISSUED PERMIT OR AN INDEPENDENT MONITOR.

3. PERMANENT STABILIZATION:
   ALL AREAS OF EXPOSED OR DISTURBED SOIL SHOULD BE PERMANENTLY STABILIZED AS SOON AS PRACTICABLE BUT NO LATER THAN 3 DAYS FOLLOWING FINAL GRADING.

4. MAXIMUM AREA OF DISTURBANCE:
   THE AREA OF UNSTABILIZED SOIL SHOULD NOT EXCEED 5 ACRES AT ANY TIME.

5. ONLY DISTURB, CLEAR, OR GRADE AREAS NECESSARY FOR CONSTRUCTION.
   A) FLAG OR OTHERWISE DELINEATE AREAS NOT TO BE DISTURBED.
   B) EXCLUDE VEHICLES AND CONSTRUCTION EQUIPMENT FROM THESE AREAS TO PRESERVE NATURAL VEGETATION.

6. ALL GRADED OR DISTURBED AREAS INCLUDING SLOPES SHOULD BE PROTECTED DURING CLEARING AND CONSTRUCTION IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN DEPICTED ON GRADING PLANS.

7. ALL EROSION AND SEDIMENT CONTROL PRACTICES AND MEASURES SHOULD BE CONSTRUCTED, APPLIED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN DEPICTED ON GRADING PLANS.

8. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHOULD BE STOCKPILED IN THE AMOUNT NECESSARY TO COMPLETE FINISHED GRADING AND BE PROTECTED FROM EROSION.

9. STOCKPILES, BORROW AREAS AND SPOILS SHALL BE STABILIZED AS DESCRIBED UNDER "SOIL STOCKPILE PRACTICES".

10. SLOPES SHOULD NOT BE CREATED SO CLOSE TO PROPERTY LINES AS TO ENDANGER ADJOINING PROPERTIES WITHOUT ADEQUATE PROTECTION AGAINST SEDIMENTATION, EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED DAMAGE.

11. AREAS TO BE FILLED SHOULD BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND/OR OTHER OBJECTIONABLE MATERIALS.

12. AREAS SHOULD BE SCARIFIED TO A MINIMUM DEPTH OF 3-INCHES PRIOR TO PLACEMENT OF TOPSOIL. TOPSOIL SHOULD BE PLACED WITHOUT SIGNIFICANT COMPACTION TO PROVIDE A LOOSE BEDDING FOR PLACEMENT OF SEED.

13. ALL FILLS SHOULD BE COMPACTED IN ACCORDANCE WITH PROJECT SPECIFICATIONS TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES, SITE UTILITIES, CONDUITS AND OTHER FACILITIES, SHOULD BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.

14. IN GENERAL, FILLS SHOULD BE COMPACTED IN LAYERS RANGING FROM 6 TO 24 INCHES IN THICKNESS. THE CONTRACTOR SHOULD REVIEW THE PROJECT GEOTECHNICAL REPORT AND/OR THE "PROJECT SPECIFIC PHASING NOTES" FOR SPECIFIC GUIDANCE.

15. ANY AND ALL FILL MATERIAL SHOULD BE FREE OF BRUSH, RUBBISH, ROCKS (LARGER THAN 3/4 THE DEPTH OF THE LIFT BEING INSTALLED), LOGS, STUMPS, BUILDING DEBRIS, FROZEN MATERIAL AND OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY LIFTS.

16. FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE (I.E. CLAY, SILT) MATERIALS ARE SUSCEPTIBLE TO ACCELERATED SETTLEMENT AND POTENTIAL ACCELERATED EROSION. WORK IN AREAS OF THESE MATERIALS SHOULD BE PERFORMED UNDER THE DIRECTION OF A PROFESSIONAL ENGINEER.

17. THE OUTER FACE OF THE FILL SLOPE SHOULD BE ALLOWED TO STAY LOOSE, NOT ROLLED OR COMPACTED, OR BLADE SMOOTHED. A BULLDOZER MAY RUN UP AND DOWN THE FILL SLOPE SO THE DOZER TREADS (CLEAT TRACKS) CREATE GROOVES PERPENDICULAR TO THE SLOPE. IF THE SOIL IS NOT TOO MOIST, EXCESSIVE COMPACTION WILL NOT OCCUR. SEE "SURFACE ROUGHENING" IN THE NHSMM, VOL.3.

18. ROUGHEN THE SURFACE OF ALL SLOPES DURING THE CONSTRUCTION OPERATION TO RETAIN WATER, INCREASE INFILTRATION AND FACILITATE VEGETATION ESTABLISHMENT.

19. USE SLOPE BREAKS, SUCH AS DIVERSIONS, BENCHES, OR CONTOUR FURROWS AS APPROPRIATE TO REDUCE THE LENGTH OF CUT-FILL SLOPES TO LIMIT SHEET AND RILL EROSION AND PREVENT GULLY EROSION. ALL BENCHES SHOULD BE KEPT FREE OF SEDIMENT DURING ALL PHASES OF CONSTRUCTION.

20. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHOULD BE EVALUATED BY A PROFESSIONAL ENGINEER (PREFERABLY THE DESIGN ENGINEER) TO DETERMINE IF THE PROPOSED DESIGN SHOULD BE REVISED TO PROPERLY MANAGE THE CONDITION.

21. STABILIZE ALL GRADED AREAS (AS ABOVE) WITH VEGETATION, CRUSHED STONE, COMPOST BLANKET, OR OTHER GROUND COVER AS SOON AS GRADING IS COMPLETE OR IF WORK IS INTERRUPTED FOR 21 WORKING DAYS OR MORE. USE MULCH OR OTHER APPROVED METHODS TO STABILIZE AREAS TEMPORARILY WHERE FINAL GRADING MUST BE DELAYED.

22. ALL GRADED AREAS SHOULD BE PERMANENTLY STABILIZED IMMEDIATELY FOLLOWING FINISHED GRADING.

ABOVE NOTES EXCERPTED, ADAPTED AND REFERENCED FROM "NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3 CONSTRUCTION PHASE EROSION AND SEDIMENT CONTROLS, DECEMBER 2008" (NHSMM, VOL. 3)

SOIL STOCKPILE PRACTICES:

1. LOCATE STOCKPILES A MINIMUM OF 50-FT. AWAY FROM CONCENTRATED FLOWS OF STORMWATER, DRAINAGE COURSES OR INLETS.
2. PROTECT ALL STOCKPILES FROM STORMWATER RUN-ON USING TEMPORARY PERIMETER MEASURES SUCH AS DIVERSIONS, BERMS, SANDBAGS OR OTHER APPROVED PRACTICES.
3. STOCKPILES SHOULD BE SURROUNDED BY SEDIMENT BARRIERS AS DESCRIBED ON THE PLANS AND IN NHSMM VOL. 3. TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILE.
4. IMPLEMENT WIND EROSION CONTROL PRACTICES AS APPROPRIATE ON ALL STOCKPILED MATERIAL.
5. PLACE BAGGED MATERIALS ON PALLETS OR UNDERCOVER.

PROTECTION OF INACTIVE STOCKPILES:

6. INACTIVE SOIL STOCKPILES SHOULD BE COVERED WITH ANCHORED TARPS OR PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY SEED AND MULCH OR OTHER TEMPORARY STABILIZATION PRACTICE) AND TEMPORARY PERIMETER SEDIMENT BARRIERS (I.E. SILT FENCE, ETC.) AT ALL TIMES.
7. INACTIVE STOCKPILES OF CONCRETE RUBBLE, ASPHALT CONCRETE RUBBLE, AGGREGATE MATERIALS, AND SIMILAR MATERIALS SHOULD BE PROTECTED WITH TEMPORARY SEDIMENT PERIMETER BARRIERS (I.E. SILT FENCE, ETC.) AT ALL TIMES. IF THE MATERIALS ARE A SOURCE OF DUST, THEY SHOULD ALSO BE COVERED.

PROTECTION OF ACTIVE STOCKPILES:

8. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY LINEAR SEDIMENT BARRIERS (I.E. SILT FENCE, ETC.) PRIOR TO THE ONSET OF PRECIPITATION. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIAL FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.
9. WHEN A STORM IS PREDICTED, STOCKPILES SHOULD BE PROTECTED WITH AN ANCHORED PROTECTIVE COVERING.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: NTS VERT.:
DATUM: HORZ.: VERT.:
0
GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC
EROSION CONTROL DETAILS
CATE STREET
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CD-560

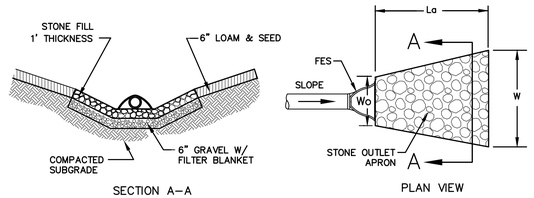
File Path: F:\P2018\0317\A10\Civil3\Dwg\20180317A10_DET01-RDWY.dwg Layout: CD-560-ECP Plotted: Tue, September 10, 2019 - 11:18 AM User: jandretta
Plotter: DWG TO PDF.PC3 CTB File: FO.STB
MS VIEW: LAYER STATE:

D10=10"
RIP-RAP GRADATION

% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)		
100	15	TO	20
85	13	TO	18
50	10	TO	15
15	3	TO	5

APRON DIMENSION TABLE

PIPE OUTLET	Wo	W	La	T	d50
24" HDPE OUTLET	6.0'	11'	8'	12"	3"



SECTION A–A PLAN VIEW

STONE: D50 = 6"
WELL GRADED WITH SUFFICIENT SAND
AND GRAVEL TO FILL THE VOIDS

THE HEIGHT OF THE STRUCTURAL LINING ALONG THE CHANNEL SIDES SHALL BEGIN AT THE ELEVATION EQUAL TO THE TOP OF THE CONDUIT AND TAPER DOWN TO THE CHANNEL BOTTOM THROUGH THE LENGTH OF THE APRON.

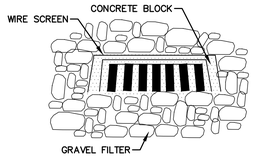
NOTES:
1. ALL PIPE CULVERTS SHALL HAVE END SECTIONS OR HEADWALLS. END SECTION MATERIAL AND MANUFACTURER SHALL MATCH THAT OF THE PIPE CULVERT.
2. THE LARGEST RIP-RAP SIZE DETERMINED DURING HYDROLOGIC ANALYSIS HAS BEEN USED FOR ALL OUTLETS FOR ECONOMY AND SIMPLICITY.
3. APRON LENGTHS, WIDTHS AND THICKNESSES HAVE BEEN ROUNDED UP TO WHOLE NUMBERS FOR EASE OF CONSTRUCTION.

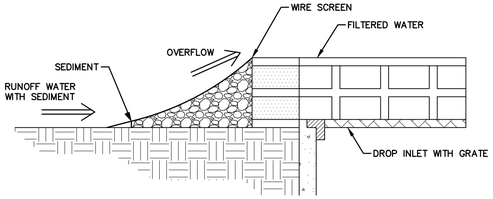
CONSTRUCTION SPECIFICATIONS:
1. PREPARE THE SUB-GRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP-RAP TO THE GRADES SHOWN ON THE PLANS.
2. MINIMUM 6" SAND/GRAVEL BEDDING OR GEOTEXTILE FABRIC REQUIRED UNDER ALL ROCK RIP-RAP.
3. THE ROCK OR GRAVEL USED FOR FILTER OR RIP-RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF ROCK RIP-RAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO (2) PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
5. STONE FOR THE RIP-RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
6. RIP-RAP SIZE CHOSEN FOR THE WORST CASE OF ALL OUTLETS. ALL RIP-RAP USED FOR PIPE OUTLET PROTECTION WILL HAVE THE SAME GRADATION AND THICKNESS.

MAINTENANCE NOTES:
1. OUTLETS SHALL BE INSPECTED AND CLEANED ANNUALLY AND AFTER ANY MAJOR STORM EVENT. ANY EROSION OR DAMAGE TO THE RIP-RAP SHALL BE REPAIRED IMMEDIATELY.
2. THE CHANNEL IMMEDIATELY DOWNSTREAM FROM THE OUTLET SHOULD BE CHECKED TO SEE THAT NO EROSION IS OCCURRING.
3. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

RIP RAP APRON OUTLET PROTECTION

NOT TO SCALE





BLOCK AND GRAVEL INLET SEDIMENT FILTER

NOT TO SCALE

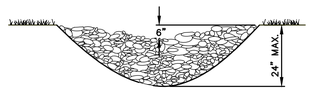
CONSTRUCTION SPECIFICATIONS:
1. PLACE CONCRETE BLOCKS LENGTHWISE ON THEIR SIDE IN A SINGLE ROW AROUND THE PERIMETER OF THE INLET, WITH THE ENDS OF ADJACENT BLOCKS ABUTTING. THE HEIGHT OF THE BARRIER CAN BE VARIED, DEPENDING ON DESIGN NEEDS, BY STACKING COMBINATIONS OF 4-INCH, 8-INCH AND 12-INCH WIDE BLOCKS. THE BARRIER OF BLOCKS SHALL BE AT LEAST 12 INCHES HIGH AND NO GREATER THAN 24 INCHES HIGH
.
2. WIRE MESH SHALL BE PLACED OVER THE OUTSIDE VERTICAL FACE (WEBBING) OF THE CONCRETE BLOCKS TO PREVENT STONE FROM BEING WASHED THROUGH THE HOLES IN THE BLOCKS. HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2-INCH OPENINGS SHALL BE USED.
3. STONE SHALL BE PILED AGAINST THE WIRE TO THE TOP OF THE BLOCK BARRIER, AS SHOWN ABOVE. STONE GRADATION SHALL BE WELL GRADED WITH THE MAXIMUM STONE SIZE OF 6 INCHES AND MINIMUM STONE SIZE OF 1 INCH.
4. IF THE STONE FILTER BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PERFORMS ITS FUNCTION, THE STONE MUST BE PULLED AWAY FROM THE BLOCKS, CLEANED AND REPLACED.

MAINTENANCE NOTES:
1. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
2. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
3. STRUCTURES SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

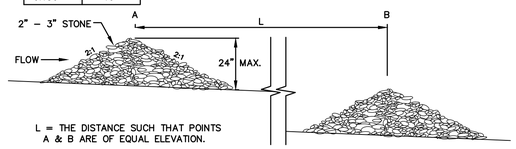
SEDIMENTATION CONTROL AT CATCH BASINS

NOT TO SCALE

SPACING BETWEEN CHECK DAMS	
SLOPE (FT/FT)	LENGTH (FT)
0.020	75
0.030	50
0.040	37
0.050	30
0.080	19
0.100	15
0.120	13
0.150	10



DRAINAGEWAY CROSS-SECTION



L = THE DISTANCE SUCH THAT POINTS A & B ARE OF EQUAL ELEVATION.

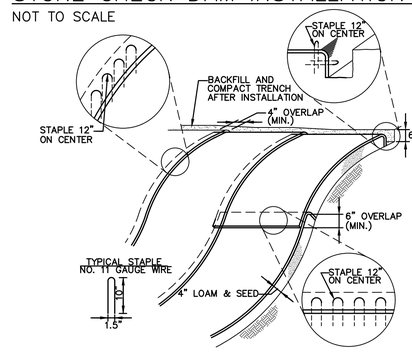
SPACING BETWEEN STONE CHECK DAMS

CONSTRUCTION SPECIFICATIONS:
1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION, AIR AND WATER POLLUTION WILL BE MINIMIZED.
3. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.

MAINTENANCE NOTES:
1. TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE INSPECTED AFTER EACH STORM AND DAILY DURING PROLONGED STORM EVENTS. ANY DAMAGE TO THE STRUCTURES SHALL BE REPAIRED IMMEDIATELY.
2. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE.
3. WHEN REMOVING THE STRUCTURES, THE DISTURBED AREAS SHALL BE BROUGHT UP TO EXISTING CHANNEL GRADE AND THE AREAS PREPARED, SEEDED AND MULCHED
.
4. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT REACHES 1/2 THE ORIGINAL HEIGHT OF THE STRUCTURE.

STONE CHECK DAM INSTALLATION DETAIL

NOT TO SCALE



SLOPE INSTALLATION

MAINTENANCE REQUIREMENTS:
1. ALL BLANKET AND MATS SHOULD BE INSPECTED WEEKLY DURING THE CONSTRUCTION PERIOD, AND AFTER ANY RAINFALL EVENT EXCEEDING 1/2 INCH IN A 24-HOUR PERIOD.
2. ANY FAILURE SHOULD BE REPAIRED IMMEDIATELY. IF WASHOUT OF THE SLOPE, DISPLACEMENT OF THE MAT, OR DAMAGE TO THE MAT OCCURS, THE AFFECTED SLOPE SHALL BE REPAIRED AND RESEEDED, AND THE AFFECTED AREA OF MAT SHALL BE RE-INSTALLED.

CONSTRUCTION SPECIFICATIONS:
1. MANUFACTURE'S INSTALLATION INSTRUCTIONS:
   A. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
   B. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM)PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
   C. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
   D. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" (5 CM – 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
   E. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH. NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.
2. SITE PREPARATION:
   A. PROPER SITE PREPARATION IS ESSENTIAL TO ENSURE COMPLETE CONTACT OF THE PROTECTION MATTING WITH THE SOIL.
   B. GRADE AND SHAPE AREA IF INSTALLATION.
   C. REMOVE ALL ROCKS, CLODS, TRASH, VEGETATIVE OR OTHER OBSTRUCTIONS SO THAT THE INSTALLED BLANKETS WILL HAVE DIRECT CONTACT WITH THE SOIL.
   D. PREPARE SEEDBED BY LOOSENING 2-3 INCHES OF TOPSOIL ABOVE FINAL GRADE.
   E. INCORPORATE AMENDMENTS, SUCH AS LIME AND FERTILIZER, INTO SOIL ACCORDING TO SOIL TEST AND THE SEEDING PLAN.
3. SEEDING:
   A. SEED AREA BEFORE BLANKET INSTALLATION FOR EROSION CONTROL AND REVEGETATION. SEEDING AFTER MAT INSTALLATION IS OFTEN SPECIFIED FOR TURF REINFORCEMENT APPLICATIONS. WHEN SEEDING PRIOR TO BLANKET INSTALLATION, ALL CHECK SLOTS AND OTHER AREAS DISTURBED DURING INSTALLATION MUST BE RESEEDED.
   B. WHEN SOIL FILLING IS SPECIFIED, SEED THE MATTING AND THE ENTIRE DISTURBED AREA AFTER INSTALLATION AND PRIOR TO FILLING THE MAT WITH SOIL.

EROSION CONTROL – BLANKET SLOPE PROTECTION

NOT TO SCALE

PERMANENT VEGETATION:

SPECIFICATIONS:

SITE PREPARATION:
1. INSTALL NEEDED EROSION AND SEDIMENT CONTROL MEASURES SUCH AS SILTATION BARRIERS, DIVERSIONS, AND SEDIMENT TRAPS.
2. GRADE AS NEEDED FOR THE ACCESS OF EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, AND MULCH ANCHORING.
3. RUNOFF SHOULD BE DIVERTED FROM THE SEEDBED AREA.
4. ON SLOPES 4:1 OR STEEPER, THE FINAL PREPARATION SHOULD INCLUDE CREATING HORIZONTAL GROOVES PERPENDICULAR O THE DIRECTION OF THE SLOPE TO CATCH SEED AND REDUCE RUNOFF.

SEEDBED PREPARATION:
1. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRING TOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY AND SILT SOILS SHOULD BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE.
2. REMOVE FROM THE SURFACE ALL STONES 2INCHES OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, CONCRETE CLODS, LUMPS, TRASH OR OTHER UNSUITABLE MATERIAL.
3. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED; THE AREA MUST BE TILLED AND FIRMED AS ABOVE.
4. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
5. IF APPLICABLE, FERTILIZER AND ORGANIC SOIL AMENDMENTS SHOULD BE APPLIED DURING THE GROWING SEASON.
6. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL FERTILIZER AND LIMESTONE MAY BE APPLIED AT THE FOLLOWING RATES:

   LIMESTONE APPLICATION RATE = 3 TONS/ACRE (138 LB./1,000–SF)*

   *EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE

   FERTILIZER APPLICATION RATE = 600 LB./ACRE (13.8 LB./1,000–SF)*

   *LOW PHOSPHATE FERTILIZER (N–P205–K20) OR EQUIVALENT
7. FERTILIZER SHOULD BE RESTRICTED TO LOW PHOSPHATE, SLOW RELEASE NITROGEN FERTILIZER WHEN APPLIED TO AREAS BETWEEN 25 AND 250–FT FROM A SURFACE WATER BODY. NO FERTILIZER EXCEPT LIMESTONE SHOULD BE APPLIED WITHIN 25–FT OF A SURFACE WATER BODY. THESE ARE THE REQUIREMENTS FOR ANY WATER BODY PROTECTED BY THE COMPREHENSIVE SHORELAND PROTECTION ACT.

SEEDING:
1. INOCULATE ALL LEGUME SEED WITH THE CORRECT TYPE OF INOCULANT.
2. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM 1/4 TO 1/2 INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE.
3. WHERE FEASIBLE EXCEPT WHERE EITHER CULTIPACKER TYPE SEEDER OR HYDROSEEDER IS USED, THE SEEDBED SHOULD BE FIRMED FOLLOWING SEEDING OPERATIONS WITH A ROLLER, OR LIGHT DRAG.
4. SPRING SEEDING USUALLY GIVES THE BEST RESULTS FOR ALL SEED MIXES OR WITH LEGUMES. PERMANENT SEEDING SHOULD BE COMPLETED 45 DAYS PRIOR TO FIRST KILLING FROST. WHEN CROWN VETCH IS SEEDED IN LATE SUMMER AT LEAST 35% OF THE SEED SHOULD BE HARD SEED (UNSCARIFIED). IF SEEDING CANNOT BE DONE WITHIN THE SPECIFIED SEEDING DATES, MULCH ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE DESCRIBED IN THE NHSSM, VOL 3. AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
5. AREAS SEEDED BETWEEN MAY 15 AND AUGUST 15 SHOULD BE COVERED WITH HAY OR STRAW MULCH, ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE DESCRIBED IN THE NHSSM, VOL 3.
6. VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA SHOULD BE ACHIEVED PRIOR TO OCTOBER 15. IF THIS CONDITION IS NOT ACHIEVED, IMPLEMENT OTHER TEMPORARY STABILIZATION MEASURES FOR OVERWINTER PROTECTION.

HYDROSEEDING:
1. WHEN HYDROSEEDING (HYDRAULIC APPLICATION), PREPARE THE SEEDBED AS SPECIFIED ABOVE OR BY HAND RAKING TO LOOSEN AND SMOOTH THE SOIL AND REMOVE SURFACE STONES LARGER THAN 2 INCHES IN DIAMETER.
2. SLOPES BUST BE NO STEEPER THAN 2:1 (2 FEET HORIZONTALLY BY 1 FOOT VERTICALLY.
3. LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. THE USE OF FIBER MULCH ON CRITICAL AREAS IS NOT RECOMMENDED (UNLESS IT IS USED TO HOLD STRAW OR HAY). BETTER PROTECTION IS GAINED BY USING STRAW MULCH AND HOLDING IT WITH ADHESIVE MATERIALS OR 500 POUNDS PER ACRE OF WOOD FIBER MULCH.
4. SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.

MAINTENANCE REQUIREMENTS:
1. PERMANENT SEEDED AREAS SHOULD BE INSPECTED AT LEAST MONTHLY DURING THE COURSE OF CONSTRUCTION. INSPECTION, MAINTENANCE AND CORRECTIVE ACTIONS SHOULD CONTINUE UNTIL THE OWNER ASSUMES PERMANENT OPERATION OF THE SITE.
2. SEEDED AREAS SHOULD BE MOWED AS REQUIRED TO MAINTAIN A HEALTHY STAND OF VEGETATION. MOWING HEIGHT AND FREQUENCY DEPEND OF TYPE OF GRASS COVER.
3. BASED ON INSPECTION, AREAS SHOULD BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS.
4. AT A MINIMUM 85% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION.
5. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHOULD BE MADE AND AREAS SHOULD BE RESEEDED, WITH OTHER TEMPORARY MEASURES (I.E. MULCH, ETC.) USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.

PERMANENT VEGETATION SEEDING RECOMMENDATIONS

USE	MIXTURE	SPECIES	LBS./ACRE	LBS./ 1,000–SF
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL	20 20 2 42	0.45 0.45 0.05 0.95
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER	A	TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL	20 20 2 42	0.45 0.45 0.05 0.95
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY RECREATION SITES	A	TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL	20 20 2 42	0.45 0.45 0.05 0.95
PLAY AREAS AND ATHLETIC FIELDS (TOPSOIL ESSENTIAL FOR GOOD TURF)	F	CREEPING RED FESCUE KENTUCKY BLUEGRASS TOTAL	50 50 100	1.15 1.15 2.30

SOURCES:
1. NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3, TABLES 4–2 AND 4–3
2. MINNICK, E.L. AND H.T. MARSHALL, (AUGUST 1992)

TEMPORARY VEGETATION:

SPECIFICATIONS:

SITE PREPARATION:
1. INSTALL NEEDED EROSION AND SEDIMENT CONTROL MEASURES SUCH AS SILTATION BARRIERS, DIVERSIONS, AND SEDIMENT TRAPS.
2. GRADE AS NEEDED FOR THE ACCESS OF EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, AND MULCH ANCHORING.
3. RUNOFF SHOULD BE DIVERTED FROM THE SEEDBED AREA.
4. ON SLOPES 4:1 OR STEEPER, THE FINAL PREPARATION SHOULD INCLUDE CREATING HORIZONTAL GROOVES PERPENDICULAR O THE DIRECTION OF THE SLOPE TO CATCH SEED AND REDUCE RUNOFF.

SEEDBED PREPARATION:
1. STONES AND TRASH SHOULD BE REMOVED SO AS NOT TO INTERFERE WITH THE SEEDING AREA.
2. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
3. IF APPLICABLE, FERTILIZER AND ORGANIC SOIL AMENDMENTS SHOULD BE APPLIED DURING THE GROWING SEASON.
4. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL FERTILIZER AND LIMESTONE MAY BE APPLIED AT THE FOLLOWING RATES:

   LIMESTONE APPLICATION RATE = 3 TONS/ACRE (138 LB./1,000–SF)*

   *EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE

   FERTILIZER APPLICATION RATE = 600 LB./ACRE (13.8 LB./1,000–SF)*

   *LOW PHOSPHATE FERTILIZER (N–P205–K20) OR EQUIVALENT
5. FERTILIZER SHOULD BE RESTRICTED TO LOW PHOSPHATE, SLOW RELEASE NITROGEN FERTILIZER WHEN APPLIED TO AREAS BETWEEN 25 AND 250–FT FROM A SURFACE WATER BODY. NO FERTILIZER EXCEPT LIMESTONE SHOULD BE APPLIED WITHIN 25–FT OF A SURFACE WATER BODY. THESE ARE THE REQUIREMENTS FOR ANY WATER BODY PROTECTED BY THE COMPREHENSIVE SHORELAND PROTECTION ACT.

SEEDING:
1. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL CULTIPACKER TYPE SEEDER OR HYDRO SEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM 1/4 TO 1/2 INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.
2. TEMPORARY SEED SHOULD TYPICALLY OCCUR PRIOR TO SEPTEMBER 15.
3. AREAS SEEDED BETWEEN MAY 15 AND AUGUST 15 SHOULD BE COVERED WITH HAY OR STRAW MULCH, ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE DESCRIBED IN THE NHSSM, VOL 3.
4. VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA SHOULD BE ACHIEVED PRIOR TO OCTOBER 15. IF THIS CONDITION IS NOT ACHIEVED, IMPLEMENT OTHER TEMPORARY STABILIZATION MEASURES FOR OVERWINTER PROTECTION.

MAINTENANCE REQUIREMENTS:
1. TEMPORARY SEEDING SHOULD BE INSPECTED WEEKLY AFTER ANY RAINFALL EXCEEDING 1/2 INCH IN 24 HOURS ON ACTIVE CONSTRUCTION SITES. TEMPORARY SEEDING SHOULD BE INSPECTED JUST PRIOR TO SEPTEMBER 15, TO ASCERTAIN WHETHER ADDITIONAL SEEDING IS REQUIRED TO PROVIDE STABILIZATION OVER THE WINTER PERIOD.
2. BASED ON INSPECTION, AREAS SHOULD BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS. IF IT IS TOO LATE IN THE PLANTING SEASON TO APPLY ADDITIONAL SEED, THEN OTHER TEMPORARY STABILIZATION MEASURES SHOULD BE IMPLEMENTED.
3. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHOULD BE MADE AND AREAS SHOULD BE RESEEDED, WITH OTHER TEMPORARY MEASURES (I.E. MULCH, ETC.) USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.

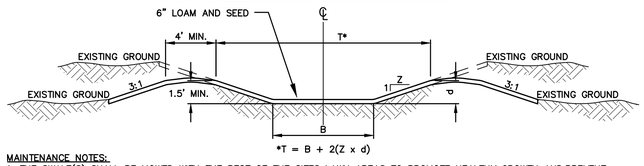
TEMPORARY VEGETATION SEEDING RECOMMENDATIONS

SPECIES	PER ACRE BUSHELS (BU) POUNDS (LBS.)	PER 1,000–SF	REMARKS
WINTER RYE	2.5 BU OR 112 LBS.	2.5 LBS.	BEST FOR FALL SEEDING. SEED FROM AUGUST 15 TO SEPTEMBER 15 FOR BEST COVER. SEED TO A DEPTH OF 1 INCH.
OATS	2.5 BU OR 80 LBS.	2.0 LBS.	BEST FOR SPRING SEEDING. SEED NO LATER THAN MAY 15 FOR SUMMER PROTECTION. SEED TO A DEPTH OF 1 INCH.
ANNUAL RYEGRASS	40 LBS.	1.0 LB.	GROWS QUICKLY, BUT IS OF SHORT DURATION. USE WHERE APPEARANCES ARE IMPORTANT. SEED EARLY SPRING AND/OR BETWEEN AUGUST 15 AND SEPTEMBER 15. COVER THE SEED WITH NO MORE THAN 0.25 INCH OF SOIL.
PERENNIAL RYEGRASS	30 LBS.	0.7 LBS.	BEST FOR FALL SEEDING. SEED FROM AUGUST 15 TO SEPTEMBER 15 FOR BEST COVER. SEED TO A DEPTH OF 1 INCH.

SOURCES:
1. NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3, TABLE 4–1
2. MINNICK, E.L. AND H.T. MARSHALL, (AUGUST 1992)

SWALE DIMENSION TABLE

LOCATION	B	d	Z	T	LENGTH
WHERE SHOWN	4–FT	2–FT	3–FT	20–FT	AS SHOWN



MAINTENANCE NOTES:
1. THE SWALE(S) SHALL BE MOWED WITH THE REST OF THE SITES LAWN AREAS TO PROMOTE HEALTHY GROWTH AND PREVENT THE ENCROACHMENT OF WEEDS AND WOODY VEGETATION. DO NOT MOW GRASS IN SWALE(S) TOO SHORT. THIS WILL REDUCE THE SWALES FILTERING ABILITY.
2. THE SWALE(S) SHOULD BE FERTILIZED ON AN AS NECESSARY BASIS, TO KEEP THE GRASS HEALTHY. OVER FERTILIZATION COULD RESULT IN THE SWALE(S) BECOMING A SOURCE OF POLLUTION TO THE SURROUNDING WETLAND AREAS.
3. THE SWALE(S) SHOULD BE INSPECTED PERIODICALLY AND AFTER EVERY MAJOR STORM. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND RE-VEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.

VEGETATED SWALE DETAIL

NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD LUNDBORN No. 10943 – LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: NTS VERT.:
DATUM: HORZ.: VERT.:
0
GRAPHIC SCALE

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CATE STREET DEVELOPMENT, LLC

DETAILS

CATE STREET NEW HAMPSHIRE
PORTSMOUTH

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CD-561

File Path: F:\P2018\03\317A10\Civil\3Dwg\20180317A10_DET01-RDWY.dwg Layout: CD-561-ECP Plotted: Tue, September 10, 2019 - 11:18 AM User: jandretta
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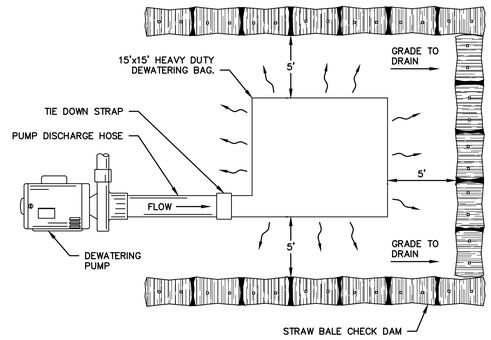
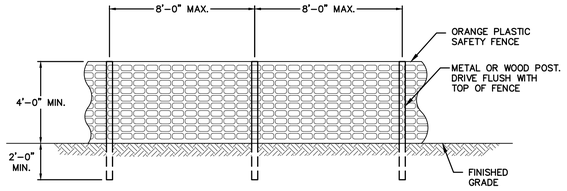
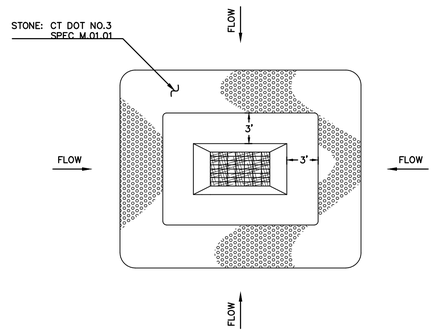


DEWATERING BAG
NOT TO SCALE

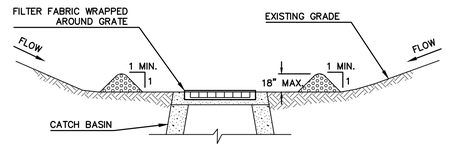


FOR TREE PROTECTION FENCE SHALL BE PLACED AT DRIPLINE OF TREES.

PROTECTIVE SAFETY FENCE
SCALE: N.T.S.

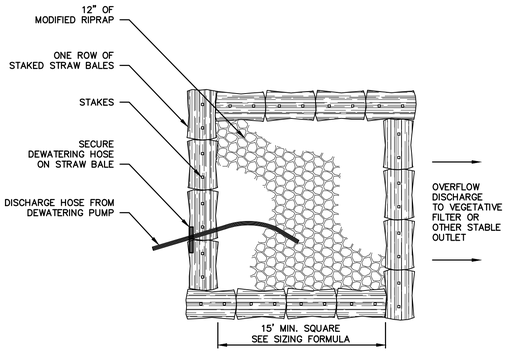


PLAN



SECTION

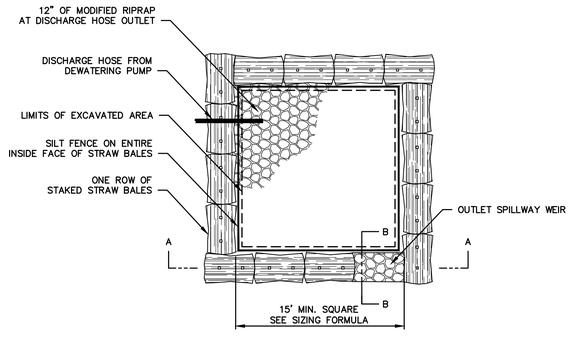
LOW POINT STONE CHECK DAM
NOT TO SCALE



SIZING FORMULA:
CUBIC FT. OF REQUIRED STORAGE = PUMP DISCHARGE RATE (GPM) x 16

PLAN

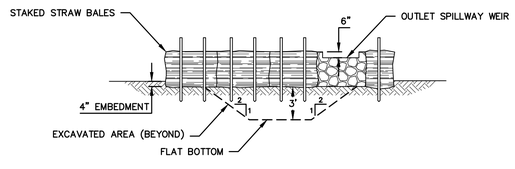
PUMP SETTLING BASIN TYPE I
NOT TO SCALE



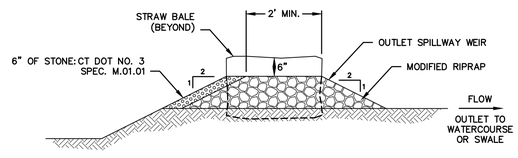
SIZING FORMULA:
CUBIC FT. OF REQUIRED STORAGE = PUMP DISCHARGE RATE (GPM) x 16

PLAN

PUMP SETTLING BASIN TYPE II
NOT TO SCALE



SECTION A–A



SECTION B–B

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 – LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: NTS
VERT.:
DATUM: HORZ.:
VERT.:
GRAPHIC SCALE 0

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CATE STREET DEVELOPMENT, LLC
EROSION CONTROL DETAILS
CATE STREET
PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CD-562

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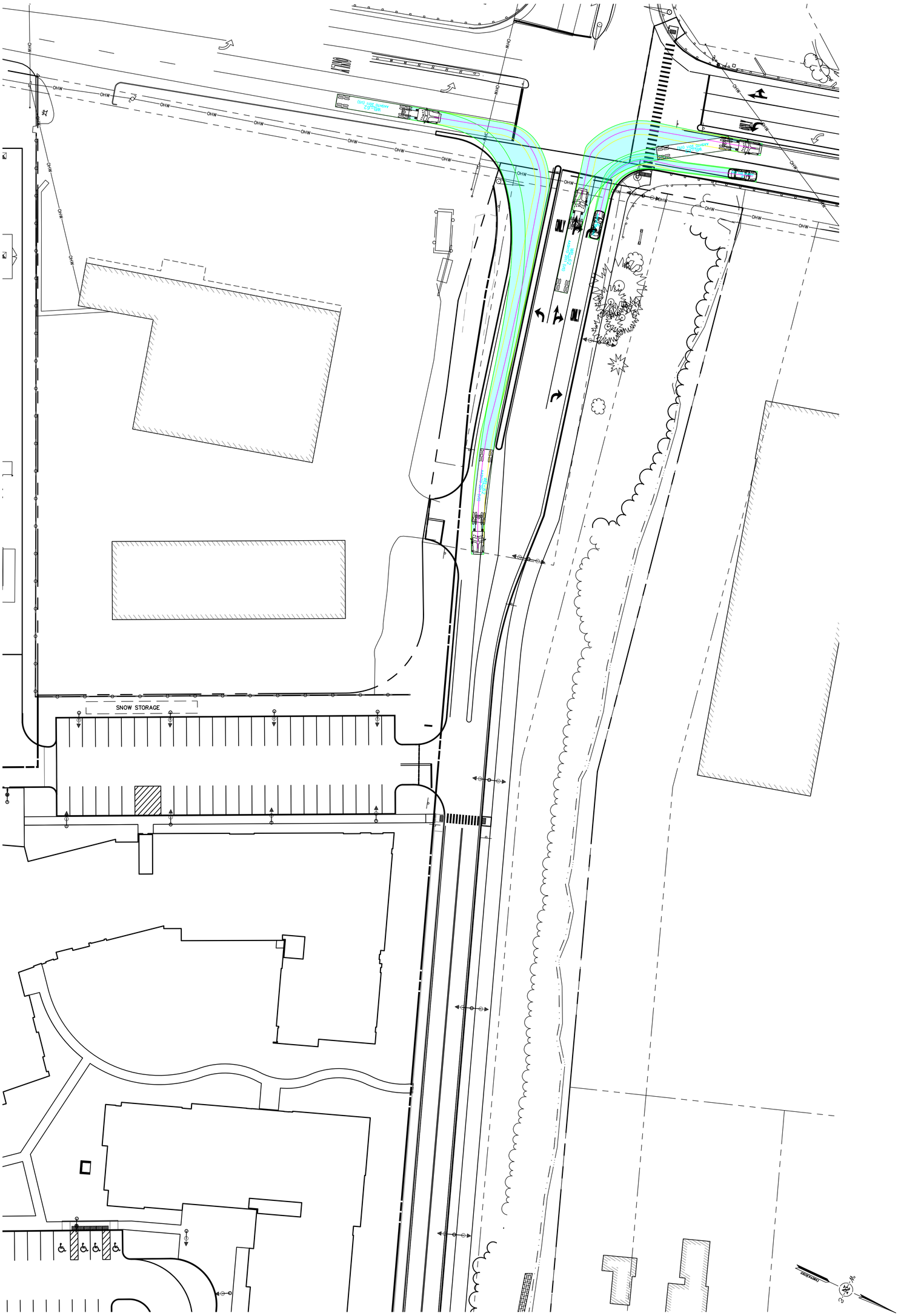

CT-101

PROJ. No: 20180317.A10
DATE: 09/10/2019

CATE STREET DEVELOPMENT, LLC

WB-62 TRUCK
TURNING MOVEMENTS
CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

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SCALE:
HORZ.: 1"=30'
VERT.: 1"=30'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
30 15 0 30
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
RICHARD R. LUNDBORN
No. 10943
LICENSED
PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

CATE STREET DEVELOPMENT, LLC

WB-62 TRUCK TURNING MOVEMENTS

CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

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SCALE:
HORZ.: 1"=20'
VERT.: 1"=20'
DATUM:
HORZ.: NAD83
VERT.: NGVD29

20 10 0 20
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE – RICHARD R. LUNDBORN No. 10943 LICENSED – PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
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4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CT-102

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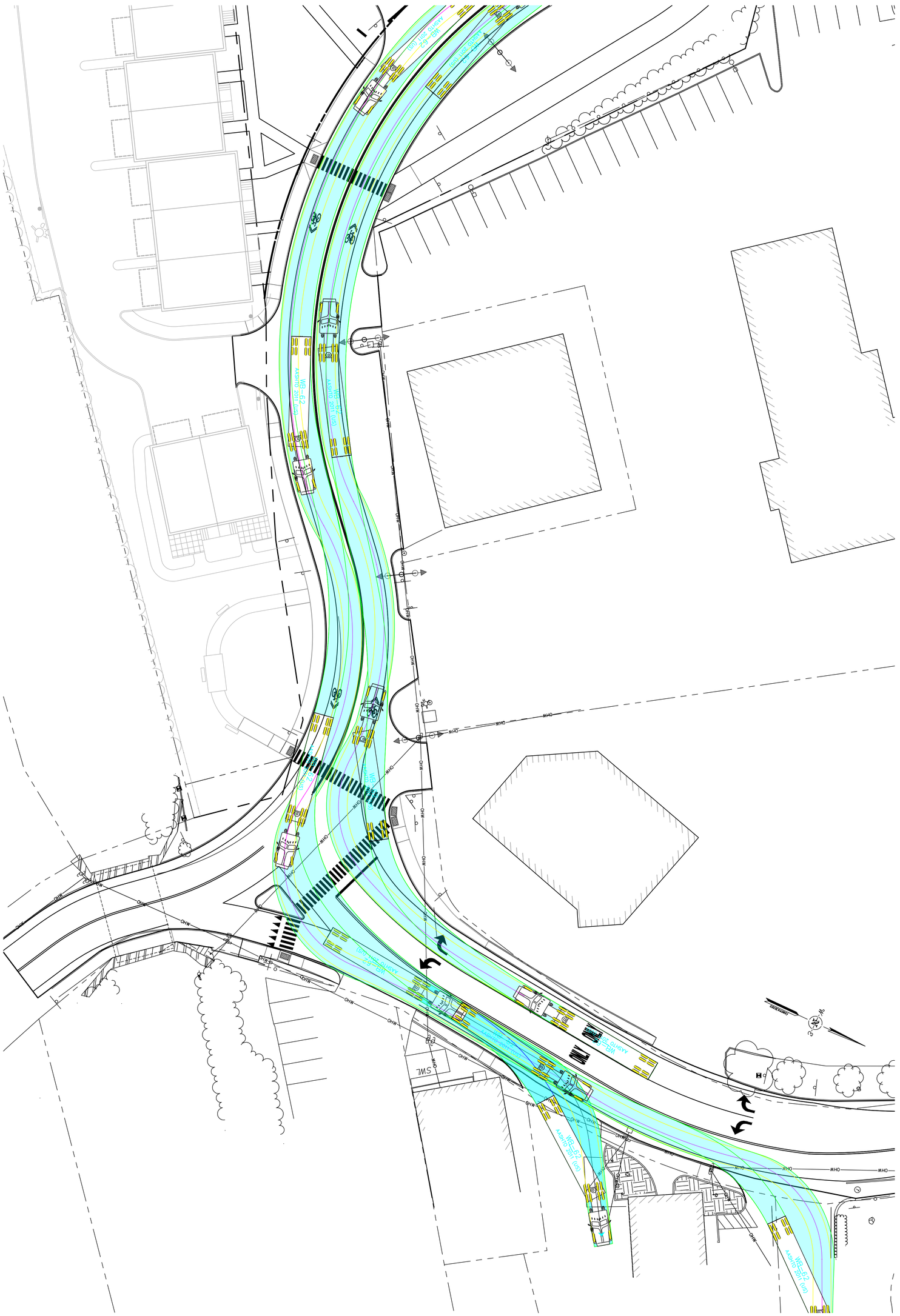

CT-103

PROJ. No: 20180317.A10
DATE: 09/10/2019

CATE STREET DEVELOPMENT, LLC

WB-62 TRUCK
TURNING MOVEMENTS
CATE STREET/ WEST END YARDS

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SCALE:
HORZ.: 1"=20'
VERT.: 1"=20'
DATUM:
HORZ.: NAD83
VERT.: NGVD29
20 10 0 20
GRAPHIC SCALE

STATE OF NEW HAMPSHIRE
RICHARD R. LUNDBORN No. 10943
LICENSED PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
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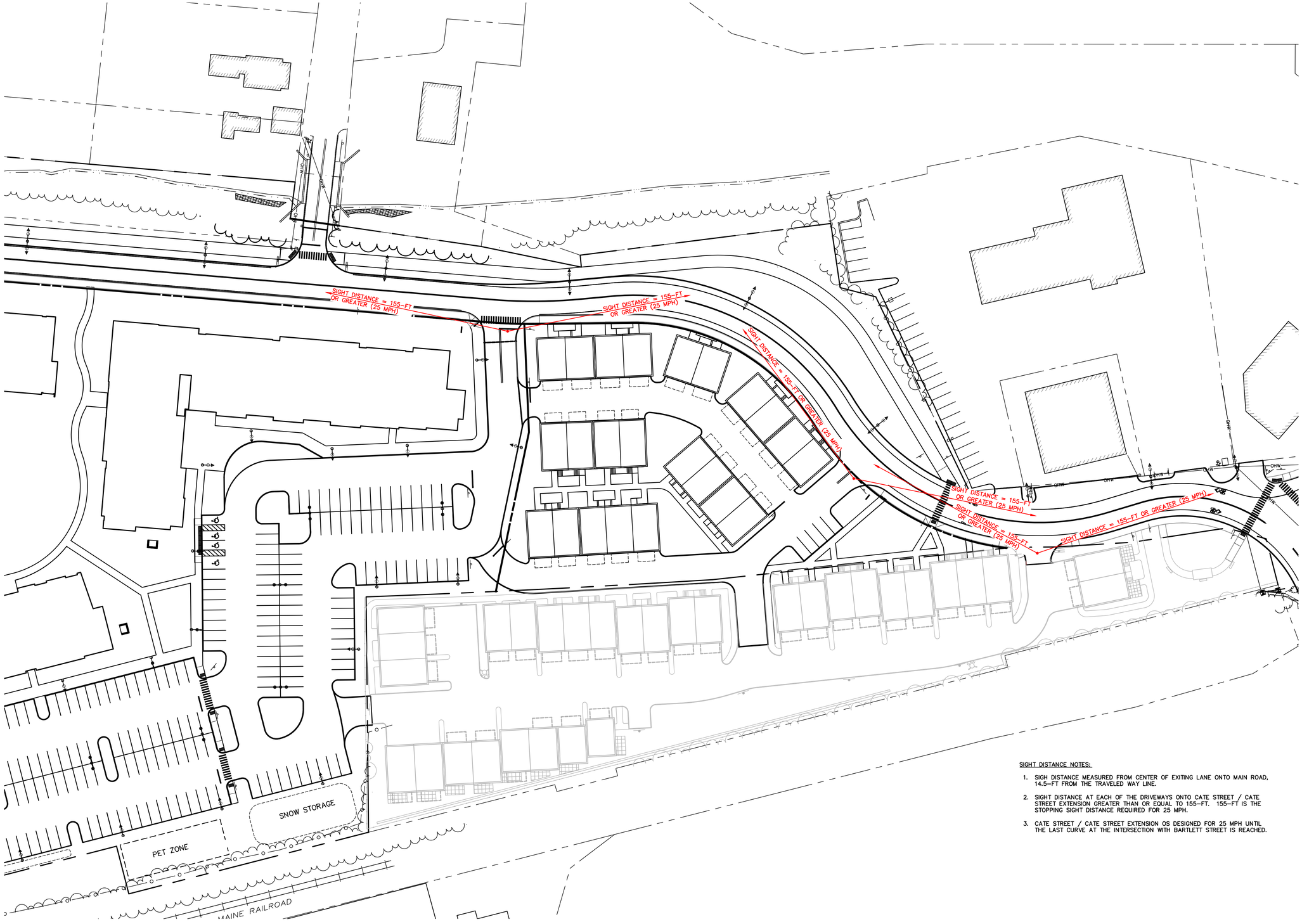
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL



SIGHT DISTANCE NOTES:

1. SIGH DISTANCE MEASURED FROM CENTER OF EXITING LANE ONTO MAIN ROAD, 14.5-FT FROM THE TRAVELED WAY LINE.
2. SIGHT DISTANCE AT EACH OF THE DRIVEWAYS ONTO CATE STREET / CATE STREET EXTENSION GREATER THAN OR EQUAL TO 155-FT. 155-FT IS THE STOPPING SIGHT DISTANCE REQUIRED FOR 25 MPH.
3. CATE STREET / CATE STREET EXTENSION OS DESIGNED FOR 25 MPH UNTIL THE LAST CURVE AT THE INTERSECTION WITH BARTLETT STREET IS REACHED.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – RICHARD R. LINDBORN No. 10843 LICENSED

SCALE: HORZ.: 1"=20'
VERT.: 1"=20'
DATUM: HORZ.: NAD83
VERT.: NGVD29
GRAPHIC SCALE 20 10 0 20

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CATE STREET DEVELOPMENT, LLC

SIGHT DISTANCE

CATE STREET/ WEST END YARDS

PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
DATE: 09/10/2019

CT-104

File Path: F:\P2018\0317A10\Civil\3Dwg\20180317.A10_CT01.dwg Layout: CT-104 Plotted: Tue, September 10, 2019 - 10:30 AM User: jandretta
MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB

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Ms. Juliet T. H. Walker, AICP
Planning Director
Planning Department
1 Junkins Avenue
Portsmouth, NH 03801

August 6, 2019

Ref. T0884

Re: Cate Street Extension Roadway Design Peer Review #4

Dear Ms. Walker:

On behalf of the City of Portsmouth, TEC, Inc. (TEC) has completed an engineering peer review of the revised Cate Street Extension roadway design based on updated and supplemental material submitted by the Applicant and dated July 2019, including responses to peer review comments previously offered by TEC in a letter dated July 9, 2019. The following details the results of this review:

Reference Documents:

The following documents provided by the City of Portsmouth Planning Department were included as part of this review:

- *Cate Street Roadway Plans,* prepared by Fuss & O'Neill – dated July 2019
- *West End Yards Site Plans,* prepared by Fuss & O'Neill – dated July 2019
- *Cate Street Extension Roadway Design Peer Review Response Matrix,* prepared by Fuss & O'Neill – dated July 17, 2019
- City of Portsmouth comments, received August 5, 2019

After review of the reference documents cited above, TEC offers the following comments shown in **BOLD** and recommendations to be addressed by the Applicant, at the discretion and direction of the City. The comment numbering from the June 4, 2019 peer review has been utilized for consistency, with new comments added at the end:

Horizontal Alignment and Roadway Plan Review:

1. **Comment adequately addressed.**

2. Clarify limits of proposed pavement treatment throughout the work limits (e.g. full depth pavement, cold plane & overlay, etc). While the Typical Sections indicate that Cate Street / Cate Street Extension will be full depth pavement, it is not clear if the same treatment is warranted or proposed on Bartlett Street and at the Cate Street intersections with US Route 1 Bypass and Bartlett Street. Add notes on the Roadway Plans and/or with corresponding shading included in legend on Sheet CN-003. Also label/shade the section of median island to be removed on US Route 1 Bypass.

   The Applicant should provide notes or legend within the plans to describe the work being done to the pavement of US Route 1 Bypass, or reference to separate US Route 1 Bypass project plans that will be needed for permitting with NHDOT.

3. **Comment adequately addressed.**

4. **Comment adequately addressed.**

5. The tight curves and proximity of the town houses to the edge of the roadway severely limits sight lines along the roadway and for vehicles turning from the site driveways onto Cate Street.

   Sight distance comment is adequately addressed with the addition of new sheet CT-104 included in the plans that shows sight distances meeting or exceeding the minimum stopping sight distance for a 25 mph design speed at the three (3) site driveways in the vicinity of the revised reverse curve.

   a. Plans should identify features in front of the town houses and the Applicant shall confirm that any vertical elements within the sight triangles will be low enough to not obstruct sight lines. Also provide note on Roadway Plans and Landscaping Plans indicating that only low height shrubs and ground cover shall be allowed within the sight triangles.

   It is noted that the landscaping proposed on the south side of Cate Street is limited, and addresses the sight distance comment as requested. Notes should be added to the plans to ensure the sight distance triangles shall be kept clear of any features that could reach a height of more than 3-feet.

   b. Sight distance easement(s) will be needed to ensure that clear sight triangles may be maintained.

   Fuss & O'Neal response:
   Sight distance easements will be developed and added to the Subdivision and Easement Plans and shown on the Roadway Plans.

   Applicant shall show the sight distance triangles and associated easements on Sheet CT-104 or other sheet as appropriate within the Roadway Plans.

6. **Comment is adequately addressed.**

7. **Comment is adequately addressed.**

8. The turning path of a WB-62 appears to encroach on the entire width of the bike lane at the beginning of the multi-use path. A bicyclist could get caught and run over by a truck in this area if it doesn't realize that a truck will be coming into its lane. Truck encroachment into the bike lane will not be allowed. The Applicant should explore all options to provide additional lane widening and/or revised alignment.

   Applicant has addressed comment by adding "Sharrow" bicycle shared lane markings from the beginning of the multi-use path to Bartlett Street. However, Applicant shall correct the direction of the "Sharrow" symbols at approximate Station 15+00, as they are shown in the wrong direction.

9. **Comment is adequately addressed.**

10. **Comment is adequately addressed.**

Vertical Alignment Review:

11. **Comment is adequately addressed.**

12. **Comment is adequately addressed.**

Traffic Signs & Pavement Markings

13. Alignment warning signs have been added to the plans per MUTCD Section 2C.07. Given that the reverse curves on Cate Street and the curve from Cate Street onto Bartlett Street have different design speeds, and in an effort to reduce sign clutter to the extent feasible, we recommend the following:

    a. Prior to reverse curves in both directions – W1-3R with W13-1P. **Applicant shall revise W13-1P signs at Station 9+50 RT and Station 15+75 LT to indicate 25 mph, consistent with the newly revised horizontal geometry that meets a 25 mph design speed. This sign shall also be added to the Sign Details sheet in addition to the 20 mph plaque.**

    b. Prior to horizontal curve at Cate Street/Bartlett Street intersection, in each direction – W1-1R/L with W13-1P. **The W1-1R & W13-1P signs are shown as requested; however, the sign assembly at Station 16+75 is shown on the left side of the road which is not MUTCD standard placement. Applicant shall relocate this sign assembly to the right side of the road.**

c. At mid-point of horizontal curve at Cate Street/Bartlett Street intersection, outside of curve facing each direction – W1-6R/L (as currently proposed).
Comment is adequately addressed.

d. Eliminate currently proposed W1-6 signs at reverse curves, as these are optional if 25 mph design speed is accommodated.
Comment is adequately addressed.

14. **Comment is adequately addressed.**

15. **Comment is adequately addressed.**

16. **Comment is adequately addressed.**

17. **Comment is adequately addressed.**

18. There is a NO LEFT TURN (R3-2) sign proposed on the site development plans at the easternmost site driveway onto Cate Street (approximate Station 14+40 RT); please clarify the purpose of this turn restriction. To effectively prohibit left turns, it should be done physically, with a raised island. Also, the R3-2 sign should be shown on the Roadway Plans and sign summary sheet.

Comment is adequately addressed. It is noted that the R3-2 sign has been removed.

19. **Comment is adequately addressed.**

Pedestrian and Bicycle Accessibility Review:

20. **Comment is adequately addressed.**

21. **Comment is adequately addressed.**

22. The flashing beacons for the crosswalks should be rectangular rapid flashing beacons, not the circular style shown in the detail. Revise detail on Sheet CD-551.

The flashing beacon detail is still incorrect as shown. The Applicant shall update the detail to meet MUTCD standards per Interim Approval 21.

23. A STOP AHEAD sign should be provided on Bartlett Street in advance of the reconfigured intersection with Cate Street at Station 20+00 per MUCTD standards.

A "Stop Ahead" sign (W3-1A) has been added to the plans at Station 22+00 RT; however, this is not an MUTCD standard sign. Applicant shall use a standard MUTCD sign (e.g. W3-1) as appropriate (see MUTCD figure 2A-4).

General Comments:

24. Overall, the plans are still missing curbing layout details, and lane and shoulder dimensions where changes in width occur. All plans should be checked for completeness.

    Applicant indicated that a curbing and striping plan is forthcoming; however, this is not yet included in the Roadway Plans. We recommend the Applicant add dimensions and labels to fully lay out the striping and curbing on the Roadway Plan and Profile sheets.

25. The proposed drainage modifications in the Cate Street / Bartlett Street intersection should be shown on the plans.

    Shown on Sheet CG-105, at the northwest corner of Bartlett Street and Cate Street, existing CB 3760 is proposed to be impacted by the proposed sidewalk and the drainage structures appear to not have been re-designed accordingly. **The Applicant should provide a proposed drainage design for the northwest corner of Bartlett Street and Cate Street to incorporate disposition of all impacted existing drainage structures and proposed drainage structures.**

    CB 63 at Station 16+50 RT is shown incorrectly in the roadway and should be shown against the new curb line. Applicant should revise CB 63.

    It appears that there is an existing catch basin at Station 15+85 RT that would be impacted by the site driveway curb return. Applicant shall consider relocation of this catch basin to the new curb line.

26. **Comment is adequately addressed.**

27. **Comment is adequately addressed.**

28. The traffic study needs to be updated to reflect the new proposed lane usage on Cate Street Extension at the US Route 1 Bypass intersection.

    The updated Traffic Study Memorandum including analyses of the revised intersection was received on July 26, 2019.

29. For construction details of drain manholes shown on Sheet CD-530, use NHDOT Standard Details.

Applicant did not revise the Drain Manhole detail to be consistent with NHDOT Standard Details.

30. **Comment is adequately addressed.**

31. **Remove R3-XX sign at approximate Station 20+75 RT, as it appears to be redundant with the R3-8(15) sign at Station 21+00 RT.**

32. **Remove the diagonal hatching from the painted median island at the U-Haul driveway intersection. Applicant shall show painted island design to meet NHDOT Standard PM-6.**

33. **The right-turning movement from Cate Street Extension onto US Route 1 Bypass is still problematic. On Sheet CT-101 the WB-62 truck turn encroaching into the southbound side of US Route 1 Bypass is not acceptable. The lanes and/or curb return radius should be modified to eliminate this potential right turn conflict and encroachment into opposing lanes.**

    Applicant shall clarify if the existing mast arm is being relocated with the US Route 1 Bypass work associated with this Cate Street project and to be permitted through NHDOT.

Site Plan Comments:

34. **The parking spaces at the easternmost driveway on Cate Street are too close to the driveway intersection with Cate Street. At least one or two should be eliminated or located elsewhere, so as not to cause conflicts with traffic turning in and out of the driveway.**

35. **On CT-201, the truck backing in behind the retail building will be maneuvering within the pedestrian shared space area. Trucks should be restricted to hours when pedestrians are not expected to be present.**

36. **The Site Plans should include an inverted U-style bike rack detail.**

Traffic Comments:

37. **The traffic analysis shows the left turn phasing on US Route 1 Bypass at the two intersections changing from a leading phase to a lead-lag phase. This change will require the approval of NHDOT, and may not be acceptable to them.**

38. **Any changes to the signal operations, lane use, or alignment at the two US Route 1 Bypass intersections that arise during NHDOT review of the traffic study and require changes to the signal analysis should also be provided to the City for review.**

Upon the receipt of additional, revised, and/or new documentation for the project, TEC reserves the right to provide additional comments as needed. Please do not hesitate to contact us directly at 978-794-1792 if you should have any questions concerning this peer review. Thank you for your consideration.

Sincerely,
TEC, Inc.
"The Engineering Corporation"

Jonathan A. Rockwell, P.E.
Director of Transportation Infrastructure Services
Ext. 1025

Anthony Ciolfi, P.E.
Senior Design Engineer
Ext. 1010

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

Color Code:		Addressed/ Corrected
		Change in progress or confirmation needed

Comment #	Comment	Status	Response
1	Typical Sections on Sheet CS-001 end at Station 15+20. Add typical sections to the limit of work on Cate Street and for work on Bartlett Street as necessary	Addressed	
2	Clarify limits of proposed pavement treatment throughout the work limits (e.g. full depth pavement, cold plane@ overlay, etc). Add notes on the Roadway Plans and/or with corresponding shading included in legend on Sheet CN-003. Also label/shade the section of median island to be removed on US Route 1 Bypass. The Applicant should provide notes or legend within the plans to describe the work being done to the pavement of US Route 1 Bypass, or reference to separate US Route 1 Bypass project plans that will be needed for permitting with NHDOT.	Addressed	CS-101 through CS-106; the full depth vs overlay is delineated and added to the legend
3a	Recommend a 75-foot taper for the exclusive right-turn lane, per NHDOT Standard Plans.	Addressed	The suggested change has been made and is depicted on CS-101

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

Color Code:		Addressed/ Corrected
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Comment #	Comment	Status	Response
3b	Recommend continuing the eastbound widening beyond the U-Haul driveway to the next site driveway at Station 5+00. This would better accommodate the turning movement for U-Haul trucks right onto Cate Street Extension, and create a wider painted median for some separation between eastbound and westbound travel.	Addressed	The suggested change has been made and is depicted on CS-101
3c	Consider a painted island to protect the left turn lane approaching US Route 1 Bypass, with appropriate taper lengths per NHDOT Standard No. PM-6 (see attached sketch).	Addressed	The suggested change has been made and is depicted on CS-101
4a	Applicant should consider adjusting the roadway alignment and adjacent site design to provide a wider roadway with 5' shoulders and use horizontal curves of R=198' to meet a 25 mph design speed, as suggested in the initial peer review letter dated May 13, 2019. It appears that the tangents before and after the reverse curves may be adjusted to create an alignment consistent with a 25 mph design speed (see attached sketch).	Addressed	The suggested change has been made and are depicted on the roadway plans

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

Color Code:		Addressed/ Corrected
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Comment #	Comment	Status	Response
4b	We recommended flattening the centerline radius as much as possible (a radius of R=120' appears to be feasible with adjusted tangents) and match into the existing granite curb on both sides just prior to the bridge abutment at approximate Station 18+35. Consider using a short tangent parallel to the edge of the railroad bridge abutment instead of the reverse curve as shown. This option appears to accommodate 11' lanes and 4' shoulder on the west side. A minor amount of additional widening and sidewalk reconstruction may be necessary within the newly constructed residential development.	Addressed	The suggested change has been made and is depicted on CS-104 and CS-105
5ai	For the site driveway at Station 14+25, the sight distance provided for turns onto Cate Street is approximately 155 feet, which would meet the minimum for 25 mph.	Addressed	The suggested change has been made and is depicted on CT-104

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

Color Code:		Addressed/ Corrected
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Comment #	Comment	Status	Response
5aii	Plans should identify features in front of the town houses and the Applicant shall confirm that any vertical elements within the sight triangles will be low enough to not obstruct sight lines. Also provide note on Roadway Plans and Landscaping Plans indicating that only low height shrubs and ground cover shall be allowed within the sight triangles.	Addressed	The suggested change has been made and is depicted on CT-104. Easements have been added to the Easement plans.
5b	Sight distance easement(s) will be needed to ensure that clear sight triangles may be maintained. Applicant shall show the sight distance triangles and associated easements on Sheet CT-104 or other sheet as appropriate within the Roadway Plans.	Addressed	The suggested change has been made and is depicted on CT-104. Easements have been added to the Easement plans.
6	A minimum of 13 feet (lane plus outside shoulder) should be provided at the westbound right turn lane on Cate Street at US Route 1 Bypass to accommodate snow storage.	Addressed	The suggested change has been made and is depicted on CS-101

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

Color Code:		Addressed/ Corrected
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Comment #	Comment	Status	Response
7	A minimum of 13 feet (lane plus outside shoulder) should be provided for the eastbound lane adjacent to the median island on Cate Street Extension to accommodate snow storage. Note: If the recommendation in Comment #3.b is incorporated, this should provide the minimum 13' width required for snow removal; otherwise, the medium length may need to be reduced.	Addressed	The suggested change has been made and is depicted on CS-101

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

Color Code:		Addressed/ Corrected
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Comment #	Comment	Status	Response
8	The turning path of a WB-62 appears to encroach on the entire width of the bike lane at the beginning of the multi-use path. A bicyclist could get caught and run over by a truck in this area if it doesn't realize that a truck will be coming into its lane. Truck encroachment into the bike lane will not be allowed. The Applicant should explore all options to provide additional lane widening and/or revised alignment. Applicant has addressed comment by adding "Sharrow" bicycle shared lane markings from the beginning of the multi-use path to Bartlett Street. However, Applicant shall correct the direction of the "Sharrow" symbols at approximate Station 15+00, as they are shown in the wrong direction.	Addressed	Bicycled Shared lane markings have been employed in place of "bicycle Lane" markings per MUTCD Section 9C.08 and Figure 9C-9 The dirtection of SHARROW has been corrected

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

Color Code:		Addressed/ Corrected
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Comment #	Comment	Status	Response
9	Please confirm at what speed the truck simulations were made. As currently shown, WB-62 vehicles are using the entire roadway width from curb to curb. If the modeled speed is not reflective of the actual driving conditions, trucks may need more room to navigate the roadway alignment. Note that software simulations typically default to low speeds for presumed intersection turning movements. Revised simulations should be provided for the reverse curve on Cate Street and the turns to/from the south leg of Bartlett Street utilizing the applicable design speed or advisory speed to show an accurate representation of actual driving conditions.	Addressed	The truck turns have been run along the proposed road for 25 mph
10	Please provide a truck turning simulation for the right turn into Ricci Lumber from Bartlett Street. Modifications may be needed to accommodate this turning movement (e.g. shorten the proposed left-turn lane on Bartlett Street).	Addressed	
11	The minimum length of vertical curves should be 3 times the desired design speed (30 mph). Adjust the profile vertical curve lengths accordingly.	Addressed	

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

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Comment #	Comment	Status	Response
12a	The tangent grade of 0.37% should revised and a minimum grade of 0.5% provided for drainage purposes. It appears that the 50-foot vertical curve at Station 2+25 can be removed by combining the tangents before and after.	Addressed	
12b	The 50-foot vertical curve at Station 4+82.7 can also be removed by combining the tangents before and after.	Addressed	
13a	Prior to reverse curves in both directions - W1-3R with W13-1P Applicant shall revise W13-1P signs at Station 9+50 RT and Station 15+75 LT to indicate 25 mph, consistent with the newly revised horizontal geometry that meets a 25 mph design speed. This sign shall also be added to the Sign Details sheet in addition to the 20 mph plaque.	Addressed	Corrections have been made Sign schedule updated.
13b	The W1-1R & W13-1P signs are shown as requested; however, the sign assembly at Station 16+75 is shown on the left side of the road which is not MUTCD standard placement. Applicant shall relocate this sign assembly to the right side of the road.	Addressed	Corrections have been made

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

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Comment #	Comment	Status	Response
13c	At mid-point of horizontal curve at Cate Street/Bartlett Street intersection, outside of curve facing each direction - W1-6R/L (as currently proposed).	Addressed	
13d	Eliminate currently proposed W1-6 signs at reverse curves, as these are optional if 25 mph design speed as accommodated.	Addressed	
14a	Station 5+40 RT - R1-1 sign not labeled	Addressed	
14b	Station 10+92 RT - R1-1 sign not shown or labeled	Addressed	
14c	Station 14+50 RT - R1-1 sign not labeled	Addressed	
15	The lane usage sign R3-8(145) at Station 2+60 LT is the appropriate sign; however, this lane use sign should be placed in advance of the lanes in the buffer strip between the roadway and the 10' side path, at approximate Station 3+50 LT.	Addressed	
16a	Sign at Station 16+65 LT appears to be on other property. Place this pedestrian sign in front of the existing utility pole and within City ROW.	Addressed	
16b	Show new stop sign at Station 23+10 RT outside of the proposed sidewalk.	Addressed	
16c	Move pedestrian sign at Station 19+26 into the ROW.	Addressed	

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

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Comment #	Comment	Status	Response
17	The W11-1 and W16-5R signs at Station 16+70 should be green bike route signs. Revise signs to D11-1 and M6-2 and update sign summary sheet accordingly.	Addressed	
18	There is a NO LEFT TURN (R3-2) sign proposed on the site development plans at the easternmost site driveway onto Cate Street (approximate Station 14+40 RT); please clarify the purpose of this turn restriction. To effectively prohibit left turns, it should be done physically, with a raised island. Also, the R3-2 sign should be shown on the Roadway Plans and sign summary sheet.	Addressed	
19	The Sign Details, sign summary sheet, CD-551 & CD552 should have the signs in correct order per the MUTCD identification number.	Addressed	
20	A pedestrian curb tip-down should be added at a drive curb return at Station 22+90 LT on Bartlett Street.	Addressed	
21	The warning panel and crosswalk at Station 15+00 LT should line up; please revise accordingly.	Addressed	

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

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Comment #	Comment	Status	Response
22	The flashing beacons for the crosswalks should be rectangular rapid flashing beacons, not the circular style shown in the detail. Revise detail on Sheet CD-551. The flashing beacon detail is still incorrect as shown. The Applicant shall update the detail to meet MUTCD standards per Interim Approval 21.	Addressed	Correction has been made
23	A STOP AHEAD sign should be provided on Bartlett Street in advance of the reconfigured intersection with Cate Street at approximate Station 20+00 per MUCTD standards. A “Stop Ahead” sign (W3-1A) has been added to the plans at Station 22+00 RT; however, this is not an MUTCD standard sign. Applicant shall use a standard MUTCD sign (e.g. W3-1) as appropriate (see MUTCD figure 2A-4).	Addressed	Correction has been made
24	Applicant indicated that a curbing and striping plan is forthcoming; however, this is not yet included in the Roadway Plans. We recommend the Applicant add dimensions and labels to fully lay out the striping and curbing on the Roadway Plan and Profile sheets.	Addressed	Correction has been made Provided CS-120 through 123

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

Color Code:		Addressed/ Corrected
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Comment #	Comment	Status	Response
25	The Applicant should provide a proposed drainage design for the northwest corner of Bartlett Street and Cate Street to incorporate disposition of all impacted existing drainage structures and proposed drainage structures. CB 63 at Station 16+50 RT is shown incorrectly in the roadway and should be shown against the new curb line. Applicant should revise CB 63. It appears that there is an existing catch basin at Station 15+85 RT that would be impacted by the site driveway curb return. Applicant shall consider relocation of this catch basin to the new curb line.	Addressed	A catch basin has been added at the low spot on Bartlett Street and a drainage analysis addendum is being provided.
26	The Bartlett Street intersection is the downstream end of the closed drainage system for Cate Street. More exiting detail, flow arrows etc., should be shown to illustrate where the stormwater is going.	Addressed	CG Sheets

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Comment #	Comment	Status	Response
27	The drainage design for the Bartlett Street intersection should seek to reduce the number of drain manholes within the travelled way. The proposed drainage system modifications should remove DMHs and old pipe and construct new CBs along the new curb lines.	Addressed	CG Sheets
28	The traffic study needs to be updated to reflect the new proposed lane usage on Cate Street Extension at the US Route 1 Bypass intersection.	Addressed	
29	For construction details of drain manholes shown on Sheet CD-530, use NHDOT Standard Details.	Addressed	It wasclarified that the Drain Manhole is on sheet CD-520
30a	Pavement mix designs in the ROW shall be approved by the Department of Public Works.	Addressed	
30b	No wire shall be used in concrete sidewalks. Use 4000 PSI cement concrete with fiber reinforcement.	Addressed	
30c	The bituminous path shall consist of 3" hot bituminous pavement, comprised of two lifts of asphalt; mix design shall be approved by the Department of Public Works.	Addressed	
30d	Truncated domes shall be cast iron; shape and configuration shall be approved by the Department of Public Works.	Addressed	

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Color Code:		Addressed/ Corrected
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Comment #	Comment	Status	Response
31	Remove R3-XX sign at approximate Station 20+75 RT, as it appears to be redundant with the R3-8(15) sign at Station 21+00 RT.	Addressed	Redundant Sign removed
32	Remove the diagonal hatching from the painted median island at the U-Haul driveway intersection. Applicant shall show painted island design to meet NHDOT Standard PM-6.	Addressed	diagonal hatch removed
33	The right-turning movement from Cate Street Extension onto US Route 1 Bypass is still problematic. On Sheet CT-101 the WB-62 truck turn encroaching into the southbound side of US Route 1 Bypass is not acceptable. The lanes and/or curb return radius should be modified to eliminate this potential right turn conflict and encroachment into opposing lanes. Applicant shall clarify if the existing mast arm is being relocated with the US Route 1 Bypass work associated with this Cate Street project and to be permitted through NHDOT.	Addressed	This is a design element that will be determined by NHDOT. The projec tis pending review by NHDOT. Any revisions required by NHDOT will be shared with the City of Portsmouth.

TABLE 2

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION ROADWAY DESIGN PEER REVIEW #4

Color Code:		Addressed/ Corrected
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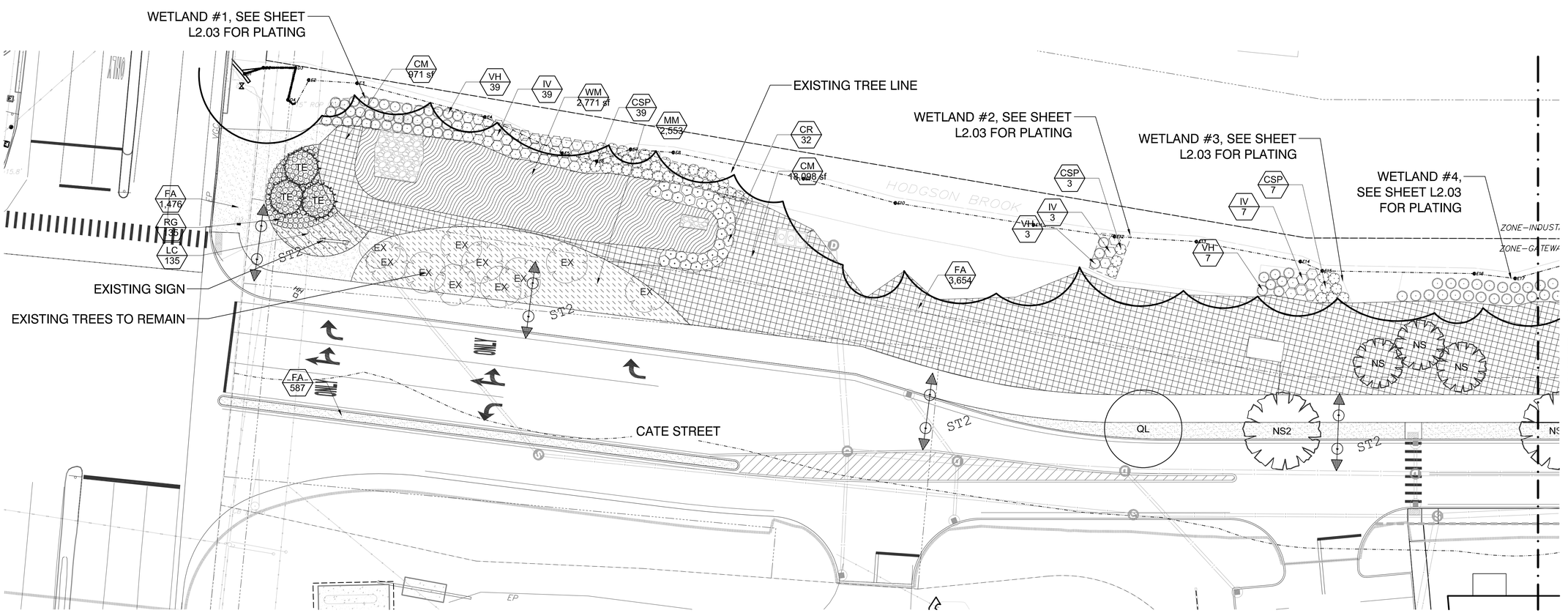
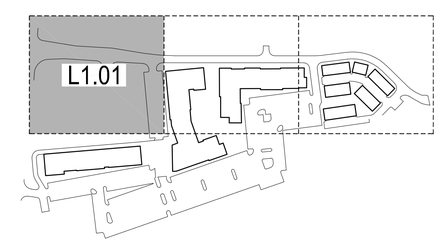
Comment #	Comment	Status	Response
34	The parking spaces at the easternmost driveway on Cate Street are too close to the driveway intersection with Cate Street. At least one or two should be eliminated or located elsewhere, so as not to cause conflicts with traffic turning in and out of the driveway.	Addressed	The Spaces have been shifted south to provide more driveway
35	On CT-201, the truck backing in behind the retail building will be maneuvering within the pedestrian shared space area. Trucks should be restricted to hours when pedestrians are not expected to be present.	Addressed	The Client will provide time restrictions for the loading zone behind the Commercial building. These will be added to the plans on CS-002.
36	The Site Plans should include an inverted U-style bike rack detail.	Addressed	a U-style Bike rack has been added to the details.
37	The traffic analysis shows the left turn phasing on US Route 1 Bypass at the two intersections changing from a leading phase to a lead-lag phase. This change will require the approval of NHDOT, and may not be acceptable to them.	Addressed	This is a design element that will be determined by NHDOT. The projec tis pending review by NHDOT. Any revisions required by NHDOT will be shared with the City of Portsmouth.
38	Any changes to the signal operations, lane use, or alignment at the two US Route 1 Bypass intersections that arise during NHDOT review of the traffic study and require changes to the signal analysis should also be provided to the City for review.	Addressed	This is a design element that will be determined by NHDOT. The projec tis pending review by NHDOT. Any revisions required by NHDOT will be shared with the City of Portsmouth.



PLANT SCHEDULE CATE STREET						
TREES	QTY	BOTANICAL / COMMON NAME	SIZE	ROOT	SPACING	REMARKS
AR	12	Acer rubrum / Red Maple	8 - 10` HT, #10		As Shown	
BN	3	Betula nigra / Rver Birch Multi-Trunk	2.5" cal.			
NS	6	Nyssa sylvatica / Sour Gum	1.5" cal.	B & B		
NS2	9	Nyssa sylvatica / Sour Gum	3" cal.	B & B		
QL	8	Quercus robur x bicolor `Long` / Regal Prince Oak	3" cal.	B & B		
TE	5	Thuja occidentalis `Emerald` / Emerald Arborvitae	6` min.	B & B	6` hgt.	
SHRUBS	QTY	BOTANICAL / COMMON NAME	CONTAINER	MIN. SIZE	SPACING	REMARKS
CA	38	Clethra alnifolia / Summersweet Clethra	1 gal		36" o.c.	
CR	73	Cornus sericea / Red Twig Dogwood	1 gal		48" o.c.	
CS	83	Clethra alnifolia `Ruby Spice` / Ruby Spice Clethra	3 gal		3` o.c.	
CSP	81	Clethra alnifolia / Sweet Pepper Clethra	3 gal		4` o.c.	
HA	86	Hydrangea arborescens / Wild Hydrangea	3 gal		4` o.c.	
IG	68	Ilex glabra / Inkberry Holly	3 gal		3` o.c.	
IV	81	Ilex verticillata / Winterberry	2 gal.		4` o.c.	
IW	87	Ilex verticillata / Winterberry	1 gal		42" o.c.	
MP	34	Myrica pensylvanica / Northern Bayberry	3 gal		36" o.c.	
RG	135	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac	3 gal.		24" o.c.	
VH	135	Vaccinium corymbosum / Highbush Blueberry	2 gal.		4` o.c.	
GROUND COVERS	QTY	BOTANICAL / COMMON NAME	CONTAINER	MIN. SIZE	SPACING	REMARKS
CM	29,688 sf	Conservation Seed Mix / Conservation Seed	SF			Hydroseed
FA	13,198	Festuca arundinacea / Tall Fescue Seed Mix	SF			
LC	135	Liriope spicata / Creeping Lily Turf	1 gal.		18" o.c.	
MM	2,425	Mulch / Hardwood Mulch	SF		12" o.c.	
WM	4,712 sf	Wetland Seed Mix / Wetland Seed	SF			Hydroseed

NOTE:

1. REFER TO SHEET L2.03 FOR INFORMATION REGARDING THE INVASIVE SPECIES REMOVAL.
2. ALL LANDSCAPING WILL BE INSTALLED PER DEPARTMENT STANDARDS. A PRE-PLANTING MEETING WILL BE HELD. CONTACT CORIN HALLOWELL @ 766-1329.



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Scale 1" = 20'

SITE solutions
LANDSCAPE ARCHITECTURE+ LAND PLANNING
3715 Northside Parkway T: 404.705.9411
300 Northcreek, Bldg. 300 F: 404.705.9491
Atlanta, Georgia 30327 www.sitesolutionsla.com

PROFESSIONAL STAMP:

CATE STREET

PREPARED FOR

CATE STREET DEVELOPMENT LLC

SHEET STATUS			
MARK	DATE	BY	RELEASE
A	03/18/2019	SS	TAC SUBMITTAL
B	05/20/2019	SS	TAC RE-SUBMITTAL
C	06/20/2019	SS	TAC RE-SUBMITTAL
D	07/24/2019	JM	TAC RE-SUBMITTAL

SHEET TITLE:

LANDSCAPE PLAN

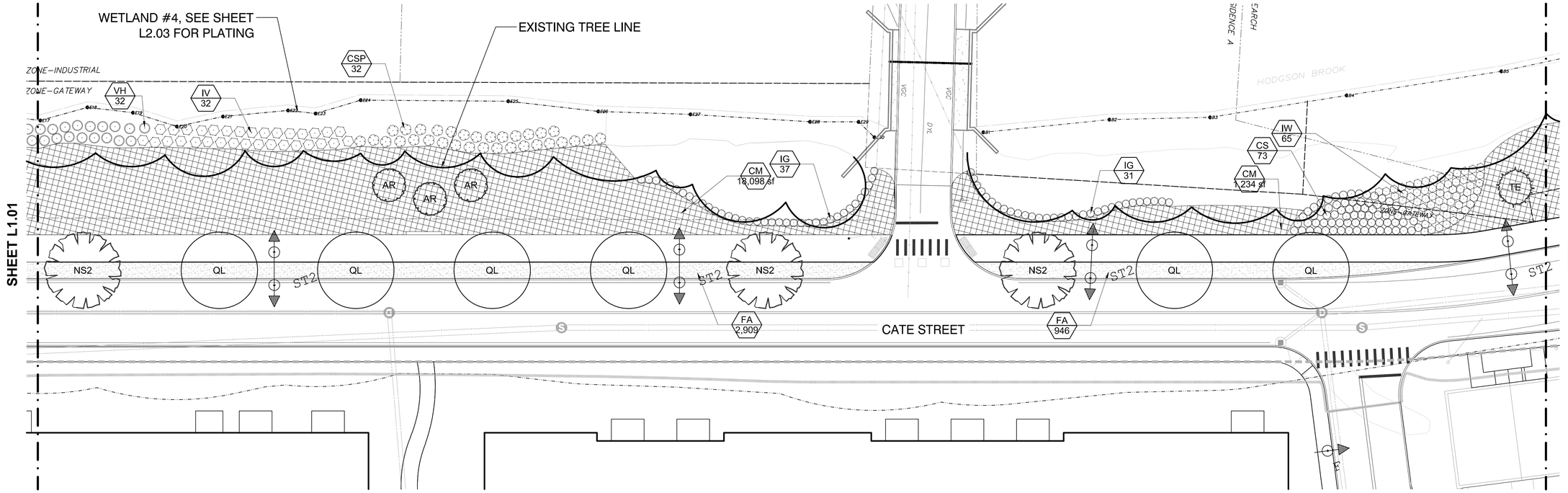
PROJECT NUMBER:

18041.00

L1.01

DATE: 03.18.2019

PERMIT ISSUE



NOTE: FOR AREA OF INVASIVE SPECIES REMOVAL,
SEE DETAIL SHEET L2.03 FOR PLANT LIST

PLANT SCHEDULE CATE STREET						
TREES	QTY	BOTANICAL / COMMON NAME	SIZE	ROOT	SPACING	REMARKS
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BN	3	Betula nigra / River Birch Multi-Trunk	2.5" cal.			
NS	6	Nyssa sylvatica / Sour Gum	1.5" cal.	B & B		
NS2	9	Nyssa sylvatica / Sour Gum	3" cal.	B & B		
QL	8	Quercus robur x bicolor `Long` / Regal Prince Oak	3" cal.	B & B		
TE	5	Thuja occidentalis `Emerald` / Emerald Arborvitae	6` min.	B & B	6` hgt.	
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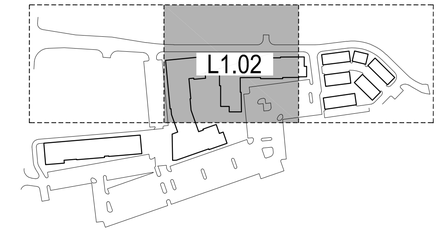

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PROFESSIONAL STAMP:

CATE STREET

PREPARED FOR

CATE STREET DEVELOPMENT LLC

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D	07/24/2019	JM	TAC RE-SUBMITTAL

SHEET TITLE:

LANDSCAPE PLAN

PROJECT NUMBER:
18041.00

L1.02

DATE: 03.18.2019

PERMIT ISSUE

SHEET L1.02

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NS	6	Nyssa sylvatica / Sour Gum	1.5" cal.	B & B		
NS2	9	Nyssa sylvatica / Sour Gum	3" cal.	B & B		
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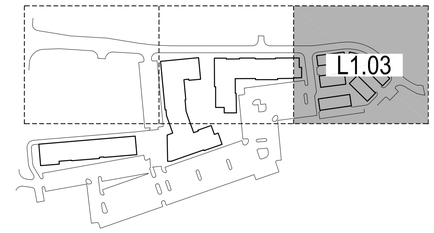
CS	83	Clethra alnifolia `Ruby Spice` / Ruby Spice Clethra	3 gal		3` o.c.	
CSP	81	Clethra alnifolia / Sweet Pepper Clethra	3 gal		4` o.c.	
HA	86	Hydrangea arborescens / Wild Hydrangea	3 gal		4` o.c.	
IG	68	Ilex glabra / Inkberry Holly	3 gal		3` o.c.	
IV	81	Ilex verticillata / Winterberry	2 gal.		4` o.c.	
IW	87	Ilex verticillata / Winterberry	1 gal		42" o.c.	
MP	34	Myrica pensylvanica / Northern Bayberry	3 gal		36" o.c.	
RG	135	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac	3 gal.		24" o.c.	
VH	135	Vaccinium corymbosum / Highbush Blueberry	2 gal.		4` o.c.	
GROUND COVERS	QTY	BOTANICAL / COMMON NAME	CONTAINER	MIN. SIZE	SPACING	REMARKS
CM	29,688 sf	Conservation Seed Mix / Conservation Seed	SF			Hydroseed
FA	13,198	Festuca arundinacea / Tall Fescue Seed Mix	SF			
LC	135	Liriope spicata / Creeping Lily Turf	1 gal.		18" o.c.	
MM	2,425	Mulch / Hardwood Mulch	SF		12" o.c.	
WM	4,712 sf	Wetland Seed Mix / Wetland Seed	SF			Hydroseed



20 0 20 40 60

Scale 1" = 20'

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PROFESSIONAL STAMP:

CATE STREET

PREPARED FOR

CATE STREET DEVELOPMENT LLC

SHEET STATUS

MARK	DATE	BY	RELEASE
A	03/18/2019	SS	TAC SUBMITTAL
B	05/20/2019	SS	TAC RE-SUBMITTAL
C	06/20/2019	SS	TAC RE-SUBMITTAL
D	07/24/2019	JM	TAC RE-SUBMITTAL

SHEET TITLE:

STREAM BUFFER PLAN

PROJECT NUMBER:

18041.00

L1.03

DATE: 03.18.2019

PERMIT ISSUE

LANDSCAPE & SCREENING 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.”

CITY OF PORTSMOUTH PLANTING SPECIFICATIONS:

1. ALL PLANTING HOLES SHALL BE HAND DUG- NO MACHINES-NO EXCEPTIONS.
2. ALL WIRE CAGE AND BURLAP SHALL BE REMOVED FROM TREE AND PLANTING HOLE.
3. THE ROOT COLLAR OF THE TREE SHALL BE 2”-3” ABOVE GRADE.
4. ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH **ORGANIC** COMPOST.
5. ALL PLANTINGS SHALL BE BACKFILLED IN LIFTS AND ALL LIFTS SHALL BE WATERED SO THAT THE PLANTING WILL BE SET AND FREE FROM AIR POCKETS.
6. A RING OF SOIL SHALL BE CREATED AROUND THE PERIMETER OF THE HOLE TO CREATE A WELL FOR WATERING.
7. AT THE TIME THE PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE THOROUGH HYDRATION OF THE ROOTS AND BACKFILL MATERIAL.
8. 2”-3” OF **COMPOSTED** WOODCHIPS SHALL BE PLACED OVER THE PLANTING AREA.
9. STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NON-DAMAGING TO THE TREE.

SITE PLAN NOTE:

ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

LANDSCAPE NOTES:

1) ALL SHRUBS ON PARKING LOT ISLANDS SHOULD BE MAINTAINED AT A HEIGHT OF NO MORE THAN 3 FEET, TO ENSURE SIGHT LINES AT INTERSECTIONS.

Date: July 24, 2019

CATE STREET AND STREAM BUFFER DETAILED PLANT SCHEDULE

Quantity	Botanical Name / Common Name	Plant Size at Installation	Plant Size at maturity	Growth Habit	Salt Tolerance (soil)	Notes
Trees						
12	Acer rubrum / Red Maple	8 - 10` HT.	45' ht.	Broadly Pyramidal	Low	Native
3	Betula nigra / River Birch Multi-Trunk	2.5" cal.	40-70' ht.	Rounded to Pyramidal	Low	Tolerates Salt Spray
6	Nyssa sylvatica / Sour Gum	1.5" cal.	40-70' ht.	Pyramidal	Medium	
9	Nyssa sylvatica / Sour Gum	3" cal.	40-70' ht.	Pyramidal	Medium	
8	Quercus robur x bicolor `Long` / Regal Prince Oak	3" cal.	60' ht.	Columnar	Medium	
5	Thuja occidentalis `Emerald` / Emerald Arborvitae	6` min.	40' ht.	Conically Pyramidal	High	Native
Shrubs						
38	Clethra alnifolia / Summersweet Clethra	1 gal	6' ht.	Spreading / Open	High	Native, Tolerates salt spray
73	Cornus sericea / Red Twig Dogwood	1 gal	4-8' ht.	Rounded		Native, Tolerates salt spray
83	Clethra alnifolia `Ruby Spice` / Ruby Spice Clethra	3 gal	6' ht.	Spreading / Open	High	Native, Tolerates salt spray
81	Clethra alnifolia / Sweet Pepper Clethra	3 gal	6' ht.	Spreading / Open	High	Native, Tolerates salt spray
86	Hydrangea arborescens / Wild Hydrangea	3 gal	4-6' ht.	Spreading / Open		
68	Ilex glabra / Inkberry Holly	3 gal	4-8' ht.	Rounded		Native, Tolerates salt spray
81	Ilex verticillata / Winterberry	2 gal.	6-8' ht.	Spreading / Open		Native. Tolerates salt spray
87	Ilex verticillata / Winterberry	1 gal	6-8' ht.	Spreading / Open		Native. Tolerates salt spray
34	Myrica pensylvanica / Northern Bayberry	3 gal	6'-8' ht.	Rounded	High	Native, Tolerates salt spray
135	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac	3 gal.	2' ht.	Low Spreading	High	
135	Vaccinium corymbosum / Highbush Blueberry	2 gal.	4-8' ht.	Rounded		Native. Two varieties
Ground Cover						
29688	Conservation Seed Mix / Conservation Seed	SF				
13198	Festuca arundinacea / Tall Fescue Grass	SF				
135	Liriope spicata / Creeping Lily Turf	1 gal.	12" ht.	Spreading	Low	
2425	Mulch / Hardwood Mulch	SF				
4712	Wetland Seed Mix / Wetland Seed	SF				

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PROFESSIONAL STAMP:

CATE STREET

PREPARED FOR

CATE STREET DEVELOPMENT LLC

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D	07/24/2019	JM	TAC RE-SUBMITTAL

SHEET TITLE:

LANDSCAPE NOTES & PLANT SCHDULES

PROJECT NUMBER:
18041.00

L1.04

DATE: 03.18.2019

PERMIT ISSUE

NEW ENGLAND WETLAND PLANTS, INC

820 WEST STREET, AMHERST, MA 01002

PHONE: 413-548-8000 FAX 413-549-4000

EMAIL: INFO@NEWP.COM WEB ADDRESS: WWW.NEWP.COM

New England Erosion Control/Restoration Mix For Detention Basins and Moist Sites

Botanical Name	Common Name	Indicator
Elymus riparius	Riverbank Wild Rye	FACW
Schizachyrium scoparium	Little Bluestem	FACU
Festuca rubra	Red Fescue	FACU
Andropogon gerardii	Big Bluestem	FAC
Panicum virgatum	Switch Grass	FAC
Vernonia noveboracensis	New York Ironweed	FACW+
Agrostis perennans	Upland Bentgrass	FACU
Bidens cernua	Nodding Bur Marigold	OBL
Eupatorium maculatum (Eutrochium maculatum)	Spotted Joe Pye Weed	OBL
Eupatorium perfoliatum	Boneset	FACW
Aster novae-angliae (Symphyotrichum novae-anglia	New England Aster	FACW-
Scirpus cyperinus	Wool Grass	FACW
Juncus effusus	Soft Rush	FACW+

PRICE PER LB. $34.00 MIN. QUANITY 3 LBS. **TOTAL:** $102.00 APPLY: 35 LBS/ACRE :1250 sq ft/lb

The New England Erosion Control/Restoration Mix for Detention Basins and Moist Sites contains a selection of native grasses and wildflowers designed to colonize generally moist, recently disturbed sites where quick growth of vegetation is desired to stabilize the soil surface. It is an appropriate seed mix for ecologically sensitive restorations that require stabilization as well as long-term establishment of native vegetation. This mix is particularly appropriate for detention basins that do not hold standing water. Many of the plants in this mix can tolerate infrequent inundation, but not constant flooding. The mix may be applied by hand, by mechanical spreader, or by hydro-seeder. After sowing, lightly rake, roll or cultipack to insure good seed-to-soil contact. Best results are obtained with a Spring or late Summer seeding. Late Fall and Winter dormant seeding requires an increase in the application rate. A light mulching of clean, weed-free straw is recommended

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged. Price is $/bulk pound, FOB warehouse, Plus SH and applicable taxes.

1 SPEC: WETLAND SEED MIX

N.T.S.

NEW ENGLAND WETLAND PLANTS, INC

820 WEST STREET, AMHERST, MA 01002

PHONE: 413-548-8000 FAX 413-549-4000

EMAIL: INFO@NEWP.COM WEB ADDRESS: WWW.NEWP.COM

New England Conservation/Wildlife Mix

Botanical Name	Common Name	Indicator
Elymus virginicus	Virginia Wild Rye	FACW-
Schizachyrium scoparium	Little Bluestem	FACU
Andropogon gerardii	Big Bluestem	FAC
Festuca rubra	Red Fescue	FACU
Sorghastrum nutans	Indian Grass	UPL
Panicum virgatum	Switch Grass	FAC
Chamaecrista fasciculata	Partridge Pea	FACU
Desmodium paniculatum	Panicledleaf Tick Trefoil	
Verbena hastata	Blue Vervain	FACW
Asclepias tuberosa	Butterfly Milkweed	NI
Rudbeckia hirta	Black Eyed Susan	FACU-
Helenium autumnale	Common Sneezeweed	FACW+
Aster pilosus (Symphyotrichum pilosum)	Heath Aster	UPL
Solidago juncea	Early Goldenrod	
Agrostis perennans	Upland Bentgrass	FACU

PRICE PER LB $36.50 MIN. QUANITY 2 LBS. **TOTAL:** $73.00 APPLY: 25 LBS/ACRE :1750 sq ft/lb

The New England Conservation/Wildlife Mix provides a permanent cover of grasses, wildflowers, and legumes
For both good erosion control and wildlife habitat value. The mix is designed to be a no maintenance seeding, and is appropriate for cut and fill slopes, detention basin side slopes, and disturbed areas adjacent to commercial and residential projects.

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged. Price is $/bulk pound, FOB warehouse, Plus SH and applicable taxes.

2 SPEC: CONSERVATION SEED MIX

N.T.S.

RESTORATION SEQUENCE NOTES:

1. EROSION CONTROL WILL BE PLACED AROUND ALL JURISDICTIONAL WETLANDS PRIOR TO THE START OF WORK.
2. INITIAL WORK FOR INVASIVE SPECIES REMOVAL WILL BE PERFORMED WITH GUIDANCE BY STAFF FROM GES INC.
3. INVASIVE SPECIES REMOVAL WILL IDEALLY BE DONE ONCE THE VEGETATION IS MATURE DURING THE LATE SPRING OR EARLY SUMMER TO AID IN IDENTIFICATION. INVASIVE SPECIES VEGETATION WILL INITAILLY BE CUT AS NEEDED TO AVOID THE POTENTIAL SPREAD OF SEEDS. ANY MATERIAL IN "SEED" WILL BE BAGGED AND DISPOSED OF PROPERLY.
4. ALL WORK WILL BE PERFORMED FROM THE UPPER AREA OF THE SITE BY LONG REACH EXCAVATORS. ANY SMALL-SCALE WORK WILL BE DONE BY HAND TO REDUCE BANK IMPACTS AND ELIMINATE ANY UNNEEDED WEEKENING OF THE STABILITY OF THE BANK. NO WORK WILL BE PERFORMED FROM WITHIN THE STREAM.
5. EXCAVATION WORK WILL BEGIN BY REMOVING REMAINING ROOT MATERIAL AND "SEED BANK" FROM THE SLOPE AND ANY DEBRIS.
6. ALL FILL MATERIAL, INCLUDING PAVEMENT, CINDER BLOCKS, CEMENT, TRASH, I.E, BUCKETS, COUCHES, APPLIANCES, EXERCISE EQUIPMENT, ETC., WILL BE REMOVED AND DISPOSED OF PROPERLY.
7. ANY CULVERTS EXISTING IN THE BANK TO BE REMOVED WILL BE SAW CUT OR CRUSHED AND REMOVED. THE REMANING PORTIONS OF CULVERTS WILL BE LEFT IN PLACE AND WILL BE FILLED WITH CEMENT TO CLOSE THEM OFF. THIS WILL REDUCE THE ADDITIONAL BANK IMPACT RESULTING FROM THEIR REMOVAL ENTIRELY.
8. ANY DEBRIS REMOVAL NEAR MATURE TREE ROOTS WILL BE PERFORMED BY HAND SHOVEL OR SMALL MACHINE TO REDUCE DAMAGE TO ROOT STRUCTURE.
9. CLEAN TOP SOIL WILL BE ADDED TO AREAS OF REMOVED MATERIALS, INCLUDING CULVERT ENDS. THIS MATERIAL WILL BE LEVELED TO CREATE A SMOOTH BANK TO BE PLANTED.
10. THE FOLLOWING SPECIES WILL BE PLANTED IN RANDOM SPACING AT THE SPECIFIED NUMBERS AND SPACING IN EACH RESTORATION AREA BELOW: HIGHBUSH BLUEBERRY (VACCINIUM CORYMBOSUM), WINTERBERRY (ILEX VERTICILATTA), SWEET PEPPER BUSH (CLETHERA ALNIFOLIA). ANY EXPOSED AREAS WILL BE SEEDED WITH AN EROSION CONTROL SEED MIX @ 35LBS/ACRE. THIS WORK WILL BE PERFOMRED BY HAND TOOLS. ALL PLANTS ARE TO BE IN 1-2 GALLON POTS AS AVAILABLE AT THE TIME OF THE PLANTING. PLANTS WILL BE LAID OUT PER THE RESTORATION PLAN IN RANDOM ORDER. HOLES WILL BE DUG BY HAND FOR PLANTING. ONCE PLANTED THE HOLES WILL BE BROUGHT LEVEL WITH ADDITIONAL SOIL. THE ENTIRE EXPOSED SLOPES WILL BE SEEDED AS SPECIFIED AND WILL BE COVERED WITH JUTE MATTING AFTER TO ELIMINATE EROSION. SUPPLEMENTAL WATERING WILL OCCUR SHOULD THERE NOT BE SIGNIFICANT RAINFALL.

IMPACT AREA 1 WILL HAVE 1,875 SF OF DISTURBANCE. THIS WILL BE PLANTED WITH A TOTAL OF 117 PLANTS AT A SPACING OF 4' OC

39- HIGHBUSH BLUEBERRY (VACCINIUM CORYMBOSUM),

39- WINTERBERRY (ILEX VERTICILATTA)

39- SWEET PEPPER BUSH (CLETHERA ALNIFOLIA),

IMPACT AREA 2 WILL HAVE 148 SF OF DISTURBANCE. THIS WILL BE PLANTED WITH A TOTAL OF 9 PLANTS AT A SPACING OF 4' OC

3- HIGHBUSH BLUEBERRY (VACCINIUM CORYMBOSUM),

3- WINTERBERRY (ILEX VERTICILATTA)

3- SWEET PEPPER BUSH (CLETHERA ALNIFOLIA),

IMPACT AREA 3 WILL HAVE 344 SF OF DISTURBANCE. THIS WILL BE PLANTED WITH 21 TOTAL PLANTS AT 4' OC SPACING

7- HIGHBUSH BLUEBERRY (VACCINIUM CORYMBOSUM),

7- WINTERBERRY (ILEX VERTICILATTA)

7- SWEET PEPPER BUSH (CLETHERA ALNIFOLIA),

IMPACT AREA 4 WILL HAVE 3,412 SF OF DISTURBANCE. THIS WILL BE PLANTED WITH A TOTAL OF 96 PLANTS AT A SPACING OF 6' OC.

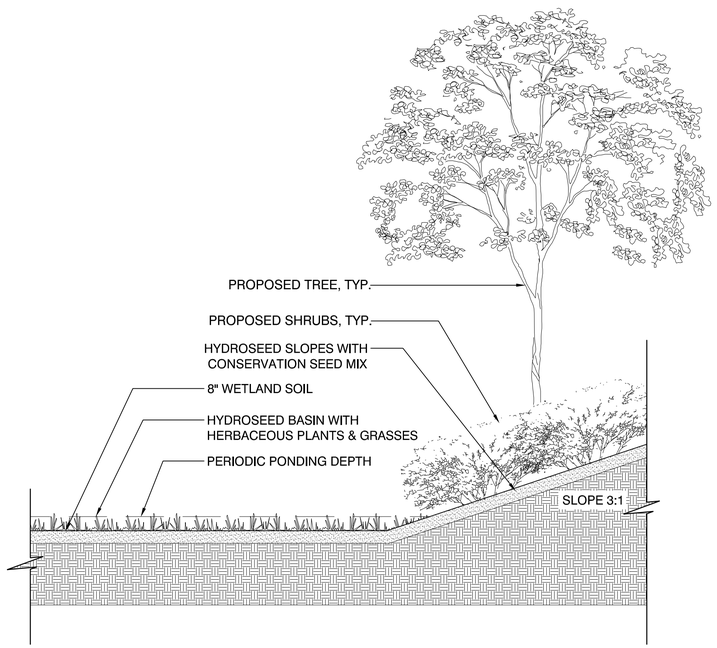
32- HIGHBUSH BLUEBERRY (VACCINIUM CORYMBOSUM),

32- WINTERBERRY (ILEX VERTICILATTA)

32- SWEET PEPPER BUSH (CLETHERA ALNIFOLIA),

10. MONITORING OF THE RESTORATION AREAS WILL BE DONE UNDER THE DIRECTION OF THE NHDES WETLANDS BUREAU, AS THESE AREAS FALL UNDER THEIR JURISDICTON.

5 DETAIL: RESTORATION SEQUENCE NOTES



3 DETAIL: WATER CONSERVATION POND

1/4" = 1'-0"

City of Portsmouth Tree Planting Requirements

The base of the City of Portsmouth Tree Planting Requirements is the *ANSI A300 Part 6 Standard Practices for Planting and Transplanting*. ANSI A300 Part 6 lays out terms and basic standards as set forth by industry but it is NOT the "end all" for the City of Portsmouth. The following are the City of Portsmouth, NH Tree Planting Requirements that are in addition to or that go beyond the ANSI A300 Part 6.

1. All planting holes shall be dug by hand- **NO MACHINES**. The only exceptions are **new** construction where new planting pits, planting beds with granite curbing, and planting sites with Silva Cells are being created. If a machine is used to dig in any of these situations and planting depth needs to be raised the material in the bottom of the planting hole MUST be firmed with machine to prevent sinking of the root ball.

2. **ALL** Wire and Burlap shall be removed from the root ball **AND** planting hole.

3. The root ball of the tree shall be worked so that the root collar of the tree is visible and no girdling roots are present.

4. The root collar of the tree shall be 2"-3" above grade of planting hole for finished depth.

5. All plantings shall be backfilled with soil from the site and amended no more than 20% with Organic Compost. The only exceptions are new construction where engineered soil is being used in conjunction with Silva Cells and where new planting beds are being created.

6. All plantings shall be backfilled in three lifts and **ALL** lifts shall be watered so the planting will be set and free of air pockets- **NO EXCEPTIONS**.

7. An earth berm shall be placed around the perimeter of the planting hole except where curbed planting beds or pits are being used.

8. 2"-3" of mulch shall be placed over the planting area.

9. At the time the planting is complete the planting shall receive additional water to ensure complete hydration of the roots, backfill material and mulch layer.

10. Stakes and guys shall be used where appropriate and/or necessary. Guy material shall be non-damaging to the tree.

11. All planting stock shall be specimen quality, free of defects, and disease or injury. The City of Portsmouth, NH reserves the right to refuse/reject any plant material or planting action that fails to meet the standards set forth in the *ANSI A300 Part 6 Standard Practices for Planting and Transplanting* and/or The City of Portsmouth, NH Planting Requirements.

4 DETAIL: CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS

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D	07/24/2019	JM	TAC RE-SUBMITTAL

SHEET TITLE:

LANDSCAPE DETAILS

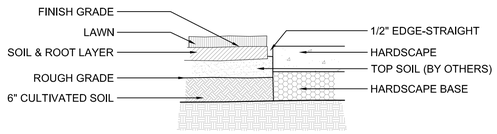
PROJECT NUMBER:

18041.00

L2.01

DATE: 03.18.2019

PERMIT ISSUE

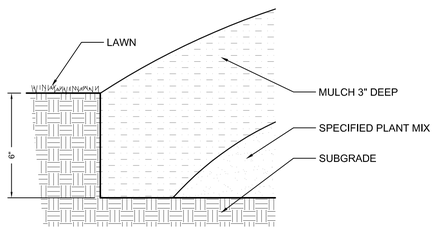


INSTALLATION NOTES:

1. GENERAL CONTRACTOR TO PROVIDE GRADES TO WITHIN TWO TENTH OF A FOOT FOR PROPOSED GRADES.
2. CULTIVATE TO A DEPTH OF 6".
3. FINE GRADE AS REQUIRED TO REACH FINISH GRADE PER CIVIL DRAWINGS.
4. APPLY LIME AND FERTILIZER, AS SPECIFIED.
5. APPLY PRE-EMERGENT HERBICIDE PER MANUFACTURE'S RECOMMENDATION.
6. LAY SOD & ROLL LEVEL.
7. WATER ENTIRE AREA THOROUGHLY.
8. 1. INSTALL SOD SO THAT THE TOP OF SOIL & ROOT LAYER IS LEVEL WITH TOP OF PAVEMENT

1 SECTION: TYP. SOD INSTALLATION

SCALE: N.T.S.

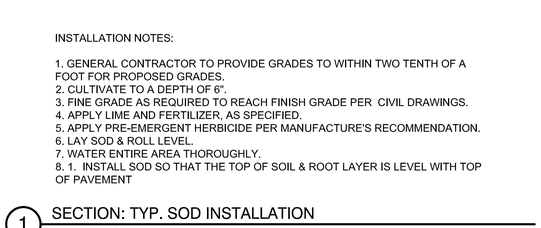


NOTES:

1. TRENCH EDGE IS TO BE LOCATED BETWEEN ALL PLANTING BEDS & LAWN AREAS.

2 SECTION: TRENCH EDGE

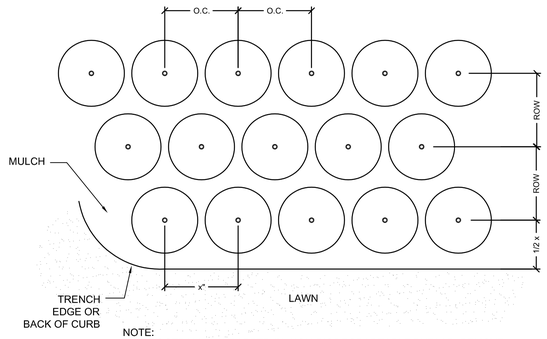
SCALE: NTS



NOTES:
1. IF ROOTBALL IS WRAPPED IN NON-BIODEGRADEABLE BURLAP, REMOVE ENTIRE WRAP AFTER PLACED IN PIT.

3 SECTION: TYP. CONTAINERIZED SHRUB PLANTING

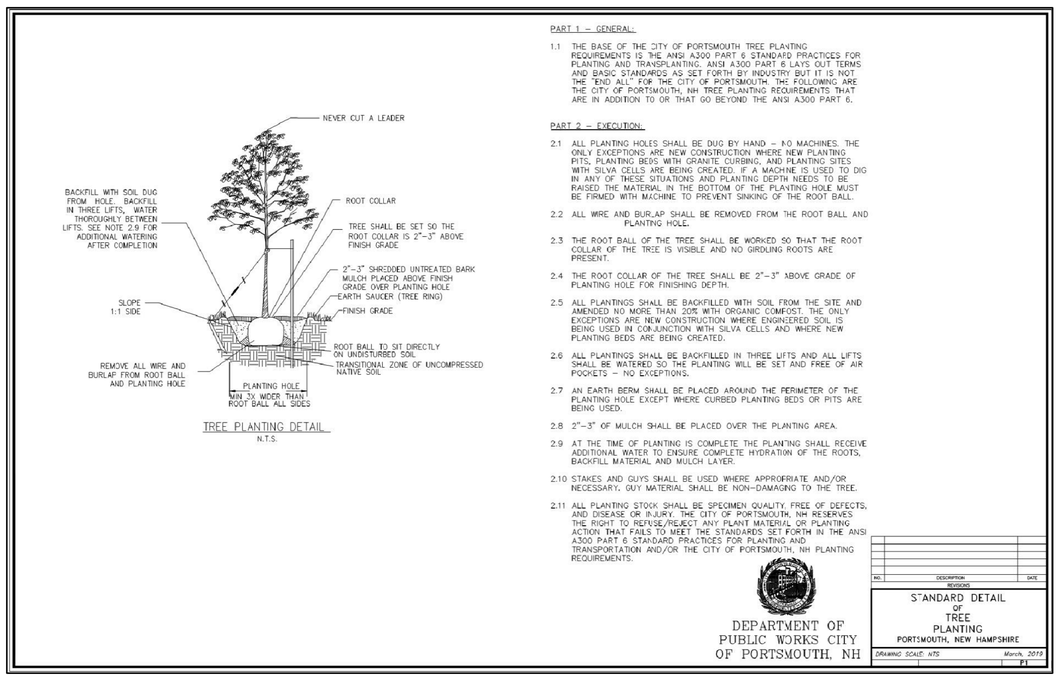
SCALE: NTS



NOTE:
1. IF ROOTBALL IS WRAPPED IN NON-BIODEGRADEABLE BURLAP, REMOVE ENTIRE WRAP AFTER PLACED IN PIT.
2. 'X'= TYP. ON CENTER SPACING AS SHOWN ON PLANT SCHEDULE
3. ALL ROWS TO BE STRAIGHT AND PARALLEL

4 PLAN: TYP. PLAN MASS SPACING

SCALE: NTS



TREE PLANTING DETAIL
N.T.S.

PART 1 – GENERAL:

1.1 THE BASE OF THE CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS IS THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING. ANSI A300 PART 6 LAYS OUT TERMS AND BASIC STANDARDS AS SET FORTH BY INDUSTRY BUT IT IS NOT THE "END ALL" FOR THE CITY OF PORTSMOUTH. THE FOLLOWING ARE THE CITY OF PORTSMOUTH, NH TREE PLANTING REQUIREMENTS THAT ARE IN ADDITION TO OR THAT GO BEYOND THE ANSI A300 PART 6.

PART 2 – EXECUTION:

2.1 ALL PLANTING HOLES SHALL BE DUG BY HAND – NO MACHINES. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE NEW PLANTING PITS, PLANTING BEDS WITH GRANITE CURBING, AND PLANTING SITES WITH SILVA CELLS ARE BEING CREATED. IF A MACHINE IS USED TO DIG IN ANY OF THESE SITUATIONS AND PLANTING DEPTH NEEDS TO BE RAISED THE MATERIAL IN THE BOTTOM OF THE PLANTING HOLE MUST BE FIRMED WITH MACHINE TO PREVENT SINKING OF THE ROOT BALL.

2.2 ALL WIRE AND BUR-AP SHALL BE REMOVED FROM THE ROOT BALL AND PLANTING HOLE.

2.3 THE ROOT BALL OF THE TREE SHALL BE WORKED SO THAT THE ROOT COLLAR OF THE TREE IS VISIBLE AND NO GIRDLING ROOTS ARE PRESENT.

2.4 THE ROOT COLLAR OF THE TREE SHALL BE 2"–3" ABOVE GRADE OF PLANTING HOLE FOR FINISHING DEPTH.

2.5 ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH ORGANIC COMPOST. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE ENGINEERED SOIL IS BEING USED IN CONJUNCTION WITH SILVA CELLS AND WHERE NEW PLANTING BEDS ARE BEING CREATED.

2.6 ALL PLANTINGS SHALL BE BACKFILLED IN THREE LIFTS AND ALL LIFTS SHALL BE WATERED SO THE PLANTING WILL BE SET AND FREE OF AIR POCKETS – NO EXCEPTIONS.

2.7 AN EARTH BERM SHALL BE PLACED AROUND THE PERIMETER OF THE PLANTING HOLE EXCEPT WHERE CURBED PLANTING BEDS OR PITS ARE BEING USED.

2.8 2"–3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.

2.9 AT THE TIME OF PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE COMPLETE HYDRATION OF THE ROOTS, BACKFILL MATERIAL AND MULCH LAYER.

2.10 STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NON–DAMAGING TO THE TREE.

2.11 ALL PLANTING STOCK SHALL BE SPECIMEN QUALITY, FREE OF DEFECTS, AND DISEASE OR INJURY. THE CITY OF PORTSMOUTH, NH RESERVES THE RIGHT TO REFUSE/REJECT ANY PLANT MATERIAL OR PLANTING ACTION THAT FAILS TO MEET THE STANDARDS SET FORTH IN THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPORTATION AND/OR THE CITY OF PORTSMOUTH, NH PLANTING REQUIREMENTS.

NO.	DESCRIPTION REVISIONS	DATE

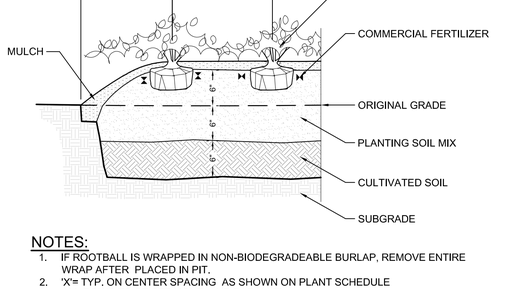
DEPARTMENT OF PUBLIC WORKS CITY OF PORTSMOUTH, NH

STANDARD DETAIL OF TREE PLANTING
PORTSMOUTH, NEW HAMPSHIRE

DRAWING SCALE: NTS — March, 2019

5 DETAIL: TREE PLANTING

SCALE: NTS

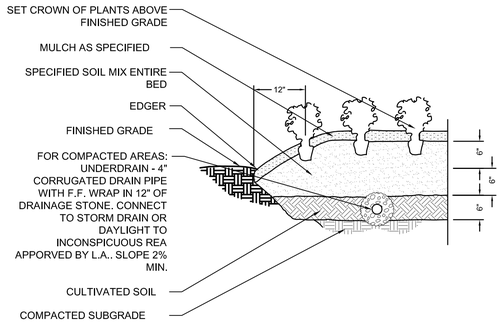


NOTES:

1. IF ROOTBALL IS WRAPPED IN NON-BIODEGRADEABLE BURLAP, REMOVE ENTIRE WRAP AFTER PLACED IN PIT.
2. 'X'= TYP. ON CENTER SPACING AS SHOWN ON PLANT SCHEDULE
3. ALL ROWS TO BE STRAIGHT AND PARALLEL
4. TYP. BED INSTALLATION DETAIL FOR ERICACEOUS PLANT MATERIAL (RHODODENDRON, AZALEAS, PIERIS, ECT.)

6 SECTION: TYP. ERICACEOUS PLANT MATERIAL INSTALL.

SCALE: NTS



NOTES:

1. REFER TO SPECIFICATIONS FOR FERTILIZATION REQUIREMENTS.

7 SECTION: SEASONAL COLOR & PERENNIAL BED PREP.

SCALE: NTS

1. Contractor to carefully examine the contract documents and existing conditions before submitting bid proposal or commencing work.
2. Damage to existing utilities or site improvements caused by the contractor are the full responsibility of contractor.
3. Contractor's base bid to include all materials, labor, permits, equipment, tools, insurance, ETC. to perform the work as described in the contract documents.
4. Contractor to complete work within schedule established by owner.
5. Contractor to provide one year warranty for all material from date of substantial completion.
6. Provide unit price for all materials (installed cost) listed on the plant schedule.
7. Contractor to provide interim maintenance (watering, pruning, fertilizing, guying, mowing, trimming, adequate drainage of ponding areas, edging, weeding, mulching, application of insecticides/herbicides, and general landscape clean-up) until substantial completion notice is provided by the owner or landscape architect.
8. Perform work in compliance with all applicable laws, codes, and regulations required by authorities having jurisdiction over such work and provide for permits required by local authorities.
9. Topsoil shall be natural, fertile, friable, sandy clay loam capable of sustaining plant growth, free of stones, stumps, ETC.
10. For all turf lawn areas spread 2-3" of topsoil into existing soil to a depth of 6" below finish grade. Hand rake finished grades to provide even contours.
11. All planted material shall be equivalent in quality to specimen grade or better, as noted by the American Association of Nurserymen, latest edition. All trees of lesser quality shall be rejected by the city arborist.
12. Plant material to be free of disease, insect pests, eggs, or larvae. Damaged plant material shall be rejected.
13. Mulch to be clean, fresh, new, double shredded bark, 3 inches deep.
14. Test plant beds and plant pits for adequate drainage. Work shall be made by the contractor at no additional cost to owner. Hardpan or moisture barriers shall be broken, or drain pipes to be installed to provide proper drainage of plant areas. Plant pits shall be excavated to the bottom of the pit. Fill each plant pit with water and observe the pit for 2 hours. If the water has not dissipated by 50% within 2 hours, notify the landscape architect of such in writing before installing plants In the questionable area(s), otherwise contractor shall be held liable for the livability of the plant. In hardpan conditions where water does not drain within 2 hours, install drain pipes as per tree planting in compacted soil area detail.
15. Trees shall be Installed 2-3" above finish grade In hardpan areas unless otherwise directed to provide drainage.
16. Plant beds shall be neatly edged using a 3" wide by 6" wide deep trench. Provide 2/1 side slope behind trench edge.
17. Ground cover, shrub mass beds shall be cultivated to a depth of 12 inches below grade to break through compacted or hardpan soil. Remove all stones, roots, and inferlor material. Add specified soil amendments and fertilizer. Elevate entire bed 6 inches above original grade. Rake to a consistent smooth surface. Install plants, edge bed area, mulch and water thoroughly.
18. Set all plants plumb and turned so that the most attractive side is viewed.
19. Plants shall be measured to their main structure, not tip to tip of branches.
20. Remove top one-third burlap of B & B wrapping. Remove all binding. If rootball is wrapped in non-biodegradeable burlap, remove entire wrap after placed in pit.
21. Tree pit and shrub pit to be twice the size of the root mass. Fill with plant mix. See details.
22. Broken root balls for trees shall be rejected.
23. Any plant materials shipped to site In uncovered vehicles/ trailer shall be rejected regardless of season.
24. Space shrubs, ground cover, and seasonal color evenly and in straight rows.
25. All tree scars over 1 -1/2" shall be rejected and tree to be replaced.
26. All shrubs to be dense and full. All trees to have a symmetrical growth habit (360 degrees) unless uncharacteristic to plant type.
27. Scarify root mass of shrubs and ground cover before installing.
28. Remove all excess growth of trees and shrubs as directed by landscape architect. Do not cut central leader.
29. Layout all plant material according to landscape drawings. Receive approval of all layouts before installation. Adjustments to the layout shall be made by the landscape architect. Landscape contractor to make adjustments to layout at no additional cost to the owner. Landscape contractor responsible for adjustment of layout in order to avoid utilities. Notify landscape architect of contemplated adjustments to the layout and receive approval before commencing.
30. General contractor to provide grades to two-tenths (.20+) of a foot of proposed finish grades.
31. All shrubs shall be dense and well-branched from bottom to top and all sides. "Leggy" shrubs will be rejected by L.A.
32. Owner or landscape architecture shall review project at completion of installation for substantial completion. Final completion shall be given at the end of the warranty period If all items are completed to the owner's satisfaction. Contractor shall be notified in writing of substantial and final completion dates.
33. See civil drawings for further information regarding: erosion sediment control information, locations of existing and proposed structures, paving, driveways, cut and fill areas, and retention areas, limits of construction, locations of existing and proposed utilities or easements.
34. Contractor shall collect three (3) soil samples of existing soil from areas on site to receive planting for testing. Each soil sample shall be approximately 1 kg. (1 gal. zlp lock bag) In volume and will receive the following tests by A&L Agricultural Labs:
- s1-a
- s3
- texture analysis
- infiltration

34. Sight lines may not be obstructed between a height of 30-inches and 84-inches above the crown of the roadway surface. The property owner must maintain all landscaping according to this requirement at all times.

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300 Northcreek, Bldg. 300 F: 404.705.9491
Atlanta, Georgia 30327 www.sitesolutionsla.com

PROFESSIONAL STAMP:

CATE STREET

PREPARED FOR CATE STREET DEVELOPMENT LLC

SHEET STATUS			
MARK	DATE	BY	RELEASE
A	03/18/2019	SS	TAC SUBMITTAL
B	05/20/2019	SS	TAC RE-SUBMITTAL
C	06/20/2019	SS	TAC RE-SUBMITTAL
D	07/24/2019	JM	TAC RE-SUBMITTAL

SHEET TITLE:

LANDSCAPE DETAILS

PROJECT NUMBER:
18041.00

L2.02

DATE: 03.18.2019

PERMIT ISSUE

New Hampshire Invasive Species Committee

NH Invasive Plant Species Watch List

Approved by the ISC April 11, 2018

The NH Invasive Plant Species Watch List is a non-regulatory reference tool that serves to:

a. identify potentially invasive non-native plant species based on degree of invasive qualities (e.g., aggressive growth, rapid reproduction, and/or lack of natural herbivores) and presence (but not necessarily abundance) in NH and/or nearby elsewhere in New England;
b. inform prevention (e.g., early detection/rapid response), monitoring, and management decision-making for species that may impact NH's ecosystems or economy; and
c. increase awareness of invasive plant species.

Scientific Name	Synonyms	Common Name
Abutilon theophrasti Medik.		Velvetleaf Indian-mallow
Acer ginnela Maxim.		Amur maple
Agrostemma githago L. var. *githago*	*Lychnis githago* (L.) Scop.	Common corncockle
Aira caryophyllea L.	*Aspris caryophyllea* (L.) Nash	Common silver-hairgrass
Allium vineale L.		Crow garlic
Amorpha fruticosa L.	*Amorpha fruticosa* L. var. *angustifolia* Pursh; *A. fruticosa* L. var. *oblongifolia* Palmer; *A. fruticosa* L. var. *tennesseensis* (Shuttlw. *ex* Kunze) Palmer	False indigo-bush
Aralia elata (Miq.) Seem.	*Dimorphanthus elatus* Miq.	Japanese angelica-tree
Barbarea vulgaris Ait. f.	*Barbarea arcuata* (Opiz *ex* J. & K. Presl) Reichenb.; *B. stricta*, of authors not Andrz.; *B. vulgaris* var. *arcuata* (Opiz *ex* J. & K. Presl) Fries; *Campe barbarea* (L.) W. Wight *ex* Piper; *C. stricta*, of authors not (Andrz.) W. Wight *ex* Piper; *Erysimum barbarea* L.	Garden yellow-rocket
Brassica juncea (L.) Czern.	*Brassica juncea* (L.) Czern. var. *crispifolia* Bailey; *Sinopis juncea* L.	Chinese mustard
Brassica nigra (L.) W.D.J. Koch	*Sinopis nigra* L.	Black mustard
Bromus tectorum L.	*Anisantha tectorum* (L.) Nevski	Cheat brome
Cardamine impatiens L.		Narrow-leaved bitter-cress
Centaurea jacea L.	*Centaurea debeauxii* Gren. & Godr. ssp. *thuillieri* Dostál; *C. jacea* L. ssp. *decipiens* (Thuill.) Čelak.; *C. jacea* L. ssp. *pratensis* Čelak.; *C. pratensis* Thuill.; *C. thuillieri* (Dostál) J. Duvign. & Lambinon; *Cyanus jacea* (L.) P. Gaertn.; *Jacea pratensis* Lam.	Brown knapweed
Centaurea nigra L.	*Jacea nigra* (L.) Hill	Black knapweed

Scientific Name	Synonyms	Common Name
Chelidonium majus L.	*Chelidonium majus* L. var. *laciniatum* (P. Mill.) Syme; *C. majus* L. var. *pleiosum* Wehrhahn	Greater celandine
Cirsium palustre (L.) Scop.	*Carduus palustris* L.	Marsh thistle
Cirsium vulgare (Savi) Ten.	*Carduus lanceolatus* L.; *C. vulgaris* Savi; *Cirsium lanceolatum* (L.) Scop.	Common thistle
Convolvulus arvensis L.	*Strophocaulos arvensis* (L.) Small	Field bindweed
Cytisus scoparius (L.) Link	*Spartium scoparium* L.	Scotch broom
Digitaria sanguinalis (L.) Scop.	*Panicum sanguinale* L.	Hairy crabgrass
Eichhornia crassipes (Mart.) Solms-Laubach	*Eichhornia speciosa* Kunth; *Piaropus crassipes* (Mart.) Raf.	Common water-hyacinth
Elymus repens (L.) Gould	*Agropyron repens* (L.) Gould; *Elytrigia repens* (L.) Desv. *ex* B.D. Jackson; *Triticum repens* L.	Creeping wild-rye
Epilobium hirsutum L.		Hairy willow-herb
Epipactis helleborine (L.) Crantz	*Epipactis latifolia* (L.) All.; *Serapias helleborine* L.	Broad-leaved helleborine
Euonymus europaeus L.		European spindle-tree
Euonymus fortunei (Turcz.) Hand.-Mazz	*Euonymus fortunei* (Turcz.) Hand.-Mazz var. *radicans* (Sieb. *ex* Miq.) Rehd.; *E. fortunei* (Turcz.) Hand.-Mazz var. *vegetus* (Rehd.) Rehd.; *E. radicans* Sieb. *ex* Miq. var. *vegetus* Rehd.	Climbing spindle-tree
Festuca filiformis Pourret	*Festuca capillata* Lam.; *F. ovina* L. var. *capillata* (Lam.) Alef.; *F. tenuifolia* Sibthorp	Fine-leaved sheep fescue
Ficaria verna Huds. ssp. *fertilis* (Lawralrée *ex* Laegaard) Stace	*Ficaria verna* Huds. ssp. *bulbifera* A. & D. Löve; *Ranunculus ficaria* L. ssp. *bulbilifer* Lambinon; *R. ficaria* L. ssp. *bulbifera* (Marsden-Jones) Lawalree, an illegitimate name; *R. ficaria* var. *bulbifera* Marsden-Jones	Fig-crowfoot
Froelichia gracilis (Hook.) Moq.	*Oplotheca gracilis* Moq.	Slender cotton-weed
Galium mollugo L.		Whorled bedstraw
Glechoma hederacea L.	*Glechoma hederacea* L. var. *micrantha* Moric.; *G. hederacea* L. var. *parviflora* (Benth.) House; *Nepeta hederacea* (L.) Trevisan	Gill-over-the-ground
Hylotelephium telephium (L.) H. Ohba	*Sedum purpureum* (L.) J.A. Schultes; *S. purpurascens* W.D.J. Koch; *S. telephium* L.	Purple orpine
Kochia scoparia (L.) Schrad.	*Bassia scoparia* (L.) A.J. Scott; *Chenopodium scoparium* L.; *Kochia scoparia* (L.) Schrad. var. *pubescens* Fenzl; *K. scoparia* (L.) Schrad. var. *subvillosa* Moq.	Summer-cypress
Lamium amplexicaule L. var. *amplexicaule*		Common henbit

Scientific Name	Synonyms	Common Name
Lamium purpureum L.	*Lamium dissectum* With.; *L. hybridum*, of authors not Vill.	Red henbit
Lonicera xylosteum L.		Fly honeysuckle
Lupinus polyphyllus Lindl. var. *polyphyllus*	*Lupinus pallidipes* Heller; *L. polyphyllus* Lindl. var. *albiflorus* L.H. Bailey; *L. polyphyllus* Lindl. var. *pallidipes* (Heller) C.P. Sm.	Blue lupine
Lychnis flos-cuculi L. ssp. *flos-cuculi*	*Coronaria flos-cuculi* (L.) A. Braun; *Silene flos-cuculi* (L.) Clairville	Ragged robin lychnis
Lysimachia arvensis (L.) U. Manns & A. Anderb.	*Anagallis arvensis* L.; *A. arvensis* L. var. *caerulea* (Schreb.) Gren. & Godr.; *A. caerulea* Schreb.	Scarlet pimpernel
Lysimachia vulgaris L.		Garden yellow-loosestrife
Miscanthus sinensis Anderss.	*Miscanthus sinensis* Anderss. var. *gracillimus* A.S. Hitchc.	Chinese silvergrass
Mycelis muralis (L.) Dumort.	*Lactuca muralis* (L.) Fresen.	Wall-lettuce
Myosotis scorpioides L.	*Myosotis palustris* (L.) Hill	Water forget-me-not
Nasturtium microphyllum Boenn. *ex* Reichenb.	*Nasturtium officinale* Ait. f. var. *microphyllum* (Boenn. *ex* Reichenb.) Thellung; *Rorippa microphylla* (Boenn. *ex* Reichenb.) Hyl. *ex* A. & D. Löve	One-rowed water-cress
Nasturtium officinale Ait. f.	*Baeumerta nasturtium-aquaticum* (L.) Hayek; *Rorippa nasturtium aquaticum* (L.) Hayek; *Sisymbrium nasturtium-aquaticum* L.	Two-rowed water-cress
Oenanthe javanica (Blume) DC		Java water dropwort
Persicaria longiseta (Bruijn) Kitagawa	*Persicaria caespitosa* (Blume) Nakai var. *longiseta* (Bruijn) Reed; *Polygonum caespitosum* Blume var. *longisetum* (Bruijn) Steward; *P. longisetum* Bruijn	Oriental lady's-thumb sma'tweed
Phellodendron amurense Rupr.	*Phellodendron amurense* Rupr. var. *sachalinense* F. Schmidt; *P. japonicum* Maxim.; *P. sachalinense* (F. Schmidt) Sarg.	Amur corktree
Poa compressa L.		Flat-stemmed blue grass
Poa nemoralis L.		Wood blue grass
Populus alba L.	*Populus alba* L. var. *bolleana* Lauche	White poplar
Ranunculus repens L.	*Ranunculus repens* L. var. *degenerates* Schur; *R. repens* L. var. *erectus* DC.; *R. repens* L. var. *glabratus* DC.; *R. repens* L. var. *pleniflorus* Fern.; *R. repens* L. var. *villosus* Lamotte	Spot-leaved crowfoot
Raphanus raphanistrum L. ssp. *raphanistrum*		Wild radish

Scientific Name	Synonyms	Common Name
Rhinanthus minor L. ssp. *minor*	*Rhinanthus crista-galli* L., in part; *R. crista-galli* L. var. *fallax* (Wimmer & Grab.) Druce; *R. stenophyllus* (Schur) Schinz & Thellung	Little yellow-rattle
Rumex acetosella L. ssp. *pyrenaicus* (Pourret *ex* Lapeyr.) Akeroyd	*Acetosella vulgaris* (Koch) Fourr. ssp. *pyrenaica* (Pourret *ex* Lapeyr.) Á. Löve; *Rumex acetosella* L. var. *pyrenaicus* (Pourret *ex* Lapeyr.) Timbal-Lagrave; *R. pyrenaicus* Pourret *ex* Lapeyr.	Sheep dock
Securigera varia (L.) Lassen	*Coronilla varia* L.	Purple crown-vetch
Silphium perfoliatum L.		Cup-plant rosinweed
Sinapis arvensis L.	*Brassica arvensis* Rabenh.; *B. kaber* (DC.) L.C. Wheeler; *B. kaber* (DC.) L.C. Wheeler var. *pinnatifida* (Stokes) L.C. Wheeler	Corn charlock
Solanum carolinense L. var. *carolinense*		Carolina nightshade
Solanum dulcamara L.		Climbing nightshade
Sonchus arvensis L.	*Sonchus arvensis* L. ssp. *uliginosus* (Bieb.) Nyman; *S. uliginosus* Bieb.	Field sow-thistle
Sorbaria sorbifolia (L.) A. Braun	*Schizonotus sorbifolius* (L.) Lindl.; *Spiraea sorbifolia* L.	False spiraea
Tanacetum vulgare L.	*Chrysanthemum uliginosum* Pers.; *C. vulgare* (L.) Bernh.	Common tansy
Tussilago farfara L.		Coltsfoot
Typha xglauca Godr.		Hybrid cattail
Valeriana officinalis L.		Common valerian
Vinca minor L.		Lesser periwinkle

Taxonomy: Haines, A. 2015 (November 17). Tracheophyte Checklist of New England. Website: http://www.arthurhaines.com/tracheophyte-checklist.

Fact Sheet:
Prohibited Invasive Plant Species Rules, Agr 3800

New Hampshire
Department of Agriculture, Markets & Food

Updated 01/31/2017

This fact sheet is a synopsis of the adopted rules on invasive plant species and is intended for general use by the nursery and landscape industry, plant growers, plant dealers, general public, State Agencies, and Municipalities. A complete copy of the rules can be accessed on the internet at http://agriculture.nh.gov/topics/plants_insects.htm.

In accordance with the Invasive Species Act, HB 1258-FN, the NH Department of Agriculture, Markets & Food, Division of Plant Industry is the lead state agency responsible for the evaluation, publication and development of rules on invasive plant species for the purpose of protecting the health of native species, the environment, commercial agriculture, forest crop production, or human health. The rule, Agr 3800, states "**No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1, New Hampshire prohibited invasive species list**".

New Hampshire Prohibited Invasive Plant Species List

Scientific name	Synonyms	Common name
Acer platanoides L.	*Acer platanoides* var. *schwedleri* Niehols.	Norway maple
Ailanthus altissima (P. Mill.) Swingle	*Ailanthus glandulosa* Desv.	Tree of heaven
Alliaria petiolata (Bieb.) Cavara & Grande	*Alliaria alliaria* (L.) Britt.; *Alliaria officinalis* Andrz. *ex* Bieb.; *Erysimum alliaria* L.; *Sisymbrium alliaria* (L.) Scop.	Garlic mustard
Alnus glutinosa (L.) Gaertn.	*Alnus alnus* (L.) Britt.; *Betula alnus* L. var. *glutinosa* L.	European black alder
Berberis thunbergii DC.		Japanese barberry
Berberis vulgaris L.		European barberry
Celastrus orbiculatus Thunb.		Oriental bittersweet
Centaurea stoebe L. ssp. *micranthos* (Gugler) Hayek	*Centaurea biebersteinii* DC.; *Centaurea maculosa* Lam., misapplied; *Centaurea maculosa* Lam. ssp. *micranthos* Gugler	Spotted knapweed
Cynanchum louiseae Kartesz & Gandhi	*Cynanchum nigrum* (L.) Pers.; *Vincetoxicum nigrum* (L.) Pers.	Black swallow-wort
Cynanchum rossicum (Kleopow) Borhidi	*Cynanchum medium*, of authors not R. Br.; *Vincetoxicum medium*, of authors not (R. Br.) Dcne.; *Vincetoxicum rossicum* (Kleopow) Barbarich	Pale swallow-wort
Elaeagnus umbellata Thunb. var. *parvifolia* (Royle) Schneid.	*Elaeagnus parvifolia* Royle	Autumn olive
Euonymus alatus (Thunb.) Sieb.	*Celastrus alatus* Thunb.	Burning bush
Frangula alnus P. Mill.	*Rhamnus frangula* L.	Glossy buckthorn
Glyceria maxima (Hartman) Holmb.	*Glyceria spectabilis* Mert. & Koch; *Molinia maxima* Hartman	Reed sweet grass
Heracleum mantegazzianum Sommier & Levier		Giant hogweed
Hesperis matronalis		Dames rocket

Impatiens glandulifera Royle	*Impatiens roylei* Walp.	Ornamental jewelweed
Iris pseudacorus L.		Water-flag
Lepidium latifolium L.	*Cardaria latifolia* (L.) Spach	Perennial pepperweed
Ligustrum obtusifolium Sieb. & Zucc. var. *obtusifolium*	*Ligustrum obtusifolium* var. *leiocalyx* (Nakai) H. Hara	Blunt-leaved privet
Ligustrum vulgare L.		Common privet
Lonicera japonica Thunb.	*Nintooa japonica* (Thunb.) Sweet	Japanese honeysuckle
Lonicera maackii (Rupr.) Herder*		Amur honeysuckle*
Lonicera morrowii Gray*		Morrow's honeysuckle*
Lonicera tatarica L.*		Tartarian honeysuckle*
Lonicera ×bella Zabel*	*Lonicera morrowii × L. tatarica*	Bella honeysuckle*
Lysimachia nummularia L.		Moneywort
Microstegium vimineum (Trin.) A. Camus	*Andropogon vimineum* Trin.; *Eulalia viminea* (Trin.) Kuntze	Japanese stilt grass
Persicaria perfoliata (L.) H. Gross	*Ampelygonum perfoliatum* (L.) Roberty & Vautier; *Polygonum perfoliatum* L.	Mile-a-minute weed
Pueraria montana (Lour.) Merr. var. *lobata* (Willd.) Maesen & S. Almeida	*Dolichos lobatus* Willd.; *Pueraria lobata* (Willd.) Ohwi; *Pueraria thunbergiana* (Sieb. & Zucc.) Benth.	Kudzu
Reynoutria japonica Houtt. var. *Japonica*	*Fallopia japonica* (Houtt.) R. Decr.; *Pleuropterus cuspidatus* (Sieb. & Zucc.) Moldenke; *Polygonum cuspidatum* Sieb. & Zucc.	Japanese knotweed
Reynoutria sachalinensis (F. Schmidt *ex* Maxim.) Nakai	*Fallopia sachalinensis* (F.S. Petrop. *ex* Maxim.) R. Decr.; *Polygonum sachalinense* F. Schmidt *ex* Maxim.	Giant knotweed
Reynoutria ×bohemica Chrtek & Chrtková	*Fallopia japonica × F. sachalinensis*; *Fallopia ×bohemica* (Chrtek & Chrtková) J.P. Bailey; *Polygonum ×bohemicum* (Chrtek & Chrtková) P.F. Zika & A.L. Jacobson	Bohemia knotweed
Rhamnus cathartica L.		Common buckthorn
Rosa multiflora Thunb. *ex* Murr.		Multiflora rose

Variance: Persons conducting temporary scientific studies, which may include hybridization of seedless species may apply for a variance to do so by contacting the NH Department of Agriculture, Markets & Food, Division of Plant Industry.

For additional Information

Douglas Cygan, Invasive Species Coordinator
New Hampshire Department of Agriculture
Division of Plant Industry
State Lab Building, Lab D
29 Hazen Drive
Concord, NH 03301
(603) 271-3488
douglas.cygan@agr.nh.gov
http://www.agriculture.nh.gov/divisions/plant-industry/invasive-plants.htm

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Atlanta, Georgia 30327 www.sitesolutionsla.com

PROFESSIONAL STAMP:

CATE STREET

PREPARED FOR

CATE STREET DEVELOPMENT LLC

SHEET STATUS

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SHEET TITLE:

LANDSCAPE DETAILS

PROJECT NUMBER:
18041.00

L2.03

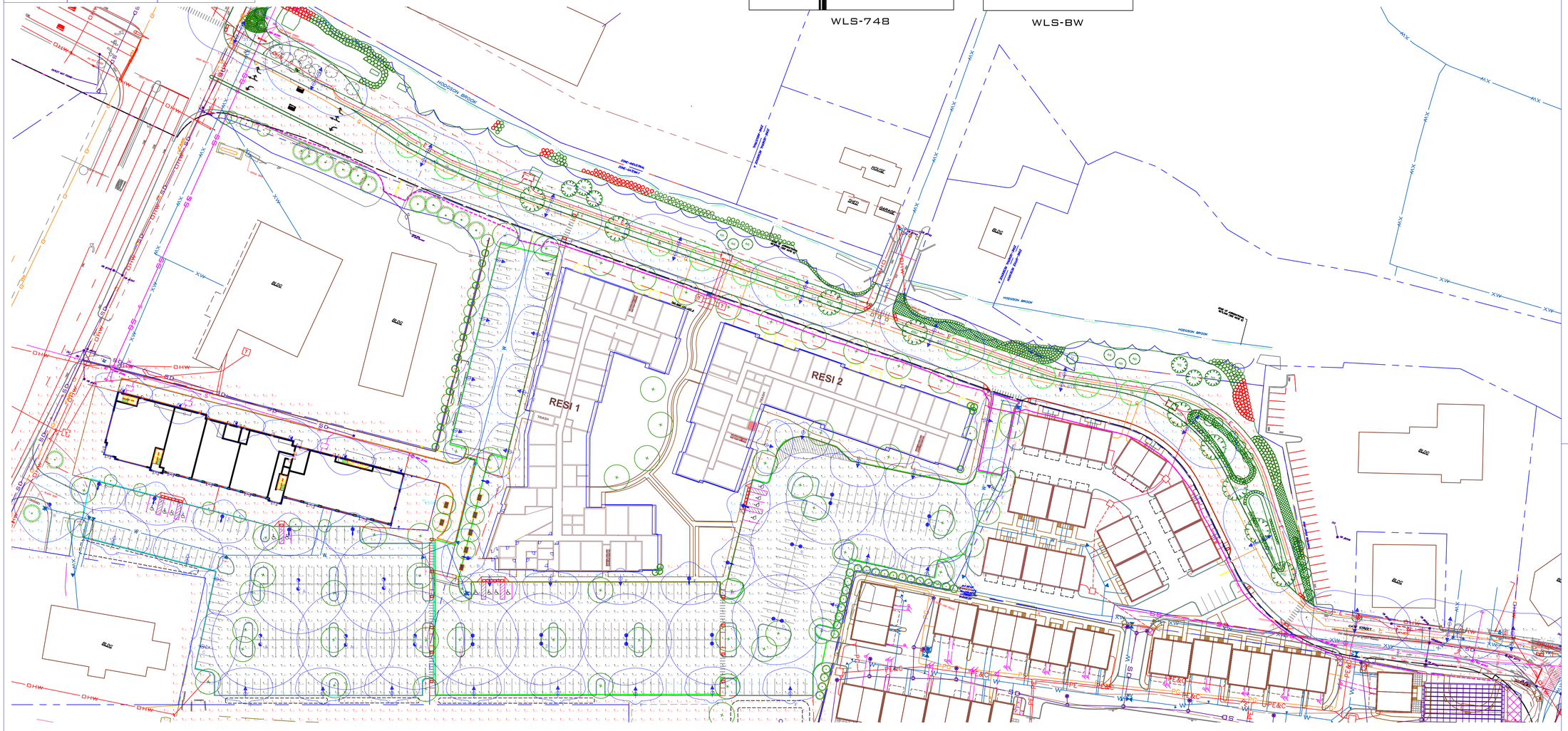
DATE: 03.18.2019

PERMIT ISSUE

REVISIONS					
Rev #	Date	BY:	5	6/20/19	TO
1	12/10/18	TO	6	6/23/19	TO
2	3/17/19	TO	7	7/10/19	TO
3	5/16/19	TO			
4	5/19/19	TO			

WLS-748

WLS-BW



ENERGY SERVICES GROUP OF WLS

1-800-633-8711 - WWW.WLSLIGHTING.COM

Based on the information provided, all dimensions and luminaire locations shown represent recommended positions. The engineer and/or architect must determine applicability of the layout to existing or future field conditions.

This lighting pattern represents illumination levels calculated from laboratory data taken under controlled conditions utilizing current industry standard lamp ratings in accordance with Illuminating Engineering Society approved methods. Actual performance of any manufacturer's luminaire may vary due to variation in electrical voltage, tolerance in lamps and other variable field conditions.

Calculation Summary							
Label	Avg	Max	Min	Avg/Min	Max/Min	PtSpcLr	PtSpcTb
CATE ST ENTRANCE	1.8	4.4	0.9	2.0	4.9	10	10
RESIDENTIAL PARKING	2.8	6.4	0.8	3.5	8.0	10	10
RETAIL PARKING	3.6	7.1	1.1	3.3	6.5	10	10
RETAIL REAR AND SIDE	2.3	4.7	0.3	7.8	15.7	10	10

Luminaire Schedule

WLS14527 WEST END YARDS PORTSMOUTH, NH PM: ROBBY PLEASE EMAIL ROBBY AT RRUDASILL@WLSLIGHTING.COM FOR PRICING.

Symbol	Qty	Label	Lumens	LLF	Description	Lum. Watts
	5	A	N.A.	0.950	WLS-748-135W-5F-4K 20' MOUNTING HEIGHT	135
	1	B	N.A.	0.950	WLS-748-135W-5F-4K 20' MOUNTING HEIGHT	135
	4	C	N.A.	0.950	WLS-748-135W-4F-4K-HS 20' MOUNTING HEIGHT	135
	8	D	N.A.	0.950	WLS-748-110W-5F-4K 20' MOUNTING HEIGHT	110
	10	E	N.A.	0.950	WLS-748-80W-4F-4K 16' MOUNTING HEIGHT	80
	28	F	N.A.	0.950	WLS-748-80W-4F-4K-HS 16' MOUNTING HEIGHT	80
	6	G	N.A.	0.980	WLS-BW-70-2M-4K ASST MOUNTING HEIGHT	70
	13	ST2	9316	0.900	AFFIN-S801-80W-30K-T2-10-M 25' MOUNTING HEIGHT	80

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FORT WORTH, TX 76110
WWW.WLSLIGHTING.COM

WLS LIGHTING SYSTEMS

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WEST END YARDS
PORTSMOUTH, NH

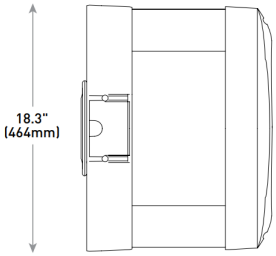
WLS-14527A | DATE - 11/16/18 | SCALE: 1"=60' | PM: ROBBY | BY: TO | 800-633-8711 | SHEET 1 OF 1

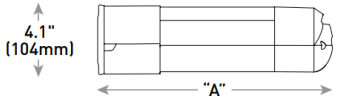
WLS LIGHTING SYSTEMS

Type:

BW SERIES LED SECURITY WALL PACK

DIMENSIONS





Wattage	Dim. "A"	Weight
25	9.9" (251mm)	20 lbs. (9.1kg)
37	9.9" (251mm)	20 lbs. (9.1kg)
50	9.9" (251mm)	20 lbs. (9.1kg)
46	11.9" (303mm)	22 lbs. (10.0kg)
70	11.9" (303mm)	22 lbs. (10.0kg)
93	11.9" (303mm)	22 lbs. (10.0kg)
66	13.9" (353mm)	25 lbs. (11.3kg)
101	13.9" (353mm)	25 lbs. (11.3kg)
134	13.9" (353mm)	25 lbs. (11.3kg)

Made in the U.S.A. of the U.S. and imported parts.
Meets Buy American requirments for ARRA.

WLS LIGHTING SYSTEMS
1919 Windsor Place
Fort Worth, TX 76110
800.622.8711
www.wlslighting.com

SPECIFICATIONS

GENERAL DESCRIPTION - The BW Series wall mount luminaire has a slim, low profile design. The luminaire end caps are made from rugged die cast aluminum with integral, weathertight LED driver compartments and high performance aluminum heat sinks specifically designed for LED applications. Housing is rugged aluminum. Includes a lightweight mounting box for installation over standard and mud ring single gang J-Boxes. Secures to wall with four 3/16" (5mm) screws (by others). Conduit entry from top, bottom, sides and rear. Allows mounting for uplight or downlight. Designed and approved for easy through-wiring. Includes leaf/debris guard.
Applications: General area and security lighting

CONSTRUCTION & MATERIALS
- Slim, low profile design
- Luminaire sides are rugged die cast aluminum with integral, weathertight LED driver compartment and high performance aluminum heat sinks specifically designed for LED applications
- Housing is rugged aluminum
- Furnished with low copper, light weight mounting box designed for installation over standard and mud ring single gang J-Boxes
- Luminaire can also be direct mounted to a wall and surface wired
- Secures to wall with four 3/16" (5mm) screws (by others)
- Conduit entry from top, bottom, sides, and rear
- Allows mounting for uplight or downlight
- Designed and approved for easy through-wiring
- Includes leaf/debris guard
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultradurable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Black, bronze, silver and white are available. Custom colors are available. Please contact your sales professional for details.
- Weight: See Dimensions and Weight Chart below.

ELECTRICAL SYSTEM
- Input Voltage: 120–277V or 347–480V, 50/60Hz, Class 1 drivers
- Power Factor: > 0.9 at full load
- Total Harmonic Distortion: < 20% at full load
- Integral weathertight J-Box with leads (wire nuts) for easy power hook up
- Integral 10kV surge suppression protection standard
- When code dictates fusing, a slow blow fuse or type C/D breaker should be used to address in rush current
- Maximum 10V Source Current: 20 LED (350mA): 10mA; 20LED (525 & 700 mA) and 40-120 LED: 0.15mA

REGULATORY & VOLUNTARY QUALIFICATIONS
- cULus Listed
- Suitable for wet locations
- Meets FCC Part 15, Subpart B, Class A standards for conducted and radiated emissions
- Enclosure rated IP66 per IEC 60529 when ordered without P, PML or ML options
- 10kV surge suppression protection tested in accordance with IEEE/ANSI C62.41.2
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- DLC qualified with select SKUs. Refer to https://www.designlights.org/search/ for most current information
- Meets Buy American requirements within ARRA

Project Name: _____
Date: _____
Location: _____
Notes: _____

29 REV. 04/18

BW SERIES LED SECURITY WALL PACK

ORDERING INFORMATION SELECT APPROPRIATE CHOICE FROM EACH COLUMN TO FORMULATE ORDER CODE.

Refer to example below.

PRODUCT	WATTAGE	OPTIC	SERIES	VOLTAGE	COLOR OPTIONS	OPTIONS
BW	**25** 25 Watts **37** 37 Watts **50** 50 Watts **46** 46 Watts **70** 70 Watts **93** 93 Watts **66** 66 Watts **101** 101 Watts **134** 134 Watts	**2M** Type II Medium **2MB** Type II Medium w/BLS **2S** Type II Short **2SB** Type II Short w/BLS **3M** Type III Medium **3MB** Type III Medium w/BLS **4M** Type IV Medium **4MB** Type IV Medium w/BLS	**E**	**UL** Universal 120-277V **UH** Universal 347-480V **34** 347V	**BK** Black **BZ** Bronze **SV** Silver **WH** White **CC**[2] Custom Color	**DIMS**[1] 0-10V Dimming (525mA maximum) **F**[3,4] Fuse **PC**[5] Photocell **ML** Multi Level **NO** No Options
ORDER:						
WLS-BW			**E**			

Example: WLS-BW-50-3M-E-UH-WH-NO

FOOTNOTES:

1 Control by others.
2 Contact your sales professional for details
3 When code dictates fusing use time delay fuse.
4 Not available when UH voltage is selected.
5 Must specify voltage other than UL or UH.

ELECTRICAL DATA						
System Watts 120-480V	Total Current (A)					
	120V	208V	240V	277V	347V	480V
25	0.21	0.13	0.11	0.10	0.08	0.07
46	0.36	0.23	0.21	0.20	0.15	0.12
66	0.52	0.31	0.28	0.26	0.20	0.15
37	0.30	0.19	0.17	0.16	0.12	0.10
70	0.58	0.34	0.31	0.28	0.21	0.16
101	0.84	0.49	0.43	0.38	0.30	0.22
50	041	0.25	0.22	0.20	0.15	0.12
93	078	0.46	0.40	0.36	0.27	0.20
134	1.14	0.65	0.57	0.50	0.39	0.29

WLS LIGHTING SYSTEMS

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www.wlslighting.com

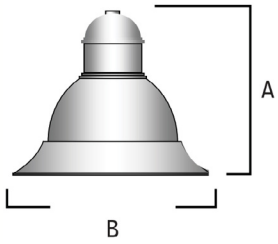
Project Name: _____
Date: _____
Location: _____
Notes: _____

29 REV. 04/18

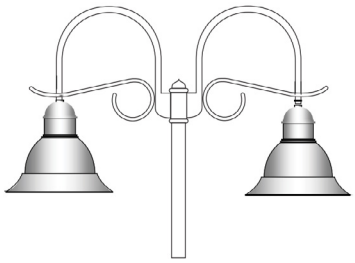
WLS LIGHTING SYSTEMS

Type:

748-DOM SERIES



TWIN MOUNTED OPTIONS



Made in the U.S.A. of the U.S. and imported parts.
Meets Buy American requirments for ARRA.

WLS LIGHTING SYSTEMS
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Specifications:

Housing

In a round shape, this housing is made of die cast A380 aluminum, c/w a watertight grommet, mechanically assembled to the bracket with four bolts 5/16 18 UNC. This suspension system permits for a full rotation of the luminaire in 90° increments.

Access-mechanism

A die cast A360 aluminum technical ring with latch, hinge and a cast in decorative skirt. The mechanism shall offer tool free access to the inside of the luminaire. An embedded memory retentive gasket shall ensure weatherproofing.

Light engine

LEDgine composed of 5 main components: **Heat Sink / Lens / LED lamp / Driver / Optical System**

Electrical components are RoHS compliant.

LED engine

LED type: Philips Lumileds LUXEON T. Composed of high-performance white LEDs. Color temperature as per ANSI/NEMA bin Neutral White, 4000 Kelvin nominal (3985K +/- 275K or 3710K to 4260K) or Warm white, 3000 Kelvin nominal (3045K +/- 175K or 2870K to 3220K), CRI 70 Min. 75 Typical.

Lens

LExF / LExS: Made of soda lime tempered glass lens, mechanically assembled and sealed onto the lower part of the heat sink.
LExA (Globe): Made of one-piece seamless injection-molded impact-resistant (DR) acrylic having an inner prismatic surface. The globe is mechanically assembled and sealed onto the lower part of the heat sink.

Heat sink

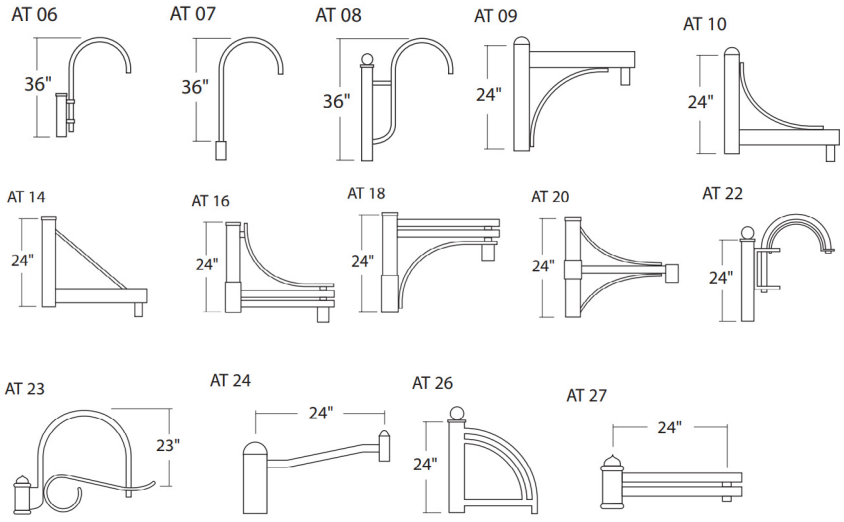
Made of cast aluminum optimizing the LEDs efficiency and life. Product does not use any cooling device with moving parts (only passive cooling device).

Driver

Driver comes standard with dimming compatible 0-10V. High power factor of 95%. Electronic driver, operating range 50/60 Hz. Auto adjusting universal voltage input from 120 to 277 VAC rated for both application line to line or line to neutral, Class I, THD of 20% max. Maximum ambient operating temperature from 40F(40C) to 130F(55C) degrees. Certified in compliance to UL1310 cULus requirement. Dry and damp location. Assembled on a unitized removable tray with Tyco quick disconnect plug resisting to 221F(105C) degrees. The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction. Standard built in driver surge protection of 2.5kV (min).

Optical system

Composed of high performance optical grade PMMA acrylic refractor lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. Optical system is rated IP66. Performance shall be tested per LM 63, LM 79 and TM 15 (IESNA) certifying its photometric performance. Street side indicated. Flat lens (F optics) is Dark Sky compliant with 0% uplight and U0 per
IESNA TM 15.



Project Name: _____

Date: _____

Location: _____

Notes: _____

02, 03 REV. 9/17

748-DOM SERIES

ORDERING INFORMATION
SELECT APPROPRIATE CHOICE FROM EACH COLUMN TO FORMULATE ORDER CODE.
Refer to example below.

SERIES	ARM STYLE	DISTRIBUTION	LAMP WATTAGE	COLOR TEMPERATURE	LENS	LINE VOLTAGE[2]	LUMINAIRE FINISH	OPTIONS
748-DOM	**AT06** **AT07** **AT08** **AT09** **AT10** **AT14** **AT16** **AT18** **AT20** **AT22** **AT23** **AT24** **AT26** **AT27**	**2** Type II **3** Type III **5** Type V **FP** Perimeter Forward Throw	**35W** **55W** **70W** **72W** **80W** **90W** **108W** **110W** **135W** **145W** **180W**	**30K** 3000K **40K** 4000K	**FG** Flat Glass Lens **SG** Sag Glass Lens **GL** Globe	**480V** **MT**[3] Multi Tap **TT**[4] Tri-Tap	**BRZ** Bronze **BLK** Black **PLT** Platinum **BUF** Buff **WHT** White **GRN** Green **CC** Custom Color	**BKS** Back Light Shield **BKT-WM** Wall Mount Plate **SF** Single Fusing **DF** Double Fusing **PC** Photocell **NO** No Options
ORDER:								
WLS-748-DOM								

Wiring

Gauge (#14) TEW/AWM 1015 or 1230 wires, 6" (152mm) minimum exceeding from luminaire.

Hardware

All exposed screws shall be complete with Ceramic primer-seal base coat to reduce seizing of the parts and offers a high resistance to corrosion. All seals and sealing devices are made and/or lined with EPDM and/or silicone and/or rubber.

Dimensions

EPA: 1.35 ft² max.
Weight: 42 lbs (19.1kg) max.

Luminaire useful life

Refer to IES files for energy consumption and delivered lumens for each option. Based on ISTMT in situ thermal testing in accordance with UL1598 and UL8750, Philips System Reliability Tool, Philips Advance data and Philips Lumileds LM-80/TM-21 data, expected to reach 100,000+ hours with >L70 lumen maintenance @ 25°C. Luminaire Useful Life accounts for LED lumen maintenance AND all of these additional factors including: LED life, driver life, PCB substrate, solder joints, on/off cycles, burning hours and corrosion. Entire luminaire is rated for operation in ambient temperature of -40°C / -40°F up to +35°C / +95°F.

Quality control

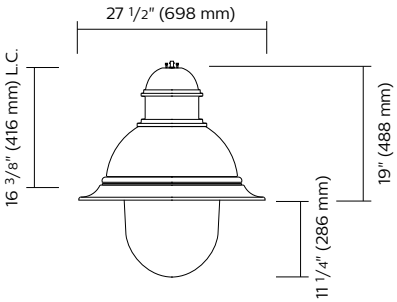
Manufactured to ISO 9001 2008 standards and ISO 14001-2004 International Quality Standards Certification.

Vibration resistance

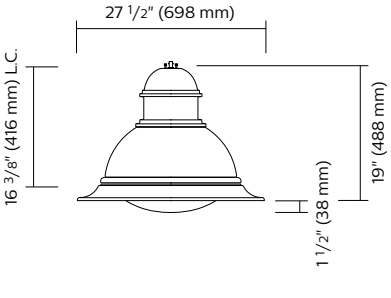
Meets the ANSI C136.31, American National Standard for Roadway Luminaire Vibration specifications for Bridge/overpass applications. (Tested for 3G over 100 000 cycles)

Certifications and Compliance

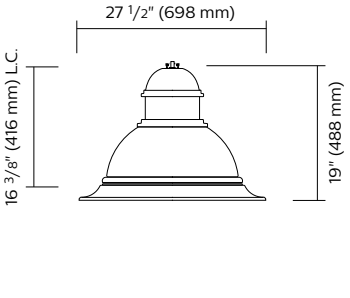
CSA, cULus Listed for Canada and USA. Domus LED luminaires are DesignLights Consortium qualified.



Long drop globe



Sag lens



Flat lens

WLS LIGHTING SYSTEMS
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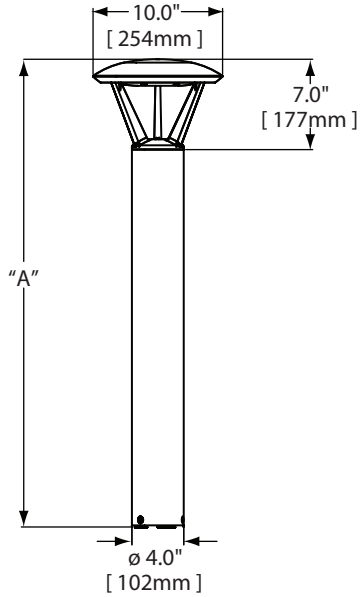
Project Name: _____
Date: _____
Location: _____
Notes: _____

02, 03 REV. 9/17

WLS LIGHTING SYSTEMS

PED LED PATHWAY SERIES

DIMENSIONS



SPECIFICATIONS

DESCRIPTION - Durable die-cast aluminum fixture housing mounts directly to 4" (102mm) diameter pole without visible mounting hardware for clean appearance. Pole mounts to rugged die-cast aluminum internal flange secured by (3) 3/8 - 16 x 6" anchor bolts with 1-1/4" hook (provided). Note: T45 Torx 3/8 socket required for head installation. Top mounted LEDs for superior optical performance and light control. Ten year limited warranty on fixture.

ELECTRICAL - PED has an input voltage of 120-277V or 347-480V, 50/60Hz, with class 1 drivers. The power factor is > 0.9 at full load at 120V, with total harmonic distribution of < 20% at full load at 120V. The luminaire is equiped with < 20% at full load at 120V. It is suitable for wet locations and is cULus Listed.

FINISH- Exclusive Colorfast Deltaguard® finish features an E-Coat epoxy primer with an ultra-durable silver powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Bronze, black, silver and white powder topcoats are also available. Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117

TESTING & COMPLIANCE - UL listed in the U.S. and Canada for wet locations. Consult factory for CE Certified products. Fixture also available with CE listing. RoHS compliant. ENERGY STAR qualified LED lighting. Dark Sky friendly, IDA approved.

Model	Dim. "A"	Weight*
Landscape (P0)	13" (330mm)	12.7 lbs. (5.8kg)
Landscape (P1)	18" (457mm)	13.3 lbs. (6.0kg)
Pathway (P3)	36" (914mm)	17.9 lbs. (8.1kg)
Pathway (P4)	42" (1068mm)	18.6 lbs. (8.4kg)
Pedestrian (P8)	96" (2438mm)	28.4 lbs (12.9kg)

* Add 4.5 lbs. (2.0kg) for 347-480V

Provided by CREE

Approved By: _____ Project Name: _____

Location: _____ Date: _____

WLS LIGHTING SYSTEMS
Consider the Impact!

1919 Windsor Place | Fort Worth, TX 76110 | 800.633.8711 | Fax: 817.735.4824 | www.wlslighting.com

PED LED PATHWAY SERIES

ORDERING INFORMATION SELECT APPROPRIATE CHOICE FROM EACH COLUMN TO FORMULATE ORDER CODE. Refer to example below.

SERIES	OPTIC	MOUNTING	# OF LEDs	SERIES	VOLTAGE	DRIVE CURRENT	LUMINAIRE FINISH	OPTIONS
PED	**2M -** Type II Medium **3M -** Type III Medium **5M -** Type V Medium **5S -** Type V Short	**P0 -** 13" landscape **P1 -** 18" landscape **P3 -** 36" pathway **P4 -** 42" pathway **P8 -** 96" pedestrian	**02 -** LED count (x9)	**E**	**UL -** Universal (120-277) **UH -** Universal (347-480) [1] **12 -** 120 **24 -** 240 **27 -** 277	**350 -** 350mA **525 -** 525mA [2]	**SV -** Silver **BLK -** Black **WHT -** White **BRZ -** Bronze **CC -** Custom Color	**40K -** 4000K Color Temperature min 70 CRI **F -** Fuse **HL -** Hi/Low [3] **TL -** Two Level (175/525) [4] **TL2 -** Two Level (0/350) [4] **TL3 -** Two Level (0/525) [4] **WB -** Welded Base [5] **NO -** No Options
PED	**2M**	**P4**	**02**	**E**	**UE**	**350**	**BRZ**	**40K**

(EXAMPLE ORDER)

ORDER:
WLS-PED _____ _____ _____ _____ _____ _____ _____ _____ _____

FOOTNOTES:

1. 347-480V utilizes magnetic step-down transformer.
2. Available with P3, P4, and P8 mounts only.
3. Available with UL voltage and 525mA driver only.
4. Available with 12 or 27 voltages only.
5. Included with P8. Sold separately for P3 and P4. Includes welded base cover.

Approved By: _____ Project Name: _____

Location: _____ Date: _____

WLS LIGHTING SYSTEMS
Consider the Impact!

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ABUTTERS

TAX MAP 158, LOT 13
SLATTERY & DUMONT, LLC
66 OLD CONCORD TURNPIKE #10
BARRINGTON, NH 03825
R.C.R.D. BOOK 3471, PAGE 196

TAX MAP 163, LOT 1
M & B PROPERTIES, LLC
54 BARTLETT STREET
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5794, PAGE 996

TAX MAP 163, LOT 2
INDUSTRIAL RENTS–NH, LLC
6 WAYNE ROAD
WESTFORD, MA 01886
R.C.R.D. BOOK 5606, PAGE 2334

TAX MAP 163, LOT 32
SHARAN R. GROSS REV. TRUST
180 BIRCH HILL RD
YORK, ME 03909
R.C.R.D BOOK 5261 PAGE 2208
R.C.R.D. BOOK 3406 PAGE 1383

TAX MAP 163, LOT 35
ELDREDGE BREWERY REALTY PARTNERSHIP
1 CATE ST
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 2572 PAGE 2635

TAX MAP 163, LOT 36
CST HOLDINGS, LLC
3 CATE ST
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 3923 PAGE 202

TAX MAP 163, LOT 37
CITY OF PORTSMOUTH
PO BOX 628
PORTSMOUTH, NH 03802
R.C.R.D. BOOK 2284 PAGE 812

TAX MAP 164, LOT 1
PORTSMOUTH LUMBER & HARDWARE, LLC
105 BARTLETT STREET
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5372, PAGE 2606

TAX MAP 164, LOT 2
PORTSMOUTH LUMBER & HARDWARE, LLC
105 BARTLETT STREET
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5808, PAGE 1379

TAX MAP 164, LOT 4
BOSTON & MAINE CORP.
IRON HORSE PARK, HIGH STREET
NO. BILLERICA, MA 01862

TAX MAP 164, LOT 5
HOUSTON HOLDINGS, LLC
653 ISLINGTON STREET
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 3558, PAGE 464

TAX MAP 164, LOT 12
JOSEPH GOBBI SUPPLY CORP.
PO BOX 125
PORTSMOUTH, NH 03802
R.C.R.D. BOOK 3233, PAGE 1949

TAX MAP 165, LOT 1
CATE STREET LLC
105 BARTLETT STREET
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5903 PAGE 1436

TAX MAP 165, LOT 14
BOSTON AND MAINE CORP
IRON HORSE PK HIGH ST
NO BILLERICA, MA 01862
R.C.R.D. BOOK PAGE

TAX MAP 172, LOT 2
406 HIGHWAY 1 BYPASS, LLC
549 US HIGHWAY 1 BYPASS
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5671 PAGE 2150

TAX MAP 173, LOT 3
EDGAR W. & JANICE E. ANDERSON
224 CATE ST
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 2956 PAGE 1071

TAX MAP 173, LOT 9
PAUL J. HOLLOWAY
C/O COAST PONTIAC
500 US HYWY 1 BYPASS
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 2821 PAGE 2396

TAX MAP 173, LOT 10
AREC 13, LLC C/O U–HAUL INTERNATIONAL
PO BOX 29046
PHOENIX, AZ 85038
R.C.R.D. BOOK 4575 PAGE 950

TAX MAP 174, LOT 14
AER RE LLC
185 COTTAGE STREET
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5965, PAGE 2216

TAX MAP 233, LOT 145
CITY OF PORTSMOUTH
1 JUNKINS AVENUE
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5127, PAGE 2074

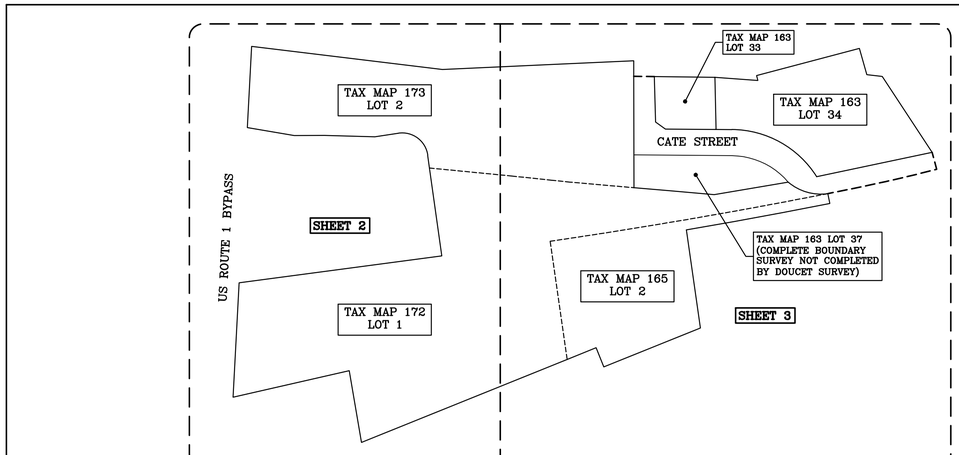
TAX MAP 234, LOT 2A
PUBLIC SERVICE CO. OF NH
PO BOX 270
HARTFORD, CT 06141
R.C.R.D. BOOK 1257, PAGE 324

TAX MAP 234, LOT 3
PUBLIC SERVICE CO. OF NH
PO BOX 270
HARTFORD, CT 06141
R.C.R.D. BOOK 5548, PAGE 738

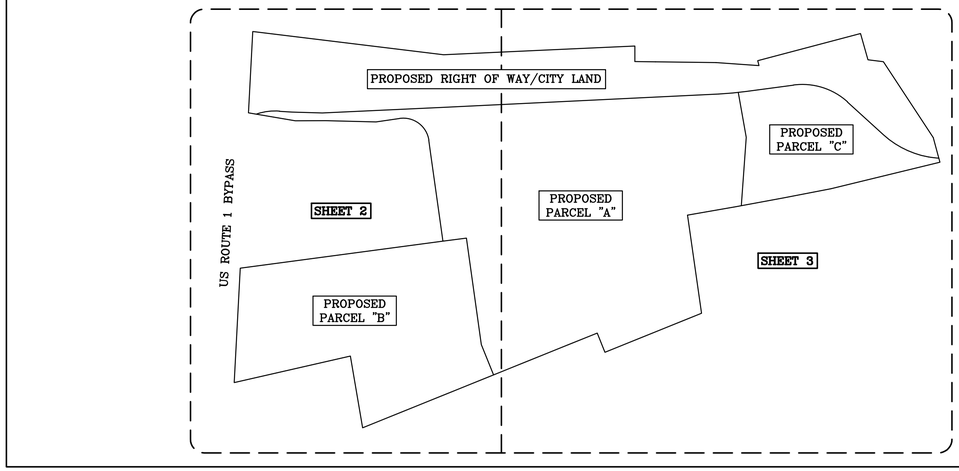
TAX MAP 234, LOT 5
SEACOAST DEVELOPMENT GROUP, LLC
505 US ROUTE 1 BYPASS
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 3107, PAGE 950

TAX MAP 234, LOT 7–6
CREFIII WARAMAUG PORTSMOUTH, LLC
C/O CTMI, LLC
PO BOX 741328
DALLAS, TX 75374
R.C.R.D. BOOK 5620, PAGE 1675

TAX MAP 234, LOT 51
MEADOWBROOK INN CORP.
C/O PORTSMOUTH CHEVROLET
549 ROUTE 1 BYPASS
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 2382, PAGE 1968



EXISTING PARCEL LAYOUT



PROPOSED PARCEL LAYOUT

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR BY THOSE UNDER MY DIRECT SUPERVISION AND FALLS UNDER THE URBAN SURVEY CLASSIFICATION OF THE NH CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS. I CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. RANDOM TRAVERSE SURVEY BY TOTAL STATION, WITH A PRECISION GREATER THAN 1:15,000.

L.L.S. #989

9/6/19
DATE

THE CERTIFICATIONS SHOWN HEREON ARE INTENDED TO MEET REGISTRY OF DEED REQUIREMENTS AND ARE NOT A CERTIFICATION TO TITLE OR OWNERSHIP OF PROPERTY SHOWN. OWNERS OF ADJOINING PROPERTIES ARE ACCORDING TO CURRENT TOWN ASSESSORS RECORDS.

STATE OF NEW HAMPSHIRE — No. 989 — MATTHEW A. FAGGINGER–AUER — LICENSED LAND SURVEYOR
SIGNATURE

NOTES:

1. REFERENCE: TAX MAP 163, LOT 33 – 12,230 SF OR 0.28 AC.
TAX MAP 163, LOT 34 – 64,109 SF OR 1.47 AC.

TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2
COMBINED AREA – 451,572 SF OR 10.37 AC.

2. OWNER OF RECORD: CATE STREET DEVELOPMENT LLC
11 ELKINS STREET, SUITE 420
BOSTON, MA 02127
R.C.R.D. BOOK 5959, PAGE 109

3. ZONES: GW1–GATEWAY NEIGHBORHOOD MIXED USE CORRIDOR (SEE CITY OF PORTSMOUTH ZONING ORDINANCE FOR DIMENSIONAL REQUIREMENTS. SUBJECT LOTS WERE REZONED TO GW1 ON DECEMBER 4, 2017 PER SAID ORDINANCE.)

–SEE SITE PLANS FOR DIMENSIONAL REQUIREMENTS AND DEVELOPMENT SITE STANDARDS.

4. FIELD SURVEY PERFORMED BY P.J.S. & J.C.M. DURING NOVEMBER 2016 USING A TRIMBLE S6 TOTAL STATION, A TRIMBLE R8 SURVEY GRADE GPS UNIT, A TRIMBLE TSC3 DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL, BY L.P.S. & S.N.F. DURING JULY 2018 AND T.M.M. & J.C.M. IN SEPTEMBER & OCTOBER 2018 USING A TRIMBLE S6 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS. ADDITONAL FIELD SURVEY PERFORMED BY M.C. DURING NOVEMBER 2016 AND OCTOBER 2018 USING A LEICA HDS SCANNER.

5. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY MARC JACOBS IN NOVEMBER 2016 AND REVIEWED BY GOVE ENVIRONMENTAL SERVICES, INC. DURING APRIL 2018 IN ACCORDING TO THE US ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y–87–1, JANUARY 1987 AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2102 AND FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, MAY 2017, NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE.

6. FLOOD HAZARD ZONE: "X", PER FIRM MAP #33015C0259E, DATED 5/17/05.

7. VERTICAL DATUM IS BASED ON NGVD29 PER DISK V 28 1942 ELEV. 25.59.

8. HORIZONTAL DATUM BASED ON NEW HAMPSHIRE STATE PLANE(2800) NAD83(2011) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.

9. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH AND IN RELATION TO THE CURRENT LEGAL DESCRIPTION, AND IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.

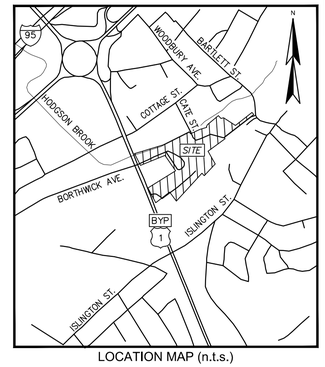
10. DUE TO THE COMPLEXITY OF RESEARCHING ROAD RECORDS AS A RESULT OF INCOMPLETE, UNORGANIZED, INCONCLUSIVE, OBLITERATED, OR LOST DOCUMENTS, THERE IS AN INHERENT UNCERTAINTY INVOLVED WHEN ATTEMPTING TO DETERMINE THE LOCATION AND WIDTH OF A ROADWAY RIGHT OF WAY. THE EXTENT OF (THE ROAD(S)) AS DEPICTED HEREON IS/ARE BASED ON RESEARCH CONDUCTED AT THE PORTSMOUTH CITY HALL, PORTSMOUTH DEPARTMENT OF ENGINEERING, THE ROCKINGHAM COUNTY REGISTRY OF DEEDS, AND THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION.

11. FINAL MONUMENTATION MAY BE DIFFERENT THAN THE PROPOSED MONUMENTATION SHOWN HEREON, DUE TO THE FACT THAT SITE CONDITIONS WILL DICTATE THE ACTUAL LOCATION AND TYPE OF MONUMENTS INSTALLED IN THE FIELD. PLEASE REFER TO EITHER THE "MONUMENTATION LOCATION PLAN" TO BE RECORDED OR CONTACT DOUCET SURVEY, INC. FOR CLARIFICATION OF MONUMENTS SET. (A RECORDED PLAN WILL BE PRODUCED AT THE DISCRETION OF DOUCET SURVEY, INC.).

–SEE SHEET 4 FOR NOTES 12 & 13 SPECIFIC TO EXISTING AND PROPOSED EASEMENT.
–SEE SHEET 6 FOR NOTES SPECIFIC TO EXISTING CONDITIONS.

REFERENCE PLANS

1. "MAINE–NEW HAMPSHIRE INTERSTATE BRIDGE AUTHORITY, PISCATAQUA RIVER BRIDGE, KITTERY, MAINE–PORTSMOUTH, NEW HAMPSHIRE, RIGHT OF WAY MAPS, N.H. APPROACH,BY ALBERT MOULTON, CE, DATED 1954, ON FILE A THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION.
2. "PLAT OF LAND U.S. ROUTE 1 BY–PASS PORTSMOUTH, NEW HAMPSHIRE FOR GRIFFIN FAMILY CORP.", BY DURGIN, VERRA AND ASSOCIATES, INC., DATED JANUARY 20, 1992, RECEIVED FROM THE OFFICE OF JAMES VERRA.
3. "LOT LINE REVISION U.S. ROUTE ONE BY–PASS, PORTSMOUTH, N.H. FOR WIGGIN, PARSONS, & O'BRIEN, BY JOHN W. DURGIN ASSOCIATES, INC., DATED JANUARY 22, 1982, R.C.R.D. PLAN D–10722.
4. "PLAN OF LAND FOR JOSEPH J. O'BRIEN JR.& SR., CATE STREET/ROUTE 1 BY–PASS, PORTSMOUTH, N.H., BY RICHARD P. MILLETTE AND ASSOCIATES, DATED NOVEMBER 17, 1988, R.C.R.D. PLAN D–19110.
5. "LAND IN PORTSMOUTH, N.H., BOSTON AND MAINE RAILROAD TO ALL STATE REALTY CORPORATION", BY BRENTON V. SCHOFIELD, DATED FEBRUARY 1964, R.C.R.D. PLAN 160.
6. "LOT LINE RELOCATION PLAN FOR U–HAUL REAL ESTATE COMPANY AND FRANCIS J. COSTELLO CATE STREET/ROUTE 1 BY–PASS, PORTSMOUTH, N.H.", BY RICHARD P. MILLETTE AND ASSOCIATES, DATED MAY 25, 1995, R.C.R.D. PLAN D–24912.
7. "SUBDIVISION OF LAND HEIRS OF CORNELUS COAKLEY", BY MCKENNA ASSOCIATES, DATED JULY 26, 1972, R.C.R.D. PLAN D–3790.
8. "LOT LINE REVISION PORTSMOUTH, N.H. FOR MICHAEL A. PAGANO", BY JOHN W. DURGIN ASSOCIATES, DATED JUNE 26, 1981, R.C.R.D. PLAN D–10278.
9. "SITE PLAN OF ELDREDGE PARK WEST PREPARED FOR ELDREDGE BREWERY REALTY PARTNERSHIP", BY KIMBALL CHASE COMPANY, INC., DATED JULY 23, 1987, R.C.R.D. PLAN D–16894.
10. "PLAN OF LAND OF FRANK JONES BREWING CORP. & PAUL C. BADGER & NORMAN E. RAND PORTSMOUTH, N.H.", BY JOHN W. DURGIN, CIVIL ENGINEERS, DATED SEPTEMBER 1950, R.C.R.D. PLAN 01635.
11. "LOT LINE ADJUSTMENT PLAN FOR LAND OWNED BY SHARON R. GROSS REVOCABLE TRUST, KNOWN AS TAX MAP 163, LOT 31 & 32 LOCATED ALONG #201 & 235 CATE STREET", BY KNIGHT HILL LAND SURVEYING SERVICES, INC., DATED JULY 28, 2011, R.C.R.D. PLAN D–37021.
12. "SITE REVIEW PLAN FOR LAND OWNED BY SHARON R. GROSS REVOCABLE TRUST, KNOWN AS TAX MAP 163, LOT 32 LOCATED ALONG #201 & CATE STREET". BY KNIGHT HILL LAND SURVEYING SERVICES, INC., DATED DECEMBER 2002, R.C.R.D. PLAN D–30850.
13. "PLAN SHOWING DIVISION OF ELDREDGE BREWING CO. LOT IN PORTSMOUTH, N.H. OWNED BY ALBERT HISLOP", BY WM A. GROVER, DATED DECEMBER 11, 1918, R.C.R.D. PLAN 18.
14. "PLAN OF LAND PORTSMOUTH, N.H. ATLANTIC REALTY CORP. TO KITTERY LAUNDRY, INC.", BY JOHN W. DURGIN, DATED AUGUST 1964, R.C.R.D. PLAN 300.
15. "CITY OF PORTSMOUTH, N.H. DEFENSE HOMES SEWER LOCATION PLAN", BY JOHN W. DURGIN DATED MAY 1961, R.C.R.D. PLAN 1106.
16. "LAND IN PORTSMOUTH, N.H. BOSTON AND MAINE RAILROAD TO M.H. PARSONS & SONS LUMBER COMPANY, INC.", R.C.R.D. BOOK 1267, PAGE 16.
17. "PLAN OF LAND PORTSMOUTH, N.H. FOR M.H. PARSONS REALTY CORP.", BY JOHN W. DURGIN, DATED DECEMBER 1956, R.C.R.D. BOOK 1431, PAGE 275.
18. "SITE PLAN PORTSMOUTH, N.H. PREPARED FOR U–HAUL OF N.H. AND VT., INC.", BY JOHN W. DURGIN, DATED JUNE 4, 1980, R.C.R.D. PLAN D–9642.
19. "STANDARD PROPERTY SURVEY & PROPOSED SIDEWALK EASEMENT FOR THE CITY OF PORTSMOUTH FOR PROPERTY AT 185 COTTAGE STREET OWNED BY COLMAN C. GARLAND", BY EASTERLY SURVEYING, INC., SATED NOVEMBER 30, 2012, R.C.R.D. PLAN D–38047.
20. "PLOT PLAN FOR MARIAN M. BADGER, PORTSMOUTH, N.H.", BY JOHN W. DURGIN, DATED JULY 1973, RECIEVED FROM THE OFFICE OF JAMES VERRA.
21. "LAND ON CATE STREET, PORTSMOUTH, N.H., BADGER & RAND TO PORTSMOUTH POWER CO.", BY JOHN W. DURGIN, DATED JANUARY 8, 1926, RECEIVED FROM THE OFFICE OF JAMES VERRA.
22. "RIGHT–OF–WAY AND TRACK MAP BOSTON AND MAINE R.R. OPERATED BY THE BOSTON & MAINE R.R., STATION 2928+05 TO 2966+20", DATED JUNE 30, 1914, ON FILE AT THE NH DEPARTMENT OF TRANSPORTATION.
23. "ALTA/ACSM LAND TITLE SURVEY, TAX MAP 234, LOT 51 PROPERTY OF THE MEADOWBROOK INN CORPORATION", BY MSC CIVIL ENGINEERS & LAND SURVEYORS, DATED DECEMBER 2, 2018, R.C.R.D. PLAN D–36980.
24. "LOT LINE REVISION PLAN TAX MAP R–34 LOTS 6 & 7–6, LOCATED ON BORTHWICK AVE., COAKLEY ROAD AND U.S. ROUTE 1 BYPASS IN PORTSMOUTH, NH", BY KIMBALL CHASE, DATED OCTOBER 20, 1993, R.C.R.D. PLAN #D–22686.
25. "PLAN OF LAND FOR SEACOAST DEVELOPMENT GROUP, LLC, US ROUTE 1 BYPASS & COAKLEY ROAD, PORTSMOUTH, NH", BY MILLETTE, SPRAGUE & COLWELL, INC., DATED JUNE 7, 2002, R.C.R.D. PLAN #D–30041.
26. "LOT LINE REVISION PLAN LAND OF SEARAY REALTY, LLC", BY DOUCET SURVEY, INC., DATED MARCH 12, 2014, R.C.R.D. PLAN D–38435.
27. "STANDARD PROPERTY SURVEY & PROPOSED SIDEWALK EASEMENT FOR THE CITY OF PROTSMOUTH FOR PROPERTY AT 185 COTTAGE STREET PORTSMOUTH, NH OWNED BY COLMAN C. GARLAND", BY NORTH EASTERLY SURVEYING, INC., DATED NOVEMBER 30, 2012, R.C.R.D. PLAN #D–38017.
28. "PLAN OF A LOT OF LAND BELONGING TO FRANK JONES", DATED JULY 1901, R.C.R.D. PLAN #223.
29. "MEADOWBROOK INN CONDOMINIUM SITE PLAN, MAP 234, LOT 51 IN PORTSMOUTH, NH, PREPARED FOR THE MEADOWBROOK INN CORPORATION", BY VANASSE HANGEN BRUSTLIN, INC., DATED SEPTEMBER 25, 2009, R.C.R.D. PLAN #D–36162.
30. "PROPOSED EASEMENTS – BARTLETT STREET, BARTLETT SEWER SEPARATION PROJECT OVER LAND OF PAN AM RAILWAYS, PORTSMOUTH, NH FOR CITY OF PORTSMOUTH", BY JAMES VERRA AND ASSOCIATES, INC., DATED OCTOBER 1, 2007, R.C.R.D. PLAN #D–35477.
31. "EASEMENT PLAN – 653 ISLINGTON STREET, BARTLETT SEWER SEPARATION PROJECT OVER LAND OF HOUSTON HOLDINGS, LLC", BY JAMES VERRA AND ASSOCIATES, INC., DATED JUNE 22, 2009, R.C.R.D. PLAN #D–35957.
32. "LAND TRANSFER AND EASEMENT PLAN, 30 CATE STREET PORTSMOUTH, NH OWNED BY MERTON ALAN INVESTMENTS, LLC.", BY TF MORAN/MSC, DATED OCTOBER 31, 2017, R.C.R.D. PLAN #D–40742.
33. "LAND IN PORTSMOUTH, N.H. BARTLETT & CATE STREET", BY JOHN W. DURGIN CIVIL ENGINEER, DATED JULY 1924, R.C.R.D. PLAN #0133.



LOCATION MAP (n.t.s.)

SUBDIVISION PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34
TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2
CATE STREET & US ROUTE 1 BYPASS
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
2	9/6/19	ADD ADDITIONAL EASEMENTS	MWF
1	8/19/19	ADD ADDITIONAL EASEMENTS	MWF

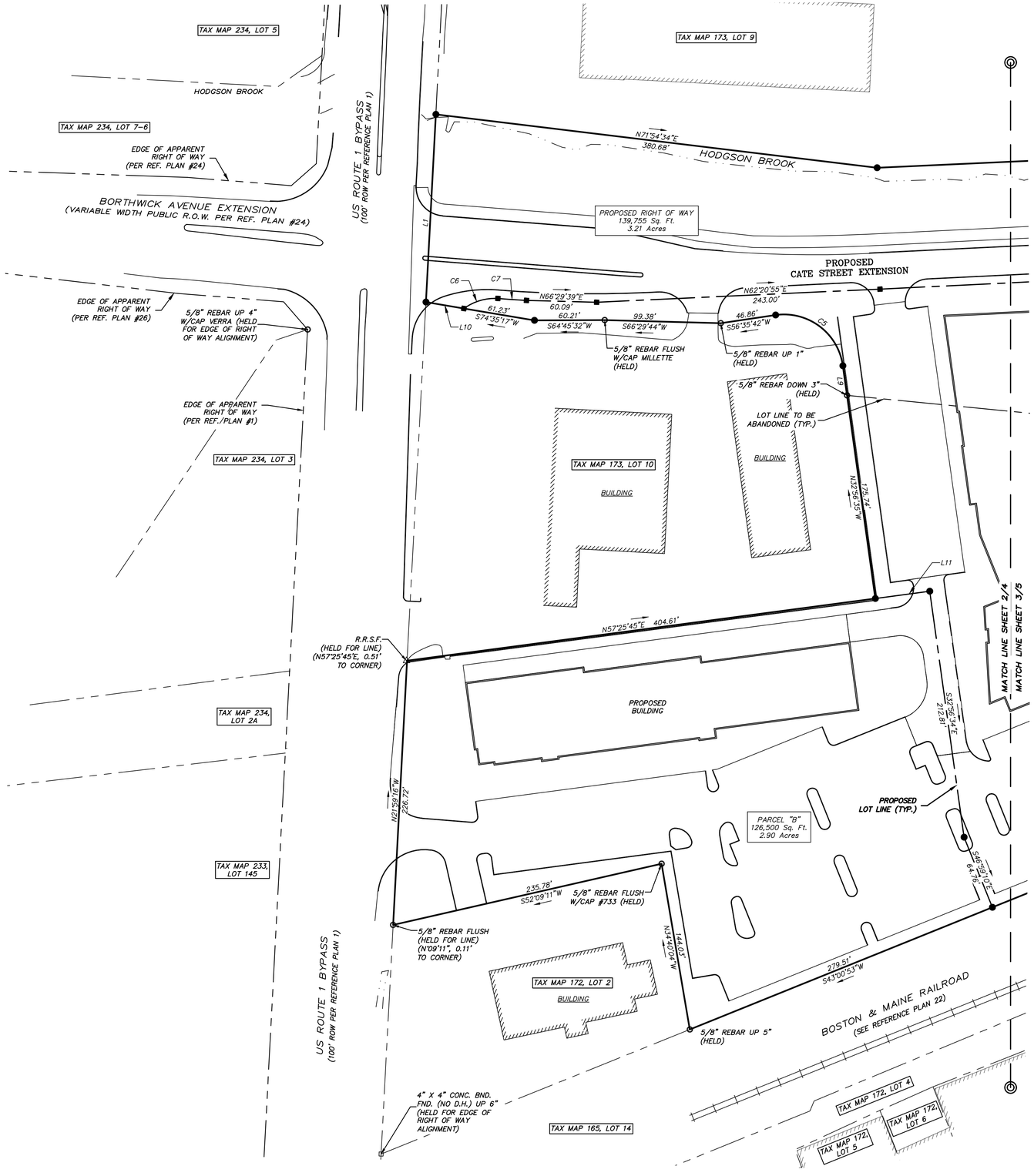
DRAWN BY:	M.W.F.	DATE:	JULY 3, 2019
CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	1 OF 10

APPROVED FOR THE RECORD

CHAIRMAN PORTSMOUTH PLANNING BOARD DATE

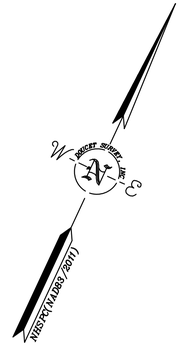
DOUCET SURVEY INC
Serving Your Professional Surveying & Mapping Needs
102 Kent Place, Newmarket, NH 03857 (603) 659-6560
2 Commerce Drive (Suite 202) Bedford, NH 03110 (603) 614-4060
10 Storer Street (Riverview Suite) Kennebunk, ME (207) 502-7005
http://www.doucetsurvey.com

FILE NAME: P:\PROJECTS\5517 CSR (SEE 4150)\DWG\5517D SUB PLAN.dwg LAYOUT NAME: SUB (01) PLOTTED: Friday, September 06, 2019 - 12:26pm



CURVE TABLE					
CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	66.21'	178.00'	21°18'42"	N85°47'06"E	65.83'
C2	20.94'	178.00'	6°44'29"	N71°45'30"E	20.93'
C3	180.71'	11451.20'	0°54'15"	N54°18'39"E	180.71'
C4	108.14'	11451.20'	0°32'28"	N55°02'01"E	108.14'
C5	80.85'	51.00'	90°49'33"	S78°21'38"E	72.64'
C6	30.94'	45.00'	39°23'52"	N48°30'09"E	30.34'
C7	24.56'	1008.50'	1°23'42"	N68°53'56"E	24.56'
C8	38.52'	635.87'	3°28'15"	N60°29'39"E	38.51'
C9	15.14'	635.87'	1°21'52"	N58°04'35"E	15.14'
C10	115.78'	133.00'	49°52'37"	N82°19'58"E	112.16'
C11	33.65'	178.00'	10°49'50"	S78°08'38"E	33.60'
C12	181.57'	200.00'	52°00'57"	S83°14'19"E	175.40'
C13	84.14'	100.00'	48°12'27"	N81°13'11"E	81.68'
C14	134.92'	2836.93'	2°43'29"	N52°04'44"E	134.90'

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N21°59'16"W	161.10'
L2	S25°06'26"E	30.74'
L3	N65°44'42"E	40.75'
L4	N38°11'17"W	10.00'
L5	N71°55'42"E	30.64'
L6	S40°12'57"E	42.38'
L7	S36°26'29"E	20.00'
L8	N46°59'07"W	41.00'
L9	N32°56'35"W	25.61'
L10	S74°35'17"W	32.98'
L11	N57°25'45"E	47.00'
L12	S26°33'24"E	20.39'
L13	S79°44'51"E	24.00'
L14	N65°28'25"E	31.49'
L15	S55°22'43"W	92.06'
L16	S55°22'43"W	56.61'
L17	N20°49'54"W	60.72'
L18	N20°49'54"W	74.81'
L19	N35°02'16"W	44.30'
L20	N35°02'16"W	46.03'



LEGEND

- LOT LINE
- PROPOSED LOT LINE
- APPARENT RIGHT OF WAY LINE
- LOT LINE TO BE ABANDONED
- APPROXIMATE ABUTTER LOT LINE
- EDGE OF WETLAND
- BOUND FOUND
- R.R.S.F. RAILROAD SPIKE FOUND
- IRON PIPE/ROD FOUND
- 4"X4" GRANITE BOUND TO BE SET
- 5/8" REBAR W/ID CAP TO BE SET
- BND. FND. BOUND FOUND
- I.P.F. IRON PIPE FOUND
- CONC. CONCRETE
- D.H. DRILL HOLE

APPROVED FOR THE RECORD

CHAIRMAN PORTSMOUTH PLANNING BOARD DATE

STATE OF NEW HAMPSHIRE — No. 989 — MATTHEW A. FAGGINER-AUER — LICENSED LAND SURVEYOR — SIGNATURE

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9/6/19 DATE

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50 0 50 100

SCALE: 1 INCH = 50 FT.

SUBDIVISION PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34

TAX MAP 165, LOT 2

TAX MAP 172, LOT 1

TAX MAP 173, LOT 2

CATE STREET & US ROUTE 1 BYPASS

PORTSMOUTH, NEW HAMPSHIRE

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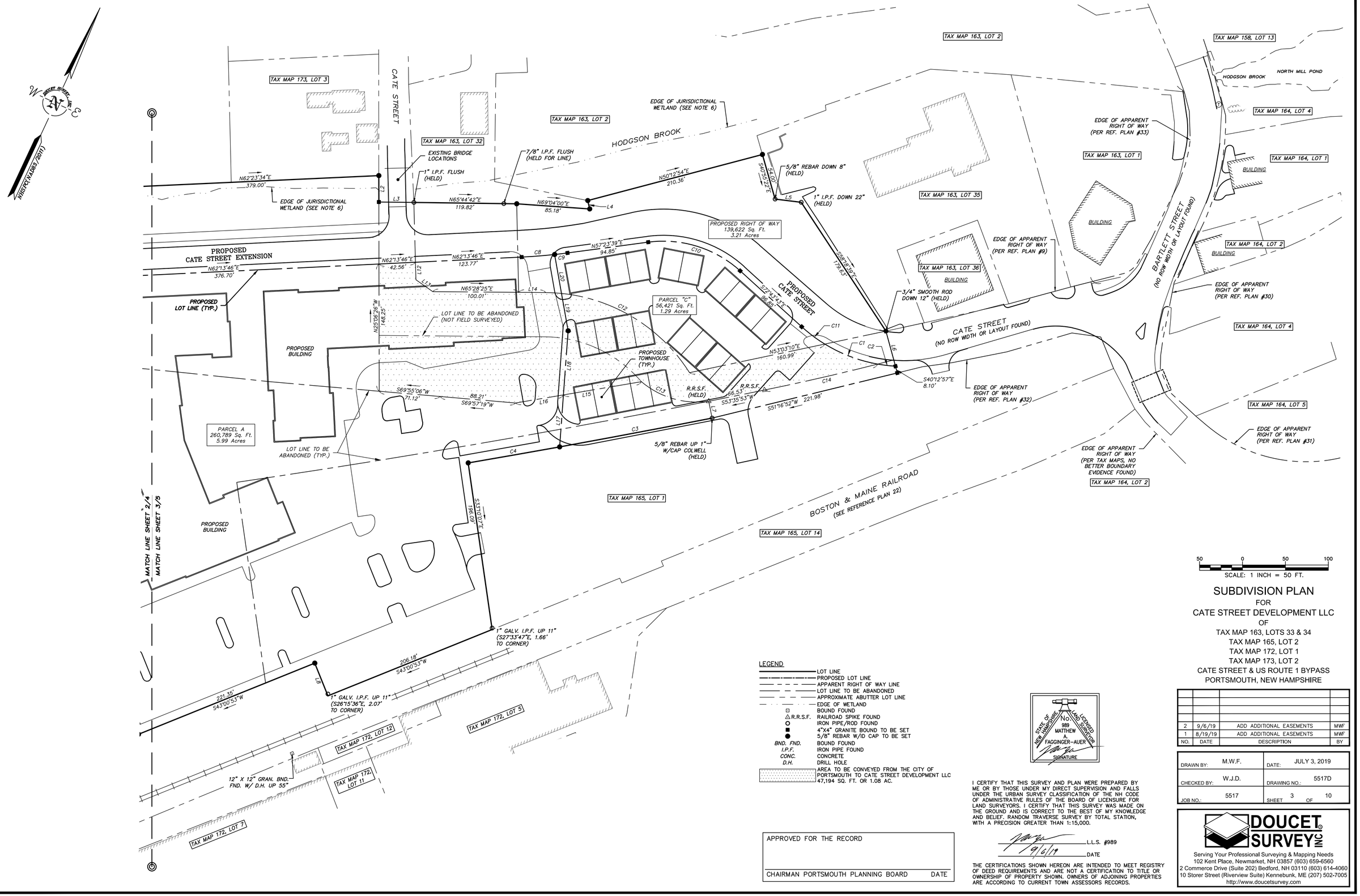

LEGEND

———	LOT LINE
——·——·——	PROPOSED LOT LINE
— — — —	APPARENT RIGHT OF WAY LINE
——— ———	LOT LINE TO BE ABANDONED
— — — —	APPROXIMATE ABUTTER LOT LINE
— · — · —	EDGE OF WETLAND
⊡	BOUND FOUND
△	R.R.S.F. RAILROAD SPIKE FOUND
○	IRON PIPE/ROD FOUND
■	4"X4" GRANITE BOUND TO BE SET
●	5/8" REBAR W/ID CAP TO BE SET
BND. FND.	BOUND FOUND
I.P.F.	IRON PIPE FOUND
CONC.	CONCRETE
D.H.	DRILL HOLE
	AREA TO BE CONVEYED FROM THE CITY OF PORTSMOUTH TO CATE STREET DEVELOPMENT LLC 47,194 SQ. FT. OR 1.08 AC.

APPROVED FOR THE RECORD

CHAIRMAN PORTSMOUTH PLANNING BOARD DATE

STATE OF NEW HAMPSHIRE — No. 989 — MATTHEW A. FAGGINGER-AUER — LICENSED LAND SURVEYOR — SIGNATURE

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50 0 50 100

SCALE: 1 INCH = 50 FT.

SUBDIVISION PLAN

FOR
CATE STREET DEVELOPMENT LLC
OF
TAX MAP 163, LOTS 33 & 34
TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
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CATE STREET & US ROUTE 1 BYPASS
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JOB NO.:	5517	SHEET	3 OF 10

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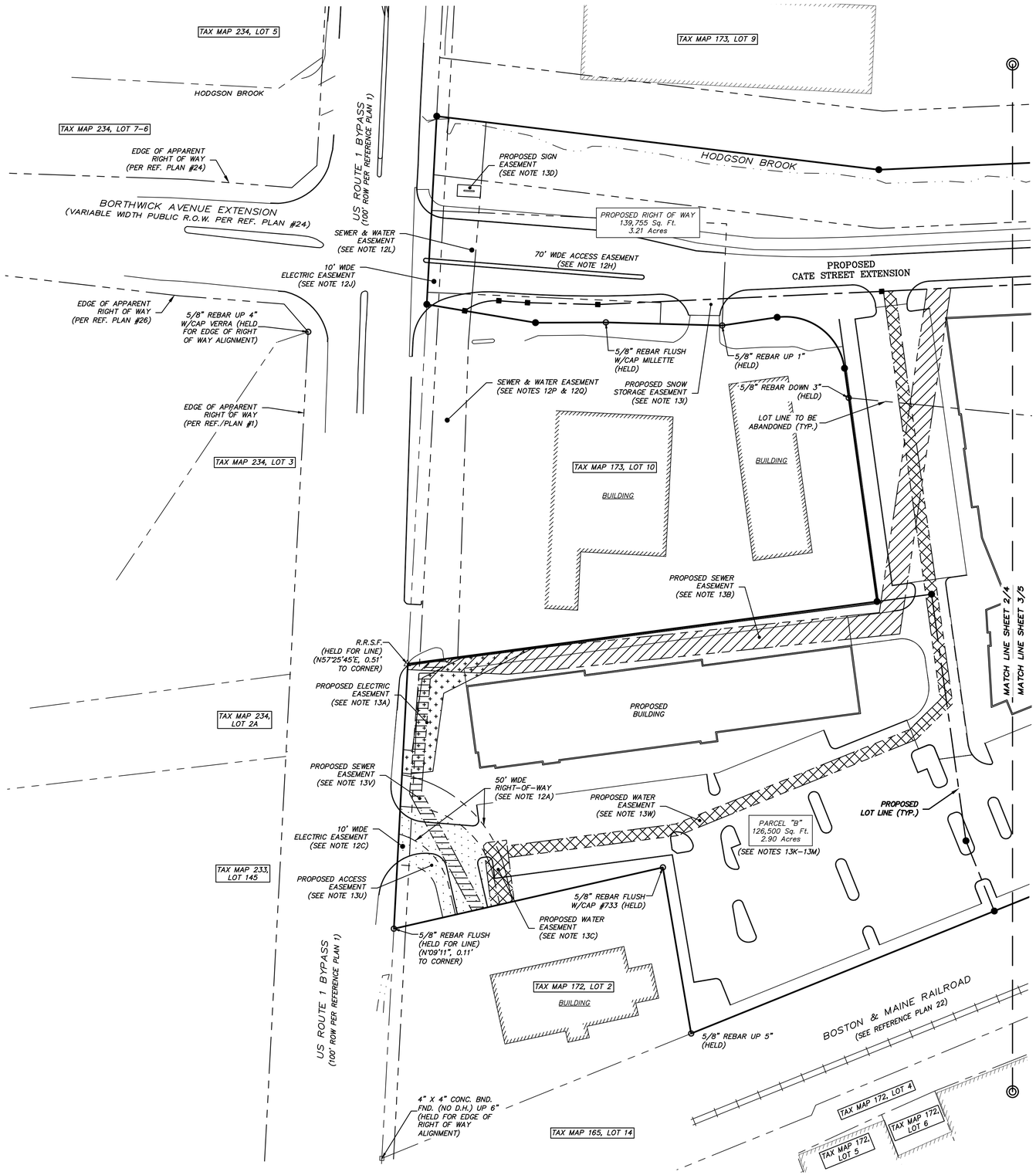
FILE NAME: T:\PROJECTS\5517 CSD (CE 4 NH)\DWG\5517D SUB PLANS.dwg LAYOUT NAME: SUB (EX) PLOTTED: Friday, September 06, 2019 - 12:40pm



SEE SHEET 1 FOR NOTES 1–11.

12. THE FOLLOWING LOTS ARE EITHER SUBJECT TO OR IN BENEFIT OF, BUT NOT LIMITED TO, THE FOLLOWING EASEMENTS/RIGHTS OF RECORD:

TAX MAP 172, LOT 1
- A. SUBJECT TO A 50' WIDE RIGHT OF WAY FOR THE BENEFIT OF TAX MAP 172, LOT 2 SEE R.C.R.D. BOOK 2411, PAGE 1484 AND R.C.R.D. PLAN D–10722 (TO BE ABANDONED).
- B. EXCEPTING AN 8" WATER PIPE LOCATED UNDER SUBJECT PARCEL, SEE R.C.R.D. BOOK 2783, PAGE 560, LOCATION OF SUBJECT WATER PIPE UNKNOWN.
- C. SUBJECT TO A 10' WIDE ELECTRIC EASEMENT, SEE R.C.R.D. BOOK 1257, PAGE 324 AND R.C.R.D. PLAN D–19110.
- D. SUBJECT TO A WATER LINE EASEMENT, SEE R.C.R.D. BOOK 950, PAGE 174, LOCATION OF SUBJECT WATERLINE UNKNOWN.
- E. SUBJECT TO AN ELECTRIC EASEMENT, SEE R.C.R.D. BOOK 1374, PAGE 97, LOCATION OF SUBJECT EASEMENT UNKNOWN.
- F. SUBJECT TO AN ELECTRIC EASEMENT, SEE R.C.R.D. BOOK 2364, PAGE 397, LOCATION OF SUBJECT EASEMENT UNKNOWN.
- G. SUBJECT TO A 15' DRIVEWAY EASEMENT, SEE R.C.R.D. BOOK 2216, PAGE 18, LOCATION OF SUBJECT EASEMENT UNKNOWN.

TAX MAP 173, LOT 2
- H. SUBJECT TO A 70' WIDE ACCESS EASEMENT IN FAVOR OF TAX MAP 173, LOT 10, SEE R.C.R.D. BOOK 3204, PAGE 87 AND R.C.R.D. PLAN D–24912 (TO BE ABANDONED).
- I. SUBJECT TO A DRAINAGE EASEMENT TO THE UNITED STATES OF AMERICA, SEE R.C.R.D. BOOK 1423, PAGE 240 AND PLAN D–19110.
- J. SUBJECT TO A 10' WIDE ELECTRIC EASEMENT, SEE R.C.R.D. BOOK 1257, PAGE 324. SEE ALSO R.C.R.D. PLAN D–19110.
- K. SUBJECT TO EASEMENTS FOR PASSAGE AND PIPE LINES, SEE R.C.R.D. BOOK 2205, PAGE 646 AND PLAN D–24912. LOCATION OF SUBJECT EASEMENTS UNKNOWN.
- L. SUBJECT TO A SEWER AND WATER EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH, SEE R.C.R.D. BOOK 1476, PAGE 252 (TO BE ABANDONED).

TAX MAP 165, LOT 2
- M. SUBJECT TO A SEWER EASEMENT, SEE R.C.R.D. BOOK 1659, PAGE 273 (TO BE ABANDONED).
- N. DRIVEWAY RIGHTS, SEE R.C.R.D. BOOK 1659, PAGE 273, LOCATION AND STATUS UNKNOWN.
- O. ADDITIONAL COVENANTS AND EXCEPTIONS, SEE R.C.R.D. BOOK 1659, PAGE 273..

TAX MAP 173, LOT 10 (NOT SUBJECT PARCEL)
- P. SUBJECT TO A SEWER EASEMENT, SEE R.C.R.D. BOOK 1270, PAGE 418.
- Q. SUBJECT TO A WATER EASEMENT, SEE R.C.R.D. BOOK 1448, PAGE 465.

13. PROPOSED EASEMENTS **(LOCATION SHOWN ON PLAN, METES AND BOUNDS DESCRIPTION TO BE ADDED ONCE EASEMENT LOCATIONS ARE APPROVED):**
- A. PROPOSED 20' WIDE ELECTRIC EASEMENT IN FAVOR OF EVERSOURCE AND TAX MAP 173, LOT 10.
- B. PROPOSED 20' WIDE SEWER EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH.
- C. PROPOSED 20' WIDE WATER SERVICE EASEMENT IN FAVOR OF TAX MAP 172, LOT 2.
- D. PROPOSED SIGN EASEMENT IN FAVOR OF CATE STREET DEVELOPMENT LLC..

ADDITIONAL PROPOSED EASEMENTS:

PARCEL "A" (RESIDENTIAL LOT)
- E. BLANKET UTILITY EASEMENT IN FAVOR OF EVERSOURCE.
- F. BLANKET WATER SERVICE EASEMENT IN FAVOR OF TAX MAP 172, LOT 2.
- G. BLANKET ACCESS EASEMENT IN FAVOR OF TAX MAP 172, LOT 2 AND PROPOSED PARCELS "B" & "C".
- H. BLANKET WATER EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH TO MAINTAIN VALVES AND HYDRANTS.
- I. 5' WIDE SNOW STORAGE EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH ALONG THE SOUTHERN LINE OF THE PROPOSED RIGHT OF WAY.
- J. BLANKET ACCESS EASEMENT FOR EMERGENCY SERVICES.

PARCEL "B" (COMMERCIAL LOT)
- K. BLANKET ACCESS EASEMENT IN FAVOR OF TAX MAP 172, LOT 2 AND PROPOSED PARCELS "A" & "C".
- L. BLANKET WATER EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH TO MAINTAIN VALVES AND HYDRANTS.
- M. BLANKET ACCESS EASEMENT FOR EMERGENCY SERVICES.

PARCEL "C" (TOWN HOUSE LOT)
- N. BLANKET UTILITY EASEMENT IN FAVOR OF EVERSOURCE.
- O. BLANKET ACCESS EASEMENT IN FAVOR OF TAX MAP 172, LOT 2 AND PROPOSED PARCELS "A" & "B".
- P. BLANKET WATER EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH TO MAINTAIN VALVES AND HYDRANTS.
- Q. 5' WIDE SNOW STORAGE EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH ALONG THE SOUTHERN LINE OF THE PROPOSED RIGHT OF WAY.
- R. BLANKET ACCESS EASEMENT FOR EMERGENCY SERVICES.
- S. SIGHT LINE EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH. NO PLANTINGS OR OBSTRUCTIONS WITHIN THIS EASEMENT TALLER THAN THREE (3) FEET WILL BE ALLOWED IN ORDER TO MAINTAIN SIGHT DISTANCE.

TAX MAP 165, LOT 1 & TAX MAP 172, LOT 2
- T. BLANKET ACCESS EASEMENT IN FAVOR OF TAX MAP 165, LOT 1 AND TAX MAP 172, LOT 2 OVER PROPOSED PARCELS A, B & C.
- U. PROPOSED ACCESS EASEMENT IN FAVOR OF TAX MAP 172, LOT 2 OVER PARCEL B.
- V. PROPOSED 10' WIDE SEWER EASEMENT IN FAVOR OF TAX MAP 172, LOT 2 OVER PARCEL B.
- W. PROPOSED 10' WIDE WATER EASEMENT IN FAVOR OF TAX MAP 172, LOT 2 OVER PARCELS A & B.
- X. PROPOSED 10' WIDE WATER EASEMENT IN FAVOR OF TAX MAP 165, LOT 1 OVER PARCEL C.
- Y. PROPOSED 30' WIDE ACCESS EASEMENT IN FAVOR OF TAX MAP 165, LOT 1 OVER PARCEL C.

LEGEND

———	LOT LINE
——·——·——	PROPOSED LOT LINE
— — — — —	APPARENT RIGHT OF WAY LINE
——— ———	LOT LINE TO BE ABANDONED
— — — — —	APPROXIMATE ABUTTER LOT LINE
— — — — —	EXISTING EASEMENT LINE (SEE NOTE #12)
— — — — —	PROPOSED EASEMENT LINE (SEE NOTE #13)
- - - — - -	EDGE OF WETLAND
⊡	BOUND FOUND
△R.R.S.F.	RAILROAD SPIKE FOUND
○	IRON PIPE/ROD FOUND
■	4"X4" GRANITE BOUND TO BE SET
●	5/8" REBAR W/ID CAP TO BE SET
BND. FND.	BOUND FOUND
I.P.F.	IRON PIPE FOUND
CONC.	CONCRETE
D.H.	DRILL HOLE

APPROVED FOR THE RECORD

CHAIRMAN PORTSMOUTH PLANNING BOARD DATE

STATE OF NEW HAMPSHIRE — No. 989 — LICENSED LAND SURVEYOR

MATTHEW A. FAGGINGER–AUER

SIGNATURE

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR BY THOSE UNDER MY DIRECT SUPERVISION AND FALLS UNDER THE URBAN SURVEY CLASSIFICATION OF THE NH CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS. I CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. RANDOM TRAVERSE SURVEY BY TOTAL STATION, WITH A PRECISION GREATER THAN 1:15,000.

L.L.S. #989

9/6/19 DATE

THE CERTIFICATIONS SHOWN HEREON ARE INTENDED TO MEET REGISTRY OF DEED REQUIREMENTS AND ARE NOT A CERTIFICATION TO TITLE OR OWNERSHIP OF PROPERTY SHOWN. OWNERS OF ADJOINING PROPERTIES ARE ACCORDING TO CURRENT TOWN ASSESSORS RECORDS.

EASEMENT PLAN

FOR
CATE STREET DEVELOPMENT LLC
OF
TAX MAP 163, LOTS 33 & 34
TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2
CATE STREET & US ROUTE 1 BYPASS
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
2	9/6/19	ADD ADDITIONAL EASEMENTS	MWF
1	8/19/19	ADD ADDITIONAL EASEMENTS	MWF

DRAWN BY:	M.W.F.	DATE:	JULY 3, 2019
CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	4 OF 10

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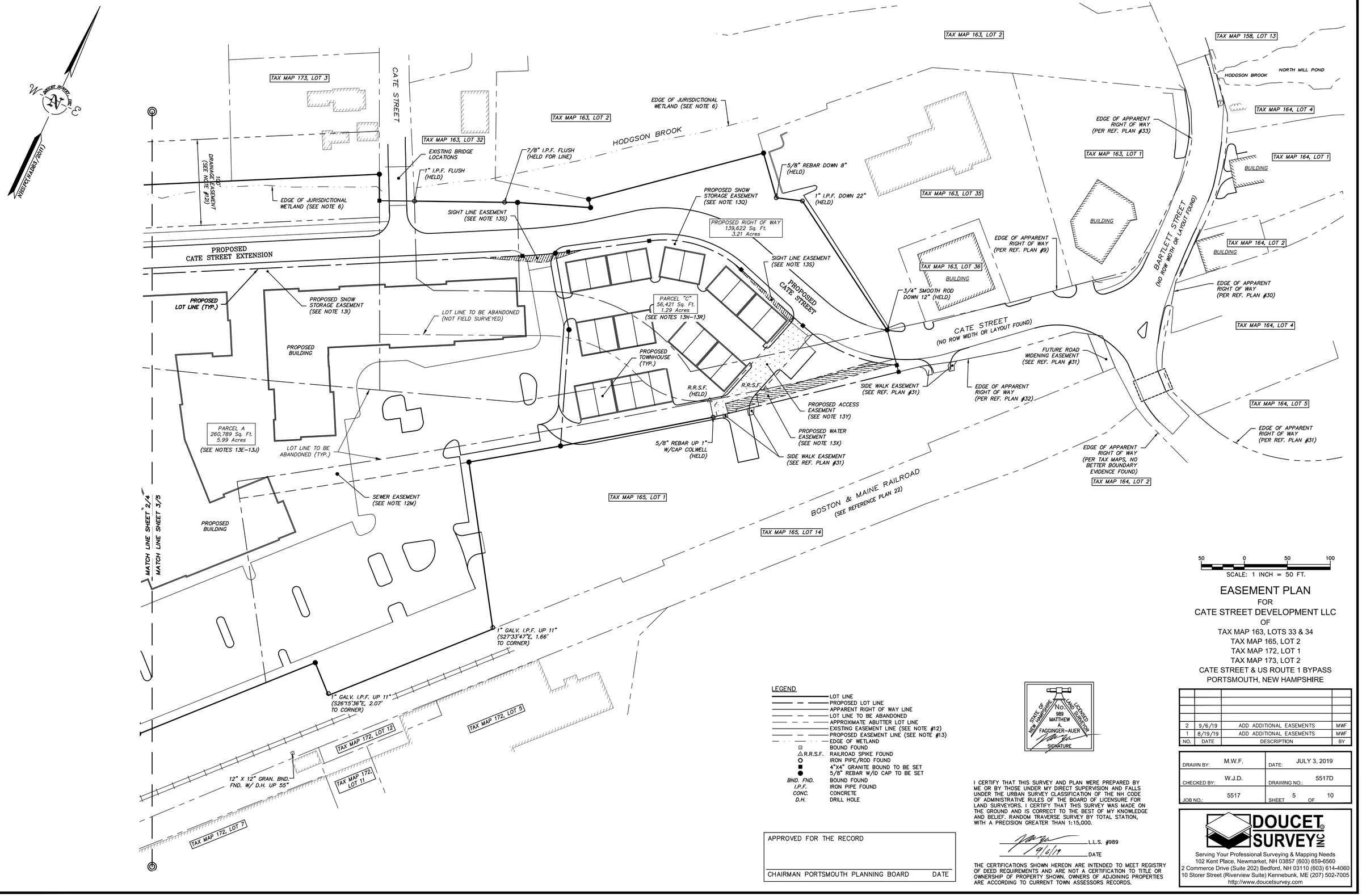

50 0 50 100

SCALE: 1 INCH = 50 FT.

EASEMENT PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34

TAX MAP 165, LOT 2

TAX MAP 172, LOT 1

TAX MAP 173, LOT 2

CATE STREET & US ROUTE 1 BYPASS

PORTSMOUTH, NEW HAMPSHIRE

LEGEND

———	LOT LINE
— — —	PROPOSED LOT LINE
———	APPARENT RIGHT OF WAY LINE
— — —	LOT LINE TO BE ABANDONED
— — —	APPROXIMATE ABUTTER LOT LINE
———	EXISTING EASEMENT LINE (SEE NOTE #12)
— — —	PROPOSED EASEMENT LINE (SEE NOTE #13)
— · — · —	EDGE OF WETLAND
⊡	BOUND FOUND
△ R.R.S.F.	RAILROAD SPIKE FOUND
○	IRON PIPE/ROD FOUND
■	4"X4" GRANITE BOUND TO BE SET
●	5/8" REBAR W/ID CAP TO BE SET
BND. FND.	BOUND FOUND
I.P.F.	IRON PIPE FOUND
CONC.	CONCRETE
D.H.	DRILL HOLE

APPROVED FOR THE RECORD

CHAIRMAN PORTSMOUTH PLANNING BOARD DATE

STATE OF NEW HAMPSHIRE — No. 989 — MATTHEW A. FAGGINGER-AUER — LICENSED LAND SURVEYOR — SIGNATURE

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR BY THOSE UNDER MY DIRECT SUPERVISION AND FALLS UNDER THE URBAN SURVEY CLASSIFICATION OF THE NH CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS. I CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. RANDOM TRAVERSE SURVEY BY TOTAL STATION, WITH A PRECISION GREATER THAN 1:15,000.

L.L.S. #989

9/6/19 DATE

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2	9/6/19	ADD ADDITIONAL EASEMENTS	MWF
1	8/19/19	ADD ADDITIONAL EASEMENTS	MWF

DRAWN BY:	M.W.F.	DATE:	JULY 3, 2019
CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	5 OF 10

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SHEET 8 INSET

CONC. BRIDGE ABUTMENT
PIPE GOES UNDERGROUND

HODGSON BROOK

DEPTH AT CENTER OF BROOK = 15.3'

CONC. BRIDGE ABUTMENT

4" PIPE, WRAPPED IN METAL INSULATION

HOSPITAL GAS PIPELINE

PNSH/26/6A

48" UNK. INV.=15.8'

12" CMP INV.=15.0'

CB #4239

PNSH/264/2S

KEEP RIGHT

CB #4181

PSNH/264/3 W/POWER DOWN

264/PNSH/2/7809/11

NETT/7809/12

DO NOT ENTER

OUTLET NOT FOUND

48" CONC. INV.=15.5'

SOUTH BYPASS 1

SMH #4565

SHOT ON TOP OF 8" PIPE WRAPPED IN INSULATION PIPE GOES UNDER GROUND

15" RCP INV.=14.7'

SMH #2789

SMH #1350

"THE FRANK JONES FUNCTION & CONFERENCE CENTER"

10" (ML)

CONC. PAD W/ TRANSFORMER

PAVED ISLAND

SIGN IS MISSING

CB #1345

~GRAVEL~

CB #1346

1/2" DIA. ROD UP 34"

PROPANE TANK

UHAUL SIGN

BUILDING

HODGSON BROOK

15" CMP INV.=14.6'

15" RCP INV.=14.7'

STOP/DO NOT ENTER

~GRASS AREA~

TURN LEFT

TURN RIGHT

STONE HDWL 12" HDPE INV.=19.0'

CB #1213

CB #1251

~PAVED PARKING LOT~

TAX MAP 173, LOT 2

CONCRETE WALL W/CHAINLINK FENCE

BUILDING

TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2
451,599 Sq. Ft.
10.37 Acres

MATCH LINE SHEET 6
MATCH LINE SHEET 7

MATCH LINE SHEET 6
MATCH LINE SHEET 8

MATCH LINE SHEET 6
MATCH LINE SHEET 9

NOTES:

1. REFERENCE: TAX MAP 163, LOT 33
   TAX MAP 163, LOT 34
   TAX MAP 165, LOT 2
   TAX MAP 172, LOT 1
   TAX MAP 173, LOT 2

   OWNER OF RECORD
   CATE STREET DEVELOPMENT, LLC
   11 ELKINS STREET, SUITE 420
   BOSTON, MA 02127
   R.C.R.D. BOOK 5959, PAGE 109

2. FIELD SURVEY PERFORMED BY P.J.S. & J.C.M. DURING NOVEMBER 2016 USING A TRIMBLE S6 TOTAL STATION, A TRIMBLE R8 SURVEY GRADE GPS UNIT, A TRIMBLE TSC3 DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL, BY L.P.S. & S.N.F. DURING JULY 2018 AND T.M.M. & J.C.M. IN SEPTEMBER & OCTOBER 2018 USING A TRIMBLE S6 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS. ADDITONAL FIELD SURVEY PERFORMED BY M.C. DURING NOVEMBER 2016 AND OCTOBER 2018 USING A LEICA HDS SCANNER.

3. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY MARC JACOBS IN NOVEMBER 2016 AND REVIEWED BY GOVE ENVIRONMENTAL SERVICES, INC. DURING APRIL 2018 IN ACCORDING TO THE US ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y-87-1, JANUARY 1987 AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2102 AND FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, MAY 2017, NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE.

4. VERTICAL DATUM IS BASED ON NGVD29 PER DISK V 28 1942 ELEV. 25.59..

5. HORIZONTAL DATUM BASED ON NEW HAMPSHIRE STATE PLANE(2800) NAD83(2011) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.

6. PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT 1' INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA, AND DOUCET SURVEY, INC. WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.

7. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVABLE PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE.

8. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING; THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MANHOLE CONFIGURATION, ETC.

9. ALL ELECTRIC, GAS, TEL. WATER, SEWER AND DRAIN SERVICES ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN ON THIS SITE USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.

10. UNDERGROUND UTILITY DATA WAS PROVIDED TO DOUCET SURVEY, INC. BY THE CITY OF PORTSMOUTH GIS DEPARTMENT ON NOVEMBER 15, 2016. THIS DATA IS FOR PLANNING PURPOSES ONLY AND DOUCET SURVEY DOES NOT GUARANTEE THE ACCURACY OR EXISTENCE OF THE DATA PROVIDED. ON-SITE INSPECTION SHOULD BE CONDUCTED PRIOR FINAL DESIGN AND/OR CONSTRUCTION.

STATE OF NEW HAMPSHIRE — No 989 — MATTHEW A. FAGGINGER-AUER — LICENSED LAND SURVEYOR — SIGNATURE

NHSPC(NAD83/2011)

NO.	DATE	DESCRIPTION	BY
2	9/6/19	ADD ADDITIONAL EASEMENTS	MWF
1	8/19/19	ADD ADDITIONAL EASEMENTS	MWF

30 0 30 60

SCALE: 1 INCH = 30 FT.

TOPOGRAPHIC PLAN

FOR
CATE STREET DEVELOPMENT LLC
OF
TAX MAP 163, LOTS 33 & 34
TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2
CATE STREET & US ROUTE 1 BYPASS
PORTSMOUTH, NEW HAMPSHIRE

SHEETS 6-10 NOT FOR RECORDING

DRAWN BY:	M.W.F.	DATE:	JULY 3, 2019
CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	6 OF 10

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http://www.doucetsurvey.com

FILE NAME: T:\PROJECTS\5517 CSI (SE 4'SS)\DWG\5517D SUB PLAN.dwg LAYOUT NAME: TOPO (56) PLOTTED: Friday, September 06, 2019 - 12:44pm

MATCH LINE SHEET 6
MATCH LINE SHEET 7

MATCH LINE SHEET 6
MATCH LINE SHEET 8

CB #1348
CB #1347
PSNH/264/5
8" DIA PIPE
POSSIBLE CLEAN OUT,
NO COVER
TBM C
"X" CUT IN BOLT
OVER MAIN OUTLET
ELEV.=24.93'
SMH #1066
CB #1072
CB #1071
TBM 4139B
MAG NAIL FOUND UP 12"
IN POLE PSNH/264/6
ELEV.=25.56'
TBM 4139A
MAG NAIL FOUND UP 6"
IN POLE PSNH/242/3
ELEV.=24.86'
CONCRETE WALL
W/CHAINLINK FENCE
NO PARKING
CB #1148
SMH #1152
CB #1128
STOP
OVERHANG
CB #1147
GRASS AREA
FF=24.2'
FF=24.1'
2" DIA. PIPE
TAX MAP 172, LOT 1
BUILDING
FIRE PULL BOX
FF=24.0'
HANDICAP
PARKING
GRASS AREA
CB #1056
PSNH/242/3A
W/POWER DOWN
BLANK SIGN
PSNH/242/3X
PSNH/242/4
4/NETT
15" RCP INV.=18.4'
~FADED PARKING STRIPING~
BUILDING
TRAILER
CHAIN LINK FENCE
ENCLOSURE
PSNH/242
PSNH/242/5
W/POWER DOWN
30" BRICK INV.=19.9'
BOSTON & MAINE RAILROAD
4"x8" CONCRETE
WHISTLE POST
4"x8" CONCRETE
WHISTLE POST,
MARKED "W"
MATCH LINE SHEET 7
MATCH LINE SHEET 8
FUEL PUMP ISLAND
CB #1186
COVER
COVER
~ROW OF PINE TREES~
STEEL STEPS
179/5E
EM
CONCRETE
RETAINING WALL
CB #1188
RAMP
STACKED STORAGE
CONTAINERS
~FADED PARKING STRIPING~
PATH
US ROUTE 1 BYPASS

NORTH (NAD83 2011)

30 0 30 60
SCALE: 1 INCH = 30 FT.

TOPOGRAPHIC PLAN
FOR
CATE STREET DEVELOPMENT LLC
OF
TAX MAP 163, LOTS 33 & 34
TAX MAP 165, LOT 2
TAX MAP 172, LOT 1
TAX MAP 173, LOT 2
CATE STREET & US ROUTE 1 BYPASS
PORTSMOUTH, NEW HAMPSHIRE

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CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	7 OF 10

STATE OF NEW HAMPSHIRE — LICENSED LAND SURVEYOR
No. 989
MATTHEW A. FAGGINGER-AUER
SIGNATURE

SHEETS 6-10 NOT FOR RECORDING

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TOPOGRAPHIC PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34

TAX MAP 165, LOT 2

TAX MAP 172, LOT 1

TAX MAP 173, LOT 2

CATE STREET & US ROUTE 1 BYPASS

PORTSMOUTH, NEW HAMPSHIRE

30 0 30 60

SCALE: 1 INCH = 30 FT.

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CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	8 OF 10

NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 989 MATTHEW A. FAGGINGER-AUER SIGNATURE

SHEETS 6-10 NOT FOR RECORDING

MATCH LINE SHEET 6
MATCH LINE SHEET 8

MATCH LINE SHEET 9
MATCH LINE SHEET 8

FUEL PUMP ISLAND
COVER
COVER
SMH #2799
(A)
(B)
BUILDING
FF=25.3'
FF=25.1'
EM
179/5C
GATE
DEBRIS PILE
5' CHAIN LINK FENCE
PSNH/179/5A
PATH
2/NET&T
TAX MAP 165, LOT 2
318B/4/179/5D
GM
FF=28.1'
STEEL STEPS
179/5E
EM
BUILDING
OUT BUILDING
CONCRETE RETAINING WALL
CB #1188
RAMP
MW 65-8
STACKED STORAGE CONTAINERS
SQUARE CONCRETE POST UP 8'
BOSTON & MAINE RAILROAD
PATH
MATCH LINE SHEET 7
MATCH LINE SHEET 8

NORTH (NAD83/2011)

INSET (1"=30')

6" X 6" CONC. BND. FND. W/ D.H. UP 6" ~GRASS~
CONC. PAD W/ TRANSFORMER 3191/319/9
W/ 1 COND. DOWN
PNSH 183/9
W/1 COND. DOWN
CB #20001
CB #2993
CB #3065
DOVER CONCORD LEFT LANE
DECK
TH=34.4'
HOUSE
~GRAVEL~ DRIVEWAY
KEEP RIGHT
SIDEWALK MAT
1 BLUE PAINT MARK
COAKLEY ROAD
(50' PUBLIC R.O.W. PER REF. PLAN #24)
CB #3281
SMH #3280
CB #3019
PORT INN HOTEL
10" X 10" METAL SIGN POST (TYP.)
4" X 4" WOODEN POST
~GRASS~
7803/PNSH/183
PNSH 183/8Y
SMH #1470
TBM 5652D
SPIKE FND. UP 12" IN POLE PSNH183/8-1/2
ELEV.=30.22'
PSNH183/8
319/8 NETCO
COTTAGE STREET
(50' PUBLIC R.O.W. PER REF. PLAN #28)
SMH #1527
US ROUTE 1 BYPASS
(100' ROW PER REFERENCE PLAN 1)
CB #4545
REFLECTOR
OUTLET NOT FOUND
WOODEN GUARD RAIL
GRAVEL AREA
STOP
~GRASS~
UNDERGROUND GAS, SINGLE PAINT MARK
HODGSON'S BROOK
UNDERGROUND GAS PIPELINE
SHEET 8 INSET

TOPOGRAPHIC PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34

TAX MAP 165, LOT 2

TAX MAP 172, LOT 1

TAX MAP 173, LOT 2

CATE STREET & US ROUTE 1 BYPASS

PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
2	9/6/19	ADD ADDITIONAL EASEMENTS	MWF
1	8/19/19	ADD ADDITIONAL EASEMENTS	MWF

DRAWN BY: M.W.F.	DATE: JULY 3, 2019
CHECKED BY: W.J.D.	DRAWING NO.: 5517D
JOB NO.: 5517	SHEET 9 OF 10

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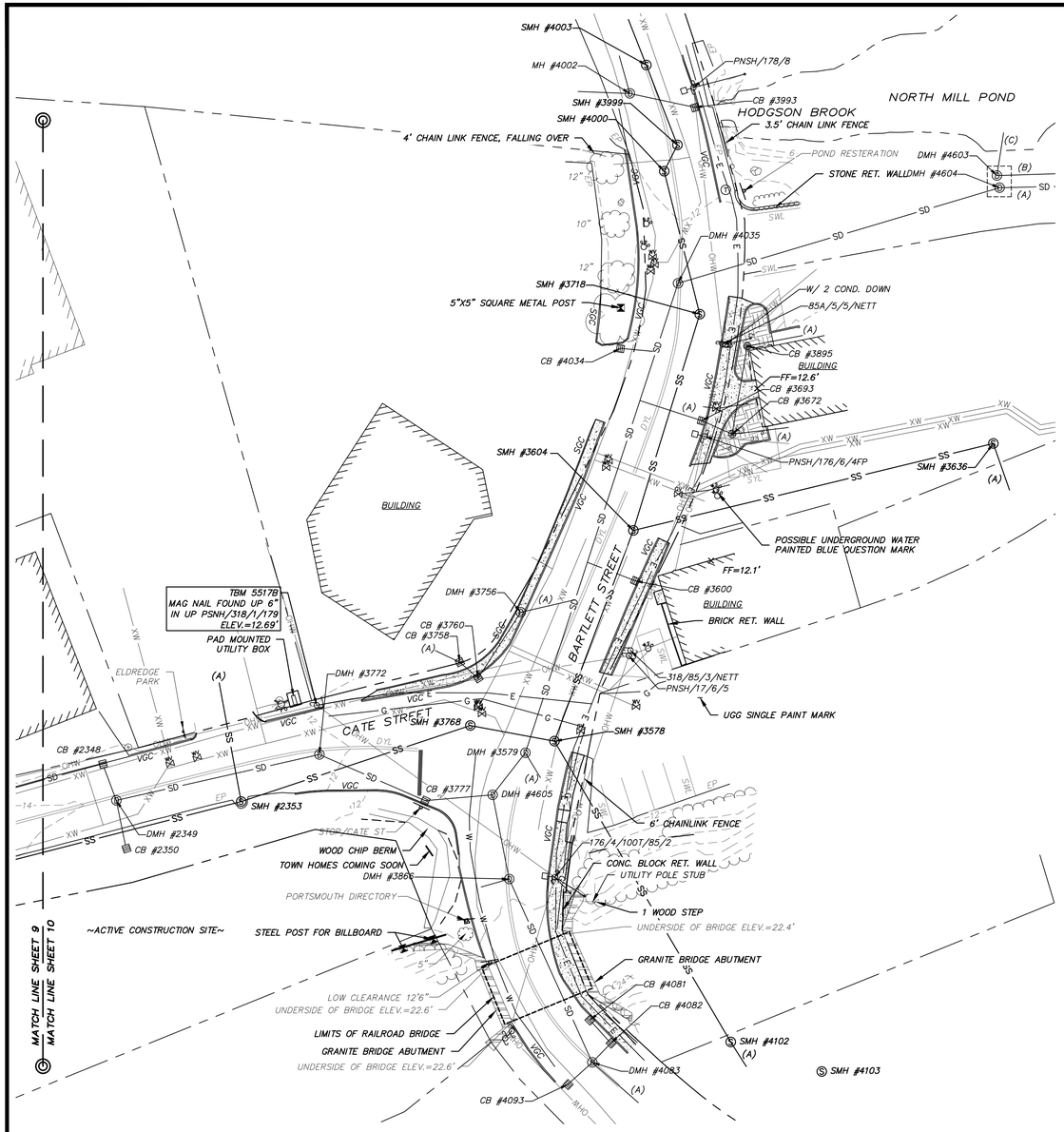
2 Commerce Drive (Suite 202) Bedford, NH 03110 (603) 614-4060
10 Storer Street (Riverview Suite) Kennebunk, ME (207) 502-7005
http://www.doucetsurvey.com

SHEETS 6-10 NOT FOR RECORDING

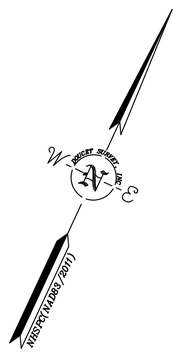


DRAINAGE STRUCTURES			
CB #1056	CB #1348	CB #3600	CB #4034
RIM ELEV.=23.3'	RIM ELEV.=24.6'	RIM ELEV.=11.1'	RIM ELEV.=10.8'
(A) 4" UNKN. INV.=17.6'	(1347) 12" RCP INV.=19.2'	12" PVC INV.=7.5'	12" PVC INV.=7.5'
(B) 4" UNKN. INV.=17.7'			
	CB #1742	CB #3672	DMH #4035
CB #1071	RIM ELEV.=24.7'	RIM ELEV.=11.9'	RIM ELEV.=11.7'
RIM ELEV.=22.7'	(1743) 12" RCP INV.=19.7'	(3693) 4" PVC INV.=8.2'	(NO VISIBLE PIPES)
(1072) 12" RCP INV.=17.3'		(3895) 4" PVC INV.=8.7'	SUMP=1.3'
	CB #1743	(A) 4" PVC INV.=8.3'	WATER LEVEL=1.8'
CB #1072	RIM ELEV.=24.7'		
RIM ELEV.=23.7'	(1742) 12" RCP INV.=19.5'	CB #3693	CB #4081
(A) 6" CMP INV.=17.6'	(A) 12" RCP INV.=19.5'	RIM ELEV.=11.0'	RIM ELEV.=8.7'
(1071) 12" RCP INV.=17.5'		(3672) 4" PVC INV.=8.2'	(4082) 12" HDPE INV.=5.8'
(1148) 12" CMP INV.=17.5'	CB #1926	(A) 12" PVC INV.=7.9'	
(1347) 15" RCP INV.=17.1'	RIM ELEV.=29.7'		CB #4082
(B) 15" RCP INV.=17.0'	8" PVC INV.=27.9' (OUTFALL)	DMH #3756	RIM ELEV.=8.7'
		RIM ELEV.=11.6'	(4081) 12" HDPE INV.=5.7'
CB #1128	CB #2346	(2360) 12" PVC INV.=7.8'	(4083) 12" HDPE INV.=5.9'
RIM ELEV.=22.7'	RIM ELEV.=15.6'	(A) 12" PVC INV.=7.8'	
(A) 6" PVC INV.=19.4'	(A) 12" RCP INV.=11.3'		DMH #4083
(1186) 12" CMP INV.=18.9'		DMH #3756	RIM ELEV.=8.9'
(1148) 12" CMP INV.=18.8'	CB #2347	RIM ELEV.=11.6'	(3866) 42"WX24H CMP INV.=5.0'
	RIM ELEV.=13.8'	(3760) 12" PVC INV.=7.7'	(4083) 12" HDPE INV.=5.7'
CB #1147	(2348) 15" HDPE INV.=9.7'	(A) 12" PVC INV.=7.8'	(4093) 12" HDPE INV.=5.6'
RIM ELEV.=22.2'			(A) 42"WX24H CMP INV.=5.0'
(A) 6" PVC INV.=18.7'	CB #2348	CB #3758	
(B) 12" CMP INV.=18.3'	RIM ELEV.=13.6'	RIM ELEV.=10.9'	CB #4093
	(2347) 15" HDPE INV.=9.8'	(3760) 12" PVC INV.=8.0'	RIM ELEV.=9.0'
CB #1148	(2349) 15" HDPE INV.=9.8'	(A) 8" PVC INV.=7.9'	(4083) 12" HDPE INV.=5.9'
RIM ELEV.=22.4'			
(A) 6" PVC INV.=18.7'	CB #2349	CB #3760	CB #4181
(1128) 12" CMP INV.=18.1'	RIM ELEV.=13.8'	RIM ELEV.=10.7'	RIM ELEV.=24.7'
(1148) 12" CMP INV.=18.2'	(2348) 15" HDPE INV.=9.1'	(3756) 12" PVC INV.=8.0'	12" CMP INV.=19.7'
	(2350) 15" HDPE INV.=10.3'	(3758) 12" PVC INV.=8.0'	
CB #1186	(3772) 15" HDPE INV.=9.1'		CB #4239
RIM ELEV.=23.5'		DMH #3772	RIM ELEV.=25.0'
(1188) 12" CMP (NOT VISIBLE)	CB #2350	RIM ELEV.=12.2'	12" CMP INV.=20.3'
(1128) 12" CMP INV.=20.0'	RIM ELEV.=12.6'	(2349) 15" HDPE INV.=8.7'	
	(FULL OF SILT & DEBRIS)	(3777) 15" HDPE INV.=8.6'	CB #4545
CB #1188			RIM ELEV.=27.8'
RIM ELEV.=25.7'	CB #2993	CB #3777	(3281) 15" RCP INV.=22.0'
(1186) 8" PVC INV.=22.3'	RIM ELEV.=30.2	RIM ELEV.=10.7'	(A) 18" RCP INV.=21.3'
	(A) 15" RCP INV.=26.2'	(3772) 15" HDPE INV.=7.7'	
CB #1213	(B) 12" UNKN. INV.=26.1'	(4605) 15" HDPE INV.=7.6'	DMH #4603 & 4604
RIM ELEV.=20.3'	(3281) 15" RCP INV.=26.0'		RIM ELEV.=10.3'
(HDWL) 12" HDPE INV.=17.6'		DMH #3866	(4035) 42" RCP INV.=1.0'
	CB #3019	RIM ELEV.=10.2'	(A) 36" RCP INV. (RECESSED)
CB #1251	RIM ELEV.=28.8'	(4083) 42"WX24H CMP INV.=5.3'	(B) UNKN. (RECESSED)
RIM ELEV.=20.9'	(A) 6" PVC INV.=25.4'	(4605) 24" RCP INV.=5.4'	(C) 42" RCP INV.=1.2'
(A) 18" CMP INV.=16.5'		(A) 8" CI INV.=8.0'	
	CB #3065		DMH #4605
CB #1345	RIM ELEV.=31.5'	CB #3895	RIM ELEV.=11.0'
RIM ELEV.=23.3'	WATER ELEV.=27.4'	RIM ELEV.=11.9'	(3579) 24" RCP INV.=4.4'
(1346) 12" RCP INV.=19.1'	(NO PIPES VISIBLE)	(3672) 4" PVC INV.=9.7'	(3777) 15" CMP INV.=7.5'
		(A) 4" PVC INV.=9.9'	(3866) 24" RCP INV.=4.6'
CB #1346	CB #3281		
RIM ELEV.=25'	RIM ELEV.=29.8'	CB #3993	
(1345) 12" RCP INV.=17.4'	(2993) 15" RCP INV.=24.3'	RIM ELEV.=12.6'	
(1347) 15" RCP INV.=15.9'	(4545) 15" RCP INV.=24.2'	(NO VISIBLE PIPES)	
(A) 15" RCP INV.=15.7'		APPEARS TO OPEN TO BROOK	
	DMH #3579	SUMP=1.5'	
CB #1347	RIM ELEV.=11.2'	WATER LEVEL=1.8'	
RIM ELEV.=23.9'	(4035) 36" BRICK TROUGH INV.=2.0'		
(1348) 12" RCP INV.=18.8'	(4605) 24" RCP INV.=4.2'	CB #4002	
(1072) 15" RCP INV.=15.9'	(A) UNKN. INV.=2.0'	RIM ELEV.=12.9'	
(1346) 15" RCP INV.=15.8'		(BOLTED SHUT)	

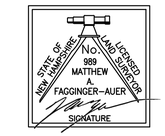
SEWER STRUCTURES		
SMH #1066	SMH #2434	SMH #3768
RIM ELEV.=23.2'	RIM ELEV.=18.2'	RIM ELEV.=11.4'
(A) 4" PVC INV.=18.5'	(2799) 10" UNKN. INV.=9.7'	(2353) 24" PVC INV.=6.0'
(D) UNKN. INV.=12.3'	(2365) 12" UNKN. INV.=9.7'	(3578) 24" PVC INV.=5.9'
(1152) 10" UNKN. INV.=11.8'		
(C) 4" PVC INV.=16.0'	SMH #2789	SMH #3999
(D) 4" PVC INV.=16.0'	RIM ELEV.=20.1'	RIM ELEV.=12.6'
(1350) UNKN. INV.=11.9'	(SUMP) INV.=9.9'	(4000) 10" PVC INV.=5.9'
(E) UNKN. INV.=11.6'	NO PIPES VISIBLE	(4003) 12" PVC INV.=5.8'
SMH #1152	SMH #2799	SMH #4000
RIM ELEV.=22.6'	RIM ELEV.=23.8'	RIM ELEV.=12.3'
(1066) 10" UNKN. INV.=11.3'	(A) 4" DI INV.=21.1'	(3718) 10" PVC INV.=5.8'
(2799) 10" UNKN. INV.=11.2'	(B) 8" UNKN. INV.=12.1'	(3999) 10" PVC INV.=5.8'
	(1152) 10" UNKN. INV.=10.7'	
SMH #1350	(2434) 10" UNKN. INV.=10.6'	SMH #4003
RIM ELEV.=25.5'		RIM ELEV.=13.3'
(A) 8" CLAY INV.=14.9'	SMH #3280	(3999) 12" PVC INV.=6.5'
(4565) UNKN. INV.=14.7'	RIM ELEV.=29.8'	(A) 10" CI INV.=6.6
(1066) UNKN. INV.=14.4'	(1527) 8" CLAY DROP INLET INV.=21.1'	
	(4565) UNKN. INV.=16.4'	SMH #4102
SMH #1470	(A) 4" CI INV.=23.3'	RIM ELEV.=11.3'
RIM ELEV.=29.4'	(B) UNKN. INV.=16.5'	(3578) 30" PVC INV.=3.7'
FULL OF DEBRIS		(A) 30" PVC INV.=3.6'
	SMH #3578	
SMH #1527	RIM ELEV.=10.9'	SMH #4103
RIM ELEV.=31.6'	(3604) 36" PVC INV.=3.0'	RIM ELEV.=10.5'
(3280) 8" CLAY INV.=24.8'	(3768) 24" PVC INV.=5.8'	(NO VISIBLE PIPES, POSSIBLE
(A) 8" CLAY INV.=25.3'	(4102) 30" PVC INV=3.1'	ELECTRIC MANHOLE)
(B) 8" CLAY INV.=24.7'		
	SMH #3604	SMH #4565
SMH #2353	RIM ELEV.=11.3'	RIM ELEV.=26.4'
RIM ELEV.=12.7'	(3578) 36" PVC INV.=2.5'	PIPES SUBMERGED
(2365) 24" PVC INV.=6.5'	(3636) 36" PVC INV.=2.5'	WATER LEVEL=16.5'
(3768) 24" PVC INV.=6.5'	(3718) 10" PVC INV.=4.7'	SUMP=15.4'
(A) 6" PVC INV.=7.2'		
	SMH #3636	SMH #4607
SMH #2365	RIM ELEV.=10.3'	RIM ELEV.=33.2'
RIM ELEV.=14.4'	(3604) 36" PVC INV.=2.3'	(A) 8" PVC INV.=17.9'
(A) 10" CI INV.=9.3'	(A) 36" PVC INV.=2.2'	(B) 8" PVC INV.=17.7'
(2434) 10" METAL INV.=9.2'		
(2353) 24" METAL INV.=9.2'	SMH #3718	
	RIM ELEV.=11.5'	
	(3604) 10" PVC INV.=5.3'	
	(4000) 10" PVC INV.=5.5'	

LEGEND

- APPROXIMATE LOT LINE
- INTERIOR LOT LINE
- APPROXIMATE ABUTTER LOT LINE
- EASEMENT LINE
- STOCKADE FENCE
- CHAIN LINK FENCE
- GUARDRAIL
- OHW — OVERHEAD WIRES
- SS — SEWER LINE
- SD — DRAIN LINE
- G — GAS LINE
- W — WATER LINE
- 20 — MAJOR CONTOUR LINE
- 22 — MINOR CONTOUR LINE
- TREE LINE
- SHRUB LINE
- EDGE OF WETLAND
- XS — SEWER LINE (SEE NOTE 20)
- XD — DRAIN LINE (SEE NOTE 20)
- XW — WATER LINE (SEE NOTE 20)
- UTILITY POLE
- UTILITY POLE & GUY WIRE
- UTILITY POLE W/ LIGHT
- LIGHT POLE
- SIGN
- SIGN (TWO POSTS)
- FENCE POST
- POST
- POST
- BOLLARD
- FIRE HYDRANT
- WATER GATE VALVE
- SPIGOT
- GAS GATE VALVE
- O.F.C. — OIL FILL CAP
- ELECTRIC BOX
- CATCH BASIN
- DRAIN MANHOLE
- RD — ROOF DRAIN
- MANHOLE
- SEWER MANHOLE
- CLEANOUT
- HAND HOLE
- WETLAND AREA
- FLAG POLE
- CONIFEROUS TREE
- DECIDUOUS TREE
- MONITORING WELL
- DRAINAGE FLOW DIRECTION ARROW
- CONCRETE
- CRUSHED STONE
- LEDGE OUTCROP
- ACCESSIBLE PARKING SPACE
- MAST ARM
- JERSEY BARRIER
- TYP. — TYPICAL
- FF — FINISHED FLOOR
- EM — ELECTRIC METER
- EP — EDGE OF PAVEMENT
- VGC — VERTICAL GRANITE CURB
- SGC — SLOPED GRANITE CURB
- SBB — SLOPED BITUMINOUS BERM
- SWL — SINGLE WHITE LINE
- SYL — SINGLE YELLOW LINE
- DYL — DOUBLE YELLOW LINE



SHEETS 6–10 NOT FOR RECORDING



30 0 30 60

SCALE: 1 INCH = 30 FT.

TOPOGRAPHIC PLAN

FOR

CATE STREET DEVELOPMENT LLC

OF

TAX MAP 163, LOTS 33 & 34

TAX MAP 165, LOT 2

TAX MAP 172, LOT 1

TAX MAP 173, LOT 2

CATE STREET & US ROUTE 1 BYPASS

PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
2	9/6/19	ADD ADDITIONAL EASEMENTS	MWF
1	8/19/19	ADD ADDITIONAL EASEMENTS	MWF

DRAWN BY:	M.W.F.	DATE:	JULY 3, 2019
CHECKED BY:	W.J.D.	DRAWING NO.:	5517D
JOB NO.:	5517	SHEET	10 OF 10

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SITE NOTES:

1. TOTAL PARCEL AREA:
   TAX MAP 163, LOT 33–12,230 SF (0.28 AC.)
   TAX MAP 163, LOT 34–64,109 SF (1.47 AC.)
   COMBINED AREA–451,572 SF (10.37 AC.)
   TAX MAP 165, LOT 2
   TAX MAP 172, LOT 1
   TAX MAP 173, LOT 2

   OWNER OF RECORD:
   CATE STREET DEVELOPMENT, LLC
   60 K STREET
   BOSTON, MA 02127
   RCRD BOOK5929, PAGE 109

2. ZONES: G–1–GATEWAY NEIGHBORHOOD MIXED USE

3. DIMENSIONAL REQUIREMENTS, DEVELOPMENT SITE STANDARDS:

	REQUIRED	PROPOSED
MIN. DEVELOPMENT AREA	20,000 sq.ft.	579,856 SF
MIN. SITE WIDTH	100 ft.	VARIES > 100 ft.
MIN. LOT DEPTH	100 ft.	VARIES > 100 ft.
MIN. PERIMETER BUFFER	75 ft. FROM RES. DIST., MIXED RES., OR CD4–L1 DIST.	N/A
MAX. DEV. BLOCK	800 ft. LENGTH, 2,200 LINEAR ft.	610 ft.
MIN. FRONTAGE	50 ft.	227 ft.
MAX. BUILDING HEIGHT 25–FT STEP BACK	45 ft.	45 ft.
MAX. BUILDING COVERAGE	70 %	18.6 %
MIN. OPEN SPACE	20 %	41 %
COMMUNITY SPACE	ALL TYPES	SEE NOTE #6
WETLAND SETBACKS	100 ft.	104 ft.
IMPERVIOUS COVER		390,471 sq. ft. (67.3%)

ZONING INFORMATION LISTED HEREON IS BASED ON THE CITY OF PORTSMOUTH ZONING ORDINANCE DATED MARCH 4, 2019 AS AVAILABLE ON THE CITY WEBSITE. ADDITIONAL REGULATIONS APPLY, AND REFERENCE IS HEREBY MADE TO THE EFFECTIVE ZONING ORDINANCE. THE LAND OWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE MUNICIPAL, STATE AND FEDERAL REGULATIONS.

4. PARKING CALCULATIONS PER 10.1112.30:

COMMERCIAL BUILDING	AREA	REQUIREMENT	REQUIRED	PROVIDED
EATING AND DRINKING	13,600SF	1/100 SF	136	--
RETAIL	5800SF	1/300 SF	20	--
OFFICE	15900SF	1/350 SF	46	--
SUB–TOTAL			202	170

RESIDENTIAL A AND B:	UNITS	REQUIREMENT	REQUIRED	PROVIDED
UNITS <500 SQ. FT.	71	0.5 SPACE/UNIT	36	--
UNITS 500–750 SQ. FT.	107	1 SPACE/UNIT	107	--
UNITS >750 SQ. FT.	72	1.3/UNIT	94	--
VISITOR	250	1 SPACE/5 UNITS	50	--
SUB–TOTAL			287	294

TOWNHOMES:	UNITS	REQUIREMENT	REQUIRED	PROVIDED
UNITS >750 SQ. FT.	23	1.3/UNIT	30	46
VISITOR	23	1/5 UNITS	5	5
SUB–TOTAL			35	51

(EACH TOWNHOME HAS A 2 CAR GARAGE)

5. SHARED PARKING CALCULATIONS: COLUMN C WEEKDAY EVENINGS, PER 10.1112.60:

COMMERCIAL BUILDING	REQUIRED	SHARED %	SHARED REQUIRED	PROVIDED
EATING AND DRINKING	136	100%	136	--
RETAIL	20	90%	18	--
OFFICE	46	20%	10	--
SUB–TOTAL			164	170
BICYCLE PARKING	1/10 PARKING		17	17
HANDICAP ACCESSIBLE = 6				

RESIDENTIAL A AND B:	REQUIRED	SHARED %	SHARED REQUIRED	PROVIDED
UNITS <500 SQ. FT.	71	0.5 SPACE/UNIT	36	--
UNITS 500–750 SQ. FT.	107	1 SPACE/UNIT	107	--
UNITS >750 SQ. FT.	72	1.3/UNIT	94	--
VISITOR	250	1 SPACE/5 UNITS	50	--
SUB–TOTAL			287	294
BICYCLE PARKING IS INTERNAL				
HANDICAP ACCESSIBLE = 8				

TOWNHOMES:	REQUIRED	SHARED %	SHARED REQUIRED	PROVIDED
UNITS >750 SQ. FT.	36	100%	30	46
VISITOR	5	100%	5	5
SUB–TOTAL			35	51
BICYCLE PARKING IS INTERNAL				

DEVELOPMENT SITE TOTAL:	REQUIRED	PROVIDED
	524	531

6. COMMUNITY SPACE CALCULATION:

	REQUIRED	PROVIDED
TOTAL DEVELOPMENT SITE	--	579,818 SF
GREENWAY	--	58,086 SF (10%)
PARK/COMMON	--	6,105 SF (1%)
POCKET PARK	--	2,648 SF (1%)
WIDE PEDESTRIAN SIDEWALK	--	20,234 SF (3%)
TOTAL	57,982 SF (10%)	87,073 SF (15%)

7. PUBLIC REALM IMPROVEMENTS ARE BEING PROVIDED AS A PART OF THIS PROJECT. A CONNECTOR ROAD CONNECTING ROUTE 1 BYPASS TO BARTLETT STREET AND THE WEST END OF PORTSMOUTH, AS WELL AS A BICYCLE/MULTI–USE TRAIL ALONG HODGSON BROOK ARE BOTH BEING PROVIDED. PUBLIC REALM SPACE CANNOT COUNT TOWARD COMMUNITY SPACE. AS SUCH THE AREA OF THE LAND OCCUPIED BY THE MULTI–USE TRAIL TO THE SIDEWALK ON THE SOUTH SIDE OF THE CONNECTOR ROAD IS EXCLUDED FROM THE CALCULATION IN NOTE #6 COMMUNITY SPACE CALCULATIONS.

PUBLIC REALM SPACE:	REQUIRED	PROVIDED
TOTAL DEVELOPMENT SITE	--	579,818 SF
PUBLIC REALM	OPTIONAL	81,879 SF (14%)

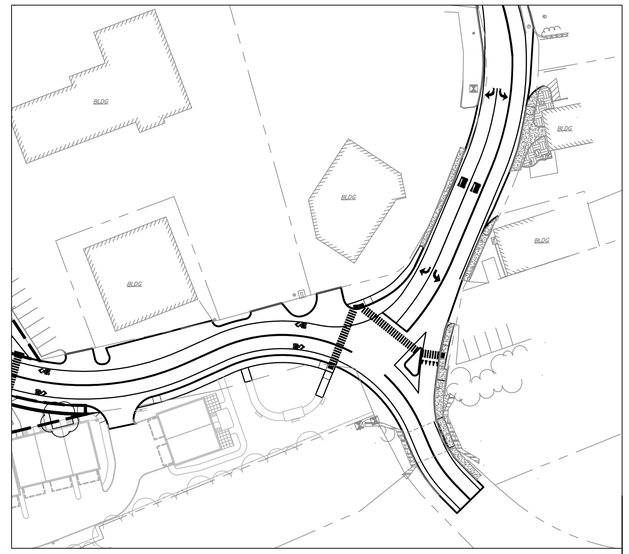
8. IF, DURING CONSTRUCTION, IT BECOMES APPARENT THAT ADDITIONAL EROSION CONTROL MEASURES ARE REQUIRED TO STOP ANY EROSION ON THE CONSTRUCTION SITE, THE PROPERTY OWNER SHALL BE REQUIRED TO INSTALL THE NECESSARY EROSION PROTECTION AT NO EXPENSE TO THE CITY.

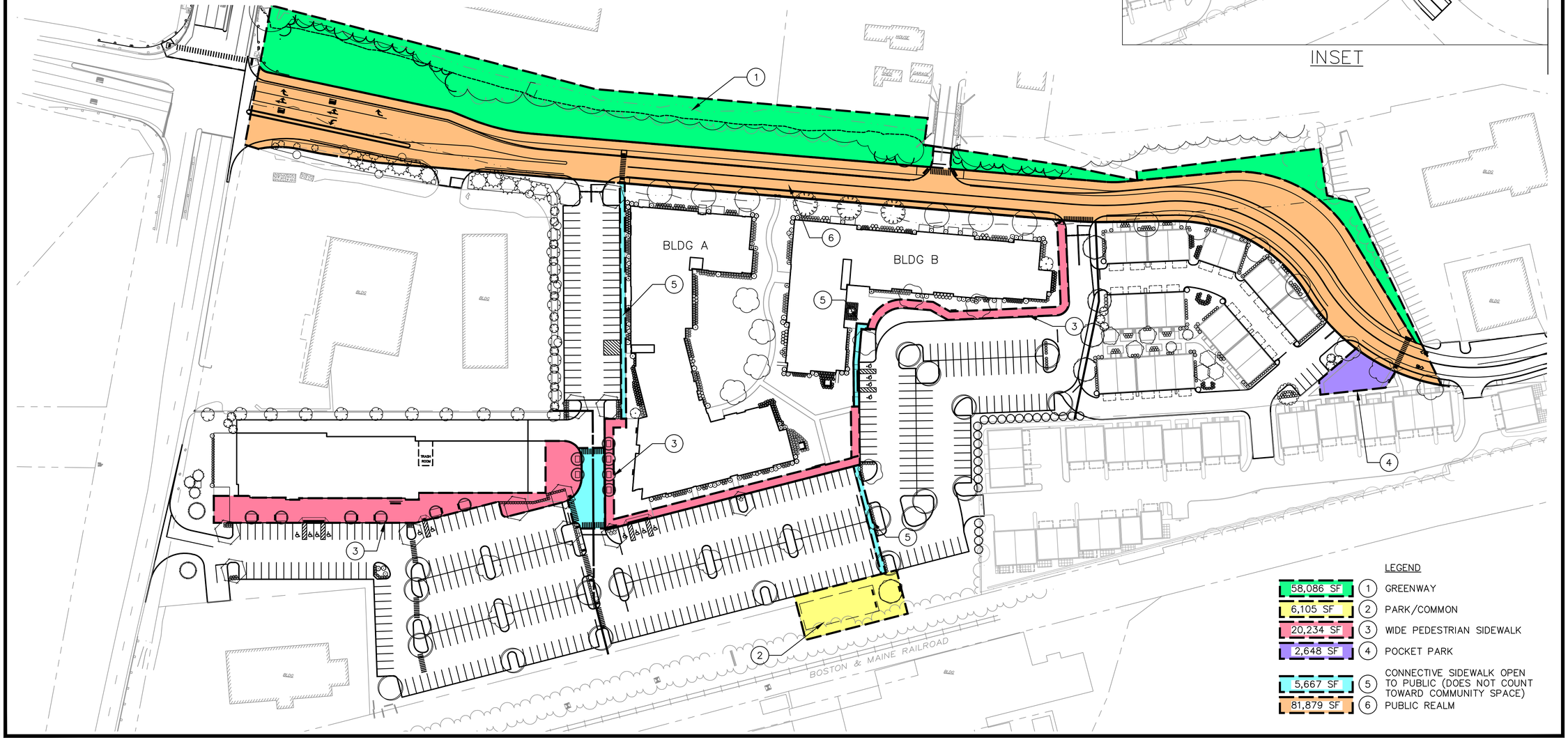
9. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REGULATIONS.

10. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.

11. ALL IMPROVEMENTS SHOWN ON THE SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.

12. SNOW SHALL BE STORED ON SITE IN DESIGNATED AREAS AS SHOWN ON CS–201 THRU CS–202. WHEN ON SITE STORAGE AREAS ARE EXCEEDED, SNOW SHALL BE DISPOSED OF OFF SITE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.





No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
6.	9/10/2019	PLANNING BOARD SUBMISSION	JVA/DAD	RRL
5.	8/19/2019	TAC SUBMITTAL	JVA/DAD	RRL
4.	7/24/2019	TAC SUBMITTAL	JVA/DAD	RRL
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

SCALE: HORZ.: 1"=60'
VERT.: 1"=60'
DATUM: HORZ.: NAD83
VERT.: NAVD88
60 30 0 60
GRAPHIC SCALE

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PROJ. No.: 20180317.A10
DATE: 09/10/2019

CS-002

TRAFFIC IMPACT AND SITE ACCESS STUDY - UPDATED

PROPOSED MIXED-USE SITE

Portsmouth, New Hampshire

April 2019

Prepared for

Torrington Properties, Inc.

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& Company, Inc.

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TRAFFIC IMPACT AND SITE ACCESS STUDY
PROPOSED MIXED-USE SITE
PORTSMOUTH, NEW HAMPSHIRE
April 24, 2019

INTRODUCTION

On July 18, 2018 this office prepared the report entitled *"Draft Traffic Impact and Site Access Study"* for Torrington Properties, Inc. in order to assess the traffic impacts associated with the proposed residential/commercial development located on the east side of US1 Bypass at the site of the Frank Jones Center; a wedding, event, and conference center in Portsmouth, New Hampshire. Since publication of the draft report, the proposed development has decreased in size (69 fewer dwelling units) and the NHDOT and City of Portsmouth have requested supplemental traffic projections and analyses to better understand the implications of: 1) a possible future extension of Cate Street to the US1 Bypass (across from Borthwick Avenue), and 2) a possible future extension of the US1 Bypass median island through the Cottage Street/Coakley Road intersection (with removal of the traffic signal system).

The purpose of this finalized report entitled "*Traffic Impact and Site Access Study"* is to summarize the data collected, the future traffic projections, the technical analyses and our findings and recommendations relative to traffic operations, capacity, and safety in the study area.

A traffic study "scope" meeting was conducted with the NHDOT and City representatives on April 27, 2018. As a result of that meeting, the analysis periods were identified as the Weekday PM and Saturday Midday peak periods, and the study area was expanded to include several intersections:

- US1 Bypass/Cottage Street/Coakley Road
- US1 Bypass/Borthwick Avenue
- US1 Bypass/Existing Site Driveway (Right-In/Right-Out only)
- Islington Street/Bartlett Street/Pharmacy Driveway
- Bartlett Street/Cate Street
- Bartlett Street/Existing Shared Driveway (Ricci Lumber, Great Rhythm Brewing)
- Cate Street Extension/Proposed Site Driveway A
- Cate Street Extension/Proposed Site Driveway B
- Cate Street Extension/Proposed Site Driveway C

The City also requested: 1) supplemental counts on Woodbury Avenue (at the US1 Bypass Ramps and Franklin Avenue) for planning purposes, and 2) pedestrian and bicycle count data. The NHDOT requested that "lane utilization" be monitored on the US1 Bypass northbound approach to the Cottage Street/Coakley Road signalized intersection, given the upstream influence of the Portsmouth Traffic Circle.

EXECUTIVE SUMMARY

The proposed residential (273 dwellings)/commercial (44 KSF) development will generate approximately 353 (PM) and 444 (SAT) vehicle-trips during the peak hour periods, and the site will be accessible via: 1) the existing right-and/right-out driveway on the Bypass, 2) the existing shared site driveway located across from the Borthwick Avenue signalized intersection, and 3) an internal connection to Cate Street.

With the implementation of the traffic mitigation measures identified in this study, the US1 Bypass intersections at Cottage Street/Coakley Road and Borthwick Avenue/Existing Site Driveway are projected to operate below capacity through 2030 with the proposed development fully occupied.

The possible future extension of Cate Street through the subject site to the US1 Bypass (across from Borthwick Avenue) has the potential to alter the prevailing traffic patterns for some drivers in the study area. The net increases that are anticipated to occur on the Bypass will increase the volume-capacity (v/c) ratio for the overall Cottage Street/Coakley Road intersection from 0.95 to 1.01 during the 2030 PM peak hour. Similarly, the v/c ratio for the Borthwick Avenue/Cate Street Extension intersection will increase from 0.83 to 0.94 in 2030.

The possible future extension of the Bypass median island through the Cottage Street/Coakley Road intersection will eliminate the need for the traffic signal system at this location. However, the added traffic demand at the Borthwick Avenue/Cate Street Extension intersection will increase the v/c ratio from 0.94 to 1.14, resulting in an over-capacity situation by 2030.

PROPOSAL

The subject site currently lies within the Mixed Residential District (G1–Gateway Corridor) on Lots 163-33, 165-2, 172-1, and 173-2. The proposed development involves razing the existing structures and constructing several new residential/commercial buildings that will contain: 250 mid-rise apartments, 23 townhomes, 22 ksf retail/restaurants, and 22 ksf of office space. The proposed development has the potential to implement the City's long-range plan to realign and extend Cate Street through the subject site to intersect with the US1 Bypass at the Borthwick Avenue signalized intersection. The existing bridge on Cate Street will be converted to a pedestrian-only bridge. A multipurpose path for bikes and pedestrians will be constructed along Hodgson Brook as well as a sidewalk on the development side of the extended roadway. For the purposes of this report only, the possible future roadway is named "Cate Street Extension."

Vehicular access to the development will continue to be provided via the existing right-in/right-out driveway on the Bypass, as well as three proposed site driveways that will intersect the south side of Cate Street Extension, if this roadway is extended. If not, then there will be an indirect driveway connection to Cate Street.

This report contains short-range and long-range traffic projections and analyses for the six existing and three proposed study area intersections for development Scenario A as shown below:

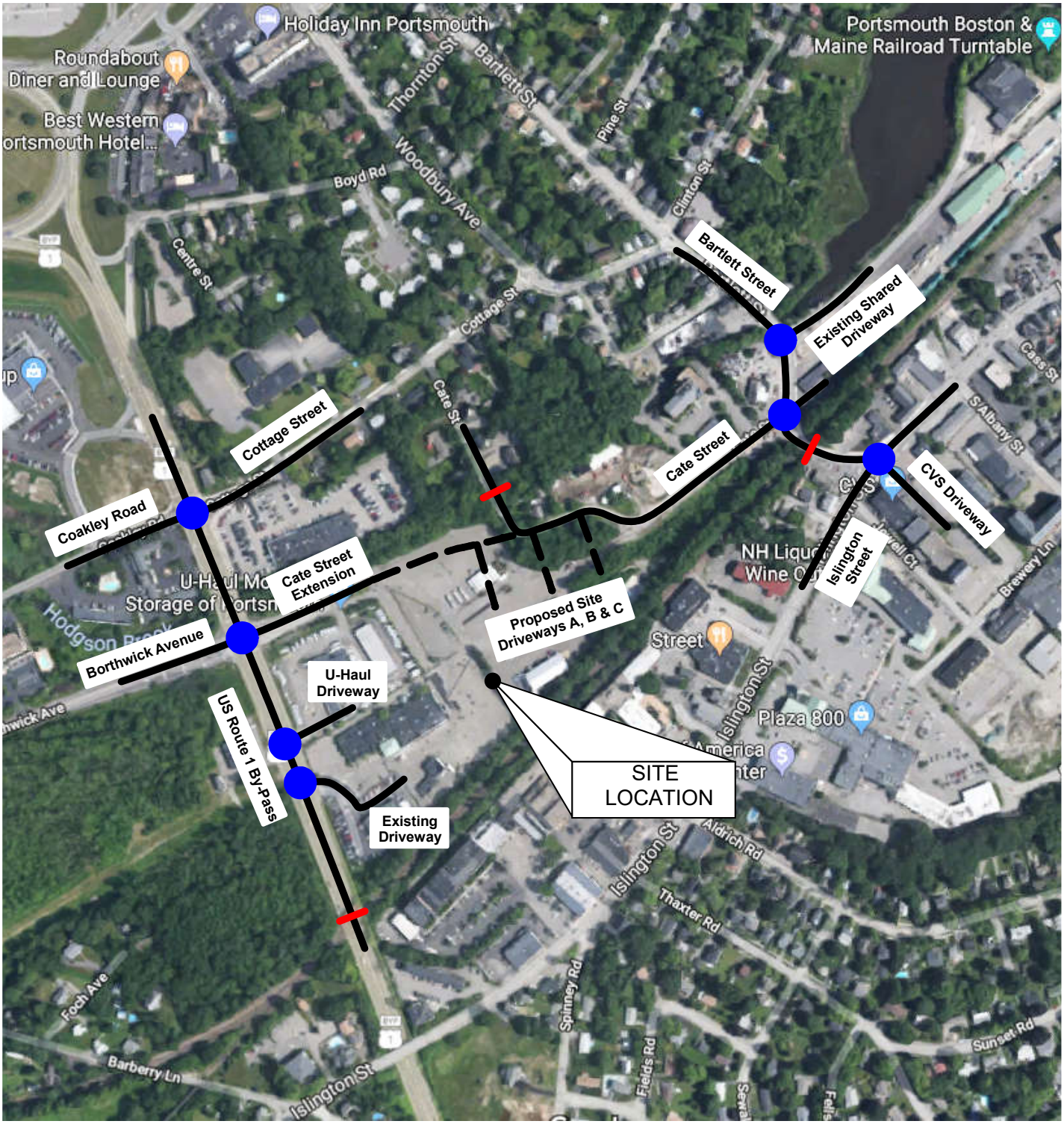
Development Scenario A: Full build-out of the subject site with Cate Street Extension.

This report also includes supplemental long-range traffic projections and analyses for the two existing signalized intersections on US1 Bypass for the following two cases:

Development Scenario B: Full build-out of the subject site without Cate Street Extension.

Development Scenario C: Full build-out of the subject site with Cate Street Extension and extension of the median island on US1 Bypass through the Cottage/Coakley intersection.

Figure 1 shows the location of the subject site with respect to the area roadway system. Appendix A contains a preliminary concept plan that is the subject of this study.



= AUTOMATIC TRAFFIC RECORDER LOCATION (NHDOT)

= INTERSECTION TURNING MOVEMENT COUNT LOCATION

NORTH

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Figure 1

Site Location

Traffic Impact and Site Access Study, Proposed Multi-Use Site, Portsmouth, New Hampshire

EXISTING CONDITIONS

ROADWAYS

The **US1 Bypass** functions as a four-lane arterial highway with a general north-south orientation in the study area that extends from the Traffic Circle (and points north in Maine), past the subject site, to US1 in Portsmouth. This roadway will provide access to the site via the Borthwick Avenue signalized intersection, as well as via the existing Right-In/Right-Out Site Driveway. The speed limit is posted at 35 mph on the Bypass.

Bartlett Street functions as a local collector road with a general northwest to southeast orientation in the study area; its carries through vehicles between Islington Street and Woodbury Avenue via Dennett Street and Thornton Street. The horizontal alignment of the roadway is curvilinear and the vertical alignment is essentially flat in the study area. A paved sidewalk is present in most places along both sides of the roadway. The speed limit is posted at 20 mph in both directions.

Cate Street functions as a local collector road with a general north to south direction from its origin at Cottage Street to a sharp corner to the left and then an "S"-curve in its alignment heading to the east where its terminates at Bartlett Street. The horizontal alignment of the roadway is curvilinear and the vertical alignment ranges from flat to rolling in the area. There are no paved sidewalks or speed limit signs along Cate Street.

Islington Street functions as an urban arterial roadway with a general southwest to northeast orientation in the study area; it carries through vehicles between NH Route 33 and downtown Portsmouth. The horizontal alignment of the roadway is curvilinear and the vertical alignment is essentially flat in the study area. Islington Street provides access to numerous commercial sites and retail businesses, as well as many residences. A paved sidewalk is present along both sides of the roadway.

INTERSECTIONS

The **US1/Cottage Street/Coakley Road** intersection functions as a typical four-leg intersection that operates under traffic signal control. The approach lanes at this intersection are designated accordingly:

NB: One exclusive left-turn lane, one exclusive through lane, one shared through-right lane
SB: One exclusive left-turn lane, one exclusive through lane, one shared through-right lane
EB: One shared left-through-right lane
WB: One shared left-through lane, one exclusive right-turn lane

This traffic signal utilizes a fully-actuated controller that operates with three basic signal phases: 1) northbound and southbound left turns, 2) northbound and southbound through-right movements, and 3) the Cottage Street and Coakley Road approaches run concurrently. This controller is programmed to operate with a 120-second (PM) and 110-second (SAT) cycle length during the peak hour periods, and is coordinated with the signal system to the south.

The **US1/Borthwick Avenue** intersection also functions as a typical four-leg intersection that operates under traffic signal control. The approach lanes at this intersection are designated accordingly:

NB: One exclusive left-turn lane, one exclusive through lane, one shared through-right lane
SB: One exclusive left-turn lane, one exclusive through lane, one shared through-right lane
EB: One exclusive left-turn lane, one shared left-through lane, one exclusive right-turn lane
WB: One exclusive left-turn lane, one shared through-right lane

This traffic signal utilizes a fully-actuated controller that operates with four basic signal phases: 1) northbound and southbound left turns, 2) northbound and southbound through-right movements, 3) eastbound departures from Borthwick Avenue and 4) westbound departures from Borthwick Avenue (future Cate Street Extension). This controller is coordinated with the traffic signal system to the north and it is programmed to operate with a 120-second (PM) and 110-second (SAT) cycle length during the peak hour periods.

The **Islington Street/Bartlett Street/Pharmacy Driveway** intersection functions as a four-leg intersection that operates under traffic signal control. The signal heads are currently post-mounted or span wire-mounted. The existing lane configuration at this intersection is delineated as follows:

EB: One shared left-through lane, one exclusive right-turn lane
WB: One shared left-through-right lane
NB: One exclusive left-turn lane, one shared through-right lane
SB: One shared left-through lane, one exclusive right-turn lane

This traffic signal utilizes a fully-actuated controller that operates with three basic signal phases and an exclusive pedestrian phase (when actuated): 1) the Islington Street southbound approach (with permitted left turns) and northbound through-right movements, 2) Islington Street northbound left turns (lagging phase) with northbound through-right movements, and then 3) the Bartlett Street and pharmacy driveway approaches run concurrently. This controller operated with a 90-second average cycle length during both peak hour periods. Three crosswalks are present and extend across the southbound, westbound and eastbound approaches. The exclusive pedestrian phase was utilized only occasionally during the peak hour periods.

The **Bartlett Street/Cate Street** intersection functions as a typical three-leg "T" intersection; however there is an existing parking lot driveway located across from Cate Street that was utilized minimally during the traffic count periods. The Cate Street approach currently operates under STOP sign control. The existing lane configuration at this intersection is delineated as follows:

EB: One shared left-right lane
NB: One shared left-through lane
SB: One shared through-right lane

Although not formally designated with two approach lanes, the Cate Street approach to Bartlett Street is flared to the extent that left and right turning vehicles are able to queue side-by-side on occasion. Crosswalks are not present at this intersection.

The **Bartlett Street/Existing Shared Driveway** intersection functions as a typical three-leg "T" intersection and the Existing Shared Driveway approach operates with no traffic control devices (no stop sign, no pavement markings). The approach lanes are designated accordingly:

WB: One shared left-right lane
NB: One shared through-right lane
SB: One shared left-through lane

The **US1 Bypass/Existing Site Driveway** intersection functions as an atypical three-leg "T" intersection where the use of the site driveway is limited to right-turn arrivals and right-turn departures (due to the median island on the Bypass). The approach lanes are designated accordingly:

WB: One right-turn exit only lane
NB: One exclusive through lane and one shared through-right lane

The **Cate Street Extension/Proposed Site Driveway A, B, & C** intersections will function as typical three-leg "T" intersections with one shared lane on each approach. Each site driveway approach will operate under stop sign control and will be delineated with a short section of four-inch double-yellow centerline and an 18-inch white stop line.

TRAFFIC VOLUMES

Research at the New Hampshire Department of Transportation (NHDOT) revealed that short-term automatic traffic recorder counts were conducted on: 1) US1 Bypass (under B&M railroad) in July-August 2018, 2) Bartlett Street (west of Islington Street) in September 2017, and 3) Cate Street (at Hodgson Brook) in August of 2017. These count stations are located a short distance from the subject site.

The NHDOT data shows that the US1 Bypass carried an Annual Average Daily Traffic (AADT) volume of 18,997 vehicles per day (vpd) in 2018. Similarly, Bartlett Street carried an AADT volume of 16,742 vpd and Cate Street carried 1,448 vpd in 2018. Data from the automatic traffic recorder counts is summarized graphically on Page 9 and shows the daily and hourly variations in traffic demand in the study area. Except for Cate Street, the hourly rate of traffic flow reached peak levels during the weekday evening commuter period. Appendix B contains a summary of the NHDOT count data.

To establish current travel patterns and traffic volumes in the study area, Pernaw & Company, Inc. conducted simultaneous turning movement and vehicle classification counts at the six existing study area intersections on Thursday, May 24th from 3:00 to 6:00 PM and on Saturday, May 26 from 11:00 AM to 3:00 PM. The new 2018 balanced count data for the study area intersections is summarized on Figure 3A & 3B. Several facts and conclusions are evident from this data.

- The highest traffic hour for the overall study area system occurred from 4:30 to 5:30 PM at which time the volume of traffic on the Bypass ranged from 2,117 vehicles south of the site to 2,273 vehicles north of Cottage Street (total both directions). The majority traveled in the northbound direction on the Bypass during this peak hour. During this same hour, Islington Street and Bartlett Street accommodated over 1,100 vehicles. Cate Street (west of Bartlett Street) carried 151 vehicles, Borthwick Avenue carried 587 vehicles (west of US1 Bypass), and Cottage Street carried 496 vehicles.

- On Saturday the highest traffic hour for the overall study area system occurred from 11:45 AM to 12:45 PM and the roadway volumes were found to be lower than during the weekday PM peak hour. The traffic volume on the Bypass ranged from 1,752 to 1,844 vehicles per hour, Islington Street and Bartlett Street generally carried fewer than 1,000 vehicles (except 1,007 vehicles were observed on Islington Street north of Bartlett Street). Cate Street (west of Bartlett Street) carried 76 vehicles, Borthwick Avenue carried 257 vehicles (west of US1 Bypass), and Cottage Street carried 305 vehicles.

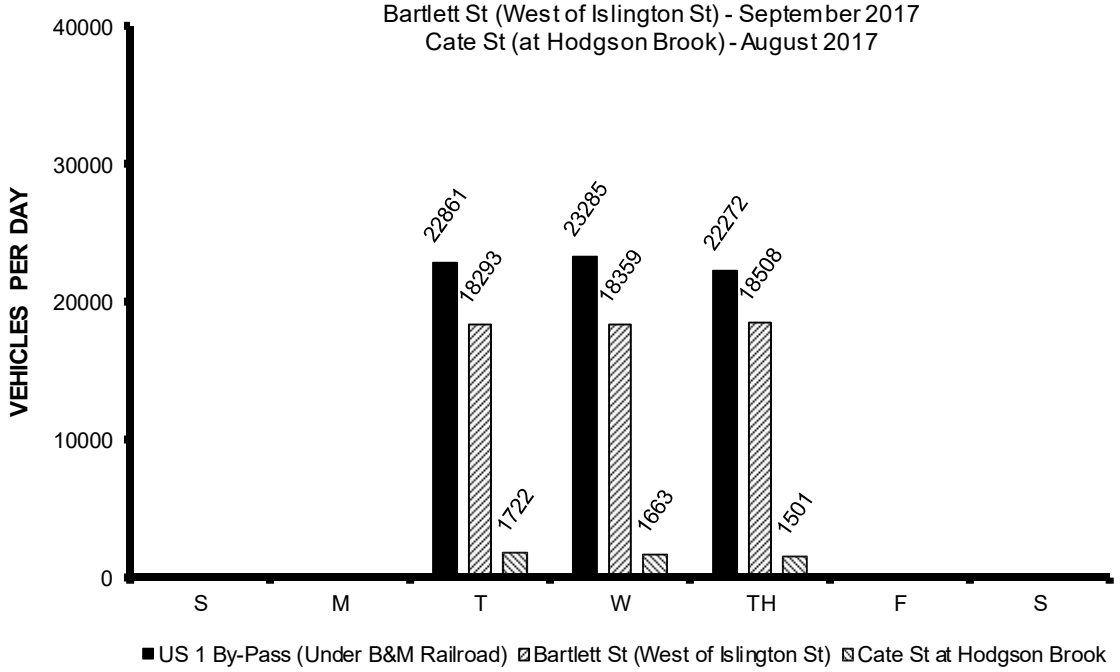
- The section of Borthwick Avenue east of US1 Bypass (where Cate Street will be extended to) carried only 33 (PM) and 40 (SAT) vehicles during the peak hour periods, primarily due to the U-Haul business.

- Truck traffic accounted for approximately 2-3% (PM) and 1% (SAT) of the traffic flow during the peak hour periods at the study area intersections.

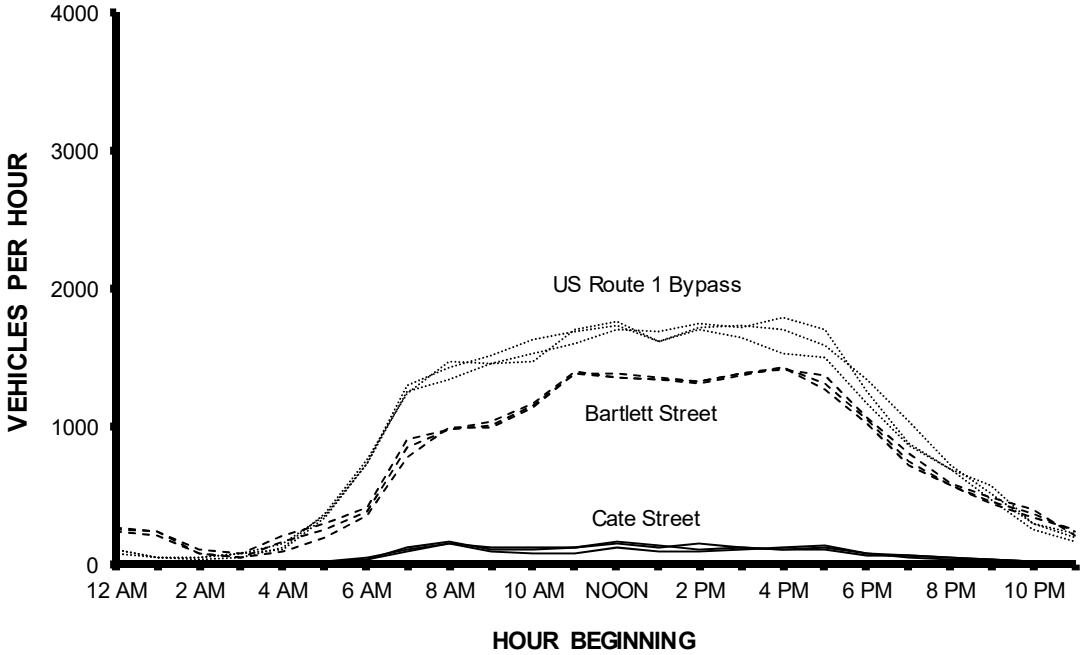
- Pedestrian activity was monitored at the study area intersections and was found to be highest at the Islington Street/Bartlett Street intersection with 49 pedestrians observed during the PM peak hour. The Bartlett Street/Cate Street intersection accommodated 17 pedestrians and there 15 pedestrians observed at the Bartlett Street/Shared Driveway. Pedestrian activity at the two study area intersections on US1 Bypass was nil during the PM peak hour. Comparable pedestrian volumes occurred during the Saturday midday peak hour.

Figure 2A (PM) and Figure 2B (SAT) summarize the raw turning movement count data for each study area intersection and its individual peak hour. Figure 3A (PM) and Figure 3B (SAT) summarize the turning movement volumes for the overall "system" peak hour. The detail sheets summarizing the intersection turning movement count data are included in Appendix C. The pedestrian count data is included in Appendix D.

DAILY TRAFFIC VARIATIONS
US 1 Bypass (Under B&M Railroad) - July & August 2018
Bartlett St (West of Islington St) - September 2017
Cate St (at Hodgson Brook) - August 2017



HOURLY TRAFFIC VARIATIONS



Source: NHDOT Counter Stations 82379042, 82379052, and 82379111

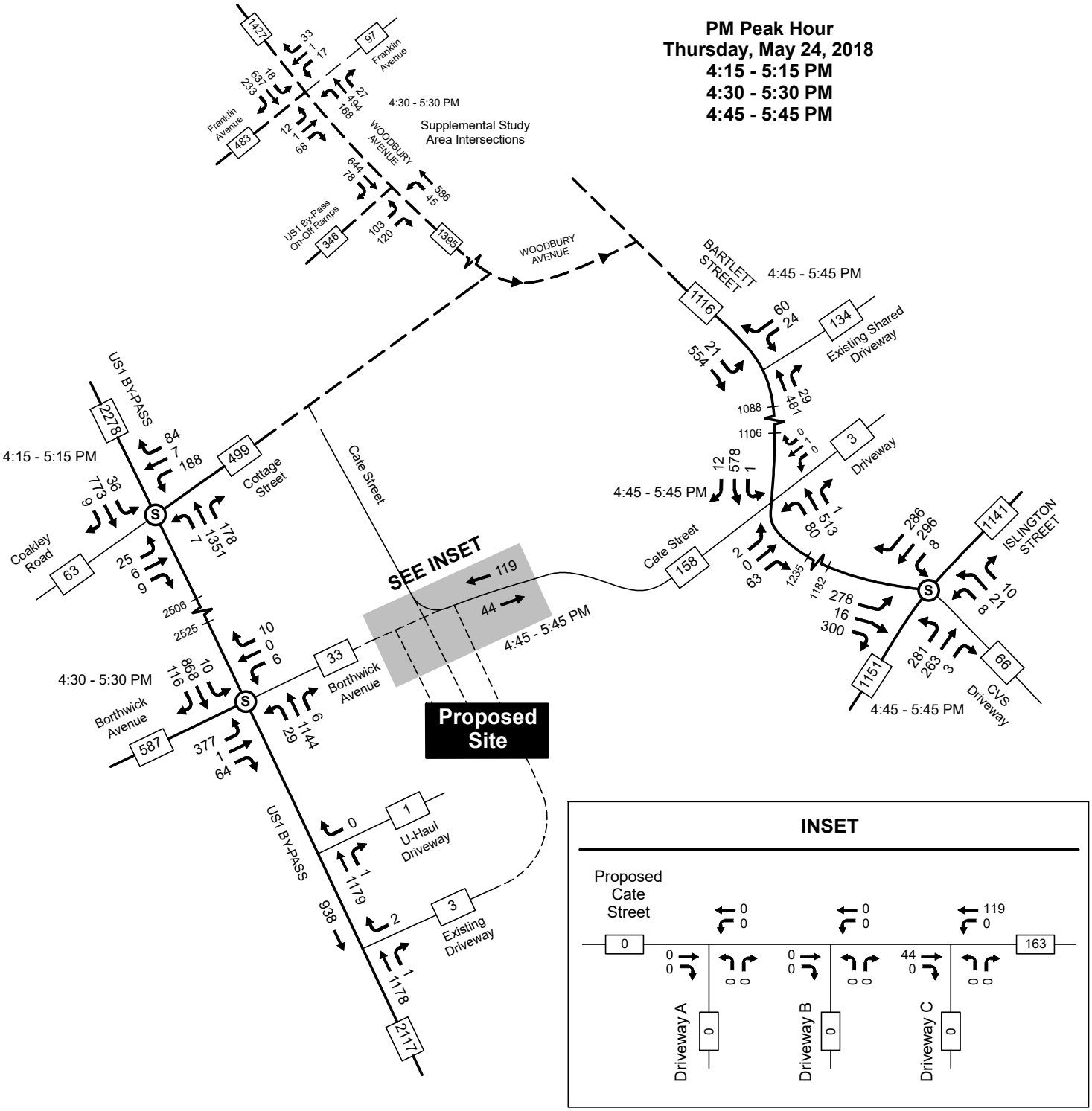


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Figure 2A

2018 Existing Traffic Volumes - PM Peak Hour

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

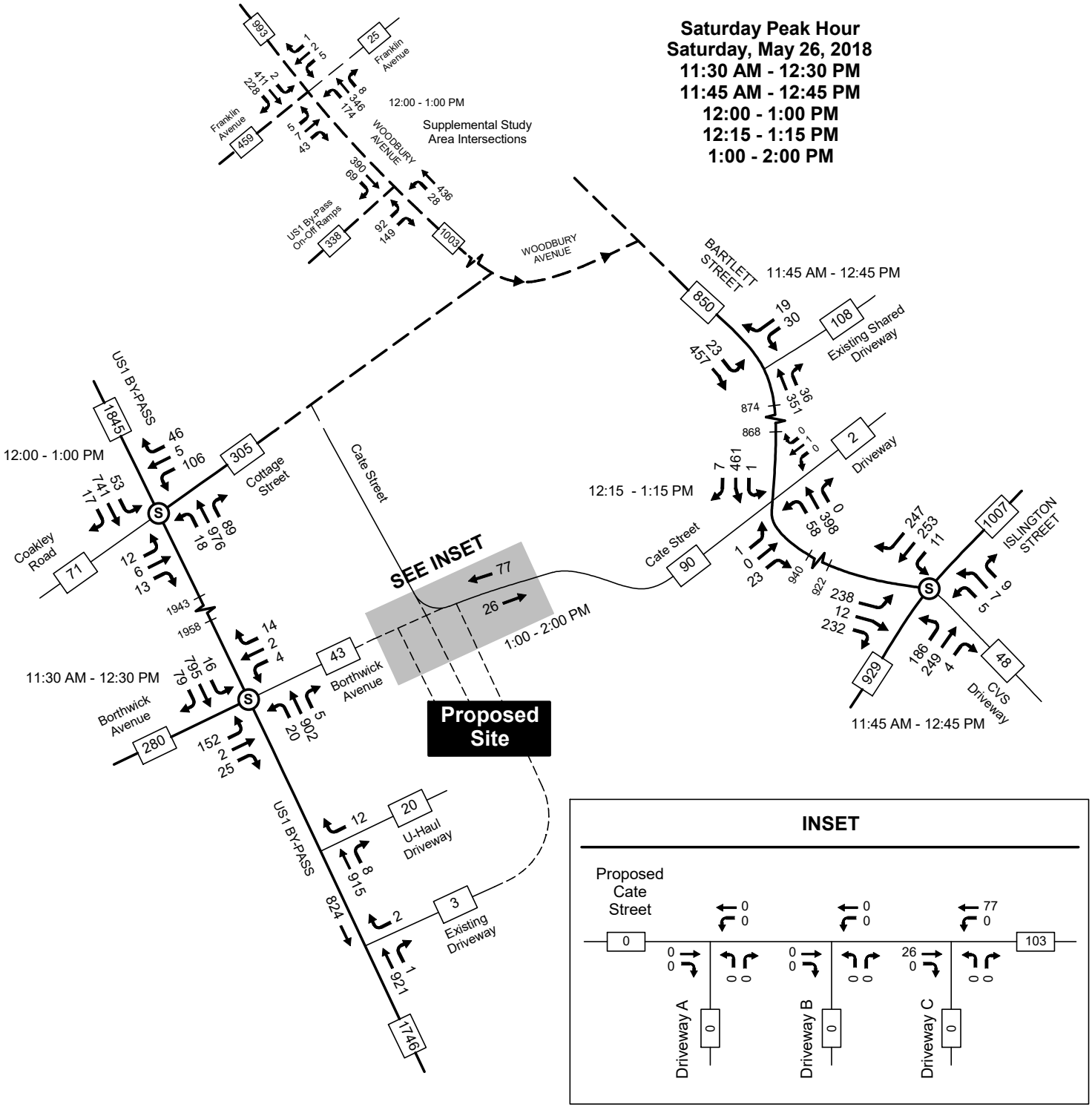

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Figure 2B

2018 Existing Traffic Volumes - Saturday Peak Hour

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

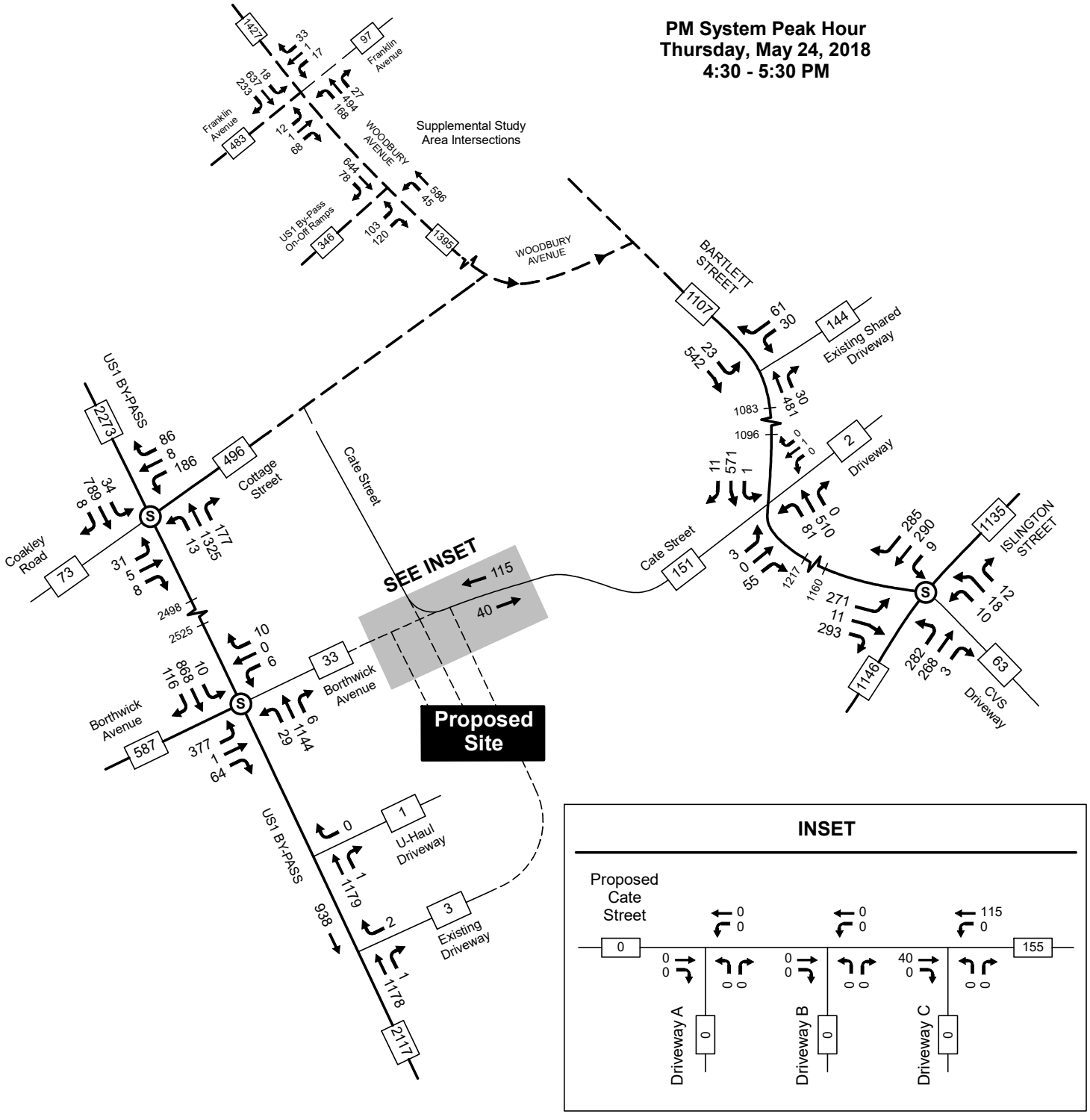

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Figure 3A

2018 Existing Traffic Volumes - PM System Peak Hour

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

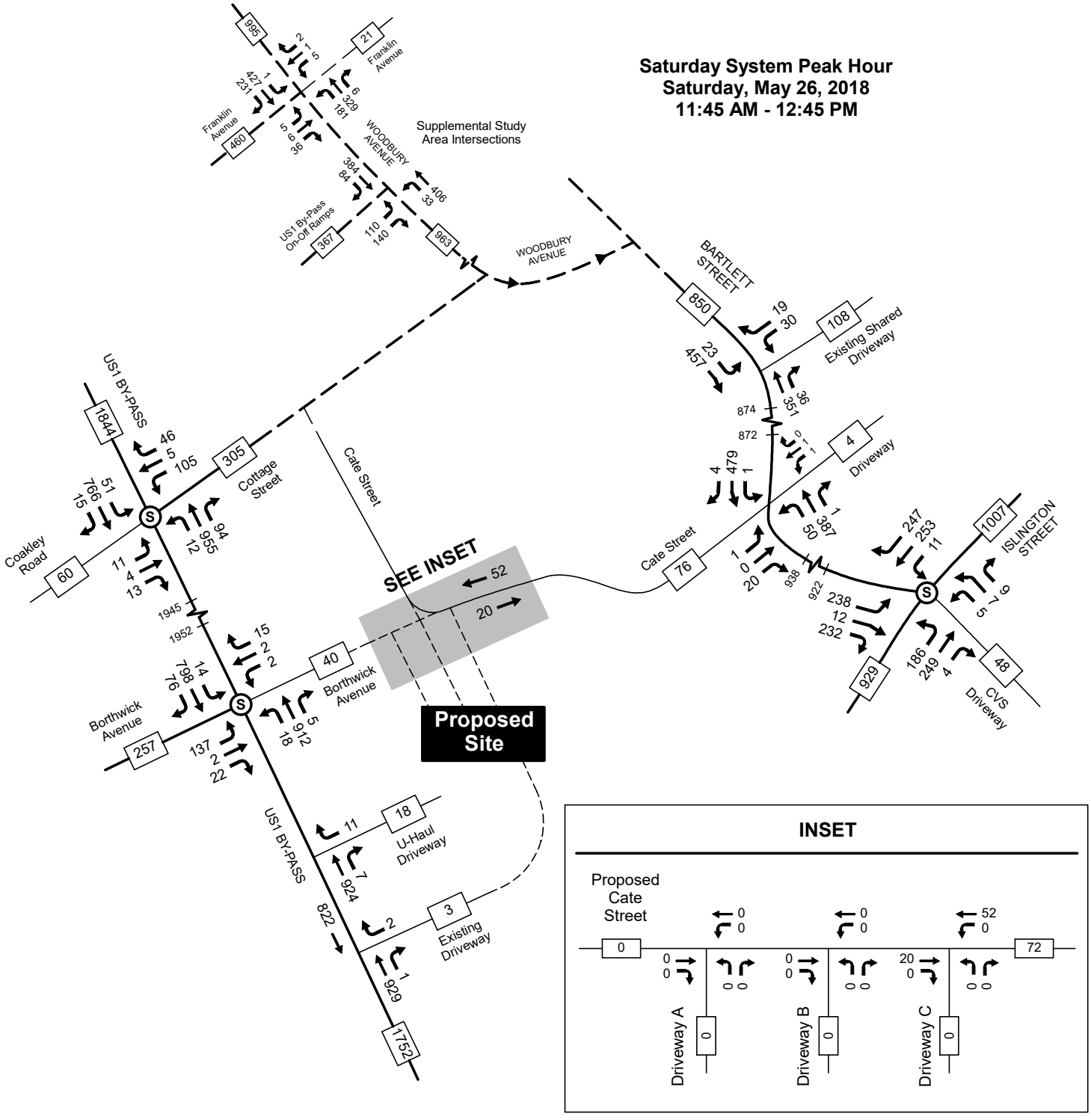

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Figure 3B

2018 Existing Traffic Volumes - Saturday System Peak Hour

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

NO-BUILD TRAFFIC VOLUMES

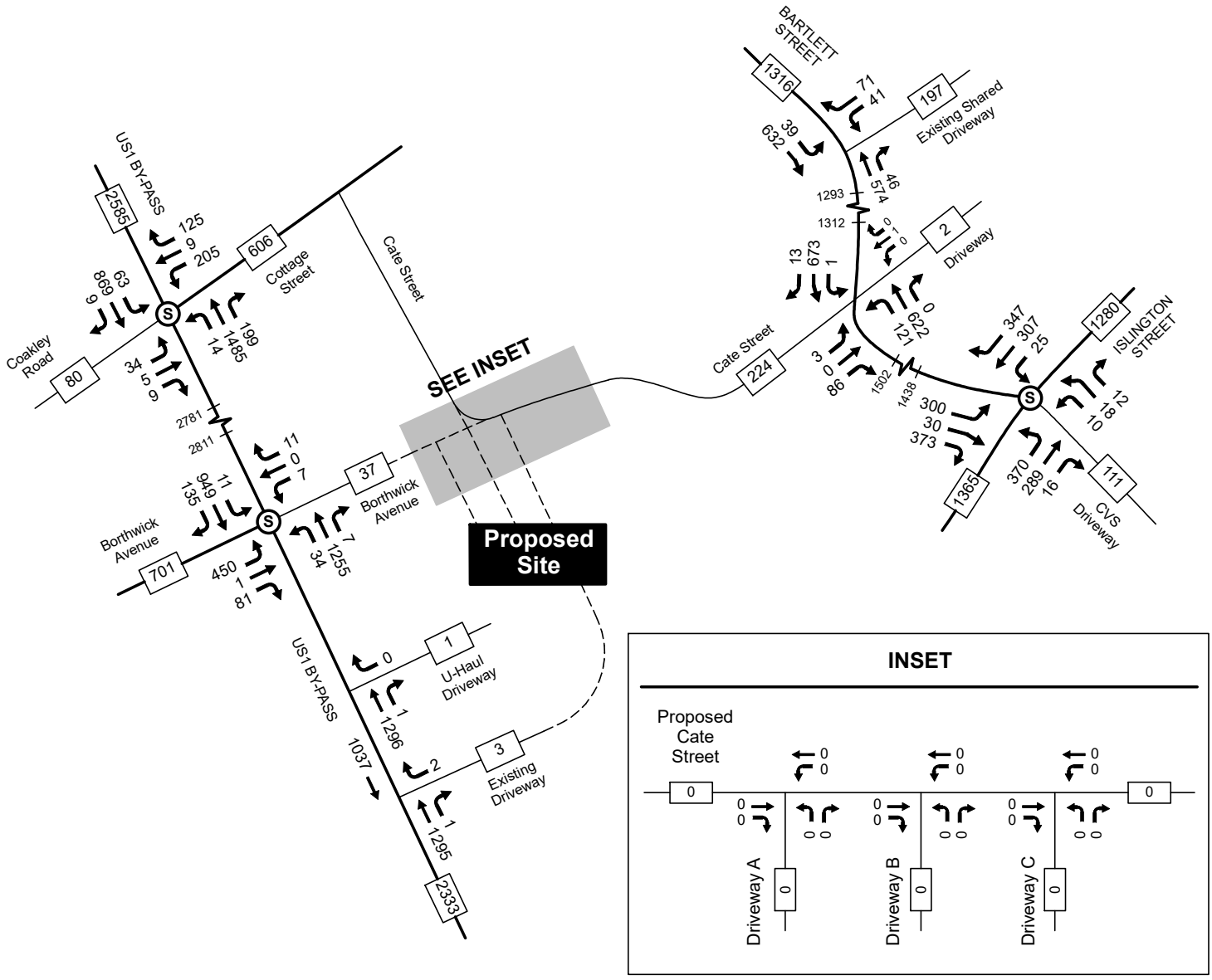
In order to identify the net impact that the proposed residential/commercial development will have in the study area, future traffic projections with and without the proposed development are necessary. The future traffic projections without the proposed development are referred to as "No-Build" traffic projections.

The No-Build traffic volumes for 2020 and 2030 are summarized schematically on Figures 4 through 7. These projections are based on the May 2018 traffic volumes, a 1-percent annual background traffic growth rate (compounded annually) to account for normal growth in the area, and peak-month seasonal adjustment factors of 1.07 (PM) and 1.08 (SAT).

The No-Build projections also account for five other pending development projects that were identified at the "scope meeting."

- Proposed Multi-Family Development – 31-unit townhouse development on Cate Street
- Proposed Office Development – 50,000 sf office building off of Borthwick Avenue
- Proposed Apartments – 92-unit apartment development at 145 Brewery Lane
- Proposed Mixed-Use Development – Mixed-use development at 110 Brewery Lane
- Proposed Residential Development – 120 dwellings off Bartlett Street (Clipper Traders)

The No-Build traffic projections are intended to reflect worst-case, peak-month, peak-hour conditions. Calculations pertaining to the derivation of the annual background traffic growth rate and the seasonal adjustment factors are contained in Appendix E. Appendix F contains the diagrams for the five other development projects.



NORTH

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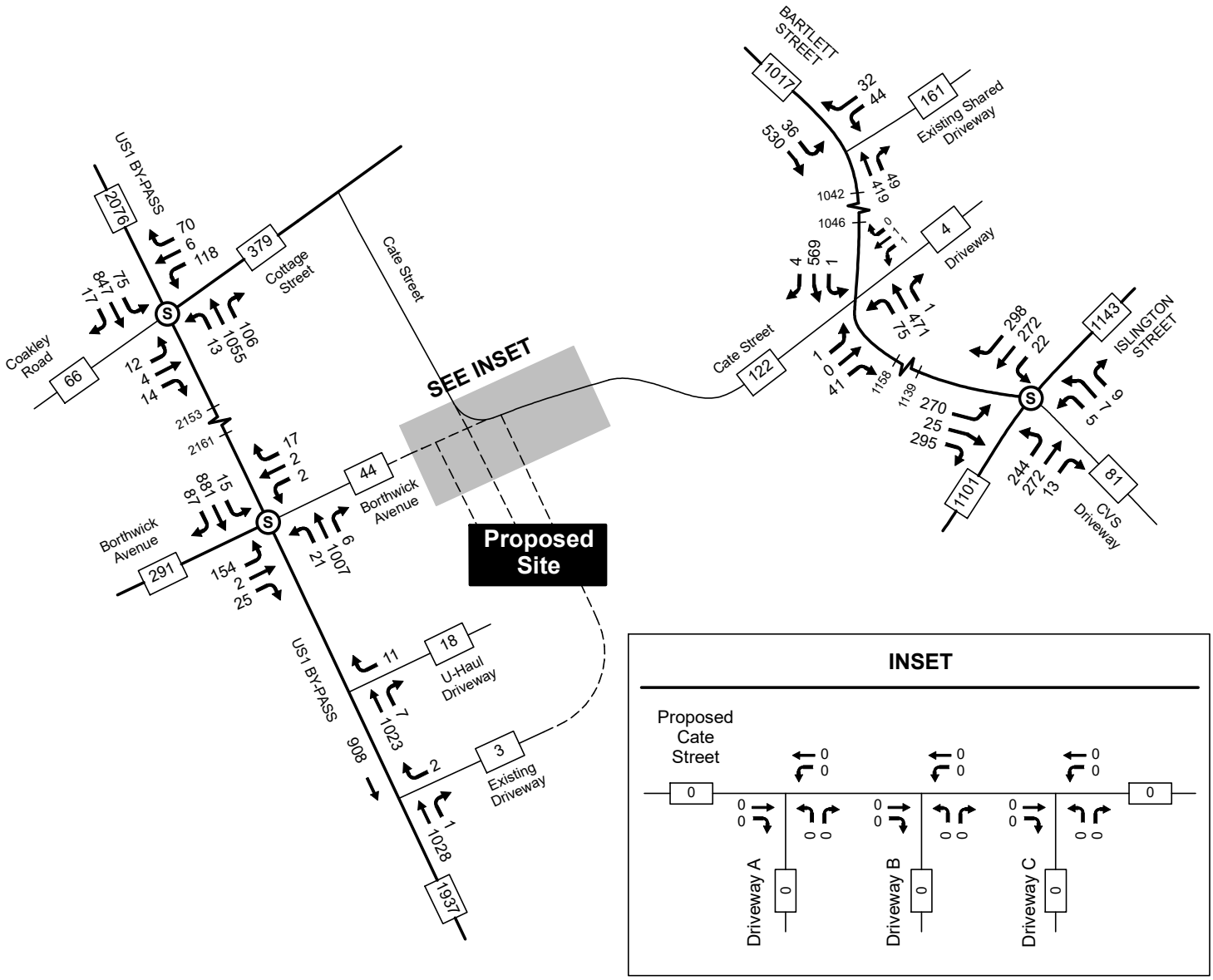
Figure 4

2020 No-Build Traffic Volumes - PM Peak Hour

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire



NORTH

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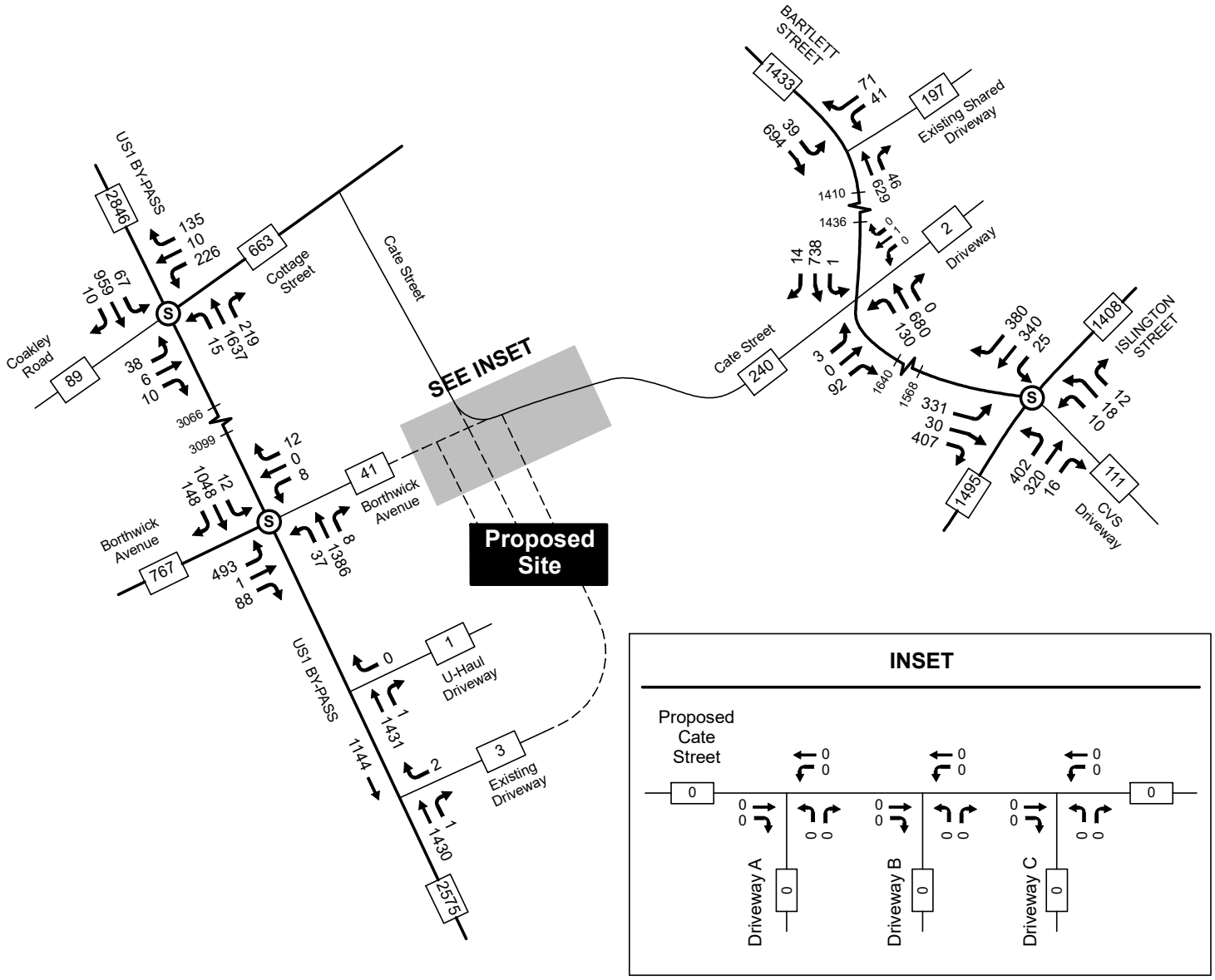
Figure 5

2020 No-Build Traffic Volumes - Saturday Peak Hour

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire



NORTH

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Figure 6

2030 No-Build Traffic Volumes - PM Peak Hour

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

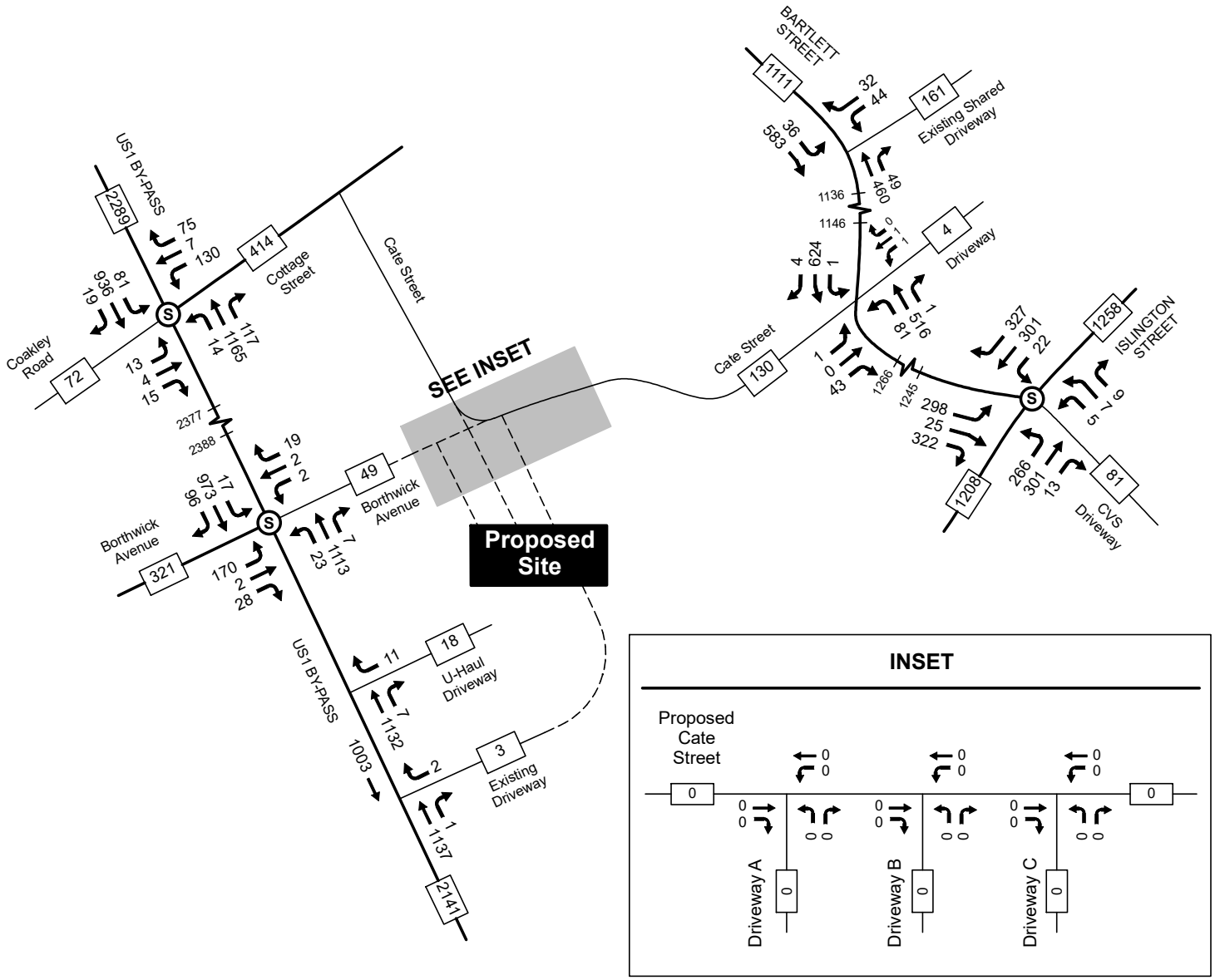

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Figure 7

2030 No-Build Traffic Volumes - Saturday Peak Hour

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

SITE GENERATED TRAFFIC

In estimating the quantity of vehicle-trips that will be produced by the proposed residential/commercial development, Pernaw & Company, Inc. considered the standardized trip-generation rates and equations published by the Institute of Transportation Engineers (ITE) [1]. In this case the number of dwelling units and the gross floor area of the commercial space were used as the independent variables.

Based upon ITE Land Use Codes (LUC) 220 & 221 – Multi-Family Housing (Low-Rise and Mid-Rise, respectively), the residential portion of the development is expected to generate approximately 123 (PM) and 128 (SAT) vehicle-trips during the peak hour periods. Trips that are generated by residences are considered to be "new" trips to the study area (primary trips).

Based on several ITE LUC (for restaurants, retail and offices), the commercial portion of the development is expected to generate approximately 230 (PM) and 316 (SAT) vehicle-trips during the peak hour periods. Restaurants and retail trips are comprised of both primary trips and "pass-by" trips which are drawn from the existing traffic stream on US1 Bypass.

Table 1 summarizes the results of the trip generation analysis and shows that the overall site will generate approximately 353 (PM) and 444 (SAT) vehicle-trips during the peak hour periods. This table also shows the breakdown between the primary trips and the pass by trips.

In mixed-use developments it is reasonable to expect some interaction will occur between certain compatible uses; i.e. some residents and office employees may utilize the eating establishments (and retail use) in the commercial building rather than traveling off-site. According to NCHRP 684 guidelines, approximately 76 of the 353 PM trips (22%) could be subtracted from the trip estimate for the overall site to account for "internal" trips. To introduce conservativeness into the subsequent analyses, the Build traffic projections do not reflect any such "credit" for internal trips. Appendix G contains the derivation of the trip generation estimates.

[1] Institute of Transportation Engineers, *Trip Generation*, tenth edition (Washington, D.C., 2017).

Stephen G. Pernaw & Company, Inc.

Table 1 — Trip Generation Summary

	Residential (273 Dwellings)		Commercial Building (44,000 sf)						Trip Composition	
	Apartments[1]	Townhomes[2]	Office[3]	Restaurant[4]	Cafe[5]	Retail[6]	Food/Beer Hall[7]	Site Total	Primary Trips	Pass-By Trips[8]
Weekday PM Peak Hour										
Entering	65 veh	10 veh	4 veh	42 veh	31 veh	9 veh	37 veh	**198 veh**	156 veh	42 veh
Exiting	42 veh	6 veh	23 veh	26 veh	26 veh	10 veh	22 veh	**155 veh**	113 veh	42 veh
Total	107 trips	16 trips	27 trips	68 trips	57 trips	19 trips	59 trips	**353 trips**	269 trips	84 trips
Saturday Peak Hour										
Entering	55 veh	8 veh	6 veh	40 veh	75 veh	12 veh	34 veh	**230 veh**	167 veh	63 veh
Exiting	57 veh	8 veh	6 veh	38 veh	61 veh	11 veh	33 veh	**214 veh**	151 veh	63 veh
Total	112 trips	16 trips	12 trips	78 trips	136 trips	23 trips	67 trips	**444 trips**	318 trips	126 trips

[1] ITE Land Use Code 221 - Multifamily Housing (Mid-Rise) 250 Dwelling Units
[2] ITE Land Use Code 220 - Multifamily Housing (Low-Rise) 23 Dwelling Units
[3] ITE Land Use Code 710 - General Office Building (approximate gross floor area = 22,000 sf)
[4] ITE Land Use Code 932 - High-Turnover (Sit-Down) Restaurant (approximate gross floor area = 7,000 sf)
[5] ITE Land Use Code 930 - Fast Casual Restaurant (approximate gross floor area = 4,000 sf)
[6] ITE Land Use Code 820 - Shopping Center (approximate gross floor area = 5,000 sf)
[7] ITE Land Use Code 932 - High-Turnover (Sit-Down) Restaurant (approximate gross floor area = 6,000 sf)
[8] ITE Handbook: LUC 932 = 43%, LUC 820 = 34% (PM) and 26% (SAT)

TRAFFIC DIVERSION

It is important to note that this development project will result in two separate and distinct impacts; the first being due to "site generated traffic" (the distribution of primary trips throughout the study area) and the second due "traffic diversion" as a result of the new connection to US1 Bypass (aka: Cate Street Extension). Providing this new connection has the potential to alter the prevailing travel patterns for some drivers in the study area (non-site traffic). Both traffic increases and decreases will occur in the study area as certain drivers will divert from their existing travel route to use the new roadway (depending upon the driver's origin/destination). The diagrams below illustrate several examples where traffic diversion is expected to occur.

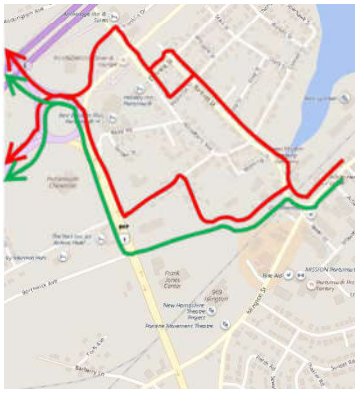
Trip Diversion Pattern 1 – (Traffic Circle area to Islington Street-NB)

Current travel routes (red):

a. Traffic Circle to Woodbury- Bartlett-Islington NB.
b. Traffic Circle to US1Byp-Cottage-Woodbury-Bartlett-Islington NB.
c. Traffic Circle to US1Byp-Cottage-Cate-Islington NB.

Future travel routes (green):

a. Traffic Circle to US1Byp-Cate St. Extension-Bartlett-Islington NB



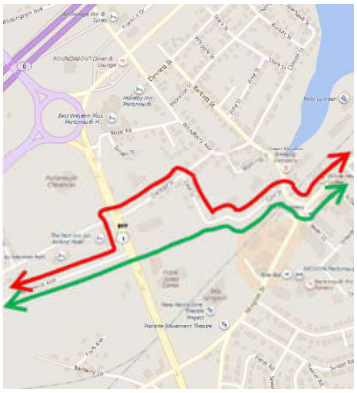
Trip Diversion Pattern 2 – (Islington Street SB to Traffic Circle area)

Current travel routes (red):

a. Islington SB to Bartlett-Thornton/Dennett-Woodbury-Franklin.
b. Islington SB to Bartlett-Cate-Cottage-US1Byp.

Future travel routes (green):

a. Islington SB to Bartlett-Cate-Cate St. Extension-US1Byp.



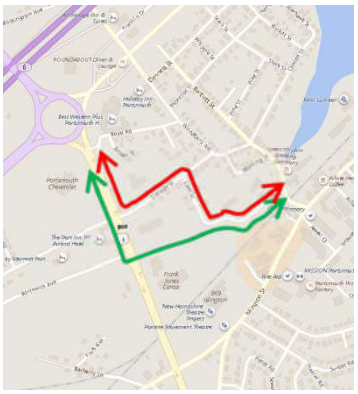
Trip Diversion Pattern 3 – (Borthwick Avenue to/from Islington Street)

Current travel routes (red):

a. Islington SB to Bartlett-Cate-Cottage-US1Byp-Borthwick.
b. Borthwick to US1Byp-Cottage-Cate-Bartlett-Islington.

Future travel routes (green):

a. Islington SB to Bartlett-Cate-Cate St. Extension-Borthwick.
b. Borthwick to Cate St. Extension-Cate-Bartlett-Islington.



Trip Diversion Pattern 4 – (US1Byp.to/from Cate Street)

Current travel routes (red):

a. US1Byp. to Cottage-Cate.
b. Cate to Cottage-US1Byp.

Future travel routes (green):

a. US1Byp to Cate St. Extension-Cate.
b. Cate to Cate St. Extension-US1Byp.

Trip Diversion Pattern 5 – (Traffic Circle area to/from Shared Driveway)

Current travel routes (red):

a. Shared Driveway to Bartlett-Thornton/ Dennett-Woodbury-Franklin-Traffic Circle.
b. Traffic Circle to Woodbury-Thornton/Dennett-Woodbury-Shared Driveway.

Future travel routes (green):

a. Shared Driveway to Bartlett-Cate-Cate St. Extension-US1Byp.
b. US1Byp. to Cate St. Extension-Cate-Bartlett-Shared Driveway.

It should be noted that traffic diversion will occur under Development Scenarios A and C (with Cate Street Extension), but not under Development Scenario B (no Cate Street Extension).

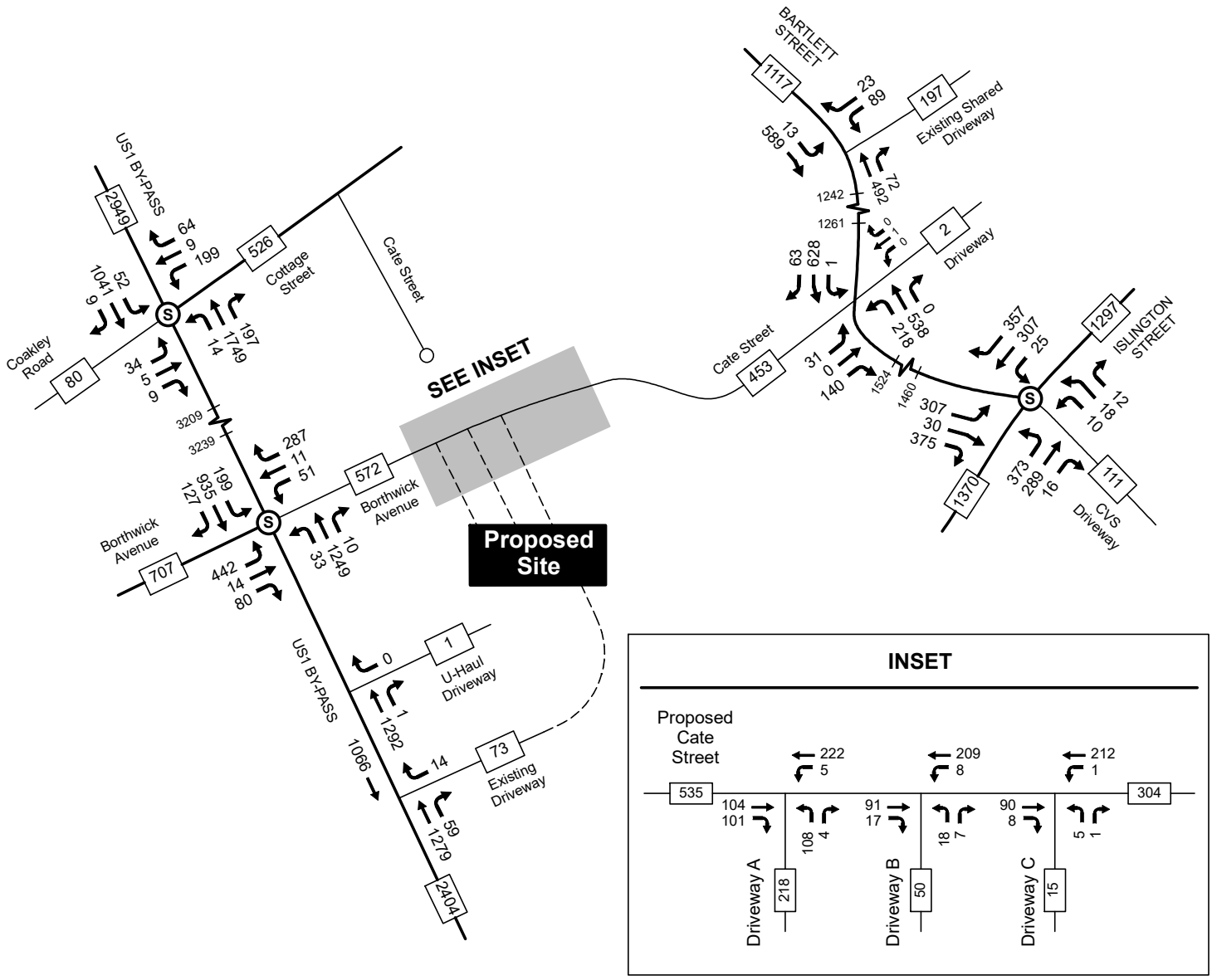
BUILD TRAFFIC PROJECTIONS

In order to identify the net impact that site traffic will have in the study area, future traffic projections with and without the proposed development are necessary. The future traffic projections with both the proposed residential/commercial units in full operation and the Cate Street Extension in place are referred to as "Build" traffic projections.

The Build traffic volume projections for 2020 and 2030 with site traffic and the Cate Street Extension (Scenario A) are summarized schematically on Figures 8 through 11. These projections are based on the No-Build projections, the trip generation estimates contained in Table 1, the anticipated traffic diversion patterns described earlier, and the expectation that the primary trips will be distributed in the following manner:

To/From Gateway:	Commercial Distribution	Residential Distribution
Gateway A - US1 Bypass (South)	21%	34%
Gateway B - Borthwick Avenue (West)	2%	3%
Gateway C - Coakley Road (West)	0%	0%
Gateway D - US1 Bypass (North)	71%	51%
Gateway E - Bartlett Street (North)	1%	1%
Gateway F - Islington Street (Northeast)	4%	9%
Gateway G - Isington Street (Southwest)	1%	2%
Total	100%	100%

These percentages were based on an analysis of area wide travel patterns from the U.S. Census Bureau - Center for Economic Studies, as well as our knowledge of the local area (see Appendix G). The pass-by trips were distributed in proportion to the approach volumes observed at the US1 Bypass/Borthwick Avenue intersection.



Scenario A = Proposed Development with Cate Street Extension

NORTH

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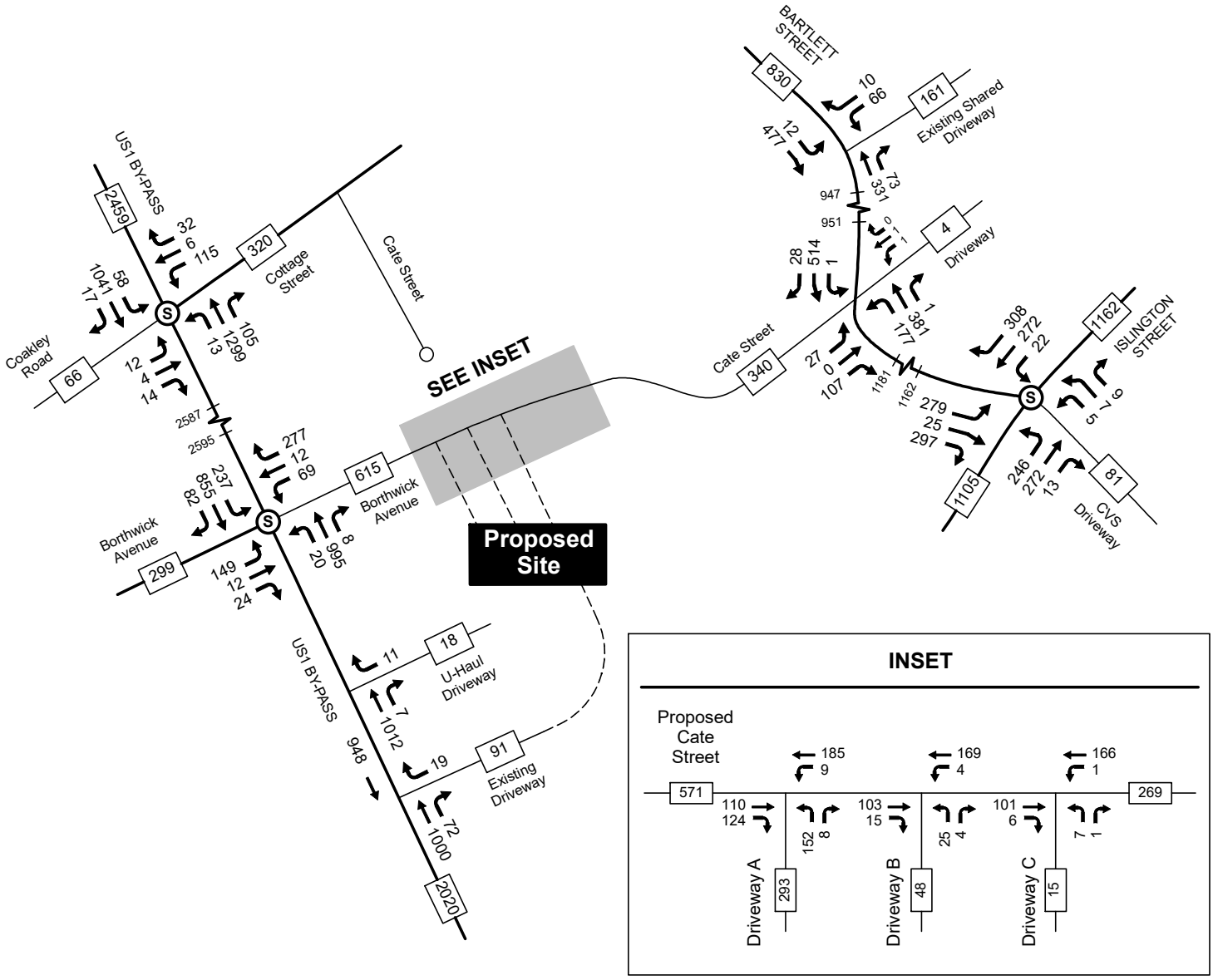
Figure 8

2020 Build Traffic Volumes - PM Peak Hour (Scenario A)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire



Scenario A = Proposed Development with Cate Street Extension

NORTH

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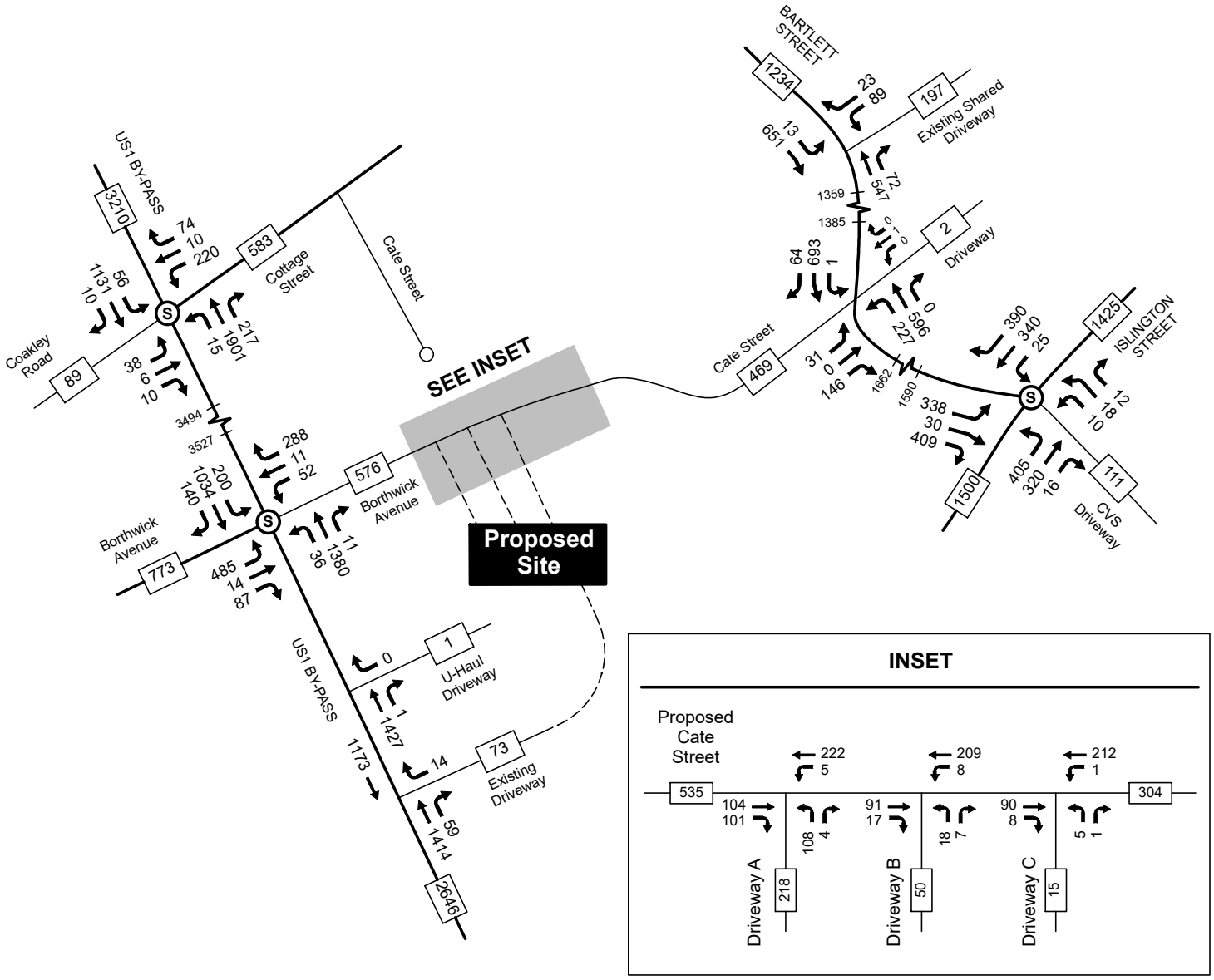
Figure 9

2020 Build Traffic Volumes - Saturday Peak Hour (Scenario A)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire



Scenario A = Proposed Development with Cate Street Extension

NORTH

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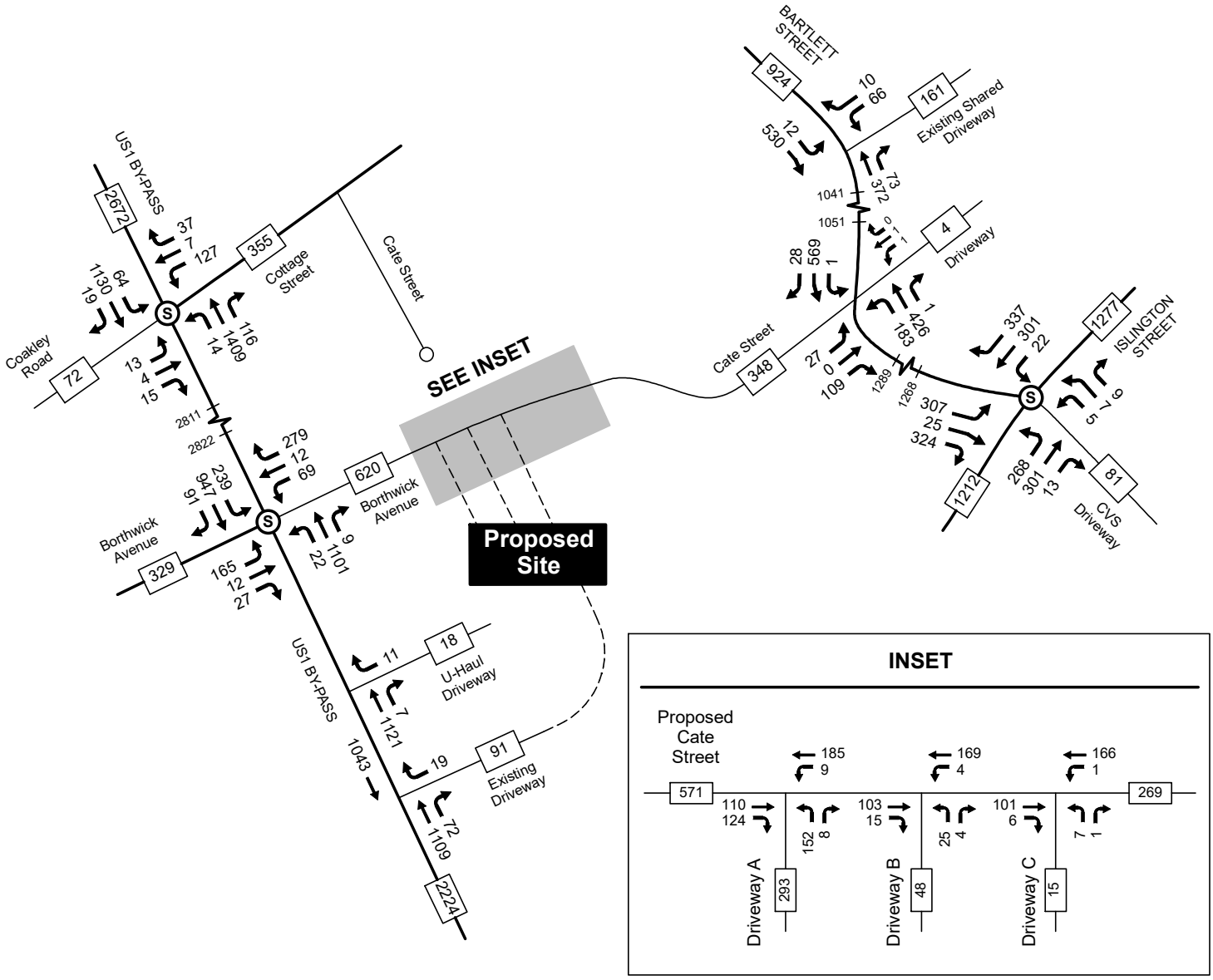
Figure 10

2030 Build Traffic Volumes - PM Peak Hour (Scenario A)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire



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Scenario A = Proposed Development with Cate Street Extension

NORTH

Figure 11

2030 Build Traffic Volumes - Saturday Peak Hour (Scenario A)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

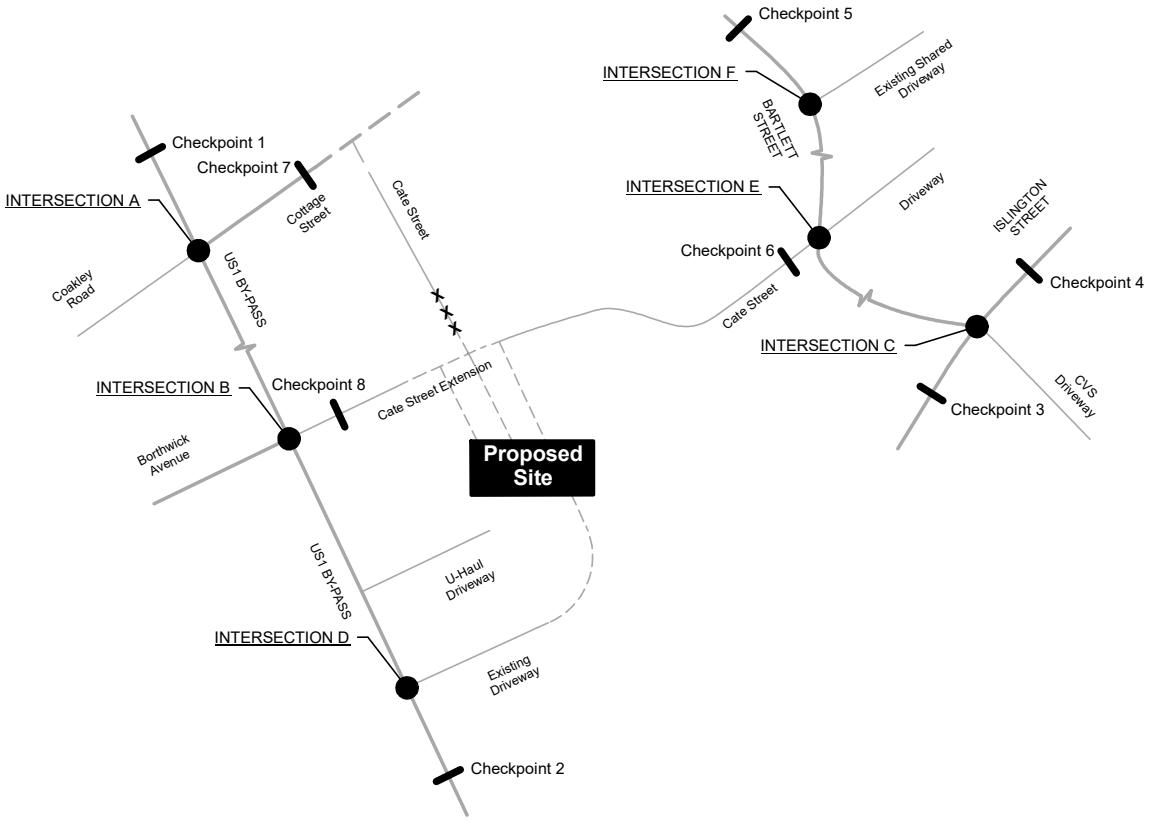
IMPACT SUMMARY – DEVELOPMENT SCENARIO A

The net impact that the proposed residential/commercial development will have on area roadway and intersection traffic volumes within the study area with Development Scenario A can be determined by comparing the No-Build traffic projections with the Build projections. A comparison for the two 2020 peak hour cases is summarized on Figure 12.

In terms of roadway segments, the greatest net increase in roadway volumes will occur on US1 Bypass, north of the Cottage Street/Coakley Road intersection during the PM peak hour period. The traffic volume on this roadway segment is projected to increase by +14% (+364 vehicles) during the PM peak hour period and by +18% (+383 vehicles) during the Saturday midday peak hour. The net impact on US1 Bypass south of the site is projected at +3% (PM) and +4% (SAT). Similarly, the impacts on Islington Street are on the order of +1% to +2%.

Net traffic decreases are expected on Bartlett Street north of the existing Shared Driveway intersection due to the anticipated traffic diversion as a result of the Cate Street Extension project. Corresponding traffic increases are expected on Cate Street west of Bartlett Street for the same reasons. Obviously, the traffic volume on the section of Cate Street between Cottage Street and the future pedestrian bridge will be limited to those with destinations on this short roadway section.

In terms of intersection utilization (total vehicles entering), the US1 Bypass/Borthwick Avenue/Cate Street Extension intersection is expected to accommodate +497 (PM) and +521 (SAT) additional vehicles during the peak hour periods. This translates into increases of approximately +17% and +23% respectively. Similarly, the US1 Bypass/Cottage Street/Coakley Road intersection is expected to undergo increases of +12% (PM) and +16% (SAT) as a result of the combined impact of site traffic and the new roadway connection to the Bypass. The impacts at the Islington Street/Bartlett Street intersection will be on the order of +1% during the peak hour periods.



PM Peak Hour

Location	2020 No-Build	2020 Build	Change	% Change
Intersection A	3026	3382	+356 veh	12%
Intersection B	2941	3438	+497 veh	17%
Intersection C	2097	2119	+22 veh	1%
Intersection D	2335	2418	+83 veh	4%
Intersection E	1520	1620	+100 veh	7%
Intersection F	1403	1278	-125 veh	-9%
Checkpoint 1	2585	2949	+364 veh	14%
Checkpoint 2	2333	2404	+71 veh	3%
Checkpoint 3	1365	1370	+5 veh	0%
Checkpoint 4	1280	1297	+17 veh	1%
Checkpoint 5	1316	1117	-199 veh	-15%
Checkpoint 6	224	453	229 veh	102%
Checkpoint 7	606	526	-80 veh	-13%
Checkpoint 8	37	572	535 veh	++%

Saturday Peak Hour

Location	2020 No-Build	2020 Build	Change	% Change
Intersection A	2337	2716	+379 veh	16%
Intersection B	2219	2740	+521 veh	23%
Intersection C	1732	1755	+23 veh	1%
Intersection D	1939	2039	+100 veh	5%
Intersection E	1165	1238	+73 veh	6%
Intersection F	1110	969	-141 veh	-13%
Checkpoint 1	2076	2459	+383 veh	18%
Checkpoint 2	1937	2020	+83 veh	4%
Checkpoint 3	1101	1105	+4 veh	0%
Checkpoint 4	1143	1162	+19 veh	2%
Checkpoint 5	1017	830	-187 veh	-18%
Checkpoint 6	122	340	218 veh	179%
Checkpoint 7	379	320	-59 veh	-16%
Checkpoint 8	44	615	571 veh	++%

NORTH

1831A

Figure 12

2020 Impact Summary

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

TRAFFIC OPERATIONS AND SAFETY

INTERSECTION CAPACITY – SIGNALIZED INTERSECTIONS

The three signalized intersections in the study area were analyzed utilizing the methods of the *Highway Capacity Manual 2010*[2], as replicated by *Synchro Traffic Signal Timing Software (Version 10).* A traffic flow rate, capacity, Level of Service (LOS), and delay estimate was determined for each critical traffic movement, lane group, and for the overall intersection. Levels of Service are simply letter grades (A-F) that categorize the vehicle delays associated with specific turning maneuvers. The following table describes the criteria used in the analysis of signalized intersections.

Table 2 — Level-of-Service Criteria for Signalized Intersections

Level of Service	Control Delay (seconds/vehicle)
A	≤ 10.0
B	> 10.0 and ≤ 20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	> 80.0

Source: Transportation Research Board, Highway Capacity Manual 2010.

Table 3 summarizes the results of the analysis for the **US1 Bypass/Cottage Street/Coakley Road** intersection and it shows that the overall intersection will operate at capacity (v/c = 1.00) and at LOS D during the 2020 PM peak hour with the proposed development fully occupied. Some individual lane groups within the intersection will operate slightly over capacity during this period. By 2030 this intersection will be capacity deficient during the PM peak hour both with (v/c = 1.10) and without (v/c = 1.01) the proposed development. This is an indicator that additional lane capacity is desirable from a long-range standpoint. With the current lane configuration the overall intersection will operate at LOS E during the 2030 PM peak hour (build case). During the 2030 Saturday midday peak hour, this intersection is expected to operate well below capacity (v/c = 0.80) and at LOS B, both with and without the proposed development.

The vehicle queuing analysis shows that minimal storage is needed in the northbound left-turn lane on US1 Bypass (for turns to Coakley Road) during both peak hour periods. Shortening the length of this turn lane will provide more storage for the southbound left-turn movement (to Cate Street Extension) at the signalized intersection to the south.

As requested by the NHDOT, the utilization of each of the two northbound through lanes was monitored during both peak hour periods. As a result of upstream conditions on the Bypass, more drivers favor the left rather than the right through lane (see Appendix H). The capacity analyses summarized on Table 3 are based on Lane Utilization Factors of 0.88 (PM) and 0.75 (SAT). This phenomenon affects intersection capacity in a negative way.

[2] Transportation Research Board, *Highway Capacity Manual* (Washington, D.C., 2010).

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Table 3

Signal-Controlled Intersection Capacity Analysis Summary (Existing Lane Configuration)
US Route 1 By-Pass / Cottage Street / Coakley Road

	2018 Existing				2020 No-Build				2020 Build (Scenario A)				2030 No-Build				2030 Build (Scenario A)			
	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]
Weekday PM Peak Hour																				
Coakley Road - EB LT&TH& RT	0.20	37.3	D	1 (2)	0.26	38.4	D	1 (3)	0.35	42.6	D	1 (3)	0.34	39.4	D	2 (3)	0.49	45.7	D	2 (3)
Cottage Street - WB LT&TH	0.83	59.9	E	7 (9)	0.93	79.1	E	9 (11)	1.04	114.8	F	9 (12)	1.03	104.8	F	10 (13)	1.17	156.4	F	11 (14)
Cottage Street - WB RT	0.14	38.1	D	1 (2)	0.29	40.0	D	2 (4)	0.06	40.5	D	0 (1)	0.33	40.2	D	2 (4)	0.10	40.9	D	0 (2)
US1 Bypass - NB LT	0.23	65.3	E	0 (1)	0.27	61.1	E	0 (1)	0.27	52.1	D	1 (1)	0.28	58.1	E	0 (1)	0.28	51.7	D	1 (1)
US1 Bypass - NB 2TH&RT	0.83	18.9	B	13 (27)	0.93	29.0	C	24 (39)	1.03	36.6	D	42 (47)	1.03	46.5	D	40 (45)	1.12	70.3	E	48 (49)
US1 Bypass - SB LT	0.45	60.2	E	1 (2)	0.71	79.3	E	2 (4)	0.59	65.3	E	2 (3)	0.76	86.0	F	2 (5)	0.63	69.6	E	2 (4)
US1 Bypass - SB 2TH&RT	0.36	10.9	B	5 (8)	0.39	11.1	B	5 (9)	0.45	10.1	B	6 (10)	0.44	11.8	B	6 (10)	0.49	10.6	B	6 (11)
Overall	**0.81**	**22.1**	**C**		**0.92**	**30.3**	**C**		**1.00**	**35.5**	**D**		**1.01**	**42.5**	**D**		**1.10**	**58.5**	**E**	
Cycle Length	**120.0**				**120.0**				**120.0**				**120.0**				**120.0**			
Saturday Peak Hour																				
Coakley Road - EB LT&TH& RT	0.10	40.1	D	1 (1)	0.11	39.9	D	1 (1)	0.11	44.3	D	1 (1)	0.12	39.6	D	1 (1)	0.14	44.8	D	1 (1)
Cottage Street - WB LT&TH	0.58	46.6	D	3 (5)	0.64	49.6	D	4 (6)	0.67	55.8	E	4 (6)	0.70	52.4	D	4 (7)	0.76	63.8	E	5 (8)
Cottage Street - WB RT	0.03	41.2	D	0 (0)	0.05	41.1	D	0 (1)	0.02	45.3	D	0 (0)	0.05	40.8	D	0 (2)	0.03	45.5	D	0 (0)
US1 Bypass - NB LT	0.17	72.3	E	0 (1)	0.19	66.2	E	0 (1)	0.23	67.8	E	0 (1)	0.23	67.4	E	0 (1)	0.25	58.3	E	0 (1)
US1 Bypass - NB 2TH&RT	0.61	9.4	A	12 (18)	0.69	11.0	B	15 (4)	0.78	8.9	A	5 (5)	0.75	13.5	B	18 (6)	0.84	11.4	B	5 (9)
US1 Bypass - SB LT	0.37	49.4	D	1 (3)	0.50	50.0	D	2 (4)	0.53	58.9	E	2 (4)	0.61	56.4	E	2 (5)	0.64	67.3	E	2 (5)
US1 Bypass - SB 2TH&RT	0.34	7.2	A	3 (8)	0.38	7.5	A	4 (8)	0.45	7.7	A	5 (10)	0.42	7.9	A	5 (9)	0.49	7.9	A	6 (11)
Overall	**0.58**	**13.4**	**B**		**0.66**	**14.9**	**B**		**0.74**	**13.0**	**B**		**0.73**	**16.6**	**B**		**0.80**	**15.0**	**B**	
Cycle Length	**110.0**				**110.0**				**120.0**				**110.0**				**120.0**			

1) Volume-to-capacity ratio, 2) Delay in vehicles per seconds, 3) Level of Service, 4) Queue length in vehicles

Table 4 summarizes the results of the analysis for the **US1 Bypass/Borthwick Avenue/Cate Street Extension** intersection and it shows that the overall intersection will operate below capacity (v/c = 0.93) and at LOS D during the 2020 PM peak hour period with the proposed development in full operation. By 2030 the overall intersection will operate at capacity (v/c = 1.00) during the PM peak hour and at LOS E. This is an indicator that additional lane capacity is desirable from a long-range standpoint. During the 2030 Saturday midday peak hour, this intersection will operate below capacity (v/c = 0.82) and at LOS D with the proposed development and the current lane configuration.

The vehicle queuing analysis shows that additional storage is needed in the southbound left-turn lane on US1 Bypass (for turns to Cate Street Extension) during both peak hour periods. Lengthening this turn lane is possible by shortening the storage for the northbound left-turn movement (to Coakley Road) at the signalized intersection to the north.

Table 5 summarizes the results of the analysis for the **Islington Street/Bartlett Street/Pharmacy Driveway** intersection and it shows that the overall intersection will operate slightly above capacity (v/c = 1.03) and at LOS D during the 2020 PM peak hour period with the proposed development in full operation. By 2030 this intersection will be capacity deficient during the PM peak hour both with (v/c = 1.12) and without (v/c = 1.11) the proposed development. Although this is an indicator that additional lane capacity is desirable, the City's current plans to reconstruct this intersection and upgrade the traffic signal system do not include additional travel lanes. Right-of-way availability appears to be a constraint. Increasing the traffic signal cycle length has the potential to increase intersection capacity; however longer vehicle queues usually result.

During the 2030 Saturday midday peak hour, this intersection will operate below capacity (v/c = 0.89) and at LOS C with the proposed development and the current lane configuration.

The calculations pertaining to the signalized intersection capacity analyses are included in Appendix I.

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Table 4

Signal-Controlled Intersection Capacity Analysis Summary (Existing Lane Configuration)
US Route 1 By-Pass / Borthwick Avenue / Cate Street Extension

	2018 Existing				2020 No-Build				2020 Build (Scenario A)				2030 No-Build				2030 Build (Scenario A)			
	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]
Weekday PM Peak Hour																				
Borthwick Avenue - EB LT	0.68	50.4	D	7 (9)	0.73	50.5	D	8 (11)	0.90	75.0	E	9 (13)	0.77	52.2	D	9 (12)	0.96	88.0	F	10 (15)
Borthwick Avenue - EB LT&TH	0.68	50.4	D	7 (9)	0.73	50.5	D	8 (11)	0.88	71.8	E	9 (13)	0.77	52.2	D	9 (12)	0.97	90.4	F	10 (15)
Borthwick Avenue - EB RT	0.05	40.8	D	0 (0)	0.06	38.7	D	0 (0)	0.06	42.3	D	0 (0)	0.07	37.9	D	0 (1)	0.07	42.2	D	0 (0)
Cate Street Extension - WB LT	0.11	56.8	E	0 (1)	0.12	56.9	E	0 (1)	0.21	45.2	D	2 (3)	0.12	55.8	E	0 (1)	0.23	46.1	D	2 (3)
Cate Street Extension - WB TH&RT	0.01	55.8	E	0 (0)	0.01	55.8	E	0 (0)	0.90	83.4	F	6 (14)	0.01	55.0	D	0 (0)	1.03	117.6	F	7 (15)
US1 Bypass - NB LT	0.33	57.1	E	1 (2)	0.38	57.4	E	1 (2)	0.47	60.8	E	1 (2)	0.47	60.0	E	1 (3)	0.51	61.7	E	1 (3)
US1 Bypass - NB 2TH&RT	0.56	14.9	B	7 (17)	0.63	17.8	B	9 (20)	0.92	45.8	D	20 (26)	0.73	22.0	C	16 (24)	0.98	54.6	D	23 (30)
US1 Bypass - SB LT	0.23	63.7	E	0 (1)	0.26	73.7	E	0 (1)	0.88	76.1	E	6 (10)	0.22	71.6	E	0 (1)	0.95	91.5	F	6 (11)
US1 Bypass - SB 2TH&RT	0.50	10.9	B	6 (10)	0.57	14.6	B	8 (7)	0.63	21.6	C	10 (17)	0.65	19.0	B	15 (20)	0.69	22.9	C	13 (19)
Overall	**0.57**	**20.8**	**C**		**0.65**	**23.8**	**C**		**0.93**	**47.8**	**D**		**0.72**	**27.4**	**C**		**1.00**	**56.9**	**E**	
Cycle Length	**120.0**				**120.0**				**120.0**				**120.0**				**120.0**			
Saturday Peak Hour																				
Borthwick Avenue - EB LT	0.49	46.1	D	3 (4)	0.51	45.7	D	3 (4)	0.68	61.5	E	4 (5)	0.54	46.0	D	4 (4)	0.70	61.7	E	4 (5)
Borthwick Avenue - EB LT&TH	0.49	46.1	D	3 (4)	0.51	45.7	D	3 (4)	0.72	64.9	E	4 (5)	0.54	45.8	D	4 (4)	0.75	66.8	E	4 (5)
Borthwick Avenue - EB RT	0.02	43.5	D	0 (0)	0.02	42.6	D	0 (0)	0.02	49.7	D	0 (0)	0.03	42.0	D	0 (0)	0.03	49.0	D	0 (0)
Cate Street Extension - WB LT	0.03	49.3	D	0 (0)	0.03	49.3	D	0 (0)	0.36	45.9	D	3 (4)	0.03	49.7	D	0 (0)	0.33	44.6	D	3 (4)
Cate Street Extension - WB TH&RT	0.05	49.4	D	0 (1)	0.05	49.4	D	0 (1)	0.74	58.8	E	4 (4)	0.05	49.8	D	0 (1)	0.83	67.1	E	6 (5)
US1 Bypass - NB LT	0.24	52.0	D	1 (1)	0.27	52.2	D	1 (2)	0.38	61.0	E	1 (2)	0.32	53.6	D	1 (2)	0.33	58.6	E	1 (2)
US1 Bypass - NB 2TH&RT	0.43	11.3	B	5 (12)	0.48	12.4	B	6 (14)	0.71	32.0	C	15 (19)	0.53	13.0	B	7 (15)	0.80	36.0	D	17 (21)
US1 Bypass - SB LT	0.19	55.0	E	0 (1)	0.20	59.6	E	0 (1)	0.78	62.3	E	6 (12)	0.25	60.0	E	0 (1)	0.83	67.7	E	6 (13)
US1 Bypass - SB 2TH&RT	0.43	8.3	A	5 (7)	0.49	9.5	A	4 (6)	0.51	12.8	B	6 (8)	0.54	9.7	A	6 (6)	0.59	16.3	B	12 (7)
Overall	**0.41**	**15.0**	**B**		**0.46**	**16.0**	**B**		**0.74**	**35.2**	**D**		**0.51**	**16.4**	**B**		**0.82**	**38.6**	**D**	
Cycle Length	**110.0**				**110.0**				**120.0**				**110.0**				**120.0**			

1) Volume-to-capacity ratio, 2) Delay in vehicles per seconds, 3) Level of Service, 4) Queue length in vehicles

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Table 5

Signal-Controlled Intersection Capacity Analysis Summary (Existing Lane Configuration)
Islington Street / Bartlett Street / Pharmacy Driveway

	2018 Existing				2020 No-Build				2020 Build (Scenario A)				2030 No-Build				2030 Build (Scenario A)			
	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]
Weekday PM Peak Hour																				
Bartlett Street - EB LT&TH	0.76	28.8	C	4 (9)	1.08	99.1	F	7 (12)	1.11	107.3	F	7 (13)	1.19	136.7	F	8 (14)	1.21	146.2	F	8 (14)
Bartlett Street - EB RT	0.20	18.6	B	0 (2)	0.43	23.4	C	1 (4)	0.45	23.6	C	1 (4)	0.54	24.8	C	2 (7)	0.56	25.2	C	2 (7)
Pharmacy Dwy - WB LT&TH&RT	0.08	16.4	B	0 (1)	0.11	19.6	B	0 (1)	0.11	19.6	B	0 (1)	0.12	19.7	B	0 (1)	0.13	19.7	B	0 (1)
Islington Street - NB LT	0.76	30.3	C	5 (9)	1.00	69.0	E	7 (13)	0.95	54.6	D	7 (13)	1.09	94.5	F	9 (14)	1.10	97.6	F	9 (14)
Islington Street - NB TH&RT	0.29	7.2	A	2 (4)	0.30	5.5	A	2 (3)	0.30	5.5	A	2 (3)	0.33	5.7	A	2 (4)	0.33	5.7	A	2 (4)
Islington Street - SB LT&TH	0.70	25.7	C	5 (8)	0.65	21.3	C	5 (8)	0.68	23.0	C	5 (8)	0.72	23.3	C	6 (9)	0.72	23.3	C	6 (9)
Islington Street - SB RT	0.21	20.1	C	0 (2)	0.25	17.6	B	0 (2)	0.26	18.4	B	0 (2)	0.28	17.8	B	0 (2)	0.28	17.9	B	0 (2)
Overall	**0.85**	**21.7**	**C**		**1.01**	**38.8**	**D**		**1.03**	**38.0**	**D**		**1.11**	**49.5**	**D**		**1.12**	**51.8**	**D**	
Cycle Length	**90.0**				**90.0**				**90.0**				**90.0**				**90.0**			
Saturday Peak Hour																				
Bartlett Street - EB LT&TH	0.62	18.0	B	3 (6)	0.73	25.9	C	5 (9)	0.73	25.3	C	5 (9)	0.81	31.7	C	5 (11)	0.83	33.8	C	5 (11)
Bartlett Street - EB RT	0.16	14.4	B	0 (2)	0.23	17.9	B	0 (2)	0.24	17.5	B	0 (2)	0.30	18.7	B	1 (3)	0.31	18.8	B	1 (3)
Pharmacy Dwy - WB LT&TH&RT	0.04	12.4	B	0 (1)	0.04	15.2	B	0 (1)	0.04	14.9	B	0 (1)	0.04	15.6	B	0 (1)	0.04	15.6	B	0 (1)
Islington Street - NB LT	0.65	25.6	C	2 (6)	0.73	31.8	C	4 (8)	0.75	33.2	C	4 (8)	0.81	37.8	D	4 (9)	0.81	38.5	D	4 (9)
Islington Street - NB TH&RT	0.28	7.2	A	2 (3)	0.30	7.9	A	2 (4)	0.30	8.3	A	2 (4)	0.32	8.0	A	3 (4)	0.32	8.0	A	3 (4)
Islington Street - SB LT&TH	0.59	18.3	B	3 (6)	0.64	22.4	C	5 (7)	0.65	23.6	C	5 (8)	0.68	23.7	C	5 (8)	0.68	23.7	C	5 (8)
Islington Street - SB RT	0.18	16.3	B	0 (2)	0.22	19.0	B	0 (2)	0.22	19.6	B	0 (2)	0.24	18.9	B	0 (2)	0.25	19.0	B	0 (2)
Overall	**0.74**	**16.2**	**B**		**0.80**	**20.5**	**C**		**0.81**	**20.9**	**C**		**0.87**	**22.6**	**C**		**0.89**	**23.1**	**C**	
Cycle Length	**80.0**				**90.0**				**90.0**				**90.0**				**90.0**			

1) Volume-to-capacity ratio, 2) Delay in vehicles per seconds, 3) Level of Service, 4) Queue length in vehicles

TRAFFIC MITIGATION POSSIBILITES

The previous capacity analyses have demonstrated that there is a long-range need to increase intersection capacity at the three signalized intersections in the study area to accommodate the anticipated 2030 PM peak hour traffic volumes. Based on an evaluation of several alternatives, it is recommended the following mitigation measures be considered:

A. US1 Bypass/Cottage Street/Coakley Road

a. Add exclusive right-turn lane on the US1 Bypass northbound approach to the signal.
b. Change existing shared through-right lane to an exclusive through lane.
c. Shorten northbound left-turn lane to 50-feet.

B. US1 Bypass/Borthwick Avenue/Cate Street Extension

a. Delineate the westbound approach with a shared left-through-right lane, and an exclusive right-turn lane.
b. Lengthen southbound left-turn lane.
c. Increase traffic signal cycle length to 120-seconds.

C. Islington Street/Bartlett Street/Pharmacy Driveway

a. Increase traffic signal cycle length to 120-seconds.

Table 6 summarizes the results of the mitigation analyses for the worst-case 2030 Weekday PM peak hour period. The mitigation measures cited above have the potential to lower the overall intersection v/c ratio at the US1 Bypass/Cottage Street/Coakley Road intersection from v/c = 1.10 (existing lanes) to v/c = 1.01 (with additional northbound right-turn lane). Similarly, the US1 Bypass/Borthwick Avenue/Cate Street Extension intersection changes from v/c = 1.00 (existing lanes) to v/c = 0.94 (with reconfiguration of approach lanes on Cate Street Extension). Increasing the traffic signal cycle length at the Islington Street/Bartlett Street/Pharmacy Driveway will lower the v/c ratio from v/c = 1.12 (90-second cycle) to v/c = 0.98 (120-second cycle).

The calculations pertaining to the mitigation analyses are also included in Appendix I.

Table 6

Signal-Controlled Intersection Capacity Analysis Summary - with Mitigation
2030 Weekday PM Peak Hour

	2030 No-Build				2030 Build				2030 Build w/Mitigation			
	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]
US1 Bypass/Cottage St/Coakley Rd [5]												
Coakley Road - EB LT&TH& RT	0.34	39.4	D	2 (3)	0.49	45.7	D	2 (3)	0.39	41.9	D	2 (3)
Cottage Street - WB LT&TH	1.03	104.8	F	10 (13)	1.17	156.4	F	11 (14)	1.07	122.0	F	10 (13)
Cottage Street - WB RT	0.33	40.2	D	2 (4)	0.10	40.9	D	0 (2)	0.10	39.3	D	0 (2)
US1 Bypass - NB LT	0.28	58.1	E	0 (1)	0.28	51.2	D	1 (1)	0.28	52.9	D	0 (1)
US1 Bypass - NB 2TH&RT	1.03	46.5	D	40 (45)	1.12	70.2	E	48 (49)	-	-	-	-
US1 Bypass - NB 2TH	-	-	-	-	-	-	-	-	1.02	30.8	C	40 (45)
US1 Bypass - NB RT	-	-	-	-	-	-	-	-	0.24	7.4	A	2 (3)
US1 Bypass - SB LT	0.76	86.0	F	2 (5)	0.63	69.6	E	2 (4)	0.63	69.6	E	2 (4)
US1 Bypass - SB 2TH&RT	0.44	11.8	B	6 (10)	0.49	10.7	B	7 (11)	0.50	11.7	B	7 (12)
Overall	**1.01**	**42.5**	**D**		**1.10**	**58.4**	**E**		**1.01**	**31.8**	**C**	
Cycle Length	**120.0**				**120.0**				**120.0**			
US1 Bypass/Borthwick Ave/Cate St Extension [6]												
Borthwick Avenue - EB LT	0.77	52.2	D	9 (12)	0.96	88.0	F	10 (15)	0.91	76.3	E	10 (15)
Borthwick Avenue - EB LT&TH	0.77	52.2	D	9 (12)	0.97	90.4	F	10 (15)	0.92	78.2	E	10 (15)
Borthwick Avenue - EB RT	0.07	37.9	D	0 (1)	0.07	42.2	D	0 (0)	0.07	41.3	D	0 (0)
Cate Street Extension - WB LT	0.12	55.8	E	0 (1)	0.28	47.4	D	2 (4)	-	-	-	-
Cate Street Extension - WB TH&RT	0.01	55.0	D	0 (0)	1.04	122.8	F	7 (15)	-	-	-	-
Cate Street Extension - WB LT&TH&RT	-	-	-	-	-	-	-	-	0.87	89.6	F	5 (11)
Cate Street Extension - WB RT	-	-	-	-	-	-	-	-	0.13	51.2	D	0 (3)
US1 Bypass - NB LT	0.47	60.0	E	1 (3)	0.51	61.7	E	1 (3)	0.51	61.7	E	1 (3)
US1 Bypass - NB 2TH&RT	0.73	22.0	C	16 (24)	0.99	54.9	D	23 (30)	0.92	41.3	D	21 (27)
US1 Bypass - SB LT	0.22	71.6	E	0 (1)	0.94	86.2	F	6 (11)	0.95	94.1	F	6 (11)
US1 Bypass - SB 2TH&RT	0.65	19.0	B	15 (20)	0.68	21.9	C	13 (19)	0.65	19.0	B	11 (18)
Overall	**0.72**	**27.4**	**C**		**1.00**	**56.9**	**E**		**0.94**	**45.7**	**D**	
Cycle Length	**110.0**				**110.0**				**120.0**			
Islington St/Bartlett St/Pharmacy Driveway [7]												
Bartlett Street - EB LT&TH	1.19	136.7	F	8 (14)	1.22	149.9	F	8 (14)	0.97	70.5	E	9 (17)
Bartlett Street - EB RT	0.54	24.8	C	2 (7)	0.56	25.4	C	2 (7)	0.58	32.3	C	4 (8)
Pharmacy Dwy - WB LT&TH&RT	0.12	19.7	B	0 (1)	0.13	19.7	B	0 (1)	0.09	24.8	C	1 (2)
Islington Street - NB LT	1.09	94.5	F	9 (14)	1.10	97.6	F	9 (14)	0.98	71.3	E	11 (18)
Islington Street - NB TH&RT	0.33	5.7	A	2 (4)	0.33	5.7	A	2 (4)	0.34	8.7	A	4 (6)
Islington Street - SB LT&TH	0.72	23.3	C	6 (9)	0.72	23.3	C	6 (9)	0.76	36.0	D	9 (13)
Islington Street - SB RT	0.28	17.8	B	0 (2)	0.28	17.9	B	0 (2)	0.28	26.6	C	0 (2)
Overall	**1.11**	**49.5**	**D**		**1.12**	**52.5**	**D**		**0.98**	**41.0**	**D**	
Cycle Length	**90.0**				**90.0**				**120.0**			

1) Volume-to-capacity ratio, 2) Delay in vehicles per seconds, 3) Level of Service, 4) Queue length in vehicles

5) Mitigation = Add exclusive right-turn lane on US1 Bypass NB approach, change NB shared through-right lane to an exclusive through lane

6) Mitigation = Reconfigure WB approach with a shared left-through-right lane and an exclusive right-turn lane, increase signal cycle to 120 seconds

7) Mitigation = Increase signal cycle to 120 seconds

INTERSECTION CAPACITY – UNSIGNALIZED INTERSECTIONS

Capacity and Level of Service (LOS) calculations pertaining to unsignalized intersections address the quality of service for those vehicles turning into and out of intersecting side streets or driveways. The availability of adequate gaps in the traffic stream on the major street actually controls the potential capacity for vehicle movements to and from the minor approaches. Levels of Service are simply letter grades (A-F), which categorize the vehicle delays associated with specific turning maneuvers. Table 7 describes the criteria used in this analysis. Calculations pertaining to these analyses are included in Appendix J.

Table 7 — Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Control Delay (seconds/vehicle)
A	≤ 10.0
B	> 10.0 and ≤ 15.0
C	> 15.0 and ≤ 25.0
D	> 25.0 and ≤ 35.0
E	> 35.0 and ≤ 50.0
F	> 50.0

Source: Transportation Research Board, Highway Capacity Manual 2010.

The three unsignalized study area intersections were analyzed according to the methodologies of the *Highway Capacity Manual*[3] as replicated by the latest edition of the *Synchro Traffic Signal Timing Software (Version 10)*, which also performs unsignalized intersection capacity analyses.

Table 8 summarizes the results for the **US1 Bypass/Existing Site Driveway** intersection. At this intersection, the only applicable traffic movement (with a conflicting traffic stream) is the right-turn departure movement from the site. The analyses demonstrate that this movement will operate well below capacity (v/c = 0.05) and at LOS C or higher through 2030 with the site in full operation. The calculations pertaining to these analyses are found in Appendix J.

[3] Transportation Research Board, *Highway Capacity Manual* (Washington, D.C., 2010).

Table 8

STOP-Controlled Intersection Capacity Analysis
US Route 1 By-Pass / Existing Site Driveway

	Weekday PM Peak Hour				Saturday Peak Hour			
	Delay [1]	V/C [2]	LOS [3]	Queue [4]	Delay [1]	V/C [2]	LOS [3]	Queue [4]
Existing Site Driveway - WB Right Turns								
2018 Existing	13.1	0.01	B	<1	11.8	0.00	B	<1
2020 No Build	13.9	0.01	B	<1	12.4	0.01	B	<1
2020 Build	14.6	0.04	B	<1	13.0	0.05	B	<1
2030 No Build	14.9	0.01	B	<1	13.0	0.01	B	<1
2030 Build	15.7	0.04	C	<1	13.7	0.05	B	<1

[1] HCM Control Delay (seconds per vehicle), [2] HCM Volume to Capacity Ratio, [3] HCM Level of Service, [4] HCM 95th Percentile Queue (vehicles)

The results of the analysis for the **Bartlett Street/Cate Street** intersection are summarized on Table 9A, and demonstrate that the departure movements from the Cate Street approach will operate well over capacity during the 2030 PM peak hour period as a result of site traffic (and diverted traffic). Departures from this approach will change from LOS D to LOS F during this period, and long vehicle queues on the minor approach will form. These findings are an indicator that physical improvements to this intersection are needed in order to accommodate site traffic.

It should be noted that this methodology is not capable of accounting for the vehicle queues that were temporarily observed on Bartlett Street that extended back from the traffic signal at Islington Street. This occurred occasionally during the PM peak hour; more so at the Cate Street intersection and to a lesser extent at the Shared Driveway. Nevertheless, driver courtesy was observed in several instances that enabled certain vehicles to turn during congested moments.

Three mitigation alternatives were evaluated for this intersection. Table 9B schematically shows the layout of each alternative, as well as an evaluation of traffic operations during the 2030 PM peak hour period.

A. Alternative Configuration A - Re-stripe the northbound Bartlett Street approach to provide an exclusive left-turn pocket for turns on to Cate Street.

B. Alternative Configuration B - Re-align the Cate Street and Bartlett Street northbound approach to create a “through street” with stop sign control on the Bartlett Street southbound approach.

C. Alternative Configuration C – Same as Configuration B with additional right-turn slip ramp.

Table 9A

STOP-Controlled Intersection Capacity Analysis - Revised 9/19/18
Bartlett Street / Cate Street / Parking Lot Driveway

	Weekday PM Peak Hour				Saturday Peak Hour			
	Delay [1]	V/C [2]	LOS [3]	Queue [4]	Delay [1]	V/C [2]	LOS [3]	Queue [4]
Bartlett Street - NB Left Turns								
2018 Existing	9.2	0.10	A	<1	8.6	0.05	A	<1
2020 No Build	10.0	0.17	B	1	9.1	0.09	A	<1
2020 Build	11.0	0.31	B	1	9.5	0.20	A	1
2030 No Build	10.5	0.19	B	1	9.3	0.10	A	<1
2030 Build	11.7	0.34	B	2	9.9	0.22	A	1
Cate Street - EB Left-Through								
2018 Existing	16.1	0.19	C	1	12.5	0.06	B	<1
2020 No Build	86.6	0.08	F	<1	35.6	0.01	E	<1
2020 Build	>300.0	1.28	F	5	68.4	0.40	F	2
2030 No Build	120.5	0.11	F	<1	43.4	0.01	E	<1
2030 Build	>300.0	1.86	F	5	97.1	0.50	F	2
Cate Street - EB Right-Turns								
2018 Existing	-	-	-	-	-	-	-	-
2020 No Build	17.0	0.27	C	1	13.2	0.11	B	<1
2020 Build	20.0	0.43	C	2	14.5	0.27	B	1
2030 No Build	19.1	0.32	C	1	14.1	0.13	B	<1
2030 Build	23.1	0.50	C	3	15.6	0.30	C	1
Parking Lot Driveway - WB Left-Through-Right-Turns								
2018 Existing	37.8	0.01	E	<1	24.7	0.02	C	<1
2020 No Build	68.3	0.02	F	<1	36.9	0.03	E	<1
2020 Build	111.2	0.03	F	<1	55.7	0.05	F	<1
2030 No Build	95.2	0.03	F	<1	45.4	0.04	E	<1
2030 Build	169.3	0.05	F	<1	71.6	0.07	F	<1
Bartlett Street - SB Left-Turns								
2018 Existing	8.7	0.00	A	<1	8.2	0.00	A	<1
2020 No Build	9.1	0.00	A	<1	8.5	0.00	A	<1
2020 Build	8.8	0.00	A	<1	8.2	0.00	A	<1
2030 No Build	9.4	0.00	A	<1	8.6	0.00	A	<1
2030 Build	9.0	0.00	A	<1	8.3	0.00	A	<1

[1] HCM Control Delay (seconds per vehicle), [2] HCM Volume to Capacity Ratio, [3] HCM Level of Service, [4] HCM 95th Percentile Queue (vehicles)

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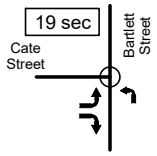
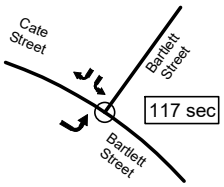
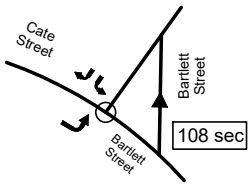
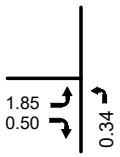
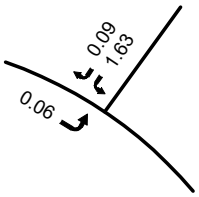
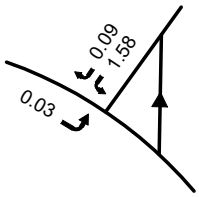
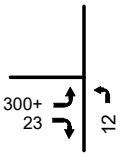
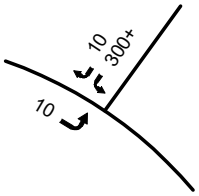
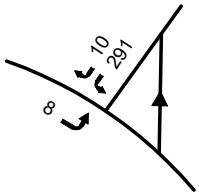
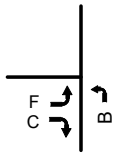
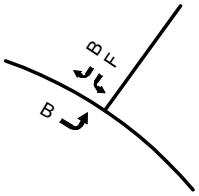
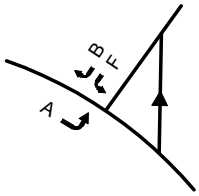
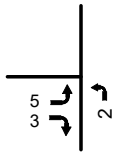
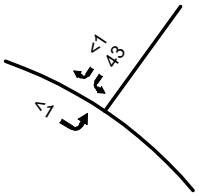
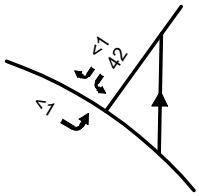
Table 9B

Alternative Mitigation Evaluation - 2030 PM Peak Hour
Bartlett Street / Cate Street

	Alternative Configuration A	Alternative Configuration B	Alternative Configuration C
1. Overall Intersection Delay (sec):			
2. Volume to Capacity Ratio:			
3. Movement Delay (sec):			
4. Level of Service:			
5. 95th Percentile Queue (veh):			

Alternative Configuration A = Add Northbound Left-Turn Lane on Bartlett Street for turns to Cate Street
Alternative Configuration B = Realign Bartlett Street Approach to Cate Street
Alternative Configuration C = Realign Bartlett Street Approach to Cate Street with "Slip Ramp"

Although there are advantages and disadvantages associated with each alternative configuration that requires city review/input, it appears that Configuration A offers the least overall intersection delay. As a short-range measure, this alternative could be enhanced by providing two approach lanes on Cate Street (one shared left-through lane, one exclusive right-turn lane).

The analysis of these alternative intersection layouts are contained in Appendix K.

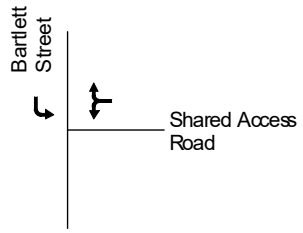
The results of the analysis for the **Bartlett Street/Existing Shared Driveway** intersection are summarized on Table 10, and demonstrate that all applicable movements will operate below capacity during the 2030 peak hour periods with the site in full operation; subject to the occasional restrictions due to vehicle queuing on Bartlett Street. Nevertheless, long delays (LOS F) and vehicle queues of up to six vehicles are expected on the minor approach during the weekday PM peak hour in 2030. The left-turn arrival movement from Bartlett Street (on to the existing Shared Driveway) will operate at LOS A during all hours of the day through the horizon year and beyond with the development fully occupied.

Table 10

STOP-Controlled Intersection Capacity Analysis
Bartlett Street / Shared Access Road

	Weekday PM Peak Hour				Saturday Peak Hour			
	Delay [1]	V/C [2]	LOS [3]	Queue [4]	Delay [1]	V/C [2]	LOS [3]	Queue [4]
Shared Access Road - WB Left & Right-Turn Departures								
2018 Existing	22.2	0.36	C	2	17.3	0.18	C	1
2020 No-Build	44.3	0.63	E	4	24.2	0.35	C	2
2020 Build	58.1	0.71	F	5	22.3	0.32	C	1
2030 No-Build	62.3	0.74	F	5	28.3	0.39	D	2
2030 Build	91.6	0.86	F	6	26.2	0.37	D	2
Bartlett Street - SB Left-Turn Arrivals								
2018 Existing	8.8	0.03	A	<1	8.3	0.02	A	<1
2020 No-Build	9.4	0.05	A	<1	8.7	0.04	A	<1
2020 Build	9.0	0.02	A	<1	8.4	0.01	A	<1
2030 No-Build	9.7	0.05	A	<1	8.8	0.04	A	<1
2030 Build	9.2	0.02	A	<1	8.5	0.01	A	<1

[1] HCM Control Delay (seconds per vehicle), [2] HCM Volume to Capacity Ratio, [3] HCM Level of Service, [4] HCM 95th Percentile Queue (vehicles)

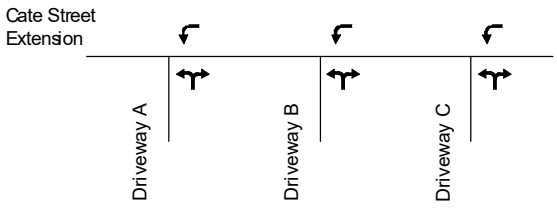


Analysis of the three **Cate Street Extension/Proposed Site Driveway** intersections are summarized on Table 11, and demonstrate that all applicable movements will operate well below capacity and at LOS B (or higher) through 2030 and beyond with the site in full operation. Vehicle queuing on the minor approaches will be minimal.

Table 11 — **STOP-Controlled Intersection Capacity Analysis**
Cate Street Extension / Site Driveways A, B & C

	Weekday PM Peak Hour				Saturday Peak Hour			
	Delay [1]	V/C [2]	LOS [3]	Queue [4]	Delay [1]	V/C [2]	LOS [3]	Queue [4]
Cate Street Extension / Site Driveway A								
Site Driveway A - NB Left & Right-Turn Departures								
2020 Build	12.7	0.21	B	1	13.5	0.30	B	1
2030 Build	12.7	0.21	B	1	13.5	0.30	B	1
Cate Street Extension - WB Left-Turn Arrivals								
2020 Build	7.7	0.00	A	<1	7.8	0.01	A	<1
2030 Build	7.7	0.00	A	<1	7.8	0.01	A	<1
Cate Street Extension / Site Driveway B								
Site Driveway B - NB Left & Right-Turn Departures								
2020 Build	10.3	0.04	B	<1	10.4	0.05	B	<1
2030 Build	10.3	0.04	B	<1	10.4	0.05	B	<1
Cate Street Extension - WB Left-Turn Arrivals								
2020 Build	7.4	0.01	A	<1	7.5	0.00	A	<1
2030 Build	7.4	0.01	A	<1	7.5	0.00	A	<1
Cate Street Extension / Site Driveway C								
Site Driveway C - NB Left & Right-Turn Departures								
2020 Build	10.3	0.01	B	<1	10.1	0.01	B	<1
2030 Build	10.3	0.01	B	<1	10.1	0.01	B	<1
Cate Street Extension - WB Left-Turn Arrivals								
2020 Build	7.4	0.00	A	<1	7.4	0.00	A	<1
2030 Build	7.4	0.00	A	<1	7.4	0.00	A	<1

[1] HCM Control Delay (seconds per vehicle), [2] HCM Volume to Capacity Ratio, [3] HCM Level of Service, [4] HCM 95th Percentile Queue (vehicles)



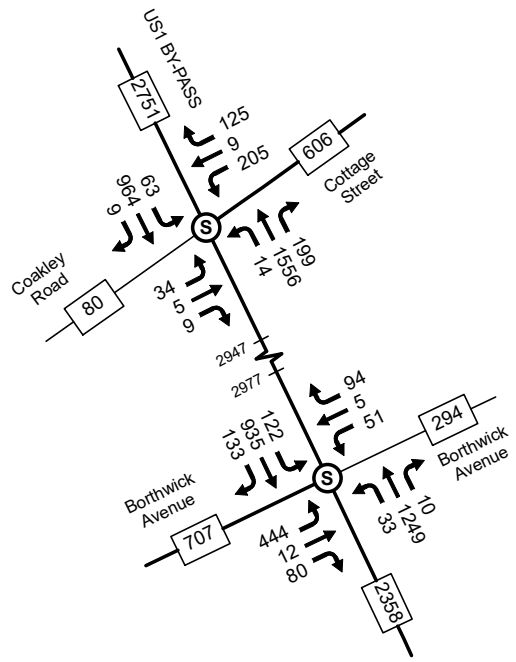
SUPPLEMENTAL DEVELOPMENT SCENARIOS

To assist the NHDOT and City in the decision-making process regarding the: 1) the possible future extension of Cate Street (to the Bypass), and 2) the possible future extension of the existing median island on the Bypass through the Coakley Road/Cottage Street intersection, supplemental traffic projections have been prepared for the two signalized intersections on the Bypass.

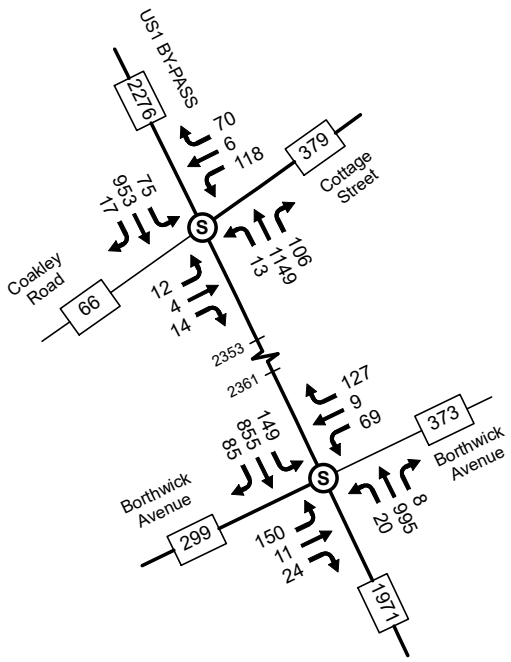
The impact of the Cate Street Extension can be identified by comparing Development Scenario A (with Cate Street Extension) with Development Scenario B (no Cate Street Extension). Similarly, the impact of the median island extension on the Bypass can be identified by comparing Development Scenario C (with median extension) with Development Scenario A (no median extension).

Figure 13 and Figure 14 summarize the Supplemental Build traffic volumes for Development Scenarios B and C, respectively. The supplemental Impact Summary for 2020 is summarized on Figure 15. The following conclusions are evident from these supplemental traffic projections for the worst-case PM peak hour:

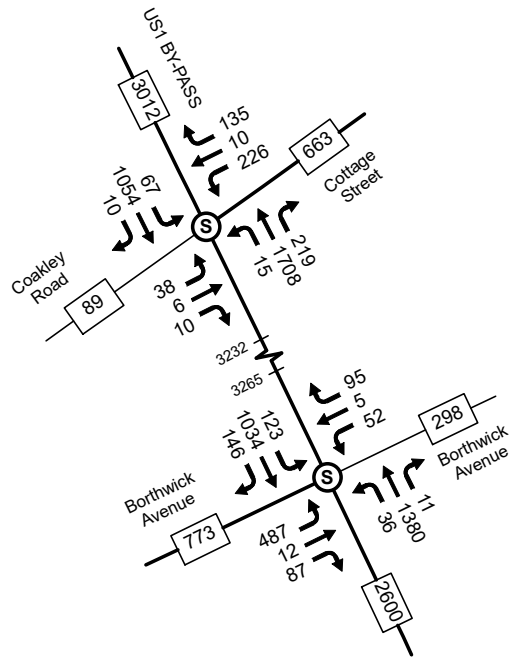
1. Extending Cate Street to the Bypass will increase the traffic demand at the Coakley Road/Cottage Street signalized intersection by approximately +190 vehicles during the PM peak hour.
2. Extending Cate Street to the Bypass will increase the traffic demand at the Borthwick Avenue/Cate Street Extension signalized intersection by approximately +270 vehicles during the PM peak hour.
3. Extending the median island on the Bypass through the Coakley Road/Cottage Street intersection (with elimination of the traffic signal) will reduce the traffic demand at this intersection by approximately -96 vehicles during the PM peak hour.
4. Extending the median island on the Bypass through the Coakley Road/Cottage Street intersection will increase the traffic demand at the Borthwick Avenue/Cate Street Extension signalized intersection by approximately +100 vehicles during the PM peak hour.



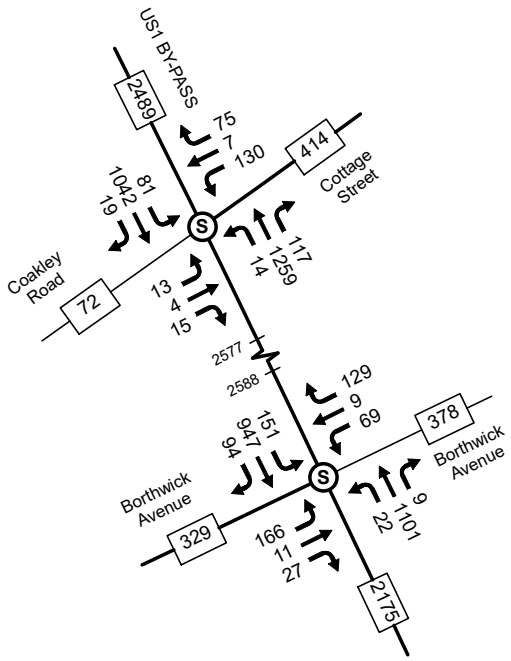
2020 PM BUILD



2020 SATURDAY BUILD



2030 PM BUILD



2030 SATURDAY BUILD

Scenario B = Proposed Development without Cate Street Extension

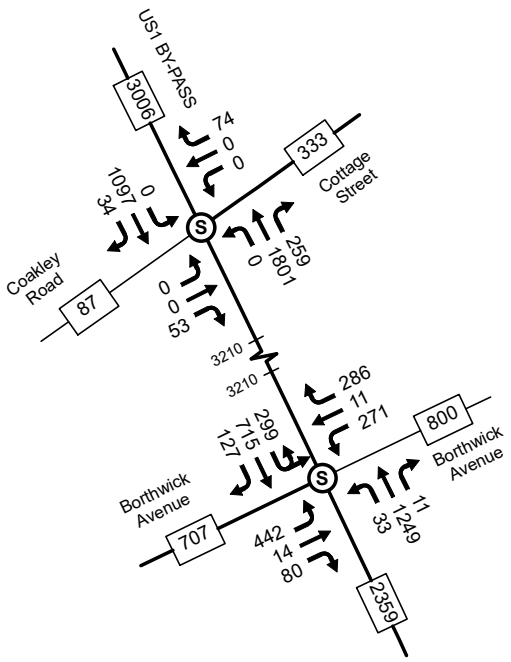
NORTH

1831A

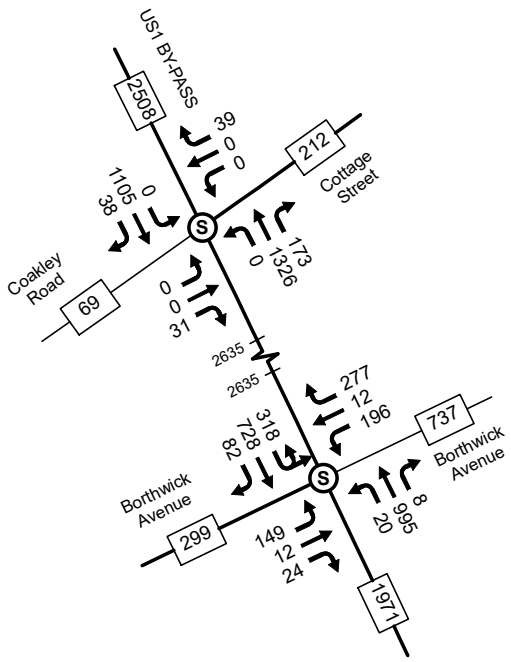
Figure 13

Supplemental Build Traffic Volumes - (Scenario B)

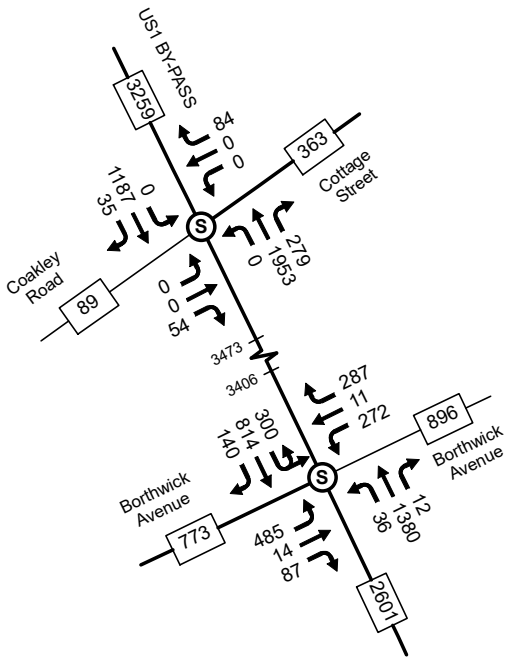
Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire



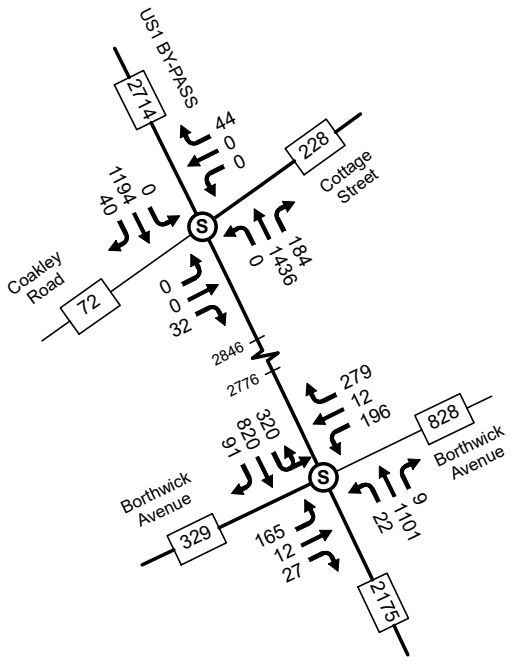
2020 PM BUILD



2020 SATURDAY BUILD



2030 PM BUILD



2030 SATURDAY BUILD

Scenario C = Proposed Development with Cate Street Extension & US1 Bypass Median

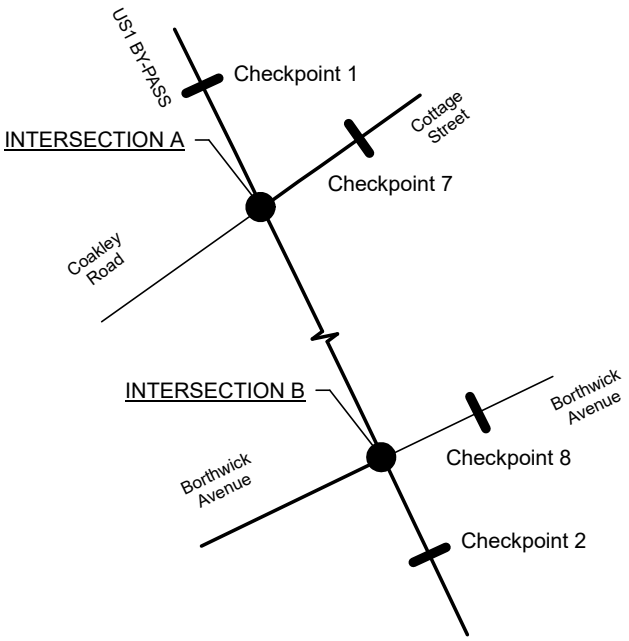
NORTH

1831A

Figure 14

Supplemental Build Traffic Volumes - (Scenario C)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire



PM Peak Hour

Location	2020 No-Build	Build Scenario A: 2020 Build	Change	% Change	Build Scenario B: 2020 Build	Change	% Change	Build Scenario C: 2020 Build	Change	% Change
Intersection A	3026	3382	+356 veh	12%	3192	+166 veh	5%	3286	+260 veh	9%
Intersection B	2941	3438	+497 veh	17%	3168	+227 veh	8%	3538	+597 veh	20%
Checkpoint 1	2585	2949	+364 veh	14%	2751	+166 veh	6%	2998	+413 veh	16%
Checkpoint 2	2333	2358	+25 veh	1%	2358	+25 veh	1%	2359	+26 veh	1%
Checkpoint 7	606	526	-80 veh	-13%	606	0 veh	0%	306	-300 veh	-50%
Checkpoint 8	37	572	+535 veh	++%	294	+257 veh	++%	892	+855 veh	++%

Saturday Peak Hour

Location	2020 No-Build	Build Scenario A: 2020 Build	Change	% Change	Build Scenario B: 2020 Build	Change	% Change	Build Scenario C: 2020 Build	Change	% Change
Intersection A	2337	2716	+379 veh	16%	2537	+200 veh	9%	2691	+354 veh	15%
Intersection B	2219	2740	+521 veh	23%	2502	+283 veh	13%	2821	+602 veh	27%
Checkpoint 1	2076	2459	+383 veh	18%	2276	+200 veh	10%	2501	+425 veh	20%
Checkpoint 2	1942	1971	+29 veh	1%	1971	+29 veh	1%	1971	+29 veh	1%
Checkpoint 7	379	320	-59 veh	-16%	379	0 veh	0%	193	-186 veh	-49%
Checkpoint 8	44	615	+571 veh	++%	373	+329 veh	++%	823	+779 veh	++%

Build Scenario A = Proposed Development with Cate Street Extension
Build Scenario B = Proposed Development without Cate Street Extension
Build Scenario C = Proposed Development with Cate Street Extension & US1 Bypass Median

NORTH

1831A

Figure 15

Supplemental 2020 Impact Summary

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

The Supplemental Capacity Analyses for these two intersections for the worst-case PM peak hour using the 2030 Build traffic volumes for each development scenario are summarized on Table 12. The following conclusions are evident from these supplemental capacity analyses:

1. Extending Cate Street to the Bypass will increase the V/C ratio for the overall Coakley Road/Cottage Street intersection from 0.95 to 1.01. Although the overall Level of Service remains at LOS C, extending Cate Street will increase the average delay at this intersection by approximately six seconds/vehicle.
2. Extending Cate Street to the Bypass will increase the V/C ratio for the overall Borthwick Avenue/Cate Street Extension from 0.83 to 0.94. Although the overall Level of Service remains at LOS D, extending Cate Street will increase the average delay at this intersection by approximately ten seconds/vehicle.
3. Extending the median island on the Bypass through the Coakley Road/Cottage Street intersection will increase the V/C ratio at the nearby Borthwick Avenue/Cate Street Extension intersection from 0.94 to 1.14. The overall Level of Service changes from LOS D to LOS F. Average delay at this intersection increases by approximately +40 seconds/vehicle as a result of the median extension.

Stephen G. Pernaw & Company, Inc.

Table 12

Supplemental Signal-Controlled Intersection Capacity Analysis Summary (with Mitigation)
2030 Weekday PM Peak Hour

	2030 No-Build				2030 Build (Scenario A)*				2030 Build (Scenario B)*				2030 Build (Scenario C)*			
	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]
US1 Bypass/Cottage St/Coakley Rd																
Coakley Road - EB LT&TH& RT	0.34	39.4	D	2 (3)	0.39	41.9	D	2 (3)	0.28	36.7	D	2 (3)	UNSIGNALIZED INTERSECTION			
Cottage Street - WB LT&TH	1.03	104.8	F	10 (13)	1.07	122.0	F	10 (13)	0.95	79.2	E	10 (13)	EB Right-Turns			
Cottage Street - WB RT	0.33	40.2	D	2 (4)	0.10	39.3	D	0 (2)	0.30	38.1	D	2 (4)	0.16	14.7	B	1
US1 Bypass - NB LT	0.28	58.1	E	0 (1)	0.28	52.9	D	0 (1)	0.28	54.7	D	0 (1)	WB Right-Turns			
US1 Bypass - NB 2TH	1.03	46.5	D	40 (45)	1.02	30.8	C	40 (45)	0.97	22.5	C	12 (39)	0.62	53.0	F	4
US1 Bypass - NB RT					0.24	7.4	A	2 (3)	0.26	8.4	A	2 (3)				
US1 Bypass - SB LT	0.76	86.0	F	2 (5)	0.63	69.6	E	2 (4)	0.76	86.0	F	2 (5)				
US1 Bypass - SB 2TH&RT	0.44	11.8	B	6 (10)	0.50	11.7	B	7 (12)	0.50	13.7	B	7 (12)				
Overall	**1.01**	**42.5**	**D**		**1.01**	**31.8**	**C**		**0.95**	**26.0**	**C**					
Cycle Length	**120.0**				**120.0**				**120.0**							
US1 Bypass/Borthwick Ave/Cate St Extension																
Borthwick Avenue - EB LT	0.77	52.2	D	9 (12)	0.91	76.3	E	10 (11)	0.83	59.3	E	9 (12)	1.11	138.9	F	11 (16)
Borthwick Avenue - EB LT&TH	0.77	52.2	D	9 (12)	0.92	78.2	E	10 (11)	0.83	59.5	E	9 (12)	1.12	142.2	F	11 (17)
Borthwick Avenue - EB RT	0.07	37.9	D	0 (1)	0.07	41.3	D	0 (0)	0.07	39.3	D	0 (1)	0.07	44.7	D	0 (0)
Cate Street Extension - WB LT&TH&RT	0.12	55.8	E	0 (1)	0.87	89.6	F	5 (11)	0.62	63.2	E	2 (6)	1.21	171.3	F	14 (22)
Cate Street Extension - WB RT	0.01	55.0	D	0 (0)	0.13	51.2	D	0 (3)	0.05	53.7	D	0 (0)	0.54	49.8	D	3 (7)
US1 Bypass - NB LT	0.47	60.0	E	1 (3)	0.51	61.7	E	1 (3)	0.51	61.7	E	1 (3)	0.51	61.7	E	1 (3)
US1 Bypass - NB 2TH&RT	0.73	22.0	C	16 (24)	0.92	41.3	D	21 (27)	0.86	33.5	C	21 (25)	1.07	82.8	F	26 (32)
US1 Bypass - SB LT	0.22	71.6	E	0 (1)	0.95	94.1	F	6 (11)	0.73	71.8	E	3 (7)	1.13	144.2	F	11 (18)
US1 Bypass - SB 2TH&RT	0.65	19.0	B	15 (20)	0.65	19.0	B	11 (18)	0.65	18.4	B	13 (19)	0.56	22.2	C	11 (14)
Overall	**0.72**	**27.4**	**C**		**0.94**	**45.7**	**D**		**0.83**	**35.6**	**D**		**1.14**	**85.3**	**F**	
Cycle Length	**120.0**				**120.0**				**120.0**				**120.0**			

1) Volume-to-capacity ratio, 2) Delay in vehicles per seconds, 3) Level of Service, 4) Queue length in vehicles
Scenario A = Proposed Development with Cate Street Extension
Scenario B = Proposed Development No Cate Street Extension
Scenario C = Proposed Development with Cate Street Extension and Median Island at Cottage Street/Coakley Road Intersection

STUDY FINDINGS AND CONCLUSIONS

Based on the existing conditions data collected along US1 Bypass and at the six existing study area intersections, the anticipated traffic increases from the proposed residential/commercial development (Development Scenario B), and the analysis of future traffic operations in the study area, Pernaw & Company, Inc. concludes that:

1. The May 2018 traffic counts revealed that the Weekday PM peak hour traffic volumes are generally higher than those observed during the Saturday Midday peak hour period. During the PM peak hour (4:30 to 5:30 PM) the US1 Bypass carried over 2,200 vehicles (total both directions, north of cottage Street), Islington Street and Bartlett Street carried over 1,100 vehicles, Cottage Street (east of the Bypass) carried 500 vehicles, and Cate Street (west of Bartlett Street) carried approximately 150 vehicles. See Figure 3A.

2. The proposed residences and commercial uses are expected to generate a total of 353 vehicle-trips (198 arrivals, 155 departures) during the weekday PM peak hour period, and 444 vehicle-trips (230 arrivals, to 214 departures) during the Saturday Midday peak hour period. Approximately 24-28% of these trips will be "pass-by" trips that will turn into the site from the existing traffic stream on the Bypass. See Table 1.

3. The intersection capacity and Level of Service analyses for the two signalized study area intersections on the Bypass indicates that with implementation of the mitigation measures recommended on Page 36, these intersections will operate <u>below</u> capacity through 2030 with the subject site in full operation. More specifically, the Cottage Street/Coakley Road intersection is projected to operate with an overall volume-to-capacity ratio of v/c = 0.95 during the 2030 PM peak hour and the Borthwick Avenue/Existing Site Driveway intersection is projected to operate at v/c = 0.83. See Table 12.

4. <u>Cate Street Extension (Supplemental Development Scenario A)</u> - The possible future realignment and extension of Cate Street through the subject site to the US1 Bypass (and the closure of the Cate Street bridge to through traffic; for pedestrian use only) is expected to alter local travel patterns as this new connection will become an attractive travel route for many drivers (depending upon their trip origin or destination). Analysis of this development scenario shows that there will be net increases on the Bypass, and these will increase the v/c ratio at Cottage Street/Coakley Road intersection from v/c = 0.95 to 1.01 (slightly over capacity) during the 2030 PM peak hour. The Borthwick Avenue/Cate Street Extension intersection increases from v/c = 0.83 to 0.94. See Table 12.

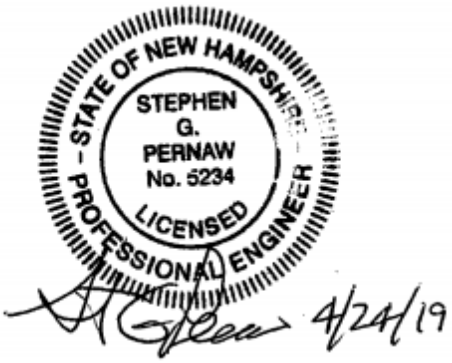
5. <u>Median Island Extension (Supplemental Development Scenario C)</u> - The possible future extension of the median island on the Bypass through the Cottage Street/Coakley Road intersection (Development Scenario C) will eliminate the need for traffic signal control at this location. However, the added traffic demand at the Borthwick Avenue/Cate Street Extension intersection increases its v/c from 0.94 to 1.14 (significantly over capacity) during the 2030 PM peak hour. See Table 12.

6. Analysis of the three existing <u>unsignalized</u> study area intersections revealed that peak period capacity deficiencies will occur at the Bartlett Street/Cate Street intersection in 2020 as a result of site traffic and diverted traffic (weekday PM peak hour). Three mitigation scenarios

were evaluated, with varying results. Configuration A, which maintains Cate Street as the minor leg of the intersection, appears to operate more efficiently than reconfiguring Bartlett Street such that the north leg functions as the minor approach (Configuration B and C) See Table 9A and 9B.

7. Analysis of the three proposed site driveway intersections on Cate Street Extension, if constructed, confirms that each intersection will operate well below capacity with single approach lanes on each leg of each intersection. These intersections will operate at LOS B (or higher) through 2030 with the site fully occupied. Vehicle queuing will be minimal. See Table 11.

In conclusion, development of the subject site as proposed can be successfully mitigated by implementing the recommendations summarized on Page 36. All signalized study area intersections will operate below capacity (v/c < 1.0) during the weekday PM and Saturday midday peak hour periods in 2030, with the site in full operation. The traffic diversion that will occur in the study area due to the possible future extension of Cate Street through the subject site to the Bypass has the potential to increase the overall v/c ratio at the Cottage Street/Coakley Road intersection to 1.01. Similarly, the traffic diversion that will occur along the Bypass due to the possible future extension of the median island through the Cottage Street/Coakley Road intersection has the potential to create a significant capacity deficiency at the Borthwick Road/Cate Street Extension intersection (v/c = 1.14) during the 2030 PM peak hour period. It should be noted that the extension of the median island will also impact several other properties in the area. The possible future extension of both Cate Street and the median island on the Bypass are not proposed by Torrington Properties, Inc. The subject site can and should be developed independently of these other longer-range projects.



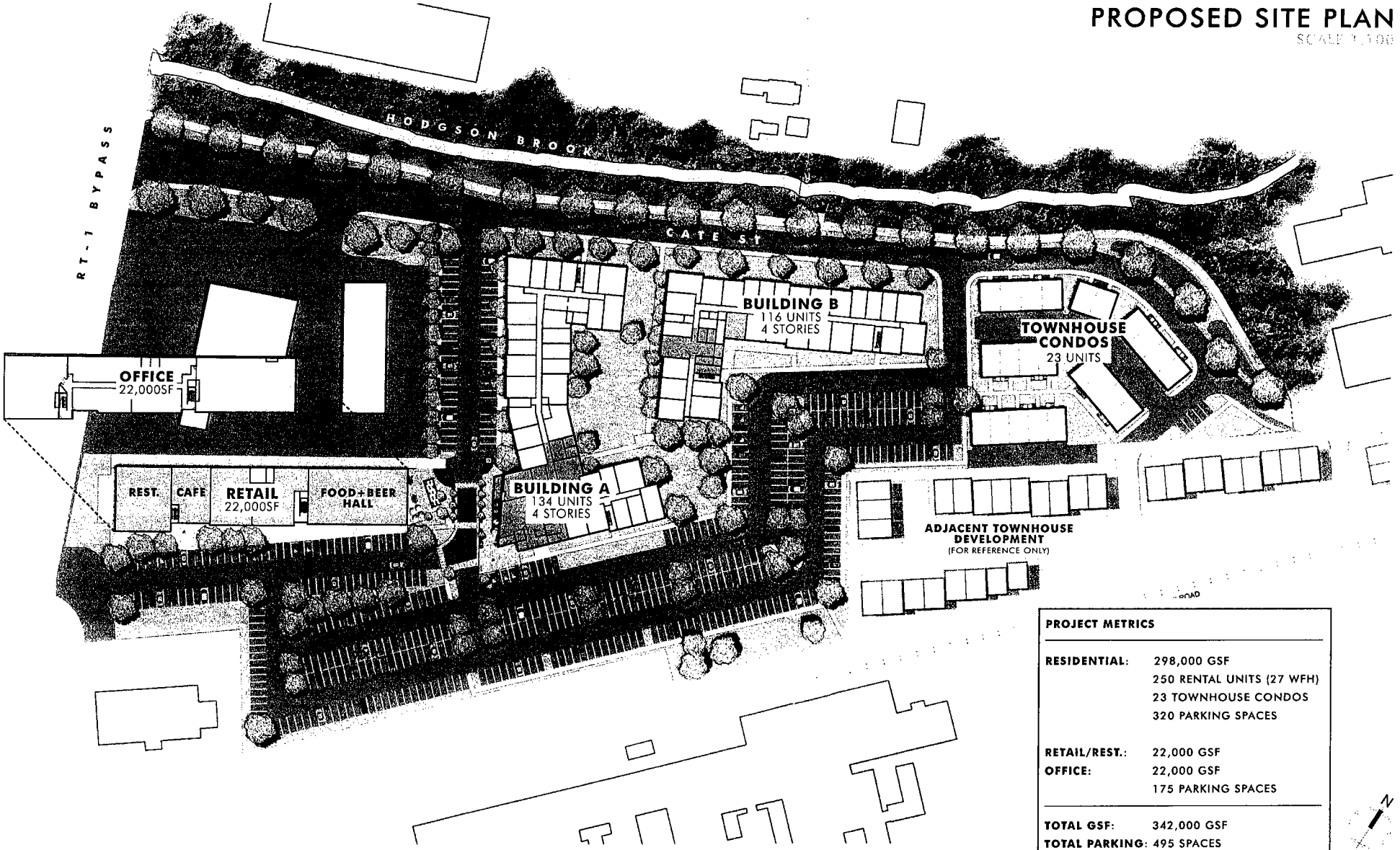
APPENDIX

Appendix A	Site Plan
Appendix B	Automatic Traffic Recorder Counts
Appendix C	Intersection Turning Movement Counts
Appendix D	Pedestrian Counts
Appendix E	Seasonal Adjustment Factors / Historical Growth Rates
Appendix F	Other Development Traffic Volumes
Appendix G	Site Generated Traffic Volumes / Trip Distribution / Traffic Diversion
Appendix H	Lane Utilization Factors
Appendix I	Capacity and Level of Service Calculations – Signalized
Appendix J	Capacity and Level of Service Calculations - Unsignalized
Appendix K	Bartlett Street / Cate Street Alternative Layouts & Analyses

Appendix A **Site Plan**

PROPOSED SITE PLAN

SCALE: 1:100



PROJECT METRICS	
RESIDENTIAL:	298,000 GSF
	250 RENTAL UNITS (27 WFH)
	23 TOWNHOUSE CONDOS
	320 PARKING SPACES
RETAIL/REST.:	22,000 GSF
OFFICE:	22,000 GSF
	175 PARKING SPACES
TOTAL GSF:	342,000 GSF
TOTAL PARKING:	495 SPACES

Appendix B **Automatic Traffic Recorder Counts**

New Hampshire DOT
Department of Transportation

MS2
Transportation Data Management System

List View | All DIRs

Record 1 of 1 Goto Record go

Location ID	82379042	MPO ID	
Type	SPOT	HPMS ID	
On NHS	Yes	On HPMS	Yes
LRS ID	U0000001B_	LRS Loc Pt.	
SF Group	03	Route Type	
AF Group	03	Route	
GF Group	E	Active	Yes
Class Dist Grp	Default	Category	3
Seas Clss Grp	Default		
WIM Group	Default		
QC Group	Default		
Fnct'l Class	Freeway & Expressway	Milepost	
Located On	US Route 1 Bypass N		
Loc On Alias	US 1 BYPASS UNDER B&M RAILROAD (EB-WB) (81379043-81379042)		

PR	MP	PT

More Detail

STATION DATA

Directions: 2-WAY | EB | WB

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2018	18,997	1,792	9	59	17,515 (92%)	1,482 (8%)	
2017	21,848[3]				20,274 (93%)	1,574 (7%)	Grown from 2016
2016	21,420[3]				19,535 (91%)	1,885 (9%)	Grown from 2015
2015	21,000						
2012	37,000						

|<< | < | > | >>| 1-5 of 13

Travel Demand Model

	Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

	Date	Int	Total
	Thu 8/2/2018	60	22,272
	Wed 8/1/2018	60	23,285
	Tue 7/31/2018	60	22,861
	Fri 9/4/2015	60	25,199
	Thu 9/3/2015	60	24,394
	Wed 9/2/2015	60	24,783
	Tue 9/1/2015	60	24,726
	Mon 8/31/2015	60	24,496
	Fri 12/14/2012	60	48,039

VOLUME TREND

Year	Annual Growth
2018	-13%
2017	2%
2016	2%
2015	-17%
2012	14%
2009	1%
2006	1%
2003	0%
2002	3%

New Hampshire DOT
Department of Transportation

MS2
Transportation Data Management System

Excel Version

Weekly Volume Report			
Location ID:	82379042	**Type:**	SPOT
Located On:	US Route 1 Bypass N	:	
Direction:	2-WAY		
Community:	PORTSMOUTH	**Period:**	Mon 7/30/2018 - Sun 8/5/2018
AADT:	18997		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph
12:00 AM		81	102	112				98	0.4%
1:00 AM		51	57	47				52	0.2%
2:00 AM		42	48	56				49	0.2%
3:00 AM		56	81	80				72	0.3%
4:00 AM		125	151	111				129	0.6%
5:00 AM		363	362	338				354	1.6%
6:00 AM		765	739	729				744	3.3%
7:00 AM		1238	1292	1257				1,262	5.5%
8:00 AM		1469	1425	1346				1,413	6.2%
9:00 AM		1450	1516	1463				1,476	6.5%
10:00 AM		1536	1628	1465				1,543	6.8%
11:00 AM		1603	1695	1696				1,665	7.3%
12:00 PM		1710	1726	1762				1,733	7.6%
1:00 PM		1692	1622	1619				1,644	7.2%
2:00 PM		1750	1713	1700				1,721	7.5%
3:00 PM		1722	1734	1643				1,700	7.5%
4:00 PM		1792	1709	1524				1,675	7.3%
5:00 PM		1710	1585	1498				1,598	7.0%
6:00 PM		1260	1343	1171				1,258	5.5%
7:00 PM		880	1043	868				930	4.1%
8:00 PM		682	717	691				697	3.1%
9:00 PM		470	516	571				519	2.3%
10:00 PM		249	290	296				278	1.2%
11:00 PM		165	191	229				195	0.9%
Total	**0**	**22,861**	**23,285**	**22,272**	**0**	**0**	**0**		
24hr Total		22861	23285	22272				22,806	
AM Pk Hr		11:00	11:00	11:00					
AM Peak		1603	1695	1696				1,665	
PM Pk Hr		4:00	3:00	12:00					
PM Peak		1792	1734	1762				1,763	
% Pk Hr		7.84%	7.45%	7.91%				7.73%	

New Hampshire DOT
Department of Transportation

MS2
Transportation Data Management System

List View | All DIRs

Record 1 of 1 Goto Record go

Location ID	82379052	MPO ID	
Type	SPOT	HPMS ID	
On NHS	No	On HPMS	Yes
LRS ID	N3790035__	LRS Loc Pt.	
SF Group	04	Route Type	
AF Group	04	Route	
GF Group	E	Active	Yes
Class Dist Grp	Default	Category	3
Seas Clss Grp	Default		
WIM Group	Default		
QC Group	Default		
Fnct'l Class	Minor Arterial	Milepost	
Located On	Bartlett St		
Loc On Alias	BARTLETT ST WEST OF ISLINGTON ST		

PR	MP	PT

More Detail

STATION DATA

Directions: 2-WAY

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2018	16,742[3]		9		15,437 (92%)	1,305 (8%)	Grown from 2017
2017	16,414	1,434	9		15,233 (93%)	1,181 (7%)	
2016	17,860[3]				16,289 (91%)	1,571 (9%)	Grown from 2015
2015	17,510[3]						Grown from 2014
2014	17,000						

|<< < > >>| 1-5 of 12

Travel Demand Model

	Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

	Date	Int	Total
	Thu 9/21/2017	60	18,508
	Wed 9/20/2017	60	18,359
	Tue 9/19/2017	60	18,293
	Fri 8/1/2014	60	18,538
	Thu 7/31/2014	60	18,997
	Wed 7/30/2014	60	19,331
	Tue 7/29/2014	60	20,116
	Mon 7/28/2014	60	20,172

VOLUME TREND

Year	Annual Growth
2018	2%
2017	-8%
2016	2%
2015	3%
2014	16%
2011	-4%
2009	-2%
2005	-9%

New Hampshire DOT
Department of Transportation

MS2
Transportation Data Management System

Excel Version

Weekly Volume Report			
Location ID:	82379052	**Type:**	SPOT
Located On:	Bartlett St	**:**	
Direction:	2-WAY		
Community:	PORTSMOUTH	**Period:**	Mon 9/18/2017 - Sun 9/24/2017
AADT:	16414		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph
12:00 AM		246	258	261				255	
1:00 AM		207	238	233				226	
2:00 AM		84	80	105				90	
3:00 AM		49	52	73				58	
4:00 AM		95	167	207				156	
5:00 AM		194	254	292				247	
6:00 AM		356	378	407				380	
7:00 AM		782	844	902				843	
8:00 AM		997	985	982				988	
9:00 AM		998	1010	1029				1,012	
10:00 AM		1134	1146	1170				1,150	
11:00 AM		1377	1387	1403				1,389	
12:00 PM		1386	1358	1349				1,364	
1:00 PM		1350	1340	1342				1,344	
2:00 PM		1326	1311	1321				1,319	
3:00 PM		1384	1376	1380				1,380	
4:00 PM		1414	1422	1434				1,423	
5:00 PM		1375	1312	1271				1,319	
6:00 PM		1071	1045	1022				1,046	
7:00 PM		800	752	720				757	
8:00 PM		593	576	568				579	
9:00 PM		480	458	445				461	
10:00 PM		392	369	345				369	
11:00 PM		203	241	247				230	
Total	**0**	**18,293**	**18,359**	**18,508**	**0**	**0**	**0**		
24hr Total		18293	18359	18508				18,387	
AM Pk Hr		11:00	11:00	11:00					
AM Peak		1377	1387	1403				1,389	
PM Pk Hr		4:00	4:00	4:00					
PM Peak		1414	1422	1434				1,423	
% Pk Hr		7.73%	7.75%	7.75%				7.74%	

New Hampshire DOT
Department of Transportation

MS2
Transportation Data Management System

List View | All DIRs

Record 1 of 1 Goto Record go

Location ID	82379111	MPO ID	
Type	SPOT	HPMS ID	
On NHS	No	On HPMS	No
LRS ID	L3790394__	LRS Loc Pt.	
SF Group	04	Route Type	
AF Group	04	Route	
GF Group	E	Active	Yes
Class Dist Grp	Default	Category	3
Seas Clss Grp	Default		
WIM Group	Default		
QC Group	Default		
Fnct'l Class	Local	Milepost	
Located On	Cate St		
Loc On Alias	CATE ST AT HODGSON BROOK		

PR	MP	PT

More Detail

STATION DATA

Directions: 2-WAY

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2018	1,448[3]		12		1,334 (92%)	114 (8%)	Grown from 2017
2017	1,420	165	12		1,319 (93%)	101 (7%)	
2016	1,576[3]				1,437 (91%)	139 (9%)	Grown from 2015
2015	1,545[3]						Grown from 2014
2014	1,500						

|<< < > >>| 1-5 of 12

Travel Demand Model

	Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

	Date	Int	Total
	Thu 8/31/2017	60	1,501
	Wed 8/30/2017	60	1,663
	Tue 8/29/2017	60	1,722
	Thu 8/7/2014	60	1,714
	Wed 8/6/2014	60	1,952
	Tue 8/5/2014	60	1,769
	Mon 8/4/2014	60	1,619
	Sun 7/17/2011	60	463

VOLUME TREND

Year	Annual Growth
2018	2%
2017	-10%
2016	2%
2015	3%
2014	16%
2011	8%
2009	3%
2005	-7%

New Hampshire DOT
Department of Transportation

MS2
Transportation Data Management System

Excel Version

Weekly Volume Report			
Location ID:	82379111	**Type:**	SPOT
Located On:	Cate St	**:**	
Direction:	2-WAY		
Community:	PORTSMOUTH	**Period:**	Mon 8/28/2017 - Sun 9/3/2017
AADT:	1420		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph
12:00 AM		2	6	1				3	
1:00 AM		3	3	3				3	
2:00 AM		3	3	1				2	
3:00 AM		0	0	0				0	
4:00 AM		4	5	5				5	
5:00 AM		19	12	17				16	
6:00 AM		40	38	50				43	
7:00 AM		128	95	108				110	
8:00 AM		160	148	152				153	
9:00 AM		102	119	95				105	
10:00 AM		105	120	86				104	
11:00 AM		127	122	79				109	
12:00 PM		147	165	116				143	
1:00 PM		120	135	101				119	
2:00 PM		148	113	87				116	
3:00 PM		125	117	103				115	
4:00 PM		111	102	129				114	
5:00 PM		130	103	131				121	
6:00 PM		81	72	86				80	
7:00 PM		61	64	54				60	
8:00 PM		54	46	34				45	
9:00 PM		30	42	34				35	
10:00 PM		16	25	20				20	
11:00 PM		6	8	9				8	
Total	**0**	**1,722**	**1,663**	**1,501**	**0**	**0**	**0**		
24hr Total		1722	1663	1501				1,629	
AM Pk Hr		8:00	8:00	8:00					
AM Peak		160	148	152				153	
PM Pk Hr		2:00	12:00	5:00					
PM Peak		148	165	131				148	
% Pk Hr		9.29%	9.92%	10.13%				9.78%	

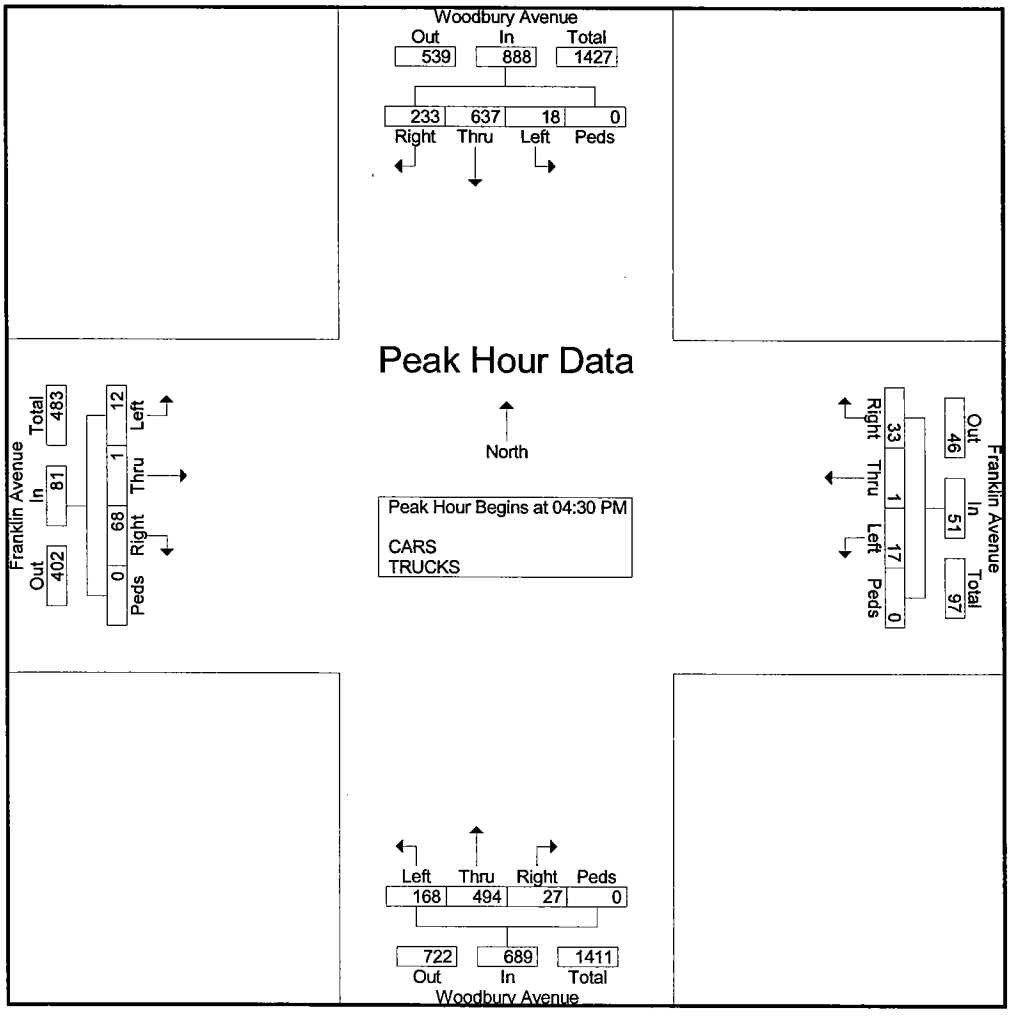
Appendix C **Intersection Turning Movement Counts**

Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Thurs Woodbury Avenue-Franklin Avenue
Site Code : 1831A
Start Date : 5/24/2018
Page No : 3

	Woodbury Avenue From North					Franklin Avenue From East					Woodbury Avenue From South					Franklin Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	59	146	3	0	208	8	0	**5**	0	13	**8**	101	40	0	149	17	0	**6**	0	**23**	393
04:45 PM	49	145	**6**	0	200	5	**1**	4	0	10	8	113	**43**	0	164	16	**1**	0	0	17	391
05:00 PM	**66**	167	5	0	238	**15**	0	5	0	**20**	7	**151**	43	0	**201**	**18**	0	4	0	22	**481**
05:15 PM	59	**179**	4	0	**242**	5	0	3	0	8	4	129	42	0	175	17	0	2	0	19	444
Total Volume	233	637	18	0	888	33	1	17	0	51	27	494	168	0	689	68	1	12	0	81	1709
% App. Total	26.2	71.7	2	0		64.7	2	33.3	0		3.9	71.7	24.4	0		84	1.2	14.8	0		
PHF	.883	.890	.750	.000	.917	.550	.250	.850	.000	.638	.844	.818	.977	.000	.857	.944	.250	.500	.000	.880	.888

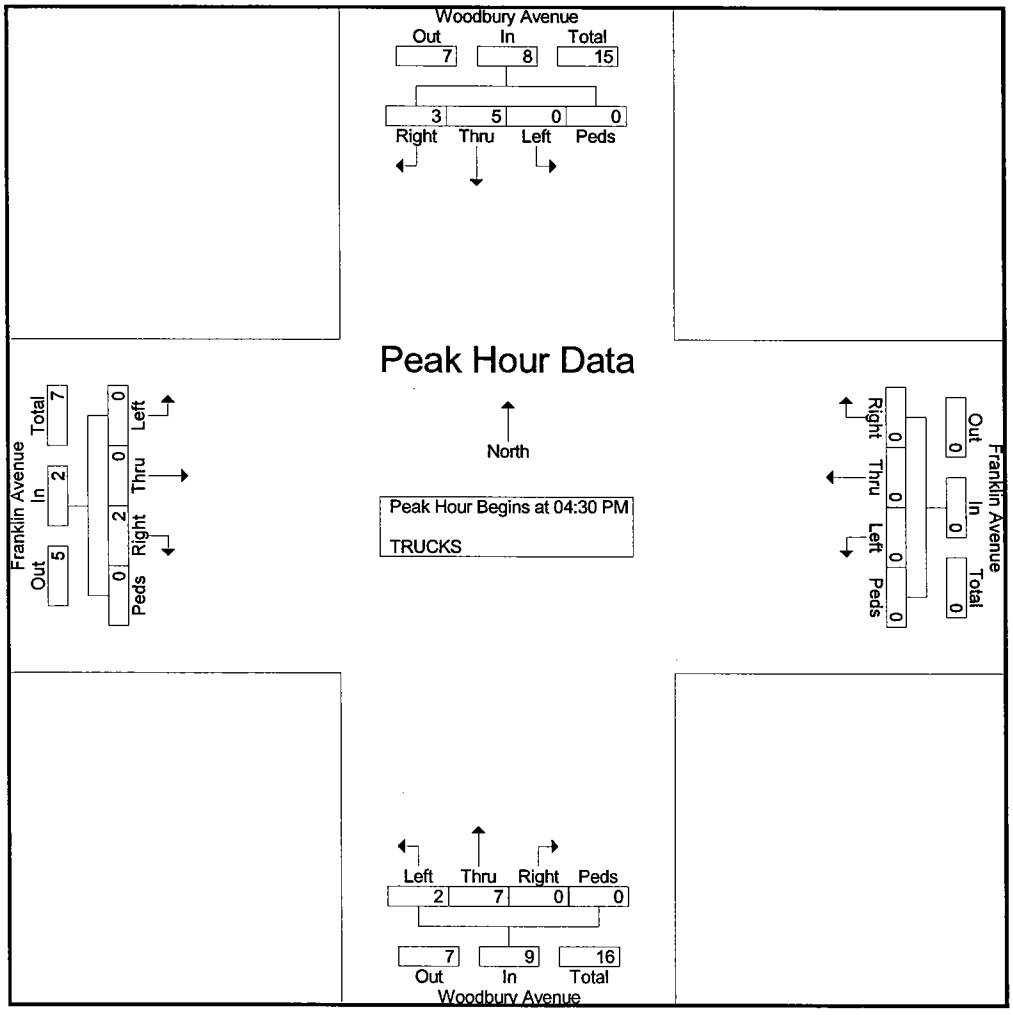


Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Thurs Woodbury Avenue-Franklin Avenue
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2

	Woodbury Avenue From North					Franklin Avenue From East					Woodbury Avenue From South					Franklin Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	2	**1**	0	0	0	**1**	3
04:45 PM	0	1	0	0	**1**	0	0	0	0	0	0	**4**	0	0	**4**	0	0	0	0	0	5
05:00 PM	1	**2**	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
05:15 PM	**2**	2	0	0	**4**	0	0	0	0	0	0	**1**	0	0	1	1	0	0	0	**1**	**6**
Total Volume	3	5	0	0	8	0	0	0	0	0	0	7	2	0	9	2	0	0	0	2	19
% App. Total	37.5	62.5	0	0		0	0	0	0		0	77.8	22.2	0		100	0	0	0		
PHF	.375	.625	.000	.000	.500	.000	.000	.000	.000	.000	.000	.438	.250	.000	.563	.500	.000	.000	.000	.500	.792



Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Thurs Woodbury Avenue-Franklin Avenue
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

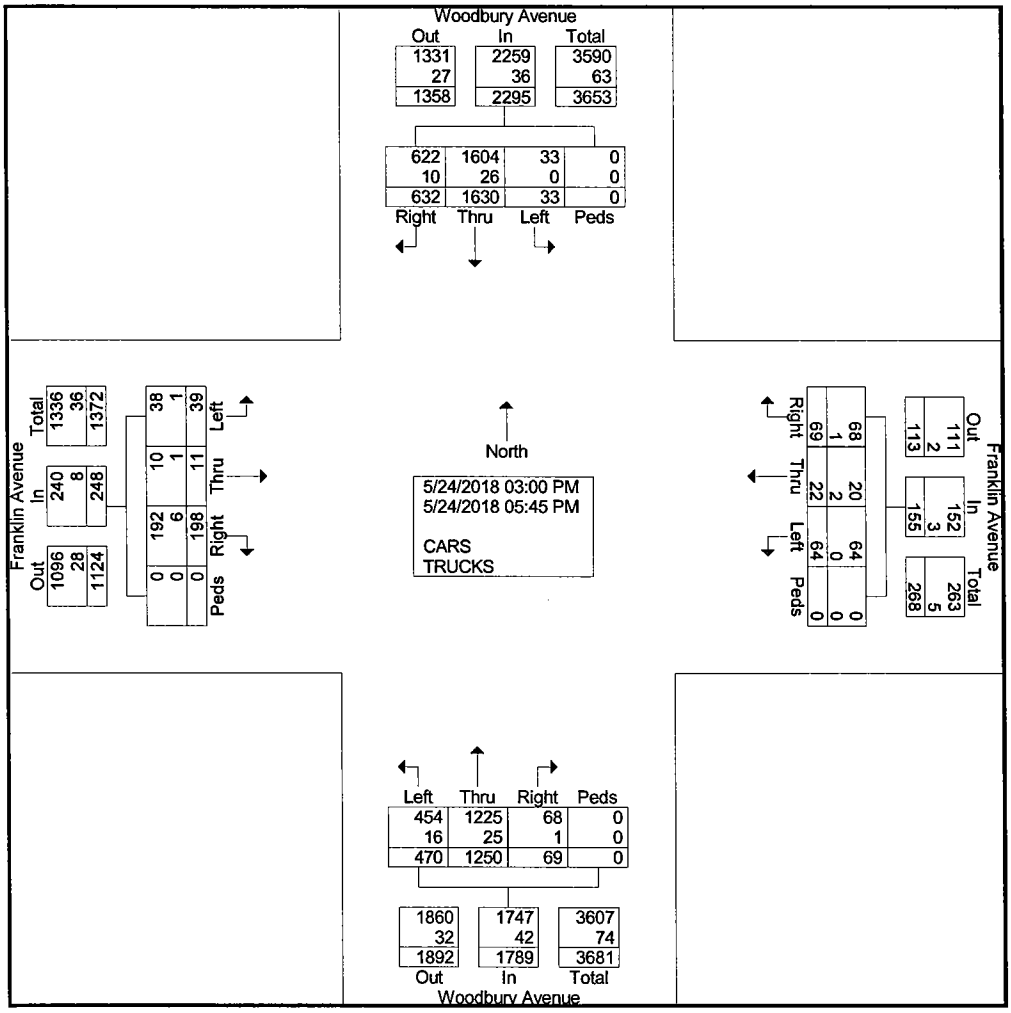
Groups Printed- CARS - TRUCKS

	Woodbury Avenue From North					Franklin Avenue From East					Woodbury Avenue From South					Franklin Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	52	95	0	0	147	7	3	10	0	20	5	83	44	0	132	15	4	1	0	20	319
03:15 PM	51	115	0	0	166	2	3	5	0	10	3	87	44	0	134	12	1	4	0	17	327
03:30 PM	57	124	1	0	182	4	7	4	0	15	3	116	40	0	159	24	1	5	0	30	386
03:45 PM	62	131	4	0	197	2	1	5	0	8	7	103	27	0	137	14	0	4	0	18	360
Total	222	465	5	0	692	15	14	24	0	53	18	389	155	0	562	65	6	14	0	85	1392
04:00 PM	42	124	1	0	167	4	1	5	0	10	4	104	35	0	143	13	1	7	0	21	341
04:15 PM	52	121	4	0	177	4	3	6	0	13	8	101	39	0	148	27	1	2	0	30	368
04:30 PM	59	146	3	0	208	8	0	5	0	13	8	101	40	0	149	17	0	6	0	23	393
04:45 PM	49	145	6	0	200	5	1	4	0	10	8	113	43	0	164	16	1	0	0	17	391
Total	202	536	14	0	752	21	5	20	0	46	28	419	157	0	604	73	3	15	0	91	1493
05:00 PM	66	167	5	0	238	15	0	5	0	20	7	151	43	0	201	18	0	4	0	22	481
05:15 PM	59	179	4	0	242	5	0	3	0	8	4	129	42	0	175	17	0	2	0	19	444
05:30 PM	42	137	3	0	182	7	1	9	0	17	11	84	43	0	138	11	0	2	0	13	350
05:45 PM	41	146	2	0	189	6	2	3	0	11	1	78	30	0	109	14	2	2	0	18	327
Total	208	629	14	0	851	33	3	20	0	56	23	442	158	0	623	60	2	10	0	72	1602
Grand Total	632	1630	33	0	2295	69	22	64	0	155	69	1250	470	0	1789	198	11	39	0	248	4487
Apprch %	27.5	71	1.4	0		44.5	14.2	41.3	0		3.9	69.9	26.3	0		79.8	4.4	15.7	0		
Total %	14.1	36.3	0.7	0	51.1	1.5	0.5	1.4	0	3.5	1.5	27.9	10.5	0	39.9	4.4	0.2	0.9	0	5.5	
CARS	622	1604	33	0	2259	68	20	64	0	152	68	1225	454	0	1747	192	10	38	0	240	4398
% CARS	98.4	98.4	100	0	98.4	98.6	90.9	100	0	98.1	98.6	98	96.6	0	97.7	97	90.9	97.4	0	96.8	98
TRUCKS	10	26	0	0	36	1	2	0	0	3	1	25	16	0	42	6	1	1	0	8	89
% TRUCKS	1.6	1.6	0	0	1.6	1.4	9.1	0	0	1.9	1.4	2	3.4	0	2.3	3	9.1	2.6	0	3.2	2

Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Thurs Woodbury Avenue-Franklin Avenue
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2



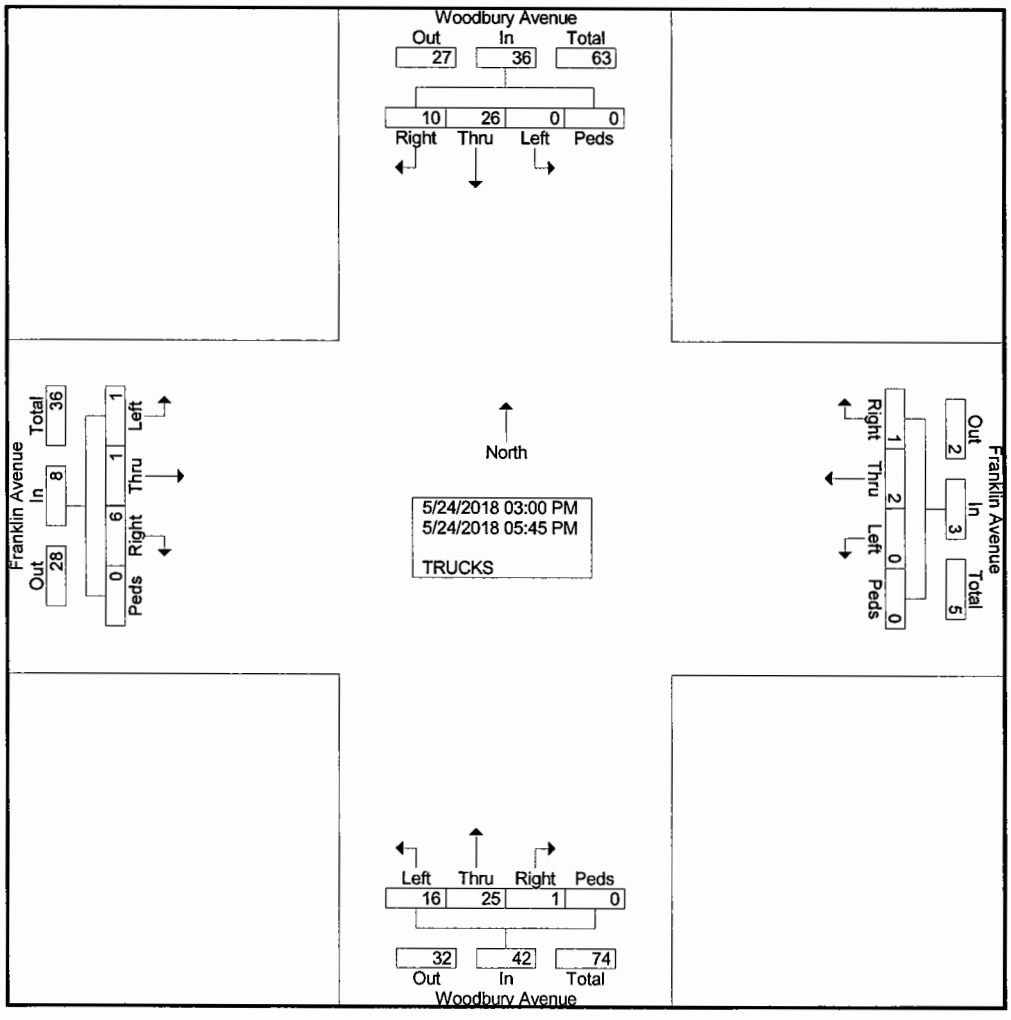
Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Thurs Woodbury Avenue-Franklin Avenue
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- TRUCKS

	Woodbury Avenue From North					Franklin Avenue From East					Woodbury Avenue From South					Franklin Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	2	2	0	0	4	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	9
03:15 PM	1	6	0	0	7	0	1	0	0	1	0	4	5	0	9	1	0	0	0	1	18
03:30 PM	0	5	0	0	5	0	1	0	0	1	0	5	2	0	7	3	0	1	0	4	17
03:45 PM	0	2	0	0	2	1	0	0	0	1	0	2	1	0	3	0	0	0	0	0	6
Total	3	15	0	0	18	1	2	0	0	3	0	15	9	0	24	4	0	1	0	5	50
04:00 PM	2	2	0	0	4	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	8
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	3
04:45 PM	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	5
Total	2	3	0	0	5	0	0	0	0	0	0	5	7	0	12	1	0	0	0	1	18
05:00 PM	1	2	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
05:15 PM	2	2	0	0	4	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	6
05:30 PM	1	3	0	0	4	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	7
05:45 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3
Total	5	8	0	0	13	0	0	0	0	0	1	5	0	0	6	1	1	0	0	2	21
Grand Total	10	26	0	0	36	1	2	0	0	3	1	25	16	0	42	6	1	1	0	8	89
Apprch %	27.8	72.2	0	0		33.3	66.7	0	0		2.4	59.5	38.1	0		75	12.5	12.5	0		
Total %	11.2	29.2	0	0	40.4	1.1	2.2	0	0	3.4	1.1	28.1	18	0	47.2	6.7	1.1	1.1	0	9	

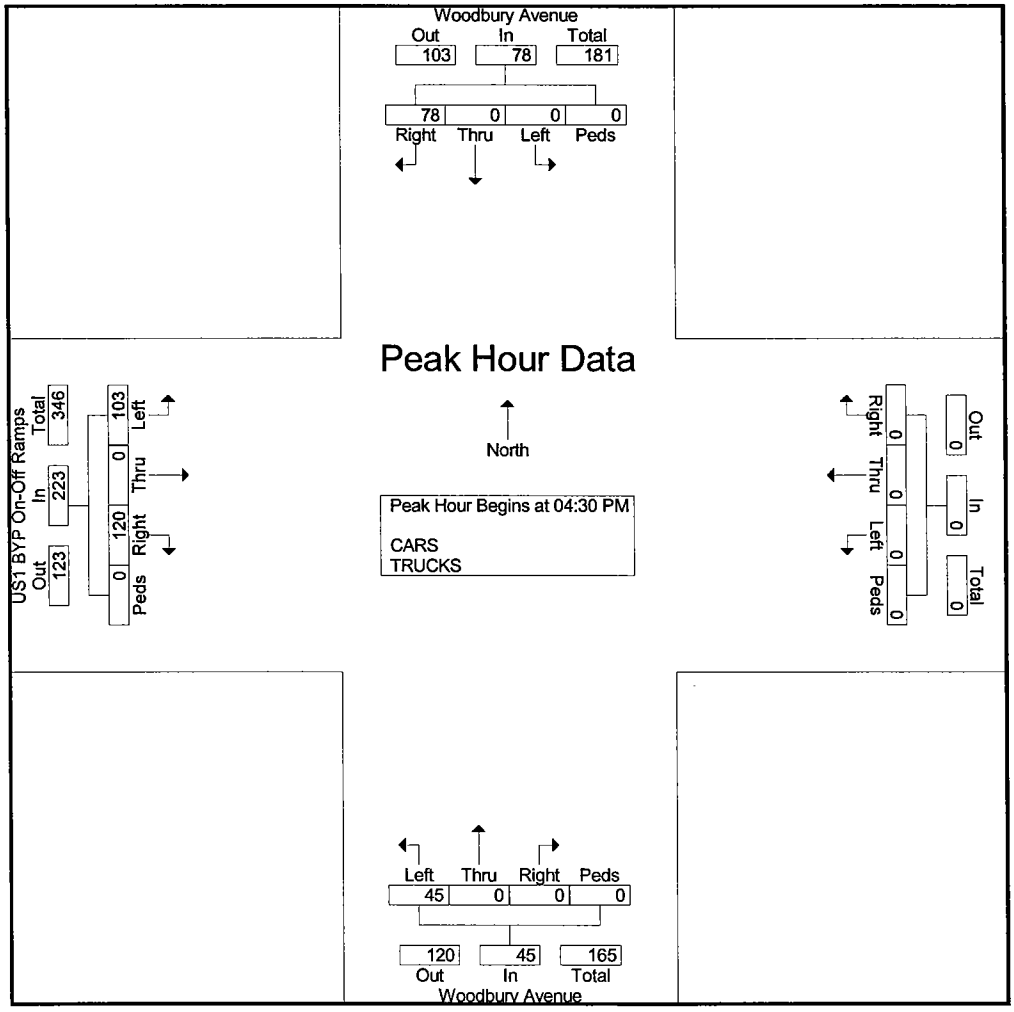


Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Thurs Woodbury Avenue-US1 BYP On-Off Ramps turns only
Site Code : 1831A
Start Date : 5/24/2018
Page No : 3

	Woodbury Avenue From North					From East					Woodbury Avenue From South					US1 BYP On-Off Ramps From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	18	0	0	0	18	0	0	0	0	0	0	0	13	0	13	**34**	0	24	0	58	89
04:45 PM	**21**	0	0	0	**21**	0	0	0	0	0	0	0	7	0	7	30	0	19	0	49	77
05:00 PM	19	0	0	0	19	0	0	0	0	0	0	0	**16**	0	**16**	28	0	28	0	56	**91**
05:15 PM	20	0	0	0	20	0	0	0	0	0	0	0	9	0	9	28	0	**32**	0	**60**	89
Total Volume	78	0	0	0	78	0	0	0	0	0	0	0	45	0	45	120	0	103	0	223	346
% App. Total	100	0	0	0		0	0	0	0		0	0	100	0		53.8	0	46.2	0		
PHF	.929	.000	.000	.000	.929	.000	.000	.000	.000	.000	.000	.000	.703	.000	.703	.882	.000	.805	.000	.929	.951



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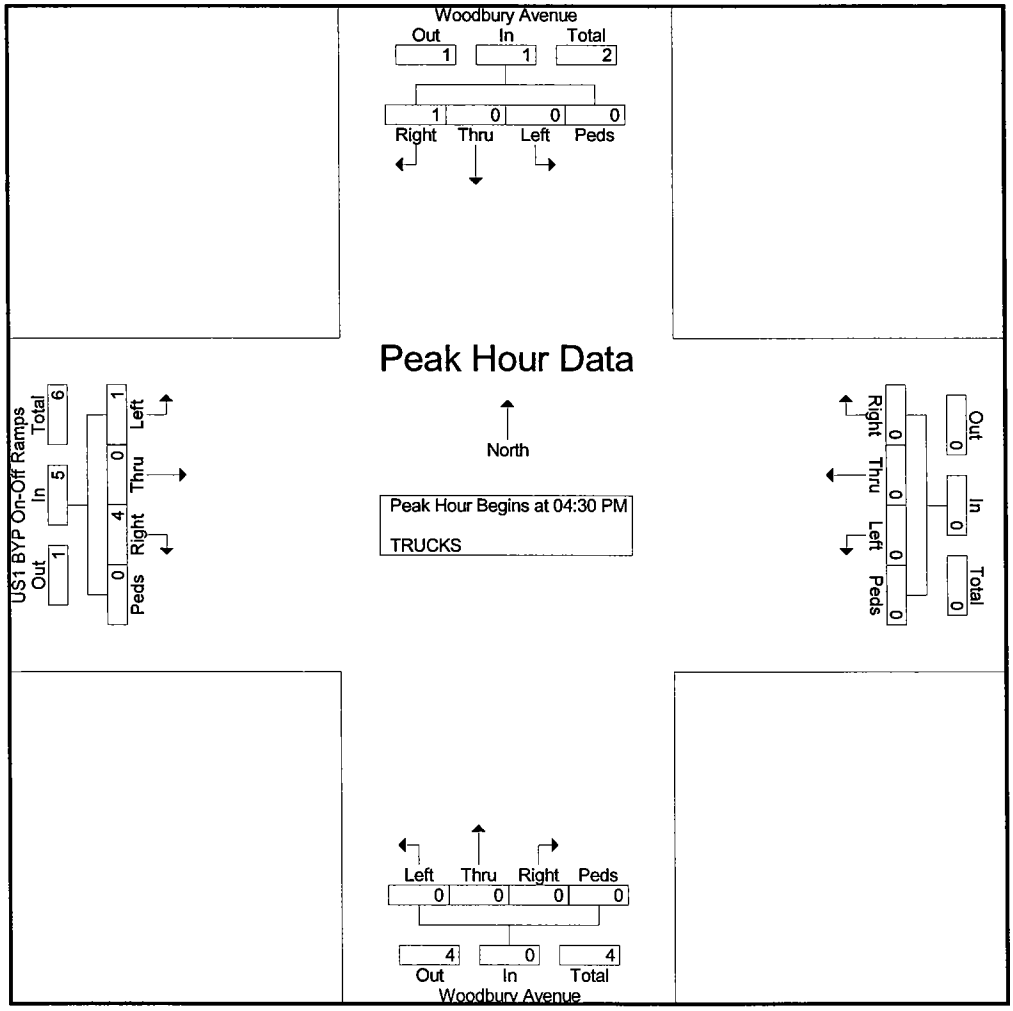
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Thurs Woodbury Avenue-US1 BYP On-Off Ramps turns only
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2

	Woodbury Avenue From North					From East					Woodbury Avenue From South					US1 BYP On-Off Ramps From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	0	0	2	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	**1**	0	**3**	**3**
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	**1**	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	0	1	0	5	6
% App. Total	100	0	0	0		0	0	0	0		0	0	0	0		80	0	20	0		
PHF	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.250	.000	.417	.500



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Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Thurs Woodbury Avenue-US1 BYP On-Off Ramps turns only
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	Woodbury Avenue From North					From East					Woodbury Avenue From South					US1 BYP On-Off Ramps From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	13	0	0	0	13	0	0	0	0	0	0	0	13	0	13	36	0	21	0	57	83
03:15 PM	20	0	0	0	20	0	0	0	0	0	0	0	10	0	10	21	0	21	0	42	72
03:30 PM	20	0	0	0	20	0	0	0	0	0	0	0	7	0	7	26	0	28	0	54	81
03:45 PM	20	0	0	0	20	0	0	0	0	0	0	0	10	0	10	35	0	23	0	58	88
Total	73	0	0	0	73	0	0	0	0	0	0	0	40	0	40	118	0	93	0	211	324
04:00 PM	19	0	0	0	19	0	0	0	0	0	0	0	5	0	5	27	0	22	0	49	73
04:15 PM	29	0	0	0	29	0	0	0	0	0	0	0	12	0	12	35	0	37	0	72	113
04:30 PM	18	0	0	0	18	0	0	0	0	0	0	0	13	0	13	34	0	24	0	58	89
04:45 PM	21	0	0	0	21	0	0	0	0	0	0	0	7	0	7	30	0	19	0	49	77
Total	87	0	0	0	87	0	0	0	0	0	0	0	37	0	37	126	0	102	0	228	352
05:00 PM	19	0	0	0	19	0	0	0	0	0	0	0	16	0	16	28	0	28	0	56	91
05:15 PM	20	0	0	0	20	0	0	0	0	0	0	0	9	0	9	28	0	32	0	60	89
05:30 PM	27	0	0	0	27	0	0	0	0	0	0	0	10	0	10	32	0	19	0	51	88
05:45 PM	24	0	0	0	24	0	0	0	0	0	0	0	10	0	10	38	0	18	0	56	90
Total	90	0	0	0	90	0	0	0	0	0	0	0	45	0	45	126	0	97	0	223	358
Grand Total	250	0	0	0	250	0	0	0	0	0	0	0	122	0	122	370	0	292	0	662	1034
Apprch %	100	0	0	0		0	0	0	0		0	0	100	0		55.9	0	44.1	0		
Total %	24.2	0	0	0	24.2	0	0	0	0	0	0	0	11.8	0	11.8	35.8	0	28.2	0	64	
CARS	245	0	0	0	245	0	0	0	0	0	0	0	118	0	118	363	0	281	0	644	1007
% CARS	98	0	0	0	98	0	0	0	0	0	0	0	96.7	0	96.7	98.1	0	96.2	0	97.3	97.4
TRUCKS	5	0	0	0	5	0	0	0	0	0	0	0	4	0	4	7	0	11	0	18	27
% TRUCKS	2	0	0	0	2	0	0	0	0	0	0	0	3.3	0	3.3	1.9	0	3.8	0	2.7	2.6

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Weather: Clear
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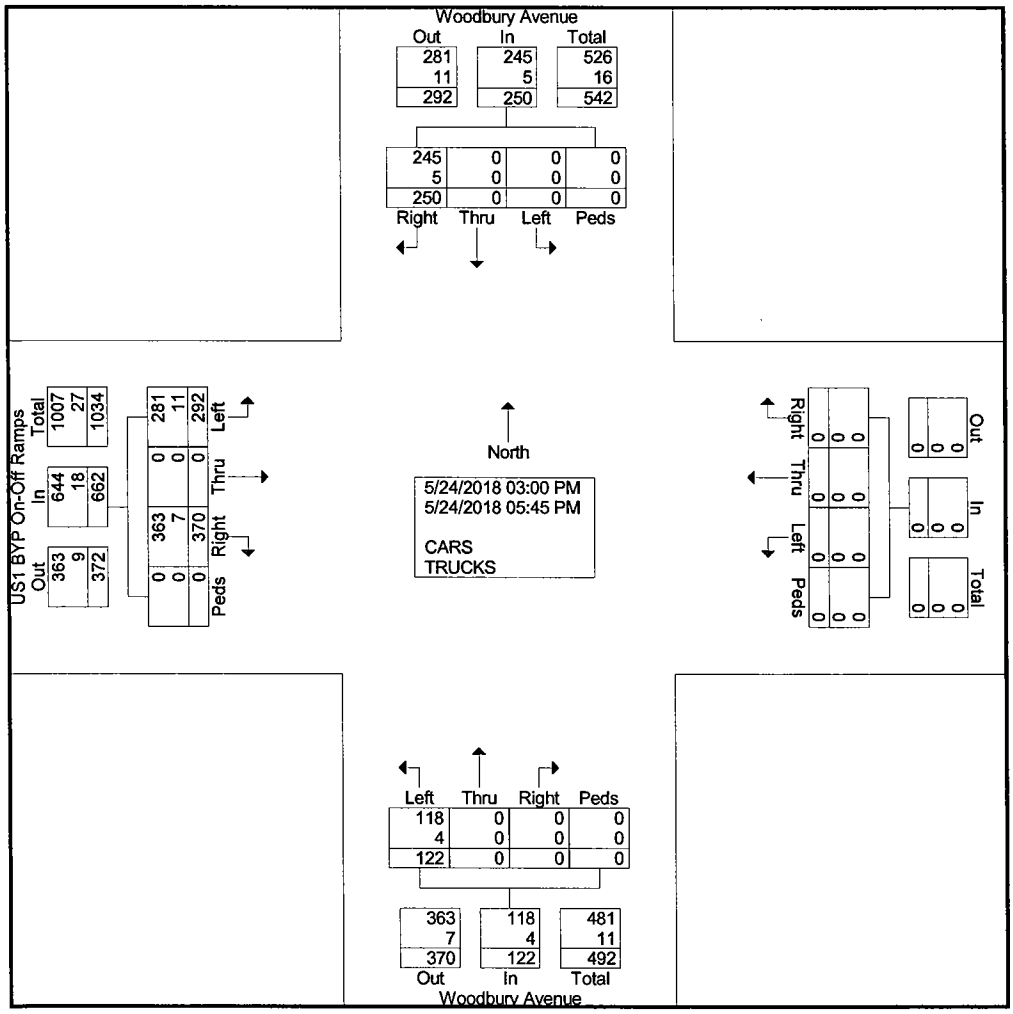
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Thurs Woodbury Avenue-US1 BYP On-Off Ramps turns only
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2



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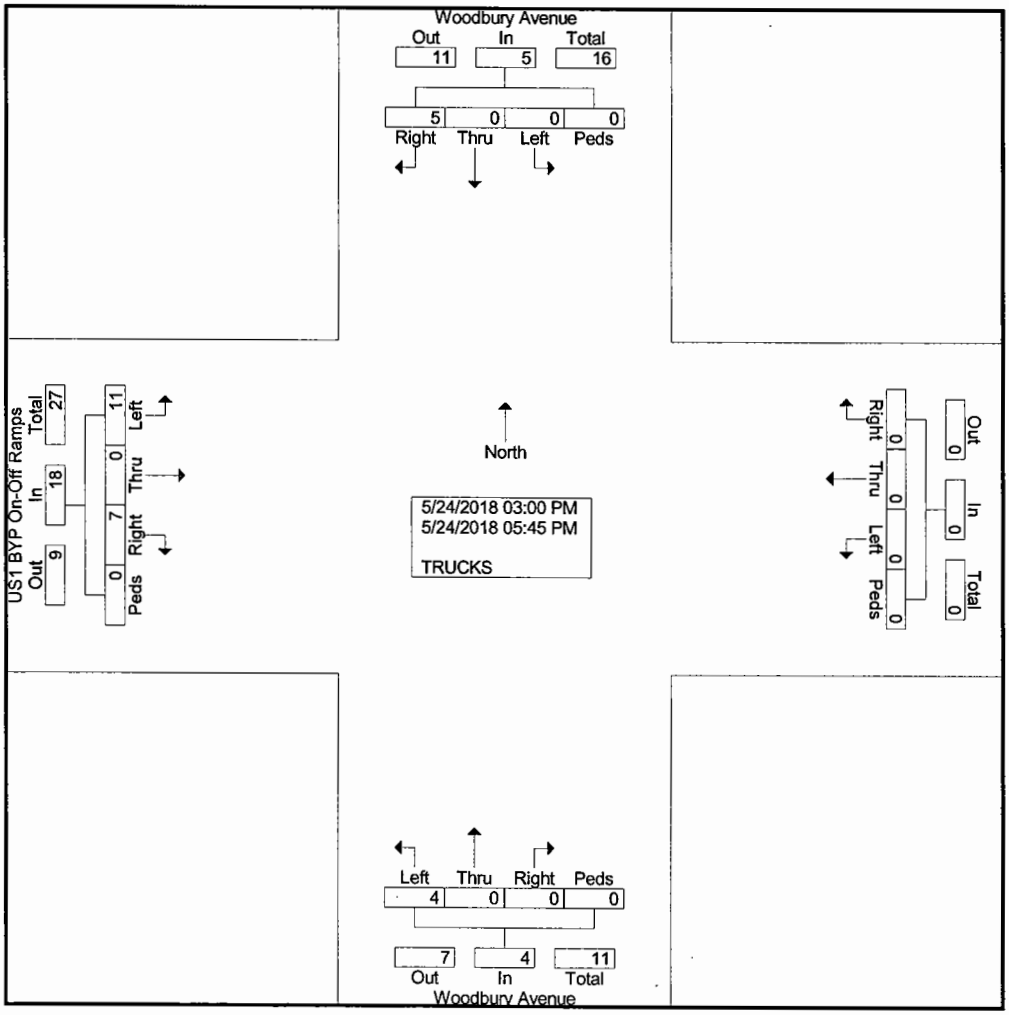
File Name : 1831A Thurs Woodbury Avenue-US1 BYP On-Off Ramps turns only
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- TRUCKS

	Woodbury Avenue From North					From East					Woodbury Avenue From South					US1 BYP On-Off Ramps From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	2	0	2	2	0	4	0	6	9
03:15 PM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	2	3
Total	3	0	0	0	3	0	0	0	0	0	0	0	3	0	3	3	0	9	0	12	18
04:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3	3
Total	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	4	0	2	0	6	8
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	5	0	0	0	5	0	0	0	0	0	0	0	4	0	4	7	0	11	0	18	27
Apprch %	100	0	0	0		0	0	0	0		0	0	100	0		38.9	0	61.1	0		
Total %	18.5	0	0	0	18.5	0	0	0	0	0	0	0	14.8	0	14.8	25.9	0	40.7	0	66.7	



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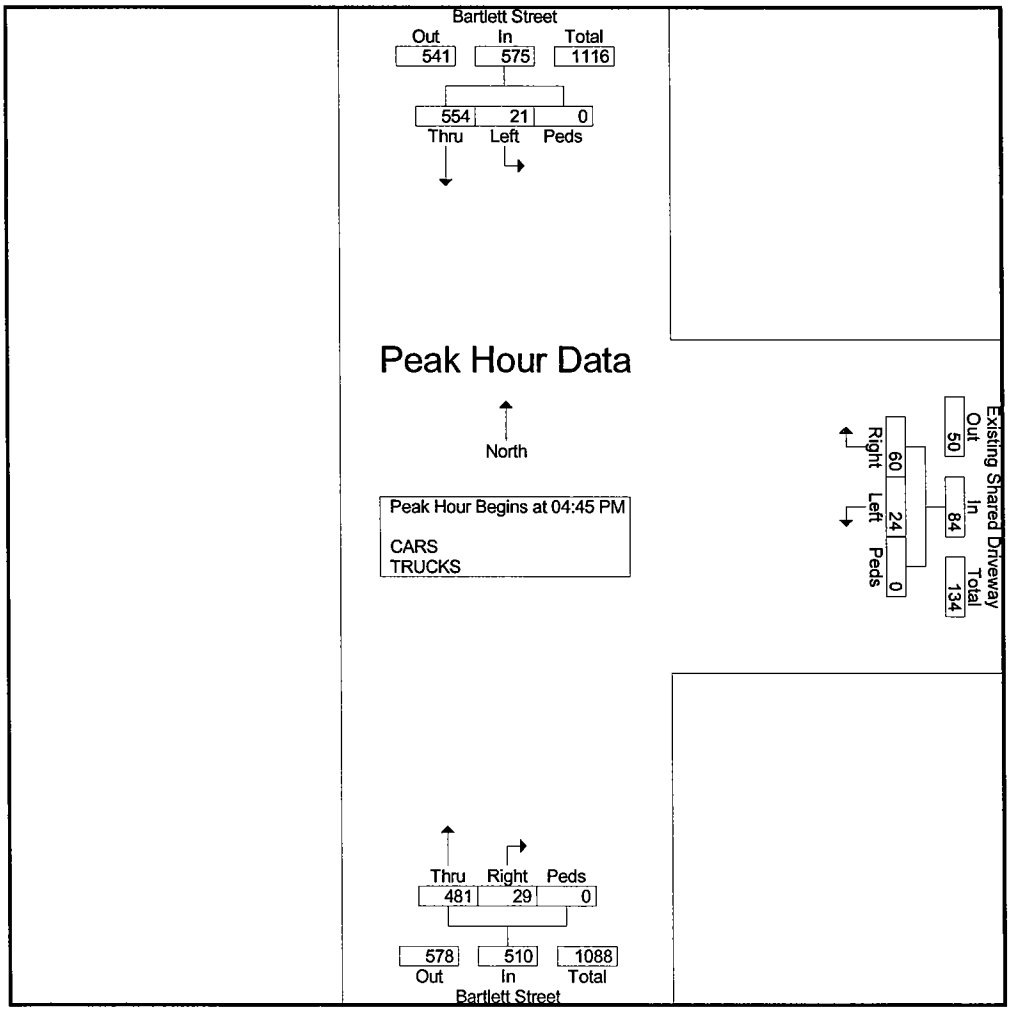
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_C_Thurs_PM_Bart-Shared
Site Code : 1831A
Start Date : 5/24/2018
Page No : 3

	Bartlett Street From North				Existing Shared Driveway From East				Bartlett Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	130	5	0	135	17	**8**	0	25	**9**	123	0	132	292
05:00 PM	128	**6**	0	134	**23**	6	0	**29**	6	**150**	0	**156**	**319**
05:15 PM	**148**	4	0	152	10	6	0	16	7	124	0	131	299
05:30 PM	148	6	0	**154**	10	4	0	14	7	84	0	91	259
Total Volume	554	21	0	575	60	24	0	84	29	481	0	510	1169
% App. Total	96.3	3.7	0		71.4	28.6	0		5.7	94.3	0		
PHF	.936	.875	.000	.933	.652	.750	.000	.724	.806	.802	.000	.817	.916



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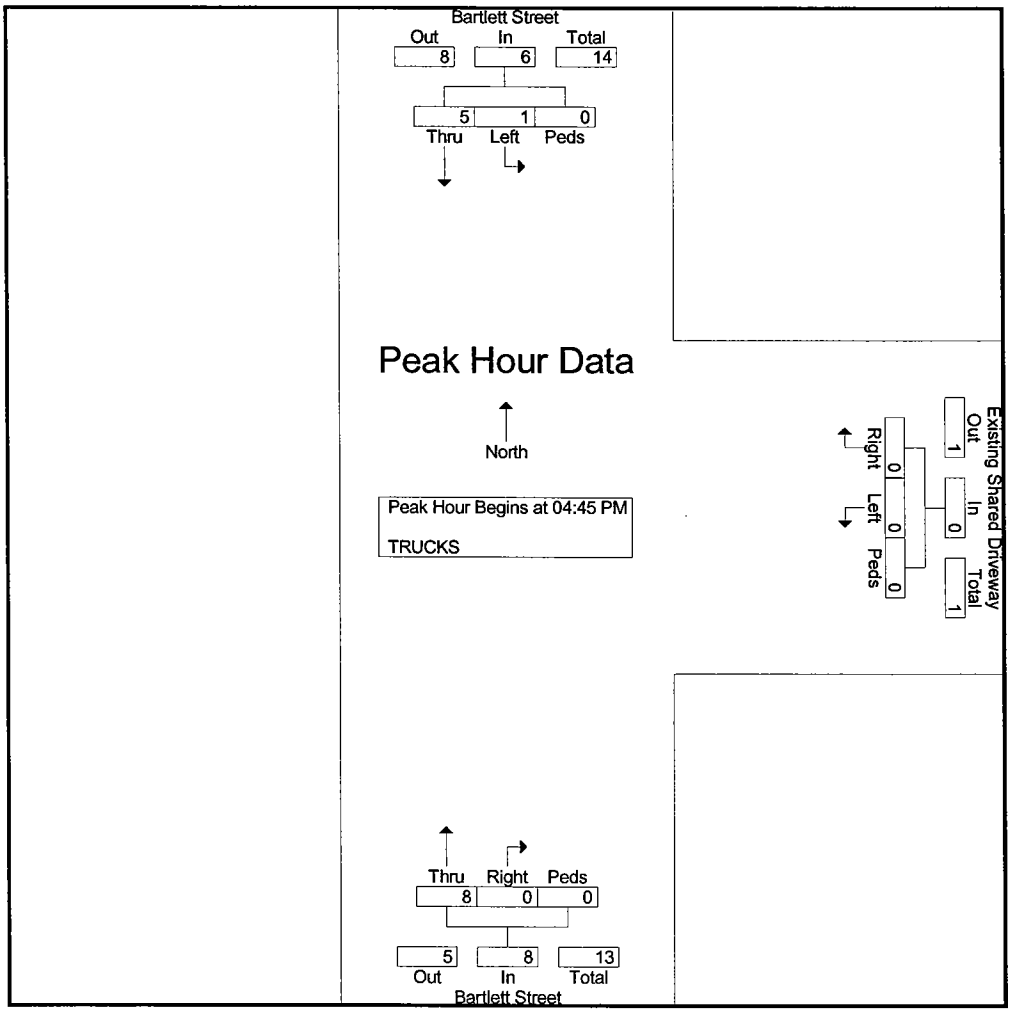
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_C_Thurs_PM_Bart-Shared
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2

	Bartlett Street From North				Existing Shared Driveway From East				Bartlett Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	3
05:00 PM	**4**	0	0	**4**	0	0	0	0	0	0	0	0	**4**
05:15 PM	0	0	0	0	0	0	0	0	0	**4**	0	**4**	4
05:30 PM	1	**1**	0	2	0	0	0	0	0	1	0	1	3
Total Volume	5	1	0	6	0	0	0	0	0	8	0	8	14
% App. Total	83.3	16.7	0		0	0	0		0	100	0		
PHF	.313	.250	.000	.375	.000	.000	.000	.000	.000	.500	.000	.500	.875



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Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_C_Thurs_PM_Bart-Shared
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	Bartlett Street From North				Existing Shared Driveway From East				Bartlett Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
03:00 PM	107	7	0	114	10	11	0	21	10	96	0	106	241
03:15 PM	106	7	0	113	6	8	0	14	11	90	0	101	228
03:30 PM	117	10	0	127	10	5	0	15	9	104	0	113	255
03:45 PM	128	4	0	132	9	7	0	16	9	113	0	122	270
Total	458	28	0	486	35	31	0	66	39	403	0	442	994
04:00 PM	132	6	0	138	9	8	0	17	9	92	0	101	256
04:15 PM	126	6	0	132	12	9	0	21	8	88	0	96	249
04:30 PM	136	8	0	144	11	10	0	21	8	84	0	92	257
04:45 PM	130	5	0	135	17	8	0	25	9	123	0	132	292
Total	524	25	0	549	49	35	0	84	34	387	0	421	1054
05:00 PM	128	6	0	134	23	6	0	29	6	150	0	156	319
05:15 PM	148	4	0	152	10	6	0	16	7	124	0	131	299
05:30 PM	148	6	0	154	10	4	0	14	7	84	0	91	259
05:45 PM	120	10	0	130	8	9	0	17	3	92	0	95	242
Total	544	26	0	570	51	25	0	76	23	450	0	473	1119
Grand Total	1526	79	0	1605	135	91	0	226	96	1240	0	1336	3167
Apprch %	95.1	4.9	0		59.7	40.3	0		7.2	92.8	0		
Total %	48.2	2.5	0	50.7	4.3	2.9	0	7.1	3	39.2	0	42.2	
CARS	1511	77	0	1588	133	90	0	223	95	1215	0	1310	3121
% CARS	99	97.5	0	98.9	98.5	98.9	0	98.7	99	98	0	98.1	98.5
TRUCKS	15	2	0	17	2	1	0	3	1	25	0	26	46
% TRUCKS	1	2.5	0	1.1	1.5	1.1	0	1.3	1	2	0	1.9	1.5

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Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_C_Thurs_PM_Bart-Shared
Site Code : 1831A
Start Date : 5/24/2018
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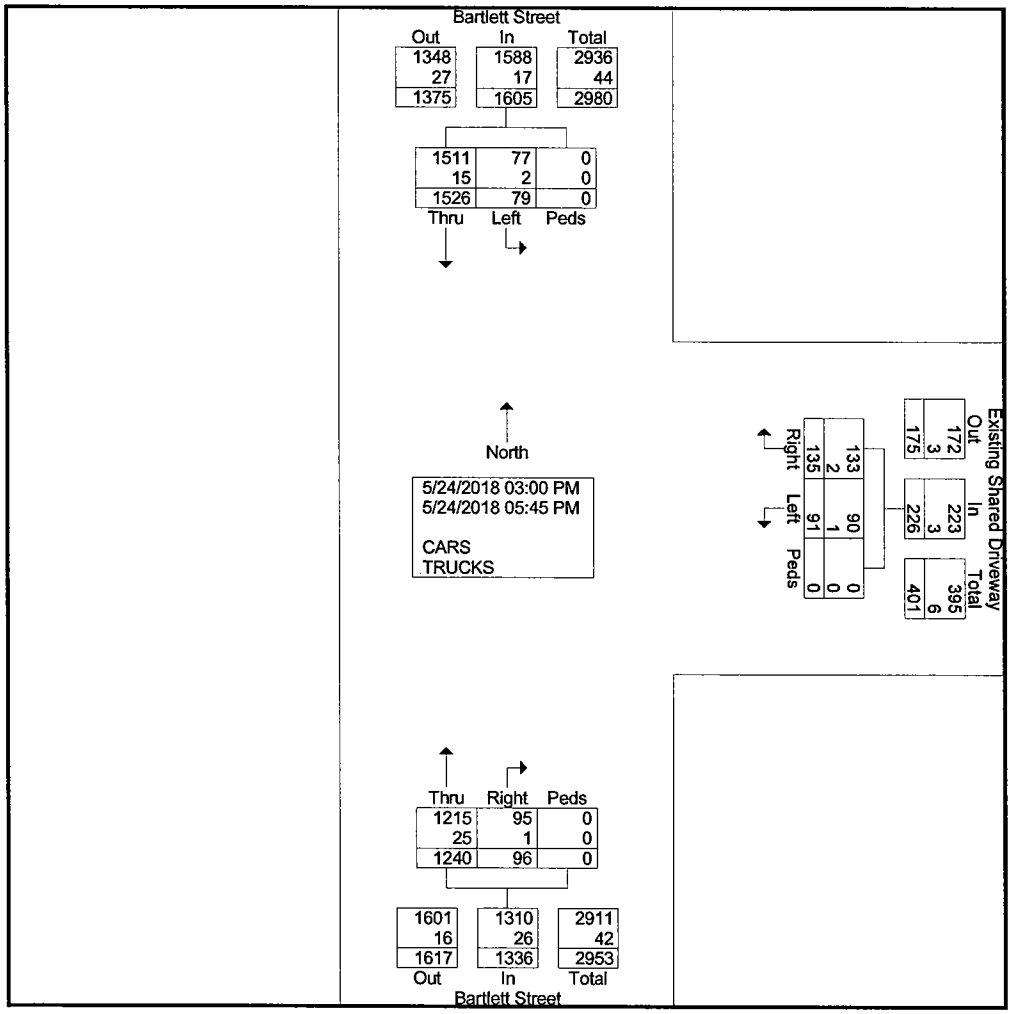

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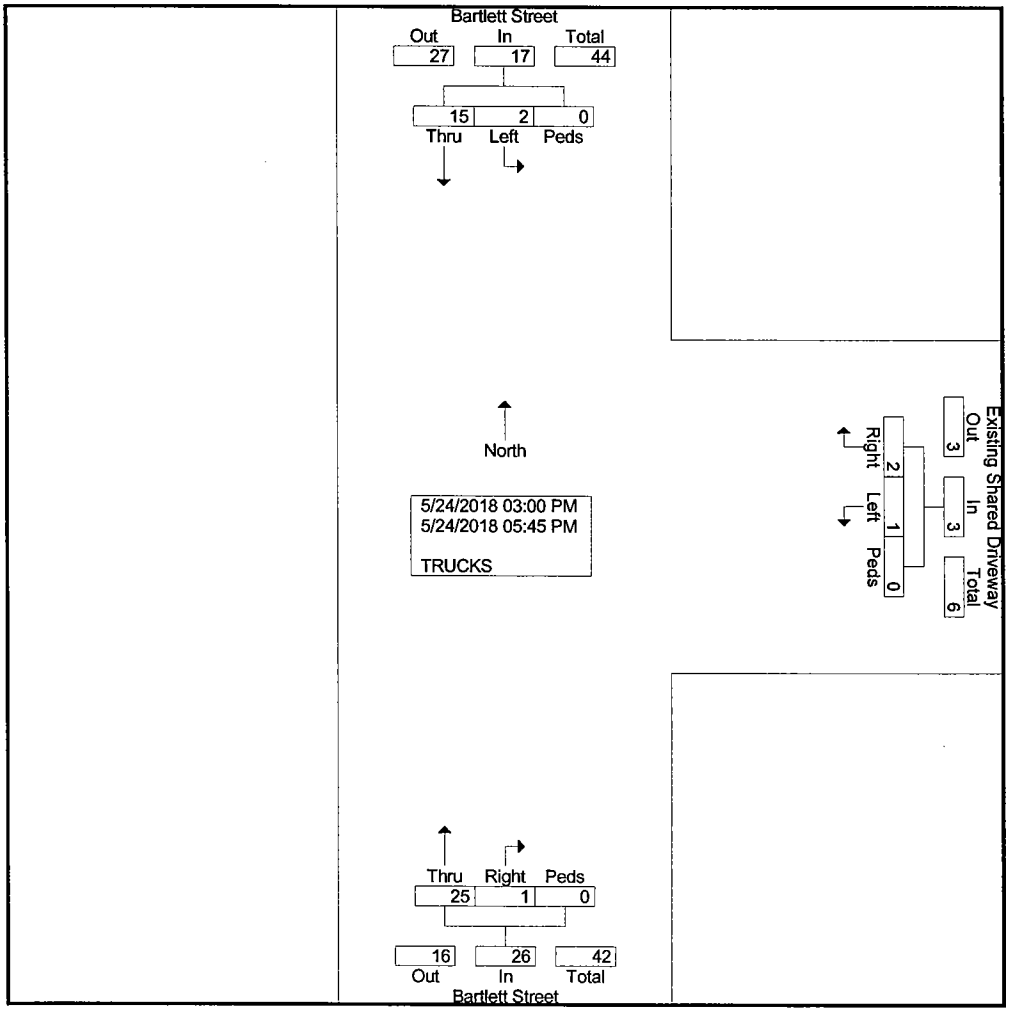
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_C_Thurs_PM_Bart-Shared
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- TRUCKS

	Bartlett Street From North				Existing Shared Driveway From East				Bartlett Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
03:00 PM	3	1	0	4	0	1	0	1	0	4	0	4	9
03:15 PM	1	0	0	1	1	0	0	1	1	2	0	3	5
03:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
03:45 PM	0	0	0	0	0	0	0	0	0	4	0	4	4
Total	5	1	0	6	1	1	0	2	1	10	0	11	19
04:00 PM	1	0	0	1	0	0	0	0	0	3	0	3	4
04:15 PM	1	0	0	1	1	0	0	1	0	0	0	0	2
04:30 PM	3	0	0	3	0	0	0	0	0	2	0	2	5
04:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	3
Total	5	0	0	5	1	0	0	1	0	8	0	8	14
05:00 PM	4	0	0	4	0	0	0	0	0	0	0	0	4
05:15 PM	0	0	0	0	0	0	0	0	0	4	0	4	4
05:30 PM	1	1	0	2	0	0	0	0	0	1	0	1	3
05:45 PM	0	0	0	0	0	0	0	0	0	2	0	2	2
Total	5	1	0	6	0	0	0	0	0	7	0	7	13
Grand Total	15	2	0	17	2	1	0	3	1	25	0	26	46
Apprch %	88.2	11.8	0		66.7	33.3	0		3.8	96.2	0		
Total %	32.6	4.3	0	37	4.3	2.2	0	6.5	2.2	54.3	0	56.5	



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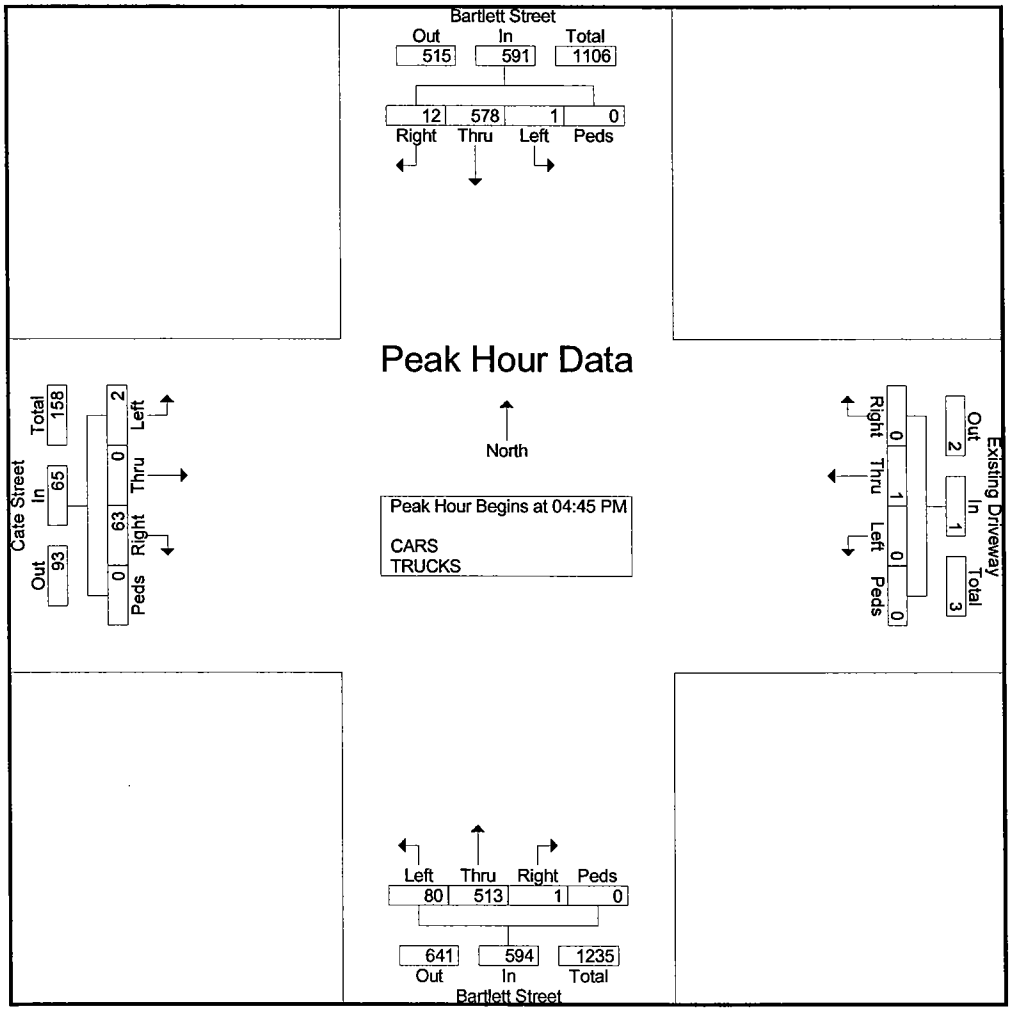
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_D_Thurs_PM_Bartlett-Cate
Site Code : 1831A
Start Date : 5/24/2018
Page No : 3

	Bartlett Street From North					Existing Driveway From East					Bartlett Street From South					Cate Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	1	142	0	0	143	0	0	0	0	0	0	131	**28**	0	159	11	0	**1**	0	12	314
05:00 PM	2	129	**1**	0	132	0	0	0	0	0	0	**158**	21	0	**179**	**18**	0	1	0	**19**	**330**
05:15 PM	2	**158**	0	0	**160**	0	**1**	0	0	**1**	0	129	16	0	145	16	0	0	0	16	322
05:30 PM	**7**	149	0	0	156	0	0	0	0	0	**1**	95	15	0	111	18	0	0	0	18	285
Total Volume	12	578	1	0	591	0	1	0	0	1	1	513	80	0	594	63	0	2	0	65	1251
% App. Total	2	97.8	0.2	0		0	100	0	0		0.2	86.4	13.5	0		96.9	0	3.1	0		
PHF	.429	.915	.250	.000	.923	.000	.250	.000	.000	.250	.250	.812	.714	.000	.830	.875	.000	.500	.000	.855	.948

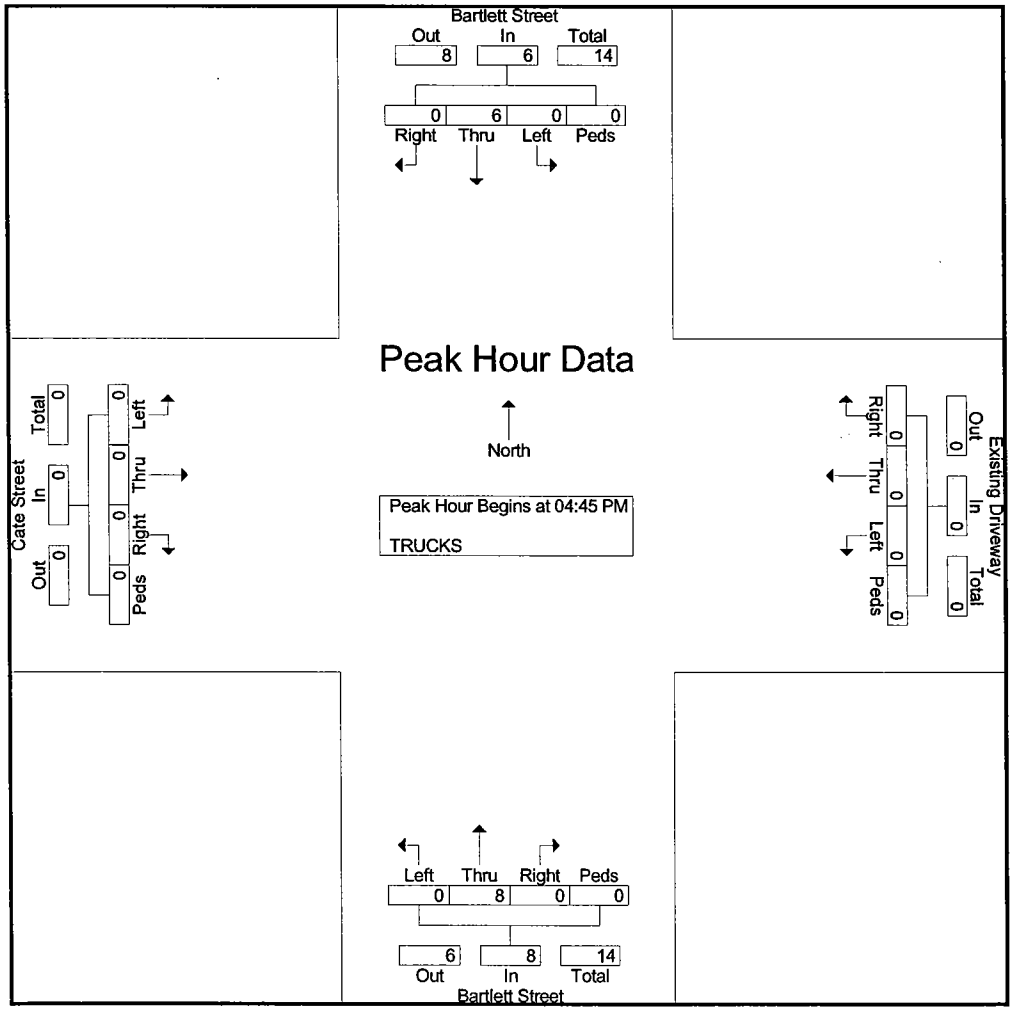


Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_D_Thurs_PM_Bartlett-Cate
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2

	Bartlett Street From North					Existing Driveway From East					Bartlett Street From South					Cate Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	1	0	0	1	0	0	0	0	0	0	**3**	0	0	**3**	0	0	0	0	0	4
05:00 PM	0	**4**	0	0	**4**	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	**5**
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total Volume	0	6	0	0	6	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	14
% App. Total	0	100	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.375	.000	.000	.375	.000	.000	.000	.000	.000	.000	.667	.000	.000	.667	.000	.000	.000	.000	.000	.700



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Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_D_Thurs_PM_Bartlett-Cate
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	Bartlett Street From North					Existing Driveway From East					Bartlett Street From South					Cate Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	4	120	0	0	124	0	0	0	0	0	0	103	24	0	127	14	0	4	0	18	269
03:15 PM	8	110	0	0	118	0	0	0	0	0	0	95	19	0	114	15	0	1	0	16	248
03:30 PM	0	124	0	0	124	0	0	0	0	0	0	113	11	0	124	6	0	3	0	9	257
03:45 PM	6	127	0	0	133	0	0	1	0	1	1	120	17	0	138	9	0	1	0	10	282
Total	18	481	0	0	499	0	0	1	0	1	1	431	71	0	503	44	0	9	0	53	1056
04:00 PM	7	142	0	0	149	0	0	0	0	0	0	98	13	0	111	27	0	1	0	28	288
04:15 PM	2	133	0	0	135	0	0	0	0	0	0	97	22	0	119	14	0	1	0	15	269
04:30 PM	6	142	0	0	148	0	0	0	0	0	0	92	16	0	108	10	0	1	0	11	267
04:45 PM	1	142	0	0	143	0	0	0	0	0	0	131	28	0	159	11	0	1	0	12	314
Total	16	559	0	0	575	0	0	0	0	0	0	418	79	0	497	62	0	4	0	66	1138
05:00 PM	2	129	1	0	132	0	0	0	0	0	0	158	21	0	179	18	0	1	0	19	330
05:15 PM	2	158	0	0	160	0	1	0	0	1	0	129	16	0	145	16	0	0	0	16	322
05:30 PM	7	149	0	0	156	0	0	0	0	0	1	95	15	0	111	18	0	0	0	18	285
05:45 PM	4	146	0	0	150	0	0	1	0	1	0	90	9	0	99	10	0	1	0	11	261
Total	15	582	1	0	598	0	1	1	0	2	1	472	61	0	534	62	0	2	0	64	1198
Grand Total	49	1622	1	0	1672	0	1	2	0	3	2	1321	211	0	1534	168	0	15	0	183	3392
Apprch %	2.9	97	0.1	0		0	33.3	66.7	0		0.1	86.1	13.8	0		91.8	0	8.2	0		
Total %	1.4	47.8	0	0	49.3	0	0	0.1	0	0.1	0.1	38.9	6.2	0	45.2	5	0	0.4	0	5.4	
CARS	47	1605	1	0	1653	0	1	2	0	3	2	1297	206	0	1505	167	0	12	0	179	3340
% CARS	95.9	99	100	0	98.9	0	100	100	0	100	100	98.2	97.6	0	98.1	99.4	0	80	0	97.8	98.5
TRUCKS	2	17	0	0	19	0	0	0	0	0	0	24	5	0	29	1	0	3	0	4	52
% TRUCKS	4.1	1	0	0	1.1	0	0	0	0	0	0	1.8	2.4	0	1.9	0.6	0	20	0	2.2	1.5

Stephen G. Pernaw & Co., Inc.
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Weather: Clear
Collected By: MV
Job Number: 1831A
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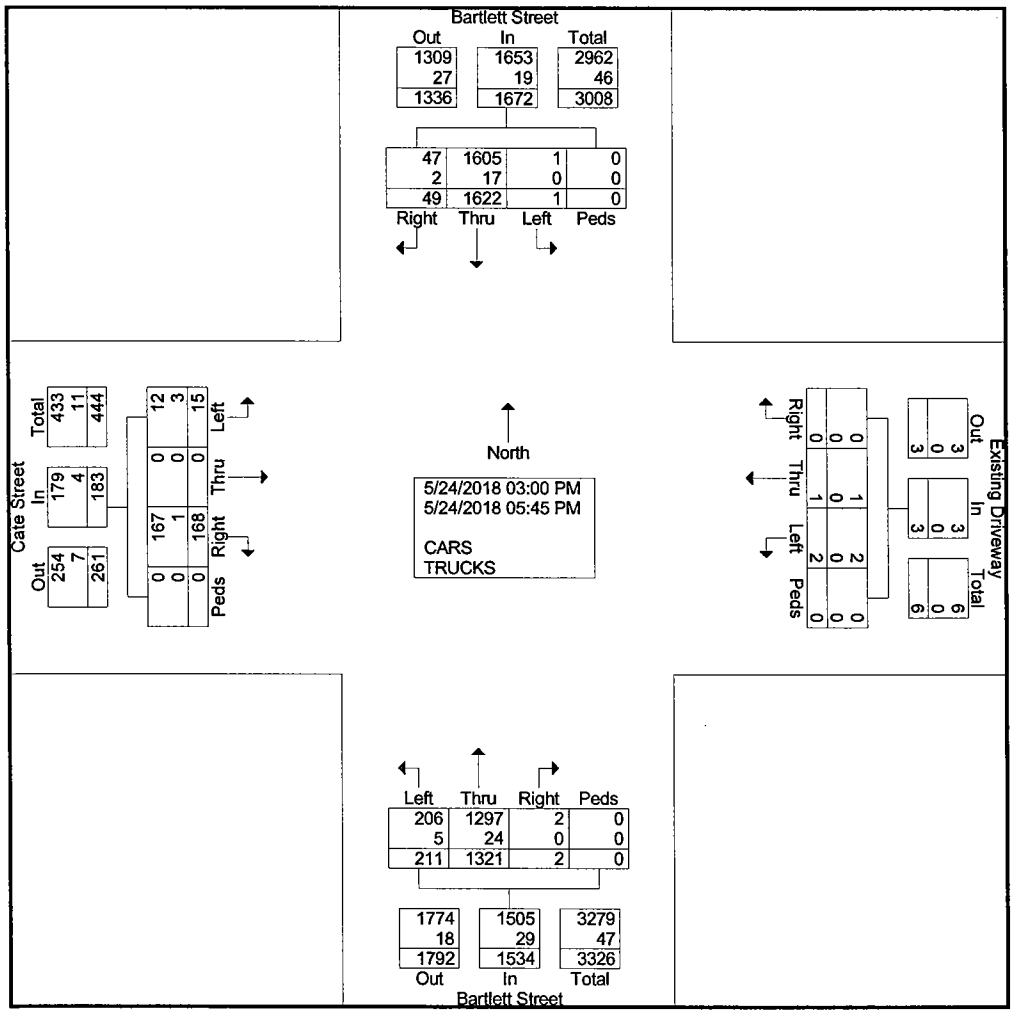
File Name : 1831A_INT_D_Thurs_PM_Bartlett-Cate
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2



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Weather: Clear
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Job Number: 1831A
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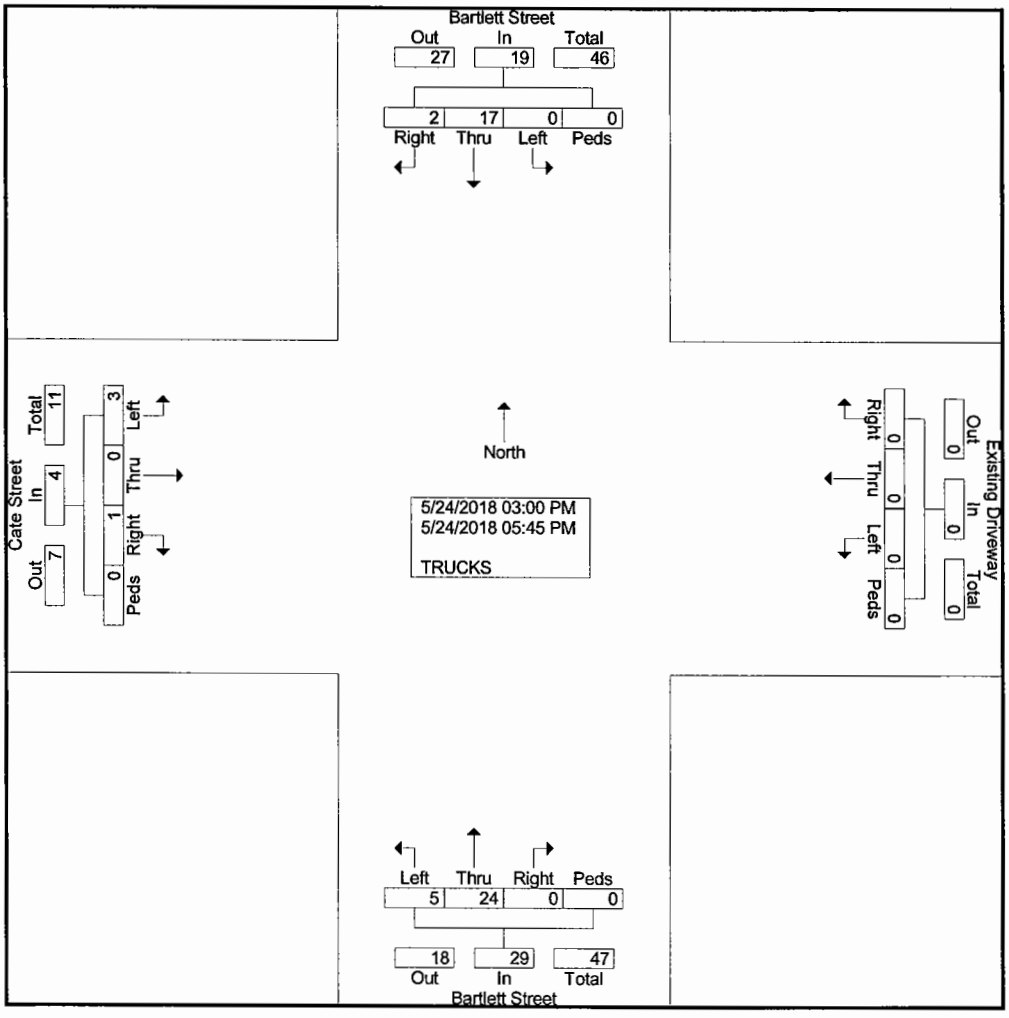
File Name : 1831A_INT_D_Thurs_PM_Bartlett-Cate
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- TRUCKS

	Bartlett Street From North					Existing Driveway From East					Bartlett Street From South					Cate Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	0	6	0	0	6	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	10
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	1	0	3	0	0	1	0	1	4
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	2	0	4	0	0	1	0	1	5
Total	0	6	0	0	6	0	0	0	0	0	0	8	4	0	12	0	0	2	0	2	20
04:00 PM	0	1	0	0	1	0	0	0	0	0	0	2	1	0	3	0	0	1	0	1	5
04:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	1	3	0	0	4	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	8
04:45 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
Total	1	6	0	0	7	0	0	0	0	0	0	8	1	0	9	1	0	1	0	2	18
05:00 PM	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
05:45 PM	1	0	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
Total	1	5	0	0	6	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	14
Grand Total	2	17	0	0	19	0	0	0	0	0	0	24	5	0	29	1	0	3	0	4	52
Apprch %	10.5	89.5	0	0		0	0	0	0		0	82.8	17.2	0		25	0	75	0		
Total %	3.8	32.7	0	0	36.5	0	0	0	0	0	0	46.2	9.6	0	55.8	1.9	0	5.8	0	7.7	



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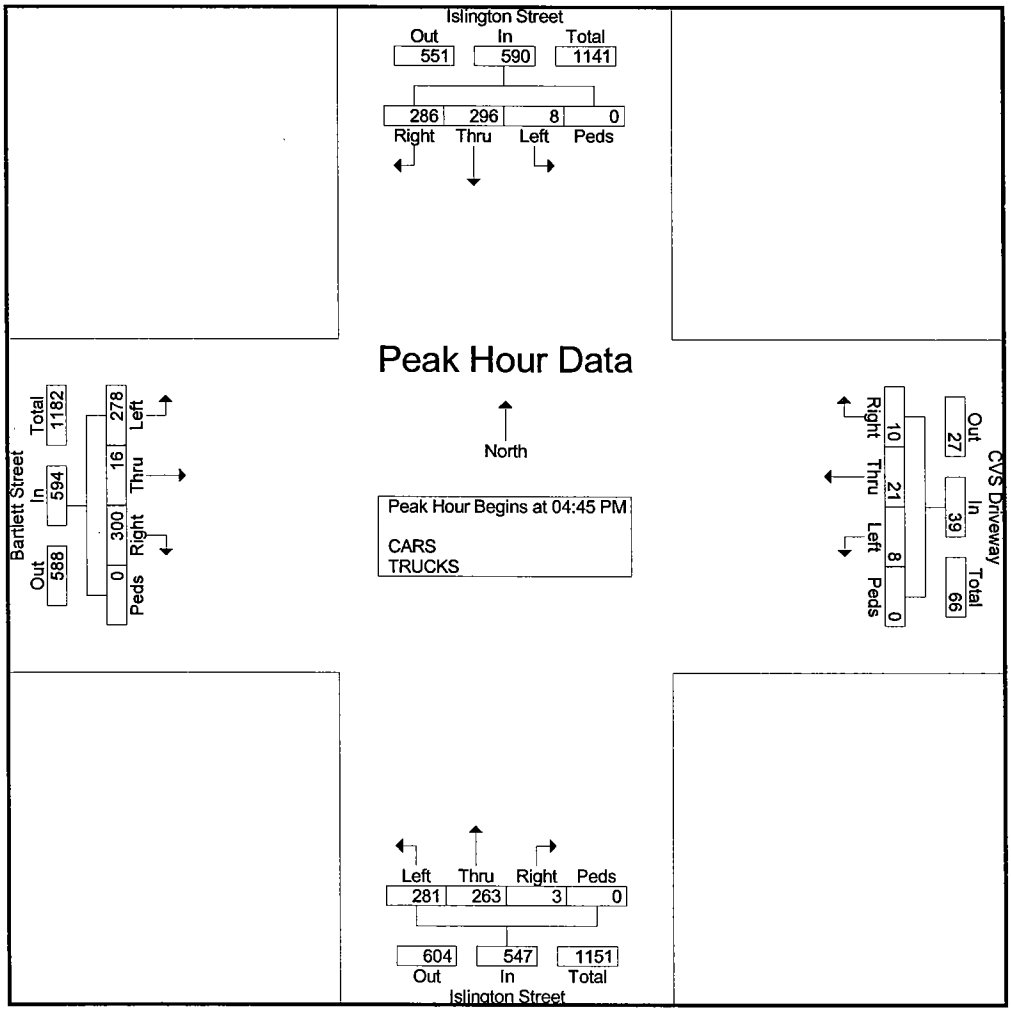
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_E_Thurs_PM_Islington-Bartlett
Site Code : 1831A
Start Date : 5/24/2018
Page No : 3

	Islington Street From North					CVS Driveway From East					Islington Street From South					Bartlett Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	84	**84**	1	0	**169**	**3**	4	1	0	8	0	64	69	0	133	73	6	61	0	140	450
05:00 PM	**91**	67	1	0	159	2	5	**3**	0	10	**3**	**75**	**83**	0	**161**	67	1	69	0	137	**467**
05:15 PM	68	81	**3**	0	152	2	5	3	0	10	0	65	70	0	135	**83**	2	68	0	153	450
05:30 PM	43	64	3	0	110	3	**7**	1	0	**11**	0	59	59	0	118	77	**7**	**80**	0	**164**	403
Total Volume	286	296	8	0	590	10	21	8	0	39	3	263	281	0	547	300	16	278	0	594	1770
% App. Total	48.5	50.2	1.4	0		25.6	53.8	20.5	0		0.5	48.1	51.4	0		50.5	2.7	46.8	0		
PHF	.786	.881	.667	.000	.873	.833	.750	.667	.000	.886	.250	.877	.846	.000	.849	.904	.571	.869	.000	.905	.948



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Weather: Clear
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Job Number: 1831A
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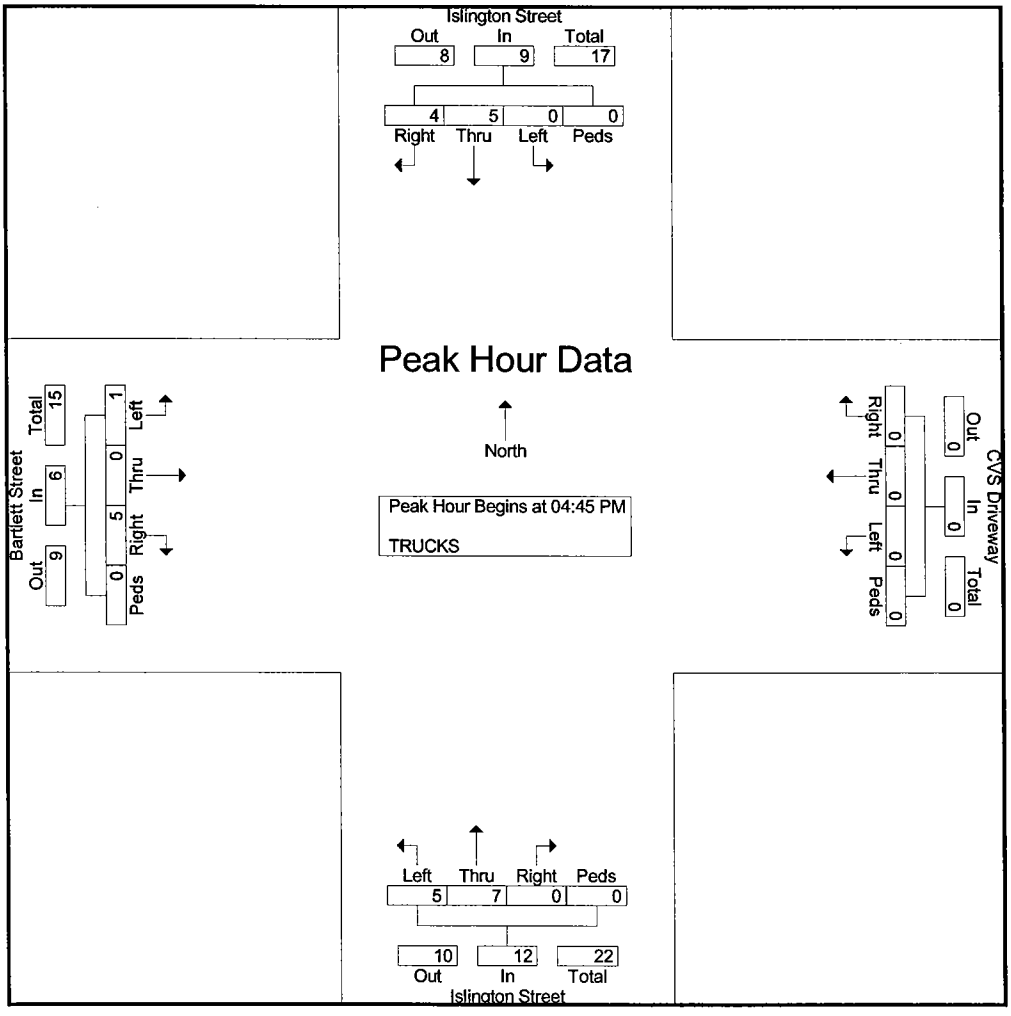
File Name : 1831A_INT_E_Thurs_PM_Islington-Bartlett
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2

	Islington Street From North					CVS Driveway From East					Islington Street From South					Bartlett Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	1	1	0	0	2	0	0	0	0	0	0	2	**2**	0	4	**1**	0	**1**	0	**2**	8
05:00 PM	1	**2**	0	0	**3**	0	0	0	0	0	0	0	1	0	1	**2**	0	0	0	2	6
05:15 PM	**2**	1	0	0	3	0	0	0	0	0	0	**4**	1	0	**5**	1	0	0	0	1	**9**
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	1	0	0	0	1	4
Total Volume	4	5	0	0	9	0	0	0	0	0	0	7	5	0	12	5	0	1	0	6	27
% App. Total	44.4	55.6	0	0		0	0	0	0		0	58.3	41.7	0		83.3	0	16.7	0		
PHF	.500	.625	.000	.000	.750	.000	.000	.000	.000	.000	.000	.438	.625	.000	.600	.625	.000	.250	.000	.750	.750



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Weather: Clear
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File Name : 1831A_INT_E_Thurs_PM_Islington-Bartlett
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	Islington Street From North					CVS Driveway From East					Islington Street From South					Bartlett Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	78	64	2	0	144	3	3	2	0	8	0	45	50	0	95	69	3	61	0	133	380
03:15 PM	61	72	1	0	134	2	3	2	0	7	3	49	48	0	100	58	4	54	0	116	357
03:30 PM	61	56	2	0	119	3	5	2	0	10	1	61	56	0	118	64	2	66	0	132	379
03:45 PM	73	84	1	0	158	0	1	0	0	1	1	54	64	0	119	59	2	72	0	133	411
Total	273	276	6	0	555	8	12	6	0	26	5	209	218	0	432	250	11	253	0	514	1527
04:00 PM	45	66	3	0	114	2	5	1	0	8	3	55	60	0	118	71	1	87	0	159	399
04:15 PM	67	63	0	0	130	1	4	2	0	7	0	55	46	0	101	70	1	65	0	136	374
04:30 PM	42	58	4	0	104	5	4	3	0	12	0	64	60	0	124	70	2	73	0	145	385
04:45 PM	84	84	1	0	169	3	4	1	0	8	0	64	69	0	133	73	6	61	0	140	450
Total	238	271	8	0	517	11	17	7	0	35	3	238	235	0	476	284	10	286	0	580	1608
05:00 PM	91	67	1	0	159	2	5	3	0	10	3	75	83	0	161	67	1	69	0	137	467
05:15 PM	68	81	3	0	152	2	5	3	0	10	0	65	70	0	135	83	2	68	0	153	450
05:30 PM	43	64	3	0	110	3	7	1	0	11	0	59	59	0	118	77	7	80	0	164	403
05:45 PM	47	52	0	0	99	1	5	3	0	9	0	50	48	0	98	83	1	79	0	163	369
Total	249	264	7	0	520	8	22	10	0	40	3	249	260	0	512	310	11	296	0	617	1689
Grand Total	760	811	21	0	1592	27	51	23	0	101	11	696	713	0	1420	844	32	835	0	1711	4824
Apprch %	47.7	50.9	1.3	0		26.7	50.5	22.8	0		0.8	49	50.2	0		49.3	1.9	48.8	0		
Total %	15.8	16.8	0.4	0	33	0.6	1.1	0.5	0	2.1	0.2	14.4	14.8	0	29.4	17.5	0.7	17.3	0	35.5	
CARS	749	785	20	0	1554	27	51	22	0	100	11	684	695	0	1390	829	32	832	0	1693	4737
% CARS	98.6	96.8	95.2	0	97.6	100	100	95.7	0	99	100	98.3	97.5	0	97.9	98.2	100	99.6	0	98.9	98.2
TRUCKS	11	26	1	0	38	0	0	1	0	1	0	12	18	0	30	15	0	3	0	18	87
% TRUCKS	1.4	3.2	4.8	0	2.4	0	0	4.3	0	1	0	1.7	2.5	0	2.1	1.8	0	0.4	0	1.1	1.8

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Site Code : 1831A
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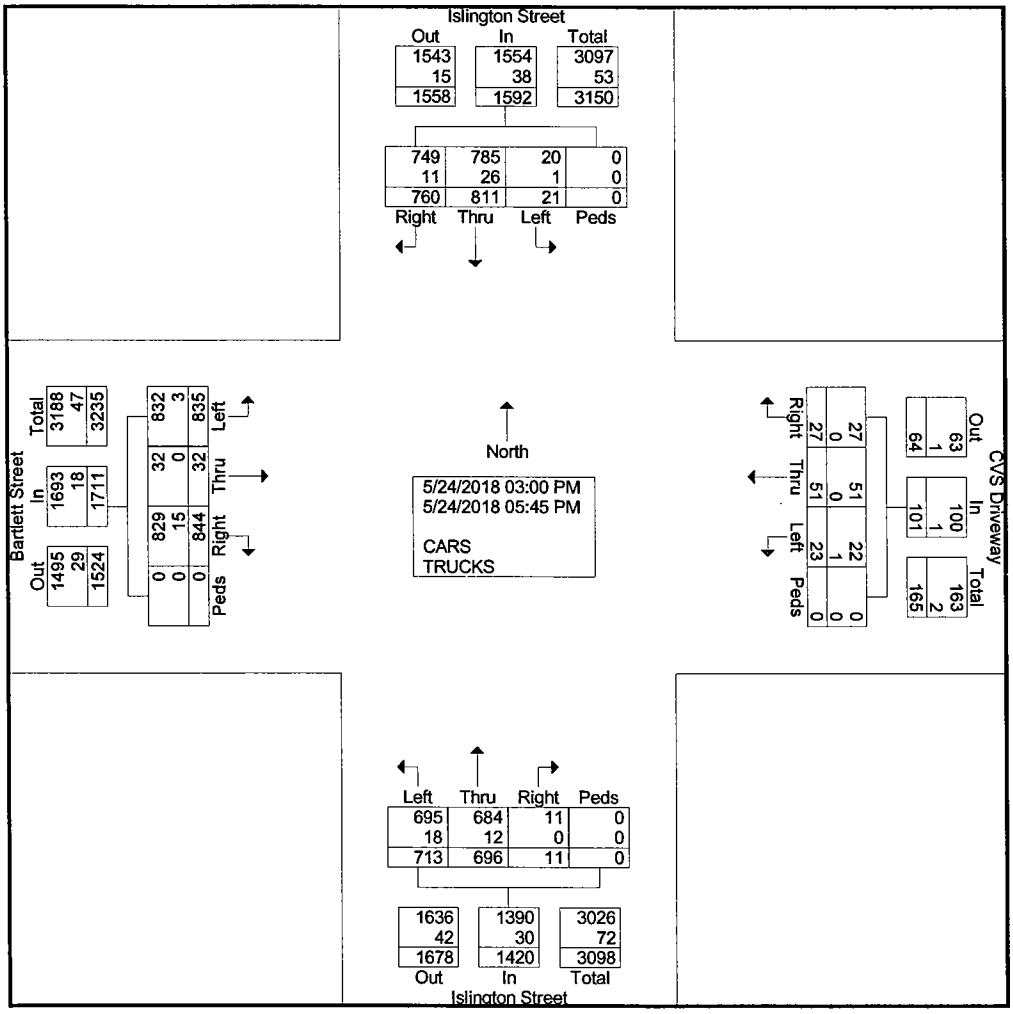

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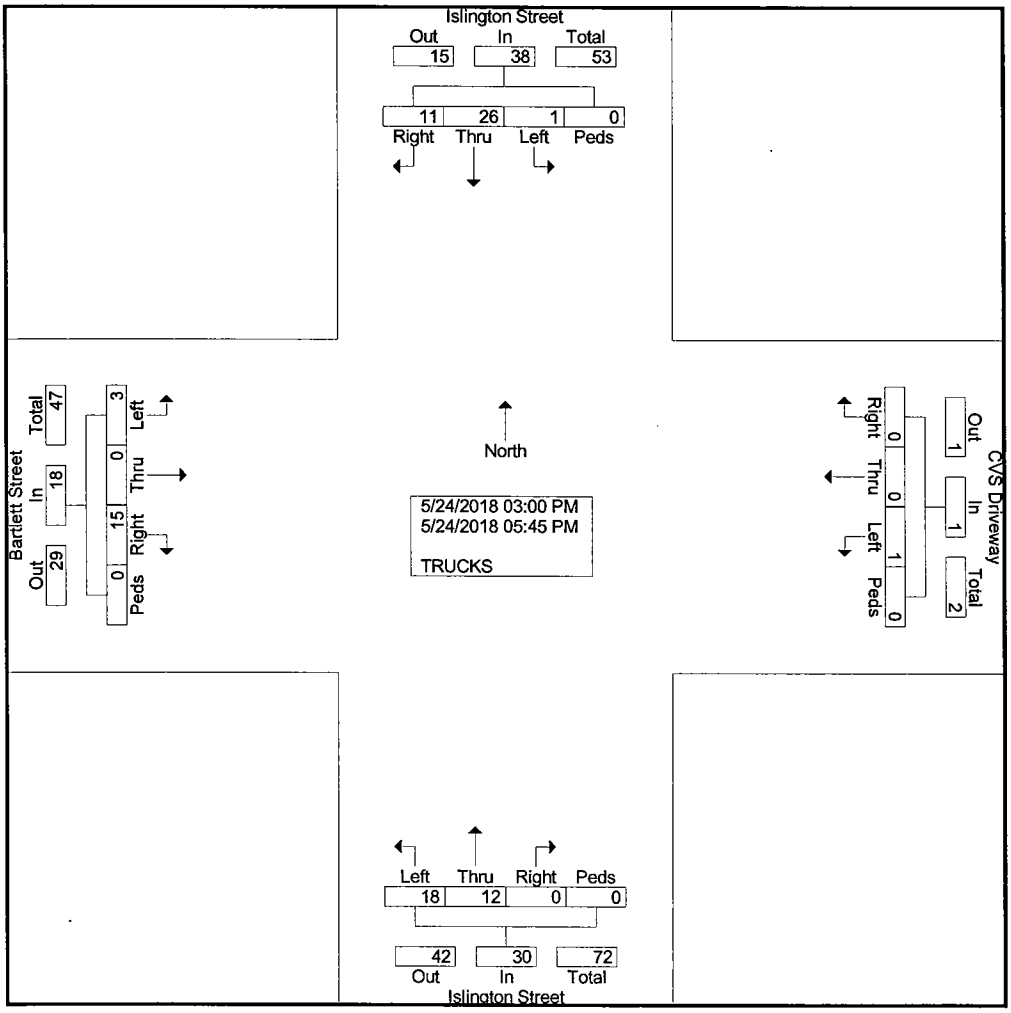
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- TRUCKS

	Islington Street From North					CVS Driveway From East					Islington Street From South					Bartlett Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	3	3	1	0	7	0	0	0	0	0	0	3	1	0	4	5	0	0	0	5	16
03:15 PM	2	3	0	0	5	0	0	1	0	1	0	0	1	0	1	1	0	0	0	1	8
03:30 PM	0	3	0	0	3	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	4
03:45 PM	2	5	0	0	7	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	9
Total	7	14	1	0	22	0	0	1	0	1	0	3	5	0	8	6	0	0	0	6	37
04:00 PM	0	1	0	0	1	0	0	0	0	0	0	1	3	0	4	1	0	0	0	1	6
04:15 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	4
04:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	2	0	2	2	0	2	0	4	7
04:45 PM	1	1	0	0	2	0	0	0	0	0	0	2	2	0	4	1	0	1	0	2	8
Total	1	5	0	0	6	0	0	0	0	0	0	4	7	0	11	5	0	3	0	8	25
05:00 PM	1	2	0	0	3	0	0	0	0	0	0	0	1	0	1	2	0	0	0	2	6
05:15 PM	2	1	0	0	3	0	0	0	0	0	0	4	1	0	5	1	0	0	0	1	9
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	1	0	0	0	1	4
05:45 PM	0	3	0	0	3	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	6
Total	3	7	0	0	10	0	0	0	0	0	0	5	6	0	11	4	0	0	0	4	25
Grand Total	11	26	1	0	38	0	0	1	0	1	0	12	18	0	30	15	0	3	0	18	87
Apprch %	28.9	68.4	2.6	0		0	0	100	0		0	40	60	0		83.3	0	16.7	0		
Total %	12.6	29.9	1.1	0	43.7	0	0	1.1	0	1.1	0	13.8	20.7	0	34.5	17.2	0	3.4	0	20.7	

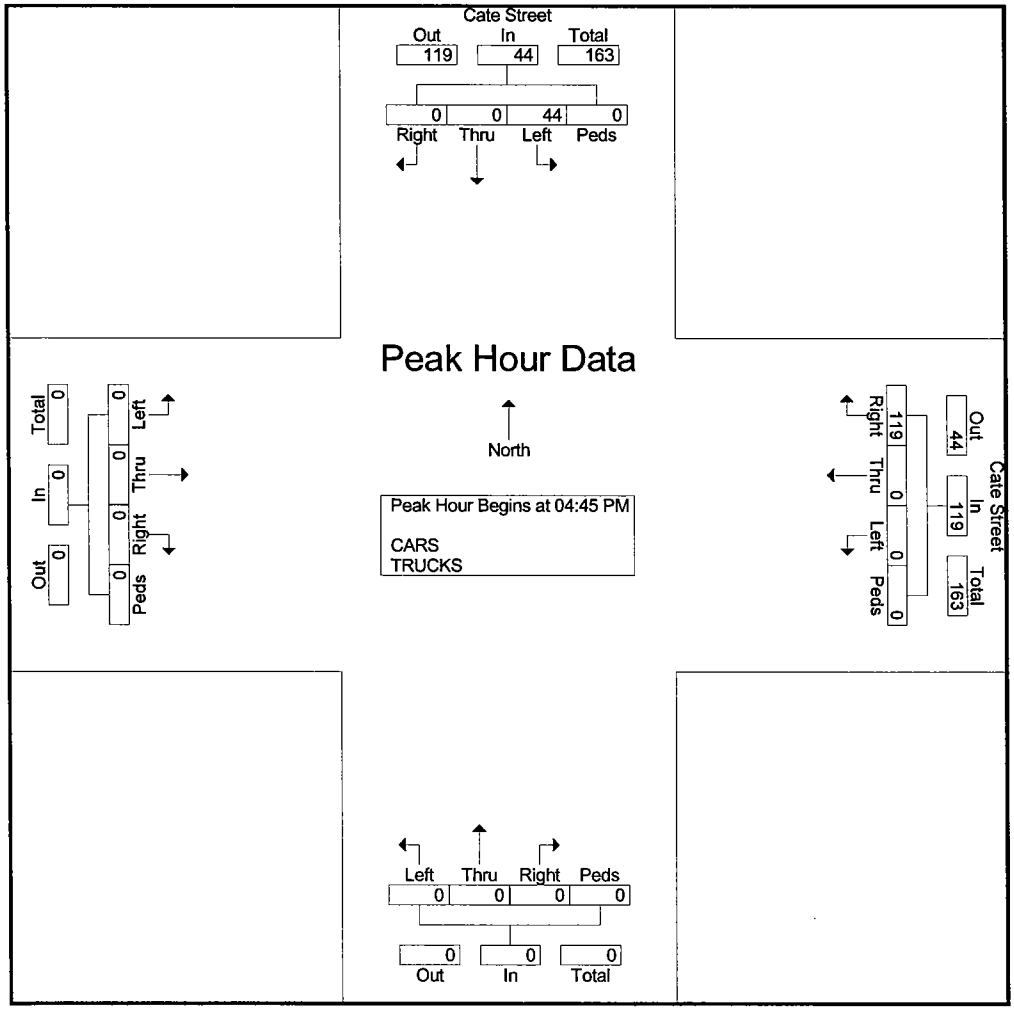


Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Cate St PM
Site Code : 1831A
Start Date : 5/24/2018
Page No : 3

	Cate Street From North					Cate Street From East					From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	6	0	6	33	0	0	0	33	0	0	0	0	0	0	0	0	0	0	39
05:00 PM	0	0	**16**	0	**16**	**41**	0	0	0	**41**	0	0	0	0	0	0	0	0	0	0	**57**
05:15 PM	0	0	9	0	9	23	0	0	0	23	0	0	0	0	0	0	0	0	0	0	32
05:30 PM	0	0	13	0	13	22	0	0	0	22	0	0	0	0	0	0	0	0	0	0	35
Total Volume	0	0	44	0	44	119	0	0	0	119	0	0	0	0	0	0	0	0	0	0	163
% App. Total	0	0	100	0		100	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.688	.000	.688	.726	.000	.000	.000	.726	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.715



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Weather: Clear
Collected By: MV
Job Number: 1831A
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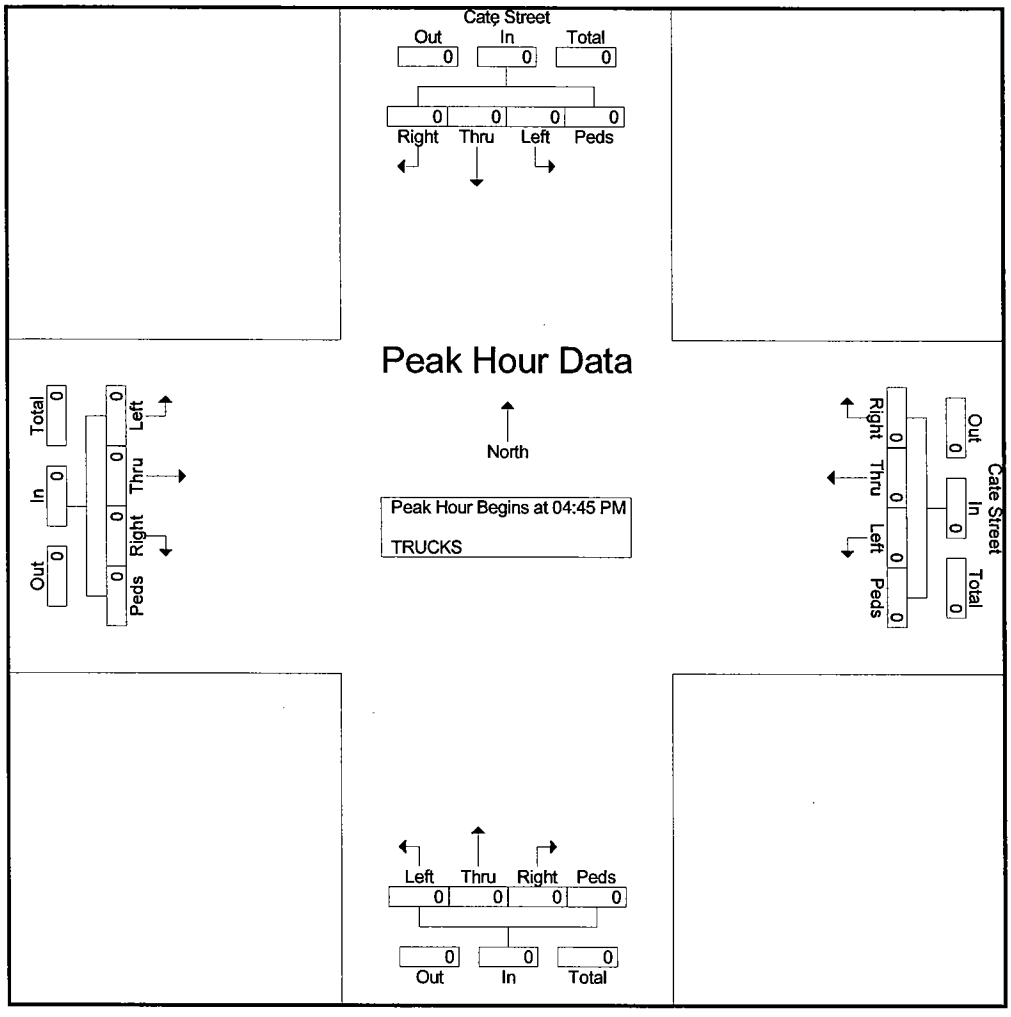
File Name : 1831A Cate St PM
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2

	Cate Street From North					Cate Street From East					From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Cate St PM
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	Cate Street From North					Cate Street From East					From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	0	0	11	0	11	28	0	0	0	28	0	0	0	0	0	0	0	0	0	0	39
03:15 PM	0	0	14	0	14	24	0	0	0	24	0	0	0	0	0	0	0	0	0	0	38
03:30 PM	0	0	9	0	9	15	0	0	0	15	0	0	0	0	0	0	0	0	0	0	24
03:45 PM	0	0	5	0	5	21	0	0	0	21	0	0	0	0	0	0	0	0	0	0	26
Total	0	0	39	0	39	88	0	0	0	88	0	0	0	0	0	0	0	0	0	0	127
04:00 PM	0	0	15	0	15	17	0	0	0	17	0	0	0	0	0	0	0	0	0	0	32
04:15 PM	0	0	14	0	14	21	0	0	0	21	0	0	0	0	0	0	0	0	0	0	35
04:30 PM	0	0	9	0	9	18	0	0	0	18	0	0	0	0	0	0	0	0	0	0	27
04:45 PM	0	0	6	0	6	33	0	0	0	33	0	0	0	0	0	0	0	0	0	0	39
Total	0	0	44	0	44	89	0	0	0	89	0	0	0	0	0	0	0	0	0	0	133
05:00 PM	0	0	16	0	16	41	0	0	0	41	0	0	0	0	0	0	0	0	0	0	57
05:15 PM	0	0	9	0	9	23	0	0	0	23	0	0	0	0	0	0	0	0	0	0	32
05:30 PM	0	0	13	0	13	22	0	0	0	22	0	0	0	0	0	0	0	0	0	0	35
05:45 PM	0	0	8	0	8	20	0	0	0	20	0	0	0	0	0	0	0	0	0	0	28
Total	0	0	46	0	46	106	0	0	0	106	0	0	0	0	0	0	0	0	0	0	152
Grand Total	0	0	129	0	129	283	0	0	0	283	0	0	0	0	0	0	0	0	0	0	412
Apprch %	0	0	100	0		100	0	0	0		0	0	0	0		0	0	0	0		
Total %	0	0	31.3	0	31.3	68.7	0	0	0	68.7	0	0	0	0	0	0	0	0	0	0	
CARS	0	0	129	0	129	281	0	0	0	281	0	0	0	0	0	0	0	0	0	0	410
% CARS	0	0	100	0	100	99.3	0	0	0	99.3	0	0	0	0	0	0	0	0	0	0	99.5
TRUCKS	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
% TRUCKS	0	0	0	0	0	0.7	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0.5

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Weather: Clear
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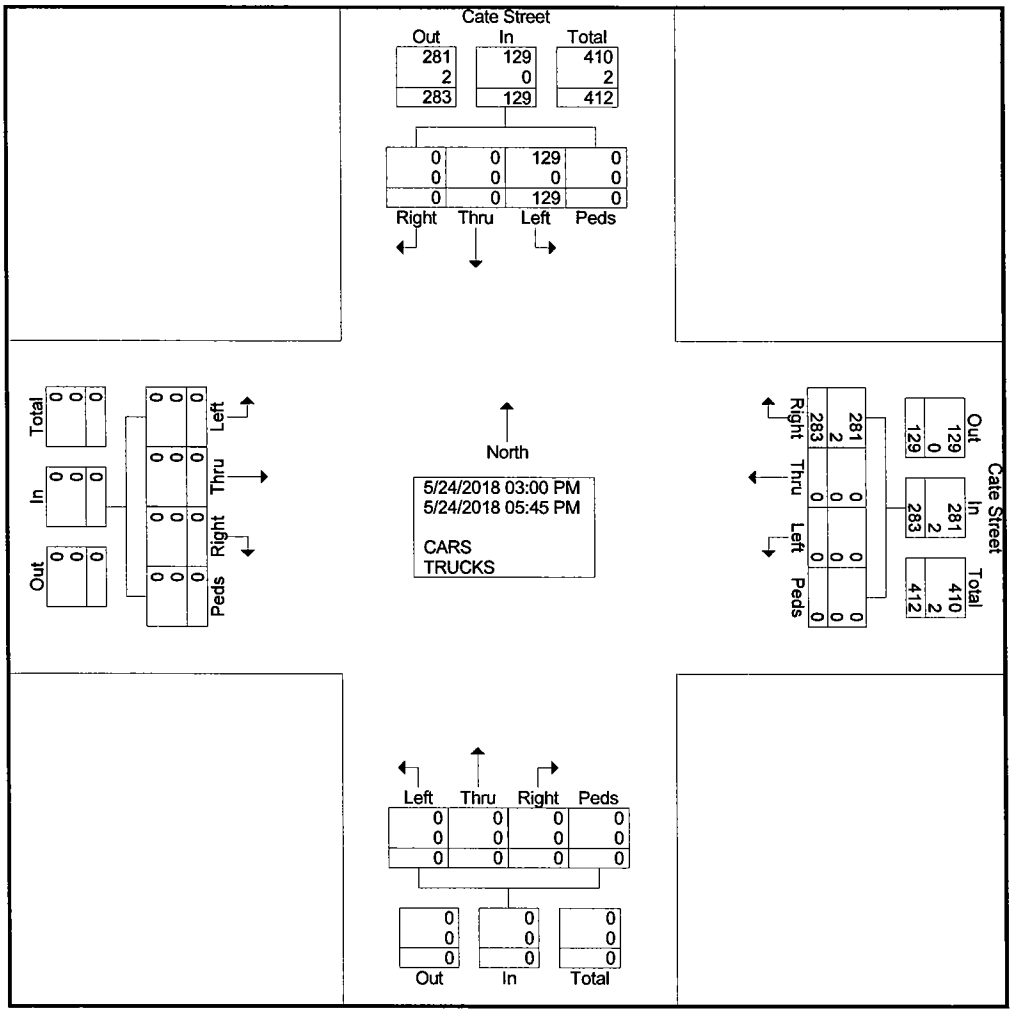
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Cate St PM
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2



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Weather: Clear
Collected By: MV
Job Number: 1831A
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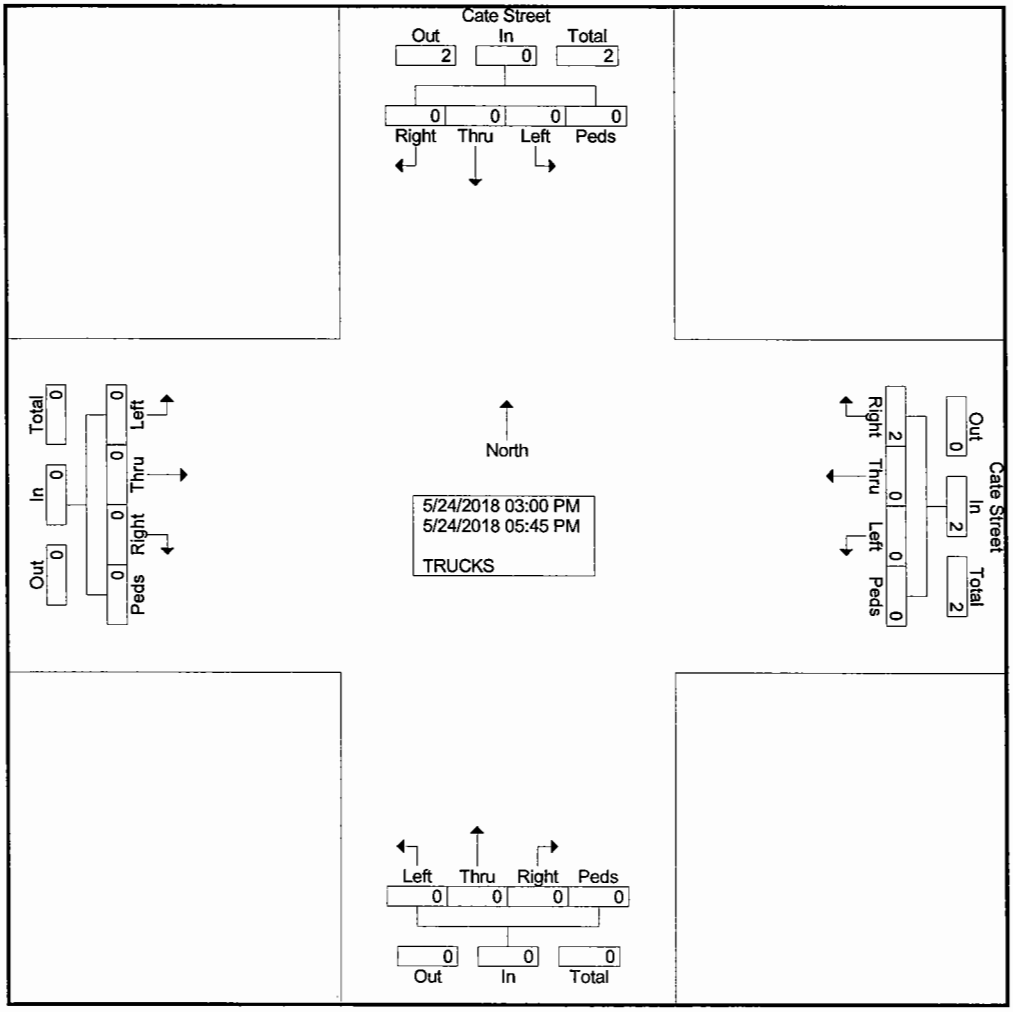
File Name : 1831A Cate St PM
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- TRUCKS

	Cate Street From North					Cate Street From East					From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Apprch %	0	0	0	0		100	0	0	0		0	0	0	0		0	0	0	0		
Total %	0	0	0	0	0	100	0	0	0	100	0	0	0	0	0	0	0	0	0	0	

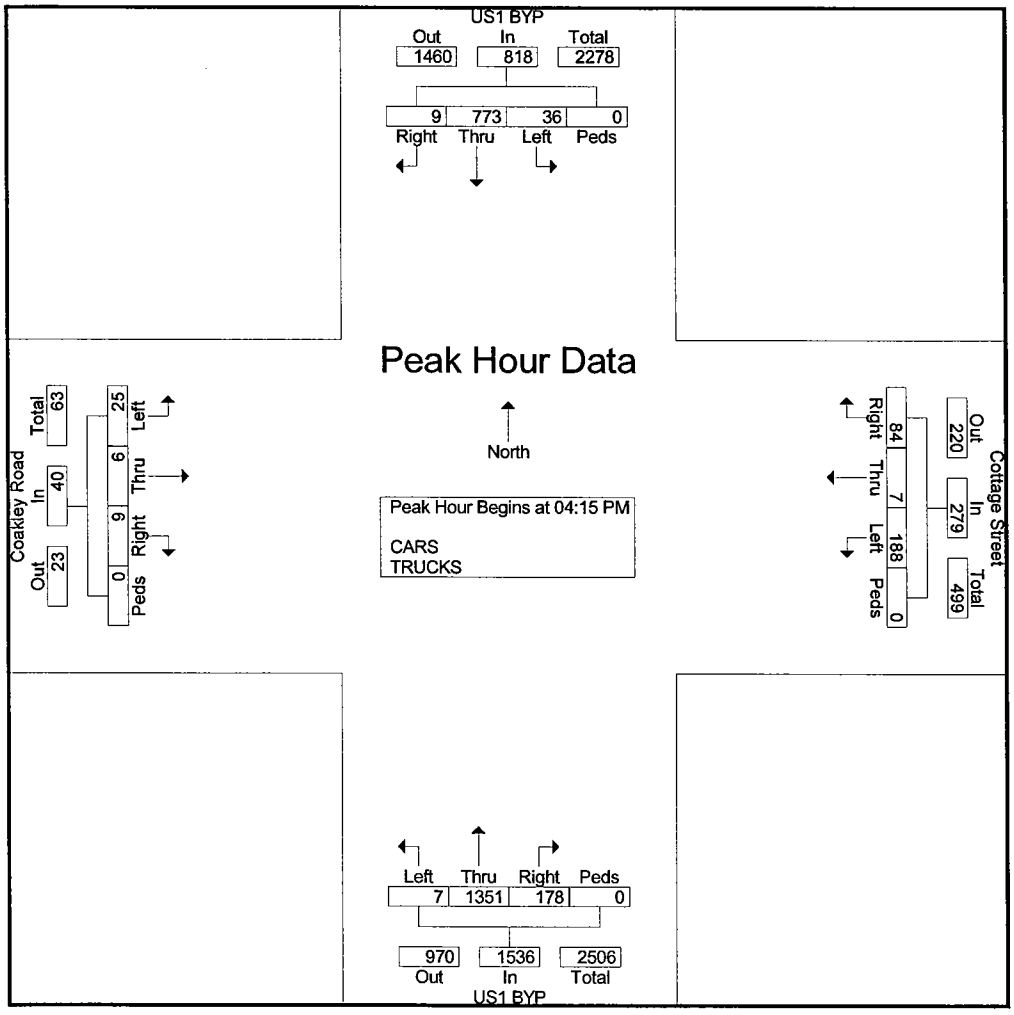


Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_G_Thurs_PM_US1 BYP-Cottage
Site Code : 1831A
Start Date : 5/24/2018
Page No : 3

	US1 BYP From North					Cottage Street From East					US1 BYP From South					Coakley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	2	186	**10**	0	198	14	0	40	0	54	39	341	0	0	380	1	**3**	5	0	9	641
04:30 PM	**4**	**198**	8	0	**210**	10	**4**	50	0	64	**52**	335	3	0	390	3	0	7	0	10	674
04:45 PM	1	196	10	0	207	27	1	41	0	69	35	312	0	0	347	**4**	0	**10**	0	**14**	637
05:00 PM	2	193	8	0	203	**33**	2	**57**	0	**92**	52	**363**	**4**	0	**419**	1	3	3	0	7	**721**
Total Volume	9	773	36	0	818	84	7	188	0	279	178	1351	7	0	1536	9	6	25	0	40	2673
% App. Total	1.1	94.5	4.4	0		30.1	2.5	67.4	0		11.6	88	0.5	0		22.5	15	62.5	0		
PHF	.563	.976	.900	.000	.974	.636	.438	.825	.000	.758	.856	.930	.438	.000	.916	.563	.500	.625	.000	.714	.927



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Weather: Clear
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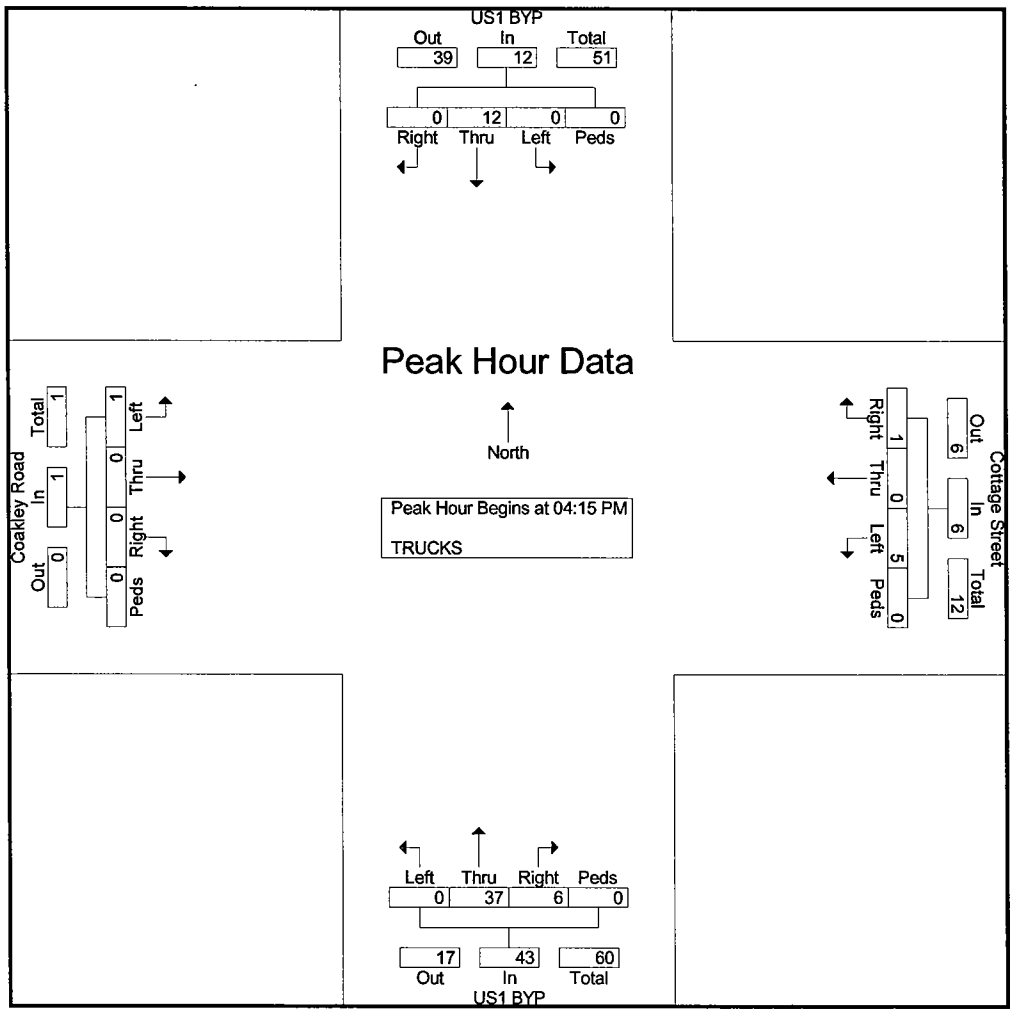
File Name : 1831A_INT_G_Thurs_PM_US1 BYP-Cottage
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2

	US1 BYP From North					Cottage Street From East					US1 BYP From South					Coakley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	1	0	0	1	**1**	0	1	0	2	**2**	**16**	0	0	**18**	0	0	0	0	0	**21**
04:30 PM	0	3	0	0	3	0	0	**3**	0	**3**	2	7	0	0	9	0	0	**1**	0	**1**	16
04:45 PM	0	**6**	0	0	**6**	0	0	1	0	1	**1**	5	0	0	6	0	0	0	0	0	13
05:00 PM	0	2	0	0	2	0	0	0	0	0	1	9	0	0	10	0	0	0	0	0	12
Total Volume	0	12	0	0	12	1	0	5	0	6	6	37	0	0	43	0	0	1	0	1	62
% App. Total	0	100	0	0		16.7	0	83.3	0		14	86	0	0		0	0	100	0		
PHF	.000	.500	.000	.000	.500	.250	.000	.417	.000	.500	.750	.578	.000	.000	.597	.000	.000	.250	.000	.250	.738



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Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_G_Thurs_PM_US1 BYP-Cottage
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	US1 BYP From North					Cottage Street From East					US1 BYP From South					Coakley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	4	212	10	0	226	18	0	32	0	50	36	317	3	0	356	2	3	9	0	14	646
03:15 PM	5	188	16	0	209	12	3	49	0	64	32	307	5	0	344	5	2	13	0	20	637
03:30 PM	3	194	8	0	205	12	1	45	0	58	48	325	3	0	376	3	1	8	0	12	651
03:45 PM	4	201	5	0	210	12	3	52	0	67	34	345	5	0	384	1	1	7	0	9	670
Total	16	795	39	0	850	54	7	178	0	239	150	1294	16	0	1460	11	7	37	0	55	2604
04:00 PM	1	208	11	0	220	9	3	45	0	57	55	326	8	0	389	5	2	10	0	17	683
04:15 PM	2	186	10	0	198	14	0	40	0	54	39	341	0	0	380	1	3	5	0	9	641
04:30 PM	4	198	8	0	210	10	4	50	0	64	52	335	3	0	390	3	0	7	0	10	674
04:45 PM	1	196	10	0	207	27	1	41	0	69	35	312	0	0	347	4	0	10	0	14	637
Total	8	788	39	0	835	60	8	176	0	244	181	1314	11	0	1506	13	5	32	0	50	2635
05:00 PM	2	193	8	0	203	33	2	57	0	92	52	363	4	0	419	1	3	3	0	7	721
05:15 PM	1	202	8	0	211	16	1	38	0	55	38	315	6	0	359	0	2	11	0	13	638
05:30 PM	4	183	16	0	203	14	0	46	0	60	31	273	3	0	307	4	1	8	0	13	583
05:45 PM	1	187	6	0	194	16	1	34	0	51	17	254	4	0	275	4	2	4	0	10	530
Total	8	765	38	0	811	79	4	175	0	258	138	1205	17	0	1360	9	8	26	0	43	2472
Grand Total	32	2348	116	0	2496	193	19	529	0	741	469	3813	44	0	4326	33	20	95	0	148	7711
Apprch %	1.3	94.1	4.6	0		26	2.6	71.4	0		10.8	88.1	1	0		22.3	13.5	64.2	0		
Total %	0.4	30.5	1.5	0	32.4	2.5	0.2	6.9	0	9.6	6.1	49.4	0.6	0	56.1	0.4	0.3	1.2	0	1.9	
CARS	32	2287	116	0	2435	190	18	512	0	720	457	3688	44	0	4189	33	20	93	0	146	7490
% CARS	100	97.4	100	0	97.6	98.4	94.7	96.8	0	97.2	97.4	96.7	100	0	96.8	100	100	97.9	0	98.6	97.1
TRUCKS	0	61	0	0	61	3	1	17	0	21	12	125	0	0	137	0	0	2	0	2	221
% TRUCKS	0	2.6	0	0	2.4	1.6	5.3	3.2	0	2.8	2.6	3.3	0	0	3.2	0	0	2.1	0	1.4	2.9

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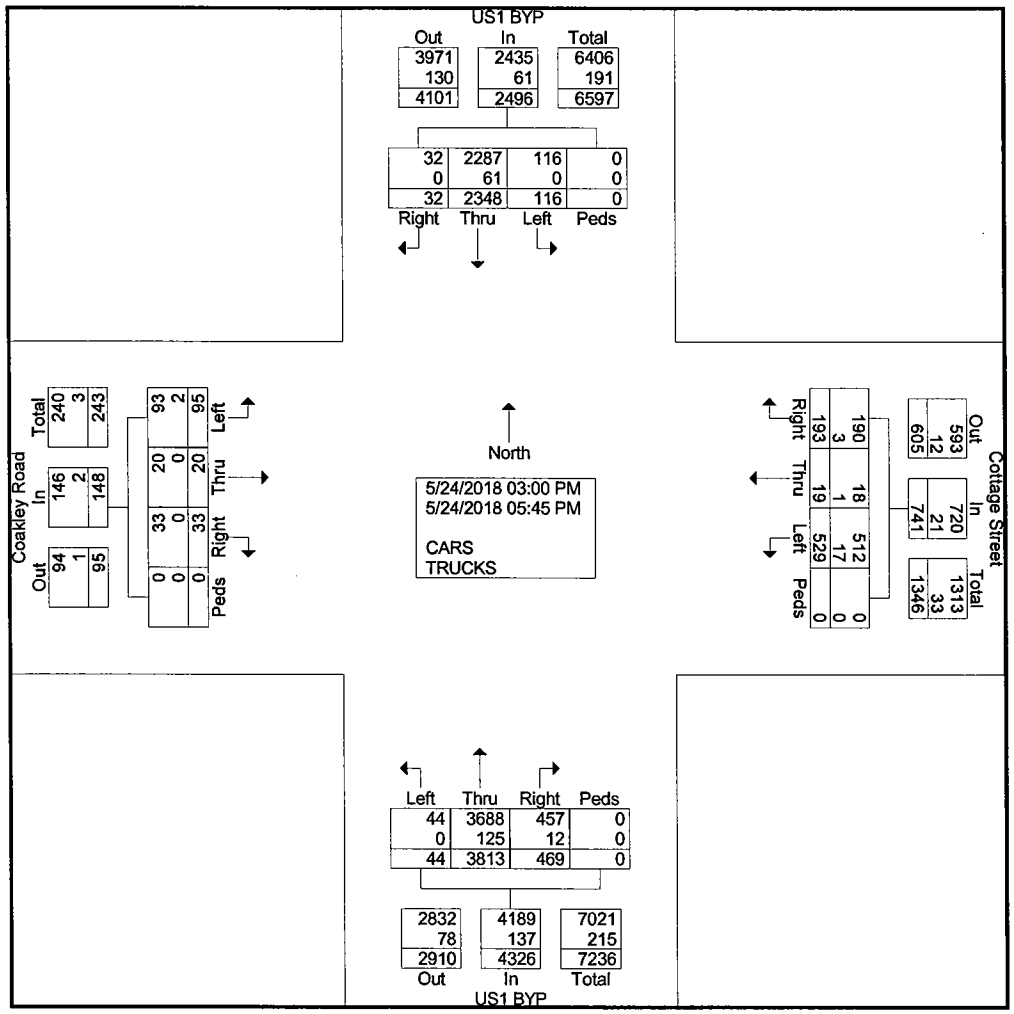
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_G_Thurs_PM_US1 BYP-Cottage
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2



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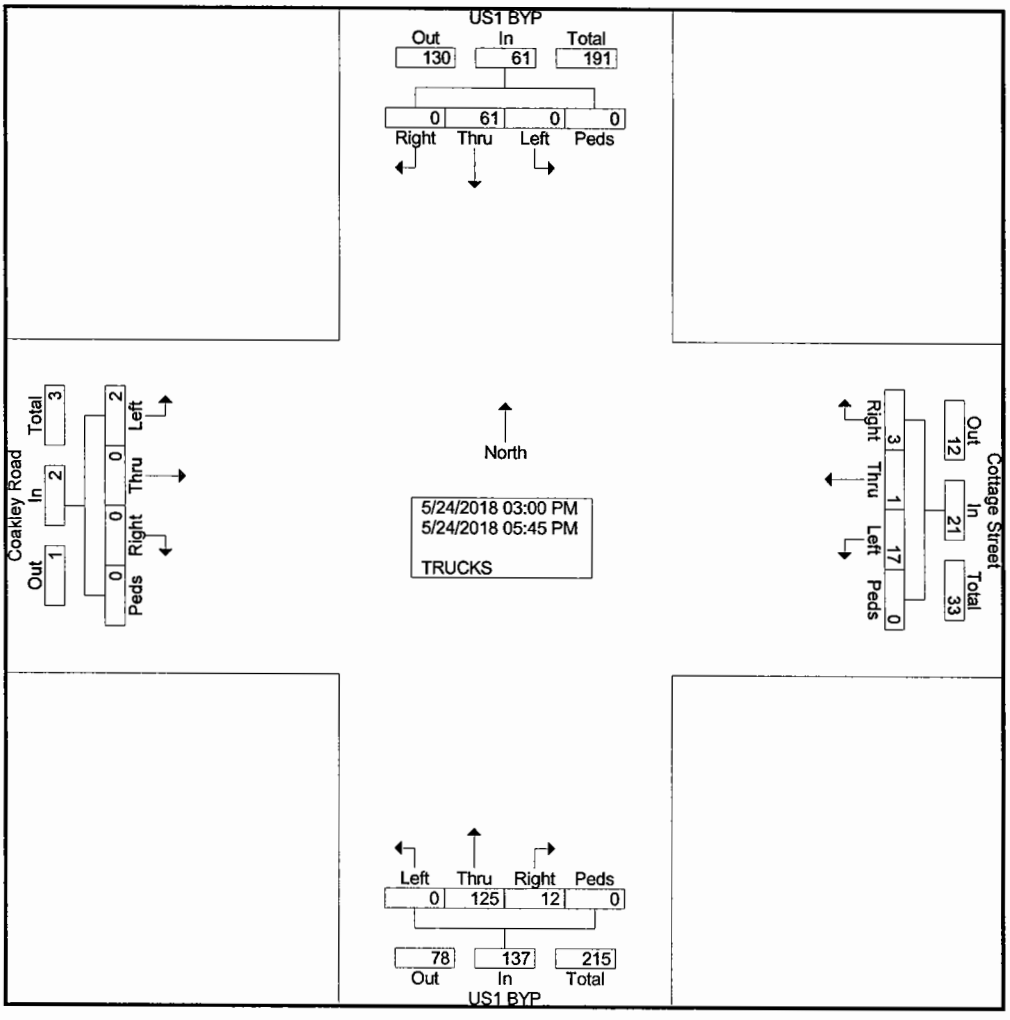
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- TRUCKS

	US1 BYP From North					Cottage Street From East					US1 BYP From South					Coakley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	0	10	0	0	10	0	0	0	0	0	1	12	0	0	13	0	0	0	0	0	23
03:15 PM	0	12	0	0	12	0	1	1	0	2	0	25	0	0	25	0	0	0	0	0	39
03:30 PM	0	6	0	0	6	0	0	1	0	1	2	15	0	0	17	0	0	1	0	1	25
03:45 PM	0	7	0	0	7	1	0	5	0	6	0	17	0	0	17	0	0	0	0	0	30
Total	0	35	0	0	35	1	1	7	0	9	3	69	0	0	72	0	0	1	0	1	117
04:00 PM	0	4	0	0	4	1	0	2	0	3	2	8	0	0	10	0	0	0	0	0	17
04:15 PM	0	1	0	0	1	1	0	1	0	2	2	16	0	0	18	0	0	0	0	0	21
04:30 PM	0	3	0	0	3	0	0	3	0	3	2	7	0	0	9	0	0	1	0	1	16
04:45 PM	0	6	0	0	6	0	0	1	0	1	1	5	0	0	6	0	0	0	0	0	13
Total	0	14	0	0	14	2	0	7	0	9	7	36	0	0	43	0	0	1	0	1	67
05:00 PM	0	2	0	0	2	0	0	0	0	0	1	9	0	0	10	0	0	0	0	0	12
05:15 PM	0	5	0	0	5	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	10
05:30 PM	0	2	0	0	2	0	0	1	0	1	1	3	0	0	4	0	0	0	0	0	7
05:45 PM	0	3	0	0	3	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	8
Total	0	12	0	0	12	0	0	3	0	3	2	20	0	0	22	0	0	0	0	0	37
Grand Total	0	61	0	0	61	3	1	17	0	21	12	125	0	0	137	0	0	2	0	2	221
Apprch %	0	100	0	0		14.3	4.8	81	0		8.8	91.2	0	0		0	0	100	0		
Total %	0	27.6	0	0	27.6	1.4	0.5	7.7	0	9.5	5.4	56.6	0	0	62	0	0	0.9	0	0.9	

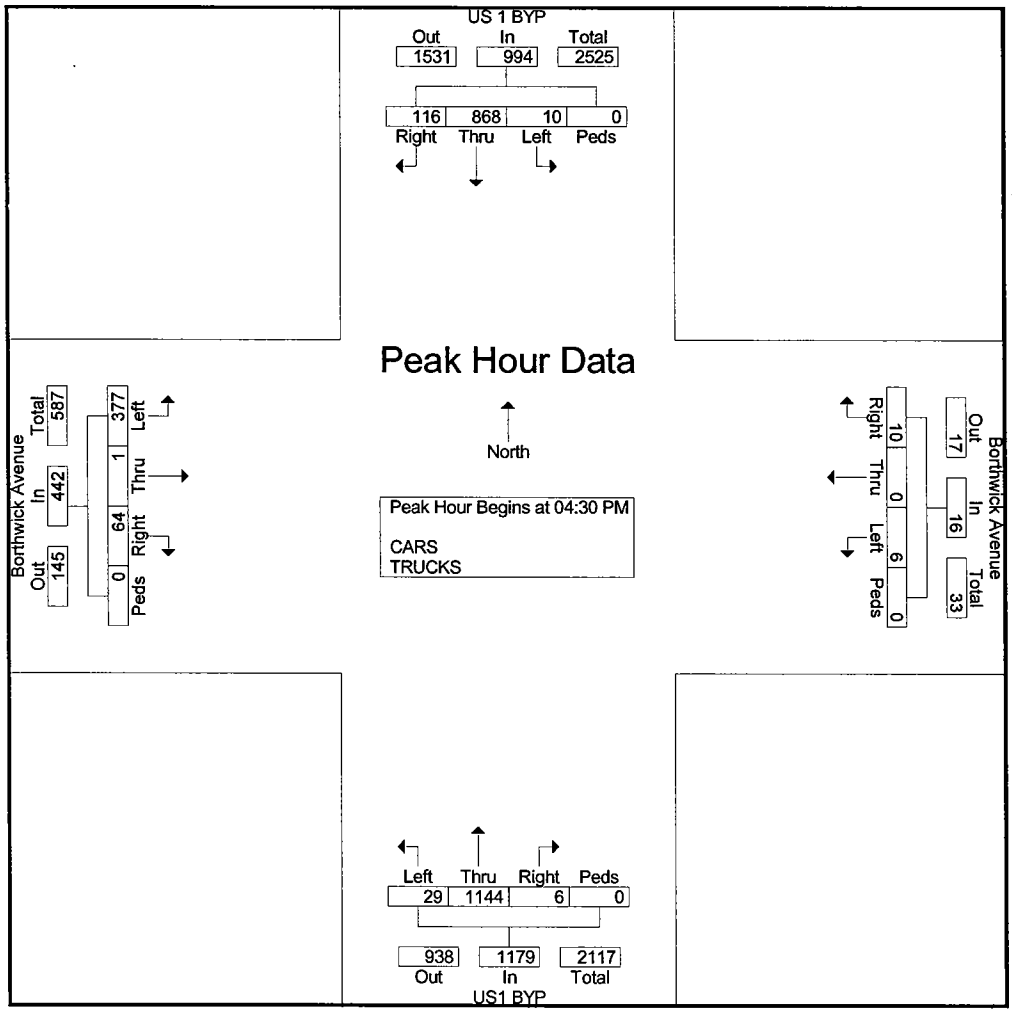


Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_H_Thurs_PM_US1 BYP-Borthwick
Site Code : 1831A
Start Date : 5/24/2018
Page No : 3

	US 1 BYP From North					Borthwick Avenue From East					US1 BYP From South					Borthwick Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	28	220	3	0	251	2	0	1	0	3	0	293	4	0	297	15	0	112	0	127	678
04:45 PM	25	214	2	0	241	**4**	0	**3**	0	**7**	**5**	270	**11**	0	286	15	0	69	0	84	618
05:00 PM	31	**227**	0	0	**258**	3	0	1	0	4	1	**297**	6	0	**304**	**18**	**1**	**115**	0	**134**	**700**
05:15 PM	**32**	207	**5**	0	244	1	0	1	0	2	0	284	8	0	292	16	0	81	0	97	635
Total Volume	116	868	10	0	994	10	0	6	0	16	6	1144	29	0	1179	64	1	377	0	442	2631
% App. Total	11.7	87.3	1	0		62.5	0	37.5	0		0.5	97	2.5	0		14.5	0.2	85.3	0		
PHF	.906	.956	.500	.000	.963	.625	.000	.500	.000	.571	.300	.963	.659	.000	.970	.889	.250	.820	.000	.825	.940



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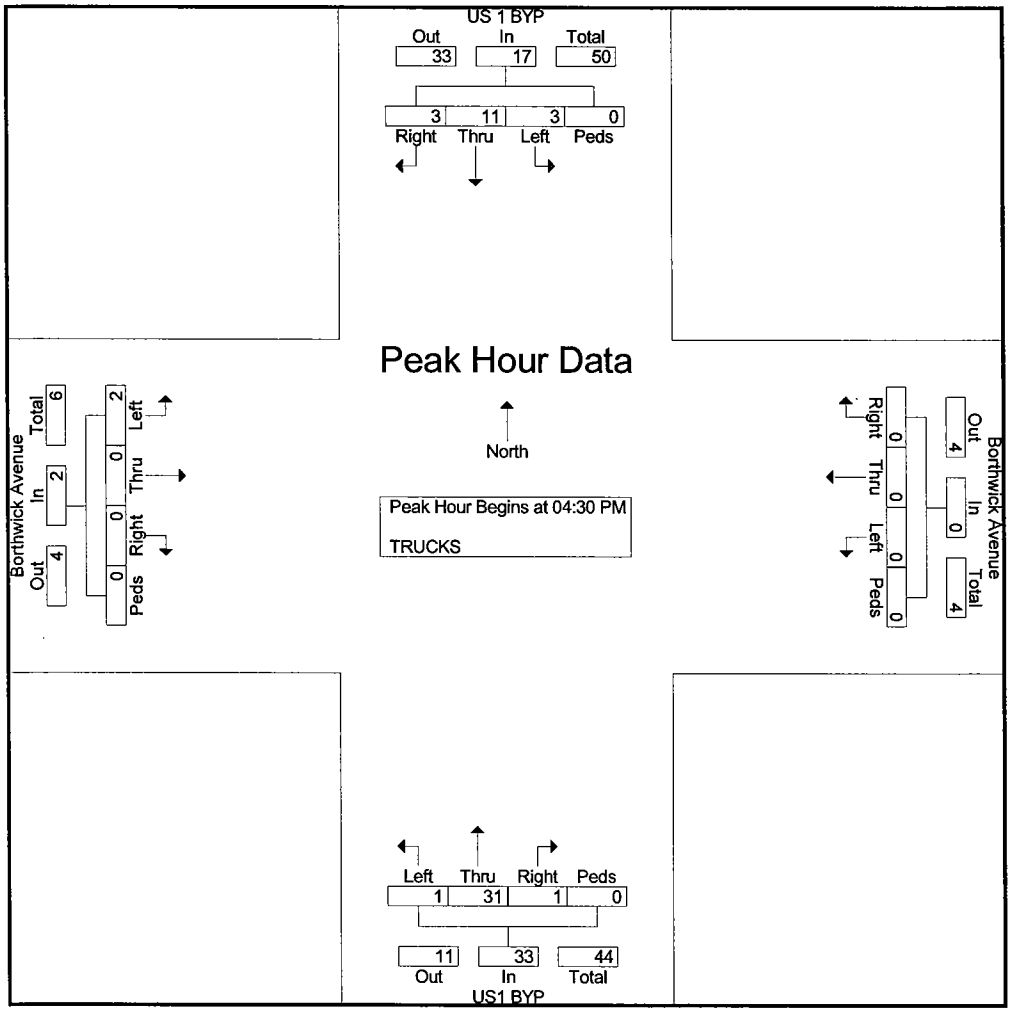
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_H_Thurs_PM_US1 BYP-Borthwick
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2

	US 1 BYP From North					Borthwick Avenue From East					US1 BYP From South					Borthwick Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	2	**2**	0	4	0	0	0	0	0	0	**10**	0	0	**10**	0	0	**1**	0	**1**	**15**
04:45 PM	1	**5**	0	0	**6**	0	0	0	0	0	**1**	7	0	0	8	0	0	0	0	0	14
05:00 PM	0	2	0	0	2	0	0	0	0	0	0	9	0	0	9	0	0	1	0	1	12
05:15 PM	**2**	2	1	0	5	0	0	0	0	0	0	5	**1**	0	6	0	0	0	0	0	11
Total Volume	3	11	3	0	17	0	0	0	0	0	1	31	1	0	33	0	0	2	0	2	52
% App. Total	17.6	64.7	17.6	0		0	0	0	0		3	93.9	3	0		0	0	100	0		
PHF	.375	.550	.375	.000	.708	.000	.000	.000	.000	.000	.250	.775	.250	.000	.825	.000	.000	.500	.000	.500	.867



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Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_H_Thurs_PM_US1 BYP-Borthwick
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	US 1 BYP From North					Borthwick Avenue From East					US1 BYP From South					Borthwick Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	47	193	5	0	245	5	0	0	0	5	2	283	5	0	290	12	0	69	0	81	621
03:15 PM	46	196	3	0	245	4	0	0	0	4	0	262	10	0	272	16	0	78	0	94	615
03:30 PM	58	174	4	0	236	1	0	0	0	1	0	295	11	0	306	12	0	92	0	104	647
03:45 PM	45	213	3	0	261	5	0	0	0	5	0	285	5	0	290	16	0	78	0	94	650
Total	196	776	15	0	987	15	0	0	0	15	2	1125	31	0	1158	56	0	317	0	373	2533
04:00 PM	39	204	4	0	247	6	0	0	0	6	1	270	5	0	276	29	1	113	0	143	672
04:15 PM	27	201	1	0	229	2	0	0	0	2	0	288	6	0	294	21	0	83	0	104	629
04:30 PM	28	220	3	0	251	2	0	1	0	3	0	293	4	0	297	15	0	112	0	127	678
04:45 PM	25	214	2	0	241	4	0	3	0	7	5	270	11	0	286	15	0	69	0	84	618
Total	119	839	10	0	968	14	0	4	0	18	6	1121	26	0	1153	80	1	377	0	458	2597
05:00 PM	31	227	0	0	258	3	0	1	0	4	1	297	6	0	304	18	1	115	0	134	700
05:15 PM	32	207	5	0	244	1	0	1	0	2	0	284	8	0	292	16	0	81	0	97	635
05:30 PM	22	217	2	0	241	3	1	1	0	5	1	250	1	0	252	18	0	59	0	77	575
05:45 PM	25	210	3	0	238	1	0	1	0	2	1	218	5	0	224	16	0	46	0	62	526
Total	110	861	10	0	981	8	1	4	0	13	3	1049	20	0	1072	68	1	301	0	370	2436
Grand Total	425	2476	35	0	2936	37	1	8	0	46	11	3295	77	0	3383	204	2	995	0	1201	7566
Apprch %	14.5	84.3	1.2	0		80.4	2.2	17.4	0		0.3	97.4	2.3	0		17	0.2	82.8	0		
Total %	5.6	32.7	0.5	0	38.8	0.5	0	0.1	0	0.6	0.1	43.6	1	0	44.7	2.7	0	13.2	0	15.9	
CARS	412	2419	28	0	2859	35	1	8	0	44	10	3183	75	0	3268	204	2	972	0	1178	7349
% CARS	96.9	97.7	80	0	97.4	94.6	100	100	0	95.7	90.9	96.6	97.4	0	96.6	100	100	97.7	0	98.1	97.1
TRUCKS	13	57	7	0	77	2	0	0	0	2	1	112	2	0	115	0	0	23	0	23	217
% TRUCKS	3.1	2.3	20	0	2.6	5.4	0	0	0	4.3	9.1	3.4	2.6	0	3.4	0	0	2.3	0	1.9	2.9

Stephen G. Pernaw & Co., Inc.
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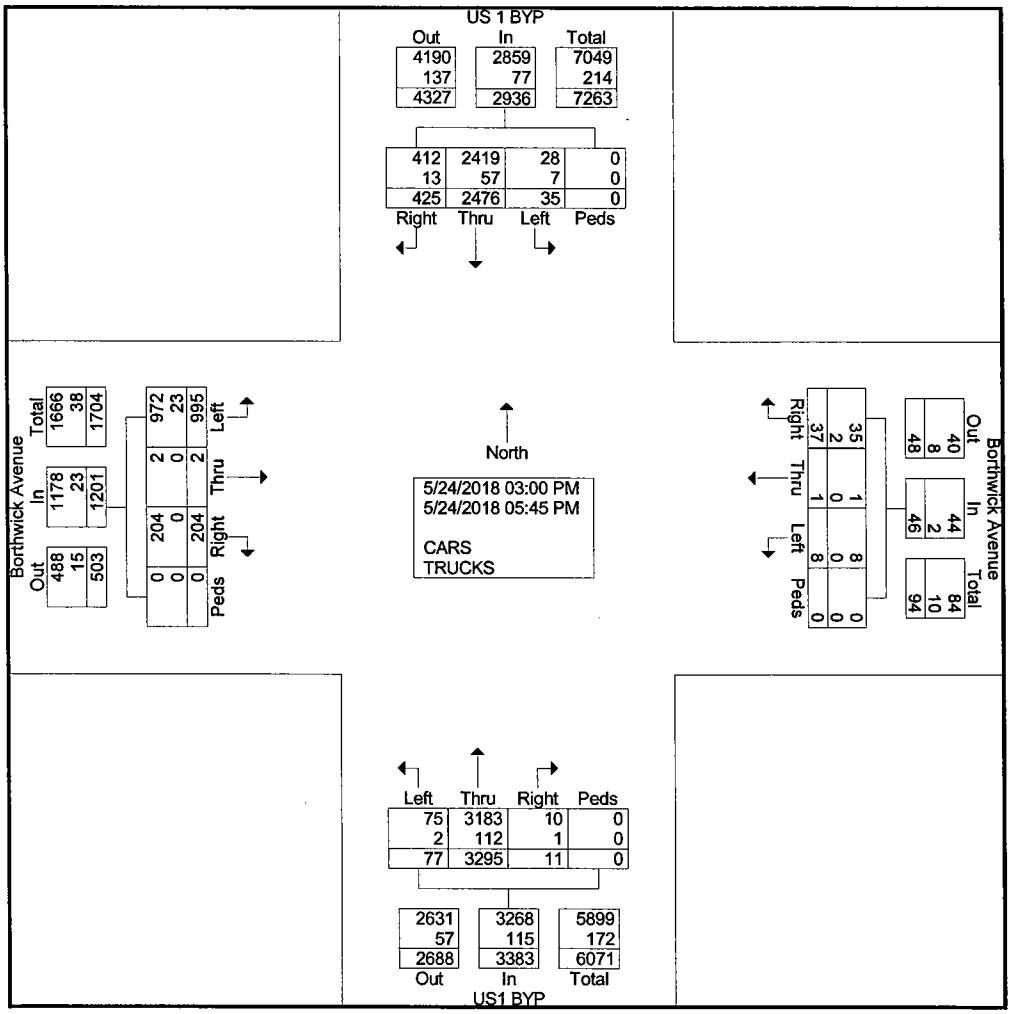
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_H_Thurs_PM_US1 BYP-Borthwick
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2



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Weather: Clear
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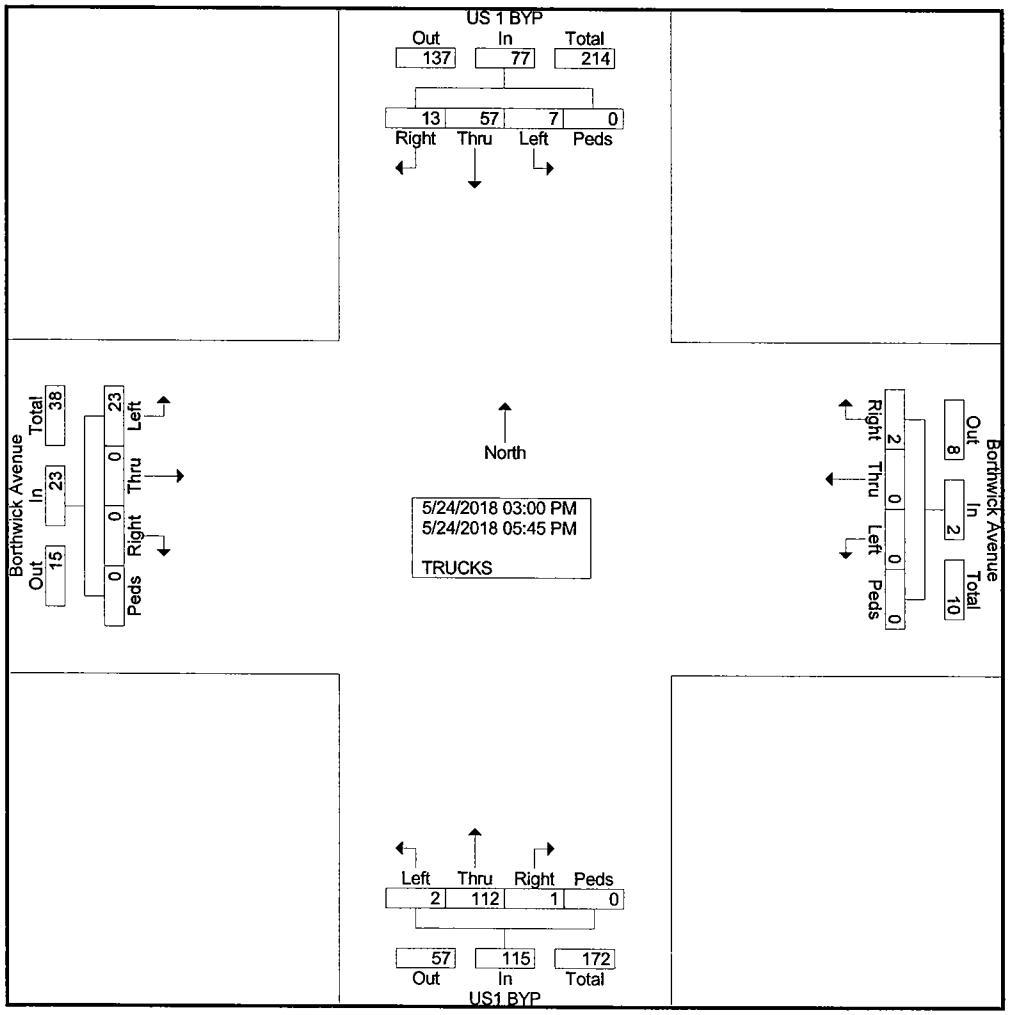
File Name : 1831A_INT_H_Thurs_PM_US1 BYP-Borthwick
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- TRUCKS

	US 1 BYP From North					Borthwick Avenue From East					US1 BYP From South					Borthwick Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	2	7	1	0	10	1	0	0	0	1	0	9	1	0	10	0	0	3	0	3	24
03:15 PM	1	12	0	0	13	0	0	0	0	0	0	17	0	0	17	0	0	6	0	6	36
03:30 PM	1	5	2	0	8	0	0	0	0	0	0	13	0	0	13	0	0	3	0	3	24
03:45 PM	2	11	0	0	13	0	0	0	0	0	0	11	0	0	11	0	0	2	0	2	26
Total	6	35	3	0	44	1	0	0	0	1	0	50	1	0	51	0	0	14	0	14	110
04:00 PM	1	2	1	0	4	1	0	0	0	1	0	9	0	0	9	0	0	2	0	2	16
04:15 PM	1	2	0	0	3	0	0	0	0	0	0	16	0	0	16	0	0	3	0	3	22
04:30 PM	0	2	2	0	4	0	0	0	0	0	0	10	0	0	10	0	0	1	0	1	15
04:45 PM	1	5	0	0	6	0	0	0	0	0	1	7	0	0	8	0	0	0	0	0	14
Total	3	11	3	0	17	1	0	0	0	1	1	42	0	0	43	0	0	6	0	6	67
05:00 PM	0	2	0	0	2	0	0	0	0	0	0	9	0	0	9	0	0	1	0	1	12
05:15 PM	2	2	1	0	5	0	0	0	0	0	0	5	1	0	6	0	0	0	0	0	11
05:30 PM	1	3	0	0	4	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	8
05:45 PM	1	4	0	0	5	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	9
Total	4	11	1	0	16	0	0	0	0	0	0	20	1	0	21	0	0	3	0	3	40
Grand Total	13	57	7	0	77	2	0	0	0	2	1	112	2	0	115	0	0	23	0	23	217
Apprch %	16.9	74	9.1	0		100	0	0	0		0.9	97.4	1.7	0		0	0	100	0		
Total %	6	26.3	3.2	0	35.5	0.9	0	0	0	0.9	0.5	51.6	0.9	0	53	0	0	10.6	0	10.6	

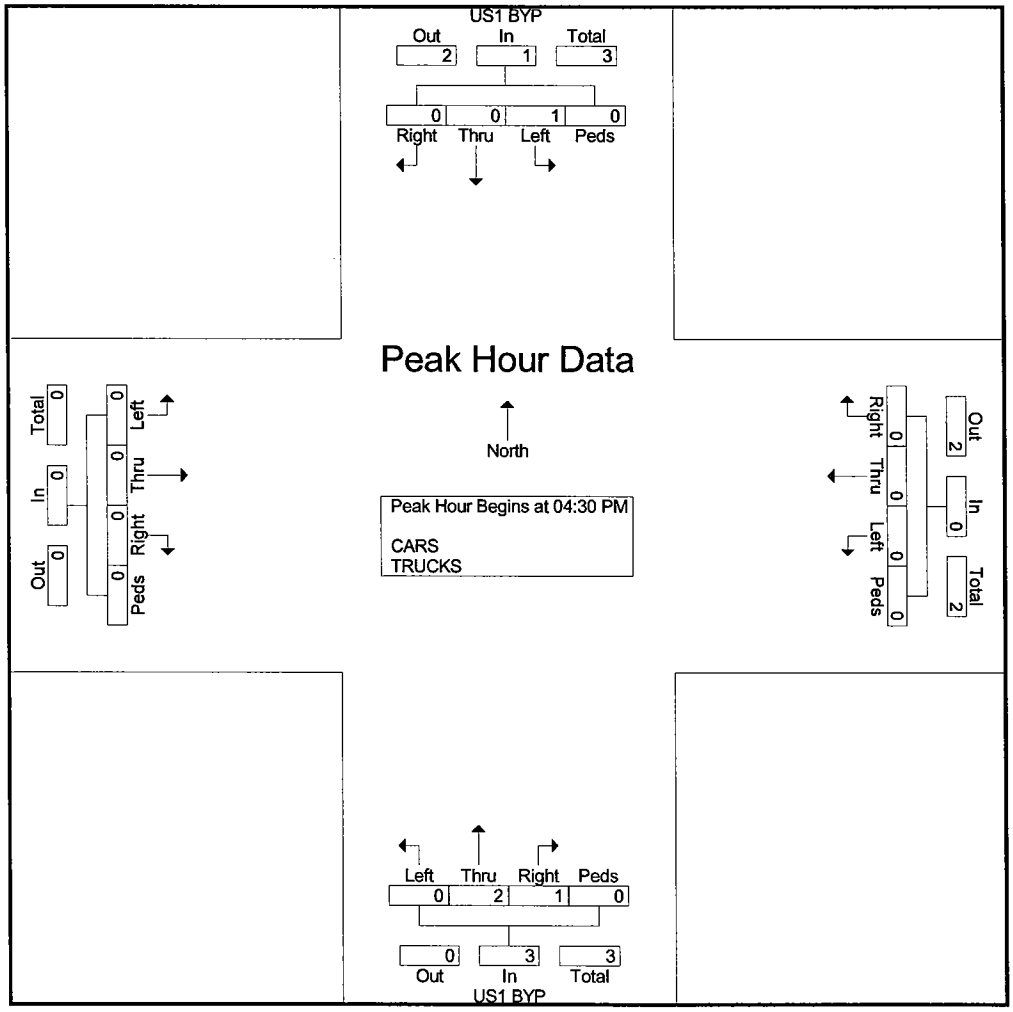


Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Thurs US1 BYP-U-Haul-Existing Site Driveways
Site Code : 1831A
Start Date : 5/24/2018
Page No : 3

	US1 BYP From North					From East					US1 BYP From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	0	0	0	0	**1**	**2**	0	0	**3**	0	0	0	0	0	**3**
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	1	0	1	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	4
% App. Total	0	0	100	0		0	0	0	0		33.3	66.7	0	0		0	0	0	0		
PHF	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.250	.000	.000	.250	.000	.000	.000	.000	.000	.333



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Weather: Clear
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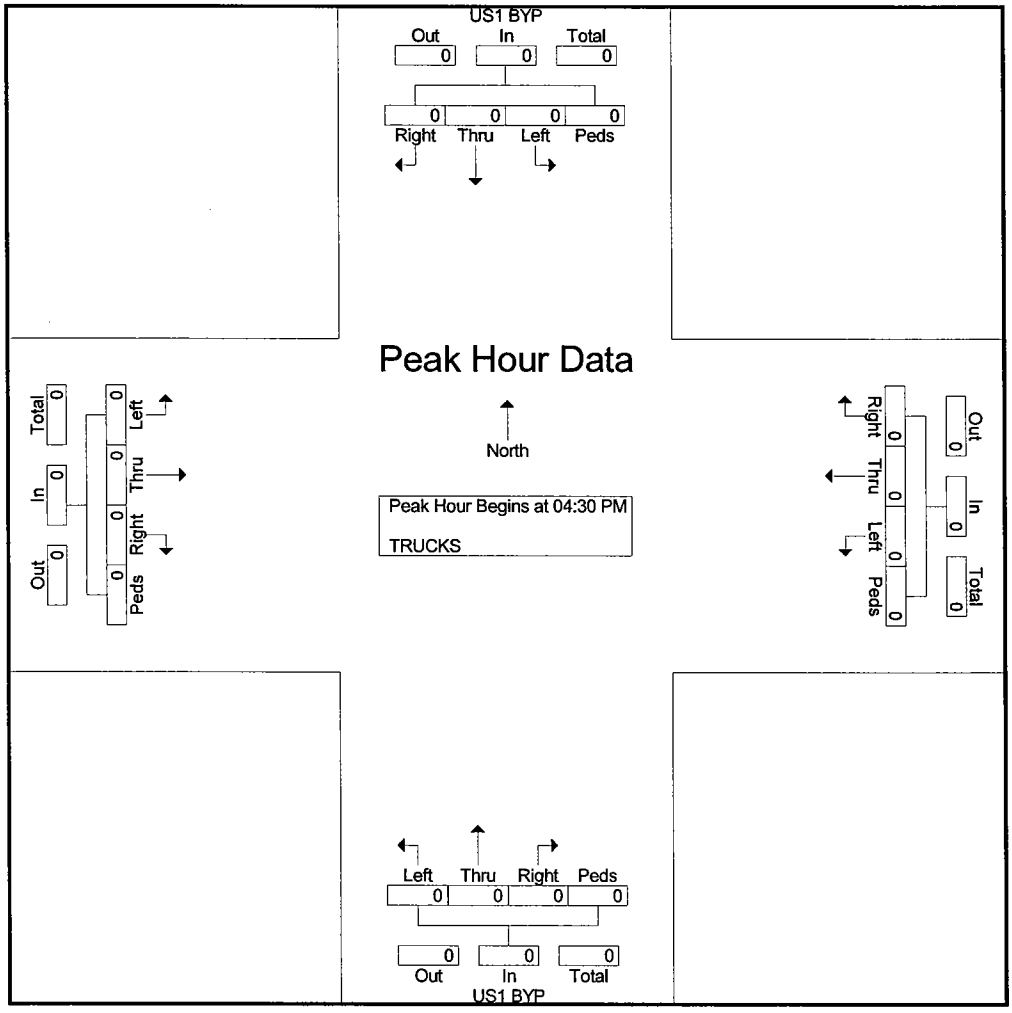
File Name : 1831A Thurs US1 BYP-U-Haul-Existing Site Driveways
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2

	US1 BYP From North					From East					US1 BYP From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



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Weather: Clear
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File Name : 1831A Thurs US1 BYP-U-Haul-Existing Site Driveways
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	US1 BYP From North					From East					US1 BYP From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
03:15 PM	0	2	1	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
03:30 PM	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
03:45 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
Total	0	6	2	0	8	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	12
04:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	2	3	0	0	5	0	0	0	0	0	6
05:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	2	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	0	2	4	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Grand Total	0	9	6	0	15	0	0	0	0	0	3	6	0	0	9	0	0	0	0	0	24
Apprch %	0	60	40	0		0	0	0	0		33.3	66.7	0	0		0	0	0	0		
Total %	0	37.5	25	0	62.5	0	0	0	0	0	12.5	25	0	0	37.5	0	0	0	0	0	
CARS	0	6	5	0	11	0	0	0	0	0	3	5	0	0	8	0	0	0	0	0	19
% CARS	0	66.7	83.3	0	73.3	0	0	0	0	0	100	83.3	0	0	88.9	0	0	0	0	0	79.2
TRUCKS	0	3	1	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5
% TRUCKS	0	33.3	16.7	0	26.7	0	0	0	0	0	0	16.7	0	0	11.1	0	0	0	0	0	20.8

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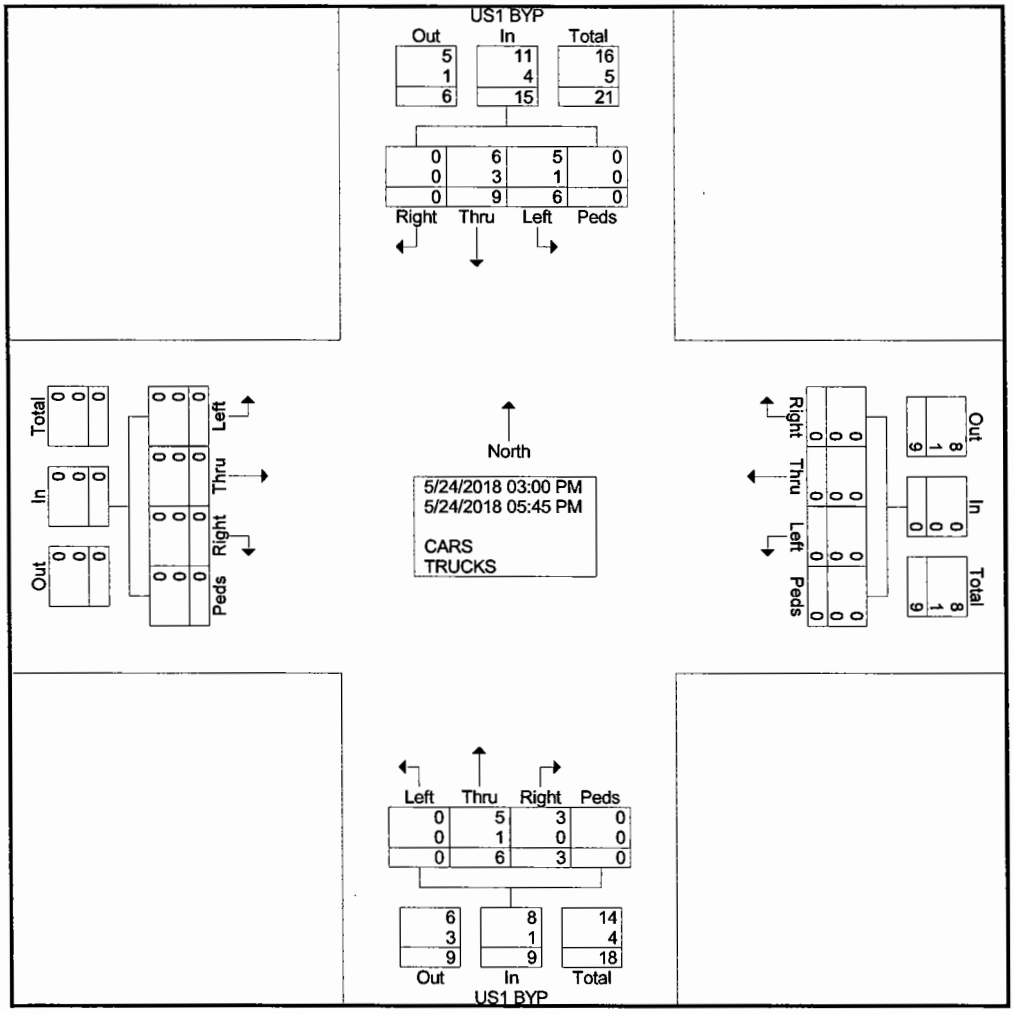
Site Code : 1831A
Start Date : 5/24/2018
Page No : 2



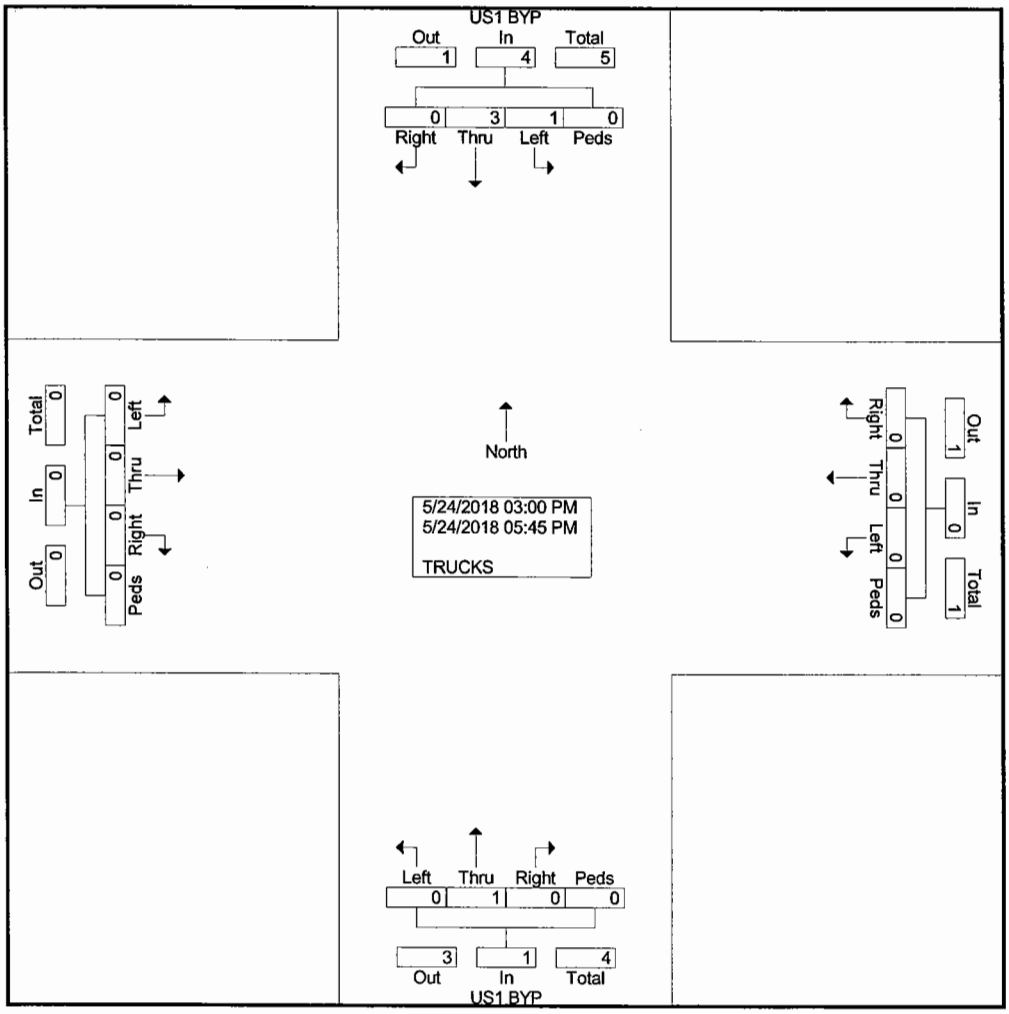
Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Thurs US1 BYP-U-Haul-Existing Site Driveways
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- TRUCKS

	US1 BYP From North					From East					US1 BYP From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total	0	2	1	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
04:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	3	1	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5
Apprch %	0	75	25	0		0	0	0	0		0	100	0	0		0	0	0	0		
Total %	0	60	20	0	80	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	



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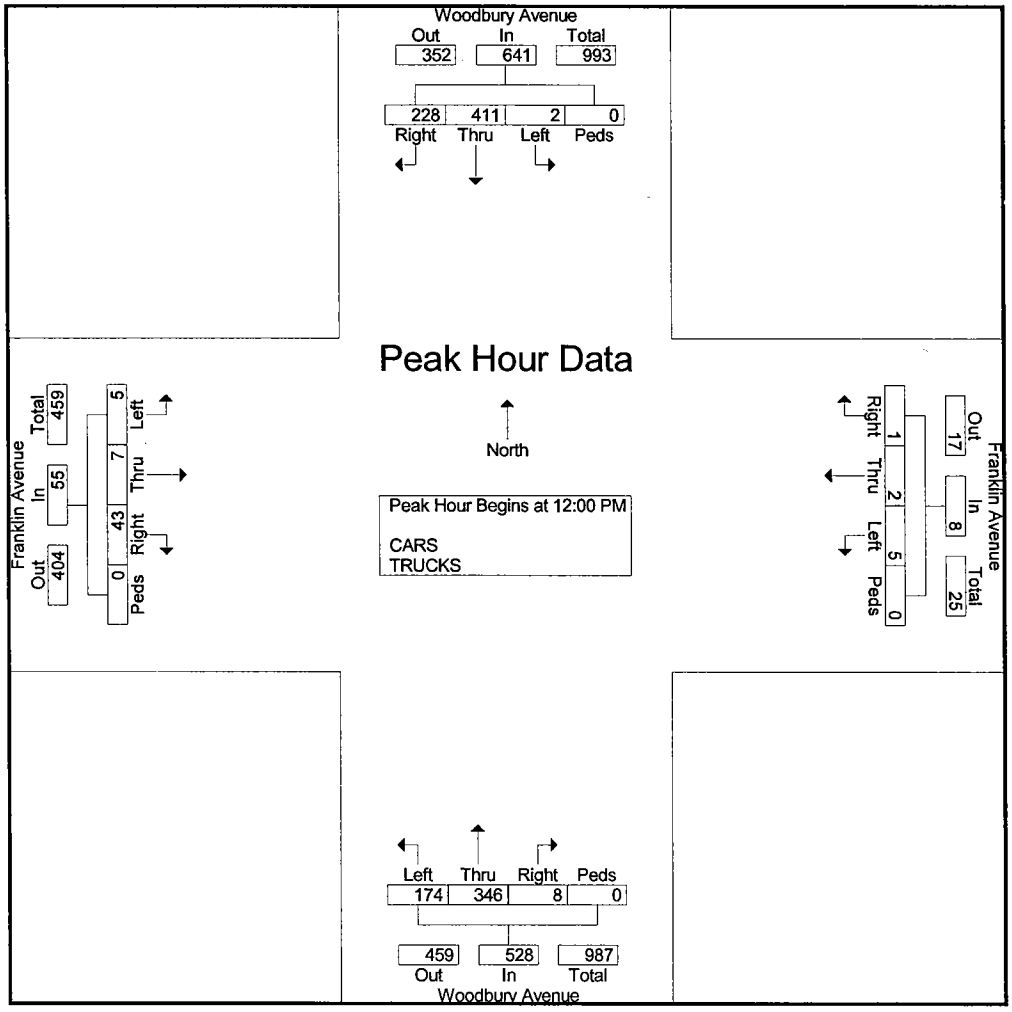
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT Woodbury Avenue-Franklin Avenue
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	Woodbury Avenue From North					Franklin Avenue From East					Woodbury Avenue From South					Franklin Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	**65**	88	0	0	153	0	0	0	0	0	**3**	80	**49**	0	132	9	**3**	1	0	13	298
12:15 PM	65	114	**1**	0	**180**	**1**	0	**4**	0	**5**	1	**102**	42	0	**145**	9	1	0	0	10	**340**
12:30 PM	54	**120**	0	0	174	0	**1**	1	0	2	1	70	44	0	115	11	2	**2**	0	15	306
12:45 PM	44	89	1	0	134	0	1	0	0	1	3	94	39	0	136	**14**	1	2	0	**17**	288
Total Volume	228	411	2	0	641	1	2	5	0	8	8	346	174	0	528	43	7	5	0	55	1232
% App. Total	35.6	64.1	0.3	0		12.5	25	62.5	0		1.5	65.5	33	0		78.2	12.7	9.1	0		
PHF	.877	.856	.500	.000	.890	.250	.500	.313	.000	.400	.667	.848	.888	.000	.910	.768	.583	.625	.000	.809	.906



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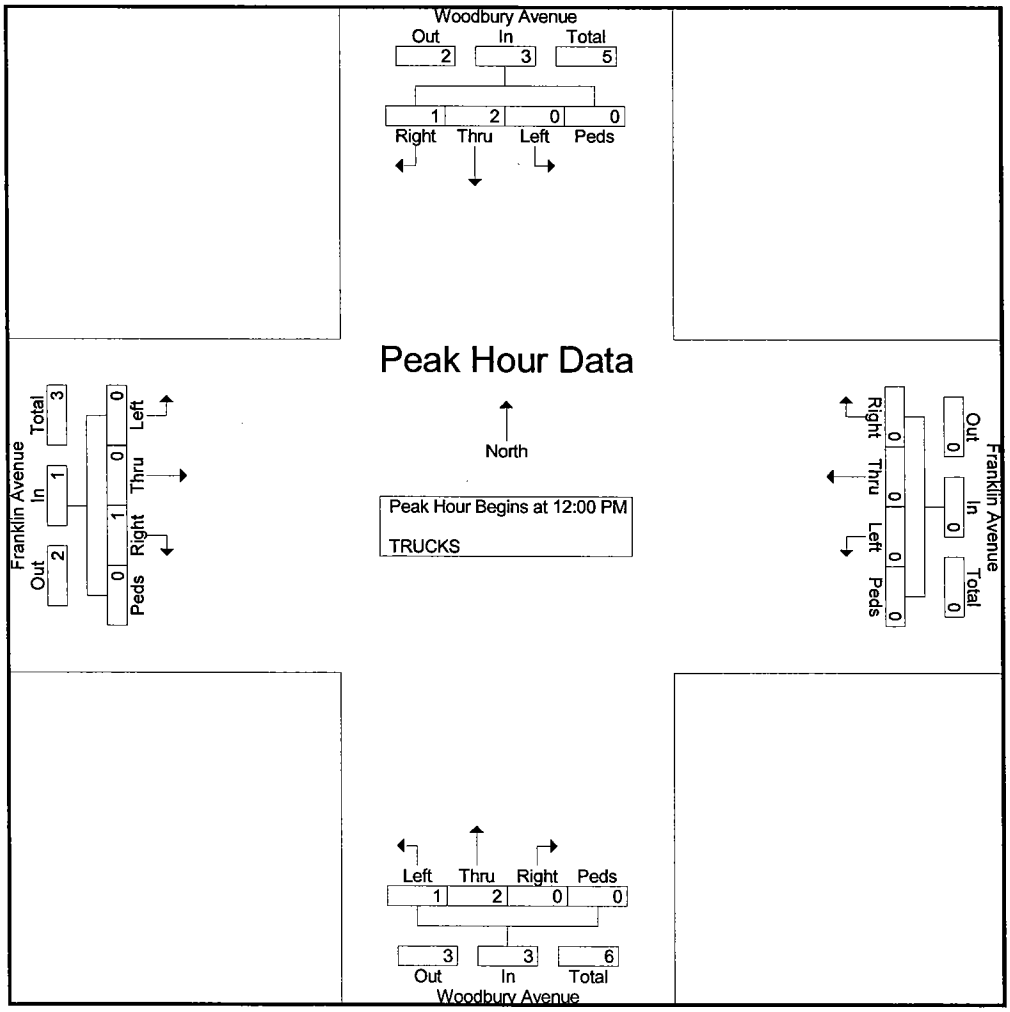
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT Woodbury Avenue-Franklin Avenue
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	Woodbury Avenue From North					Franklin Avenue From East					Woodbury Avenue From South					Franklin Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	**1**	0	0	**1**	0	0	0	0	0	0	**1**	0	0	1	0	0	0	0	0	2
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	**1**	0	**2**	0	0	0	0	0	**3**
12:45 PM	**1**	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	**1**	2
Total Volume	1	2	0	0	3	0	0	0	0	0	0	2	1	0	3	1	0	0	0	1	7
% App. Total	33.3	66.7	0	0		0	0	0	0		0	66.7	33.3	0		100	0	0	0		
PHF	.250	.500	.000	.000	.750	.000	.000	.000	.000	.000	.000	.500	.250	.000	.375	.250	.000	.000	.000	.250	.583



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Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT Woodbury Avenue-Franklin Avenue
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

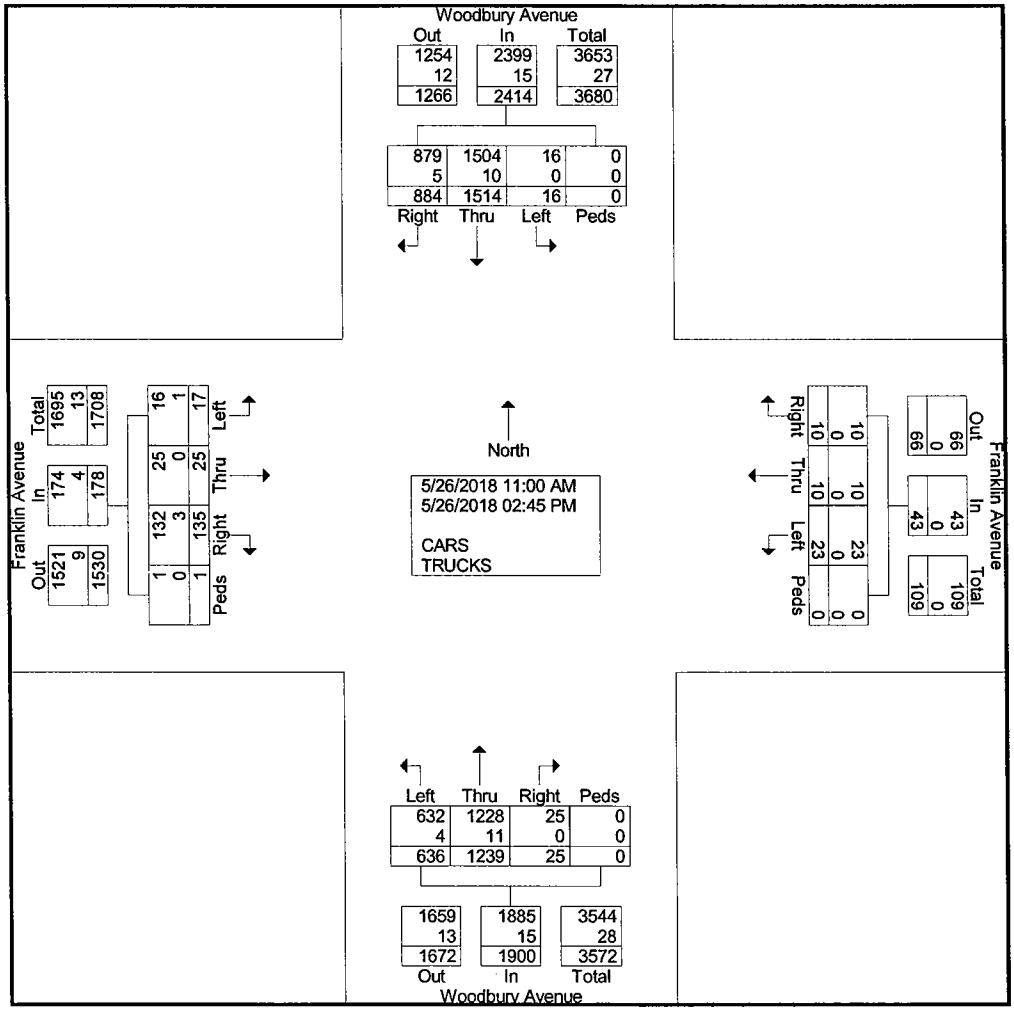
Groups Printed- CARS - TRUCKS

	Woodbury Avenue From North					Franklin Avenue From East					Woodbury Avenue From South					Franklin Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	50	100	1	0	151	0	1	1	0	2	1	66	51	0	118	6	0	0	0	6	277
11:15 AM	48	99	1	0	148	1	1	0	0	2	1	89	40	0	130	7	0	1	0	8	288
11:30 AM	66	105	1	0	172	1	1	1	0	3	1	93	27	0	121	5	1	1	0	7	303
11:45 AM	47	105	0	0	152	1	0	0	0	1	1	77	46	0	124	7	0	2	0	9	286
Total	211	409	3	0	623	3	3	2	0	8	4	325	164	0	493	25	1	4	0	30	1154
12:00 PM	65	88	0	0	153	0	0	0	0	0	3	80	49	0	132	9	3	1	0	13	298
12:15 PM	65	114	1	0	180	1	0	4	0	5	1	102	42	0	145	9	1	0	0	10	340
12:30 PM	54	120	0	0	174	0	1	1	0	2	1	70	44	0	115	11	2	2	0	15	306
12:45 PM	44	89	1	0	134	0	1	0	0	1	3	94	39	0	136	14	1	2	0	17	288
Total	228	411	2	0	641	1	2	5	0	8	8	346	174	0	528	43	7	5	0	55	1232
01:00 PM	44	83	5	0	132	1	1	1	0	3	0	76	39	0	115	5	0	2	0	7	257
01:15 PM	52	78	0	0	130	2	1	1	0	4	1	78	36	0	115	8	3	2	0	13	262
01:30 PM	61	84	0	0	145	1	1	2	0	4	1	60	35	0	96	9	1	0	0	10	255
01:45 PM	57	95	1	0	153	0	0	1	0	1	1	67	30	0	98	6	4	1	1	12	264
Total	214	340	6	0	560	4	3	5	0	12	3	281	140	0	424	28	8	5	1	42	1038
02:00 PM	54	94	1	0	149	1	0	4	0	5	2	64	30	0	96	12	4	2	0	18	268
02:15 PM	53	91	1	0	145	0	1	3	0	4	3	63	47	0	113	11	3	1	0	15	277
02:30 PM	64	77	2	0	143	0	1	3	0	4	3	89	44	0	136	6	1	0	0	7	290
02:45 PM	60	92	1	0	153	1	0	1	0	2	2	71	37	0	110	10	1	0	0	11	276
Total	231	354	5	0	590	2	2	11	0	15	10	287	158	0	455	39	9	3	0	51	1111
Grand Total	884	1514	16	0	2414	10	10	23	0	43	25	1239	636	0	1900	135	25	17	1	178	4535
Apprch %	36.6	62.7	0.7	0		23.3	23.3	53.5	0		1.3	65.2	33.5	0		75.8	14	9.6	0.6		
Total %	19.5	33.4	0.4	0	53.2	0.2	0.2	0.5	0	0.9	0.6	27.3	14	0	41.9	3	0.6	0.4	0	3.9	
CARS	879	1504	16	0	2399	10	10	23	0	43	25	1228	632	0	1885	132	25	16	1	174	4501
% CARS	99.4	99.3	100	0	99.4	100	100	100	0	100	100	99.1	99.4	0	99.2	97.8	100	94.1	100	97.8	99.3
TRUCKS	5	10	0	0	15	0	0	0	0	0	0	11	4	0	15	3	0	1	0	4	34
% TRUCKS	0.6	0.7	0	0	0.6	0	0	0	0	0	0	0.9	0.6	0	0.8	2.2	0	5.9	0	2.2	0.7

Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT Woodbury Avenue-Franklin Avenue
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT Woodbury Avenue-Franklin Avenue
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- TRUCKS

	Woodbury Avenue From North					Franklin Avenue From East					Woodbury Avenue From South					Franklin Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	2
11:15 AM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
11:45 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	2	0	0	3	0	0	0	0	0	0	6	1	0	7	0	0	0	0	0	10
12:00 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	3
12:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
Total	1	2	0	0	3	0	0	0	0	0	0	2	1	0	3	1	0	0	0	1	7
01:00 PM	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	2
01:30 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
01:45 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	2	4	0	0	6	0	0	0	0	0	0	2	0	0	2	1	0	1	0	2	10
02:00 PM	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	1	0	0	0	1	3
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	2	0	0	3	0	0	0	0	0	0	1	2	0	3	1	0	0	0	1	7
Grand Total	5	10	0	0	15	0	0	0	0	0	0	11	4	0	15	3	0	1	0	4	34
Apprch %	33.3	66.7	0	0		0	0	0	0		0	73.3	26.7	0		75	0	25	0		
Total %	14.7	29.4	0	0	44.1	0	0	0	0	0	0	32.4	11.8	0	44.1	8.8	0	2.9	0	11.8	

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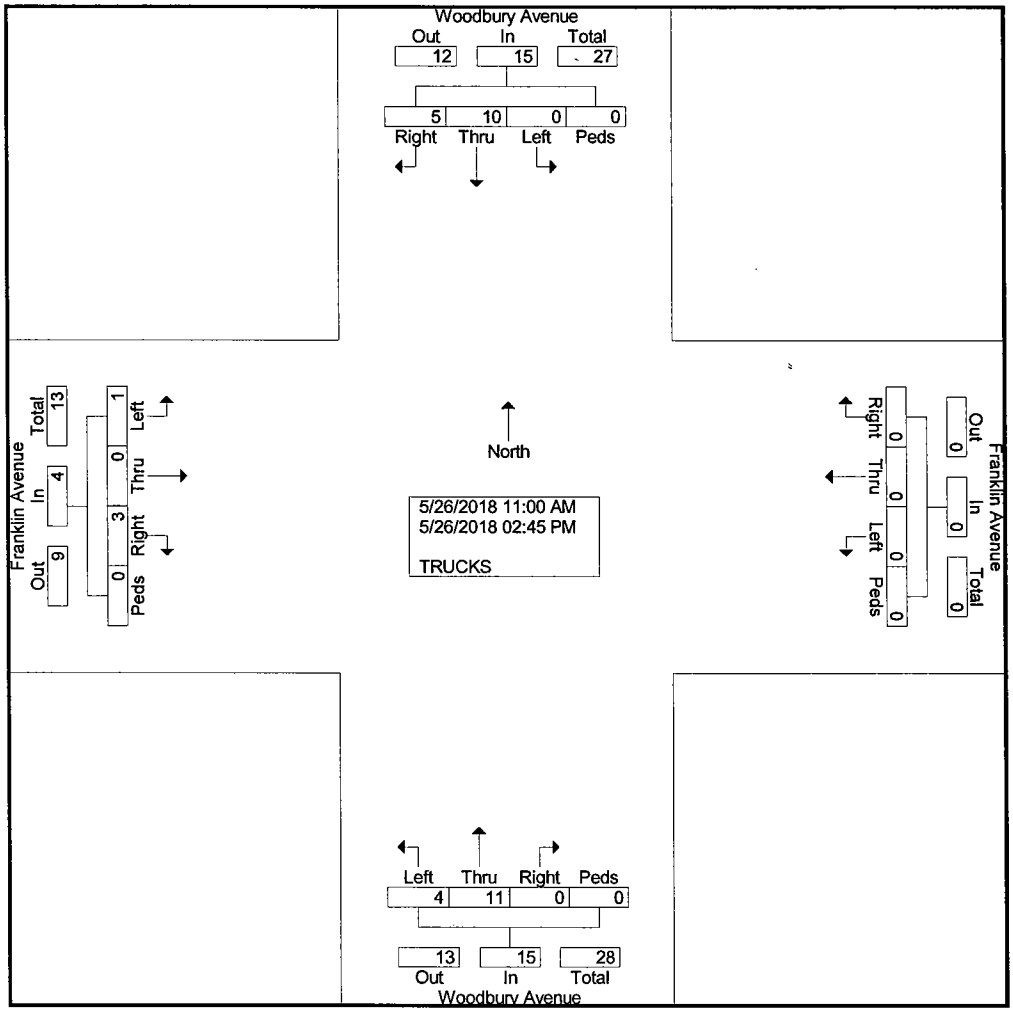
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT Woodbury Avenue-Franklin Avenue
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



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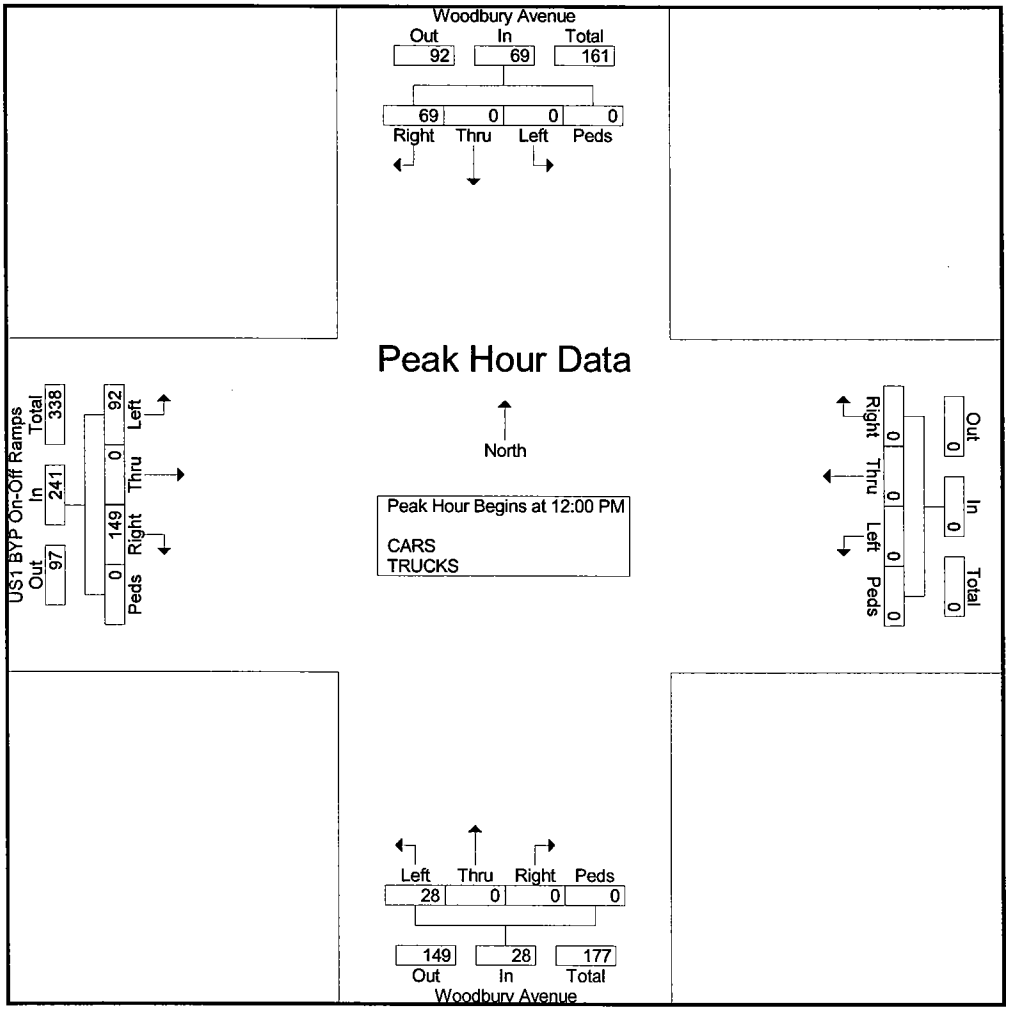
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT Woodbury Avenue-US1 BYP On-Off Ramps
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	Woodbury Avenue From North					From East					Woodbury Avenue From South					US1 BYP On-Off Ramps From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	**22**	0	0	0	**22**	0	0	0	0	0	0	0	6	0	6	**41**	0	**29**	0	**70**	**98**
12:15 PM	20	0	0	0	20	0	0	0	0	0	0	0	4	0	4	35	0	19	0	54	78
12:30 PM	18	0	0	0	18	0	0	0	0	0	0	0	**13**	0	**13**	32	0	27	0	59	90
12:45 PM	9	0	0	0	9	0	0	0	0	0	0	0	5	0	5	41	0	17	0	58	72
Total Volume	69	0	0	0	69	0	0	0	0	0	0	0	28	0	28	149	0	92	0	241	338
% App. Total	100	0	0	0		0	0	0	0		0	0	100	0		61.8	0	38.2	0		
PHF	.784	.000	.000	.000	.784	.000	.000	.000	.000	.000	.000	.000	.538	.000	.538	.909	.000	.793	.000	.861	.862



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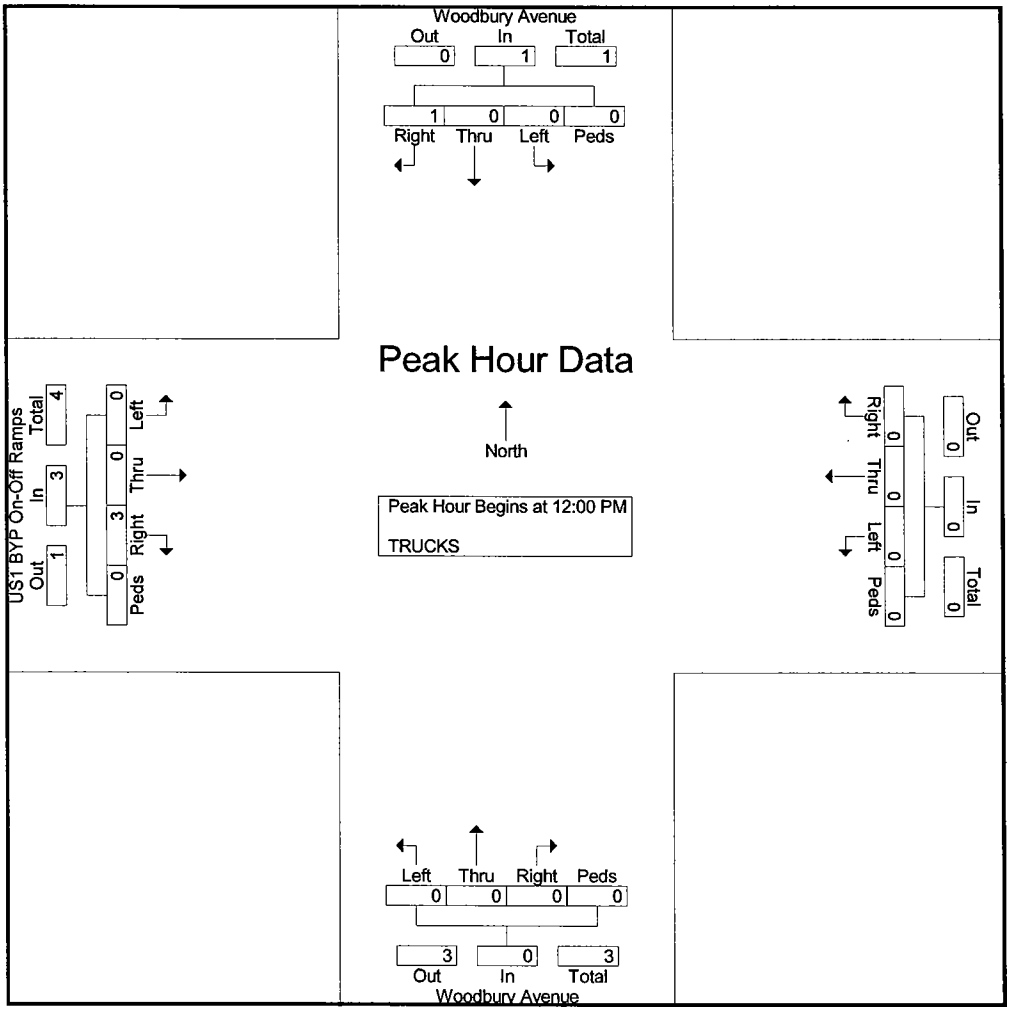
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT Woodbury Avenue-US1 BYP On-Off Ramps
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	Woodbury Avenue From North					From East					Woodbury Avenue From South					US1 BYP On-Off Ramps From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	0	0	**2**	**2**
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	**1**	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	4
% App. Total	100	0	0	0		0	0	0	0		0	0	0	0		100	0	0	0		
PHF	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375	.000	.000	.000	.375	.500



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Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT Woodbury Avenue-US1 BYP On-Off Ramps
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	Woodbury Avenue From North					From East					Woodbury Avenue From South					US1 BYP On-Off Ramps From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	10	0	0	0	10	0	0	0	0	0	0	0	13	0	13	27	0	24	0	51	74
11:15 AM	24	0	0	0	24	0	0	0	0	0	0	0	4	0	4	23	0	27	1	51	79
11:30 AM	11	0	0	0	11	0	0	0	0	0	0	0	5	0	5	30	0	28	3	61	77
11:45 AM	24	0	0	1	25	0	0	0	0	0	0	0	10	0	10	32	0	35	0	67	102
Total	69	0	0	1	70	0	0	0	0	0	0	0	32	0	32	112	0	114	4	230	332
12:00 PM	22	0	0	0	22	0	0	0	0	0	0	0	6	0	6	41	0	29	0	70	98
12:15 PM	20	0	0	0	20	0	0	0	0	0	0	0	4	0	4	35	0	19	0	54	78
12:30 PM	18	0	0	0	18	0	0	0	0	0	0	0	13	0	13	32	0	27	0	59	90
12:45 PM	9	0	0	0	9	0	0	0	0	0	0	0	5	0	5	41	0	17	0	58	72
Total	69	0	0	0	69	0	0	0	0	0	0	0	28	0	28	149	0	92	0	241	338
01:00 PM	16	0	0	0	16	0	0	0	0	0	0	0	9	0	9	20	0	21	2	43	68
01:15 PM	19	0	0	0	19	0	0	0	0	0	0	0	6	0	6	25	0	24	0	49	74
01:30 PM	18	0	0	0	18	0	0	0	0	0	0	0	8	0	8	41	0	22	0	63	89
01:45 PM	18	0	0	0	18	0	0	0	0	0	0	0	10	0	10	36	0	15	0	51	79
Total	71	0	0	0	71	0	0	0	0	0	0	0	33	0	33	122	0	82	2	206	310
02:00 PM	16	0	0	0	16	0	0	0	0	0	0	0	7	0	7	27	0	23	0	50	73
02:15 PM	8	0	0	0	8	0	0	0	0	0	0	0	7	0	7	35	0	23	0	58	73
02:30 PM	13	0	0	0	13	0	0	0	0	0	0	0	9	0	9	28	0	23	0	51	73
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	2
Total	37	0	0	0	37	0	0	0	0	0	0	0	23	0	23	91	0	70	0	161	221
Grand Total	246	0	0	1	247	0	0	0	0	0	0	0	116	0	116	474	0	358	6	838	1201
Apprch %	99.6	0	0	0.4		0	0	0	0		0	0	100	0		56.6	0	42.7	0.7		
Total %	20.5	0	0	0.1	20.6	0	0	0	0	0	0	0	9.7	0	9.7	39.5	0	29.8	0.5	69.8	
CARS	243	0	0	1	244	0	0	0	0	0	0	0	115	0	115	471	0	352	6	829	1188
% CARS	98.8	0	0	100	98.8	0	0	0	0	0	0	0	99.1	0	99.1	99.4	0	98.3	100	98.9	98.9
TRUCKS	3	0	0	0	3	0	0	0	0	0	0	0	1	0	1	3	0	6	0	9	13
% TRUCKS	1.2	0	0	0	1.2	0	0	0	0	0	0	0	0.9	0	0.9	0.6	0	1.7	0	1.1	1.1

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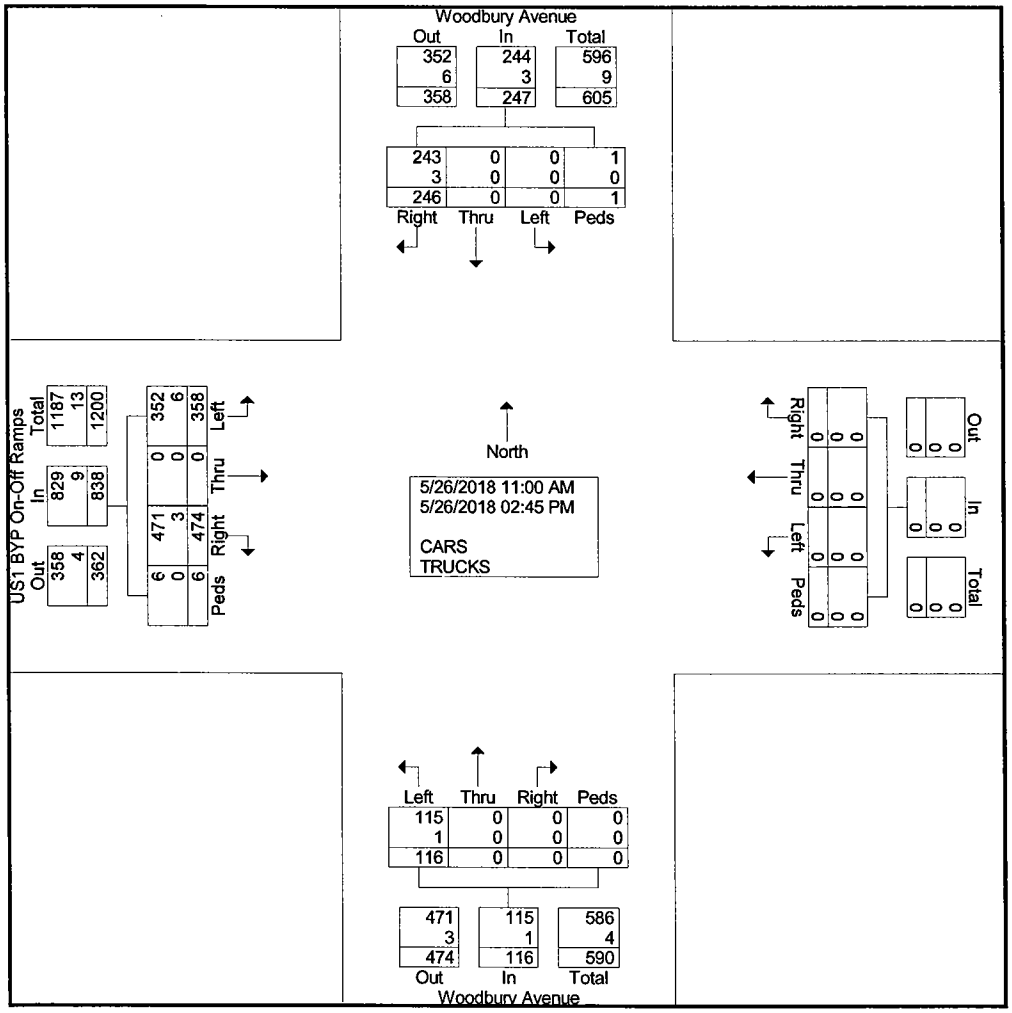
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT Woodbury Avenue-US1 BYP On-Off Ramps
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



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Weather: Clear
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File Name : 1831A SAT Woodbury Avenue-US1 BYP On-Off Ramps
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- TRUCKS

	Woodbury Avenue From North					From East					Woodbury Avenue From South					US1 BYP On-Off Ramps From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	4
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	4
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	3
Total	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	3
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
Grand Total	3	0	0	0	3	0	0	0	0	0	0	0	1	0	1	3	0	6	0	9	13
Apprch %	100	0	0	0		0	0	0	0		0	0	100	0		33.3	0	66.7	0		
Total %	23.1	0	0	0	23.1	0	0	0	0	0	0	0	7.7	0	7.7	23.1	0	46.2	0	69.2	

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Weather: Clear
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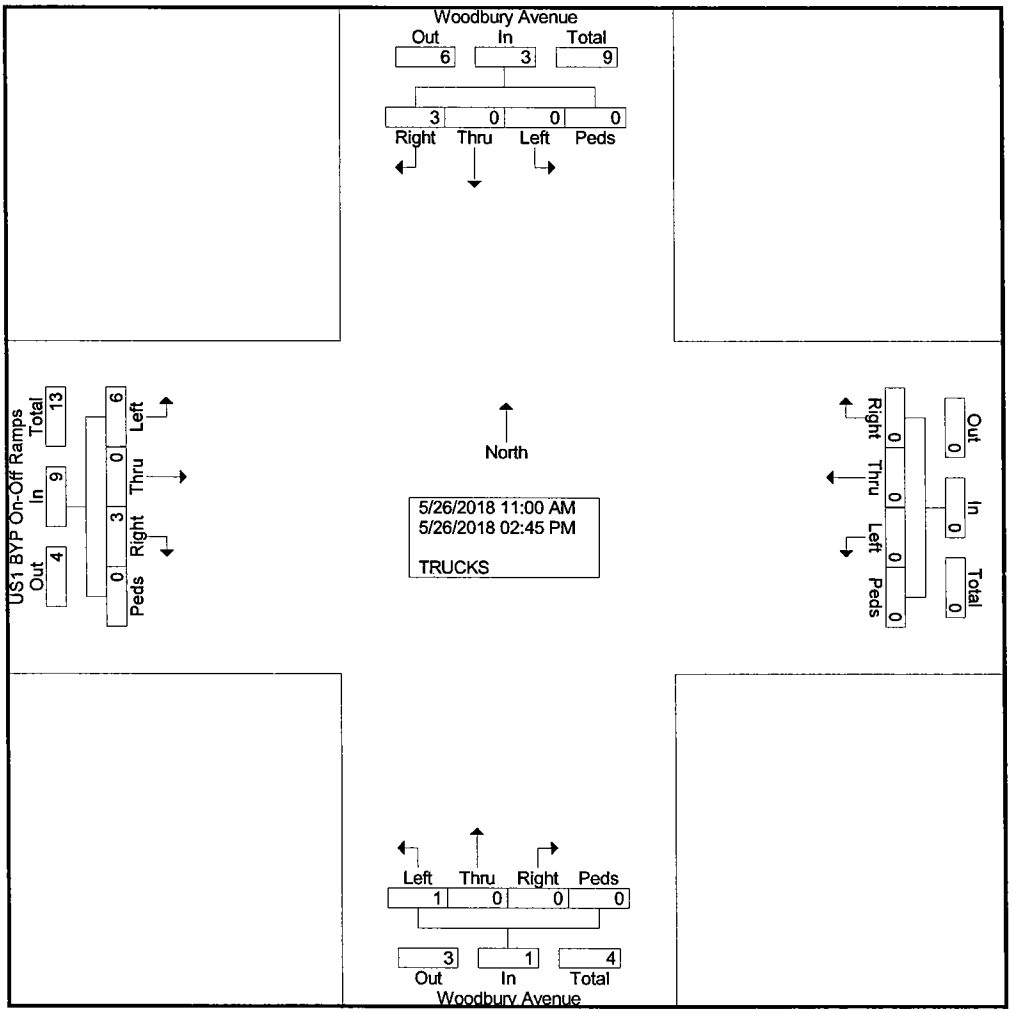
File Name : 1831A SAT Woodbury Avenue-US1 BYP On-Off Ramps
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



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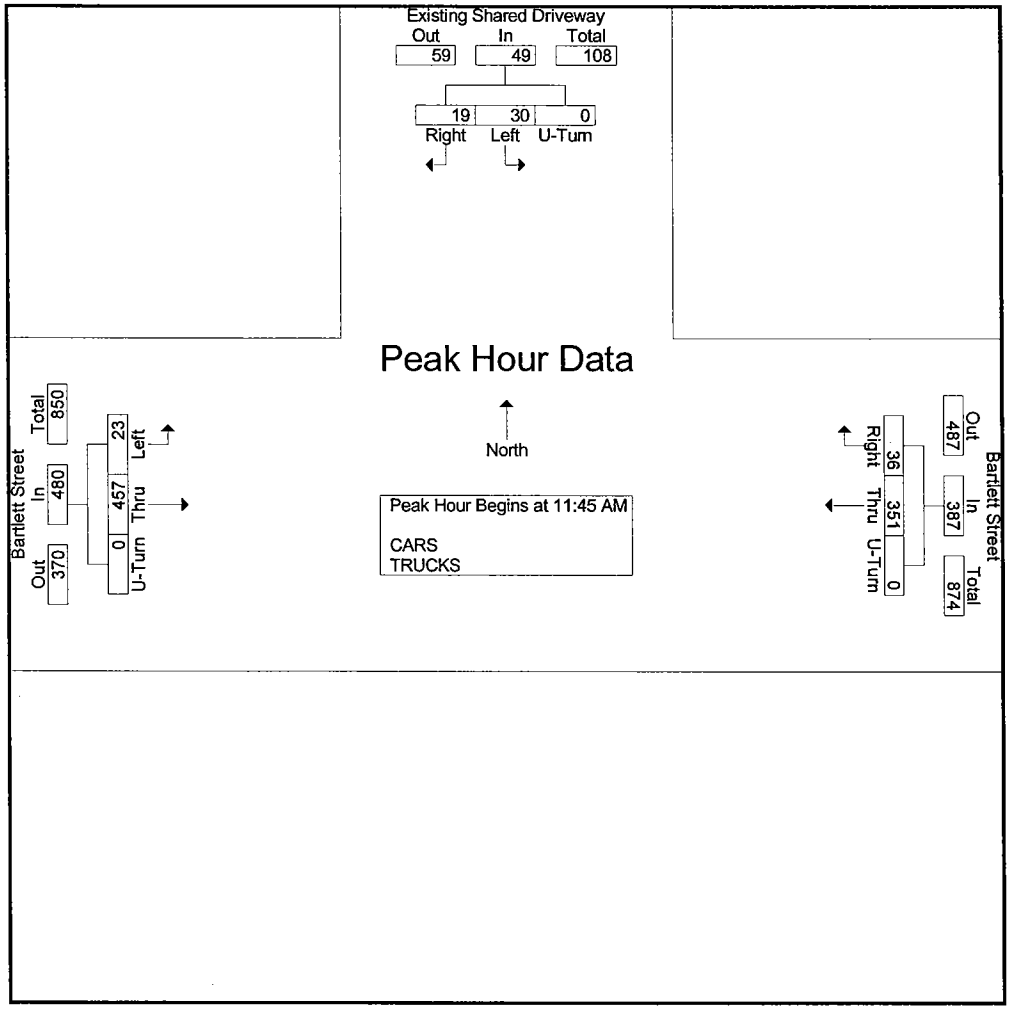
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_C_SAT_Bart-Shared
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	Existing Shared Driveway From North				Bartlett Street From East				Bartlett Street From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 02:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:45 AM													
11:45 AM	4	6	0	10	**10**	84	0	94	111	2	0	113	217
12:00 PM	**6**	**10**	0	**16**	9	79	0	88	104	**8**	0	112	216
12:15 PM	5	6	0	11	9	**102**	0	**111**	120	7	0	127	**249**
12:30 PM	4	8	0	12	8	86	0	94	**122**	6	0	**128**	234
Total Volume	19	30	0	49	36	351	0	387	457	23	0	480	916
% App. Total	38.8	61.2	0		9.3	90.7	0		95.2	4.8	0		
PHF	.792	.750	.000	.766	.900	.860	.000	.872	.936	.719	.000	.938	.920



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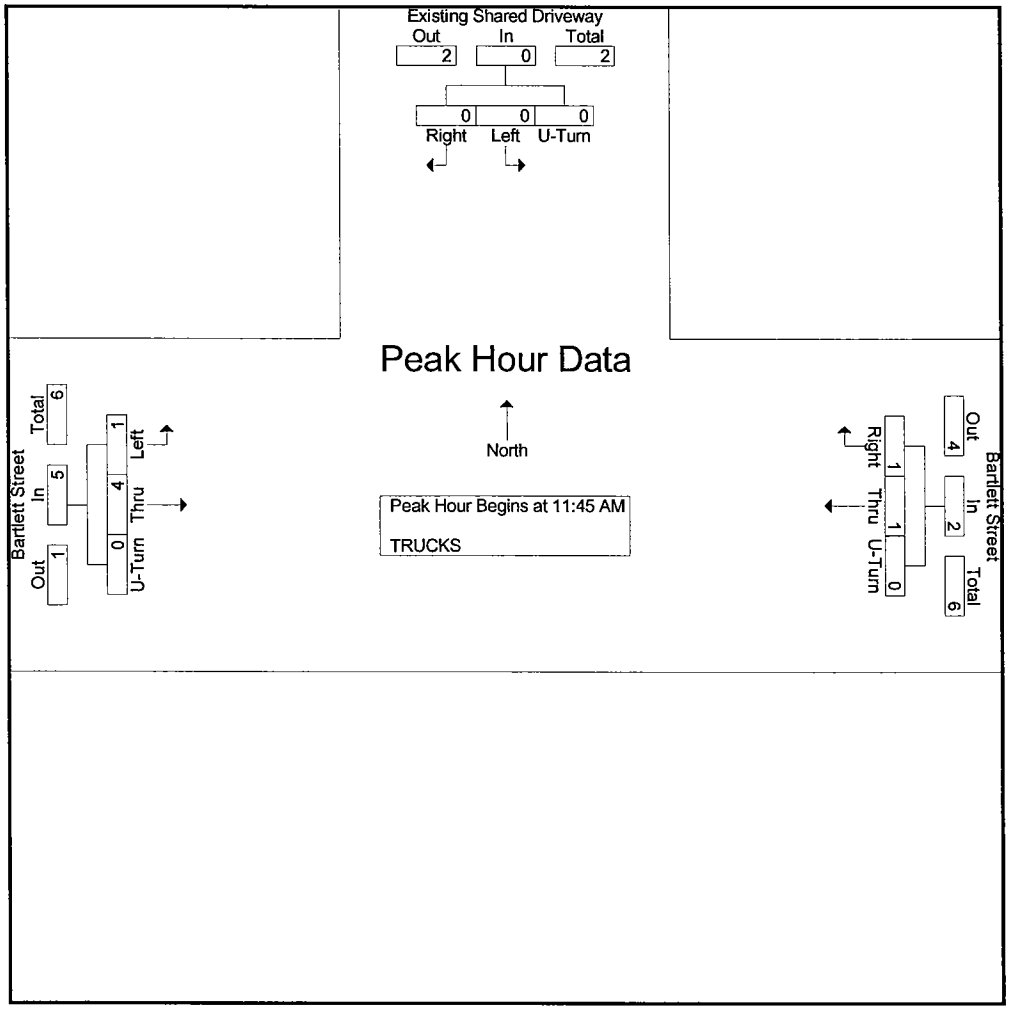
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_C_SAT_Bart-Shared
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	Existing Shared Driveway From North				Bartlett Street From East				Bartlett Street From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:45 AM to 12:30 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:45 AM													
11:45 AM	0	0	0	0	0	0	0	0	**2**	0	0	**2**	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	**1**	0	0	**1**	0	**1**	0	1	2
12:30 PM	0	0	0	0	0	**1**	0	1	2	0	0	2	**3**
Total Volume	0	0	0	0	1	1	0	2	4	1	0	5	7
% App. Total	0	0	0		50	50	0		80	20	0		
PHF	.000	.000	.000	.000	.250	.250	.000	.500	.500	.250	.000	.625	.583



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Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_C_SAT_Bart-Shared
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	Existing Shared Driveway From North				Bartlett Street From East				Bartlett Street From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
11:00 AM	2	5	0	7	6	81	0	87	116	2	0	118	212
11:15 AM	3	7	0	10	4	104	0	108	103	5	0	108	226
11:30 AM	5	4	0	9	5	79	0	84	89	1	0	90	183
11:45 AM	4	6	0	10	10	84	0	94	111	2	0	113	217
Total	14	22	0	36	25	348	0	373	419	10	0	429	838
12:00 PM	6	10	0	16	9	79	0	88	104	8	0	112	216
12:15 PM	5	6	0	11	9	102	0	111	120	7	0	127	249
12:30 PM	4	8	0	12	8	86	0	94	122	6	0	128	234
12:45 PM	6	9	0	15	8	94	0	102	93	6	0	99	216
Total	21	33	0	54	34	361	0	395	439	27	0	466	915
01:00 PM	6	6	0	12	9	84	0	93	100	2	0	102	207
01:15 PM	6	7	0	13	9	86	0	95	85	5	0	90	198
01:30 PM	8	7	0	15	8	71	0	79	97	5	0	102	196
01:45 PM	1	3	0	4	10	90	0	100	99	3	0	102	206
Total	21	23	0	44	36	331	0	367	381	15	0	396	807
02:00 PM	6	9	0	15	8	73	0	81	95	7	0	102	198
02:15 PM	8	10	0	18	7	71	0	78	90	5	0	95	191
02:30 PM	5	6	0	11	7	99	0	106	66	3	0	69	186
02:45 PM	5	8	0	13	6	86	0	92	82	6	0	88	193
Total	24	33	0	57	28	329	0	357	333	21	0	354	768
Grand Total	80	111	0	191	123	1369	0	1492	1572	73	0	1645	3328
Apprch %	41.9	58.1	0		8.2	91.8	0		95.6	4.4	0		
Total %	2.4	3.3	0	5.7	3.7	41.1	0	44.8	47.2	2.2	0	49.4	
CARS	80	110	0	190	120	1365	0	1485	1565	71	0	1636	3311
% CARS	100	99.1	0	99.5	97.6	99.7	0	99.5	99.6	97.3	0	99.5	99.5
TRUCKS	0	1	0	1	3	4	0	7	7	2	0	9	17
% TRUCKS	0	0.9	0	0.5	2.4	0.3	0	0.5	0.4	2.7	0	0.5	0.5

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Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_C_SAT_Bart-Shared
Site Code : 1831A
Start Date : 5/26/2018
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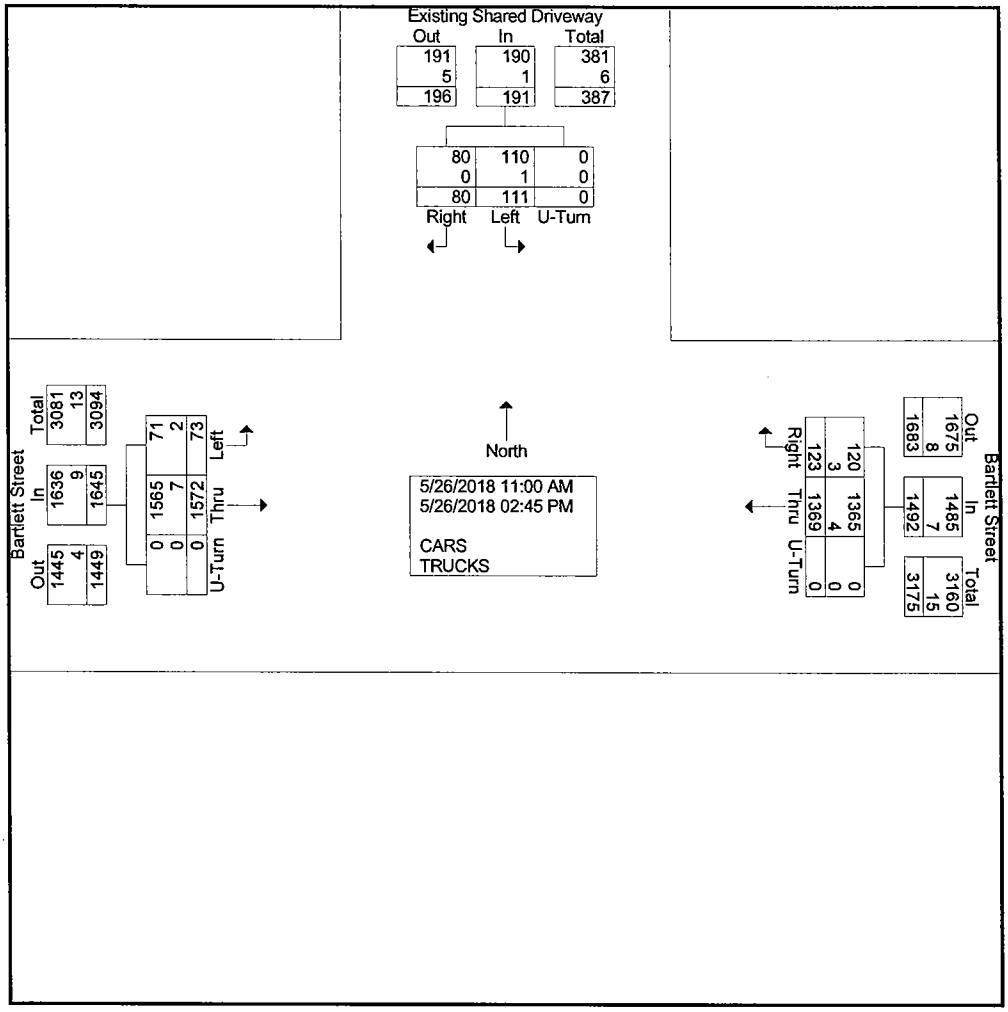

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Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_C_SAT_Bart-Shared
Site Code : 1831A
Start Date : 5/26/2018
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Groups Printed- TRUCKS

	Existing Shared Driveway From North				Bartlett Street From East				Bartlett Street From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
11:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	0	0	0	0	1	0	1	3	0	0	3	4
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	1	0	0	1	0	1	0	1	2
12:30 PM	0	0	0	0	0	1	0	1	2	0	0	2	3
12:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	1	1	0	2	2	2	0	4	6
01:00 PM	0	0	0	0	1	1	0	2	1	0	0	1	3
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	1	1	0	2	2	0	0	2	4
02:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
02:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
02:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	1	1	0	2	0	0	0	0	3
Grand Total	0	1	0	1	3	4	0	7	7	2	0	9	17
Apprch %	0	100	0		42.9	57.1	0		77.8	22.2	0		
Total %	0	5.9	0	5.9	17.6	23.5	0	41.2	41.2	11.8	0	52.9	

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File Name : 1831A_INT_C_SAT_Bart-Shared
Site Code : 1831A
Start Date : 5/26/2018
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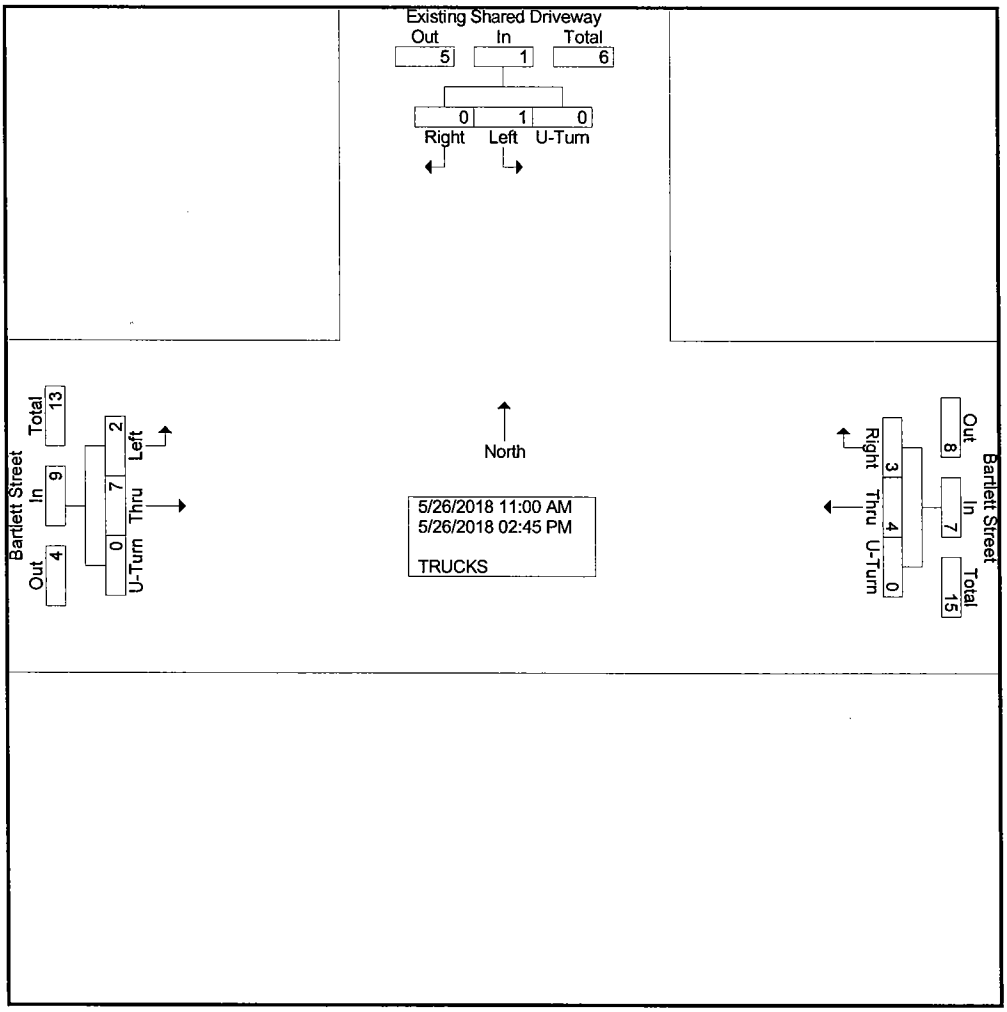

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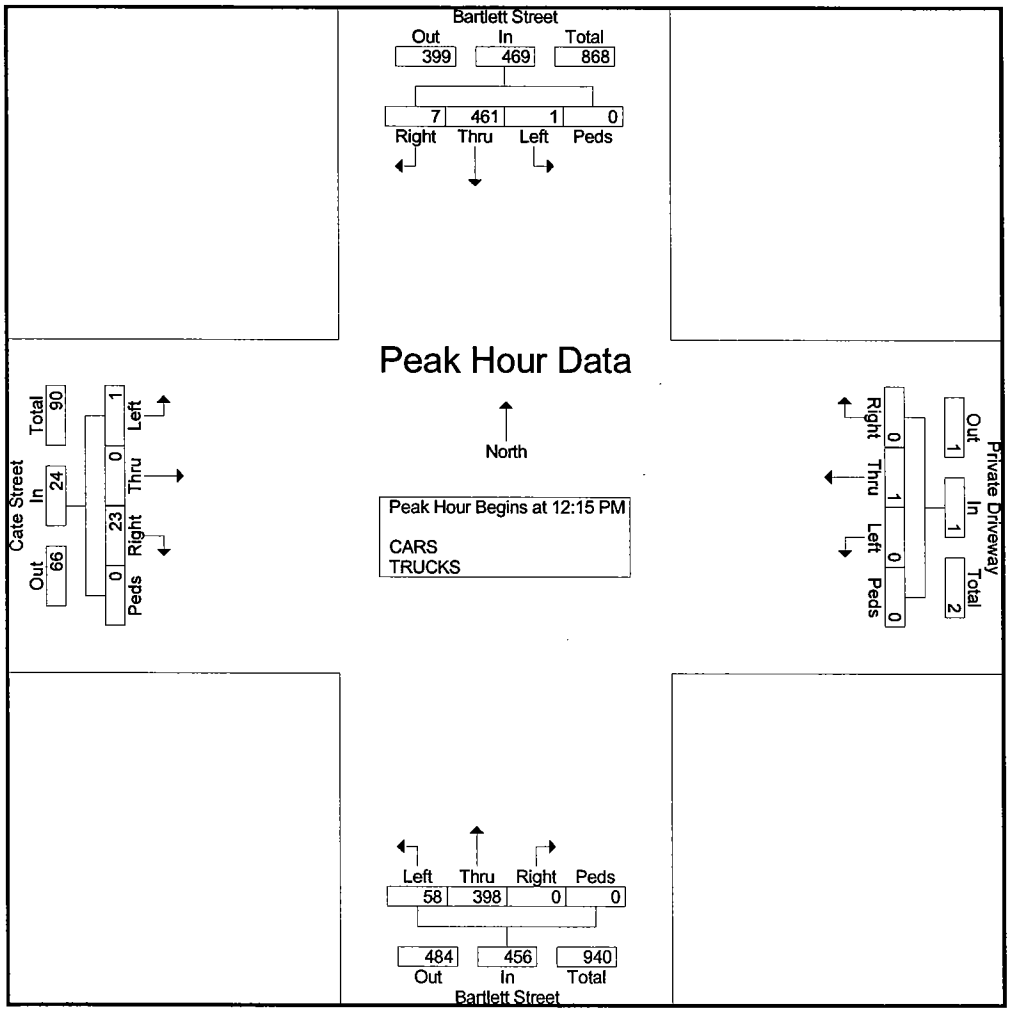
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_D_SAT_Bartlett-Cate
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	Bartlett Street From North					Private Driveway From East					Bartlett Street From South					Cate Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:15 PM																					
12:15 PM	1	125	0	0	126	0	0	0	0	0	0	**109**	16	0	**125**	5	0	0	0	5	**256**
12:30 PM	0	**130**	1	0	**131**	0	**1**	0	0	**1**	0	95	9	0	104	4	0	0	0	4	240
12:45 PM	1	102	0	0	103	0	0	0	0	0	0	102	16	0	118	5	0	**1**	0	6	227
01:00 PM	**5**	104	0	0	109	0	0	0	0	0	0	92	**17**	0	109	**9**	0	0	0	**9**	227
Total Volume	7	461	1	0	469	0	1	0	0	1	0	398	58	0	456	23	0	1	0	24	950
% App. Total	1.5	98.3	0.2	0		0	100	0	0		0	87.3	12.7	0		95.8	0	4.2	0		
PHF	.350	.887	.250	.000	.895	.000	.250	.000	.000	.250	.000	.913	.853	.000	.912	.639	.000	.250	.000	.667	.928



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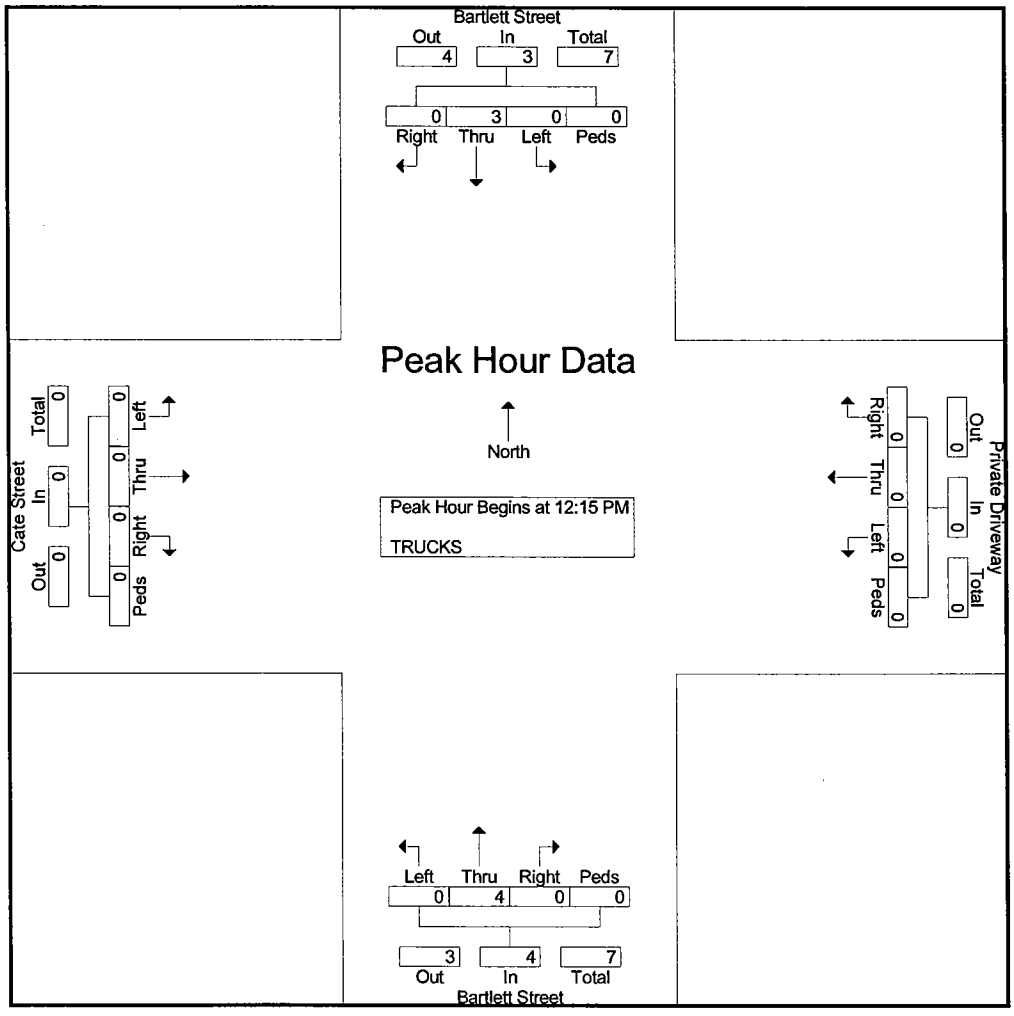
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_D_SAT_Bartlett-Cate
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	Bartlett Street From North					Private Driveway From East					Bartlett Street From South					Cate Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:15 PM to 01:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:15 PM																					
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
12:30 PM	0	**2**	0	0	**2**	0	0	0	0	0	0	**1**	0	0	1	0	0	0	0	0	**3**
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	1	0	0	1	0	0	0	0	0	0	**2**	0	0	**2**	0	0	0	0	0	3
Total Volume	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7
% App. Total	0	100	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.375	.000	.000	.375	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.583



Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_D_SAT_Bartlett-Cate
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	Bartlett Street From North					Private Driveway From East					Bartlett Street From South					Cate Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	118	0	0	118	0	0	0	0	0	0	89	14	0	103	10	0	0	0	10	231
11:15 AM	2	110	0	0	112	0	0	0	0	0	0	106	20	0	126	8	0	0	0	8	246
11:30 AM	1	90	0	0	91	0	0	0	0	0	0	84	11	0	95	1	0	1	0	2	188
11:45 AM	2	112	0	0	114	0	0	0	0	0	0	97	13	0	110	6	0	1	0	7	231
Total	5	430	0	0	435	0	0	0	0	0	0	376	58	0	434	25	0	2	0	27	896
12:00 PM	1	112	0	0	113	0	0	1	0	1	1	86	12	0	99	5	0	0	0	5	218
12:15 PM	1	125	0	0	126	0	0	0	0	0	0	109	16	0	125	5	0	0	0	5	256
12:30 PM	0	130	1	0	131	0	1	0	0	1	0	95	9	0	104	4	0	0	0	4	240
12:45 PM	1	102	0	0	103	0	0	0	0	0	0	102	16	0	118	5	0	1	0	6	227
Total	3	469	1	0	473	0	1	1	0	2	1	392	53	0	446	19	0	1	0	20	941
01:00 PM	5	104	0	0	109	0	0	0	0	0	0	92	17	0	109	9	0	0	0	9	227
01:15 PM	4	91	0	0	95	0	0	0	0	0	0	93	17	0	110	4	0	4	0	8	213
01:30 PM	2	101	1	0	104	1	0	1	0	2	1	79	12	0	92	9	0	0	0	9	207
01:45 PM	2	105	0	0	107	0	0	0	0	0	0	98	24	0	122	5	0	1	0	6	235
Total	13	401	1	0	415	1	0	1	0	2	1	362	70	0	433	27	0	5	0	32	882
02:00 PM	1	96	0	0	97	0	0	0	0	0	0	80	19	0	99	3	0	1	0	4	200
02:15 PM	0	99	0	0	99	1	0	0	0	1	1	80	14	0	95	5	0	0	0	5	200
02:30 PM	1	81	0	0	82	0	0	0	0	0	0	102	10	0	112	2	0	2	0	4	198
02:45 PM	0	94	0	0	94	0	0	0	0	0	0	95	12	0	107	5	0	0	0	5	206
Total	2	370	0	0	372	1	0	0	0	1	1	357	55	0	413	15	0	3	0	18	804
Grand Total	23	1670	2	0	1695	2	1	2	0	5	3	1487	236	0	1726	86	0	11	0	97	3523
Apprch %	1.4	98.5	0.1	0		40	20	40	0		0.2	86.2	13.7	0		88.7	0	11.3	0		
Total %	0.7	47.4	0.1	0	48.1	0.1	0	0.1	0	0.1	0.1	42.2	6.7	0	49	2.4	0	0.3	0	2.8	
CARS	23	1662	2	0	1687	2	1	2	0	5	3	1479	235	0	1717	86	0	11	0	97	3506
% CARS	100	99.5	100	0	99.5	100	100	100	0	100	100	99.5	99.6	0	99.5	100	0	100	0	100	99.5
TRUCKS	0	8	0	0	8	0	0	0	0	0	0	8	1	0	9	0	0	0	0	0	17
% TRUCKS	0	0.5	0	0	0.5	0	0	0	0	0	0	0.5	0.4	0	0.5	0	0	0	0	0	0.5

Stephen G. Pernaw & Co., Inc.
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Weather: Clear
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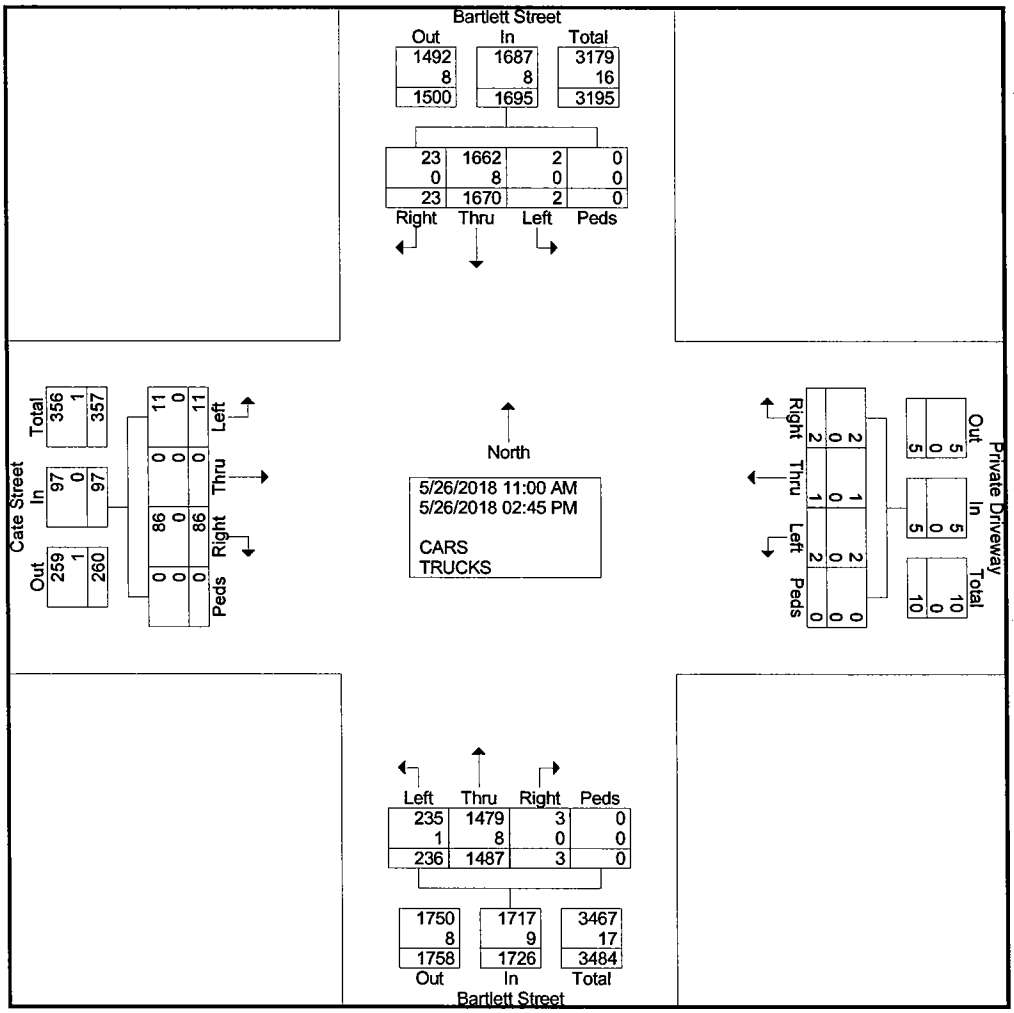
File Name : 1831A_INT_D_SAT_Bartlett-Cate
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



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Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- TRUCKS

	Bartlett Street From North					Private Driveway From East					Bartlett Street From South					Cate Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
11:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
12:30 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
01:00 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
02:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
02:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total	0	2	0	0	2	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	6
Grand Total	0	8	0	0	8	0	0	0	0	0	0	8	1	0	9	0	0	0	0	0	17
Apprch %	0	100	0	0		0	0	0	0		0	88.9	11.1	0		0	0	0	0		
Total %	0	47.1	0	0	47.1	0	0	0	0	0	0	47.1	5.9	0	52.9	0	0	0	0	0	

Stephen G. Pernaw & Co., Inc.
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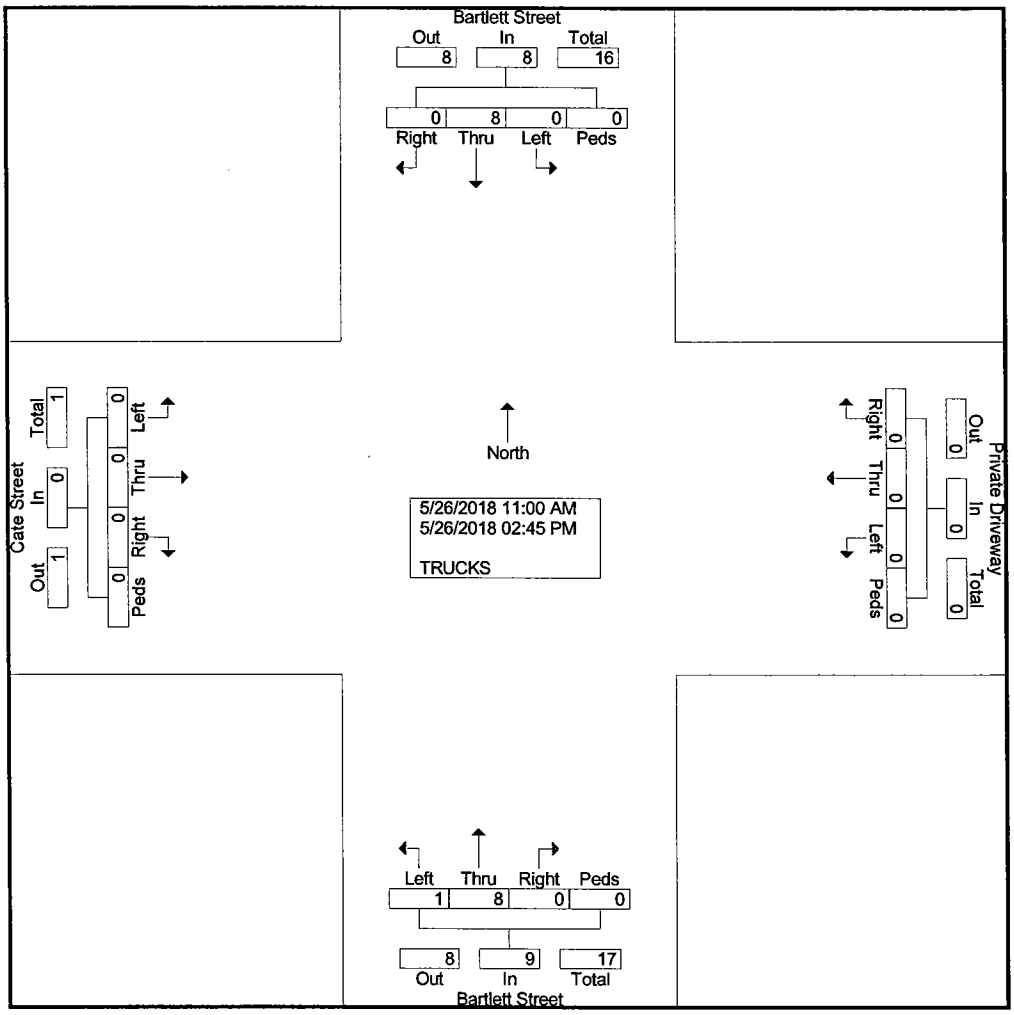
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



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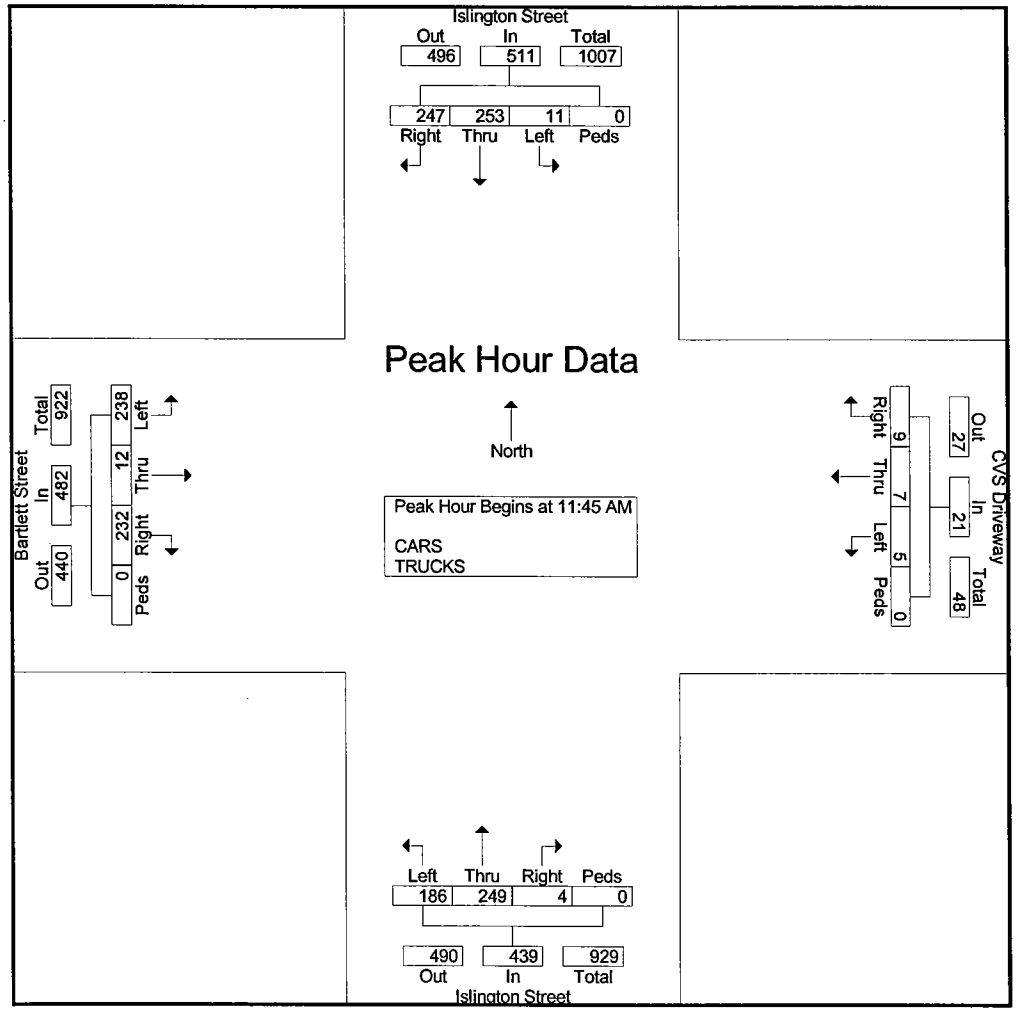
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_E_SAT_Islington-Bartlett
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	Islington Street From North					CVS Driveway From East					Islington Street From South					Bartlett Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:45 AM																					
11:45 AM	**71**	**73**	**4**	0	**148**	2	0	0	0	2	**1**	66	39	0	106	62	1	47	0	110	**366**
12:00 PM	52	67	4	0	123	2	2	**3**	0	**7**	1	**70**	47	0	**118**	45	2	65	0	112	360
12:15 PM	67	45	0	0	112	**4**	2	1	0	7	1	54	**57**	0	112	62	4	**67**	0	**133**	364
12:30 PM	57	68	3	0	128	1	**3**	1	0	5	1	59	43	0	103	**63**	**5**	59	0	127	363
Total Volume	247	253	11	0	511	9	7	5	0	21	4	249	186	0	439	232	12	238	0	482	1453
% App. Total	48.3	49.5	2.2	0		42.9	33.3	23.8	0		0.9	56.7	42.4	0		48.1	2.5	49.4	0		
PHF	.870	.866	.688	.000	.863	.563	.583	.417	.000	.750	1.00	.889	.816	.000	.930	.921	.600	.888	.000	.906	.992



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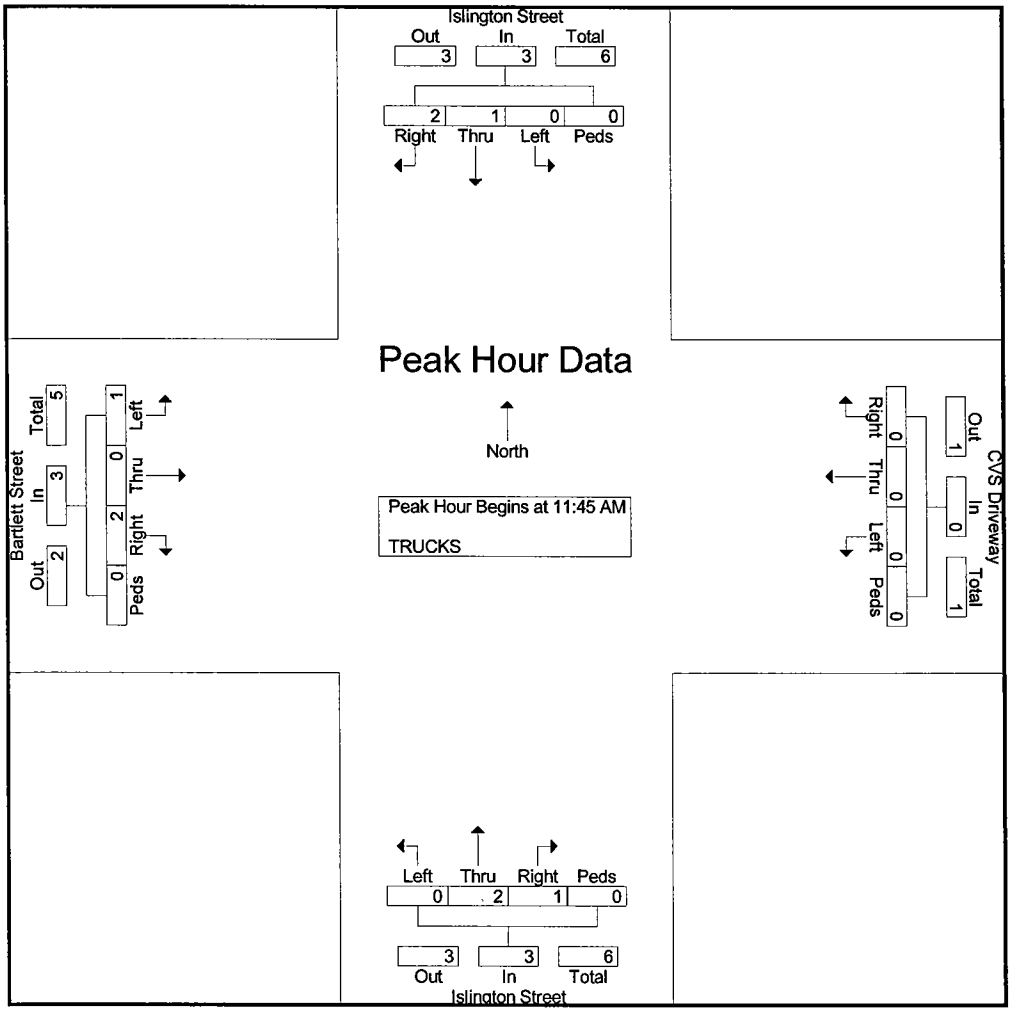
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_E_SAT_Islington-Bartlett
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	Islington Street From North					CVS Driveway From East					Islington Street From South					Bartlett Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:45 AM to 12:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:45 AM																					
11:45 AM	0	**1**	0	0	**1**	0	0	0	0	0	**1**	**1**	0	0	**2**	**1**	0	0	0	1	**4**
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	**1**	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
12:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	**1**	0	**2**	3
Total Volume	2	1	0	0	3	0	0	0	0	0	1	2	0	0	3	2	0	1	0	3	9
% App. Total	66.7	33.3	0	0		0	0	0	0		33.3	66.7	0	0		66.7	0	33.3	0		
PHF	.500	.250	.000	.000	.750	.000	.000	.000	.000	.000	.250	.500	.000	.000	.375	.500	.000	.250	.000	.375	.563



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Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_E_SAT_Islington-Bartlett
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	Islington Street From North					CVS Driveway From East					Islington Street From South					Bartlett Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	59	65	6	0	130	1	3	3	0	7	3	46	43	0	92	54	5	70	0	129	358
11:15 AM	71	63	1	0	135	2	2	1	0	5	1	54	61	0	116	56	0	60	0	116	372
11:30 AM	56	63	0	0	119	2	1	0	0	3	0	69	40	0	109	46	0	52	0	98	329
11:45 AM	71	73	4	0	148	2	0	0	0	2	1	66	39	0	106	62	1	47	0	110	366
Total	257	264	11	0	532	7	6	4	0	17	5	235	183	0	423	218	6	229	0	453	1425
12:00 PM	52	67	4	0	123	2	2	3	0	7	1	70	47	0	118	45	2	65	0	112	360
12:15 PM	67	45	0	0	112	4	2	1	0	7	1	54	57	0	112	62	4	67	0	133	364
12:30 PM	57	68	3	0	128	1	3	1	0	5	1	59	43	0	103	63	5	59	0	127	363
12:45 PM	59	47	4	0	110	3	1	3	0	7	1	51	52	0	104	42	2	62	0	106	327
Total	235	227	11	0	473	10	8	8	0	26	4	234	199	0	437	212	13	253	0	478	1414
01:00 PM	59	51	3	0	113	1	1	4	0	6	0	31	50	0	81	64	0	53	0	117	317
01:15 PM	62	57	5	0	124	1	1	0	0	2	1	48	48	0	97	43	1	50	0	94	317
01:30 PM	49	54	2	0	105	0	1	2	0	3	2	47	45	0	94	54	4	54	0	112	314
01:45 PM	60	53	2	0	115	3	2	2	0	7	0	35	60	0	95	41	9	61	0	111	328
Total	230	215	12	0	457	5	5	8	0	18	3	161	203	0	367	202	14	218	0	434	1276
02:00 PM	46	49	2	0	97	1	1	1	0	3	3	44	48	0	95	54	1	52	0	107	302
02:15 PM	55	67	2	0	124	4	4	1	0	9	2	36	39	0	77	51	3	51	0	105	315
02:30 PM	56	41	1	0	98	2	3	1	0	6	1	47	54	0	102	36	4	53	0	93	299
02:45 PM	61	61	2	0	124	1	2	1	0	4	0	45	48	0	93	44	3	48	0	95	316
Total	218	218	7	0	443	8	10	4	0	22	6	172	189	0	367	185	11	204	0	400	1232
Grand Total	940	924	41	0	1905	30	29	24	0	83	18	802	774	0	1594	817	44	904	0	1765	5347
Apprch %	49.3	48.5	2.2	0		36.1	34.9	28.9	0		1.1	50.3	48.6	0		46.3	2.5	51.2	0		
Total %	17.6	17.3	0.8	0	35.6	0.6	0.5	0.4	0	1.6	0.3	15	14.5	0	29.8	15.3	0.8	16.9	0	33	
CARS	936	921	41	0	1898	30	29	24	0	83	17	798	770	0	1585	811	44	901	0	1756	5322
% CARS	99.6	99.7	100	0	99.6	100	100	100	0	100	94.4	99.5	99.5	0	99.4	99.3	100	99.7	0	99.5	99.5
TRUCKS	4	3	0	0	7	0	0	0	0	0	1	4	4	0	9	6	0	3	0	9	25
% TRUCKS	0.4	0.3	0	0	0.4	0	0	0	0	0	5.6	0.5	0.5	0	0.6	0.7	0	0.3	0	0.5	0.5

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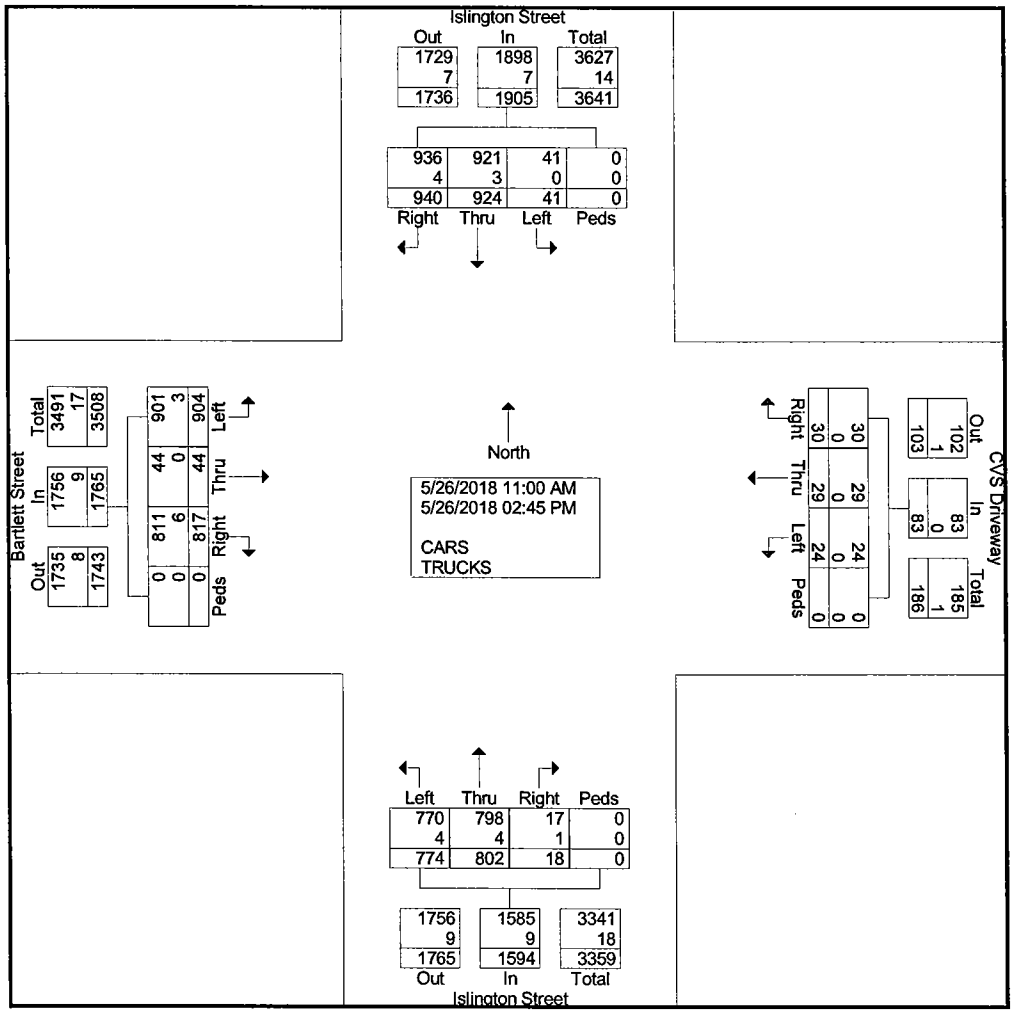

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Groups Printed- TRUCKS

	Islington Street From North					CVS Driveway From East					Islington Street From South					Bartlett Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
11:45 AM	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	1	0	0	0	1	4
Total	0	1	0	0	1	0	0	0	0	0	1	2	1	0	4	1	0	1	0	2	7
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
12:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	3
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	0	2	0	0	0	0	0	0	1	0	0	1	1	0	1	0	2	5
01:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	4
01:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	2	0	0	2	0	0	0	0	0	0	0	2	0	2	2	0	0	0	2	6
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0	2	3
02:15 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
02:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
Total	2	0	0	0	2	0	0	0	0	0	0	1	1	0	2	2	0	1	0	3	7
Grand Total	4	3	0	0	7	0	0	0	0	0	1	4	4	0	9	6	0	3	0	9	25
Apprch %	57.1	42.9	0	0		0	0	0	0		11.1	44.4	44.4	0		66.7	0	33.3	0		
Total %	16	12	0	0	28	0	0	0	0	0	4	16	16	0	36	24	0	12	0	36	

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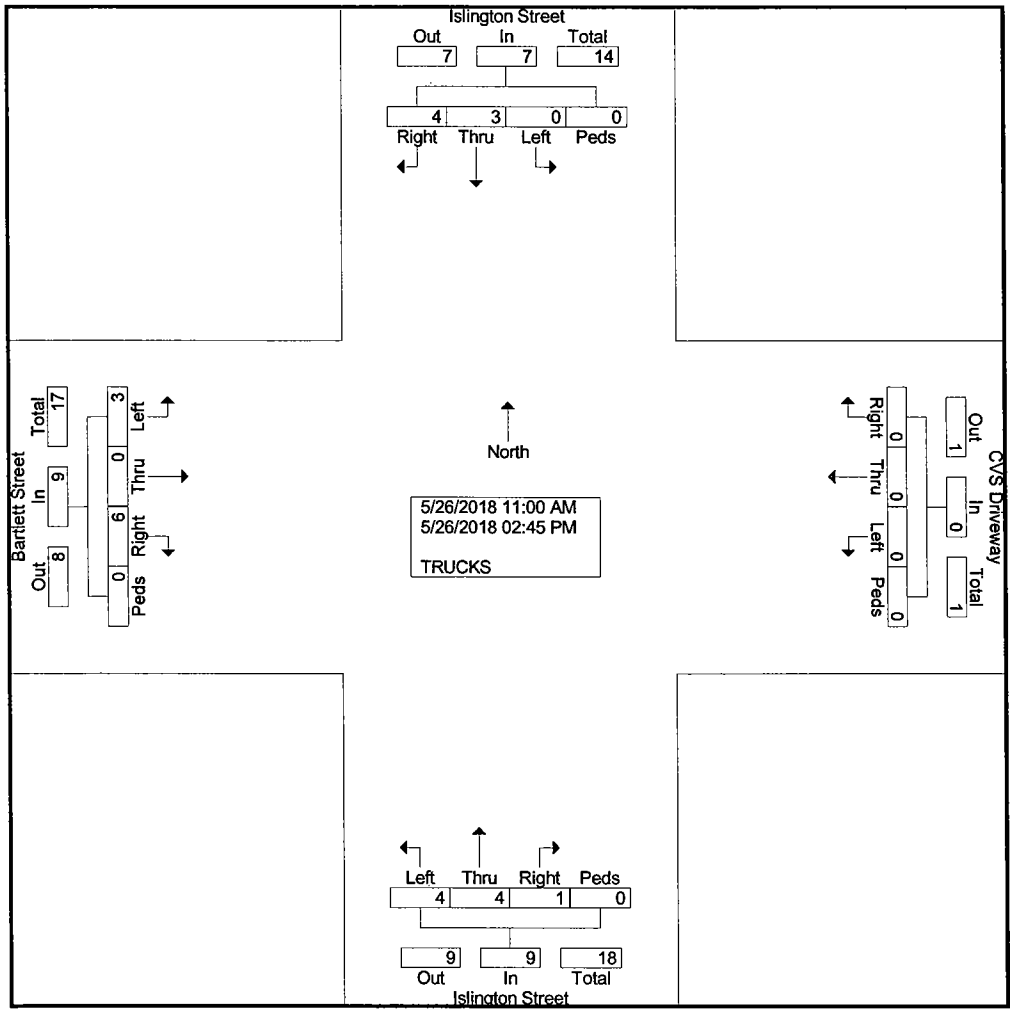
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_E_SAT_Islington-Bartlett
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



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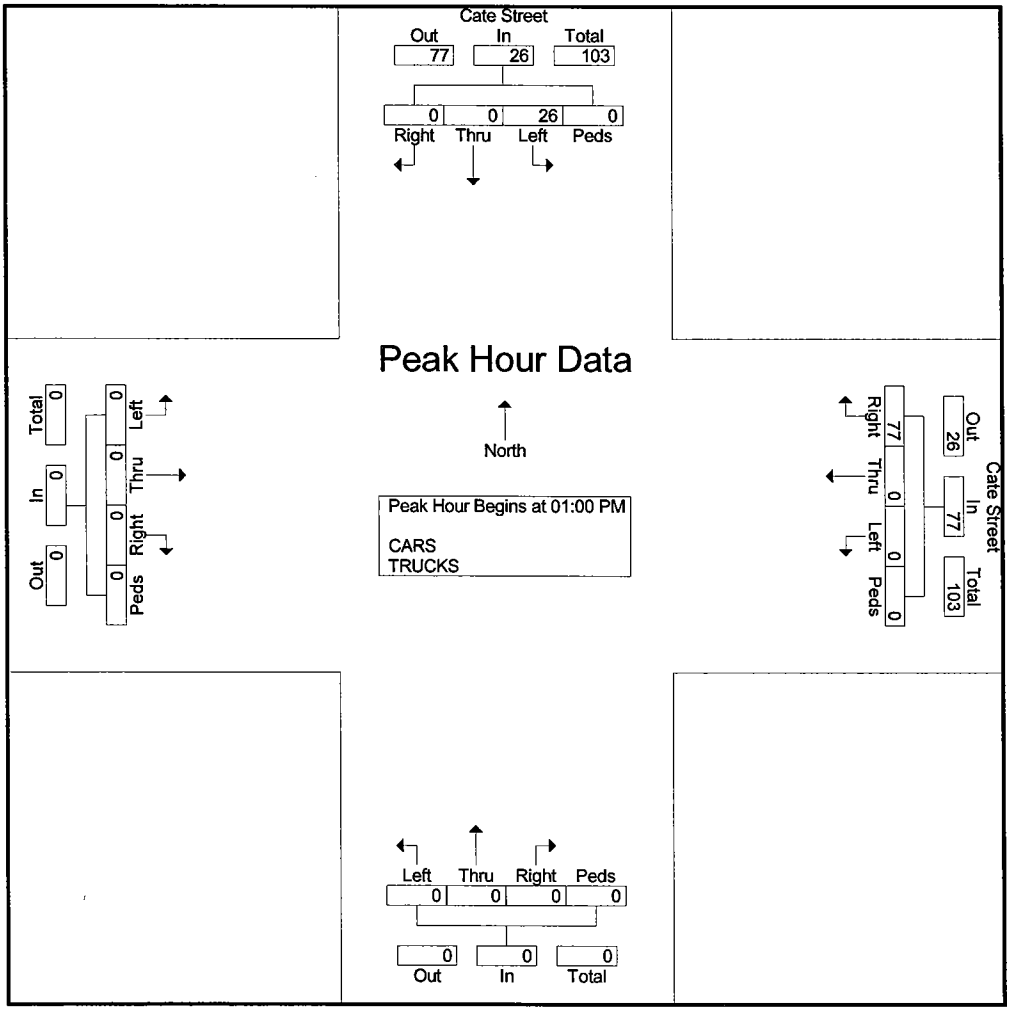
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Cate St SAT
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	Cate Street From North					Cate Street From East					From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	0	0	**8**	0	**8**	19	0	0	0	19	0	0	0	0	0	0	0	0	0	0	27
01:15 PM	0	0	4	0	4	18	0	0	0	18	0	0	0	0	0	0	0	0	0	0	22
01:30 PM	0	0	8	0	8	15	0	0	0	15	0	0	0	0	0	0	0	0	0	0	23
01:45 PM	0	0	6	0	6	**25**	0	0	0	**25**	0	0	0	0	0	0	0	0	0	0	**31**
Total Volume	0	0	26	0	26	77	0	0	0	77	0	0	0	0	0	0	0	0	0	0	103
% App. Total	0	0	100	0		100	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.813	.000	.813	.770	.000	.000	.000	.770	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.831



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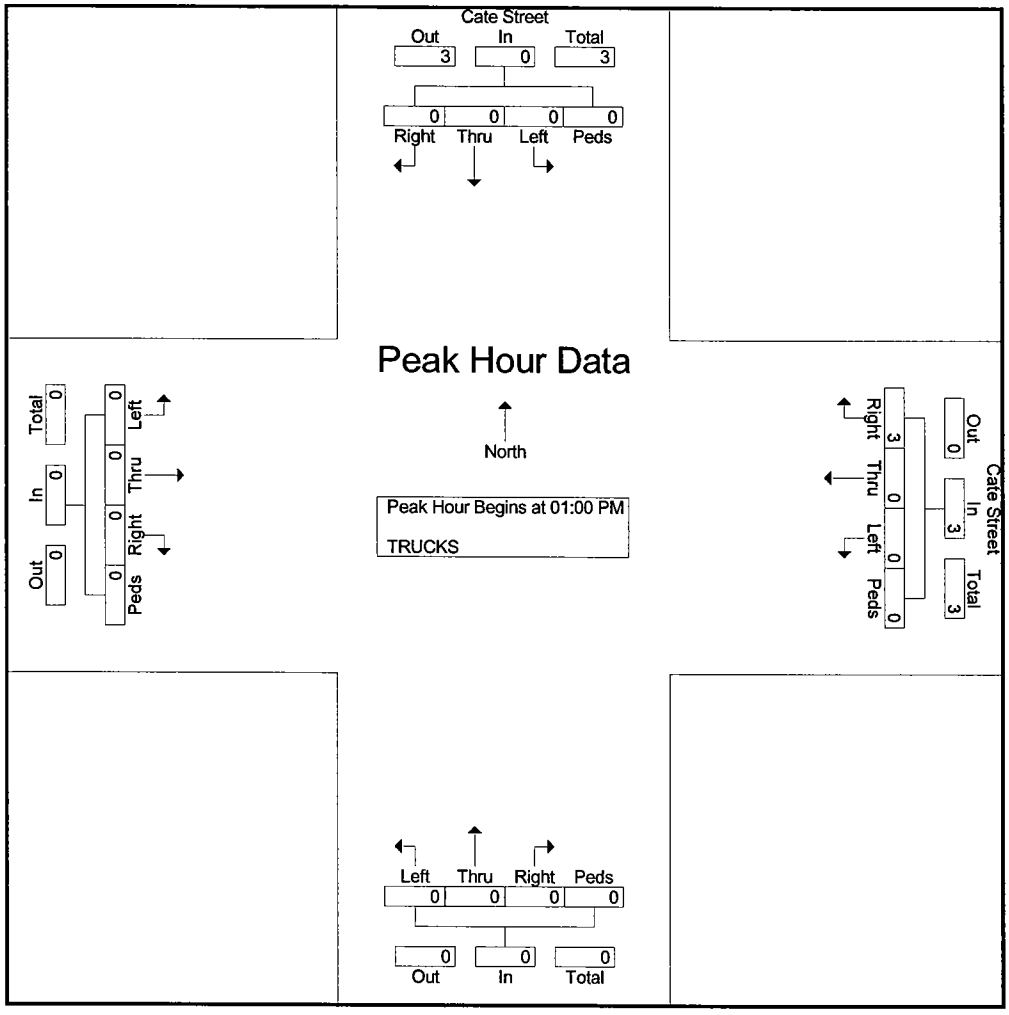
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Cate St SAT
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	Cate Street From North					Cate Street From East					From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
01:45 PM	0	0	0	0	0	**2**	0	0	0	**2**	0	0	0	0	0	0	0	0	0	0	**2**
Total Volume	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
% App. Total	0	0	0	0		100	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.375	.000	.000	.000	.375	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375



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Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Cate St SAT
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

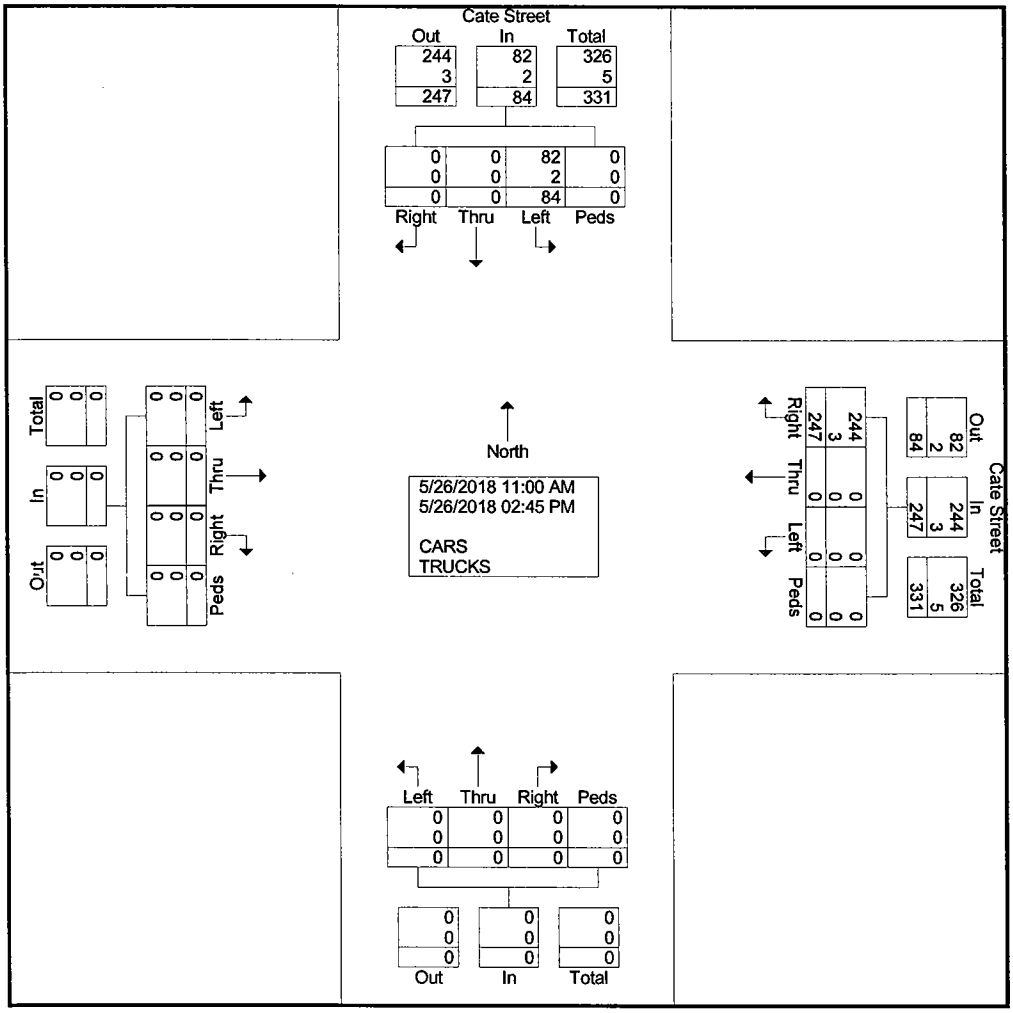
Groups Printed- CARS - TRUCKS

	Cate Street From North					Cate Street From East					From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	8	0	8	13	0	0	0	13	0	0	0	0	0	0	0	0	0	0	21
11:15 AM	0	0	5	0	5	20	0	0	0	20	0	0	0	0	0	0	0	0	0	0	25
11:30 AM	0	0	1	0	1	11	0	0	0	11	0	0	0	0	0	0	0	0	0	0	12
11:45 AM	0	0	7	0	7	14	0	0	0	14	0	0	0	0	0	0	0	0	0	0	21
Total	0	0	21	0	21	58	0	0	0	58	0	0	0	0	0	0	0	0	0	0	79
12:00 PM	0	0	4	0	4	12	0	0	0	12	0	0	0	0	0	0	0	0	0	0	16
12:15 PM	0	0	5	0	5	15	0	0	0	15	0	0	0	0	0	0	0	0	0	0	20
12:30 PM	0	0	4	0	4	11	0	0	0	11	0	0	0	0	0	0	0	0	0	0	15
12:45 PM	0	0	5	0	5	16	0	0	0	16	0	0	0	0	0	0	0	0	0	0	21
Total	0	0	18	0	18	54	0	0	0	54	0	0	0	0	0	0	0	0	0	0	72
01:00 PM	0	0	8	0	8	19	0	0	0	19	0	0	0	0	0	0	0	0	0	0	27
01:15 PM	0	0	4	0	4	18	0	0	0	18	0	0	0	0	0	0	0	0	0	0	22
01:30 PM	0	0	8	0	8	15	0	0	0	15	0	0	0	0	0	0	0	0	0	0	23
01:45 PM	0	0	6	0	6	25	0	0	0	25	0	0	0	0	0	0	0	0	0	0	31
Total	0	0	26	0	26	77	0	0	0	77	0	0	0	0	0	0	0	0	0	0	103
02:00 PM	0	0	6	0	6	20	0	0	0	20	0	0	0	0	0	0	0	0	0	0	26
02:15 PM	0	0	6	0	6	15	0	0	0	15	0	0	0	0	0	0	0	0	0	0	21
02:30 PM	0	0	2	0	2	11	0	0	0	11	0	0	0	0	0	0	0	0	0	0	13
02:45 PM	0	0	5	0	5	12	0	0	0	12	0	0	0	0	0	0	0	0	0	0	17
Total	0	0	19	0	19	58	0	0	0	58	0	0	0	0	0	0	0	0	0	0	77
Grand Total	0	0	84	0	84	247	0	0	0	247	0	0	0	0	0	0	0	0	0	0	331
Apprch %	0	0	100	0		100	0	0	0		0	0	0	0		0	0	0	0		
Total %	0	0	25.4	0	25.4	74.6	0	0	0	74.6	0	0	0	0	0	0	0	0	0	0	
CARS	0	0	82	0	82	244	0	0	0	244	0	0	0	0	0	0	0	0	0	0	326
% CARS	0	0	97.6	0	97.6	98.8	0	0	0	98.8	0	0	0	0	0	0	0	0	0	0	98.5
TRUCKS	0	0	2	0	2	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	5
% TRUCKS	0	0	2.4	0	2.4	1.2	0	0	0	1.2	0	0	0	0	0	0	0	0	0	0	1.5

Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Cate St SAT
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



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Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Cate St SAT
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- TRUCKS

	Cate Street From North					Cate Street From East					From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
01:45 PM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
02:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
02:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Grand Total	0	0	2	0	2	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	5
Apprch %	0	0	100	0		100	0	0	0		0	0	0	0		0	0	0	0		
Total %	0	0	40	0	40	60	0	0	0	60	0	0	0	0	0	0	0	0	0	0	

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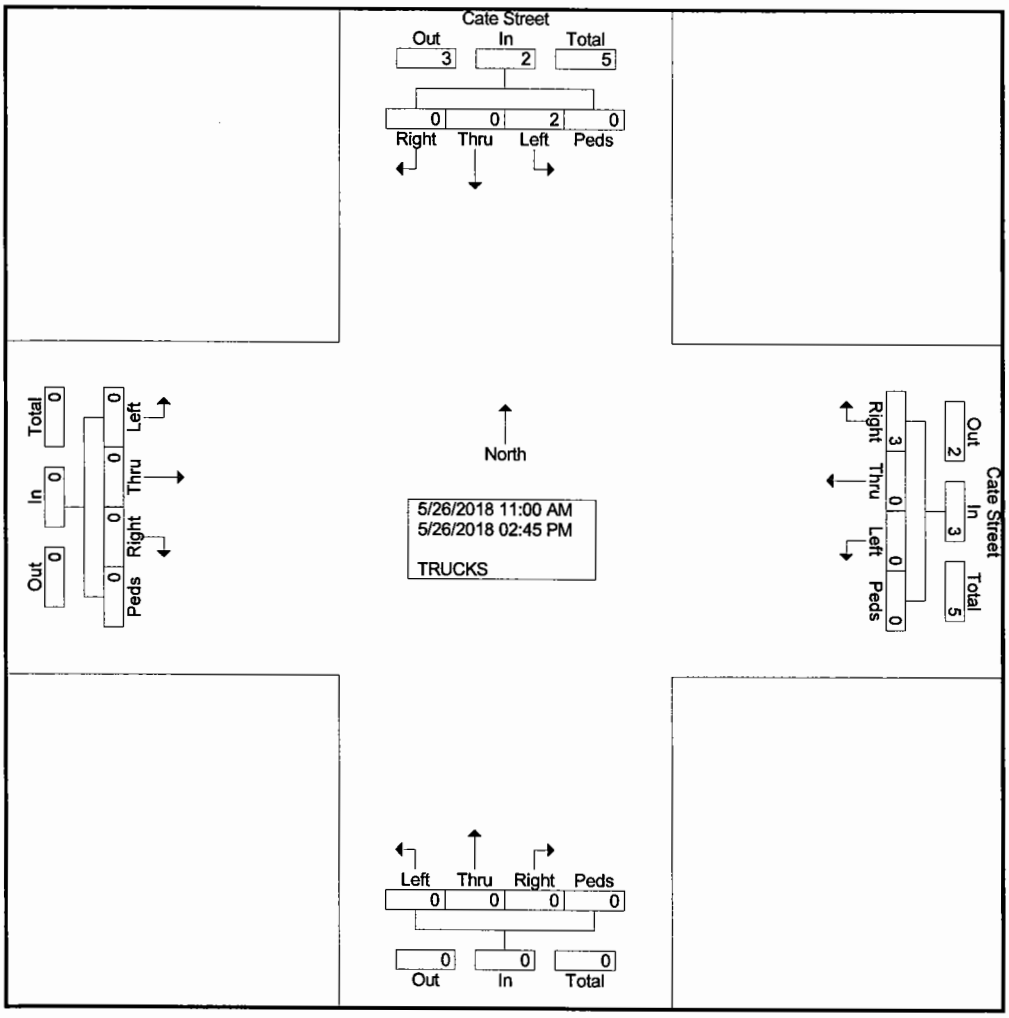
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A Cate St SAT
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2

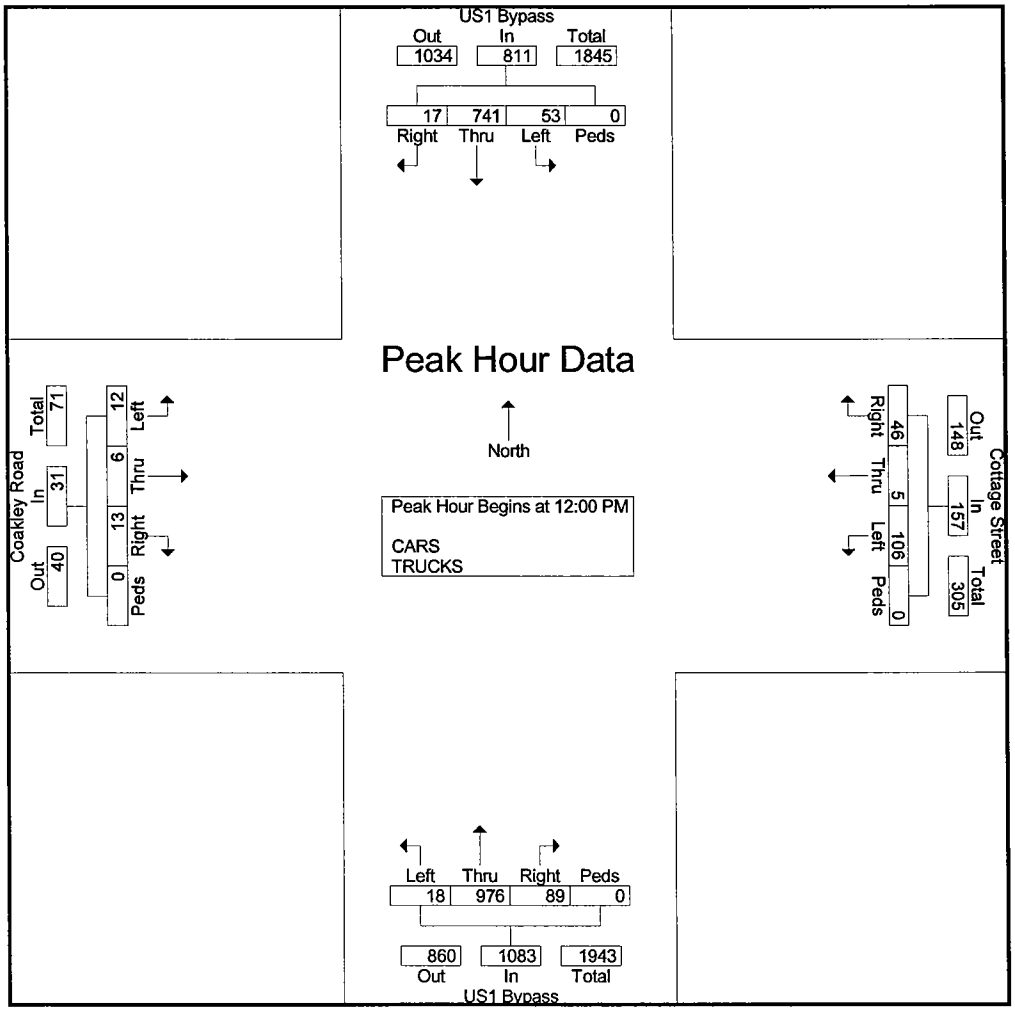


Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_G_SAT_US1 BYP-Cottage
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	US1 Bypass From North					Cottage Street From East					US1 Bypass From South					Coakley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	4	182	11	0	197	11	0	19	0	30	26	250	5	0	**281**	1	**2**	2	0	5	513
12:15 PM	**5**	**202**	**19**	0	**226**	11	**3**	26	0	40	**30**	232	2	0	264	**6**	2	2	0	**10**	**540**
12:30 PM	5	177	14	0	196	10	2	28	0	40	16	238	**4**	0	258	4	0	**4**	0	8	502
12:45 PM	3	180	9	0	192	**14**	0	**33**	0	**47**	17	**256**	**7**	0	280	2	2	4	0	8	527
Total Volume	17	741	53	0	811	46	5	106	0	157	89	976	18	0	1083	13	6	12	0	31	2082
% App. Total	2.1	91.4	6.5	0		29.3	3.2	67.5	0		8.2	90.1	1.7	0		41.9	19.4	38.7	0		
PHF	.850	.917	.697	.000	.897	.821	.417	.803	.000	.835	.742	.953	.643	.000	.964	.542	.750	.750	.000	.775	.964



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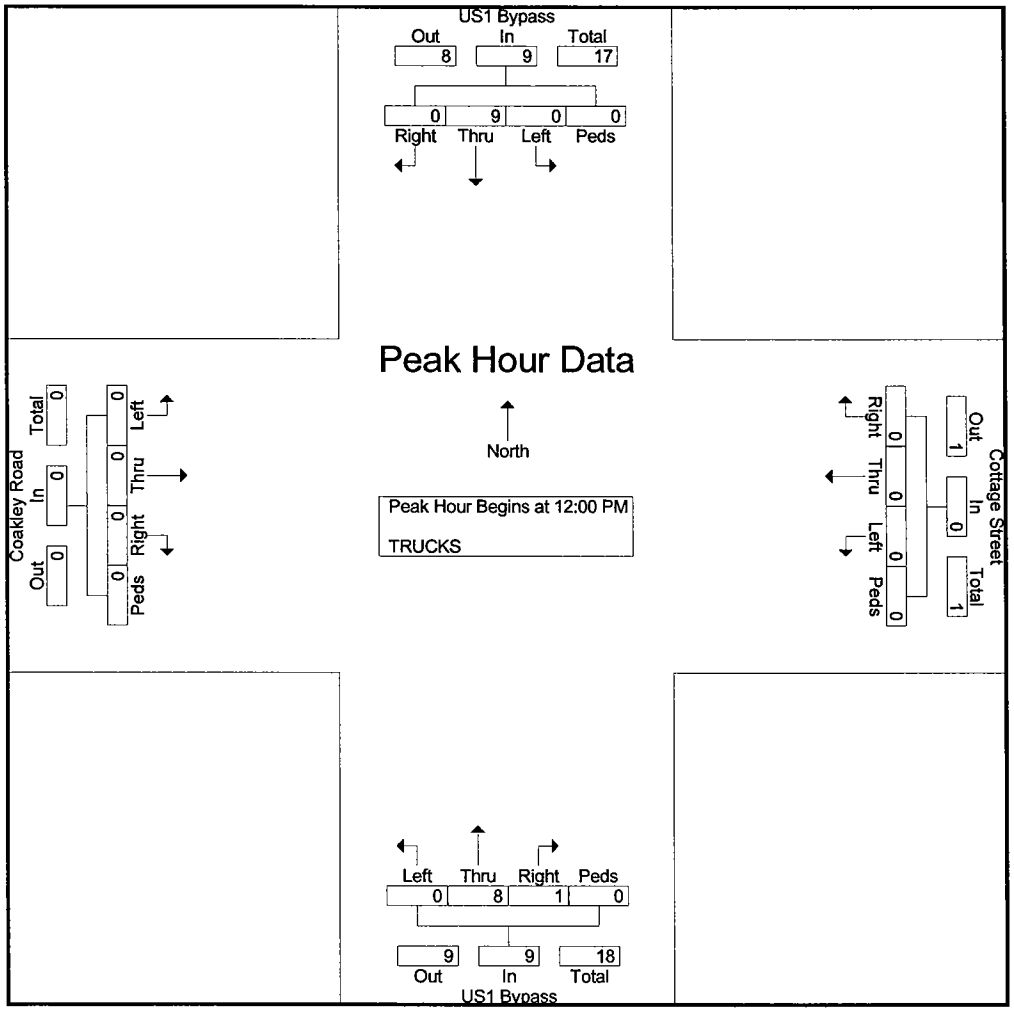
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_G_SAT_US1 BYP-Cottage
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	US1 Bypass From North					Cottage Street From East					US1 Bypass From South					Coakley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
12:15 PM	0	**4**	0	0	**4**	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	**6**
12:30 PM	0	1	0	0	1	0	0	0	0	0	**1**	**4**	0	0	**5**	0	0	0	0	0	6
12:45 PM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	9	0	0	9	0	0	0	0	0	1	8	0	0	9	0	0	0	0	0	18
% App. Total	0	100	0	0		0	0	0	0		11.1	88.9	0	0		0	0	0	0		
PHF	.000	.563	.000	.000	.563	.000	.000	.000	.000	.000	.250	.500	.000	.000	.450	.000	.000	.000	.000	.000	.750



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P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_G_SAT_US1 BYP-Cottage
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	US1 Bypass From North					Cottage Street From East					US1 Bypass From South					Coakley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	2	163	14	0	179	11	3	33	0	47	27	197	3	0	227	4	1	2	0	7	460
11:15 AM	2	155	11	0	168	17	2	30	0	49	26	235	1	0	262	3	2	5	0	10	489
11:30 AM	2	180	9	0	191	13	1	27	0	41	30	231	3	0	264	4	0	6	0	10	506
11:45 AM	1	205	7	0	213	14	0	32	0	46	22	235	1	0	258	2	0	3	0	5	522
Total	7	703	41	0	751	55	6	122	0	183	105	898	8	0	1011	13	3	16	0	32	1977
12:00 PM	4	182	11	0	197	11	0	19	0	30	26	250	5	0	281	1	2	2	0	5	513
12:15 PM	5	202	19	0	226	11	3	26	0	40	30	232	2	0	264	6	2	2	0	10	540
12:30 PM	5	177	14	0	196	10	2	28	0	40	16	238	4	0	258	4	0	4	0	8	502
12:45 PM	3	180	9	0	192	14	0	33	0	47	17	256	7	0	280	2	2	4	0	8	527
Total	17	741	53	0	811	46	5	106	0	157	89	976	18	0	1083	13	6	12	0	31	2082
01:00 PM	5	151	7	0	163	11	4	27	0	42	21	242	3	0	266	5	1	8	0	14	485
01:15 PM	4	166	11	0	181	13	3	23	0	39	13	254	4	0	271	1	1	6	0	8	499
01:30 PM	3	168	12	0	183	9	0	19	0	28	21	210	3	0	234	5	1	5	0	11	456
01:45 PM	2	160	7	0	169	24	5	20	0	49	23	234	2	0	259	2	1	6	0	9	486
Total	14	645	37	0	696	57	12	89	0	158	78	940	12	0	1030	13	4	25	0	42	1926
02:00 PM	9	173	15	0	197	18	5	26	0	49	9	244	7	0	260	2	2	8	0	12	518
02:15 PM	8	167	8	0	183	12	4	21	0	37	14	224	2	0	240	3	2	2	0	7	467
02:30 PM	0	159	3	0	162	8	1	29	0	38	14	263	6	0	283	2	0	3	0	5	488
02:45 PM	1	148	9	0	158	14	2	26	0	42	25	255	3	0	283	4	2	2	0	8	491
Total	18	647	35	0	700	52	12	102	0	166	62	986	18	0	1066	11	6	15	0	32	1964
Grand Total	56	2736	166	0	2958	210	35	419	0	664	334	3800	56	0	4190	50	19	68	0	137	7949
Apprch %	1.9	92.5	5.6	0		31.6	5.3	63.1	0		8	90.7	1.3	0		36.5	13.9	49.6	0		
Total %	0.7	34.4	2.1	0	37.2	2.6	0.4	5.3	0	8.4	4.2	47.8	0.7	0	52.7	0.6	0.2	0.9	0	1.7	
CARS	56	2705	165	0	2926	210	34	416	0	660	329	3756	56	0	4141	50	19	67	0	136	7863
% CARS	100	98.9	99.4	0	98.9	100	97.1	99.3	0	99.4	98.5	98.8	100	0	98.8	100	100	98.5	0	99.3	98.9
TRUCKS	0	31	1	0	32	0	1	3	0	4	5	44	0	0	49	0	0	1	0	1	86
% TRUCKS	0	1.1	0.6	0	1.1	0	2.9	0.7	0	0.6	1.5	1.2	0	0	1.2	0	0	1.5	0	0.7	1.1

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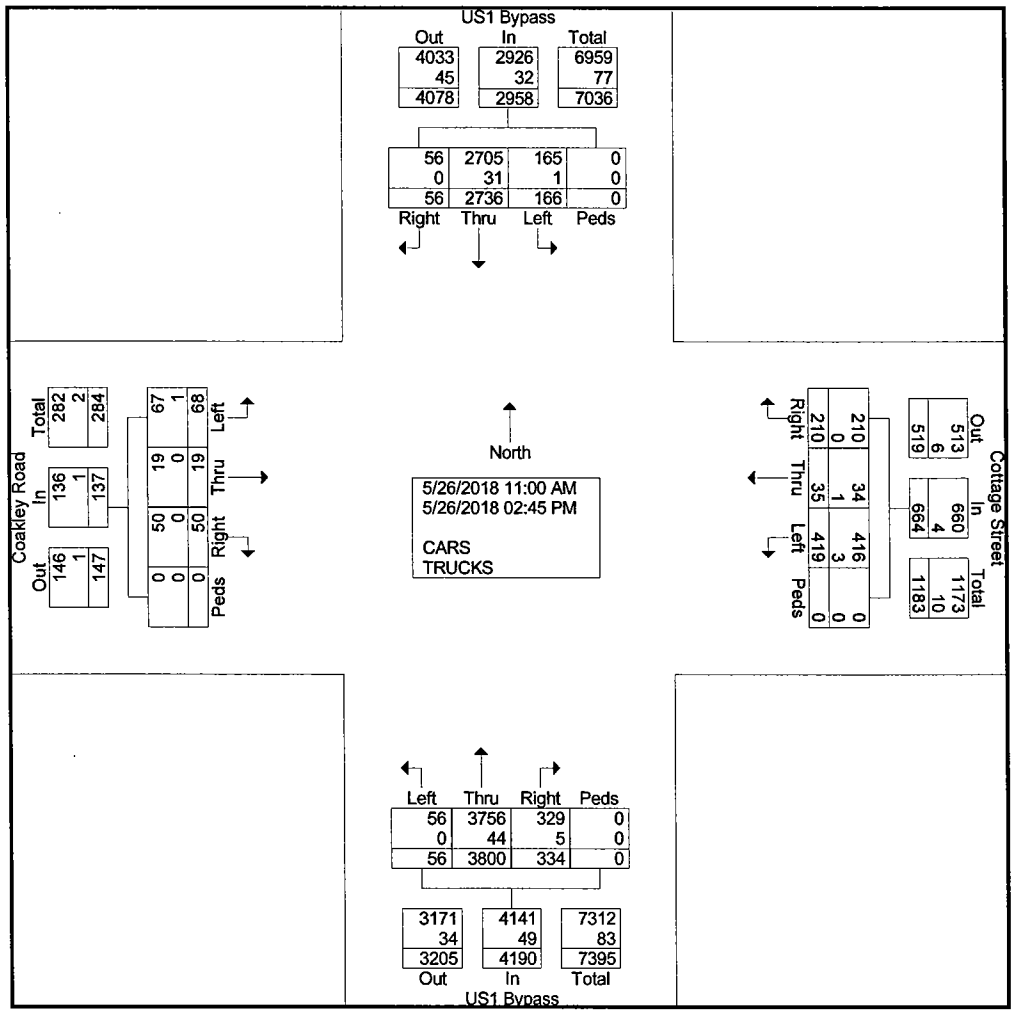
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_G_SAT_US1 BYP-Cottage
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



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File Name : 1831A_INT_G_SAT_US1 BYP-Cottage
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- TRUCKS

	US1 Bypass From North					Cottage Street From East					US1 Bypass From South					Coakley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	8
11:15 AM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
11:30 AM	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
11:45 AM	0	3	0	0	3	0	0	0	0	0	1	5	0	0	6	0	0	0	0	0	9
Total	0	11	0	0	11	0	0	0	0	0	1	16	0	0	17	0	0	0	0	0	28
12:00 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
12:15 PM	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	6
12:30 PM	0	1	0	0	1	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	6
12:45 PM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	9	0	0	9	0	0	0	0	0	1	8	0	0	9	0	0	0	0	0	18
01:00 PM	0	1	0	0	1	0	0	1	0	1	0	2	0	0	2	0	0	1	0	1	5
01:15 PM	0	1	0	0	1	0	0	0	0	0	1	6	0	0	7	0	0	0	0	0	8
01:30 PM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	3
01:45 PM	0	3	0	0	3	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	6
Total	0	5	0	0	5	0	0	1	0	1	3	12	0	0	15	0	0	1	0	1	22
02:00 PM	0	2	1	0	3	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	8
02:15 PM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
02:30 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
02:45 PM	0	1	0	0	1	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	3
Total	0	6	1	0	7	0	1	2	0	3	0	8	0	0	8	0	0	0	0	0	18
Grand Total	0	31	1	0	32	0	1	3	0	4	5	44	0	0	49	0	0	1	0	1	86
Apprch %	0	96.9	3.1	0		0	25	75	0		10.2	89.8	0	0		0	0	100	0		
Total %	0	36	1.2	0	37.2	0	1.2	3.5	0	4.7	5.8	51.2	0	0	57	0	0	1.2	0	1.2	

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Weather: Clear
Collected By: MV
Job Number: 1831A
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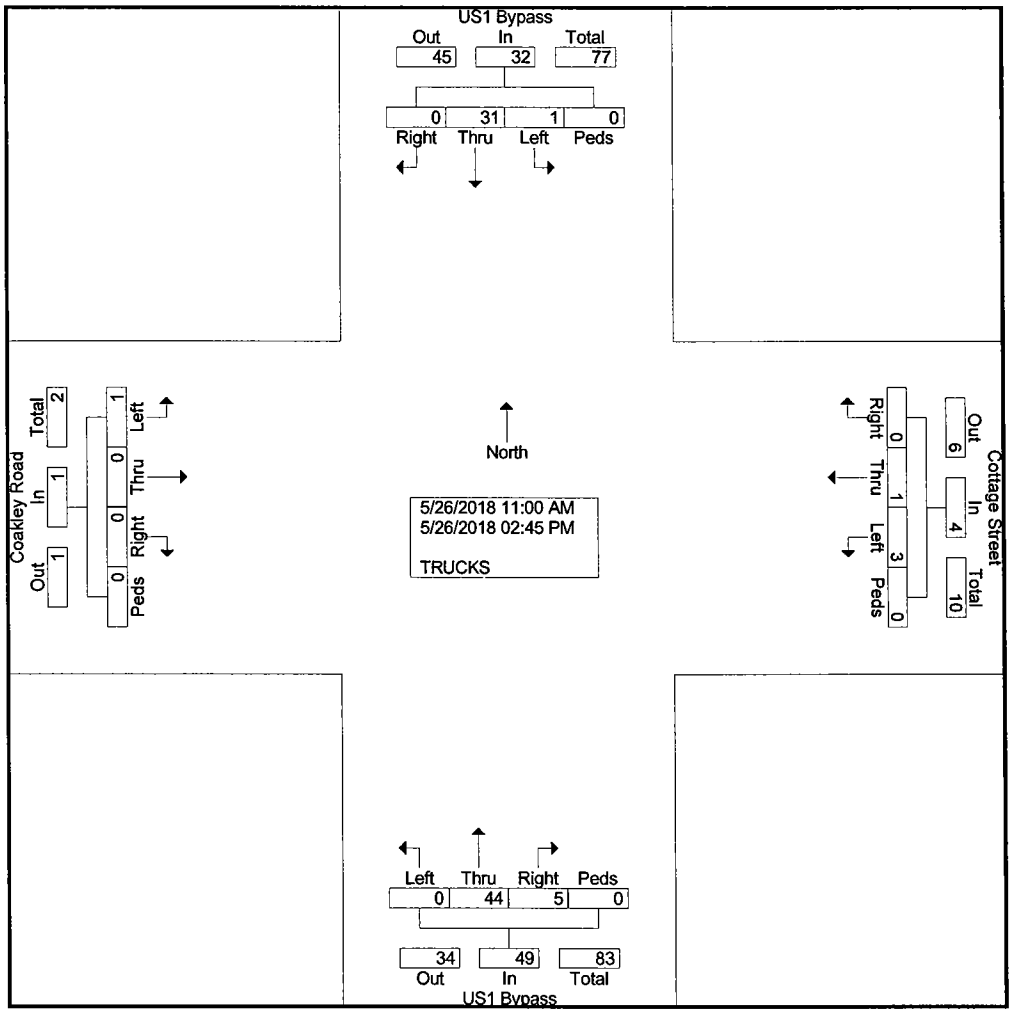
File Name : 1831A_INT_G_SAT_US1 BYP-Cottage
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



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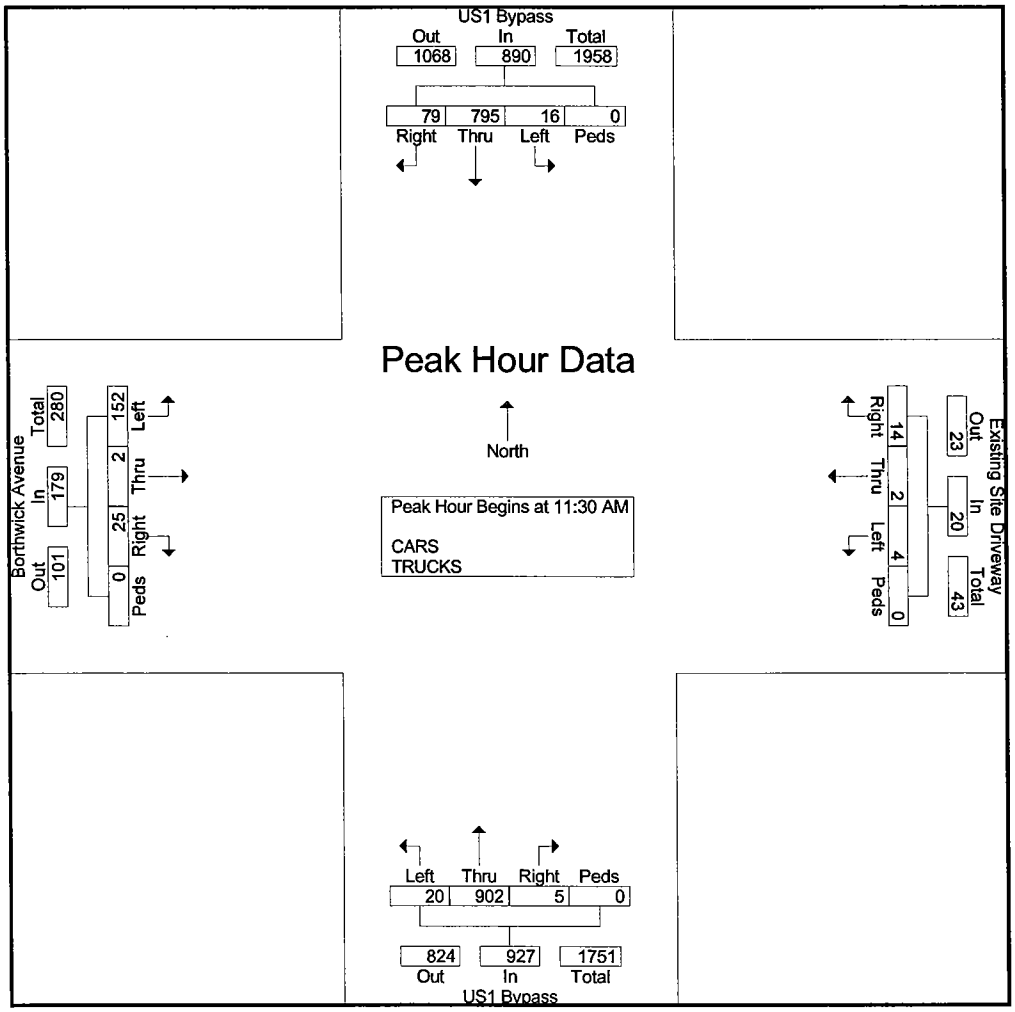
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_H_SAT_US1 BYP-Borthwick
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	US1 Bypass From North					Existing Site Driveway From East					US1 Bypass From South					Borthwick Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	15	193	2	0	210	1	0	**2**	0	3	0	231	5	0	236	**8**	0	36	0	44	493
11:45 AM	18	**215**	**8**	0	**241**	2	**2**	0	0	4	**2**	213	5	0	220	6	**1**	37	0	44	509
12:00 PM	**30**	173	1	0	204	**6**	0	1	0	**7**	2	224	4	0	230	8	0	**54**	0	**62**	503
12:15 PM	16	214	5	0	235	5	0	1	0	6	1	**234**	**6**	0	**241**	3	1	25	0	29	**511**
Total Volume	79	795	16	0	890	14	2	4	0	20	5	902	20	0	927	25	2	152	0	179	2016
% App. Total	8.9	89.3	1.8	0		70	10	20	0		0.5	97.3	2.2	0		14	1.1	84.9	0		
PHF	.658	.924	.500	.000	.923	.583	.250	.500	.000	.714	.625	.964	.833	.000	.962	.781	.500	.704	.000	.722	.986



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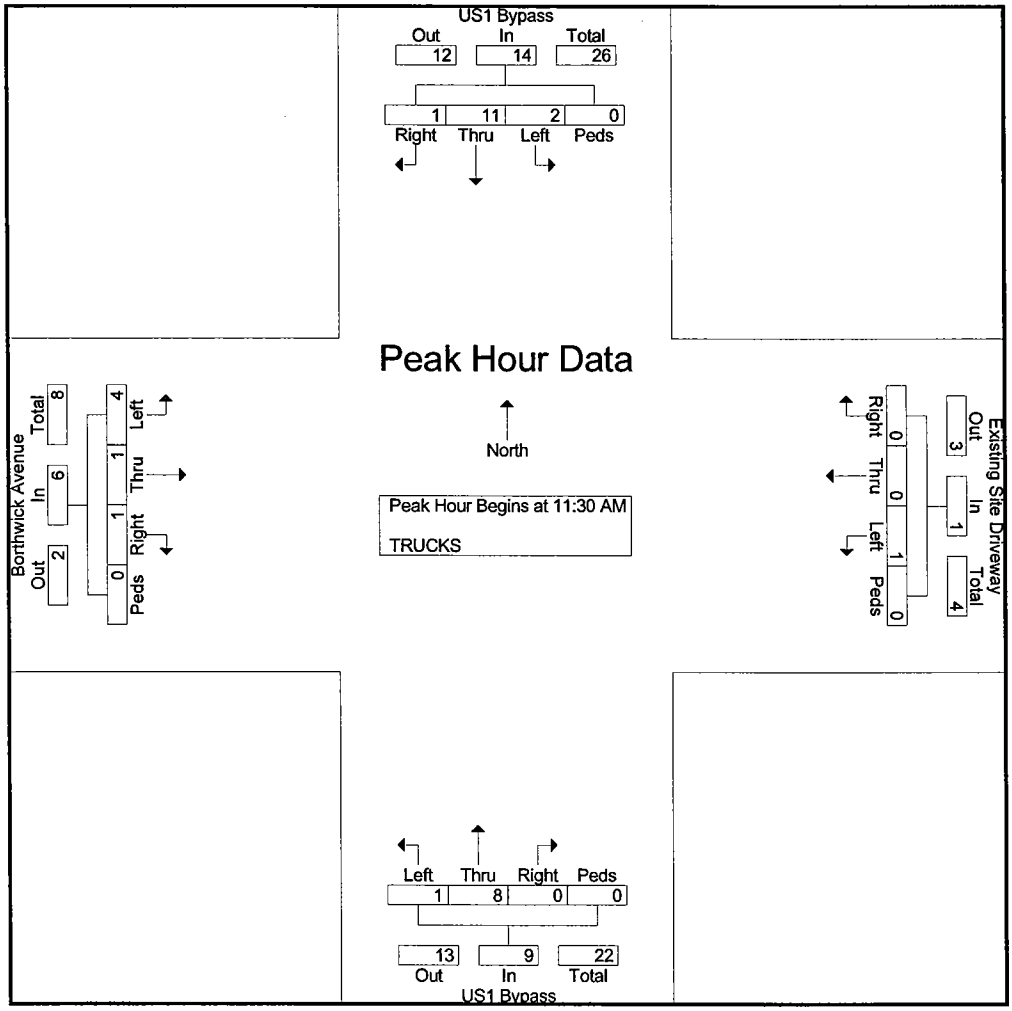
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_H_SAT_US1 BYP-Borthwick
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	US1 Bypass From North					Existing Site Driveway From East					US1 Bypass From South					Borthwick Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:30 AM to 12:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	0	**4**	0	0	4	0	0	**1**	0	**1**	0	2	0	0	2	0	0	**2**	0	**2**	**9**
11:45 AM	0	2	**1**	0	3	0	0	0	0	0	0	**3**	0	0	**3**	0	0	2	0	2	8
12:00 PM	0	1	0	0	1	0	0	0	0	0	0	1	**1**	0	2	**1**	0	0	0	1	4
12:15 PM	**1**	4	1	0	**6**	0	0	0	0	0	0	2	0	0	2	0	**1**	0	0	1	9
Total Volume	1	11	2	0	14	0	0	1	0	1	0	8	1	0	9	1	1	4	0	6	30
% App. Total	7.1	78.6	14.3	0		0	0	100	0		0	88.9	11.1	0		16.7	16.7	66.7	0		
PHF	.250	.688	.500	.000	.583	.000	.000	.250	.000	.250	.000	.667	.250	.000	.750	.250	.250	.500	.000	.750	.833



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Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_H_SAT_US1 BYP-Borthwick
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- CARS - TRUCKS

	US1 Bypass From North					Existing Site Driveway From East					US1 Bypass From South					Borthwick Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	24	170	1	0	195	3	0	1	0	4	0	182	1	0	183	6	1	46	0	53	435
11:15 AM	20	172	2	0	194	3	0	0	0	3	1	217	6	0	224	6	0	47	0	53	474
11:30 AM	15	193	2	0	210	1	0	2	0	3	0	231	5	0	236	8	0	36	0	44	493
11:45 AM	18	215	8	0	241	2	2	0	0	4	2	213	5	0	220	6	1	37	0	44	509
Total	77	750	13	0	840	9	2	3	0	14	3	843	17	0	863	26	2	166	0	194	1911
12:00 PM	30	173	1	0	204	6	0	1	0	7	2	224	4	0	230	8	0	54	0	62	503
12:15 PM	16	214	5	0	235	5	0	1	0	6	1	234	6	0	241	3	1	25	0	29	511
12:30 PM	12	196	0	0	208	2	0	0	0	2	0	241	3	0	244	5	0	21	0	26	480
12:45 PM	25	183	2	0	210	3	0	0	0	3	0	246	4	0	250	1	0	27	0	28	491
Total	83	766	8	0	857	16	0	2	0	18	3	945	17	0	965	17	1	127	0	145	1985
01:00 PM	12	171	1	0	184	3	0	1	0	4	2	247	1	0	250	5	0	16	0	21	459
01:15 PM	12	177	0	0	189	1	0	2	0	3	1	248	0	0	249	3	0	17	0	20	461
01:30 PM	23	170	1	0	194	2	0	1	0	3	0	200	3	0	203	3	1	29	0	33	433
01:45 PM	18	158	4	0	180	4	0	1	0	5	0	237	1	0	238	8	0	20	0	28	451
Total	65	676	6	0	747	10	0	5	0	15	3	932	5	0	940	19	1	82	0	102	1804
02:00 PM	16	176	7	0	199	6	0	2	0	8	2	239	7	0	248	4	0	23	0	27	482
02:15 PM	14	173	2	0	189	1	1	5	0	7	2	225	2	0	229	4	1	17	0	22	447
02:30 PM	14	176	3	0	193	6	0	1	0	7	1	244	7	0	252	4	2	23	0	29	481
02:45 PM	14	163	2	0	179	3	2	1	0	6	0	264	6	0	270	3	0	18	0	21	476
Total	58	688	14	0	760	16	3	9	0	28	5	972	22	0	999	15	3	81	0	99	1886
Grand Total	283	2880	41	0	3204	51	5	19	0	75	14	3692	61	0	3767	77	7	456	0	540	7586
Apprch %	8.8	89.9	1.3	0		68	6.7	25.3	0		0.4	98	1.6	0		14.3	1.3	84.4	0		
Total %	3.7	38	0.5	0	42.2	0.7	0.1	0.3	0	1	0.2	48.7	0.8	0	49.7	1	0.1	6	0	7.1	
CARS	280	2855	35	0	3170	48	5	18	0	71	13	3652	59	0	3724	76	6	450	0	532	7497
% CARS	98.9	99.1	85.4	0	98.9	94.1	100	94.7	0	94.7	92.9	98.9	96.7	0	98.9	98.7	85.7	98.7	0	98.5	98.8
TRUCKS	3	25	6	0	34	3	0	1	0	4	1	40	2	0	43	1	1	6	0	8	89
% TRUCKS	1.1	0.9	14.6	0	1.1	5.9	0	5.3	0	5.3	7.1	1.1	3.3	0	1.1	1.3	14.3	1.3	0	1.5	1.2

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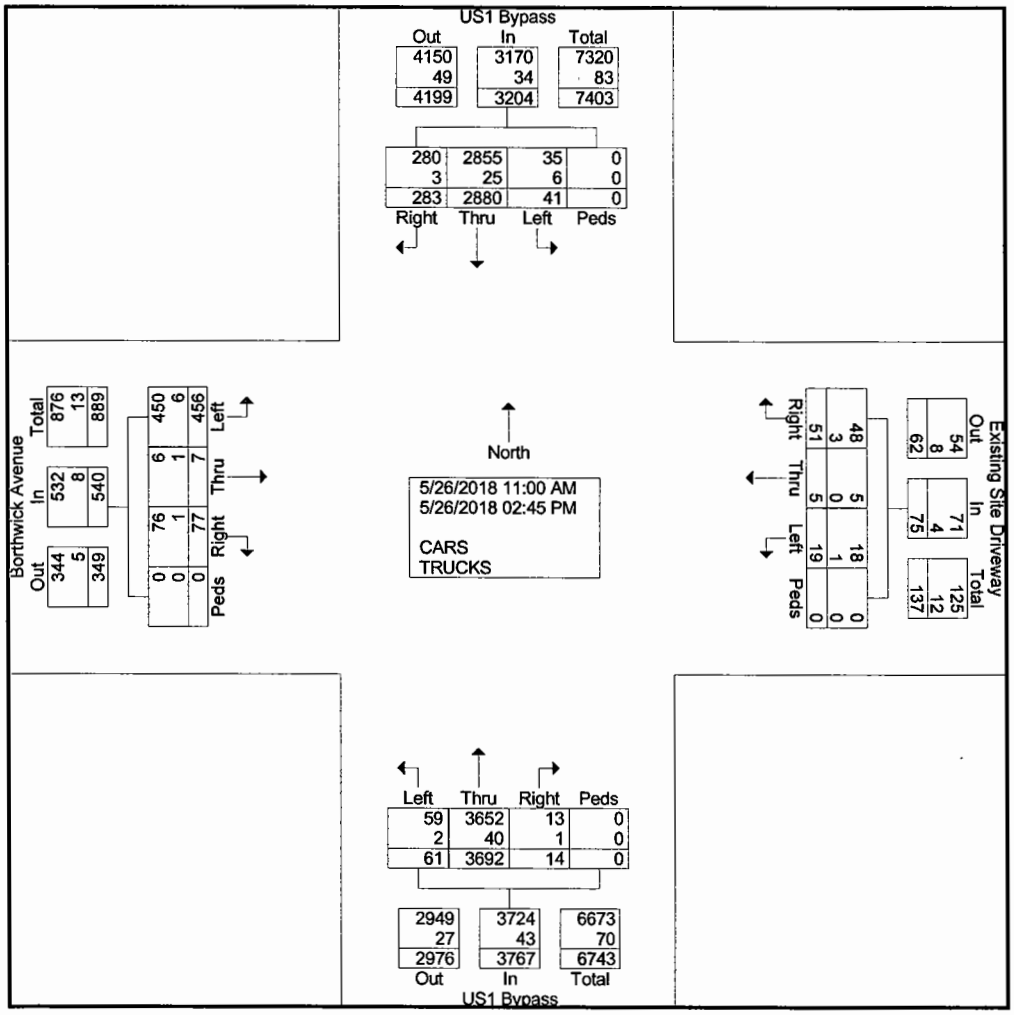
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_H_SAT_US1 BYP-Borthwick
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



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File Name : 1831A_INT_H_SAT_US1 BYP-Borthwick
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- TRUCKS

	US1 Bypass From North					Existing Site Driveway From East					US1 Bypass From South					Borthwick Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	2	0	0	2	1	0	0	0	1	0	5	0	0	5	0	0	0	0	0	8
11:15 AM	0	1	0	0	1	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	4
11:30 AM	0	4	0	0	4	0	0	1	0	1	0	2	0	0	2	0	0	2	0	2	9
11:45 AM	0	2	1	0	3	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	8
Total	0	9	1	0	10	1	0	1	0	2	0	12	1	0	13	0	0	4	0	4	29
12:00 PM	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	1	0	0	0	1	4
12:15 PM	1	4	1	0	6	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	9
12:30 PM	1	0	0	0	1	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	7
12:45 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
Total	2	7	1	0	10	0	0	0	0	0	0	9	1	0	10	1	1	1	0	3	23
01:00 PM	1	0	1	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
01:15 PM	0	1	0	0	1	1	0	0	0	1	0	6	0	0	6	0	0	0	0	0	8
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
01:45 PM	0	2	1	0	3	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	6
Total	1	3	2	0	6	1	0	0	0	1	0	12	0	0	12	0	0	1	0	1	20
02:00 PM	0	2	1	0	3	1	0	0	0	1	0	3	0	0	3	0	0	0	0	0	7
02:15 PM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
02:30 PM	0	1	0	0	1	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	4
02:45 PM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	6	2	0	8	1	0	0	0	1	1	7	0	0	8	0	0	0	0	0	17
Grand Total	3	25	6	0	34	3	0	1	0	4	1	40	2	0	43	1	1	6	0	8	89
Apprch %	8.8	73.5	17.6	0		75	0	25	0		2.3	93	4.7	0		12.5	12.5	75	0		
Total %	3.4	28.1	6.7	0	38.2	3.4	0	1.1	0	4.5	1.1	44.9	2.2	0	48.3	1.1	1.1	6.7	0	9	

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File Name : 1831A_INT_H_SAT_US1 BYP-Borthwick
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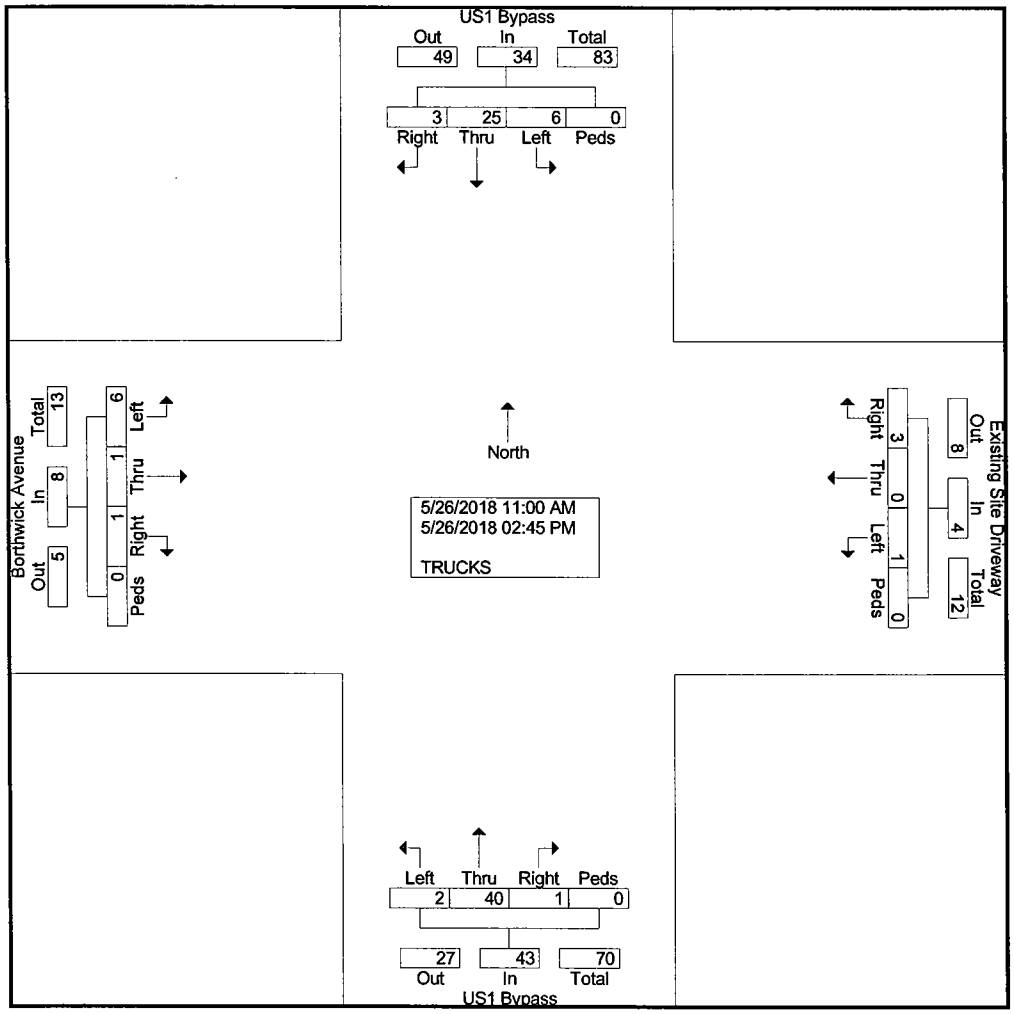

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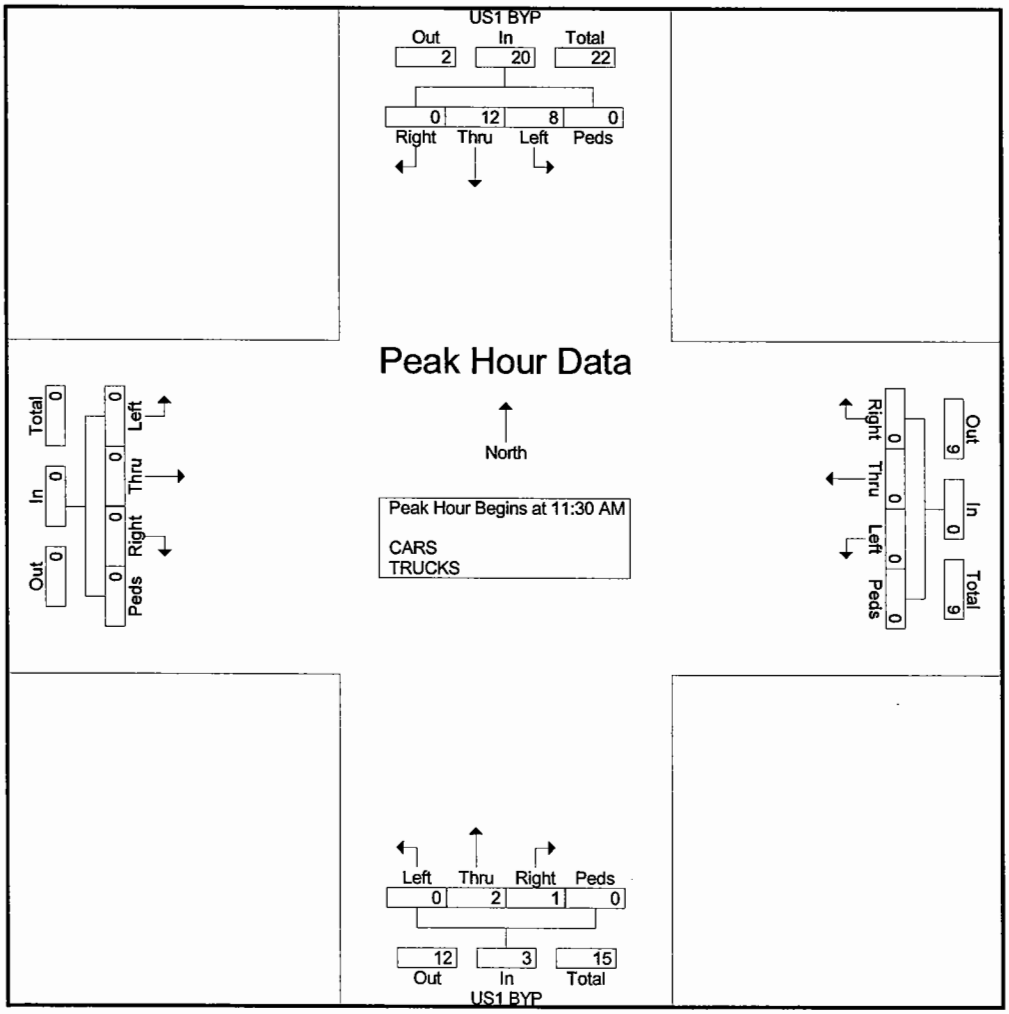
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT US1 BYP-U-Haul-Existing Site Driveways
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	US1 BYP From North					From East					US1 BYP From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	0	2	3	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
11:45 AM	0	**4**	**4**	0	**8**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**8**
12:00 PM	0	3	0	0	3	0	0	0	0	0	**1**	**1**	0	0	**2**	0	0	0	0	0	5
12:15 PM	0	3	1	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5
Total Volume	0	12	8	0	20	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	23
% App. Total	0	60	40	0		0	0	0	0		33.3	66.7	0	0		0	0	0	0		
PHF	.000	.750	.500	.000	.625	.000	.000	.000	.000	.000	.250	.500	.000	.000	.375	.000	.000	.000	.000	.000	.719



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Weather: Clear
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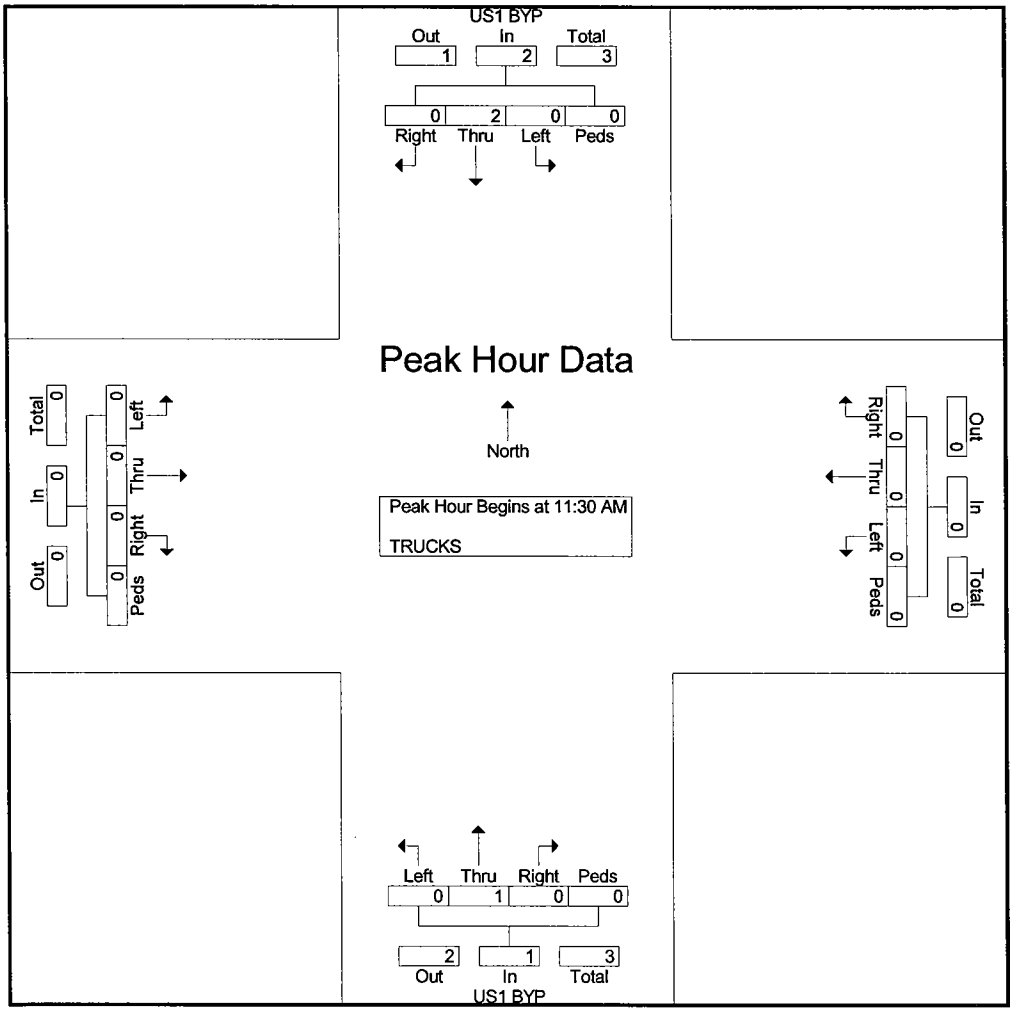
File Name : 1831A SAT US1 BYP-U-Haul-Existing Site Driveways
Site Code : 1831A
Start Date : 5/26/2018
Page No : 3

	US1 BYP From North					From East					US1 BYP From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:30 AM to 12:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:00 PM	0	1	0	0	1	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	**2**
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
% App. Total	0	100	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.375



Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT US1 BYP-U-Haul-Existing Site Driveways
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

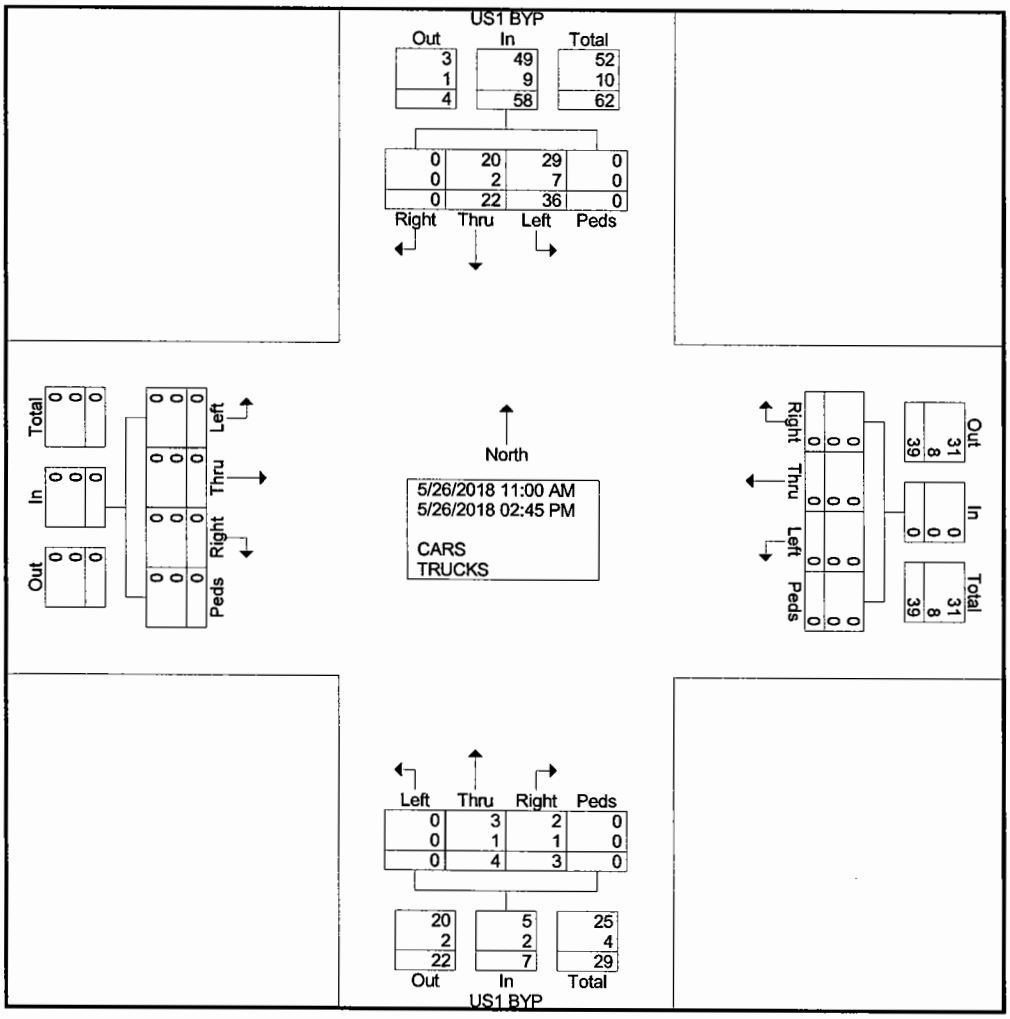
Groups Printed- CARS - TRUCKS

	US1 BYP From North					From East					US1 BYP From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	2	3	0	5	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	6
11:15 AM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
11:30 AM	0	2	3	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
11:45 AM	0	4	4	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Total	0	8	12	0	20	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	21
12:00 PM	0	3	0	0	3	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	5
12:15 PM	0	3	1	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5
12:30 PM	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
12:45 PM	0	1	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	0	8	6	0	14	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	17
01:00 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
01:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
01:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
01:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
02:00 PM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
02:15 PM	0	1	4	0	5	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	8
02:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
02:45 PM	0	3	8	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Total	0	6	13	0	19	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	22
Grand Total	0	22	36	0	58	0	0	0	0	0	3	4	0	0	7	0	0	0	0	0	65
Apprch %	0	37.9	62.1	0		0	0	0	0		42.9	57.1	0	0		0	0	0	0		
Total %	0	33.8	55.4	0	89.2	0	0	0	0	0	4.6	6.2	0	0	10.8	0	0	0	0	0	
CARS	0	20	29	0	49	0	0	0	0	0	2	3	0	0	5	0	0	0	0	0	54
% CARS	0	90.9	80.6	0	84.5	0	0	0	0	0	66.7	75	0	0	71.4	0	0	0	0	0	83.1
TRUCKS	0	2	7	0	9	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	11
% TRUCKS	0	9.1	19.4	0	15.5	0	0	0	0	0	33.3	25	0	0	28.6	0	0	0	0	0	16.9

Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT US1 BYP-U-Haul-Existing Site Driveways
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT US1 BYP-U-Haul-Existing Site Driveways
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- TRUCKS

	US1 BYP From North					From East					US1 BYP From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
11:15 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	2	0	3	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	4
12:00 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
01:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
02:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
02:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Grand Total	0	2	7	0	9	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	11
Apprch %	0	22.2	77.8	0		0	0	0	0		50	50	0	0		0	0	0	0		
Total %	0	18.2	63.6	0	81.8	0	0	0	0	0	9.1	9.1	0	0	18.2	0	0	0	0	0	

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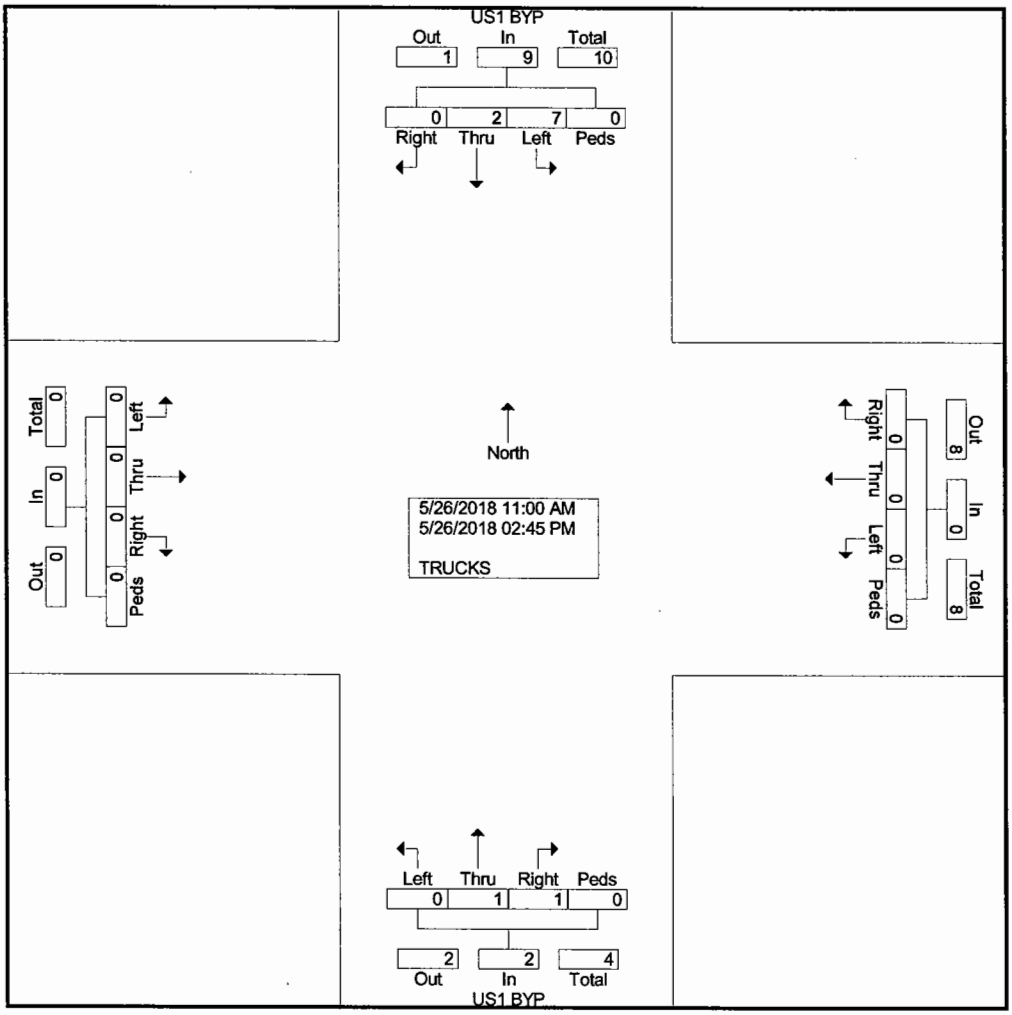
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A SAT US1 BYP-U-Haul-Existing Site Driveways
Site Code : 1831A
Start Date : 5/26/2018
Page No : 2



Appendix D **Pedestrian Counts**

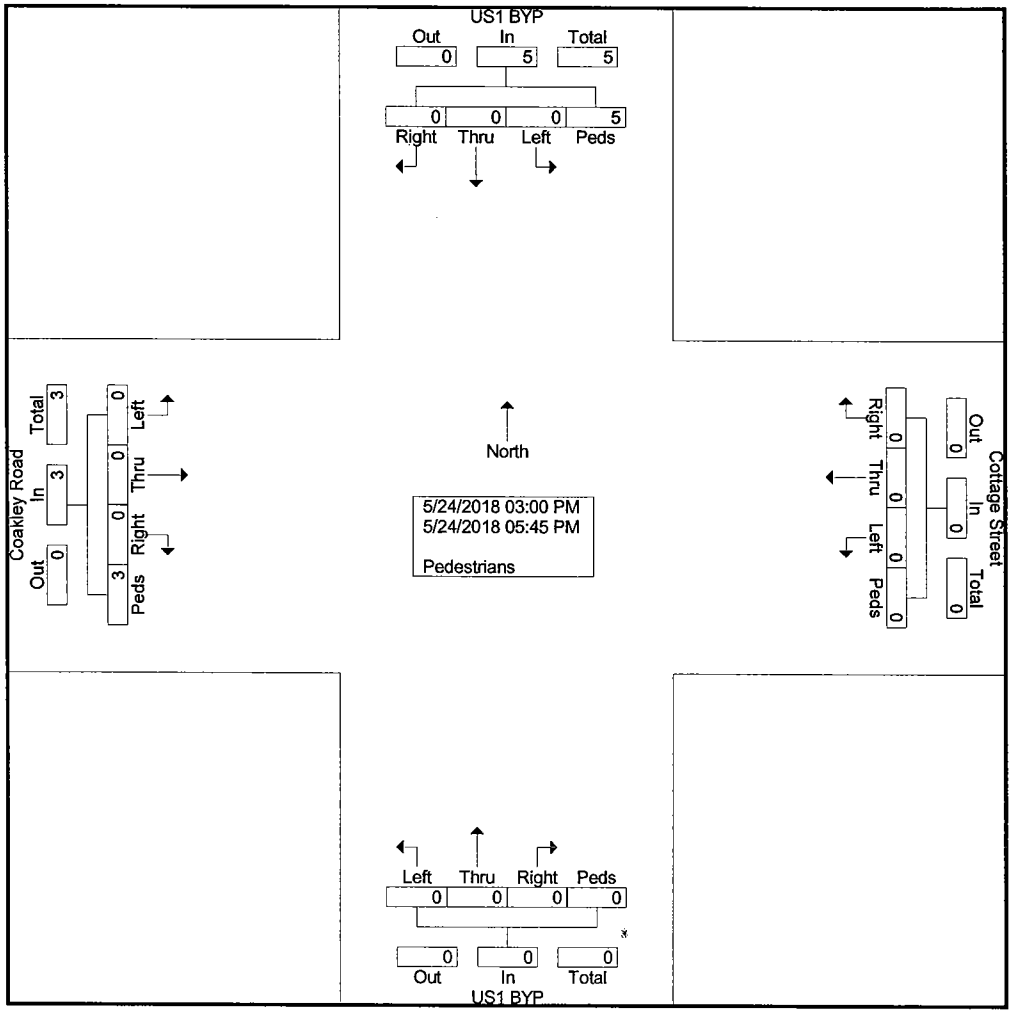
Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_G_Thurs_PM_US1 BYP-Cottage
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- Pedestrians

	US1 BYP From North					Cottage Street From East					US1 BYP From South					Coakley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
05:45 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
Total	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	6
Grand Total	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	8
Apprch %	0	0	0	100		0	0	0	0		0	0	0	0		0	0	0	100		
Total %	0	0	0	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0	0	0	37.5	37.5	



Stephen G. Pernaw & Co., Inc.
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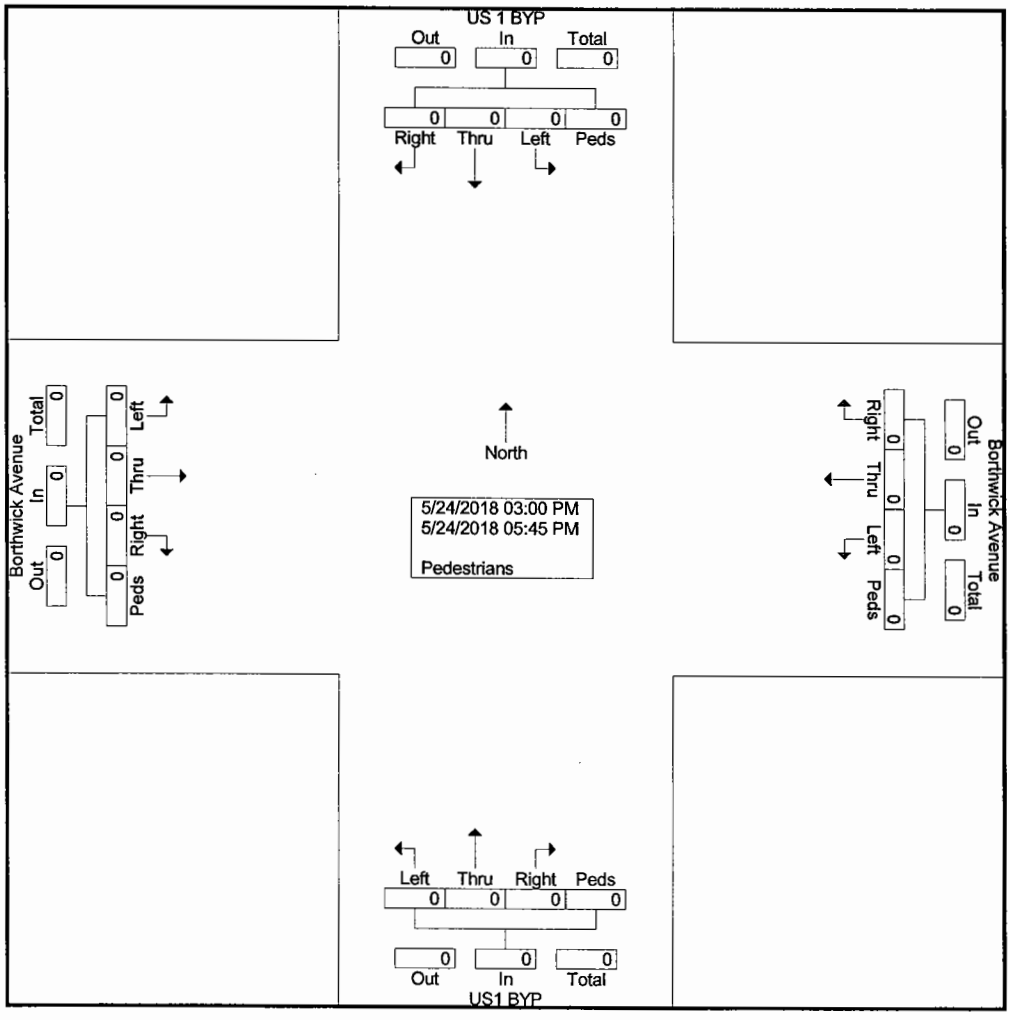
Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_H_Thurs_PM_US1 BYP-Borthwick
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- Pedestrians

	US 1 BYP From North					Borthwick Avenue From East					US1 BYP From South					Borthwick Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					



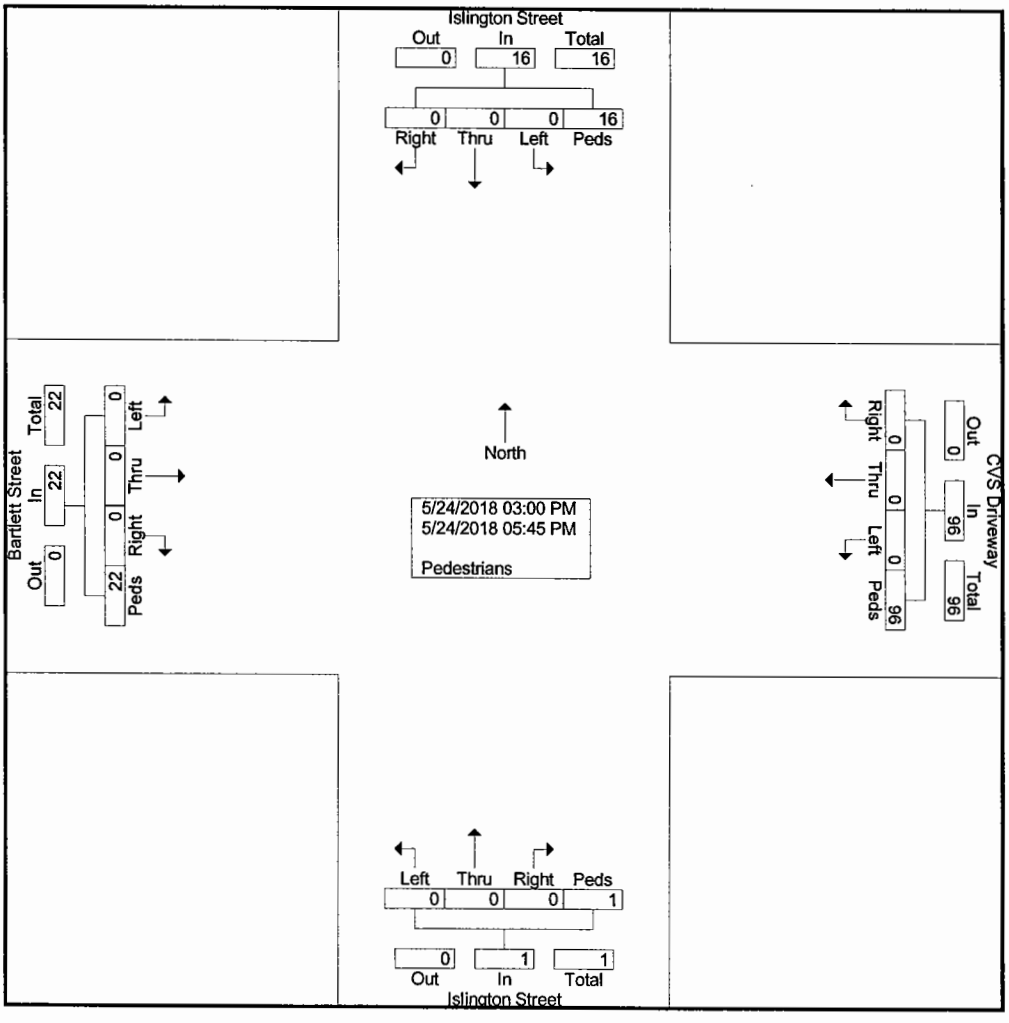
Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_E_Thurs_PM_Islington-Bartlett
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- Pedestrians

	Islington Street From North					CVS Driveway From East					Islington Street From South					Bartlett Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	8
03:15 PM	0	0	0	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	1	1	8
03:30 PM	0	0	0	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	2	2	11
03:45 PM	0	0	0	1	1	0	0	0	10	10	0	0	0	0	0	0	0	0	2	2	13
Total	0	0	0	1	1	0	0	0	34	34	0	0	0	0	0	0	0	0	5	5	40
04:00 PM	0	0	0	4	4	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	14
04:15 PM	0	0	0	2	2	0	0	0	9	9	0	0	0	0	0	0	0	0	2	2	13
04:30 PM	0	0	0	2	2	0	0	0	6	6	0	0	0	1	1	0	0	0	1	1	10
04:45 PM	0	0	0	2	2	0	0	0	14	14	0	0	0	0	0	0	0	0	1	1	17
Total	0	0	0	10	10	0	0	0	39	39	0	0	0	1	1	0	0	0	4	4	54
05:00 PM	0	0	0	1	1	0	0	0	6	6	0	0	0	0	0	0	0	0	5	5	12
05:15 PM	0	0	0	2	2	0	0	0	3	3	0	0	0	0	0	0	0	0	5	5	10
05:30 PM	0	0	0	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	3	3	11
05:45 PM	0	0	0	2	2	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	8
Total	0	0	0	5	5	0	0	0	23	23	0	0	0	0	0	0	0	0	13	13	41
Grand Total	0	0	0	16	16	0	0	0	96	96	0	0	0	1	1	0	0	0	22	22	135
Apprch %	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
Total %	0	0	0	11.9	11.9	0	0	0	71.1	71.1	0	0	0	0.7	0.7	0	0	0	16.3	16.3	



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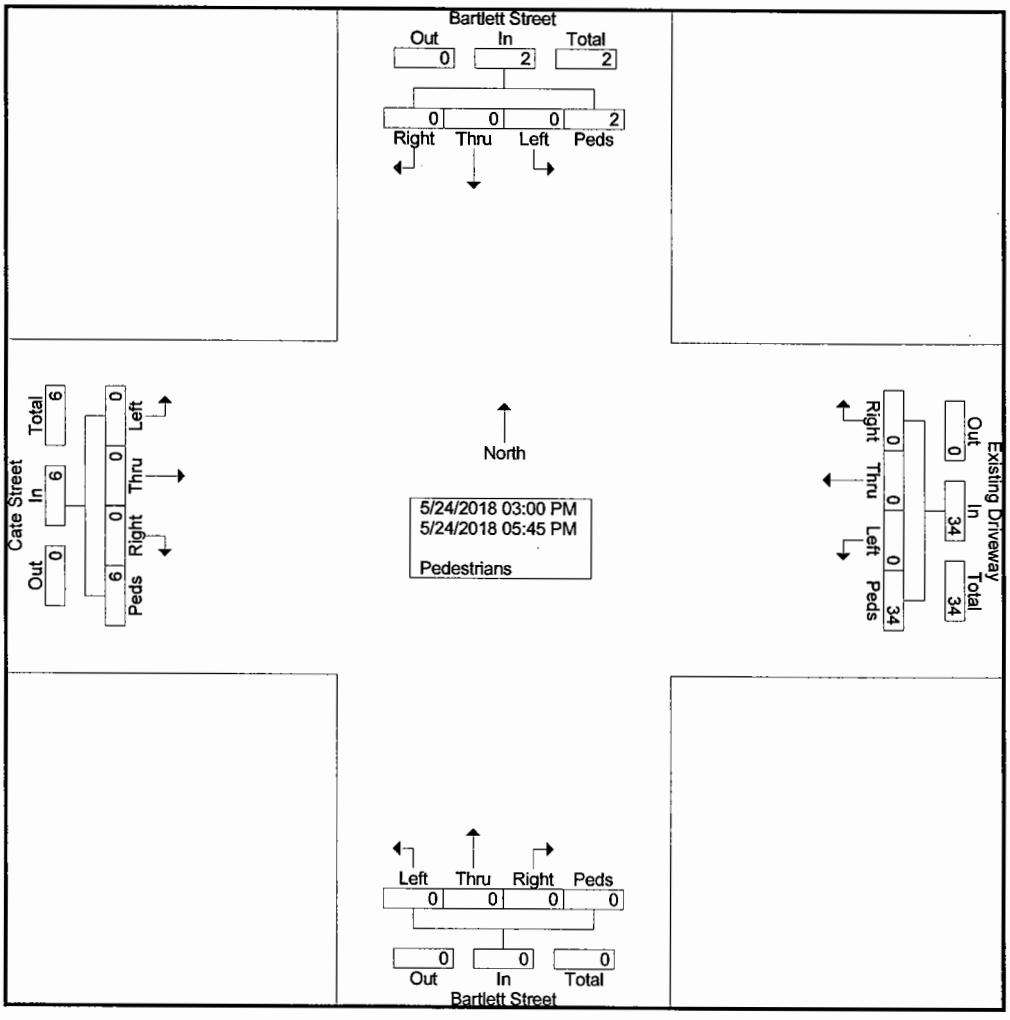
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_D_Thurs_PM_Bartlett-Cate
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- Pedestrians

	Bartlett Street From North					Existing Driveway From East					Bartlett Street From South					Cate Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
03:45 PM	0	0	0	2	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	2	2	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	7
04:00 PM	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	1	1	4
04:15 PM	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	3
04:45 PM	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	5
Total	0	0	0	0	0	0	0	0	13	13	0	0	0	0	0	0	0	0	1	1	14
05:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	2
05:15 PM	0	0	0	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	7
05:30 PM	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	2	2	8
05:45 PM	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2	4
Total	0	0	0	0	0	0	0	0	16	16	0	0	0	0	0	0	0	0	5	5	21
Grand Total	0	0	0	2	2	0	0	0	34	34	0	0	0	0	0	0	0	0	6	6	42
Apprch %	0	0	0	100		0	0	0	100		0	0	0	0		0	0	0	100		
Total %	0	0	0	4.8	4.8	0	0	0	81	81	0	0	0	0	0	0	0	0	14.3	14.3	



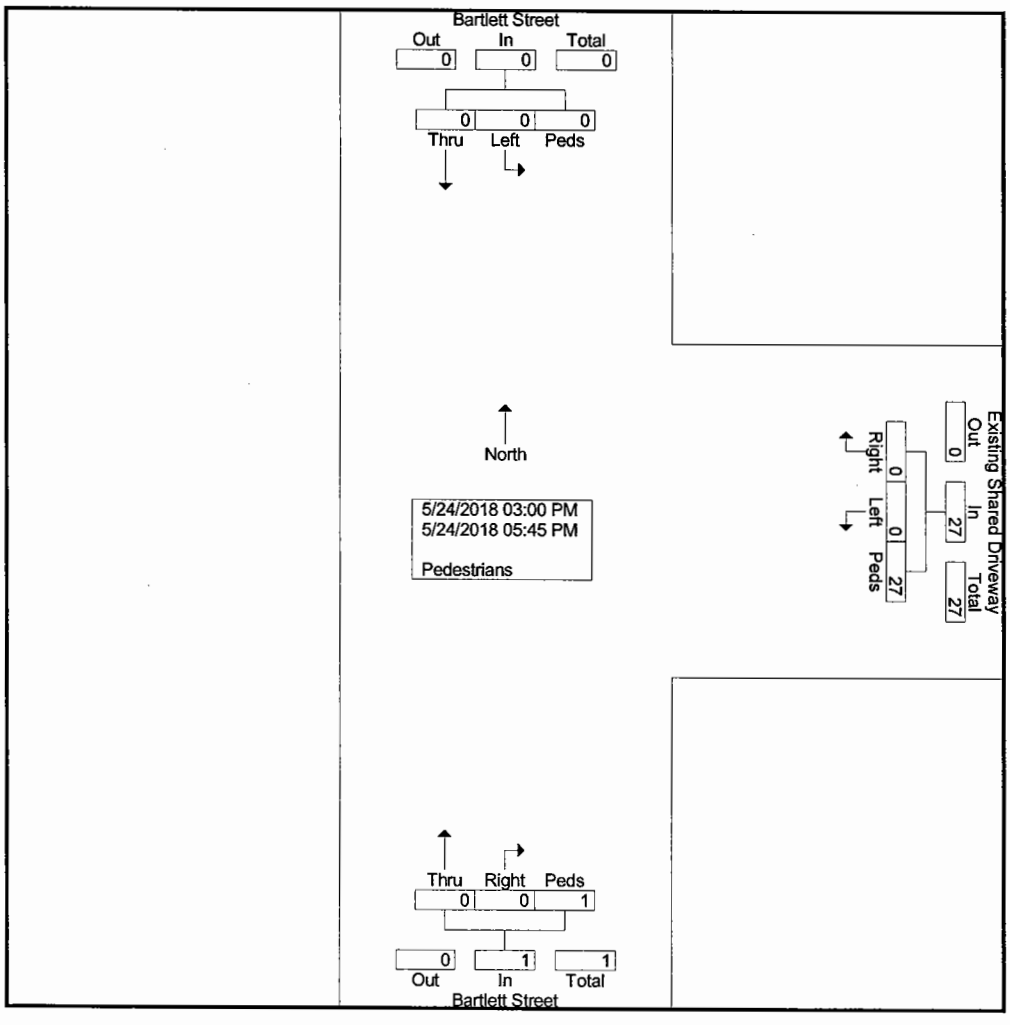
Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_C_Thurs_PM_Bart-Shared
Site Code : 1831A
Start Date : 5/24/2018
Page No : 1

Groups Printed- Pedestrians

	Bartlett Street From North				Existing Shared Driveway From East				Bartlett Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	2	2	0	0	0	0	2
03:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	1
Total	0	0	0	0	0	0	3	3	0	0	0	0	3
04:00 PM	0	0	0	0	0	0	3	3	0	0	0	0	3
04:15 PM	0	0	0	0	0	0	2	2	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	4	4	0	0	0	0	4
04:45 PM	0	0	0	0	0	0	5	5	0	0	1	1	6
Total	0	0	0	0	0	0	14	14	0	0	1	1	15
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	5	5	0	0	0	0	5
05:30 PM	0	0	0	0	0	0	4	4	0	0	0	0	4
05:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	1
Total	0	0	0	0	0	0	10	10	0	0	0	0	10
Grand Total	0	0	0	0	0	0	27	27	0	0	1	1	28
Apprch %	0	0	0		0	0	100		0	0	100		
Total %	0	0	0	0	0	0	96.4	96.4	0	0	3.6	3.6	



Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_G_SAT_US1 BYP-Cottage
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- Pedestrians

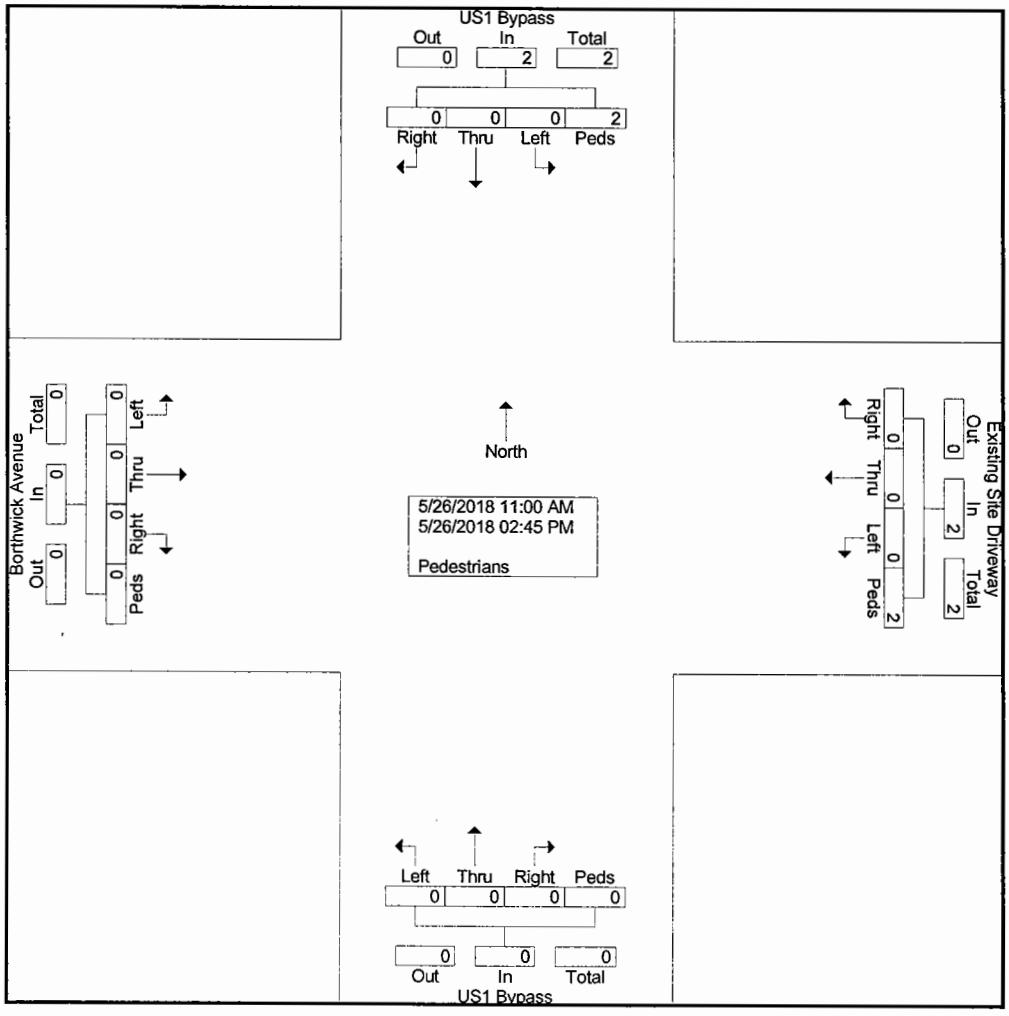
	US1 Bypass From North					Cottage Street From East					US1 Bypass From South					Coakley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	5
Total	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	7
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Total	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	9
Apprch %	0	0	0	100		0	0	0	0		0	0	0	0		0	0	0	100		
Total %	0	0	0	66.7	66.7	0	0	0	0	0	0	0	0	0	0	0	0	0	33.3	33.3	

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_H_SAT_US1 BYP-Borthwick
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- Pedestrians

	US1 Bypass From North					Existing Site Driveway From East					US1 Bypass From South					Borthwick Avenue From West					
Start Time	Peds	Right	Thru	Left	App. Total	Peds	Right	Thru	Left	App. Total	Peds	Right	Thru	Left	App. Total	Peds	Right	Thru	Left	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4
Grand Total	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4
Apprch %	100	0	0	0		100	0	0	0		0	0	0	0		0	0	0	0		
Total %	50	0	0	0	50	50	0	0	0	50	0	0	0	0	0	0	0	0	0	0	



Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_E_SAT_Islington-Bartlett
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- Pedestrians

	Islington Street From North					CVS Driveway From East					Islington Street From South					Bartlett Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	0	4	4	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	17
11:15 AM	0	0	0	2	2	0	0	0	9	9	0	0	0	0	0	0	0	0	2	2	13
11:30 AM	0	0	0	2	2	0	0	0	4	4	0	0	0	0	0	0	0	0	6	6	12
11:45 AM	0	0	0	0	0	0	0	0	11	11	0	0	0	0	0	0	0	0	1	1	12
Total	0	0	0	8	8	0	0	0	37	37	0	0	0	0	0	0	0	0	9	9	54
12:00 PM	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	1	1	7
12:15 PM	0	0	0	1	1	0	0	0	8	8	0	0	0	0	0	0	0	0	6	6	15
12:30 PM	0	0	0	2	2	0	0	0	10	10	0	0	0	0	0	0	0	0	2	2	14
12:45 PM	0	0	0	1	1	0	0	0	15	15	0	0	0	0	0	0	0	0	6	6	22
Total	0	0	0	4	4	0	0	0	39	39	0	0	0	0	0	0	0	0	15	15	58
01:00 PM	0	0	0	1	1	0	0	0	9	9	0	0	0	0	0	0	0	0	1	1	11
01:15 PM	0	0	0	1	1	0	0	0	9	9	0	0	0	0	0	0	0	0	1	1	11
01:30 PM	0	0	0	1	1	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0	16
01:45 PM	0	0	0	1	1	0	0	0	12	12	0	0	0	0	0	0	0	0	3	3	16
Total	0	0	0	4	4	0	0	0	45	45	0	0	0	0	0	0	0	0	5	5	54
02:00 PM	0	0	0	0	0	0	0	0	8	8	0	0	0	1	1	0	0	0	7	7	16
02:15 PM	0	0	0	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	2	2	9
02:30 PM	0	0	0	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	4	4	14
02:45 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	5	5	7
Total	0	0	0	1	1	0	0	0	26	26	0	0	0	1	1	0	0	0	18	18	46
Grand Total	0	0	0	17	17	0	0	0	147	147	0	0	0	1	1	0	0	0	47	47	212
Apprch %	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
Total %	0	0	0	8	8	0	0	0	69.3	69.3	0	0	0	0.5	0.5	0	0	0	22.2	22.2	

Stephen G. Pernaw & Co., Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 1831A
Town/State: Portsmouth, NH

File Name : 1831A_INT_D_SAT_Bartlett-Cate
Site Code : 1831A
Start Date : 5/26/2018
Page No : 1

Groups Printed- Pedestrians

	Bartlett Street From North					Private Driveway From East					Bartlett Street From South					Cate Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	2	2	9
11:15 AM	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	6	6	9
11:30 AM	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	1	1	7
11:45 AM	0	0	0	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	1	1	8
Total	0	0	0	0	0	0	0	0	23	23	0	0	0	0	0	0	0	0	10	10	33
12:00 PM	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	1	1	4
12:15 PM	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	4
12:30 PM	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	5
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	12	12	0	0	0	0	0	0	0	0	1	1	13
01:00 PM	0	0	0	2	2	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	9
01:15 PM	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	1	1	7
01:30 PM	0	0	0	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	7
01:45 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	2
Total	0	0	0	2	2	0	0	0	21	21	0	0	0	1	1	0	0	0	1	1	25
02:00 PM	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	0	0	0	0	0	3
02:15 PM	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	5
02:30 PM	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	3
02:45 PM	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	0	0	0	12	12	0	0	0	1	1	0	0	0	0	0	13
Grand Total	0	0	0	2	2	0	0	0	68	68	0	0	0	2	2	0	0	0	12	12	84
Apprch %	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
Total %	0	0	0	2.4	2.4	0	0	0	81	81	0	0	0	2.4	2.4	0	0	0	14.3	14.3	

Appendix E **Seasonal Adjustment Factors / Historical Growth Rates**

Stephen G. Pernaw & Company, Inc.

STEPHEN G. PERNAW & COMPANY, INC.
PROJECT: Proposed Mixed-Use Site, Portsmouth, New Hampshire
NUMBER: 1821A
STATION: 02331001

SEASONAL ADJUSTMENT FACTOR - SUMMARY

CASE: Peak Hour Data (May to Peak Month)

LOCATION : US4/NH16 - East/South of General Sullivan Bridge, Newington, NH

	PM	SAT
2017 Monthly Data	1.08	1.08
2016 Monthly Data	1.10	1.10
2015 Monthly Data	NA	NA
2014 Monthly Data	NA	NA
2013 Monthly Data	1.02	1.07
Average	1.07	1.08
Use	**1.07**	**1.08**

Stephen G. Pernaw & Company, Inc.

Year 2017 Monthly Data

Town: Newington
Station: 02331001
Location: US 4/NH 16 (Spaulding TPK) east/south of General Sullivan Bridge (Exit 4-5)
Group: 3

		Adjustment to	
Month	ADT	Average	Peak
January	60,218	1.17	1.29
February	69,482	1.01	1.11
March	65,848	1.07	1.18
April	68,406	1.03	1.13
May	71,759	0.98	1.08
June	75,074	0.94	1.03
July	74,839	0.94	1.04
August	77,466	0.91	1.00
September	73,005	0.96	1.06
October	72,519	0.97	1.07
November	68,986	1.02	1.12
December	64,695	1.09	1.20

AADT: 70,335
Peak Month: 77,466

Notes: XX *A box around data indicates an estimated value. Do not use as data.*
NA Data Not Available for consecutive months. Estimates not provided.

Stephen G. Pernaw & Company, Inc.

Year 2016 Monthly Data

Town: Newington
Station: 02331001
Location: US 4/NH 16 (Spaulding TPK) east/south of General Sullivan Bridge (Exit 4-5)
Group: 3

		Adjustment to	
Month	ADT	Average	Peak
January	62,174	1.13	1.26
February	65,447	1.08	1.19
March	67,316	1.05	1.16
April	68,975	1.02	1.13
May	71,099	0.99	1.10
June	75,185	0.94	1.04
July	75,497	0.93	1.04
August	78,156	0.90	1.00
September	73,373	0.96	1.07
October	72,103	0.98	1.08
November	68,579	1.03	1.14
December	66,463	1.06	1.18

AADT: 70,393
Peak Month: 78,156

Notes:

XX	*A box around data indicates an estimated value. Do not use as data.*
NA	*Data Not Available for consecutive months. Estimates not provided.*

Stephen G. Pernaw & Company, Inc.

Year 2015 Monthly Data										
Peak Hour Data										
	331003	Newington, US 4 and NH 16 WB E of Gen. Sullivan Bridge								
Stations =	331001	Newington, US 4 and NH 16 E of Gen. Sullivan E			Group:		03			
	331002	Newington, US 4 and NH 16 EB E of Gen Sullivan Bridge								
	Data				Factors					Number
Month	AM	Mid	PM	Sat Mid	AM	Mid	PM	Sat Mid		of Days
Jan	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A
Feb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A
Mar	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A
Apr	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A
May	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A
Jun	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A
Jul	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A
Aug	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A
Sep	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A
Oct	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A
Nov	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A
Dec	5131	4349	5936	5310	1.00	1.00	1.00	1.00		31
Average	5131	4349	5936	5310						
Average Daily Data										
	Data				Factors					
Month	AveSun	AveWD	AveSat	AveDay	AveSun	AveWD	AveSat	AveDay		
Jan	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Feb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Mar	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Apr	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
May	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Jun	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Jul	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Aug	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Sep	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Oct	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Nov	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Dec	51443	71270	65846	68012	1.00	1.00	1.00	1.00		
Average	51443	71270	65846	68012						
Notes:	1. A box around the data indicates a calculated value. Do not use as data.									
	2. Yearly average days may not match the published report									
	3. Factors are based on Average Month									

Stephen G. Pernaw & Company, Inc.

Year 2014 Monthly Data

Peak Hour Data

	331003	Newington, US 4 and NH 16 WB E of Gen. Sullivan Bridge	
Stations =	331001	Newington, US 4 and NH 16 E of Gen. Sullivan E	Group: 03
	331002	Newington, US 4 and NH 16 EB E of Gen Sullivan Bridge	

	Data				Factors				Number
Month	AM	Mid	PM	Sat Mid	AM	Mid	PM	Sat Mid	of Days
Jan	4838	3543	5617	4428	1.10	1.13	1.07	1.11	31
Feb	5005	3601	5341	4825	1.06	1.11	1.12	1.02	28
Mar	5405	3536	5917	4779	0.99	1.13	1.02	1.03	31
Apr	5476	3866	6188	4810	0.97	1.03	0.97	1.02	30
May	5533	4058	6245	4843	0.96	0.98	0.96	1.02	31
Jun	5489	4180	6223	4944	0.97	0.96	0.97	1.00	30
Jul	5186	4454	6101	5178	1.03	0.90	0.98	0.95	31
Aug	5361	4636	6271	5427	0.99	0.86	0.96	0.91	31
Sep	5628	4060	6168	5078	0.95	0.98	0.97	0.97	25
Oct	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Nov	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Dec	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Average	5325	3993	6008	4924					

Average Daily Data

	Data				Factors			
Month	AveSun	AveWD	AveSat	AveDay	AveSun	AveWD	AveSat	AveDay
Jan	44967	62378	50587	58610	1.19	1.13	1.23	1.14
Feb	48350	62848	58292	60126	1.11	1.12	1.06	1.11
Mar	49619	66528	60632	62850	1.08	1.06	1.02	1.06
Apr	48985	70291	61380	66262	1.10	1.00	1.01	1.01
May	53853	71763	62887	68020	1.00	0.98	0.99	0.98
Jun	58659	74335	65260	70512	0.92	0.95	0.95	0.95
Jul	61500	75471	66432	72502	0.87	0.93	0.93	0.92
Aug	61652	77918	68643	73798	0.87	0.90	0.90	0.91
Sep	55907	72421	63885	69081	0.96	0.97	0.97	0.97
Oct	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Nov	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Dec	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Average	53721	70439	62000	66862				

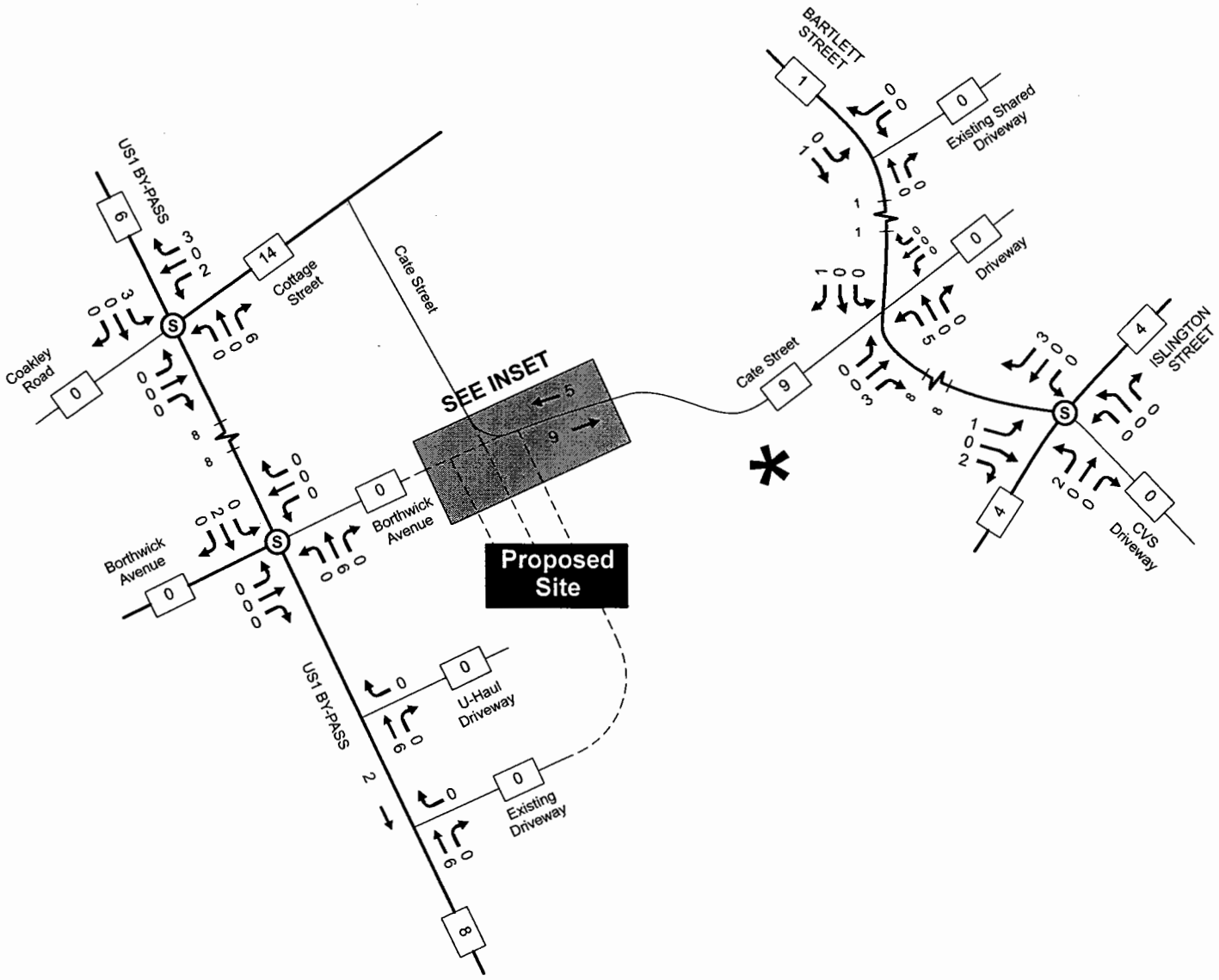
Notes:
1. A box around the data indicates a calculated value. Do not use as data.
2. Yearly average days may not match the published report
3. Factors are based on Average Month

Stephen G. Pernaw & Company, Inc.

Year 2013 Monthly Data										
Peak Hour Data										
	331003	Newington, US 4 and NH 16 WB E of Gen. Sullivan Bridge								
Stations =	331001	Newington, US 4 and NH 16 E of Gen. Sullivan E			Group:			03		
	331002	Newington, US 4 and NH 16 EB E of Gen Sullivan Bridge								
	Data				Factors					Number
Month	AM	Mid	PM	Sat Mid	AM	Mid	PM	Sat Mid		of Days
Jan	4932	3613	5645	4507	1.06	1.12	1.07	1.08		31
Feb	5191	3721	5722	3796	1.01	1.09	1.06	1.29		28
Mar	5176	3606	5885	4919	1.01	1.12	1.03	0.99		31
Apr	5424	3801	6166	4823	0.97	1.06	0.98	1.01		30
May	5434	4061	6248	5023	0.96	0.99	0.97	0.97		31
Jun	5455	4204	6212	4969	0.96	0.96	0.97	0.98		30
Jul	5049	4458	6133	5197	1.04	0.91	0.99	0.94		31
Aug	5235	4702	6305	5377	1.00	0.86	0.96	0.91		31
Sep	5511	4055	6218	4974	0.95	1.00	0.97	0.98		30
Oct	5636	4037	6349	5104	0.93	1.00	0.95	0.96		31
Nov	5202	3999	6040	4764	1.01	1.01	1.00	1.03		30
Dec	4604	4210	5711	5172	1.14	0.96	1.06	0.94		31
Average	5237	4039	6053	4885						

FACTOR = 1.02 1.07

Appendix F **Other Development Traffic Volumes**

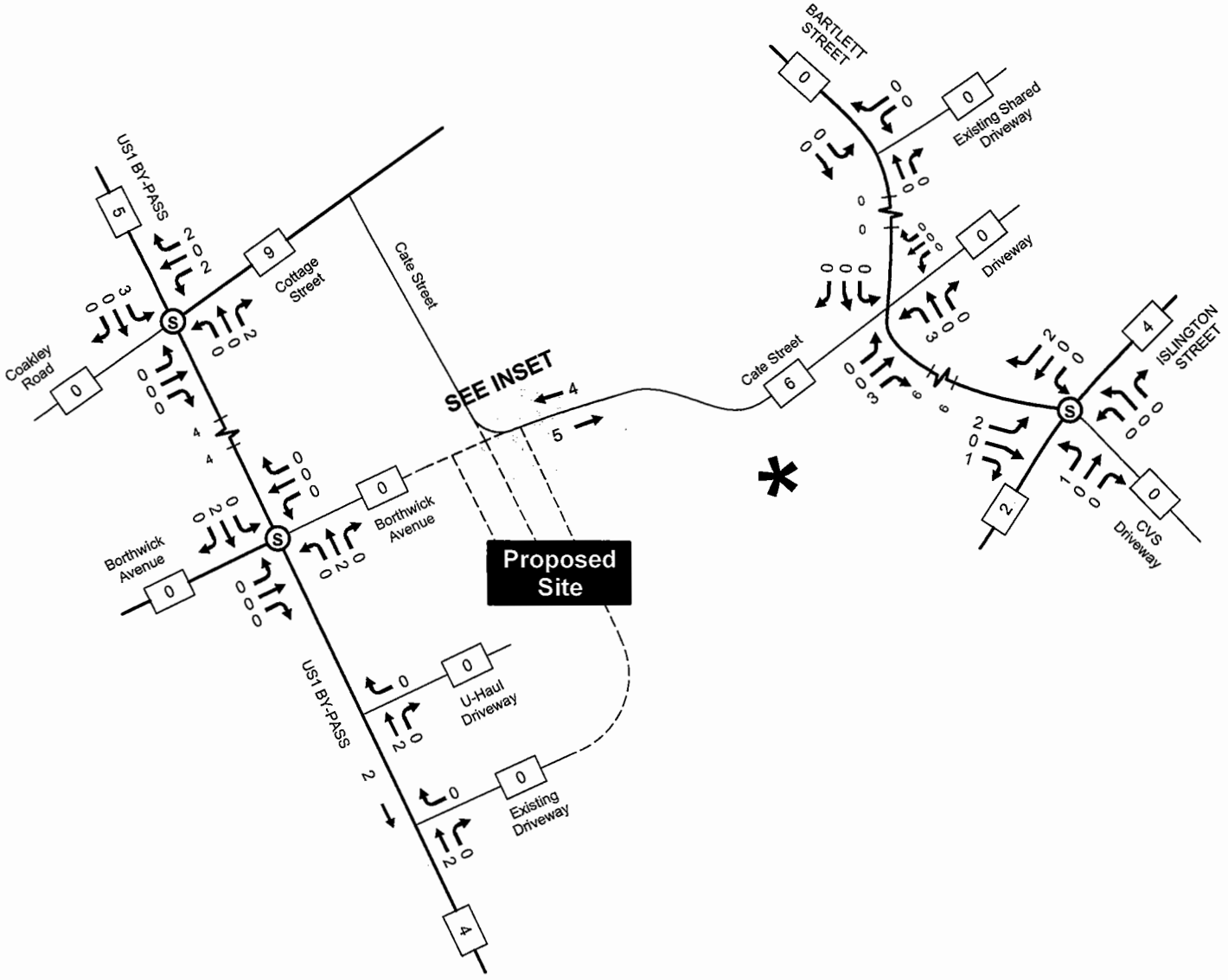


1831A

Appendix

Other Development Traffic Volumes - #30 Cate Street (PM Peak Hour)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

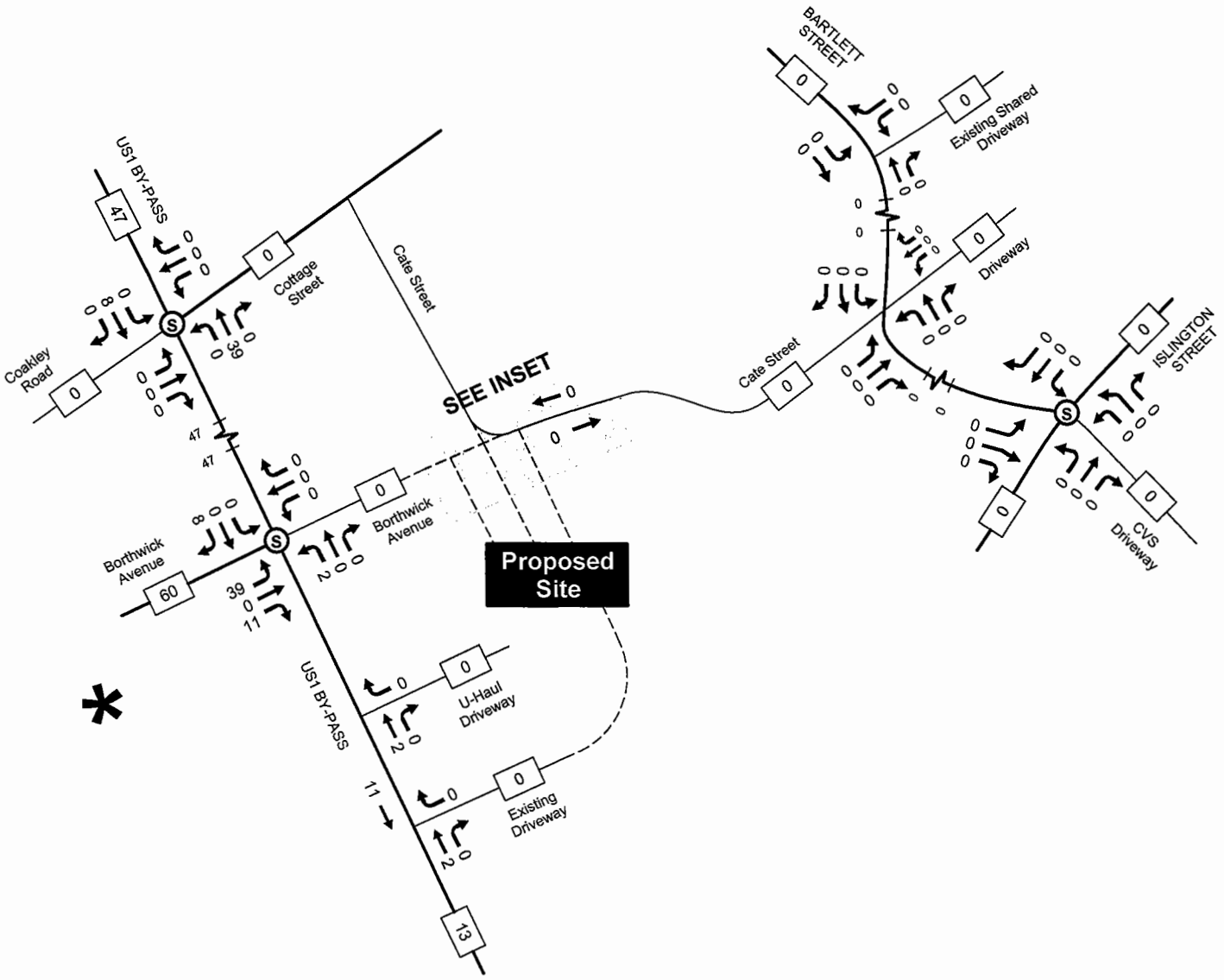


1831A

Appendix

Other Development Traffic Volumes - #30 Cate Street (Saturday Peak Hour)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

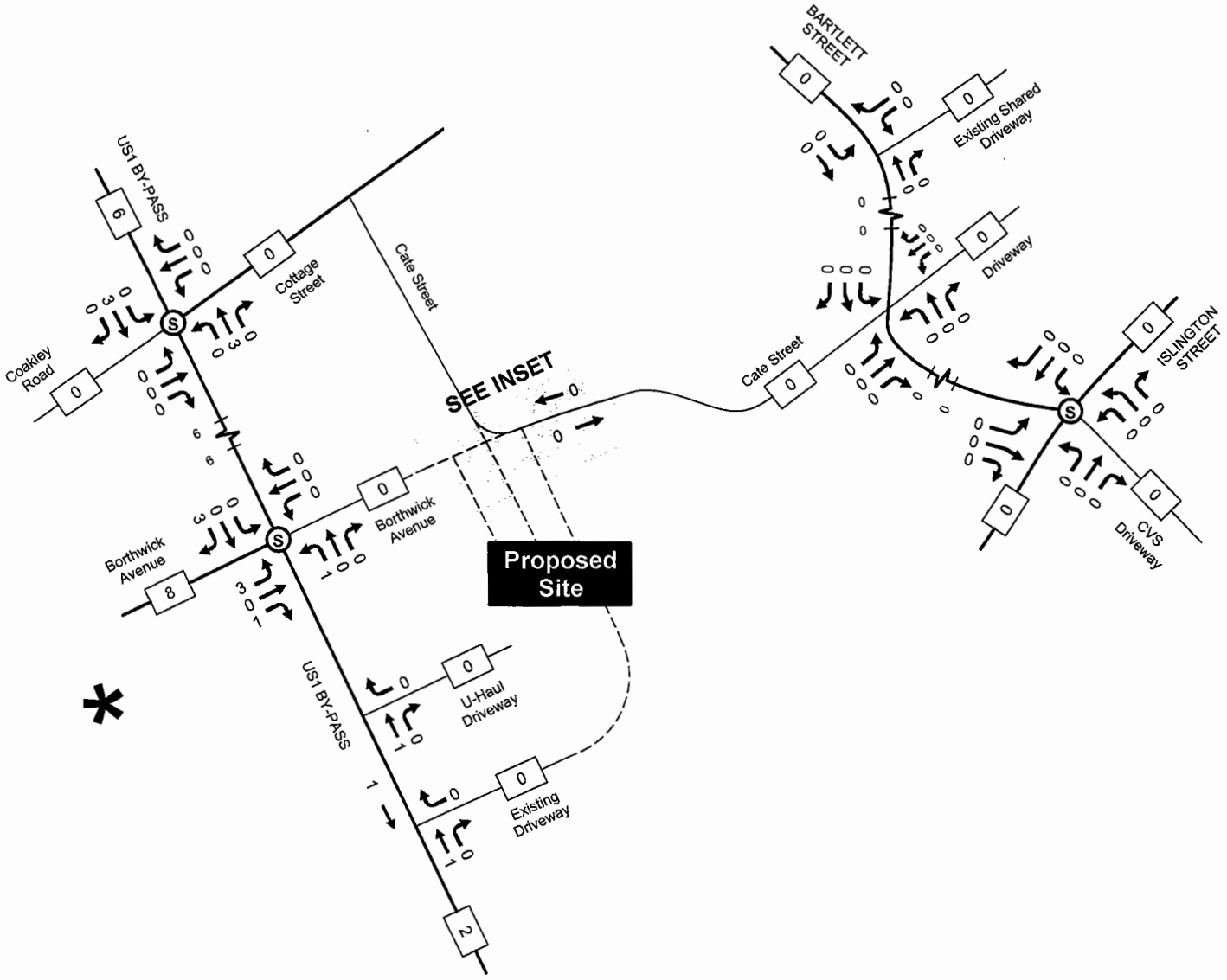


1831A

Appendix

Other Development Traffic Volumes - Borthwick Ave Office Dev (PM Peak Hour)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

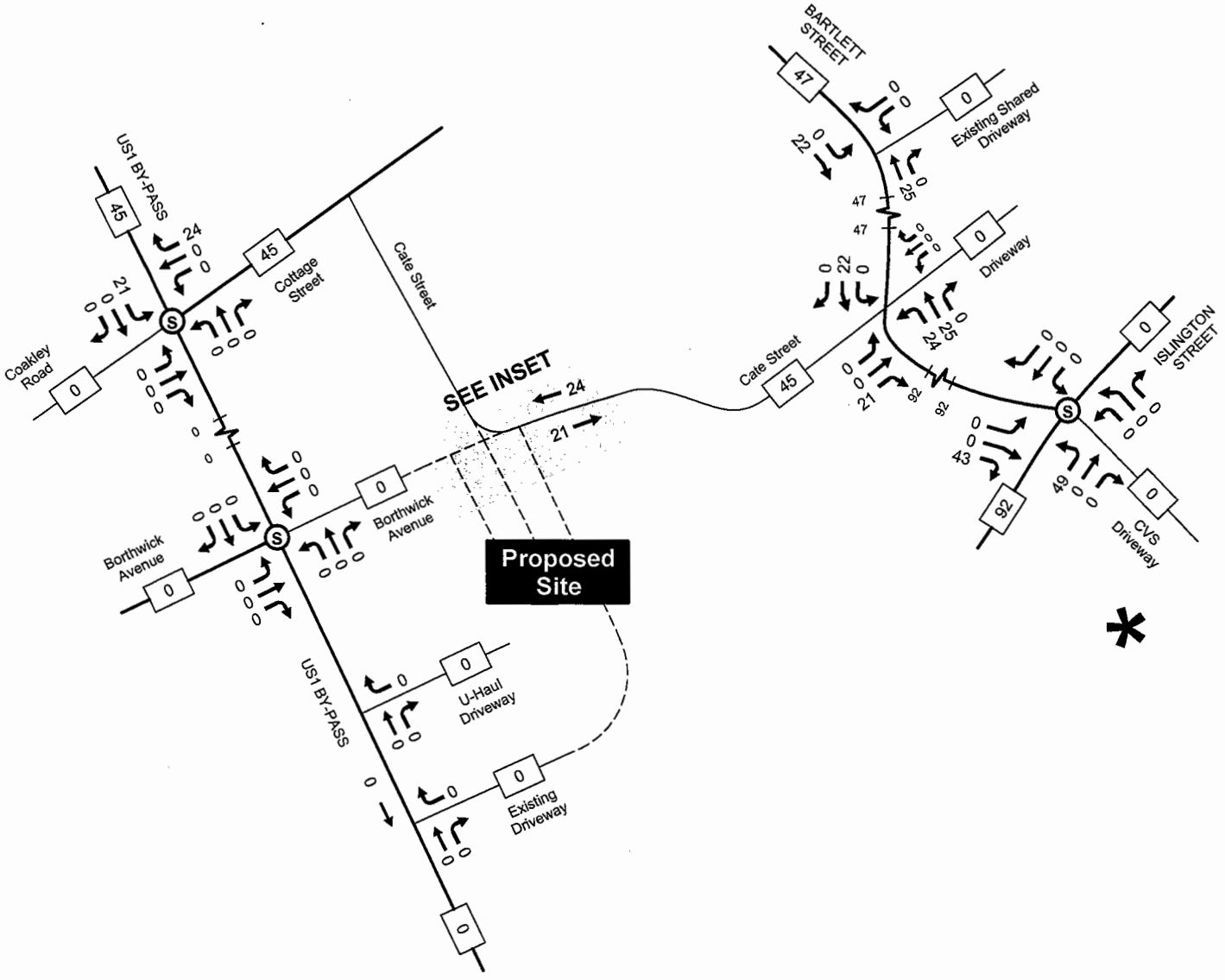


1831A

Appendix

Other Development Traffic Volumes - Borthwick Ave Office Dev (SAT Peak Hour)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

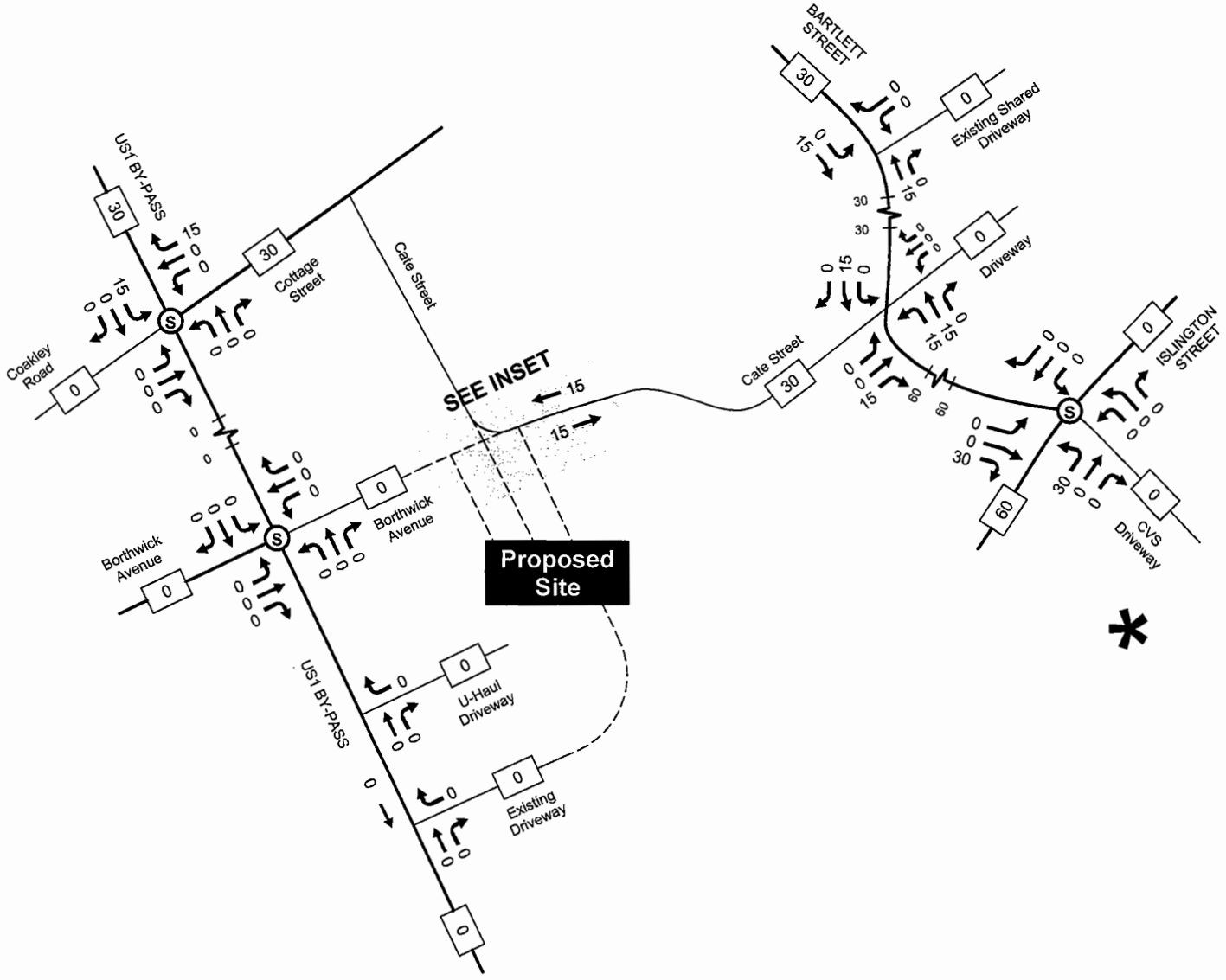


1831A

Appendix

Other Development Traffic Volumes - 145 Brewery Lane (PM Peak Hour)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

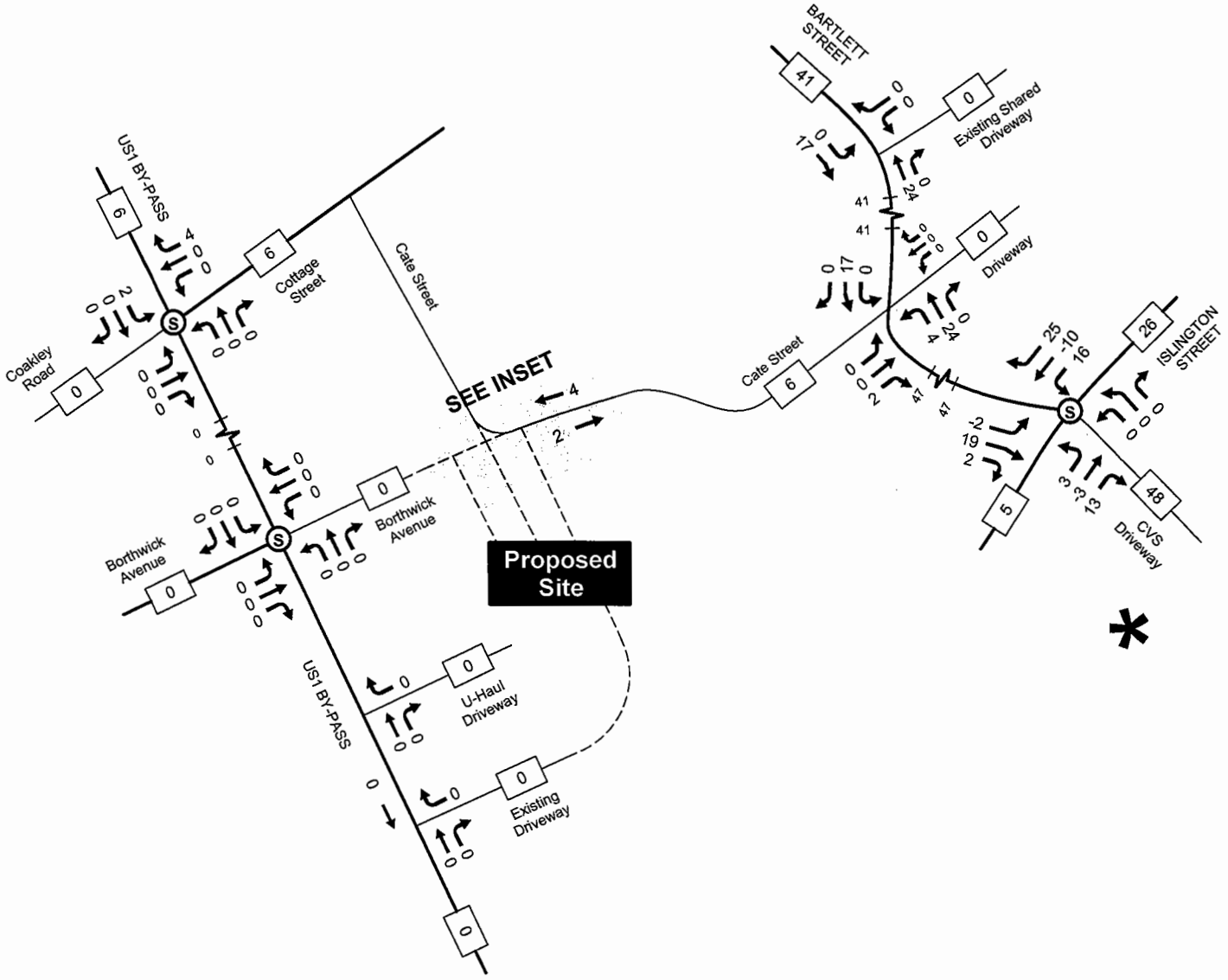


1831A

Appendix

Other Development Traffic Volumes - 145 Brewery Lane (SAT Peak Hour)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

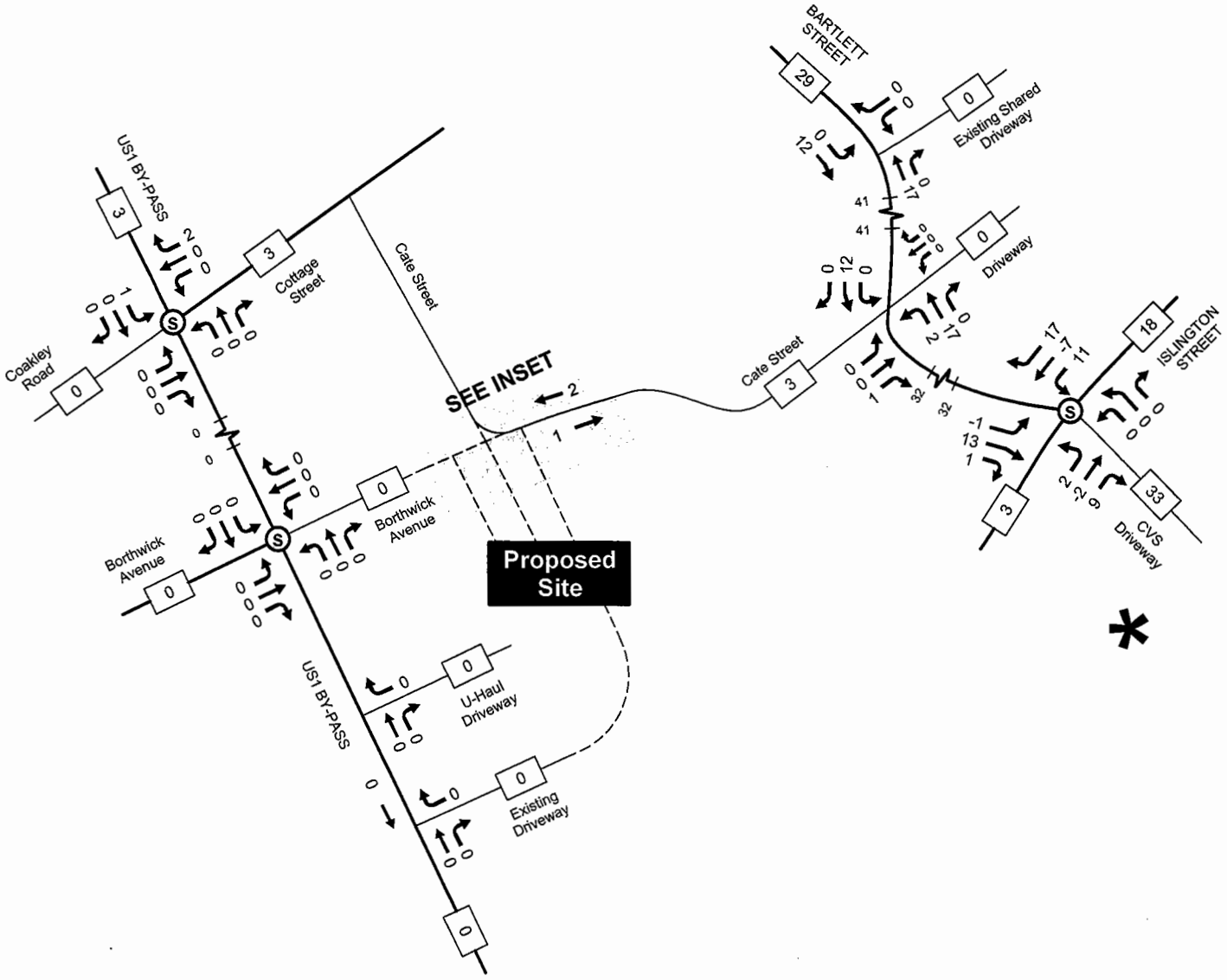


1831A

Appendix

Other Development Traffic Volumes - 110 Brewery Ln. - Jewel Ct. (PM Peak Hour)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

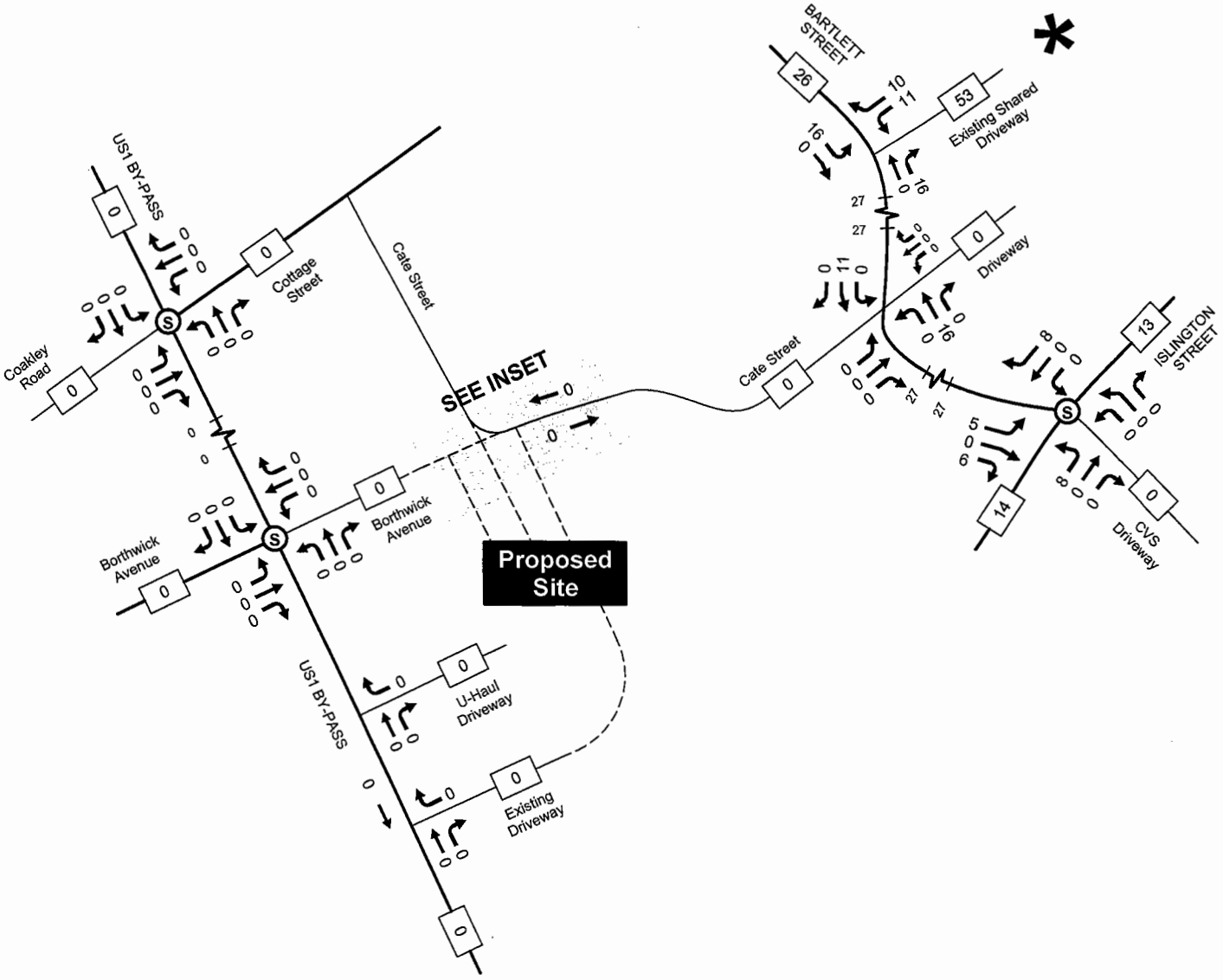


1831A

Appendix

Other Development Traffic Volumes - 110 Brewery Ln. - Jewel Ct. (SAT Peak Hour)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

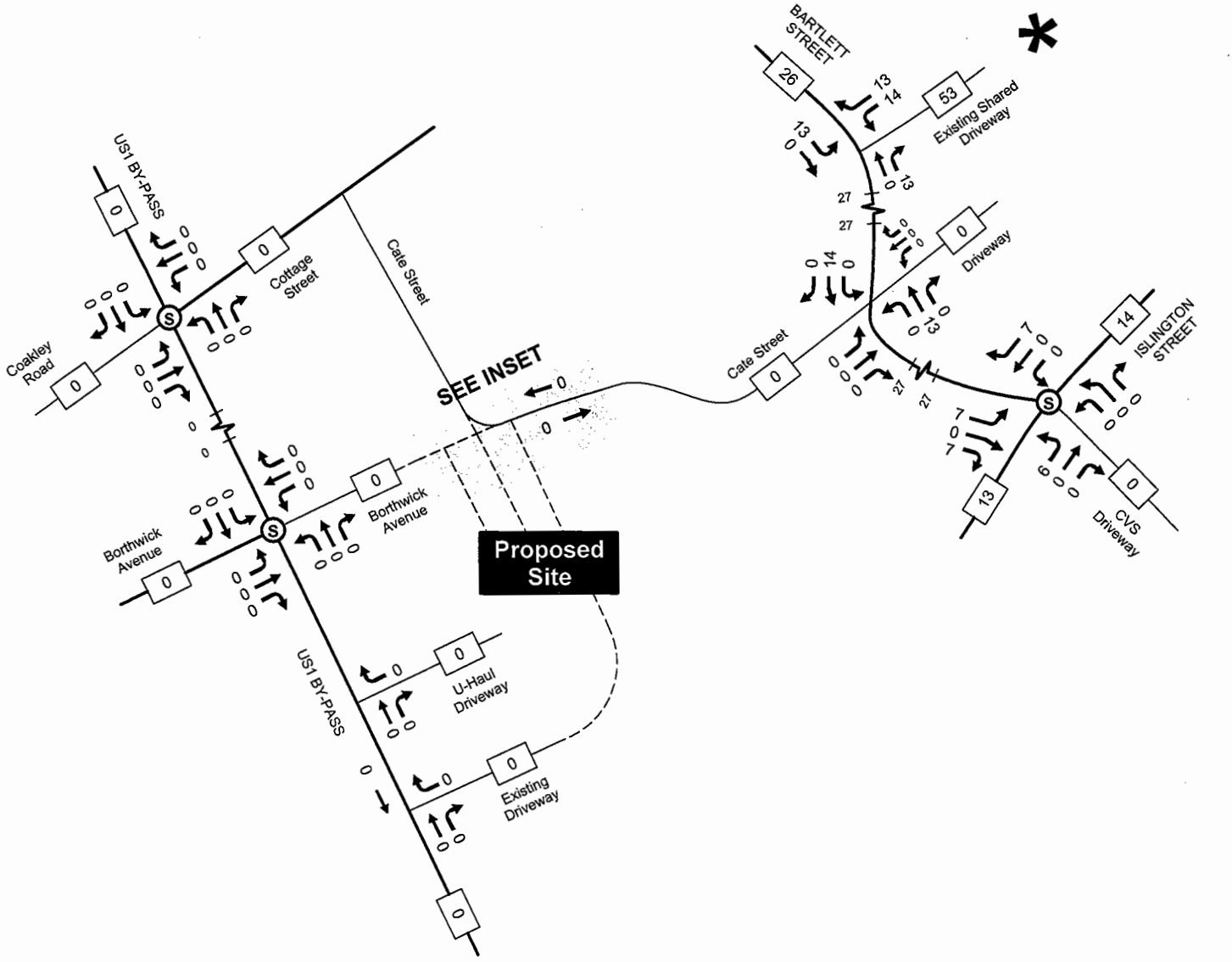


1831A

Appendix

Other Development Traffic Volumes - Clipper Traders (PM Peak Hour)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire



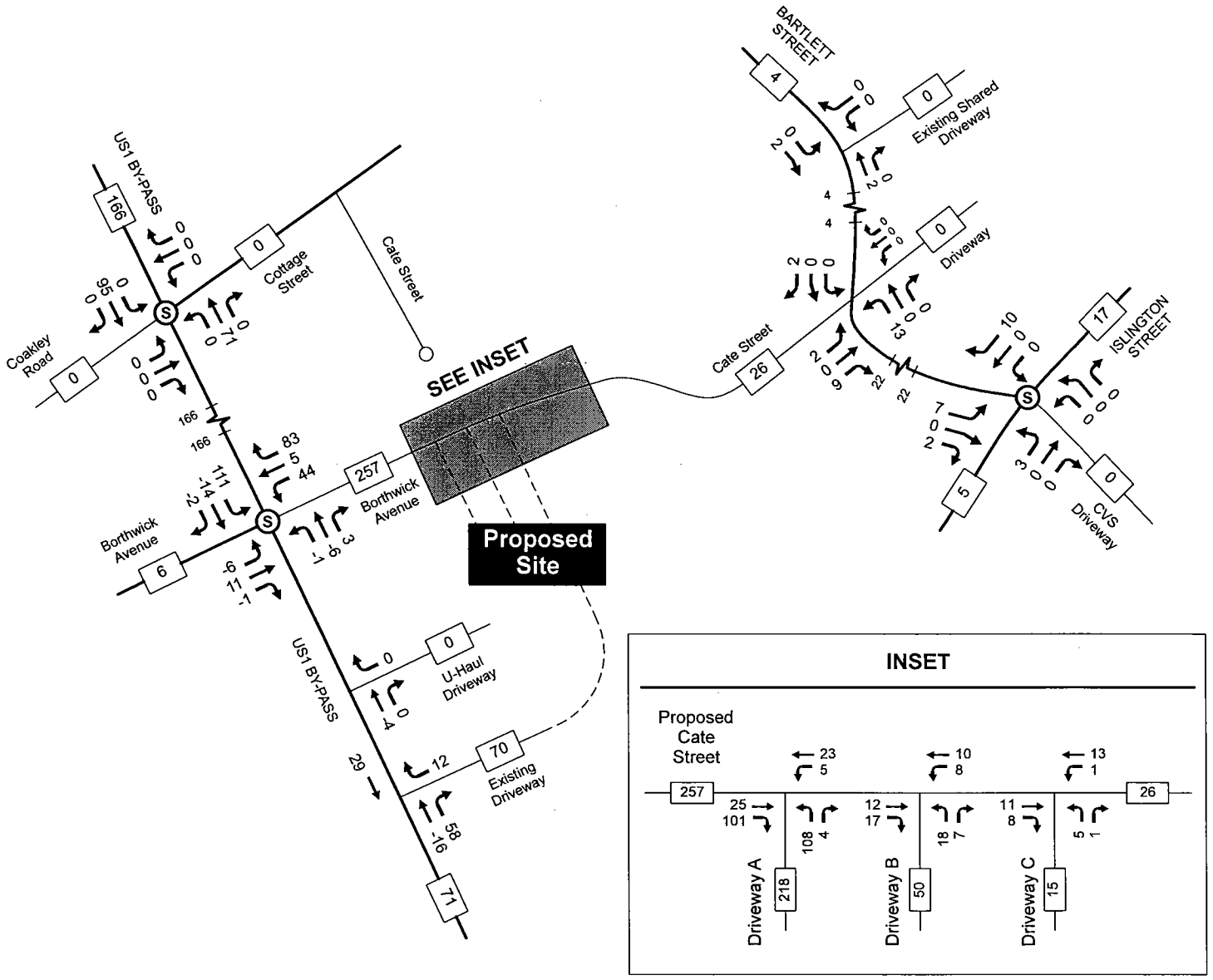
1831A

Appendix

Other Development Traffic Volumes - Clipper Traders (SAT Peak Hour)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

Appendix G **Site Generated Traffic Volumes / Trip Distribution / Traffic Diversion**

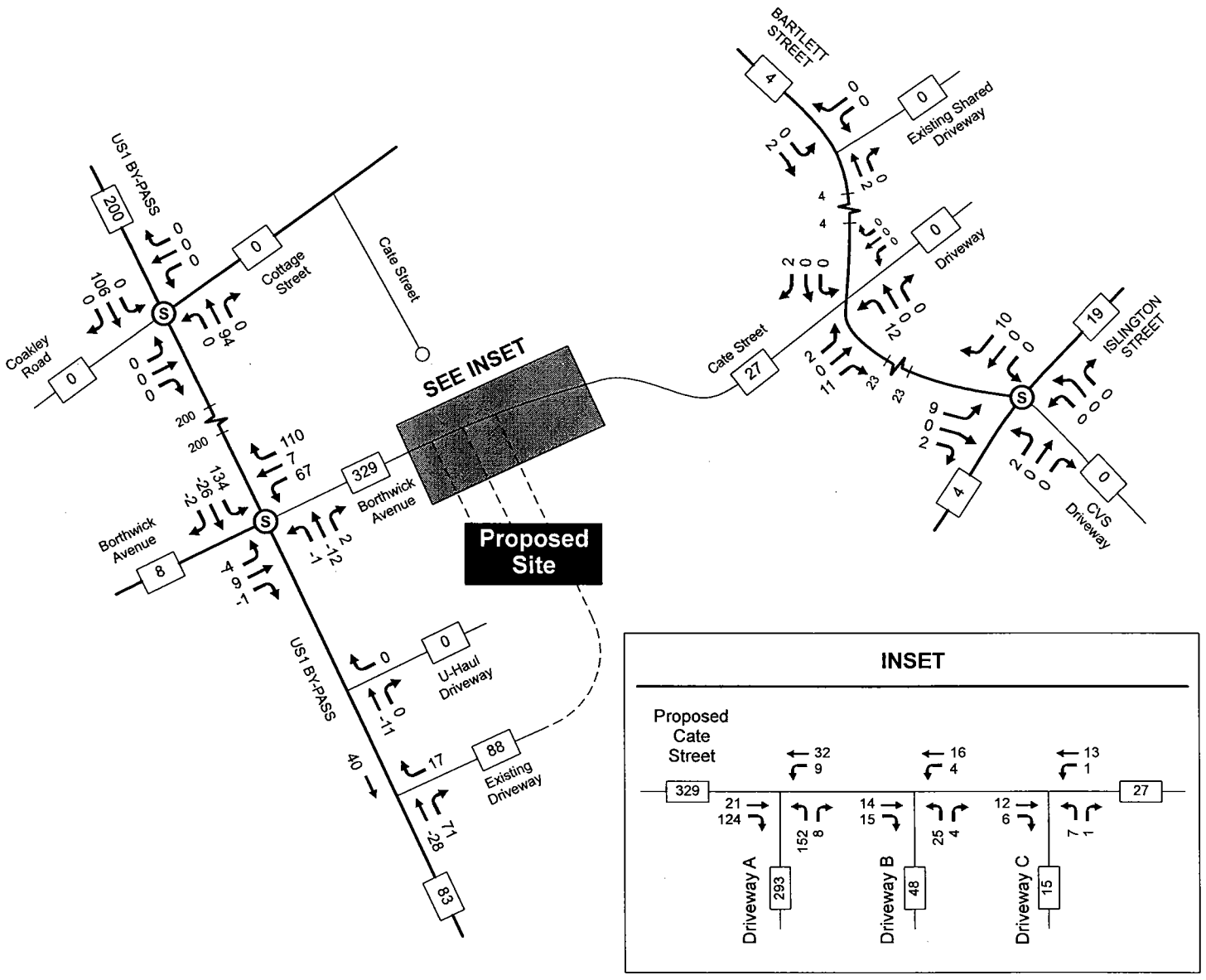


1831A

Appendix

Site Generated Traffic Volumes - PM Peak Hour (Scenario A & B)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire



NORTH

1831A

Appendix

Site Generated Traffic Volumes - Saturday Peak Hour (Scenario A & B)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

DATA SOURCE:
Trip Generation Manual, 10th Ed

SEARCH BY LAND USE CODE:
221

LAND USE CATEGORY:
(200-299) Residential

LAND USE :
221 - Multifamily Housing (Mid-Rise)

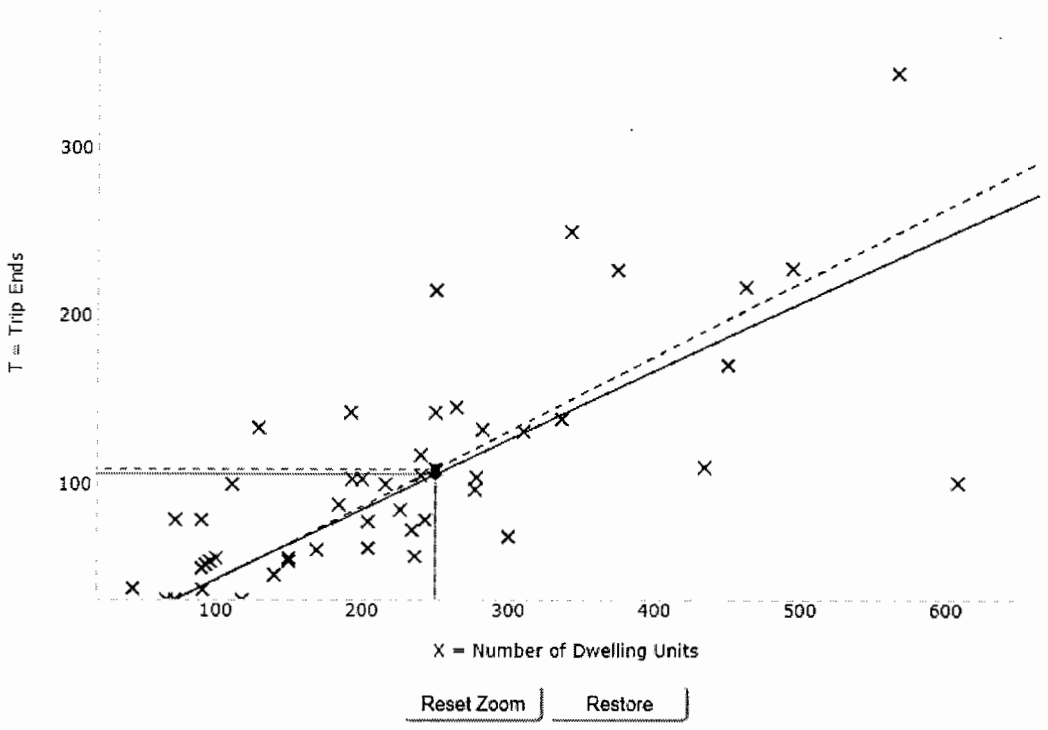
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
250 Calculate



Land Use:
Multifamily Housing (Mid-Rise) (221; See full land use details)

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
60

Avg. Num. of Dwelling Units:
208

Average Rate:
0.44

Range of Rates:
0.15 - 1.11

Standard Deviation:
0.19

Fitted Curve Equation:
Ln(T) = 0.96 Ln(X) - 0.65

R^2:
0.72

Directional Distribution:
61% entering, 39% exiting

Calculated Trip Ends:
Average Rate: 110 (Total), 67 (Entry), 43 (Exit)
Fitted Curve: 107 (Total), 65 (Entry), 42 (Exit)

Query

DATA SOURCE:
Trip Generation Manual, 10th Ed

SEARCH BY LAND USE CODE:
221

LAND USE CATEGORY:
(200-299) Residential

LAND USE :
221 - Multifamily Housing (Mid-Rise)

INDEPENDENT VARIABLE (IV):
Dwelling Units

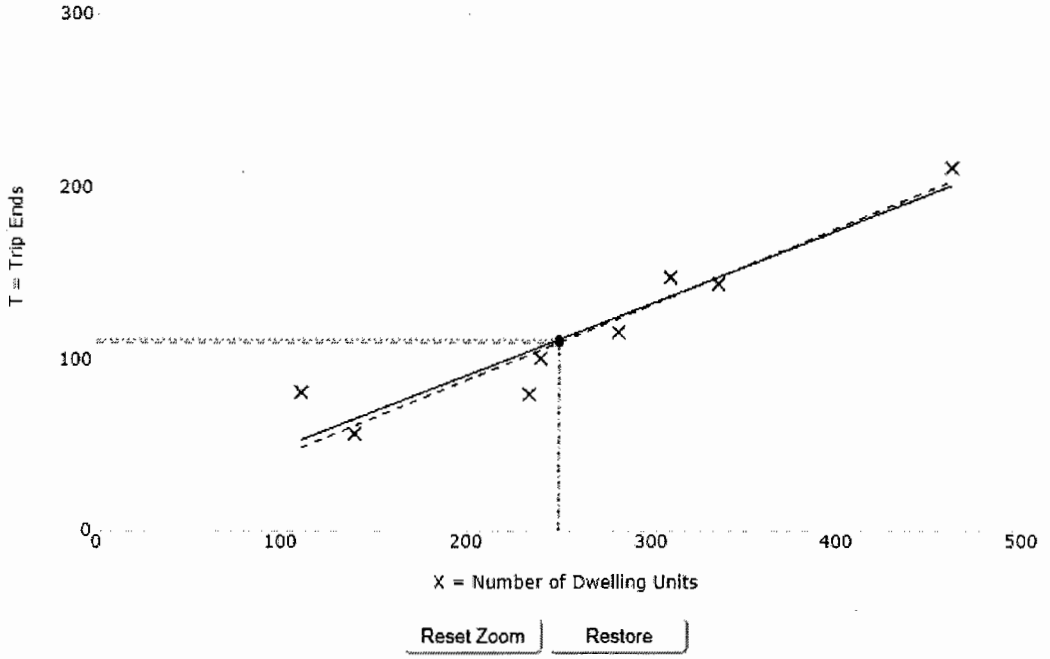
TIME PERIOD:
Saturday, Peak Hour of Generator

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
250 Calculate

Data Plot and Equation



DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) (221) Click for more details

Independent Variable:
Dwelling Units

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
8

Avg. Num. of Dwelling Units:
264

Average Rate:
0.44

Range of Rates:
0.34 - 0.73

Standard Deviation:
0.09

Fitted Curve Equation:
T = 0.42(X) + 6.73

R^2:
0.89

Directional Distribution:
49% entering, 51% exiting

Calculated Trip Ends:
Average Rate: 110 (Total), 54 (Entry), 56 (Exit)
Fitted Curve: 112 (Total), 55 (Entry), 57 (Exit)

Query

DATA SOURCE:
Trip Generation Manual, 10th Ed

SEARCH BY LAND USE CODE:
220

LAND USE CATEGORY:
(200-299) Residential

LAND USE:
220 - Multifamily Housing (Low-Rise)

INDEPENDENT VARIABLE (IV):
Dwelling Units

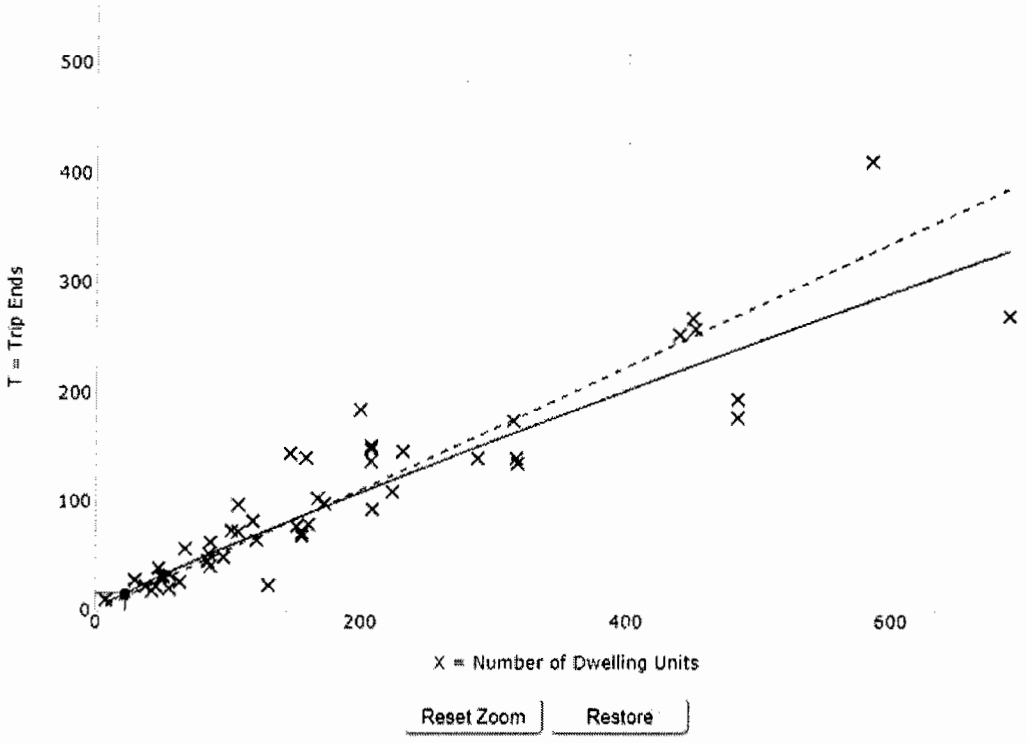
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
23 Calculate

Data Plot and Equation



DATA STATISTICS

Land Use:
Multifamily Housing (Low-Rise) (220) Click for more details

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
50

Avg. Num. of Dwelling Units:
167

Average Rate:
0.56

Range of Rates:
0.18 - 1.25

Standard Deviation:
0.16

Fitted Curve Equation:
Ln(T) = 0.89 Ln(X) - 0.02

R^2:
0.86

Directional Distribution:
63% entering, 37% exiting

Calculated Trip Ends:
Average Rate: 13 (Total), 8 (Entry), 5 (Exit)
Fitted Curve: 16 (Total), 10 (Entry), 6 (Exit)

DATA SOURCE:
Trip Generation Manual, 10th Ed

SEARCH BY LAND USE CODE:
220

LAND USE CATEGORY:
(200-299) Residential

LAND USE :
220 - Multifamily Housing (Low-Rise)

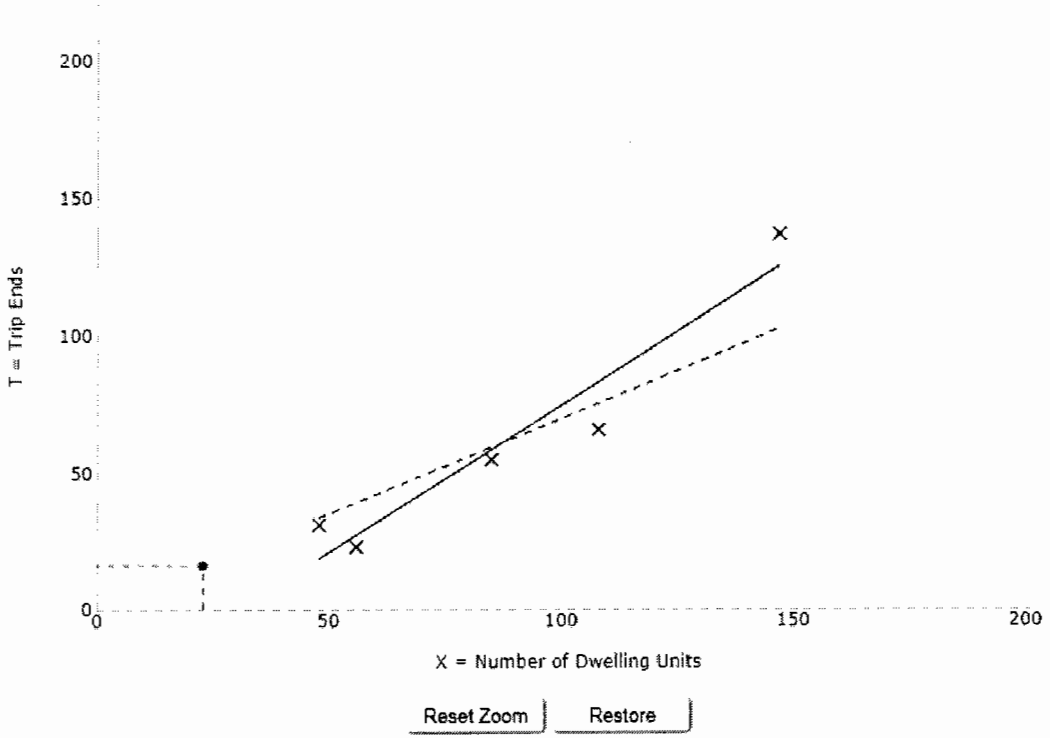
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Saturday, Peak Hour of Generator

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
23 Calculate



Land Use:
Multifamily Housing (Low-Rise) (220)

Independent Variable:
Dwelling Units

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
5

Avg. Num. of Dwelling Units:
89

Average Rate:
0.70

Range of Rates:
0.41 - 0.93

Standard Deviation:
0.20

Fitted Curve Equation:
T = 1.08(X) - 33.24

R^2:
0.92

Directional Distribution:
Not available

Calculated Trip Ends:

23 X .70 = 16.1

16 TOTAL, 8 ENTRY, 8 EXIT

DATA SOURCE:
ITE-TGM 10th Edition

SEARCH BY LAND USE CODE:
710

LAND USE CATEGORY:
(700-799) Office

LAND USE :
710 - General Office Building

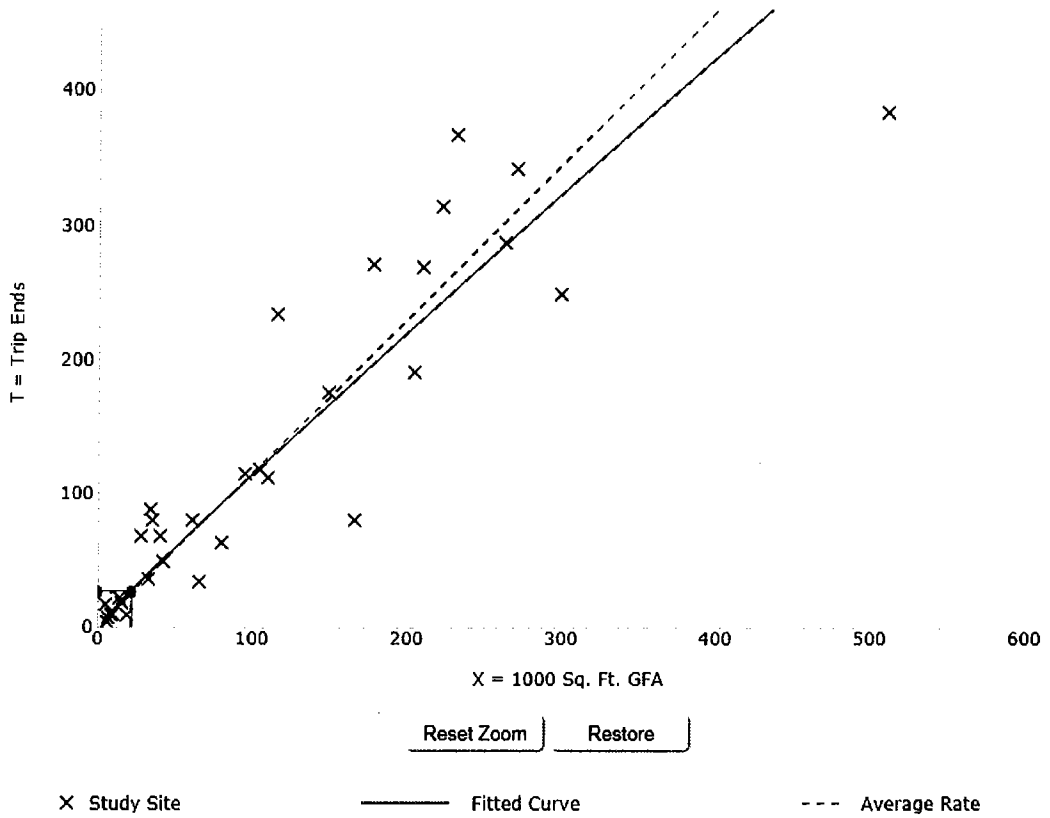
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
22 Calculate



DATA STATISTICS

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
32

Avg. 1000 Sq. Ft. GFA:
114

Average Rate:
1.15

Range of Rates:
0.47 - 3.23

Standard Deviation:
0.42

Fitted Curve Equation:
Ln(T) = 0.95 Ln(X) + 0.36

R^2:
0.88

Directional Distribution:
16% entering, 84% exiting

Calculated Trip Ends:
Average Rate: 25 (Total), 4 (Entry), 21 (Exit)
Fitted Curve: 27 (Total), 4 (Entry), 23 (Exit)

Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA SOURCE:
ITE-TGM 10th Edition

SEARCH BY LAND USE CODE:
710

LAND USE CATEGORY:
(700-799) Office

LAND USE :
710 - General Office Building

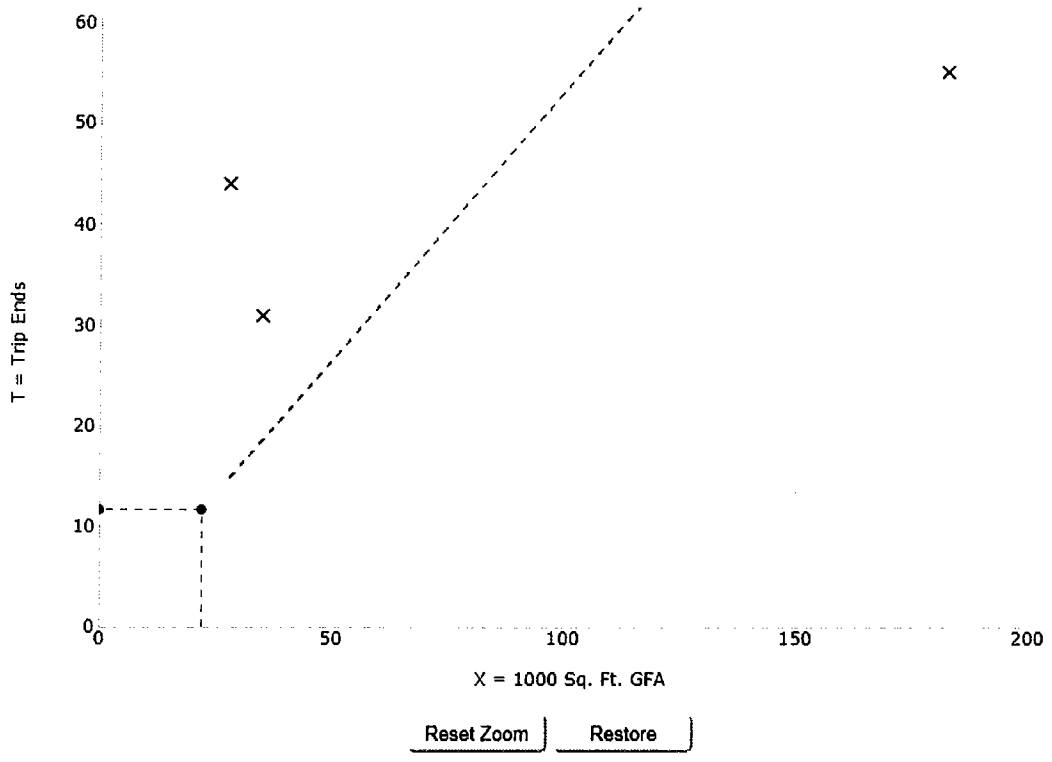
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Saturday, Peak Hour of Generator

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
22 Calculate



DATA STATISTICS

Land Use:
General Office Building (710) Click for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
3

Avg. 1000 Sq. Ft. GFA:
82

Average Rate:
0.53

Range of Rates:
0.30 - 1.57

Standard Deviation:
0.52

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
54% entering, 46% exiting

Calculated Trip Ends:
Average Rate: 12 (Total), 6 (Entry), 6 (Exit)

Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA SOURCE:
ITE-TGM 10th Edition

SEARCH BY LAND USE CODE:
932

LAND USE CATEGORY:
(900-999) Services

LAND USE :
932 - High-Turnover (Sit-Down) Restaurant

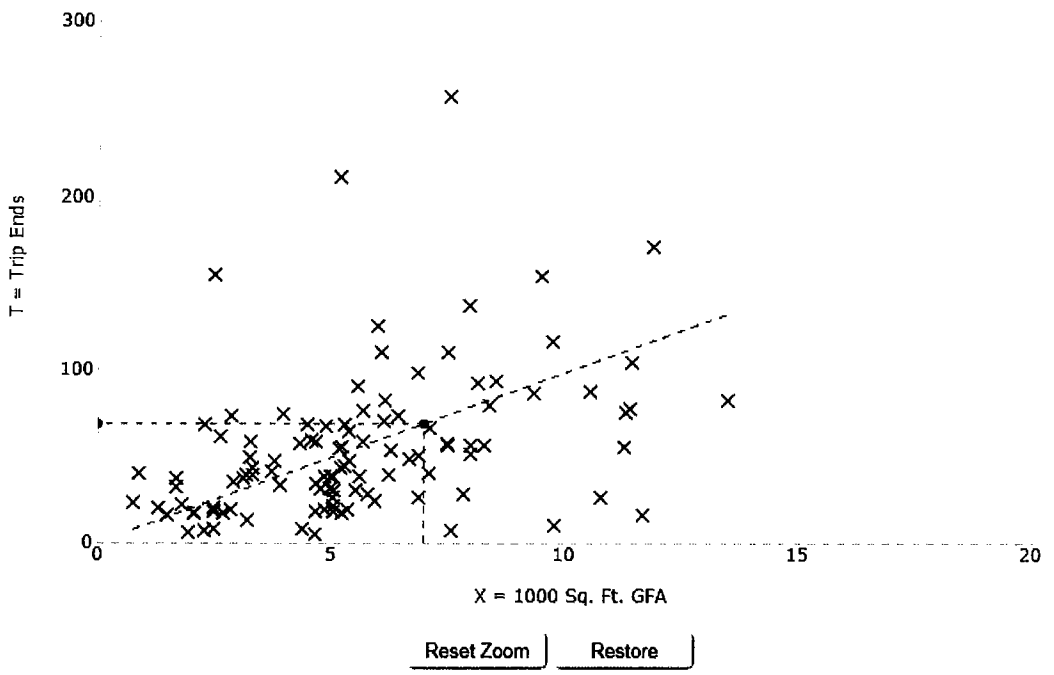
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
7.0 Calculate



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
107

Avg. 1000 Sq. Ft. GFA:
6

Average Rate:
9.77

Range of Rates:
0.92 - 62.00

Standard Deviation:
7.37

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
62% entering, 38% exiting

Calculated Trip Ends:
Average Rate: 68 (Total), 42 (Entry), 26 (Exit)

DATA SOURCE:
ITE-TGM 10th Edition

SEARCH BY LAND USE CODE:
932

LAND USE CATEGORY:
(900-999) Services

LAND USE :
932 - High-Turnover (Sit-Down) Restaurant

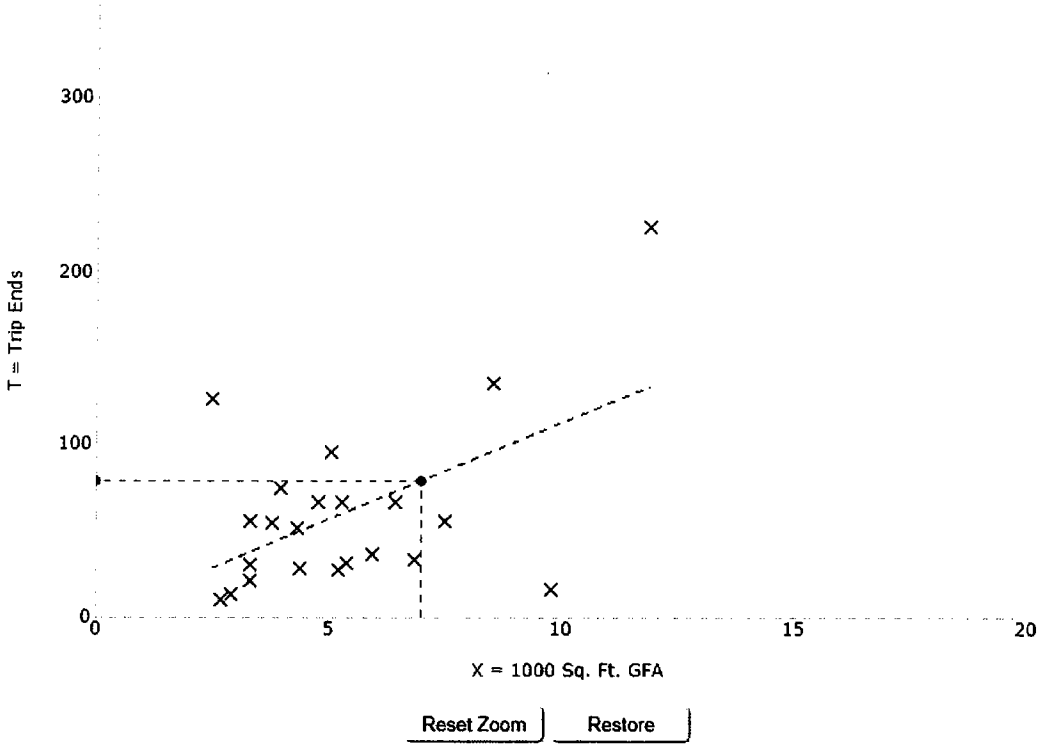
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Saturday, Peak Hour of Generator

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
7.0 Calculate



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

High-Turnover (Sit-Down) Restaurant (932) (Set for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
22

Avg. 1000 Sq. Ft. GFA:
5

Average Rate:
11.19

Range of Rates:
1.63 - 50.40

Standard Deviation:
8.30

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
51% entering, 49% exiting

Calculated Trip Ends:
Average Rate: 78 (Total), 40 (Entry), 38 (Exit)

DATA SOURCE:
ITE-TGM 10th Edition

SEARCH BY LAND USE CODE:
930

LAND USE CATEGORY:
(900-999) Services

LAND USE :
930 - Fast Casual Restaurant

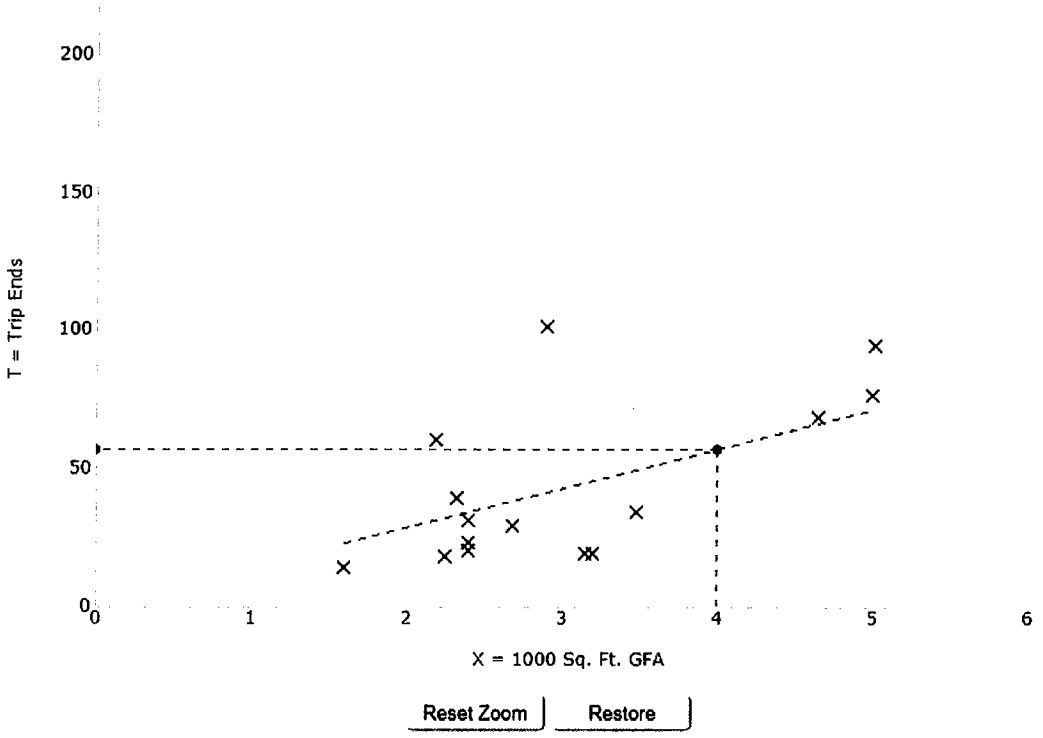
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
4.0 Calculate



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Fast Casual Restaurant (930) Click for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
15

Avg. 1000 Sq. Ft. GFA:
3

Average Rate:
14.13

Range of Rates:
5.94 - 34.83

Standard Deviation:
7.72

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
55% entering, 45% exiting

Calculated Trip Ends:
Average Rate: 57 (Total), 31 (Entry), 26 (Exit)

DATA SOURCE:
ITE-TGM 10th Edition

SEARCH BY LAND USE CODE:
930

LAND USE CATEGORY:
(900-999) Services

LAND USE :
930 - Fast Casual Restaurant

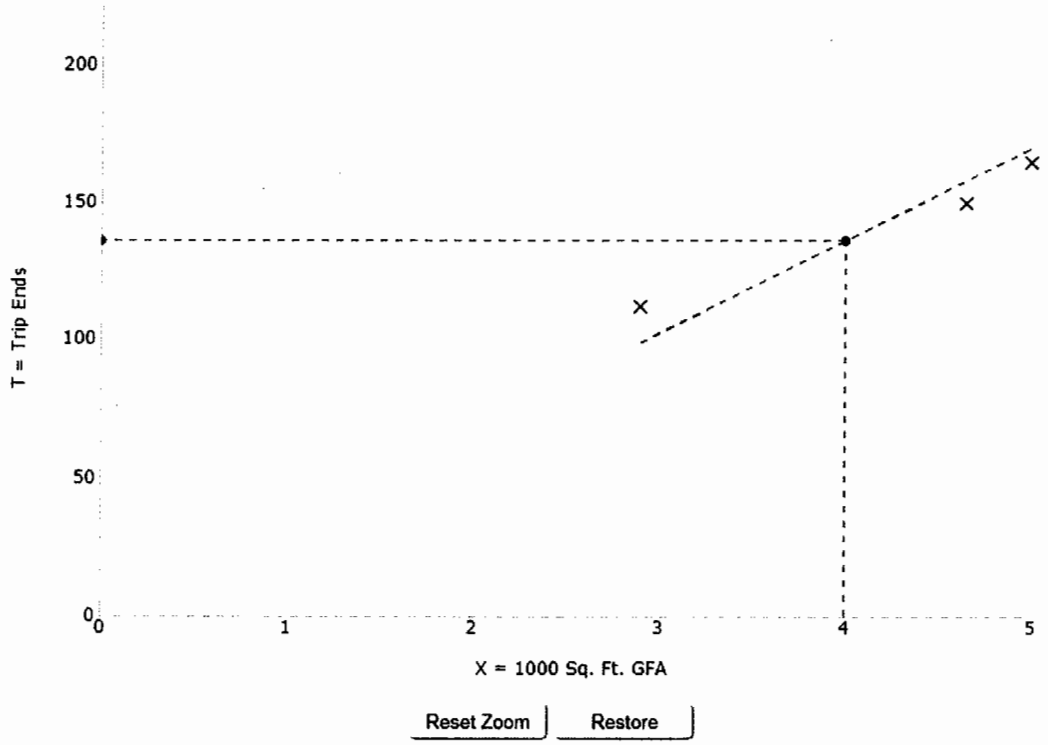
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Saturday, Peak Hour of Generator

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
4.0 Calculate



DATA STATISTICS

Land Use:
Fast Casual Restaurant (930) Click for more detail

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
3

Avg. 1000 Sq. Ft. GFA:
4

Average Rate:
34.02

Range of Rates:
32.26 - 38.62

Standard Deviation:
3.11

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
55% entering, 45% exiting

Calculated Trip Ends:
Average Rate: 136 (Total), 75 (Entry), 61 (Exit)

Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA SOURCE:
ITE-TGM 10th Edition

SEARCH BY LAND USE CODE:
820

LAND USE CATEGORY:
(800-899) Retail

LAND USE :
820 - Shopping Center

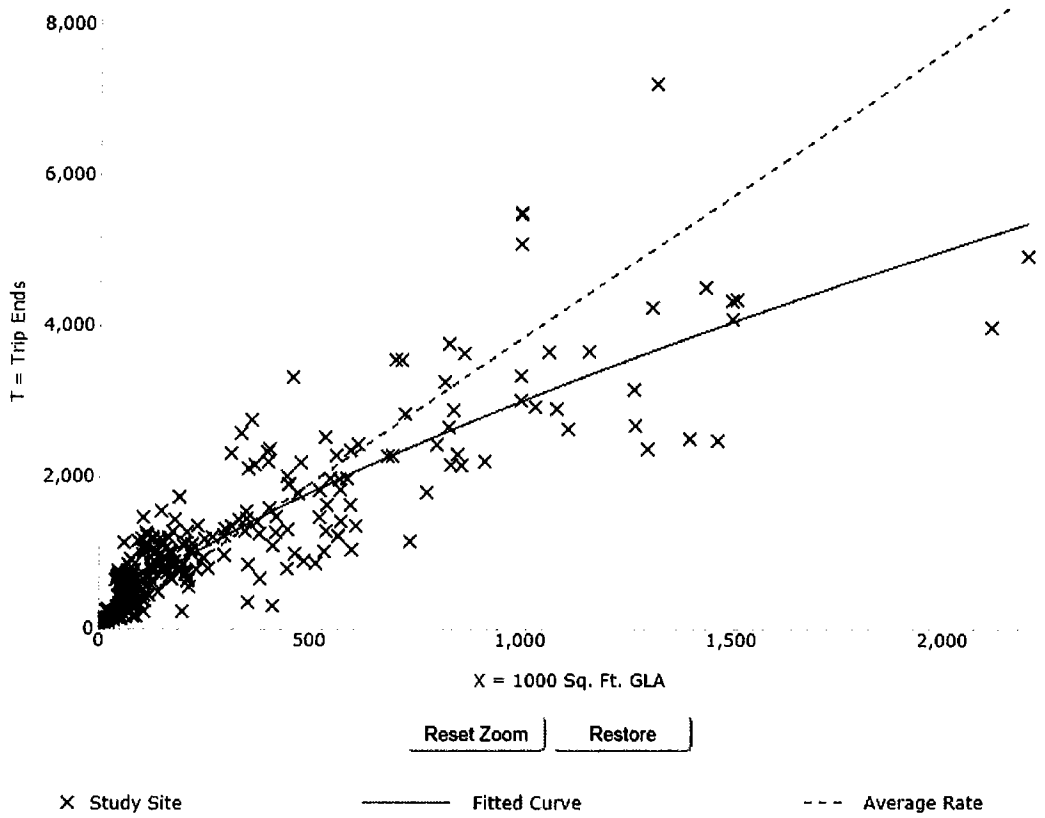
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GLA

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
5.0 Calculate



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Independent Variable:
1000 Sq. Ft. GLA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
261

Avg. 1000 Sq. Ft. GLA:
327

Average Rate:
3.81

Range of Rates:
0.74 - 18.69

Standard Deviation:
2.04

Fitted Curve Equation:
Ln(T) = 0.74 Ln(X) + 2.89

R^2:
0.82

Directional Distribution:
48% entering, 52% exiting

Calculated Trip Ends:
Average Rate: 19 (Total), 9 (Entry), 10 (Exit)
Fitted Curve: 59 (Total), 28 (Entry), 31 (Exit)

DATA SOURCE:
ITE-TGM 10th Edition

SEARCH BY LAND USE CODE:
820

LAND USE CATEGORY:
(800-899) Retail

LAND USE :
820 - Shopping Center

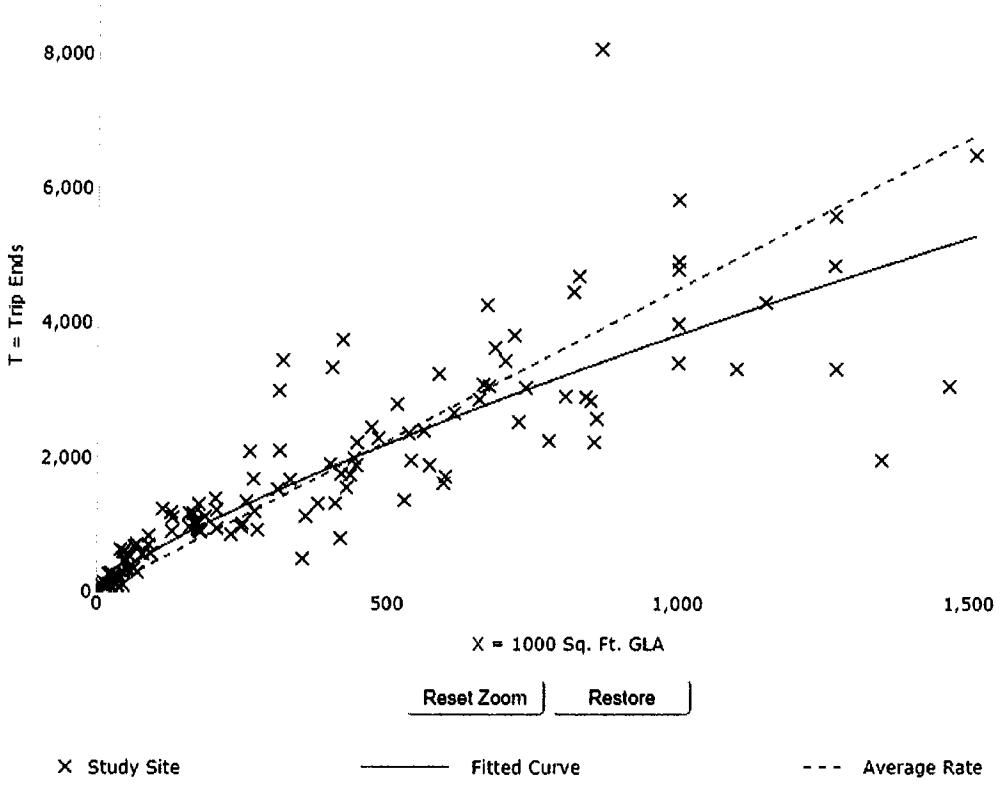
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GLA

TIME PERIOD:
Saturday, Peak Hour of Generator

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
5.0 Calculate



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Shopping Center (820) Click for more details

Independent Variable:
1000 Sq. Ft. GLA

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
119

Avg. 1000 Sq. Ft. GLA:
416

Average Rate:
4.50

Range of Rates:
1.42 - 15.10

Standard Deviation:
1.88

Fitted Curve Equation:
Ln(T) = 0.79 Ln(X) + 2.79

R^2:
0.87

Directional Distribution:
52% entering, 48% exiting

Calculated Trip Ends:
Average Rate: 23 (Total), 12 (Entry), 11 (Exit)
Fitted Curve: 58 (Total), 30 (Entry), 28 (Exit)

Query

DATA SOURCE:
ITE-TGM 10th Edition

SEARCH BY LAND USE CODE:
932

LAND USE CATEGORY:
(900-999) Services

LAND USE :
932 - High-Turnover (Sit-Down) Restaurant

INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

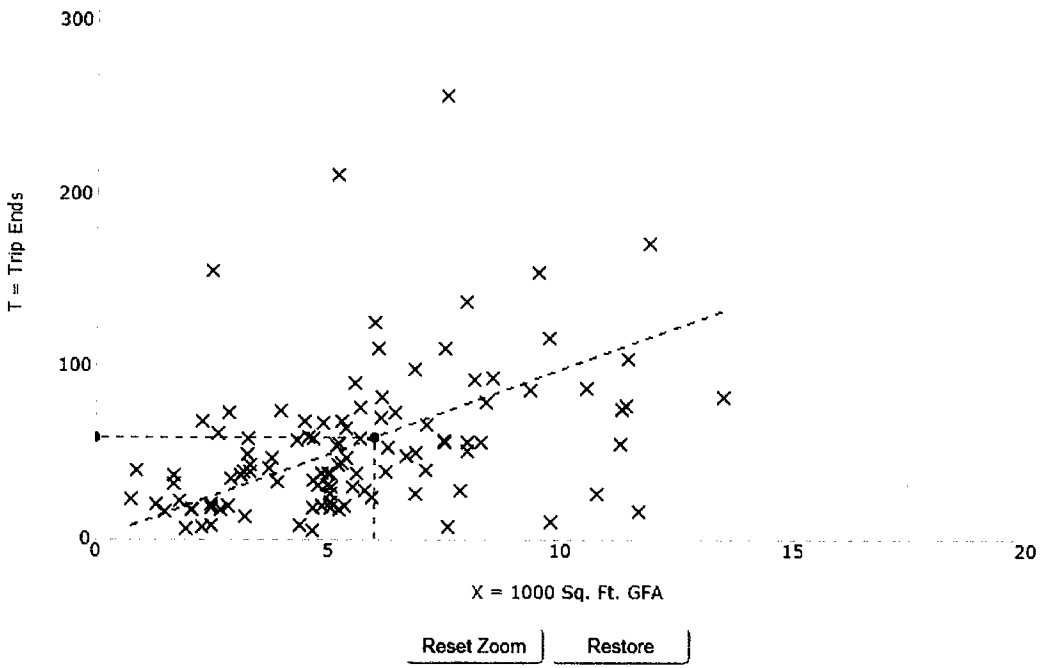
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
6.0 Calculate

Data Plot and Equation



DATA STATISTICS

for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
107

Avg. 1000 Sq. Ft. GFA:
6

Average Rate:
9.77

Range of Rates:
0.92 - 62.00

Standard Deviation:
7.37

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
62% entering, 38% exiting

Calculated Trip Ends:
Average Rate: 59 (Total), ~~36~~ 37 (Entry), ~~23~~ 22 (Exit)

DATA SOURCE:
ITE-TGM 10th Edition

SEARCH BY LAND USE CODE:
932

LAND USE CATEGORY:
(900-999) Services

LAND USE :
932 - High-Turnover (Sit-Down) Restaurant

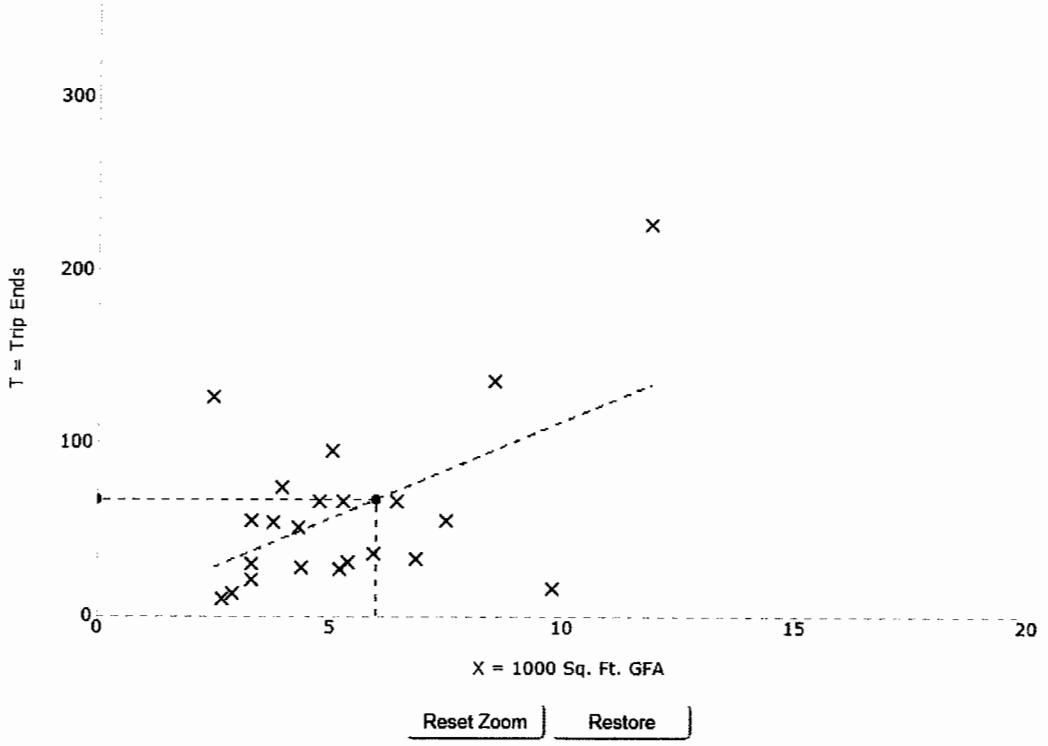
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Saturday, Peak Hour of Generator

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
6.0 Calculate



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

High-Turnover (Sit-Down) Restaurant (932) Click for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
22

Avg. 1000 Sq. Ft. GFA:
5

Average Rate:
11.19

Range of Rates:
1.63 - 50.40

Standard Deviation:
8.30

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
51% entering, 49% exiting

Calculated Trip Ends:
Average Rate: 67 (Total), 34 (Entry), 33 (Exit)

Stephen G. Pernaw & Company, Inc.

Home Destination Report - Where Workers Live Who are Employed in the Selection Area - by County Subdivisions

Jobs Counts by County Subdivisions Where Workers Live - All Jobs

	2015		GATEWAY PERCENTAGE							GATEWAY ALLOCATION							
	Count	Share	A	B	C	D	E	F	G	A	B	C	D	E	F	G	
Portsmouth city (Rockingham, NH)	4,324	13.6%	0.55	0.05	0.00	0.20	0.02	0.15	0.03	2378	216	0	865	86	649	130	4324
Dover city (Strafford, NH)	3,007	9.5%				1.00				0	0	0	3007	0	0	0	3007
Rochester city (Strafford, NH)	1,762	5.5%				1.00				0	0	0	1762	0	0	0	1762
Hampton town (Rockingham, NH)	978	3.1%	0.40			0.60				391	0	0	587	0	0	0	978
Somersworth city (Strafford, NH)	953	3.0%				1.00				0	0	0	953	0	0	0	953
Exeter town (Rockingham, NH)	839	2.6%				1.00				0	0	0	839	0	0	0	839
Newmarket town (Rockingham, NH)	819	2.6%				1.00				0	0	0	819	0	0	0	819
Kittery town (York, ME)	732	2.3%				1.00				0	0	0	732	0	0	0	732
Stratham town (Rockingham, NH)	705	2.2%				1.00				0	0	0	705	0	0	0	705
Rye town (Rockingham, NH)	616	1.9%	0.50	0.20		0.30				308	123	0	185	0	0	0	616
	14,735									3077	339	0	10454	86	649	130	14735
										21%	2%	0%	71%	1%	4%	1%	100%

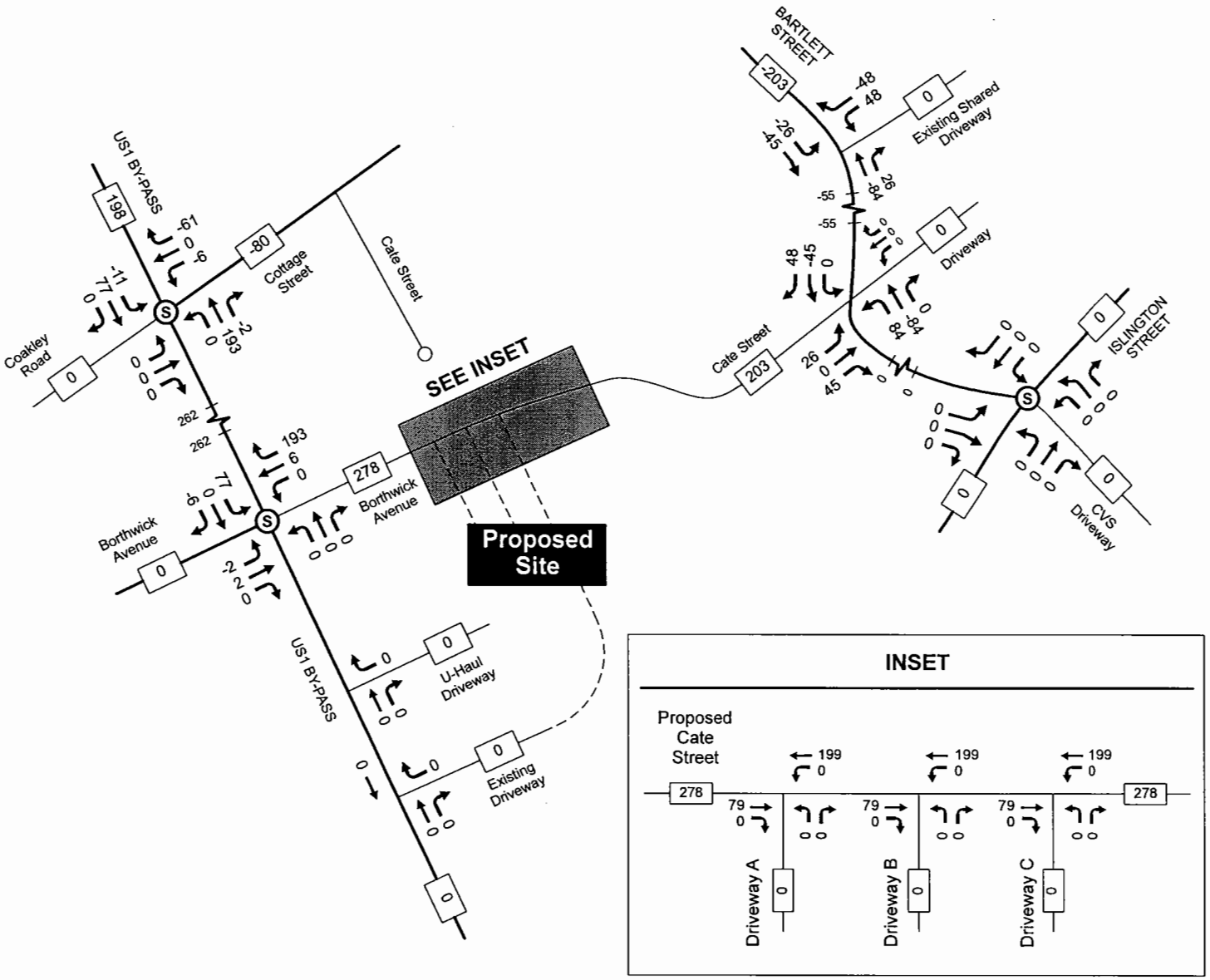
Gateway A = US1 Bypass (South)
Gateway B = Borthwick Avenue (West)
Gateway C = Coakly Road (West)
Gateway D = US1 Bypass (North)
Gateway E = Bartlett Street (North)
Gateway F = Islington Street (East)
Gateway G = Islington Street (West)

Work Destination Report - Where Workers are Employed Who Live in the Selection Area - by County Subdivisions

Total All Jobs

	2015		GATEWAY PERCENTAGE							GATEWAY ALLOCATION							
	Count	Share	A	B	C	D	E	F	G	A	B	C	D	E	F	G	
Portsmouth city (Rockingham, NH)	4,324	36.4%	0.55	0.05	0.00	0.20	0.02	0.15	0.03	2378	216	0	865	86	649	130	4324
Dover city (Strafford, NH)	578	4.9%				1.00				0	0	0	578	0	0	0	578
Exeter town (Rockingham, NH)	387	3.3%				1.00				0	0	0	387	0	0	0	387
Manchester city (Hillsborough, NH)	334	2.8%				1.00				0	0	0	334	0	0	0	334
Boston city (Suffolk, MA)	327	2.8%				1.00				0	0	0	327	0	0	0	327
Newington town (Rockingham, NH)	296	2.5%				1.00				0	0	0	296	0	0	0	296
Hampton town (Rockingham, NH)	288	2.4%	0.40			0.60				115	0	0	173	0	0	0	288
Durham town (Strafford, NH)	281	2.4%				1.00				0	0	0	281	0	0	0	281
Nashua city (Hillsborough, NH)	235	2.0%				1.00				0	0	0	235	0	0	0	235
Salem town (Rockingham, NH)	208	1.8%				1.00				0	0	0	208	0	0	0	208
	7,258									2493	216	0	3684	86	649	130	7258
										34%	3%	0%	51%	1%	9%	2%	100%

Gateway A = US1 Bypass (South)
Gateway B = Borthwick Avenue (West)
Gateway C = Coakly Road (West)
Gateway D = US1 Bypass (North)
Gateway E = Bartlett Street (North)
Gateway F = Islington Street (East)
Gateway G = Islington Street (West)



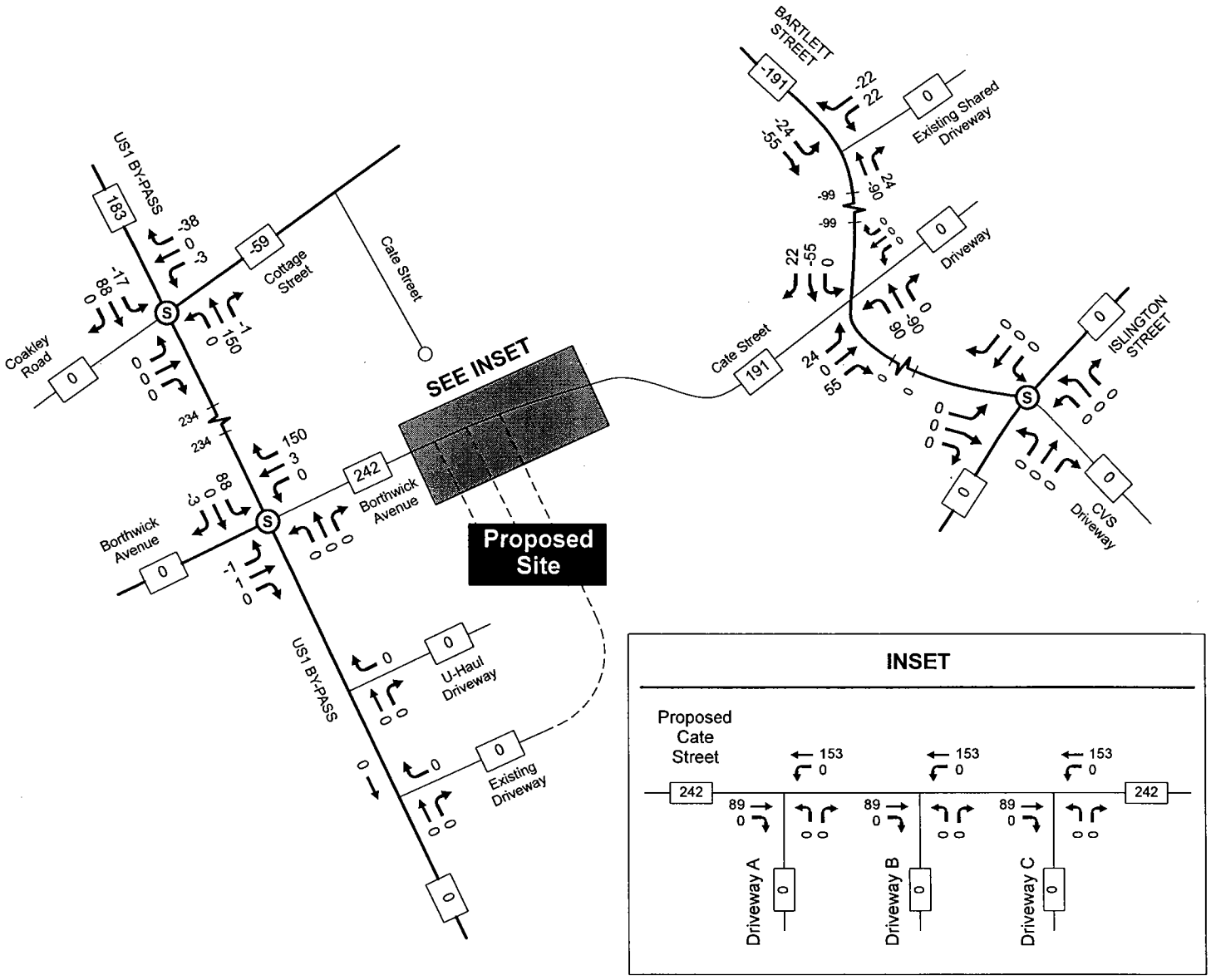
NORTH

1831A

Appendix

Diverted Traffic Volumes - PM Peak Hour (Scenario A)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire



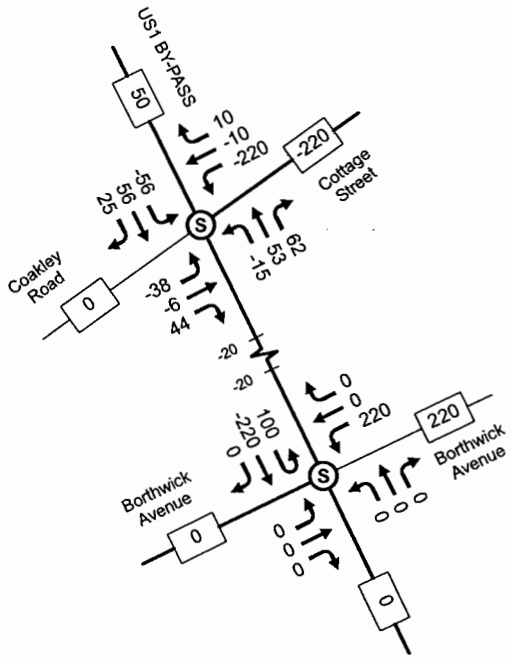
NORTH

1831A

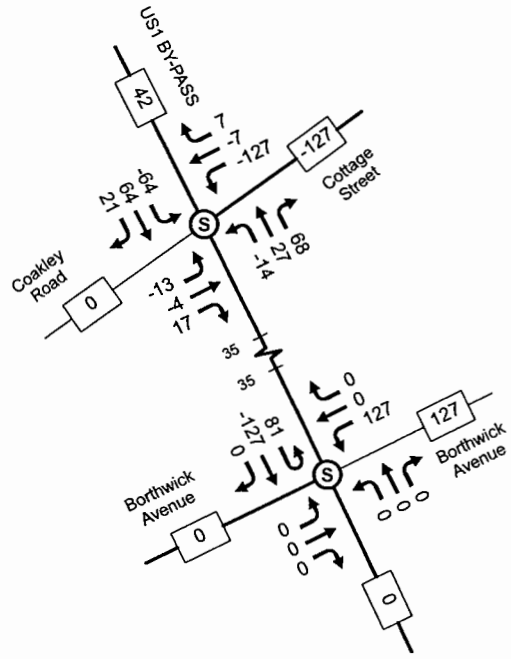
Appendix

Diverted Traffic Volumes - Saturday Peak Hour (Scenario A)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire



PM Peak Hour



Saturday Peak Hour

NORTH

1831A

Appendix

Median Island Changes - (Scenario C)

Traffic Impact and Site Access Study, Proposed Mixed-Use Site, Portsmouth, New Hampshire

Appendix H **Lane Utilization Factors**

CALCULATION SHEET

Stephen G. Pernaw & Company, Inc.

Project:	Torrington Properties	Job Number:	1831A
Calculated By:	SP	Date:	7/2/2018
Checked By:	CA	Date:	7/2/2018
Sheet No:	1	Of:	1
Subject:	Lane Utilization Factors		

Given: US1 Bypass northbound through lanes at the Cottage/Coakley intersection are not utilized equally due to upstream constraints.

Calculate: The appropriate Lane Utilization Factors for use in the intersection capacity and Level of Service analyses.

PM Peak Hour Calculation:

	Right Thru Lane	Left Thru Lane	Sum	Utilization Factor		
4:30 - 4:45 PM	163	215	378	= 378 / 2 / 215 =	0.88	⇦ Use
4:45 - 5:00 PM	166	192	358	= 358 / 2 / 192 =	0.93	
5:00 - 5:15 PM	210	215	425	= 425 / 2 / 215 =	0.99	
5:15 - 5:30 PM	167	181	348	= 348 / 2 / 181 =	0.96	
Total:	706	803	1509		0.94	

SAT Peak Hour Calculation:

	Right Thru Lane	Left Thru Lane	Sum	Utilization Factor		
11:45 - 12:00 PM	86	171	257	= 257 / 2 / 171 =	0.75	⇦ Use
12:00 - 12:15 PM	121	154	275	= 275 / 2 / 154 =	0.89	
12:15 - 12:30 PM	107	155	262	= 262 / 2 / 155 =	0.85	
12:30 - 12:45 PM	93	163	256	= 256 / 2 / 163 =	0.79	
Total:	407	643	1050		0.82	

Appendix I **Capacity and Level of Service Calculations – Signalized**

HCM Signalized Intersection Capacity Analysis
1: US1 Bypass & Coakly Road/Cottage Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	5	8	186	8	86	13	1325	177	34	789	8
Future Volume (vph)	31	5	8	186	8	86	13	1325	177	34	789	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	*0.88		1.00	0.95	
Frt		0.98			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1763	1615	1805	3220		1805	3535	
Flt Permitted		0.58			0.72	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1048			1325	1615	1805	3220		1805	3535	
Peak-hour factor, PHF	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90	0.99	0.99	0.99
Adj. Flow (vph)	39	6	10	245	11	113	14	1472	197	34	797	8
RTOR Reduction (vph)	0	7	0	0	0	64	0	7	0	0	0	0
Lane Group Flow (vph)	0	48	0	0	256	49	14	1662	0	34	805	0
Heavy Vehicles (%)	3%	0%	0%	3%	0%	0%	0%	2%	2%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		26.1			26.1	26.1	2.0	72.8		3.1	73.9	
Effective Green, g (s)		28.1			28.1	26.1	4.0	74.8		5.1	75.9	
Actuated g/C Ratio		0.23			0.23	0.22	0.03	0.62		0.04	0.63	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		245			310	351	60	2007		76	2235	
v/s Ratio Prot							0.01	c0.52		c0.02	0.23	
v/s Ratio Perm		0.05			c0.19	0.03						
v/c Ratio		0.20			0.83	0.14	0.23	0.83		0.45	0.36	
Uniform Delay, d1		36.9			43.6	37.9	56.5	17.6		56.1	10.5	
Progression Factor		1.00			1.00	1.00	1.12	0.87		1.00	1.00	
Incremental Delay, d2		0.4			16.2	0.2	1.8	3.6		4.1	0.5	
Delay (s)		37.3			59.9	38.1	65.3	18.9		60.2	10.9	
Level of Service		D			E	D	E	B		E	B	
Approach Delay (s)		37.3			53.2			19.3			12.9	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

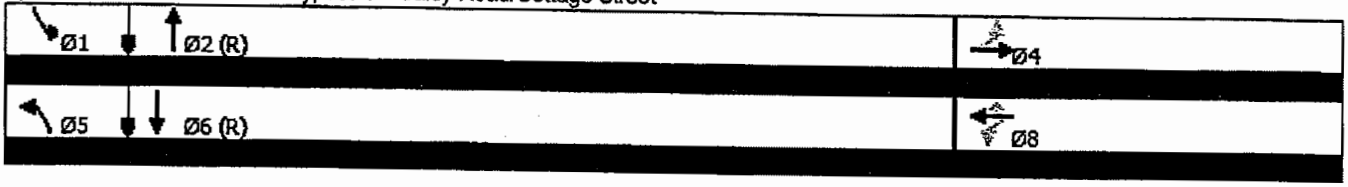
Timings
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	31	5	186	8	86	13	1325	34	789
Future Volume (vph)	31	5	186	8	86	13	1325	34	789
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA
Protected Phases		4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phase	4	4	8	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	35.0	35.0	35.0	35.0	35.0	11.0	74.0	11.0	74.0
Total Split (%)	29.2%	29.2%	29.2%	29.2%	29.2%	9.2%	61.7%	9.2%	61.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0		4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)		28.1		28.1	26.1	7.3	77.2	7.5	79.5
Actuated g/C Ratio		0.23		0.23	0.22	0.06	0.64	0.06	0.66
v/c Ratio		0.22		0.83	0.27	0.13	0.80	0.30	0.34
Control Delay		32.7		65.3	14.5	62.8	18.8	61.5	10.5
Queue Delay		0.0		0.0	0.0	0.0	0.6	0.0	0.0
Total Delay		32.7		65.3	14.5	62.8	19.3	61.5	10.5
LOS		C		E	B	E	B	E	B
Approach Delay		32.7		49.8			19.7		12.5
Approach LOS		C		D			B		B

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 21.7 — Intersection LOS: C
Intersection Capacity Utilization 62.6% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: US1 Bypass & Coakly Road/Cottage Street



Queues
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	282	164	16	1871	64	887
v/c Ratio	0.28	0.93	0.40	0.15	0.92	0.59	0.38
Control Delay	36.4	82.8	23.4	59.0	27.9	77.2	10.1
Queue Delay	0.0	0.0	0.0	0.0	1.9	0.0	0.0
Total Delay	36.4	82.8	23.4	59.0	29.8	77.2	10.1
Queue Length 50th (ft)	32	215	53	12	597	49	129
Queue Length 95th (ft)	63	#283	88	m21	#972	#112	220
Internal Link Dist (ft)	998	606			304		719
Turn Bay Length (ft)			50	100		150	
Base Capacity (vph)	217	306	414	106	2033	109	2353
Starvation Cap Reductn	0	0	0	0	75	0	0
Spillback Cap Reductn	0	0	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.92	0.40	0.15	0.96	0.59	0.38

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
1: US1 Bypass & Coakly Road/Cottage Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	6	10	226	10	135	15	1637	219	67	959	10
Future Volume (vph)	38	6	10	226	10	135	15	1637	219	67	959	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	*0.88		1.00	0.95	
Frt		0.97			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1762	1615	1805	3220		1805	3535	
Flt Permitted		0.43			0.70	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		783			1296	1615	1805	3220		1805	3535	
Peak-hour factor, PHF	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90	0.99	0.99	0.99
Adj. Flow (vph)	48	8	13	297	13	178	17	1819	243	68	969	10
RTOR Reduction (vph)	0	7	0	0	0	64	0	8	0	0	1	0
Lane Group Flow (vph)	0	62	0	0	310	114	17	2054	0	68	978	0
Heavy Vehicles (%)	3%	0%	0%	3%	0%	0%	0%	2%	2%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		26.0			26.0	26.0	2.0	72.0		4.0	74.0	
Effective Green, g (s)		28.0			28.0	26.0	4.0	74.0		6.0	76.0	
Actuated g/C Ratio		0.23			0.23	0.22	0.03	0.62		0.05	0.63	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		182			302	349	60	1985		90	2238	
v/s Ratio Prot							0.01	c0.64		c0.04	0.28	
v/s Ratio Perm		0.08			c0.24	0.07						
v/c Ratio		0.34			1.03	0.33	0.28	1.03		0.76	0.44	
Uniform Delay, d1		38.3			46.0	39.6	56.6	23.0		56.3	11.2	
Progression Factor		1.00			1.00	1.00	0.99	0.84		1.00	1.00	
Incremental Delay, d2		1.1			58.8	0.5	1.9	27.3		29.7	0.6	
Delay (s)		39.4			104.8	40.2	58.1	46.5		86.0	11.8	
Level of Service		D			F	D	E	D		F	B	
Approach Delay (s)		39.4			81.2			46.6			16.6	
Approach LOS		D			F			D			B	

Intersection Summary			
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

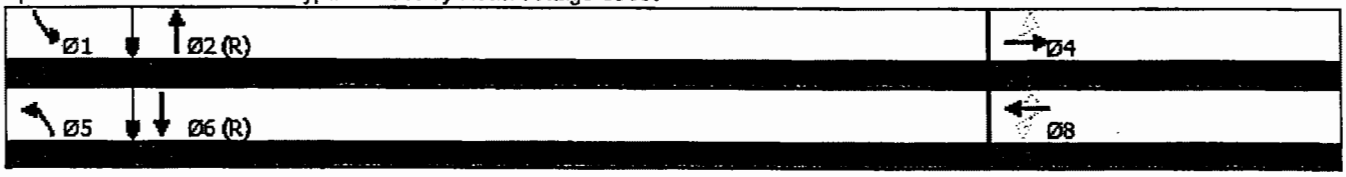
Timings
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	38	6	226	10	135	15	1637	67	959
Future Volume (vph)	38	6	226	10	135	15	1637	67	959
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA
Protected Phases		4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phase	4	4	8	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	11.0	77.0	11.0	77.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%	9.2%	64.2%	9.2%	64.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0		4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)		28.0		28.0	26.0	7.0	75.2	7.0	79.6
Actuated g/C Ratio		0.23		0.23	0.22	0.06	0.63	0.06	0.66
v/c Ratio		0.37		1.03	0.43	0.16	1.02	0.65	0.42
Control Delay		39.9		104.4	25.1	56.2	42.3	82.9	10.7
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.1
Total Delay		39.9		104.4	25.1	56.2	42.3	82.9	10.8
LOS		D		F	C	E	D	F	B
Approach Delay		39.9		75.5			42.4		15.5
Approach LOS		D		E			D		B

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 39.1 — Intersection LOS: D
Intersection Capacity Utilization 79.0% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: US1 Bypass & Coakly Road/Cottage Street



Queues
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	310	178	17	2062	68	979
v/c Ratio	0.37	1.03	0.43	0.16	1.02	0.65	0.42
Control Delay	39.9	104.4	25.1	56.2	42.3	82.9	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	39.9	104.4	25.1	56.2	42.3	82.9	10.8
Queue Length 50th (ft)	39	~256	62	12	~996	53	147
Queue Length 95th (ft)	73	#330	98	m20	#1123	#121	250
Internal Link Dist (ft)	998	606			304		719
Turn Bay Length (ft)			50	100		150	
Base Capacity (vph)	189	302	414	105	2025	105	2344
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	388
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	1.03	0.43	0.16	1.02	0.65	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
1: US1 Bypass & Coakly Road/Cottage Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	5	9	199	9	64	14	1749	197	52	1041	9
Future Volume (vph)	34	5	9	199	9	64	14	1749	197	52	1041	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	*0.88		1.00	0.95	
Frt		0.98			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1751			1763	1615	1805	3229		1805	3535	
Flt Permitted		0.43			0.71	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		773			1318	1615	1805	3229		1805	3535	
Peak-hour factor, PHF	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90	0.99	0.99	0.99
Adj. Flow (vph)	43	6	11	262	12	84	16	1943	219	53	1052	9
RTOR Reduction (vph)	0	6	0	0	0	67	0	6	0	0	0	0
Lane Group Flow (vph)	0	54	0	0	274	17	16	2156	0	53	1061	0
Heavy Vehicles (%)	3%	0%	0%	3%	0%	0%	0%	2%	2%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		22.0			22.0	22.0	2.0	76.0		4.0	78.0	
Effective Green, g (s)		24.0			24.0	22.0	4.0	78.0		6.0	80.0	
Actuated g/C Ratio		0.20			0.20	0.18	0.03	0.65		0.05	0.67	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		154			263	296	60	2098		90	2356	
v/s Ratio Prot							0.01	c0.67		c0.03	0.30	
v/s Ratio Perm		0.07			c0.21	0.01						
v/c Ratio		0.35			1.04	0.06	0.27	1.03		0.59	0.45	
Uniform Delay, d1		41.3			48.0	40.4	56.6	21.0		55.8	9.5	
Progression Factor		1.00			1.00	1.00	0.90	0.77		1.00	1.00	
Incremental Delay, d2		1.4			66.8	0.1	1.0	20.5		9.5	0.6	
Delay (s)		42.6			114.8	40.5	52.1	36.6		65.3	10.1	
Level of Service		D			F	D	D	D		E	B	
Approach Delay (s)		42.6			97.4			36.7			12.8	
Approach LOS		D			F			D			B	

Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

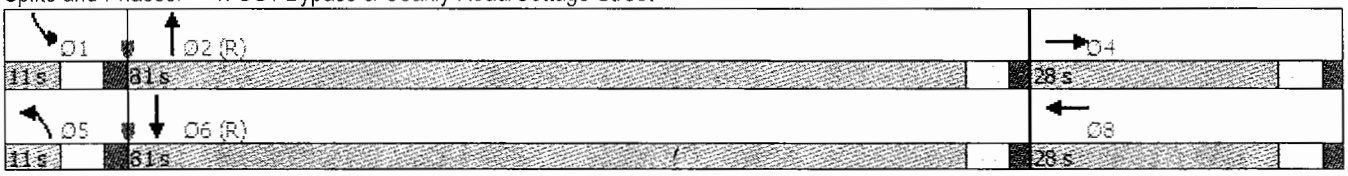
Timings
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	34	5	199	9	64	14	1749	52	1041
Future Volume (vph)	34	5	199	9	64	14	1749	52	1041
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA
Protected Phases		4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phase	4	4	8	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	28.0	28.0	28.0	28.0	28.0	11.0	81.0	11.0	81.0
Total Split (%)	23.3%	23.3%	23.3%	23.3%	23.3%	9.2%	67.5%	9.2%	67.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0		4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)		24.0		24.0	22.0	7.0	79.2	7.0	83.6
Actuated g/C Ratio		0.20		0.20	0.18	0.06	0.66	0.06	0.70
v/c Ratio		0.37		1.04	0.23	0.15	1.01	0.50	0.43
Control Delay		43.9		113.8	11.0	50.2	33.0	71.8	9.1
Queue Delay		0.0		0.0	0.0	0.0	9.2	0.0	0.0
Total Delay		43.9		113.8	11.0	50.2	42.2	71.8	9.2
LOS		D		F	B	D	D	E	A
Approach Delay		43.9		89.7			42.2		12.2
Approach LOS		D		F			D		B

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 37.8 — Intersection LOS: D
Intersection Capacity Utilization 75.9% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: US1 Bypass & Coakly Road/Cottage Street



Queues
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	274	84	16	2162	53	1061
v/c Ratio	0.37	1.04	0.23	0.15	1.01	0.50	0.43
Control Delay	43.9	113.8	11.0	50.2	33.0	71.8	9.1
Queue Delay	0.0	0.0	0.0	0.0	9.2	0.0	0.0
Total Delay	43.9	113.8	11.0	50.2	42.2	71.8	9.2
Queue Length 50th (ft)	35	~229	1	13	~1047	41	144
Queue Length 95th (ft)	68	#305	30	m14	#1177	#86	251
Internal Link Dist (ft)	998	606			304		719
Turn Bay Length (ft)			50	100		150	
Base Capacity (vph)	161	263	363	105	2137	105	2463
Starvation Cap Reductn	0	0	0	0	56	0	0
Spillback Cap Reductn	0	0	0	0	0	0	161
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	1.04	0.23	0.15	1.04	0.50	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	6	10	220	10	74	15	1901	217	56	1131	10
Future Volume (vph)	38	6	10	220	10	74	15	1901	217	56	1131	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	*0.88		1.00	0.95	
Frt		0.97			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1763	1615	1805	3228		1805	3535	
Flt Permitted		0.34			0.70	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		625			1298	1615	1805	3228		1805	3535	
Peak-hour factor, PHF	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90	0.99	0.99	0.99
Adj. Flow (vph)	48	8	13	289	13	97	17	2112	241	57	1142	10
RTOR Reduction (vph)	0	7	0	0	0	67	0	6	0	0	0	0
Lane Group Flow (vph)	0	62	0	0	302	30	17	2347	0	57	1152	0
Heavy Vehicles (%)	3%	0%	0%	3%	0%	0%	0%	2%	2%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		22.0			22.0	22.0	2.0	76.0		4.0	78.0	
Effective Green, g (s)		24.0			24.0	22.0	4.0	78.0		6.0	80.0	
Actuated g/C Ratio		0.20			0.20	0.18	0.03	0.65		0.05	0.67	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		125			259	296	60	2098		90	2356	
v/s Ratio Prot							0.01	c0.73		c0.03	0.33	
v/s Ratio Perm		0.10			c0.23	0.02						
v/c Ratio		0.49			1.17	0.10	0.28	1.12		0.63	0.49	
Uniform Delay, d1		42.6			48.0	40.8	56.6	21.0		55.9	9.9	
Progression Factor		1.00			1.00	1.00	0.90	0.70		1.00	1.00	
Incremental Delay, d2		3.1			108.4	0.2	0.8	55.6		13.7	0.7	
Delay (s)		45.7			156.4	40.9	51.7	70.3		69.6	10.6	
Level of Service		D			F	D	D	E		E	B	
Approach Delay (s)		45.7			128.3			70.1			13.4	
Approach LOS		D			F			E			B	

Intersection Summary			
HCM 2000 Control Delay	58.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

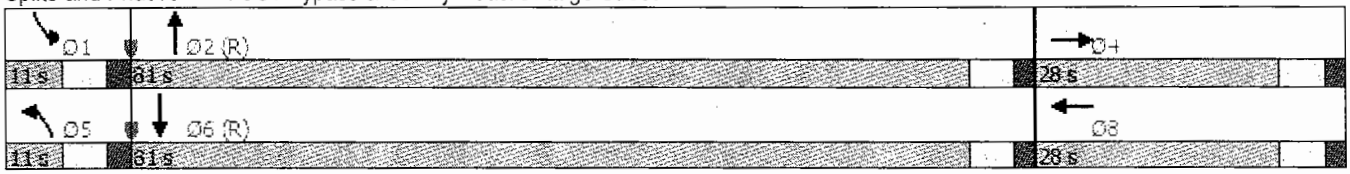
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	38	6	220	10	74	15	1901	56	1131
Future Volume (vph)	38	6	220	10	74	15	1901	56	1131
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA
Protected Phases		4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phase	4	4	8	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	28.0	28.0	28.0	28.0	28.0	11.0	81.0	11.0	81.0
Total Split (%)	23.3%	23.3%	23.3%	23.3%	23.3%	9.2%	67.5%	9.2%	67.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0		4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)		24.0		24.0	22.0	7.0	79.2	7.0	83.6
Actuated g/C Ratio		0.20		0.20	0.18	0.06	0.66	0.06	0.70
v/c Ratio		0.52		1.17	0.27	0.16	1.10	0.54	0.47
Control Delay		52.9		151.2	14.0	49.7	65.5	74.3	9.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.1
Total Delay		52.9		151.2	14.0	49.7	65.5	74.3	9.7
LOS		D		F	B	D	E	E	A
Approach Delay		52.9		117.8			65.4		12.7
Approach LOS		D		F			E		B

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 54.6 — Intersection LOS: D
Intersection Capacity Utilization 82.3% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: US1 Bypass & Coakly Road/Cottage Street



Queues
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	302	97	17	2353	57	1152
v/c Ratio	0.52	1.17	0.27	0.16	1.10	0.54	0.47
Control Delay	52.9	151.2	14.0	49.7	65.5	74.3	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	52.9	151.2	14.0	49.7	65.5	74.3	9.7
Queue Length 50th (ft)	42	~278	10	13	~1193	44	162
Queue Length 95th (ft)	80	#353	39	m13	m#1227	#97	282
Internal Link Dist (ft)	998	606			304		719
Turn Bay Length (ft)			50	100		150	
Base Capacity (vph)	132	259	363	105	2137	105	2463
Starvation Cap Reductn	0	0	0	0	18	0	0
Spillback Cap Reductn	0	0	0	0	0	0	293
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	1.17	0.27	0.16	1.11	0.54	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
1: US1 Bypass & Coakly Road/Cottage Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	4	13	105	5	46	12	955	94	51	766	15
Future Volume (vph)	11	4	13	105	5	46	12	955	94	51	766	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	*0.75		1.00	0.95	
Frt		0.94			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1747			1814	1615	1805	2781		1805	3565	
Flt Permitted		0.87			0.77	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1544			1458	1615	1805	2781		1805	3565	
Peak-hour factor, PHF	0.70	0.70	0.70	0.85	0.85	0.85	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	16	6	19	124	6	54	13	1016	100	55	833	16
RTOR Reduction (vph)	0	16	0	0	0	47	0	5	0	0	1	0
Lane Group Flow (vph)	0	25	0	0	130	7	13	1111	0	55	848	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		15.1			15.1	15.1	2.7	69.9		7.0	74.2	
Effective Green, g (s)		17.1			17.1	15.1	4.7	71.9		9.0	76.2	
Actuated g/C Ratio		0.16			0.16	0.14	0.04	0.65		0.08	0.69	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		240			226	221	77	1817		147	2469	
v/s Ratio Prot							0.01	c0.40		c0.03	0.24	
v/s Ratio Perm		0.02			c0.09	0.00						
v/c Ratio		0.10			0.58	0.03	0.17	0.61		0.37	0.34	
Uniform Delay, d1		39.9			43.1	41.1	50.8	11.0		47.8	6.8	
Progression Factor		1.00			1.00	1.00	1.40	0.72		1.00	1.00	
Incremental Delay, d2		0.2			3.5	0.1	1.0	1.5		1.6	0.4	
Delay (s)		40.1			46.6	41.2	72.3	9.4		49.4	7.2	
Level of Service		D			D	D	E	A		D	A	
Approach Delay (s)		40.1			45.0			10.1			9.8	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

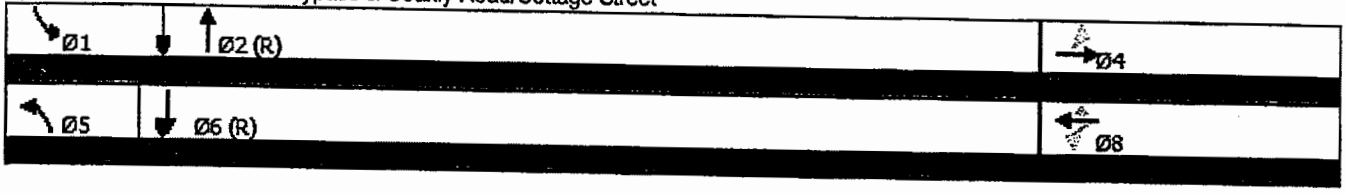
Timings
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	11	4	105	5	46	12	955	51	766
Future Volume (vph)	11	4	105	5	46	12	955	51	766
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA
Protected Phases		4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phase	4	4	8	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	11.0	72.0	13.0	74.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	22.7%	10.0%	65.5%	11.8%	67.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0		4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)		17.1		17.1	15.1	8.2	73.1	10.1	79.8
Actuated g/C Ratio		0.16		0.16	0.14	0.07	0.66	0.09	0.73
v/c Ratio		0.16		0.58	0.18	0.10	0.60	0.33	0.33
Control Delay		25.2		52.3	3.9	68.0	10.2	52.1	7.3
Queue Delay		0.0		0.0	0.0	0.0	0.2	0.0	0.0
Total Delay		25.2		52.3	3.9	68.0	10.4	52.1	7.3
LOS		C		D	A	E	B	D	A
Approach Delay		25.2		38.1			11.0		10.0
Approach LOS		C		D			B		A

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 13.1 — Intersection LOS: B
Intersection Capacity Utilization 55.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: US1 Bypass & Coakly Road/Cottage Street



Queues
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	41	130	54	13	1116	55	849
v/c Ratio	0.16	0.58	0.18	0.10	0.60	0.33	0.33
Control Delay	25.2	52.3	3.9	68.0	10.2	52.1	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	25.2	52.3	3.9	68.0	10.4	52.1	7.3
Queue Length 50th (ft)	14	86	0	7	300	37	77
Queue Length 95th (ft)	30	131	9	m25	458	78	195
Internal Link Dist (ft)	998	606			304		719
Turn Bay Length (ft)			50	100		150	
Base Capacity (vph)	316	284	358	134	1883	169	2615
Starvation Cap Reductn	0	0	0	0	178	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.46	0.15	0.10	0.65	0.33	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
1: US1 Bypass & Coakly Road/Cottage Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	4	14	118	6	70	13	1055	106	75	847	17
Future Volume (vph)	12	4	14	118	6	70	13	1055	106	75	847	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	*0.75		1.00	0.95	
Frt		0.94			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1746			1814	1615	1805	2781		1805	3565	
Flt Permitted		0.86			0.76	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1529			1447	1615	1805	2781		1805	3565	
Peak-hour factor, PHF	0.70	0.70	0.70	0.85	0.85	0.85	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	17	6	20	139	7	82	14	1122	113	82	921	18
RTOR Reduction (vph)	0	17	0	0	0	71	0	5	0	0	1	0
Lane Group Flow (vph)	0	26	0	0	146	11	14	1230	0	82	938	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		15.3			15.3	15.3	2.4	68.7		8.0	74.3	
Effective Green, g (s)		17.3			17.3	15.3	4.4	70.7		10.0	76.3	
Actuated g/C Ratio		0.16			0.16	0.14	0.04	0.64		0.09	0.69	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		240			227	224	72	1787		164	2472	
v/s Ratio Prot							0.01	c0.44		c0.05	0.26	
v/s Ratio Perm		0.02			c0.10	0.01						
v/c Ratio		0.11			0.64	0.05	0.19	0.69		0.50	0.38	
Uniform Delay, d1		39.7			43.5	41.1	51.1	12.6		47.6	7.0	
Progression Factor		1.00			1.00	1.00	1.27	0.71		1.00	1.00	
Incremental Delay, d2		0.2			6.1	0.1	1.2	2.0		2.4	0.4	
Delay (s)		39.9			49.6	41.1	66.2	11.0		50.0	7.5	
Level of Service		D			D	D	E	B		D	A	
Approach Delay (s)		39.9			46.5			11.6			10.9	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

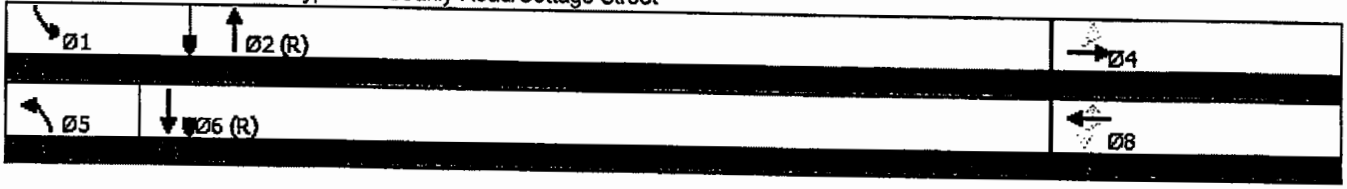
Timings
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	4	118	6	70	13	1055	75	847
Future Volume (vph)	12	4	118	6	70	13	1055	75	847
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA
Protected Phases		4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phase	4	4	8	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	24.0	24.0	24.0	24.0	24.0	11.0	71.0	15.0	75.0
Total Split (%)	21.8%	21.8%	21.8%	21.8%	21.8%	10.0%	64.5%	13.6%	68.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0		4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)		17.3		17.3	15.3	7.9	71.9	11.3	79.9
Actuated g/C Ratio		0.16		0.16	0.14	0.07	0.65	0.10	0.73
v/c Ratio		0.17		0.64	0.27	0.11	0.68	0.45	0.36
Control Delay		25.7		56.2	9.8	62.9	11.8	54.1	7.2
Queue Delay		0.0		0.0	0.0	0.0	0.2	0.0	0.0
Total Delay		25.7		56.2	9.8	62.9	12.0	54.1	7.2
LOS		C		E	A	E	B	D	A
Approach Delay		25.7		39.5			12.5		10.9
Approach LOS		C		D			B		B

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 14.5 — Intersection LOS: B
Intersection Capacity Utilization 60.2% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: US1 Bypass & Coakly Road/Cottage Street



Queues
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	43	146	82	14	1235	82	939
v/c Ratio	0.17	0.64	0.27	0.11	0.68	0.45	0.36
Control Delay	25.7	56.2	9.8	62.9	11.8	54.1	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	25.7	56.2	9.8	62.9	12.0	54.1	7.2
Queue Length 50th (ft)	14	97	0	7	371	55	94
Queue Length 95th (ft)	33	152	33	m25	90	106	192
Internal Link Dist (ft)	998	606			304		719
Turn Bay Length (ft)			50	100		150	
Base Capacity (vph)	297	265	341	129	1840	194	2607
Starvation Cap Reductn	0	0	0	0	117	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.55	0.24	0.11	0.72	0.42	0.36

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
1: US1 Bypass & Coakly Road/Cottage Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	4	15	130	7	75	14	1165	117	81	936	19
Future Volume (vph)	13	4	15	130	7	75	14	1165	117	81	936	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.75		1.00	0.95	
Frt		0.94			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1747			1814	1615	1805	2781		1805	3564	
Flt Permitted		0.83			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1471			1429	1615	1805	2781		1805	3564	
Peak-hour factor, PHF	0.70	0.70	0.70	0.85	0.85	0.85	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	19	6	21	153	8	88	15	1239	124	88	1017	21
RTOR Reduction (vph)	0	18	0	0	0	75	0	5	0	0	1	0
Lane Group Flow (vph)	0	28	0	0	161	13	15	1358	0	88	1037	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		15.8			15.8	15.8	2.0	69.4		6.8	74.2	
Effective Green, g (s)		17.8			17.8	15.8	4.0	71.4		8.8	76.2	
Actuated g/C Ratio		0.16			0.16	0.14	0.04	0.65		0.08	0.69	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		238			231	231	65	1805		144	2468	
v/s Ratio Prot							0.01	c0.49		c0.05	0.29	
v/s Ratio Perm		0.02			c0.11	0.01						
v/c Ratio		0.12			0.70	0.05	0.23	0.75		0.61	0.42	
Uniform Delay, d1		39.4			43.6	40.7	51.5	13.2		48.9	7.3	
Progression Factor		1.00			1.00	1.00	1.28	0.82		1.00	1.00	
Incremental Delay, d2		0.2			8.8	0.1	1.6	2.7		7.5	0.5	
Delay (s)		39.6			52.4	40.8	67.4	13.5		56.4	7.9	
Level of Service		D			D	D	E	B		E	A	
Approach Delay (s)		39.6			48.3			14.1			11.6	
Approach LOS		D			D			B			B	

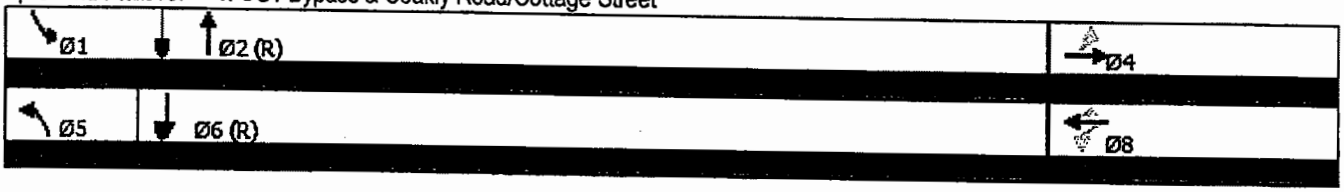
Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	13	4	130	7	75	14	1165	81	936
Future Volume (vph)	13	4	130	7	75	14	1165	81	936
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA
Protected Phases		4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phase	4	4	8	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	24.0	24.0	24.0	24.0	24.0	11.0	73.0	13.0	75.0
Total Split (%)	21.8%	21.8%	21.8%	21.8%	21.8%	10.0%	66.4%	11.8%	68.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0		4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)		17.8		17.8	15.8	7.5	72.6	10.1	79.8
Actuated g/C Ratio		0.16		0.16	0.14	0.07	0.66	0.09	0.73
v/c Ratio		0.18		0.70	0.29	0.12	0.74	0.53	0.40
Control Delay		26.2		59.7	10.9	64.1	14.1	60.2	7.3
Queue Delay		0.0		0.0	0.0	0.0	0.3	0.0	0.0
Total Delay		26.2		59.7	10.9	64.1	14.3	60.2	7.3
LOS		C		E	B	E	B	E	A
Approach Delay		26.2		42.5			14.9		11.5
Approach LOS		C		D			B		B

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 16.1 — Intersection LOS: B
Intersection Capacity Utilization 64.7% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: US1 Bypass & Coakly Road/Cottage Street



Queues
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	161	88	15	1363	88	1038
v/c Ratio	0.18	0.70	0.29	0.12	0.74	0.53	0.40
Control Delay	26.2	59.7	10.9	64.1	14.1	60.2	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	26.2	59.7	10.9	64.1	14.3	60.2	7.3
Queue Length 50th (ft)	15	106	0	8	453	59	115
Queue Length 95th (ft)	34	167	38	m24	139	#124	220
Internal Link Dist (ft)	998	606			304		719
Turn Bay Length (ft)			50	100		150	
Base Capacity (vph)	284	259	338	122	1857	167	2587
Starvation Cap Reductn	0	0	0	0	105	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.62	0.26	0.12	0.78	0.53	0.40

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	4	14	115	6	32	13	1299	105	58	1041	17
Future Volume (vph)	12	4	14	115	6	32	13	1299	105	58	1041	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	*0.75		1.00	0.95	
Frt		0.94			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1746			1814	1615	1805	2788		1805	3566	
Flt Permitted		0.86			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1530			1426	1615	1805	2788		1805	3566	
Peak-hour factor, PHF	0.70	0.70	0.70	0.85	0.85	0.85	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	17	6	20	135	7	38	14	1382	112	63	1132	18
RTOR Reduction (vph)	0	17	0	0	0	33	0	3	0	0	1	0
Lane Group Flow (vph)	0	26	0	0	142	5	14	1491	0	63	1149	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		16.0			16.0	16.0	2.0	80.1		5.9	84.0	
Effective Green, g (s)		18.0			18.0	16.0	4.0	82.1		7.9	86.0	
Actuated g/C Ratio		0.15			0.15	0.13	0.03	0.68		0.07	0.72	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		229			213	215	60	1907		118	2555	
v/s Ratio Prot							0.01	c0.53		c0.03	c0.32	
v/s Ratio Perm		0.02			c0.10	0.00						
v/c Ratio		0.11			0.67	0.02	0.23	0.78		0.53	0.45	
Uniform Delay, d1		44.1			48.2	45.2	56.5	12.9		54.3	7.1	
Progression Factor		1.00			1.00	1.00	1.18	0.52		1.00	1.00	
Incremental Delay, d2		0.2			7.7	0.0	1.4	2.2		4.6	0.6	
Delay (s)		44.3			55.8	45.3	67.8	8.9		58.9	7.7	
Level of Service		D			E	D	E	A		E	A	
Approach Delay (s)		44.3			53.6			9.5			10.3	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

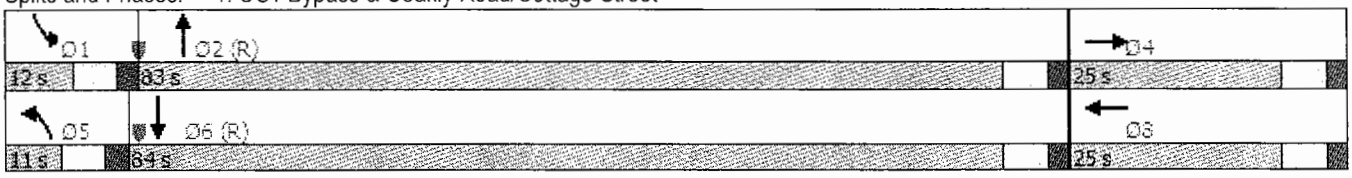
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	4	115	6	32	13	1299	58	1041
Future Volume (vph)	12	4	115	6	32	13	1299	58	1041
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA
Protected Phases		4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phase	4	4	8	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	11.0	83.0	12.0	84.0
Total Split (%)	20.8%	20.8%	20.8%	20.8%	20.8%	9.2%	69.2%	10.0%	70.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0		4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)		18.0		18.0	16.0	7.5	83.3	9.1	89.6
Actuated g/C Ratio		0.15		0.15	0.13	0.06	0.69	0.08	0.75
v/c Ratio		0.17		0.67	0.13	0.12	0.77	0.46	0.43
Control Delay		28.5		63.2	1.0	64.8	9.3	64.9	7.3
Queue Delay		0.0		0.6	0.0	0.0	0.5	0.0	0.0
Total Delay		28.6		63.9	1.0	64.8	9.8	64.9	7.3
LOS		C		E	A	E	A	E	A
Approach Delay		28.6		50.6			10.3		10.3
Approach LOS		C		D			B		B

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 13.0 — Intersection LOS: B
Intersection Capacity Utilization 65.9% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: US1 Bypass & Coakly Road/Cottage Street



Queues
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	43	142	38	14	1494	63	1150
v/c Ratio	0.17	0.67	0.13	0.12	0.77	0.46	0.43
Control Delay	28.5	63.2	1.0	64.8	9.3	64.9	7.3
Queue Delay	0.0	0.6	0.0	0.0	0.5	0.0	0.0
Total Delay	28.6	63.9	1.0	64.8	9.8	64.9	7.3
Queue Length 50th (ft)	15	104	0	11	126	47	131
Queue Length 95th (ft)	34	161	0	m15	135	#98	256
Internal Link Dist (ft)	998	606			304		719
Turn Bay Length (ft)			50	100		150	
Base Capacity (vph)	284	249	324	112	1948	136	2665
Starvation Cap Reductn	0	0	0	0	151	0	0
Spillback Cap Reductn	15	14	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.60	0.12	0.13	0.83	0.46	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	4	15	127	7	37	14	1409	116	64	1130	19
Future Volume (vph)	13	4	15	127	7	37	14	1409	116	64	1130	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	*0.75		1.00	0.95	
Frt		0.94			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1747			1814	1615	1805	2788		1805	3566	
Flt Permitted		0.77			0.74	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1382			1410	1615	1805	2788		1805	3566	
Peak-hour factor, PHF	0.70	0.70	0.70	0.85	0.85	0.85	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	19	6	21	149	8	44	15	1499	123	70	1228	21
RTOR Reduction (vph)	0	18	0	0	0	38	0	4	0	0	1	0
Lane Group Flow (vph)	0	28	0	0	157	6	15	1618	0	70	1248	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		15.7			15.7	15.7	2.0	81.0		5.3	84.3	
Effective Green, g (s)		17.7			17.7	15.7	4.0	83.0		7.3	86.3	
Actuated g/C Ratio		0.15			0.15	0.13	0.03	0.69		0.06	0.72	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		203			207	211	60	1928		109	2564	
v/s Ratio Prot							0.01	c0.58		c0.04	c0.35	
v/s Ratio Perm		0.02			c0.11	0.00						
v/c Ratio		0.14			0.76	0.03	0.25	0.84		0.64	0.49	
Uniform Delay, d1		44.5			49.1	45.5	56.5	13.6		55.1	7.3	
Progression Factor		1.00			1.00	1.00	1.01	0.64		1.00	1.00	
Incremental Delay, d2		0.3			14.7	0.1	1.3	2.7		12.2	0.7	
Delay (s)		44.8			63.8	45.5	58.3	11.4		67.3	7.9	
Level of Service		D			E	D	E	B		E	A	
Approach Delay (s)		44.8			59.8			11.8			11.1	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

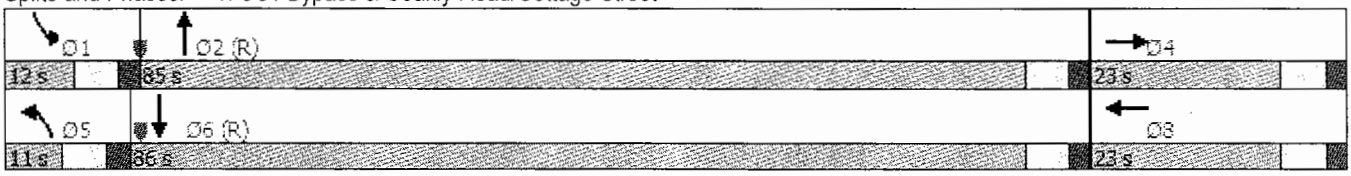
Timings
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	13	4	127	7	37	14	1409	64	1130
Future Volume (vph)	13	4	127	7	37	14	1409	64	1130
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA
Protected Phases		4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phase	4	4	8	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	23.0	23.0	23.0	23.0	23.0	11.0	85.0	12.0	86.0
Total Split (%)	19.2%	19.2%	19.2%	19.2%	19.2%	9.2%	70.8%	10.0%	71.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0		4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)		17.7		17.7	15.7	7.2	84.1	8.6	89.9
Actuated g/C Ratio		0.15		0.15	0.13	0.06	0.70	0.07	0.75
v/c Ratio		0.21		0.75	0.16	0.14	0.83	0.54	0.47
Control Delay		30.4		71.5	3.0	56.1	11.8	70.3	7.3
Queue Delay		0.0		0.0	0.0	0.0	0.6	0.0	0.0
Total Delay		30.4		71.5	3.0	56.1	12.4	70.3	7.3
LOS		C		E	A	E	B	E	A
Approach Delay		30.4		56.5			12.8		10.7
Approach LOS		C		E			B		B

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 14.9 — Intersection LOS: B
Intersection Capacity Utilization 70.3% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: US1 Bypass & Coakly Road/Cottage Street



Queues
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	157	44	15	1622	70	1249
v/c Ratio	0.21	0.75	0.16	0.14	0.83	0.54	0.47
Control Delay	30.4	71.5	3.0	56.1	11.8	70.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Total Delay	30.4	71.5	3.0	56.1	12.4	70.3	7.3
Queue Length 50th (ft)	17	117	0	12	132	54	147
Queue Length 95th (ft)	37	#191	4	m15	213	#114	272
Internal Link Dist (ft)	998	606			304		719
Turn Bay Length (ft)			50	100		150	
Base Capacity (vph)	236	223	299	108	1966	129	2669
Starvation Cap Reductn	0	0	0	0	103	0	0
Spillback Cap Reductn	0	0	0	0	0	0	108
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.70	0.15	0.14	0.87	0.54	0.49

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	377	1	64	6	0	10	29	1144	6	10	868	116
Future Volume (vph)	377	1	64	6	0	10	29	1144	6	10	868	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.85		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1698	1702	1615	1805	1615		1752	3500		1752	3503	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1698	1702	1615	1805	1615		1752	3500		1752	3503	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.97	0.97	0.97	0.96	0.96	0.96
Adj. Flow (vph)	454	1	77	7	0	11	30	1179	6	10	904	121
RTOR Reduction (vph)	0	0	63	0	11	0	0	0	0	0	7	0
Lane Group Flow (vph)	227	228	14	7	0	0	30	1185	0	10	1018	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	3%	3%	17%	3%	1%	3%
Turn Type	Split	NA	Prot	Split	NA		Prot	NA		Prot	NA	
Protected Phases	7	7	7	8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	21.6	21.6	21.6	2.3	2.3		4.2	71.1		1.0	67.9	
Effective Green, g (s)	23.6	23.6	21.6	4.3	4.3		6.2	73.1		3.0	69.9	
Actuated g/C Ratio	0.20	0.20	0.18	0.04	0.04		0.05	0.61		0.02	0.58	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	333	334	290	64	57		90	2132		43	2040	
v/s Ratio Prot	0.13	c0.13	0.01	c0.00	0.00		c0.02	c0.34		0.01	0.29	
v/s Ratio Perm												
v/c Ratio	0.68	0.68	0.05	0.11	0.01		0.33	0.56		0.23	0.50	
Uniform Delay, d1	44.7	44.7	40.7	56.0	55.8		54.9	13.9		57.4	14.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.07	0.68	
Incremental Delay, d2	5.7	5.7	0.1	0.8	0.0		2.2	1.1		2.5	0.8	
Delay (s)	50.4	50.4	40.8	56.8	55.8		57.1	14.9		63.7	10.9	
Level of Service	D	D	D	E	E		E	B		E	B	
Approach Delay (s)		49.0			56.2			15.9			11.4	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

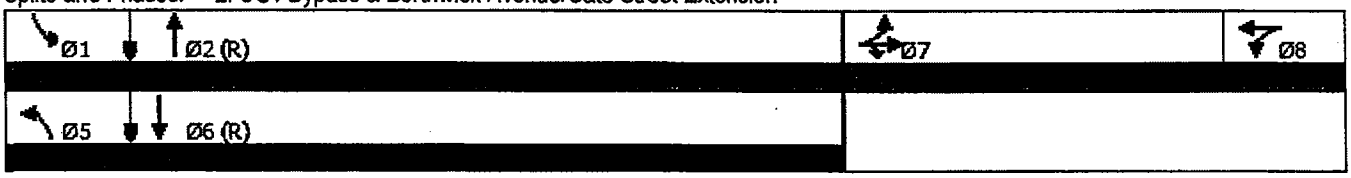
Timings
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	377	1	64	6	0	29	1144	10	868
Future Volume (vph)	377	1	64	6	0	29	1144	10	868
Turn Type	Split	NA	Prot	Split	NA	Prot	NA	Prot	NA
Protected Phases	7	7	7	8	8	5	2	1	6
Permitted Phases									
Detector Phase	7	7	7	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	34.0	34.0	34.0	11.0	11.0	11.0	64.0	11.0	64.0
Total Split (%)	28.3%	28.3%	28.3%	9.2%	9.2%	9.2%	53.3%	9.2%	53.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	23.6	23.6	21.6	7.7	7.7	8.6	81.5	7.8	75.9
Actuated g/C Ratio	0.20	0.20	0.18	0.06	0.06	0.07	0.68	0.06	0.63
v/c Ratio	0.68	0.68	0.19	0.06	0.05	0.24	0.50	0.09	0.46
Control Delay	54.5	54.6	1.3	54.3	0.4	57.7	12.8	58.2	10.5
Queue Delay	0.4	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.4
Total Delay	54.9	54.9	1.3	54.3	0.4	57.7	12.9	58.2	10.9
LOS	D	D	A	D	A	E	B	E	B
Approach Delay		47.2			21.4		14.0		11.4
Approach LOS		D			C		B		B

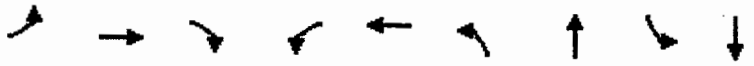
Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 100 (83%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 19.4 — Intersection LOS: B
Intersection Capacity Utilization 55.6% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



Queues
2: US1 Bypass & Borthwick Avenue/Cate Street Extension



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	227	228	77	7	11	30	1185	10	1025
v/c Ratio	0.68	0.68	0.19	0.06	0.05	0.24	0.50	0.09	0.46
Control Delay	54.5	54.6	1.3	54.3	0.4	57.7	12.8	58.2	10.5
Queue Delay	0.4	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.4
Total Delay	54.9	54.9	1.3	54.3	0.4	57.7	12.9	58.2	10.9
Queue Length 50th (ft)	172	172	0	5	0	22	171	8	143
Queue Length 95th (ft)	224	225	0	21	0	55	431	m19	242
Internal Link Dist (ft)		916			388		250		304
Turn Bay Length (ft)	225		225	150		200		150	
Base Capacity (vph)	424	425	481	115	230	125	2376	113	2236
Starvation Cap Reductn	0	0	0	0	0	0	0	0	668
Spillback Cap Reductn	28	28	0	0	0	0	178	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.57	0.16	0.06	0.05	0.24	0.54	0.09	0.65

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	450	1	81	7	0	11	34	1255	7	11	949	135
Future Volume (vph)	450	1	81	7	0	11	34	1255	7	11	949	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.85		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1698	1702	1615	1805	1615		1752	3499		1752	3499	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1698	1702	1615	1805	1615		1752	3499		1752	3499	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.97	0.97	0.97	0.96	0.96	0.96
Adj. Flow (vph)	542	1	98	8	0	12	35	1294	7	11	989	141
RTOR Reduction (vph)	0	0	78	0	12	0	0	0	0	0	8	0
Lane Group Flow (vph)	271	272	20	8	0	0	35	1301	0	11	1122	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	3%	3%	17%	3%	1%	3%
Turn Type	Split	NA	Prot	Split	NA		Prot	NA		Prot	NA	
Protected Phases	7	7	7	8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	24.3	24.3	24.3	2.3	2.3		4.4	68.4		1.0	65.0	
Effective Green, g (s)	26.3	26.3	24.3	4.3	4.3		6.4	70.4		3.0	67.0	
Actuated g/C Ratio	0.22	0.22	0.20	0.04	0.04		0.05	0.59		0.02	0.56	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	372	373	327	64	57		93	2052		43	1953	
v/s Ratio Prot	0.16	c0.16	0.01	c0.00	0.00		c0.02	c0.37		0.01	0.32	
v/s Ratio Perm												
v/c Ratio	0.73	0.73	0.06	0.12	0.01		0.38	0.63		0.26	0.57	
Uniform Delay, d1	43.5	43.5	38.6	56.0	55.8		54.9	16.3		57.4	17.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.24	0.78	
Incremental Delay, d2	7.0	7.0	0.1	0.9	0.1		2.5	1.5		2.8	1.1	
Delay (s)	50.5	50.5	38.7	56.9	55.8		57.4	17.8		73.7	14.6	
Level of Service	D	D	D	E	E		E	B		E	B	
Approach Delay (s)		48.7			56.3			18.9			15.1	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

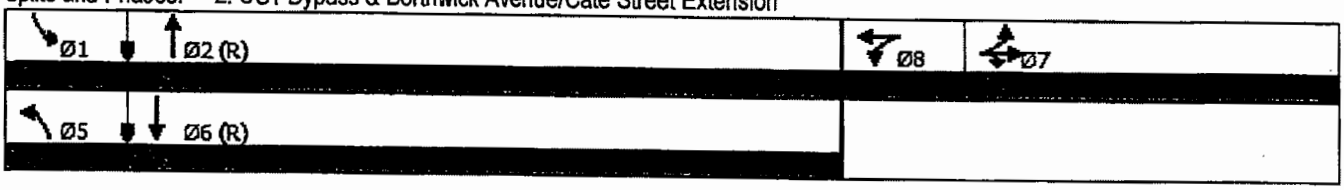
Timings
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	450	1	81	7	0	34	1255	11	949
Future Volume (vph)	450	1	81	7	0	34	1255	11	949
Turn Type	Split	NA	Prot	Split	NA	Prot	NA	Prot	NA
Protected Phases	7	7	7	8	8	5	2	1	6
Permitted Phases									
Detector Phase	7	7	7	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	34.0	34.0	34.0	11.0	11.0	11.0	64.0	11.0	64.0
Total Split (%)	28.3%	28.3%	28.3%	9.2%	9.2%	9.2%	53.3%	9.2%	53.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	26.3	26.3	24.3	7.7	7.7	8.8	78.8	7.8	73.1
Actuated g/C Ratio	0.22	0.22	0.20	0.06	0.06	0.07	0.66	0.06	0.61
v/c Ratio	0.73	0.73	0.23	0.07	0.05	0.27	0.57	0.10	0.53
Control Delay	55.1	55.1	3.6	54.4	0.5	58.4	15.0	67.3	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.2
Total Delay	55.1	55.1	3.6	54.4	0.5	58.4	16.8	67.3	14.0
LOS	E	E	A	D	A	E	B	E	B
Approach Delay		47.2			22.0		17.9		14.5
Approach LOS		D			C		B		B

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 5 (4%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 22.7 — Intersection LOS: C
Intersection Capacity Utilization 60.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



Queues
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	271	272	98	8	12	35	1301	11	1130
v/c Ratio	0.73	0.73	0.23	0.07	0.05	0.27	0.57	0.10	0.53
Control Delay	55.1	55.1	3.6	54.4	0.5	58.4	15.0	67.3	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.2
Total Delay	55.1	55.1	3.6	54.4	0.5	58.4	16.8	67.3	14.0
Queue Length 50th (ft)	203	204	0	6	0	26	226	8	195
Queue Length 95th (ft)	269	269	12	23	0	61	496	m20	m185
Internal Link Dist (ft)		916			388		250		304
Turn Bay Length (ft)	225		225	150		200		150	
Base Capacity (vph)	427	428	484	115	230	128	2299	114	2176
Starvation Cap Reductn	0	0	0	0	0	0	0	0	336
Spillback Cap Reductn	0	0	0	0	0	0	783	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.64	0.20	0.07	0.05	0.27	0.86	0.10	0.61

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	493	1	88	8	0	12	37	1386	8	12	1048	148
Future Volume (vph)	493	1	88	8	0	12	37	1386	8	12	1048	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.85		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1698	1702	1615	1805	1615		1752	3499		1752	3499	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1698	1702	1615	1805	1615		1752	3499		1752	3499	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.97	0.97	0.97	0.96	0.96	0.96
Adj. Flow (vph)	594	1	106	9	0	13	38	1429	8	12	1092	154
RTOR Reduction (vph)	0	0	84	0	12	0	0	0	0	0	8	0
Lane Group Flow (vph)	297	298	22	9	1	0	38	1437	0	13	1238	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	3%	3%	17%	3%	1%	3%
Turn Type	Split	NA	Prot	Split	NA		Prot	NA		Prot	NA	
Protected Phases	7	7	7	8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	25.4	25.4	25.4	3.2	3.2		3.6	65.4		2.0	63.8	
Effective Green, g (s)	27.4	27.4	25.4	5.2	5.2		5.6	67.4		4.0	65.8	
Actuated g/C Ratio	0.23	0.23	0.21	0.04	0.04		0.05	0.56		0.03	0.55	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	387	388	341	78	69		81	1965		58	1918	
v/s Ratio Prot	0.17	c0.18	0.01	c0.00	0.00		c0.02	c0.41		0.01	0.35	
v/s Ratio Perm												
v/c Ratio	0.77	0.77	0.07	0.12	0.01		0.47	0.73		0.22	0.65	
Uniform Delay, d1	43.3	43.3	37.8	55.2	54.9		55.8	19.6		56.5	18.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.24	0.93	
Incremental Delay, d2	8.8	8.8	0.1	0.7	0.0		4.2	2.4		1.6	1.4	
Delay (s)	52.2	52.2	37.9	55.8	55.0		60.0	22.0		71.6	19.0	
Level of Service	D	D	D	E	D		E	C		E	B	
Approach Delay (s)		50.0			55.3			23.0			19.5	
Approach LOS		D			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

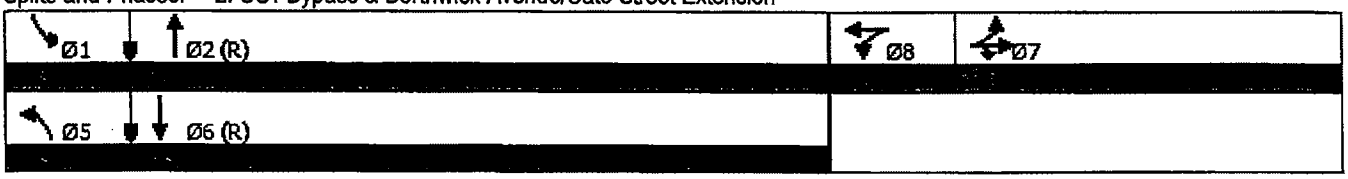
Timings
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	493	1	88	8	0	37	1386	12	1048
Future Volume (vph)	493	1	88	8	0	37	1386	12	1048
Turn Type	Split	NA	Prot	Split	NA	Prot	NA	Prot	NA
Protected Phases	7	7	7	8	8	5	2	1	6
Permitted Phases									
Detector Phase	7	7	7	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	35.0	35.0	35.0	11.0	11.0	11.0	63.0	11.0	63.0
Total Split (%)	29.2%	29.2%	29.2%	9.2%	9.2%	9.2%	52.5%	9.2%	52.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	27.4	27.4	25.4	7.4	7.4	8.1	73.4	7.5	70.6
Actuated g/C Ratio	0.23	0.23	0.21	0.06	0.06	0.07	0.61	0.06	0.59
v/c Ratio	0.77	0.77	0.24	0.08	0.06	0.32	0.67	0.12	0.60
Control Delay	56.6	56.7	4.1	55.1	0.5	61.5	20.5	68.5	18.5
Queue Delay	1.4	1.4	0.0	0.0	0.0	0.0	1.1	0.0	0.2
Total Delay	58.0	58.1	4.1	55.1	0.5	61.5	21.5	68.5	18.7
LOS	E	E	A	E	A	E	C	E	B
Approach Delay		49.9			22.8		22.6		19.2
Approach LOS		D			C		C		B

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 14 (12%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 26.9 — Intersection LOS: C
Intersection Capacity Utilization 65.6% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



Queues
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	297	298	106	9	13	38	1437	13	1246
v/c Ratio	0.77	0.77	0.24	0.08	0.06	0.32	0.67	0.12	0.60
Control Delay	56.6	56.7	4.1	55.1	0.5	61.5	20.5	68.5	18.5
Queue Delay	1.4	1.4	0.0	0.0	0.0	0.0	1.1	0.0	0.2
Total Delay	58.0	58.1	4.1	55.1	0.5	61.5	21.5	68.5	18.7
Queue Length 50th (ft)	222	223	0	7	0	28	388	9	363
Queue Length 95th (ft)	292	293	17	24	0	66	593	m21	m495
Internal Link Dist (ft)		916			388		250		304
Turn Bay Length (ft)	225		225	150		200		150	
Base Capacity (vph)	438	439	493	111	227	117	2141	109	2081
Starvation Cap Reductn	0	0	0	0	0	0	0	0	185
Spillback Cap Reductn	41	42	0	0	0	0	426	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.75	0.22	0.08	0.06	0.32	0.84	0.12	0.66

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	442	14	80	51	11	287	33	1249	10	199	935	127
Future Volume (vph)	442	14	80	51	11	287	33	1249	10	199	935	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.86		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1698	1708	1615	1805	1625		1752	3497		1752	3502	
Flt Permitted	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1698	1708	1615	1805	1625		1752	3497		1752	3502	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.97	0.97	0.97	0.96	0.96	0.96
Adj. Flow (vph)	533	17	96	57	12	319	34	1288	10	207	974	132
RTOR Reduction (vph)	0	0	80	0	112	0	0	1	0	0	9	0
Lane Group Flow (vph)	277	273	16	57	219	0	34	1297	0	207	1097	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	3%	3%	17%	3%	1%	3%
Turn Type	Split	NA	Prot	Split	NA		Prot	NA		Prot	NA	
Protected Phases	7	7	7	8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	19.8	19.8	19.8	15.9	15.9		3.0	46.2		14.1	57.3	
Effective Green, g (s)	21.8	21.8	19.8	17.9	17.9		5.0	48.2		16.1	59.3	
Actuated g/C Ratio	0.18	0.18	0.17	0.15	0.15		0.04	0.40		0.13	0.49	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	308	310	266	269	242		73	1404		235	1730	
v/s Ratio Prot	c0.16	0.16	0.01	0.03	c0.13		0.02	c0.37		c0.12	0.31	
v/s Ratio Perm												
v/c Ratio	0.90	0.88	0.06	0.21	0.90		0.47	0.92		0.88	0.63	
Uniform Delay, d1	48.0	47.8	42.2	44.9	50.2		56.2	34.2		51.0	22.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.98	0.90	
Incremental Delay, d2	27.0	23.9	0.1	0.4	33.2		4.6	11.6		26.0	1.5	
Delay (s)	75.0	71.8	42.3	45.2	83.4		60.8	45.8		76.1	21.6	
Level of Service	E	E	D	D	F		E	D		E	C	
Approach Delay (s)		68.8			77.8			46.2			30.2	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	47.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

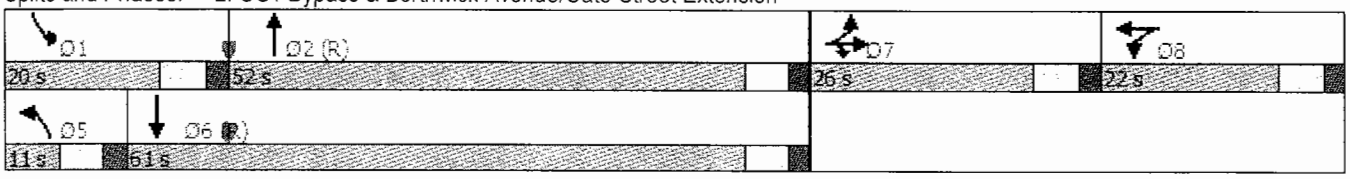
Timings
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	442	14	80	51	11	33	1249	199	935
Future Volume (vph)	442	14	80	51	11	33	1249	199	935
Turn Type	Split	NA	Prot	Split	NA	Prot	NA	Prot	NA
Protected Phases	7	7	7	8	8	5	2	1	6
Permitted Phases									
Detector Phase	7	7	7	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	26.0	26.0	26.0	22.0	22.0	11.0	52.0	20.0	61.0
Total Split (%)	21.7%	21.7%	21.7%	18.3%	18.3%	9.2%	43.3%	16.7%	50.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	21.8	21.8	19.8	17.9	17.9	7.1	48.2	16.1	61.8
Actuated g/C Ratio	0.18	0.18	0.16	0.15	0.15	0.06	0.40	0.13	0.52
v/c Ratio	0.90	0.88	0.23	0.21	0.94	0.33	0.92	0.88	0.61
Control Delay	79.8	76.8	1.2	47.2	64.9	63.2	46.2	81.3	20.6
Queue Delay	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.4
Total Delay	79.8	76.8	1.2	47.2	114.9	63.2	46.2	81.3	21.0
LOS	E	E	A	D	F	E	D	F	C
Approach Delay		66.9			104.9		46.6		30.5
Approach LOS		E			F		D		C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 20 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 50.6 — Intersection LOS: D
Intersection Capacity Utilization 90.1% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	277	273	96	57	331	34	1298	207	1106
v/c Ratio	0.90	0.88	0.23	0.21	0.94	0.33	0.92	0.88	0.61
Control Delay	79.8	76.8	1.2	47.2	64.9	63.2	46.2	81.3	20.6
Queue Delay	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.4
Total Delay	79.8	76.8	1.2	47.2	114.9	63.2	46.2	81.3	21.0
Queue Length 50th (ft)	223	218	0	39	160	26	497	152	254
Queue Length 95th (ft)	#336	#328	0	80	#341	61	#646	m#260	m426
Internal Link Dist (ft)		916			388		250		304
Turn Bay Length (ft)	225		225	150		200		150	
Base Capacity (vph)	311	313	428	270	355	103	1405	235	1810
Starvation Cap Reductn	0	0	0	0	0	0	0	0	266
Spillback Cap Reductn	0	0	0	0	139	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.87	0.22	0.21	1.53	0.33	0.92	0.88	0.72

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	485	14	87	52	11	288	36	1380	11	200	1034	140
Future Volume (vph)	485	14	87	52	11	288	36	1380	11	200	1034	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.86		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1698	1708	1615	1805	1625		1752	3497		1752	3502	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1698	1708	1615	1805	1625		1752	3497		1752	3502	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.97	0.97	0.97	0.96	0.96	0.96
Adj. Flow (vph)	584	17	105	58	12	320	37	1423	11	208	1077	146
RTOR Reduction (vph)	0	0	88	0	96	0	0	1	0	0	9	0
Lane Group Flow (vph)	298	303	18	58	236	0	37	1433	0	208	1215	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	3%	3%	17%	3%	1%	3%
Turn Type	Split	NA	Prot	Split	NA		Prot	NA		Prot	NA	
Protected Phases	7	7	7	8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	20.0	20.0	20.0	15.0	15.0		3.0	48.0		13.0	58.0	
Effective Green, g (s)	22.0	22.0	20.0	17.0	17.0		5.0	50.0		15.0	60.0	
Actuated g/C Ratio	0.18	0.18	0.17	0.14	0.14		0.04	0.42		0.12	0.50	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	311	313	269	255	230		73	1457		219	1751	
v/s Ratio Prot	0.18	c0.18	0.01	0.03	c0.15		0.02	c0.41		c0.12	0.35	
v/s Ratio Perm												
v/c Ratio	0.96	0.97	0.07	0.23	1.03		0.51	0.98		0.95	0.69	
Uniform Delay, d1	48.5	48.7	42.1	45.7	51.5		56.3	34.6		52.1	23.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.98	0.92	
Incremental Delay, d2	39.4	41.8	0.1	0.5	66.1		5.4	20.0		40.4	1.8	
Delay (s)	88.0	90.4	42.2	46.1	117.6		61.7	54.6		91.5	22.9	
Level of Service	F	F	D	D	F		E	D		F	C	
Approach Delay (s)		82.2			107.0			54.8			32.9	
Approach LOS		F			F			D			C	

Intersection Summary			
HCM 2000 Control Delay	56.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		

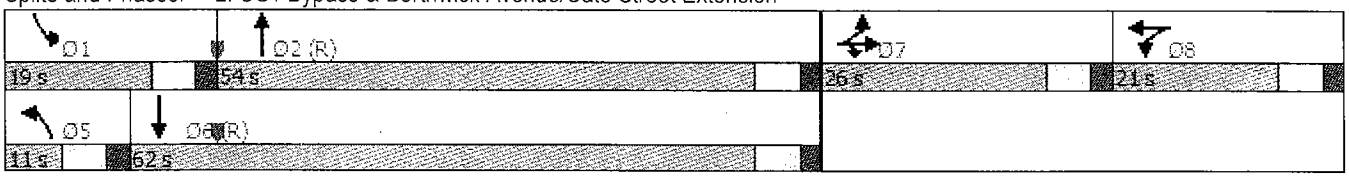
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	485	14	87	52	11	36	1380	200	1034
Future Volume (vph)	485	14	87	52	11	36	1380	200	1034
Turn Type	Split	NA	Prot	Split	NA	Prot	NA	Prot	NA
Protected Phases	7	7	7	8	8	5	2	1	6
Permitted Phases									
Detector Phase	7	7	7	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	26.0	26.0	26.0	21.0	21.0	11.0	54.0	19.0	62.0
Total Split (%)	21.7%	21.7%	21.7%	17.5%	17.5%	9.2%	45.0%	15.8%	51.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	22.0	22.0	20.0	17.0	17.0	7.0	50.0	15.0	62.4
Actuated g/C Ratio	0.18	0.18	0.17	0.14	0.14	0.06	0.42	0.12	0.52
v/c Ratio	0.96	0.97	0.25	0.23	1.02	0.36	0.98	0.95	0.67
Control Delay	90.5	92.5	1.4	48.3	88.7	64.7	54.9	94.7	21.8
Queue Delay	0.0	0.0	0.0	0.0	39.0	0.0	0.0	0.0	0.4
Total Delay	90.5	92.5	1.4	48.3	127.7	64.7	54.9	94.7	22.2
LOS	F	F	A	D	F	E	D	F	C
Approach Delay		78.1			115.9		55.1		32.8
Approach LOS		E			F		E		C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 20 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 57.1 — Intersection LOS: E
Intersection Capacity Utilization 95.1% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



Queues
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	298	303	105	58	332	37	1434	208	1223
v/c Ratio	0.96	0.97	0.25	0.23	1.02	0.36	0.98	0.95	0.67
Control Delay	90.5	92.5	1.4	48.3	88.7	64.7	54.9	94.7	21.8
Queue Delay	0.0	0.0	0.0	0.0	39.0	0.0	0.0	0.0	0.4
Total Delay	90.5	92.5	1.4	48.3	127.7	64.7	54.9	94.7	22.2
Queue Length 50th (ft)	243	247	0	40	~187	28	568	154	326
Queue Length 95th (ft)	#375	#382	0	82	#379	65	#738	m#268	m469
Internal Link Dist (ft)		916			388		250		304
Turn Bay Length (ft)	225		225	150		200		150	
Base Capacity (vph)	311	313	428	255	326	102	1458	219	1829
Starvation Cap Reductn	0	0	0	0	0	0	0	0	207
Spillback Cap Reductn	0	0	0	0	181	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.97	0.25	0.23	2.29	0.36	0.98	0.95	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	2	22	2	2	15	18	912	5	14	798	76
Future Volume (vph)	137	2	22	2	2	15	18	912	5	14	798	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.87		1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1665	1583	1805	1649		1703	3572		1770	3521	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1665	1583	1805	1649		1703	3572		1770	3521	
Peak-hour factor, PHF	0.65	0.65	0.65	0.68	0.68	0.68	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	211	3	34	3	3	22	19	950	5	15	867	83
RTOR Reduction (vph)	0	0	30	0	21	0	0	0	0	0	5	0
Lane Group Flow (vph)	108	106	4	3	4	0	19	955	0	15	945	0
Heavy Vehicles (%)	2%	50%	2%	0%	0%	0%	6%	1%	0%	2%	1%	3%
Turn Type	Split	NA	Prot	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4	4	8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.4	12.4	12.4	4.1	4.1		3.2	66.5		3.0	66.3	
Effective Green, g (s)	14.4	14.4	12.4	6.1	6.1		5.2	68.5		5.0	68.3	
Actuated g/C Ratio	0.13	0.13	0.11	0.06	0.06		0.05	0.62		0.05	0.62	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	220	217	178	100	91		80	2224		80	2186	
v/s Ratio Prot	c0.06	0.06	0.00	0.00	c0.00		c0.01	0.27		0.01	c0.27	
v/s Ratio Perm												
v/c Ratio	0.49	0.49	0.02	0.03	0.05		0.24	0.43		0.19	0.43	
Uniform Delay, d1	44.4	44.4	43.4	49.2	49.2		50.5	10.7		50.5	10.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.07	0.71	
Incremental Delay, d2	1.7	1.7	0.0	0.1	0.2		1.5	0.6		1.1	0.6	
Delay (s)	46.1	46.1	43.5	49.3	49.4		52.0	11.3		55.0	8.3	
Level of Service	D	D	D	D	D		D	B		E	A	
Approach Delay (s)		45.7			49.4			12.1			9.0	
Approach LOS		D			D			B			A	

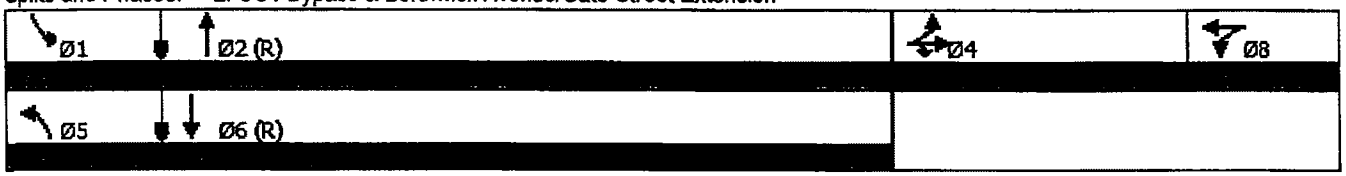
Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	137	2	22	2	2	18	912	14	798
Future Volume (vph)	137	2	22	2	2	18	912	14	798
Turn Type	Split	NA	Prot	Split	NA	Prot	NA	Prot	NA
Protected Phases	4	4	4	8	8	5	2	1	6
Permitted Phases									
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	1.0	4.0	1.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	24.0	24.0	24.0	13.0	13.0	13.0	60.0	13.0	60.0
Total Split (%)	21.8%	21.8%	21.8%	11.8%	11.8%	11.8%	54.5%	11.8%	54.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	14.4	14.4	12.4	8.3	8.3	8.8	74.6	8.5	74.3
Actuated g/C Ratio	0.13	0.13	0.11	0.08	0.08	0.08	0.68	0.08	0.68
v/c Ratio	0.49	0.49	0.11	0.02	0.17	0.14	0.39	0.11	0.40
Control Delay	51.3	51.3	0.7	46.5	23.5	48.8	11.3	51.6	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	51.3	51.3	0.7	46.5	23.5	48.8	11.3	51.6	8.4
LOS	D	D	A	D	C	D	B	D	A
Approach Delay		44.4			25.9		12.0		9.1
Approach LOS		D			C		B		A

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 107 (97%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.49
Intersection Signal Delay: 14.5 — Intersection LOS: B
Intersection Capacity Utilization 42.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



Queues
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	106	34	3	25	19	955	15	950
v/c Ratio	0.49	0.49	0.11	0.02	0.17	0.14	0.39	0.11	0.40
Control Delay	51.3	51.3	0.7	46.5	23.5	48.8	11.3	51.6	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	51.3	51.3	0.7	46.5	23.5	48.8	11.3	51.6	8.4
Queue Length 50th (ft)	75	73	0	2	2	13	133	10	115
Queue Length 95th (ft)	90	88	0	9	18	36	294	m30	175
Internal Link Dist (ft)		916			388		250		304
Turn Bay Length (ft)	225		225	150		200		150	
Base Capacity (vph)	305	302	383	151	158	146	2429	148	2397
Starvation Cap Reductn	0	0	0	0	0	0	0	0	519
Spillback Cap Reductn	0	0	0	0	0	0	148	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.35	0.09	0.02	0.16	0.13	0.42	0.10	0.51

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	2	25	2	2	17	21	1007	6	15	881	87
Future Volume (vph)	154	2	25	2	2	17	21	1007	6	15	881	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.87		1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1668	1583	1805	1646		1703	3571		1770	3520	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1668	1583	1805	1646		1703	3571		1770	3520	
Peak-hour factor, PHF	0.65	0.65	0.65	0.68	0.68	0.68	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	237	3	38	3	3	25	22	1049	6	16	958	95
RTOR Reduction (vph)	0	0	33	0	24	0	0	0	0	0	5	0
Lane Group Flow (vph)	121	119	5	3	4	0	22	1055	0	16	1048	0
Heavy Vehicles (%)	2%	50%	2%	0%	0%	0%	6%	1%	0%	2%	1%	3%
Turn Type	Split	NA	Prot	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4	4	8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	13.4	13.4	13.4	4.1	4.1		3.3	65.5		3.0	65.2	
Effective Green, g (s)	15.4	15.4	13.4	6.1	6.1		5.3	67.5		5.0	67.2	
Actuated g/C Ratio	0.14	0.14	0.12	0.06	0.06		0.05	0.61		0.05	0.61	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	235	233	192	100	91		82	2191		80	2150	
v/s Ratio Prot	c0.07	0.07	0.00	0.00	c0.00		c0.01	0.30		0.01	c0.30	
v/s Ratio Perm												
v/c Ratio	0.51	0.51	0.02	0.03	0.05		0.27	0.48		0.20	0.49	
Uniform Delay, d1	43.8	43.8	42.5	49.2	49.2		50.5	11.7		50.6	11.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.16	0.74	
Incremental Delay, d2	1.9	1.9	0.1	0.1	0.2		1.8	0.8		1.2	0.7	
Delay (s)	45.7	45.7	42.6	49.3	49.4		52.2	12.4		59.6	9.5	
Level of Service	D	D	D	D	D		D	B		E	A	
Approach Delay (s)		45.3			49.4			13.2			10.3	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

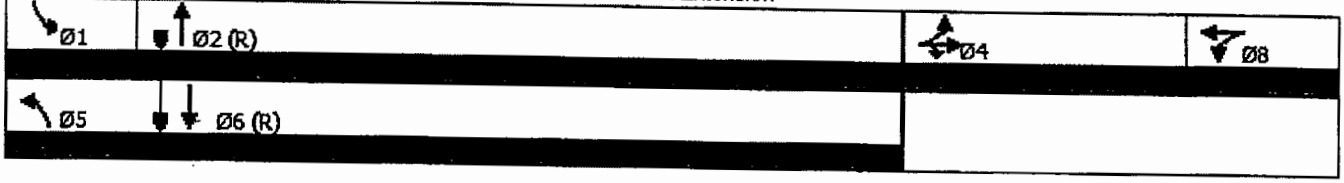
Timings
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	154	2	25	2	2	21	1007	15	881
Future Volume (vph)	154	2	25	2	2	21	1007	15	881
Turn Type	Split	NA	Prot	Split	NA	Prot	NA	Prot	NA
Protected Phases	4	4	4	8	8	5	2	1	6
Permitted Phases									
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	1.0	4.0	1.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	23.0	23.0	23.0	13.0	13.0	13.0	63.0	11.0	61.0
Total Split (%)	20.9%	20.9%	20.9%	11.8%	11.8%	11.8%	57.3%	10.0%	55.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	15.4	15.4	13.4	8.3	8.3	9.0	73.5	8.5	73.2
Actuated g/C Ratio	0.14	0.14	0.12	0.08	0.08	0.08	0.67	0.08	0.67
v/c Ratio	0.52	0.51	0.12	0.02	0.19	0.16	0.44	0.12	0.45
Control Delay	50.9	50.8	0.8	46.5	22.7	49.0	12.5	55.9	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	50.9	50.8	0.8	46.5	22.7	49.0	12.5	55.9	9.7
LOS	D	D	A	D	C	D	B	E	A
Approach Delay		44.0			25.0		13.2		10.4
Approach LOS		D			C		B		B

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 15.6 — Intersection LOS: B
Intersection Capacity Utilization 45.7% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



Queues
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	121	119	38	3	28	22	1055	16	1053
v/c Ratio	0.52	0.51	0.12	0.02	0.19	0.16	0.44	0.12	0.45
Control Delay	50.9	50.8	0.8	46.5	22.7	49.0	12.5	55.9	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	50.9	50.8	0.8	46.5	22.7	49.0	12.5	55.9	9.7
Queue Length 50th (ft)	84	83	0	2	2	15	157	11	92
Queue Length 95th (ft)	96	95	0	9	19	39	349	m31	160
Internal Link Dist (ft)		916			388		250		304
Turn Bay Length (ft)	225		225	150		200		150	
Base Capacity (vph)	297	295	376	151	161	147	2429	137	2380
Starvation Cap Reductn	0	0	0	0	0	0	0	0	417
Spillback Cap Reductn	0	0	0	0	0	0	42	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.40	0.10	0.02	0.17	0.15	0.44	0.12	0.54

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	2	28	2	2	19	23	1113	7	17	973	96
Future Volume (vph)	170	2	28	2	2	19	23	1113	7	17	973	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.86		1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1669	1583	1805	1643		1703	3571		1770	3520	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1669	1583	1805	1643		1703	3571		1770	3520	
Peak-hour factor, PHF	0.65	0.65	0.65	0.68	0.68	0.68	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	262	3	43	3	3	28	24	1159	7	18	1058	104
RTOR Reduction (vph)	0	0	37	0	27	0	0	0	0	0	5	0
Lane Group Flow (vph)	134	131	6	3	4	0	24	1166	0	18	1157	0
Heavy Vehicles (%)	2%	50%	2%	0%	0%	0%	6%	1%	0%	2%	1%	3%
Turn Type	Split	NA	Prot	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4	4	8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.1	14.1	14.1	3.7	3.7		2.8	65.7		2.5	65.4	
Effective Green, g (s)	16.1	16.1	14.1	5.7	5.7		4.8	67.7		4.5	67.4	
Actuated g/C Ratio	0.15	0.15	0.13	0.05	0.05		0.04	0.62		0.04	0.61	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	246	244	202	93	85		74	2197		72	2156	
v/s Ratio Prot	c0.08	0.08	0.00	0.00	c0.00		c0.01	0.33		0.01	c0.33	
v/s Ratio Perm												
v/c Ratio	0.54	0.54	0.03	0.03	0.05		0.32	0.53		0.25	0.54	
Uniform Delay, d1	43.6	43.5	42.0	49.5	49.6		51.0	12.1		51.1	12.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.14	0.72	
Incremental Delay, d2	2.5	2.3	0.1	0.1	0.3		2.5	0.9		1.7	0.9	
Delay (s)	46.0	45.8	42.0	49.7	49.8		53.6	13.0		60.0	9.7	
Level of Service	D	D	D	D	D		D	B		E	A	
Approach Delay (s)		45.3			49.8			13.8			10.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

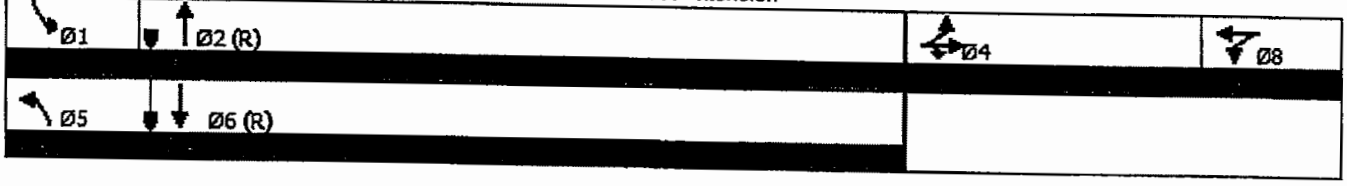
Timings
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	170	2	28	2	2	23	1113	17	973
Future Volume (vph)	170	2	28	2	2	23	1113	17	973
Turn Type	Split	NA	Prot	Split	NA	Prot	NA	Prot	NA
Protected Phases	4	4	4	8	8	5	2	1	6
Permitted Phases									
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	1.0	4.0	1.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	24.0	24.0	24.0	12.0	12.0	12.0	63.0	11.0	62.0
Total Split (%)	21.8%	21.8%	21.8%	10.9%	10.9%	10.9%	57.3%	10.0%	56.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	16.1	16.1	14.1	7.9	7.9	8.5	73.8	8.0	73.5
Actuated g/C Ratio	0.15	0.15	0.13	0.07	0.07	0.08	0.67	0.07	0.67
v/c Ratio	0.55	0.54	0.13	0.02	0.22	0.18	0.49	0.14	0.49
Control Delay	51.3	51.0	0.8	47.5	23.0	50.9	12.6	57.2	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Total Delay	51.3	51.0	0.8	47.5	23.0	50.9	12.7	57.2	9.5
LOS	D	D	A	D	C	D	B	E	A
Approach Delay		44.1			25.2		13.4		10.2
Approach LOS		D			C		B		B

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 15.7 — Intersection LOS: B
Intersection Capacity Utilization 49.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



Queues
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	134	131	43	3	31	24	1166	18	1162
v/c Ratio	0.55	0.54	0.13	0.02	0.22	0.18	0.49	0.14	0.49
Control Delay	51.3	51.0	0.8	47.5	23.0	50.9	12.6	57.2	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Total Delay	51.3	51.0	0.8	47.5	23.0	50.9	12.7	57.2	9.5
Queue Length 50th (ft)	93	91	0	2	2	16	187	12	150
Queue Length 95th (ft)	105	103	0	9	19	44	365	m32	160
Internal Link Dist (ft)		916			388		250		304
Turn Bay Length (ft)	225		225	150		200		150	
Base Capacity (vph)	310	308	387	134	147	132	2415	128	2373
Starvation Cap Reductn	0	0	0	0	0	0	0	0	309
Spillback Cap Reductn	0	0	0	0	2	0	261	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.43	0.11	0.02	0.21	0.18	0.54	0.14	0.56

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	12	24	69	12	277	20	995	8	237	855	82
Future Volume (vph)	149	12	24	69	12	277	20	995	8	237	855	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.86		1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1588	1583	1805	1627		1703	3570		1770	3521	
Flt Permitted	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1588	1583	1805	1627		1703	3570		1770	3521	
Peak-hour factor, PHF	0.65	0.65	0.65	0.68	0.68	0.68	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	229	18	37	101	18	407	21	1036	8	258	929	89
RTOR Reduction (vph)	0	0	34	0	236	0	0	1	0	0	5	0
Lane Group Flow (vph)	124	123	3	101	189	0	21	1043	0	258	1013	0
Heavy Vehicles (%)	2%	50%	2%	0%	0%	0%	6%	1%	0%	2%	1%	3%
Turn Type	Split	NA	Prot	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4	4	8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.0	11.0	11.0	16.9	16.9		2.0	47.7		20.4	66.1	
Effective Green, g (s)	13.0	13.0	11.0	18.9	18.9		4.0	49.7		22.4	68.1	
Actuated g/C Ratio	0.11	0.11	0.09	0.16	0.16		0.03	0.41		0.19	0.57	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	182	172	145	284	256		56	1478		330	1998	
v/s Ratio Prot	0.07	c0.08	0.00	0.06	c0.12		0.01	c0.29		c0.15	0.29	
v/s Ratio Perm												
v/c Ratio	0.68	0.72	0.02	0.36	0.74		0.38	0.71		0.78	0.51	
Uniform Delay, d1	51.5	51.7	49.6	45.1	48.2		56.8	29.1		46.5	15.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.11	0.76	
Incremental Delay, d2	10.0	13.2	0.1	0.8	10.6		4.2	2.9		10.5	0.8	
Delay (s)	61.5	64.9	49.7	45.9	58.8		61.0	32.0		62.3	12.8	
Level of Service	E	E	D	D	E		E	C		E	B	
Approach Delay (s)		61.5			56.3			32.5			22.8	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

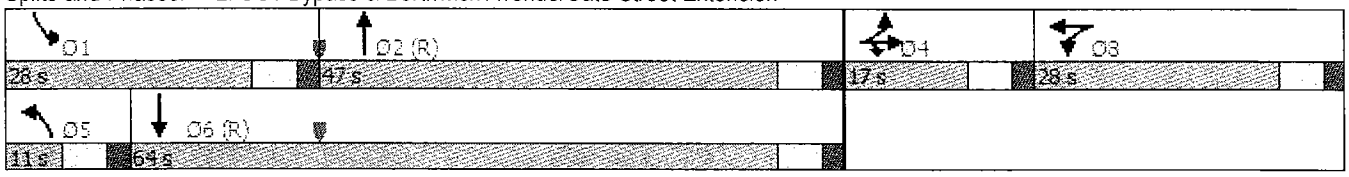
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	149	12	24	69	12	20	995	237	855
Future Volume (vph)	149	12	24	69	12	20	995	237	855
Turn Type	Split	NA	Prot	Split	NA	Prot	NA	Prot	NA
Protected Phases	4	4	4	8	8	5	2	1	6
Permitted Phases									
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	1.0	4.0	1.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	17.0	17.0	17.0	28.0	28.0	11.0	47.0	28.0	64.0
Total Split (%)	14.2%	14.2%	14.2%	23.3%	23.3%	9.2%	39.2%	23.3%	53.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	13.0	13.0	11.0	18.9	18.9	7.7	49.7	22.4	71.7
Actuated g/C Ratio	0.11	0.11	0.09	0.16	0.16	0.06	0.41	0.19	0.60
v/c Ratio	0.68	0.72	0.12	0.36	0.87	0.19	0.71	0.78	0.48
Control Delay	70.9	74.8	0.8	47.0	34.2	58.0	34.0	67.2	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2
Total Delay	70.9	74.8	0.8	47.0	34.2	58.0	34.0	67.3	12.6
LOS	E	E	A	D	C	E	C	E	B
Approach Delay		63.5			36.7		34.5		23.7
Approach LOS		E			D		C		C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 4 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 33.1 — Intersection LOS: C
Intersection Capacity Utilization 76.4% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	124	123	37	101	425	21	1044	258	1018
v/c Ratio	0.68	0.72	0.12	0.36	0.87	0.19	0.71	0.78	0.48
Control Delay	70.9	74.8	0.8	47.0	34.2	58.0	34.0	67.2	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2
Total Delay	70.9	74.8	0.8	47.0	34.2	58.0	34.0	67.3	12.6
Queue Length 50th (ft)	98	98	0	69	110	16	373	147	142
Queue Length 95th (ft)	117	117	0	88	98	43	470	#310	208
Internal Link Dist (ft)		916			388		250		304
Turn Bay Length (ft)	225		225	150		200		150	
Base Capacity (vph)	187	176	322	361	549	109	1480	356	2110
Starvation Cap Reductn	0	0	0	0	0	0	0	2	406
Spillback Cap Reductn	0	0	0	0	2	0	30	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.70	0.11	0.28	0.78	0.19	0.72	0.73	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	12	27	69	12	279	22	1101	9	239	947	91
Future Volume (vph)	165	12	27	69	12	279	22	1101	9	239	947	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.86		1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1597	1583	1805	1627		1703	3570		1770	3521	
Flt Permitted	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1597	1583	1805	1627		1703	3570		1770	3521	
Peak-hour factor, PHF	0.65	0.65	0.65	0.68	0.68	0.68	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	254	18	42	101	18	410	23	1147	9	260	1029	99
RTOR Reduction (vph)	0	0	38	0	201	0	0	1	0	0	6	0
Lane Group Flow (vph)	135	137	4	101	227	0	23	1155	0	260	1123	0
Heavy Vehicles (%)	2%	50%	2%	0%	0%	0%	6%	1%	0%	2%	1%	3%
Turn Type	Split	NA	Prot	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4	4	8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.8	11.8	11.8	18.2	18.2		3.0	46.7		19.3	63.0	
Effective Green, g (s)	13.8	13.8	11.8	20.2	20.2		5.0	48.7		21.3	65.0	
Actuated g/C Ratio	0.12	0.12	0.10	0.17	0.17		0.04	0.41		0.18	0.54	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	193	183	155	303	273		70	1448		314	1907	
v/s Ratio Prot	0.08	c0.09	0.00	0.06	c0.14		0.01	c0.32		c0.15	0.32	
v/s Ratio Perm												
v/c Ratio	0.70	0.75	0.03	0.33	0.83		0.33	0.80		0.83	0.59	
Uniform Delay, d1	51.1	51.4	48.9	44.0	48.2		55.9	31.3		47.6	18.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.11	0.82	
Incremental Delay, d2	10.6	15.4	0.1	0.7	18.9		2.7	4.7		14.6	1.2	
Delay (s)	61.7	66.8	49.0	44.6	67.1		58.6	36.0		67.7	16.3	
Level of Service	E	E	D	D	E		E	D		E	B	
Approach Delay (s)		62.2			62.8			36.4			26.0	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	38.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

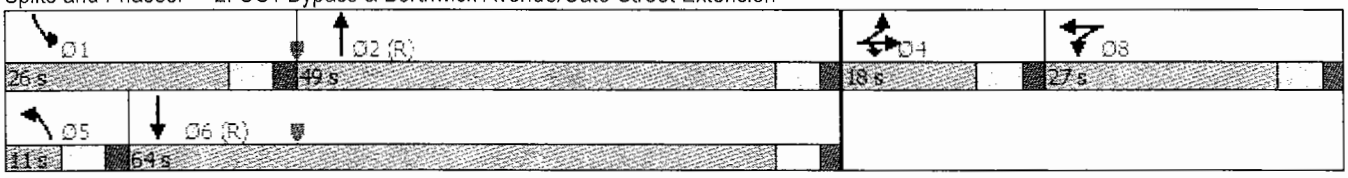
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	165	12	27	69	12	22	1101	239	947
Future Volume (vph)	165	12	27	69	12	22	1101	239	947
Turn Type	Split	NA	Prot	Split	NA	Prot	NA	Prot	NA
Protected Phases	4	4	4	8	8	5	2	1	6
Permitted Phases									
Detector Phase	4	4	4	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	1.0	4.0	1.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	18.0	18.0	18.0	27.0	27.0	11.0	49.0	26.0	64.0
Total Split (%)	15.0%	15.0%	15.0%	22.5%	22.5%	9.2%	40.8%	21.7%	53.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	13.8	13.8	11.8	20.2	20.2	7.3	48.7	21.3	67.4
Actuated g/C Ratio	0.12	0.12	0.10	0.17	0.17	0.06	0.41	0.18	0.56
v/c Ratio	0.70	0.75	0.13	0.33	0.90	0.22	0.80	0.83	0.57
Control Delay	70.8	76.2	0.8	46.0	43.7	59.4	37.4	73.0	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	70.8	76.2	0.8	46.0	43.7	59.4	37.4	73.0	16.5
LOS	E	E	A	D	D	E	D	E	B
Approach Delay		63.8			44.2		37.9		27.1
Approach LOS		E			D		D		C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 14 (12%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 36.8 — Intersection LOS: D
Intersection Capacity Utilization 80.1% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



Queues
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	135	137	42	101	428	23	1156	260	1128
v/c Ratio	0.70	0.75	0.13	0.33	0.90	0.22	0.80	0.83	0.57
Control Delay	70.8	76.2	0.8	46.0	43.7	59.4	37.4	73.0	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	70.8	76.2	0.8	46.0	43.7	59.4	37.4	73.0	16.5
Queue Length 50th (ft)	107	109	0	68	146	17	430	151	310
Queue Length 95th (ft)	125	127	0	89	136	45	525	#320	187
Internal Link Dist (ft)		916			388		250		304
Turn Bay Length (ft)	225		225	150		200		150	
Base Capacity (vph)	198	188	332	345	507	103	1450	325	1983
Starvation Cap Reductn	0	0	0	0	0	0	0	0	256
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.73	0.13	0.29	0.84	0.22	0.80	0.80	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Islington Street & CVS Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	11	293	10	18	12	282	268	3	9	290	285
Future Volume (vph)	271	11	293	10	18	12	282	268	3	9	290	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0		4.0	4.0			4.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85		0.96		1.00	1.00			1.00	0.85
Flt Protected		0.95	1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1796	1583		1803		1770	1860			1861	1599
Flt Permitted		0.70	1.00		0.90		0.95	1.00			0.99	1.00
Satd. Flow (perm)		1316	1583		1642		1770	1860			1837	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.83	0.83	0.83	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	288	12	312	12	22	14	328	312	3	10	337	331
RTOR Reduction (vph)	0	0	228	0	10	0	0	0	0	0	0	252
Lane Group Flow (vph)	0	300	84	0	38	0	328	315	0	0	347	79
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	2%	2%	0%	0%	2%	1%
Turn Type	custom	NA	custom	custom	NA		Prot	NA		custom	NA	custom
Protected Phases							5					
Permitted Phases	4	4	4	8	8			2		2 5 6	6	6
Actuated Green, G (s)		17.7	17.7		17.7		14.0	35.7			15.7	15.7
Effective Green, g (s)		19.7	17.7		19.7		16.0	37.7			17.7	15.7
Actuated g/C Ratio		0.30	0.27		0.30		0.24	0.58			0.27	0.24
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		396	428		494		433	1072			497	383
v/s Ratio Prot							c0.19					
v/s Ratio Perm		c0.23	0.05		0.02			0.17			c0.19	0.05
v/c Ratio		0.76	0.20		0.08		0.76	0.29			0.70	0.21
Uniform Delay, d1		20.7	18.4		16.3		22.9	7.1			21.4	19.9
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		8.1	0.2		0.1		7.4	0.2			4.3	0.3
Delay (s)		28.8	18.6		16.4		30.3	7.2			25.7	20.1
Level of Service		C	B		B		C	A			C	C
Approach Delay (s)		23.6			16.4			19.0			23.0	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	65.4	Sum of lost time (s)	19.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

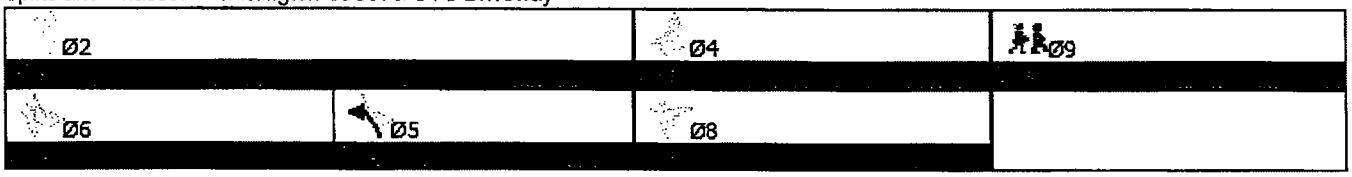
Timings
4: Islington Street & CVS Driveway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations											
Traffic Volume (vph)	271	11	293	10	18	282	268	9	290	285	
Future Volume (vph)	271	11	293	10	18	282	268	9	290	285	
Turn Type	custom	NA	custom	custom	NA	Prot	NA	custom	NA	custom	
Protected Phases						5					9
Permitted Phases	4	4	4	8	8		2	256	6	6	
Detector Phase	4	4	4	8	8	5	2	256	6	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	10.0		10.0	10.0	7.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0		16.0	16.0	24.0
Total Split (s)	24.0	24.0	24.0	24.0	24.0	20.0	42.0		22.0	22.0	24.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%	22.2%	46.7%		24.4%	24.4%	27%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	0.0		-2.0	-2.0	-2.0		-2.0	0.0	
Total Lost Time (s)		4.0	6.0		4.0	4.0	4.0		4.0	6.0	
Lead/Lag						Lag			Lead	Lead	
Lead-Lag Optimize?						Yes			Yes	Yes	
Recall Mode	None	None	None	None	None	None	Min		Min	Min	None
Act Effct Green (s)		19.7	17.7		19.7	16.0	37.8		17.7	15.7	
Actuated g/C Ratio		0.30	0.27		0.30	0.24	0.58		0.27	0.24	
v/c Ratio		0.76	0.48		0.10	0.76	0.29		0.70	0.52	
Control Delay		35.7	5.4		13.5	36.8	8.0		30.4	6.2	
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay		35.7	5.4		13.5	36.8	8.0		30.4	6.2	
LOS		D	A		B	D	A		C	A	
Approach Delay		20.3			13.5		22.7		18.6		
Approach LOS		C			B		C		B		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 65.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 20.3 — Intersection LOS: C
Intersection Capacity Utilization 63.6% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Islington Street & CVS Driveway



Queues
4: Islington Street & CVS Driveway

Lane Group	EBT	EBR	WBT	WBL	NBT	SBT	SBR
Lane Group Flow (vph)	300	312	48	328	315	347	331
v/c Ratio	0.76	0.48	0.10	0.76	0.29	0.70	0.52
Control Delay	35.7	5.4	13.5	36.8	8.0	30.4	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	5.4	13.5	36.8	8.0	30.4	6.2
Queue Length 50th (ft)	108	0	10	123	58	125	0
Queue Length 95th (ft)	#224	53	28	#221	92	196	48
Internal Link Dist (ft)	212		69		292	271	
Turn Bay Length (ft)		125		150			
Base Capacity (vph)	401	661	511	432	1080	505	641
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.47	0.09	0.76	0.29	0.69	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Islington Street & CVS Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	30	373	10	18	12	370	289	16	25	307	347
Future Volume (vph)	300	30	373	10	18	12	370	289	16	25	307	347
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0		4.0	4.0			4.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99			1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1801	1583		1803		1770	1850			1859	1599
Flt Permitted		0.71	1.00		0.77		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1338	1583		1412		1770	1850			1779	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.83	0.83	0.83	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	319	32	397	12	22	14	430	336	19	29	357	403
RTOR Reduction (vph)	0	0	253	0	11	0	0	1	0	0	0	281
Lane Group Flow (vph)	0	351	144	0	37	0	430	354	0	0	386	122
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	2%	2%	0%	0%	2%	1%
Turn Type	custom	NA	custom	custom	NA		Prot	NA		custom	NA	custom
Protected Phases							5					
Permitted Phases	4	4	4	8	8			2		2 5 6	6	6
Actuated Green, G (s)		14.0	14.0		14.0		14.0	40.0			20.0	20.0
Effective Green, g (s)		16.0	14.0		16.0		16.0	42.0			22.0	20.0
Actuated g/C Ratio		0.24	0.21		0.24		0.24	0.64			0.33	0.30
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		324	335		342		429	1177			593	484
v/s Ratio Prot							c0.24					
v/s Ratio Perm		c0.26	0.09		0.03			0.19			c0.22	0.08
v/c Ratio		1.08	0.43		0.11		1.00	0.30			0.65	0.25
Uniform Delay, d1		25.0	22.5		19.5		25.0	5.4			18.7	17.4
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		74.1	0.9		0.1		44.0	0.1			2.6	0.3
Delay (s)		99.1	23.4		19.6		69.0	5.5			21.3	17.6
Level of Service		F	C		B		E	A			C	B
Approach Delay (s)		58.9			19.6			40.3			19.4	
Approach LOS		E			B			D			B	

Intersection Summary			
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

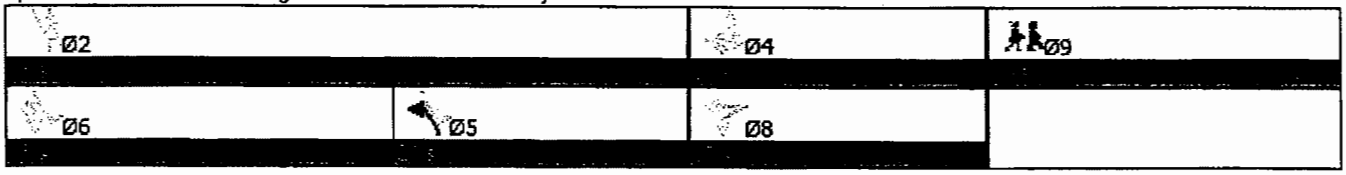
Timings
4: Islington Street & CVS Driveway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations											
Traffic Volume (vph)	300	30	373	10	18	370	289	25	307	347	
Future Volume (vph)	300	30	373	10	18	370	289	25	307	347	
Turn Type	custom	NA	custom	custom	NA	Prot	NA	custom	NA	custom	
Protected Phases						5					9
Permitted Phases	4	4	4	8	8		2	2 5 6	6	6	
Detector Phase	4	4	4	8	8	5	2	2 5 6	6	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	10.0		10.0	10.0	7.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0		16.0	16.0	24.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	46.0		26.0	26.0	24.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	51.1%		28.9%	28.9%	27%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	0.0		-2.0	-2.0	-2.0		-2.0	0.0	
Total Lost Time (s)		4.0	6.0		4.0	4.0	4.0		4.0	6.0	
Lead/Lag						Lag			Lead	Lead	
Lead-Lag Optimize?						Yes			Yes	Yes	
Recall Mode	None	None	None	None	None	None	Min		Min	Min	None
Act Effct Green (s)		16.0	14.0		16.0	16.0	42.0		22.0	20.0	
Actuated g/C Ratio		0.24	0.21		0.24	0.24	0.64		0.33	0.30	
v/c Ratio		1.08	0.68		0.14	1.00	0.30		0.65	0.53	
Control Delay		102.5	12.2		16.4	72.8	6.2		24.9	5.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay		102.5	12.2		16.4	72.8	6.2		24.9	5.1	
LOS		F	B		B	E	A		C	A	
Approach Delay		54.6			16.4		42.7		14.8		
Approach LOS		D			B		D		B		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 66
Natural Cycle: 130
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 36.6 — Intersection LOS: D
Intersection Capacity Utilization 72.9% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: Islington Street & CVS Driveway



Queues
4: Islington Street & CVS Driveway

Lane Group	EBT	EBR	WBT	WBL	NBT	SBT	SBR
Lane Group Flow (vph)	351	397	48	430	355	386	403
v/c Ratio	1.08	0.68	0.14	1.00	0.30	0.65	0.53
Control Delay	102.5	12.2	16.4	72.8	6.2	24.9	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.5	12.2	16.4	72.8	6.2	24.9	5.1
Queue Length 50th (ft)	~163	26	11	~174	54	130	0
Queue Length 95th (ft)	#309	107	32	#321	85	204	47
Internal Link Dist (ft)	212		69		292	271	
Turn Bay Length (ft)		125		150			
Base Capacity (vph)	324	588	353	429	1179	593	765
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.68	0.14	1.00	0.30	0.65	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Islington Street & CVS Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	331	30	407	10	18	12	402	320	16	25	340	380
Future Volume (vph)	331	30	407	10	18	12	402	320	16	25	340	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0		4.0	4.0			4.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99			1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1800	1583		1803		1770	1851			1859	1599
Flt Permitted		0.71	1.00		0.70		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1335	1583		1272		1770	1851			1780	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.83	0.83	0.83	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	352	32	433	12	22	14	467	372	19	29	395	442
RTOR Reduction (vph)	0	0	252	0	11	0	0	1	0	0	0	308
Lane Group Flow (vph)	0	384	181	0	37	0	467	390	0	0	424	134
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	2%	2%	0%	0%	2%	1%
Turn Type	custom	NA	custom	custom	NA		Prot	NA		custom	NA	custom
Protected Phases							5					
Permitted Phases	4	4	4	8	8			2		2 5 6	6	6
Actuated Green, G (s)		14.0	14.0		14.0		14.0	40.0			20.0	20.0
Effective Green, g (s)		16.0	14.0		16.0		16.0	42.0			22.0	20.0
Actuated g/C Ratio		0.24	0.21		0.24		0.24	0.64			0.33	0.30
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		323	335		308		429	1177			593	484
v/s Ratio Prot							c0.26					
v/s Ratio Perm		c0.29	0.11		0.03			0.21			c0.24	0.08
v/c Ratio		1.19	0.54		0.12		1.09	0.33			0.72	0.28
Uniform Delay, d1		25.0	23.1		19.5		25.0	5.5			19.3	17.5
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		111.7	1.7		0.2		69.5	0.2			4.1	0.3
Delay (s)		136.7	24.8		19.7		94.5	5.7			23.3	17.8
Level of Service		F	C		B		F	A			C	B
Approach Delay (s)		77.4			19.7			54.0			20.5	
Approach LOS		E			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	49.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

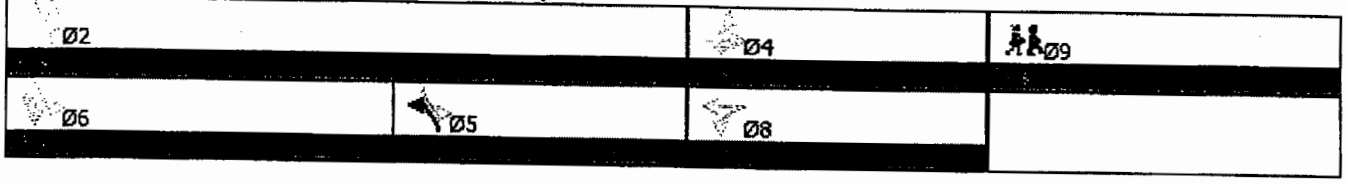
Timings
4: Islington Street & CVS Driveway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations											
Traffic Volume (vph)	331	30	407	10	18	402	320	25	340	380	
Future Volume (vph)	331	30	407	10	18	402	320	25	340	380	
Turn Type	custom	NA	custom	custom	NA	Prot	NA	custom	NA	custom	
Protected Phases						5					9
Permitted Phases	4	4	4	8	8		2	2 5 6	6	6	
Detector Phase	4	4	4	8	8	5	2	2 5 6	6	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	10.0		10.0	10.0	7.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0		16.0	16.0	24.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	46.0		26.0	26.0	24.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	51.1%		28.9%	28.9%	27%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	0.0		-2.0	-2.0	-2.0		-2.0	0.0	
Total Lost Time (s)		4.0	6.0		4.0	4.0	4.0		4.0	6.0	
Lead/Lag						Lag			Lead	Lead	
Lead-Lag Optimize?						Yes			Yes	Yes	
Recall Mode	None	None	None	None	None	None	Min		Min	Min	None
Act Effct Green (s)		16.0	14.0		16.0	16.0	42.0		22.0	20.0	
Actuated g/C Ratio		0.24	0.21		0.24	0.24	0.64		0.33	0.30	
v/c Ratio		1.19	0.74		0.15	1.09	0.33		0.72	0.56	
Control Delay		139.2	16.1		16.8	97.5	6.4		27.6	5.2	
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay		139.2	16.1		16.8	97.5	6.4		27.6	5.2	
LOS		F	B		B	F	A		C	A	
Approach Delay		74.0			16.8		56.0		16.2		
Approach LOS		E			B		E		B		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 66
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.19
Intersection Signal Delay: 47.6 — Intersection LOS: D
Intersection Capacity Utilization 78.1% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 4: Islington Street & CVS Driveway



Queues
4: Islington Street & CVS Driveway

Lane Group	EBT	EBR	WBT	WBL	NBT	SBT	SBR
Lane Group Flow (vph)	384	433	48	467	391	424	442
v/c Ratio	1.19	0.74	0.15	1.09	0.33	0.72	0.56
Control Delay	139.2	16.1	16.8	97.5	6.4	27.6	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.2	16.1	16.8	97.5	6.4	27.6	5.2
Queue Length 50th (ft)	~192	39	11	~218	61	147	0
Queue Length 95th (ft)	#343	#164	32	#356	95	227	48
Internal Link Dist (ft)	212		69		292	271	
Turn Bay Length (ft)		125		150			
Base Capacity (vph)	323	587	319	429	1179	593	792
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.19	0.74	0.15	1.09	0.33	0.72	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	307	30	375	10	18	12	373	289	16	25	307	357
Future Volume (vph)	307	30	375	10	18	12	373	289	16	25	307	357
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0		4.0	4.0			4.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99			1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1801	1583		1803		1770	1850			1859	1599
Flt Permitted		0.71	1.00		0.76		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1337	1583		1379		1770	1850			1777	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.83	0.83	0.83	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	327	32	399	12	22	14	434	336	19	29	357	415
RTOR Reduction (vph)	0	0	249	0	11	0	0	1	0	0	0	296
Lane Group Flow (vph)	0	359	150	0	37	0	434	354	0	0	386	119
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	2%	2%	0%	0%	2%	1%
Turn Type	custom	NA	custom	custom	NA		Prot	NA		custom	NA	custom
Protected Phases							5					
Permitted Phases	4	4	4	8	8			2		2 5 6	6	6
Actuated Green, G (s)		14.0	14.0		14.0		15.0	40.0			19.0	19.0
Effective Green, g (s)		16.0	14.0		16.0		17.0	42.0			21.0	19.0
Actuated g/C Ratio		0.24	0.21		0.24		0.26	0.64			0.32	0.29
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		324	335		334		455	1177			565	460
v/s Ratio Prot							c0.25					
v/s Ratio Perm		c0.27	0.09		0.03			0.19			c0.22	0.07
v/c Ratio		1.11	0.45		0.11		0.95	0.30			0.68	0.26
Uniform Delay, d1		25.0	22.6		19.5		24.1	5.4			19.6	18.1
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		82.3	1.0		0.1		30.5	0.1			3.4	0.3
Delay (s)		107.3	23.6		19.6		54.6	5.5			23.0	18.4
Level of Service		F	C		B		D	A			C	B
Approach Delay (s)		63.2			19.6			32.5			20.6	
Approach LOS		E			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

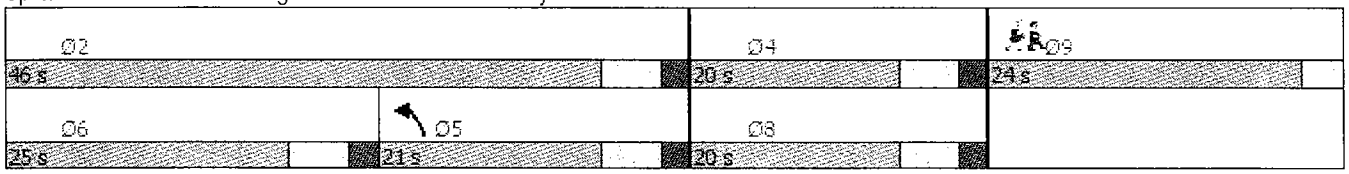
Timings
4: Islington Street & CVS Driveway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations											
Traffic Volume (vph)	307	30	375	10	18	373	289	25	307	357	
Future Volume (vph)	307	30	375	10	18	373	289	25	307	357	
Turn Type	custom	NA	custom	custom	NA	Prot	NA	custom	NA	custom	
Protected Phases						5					9
Permitted Phases	4	4	4	8	8		2	2 5 6	6	6	
Detector Phase	4	4	4	8	8	5	2	2 5 6	6	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	10.0		10.0	10.0	7.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0		16.0	16.0	24.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	21.0	46.0		25.0	25.0	24.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	22.2%	23.3%	51.1%		27.8%	27.8%	27%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	0.0		-2.0	-2.0	-2.0		-2.0	0.0	
Total Lost Time (s)		4.0	6.0		4.0	4.0	4.0		4.0	6.0	
Lead/Lag						Lag			Lead	Lead	
Lead-Lag Optimize?						Yes			Yes	Yes	
Recall Mode	None	None	None	None	None	None	Min		Min	Min	None
Act Effct Green (s)		16.0	14.0		16.0	17.0	42.0		21.0	19.0	
Actuated g/C Ratio		0.24	0.21		0.24	0.26	0.64		0.32	0.29	
v/c Ratio		1.11	0.68		0.14	0.95	0.30		0.68	0.55	
Control Delay		110.7	12.8		16.5	59.7	6.2		27.0	5.4	
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay		110.7	12.8		16.5	59.7	6.2		27.0	5.4	
LOS		F	B		B	E	A		C	A	
Approach Delay		59.2			16.5		35.6		15.8		
Approach LOS		E			B		D		B		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 66
Natural Cycle: 130
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 36.1 — Intersection LOS: D
Intersection Capacity Utilization 73.5% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 4: Islington Street & CVS Driveway



Queues
4: Islington Street & CVS Driveway

Lane Group	EBT	EBR	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	359	399	48	434	355	386	415
v/c Ratio	1.11	0.68	0.14	0.95	0.30	0.68	0.55
Control Delay	110.7	12.8	16.5	59.7	6.2	27.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.7	12.8	16.5	59.7	6.2	27.0	5.4
Queue Length 50th (ft)	~170	28	11	172	54	133	0
Queue Length 95th (ft)	#317	111	32	#313	85	209	49
Internal Link Dist (ft)	212		69		292	271	
Turn Bay Length (ft)		125		150			
Base Capacity (vph)	324	584	344	455	1178	565	755
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.68	0.14	0.95	0.30	0.68	0.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Islington Street & CVS Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	338	30	409	10	18	12	405	320	16	25	340	390
Future Volume (vph)	338	30	409	10	18	12	405	320	16	25	340	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0		4.0	4.0			4.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99			1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1800	1583		1803		1770	1851			1859	1599
Flt Permitted		0.71	1.00		0.68		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1334	1583		1237		1770	1851			1780	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.83	0.83	0.83	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	360	32	435	12	22	14	471	372	19	29	395	453
RTOR Reduction (vph)	0	0	248	0	11	0	0	1	0	0	0	316
Lane Group Flow (vph)	0	392	187	0	37	0	471	390	0	0	424	137
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	2%	2%	0%	0%	2%	1%
Turn Type	custom	NA	custom	custom	NA		Prot	NA		custom	NA	custom
Protected Phases							5					
Permitted Phases	4	4	4	8	8			2		2 5 6	6	6
Actuated Green, G (s)		14.0	14.0		14.0		14.0	40.0			20.0	20.0
Effective Green, g (s)		16.0	14.0		16.0		16.0	42.0			22.0	20.0
Actuated g/C Ratio		0.24	0.21		0.24		0.24	0.64			0.33	0.30
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		323	335		299		429	1177			593	484
v/s Ratio Prot							c0.27					
v/s Ratio Perm		c0.29	0.12		0.03			0.21			c0.24	0.09
v/c Ratio		1.21	0.56		0.13		1.10	0.33			0.72	0.28
Uniform Delay, d1		25.0	23.2		19.5		25.0	5.5			19.3	17.5
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		121.2	2.0		0.2		72.6	0.2			4.1	0.3
Delay (s)		146.2	25.2		19.7		97.6	5.7			23.3	17.9
Level of Service		F	C		B		F	A			C	B
Approach Delay (s)		82.6			19.7			55.9			20.5	
Approach LOS		F			B			E			C	

Intersection Summary

HCM 2000 Control Delay	51.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

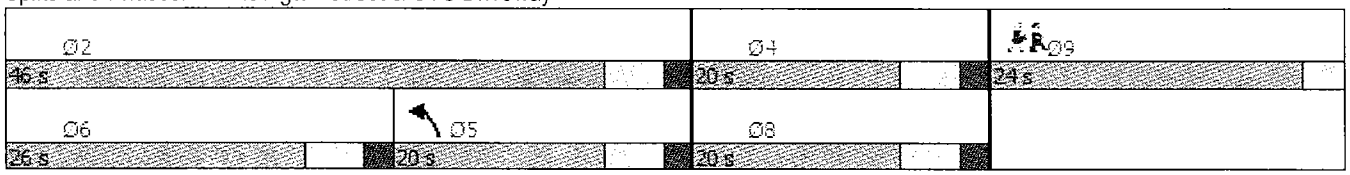
Timings
4: Islington Street & CVS Driveway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations											
Traffic Volume (vph)	338	30	409	10	18	405	320	25	340	390	
Future Volume (vph)	338	30	409	10	18	405	320	25	340	390	
Turn Type	custom	NA	custom	custom	NA	Prot	NA	custom	NA	custom	
Protected Phases						5					9
Permitted Phases	4	4	4	8	8		2	2 5 6	6	6	
Detector Phase	4	4	4	8	8	5	2	2 5 6	6	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	10.0		10.0	10.0	7.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0		16.0	16.0	24.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	46.0		26.0	26.0	24.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	51.1%		28.9%	28.9%	27%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	0.0		-2.0	-2.0	-2.0		-2.0	0.0	
Total Lost Time (s)		4.0	6.0		4.0	4.0	4.0		4.0	6.0	
Lead/Lag						Lag			Lead	Lead	
Lead-Lag Optimize?						Yes			Yes	Yes	
Recall Mode	None	None	None	None	None	None	Min		Min	Min	None
Act Effct Green (s)		16.0	14.0		16.0	16.0	42.0		22.0	20.0	
Actuated g/C Ratio		0.24	0.21		0.24	0.24	0.64		0.33	0.30	
v/c Ratio		1.21	0.75		0.15	1.10	0.33		0.72	0.57	
Control Delay		148.5	16.9		16.9	100.6	6.4		27.6	5.3	
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay		148.5	16.9		16.9	100.6	6.4		27.6	5.3	
LOS		F	B		B	F	A		C	A	
Approach Delay		79.3			16.9		57.9		16.0		
Approach LOS		E			B		E		B		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 66
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.21
Intersection Signal Delay: 49.9 — Intersection LOS: D
Intersection Capacity Utilization 78.7% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 4: Islington Street & CVS Driveway



Queues
4: Islington Street & CVS Driveway

Lane Group	EBT	EBR	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	392	435	48	471	391	424	453
v/c Ratio	1.21	0.75	0.15	1.10	0.33	0.72	0.57
Control Delay	148.5	16.9	16.9	100.6	6.4	27.6	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	148.5	16.9	16.9	100.6	6.4	27.6	5.3
Queue Length 50th (ft)	~198	42	11	~221	61	147	0
Queue Length 95th (ft)	#352	#169	32	#360	95	227	49
Internal Link Dist (ft)	212		69		292	271	
Turn Bay Length (ft)		125		150			
Base Capacity (vph)	323	583	310	429	1179	593	800
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.21	0.75	0.15	1.10	0.33	0.72	0.57

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Islington Street & CVS Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	238	12	232	5	7	9	186	249	4	11	253	247
Future Volume (vph)	238	12	232	5	7	9	186	249	4	11	253	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0		4.0	4.0			4.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85		0.94		1.00	1.00			1.00	0.85
Flt Protected		0.95	1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1814	1599		1768		1805	1871			1896	1599
Flt Permitted		0.72	1.00		0.91		0.95	1.00			0.98	1.00
Satd. Flow (perm)		1360	1599		1632		1805	1871			1860	1599
Peak-hour factor, PHF	0.91	0.91	0.91	0.75	0.75	0.75	0.93	0.93	0.93	0.86	0.86	0.86
Adj. Flow (vph)	262	13	255	7	9	12	200	268	4	13	294	287
RTOR Reduction (vph)	0	0	182	0	8	0	0	0	0	0	0	217
Lane Group Flow (vph)	0	275	73	0	20	0	200	272	0	0	307	70
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	1%	25%	0%	0%	1%
Turn Type	custom	NA	custom	custom	NA		Prot	NA		custom	NA	custom
Protected Phases							5					
Permitted Phases	4	4	4	8	8			2		2 5 6	6	6
Actuated Green, G (s)		15.4	15.4		15.4		7.1	26.1			13.0	13.0
Effective Green, g (s)		17.4	15.4		17.4		9.1	28.1			15.0	13.0
Actuated g/C Ratio		0.33	0.29		0.33		0.17	0.53			0.28	0.24
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		442	460		530		307	982			521	388
v/s Ratio Prot							c0.11					
v/s Ratio Perm		c0.20	0.05		0.01			0.15			c0.17	0.04
v/c Ratio		0.62	0.16		0.04		0.65	0.28			0.59	0.18
Uniform Delay, d1		15.3	14.2		12.3		20.7	7.1			16.6	16.0
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		2.7	0.2		0.0		4.9	0.2			1.7	0.2
Delay (s)		18.0	14.4		12.4		25.6	7.2			18.3	16.3
Level of Service		B	B		B		C	A			B	B
Approach Delay (s)		16.3			12.4			15.0			17.3	
Approach LOS		B			B			B			B	

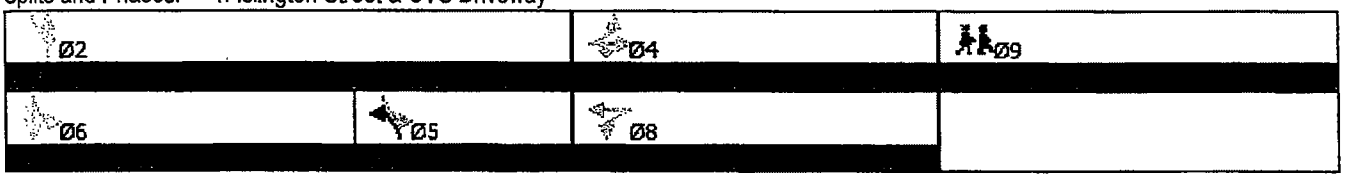
Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	19.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations											
Traffic Volume (vph)	238	12	232	5	7	186	249	11	253	247	
Future Volume (vph)	238	12	232	5	7	186	249	11	253	247	
Turn Type	custom	NA	custom	custom	NA	Prot	NA	custom	NA	custom	
Protected Phases						5					9
Permitted Phases	4	4	4	8	8		2	2 5 6	6	6	
Detector Phase	4	4	4	8	8	5	2	2 5 6	6	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	10.0		10.0	10.0	7.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0		16.0	16.0	24.0
Total Split (s)	22.0	22.0	22.0	22.0	22.0	13.0	34.0		21.0	21.0	24.0
Total Split (%)	27.5%	27.5%	27.5%	27.5%	27.5%	16.3%	42.5%		26.3%	26.3%	30%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	0.0		-2.0	-2.0	-2.0		-2.0	0.0	
Total Lost Time (s)		4.0	6.0		4.0	4.0	4.0		4.0	6.0	
Lead/Lag						Lag			Lead	Lead	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Min		Min	Min	None
Act Effct Green (s)		17.4	15.4		17.4	9.0	28.1		15.0	13.0	
Actuated g/C Ratio		0.33	0.29		0.33	0.17	0.53		0.28	0.24	
v/c Ratio		0.62	0.40		0.05	0.66	0.28		0.59	0.47	
Control Delay		23.2	4.7		10.1	34.7	8.1		21.9	5.6	
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay		23.2	4.7		10.1	34.7	8.1		21.9	5.6	
LOS		C	A		B	C	A		C	A	
Approach Delay		14.3			10.1		19.4		14.0		
Approach LOS		B			B		B		B		

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 53.5
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 15.6 — Intersection LOS: B
Intersection Capacity Utilization 57.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Islington Street & CVS Driveway



Queues
4: Islington Street & CVS Driveway

Lane Group	EBT	EBR	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	275	255	28	200	272	307	287
v/c Ratio	0.62	0.40	0.05	0.66	0.28	0.59	0.47
Control Delay	23.2	4.7	10.1	34.7	8.1	21.9	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	4.7	10.1	34.7	8.1	21.9	5.6
Queue Length 50th (ft)	74	0	4	62	44	84	0
Queue Length 95th (ft)	#151	43	14	#147	80	141	41
Internal Link Dist (ft)	212		69		292	271	
Turn Bay Length (ft)		125		150			
Base Capacity (vph)	459	658	558	304	1052	593	656
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.39	0.05	0.66	0.26	0.52	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Islington Street & CVS Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	25	295	5	7	9	244	272	13	22	272	298
Future Volume (vph)	270	25	295	5	7	9	244	272	13	22	272	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0		4.0	4.0			4.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85		0.94		1.00	0.99			1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1817	1599		1768		1805	1848			1893	1599
Flt Permitted		0.72	1.00		0.91		0.95	1.00			0.96	1.00
Satd. Flow (perm)		1375	1599		1630		1805	1848			1818	1599
Peak-hour factor, PHF	0.91	0.91	0.91	0.75	0.75	0.75	0.93	0.93	0.93	0.86	0.86	0.86
Adj. Flow (vph)	297	27	324	7	9	12	262	292	14	26	316	347
RTOR Reduction (vph)	0	0	216	0	8	0	0	1	0	0	0	255
Lane Group Flow (vph)	0	324	108	0	20	0	262	305	0	0	342	92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	1%	25%	0%	0%	1%
Turn Type	custom	NA	custom	custom	NA		Prot	NA		custom	NA	custom
Protected Phases							5					
Permitted Phases	4	4	4	8	8			2		2 5 6	6	6
Actuated Green, G (s)		19.0	19.0		19.0		11.0	34.3			17.3	17.3
Effective Green, g (s)		21.0	19.0		21.0		13.0	36.3			19.3	17.3
Actuated g/C Ratio		0.32	0.29		0.32		0.20	0.56			0.30	0.26
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		442	465		524		359	1027			537	423
v/s Ratio Prot							c0.15					
v/s Ratio Perm		c0.24	0.07		0.01			0.16			c0.19	0.06
v/c Ratio		0.73	0.23		0.04		0.73	0.30			0.64	0.22
Uniform Delay, d1		19.7	17.6		15.2		24.5	7.7			20.0	18.7
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		6.2	0.3		0.0		7.3	0.2			2.5	0.3
Delay (s)		25.9	17.9		15.2		31.8	7.9			22.4	19.0
Level of Service		C	B		B		C	A			C	B
Approach Delay (s)		21.9			15.2			18.9			20.7	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	65.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

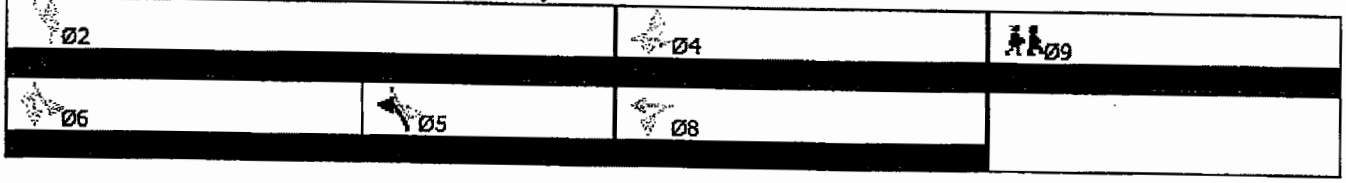
Timings
4: Islington Street & CVS Driveway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations											
Traffic Volume (vph)	270	25	295	5	7	244	272	22	272	298	
Future Volume (vph)	270	25	295	5	7	244	272	22	272	298	
Turn Type	custom	NA	custom	custom	NA	Prot	NA	custom	NA	custom	
Protected Phases						5					9
Permitted Phases	4	4	4	8	8		2	2 5 6	6	6	
Detector Phase	4	4	4	8	8	5	2	2 5 6	6	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	10.0		10.0	10.0	7.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0		16.0	16.0	24.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	17.0	41.0		24.0	24.0	24.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	27.8%	18.9%	45.6%		26.7%	26.7%	27%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	0.0		-2.0	-2.0	-2.0		-2.0	0.0	
Total Lost Time (s)		4.0	6.0		4.0	4.0	4.0		4.0	6.0	
Lead/Lag						Lag			Lead	Lead	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Min		Min	Min	None
Act Effct Green (s)		21.0	19.0		21.0	13.0	36.3		19.3	17.3	
Actuated g/C Ratio		0.32	0.29		0.32	0.20	0.56		0.30	0.26	
v/c Ratio		0.73	0.48		0.05	0.73	0.30		0.64	0.51	
Control Delay		32.1	5.9		11.8	39.0	8.6		26.3	5.6	
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay		32.1	5.9		11.8	39.0	8.6		26.3	5.6	
LOS		C	A		B	D	A		C	A	
Approach Delay		19.0			11.8		22.6		15.9		
Approach LOS		B			B		C		B		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 65.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 18.8 — Intersection LOS: B
Intersection Capacity Utilization 63.6% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Islington Street & CVS Driveway



Queues
4: Islington Street & CVS Driveway

Lane Group	EBT	EBR	WBT	WBL	NBT	SBT	SBR
Lane Group Flow (vph)	324	324	28	262	306	342	347
v/c Ratio	0.73	0.48	0.05	0.73	0.30	0.64	0.51
Control Delay	32.1	5.9	11.8	39.0	8.6	26.3	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.1	5.9	11.8	39.0	8.6	26.3	5.6
Queue Length 50th (ft)	115	6	4	100	58	117	0
Queue Length 95th (ft)	#233	60	16	#203	99	185	47
Internal Link Dist (ft)	212		69		292	271	
Turn Bay Length (ft)		125		150			
Base Capacity (vph)	442	680	533	359	1049	556	692
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.48	0.05	0.73	0.29	0.62	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Islington Street & CVS Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	298	25	322	5	7	9	266	301	13	22	301	327
Future Volume (vph)	298	25	322	5	7	9	266	301	13	22	301	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0		4.0	4.0			4.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85		0.94		1.00	0.99			1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1816	1599		1768		1805	1851			1893	1599
Flt Permitted		0.72	1.00		0.91		0.95	1.00			0.96	1.00
Satd. Flow (perm)		1372	1599		1621		1805	1851			1820	1599
Peak-hour factor, PHF	0.91	0.91	0.91	0.75	0.75	0.75	0.93	0.93	0.93	0.86	0.86	0.86
Adj. Flow (vph)	327	27	354	7	9	12	286	324	14	26	350	380
RTOR Reduction (vph)	0	0	216	0	8	0	0	1	0	0	0	276
Lane Group Flow (vph)	0	354	138	0	20	0	286	337	0	0	376	104
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	1%	25%	0%	0%	1%
Turn Type	custom	NA	custom	custom	NA		Prot	NA		custom	NA	custom
Protected Phases							5					
Permitted Phases	4	4	4	8	8			2		2 5 6	6	6
Actuated Green, G (s)		19.0	19.0		19.0		11.0	35.0			18.0	18.0
Effective Green, g (s)		21.0	19.0		21.0		13.0	37.0			20.0	18.0
Actuated g/C Ratio		0.32	0.29		0.32		0.20	0.56			0.30	0.27
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		436	460		515		355	1037			551	436
v/s Ratio Prot							c0.16					
v/s Ratio Perm		c0.26	0.09		0.01			0.18			c0.21	0.06
v/c Ratio		0.81	0.30		0.04		0.81	0.32			0.68	0.24
Uniform Delay, d1		20.7	18.3		15.5		25.3	7.8			20.2	18.7
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		11.0	0.4		0.0		12.5	0.2			3.5	0.3
Delay (s)		31.7	18.7		15.6		37.8	8.0			23.7	18.9
Level of Service		C	B		B		D	A			C	B
Approach Delay (s)		25.2			15.6			21.6			21.3	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

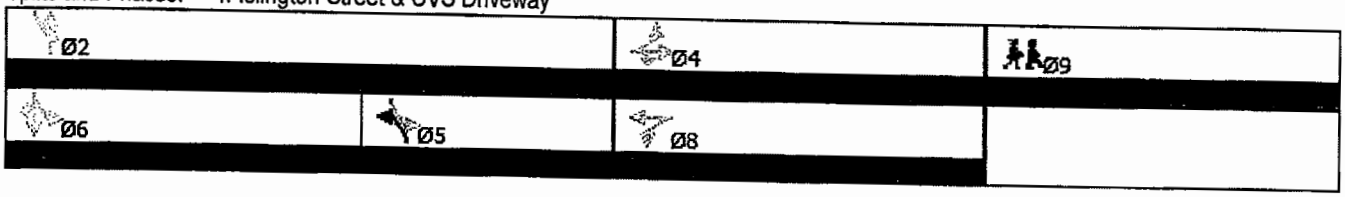
Timings
4: Islington Street & CVS Driveway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations											
Traffic Volume (vph)	298	25	322	5	7	266	301	22	301	327	
Future Volume (vph)	298	25	322	5	7	266	301	22	301	327	
Turn Type	custom	NA	custom	custom	NA	Prot	NA	custom	NA	custom	
Protected Phases						5					9
Permitted Phases	4	4	4	8	8		2	2 5 6	6	6	
Detector Phase	4	4	4	8	8	5	2	2 5 6	6	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	10.0		10.0	10.0	7.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0		16.0	16.0	24.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	17.0	41.0		24.0	24.0	24.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	27.8%	18.9%	45.6%		26.7%	26.7%	27%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	0.0		-2.0	-2.0	-2.0		-2.0	0.0	
Total Lost Time (s)		4.0	6.0		4.0	4.0	4.0		4.0	6.0	
Lead/Lag						Lag			Lead	Lead	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Min		Min	Min	None
Act Effct Green (s)		21.0	19.0		21.0	13.0	37.0		20.0	18.0	
Actuated g/C Ratio		0.32	0.29		0.32	0.20	0.56		0.30	0.27	
v/c Ratio		0.81	0.52		0.05	0.81	0.33		0.68	0.53	
Control Delay		38.2	7.3		11.8	45.2	8.8		27.8	5.6	
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay		38.2	7.3		11.8	45.2	8.8		27.8	5.6	
LOS		D	A		B	D	A		C	A	
Approach Delay		22.7			11.8		25.5		16.6		
Approach LOS		C			B		C		B		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 66
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 21.2 — Intersection LOS: C
Intersection Capacity Utilization 68.2% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: Islington Street & CVS Driveway



Queues
4: Islington Street & CVS Driveway

Lane Group	EBT	EBR	WBT	WBL	NBT	SBT	SBR
Lane Group Flow (vph)	354	354	28	286	338	376	380
v/c Ratio	0.81	0.52	0.05	0.81	0.33	0.68	0.53
Control Delay	38.2	7.3	11.8	45.2	8.8	27.8	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	7.3	11.8	45.2	8.8	27.8	5.6
Queue Length 50th (ft)	129	15	4	111	66	132	0
Queue Length 95th (ft)	#264	75	16	#228	110	205	49
Internal Link Dist (ft)	212		69		292	271	
Turn Bay Length (ft)		125		150			
Base Capacity (vph)	436	676	524	355	1039	551	712
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.52	0.05	0.81	0.33	0.68	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Islington Street & CVS Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	25	297	5	7	9	246	272	13	22	272	308
Future Volume (vph)	279	25	297	5	7	9	246	272	13	22	272	308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0		4.0	4.0			4.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85		0.94		1.00	0.99			1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1817	1599		1768		1805	1848			1893	1599
Flt Permitted		0.72	1.00		0.91		0.95	1.00			0.96	1.00
Satd. Flow (perm)		1373	1599		1631		1805	1848			1817	1599
Peak-hour factor, PHF	0.91	0.91	0.91	0.75	0.75	0.75	0.93	0.93	0.93	0.86	0.86	0.86
Adj. Flow (vph)	307	27	326	7	9	12	265	292	14	26	316	358
RTOR Reduction (vph)	0	0	210	0	8	0	0	1	0	0	0	266
Lane Group Flow (vph)	0	334	116	0	20	0	265	305	0	0	342	92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	1%	25%	0%	0%	1%
Turn Type	custom	NA	custom	custom	NA		Prot	NA		custom	NA	custom
Protected Phases							5					
Permitted Phases	4	4	4	8	8			2		2 5 6	6	6
Actuated Green, G (s)		20.0	20.0		20.0		11.0	34.0			17.0	17.0
Effective Green, g (s)		22.0	20.0		22.0		13.0	36.0			19.0	17.0
Actuated g/C Ratio		0.33	0.30		0.33		0.20	0.55			0.29	0.26
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		457	484		543		355	1008			523	411
v/s Ratio Prot							c0.15					
v/s Ratio Perm		c0.24	0.07		0.01			0.16			c0.19	0.06
v/c Ratio		0.73	0.24		0.04		0.75	0.30			0.65	0.22
Uniform Delay, d1		19.4	17.3		14.8		24.9	8.2			20.6	19.3
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		5.9	0.3		0.0		8.3	0.2			2.9	0.3
Delay (s)		25.3	17.5		14.9		33.2	8.3			23.6	19.6
Level of Service		C	B		B		C	A			C	B
Approach Delay (s)		21.5			14.9			19.9			21.5	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

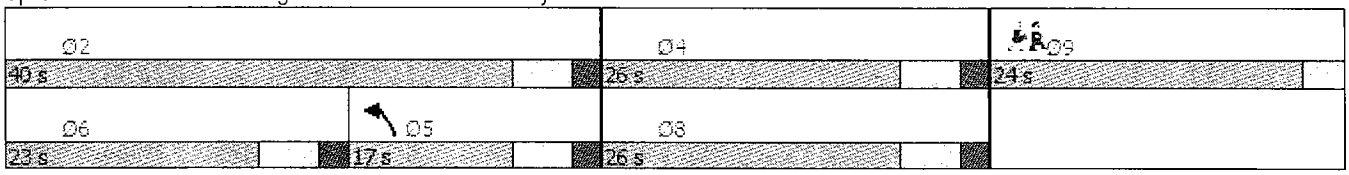
Timings
4: Islington Street & CVS Driveway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations											
Traffic Volume (vph)	279	25	297	5	7	246	272	22	272	308	
Future Volume (vph)	279	25	297	5	7	246	272	22	272	308	
Turn Type	custom	NA	custom	custom	NA	Prot	NA	custom	NA	custom	
Protected Phases						5					9
Permitted Phases	4	4	4	8	8		2	2 5 6	6	6	
Detector Phase	4	4	4	8	8	5	2	2 5 6	6	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	10.0		10.0	10.0	7.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0		16.0	16.0	24.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	17.0	40.0		23.0	23.0	24.0
Total Split (%)	28.9%	28.9%	28.9%	28.9%	28.9%	18.9%	44.4%		25.6%	25.6%	27%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	0.0		-2.0	-2.0	-2.0		-2.0	0.0	
Total Lost Time (s)		4.0	6.0		4.0	4.0	4.0		4.0	6.0	
Lead/Lag						Lag			Lead	Lead	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Min		Min	Min	None
Act Effct Green (s)		22.0	20.0		22.0	13.0	36.0		19.0	17.0	
Actuated g/C Ratio		0.33	0.30		0.33	0.20	0.55		0.29	0.26	
v/c Ratio		0.73	0.47		0.05	0.75	0.30		0.66	0.53	
Control Delay		31.0	5.8		11.3	40.3	9.1		27.6	5.9	
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay		31.0	5.8		11.3	40.3	9.1		27.6	5.9	
LOS		C	A		B	D	A		C	A	
Approach Delay		18.5			11.3		23.6		16.5		
Approach LOS		B			B		C		B		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 66
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 19.2 — Intersection LOS: B
Intersection Capacity Utilization 64.1% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: Islington Street & CVS Driveway



Queues
4: Islington Street & CVS Driveway

Lane Group	EBT	EBR	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	334	326	28	265	306	342	358
v/c Ratio	0.73	0.47	0.05	0.75	0.30	0.66	0.53
Control Delay	31.0	5.8	11.3	40.3	9.1	27.6	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	5.8	11.3	40.3	9.1	27.6	5.9
Queue Length 50th (ft)	117	7	4	102	60	120	0
Queue Length 95th (ft)	#234	60	16	#206	103	190	49
Internal Link Dist (ft)	212		69		292	271	
Turn Bay Length (ft)		125		150			
Base Capacity (vph)	458	694	551	355	1009	522	677
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.47	0.05	0.75	0.30	0.66	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	307	25	324	5	7	9	268	301	13	22	301	337
Future Volume (vph)	307	25	324	5	7	9	268	301	13	22	301	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0		4.0	4.0			4.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85		0.94		1.00	0.99			1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1816	1599		1768		1805	1851			1893	1599
Flt Permitted		0.72	1.00		0.90		0.95	1.00			0.96	1.00
Satd. Flow (perm)		1371	1599		1619		1805	1851			1820	1599
Peak-hour factor, PHF	0.91	0.91	0.91	0.75	0.75	0.75	0.93	0.93	0.93	0.86	0.86	0.86
Adj. Flow (vph)	337	27	356	7	9	12	288	324	14	26	350	392
RTOR Reduction (vph)	0	0	212	0	8	0	0	1	0	0	0	285
Lane Group Flow (vph)	0	364	144	0	20	0	288	337	0	0	376	107
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	1%	25%	0%	0%	1%
Turn Type	custom	NA	custom	custom	NA		Prot	NA		custom	NA	custom
Protected Phases							5					
Permitted Phases	4	4	4	8	8			2		2 5 6	6	6
Actuated Green, G (s)		19.0	19.0		19.0		11.0	35.0			18.0	18.0
Effective Green, g (s)		21.0	19.0		21.0		13.0	37.0			20.0	18.0
Actuated g/C Ratio		0.32	0.29		0.32		0.20	0.56			0.30	0.27
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		436	460		515		355	1037			551	436
v/s Ratio Prot							c0.16					
v/s Ratio Perm		c0.27	0.09		0.01			0.18			c0.21	0.07
v/c Ratio		0.83	0.31		0.04		0.81	0.32			0.68	0.25
Uniform Delay, d1		20.9	18.4		15.5		25.3	7.8			20.2	18.7
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		12.9	0.4		0.0		13.1	0.2			3.5	0.3
Delay (s)		33.8	18.8		15.6		38.5	8.0			23.7	19.0
Level of Service		C	B		B		D	A			C	B
Approach Delay (s)		26.4			15.6			22.0			21.3	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

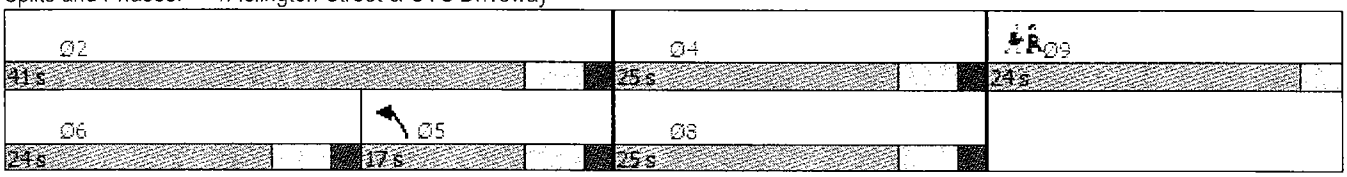
Timings
4: Islington Street & CVS Driveway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations											
Traffic Volume (vph)	307	25	324	5	7	268	301	22	301	337	
Future Volume (vph)	307	25	324	5	7	268	301	22	301	337	
Turn Type	custom	NA	custom	custom	NA	Prot	NA	custom	NA	custom	
Protected Phases						5					9
Permitted Phases	4	4	4	8	8		2	2 5 6	6	6	
Detector Phase	4	4	4	8	8	5	2	2 5 6	6	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	10.0		10.0	10.0	7.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0		16.0	16.0	24.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	17.0	41.0		24.0	24.0	24.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	27.8%	18.9%	45.6%		26.7%	26.7%	27%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	0.0		-2.0	-2.0	-2.0		-2.0	0.0	
Total Lost Time (s)		4.0	6.0		4.0	4.0	4.0		4.0	6.0	
Lead/Lag						Lag			Lead	Lead	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Min		Min	Min	None
Act Effct Green (s)		21.0	19.0		21.0	13.0	37.0		20.0	18.0	
Actuated g/C Ratio		0.32	0.29		0.32	0.20	0.56		0.30	0.27	
v/c Ratio		0.84	0.53		0.05	0.81	0.33		0.68	0.54	
Control Delay		40.7	7.6		11.8	45.7	8.8		27.8	5.6	
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay		40.7	7.6		11.8	45.7	8.8		27.8	5.6	
LOS		D	A		B	D	A		C	A	
Approach Delay		24.4			11.8		25.8		16.5		
Approach LOS		C			B		C		B		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 66
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 21.8 — Intersection LOS: C
Intersection Capacity Utilization 68.7% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: Islington Street & CVS Driveway



Queues
4: Islington Street & CVS Driveway

Lane Group	EBT	EBR	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	364	356	28	288	338	376	392
v/c Ratio	0.84	0.53	0.05	0.81	0.33	0.68	0.54
Control Delay	40.7	7.6	11.8	45.7	8.8	27.8	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	7.6	11.8	45.7	8.8	27.8	5.6
Queue Length 50th (ft)	134	17	4	112	66	132	0
Queue Length 95th (ft)	#274	79	16	#230	110	205	49
Internal Link Dist (ft)	212		69		292	271	
Turn Bay Length (ft)		125		150			
Base Capacity (vph)	435	672	523	355	1039	551	721
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.53	0.05	0.81	0.33	0.68	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	6	10	220	10	74	15	1901	217	56	1131	10
Future Volume (vph)	38	6	10	220	10	74	15	1901	217	56	1131	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	6.0	4.0	4.0	6.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	*0.88	*0.88	1.00	0.95	
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1753			1763	1615	1805	3278	1393	1805	3535	
Flt Permitted		0.40			0.70	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		725			1297	1615	1805	3278	1393	1805	3535	
Peak-hour factor, PHF	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90	0.99	0.99	0.99
Adj. Flow (vph)	48	8	13	289	13	97	17	2112	241	57	1142	10
RTOR Reduction (vph)	0	7	0	0	0	66	0	0	31	0	0	0
Lane Group Flow (vph)	0	62	0	0	302	31	17	2112	210	57	1152	0
Heavy Vehicles (%)	3%	0%	0%	3%	0%	0%	0%	2%	2%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		24.0			24.0	24.0	2.0	74.0	74.0	4.0	76.0	
Effective Green, g (s)		26.0			26.0	24.0	4.0	76.0	74.0	6.0	78.0	
Actuated g/C Ratio		0.22			0.22	0.20	0.03	0.63	0.62	0.05	0.65	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		157			281	323	60	2076	859	90	2297	
v/s Ratio Prot							0.01	c0.64		c0.03	0.33	
v/s Ratio Perm		0.09			c0.23	0.02			0.15			
v/c Ratio		0.39			1.07	0.10	0.28	1.02	0.24	0.63	0.50	
Uniform Delay, d1		40.3			47.0	39.2	56.6	22.0	10.4	55.9	10.9	
Progression Factor		1.00			1.00	1.00	0.91	0.58	0.68	1.00	1.00	
Incremental Delay, d2		1.6			75.0	0.1	1.2	18.0	0.3	13.7	0.8	
Delay (s)		41.9			122.0	39.3	52.9	30.8	7.4	69.6	11.7	
Level of Service		D			F	D	D	C	A	E	B	
Approach Delay (s)		41.9			101.9			28.6			14.4	
Approach LOS		D			F			C			B	

Intersection Summary			
HCM 2000 Control Delay	31.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

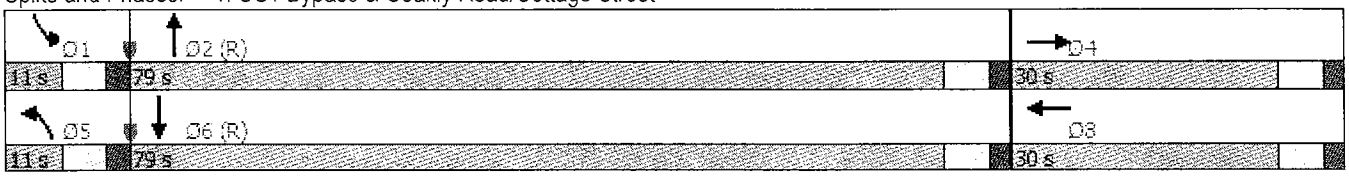
Timings
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	38	6	220	10	74	15	1901	217	56	1131
Future Volume (vph)	38	6	220	10	74	15	1901	217	56	1131
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8			2		
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	11.0	16.0	16.0	11.0	16.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	11.0	79.0	79.0	11.0	79.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	9.2%	65.8%	65.8%	9.2%	65.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	0.0	-2.0	-2.0	0.0	-2.0	-2.0
Total Lost Time (s)		4.0		4.0	6.0	4.0	4.0	6.0	4.0	4.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		26.0		26.0	24.0	7.0	77.2	75.2	7.0	81.6
Actuated g/C Ratio		0.22		0.22	0.20	0.06	0.64	0.63	0.06	0.68
v/c Ratio		0.42		1.07	0.25	0.16	1.00	0.27	0.54	0.48
Control Delay		44.2		119.9	13.3	51.0	28.4	5.1	74.3	10.6
Queue Delay		0.0		0.0	0.0	0.0	1.1	0.5	0.0	0.1
Total Delay		44.2		119.9	13.3	51.0	29.5	5.6	74.3	10.6
LOS		D		F	B	D	C	A	E	B
Approach Delay		44.2		94.0			27.2			13.6
Approach LOS		D		F			C			B

Intersectiop Summa

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 30.0 Intersection LOS: C
Intersection Capacity Utilization 75.4% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: US1 Bypass & Coakly Road/Cottage Street



1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	69	302	97	17	2112	241	57	1152
v/c Ratio	0.42	1.07	0.25	0.16	1.00	0.27	0.54	0.48
Control Delay	44.2	119.9	13.3	51.0	28.4	5.1	74.3	10.6
Queue Delay	0.0	0.0	0.0	0.0	1.1	0.5	0.0	0.1
Total Delay	44.2	119.9	13.3	51.0	29.5	5.6	74.3	10.6
Queue Length 50th (ft)	40	~260	9	11	~1007	50	44	174
Queue Length 95th (ft)	76	#336	38	m13	#1133	m71	#97	297
Internal Link Dist (ft)	998	606			304			719
Turn Bay Length (ft)			50	100		100	150	
Base Capacity (vph)	164	281	388	105	2108	903	105	2404
Starvation Cap Reductn	0	0	0	0	9	348	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	235
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	1.07	0.25	0.16	1.01	0.43	0.54	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	485	14	87	52	11	288	36	1380	11	200	1034	140
Future Volume (vph)	485	14	87	52	11	288	36	1380	11	200	1034	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0		4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00		0.95	0.95	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85		0.90	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1698	1708	1615		1606	1534	1752	3497		1752	3502	
Flt Permitted	0.95	0.95	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1698	1708	1615		1606	1534	1752	3497		1752	3502	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.97	0.97	0.97	0.96	0.96	0.96
Adj. Flow (vph)	584	17	105	58	12	320	37	1423	11	208	1077	146
RTOR Reduction (vph)	0	0	87	0	55	175	0	1	0	0	8	0
Lane Group Flow (vph)	298	303	18	0	143	17	37	1433	0	208	1215	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	3%	3%	17%	3%	1%	3%
Turn Type	Split	NA	Prot	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	7	7	8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	21.1	21.1	21.1		10.3	10.3	3.0	51.6		13.0	61.6	
Effective Green, g (s)	23.1	23.1	21.1		12.3	10.3	5.0	53.6		15.0	63.6	
Actuated g/C Ratio	0.19	0.19	0.18		0.10	0.09	0.04	0.45		0.12	0.53	
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	326	328	283		164	131	73	1561		219	1856	
v/s Ratio Prot	0.18	c0.18	0.01		c0.09		0.02	c0.41		c0.12	0.35	
v/s Ratio Perm						0.01						
v/c Ratio	0.91	0.92	0.07		0.87	0.13	0.51	0.92		0.95	0.65	
Uniform Delay, d1	47.5	47.6	41.2		53.1	50.7	56.3	31.1		52.1	20.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.03	0.87	
Incremental Delay, d2	28.8	30.6	0.1		36.6	0.5	5.4	10.2		40.6	1.5	
Delay (s)	76.3	78.2	41.3		89.6	51.2	61.7	41.3		94.1	19.0	
Level of Service	E	E	D		F	D	E	D		F	B	
Approach Delay (s)		71.9			70.7			41.8			29.9	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	45.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

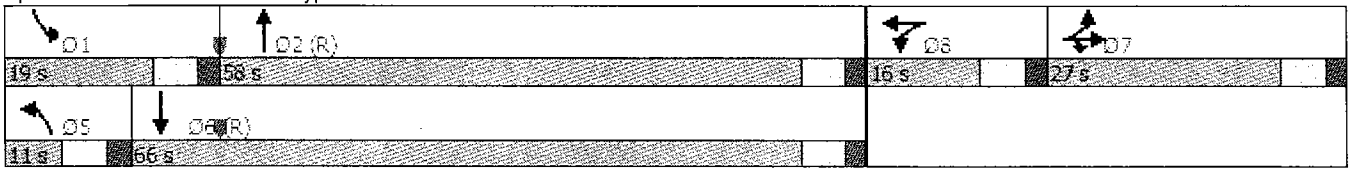
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	485	14	87	11	288	36	1380	200	1034
Future Volume (vph)	485	14	87	11	288	36	1380	200	1034
Turn Type	Split	NA	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	7	7	8		5	2	1	6
Permitted Phases					8				
Detector Phase	7	7	7	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	27.0	27.0	27.0	16.0	16.0	11.0	58.0	19.0	66.0
Total Split (%)	22.5%	22.5%	22.5%	13.3%	13.3%	9.2%	48.3%	15.8%	55.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	23.1	23.1	21.1	12.3	10.3	7.0	53.5	15.0	66.0
Actuated g/C Ratio	0.19	0.19	0.18	0.10	0.09	0.06	0.45	0.12	0.55
v/c Ratio	0.91	0.92	0.24	0.90	0.63	0.36	0.92	0.95	0.63
Control Delay	80.1	81.7	1.3	77.3	17.2	64.6	41.8	96.6	18.0
Queue Delay	19.0	20.7	0.0	10.3	2.5	0.0	3.4	0.0	0.3
Total Delay	99.2	102.4	1.3	87.5	19.7	64.6	45.2	96.6	18.3
LOS	F	F	A	F	B	E	D	F	B
Approach Delay		86.0		54.1			45.7		29.7
Approach LOS		F		D			D		C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 16 (13%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 47.9 Intersection LOS: D
Intersection Capacity Utilization 80.0% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



Queues
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	298	303	105	198	192	37	1434	208	1223
v/c Ratio	0.91	0.92	0.24	0.90	0.63	0.36	0.92	0.95	0.63
Control Delay	80.1	81.7	1.3	77.3	17.2	64.6	41.8	96.6	18.0
Queue Delay	19.0	20.7	0.0	10.3	2.5	0.0	3.4	0.0	0.3
Total Delay	99.2	102.4	1.3	87.5	19.7	64.6	45.2	96.6	18.3
Queue Length 50th (ft)	240	245	0	113	1	28	533	140	285
Queue Length 95th (ft)	#363	#370	0	#268	77	65	#663	m#273	m455
Internal Link Dist (ft)		916		388			250		304
Turn Bay Length (ft)	225		225			200		150	
Base Capacity (vph)	326	328	441	219	306	103	1574	219	1933
Starvation Cap Reductn	0	0	0	0	0	0	0	0	220
Spillback Cap Reductn	32	32	0	14	44	0	84	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	1.02	0.24	0.97	0.73	0.36	0.96	0.95	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	338	30	409	10	18	12	405	320	16	25	340	390
Future Volume (vph)	338	30	409	10	18	12	405	320	16	25	340	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0		4.0	4.0			4.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99			1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)		1800	1583		1803		1770	1851			1859	1599
Flt Permitted		0.74	1.00		0.84		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1388	1583		1526		1770	1851			1779	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.83	0.83	0.83	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	360	32	435	12	22	14	471	372	19	29	395	453
RTOR Reduction (vph)	0	0	186	0	10	0	0	1	0	0	0	321
Lane Group Flow (vph)	0	392	249	0	38	0	471	390	0	0	424	132
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	2%	2%	0%	0%	2%	1%
Turn Type	custom	NA	custom	custom	NA		Prot	NA		custom	NA	custom
Protected Phases							5					
Permitted Phases	4	4	4	8	8			2		2 5 6	6	6
Actuated Green, G (s)		26.0	26.0		26.0		24.0	58.0			28.0	28.0
Effective Green, g (s)		28.0	26.0		28.0		26.0	60.0			30.0	28.0
Actuated g/C Ratio		0.29	0.27		0.29		0.27	0.62			0.31	0.29
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		404	428		445		479	1156			555	466
v/s Ratio Prot							c0.27					
v/s Ratio Perm		c0.28	0.16		0.02			0.21			c0.24	0.08
v/c Ratio		0.97	0.58		0.09		0.98	0.34			0.76	0.28
Uniform Delay, d1		33.6	30.3		24.7		34.8	8.6			29.8	26.3
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		36.9	2.0		0.1		36.5	0.2			6.2	0.3
Delay (s)		70.5	32.3		24.8		71.3	8.7			36.0	26.6
Level of Service		E	C		C		E	A			D	C
Approach Delay (s)		50.4			24.8			42.9			31.1	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

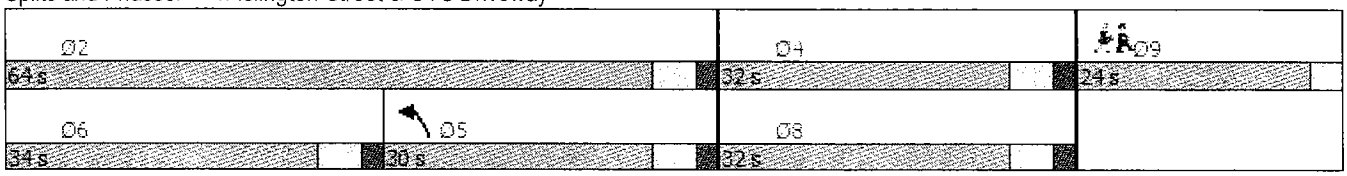
Timings
4: Islington Street & CVS Driveway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations											
Traffic Volume (vph)	338	30	409	10	18	405	320	25	340	390	
Future Volume (vph)	338	30	409	10	18	405	320	25	340	390	
Turn Type	custom	NA	custom	custom	NA	Prot	NA	custom	NA	custom	
Protected Phases						5					9
Permitted Phases	4	4	4	8	8		2	2 5 6	6	6	
Detector Phase	4	4	4	8	8	5	2	2 5 6	6	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	10.0		10.0	10.0	7.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0		16.0	16.0	24.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	30.0	64.0		34.0	34.0	24.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%	25.0%	53.3%		28.3%	28.3%	20%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	0.0		-2.0	-2.0	-2.0		-2.0	0.0	
Total Lost Time (s)		4.0	6.0		4.0	4.0	4.0		4.0	6.0	
Lead/Lag						Lag			Lead	Lead	
Lead-Lag Optimize?						Yes			Yes	Yes	
Recall Mode	None	None	None	None	None	None	Min		Min	Min	None
Act Effct Green (s)		28.0	26.0		28.0	26.0	60.0		30.0	28.0	
Actuated g/C Ratio		0.29	0.27		0.29	0.27	0.62		0.31	0.29	
v/c Ratio		0.97	0.71		0.11	0.98	0.34		0.76	0.58	
Control Delay		73.4	19.9		19.9	73.6	9.5		40.4	5.9	
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay		73.4	19.9		19.9	73.6	9.5		40.4	5.9	
LOS		E	B		B	E	A		D	A	
Approach Delay		45.2			19.9		44.5		22.6		
Approach LOS		D			B		D		C		

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 96
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 36.9 — Intersection LOS: D
Intersection Capacity Utilization 78.7% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 4: Islington Street & CVS Driveway



Queues
4: Islington Street & CVS Driveway

Lane Group	EBT	EBR	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	392	435	48	471	391	424	453
v/c Ratio	0.97	0.71	0.11	0.98	0.34	0.76	0.58
Control Delay	73.4	19.9	19.9	73.6	9.5	40.4	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	19.9	19.9	73.6	9.5	40.4	5.9
Queue Length 50th (ft)	235	96	15	285	102	232	0
Queue Length 95th (ft)	#421	212	38	#452	145	326	56
Internal Link Dist (ft)	212		69		292	271	
Turn Bay Length (ft)		125		150			
Base Capacity (vph)	404	614	455	479	1158	555	787
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.71	0.11	0.98	0.34	0.76	0.58

Intersection Summa

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	6	10	226	10	135	15	1707	219	67	1054	10
Future Volume (vph)	38	6	10	226	10	135	15	1707	219	67	1054	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	6.0	4.0	4.0	6.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	*0.88	*0.88	1.00	0.95	
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1753			1762	1615	1805	3278	1393	1805	3535	
Flt Permitted		0.48			0.70	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		873			1295	1615	1805	3278	1393	1805	3535	
Peak-hour factor, PHF	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90	0.99	0.99	0.99
Adj. Flow (vph)	48	8	13	297	13	178	17	1897	243	68	1065	10
RTOR Reduction (vph)	0	7	0	0	0	63	0	0	34	0	0	0
Lane Group Flow (vph)	0	62	0	0	310	115	17	1897	209	68	1075	0
Heavy Vehicles (%)	3%	0%	0%	3%	0%	0%	0%	2%	2%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		28.4			28.4	28.4	2.0	69.6	69.6	4.0	71.6	
Effective Green, g (s)		30.4			30.4	28.4	4.0	71.6	69.6	6.0	73.6	
Actuated g/C Ratio		0.25			0.25	0.24	0.03	0.60	0.58	0.05	0.61	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		221			328	382	60	1955	807	90	2168	
v/s Ratio Prot							0.01	c0.58		c0.04	0.30	
v/s Ratio Perm		0.07			c0.24	0.07			0.15			
v/c Ratio		0.28			0.95	0.30	0.28	0.97	0.26	0.76	0.50	
Uniform Delay, d1		36.0			44.0	37.7	56.6	23.2	12.5	56.3	12.9	
Progression Factor		1.00			1.00	1.00	0.94	0.54	0.64	1.00	1.00	
Incremental Delay, d2		0.7			35.2	0.4	1.5	9.9	0.4	29.7	0.8	
Delay (s)		36.7			79.2	38.1	54.7	22.5	8.4	86.0	13.7	
Level of Service		D			E	D	D	C	A	F	B	
Approach Delay (s)		36.7			64.2			21.2			18.0	
Approach LOS		D			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

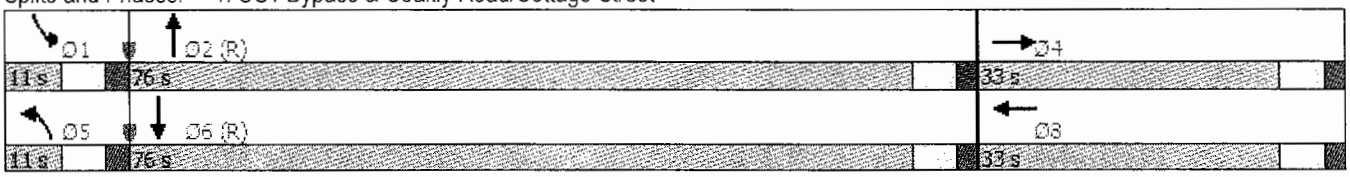
Timings
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	38	6	226	10	135	15	1707	219	67	1054
Future Volume (vph)	38	6	226	10	135	15	1707	219	67	1054
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8			2		
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	11.0	16.0	16.0	11.0	16.0
Total Split (s)	33.0	33.0	33.0	33.0	33.0	11.0	76.0	76.0	11.0	76.0
Total Split (%)	27.5%	27.5%	27.5%	27.5%	27.5%	9.2%	63.3%	63.3%	9.2%	63.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	0.0	-2.0	-2.0	0.0	-2.0	-2.0
Total Lost Time (s)		4.0		4.0	6.0	4.0	4.0	6.0	4.0	4.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		30.4		30.4	28.4	7.1	72.8	70.8	7.3	77.2
Actuated g/C Ratio		0.25		0.25	0.24	0.06	0.61	0.59	0.06	0.64
v/c Ratio		0.30		0.95	0.40	0.16	0.95	0.28	0.62	0.47
Control Delay		36.7		83.3	24.1	52.8	21.1	5.6	79.7	12.2
Queue Delay		0.0		0.0	0.0	0.0	2.5	0.6	0.0	0.1
Total Delay		36.7		83.3	24.1	52.8	23.7	6.2	79.7	12.3
LOS		D		F	C	D	C	A	E	B
Approach Delay		36.7		61.7			21.9			16.3
Approach LOS		D		E			C			B

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 25.6 — Intersection LOS: C
Intersection Capacity Utilization 77.6% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: US1 Bypass & Coakly Road/Cottage Street



Queues
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	69	310	178	17	1897	243	68	1075
v/c Ratio	0.30	0.95	0.40	0.16	0.95	0.28	0.62	0.47
Control Delay	36.7	83.3	24.1	52.8	21.1	5.6	79.7	12.2
Queue Delay	0.0	0.0	0.0	0.0	2.5	0.6	0.0	0.1
Total Delay	36.7	83.3	24.1	52.8	23.7	6.2	79.7	12.3
Queue Length 50th (ft)	38	241	62	12	309	43	53	174
Queue Length 95th (ft)	71	#322	97	m16	#974	m76	#121	290
Internal Link Dist (ft)	998	606			304			719
Turn Bay Length (ft)			50	100		100	150	
Base Capacity (vph)	227	327	444	106	1988	855	109	2275
Starvation Cap Reductn	0	0	0	0	48	315	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	260
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.95	0.40	0.16	0.98	0.45	0.62	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	487	12	87	52	5	94	36	1380	12	123	1034	146
Future Volume (vph)	487	12	87	52	5	94	36	1380	12	123	1034	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0		4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00		0.95	0.95	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85		0.96	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1698	1707	1615		1676	1534	1752	3496		1752	3499	
Flt Permitted	0.95	0.95	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1698	1707	1615		1676	1534	1752	3496		1752	3499	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.97	0.97	0.97	0.96	0.96	0.96
Adj. Flow (vph)	587	14	105	58	6	104	37	1423	12	128	1077	152
RTOR Reduction (vph)	0	0	84	0	11	75	0	1	0	0	9	0
Lane Group Flow (vph)	299	302	21	0	77	5	37	1434	0	128	1220	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	3%	3%	17%	3%	1%	3%
Turn Type	Split	NA	Prot	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	7	7	8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	23.6	23.6	23.6		6.9	6.9	3.0	55.5		10.0	62.5	
Effective Green, g (s)	25.6	25.6	23.6		8.9	6.9	5.0	57.5		12.0	64.5	
Actuated g/C Ratio	0.21	0.21	0.20		0.07	0.06	0.04	0.48		0.10	0.54	
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	362	364	317		124	88	73	1675		175	1880	
v/s Ratio Prot	0.18	c0.18	0.01		c0.05		0.02	c0.41		c0.07	0.35	
v/s Ratio Perm						0.00						
v/c Ratio	0.83	0.83	0.07		0.62	0.05	0.51	0.86		0.73	0.65	
Uniform Delay, d1	45.1	45.1	39.2		53.9	53.5	56.3	27.6		52.4	19.7	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.14	0.86	
Incremental Delay, d2	14.2	14.4	0.1		9.3	0.2	5.4	5.9		12.3	1.5	
Delay (s)	59.3	59.5	39.3		63.2	53.7	61.7	33.5		71.8	18.4	
Level of Service	E	E	D		E	D	E	C		E	B	
Approach Delay (s)		56.4			58.7			34.2			23.4	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

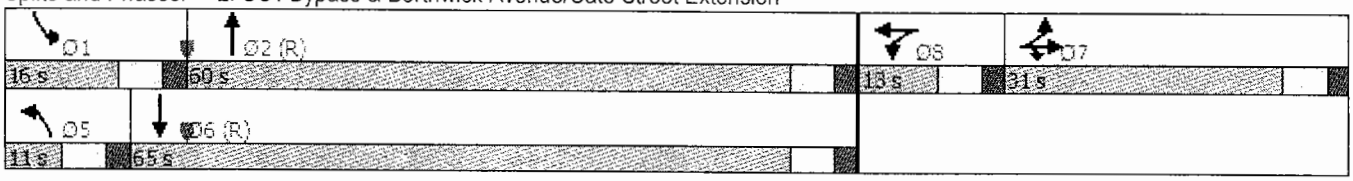
Timings
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	487	12	87	5	94	36	1380	123	1034
Future Volume (vph)	487	12	87	5	94	36	1380	123	1034
Turn Type	Split	NA	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	7	7	8		5	2	1	6
Permitted Phases					8				
Detector Phase	7	7	7	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	31.0	31.0	31.0	13.0	13.0	11.0	60.0	16.0	65.0
Total Split (%)	25.8%	25.8%	25.8%	10.8%	10.8%	9.2%	50.0%	13.3%	54.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	25.6	25.6	23.6	8.9	6.9	7.2	57.5	12.0	66.9
Actuated g/C Ratio	0.21	0.21	0.20	0.07	0.06	0.06	0.48	0.10	0.56
v/c Ratio	0.83	0.83	0.25	0.65	0.37	0.35	0.86	0.73	0.63
Control Delay	64.4	65.0	4.4	69.4	5.8	63.9	34.4	79.9	17.8
Queue Delay	1.7	1.8	0.0	0.0	0.2	0.0	1.3	0.0	0.2
Total Delay	66.1	66.7	4.4	69.4	6.0	63.9	35.6	79.9	18.0
LOS	E	E	A	E	A	E	D	E	B
Approach Delay		57.2		39.2			36.3		23.9
Approach LOS		E		D			D		C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 14 (12%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 35.9 — Intersection LOS: D
Intersection Capacity Utilization 75.8% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	299	302	105	88	80	37	1435	128	1229
v/c Ratio	0.83	0.83	0.25	0.65	0.37	0.35	0.86	0.73	0.63
Control Delay	64.4	65.0	4.4	69.4	5.8	63.9	34.4	79.9	17.8
Queue Delay	1.7	1.8	0.0	0.0	0.2	0.0	1.3	0.0	0.2
Total Delay	66.1	66.7	4.4	69.4	6.0	63.9	35.6	79.9	18.0
Queue Length 50th (ft)	230	233	0	61	0	28	516	80	334
Queue Length 95th (ft)	309	311	18	#140	7	65	623	m#166	m483
Internal Link Dist (ft)		916		388			250		304
Turn Bay Length (ft)	225		225			200		150	
Base Capacity (vph)	382	383	444	136	217	105	1676	177	1959
Starvation Cap Reductn	0	0	0	0	0	0	0	0	187
Spillback Cap Reductn	20	20	0	0	12	0	95	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.83	0.24	0.65	0.39	0.35	0.91	0.72	0.69

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Intersection												
Int Delay, s/veh	1.8											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	54	0	0	84	0	1953	217	0	1187	35
Future Vol, veh/h	0	0	54	0	0	84	0	1953	217	0	1187	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	76	76	76	90	90	90	99	99	99
Heavy Vehicles, %	3	0	0	3	0	0	0	2	2	0	2	0
Mvmt Flow	0	0	68	0	0	111	0	2170	241	0	1199	35

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	617	-	-	1206	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	438	0	0	179	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	438	-	-	179	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	53	0	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	438	179	-	-
HCM Lane V/C Ratio	-	-	0.156	0.617	-	-
HCM Control Delay (s)	-	-	14.7	53	-	-
HCM Lane LOS	-	-	B	F	-	-
HCM 95th %tile Q(veh)	-	-	0.5	3.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	485	14	87	272	11	287	36	1380	12	300	814	140
Future Volume (vph)	485	14	87	272	11	287	36	1380	12	300	814	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0		4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00		0.95	0.95	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85		0.99	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1698	1708	1615		1706	1534	1752	3496		1752	3485	
Flt Permitted	0.95	0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1698	1708	1615		1706	1534	1752	3496		1752	3485	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.97	0.97	0.97	0.96	0.96	0.96
Adj. Flow (vph)	584	17	105	302	12	319	37	1423	12	312	848	146
RTOR Reduction (vph)	0	0	90	0	3	162	0	1	0	0	11	0
Lane Group Flow (vph)	298	303	15	0	343	125	37	1434	0	313	983	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	3%	3%	17%	3%	1%	3%
Turn Type	Split	NA	Prot	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	7	7	8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	17.0	17.0	17.0		18.0	18.0	3.0	44.0		17.0	58.0	
Effective Green, g (s)	19.0	19.0	17.0		20.0	18.0	5.0	46.0		19.0	60.0	
Actuated g/C Ratio	0.16	0.16	0.14		0.17	0.15	0.04	0.38		0.16	0.50	
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	268	270	228		284	230	73	1340		277	1742	
v/s Ratio Prot	0.18	c0.18	0.01		c0.20		0.02	c0.41		c0.18	0.28	
v/s Ratio Perm						0.08						
v/c Ratio	1.11	1.12	0.07		1.21	0.54	0.51	1.07		1.13	0.56	
Uniform Delay, d1	50.5	50.5	44.6		50.0	47.2	56.3	37.0		50.5	20.9	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	88.4	91.7	0.1		121.3	2.6	5.4	45.8		93.7	1.3	
Delay (s)	138.9	142.2	44.7		171.3	49.8	61.7	82.8		144.2	22.2	
Level of Service	F	F	D		F	D	E	F		F	C	
Approach Delay (s)		126.3			116.2			82.3			51.4	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	85.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		

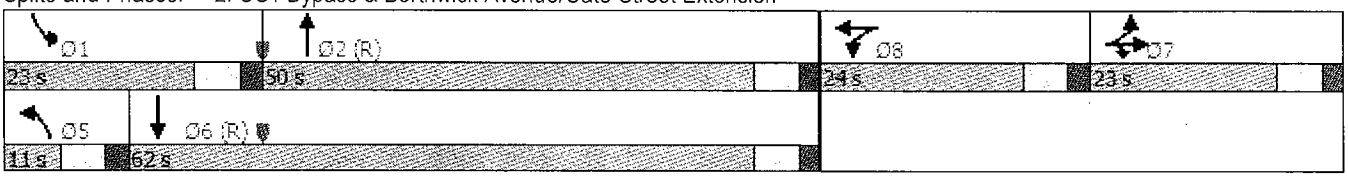
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	485	14	87	11	287	36	1380	300	814
Future Volume (vph)	485	14	87	11	287	36	1380	300	814
Turn Type	Split	NA	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	7	7	8		5	2	1	6
Permitted Phases					8				
Detector Phase	7	7	7	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	23.0	23.0	23.0	24.0	24.0	11.0	50.0	23.0	62.0
Total Split (%)	19.2%	19.2%	19.2%	20.0%	20.0%	9.2%	41.7%	19.2%	51.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	19.0	19.0	17.0	20.0	18.0	7.0	46.0	19.0	62.4
Actuated g/C Ratio	0.16	0.16	0.14	0.17	0.15	0.06	0.38	0.16	0.52
v/c Ratio	1.11	1.12	0.27	1.21	0.73	0.36	1.07	1.13	0.55
Control Delay	134.8	137.8	1.7	163.2	28.7	64.7	81.7	139.5	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	134.8	137.8	1.7	163.2	28.7	64.7	81.7	139.5	21.0
LOS	F	F	A	F	C	E	F	F	C
Approach Delay		116.3		102.2			81.3		49.4
Approach LOS		F		F			F		D

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.21
Intersection Signal Delay: 80.4 — Intersection LOS: F
Intersection Capacity Utilization 93.3% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



Queues
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	298	303	105	346	287	37	1435	313	994
v/c Ratio	1.11	1.12	0.27	1.21	0.73	0.36	1.07	1.13	0.55
Control Delay	134.8	137.8	1.7	163.2	28.7	64.7	81.7	139.5	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	134.8	137.8	1.7	163.2	28.7	64.7	81.7	139.5	21.0
Queue Length 50th (ft)	~277	~284	0	~342	72	28	~649	~281	277
Queue Length 95th (ft)	#411	#418	0	#544	#187	65	#790	#461	344
Internal Link Dist (ft)		916		388			250		304
Turn Bay Length (ft)	225		225			200		150	
Base Capacity (vph)	268	270	392	287	392	102	1341	277	1822
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	1.12	0.27	1.21	0.73	0.36	1.07	1.13	0.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

NH DOT - SEQUENCE AND TIMING CHART

4/18/2018 12:18:09 PM

CITY/TOWN: PORTSMOUTH **SIGNAL ID#:** S-379-07

LOCATION: US 1 BYPASS

INTERSECT: BORTHWICK AVE

CABINET TYPE: P TYPE-1 **Meter Number and Mfr:** 80097957

CONTROLLER MFG Econolite ASC 2100

INSTALL DATE: 12/8 /1986

CONTROLLER TIMINGS

	PH 1	PH 2	PH 5	PH 6	PH 7	PH 8
INITIAL	4	4	4	4	4	4
PASSAGE	3	8	3	8	3	4
YELLOW	4	4	4	4	4	4
ALL RED	2	2	2	2	2	2
MAXIMUM 1	11	52	11	52	14	14
MAXIMUM 2	11	57	11	57	20	25
MAXIMUM 3						
MAXIMUM EXT						
RECALL	OFF	SOFT	OFF	SOFT	OFF	OFF
WALK						
DON'T WALK						
FL YEL ARROW						

NOTES::

NH DOT - SEQUENCE AND TIMING CHART

4/18/2018 12:18:09 PM

TBC COORDINATION M - F 07:00 - 11:00 PLAN 1
M - F 11:00 - 15:00 PLAN 2
SAT 11:00 - 17:00 PLAN 2
M - F 15:00 - 18:00 PLAN 3
FREE ALL OTHER TIMES

PLAN 1 CYCLE = 130s OFF = 10 (END OF GREEN) FORCE OFF = FIXED PED SERVICE COORD = OFF
SPLIT = 19, 69, 21 SHORTWAY 10% LONGWAY 24%

PLAN 2 CYCLE = 110s OFF = 105 (END OF GREEN) FORCE OFF = FIXED PED SERVICE COORD = OFF
SPLIT = 12, 58, 20 SHORTWAY 10% LONGWAY 24%

PLAN 3 CYCLE = 120s OFF = 115 (END OF GREEN) FORCE OFF = FIXED PED SERVICE COORD = OFF
SPLIT = 15, 61, 29 SHORTWAY 10% LONGWAY 24%

NH DOT - SEQUENCE AND TIMING CHART

4/18/2018 12:17:43 PM

TBC COORDINATION M - F 07:00 - 11:00 PLAN 1
M - F 11:00 - 15:00 PLAN 2
SAT 11:00 - 17:00 PLAN 2
M - F 15:00 - 18:00 PLAN 3
FREE ALL OTHER TIMES

PLAN 1 CYCLE = 130s OFF = 0 (END OF GREEN) FORCE OFF = FIXED PED SERVICE COORD = OFF
SPLIT = 15, 76, 39 SHORTWAY 10% LONGWAY 24%

PLAN 2 CYCLE = 110s OFF = 0 (END OF GREEN) FORCE OFF = FIXED PED SERVICE COORD = OFF
SPLIT = 15, 57, 38 SHORTWAY 10% LONGWAY 24%

PLAN 3 CYCLE = 120s OFF = 0 (END OF GREEN) FORCE OFF = FIXED PED SERVICE COORD = OFF
SPLIT = 12, 78, 30 SHORTWAY 10% LONGWAY 24%

NH DOT - SEQUENCE AND TIMING CHART

4/18/2018 12:17:43 PM

CITY/TOWN: PORTSMOUTH **SIGNAL ID#:** S-379-11

LOCATION: US 1 BYPASS

INTERSECT: COTTAGE ST/COAKLEY AVE

CABINET TYPE: P TYPE-1 **Meter Number and Mfr:** 80063578

CONTROLLER MFG Econolite ASC 2100

INSTALL DATE: 6 /24/1966

CONTROLLER TIMINGS

	PH 1	PH 2	PH 4	PH 5	PH 6	PH 8
INITIAL	4	4	4	4	4	4
PASSAGE	3	8	3	3	8	3
YELLOW	4	4	4	4	4	4
ALL RED	2	2	2	2	2	2
MAXIMUM 1	10	50	32	10	50	32
MAXIMUM 2		56			56	
MAXIMUM 3						
MAXIMUM EXT						
RECALL	NL	ON	OFF	VEH	OFF	
WALK						
DON'T WALK						
FL YEL ARROW						

NOTES::

Appendix J **Capacity and Level of Service Calculations - Unsignalized**

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	1178	1	0	938
Future Vol, veh/h	0	2	1178	1	0	938
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	97	97	96	96
Heavy Vehicles, %	0	0	3	0	0	1
Mvmt Flow	0	2	1214	1	0	977

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	608	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	444	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	444	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	444	-
HCM Lane V/C Ratio	-	-	0.005	-
HCM Control Delay (s)	-	-	13.1	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	1295	1	0	1037
Future Vol, veh/h	0	2	1295	1	0	1037
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	97	97	96	96
Heavy Vehicles, %	0	0	3	0	0	1
Mvmt Flow	0	2	1335	1	0	1080

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	668	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	405	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	405	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	405	-
HCM Lane V/C Ratio	-	-	0.005	-
HCM Control Delay (s)	-	-	13.9	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	1430	1	0	1144
Future Vol, veh/h	0	2	1430	1	0	1144
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	97	97	96	96
Heavy Vehicles, %	0	0	3	0	0	1
Mvmt Flow	0	2	1474	1	0	1192

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	738	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	365	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	365	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBL	SBT
Capacity (veh/h)	-	-	365	-
HCM Lane V/C Ratio	-	-	0.006	-
HCM Control Delay (s)	-	-	14.9	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0	-

Intersection						
Int Delay, s/veh	0.1					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	14	1280	59	0	1066
Future Vol, veh/h	0	14	1280	59	0	1066
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	97	97	96	96
Heavy Vehicles, %	0	0	3	0	0	1
Mvmt Flow	0	16	1320	61	0	1110

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	691	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	392	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	392	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	392	-
HCM Lane V/C Ratio	-	-	0.04	-
HCM Control Delay (s)	-	-	14.6	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	14	1415	59	0	1173
Future Vol, veh/h	0	14	1415	59	0	1173
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	97	97	96	96
Heavy Vehicles, %	0	0	3	0	0	1
Mvmt Flow	0	16	1459	61	0	1222

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	760	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	353	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	353	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	353	-
HCM Lane V/C Ratio	-	-	0.044	-
HCM Control Delay (s)	-	-	15.7	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	929	1	0	822
Future Vol, veh/h	0	2	929	1	0	822
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	95	95	92	92
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	0	2	978	1	0	893

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	490	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	529	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	529	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	529	-
HCM Lane V/C Ratio	-	-	0.004	-
HCM Control Delay (s)	-	-	11.8	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	1028	1	0	908
Future Vol, veh/h	0	2	1028	1	0	908
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	95	95	92	92
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	0	2	1082	1	0	987

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	542	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	490	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	490	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	490	-
HCM Lane V/C Ratio	-	-	0.005	-
HCM Control Delay (s)	-	-	12.4	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	1137	1	0	1003
Future Vol, veh/h	0	2	1137	1	0	1003
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	95	95	92	92
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	0	2	1197	1	0	1090

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	599	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	450	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	450	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	450	-
HCM Lane V/C Ratio	-	0.005	-
HCM Control Delay (s)	-	13	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0	-

Intersection						
Int Delay, s/veh	0.1					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	19	1000	72	0	948
Future Vol, veh/h	0	19	1000	72	0	948
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	95	95	92	92
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	0	21	1053	76	0	1030

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	565	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	473	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	473	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	473	-
HCM Lane V/C Ratio	-	-	0.045	-
HCM Control Delay (s)	-	-	13	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	19	1109	72	0	1043
Future Vol, veh/h	0	19	1109	72	0	1043
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	95	95	92	92
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	0	21	1167	76	0	1134

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	622	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	434	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	434	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	434	-
HCM Lane V/C Ratio	-	-	0.049	-
HCM Control Delay (s)	-	-	13.7	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.2	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	0	55	0	1	0	81	510	0	1	571	11
Future Vol, veh/h	3	0	55	0	1	0	81	510	0	1	571	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	90	90	90	83	83	83	91	91	91
Heavy Vehicles, %	0	0	2	0	0	0	0	2	0	0	1	9
Mvmt Flow	4	0	72	0	1	0	98	614	0	1	627	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1446	1445	633	1481	1451	614	639	0	0	614	0	0
Stage 1	635	635	-	810	810	-	-	-	-	-	-	-
Stage 2	811	810	-	671	641	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.22	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.318	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	111	133	480	105	132	496	955	-	-	975	-	-
Stage 1	470	476	-	377	396	-	-	-	-	-	-	-
Stage 2	376	396	-	449	473	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	97	112	480	78	111	496	955	-	-	975	-	-
Mov Cap-2 Maneuver	97	112	-	78	111	-	-	-	-	-	-	-
Stage 1	397	475	-	318	334	-	-	-	-	-	-	-
Stage 2	316	334	-	381	472	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	37.8	1.3	0
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	955	-	-	399 111	975	-	-
HCM Lane V/C Ratio	0.102	-	-	0.191 0.01	0.001	-	-
HCM Control Delay (s)	9.2	0	-	16.1 37.8	8.7	0	-
HCM Lane LOS	A	A	-	C E	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.7 0	0	-	-

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	86	0	1	0	121	622	0	1	673	13
Future Vol, veh/h	3	0	86	0	1	0	121	622	0	1	673	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	90	90	90	83	83	83	91	91	91
Heavy Vehicles, %	0	0	2	0	0	0	0	2	0	0	1	9
Mvmt Flow	4	0	113	0	1	0	146	749	0	1	740	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1791	1790	747	1847	1797	749	754	0	0	749	0	0
Stage 1	749	749	-	1041	1041	-	-	-	-	-	-	-
Stage 2	1042	1041	-	806	756	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.22	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.318	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	63	82	413	58	81	415	865	-	-	869	-	-
Stage 1	407	422	-	280	310	-	-	-	-	-	-	-
Stage 2	280	310	-	379	419	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	48	58	413	33	58	415	865	-	-	869	-	-
Mov Cap-2 Maneuver	48	58	-	33	58	-	-	-	-	-	-	-
Stage 1	289	421	-	199	220	-	-	-	-	-	-	-
Stage 2	198	220	-	275	418	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.3	68.3	1.6	0
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	865	-	-	48	413	58	869	-	-
HCM Lane V/C Ratio	0.169	-	-	0.082	0.274	0.019	0.001	-	-
HCM Control Delay (s)	10	0	-	86.6	17	68.3	9.1	0	-
HCM Lane LOS	B	A	-	F	C	F	A	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0.3	1.1	0.1	0	-	-

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	92	0	1	0	130	680	0	1	738	14
Future Vol, veh/h	3	0	92	0	1	0	130	680	0	1	738	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	90	90	90	83	83	83	91	91	91
Heavy Vehicles, %	0	0	2	0	0	0	0	2	0	0	1	9
Mvmt Flow	4	0	121	0	1	0	157	819	0	1	811	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1955	1954	819	2014	1961	819	826	0	0	819	0	0
Stage 1	821	821	-	1133	1133	-	-	-	-	-	-	-
Stage 2	1134	1133	-	881	828	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.22	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.318	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	49	65	375	44	64	379	813	-	-	818	-	-
Stage 1	371	391	-	249	280	-	-	-	-	-	-	-
Stage 2	249	280	-	344	389	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	35	42	375	22	41	379	813	-	-	818	-	-
Mov Cap-2 Maneuver	35	42	-	22	41	-	-	-	-	-	-	-
Stage 1	240	390	-	161	181	-	-	-	-	-	-	-
Stage 2	160	181	-	232	388	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.3	95.2	1.7	0
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	813	-	-	35	375	41	818	-	-
HCM Lane V/C Ratio	0.193	-	-	0.113	0.323	0.027	0.001	-	-
HCM Control Delay (s)	10.5	0	-	120.5	19.1	95.2	9.4	0	-
HCM Lane LOS	B	A	-	F	C	F	A	A	-
HCM 95th %tile Q(veh)	0.7	-	-	0.3	1.4	0.1	0	-	-

Intersection												
Int Delay, s/veh	13											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	0	140	0	1	0	218	538	0	1	628	63
Future Vol, veh/h	31	0	140	0	1	0	218	538	0	1	628	63
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	90	90	90	83	83	83	91	91	91
Heavy Vehicles, %	0	0	2	0	0	0	0	2	0	0	1	9
Mvmt Flow	41	0	184	0	1	0	263	648	0	1	690	69

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1902	1901	725	1993	1935	648	759	0	0	648	0	0
Stage 1	727	727	-	1174	1174	-	-	-	-	-	-	-
Stage 2	1175	1174	-	819	761	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.22	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.318	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	53	70	425	46	67	474	862	-	-	947	-	-
Stage 1	419	432	-	236	268	-	-	-	-	-	-	-
Stage 2	236	268	-	372	417	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 32	37	425	16	35	474	862	-	-	947	-	-
Mov Cap-2 Maneuver	~ 32	37	-	16	35	-	-	-	-	-	-	-
Stage 1	219	431	-	123	140	-	-	-	-	-	-	-
Stage 2	122	140	-	210	416	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	96.1	111.2	3.2	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	862	-	-	32	425	35	947	-	-
HCM Lane V/C Ratio	0.305	-	-	1.275	0.433	0.032	0.001	-	-
HCM Control Delay (s)	11	0	-	$ 440.7	19.8	111.2	8.8	0	-
HCM Lane LOS	B	A	-	F	C	F	A	A	-
HCM 95th %tile Q(veh)	1.3	-	-	4.5	2.1	0.1	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	19.2											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	0	146	0	1	0	227	596	0	1	693	64
Future Vol, veh/h	31	0	146	0	1	0	227	596	0	1	693	64
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	90	90	90	83	83	83	91	91	91
Heavy Vehicles, %	0	0	2	0	0	0	0	2	0	0	1	9
Mvmt Flow	41	0	192	0	1	0	273	718	0	1	762	70

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2064	2063	797	2159	2098	718	832	0	0	718	0	0
Stage 1	799	799	-	1264	1264	-	-	-	-	-	-	-
Stage 2	1265	1264	-	895	834	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.22	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.318	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	41	55	387	35	53	432	809	-	-	892	-	-
Stage 1	382	401	-	210	243	-	-	-	-	-	-	-
Stage 2	210	243	-	338	386	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 22	24	387	10	23	432	809	-	-	892	-	-
Mov Cap-2 Maneuver	~ 22	24	-	10	23	-	-	-	-	-	-	-
Stage 1	168	400	-	92	107	-	-	-	-	-	-	-
Stage 2	91	107	-	170	385	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	155.2	169.3	3.2	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	809	-	-	22	387	23	892	-	-
HCM Lane V/C Ratio	0.338	-	-	1.854	0.496	0.048	0.001	-	-
HCM Control Delay (s)	11.7	0	-	$ 777.3	23.1	169.3	9	0	-
HCM Lane LOS	B	A	-	F	C	F	A	A	-
HCM 95th %tile Q(veh)	1.5	-	-	5.3	2.7	0.1	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	20	1	1	0	50	387	1	1	479	4
Future Vol, veh/h	1	0	20	1	1	0	50	387	1	1	479	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	50	50	50	88	88	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	1	0	27	2	2	0	57	440	1	1	521	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1081	1080	523	1094	1082	441	525	0	0	441	0	0
Stage 1	525	525	-	555	555	-	-	-	-	-	-	-
Stage 2	556	555	-	539	527	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	197	220	558	193	219	621	1052	-	-	1130	-	-
Stage 1	540	533	-	520	516	-	-	-	-	-	-	-
Stage 2	519	516	-	530	532	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	185	204	558	174	203	621	1052	-	-	1130	-	-
Mov Cap-2 Maneuver	185	204	-	174	203	-	-	-	-	-	-	-
Stage 1	501	532	-	483	479	-	-	-	-	-	-	-
Stage 2	480	479	-	504	531	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.5	24.7	1	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1052	-	-	509	187	1130	-	-
HCM Lane V/C Ratio	0.054	-	-	0.055	0.021	0.001	-	-
HCM Control Delay (s)	8.6	0	-	12.5	24.7	8.2	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.1	0	-	-

Intersection												
Int Delay, s/veh	1.3											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	41	1	1	0	75	471	1	1	569	4
Future Vol, veh/h	1	0	41	1	1	0	75	471	1	1	569	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	50	50	50	88	88	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	1	0	55	2	2	0	85	535	1	1	618	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1329	1328	620	1356	1330	536	622	0	0	536	0	0
Stage 1	622	622	-	706	706	-	-	-	-	-	-	-
Stage 2	707	706	-	650	624	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	133	157	492	128	156	549	969	-	-	1042	-	-
Stage 1	478	482	-	430	442	-	-	-	-	-	-	-
Stage 2	429	442	-	461	481	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	119	137	492	103	136	549	969	-	-	1042	-	-
Mov Cap-2 Maneuver	119	137	-	103	136	-	-	-	-	-	-	-
Stage 1	418	482	-	376	387	-	-	-	-	-	-	-
Stage 2	373	387	-	409	481	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.7	36.9	1.2	0
HCM LOS	B	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	969	-	-	119	492	117	1042	-	-
HCM Lane V/C Ratio	0.088	-	-	0.011	0.111	0.034	0.001	-	-
HCM Control Delay (s)	9.1	0	-	35.6	13.2	36.9	8.5	0	-
HCM Lane LOS	A	A	-	E	B	E	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	0.4	0.1	0	-	-

Intersection												
Int Delay, s/veh	1.4											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	43	1	1	0	81	516	1	1	624	4
Future Vol, veh/h	1	0	43	1	1	0	81	516	1	1	624	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	50	50	50	88	88	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	1	0	57	2	2	0	92	586	1	1	678	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1454	1453	680	1482	1455	587	682	0	0	587	0	0
Stage 1	682	682	-	771	771	-	-	-	-	-	-	-
Stage 2	772	771	-	711	684	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	109	132	454	104	131	513	920	-	-	998	-	-
Stage 1	443	453	-	396	413	-	-	-	-	-	-	-
Stage 2	395	413	-	427	452	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	95	112	454	80	111	513	920	-	-	998	-	-
Mov Cap-2 Maneuver	95	112	-	80	111	-	-	-	-	-	-	-
Stage 1	377	452	-	337	352	-	-	-	-	-	-	-
Stage 2	335	352	-	372	451	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	45.4	1.3	0
HCM LOS	B	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	920	-	-	95	454	93	998	-	-
HCM Lane V/C Ratio	0.1	-	-	0.014	0.126	0.043	0.001	-	-
HCM Control Delay (s)	9.3	0	-	43.4	14.1	45.4	8.6	0	-
HCM Lane LOS	A	A	-	E	B	E	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	0.4	0.1	0	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	107	1	1	0	177	381	1	1	514	28
Future Vol, veh/h	27	0	107	1	1	0	177	381	1	1	514	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	50	50	50	88	88	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	36	0	143	2	2	0	201	433	1	1	559	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1413	1412	574	1484	1427	434	589	0	0	434	0	0
Stage 1	576	576	-	836	836	-	-	-	-	-	-	-
Stage 2	837	836	-	648	591	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	117	139	522	104	136	626	996	-	-	1136	-	-
Stage 1	506	505	-	364	385	-	-	-	-	-	-	-
Stage 2	364	385	-	462	498	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	91	102	522	60	100	626	996	-	-	1136	-	-
Mov Cap-2 Maneuver	91	102	-	60	100	-	-	-	-	-	-	-
Stage 1	371	504	-	267	283	-	-	-	-	-	-	-
Stage 2	265	283	-	335	498	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.4	55.7	3	0
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	996	-	-	91	522	75	1136	-	-
HCM Lane V/C Ratio	0.202	-	-	0.396	0.273	0.053	0.001	-	-
HCM Control Delay (s)	9.5	0	-	68.4	14.5	55.7	8.2	0	-
HCM Lane LOS	A	A	-	F	B	F	A	A	-
HCM 95th %tile Q(veh)	0.8	-	-	1.6	1.1	0.2	0	-	-

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	109	1	1	0	183	426	1	1	569	28
Future Vol, veh/h	27	0	109	1	1	0	183	426	1	1	569	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	50	50	50	88	88	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	36	0	145	2	2	0	208	484	1	1	618	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1537	1536	633	1609	1551	485	648	0	0	485	0	0
Stage 1	635	635	-	901	901	-	-	-	-	-	-	-
Stage 2	902	901	-	708	650	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	96	117	483	85	115	586	947	-	-	1088	-	-
Stage 1	470	476	-	335	360	-	-	-	-	-	-	-
Stage 2	335	360	-	429	468	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	72	82	483	46	80	586	947	-	-	1088	-	-
Mov Cap-2 Maneuver	72	82	-	46	80	-	-	-	-	-	-	-
Stage 1	329	476	-	234	252	-	-	-	-	-	-	-
Stage 2	232	252	-	300	468	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	31.8	71.6	3	0
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	947	-	-	72	483	58	1088	-	-
HCM Lane V/C Ratio	0.22	-	-	0.5	0.301	0.069	0.001	-	-
HCM Control Delay (s)	9.9	0	-	97.1	15.6	71.6	8.3	0	-
HCM Lane LOS	A	A	-	F	C	F	A	A	-
HCM 95th %tile Q(veh)	0.8	-	-	2.1	1.3	0.2	0	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	61	481	30	23	542
Future Vol, veh/h	30	61	481	30	23	542
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	82	82	93	93
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	38	78	587	37	25	583

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1239	606	0	0	624	0
Stage 1	606	-	-	-	-	-
Stage 2	633	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	196	501	-	-	967	-
Stage 1	548	-	-	-	-	-
Stage 2	533	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	189	501	-	-	967	-
Mov Cap-2 Maneuver	189	-	-	-	-	-
Stage 1	527	-	-	-	-	-
Stage 2	533	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.2	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	324	967	-
HCM Lane V/C Ratio	-	-	0.36	0.026	-
HCM Control Delay (s)	-	-	22.2	8.8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.6	0.1	-

Intersection	
Int Delay, s/veh	4.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	41	71	574	46	39	632
Future Vol, veh/h	41	71	574	46	39	632
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	82	82	93	93
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	53	91	700	56	42	680

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1492	728	0	0	756	0
Stage 1	728	-	-	-	-	-
Stage 2	764	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	137	427	-	-	864	-
Stage 1	482	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Platoon blocked, %				-		-
Mov Cap-1 Maneuver	126	427	-	-	864	-
Mov Cap-2 Maneuver	126	-	-	-	-	-
Stage 1	444	-	-	-	-	-
Stage 2	463	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	44.3	0	0.5
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	228	864	-
HCM Lane V/C Ratio	-	-	0.63	0.049	-
HCM Control Delay (s)	-	-	44.3	9.4	0
HCM Lane LOS	-	-	E	A	A
HCM 95th %tile Q(veh)	-	-	3.8	0.2	-

Intersection	
Int Delay, s/veh	5.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	41	71	629	46	39	694
Future Vol, veh/h	41	71	629	46	39	694
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	82	82	93	93
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	53	91	767	56	42	746

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1625	795	0	0	823	0
Stage 1	795	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	114	391	-	-	816	-
Stage 1	448	-	-	-	-	-
Stage 2	432	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	104	391	-	-	816	-
Mov Cap-2 Maneuver	104	-	-	-	-	-
Stage 1	409	-	-	-	-	-
Stage 2	432	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	62.3	0	0.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	195	816	-
HCM Lane V/C Ratio	-	-	0.736	0.051	-
HCM Control Delay (s)	-	-	62.3	9.7	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	4.8	0.2	-

Intersection	
Int Delay, s/veh	5.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	89	23	491	72	13	589
Future Vol, veh/h	89	23	491	72	13	589
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	82	82	93	93
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	114	29	599	88	14	633

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1304	643	0	0	687	0
Stage 1	643	-	-	-	-	-
Stage 2	661	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	179	477	-	-	916	-
Stage 1	527	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	175	477	-	-	916	-
Mov Cap-2 Maneuver	175	-	-	-	-	-
Stage 1	527	-	-	-	-	-
Stage 2	505	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	58.1	0	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	201	916	-
HCM Lane V/C Ratio	-	-	0.714	0.015	-
HCM Control Delay (s)	-	-	58.1	9	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	4.6	0	-

Intersection	
Int Delay, s/veh	8.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	89	23	546	72	13	651
Future Vol, veh/h	89	23	546	72	13	651
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	82	82	93	93
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	114	29	666	88	14	700

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1438	710	0	0	754	0
Stage 1	710	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	148	437	-	-	865	-
Stage 1	491	-	-	-	-	-
Stage 2	482	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	144	437	-	-	865	-
Mov Cap-2 Maneuver	144	-	-	-	-	-
Stage 1	491	-	-	-	-	-
Stage 2	469	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	91.6	0	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	167	865	-
HCM Lane V/C Ratio	-	-	0.86	0.016	-
HCM Control Delay (s)	-	-	91.6	9.2	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	6	0	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	19	351	36	23	457
Future Vol, veh/h	30	19	351	36	23	457
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	87	87	94	94
Heavy Vehicles, %	0	0	0	3	4	1
Mvmt Flow	39	25	403	41	24	486

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	958	424	0	0	444	0
Stage 1	424	-	-	-	-	-
Stage 2	534	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.14	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.236	-
Pot Cap-1 Maneuver	288	634	-	-	1106	-
Stage 1	664	-	-	-	-	-
Stage 2	592	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	279	634	-	-	1106	-
Mov Cap-2 Maneuver	279	-	-	-	-	-
Stage 1	644	-	-	-	-	-
Stage 2	592	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.3	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	356	1106	-
HCM Lane V/C Ratio	-	-	0.179	0.022	-
HCM Control Delay (s)	-	-	17.3	8.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	44	32	419	49	36	530
Future Vol, veh/h	44	32	419	49	36	530
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	87	87	94	94
Heavy Vehicles, %	0	0	0	3	4	1
Mvmt Flow	57	42	482	56	38	564

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1150	510	0	0	538	0
Stage 1	510	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.14	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.236	-
Pot Cap-1 Maneuver	221	567	-	-	1020	-
Stage 1	607	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	209	567	-	-	1020	-
Mov Cap-2 Maneuver	209	-	-	-	-	-
Stage 1	574	-	-	-	-	-
Stage 2	529	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.2	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	285	1020	-
HCM Lane V/C Ratio	-	-	0.346	0.038	-
HCM Control Delay (s)	-	-	24.2	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.5	0.1	-

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	44	32	460	49	36	583
Future Vol, veh/h	44	32	460	49	36	583
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	87	87	94	94
Heavy Vehicles, %	0	0	0	3	4	1
Mvmt Flow	57	42	529	56	38	620

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1253	557	0	0	585	0
Stage 1	557	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.14	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.236	-
Pot Cap-1 Maneuver	192	534	-	-	980	-
Stage 1	578	-	-	-	-	-
Stage 2	498	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	181	534	-	-	980	-
Mov Cap-2 Maneuver	181	-	-	-	-	-
Stage 1	544	-	-	-	-	-
Stage 2	498	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.3	0	0.5
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	251	980	-
HCM Lane V/C Ratio	-	-	0.393	0.039	-
HCM Control Delay (s)	-	-	28.3	8.8	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	1.8	0.1	-

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	66	10	331	73	12	477
Future Vol, veh/h	66	10	331	73	12	477
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	87	87	94	94
Heavy Vehicles, %	0	0	0	3	4	1
Mvmt Flow	86	13	380	84	13	507

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	955	422	0	0	464	0
Stage 1	422	-	-	-	-	-
Stage 2	533	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.14	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.236	-
Pot Cap-1 Maneuver	289	636	-	-	1087	-
Stage 1	666	-	-	-	-	-
Stage 2	593	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	284	636	-	-	1087	-
Mov Cap-2 Maneuver	284	-	-	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	583	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.3	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	306	1087	-
HCM Lane V/C Ratio	-	-	0.323	0.012	-
HCM Control Delay (s)	-	-	22.3	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.4	0	-

Intersection						
Int Delay, s/veh	2.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	66	10	372	73	12	530
Future Vol, veh/h	66	10	372	73	12	530
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	87	87	94	94
Heavy Vehicles, %	0	0	0	3	4	1
Mvmt Flow	86	13	428	84	13	564

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1060	470	0	0	512	0
Stage 1	470	-	-	-	-	-
Stage 2	590	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.14	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.236	-
Pot Cap-1 Maneuver	250	598	-	-	1043	-
Stage 1	633	-	-	-	-	-
Stage 2	558	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	246	598	-	-	1043	-
Mov Cap-2 Maneuver	246	-	-	-	-	-
Stage 1	633	-	-	-	-	-
Stage 2	548	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.2	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	267	1043	-
HCM Lane V/C Ratio	-	-	0.37	0.012	-
HCM Control Delay (s)	-	-	26.2	8.5	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	1.6	0	-

Intersection						
Int Delay, s/veh	2.7					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	104	101	5	222	108	4
Future Vol, veh/h	104	101	5	222	108	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	116	112	6	247	120	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	228	0	431	172
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	259	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1352	-	585	877
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	789	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1352	-	582	877
Mov Cap-2 Maneuver	-	-	-	-	582	-
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	785	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	589	-	-	1352	-
HCM Lane V/C Ratio	0.211	-	-	0.004	-
HCM Control Delay (s)	12.7	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Intersection						
Int Delay, s/veh	2.7					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	104	101	5	222	108	4
Future Vol, veh/h	104	101	5	222	108	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	116	112	6	247	120	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	228	0	431	172
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	259	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1352	-	585	877
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	789	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1352	-	582	877
Mov Cap-2 Maneuver	-	-	-	-	582	-
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	785	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	589	-	-	1352	-
HCM Lane V/C Ratio	0.211	-	-	0.004	-
HCM Control Delay (s)	12.7	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Intersection						
Int Delay, s/veh	3.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	110	124	9	185	152	8
Future Vol, veh/h	110	124	9	185	152	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	122	138	10	206	169	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	260	0	417	191
Stage 1	-	-	-	-	191	-
Stage 2	-	-	-	-	226	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1316	-	596	856
Stage 1	-	-	-	-	846	-
Stage 2	-	-	-	-	816	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1316	-	591	856
Mov Cap-2 Maneuver	-	-	-	-	591	-
Stage 1	-	-	-	-	846	-
Stage 2	-	-	-	-	809	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	600	-	-	1316	-
HCM Lane V/C Ratio	0.296	-	-	0.008	-
HCM Control Delay (s)	13.5	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	0	-

Intersection						
Int Delay, s/veh	3.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	110	124	9	185	152	8
Future Vol, veh/h	110	124	9	185	152	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	122	138	10	206	169	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	260	0	417	191
Stage 1	-	-	-	-	191	-
Stage 2	-	-	-	-	226	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1316	-	596	856
Stage 1	-	-	-	-	846	-
Stage 2	-	-	-	-	816	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1316	-	591	856
Mov Cap-2 Maneuver	-	-	-	-	591	-
Stage 1	-	-	-	-	846	-
Stage 2	-	-	-	-	809	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	600	-	-	1316	-
HCM Lane V/C Ratio	0.296	-	-	0.008	-
HCM Control Delay (s)	13.5	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	91	17	8	209	18	7
Future Vol, veh/h	91	17	8	209	18	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	101	19	9	232	20	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	120	0	361	111
Stage 1	-	-	-	-	111	-
Stage 2	-	-	-	-	250	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1480	-	642	948
Stage 1	-	-	-	-	919	-
Stage 2	-	-	-	-	796	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1480	-	638	948
Mov Cap-2 Maneuver	-	-	-	-	638	-
Stage 1	-	-	-	-	919	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	702	-	-	1480	-
HCM Lane V/C Ratio	0.04	-	-	0.006	-
HCM Control Delay (s)	10.3	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	91	17	8	209	18	7
Future Vol, veh/h	91	17	8	209	18	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	101	19	9	232	20	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	120	0	361	111
Stage 1	-	-	-	-	111	-
Stage 2	-	-	-	-	250	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1480	-	642	948
Stage 1	-	-	-	-	919	-
Stage 2	-	-	-	-	796	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1480	-	638	948
Mov Cap-2 Maneuver	-	-	-	-	638	-
Stage 1	-	-	-	-	919	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	702	-	-	1480	-
HCM Lane V/C Ratio	0.04	-	-	0.006	-
HCM Control Delay (s)	10.3	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection						
Int Delay, s/veh	1.1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	103	15	4	169	25	4
Future Vol, veh/h	103	15	4	169	25	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	114	17	4	188	28	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	131	0	319	123
Stage 1	-	-	-	-	123	-
Stage 2	-	-	-	-	196	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1467	-	678	933
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	842	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1467	-	676	933
Mov Cap-2 Maneuver	-	-	-	-	676	-
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	839	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	703	-	-	1467	-
HCM Lane V/C Ratio	0.046	-	-	0.003	-
HCM Control Delay (s)	10.4	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	103	15	4	169	25	4
Future Vol, veh/h	103	15	4	169	25	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	114	17	4	188	28	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	131	0	319	123
Stage 1	-	-	-	-	123	-
Stage 2	-	-	-	-	196	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1467	-	678	933
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	842	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1467	-	676	933
Mov Cap-2 Maneuver	-	-	-	-	676	-
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	839	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	703	-	-	1467	-
HCM Lane V/C Ratio	0.046	-	-	0.003	-
HCM Control Delay (s)	10.4	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection						
Int Delay, s/veh	0.2					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	90	8	1	212	5	1
Future Vol, veh/h	90	8	1	212	5	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	100	9	1	236	6	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	109	0	343	105
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	238	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1494	-	657	955
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	806	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1494	-	656	955
Mov Cap-2 Maneuver	-	-	-	-	656	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	805	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	692	-	-	1494	-
HCM Lane V/C Ratio	0.01	-	-	0.001	-
HCM Control Delay (s)	10.3	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection						
Int Delay, s/veh	0.2					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	90	8	1	212	5	1
Future Vol, veh/h	90	8	1	212	5	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	100	9	1	236	6	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	109	0	343	105
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	238	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1494	-	657	955
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	806	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1494	-	656	955
Mov Cap-2 Maneuver	-	-	-	-	656	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	805	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	692	-	-	1494	-
HCM Lane V/C Ratio	0.01	-	-	0.001	-
HCM Control Delay (s)	10.3	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection						
Int Delay, s/veh	0.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	101	6	1	166	7	1
Future Vol, veh/h	101	6	1	166	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	112	7	1	184	8	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	119	0	302	116
Stage 1	-	-	-	-	116	-
Stage 2	-	-	-	-	186	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1482	-	694	942
Stage 1	-	-	-	-	914	-
Stage 2	-	-	-	-	851	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1482	-	693	942
Mov Cap-2 Maneuver	-	-	-	-	693	-
Stage 1	-	-	-	-	914	-
Stage 2	-	-	-	-	850	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	717	-	-	1482	-
HCM Lane V/C Ratio	0.012	-	-	0.001	-
HCM Control Delay (s)	10.1	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection						
Int Delay, s/veh	0.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	101	6	1	166	7	1
Future Vol, veh/h	101	6	1	166	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	112	7	1	184	8	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	119	0	302	116
Stage 1	-	-	-	-	116	-
Stage 2	-	-	-	-	186	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1482	-	694	942
Stage 1	-	-	-	-	914	-
Stage 2	-	-	-	-	851	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1482	-	693	942
Mov Cap-2 Maneuver	-	-	-	-	693	-
Stage 1	-	-	-	-	914	-
Stage 2	-	-	-	-	850	-

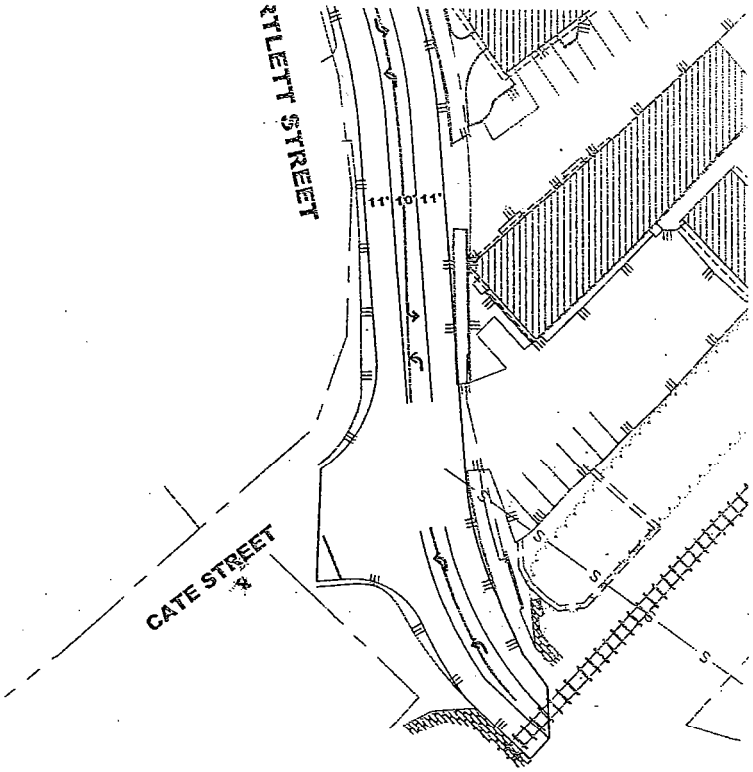
Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	717	-	-	1482	-
HCM Lane V/C Ratio	0.012	-	-	0.001	-
HCM Control Delay (s)	10.1	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

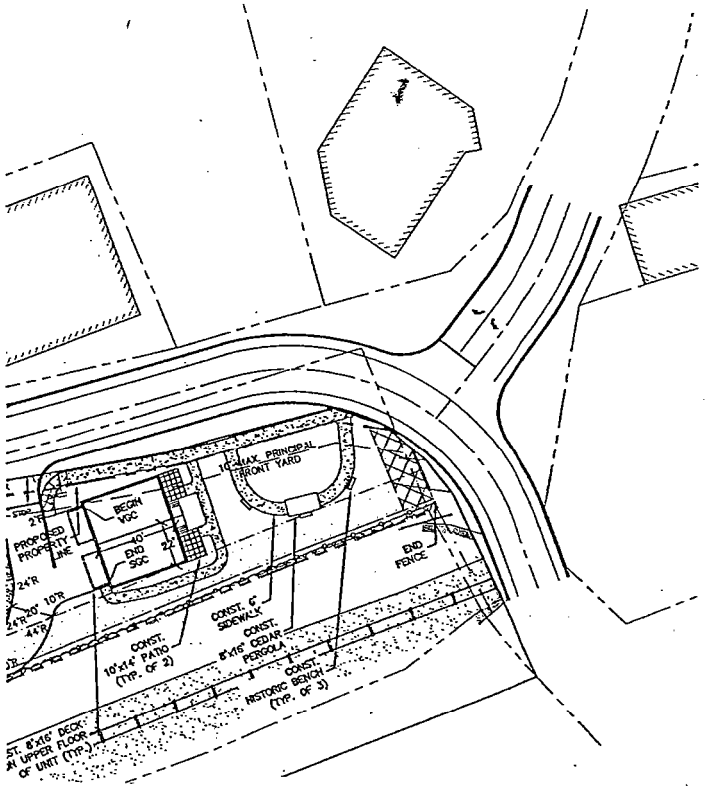
Appendix K **Bartlett Street / Cate Street Alternative Layouts & Analyses**

ALTERNATIVE CONFIGURATION SKETCHES

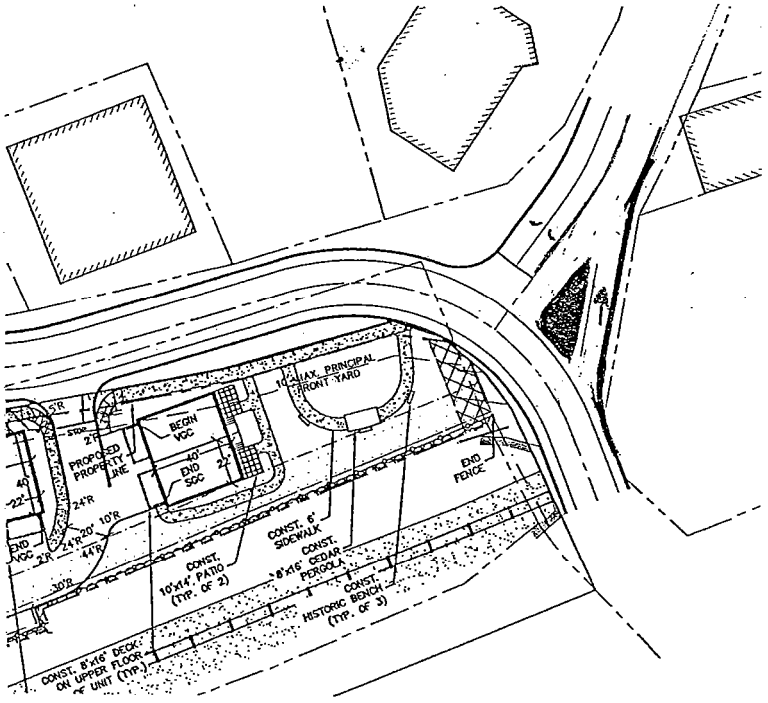
Stephen G. Pernaw & Company, Inc.



CONFIGURATION A



CONFIGURATION B



CONFIGURATION C

Intersection						
Int Delay, s/veh	37.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	31	146	227	596	693	64
Future Vol, veh/h	31	146	227	596	693	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	41	192	273	718	762	70

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2061	797	832	0	-	0
Stage 1	797	-	-	-	-	-
Stage 2	1264	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.2	-	-	-
Pot Cap-1 Maneuver	61	387	809	-	-	-
Stage 1	447	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 40	387	809	-	-	-
Mov Cap-2 Maneuver	~ 40	-	-	-	-	-
Stage 1	296	-	-	-	-	-
Stage 2	268	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s$	314.5	3.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	809	-	154	-	-
HCM Lane V/C Ratio	0.338	-	1.512	-	-
HCM Control Delay (s)	11.7	-	$ 314.5	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	1.5	-	15.5	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	109	183	426	569	28
Future Vol, veh/h	27	109	183	426	569	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	85	85	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	36	145	215	501	618	30

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1564	633	648	0	-	0
Stage 1	633	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	124	483	947	-	-	-
Stage 1	533	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	96	483	947	-	-	-
Mov Cap-2 Maneuver	96	-	-	-	-	-
Stage 1	412	-	-	-	-	-
Stage 2	387	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.5	3	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	947	-	268	-	-
HCM Lane V/C Ratio	0.227	-	0.677	-	-
HCM Control Delay (s)	9.9	-	42.5	-	-
HCM Lane LOS	A	-	E	-	-
HCM 95th %tile Q(veh)	0.9	-	4.4	-	-

Intersection						
Int Delay, s/veh	116.7					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	146	227	596	693	64
Future Vol, veh/h	31	146	227	596	693	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	41	192	273	718	762	70

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	991	0	-	0	547	273
Stage 1	-	-	-	-	273	-
Stage 2	-	-	-	-	274	-
Critical Hdwy	4.1	-	-	-	6.41	6.29
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.381
Pot Cap-1 Maneuver	706	-	-	-	~ 500	749
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	774	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	706	-	-	-	~ 468	749
Mov Cap-2 Maneuver	-	-	-	-	~ 468	-
Stage 1	-	-	-	-	~ 725	-
Stage 2	-	-	-	-	774	-

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	288
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	706	-	-	-	468	749
HCM Lane V/C Ratio	0.058	-	-	-	1.627	0.094
HCM Control Delay (s)	10.4	0	-	-	$ 313.7	10.3
HCM Lane LOS	B	A	-	-	F	B
HCM 95th %tile Q(veh)	0.2	-	-	-	43.3	0.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	38.6					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	109	183	426	569	28
Future Vol, veh/h	27	109	183	426	569	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	88	88	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	36	145	208	484	618	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	692	0	-	0	425	208
Stage 1	-	-	-	-	208	-
Stage 2	-	-	-	-	217	-
Critical Hdwy	4.1	-	-	-	6.41	6.2
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.3
Pot Cap-1 Maneuver	912	-	-	-	~ 588	837
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	822	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	912	-	-	-	~ 563	837
Mov Cap-2 Maneuver	-	-	-	-	~ 563	-
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	822	-

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	90
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	912	-	-	-	563	837
HCM Lane V/C Ratio	0.039	-	-	-	1.099	0.036
HCM Control Delay (s)	9.1	0	-	-	94	9.5
HCM Lane LOS	A	A	-	-	F	A
HCM 95th %tile Q(veh)	0.1	-	-	-	19.1	0.1

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	108.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	146	227	596	693	64
Future Vol, veh/h	31	146	227	596	693	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	41	192	273	718	762	70

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	273	0	-	0	547	273
Stage 1	-	-	-	-	273	-
Stage 2	-	-	-	-	274	-
Critical Hdwy	4.1	-	-	-	6.41	6.29
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.381
Pot Cap-1 Maneuver	1302	-	-	-	~ 500	749
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	774	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1302	-	-	-	~ 483	749
Mov Cap-2 Maneuver	-	-	-	-	~ 483	-
Stage 1	-	-	-	-	~ 748	-
Stage 2	-	-	-	-	774	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	267.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1302	-	-	-	483	749
HCM Lane V/C Ratio	0.031	-	-	-	1.577	0.094
HCM Control Delay (s)	7.9	0	-	-	291	10.3
HCM Lane LOS	A	A	-	-	F	B
HCM 95th %tile Q(veh)	0.1	-	-	-	41.7	0.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	36.1					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	109	183	426	569	28
Future Vol, veh/h	27	109	183	426	569	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	88	88	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	36	145	208	484	618	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	208	0	-	0	425	208
Stage 1	-	-	-	-	208	-
Stage 2	-	-	-	-	217	-
Critical Hdwy	4.1	-	-	-	6.41	6.2
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.3
Pot Cap-1 Maneuver	1375	-	-	-	~ 588	837
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	822	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1375	-	-	-	~ 572	837
Mov Cap-2 Maneuver	-	-	-	-	~ 572	-
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	822	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	84.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1375	-	-	-	572	837
HCM Lane V/C Ratio	0.026	-	-	-	1.081	0.036
HCM Control Delay (s)	7.7	0	-	-	87.9	9.5
HCM Lane LOS	A	A	-	-	F	A
HCM 95th %tile Q(veh)	0.1	-	-	-	18.4	0.1

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

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Transportation: Engineering • Planning • Design

M E M O R A N D U M

Ref: 1831A

To: Juliet T.H. Walker, AICP
City of Portsmouth

From: Stephen G. Pernaw, P.E., PTOE

Subject: Updated Traffic Study – Proposed Mixed-Use Site
Portsmouth, New Hampshire

Date: June 10, 2019

On April 24, 2019 our office published the report entitled *"Traffic Impact and Site Access Study-Updated / Proposed Mixed-Use Site"* for Torrington Properties, Inc. to assess the traffic impacts associated with the proposed residential/commercial development located on the east side of US1 Bypass at the site of the Frank Jones Center in Portsmouth, New Hampshire. We are now in receipt of peer review comments from The Engineering Corporation (TEC) dated June 3, 2019. The purpose of this memorandum is to respond to their request in Comment #9 (Page 4 of 7).

TEC Comment 1: Cate Street/Bartlett Street – *"TEC requests that additional analyses be performed for the 2018 Existing, 2020 No Build, 2020 Build and 2030 No Build conditions for Configuration C of the Cate Street/Bartlett Street intersection to show the progression of the operation of this intersection."*

SGP & Company, Inc. Response: The table below and Attachments 1-5.

Alternative Mitigation Evaluation - Bartlett Street/Cate Street Realignment
Alternative Configuration C - Weekday PM Peak Hour
June 10, 2019

		2018 Existing	2020 No-Build	2020 Build	2030 No Build	2030 Build
Overall Intersection Delay (sec)		10.6	26.8	78.3	44.7	108.3
Volume to Capacity Ratio	EBL	0.00	0.00	0.03	0.00	0.03
	SBL	0.79	1.02	1.04	1.15	1.58
	SBR	0.01	0.02	0.09	0.02	0.09
Movement Delay (sec)	EBL	7	8	8	8	8
	SBL	24	64	214	106	291
	SBR	9	9	10	9	10
Level of Service	EBL	A	A	A	A	A
	SBL	C	F	F	F	F
	SBR	A	A	B	A	B
95th Percentile Queue	EBL	<1	<1	<1	<1	<1
	SBL	8	18	33	25	42
	SBR	<1	<1	<1	<1	<1

cc: Jay Bisognano, Torrington Properties, Inc.
Gregg M. Mikolaities, P.E., August Consulting, PLLC

HCM 2010 TWSC
1: Cate St. Realigned/Cate Street Realigned & Bartlett Street

Intersection	
Int Delay, s/veh	10.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	63	80	513	578	12
Future Vol, veh/h	2	63	80	513	578	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Stop
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	3	83	96	618	635	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	96	0	-	0	185	96
Stage 1	-	-	-	-	96	-
Stage 2	-	-	-	-	89	-
Critical Hdwy	4.1	-	-	-	6.41	6.29
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.381
Pot Cap-1 Maneuver	1510	-	-	-	807	942
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	937	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1510	-	-	-	805	942
Mov Cap-2 Maneuver	-	-	-	-	805	-
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	937	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	23.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1510	-	-	-	805	942
HCM Lane V/C Ratio	0.002	-	-	-	0.789	0.014
HCM Control Delay (s)	7.4	0	-	-	24	8.9
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0	-	-	-	8.1	0

HCM 2010 TWSC
1: Cate St. Realigned/Cate Street Realigned & Bartlett Street

Intersection	
Int Delay, s/veh	26.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	86	121	622	673	13
Future Vol, veh/h	3	86	121	622	673	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Stop
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	4	113	146	749	740	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	146	0	-	0	267	146
Stage 1	-	-	-	-	146	-
Stage 2	-	-	-	-	121	-
Critical Hdwy	4.1	-	-	-	6.41	6.29
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.381
Pot Cap-1 Maneuver	1448	-	-	-	~ 724	883
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	907	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1448	-	-	-	~ 722	883
Mov Cap-2 Maneuver	-	-	-	-	~ 722	-
Stage 1	-	-	-	-	881	-
Stage 2	-	-	-	-	907	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	62.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1448	-	-	-	722	883
HCM Lane V/C Ratio	0.003	-	-	-	1.024	0.016
HCM Control Delay (s)	7.5	0	-	-	63.7	9.1
HCM Lane LOS	A	A	-	-	F	A
HCM 95th %tile Q(veh)	0	-	-	-	17.8	0

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 TWSC
1: Cate St. Realigned/Cate Street Realigned & Bartlett Street

Intersection	
Int Delay, s/veh	78.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑	↱	↰	↱
Traffic Vol, veh/h	31	140	218	538	628	63
Future Vol, veh/h	31	140	218	538	628	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Stop
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	41	184	263	648	690	69

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	263	0	-	0	529	263
Stage 1	-	-	-	-	263	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	4.1	-	-	-	6.41	6.29
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.381
Pot Cap-1 Maneuver	1313	-	-	-	~ 512	759
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	781	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1313	-	-	-	~ 494	759
Mov Cap-2 Maneuver	-	-	-	-	~ 494	-
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	781	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	195.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1313	-	-	-	494	759
HCM Lane V/C Ratio	0.031	-	-	-	1.397	0.091
HCM Control Delay (s)	7.8	0	-	-	213.7	10.2
HCM Lane LOS	A	A	-	-	F	B
HCM 95th %tile Q(veh)	0.1	-	-	-	32.5	0.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 TWSC
1: Cate St. Realigned/Cate Street Realigned & Bartlett Street

Intersection	
Int Delay, s/veh	44.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↱	↰	↱
Traffic Vol, veh/h	3	92	130	680	738	14
Future Vol, veh/h	3	92	130	680	738	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Stop
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	4	121	157	819	811	15

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	157	0	-	0	286	157
Stage 1	-	-	-	-	157	-
Stage 2	-	-	-	-	129	-
Critical Hdwy	4.1	-	-	-	6.41	6.29
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.381
Pot Cap-1 Maneuver	1435	-	-	-	~ 706	870
Stage 1	-	-	-	-	874	-
Stage 2	-	-	-	-	899	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1435	-	-	-	~ 704	870
Mov Cap-2 Maneuver	-	-	-	-	~ 704	-
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	899	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	104.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1435	-	-	-	704	870
HCM Lane V/C Ratio	0.003	-	-	-	1.152	0.018
HCM Control Delay (s)	7.5	0	-	-	106.1	9.2
HCM Lane LOS	A	A	-	-	F	A
HCM 95th %tile Q(veh)	0	-	-	-	25.4	0.1

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 TWSC
1: Cate St. Realigned/Cate Street Realigned & Bartlett Street

Intersection	
Int Delay, s/veh	108.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	146	227	596	693	64
Future Vol, veh/h	31	146	227	596	693	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Stop
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	41	192	273	718	762	70

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	273	0	-	0	547	273
Stage 1	-	-	-	-	273	-
Stage 2	-	-	-	-	274	-
Critical Hdwy	4.1	-	-	-	6.41	6.29
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.381
Pot Cap-1 Maneuver	1302	-	-	-	~ 500	749
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	774	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1302	-	-	-	~ 483	749
Mov Cap-2 Maneuver	-	-	-	-	~ 483	-
Stage 1	-	-	-	-	~ 748	-
Stage 2	-	-	-	-	774	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	267.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1302	-	-	-	483	749
HCM Lane V/C Ratio	0.031	-	-	-	1.577	0.094
HCM Control Delay (s)	7.9	0	-	-	291	10.3
HCM Lane LOS	A	A	-	-	F	B
HCM 95th %tile Q(veh)	0.1	-	-	-	41.7	0.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

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Transportation: Engineering • Planning • Design

M E M O R A N D U M

Ref: 1831A

To: Juliet T.H. Walker, AICP
City of Portsmouth

From: Stephen G. Pernaw, P.E., PTOE

Subject: West End Yards Traffic Study – ADDENDUM 1
Portsmouth, New Hampshire

Date: July 25, 2019

On April 24, 2019 our office published the report entitled *"Traffic Impact and Site Access Study-Updated / Proposed Mixed-Use Site"* for Torrington Properties, Inc. to assess the traffic impacts associated with the proposed West End Yards residential/commercial development located on the east side of US1 Bypass at the site of the Frank Jones Center in Portsmouth, New Hampshire.

We recently received the plan entitled *"Roadway Plan & Profile – Cate Street,"* Sheet CS-101, prepared by Fuss & O'Neill dated 06/20/2019 (revised 06/20/2019) that shows the widening of the Cate Street Extension approach to the Bypass from two to three westbound lanes (see Attachment 1). The proposed lane configuration includes one exclusive left-turn lane, one shared through-right lane, and one exclusive right-turn lane. As recommended by The Engineering Corporation (TEC), the City's peer review engineer, the previously proposed northbound right-turn lane on US1 Bypass at the Cottage Street/Coakley Road intersection has been eliminated.

The purpose of this memorandum is to provide the City with the updated intersection capacity and Level of Service analyses for these two signalized intersections on the Bypass. Table 6 from the original traffic report has been updated with a new column labeled "Mitigation 2" and is found on the following page. The computations are attached (see Attachments 2-7).

We remain available to discuss these findings with TEC and the City staff, if necessary.

Attachments

cc: Jay Bisognano, Torrington Properties, Inc.
Gregg M. Mikolaities, P.E., August Consulting, PLLC
Richard Lundborn, P.E., Fuss & O'Neill

Table 6
(Addendum 1)

Signal-Controlled Intersection Capacity Analysis Summary - with Mitigation
2030 Weekday PM Peak Hour

	2030 No-Build				2030 Build				2030 Build w/Mitigation 2			
	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]
US1 Bypass/Cottage St/Coakley Rd [5]												
Coakley Road - EB LT&TH& RT	0.34	39.4	D	2 (3)	0.49	45.7	D	2 (3)	0.49	45.7	D	2 (3)
Cottage Street - WB LT&TH	1.03	104.8	F	10 (13)	1.17	156.4	F	11 (14)	1.17	156.4	F	11 (14)
Cottage Street - WB RT	0.33	40.2	D	2 (4)	0.10	40.9	D	0 (2)	0.06	40.5	D	0 (0)
US1 Bypass - NB LT	0.28	58.1	E	0 (1)	0.28	51.7	D	1 (1)	0.21	54.4	D	0 (1)
US1 Bypass - NB 2TH&RT	1.03	46.5	D	40 (45)	1.12	70.3	E	48 (49)	1.12	69.8	E	49 (53)
US1 Bypass - NB 2TH	-	-	-	-	-	-	-	-	-	-	-	-
US1 Bypass - NB RT	-	-	-	-	-	-	-	-	-	-	-	-
US1 Bypass - SB LT	0.76	86.0	F	2 (5)	0.63	69.6	E	2 (4)	0.63	69.6	E	2 (4)
US1 Bypass - SB 2TH&RT	0.44	11.8	B	6 (10)	0.49	10.6	B	6 (11)	0.50	11.4	B	6 (15)
Overall	**1.01**	**42.5**	**D**		**1.10**	**58.5**	**E**		**1.10**	**58.5**	**E**	
Cycle Length	**120.0**				**120.0**				**120.0**			
US1 Bypass/Borthwick Ave/Cate St Extension [6]												
Borthwick Avenue - EB LT	0.77	52.2	D	9 (12)	0.96	88.0	F	10 (15)	0.87	46.3	E	9 (14)
Borthwick Avenue - EB LT&TH	0.77	52.2	D	9 (12)	0.97	90.4	F	10 (15)	0.88	46.4	E	10 (14)
Borthwick Avenue - EB RT	0.07	37.9	D	0 (1)	0.07	42.2	D	0 (0)	0.07	40.3	D	0 (0)
Cate Street Extension - WB LT	0.12	55.8	E	0 (1)	0.23	46.1	D	2 (3)	0.48	54.0	E	2 (4)
Cate Street Extension - WB TH&RT	0.01	55.0	D	0 (0)	1.03	117.6	F	7 (15)	0.22	53.0	D	0 (4)
Cate Street Extension - WB LT&TH&RT	-	-	-	-	-	-	-	-	-	-	-	-
Cate Street Extension - WB RT	-	-	-	-	-	-	-	-	0.11	54.4	E	0 (2)
US1 Bypass - NB LT	0.47	60.0	E	1 (3)	0.51	61.7	E	1 (3)	0.31	53.3	D	1 (3)
US1 Bypass - NB 2TH&RT	0.73	22.0	C	16 (24)	0.98	54.6	D	23 (30)	0.89	29.4	D	21 (25)
US1 Bypass - SB LT	0.22	71.6	E	0 (1)	0.95	91.5	F	6 (11)	0.88	51.0	E	5 (10)
US1 Bypass - SB 2TH&RT	0.65	19.0	B	15 (20)	0.69	22.9	C	13 (19)	0.65	20.3	B	17 (5)
Overall	**0.72**	**27.4**	**C**		**1.00**	**56.9**	**E**		**0.89**	**39.1**	**D**	
Cycle Length	**120.0**				**120.0**				**120.0**			

1) Volume-to-capacity ratio, 2) Delay in vehicles per seconds, 3) Level of Service, 4) Queue length in vehicles
5) Mitigation 2 = Maintain existing lanes, optimize signal phasing and offset.
6) Mitigation 2 = Widen WB approach to three lanes: one exclusive left-turn lane, one shared through-right lane, and one exclusive right-turn lane

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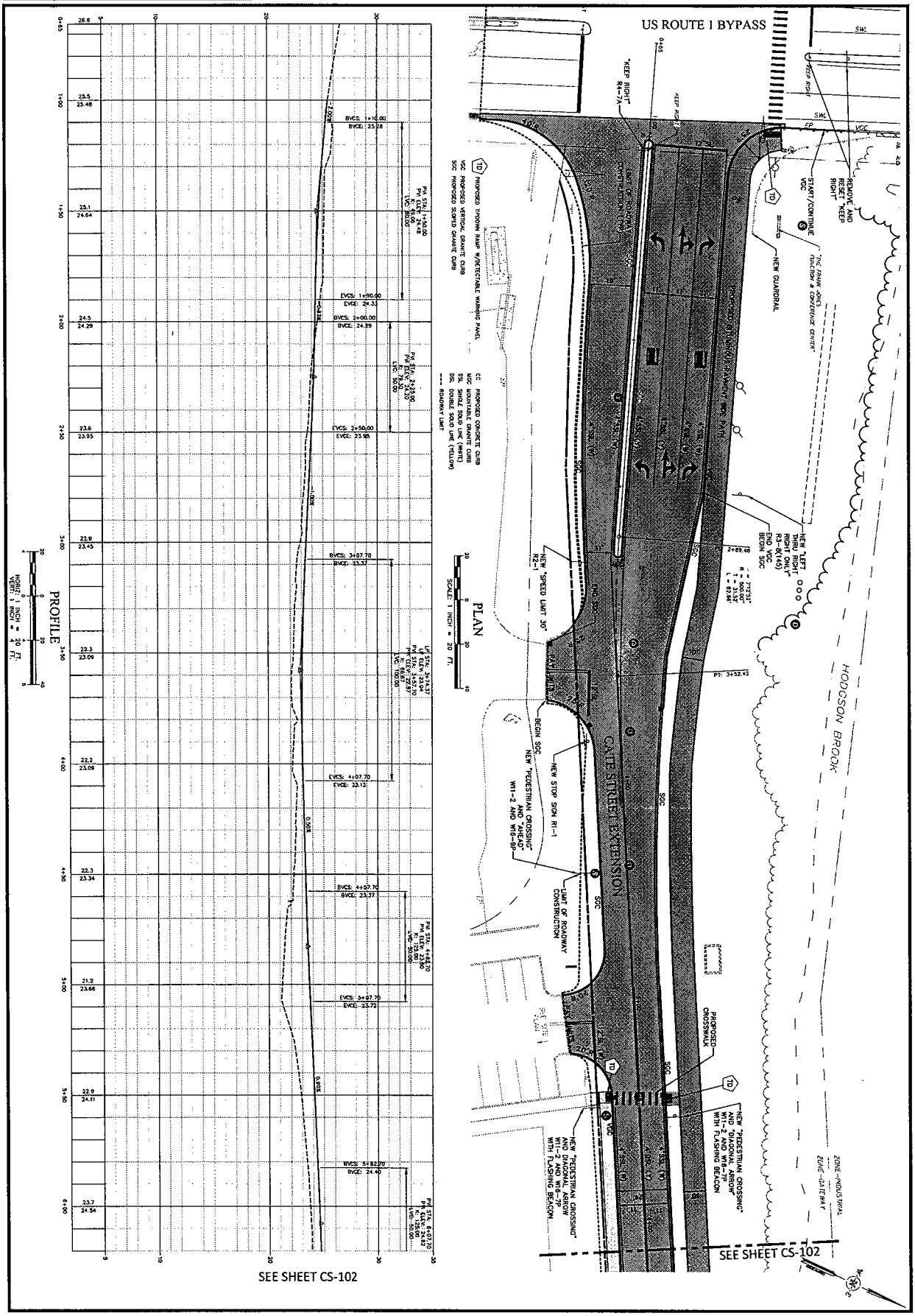
MS VIEW: | LAYER STATE: | Plotter: DWG TO PDF.PC3 CTB File: FO.STB



CS-101	PROJ. NO.: 20180317A10 DATE: 06/20/2019	CATE STREET DEVELOPMENT, LLC ROADWAY PLAN & PROFILE CATE STREET PORTSMOUTH NEW HAMPSHIRE	FUSS & O'NEILL UPPER SQUARE BUSINESS CENTER 5 FLETCHER STREET, SUITE 1 KENNEBUNK, MAINE 04043 207.363.0669 www.fando.com	SCALE: HORZ.: VERT.: DATUM: HORZ.: NAD83 VERT.: NGVD29 0 GRAPHIC SCALE	RICHARD LORDBORN No. 10843 LICENSED PROFESSIONAL ENGINEER

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
3.	6/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
2.	5/20/2019	TAC SUBMITTAL	JVA/DAD	RRL
1.	3/18/2019	TAC SUBMITTAL	JVA/DAD	RRL

Attachment 1

HCM Signalized Intersection Capacity Analysis
1: US1 Bypass & Coakly Road/Cottage Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	6	10	220	10	74	15	1901	217	56	1131	10
Future Volume (vph)	38	6	10	220	10	74	15	1901	217	56	1131	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	*0.88		1.00	0.95	
Frt		0.97			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1763	1615	1805	3228		1805	3535	
Flt Permitted		0.34			0.70	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		625			1298	1615	1805	3228		1805	3535	
Peak-hour factor, PHF	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90	0.99	0.99	0.99
Adj. Flow (vph)	48	8	13	289	13	97	17	2112	241	57	1142	10
RTOR Reduction (vph)	0	7	0	0	0	79	0	6	0	0	0	0
Lane Group Flow (vph)	0	62	0	0	302	18	17	2347	0	57	1152	0
Heavy Vehicles (%)	3%	0%	0%	3%	0%	0%	0%	2%	2%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		22.0			22.0	22.0	3.4	76.0		4.0	76.6	
Effective Green, g (s)		24.0			24.0	22.0	5.4	78.0		6.0	78.6	
Actuated g/C Ratio		0.20			0.20	0.18	0.05	0.65		0.05	0.65	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		125			259	296	81	2098		90	2315	
v/s Ratio Prot							0.01	c0.73		c0.03	0.33	
v/s Ratio Perm		0.10			c0.23	0.01						
v/c Ratio		0.49			1.17	0.06	0.21	1.12		0.63	0.50	
Uniform Delay, d1		42.6			48.0	40.5	55.2	21.0		55.9	10.6	
Progression Factor		1.00			1.00	1.00	0.97	0.59		1.00	1.00	
Incremental Delay, d2		3.1			108.4	0.1	0.7	57.3		13.7	0.8	
Delay (s)		45.7			156.4	40.5	54.4	69.8		69.6	11.4	
Level of Service		D			F	D	D	E		E	B	
Approach Delay (s)		45.7			128.2			69.7			14.1	
Approach LOS		D			F			E			B	

Intersection Summary			
HCM 2000 Control Delay	58.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

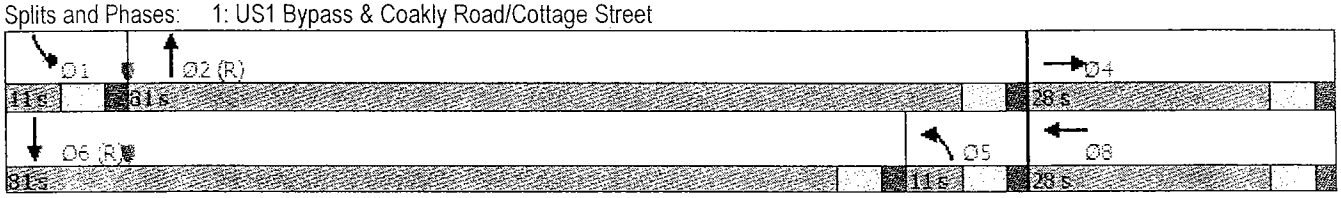
Timings
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	38	6	220	10	74	15	1901	56	1131
Future Volume (vph)	38	6	220	10	74	15	1901	56	1131
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA
Protected Phases		4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phase	4	4	8	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	28.0	28.0	28.0	28.0	28.0	11.0	81.0	11.0	81.0
Total Split (%)	23.3%	23.3%	23.3%	23.3%	23.3%	9.2%	67.5%	9.2%	67.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0		4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag						Lag	Lag	Lead	Lead
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)		24.0		24.0	22.0	10.3	79.2	7.0	83.4
Actuated g/C Ratio		0.20		0.20	0.18	0.09	0.66	0.06	0.70
v/c Ratio		0.52		1.17	0.24	0.11	1.10	0.54	0.47
Control Delay		52.9		151.2	3.9	47.7	65.8	74.3	10.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.1
Total Delay		52.9		151.2	3.9	47.7	65.8	74.3	10.4
LOS		D		F	A	D	E	E	B
Approach Delay		52.9		115.4			65.7		13.4
Approach LOS		D		F			E		B

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 54.8 — Intersection LOS: D
Intersection Capacity Utilization 82.3% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: US1 Bypass & Coakly Road/Cottage Street



Queues
1: US1 Bypass & Coakly Road/Cottage Street

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	302	97	17	2353	57	1152
v/c Ratio	0.52	1.17	0.24	0.11	1.10	0.54	0.47
Control Delay	52.9	151.2	3.9	47.7	65.8	74.3	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	52.9	151.2	3.9	47.7	65.8	74.3	10.4
Queue Length 50th (ft)	42	~278	0	12	~1216	44	162
Queue Length 95th (ft)	80	#353	3	m13	#1336	#97	372
Internal Link Dist (ft)	998	606			304		719
Turn Bay Length (ft)			50	100		150	
Base Capacity (vph)	132	259	407	154	2137	105	2528
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	284
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	1.17	0.24	0.11	1.10	0.54	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	485	14	87	52	11	288	36	1380	11	200	1034	140
Future Volume (vph)	485	14	87	52	11	288	36	1380	11	200	1034	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.86	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1698	1708	1615	1805	1554	1534	1752	3497		1752	3502	
Flt Permitted	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1698	1708	1615	1805	1554	1534	1752	3497		1752	3502	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.97	0.97	0.97	0.96	0.96	0.96
Adj. Flow (vph)	584	17	105	58	12	320	37	1423	11	208	1077	146
RTOR Reduction (vph)	0	0	85	0	144	158	0	1	0	0	9	0
Lane Group Flow (vph)	298	303	20	58	22	8	37	1433	0	208	1214	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	3%	3%	17%	3%	1%	3%
Turn Type	Split	NA	Prot	Split	NA	Prot	Prot	NA		Prot	NA	
Protected Phases	7	7	7	8	8	8	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.3	22.3	22.3	6.0	6.0	6.0	6.1	53.5		14.2	61.6	
Effective Green, g (s)	24.3	24.3	22.3	8.0	8.0	6.0	8.1	55.5		16.2	63.6	
Actuated g/C Ratio	0.20	0.20	0.19	0.07	0.07	0.05	0.07	0.46		0.13	0.53	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	343	345	300	120	103	76	118	1617		236	1856	
v/s Ratio Prot	0.18	c0.18	0.01	c0.03	0.01	0.01	0.02	c0.41		c0.12	0.35	
v/s Ratio Perm												
v/c Ratio	0.87	0.88	0.07	0.48	0.22	0.11	0.31	0.89		0.88	0.65	
Uniform Delay, d1	46.3	46.4	40.3	54.0	53.0	54.4	53.3	29.4		51.0	20.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.90	0.76	
Incremental Delay, d2	20.1	21.4	0.1	3.0	1.1	0.6	1.5	7.6		25.2	1.5	
Delay (s)	66.4	67.8	40.4	57.1	54.1	55.1	54.8	37.0		71.1	16.9	
Level of Service	E	E	D	E	D	E	D	D		E	B	
Approach Delay (s)		63.2			55.0			37.4			24.7	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

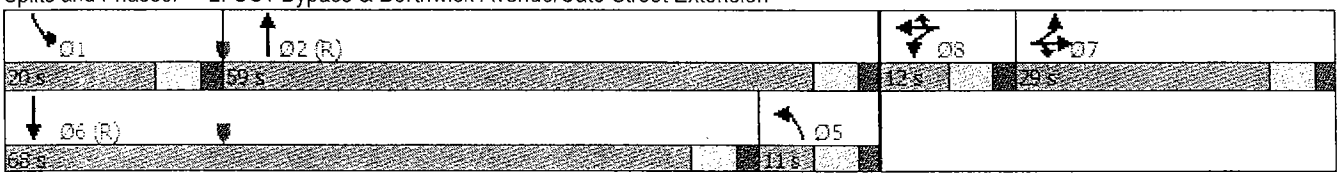
Timings
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	485	14	87	52	11	288	36	1380	200	1034
Future Volume (vph)	485	14	87	52	11	288	36	1380	200	1034
Turn Type	Split	NA	Prot	Split	NA	Prot	Prot	NA	Prot	NA
Protected Phases	7	7	7	8	8	8	5	2	1	6
Permitted Phases										
Detector Phase	7	7	7	8	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	16.0
Total Split (s)	29.0	29.0	29.0	12.0	12.0	12.0	11.0	59.0	20.0	68.0
Total Split (%)	24.2%	24.2%	24.2%	10.0%	10.0%	10.0%	9.2%	49.2%	16.7%	56.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	0.0	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	24.3	24.3	22.3	8.0	8.0	6.0	10.5	55.6	16.2	66.1
Actuated g/C Ratio	0.20	0.20	0.19	0.07	0.07	0.05	0.09	0.46	0.14	0.55
v/c Ratio	0.87	0.88	0.23	0.49	0.67	0.65	0.24	0.89	0.88	0.63
Control Delay	71.2	72.4	1.2	68.2	24.6	17.1	55.0	37.5	76.8	16.4
Queue Delay	11.5	12.6	0.0	0.0	4.7	5.0	0.0	2.4	0.0	0.2
Total Delay	82.7	85.0	1.2	68.2	29.4	22.0	55.0	39.8	76.8	16.6
LOS	F	F	A	E	C	C	D	D	E	B
Approach Delay		71.6			32.0			40.2		25.3
Approach LOS		E			C			D		C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 16 (13%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 39.6 — Intersection LOS: D
Intersection Capacity Utilization 80.0% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: US1 Bypass & Borthwick Avenue/Cate Street Extension



Queues
2: US1 Bypass & Borthwick Avenue/Cate Street Extension

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	298	303	105	58	166	166	37	1434	208	1223
v/c Ratio	0.87	0.88	0.23	0.49	0.67	0.65	0.24	0.89	0.88	0.63
Control Delay	71.2	72.4	1.2	68.2	24.6	17.1	55.0	37.5	76.8	16.4
Queue Delay	11.5	12.6	0.0	0.0	4.7	5.0	0.0	2.4	0.0	0.2
Total Delay	82.7	85.0	1.2	68.2	29.4	22.0	55.0	39.8	76.8	16.6
Queue Length 50th (ft)	234	240	0	44	9	0	26	524	136	417
Queue Length 95th (ft)	#340	#346	0	90	#94	51	64	634	m#256	m125
Internal Link Dist (ft)		916			388			250		304
Turn Bay Length (ft)	225		225	150			200		150	
Base Capacity (vph)	353	355	463	120	247	258	153	1619	236	2025
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	201
Spillback Cap Reductn	41	41	0	0	38	47	0	96	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.96	0.23	0.48	0.79	0.79	0.24	0.94	0.88	0.67

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

TABLE C

RESOLUTION SUMMARY of JUNE 3, 2019 CATE STREET EXTENSION TRAFFIC STUDY - MIXED USE PROPOSAL

TRANSPORTATION PEER REVIEW #2

Color Code:		Addressed/ Corrected
		Change in progress or confirmation needed

Comment #	Comment	Status	Response
Updated Traffic Study			
1	Regarding the Traffic Impact Study; Study Area, Traffic Counts, Background Growth Used and Crash Data. TEC Concurs with Traffic Impact Study	Addressed	
2	Regarding the Revised size of the project, Land Use selection and Traffic Generation TEC Concurs with Traffic Impact Study	Addressed	
3	Regarding the Trip redistribution created by the construction of Cate St. Ext.; TEC Concurs with Traffic Impact Study	Addressed	
4	Comment is in regard to dedicated Route 1 Bypass northbound right turn lane into Cate St. Ext. instead of Cottage St. as the traffic study shows to work best TEC recommends this be discussed with NHDOT	Addressed Comment to be discussed with NHDOT during permitting	Applicant will discuss with NHDOT
5	Regarding the Cate St. Ext. Westbound lanes configuration, suggest dedicated left turn lane, thru right and rededicated right at Cate St. Ext. /Route 1 bypass intersection TEC recommends Acquisition of NHDOT Access Permit and consultation on Southbound Route 1 left turn lane length	Addressed Comment to be discussed with NHDOT during permitting	Queue data based on synchro, which is know to be overly conservative, NHDOT requires SimTraffic. Queue lengths to be recalculated using SimTraffic. Design being revised according to new queue data and if possible to accommodate suggestion.

TABLE C

RESOLUTION SUMMARY of JUNE 3, 2019 CATE STREET EXTENSION TRAFFIC STUDY - MIXED USE PROPOSAL

TRANSPORTATION PEER REVIEW #2

Color Code:		Addressed/ Corrected
		Change in progress or confirmation needed

Comment #	Comment	Status	Response
6	Regarding the extension of the southbound left turn lane into Cate St. Ext., Current plans not depicting it as proposed TEC recommends Acquisition of NHDOT Access Permit and consultation on Southbound Route 1 left turn lane length	Addressed Comment to be discussed with NHDOT during permitting	Queue data based on synchro, which is know to be overly conservative, NHDOT requires SimTraffic. Queue lengths to be recalculated using SimTraffic. Inclusion of Left turn lane is provided in updated plans
7	Regarding westbound left turn lane on Cate St. Ext, and elimination of the Cottage / Coakley signal by closing the median and not allowing thru traffic from Cottage to Coakley and vice versa TEC acknowledges the elimination of the signal is not part of this project and for the city and NHDOT to work together on. TEC recommends the Cate St. Ext. Westbound left turn lane	Addressed Comment to be discussed with NHDOT during permitting	Queue data based on synchro, which is know to be overly conservative, NHDOT requires SimTraffic. Queue lengths to be recalculated using SimTraffic. Inclusion of Left turn lane is provided in updated plans
8	Regarding the Islington Street / Proposed Cate St. (Existing Bartlett St.) Pharmacy driveway intersection	Continued City Monitoring of queue lengths at intersection recommended to optimize Signal timing No further Development Team action required	

TABLE C

RESOLUTION SUMMARY of JUNE 3, 2019 CATE STREET EXTENSION TRAFFIC STUDY - MIXED USE PROPOSAL

TRANSPORTATION PEER REVIEW #2

Color Code:		Addressed/ Corrected
		Change in progress or confirmation needed

Comment #	Comment	Status	Response
9	Regarding requested updated study at Cate St. / Bartlett St. Intersection	Awaiting review of additional information provided Tuesday, June 11, 2019	Development Team Traffic Engineer provided additional information Tuesday June 11, 2019 to City Staff and TEC
10	Regarding the Operation of the Driveways intersecting Cate St. / Cate St. Extension TEC concurs with finding that they will operate with acceptable levels of services	Addressed	
Site Plan			
11	Sight triangles should be provided at driveway intersections with Cate St / Cate St. Ext. to ensure landscaping (trees) do not interfere with adequate sight distance	Addressed	Sight lines have been added to the driveway locations on the Turning Movement Plans.
12	Applicant shall discuss need for a school bus stop shelter with the School Department and DPW to determine need and, if needed, location		Applicant will contact the School Department and DPW to discuss the need for a School Bus Stop Shelter
13	Turning templates for the SU-40 delivery vehicle and Garbage truck should be revised to show circulation possible without conflict with parked cars or leaving proposed pavement or pavement layout should be revised to accommodate needed turns.	Addressed	Turning Movements have been revised to ensure that there are no conflicts with parked cars
14	Large truck Turning Templates (WB-50) should be revised to show circulation possible without conflict with parked cars or leaving proposed pavement or pavement layout should be revised to accommodate needed turns.	Addressed	WB-50 was originally used as a stand in for the Tower 5 vehicle. This has been replaced.

TABLE C

RESOLUTION SUMMARY of JUNE 3, 2019 CATE STREET EXTENSION TRAFFIC STUDY - MIXED USE PROPOSAL

TRANSPORTATION PEER REVIEW #2

Color Code:		Addressed/ Corrected
		Change in progress or confirmation needed

Comment #	Comment	Status	Response
15	Portsmouth Fire Department Tower 5 turning movements should be provided for the site to ensure it can circulate freely.	Addressed	Tower 5 turning movements have been run and are depicted on sheets CT-202 through CT-204
16	Applicant should coordinate the need for fire lanes with Portsmouth Fire Dept. and the need for fire hydrants on site. TEC notes hydrants are provided on site as shown on the plans.	Addressed	Hydrant locations have been reviewed at TAC Work Sessions with Fire Department and Public Works
17	Applicant should coordinate with Portsmouth fire regarding whether direct access to the rear of building A is needed	Addressed	The project has been before TAC numerous times and the Fire Department has not expressed concern regarding Building A or access to the back side.
18	Addition of crosswalks within the parking area between the center of Commercial building and the parking field should be added as well as any other areas where conflicts could be created between building entrances and parking fields		This will be reviewed and cross walks added in locations that make sense with the curb tipdowns Per Section 10.1110
19	A Sign Summary should be provided depicting the sign legend, sign size and sign lettering dimensions in compliance with the MUTCD	Addressed	A sign Legend has been added to the Road Plan Set and to the Site Plan Set
20	Stop sign and stop bar at easternmost townhouse entrance should be flipped to right side of lane line	Addressed	This has been corrected
21	Parking Calculations for the Apartment buildings should be revisited and revised per Section 10.1112.31	Addressed	Revised parking Calculation on CS-002 note #4
22	Townhouse parking should be clarified to ensure compliance with Section 10.11.12.31 30 resident and 5 visitor spaces required	Addressed	Revised parking Calculation on CS-002 note #4

TABLE C

RESOLUTION SUMMARY of JUNE 3, 2019 CATE STREET EXTENSION TRAFFIC STUDY - MIXED USE PROPOSAL

TRANSPORTATION PEER REVIEW #2

Color Code:		Addressed/ Corrected
		Change in progress or confirmation needed

Comment #	Comment	Status	Response
23	Commercial Building Parking should be reviewed / revised to ensure compliance with Section 10.11.12.32 Shared parking calcs. Should be done for the entire site per section 10.1112.61 and 10.5B83.20 using a worst case scenario time period of 6:00 PM to Midnight	Addressed	Revised parking Calculation on CS-002 note #4

Inspection & Maintenance Plan
West End Yards

Cate Street / Route 1
Portsmouth, NH 03801

APPLICANT & OWNER

Cate Street Development, LLC

11 Elkins Street
Suite 420
Boston, MA 02127

July 24, 2019

FUSS & O'NEILL

5 Fletcher Street, Suite 1
Kennebunk, ME 04043

Project No. 20180317.A10

FUSS & O'NEILL

Table of Contents

Long-Term Inspection & Maintenance Plan
Cate Street Development, LLC
Belmont, NH 03220

1 Introduction

This report outlines the long-term inspection and maintenance for West End Yards, owned by Cate Street Development, LLC, located at 428 US Route 1 Bypass & Cate Street in Portsmouth, New Hampshire. Site development includes two residential buildings, one commercial building, 23 townhomes, and new section of roadway. The stormwater management system consists of 2 bioretention basins, 3 subsurface infiltration basins, 2 subsurface detention basins, 2 water quality units, deep sump hooded catch basins in an off line configuration, and rip rap energy dissipaters, together with conveyance systems that open grass channels. Theses best management practices (BMPs) will provide groundwater recharge and peak flow mitigation of stormwater runoff.

The purpose of this this Long-Term Inspection and Maintenance Plan is to identify specific inspection and maintenance activities that are necessary to ensure the success and minimize the deterioration of the stormwater system over time. The Contractor is responsible for implementing Inspection and Maintenance through the completion of construction and during the warrantee period. The Inspection shall be responsible implementing this Long-Term Inspection and Maintenance Plan thereafter.

Maintenance operations shall be funded by the Operator. In the event the facility becomes owned by different entities, this Long-Term Inspection and Maintenance Plan shall be transferred to the future owners/operators.

2 Inspection and Maintenance Requirements

The following inspection and maintenance activities shall be conducted to ensure the success and minimize the deterioration of the stormwater system over time. All BMPs shall be inspected after every storm event larger than one-inch (over a 24-hour period) in the first six-months following construction. Afterwards, BMPs shall be inspected after major storm events greater than 2.8 inches (over a 48-hour period), and at a minimum twice per year in late spring (May/June) and early fall (September/October). Checklists to assist with the inspection and maintenance activities are provided in Appendix A. A map depicting the location of the components of the stormwater management system is provided in Appendix B.

2.1 Bioretention Basins

Bioretention basin inspections shall include inspecting the isolator rows for accumulated sediment. Inlets and outlets should be inspected for erosion and damage. If inspection of the isolator row indicates the need for maintenance, the sediment shall be removed using the JetVac process. Once sediment is removed from the isolator row, catch basins and manholes upstream of the basin shall be inspected and cleaned.

2.2 Drainage Channel

Channels shall be inspected for sediment accumulation, erosion, and condition of the surface lining material. Vegetative channels shall be inspected to determine if high flows have caused erosion of the vegetative surface lining. Any areas subject to erosion shall be replenished with the original design material and re-vegetated according to design drawings. Materials deposited on the surface of the channels (e.g., trash, litter, sediment, debris) must be removed manually. Vegetation within the channel shall be mowed a minimum of once per year to eliminate woody vegetation. It is recommended to cut grass no shorter than four inches to maintain establishment of hearty stand of grass.

2.3 Drainage Structures

Immediately prior to the end of construction or acceptance by the Owner/Operator, the Contractor shall clean all drainage structures. Once construction is complete and has been accepted by the Owner/Operator, all drainage structures shall be inspected annually. Inspections shall include checking for debris, sediment, and hydrocarbons, and structural integrity or damage. Deficiencies must be corrected immediately. Grates shall not be welded to the frame so the structures can be easily inspected and maintained.

2.4 Energy Dissipator and Level Spreader

Energy dissipator shall be inspected to determine if high flows have caused scour or dislodged any of the stone. If repairs are needed, they should be accomplished immediately. Materials deposited on the surface of the dissipator/spreader (e.g., trash, litter, sediment, debris) must be removed.

3 Pollution Prevention

The following pollution prevention activities shall be conducted to minimize potential impacts on stormwater runoff quality. The Contractor is responsible for all activities during construction. The Owner/Operator is responsible thereafter.

3.1 Spill Procedures

Any discharge of waste oil or other pollutant shall be reported immediately to the New Hampshire Department of Environmental Services (NHDES). The operator will be responsible for any incident of groundwater contamination resulting from the improper discharge of pollutants to the stormwater system, and may be required by NHDES to remediate incidents that may impact groundwater quality. Should property ownership be transferred, the subsequent owner/operator will be informed of the legal responsibilities associated with operation of the stormwater system, as indicated above.

3.2 Sanitary Facilities

Sanitary facilities shall be provided during all phases of construction. There are no bathroom facilities on site long term.

3.3 Material Storage

No on site trash facility is provided. The customers are required to remove trash from the site. Hazardous material storage is prohibited.

3.4 Material Disposal

All waste material, trash, sediment, and debris shall be removed from the site and disposed of in accordance with applicable local, state, and federal guidelines and regulations. Removed sediments shall be dewatered (if necessary) prior to disposal.

4 Contacts

Owner

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11 Elkins Street
Suite 420
Boston, MA 02127

Operator

TBD

Maintenance Contact

TBD

I&M Plan Contact

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Appendix A

Operation, Maintenance, and Management Inspection Checklist

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Inspection & Maintenance
Manual Checklist

BMP/System	Minimum Inspection Frequency	Minimum Inspection requirements	Maintenance / Cleanout Threshold
Closed Drainage (Structures & Pipes)	Twice Annually	Check for sediment accumulation, clogging, and debris.	Clean catch basin sump when half full. Remove all floating debris. Clean pipe runs with 2" or more of sediment.
Catch Basin Hood Inserts	Twice Annually	Check for blocked hoods and floating debris in associated catch basins	Unclog any debris from hoods, remove floatables and hydrocarbons. Check insertion to outlet pipe. Replace if damaged.
Infiltration Basin	Routinely during 1st year, twice annually after	Check for sediment accumulation, clogging, and debris. Monitor growth of vegetation	Inspect vegetation as necessary, remove debris from structures, and remove sediment accumulation from forebay and basin bottom. Mow, cut back, and control woody growth on the side slopes and inside the infiltration basin. Check slopes and spillways for structural integrity.
Bioretention Basin	Twice Annually	System should be inspected for drawdown time, sediment removed, and vegetation	Remove any trash or debris from structures or drains, vegetation maintained in healthy condition and bioretention basin drain time inspected for filtration function.
Invasive Plant Control	Routinely	Inspect for any invasive plants that destroy the natural communities or obstruct drainage structures	Pull deadhead, mow, cut, use controlled burning use a herbicide, girdle, frill or use a foliar spray with glyphosate to control or remove invasive plants.
Litter / Trash Removal	Routinely	Inspect parking areas, driveways, storm water systems, and around buildings.	Site will be free of trash / litter

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Inspection & Maintenance Manual Log Form

West End Yards
Cate Street / Route 1
Portsmouth, New Hampshire 03801

BMP / System	Date Inspected	Inspector	Cleaning or Repair	Repair Date	Repair Performed By

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Appendix B

BMP Location Map

TABLE 3

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION WEST END YARDS SITE STORMWATER PEER REVIEW #3

Color Code:		Addressed/ Corrected
		Change in progress or confirmation needed

Comment #	Comment	Status	Response
1	Prior to Site approval Applicant shall provide confirmation by hydrogeologist as required by the City of Portsmouth.	In progress	We are workign with Mc Phail Associates, the project Environmental and Geotechnical Engineers to have provide the required hydrogeologist certification
2	Appendix J, UIC Registrations for infiltration to Groundwater, and Appendix K, Inspection and Maintenance Manual, are still pending and should be included with the final Site Plan submittal	Addressed	Submitted to AOT and provided as part of this submission.
3	Shown on Sheet CG-101, CB #5 at U-Haul drive appears to be in the wrong location. It should be either on the pavement side of the curb or further into the grass area within a depressed/swale area for the inlet. The CB location has been addressed as requested; however, the existing 12” HDPE does not appear to be connected to the new CB, and no disposition of the existing pipe is noted. The Applicant should show the reconstruction of the existing pipe and the connection to the new CB.	Addressed	CB and pipe have been corrected

TABLE 3

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION WEST END YARDS SITE STORMWATER PEER REVIEW #3

Color Code:		Addressed/ Corrected
		Change in progress or confirmation needed

Comment #	Comment	Status	Response
4	The Applicant should provide a proposed drainage design for the northwest corner of Bartlett Street and Cate Street. See also Roadway Plan peer review #4, comment #25.	Addressed	A CB has been added ot the low spot on Bartlett St. A Drainage Analysis addendum is supplied regarding its sizing the final drainage study will include this as part of the overall report and will be submitted ot AOT and the City.
5	All stormwater structures that need to be cleaned should be adjacent to the roadway or some other accommodation made to provide truck access. The Roadway Plans should include maintenance access provisions for trucks to access the drainage structures at the vegetated treatment swales and the two (2) bioretention basins. Applicant shall also adjust the Landscaping Plans as necessary to avoid proposed vegetation in conflict with maintenance access.	Addressed	the Water Quality Units have been moved to locaitons close ot paved access.
6	The Applicant shall provide the City an exhibit showing the locations of any known hazardous soils overlaid with the proposed sewer and drainage system layouts.	Addressed	there are no hazardous soils on site. Ledge probes have been added ot the plan profiles.

TABLE 3

RESOLUTION SUMMARY of AUGUST 6, 2019 CATE STREET EXTENSION WEST END YARDS SITE STORMWATER PEER REVIEW #3

Color Code:		Addressed/ Corrected
		Change in progress or confirmation needed

Comment #	Comment	Status	Response
7	Applicant shall clarify the disposition of existing SMH 1066 near the edge of US Route 1 Bypass that is shown at the edge of the site demolition limit on Sheet CP-203.	Addressed	SMH 1066 is being replaced