M-5131-001
October 23, 2023

Mr. Peter Britz, Director of Planning & Sustainability
City of Portsmouth Planning & Sustainability Department
1 Junkins Avenue
Portsmouth NH, 03801

Re: Request for Site Review, & Wetland Conditional Use Permits
Proposed Multi-Family Development, 815 Lafayette Road, Portsmouth, NH

Dear Peter,

On behalf of Prospect North 815, LLC (owner/applicant) we are pleased to submit one (1) set of hard copies and one electronic file (.pdf) of the following information to support a request for a Site Review Permit and a Wetland Conditional Use Permit for the above referenced project:

- One (1) 22x34 & one (1) 11x17 copy of the Site Plan Set, dated October 23, 2023;
- Drainage Analysis, dated October 23, 2023;
- Long-Term Operation & Maintenance Plan, dated October 23, 2023;
- Grade Plane Exhibit, dated October 23, 2023;
- Wetland Buffer Impervious Surface Exhibit, dated October 23, 2023;
- Wetland Delineation Report, dated November 22, 2022;
- Invasive Species Removal Plan, dated October 23, 2023
- Community Space Exhibit, dated October 23, 2023;
- Truck Turning Exhibit, dated October 23, 2023;
- Traffic Impact Study, dated October 23, 2023;
- Unitil Will Service Letter, dated October 19, 21023;
- Green Energy Statement, dated October 23, 2023;
- Site Review Checklist, dated October 23, 2023;
- Application Fee Calculation Form;
- Owners Authorization, dated June 1, 2023

PROJECT SUMMARY

Existing Conditions

The proposed project is located at 815 Lafayette Road (US Route 1) which is identified as Map 245 Lot 3 on the City of Portsmouth Tax Maps. The site was previously home to the WHEB radio station which no longer operates at this location. The property is a 19.6-acre parcel of land that is located in the Gateway District (G1). The property is bound to the west by Route 1 and the abutting Lafayette Plaza shopping center property, to the north and east by the Winchester Place property and to the south by Sagamore Creek.

Proposed Redevelopment

The proposed project consists of the demolition of the existing building along Sagamore Creek and the construction of three 4-story, 24-unit multi-family buildings (72 total units) with ground floor parking. The project will include associated site improvements such as parking,

pedestrian access, utilities, stormwater management, lighting, and landscaping. The site will be accessed via the existing driveway on Route 1.

The project met with the Zoning Board of Adjustments (ZBA) at its regularly scheduled meeting on September 26, 2023, at which the board granted two variances. The first is a variance from Section 10.5B33.20 (front build-out) to permit a front build-out of less than 50% of the total front yard width and the second is a variance from Section 10.5B33.30 (Façade Orientation) to permit an orientation that is not parallel with the front property line.

Open Space & Buffer Enhancement

The proposed project results in work within the 100-foot Tidal Buffer and therefore is subject to conditional use approval for demolition and construction activities. The 100-foot tidal buffer within the development area includes impervious parking surfaces, walkways, patio, concrete pads, and a building. The project will provide an overall improvement by removing all impervious cover within the 100-foot tidal buffer. The impervious surface impacts from the proposed project are shown in Table 1. In addition to the summary in Table 1 below, detailed calculations of the impervious surfaces within the buffer for the existing and proposed condition are depicted in the enclosed Wetland Buffer Impervious Surface Exhibit.

The projects landscape plan proposes to replace existing impervious areas with native grass mix and plant native trees in an effort to enhance the previously disturbed wetlands buffer.

Table 1. 815 Lafayette Road, Wetland Buffer Impervious Surfaces

Buffer Segment	Existing Impervious (SF)	Final Impervious (SF)
0-25 feet	218	0
25-50 feet	1,937	0
50-100 feet	9,583	0
Total	11,738	0
Net Impervious Surface	**-11,738**	

Section 10.1017.24 of the Zoning Ordinance which indicates "Where feasible, the application shall include removal of impervious surfaces at least equal in area to the area of impervious surface impact. The intent of this provision is that the project will not result in a net loss of pervious surface within a jurisdictional wetland buffer." As shown in Table 1, the proposed project exceeds this requirement by providing an 11,738 SF reduction in impervious surface.

Land Use Permit Applications

Site Plan Review Permit

The project will require a Site Plan Review Permit for the site improvements described above in the project summary. The project has previously met with the Planning Board for Conceptual Consultation and the Technical Advisory Committee (TAC) and Conservation Commission (CC) for work sessions.

Wetland Conditional Use Permit

Jurisdictional wetland areas, including 2,782+/- linear feet of tidal wetlands and buffers along Sagamore Creek. A Conditional Use Permit for Wetland Buffer Impact will be required for the project for work within the 100 ft wetland buffer.

Conditional Use Permit Criteria

Based on the above described and enclosed materials, the following addresses how the proposed project warrants the granting of a Wetland Conditional Use Permit by satisfying the following six (6) criteria for approval in Section 10.1017.50 of the Zoning Ordinance:

(1) The land is reasonably suited to the use, activity or alteration.

The land is currently a previously disturbed site that consists of the former WHEB Radio Station building. The proposed project design is an allowed use within the Gateway Neighborhood Mixed Use District. Additionally, the proposed project site consists of a previously disturbed tidal buffer area which has historically been used as a commercial area. The proposed project will result in impervious surface reduction in the buffer, buffer enhancement, and will provide public access in the upland area along Sagamore Creek.

(2) There is no alternative location outside the wetland buffer that is feasible and reasonable for the proposed use, activity or alteration.

The placement of the proposed buildings and parking areas was done in a manner to remove all impervious surfaces within the 25-, 50-, and 100-foot tidal buffers and proposes to replace existing impervious surfaces with native grass mix and plant native trees and shrubs.

(3) There will be no adverse impact on the wetland functional values of the site or surrounding properties;

There will be no adverse impact on the wetland functional values of the site as the existing condition is previously disturbed and consists of buildings, parking area, concrete pads, and sidewalks. The proposed project intends to remove the all impervious surfaces from the wetland buffer area. The remainder of the buffer will be enhanced by the removal of invasive species and enhance the existing vegetation with native vegetation. The proposed project design site and landscape plans enhance the previously disturbed tidal buffer area given the existing condition and provide added value by creating public open space for recreation along the upland bank of Sagamore Creek.

(4) Alteration of the natural vegetative state or managed woodland will occur only to the extent necessary to achieve construction goals; and

The proposed project design proposes minimal alteration to the natural woodland to the greatest extent practical. This alteration includes the removal of invasive species and the construction of a wood chip greenway community trail. The construction of the wood chip trail is intended to minimize disturbance of the natural vegetative state by field alignment of the proposed trail around existing large native trees.

(5) The proposal is the alternative with the least adverse impact to areas and environments under the jurisdiction of this Section.

The proposed project design does not have an adverse impact on the site as it would enhance the buffer by improving water quality through stormwater

treatment and providing public access to the upland bank of Sagamore Creek. Impervious surfaces within the 25-foot, 50-foot, and 100-foot tidal buffers have been removed by eliminating buildings, parking, sidewalks, patios, and concrete pads.

(6) Any area within the vegetated buffer strip will be returned to a natural state to the extent feasible.

The proposed project design within the vegetated buffer strip is limited to the removal of impervious areas and selective invasive species removal. The proposed project will collect and treat the onsite impervious surfaces prior to discharging to Sagamore Creek. Implementing these treatment measures will help improve the water quality in Sagamore Creek. In order for this system to work, disturbances with the buffer strip are necessary. Areas temporarily disturbed for the construction of the outlet will be restored following construction. The landscape plan proposes replacing the existing disturbed areas within the 25-foot wetland buffer with a native grass mix, mown as required to avoid incursions of invasive species, and the addition of several native trees and shrubs on the water side of the wood chip path.

Conclusion

As shown in the enclosed information, the proposed plan will remove impervious surface within the buffer area, improve stormwater management, enhance the Sagamore Creek tidal wetland buffer and provide public benefit in the form of open space along the upland bank of Sagamore Creek.

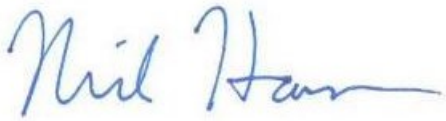
Under separate cover, a Site Plan Review application fee in the amount of $4,591.92, and Wetlands Conditional Use Permit application fee in the amount of $1,300.00 will be delivered to the Planning Department. A copy of the application fee calculation form is enclosed.

We respectfully request to be placed on the TAC meeting agenda for November 7, 2023, and the Conservation Commission agenda for November 8, 2023. If you have any questions or need any additional information, please contact me by phone at (603) 433-8818 or by email at NAHansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.

Patrick M. Crimmins, PE
Vice President



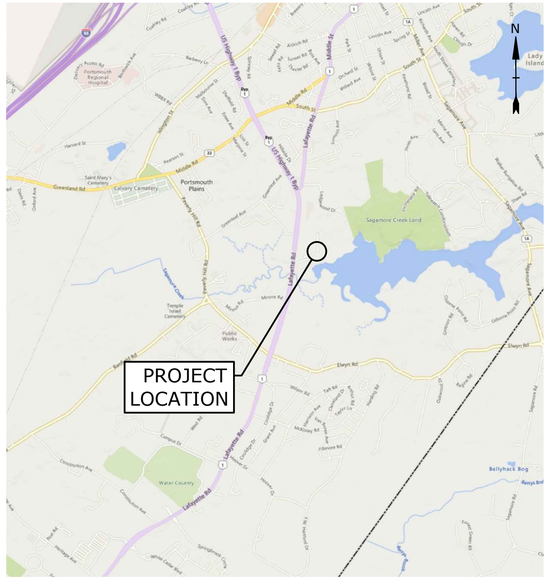
Neil A. Hansen, PE
Project Manager

Copy: Prospect North 815, LLC

815 LAFAYETTE ROAD
PROPOSED MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NEW HAMPSHIRE
DATE OCTOBER 23, 2023

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	10/23/2023
1 OF 1	STANDARD BOUNDARY SURVEY	2/17/2023
C1	EXISTING CONDITIONS PLAN	10/20/2023
C2	EXISTING CONDITIONS PLAN	10/20/2023
G-100	GENERAL NOTES AND LEGEND	10/23/2023
C-101	EXISTING CONDITIONS AND DEMOLITION PLAN	10/23/2023
C-102	OVERALL SITE PLAN	10/23/2023
C-102.1	SITE PLAN	10/23/2023
C-103	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	10/23/2023
C-104	UTILITY PLAN	10/23/2023
C-105	PHOTOMETRIC PLAN	10/23/2023
C-201	EASEMENT PLAN	10/23/2023
L-100	LANDSCAPE SCHEDULE AND NOTES	10/23/2023
L-101	LANDSCAPE PLAN	10/23/2023
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	10/23/2023
C-502	DETAILS SHEET	10/23/2023
C-503	DETAILS SHEET	10/23/2023
C-504	DETAILS SHEET	10/23/2023
C-505	DETAILS SHEET	10/23/2023
C-506	DETAILS SHEET	10/23/2023
C-507	DETAILS SHEET	10/23/2023
1 OF 2	BUILDING ELEVATIONS	8/29/2023
2 OF 2	TYPICAL FLOOR PLANS	8/29/2023

LIST OF PERMITS		
LOCAL	STATUS	DATE
SITE PLAN REVIEW PERMIT	PENDING	
CONDITIONAL USE PERMIT - WETLAND BUFFER	PENDING	
ZONING BOARD OF ADJUSTMENTS	APPROVED	9/26/2023
STATE		
NHDES - SEWER CONNECTION PERMIT	NOT SUBMITTED	
NHDES - ALTERATION OF TERRAIN PERMIT	NOT SUBMITTED	
NHDES - SHORELAND PERMIT	NOT SUBMITTED	
NHDES - WETLAND PERMIT	NOT SUBMITTED	
FEDERAL		
NPDES - CONSTRUCTION GENERAL PERMIT	NOT SUBMITTED	



LOCATION MAP
SCALE: 1" = 2000'

CONSTRUCTION NOTES:
1. THE CONTRACTOR SHALL NOT RELY ON SCALED DIMENSIONS AND SHALL CONTACT THE ENGINEER FOR CLARIFICATION IF A REQUIRED DIMENSION IS NOT PROVIDED ON THE PLANS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS, AND FOR SITE CONDITIONS THROUGHOUT CONSTRUCTION. NEITHER THE PLANS NOR THE SEAL OF THE ENGINEER AFFIXED HEREON EXTEND TO OR INCLUDE SYSTEMS REQUIRED FOR THE SAFETY OF THE CONTRACTOR, THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING AND IMPLEMENTING SAFETY PROCEDURES AND SYSTEMS AS REQUIRED BY THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AND ANY STATE OR LOCAL SAFETY REGULATIONS.
3. TIGHE & BOND ASSUMES NO RESPONSIBILITY FOR ANY ISSUES LEGAL OR OTHERWISE, RESULTING FROM CHANGES MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION OF TIGHE & BOND.

PREPARED BY:
Tighe&Bond
177 CORPORATE DRIVE
PORTSMOUTH, NH 03801
603-433-8818

APPLICANT:
PROSPECT NORTH 815, LLC
PO Box 372
Greenland, NH 04840

ARCHITECT:
MICHAEL J. KEANE ARCHITECTS, PLLC
101 Kent Place
Newmarket, NH 03857

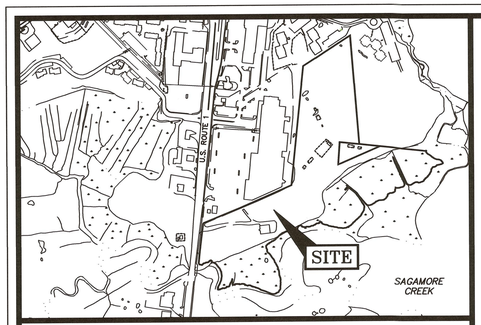
STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 10/23/2023
STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 10/23/2023
LICENSED LANDSCAPE ARCHITECT – RALPH GORDON LEEDY, JR 007 – STATE OF NEW HAMPSHIRE – 10/23/2023

SURVEYOR:
AMBIT ENGINEERING, INC.
200 Griffin Road - Unit 3
Portsmouth, NH 03801

811 DigSafe MA-ME-NH-RI-VT

TAC SUBMISSION
COMPLETE SET 23 SHEETS

Last Save Date: October 20, 2023 3:56 PM By: CWEZCUIK
Plot Date: October 23, 2023 2:23 PM By: CWEZCUIK
T&B File Location: J:\M\M5131 M82 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-CS.dwg Layout Tab: CS



LOCATION MAP SCALE: 1"=500'

LEGEND:

N/F	NOW OR FORMERLY
RP	RECORD OF PROBATE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
11/21	MAP 11 / LOT 21
	BOUNDARY
	SETBACK
	RAILROAD SPIKE FOUND
	IRON ROD/PIPE FOUND
	DRILL HOLE FOUND
	STONE/CONCRETE BOUND FOUND
	RAILROAD SPIKE SET
	IRON ROD SET
	DRILL HOLE SET
	GRANITE BOUND SET
	EDGE OF PAVEMENT (EP)
	WOODS / TREE LINE
	UTILITY POLE (w/ GUY)
G W E	METER (GAS, WATER, ELECTRIC)
TYP.	TYPICAL
LSA	LANDSCAPED AREA
	PERPETUAL EASEMENT
	DETERMINABLE EASEMENT

LENGTH TABLE

LINE	BEARING	DISTANCE
L1	N05°26'56"E	92.87'
L2	N06°34'36"E	194.98'
L3	N67°59'01"E	273.67'
L4	N66°37'14"E	370.70'
L5	N05°59'07"E	792.74'
L6	N57°24'25"E	90.94'
L7	N66°41'14"E	8.54'
L8	N56°24'15"E	54.03'
L9	N51°51'18"E	3.74'
L10	N57°31'35"E	212.27'
L11	S04°29'13"E	719.99'
L12	N84°02'00"W	129.90'
L13	S04°07'00"W	148.50'
L14	N66°37'20"E	302.87'
L15	S84°02'00"E	271.46'
L16	S84°02'00"E	138.90'

TIE LINE LENGTH TABLE

LINE	BEARING	DISTANCE
T1	S62°48'20"W	1668.11'

(NOT A BOUNDARY LINE–FOR CLOSURE PURPOSES ONLY)

ADDITIONAL ABUTTERS:

228/1 N/F
CITY OF PORTSMOUTH DPW
1 JUNKINS AVENUE
PORTSMOUTH, NH 03802
2237/1506

229/3 N/F
CITY OF PORTSMOUTH SCH
1 JUNKINS AVENUE
PORTSMOUTH, NH 03801
1985/0379

251/1 N/F
STATE OF NEW HAMPSHIRE
P.O. BOX 856
CONCORD, NH 03301
2260/1484

PLAN REFERENCES:

1) PLAN OF LAND PORTSMOUTH, N.H. FOR BONOBEST DEVELOPMENT CORP., SCALE 1IN. = 40FT., DATED JAN. 1964, PREPARED BY JOHN W. DURGIN C.E., RCRD PLAN#161

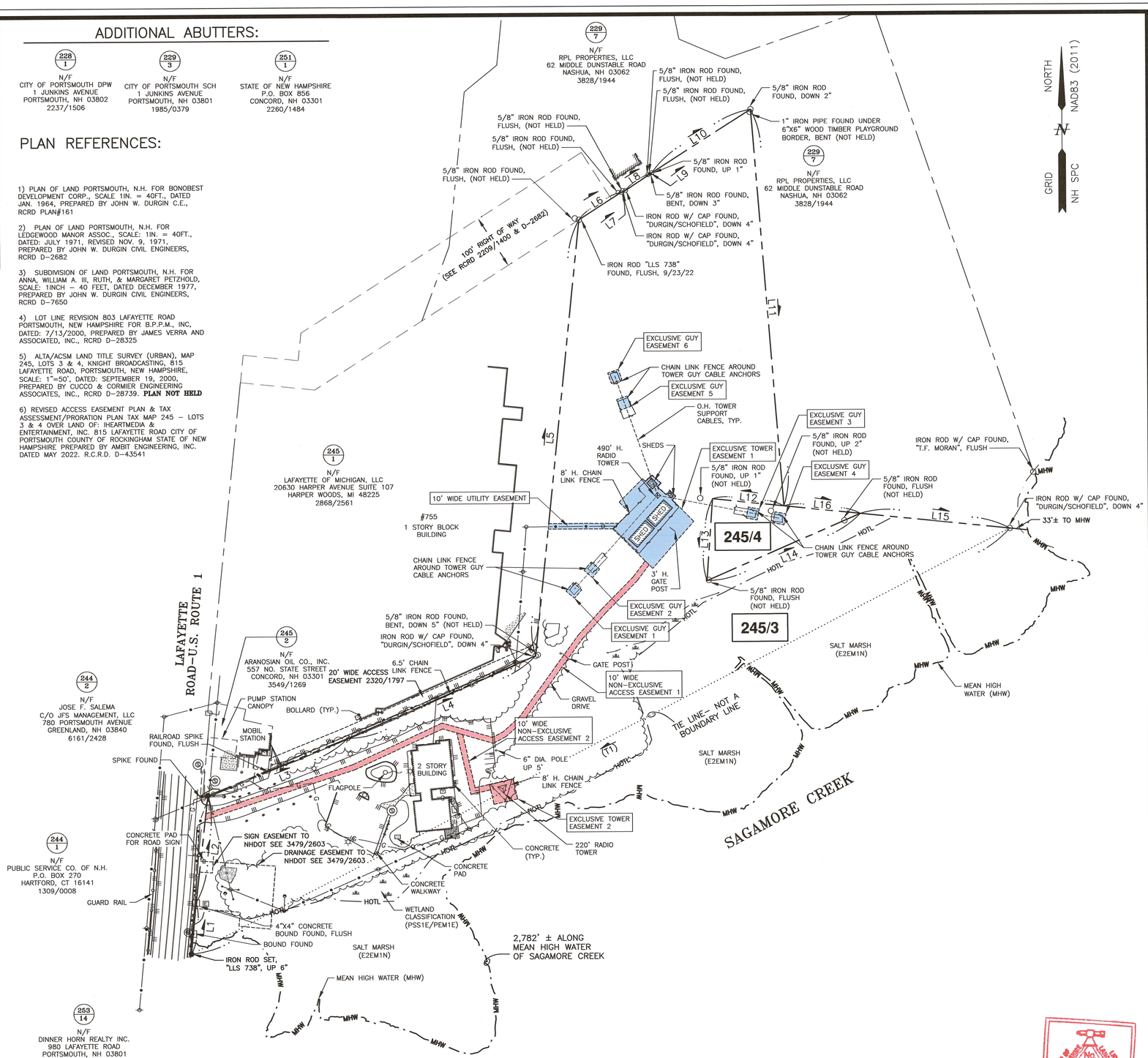
2) PLAN OF LAND PORTSMOUTH, N.H. FOR LEDGEWOOD MANOR ASSOC., SCALE: 1IN. = 40FT., DATED: JULY 1971, REVISED NOV. 9, 1971, PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS, RCRD D–2682

3) SUBDIVISION OF LAND PORTSMOUTH, N.H. FOR ANNA, WILLIAM A. III, RUTH, & MARGARET PETZHOLD, SCALE: 1INCH – 40 FEET, DATED DECEMBER 1977, PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS, RCRD D–7650

4) LOT LINE REVISION 803 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE FOR B.P.P.M., INC, DATED: 7/13/2000, PREPARED BY JAMES VERRA AND ASSOCIATED, INC., RCRD D–28325

5) ALTA/ACSM LAND TITLE SURVEY (URBAN), MAP 245, LOTS 3 & 4, KNIGHT BROADCASTING, 815 LAFAYETTE ROAD, PORTSMOUTH, NEW HAMPSHIRE, SCALE: 1"=50', DATED: SEPTEMBER 19, 2000, PREPARED BY CUCCO & CORMIER ENGINEERING ASSOCIATES, INC., RCRD D–28739. **PLAN NOT HELD**

6) REVISED ACCESS EASEMENT PLAN & TAX ASSESSMENT/PRORATION PLAN TAX MAP 245 – LOTS 3 & 4 OVER LAND OF: IHEARTMEDIA & ENTERTAINMENT, INC. 815 LAFAYETTE ROAD CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE PREPARED BY AMBIT ENGINEERING, INC. DATED MAY 2022. R.C.R.D. D–43541



I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION WHICH HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000.

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

JOHN R. CHAGNON, LLS 738

2.17.23
DATE

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801–7114
Tel (603) 430–9282
Fax (603) 436–2315

NOTES:

1) PARCELS ARE SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 245 AS LOTS 3 AND 4.

2) OWNER OF RECORD:
PROSPECT NORTH 815 LLC
PO BOX 372
GREENLAND, NH 03840
6443/665

3) PARCEL IS PARTIALLY IN A SPECIAL FLOOD HAZARD AREA (ZONE AE) AS SHOWN ON FIRM PANEL 33015C0270F. EFFECTIVE DATE JANUARY 29, 2021.

4) EXISTING LOT AREA:

MAP 245 LOT 3	MAP 245 LOT 4
855,562 S.F ± (TO MHW)	19,948 S.F.
19.6410 AC ± (TO MHW)	0.4579 ACRES

5) PARCELS ARE LOCATED IN THE GATEWAY CORRIDOR (G1) ZONING DISTRICT.

6) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE RESULTS OF A STANDARD BOUNDARY SURVEY OF ASSESSOR'S MAP 245 LOTS 3 & 4 IN THE CITY OF PORTSMOUTH.

8) THE BOUNDARY SHOWN HEREON IS DERIVED FROM ORIGINAL MONUMENTS CORRELATING TO REFERENCE PLANS 1, 2, 3, & 4. ADDITIONAL MONUMENTATION CORRELATING TO REFERENCE PLAN 5 WERE FOUND AND NOT HELD.

9) SEE AMENDED AND RESTATED EASEMENT AGREEMENT AND RESTRICTIVE COVENANTS AT RCRD 6443/639.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	1/26/23

REVISIONS

STANDARD BOUNDARY SURVEY TAX MAP 245 – LOTS 3 & 4

OWNER:
PROSPECT NORTH 815 LLC
815 LAFAYETTE ROAD
CITY OF PORTSMOUTH
COUNTY OF ROCKINGHAM
STATE OF NEW HAMPSHIRE

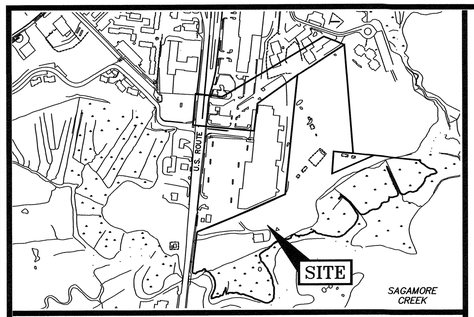
SCALE: 1"=100' JANUARY 2023

FB 414 PG 1

3458

STATE OF NEW HAMPSHIRE LAND SURVEYOR NO. 738 JOHN R. CHAGNON

J:\JOBS\3K 3400's\3400's\3458\2022 Survey\Plans & Specs\3458 Survey 2023.dwg, STANDARD BOUNDARY SURVEY

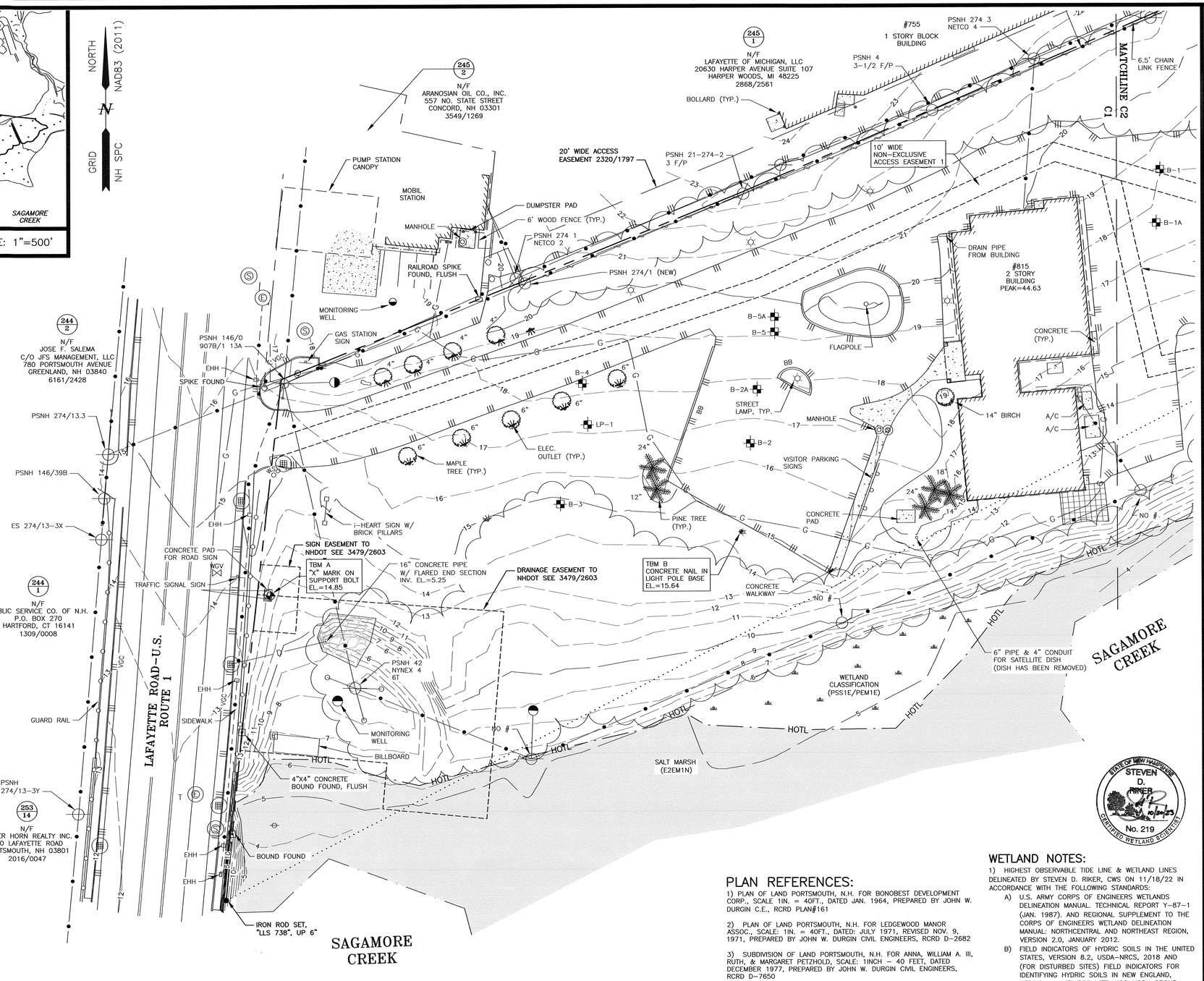


LOCATION MAP SCALE: 1"=500'

NORTH NAD83 (2011) GRID NH SPC

LEGEND:

N/F	NOW OR FORMERLY
RP	RECORD OF PROBATE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
11/21	MAP 11 / LOT 21
	BOUNDARY
	SETBACK
HOTL	HIGHEST OBSERVABLE TIDE LINE
	RAILROAD SPIKE FOUND
	IRON ROD/PIPE FOUND
	DRILL HOLE FOUND
	STONE/CONCRETE BOUND FOUND
	RAILROAD SPIKE SET
	IRON ROD SET
	DRILL HOLE SET
	GRANITE BOUND SET
EP	EDGE OF PAVEMENT (EP)
	UNDERGROUND ELECTRIC
	OVERHEAD ELECTRIC/WIRES
100	CONTOUR
	WOODS / TREE LINE
WSO	WATER SHUT OFF/CURB STOP
GSO	GAS SHUT OFF/CURB STOP
WGV	WATER GATE VALVE
GGV	GAS GATE VALVE
	UTILITY POLE (w/ GUY)
G E	METER (GAS, WATER, ELECTRIC)
	CATCH BASIN
E	ELECTRIC MANHOLE
S	SEWER MANHOLE
T	TELEPHONE/COMMUNICATIONS MANHOLE
	LIGHTPOLE
	SIGNS
TYP.	TYPICAL
LSA	LANDSCAPED AREA
EHH	ELECTRIC HANDHOLE
MW	MONITORING WELL
TH	THRESHOLD
EL.	ELEVATION
TBM	TEMPORARY BENCHMARK
VGC	VERTICAL GRANITE CURB
BC	BITUMINOUS CURB
INV.	INVERT
.ORN	ORNAMENTAL TREE



GRAPHIC SCALE

30 0 50 100 120 FEET

10 5 0 10 20 30 METERS

I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, WHICH HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000.

JOHN R. CHAGNON, LLS 738 — DATE 10.20.23

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 738 JOHN R. CHAGNON SIGNATURE

PLAN REFERENCES:

1) PLAN OF LAND PORTSMOUTH, N.H. FOR BONOBEST DEVELOPMENT CORP., SCALE 1IN. = 40FT., DATED JAN. 1964, PREPARED BY JOHN W. DURGIN C.E., RCRD PLAN#161

2) PLAN OF LAND PORTSMOUTH, N.H. FOR LEDGEWOOD MANOR ASSOC., SCALE: 1IN. = 40FT., DATED: JULY 1971, REVISED NOV. 9, 1971, PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS, RCRD D-2682

3) SUBDIVISION OF LAND PORTSMOUTH, N.H. FOR ANNA, WILLIAM A. III, RUTH, & MARGARET PETZHOLD, SCALE: 1INCH = 40 FEET, DATED DECEMBER 1977, PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS, RCRD D-7650

4) LOT LINE REVISION 803 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE FOR B.P.P.M., INC, DATED: 7/13/2000, PREPARED BY JAMES VERRA AND ASSOCIATED, INC., RCRD D-28325

5) ALTA/ACSM LAND TITLE SURVEY (URBAN), MAP 245, LOTS 3 & 4, KNIGHT BROADCASTING, 815 LAFAYETTE ROAD, PORTSMOUTH, NEW HAMPSHIRE, SCALE: 1"=50', DATED: SEPTEMBER 19, 2000, PREPARED BY CUCCO & CORMIER ENGINEERING ASSOCIATES, INC., RCRD D-28739. **PLAN NOT HELD**

6) REVISED ACCESS EASEMENT PLAN & TAX ASSESSMENT/PRORATION PLAN TAX MAP 245 – LOTS 3 & 4 OVER LAND OF: iHEARTMEDIA & ENTERTAINMENT, INC. 815 LAFAYETTE ROAD CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE PREPARED BY AMBIT ENGINEERING, INC. DATED MAY 2022. R.C.R.D. D-43541

WETLAND NOTES:

1) HIGHEST OBSERVABLE TIDE LINE & WETLAND LINES DELINEATED BY STEVEN D. RIKER, CWS ON 11/18/22 IN ACCORDANCE WITH THE FOLLOWING STANDARDS:

A) U.S. ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. TECHNICAL REPORT Y-87-1 (JAN. 1987). AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012.

B) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 8.2, USDA-NRCS, 2018 AND (FOR DISTURBED SITES) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4. NEIWPCC WETLANDS WORK GROUP (2019).

C) NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: NORTHEAST (REGION 1). USFWS (MAY 1988).

D) CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. USFW MANUAL FWS/OBS-79/31 (1997).

E) "IDENTIFICATION AND DOCUMENTATION OF VERNAL POOLS IN NEW HAMPSHIRE" (1997). NEW HAMPSHIRE FISH AND GAME DEPARTMENT.

2) HOTL & WETLAND WERE FIELD LOCATED BY AMBIT ENGINEERING, INC.

STATE OF NEW HAMPSHIRE STEVEN D. RIKER 10/20/23 No. 219 CERTIFIED WETLAND SCIENTIST

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
WWW.HALEYWARD.COM
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282

NOTES:

1) PARCELS ARE SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 245 AS LOTS 3 AND 4.

2) OWNER OF RECORD:
PROSPECT NORTH 815 LLC
PO BOX 372
GREENLAND, NH 03840
6443/665

3) PARCEL IS PARTIALLY IN A SPECIAL FLOOD HAZARD AREA (ZONE AE) AS SHOWN ON FIRM PANEL 33015C0270F. EFFECTIVE DATE JANUARY 29, 2021.

4) EXISTING LOT AREA:

MAP 245 LOT 3	MAP 245 LOT 4
855,562 S.F ± (TO MHW)	19,948 S.F.
19.6410 AC ± (TO MHW)	0.4579 ACRES

5) PARCELS ARE LOCATED IN THE GATEWAY CORRIDOR (G1) ZONING DISTRICT.

6) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE RESULTS OF EXISTING CONDITIONS SURVEY OF ASSESSOR'S MAP 245 LOTS 3 & 4 IN THE CITY OF PORTSMOUTH.

8) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY WITHIN 100 FEET OF UNDERGROUND UTILITIES. THE EXCAVATOR IS RESPONSIBLE TO MAINTAIN MARKS. DIG SAFE TICKETS EXPIRE IN THIRTY DAYS.

9) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

10) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

SITE DEVELOPMENT
815 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	ADD WETLAND NOTES	10/20/23
0	ISSUED FOR COMMENT	2/2/23

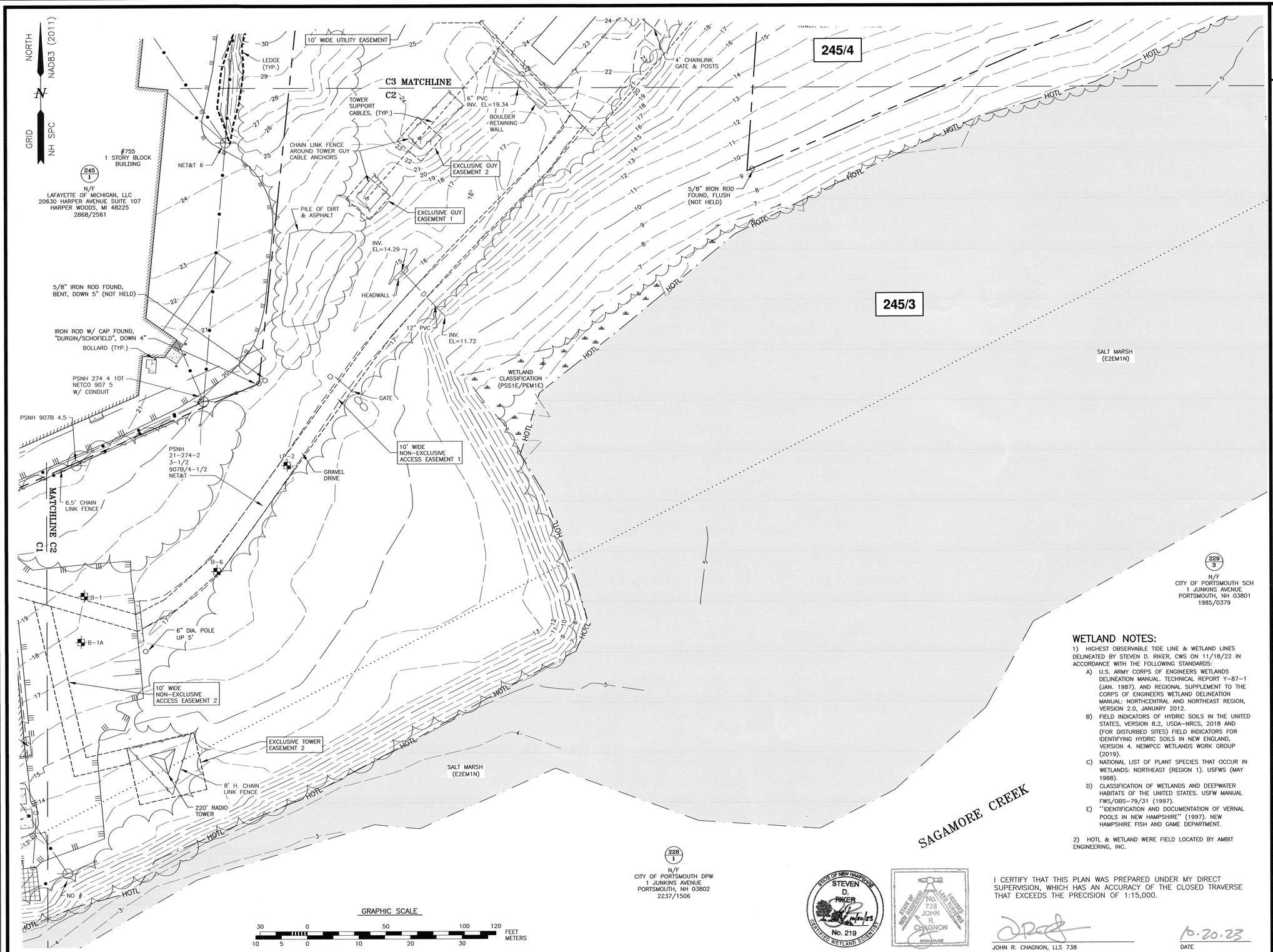
REVISIONS

SCALE: 1" = 30' JANUARY 2023

EXISTING CONDITIONS PLAN C1

FB 441 PG 1 3458

P:\NHS\01015-MBZ_Development\3458-Lafayette Rd-JRC\2022 Survey\Plans & Specs\Site\3458 Exis Cond 2023.dwg, C1 EXIS COND, 10/20/2023 7:14:25 AM



WETLAND NOTES:

1) HIGHEST OBSERVABLE TIDE LINE & WETLAND LINES DELINEATED BY STEVEN D. RIKER, CWS ON 11/18/22 IN ACCORDANCE WITH THE FOLLOWING STANDARDS:
   - A) U.S. ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. TECHNICAL REPORT Y-87-1 (JAN. 1987). AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012.
   - B) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 8.2, USDA-NRCS, 2018 AND (FOR DISTURBED SITES) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4. NEIWPCC WETLANDS WORK GROUP (2019).
   - C) NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: NORTHEAST (REGION 1). USFWS (MAY 1988).
   - D) CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. USFW MANUAL FWS/OBS-79/31 (1997).
   - E) "IDENTIFICATION AND DOCUMENTATION OF VERNAL POOLS IN NEW HAMPSHIRE" (1997). NEW HAMPSHIRE FISH AND GAME DEPARTMENT.

2) HOTL & WETLAND WERE FIELD LOCATED BY AMBIT ENGINEERING, INC.

STATE OF NEW HAMPSHIRE STEVEN D. RIKER 10/20/23 No. 219 CERTIFIED WETLAND SCIENTIST

STATE OF NEW HAMPSHIRE No. 738 JOHN R. CHAGNON LICENSED LAND SURVEYOR SIGNATURE

I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, WHICH HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000.

JOHN R. CHAGNON, LLS 738 — DATE 10.20.23

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282
WWW.HALEYWARD.COM

1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY WITHIN 100 FEET OF UNDERGROUND UTILITIES. THE EXCAVATOR IS RESPONSIBLE TO MAINTAIN MARKS. DIG SAFE TICKETS EXPIRE IN THIRTY DAYS.

2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

SITE DEVELOPMENT
815 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	ADD WETLAND NOTES	10/20/23
0	ISSUED FOR COMMENT	2/2/23

REVISIONS

SCALE: 1" = 30' JANUARY 2023

EXISTING CONDITIONS PLAN

C2

FB 441 PG 1

3458

GENERAL NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
3. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
4. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES AND COMPLY WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
6. THE CONTRACTOR SHALL OBTAIN AND PAY FOR AND COMPLY WITH ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
7. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES AND HOMES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS AND HOME SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
12. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.

DEMOLITION NOTES:

1. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
2. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
3. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
4. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
5. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
7. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND CITY OF PORTSMOUTH STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
9. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
10. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, LIGHTING, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, STAIRS, SIGNS, FENCES, RAMPS, WALLS, BOLLARDS, BUILDING SLABS, FOUNDATION, TREES AND LANDSCAPING.
11. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
12. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
13. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
15. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
16. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
17. THE CONTRACTOR SHALL REMOVE AND SALVAGE EXISTING GRANITE CURB FOR REUSE.

SITE NOTES:

1. PAVEMENT MARKINGS SHALL BE INSTALLED AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, FIRE LANES, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES. ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE PAVEMENT MARKINGS. ALL THERMOPLASTIC PAVEMENT MARKINGS INCLUDING LEGENDS, ARROWS, CROSSWALKS AND STOP BARS SHALL MEET THE REQUIREMENTS OF AASHTO M249. ALL PAINTED PAVEMENT MARKINGS INCLUDING CENTERLINES, LANE LINES AND PAINTED MEDIANS SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F".
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PAVEMENT MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE, WHITE THERMOPLASTIC AND CONFORM TO CURRENT MUTCD STANDARDS.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
8. SEE ARCHITECTURAL/BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
10. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
11. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
12. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
13. GATE SHALL BE EQUIPPED WITH KNOX BOX. COORDINATE WITH THE CITY OF PORTSMOUTH FIRE DEPARTMENT.
14. THE PROPERTY MANAGER WILL BE RESPONSIBLE FOR TIMELY SNOW REMOVAL FROM ALL PRIVATE SIDEWALKS, DRIVEWAYS, AND PARKING AREAS. SNOW REMOVAL WILL BE HAULED OFF-SITE AND LEGALLY DISPOSED OF WHEN SNOW BANKS EXCEED 3 FEET IN HEIGHT.
15. CONTRACTOR SHALL COORDINATE WITH OWNER AND ELECTRICAL DRAWINGS FOR THE PROPOSED DUAL ELECTRIC VEHICLE CHARGING STATION TYPE, ELECTRICAL REQUIREMENTS AND CONDUIT LAYOUT PRIOR TO CONSTRUCTION.

GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

BELOW PAVED OR CONCRETE AREAS	95%
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREAS	90%

* ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.

2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL) OR RCP CLASS IV, UNLESS OTHERWISE SPECIFIED.
3. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
4. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
5. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
6. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
7. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.

EROSION CONTROL NOTES:

1. SEE SHEET C-501 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.

UTILITY NOTES:

1. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - NATURAL GAS - UNITIL
   - WATER - CITY OF PORTSMOUTH
   - SEWER - CITY OF PORTSMOUTH
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - CONSOLIDATED COMM/FAIRPOINT/COMCAST
2. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
3. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT.
4. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
5. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH DPW STANDARDS.
6. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
7. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
8. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
9. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
10. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
11. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
12. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
13. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
14. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
15. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
16. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
17. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
18. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
19. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
20. CONTRACTOR SHALL FIELD VERIFY EXISTING SEWER LINE LOCATION, INVERT AND DIAMETER PRIOR TO CONSTRUCTION AND SHALL SUBMIT FIELD INFORMATION TO ENGINEER FOR REVIEW. MODIFICATIONS TO THE NEW SEWER CONNECTION LOCATION AND ELEVATION MAY BE NECESSARY BASED ON THE OBSERVED EXISTING CONDITIONS.

EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY AMBIT ENGINEERING, INC. DATED 01/26/2023.

LEGEND

- APPROXIMATE LIMIT OF SAWCUT
- LIMIT OF WORK
- APPROXIMATE LIMIT OF PAVEMENT TO BE REMOVED
- EXISTING TREES TO BE REMOVED
- EXISTING BUILDING TO BE REMOVED
- LOCATION OF PROPOSED BUILDING
- PROPERTY LINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED CURB
- PROPOSED GRAVEL PAVEMENT SECTION
- PROPOSED PAVEMENT SECTION
- PROPOSED WOOD CHIP TRAIL
- PROPOSED CONCRETE
- PROPOSED PATIO PAVERS
- 25 PROPOSED MAJOR CONTOUR LINE
- 24 PROPOSED MINOR CONTOUR LINE
- D EXISTING STORM DRAIN
- XD APPROXIMATE STORM DRAIN
- EXISTING DRAIN CATCH BASIN
- S EXISTING SANITARY SEWER
- XS APPROXIMATE SANITARY SEWER
- W EXISTING WATER
- W EXISTING WATER TBR
- G EXISTING GAS
- G EXISTING GAS TBR
- E EXISTING UNDERGROUND ELECTRIC
- OHW EXISTING OVERHEAD UTILITY
- S EXISTING SEWER MANHOLE
- EXISTING HYDRANT
- WV EXISTING WATER VALVE
- EXISTING ELECTRIC MANHOLE
- EXISTING TELEPHONE MANHOLE
- PROPOSED DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED JELLY FISH FILTER
- PROPOSED INLET PROTECTION BARRIER
- PROPOSED DRAINLINE
- PROPOSED SEWER MANHOLE
- PS PROPOSED SEWER LINE
- G PROPOSED GAS LINE
- PW PROPOSED WATER LINE
- PROPOSED WATER VALVE
- PROPOSED THRUST BLOCK
- PE PROPOSED UNDERGROUND ELECTRIC LINE
- T PROPOSED TRANSFORMER

ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS
AC	ACRES
ADA	AMERICANS WITH DISABILITIES ACT
AGGR	AGGREGATE
BLDG	BUILDING
BC	BOTTOM OF CURB
CB	CATCH BASIN
CONST	CONSTRUCT
COORD	COORDINATE
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DMH	DRAINAGE MANHOLE
DWG	DRAWING
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EV	ELECTRIC VEHICLE
FF	FINISHED FLOOR
FGC	FLUSH GRANITE CURB
HDPE	HIGH DENSITY POLYETHYLENE
HMA	HOT MIX ASPHALT
HYD	HYDRANT
ID	INSIDE DIAMETER
INV	INVERT
L	LENGTH
LF	LINEAR FEET
MAX	MAXIMUM
MIN	MINIMUM
OC	ON CENTER
PCB	PROPOSED CATCH BASIN
PDMH	PROPOSED DRAINAGE MANHOLE
POS	PROPOSED OUTLET STRUCTURE
PROP	PROPOSED
PSMH	PROPOSED SEWER MANHOLE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT OF WAY
SGC	SLOPED GRANITE CURB
SF	SQUARE FEET
STD	STANDARD
TBR	TO BE REMOVED
TC	TOP OF CURB
TYP	TYPICAL
UD	UNDERDRAIN
W	WIDTH
W/	WITH
YD	YARD DRAIN

Tighe&Bond

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE

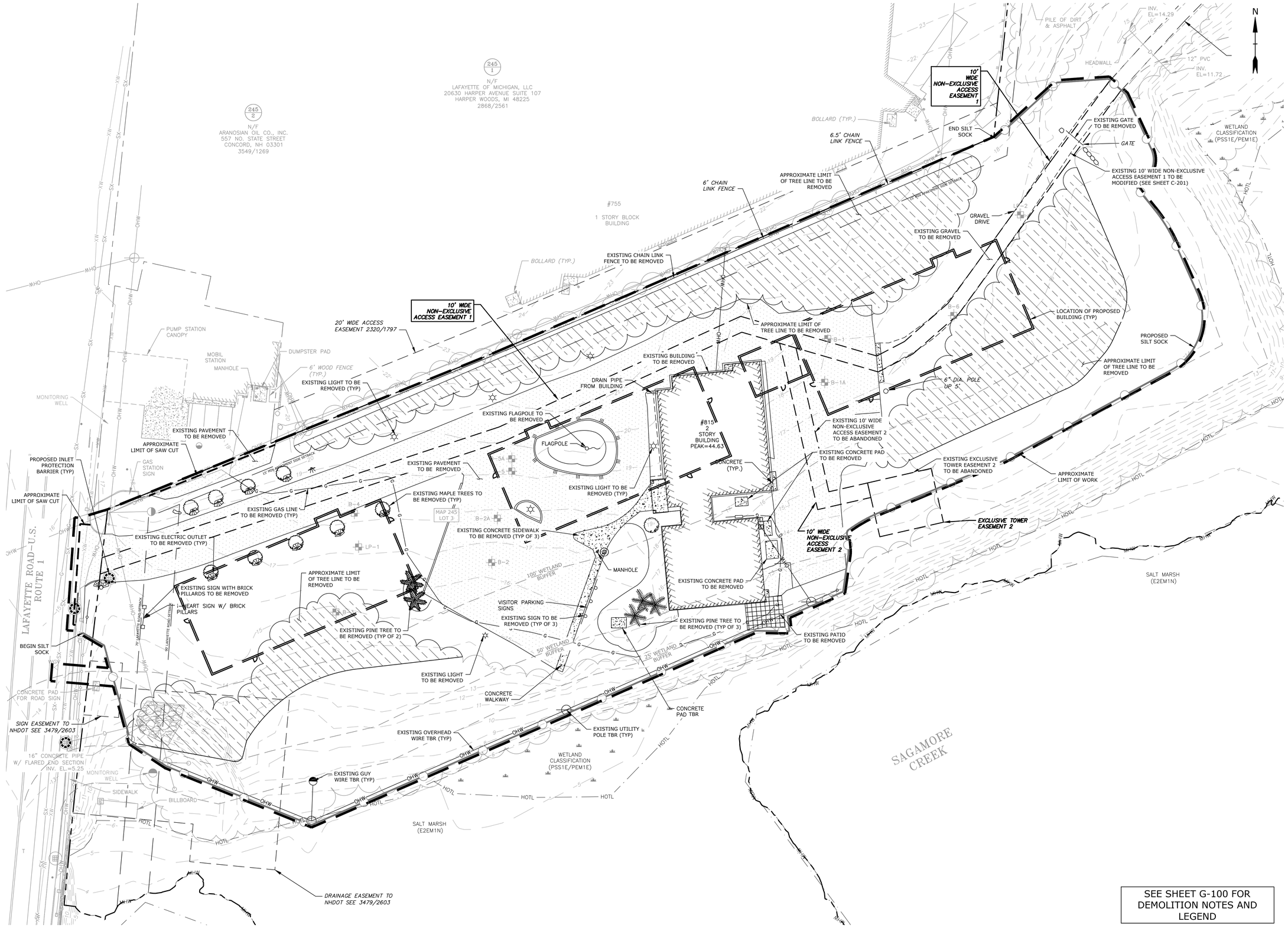
MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DSGN.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

GENERAL NOTES

SCALE: AS SHOWN

G-100



Tighe&Bond

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

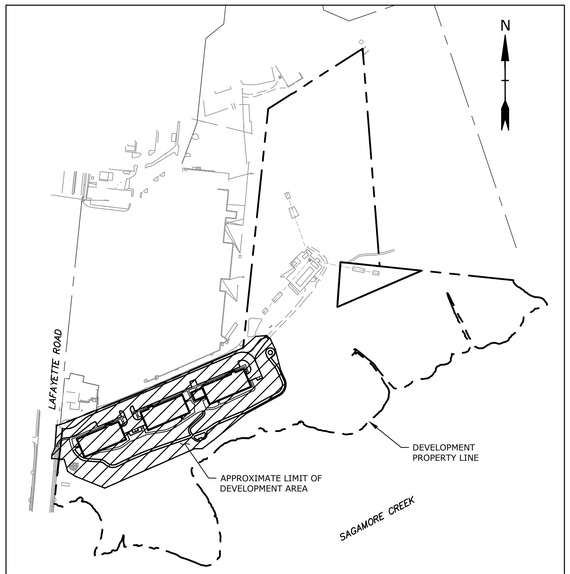
MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DSGN.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

EXISTING CONDITIONS AND DEMOLITION PLAN

SCALE: AS SHOWN

C-101



SITE DEVELOPMENT PLAN

0 250' 500'
GRAPHIC SCALE

SITE DATA:
LOCATION: TAX MAP 245, LOT 3
815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

ZONING DISTRICT: GATEWAY DISTRICT (G1)

PROPOSED USE: MULTIFAMILY

DIMENSIONAL REQUIREMENTS:	REQUIRED	PROPOSED
MINIMUM LOT AREA:	10,000 SF	±855,567 SF
MINIMUM SITE WIDTH:	75 FT	±265 FT
MINIMUM SITE LENGTH:	100 FT	±983 FT
MINIMUM COMMUNITY SPACE:	10%	
MINIMUM STREET FRONTAGE:		
APARTMENT BUILDING:	100 FT	±267 FT
FRONT YARD SETBACK:		
LAFAYETTE ROAD SETBACK	70-90 FT	±90 FT
MIN. SIDE YARD SETBACK		
APARTMENT BUILDING:	15 FT	±56 FT
MIN. REAR YARD SETBACK		
APARTMENT BUILDING:	20 FT	±370 FT
MAXIMUM BUILDING HEIGHT		
APARTMENT BUILDING:	50 FT	45.89 FT
MAXIMUM BUILDING COVERAGE:	50%	±3.6%
FRONT LOT LINE BUILD OUT:	50%	±0%(1)
MINIMUM OPEN SPACE:	20%	±91%

(1) - VARIANCE GRANTED BY ZONING BOARD OF ADJUSTMENTS ON SEPTEMBER 26, 2023, FROM SECTION 10.5B33.20, 50% FRONT LOT LINE BUILD OUT, AND SECTION 10.5B33.30, PRIMARY FACADE BUILT PARALLEL TO A FRONT LOT LINE.

PARKING CALCULATIONS:

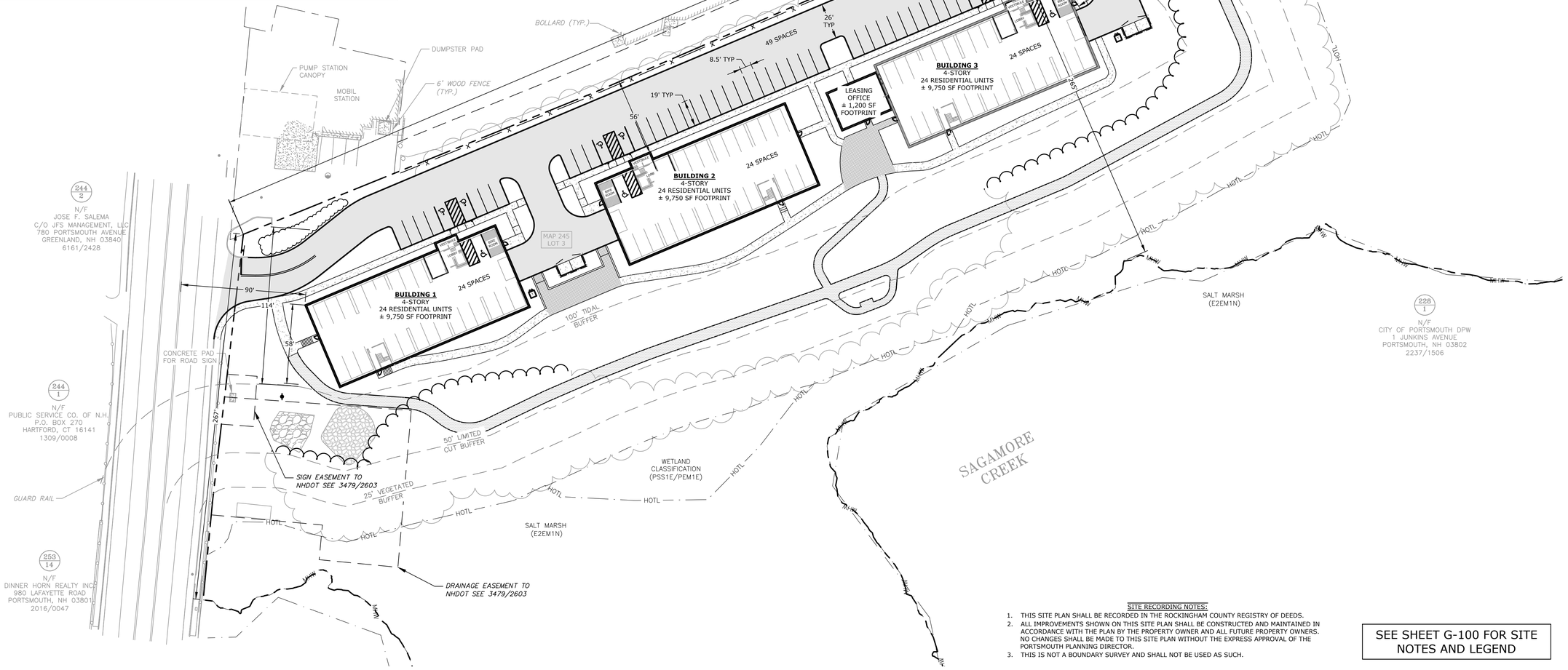
PARKING SPACE REQUIREMENTS:

REQUIRED PARKING SPACES	
1.3 SPACES PER UNIT x 72 UNITS	= 94 SPACES
+1 VISITOR PER 5 UNITS	= 15 SPACES
TOTAL REQUIRED PARKING	= 109 SPACES
PROVIDED PARKING SPACES	
SURFACE SPACES	= 49 SPACES
INTERNAL SPACES	= 72 SPACES
TOTAL PROVIDED SPACES	= 121 SPACES

	REQUIRED	PROPOSED
ACCESSIBLE PARKING SPACES:	5 SPACES	9 SPACES

DIMENSIONAL REQUIREMENTS:

STANDARD 90° STALL :		
WIDTH	8.5 FT MIN	8.5 FT
LENGTH	19 FT MIN	19 FT
DRIVE AISLE WIDTH:		
• 90° (2-WAY TRAFFIC)	24 FT	24 FT (MIN)



SITE RECORDING NOTES:

1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. 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.
3. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET G-100 FOR SITE NOTES AND LEGEND

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0 40' 80'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

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OVERALL SITE PLAN

SCALE: AS SHOWN

C-102

Last Saved: 10/23/2023
Plotted: Oct 23, 2023-8:59am By: CKrzaiuk
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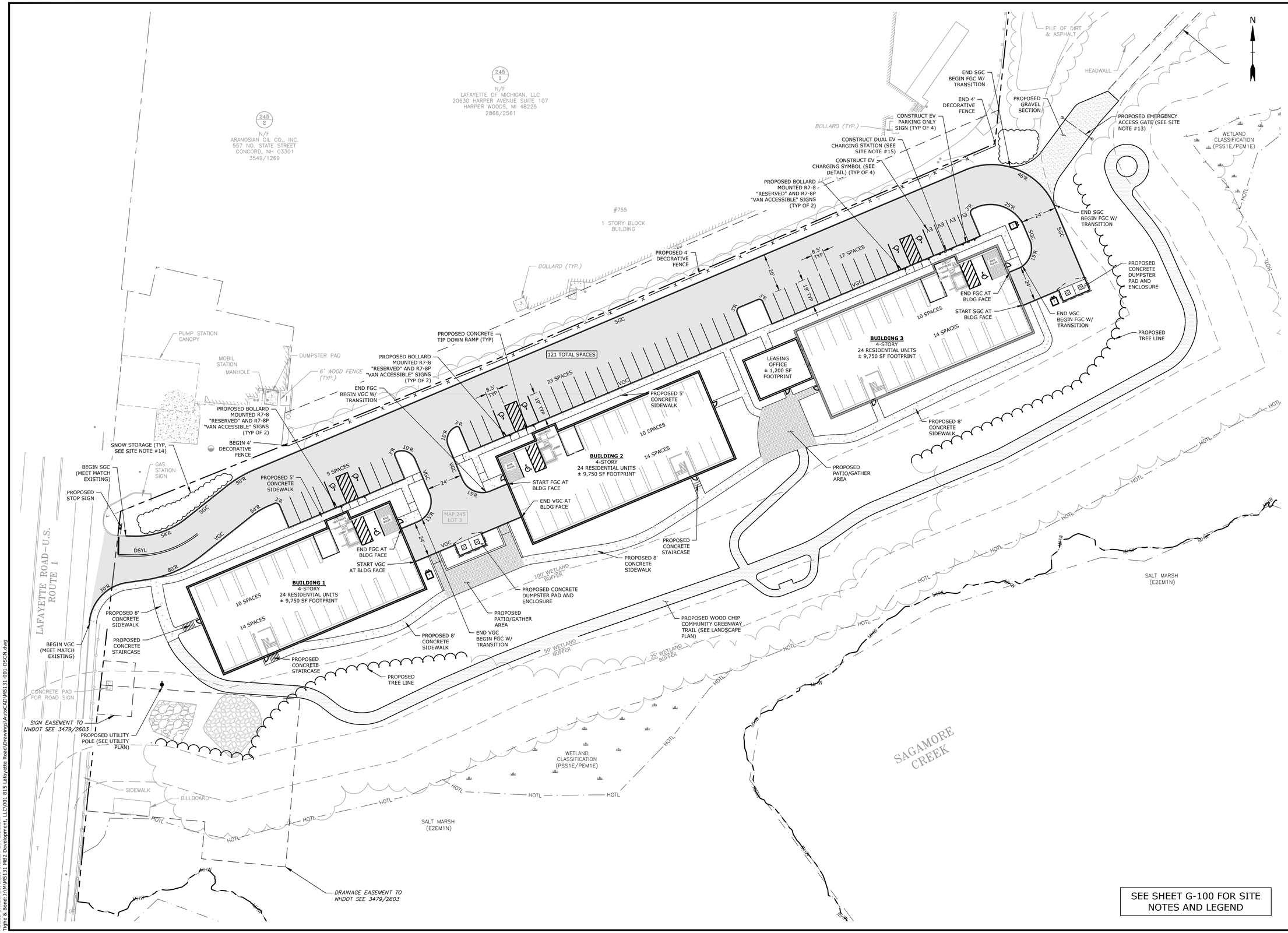

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10/23/2023

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

0 30' 60'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

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815 LAFAYETTE ROAD
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SITE PLAN

SCALE: AS SHOWN

C-102.1

Last Saved: 10/23/2023
Plotted: 10/23/2023 8:49:31 am By: Ckrzoulk
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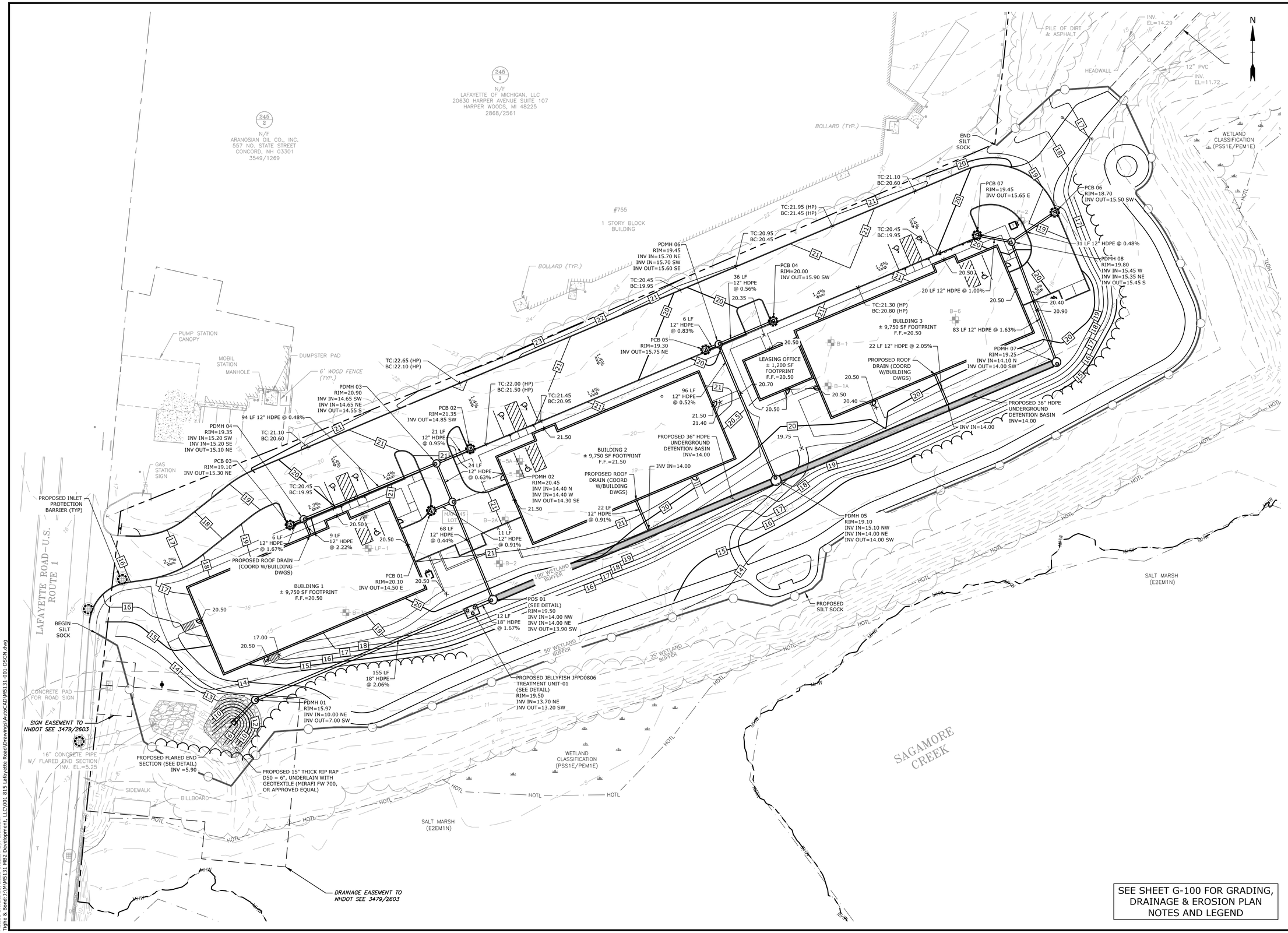

SEE SHEET G-100 FOR GRADING, DRAINAGE & EROSION CONTROL NOTES AND LEGEND

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GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103

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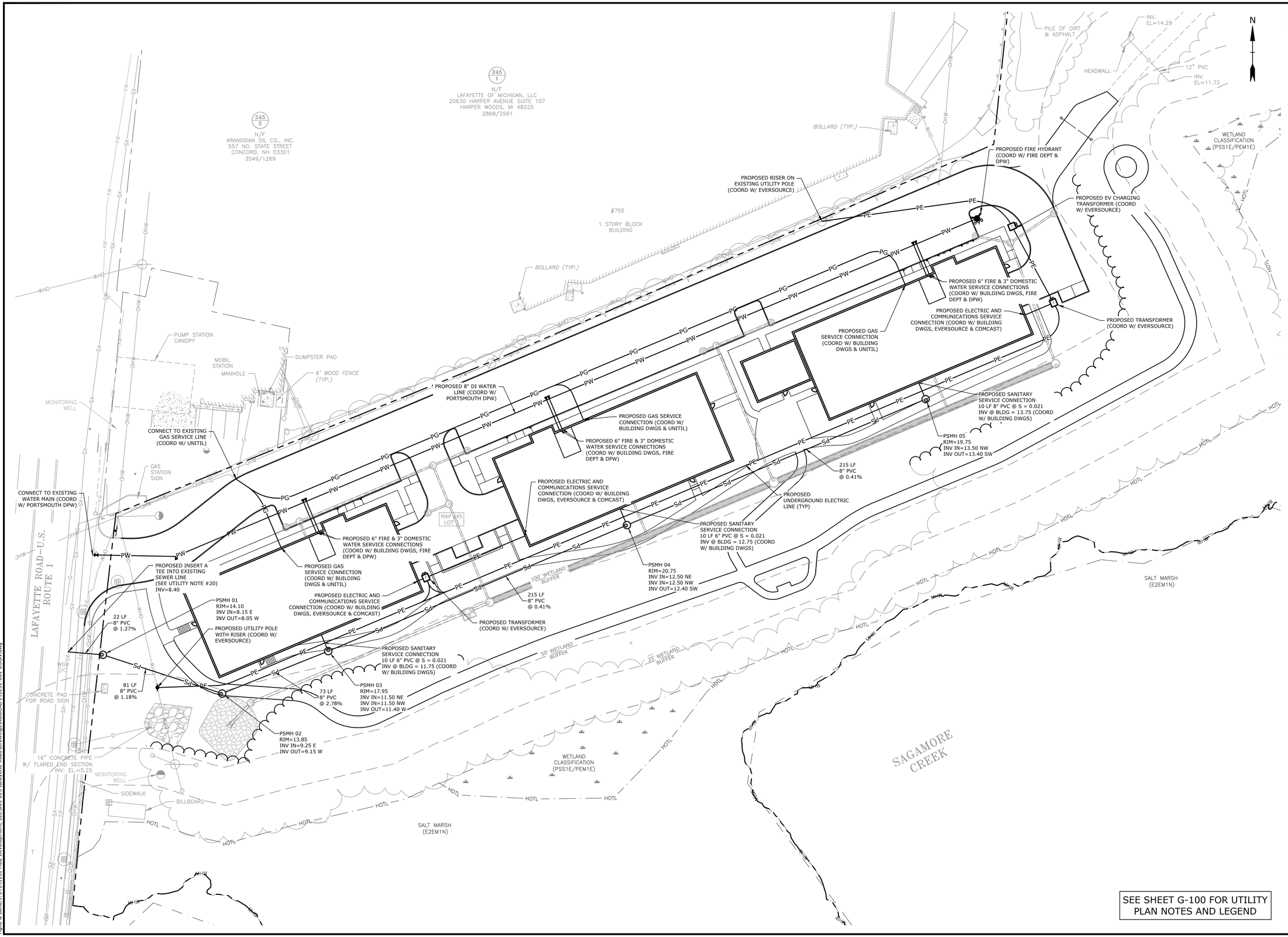

SEE SHEET G-100 FOR UTILITY PLAN NOTES AND LEGEND

Tighe&Bond

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0 30' 60'
GRAPHIC SCALE

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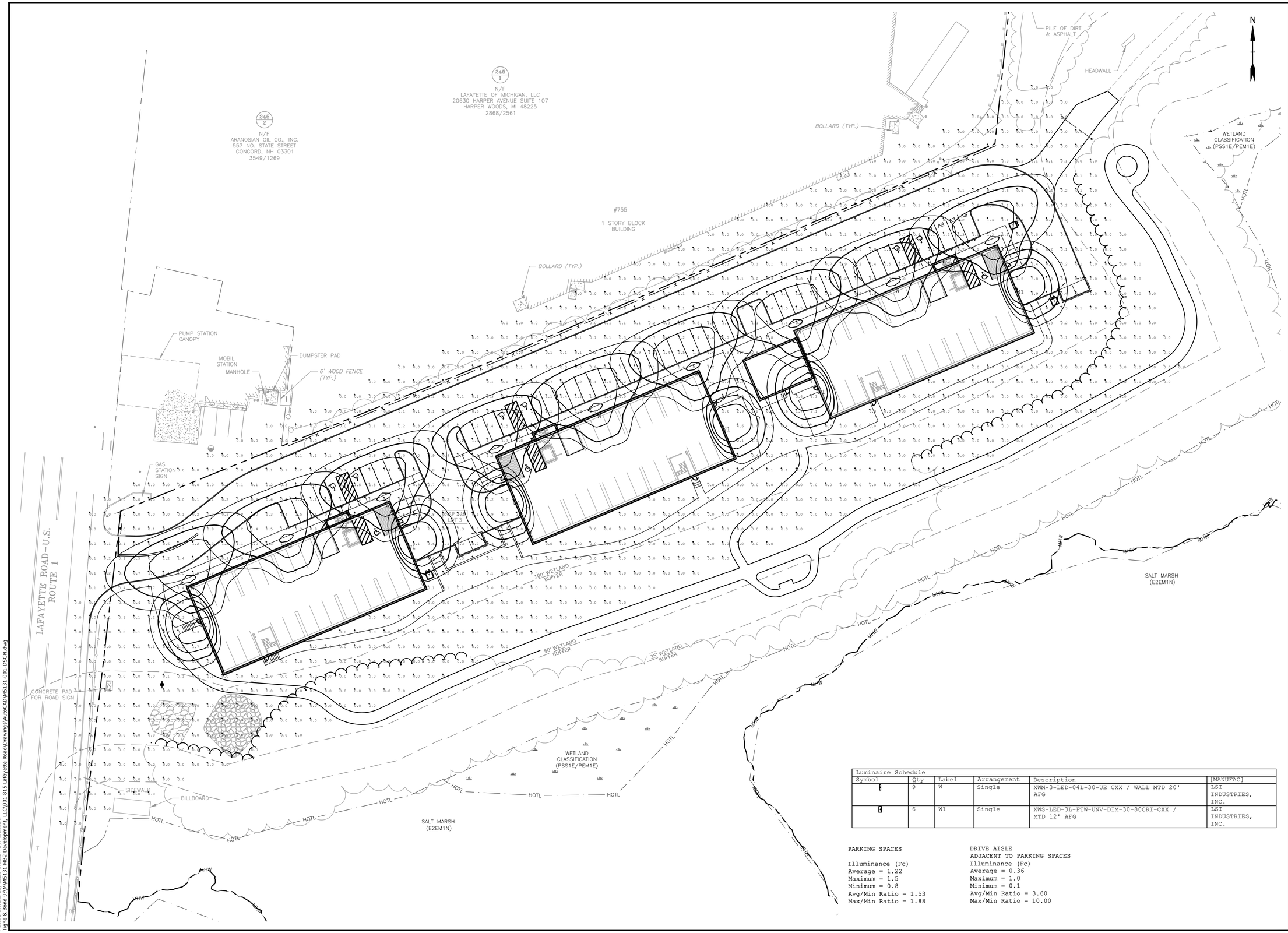
UTILITY PLAN

SCALE: AS SHOWN

C-104

Last Saved: 10/23/2023
Printed: Oct 23, 2023 - 9:40am By: CKrzsiak
Tighe & Bond:J:\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DSGN.dwg



Luminaire Schedule					
Symbol	Qty	Label	Arrangement	Description	[MANUFAC]
	9	W	Single	XWM-3-LED-04L-30-UE CXX / WALL MTD 20' AFG	LSI INDUSTRIES, INC.
	6	W1	Single	XWS-LED-3L-FTW-UNV-DIM-30-80CRI-CXX / MTD 12' AFG	LSI INDUSTRIES, INC.

PARKING SPACES

Illuminance (Fc)
Average = 1.22
Maximum = 1.5
Minimum = 0.8
Avg/Min Ratio = 1.53
Max/Min Ratio = 1.88

DRIVE AISLE
ADJACENT TO PARKING SPACES
Illuminance (Fc)
Average = 0.36
Maximum = 1.0
Minimum = 0.1
Avg/Min Ratio = 3.60
Max/Min Ratio = 10.00

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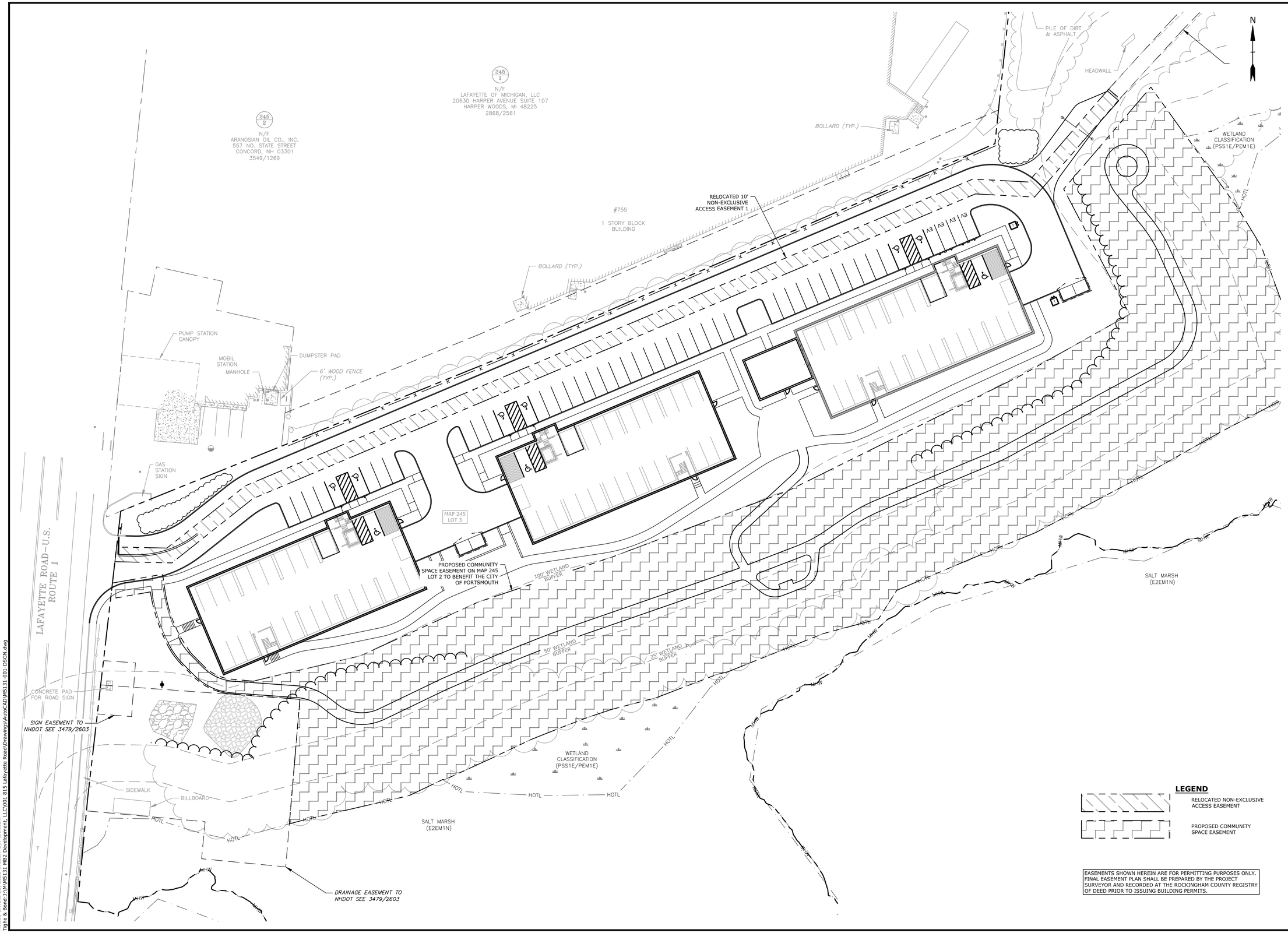
PHOTOMETRIC PLAN

SCALE: AS SHOWN

C-105



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EASEMENT PLAN

SCALE: AS SHOWN

C-201

LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL FURNISH AND PLANT ALL PLANTS IN QUANTITIES AS SHOWN ON THIS PLAN. NO SUBSTITUTIONS WILL BE PERMITTED UNLESS APPROVED BY OWNER. ALL PLANTS SHALL BE NURSERY GROWN.
2. ALL PLANTS SHALL BE NURSERY GROWN AND PLANTS AND WORKMANSHIP SHALL CONFORM TO THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS, INCLUDING BUT NOT LIMITED TO SIZE, HEALTH, SHAPE, ETC., AND SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO ARRIVAL ON-SITE AND AFTER PLANTING.
3. PLANT STOCK SHALL BE GROWN WITHIN THE HARDINESS ZONES 4 THRU 7 ESTABLISHED BY THE PLANT HARDINESS ZONE MAP, MISCELLANEOUS PUBLICATIONS NO. 814, AGRICULTURAL RESEARCH SERVICE, UNITED STATES DEPARTMENT AGRICULTURE, LATEST REVISION.
4. PLANT MATERIAL SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE PRIOR TO DIGGING.
5. THE NUMBER OF EACH INDIVIDUAL PLANT TYPE AND SIZE PROVIDED IN THE PLANT LIST OR ON THE PLAN IS FOR THE CONTRACTOR'S CONVENIENCE ONLY. IF A DISCREPANCY EXISTS BETWEEN THE NUMBER OF PLANTS ON THE LABEL AND THE NUMBER OF SYMBOLS SHOWN ON THE DRAWINGS, THE GREATER NUMBER SHALL APPLY.
6. NO SUBSTITUTION OF PLANT MATERIALS WILL BE ALLOWED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
7. THE CONTRACTOR SHALL LOCATE, VERIFY AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWN WORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTING AND UTILITIES SHALL IMMEDIATELY BE REPORTED TO THE OWNER SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.
8. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED, SHALL RECEIVE 6" OF LOAM AND SEED. NO FILL SHALL BE PLACED IN ANY WETLAND AREA.
9. THREE INCHES (3") OF BARK MULCH IS TO BE USED AROUND THE TREE AND SHRUB PLANTING AS SPECIFIED IN THE DETAILS. WHERE BARK MULCH IS TO BE USED IN A CURBED ISLAND THE BARK MULCH SHALL MEET THE TOP INSIDE EDGE OF THE CURB. ALL OTHER AREAS SHALL RECEIVE 6" INCHES OF LOAM AND SEED.
10. LANDSCAPING SHALL BE LOCATED WITHIN 150 FT OF EXTERIOR HOSE ATTACHMENT OR SHALL BE PROVIDED WITH AN IRRIGATION SYSTEM.
11. SEE PLANTING DETAILS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
12. TREE STAKES SHALL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR.
13. PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 1ST. NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT.
14. PARKING AREA PLANTED ISLANDS TO HAVE MINIMUM OF 1'-0" TOPSOIL PLACED TO WITHIN 3 INCHES OF THE TOP OF CURB ELEVATION. REMOVE ALL CONSTRUCTION DEBRIS BEFORE PLACING TOPSOIL.
15. TREES SHALL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 'TREES, SHRUBS AND OTHER WOOD PLANT MAINTENANCE STANDARD PRACTICES.
16. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24 HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN, IF NECESSARY DURING THE FIRST GROWING SEASON. LANDSCAPE CONTRACTOR SHALL COORDINATE WATERING SCHEDULE WITH OWNER DURING THE ONE (1) YEAR GUARANTEE PERIOD.
17. EXISTING TREES AND SHRUBS SHOWN ON THE PLAN ARE TO REMAIN UNDISTURBED. ALL EXISTING TREES AND SHRUBS SHOWN TO REMAIN ARE TO BE PROTECTED WITH A 4-FOOT SNOW FENCE PLACED AT THE DRIP LINE OF THE BRANCHES OR AT 8 FEET MINIMUM FROM THE TREE TRUNK. ANY EXISTING TREE OR SHRUB SHOWN TO REMAIN, WHICH IS REMOVED DURING CONSTRUCTION, SHALL BE REPLACED BY A TREE OF COMPARABLE SIZE AND SPECIES TREE OR SHRUB.
18. THE CONTRACTOR SHALL GUARANTEE ALL PLANTINGS TO BE IN GOOD HEALTHY, FLOURISHING AND ACCEPTABLE CONDITION FOR A PERIOD OF ONE (1) YEAR BEGINNING AT THE DATE OF ACCEPTANCE OF SUBSTANTIAL COMPLETION. ALL GRASSES, TREES AND SHRUBS THAT, IN THE OPINION OF THE LANDSCAPE ARCHITECT, SHOW LESS THAN 80% HEALTHY GROWTH AT THE END OF ONE YEAR PERIOD SHALL BE REPLACED BY THE CONTRACTOR.
19. UPON EXPIRATION OF THE CONTRACTOR'S ONE YEAR GUARANTEE PERIOD, THE OWNER SHALL BE RESPONSIBLE FOR LANDSCAPE MAINTENANCE INCLUDING WATERING DURING PERIODS OF DROUGHT
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PLANTING AND LAWNS AGAINST DAMAGE FROM ONGOING CONSTRUCTION. THIS PROTECTION SHALL BEGIN AT THE TIME THE PLANT IS INSTALLED AND CONTINUE UNTIL THE FORMAL ACCEPTANCE OF ALL THE PLANTINGS.
21. PRE-PURCHASE PLANT MATERIAL AND ARRANGE FOR DELIVERY TO MEET PROJECT SCHEDULE AS REQUIRED IT MAY BE NECESSARY TO PRE-DIG CERTAIN SPECIES WELL IN ADVANCE OF ACTUAL PLANTING DATES.

COMMUNITY TRAIL NOTES:

1. THE COMMUNITY TRAIL DEPICTED ON THIS PLAN IS INTENDED FOR PERMITTING PURPOSES ONLY. FINAL TRAIL ALIGNMENT SHALL BE FIELD DELINEATED AND VERIFIED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.
   - 1.1. THE TRAIL SHALL BE LAID OUT IN MANNER THAT PROTECTS EXISTING NATIVE WELL ESTABLISHED TREES GREATER THAN 3 INCHES IN DIAMETER.
   - 1.2. TRAIL WIDTH SHALL HAVE A MINIMUM WIDTH OF APPROXIMATELY 5' AND A MAXIMUM WIDTH OF 8'.
   - 1.3. IN NO INSTANCE SHALL SOIL BE CUT OR FILLED TO CONSTRUCT THE TRAIL IN EXISTING WOODLAND RESTORATION AREA.
   - 1.4. TRAIL ALIGNMENT SHALL BE LIMITED TO THE UPLAND PORTION OF LAND BETWEEN THE 50 FT AND 100 FT WETLAND BUFFER EXCEPT FOR THE CENTRAL LOOP AS DEPICTED ON THE PLAN.
   - 1.5. TRAIL ALIGNMENT SHALL BE COORDINATED WITH THE INVASIVE SPECIES REMOVAL TO BE STRATEGICALLY PLACED WHERE EXISTING VEGETATION HAS BEEN DISTURBED.
2. THE TRAIL SHALL CONSIST OF 2 INCHES OF NATIVE WOOD CHIPS LAID DIRECTLY ON EXISTING FORESTED LAND OR PLACED LOAM.
3. CONTRACTOR SHALL PRIORITIZE THE USE OF WOOD CHIPS FROM THE NATIVE TREES ON SITE REQUIRED TO BE REMOVED FOR CONSTRUCTION ACTIVITIES.
4. SHOULD ADDITIONAL WOOD CHIPS BE NEEDED, THEY SHALL BE NON INVASIVE NATIVE WOOD CHIPS.

WOODLAND RESTORATION NOTES

1. INVASIVE PLANT MATERIALS WILL BE REMOVED IN ACCORDANCE WITH THE INVASIVE SPECIES REMOVAL PLAN. INVASIVE REMOVAL WILL BE CONDUCTED USING MECHANICAL WHOLE PLANT REMOVAL STRATEGIES AND CHIPPED AND COMPOSTED AT AN APPROPRIATE FACILITY OR BURNED ON SITE ACCORDING TO LOCAL FIRE DEPARTMENT RULES AND REGULATIONS.
2. AN EXISTING TREE SURVEY WILL BE COMPLETED FOR THE PROJECT AS PART OF THE NHDES SHORELAND PERMITTING PROCESS AT WHICH TIME ALL EXISTING TREES ALONG THE SHORELAND WILL BE IDENTIFIED BY SPECIES AND SIZE.
3. EXISTING TREES THAT ARE DEEMED IN GOOD HEALTH WILL BE IDENTIFIED ON THE LANDSCAPE PLAN AS TO REMAIN.
4. TREES DEEMED TO BE IN POOR HEALTH BY THE PROJECT ENVIRONMENTAL SCIENTIST OR INUNDATED BY INVASIVE SPECIES WILL BE REMOVED AND REPLACED IN KIND WITH A NATIVE TREE.
5. ADDITIONAL LANDSCAPE BUFFER ENHANCEMENT MAY BE ADDED TO THE PROPOSED LANDSCAPE PLAN TO FURTHER ENHANCE THE WETLAND BUFFER.
6. INVASIVE SPECIES REMOVAL WILL BE LIMITED TO THE UPLAND AREA OUTSIDE OF MEAN HIGH WATER LINE AND OR TO THE TOP OF THE STEEP BANK SLOPES TO MAINTAIN VEGETATION FOR SOIL STABILIZATION MEASURES.

RESTORATION PLANTING NOTES

1. INVASIVE PLANT MATERIALS WILL BE REMOVED USING MECHANICAL WHOLE PLANT REMOVAL STRATEGIES AND CHIPPED AND COMPOSTED AT AN APPROPRIATE FACILITY OR BURNED ON SITE ACCORDING TO LOCAL FIRE DEPARTMENT RULES AND REGULATIONS.
2. DISTURBED SOILS WILL BE AUGMENTED AS NEEDED WITH A CUSTOM BLENDED SOIL OF ONE PART LOAM, ONE PART COMPOST AND ONE PART CLEAN SAND.
3. SEEDED AREAS ARE TO BE COVERED WITH SALT MARSH HAY TO RETAIN SOIL MOISTURE AND PROTECT AGAINST SEED PREDATION BY BIRDS AND SMALL ANIMALS.
4. NATIVE PLANT MATERIAL WILL BE LAID OUT AND INSTALLED BY AN ECOLOGICAL RESTORATION SPECIALIST OR PERSONS TRAINED IN HORTICULTURAL PRACTICES. EXACT PLANT LOCATIONS WILL BE DETERMINED IN THE FIELD BASED ON SITE SPECIFIC PLANTING CONDITIONS AND MICROTOPOGRAPHY.
5. THE NEW PLANTINGS WILL BE WATERED FOR ONE FULL GROWING SEASON OR UNTIL SEED AND PLANT MATERIALS ARE ESTABLISHED.
6. MONTHLY INSPECTIONS WILL BE CONDUCTED DURING THE FIRST GROWING SEASON AND TREATMENT/REMOVAL OF INVASIVE SPECIES WILL BE IMPLEMENTED AS NEEDED DURING THE ESTABLISHMENT PERIOD.
7. CARE IS TO BE TAKEN IN REMOVING ANY NEW COLONIZING INVASIVE PLANT MATERIAL TO MINIMIZE DISTURBANCE TO ESTABLISHING NATIVE PLANT SPECIES.
8. PRACTICES REGARDING USE OF FERTILIZERS AND PESTICIDES WILL COMPLY WITH ORDINANCES 10.1018.24 AND 10.1018.25.

Symbol	Botanical Name	Common Name	Size	Spacing
TREES				
AA	*Acer rubrum 'Armstrong'*	Armstrong Red Maple	2.5-3" Cal.	
AG	*Amelanchier 'Autumn Brilliance'*	Autumn Brilliance Serviceberry	2.5-3" Cal.	
AF	*Acer X freemanii 'Autumn Blaze'*	Autumn Blaze Maple	2.5-3" Cal.	
AR	*Acer rubrum*	Red Maple	3-3.5" Cal.	
BN	*Betula nigra 'Heritage'*	Heritage River Birch	3-3.5" Cal.	
JC	*Juniperus chinensis 'Robusta Green'*	Robusta Green Juniper	7-8' Ht.	
JV	*Juniperus virginiana*	Eastern Red Cedar	7-8' Ht.	
PG	*Picea glauca*	White Spruce	8'-10' Ht.	
QB	*Quercus bicolor*	Swamp White Oak	3-3.5" Cal.	
QP	*Quercus palustris*	Pin Oak	3-3.5" Cal.	
TN	*Thuja occidentalis 'Nigra'*	Dark American Arborvitae	7-8' Ht.	
TS	*Thuja occidentalis "Smaragd'*	Emerald Green Arborvitae	5-6' Ht.	
SHRUBS				
CA	*Clethra alnifolia*	Summersweet	5 Gal.	30" oc
CP	*Comptonia peregrina*	Sweet Fern	5 Gal.	30" oc
CR	*Cornus racemosa*	Gray Dogwood	7 Gal.	30" oc
IF	*Iva frutescens*	Bigleaf Marsh Elder	5 Gal.	30" oc
IG	*Ilex glabra 'Shamrock'*	Shamrock Inkberry	5 Gal.	30" oc
IJ	*Ilex verticillata 'Jim Dandy'*	Jim Dandy Winterberry	3 Gal.	30" oc
IV	*Ilex verticillata 'Red Sprite'*	Red Sprite Winterberry	5 Gal.	30" oc
MP	*Myrica pennsylvanica*	Northern Bayberry	5 Gal.	30" oc
RG	*Rhus aromatica 'Grow-Low'*	Gro-Low Fragrant Sumac	3 Gal.	30" oc
ST	*Spirea tomentosa*	Steeplebush	5 Gal.	30" oc
VD	*Viburnum dentatum*	Arrowwood Viburnum	5 Gal.	30" oc
PERENNIALS				
AM	*Amsonia tabermontana 'Walter'*	Eastern Bluestar	2 Gal.	18" oc
AN	*Aster nova-angliae*	New England Aster	2 Gal.	18" oc
AT	*Asclepias tuberosa*	Butterfly Weed	2 Gal.	18" oc
BA	*Baptisia australis*	Blue False Indigo	2 Gal.	18" oc
DP	*Dennstaedtia punctilobula*	Hay Scented Fern	1 Gal.	18" oc
EF	*Eupatorium fistulosum*	Joe Pye Weed	2 Gal.	18" oc
EP	*Echinacia purpurea*	Purple Coneflower	2 Gal.	18" oc
OS	*Onoclea sensibilis*	Sensitive Fern	2 Gal.	18" oc
SS	*Solidago sempervirens*	Seaside Goldenrod	2 Gal.	18" oc
ORNAMENTAL GRASSES				
AP	*Agrostis pernans*	Upland Bentgrass	2 Gal.	
BC	*Bouteloua curtipendula*	Side of Oats Grama	2 Gal.	
SC	*Schizachyrium scoparium*	Little Bluestem	2 Gal.	
SN	*Sorgastrum nutans*	Indian Grass	2 Gal.	
SEED MIXES				
Buffer Seed Mix 1	*Ernst Seed Riparian Buffer Mix*			
Buffer Seed Mix 2	*Ernst Seed Fescue Mix composed of 45% Creeping Red Fescue / 27.5% Hard Fescue 'Minimua' / 27.5% Hard Fescue 'Beacon'*			
Lawns	*70% 'Rebel II' Tall Fescue, 10% "Baron" Kentucky Bluegrass, & 20% "Palmer" Perennial Ryegrass*			

Tighe&Bond

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

LICENSED LANDSCAPE ARCHITECT – RALPH GORDON LEEDY, JR 007 STATE OF NEW HAMPSHIRE – 10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH,
NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DSGN.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

LANDSCAPE SCHEDULE AND NOTES

SCALE: AS SHOWN

L-100

LEGEND

- PROPOSED DECIDUOUS TREE
- PROPOSED EVERGREEN TREE
- PROPOSED SHURBS
- PROPOSED MOW TO LINE
- PROPOSED COMMUNITY TRAIL
- PROPOSED WOODLAND RESTORATION AREA
- PROPOSED BUFFER SEED MIX 1
- PROPOSED BUFFER SEED MIX 2
- PROPOSED ORNAMENTAL GRASSES
- PROPOSED PERENNIAL PLANTER BED
- PROPOSED PERENNIAL PLANTER BED

N

245/1
N/F
LAFAYETTE OF MICHICAN, LLC
20630 HARPER AVENUE SUITE 107
HARPER WOODS, MI 48225
2868/2561

#755
1 STORY BLOCK BUILDING

MAP 245 LOT 1

LAFAYETTE ROAD–U.S. ROUTE 1

PUMP STATION CANOPY
MOBIL STATION
MANHOLE
DUMPSTER PAD
6' WOOD FENCE (TYP.)
MONITORING WELL
GAS STATION CANOPY
CONCRETE PAD FOR ROAD SIGN
16" CONCRETE PIPE W/ FLARED END SECTION INV. EL.=5.25
MONITORING WELL
SIDEWALK
BILLBOARD
PILE OF DIRT & ASPHALT
INV. EL=14.29
HEADWALL
12" PVC
INV. EL=11.72
BOLLARD (TYP.)
WETLAND CLASSIFICATION (PSS1E/PEM1E)
SEEDED LAWN (TYP)
BUFFER SEED MIX 2
EXISTING WOODLAND RESTORATION AREA (SEE WOODLAND RESTORATION NOTES)
BUFFER SEED MIX 1
PROPOSED ORNAMENTAL GRASSES (TYP)
PROPOSED PLANTING BED (TYP)
PROPOSED BENCH AND TRASH RECEPTICAL
PROPOSED SHURB (TYP)
PROPOSED WOOD CHIP COMMUNITY GREENWAY TRAIL (SEE COMMUNITY TRAIL NOTES)
EXISTING WOODLAND RESTORATION AREA (SEE WOODLAND RESTORATION NOTES)
WETLAND CLASSIFICATION (PSS1E/PEM1E)
SALT MARSH (E2EM1N)
SAGAMORE CREEK
SALT MARSH (E2EM1N)
PROPOSED MOW TO LINE (TYP)
PROPOSED PLANTING BED (TYP)
100' WETLAND BUFFER
50' WETLAND BUFFER
25' WETLAND BUFFER

5 JC, 9 TN, AA, 6 JC, 6 TN, QB, 7 JC, 2 AF, AG, 9 TS, 2 AG, 2 BN, AR, 2 BA, 3 PG, AF, 2 AG, 3 JV, 3 AR, 3 BA

SEE SHEET L-100 FOR LANDSCAPE NOTES AND PLANT SCHEDULE

Tighe&Bond

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

RALPH GORDON LEEDY, JR 007 LICENSED LANDSCAPE ARCHITECT – STATE OF NEW HAMPSHIRE
10/23/2023

0 30' 60'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
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DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

LANDSCAPE PLAN

SCALE: AS SHOWN

L-101

Last Saved: 10/23/2023
Last Saved By: CKrzesik
Plotted: 10/23/2023 9:44am By: CKrzesik
Tighe & Bond J:\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DSGN.dwg

GENERAL PROJECT INFORMATION
PROJECT APPLICANT: PROSPECT NORTH 815, LLC
PROJECT NAME: PROPOSED DEVELOPMENT
PROJECT ADDRESS: 815 LAFAYETTE ROAD, PORTSMOUTH NH
PROJECT MAP / LOT: TAX MAP 245, LOT 3
PROJECT LATITUDE: 43°-03'-06.32"N
PROJECT LONGITUDE: 70°-46'-07.81"W

PROJECT DESCRIPTION
THE PROPOSED PROJECT CONSISTS OF REDEVELOPING THE EXISTING WHEB SITE TO A MULTI-FAMILY HOUSING SITE. THE SITE WILL CONSIST OF THREE PRIMARY BUILDING, ALL HAVING A SQUARE FOOTAGE 9,750 SF WITH 24 DWELLING UNITS IN EACH.

DISTURBED AREA
THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 3.99 ACRES.

SOIL CHARACTERISTICS
BASED ON THE NRCS WEB SOIL SURVEY FOR STRAFFORD COUNTY - NEW HAMPSHIRE, THE SOILS ON SITE CONSIST OF URBAN LAND-CANTON GRAVELLY FINE SANDY LOAM SOILS WHICH HAVE A FAST INFILTRATION RATE WHEN THOROUGHLY WET. THESE SOILS HAVE A HYDROLOGIC SOIL GROUP RATING OF D.

NAME OF RECEIVING WATERS
THE STORM WATER RUNOFF WILL ULTIMATELY DISCHARGE INTO THE SAGAMORE CREEK TO THE SOUTH OF THE SITE.

CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:
1. CUT AND CLEAR TREES.
2. CONSTRUCT TEMPORARY AND PERMANENT SEDIMENT, EROSION AND DETENTION CONTROL FACILITIES. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING OPERATIONS THAT WILL INFLUENCE STORMWATER RUNOFF SUCH AS:
   - NEW CONSTRUCTION
   - CONTROL OF DUST
   - NEARNESS OF CONSTRUCTION SITE TO RECEIVING WATERS
   - CONSTRUCTION DURING LATE WINTER AND EARLY SPRING
3. ALL PERMANENT DITCHES, SWALES, DETENTION, RETENTION AND SEDIMENTATION BASINS TO BE STABILIZED USING THE VEGETATIVE AND NON-STRUCTURAL BMPS PRIOR TO DIRECTING RUNOFF TO THEM.
4. CLEAR AND DISPOSE OF DEBRIS.
5. CONSTRUCT TEMPORARY CULVERTS AND DIVERSION CHANNELS AS REQUIRED.
6. GRADE AND GRAVEL ROADWAYS AND PARKING AREAS - ALL ROADS AND PARKING AREA SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
7. BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
8. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, PERIMETER EROSION CONTROL MEASURES, SEDIMENT TRAPS, ETC., MULCH AND SEED AS REQUIRED.
9. SEDIMENT TRAPS AND/OR BASINS SHALL BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.
10. FINISH PAVING ALL ROADWAYS AND PARKING LOTS.
11. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
12. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
13. REMOVE TRAPPED SEDIMENTS FROM COLLECTOR DEVICES AS APPROPRIATE AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES.

SPECIAL CONSTRUCTION NOTES:
1. THE CONSTRUCTION SEQUENCE MUST LIMIT THE DURATION AND AREA OF DISTURBANCE.
2. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

EROSION CONTROL NOTES:
1. ALL EROSION CONTROL MEASURES AND PRACTICES SHALL CONFORM TO THE "NEW HAMPSHIRE STORMWATER MANUAL VOLUME 3: EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION" PREPARED BY THE NHDES.
2. PRIOR TO ANY WORK OR SOIL DISTURBANCE, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR EROSION CONTROL MEASURES AS REQUIRED IN THE PROJECT MANUAL.
3. CONTRACTOR SHALL INSTALL TEMPORARY EROSION CONTROL BARRIERS, INCLUDING HAY BALES, SILT FENCES, MULCH BERMS, SILT SACKS AND SILT SOCKS AS SHOWN IN THESE DRAWINGS AS THE FIRST ORDER OF WORK.
4. SILT SACK INLET PROTECTION SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASIN INLETS WITHIN THE WORK LIMITS AND BE MAINTAINED FOR THE DURATION OF THE PROJECT.
5. PERIMETER CONTROLS INCLUDING SILT FENCES, MULCH BERM, SILT SOCK, AND/OR HAY BALE BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT UNTIL NON-PAVED AREAS HAVE BEEN STABILIZED.
6. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
7. ALL DISTURBED AREAS NOT OTHERWISE BEING TREATED SHALL RECEIVE 6" LOAM, SEED AND FERTILIZER.
8. INSPECT ALL INLET PROTECTION AND PERIMETER CONTROLS WEEKLY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
9. CONSTRUCT EROSION CONTROL BLANKETS ON ALL SLOPES STEEPER THAN 3:1.

STABILIZATION:
1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.;
   E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
2. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
   A. TEMPORARY SEEDING;
   B. MULCHING.
4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY NOVEMBER 15.

DUST CONTROL:
1. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE CONSTRUCTION PERIOD.
2. DUST CONTROL METHODS SHALL INCLUDE, BUT BE NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING.
3. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.

STOCKPILES:
1. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CATCH BASINS, SWALES, AND CULVERTS.
2. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE ONSET OF PRECIPITATION.
3. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIALS FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.
4. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY EROSION CONTROL MEASURES SUCH AS BERMS, SILT SOCK, OR OTHER APPROVED PRACTICE TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILES.

OFF SITE VEHICLE TRACKING:
1. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S) PRIOR TO ANY EXCAVATION ACTIVITIES.

VEGETATION:
1. TEMPORARY GRASS COVER:
   A. SEEDBED PREPARATION:
      a. APPLY FERTILIZER AT THE RATE OF 600 POUNDS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF THREE (3) TONS PER ACRE;
   B. SEEDING:
      a. UTILIZE ANNUAL RYE GRASS AT A RATE OF 40 LBS/ACRE;
      b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF TWO (2) INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED;
      c. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). HYDROSEEDINGS, WHICH INCLUDE MULCH, MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING;
   C. MAINTENANCE:
      a. TEMPORARY SEEDING SHALL BE PERIODICALLY INSPECTED. AT A MINIMUM, 95% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER BARRIERS, CHECK DAMS, ETC.).
2. VEGETATIVE PRACTICE:
   A. FOR PERMANENT MEASURES AND PLANTINGS:
      a. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF THREE (3) TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 7.6;
      b. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 800 POUNDS PER ACRE OF 10-20-20 FERTILIZER;
      c. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4-1/2 POUNDS AND 5-1/2 POUNDS PER INCH OF WIDTH;
      d. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH;
      e. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE;
      f. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED;
      g. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
      h. A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE APPLIED AT THE INDICATED RATE:

SEED MIX	APPLICATION RATE
CREEPING RED FESCUE	20 LBS/ACRE
TALL FESCUE	20 LBS/ACRE
REDTOP	2 LBS/ACRE

   IN NO CASE SHALL THE WEED CONTENT EXCEED ONE (1) PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. SEEDING SHALL BE DONE NO LATER THAN SEPTEMBER 15. IN NO CASE SHALL SEEDING TAKE PLACE OVER SNOW.
3. DORMANT SEEDING (SEPTEMBER 15 TO FIRST SNOWFALL):
   A. FOLLOW PERMANENT MEASURES SLOPE, LIME, FERTILIZER AND GRADING REQUIREMENTS. APPLY SEED MIXTURE AT TWICE THE INDICATED RATE. APPLY MULCH AS INDICATED FOR PERMANENT MEASURES.

CONCRETE WASHOUT AREA:
1. THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
   A. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FACILITY;
   B. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
   C. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
   D. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

ALLOWABLE NON-STORMWATER DISCHARGES:
1. FIRE-FIGHTING ACTIVITIES;
2. FIRE HYDRANT FLUSHING;
3. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
4. WATER USED TO CONTROL DUST;
5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
7. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
8. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
9. UNCONTAMINATED GROUND WATER OR SPRING WATER;
10. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
11. LANDSCAPE IRRIGATION.

WASTE DISPOSAL:
1. WASTE MATERIAL:
   A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE:
   A. ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
   B. SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE:
   A. ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

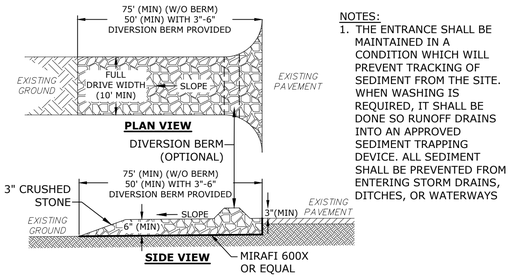
SPILL PREVENTION:
1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
   A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
      a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
      b. ALL MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE;
      c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
      d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
      e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
      f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      g. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      h. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      i. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
   C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
      a. PETROLEUM PRODUCTS:
         - ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
         - PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
      b. FERTILIZERS:
         - FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
         - ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
         - STORAGE SHALL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
      c. PAINTS:
         - ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
         - EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
         - EXCESS PAINT SHALL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
   D. SPILL CONTROL PRACTICES - IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
      a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES;
      b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS SHALL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE;
      c. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY AND REPORTED TO PEASE DEVELOPMENT AUTHORITY;
      d. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE;
      e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE LOCAL, STATE OR FEDERAL AGENCIES AS REQUIRED;
      f. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.
   E. VEHICLE FUELING AND MAINTENANCE PRACTICE:
      a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
      b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
      c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
      d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
      e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
      f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES
THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A SWPPP.

THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:
1. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
2. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
3. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT;
4. AN NPDES NOTICE OF INTENT SHALL BE SUBMITTED.

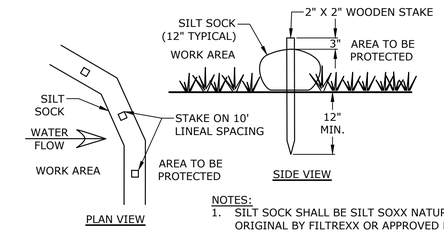
NOTES:
1. CONCRETE WASHOUT SHALL BE "JESCRAFT" STACKABLE CONCRETE WASHOUT PAN (72"x72"x14") OR APPROVED EQUAL.
2. INSTALL AND MAINTAIN CONCRETE WASHOUT IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. CONCRETE WASHOUT SHALL NOT BE PLACED WITHIN 100' WETLAND BUFFER.

CONCRETE WASHOUT DETAIL
NO SCALE



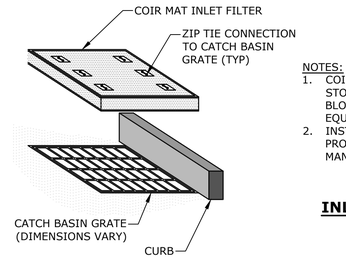
NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION EXIT
NO SCALE



NOTES:
1. SILT SOCK SHALL BE SILT SOXX NATURAL ORIGINAL BY FILTREXX OR APPROVED EQUAL.
2. INSTALL SILT SOCK IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

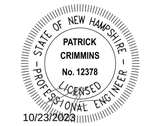
SILT SOCK
NO SCALE



NOTES:
1. COIR MAT INLET FILTER SHALL BE STORM WATER INLET FILTER BY BLOCKSOM & CO. OR APPROVED EQUAL.
2. INSTALL AND MAINTAIN INLET PROTECTION IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

INLET PROTECTION
NO SCALE

Tighe&Bond



PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

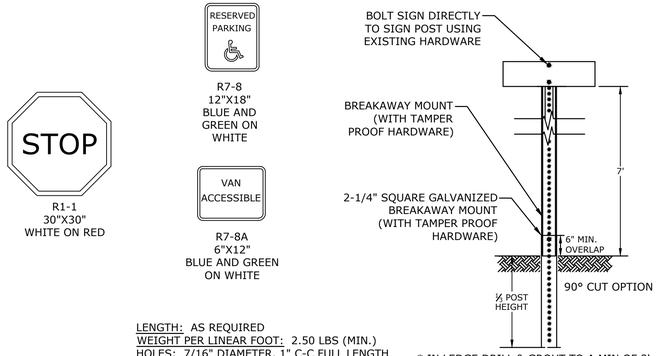
PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DTLS.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

EROSION CONTROL NOTES & DETAILS

SCALE: AS SHOWN

C-501

Last Saved: 10/20/2023
Printed: Oct 23, 2023 - 9:19am By: CKrzoiuk
Tighe & Bond:):M\M5131 M82 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DTLS.dwg

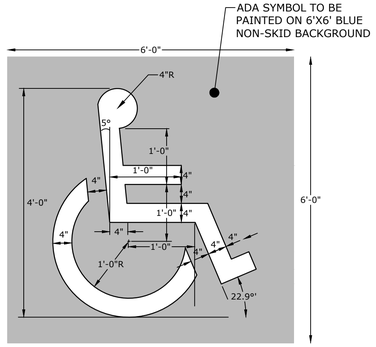


* IN LEDGE DRILL & GROUT TO A MIN OF 2'

LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 7/16" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 - 1080)
FINISH: STREET SIGNS - GALVANIZED STEEL ALL OTHER - SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN BAKED ON OR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

NOTES:
ALL SIGNS TO BE CONSTRUCTED PER THE LATEST EDITION OF THE FHWA STANDARD HIGHWAY SIGNS MANUAL AND INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

SIGN LEGEND & SIGN POST
NO SCALE

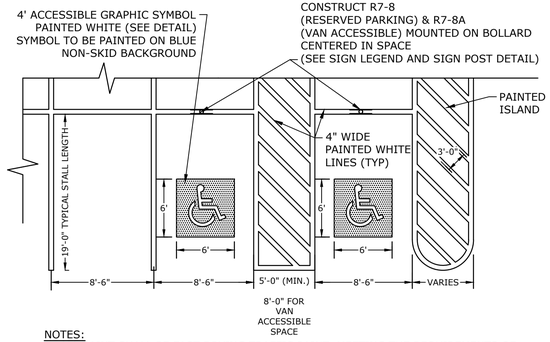


NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL
NO SCALE

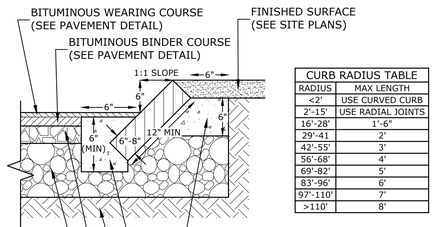
NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ELECTRIC VEHICLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST STATE AND LOCAL REQUIREMENTS.

EV CHARGING SYMBOL
NO SCALE



NOTES:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. FINISH PAVEMENT GRADES AT ALL HANDICAP ACCESSIBLE STALLS AND PAINTED ACCESS AISLES SHALL NOT EXCEED 2% IN ANY DIRECTION.

PARKING STALL/PAINTED ISLAND STRIPING
NO SCALE



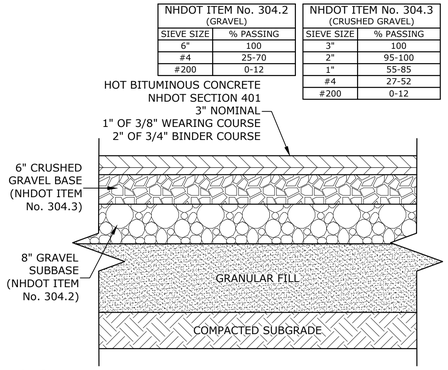
CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-5"
29'-41	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
6. JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

SLOPED GRANITE CURB
NO SCALE

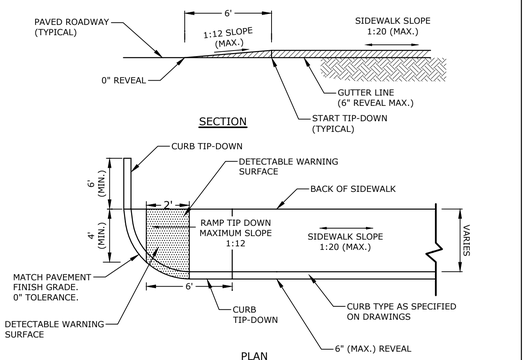
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12



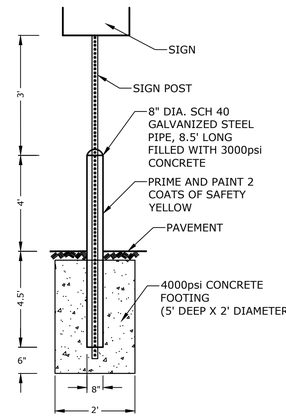
NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.

TYPICAL PAVEMENT SECTION
NO SCALE

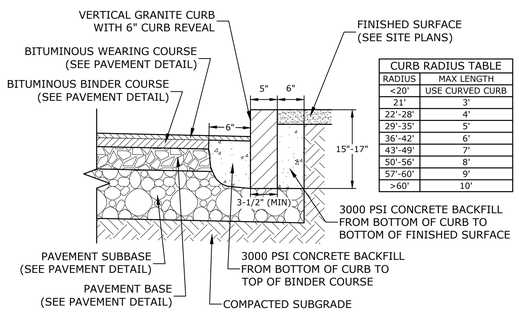


NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. PROVIDE 6" COMPACTED CRUSHED GRAVEL BASE BENEATH RAMPS.
3. DETECTABLE WARNING STRIP SHALL BE ADA SOLUTIONS, INC. CAST IN PLACE RAMP. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

CONCRETE SIDEWALK TIP-DOWN RAMP
NO SCALE



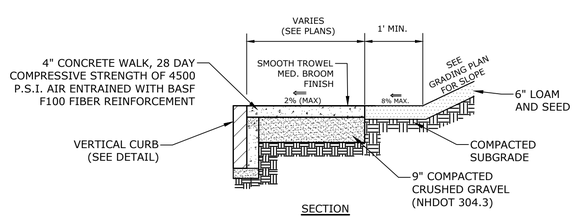
BOLLARD MOUNTED SIGN DETAIL
NO SCALE

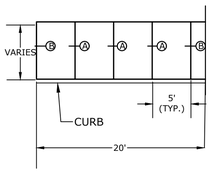


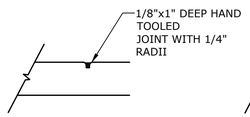
CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

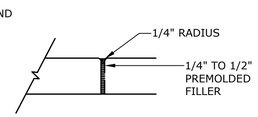
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
6. ALL RADII 20 FEET AND SMALLER SHALL BE CONSTRUCTED USING CURVED SECTIONS.
7. JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

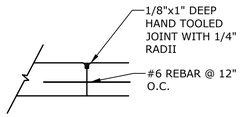
VERTICAL GRANITE CURB
NO SCALE





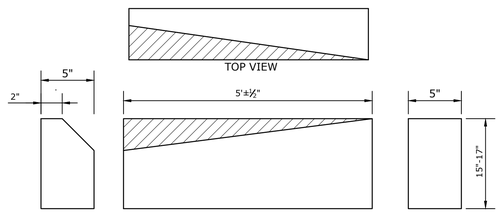






NOTES:
1. SIDEWALK SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS

CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE



TRANSITION SECTION

MOUNTABLE VERTICAL GRANITE CURB TO VERTICAL GRANITE CURB

NOTES:
1. THE INTENT OF THIS ITEM IS TO PROVIDE A SMOOTH TRANSITION BETWEEN VERTICAL GRANITE CURB AND MOUNTABLE VERTICAL GRANITE CURB WITHOUT REQUIRING FIELD CHIPPING DURING INSTALLATION. THE MOUNTABLE VERTICAL GRANITE CURB MAY REQUIRE ADJUSTMENTS TO MEET THE TRANSITION PIECE HEIGHT. TRANSITION SLOPE CURB TO STANDARD REVEAL AS QUICKLY AS POSSIBLE TO PROVIDE FOR THIS SMOOTH TRANSITION.

CURB TRANSITION
NO SCALE

Tighe&Bond

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

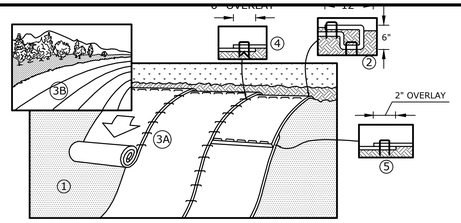
PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DTLS.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS

SCALE: AS SHOWN

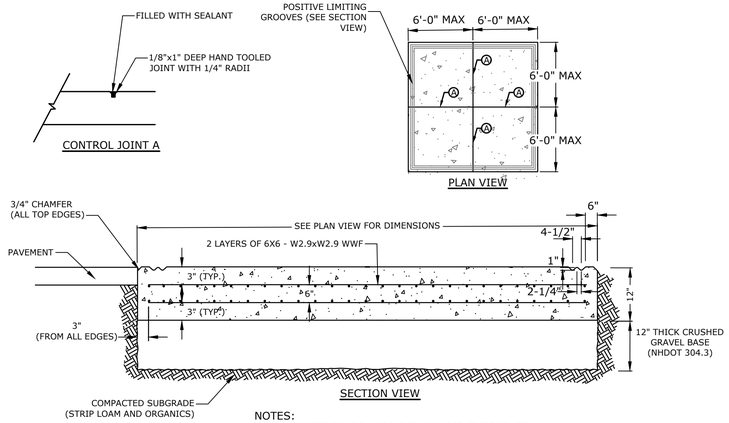
C-502

Last Saved: 10/20/2023
Plotted: Oct 23, 2023 - 9:19am By: CKrzcuik
Tighe & Bond J:\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DTLS.dwg



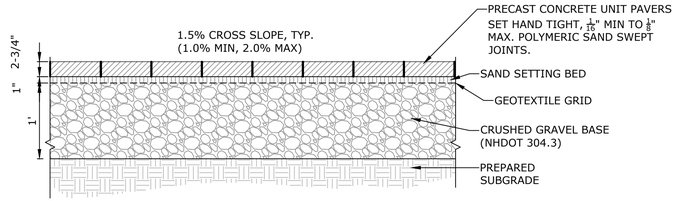
NOTES:
1. EROSION CONTROL BLANKET SHALL BE AN ALL NATURAL PRODUCT WITH NO PHOTO DEGRADABLE COMPONENTS, NORTH AMERICAN GREEN SC150BN OR APPROVED EQUAL.
2. STAKES SHALL BE BIODEGRADABLE BIOSTAKES OR ALL NATURAL WOOD ECOSTAKES OR APPROVED EQUAL. THE LENGTH OF STAKES SHALL BE BASED OFF OF THE MANUFACTURERS RECOMMENDATION.
3. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, COMPOST AND SEED.
4. BEGIN AT THE TOP OF THE SLOPE, 36" OVER THE GRADE BREAK, BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UPSLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAKES IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAKING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAKES ACROSS THE WIDTH OF THE BLANKET.
5. ROLL THE BLANKETS DOWN THE SLOPE. ALL BLANKETS MUST BE SECURELY FASTENED TO THE SOIL SURFACE BY PLACING STAKES IN APPROPRIATE LOCATIONS AS SHOWN ON THE MANUFACTURERS PATTERN GUIDE.
6. THERE SHALL BE NO PLASTIC, OR MULTI-FILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCHES MATERIAL UTILIZED.

EROSION CONTROL BLANKET
NO SCALE



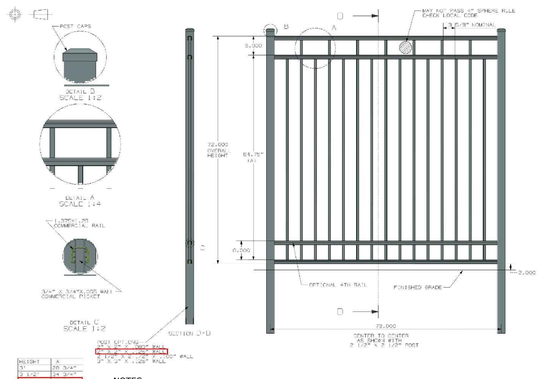
NOTES:
1. CONCRETE TO BE 4500 PSI, 7% AIR ENTRAINED
2. STANDARD BROOM FINISH.

DUMPSTER PAD
NO SCALE



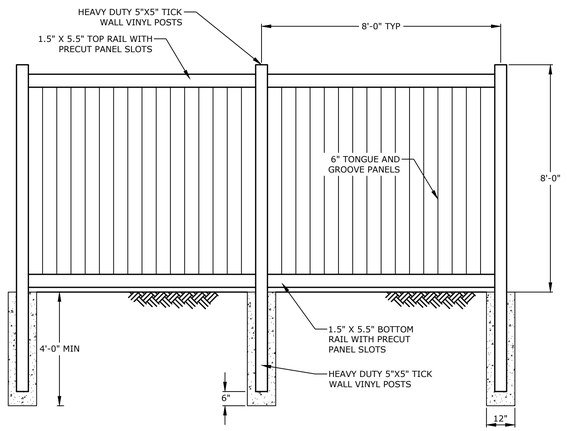
NOTES:
1. PROVIDE A METAL EDGE RESTRAINT AT ALL LOCATIONS WHERE EDGE OF PAVERS MEETS SEEDED LAWN OR PLANT BED.

UNIT PAVERS DETAIL
NO SCALE



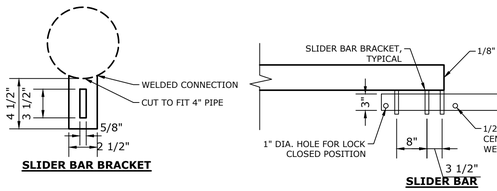
NOTES:
1. FENCE SHALL BE UAF-220 FLAT TOP FLUSH BOTTOM, NO SPEAR, FENCE BY ULTRA ALUMINUM MANUFACTURING, INC. OR APPROVED EQUAL.
2. VINYL DUMPSTER ENCLOSE SHALL BE INSTALLED PER MANUFACTURER SPECIFICATIONS.
3. COORDINATE FINAL COLOR AND STYLE WITH OWNER PRIOR TO CONSTRUCTION.

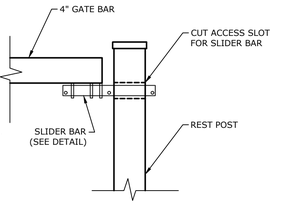
4' DECORATIVE FENCE DETAIL
NO SCALE

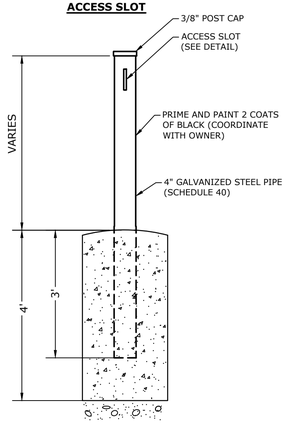


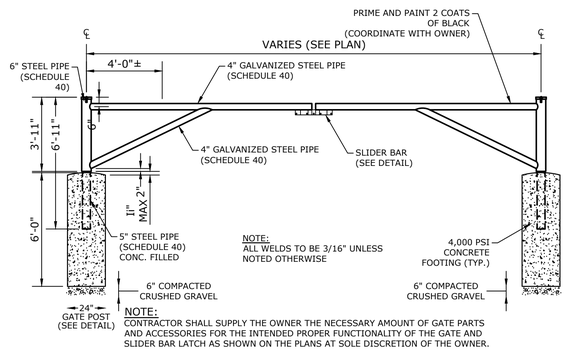
NOTES:
1. VINYL DUMPSTER ENCLOSE SHALL BE INSTALLED PER MANUFACTURER SPECIFICATIONS.
2. COORDINATE FINAL COLOR AND STYLE WITH OWNER PRIOR TO CONSTRUCTION.

DUMPSTER PAD ENCLOSURE
NO SCALE



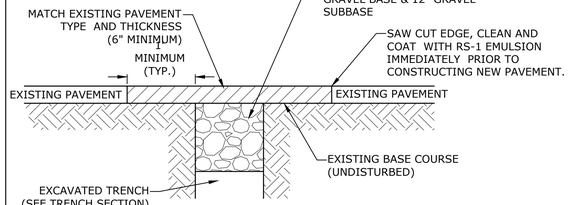




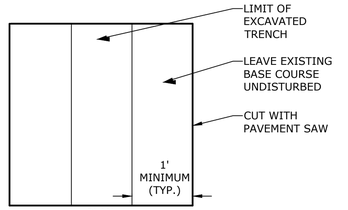


NOTE:
CONTRACTOR SHALL SUPPLY THE OWNER THE NECESSARY AMOUNT OF GATE PARTS AND ACCESSORIES FOR THE INTENDED PROPER FUNCTIONALITY OF THE GATE AND SLIDER BAR LATCH AS SHOWN ON THE PLANS AT SOLE DISCRETION OF THE OWNER.

DOUBLE SWING GATE
NO SCALE



SECTION



PLAN

NOTE:
1. COORDINATE AND OBTAIN APPROVAL FOR ALL TRENCHING AND PATCHING WITHIN CITY RIGHT OF WAY WITH CITY OF PORTSMOUTH DPW PRIOR TO COMMENCING WORK.

ROADWAY TRENCH PATCH
NO SCALE

Tighe&Bond

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

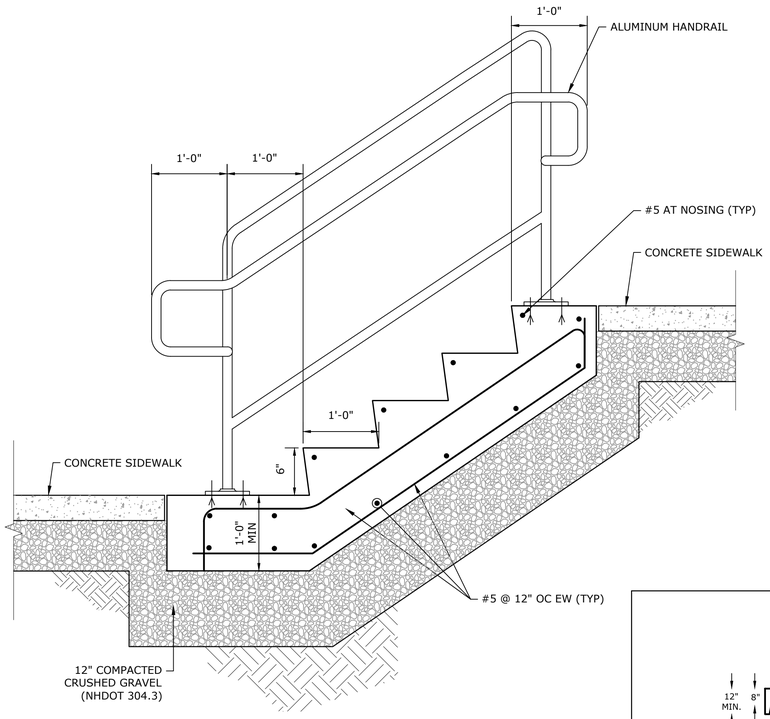
PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DTLS.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS

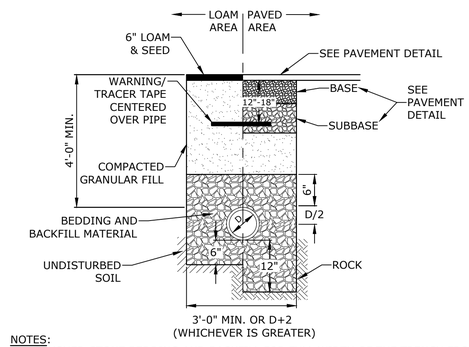
SCALE: AS SHOWN

C-503

Last Saved: 10/20/2023
Plotted: Oct 23, 2023 - 9:19am By: CKrzaik
Tighe & Bond:\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DTLS.dwg

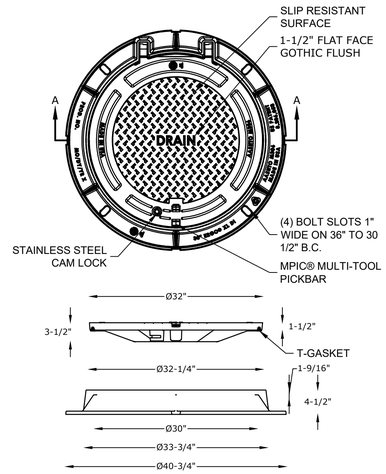


CONCRETE STAIRS AND HANDRAIL
NO SCALE



NOTES:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.
3. DRAIN LINE SHALL BE INSULATED WHERE THERE IS LESS THAN 6' OF COVER IN PAVED AREAS AND LESS THAN 4' OF COVER IN NON-PAVED AREAS.

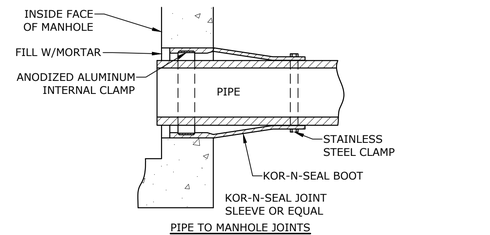
STORM DRAIN TRENCH
NO SCALE



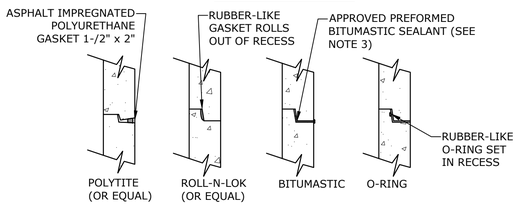
SECTION A-A

NOTES:
1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.
2. ALL DIMENSIONS ARE NOMINAL.
3. 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.
4. LABEL TYPE OF MANHOLE WITH 3" HIGH LETTERS IN HE CENTER OF THE COVER.

DRAIN MANHOLE FRAME & COVER
NO SCALE



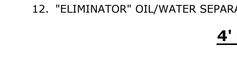
PIPE TO MANHOLE JOINTS



HORIZONTAL JOINTS

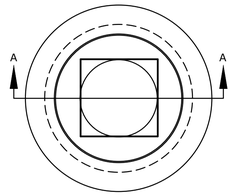
NOTES:
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
3. FOR BITUMASTIC 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 MANUFACTURERS' WRITTEN INSTRUCTIONS.

MANHOLE JOINTS
NO SCALE

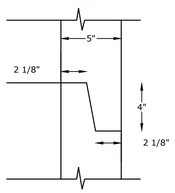


SECTION B-B

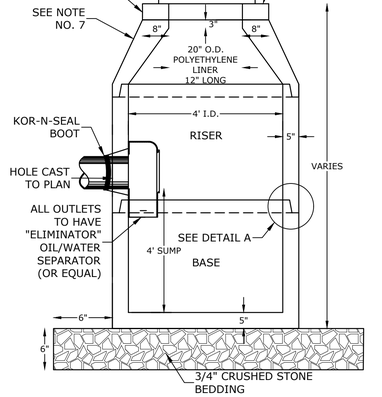
FLAT SLAB TOP



PLAN



DETAIL A
(TONGUE AND GROOVE JOINT)

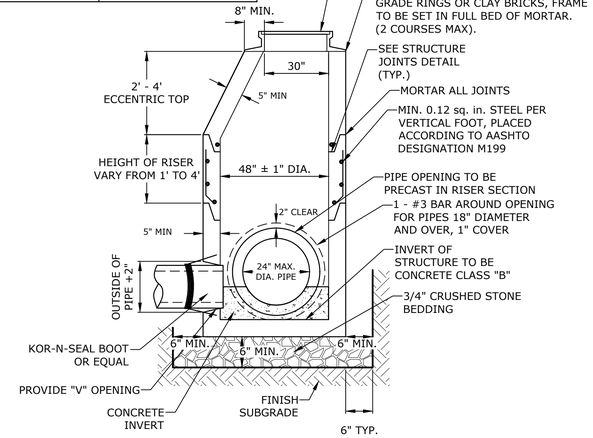


SECTION A-A

NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. 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 LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. CONE SECTIONS MAY BE EITHER 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.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. 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 AN APPROVED FLEXIBLE SEALANT IN JOINTS.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

4' DIAMETER CATCHBASIN
NO SCALE

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	
SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5



NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. CONSTRUCT CRUSHED STONE BEDDING AND BACKFILL UNDER (6" MINIMUM THICKNESS)
6. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
7. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
8. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
9. 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 AN APPROVED FLEXIBLE SEALANT IN JOINTS.
10. ALL STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 12" OF INSIDE SURFACE BETWEEN HOLES, NO MORE THAN 75% OF A HORIZNTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINTS.

4' DIAMETER DRAIN MANHOLE
NO SCALE

MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) WORD "DRAIN" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.

ADJUST TO GRADE WITH CONCRETE GRADE RINGS OR CLAY BRICKS, FRAME TO BE SET IN FULL BED OF MORTAR. (2 COURSES MAX).

SEE STRUCTURE JOINTS DETAIL (TYP.)

MORTAR ALL JOINTS

MIN. 0.12 sq. in. STEEL PER VERTICAL FOOT, PLACED ACCORDING TO AASHTO DESIGNATION M199

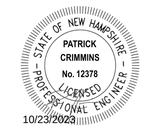
PIPE OPENING TO BE PRECAST IN RISER SECTION

1 - #3 BAR AROUND OPENING FOR PIPES 18" DIAMETER AND OVER, 1" COVER

INVERT OF STRUCTURE TO BE CONCRETE CLASS "B"

3/4" CRUSHED STONE BEDDING

Tighe&Bond



PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
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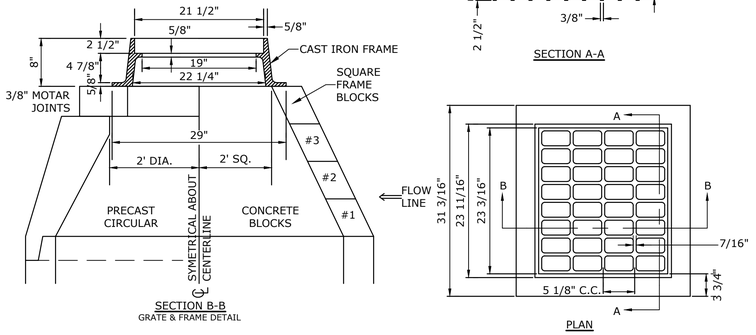
DETAILS

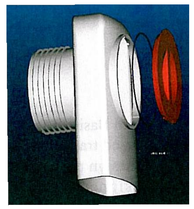
SCALE: AS SHOWN

C-504



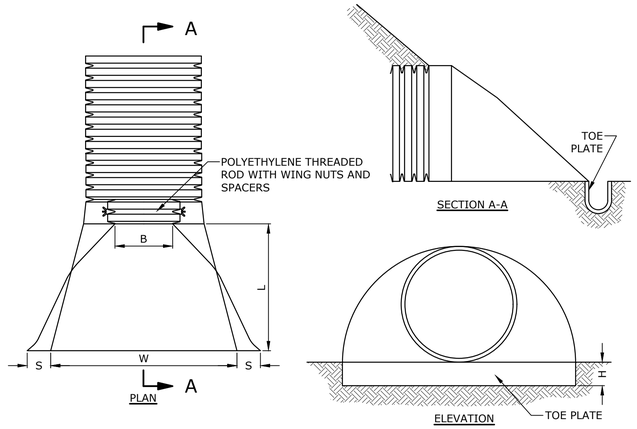
NOTES:
1. GRATE TO BE CAST IRON (NHDOT TYPE B ALTERNATE 1)
2. FRAME AND GRATE TO BE MANUFACTURED IN THE USA

CATCH BASIN FRAME & GRATE
NO SCALE



NOTES:
1. ALL CATCH BASIN OUTLETS TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTREAM (NO EQUAL)
2. INSTALL DEBRIS TRAP TIGHT TO INSIDE OF STRUCTURE.
3. 1/4" HOLE SHALL BE DRILLED IN TOP OF DEBRIS TRAP

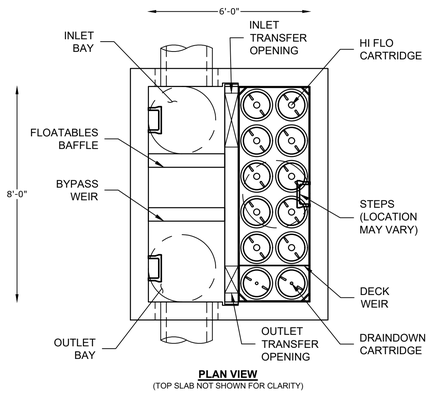
"ELIMINATOR" OIL FLOATING DEBRIS TRAP
NO SCALE



PIPE DIA.	S	B	H	L	W
12"	6.5"	10"	6.5"	25"	29"
15"	6.5"	10"	6.5"	25"	29"
18"	7.5"	15"	6.5"	32"	35"
24"	7.5"	18"	6.5"	36"	45"
30"	7.5"	12"	8.6"	58"	63"
36"	7.5"	25"	8.6"	58"	63"

NOTE:
1. END SECTIONS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, COLUMBUS, OHIO. END SECTIONS TO BE WELDED TO PIPE AS PER MANUFACTURER'S RECOMMENDATIONS.

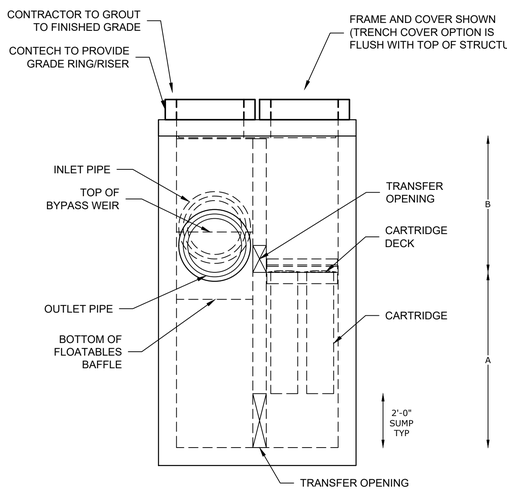
HDPE END SECTION
NO SCALE



PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)

JELLYFISH JFPD0806 - DESIGN NOTES				
JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD PEAK DIVERSION STYLE WITH PRECAST TOP SLAB IS SHOWN. ALTERNATE OFFLINE VAULT AND/OR SHALLOW ORIENTATIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD				
CARTRIDGE SELECTION				
CARTRIDGE LENGTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-6"	5'-4"	4'-3"	3'-3"
FLOW RATE HI-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	1.96	1.47	0.98	0.54
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00

SITE SPECIFIC DATA REQUIREMENTS	
STRUCTURE ID	JF-1
MODEL SIZE	JFPD0806
WATER QUALITY FLOW RATE (cfs)	1.38
PEAK FLOW RATE (cfs)	8.26
RETURN PERIOD OF PEAK FLOW (yrs)	25
# OF CARTRIDGES REQUIRED (HF / DD)	7/2
CARTRIDGE SIZE	54"



ELEVATION VIEW

GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 3', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

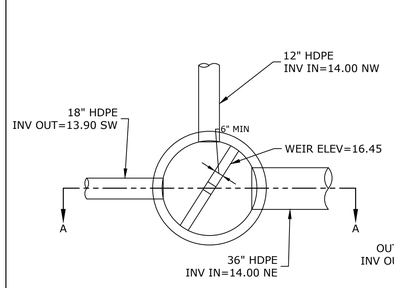
INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION AT (866) 740-3318.

NOTE:
1. A QUALIFIED ENGINEER SHALL PROVIDE SUFFICIENT INSPECTION TO CERTIFY THAT THE SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED DESIGN PLANS PER THE REQUIREMENTS OF THE ALTERATION OF TERRAIN PERMIT. CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO THE CONSTRUCTION OF THE UNDERGROUND FILTRATION UNITS.

Jellyfish Filter
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING: U.S. PATENT NO. 8,287,726, 8,221,618 & US 8,123,935; OTHER INTERNATIONAL PATENTS PENDING

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH JELLYFISH STORMWATER FILTER (JFPD0806)
NO SCALE



PLAN VIEW

NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER OF THE THIRD WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

POS-01
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 10/23/2023

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DETAILS

SCALE: AS SHOWN

C-505

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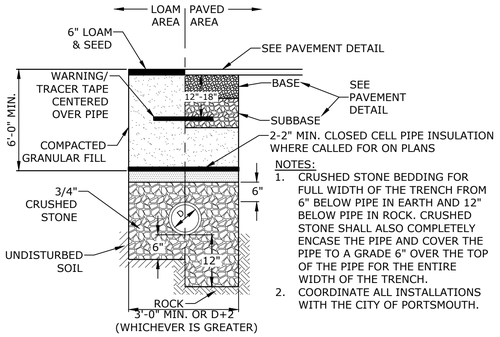
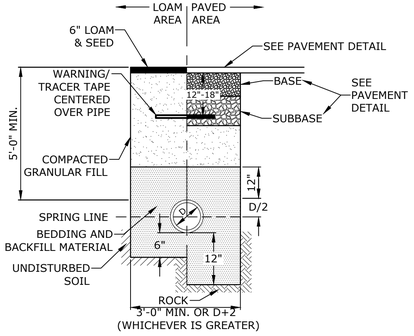
Printed: Oct 23, 2023 - 9:19am By: CKrzcsiak
Tighe & Bond J:\W\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DTLS.dwg



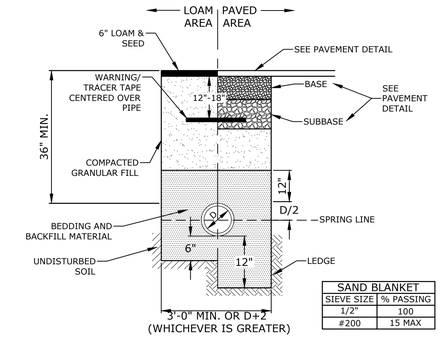
NOTES:
1. CRUSHED STONE BEDDING FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK. CRUSHED STONE SHALL ALSO COMPLETELY ENCASE THE PIPE AND COVER THE PIPE TO A GRADE 6" OVER THE TOP OF THE PIPE FOR THE ENTIRE WIDTH OF THE TRENCH.
2. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

SEWER SERVICE TRENCH
NO SCALE



NOTES:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. WATER MAIN SHALL BE INSTALLED PER CITY OF PORTSMOUTH STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

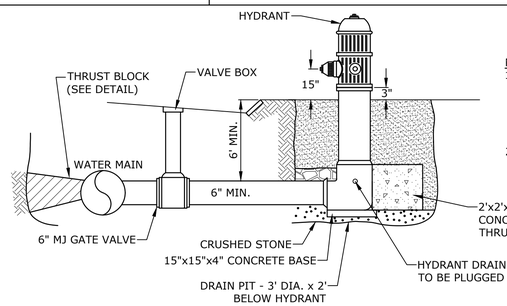
WATER TRENCH
NO SCALE



SAND BLANKET	
SIEVE SIZE	% PASSING
1/2"	100
#200	15 MAX

NOTES:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS LINE SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.

GAS TRENCH
NO SCALE

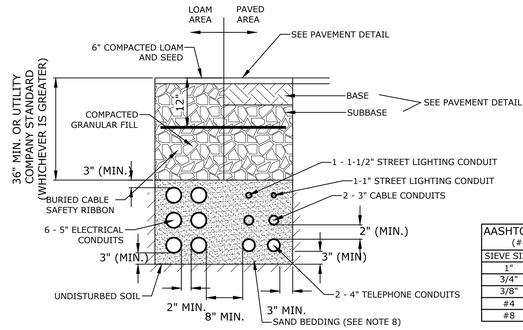


NOTES:
1. HYDRANT TO BE KENNEDY TYPE K-81, RIGHT OPEN (NO EQUAL). COORDINATE WITH CITY OF PORTSMOUTH WATER DEPARTMENT AND CITY OF PORTSMOUTH FIRE DEPARTMENT.
2. PAINT HYDRANT IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS AFTER INSTALLATION AND TESTING.

FIRE HYDRANT
NO SCALE

GRANULAR FILL (GRAVEL)	
SIEVE SIZE	% PASSING
3"	95-100
#4	25-70

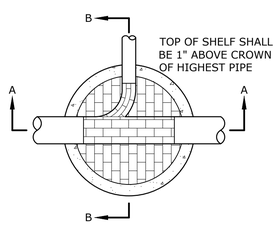
SAND BLANKET	
SIEVE SIZE	% PASSING
1/2"	100
#200	15 MAX

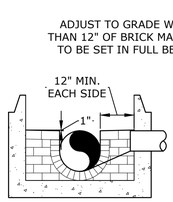


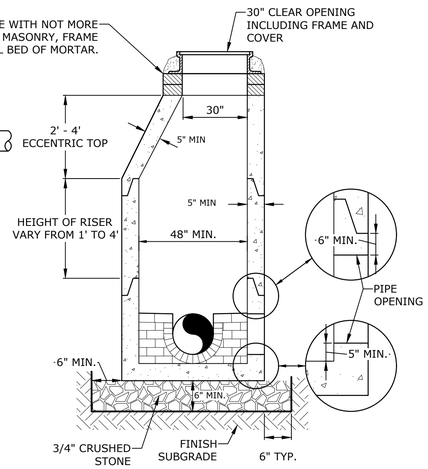
AASHTO #67 STONE (#4 to 3/4")	
SIEVE SIZE	% PASSING
1"	100
3/4"	90-100
3/8"	20-55
#4	0-10
#8	0-5

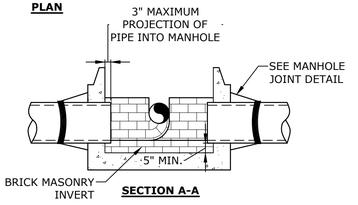
NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT SHALL NOT BE LESS THAN THOSE SHOWN.
3. NO CONDUIT RUN 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 36 TO 48 INCH RADIUS.
8. SAND BEDDING TO BE REPLACED WITH CONCRETE ENCASEMENT WHERE COVER IS LESS THAN 3 FEET, WHEN LOCATED BELOW PAVEMENT, OR WHERE SHOWN ON THE UTILITIES PLAN.

ELECTRICAL AND COMMUNICATION CONDUIT TRENCH
NO SCALE





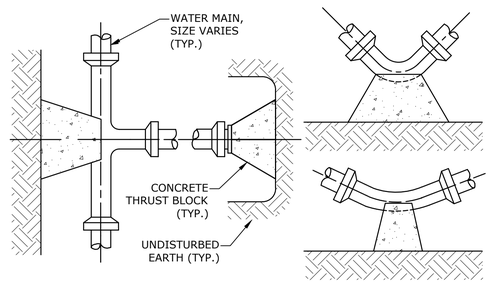




TYPICAL SECTION

NOTES:
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICKS SHALL BE LAID ON EDGE.
4. TWO (2) COATS OF BITUMINOUS WATERPROOF COATING SHALL BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
5. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS WITHIN CITY RIGHT OF WAY SHALL BE CITY STANDARD HINGE COVERS MANUFACTURED BY EJ. FRAMES AND COVERS WILL BE PURCHASED FROM THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS. ALL OTHER MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) WORD "SEWER" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
6. HORIZONTAL JOINTS SHALL BE SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF ELASTOMERIC OR MASTIC-LIKE SEALANT.
7. BARREL AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE DESIGNED FOR H20 LOADING, AND CONFORMING TO ASTM C478-06.

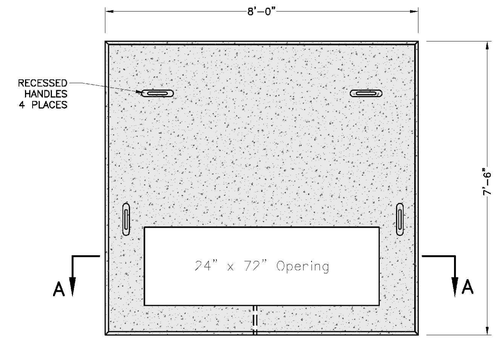
SEWER MANHOLE
NO SCALE

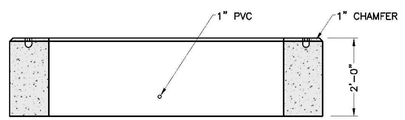


TEST PRESSURE = 200psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL					
	REACTION TYPE	PIPE SIZE				
		4"	6"	8"	10"	12"
	A 90°	0.89	2.19	3.82	11.14	17.24
	B 180°	0.65	1.55	2.78	8.38	12.00
	C 45°	0.48	1.19	2.12	6.02	9.32
	D 22-1/2°	0.25	0.60	1.06	3.08	4.74
	E 11-1/4°	0.13	0.30	0.54	1.54	2.38

NOTES:
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS.
4. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
5. INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE WITH CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS.

THRUST BLOCKING DETAIL
NO SCALE





NOTES:
1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION
2. CONCRETE MINIMUM STRENGTH - 4,000 PSI @ 28 DAYS
3. STEEL REINFORCEMENT - ASTM A615, GRADE 60
4. PAD MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS
5. TRANSFORMER PAD SHALL BE REVIEWED AND APPROVED BY EVERSOURCE PRIOR TO CONSTRUCTION.

TRANSFORMER PAD DETAIL
NO SCALE

Tighe&Bond

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE

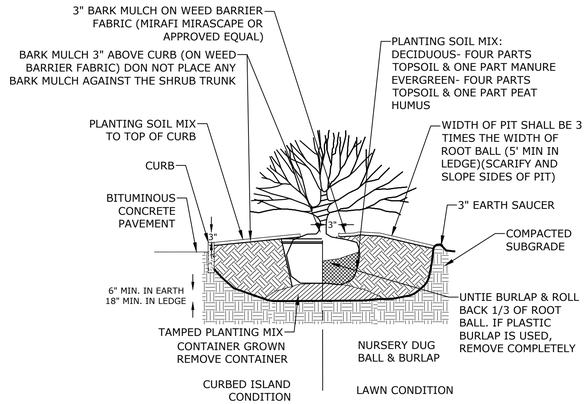
MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DTLS.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS

SCALE: AS SHOWN

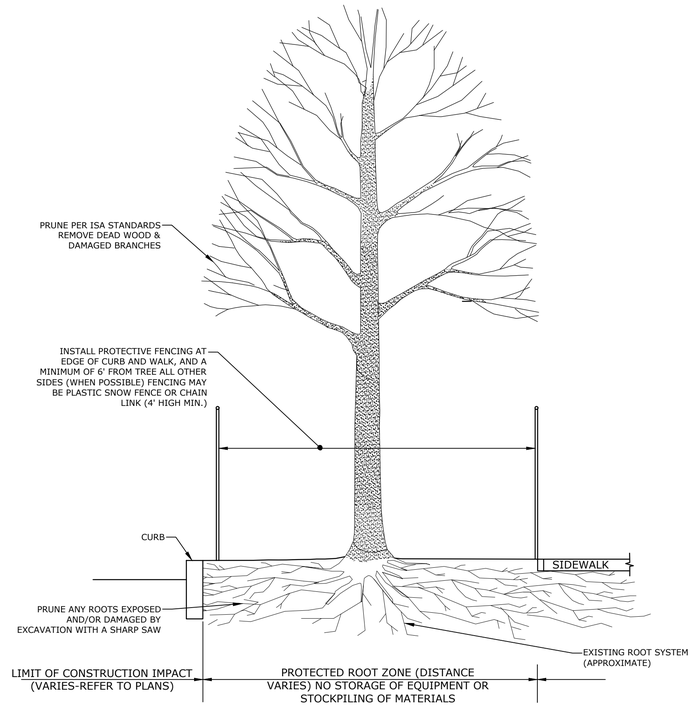
C-506



NOTE:
1. PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED, OR WITHIN 2" ABOVE.

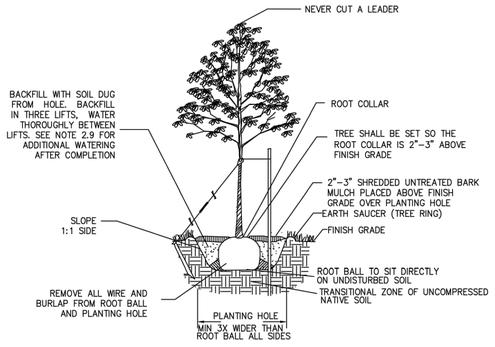
SHRUB PLANTING

NO SCALE



TREE PROTECTION FOR EXISTING TREE

NO SCALE



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 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.

Tighe&Bond

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
10/23/2023

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
10/23/2023

LICENSED LANDSCAPE ARCHITECT – RALPH GORDON LEEDY, JR 007 – STATE OF NEW HAMPSHIRE
10/23/2023

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
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DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

DETAILS

SCALE: AS SHOWN

C-507

Last Saved: 10/20/2023
Printed: Oct 23, 2023 - 9:19am By: CKrzsiik
Tighe & Bond:J:\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DTLS.dwg

SOUTH ELEVATION
SCALE: 1" = 10'-0"

WEST ELEVATION
SCALE: 1" = 10'-0"

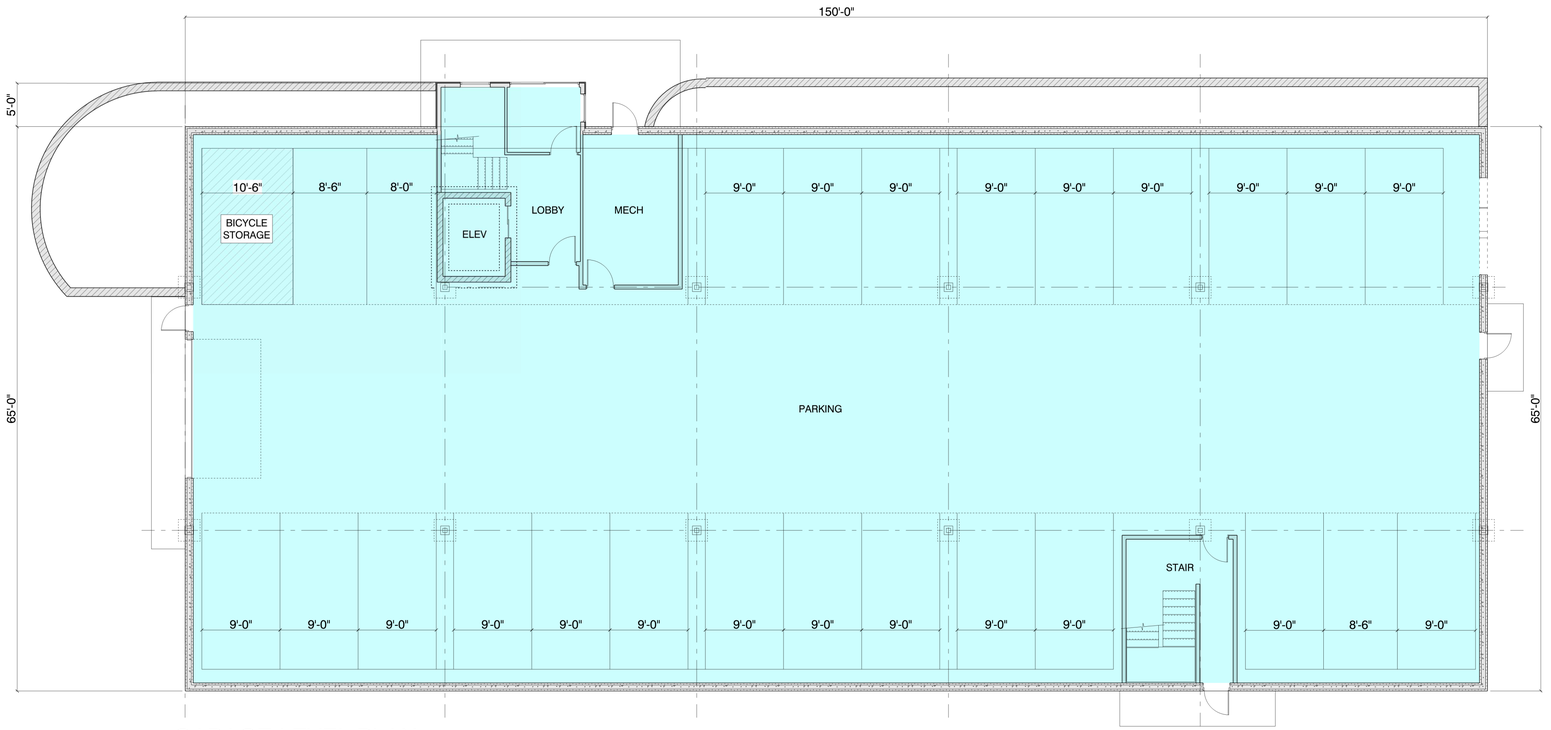
NORTH ELEVATION
SCALE: 1" = 10'-0"

EAST ELEVATION
SCALE: 1" = 10'-0"

PROPOSED APARTMENT BUILDING - 815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

BOA SUBMISSION 8/29/2023

MICHAEL J. KEANE ARCHITECTS, PLLC
101 KENT PLACE NEWMARKET, NH 03857 603.292.1400



GARAGE LEVEL PLAN

SCALE: 1/8" = 1'-0"

TYPICAL FLOOR PLAN 2-4

SCALE: 1/8" = 1'-0"

PROPOSED APARTMENT BUILDING - 815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

BOA SUBMISSION 8/29/2023

MICHAEL J. KEANE ARCHITECTS, PLLC
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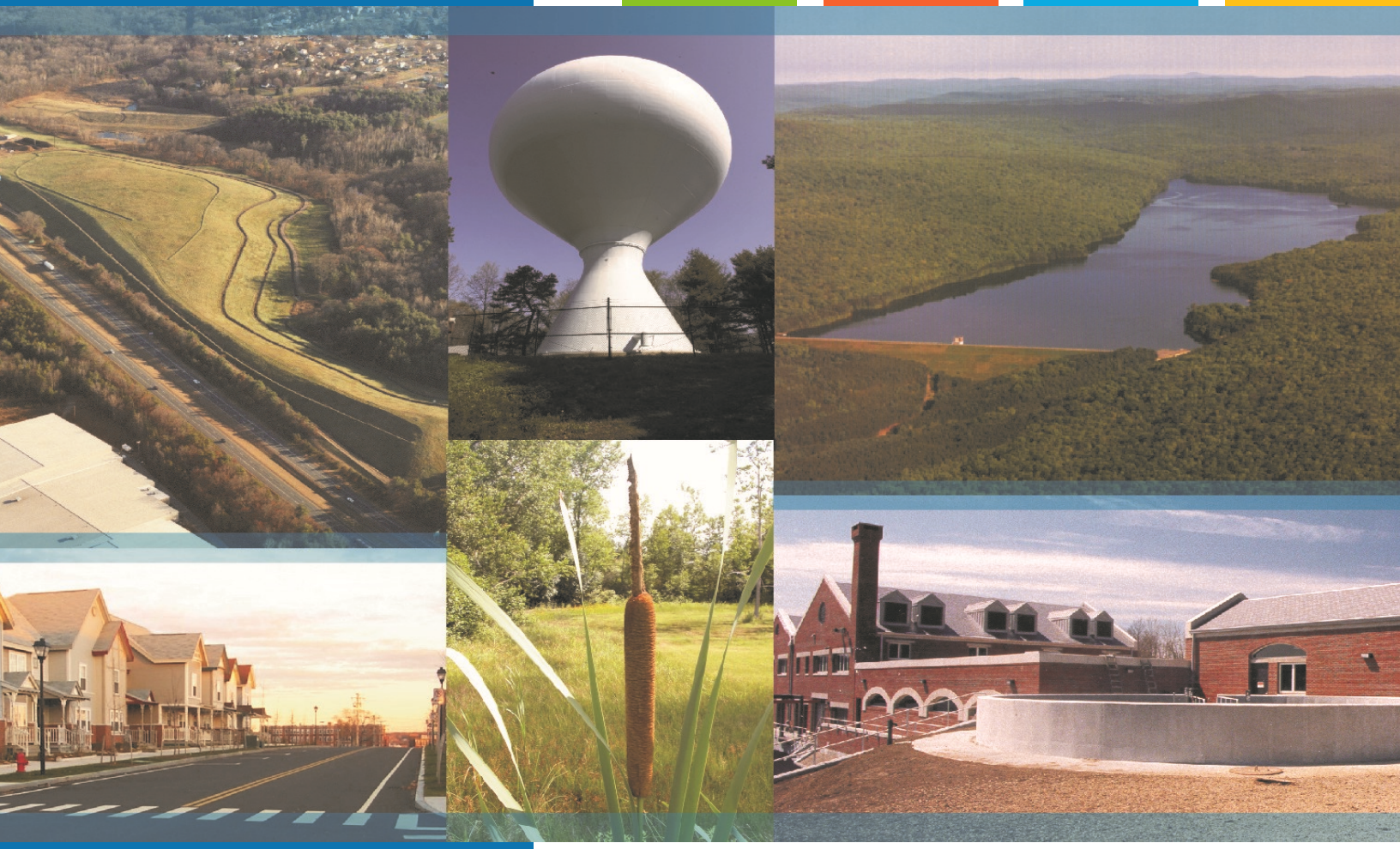


Proposed Multi-Family Development
815 Lafayette Rd
Portsmouth, NH

Drainage Analysis

Prospect North 815, LLC

October 23, 2023

10/23/2023

Tighe&Bond

100% Recyclable

Table of Contents

Section 1
Project Description

The project is located at 815 Lafayette Road identified as Map 245 Lot 3 on the City of Portsmouth Tax Maps. The existing property is approximately 19.6 acres in size and is bound to the west by Route 1 and the abutting Lafayette Plaza shopping center property, to the north and east by the Winchester Place property, and to the south by Sagamore Creek. The proposed project is limited to approximately 4 acres of land near the southwest portion of the parcel herein referred to as the project site.

The proposed project consists of the demolition of the existing building along Sagamore Creek and the construction of three 4-story, 24-unit multi-family buildings (72 total units) with ground floor parking. The project will include associated site improvements such as parking, pedestrian access, utilities, stormwater management, lighting, and landscaping.

1.1 On-Site Soil Description

The project site consists of terrain that is generally sloping from the north to the south at grades below 10% with a step portion of terrain directly abutting the Sagamore Creek. The site has an approximate high point of elevation 23 located along the property line abutting the Lafayette Plaza property to the north.

A web soil survey was completed for the project and can be found in Appendix A of this report. Based on the soil survey, the runoff analyzed within this study has been modeled using Hydrologic Soil Group D soils.

1.2 Pre- and Post-Development Comparison

The pre-development and post-development watershed areas have been analyzed at one (1) distinct point of analysis (PA-1.) While the point of analysis has remained unchanged, the contributing sub-catchment areas varied between pre-development and post-development conditions. These adjustments were made to reflect the differences in drainage patterns between the existing and proposed conditions. The overall area analyzed as part of this drainage analysis was held constant. PA-1 is located just off site at the sagamore creek, which is a tidal estuary.

The peak discharge rates at this point of analysis were determined by analyzing Type III, 24-hour storm events. The rainfall data for these storm events were obtained from the data published by the Northeast Regional Climate Center at Cornell University, which can be found in Appendix B.

Furthermore, the site is located within a Coastal and Great Bay Community, therefore an added factor of safety of 15% was included as required by Env-Wq 1503.08(l).

1.3 Calculation Methods

The design storms analyzed in this study are the 2-year, 10-year, 25-year and 50-year 24-hour duration storm events. The stormwater modeling system, HydroCAD 10.0 was utilized to predict the peak runoff rates from these storm events. The peak discharge rates were determined by analyzing Type III 24-hour storm events. The rainfall data for these storm events were obtained from the data published by the Northeast Regional Climate Center at Cornell University, with an additional 15% added factor of safety as required by Env-Wq 1503.08(l).

The time of concentration was computed using the TR-55 Method, which provides a means of determining the time for an entire watershed to contribute runoff to a specific location via sheet flows, shallow concentrated flow, and channel flow. Runoff curve numbers were calculated by estimating the coverage areas and then summing the curve number for the coverage area as a percent of the entire watershed.

References:

1. HydroCAD Stormwater Modeling System, by HydroCAD Software Solutions LLC, Chocorua, New Hampshire.
2. New Hampshire Stormwater Management Manual, Volume 2, Post-Construction Best Management Practices Selection and Design, December 2008.
3. "Extreme Precipitation in New York & New England." Extreme Precipitation in New York & New England by Northeast Regional Climate Center (NRCC), 26 June 2012.

Section 2
Pre-Development Conditions

To analyze the pre-development condition, the site has been modeled utilizing (1) distinct point of analysis (PA-1). This point of analysis and watershed are depicted on the plan entitled "Pre-Development Watershed Plan", Sheet C-801.

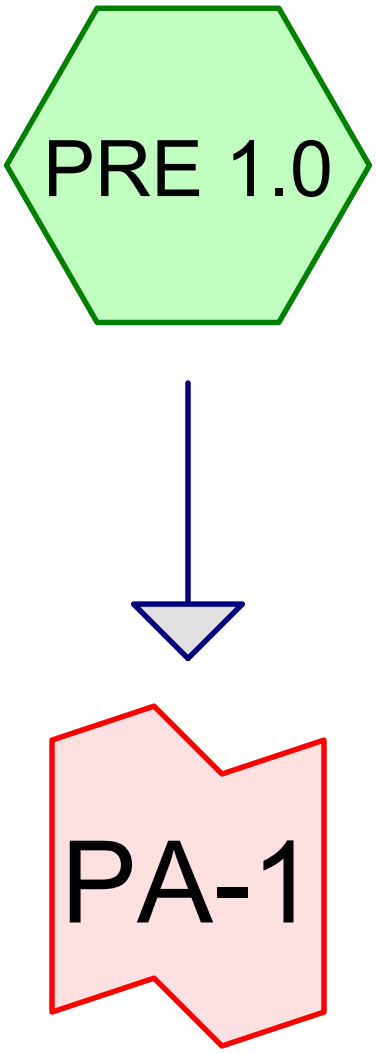
The point of analysis and its contributing watershed area is described below:

Point of Analysis (PA-1)

Point of analysis 1 is comprised of one subcatchment area (PRE 1.0). This area is comprised of mostly impervious surfaces, grass, and woods with small portions of roofs and gravel surfaces. Runoff from this watershed sheet flows untreated stormwater directly into Sagamore Creek and ultimately the Piscataqua River.

2.1 Pre-Development Calculations

2.2 Pre-Development Watershed Plan



Subcat Reach Pond Link

Routing Diagram for M-5131-001_PRE
Prepared by Tighe & Bond, Printed 10/18/2023

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.168	80	>75% Grass cover, Good, HSG D (PRE 1.0)
0.048	96	Gravel surface, HSG D (PRE 1.0)
0.961	98	Paved parking, HSG D (PRE 1.0)
0.241	98	Roofs, HSG D (PRE 1.0)
1.932	79	Woods, Fair, HSG D (PRE 1.0)
4.350	**85**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
4.350	HSG D	PRE 1.0
0.000	Other	
4.350		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE 1.0: Runoff Area=189,480 sf 27.62% Impervious Runoff Depth>2.19"
Flow Length=268' Tc=7.3 min CN=85 Runoff=10.55 cfs 0.794 af

Link PA-1: Inflow=10.55 cfs 0.794 af
Primary=10.55 cfs 0.794 af

Total Runoff Area = 4.350 ac Runoff Volume = 0.794 af Average Runoff Depth = 2.19"
72.38% Pervious = 3.148 ac 27.62% Impervious = 1.202 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE 1.0: Runoff Area=189,480 sf 27.62% Impervious Runoff Depth>3.94"
Flow Length=268' Tc=7.3 min CN=85 Runoff=18.71 cfs 1.429 af

Link PA-1: Inflow=18.71 cfs 1.429 af
Primary=18.71 cfs 1.429 af

Total Runoff Area = 4.350 ac Runoff Volume = 1.429 af Average Runoff Depth = 3.94"
72.38% Pervious = 3.148 ac 27.62% Impervious = 1.202 ac

Summary for Subcatchment PRE 1.0:

Runoff = 18.71 cfs @ 12.10 hrs, Volume= 1.429 af, Depth> 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
10,490	98	Roofs, HSG D
50,881	80	>75% Grass cover, Good, HSG D
2,082	96	Gravel surface, HSG D
84,175	79	Woods, Fair, HSG D
41,852	98	Paved parking, HSG D
189,480	85	Weighted Average
137,138		72.38% Pervious Area
52,342		27.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	34	0.0436	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.68"
0.9	200	0.0350	3.80		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	34	0.2500	2.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.3	268	Total			

Summary for Link PA-1:

Inflow Area = 4.350 ac, 27.62% Impervious, Inflow Depth > 3.94" for 10-Yr event
Inflow = 18.71 cfs @ 12.10 hrs, Volume= 1.429 af
Primary = 18.71 cfs @ 12.10 hrs, Volume= 1.429 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE 1.0: Runoff Area=189,480 sf 27.62% Impervious Runoff Depth>5.37"
Flow Length=268' Tc=7.3 min CN=85 Runoff=25.16 cfs 1.947 af

Link PA-1: Inflow=25.16 cfs 1.947 af
Primary=25.16 cfs 1.947 af

Total Runoff Area = 4.350 ac Runoff Volume = 1.947 af Average Runoff Depth = 5.37"
72.38% Pervious = 3.148 ac 27.62% Impervious = 1.202 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE 1.0: Runoff Area=189,480 sf 27.62% Impervious Runoff Depth>6.72"
Flow Length=268' Tc=7.3 min CN=85 Runoff=31.11 cfs 2.436 af

Link PA-1: Inflow=31.11 cfs 2.436 af
Primary=31.11 cfs 2.436 af

Total Runoff Area = 4.350 ac Runoff Volume = 2.436 af Average Runoff Depth = 6.72"
72.38% Pervious = 3.148 ac 27.62% Impervious = 1.202 ac

LEGEND

PRE-DEVELOPMENT WATERSHED BOUNDARY

LONGEST FLOW PATH

PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

PA-1 — POINT OF ANALYSIS

N

245/1 N/F LAFAYETTE OF MICHIGAN, LLC 20630 HARPER AVENUE SUITE 107 HARPER WOODS, MI 48225 2868/2561

#755 1 STORY BLOCK BUILDING

#815 2 STORY BUILDING PEAK=44.63

MAP 245 LOT 3

PRE 1.0

PA-1

LAFAYETTE ROAD–U.S. ROUTE 1

10' WIDE NON-EXCLUSIVE ACCESS EASEMENT 1

10' WIDE NON-EXCLUSIVE ACCESS EASEMENT 2

EXCLUSIVE TOWER EASEMENT 2

100' WETLAND BUFFER

50' WETLAND BUFFER

25' WETLAND BUFFER

WETLAND CLASSIFICATION (PSS1E/PEM1E)

SALT MARSH (E2EM1N)

SAGAMORE CREEK

PILE OF DIRT & ASPHALT

HEADWALL

INV. EL=14.29

12" PVC

INV. EL=11.72

BOLLARD (TYP.)

6.5' CHAIN LINK FENCE

6' CHAIN LINK FENCE

GATE

GRAVEL DRIVE

LP-2

B-6

B-1

B-1A

6" DIA. FLOOD UP 5'

DRAIN PIPE FROM BUILDING

FLAGPOLE

CONCRETE (TYP.)

B-5A

B-5

B-4

B-2A

LP-1

B-2

B-3

MANHOLE

VISITOR PARKING SIGNS

i-HEART SIGN W/ BRICK PILLARS

CONCRETE WALKWAY

CONCRETE PAD

PUMP STATION CANOPY

MOBIL STATION

MANHCLE

DUMPSTER PAD

6' WOOD FENCE (TYP.)

MONITORING WELL

GAS STATION SIGN

CONCRETE PAD FOR ROAD SIGN

16" CONCRETE PIPE W/ FLARED END SECTION INV. EL=

SIDEWALK

BILLBOARD

OHW WHO WW SX WGV HOTL

0 30' 60'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DSGN.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

PRE DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Saved: 10/23/2023
Printed: Oct 23, 2023 - 9:54am By: Ckrzcuk
Tighe & Bond:J:\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DSGN.dwg

Section 3
Post-Development Conditions

The post-development condition was analyzed by dividing the watersheds into three (3) watershed areas. Stormwater runoff from these sub-catchment areas flow via subsurface drainage systems prior to discharging to an existing swale and ultimately the Sagamore Creek. Like the pre-development condition, flows from these sub-catchment areas are modeled at the same point of analysis (PA-1).

An underground detention system is included on the development site for the purpose of mitigating peak flowrates as well as mitigating temperature differences between the stormwater runoff and Sagamore Creek. Additionally, a Jellyfish Filter unit is proposed for treatment purposes. The treatment unit located post detention, is designed that flows greater than the 2-year storm event bypass the unit.

The point of analysis and its sub-catchment areas are depicted on the plan entitled "Post-Development Watershed Plan," Sheet C-802. The point of analysis and it's contributing watershed areas are described below:

Point of Analysis (PA-1)

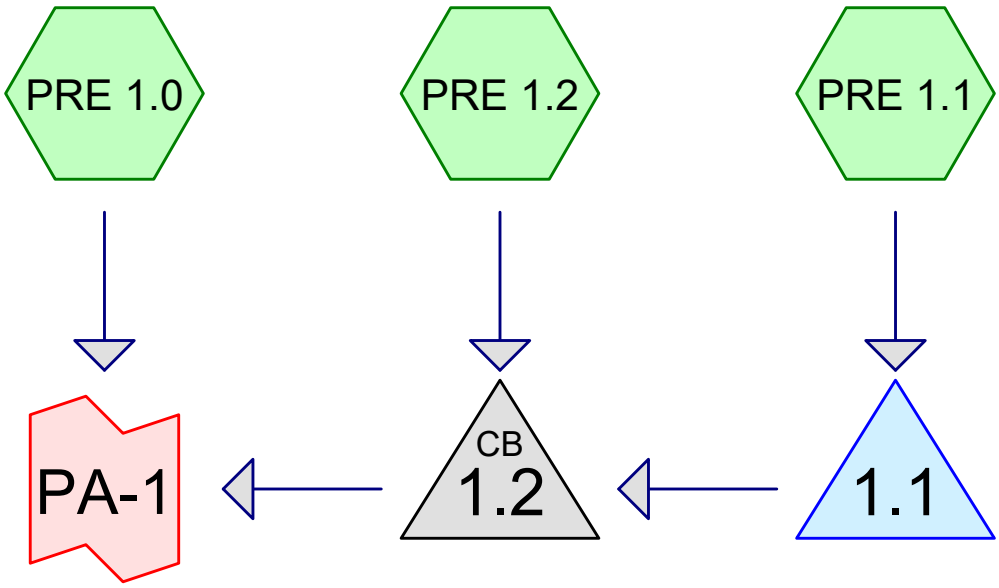
Post-development Watershed 1.0 (POST 1.0) is comprised mostly of the area surrounding the project site and is composed of mainly grass and wood with small portions of concrete sidewalk.

Post-development Watershed 1.1 (Post 1.1) is comprised of the majority of the development area. This watershed contains proposed buildings 2 and 3 as well as portions of its associated paved parking lots and sidewalks. Runoff from this watershed is captured by various catch basins and roof leaders connecting to a proposed underground detention system (Pond 1.1). The detention system discharges to the treatment unit, a Contech Jellyfish Stormwater Filter (Pond PJFF 1). Flows exiting the Jellyfish Filter discharge to the existing DOT drainage swale flowing to Sagamore Creek.

Post-development Watershed 1.2 (Post 1.2) is similar in nature to post-development Watershed 1.1. This watershed contains proposed building 1 as well as portions of its associated paved parking lots and sidewalks. Runoff from this watershed is also captured by various catch basins and a roof leader connecting to the closed drainage system downstream of the underground detention basin. Runoff from this area discharges to the same Jellyfish Filter which discharges to Sagamore Creek and ultimately the Piscataqua River.

3.1 Post-Development Calculations

3.2 Post-Development Watershed Plan



Subcat Reach Pond Link

Routing Diagram for M-5131-001_POST
Prepared by Tighe & Bond, Printed 10/18/2023

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
63,790	80	>75% Grass cover, Good, HSG D (PRE 1.0, PRE 1.1, PRE 1.2)
791	96	Gravel surface, HSG D (PRE 1.0)
43,125	98	Paved parking, HSG D (PRE 1.0, PRE 1.1, PRE 1.2)
30,714	98	Roofs, HSG D (PRE 1.1, PRE 1.2)
51,060	79	Woods, Fair, HSG D (PRE 1.0)
189,480	**87**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
0	HSG C	
189,480	HSG D	PRE 1.0, PRE 1.1, PRE 1.2
0	Other	
189,480		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE 1.0: Runoff Area=117,943 sf 9.16% Impervious Runoff Depth>1.87"
Flow Length=160' Tc=5.7 min CN=81 Runoff=5.86 cfs 18,382 cf

SubcatchmentPRE 1.1: Runoff Area=50,737 sf 87.11% Impervious Runoff Depth>3.24"
Flow Length=102' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=4.11 cfs 13,705 cf

SubcatchmentPRE 1.2: Runoff Area=20,800 sf 90.53% Impervious Runoff Depth>3.24"
Flow Length=315' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=1.68 cfs 5,618 cf

Pond 1.1: Peak Elev=15.13' Storage=0.015 af Inflow=4.11 cfs 13,705 cf
Outflow=3.09 cfs 13,705 cf

Pond 1.2: Peak Elev=14.25' Inflow=4.61 cfs 19,323 cf
18.0" Round Culvert n=0.013 L=128.0' S=0.0133 '/' Outflow=4.61 cfs 19,323 cf

Link PA-1: Inflow=10.47 cfs 37,705 cf
Primary=10.47 cfs 37,705 cf

Total Runoff Area = 189,480 sf Runoff Volume = 37,705 cf Average Runoff Depth = 2.39"
61.03% Pervious = 115,641 sf 38.97% Impervious = 73,839 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE 1.0: Runoff Area=117,943 sf 9.16% Impervious Runoff Depth>3.54"
Flow Length=160' Tc=5.7 min CN=81 Runoff=11.03 cfs 34,758 cf

SubcatchmentPRE 1.1: Runoff Area=50,737 sf 87.11% Impervious Runoff Depth>5.15"
Flow Length=102' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=6.37 cfs 21,760 cf

SubcatchmentPRE 1.2: Runoff Area=20,800 sf 90.53% Impervious Runoff Depth>5.15"
Flow Length=315' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=2.61 cfs 8,921 cf

Pond 1.1: Peak Elev=15.95' Storage=0.036 af Inflow=6.37 cfs 21,760 cf
Outflow=4.13 cfs 21,761 cf

Pond 1.2: Peak Elev=14.51' Inflow=6.35 cfs 30,681 cf
18.0" Round Culvert n=0.013 L=128.0' S=0.0133 '/' Outflow=6.35 cfs 30,681 cf

Link PA-1: Inflow=17.37 cfs 65,439 cf
Primary=17.37 cfs 65,439 cf

Total Runoff Area = 189,480 sf Runoff Volume = 65,439 cf Average Runoff Depth = 4.14"
61.03% Pervious = 115,641 sf 38.97% Impervious = 73,839 sf

Summary for Subcatchment PRE 1.0:

[49] Hint: Tc<2dt may require smaller dt

Runoff = 11.03 cfs @ 12.09 hrs, Volume= 34,758 cf, Depth> 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
0	98	Roofs, HSG D
55,283	80	>75% Grass cover, Good, HSG D
791	96	Gravel surface, HSG D
51,060	79	Woods, Fair, HSG D
10,809	98	Paved parking, HSG D
117,943	81	Weighted Average
107,134		90.84% Pervious Area
10,809		9.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	35	0.0265	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.0	18	0.3333	8.66		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.7	82	0.0244	0.78		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	25	0.0320	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.7	160	Total			

Summary for Subcatchment PRE 1.1:

[49] Hint: Tc<2dt may require smaller dt

Runoff = 6.37 cfs @ 12.07 hrs, Volume= 21,760 cf, Depth> 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
20,875	98	Roofs, HSG D
6,538	80	>75% Grass cover, Good, HSG D
0	96	Gravel surface, HSG D
0	79	Woods, Fair, HSG D
23,324	98	Paved parking, HSG D
50,737	96	Weighted Average
6,538		12.89% Pervious Area
44,199		87.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	102	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	102	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment PRE 1.2:

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.61 cfs @ 12.07 hrs, Volume= 8,921 cf, Depth> 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.62"

Area (sf)	CN	Description
9,839	98	Roofs, HSG D
1,969	80	>75% Grass cover, Good, HSG D
0	96	Gravel surface, HSG D
0	79	Woods, Fair, HSG D
8,992	98	Paved parking, HSG D
20,800	96	Weighted Average
1,969		9.47% Pervious Area
18,831		90.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	120	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	195	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
2.4	315	Total, Increased to minimum Tc = 5.0 min			

Summary for Pond 1.1:

Inflow Area = 50,737 sf, 87.11% Impervious, Inflow Depth > 5.15" for 10-Yr event
Inflow = 6.37 cfs @ 12.07 hrs, Volume= 21,760 cf
Outflow = 4.13 cfs @ 12.18 hrs, Volume= 21,761 cf, Atten= 35%, Lag= 6.7 min
Primary = 4.13 cfs @ 12.18 hrs, Volume= 21,761 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 15.95' @ 12.17 hrs Surf.Area= 0.058 ac Storage= 0.036 af
Flood Elev= 17.00' Surf.Area= 0.058 ac Storage= 0.059 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.6 min (760.0 - 758.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	13.50'	0.000 af	**6.50'W x 193.00'L x 4.50'H Field A** 0.130 af Overall - 0.039 af Embedded = 0.091 af x 0.0% Voids
#2A	14.00'	0.031 af	**ADS N-12 36"** x 9 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +10.00' x 7.10 sf x 1 rows
#3B	13.50'	0.000 af	**6.50'W x 193.00'L x 4.50'H Field B** 0.130 af Overall - 0.039 af Embedded = 0.091 af x 0.0% Voids
#4B	14.00'	0.031 af	**ADS N-12 36"** x 9 Inside #3 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +10.00' x 7.10 sf x 1 rows
		0.062 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	13.90'	**18.0" Round Culvert** L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 13.90' / 13.70' S= 0.0167 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	14.00'	**17.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	16.45'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 4.00 4.00

Primary OutFlow Max=4.19 cfs @ 12.18 hrs HW=15.91' TW=14.39' (Dynamic Tailwater)
└─**1=Culvert** (Passes 4.19 cfs of 9.13 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 4.19 cfs @ 5.91 fps)
  └─**3=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Pond 1.2:

Inflow Area = 71,537 sf, 88.11% Impervious, Inflow Depth > 5.15" for 10-Yr event
Inflow = 6.35 cfs @ 12.10 hrs, Volume= 30,681 cf
Outflow = 6.35 cfs @ 12.10 hrs, Volume= 30,681 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.35 cfs @ 12.10 hrs, Volume= 30,681 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 14.51' @ 12.10 hrs
Flood Elev= 20.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	13.20'	**18.0" Round Culvert** L= 128.0' Ke= 0.500 Inlet / Outlet Invert= 13.20' / 11.50' S= 0.0133 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=6.32 cfs @ 12.10 hrs HW=14.50' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 6.32 cfs @ 3.88 fps)

Summary for Link PA-1:

Inflow Area = 189,480 sf, 38.97% Impervious, Inflow Depth > 4.14" for 10-Yr event
Inflow = 17.37 cfs @ 12.09 hrs, Volume= 65,439 cf
Primary = 17.37 cfs @ 12.09 hrs, Volume= 65,439 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE 1.0: Runoff Area=117,943 sf 9.16% Impervious Runoff Depth>4.92"
Flow Length=160' Tc=5.7 min CN=81 Runoff=15.19 cfs 48,381 cf

SubcatchmentPRE 1.1: Runoff Area=50,737 sf 87.11% Impervious Runoff Depth>6.65"
Flow Length=102' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=8.13 cfs 28,117 cf

SubcatchmentPRE 1.2: Runoff Area=20,800 sf 90.53% Impervious Runoff Depth>6.65"
Flow Length=315' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=3.33 cfs 11,527 cf

Pond 1.1: Peak Elev=16.66' Storage=0.053 af Inflow=8.13 cfs 28,117 cf
Outflow=5.91 cfs 28,117 cf

Pond 1.2: Peak Elev=14.89' Inflow=8.26 cfs 39,644 cf
18.0" Round Culvert n=0.013 L=128.0' S=0.0133 '/' Outflow=8.26 cfs 39,644 cf

Link PA-1: Inflow=22.71 cfs 88,025 cf
Primary=22.71 cfs 88,025 cf

Total Runoff Area = 189,480 sf Runoff Volume = 88,025 cf Average Runoff Depth = 5.57"
61.03% Pervious = 115,641 sf 38.97% Impervious = 73,839 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE 1.0: Runoff Area=117,943 sf 9.16% Impervious Runoff Depth>6.24"
Flow Length=160' Tc=5.7 min CN=81 Runoff=19.06 cfs 61,326 cf

SubcatchmentPRE 1.1: Runoff Area=50,737 sf 87.11% Impervious Runoff Depth>8.05"
Flow Length=102' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=9.76 cfs 34,018 cf

SubcatchmentPRE 1.2: Runoff Area=20,800 sf 90.53% Impervious Runoff Depth>8.05"
Flow Length=315' Slope=0.0050 '/' Tc=5.0 min CN=96 Runoff=4.00 cfs 13,946 cf

Pond 1.1: Peak Elev=16.91' Storage=0.058 af Inflow=9.76 cfs 34,018 cf
Outflow=8.38 cfs 34,018 cf

Pond 1.2: Peak Elev=15.93' Inflow=12.00 cfs 47,964 cf
18.0" Round Culvert n=0.013 L=128.0' S=0.0133 '/' Outflow=12.00 cfs 47,964 cf

Link PA-1: Inflow=30.78 cfs 109,290 cf
Primary=30.78 cfs 109,290 cf

Total Runoff Area = 189,480 sf Runoff Volume = 109,290 cf Average Runoff Depth = 6.92"
61.03% Pervious = 115,641 sf 38.97% Impervious = 73,839 sf

LEGEND

PRE-DEVELOPMENT WATERSHED BOUNDARY

LONGEST FLOW PATH

PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

PA-1 — POINT OF ANALYSIS

N

POST 1.1

POST 1.2

POST 1.0

POST POND 1.1

POST POND 1.2

PA-1

245/1 N/F LAFAYETTE OF MICHIGAN, LLC 20630 HARPER AVENUE SUITE 107 HARPER WOODS, MI 48225 2868/2561

#755 1 STORY BLOCK BUILDING

PILE OF DIRT & ASPHALT

INV. EL=14.29 12"

HEADWALL

12" PVC INV. EL=11.72

WETLAND CLASSIFICATION (PSS1E/PEM1E)

BOLLARD (TYP.)

PUMP STATION CANOPY

MOBIL STATION MANHOLE

DUMPSTER PAD

6' WOOD FENCE (TYP.)

GAS STATION SIGN

MARQUEE LOT

B-1 B-1A B-2 B-2A B-6 LP-1

100' WETLAND BUFFER

50' WETLAND BUFFER

25' WETLAND BUFFER

LAFAYETTE ROAD–U.S. ROUTE 1

CONCRETE PAD FOR ROAD SIGN

16" CONCRETE PIPE W/ FLARED END SECTION INV. EL=5.00

SIDEWALK

BILLBOARD

WETLAND CLASSIFICATION (PSS1E/PEM1E)

SALT MARSH (E2EM1N)

SAGAMORE CREEK

HOTL

MHW

0 30' 60'

GRAPHIC SCALE

Tighe&Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	10/23/2023	TAC SUBMISSION

PROJECT NO:	M5131-001
DATE:	10/23/2023
FILE:	M5131-001-DSGN.dwg
DRAWN BY:	CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

POST DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Saved: 10/23/2023
Printed: 10/23/2023 9:58am By: CKrzoiuk
Tighe & Bond:J:\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DSGN.dwg

Section 4
Peak Rate Comparison

The following table summarizes and compares the pre- and post-development peak runoff rates from the 2-year, 10-year, 25-year and 50-year storm events at the point of analysis.

Table 4.1
Comparison of Pre- and Post-Development Flows (CFS)

	2-Year Storm	10-Year Storm	25-Year Storm	50-Year Storm
Pre-Development Watershed				
PA-1	10.55	18.71	25.16	31.11
Post-Development Watershed				
PA-1	10.47	17.37	22.71	30.78

The Peak Runoff Control Requirements of Env-Wq 1507.06 are not required to be met for the point of analysis per NHDES Alteration of Terrain regulation Env-Wq 1507.06(d). However, a detention system is included on the development site for the purpose of mitigating temperature differences. As shown in Table 1.2 the Post-development flows are decreased from the Pre-development flows for the point of analysis with the addition of this underground detention system.

Section 5
Mitigation Description

The stormwater management system has been designed to provide stormwater treatment as required by the City of Portsmouth Site Review Regulations and NHDES AoT Regulations (Env-Wq 1500).

5.1 Pre-Treatment Methods for Protecting Water Quality

Pre-treatment for the stormwater filtration systems consists of off-line deep sump catch basins.

5.2 Treatment Methods for Protecting Water Quality.

The runoff from proposed impervious areas will be treated by a Contech Jellyfish stormwater filtration system. This Jellyfish system is sized to treat the Water Quality Flow of its respective sub catchment areas. The system is outfitted with an internal bypass that diverts peak flows away from treatment. The BMP worksheet for this treatment practice has been included in Section 6 of this report.

The proposed stormwater management system is required to remove 80% of the annual Total Suspended Soils (TSS) loads and 50% of the annual Total Nitrogen (TN) loads per the City of Portsmouth's Site Plan regulations, Section 7.6.2.1.a.i. As shown in table 5.1 the pollutant removal efficiencies for the proposed treatment system exceeds the City of Portsmouth's removal requirements.

Table 5.1 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Jellyfish Filter w/Pretreatment[1]	91%	53%	61%

1. Pollutant removal calculations for Jellyfish Filter with deep sump catchbasin pretreatment are shown in Table 5.2.

Table 5.2 – Pollutant Removal Calculations				
Contech Jellyfish Filter				
BMP	TSS Removal Rate	Starting TSS Load	TSS Removed	Remaining TSS Load
Deep Sump Catchbasin w/Hood[1]	0.15	1.00	0.15	0.85
Jellyfish Filter[2]	0.89	0.85	0.76	0.09
	Total Suspended Solids Removed:			**91%**
	TN Removal Rate	Starting TN Load	TN Removed	Remaining TN Load
Deep Sump Catchbasin w/Hood[1]	0.05	1.00	0.05	0.95
Jellyfish Filter[2]	0.51	0.95	0.48	0.47
	Total Nitrogen Removed:			**53%**
	TP Removal Rate	Starting TP Load	TP Removed	Remaining TP Load
Deep Sump Catchbasin w/Hood[1]	0.05	1.00	0.05	0.95
Jellyfish Filter[2]	0.59	0.95	0.56	0.39
	Total Phosphorus Removed:			**61%**

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix E.
2. Pollutant removal efficiencies from Contech Engineered Solutions, Jellyfish Filter Stormwater Treatment performance testing results.

Section 6
BMP Worksheet

General Calculations - WQV and WQF (optional worksheet)

This worksheet may be useful when designing a BMP that does not fit into one of the specific worksheets already provided (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

1.64	ac	A = Area draining to the practice
1.45	ac	A_I = Impervious area draining to the practice
0.88	decimal	I = percent impervious area draining to the practice, in decimal form
0.85	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
1.39	ac-in	WQV= 1" x Rv x A
5,035	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = amount of rainfall. For WQF in NH, P = 1".
0.85	inches	Q = water quality depth. Q = WQV/A
99	unitless	CN = unit peak discharge curve number. $CN = 1000/(10+5P+10Q-10*[Q^2 + 1.25*Q*P]^{0.5})$
0.1	inches	S = potential maximum retention. S = (1000/CN) - 10
0.029	inches	Ia = initial abstraction. Ia = 0.2S
5.0	minutes	T_c = Time of Concentration
640.0	$cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
1.387	cfs	WQF = q_u x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$

Designer's Notes: JELLYFISH FILTER - 01

Pretreatment: Offline Deep Sump Catch Basins

Treatment: (1) Contech Jellyfish Model JF0806-7-2- design capacity of 1.43 cfs

APPENDIX A

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Rockingham County, New Hampshire

October 10, 2023

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,550 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 26, Aug 22, 2023

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

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
299	Udorthents, smoothed	3.7	61.5%
397	Ipswich mucky peat, 0 to 2 percent slopes, very frequently flooded	1.9	31.7%
597	Westbrook mucky peat, 0 to 2 percent slopes, very frequently flooded	0.2	3.7%
W	Water	0.2	3.1%
Totals for Area of Interest		**6.0**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Rockingham County, New Hampshire

299—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9cmt
Elevation: 0 to 840 feet
Mean annual precipitation: 44 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Properties and qualities

Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

397—Ipswich mucky peat, 0 to 2 percent slopes, very frequently flooded

Map Unit Setting

National map unit symbol: 2tyqj
Elevation: 0 to 10 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Ipswich and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ipswich

Setting

Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Partially- decomposed herbaceous organic material

Typical profile

Oe - 0 to 42 inches: mucky peat

Oa - 42 to 59 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.14 to 99.90 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to strongly saline (0.7 to 111.6 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Very high (about 26.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Ecological site: R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded, R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded
Hydric soil rating: Yes

Minor Components

Westbrook

Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

Pawcatuck

Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

597—Westbrook mucky peat, 0 to 2 percent slopes, very frequently flooded

Map Unit Setting

National map unit symbol: 2tyqf
Elevation: 0 to 10 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Westbrook and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Westbrook

Setting

Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Partly-decomposed herbaceous organic material over loamy mineral material

Typical profile

Oe - 0 to 19 inches: mucky peat
Cg - 19 to 59 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to strongly saline (0.7 to 111.6 mmhos/cm)
Sodium adsorption ratio, maximum: 33.0
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D

Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

Minor Components

Ipswich
Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

Pawcatuck
Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

W—Water

Map Unit Setting
National map unit symbol: 9cq3
Elevation: 200 to 2,610 feet
Farmland classification: Not prime farmland

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

APPENDIX B

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Metadata for Point	
Smoothing	Yes
State	
Location	
Latitude	43.052 degrees North
Longitude	70.768 degrees West
Elevation	0 feet
Date/Time	Tue Oct 10 2023 16:27:23 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.57	2.04	2.67	2.93	**1yr**	2.36	2.82	3.23	3.96	4.57	**1yr**
2yr	0.32	0.50	0.62	0.82	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.50	3.22	3.58	**2yr**	2.85	3.45	3.95	4.70	5.35	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.44	3.15	4.08	4.60	**5yr**	3.61	4.42	5.06	5.96	6.73	**5yr**
10yr	0.41	0.65	0.82	1.12	1.45	1.89	**10yr**	1.25	1.73	2.24	2.90	3.76	4.89	5.55	**10yr**	4.33	5.34	6.11	7.14	8.01	**10yr**
25yr	0.48	0.76	0.97	1.34	1.78	2.34	**25yr**	1.53	2.15	2.78	3.64	4.76	6.20	7.13	**25yr**	5.49	6.86	7.85	9.07	10.10	**25yr**
50yr	0.54	0.86	1.10	1.54	2.08	2.76	**50yr**	1.79	2.53	3.30	4.34	5.68	7.42	8.62	**50yr**	6.57	8.29	9.48	10.87	12.03	**50yr**
100yr	0.60	0.97	1.25	1.78	2.42	3.27	**100yr**	2.09	2.99	3.92	5.18	6.80	8.90	10.43	**100yr**	7.87	10.03	11.46	13.04	14.35	**100yr**
200yr	0.68	1.10	1.43	2.05	2.83	3.85	**200yr**	2.45	3.53	4.63	6.15	8.12	10.66	12.61	**200yr**	9.44	12.13	13.85	15.64	17.11	**200yr**
500yr	0.80	1.32	1.72	2.49	3.49	4.78	**500yr**	3.01	4.39	5.79	7.74	10.27	13.55	16.22	**500yr**	11.99	15.60	17.81	19.91	21.61	**500yr**

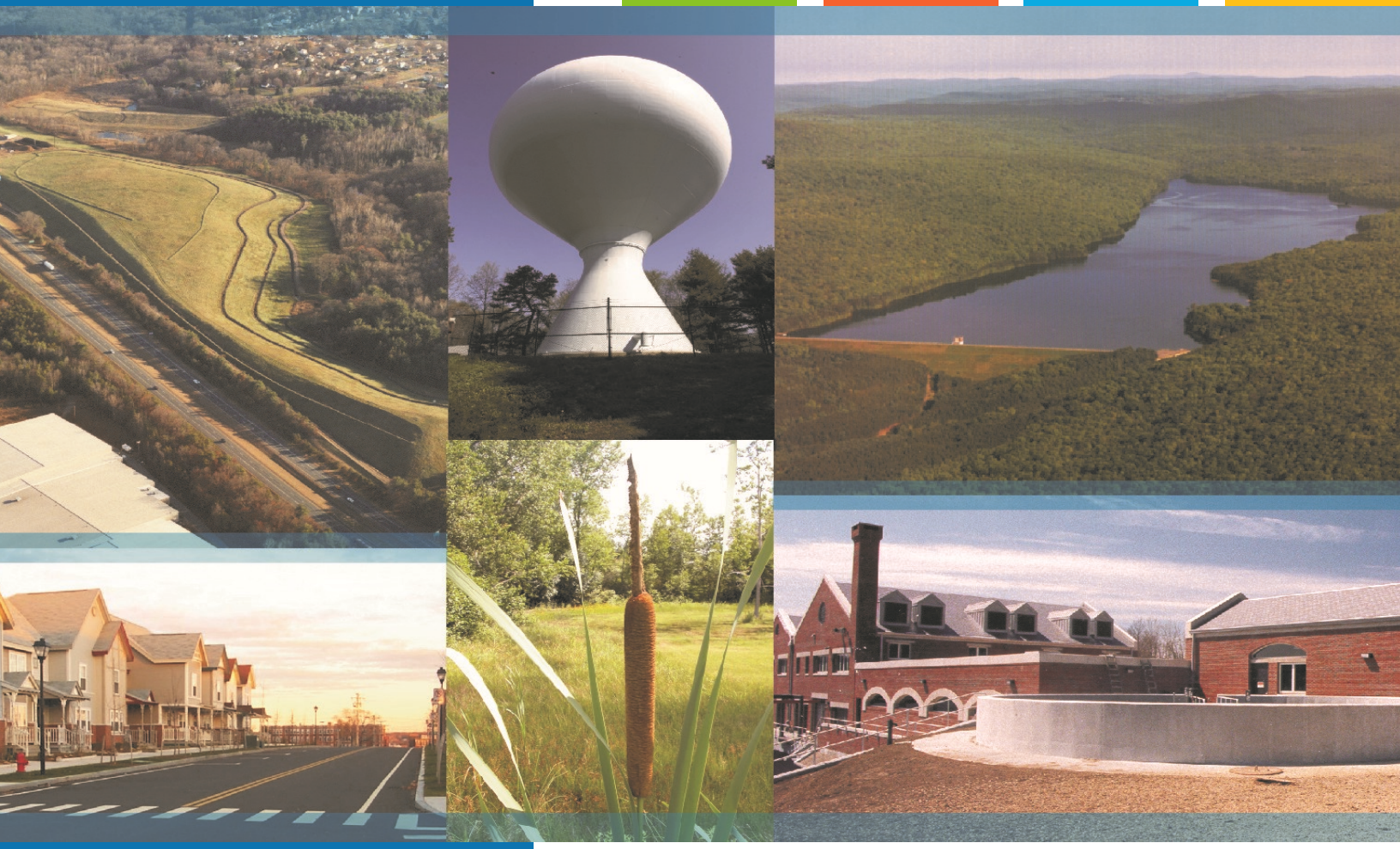
Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.63	0.87	0.92	1.33	1.68	2.25	2.53	**1yr**	1.99	2.43	2.88	3.18	3.91	**1yr**
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.07	3.47	**2yr**	2.72	3.34	3.84	4.57	5.10	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.73	3.81	4.22	**5yr**	3.37	4.06	4.74	5.57	6.28	**5yr**
10yr	0.39	0.59	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.81	2.39	3.06	4.40	4.90	**10yr**	3.89	4.71	5.49	6.46	7.24	**10yr**
25yr	0.44	0.67	0.83	1.19	1.57	1.90	**25yr**	1.35	1.86	2.10	2.75	3.53	4.75	5.95	**25yr**	4.20	5.72	6.72	7.87	8.75	**25yr**
50yr	0.48	0.74	0.92	1.32	1.77	2.17	**50yr**	1.53	2.12	2.35	3.07	3.93	5.37	6.88	**50yr**	4.75	6.61	7.83	9.14	10.11	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.47	**100yr**	1.74	2.42	2.63	3.41	4.35	6.04	7.95	**100yr**	5.35	7.65	9.12	10.64	11.68	**100yr**
200yr	0.60	0.90	1.14	1.64	2.29	2.82	**200yr**	1.98	2.76	2.94	3.77	4.79	6.78	9.19	**200yr**	6.00	8.84	10.63	12.40	13.51	**200yr**
500yr	0.69	1.03	1.32	1.92	2.73	3.37	**500yr**	2.36	3.30	3.42	4.30	5.45	7.90	11.13	**500yr**	7.00	10.70	13.00	15.20	16.37	**500yr**

Coastal and Great Bay Region Precipitation Increase		
	24-hr Storm Event (in.)	24-hr Storm Event + 15% (in.)
1 Year	2.67	3.07
2 Year	3.22	3.70
10 Year	4.89	5.62
25 Year	6.20	7.13
50 Year	7.42	8.53

www.tighebond.com

100% Recyclable



Proposed Multi-Family Development
815 Lafayette Rd
Portsmouth, NH

Long-Term Operation & Maintenance Plan

Prospect North 815, LLC

October 23, 2023

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Section 1 Long-Term Operation & Maintenance Plan

Section 2 Invasive Species

Section 3 Annual Updates and Log Requirements

Section 1
Long-Term Operation & Maintenance Plan

It is the intent of this Operation and Maintenance Plan to identify the areas of this site that need special attention and consideration, as well as implement a plan to assure routine maintenance. By identifying the areas of concern as well as implementing a frequent and routine maintenance schedule the site will maintain a high-quality stormwater runoff.

1.1 Contact/Responsible Party

Prospect North 815, LLC
PO Box 372
Greenland, NH 03857

(Note: The contact information for the Contact/Responsible Party shall be kept current. If ownership changes, the Operation and Maintenance Plan must be transferred to the new party.)

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Landscaping
- Catchbasin Cleaning
- Pavement Sweeping
- Underground Detention System
- Contech Jellyfish Filtration System

The following maintenance items and schedule represent the minimum action required. Periodic site inspections shall be conducted, and all measures must be maintained in effective operating condition. The following items shall be observed during site inspection and maintenance:

- Inspect vegetated areas, particularly slopes and embankments for areas of erosion. Replant and restore as necessary
- Inspect catch basins for sediment buildup
- Inspect site for trash and debris

1.3 Overall Site Operation & Maintenance Schedule

Maintenance Item	Frequency of Maintenance
Litter/Debris Removal	Weekly
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually
Contech Jelly Fish Units	In accordance with Manufacturer's Recommendations (See section 1.5)
Underground Detention Basin - Visual observation of sediment levels within system	Bi-Annually (See Section 1.4)

1.3.1 Disposal Requirements

Disposal of debris, trash, sediment and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.

1.4 Underground Detention System Maintenance Requirements

Underground Detention System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed
Deep Sump Catchbasins	Two (2) times annually	- Removal of sediment as warranted by inspection - No less than once annually
Monitor detention system for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed

1.5 Contech Jellyfish Filter System Maintenance Requirements

Contech Jellyfish Filter System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Inspect vault for sediment build up, static water, plugged media and bypass condition	Quarterly during the first year of operation, Minimum of annually in subsequent years	- See section 4 & 5 of Jellyfish Filter Owner's Manual
Replace Cartridges	As required by inspection, 1–5 years.	- See section 6 & 7 of Jellyfish Filter Owner's Manual

CONTECH®
ENGINEERED SOLUTIONS

Jellyfish® Filter
Owner's Manual

Jellyfish® Filter

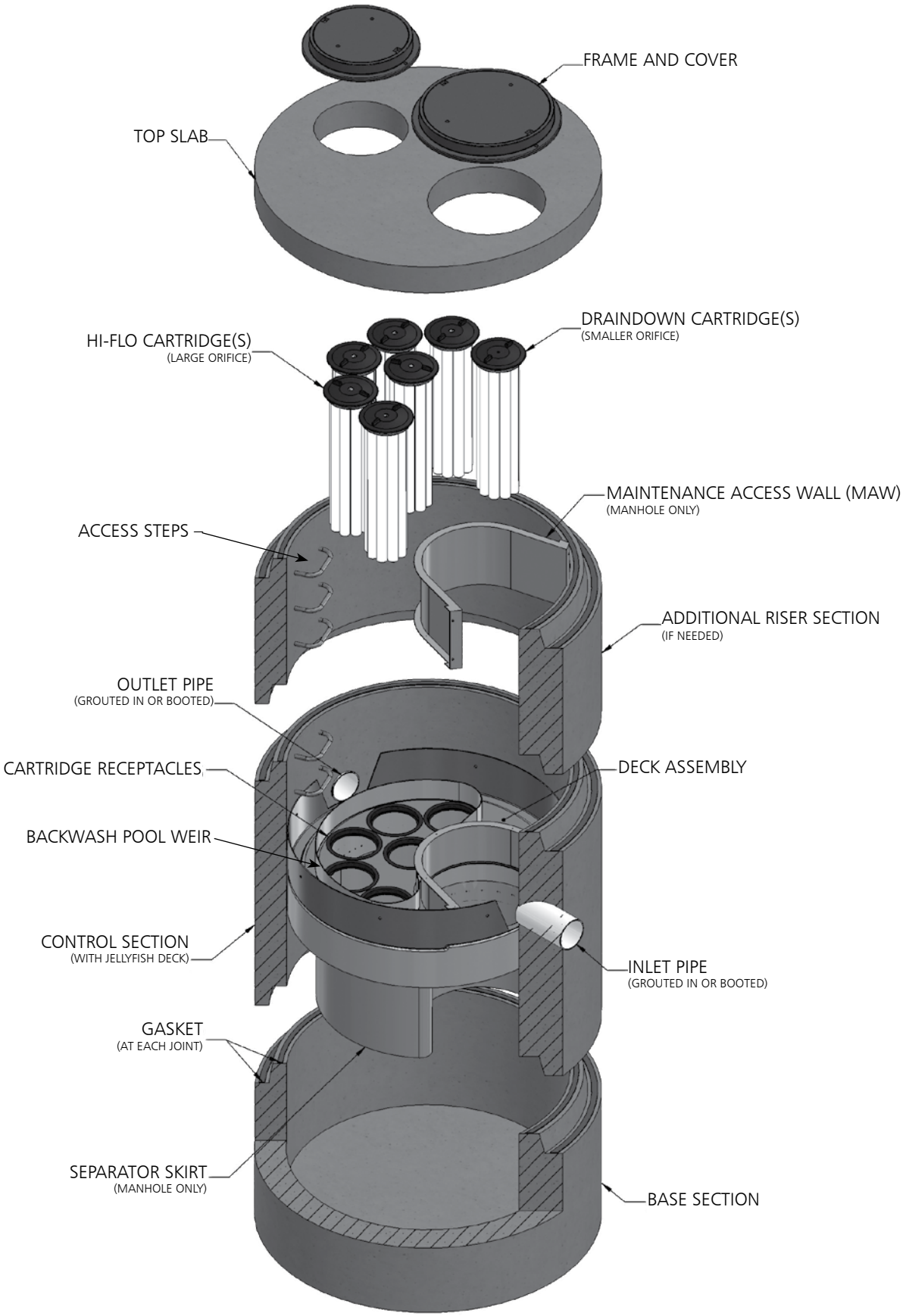
Table of Contents

THANK YOU FOR PURCHASING THE JELLYFISH® FILTER!

Contech Engineered Solutions would like to thank you for selecting the Jellyfish Filter to meet your project's stormwater treatment needs. With proper inspection and maintenance, the Jellyfish Filter is designed to deliver ongoing, high levels of stormwater pollutant removal.

If you have any questions, please feel free to call us or e-mail us:

Contech Engineered Solutions
9025 Centre Pointe Drive, Suite 400 | West Chester, OH 45069
513-645-7000 | 800-338-1122
www.ContechES.com
info@conteches.com


FRAME AND COVER
TOP SLAB
DRAINDOWN CARTRIDGE(S)
(SMALLER ORIFICE)
HI-FLO CARTRIDGE(S)
(LARGE ORIFICE)
MAINTENANCE ACCESS WALL (MAW)
(MANHOLE ONLY)
ACCESS STEPS
ADDITIONAL RISER SECTION
(IF NEEDED)
OUTLET PIPE
(GROUTED IN OR BOOTED)
CARTRIDGE RECEPTACLES
DECK ASSEMBLY
BACKWASH POOL WEIR
CONTROL SECTION
(WITH JELLYFISH DECK)
INLET PIPE
(GROUTED IN OR BOOTED)
GASKET
(AT EACH JOINT)
SEPARATOR SKIRT
(MANHOLE ONLY)
BASE SECTION

WARNINGS / CAUTION

1. FALL PROTECTION may be required.
2. WATCH YOUR STEP if standing on the Jellyfish Filter Deck at any time; Great care and safety must be taken while walking or maneuvering on the Jellyfish Filter Deck. Attentive care must be taken while standing on the Jellyfish Filter Deck at all times to prevent stepping onto a lid, into or through a cartridge hole or slipping on the deck.
3. The Jellyfish Filter Deck can be SLIPPERY WHEN WET.
4. If the Top Slab, Covers or Hatches have not yet been installed, or are removed for any reason, great care must be taken to NOT DROP ANYTHING ONTO THE JELLYFISH FILTER DECK. The Jellyfish Filter Deck and Cartridge Receptacle Rings can be damaged under high impact loads. This type of activity voids all warranties. All damaged items to be replaced at owner's expense.
5. Maximum deck load 2 persons, total weight 450 lbs.

Safety Notice

Jobsite safety is a topic and practice addressed comprehensively by others. The inclusions here are intended to be reminders to whole areas of Safety Practice that are the responsibility of the Owner(s), Manager(s) and Contractor(s). OSHA and Canadian OSH, and Federal, State/Provincial, and Local Jurisdiction Safety Standards apply on any given site or project. The knowledge and applicability of those responsibilities is the Contractor's responsibility and outside the scope of Contech Engineered Solutions.

Confined Space Entry

Secure all equipment and perform all training to meet applicable local and OSHA regulations regarding confined space entry. It is the Contractor's or entry personnel's responsibility to proceed safely at all times.

Personal Safety Equipment

Contractor is responsible to provide and wear appropriate personal protection equipment as needed including, but not limited to safety boots, hard hat, reflective vest, protective eyewear, gloves and fall protection equipment as necessary. Make sure all equipment is staffed with trained and/or certified personnel, and all equipment is checked for proper operation and safety features prior to use.

- Fall protection equipment
- Eye protection
- Safety boots
- Ear protection
- Gloves
- Ventilation and respiratory protection
- Hard hat
- Maintenance and protection of traffic plan

Chapter 1

1.0 – Owner Specific Jellyfish Filter Product Information

Below you will find a reference page that can be filled out according to your Jellyfish Filter specification to help you easily inspect, maintain and order parts for your system.

Owner Name:	
Phone Number:	
Site Address:	
Site GPS Coordinates/unit location:	
Unit Location Description:	
Jellyfish Filter Model No.:	
Contech Project & Sequence Number	
No. of Hi-Flo Cartridges	
No. of Cartridges:	
Length of Draindown Cartridges:	
No. of Blank Cartridge Lids:	
Bypass Configuration (Online/Offline):	

Notes:

_____

_____

_____

_____

Chapter 2

2.0 – Jellyfish Filter System Operations and Functions

The Jellyfish Filter is an engineered stormwater quality treatment technology that removes a high level and wide variety of stormwater pollutants. Each Jellyfish Filter cartridge consists of eleven membrane - encased filter elements ("filtration tentacles") attached to a cartridge head plate. The filtration tentacles provide a large filtration surface area, resulting in high flow and high pollutant removal capacity.

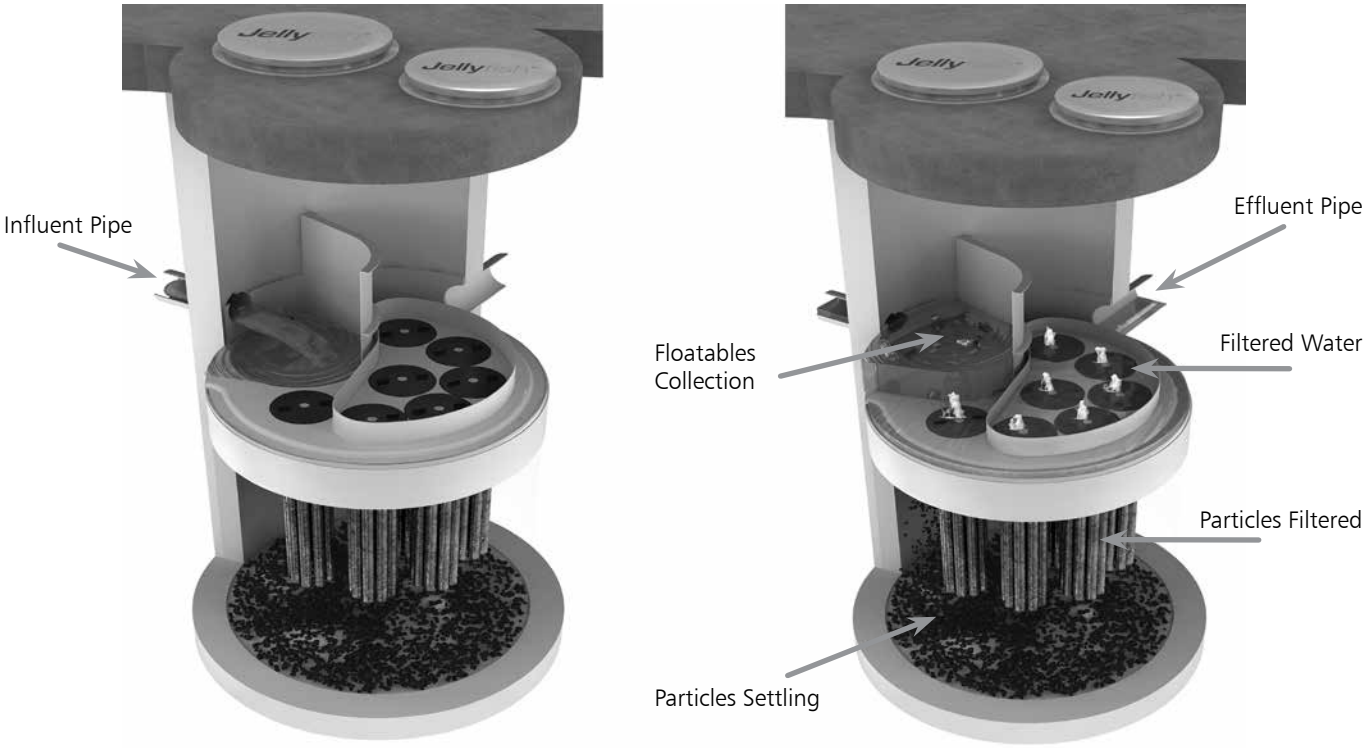
The Jellyfish Filter functions are depicted in Figure 1 below.

FIGURE 1

Jellyfish Filter Treatment Functions

Membrane Filtration

Section View with Maintenance Access Wall (MAW) Cutaway



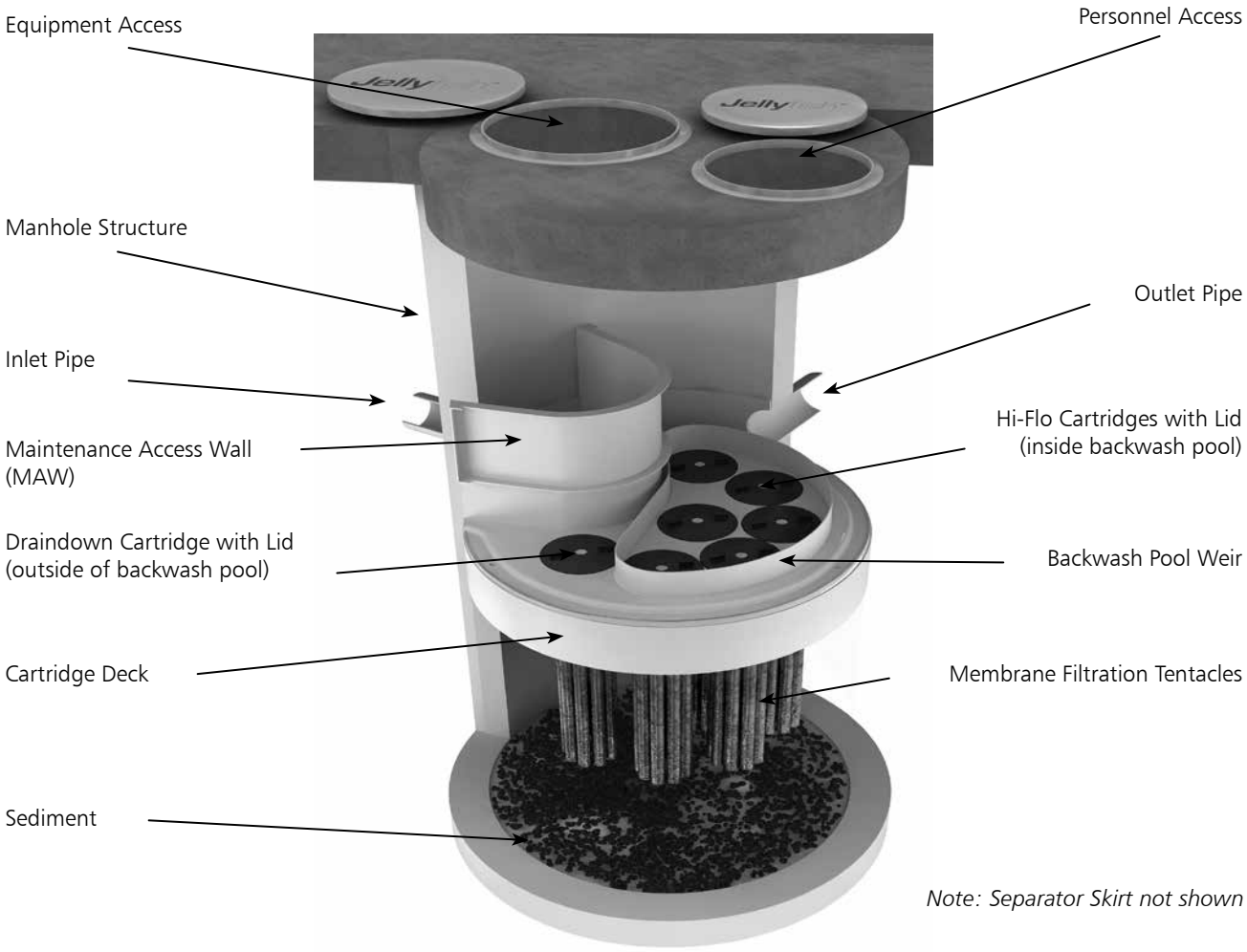
Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

For additional details on the operation and pollutant capabilities of the Jellyfish Filter please refer to additional details on our website at www.ContechES.com.

2.1 – Components and Cartridges

The Jellyfish Filter and components are depicted in Figure 2 below.

FIGURE 2 **Jellyfish Filter Components**



Tentacles are available in various lengths as depicted in Table 1 below.

Table 1 – Cartridge Lengths / Weights and Cartridge Lid Orifice Diameters

Cartridge Lengths	Dry Weight	Hi-Flo Orifice Diameter	Draindown Orifice Diameter
15 inches (381 mm)	10 lbs (4.5 kg)	35 mm	20 mm
27 inches (686 mm)	14.5 lbs (6.6 kg)	45 mm	25 mm
40 inches (1,016 mm)	19.5 lbs (8.9 kg)	55 mm	30 mm
54 inches (1,372 mm)	25 lbs (11.4 kg)	70 mm	35 mm

2.2 – Jellyfish Membrane Filtration Cartridge Assembly

The Jellyfish Filter utilizes multiple membrane filtration cartridges. Each cartridge consists of removable cylindrical filtration "tentacles" attached to a cartridge head plate. Each filtration tentacle has a threaded pipe nipple and o-ring. To attach, insert the top pipe nipples with the o-ring through the head plate holes and secure with locking nuts. Hex nuts to be hand tightened and checked with a wrench as shown below.

2.3 – Jellyfish Membrane Filtration Cartridge Installation

- Cartridge installation will be performed by trained individuals and coordinated with the installing site Contractor. Flow diversion devices are required to be in place until the site is stabilized (final paving and landscaping in place). Failure to address this step completely will reduce the time between required maintenance.
- Descend to the cartridge deck (see Safety Notice and page 3).
- Refer to Contech's submittal drawings to determine proper quantity and placement of Hi-Flo, Draindown and Blank cartridges with appropriate lids. Lower the Jellyfish membrane filtration cartridges into the cartridge receptacles within the cartridge deck. It is possible that not all cartridge receptacles will be filled with a filter cartridge. In that case, a blank headplate and blank cartridge lid (no orifice) would be installed.

Cartridge Assembly

Do not force the tentacles down into the cartridge receptacle, as this may damage the membranes. Apply downward pressure on the cartridge head plate to seat the lubricated rim gasket (thick circular gasket surrounding the circumference of the head plate) into the cartridge receptacle. (See Figure 3 for details on approved lubricants for use with rim gasket.)

- Examine the cartridge lids to differentiate lids with a small orifice, a large orifice, and no orifice.
  - Lids with a small orifice are to be inserted into the Draindown cartridge receptacles, outside of the backwash pool weir.
  - Lids with a large orifice are to be inserted into the Hi-Flo cartridge receptacles within the backwash pool weir.
  - Lids with no orifice (blank cartridge lids) and a blank headplate are to be inserted into unoccupied cartridge receptacles.
- To install a cartridge lid, align both cartridge lid male threads with the cartridge receptacle female threads before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation.

3.0 Inspection and Maintenance Overview

The primary purpose of the Jellyfish® Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, these pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system.
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.
Inspection activities are typically conducted from surface observations and include:

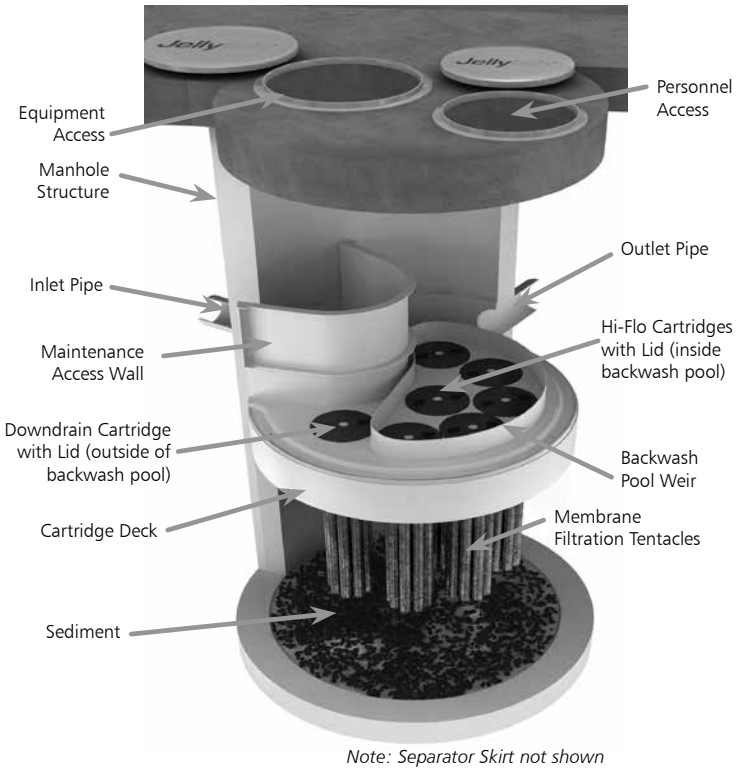
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

Maintenance activities include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed

4.0 Inspection Timing

Inspection of the Jellyfish Filter is key in determining the maintenance requirements for, and to develop a history of, the site's pollutant loading characteristics. In general, inspections should be performed at the times indicated below; *or per the approved project stormwater quality documents (if applicable), whichever is more frequent*.



Note: Separator Skirt not shown

1. A minimum of quarterly inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
2. Inspection frequency in subsequent years is based on the inspection and maintenance plan developed in the first year of operation. Minimum frequency should be once per year.
3. Inspection is recommended after each major storm event.
4. Inspection is required immediately after an upstream oil, fuel or other chemical spill.

5.0 Inspection Procedure

The following procedure is recommended when performing inspections:

1. Provide traffic control measures as necessary.
2. Inspect the MAW or inlet bay for floatable pollutants such as trash, debris, and oil sheen.
3. Measure oil and sediment depth in several locations, by lowering a sediment probe until contact is made with the floor of the structure. Record sediment depth, and presences of any oil layers.
4. Inspect cartridge lids. Missing or damaged cartridge lids to be replaced.
5. Inspect the MAW (where appropriate), cartridge deck and receptacles, and backwash pool weir, for damaged or broken components.

5.1 Dry weather inspections

- Inspect the cartridge deck for standing water, and/or sediment on the deck.
- No standing water under normal operating conditions.
- Standing water inside the backwash pool, but not outside the backwash pool indicates, that the filter cartridges need to be rinsed.

Inspection Utilizing Sediment Probe

- Standing water outside the backwash pool is not anticipated and may indicate a backwater condition caused by high water elevation in the receiving water body, or possibly a blockage in downstream infrastructure.
- Any appreciable sediment (≥1/16") accumulated on the deck surface should be removed.

5.2 Wet weather inspections

- Observe the rate and movement of water in the unit. Note the depth of water above deck elevation within the MAW or inlet bay.
- Less than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges (i.e. cartridges located outside the backwash pool).
- Greater than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges and each of the hi-flo cartridges (i.e. cartridges located inside the backwash pool), and water should be overflowing the backwash pool weir.
- 18 inches or greater and relatively little flow is exiting the cartridge lids and outlet pipe, this condition indicates that the filter cartridges need to be rinsed.

6.0 Maintenance Requirements

Required maintenance for the Jellyfish Filter is based upon results of the most recent inspection, historical maintenance records, or the site specific water quality management plan; whichever is more frequent. In general, maintenance requires some combination of the following:

1. Sediment removal for depths reaching 12 inches or greater, or within 3 years of the most recent sediment cleaning, whichever occurs sooner.
2. Floatable trash, debris, and oil removal.
3. Deck cleaned and free from sediment.
4. Filter cartridges rinsed and re-installed as required by the most recent inspection results, or within 12 months of the most recent filter rinsing, whichever occurs sooner.
5. Replace tentacles if rinsing does not restore adequate hydraulic capacity, remove accumulated sediment, or if damaged or missing. It is recommended that tentacles should remain in service no longer than 5 years before replacement.
6. Damaged or missing cartridge deck components must be repaired or replaced as indicated by results of the most recent inspection.
7. The unit must be cleaned out and filter cartridges inspected immediately after an upstream oil, fuel, or chemical spill. Filter cartridge tentacles should be replaced if damaged or compromised by the spill.

7.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

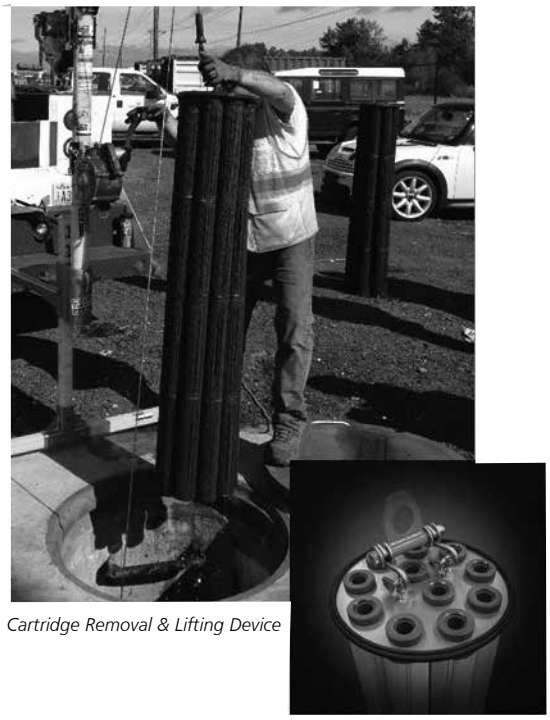
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

7.1 Filter Cartridge Removal

1. Remove a cartridge lid.
2. Remove cartridges from the deck using the lifting loops in the cartridge head plate. Rope or a lifting device (available from Contech) should be used. *Caution: Should a snag occur, do not force the cartridge upward as damage to the tentacles may result. Wet cartridges typically weigh between 100 and 125 lbs*.
3. Replace and secure the cartridge lid on the exposed empty receptacle as a safety precaution. Contech does not recommend exposing more than one empty cartridge receptacle at a time.

7.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.
2. Position tentacles in a container (or over the MAW), with the threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.



Cartridge Removal & Lifting Device

3. Using the Jellyfish rinse tool (available from Contech) or a low-pressure garden hose sprayer, direct water spray onto the tentacle membrane, sweeping from top to bottom along the length of the tentacle. Rinse until all sediment is removed from the membrane. *Caution: Do not use a high pressure sprayer or focused stream of water on the membrane. Excessive water pressure may damage the membrane*.
4. Collected rinse water is typically removed by vacuum hose.

5. Reassemble cartridges as detailed later in this document. Reuse O-rings and nuts, ensuring proper placement on each tentacle.

7.3 Sediment and Flotables Extraction

1. Perform vacuum cleaning of the Jellyfish Filter only after filter cartridges have been removed from the system. Access the lower chamber for vacuum cleaning only through the maintenance access wall (MAW) opening. Be careful not to damage the flexible plastic separator skirt that is attached to the underside of the deck on manhole systems. Do not lower the vacuum wand through a cartridge receptacle, as damage to the receptacle will result.
2. Vacuum floatable trash, debris, and oil, from the MAW opening or inlet bay. Alternatively, floatable solids may be removed by a net or skimmer.
3. Pressure wash cartridge deck and receptacles to remove all

Rinsing Cartridge with Contech Rinse Tool

sediment and debris. Sediment should be rinsed into the sump area. Take care not to flush rinse water into the outlet pipe.

4. Remove water from the sump area. Vacuum or pump equipment should only be introduced through the MAW or inlet bay.
5. Remove the sediment from the bottom of the unit through the MAW or inlet bay opening.
6. For larger diameter Jellyfish Filter manholes (≥8-ft) and some

Vacuuming Sump Through MAW

vaults complete sediment removal may be facilitated by removing a cartridge lid from an empty receptacle and inserting a jetting wand (not a vacuum wand) through the receptacle. Use the sprayer to rinse loosened sediment toward the vacuum hose in the MAW opening, being careful not to damage the receptacle.

7.4 Filter Cartridge Reinstallation and Replacement

1. Cartridges should be installed after the deck has been cleaned. It is important that the receptacle surfaces be free from grit and debris.
2. Remove cartridge lid from deck and carefully lower the filter cartridge into the receptacle until head plate gasket is seated squarely in receptacle. *Caution: Do not force the cartridge downward; damage may occur.*
3. Replace the cartridge lid and check to see that both male threads are properly seated before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation. See next page for additional details.
4. If rinsing is ineffective in removing sediment from the tentacles, or if tentacles are damaged, provisions must be made to replace the spent or damaged tentacles with new tentacles. Contact Contech to order replacement tentacles.

7.5 Chemical Spills

Caution: If a chemical spill has been captured, do not attempt maintenance. Immediately contact the local hazard response agency and contact Contech.

7.6 Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Jellyfish Filter Components & Filter Cartridge Assembly and Installation

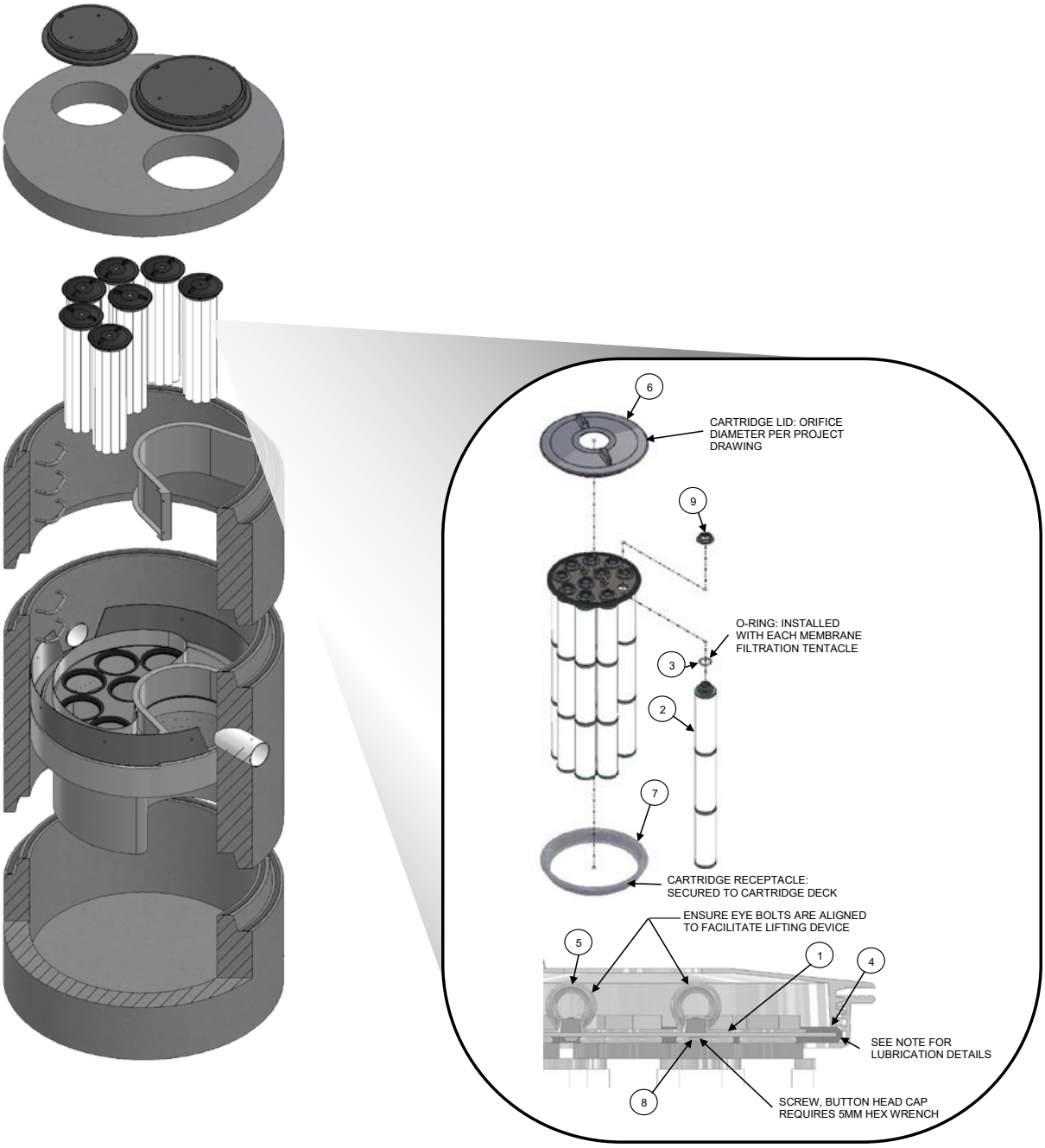


TABLE 1: BOM

ITEM NO.	DESCRIPTION
1	JF HEAD PLATE
2	JF TENTACLE
3	JF O-RING
4	JF HEAD PLATE GASKET
5	JF CARTRIDGE EYELET
6	JF 14IN COVER
7	JF RECEPTACLE
8	BUTTON HEAD CAP SCREW M6X14MM SS
9	JF CARTRIDGE NUT

TABLE 2: APPROVED GASKET LUBRICANTS

PART NO.	MFR	DESCRIPTION
78713	LA-CO	LUBRI-JOINT
40501	HERCULES	DUCK BUTTER
30600	OATEY	PIPE LUBRICANT
PSLUBXL1Q	PROSELECT	PIPE JOINT LUBRICANT

NOTES:

Head Plate Gasket Installation:
Install Head Plate Gasket (Item 4) onto the Head Plate (Item 1) and liberally apply a lubricant from Table 2: Approved Gasket Lubricants onto the gasket where it contacts the Receptacle (Item 7) and Cartridge Lid (Item 6). Follow Lubricant manufacturer's instructions.

Lid Assembly:
Rotate Cartridge Lid counter-clockwise until both male threads drop down and properly seat. Then rotate Cartridge Lid clock-wise approximately one-third of a full rotation until Cartridge Lid is firmly secured, creating a watertight seal.

Jellyfish Filter Inspection and Maintenance Log

Owner: _____ Jellyfish Model No.:_____

Location: _____ GPS Coordinates: _____

Land Use: Commercial:_____ Industrial: _____ Service Station:_____

Road/Highway:____ Airport: _____ Residential: _____ Parking Lot:_____

Date/Time:					
Inspector:					
Maintenance Contractor:					
Visible Oil Present: (Y/N)					
Oil Quantity Removed					
Floatable Debris Present: (Y/N)					
Floatable Debris removed: (Y/N)					
Water Depth in Backwash Pool					
Cartridges externally rinsed/re-commissioned: (Y/N)					
New tentacles put on Cartridges: (Y/N)					
Sediment Depth Measured: (Y/N)					
Sediment Depth (inches or mm):					
Sediment Removed: (Y/N)					
Cartridge Lids intact: (Y/N)					
Observed Damage:					
Comments:					

1.6 Snow & Ice Management for Standard Asphalt and Walkways

Snow storage areas shall be located such that no direct untreated discharges are possible to receiving waters from the storage site (snow storage areas have been shown on the Site Plan). The property manager will be responsible for timely snow removal from all private sidewalks, driveways, and parking areas. Any snow accumulation beyond a height of 3' in the snow storage areas will be hauled off-site and legally disposed of. Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume 2,).

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

These rates are not fixed values, but rather the middle of a range to be selected and adjusted by an agency according to its local conditions and experience.

			Pounds per two-lane mile			
Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	Salt Prewetted / Pretreated with Salt Brine	Salt Prewetted / Pretreated with Other Blends	Dry Salt*	Winter Sand (abrasives)
> 30° ↑	Snow	Plow, treat intersections only	80	70	100*	Not recommended
	Freezing Rain	Apply Chemical	80 - 160	70 - 140	100 - 200*	Not recommended
30° ↓	Snow	Plow and apply chemical	80 - 160	70 - 140	100 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↑	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↓	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↑	Snow or Freezing Rain	Plow and apply chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↓	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↑	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↓	Snow or Freezing Rain	Plow and apply chemical	240 - 320	210 - 280	300 - 400*	500 for freezing rain
0° - 15° ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	300 - 400	Not recommended	500 - 750 spot treatment as needed
< 0°	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	400 - 600**	Not recommended	500 - 750 spot treatment as needed

* Dry salt is not recommended. It is likely to blow off the road before it melts ice.

** A blend of 6 - 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10°.

Anti-icing Route Data Form				
Truck Station:				
Date:				
Air Temperature	Pavement Temperature	Relative Humidity	Dew Point	Sky
Reason for applying:				
Route:				
Chemical:				
Application Time:				
Application Amount:				
Observation (first day):				
Observation (after event):				
Observation (before next application):				
Name:				

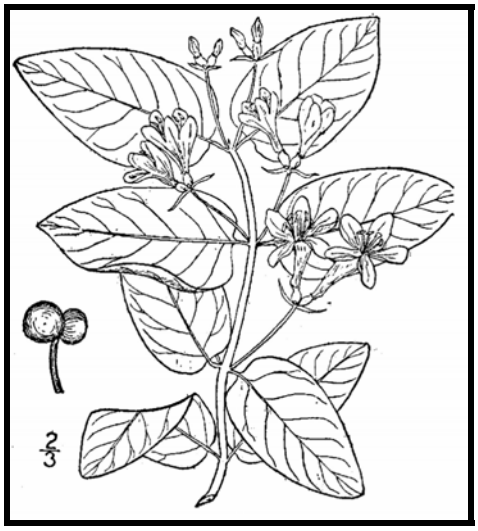
Section 2
Invasive Species

With respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem is classified as an invasive species. Refer to the following fact sheet prepared by the University of New Hampshire Cooperative Extension entitled Methods for Disposing Non-Native Invasive Plants for recommended methods to dispose of invasive plant species.

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

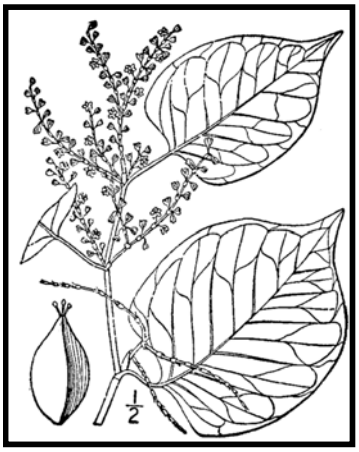
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

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 or 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.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

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 before 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 nonviable before composting. Closely examine 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 bring invasives to a local transfer station, unless there is a designated area for their 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 aquatic plants isn't addressed.

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
  </td><td>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.</td></tr>
<tr><td>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.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
  </td><td>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.</td></tr>
<tr><td>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.</td></tr>
</table>

Non-Woody Plants	Method of Reproducing	Methods 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 *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial 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 or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**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.

January 2010

Managing Invasive Plants
Methods of Control

by Christopher Mattrick

They're out there. The problem of invasive plants is as close as your own backyard.

Maybe a favorite dogwood tree is struggling in the clutches of an Oriental bittersweet vine. Clawlike canes of multiflora rose are scratching at the side of your house. That handsome burning bush you planted few years ago has become a whole clump in practically no time … but what happened to the azalea that used to grow right next to it?

If you think controlling or managing invasive plants on your property is a daunting task, you're not alone. Though this topic is getting lots of attention from federal, state, and local government agencies, as well as the media, the basic question for most homeowners is simply, "How do I get rid of the invasive plants in my own landscape?" Fortunately, the best place to begin to tackle this complex issue is in our own backyards and on local conservation lands. We hope the information provided here will help you take back your yard. We won't kid you—there's some work involved, but the payoff in beauty, wildlife habitat, and peace of mind makes it all worthwhile.

PLAN OF ATTACK

Three broad categories cover most invasive plant control: mechanical, chemical, and biological. Mechanical control means physically removing plants from the environment through cutting or pulling. Chemical control uses herbicides to kill plants and inhibit regrowth. Techniques and chemicals used will vary depending on the species. Biological controls use plant diseases or insect predators, typically from the targeted species' home range. Several techniques may be effective in controlling a single species, but there is usually one preferred method—the one that is most resource efficient with minimal impact on non-target species and the environment.

Spraying chemicals to control invasive plants.

MECHANICAL CONTROL METHODS

Mechanical treatments are usually the first ones to look at when evaluating an invasive plant removal project. These procedures do not require special licensing or introduce chemicals into the environment. They do require permits in some situations, such as wetland zones. [See sidebar on page 23.] Mechanical removal is highly labor intensive and creates a significant amount of site disturbance, which can lead to rapid reinvasion if not handled properly.

Pulling and digging

Many herbaceous plants and some woody species (up to about one inch in diameter), if present in limited quantities, can be pulled out or dug up. It's important to remove as much of the root system as possible; even a small portion can restart the infestation. Pull plants by hand or use a digging fork, as shovels can shear off portions of the root system, allowing for regrowth. To remove larger woody stems (up to about three inches in diameter), use a Weed Wrench™, Root Jack, or Root Talon. These tools, available from several manufacturers, are designed to remove the aboveground portion of the plant as well as the entire root system. It's easiest to undertake this type of control in the spring or early summer when soils are moist and plants come out more easily.

Using tools to remove woody stems.

Volunteers hand pulling invasive plants.

Suffocation

Try suffocating small seedlings and herbaceous plants. Place double or triple layers of thick UV-stabilized plastic sheeting, either clear or black (personally I like clear), over the infestation and secure the plastic with stakes or weights. Make sure the plastic extends at least five feet past the edge of infestation on all sides. Leave the plastic in place for at least two years. This technique will kill everything beneath the plastic—invasive and non-invasive plants alike. Once the plastic is removed, sow a cover crop such as annual rye to prevent new invasions.

Cutting or mowing

This technique is best suited for locations you can visit and treat often. To be effective, you will need to mow or cut infested areas three or four times a year for up to five years. The goal is to interrupt the plant's ability to photosynthesize by removing as much leafy material as possible. Cut the plants at ground level and remove all resulting debris from the site. With this treatment, the infestation may actually appear to get worse at first, so you will need to be as persistent as the invasive plants themselves. Each time you cut the plants back, the root system gets slightly larger, but must also rely on its energy reserves to push up new growth. Eventually, you will exhaust these reserves and the plants will die. This may take many years, so you have to remain committed to this process once you start; otherwise the treatment can backfire, making the problem worse.

CHEMICAL CONTROL METHODS

Herbicides are among the most effective and resource-efficient tools to treat invasive species. Most of the commonly known invasive plants can be treated using only two herbicides—glyphosate (the active ingredient in Roundup™ and Rodeo™) and triclopyr (the active ingredient in Brush-B-Gone™ and Garlon™). Glyphosate is non-selective, meaning it kills everything it contacts. Triclopyr is selective and does not injure monocots (grasses, orchids, lilies, etc.). Please read labels and follow directions precisely for both environmental and personal safety. These are relatively benign herbicides, but improperly used they can still cause both short- and long-term health and environmental problems. Special aquatic formulations are required when working in wetland zones. You are required to have a state-issued pesticide applicator license when applying these chemicals on land you do not own. To learn more about the pesticide regulations in your state, visit or call your state's pesticide control division, usually part of the state's Department of Agriculture. In wetland areas, additional permits are usually required by the Wetlands Protection Act. [See sidebar on page 23.]

Foliar applications

When problems are on a small scale, this type of treatment is usually applied with a backpack sprayer or even a small handheld spray bottle. It is an excellent way to treat large monocultures of herbaceous plants, or to spot-treat individual plants that are difficult to remove mechanically, such as goutweed, swallowwort, or purple loosestrife. It is also an effective treatment for some woody species, such as Japanese barberry, multiflora rose, Japanese honeysuckle, and Oriental bittersweet that grow in dense masses or large numbers over many acres. The herbicide mixture should contain no more than five percent of the active ingredient, but it is important to follow the instructions on the product label. This treatment is most effective when the plants are actively growing, ideally when they are flowering or beginning to form fruit. It has been shown that plants are often more susceptible to this type of treatment if the existing stems are cut off and the regrowth is treated. This is especially true for Japanese knotweed. The target plants should be thoroughly wetted with the herbicide on a day when there is no rain in the forecast for the next 24 to 48 hours.

Cut stem treatments

There are several different types of cut stem treatments, but here we will review only the one most commonly used. All treatments of this type require a higher concentration of the active ingredient than is used in foliar applications. A 25 to 35 percent solution of the active ingredient should be used for cut stem treatments, but read and follow all label instructions. In most cases, the appropriate herbicide is glyphosate, except for Oriental bittersweet, on which triclopyr should be used. This treatment can be used on all woody stems, as well as phragmites and Japanese knotweed.

For woody stems, treatments are most effective when applied in the late summer and autumn—between late August and November. Stems should be cut close to the ground, but not so close that you will lose track of them. Apply herbicide directly to the cut surface as soon as possible after cutting. Delaying the application will reduce the effectiveness of the treatment. The herbicide can be applied with a sponge, paintbrush, or spray bottle.

Cut stem treatment tools.

For phragmites and Japanese knotweed, treatment is the same, but the timing and equipment are different. Plants should be treated anytime from mid-July through September, but the hottest, most humid days of the summer are best for this method. Cut the stems halfway between two leaf nodes at a comfortable height. Inject (or squirt) herbicide into the exposed hollow stem. All stems in an infestation should be treated. A wash bottle is the most effective application tool, but you can also use an eyedropper, spray bottle, or one of the recently developed high-tech injection systems.

It is helpful to mix a dye in with the herbicide solution. The dye will stain the treated surface and mark the areas that have been treated, preventing unnecessary reapplication. You can buy a specially formulated herbicide dye, or use food coloring or laundry dye.

There is not enough space in this article to describe all the possible ways to control invasive plants. You can find other treatments, along with more details on the above-described methods, and species-specific recommendations on The Nature Conservancy Web site (tncweeds.ucdavis.edu). An upcoming posting on the Invasive Plant Atlas of New England (www.ipane.org) and the New England Wild Flower Society (www.newfs.org) Web sites will also provide further details.

Hollow stem injection tools.

Biological controls—still on the horizon

Biological controls are moving into the forefront of control methodology, but currently the only widely available and applied biocontrol relates to purple loosestrife. More information on purple loosestrife and other biological control projects can be found at www.invasiveplants.net.

DISPOSAL OF INVASIVE PLANTS

Proper disposal of removed invasive plant material is critical to the control process. Leftover plant material can cause new infestations or reinfest the existing project area. There are many appropriate ways to dispose of invasive plant debris. I've listed them here in order of preference.

1. **Burn it**—Make a brush pile and burn the material following local safety regulations and restrictions, or haul it to your town's landfill and place it in their burn pile.

2. **Pile it**—Make a pile of the woody debris. This technique will provide shelter for wildlife as well.

3. **Compost it**—Place all your herbaceous invasive plant debris in a pile and process as compost. Watch the pile closely for resprouts and remove as necessary. Do not use the resulting compost in your garden. The pile is for invasive plants only.

Injecting herbicide into the hollow stem of phragmites.

4. **Dry it/cook it**—Place woody debris out on your driveway or any asphalt surface and let it dry out for a month. Place herbaceous material in a doubled-up black trash bag and let it cook in the sun for one month. At the end of the month, the material should be non-viable and you can dump it or dispose of it with the trash. The method assumes there is no viable seed mixed in with the removed material.

Care should be taken in the disposal of all invasive plants, but several species need extra attention. These are the ones that have the ability to sprout vigorously from plant fragments and should ideally be burned or dried prior to disposal: Oriental bittersweet, multiflora rose, Japanese honeysuckle, phragmites, and Japanese knotweed.

Christopher Mattrick is the former Senior Conservation Programs Manager for New England Wild Flower Society, where he managed conservation volunteer and invasive and rare plant management programs. Today, Chris and his family work and play in the White Mountains of New Hampshire, where he is the Forest Botanist and Invasive Species Coordinator for the White Mountain National Forest.

Controlling Invasive Plants in Wetlands

Special concerns; special precautions

Control of invasive plants in or around wetlands or bodies of water requires a unique set of considerations. Removal projects in wetland zones can be legal and effective if handled appropriately. In many cases, herbicides may be the least disruptive tools with which to remove invasive plants. You will need a state-issued pesticide license to apply herbicide on someone else's property, but all projects in wetland or aquatic systems fall under the jurisdiction of the Wetlands Protection Act and therefore require a permit. ***Yes, even hand-pulling that colony of glossy buckthorn plants from your own swampland requires a permit.*** Getting a permit for legal removal is fairly painless if you plan your project carefully.

1. Investigate and understand the required permits and learn how to obtain them. The entity charged with the enforcement of the Wetlands Protection Act varies from state to state. For more information in your state, contact:

   ME: Department of Environmental Protection
   www.state.me.us/dep/blwq/docstand/nrpapage.htm

   NH: Department of Environmental Services
   www.des.state.nh.us/wetlands/

   VT: Department of Environmental Conservation
   www.anr.state.vt.us/dec/waterq/permits/htm/pm_cud.htm

   MA: Consult your local town conservation commission

   RI: Department of Environmental Management
   www.dem.ri.gov/programs/benviron/water/permits/fresh/index.htm

   CT: Consult your local town Inland Wetland and Conservation Commission

2. Consult an individual or organization with experience in this area. Firsthand experience in conducting projects in wetland zones and navigating the permitting process is priceless. Most states have wetland scientist societies whose members are experienced in working in wetlands and navigating the regulations affecting them. A simple Web search will reveal the contact point for these societies. Additionally, most environmental consulting firms and some nonprofit organizations have skills in this area.

3. Develop a well-written and thorough project plan. You are more likely to be successful in obtaining a permit for your project if you submit a project plan along with your permit application. The plan should include the reasons for the project, your objectives in completing the project, how you plan to reach those objectives, and how you will monitor the outcome.

4. Ensure that the herbicides you plan to use are approved for aquatic use. Experts consider most herbicides harmful to water quality or aquatic organisms, but rate some formulations as safe for aquatic use. Do the research and select an approved herbicide, and then closely follow the instructions on the label.

5. If you are unsure—research, study, and most of all, ask for help. Follow the rules. The damage caused to aquatic systems by the use of an inappropriate herbicide or the misapplication of an appropriate herbicide not only damages the environment, but also may reduce public support for safe, well-planned projects.

Section 3
Annual Updates and Log Requirements

The Owner and/or Contact/Responsible Party shall review this Operation and Maintenance Plan once per year for its effectiveness and adjust the plan and deed as necessary.

A log of all preventative and corrective measures for the stormwater system shall be kept on-site and be made available upon request by any public entity with administrative, health environmental or safety authority over the site including NHDES.

Copies of the Stormwater Maintenance report shall be submitted to the City of Portsmouth on an annual basis.

Stormwater Management Report						
Proposed Multi-Family Development		**815 Lafayette Road – Tax Map 245 Lot 3**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Deep Sump CB's			❑Yes ❑No			
Underground Detention Basin			❑Yes ❑No			
Jellyfish Filter 1			❑Yes ❑No			

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100% Recyclable

BUILDING 1 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
16.11'	66.11'	62.00'	50.00'	45.89'

BUILDING 2 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
19.09'	69.09'	63.00'	50.00'	43.91'

BUILDING 3 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
17.80'	67.80'	62.00'	50.00'	44.20'

PROPOSED MULTI-FAMILY DEVELOPMENT
815 LAFAYETTE RD
PORTSMOUTH, NEW HAMPSHIRE

GRADE PLANE EXHIBIT

CONCORD, NH 03301
3549/1269

#755
1 STORY BLOCK BUILDING

#815
2 STORY BUILDING
PEAK=44.63

MAP 245
LOT 3

6' CHAIN LINK FENCE

BOLLARD (TYP.)

GRAVEL DRIVE

GATE

PROPOSED BUILDING 1 FOOTPRINT

PROPOSED BUILDING 2 FOOTPRINT

PROPOSED BUILDING 3 FOOTPRINT

FLAGPOLE

PUMP STATION CANOPY

MOBIL STATION

MANHOLE

DUMPSTER PAD

6' WOOD FENCE (TYP.)

GAS STATION SIGN

CONCRETE PAD FOR ROAD SIGN

SIDEWALK

BILLBOARD

LAFAYETTE ROAD–U.S. ROUTE 1

HOTL

WETLAND CLASSIFICATION (PSS1E/PEM1E)

SALT MARSH (E2EM1N)

SAGAMORE CREEK

CITY OF P
1 JUNK
PORTSMOU
22

N

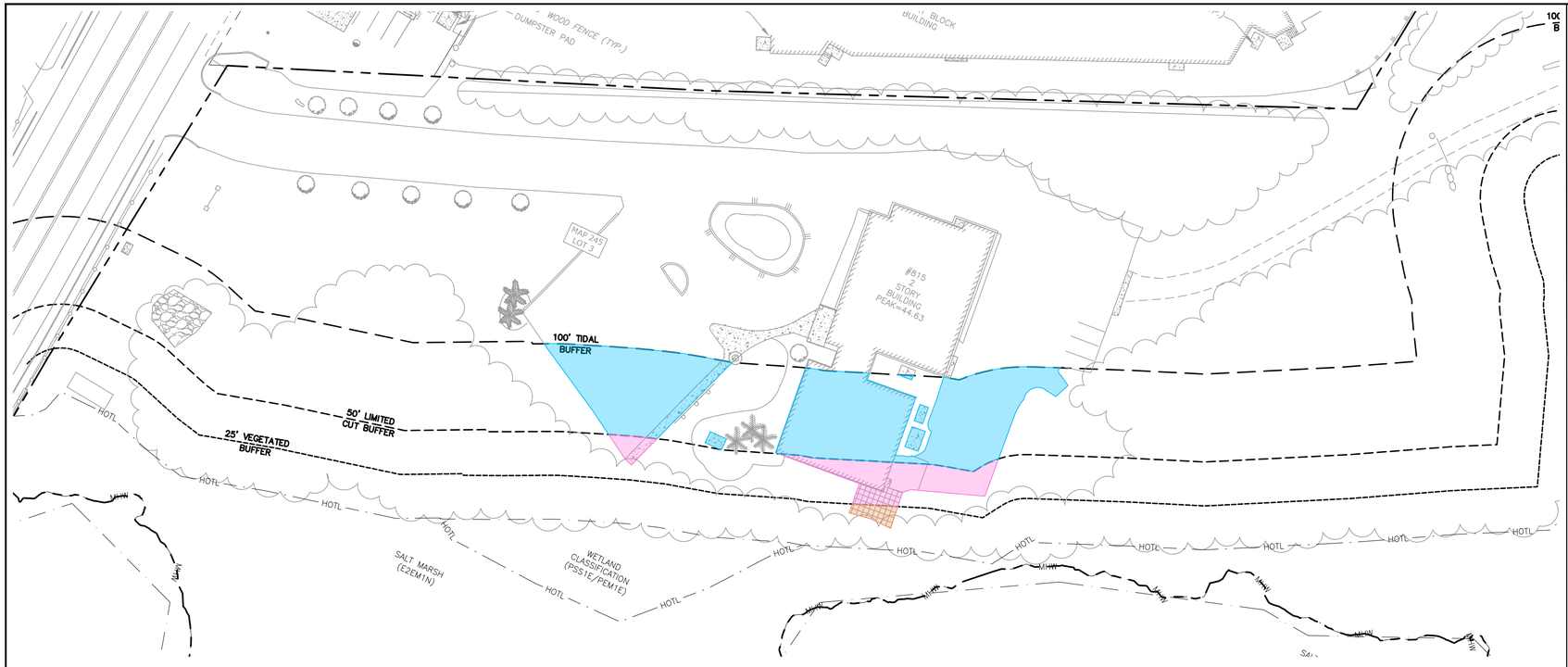
0 80' 160'
GRAPHIC SCALE

Tighe&Bond

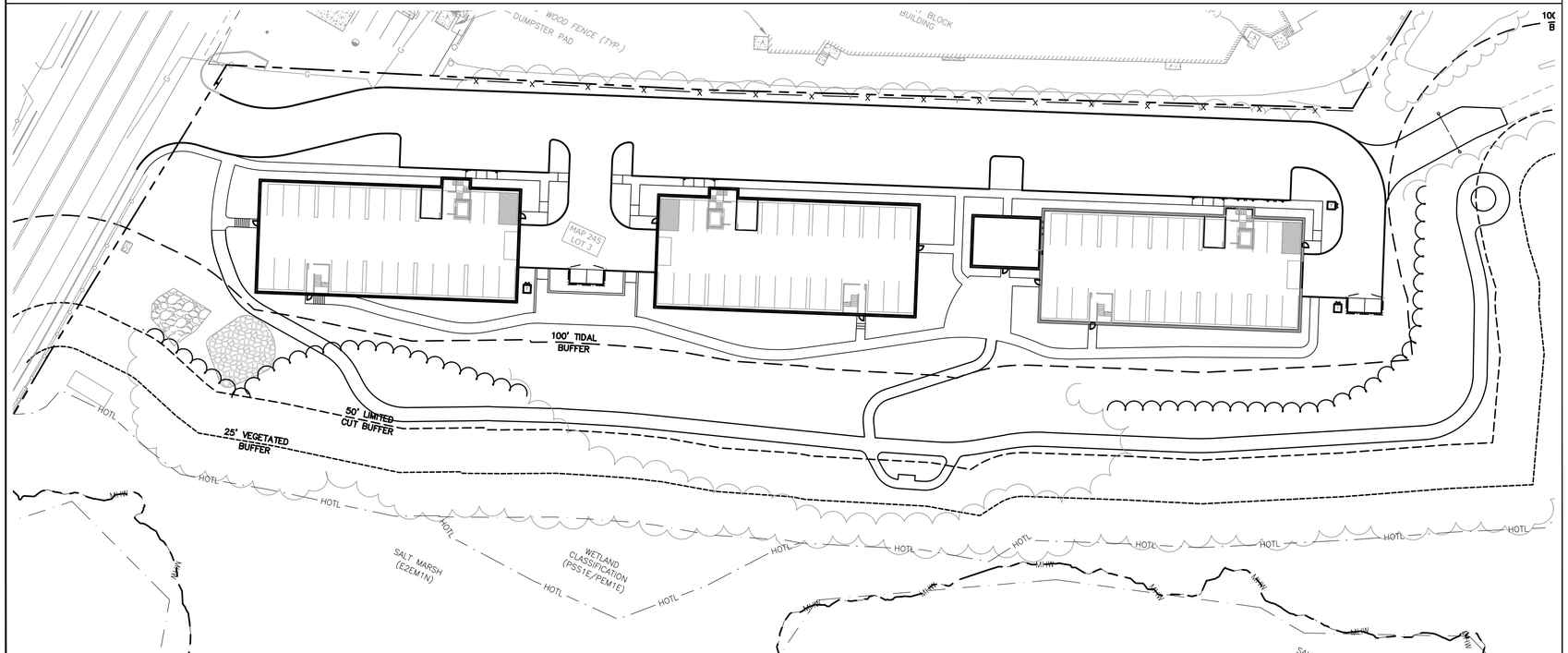
October 23, 2023
M5131-001-FIGS.dwg

PROPOSED MULTI-FAMILY DEVELOPMENT
815 LAFAYETTE RD
PORTSMOUTH, NEW HAMPSHIRE

WETLAND BUFFER IMPERVIOUS SURFACE EXHIBIT



EXISTING WETLAND BUFFER IMPERVIOUS SURFACE
SCALE 1" = 40'



PROPOSED WETLAND BUFFER IMPERVIOUS SURFACE
SCALE 1" = 40'

Impervious Surface Within Buffer Area		
Local Wetland Buffer Setback	Impervious Surface	
	Existing Condition	Proposed Development
0 - 25 FT	218 SF	0 SF
25 - 50 FT	1,937 SF	0 SF
50 - 100 FT	9,583 SF	0 SF
Total Impervious Surface	**11,738 SF**	**0 SF**
Net Impervious Sruface	**-11,738 SF**	

N

0 80' 160'
GRAPHIC SCALE

Tighe&Bond

October 23, 2023
M5131-001-FIGS.dwg

Last Save Date: October 22, 2023 2:50 PM By: CKRZCUJK
Plot Date: Monday, October 23, 2023 Plotted By: Colter Krzcuik
DGS File Location: J:\MM\5131 M&B Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-FIGS.dwg Layout Tab: WETL-IMPRV

AMBIT ENGINEERING,INC. CIVIL ENGINEERS AND LAND SURVEYORS
200 Griffin Road, Unit 3, Portsmouth, NH 03801 Phone (603) 430-9282 Fax 436-2315

TECHNICAL REPORT OF WETLAND DELINEATION, CLASSIFICATION & IDENTIFICATION

Ambit Engineering Project No.:3458 **Date(s) of Delineation**:11/18/22 **Date of Report**: 11/22/22

Field Delineator: Steven D. Riker **Compiled by:** Steven D. Riker

Project Location/Tax Map & Lot: 815 Lafayette Road, Portsmouth, NH. Tax Map 245, Lot 3

Prepared for: MB2 Development, Mike Brown, PO Box 372, Portsmouth, NH 03802

Site Area Observed: Entire lot to establish tidal & freshwater wetlands and buffers.

Site Conditions: Lot with uplands adjacent to freshwater and tidal wetlands.

Weather/Seasonal Conditions: 40 sunny, early winter conditions, no snow cover.

Site Disturbance: Historical upland disturbance from existing development.

Wetlands Present: Yes. Property adjacent to freshwater and tidal wetlands.

Wetland conditions/atypical situation/problem area: Wetlands are not considered atypical or a problem area.

Hydric Soil Criterion: A4 & A11. Field Indicators of Hydric Soils in the United States, Version 8.2, USDA-NRCS, 2018.

Delineation Standards Utilized:

1. *US Army Corps of Engineers Wetlands Delineation Manual,* Technical Report Y-87-1 (Jan 1987). **AND** Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0, January 2012.
2. Field Indicators of Hydric Soils in the United States, Version 8.2, USDA-NRCS, 2018 **AND (for disturbed sites)** *Field Indicators for Identifying Hydric Soils in New England,* Version 4. NEIWPCC Wetlands Work Group (April 2019).
3. *National List of Plant Species That Occur in Wetlands: Northeast (Region 1).* USFWS (May 1988).

Notes: The tidal wetland associated with the site (Highest Observable Tide Line) would be classified as an estuarine intertidal emergent persistent wetland system that is regularly flooded by the tides (E2EM1N). The freshwater wetlands associated with the site delineate a poorly drained combination palustrine scrub shrub broad-leaved deciduous / palustrine emergent persistent wetland system that is seasonally flooded and or saturated (PSS1E/PEM1E). Please note that the wetlands were survey located immediately following the delineation.

Invasive Species Removal Plan

ADDRESS: 815 Lafayette Road, Portsmouth, NH

PROPERTY: Map 245 Lot 3

OWNER: Prospect North 815, LLC

DATE: October 23, 2023

On October 17, 2023, Tighe & Bond environmental scientists assessed the Project Site at 815 Lafayette Road, Portsmouth NH, for the presence, identification, and relative extent of invasive plant species. An inventory of existing vegetation and dominant plant communities was documented from the western extent of the property, just downstream of the Route 1 Bypass (Lafayette Road) bridge, to the eastern most portion of the property, between the cleared area in the southwest portion of the lot and the broad salt marsh along the northern bank of Sagamore Creek.

The vegetative community in the area assessed is dominated by invasive plant species, including:

- Autumn olive (*Elaeagnus umbellata*)
- Oriental bittersweet (*Celastrus orbicalatus*)
- Common buckthorn (*Rhamnus cathartica*)
- Glossy buckthorn (*Rhamnus frangula*)
- Honeysuckle (*Lonicera spp*.)
- Multiflora rose (*Rosa multiflora*)
- Black swallowwort (*Cyanchum louiseae*)
- Common reed (*Phragmites australis*)

Honeysuckle (spp), especially along the western shoreline, forms a dense vegetative layer that is outcompeting native species. There is a gradual transition towards a more forested community that is less heavily infested with invasive species, starting at the western side of the existing building (rear parking lot) and moving easterly. A more mature, native, tree canopy exists in this area relative to the western portion of the property, though the understory is still dominated by invasive species. Oriental bittersweet was observed to be "strangling" several mature trees and, in some cases, had caused the tree(s) to completely topple over.

Effort will be made to protect and retain native, healthy, individual trees and shrubs along the shoreline during planning and design for redevelopment of the site. Select individuals will be field located as planning and design progresses.

The overall area was divided into seven sub-areas based on typical vegetation class (strata) and relative dominance of invasive species. Each area is further described in Section 1 of this memo and depicted in the exhibit titled Invasive Species Inventory Plan which can be found in Appendix A.

1 Existing Invasive Species Inventory Areas

1.1 Area 1

"Area 1" is located at the western extent of the property, along the northern shoreline of Sagamore Creek, just downstream of the Route 1 Bypass (Lafayette Road) bridge. There is an existing stormwater outfall which drains through an approximately 120-foot long swale and discharges into the fringing salt marsh along Sagamore Creek. The swale bottom is approximately six (6)-feet wide, sparsely vegetated, and contains a substantial amount of trash and debris. The swale is bounded by steep, vegetated, banks on either side. Vegetation in this area contains interspersed native species, such as Goldenrod (*Solidago s*pp), Beach plum (*Prunus maritima*), Black Cherry (*Prunus serotina*), Pin Cherry (*Prunus pensylvanica*), Staghorn sumac (*Rhus hirta*), and American pokeweed (*Phytolacca americana*). However, the dominant aerial coverage is comprised of invasive species, including Autumn olive (*Elaeagnus umbellata*), Oriental bittersweet (*Celastrus orbicalatus*), Common buckthorn (*Rhamnus cathartica*), Glossy buckthorn (*Rhamnus frangula*), Honeysuckle (*Lonicera spp.*), Multiflora rose (*Rosa multiflora*) and Coralberry (*Ardisia crenata*).

1.2 Area 2

"Area 2" is the forested area located towards the western extent of the property, east of the stormwater swale, and landward of the upland shrub zone along the shoreline (salt marsh; Area 3). This area contains a primarily forested vegetative community consisting of native trees (Black locust, Pin cherry, White pine (*Pinus strobus*), Northern red oak (*Quercus Rubra*), and Grey birch (*Betula populifolia*)); though it is also overrun with Oriental bittersweet and interspersed with Common and Glossy buckthorn, Honeysuckle (spp), Multiflora rose, and Autumn olive.

1.3 Area 3

"Area 3" is the narrow upland zone fringing along the shoreline, located towards the western extent of the property, between the forested area (Area 2) and the salt marsh. This area primarily consists of Black cherry and Callery pear (*Pyrus calleryana*) shrubs dominated by invasive species (Honeysuckle (spp) and Oriental bittersweet, interspersed with Buckthorn (spp), Autumn olive, and Multiflora rose). Goldenrod and American burnweed (*Erechtites hieraciifolius*) exist in the herbaceous stratum though are not dominant relative to the invasive species present.

Two dominant areas of Common reed (*Phragmites australis*) exist on the landward margin of the salt marsh, along the western shoreline of the property.

1.4 Area 4

"Area 4" is located off the southeast corner of the front parking lot and consists of a dominant stand of Staghorn sumac along the steep drop off to the salt marsh. The Staghorn sumac is interspersed with some Oriental bittersweet and multiflora rose on the narrow shelf before dropping off (seaward) into a dominant stand of Common reed.

1.5 Area 5

"Area 5" is located off the southeast corner of the building, between the southern edge of the rear parking lot and the fringing salt marsh along the outer radius of Sagamore Creek. Area 5 begins a transition zone towards a more forested community, less heavily infested with invasive species. Vegetation in this area consists of Cottonwood (*Populous deltoides*; diseased, dying), Black locust, Grey birch and Northern red oak in the tree stratum; and, Beach plum, Bayberry (*Morella caroliniensis*), and Black cherry in the shrub stratum. These species are mixed with invasives (Callery pear, Honeysuckle (spp), Multiflora rose, Autumn olive, Buckthorn (spp), and Oriental bittersweet).

There is a large white pine near the center of this area that likely provides important habitat value and stability along the bank. Effort should be made to protect and retain it during redevelopment of the site.

1.6 Area 6

"Area 6" encompasses the eastern most portion of the property along the shoreline between the cleared area in the southwest portion of the lot and the broad salt marsh along the northern bank of Sagamore Creek. There is a sharp "corner" along the shoreline bound by a steep slope, clearly defining the edge of the marsh.

This area primarily consists of an upland forested community with a freshwater emergent and scrub-shrub wetland delineated in the northeast corner. A more mature, native, tree canopy exists here (*Populus* spp, Black cherry, Black locust, White pine, Grey birch, White birch, White oak (*Quercus bicolor*), Beach plum, Pin cherry, Red maple (*Acer rubrum*) and Sugar maple (*Acer saccharum*)), relative to the western portion of the property. The understory is still dominated by invasive species; primarily Oriental bittersweet, Buckthorn (spp) and Honeysuckle (spp), interspersed with Multiflora rose and Autumn olive. In several instances, Oriental bittersweet was observed to be "strangling" mature trees and, in some cases, had caused the tree(s) to completely topple over.

1.7 Area 7

"Area 7" is a small patch of Black swallowwort (*Cyanchum louiseae*) on the ground, located just inside the tree line off the western edge of the cleared area in the back of the lot.

2 Invasive Species Removal

As described above, we have identified the dominant invasive plant community within and adjacent to the Project Site. Widespread presence of invasive species has been documented throughout the understory and canopy of the site. These species are targeted for removal to enhance the Sagamore Creek shoreline habitat value. Mechanical removal (pulling and digging) is the proposed strategy.

A detailed inventory of all trees, shrubs and ground cover will be undertaken to demonstrate compliance with the minimum vegetation maintenance standards of the Shoreland Water Quality Protection Act and to field locate native, healthy, individual trees and shrubs along the shoreline that will be protected and retained through redevelopment of the site. The entire restoration area will be cleared of the invasive trees and shrubs, replanted with native species, and monitored and maintained long term to minimize the potential for re-invasion.

2.1 Mechanical Removal: Pulling and Digging

The goal of the mechanical removal method (versus chemical or biological methods) is to physically remove the entire plant, including above-ground material as well as the roots and rhizomes. It is most effective for species that have a tap root or shallow, lateral, root systems that may be easily pulled from the ground, such as Honeysuckle, Buckthorn and Multiflora rose. In this way, the entire plant is removed, and the potential for regrowth within the treatment area is substantially reduced. For many invasive species, such as Glossy Buckthorn, cutting or mowing the above-ground material will only stimulate regrowth and cause an increased density to return in subsequent growing seasons.

100% removal success is rarely achievable in the initial effort. Professional judgment is necessary to determine where and when to prioritize removal effort based on species-specific factors such as rooting structure and reproductive period. This work is typically conducted in the fall and winter, before the ground freezes, or in early spring. Summer work can also be effective, especially when the season is dry and reduced impact to soils is achievable. During the spring and summer months, monitoring and additional hand pulling of newly sprouted material is necessary to maximize removal success and reduce the potential for regrowth the following season.

2.1.1 Initial Removal with Mechanized Equipment or Weed Wrench

Trees and shrubs designated to be removed will be clearly marked in the field prior to commencing work. An arborist will assess the Project Site and identify invasive, dead, and hazardous trees. The trees will be clearly marked by a qualified professional scientist prior to commencing work. Vegetation designated for removal will be cut with machinery or by hand, as necessary, and stockpiled for proper disposal.

A mini excavator will be used to remove the root masses of targeted shrub species. Where access for heavy machinery is necessary for removal of root material, timber mats (or equivalent) will be placed to minimize soil disturbance by dispersing the weight of the equipment over a larger surface area. The stumps of cut trees will be ground to prevent coppicing and re-growth.

2.1.2 Removal of Root Masses and Trailing Roots or Rhizomes

Special attention will be pain when pulling the root masses of invasive shrub species. The use of a mini excavator, as described above, may facilitate the removal of larger root masses. Carefully lifting and shaking the root ball as it is extracted from the soil facilitates the removal of the trailing roots and rhizomes. The soil is then released from the root ball by gentle shaking of the bucket by the machine operator. For smaller individuals and in areas that are inaccessible by machine, work will be completed by hand, with a weed wrench. If root masses are too large for extraction in locations inaccessible by machinery, weed wrenches, chains , straps and "come-alongs" will be lead out to the mini excavator to manually pull the root ball out of the soil.

2.1.3 Hand Clearing and Grubbing of Plant Fragments

Hand clearing and removal of leftover plant material is critical for the success of any invasive species management effort. For some species, such as Oriental Bittersweet, the emergence of new shoots (or "suckers") from remaining root fragments can occur from the crown or along the root itself, if left in place. Qualified field staff will go along with the excavator operator to clear leftover invasive plant material, root fragments and rhizomes by hand.

2.2 Proper Disposal and Final Disposition of Removed Invasive Plant Material

Stockpiled invasive plant material will either be burned during the local brush-burning season or chipped and removed to be composted off site. If work occurs during the burning season there are several advantages to burning the material on site. Firstly, burning on site reduces the cost of transport and off-site disposal. Secondly, the burning of woody material returns valuable nutrients to the soil structure. Wood ash is a beneficial amendment for fields and planting areas as it contains phosphorous and other nutrients, which in many systems are depleted by plant growth and microbial activity. The UNH Cooperative Extension also recommends burning as a preferred method of disposal of woody invasive plants. They advise against burning plants that contain easily airborne seeds, such as Black swallow-wort. Harvested material would be burnt in small, manageable, brush piles to facilitate these benefits to the local ecosystem.

If the work is conducted outside of the local brush-burning season, the harvested material will be chipped on-site and transported to an appropriate off-site composting facility. Entire root balls can be transported to an off-site facility for grinding, chipping and composting. Above-ground plant material may be chipped separately for wood chips to be reused on-site. To the extent possible, this work would be completed on-site to reduce the volume of material that would need to be transported. For woody species that do not propagate vegetatively, chipping the plant material before it develops seeds or flowers renders the plant non-viable, especially once the material has completely dried.

3 Conclusion

In conclusion, the Project Site is substantially dominated by invasive plant species. This invasive community is outcompeting native species, compromising biodiversity and the habitat value along the shoreline of Sagamore Creek. Relative density of invasive species decreases where the vegetation transitions towards a more mature, native, forested community that is less heavily infested towards the eastern extent of the property. However, the understory is still largely dominated by invasive shrubs and woody vines.

In lieu of chemical or biological control methods, these species are targeted for mechanical removal (pulling and digging) to enhance the Sagamore Creek shoreline habitat value. A detailed inventory of all trees, shrubs and ground cover will be undertaken in an effort to protect and retain native, healthy, individual trees and shrubs along the shoreline to the extent possible.

The entire restoration area will be cleared of the invasive trees and shrubs, replanted with native species, and monitored and maintained long term to minimize the potential for re-invasion. Work will be monitored by a qualified scientist on-site to implement best professional judgement in cooperation with equipment operators and to ensure leftover plant fragments are entirely removed. The qualified scientist will return in subsequent growing seasons to assess and adaptively manage the buffer enhancement area to monitor success of native plantings and to minimize recolonization of targeted invasive species.

PROPOSED MULTI-FAMILY DEVELOPMENT
815 LAFAYETTE RD
PORTSMOUTH, NEW HAMPSHIRE

INVASIVE SPECIES INVENTORY PLAN

AREA 1
AUTUMN OLIVE (*ELAEAGNUS UMBELLATA*)
ORIENTAL BITTERSWEET (*CELASTRUS ORBICALATUS*)
COMMON BUCKTHORN (*RHAMNUS CATHARTICA*)
GLOSSY BUCKTHORN (*RHAMNUS FRANGULA*)
HONEYSUCKLE (*LONICERA SPP.*)
MULTIFLORA ROSE (*ROSA MULTIFLORA*)
CORALBERRY (*ARDISIA CRENATA*)

AREA 2
AUTUMN OLIVE (*ELAEAGNUS UMBELLATA*)
ORIENTAL BITTERSWEET (*CELASTRUS ORBICALATUS*)
COMMON BUCKTHORN (*RHAMNUS CATHARTICA*)
GLOSSY BUCKTHORN (*RHAMNUS FRANGULA*)
HONEYSUCKLE (*LONICERA SPP.*)
MULTIFLORA ROSE (*ROSA MULTIFLORA*)

AREA 7
BLACK SWALLOWWORT (*CYANCHUM LOUISEAE*)

AREA 3
AUTUMN OLIVE (*ELAEAGNUS UMBELLATA*)
ORIENTAL BITTERSWEET (*CELASTRUS ORBICALATUS*)
COMMON BUCKTHORN (*RHAMNUS CATHARTICA*)
GLOSSY BUCKTHORN (*RHAMNUS FRANGULA*)
HONEYSUCKLE (*LONICERA SPP.*)
MULTIFLORA ROSE (*ROSA MULTIFLORA*)

AREA 4
STAGHORN SUMAC (RHUS TYPHINA)
ORIENTAL BITTERSWEET (*CELASTRUS ORBICALATUS*)
MULTIFLORA ROSE (*ROSA MULTIFLORA*)
COMMON REED (PHRAGMITES AUSTRALIS)

AREA 5
AUTUMN OLIVE (*ELAEAGNUS UMBELLATA*)
ORIENTAL BITTERSWEET (*CELASTRUS ORBICALATUS*)
COMMON BUCKTHORN (*RHAMNUS CATHARTICA*)
GLOSSY BUCKTHORN (*RHAMNUS FRANGULA*)
HONEYSUCKLE (*LONICERA SPP.*)
MULTIFLORA ROSE (*ROSA MULTIFLORA*)
CALLERY PEAR (*PYRUS CALLERYANA*)

AREA 6
AUTUMN OLIVE (*ELAEAGNUS UMBELLATA*)
ORIENTAL BITTERSWEET (*CELASTRUS ORBICALATUS*)
COMMON BUCKTHORN (*RHAMNUS CATHARTICA*)
GLOSSY BUCKTHORN (*RHAMNUS FRANGULA*)
HONEYSUCKLE (*LONICERA SPP.*)
MULTIFLORA ROSE (*ROSA MULTIFLORA*)

0 60' 120'
GRAPHIC SCALE

Tighe&Bond

October 23, 2023
M5131-001-FIGS.dwg

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Plot Date: Thursday, October 19, 2023 Plotted By: Colter Krcuik
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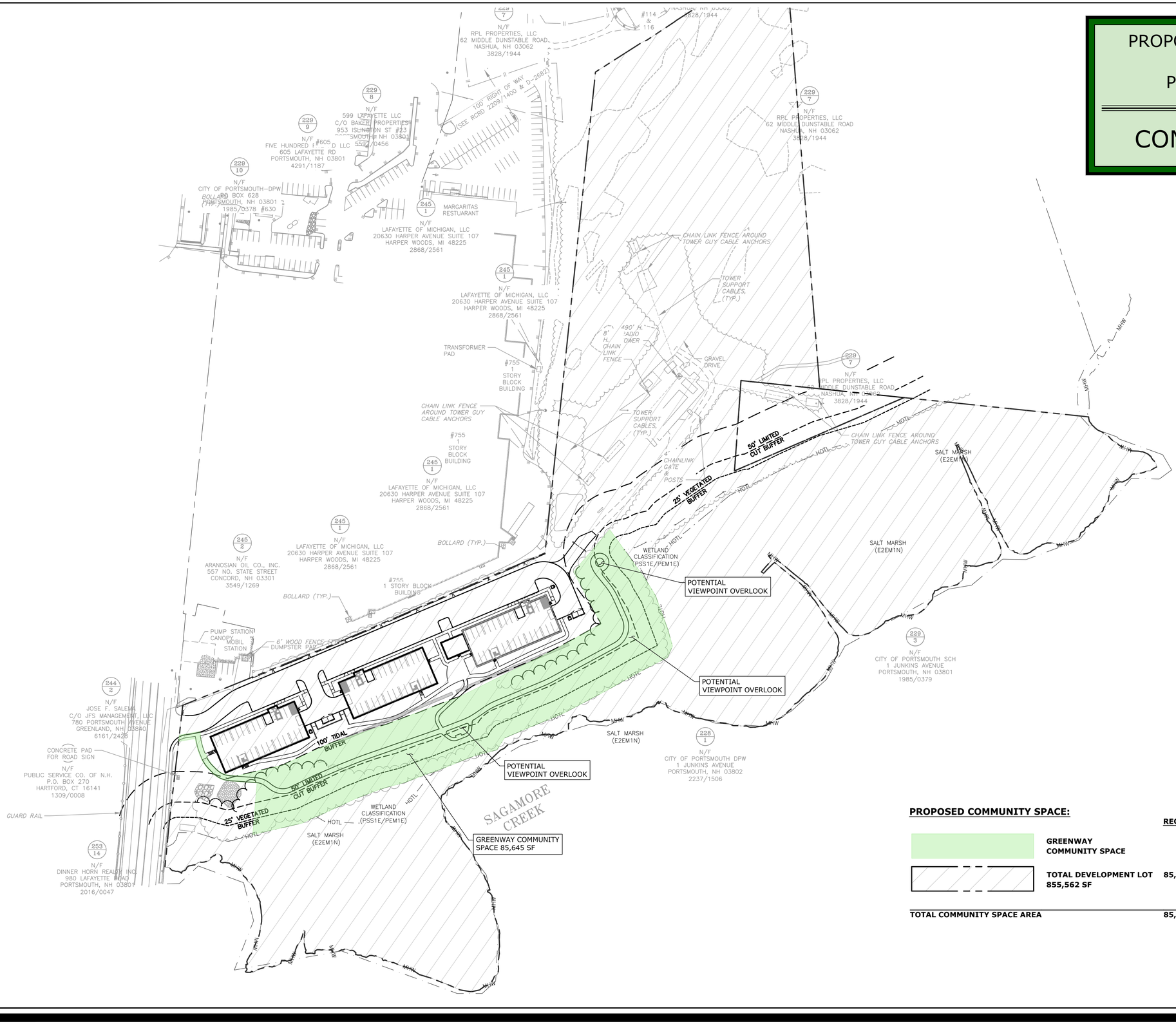
PROPOSED MULTI-FAMILY DEVELOPMENT
815 LAFAYETTE RD
PORTSMOUTH, NEW HAMPSHIRE

COMMUNITY SPACE EXHIBIT



PROPOSED COMMUNITY SPACE:

		REQUIRED	PROVIDED
	GREENWAY COMMUNITY SPACE		85,645 SF
	TOTAL DEVELOPMENT LOT 855,562 SF	85,556 SF (10%)	
TOTAL COMMUNITY SPACE AREA		85,556 SF	85,645 SF (10.0%)

N

0 80' 160'

GRAPHIC SCALE

Tighe&Bond

October 23, 2023
M5131-001-FIGS.dwg

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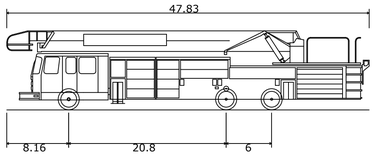
PROPOSED MULTI-FAMILY DEVELOPMENT
815 LAFAYETTE RD
PORTSMOUTH, NEW HAMPSHIRE

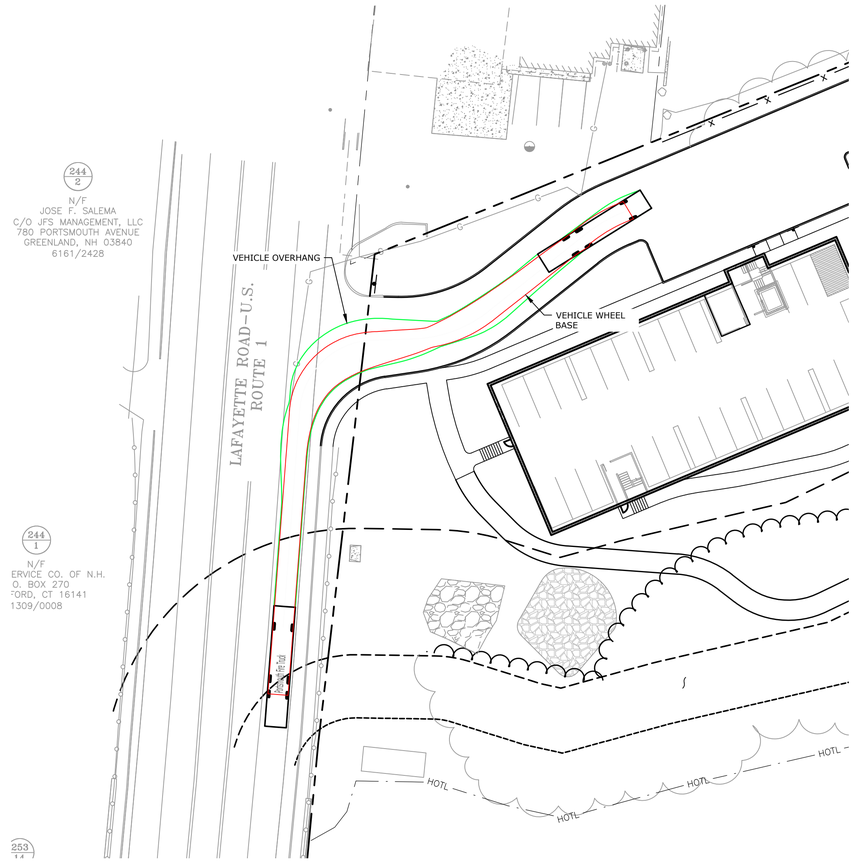
FIRE TRUCK TURNING EXHIBIT



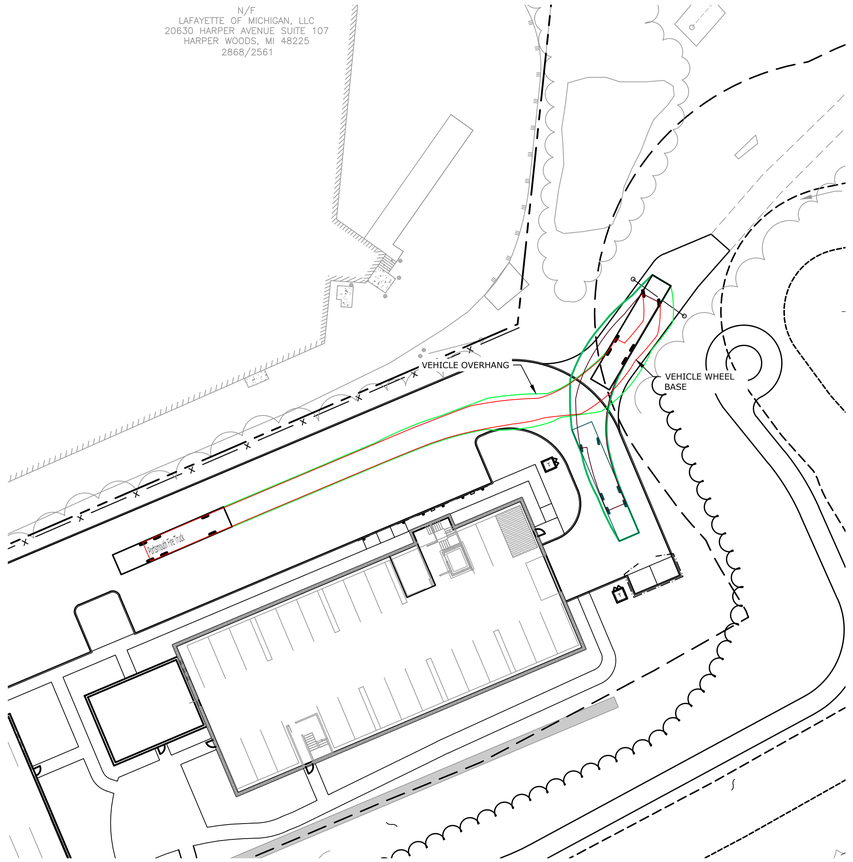
Portsmouth Fire Truck	
Overall Length	47.830ft
Overall Width	8.500ft
Overall Body Height	10.432ft
Min Body Ground Clearance	0.862ft
Track Width	8.000ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	38.00°

LEGEND

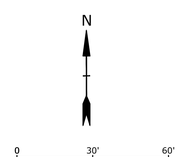
- FORWARD VEHICLE WHEEL BASE
- FORWARD VEHICLE OVERHANG
- REVERSE VEHICLE WHEEL BASE
- REVERSE VEHICLE OVERHANG



LAFAYETTE ROAD ENTRANCE



TURN AROUND WITHIN SITE



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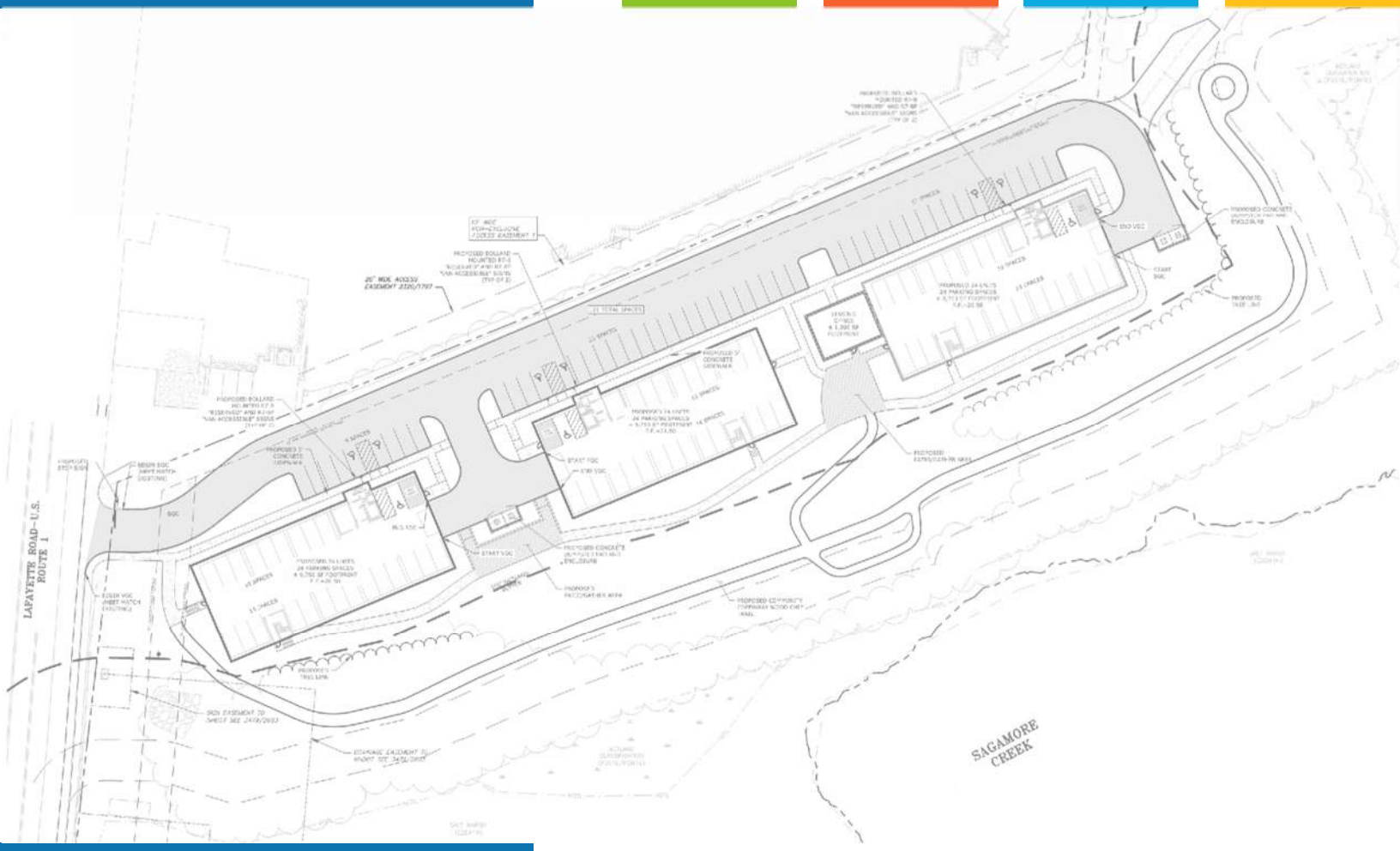

815 Lafayette Road (U.S. Route 1) Development
Portsmouth, New Hampshire

TRAFFIC IMPACT STUDY

Prospect North 815, LLC

October 23, 2023

Tighe&Bond

100% Recyclable

M5131-001
October 23, 2023

Mr. Roger Appleton, P.E.
Assistant District 6 Engineer
New Hampshire Department of Transportation
271 Main Street, P.O. Box 740
Durham, New Hampshire 03824

Re: **Certification Letter**
815 Lafayette Road Development
Portsmouth, New Hampshire

Dear Roger:

This letter certifies that the 815 Lafayette Road residential development located in Portsmouth, New Hampshire, dated October 23, 2023, was prepared under the oversight of a licensed Professional Engineer in the state of New Hampshire. I am a licensed Professional Engineer in the State of New Hampshire (NH PE No. 17429). I also hold Professional Traffic Operations Engineer (PTOE) (Certificate No. 2845) and Road Safety Professional 1 (RSP1) (Certificate No. 116) certifications from the Transportation Professional Certification Board (TPCB).

Sincerely,

TIGHE & BOND, INC.

Greg Lucas, PE, PTOE, RSP1
Senior Project Manager

10/20/2023

Copy: Peter Britz, Director of Planning & Sustainability, City of Portsmouth

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Table of Contents

Technical Appendices (Available Upon Request Under Separate Cover)

Section 1
Study Overview

This Traffic Impact Study (TIS) evaluates the potential traffic impact of the proposed residential development located at 815 Lafayette Road, in the City of Portsmouth, New Hampshire. The proposed development includes the demolition of the former WHEB radio station office building and construction of three residential buildings. The site is bounded by Lafayette Plaza to the north, Sagamore Creek to the east and south, and Lafayette Road to the west. Figure 1 shows the Site location relative to the surrounding roadway network.

The project site currently contains the former WHEB radio station building. The project proposes to demolish the existing building and construct 72 residential units located in three separate three-story buildings. The Site will provide 121 total parking spaces including nine accessible spaces. A total of 72 covered spaces will be provided via structured parking on the ground level below each of the buildings, while 49 uncovered spaces will be provided within the adjacent surface lot north of the buildings. Site access will continue to be provided via the existing driveway along Lafayette Road (US Route 1). The project is expected to be completed in 2025.

Based on the analyses conducted, it is the professional opinion of Tighe & Bond that the additional traffic expected to be generated by the proposed residential development is not expected to have a significant impact to traffic operations within the study area.

Section 2
Existing Conditions

The Project site is bounded by Lafayette Plaza to the north, Sagamore Creek to the east and south, and Lafayette Road to the west. The property is currently accessible via a single full-access unsignalized driveway on Lafayette Road. The following sections provide details on the adjacent roadways within the study area.

2.1 Roadways

2.1.1 Lafayette Road (US Route 1)

Lafayette Road (US Route 1) is classified as a principal arterial under NHDOT District 6 jurisdiction. The roadway runs in a north-south direction, providing local and regional connectivity through southeastern New Hampshire, generally running parallel to I-95 between the Massachusetts state line and the Maine state line. Within the study area, Lafayette Road generally provides two travel lanes in each direction with a two-way center turn lane, and northbound and southbound left turn lanes at Mirona Road and Greenleaf Woods Drive. There are driveways to retail developments along both sides of the roadway.

Sidewalks are generally provided along both sides of Lafayette Road in the study area, with crossings located at the two signalized study area intersections at Mirona Road and Greenleaf Woods Drive. A varying shoulder typically 1 to 3 feet wide exists delineated by a solid white edge line. The speed limit is posted at 35 miles per hour (mph) in both directions in the vicinity of the site.

2.2 Study Area Intersections

2.2.1 Lafayette Road (US Route 1) at Mirona Road

Mirona Road intersects Lafayette Road from the east and west to form a four-way signalized intersection. The northbound and southbound approaches provide two through lanes and one dedicated left-turn lane that is separated from opposing traffic by a narrow raised median. The northbound and southbound left-turns operate under a protected signal phase. The eastbound approach provides a shared through/ left-turn lane and exclusive right-turn lane. The westbound approach provides a single all-purpose lane.

Marked crosswalks are provided on the north, east, and west legs with a concurrent pedestrian phase provided. Marked edge lines provide narrow 1-3 foot shoulders on all intersection approaches.

2.2.2 Lafayette Road (US Route 1) at Greenleaf Woods Drive/ Lafayette Plaza North Driveway

Greenleaf Woods Drive and Lafayette Plaza north driveway intersect Lafayette Road from the west and east, respectively, to form a four-way signalized intersection. The northbound and southbound approaches provide two through lanes and one dedicated left-turn lane that is separated from opposing traffic by a narrow raised median. The eastbound approach provides a shared through/ left lane and shared through/ right lane

with a short raised median. The westbound approach provides a shared through/ left and dedicated right-turn lane with a raised median. Marked crosswalks are provided on the north, south, and west legs with a concurrent pedestrian phase provided.

2.2.3 Lafayette Road (US Route 1) at Site Driveway

The site driveway intersects Lafayette Road from the east to form a three-way unsignalized intersection. Two travel lanes are provided in each direction on Lafayette Road with a center turn lane provided at the site driveway. The site driveway provides a single approach lane under stop control. Sidewalks and narrow shoulders are provided in the vicinity of the site driveway.

2.3 Traffic Volumes

Turning movement counts (TMC) were collected at the study area intersections on May 25, 2023 during the weekday morning (7:00 AM to 9:00 AM) and weekday afternoon peak periods (4:00 PM to 6:00 PM). Automatic Traffic Recorder (ATR) counts were collected on Lafayette Road approximately 250 feet south of the site driveway during a 48-hour period from Wednesday (May 24, 2023) thru Thursday (May 25, 2023) concurrently with the TMC to record hourly traffic volumes and vehicular speeds.

Based on current NHDOT guidance, 2023 traffic volumes were compared to 2019 traffic volumes to determine if adjustments to the collected traffic volumes should be made. NHDOT continuous count station No. 02125090, located on Spaulding Turnpike (NH Route 16) one half mile north of the US Route 4 interchange was used as a basis for comparison. The average traffic volumes from Tuesday to Thursday during the same week in May 2019 and May 2023 were used as a basis for the comparison. The review shows May 2023 traffic volumes on Spaulding Turnpike during the week the TMC were collected were 11.1% lower during the weekday morning peak hour, 7.4% higher during the weekday afternoon peak hour, and 2.7% lower on a daily basis as compared to 2019 traffic volumes. Therefore, the May 2023 weekday morning peak hour TMC and May 2023 daily traffic volumes were adjusted upward by 11.1% and 2.7%, respectively. No adjustment was made to the weekday afternoon peak hour.

The adjusted, seasonally adjusted ATR data indicates average daily traffic (ADT) of approximately 16,000 vehicles per day in the northbound direction and 14,000 vehicles per day in the southbound direction. The measured 85th percentile speeds, also known as the operating speed of the roadway, were approximately 45 mph and 43 mph in the northbound and southbound directions, respectively.

The weekday morning and weekday afternoon turning movement counts were each seasonally adjusted to the peak and adjusted as applicable based on the historical volume comparison per NHDOT guidelines. The adjusted 2023 existing traffic volumes for the weekday morning and weekday afternoon peak hours are shown in Figures 2 and 3, respectively. The raw TMC data and ATR data are provided in Appendix A. The NHDOT historical traffic volumes on Spaulding Turnpike, seasonal adjustment factors, and historical growth rates are enclosed in Appendix B. The Traffic Volume Adjustment Factor calculation is provided in Appendix C.

2.4 Capacity and Queue Analyses - Existing Condition

Capacity and queue analyses were performed for the study intersections for the 2023 Existing Conditions during the weekday morning and weekday afternoon peak hours.

Analyses were conducted using Trafficware Synchro Studio 11 software, which conducts the analysis based on *Highway Capacity Manual (HCM)* methodology. Consistent with NHDOT guidelines, analyses for signalized intersections were conducted using methods of the 2000 HCM, while analysis for unsignalized intersections utilized the HCM 6th Edition methodology. The analysis results are categorized in terms of Level of Service (LOS), which describes the qualitative intersection operational conditions based on the calculated average delay per vehicle. A summary of the HCM capacity analysis methodology and a detailed definition of LOS is provided in Appendix D. The queue analysis results are summarized based upon the length of vehicle queueing on an intersection approach. For unsignalized intersections, queues are quantified for 95th percentile (design queues). For signalized intersections, queues are quantified by 95th percentile (design) and 50th percentile (average) queues. Tables 2 and 3 in Section 7 summarize the capacity and queue analyses results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

As shown in Table 2, the majority of the overall intersections and individual intersection approaches operate acceptably at LOS D or better during the peak hours with the exception of the Lafayette Road at Mirona Road southbound left movement which operates at LOS E during the weekday afternoon peak hour. A review of the queuing results in Table 3 shows that all of the design queues are accommodated within available storage between intersections.

2.5 Collision History

Vehicle collision data for the study intersections was requested from the Portsmouth Police Department. However, as of this time, vehicle accident reports were not able to be provided due to staffing shortages.

2.6 Alternative Travel Modes

The study area is in an urban setting in the City of Portsmouth where several multimodal travel options are readily available. The following summarizes the details of various alternative travel modes supported within the study area.

Pedestrian facilities are present throughout the study area. There are existing sidewalks along both sides of Lafayette Road throughout the entire study area. Market crosswalks with concurrent pedestrian phases are present at both signalized study intersections.

The Cooperative Alliance for Seacoast Transportation (COAST) provides transit service within the study area. Bus Route 41 is the primary bus route in the study area with stops along Lafayette Road between Hanover Station to the north and Hillcrest Estimates to the south. An existing bus stop is located approximately a quarter mile north of the site, just north of the intersection with Greenleaf Woods Drive and the Lafayette Plaza north driveway. The route operates from 6:00 AM to 8:49 PM Monday through Saturday. The Route 41 map and schedule are included in Appendix F.

Section 3
No-Build Conditions

The No-Build Condition represents the projection of traffic volumes and operating conditions without the anticipated additional site generated traffic. Consistent with NHDOT guidelines, the study area is analyzed for an Opening Year (2025) and Design Year (2035). This section describes the growth and development considerations included in the 2025 and 2035 No-Build traffic volumes.

3.1 Traffic Growth

To develop the traffic volumes for the 2025 and 2035 No-Build Conditions, the 2023 Existing traffic volumes were grown by one percent per year to represent the general growth of traffic on the study area roadways. This growth rate is consistent with the average growth rate in NHDOT Region E - Southeast, the region in which Portsmouth is located. Background NHDOT growth data is included in Appendix B.

NHDOT and the City of Portsmouth were contacted about other planned/approved developments in the area that may add new traffic to the study area prior to 2025. The following developments were identified:

- **428 US Route 1 Bypass – West End Yards Mixed-use Development:** The project includes 273 residential units, 22,000 SF of retail/ restaurant space, and 22,000 SF of office space. The project is constructed and occupied except for Parcel D of the project which includes a proposed commercial space. A review of the previous traffic analyses indicates negligible site traffic from the remaining development is anticipated to be added to the study intersections. Therefore, the remaining projected site traffic is assumed to be included in the background traffic volume growth.

- **105 Bartlett Street – North Mill Pond Residential Development:** The project proposes to construct 152 residential units. The project has been approved and construction is anticipated to begin in Spring 2024. Based on a review of the previous analyses, it was determined that the estimated project trips will not add traffic to the study intersections based on anticipated travel patterns, and therefore was not added to the No-Build traffic volumes.

It is assumed that other smaller developments or small vacancies in existing developments are also captured by the background traffic growth rate. The 2025 and 2035 No-Build traffic volumes for the weekday morning and weekday afternoon peak hours are shown in Figures 4 through 7.

3.2 Capacity and Queue Analyses – No-Build Conditions

Capacity and queue analyses were conducted for the 2025 and 2035 No-Build Conditions traffic volumes for both peak periods using the methodology described in Section 2.4. Tables 2 and 3 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

The increase in expected future traffic based on the one percent per year compounded growth rate added to the future No-Build Conditions results in some degradation of operations when compared to existing conditions. In the 2025 No-Build Condition, most overall intersections and individual intersection approaches operate at a similar LOS to the Existing Condition. The 2035 No-Build Condition includes some additional degradation of LOS based on the addition of ten years of compounded annual growth. The following identifies intersections and approaches which predict a degradation of LOS, increased delay or queues exceeding available storage between the 2023 Existing and 2025 No-Build Condition, and/or between the 2025 and 2035 No-Build Condition:

- **Lafayette Road at Greenleaf Woods Drive/Lafayette Plaza North Driveway:**
  - The southbound left turn movement degrades from LOS D to LOS E in the 2035 weekday afternoon peak hour.
  - The northbound through/right turn movement exceeds the available storage by less than one vehicle length in the 2035 weekday afternoon peak hour.
- **Lafayette Road at Mirona Road:**
  - The northbound left turn movement degrades from LOS D to LOS E in the 2035 weekday morning and afternoon peak hours.
  - The southbound left turn movement degrades from LOS D to LOS E in the 2035 weekday morning peak hour and degrades from LOS E to LOS F in the 2025 weekday afternoon peak hour.
  - The eastbound shared through/left turn movement degrades from LOS D to LOS E in the 2035 weekday afternoon peak hour.
  - It important to note that while the overall LOS of the intersection degrades and volume-to-capacity ratio nears 1.0 in 2035 during the weekday afternoon due to the increase in traffic volume, the southbound left movement does experience an improvement in LOS from F to D. This improvement is offset by the degradation in LOS on the northbound left and shared eastbound through/ left movements.

It should be noted that in instances where 95th percentile queues slightly exceed available storage, average (50th percentile) queues are well within the available storage for the turn lane, and that the 95th percentile is the queue length that is predicted to be reached only 5 percent of the time, or approximately 3 minutes out of 60 minutes in the affected peak hour.

Section 4
Proposed Conditions

The proposed 72-unit residential development will include three buildings with structured parking on the ground floor of each building and a separate surface parking lot. The proposed development is expected to be complete and occupied in 2025. The Site Plan is presented in Appendix H.

4.1 Site Access

Access to the Site will be provided via the existing full access, unsignalized driveway on the east side of Lafayette Road. The driveway is located approximately 750 feet south of the intersection with Greenleaf Woods Drive. All tenants will utilize this driveway on Lafayette Road to access the site.

Intersection sight distance was reviewed at the proposed site driveway on Lafayette Road, in accordance with criteria set forth in the AASHTO publication *A Policy on the Geometric Design of Highways and Streets*, 7th Edition, 2018. Stopping sight distance was also reviewed along Lafayette Road. Available site distances were estimated based on the site layout plan and available aerial mapping. The 85th percentile speeds were measured to be approximately 45 mph in the northbound direction and 43 mph in the southbound direction on Lafayette Road. A design speed of 45 mph was used as a basis for the analysis.

Based on AASHTO guidelines and the 85th percentile speed of the roadway, the northbound and southbound intersection sight distance requirement is 530 feet for passenger cars and 675 feet for single-unit trucks turning left under *Case B – Left Turn from Stop*. The site driveway provides intersection sight distance in excess of 700 feet in each direction, exceeding the AASHTO requirements for passenger vehicles and single-unit trucks.

Based on AASHTO guidelines, roadway grades, and the 85th percentile speed of the roadway, the stopping sight distance requirement is 360 feet for vehicles traveling in both the northbound and southbound directions. The sight distance provided is in excess of the requirement.

4.2 Trip Generation

Site generated traffic volumes for the proposed residential development were estimated using rates published in the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition, 2021. The proposed site generated traffic volumes were calculated based on the number of proposed apartments. Trip generation is based on the peak hour of the adjacent street (site). It is estimated that the proposed development may generate a total of 45 trips (11 entering, 34 exiting) during weekday morning peak hour and 52 trips (32 entering, 20 exiting) during weekday afternoon peak hour. The proposed site generated traffic is summarized in Table 1.

TABLE 1
Site-Generated Traffic Summary

Proposed - 72 Apartments (3 Stories) Peak Hour Period	Enter	Exit	LUC 220 Total
Weekday Morning	11	34	45
Weekday Afternoon	32	20	52
Weekday	268	269	537

Source: Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021
Land Use - 220 [Multifamily Housing (Low-Rise)]

4.3 Arrival and Departure Distribution

The distribution of the proposed site-generated traffic entering and exiting the Site was applied to the roadway network based on existing traffic patterns within the study area as well as a review of US Census Journey-to-Work data which is included in Appendix G. The following arrival/departure distributions are anticipated:

- 30% North to/from US Route 1
- 25% South to/from US Route 1
- 20% North to/from NH Route 4
- 15% South to/from I-95
- 5% North to/from I-95
- 5% West to/from Route 33

Figure 8 presents the arrival and departure distributions of the traffic through the study area by intersection movement. Figures 9 and 10 show the proposed site generated traffic distributed to the study area roadways for the morning and afternoon peak periods, respectively.

4.4 Off-Site Mitigation Review

Right and left turn bay analyses were conducted to determine the potential need for turning bays at the site driveway based on guidance outlined in National Cooperative Highway Research Program (NCHRP) Report 457, Evaluating Intersection Improvements: An Engineering Study Guide. Figures 2-5 and Figure 2-6 provide guidance for left and right turn bay warrants, respectively. Based on the 85th percentile speeds and projected 2035 Build Condition traffic volumes, a northbound right turn bay is not warranted. The analysis does indicate that a southbound left turn bay is warranted. However, due to the presence of the existing center turn lane, a dedicated left turn lane is not recommended as site traffic turning into the site can utilize the existing center turn lane for left turns. It is not recommended to modify the existing striping to maintain cross section continuity along the corridor. The turn bay analyses calculation and results are included in Appendix I.

Section 5
Build Conditions

The anticipated site generated traffic volumes associated with the proposed development were added to the 2025 and 2035 No-Build Conditions traffic volumes to develop the 2025 and 2035 Build Conditions traffic volumes, which are presented in Figure 11 through 14 for both peak periods.

5.1 Capacity and Queue Analyses - Build Condition

Capacity and queue analyses were conducted for the 2025 and 2035 Build Conditions for the peak hours using the methodology described in Section 2.4. Tables 2 and 3 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

A majority of the study area intersections and individual intersection approaches continue to operate at acceptable LOS D or better during the peak hours in the 2025 and 2035 Build Conditions. Study area intersections that were identified in Section 2.4 and 3.3 to operate at LOS E or LOS F in the No-Build Conditions continue to operate at the same LOS under Build Conditions. The signalized intersection movements experience queue increases of no more than one car length.

The 815 Lafayette Road Development site driveway approach (unsignalized) operates at LOS D in 2025 and LOS E in 2035 during the weekday morning and afternoon peak hours. Queues of less than one vehicle are expected on the driveway approach.

Section 6
Conclusions & Recommendations

1. The project proposes to demolish the existing building (former WHEB radio station) on site and construct a 72-unit residential development comprised of three separate buildings. The project includes approximately 121 parking spaces in both structured parking on the ground level of each building and a surface lot. The development is expected to be complete and occupied in 2025.

2. Access to the site will be provided via the existing full access driveway. The site driveway will continue to operate under stop control.

3. Based on the ITE data, the project is expected to generate 45 trips during the weekday morning peak hour (11 entering, 34 exiting) and 52 trips during the weekday afternoon peak hour (32 entering, 20 exiting).

4. The project proposes internal sidewalk connections to the existing sidewalk network along Lafayette Road, promoting connections to the existing sidewalk network along study area roadways.

5. Consistent with NHDOT guidelines, existing traffic volumes have been seasonally adjusted to the peak month condition and adjusted as necessary based on a comparison between 2023 and 2019 continuous count station data to represent a pre-pandemic condition.

6. The capacity analyses show that the study area intersections will continue to operate at the same LOS under Build Conditions as compared to the No-Build Conditions for both the 2025 opening year and 2035 design year with minimal increases in delay or queues.

7. Based on the left and right turn bay analysis, it was determined that a southbound left-turn bay is warranted. However, the existing center turn lane can accommodate southbound left-turn traffic. Restriping the roadway to provide a directional southbound left-turn lane is not recommended in order to maintain roadway cross section continuity along the corridor.

8. Based on the results of the foregoing analysis, it is the professional opinion of Tighe & Bond that the addition of site-generated traffic is expected to have a negligible effect on traffic operations within the study area.

Section 7
Tables

TABLE 2
Intersection Operation Summary - Capacity

	Lane Use	Weekday Morning Peak Hour																Weekday Afternoon Peak Hour											
		2023 Existing			2025 No-Build			2025 Build			2035 No-Build			2035 Build				2023 Existing			2025 No-Build			2025 Build			2035 No-Build			2035 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Lafayette Road (U.S. Route 1) at Greenleaf Woods Drive/North Plaza Driveway																															
Overall		**B**	**14.7**	**0.79**	**B**	**15.2**	**0.80**	**B**	**15.4**	**0.82**	**B**	**18.2**	**0.89**	**B**	**18.8**	**0.91**		**C**	**22.3**	**0.83**	**C**	**23.0**	**0.84**	**C**	**23.2**	**0.85**	**C**	**28.1**	**0.93**	**C**	**28.6**	**0.94**
	NBL	D	38.1	0.44	D	38.5	0.46	D	38.5	0.46	D	39.8	0.51	D	39.8	0.51		D	45.7	0.43	D	45.9	0.42	D	46.0	0.42	D	48.4	0.47	D	48.4	0.47
Lafayette Road	NBTR	B	15.1	0.79	B	15.8	0.80	B	16.3	0.82	C	20.8	0.89	C	21.8	0.91		C	23.1	0.83	C	24.0	0.84	C	24.2	0.85	C	31.7	0.93	C	32.9	0.94
(U.S. Route 1)	SBL	D	37.4	0.57	D	37.4	0.58	D	37.4	0.58	D	40.0	0.63	D	40.0	0.63		D	48.1	0.74	D	50.5	0.76	D	50.6	0.76	E	63.4	0.85	E	63.4	0.85
	SBTR	A	9.0	0.56	A	9.2	0.57	A	9.3	0.57	B	10.2	0.63	B	10.2	0.63		B	12.6	0.60	B	12.9	0.62	B	13.0	0.63	B	14.6	0.68	B	14.9	0.70
Greenleaf Woods Drive	EB	C	31.4	0.02	C	31.4	0.02	C	31.4	0.02	C	31.4	0.02	C	31.4	0.02		C	30.3	0.30	C	30.6	0.30	C	30.7	0.30	C	31.2	0.33	C	31.2	0.33
North Plaza Driveway	WBLT	D	35.6	0.47	D	35.7	0.48	D	35.7	0.48	D	36.1	0.50	D	36.1	0.50		D	44.6	0.73	D	45.8	0.74	D	46.5	0.74	D	52.2	0.80	D	52.2	0.80
	WBR	C	31.5	0.03	C	31.5	0.03	C	31.5	0.03	C	31.5	0.03	C	31.5	0.03		C	28.7	0.07	C	29.0	0.07	C	29.1	0.07	C	29.3	0.08	C	29.3	0.08
Traffic Signal - Lafayette Road (U.S. Route 1) at Mirona Road																															
Overall		**B**	**19.1**	**0.75**	**B**	**19.6**	**0.76**	**B**	**19.8**	**0.76**	**C**	**22.8**	**0.83**	**C**	**22.9**	**0.83**		**C**	**21.0**	**0.75**	**C**	**21.3**	**0.78**	**C**	**21.7**	**0.80**	**C**	**24.5**	**0.93**	**C**	**25.1**	**0.96**
	NBL	D	46.4	0.53	D	47.8	0.55	D	48.6	0.55	E	59.7	0.64	E	59.9	0.64		D	44.5	0.52	D	45.5	0.54	D	46.1	0.54	E	55.8	0.63	E	56.8	0.63
Lafayette Road	NBTR	B	16.6	0.75	B	17.1	0.76	B	17.3	0.76	C	20.6	0.83	C	20.6	0.83		B	17.1	0.70	B	17.1	0.71	B	17.1	0.71	B	18.4	0.75	B	18.4	0.76
(U.S. Route 1)	SBL	D	48.5	0.35	D	49.4	0.36	D	49.7	0.36	E	55.4	0.42	E	55.7	0.42		E	71.6	0.57	F	80.1	0.59	F	80.2	0.59	D	51.5	0.35	D	51.7	0.35
	SBTR	B	15.8	0.62	B	16.0	0.63	B	16.3	0.63	B	18.0	0.68	B	18.2	0.69		B	19.7	0.70	B	19.8	0.71	B	19.8	0.71	B	19.7	0.73	B	19.6	0.73
	EBLT	D	44.7	0.75	D	45.6	0.75	D	45.5	0.75	D	51.6	0.80	D	52.3	0.80		D	39.8	0.75	D	42.5	0.78	D	45.1	0.80	E	70.2	0.93	E	77.4	0.96
Mirona Road	EBR	B	19.9	0.03	C	20.3	0.03	C	20.3	0.03	C	21.9	0.03	C	22.1	0.03		B	16.8	0.04	B	17.2	0.04	B	17.3	0.04	C	20.3	0.04	C	20.6	0.05
	WB	C	28.7	0.05	C	29.0	0.05	C	29.0	0.05	C	30.8	0.05	C	31.0	0.05		C	25.0	0.07	C	25.6	0.07	C	25.7	0.07	C	29.1	0.08	C	29.4	0.09
Unsignalized TWSC - Lafayette Road (U.S. Route 1) at Site Driveway																															
Site Driveway	WB	--	--	--	--	--	--	D	30.1	0.21	--	--	--	E	36.6	0.25		--	--	--	--	--	--	D	27.7	0.12	--	--	--	E	35.3	0.16
Lafayette Road (U.S. Route 1)	SBL	--	--	--	--	--	--	B	14.7	0.02	--	--	--	C	16.4	0.02		--	--	--	--	--	--	B	14.1	0.05	--	--	--	C	15.7	0.06

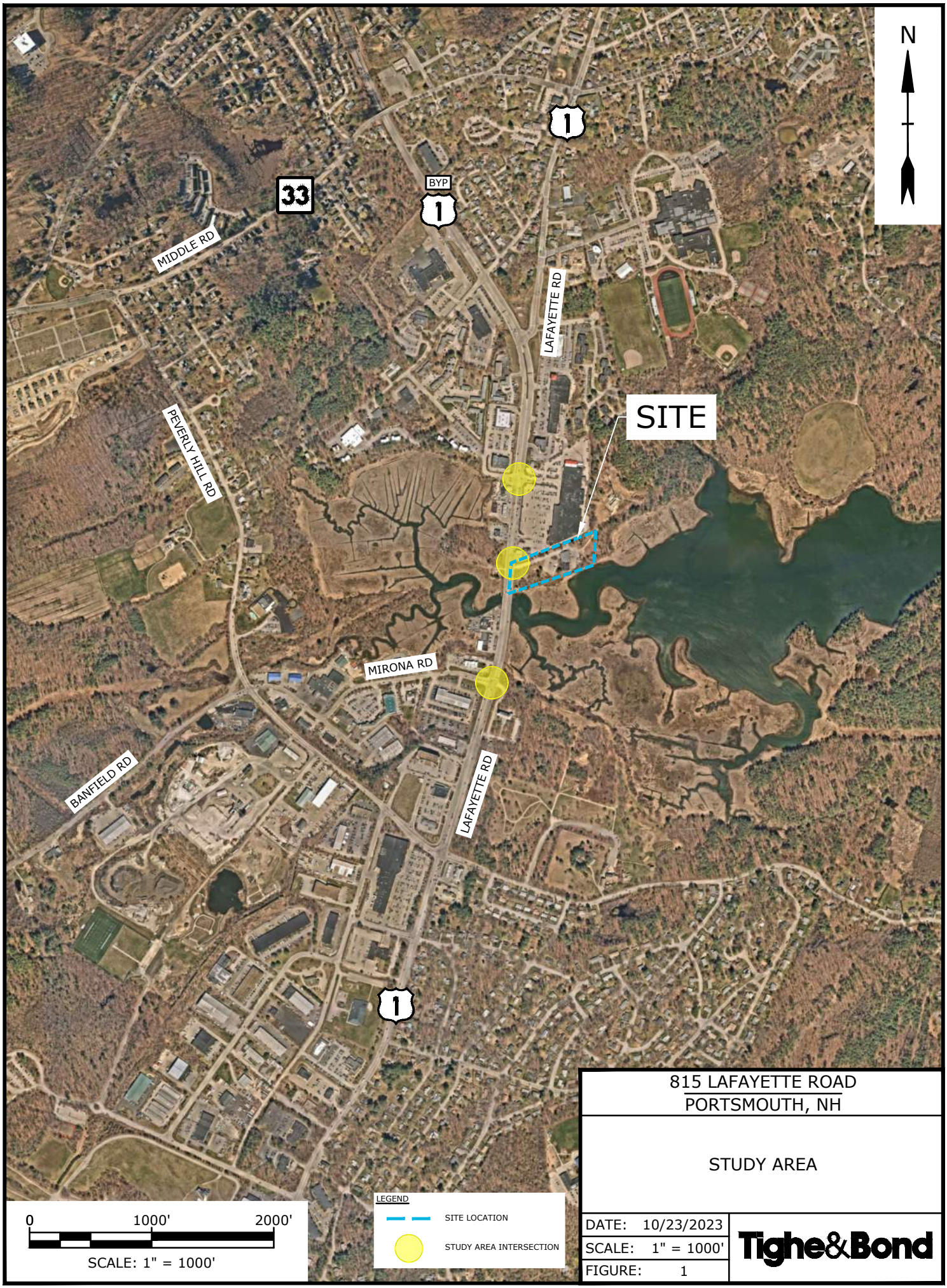
Legend
LOS - Level of Service
Delay - average delay per vehicle in seconds
V/C - volume to capacity ratio

TABLE 3
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Weekday Morning Peak Hour										Weekday Afternoon Peak Hour									
			2023 Existing		2025 No-Build		2025 Build		2035 No-Build		2035 Build		2023 Existing		2025 No-Build		2025 Build		2035 No-Build		2035 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Lafayette Road (U.S. Route 1) at Greenleaf Woods Drive/North Plaza Driveway																						
	NBL	150	18	45	18	46	18	46	20	50	20	50	12	37	12	37	12	37	14	40	14	40
Lafayette Road	NBTR	625	296	407	308	462	317	475	386	556	410	569	330	515	345	533	350	542	448	628	463	637
(U.S. Route 1)	SBL	550	42	90	43	92	43	92	48	100	48	100	86	172	89	177	89	177	103	201	103	201
	SBTR	>1000	172	266	177	274	180	277	213	328	215	331	146	322	153	331	157	341	203	385	208	395
Greenleaf Woods Drive	EB	100	0	0	0	0	0	0	0	0	0	0	28	45	29	45	29	45	33	50	33	50
North Plaza Driveway	WBLT	250	25	60	26	61	26	61	29	65	29	65	76	106	77	108	77	108	87	119	87	119
	WBR	250	0	0	0	0	0	0	0	3	0	3	0	21	0	21	0	21	0	22	0	22
Traffic Signal - Lafayette Road (U.S. Route 1) at Mirona Road																						
	NBL	475	28	81	29	83	29	83	34	95	35	95	30	80	31	83	31	83	38	108	38	108
Lafayette Road	NBTR	>1000	232	393	247	405	252	407	301	480	302	482	205	375	213	386	215	391	251	448	254	452
(U.S. Route 1)	SBL	225	7	34	8	34	8	34	9	37	9	37	7	28	7	28	7	28	9	34	9	34
	SBTR	875	235	300	247	308	254	315	291	357	297	365	265	333	274	341	276	344	320	390	323	394
	EBLT	>1000	89	224	92	232	94	233	113	266	117	269	119	229	124	243	129	255	157	325	162	334
Mirona Road	EBR	225	0	20	0	21	0	21	0	21	0	21	0	18	0	19	0	19	1	23	2	24
	WB	250	5	17	6	18	6	18	7	20	7	20	9	16	9	16	9	16	11	20	12	20
Unsignalized TWSC - Lafayette Road (U.S. Route 1) at Site Driveway																						
Site Driveway	WB	250	--	--	--	--	--	20	--	--	--	23	--	--	--	--	--	10	--	--	--	13
Lafayette Road (U.S. Route 1)	SBL	350	--	--	--	--	--	3	--	--	--	3	--	--	--	--	--	5	--	--	--	5

Legend
50th & 90th - 50th and 95th percentile queue lengths in feet

Section 8
Figures

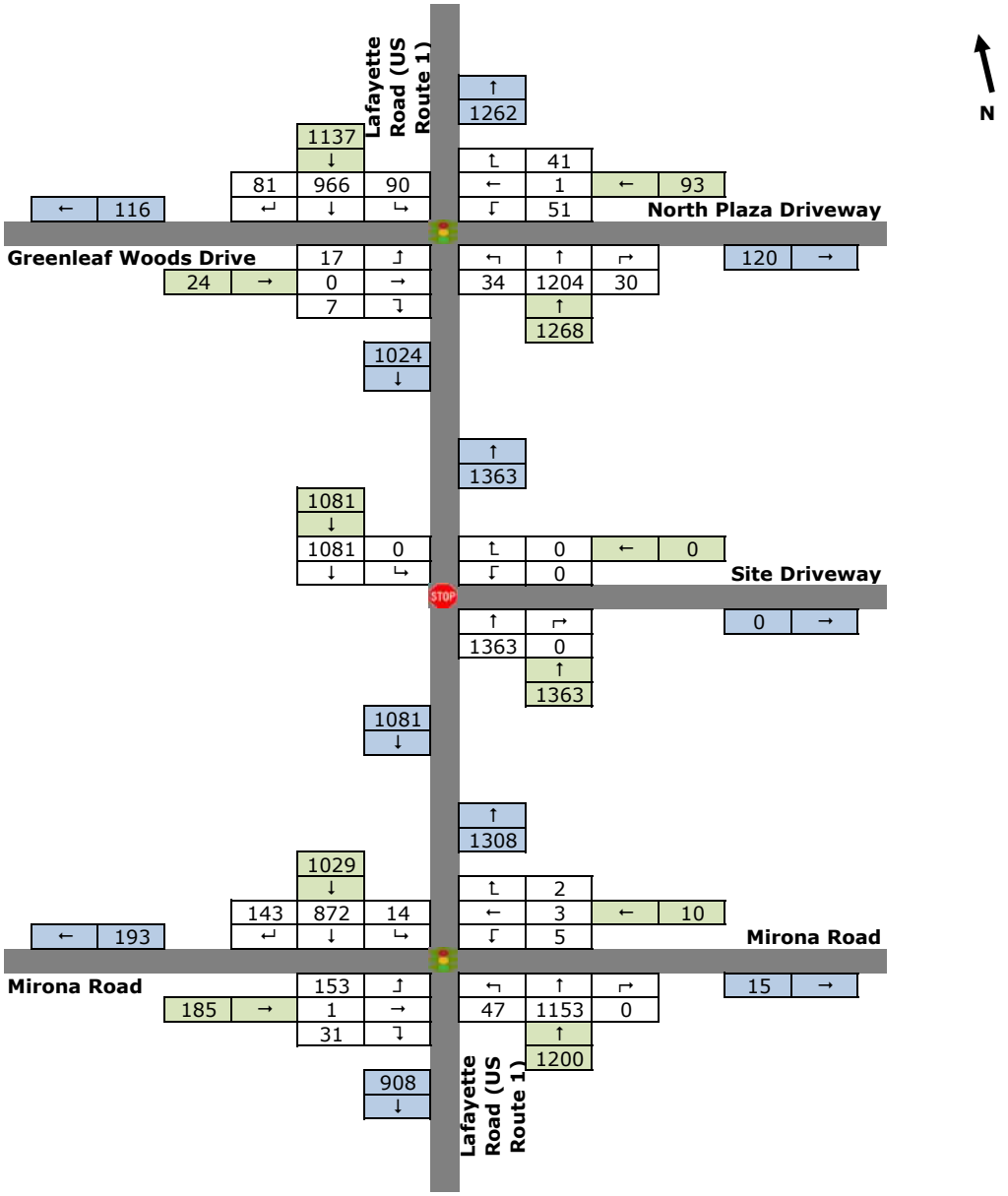


815 LAFAYETTE ROAD
PORTSMOUTH, NH

STUDY AREA

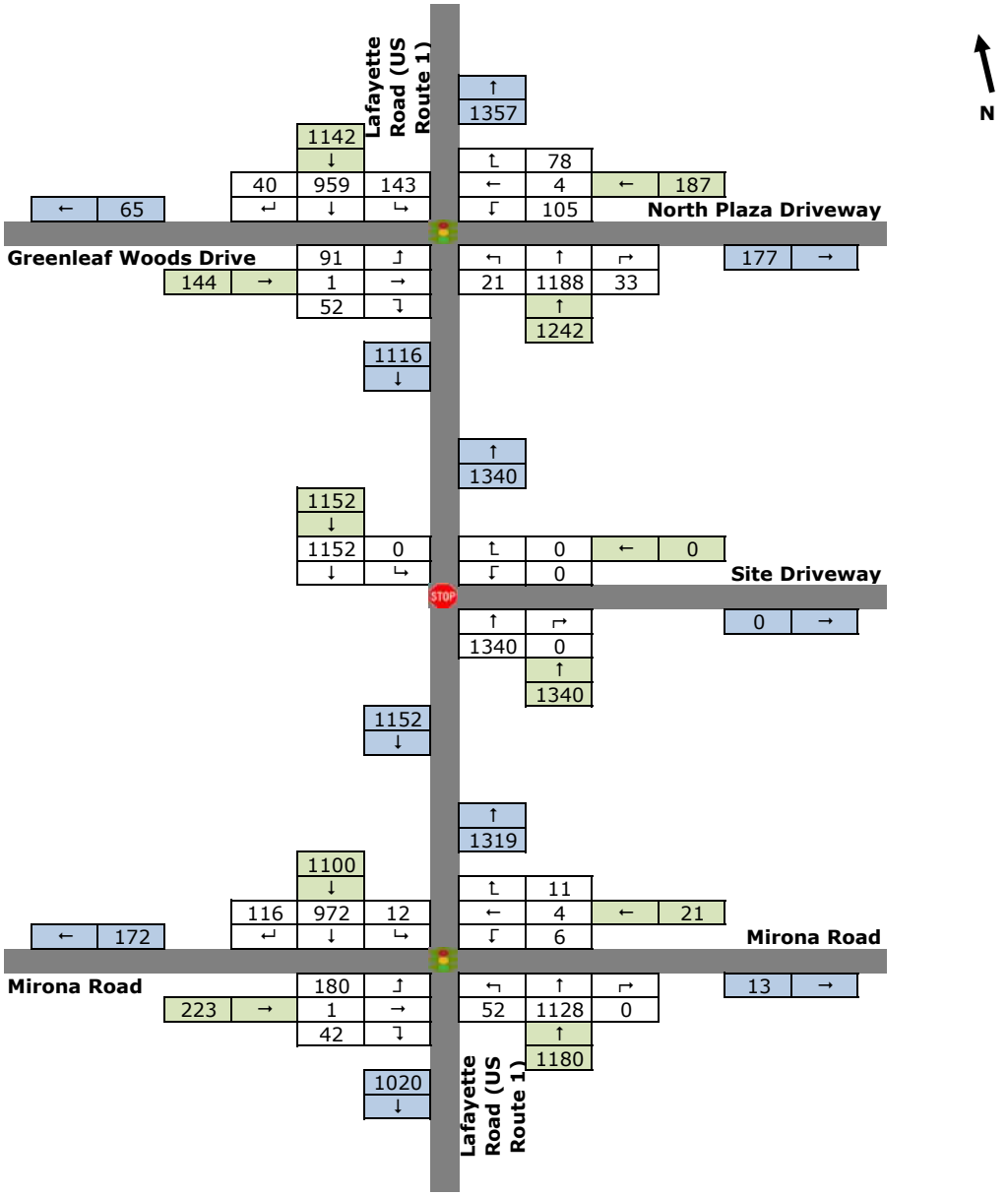
DATE:	10/23/2023
SCALE:	1" = 1000'
FIGURE:	1

Tighe&Bond



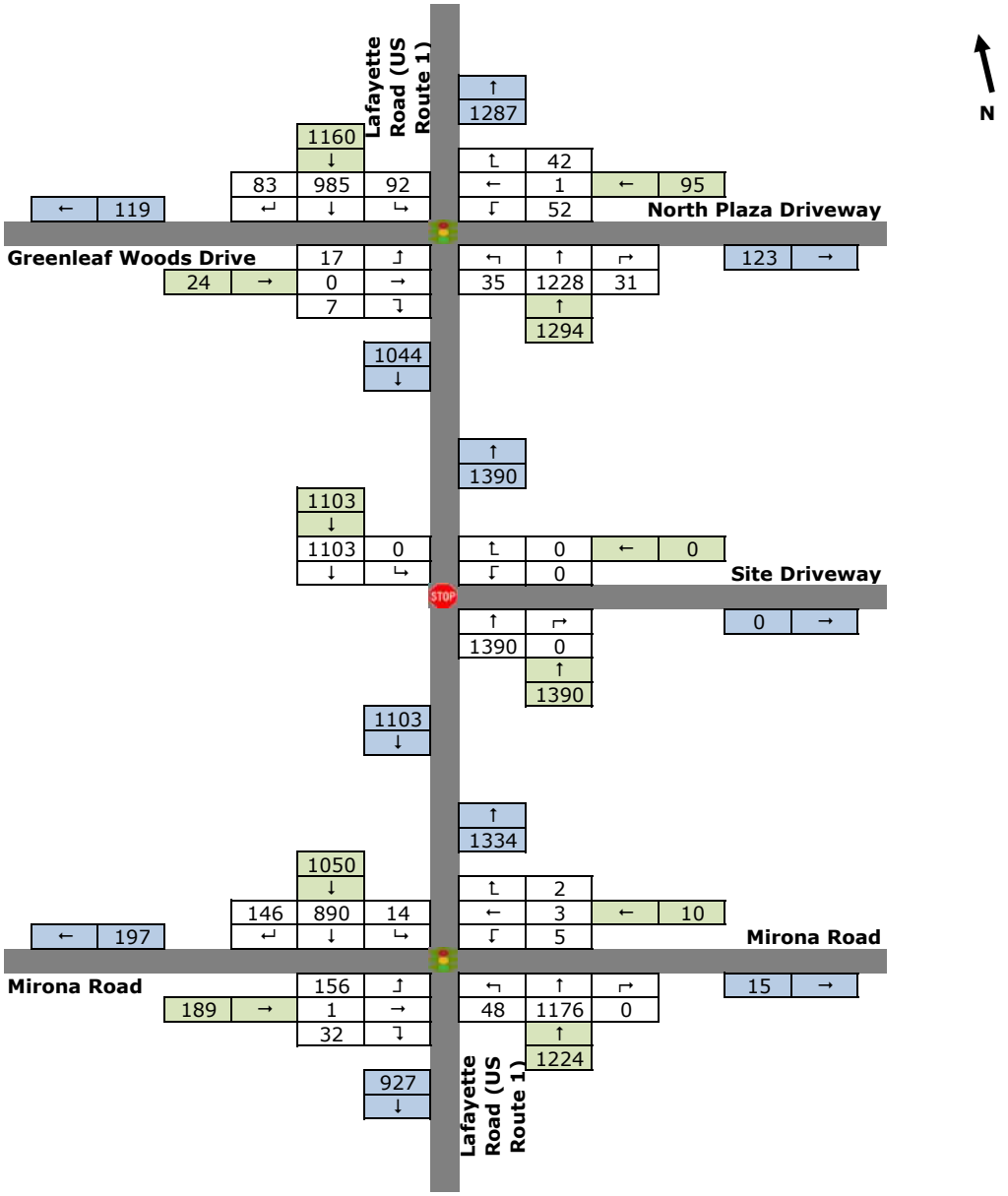
2023 Existing Condition Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 2



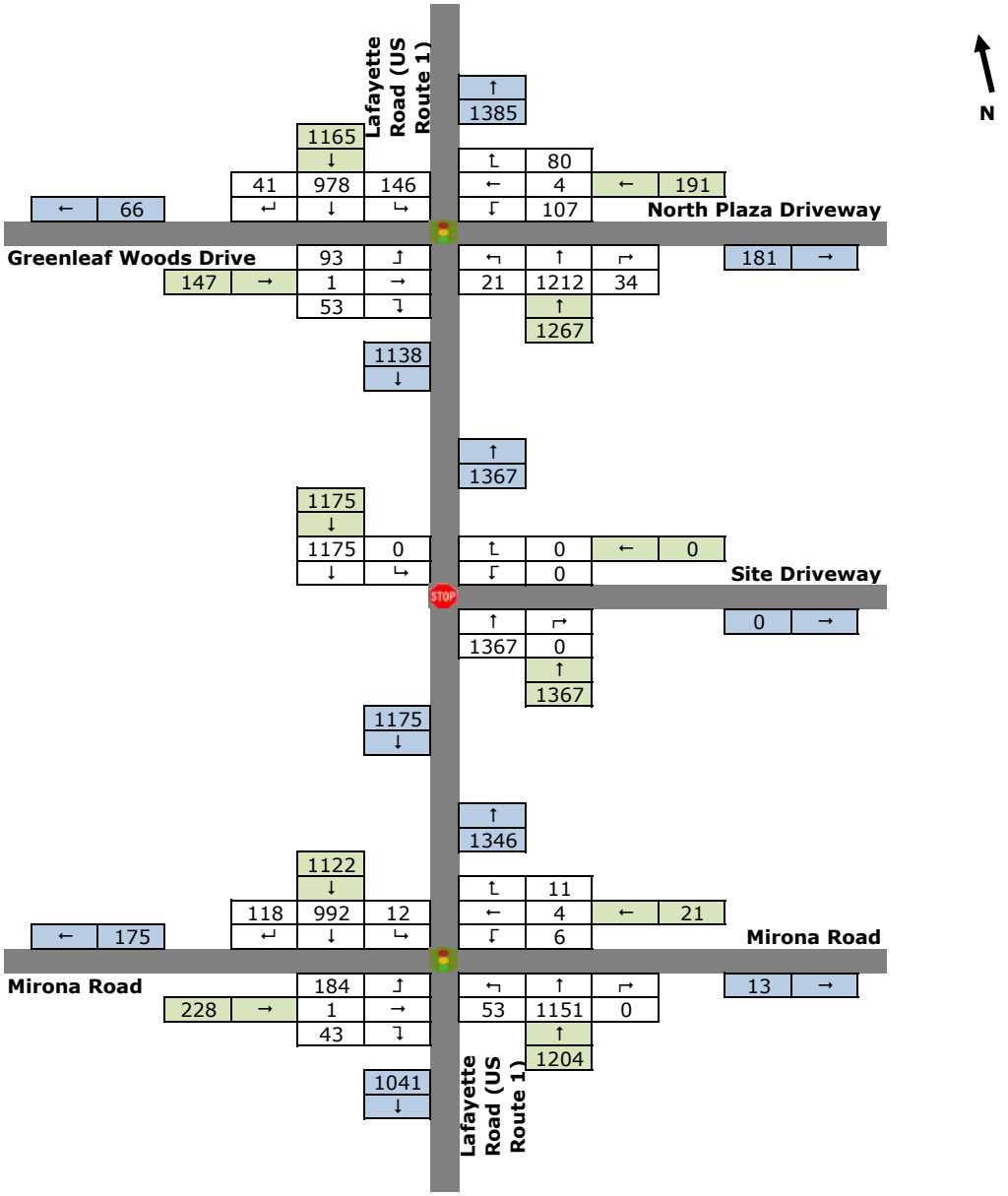
2023 Existing Condition Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 3



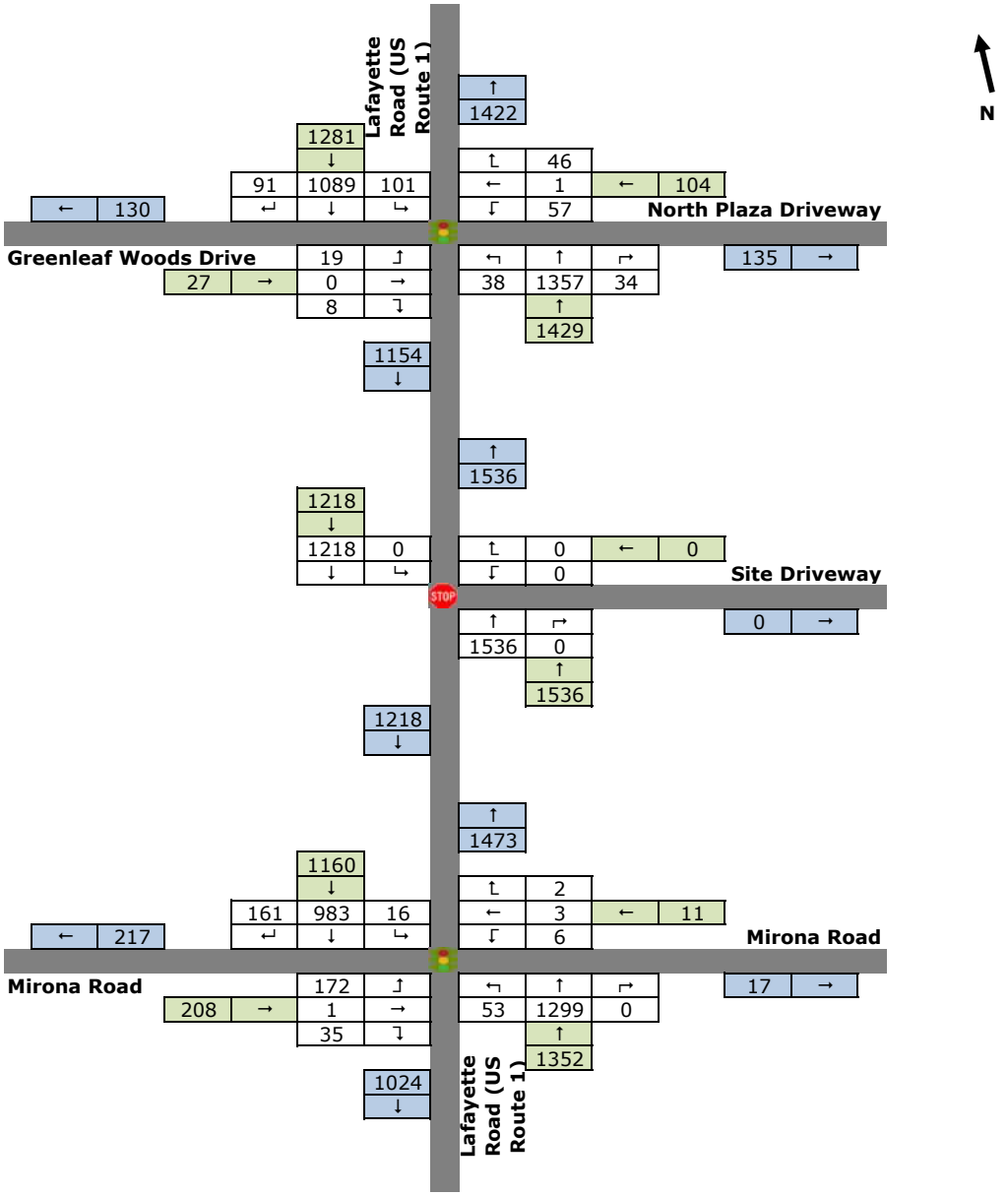
2025 No-Build Condition Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 4



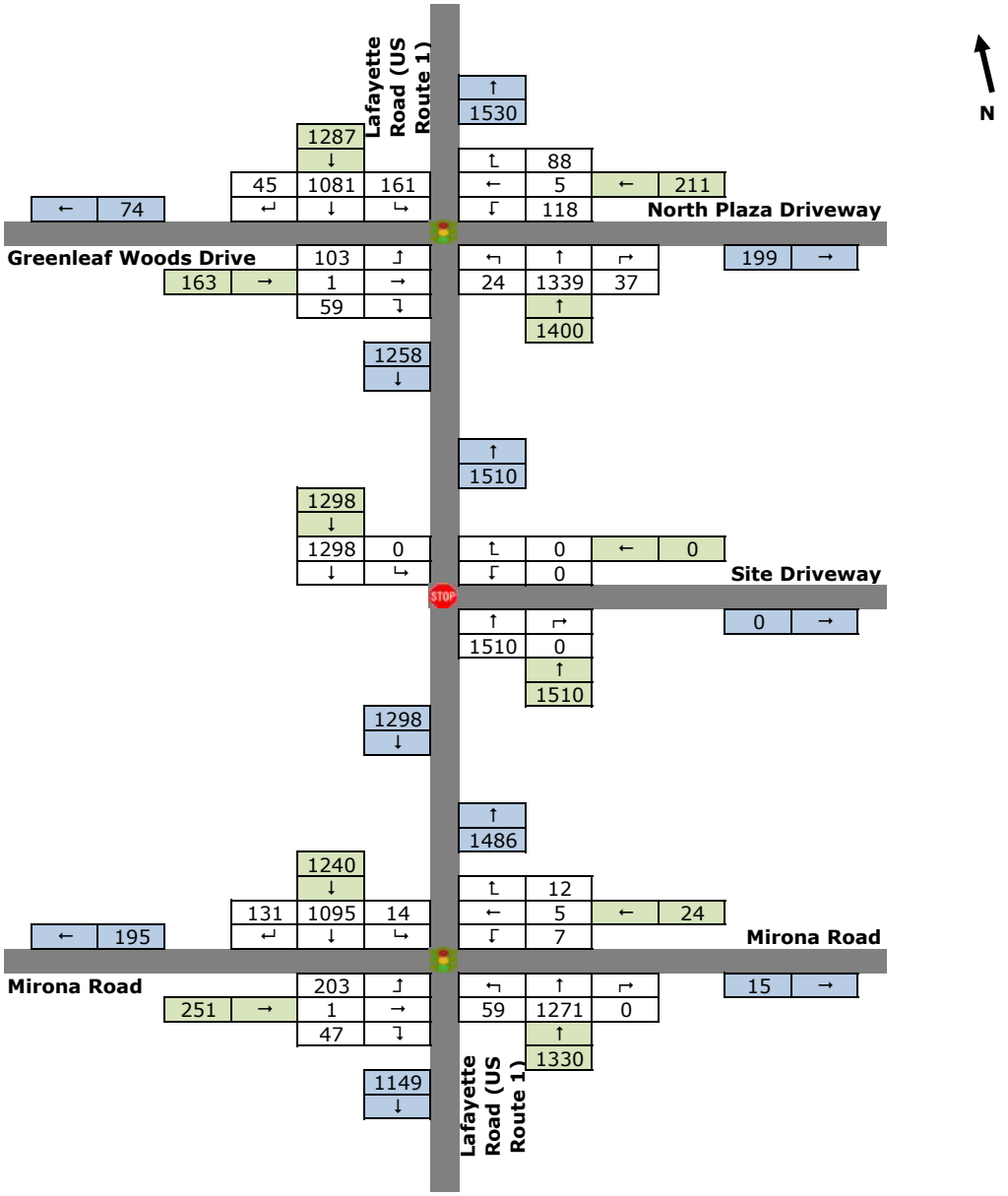
2025 No-Build Condition Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 5



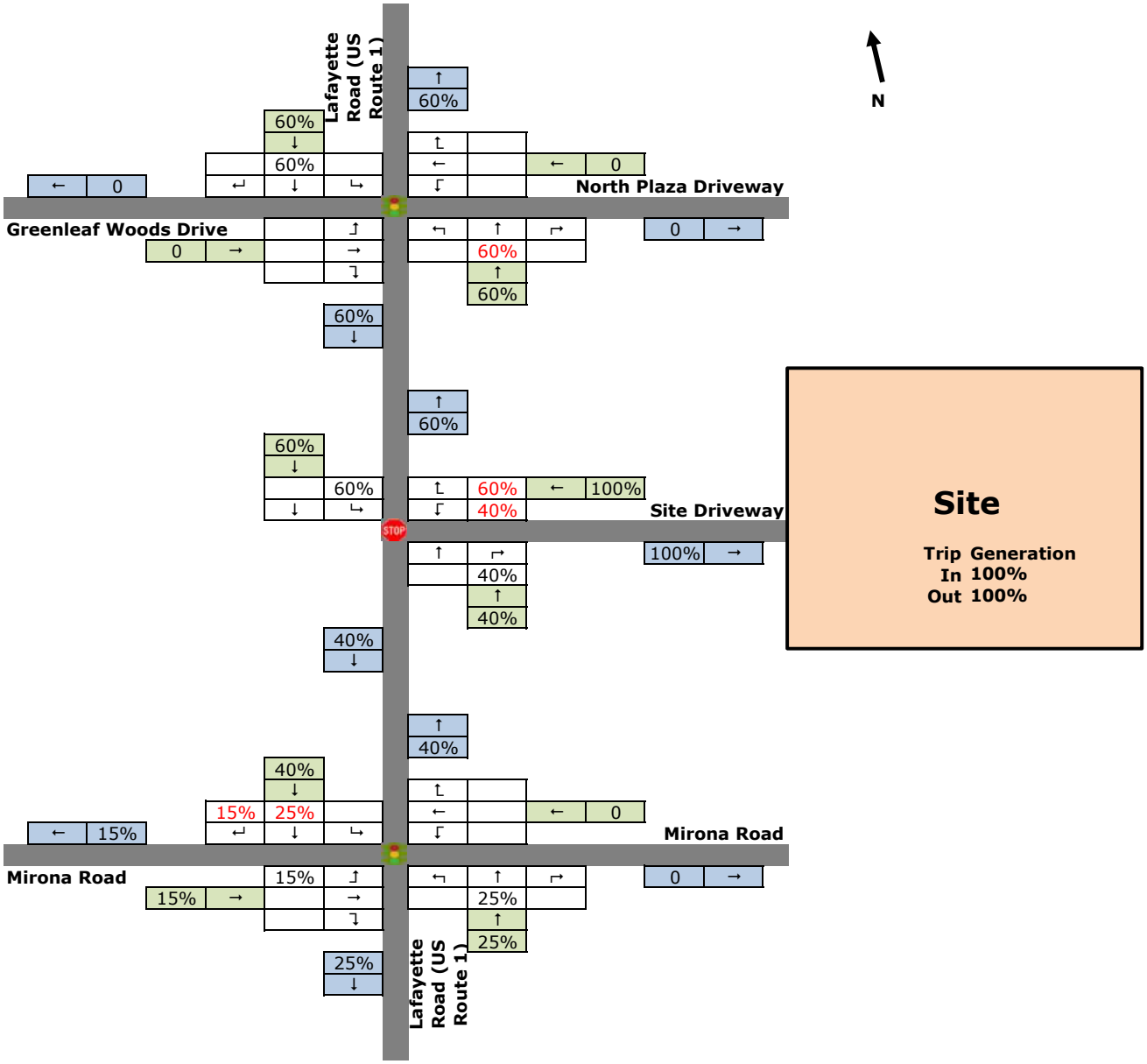
2035 No-Build Condition Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 6



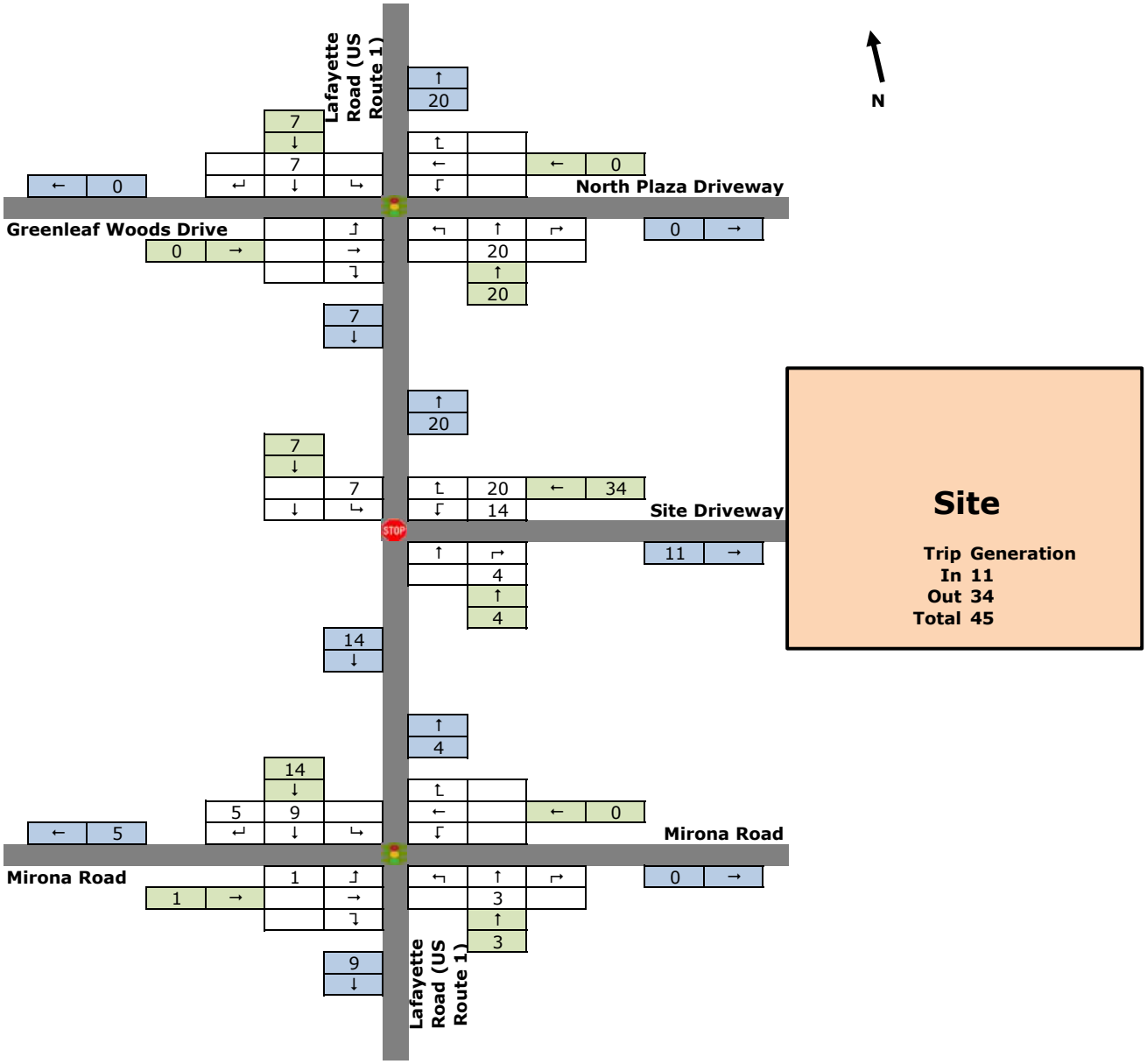
2035 No-Build Condition Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 7



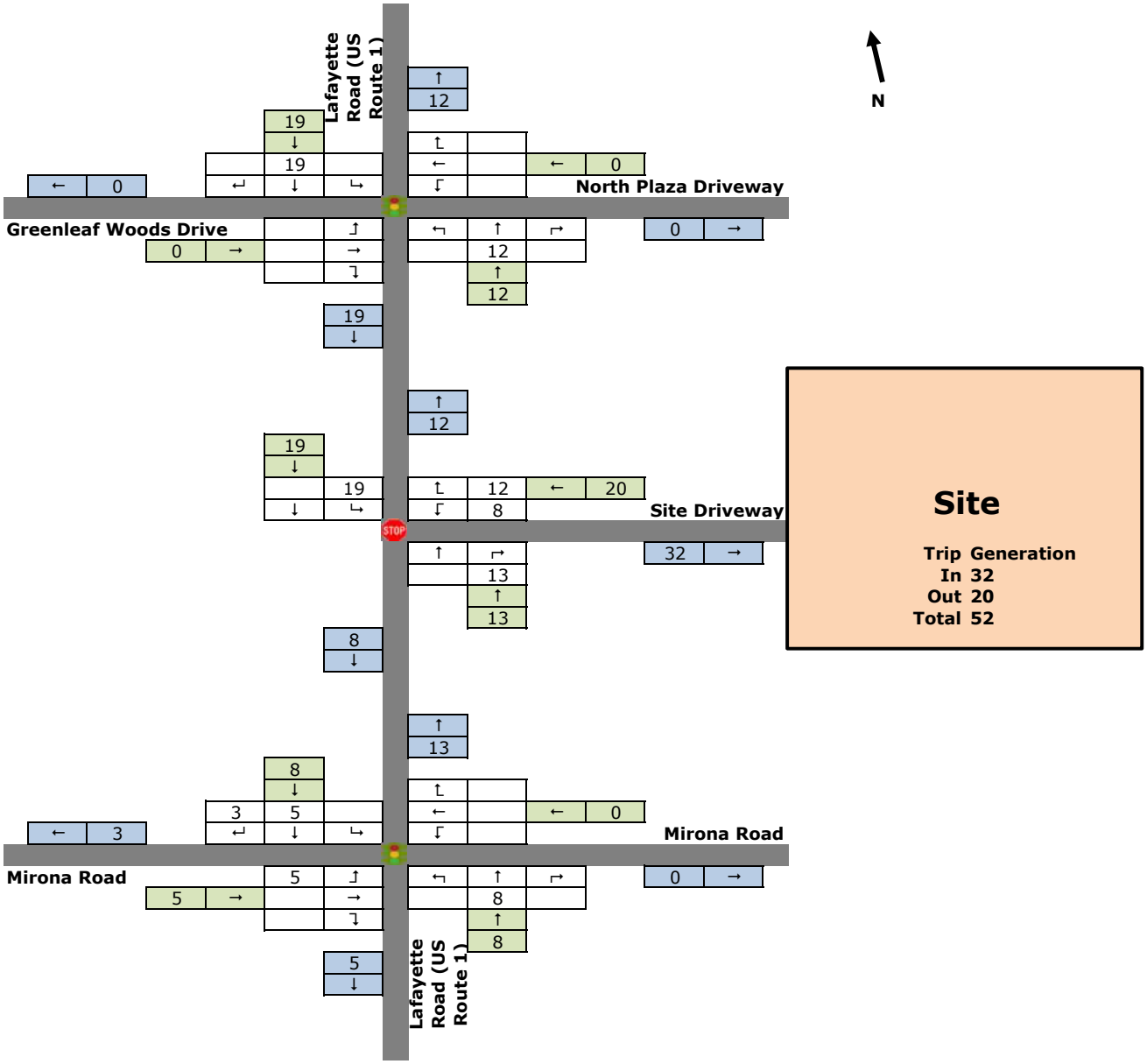
Trip Distribution Traffic Volumes
815 Lafayette Road Development

Figure 8



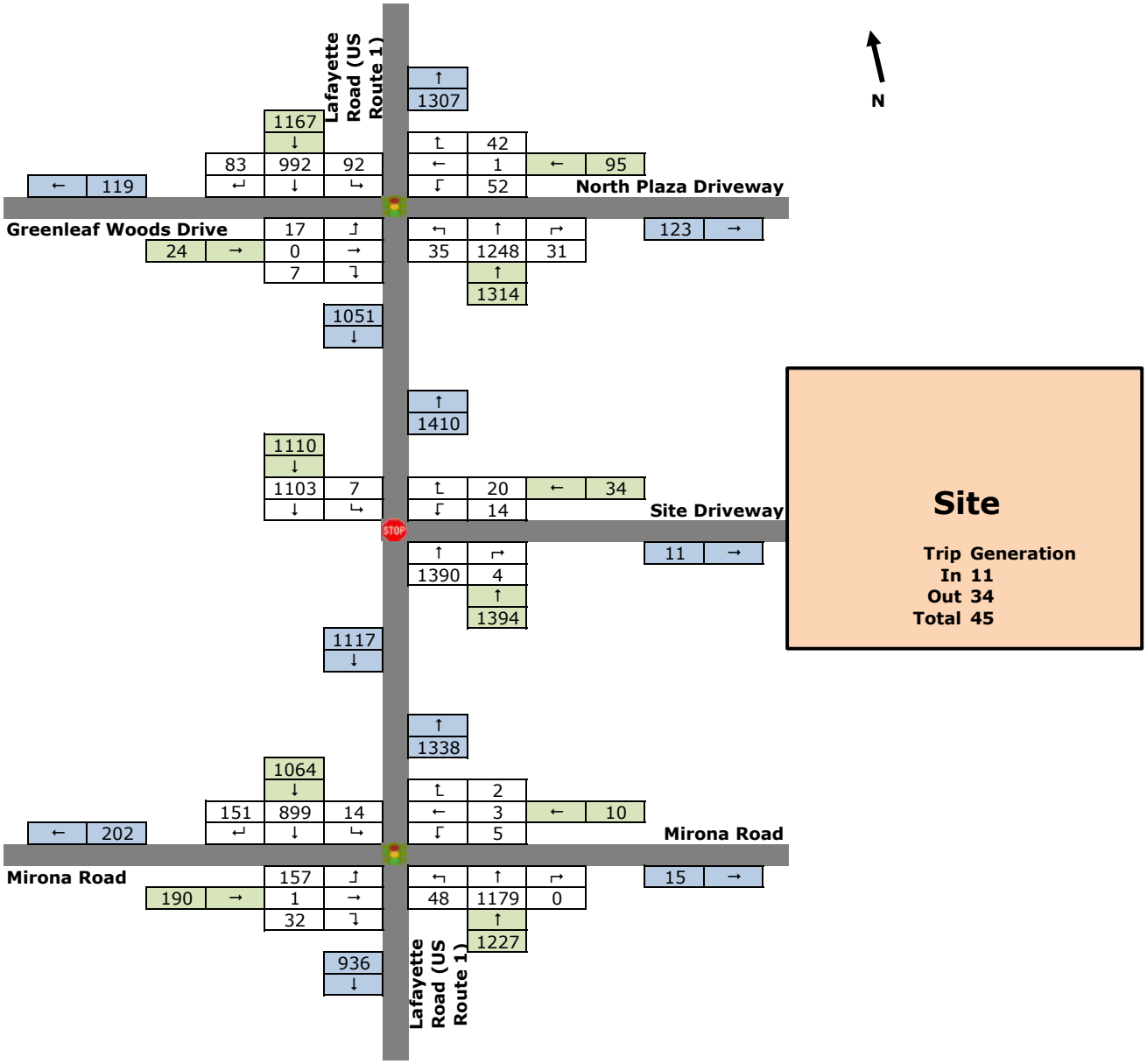
Site Generated Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 9



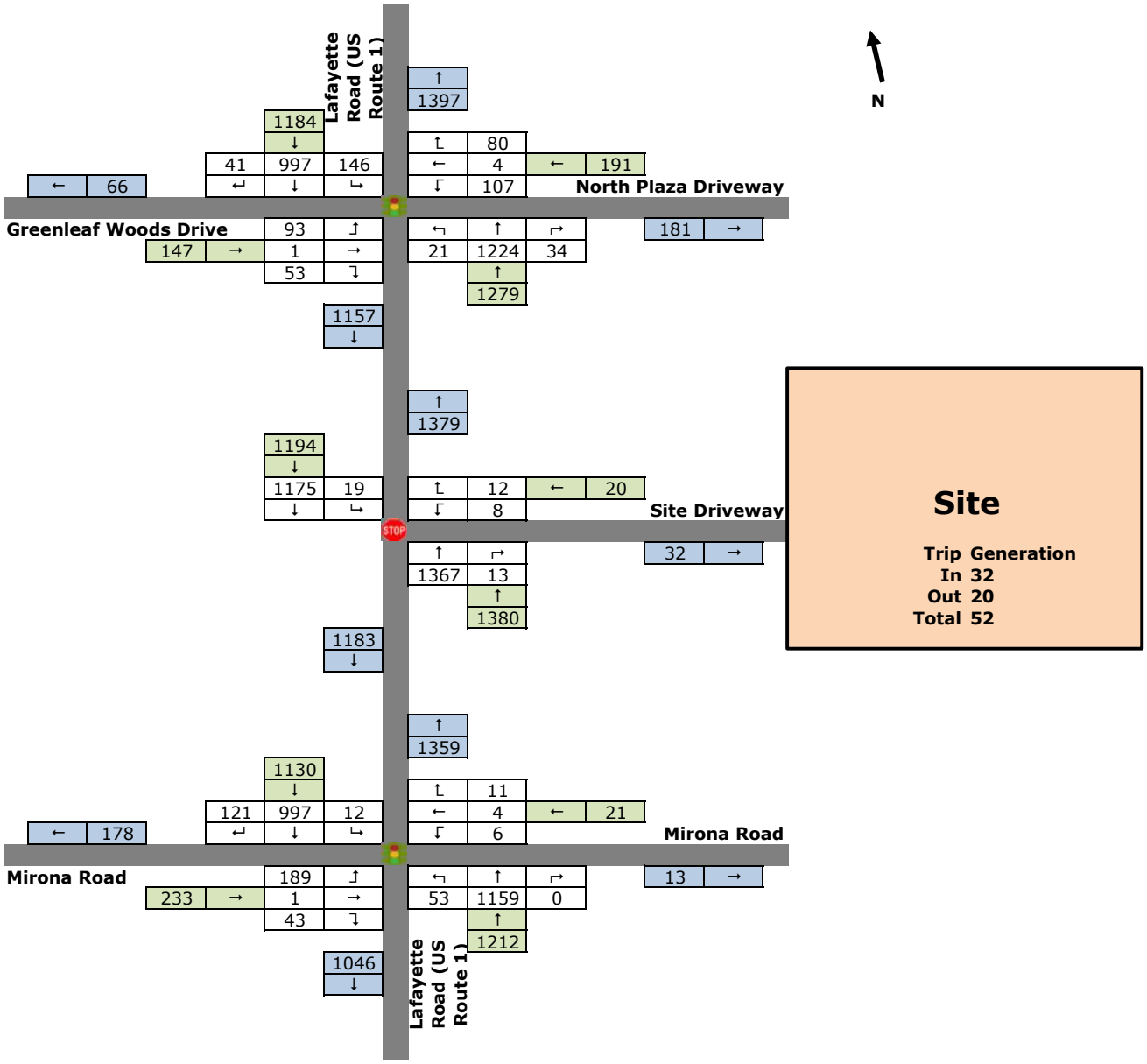
Site Generated Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 10



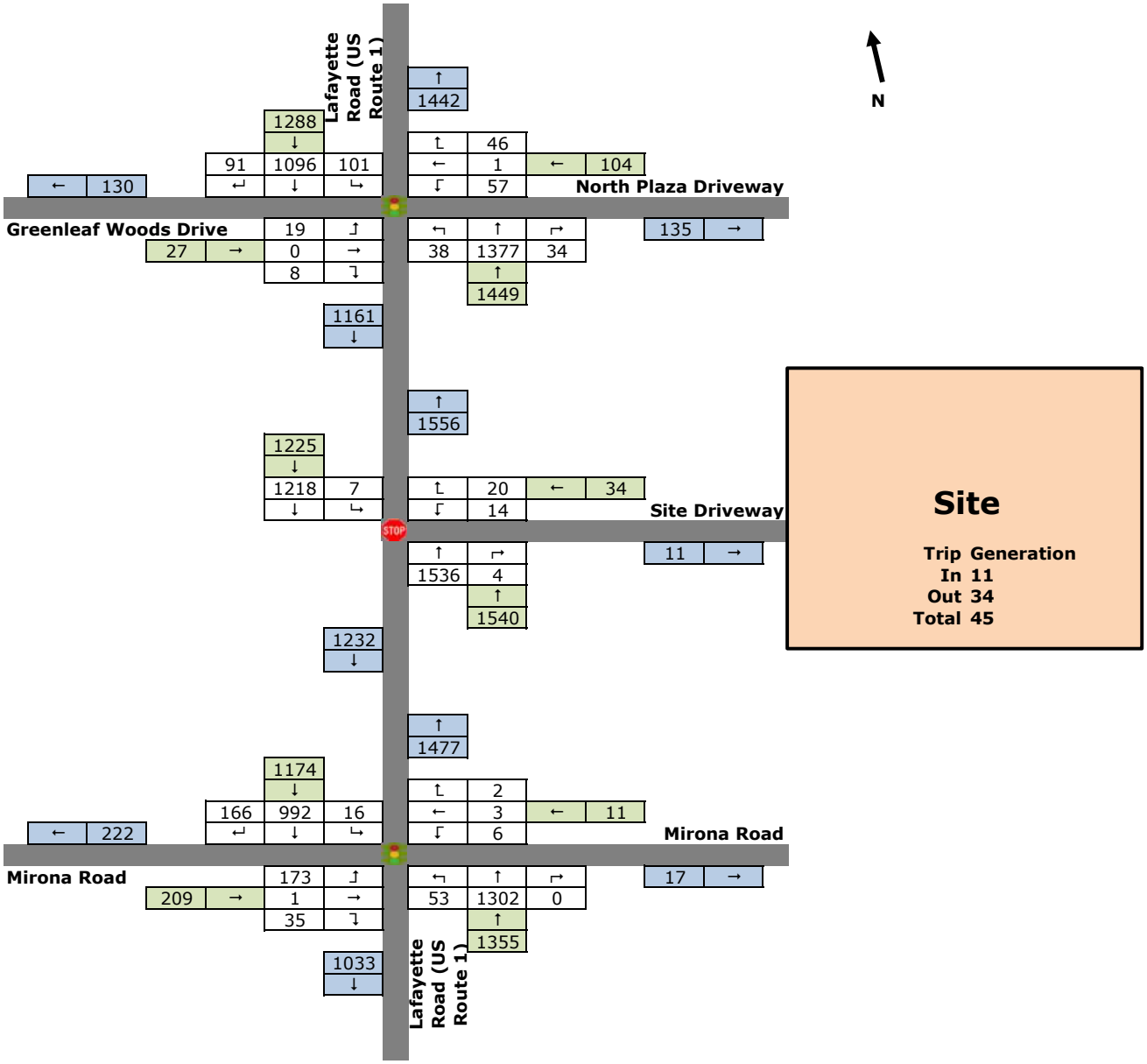
2025 Build Condition Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 11



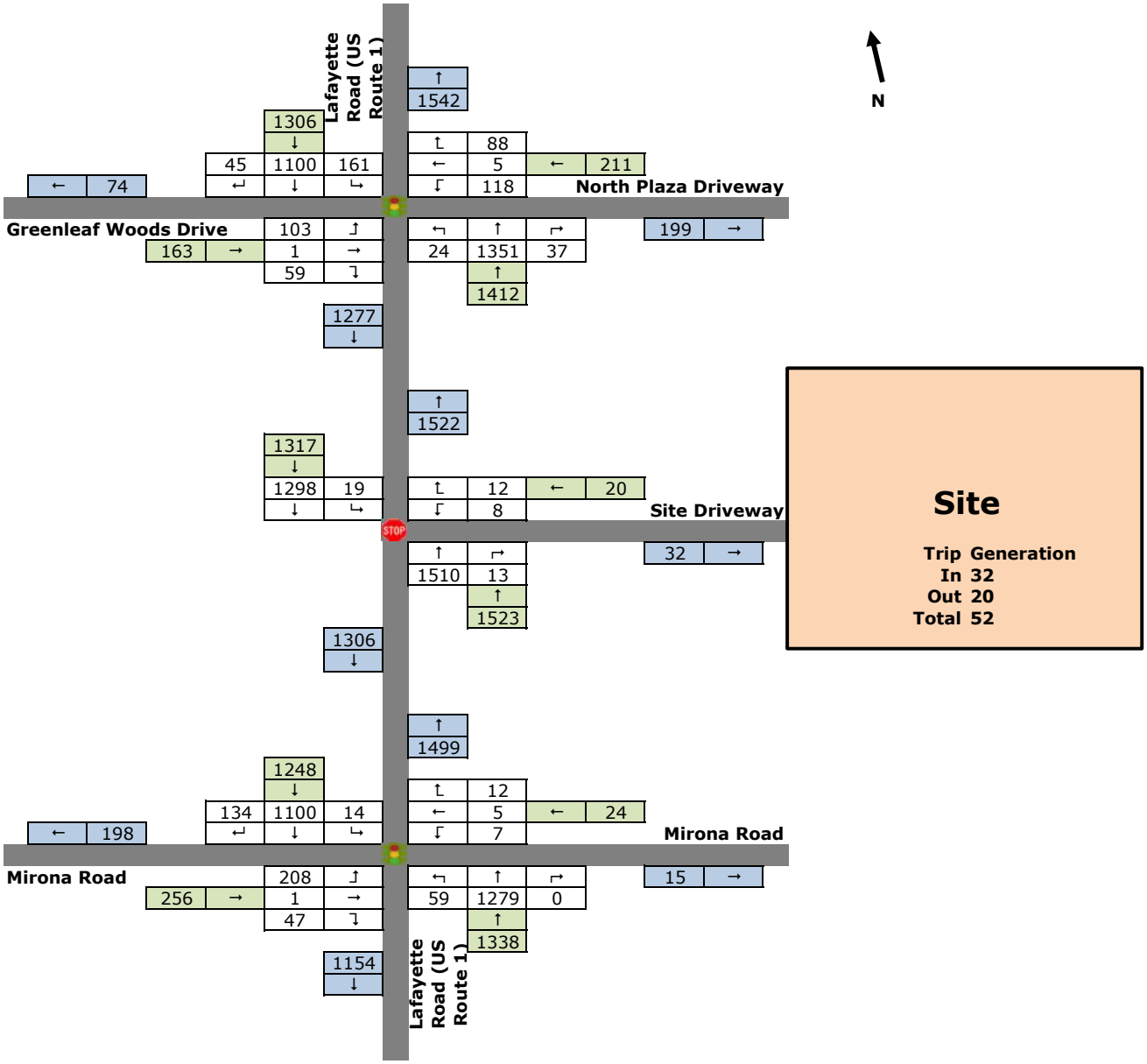
2025 Build Condition Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 12



2035 Build Condition Traffic Volumes
Weekday AM Peak
815 Lafayette Road Development

Figure 13



2035 Build Condition Traffic Volumes
Weekday PM Peak
815 Lafayette Road Development

Figure 14

APPENDIX A

Traffic Count Data

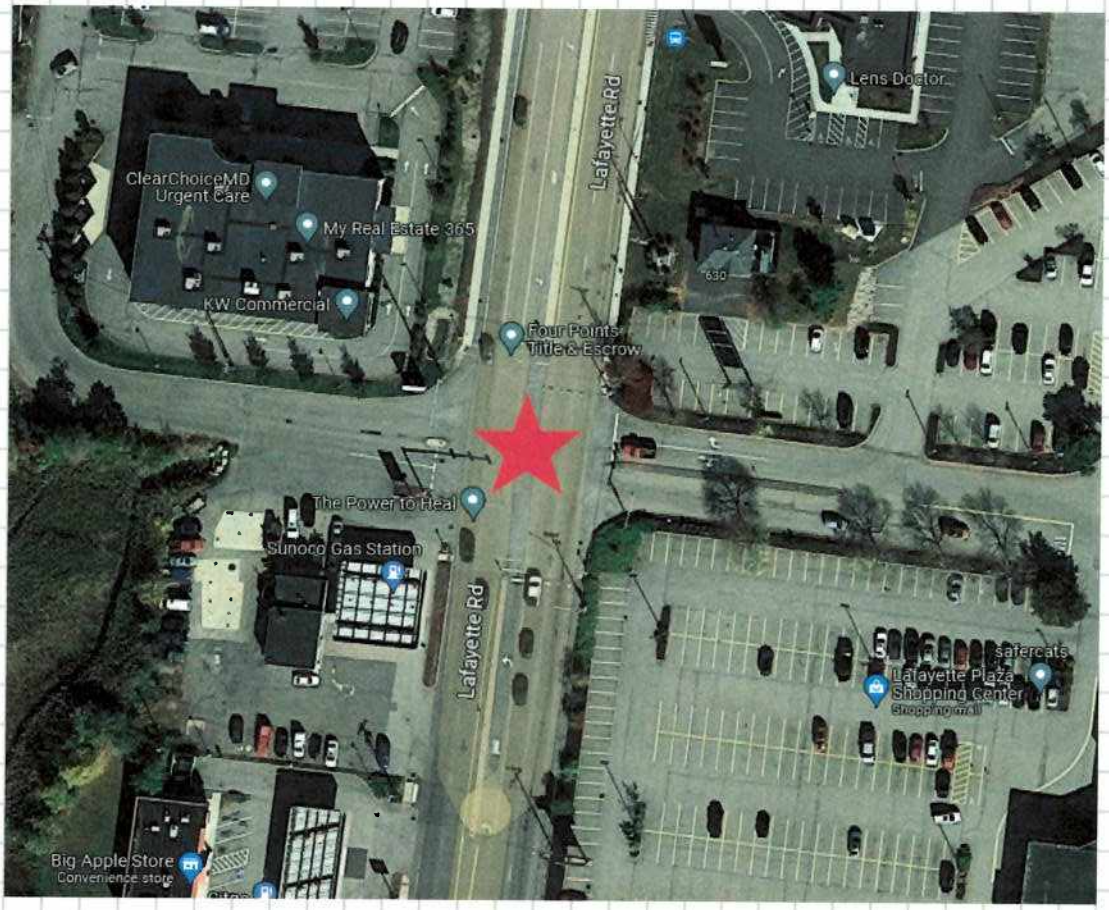
Stephen G. Pernaw & Company, Inc.

CALCULATION SHEET

Project:	VAI - Portsmouth	Job Number:	2268A
Calculated By:		Date:	
Checked By:		Date:	
Sheet No:		Of.	
Subject:	TMC Data - Intersection 1		

US1 - Lafayette Plaza North Driveway / Greenleaf Woods

Thursday May 25, (7:00 - 9:00 AM & 3:00 - 6:00 PM)

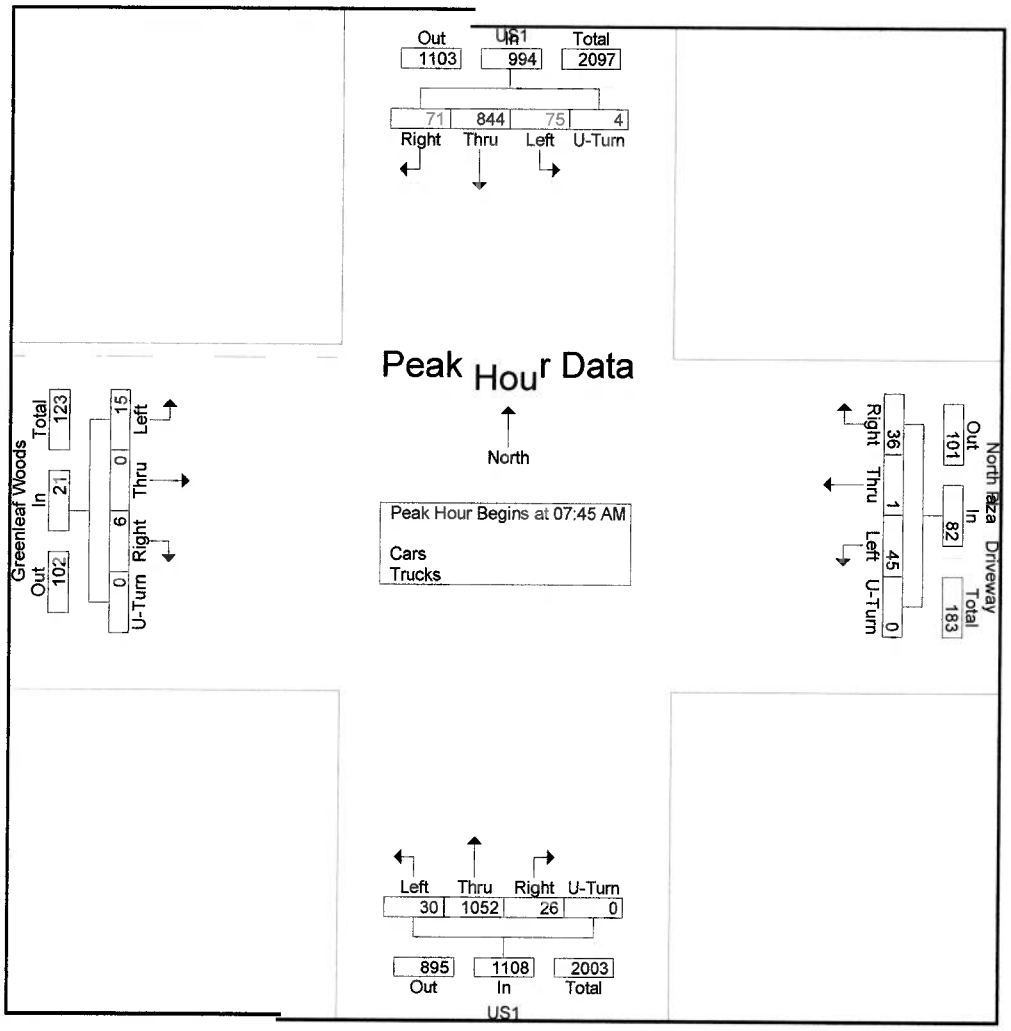


Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

File Name : 2268A_N_Plaza_1073869_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 2

	US1 From North					North Plaza Driveway From East					US1 From South					Greenleaf Woods From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07.00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	15	**217**	14	1	247	9	0	7	0	16	3	249	6	0	258	1	0	0	0	1	522
08:00 AM	11	201	15	**2**	229	10	0	11	0	21	7	**318**	8	0	**333**	1	0	**9**	0	**10**	593
08:15 AM	**25**	217	**24**	0	**266**	6	**1**	**16**	0	**23**	6	289	**10**	0	305	**2**	0	2	0	4	**598**
08:30 AM	20	209	22	1	252	**11**				22	**10**	196	6	0	212	2	0	4	0		
Total Volume	71	844	75	4			0	11	0	82	26	1052	30	0	1108	6				6	492
% App. Total	7.1	84.9	7.5	0.4	994	36	1	45	0		2.3	94.9	2.7	0		28.6	0	71.4	0	21	2205
PHF	.710	.972	.781	.500	.934	.818								.000	.832	.750	.000	.417	.000		
							.250	.703	.000	.891	.650	.827	.750							.525	.922



Stephen G. Pernaw & Company, Inc.

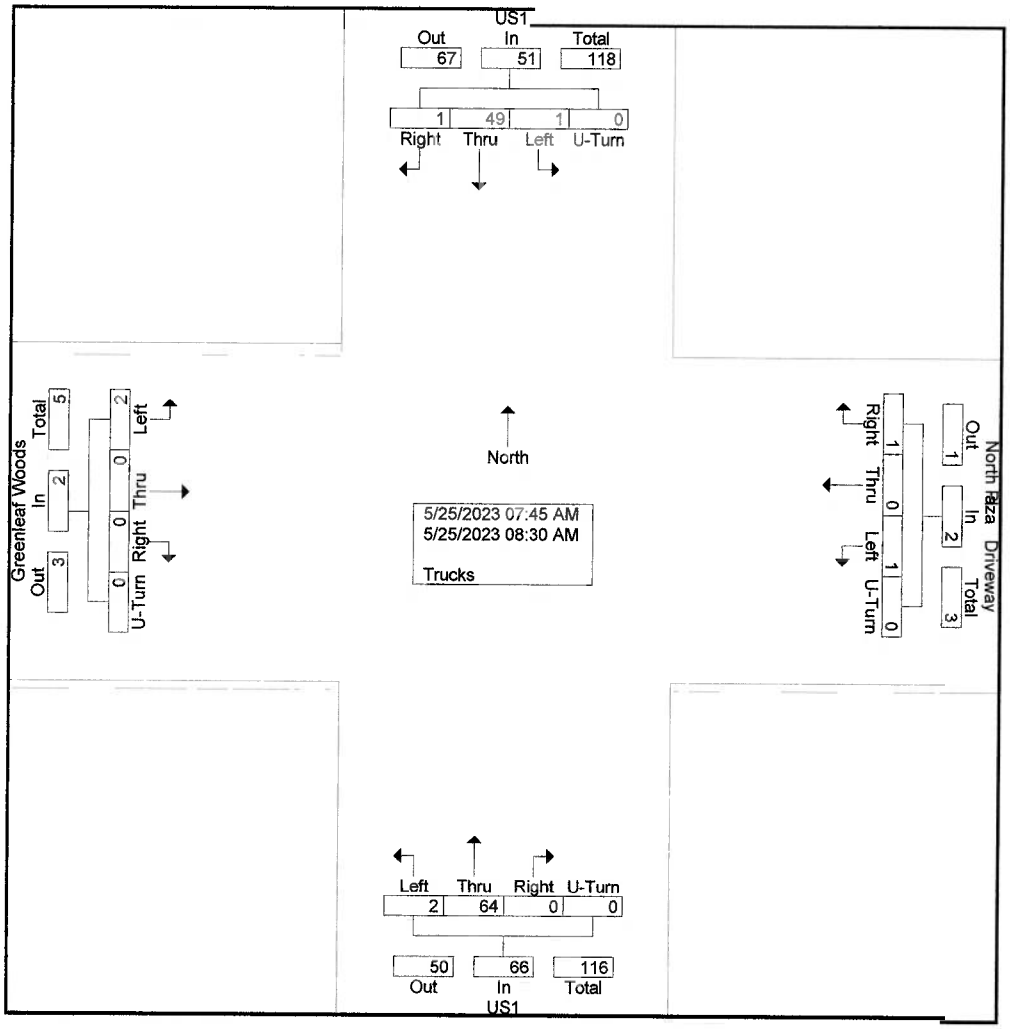
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Nu . 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_N_Plaza_1073869_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No . 1

Grou Printed- Trucks

	US1 From North					North Plaza Driveway From East					US1 From South					reenleaf Woods m West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:45 AM	0	13	0	0	13	1	0	0	0	1	0	17	1	0	18	0	0	0	0	0	32
Total	0	13	0	0	13	1	0	0	0	1	0	17	1	0	18	0	0	0	0	0	2
			0	0	13	1	0	0								0	0	0	0	0	3
08:00 AM	0	12	1	0	13	0	0	0	0	0	0	15	0	0	15	0	0	1	0	1	29
08:15 AM	0	12	0	0	12	0	0	1	0	1	0	19	1	0	20	0	0	0	0	0	33
08:30 AM	1	12	0	0	13	0	0	0	0	0	0	13	0	0	13	0	0	1	0	1	27
Grand Total	1	49	1	0	51	1	0	1	0	2	0	64	2	0	66	0	0	2	0	2	121
Apprch %	2	96.1	2	0		50	0	50	0		0	97	3	0		0	0	100	0		
Total %	0.8	40.5	0.8	0	42.1	0.8	0	0.8	0	1.7	0	52.9	1.7	0	54.5	0	0	1.7	0	1.7	



Stephen G. Pernaw & Company, Inc.

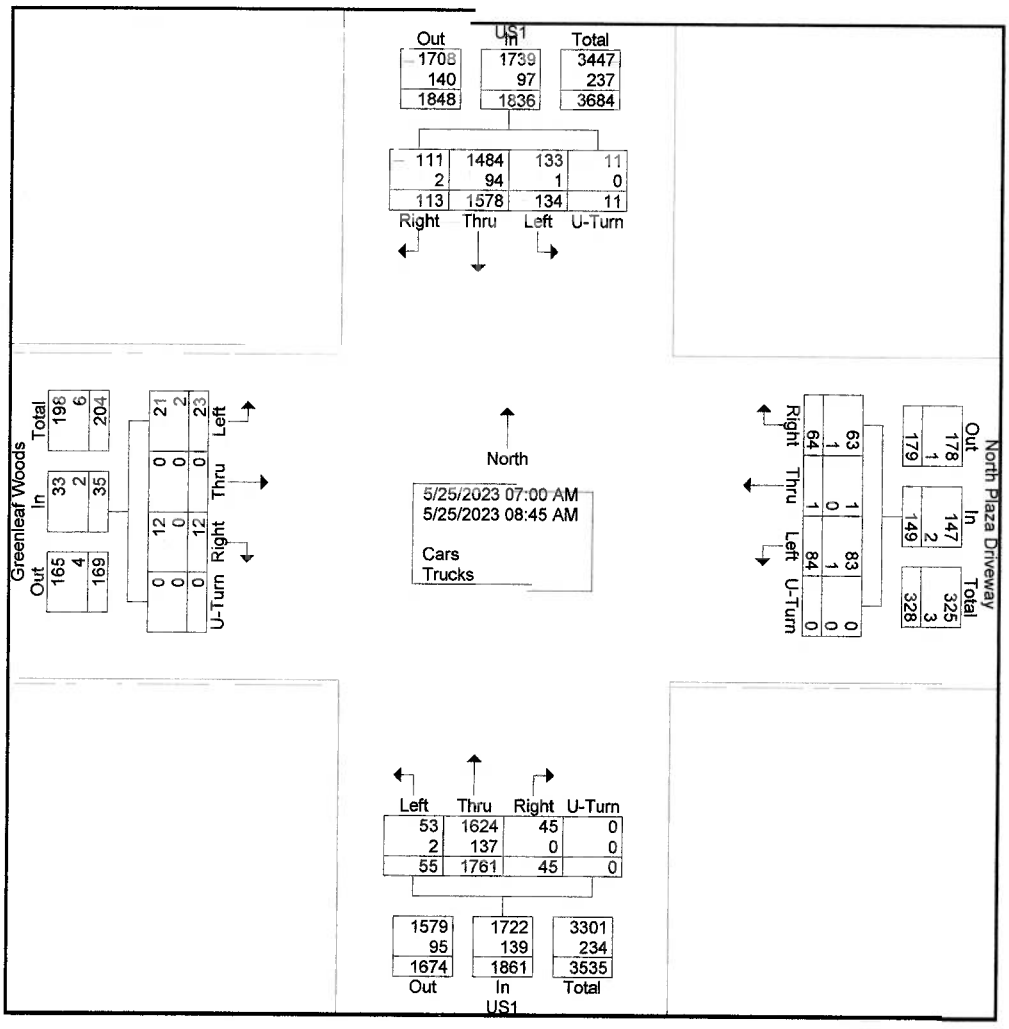
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_N_Plaza_1073869_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

s Printed- Cars - Trucks

Start Time	From North US1					From East North Plaza Driveway					From South US1					From West Greenleaf Woods					Int. Total
	R ht	u	orth			Right	Thru	Left	U-Turn	Total	R ht	Thru	Left	U-Turn	A	Right	Thru	Left	U-Turn	Total	
07:00 AM	ig 10	Thr	Left	U-Turn	App. Total					App 14	ig 2	138	Left	0	pp. Total					App. 3	354
07:15 AM	6	160	18	4	185	10	0	8	0	18	2	155	5	0	162	2	0	2	0	3	368
07:30 AM	10	196	6	2	214	5	0	12	0	17	5	203	8	0	216	1	0	1	0	2	449
07:45 AM	15	217	14	1	247	9	0	7	0	16	3	249	6	0	258	1	0	0	0	1	522
Total	41	743	51	7	842	30	0	35	0	65	12	745	20	0	777	5	0	4	0	9	1693
08:00 AM	11	201	15	2	229	10	0	11	0	21	7	318	8	0	333	1	0	9	0	10	593
08:15 AM	25	217	24	0	266	6	1	16	0	23	6	289	10	0	305	2	0	2	0	4	598
08:30 AM	20	209	22	1	252	11	0	11	0	22	10	196	6	0	212	2	0	4	0	6	492
08:45 AM	16	208	22	1	247	7	0	11	0	18	10	213	11	0	234	2	0	4	0	6	505
Total	72	835	83	4	994	34	1	49	0	84	33	1016	35	0	1084	7	0	19	0	26	2188
Grand Total	113	1578	134	11	1836	64	1	84	0	149	45	1761	55	0	1861	12	0	23	0	35	3881
Apprch %	6.2	85.9	7.3	0.6		43	0.7	56.4	0		2.4	94.6	3	0		34.3	0	65.7	0		
Total %	2.9	40.7	3.5	0.3	47.3	1.6	0	2.2	0	3.8	1.2	45 4	1.4	0	48	0.3	0	0.6	0	0.9	
Cars	111	1484	133	11	1739	63	1	83	0	147	45	1624	53	0	1722	12	0	21	0	33	3641
% Cars	98.2	94	99.3	100	94.7	98.4	100	98.8	0	98.7	100	92.2	96.4	0	92.5	100	0	91.3	0	94.3	93.8
Trucks	2	94	1	0	97	1	0	1	0	2	0	137	2	0	139	0	0	2	0	2	240
% Trucks	1.8	6	0.7	0	5.3	1.6	0	1.2	0	1.3	0	7.8	3.6	0	7.5	0	0	8.7	0	5.7	6.2



Stephen G. Pernaw & Company, Inc.

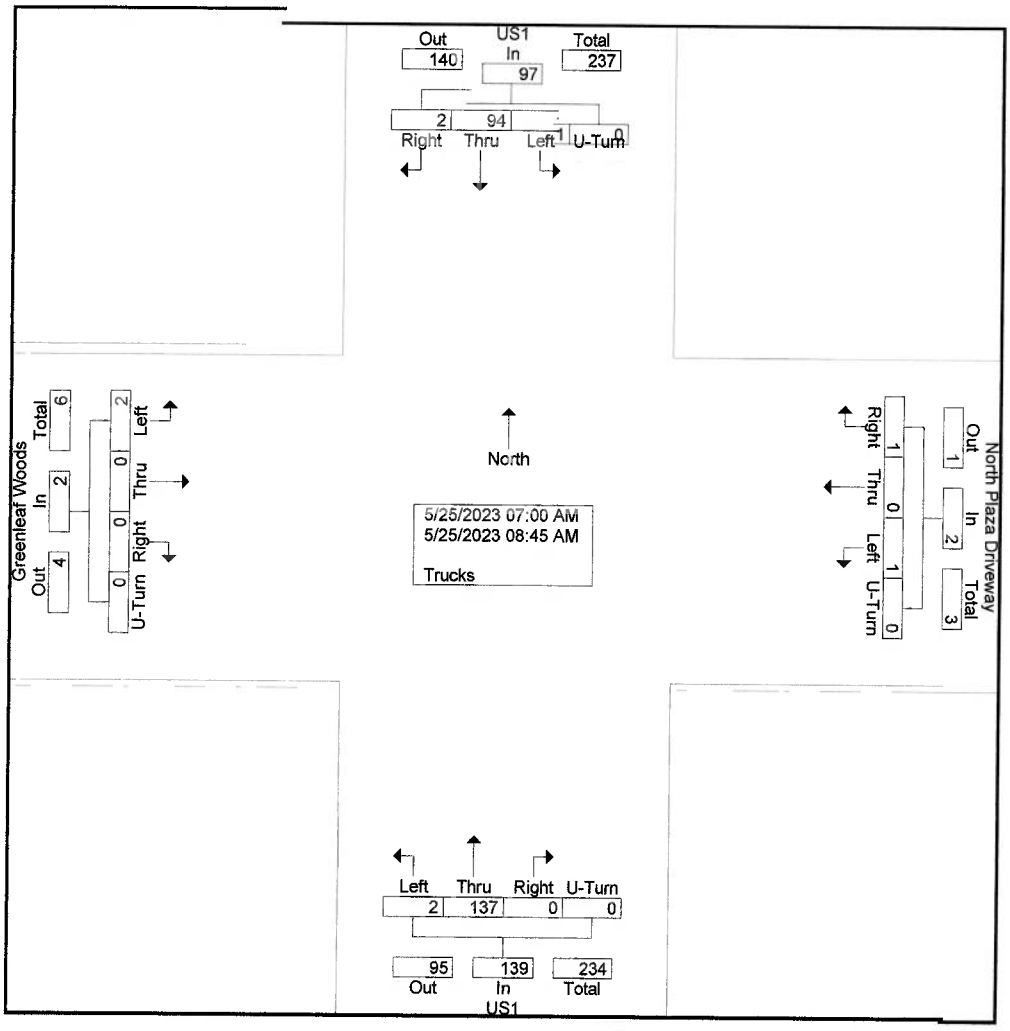
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_N_Plaza_1073869_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Trucks

	US1 From North					North Plaza Driveway From East					US1 From South					Green Leaf Woods From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	0	9	0	0	9	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	23
07:15 AM	0	6	0	0	6	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	20
07:30 AM	0	17	0	0	17	0	0	0	0	0	0	24	0	0	24	0	0	0	0	0	41
07:45 AM	0	13	0	0	13	1	0	0	0	1	0	17	1	0	18	0	0	0			32
Total	0	45	0	0	45	1	0	0	0	1	0	69	1	0	70	0			0	0	
																	0	0	0	0	116
08:00 AM	0	12	1	0	13	0	0	0	0	0	0	15	0	0	15	0	0	1	0	1	29
08:15 AM	0	12	0	0	12	0	0	1	0	1	0	19	1	0	20	0	0	0	0	0	33
08:30 AM	1	12	0	0	13	0	0	0	0	0	0	13	0	0	13	0	0	1	0	1	27
08:45 AM	1	13	0	0	14	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	35
Total	2	49	1	0	52	0	0	1	0	1	0	68	1	0	69	0	0	2	0	2	124
Grand Total	2	94	1	0	97	1	0	1	0	2	0	137	2	0	139	0	0	2	0	2	240
Apprch %	2.1	96.9	1	0		50	0	50	0		0	98.6	1.4	0		0	0	100	0		
Total %	0.8	39.2	0.4	0	40.4	0.4	0	0.4	0	0.8	0	57.1	0.8	0	57.9	0	0	0.8	0	0.8	

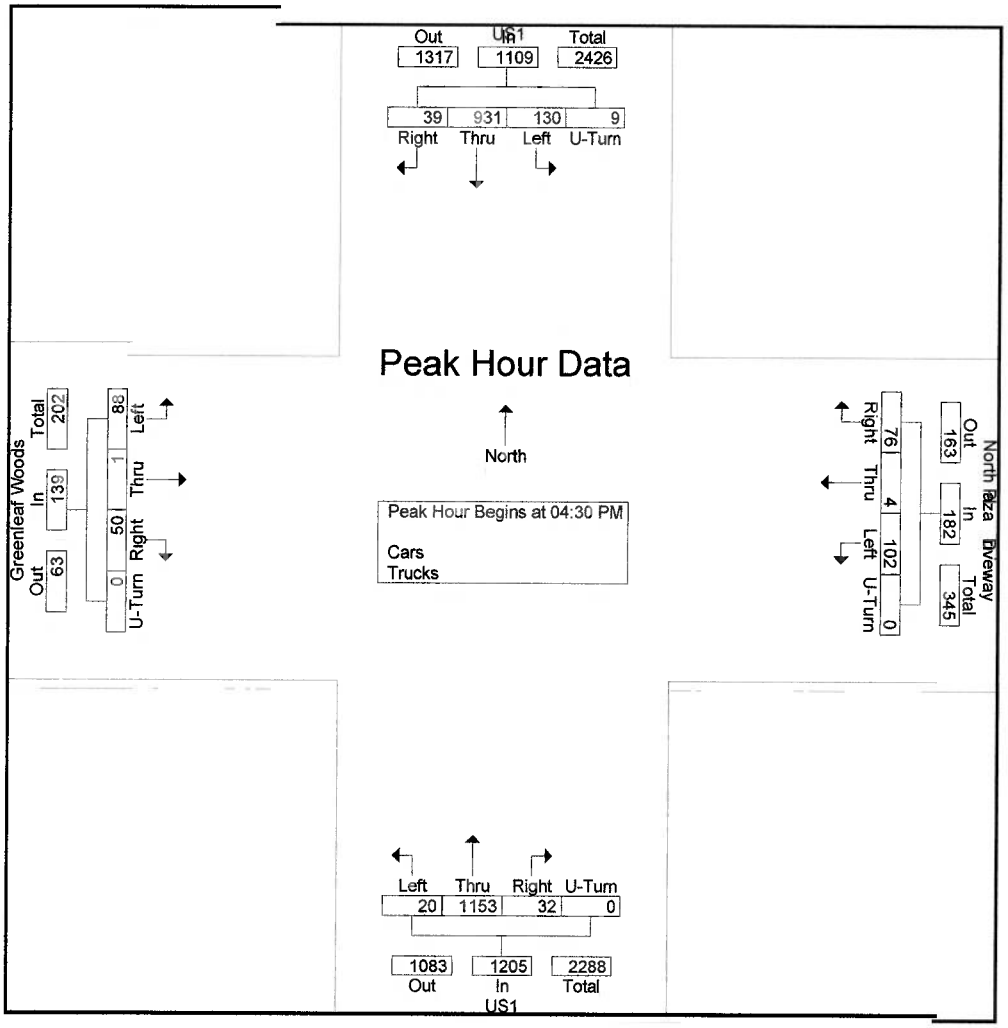


Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

File Name : 2268A_N_Plaza_1073872_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 3

	US1 From North					North Plaza Driveway From East					US1 From South					Greenleaf Woods From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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	7	224	32	3	266	17	0	27	0	44	2	278	5	0	285	**16**	0	21	0	37	632
04.45 PM	8	**276**	**37**	**4**	**325**	15	0	12	0	27	9	245	3	0	257	12	0	20	0	32	641
05:00 PM	9	211	35	1	256	**22**	1	**40**	0	**63**	7	313	**6**	0	326	13	**1**	**32**	0	**46**	**691**
05:15 PM	**15**	220	26	1				23	0	48	**14**	**317**	6	0	**337**	9	0	15	0	24	1
Total Volume	39	931	130	9	262	22	2	1	0	182	32	1153	20	0	1205	50	1				67
% App. Total	3.5	83.9	11.7	0.8	1109	41.8	2.2	56	0		2.7	95.7	1.7	0		36	0.7	63.9	0	139	2635
PHF	.650	.843											.833	.000	.894	.781	.250	.688	.000	.755	
			.878	.563	.853	.864	.333	.638	.000	.722	.571	.909									.953



Stephen G. Pernaw & Company, Inc.

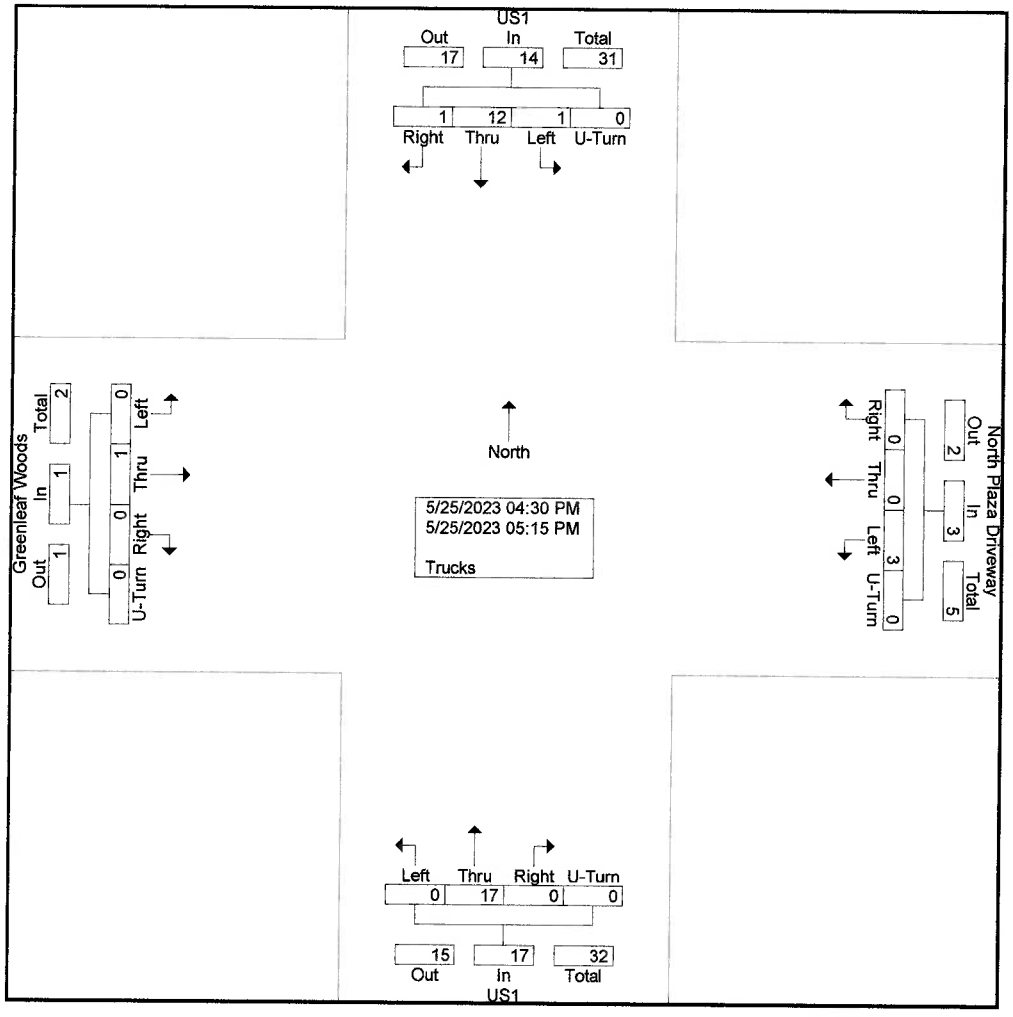
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_N_Plaza_1073872_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Trucks

	US1 From North					North Plaza Driveway From East					US1 From South					Greenleaf Woods From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
04:30 PM	0	4	1	0	5	0	0	1	0	1	0	6	0	0	6	0	0	0	0	0	12
04:45 PM	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7
Total	0	7	1	0	8	0	0	1	0	1	0	10	0	0	10	0	0	0	0	0	19
05:00 PM	1	3	0	0	4	0	0	2	0	2	0	2	0	0	2	0	1	0	0	1	9
05:15 PM	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	7
Grand Total	1	12	1	0	14	0	0	3	0	3	0	17	0	0	17	0	1	0	0	1	35
Apprch %	7.1	85.7	7.1	0		0	0	100	0		0	100	0	0		0	100	0	0		
Total %	2.9	34.3	2.9	0	40	0	0	8.6	0	8.6	0	48.6	0	0	48.6	0	2.9	0	0	2.9	



Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_N_Plaza_1073872_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

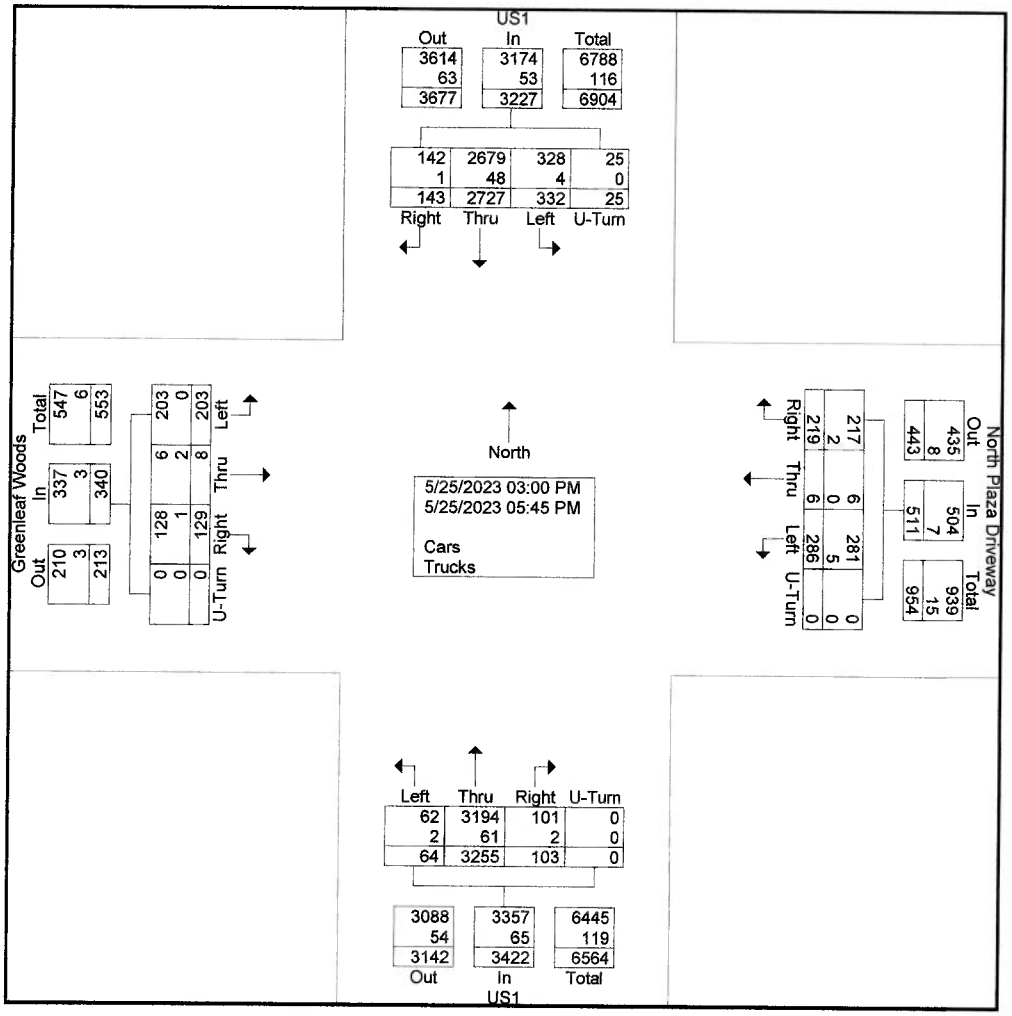
Groups Printed- Cars - Trucks

	US1 From North					North Plaza Driveway From East					US1 From South					Greenleaf Woods From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	17	220	25	0	262	19	0	19	0	38	5	278	3	0	286	14	1	18	0	33	619
03:15 PM	8	230	20	1	259	18	1	39	0	58	11	275	8	0	294	8	0	2	0	10	621
03:30 PM	27	224	22	4	277	14	0	22	0	36	5	247	10	0	262	15	0	15	0	30	605
03:45 PM	15	246	22	1	284	13	0	15	0	28	11	238	6	0	255	8	3	20	0	31	598
Total	67	920	89	6	1082	64	1	95	0	160	32	1038	27	0	1097	45	4	55	0	104	2443
04:00 PM	22	222	27	3	274	27	0	29	0	56	9	264	7	0	280	10	2	24	0	36	646
04:15 PM	11	260	27	4	302	18	1	13	0	32	7	275	3	0	285	14	0	15	0	29	648
04:30 PM	7	224	32	3	266	17	0	27	0	44	2	278	5	0	285	16	0	21	0	37	632
04:45 PM	8	276	37	4	325	15	0	12	0	27	9	245	3	0	257	12	0	20	0	32	641
Total	48	982	123	14	1167	77	1	81	0	159	27	1062	18	0	1107	52	2	80	0	134	2567
05:00 PM	9	211	35	1	256	22	1	40	0	63	7	313	6	0	326	13	1	32	0	46	691
05:15 PM	15	220	26	1	262	22	3	23	0	48	14	317	6	0	337	9	0	15	0	24	671
05:30 PM	1	204	27	1	233	18	0	23	0	41	13	288	0	0	301	7	1	12	0	20	595
05:45 PM	3	190	32	2	227	16	0	24	0	40	10	237	7	0	254	3	0	9	0	12	533
Total	28	825	120	5	978	78	4	110	0	192	44	1155	19	0	1218	32	2	68	0	102	2490
Grand Total	143	2727	332	25	3227	219	6	286	0	511	103	3255	64	0	3422	129	8	203	0	340	7500
Apprch %	4.4	84.5	10.3	0.8		42.9	1.2	56	0		3	95.1	1.9	0		37.9	2.4	59.7	0		
Total %	1.9	36.4	4.4	0.3	43	2.9	0.1	3.8	0	6.8	1.4	43.4	0.9	0	45.6	1.7	0.1	2.7	0	4.5	
Cars	142	2679	328	25	3174	217	6	281	0	504	101	3194	62	0	3357	128	6	203	0	337	7372
% Cars	99.3	98.2	98.8	100	98.4	99.1	100	98.3	0	98.6	98.1	98.1	96.9	0	98.1	99.2	75	100	0	99.1	98.3
Trucks	1	48	4	0	53	2	0	5	0	7	2	61	2	0	65	1	2	0	0	3	128
% Trucks	0.7	1.8	1.2	0	1.6	0.9	0	1.7	0	1.4	1.9	1.9	3.1	0	1.9	0.8	25	0	0	0.9	1.7

Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

File Name : 2268A_N_Plaza_1073872_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 2



Stephen G. Pernaw & Company, Inc.

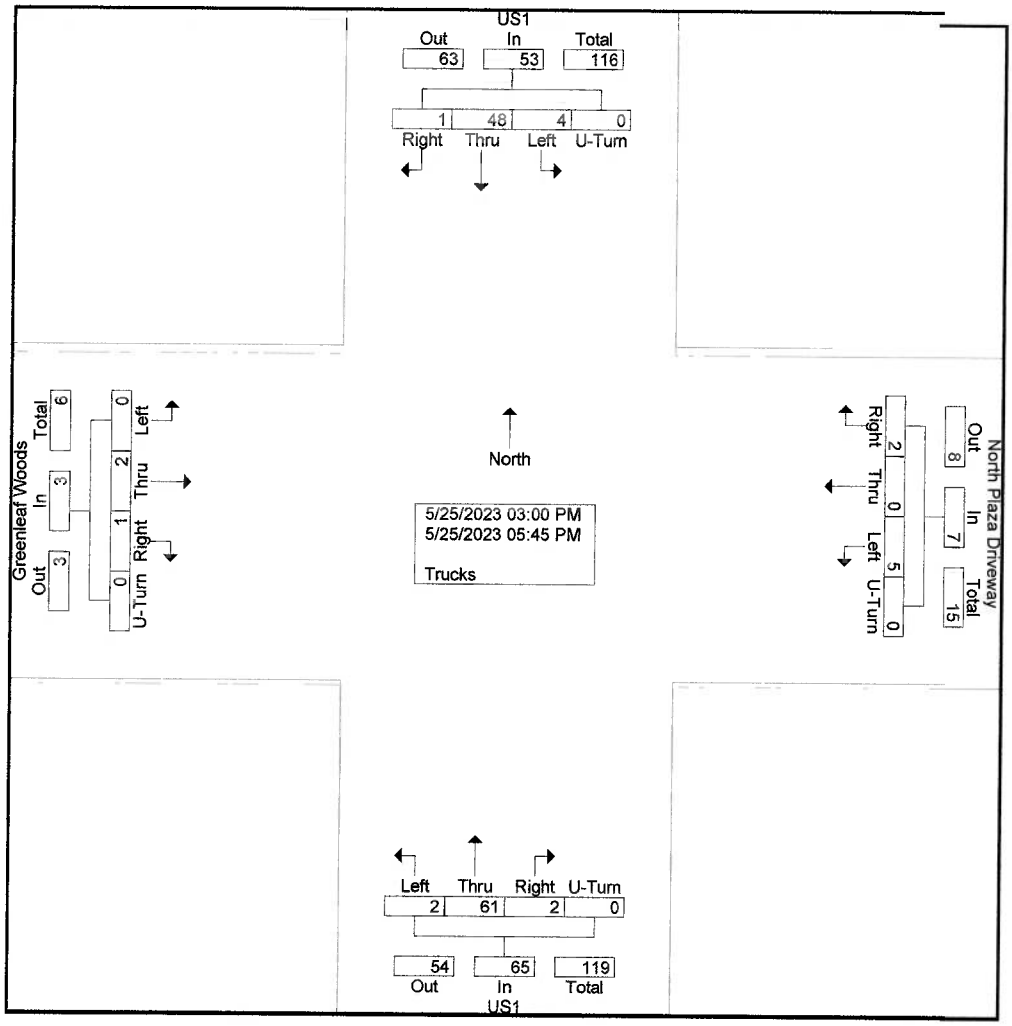
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_N_Plaza_1073872_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Trucks

	US1 From North					North Plaza Driveway From East					US1 From South					Greenleaf Woods From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	0	4	1	0	5	1	0	1	0	2	0	9	0	0	9	0	0	0	0	0	16
03:15 PM	0	8	0	0	8	0	0	1	0	1	1	10	0	0	11	0	0	0	0	0	20
03:30 PM	0	10	0	0	10	0	0	0	0	0	0	4	2	0	6	1	0	0	0	1	17
03:45 PM	0	6	1	0	7	1	0	0	0	1	0	11	0	0	11	0	1			1	20
Total	0	28	2	0	30	2	0	2	0	4	1	34	2	0	37			0	0	2	73
																1	1	0	0		
04:00 PM	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	9
04:15 PM	0	2	1	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
04:30 PM	0	4	1	0	5	0	0	1	0	1	0	6	0	0	6	0	0	0	0	0	12
04:45 PM	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7
Total	0	13	2	0	15	0	0	1	0	1	0	17	0	0	17	0	0	0	0	0	33
05:00 PM	1	3	0	0	4	0	0	2	0	2	0	2	0	0	2	0	1	0	0	1	9
05:15 PM	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	7
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
05:45 PM	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	3
Total	1	7	0	0	8	0	0	2	0	2	1	10	0	0	11	0	1	0	0	1	22
Grand Total	1	48	4	0	53	2	0	5	0	7	2	61	2	0	65	1	2	0	0	3	128
Apprch %	1 9	90.6	7.5	0		28.6	0	71.4	0		3.1	93.8	3.1	0		33.3	66.7	0	0		
Total %	0:8	37.5	3.1	0	41 4	1.6	0	3.9	0	5.5	1.6	47.7	1.6	0	50.8	0.8	1.6	0	0	2.3	



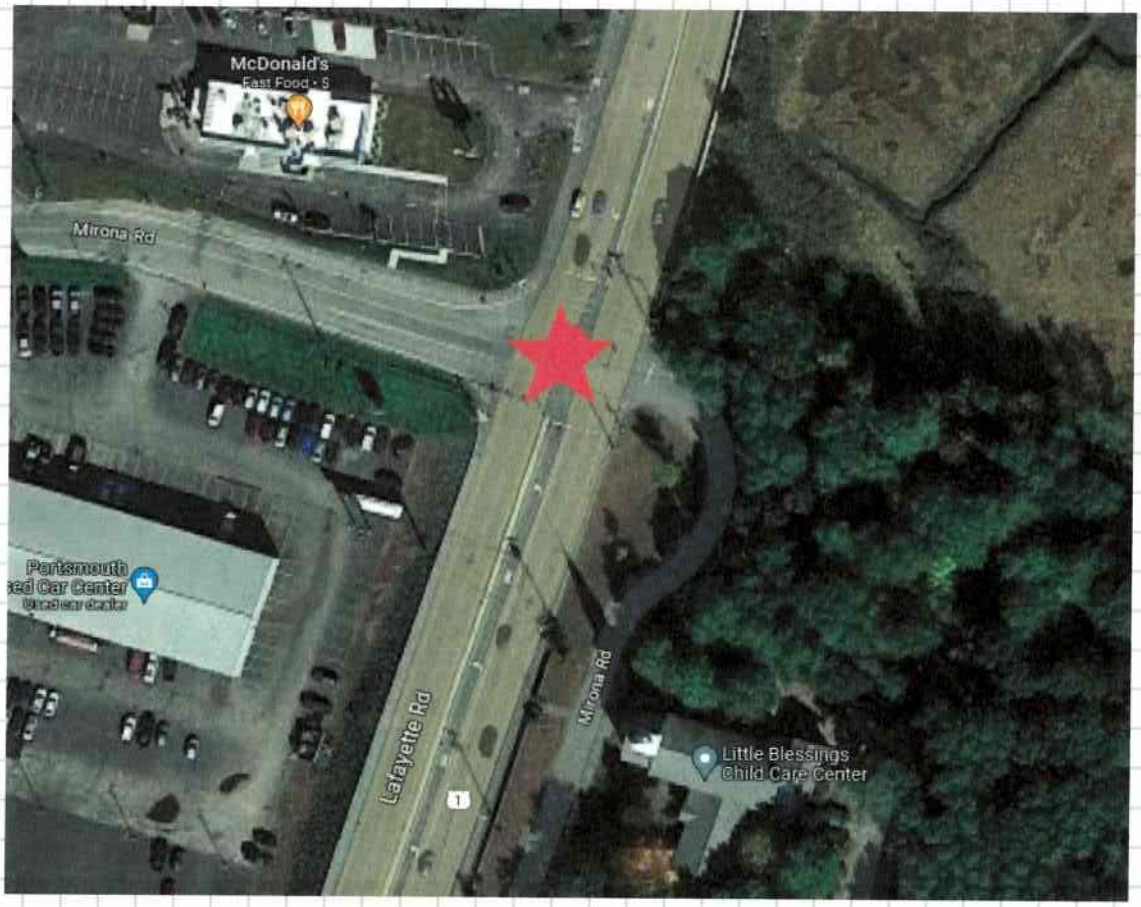
CALCULATION SHEET

Stephen G. Pernaw & Company, Inc.

Project:	VAI - Portsmouth	Job Number:	2268A
Calculated By:		Date:	
Checked By:		Date:	
Sheet No:		Of:	
Subject:	TMC Data - Intersection 3		

US1 - Mirona Road

Thursday, May 25, (7:00 - 9:00 AM & 3:00 - 6:00 PM)

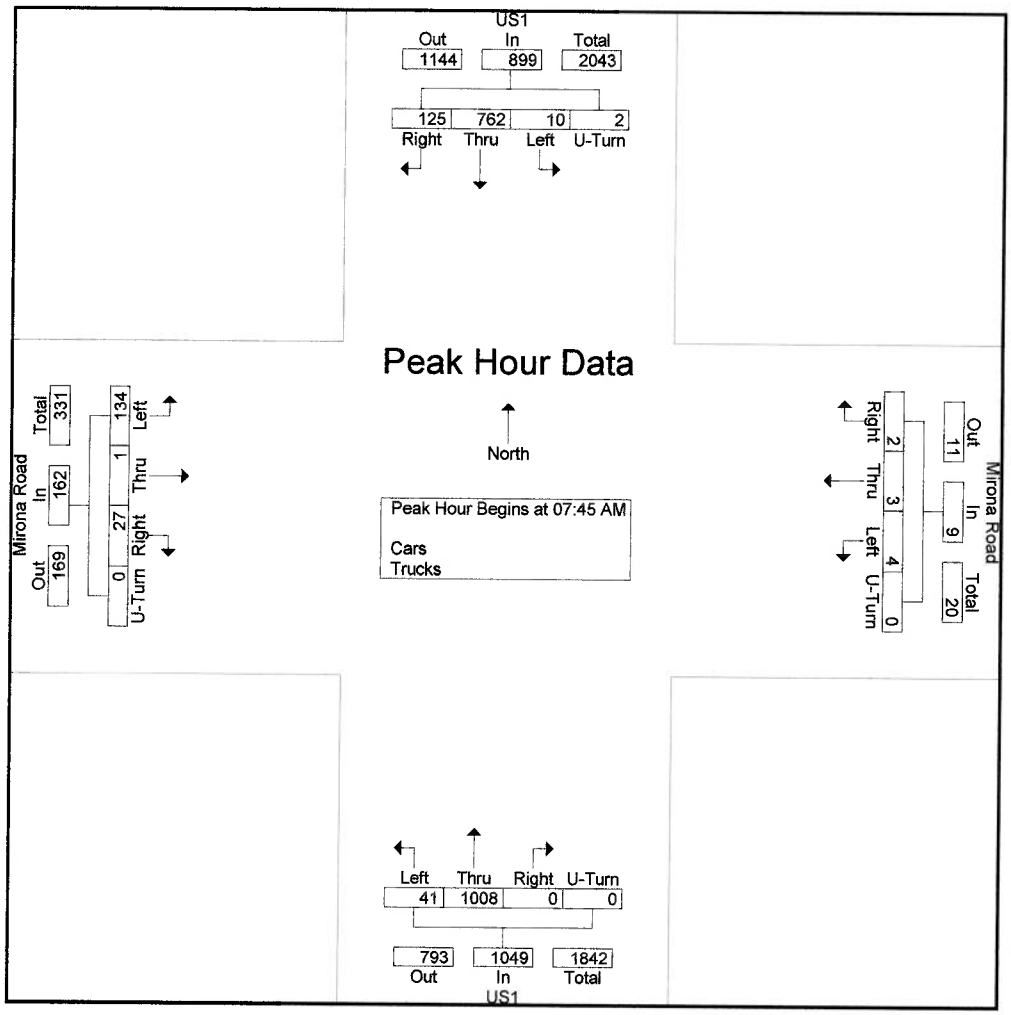


Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

File Name : 2268A_Mirona_1073884_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 2

	US1 From North					Mirona Road From East					US1 From South					Mirona Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	**40**	188	**3**	**1**	232	0	0	0	0	0	0	249	9	0	258	2	0	33	0	35	525
08:00 AM	29	172	2	0	203	0	**2**	1	0	3	0	**297**	**15**	0	**312**	**9**	**1**	**41**	0	**51**	**569**
08:15 AM	26	**213**	3	0	**242**	**1**	0	1	0	2	0	266	11	0	277	9	0	38	0	47	568
08:30 AM	30	189	2	1	222	1	1	**2**	0	**4**	0	196	6	0	202	7	0	22	0	29	457
Total Volume	125	762	10	2	899	2	3	4	0	9	0	1008	41	0	1049	27	1	134	0	162	2119
% App. Total	13.9	84.8	1.1	0.2		22.2	33.3	44.4	0		0	96.1	3.9	0		16.7	0.6	82.7	0		
PHF	.781	.894	.833	.500	.929	.500	.375	.500	.000	.563	.000	.848	.683	.000	.841	.750	.250	.817	.000	.794	.931



Stephen G. Pernaw & Company, Inc.

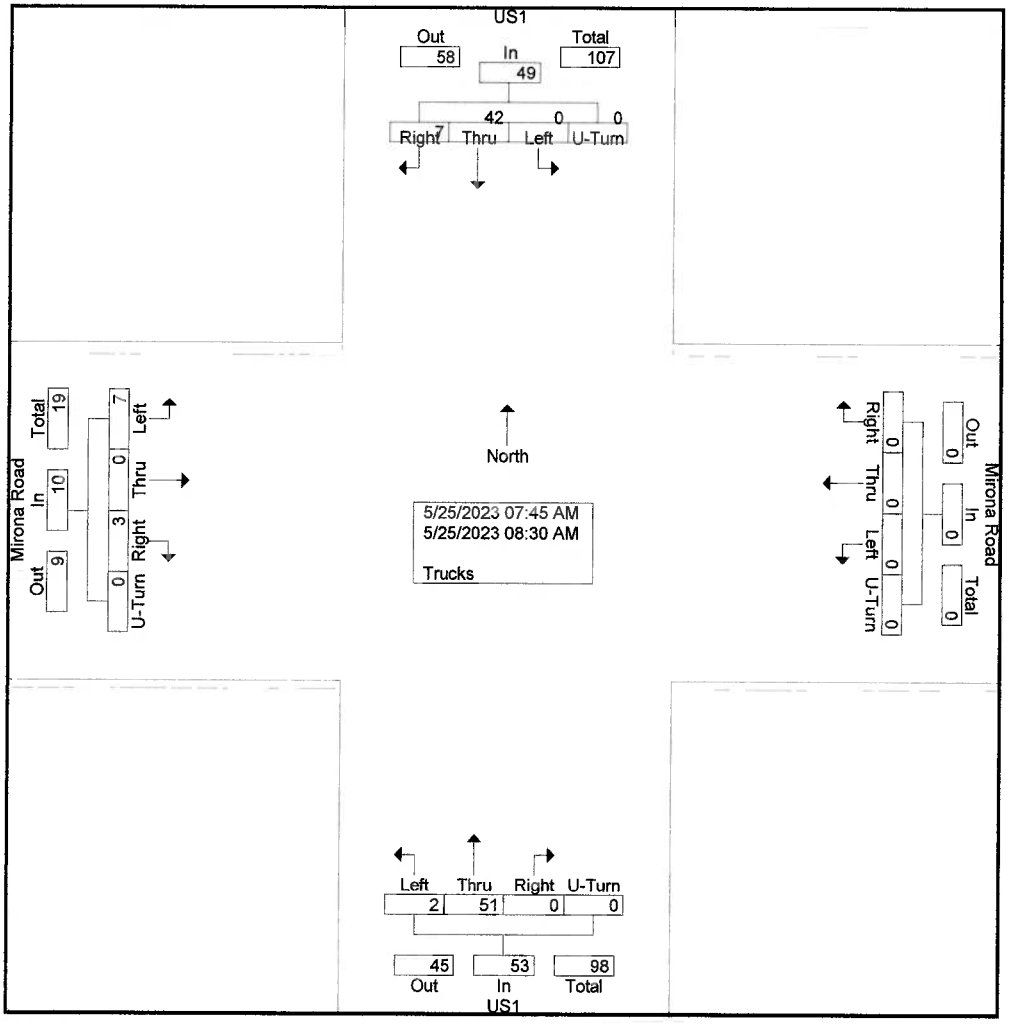
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_Mirona_1073884_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Printed- Trucks Groups

Start Time	US1 From North Right	Thru	Left	U-Turn	App. Total	Mirona Road From East Right	Thru	Left	U-Turn	App. Total	US1 From South Right	Thru	Left	U-Turn	App. Total	Mirona Road From West Right	Thru	Left	U-Turn	App. Total	Int. Total
07:45 AM	0	16	0	0	16	0	0	0	0	0	0	14	0	0	14	1	0	1	0	2	32
Total	0	16	0	0	16											1	0	1	0	2	32
08:00 AM	3	9	0	0	12	0	0	0	0	0	0	12	2	0	14	1	0	2	0	3	29
08:15 AM	3	9	0	0	12	0	0	0	0	0	0	14	0	0	14	1	0	3	0	4	30
08:30 AM	1	8	0	0	9	0	0	0	0	0	0	11	0	0	11	0	0	1	0	1	21
Grand Total	7	42	0	0	49	0	0	0	0	0	0	51	2	0	53	3	0	7	0	10	112
Apprch %	14.3	85.7	0	0		0	0	0	0		0	96.2	3.8	0		30	0	70	0		
Total %	6.2	37.5	0	0	43.8	0	0	0	0	0	0	45.5	1.8	0	47.3	2.7	0	6.2	0	8.9	



Stephen G. Pernaw & Company, Inc.

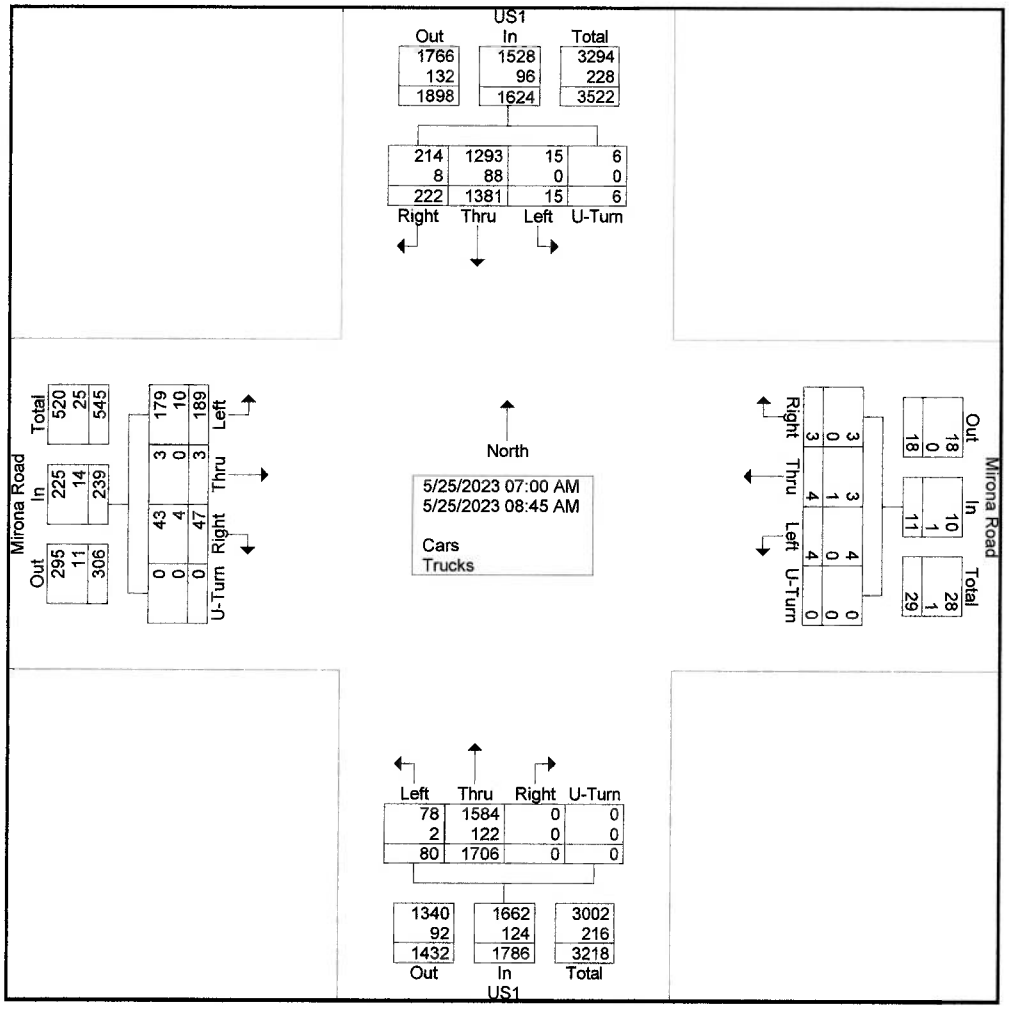
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_Mirona_1073884_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Cars - Trucks

	US1 From North					Mirona Road From East					US1 From South					Mirona Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	23	130	2	1	156	1	0	0	0	1	0	134	12	0	146	2	0	7	0	9	312
07:15 AM	20	159	1	0	180	0	1	0	0	1	0	167	6	0	173	2	0	8	0	10	364
07:30 AM	35	149	1	3	188	0	0	0	0	0	0	188	13	0	201	7	1	19	0	27	416
07:45 AM	40	188	3	1	232	0	0	0	0	0	0	249	9	0	258	2	0	33	0	35	525
Total	118	626	7	5	756	1	1	0	0	2	0	738	40	0	778	13	1	67	0	81	1617
08:00 AM	29	172	2	0	203	0	2	1	0	3	0	297	15	0	312	9	1	41	0	51	569
08:15 AM	26	213	3	0	242	1	0	1	0	2	0	266	11	0	277	9	0	38	0	47	568
08:30 AM	30	189	2	1	222	1	1	2	0	4	0	196	6	0	202	7	0	22	0	29	457
08:45 AM	19	181	1	0	201	0	0	0	0	0	0	209	8	0	217	9	1	21	0	31	449
Total	104	755	8	1	868	2	3	4	0	9	0	968	40	0	1008	34	2	122	0	158	2043
Grand Total	222	1381	15	6	1624	3	4	4	0	11	0	1706	80	0	1786	47	3	189	0	239	3660
Apprch %	13.7	85	0.9	0.4		27.3	36.4	36.4	0		0	95.5	4.5	0		19.7	1.3	79.1	0		
Total %	6.1	37.7	0.4	0.2	44.4	0.1	0.1	0.1	0	0.3	0	46.6	2.2	0	48.8	1.3	0.1	5.2	0	6.5	
Cars	214	1293	15	6	1528	3	3	4	0	10	0	1584	78	0	1662	43	3	179	0	225	3425
% Cars	96.4	93.6	100	100	94.1	100	75	100	0	90.9	0	92.8	97.5	0	93.1	91.5	100	94.7	0	94.1	93.6
Trucks	8	88	0	0	96	0	1	0	0	1	0	122	2	0	124	4	0	10	0	14	235
% Trucks	3.6	6.4	0	0	5.9	0	25	0	0	9.1	0	7.2	2.5	0	6.9	8.5	0	5.3	0	5.9	6.4



Stephen G. Pernaw & Company, Inc.

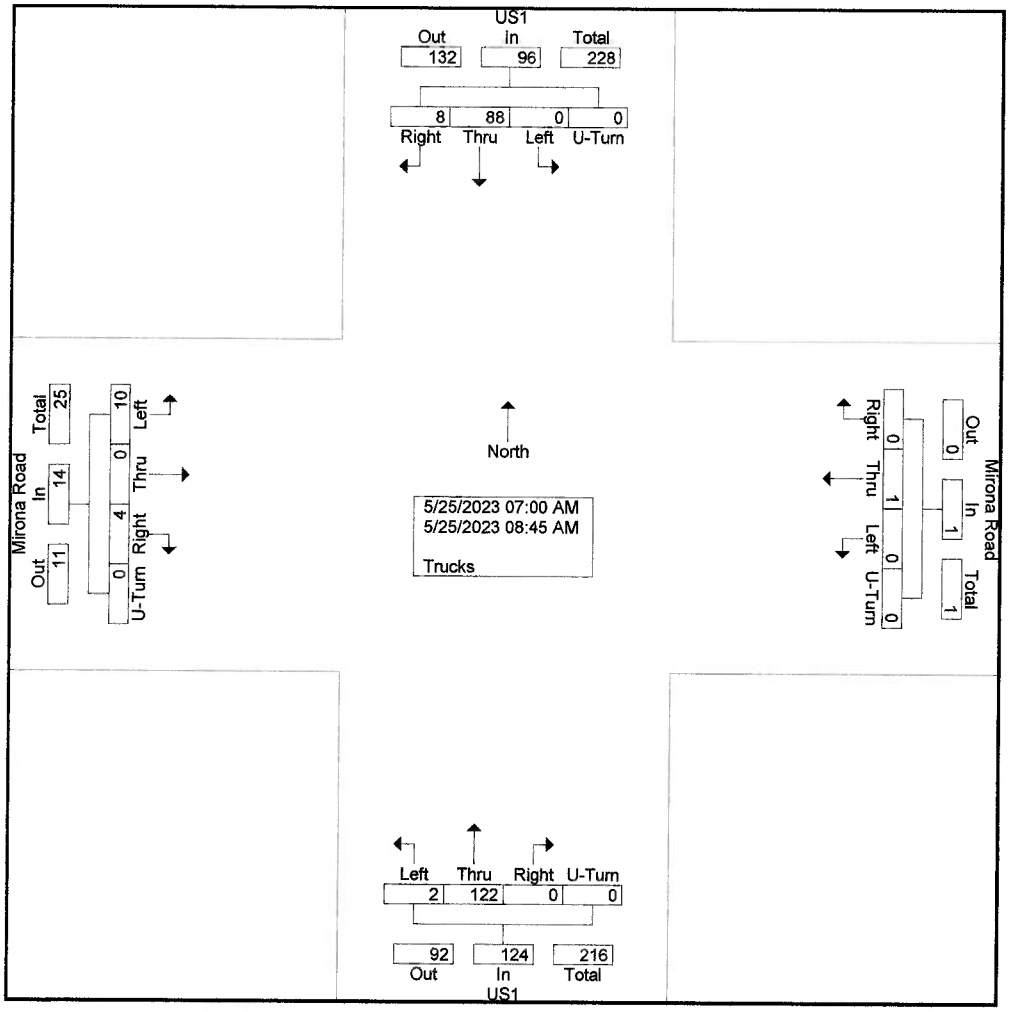
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouth, New Hampshire

File Name : 2268A_Mirona_1073884_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Trucks

	US1 From North					Mirona Road From East					US1 From South					Mirona Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	0	10	0	0	10	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	24
07:15 AM	0	8	0	0	8	0	1	0	0	1	0	16	0	0	16	0	0	0	0	0	25
07:30 AM	1	16	0	0	17	0	0	0	0	0	0	19	0	0	19	0	0	3	0	3	39
07:45 AM	0	16	0	0	16	0	0	0	0	0	0	14	0	0	14	1	0	1	0	2	32
Total	1	50	0	0	51	0	1	0	0	1	0	63	0	0	63	1	0	4	0	5	120
08:00 AM	3	9	0	0	12	0	0	0	0	0	0	12	2	0	14	1	0	2	0	3	29
08:15 AM	3	9	0	0	12	0	0	0	0	0	0	14	0	0	14	1	0	3	0	4	30
08:30 AM	1	8	0	0	9	0	0	0	0	0	0	11	0	0	11	0	0	1	0	1	21
08:45 AM	0	12	0	0	12	0	0	0	0	0	0	22	0	0	22	1	0	0	0	1	35
Total	7	38	0	0	45	0	0	0	0	0	0	59	2	0	61	3	0	6	0	9	115
Grand Total	8	88	0	0	96	0	1	0	0	1	0	122	2	0	124	4	0	10	0	14	235
Apprch %	8.3	91.7	0	0		0	100	0	0		0	98.4	1.6	0		28.6	0	71.4	0		
Total %	3.4	37.4	0	0	40.9	0	0.4	0	0	0.4	0	51.9	0.9	0	52.8	1.7	0	4.3	0	6	

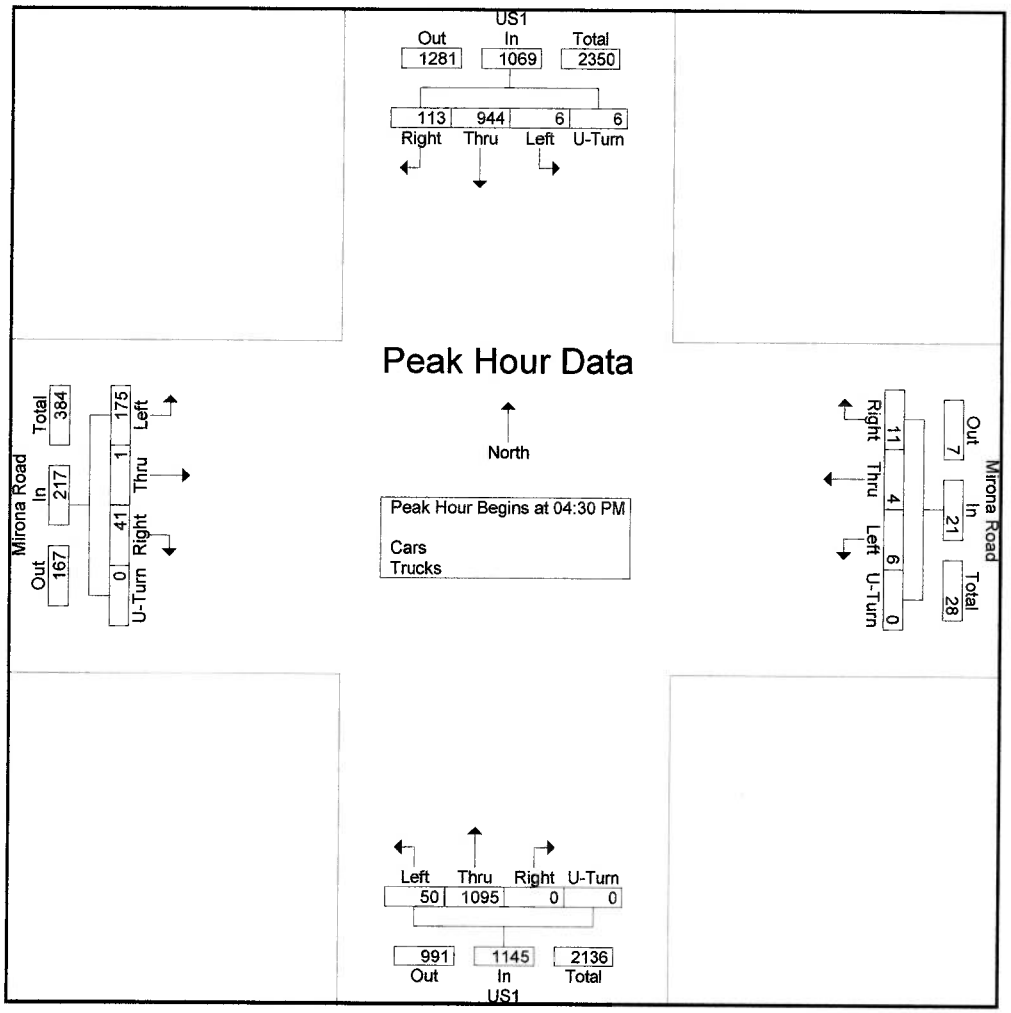


Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

File Name : 2268A_Mirona_1073885_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 3

	US1 From North					Mirona Road From East					US1 From South					Mirona Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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	**33**	240	1	2	276	2	0	0	0	2	0	261	8	0	269	8	0	36	0	44	591
04:45 PM	28	**253**	**5**	**3**	**289**	3	**2**	**3**	0	8	0	222	**19**	0	241	**13**	**1**	35	0	49	587
05:00 PM	22	233	0	1	256	**6**	2	3	0	**11**	0	302	11	0	313	12	0	**60**	0	**72**	**652**
05:15 PM	30	218	0	0	248	0	0	0	0	0	0	**310**	12	0	**322**	8	0	44	0	52	622
Total Volume	113	944	6	6	1069	11	4	6	0	21	0	1095	50	0	1145	41	1	175	0	217	2452
% App. Total	10.6	88.3	0.6	0.6		52.4	19	28.6	0		0	95.6	4.4	0		18.9	0.5	80.6	0		
PHF	.856	.933	.300	.500	.925	.458	.500	.500	.000	.477	.000	.883	.658	.000	.889	.788	.250	.729	.000	.753	.940



Stephen G. Pernaw & Company, Inc.

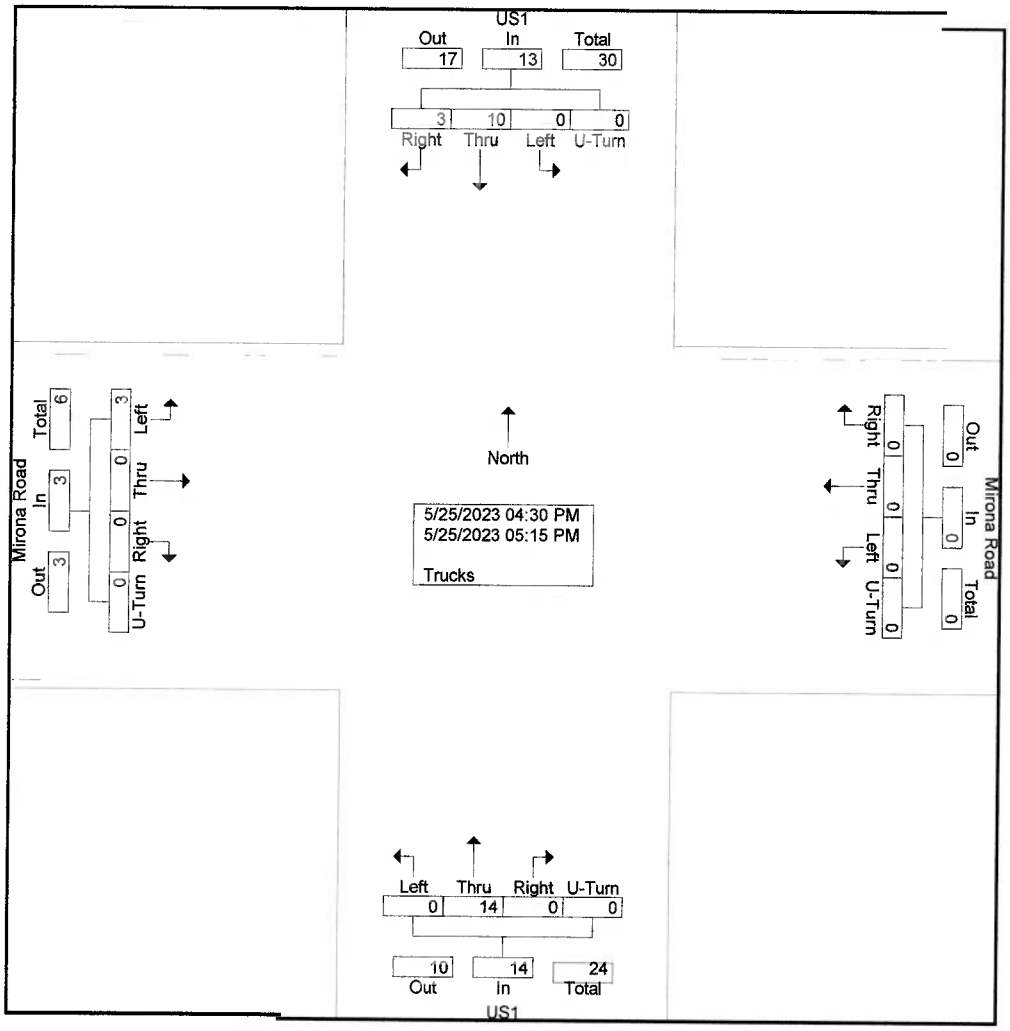
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouyh, New Hampshire

File Name : 2268A_Mirona_1073885_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

Groups Printed- Trucks

	US1 From North					Mirona Road From East					US1 From South					Mirona Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
04:30 PM	0	5	0	0	5	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	9
04:45 PM	1	2	0	0	3	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	8
Total	1	7	0	0	8	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	17
05:00 PM	1	3	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
05:15 PM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	3	0	3	5
Grand Total	3	10	0	0	13	0	0	0	0	0	0	14	0	0	14	0	0	3	0	3	30
Apprch %	23.1	76.9	0	0		0	0	0	0		0	100	0	0		0	0	100	0		
Total %	10	33.3	0	0	43.3	0	0	0	0	0	0	46.7	0	0	46.7	0	0	10	0	10	



Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouyh, New Hampshire

File Name . 2268A_Mirona_1073885_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 1

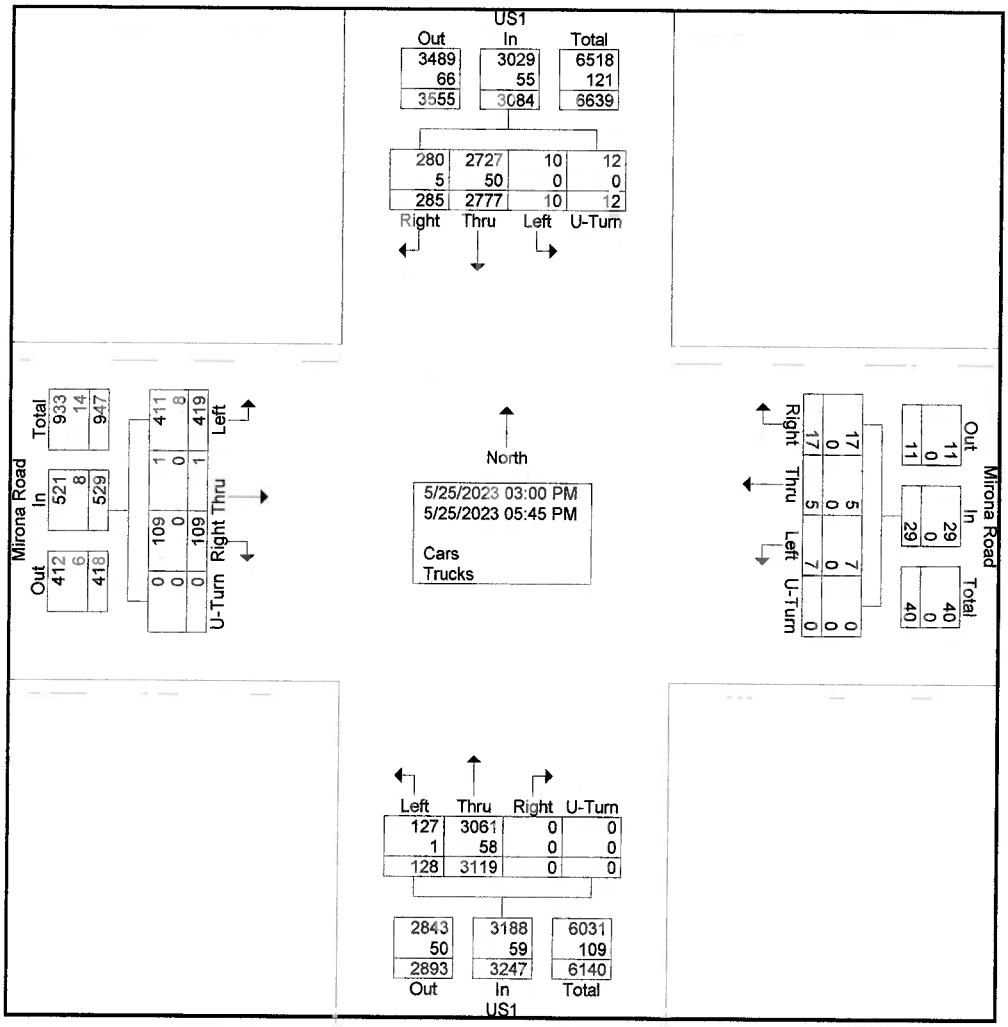
s Printed- Cars - Trucks

	US1 From North					Mirona Group					US1 From South					Mirona Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	23	207	0	1	231	0	0	0	0	0	0	271	13	0	284	5	0	28	0	33	548
03:15 PM	23	260	0	1	284	0	0	0	0	0	0	253	10	0	263	9	0	30	0	39	586
03:30 PM	18	247	1	0	266	1	0	0	0	1	0	233	8	0	241	8	0	35	0	43	551
03:45 PM	23	234	0	0	257	2	0	0	0	2	0	237	8	0	245	6	0	34	0	40	544
Total	87	948	1	2	1038	3	0	0	0	3	0	994	39	0	1033	28	0	127	0	155	2229
04:00 PM	18	247	0	2	267	0	0	0	0	0	0	253	12	0	265	4	0	29	0	33	565
04:15 PM	29	231	2	2	264	2	1	1	0	4	0	283	11	0	294	10	0	25	0	35	597
04:30 PM	33	240	1	2	276	2	0	0	0	2	0	261	8	0	269	8	0	36	0	44	591
04:45 PM	28	253	5	3	289	3	2	3	0	8	0	222	19	0	241	13	1	35	0	49	587
Total	108	971	8	9	1096	7	3	4	0	14	0	1019	50	0	1069	35	1	125	0	161	2340
05:00 PM	22	233	0	1	256	6	2	3	0	11	0	302	11	0	313	12	0	60	0	72	652
05:15 PM	30	218	0	0	248	0	0	0	0	0	0	310	12	0	322	8	0	44	0	52	622
05:30 PM	23	212	1	0	236	0	0	0	0	0	0	256	12	0	268	10	0	41	0	51	555
05:45 PM	15	195	0	0	210	1	0	0	0	1	0	238	4	0	242	16	0	22	0	38	531
Total	90	858	1	1	950	7	2	3	0	12	0	1106	39	0	1145	46	0	167	0	213	2320
Grand Total	285	2777	10	12	3084	17	5	7	0	29	0	3119	128	0	3247	109	1	419	0	529	6889
Apprch %	9.2	90	0.3	0.4		58.6	17.2	24.1	0		0	96.1	3.9	0		20.6	0.2	79.2	0		
Total %	4.1	40.3	0.1	0.2	44.8	0.2	0.1	0.1	0	0.4	0	45.3	1.9	0	47.1	1.6	0	6.1	0	7.7	
Cars	280	2727	10	12	3029	17	5	7	0	29	0	3061	127	0	3188	109	1	411	0	521	6767
% Cars	98.2	98.2	100	100	98.2	100	100	100	0	100	0	98.1	99.2	0	98.2	100	100	98.1	0	98.5	98.2
Trucks	5	50	0	0	55	0	0	0	0	0	0	58	1	0	59	0	0	8	0	8	122
% Trucks	1.8	1.8	0	0	1.8	0	0	0	0	0	0	1.9	0.8	0	1.8	0	0	1.9	0	1.5	1.8

Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

File Name : 2268A_Mirona_1073885_05-25-2023
Site Code :
Start Date : 5/25/2023
Page No : 2



Stephen G. Pernaw & Company, Inc.

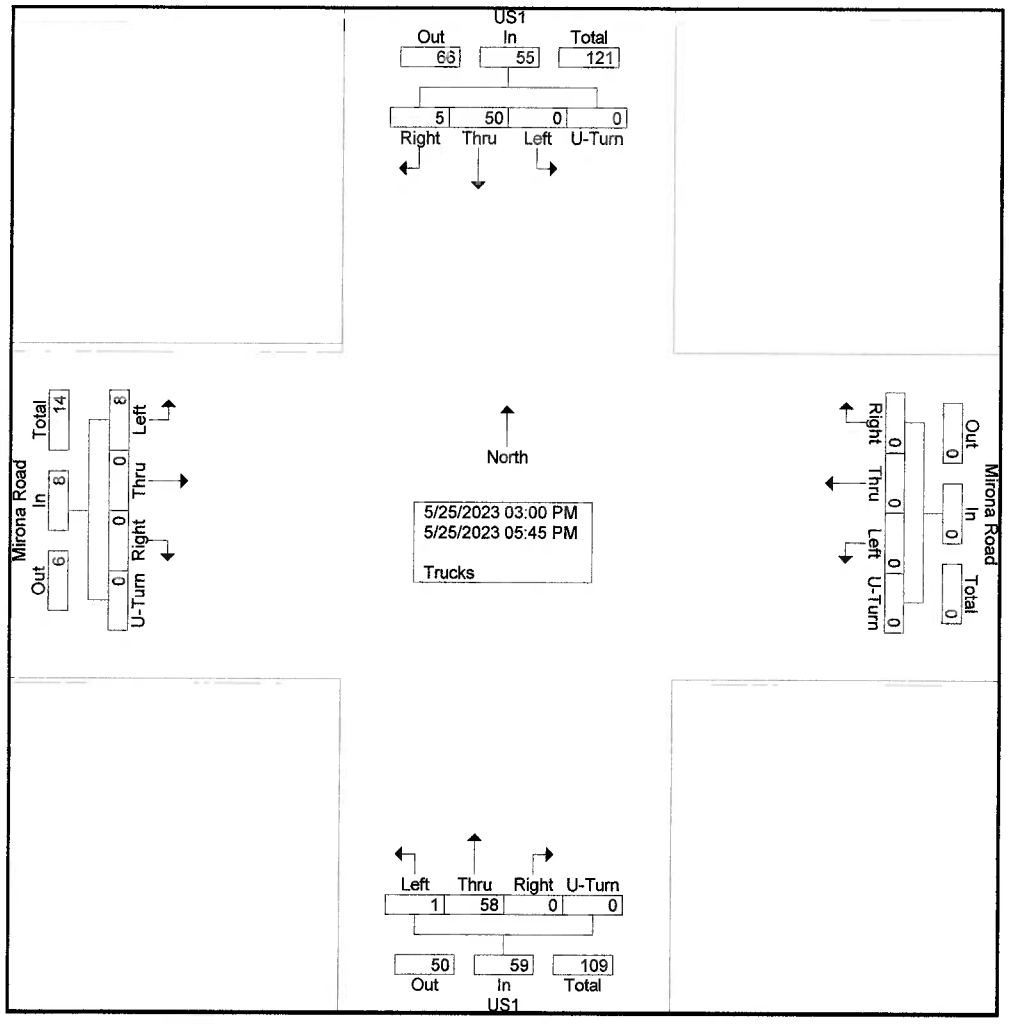
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2268A
Town/State: Portsmouyh, New Hampshire

File Name : 2 _1073885_05-25-2023
Site Code : 268A_Mirona
Start Date : 5/25/2023
Page No : 1

Groups Printed- Trucks

	US1 From North					Mirona Road From East					US1 From South					rona Mi Road From West						
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	Total App.	Thru	Right		Left	U-Turn	App. Total	Int. Total
03:00 PM	0	6	0	0	6	0	0	0	0	0	0	8	0	0	10	0	0		1	0	1	20
03:15 PM	0	9	0	0	9	0	0	0	0	0	0	10	0	0	7	0	0		1	0	1	20
03:30 PM	1	11	0	0	12	0	0	0	0	0	0	7	0	0						0	2	16
03:45 PM	0	5	0	0	5	0	0	0	0	0	0	8	1	0	9	0	0		2		4	70
Total	1	31	0	0	32	0	0	0	0	0	0	33	1	0	34	0	0		4	0		
04:00 PM	0	5	0	0	5	0	0	0	0	0	0	5	0	0	5	0	0		0	0	0	10
04:15 PM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0		0	0	0	4
04:30 PM	0	5	0	0	5	0	0	0	0	0	0	4	0	0	4	0	0		0	0	0	9
04:45 PM	1	2	0	0	3	0	0	0	0	0	0	5	0	0	5	0	0		0	0	0	8
Total	1	14	0	0	15	0	0	0	0	0	0	16	0	0	16	0	0		0	0	0	31
05:00 PM	1	3	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0		0	0	0	8
05:15 PM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0		3	0	3	5
05:30 PM	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0		1	0	1	4
05:45 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0		0	0	0	4
Total	3	5	0	0	8	0	0	0	0	0	0	9	0	0	9	0	0		4	0	4	21
Grand Total	5	50	0	0	55	0	0	0	0	0	0	58	1	0	59	0	0		8	0	8	122
Apprch %	9.1	90.9	0	0		0	0	0	0		0	98.3	1.7	0		0	0		100	0		
Total %	4.1	41	0	0	45.1	0	0	0	0	0	0	47.5	0.8	0	48.4	0	0		6.6	0	6.6	



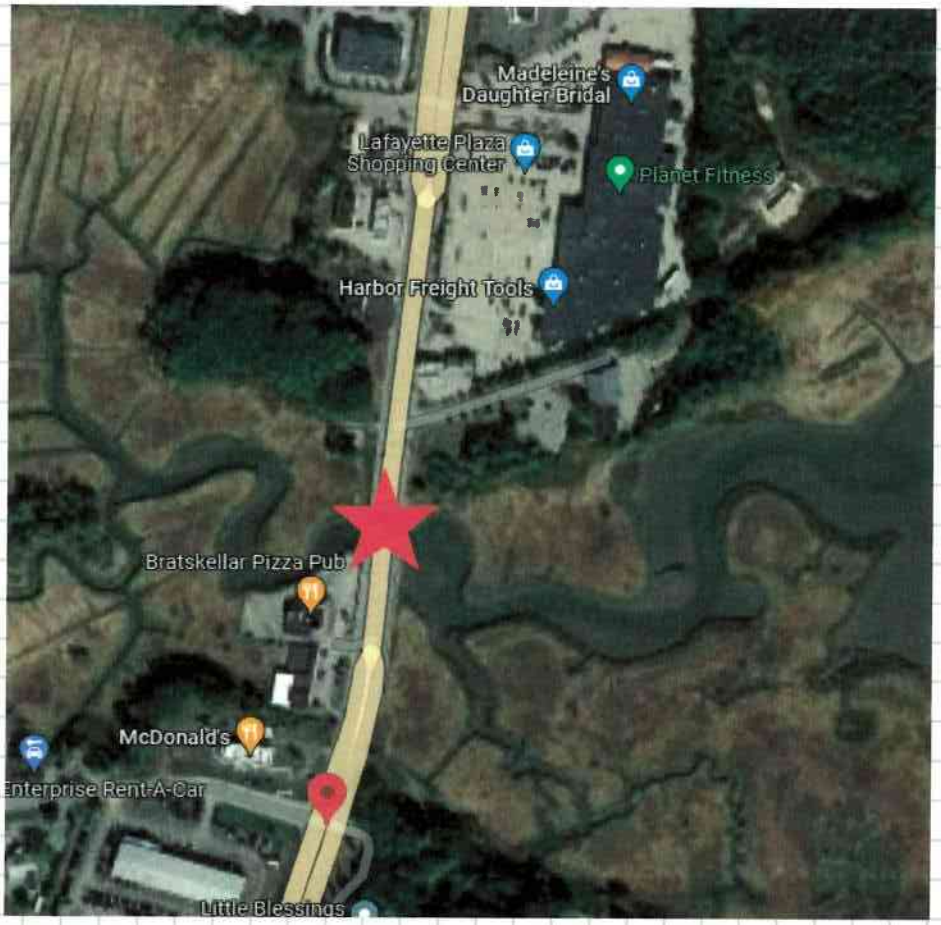
CALCULATION SHEET

Stephen G. Pernaw & Company, Inc.

Project:	VAI - Portsmouth	Job Number:	2268A
Calculated By:		Date:	
Checked By:		Date.	
Sheet No:		Of:	
Subject:	ATR Count - US1		

US1 ATR Count (Over Sagamore Creek)

Wednesday, May 24, 2023 & Thursday, May 25, 2023



Weekly Volumes

Unit ID: SGP15

Location: Lafayette Road, North of Mirona Road

Week of 05/23/2023

Start Time	05/23 Tue	05/24 Wed	05/25 Thu	05/26 Fri	05/27 Sat	05/28 Sun	05/29 Mon	Average
	NB	NB	NB	NB	NB	NB	NB	NB
00:00	-	40	24	45	-	-	-	36
01:00	-	21	14	26	-	-	-	20
02:00	-	17	17	12	-	-	-	15
03:00	-	62	66	65	-	-	-	64
04:00	-	78	84	80	-	-	-	81
05:00	-	246	247	231	-	-	-	241
06:00	-	414	455	397	-	-	-	422
07:00	-	841	831	799	-	-	-	824
08:00	-	1089	1135	1016	-	-	-	1080
09:00	-	907	960	971	-	-	-	946
10:00	233	950	951	1093	-	-	-	807
11:00	1048	1023	1079	243	-	-	-	848
12:00	1075	1156	1160	-	-	-	-	1130
13:00	1139	1125	1138	-	-	-	-	1134
14:00	1105	1037	1066	-	-	-	-	1069
15:00	1217	1213	1153	-	-	-	-	1194
16:00	1264	1170	1162	-	-	-	-	1199
17:00	1183	1172	1279	-	-	-	-	1211
18:00	877	896	954	-	-	-	-	909
19:00	638	536	645	-	-	-	-	606
20:00	432	357	475	-	-	-	-	421
21:00	285	231	308	-	-	-	-	275
22:00	143	156	202	-	-	-	-	167
23:00	70	68	84	-	-	-	-	74
Lane Total	10709	14805	15489	4978	-	-	-	14773
Day Total	10709	14805	15489	4978	-	-	-	14773
AM Peak	11:00	07:28	07:41	10:04	-	-	-	08:00
AM Count	1048	1198	1191	1104	-	-	-	1080
PM Peak	16:27	16:32	16:33	-	-	-	-	17:00
PM Count	1341	1265	1301	-	-	-	-	1211

Weekly Volumes

Unit ID: SGP13

Location: Laffayette Road, North of Mirona Road

Week of 05/23/2023

Start Time	05/23 Tue	05/24 Wed	05/25 Thu	05/26 Fri	05/27 Sat	05/28 Sun	05/29 Mon	Average
	SB	SB	SB	SB	SB	SB	SB	SB
00:00	-	33	44	77	-	-	-	51
01:00	-	28	29	31	-	-	-	29
02:00	-	16	25	20	-	-	-	20
03:00	-	16	19	28	-	-	-	21
04:00	-	73	71	73	-	-	-	72
05:00	-	210	212	201	-	-	-	208
06:00	-	443	421	418	-	-	-	427
07:00	-	689	791	774	-	-	-	751
08:00	-	950	924	896	-	-	-	923
09:00	-	815	860	867	-	-	-	847
10:00	7	886	877	878	-	-	-	662
11:00	998	905	923	215	-	-	-	760
12:00	1040	966	1036	-	-	-	-	1014
13:00	942	889	961	-	-	-	-	931
14:00	903	910	929	-	-	-	-	914
15:00	1003	1028	1061	-	-	-	-	1031
16:00	1058	994	1091	-	-	-	-	1048
17:00	1069	1017	956	-	-	-	-	1014
18:00	817	696	721	-	-	-	-	745
19:00	545	460	619	-	-	-	-	541
20:00	392	338	426	-	-	-	-	385
21:00	221	228	338	-	-	-	-	262
22:00	139	136	240	-	-	-	-	172
23:00	98	77	119	-	-	-	-	98
Lane Total	9232	12803	13693	4478	-	-	-	12926
Day Total	9232	12803	13693	4478	-	-	-	12926
AM Peak	11:00	08:03	08:11	07:31	-	-	-	08:00
AM Count	998	964	945	926	-	-	-	923
PM Peak	16:33	16:49	15:22	-	-	-	-	16:00
PM Count	1154	1076	1118	-	-	-	-	1048

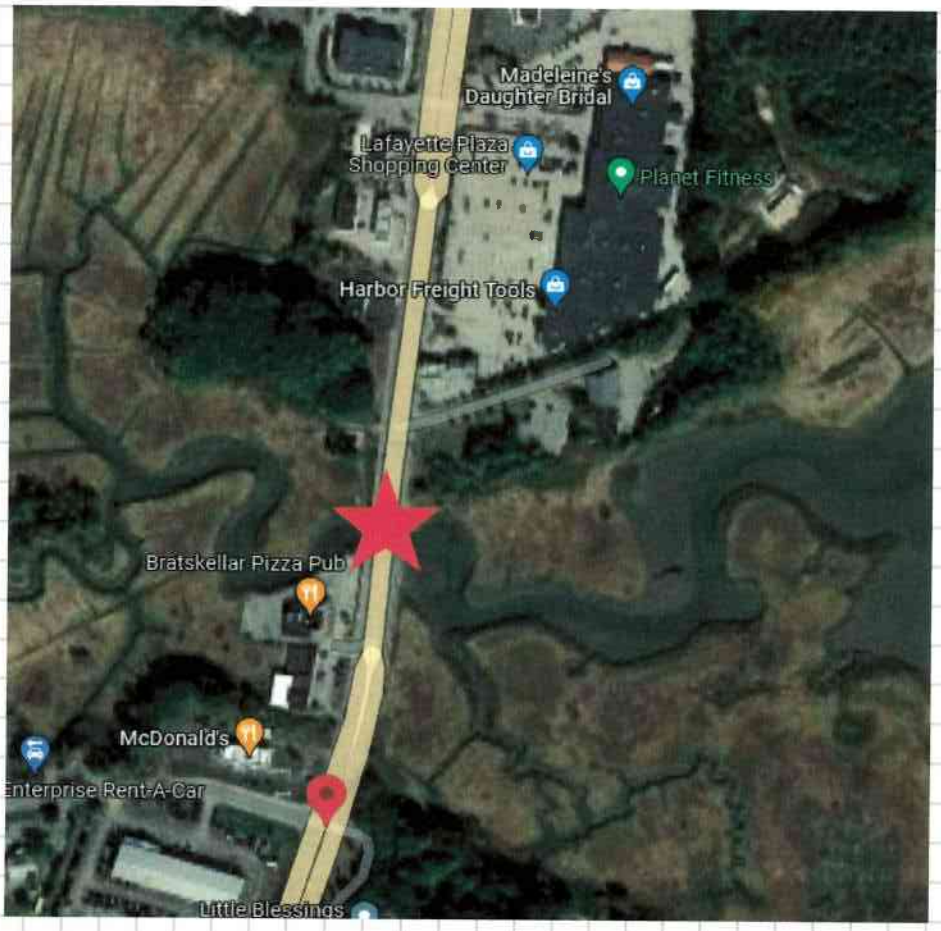
CALCULATION SHEET

Stephen G. Pernaw & Company, Inc.

Project:	VAI - Portsmouth	Job Number:	2268A
Calculated By:		Date:	
Checked By:		Date:	
Sheet No:		Of:	
Subject:	Speed Survey - US1		

US1 Speed Survey (Over Sagamore Creek)

Wednesday, May 24, 2023 & Thursday, May 25, 2023



Daily Northbound Speeds (MPH)

Study Date: Wednesday, 05/24/2023
Unit ID: SGP15
Location: Lafayette Road, North of Mirona Road

Posted Speed. 35

	5-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-99	Total
00:00 - 00:59	0	0	0	1	7	9	12	2	3	0	0	0	0	0	0	34
01:00 - 01:59	0	0	0	0	5	6	6		0	0	0	0	0	0	0	17
02:00 - 02:59	0	0	0		2	2	9	0	0	0	0	0	0	0		15
03:00 - 03:59	0	0	0	1	4	11		1	3	1		0	0	0	0	5
04:00 - 04:59	0	0	0	2	2	15	20	20		0	0	0	0	0	0	79
05:00 - 05:59	0	0	0	0	6	34	8	87	17		0	0	0	0	0	231
06:00 - 06:59	0	0	0	3	25	66	134	109	47	3	0		0	0	0	391
07:00 - 07:59	0	0		1	159	203	232	111	26	4	2	0	0	0	0	
08:00 - 08:59	0	0	2	2	2	363	259	110	3	0	0	0	0	0		754
09:00 - 09:59	0	0	1	2	21		5	86	14	0	0	0		0	0	976
10:00 - 10:59	0	0	1	8	1	263	256		12	0	0	0	0	0	0	7
11:00 - 11:59	0	1	7	26	155	300	283	81	1	3	1	0	0	0	1	861
12:00 - 12:59	0	1	7	21	156	334	295	99	0		1	0	0	0	0	923
13:00 - 13:59	0	1	7	27	227	335	315	107	7	2		0	0	0	0	1038
14:00 - 14:59	0		1	48	242	365	265	67	16		0	0	0	0	0	1005
15:00 - 15:59	0	1		23	137	368	297	105	12	3	0	0	0	0		949
16:00 - 16:59	0	4	3	25		379	324	90	14	1	0	0	0	0	0	1099
17:00 - 17:59	0	0	7	40	203	426	341	101	19	1	0	0	0	0	0	
18:00 - 18:59	2	6	3	48	197	388	2	7	15	2	0	1	0	0	0	1088
19:00 - 19:59	0	5	1	32	230	389	92	6	14	2	0	0	0	0	0	1072
20:00 - 20:59	0	5	2	12	17	266	216	7		0	1		0	0	0	812
21:00 - 21:59	0	0	3	14	10	195	152	5	18	0		0	0	0	0	522
22:00 - 22:59	0	0	6	13	0	113	110	4	4		0	0	0	0	0	344
23:00 - 23:59	0	0	2	4	4	62	89	2	7	2	0	0	0	0	0	221
Totals	2	1	3	0	9	2	54	7	3	2	0	0	0	0	0	50
Percent of Total	0.0	0.1	0.2	0.0	2	26	48	15	3	0	0	0	0	0	0	64
Percent of AM	0.0	0.6	0.8	0.2	13	28	15	7	0	1	0	0	0	0	0	
Percent of PM	0.0	0.1	0.2	0.0	2523	4599	4081	1496	267	36	5	1	0	0	1	13513
		0.6	0.8	0.2	18.7	34.0	30.2	11.1	2.0	0.3	0.0	0.0	0.0	0.0	0.0	100
		3.0	3.4	2.3	17.6	31.2	31.4	14.1	2.8	0.4	0.1	0.0	0.0	0.0	0.0	100
		2.3	3.4	2.3	19.4	35.8	29.5	9.2	1.5	0.2	0.0	0.0	0.0	0.0	0.0	100

Standard Deviation: 5.8 MPH
Mean Speed: 39.1 MPH
Median Speed: 39.1 MPH
Modal Speed: 37.5 MPH

Ten Mile Pace: 35 to 44 MPH
Percent in Ten Mile Pace: 64.2%

85th Percentile: 44.7 MPH
15th Percentile: 33.0 MPH
90th Percentile: 46.5 MPH
95th Percentile: 48.8 MPH

Daily Northbound Speeds (MPH)

Study Date: Thursday, 05/25/2023
Unit ID: SGP15
Location: Lafayette Road, North of Mirona Road

Posted Speed: 35

	5-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-99	Total
00:00 - 00:59	0	0	0	1	0	8	5	6	2	0	0	0	0	0	0	22
01:00 - 01:59	0	0	0	0	1	3	4	2	0	0	0	0	0	0	0	10
02:00 - 02:59	0	0	0	0	1	7	3	1	2	1	0	0	0	0	0	15
03:00 - 03:59	0	0	0	0	5	16	19	15	8	1	0	0	0	0	0	64
04:00 - 04:59	0	0	0	2	3	17	26	22	12	0	0	0	0	0	0	82
05:00 - 05:59	0	0	0	1	9	27	83	73	31	10	2	0	0	0	0	236
06:00 - 06:59	0	0	0	7	34	71	153	117	34	3	0	2	0	0	0	421
07:00 - 07:59	0	0	2	12	111	220	244	117	24	1	0	0	0	0	0	731
08:00 - 08:59	0	0	13	34	212	358	275	96	16	2	1	0	0	0	0	1007
09:00 - 09:59	0	0	8	34	209	318	209	70	6	1	0	0	0	0	0	855
10:00 - 10:59	1	0	2	30	202	332	208	79	8	0	0	0	0	0	0	862
11:00 - 11:59	3	1	13	45	232	352	238	56	6	0	0	0	0	0	0	946
12:00 - 12:59	0	4	24	41	274	380	233	62	5	1	0	0	0	0	0	1024
13:00 - 13:59	0	0	3	41	246	383	282	68	6	2	0	0	0	0	0	1031
14:00 - 14:59	0	0	7	26	196	321	306	87	9	1	0	0	0	0	0	953
15:00 - 15:59	0	1	2	30	229	360	291	96	14	1	0	0	0	0	0	1024
16:00 - 16:59	0	1	15	25	225	390	269	98	11	1	0	0	0	0	0	1035
17:00 - 17:59	0	2	17	36	235	437	296	112	9	0	0	0	0	0	0	1144
18:00 - 18:59	0	1	6	16	129	259	326	106	15	4	1	0	0	0	0	863
19:00 - 19:59	0	0	4	23	98	211	180	78	16	2	0	0	0	0	0	612
20:00 - 20:59	0	1	0	13	68	123	183	56	7	0	0	0	0	0	0	451
21:00 - 21:59	0	0	2	7	38	87	110	39	7	2	0	0	0	0	0	292
22:00 - 22:59	0	0	2	7	29	59	75	19	3	2	0	0	0	0	0	196
23:00 - 23:59	0	0	0	2	10	24	30	12	2	0	0	0	0	0	0	80
Totals	**4**	**11**	**120**	**433**	**2796**	**4763**	**4048**	**1487**	**253**	**35**	**4**	**2**	**0**	**0**	**0**	**13956**
Percent of Total	**0.0**	**0.1**	**0.9**	**3.1**	**20.0**	**34.1**	**29.0**	**10.7**	**1.8**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**100**
Percent of AM	**0.1**	**0.0**	**0.7**	**3.2**	**19.4**	**32.9**	**27.9**	**12.5**	**2.8**	**0.4**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**100**
Percent of PM	**0.0**	**0.1**	**0.9**	**3.1**	**20.4**	**34.9**	**29.6**	**9.6**	**1.2**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**100**

Standard Deviation: 5.8 MPH
Mean Speed: 38.9 MPH
Median Speed: 38.8 MPH
Modal Speed: 37.5 MPH

Ten Mile Pace: 35 to 44 MPH
Percent in Ten Mile Pace: 63.1%

85th Percentile: 44.6 MPH
15th Percentile: 32.7 MPH
90th Percentile: 46.3 MPH
95th Percentile: 48.6 MPH

Daily Southbound Speeds (MPH)

Study Date: Wednesday, 05/24/2023
Unit ID: SGP13
Location: Laffayette Road, North of Mirona Road

Posted Speed: 35

	5-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-99	Total
00:00 - 00:59	0	0	0	2	3	14	7		0			0	0	0	0	29
01:00 - 01:59	0	0		0		10	12	3	1	0	0		0	0	0	28
02:00 - 02:59		0	0	0	3	7	2	2	2	1	0	0		0	0	15
03:00 - 03:59	0	0	0	0		2	4	2	0	0	0	0	0	0	0	14
04:00 - 04:59	0	0	0	2	6			8	6	0	0	0	0	0	0	6
05:00 - 05:59	0	0	0	1	5	19	27	45	14	2	0	0	0	0	0	20
06:00 - 06:59	1		0	35	58	85	12	77	1	4		0	0	0	0	42
07:00 - 07:59	4	1	26	72	115	175	14	54	12	3	0			0	0	622
08:00 - 08:59	7	4	76	107	178	192	14	29	3	1	0	0	0		0	794
09:00 - 09:59	21	8		115	159	173	10	40	4	0	0	0	0	0		701
10:00 - 10:59	16	4	84	1	1	1	10	48	15	3	0	0	0	0	0	772
11:00 - 11:59	38	41	84	111	179	159	9			0	0	0	0	0	0	739
12:00 - 12:59	38	52	87	121	152	183	92	29	2	0	0	0	0	0	0	755
13:00 - 13:59	32	60	93	111	179	156	120	27	1	1	0	0	0	0		782
14:00 - 14:59	2	57	92	11	152	160	133	34	3	0	0	0	0	0	0	779
15:00 - 15:59	3		73	14	160	19	137	32	5	1	0	0	0	0	1	827
16:00 - 16:59	3	46		1	142	21	163	40	2	4	1	0	0	0		835
17:00 - 17:59	3	40	72	14		16	152	40	6	1	0	0	0		0	821
18:00 - 18:59	8	46	85	137	157	0		36	5	0	0		0	0	0	630
19:00 - 19:59	11	23	80	85	98	1	122	10	6		0	0	0	0	0	442
20:00 - 20:59	2	8	31	46	98	69	84		0	1	0	0	0	0	0	327
21:00 - 21:59	0	6	22	38	71	106	70	10	3	1	0	0	0	0	0	224
22:00 - 22:59	0	1	7	20	36	79	59	1	2	1	0	0	1	0	0	132
23:00 - 23:59	0	0	6	17	28	42	35	8	0		0	0	0	0	0	75
Totals	321	528	990	1512	2167	2726	2037	620	108	25	1	0	1	0	1	11037
Percent of Total	2.9	4.8	9.0	13.7	19.6	24.7	18.5	5.6	1.0	0.2	0.0	0.0	0.0	0.0	0.0	100
Percent of AM	2.2	4.3	7.8	12.6	19.7	24.3	19.4	7.6	1.7	0.3	0.0	0.0	0.0	0.0	0.0	100
Percent of PM	3.4	5.1	9.8	14.4	19.6	25.0	17.8	4.3	0.5	0.2	0.0	0.0	0.0	0.0	0.0	100

Standard Deviation: 9.0 MPH
Mean Speed: 33.7 MPH
Median Speed: 35.0 MPH
Modal Speed: 37.5 MPH

Ten Mile Pace: 30 to 39 MPH
Percent in Ten Mile Pace: 44.3%

85th Percentile: 42.8 MPH
15th Percentile: 24.1 MPH
90th Percentile: 44.1 MPH
95th Percentile: 46.6 MPH

Daily Southbound Speeds (MPH)

Study Date: Thursday, 05/25/2023
Unit ID: SGP13
Location: Laffayette Road, North of Mirona Road

Posted Speed: 35

	5-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-99	Total
00:00 - 00:59	0	0	0	0	7	11	15	7	1	0	0	0	0	0	0	41
01:00 - 01:59	0	0	0	0	3	10	5	7	2	0	0	0	0	0	0	2
02:00 - 02:59	0	0	0	1	1	3	8	5	2	1	0	0	0	0	0	21
03:00 - 03:59	0	0	0	0	6	2	6			0	0	0	0	0	0	19
04:00 - 04:59	0	0	0	2	6	12	30	15	5		0	0	0	0	0	70
05:00 - 05:59	0	0	1	4	14	42	70	51	16	5	0	0	0	0	0	203
06:00 - 06:59	2	1	7	26	62	81	119	82	11	3	1	0			0	395
07:00 - 07:59	18	31	54	75	126	163	134	5	17	4	2	0	1	0		681
08:00 - 08:59	24	50	71	120	169	180	130	41	3	1	0	0	0	0	0	789
09:00 - 09:59	18	39	65	132	140	164	124	3	6		1	0	0	0	0	719
10:00 - 10:59	21	34	70	98	160	164	129	3	4	0	0	0	0	0	0	716
11:00 - 11:59	15	40	61	123	131	205	155	4	6	0		0	0	0	0	783
12:00 - 12:59	45	64	101	134	136	154	120	39	5	1	0				0	799
13:00 - 13:59	14	37	78	117	159	189	110	36	2	1	0	0	0		0	743
14:00 - 14:59	28	36	62	104	172	191	139	35	6	2	0	0	0	0	0	775
15:00 - 15:59	33	54	132	141	158	179	118	27	4	0	0	0	0	0	0	846
16:00 - 16:59	32	47	119	147	152	174	131	37	3	0	0	0	0	0	0	842
17:00 - 17:59	30	41	93	112	154	184	135	43		1	0	0	0	0	0	802
18:00 - 18:59	6	19	52	80	114	148	157	59	16			0	0	0	0	654
19:00 - 19:59	7	6	39	67	114	144	129	59	13	3	0	0	0		0	579
20:00 - 20:59	2	8	25	62	86	111	90	23		1	0	0	0	0	0	412
21:00 - 21:59	0	0	10	35	70	100	77	32	5	0	0	0	0	0	0	329
22:00 - 22:59	0	4	16	30	52	66	50	10	4	1	0	0	0	0	0	230
23:00 - 23:59	0	0	7	12	15	39	32	11	2	0	0	0	0	0	0	118
Totals	**295**	**511**	**1063**	**1622**	**2207**	**2716**	**2213**	**793**	**144**	**24**	**4**	**0**	**1**	**0**	**0**	**1159**
Percent of Total	**2.5**	**4.4**	**9.2**	**14.0**	**19.0**	**23.4**	**19.1**	**6.8**	**1.2**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**100**
Percent of AM	**2.2**	**4.4**	**7.4**	**13.0**	**18.5**	**23.2**	**20.7**	**8.6**	**1.6**	**0.3**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**100**
Percent of PM	**2.8**	**4.4**	**10.3**	**14.6**	**19.4**	**23.6**	**18.1**	**5.8**	**1.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**100**

Standard Deviation: 9.1 MPH
Mean Speed: 34.1 MPH
Median Speed: 35.2 MPH
Modal Speed: 37.5 MPH

Ten Mile Pace: 35 to 44 MPH
Percent in Ten Mile Pace: 42.5%

85th Percentile: 43.3 MPH
15th Percentile: 24.4 MPH
90th Percentile: 44.6 MPH
95th Percentile: 47.4 MPH

APPENDIX B

NHDOT Traffic Data

Year 2019 Monthly Data

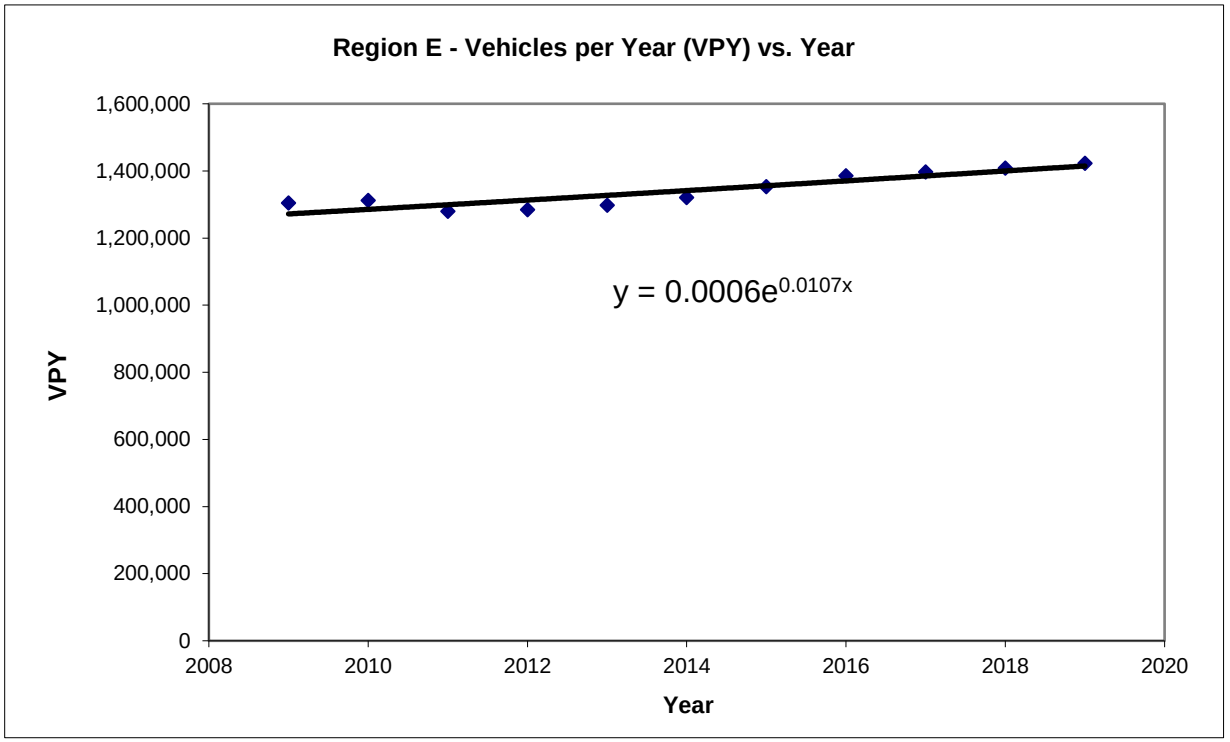
Group 4 Averages: Urban Highways

Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265	1.05	1.14
December	11,496	1.12	1.22
Average ADT:	12,838		
Peak ADT:	14,016		

GROUP	COUNTER	TOWN	LOCATION
04	02051003	BOW	NH 3A south of Robinson Rd
04	02089001	CHICHESTER	NH 28 (Suncook Valley Rd) north of Bear Hill Rd
04	02091001	CLAREMONT	NH 12/103 east of Vermont SL
04	62099056	CONCORD	NH 106 (Sheep Davis Rd) at Loudon TL (north of Ashby Rd)
04	72099278	CONCORD	US 3 (Fisherville Rd) north of Sewalls Falls Rd
04	02125001	DOVER	Dover Point Rd south of Thornwood Ln
04	02133021	DURHAM	US 4 east of NH 108
04	82197076	HAMPTON	US 1 (Lafayette Rd) south of Ramp to NH 101
04	*02229022*	*HUDSON**	*Circumferential Hwy east of Nashua TL*
04	02253025	LEBANON	NH 120 1 mile south of Hanover TL (south of Lahaye Dr)
04	02255001	LEE	NH 125 (Calef Hwy) north of Pinkham Rd
04	02287001	MARLBOROUGH	NH 12 at Swanzey TL
04	02297001	MERRIMACK	US 3 (Daniel Webster Hwy) north of Hilton Dr
04	*02303001*	*MILFORD**	*NH 101A at Amherst TL (west of Overlook Dr)*
04	*02315051*	*NASHUA**	*NH 111 (Bridge / Ferry St) at Hudson TL*
04	02339001	NEWPORT	NH 10 1 mile south of Croydon TL (north of Corbin Rd)
04	02345001	NORTH HAMPTON	US 1 (Lafayette Rd) north of North Rd
04	*62387052*	*RINDGE**	*US 202 at Jaffrey TL (north of County Rd)*
04	02445001	TEMPLE	NH 101 at Wilton TL (west of Old County Farm Rd)
04	02489001	WINDHAM	NH 28 at Derry TL (north of Northland Rd)

** denotes counter that is not included in calculation*

Year	Total
2009	1303948
2010	1312251
2011	1279824
2012	1284314
2013	1298171
2014	1320862
2015	1353486
2016	1385361
2017	1396932
2018	1408237
2019	1422176
CAGR	0.87%
Exp	1.07%
Avg	0.97%



Location Info	
Location ID	2125090
Type	I-SECTION
Functional Class	2
Located On	Spaulding Tpke N
Direction	2-WAY
Community	DOVER
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	5/21/2019
End Date	5/22/2019
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_201905_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins

Time	Hourly Count
00:00 - 01:00	351
01:00 - 02:00	149
02:00 - 03:00	124
03:00 - 04:00	193
04:00 - 05:00	633
05:00 - 06:00	1635
06:00 - 07:00	3114
07:00 - 08:00	4180
08:00 - 09:00	3433
09:00 - 10:00	2251
10:00 - 11:00	2011
11:00 - 12:00	2037
12:00 - 13:00	2112
13:00 - 14:00	2210
14:00 - 15:00	2819
15:00 - 16:00	3496
16:00 - 17:00	3774
17:00 - 18:00	3778
18:00 - 19:00	2300
19:00 - 20:00	1588
20:00 - 21:00	1083
21:00 - 22:00	904
22:00 - 23:00	621
23:00 - 24:00	443
TOTAL	45239

Location Info	
Location ID	2125090
Type	I-SECTION
Functional Class	2
Located On	Spaulding Tpke N
Direction	2-WAY
Community	DOVER
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	5/22/2019
End Date	5/23/2019
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_201905_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	371
01:00 - 02:00	142
02:00 - 03:00	148
03:00 - 04:00	227
04:00 - 05:00	618
05:00 - 06:00	1649
06:00 - 07:00	3090
07:00 - 08:00	4470
08:00 - 09:00	3861
09:00 - 10:00	2498
10:00 - 11:00	2385
11:00 - 12:00	2481
12:00 - 13:00	2505
13:00 - 14:00	2650
14:00 - 15:00	3351
15:00 - 16:00	4064
16:00 - 17:00	4180
17:00 - 18:00	4172
18:00 - 19:00	2659
19:00 - 20:00	1870
20:00 - 21:00	1522
21:00 - 22:00	1184
22:00 - 23:00	749
23:00 - 24:00	505
TOTAL	51351

Location Info	
Location ID	2125090
Type	I-SECTION
Functional Class	2
Located On	Spaulding Tpke N
Direction	2-WAY
Community	DOVER
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	5/23/2019
End Date	5/24/2019
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_201905_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	365
01:00 - 02:00	190
02:00 - 03:00	168
03:00 - 04:00	239
04:00 - 05:00	615
05:00 - 06:00	1656
06:00 - 07:00	3099
07:00 - 08:00	4190
08:00 - 09:00	3595
09:00 - 10:00	2501
10:00 - 11:00	2283
11:00 - 12:00	2423
12:00 - 13:00	2591
13:00 - 14:00	2637
14:00 - 15:00	3271
15:00 - 16:00	3976
16:00 - 17:00	4106
17:00 - 18:00	4010
18:00 - 19:00	2625
19:00 - 20:00	1878
20:00 - 21:00	1470
21:00 - 22:00	1222
22:00 - 23:00	768
23:00 - 24:00	508
TOTAL	50386

Location Info	
Location ID	2125090
Type	I-SECTION
Functional Class	2
Located On	Spaulding Tpke N
Direction	2-WAY
Community	DOVER
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	5/23/2023
End Date	5/24/2023
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_202305_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	284
01:00 - 02:00	142
02:00 - 03:00	153
03:00 - 04:00	274
04:00 - 05:00	764
05:00 - 06:00	1727
06:00 - 07:00	2777
07:00 - 08:00	3787
08:00 - 09:00	3200
09:00 - 10:00	2274
10:00 - 11:00	2132
11:00 - 12:00	2176
12:00 - 13:00	2221
13:00 - 14:00	2418
14:00 - 15:00	3114
15:00 - 16:00	3852
16:00 - 17:00	4176
17:00 - 18:00	3815
18:00 - 19:00	2248
19:00 - 20:00	1543
20:00 - 21:00	1127
21:00 - 22:00	757
22:00 - 23:00	547
23:00 - 24:00	467
TOTAL	45975

Location Info	
Location ID	2125090
Type	I-SECTION
Functional Class	2
Located On	Spaulding Tpke N
Direction	2-WAY
Community	DOVER
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	5/24/2023
End Date	5/25/2023
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_202305_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	308
01:00 - 02:00	135
02:00 - 03:00	143
03:00 - 04:00	272
04:00 - 05:00	781
05:00 - 06:00	1667
06:00 - 07:00	2678
07:00 - 08:00	3854
08:00 - 09:00	3257
09:00 - 10:00	2376
10:00 - 11:00	2138
11:00 - 12:00	2229
12:00 - 13:00	2406
13:00 - 14:00	2524
14:00 - 15:00	3296
15:00 - 16:00	3936
16:00 - 17:00	4456
17:00 - 18:00	3864
18:00 - 19:00	2243
19:00 - 20:00	1471
20:00 - 21:00	1032
21:00 - 22:00	831
22:00 - 23:00	516
23:00 - 24:00	448
TOTAL	46861

Location Info	
Location ID	2125090
Type	I-SECTION
Functional Class	2
Located On	Spaulding Tpke N
Direction	2-WAY
Community	DOVER
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	5/25/2023
End Date	5/26/2023
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	
Count Source	1125201
File Name	TRV70_RPT21_202305_CDC.txt
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	400
01:00 - 02:00	188
02:00 - 03:00	160
03:00 - 04:00	264
04:00 - 05:00	750
05:00 - 06:00	1673
06:00 - 07:00	2710
07:00 - 08:00	3770
08:00 - 09:00	3301
09:00 - 10:00	2474
10:00 - 11:00	2382
11:00 - 12:00	2461
12:00 - 13:00	2690
13:00 - 14:00	2699
14:00 - 15:00	3577
15:00 - 16:00	4115
16:00 - 17:00	4320
17:00 - 18:00	4022
18:00 - 19:00	2563
19:00 - 20:00	1914
20:00 - 21:00	1518
21:00 - 22:00	1014
22:00 - 23:00	686
23:00 - 24:00	579
TOTAL	50230

APPENDIX C

Traffic Volume Adjustment Calculation

Traffic Volume Adjustment Check

NHDOT Count Station Data (Loc ID 02125090) - Spaulding Turnpike									
	2019 Traffic Volumes				2023 Traffic Volumes				
Time Period	Tues 5/21/19	Wed 5/22/19	Thurs 5/23/19	Average (Tues-Thurs)	Tues 5/23/23	Wed 5/24/23	Thurs 5/25/23	Average (Tues-Thurs)	Tues-Thurs Average Comparison
DAILY	45,239	51,351	50,386	48,992	45,975	46,861	50,230	47,689	***-2.7%***
AM Peak (7-8AM)	4,180	4,470	4,190	4,280	3,787	3,854	3,770	3,804	***-11.1%***
PM Peak (4-5PM)	3,774	4,180	4,106	4,020	4,176	4,456	4,320	4,317	***7.4%***

APPENDIX D

Capacity Analysis Methodology

CAPACITY ANALYSIS METHODOLOGY

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM).[1] The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year. A description of the operating condition under each level of service is provided below:

- *LOS A* describes conditions with little to no delay to motorists.
- *LOS B* represents a desirable level with relatively low delay to motorists.
- *LOS C* describes conditions with average delays to motorists.
- *LOS D* describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- *LOS E* represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- *LOS F* is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on average *control* delay. Control delay is used to establish the operating characteristics for an intersection or an approach to an intersection. Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a lane group's capacity at an intersection. A v/c ratio of ≥1.00 represents conditions when the traffic signal cycle capacity is fully utilized and indicates a capacity failure. The level-of-service criteria for signalized intersections are shown in Table A-1.

[1] *Highway Capacity Manual, 6TH Edition: A Guide for Multimodal Mobility Analysis.* Washington, D.C.: Transportation Research Board, 2016.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay at an unsignalized intersection is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position.

Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a movement's capacity at an intersection. A v/c ratio of ≥1.00 represents conditions when the movement is fully utilized and indicates a capacity failure. The capacity of the movements is based on the distribution of gaps in the major street traffic stream, the selection of gaps to complete the desired movement, and the follow-up headways for each driver in the queue. When an unsignalized intersection is located within 0.25 miles of a signalized intersection, traffic flows may not be random and some platoon structure may exist, thereby affecting the minor street operations. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

TABLE A-1
Level-of-Service Criteria for Intersections

Level of Service	**Signalized Intersection Criteria** Average Control Delay (Seconds per Vehicle)	**Unsignalized Intersection Criteria** Average Control Delay (Seconds per Vehicle)	**V/C Ratio >1.00[a]**
A	≤10	≤10	F
B	>10 and ≤20	>10 and ≤15	F
C	>20 and ≤35	>15 and ≤25	F
D	>35 and ≤55	>25 and ≤35	F
E	>55 and ≤80	>35 and ≤50	F
F	>80	>50	F

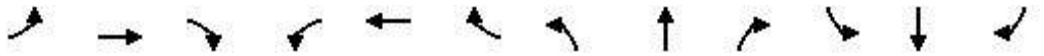
Note: [a]For approach-based and intersection-wide assessments, LOS is defined solely by control delay.

Source: *Highway Capacity Manual, 6th Edition: A Guide for Multimodal Mobility Analysis.* Washington, D.C.: Transportation Research Board, 2016. Exhibit 19-8, Pg. 19-16.

For signalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups on the minor street approaches or to the left turns from the major street approaches.

APPENDIX E

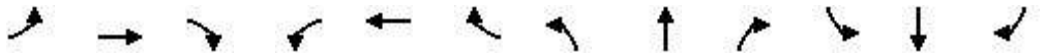
Capacity Analysis Worksheets



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	7	51	1	41	34	1204	30	90	966	81
Future Volume (vph)	17	0	7	51	1	41	34	1204	30	90	966	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3146			1793	1599	1616	3330		1662	3285	
Flt Permitted		0.77			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2510			1307	1599	1616	3330		1662	3285	
Peak-hour factor, PHF	0.53	0.53	0.53	0.89	0.89	0.89	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	32	0	13	57	1	46	41	1451	36	97	1039	87
RTOR Reduction (vph)	0	41	0	0	0	42	0	1	0	0	5	0
Lane Group Flow (vph)	0	4	0	0	58	4	41	1486	0	97	1121	0
Heavy Vehicles (%)	6%	6%	6%	1%	1%	1%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		7.2			7.2	7.2	4.4	43.4		7.8	46.8	
Effective Green, g (s)		7.2			7.2	7.2	4.4	43.4		7.8	46.8	
Actuated g/C Ratio		0.09			0.09	0.09	0.06	0.57		0.10	0.61	
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)		236			123	150	93	1891		169	2012	
v/s Ratio Prot						0.00	0.03	c0.45		c0.06	c0.34	
v/s Ratio Perm		0.00			c0.04							
v/c Ratio		0.02			0.47	0.03	0.44	0.79		0.57	0.56	
Uniform Delay, d1		31.4			32.8	31.4	34.8	12.9		32.7	8.7	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			2.8	0.1	3.3	2.2		4.7	0.3	
Delay (s)		31.4			35.6	31.5	38.1	15.1		37.4	9.0	
Level of Service		C			D	C	D	B		D	A	
Approach Delay (s)		31.4			33.8			15.7			11.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	1	31	5	3	2	47	1153	0	14	872	143
Future Volume (vph)	153	1	31	5	3	2	47	1153	0	14	872	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1651	1524		1650		1631	3261		1646	3334	
Flt Permitted		0.71	1.00		0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1238	1524		1431		1631	3261		1646	3334	
Peak-hour factor, PHF	0.79	0.79	0.79	0.56	0.56	0.56	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	194	1	39	9	5	4	56	1373	0	15	938	154
RTOR Reduction (vph)	0	0	26	0	3	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	195	13	0	15	0	56	1373	0	15	1079	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		19.3	31.2		19.3		5.9	51.5		2.4	48.0	
Effective Green, g (s)		19.3	31.2		19.3		5.9	51.5		2.4	48.0	
Actuated g/C Ratio		0.21	0.34		0.21		0.06	0.56		0.03	0.53	
Clearance Time (s)		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	
Lane Grp Cap (vph)		261	521		302		105	1841		43	1754	
v/s Ratio Prot			0.01				c0.03	c0.42		0.01	0.32	
v/s Ratio Perm		c0.16			0.01							
v/c Ratio		0.75	0.03		0.05		0.53	0.75		0.35	0.62	
Uniform Delay, d1		33.7	19.9		28.6		41.3	14.9		43.6	15.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.1	0.0		0.1		5.1	1.7		4.9	0.6	
Delay (s)		44.7	19.9		28.7		46.4	16.6		48.5	15.8	
Level of Service		D	B		C		D	B		D	B	
Approach Delay (s)		40.6			28.7			17.8			16.2	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	91.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

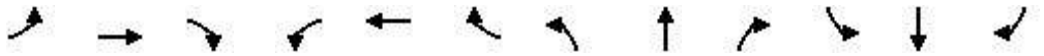
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1363	0	0	1081
Future Vol, veh/h	0	0	1363	0	0	1081
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	85	85	97	97
Heavy Vehicles, %	2	2	7	7	5	5
Mvmt Flow	0	0	1604	0	0	1114

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2161	802	0	0	1604	0
Stage 1	1604	-	-	-	-	-
Stage 2	557	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.2	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.25	-
Pot Cap-1 Maneuver	40	327	-	-	390	-
Stage 1	150	-	-	-	-	-
Stage 2	537	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	40	327	-	-	390	-
Mov Cap-2 Maneuver	119	-	-	-	-	-
Stage 1	150	-	-	-	-	-
Stage 2	537	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

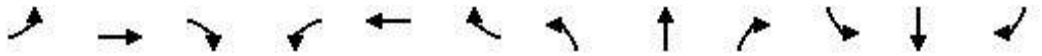
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	390	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	1	52	105	4	78	21	1188	33	143	959	40
Future Volume (vph)	91	1	52	105	4	78	21	1188	33	143	959	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.95			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3277			1795	1599	1711	3525		1711	3401	
Flt Permitted		0.72			0.60	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2434			1127	1599	1711	3525		1711	3401	
Peak-hour factor, PHF	0.76	0.76	0.76	0.72	0.72	0.72	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	120	1	68	146	6	108	24	1335	37	168	1128	47
RTOR Reduction (vph)	0	55	0	0	0	88	0	2	0	0	3	0
Lane Group Flow (vph)	0	134	0	0	152	20	24	1370	0	168	1172	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		15.9			15.9	15.9	2.8	40.2		11.3	48.7	
Effective Green, g (s)		15.9			15.9	15.9	2.8	40.2		11.3	48.7	
Actuated g/C Ratio		0.19			0.19	0.19	0.03	0.47		0.13	0.57	
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)		453			209	297	56	1659		226	1939	
v/s Ratio Prot						0.01	0.01	c0.39		c0.10	0.34	
v/s Ratio Perm		0.05			c0.13							
v/c Ratio		0.30			0.73	0.07	0.43	0.83		0.74	0.60	
Uniform Delay, d1		29.9			32.7	28.6	40.5	19.6		35.7	12.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			11.9	0.1	5.2	3.5		12.4	0.5	
Delay (s)		30.3			44.6	28.7	45.7	23.1		48.1	12.6	
Level of Service		C			D	C	D	C		D	B	
Approach Delay (s)		30.3			38.0			23.5			17.0	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	85.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	1	42	6	4	11	52	1128	0	12	972	116
Future Volume (vph)	180	1	42	6	4	11	52	1128	0	12	972	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715	1583		1740		1711	3421		1711	3482	
Flt Permitted		0.69	1.00		0.89		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1251	1583		1567		1711	3421		1711	3482	
Peak-hour factor, PHF	0.75	0.75	0.75	0.48	0.48	0.48	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	240	1	56	12	8	23	58	1267	0	13	1045	125
RTOR Reduction (vph)	0	0	34	0	17	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	241	22	0	27	0	58	1267	0	13	1160	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		22.8	34.6		22.8		5.8	46.7		1.2	42.1	
Effective Green, g (s)		22.8	34.6		22.8		5.8	46.7		1.2	42.1	
Actuated g/C Ratio		0.26	0.39		0.26		0.07	0.53		0.01	0.47	
Clearance Time (s)		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	
Lane Grp Cap (vph)		321	617		402		111	1801		23	1652	
v/s Ratio Prot			0.01				c0.03	c0.37		0.01	0.33	
v/s Ratio Perm		c0.19			0.02							
v/c Ratio		0.75	0.04		0.07		0.52	0.70		0.57	0.70	
Uniform Delay, d1		30.3	16.7		24.9		40.1	15.8		43.5	18.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		9.5	0.0		0.1		4.4	1.3		28.1	1.4	
Delay (s)		39.8	16.8		25.0		44.5	17.1		71.6	19.7	
Level of Service		D	B		C		D	B		E	B	
Approach Delay (s)		35.5			25.0			18.3			20.3	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	88.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1340	0	0	1152
Future Vol, veh/h	0	0	1340	0	0	1152
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	88	88	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1523	0	0	1371

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2209	762	0	0	1523	0
Stage 1	1523	-	-	-	-	-
Stage 2	686	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	38	347	-	-	434	-
Stage 1	166	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	38	347	-	-	434	-
Mov Cap-2 Maneuver	124	-	-	-	-	-
Stage 1	166	-	-	-	-	-
Stage 2	461	-	-	-	-	-

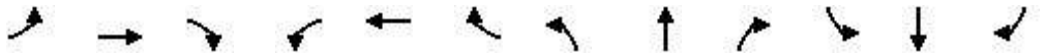
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	434	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	7	52	1	42	35	1228	31	92	985	83
Future Volume (vph)	17	0	7	52	1	42	35	1228	31	92	985	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3146			1793	1599	1616	3330		1662	3285	
Flt Permitted		0.77			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2506			1307	1599	1616	3330		1662	3285	
Peak-hour factor, PHF	0.53	0.53	0.53	0.89	0.89	0.89	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	32	0	13	58	1	47	42	1480	37	99	1059	89
RTOR Reduction (vph)	0	41	0	0	0	43	0	1	0	0	5	0
Lane Group Flow (vph)	0	4	0	0	59	4	42	1516	0	99	1143	0
Heavy Vehicles (%)	6%	6%	6%	1%	1%	1%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		7.3			7.3	7.3	4.4	43.3		7.9	46.8	
Effective Green, g (s)		7.3			7.3	7.3	4.4	43.3		7.9	46.8	
Actuated g/C Ratio		0.10			0.10	0.10	0.06	0.57		0.10	0.61	
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)		239			124	152	92	1884		171	2009	
v/s Ratio Prot						0.00	0.03	c0.46		c0.06	c0.35	
v/s Ratio Perm		0.00			c0.05							
v/c Ratio		0.02			0.48	0.03	0.46	0.80		0.58	0.57	
Uniform Delay, d1		31.4			32.8	31.4	34.9	13.2		32.7	8.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			2.9	0.1	3.6	2.6		4.7	0.4	
Delay (s)		31.4			35.7	31.5	38.5	15.8		37.4	9.2	
Level of Service		C			D	C	D	B		D	A	
Approach Delay (s)		31.4			33.8			16.4			11.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	1	32	5	3	2	48	1176	0	14	890	146
Future Volume (vph)	156	1	32	5	3	2	48	1176	0	14	890	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1651	1524		1650		1631	3261		1646	3334	
Flt Permitted		0.71	1.00		0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1238	1524		1432		1631	3261		1646	3334	
Peak-hour factor, PHF	0.79	0.79	0.79	0.56	0.56	0.56	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	197	1	41	9	5	4	57	1400	0	15	957	157
RTOR Reduction (vph)	0	0	27	0	3	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	198	14	0	15	0	57	1400	0	15	1101	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		19.7	31.6		19.7		5.9	52.4		2.4	48.9	
Effective Green, g (s)		19.7	31.6		19.7		5.9	52.4		2.4	48.9	
Actuated g/C Ratio		0.21	0.34		0.21		0.06	0.57		0.03	0.53	
Clearance Time (s)		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	
Lane Grp Cap (vph)		263	520		304		104	1847		42	1762	
v/s Ratio Prot			0.01				c0.03	c0.43		0.01	0.33	
v/s Ratio Perm		c0.16			0.01							
v/c Ratio		0.75	0.03		0.05		0.55	0.76		0.36	0.63	
Uniform Delay, d1		34.1	20.2		28.9		42.0	15.2		44.3	15.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.5	0.0		0.1		5.8	1.8		5.1	0.7	
Delay (s)		45.6	20.3		29.0		47.8	17.1		49.4	16.0	
Level of Service		D	C		C		D	B		D	B	
Approach Delay (s)		41.3			29.0			18.3			16.5	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	92.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1390	0	0	1103
Future Vol, veh/h	0	0	1390	0	0	1103
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	85	85	97	97
Heavy Vehicles, %	2	2	7	7	5	5
Mvmt Flow	0	0	1635	0	0	1137

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2204	818	0	0	1635	0
Stage 1	1635	-	-	-	-	-
Stage 2	569	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.2	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.25	-
Pot Cap-1 Maneuver	38	319	-	-	379	-
Stage 1	144	-	-	-	-	-
Stage 2	530	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	38	319	-	-	379	-
Mov Cap-2 Maneuver	114	-	-	-	-	-
Stage 1	144	-	-	-	-	-
Stage 2	530	-	-	-	-	-

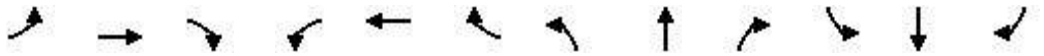
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	379	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	1	53	107	4	80	21	1212	34	146	978	41
Future Volume (vph)	93	1	53	107	4	80	21	1212	34	146	978	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.95			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3276			1795	1599	1711	3525		1711	3401	
Flt Permitted		0.71			0.60	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2416			1122	1599	1711	3525		1711	3401	
Peak-hour factor, PHF	0.76	0.76	0.76	0.72	0.72	0.72	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	122	1	70	149	6	111	24	1362	38	172	1151	48
RTOR Reduction (vph)	0	57	0	0	0	90	0	2	0	0	3	0
Lane Group Flow (vph)	0	136	0	0	155	21	24	1398	0	172	1196	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		16.2			16.2	16.2	2.9	40.8		11.4	49.3	
Effective Green, g (s)		16.2			16.2	16.2	2.9	40.8		11.4	49.3	
Actuated g/C Ratio		0.19			0.19	0.19	0.03	0.47		0.13	0.57	
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)		453			210	299	57	1664		225	1940	
v/s Ratio Prot						0.01	0.01	c0.40		c0.10	0.35	
v/s Ratio Perm		0.06			c0.14							
v/c Ratio		0.30			0.74	0.07	0.42	0.84		0.76	0.62	
Uniform Delay, d1		30.2			33.1	28.9	40.9	19.9		36.2	12.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			12.7	0.1	5.0	4.0		14.3	0.6	
Delay (s)		30.6			45.8	29.0	45.9	24.0		50.5	12.9	
Level of Service		C			D	C	D	C		D	B	
Approach Delay (s)		30.6			38.8			24.3			17.6	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	86.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	1	43	6	4	11	53	1151	0	12	992	118
Future Volume (vph)	184	1	43	6	4	11	53	1151	0	12	992	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715	1583		1740		1711	3421		1711	3483	
Flt Permitted		0.69	1.00		0.89		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1251	1583		1564		1711	3421		1711	3483	
Peak-hour factor, PHF	0.75	0.75	0.75	0.48	0.48	0.48	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	245	1	57	12	8	23	60	1293	0	13	1067	127
RTOR Reduction (vph)	0	0	35	0	17	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	246	22	0	27	0	60	1293	0	13	1184	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		22.8	34.7		22.8		5.9	47.9		1.2	43.2	
Effective Green, g (s)		22.8	34.7		22.8		5.9	47.9		1.2	43.2	
Actuated g/C Ratio		0.25	0.39		0.25		0.07	0.53		0.01	0.48	
Clearance Time (s)		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	
Lane Grp Cap (vph)		317	611		396		112	1822		22	1673	
v/s Ratio Prot			0.01				c0.04	c0.38		0.01	0.34	
v/s Ratio Perm		c0.20			0.02							
v/c Ratio		0.78	0.04		0.07		0.54	0.71		0.59	0.71	
Uniform Delay, d1		31.2	17.2		25.5		40.7	15.8		44.1	18.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.3	0.0		0.1		4.9	1.3		36.0	1.4	
Delay (s)		42.5	17.2		25.6		45.5	17.1		80.1	19.8	
Level of Service		D	B		C		D	B		F	B	
Approach Delay (s)		37.7			25.6			18.3			20.4	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

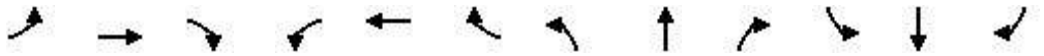
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1367	0	0	1175
Future Vol, veh/h	0	0	1367	0	0	1175
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	88	88	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1553	0	0	1399

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2253	777	0	0	1553	0
Stage 1	1553	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	35	340	-	-	422	-
Stage 1	160	-	-	-	-	-
Stage 2	454	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	35	340	-	-	422	-
Mov Cap-2 Maneuver	120	-	-	-	-	-
Stage 1	160	-	-	-	-	-
Stage 2	454	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

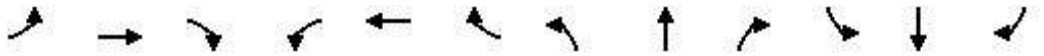
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	422	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	7	52	1	42	35	1248	31	92	992	83
Future Volume (vph)	17	0	7	52	1	42	35	1248	31	92	992	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3146			1793	1599	1616	3331		1662	3285	
Flt Permitted		0.77			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2506			1307	1599	1616	3331		1662	3285	
Peak-hour factor, PHF	0.53	0.53	0.53	0.89	0.89	0.89	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	32	0	13	58	1	47	42	1504	37	99	1067	89
RTOR Reduction (vph)	0	41	0	0	0	43	0	1	0	0	5	0
Lane Group Flow (vph)	0	4	0	0	59	4	42	1540	0	99	1151	0
Heavy Vehicles (%)	6%	6%	6%	1%	1%	1%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		7.3			7.3	7.3	4.4	43.3		7.9	46.8	
Effective Green, g (s)		7.3			7.3	7.3	4.4	43.3		7.9	46.8	
Actuated g/C Ratio		0.10			0.10	0.10	0.06	0.57		0.10	0.61	
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)		239			124	152	92	1885		171	2009	
v/s Ratio Prot						0.00	0.03	c0.46		c0.06	c0.35	
v/s Ratio Perm		0.00			c0.05							
v/c Ratio		0.02			0.48	0.03	0.46	0.82		0.58	0.57	
Uniform Delay, d1		31.4			32.8	31.4	34.9	13.4		32.7	8.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			2.9	0.1	3.6	2.9		4.7	0.4	
Delay (s)		31.4			35.7	31.5	38.5	16.3		37.4	9.3	
Level of Service		C			D	C	D	B		D	A	
Approach Delay (s)		31.4			33.8			16.9			11.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	1	32	5	3	2	48	1179	0	14	899	151
Future Volume (vph)	157	1	32	5	3	2	48	1179	0	14	899	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1651	1524		1650		1631	3261		1646	3332	
Flt Permitted		0.71	1.00		0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1238	1524		1432		1631	3261		1646	3332	
Peak-hour factor, PHF	0.79	0.79	0.79	0.56	0.56	0.56	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	199	1	41	9	5	4	57	1404	0	15	967	162
RTOR Reduction (vph)	0	0	27	0	3	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	200	14	0	15	0	57	1404	0	15	1116	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		20.0	31.9		20.0		5.9	52.6		2.4	49.1	
Effective Green, g (s)		20.0	31.9		20.0		5.9	52.6		2.4	49.1	
Actuated g/C Ratio		0.22	0.34		0.22		0.06	0.57		0.03	0.53	
Clearance Time (s)		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	
Lane Grp Cap (vph)		266	522		307		103	1844		42	1759	
v/s Ratio Prot			0.01				c0.03	c0.43		0.01	0.33	
v/s Ratio Perm		c0.16			0.01							
v/c Ratio		0.75	0.03		0.05		0.55	0.76		0.36	0.63	
Uniform Delay, d1		34.2	20.3		29.0		42.3	15.4		44.5	15.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.4	0.0		0.1		6.3	1.9		5.1	0.8	
Delay (s)		45.5	20.3		29.0		48.6	17.3		49.7	16.3	
Level of Service		D	C		C		D	B		D	B	
Approach Delay (s)		41.2			29.0			18.5			16.8	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

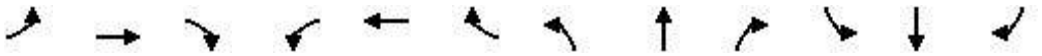
Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	20	1390	4	7	1103
Future Vol, veh/h	14	20	1390	4	7	1103
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	85	85	97	97
Heavy Vehicles, %	2	2	7	7	5	5
Mvmt Flow	16	22	1635	5	7	1137

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2221	820	0	0	1640	0
Stage 1	1638	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.2	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.25	-
Pot Cap-1 Maneuver	37	318	-	-	377	-
Stage 1	144	-	-	-	-	-
Stage 2	521	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	35	318	-	-	377	-
Mov Cap-2 Maneuver	112	-	-	-	-	-
Stage 1	144	-	-	-	-	-
Stage 2	495	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	30.1	0	0.5
HCM LOS	D		

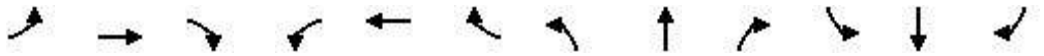
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	181	377	-
HCM Lane V/C Ratio	-	-	0.209	0.019	-
HCM Control Delay (s)	-	-	30.1	14.7	0.4
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	1	53	107	4	80	21	1224	34	146	997	41
Future Volume (vph)	93	1	53	107	4	80	21	1224	34	146	997	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.95			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3276			1795	1599	1711	3525		1711	3401	
Flt Permitted		0.71			0.60	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2415			1122	1599	1711	3525		1711	3401	
Peak-hour factor, PHF	0.76	0.76	0.76	0.72	0.72	0.72	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	122	1	70	149	6	111	24	1375	38	172	1173	48
RTOR Reduction (vph)	0	57	0	0	0	90	0	2	0	0	3	0
Lane Group Flow (vph)	0	136	0	0	155	21	24	1411	0	172	1218	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		16.2			16.2	16.2	2.9	41.0		11.4	49.5	
Effective Green, g (s)		16.2			16.2	16.2	2.9	41.0		11.4	49.5	
Actuated g/C Ratio		0.19			0.19	0.19	0.03	0.47		0.13	0.57	
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)		451			209	299	57	1668		225	1943	
v/s Ratio Prot						0.01	0.01	c0.40		c0.10	0.36	
v/s Ratio Perm		0.06			c0.14							
v/c Ratio		0.30			0.74	0.07	0.42	0.85		0.76	0.63	
Uniform Delay, d1		30.3			33.2	29.0	41.0	20.0		36.3	12.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			13.2	0.1	5.0	4.2		14.3	0.6	
Delay (s)		30.7			46.5	29.1	46.0	24.2		50.6	13.0	
Level of Service		C			D	C	D	C		D	B	
Approach Delay (s)		30.7			39.2			24.5			17.7	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	86.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	189	1	43	6	4	11	53	1159	0	12	997	121
Future Volume (vph)	189	1	43	6	4	11	53	1159	0	12	997	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715	1583		1740		1711	3421		1711	3482	
Flt Permitted		0.69	1.00		0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1251	1583		1562		1711	3421		1711	3482	
Peak-hour factor, PHF	0.75	0.75	0.75	0.48	0.48	0.48	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	252	1	57	12	8	23	60	1302	0	13	1072	130
RTOR Reduction (vph)	0	0	35	0	17	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	253	22	0	27	0	60	1302	0	13	1192	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		22.8	34.7		22.8		5.9	48.2		1.2	43.5	
Effective Green, g (s)		22.8	34.7		22.8		5.9	48.2		1.2	43.5	
Actuated g/C Ratio		0.25	0.38		0.25		0.07	0.53		0.01	0.48	
Clearance Time (s)		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	
Lane Grp Cap (vph)		316	608		394		111	1828		22	1679	
v/s Ratio Prot			0.01				c0.04	c0.38		0.01	0.34	
v/s Ratio Perm		c0.20			0.02							
v/c Ratio		0.80	0.04		0.07		0.54	0.71		0.59	0.71	
Uniform Delay, d1		31.6	17.3		25.6		40.8	15.8		44.3	18.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		13.5	0.0		0.1		5.3	1.3		36.0	1.4	
Delay (s)		45.1	17.3		25.7		46.1	17.1		80.2	19.8	
Level of Service		D	B		C		D	B		F	B	
Approach Delay (s)		40.0			25.7			18.4			20.5	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	12	1367	13	19	1175
Future Vol, veh/h	8	12	1367	13	19	1175
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	88	88	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	13	1553	15	23	1399

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2307	784	0	0	1568	0
Stage 1	1561	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	32	336	-	-	417	-
Stage 1	159	-	-	-	-	-
Stage 2	430	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	24	336	-	-	417	-
Mov Cap-2 Maneuver	107	-	-	-	-	-
Stage 1	159	-	-	-	-	-
Stage 2	324	-	-	-	-	-

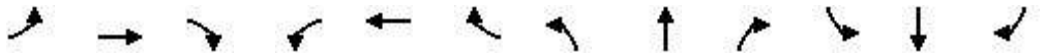
Approach	WB	NB	SB
HCM Control Delay, s	27.7	0	1.9
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	181	417	-
HCM Lane V/C Ratio	-	-	0.123	0.054	-
HCM Control Delay (s)	-	-	27.7	14.1	1.7
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	8	57	1	46	38	1357	34	101	1089	91
Future Volume (vph)	19	0	8	57	1	46	38	1357	34	101	1089	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3144			1793	1599	1616	3330		1662	3285	
Flt Permitted		0.77			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2494			1298	1599	1616	3330		1662	3285	
Peak-hour factor, PHF	0.53	0.53	0.53	0.89	0.89	0.89	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	36	0	15	64	1	52	46	1635	41	109	1171	98
RTOR Reduction (vph)	0	46	0	0	0	47	0	1	0	0	5	0
Lane Group Flow (vph)	0	5	0	0	65	5	46	1675	0	109	1264	0
Heavy Vehicles (%)	6%	6%	6%	1%	1%	1%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		7.7			7.7	7.7	4.4	43.5		8.1	47.2	
Effective Green, g (s)		7.7			7.7	7.7	4.4	43.5		8.1	47.2	
Actuated g/C Ratio		0.10			0.10	0.10	0.06	0.56		0.10	0.61	
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)		248			129	159	91	1873		174	2005	
v/s Ratio Prot						0.00	0.03	c0.50		c0.07	c0.38	
v/s Ratio Perm		0.00			c0.05							
v/c Ratio		0.02			0.50	0.03	0.51	0.89		0.63	0.63	
Uniform Delay, d1		31.4			33.0	31.4	35.4	14.9		33.2	9.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			3.1	0.1	4.4	5.9		6.9	0.7	
Delay (s)		31.4			36.1	31.5	39.8	20.8		40.0	10.2	
Level of Service		C			D	C	D	C		D	B	
Approach Delay (s)		31.4			34.0			21.3			12.5	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	1	35	6	3	2	53	1299	0	16	983	161
Future Volume (vph)	172	1	35	6	3	2	53	1299	0	16	983	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1651	1524		1651		1631	3261		1646	3334	
Flt Permitted		0.71	1.00		0.83		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1235	1524		1402		1631	3261		1646	3334	
Peak-hour factor, PHF	0.79	0.79	0.79	0.56	0.56	0.56	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	218	1	44	11	5	4	63	1546	0	17	1057	173
RTOR Reduction (vph)	0	0	29	0	3	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	219	15	0	17	0	63	1546	0	17	1218	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		22.4	34.5		22.4		6.1	57.6		2.5	54.0	
Effective Green, g (s)		22.4	34.5		22.4		6.1	57.6		2.5	54.0	
Actuated g/C Ratio		0.22	0.34		0.22		0.06	0.57		0.02	0.54	
Clearance Time (s)		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	
Lane Grp Cap (vph)		275	523		312		98	1868		40	1791	
v/s Ratio Prot			0.01				c0.04	c0.47		0.01	0.37	
v/s Ratio Perm		c0.18			0.01							
v/c Ratio		0.80	0.03		0.05		0.64	0.83		0.42	0.68	
Uniform Delay, d1		36.9	21.9		30.7		46.1	17.4		48.3	16.9	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		14.7	0.0		0.1		13.5	3.2		7.1	1.0	
Delay (s)		51.6	21.9		30.8		59.7	20.6		55.4	18.0	
Level of Service		D	C		C		E	C		E	B	
Approach Delay (s)		46.6			30.8			22.1			18.5	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1536	0	0	1218
Future Vol, veh/h	0	0	1536	0	0	1218
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	85	85	97	97
Heavy Vehicles, %	2	2	7	7	5	5
Mvmt Flow	0	0	1807	0	0	1256

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2435	904	0	0	1807	0
Stage 1	1807	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.2	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.25	-
Pot Cap-1 Maneuver	26	280	-	-	324	-
Stage 1	116	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	26	280	-	-	324	-
Mov Cap-2 Maneuver	93	-	-	-	-	-
Stage 1	116	-	-	-	-	-
Stage 2	494	-	-	-	-	-

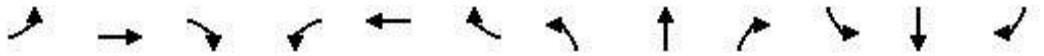
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	324	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	1	59	118	5	88	24	1339	37	161	1081	45
Future Volume (vph)	103	1	59	118	5	88	24	1339	37	161	1081	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.95			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3276			1795	1599	1711	3525		1711	3401	
Flt Permitted		0.69			0.58	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2340			1097	1599	1711	3525		1711	3401	
Peak-hour factor, PHF	0.76	0.76	0.76	0.72	0.72	0.72	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	136	1	78	164	7	122	27	1504	42	189	1272	53
RTOR Reduction (vph)	0	63	0	0	0	98	0	2	0	0	3	0
Lane Group Flow (vph)	0	152	0	0	171	24	27	1544	0	189	1322	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		17.5			17.5	17.5	3.0	42.0		11.6	50.6	
Effective Green, g (s)		17.5			17.5	17.5	3.0	42.0		11.6	50.6	
Actuated g/C Ratio		0.20			0.20	0.20	0.03	0.47		0.13	0.57	
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)		459			215	314	57	1661		222	1931	
v/s Ratio Prot						0.01	0.02	c0.44		c0.11	0.39	
v/s Ratio Perm		0.07			c0.16							
v/c Ratio		0.33			0.80	0.08	0.47	0.93		0.85	0.68	
Uniform Delay, d1		30.8			34.1	29.2	42.3	22.2		37.9	13.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			18.1	0.1	6.1	9.6		25.5	1.0	
Delay (s)		31.2			52.2	29.3	48.4	31.7		63.4	14.6	
Level of Service		C			D	C	D	C		E	B	
Approach Delay (s)		31.2			42.7			32.0			20.7	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	89.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	203	1	47	7	5	12	59	1271	0	14	1095	131
Future Volume (vph)	203	1	47	7	5	12	59	1271	0	14	1095	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715	1583		1746		1711	3421		1711	3482	
Flt Permitted		0.69	1.00		0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1243	1583		1544		1711	3421		1711	3482	
Peak-hour factor, PHF	0.75	0.75	0.75	0.48	0.48	0.48	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	271	1	63	15	10	25	66	1428	0	15	1177	141
RTOR Reduction (vph)	0	0	38	0	19	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	272	25	0	31	0	66	1428	0	15	1309	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		23.0	35.0		23.0		6.0	53.9		2.5	50.4	
Effective Green, g (s)		23.0	35.0		23.0		6.0	53.9		2.5	50.4	
Actuated g/C Ratio		0.24	0.36		0.24		0.06	0.55		0.03	0.52	
Clearance Time (s)		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	
Lane Grp Cap (vph)		293	568		364		105	1893		43	1801	
v/s Ratio Prot			0.02				c0.04	c0.42		0.01	0.38	
v/s Ratio Perm		c0.22			0.02							
v/c Ratio		0.93	0.04		0.08		0.63	0.75		0.35	0.73	
Uniform Delay, d1		36.4	20.3		29.0		44.6	16.7		46.6	18.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		33.9	0.0		0.1		11.2	1.8		4.9	1.5	
Delay (s)		70.2	20.3		29.1		55.8	18.4		51.5	19.7	
Level of Service		E	C		C		E	B		D	B	
Approach Delay (s)		60.9			29.1			20.1			20.0	
Approach LOS		E			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	97.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

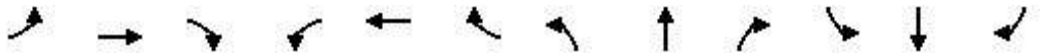
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1510	0	0	1298
Future Vol, veh/h	0	0	1510	0	0	1298
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	88	88	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1716	0	0	1545

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2489	858	0	0	1716	0
Stage 1	1716	-	-	-	-	-
Stage 2	773	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	24	300	-	-	365	-
Stage 1	130	-	-	-	-	-
Stage 2	416	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	24	300	-	-	365	-
Mov Cap-2 Maneuver	98	-	-	-	-	-
Stage 1	130	-	-	-	-	-
Stage 2	416	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

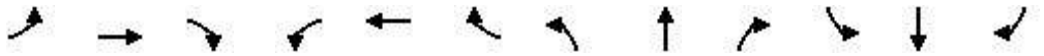
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	365	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	8	57	1	46	38	1377	34	101	1096	91
Future Volume (vph)	19	0	8	57	1	46	38	1377	34	101	1096	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3144			1793	1599	1616	3331		1662	3285	
Flt Permitted		0.77			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2494			1298	1599	1616	3331		1662	3285	
Peak-hour factor, PHF	0.53	0.53	0.53	0.89	0.89	0.89	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	36	0	15	64	1	52	46	1659	41	109	1178	98
RTOR Reduction (vph)	0	46	0	0	0	47	0	1	0	0	5	0
Lane Group Flow (vph)	0	5	0	0	65	5	46	1699	0	109	1271	0
Heavy Vehicles (%)	6%	6%	6%	1%	1%	1%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		7.7			7.7	7.7	4.4	43.5		8.1	47.2	
Effective Green, g (s)		7.7			7.7	7.7	4.4	43.5		8.1	47.2	
Actuated g/C Ratio		0.10			0.10	0.10	0.06	0.56		0.10	0.61	
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)		248			129	159	91	1874		174	2005	
v/s Ratio Prot						0.00	0.03	c0.51		c0.07	c0.39	
v/s Ratio Perm		0.00			c0.05							
v/c Ratio		0.02			0.50	0.03	0.51	0.91		0.63	0.63	
Uniform Delay, d1		31.4			33.0	31.4	35.4	15.1		33.2	9.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			3.1	0.1	4.4	6.7		6.9	0.7	
Delay (s)		31.4			36.1	31.5	39.8	21.8		40.0	10.2	
Level of Service		C			D	C	D	C		D	B	
Approach Delay (s)		31.4			34.0			22.3			12.6	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	1	35	6	3	2	53	1302	0	16	992	166
Future Volume (vph)	173	1	35	6	3	2	53	1302	0	16	992	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1651	1524		1651		1631	3261		1646	3333	
Flt Permitted		0.71	1.00		0.83		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1235	1524		1402		1631	3261		1646	3333	
Peak-hour factor, PHF	0.79	0.79	0.79	0.56	0.56	0.56	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	219	1	44	11	5	4	63	1550	0	17	1067	178
RTOR Reduction (vph)	0	0	29	0	3	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	220	15	0	17	0	63	1550	0	17	1232	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		22.5	34.6		22.5		6.1	58.0		2.5	54.4	
Effective Green, g (s)		22.5	34.6		22.5		6.1	58.0		2.5	54.4	
Actuated g/C Ratio		0.22	0.34		0.22		0.06	0.57		0.02	0.54	
Clearance Time (s)		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	
Lane Grp Cap (vph)		275	522		312		98	1872		40	1795	
v/s Ratio Prot			0.01				c0.04	c0.48		0.01	0.37	
v/s Ratio Perm		c0.18			0.01							
v/c Ratio		0.80	0.03		0.05		0.64	0.83		0.42	0.69	
Uniform Delay, d1		37.1	22.0		30.9		46.4	17.5		48.5	17.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		15.2	0.0		0.1		13.5	3.2		7.1	1.1	
Delay (s)		52.3	22.1		31.0		59.9	20.6		55.7	18.2	
Level of Service		D	C		C		E	C		E	B	
Approach Delay (s)		47.3			31.0			22.2			18.7	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

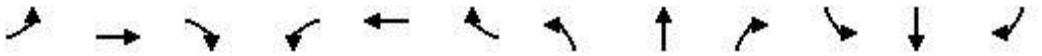
Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	20	1536	4	7	1218
Future Vol, veh/h	14	20	1536	4	7	1218
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	85	85	97	97
Heavy Vehicles, %	2	2	7	7	5	5
Mvmt Flow	16	22	1807	5	7	1256

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2452	906	0	0	1812	0
Stage 1	1810	-	-	-	-	-
Stage 2	642	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.2	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.25	-
Pot Cap-1 Maneuver	26	279	-	-	323	-
Stage 1	116	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	24	279	-	-	323	-
Mov Cap-2 Maneuver	91	-	-	-	-	-
Stage 1	116	-	-	-	-	-
Stage 2	451	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	36.6	0	0.7
HCM LOS	E		

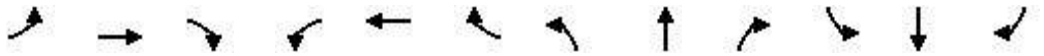
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	151	323	-
HCM Lane V/C Ratio	-	-	0.25	0.022	-
HCM Control Delay (s)	-	-	36.6	16.4	0.6
HCM Lane LOS	-	-	E	C	A
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	1	59	118	5	88	24	1351	37	161	1100	45
Future Volume (vph)	103	1	59	118	5	88	24	1351	37	161	1100	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	11	11
Total Lost time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.95			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3276			1795	1599	1711	3525		1711	3401	
Flt Permitted		0.69			0.58	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2340			1097	1599	1711	3525		1711	3401	
Peak-hour factor, PHF	0.76	0.76	0.76	0.72	0.72	0.72	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	136	1	78	164	7	122	27	1518	42	189	1294	53
RTOR Reduction (vph)	0	63	0	0	0	98	0	2	0	0	3	0
Lane Group Flow (vph)	0	152	0	0	171	24	27	1558	0	189	1344	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		4			4	4	1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		17.5			17.5	17.5	3.0	42.0		11.6	50.6	
Effective Green, g (s)		17.5			17.5	17.5	3.0	42.0		11.6	50.6	
Actuated g/C Ratio		0.20			0.20	0.20	0.03	0.47		0.13	0.57	
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)		459			215	314	57	1661		222	1931	
v/s Ratio Prot						0.01	0.02	c0.44		c0.11	0.40	
v/s Ratio Perm		0.07			c0.16							
v/c Ratio		0.33			0.80	0.08	0.47	0.94		0.85	0.70	
Uniform Delay, d1		30.8			34.1	29.2	42.3	22.3		37.9	13.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			18.1	0.1	6.1	10.6		25.5	1.1	
Delay (s)		31.2			52.2	29.3	48.4	32.9		63.4	14.9	
Level of Service		C			D	C	D	C		E	B	
Approach Delay (s)		31.2			42.7			33.1			20.8	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	89.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	208	1	47	7	5	12	59	1279	0	14	1100	134
Future Volume (vph)	208	1	47	7	5	12	59	1279	0	14	1100	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	12	11	11	11	11	12	12
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715	1583		1746		1711	3421		1711	3482	
Flt Permitted		0.69	1.00		0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1243	1583		1540		1711	3421		1711	3482	
Peak-hour factor, PHF	0.75	0.75	0.75	0.48	0.48	0.48	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	277	1	63	15	10	25	66	1437	0	15	1183	144
RTOR Reduction (vph)	0	0	37	0	19	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	278	26	0	31	0	66	1437	0	15	1318	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	4 1		4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		22.9	34.9		22.9		6.0	54.4		2.5	50.9	
Effective Green, g (s)		22.9	34.9		22.9		6.0	54.4		2.5	50.9	
Actuated g/C Ratio		0.23	0.36		0.23		0.06	0.56		0.03	0.52	
Clearance Time (s)		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	
Lane Grp Cap (vph)		291	564		360		104	1902		43	1812	
v/s Ratio Prot			0.02				c0.04	c0.42		0.01	0.38	
v/s Ratio Perm		c0.22			0.02							
v/c Ratio		0.96	0.05		0.09		0.63	0.76		0.35	0.73	
Uniform Delay, d1		36.9	20.6		29.3		44.8	16.6		46.8	18.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		40.4	0.0		0.1		12.0	1.8		4.9	1.5	
Delay (s)		77.4	20.6		29.4		56.8	18.4		51.7	19.6	
Level of Service		E	C		C		E	B		D	B	
Approach Delay (s)		66.9			29.4			20.1			19.9	
Approach LOS		E			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	97.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	12	1510	13	19	1298
Future Vol, veh/h	8	12	1510	13	19	1298
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	88	88	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	13	1716	15	23	1545

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2543	866	0	0	1731	0
Stage 1	1724	-	-	-	-	-
Stage 2	819	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	22	297	-	-	360	-
Stage 1	129	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	12	297	-	-	360	-
Mov Cap-2 Maneuver	79	-	-	-	-	-
Stage 1	129	-	-	-	-	-
Stage 2	216	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	35.3	0	3.6
HCM LOS	E		

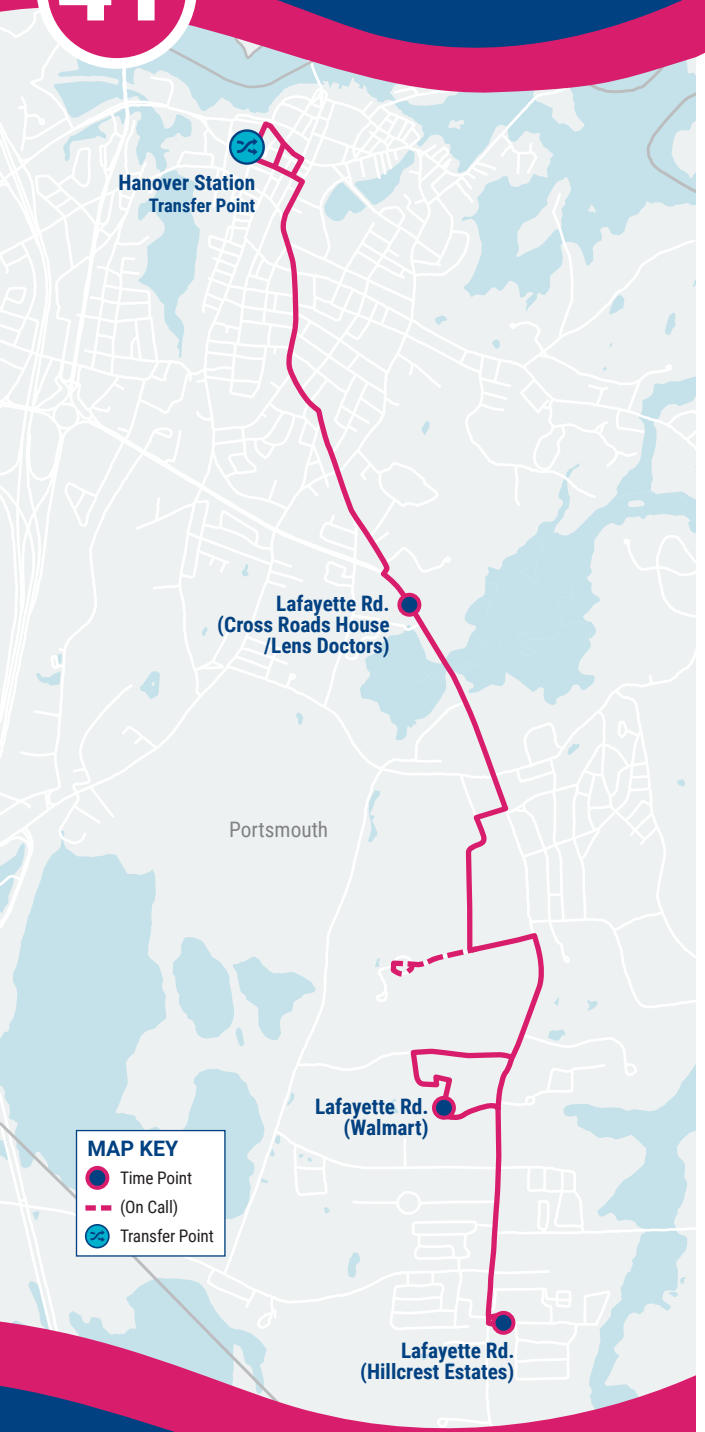
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	141	360	-
HCM Lane V/C Ratio	-	-	0.158	0.063	-
HCM Control Delay (s)	-	-	35.3	15.7	3.4
HCM Lane LOS	-	-	E	C	A
HCM 95th %tile Q(veh)	-	-	0.5	0.2	-

APPENDIX F

COAST Bus Schedule & Map

Route 41 Map

Portsmouth • Lafayette Road



Ride Information

COAST BUS FARES

Base Cash Fare **$1.50**

All passengers ages 5 and up are required to pay this fare each time they board a COAST bus.

Half-Fare **$ 0.75**

Passengers 65 and older, or passengers with a disability are entitled to pay half the cash fare. Proof of eligibility is required by showing a Medicare card, photo ID with birth date, COAST ADA Paratransit Card, or COAST Half-Fare Card. Please contact COAST to apply for a Half-Fare Card.

Multi-Ride Tickets and Passes

*Available at **www.coastbus.org** or call 603-743-5777, TTY 711.*

Unlimited Monthly Pass **$ 52**

Unlimited rides on COAST Routes for the month.

YOUR RIGHTS

COAST adheres to all Federal regulations regarding Civil Rights. If you need to request an ADA Reasonable Modification/ Accommodation, or if you believe you have been discriminated against or would like to file a complaint under the ADA or Title VI, please contact COAST's Civil Rights Officer at 603-516-0788, TTY 711 or email CivilRights@coastbus.org.

NO SERVICE DAYS

COAST does not operate on the following holidays:

- New Year's Day
- Martin Luther King Jr./ Civil Rights Day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Christmas Eve Day
- Christmas Day

42 Sumner Drive • Dover, NH 03820

603-743-5777 • TTY 711 • **www.coastbus.org**

This brochure is available in alternative formats upon request.

Bus Schedule & Map 41

COAST

Effective 09.17.22

ROUTE 41

Portsmouth • Lafayette Road

Find all of the full COAST schedules online at **coastbus.org**

MAP OUT YOUR GAME PLAN

Planning your trip has never been easier!

www.coastbus.org

COAST SYSTEM MAP

OUTBOUND • INBOUND

Route 41 Portsmouth • Lafayette Road

How to Read the Schedule

Printed bus schedules only show the timepoints (major bus stops where the bus will hold until the scheduled departure time). In between those timepoints are many other stops that you can use. For a full listing of bus stops, visit **www.coastbus.org**, or use the Passio GO! App.

The times shown represent the number of minutes after the hour that the bus will depart from that stop. Last stop times are arrivals. Any exceptions will be noted.

OUTBOUND (M-Sat)	Service On Every Hour		
Hanover Station - Lafayette Rd. (Hillcrest Estates)	First Bus	Minutes Past Hour	Last Bus
• Hanover Station	6:00am	:00	8:00pm
• Lafayette Rd. (Cross Roads House)	6:10am	:10	8:10pm
• Lafayette Rd. (Walmart)	6:20am	:20	8:20pm
• Lafayette Rd. (Hillcrest Estates)	6:29am	:29	8:29pm

INBOUND (M-Sat)	Service On Every Hour		
Lafayette Rd. (Hillcrest Estates) - Hanover Station	First Bus	Minutes Past Hour	Last Bus
• Lafayette Rd. (Hillcrest Estates)	6:30am	:30	8:30pm
• Lafayette Rd. (Lens Doctors)	6:38am	:38	8:38pm
• Hanover Station	6:49am	:49	8:49pm

MAP IT!

For a full listing of bus stops, visit
www.coastbus.org
or use the Passio GO! App.

Passio GO! App
Download the Passio GO! App for real-time information at the Google Play or App store.

Making Connections

Please tell your driver if you are trying to make a connection to another Route.

TRANSFER POINTS

Hanover Station	13 14 40 41 42 43 44
Dover Transportation Center	1 12 13 33 M-F 33 SAT 34
Dover NHDOT Park & Ride (Exit 9)	1 14
Rochester City Hall	6 12 14

14 33 SAT Temporarily suspended part of route due to driver shortage.

Hanover Station, Portsmouth

APPENDIX G

Trip Distribution Analysis

Table 3. Residence MCD/County to Workplace MCD/County Commuting Flows for the United States and Puerto Ric

For more information on sampling and estimation methods, confidentiality protection, and sampling and nonsampling errors, see

Universe: Workers 16 years and over.

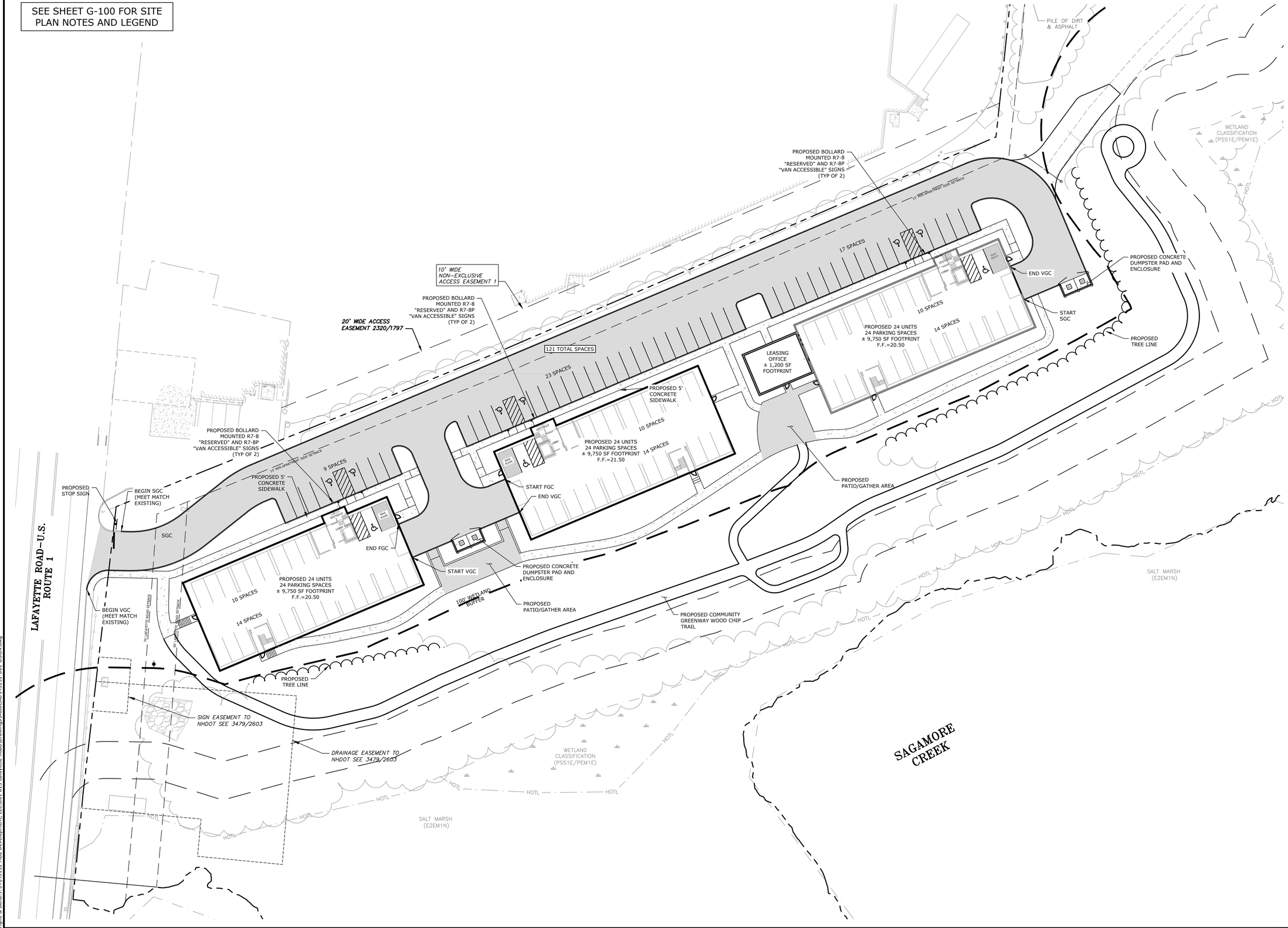
Commuting flows are sorted by residence state, residence county, and residence minor civil division.

Residence		Place of Work		Commuting Flow	TO / FROM						
State Name	Minor Civil Division Name	State Name	Minor Civil Division Name	Workers in Commuting Flow	I-95 NB via Route 1 Bypass	I-95 SB via NH 33	Spaulding Tpke via Route 1 Bypass	South via Route 1	Portsmouth Center via Lafayette Rd	West via Route 33	
New Hampshire	Portsmouth city	New Hampshire	Portsmouth city	6,310	315.5		315.5	1893	3470.5	315.5	
New Hampshire	Portsmouth city	New Hampshire	Dover city	643			643				
New Hampshire	Portsmouth city	New Hampshire	Durham town	470			376			117.5	
New Hampshire	Portsmouth city	New Hampshire	Exeter town	437		327.75				109.25	
New Hampshire	Portsmouth city	Maine	Kittery town	379	151.6				227.4		
New Hampshire	Portsmouth city	New Hampshire	Newington town	360			324			36	
New Hampshire	Portsmouth city	New Hampshire	Hampton town	354		106.2		247.8			
New Hampshire	Portsmouth city	Massachusetts	Boston city	164		82		82			
New Hampshire	Portsmouth city	New Hampshire	North Hampton town	162		48.6		113.4			
New Hampshire	Portsmouth city	New Hampshire	Salem town	159		159					
New Hampshire	Portsmouth city	Maine	York town	142	71				71		
New Hampshire	Portsmouth city	New Hampshire	New Castle town	134					134		
New Hampshire	Portsmouth city	New Hampshire	Manchester city	129		51.6	38.7			38.7	
New Hampshire	Portsmouth city	New Hampshire	Somersworth city	125			125				
New Hampshire	Portsmouth city	New Hampshire	Rye town	123				123			
New Hampshire	Portsmouth city	New Hampshire	Stratham town	123				92.25		30.75	
New Hampshire	Portsmouth city	New Hampshire	Greenland town	112				84		28	
New Hampshire	Portsmouth city	New Hampshire	Londonderry town	92		92					
New Hampshire	Portsmouth city	New Hampshire	Concord city	89			89				
New Hampshire	Portsmouth city	Massachusetts	Newburyport city	86		43		43			
New Hampshire	Portsmouth city	New Hampshire	Seabrook town	85		42.5		42.5			
New Hampshire	Portsmouth city	New Hampshire	Rochester city	80			80				
New Hampshire	Portsmouth city	Massachusetts	Peabody city	78		39		39			
New Hampshire	Portsmouth city	New Hampshire	Brentwood town	77		57.75				19.25	
New Hampshire	Portsmouth city	New Hampshire	Raymond town	75		37.5				37.5	
New Hampshire	Portsmouth city	Maine	North Berwick town	72	36		36				
New Hampshire	Portsmouth city	New Hampshire	Bedford town	69		69					
New Hampshire	Portsmouth city	New Hampshire	Barrington town	56			56				
New Hampshire	Portsmouth city	New Hampshire	Hampton Falls town	53		26.5		26.5			
New Hampshire	Portsmouth city	New Hampshire	Plymouth town	51		45.9	5.1				
New Hampshire	Portsmouth city	Massachusetts	North Andover town	49		36.75		12.25			
New Hampshire	Portsmouth city	New Hampshire	Wolfeboro town	49			49				
New Hampshire	Portsmouth city	Maine	Eliot town	48	24				24		
New Hampshire	Portsmouth city	Massachusetts	Amesbury Town city	48		24		24			
New Hampshire	Portsmouth city	Massachusetts	Quincy city	43		21.5		21.5			
New Hampshire	Portsmouth city	Massachusetts	Andover town	41		20.5		20.5			
New Hampshire	Portsmouth city	Massachusetts	Methuen Town city	40		20		20			
New Hampshire	Portsmouth city	Massachusetts	Stoneham town	39		19.5		19.5			
New Hampshire	Portsmouth city	New Hampshire	Plaistow town	39		39					
New Hampshire	Portsmouth city	New Hampshire	Nashua city	38		38					
New Hampshire	Portsmouth city	Massachusetts	Burlington town	37		18.5		18.5			
New Hampshire	Portsmouth city	New Hampshire	Hooksett town	37		33.3	3.7				
New Hampshire	Portsmouth city	New Hampshire	Rollinsford town	37			37				
New Hampshire	Portsmouth city	New Hampshire	Newmarket town	33						33	
New Hampshire	Portsmouth city	Massachusetts	Haverhill city	32		16		16			
New Hampshire	Portsmouth city	Maine	South Portland city	25	25						
New Hampshire	Portsmouth city	Massachusetts	Groveland town	25		12.5		12.5			
New Hampshire	Portsmouth city	Massachusetts	Cambridge city	25		12.5		12.5			
New Hampshire	Portsmouth city	Massachusetts	Chelmsford town	24		12		12			
New Hampshire	Portsmouth city	Maine	South Berwick town	23	17.25		5.75				
New Hampshire	Portsmouth city	New Hampshire	Hampstead town	22		22					
New Hampshire	Portsmouth city	Maine	Portland city	21	21						
New Hampshire	Portsmouth city	Massachusetts	Boxborough town	21		10.5		10.5			
New Hampshire	Portsmouth city	Massachusetts	Billerica town	20		10		10			
			TOTAL	12,105	661	1,595	2,184	2,996	3,927	765	0
					5%	15%	20%	25%	30%	5%	

APPENDIX H

Site Development Plan

SEE SHEET G-100 FOR SITE PLAN NOTES AND LEGEND



Tighe&Bond

N

0 30' 60'

GRAPHIC SCALE

PROGRESS PRINT

PROPOSED DEVELOPMENT

PROSPECT NORTH 815, LLC

815 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION

PROJECT NO:	M5131-001
DATE:	9/5/2023
FILE:	M5131-001-DSGN.dwg
DRAWN BY:	NHW/CJK
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

SITE PLAN

SCALE: AS SHOWN

C-102.1

Last Saved: 10/5/2023
Printed: Oct 05, 2023 - 10:30am By: CKcroulk
Tighe & Bond:J:\M\M5131 MB2 Development, LLC\001 815 Lafayette Road\Drawings\AutoCAD\M5131-001-DSGN.dwg

APPENDIX I

Off-Site Mitigation Analysis

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

2035 Build Condition Weekday AM Peak Hour Volumes (4-lane roadway)

INPUT

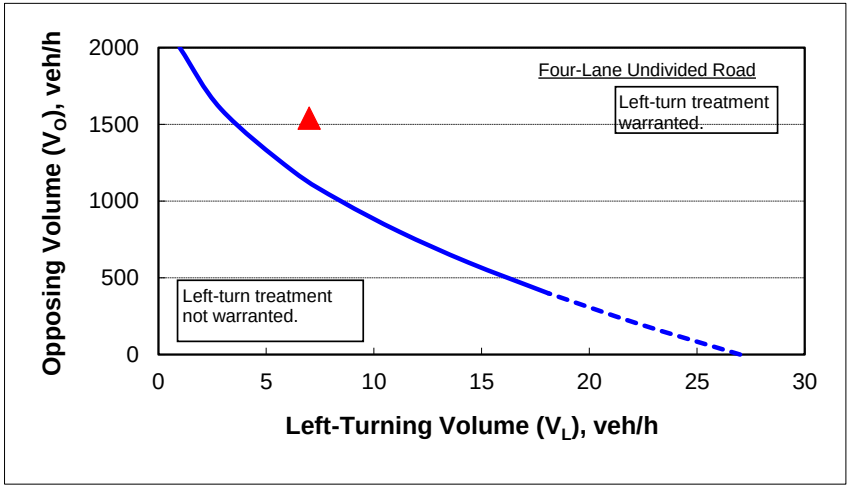
Variable	Value
Left-turning volume (V_L), veh/h:	7
Advancing volume (V_A), veh/h:	1225
Opposing volume (V_O), veh/h:	1540

OUTPUT

Variable	Message
Opposing volume (Vo) check:	O.K.
Combined volume (V_A and V_O) check:	O.K.
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	4.0
Critical headway, s:	6.0



Note: When V_O < 400 veh/h (dashed line), a left-turn lane is not normally warranted unless the advancing volume (V_A) in the same direction as the left-turning traffic exceeds 400 veh/h (V_A > 400 veh/h).

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

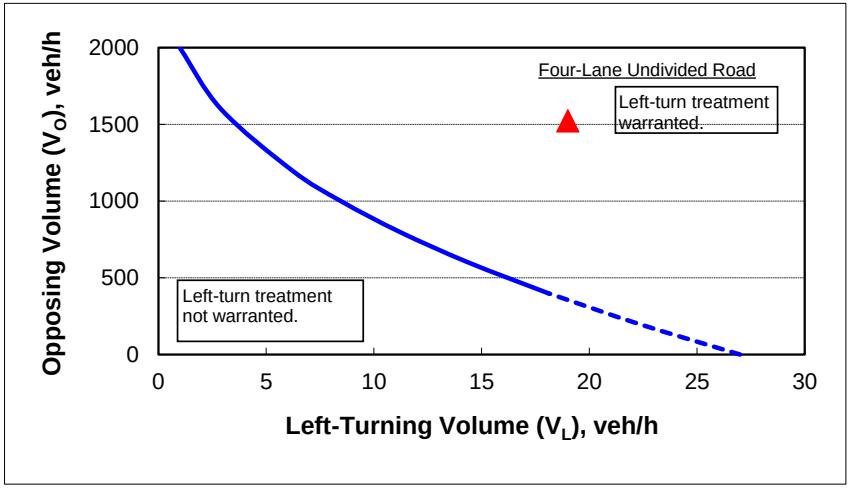
2035 Build Condition Weekday PM Peak Hour Volumes (4-lane roadway)

INPUT

Variable	Value
Left-turning volume (V_L), veh/h:	19
Advancing volume (V_A), veh/h:	1317
Opposing volume (V_O), veh/h:	1523

OUTPUT

Variable	Message
Opposing volume (Vo) check:	O.K.
Combined volume (V_A and V_O) check:	O.K.
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



Note: When V_O < 400 veh/h (dashed line), a left-turn lane is not normally warranted unless the advancing volume (V_A) in the same direction as the left-turning traffic exceeds 400 veh/h (V_A > 400 veh/h).

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	4.0
Critical headway, s:	6.0

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

2035 Build Condition Weekday AM Peak Hour Volumes

INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	44.7
Major-road volume (one direction), veh/h:	1540
Right-turn volume, veh/h:	4

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	14
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	

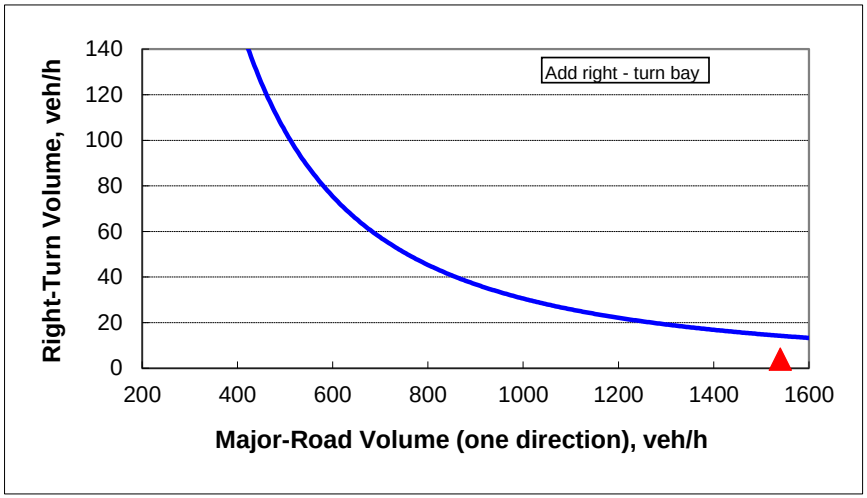


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

2035 Build Condition Weekday PM Peak Hour Volumes

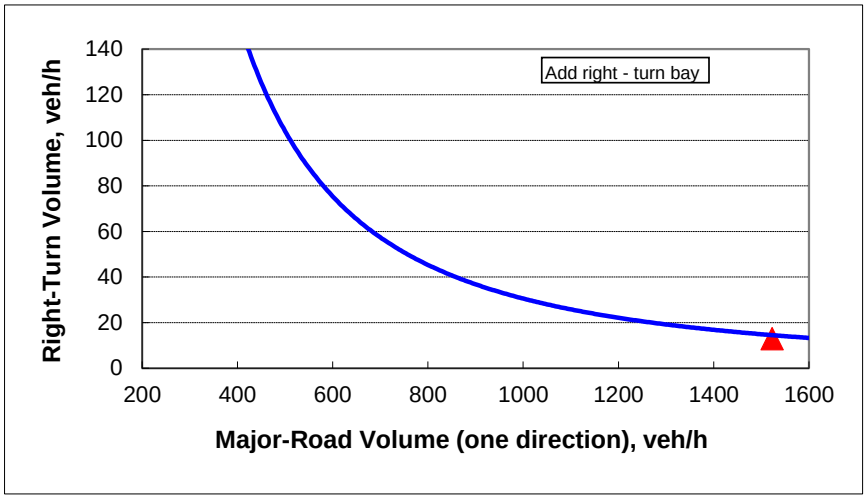
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	44.7
Major-road volume (one direction), veh/h:	1523
Right-turn volume, veh/h:	13

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	15
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



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October 19, 2023

Prospect North 815 LLC

RE: Natural Gas Availability to 815 Lafayette Rd Portsmouth NH

Dear Mike,

Unitil's natural gas division has reviewed the requested site for natural gas service.

Unitil hereby confirms natural gas service will be available to the 815 Lafayette Rd Portsmouth Project to serve three new residential 24 unit buildings.

Installation is pending an authorized installation agreement with Prospect North 815 LLC and street opening approval from the City of Portsmouth DPW.

Let me know if you have any questions. You can email me at oliver@unitil.com. My phone number is 603-294-5174.

Sincerely,

Janet Oliver
Senior Business Development Representative

CUSTOMER ENERGY SOLUTIONS
325 West Road
Portsmouth, NH 03801

T 888.486.4845 www.unitil.com

October 23, 2023

Green Energy Statement for

815 Lafayette Road, Portsmouth NH

Exterior Wall Systems: The exterior walls will meet or exceed the 2018 IECC standards for energy efficient design with any applicable State of New Hampshire and/or City of Portsmouth Amendments. The ground level walls are proposed to be constructed using Insulated Concrete Forms (ICF), All exterior walls enclosing conditioned spaces on the upper floors will be wood framed with insulation in the stud cavity and at all the rim joists. The exterior cladding materials will a combination of vinyl cladding over a continuous water and air infiltration resistive barrier system.

Window Systems: All windows systems in the project will meet or exceed the 2018 IECC standards with any applicable State of New Hampshire and/or City of Portsmouth Amendments. for u-value, shading coefficient and solar heat gain including high-performance, low-e glazing.

Roofing Systems: the roofing system in the project will consist of a roof membrane over continuous sloped insulation above the roof deck. Insulation value will meet or exceed the 2018 IECC standards with any applicable State of New Hampshire and/or City of Portsmouth Amendments. Slopes will direct water to interior roof drains to be managed in the site drainage.

HVAC Systems: The dwelling units will be provided with individualized heating and cooling units. Systems may include electric heat pumps and energy recovery ventilation units with EnergyStar electric domestic hot water heaters. The enclosed parking areas will be minimally heat using either gas fired unit heaters or a radiant heated slab with gas fired boiler. A heated slab will be continuously insulated to meet or exceed the 2018 IECC standards for energy efficient design with any applicable State of New Hampshire and/or City of Portsmouth Amendments.

Plumbing Systems: All plumbing fixtures in the project will be low-flow fixtures. Dwelling units will have individual EnergyStar rated hot water heaters.

Lighting Systems: All permanent interior light fixtures will use LED lamping.

Appliances: All appliances provided with the project will be EnergyStar rated.

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. The checklist is required to be completed and uploaded to the Site Plan application in the City's online permitting system. 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 Applicant: Prospect North 815, LLC Date Submitted: October 23, 2023

Application # (in City's online permitting): LU 23-149

Site Address: 815 Lafayette Rd Map: 245 Lot: Lot 3

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☑	Complete application form submitted via the City's web-based permitting program (2.5.2.1**(2.5.2.3A)**	Enclosed	N/A
☑	All application documents, plans, supporting documentation and other materials uploaded to the application form in viewpoint in digital Portable Document Format (PDF). One hard copy of all plans and materials shall be submitted to the Planning Department by the published deadline. **(2.5.2.8)**	Enclosed	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. **(2.5.3.1B)**	Enclosed	Yes
☑	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**	Site Plan Sheet C-102	N/A
☑	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Site Plan Sheet C-102	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Enclosed Cover Sheet	N/A
☑	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. **(2.5.3.1F)**	Existing Conditions Plan Sheets	N/A
☑	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Cover Sheet	N/A
☑	List of reference plans. **(2.5.3.1H)**	General Notes Sheet G-100 & Existing Conditions Plan Sheets	N/A
☑	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	General Notes Sheet G-100	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.. **(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)**	Existing Conditions Plan Sheets	N/A
☑	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☑	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	Existing Conditions Plan Sheets	N/A
☑	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Required on all plan sheets	N/A
☑	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	Required on all plan 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)**	Required on all plan sheets	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)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Existing Conditions Plan Sheets	
☑	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Site Plan Sheets C-102 & C-102.1	
☑	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Site Plan Sheets C-102 & C-102.1	
☑	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Site Plan Sheets C-102 & C-102.1	
☑	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	Utilities Plan Sheet C-104	
☑	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	Utilities Plan Sheet C-104	

☑	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	Utilities Plan Sheet C-104	
☑	**8. Solid Waste Facilities: (2.5.4.3H)**		
	• The size, type and location of solid waste facilities.	Site Plan Sheet C-102.1	
☑	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Grading and Drainage Plan Sheet C-103	
☑	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	Photometrics Plan	
☑	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Photometrics Plan	
☑	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	Landscape Plan Sheet C-105	
☑	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading and Drainage Plan Sheet C-103	
☑	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Site Plan Sheet C-102	
☑	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Existing Conditions Plan Sheets	
☑	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	Site Plan Sheet C-102	
☑	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	Existing Conditions Plan Sheets	

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. **(3.2.1-2)**	Enclosed	
☑	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Grading and Drainage Plan Sheet C-103	
☑	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)**	N/A	
☑	Stormwater Management and Erosion Control Plan. **(7.4)**	Enclosed	
☑	Inspection and Maintenance Plan **(7.6.5)**	Enclosed	

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: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**	Cover Sheet	
☑	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post-construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. **(2.5.3.2B)**	Enclosed	
☑	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)**	Unitil Will Serve Letter has been included. The applicant is currently working with Eversource to get a will serve letter.	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Cover Sheet	
☑	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)**	Site Plan Sheet C-102	N/A
☑	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	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)**	Site Plan Sheet C-102	N/A

Applicant's Signature: Neil Hansen (Applicant's Agent) **Date:** 10/23/2023

City of Portsmouth Planning Department

Site Plan Review Application Fee

Project: 815 Lafayette Rd **Map/Lot:** Map 245 Lot 3

Applicant: Prospect North 815, LLC

All development

Base fee $600			$600.00
Plus $5.00 per $1,000 of site costs			
Site costs	$450,000	+	$2,250.00
Plus $10.00 per 1,000 S.F. of site development area			
Site development area	174,192 S.F.	+	$1,741.92
		Fee	**$4,591.92**

Maximum fee: $20,000.00

Fee received by: _____ Date: _____

Note: Initial application fee may be based on the applicant's estimates of site costs and site development area. Following site plan approval, the application fee will be recalculated based on the approved site plan and site engineer's corresponding site cost estimate as approved by the Department of Public Works, and any additional fee shall be paid prior to the issuance of a building permit.

Owner/Agent Letter of Authorization

This letter is to authorize Tighe & Bond, Inc. (Civil Engineer), to represent and submit on behalf of Prospect North 815, LLC (Owner/Applicant), applications and materials in all site design and permitting matters for the proposed development project located at 815 Lafayette Road in Portsmouth, New Hampshire on parcel of land identified as Map 245 Lot 3. This project includes the construction of multifamily buildings, an office building, and associated on-site improvements. This authorization shall relate to those activities that are required for local, state and federal permitting for the above project and include any required signatures for those applications.

Signature	Michael Brown Print Name	6-1-23 Date
Witness	Jeffrey A. Philbrick Print Name	6/1/23 Date