November 22, 2023

Portsmouth Planning Board
Attn: Rick Chellman
1 Junkins Avenue, Suite 3rd Floor
Portsmouth, NH 03801

RE: Planning Board Review - ATDG, LLC

Dear Mr. Rick Chellman:

On behalf of the Applicant, ATDG, LLC, Apex Design Build respectfully submits an application for Planning Board Review for the construction of a new Medical Office Building at 360 Corporate Drive, Portsmouth, NH 03801. The Applicant is proposing a new state-of-the-art 52,401 GSF facility which features (3) floors of dedicated Healthcare Space for up to ten (10) Healthcare Tenants which includes an Ambulatory Surgery Center, Imaging Center, and Plastic Surgery Center. Access to this site will be administered via new entrances constructed at both Corporate Drive and International Drive, and features substantial enhancement to the surrounding landscape at the respective roadways and within the site.

This building features a modern aesthetic with neutral color palette which has been carefully designed to incorporate colors from surrounding developments within the Pease Development District. Through coordination with the Pease Development Authority, and the Portsmouth Technical Review Board, we have been able to carefully design a site which provides no impacts to surrounding wetlands and their respective buffers. This development brings enhanced public accessibility via new sidewalks along all public rights-of-way and an enlarged bus stop. Lastly, all contingencies cited in the TAC Public Hearing on 11/7/2023 have been satisfied with this application.

Should there be any questions or concerns about the aforementioned application, please feel free to contact me directly.

Sincerely,

Jeff Kilburg

Project Director

Encl: Application Materia

400 Harvey Road, Manchester, NH 03103 | T (603) 627-5500 | F (603) 627-5501
allenmajor.com

ALLEN & MAJOR ASSOCIATES, INC.

November 21, 2023

To:	Stefanie Casella Planner Portsmouth Planning Department 1 Junkins Avenue Portsmouth, NH 03801	**A&M Project #:** **Re:**	3250-01 ASC / Medical Office 360 Corporate Drive Portsmouth, NH TAC Response Letter
Copy:	Michael Mates, PE, PDA Jeff Kilburg, Apex Design Build Dr. Alex Slocum, MD		

Dear Ms. Casella

Allen & Major Associates, Inc. is in receipt of the Technical Advisory Committee (TAC) comments listed in the letter of decision. Please find A&M's responses to these comments below. The initial comments are provided along with A&M's responses in **bold**.

1. The sidewalk on International Drive be extended to the neighbor's driveway as previously requested.

   A&M Response: Revised as requested.

2. Tactile pads be installed at all driveways.

   A&M Response: Revised as requested.

3. Work with City staff to coordinate the installation of signage along the wetland buffer edge that indicates the area as a 'low' or 'no-mow' area.

   A&M Response: Signs will be installed post construction along the wetland buffer which indicate that no mowing is allowed within the 25' wetland buffer. See Sheet L-101.

4. Add a note to landscape plan indicating buffer and wetland area "to remain natural and undisturbed".

   A&M Response: Revised as requested. See Sheet L-101, Note #5.

Very Truly Yours,

ALLEN & MAJOR ASSOCIATES, INC.

Brian D. Jones, P.E.
Senior Project Manager

Attachments:
1. ASC / Medical Office Site Development Plans, Revision 4, dated November 10, 2023

ADTG, LLC

360 CORPORATE DR.
PORTSMOUTH , NH 03801

PROPERTY OWNER & APPLICANT INFO

APPLICANT/ LESSEE:
DR. ALEXANDER SLOCUM - ATDG, LLC
1 MERRILL CROSSING, BOW, NH 03304
603-777-6506

LESSOR:
PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DR,
PORTSMOUTH, NH 03801
603-433-6088

INFO OF PROFESSIONALS INVOLVED IN THE SITE PLAN DESIGN

DESIGN, ARCHITECTURE, AND CONSTRUCTION FIRM:
JEFF KILBURG, PROJECT DIRECTOR
APEX DESIGN BUILD
9550 W HIGGINS RD STE 170,
ROSEMONT, IL 60018
847-288-0100

CIVIL ENGINEER:
BRIAN JONES, SENIOR PROJECT MANAGER, PE
ALLEN & MAJOR ASSOCIATES, INC
400 HARVEY ROAD
MANCHESTER, NH 03103
603-627-5500

SURVEYOR:
JACK KAISER
DOUCET SURVEY LLC
102 KENT PLACE
NEWMARKET, NH 03857
603-659-6560

UTILITY PROVIDERS

WATER SERVICE:
CITY OF PORTSMOUTH
680 PEVERLY HILL RD, PORTSMOUTH, NH 03801

SEWER SERVICE:
CITY OF PORTSMOUTH
680 PEVERLY HILL RD, PORTSMOUTH, NH 03801

GAS SERVICES:
UNITIL
325 WEST RD, PORTSMOUTH, NH 03801
888-301-7700

ELECTRIC SERVICES:
EVERSOURCE
800-662-7764
PO BOX 330, MANCHESTER, NH 03105-0330

FLOOR ARE OF PROJECT

PROPOSED GROSS FLOOR AREA

- **OVERALL GROSS AREA: 52,401 SF**

- FIRST FLOOR
  - IMAGING SUITE AREA: 2,437 SF
  - TENANT SUITE 1 AREA: 2,754 SF
  - TENANT SUITE 2 AREA: 4,577 SF
  - TENANT SUITE 3 AREA: 2,661 SF
  - PUBLIC AREA: 4,294SF
  - **OVERALL FIRST FLOOR GROSS AREA: 16,723 SF**
- SECOND FLOOR
  - TENANT SUITE 4 AREA: 2,385 SF
  - TENANT SUITE 5 AREA: 2,660 SF
  - ASC AREA: 9,566 SF
  - PUBLIC AREA: 3,228 SF
  - **OVERALL SECOND FLOOR GROSS AREA: 17,839 SF**
- THIRD FLOOR:
  - TENANT SUITE 6 AREA: 4,163 SF
  - TENANT SUITE 7 AREA: 3,668 SF
  - MEDICAL CLINIC & MED SPA: 7,112 SF
  - PUBLIC AREA: 2,896 SF
  - **OVERALL THIRD FLOOR GROSS AREA: 17,839 SF**

SCOPE OF WORK

1. ARCHITECTURAL SCOPE - 3-STORY TYPE II-B SLAB ON GRADE MEDICAL OFFICE BUILDING WITH NEW SITE WORK AND LANDSCAPING TO ACCOMMODATE NEW BUILDING LAYOUT.

ACCESSIBILITY NOTES

1. ALL FIXTURES AND ACCESSORIES SHALL BE MOUNTED IN ACCORDANCE WITH ALL CITY / VILLAGE ADOPTED ACCESSIBILITY REGULATIONS.
2. ALL THRESHOLDS MUST COMPLY WITH CITY/VILLAGE ADOPTED ACCESSIBILITY REGULATIONS.

APPLICABLE BUILDING CODES

APPLICABLE BUILDING CODES

2018 NFPA 1, FIRE CODE AS AMENDED BY SAF-FMO 300

2018 NFPA 101, LIFE SAFETY CODE AS AMENDED BY SAF-FMO 300

2016 NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS

2017 NFPA 25, STANDARD FOR THE INSPECTION, TESTING, AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS

2020 NFPA 70, NATIONAL ELECTRICAL CODE (NEC) WITH NH AMENDMENTS

2016 NFPA 72, NATIONAL FIRE ALARM AND SIGNALING CODE

2015 NFPA 720, STANDARD FOR THE INSTALLATION OF CARBON MONOXIDE (CO) DETECTION AND WARNING EQUIPMENT

2018 INTERNATIONAL BUILDING CODE (IBC) WITH NH AMENDMENTS

2018 INTERNATIONAL RESIDENTIAL BUILDING CODE (IRC) WITH NH AMENDMENTS

2018 INTERNATIONAL ENERGY CONSERVATION CODE (IEC) WITH NH AMENDMENTS

2018 INTERNATIONAL MECHANICAL CODE (IMC) WITH NH AMENDMENTS

2018 INTERNATIONAL PLUMBING CODE (IPC) WITH NH AMENDMENTS

2009 ICCA117.1 AND FHA/UFAS AS APPLICABLE

1. FIRE PROTECTION SYSTEM
   CONTRACTOR SHALL PROVIDE A COMPLETE FIRE SUPPRESSION SYSTEM FROM THE 8" MAIN TO BE THROUGHOUT THE TENANT SPACE. ALL SPRINKLER LINES TO BE IN COMPLIANCE WITH NFPA LOAD FIRE CODES. ALL SPRINKLERS TO HAVE CONCEALED COVER PLATE HEADS FLUSH WITH CEILING TILE. SPRINKLER CONTRACTOR TO SUBMIT COMPLETE SHOP DRAWINGS UNDER SEPARATE SUBMITTAL TO BUILDING AND FIRE DEPT. FOR APPROVAL BY FIRE SUPPRESSION CONTRACTOR. PRIORITY-LTS, DIFFUSERS, RETURNS, EXH., THEN SPRINKLER HEADS, FOR POSITION IN CEILING.
2. FIRE ALARM SYSTEM
   AN AUTOMATIC AND MANUAL FIRE ALARM SYSTEM IS NEW WITHIN THE BUILDING AND SEPARATE PLANS AND SPECIFICATIONS WILL BE PROVIDED FOR PERMITTING OUTSIDE OF THESE DRAWINGS. AN AUTOMATIC SYSTEM SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE PROVISIONS OF THE INTERNATIONAL BUILDING CODE AND NFPA 72 IN ALL BUILDINGS OF GROUPS A, B, E, F, H, I, M, R, S AND U. (AMENDS SEC. 907.2, INTERNATIONAL BUILDING CODE). A MANUAL FIRE ALARM SYSTEM WILL BE INSTALLED AND MAINTAINED IN THE FOLLOWING OCCUPANCIES REGARDLESS OF THE OCCUPANT LOAD: A, B, E, F, H, I-1, I-2, I-3, M, R-1, R-2, AND S. (AMENDS SECTION 907, INTERNATIONAL FIRE CODE). FA SUB WILL ALSO PROVIDE ALL REQUIRED SMOKE AND CARBON MONOXIDE DETECTOR LOCATIONS.

DRAWING INDEX

DRAFTING SYMBOLS

DETAIL TITLE DESIGNATION
DETAIL NO. DESIGNATION
TITLE
#' - #" = 1' - 0"
DRAWING SCALE

SECTION CUT DETAIL DESIGNATION
SECTION NO. DESIGNATION
SHEET NUMBER. WHERE DRAWING IS LOCATED

ELEVATION DETAIL DESIGNATION
SECTION NO. DESIGNATION
SHEET NUMBER. WHERE DRAWING IS LOCATED

CALLOUT DETAIL DESIGNATION
SECTION NO. DESIGNATION
SHEET NUMBER. WHERE DRAWING IS LOCATED

SPOT ELEVATION MARK
SPOT ELEVATION HEIGHT
#' - #" SEE RCP

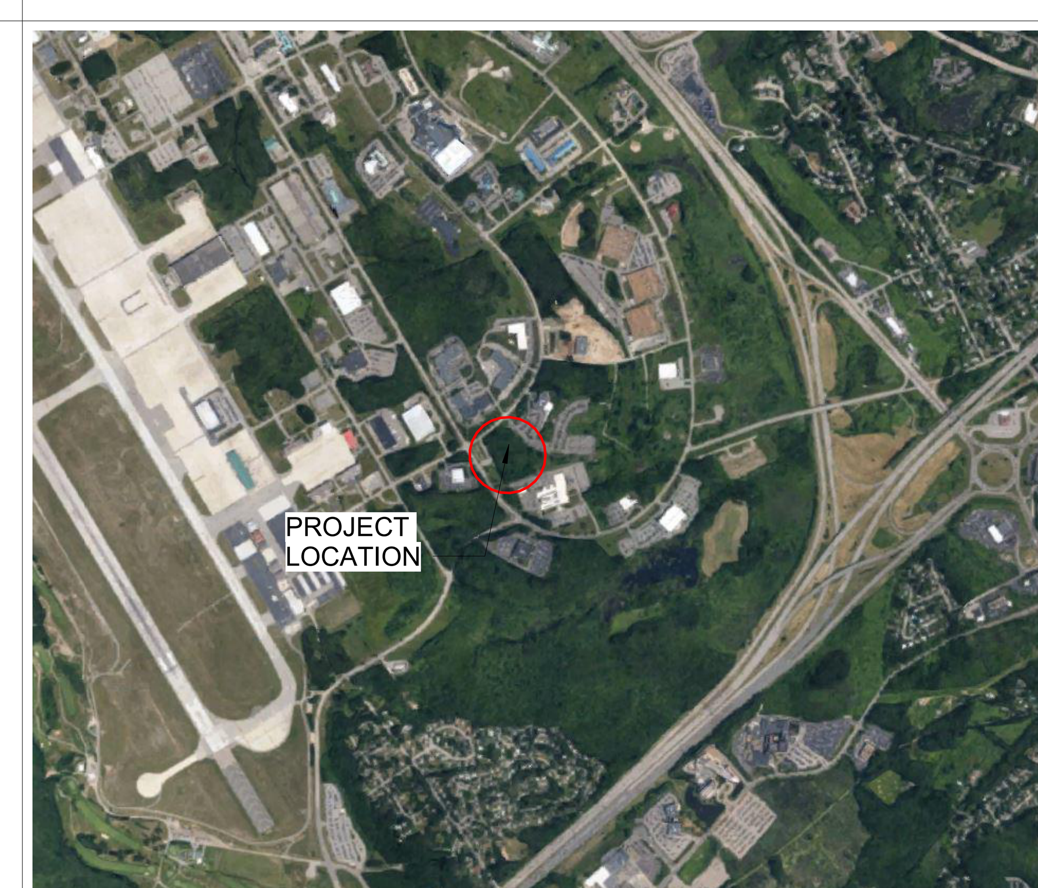
NORTH ARROW

XX WALL TYPE DESIGNATION
XX DOOR NUMBER DESIGNATION
XX WINDOW TYPE DESIGNATION
\# KEY NOTE TAG
XX FINISH TAG
\# REVISION TAG

LINE TYPES
OBJECT LINE
HIDDEN LINE (DENOTATES SOMETHING LOCATED BELOW OR BEHIND)
PHANTOM LINE (DENOTATES SOMETHING LOCATED ABOVE OR IN FRONT)
CENTER LINE

MATERIAL DESIGNATIONS
EARTH | EXISTING MASONRY
GRANULAR FILL | STEEL
CONCRETE | BATT INSULATION
FACE BRICK | RIGID INSULATION
C.M.U. | GYPSUM BOARD

LOCATION MAP



PROJECT RENDERING

apex DESIGN > BUILD
9550 W.Higgins Rd. 170
Rosemont, IL 60018

ADTG, LLC
360 CORPORATE DR.
PORTSMOUTH , NH 03801

ARCHITECT OF RECORD
SUSAN L. SKIBELL, ARCHITECT 1360 N. SANDBURG TERRACE #1902 CHICAGO, IL. 60610
312.350.7161

SEAL:

No.	Description	Date
1	TAC WORKSHOP REVIEW	07/25/2023
2	TAC PUBLIC HEARING	08/21/2023

COVER PAGE

Project number	#10323
Date	10/10/2023
Drawn by	JY
Checked by	JV

G0-0

Scale 12" = 1'-0"

10/18/2023 12:24:43 PM

apex DESIGN > BUILD

9550 W.Higgins Rd. 170
Rosemont, IL 60018

ADTG, LLC

360 CORPORATE DR.
PORTSMOUTH , NH 03801

ARCHITECT OF RECORD
SUSAN L. SKIBELL, ARCHITECT 1360 N. SANDBURG TERRACE #1902 CHICAGO, IL. 60610
312.350.7161

SEAL:

No.	Description	Date
1	TAC WORKSHOP REVIEW	07/25/2023
2	TAC PUBLIC HEARING	08/21/2023
4	TAC PUBLIC HEARING #2	10/20/2023

EXTERIOR RENDERINGS

Project number	#10323
Date	10/10/2023
Drawn by	JY
Checked by	JV

GA0-1.0

Scale

10/18/2023 12:08:56 PM

apex
DESIGN > BUILD

9550 W.Higgins Rd. 170
Rosemont, IL 60018

ADTG, LLC

360 CORPORATE DR.
PORTSMOUTH , NH 03801

ARCHITECT OF RECORD
SUSAN L. SKIBELL, ARCHITECT 1360 N. SANDBURG TERRACE #1902 CHICAGO, IL. 60610
312.350.7161

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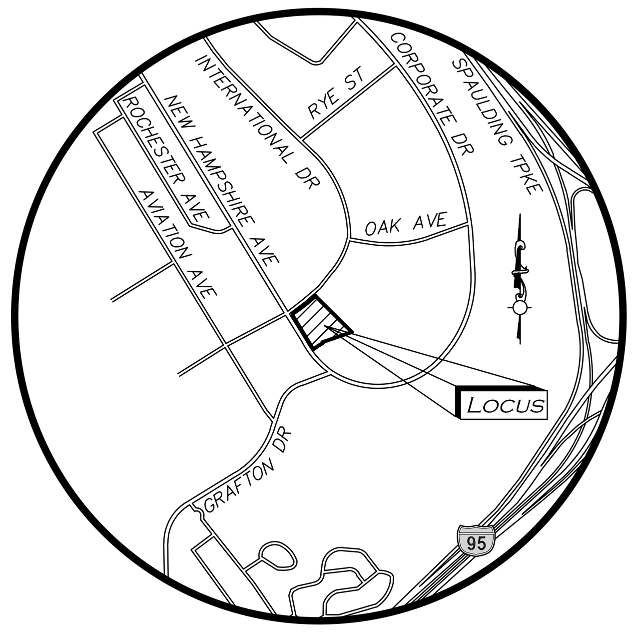
EXTERIOR RENDERINGS

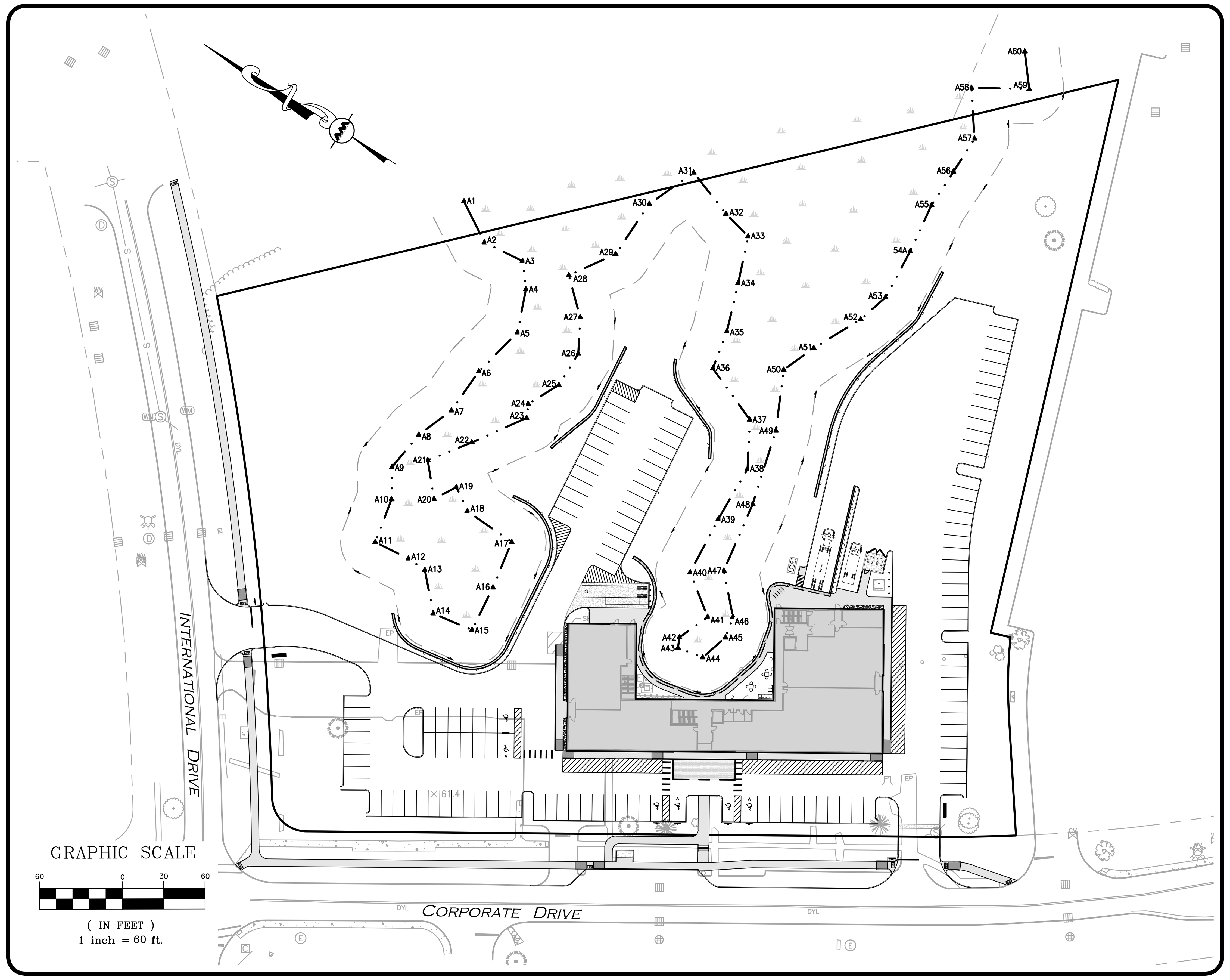
Project number	#10323
Date	10/10/2023
Drawn by	Author
Checked by	Checker
GA0-1.1	
Scale	

10/18/2023 12:08:57 PM

SITE DEVELOPMENT PLANS FOR
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801



LOCUS MAP
SCALE: 1" = 2,000'



APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

LESSOR:
PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DRIVE
PORTSMOUTH, NH 03801

ARCHITECT:
APEX DESIGN BUILD
9550 W. HIGGINS ROAD. SUITE 170
ROSEMONT, IL 60018

CIVIL ENGINEER / LANDSCAPE ARCHITECT
ALLEN & MAJOR ASSOCIATES, INC.
400 HARVEY ROAD
MANCHESTER, NH 03103
(603) 627-5500

SURVEYOR:
DOUCET SURVEY LLC
102 KENT PLACE
NEWMARKET, NH 03857

UTILITY PROVIDERS:

NATURAL GAS:	UNITIL CORP.
ELECTRIC:	EVERSOURCE
TELEPHONE:	CONSOLIDATED COMMUNICATIONS

LIST OF DRAWINGS

DRAWING TITLE	SHEET NO.	ISSUED	REV 1	REV 2	REV 3	REV 4
EXISTING CONDITIONS PLAN	1 OF 1	08-14-23	08-17-23	-	-	-
SITE SPECIFIC SOIL MAPPING	C-100	08-14-23	08-17-23	-	-	-
SITE PREPARATION PLAN	C-101	08-14-23	08-17-23	10-20-23	-	-
LAYOUT & MATERIALS PLAN	C-102	08-14-23	08-17-23	10-20-23	-	-
GRADING & DRAINAGE PLAN	C-103	08-14-23	08-17-23	08-28-23	10-20-23	11-10-23
UTILITIES PLAN & SEWER PROFILE	C-104	08-14-23	08-17-23	10-20-23	-	-
TRUCK TURNING PLAN	C-105	08-14-23	08-17-23	10-20-23	-	-
FIRE TRUCK TURNING PLAN	C-106	10-20-23	-	-	-	-
AMBULANCE TURNING PLAN	C-107	10-20-23	-	-	-	-
DETAILS	C-501	08-14-23	08-17-23	10-20-23	-	-
DETAILS	C-502	08-14-23	08-17-23	10-20-23	-	-
DETAILS	C-503	08-14-23	08-17-23	08-28-23	10-20-23	-
DETAILS	C-504	08-14-23	08-17-23	10-20-23	-	-
DETAILS	C-505	08-14-23	08-17-23	10-20-23	11-10-23	-
DETAILS	C-506	08-14-23	08-17-23	08-28-23	10-20-23	11-10-23
DETAILS	C-507	08-14-23	08-17-23	-	-	-
DETAILS	C-508	08-14-23	08-17-23	-	-	-
LANDSCAPE PLAN	L-101	08-14-23	08-17-23	10-20-23	11-10-23	-
LANDSCAPE NOTES	L-401	08-14-23	08-17-23	10-20-23	-	-
LANDSCAPE DETAILS	L-501	08-14-23	08-17-23	10-20-23	-	-
RIGHT-OF-WAY LANDSCAPE NOTES & DETAILS	L-502	10-20-23	-	-	-	-

WILDLIFE PROTECTION NOTES:

1. ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES SHALL BE REPORTED IMMEDIATELY TO THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM BY PHONE AT 603-271-2461 AND BY EMAIL AT NHFGREVIEW@WILDLIFE.NH.GOV. EMAIL SUBJECT LINE: NHB23-1980, ASC/MEDICAL OFFICE, WILDLIFE SPECIES OBSERVATION.
2. PHOTOGRAPHS OF THE OBSERVED SPECIES AND NEARBY ELEMENTS OF HABITAT OR AREAS OF LAND DISTURBANCE SHALL BE PROVIDED TO NHF&G IN DIGITAL FORMAT AT THE ABOVE EMAIL ADDRESS FOR VERIFICATION AS FEASIBLE.
3. IN THE EVENT A THREATENED OR ENDANGERED SPECIES IS OBSERVED ON THE PROJECT SITE DURING THE TERM OF THE PERMIT, THE SPECIES SHALL NOT BE DISTURBED, HANDLED, OR HARMED IN ANY WAY PRIOR TO CONSULTATION WITH NHF&G AND IMPLEMENTATION OF CORRECTIVE ACTIONS RECOMMENDED BY NHF&G, IF ANY, TO ASSURE THE PROJECT DOES NOT APPRECIABLY JEOPARDIZE THE CONTINUED EXISTENCE OF THREATENED AND ENDANGERED SPECIES AS DEFINED IN FIS 1002.04
4. THE NHF&G, INCLUDING ITS EMPLOYEES AND AUTHORIZED AGENTS, SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.

STATE OF NEW HAMPSHIRE
BRIAN D. JONES
No. 13809
LICENSED
PROFESSIONAL ENGINEER

11-20-23

PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

FOR MORE INFORMATION ABOUT THIS PLAN SET, CONTACT:
BRIAN D. JONES AT ALLEN & MAJOR ASSC., INC. 603-627-5500

PREPARED BY:

ALLEN & MAJOR
ASSOCIATES, INC.
civil & structural engineering ♦ land surveying
environmental consulting ♦ landscape architecture
www.allenmajor.com
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501
WOBURN, MA ♦ LAKEVILLE, MA ♦ MANCHESTER, NH

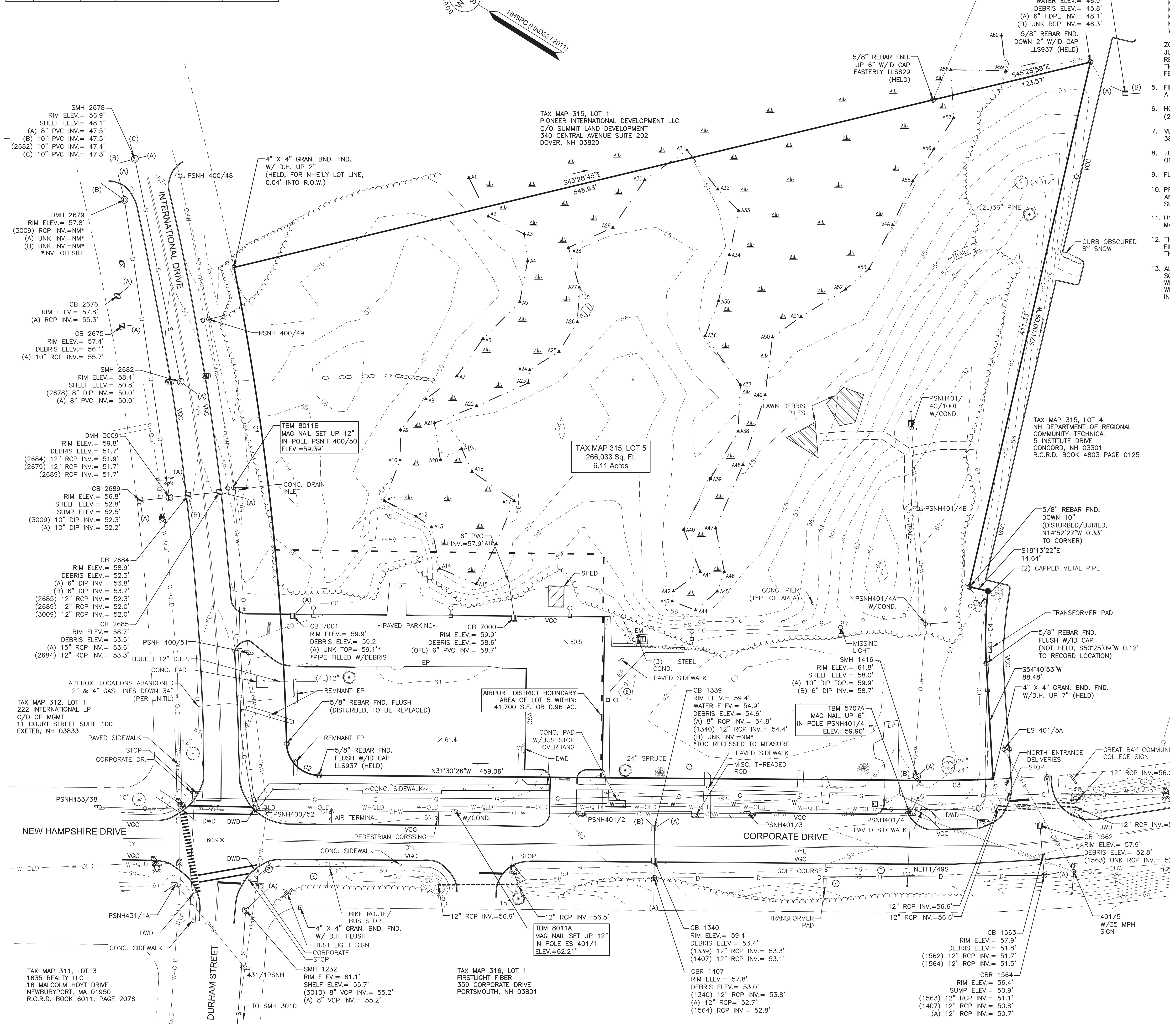
ISSUED FOR SITE PLAN REVIEW: AUGUST 14, 2023
REVISED PER PDA COMMENTS: AUGUST 17, 2023
ISSUED FOR ALTERATION OF TERRAIN PERMIT: AUGUST 28, 2023
REVISED PER TAC COMMENTS: OCTOBER 20, 2023
REVISED PER AOT & TAC COMMENTS: NOVEMBER 10, 2023

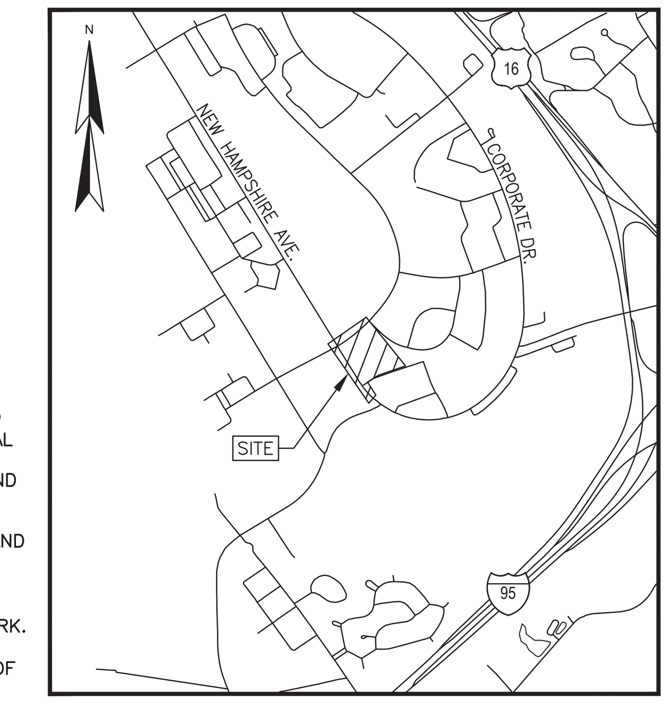
R:\PROJECTS\3250-01\CIVIL\DRAWINGS\CURRENT\C-3250-01_COVER.DWG

CURVE TABLE					
CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	366.29'	2155.00'	9°44'19"	N51°42'46"E	365.85'
C2	38.44'	25.00'	88°05'22"	S12°32'15"W	34.76'
C3	55.78'	1030.00'	3°06'09"	N33°03'31"W	55.77'
C4	55.43'	350.00'	9°04'25"	S59°13'06"W	55.37'

REFERENCE PLAN:

1. "LOT LINE REVISION PLAN FOR PEASE DEVELOPMENT AUTHORITY AND NEW HAMPSHIRE DEPT. OF REGIONAL COMMUNITY-TECHNICAL COLLEGES (TAC MAP 315, LOTS 4 & 5) CORPORATE & INTERNATIONAL DRIVE PORTSMOUTH, NEW HAMPSHIRE" DATED APRIL 9, 2009 BY DOUCET SURVEY INC. R.C.R.D. PLAN D-36858.





LOCATION MAP (n.t.s.)

NOTES:

1. REFERENCE: TAX MAP 315, LOT 5
2. TOTAL PARCEL AREA: 266,033 SQ. FT. OR 6.11 AC.
3. OWNER OF RECORD: PEASE DEVELOPMENT AUTHORITY R.C.R.D. BOOK 4227, PAGE 001
4. ZONE: AIRPORT BUSINESS AND COMMERCIAL ZONE DIMENSIONAL REQUIREMENTS:

MIN. LOT AREA	5 AC.
MIN. FRONTAGE	200 ft.
MIN. FRONT SETBACK	70 ft.
MIN. SIDE SETBACK	30 ft.
MIN. REAR SETBACK	50 ft.
WETLAND BUFFER	25 ft.

ZONING INFORMATION LISTED HEREON IS BASED ON THE PDA LAND USE CONTROLS REVISED TO JUNE 16, 2022 AS AVAILABLE ON THE PEASE DEVELOPMENT WEBSITE ON 4/5/2023. ADDITIONAL REGULATIONS APPLY, AND REFERENCE IS HEREBY MADE TO THE EFFECTIVE ZONING ORDINANCE. THE LAND OWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE MUNICIPAL, STATE AND FEDERAL REGULATIONS.

5. FIELD SURVEY PERFORMED BY J.H.H. & H.J.R. DURING MARCH 2023 USING A TOTAL STATION AND A SURVEY GRADE GPS.
6. HORIZONTAL DATUM BASED ON NAD83(2011) NEW HAMPSHIRE STATE PLANE COORDINATE ZONE (2800) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.
7. VERTICAL DATUM NAVD88 BASED ON NHDOT DISK 379-0740 HAVING A PUBLISHED ELEVATION OF 38.17'.
8. JURISDICTIONAL WETLANDS DELINEATED BY DAMON BURT, C.W.S. OF FRAGGLE ROCK ENVIRONMENTAL ON MARCH 23, 2023.
9. FLOOD HAZARD ZONE: X, PER FIRM MAP #33015C0260F, DATED 1/29/2021.
10. PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT 1' INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA, AND DOUCET SURVEY WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION.
11. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVED PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE.
12. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING; THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MANHOLE CONFIGURATION, ETC.
13. ALL UNDERGROUND UTILITIES (ELECTRIC, GAS, TEL. WATER, SEWER DRAIN SERVICES) ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.

LEGEND

EXISTING LOT LINE
APPROXIMATE ABUTTERS LINE
100 MAJOR CONTOUR LINE
99 MINOR CONTOUR LINE
STONE WALL
OHW OVERHEAD WIRE
D DRAIN LINE
S SEWER LINE
W WATER LINE (PER SITE MARKINGS)
W-QLD WATER LINE (PER CITY GIS)
G GAS LINE
E ELECTRIC LINE
C CABLE/INTERNET LINE
U UNIDENTIFIED UNDERGROUND UTILITY
TREE LINE
SHRUB LINE
EDGE OF DELINEATED WETLAND
WETLAND AREA
CONCRETE
RIP RAP
PILE
× 100.0 SPOT GRADE
BOUND FOUND (BND. FND.)
PIPE/ROD FOUND
5/8" REBAR W/LLS 937 CAP TO BE SET
UTILITY POLE
UTILITY POLE & GUY WIRE
UTILITY POLE W/LIGHT
LIGHT POLE W/ARM
LIGHT POST
GROUND LIGHT
DRAIN MANHOLE
CATCH BASIN
SEWER MANHOLE
FIRE HYDRANT

WV WATER GATE VALVE
WM WATER METER
GV GAS GATE VALVE
E ELECTRIC MANHOLE
T PAD MOUNTED TRANSFORMER
EM ELECTRIC METER
T TELEPHONE MANHOLE
TB TELEPHONE BOX
C CABLE BOX
SIGN
SIGN (TWO POSTS)
ROCK/BOULDER
CONIFEROUS TREE
DECIDUOUS TREE
BUSH
JERSEY BARRIER
CONC. CONCRETE
COND. CONDUIT
D.H. DRILL HOLE
DIP DUCTILE IRON PIPE
DYL DOUBLE YELLOW LINE
DWD DETECTABLE WARNING DEVICE
EP EDGE OF PAVEMENT
GRAN. GRANITE
HDPE HIGH DENSITY POLYETHYLENE PIPE
OFL OUTFALL
PVC POLYVINYL CHLORIDE PIPE
RCP REINFORCED CONCRETE PIPE
SWL SINGLE WHITE LINE
SYL SINGLE YELLOW LINE
TYP. TYPICAL
UNK UNKNOWN
VCC VERTICAL CONCRETE CURB
VCP VITREOUS CLAY PIPE
VGC VERTICAL GRANITE CURB
(X) INVERT I.D. CONNECTION UNKNOWN

40 0 40 80
SCALE: 1 INCH = 40 FT.

STATE OF NEW HAMPSHIRE
DAMON E. BURT
No. 163
CERTIFIED WETLAND SCIENTIST
8/17/2023

STATE OF NEW HAMPSHIRE
No. 937
JOHN F. KAISER
LICENSED LAND SURVEYOR
John Kaiser
SIGNATURE

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

John Kaiser L.L.S. #937

8/18/23 DATE

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

EXISTING CONDITIONS PLAN
FOR
ATDG, LLC
OWNED BY: PEASE DEVELOPMENT AUTHORITY
TAX MAP 315, LOT 5
360 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
2	08/18/23	ADD GIS WATER LINE	J.R.P.
1	07/27/23	ADD LOCATED UTILITY MARKINGS	J.R.P.

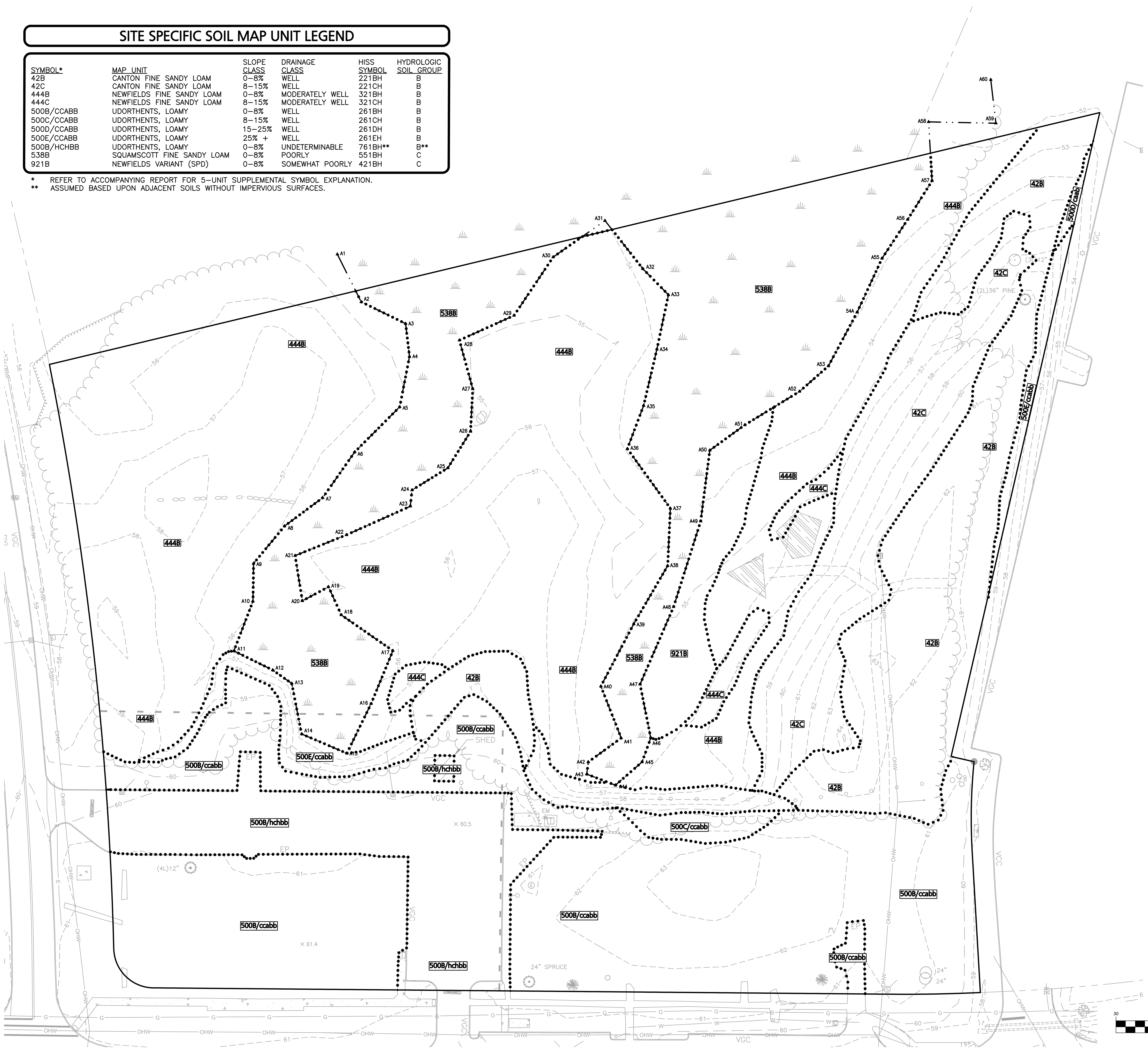
DRAWN BY: J.R.P.	DATE: APRIL 5, 2023
CHECKED BY: J.F.K.	DRAWING NO. 8011A
JOB NO. 8011	SHEET 1 OF 1

DOUCET SURVEY LLC
Serving Your Professional Surveying & Mapping Needs
102 Kent Place, Newmarket, NH 03857 (603) 659-6560
Offices in Bedford & Keene, NH and Kennebunk, ME
http://www.doucetsurvey.com

SITE SPECIFIC SOIL MAP UNIT LEGEND

SYMBOL*	MAP UNIT	SLOPE CLASS	DRAINAGE CLASS	HISS SYMBOL	HYDROLOGIC SOIL GROUP
42B	CANTON FINE SANDY LOAM	0–8%	WELL	221BH	B
42C	CANTON FINE SANDY LOAM	8–15%	WELL	221CH	B
444B	NEWFIELDS FINE SANDY LOAM	0–8%	MODERATELY WELL	321BH	B
444C	NEWFIELDS FINE SANDY LOAM	8–15%	MODERATELY WELL	321CH	B
500B/CCABB	UDORTHENTS, LOAMY	0–8%	WELL	261BH	B
500C/CCABB	UDORTHENTS, LOAMY	8–15%	WELL	261CH	B
500D/CCABB	UDORTHENTS, LOAMY	15–25%	WELL	261DH	B
500E/CCABB	UDORTHENTS, LOAMY	25% +	WELL	261EH	B
500B/HCHBB	UDORTHENTS, LOAMY	0–8%	UNDETERMINABLE	761BH**	B**
538B	SQUAMSCOTT FINE SANDY LOAM	0–8%	POORLY	551BH	C
921B	NEWFIELDS VARIANT (SPD)	0–8%	SOMEWHAT POORLY	421BH	C

* REFER TO ACCOMPANYING REPORT FOR 5–UNIT SUPPLEMENTAL SYMBOL EXPLANATION.
** ASSUMED BASED UPON ADJACENT SOILS WITHOUT IMPERVIOUS SURFACES.



SITE SPECIFIC SOIL SURVEY PERFORMED BY:

THOMAS E. SOKOLOSKI No. 063 8/9/2023

TES ENVIRONMENTAL CONSULTANTS, LLC
1494 ROUTE 3A, UNIT 1
BOW, NH 03304

SOIL MAPPING NOTES:

1. THIS DETAILED SITE–SPECIFIC SOIL MAP, PREPARED ON AUGUST 9, 2023 BY THOMAS E. SOKOLOSKI, CERTIFIED SOIL SCIENTIST #063 OF TES ENVIRONMENTAL CONSULTANTS, L.L.C. IN BOW, NEW HAMPSHIRE, CONFORMS TO THE STANDARDS OF SSSNNE PUBLICATION NO. 3, VERSION 7.0, "SITE–SPECIFIC SOIL MAPPING STANDARDS FOR NEW HAMPSHIRE AND VERMONT", MARCH 2021.
2. THIS MAP HAS BEEN PREPARED TO COMPLY WITH SOIL MAPPING REQUIREMENTS OF RSA 485 A: 17 AND NHDES ENV–WQ 1500, ALTERATION OF TERRAIN. SEE ACCOMPANYING REPORT FOR METHODOLOGY, MAP SYMBOL LEGEND, AND INTERPRETATIONS. USE OF THE MAP SYMBOL DENOMINATORS FOR DISTURBED OR ALTERED SOILS, WHERE GIVEN, IS AT THE DISCRETION OF THE CERTIFIED SOIL SCIENTIST.
3. THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR USE IN SUPPORT OF A NEW HAMPSHIRE ALTERATION TERRAIN PERMIT APPLICATION. IT WAS PRODUCED BY A CERTIFIED SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A NARRATIVE REPORT THAT ACCOMPANIES THIS MAP.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

STATE OF NEW HAMPSHIRE BRIAN D. JONES No. 13809 LICENSED PROFESSIONAL ENGINEER

08-17-23

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:

ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	1" = 30'	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:

SITE SPECIFIC SOIL MAPPING PLAN

SHEET No.

C-100

R:\PROJECTS\3250-01\CIVIL\DRAWINGS\CURRENT\C-3250-01_SOIL MAPPING.DWG

ALTERATION OF TERRAIN NOTES:

1. ARTIFICIAL DETENTION IN WETLANDS IS NOT ALLOWED.
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.
3. PERIMETER CONTROLS MUST BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS.
4. TEMPORARY WATER DIVERSION (SWALES, BASINS, ETC.) MUST BE USED AS NECESSARY UNTIL AREAS ARE STABILIZED.
5. PONDS AND SWALES SHALL BE INSTALLED EARLY ON IN THE CONSTRUCTION SEQUENCE.
6. RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMPS ARE STABILIZED.
7. BASINS, DITCHES AND SWALES MUST BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
8. ROADWAYS AND PARKING AREAS MUST BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
9. CUT AND FILL SLOPES MUST BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
10. EROSION CONTROL PRACTICES MUST BE INSPECTED AT LEAST WEEKLY AND AFTER EVERY RAIN EVENT OF 0.25 INCH OR MORE.
11. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION AND SHALL NOT EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. IF THE PROJECT RESULTS IN A DISTURBANCE OF GREATER THAN 5 ACRES AT ANY ONE TIME, THE FOLLOWING IS REQUIRED BEFOREHAND TO COMPLY WITH ENV WQ 1505.02(B):

A. CONSTRUCTION SEQUENCE PLAN DEVELOPED BY A QUALIFIED ENGINEER OR CERTIFIED PROFESSIONAL EROSION AND SEDIMENT CONTROL SPECIALIST (CPESC SPECIALIST)
B. EMPLOY AN ENVIRONMENTAL MONITOR DURING CONSTRUCTION TO PERFORM DUTIES IN ACCORDANCE WITH ENV WQ 1505.02(C) OR THE NOTES HEREON, WHICHEVER IS MORE STRINGENT.

12. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:

A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
B. A MINIMUM OF 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED.
C. A MINIMUM OF 3 INCHES OF NON–EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED. OR,
D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

13. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
14. IN AREAS THAT WILL NOT BE PAVED, "STABLE" MEANS THAT:

A. A MINIMUM OF 85% VEGETATIVE COVER HAS BEEN ESTABLISHED;
B. A MINIMUM OF 3 INCHES OF NON–EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED; OR
C. EROSION CONTROL BLANKETS HAVE BEEN INSTALLED IN ACCORDANCE WITH ENV–WQ 1506.03.

COLD WEATHER SITE STABILIZATION NOTES:

A. TO ADEQUATELY PROTECT WATER QUALITY DURING COLD WEATHER AND DURING SPRING RUNOFF, THE ADDITIONAL STABILIZATION TECHNIQUES SPECIFIED IN THIS SECTION SHALL BE EMPLOYED DURING THE PERIOD FROM OCTOBER 15 THROUGH MAY 1.

B. SUBJECT TO (C), BELOW, THE AREA OF EXPOSED, UNSTABILIZED SOIL SHALL BE:

1. LIMITED TO ONE ACRE; AND
2. PROTECTED AGAINST EROSION BY THE METHODS DESCRIBED IN THIS SECTION PRIOR TO ANY THAW OR SPRING MELT EVENT.

C. THE ALLOWABLE AREA OF EXPOSED SOIL MAY BE INCREASED IF A WINTER CONSTRUCTION PLAN IS DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST AND SUBMITTED TO THE DEPARTMENT FOR APPROVAL AS A REQUEST TO WAIVE THE ONE–ACRE LIMIT.

D. SUBJECT TO (F) AND (G), BELOW, ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF LESS THAN 15% THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR THAT ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH 3 TO 4 TONS OF HAY OR STRAW MULCH PER ACRE SECURED WITH ANCHORED NETTING OR TACKIFIER OR WITH AT LEAST 2 INCHES OF EROSION CONTROL MIX MEETING THE CRITERIA OF ENV–WQ 1506.05(B).

E. SUBJECT TO (F) AND (G), BELOW, ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF 15% OR GREATER THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR THAT ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH A PROPERLY INSTALLED AND ANCHORED EROSION CONTROL BLANKET OR WITH AT LEAST 4 INCHES OF EROSION CONTROL MIX MEETING THE CRITERIA OF ENV–WQ 1506.05(B).

F. ANCHORED HAY MULCH OR EROSION CONTROL MIX THAT MEETS THE CRITERIA OF ENV–WQ 1506.05(B) SHALL NOT BE INSTALLED OVER SNOW GREATER THAN ONE INCH IN DEPTH.

G. EROSION CONTROL BLANKETS SHALL NOT BE INSTALLED OVER SNOW GREATER THAN ONE INCH IN DEPTH OR ON FROZEN GROUND.

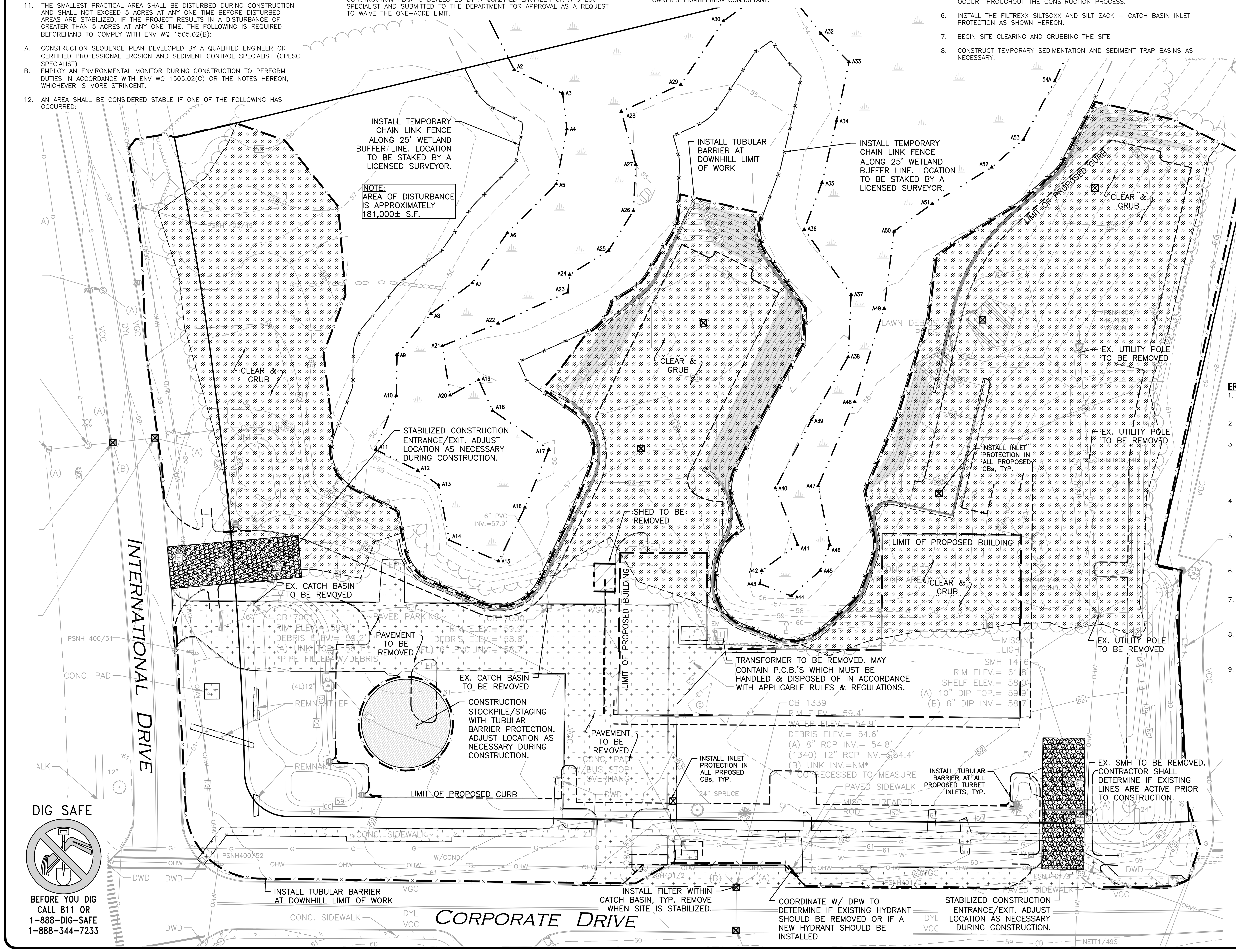
H. ALL PROPOSED STABILIZATION IN ACCORDANCE WITH (D) OR (E), ABOVE, SHALL BE COMPLETED WITHIN A DAY OF ESTABLISHING THE GRADE THAT IS FINAL OR THAT OTHERWISE WILL EXIST FOR MORE THAN 5 DAYS.

I. ALL DITCHES OR SWALES THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR THAT ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS, AS DETERMINED BY THE OWNER'S ENGINEERING CONSULTANT.

J. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING AREAS WHERE ACTIVE CONSTRUCTION OF THE ROAD OR PARKING AREA HAS STOPPED FOR THE WINTER SEASON SHALL BE PROTECTED WITH A MINIMUM 3–INCH LAYER OF BASE COURSE GRAVELS MEETING THE GRADATION REQUIREMENTS OF NHDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2016, TABLE 304–1, ITEM NO. 304.1, 304.2, OR 304.3, AVAILABLE AS NOTED IN APPENDIX B.

GENERAL SEQUENCE OF CONSTRUCTION:

1. CONTACT THE CITY OF PORTSMOUTH, PEASE DEVELOPMENT AUTHORITY (PDA), AND NHDES AOT BUREAU AT LEAST TWO (2) WEEKS PRIOR TO START OF CONSTRUCTION. A COPY OF THE NHDES NOTIFICATION FORM IS INCLUDED IN THE OPERATION AND MAINTENANCE SECTION OF THE PROJECT DRAINAGE REPORT.
2. THE CONTRACTOR SHALL ACQUIRE A PDA DIG PERMIT BEFORE ANY DISTURBANCE CAN TAKE PLACE. ALLOW 7 CALENDAR DAYS FOR PROCESSING.
3. CONTRACTOR TO OBTAIN A NPDES CONSTRUCTION GENERAL PERMIT PRIOR TO CONSTRUCTION. PDA SHALL BE PROVIDED WITH A COPY OF THE SWPPP AND NOI.
4. INSTALL STABILIZED CONSTRUCTION ENTRANCES. SITE ACCESS SHALL BE ACHIEVED ONLY FROM THE DESIGNATED CONSTRUCTION ENTRANCE.
5. PREPARE TEMPORARY PARKING AND STORAGE AREA. UPON IMPLEMENTATION AND INSTALLATION OF THE FOLLOWING AREAS: TRAILER, PARKING, LAY DOWN, WHEEL WASH, CONCRETE WASHOUT, MASONS AREA, FUEL AND MATERIAL STORAGE CONTAINERS, SOLID WASTE CONTAINERS, ETC., DENOTE THEM ON THE SITE MAPS IMMEDIATELY AND NOTE ANY CHANGES IN THE LOCATIONS AS THEY OCCUR THROUGHOUT THE CONSTRUCTION PROCESS.
6. INSTALL THE FILTREXX SILTSOXX AND SILT SACK – CATCH BASIN INLET PROTECTION AS SHOWN HEREON.
7. BEGIN SITE CLEARING AND GRUBBING THE SITE
8. CONSTRUCT TEMPORARY SEDIMENTATION AND SEDIMENT TRAP BASINS AS NECESSARY.
9. BEGIN GRADING THE SITE.
10. CONSTRUCT STORMWATER MEASURES. SITE SHALL BE STABILIZED PRIOR TO STORMWATER MEASURES RECEIVING RUNOFF.
11. START CONSTRUCTION OF BUILDING PAD AND STRUCTURES. TEMPORARILY SEED DENUDED AREAS. ALL CUT AND FILL SLOPES SHALL BE SEEDED / LOAMED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE, EXCEPT WHERE RIP RAP IS APPLIED.
12. INSTALL BUILDING, UTILITIES, STORM SEWERS, CURBS AND GUTTERS.
13. INSTALL INLET PROTECTION DEVICES AROUND ALL STORM DRAIN STRUCTURES.
14. INSTALL RIP RAP AROUND OUTLET STRUCTURES.
15. FINALIZE GRADING, AND PREPARE SITE FOR PAVING. NOTE, ALL PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE.
16. PAVE SITE. COMPLETE FINISH GRADING AND INSTALL PERMANENT SEEDING AND PLANTING.
17. ONCE SITE IS STABILIZED, REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES.
18. ALL EROSION CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER ALL RAINFALL EVENTS GREATER THAN 0.25", AND SHALL BE MAINTAINED, REPAIRED OR REPLACED AS REQUIRED OR AT THE DIRECTION OF THE OWNER'S ENGINEER, OR THE TOWN ENGINEER.
19. SEDIMENT ACCUMULATION UP–GRADIENT OF THE TUBULAR BARRIERS GREATER THAN 6" IN DEPTH SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
20. SILT SACKS SHALL BE INSTALLED IN ALL CATCH BASINS ADJACENT TO THE SITE. SEDIMENT ACCUMULATION ON ALL ADJACENT CATCH BASIN INLETS SHALL BE REMOVED AND THE SILT SACK REPLACED IF TORN OR DAMAGED.
21. THE CONTRACTOR SHALL COMPLY WITH THE GENERAL AND EROSION NOTES AS SHOWN ON THE SITE DEVELOPMENT PLANS.



LEGEND

LIMIT OF 'CLEAR AND GRUB'	
BUILDING TO BE REMOVED	
PAVEMENT TO BE REMOVED	
UTILITY CUT AND CAP	
TEMPORARY FENCE	—×—×—
TUBULAR BARRIER	
EROSION CONTROL FABRIC	
CATCH BASIN FILTER	⊠
STABILIZED ENTRANCE	
STOCKPILE/STAGING AREA	

EROSION CONTROL AND SEDIMENT CONTROL NOTES:

1. AREAS WITH OVER 3:1 SLOPES SHALL BE PROTECTED WITH AN EROSION CONTROL BLANKET OR JUTE MESH. SEE THE GRADING & DRAINAGE PLAN, SHEET C–103 FOR SPECIFIC LOCATIONS.
2. SILT CONTROLS SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND SHALL BE ADEQUATE TO MAINTAIN SEDIMENT ON SITE.
3. THE CONTRACTOR SHALL USE EXTREME CAUTION TO AVOID ALLOWING SEDIMENTS TO ENTER THE STORM DRAIN SYSTEM DURING CONSTRUCTION. CATCH BASIN INLETS SHALL ALSO BE PROTECTED DURING CONSTRUCTION BY THE USE OF SILT SACKS; SILT SACKS SHOULD BE INSTALLED IN ALL EXISTING CATCH BASINS WITHIN THE PROJECT AREA. INLET PROTECTION MAY BE REMOVED ONLY AFTER FINISHED AREAS ARE PAVED AND THE VEGETATED SLOPES ARE ESTABLISHED WITH AT LEAST 85–90% OF VIGOROUS PERENNIAL GROWTH.
4. AT THE OWNER'S DISCRETION ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED TO MAINTAIN STABILITY OF EARTHWORKS AND FINISHED GRADED AREAS. THE CONTRACTOR, AT HIS EXPENSE, WILL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ANY ADDITIONAL MEASURES AS SPECIFIED BY THE OWNER.
5. THE AREA OR AREAS OF ENTRANCE AND EXIT TO AND FROM THE SITE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED THE RIGHT–OF–WAY MUST BE REMOVED IMMEDIATELY.
6. STOCKPILES SHALL BE SURROUNDED ON THEIR PERIMETERS WITH STAKED TUBULAR BARRIERS AND/OR SILTATION FENCES TO PREVENT AND/OR CONTROL SILTATION AND EROSION.
7. ALL EXISTING & PROPOSED CATCH BASINS SUBJECT TO STORMWATER RUNOFF DURING CONSTRUCTION SHALL HAVE SILT SACKS INSTALLED AS DIRECTED BY THE OWNER/ENGINEER. NO SEDIMENTATION SHALL ENTER THE ON–SITE OR OFF–SITE DRAINAGE SYSTEMS AT ANY TIME.
8. BEFORE ANY DEWATERING IS PERFORMED, THE CONTRACTOR SHALL FILE AND OBTAIN A TEMPORARY GROUNDWATER DISCHARGE PERMIT FROM NHDES. COORDINATION BETWEEN THE APPLICANT, PDA, NHDES AND THE AIR FORCE IS NECESSARY PRIOR TO FILING THIS APPLICATION.
9. WETLANDS AND BUFFERS ARE PRESENT ON SITE. THERE ARE NO WETLAND OR WETLAND BUFFER DISTURBANCES ASSOCIATED WITH THIS PROJECT. TAKE EXTREME CARE NOT TO IMPACT THESE RESOURCE AREAS.

SEEDINGS FOR TEMPORARY COVER

SPECIES	SEEDING RATE (LB/UNIT AREA		RECOMMENDED SEEDING DATES
	1,000 S.F.	ACRE	
ANNUAL RYEGRASS	1	40	APRIL 1 – JUNE 1 AUG. 15 – SEPT. 15
FOXTAIL MILLET	0.7	30	MAY 1 – JUNE 30
OATS	2	80	APRIL 1 – JULY 1 AUG. 15 – SEPT. 15
WINTER RYE	3	120	AUG. 15 – OCT. 15
"HYDRO–SEEDING" APPLICATIONS WITH APPROPRIATE SEED–MULCH–FERTILIZER MIXTURES MAY ALSO BE USED.			

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

STATE OF NEW HAMPSHIRE
BRIAN D. JONES
No. 13809
LICENSED PROFESSIONAL ENGINEER

11-20-23

PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
2	10-20-23	REVISED PER TAC COMMENTS
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	1" = 30'	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:
ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
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MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:	SHEET No.
SITE PREPARATION PLAN	C-101

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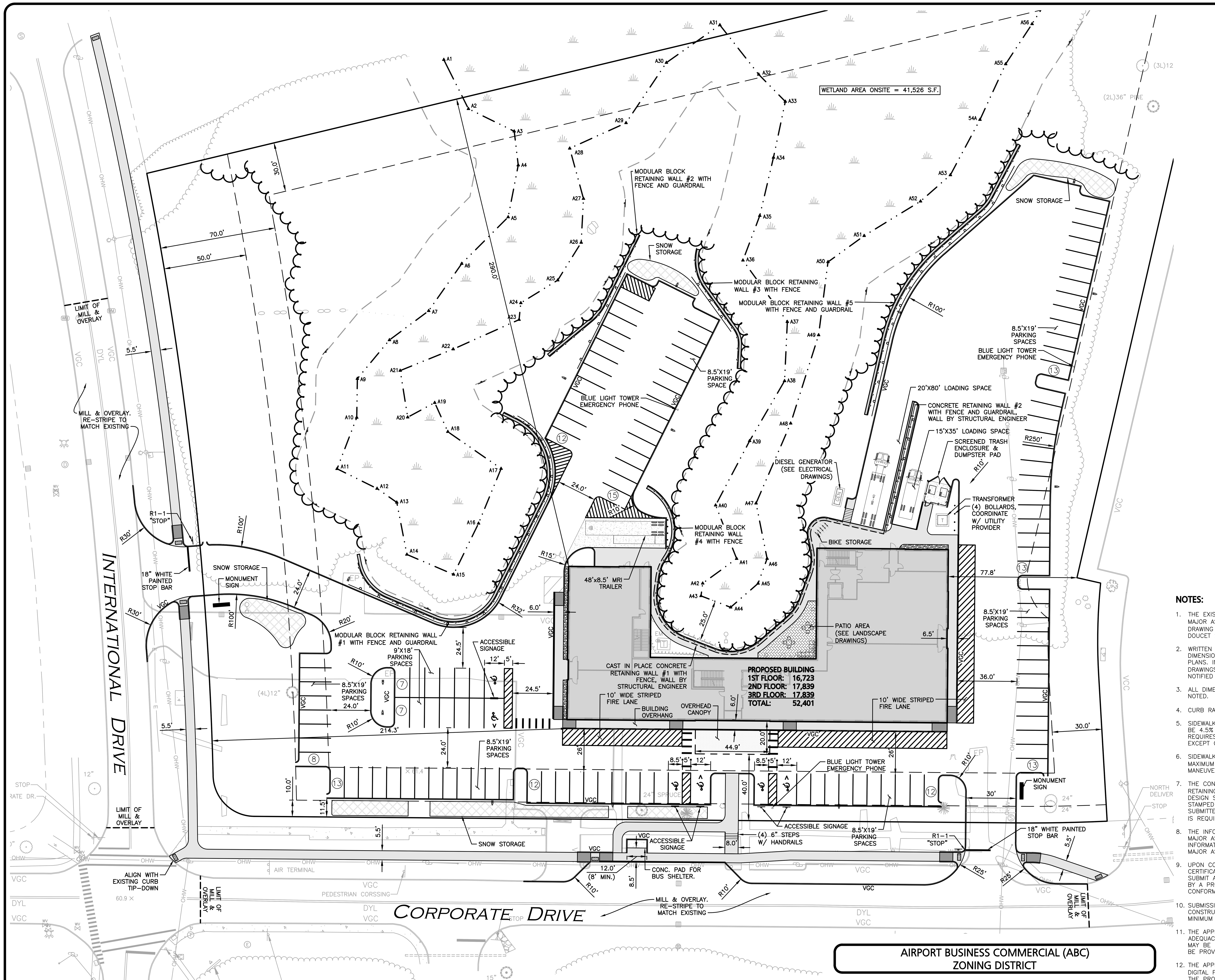

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1-888-344-7233

LEGEND

PROPERTY LINE	
SIGN	
BOLLARD	
BUILDING	
BUILDING ABOVE	
BUILDING ARCHITECTURE	
CURB	
RETAINING WALL	
PARKING STRIPING	
TRAFFIC ARROWS	
HEAVY DUTY CONCRETE	
SIDEWALK	
ADA DET. WARNING SURFACE	
BRICK PATIO	
ADA ACCESSIBLE RAMP	
SNOW STORAGE	
SETBACK LINE	
SAW-CUT LINE	
PARKING COUNT	
STEEL GUARDRAIL	
DECORATIVE FENCE	
SITE LIGHT	
TREE LINE	
VERTICAL GRANITE CURB	VGC

NOTES:

1. THE EXISTING CONDITIONS SHOWN HEREON HAVE BEEN PROVIDED TO ALLEN & MAJOR ASSOCIATES, INC. (A&M) BY THE APPLICANT AND ARE TAKEN FROM A DRAWING ENTITLED "EXISTING CONDITIONS PLAN FOR ATDG, LLC", PREPARED BY DOUCET SURVEY LLC, DATED APRIL 5, 2023.
2. WRITTEN DIMENSIONS ON THIS PLAN TAKE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN THE EVENT OF A CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND/OR SPECIFICATIONS OR CONDITIONS, THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR.
3. ALL DIMENSIONS AND RADII ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
4. CURB RADII SHALL BE 3' UNLESS OTHERWISE SHOWN.
5. SIDEWALK CROSS SLOPE TO BE 1.5% MAX. LONGITUDINAL RUNNING SLOPE TO BE 4.5% MAX. ANY SIDEWALK WITH A RUNNING SLOPE BETWEEN 5% AND 8.3% REQUIRES HAND RAILS ON BOTH SIDES IN ACCORDANCE WITH ADA REQUIREMENTS, EXCEPT CURB TRANSITIONS.
6. SIDEWALK AND HARDSCAPE AREAS AT ACCESSIBLE ENTRY DOORS SHALL HAVE A MAXIMUM OF 1.5% SLOPE/CROSS SLOPE IN ALL DIRECTIONS AT THE DOOR MANEUVERING CLEARANCE.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ANY STRUCTURAL RETAINING WALLS (WALLS WITH AN EXPOSED FACE OF GREATER THAN 4'). DESIGN SHALL BE BY A REGISTERED STRUCTURAL ENGINEER AND SHALL BE STAMPED ACCORDINGLY. STRUCTURAL RETAINING WALL DESIGNS SHALL BE SUBMITTED TO PEASE DEVELOPMENT AUTHORITY FOR REVIEW. A BUILDING PERMIT IS REQUIRED FOR ANY WALLS OVER 4' IN HEIGHT.
8. THE INFORMATION SHOWN ON THIS PLAN IS THE SOLE PROPERTY OF ALLEN & MAJOR ASSOCIATES, INC. ANY ALTERATION, MISUSE, OR RECALCULATION OF INFORMATION OR DATA WITHOUT THE EXPRESSED, WRITTEN CONSENT OF ALLEN & MAJOR ASSOCIATES, INC. IS STRICTLY PROHIBITED.
9. UPON COMPLETION OF CONSTRUCTION AND PRIOR TO THE ISSUANCE OF CERTIFICATE OF OCCUPANCY OR RELEASE OF BOND, THE APPLICANT SHALL SUBMIT A LETTER TO THE PEASE DEVELOPMENT AUTHORITY, SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER, STATING CONSTRUCTION HAS BEEN COMPLETED IN CONFORMANCE WITH THE APPROVED PLANS.
10. SUBMISSION OF MULTIPLE 7460-1'S TO THE FAA WILL BE REQUIRED FOR THE CONSTRUCTION OF THE BUILDING AND TEMPORARY USE OF A CRANE. ALLOW A MINIMUM OF 45 DAYS FOR PROCESSING.
11. THE APPLICANT SHALL COORDINATE WITH THE CITY OF PORTSMOUTH TO CONFIRM ADEQUACY OF RADIO SIGNAL STRENGTH FOR EMERGENCY SERVICES. AMPLIFIERS MAY BE REQUIRED TO BOOST SIGNAL STRENGTH, WHICH, IF NECESSARY, SHALL BE PROVIDED AND INSTALLED BY THE APPLICANT.
12. THE APPLICANT SHALL SUBMIT AS-BUILT PLANS ON REPRODUCIBLE MYLAR AND IN DIGITAL FORMAT (AUTOCAD .DWG FORMAT) ON CD TO PDA UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A REGISTERED NEW HAMPSHIRE LAND SURVEYOR OR PROFESSIONAL ENGINEER. AN ELECTRONIC FILE OF THE SITE LAYOUT SHALL BE SUBMITTED TO THE CITY OF PORTSMOUTH'S GIS DEPARTMENT.
13. SNOW SHALL BE TAKEN OFFSITE ONCE SNOW STORAGE AREAS ONSITE BECOME INADEQUATE, AND BEGINS TO BLOCK ACCESS TO AND FROM THE SITE OR BLOCKS THE USE OF ONSITE PARKING. ANY EXCESS WILL BE BE TRUCKED OFFSITE & DISPOSED OF IN ACCORDANCE WITH LOCAL AND NHDES GUIDELINES.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

OFF-STREET PARKING SUMMARY

USE	CALCULATION	PROVIDED
PROFESSIONAL OFFICES: 3 SPACES PER PROFESSIONAL + 1 PER OTHER EMPLOYEE	(20 PROFESSIONALS)x3 =60 (50 OFFICE STAFF)x1 + 50 SPACES REQUIRED =110	113 SPACES
HOSPITAL: 1 PER BED	(9 HOSPITAL BEDS) x1 = 9	10 SPACES
TOTAL	119 SPACES REQUIRED	123 SPACES

AIRPORT BUSINESS COMMERCIAL (ABC) ZONING DISTRICT

LOT	REQUIRED/ALLOWED	EXISTING/PROPOSED
MINIMUM LOT SIZE	5.00 ACRES	6.12 ACRES
MINIMUM FRONTAGE	200 FEET	366± FEET (INTERNATIONAL DRIVE)
FRONT SETBACK	70 FEET	214.3 FEET
SIDE SETBACK	30 FEET	40.0 FEET
REAR SETBACK	50 FEET	77.8 FEET
MAXIMUM BUILDING HEIGHT	FAA CRITERIA	3 STORY
MINIMUM OPEN SPACE	25% (UPLAND)	49%

STATE OF NEW HAMPSHIRE
BRIAN D. JONES
No. 13809
LICENSED PROFESSIONAL ENGINEER

11-20-23

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
2	10-20-23	REVISED PER TAC COMMENTS
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:

ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE

360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	1" = 30'	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

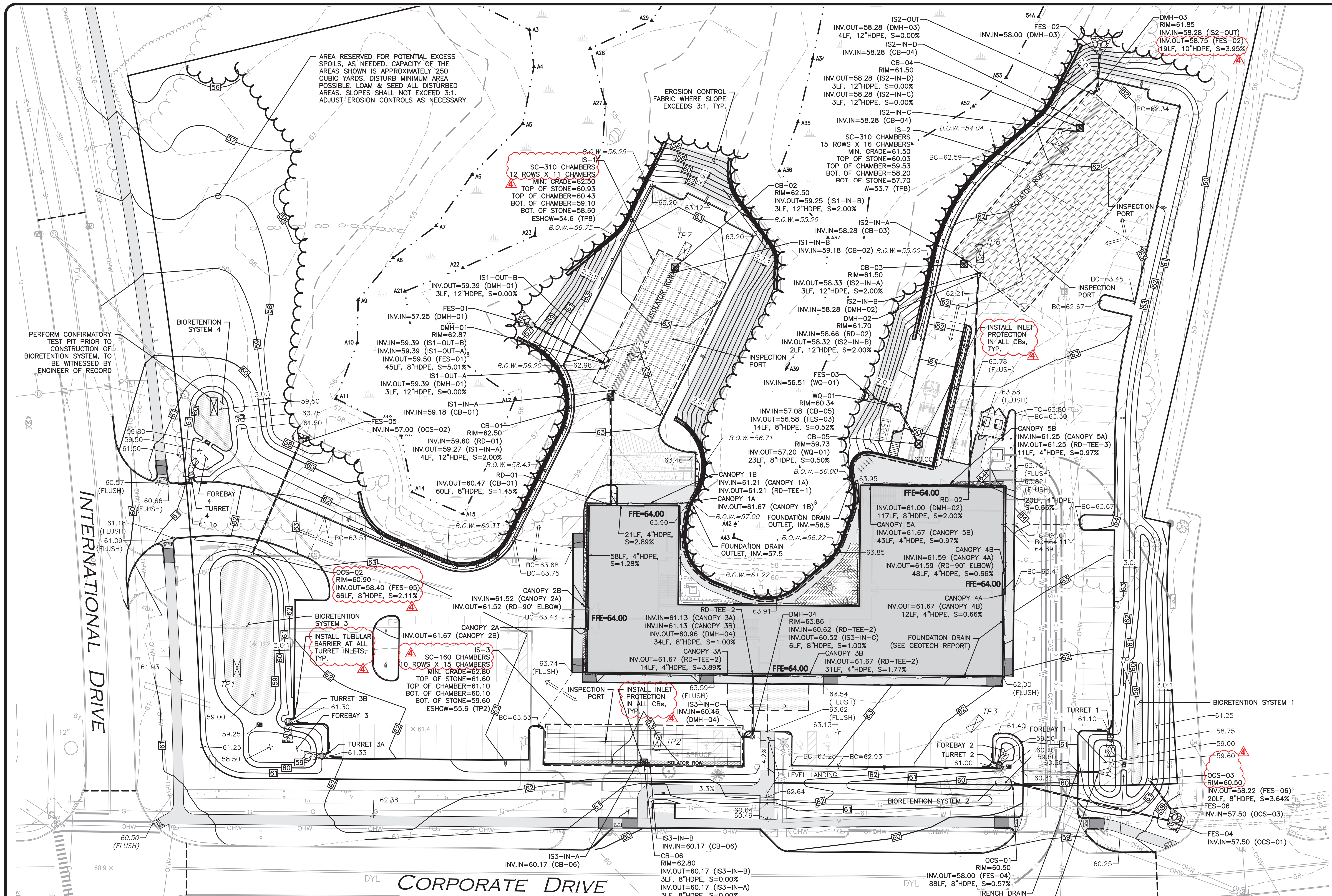
ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501

WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: LAYOUT & MATERIALS PLAN

SHEET No. C-102

R:\PROJECTS\3250-01\CIVIL\DRAWINGS\CURRENT\C-3250-01_LAYOUT & MATERIALS.DWG



LEGEND

- DRAIN MANHOLE
- NYLOPLAST DMH (30"ø)
- CATCH BASIN
- NYLOPLAST C.B. (30"/24"ø)
- RAIN GUARDIAN TURRET
- WATER QUALITY UNIT
- FLARED END SECTION
- DRAIN LINE
- RIPRAP OUTFALL
- 5' CONTOUR — 60
- 1' CONTOUR — 63
- SPOT GRADE — ×64.50
- INFILTRATION SYSTEM PERIMETER
- INFILTRATION SYSTEM (SC-160)
- INFILTRATION SYSTEM (SC-310)
- ISOLATOR ROW
- UNDERDRAIN — UD
- FLOW DIRECTION
- TEST PIT — TP1
- EROSION CONTROL FABRIC
- BIORETENTION SYSTEM

NOTES:

1. THE EXISTING CONDITIONS SHOWN HEREON HAVE BEEN PROVIDED TO ALLEN & MAJOR ASSOCIATES, INC. (A&M) BY THE APPLICANT AND ARE TAKEN FROM A DRAWING ENTITLED "EXISTING CONDITIONS PLAN FOR ATDG, LLC", PREPARED BY DOUCET SURVEY LLC, DATED APRIL 5, 2023.
2. WRITTEN DIMENSIONS ON THIS PLAN TAKE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN THE EVENT OF A CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND/OR SPECIFICATIONS OR CONDITIONS, THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR.
3. SIDEWALK CROSS SLOPE TO BE 1.5% MAX. LONGITUDINAL RUNNING SLOPE TO BE 4.5% MAX. ANY SIDEWALK WITH A RUNNING SLOPE BETWEEN 5% AND 8.3% REQUIRES HAND RAILS ON BOTH SIDES IN ACCORDANCE WITH ADA REQUIREMENTS, EXCEPT CURB TRANSITIONS.
4. SIDEWALK AND HARDSCAPE AREAS AT ACCESSIBLE ENTRY DOORS SHALL HAVE A MAXIMUM OF 1.5% SLOPE/CROSS SLOPE IN ALL DIRECTIONS AT THE DOOR MANEUVERING CLEARANCE.
5. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ANY STRUCTURAL RETAINING WALLS (WALLS WITH AN EXPOSED FACE OF GREATER THAN 4'). DESIGN SHALL BE BY A REGISTERED STRUCTURAL ENGINEER AND SHALL BE STAMPED ACCORDINGLY. STRUCTURAL RETAINING WALL DESIGNS SHALL BE SUBMITTED TO PEASE DEVELOPMENT AUTHORITY FOR REVIEW. A BUILDING PERMIT IS REQUIRED FOR ANY WALLS OVER 4' IN HEIGHT.
6. THE INFORMATION SHOWN ON THIS PLAN IS THE SOLE PROPERTY OF ALLEN & MAJOR ASSOCIATES, INC. ANY ALTERATION, MISUSE, OR RECALCULATION OF INFORMATION OR DATA WITHOUT THE EXPRESSED, WRITTEN CONSENT OF ALLEN & MAJOR ASSOCIATES, INC. IS STRICTLY PROHIBITED.
7. THE CONTRACTOR SHALL CLEAN THE ENTIRE STORMWATER SYSTEM OF ALL SEDIMENT AND DEBRIS, WITHIN THE LIMIT OF WORK, UPON COMPLETION OF CONSTRUCTION.
8. THE PROJECT, AS SHOWN HEREON, ANTICIPATES A NET IMPORT OF APPROXIMATELY **12,100** CUBIC YARDS OF FILL MATERIAL. THIS IS THE RESULT OF A COMPARISON OF THE EXISTING AND PROPOSED FINISHED GRADES AND DOES NOT INCLUDE REMOVAL OF MATERIAL REQUIRED FOR FOUNDATIONS, UTILITIES, OR UNDERGROUND STORMWATER INFRASTRUCTURE.
9. ALL EXCESS EXCAVATED SOIL MATERIAL SHALL REMAIN ON SITE AND SHALL BE PLACED IN THE EXCESS SOIL BERM AS SHOWN HEREON. NO EXISTING SOIL SHALL BE REMOVED FROM THE PROJECT SITE.

TEST PIT #6 (TP6)
EXISTING GROUND ELEVATION: 56.4
PERFORMED BY: BRIAN D. JONES, PE
DATE: 07-17-2023

HORIZON	DEPTH	TEXTURE	COLOR	STRUCTURE	NOTES
O	0-3"	N.A.	N.A.	N.A.	LEAF LITTER
A	3-10"	SANDY LOAM	7.5YR 3/2	MASSIVE FRIABLE	DRY
Bw	10-16"	SANDY LOAM	10YR 5/4	MASSIVE FRIABLE	DRY
C	16-80"	SANDY LOAM	2.5Y 5/4	MASSIVE, FRIABLE	DRY TO MOIST

ESHWT: 34" (ELEVATION=53.6)
WEEP: NONE
BEDROCK/REFUSAL: NONE

TEST PIT #7 (TP7)
EXISTING GROUND ELEVATION: 57.8
PERFORMED BY: BRIAN D. JONES, PE
DATE: 07-17-2023

HORIZON	DEPTH	TEXTURE	COLOR	STRUCTURE	NOTES
O	0-3"	N.A.	N.A.	N.A.	LEAF LITTER
A	3-8"	SANDY LOAM	7.5YR 3/2	MASSIVE FRIABLE	DRY
Bw	8-14"	SANDY LOAM	10YR 5/4	MASSIVE FRIABLE	DRY
C	14-72"	SANDY LOAM	2.5Y 5/4	MASSIVE, FRIABLE	DRY TO MOIST

ESHWT: 40" (ELEVATION=54.5)
WEEP: NONE
BEDROCK/REFUSAL: NONE

TEST PIT #8 (TP8)
EXISTING GROUND ELEVATION: 57.6
PERFORMED BY: BRIAN D. JONES, PE
DATE: 07-17-2023

HORIZON	DEPTH	TEXTURE	COLOR	STRUCTURE	NOTES
O	0-3"	N.A.	N.A.	N.A.	LEAF LITTER
A	3-6"	SANDY LOAM	7.5YR 3/2	MASSIVE FRIABLE	DRY
Bw	6-12"	SANDY LOAM	10YR 5/4	MASSIVE FRIABLE	DRY
C	12-72"	SANDY LOAM	2.5Y 5/4	MASSIVE, FRIABLE	DRY TO MOIST

ESHWT: 36" (ELEVATION=54.6)
WEEP: NONE
BEDROCK/REFUSAL: NONE

DIG SAFE

BEFORE YOU DIG CALL 811 OR 1-888-DIG-SAFE 1-888-344-7233

TEST PIT #1 (TP1)
EXISTING GROUND ELEVATION: 61.5
PERFORMED BY: BRIAN D. JONES, PE
DATE: 07-17-2023

HORIZON	DEPTH	TEXTURE	COLOR	STRUCTURE	NOTES
HTM (FILL)	0-48"	GENERALLY LOAMY SAND	N.A.	N.A.	DRY, SOME CONST. DEBRIS
C	48-96"	SANDY LOAM	2.5Y 5/4	MASSIVE, FIRM	DRY TO MOIST

ESHWT: 72" (ELEVATION=55.5)
WEEP: NONE
BEDROCK/REFUSAL: NONE

TEST PIT #2 (TP2)
EXISTING GROUND ELEVATION: 61.4
PERFORMED BY: BRIAN D. JONES, PE
DATE: 07-17-2023

HORIZON	DEPTH	TEXTURE	COLOR	STRUCTURE	NOTES
HTM (FILL)	0-80"	GENERALLY LOAMY SAND	N.A.	N.A.	DRY TO MOIST
O	80-82"	N.A.	GLEY1 N	N.A.	BURIED "O" HORIZON
C	82-96"	FINE SANDY LOAM	GLEY2 4/10G	MASSIVE, FIRM	MOIST

ESHWT: 70" (ELEVATION=55.6)
WEEP: NONE
BEDROCK/REFUSAL: NONE

TEST PIT #3 (TP3)
EXISTING GROUND ELEVATION: 62.2
PERFORMED BY: BRIAN D. JONES, PE
DATE: 07-17-2023

HORIZON	DEPTH	TEXTURE	COLOR	STRUCTURE	NOTES
HTM (FILL)	0-60"	GENERALLY LOAMY SAND	N.A.	N.A.	DRY, SOME CONSTR. DEBRIS
C	60-94"	SANDY LOAM	2.5Y 5/4	MASSIVE, FIRM	DRY TO MOIST

ESHWT: 76" (ELEVATION=55.9)
WEEP: NONE
BEDROCK/REFUSAL: NONE

TEST PIT #4 (TP4)
EXISTING GROUND ELEVATION: 60.8
PERFORMED BY: BRIAN D. JONES, PE
DATE: 07-17-2023

HORIZON	DEPTH	TEXTURE	COLOR	STRUCTURE	NOTES
HTM (FILL)	0-18"	GENERALLY LOAMY SAND	N.A.	N.A.	DRY
Ab	18-24"	SANDY LOAM	2.5Y 4/2	MASSIVE FRIABLE	DRY
Bw	24-32"	SANDY LOAM	7.5YR 4/6	MASSIVE FRIABLE	DRY
C_1	32-48"	SANDY LOAM	2.5Y 5/4	MASSIVE, FRIABLE	DRY
C_2	48-96"	SANDY LOAM	2.5Y 7/2	MASSIVE FIRM	DRY TO MOIST

ESHWT: 67" (ELEVATION=55.2)
WEEP: NONE
BEDROCK/REFUSAL: NONE

TEST PIT #5 (TP5)
EXISTING GROUND ELEVATION: 56.7
PERFORMED BY: BRIAN D. JONES, PE
DATE: 07-17-2023

HORIZON	DEPTH	TEXTURE	COLOR	STRUCTURE	NOTES
O	0-3"	N.A.	N.A.	N.A.	LEAF LITTER
A	3-9"	SANDY LOAM	7.5YR 3/2	MASSIVE FRIABLE	DRY
Bw	9-14"	SANDY LOAM	10YR 5/4	MASSIVE FRIABLE	DRY
C	14-72"	SANDY LOAM	2.5Y 5/4	MASSIVE, FRIABLE	DRY TO MOIST

ESHWT: 36" (ELEVATION=53.7)
WEEP: NONE
BEDROCK/REFUSAL: NONE

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

STATE OF NEW HAMPSHIRE BRIAN D. JONES No. 13809 LICENSED PROFESSIONAL ENGINEER

11-20-23

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
4	11-10-23	REVISED PER AOT COMMENTS
3	10-20-23	REVISED PER TAC COMMENTS
2	08-28-23	ISSUED FOR AOT PERMIT APPLICATION
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:

ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	1" = 30'	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501

WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: GRADING & DRAINAGE PLAN

SHEET No. C-103

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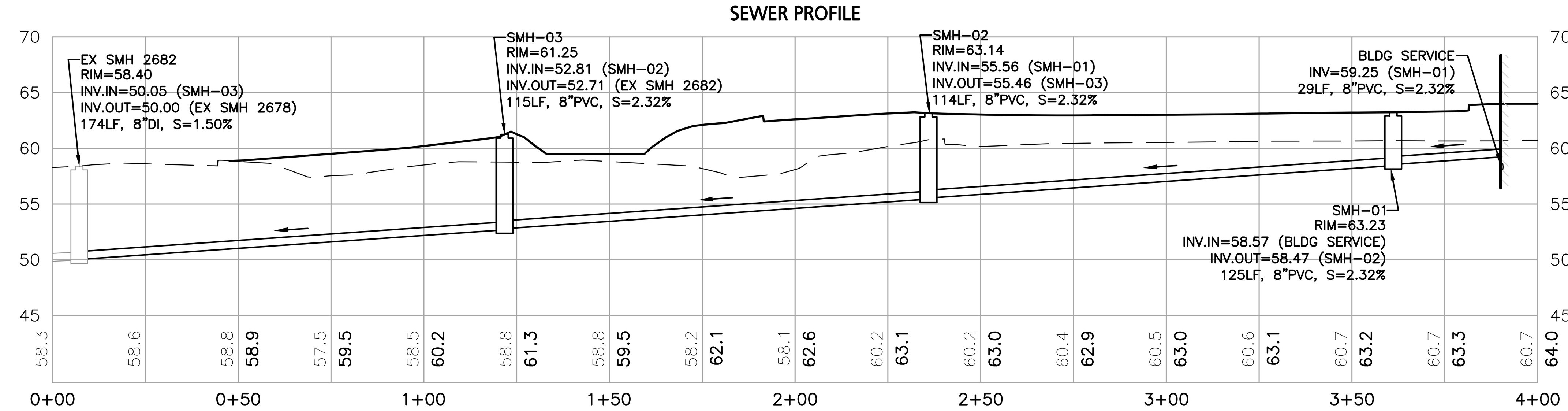
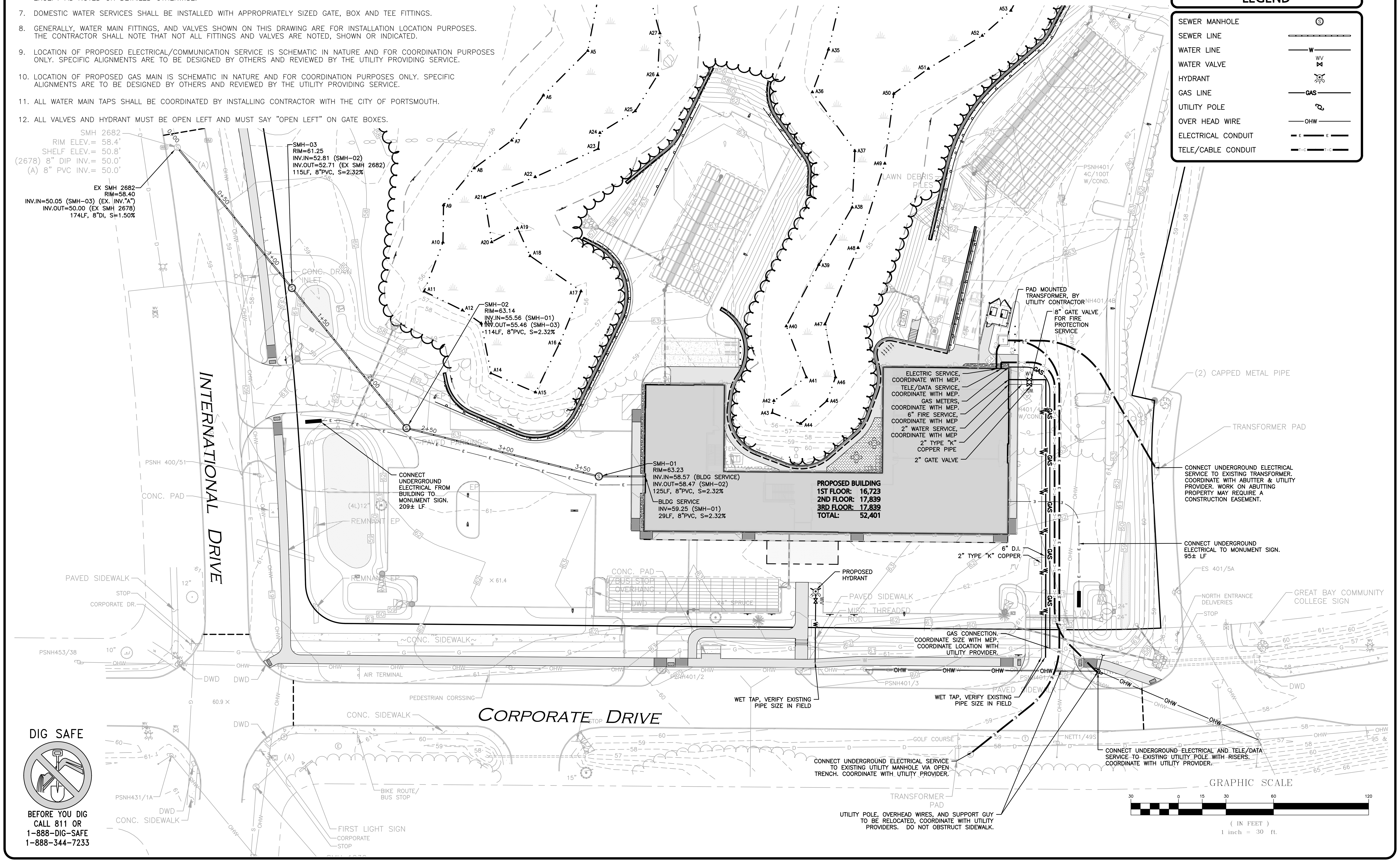
UTILITY NOTES:

1. A MINIMUM OF 10 FEET CLEAR HORIZONTALLY SHALL BE MAINTAINED BETWEEN WATER MAINS AND SANITARY SEWER MAINS AND/OR STORM DRAINS. WHENEVER CONDITIONS PREVENT A LATERAL SEPARATION OF 10 FEET TO A WATER MAIN, THE WATER MAIN SHALL BE LAID IN A SEPARATE TRENCH AND THE DIFFERENCE IN ELEVATION BETWEEN THE WATER MAIN AND THE SEWER MAIN SHALL BE AT LEAST 18 INCHES.
2. IN THE CASE THAT WATER MAINS CROSS SANITARY SEWER MAINS AND/OR STORM DRAINS AND ARE SEPARATED BY LESS THAT 18" OF VERTICAL CLEARANCE, THE CROSSING PIPES SHALL BE ENCASED IN CONCRETE OR SLEEVED IN A LARGER DIAMETER PIPE FOR A DISTANCE OF 10 FEET ON EITHER SIDE OF THE CROSSING.
3. THE CONTRACTOR SHALL REFER TO ARCHITECT'S PLANS AND SPECIFICATIONS FOR ACTUAL LOCATION OF ALL ROOF DRAIN LATERALS AND UTILITY ENTRANCES TO INCLUDE SANITARY SEWER LATERALS, DOMESTIC AND FIRE PROTECTION WATER SERVICE, ELECTRIC, TELEPHONE, AND GAS SERVICE. THE CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES IN SUCH A MANNER AS TO AVOID CONFLICTS AND COORDINATE WITH THE PROPER AGENCY THE LOCATION AND SCHEDULING OF CONNECTIONS WITH THEIR FACILITIES.
4. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION.
5. THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENTS OF NATURAL GAS, ELECTRIC, TELEPHONE AND ANY OTHER UTILITY BY THE UTILITY OWNER.
6. ALL WATER MAINS SHALL BE INSTALLED WITH A MINIMUM OF 4.5 FEET OF COVER AND A MAXIMUM OF 8 FEET OF COVER EXCEPT AS NOTED OR DETAILED OTHERWISE.
7. DOMESTIC WATER SERVICES SHALL BE INSTALLED WITH APPROPRIATELY SIZED GATE, BOX AND TEE FITTINGS.
8. GENERALLY, WATER MAIN FITTINGS, AND VALVES SHOWN ON THIS DRAWING ARE FOR INSTALLATION LOCATION PURPOSES. THE CONTRACTOR SHALL NOTE THAT NOT ALL FITTINGS AND VALVES ARE NOTED, SHOWN OR INDICATED.
9. LOCATION OF PROPOSED ELECTRICAL/COMMUNICATION SERVICE IS SCHEMATIC IN NATURE AND FOR COORDINATION PURPOSES ONLY. SPECIFIC ALIGNMENTS ARE TO BE DESIGNED BY OTHERS AND REVIEWED BY THE UTILITY PROVIDING SERVICE.
10. LOCATION OF PROPOSED GAS MAIN IS SCHEMATIC IN NATURE AND FOR COORDINATION PURPOSES ONLY. SPECIFIC ALIGNMENTS ARE TO BE DESIGNED BY OTHERS AND REVIEWED BY THE UTILITY PROVIDING SERVICE.
11. ALL WATER MAIN TAPS SHALL BE COORDINATED BY INSTALLING CONTRACTOR WITH THE CITY OF PORTSMOUTH.
12. ALL VALVES AND HYDRANT MUST BE OPEN LEFT AND MUST SAY "OPEN LEFT" ON GATE BOXES.

SEWER PROFILE



HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: 1" = 10'



LEGEND

SEWER MANHOLE	S
SEWER LINE	
WATER LINE	W
WATER VALVE	WV
HYDRANT	
GAS LINE	GAS
UTILITY POLE	
OVER HEAD WIRE	OHW
ELECTRICAL CONDUIT	E
TELE/CABLE CONDUIT	T/C

DIG SAFE
BEFORE YOU DIG CALL 811 OR 1-888-DIG-SAFE 1-888-344-7233

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STATE OF NEW HAMPSHIRE BRIAN D. JONES No. 13809 LICENSED PROFESSIONAL ENGINEER
11-20-23
PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
3	10-25-23	MISC. UTILITY REVISIONS
2	10-20-23	REVISED PER TAC COMMENTS
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	1" = 30'	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:
ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
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MANCHESTER, NH 03103
TEL: (603) 627-5500
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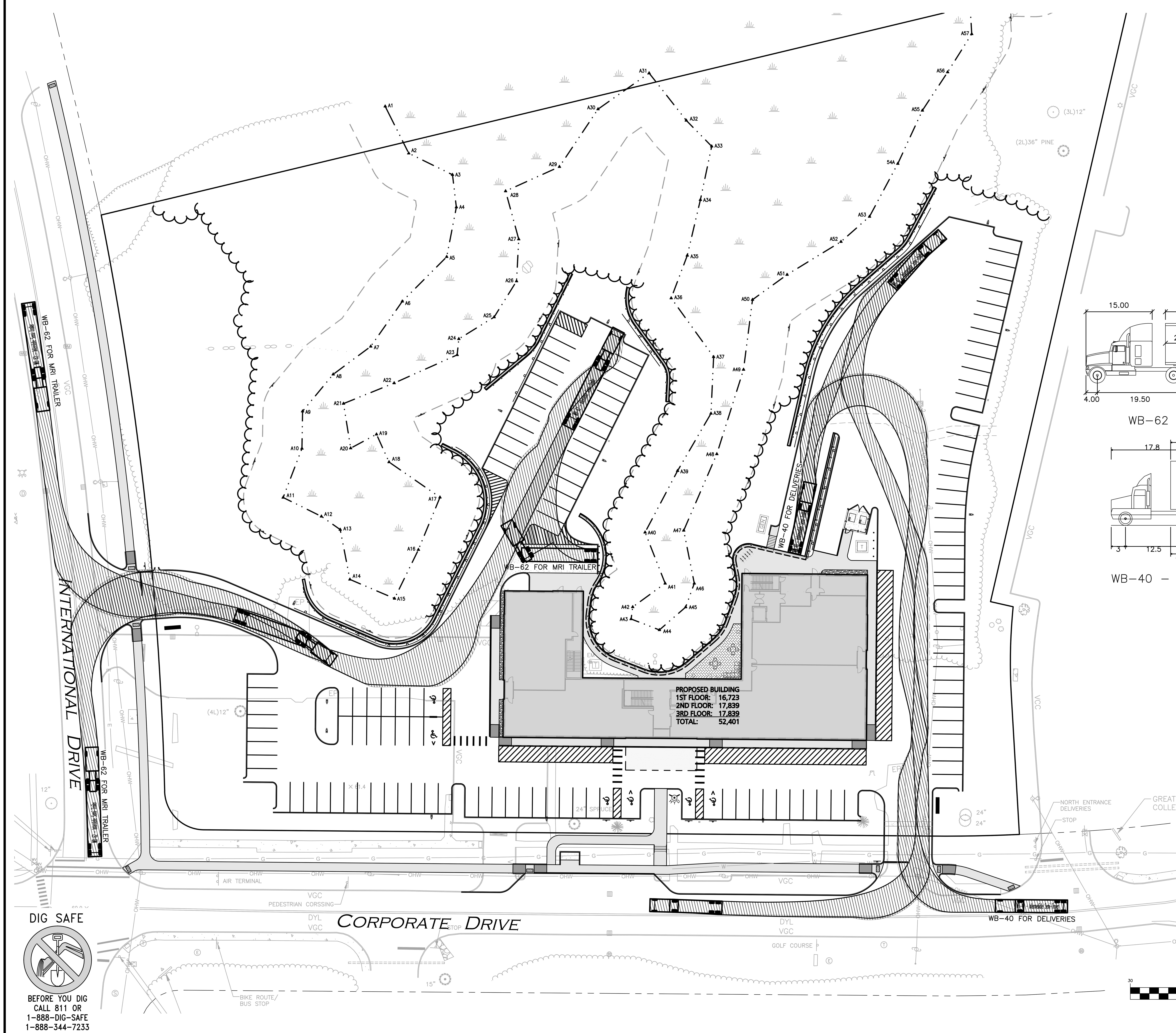
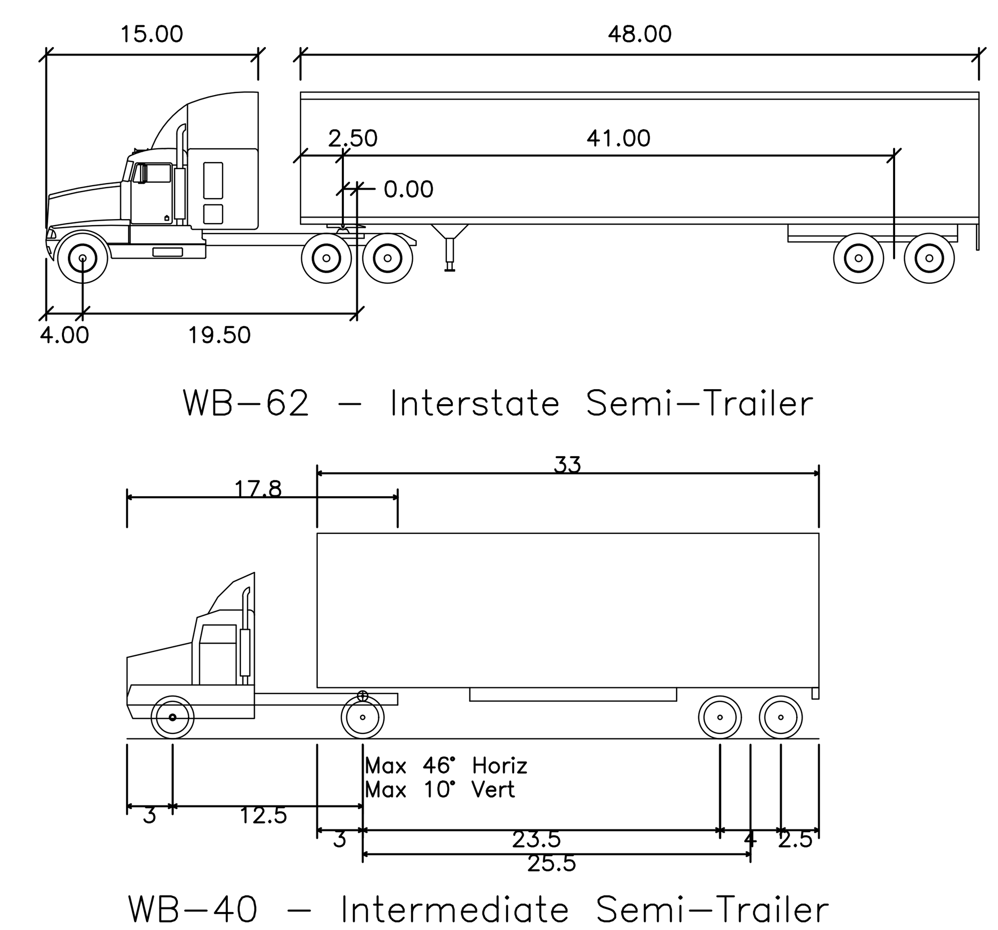
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

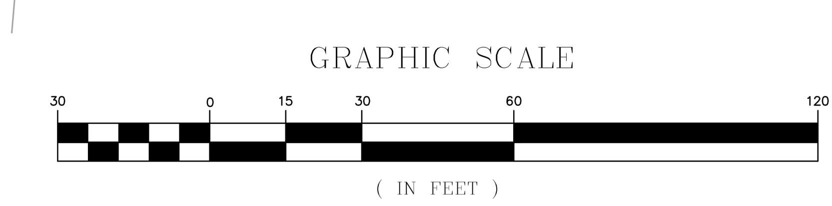
DRAWING TITLE: UTILITIES PLAN
SHEET No. C-104





NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT TRUCK MOVEMENTS THROUGH THE SITE.
2. THE EXISTING CONDITIONS SHOWN HEREON HAVE BEEN PROVIDED TO ALLEN & MAJOR ASSOCIATES, INC. (A&M) BY THE APPLICANT AND ARE TAKEN FROM A DRAWING ENTITLED "EXISTING CONDITIONS PLAN FOR ATDG, LLC", PREPARED BY DOUCET SURVEY LLC, DATED APRIL 5, 2023.
3. THE INFORMATION SHOWN ON THIS PLAN IS THE SOLE PROPERTY OF ALLEN & MAJOR ASSOCIATES, INC. ANY ALTERATION, MISUSE, OR RECALCULATION OF INFORMATION OR DATA WITHOUT THE EXPRESSED, WRITTEN CONSENT OF ALLEN & MAJOR ASSOCIATES, INC. IS STRICTLY PROHIBITED.



STATE OF NEW HAMPSHIRE
BRIAN D. JONES
No. 13809
LICENSED
PROFESSIONAL ENGINEER

11-20-23

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
2	10-20-23	REVISED PER TAC COMMENTS
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:

ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	1" = 30'	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

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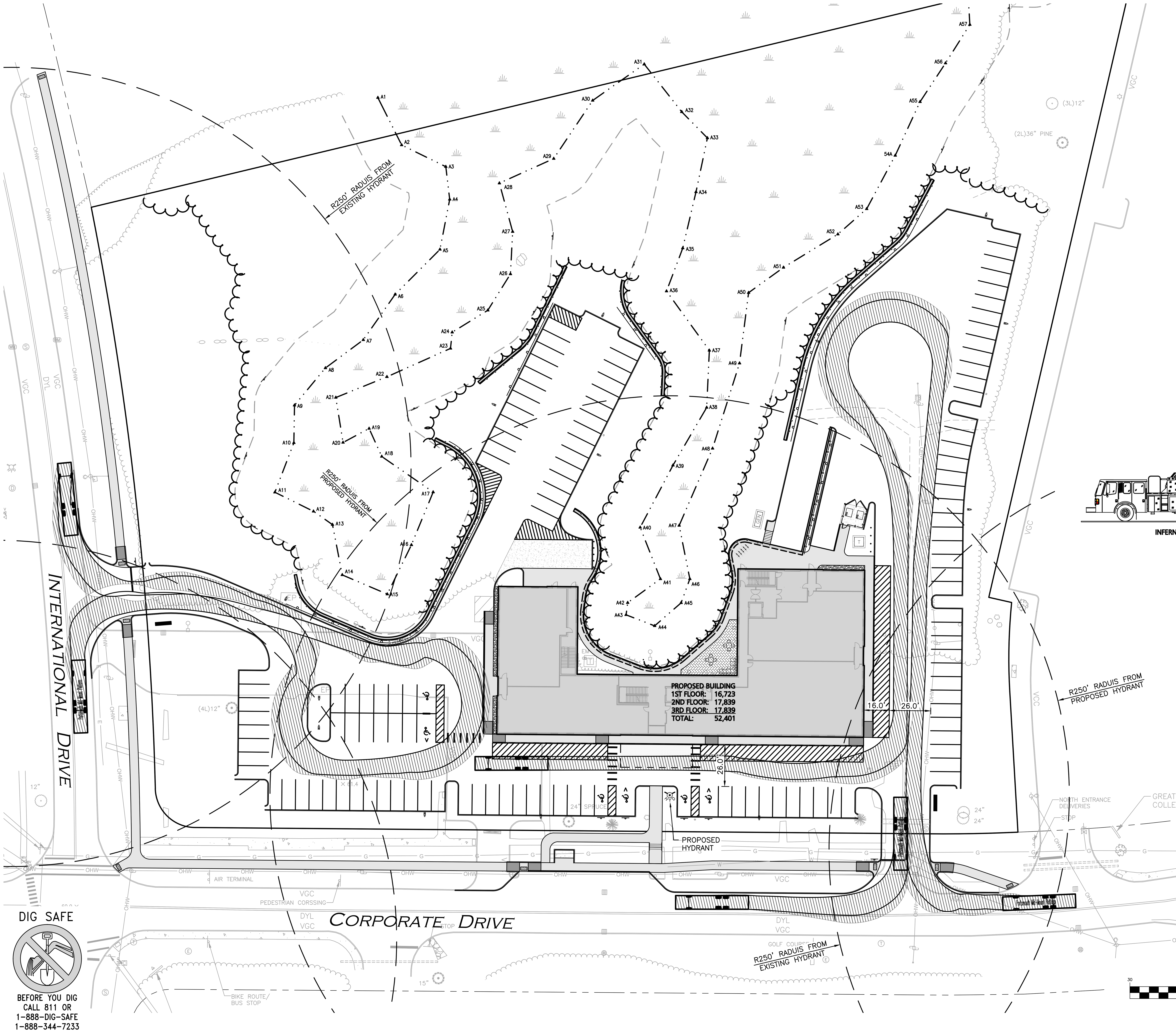
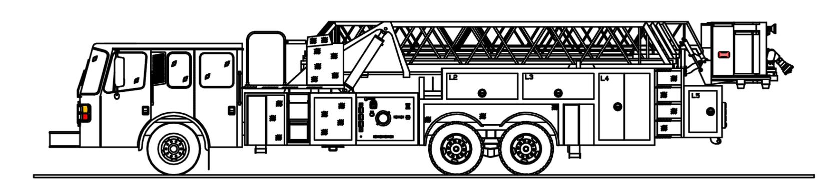
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: TRUCK TURNING PLAN

SHEET No. C-105





INFERNO MID-MOUNT PLATFORM

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT PORTSMOUTH FIRE APPARATUS MOVEMENTS THROUGH THE SITE.
2. THE EXISTING CONDITIONS SHOWN HEREON HAVE BEEN PROVIDED TO ALLEN & MAJOR ASSOCIATES, INC. (A&M) BY THE APPLICANT AND ARE TAKEN FROM A DRAWING ENTITLED "EXISTING CONDITIONS PLAN FOR ATDG, LLC", PREPARED BY DOUCET SURVEY LLC, DATED APRIL 5, 2023.
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GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

STATE OF NEW HAMPSHIRE
BRIAN D. JONES
No. 13809
LICENSED
PROFESSIONAL ENGINEER

11-20-23

PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION

APPLICANT/LESSEE:

ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	10-20-23
SCALE:	1" = 30'	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

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WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:	SHEET No.
FIRE TRUCK TURNING PLAN	C-106

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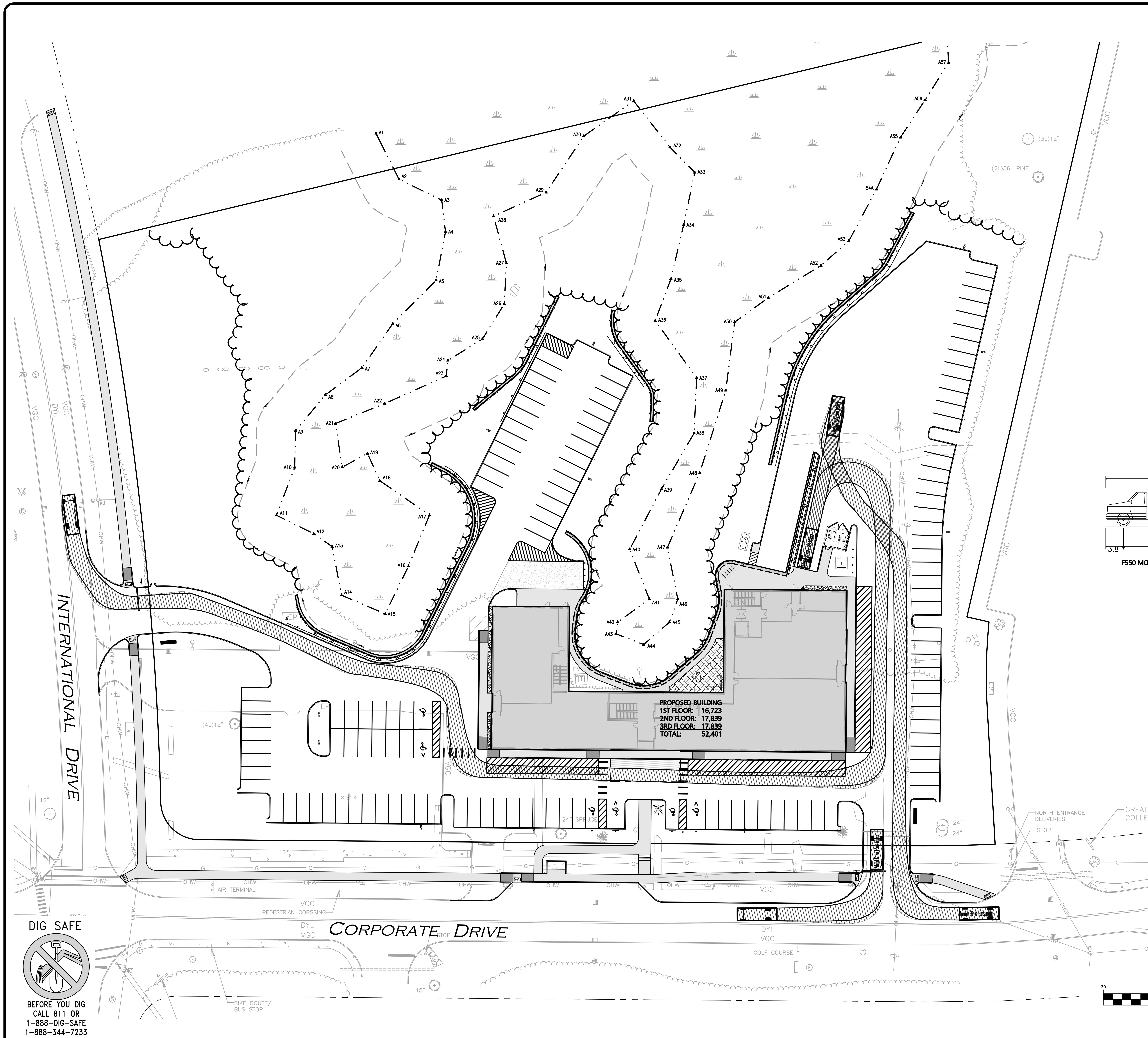

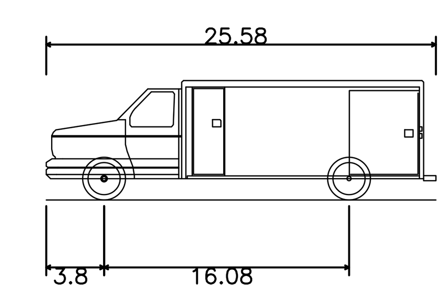

F550 MODEL 623 AMBULANCE

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT PORTSMOUTH EMERGENCY VEHICLE MOVEMENTS THROUGH THE SITE.
2. THE EXISTING CONDITIONS SHOWN HEREON HAVE BEEN PROVIDED TO ALLEN & MAJOR ASSOCIATES, INC. (A&M) BY THE APPLICANT AND ARE TAKEN FROM A DRAWING ENTITLED "EXISTING CONDITIONS PLAN FOR ATDG, LLC", PREPARED BY DOUCET SURVEY LLC, DATED APRIL 5, 2023.
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STATE OF NEW HAMPSHIRE
BRIAN D. JONES
No. 13809
LICENSED PROFESSIONAL ENGINEER

11-20-23

PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION

APPLICANT/LESSEE:

ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	10-20-23
SCALE:	1" = 30'	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

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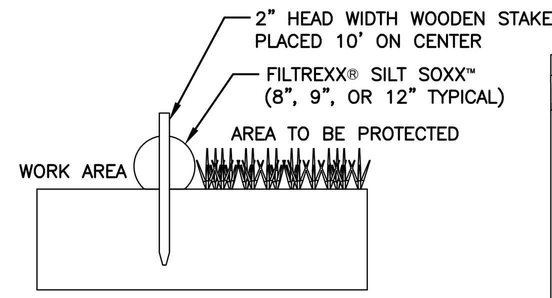
FAX: (603) 627-5501

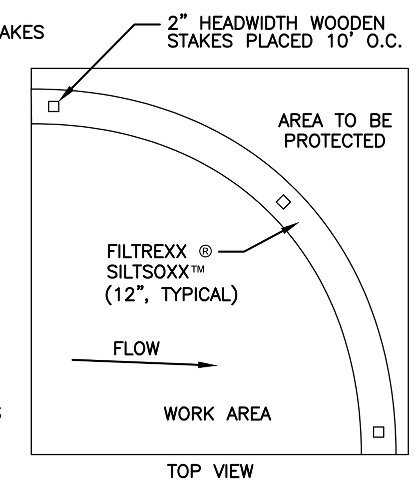
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: AMBULANCE TURNING PLAN

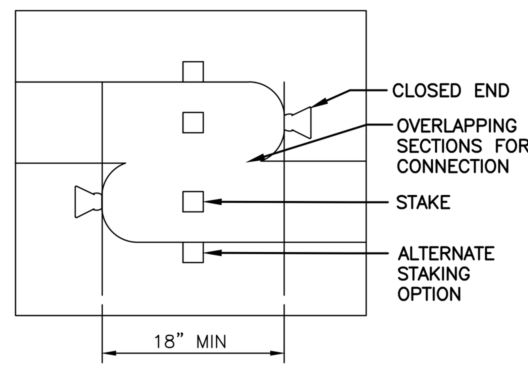
SHEET No. C-107

R:\PROJECTS\3250-01\CIVIL\DRAWINGS\CURRENT\C-3250-01_TRUCK TURNING.DWG

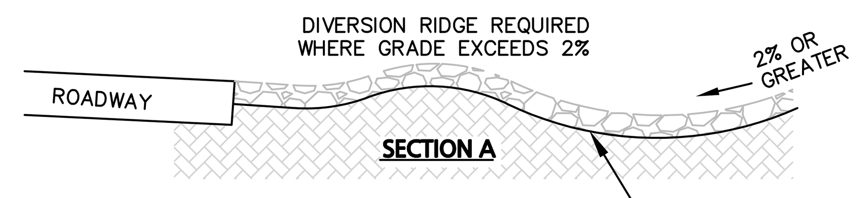


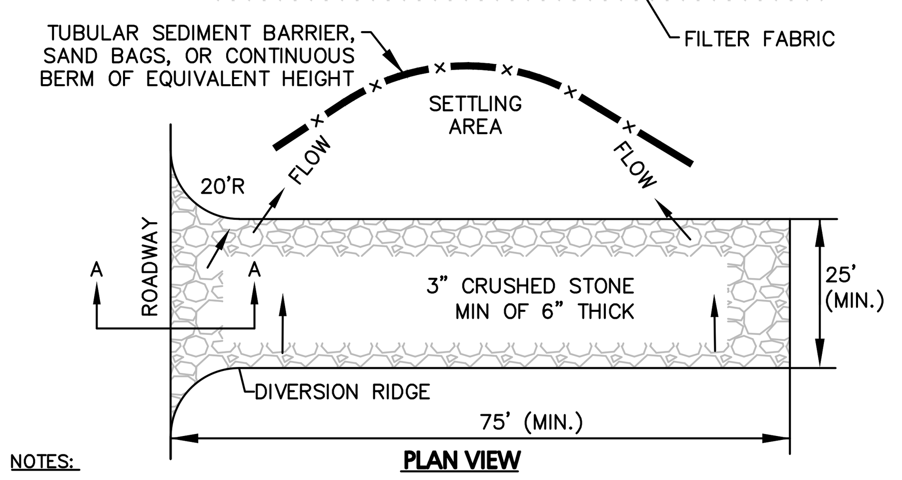


NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. SILTSOXX™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.
4. TUBULAR SEDIMENT CONTROL SHALL BE 12" MIN. DIAMETER BIOSOXX™ COTTON FIBER MESH TUBE WITH NATURAL FILTER MEDIA BY FILTREXX OR APPROVED EQUAL.
5. THE CONTRACTOR SHALL MAINTAIN THE TUBULAR BARRIERS IN A FUNCTIONAL CONDITION AT ALL TIMES. THE CONTROLS SHALL BE ROUTINELY INSPECTED BY THE CONTRACTOR.
6. WHERE THE TUBULAR BARRIERS REQUIRE REPAIR OR SEDIMENT REMOVAL, IT WILL BE COMPLETED BY THE CONTRACTOR AT NO ADDITIONAL COST.
7. AT A MINIMUM, THE CONTRACTOR SHALL REMOVE SEDIMENTS COLLECTED AT THE BASE WHEN THEY REACH 1/3 THE EXPOSED HEIGHT OF THE BARRIER.



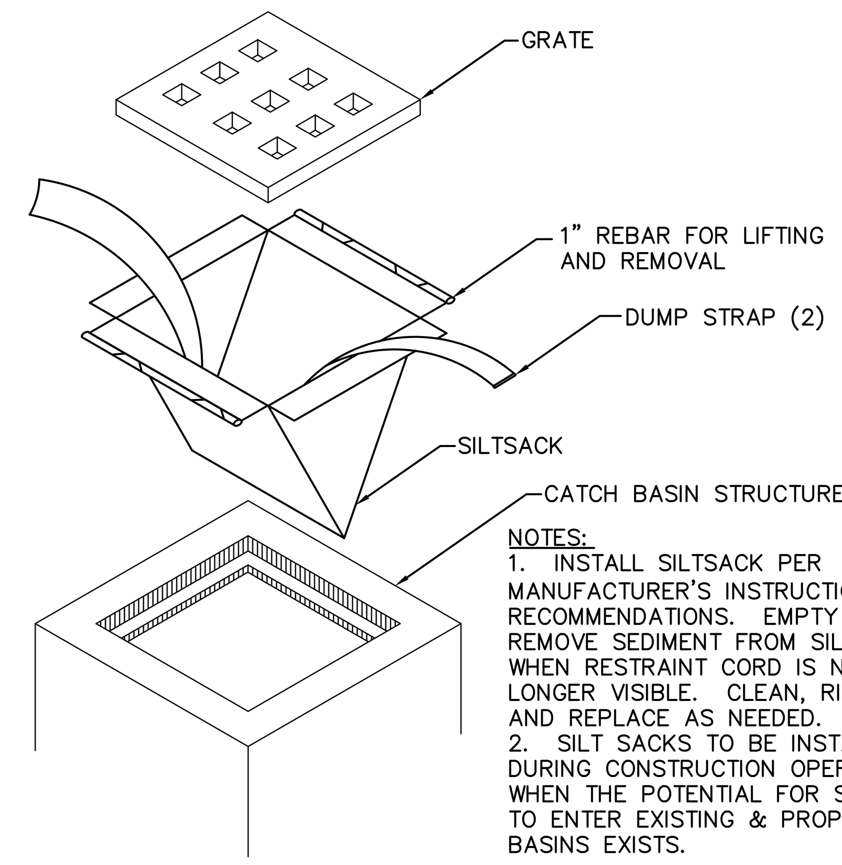
FILTREXX SILTSOXX DETAIL (1)
NOT TO SCALE





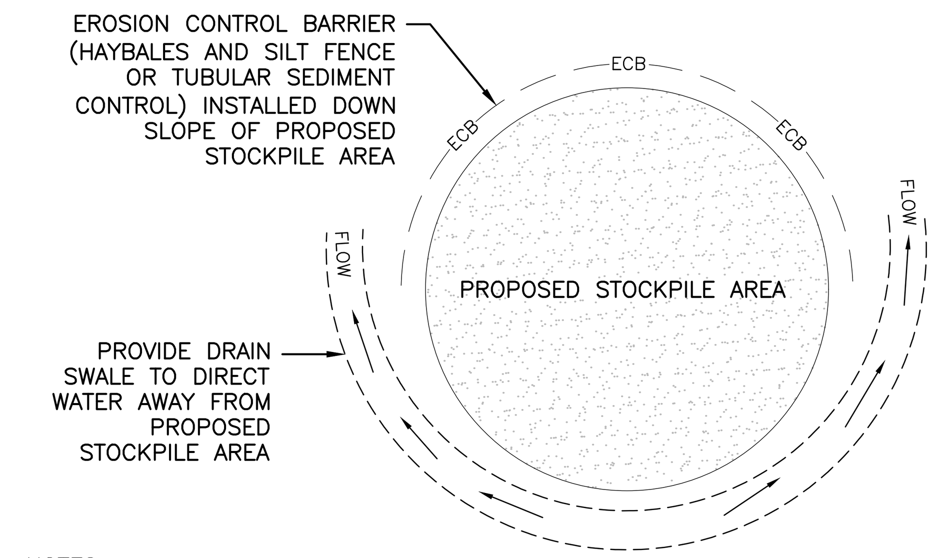
NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTERING THE PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

STABILIZED CONSTRUCTION ENTRANCE (2)
NOT TO SCALE



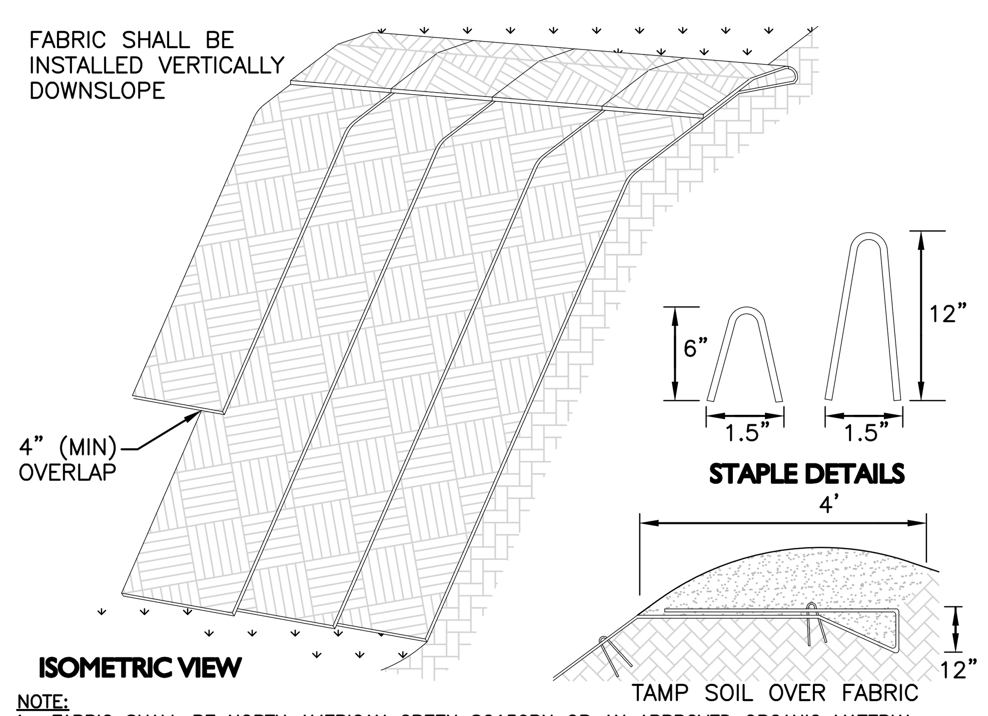
NOTES:
1. INSTALL SILTSACK PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. EMPTY OR REMOVE SEDIMENT FROM SILTSACK WHEN RESTRAINT CORD IS NO LONGER VISIBLE. CLEAN, RINSE, AND REPLACE AS NEEDED.
2. SILT SACKS TO BE INSTALLED DURING CONSTRUCTION OPERATIONS WHEN THE POTENTIAL FOR SEDIMENT TO ENTER EXISTING & PROPOSED BASINS EXISTS.

CATCH BASIN INLET PROTECTION (3)
NOT TO SCALE



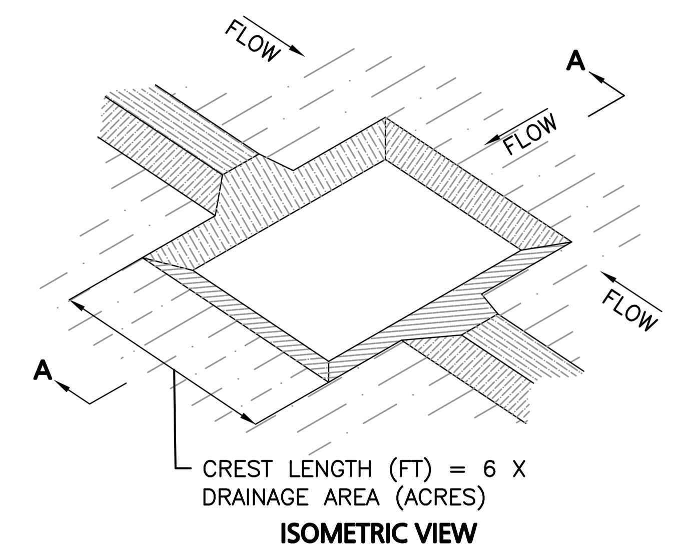
NOTES:
1. SOIL AND FILL STOCKPILES EXPECTED TO REMAIN IN PLACE FOR LESS THAN 90 DAYS SHALL BE COVERED WITH HAY AND MULCH (AT 100LBS/1,000 SF), OR WITH AN ANCHORED TARP WITHIN 7 DAYS OR PRIOR TO ANY RAINFALL.
2. SOIL AND FILL STOCKPILES EXPECTED TO REMAIN IN PLACE FOR 90 DAYS OR MORE SHALL BE SEEDED WITH WINTER RYE (FOR FALL SEEDING AT 3LB/1,000 SF) OR OATS (FOR SUMMER SEEDING AT 2LB/1,000 SF) AND THEN COVERED WITH HAY MULCH (AT 100LB/1,000 SF) OR AN ANCHORED TARP WITHIN 7 DAYS OR PRIOR TO ANY RAINFALL.

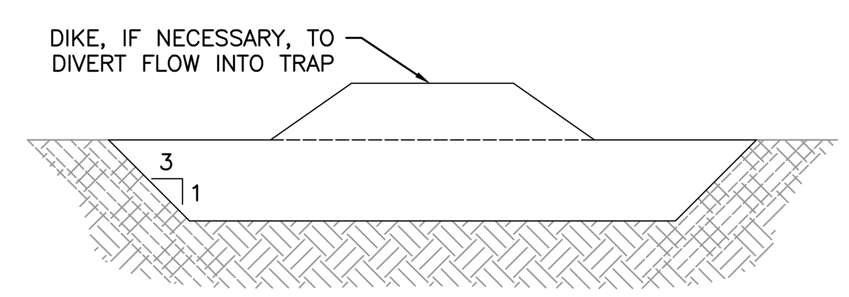
STOCKPILE PROTECTION (4)
NOT TO SCALE



NOTE:
1. FABRIC SHALL BE NORTH AMERICAN GREEN SC150BN OR AN APPROVED ORGANIC MATERIAL EQUAL.
2. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS.
3. APPLY PERMANENT SEEDING BEFORE PLACING FABRIC.
4. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
5. 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 FABRIC (5)
NOT TO SCALE

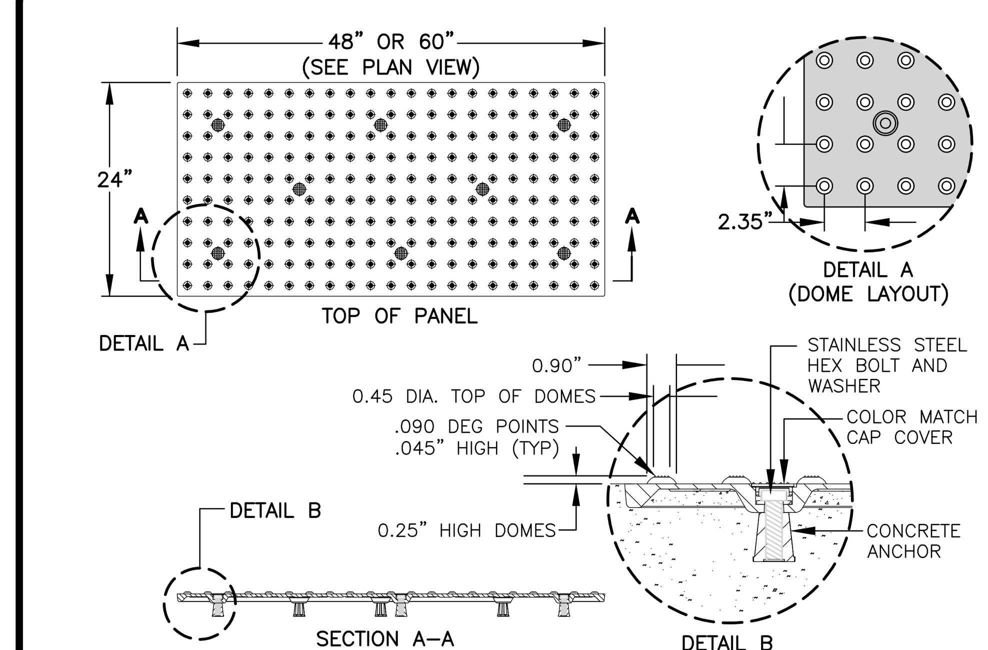




SECTION A-A

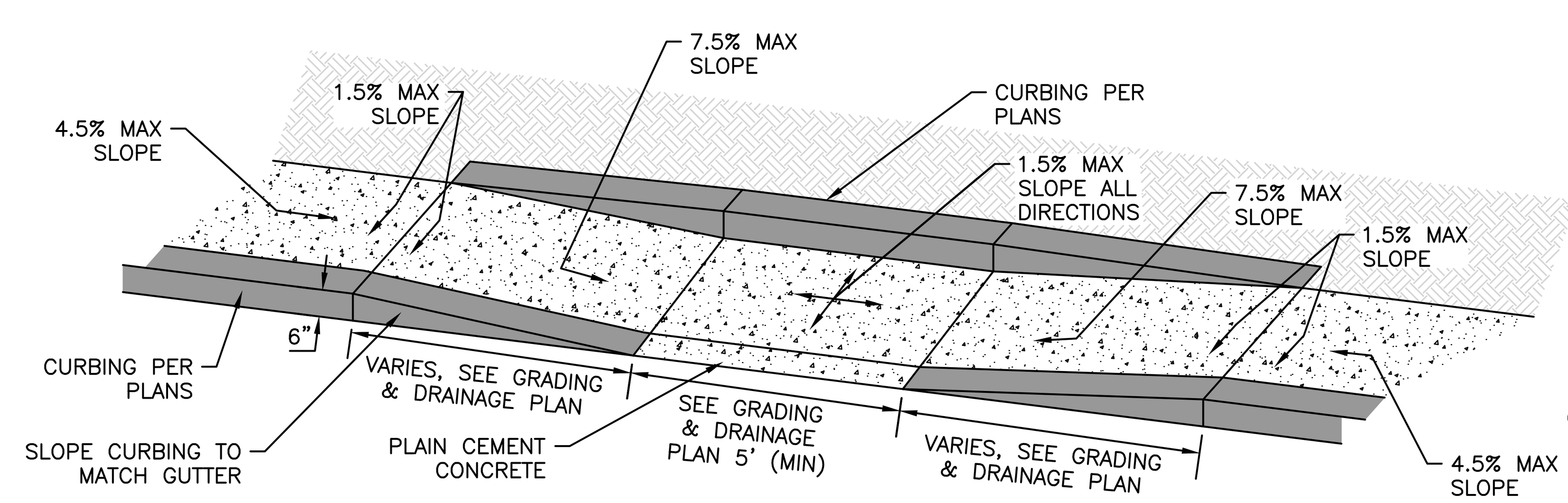
NOTES:
1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA OR SOURCE OF SEDIMENT AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. THE SIDE SLOPES OF THE TRAP SHALL BE 3:1 OR FLATTER, AND SHALL BE STABILIZED IMMEDIATELY AFTER THEIR CONSTRUCTION.
5. THE OUTLET OF THE TRAP SHALL BE A MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP AND SHALL DISCHARGE TO A STABILIZED AREA.
6. THE TRAP SHALL BE CLEANED WHEN 50% OF THE ORIGINAL VOLUME IS FILLED.
7. THE MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AN STABILIZED.

TEMPORARY EARTH OUTLET SEDIMENT TRAP (6)
NOT TO SCALE

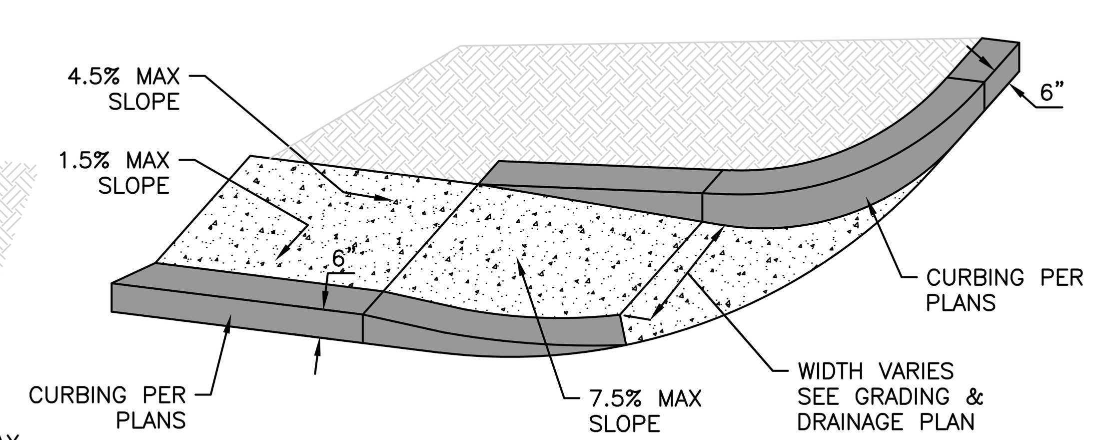


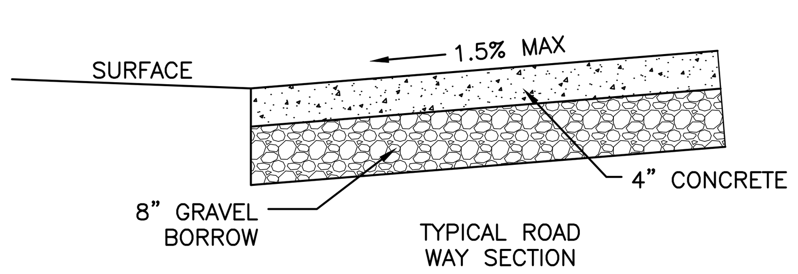
NOTES:
1. VENDOR INFORMATION: "ADATILE" WET SET ADA REPLACEABLE TACTILE (OR APPROVED EQUAL) AS MANUFACTURED BY ADATILE, PHONE: 1-800-372-0519, WWW.ADATILE.COM, EMAIL: INFO@ADATILE.COM
2. COLOR SHALL BE YELLOW.
3. INSTALL PER MANUFACTURER'S INSTALLATION GUIDELINES.

WET SET ADA REPLACEABLE TACTILE PANEL (7)
NOT TO SCALE



SECTION VIEW

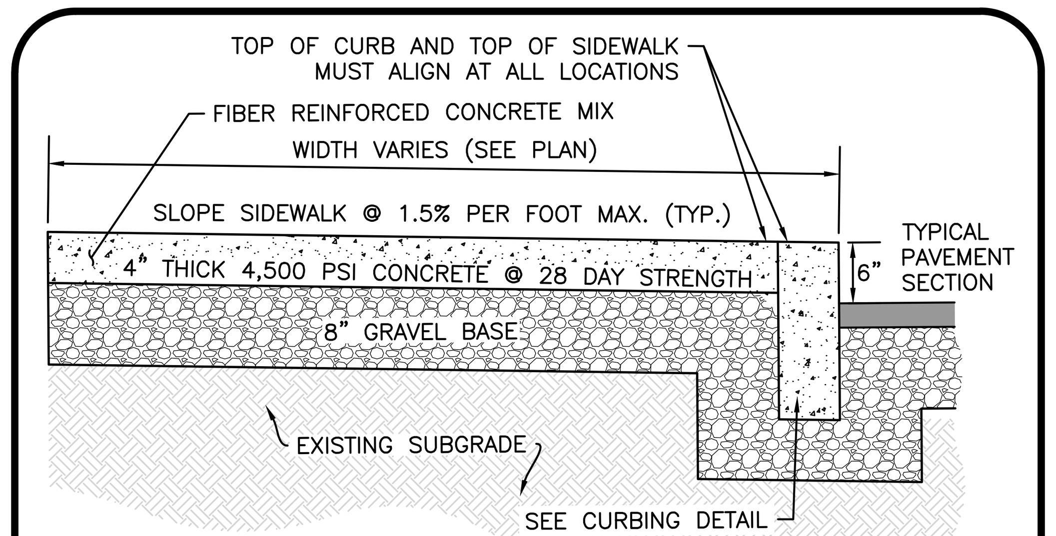




TYPICAL ROAD WAY SECTION

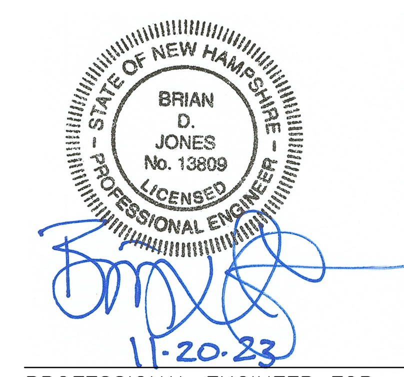
NOTES:
1. THE DIMENSIONS SHOWN AT ROADWAY EDGE ARE FIXED DISTANCES.
2. RAMP CROSS SECTION TO BE THE SAME AS ADJACENT SIDEWALK; I.E. DEPTH OF SURFACE AND FOUNDATION.
3. PORTLAND CEMENT CONCRETE RAMPS ARE TO BE TEXTURED BY BROOMING IN A DIRECTION PARALLEL TO THE LENGTH OF THE RAMP.
4. IN NO CASE ARE THE RAMPS TO BE PLACED BEHIND THE STOP LINE.
5. THE DIMENSIONS ARE SUBJECT TO CHANGE IN THE FIELD IF EXISTING APPURTENANCES OR CONDITIONS WILL MAKE THE RAMP LOCATIONS IMPRACTICAL OR UNSAFE. CONSULT CIVIL ENGINEER PRIOR TO MAKING ANY MODIFICATIONS.

ADA ACCESSIBLE CURB CUT AND TRANSITION (8)
NOT TO SCALE



NOTES:
1. SIDEWALK TO HAVE TOOLED JOINTS IN A 5' x 5' (TYP.) GRID WITH EXPANSION JOINTS 15' ON CENTER AND PREMOLDED FILLER
2. TOOLED JOINT 6" FROM FACE OF CURB
3. SEE PLAN FOR ELEVATIONS AT CURB
4. SIDEWALK CROSS SLOPE TO BE 1.5% MAX & SIDEWALK LONGITUDINAL SLOPE TO BE 4.5% MAX, TYP.
5. ALL SIDEWALKS SHALL BE PORTLAND CEMENT CONCRETE, PER PDA REQUIREMENTS.

CONCRETE SIDEWALK WITH CURB (9)
NOT TO SCALE



PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
2	10-20-23	REVISED PER TAC COMMENTS
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	AS SHOWN	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:
ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:	SHEET No.
DETAILS	C-501

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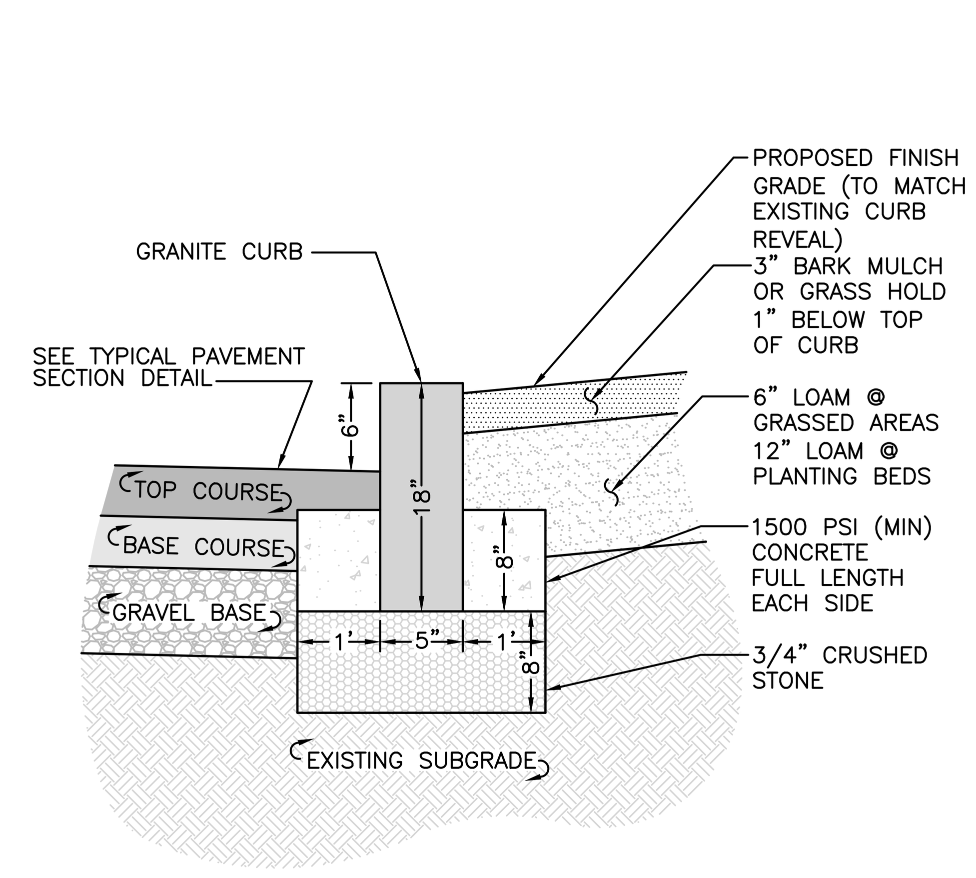
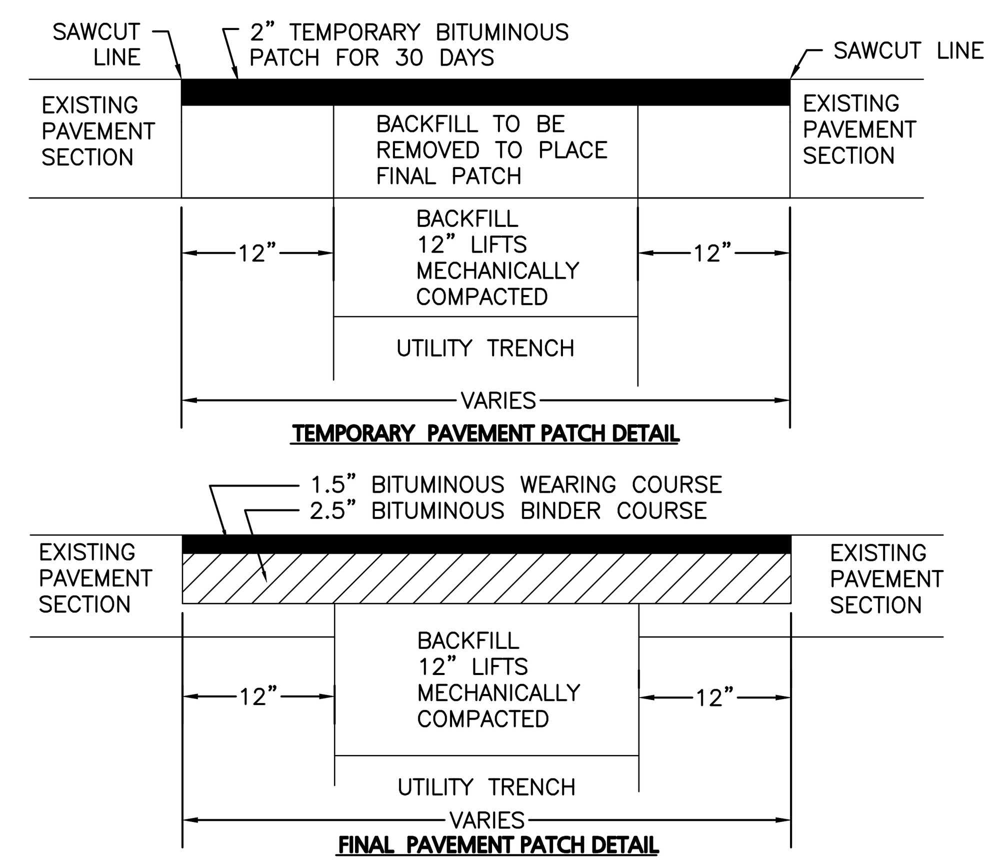
1 VERTICAL GRANITE CURB



VERTICAL GRANITE CURB
NOT TO SCALE

2 PAVEMENT TRENCH PATCH



PAVEMENT TRENCH PATCH
NOT TO SCALE

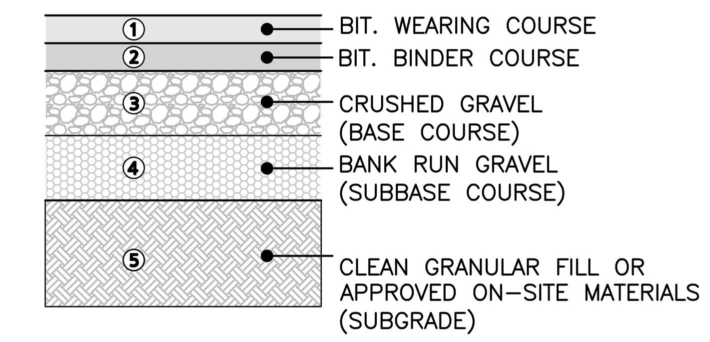
3 PAVEMENT SECTIONS

STANDARD DUTY FLEXIBLE PAVEMENT DESIGN SECTION

LAYER NUMBER	LAYER DESCRIPTION	LAYER THICKNESS (INCHES)
1	BITUMINOUS WEARING COURSE (½" AGGREGATE – NHDOT PRE-APPROVED MIX DESIGN)	1.5"
2	BITUMINOUS BINDER COURSE (¾" AGGREGATE – NHDOT PRE-APPROVED MIX DESIGN)	1.5"
3	CRUSHED GRAVEL (BASE COURSE) (NHDOT ITEM 304.3)	6.0"
4	GRAVEL BORROW (SUBBASE COURSE) (NHDOT ITEM 304.2)	12"
5	CLEAN GRANULAR FILL MATERIAL OR APPROVED ON-SITE MATERIALS (SUBGRADE)	AS NECESSARY

NHDOT GRADATION SPECIFICATION

SIEVE SIZE	PERCENT PASSING BY WEIGHT: CLEAN GRANULAR FILL	BASE COURSE	SELECT GRANULAR FILL
8"	100	100	100
3"	70–100	100	70–100
¾"	40–100	40–80	40–90
No. 4	25–100	30–70	25–80
No. 10	15–95	20–60	15–70
No. 40	10–70	10–30	5–40
No. 200	0–15	3–10	0–12

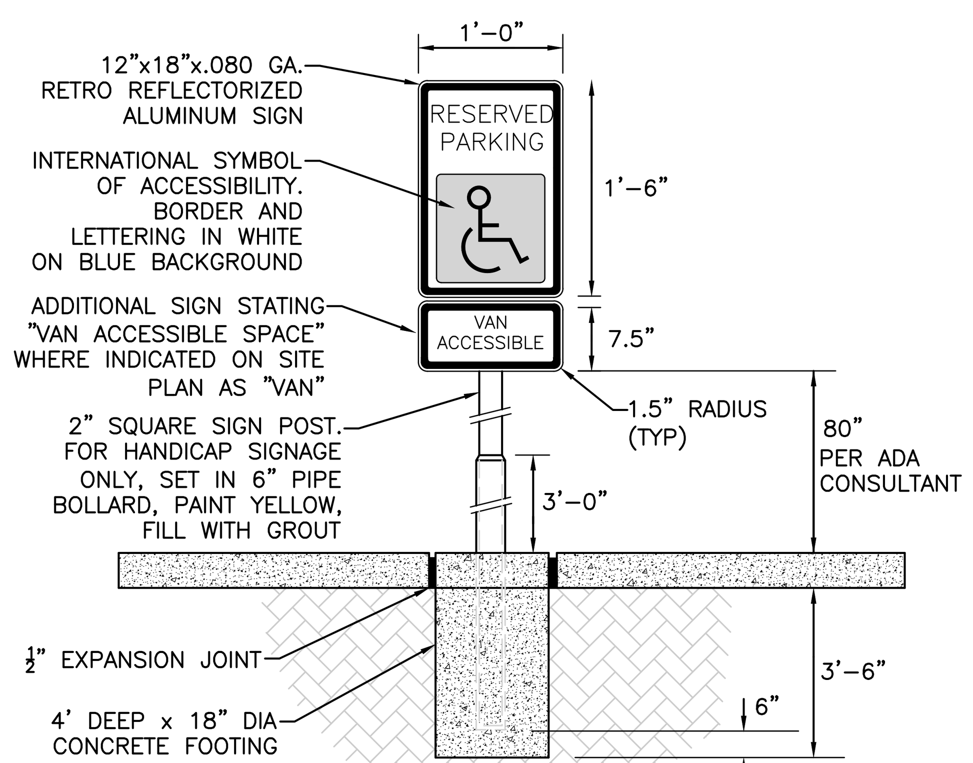


NOTES:
IF A GEOTECHNICAL REPORT IS PREPARED THE RECOMMENDATIONS WITHIN THAT REPORT SHALL SUPERCEDE RECOMMENDATIONS HEREIN. THE CONTRACTOR SHALL HAVE AND REVIEW A COPY OF THE GEOTECHNICAL REPORT AND COMPLY WITH THE RECOMMENDATIONS THEREIN.

1. TOPSOIL SHALL BE REMOVED BENEATH ALL PAVEMENT AREAS TO EXPOSE THE NATURALLY-OCCURRING SOILS OR ACCEPTABLE ON-SITE FILL MATERIALS.
2. THE SUBGRADE SHOULD BE PROOFROLLED UNDER THE SUPERVISION OF A GEOTECHNICAL ENGINEER USING AT LEAST 4 PASSES OF A 10-TON VIBRATORY ROLLER. AREAS OF THE SUBGRADE THAT "WEAVE" OR "ROLL" EXCESSIVELY SHOULD BE OVEREXCAVATED AND REPLACED WITH DRIER CLEAN GRANULAR FILL MATERIAL.
3. THE PAVEMENT SUBGRADE CONSISTING OF THE SPECIFIED CLEAN GRANULAR FILL SHALL BE PLACED IN 12" MAXIMUM LIFTS AND COMPACTED TO A DRY DENSITY OF AT LEAST 95 PERCENT OF THE MATERIALS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM DESIGNATION D-1557.
4. PAVEMENT AND GRAVEL SPECIFICATIONS WITHIN THE CITY RIGHT-OF-WAY ARE TO BE DESIGNATED BY THE CITY'S DESIGN CONSULTANT FOR THE ROUNDABOUT PROJECT.

PAVEMENT SECTIONS
NOT TO SCALE

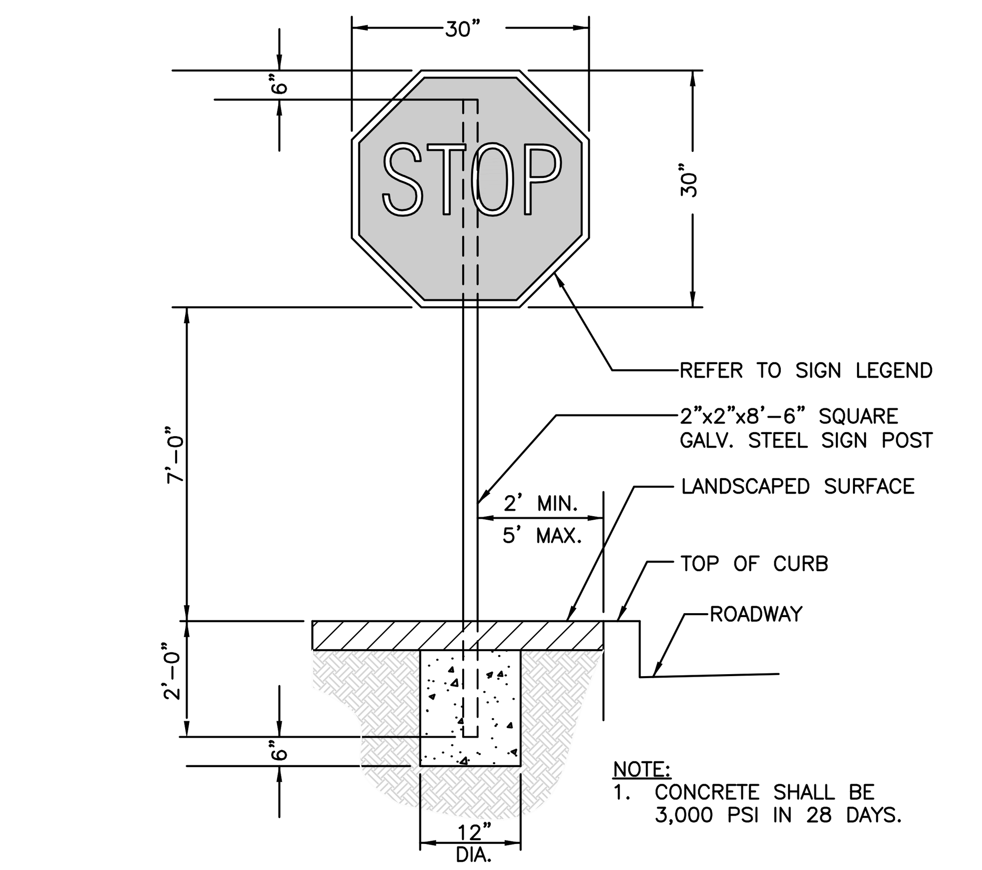
4 ACCESSIBLE PARKING SIGN POST



NOTES:
1. SPECIFIC CODE SHALL BE REFERENCED FOR LOCAL AND STATE REQUIREMENTS.
2. PROVIDE (1) SIGN PER HANDICAP SPACE. SEE SITE PLAN FOR EXACT LOCATION.
3. EXPANSION JOINT MATERIAL NOT REQUIRED WITH FLEXIBLE PAVEMENT.

ACCESSIBLE PARKING SIGN POST
NOT TO SCALE

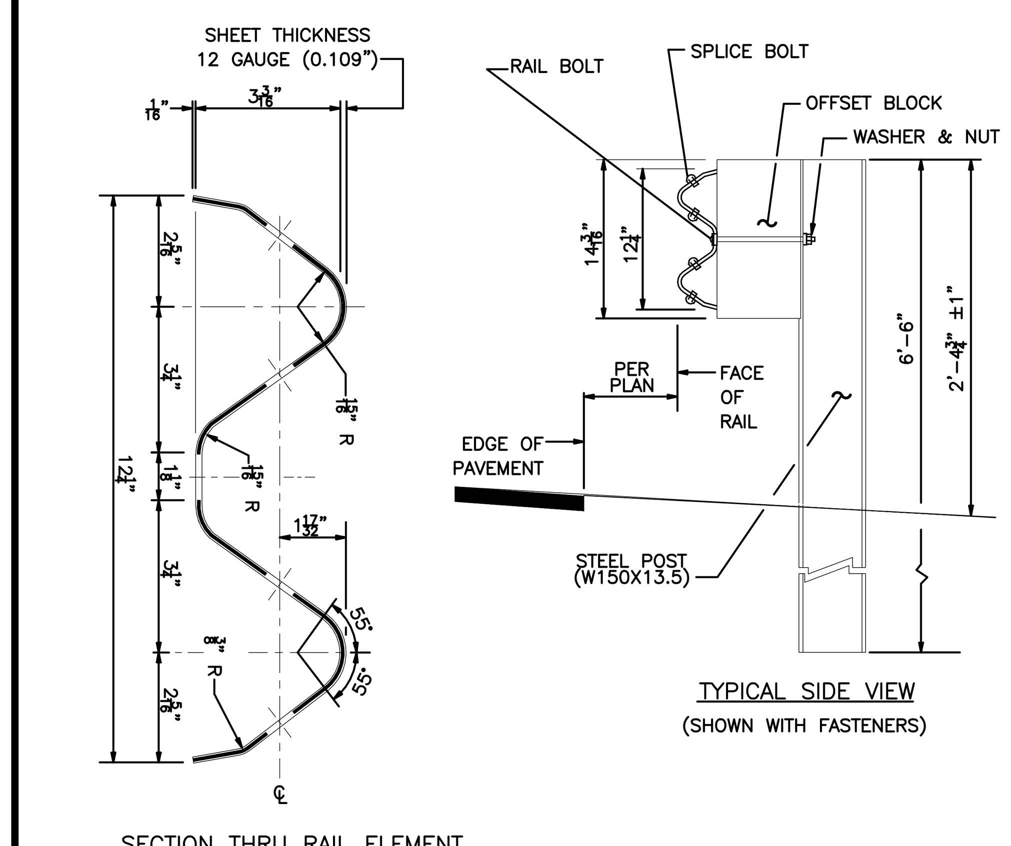
5 STOP SIGN POST



NOTE:
1. CONCRETE SHALL BE 3,000 PSI IN 28 DAYS.

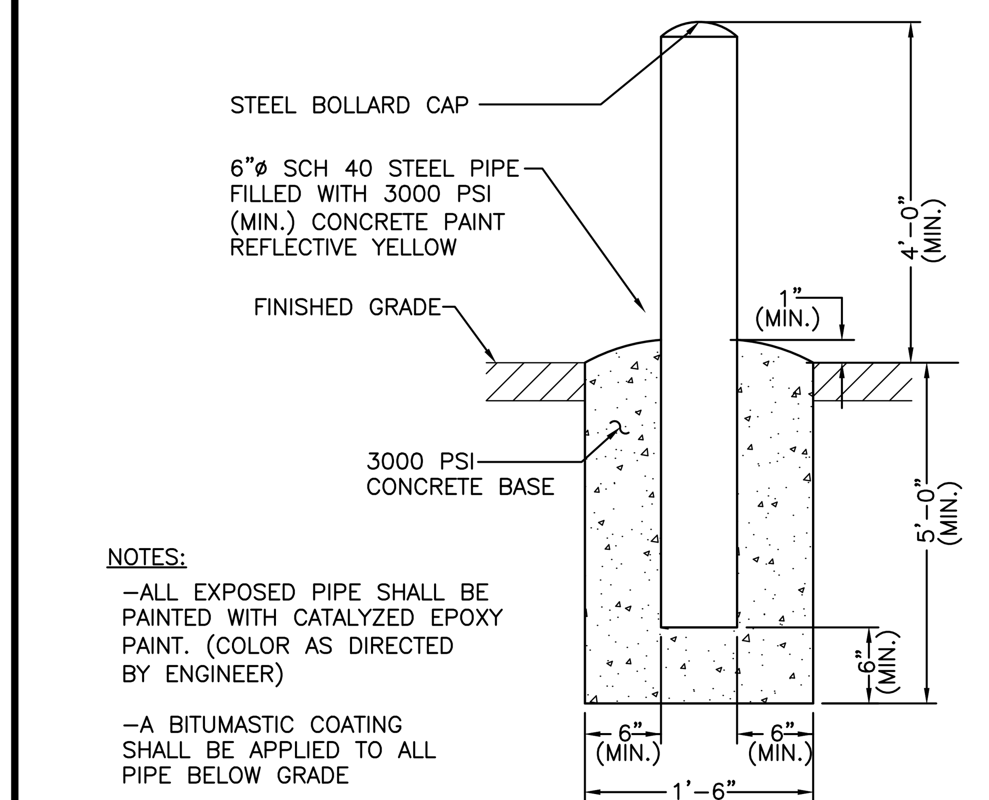
STOP SIGN POST
NOT TO SCALE

6 STEEL GUARDRAIL



STEEL GUARDRAIL
NOT TO SCALE

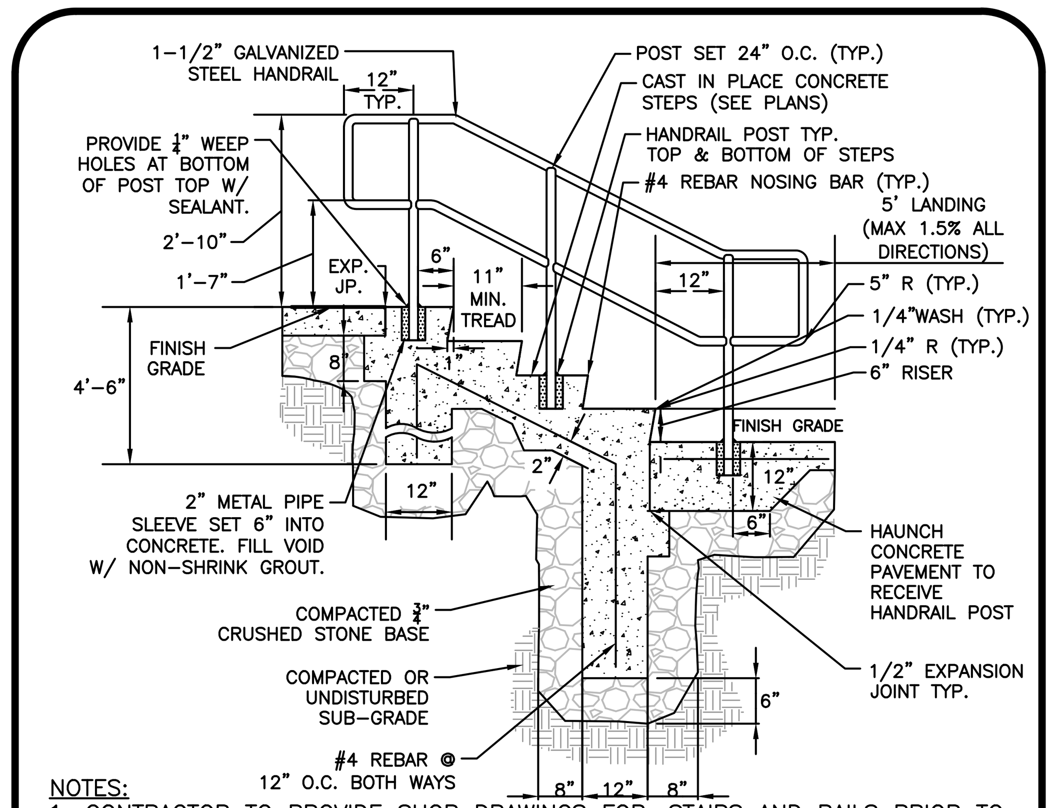
7 FIXED PIPE BOLLARD



NOTES:
–ALL EXPOSED PIPE SHALL BE PAINTED WITH CATALYZED EPOXY PAINT. (COLOR AS DIRECTED BY ENGINEER)
–A BITUMASTIC COATING SHALL BE APPLIED TO ALL PIPE BELOW GRADE

FIXED PIPE BOLLARD
NOT TO SCALE

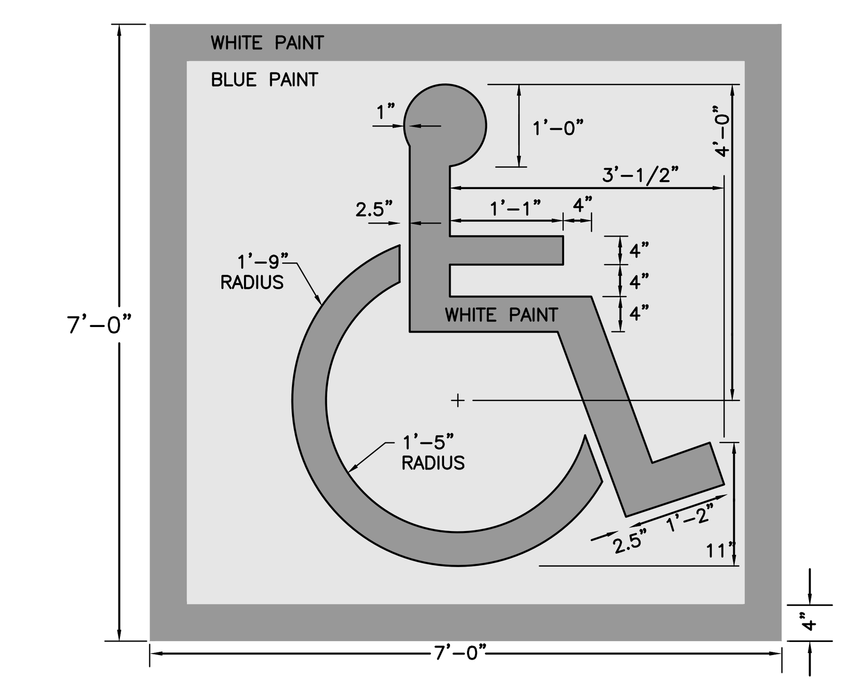
8 CONCRETE STAIRS WITH HANDRAILS



NOTES:
1. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR: STAIRS AND RAILS PRIOR TO FABRICATION OF HANDRAILS; AND, DESIGN OF CAST-IN-PLACE WALLS REQUIRED TO RETAIN SOIL ADJACENT TO STAIRS.
2. ALL POSTS TO BE SET PLUMB AND VERTICAL. ALL RAILS SHALL FOLLOW GRADE AT BASE. 3. ALL CONSTRUCTION SHALL CONFORM TO MASS. STATE BUILDING CODE, LATEST EDITION.

CONCRETE STAIRS WITH HANDRAILS
NOT TO SCALE

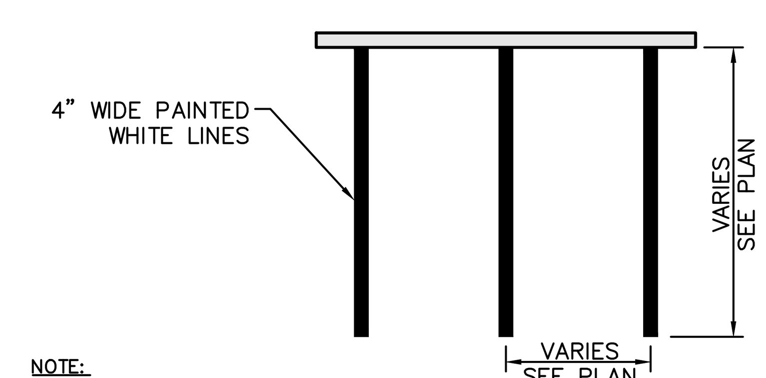
9 ACCESSIBLE PARKING STALL PAVEMENT MARKING



SYMBOL TO BE CENTERED ON WIDTH OF PARKING STALL. SYMBOL IS REQUIRED TO CONTRAST WITH BACKGROUND. USE WHITE ON BLUE (COLOR #105090 IN FEDERAL STANDARD 5952) DOUBLE COAT.

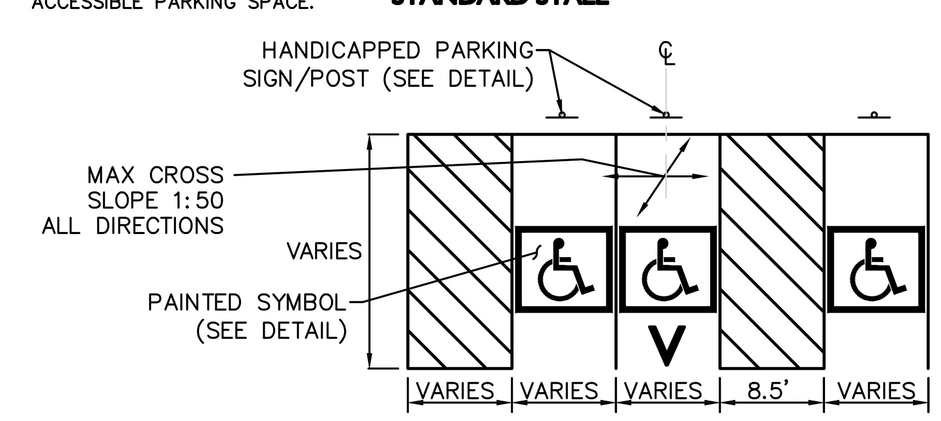
ACCESSIBLE PARKING STALL PAVEMENT MARKING
NOT TO SCALE

10 HANDICAP & STANDARD PARKING STRIPING



NOTE:
1. "V" DENOTES HANDICAPPED ACCESSIBLE PARKING SPACE.

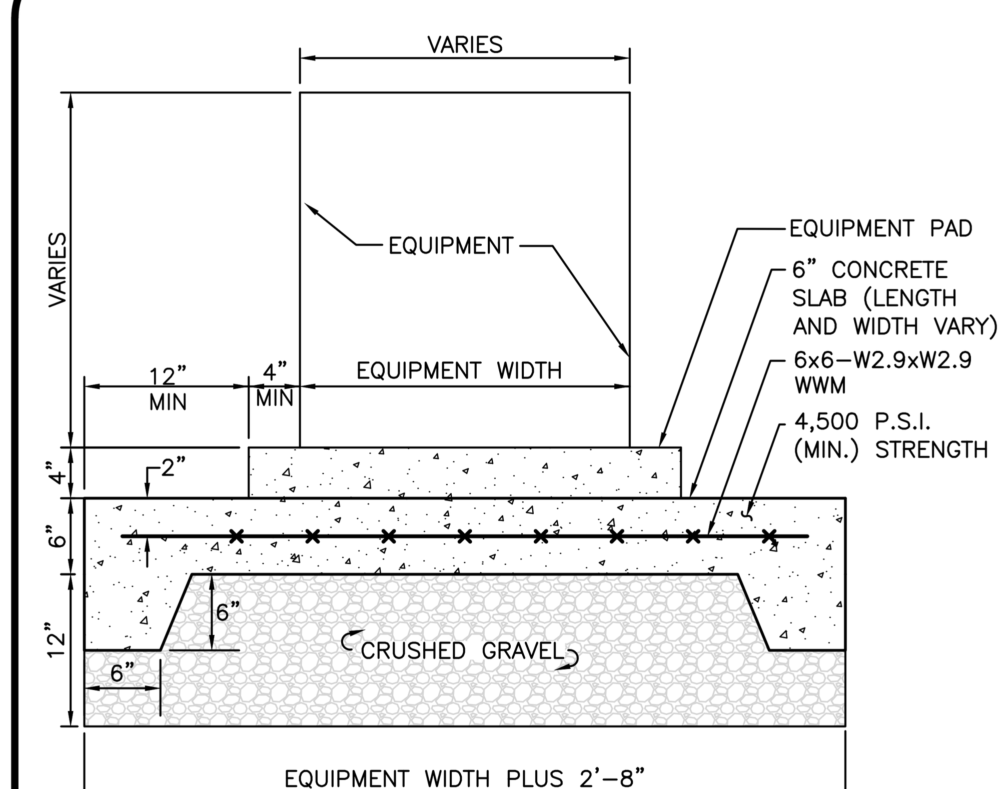
STANDARD STALL



STANDARD AND VAN ACCESSIBLE HANDICAPPED PARKING SPACE

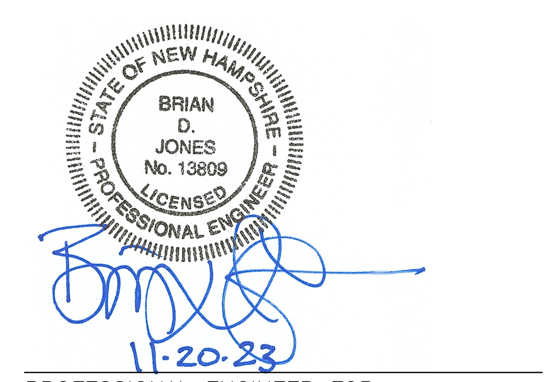
HANDICAP & STANDARD PARKING STRIPING
NOT TO SCALE

11 TYPICAL UTILITY PAD



NOTE:
REFERENCE MECHANICAL ENGINEER'S PLANS FOR ANY PIPE, CONDUIT AND GROUND WIRE LOCATIONS

TYPICAL UTILITY PAD
NOT TO SCALE



PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
2	10-20-23	REVISED PER TAC COMMENTS
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

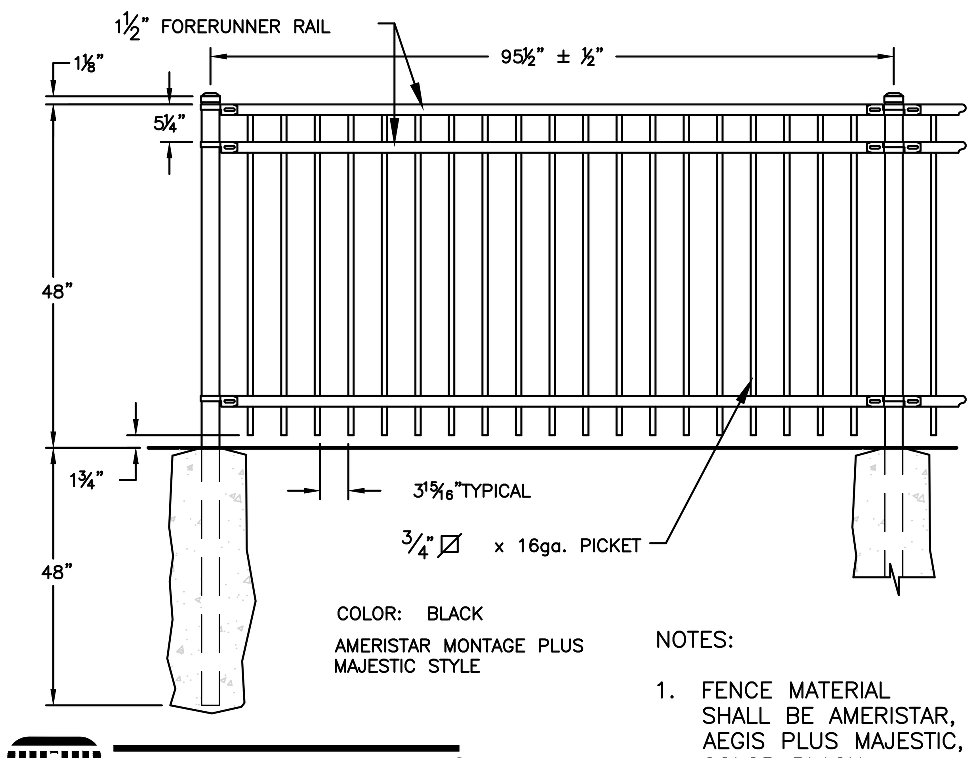
PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	AS SHOWN	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ♦ land surveying
environmental consulting ♦ landscape architecture
www.allenmajor.com
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501
WOBURN, MA ♦ LAKEVILLE, MA ♦ MANCHESTER, NH

DRAWING TITLE: DETAILS
SHEET No. C-502

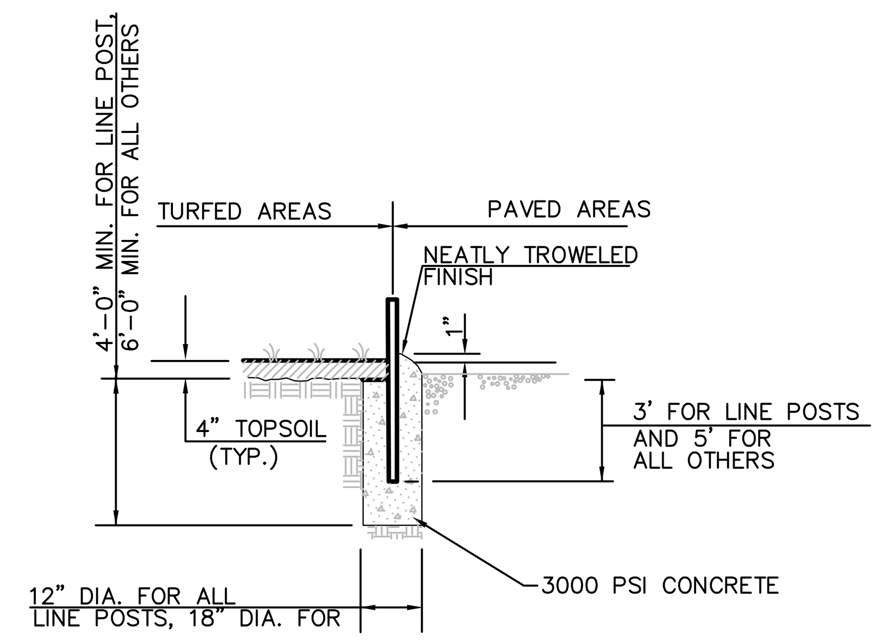


NOTES:

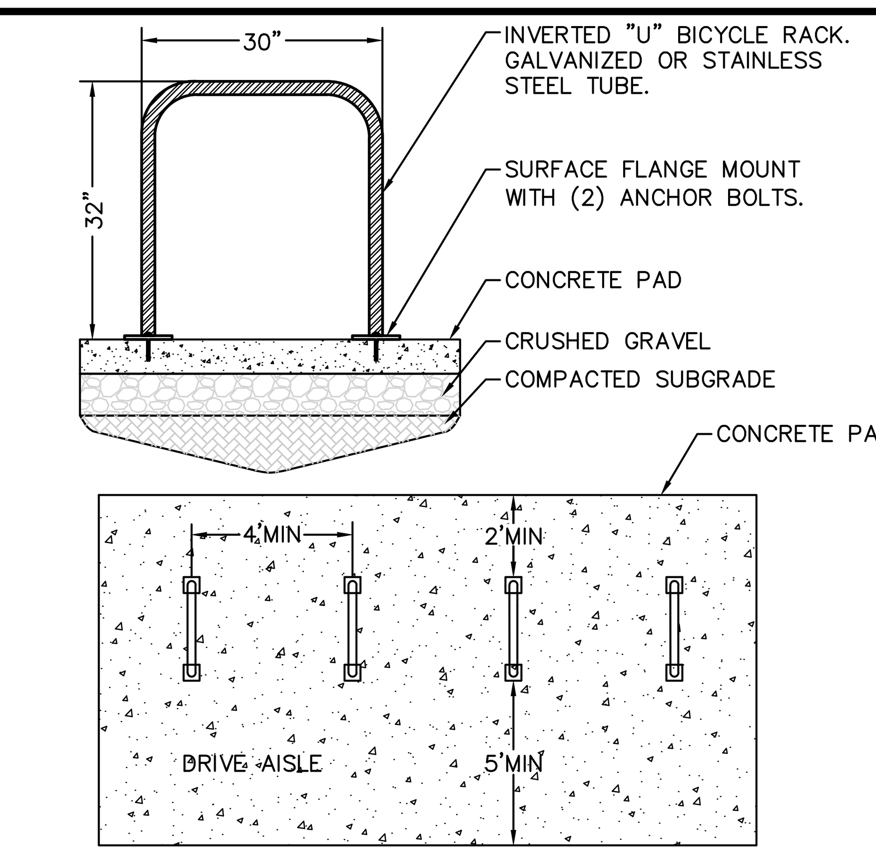
1. FENCE MATERIAL SHALL BE AMERISTAR, AEGIS PLUS MAJESTIC, COLOR BLACK.
2. POST SIZE SHALL BE PER AEGIS PLUS SIZING CHART

AMERISTAR®
1555 N. Mingo
Tulsa, OK 74116
1-888-333-3422

48" HIGH DECORATIVE STEEL FENCE (1)
NOT TO SCALE

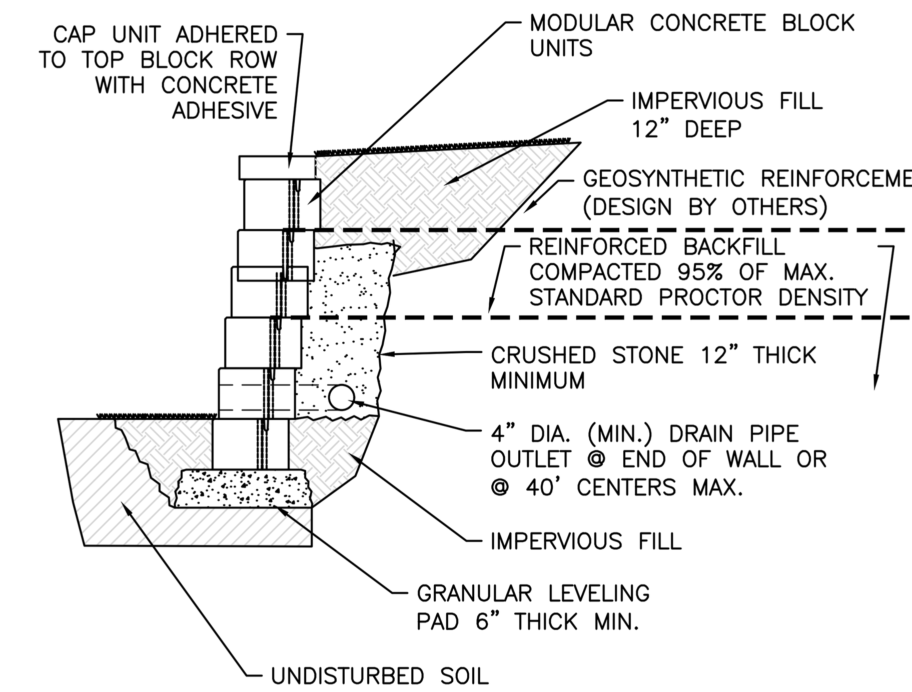


POST SETTING DETAIL (2)
NOT TO SCALE



NOTE: BIKE RACKS TO BE FROM GROUND CONTROL SYSTEMS: HOOP RUNNER™ –INVERTED U SURFACE MOUNTED BIKE PARKING RACKS. SURFACE MOUNT PER MANUFACTURER'S RECOMMENDATIONS. FINISH SELECTED BY OWNER. PROVIDE SHOP DRAWINGS FOR APPROVAL PRIOR TO ORDERING.

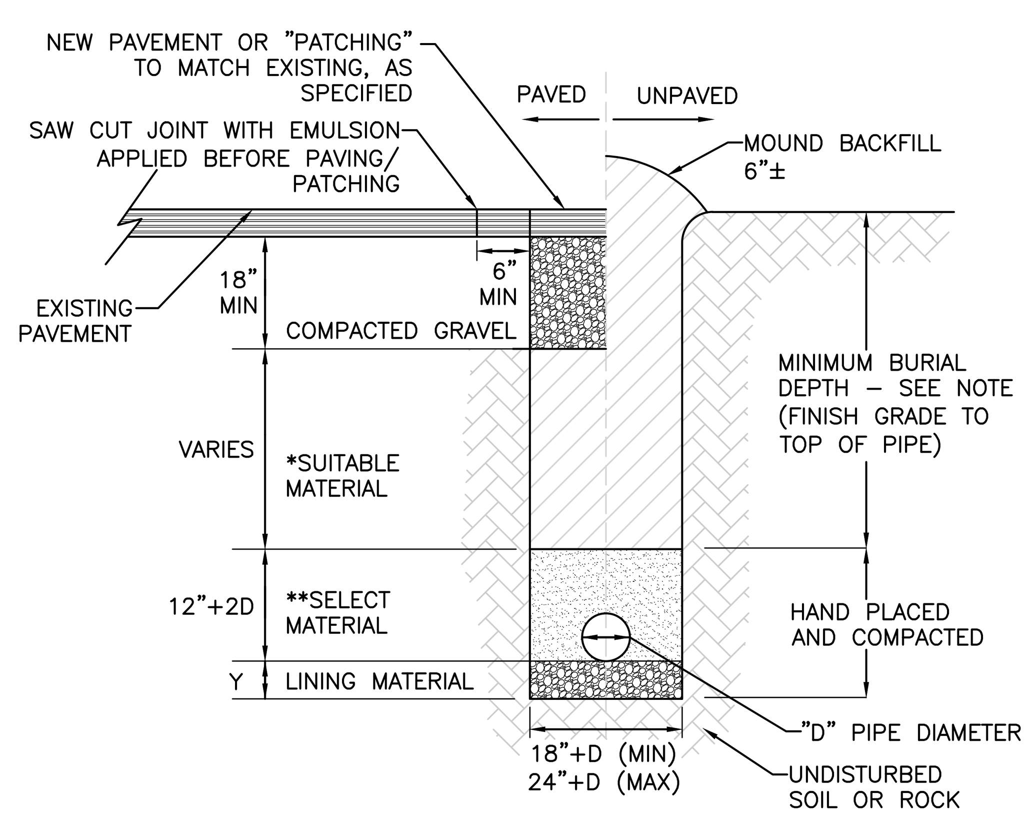
BICYCLE RACK DETAIL (3)
NOT TO SCALE



NOTES:

1. THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE STRUCTURAL DESIGN OF THE MODULAR BLOCK RETAINING WALLS.
2. WALLS THREE FEET OR GREATER IN HEIGHT SHALL BE DESIGNED BY A NEW HAMPSHIRE REGISTERED PROFESSIONAL STRUCTURAL ENGINEER.
3. WALL DESIGNS AND CALCULATIONS SHALL BE PROVIDED TO THE PROJECT GEOTECHNICAL ENGINEER TO CONFIRM THAT GEOTECHNICAL RECOMENDATIONS HAVE BEEN PROPERLY INCLUDED.
4. WALL DESIGNS AND CALCULATIONS SHALL BE PROVIDED TO THE PROJECT CIVIL ENGINEER TO CONFIRM ELEVATIONS AND ALIGNMENT HAVE BEEN PROPERLY INCLUDED.
5. SMALL BLOCK UNITS SHALL BE THE SQUARE FOOT PRODUCT BY VERSA-LOK OR APPROVED EQUAL.
6. WALL HEIGHT WITHOUT REINFORCEMENT SHALL BE LIMITED TO 3' EXPOSED FACE.
7. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

TYPICAL "SMALL BLOCK" RETAINING WALL (5)
NOT TO SCALE



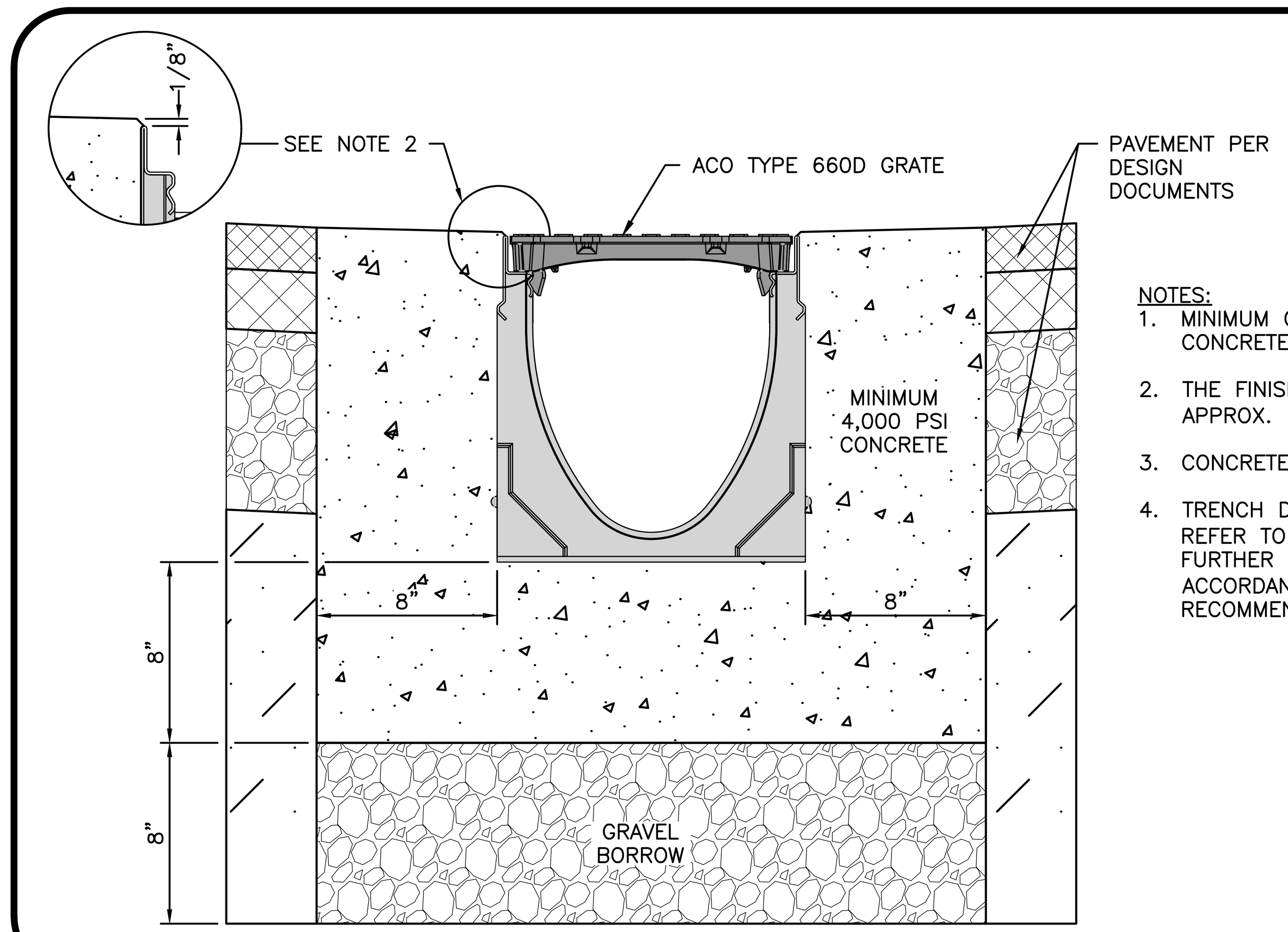
CONDITION & PIPE	**SELECT MATERIAL	LINING MATERIAL	Y-DIMENSION
DUCTILE IRON "ORDINARY SOIL"	TYPE I, II, OR III	SAND OR TYPE III	3"
RCP "ORDINARY SOIL"	TYPE II OR III	SAND OR TYPE III	3"
ALL PIPE OVER BEDROCK OR LEDGE	TYPE II OR III	SAND OR TYPE III	8"
DUCTILE IRON IN CLAY OR MUCK	TYPE II OR III	SAND	4"
RCP IN CLAY	TYPE II OR III	SAND	8"
ALL PLASTICS	TYPE III	SAND OR TYPE III	6"

* SUITABLE MATERIAL SHALL CONTAIN NO STONE GREATER THAN 4" IN DIAMETER, NO FROZEN LUMPS, AND ONLY MINOR AMOUNTS OF CLAY OR ORGANIC MATERIAL. ALL MATERIAL TO BE PLACED IN MAX 6" LIFTS AND COMPACTED BEFORE PLACING NEXT LIFT.
**TYPE I MATERIAL SHALL BE EITHER GRAVEL OR EXCAVATED MATERIAL CONTAINING NO STONES GREATER THAN 1.5" DIAMETER, NO FROZEN LUMPS, CLAY OR ORGANIC MATERIAL.
**TYPE II MATERIAL SHALL BE CLEAN, HARD, CRUSHED OR NATURAL STONE WITH A GRADATION BY WEIGHT OF 100% PASSING A 1.5" SQUARE OPENING, NOT MORE THAN 25% PASSING A ¾" OPENING, AND NOT MORE THAN 5% PASSING A ¼" SQUARE OPENING.
**TYPE III MATERIAL SHALL BE CLEAN, HARD, CRUSHED STONE FREE FROM COATINGS AND THOROUGHLY WASHED WITH A GRADATION BY WEIGHT OF 100% PASSING A 1" SQUARE OPENING, AND 0 TO 5% PASSING A ¼" SQUARE OPENING.

NOTES:

1. MINIMUM BURIAL DEPTH (FINISH GRADE TO TOP OF PIPE)
   GRAVITY PIPE – SEE PLAN OR PROFILE
   PRESSURE PIPE UNDER PAVING – 4'
   PRESSURE PIPE BENEATH UNPAVED – 3'
2. WHERE BACKFILL IS DESIGNATED AS COMPACTED, THIS MEANS 90 TO 95% STANDARD PROCTOR. AASHTO T-99. ALL FILL PLACED BELOW PIPES AND STRUCTURES MUST MEET THIS REQUIREMENT.
3. FOR ALL TRENCHES WITH A GRADE GREATER THAN 4% AND/OR WHERE GROUNDWATER IS APPARENT, INSTALL CLAY DAMS AROUND THE PIPE AT 100' INTERVALS.
4. BACKFILL AS PER DCED-R100 AND REFERENCED AS STANDARD DRAWING.

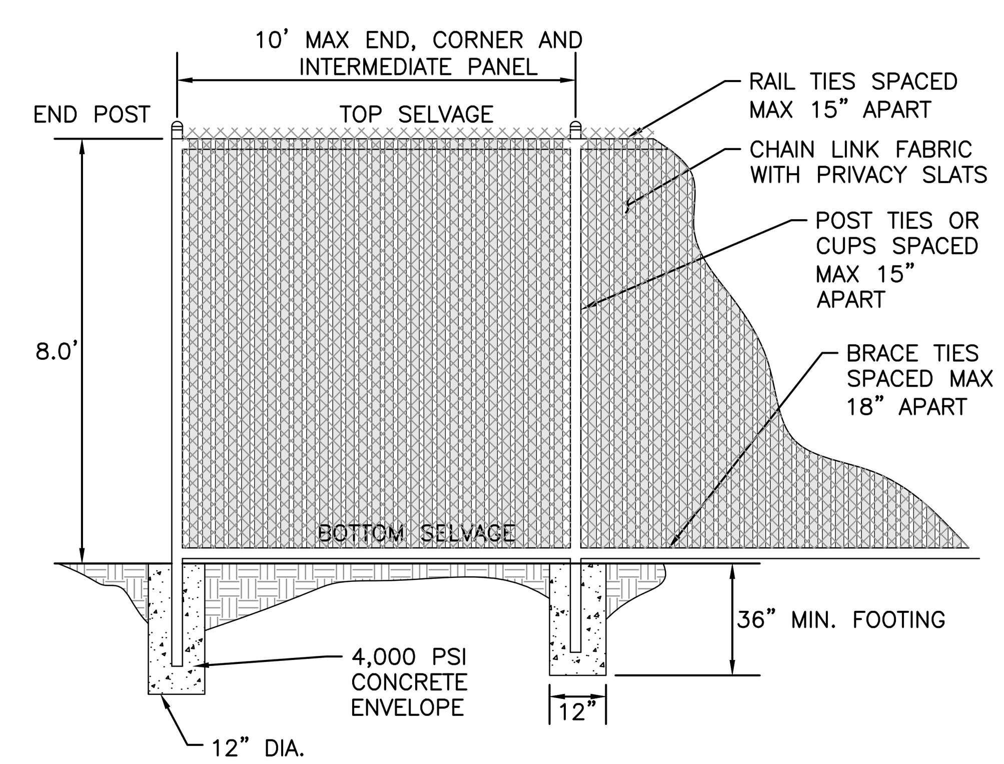
TRENCH DETAIL (4)
NOT TO SCALE



NOTES:

1. MINIMUM CONCRETE STRENGTH OF 4,000 PSI IS RECOMMENDED. CONCRETE SHOULD BE VIBRATED TO ELIMINATE AIR POCKETS.
2. THE FINISHED LEVEL OF THE CONCRETE SURROUND MUST BE APPROX. 1/8" ABOVE THE TOP OF THE CHANNEL EDGE.
3. CONCRETE BASE THICKNESS SHOULD MATCH SLAB THICKNESS.
4. TRENCH DRAIN SHALL BE K200 BY ACO, OR APPROVED EQUAL. REFER TO ACO'S LATEST INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS. TRENCH DRAIN SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURE'S SPECIFICATIONS AND RECOMMENDATIONS.

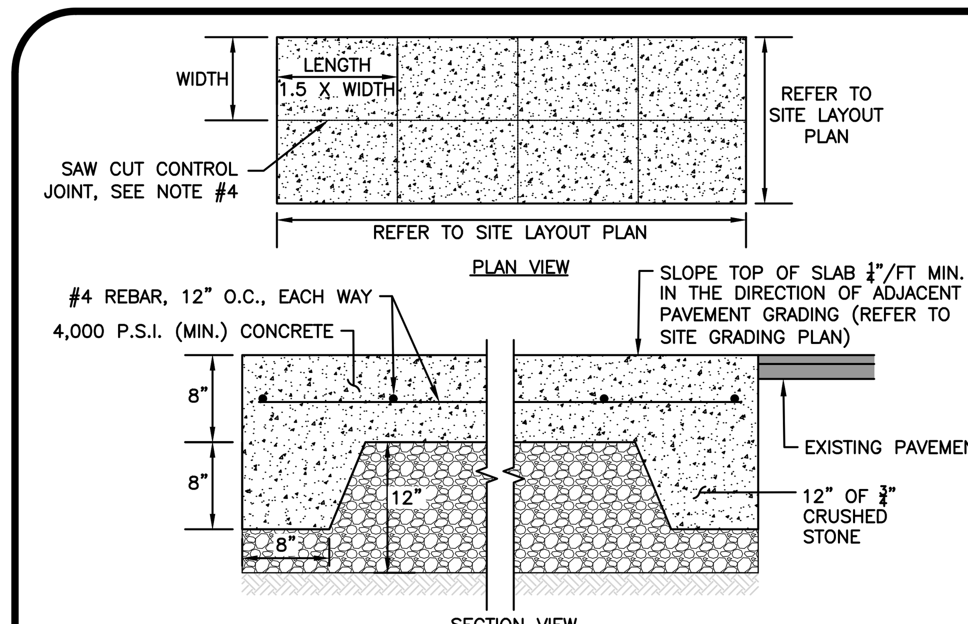
TRENCH DRAIN (6)
NOT TO SCALE



NOTES:

1. ALL INTERMEDIATE POSTS TO BE MECHANICALLY DRIVEN INTO THE GROUND.
2. COLOR OF PRIVACY SLATS TO BE APPROVED BY OWNER.

8'-HIGH CHAIN LINK FENCE FOR DUMPSTER ENCLOSURE (7)
NOT TO SCALE



NOTES:

1. PROVIDE NON-SLIP BROOM FINISH TO TOP SURFACE.
2. ALL CONCRETE SHALL BE PROPORTIONED, MIXED AND PLACED CONFORMING TO CURRENT AMERICAN CONCRETE INSTITUTE (ACI) 301, 304, AND 308 STANDARDS. THE FOLLOWING MIX DESIGNS SHALL BE SUBMITTED FOR REVIEW:
   EXTERIOR CONCRETE
   28-DAY STRENGTH (MIN): 4,000 PSI
   COARSE AGGREGATE (MAX): 3/4"
   WATER CEMENT RATIO (W/C): 0.45
   AIR ENTRAINMENT: 6% (±1%)
   SLUMP: 3.5" (±1")
3. REINFORCING STEEL SHALL BE NEW BILLET STEEL IN ACCORDANCE WITH ASTM A615, GRADE 60. ALL DETAILS SHALL BE IN ACCORDANCE WITH ACI DETAIL STANDARD ACI 315.
4. CONTROL JOINTS SHALL BE SAW CUT TO A DEPTH OF 1.0" AT A RATIO NOT TO EXCEED 1.5:1.0 LENGTH TO WIDTH, SEE PLAN VIEW ABOVE.

HEAVY DUTY CONCRETE PAD (8)
NOT TO SCALE

STATE OF NEW HAMPSHIRE
BRIAN D. JONES
No. 13809
LICENSED PROFESSIONAL ENGINEER
11-20-23

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
3	10-20-23	REVISED PER TAC COMMENTS
2	08-28-23	ISSUED FOR AOT PERMIT APPLICATION
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	AS SHOWN	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:
ALLEN & MAJOR ASSOCIATES, INC.
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environmental consulting ◆ landscape architecture
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DRAWING TITLE: DETAILS
SHEET No. C-503

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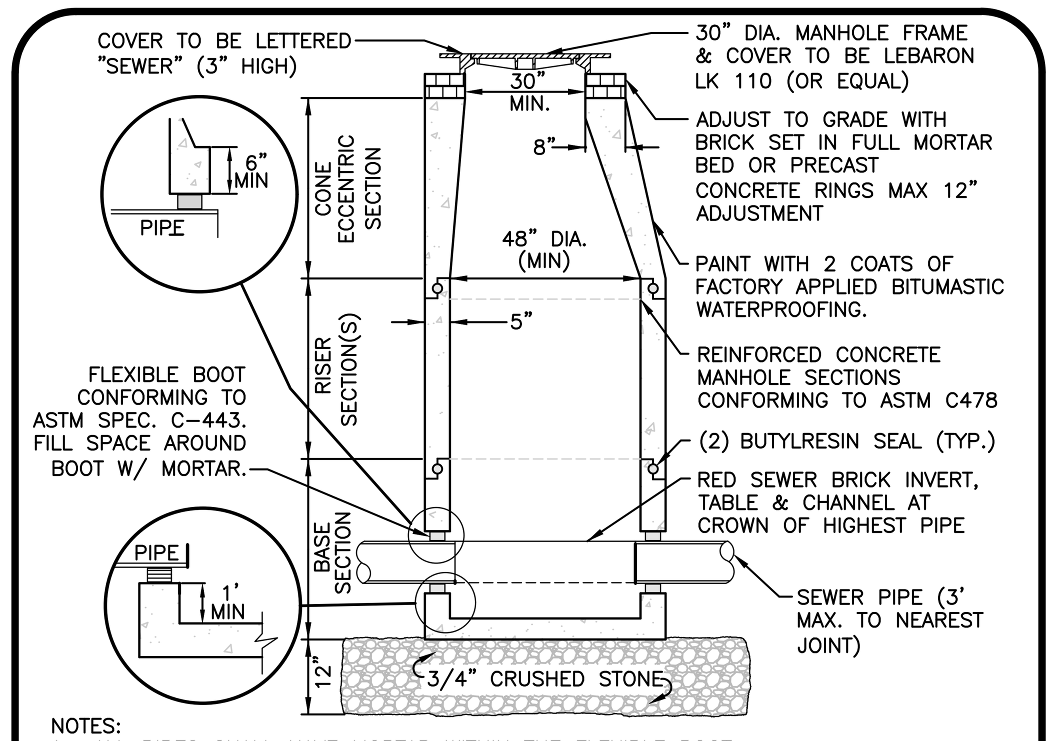
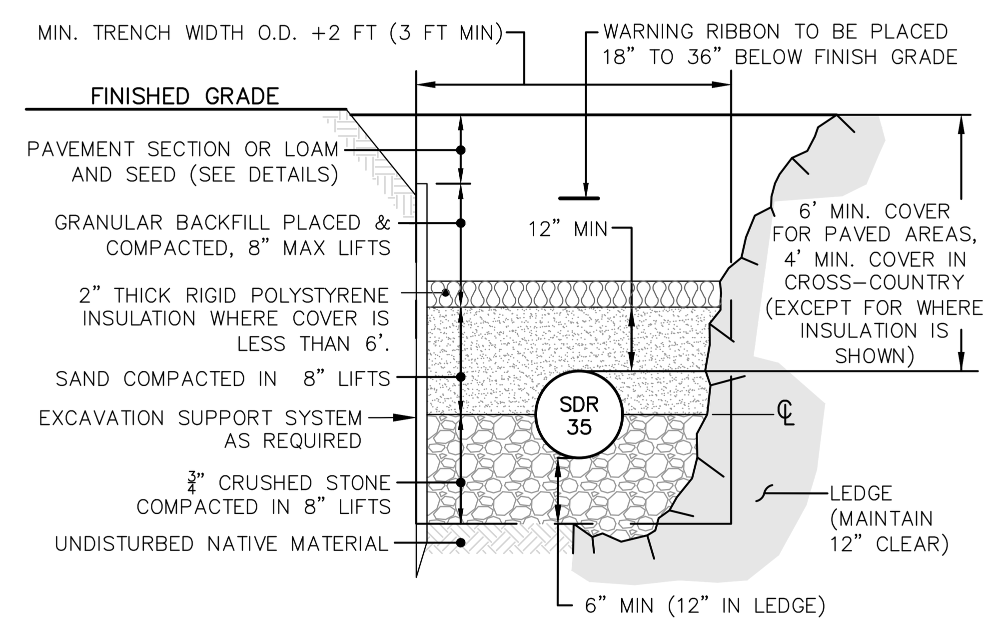


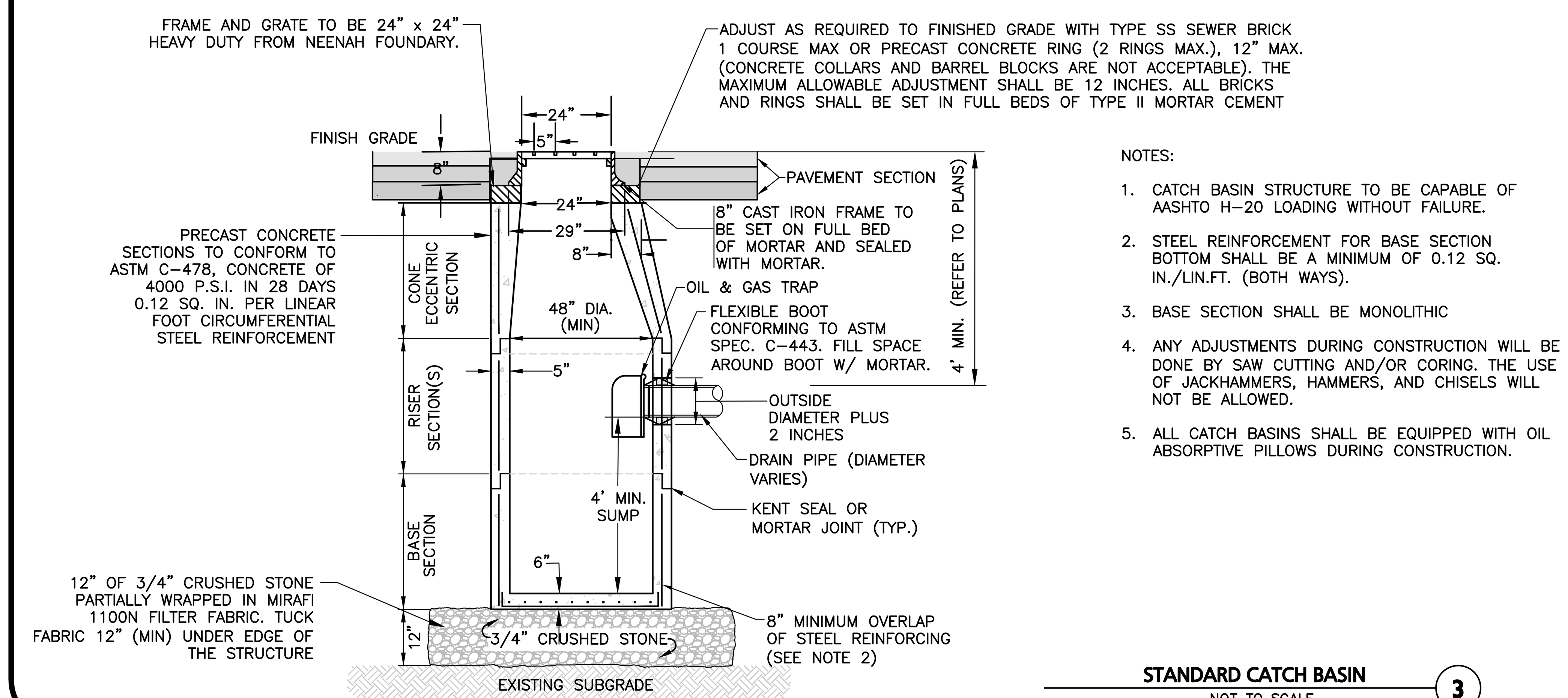
NOTES:
1. ALL PIPES SHALL HAVE MORTAR WITHIN THE FLEXIBLE BOOT.
2. TWO (2) BUTYL SEALS ARE REQUIRED AT JOINTS.
3. ALL MANHOLES SHALL BE PRESSURE TESTED PER NHDOT REGULATIONS.
4. THE MANHOLE, INCLUDING ALL COMPONENT PARTS, SHALL HAVE ADEQUATE SPACE, STRENGTH AND LEAK PROOF QUALITIES CONSIDERED NECESSARY FOR THE INTENDED SERVICE. SPACE REQUIREMENT AND CONFIGURATIONS SHALL BE AS SHOWN ON THE DRAWING. THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND (H-20 LOADING) OR WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE.

SEWER MANHOLE (1)
NOT TO SCALE



NOTES:
1. WHERE BACKFILL IS DESIGNATED AS COMPACTED, THIS MEANS 90 TO 95% STANDARD PROCTOR. AASHTO T-99. ALL FILL PLACED BELOW PIPES AND STRUCTURES MUST MEET THIS REQUIREMENT.
2. FOR ALL TRENCHES WITH A GRADE GREATER THAN 4% AND/OR WHERE GROUNDWATER IS APPARENT, INSTALL CLAY DAMS AROUND THE PIPE AT 100' INTERVALS.
3. CRUSHED STONE SHALL BE CLEAN, HARD, FREE FROM COATINGS AND THOROUGHLY WASHED WITH A GRADATION BY WEIGHT OF 100% PASSING A 1" SQUARE OPENING, AND 0 TO 5% PASSING A 1/4" SQUARE OPENING.

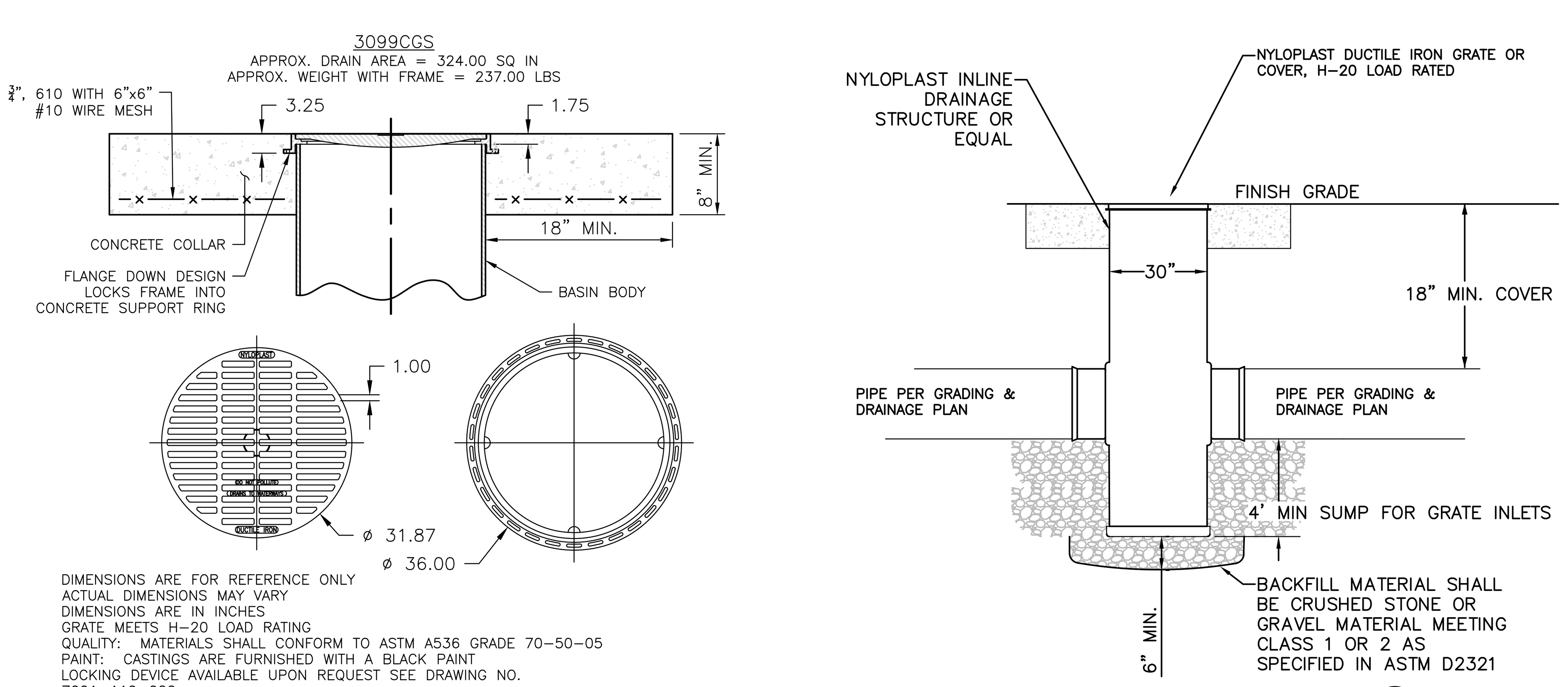
SEWER TRENCH DETAIL (2)
NOT TO SCALE



NOTES:
1. CATCH BASIN STRUCTURE TO BE CAPABLE OF AASHTO H-20 LOADING WITHOUT FAILURE.
2. STEEL REINFORCEMENT FOR BASE SECTION BOTTOM SHALL BE A MINIMUM OF 0.12 SQ. IN./LIN.FT. (BOTH WAYS).
3. BASE SECTION SHALL BE MONOLITHIC
4. ANY ADJUSTMENTS DURING CONSTRUCTION WILL BE DONE BY SAW CUTTING AND/OR CORING. THE USE OF JACKHAMMERS, HAMMERS, AND CHISELS WILL NOT BE ALLOWED.
5. ALL CATCH BASINS SHALL BE EQUIPPED WITH OIL ABSORPTIVE PILLOWS DURING CONSTRUCTION.

STANDARD CATCH BASIN (3)
NOT TO SCALE

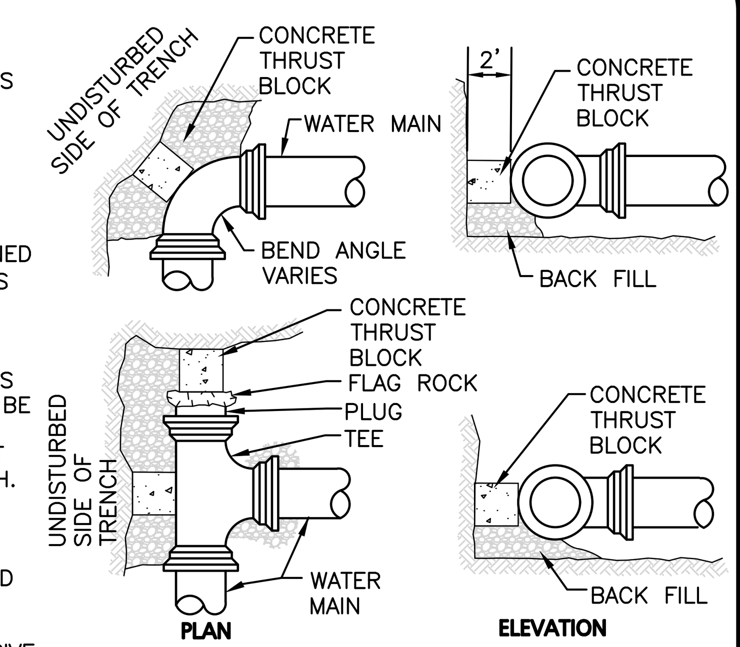
FRAMES AND SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05



DIMENSIONS ARE FOR REFERENCE ONLY
ACTUAL DIMENSIONS MAY VARY
DIMENSIONS ARE IN INCHES
GRATE MEETS H-20 LOAD RATING
QUALITY: MATERIALS SHALL CONFORM TO ASTM A536 GRADE 70-50-05
PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT
LOCKING DEVICE AVAILABLE UPON REQUEST SEE DRAWING NO. 7001-110-022

NYLOPLAST DRAIN STRUCTURE (4)
NOT TO SCALE

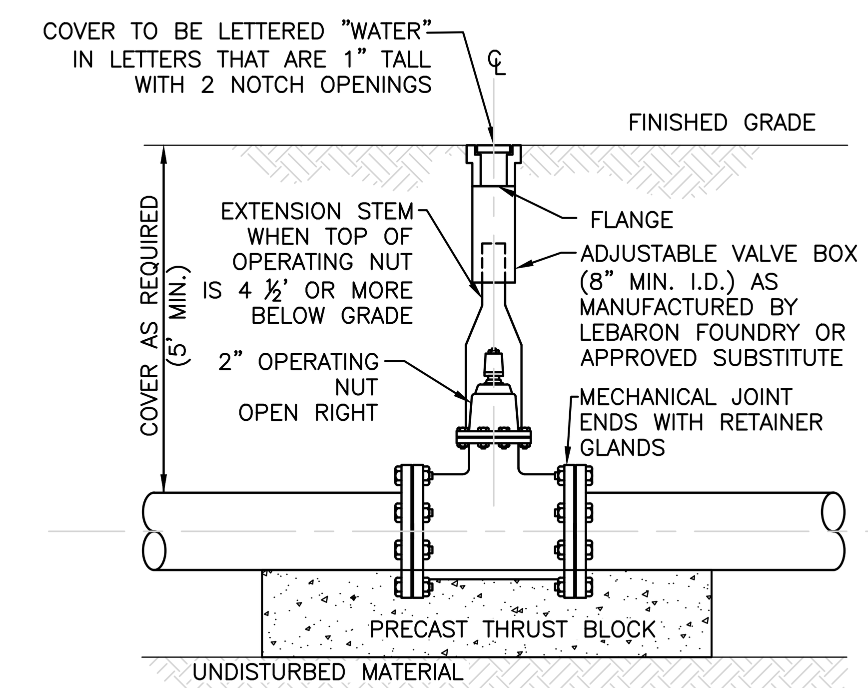
NOTES:
1. ALL THRUST BLOCKS SHALL BE PRECAST CONCRETE.
2. ALL WATER MAIN FITTINGS, BENDS, TEES, PLUGS ETC. SHALL BE RESTRAINED W/ THRUST BLOCKS EXCEPT WHERE NOTED.
3. ALL THRUST BLOCKS & COLLARS SHALL BE INSTALLED SO THAT THEY BEAR AGAINST UNDISTURBED EARTH.
4. SIZE OF CONCRETE THRUST BLOCKS SHALL BE AS NOTED BELOW.
5. MINIMUM COMPRESSIVE STRENGTH OF THRUST BLOCK CONCRETE SHALL BE 3,000 P.S.I.
6. KEEP CONCRETE CLEAR OF MECHANICAL JOINTS.



MINIMUM THRUST BLOCK BEARING AREAS

PIPE ø	90° BEND (SQ. FT.)	45° BEND (SQ. FT.)	22.5° BEND (SQ. FT.)	TEES, PLUGS, CAPS & HYD. (SQ.FT.)
6"	5	3	3	4
8"	9	6	3	9
10"	13	7	4	12
12"	20	10	5	16

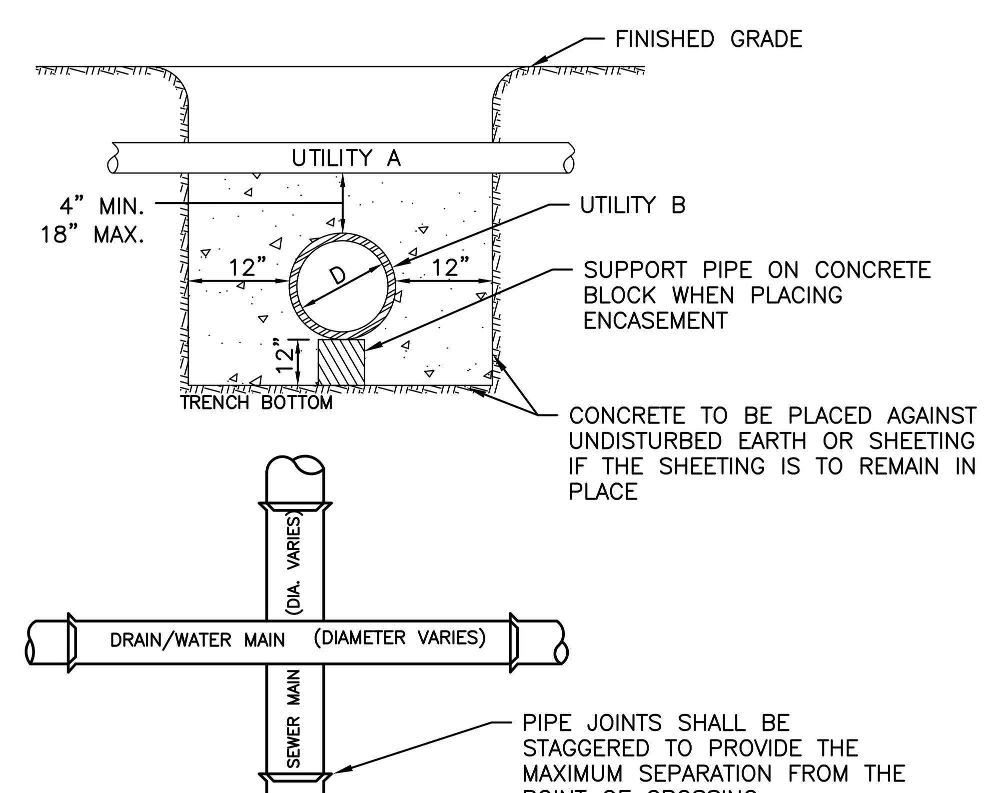
THRUST BLOCK DETAILS (5)
NOT TO SCALE



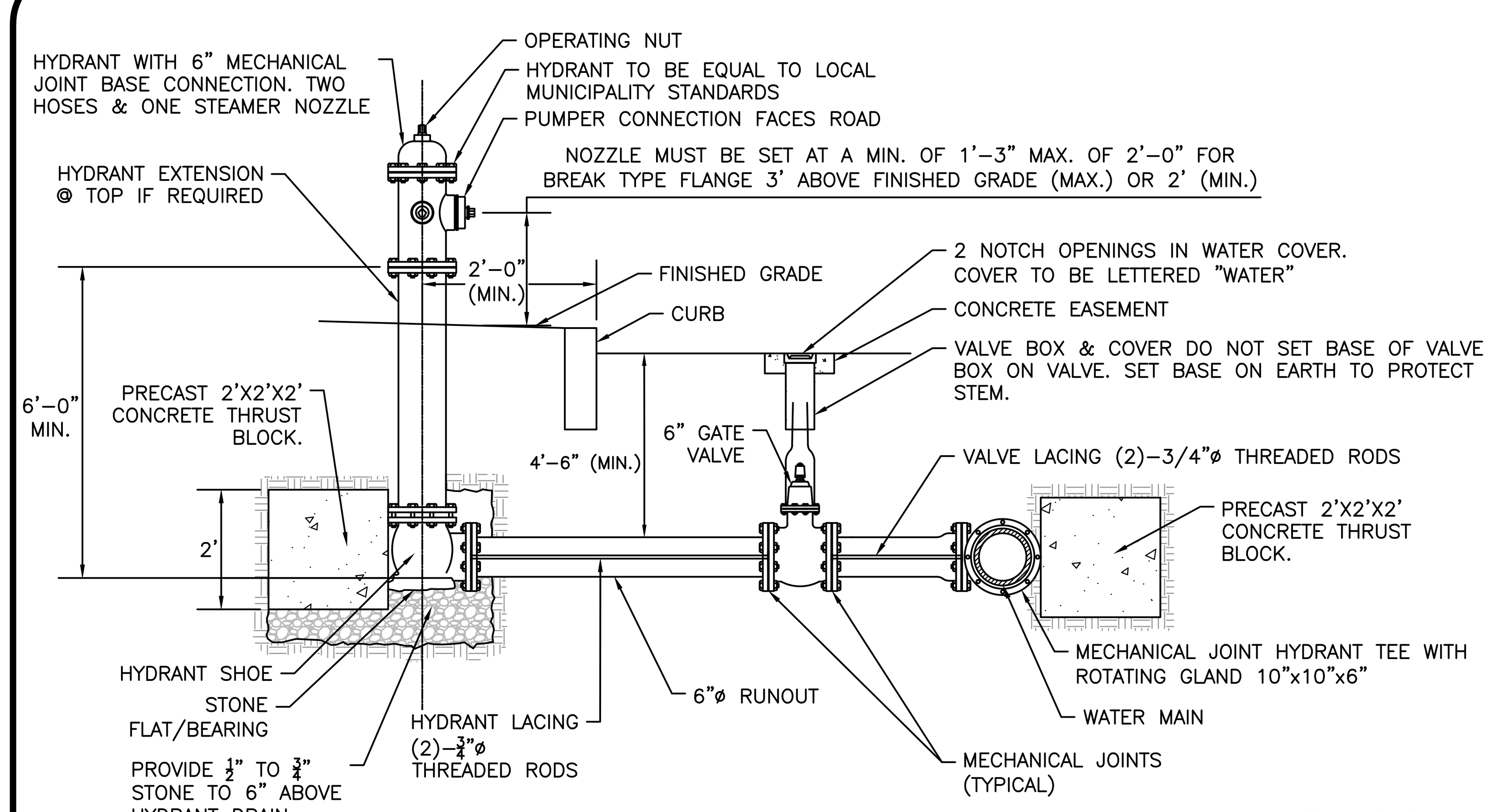
NOTES:
1. CONTRACTOR MAY USE ANCHOR TEES AT HIS OPTION.
2. HYDRANTS AND VALVES SHALL BE LEFT TURN OPEN (OPEN LEFT).
3. ALL VALVES SHALL SAY "OPEN LEFT" ON GATE BOXES.

GATE VALVE (6)
NOT TO SCALE

NOTES:
1. WHENEVER CONDITIONS PREVENT A LATERAL SEPARATION OF 10 FEET BETWEEN A SEWER MAIN AND A WATER/DRAIN MAIN:
2. THE WATER/DRAIN MAIN SHALL BE LAID IN A SEPARATE TRENCH AND THE DIFFERENCE IN ELEVATION BETWEEN THE WATER/DRAIN MAIN AND THE SEWER MAIN SHALL BE AT LEAST 18 INCHES.
3. THE PIPE CROSSING SHALL OCCUR AS CLOSE TO 90° AS PRACTICABLE.
4. THE PIPE JOINTS SHALL BE STAGGERED TO PROVIDE THE MAXIMUM SEPARATION FROM THE POINT OF CROSSING, 6' OF SEPARATION MINIMUM.
5. THE CROSSING SHALL BE ENCASED IN CONCRETE FOR THE ENTIRE WIDTH OF THE TRENCH AND FOR A DISTANCE OF 10 LINEAR FEET CENTERED ON THE CROSSING.
6. UTILITIES A AND B CAN BE EITHER NEW OR EXISTING.
7. WHEN ONE UTILITY IS A SANITARY SEWER. IT IS PREFERABLE TO BE POSITIONED AS SHOWN FOR UTILITY B.
8. ENCASEMENT EXTENDS 10'-0" ON EACH SIDE OF THE CENTERLINE OF UTILITY A.
9. PIPE MUST BE BRACED VERTICALLY AND HORIZONTALLY TO PREVENT FLOATATION DURING PLACEMENT OF CONCRETE.



SEWER, WATER/DRAIN CROSSING DETAIL (7)
NOT TO SCALE



NOTES:
1. ALL HYDRANTS, VALVES AND LOCAL CONNECTIONS SHALL COMPLY WITH THE SPECIFICATIONS OF THE LOCAL MUNICIPALITY.
2. PIPING TO BE RESTRAINED WITH RODDING OR RETAINING GLANDS.
3. GATE VALVE INSTALLATION IS TYPICAL FOR ALL GATES SHOWN ON THE DRAWINGS.
4. HYDRANTS AND VALVES SHALL BE LEFT TURN OPEN (OPEN LEFT).
5. ALL VALVES SHALL SAY "OPEN LEFT" ON GATE BOXES.

FIRE HYDRANT CONNECTION WITH MECHANICAL JOINT (8)
NOT TO SCALE

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STATE OF NEW HAMPSHIRE
BRIAN D. JONES
No. 13809
LICENSED PROFESSIONAL ENGINEER
11-20-23

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
2	10-20-23	REVISED PER TAC COMMENTS
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	AS SHOWN	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

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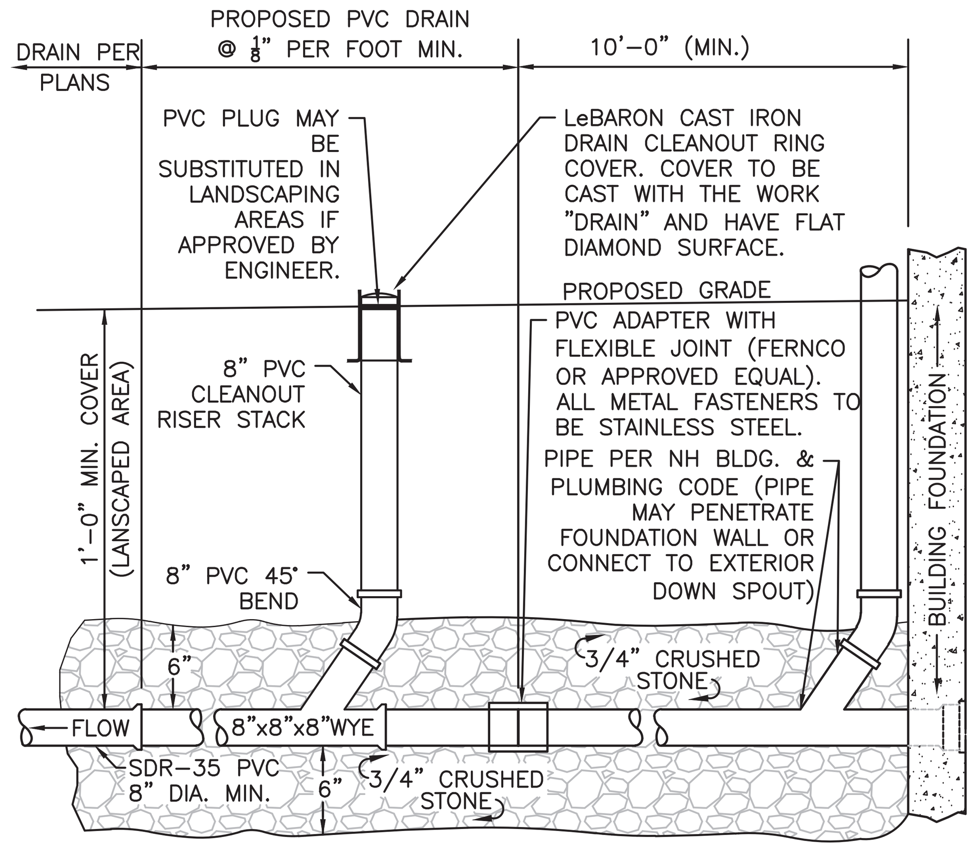
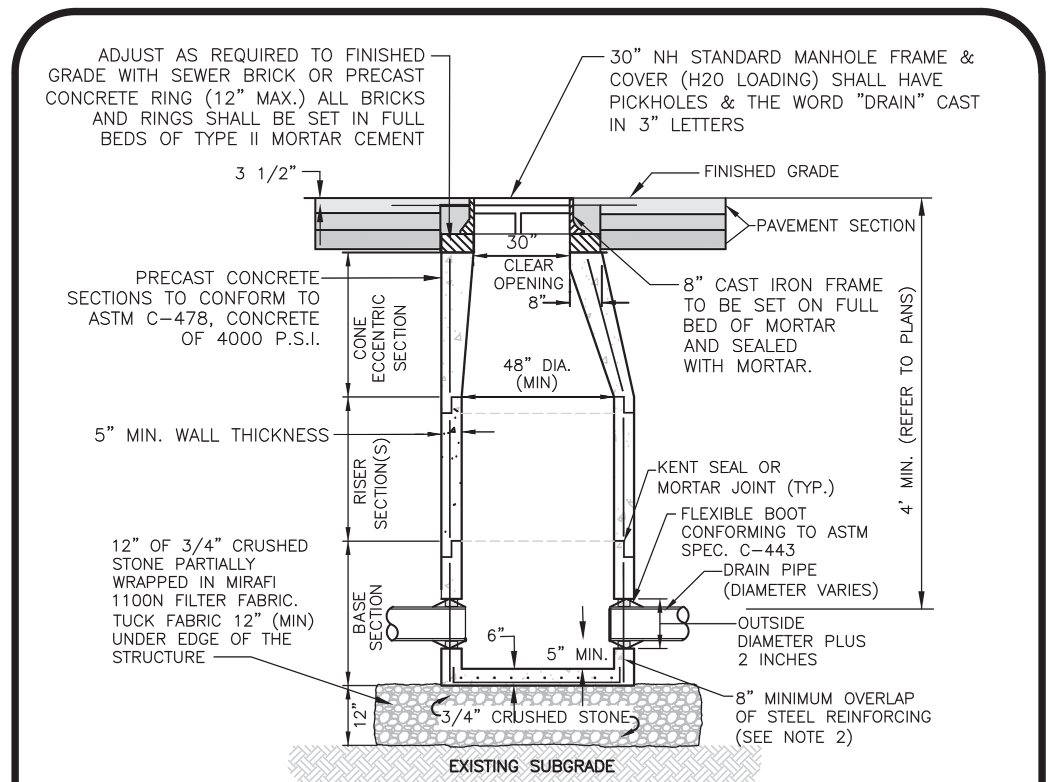
DRAWING TITLE: DETAILS
SHEET No. C-504

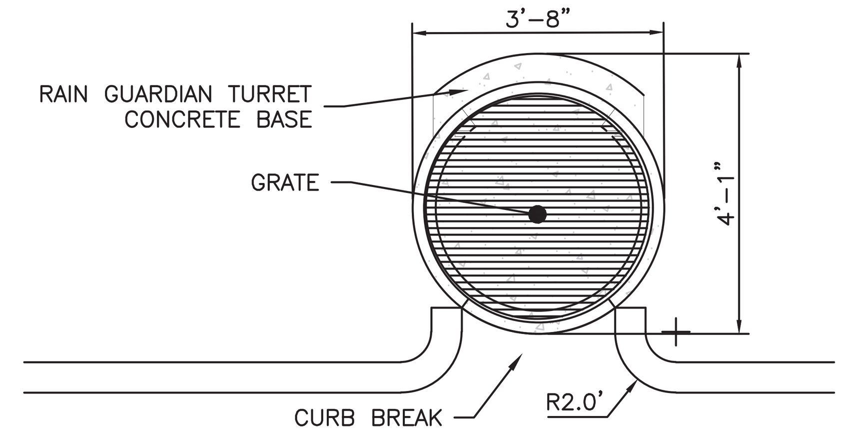


ROOF DRAIN
NOT TO SCALE
1

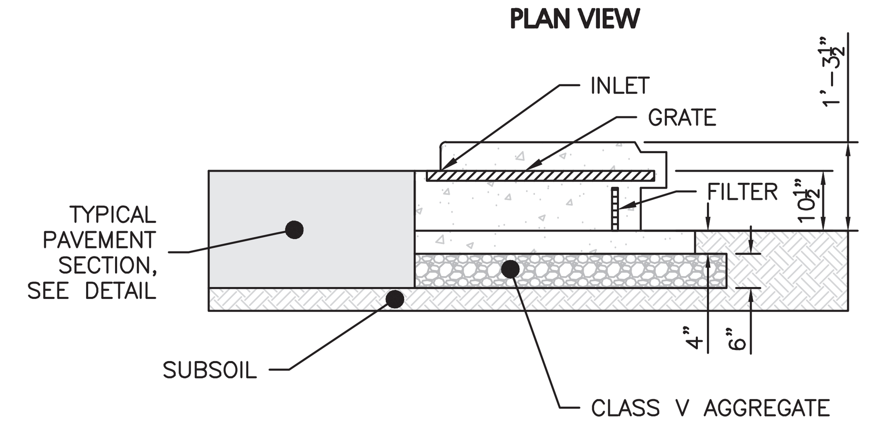


NOTES:
1. MANHOLE TO BE CAPABLE OF AASHTO H-20 LOADING WITHOUT FAILURE.
2. STEEL REINFORCEMENT FOR BASE SECTION BOTTOM SHALL BE A MINIMUM OF 0.12 SQ. IN./LIN. FT. (BOTH WAYS).
3. BASE SECTION SHALL BE MONOLITHIC
4. ANY ADJUSTMENTS DURING CONSTRUCTION WILL BE DONE BY SAW CUTTING AND/OR CORING. THE USE OF JACKHAMMERS, HAMMERS, AND CHISELS WILL NOT BE ALLOWED.

DRAIN MANHOLE
NOT TO SCALE
2



PLAN VIEW



SECTION VIEW

NOTES:

1. STEEL REINFORCED, COLD JOINT SECURED MONOLITHIC CONCRETE STRUCTURE (1,030 LBS).
2. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS. CONCRETE AIR ENTRAINED (4% TO 8% BY VOLUME).
3. MANUFACTURED AND DESIGNED TO ASTM C858.
4. THREE-POINT PICK USING RECESSED LIFTING POCKETS WITH A STANDARD HOOK.
5. SOIL UNDER BASE TO BE COMPACTED TO 95% STANDARD PROCTOR.
6. TWO-PIECE LIGHT DUTY GALVANIZED GRATE (34.5 LBS/PIECE) FOR 541 LB CONCENTRATED LOAD OR 309 LB/SQ FT UNIFORM LOAD.
7. TWO-PIECE HEAVY DUTY GALVANIZED GRATE (77.5 LBS/PIECE) FOR 2,456 LB CONCENTRATED LOAD OR 1,404 LB/SQ FT UNIFORM LOAD.
8. USE EXPANSION JOINT MATERIAL BETWEEN TURRET AND BIORETENTION INLET.

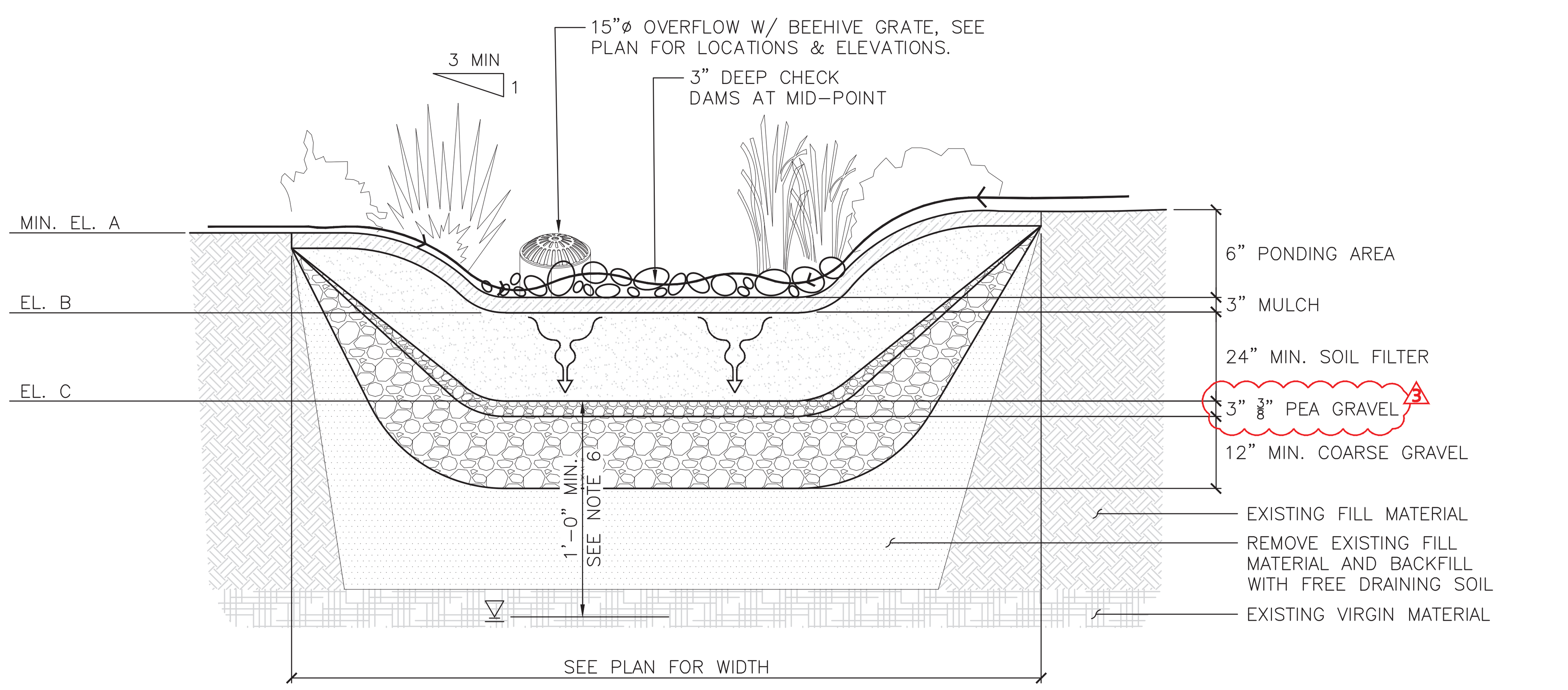
RAIN GUARDIAN - TURRET TYPICAL DETAIL
NOT TO SCALE
3

BIORETENTION FILTER MEDIA

COMPONENT MATERIAL	PERCENT OF MIXTURE BY VOLUME	GRADATION OF MATERIAL: SIEVE NO.	GRADATION OF MATERIAL: PERCENT BY WEIGHT PASSING STANDARD SIEVE
FILTER MEDIA OPTION A			
ASTM C-22 CONCRETE SAND	50 TO 55		
LOAMY SAND TOPSOIL, WITH FINES AS INDICATED	20 TO 30	200	15 TO 25
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20 TO 30	200	<5
FILTER MEDIA OPTION B			
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20 TO 30	200	<5
LOAMY COARSE SAND	70 TO 80	10	85 TO 100
		20	70 TO 100
		60	15 TO 40
		200	8 TO 15

BIORETENTION ELEVATION TABLE

ELEV. ID	BR #1	BR #2	BR #3	BR #4
A	61.25	61.25	61.25	61.50
B	58.75	59.50	59.00	59.50
C	56.75	57.50	57.00	57.50



NOTES:

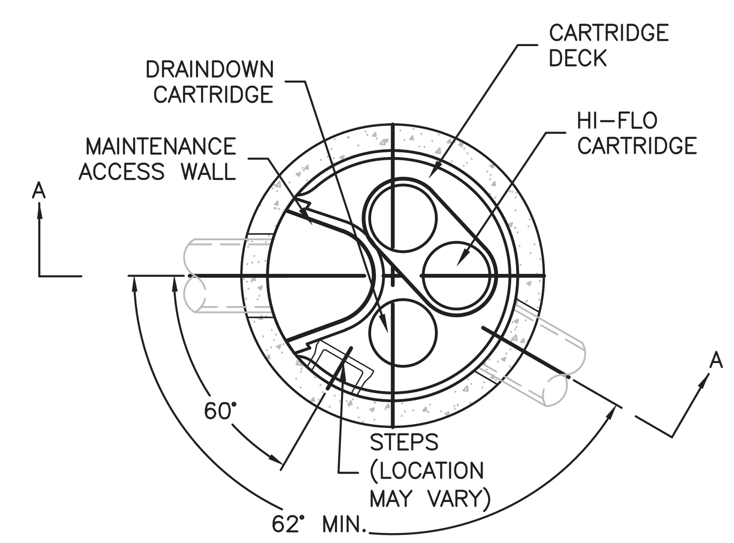
1. SEE LANDSCAPE PLAN FOR PLANT TYPES.
2. GRADING, AND PLANTING OF BIORETENTION SHALL BE COMPLETED IN EARLY PHASES OF CONSTRUCTION. PLANTS AND SEED ON SLOPES AND BOTTOM OF BASIN MUST BE ESTABLISHED PRIOR TO CONNECTING STORM DRAINAGE SYSTEM OUTLETS TO BIORETENTION AREA. PLANTS AND SEED MIX SHALL HAVE A MINIMUM OF 6 MONTHS GROWING, BE ESTABLISHED AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO CONNECTING STORM DRAINAGE SYSTEM OUTLETS TO BIORETENTION AREA.
3. EROSION CONTROL MEASURES AS SHOWN ON THE EROSION CONTROL PLAN, SHALL BE IN PLACE PRIOR TO ANY REGRADING ACTIVITY.
4. EXCAVATION, FILLING AND PLANTING SHALL OCCUR IN THE DRY. WATER LEVELS MUST BE LOWERED IN THE BIORETENTION AREA BY RELYING ON DRY SEASON AND OR DRY SPELLS; OR MAY BE ACCOMPLISHED THROUGH THE USE OF DEWATERING METHODS. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ANY DEWATERING METHODS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
5. WATER FROM ANY DEWATERING OPERATION SHALL BE TREATED TO REDUCE TOTAL SUSPENDED SOLIDS AND BE IN COMPLIANCE WITH STATE AND FEDERAL STANDARDS. BEFORE ANY DEWATERING IS PERFORMED, THE CONTRACTOR SHALL FILE AND OBTAIN A TEMPORARY GROUNDWATER DISCHARGE PERMIT FROM NHDES. COORDINATION BETWEEN THE APPLICANT, PDA, NHDES AND THE AIR FORCE IS NECESSARY PRIOR TO FILING THIS APPLICATION.
6. A MINIMUM OF 1 FOOT SEPARATION BETWEEN THE BOTTOM OF THE PRACTICE AND SEASONAL HIGH WATER TABLE SHALL BE PROVIDED, VERIFY IN FIELD. IF SEPARATION CAN NOT BE ACHIEVED, SET UNDERDRAIN AT BOTTOM OF COARSE GRAVEL LAYER, OMIT PEA GRAVEL LAYER, AND PROVIDE IMPERMEABLE LINER AT BOTTOM OF PRACTICE.

CONSTRUCTION NOTES:

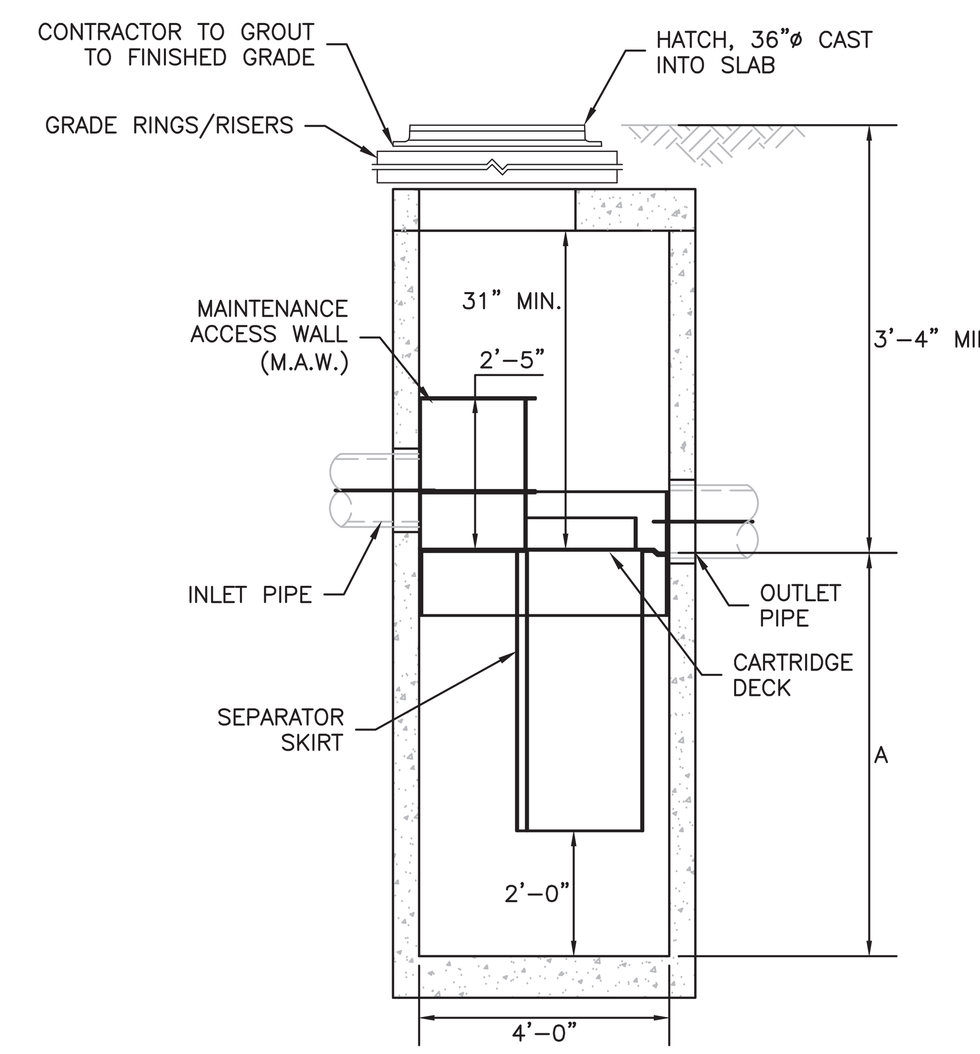
1. DO NOT PLACE THE BIORETENTION SYSTEM INTO SERVICE UNTIL THE BMP HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.
3. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.

3

BIORETENTION SYSTEM DETAIL
NOT TO SCALE
4



PLAN VIEW



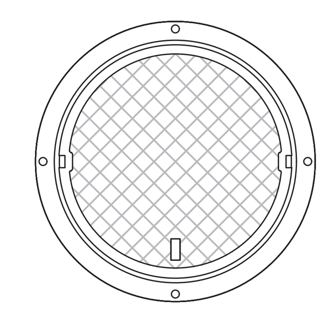
SECTION A-A

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 BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.
5. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS DIRECTED BY THE ENGINEER OF RECORD.

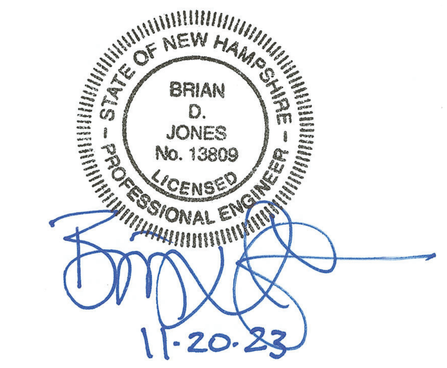
INSTALLATION NOTES:

1. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED).
2. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT).
3. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
4. 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.



36" DIA. HATCH

WQ-01 - JELLYFISH (JF4) STANDARD DETAIL
NOT TO SCALE
5



PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
3	11-10-23	REVISED PER AOT COMMENTS
2	10-20-23	REVISED PER TAC COMMENTS
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

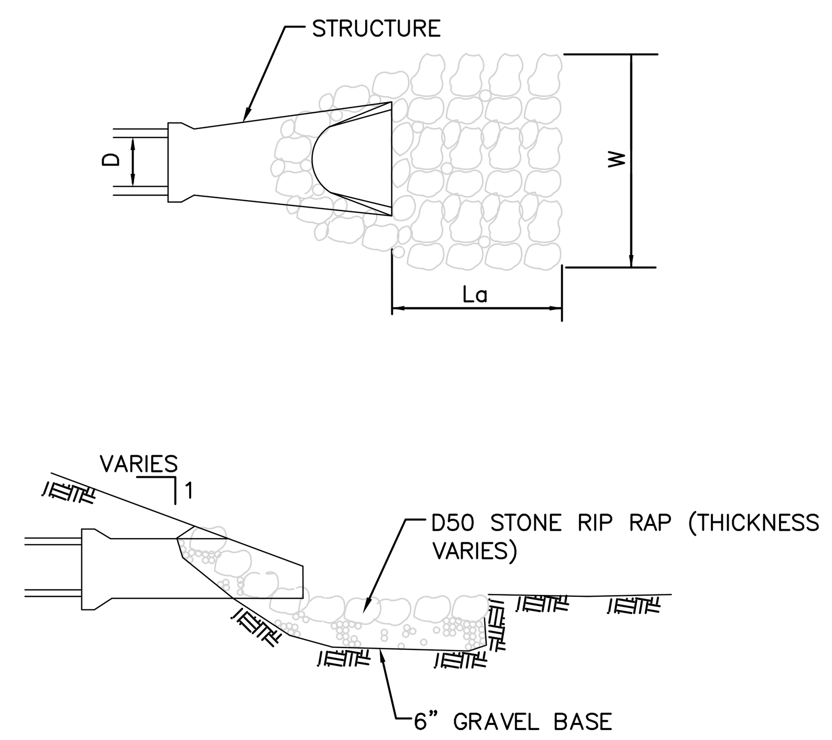
PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	AS SHOWN	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:
ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

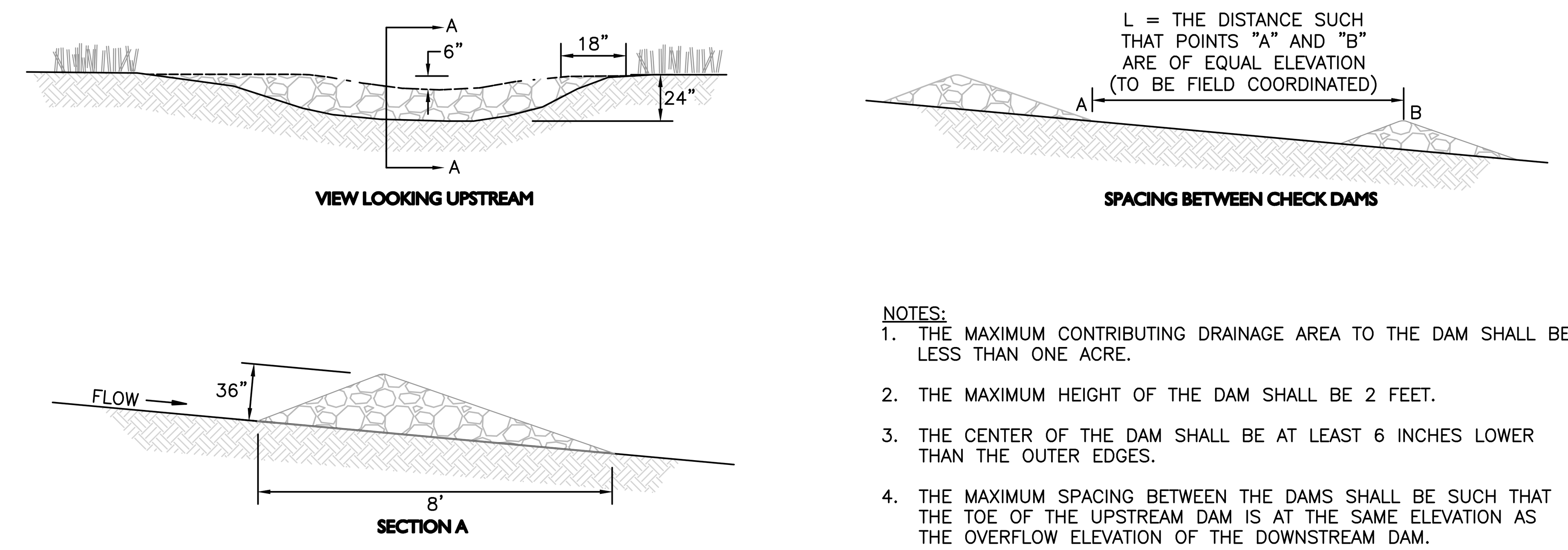
DRAWING TITLE: DETAILS

SHEET No. C-505



RIP-RAP SIZING CHART					
STRUCTURE	D	La	W	D50	THICKNESS
FES-01	8"	10'	10'	3"	7"
FES-02	10"	9'	11'	3"	7"
FES-03	8"	6.5'	8'	3"	7"
FES-04	8"	8'	8'	3"	7"
FES-05	8"	5'	7'	3"	7"
FES-06	8"	8'	9'	3"	7"

RIP-RAP OUTFALL APRON
NOT TO SCALE
1



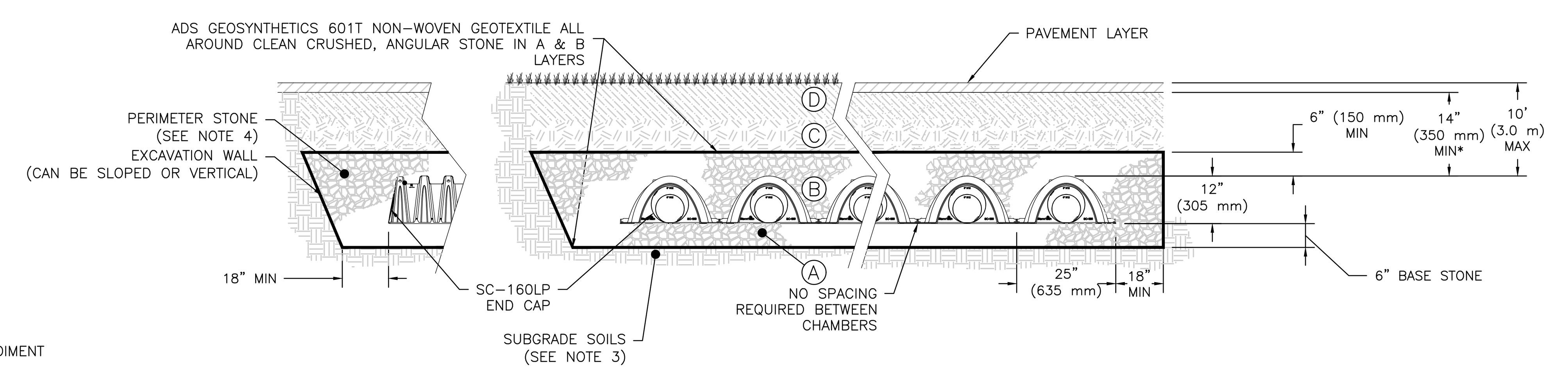
NOTES:
1. THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE DAM SHALL BE LESS THAN ONE ACRE.
2. THE MAXIMUM HEIGHT OF THE DAM SHALL BE 2 FEET.
3. THE CENTER OF THE DAM SHALL BE AT LEAST 6 INCHES LOWER THAN THE OUTER EDGES.
4. THE MAXIMUM SPACING BETWEEN THE DAMS SHALL BE SUCH THAT THE TOE OF THE UPSTREAM DAM IS AT THE SAME ELEVATION AS THE OVERFLOW ELEVATION OF THE DOWNSTREAM DAM.
5. THE DAMS SHALL BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
6. CHECK DAMS SHALL BE CONSTRUCTED OF A WELL-GRADED ANGULAR 2-INCH TO 3-INCH STONE.

TEMPORARY CHECK DAM
NOT TO SCALE
2

ACCEPTABLE FILL MATERIALS: STORMTECH SC-160LP CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	GENERAL BACKFILL. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	SEE FULL DEPTH PAVEMENT SECTION DETAIL
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 14" (355 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



INSPECTION & MAINTENANCE

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

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

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

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

NOTES

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

SC-160LP STORMTECH CHAMBER SPECIFICATIONS

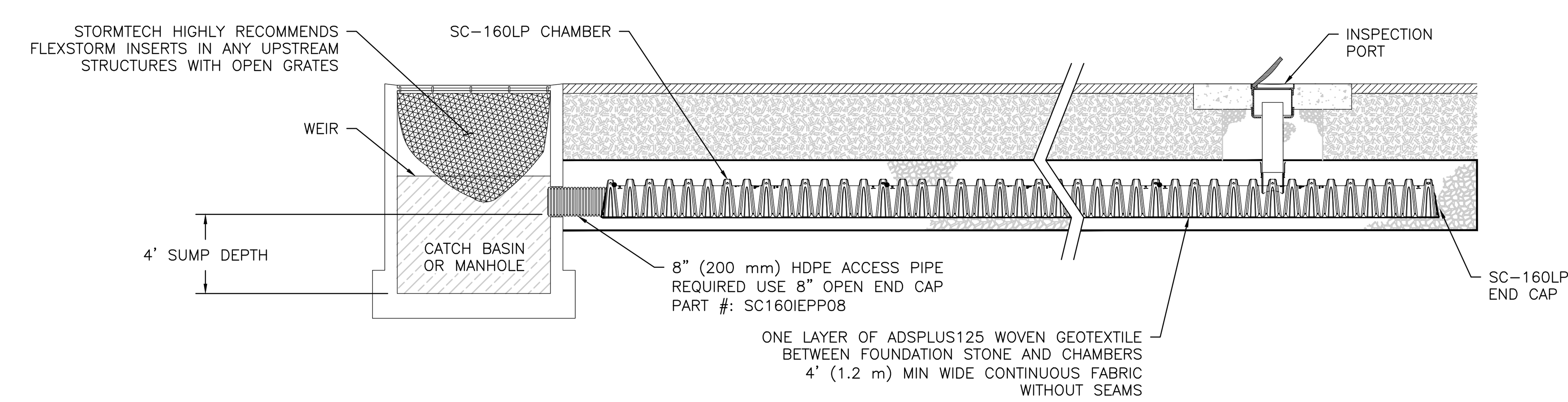
1. CHAMBERS SHALL BE STORMTECH SC-160LP.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 1.5".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 400 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

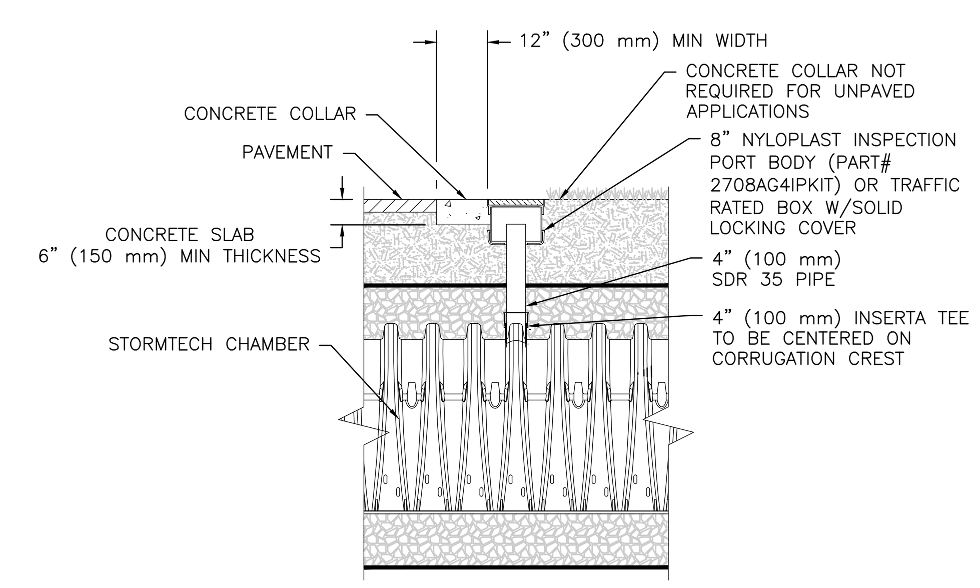
CONSTRUCTION NOTES:
1. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE INFILTRATION SYSTEM.
2. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION SYSTEM.
3. AFTER THE AREA IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE INFILTRATION RATES, FOLLOWED BY A PASS WITH A LEVELING DRAG.
4. DO NOT PLACE INFILTRATION SYSTEMS INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.

4

Advanced Drainage Systems, Inc.



SC-160LP ISOLATOR ROW PLUS DETAIL
NOT TO SCALE



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

INSPECTION PORT DETAIL
NOT TO SCALE

STORMTECH SC-160LP INFILTRATION SYSTEM
NOT TO SCALE
3

STATE OF NEW HAMPSHIRE
BRIAN D. JONES
No. 13809
LICENSED PROFESSIONAL ENGINEER
11-20-23

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
4	11-10-23	REVISED PER AOT COMMENTS
3	10-20-23	REVISED PER TAC COMMENTS
2	08-28-23	ISSUED FOR AOT PERMIT APPLICATION
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	AS SHOWN	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
w w w . a l l e n m a j o r . c o m
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

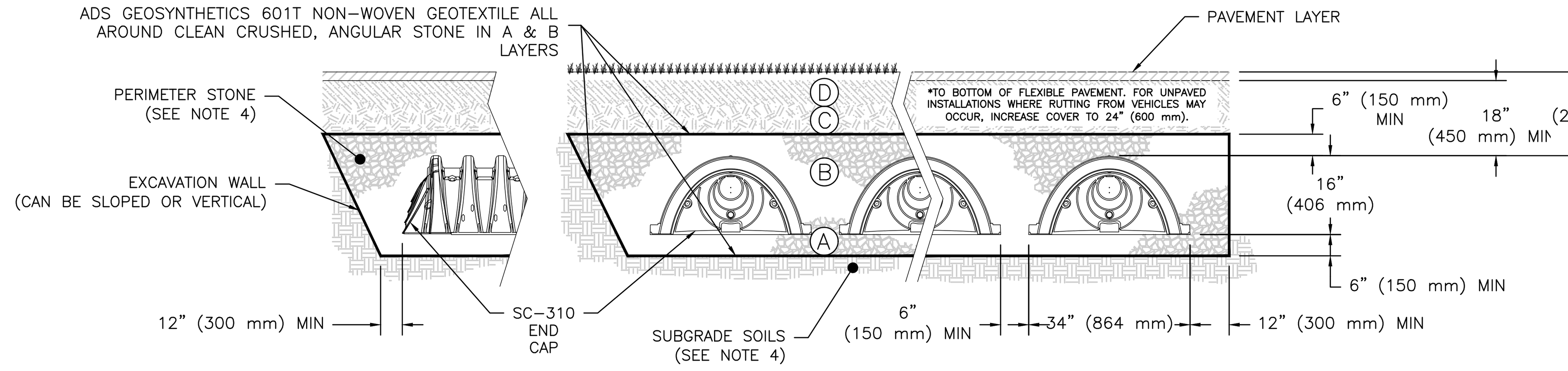
DRAWING TITLE: DETAILS
SHEET No. C-506

R:\PROJECTS\3250-01\CIVIL\DRAWINGS\CURRENT\C-3250-01_DETAILS.DWG

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

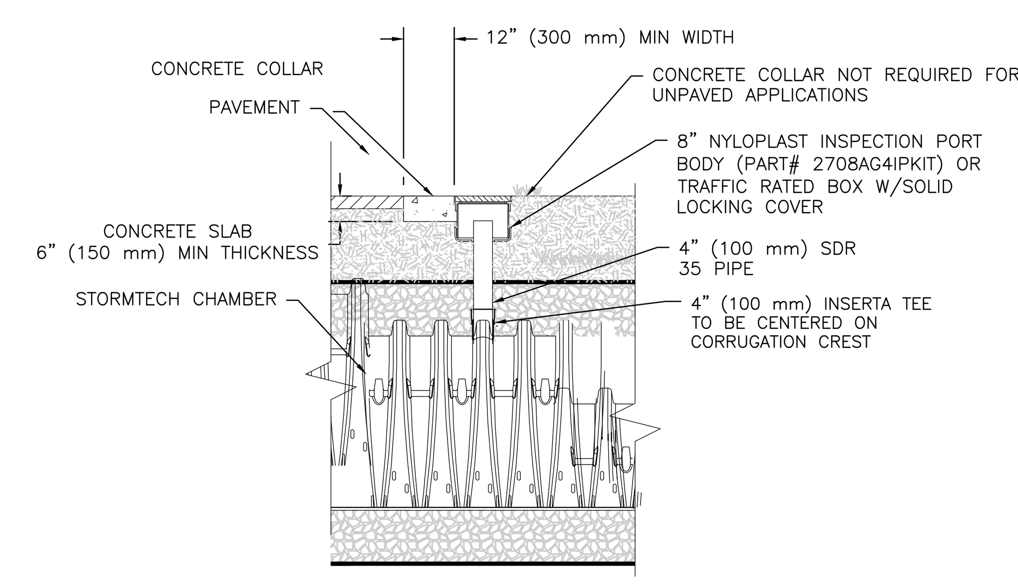
MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.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

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



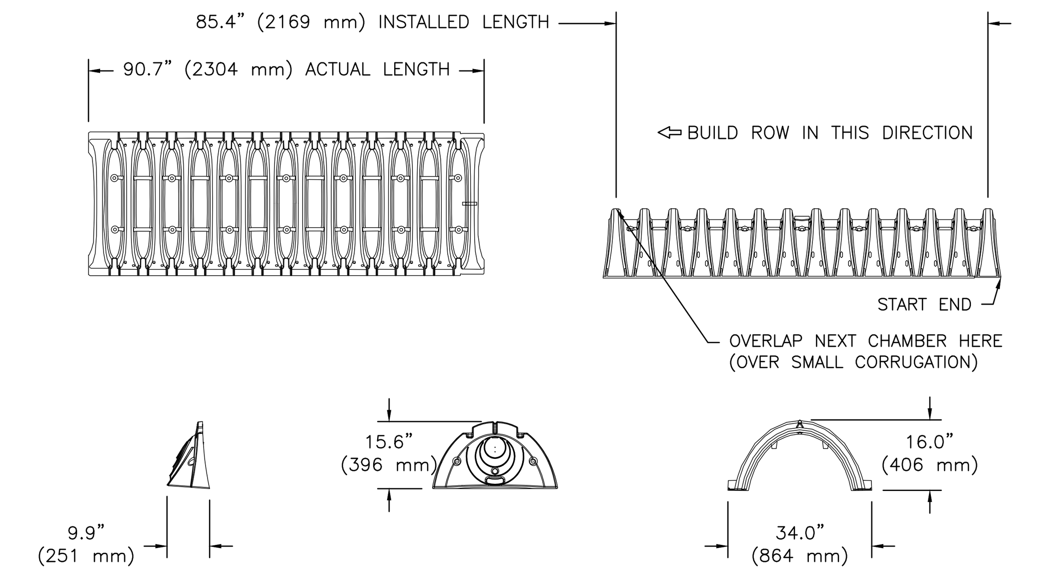
NOTES:
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. COORDINATE WITH THE PROJECT GEOTECHNICAL ENGINEER FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2922 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

SC-310 - CROSS SECTION DETAIL
NOT TO SCALE



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

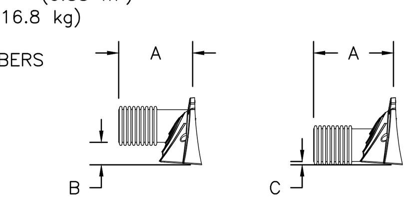
4" PVC INSPECTION PORT
NOT TO SCALE



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	34.0" X 16.0" X 85.4" (864 mm X 406 mm X 2169 mm)	
CHAMBER STORAGE	14.7 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	31.0 CUBIC FEET	(0.88 m³)
WEIGHT	35.0 lbs.	(16.8 kg)

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



PRE-FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "BR"
PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE CORED END CAPS END WITH "PC"

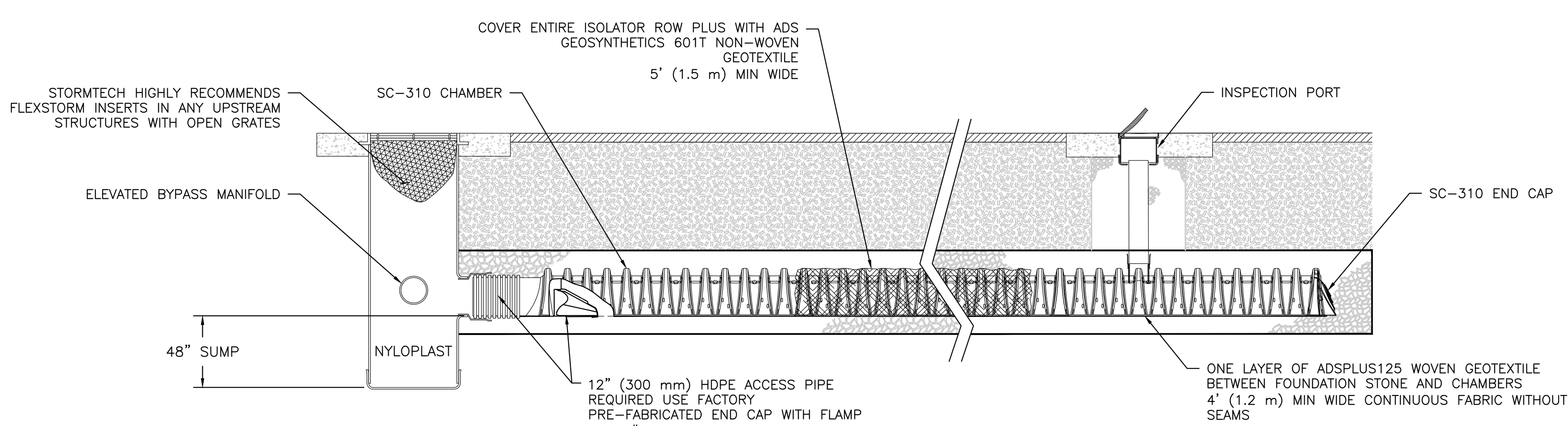
PART #	STUB	A	B	C
SC310EPE06T / SC310EPE06TPC	6" (150 mm)	9.6" (244 mm)	5.8" (147 mm)	---
SC310EPE06B / SC310EPE06BPC			---	0.5" (13 mm)
SC310EPE08T / SC310EPE08TPC	8" (200 mm)	11.9" (302 mm)	3.5" (89 mm)	---
SC310EPE08B / SC310EPE08BPC			---	0.6" (15 mm)
SC310EPE10T / SC310EPE10TPC	10" (250 mm)	12.7" (323 mm)	1.4" (36 mm)	---
SC310EPE10B / SC310EPE10BPC			---	0.7" (18 mm)
SC310EPE12B	12" (300 mm)	13.5" (343 mm)	---	0.9" (23 mm)
SC310EPE12BR	12" (300 mm)	13.5" (343 mm)	---	0.9" (23 mm)

ALL STUBS, EXCEPT FOR THE SC310EPE12B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC310EPE12B THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

TECHNICAL SPECIFICATIONS
NOT TO SCALE



SC-310 - ISOLATOR ROW PLUS DETAIL
NOT TO SCALE

SC-310 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-310.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE OR POLYETHYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 400 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2922 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

ADS Advanced Drainage Systems, Inc.

STORMTECH SC-310 CHAMBER INFILTRATION SYSTEM 1
NOT TO SCALE

R:\PROJECTS\3250-01\CIVIL\DRAWINGS\CURRENT\C-3250-01_DETAILS.DWG

STATE OF NEW HAMPSHIRE BRIAN D. JONES No. 13809 LICENSED PROFESSIONAL ENGINEER
11-20-23
PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	AS SHOWN	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:
ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
w w w . a l l e n m a j o r . c o m
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TEL: (603) 627-5500
FAX: (603) 627-5501
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:	SHEET No.
DETAILS	C-507

SECTION 33 36 00 - SANITARY SEWER SYSTEMS

PART 1 GENERAL

1.01 PRODUCTS

A. GENERAL: MATERIALS SHALL BE AS SPECIFIED HEREIN, EXCEPT THAT CONSIDERATION SHALL BE GIVEN TO OTHER PRODUCTS THAT MEET OR EXCEED THOSE SPECIFIED IF REQUESTED TEN (10) DAYS PRIOR TO DATE OF BID OPENING, IN ACCORDANCE WITH THE GENERAL CONDITIONS.

1.02 DESCRIPTION:

A. THE WORK UNDER THIS SECTION SHALL INCLUDE THE FURNISHING OF ALL MATERIAL, LABOR, EQUIPMENT AND SUPPLIES AND THE PERFORMANCE OF ALL OPERATIONS TO PROVIDE A COMPLETE WORKING SYSTEM AS REQUIRED BY THE DRAWINGS AND DETAILS AND AS SPECIFIED HEREIN, IN GENERAL, TO INCLUDE THE FOLLOWING ITEMS:

1. SANITARY SEWER SYSTEM FROM 5 FEET OUTSIDE THE BUILDING TO POINT OF TERMINATION AS SHOWN ON THE DRAWINGS.
2. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE LOCAL DEPARTMENT OF PUBLIC WORKS AND NHDES.

1.03 RELATED WORK:

A. SECTION 31 23 00 – EARTHWORK.

B. SECTION 15401 – PLUMBING.

1.04 RELATED DOCUMENTS:

A. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE MUNICIPALITY.

B. ALL WORK FOR ITEMS NOT OTHERWISE COVERED BY 1.03.A ABOVE SHALL CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE CONSTRUCTION (LATEST EDITION).

C. ALL WORK SHALL CONFORM TO THE PERMITS ISSUED BY THE STATE OF NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES.

1.05 PROJECT CONDITIONS:

A. KNOWN UNDERGROUND AND SURFACE UTILITY LINES ARE INDICATED ON THE DRAWINGS. INFORMATION ON THE DRAWINGS RELATING TO EXISTING UTILITY LINES AND SERVICES IS FROM THE BEST SOURCE PRESENTLY AVAILABLE. ALL SUCH INFORMATION IS FURNISHED ONLY FOR INFORMATION AND IS NOT GUARANTEED. COORDINATE WITH UTILITY COMPANIES, DIG SAFE AND THEIR CONTRACTORS, AND EXCAVATE TEST PITS AS REQUIRED TO DETERMINE EXACT LOCATIONS OF EXISTING UTILITIES.

B. TEST BORINGS HAVE BEEN PERFORMED BY OWNER'S SEPARATE CONTRACTOR. LOCATIONS OF TEST BORINGS ARE SHOWN ON THE DRAWINGS. NEITHER THE OWNER NOR THE ENGINEERS MAKE WARRANTY, EITHER EXPRESSED OR IMPLIED, OF ACCURACY OF BORING DATA AS A REPRESENTATION OF TYPICAL CONDITIONS. THE CONTRACTOR SHALL MAKE HIS/HER OWN INVESTIGATION OF SUBSURFACE CONDITIONS AND SATISFY HER/HIMSELF AS TO CONDITION THEREOF AND SHALL BASE HIS/HER BID IN SOLE RELIANCE THEREON. SUCH INVESTIGATION MAY INCLUDE, BUT IS NOT NECESSARILY LIMITED TO: ADDITIONAL TEST PITS, BORINGS. NO ALLOWANCE WILL BE MADE FOR THE CONTRACTOR'S FAILURE TO PERFORM INVESTIGATION NECESSARY TO FULLY IDENTIFY AND SATISFY HIM/HERSELF AS TO SUBSURFACE CONDITIONS WHICH COULD AFFECT THE WORK.

C. PROTECT EXCAVATIONS BY SHORING, BRACING, SHEETING, UNDERPINNING, OR OTHER METHODS, AS REQUIRED TO PREVENT CAVE–INS OR LOOSE DIRT FROM ENTERING EXCAVATIONS. BARRICADE OPEN EXCAVATIONS AND POST WARNING LIGHTS AT WORK ADJACENT TO PUBLIC STREETS AND WALKS.

D. UNDERPIN ADJACENT STRUCTURE(S), INCLUDING UTILITY SERVICE LINES, WHICH MAY BE DAMAGED BY EXCAVATION OPERATIONS.

E. PROMPTLY REPAIR DAMAGE TO ADJACENT FACILITIES CAUSED BY SITE SEWER AND DRAINAGE OPERATIONS.

F. PROMPTLY NOTIFY THE OWNER OF UNEXPECTED SUB–SURFACE CONDITION

1.06 QUALITY ASSURANCE:

A. STANDARDS: COMPLY WITH STANDARDS SPECIFIED IN THIS SECTION. PROVIDE SHOP DRAWINGS TO THE OWNER OR OWNER'S REPRESENTATIVE.

B. QUALIFICATIONS OF INSTALLERS: USE ADEQUATE NUMBERS OF SKILLED WORKERS WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND WHO ARE COMPLETELY FAMILIAR WITH THE SPECIFIED REQUIREMENTS AND METHODS FOR PROPER PERFORMANCE OF THE WORK OF THIS SECTION.

C. OBTAIN OWNER OR OWNER'S REPRESENTATIVE'S ACCEPTANCE OF INSTALLED AND TESTED SITE DRAINAGE SYSTEM PRIOR TO BACKFILLING.

1.07 SUBMITTALS:

A. PRODUCT DATA:

1. COMPLETE MATERIALS LIST OF ALL ITEMS PROPOSED TO BE FURNISHED AND INSTALLED UNDER THIS SECTION.
2. MANUFACTURER'S SPECIFICATIONS AND OTHER DATA REQUIRED TO DEMONSTRATE COMPLIANCE WITH THE SPECIFIED REQUIREMENTS.
3. MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES.

B. TESTING AND INSPECTION REPORTS.

C. PROVIDE SITE SEWER AND DRAINAGE RECORD DRAWINGS:

1. LEGIBLY MARK DRAWINGS TO RECORD ACTUAL CONSTRUCTION.
2. INDICATE HORIZONTAL AND VERTICAL LOCATIONS REFERENCED TO PERMANENT SURFACE IMPROVEMENTS.
3. IDENTIFY FIELD CHANGES OF DIMENSIONS AND DETAILS AND CHANGES MADE BY CHANGE ORDER.

1.08 COOPERATION AND COORDINATION WITH OTHER TRADES:

A. THE WORK SHALL BE SO PERFORMED THAT THE PROGRESS OF THE ENTIRE PROJECT CONSTRUCTION, INCLUDING ALL OTHER TRADES, SHALL NOT BE DELAYED AND NOT INTERFERED WITH. MATERIALS AND APPARATUS SHALL BE INSTALLED AS FAST AS CONDITIONS WILL PERMIT AND MUST BE INSTALLED PROMPTLY WHEN AND AS DIRECTED.

B. ALL WORK SHALL BE COORDINATED WITH OTHERS TRADES. THE WORK IN THIS SECTION SHALL AT NO TIME INTERRUPT THE NORMAL OPERATIONS OF EXISTING BUILDINGS.

PART 2 PRODUCTS

2.01 POLYVINYL CHLORIDE PIPE (PVC):

A. PVC PIPE SHALL BE MADE FROM VIRGIN PLASTIC AND SHALL CONFORM TO ASTM D1784. SOLID PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM D3034 SDR 35. PERFORATED PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM D2729 SDR 35.

B. STANDARD NOMINAL LENGTHS OF PIPE SHALL BE A MINIMUM OF 10 FEET.

C. THE PIPE FITTINGS SHALL BE AS UNIFORM AS COMMERCIALLY PRACTICAL IN COLOR, OPACITY, DENSITY AND OTHER PHYSICAL PROPERTIES.

D. PIPE SHALL BE TESTED IN ACCORDANCE WITH SECTION 10 OF ASTM D2412 STANDARD METHOD OF "TEST FOR EXTERNAL LOADING PROPERTIES OF PLASTIC PIPE BY PARALLEL–PLATE LOADING". THE MINIMUM VALUE OF PIPE STIFFNESS AT 5% DEFLECTION COMPUTED FROM DATA OBTAINED FROM THE ABOVE TESTING PROCEDURE SHALL BE IN ACCORDANCE WITH ASTM D2412.

E. EACH PIPE AND ALL COUPLINGS AND FITTINGS SHALL BE CLEARLY MARKED ON THE OUTSIDE SURFACE WITH THE NAME OF THE MANUFACTURER, ASTM DESIGNATION WITH TYPE AND GRADE, AND NOMINAL DIAMETER.

2.02 DUCTILE IRON (D.I.) SEWER PIPE:

A. ANSI/AWWA C151/ A21.51 CLASS 52 WITH CEMENT LINING CONFORMING TO ANSI A21.4. PRESSURE CLASS SHALL BE ANSI PRESSURE CLASS 350. PROTECTIVE COATING ON EXTERIOR SHALL BE APPROVED BITUMASTIC OR COAL TAR ENAMEL CONFORMING TO ANSI A21.4 AND A21.10

B. FITTINGS FOR DUCTILE IRON PIPE SHALL BE DUCTILE IRON SHORT BODY FITTINGS CONFORMING TO ANSI A21.1 WITH CEMENT LINING CONFORMING TO ANSI A21.4. THICKNESS CLASS SHALL BE ANSI PRESSURE CLASS 350.

C. LENGTH AND JOINTS – DUCTILE IRON PIPE LENGTHS SHALL GENERALLY BE AS LONG AS POSSIBLE BUT SHALL HAVE A BELL–AND–SPIGOT OR SHALL HAVE FURNISHED WITH IT A SEPARATE JOINTING SLEEVE OR COUPLING WITH RUBBER RINGS COMPRESSED INTO PLACE TO MAKE A WATERTIGHT CLOSURE. JOINTS SHALL BE SEALED WITH A RUBBER RING GASKET AND SHALL BE OF A COMPOSITION AND TEXTURE WHICH WILL ENDURE PERMANENTLY UNDER THE CONDITIONS LIKELY TO BE IMPOSED BY THIS USE, AND SHALL CONFORM TO ASTM SPECIFICATIONS C–361 AMENDED TO DATE. JOINTS SHALL BE "PUSH–ON" TYPE COMPLYING WITH ANSI A21.1.

2.03 HIGH DENSITY POLYETHYLENE (HDPE)

A. FORCE MAINS AND LOW PRESSURE SEWERS SHALL BE TREATED AS GRAVITY SEWERS FOR PURPOSES OF FOUNDATION BEDDING AND BACKFILL REQUIREMENTS.

B. HDPE PIPE USED FOR FORCE MAINS AND LOW PRESSURE SEWERS SHALL CONFORM TO ASTM D3035–03A.

2.04 CAST IRON SOIL PIPE:

A. CAST IRON SOIL PIPE SHALL BE ASTM A 74, EXTRA HEAVY TYPE, INSIDE NOMINAL DIAMETER AS SPECIFIED ON CONSTRUCTION DRAWINGS, BELL AND SPIGOT END. JOINTS SHALL BE IN CONFORMANCE WITH AWWA C111, RUBBER GASKET JOINT DEVICES.

2.05 PIPE JOINTS AND FITTINGS:

A. DUCTILE IRON FITTINGS SHALL BE MECHANICAL JOINTS. ALL FITTINGS SHALL BE RESTRAINED OR RODDED.

B. DUCTILE IRON FITTINGS SHALL CONFORM TO ANSI 21.10 AND 21.11 (AWWA C110 AND AWWA C111).

C. HDPE AND PVC FITTINGS SHALL BE WATERTIGHT. STRUCTURAL INTEGRITY AND JOINT CONFIGURATION SHALL BE IDENTICAL TO THAT OF PIPE.

2.06 SEWER MANHOLES:

A. PRECAST CONCRETE MANHOLE, CATCH BASIN, LEACHING CATCH BASIN BASE, AND LEACHING PIT SECTIONS, RISER SECTIONS AND CONE SECTIONS SHALL BE CONSTRUCTED OF A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, AIR ENTRAINED CONCRETE WITH HOOP REINFORCING AND LIFTING HOLES. SECTIONS SHALL BE FURNISHED WITH "O" RING RUBBER GASKETS. LIFTING HOLES IN ALL SECTIONS SHALL BE FILLED WITH NONSHRINK MORTAR AFTER SECTIONS ARE IN PLACE.

B. CLASS "A" CONCRETE: ASTM C94. ALL CONCRETE SHALL BE CLASS A UNLESS STATED OTHERWISE.

1. STRENGTH : 3000 PSI @ 28 DAYS
2. CEMENT CONTENT : TYPE II, 6.5 SACKS/CY (MIN)
3. W/C RATIO : 0.464 (MAX)
4. FINE AGGREGATE : ASTM C33
5. COARSE AGGREGATE : ASTM C33 SIZE #67

C. CLASS "B" CONCRETE:

1. STRENGTH : 3000 PSI @ 28 DAYS
2. CEMENT CONTENT : TYPE II, 6.0 SACKS/CY (MIN)
3. W/C RATIO : 0.488 (MAX)
4. FINE AGGREGATE : ASTM C33
5. COARSE AGGREGATE : ASTM C33 SIZE #67

D. REINFORCING STEEL: ASTM A615, A616, OR A185.

E. PRECAST CONCRETE: ASTM C478 EXCEPT AS SPECIFIED OTHERWISE.

F. TABLES AND INVERTS SHALL BE CONSTRUCTED OF BRICK, SHALL HAVE THE SAME SHAPE OF THE PIPE THAT ARE CONNECTED AND ANY CHANGE IN SIZE OR DIRECTION SHALL BE GRADUAL AND EVEN.

G. PRECAST STRUCTURES SHALL BE ABLE TO WITHSTAND H–20 LOADING.

H. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATER–TIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC–LIKE SEALANT.

I. PIPE TO MANHOLE JOINTS SHALL BE AS FOLLOWS:

1. ELASTOMERIC, RUBBER SLEEVE WITH WATERTIGHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES;
2. CAST INTO THE WALL OR SECURED WITH STAINLESS STEEL CLAMPS;\
3. ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH SEAL FORMED ON THE SURFACE OF THE PIPE BY COMPRESSION OF THE RING.
4. PIPE TO MANHOLE JOINTS SHALL BE ONE OF THE FOLLOWING OR APPROVED EQUAL:
   a. KOR – N – SEAL
   b. LOCK JOINT
   c. PRESS WEDGE II

2.07 BRICK MASONRY:

A. CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C 150–05, TYPE H.

B. HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207–06 "STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES".

C. SAND SHALL BE CLEAN, HARD, DURABLE PARTICLES AND WITH NOT MORE THAN 5% IN VOLUME OF MICA, CLAY AND OTHER DELETERIOUS MATERIALS. THE SAND SHALL BE GRADED FROM FINE TO COURSE SO THAT WHEN TESTED DRY, IT WILL CONFORM TO THE LIMITS OF ASTM C33–03 "STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES".

D. MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;

1. PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
   a. 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
   b. 4.5 PARTS SAND, ONE PART CEMENT AND 0.5 PART HYDRATED LIME

E. WATER SHALL BE FREE FROM OILS, ACIDS, ALKALIS OR ORGANIC MATTER, AND SHALL BE CLEAN AND FRESH.

F. BRICK SHALL BE SOUND, HARD AND UNIFORMLY BURNED, REGULAR AND UNIFORM IN SHAPE AND SIZE, OF COMPACT TEXTURE AND SATISFACTORY TO THE OWNER OR OWNER'S REPRESENTATIVE. BRICKS SHALL COMPLY WITH ASTM C32, GRADE SS. ONLY WHOLE BRICK SHALL BE USED UNLESS OTHERWISE PERMITTED.

2.08 MANHOLE STEPS: (NOT USED)

2.09 MANHOLE FRAMES AND COVERS:

A. CASTINGS SHALL BE OF GOOD QUALITY, STRONG, TOUGH EVENLY GRAINED, SMOOTH CAST IRON, FREE FROM SCALE, LUMPS, BLISTERS, SAND HOLES, AND DEFECTS OF ANY KIND. CASTINGS SHALL BE THOROUGHLY CLEANED AND ALL FINISHED SURFACES SHALL BE MACHINED TO A TRUE PLANED SURFACE AND SHALL SEAT AT ALL POINTS WITHOUT ROCKING.

B. CASTINGS SHALL NOT BE ACCEPTABLE IF THE ACTUAL WEIGHT IS LESS THAN 95% OF THE THEORETICAL WEIGHT OF THE CASTINGS SHOWN ON THE DRAWINGS. CONTRACTOR SHALL FURNISH INVOICES TO THE OWNER SHOWING TRUE WEIGHTS, CERTIFIED BY THE SUPPLIER.

C. CAST IRON SHALL CONFORM TO ASTM A48, CLASS 30 AND FRAMES, COVERS AND GRATES SHALL BE ABLE TO WITHSTAND H–20 LOADING.

D. PROVIDE A 30 INCH DIAMETER CLEAR OPENING. SEWER MANHOLE COVERS SHALL HAVE THE WORD "SEWER" IN 3" LETTERS CAST INTO THE TOP SURFACE.

2.10 FORCE MAINS

A. FORCE MAINS FOR CONSTANT SPEED PUMPS SHALL BE SIZED TO YIELD A CLEANSING VELOCITY OF 3 FEET PER SECOND OR GREATER AT DESIGN PUMP CAPACITY.

B. FORCE MAINS SHALL ENTER THE GRAVITY SEWER SYSTEM AT THE FLOW LINE OF THE RECEIVING MANHOLE.

C. TO PREVENT AIR LOCKING, FORCE MAINS SHALL BE PROVIDED WITH AN AUTOMATIC AIR RELIEF VALVE AT EACH HIGH POINT, INSTALLED WITHIN A MANHOLE STRUCTURE THAT MEETS THE DESIGN REQUIREMENTS OF ENV–WQ 704.12 THROUGH ENV–WQ 704.17.

D. FORCE MAINS SHALL BE PROVIDED WITH A DRAINAGE BLOW–OFF AT EACH LOW POINT THAT:

- HAS A PROPERLY VALVED CONNECTION FOR A VACUUM TRUCK OR OTHER SUITABLE CONTAINMENT DEVICE;
- IS INSTALLED WITHIN A MANHOLE STRUCTURE THAT MEETS THE DESIGN REQUIREMENTS OF ENV–WQ 704.12 THROUGH ENV–WQ 704.17, WITH SUFFICIENT SPACE FOR HANDLING THE DISPLACED WASTE WITHOUT DANGER OF POLLUTION OR HEALTH HAZARD.

E. FORCE MAINS SHALL BE DESIGNED IN ACCORDANCE WITH ENV–WQ 704.07, CONSTRUCTED WITH MATERIALS AS SPECIFIED IN ENV–WQ 704.08, AND TESTED AS SPECIFIED IN ENV–WQ 704.09.

F. THRUST BLOCKS MADE FROM INORGANIC, CORROSION–RESISTANT MATERIAL SHALL BE PLACED AT ALL BENDS, ELBOWS, TEES, AND JUNCTIONS.

G. FORCE MAINS SHALL BE DESIGNED TO WITHSTAND HYDROSTATIC PRESSURES OF AT LEAST 2.5 TIMES THE DESIGN TOTAL DYNAMIC HEAD;

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS:

A. OBTAIN DETAILED INFORMATION FROM THE MANUFACTURERS OF APPARATUS AS TO THE PROPER METHOD OF INSTALLING AND CONNECTING SAME.

B. CAREFULLY STORE MATERIALS AND EQUIPMENT WHICH ARE NOT IMMEDIATELY INSTALLED AFTER DELIVERY. CLOSE OPEN ENDS OF WORK WITH TEMPORARY COVERS OR PLUG DURING CONSTRUCTION TO PREVENT ENTRY OF OBSTRUCTING MATERIAL.

C. ANY DEFECTIVE PIPE, FITTING OR DRAIN APPARATUS THAT IS DISCOVERED AFTER IT HAS BEEN INSTALLED OR HAS BEEN INSTALLED IMPROPERLY, SHALL BE REMOVED AND REPLACED WITH NON–DEFECTIVE PARTS TO THE SATISFACTION OF THE OWNER OR OWNER'S REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE.

D. TRENCHES SHALL BE KEPT FREE OF WATER AND AS DRY AS POSSIBLE DURING THE INSTALLATION OF THE BEDDING MATERIAL, PIPE AND JOINTING FOR AS LONG A PERIOD AS REQUIRED. PIPE SHALL NOT BE LAID IN WATER OR WHEN TRENCH CONDITIONS ARE UNSUITABLE FOR THE WORK.

E. PROVIDE ALL INSPECTION AGENTS AT LEAST 24 HOURS NOTICE PRIOR TO WORK BEGINNING. INSPECTOR SHALL BE ON–SITE DURING ANY/ALL EXCAVATION, INSTALLATION, BACKFILL, AND TESTING OF ALL SEWERAGE PIPES, MANHOLES, AND APPURTENANCES.

F. NO BACKFILLING SHALL TAKE PLACE, UNLESS OTHERWISE ORDERED BY THE OWNER OR OWNER'S REPRESENTATIVE, UNTIL THE INSPECTION HAS BEEN COMPLETED.

G. EXCAVATION, BACKFILL AND PIPE BEDDING MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 31 23 00, EARTHWORK.

3.02 LAYING PIPE:

A. THIS WORK SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY FOR THE COMPLETE INSTALLATION OF DRAIN LINES IN ACCORDANCE WITH THESE SPECIFICATIONS, THE MUNICIPALITY AND OTHER AUTHORITIES HAVING JURISDICTION.

B. ALL PIPE SHALL BE SOUND AND CLEAN BEFORE INSTALLING. WHEN LAYING OF PIPE IS NOT IN PROGRESS, INCLUDING LUNCH TIME, THE OPEN ENDS OF THE PIPE SHALL BE CLOSED BY WATERTIGHT PLUGS OR OTHER APPROVED MEANS.

C. THE FULL LENGTH OF PIPE SHALL REST SOLIDLY ON THE UNDISTURBED TRENCH BOTTOM, WITH RECESSES EXCAVATED TO ACCOMMODATE BELLS, COUPLINGS AND JOINTS. BLOCKING WILL NOT BE PERMITTED.

D. PIPE SHALL BE LAID TRUE TO THE SPECIFIED LINES AND GRADES. THE BELL END SHALL BE TOWARD THE RISING GRADE AND EACH SECTION OF PIPE SHALL HAVE A FIRM BEARING THROUGHOUT ITS LENGTH. MATERIAL PLACED AROUND AND UNDER THE PIPE SHALL BE FREE OF STONES. ROCKS SHALL NOT BE ROLLED INTO TRENCHES AND ALLOWED TO DROP ONTO PIPES. PIPE SHALL BE BEDDED IN $\frac{3}{4}$" STONE TO SPRING LINE OF PIPE AND THEN BURIED IN CLEAN SAND FREE OF STONES. STONE AND SAND SHALL BE IN ACCORDANCE WITH ENV–WQ 704.11(a) AND (b).

E. WHEN PIPE CUTTING IS REQUIRED AND APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE, THE PIPE MATERIAL SHALL BE CUT BY USING A SAW OR MILLING PROCESS, APPROVED BY THE PIPE MANUFACTURER AND NOT BY ANY IMPACT DEVICE, SUCH AS A HAMMER AND CHISEL, TO BREAK THE PIPE. THE PIPE SHALL BE CUT, NOT BROKEN. THE CUT END OF THE PIPE SHALL BE SQUARE TO THE AXIS OF THE PIPE AND ANY ROUGH EDGES GROUND SMOOTH.

F. INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPE SHALL BE IN ACCORDANCE WITH ASTM D2321 AND AS RECOMMENDED BY THE PIPE MANUFACTURER. BACKFILL SHALL BE IN ACCORDANCE WITH SECTION 31 23 00, EARTHWORK. BACKFILL SHALL BE PLACED IN SIX INCH LIFTS AND COMPACTED TO 95% MINIMUM DENSITY AS PER AASHTO T99. CARE SHOULD BE TAKEN TO AVOID ANY USE OF FRACTURED STONE IN BACKFILL EXCEEDING TWO INCHES (2").

G. THE CONTRACTOR MAY USE A LASER BEAM TO ASSIST IN SETTING THE PIPE, PROVIDED HE CAN DEMONSTRATE SATISFACTORY SKILL IN ITS USE. THE USE OF STRING LEVELS, HAND LEVELS, CARPENTERS LEVELS OR OTHER RELATIVELY CRUDE DEVICES FOR TRANSFERRING GRADE OR SETTING PIPE WILL NOT BE PERMITTED.

H. WHEN LAYING REINFORCED CONCRETE PIPE, BEDDING SHALL CONSIST OF CAREFULLY PREPARING AND SHAPING A BED OF FINE GRANULAR MATERIAL TO FIT THE LOWER 15 PERCENT OF THE EXTERNAL HEIGHT OF THE PIPE WITH A MINIMUM OF 4 IN. UNDER THE BOTTOM OF THE PIPE. RECESS SHALL BE EXCAVATED FOR THE BELLS OF THE PIPE. AS SOON AS THE EXCAVATION IS COMPLETED AND THE SPECIFIED PIPE BEDDING PROVIDED, THE CONTRACTOR SHALL FIRMLY BED THE PIPE TO CONFORM ACCURATELY TO THE LINE AND GRADE INDICATED ON THE PLANS. NO BLOCKING WILL BE PERMITTED UNDER THE PIPE. AS SOON AS THE PIPE IS IN PLACE, FINE GRANULAR MATERIAL SHALL BE PLACED AND COMPACTED TO THE MID–DIAMETER OF THE PIPE. THE REMAINING BACKFILL SHALL BE IN ACCORDANCE WITH SECTION 31 23 00, EARTHWORK. BACKFILL SHALL BE PLACED IN SIX INCH LIFTS AND COMPACTED TO 95% MINIMUM DENSITY AS PER AASHTO T99.

3.03 SEWER MANHOLES:

A. SEWER MANHOLES, DRAIN MANHOLES, CATCH BASINS AND INSPECTION MANHOLES SHALL BE BUILT TO THE LINES, GRADES, DIMENSIONS AND DESIGN SHOWN ON THE PLANS WITH THE NECESSARY FRAMES, COVERS AND GRATES.

B. MANHOLE AND CATCH BASIN BASES SHALL BE PLACED ON 6 INCHES OF COMPACTED BEDDING MATERIAL.

C. PRECAST SECTIONS SHALL BE SET SO AS TO BE VERTICAL AND IN TRUE ALIGNMENT WITH A 1/4 INCH MAXIMUM TOLERANCE TO BE ALLOWED. THE PRECAST SECTIONS SHALL BE INSTALLED IN A MANNER THAT WILL RESULT IN A WATERTIGHT JOINT.

D. WHERE HOLES MUST BE CUT IN THE PRECAST SECTIONS TO ACCOMMODATE PIPES, CUTTING SHALL BE DONE PRIOR TO SETTING THEM IN PLACE TO PREVENT ANY SUBSEQUENT JARRING WHICH MAY LOOSEN THE JOINTS.

3.04 BRICKWORK:

A. MORTAR SHALL BE MIXED ONLY IN SUCH QUANTITY AS MAY BE REQUIRED FOR IMMEDIATE USE AND USED BEFORE THE INITIAL SET HAS TAKEN PLACE. MORTAR SHALL NOT BE RETAINED FOR MORE THAN ONE HOUR AND SHALL BE CONSISTENTLY WORKED OVER WITH A SHOVEL OR HOE UNTIL USED.

B. BRICK MASONRY SHALL BE PROTECTED FROM TOO RAPID DRYING BY APPROVED MEANS AND SHALL BE PROTECTED FROM WEATHER AND FROST AS REQUIRED.

C. BRICKS SHALL BE CLEANED AND THOROUGHLY WETTED SHORTLY BEFORE THEY ARE PUT INTO THE WORK, AND EACH BRICK SHALL BE LAID IN A FULL BED OF MORTAR WITHOUT REQUIRING SUBSEQUENT GROUTING OR FILLING. JOINTS BETWEEN BRICKS SHALL NOT EXCEED 1/2 INCH AND SHALL BE POINTED.

3.05 FRAMES AND COVERS:

A. MANHOLE FRAMES – SHALL BE SET WITH THE TOPS CONFORMING ACCURATELY TO THE GRADE OF THE PAVEMENT OR FINISHED GROUND SURFACE OR AS INDICATED ON THE DRAWINGS. FRAMES SHALL BE SET CONCENTRIC WITH THE TOP OF THE MASONRY AND IN A FULL BED OF MORTAR SO THAT THE SPACE BETWEEN THE TOP OF THE MANHOLE MASONRY AND THE BOTTOM FLANGE OF THE FRAME SHALL BE COMPLETELY FILLED AND MADE WATERTIGHT. A THICK RING OF MORTAR EXTENDING TO THE OUTER EDGE OF THE MASONRY SHALL BE PLACED ALL AROUND AND ON THE TOP OF THE BOTTOM FLANGE. THE MORTAR SHALL BE SMOOTHLY FINISHED AND HAVE A SLIGHT SLOPE TO SHED WATER AWAY FROM THE FRAME.

B. MANHOLE COVERS SHALL BE LEFT IN PLACE IN THE FRAMES ON COMPLETION OF OTHER WORK AT THE MANHOLES.

C. A MAXIMUM OF 12" OF BRICK AND MORTAR SHALL BE ALLOWED FOR GRADE ADJUSTMENT.

D. COVERS AND GRATES SHALL BE SET IN THE FRAMES, SEATING BEING CLEANED BEFORE COVERS AND GRATES ARE SET.

3.06 SEWER SERVICE CONNECTIONS:

A. THE MINIMUM SIZE FOR THE BUILDING SEWER SERVICE CONNECTION SHALL BE 6".

B. THE MINIMUM SLOPE FOR THE BUILDING SEWER SERVICE SHALL BE 1/4" PER, FOOT, UNLESS OTHERWISE APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE.

C. BEFORE BACKFILLING, THE CONTRACTOR SHALL NOTIFY THE INSPECTOR SO THAT HE CAN MAKE THE NECESSARY MEASUREMENTS TO LOCATE THE OPENING LATER. IN ADDITION, AN APPROVED FERROUS ROD OR PIPE SHALL BE PLACED OVER THE PLUGGED OPENING AT THE PROPERTY LINE, EXTENDING TO WITHIN 2 INCHES OF THE FINAL GROUND SURFACE.

1. PROXIMITY TO WATER LINES:

a. THERE SHALL BE NO PHYSICAL CONNECTION BETWEEN A PUBLIC OR PRIVATE POTABLE WATER SUPPLY SYSTEM AND A SEWER OR SEWER APPURTENANCE WHICH WOULD PERMIT THE PASSAGE OF SEWAGE OR POLLUTED WATER INTO THE POTABLE SUPPLY. NO WATER PIPE SHALL PASS THROUGH OR COME IN CONTACT WITH ANY PART OF A SEWER OR SEWER MANHOLE.

1) NO SEWER SHALL BE LOCATED WITHIN THE WELL PROTECTIVE RADII ESTABLISHED IN ENV–WS 300 FOR ANY PUBLIC WATER SUPPLY WELLS OR WITHIN 100 FEET OF ANY PRIVATE WATER SUPPLY WELL.

2) SEWERS SHALL BE LOCATED AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN.

3) A DEVIATION FROM THE SEPARATION REQUIREMENTS OF (1) OR (2) ABOVE SHALL BE ALLOWED WHERE NECESSARY TO AVOID CONFLICT WITH SUBSURFACE STRUCTURES, UTILITY CHAMBERS, AND BUILDING FOUNDATIONS, PROVIDED THAT THE SEWER IS CONSTRUCTED IN ACCORDANCE WITH THE FORCE MAIN CONSTRUCTION REQUIREMENTS SPECIFIED IN ENV–WQ 704.08.

b. WHENEVER SEWERS MUST CROSS WATER MAINS, THE SEWER SHALL BE CONSTRUCTED AS FOLLOWS:

c. VERTICAL SEPARATION OF THE SEWER AND WATER MAIN SHALL BE NOT LESS THAN 18 INCHES, WITH WATER ABOVE SEWER; AND

d. SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.

e. HOWEVER, SHOULD CONSTRUCTION OPERATIONS REVEAL OR EXPOSE A WATERLINE MAIN OR SERVICE RUNNING APPROXIMATELY PARALLEL AND LESS THAN 10 FEET HORIZONTALLY FROM THE PROPOSED SEWER INSTALLATION AND WHERE IT IS NOT PRACTICABLE TO RELOCATE THE SEWER, THE FOLLOWING METHODS OF PROTECTION MUST BE EMPLOYED:

1) IF THE ABOVE SEPARATION CANNOT BE ACHIEVED, THE SEWER SHALL BE DUCTILE IRON PIPE OF THE SAME SIZE SHALL BE UTILIZED. APPROPRIATE MANUFACTURED FITTINGS SHALL BE EMPLOYED TO ADAPT THE IRON PIPE TO THE CONTRACT SEWER PIPE.

2) WHENEVER THE WATERLINE CROSSES OVER THE NEW SEWER WITH LESS THAN 18 INCHES OF SEPARATION, THE SEWER PIPE FOR A DISTANCE OF 6 FEET ON EACH SIDE OF THE WATERLINE SHALL BE CLASS 52 DUCTILE IRON PIPE. APPROPRIATE MANUFACTURED FITTINGS SHALL BE EMPLOYED TO ADAPT THE IRON PIPE TO THE CONTRACT SEWER PIPE. AS AN ALTERNATIVE, THE WATERLINE MAY BE RAISED, IF FEASIBLE, TO ACHIEVE THE REQUIRED SEPARATION.

3) SHOULD THE WATERLINE IN EITHER SITUATION BE AT OR BELOW THE SEWER ELEVATION, THE WATERLINE OR THE SEWER MUST BE RELOCATED TO ACHIEVE 10 FT. SEPARATION OR THE WATERLINE RAISED.

3.07 GRAVITY SEWER PIPE TESTING:

A. ALL NEW GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY THE USE OF LOW–PRESSURE AIR TESTS.

B. LOW–PRESSURE AIR TESTING SHALL BE IN CONFORMANCE WITH:

1. ASTM F1417–92(2005) "STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW–PRESSURE AIR"; OR
2. UNI–BELL PVC PIPE ASSOCIATION UNI–B–6, "LOW–PRESSURE AIR TESTING OF INSTALLED SEWER PIPE" (1998).

C. ALL NEW GRAVITY SEWERS SHALL BE:

1. CLEANED AND VISUALLY INSPECTED USING A LAMP TEST AND BY INTRODUCING WATER TO DETERMINE THAT THERE IS NO STANDING WATER IN THE SEWER; AND
2. TRUE TO LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE.

D. ALL PLASTIC SEWER PIPE SHALL BE VISUALLY INSPECTED AND DEFLECTION TESTED NOT LESS THAN 30 DAYS NOR MORE THAN 90 DAYS FOLLOWING INSTALLATION.

E. THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 5% OF AVERAGE INSIDE DIAMETER. A RIGID BALL OR MANDREL WITH A DIAMETER OF AT LEAST 95% OF THE AVERAGE INSIDE PIPE DIAMETER SHALL BE USED FOR TESTING PIPE DEFLECTION. THE DEFLECTION TEST SHALL BE CONDUCTED WITHOUT MECHANICAL PULLING DEVICES.

F. INSPECTION AND TESTING: – UPON COMPLETION OF THE INSTALLATION AND BACKFILLING PORTIONS OF THE SANITARY SEWER, THE PIPE SHALL BE INSPECTED BY THE VISUAL AND AIR TEST METHODS SUBSEQUENTLY DESCRIBED, OR AS REQUIRED BY THE TOWN DPW AND THE NHDES. THIS INSPECTION AND TESTING SHALL BE UNDERTAKEN AS THE WORK PROGRESSES. THE ENGINEER SHALL BE NOTIFIED IN ADVANCE OF SUCH INSPECTION AND TESTING AND THE CONTRACTOR SHALL PROVIDE ALL FACILITIES, MATERIALS, EQUIPMENT AND LABOR REQUIRED FOR SUCH TESTING. SUCH INSPECTION AND TESTING SHALL BE A PREREQUISITE FOR ACCEPTANCE OF ALL WORK.

1. VISUAL INSPECTION: – AN INSPECTION OF THE INTERIOR OF THE COMPLETED SANITARY SEWER PIPE BY DIRECT VISUAL INSPECTION SHALL BE MADE FOR ALL PIPE INSTALLED FROM MANHOLE TO MANHOLE AND FOR SERVICE LATERALS. ANY LIGHTS, EQUIPMENT OR LABOR NECESSARY FOR SUCH INSPECTION SHALL BE PROVIDED BY THE CONTRACTOR. CAMERA WORK TO BE PERFORMED BY NASSCO CERTIFIED CONTRACTOR.

ANY FOREIGN MATERIAL FOUND IN THE INTERIOR OF THE SEWER, ANY DIRT, DEBRIS OR OTHER OBJECTS SHALL BE REMOVED BY THE CONTRACTOR. VISIBLE DEFECTS SUCH AS BROKEN PIPE SECTIONS, IMPROPERLY INSTALLED GASKETS, PROJECTING CONNECTIONS, CRACKS, VISIBLE LEAKS OR OTHER DEFECTS SHALL BE NOTED, CORRECTED AND THE PIPE RE–INSPECTED.

2. AIR TESTING OF MAIN LINE GRAVITY SEWERS:

PROCEDURE:

a. PLUG PIPE OUTLETS WITH SUITABLE TEST PLUGS. BRACE EACH PLUG SECURELY.

b. PIPE AIR SUPPLY TO PIPELINE TO BE TESTED IN SUCH MANNER THAT AIR SUPPLY MAY BE SHUT OFF, PRESSURE OBSERVED, AND AIR PRESSURE RELEASED FROM PIPE WITHOUT WORKMEN ENTERING MANHOLE.

c. ADD AIR SLOWLY TO PORTION OF PIPE UNDER TEST UNTIL INTERNAL PRESSURE OF LINE IS RAISED TO APPROXIMATELY 4 PSIG, BUT LESS THAN 5 PSIG.

d. SHUT AIR SUPPLY OFF AND ALLOW AT LEAST 2 MINUTES FOR AIR PRESSURE TO STABILIZE.

e. WHEN PRESSURE HAS STABILIZED AND IS AT OR ABOVE STARTING TEST PRESSURE OF 3.5 PSI, START TEST.

f. DETERMINE TIME IN SECONDS WITH STOPWATCH FOR PRESSURE TO FALL 0.5 PSIG SO THAT PRESSURE AT END OF TIME IS AT OR ABOVE 3.0 PSIG.

g. COMPARE OBSERVED TIME WITH MINIMUM ALLOWABLE TIMES IN CHART BELOW FOR PASS/FAIL DETERMINATION.

AIR TESTING PASS/FAIL TESTING CRITERIA
SPECIFICATION TIME FOR LENGTH (L) SHOWN (MIN:SEC)

1 Pipe Diameter (in.)	2 Minimum Time (min:sec)	3 Length for Minimum Time (ft.)	4 Time for Longer Length (sec.)	100 ft	150 ft.	200 ft.	250 ft.	300 ft.	350 ft.	400 ft.
4	1:53	597	.190L	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	.427L	2:50	2:50	2:50	2:50	2:50	2:50	2:51
8	3:47	298	.760L	3:47	3:47	3:47	3:47	3:48	4:26	5:04
10	4:43	239	1.187L	4:43	4:43	4:43	4:57	5:56	6:55	7:54
12	5:40	199	1.709L	5:40	5:40	5:42	7:08	8:33	9:58	11:24
15	7:05	159	2.671L	7:05	7:05	8:54	11:08	13:21	15:35	17:48
18	8:30	133	3.846L	8:30	9:37	12:49	16:01	19:14	22:26	25:38
24	11:20	99	2.671L	11:24	17:57	22:48	28:30	34:11	39:53	45:35

3. SAFETY PRECAUTIONS:

LOW–PRESSURE AIR TEST MAY BE DANGEROUS TO PERSONNEL IF, THROUGH LACK OF UNDERSTANDING OR CARELESSNESS, LINE IS OVERPRESSURIZED OR PLUGS ARE INSTALLED IMPROPERLY. IT IS EXTREMELY IMPORTANT THAT VARIOUS PLUGS BE INSTALLED SO AS TO PREVENT THE SUDDEN EXPULSION OF POORLY INFLATED PLUGS. AS EXAMPLE OF HAZARD, FORCE OF 250–LB IS EXERTED ON 8–IN. PLUG BY INTERNAL PRESSURE OF 5 PSI. OBSERVE FOLLOWING SAFETY PRECAUTIONS:

a. NO PERSON SHALL BE ALLOWED IN MANHOLES DURING TEST OR WHEN PLUGGED PIPE IS UNDER PRESSURE.

b. GAUGES, AIR PIPING MANIFOLDS AND VALVES SHALL BE LOCATED AT TOP OF GROUND.

c. INSTALL AND BRACE PLUGS SECURELY.

d. DO NOT OVERPRESSURE LINES.

4. GROUNDWATER ELEVATION:

IF PIPELINE TO BE TESTED IS BELOW GROUNDWATER LEVEL, STARTING TEST PRESSURE SHALL BE INCREASED BY 0.433 PSI FOR EACH FOOT GROUNDWATER LEVEL IS ABOVE INVERT OF SEWER PIPE. IN NO CASE SHALL STARTING TEST PRESSURE EXCEED 9.0 PSIG.

FOR THE DETERMINATION OF GROUNDWATER LEVELS, OBSERVATION PIPES MAY BE PLACED IN THE TRENCH PRIOR TO BACKFILLING AS REQUIRED. THE LOWER END OF THE OBSERVATION PIPE SHALL BE EMBEDDED IN THE FOUNDATION STONE USED FOR SEWER BEDDING AT APPROXIMATELY THE SEWER INVERT ELEVATION AND THE UPPER END AT OR ABOVE FINISHED GRADE. PIPE SO INSTALLED FOR DEWATERING PURPOSES MAY BE USED FOR THIS PURPOSE. OBSERVATION PIPES SHALL BE INSTALLED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER AT LOCATIONS ADJACENT TO MANHOLES WHERE ORDERED BY THE ENGINEER.

5. ACCEPTANCE OF INSTALLATION:

NO GRAVITY SEWER OR MANHOLE WILL BE ACCEPTED THAT DOES NOT COMPLY WITH MINIMUM REQUIREMENTS OF TESTS DESCRIBED IN HEREIN. SEWERS, WHICH FAIL TO MEET TESTS, SHALL BE REPAIRED UNTIL THE NECESSARY REQUIREMENTS OF THIS SPECIFICATION ARE COMPLIED WITH AS EVIDENCED BY SUBSEQUENT TESTS. GROUNDWATER LEAKAGE INTO MANHOLES SHALL BE SUFFICIENT REASON FOR REQUIRING THE CONTRACTOR TO UNCOVER OR EXPOSE ANY PORTION OF THE MANHOLE FOR A THOROUGH EXAMINATION BY THE ENGINEER, AFTER WHICH THE MANHOLE SHALL BE REPAIRED AND AGAIN TESTED BY THE CONTRACTOR. FINAL ACCEPTANCE OF THE ENTIRE LENGTH OF SEWER CONSTRUCTED UNDER THIS CONTRACT WILL NOT BE ISSUED UNTIL THE ACCEPTABLE CRITERIA FOR EACH SECTION TESTED HAS BEEN REDUCED TO RATES HEREINBEFORE SPECIFIED. FAILURE TO CONFORM TO THE FOREGOING REQUIREMENTS SHALL CAUSE THE WORK TO BE REJECTED. IF THERE IS A VISIBLE LEAK AT ANY JOINT OR AT ANY OTHER PART OF THE SEWER OR SEWER STRUCTURE, THE WORK SHALL BE REJECTED.

6. TEST EQUIPMENT:

NECESSARY EQUIPMENT TO PERFORM AIR TEST IN ACCORDANCE WITH SPECIFICATIONS SHALL BE PROVIDED BY CONTRACTOR. TEST GAUGE SHALL PREFERABLY HAVE INCREMENTAL DIVISION OF 0.10 PSI AND HAVE ACCURACY OF AT LEAST 0.04 PSI. IN NO CASE SHALL TEST GAUGE BE USED WHICH HAS INCREMENTAL DIVISIONS OF GREATER THAN 0.25 PSI. GAUGE SHALL BE OF SUFFICIENT SIZE IN ORDER TO DETERMINE THIS ACCURACY.

7. SUBMITTALS:

FURNISH 1 COPY OF GRAVITY SEWER AND MANHOLE TEST RESULTS TO OWNER AND GOVERNING AGENCY UPON COMPLETION OF GRAVITY SEWER SYSTEM BACKFILLING OPERATIONS.

3.08 SANITARY MANHOLE TESTING:

A. MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST.

B. THE MANHOLE VACUUM TEST SHALL CONFORM TO THE FOLLOWING:

C. THE INITIAL VACUUM GAUGE TEST PRESSURE SHALL BE 10 INCHES HG; AND

1. THE MINIMUM ACCEPTABLE TEST HOLD TIME FOR A 1–INCH HG PRESSURE DROP TO 9 INCHES HG SHALL BE:
   a. NOT LESS THAN 2 MINUTES FOR MANHOLES LESS THAN 10 FEET DEEP IN DEPTH;
   b. NOT LESS THAN 2.5 MINUTES FOR MANHOLES 10 TO 15 FEET DEEP; AND
   c. NOT LESS THAN 3 MINUTES FOR MANHOLES MORE THAN 15 FEET DEEP;
2. THE MANHOLE SHALL BE REPAIRED AND RETESTED IF THE TEST HOLD TIMES FAIL TO ACHIEVE THE ACCEPTANCE LIMITS SPECIFIED ABOVE.
3. FOLLOWING COMPLETION OF THE LEAKAGE TEST, THE FRAME AND COVER SHALL BE PLACED ON THE TOP OF THE MANHOLE OR SOME OTHER MEANS USED TO PREVENT ACCIDENTAL ENTRY BY UNAUTHORIZED PERSONS, CHILDREN, OR ANIMALS, UNTIL THE CONTRACTOR IS READY TO MAKE FINAL ADJUSTMENT TO GRADE
4. NO INVERTS SHALL BE INSTALLED UNTIL MANHOLE TESTING HAS BEEN SATISFACTORILY COMPLETED.

3.09 FORCE MAIN TESTING: PER Env–Wq 704.09, FORCE MAINS AND PRESSURE SEWERS SHALL BE TESTED IN ACCORDANCE WITH SECTION 5 OF THE AWWA C600, "INSTALLATION OF CAST IRON WATER MAINS AND THEIR APPURTENANCES" STANDARD IN EFFECT WHEN THE TEST IS CONDUCTED AT A PRESSURE EQUAL TO THE GREATER OF 150 PERCENT OF THE DESIGN OPERATING TOTAL DYNAMIC HEAD OR AT LEAST 100 PSI.

STATE OF NEW HAMPSHIRE – BRIAN D. JONES No. 13809 LICENSED – PROFESSIONAL ENGINEER

11-20-23

PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:

ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	AS SHOWN	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
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MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501

WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: DETAILS

SHEET No. C-508

LEGEND

- DECIDUOUS TREE
- EVERGREEN TREE
- FLOWERING TREE
- SHRUBS
- MULCH BED
- PERENNIALS/GROUNDCOVER
- WILDFLOWER SEED MIX
- EROSION CONTROL SEED MIX

GENERAL NOTES

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR IT'S REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
2. THE INFORMATION SHOWN ON THIS PLAN IS THE SOLE PROPERTY OF ALLEN & MAJOR ASSOCIATES, INC. IT'S INTENDED USE IS TO PROVIDE INFORMATION. ANY ALTERATION, MISUSE, OR RECALCULATION OF INFORMATION OR DATA WITHOUT THE EXPRESSED, WRITTEN CONSENT OF ALLEN & MAJOR ASSOCIATES, INC. IS STRICTLY PROHIBITED.
3. ALL LANDSCAPED AREAS WITH SHRUBS, TREES, AND PERENNIALS TO HAVE 2 FEET MINIMUM DEPTH OF TOPSOIL. TWO FEET OF TOPSOIL AROUND TREES AND SHRUBS DOES NOT INCLUDE AMENDED PLANTING SOIL WITHIN TREE / SHRUB PIT FOR FULL DEPTH OF ROOTBALLS. SEE PLANTING DETAILS FOR PLANTING DEPTH AT SHRUBS AND TREES. ALL AREAS OF LOAM AND SEED TO HAVE 6" MINIMUM DEPTH OF TOPSOIL. TOPSOIL TO BE TESTED BY CONTRACTOR, AND APPROVED BY A&M PRIOR TO PURCHASE AND OR PLACEMENT. GENERAL CONTRACTOR, DEMOLITION CONTRACTOR, AND LANDSCAPE CONTRACTOR TO COORDINATE PROPER DEPTH OF EXISTING MATERIAL REMOVAL ACROSS SITE SO THAT 2 FEET MINIMUM AND 6" MINIMUM DEPTHS OF PROPOSED TOPSOIL NOTED ABOVE ARE MET AT NO ADDITIONAL COST TO OWNER. SEE TOPSOIL DETAIL.
4. ALL PLANTING AND SEEDING WORK WITHIN THE RIGHT-OF-WAY SHALL CONFORM TO THE CITY OF PORTSMOUTH REQUIREMENTS, SEE SHEET L-502 FOR ADDITIONAL INFORMATION.
5. NO CLEARING OR WORK SHALL BE PERFORMED WITHIN THE 25' WETLAND BUFFER. SIGNS SHALL BE INSTALLED ALONG THE 25' WETLAND BUFFER AND SHALL READ "NO MOWING BEYOND THIS POINT". SIGNS SHALL BE INSTALLED ON METAL POSTS AT 48" ABOVE THE GROUND AND SPACED NO MORE THAN 50' APART.

LICENSED LANDSCAPE ARCHITECT
BETHANY C. DERMODY
006
STATE OF NEW HAMPSHIRE
11-10-23

PROFESSIONAL LANDSCAPE ARCHITECT FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
3	11-10-23	REVISED PER TAC COMMENTS
2	10-20-23	REVISED PER TAC COMMENTS
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	1" = 30'	DWG. NAME:	L-3250-01.dwg
DESIGNED BY:	BCD	CHECKED BY:	RPC

PREPARED BY:
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WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: LANDSCAPE PLAN

SHEET No. L-101

PEASE DEVELOPMENT CONTROLS REGULATIONS:

305.03 LANDSCAPING AND SCREENING

(a) LANDSCAPING

(1) APPROPRIATE LANDSCAPING SHALL BE PROVIDED IN ACCORDANCE WITH AN APPROVED LANDSCAPING PLAN.

(2) LANDSCAPING TREATMENT SHALL CONSIST OF NATURAL VEGETATION OR FEATURES, GROUND COVER, SHRUBS AND TREES AS APPROPRIATE.

(3) LANDSCAPING PLANS SHALL MEET THE REQUIREMENTS OF SECTION 405.03 OF THE PEASE DEVELOPMENT AUTHORITY SITE PLAN REGULATIONS.

(b) SCREENING

(1) APPROPRIATE BUFFERS SHALL BE PROVIDED AND MAINTAINED TO SCREEN THE FOLLOWING USES FROM ADJOINING PROPERTIES:

a) ANY OFF-STREET PARKING OR LOADING AREA.

b) ALL OUTDOOR AREAS OR FACILITIES FOR THE STORAGE OF FUEL, SOLID WASTE, MATERIALS OR PRODUCTS.

c) ANY COMMERCIAL PARKING LOT.

d) ANY PRINCIPAL USE NOT CONDUCTED WHOLLY WITHIN A BUILDING.

1. E) AS OTHERWISE REQUIRED BY THE BOARD.

PEASE DEVELOPMENT SITE PLAN REGULATIONS:

405.03

SCREENING AND LANDSCAPING

(a) LANDSCAPING PLAN

(1) A LANDSCAPING PLAN SHALL BE SUBMITTED AS PART OF THE SITE PLAN APPLICATION. THE PLAN SHALL IDENTIFY EXISTING AND PROPOSED LANDSCAPING ELEMENTS AND SHOW LOCATION AND PLANTING AND/OR CONSTRUCTION DETAILS. WHERE EXISTING PLANTINGS ARE TO BE RETAINED, PROPOSED METHODS OF PROTECTING SUCH PLANTINGS DURING CONSTRUCTION SHALL BE INCLUDED WHERE APPLICABLE.

(2) LANDSCAPING SHALL BE CONCEIVED IN A TOTAL PATTERN THROUGHOUT THE SITE, INTEGRATING THE VARIOUS ELEMENTS OF SITE DESIGN, PRESERVING AND ENHANCING THE PARTICULAR IDENTITY OF THE SITE, AND CREATING A PLEASING SITE CHARACTER.

(3) LANDSCAPING MAY INCLUDE PLANT MATERIALS SUCH AS TREES, SHRUBS, GROUND COVERS, PERENNIALS, AND ANNUALS, AND OTHER MATERIALS SUCH AS ROCKS, WATER, SCULPTURE, ART, WALLS, FENCES, PAVING MATERIALS AND STREET FURNITURE.

(4) ALL PARKING LOTS CONSTRUCTED OR REDEVELOPED AT PEASE SHALL MEET THE FOLLOWING REQUIREMENTS:

a) SCREENING: ALL PARKING LOTS CONTAINING MORE THAN 25 PARKING SPACES SHALL BE APPROPRIATELY SCREENED FROM ADJACENT PROPERTIES AND ROADWAYS WITH LANDSCAPE BERMS AND/OR PLANTINGS IN ORDER TO MINIMIZE THE AESTHETIC IMPACT OF THE PARKING LOT.

b) LANDSCAPED ISLANDS: ALL PARKING ROWS CONTAINING MORE THAN 10 SPACES SHALL HAVE LANDSCAPED ISLANDS THE SIZE OF A PARKING SPACE AT BOTH ENDS OF THE ROW.

c) LENGTH OF ROWS: NO PARKING LOT SHALL CONTAIN MORE THAN 18 PARKING SPACES IN A ROW WITHOUT THE INCLUSION OF A LANDSCAPED ISLAND OF THE SAME SIZE AS THE PARKING SPACES IN THAT ROW.

d) MULTIPLE PARKING AISLES: THERE MUST BE A 12' WIDE LANDSCAPED STRIP BETWEEN EVERY SECOND ROW OF DOUBLE STACKED PARKING.

e)LANDSCAPE ISLANDS EXCEPT THAT THE CURBING MAY BE INTERRUPTED TO ALLOW FOR INFILTRATION OF STORMWATER.

(B) SCREENING

(1) SCREENING SHALL BE PROVIDED FOR ALL DEVELOPMENT OF LAND IN ORDER TO MINIMIZE ADVERSE VISUAL IMPACTS.

(2) STRUCTURES VISIBLE FROM A PUBLIC STREET SHALL BE PARTIALLY SCREENED WITH FLOWERING OR EVERGREEN SHRUBS.

(3) SOLID WASTE COLLECTION EQUIPMENT, PUMP STATIONS, OUTDOOR STORAGE AND OTHER OUTDOOR USES VISIBLE FROM A PUBLIC STREET SHALL BE SCREENED WITH A SOLID FENCE AND/OR EVERGREEN SHRUBS.

PLANTING SCHEDULE -TREES, SHRUBS, GROUNDCOVERS & PERENNIALS

KEY	QUANTITY	BOTANICAL NAME	COMMON NAME	MIN. SIZE	SPACING	COMMENTS
DECIDUOUS TREES						
AR	7	ACER RUBRUM 'RED SUNSET'	RED SUNSET MAPLE	2"-2.5" CAL.	AS SHOWN	B&B
AC	5	AMELANCHIER CANADENSIS	SERVICEBERRY	6-7' HT.	AS SHOWN	B&B, MULTISTEM
BP	4	BETULA PAPYRIFERA	PAPER BIRCH	12-14' HT.	AS SHOWN	B&B, MULTISTEM
CK	3	CORNUS KOUSA	KOUSA DOGWOOD	2"-2.5" CAL.	AS SHOWN	B&B
CKW	1	CORNUS KOUSA 'WOLF EYES'	WOLF EYES KOUSA DOGWOOD	2"-2.5" CAL.	AS SHOWN	B&B-SPECIMEN
CV	3	CHIONANTHUS VIRGINICUS	WHITE FRINGE TREE	2"-2.5" CAL.	AS SHOWN	B&B
FA	3	FRANKLINIA ALATAMAHA	FRANKLIN TREE	6-7' HT.	AS SHOWN	B&B
FS	1	FAGUS SYLVATICA 'RIVERSII'	RIVER'S PURPLE BEECH	2"-2.5" CAL.	AS SHOWN	B&B
MB	2	MAGNOLIA 'BUTTERFLY'	BUTTERFLY MAGNOLIA	6-7' HT.	AS SHOWN	B&B
QA	3	QUERCUS ALBA	WHITE OAK	2"-2.5" CAL.	AS SHOWN	B&B
QC	3	QUERCUS COCCINEA	SCARLET OAK	2"-2.5" CAL.	AS SHOWN	B&B
NS	8	NYSSA SYLVATICA 'GREEN GABLE'	GREEN GABLE TUPELO	2"-2.5" CAL.	AS SHOWN	B&B
TC	6	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LINDEN	2"-2.5" CAL.	AS SHOWN	B&B
EVERGREEN TREES						
PG	9	PICEA GLAUCA	WHITE SPRUCE	6-7' HT.	AS SHOWN	B&B
TO	9	THUJA OCCIDENTALIS 'SMARAGD'	EMERALD GREEN ARBORVITAE	5-6' HT.	AS SHOWN	B&B
SHRUBS						
AZ	24	AZALEA 'DELAWARE WHITE'	DELAWARE WHITE AZALEA	#5	AS SHOWN	POT
BG	8	BUXUS 'GREEN GEM'	GREEN GEM BOXWOOD	#3	AS SHOWN	B&B
CA	26	CLETHRA ALNIFOLIA 'HUMMINGBIRD'	HUMMINGBIRD SUMMERSWEET	#5	AS SHOWN	POT
CI	18	CORNUS SERICEA 'ALLEMAN'S COMPACTA'	ALLEMAN'S COMPACT RED OSIER DOGWOOD	#5	AS SHOWN	POT
FG	24	FOTHERGILLA GARDENII	DWARF FOTHEREGILLA	2-2.5'	AS SHOWN	B&B
HY	18	HYDRANGEA ARBORESCENS 'INCREDIBALL'	INCREDIBALL HYDRANGEA	#5	AS SHOWN	B&B
IG	61	ILEX GLABRA 'SHAMROCK'	SHAMROCK INKBERRY	#5	AS SHOWN	B&B
MP	52	MYRICA PENSYLVANICA	BAYBERRY	2.5'-3' HT.	AS SHOWN	B&B
RA	6	RHODODENDRON 'APRIL ROSE'	APRIL ROSE RHODODENDRON	2.5'-3' HT.	AS SHOWN	B&B
PM	12	PRUNUS MARITIMA	BEACH PLUM	#10	AS SHOWN	POT
RK	12	PINK DOUBLE KNOCK OUT	PINK DOUBLE KNOCK OUT ROSE	#3	AS SHOWN	POT
TM	86	TAXUS MEDIA 'GREENWAVE'	GREENWAVE YEW	18-24"	AS SHOWN	B&B
VD	22	VIBURNUM DENTATUM 'BLUE MUFFIN'	BLUE MUFFIN VIBURNUM	3-4' HT.	AS SHOWN	B&B
PERENNIALS/GRASSES						
AI	73	ASCLEPIAS INCARNATA	ROSE MILK WEED	#2	36" O.C.	STAGGERED
AT	113	ASCLEPIAS TUBEROSA	BUTTERFLY WEED	#2	24" O.C.	STAGGERED
AH	57	AMSONIA HUBRICHTII	THREAD-LEAFED BLUESTAR	#2	24" O.C.	STAGGERED
BA	41	BAPTISIA AUSTRALIS	BLUE FALSE INDIGO	#2	AS SHOWN	STAGGERED
PV	62	PANICUM VIRGATUM	SWITCH GRASS	#3	36" O.C.	STAGGERED
DP	79	DENSTEADTIA PUNCTILOBA	HAYSCENTED FERN	#2	24" O.C.	STAGGERED
DS	42	SPOROBOLUS HETEROLEPIS	PRAIRIE DROPSEED	#2	24" O.C.	STAGGERED
HO	34	HOSTA 'GUACAMOLE'	GUACAMOLE HOSTA	#2	24" O.C.	STAGGERED
HS	48	HEMEROCALLIS 'BIG TIME HAPPY'	BIG TIME HAPPY DAYLILLY	#2	24" O.C.	STAGGERED
NP	42	NEPETA 'PURRSIAN BLUE'	PURRSIAN BLUE CATMINT	#2	24" O.C.	STAGGERED
RF	182	RUDBECKIA FULGIDA FULGIDA	BLACK EYED SUSAN	#2	24" O.C.	STAGGERED

*ANNUALS / SEASONAL COLOR TO BE "MIDNIGHT FROST" MIX BY PROVEN WINNERS OR EQUAL.

CONSERVATION WILDLIFE SEED MIX:

NEW ENGLAND CONSERVATION / WILDLIFE MIX
(BY NEW ENGLAND WETLAND PLANTS INC. – NEWP.COM)
APPLICATION RATE: 25 LBS/ACRE | 1750 SQ FT/LB

ITEM	BOTANICAL NAME	COMMON NAME	INDICATOR
1.	ELYMUS VIRGINICUS	VIRGINIA WILD RYE	FACW
2.	CHAMAECRISTA FASCICULATA	PARTRIDGE PEA	FACU
3.	FESTUCA RUBRA	RED FESCUE	FACU
4.	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	FACU
5.	ANDROPOGON GERARDII	BIG BLUESTEM	FACU
6.	PANICUM VIRGATUM	SWITCH GRASS	FAC
7.	DESMODIUM PANICULATUM	PANICLEDLEAF TICK TREFOIL	FACU
8.	SORGHASTRUM NUTANS	INDIAN GRASS	FACU
9.	VERBENA HASTATA	BLUE VERVAIN	FACW
10.	ASCLEPIAS TUBEROSA	BUTTERFLY MILKWEED	
11.	RUDBECKIA HIRTA	BLACK EYED SUSAN	FACU
12.	HELENIUM AUTUMNALE	FALL SNEEZEWEED	FACW
13.	ASTERPILOSUS/SYMPHYOTRICHUM PILOSUM	HEATH ASTER	FACU
14.	SOLIDAGO JUNCEA	EARLY GOLDENROD	
15.	AGROSTIS PERENNANS	UPLAND BENTGRASS	FACU

THE NEW ENGLAND CONSERVATION/WILDLIFE MIX PROVIDES A PERMANENT COVER OF GRASSES, WILDFLOWERS, AND LEGUMES. FOR BOTH GOOD EROSION CONTROL AND WILDLIFE HABITAT VALUE. THE MIX IS DESIGNED TO BE A NO MAINTENANCE SEEDING, AND IS APPROPRIATE FOR CUT AND FILL SLOPES, DETENTION BASIN SIDE SLOPES, AND DISTURBED AREAS ADJACENT TO COMMERCIAL AND RESIDENTIAL PROJECTS.

LANDSCAPE NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY/TOWN OF PORTSMOUTH, NH. PLANTING PLAN IS DIAGRAMMATIC IN NATURE. FINAL PLACEMENT OF PLANTS TO BE APPROVED BY THE LANDSCAPE ARCHITECT IN THE FIELD.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES, ANY PERMITTING AGENCIES, AND "DIG-SAFE" (1-888-344-7233) AT LEAST 72 HOURS IN ADVANCE OF ANY WORK THAT WILL REQUIRE EXCAVATION. CONTRACTOR SHALL NOTIFY THE OWNERS REPRESENTATIVE OF NAY CONFLICTS IN WRITING.
3. NO PLANT MATERIAL SHALL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
4. ANY TREES NOTED AS "SEAL OR SELECTED SPECIMEN" SHALL BE TAGGED AND SEALED BY THE LANDSCAPE ARCHITECT.
5. ALL TREES SHALL BE BALLED AND BURLAPPED (B&B) UNLESS OTHERWISE NOTED OR APPROVED BY THE OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT.
6. CONTRACTOR SHALL VERIFY QUANTITIES SHOWN ON PLANT LIST. QUANTITIES SHOWN ON PLANS SHALL GOVERN OVER PLANT LIST.
7. ANY PROPOSED PLANT SUBSTITUTIONS MUST BE APPROVED IN WRITING BY OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT.
8. ALL PLANT MATERIALS INSTALLED SHALL MEET THE GUIDELINES ESTABLISHED BY THE AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY AMERICANHORT (LATEST EDITION).
9. ALL PLANT MATERIALS SHALL BE GUARANTEED FOR ONE YEAR FOLLOWING DATE OF ACCEPTANCE. ANY PLANT MATERIALS WHICH DIE WITHIN THE ONE YEAR PLANT GUARANTEE PERIOD WILL BE REPLACED BY THE LANDSCAPE CONTRACTOR. OWNERS TO COORDINATE DIRECTLY WITH THE LANDSCAPE CONTRACTOR FOR REPLACEMENT PLANTINGS.
10. ALL DISTURBED AREAS NOT OTHERWISE NOTED SHALL RECEIVE 6" OF SUITABLE LOAM & SEED.
11. LAWNS WITH 3:1 OR GREATER SLOPES SHALL BE PROTECTED WITH AN EROSION CONTROL BLANKET.
12. ANY FALL TRANSPLANTING HAZARD PLANTS SHALL BE DUG IN THE SPRING AND STORED FOR FALL PLANTING.
13. TREES SHALL HAVE A MINIMUM CALIPER AS INDICATED ON THE PLANTING SCHEDULE TAKEN ONE FOOT ABOVE THE ROOT CROWN.
14. ALL PLANT BEDS AND TREE SAUCERS TO RECEIVE 3" OF PINE BARK MULCH. GROUNDCOVER AREAS SHALL RECEIVE 1" OF PINE BARK MULCH.
15. ALL DECIDUOUS TREES ADJACENT TO WALKWAYS AND ROADWAYS SHALL HAVE A BRANCHING PATTERN TO ALLOW FOR A MINIMUM OF 7' OF CLEARANCE BETWEEN THE GROUND AND THE LOWEST BRANCH.
16. ALL TREE STAKES SHALL BE STAINED DARK BROWN.
17. CONTRACTOR RESPONSIBLE FOR WATERING AND RESEEDING OF BARE SPOTS UNTIL A UNIFORM STAND OF VEGETATION IS ESTABLISHED AND ACCEPTED.
18. ALL PARKING ISLANDS PLANTED WITH SHRUBS SHALL HAVE 24" OF TOP SOIL. FINISH GRADE SHALL BE SLOPED TO SIX INCHES (6") ABOVE THE TOP OF CURB.
19. SOIL SAMPLES, TESTS, AND SHOP DRAWINGS SHALL BE PROVIDED TO THE LANDSCAPE ARCHITECT OR THE OWNER FOR APPROVAL PRIOR TO CONSTRUCTION.
20. SLOPES AT 2:1 SHOULD HAVE 6" LOAM & SEED. SEEDING OF 2:1 SLOPES SHALL OCCUR IN THE DRY & AFTER SLOPES ARE COMPACTED.
21. ALL LANDSCAPED AREAS WITH SHRUBS, TREES, AND PERENNIALS TO HAVE 2 FEET MINIMUM DEPTH OF TOPSOIL. TWO FEET OF TOPSOIL AROUND TREES AND SHRUBS DOES NOT INCLUDE AMENDED PLANTING SOIL WITHIN TREE / SHRUB PIT FOR FULL DEPTH OF ROOTBALLS. SEE PLANTING DETAILS FOR PLANTING DEPTH AT SHRUBS AND TREES. ALL AREAS OF LOAM AND SEED TO HAVE 6" MINIMUM DEPTH OF TOPSOIL. TOPSOIL TO BE TESTED BY CONTRACTOR, AND APPROVED BY A&M PRIOR TO PURCHASE AND OR PLACEMENT. GENERAL, DEMOLITION, AND LANDSCAPE CONTRACTORS TO COORDINATE PROPER DEPTH OF EXISTING MATERIAL REMOVAL ACROSS SITE SO THAT 2 FEET MINIMUM AND 6" MINIMUM DEPTHS OF PROPOSED TOPSOIL NOTED ABOVE ARE MET. SEE TOPSOIL DETAIL.
22. PRIOR TO LAYING TOPSOIL, ALL SUBSOIL (BELOW PROPOSED TOPSOIL) TO BE TILLED TO A DEPTH OF AT LEAST 18" TO REMOVE CONSTRUCTION COMPACTION AND ALLOW FOR PROPER DRAINAGE OF TOPSOILS.
23. ALL SEEDING TO BE COMPLETED "IN SEASON" BETWEEN APRIL 1 TO JUNE 15 OR AUGUST 15 TO OCTOBER 1, EXCEPT FOR RE-SEEDING OF BARE SPOTS. AT ALL SLOPED AREAS CONTRACTOR TO INSTALL COCONUT FIBER JUTE MESH NETTING ON ALL SLOPES 3:1 AND GREATER, HYDROSEED ALL EXPOSED AREAS, ADD SOIL STABILIZER "FLEXTERRA HP-FGM" AS MANUFACTURED BY "PROFILE" TO HYDROSEED (AT RATE OF 3,000 LBS PER ACRE). CONTRACTOR TO ALSO BE RESPONSIBLE FOR RE-GRADING AND RE-SEEDING ALL DISTURBED, ERODED, OR BARE SPOTS & UNTIL SLOPES ARE FULLY STABLE. CONTRACTOR RESPONSIBLE FOR ALL MAINTENANCE UNTIL FINAL ACCEPTANCE OF LAWN AREAS INCLUDING: WATERING, ADDING FERTILIZERS AND LIME AND MOWING.
24. AFTER SEEDING, ALL AREAS TO BE LIGHTLY MULCHED WITH WEED FREE STRAW & CONTINUALLY WATERED EVERY DAY SO THAT SEED IS KEPT MOIST UNTIL SEED IS ESTABLISHED & APPROVED BY A&M LANDSCAPE ARCHITECT (USE NO HAY).
25. IF THERE IS NO PROPOSED IRRIGATION SYSTEM AFTER PLANTINGS & LAWNS & SEEDED AREAS HAVE BEEN INSTALLED, LANDSCAPE CONTRACTOR RESPONSIBLE TO TEMPORARILY WATER ALL INSTALLED PLANTINGS, SEEDED AREAS, & LAWN AREAS MIN. 4 TIMES A WEEK DURING INITIAL ESTABLISHMENT PERIOD OF 6 MONTHS AFTER ALL LANDSCAPING IS INSTALLED.
26. ALL PROPOSED LANDSCAPE AREAS INCLUDING MOWED LAWNS, TREES, SHRUB BEDS, AND PERENNIALS SHALL BE PROVIDED WITH WATER EFFICIENT UNDERGROUND IRRIGATION. DESIGN AND INSTALLATION OF IRRIGATION SYSTEM TO BE PERFORMED BY AN APPROVED IRRIGATION DESIGN BUILD CONTRACTOR OR BY AN APPROVED EQUAL TO BE DETERMINED BY THE OWNERS REPRESENTATIVE AND LANDSCAPE ARCHITECT. IRRIGATION SYSTEM IS TO BE DESIGNED FOR EFFICIENT WATER USAGE INCLUDING: USE OF DRIP IRRIGATION FOR SHRUBS AND PERENNIALS, IRRIGATION SYSTEM WITH HEAD-TO-HEAD COVERAGE, A CENTRAL SHUT-OFF VALVE, SEPARATE ZONES FOR EACH TYPE OF BEDDING AREA BASED ON WATERING NEEDS, AND A RAIN SENSOR TO SHUT OFF IRRIGATION DURING RAIN EVENTS.
27. SEEDING OF BIORETENTION & DETENTION AREAS & OTHER SLOPE AREAS SHALL OCCUR IN THE DRY & AFTER SLOPES ARE COMPACTED. IT IS IMPORTANT, THAT THE BIORETENTION AREAS/ DETENTION BASIN BE SEEDED AT THE BEGINNING OF THE PROJECT & PRIOR TO ANY DRAINAGE BEING DIRECTED TOWARDS THE BASIN. THE SEED AT DETENTION AREAS & OTHER SLOPED AREAS WILL NEED A MINIMUM OF 6 MONTHS TO INITIALLY ESTABLISH PRIOR TO THE DETENTION BASIN BEING UTILIZED SO THAT THERE IS NOT EROSION & SLOPE FAILURE. LIGHTLY RAKE SOIL TO ENSURE GOOD SEED-TO-SOIL CONTACT. SEE SEED MIX DETAIL NOTES.
28. FOR SPREADING OF THE SEED WITH DRY DETENTION BASINS, WATER LEVELS MAY BE LOWERED IN THE DETENTION AREAS BY RELYING ON DRY SEASON AND OR DRY SPELLS; OR MAY BE ACCOMPLISHED THROUGH THE USE OF DEWATERING METHODS. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ANY DEWATERING METHODS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. WATER FROM ANY DEWATERING OPERATION SHALL BE TREATED TO REDUCE TOTAL SUSPENDED SOLIDS AND BE IN COMPLIANCE WITH STATE AND FEDERAL STANDARDS.
29. NO SOIL MATERIAL TO BE REMOVED OFF SITE PER PEASE DEVELOPMENT REGULATIONS.
30. SEE L-502 FOR PORTSMOUTH TREE PLANTING DETAIL, TOPSOIL SPECIFICATIONS AND PLANTING REQUIREMENTS.

LICENSED LANDSCAPE ARCHITECT
BETHANY C. DERMODY
006
STATE OF NEW HAMPSHIRE
11-10-23
Bethany C. Dermody

PROFESSIONAL LANDSCAPE ARCHITECT FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
2	10-20-23	REVISED PER TAC COMMENTS
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	AS SHOWN	DWG. NAME:	L-3250-01.dwg
DESIGNED BY:	BCD	CHECKED BY:	RPC

PREPARED BY:
ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
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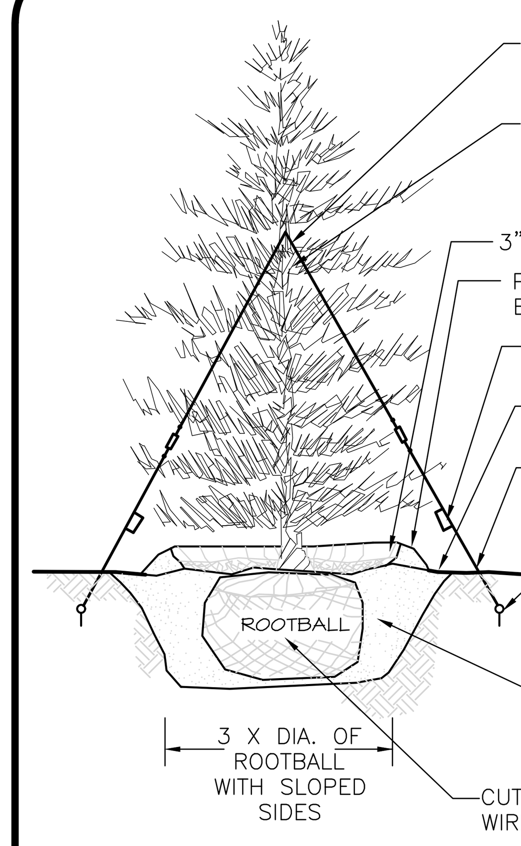
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: LANDSCAPE NOTES & DETAILS

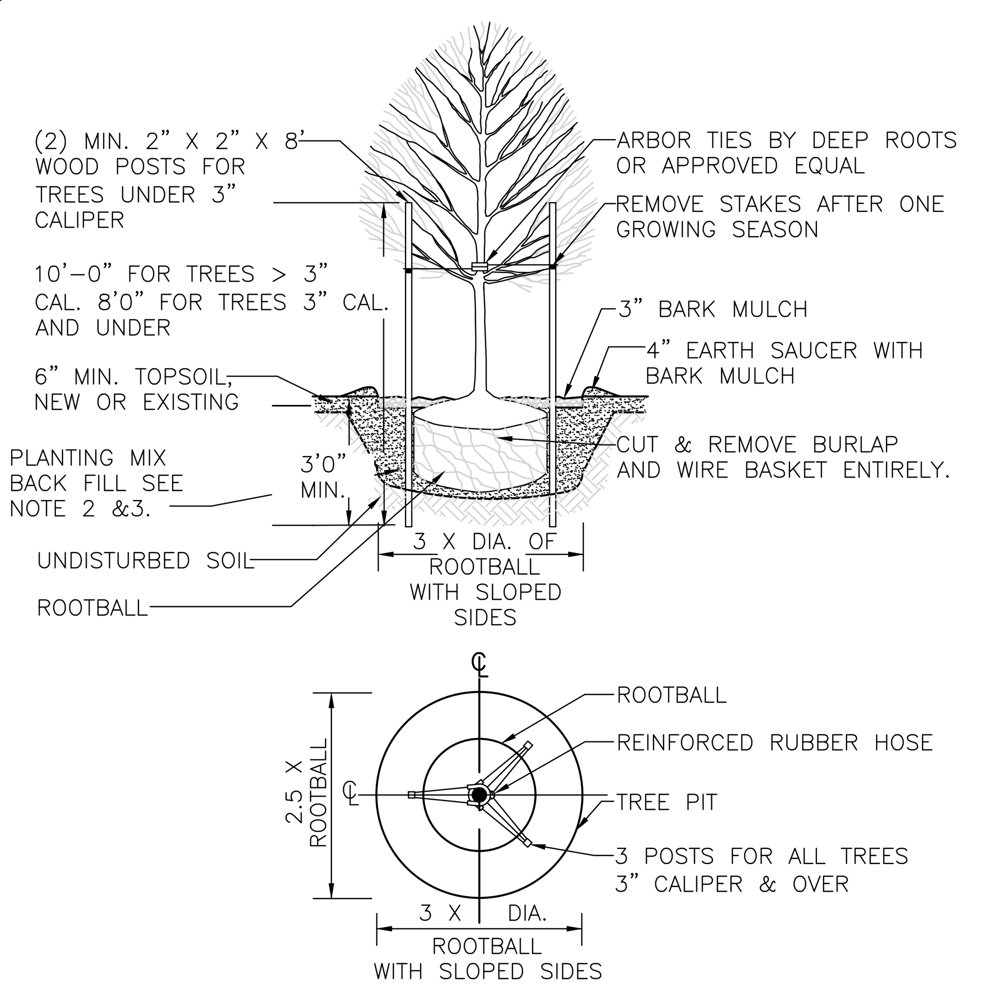
SHEET No. L-401



NOTES

1. TREES SHALL BEAR SAME RELATIONSHIP TO FINISH GRADE AS IT BORE TO NURSERY OR FIELD GRADE. ROOT FLARE SHALL BE 2" ABOVE FINISH GRADE. REMOVE SOIL FROM TRUNK FLARE OF TREE TO DETERMINE ACTUAL TOP OF ROOTBALL AREA.
2. INSTALL THREE GUYS PER TREE; EQUALLY SPACED AROUND BALL.
3. ATTACH GUYS AT 2/3 HEIGHT OF TREE.
4. BACKFILL WITH PLANTING MIX. PLANT MIX TO BE: 50% NATIVE TOPSOIL, 20% COMPOST (LEAVES & ORGANIC MATERIAL, NO ASH) 20% PEAT MOSS, 10% SAND.
5. ADD MYCORRHIZA SOIL ADDITIVES AND SLOW RELEASE FERTILIZER WHEN PLANT HOLES ARE 50% FILLED AND WATER THOROUGHLY AT COMPLETION.

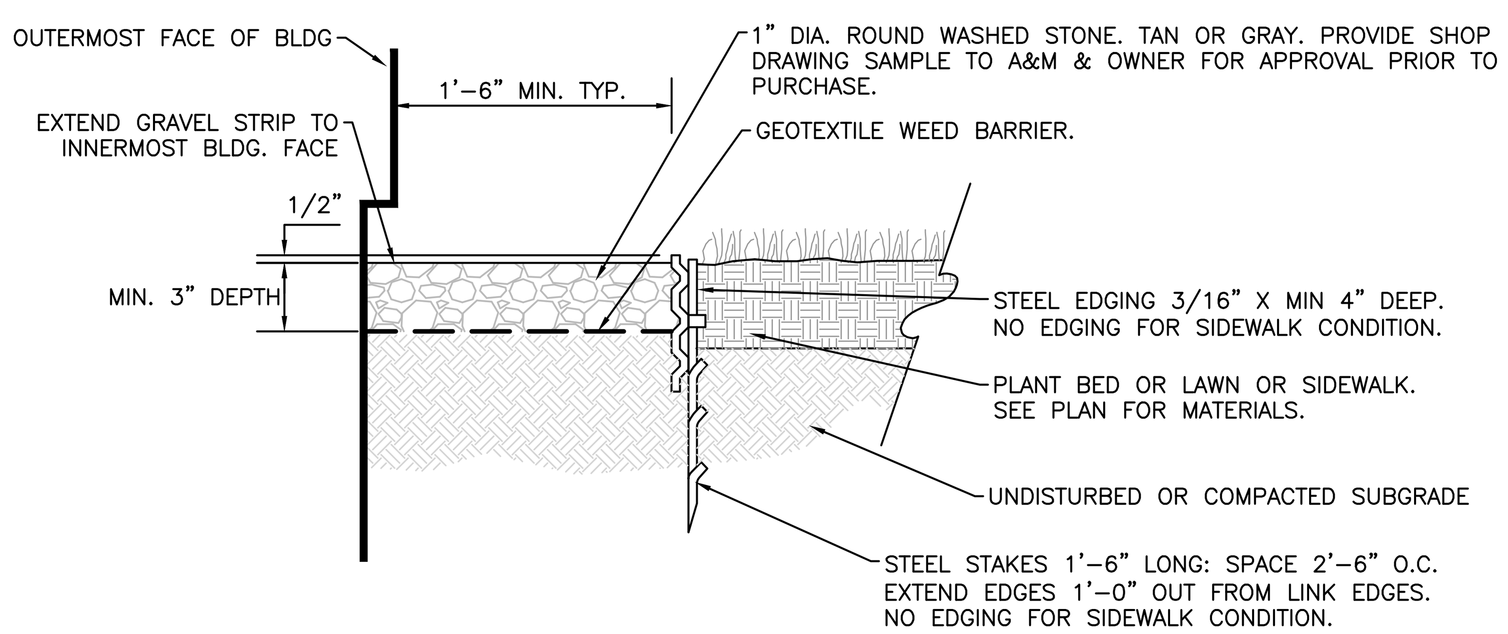
EVERGREEN TREE DETAIL (1)
NOT TO SCALE



NOTES:

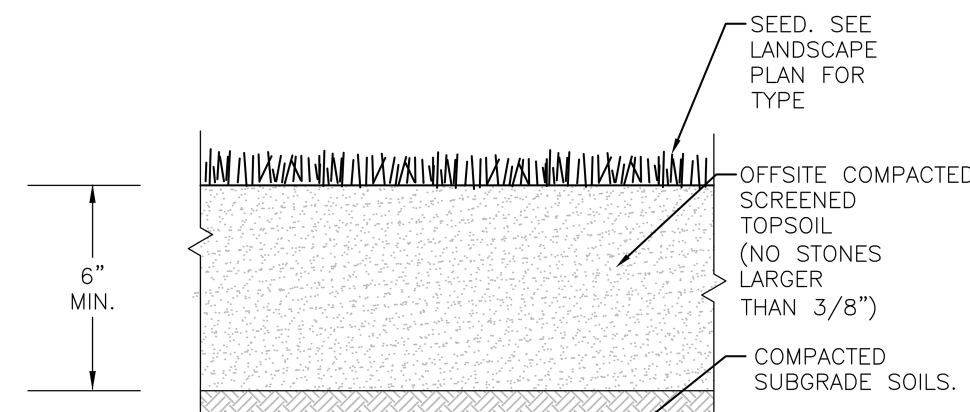
1. ALL TREES SHALL HAVE THE SAME RELATIONSHIP TO FINISH GRADE AFTER PLANTING AS THEY HAD AT THE ORIGINAL NURSERY SETTING. ROOT FLARE SHALL BE 2" ABOVE FINISH GRADE. REMOVE SOIL FROM TRUNK FLARE OF TREE TO DETERMINE ACTUAL ROOTBALL AREA.
2. BACKFILL WITH PLANTING MIX. PLANT MIX TO BE: 50% NATIVE TOPSOIL, 20% COMPOST (LEAVES & ORGANIC MATERIAL, NO ASH) 20% PEAT MOSS, 10% SAND.
3. ADD MYCORRHIZA SOIL ADDITIVES AND SLOW RELEASE FERTILIZER WHEN PLANT HOLES ARE 50% FILLED AND WATER THOROUGHLY AT COMPLETION.
4. SEE MATERIALS PLAN AND DETAILS PLANS FOR STREET TREE PLANTING IN WITH TREE GRATES DETAIL.
5. SEE ALSO PORTSMOUTH TREE PLANTING DETAIL L-502 FOR TREES IN R.O.W.

DECIDUOUS TREE PLANTING DETAIL (3)
NOT TO SCALE



NOTES:
1. STONE EDGE IS TO BE INSTALLED CONTINUOUS ADJACENT TO THE ENTIRE FACE OF BUILDINGS EXCEPT WHERE OTHER HARD SURFACING MATERIALS ARE SPECIFIED OR IF SHOWN OTHERWISE ON PLAN.

LANDSCAPE STONE AROUND BUILDING DETAIL (4)
NOT TO SCALE



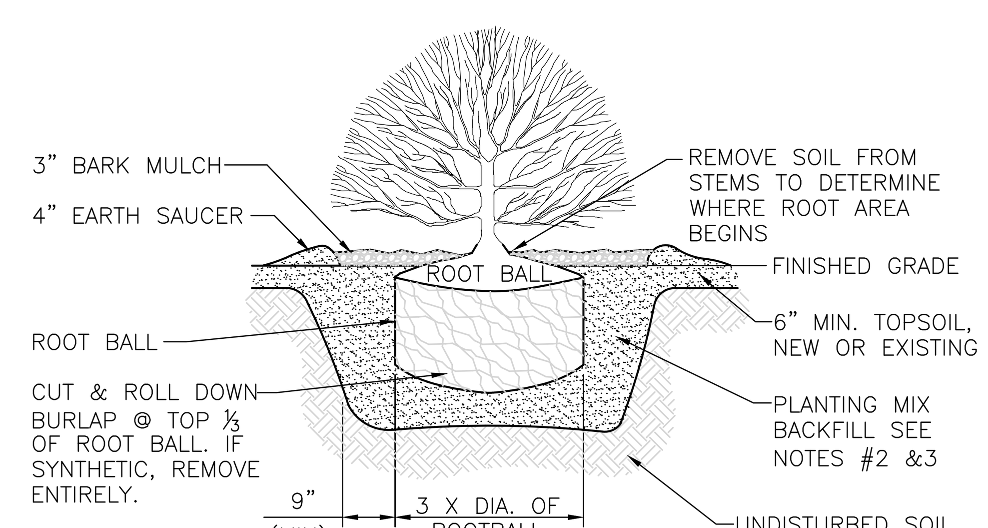
TEXTURE CLASS	% OF TOTAL WEIGHT
SAND	40%
SILT	40%
CLAY	20%

SIEVE	% PASSING
3/8"	100
NO. 4	85-100
NO. 40	60-85
NO. 100	38-60
NO. 200	10-35
20 um	LESS THAN 5%

NOTES:
1. TOP OF LOAM (TOPSOIL) IS FINISH GRADE.
2. ALL TOPSOIL (BOTH ONSITE AND OFFSITE SOURCES) SHALL BE COMPOSED OF A NATURAL, FERTILE, FRIABLE SOIL TYPICAL OF CULTIVATED TOPSOILS OF THE LOCALITY. OFFSITE SOIL SHALL BE SUITABLE FOR THE GERMINATION OF SEEDS AND SUPPORT OF VEGETATIVE GROWTH, WITH ADDITIVES, IF REQUIRED, TO ACHIEVE PARTICLE DISTRIBUTION AND ORGANIC CONTENT BELOW. TOPSOIL SHALL BE TAKEN FROM A WELL-DRAINED, ARABLE SITE, FREE OF SUBSOIL, LARGE STONES, EARTH CLODS, STICKS, STUMPS, CLAY LUMPS, ROOTS, OTHER OBJECTIONABLE, EXTRANEOUS MATTER OR DEBRIS NOR CONTAIN TOXIC SUBSTANCES.
3. THE CONTRACTOR SHALL PROVIDE THE OWNER / LANDSCAPE ARCHITECT WITH TOPSOIL TEST RESULTS (RECOMMEND UMASS AMHERST SOIL TESTING LAB) FOR APPROVAL PRIOR TO OBTAINING AND PLACING THE SOIL. IF ANY TOPSOIL IS PURCHASED OR PLACED PRIOR TO APPROVAL BY OWNER / LANDSCAPE ARCHITECT, IT IS AT CONTRACTORS RISK, AND IT CAN BE REMOVED AT NO ADDITIONAL COST TO THE OWNER. IF THE PLANTING SOIL (BOTH ONSITE AND OFFSITE SOURCES) DOES NOT FALL WITHIN THE REQUIRED SIEVE ANALYSIS, TEXTURAL CLASS, ORGANIC CONTENT, OR PH RANGE, IT SHALL BE ADJUSTED TO MEET THE SPECIFICATIONS THROUGH THE ADDITION OF SAND, COMPOST, LIMESTONE, OR ALUMINUM SULFATE TO BRING IT WITHIN THE SPECIFIED LIMITS AT NO ADDITIONAL COST TO THE OWNER.
4. SEE ALSO CITY OF PORTSMOUTH TOPSOIL SPECIFICATION L-502 FOR THE ADDITION OF 25% COMPOST SPECIFICATIONS FOR R.O.W. WORK.

TOPSOIL FOR LAWN, TREES, SHRUBS, & PERENNIALS (2)
NOT TO SCALE

NOTES:
1. ALL SHRUBS SHALL HAVE THE SAME RELATIONSHIP TO FINISH GRADE AFTER PLANTING AS THEY HAD AT THE ORIGINAL NURSERY SETTING. SET SHRUB 1"-2" ABOVE FINISH GRADE.
2. BACKFILL WITH PLANTING MIX. PLANT MIX TO BE: 50% NATIVE TOPSOIL, 20% COMPOST (LEAVES & ORGANIC MATERIAL, NO ASH) 20% PEAT MOSS, 10% SAND.
3. ADD MYCORRHIZA SOIL ADDITIVES AND SLOW RELEASE FERTILIZER WHEN PLANT HOLES ARE 50% FILLED AND WATER THOROUGHLY AT COMPLETION.
4. SHRUB BEDS TO HAVE 24" MIN. OF CONTINUOUS PLANTING SOIL.



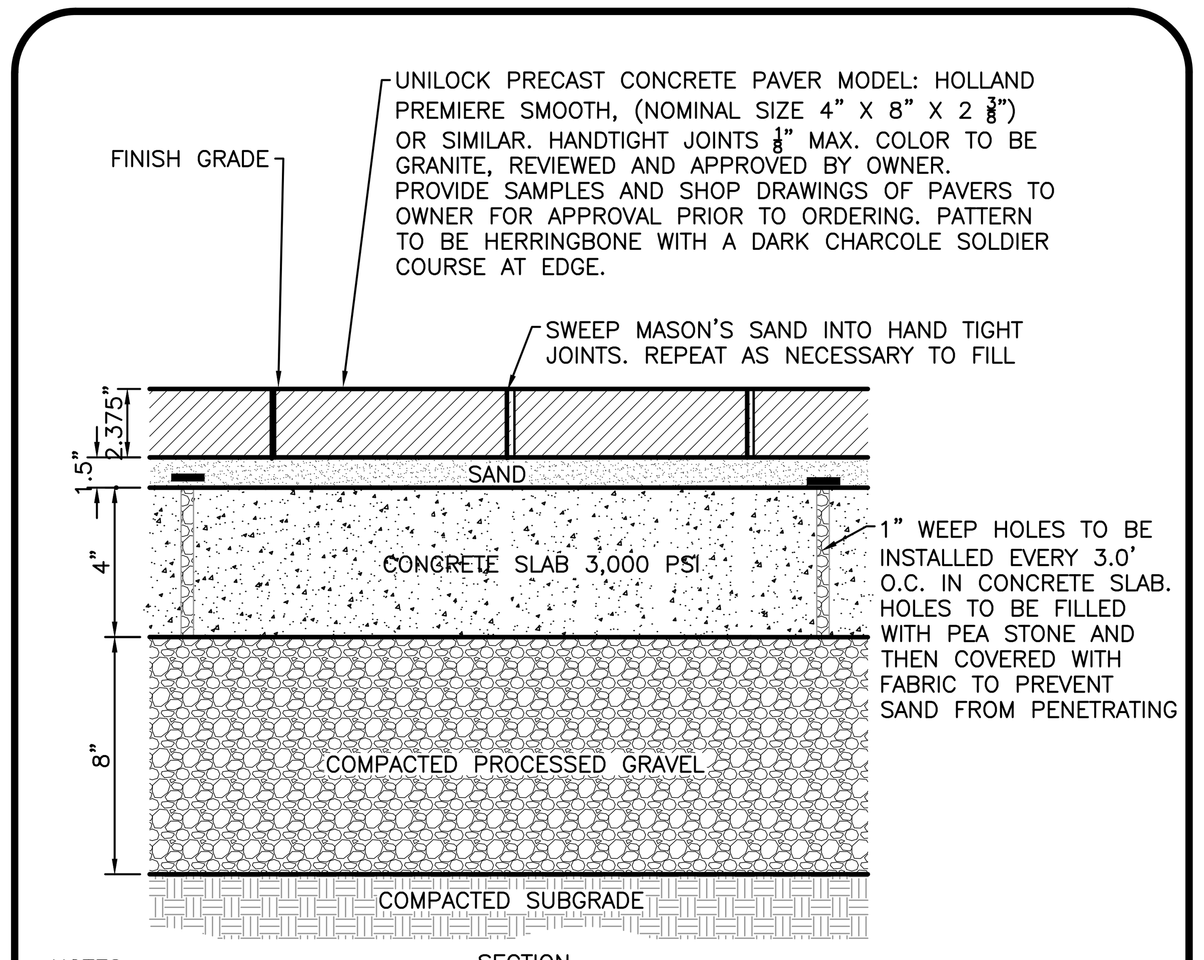
SHRUB PLANTING DETAIL (5)
NOT TO SCALE

LOAM AND SEEDING NOTES:

CONTRACTOR SHALL SEED ALL DISTURBED AREAS NOT NOTED TO RECEIVE OTHER MATERIALS, AND AT AREAS SHOWN ON THE PLAN PER SPECIFICATIONS BELOW

SCIENTIFIC NAME	COMMON NAME	PROPORTION BY WEIGHT	PERCENT PURITY	PERCENT GERMINATION
FESTUCA RUBRA "RUBRA"	CREEPING RED FESCUE	37%	95%	90%
PAO PRAENTENSIS "BARON"	BARON KENTUCKY BLUEGRASS	40%	85%	90%
LOLIUM PERENNE "PALMER"	PALMER PERENNIAL RYEGRASS	15%	95%	90%
FESTUCA RUBRA COMMUTATA WILMA	WILMA CHEWINGS	8%	95%	80%

1. SEED TO BE SPREAD AT MINIMUM RATE OF 5 LBS. PER 1000 SQ. FT.
2. SEEDING TO BE COMPLETED "IN SEASON" BETWEEN APRIL 1 TO JUNE 15 OR AUGUST 15 TO OCTOBER 1, EXCEPT FOR RESEEDING OF BARE SPOTS. IF UNABLE TO SEED WITHIN THESE TIMEFRAMES, CONTRACTOR TO INSTALL EROSION CONTROL MATS ON ALL SLOPES 3:1 AND OVER, HYDROSEED ALL EXPOSED AREAS, ADD SOIL STABILIZER "FLUX TERRA HP-FGM SOIL STABILIZER" AS MANUFACTURED BY "PROFILE" TO HYDROSEED (AT RATE OF 3,000 LBS PER ACRE), AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR TO COMPLETE ALL ABOVE "OUT OF SEASON" REQUIREMENTS AND THEN ALSO BE RESPONSIBLE FOR RE-GRADING AND RE-SEEDING ALL DISTURBED, ERODED, OR BARE SPOTS WITHIN NEXT CLOSEST PLANTING SEASON IN FALL OR SPRING AT NO ADDITIONAL COST TO OWNER. CONTRACTOR RESPONSIBLE FOR ALL MAINTENANCE UNTIL FINAL ACCEPTANCE OF LAWN AREAS INCLUDING: WATERING, ADDING FERTILIZERS AND LIME AND MOWING AT NO ADDITIONAL COST TO OWNER.
3. COMMERCIAL FERTILIZER SHALL BE APPLIED AT THE RATE OF 25 POUNDS PER 1000 SQ. FT. OR AS RECOMMENDED BY THE TESTING AGENCY. LIME TO BE SPREAD AT THE RATE OF 100 POUNDS PER 1000 SQ. FT OR AS RECOMMENDED BY THE TESTING AGENCY. COMMERCIAL FERTILIZER SHALL BE A COMPLETE FERTILIZER CONTAINING AT LEAST 50% OF THE NITROGEN OF WHICH IS DERIVED FROM NATURAL ORGANIZE SOURCES OF UREAFORM. IT SHALL CONTAIN THE FOLLOWING PERCENTAGES BY WEIGHT: NITROGEN (N) 10%, PHOSPHORUS (P) 6%, POTASH (K) 4%. LIME SHALL BE AN APPROVED AGRICULTURAL LIMESTONE CONTAINING NOT LESS THAN 85% OF TOTAL CARBONATES. LIMESTONE SHALL BE GROUND TO SUCH FINENESS THAT 50% WILL PASS A 100 MESH SIEVE AND 90% WILL PASS THROUGH A 20 MESH SIEVE.
4. LAWN AREAS TO BE SEEDED BY SOWING EVENLY WITH AN APPROVED MECHANICAL SEEDER AT THE RATE OF TEN POUNDS PER 1000 SQUARE FEET.
5. CONTRACTOR RESPONSIBLE FOR WATERING, MOWING, AND RESEEDING OF LAWN BARE SPOTS UNTIL A UNIFORM, HEALTHY STAND OF GRASS IS ESTABLISHED AND ACCEPTED.



NOTES:
1. INSTALL EXPANSION JOINTS @ 30'-0" O.C. MIN. IN CONCRETE SLAB
2. WHERE PAVEMENT ABUTS LAWN OR SHRUB BED, PROVIDE 'PAVE-EDGE' OR APPROVED EQUAL.
3. 1" WEEP HOLES TO BE INSTALLED EVERY 3.0' O.C. IN CONCRETE SLAB. HOLES TO BE FILLED WITH GRAVEL AND THEN COVER WITH FABRIC TO PREVENT SAND FROM PENETRATING.

PEDESTRIAN CONCRETE PAVERS OR EQUAL (6)
NOT TO SCALE

LICENSED LANDSCAPE ARCHITECT
BETHANY C. DERMODY
006
STATE OF NEW HAMPSHIRE
11-10-23
Bethany C. Dermody

PROFESSIONAL LANDSCAPE ARCHITECT FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
2	10-20-23	REVISED PER TAC COMMENTS
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	AS SHOWN	DWG. NAME:	L-3250-01.dwg
DESIGNED BY:	BCD	CHECKED BY:	RPC

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
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MANCHESTER, NH 03103
TEL: (603) 627-5500
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WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: LANDSCAPE NOTES & DETAILS
SHEET No. L-501

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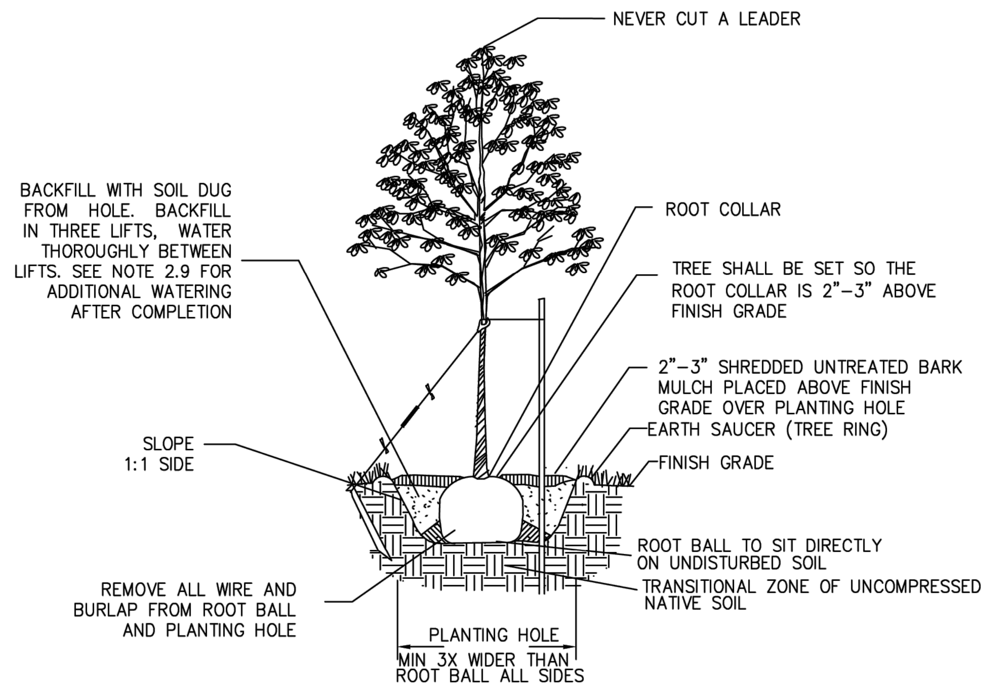

TREE PLANTING DETAIL

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.

DEPARTMENT OF PUBLIC WORKS CITY OF PORTSMOUTH, NH

NO.	DESCRIPTION	DATE

REVISIONS

STANDARD DETAIL OF TREE PLANTING
PORTSMOUTH, NEW HAMPSHIRE

DRAWING SCALE: NTS — March, 2019 — P1

CITY OF PORTSMOUTH TREE PLANTING DETAIL (1)
NOT TO SCALE

CITY OF PORTSMOUTH TOPSOIL SPECIFICATIONS

ATTACHMENT B: TOPSOIL SPECIFICATIONS

1. THE CITY OF PORTSMOUTH RECOMMENDS A MIXTURE OF ¾ (75%) LOAM, AND ¼(25%) COMPOST FOR ALL TOPSOIL AREAS. THIS INCLUDES BUT IS NOT LIMITED TO PLANTING BEDS, TURF AREAS AND THE GREEN STRIP BETWEEN THE SIDEWALK AND ROADWAY.

2. THE CITY REQUIRES A CHEMICAL AND COMPOSITION SOIL TEST FOR THIS MIXTURE BEFORE APPLYING TO ANY AREAS.

3. THE SOIL MIXTURE SHALL BE APPLIED AT A MINIMUM DEPTH OF 6".

4. LOAM SHOULD CONSIST OF 40% SAND, 40% SILT, AND 20% CLAY.

5. COMPOST SHALL MEET ALL OF THE FOLLOWING CRITERIA AND A SOIL TEST SHALL BE PROVIDED FROM THE COMPOST DISTRIBUTOR:
   A. PRODUCT SHALL BE MANUFACTURED THROUGH THE CONTROLLED AEROBIC, BIOLOGICAL DECOMPOSITION OF BIODEGRADABLE MATERIALS;
   B. PRODUCT SHALL HAVE UNDERGONE MESOPHILIC AND THERMOPHILIC TEMPERATURES IN ORDER TO REDUCE THE VIABILITY OF PATHOGENS AND WEED SEEDS, AND STABILIZE THE CARBON SUCH THAT IT IS BENEFICIAL TO PLANT GROWTH;
   C. PRODUCT SANITIZATION THROUGH THE GENERATION OF THERMOPHILIC HEAT SHALL MEET THE STANDARDS OF THE PROCESSES TO FURTHER REDUCE PATHOGENS (PFRP), AS DEFINED BY THE CODE OF FEDERAL REGULATIONS TITLE 40, PART 503, APPENDIX B, SECTION B;
   D. PRODUCT SHALL BEAR LITTLE PHYSICAL RESEMBLANCE TO THE RAW MATERIAL FROM WHICH IT ORIGINATED;
   E. PRODUCT SHALL BE AN ORGANIC MATTER SOURCE THAT HAS THE UNIQUE ABILITY TO IMPROVE THE CHEMICAL, PHYSICAL, AND BIOLOGICAL CHARACTERISTICS OF SOILS OR GROWING MEDIA.

6. LOAM SHALL HAVE A ORGANIC MATTER CONTENT OF 5% TO 7%.

CITY OF PORTSMOUTH TOPSOIL SPECIFICATION (2)
NOT TO SCALE

CITY OF PORTSMOUTH PLANTING REQUIREMENTS

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

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2. ALL WIRE AND BURLAP SHALL BE REMOVED FROM THE ROOT BALL AND PLANTING HOLE.
3. THE ROOT BALL OF THE TREE SHALL BE WORKED SO THAT THE ROOT COLLAR OF THE TREE IS VISIBLE AND NO GIRDLING ROOTS ARE PRESENT.
4. THE ROOT COLLAR OF THE TREE SHALL BE 2"–3" ABOVE GRADE OF PLANTING HOLE FOR FINISHED DEPTH. 5. ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH ORGANIC COMPOST. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE ENGINEERED SOIL IS BEING USED IN CONJUNCTION WITH SILVA CELLS AND WHERE NEW PLANTING BEDS ARE BEING CREATED.
6. ALL PLANTINGS SHALL BE BACKFILLED IN THREE LIFTS AND ALL LIFTS SHALL BE WATERED SO THE PLANTING WILL BE SET AND FREE OF AIR POCKETS– NO EXCEPTIONS.
7. AN EARTH BERM SHALL BE PLACED AROUND THE PERIMETER OF THE PLANTING HOLE EXCEPT WHERE CURBED PLANTING BEDS OR PITS ARE BEING USED.
8. 2'–3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.
9. AT THE TIME THE PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE COMPLETE HYDRATION OF THE ROOTS, BACKFILL MATERIAL AND MULCH LAYER.
10. STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NONDAMAGING TO THE TREE.
11. ALL PLANTING STOCK SHALL BE SPECIMEN QUALITY, FREE OF DEFECTS, AND DISEASE OR INJURY. THE CITY OF PORTSMOUTH, NH RESERVES THE RIGHT TO REFUSE/REJECT ANY PLANT MATERIAL OR PLANTING ACTION THAT FAILS TO MEET THE STANDARDS SET FORTH IN THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING AND/OR THE CITY OF PORTSMOUTH, NH PLANTING REQUIREMENTS.

CITY OF PORTSMOUTH PLANTING REQUIREMENTS (3)
NOT TO SCALE

NOTE:
NOTES & DETAILS SHOWN HEREON APPLY TO WORK WITHIN THE PUBLIC RIGHTS–OF WAY ONLY.

BETHANY C. DERMODY 006 — LICENSED LANDSCAPE ARCHITECT — STATE OF NEW HAMPSHIRE
11-10-23
PROFESSIONAL LANDSCAPE ARCHITECT FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION

APPLICANT/LESSEE:
ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:
ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

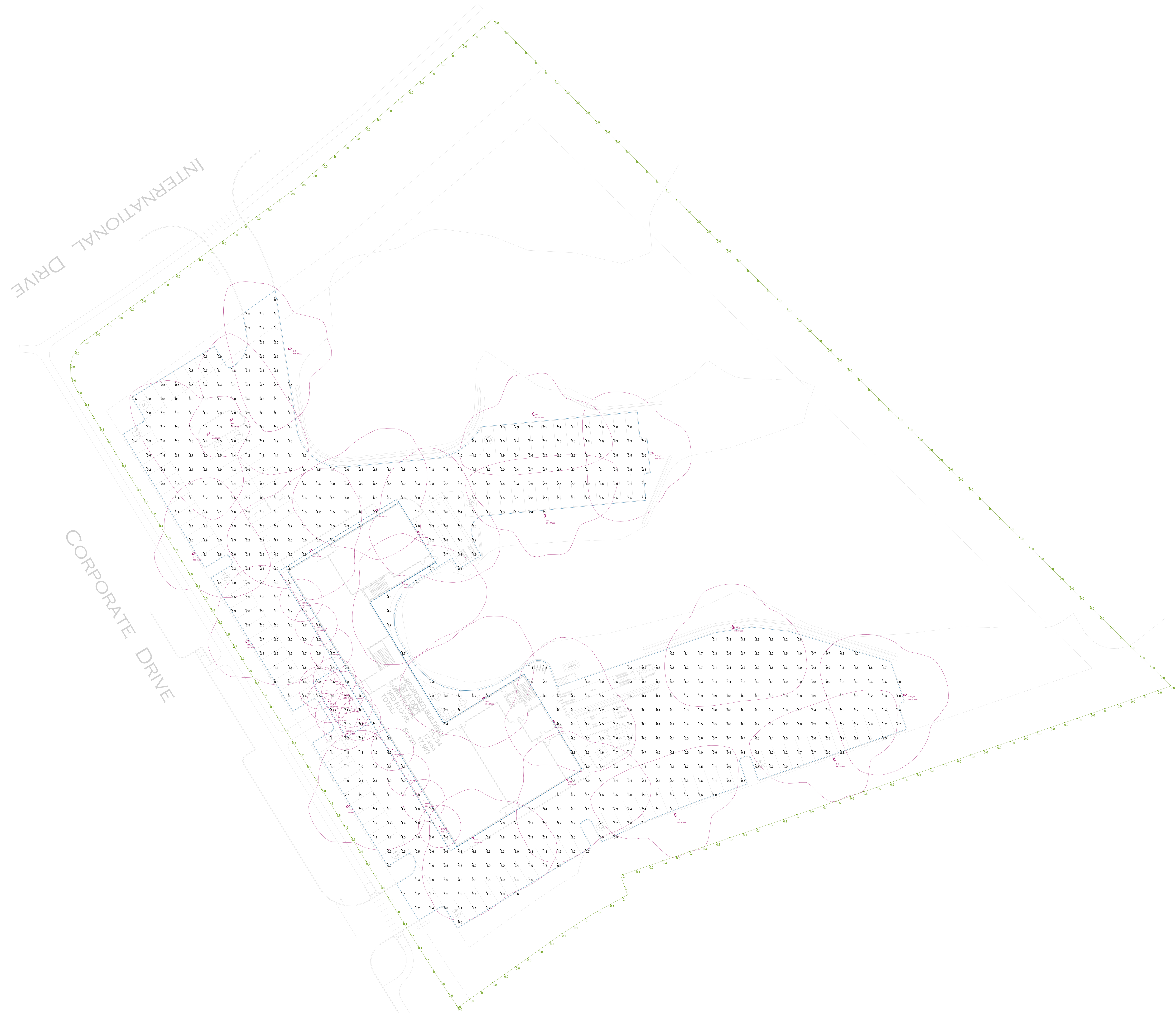
PROJECT NO.	3250-01	DATE:	10-20-23
SCALE:	AS SHOWN	DWG. NAME:	L-3250-01.dwg
DESIGNED BY:	BCD	CHECKED BY:	RPC

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:
RIGHT-OF-WAY LANDSCAPE NOTES & DETAILS

SHEET No.
L-502



Luminaire Schedule										
Symbol	Qty	Tag	Mfer	Description	LLF	Luminaire Lumens	Luminaire Watts	Tot. Watts	BUG Rating	Dark Sky
	15	EXT LT-2	WILLIAMS	4DR-TL-L30-840-DIM-UNV-LW-OF-WH-WETCC	0.900	2042	27.8	417	B2-U1-G0	N
	2	S-FT_HI	LSI INDUSTRIES, INC.	MRM-LED-12L-SIL-FT-40-70CRI	0.900	13138	85	170	B2-U0-G3	Y
	4	S-FT_LO	LSI INDUSTRIES, INC.	MRM-LED-09L-SIL-FT-40-70CRI	0.900	9856	62	248	B2-U0-G3	Y
	7	S-III	LSI INDUSTRIES, INC.	MRM-LED-09L-SIL-3-40-70CRI	0.900	9926	62	434	B2-U0-G2	Y
	8	W-FT	LSI INDUSTRIES, INC.	XWM-FT-LED-18L-40	0.900	17920	130	1040	B3-U0-G3	Y

Calculation Summary						
Label	CalcType	Units	Avg	Max	Min	Max/Min
PARKING_SURFACE	Illuminance	Fc	2.35	11.4	0.1	114.00
PROPERTY LINE	Illuminance	Fc	0.18	2.8	0.0	N.A.

A+M

Photometric calculations are being provided to the recipient per the following disclaimers. This light level analysis is an estimate only, and is based on standard interior reflectance values of 0.8 ceilings, 0.5 walls, and 0.2 floors, unless otherwise specified. Any variance from reflectance values, obstructions, light loss factors or dimensional data will affect the actual light levels obtained. This analysis is a mathematical model and can only be as accurate as is permitted by the third party software and the IES files provided by our manufacturers.

Calculation by:
Chris Collins
Email:
ccollins@amirep.com

REVISIONS

#	DATE	COMMENTS

Calculation For:
Apex Design Build

Project:
NEW HAMPSHIRE PROJECT

Date:8/9/2023

Scale: NTS

PROJECT ENERGY CODE INFORMATION

CLIMATE ZONE ZONE 5A

DOES THE BUILDING INCLUDE GROUP R OCCUPANCY? NO

OPAQUE ENVELOPE ITEM	REQUIRED R-VALUE	ACTUAL R-VALUE
ROOF (ATTIC AND OTHER)	R30ci	R30ci
WALLS ABOVE GRADE (WOOD FRAMED AND OTHER)	R13 + R7.5ci	R13+R10ci
WALLS BELOW GRADE	R7.5ci	R7.5ci
SLAB-ON-GRADE FLOORS (UNHEATED SLABS)	R10 FOR 24" BELOW	R10 FOR 24" BELOW
OPAQUE DOORS (NONSWINGING)	R4.75	R8
OPAQUE DOORS (SWINGING)	0.37 U-VALUE	0.37 U-VALUE

ENVELOPE FENESTRATION	REQUIRED	ACTUAL
FIXED FENESTRATION	0.38	0.38
OPERABLE FENESTRATION	0.45	0.45
ENTRANCE DOORS	0.77	0.77
SHGC - NORTH ORIENTATION (PF < 0.2)	0.51	0.53
SHGC - SEW ORIENTATION (PF < 0.2)	0.38	0.38
SKYLIGHTS U-FACTOR	0.50	N/A
SKYLIGHTS SHGC	0.40	N/A

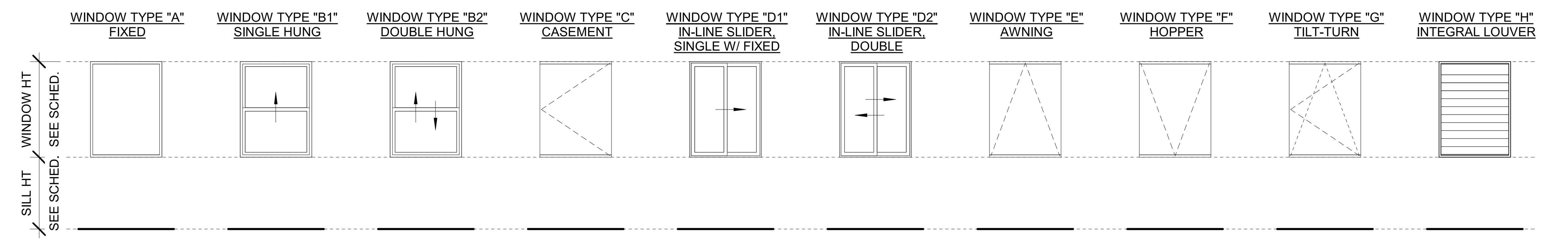
STOREFRONT SCHEDULE

1. REFER TO APPROVED COMPONENT BOOK FOR MORE DETAILED WINDOW SPECIFICATION INFORMATION.

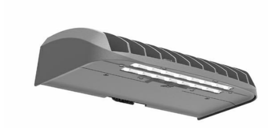
TUBELITE: T14000 SERIES STOREFRONT 2" X 4 1/2", FINISH: DARK BRONZE, REFER TO A1-4.3, A1-4.5, AND A1-4.8 EXTERIOR ELEVATION.

TAG	WIDTH	HEIGHT	SILL HEIGHT	WINDOW TYPE	WINDOW MATERIAL	FRAME MATERIAL	REMARKS	Remarks
A	3' - 11"	7' - 6"	3' - 0"	A	TEMPERED GLASS	HOLLOW METAL	TUBELITE: T14000 SERIES STOREFRONT 2" X 4 1/2", FINISH: DARK BRONZE	SEE EXT. ELEVATIONS FOR LOCATIONS.
B	1' - 11"	7' - 6"	3' - 0"	A	TEMPERED GLASS	HOLLOW METAL	TUBELITE: T14000 SERIES STOREFRONT 2" X 4 1/2", FINISH: DARK BRONZE	SEE EXT. ELEVATIONS FOR LOCATIONS.
C	4' - 4"	7' - 6"	3' - 0"	A	TEMPERED GLASS	HOLLOW METAL	TUBELITE: T14000 SERIES STOREFRONT 2" X 4 1/2", FINISH: DARK BRONZE	SEE EXT. ELEVATIONS FOR LOCATIONS.
E	4' - 4"	6' - 8"	3' - 0"	A	TEMPERED GLASS	HOLLOW METAL	TUBELITE: T14000 SERIES STOREFRONT 2" X 4 1/2", FINISH: DARK BRONZE, DIMENSION: 4'-6" X 6'-8"	SEE EXT. ELEVATIONS FOR LOCATIONS.
F	4' - 4"	2' - 2"	9' - 5"	A	SPANDREL PANEL	HOLLOW METAL	H&H METAL: INSULATED ALUMINUM COMPOSITE INFILL SPANDREL PANELS, 1/4" THICK FOR STOREFRONT INFILL, 2" X 4 1/2", FINISH: DARK BRONZE, DIMENSION: 4'-6" X 1'-10"	SEE EXT. ELEVATIONS FOR LOCATIONS.
J	4' - 4"	6' - 8"	3' - 0"	A	TEMPERED GLASS	HOLLOW METAL	TUBELITE: T14000 SERIES STOREFRONT 2" X 4 1/2", FINISH: DARK BRONZE, DIMENSION: 4'-6" X 6'-8"	SEE EXT. ELEVATIONS FOR LOCATIONS.

WINDOW TYPES



EXT LIGHT FIXTURE SCHEDULE

TAG	DESCRIPTION	MANUFACTURER	MODEL	LAMP	WATTAGE	COLOR TEMPERATURE	QTY	IMAGE	REMARKS	LOCATION
EX. LT-1	OUTDOOR WALL SCONCE	KUZCO LIGHTING	MFR ID: AT797-BK; FINISH: BLACK; HHEIGHT: 72"	LED BUILT IN	92 W	4000K	2		SEE ELEVATIONS FOR LOCATION	
EX. LT-2	LED OUTDOOR WALL LIGHT	LUMASCAPE	sQAD8-A ZDC DN BL, FINISH: BLACK	INTEGRATED LED	11 W	4000K	3		SEE ELEVATIONS FOR LOCATION	
EX. LT-3	OUTDOOR WALL SCONCE	KUZCO LIGHTING	MFR ID: AT7935-BK; FINISH: BLACK; HEIGHT: 35"	LED BUILT IN	41 W	4000K	4		SEE ELEVATIONS FOR LOCATION	
EX. LT-5	WALLPACK LIGHT	LSI INDUSTRIES	XWM-FT-LED-18L-40, FINISH: DARK BRONZE	LED	37 W	4000K	8		SEE ELEVATIONS FOR LOCATION	
EX. LT-6	5" RECESSED CAN FIXTURE	SATCO	S11837	LED BUILT IN	9 W	4000K	12		TO BE INSTALLED WITH SATCO S9540 HOUSING; 840L	
EX. LT-7	OUTDOOR LED AREA LIGHT	LSI INDUSTRIES	MRM-LED-12L-SIL-FT-40 -70CRI - BRZ	LED		4000CCT	2			SEE PHOTOMETRICS
EX. LT-8	OUTDOOR LED AREA LIGHT	LSI INDUSTRIES	MRM-LED-09L-SIL-FT-40 -70CRI - BRZ	LED		4000CCT	4			SEE PHOTOMETRICS
EX. LT-9	OUTDOOR LED AREA LIGHT	LSI INDUSTRIES	MRM-LED-09L-SIL-3-40-7 0CRI - BRZ	LED		4000CCT	7			SEE PHOTOMETRICS
EX. LT-10	EXTERIOR RECESSED CAN	LOTUS LED LIGHTS	6" AIR TIGHT RECESSED TRIM; BLACK FINISH	LED BUILT IN	17 W	PROVIDE BATTERY BACKUP FOR CAN LIGHT. EQUAL PRODUCT W/ ARCHITECT APPROVAL ARE ACCEPTABLE.	14			

SUBCONTRACTOR NOTES

A. PROVIDE WEATHER BARRIER OVER ALL EXTERIOR SHEATHING PRIOR TO THE INSTALLATION OF ANY EXTERIOR FINISH MATERIAL.
B. INSTALL PER MANUFACTURER'S SPECIFICATIONS AND PROVIDE ALL MANUFACTURER'S ACCESSORIES TO FULLY FLASH AND COUNTER-FLASH AT ALL WINDOWS, DOORS, AND EXTERIOR PENETRATIONS.
C. PROVIDE A WEATHER TIGHT BARRIER AT ALL SURFACES.
D. COORDINATE FLASHING WITH WINDOW, DOOR, VENT, ETC. MANUFACTURER'S FOR A WEATHER TIGHT SEAL AT ALL OPENINGS.
E. TAPE FLASH AROUND ALL OPENINGS AND ON WALL JOINTS PER MANUFACTURER REQUIREMENTS.

apex DESIGN > BUILD

9550 W.Higgins Rd. 170
Rosemont, IL 60018

ADTG, LLC

360 CORPORATE DR.
PORTSMOUTH , NH 03801

ARCHITECT OF RECORD
SUSAN L. SKIBELL, ARCHITECT 1360 N. SANDBURG TERRACE #1902 CHICAGO, IL. 60610
312.350.7161

SEAL:

No.	Description	Date
1	TAC WORKSHOP REVIEW	07/25/2023
2	TAC PUBLIC HEARING	08/21/2023
3	PRICING SET	10/13/2023
4	TAC PUBLIC HEARING #2	10/20/2023

EXTERIOR SCHEDULES

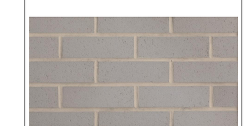
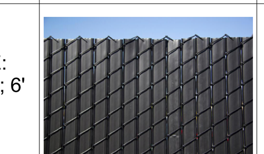
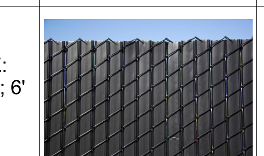
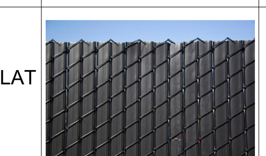
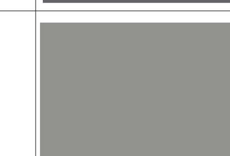
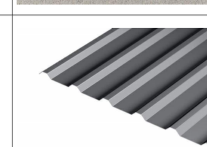
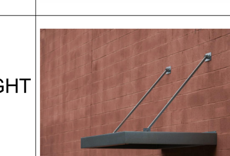
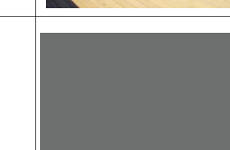
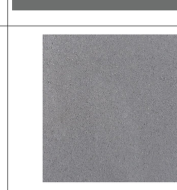
Project number	#10323
Date	10/10/2023
Drawn by	JY
Checked by	JV
	A1-2
Scale	As indicated

10/18/2023 12:08:28 PM

EXTERIOR FINISH SCHEDULE 2

1. EQUAL PRODUCTS ARE ACCPETABLE AFTER IT HAS BEEN SUBMITTED & APPROVED BY ARCHITECT.

2. ALL PRODUCTS TO BE INSTALLED PER MANUFACTURER REQUIREMENTS

TAG	MATERIAL	MFG.	SPECIFICATION / DESCRIPTION	IMAGE	LOCATION	REMARKS
EXT. AP-1	ACM PANEL	STACBOND	ACM PANEL, SEE ELEVATIONS FOR DIMENSIONS, FINISH: UNBRA GRAY		PER ELEVATIONS	SEE ELEVATIONS FOR DIMENISONS
EXT. AP-2	ACM PANEL	STACBOND	ACM PANEL, SEE ELEVATIONS FOR DIMENSIONS, FINISH: DUSTY GRAY		PER ELEVATIONS	SEE ELEVATIONS FOR DIMENISONS
EXT. BB-1	BIKE RACK	GLOBAL INDUSTRIAL	GLOBAL INDUSTRIAL SARIS TWO BIKE U-RACK , SURFACE MOUNT, BLACK		PER ELEVATIONS	SEE CIVIL
EXT. BR-1	FACE BRICK	SPAULDING BRICK	BELGIAN GRAY WIRE CUT FACE BRICK; MORTAR COLOR: SM100 GRAY		PER ELEVATIONS	SEE ELEVATIONS
EXT. CG-1	PRIVACY LINK GATE	PRIVACY LINK	PRIVACY LINK 3-1/2" MESH CHAIN LINKS W/ CHAINLINK GATE HARDWARE: HARDWARE TO BE BLACK; FIN2000 SLATS FACTORY BLACK SLAT INSERTS; 6' HIGH; COLOR: BLACK, 12' CLEAR FENCE GATE;		PER ELEVATIONS	12' DOUBLE
EXT. CG-2	PRIVACY LINK GATE	PRIVACY LINK	PRIVACY LINK 3-1/2" MESH CHAIN LINKS W/ CHAINLINK GATE HARDWARE: HARDWARE TO BE BLACK; FIN2000 SLATS FACTORY BLACK SLAT INSERTS; 6' HIGH; COLOR: BLACK, 6' CLEAR FENCE GATE;		PER ELEVATIONS	6' SINGLE
EXT. CL-1	PRIVACY LINK	PRIVACY LINK	PRIVACY LINK 3-1/2" MESH CHAIN LINKS; FIN2000 SLATS FACTORY BLACK SLAT INSERTS; 6' HIGH; COLOR: BLACK		PER ELEVATIONS	
EXT. CP-1	METAL COPING	PAC-CLAD	PAC-TITE TAPERED COPING, FINISH: MUSKET GRAY		PER ELEVATIONS	SEE ELEVATIONS FOR DIMENISONS
EXT. CP-2	METAL COPING	PAC-CLAD	PAC-TITE TAPERED COPING, FINISH: SLATE GRAY		PER ELEVATIONS	SEE ELEVATIONS FOR DIMENISONS
EXT. CS-1	STONE SILL	ROCKCAST	BY READING ROCK SL100, FINISH: BUFFSTONE		PER ELEVATIONS	
EXT. MP-1	EXPOSED FASTNER METAL PANEL	PACCLAD	PACCLAD PETERSON M-36 WITH TRIMS, FINISH: SLATE GRAY		PER ELEVATIONS	
EXT. PC-2	PREFAB. CANOPY	AWNEX	COLORADO SYSTEM, CANTILEVERED, 10" FLAT, OUTLET DRAINAGE, LED LIGHT WITH OUTRIGGER, FINISH: BLACK HORIZON		PER ELEVATIONS	SEE ELEVATIONS AND RCP FOR DIMENISONS
EXT. PV-1	PAVER	UNILOCK	UNILOCK PRECAST CONCRETE PAVER MODEL: HOLLAND PREMIERE SMOOTH, (4"X8"X2-3/8") OR SIMILR: FINISH - GRANITE		SEE CIVIL AND LANDSCAPE PLANS	
EXT. R-1	TPO ROOFING	HOLCIM	PROFILE: HOLCIM TPO SELF ADHERED MEMBRANE		PER ROOF PLAN	
EXT. RR-1	ALUMINUM RAILING	DIGGER SPECIALTIES INC.	WESTBURY ALUMINUM DECK RAILING, TUSCANY, SQUARE BALUSTER, CURVED PER A1-4.10 FENCE PLAN, FINISH: BLACK FINE TEXTURE		PER PLAN AND ELEVATION	SEE ELEVATIONS FOR DIMENSIONS; PROVIDE HANDRAIL FOR GURDRAIL ON STAIRS IN LOADING AREA
EXT. SF-1	SOFFIT	STACBOND	ACM PANEL, SEE ELEVATIONS FOR DIMENSOINS, FINISH: DUSTY GREY		PER RCP	SEE ELEVATIONS FOR DIMENISONS
EXT. SS-1	STONE SILL	ROCKCAST	SL-100 5" STONE SILL, FINISH: LIGHT GRAY		PER ELEVATIONS	SEE ELEVATIONS

apex DESIGN > BUILD
9550 W.Higgins Rd. 170
Rosemont, IL 60018

ADTG, LLC

360 CORPORATE DR.
PORTSMOUTH , NH 03801

ARCHITECT OF RECORD
SUSAN L. SKIBELL, ARCHITECT 1360 N. SANDBURG TERRACE #1902 CHICAGO, IL. 60610
312.350.7161

SEAL:

No.	Description	Date
3	PRICING SET	10/13/2023
4	TAC PUBLIC HEARING #2	10/20/2023

EXTERIOR SCHEDULES

Project number #10323

Date 10/10/2023

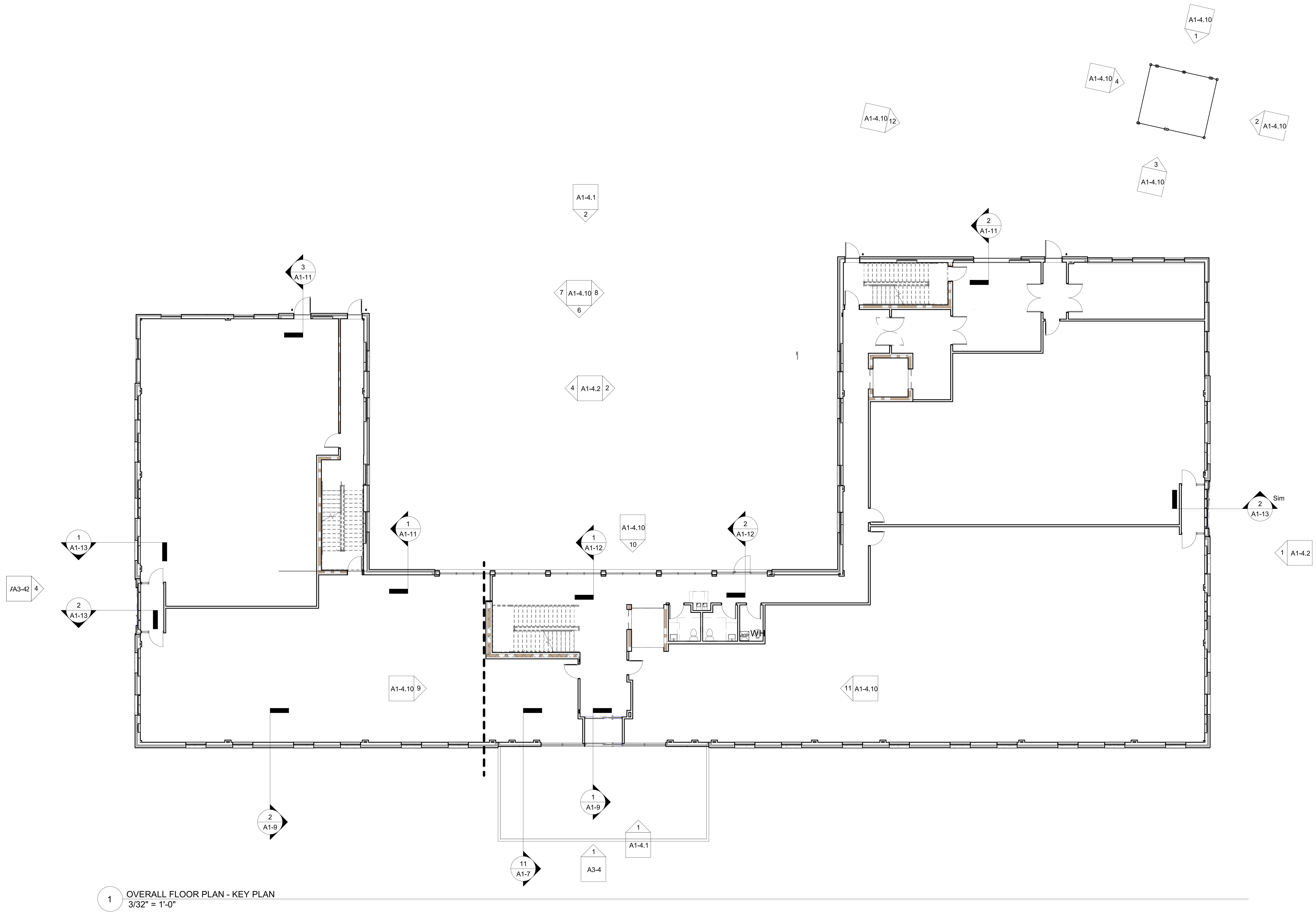
Drawn by JY

Checked by JV

A1-2.1

Scale

10/18/2023 12:08:28 PM



1 OVERALL FLOOR PLAN - KEY PLAN
3/32" = 1'-0"

0' 4' 8' 16' 32'

apex DESIGN > BUILD

9550 W.Higgins Rd. 170
Rosemont, IL 60018

ADTG, LLC

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PORTSMOUTH , NH 03801

ARCHITECT OF RECORD
SUSAN L. SKIBELL, ARCHITECT 1360 N. SANDBURG TERRACE #1902 CHICAGO, IL. 60610
312.350.7161

SEAL:

No.	Description	Date
1	TAC WORKSHOP REVIEW	07/25/2023
2	TAC PUBLIC HEARING	08/21/2023
3	PRICING SET	10/13/2023
4	TAC PUBLIC HEARING #2	10/20/2023

EXTERIOR VIEWS KEY

Project number #10323

Date 10/10/2023

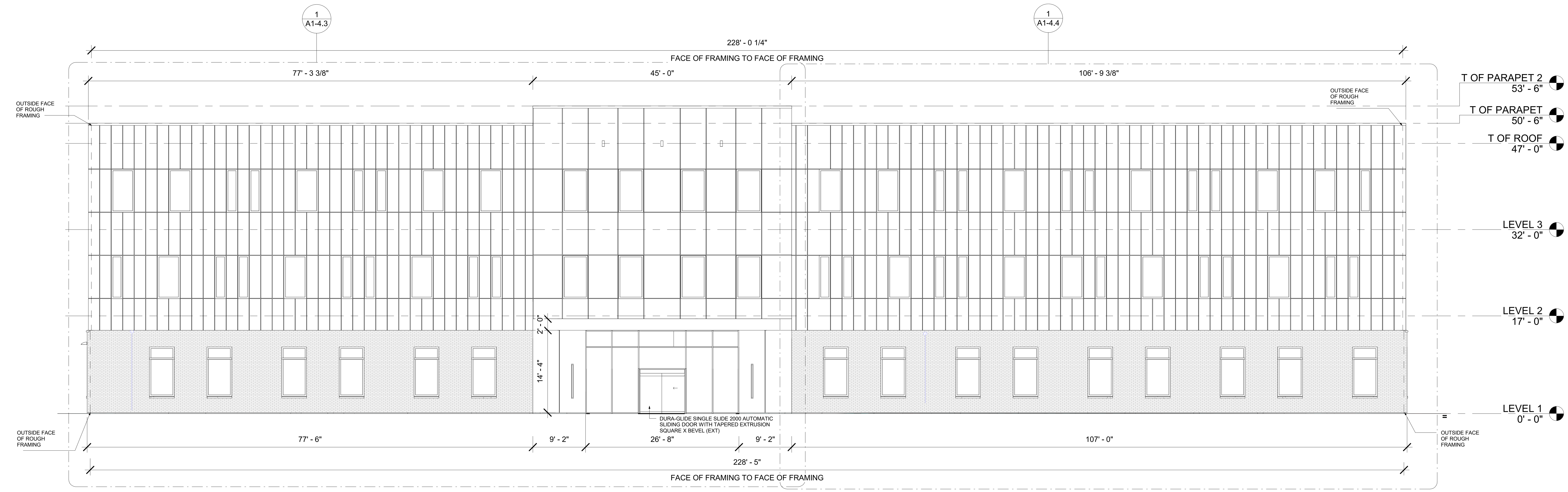
Drawn by JY

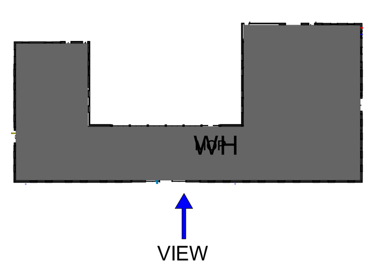
Checked by JV

A1-3

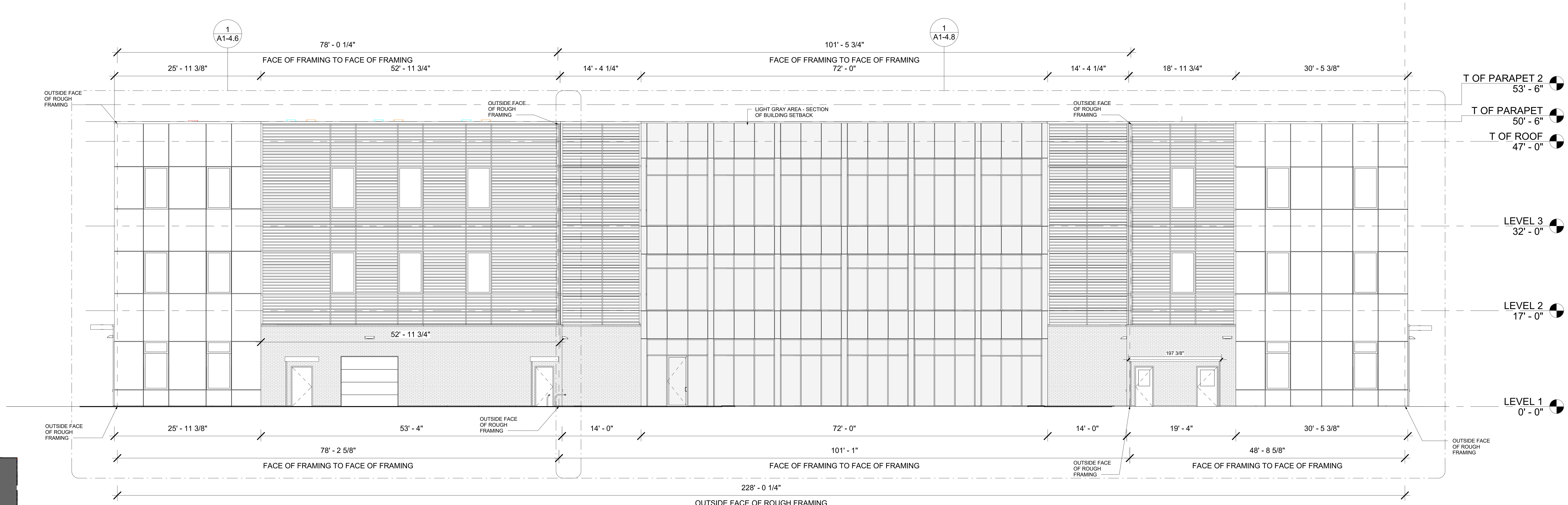
Scale 3/32" = 1'-0"

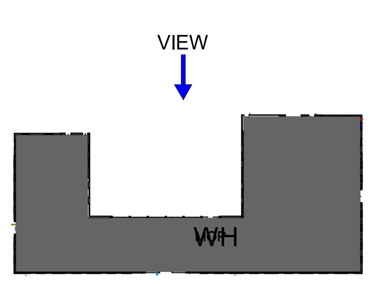
10/18/2023 12:08:29 PM





1 ELEVATION WEST
1" = 10'-0"





2 ELEVATION EAST
1" = 10'-0"

apex DESIGN > BUILD

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ARCHITECT OF RECORD
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312.350.7161

SEAL:

No.	Description	Date
1	TAC WORKSHOP REVIEW	07/25/2023
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3	PRICING SET	10/13/2023
4	TAC PUBLIC HEARING #2	10/20/2023

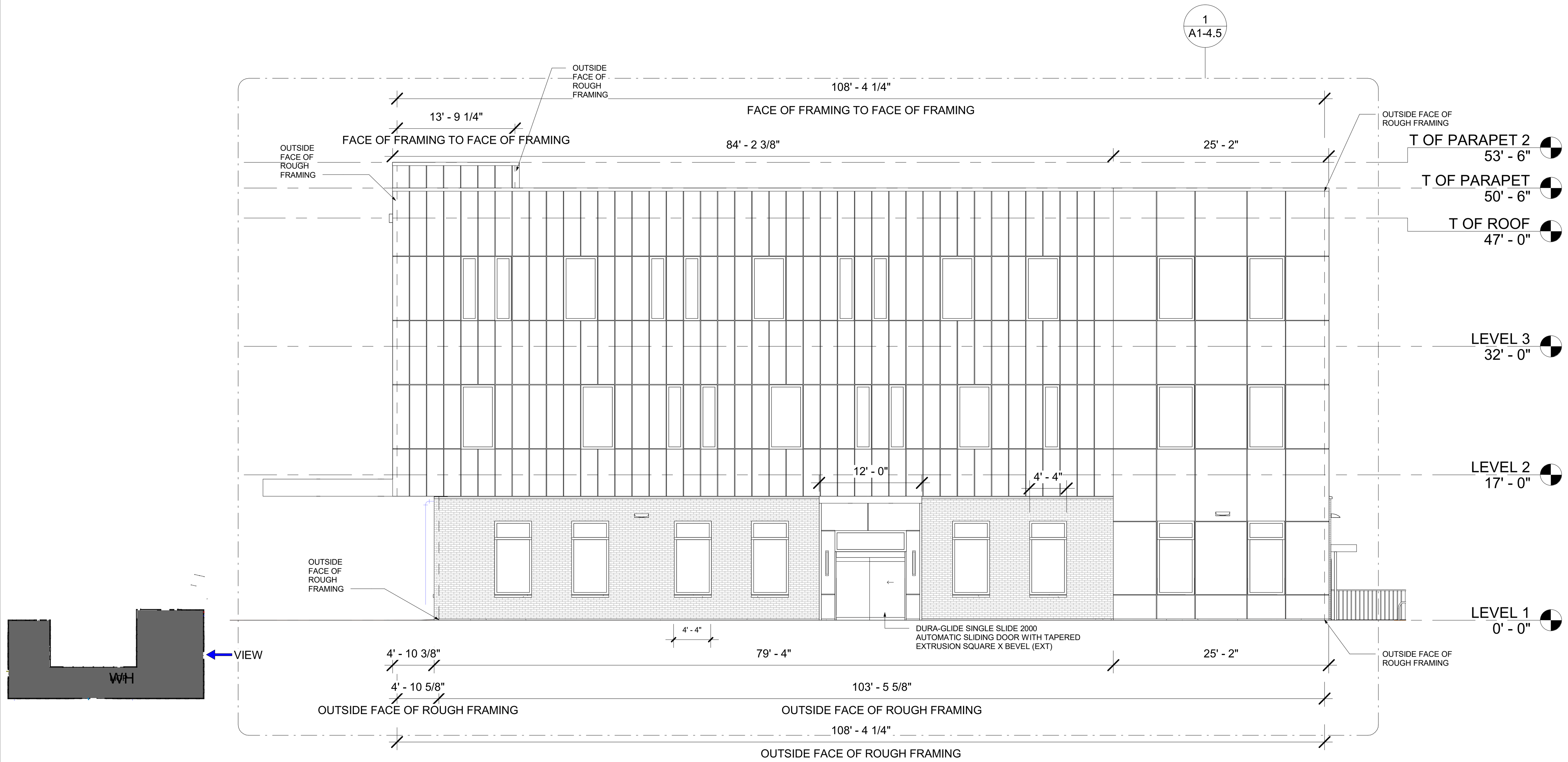
OVERALL EXTERIOR ELEVATIONS

Project number #10323
Date 10/10/2023
Drawn by JY
Checked by JV

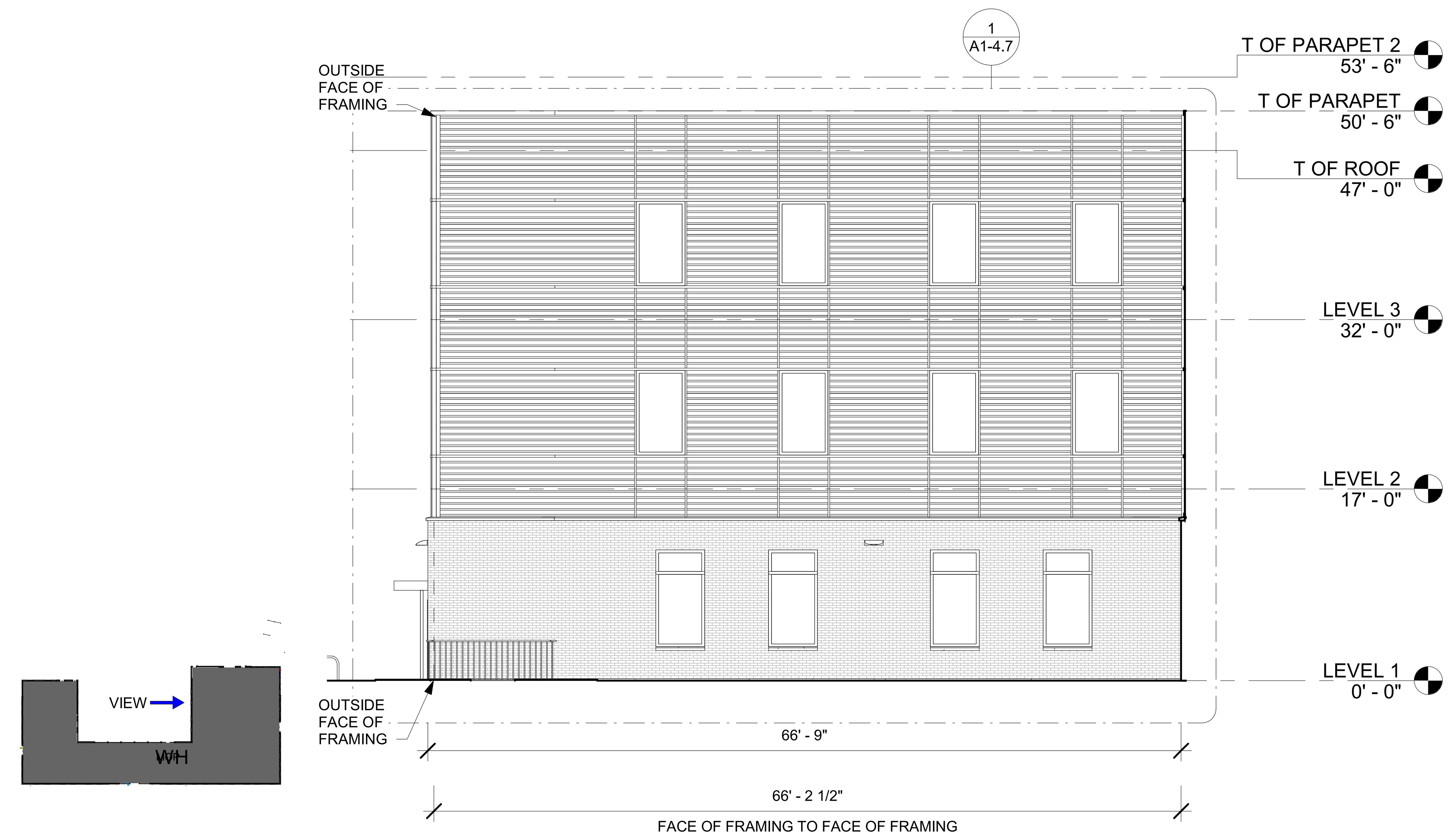
A1-4.1

Scale As indicated

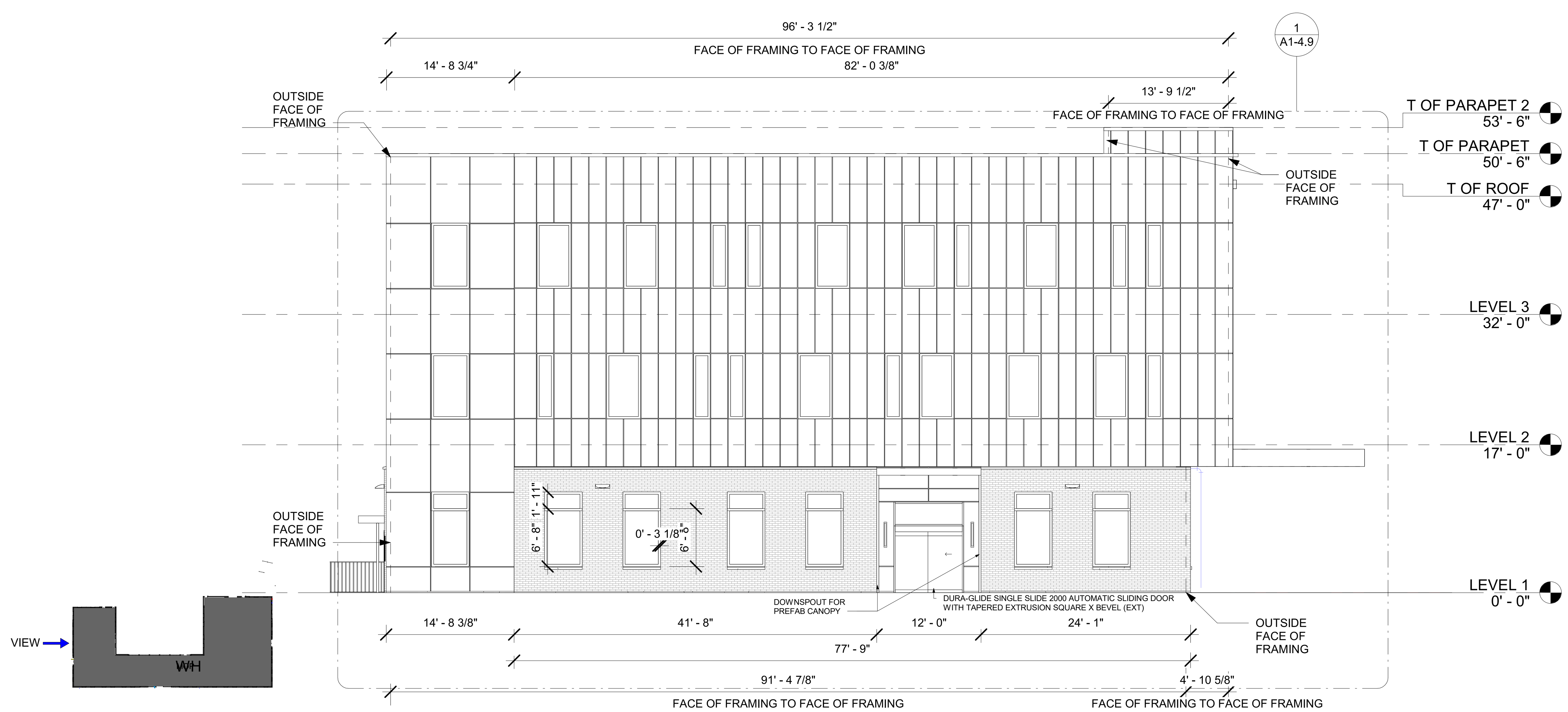
10/18/2023 12:08:33 PM



1 ELEVATION SOUTH
1" = 10'-0"



2 ELEVATIONS NORTH 2
1" = 10'-0"



3 ELEVATION NORTH
1" = 10'-0"

4 ELEVATIONS SOUTH 2
1" = 10'-0"

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ARCHITECT OF RECORD
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312.350.7161

SEAL:

No.	Description	Date
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3	PRICING SET	10/13/2023
4	TAC PUBLIC HEARING #2	10/20/2023

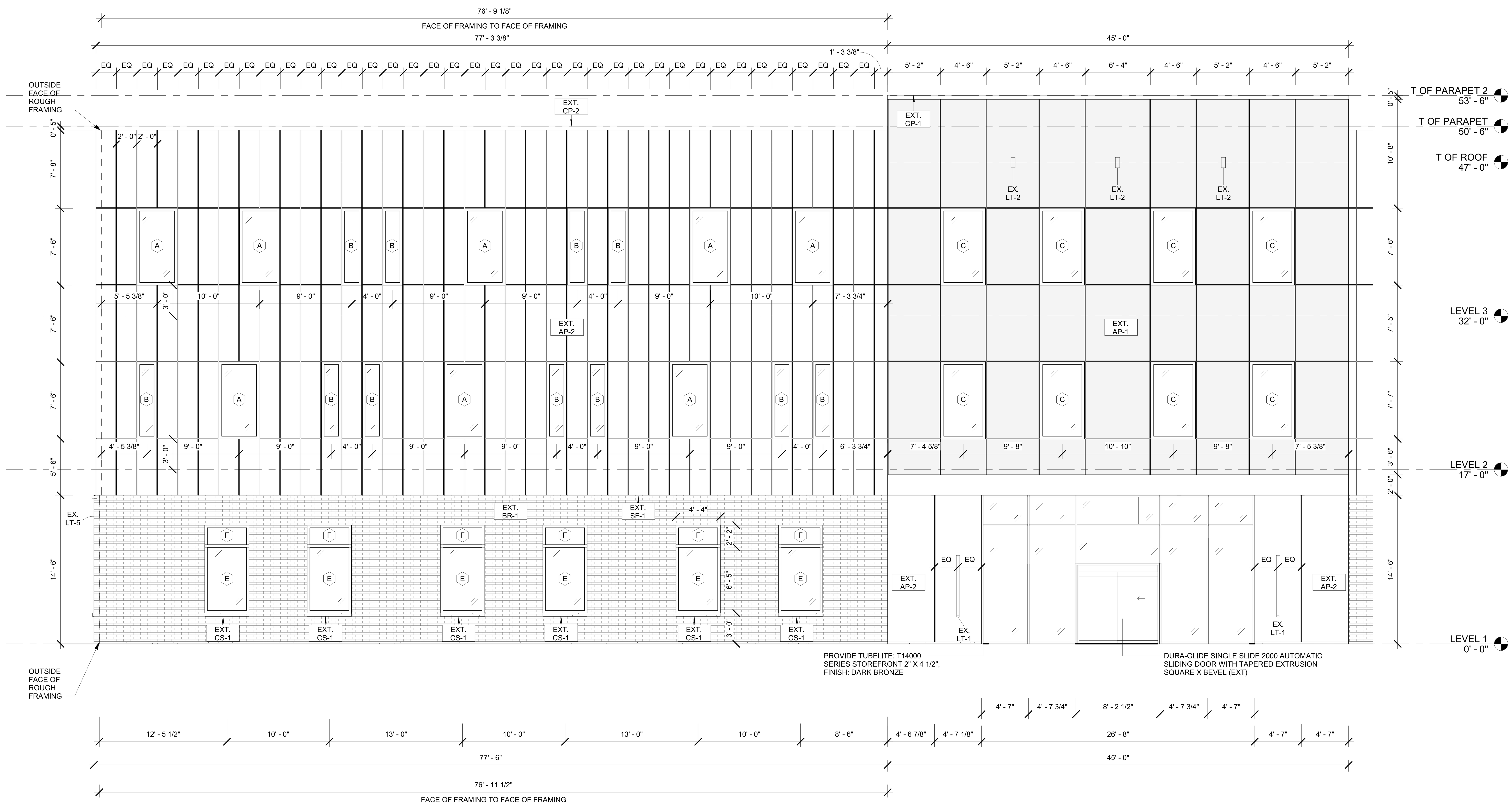
OVERALL EXTERIOR ELEVATIONS

Project number	#10323
Date	10/10/2023
Drawn by	JY
Checked by	JV

A1-4.2

Scale As indicated

10/18/2023 12:08:37 PM



1 ENLARGED ELEVATION WEST 1
3/16" = 1'-0"

apex DESIGN > BUILD
9550 W.Higgins Rd. 170
Rosemont, IL 60018

ADTG, LLC

360 CORPORATE DR.
PORTSMOUTH , NH 03801

ARCHITECT OF RECORD
SUSAN L. SKIBELL, ARCHITECT 1360 N. SANDBURG TERRACE #1902 CHICAGO, IL. 60610
312.350.7161

SEAL:

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2	TAC PUBLIC HEARING	08/21/2023
3	PRICING SET	10/13/2023
4	TAC PUBLIC HEARING #2	10/20/2023

EXTERIOR ELEVATIONS

Project number #10323

Date 10/10/2023

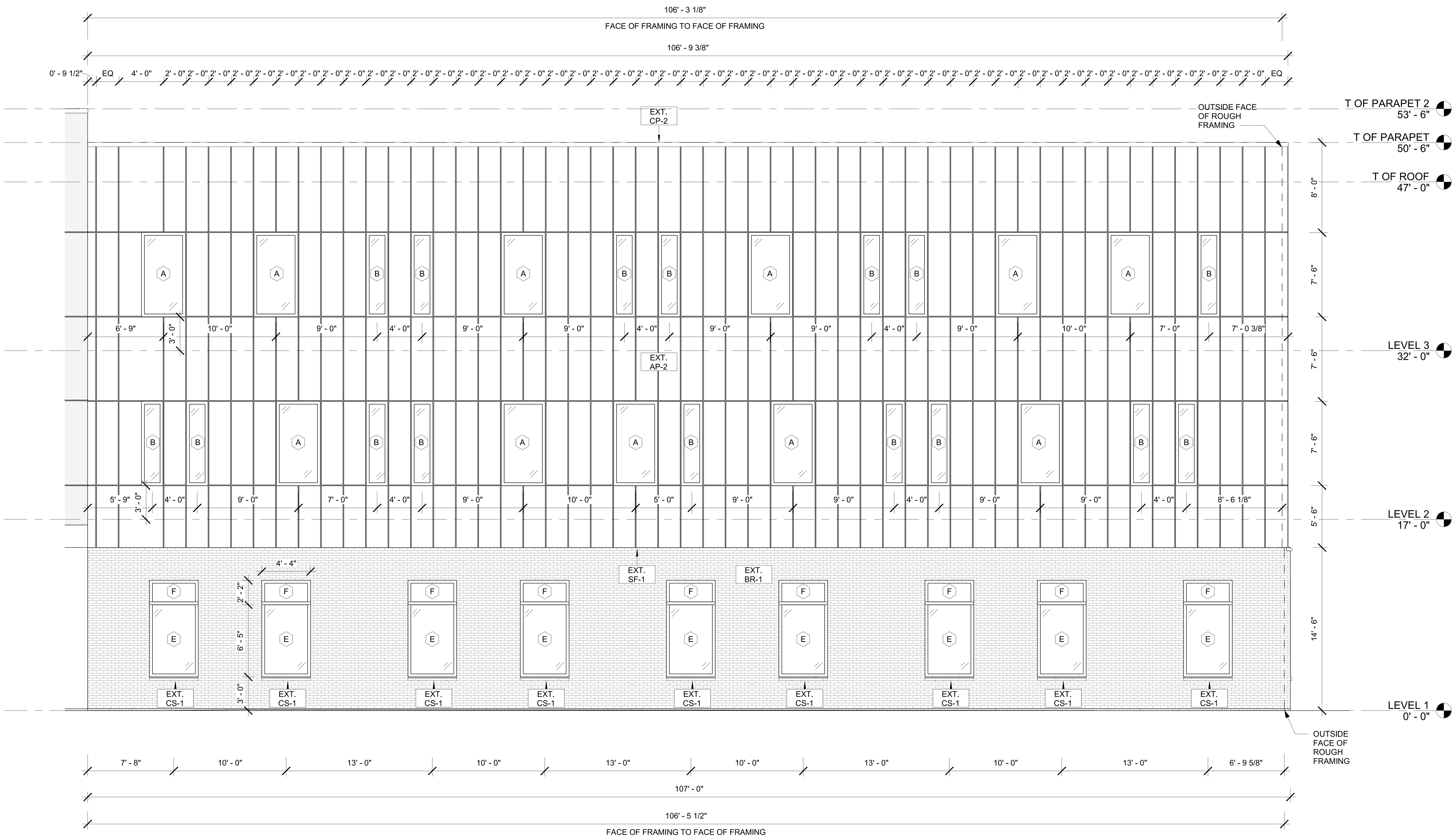
Drawn by JY

Checked by JV

A1-4.3

Scale 3/16" = 1'-0"

10/18/2023 12:08:38 PM



1 ENLARGED ELEVATION WEST 2
3/16" = 1'-0"

apex DESIGN > BUILD
9550 W.Higgins Rd. 170
Rosemont, IL 60018

ADTG, LLC

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PORTSMOUTH , NH 03801

ARCHITECT OF RECORD
SUSAN L. SKIBELL, ARCHITECT 1360 N. SANDBURG TERRACE #1902 CHICAGO, IL. 60610
312.350.7161

SEAL:

No.	Description	Date
1	TAC WORKSHOP REVIEW	07/25/2023
2	TAC PUBLIC HEARING	08/21/2023
3	PRICING SET	10/13/2023
4	TAC PUBLIC HEARING #2	10/20/2023

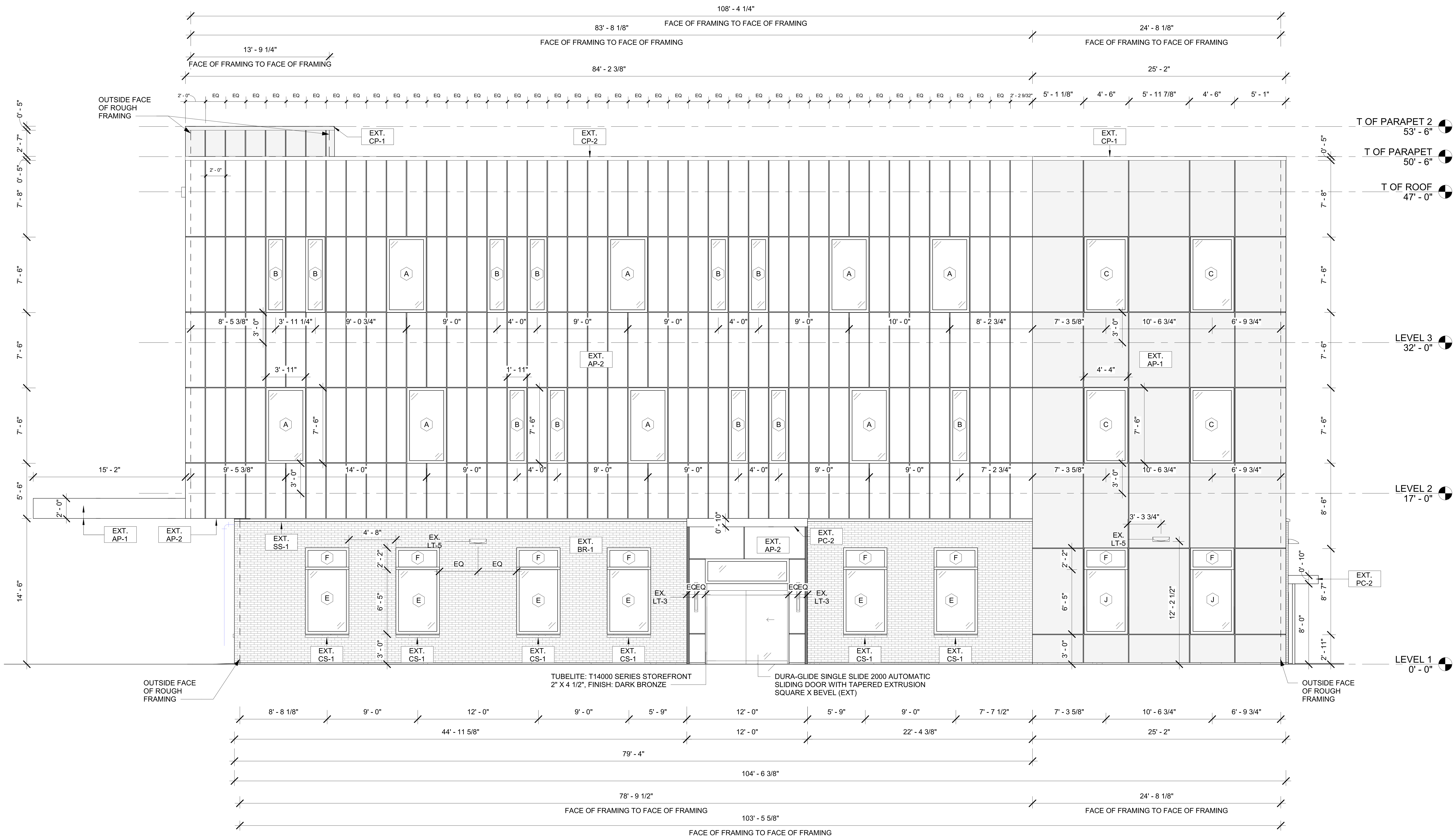
EXTERIOR ELEVATIONS

Project number	#10323
Date	10/10/2023
Drawn by	JY
Checked by	JV

A1-4.4

Scale 3/16" = 1'-0"

10/18/2023 12:08:39 PM



1 ENLARGED ELEVATION SOUTH 1
3/16" = 1'-0"

apex DESIGN > BUILD

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ARCHITECT OF RECORD
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No.	Description	Date
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3	PRICING SET	10/13/2023
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EXTERIOR ELEVATIONS

Project number #10323

Date 10/10/2023

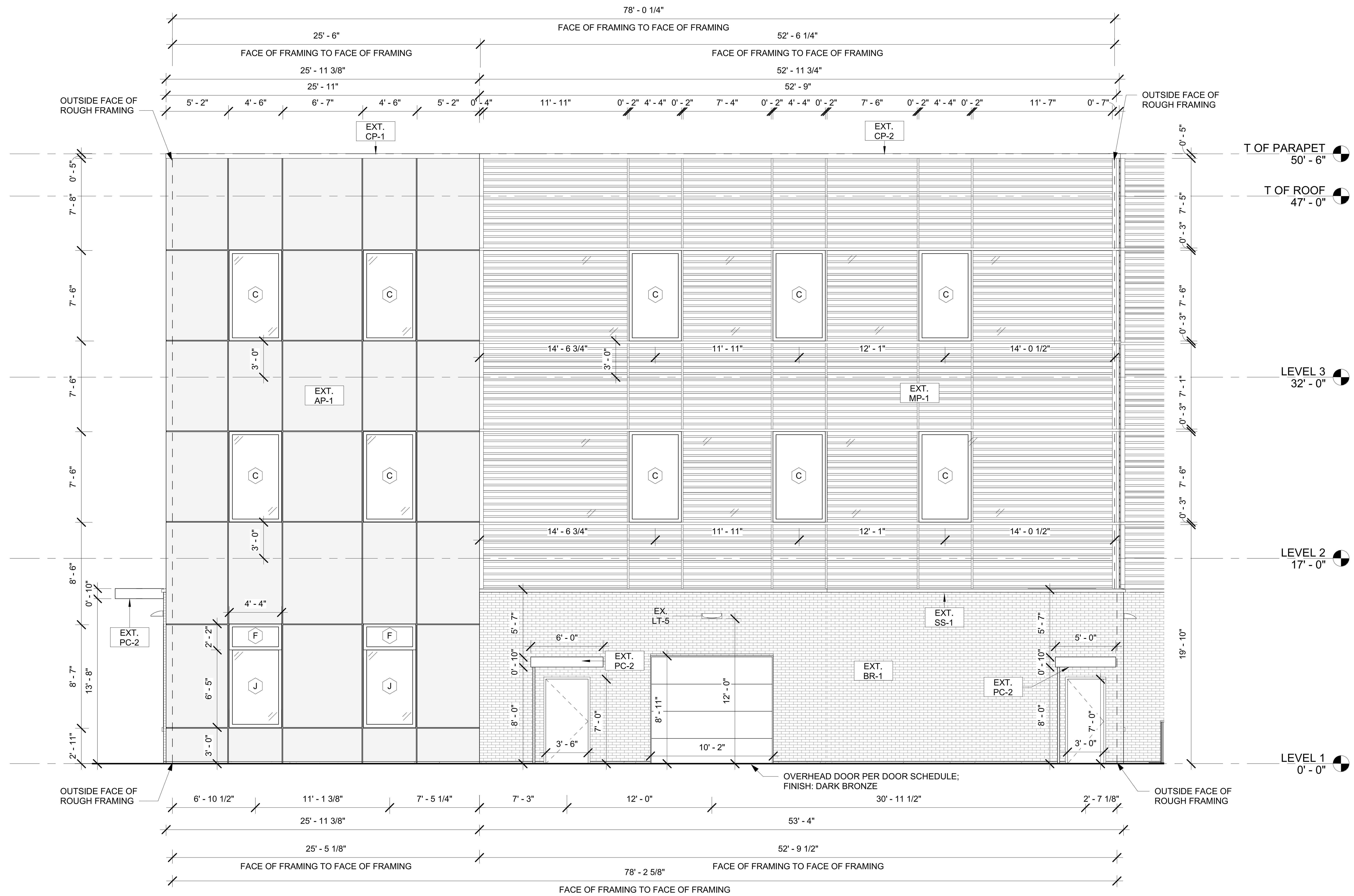
Drawn by JY

Checked by JV

A1-4.5

Scale 3/16" = 1'-0"

10/18/2023 12:08:41 PM



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

apex DESIGN > BUILD

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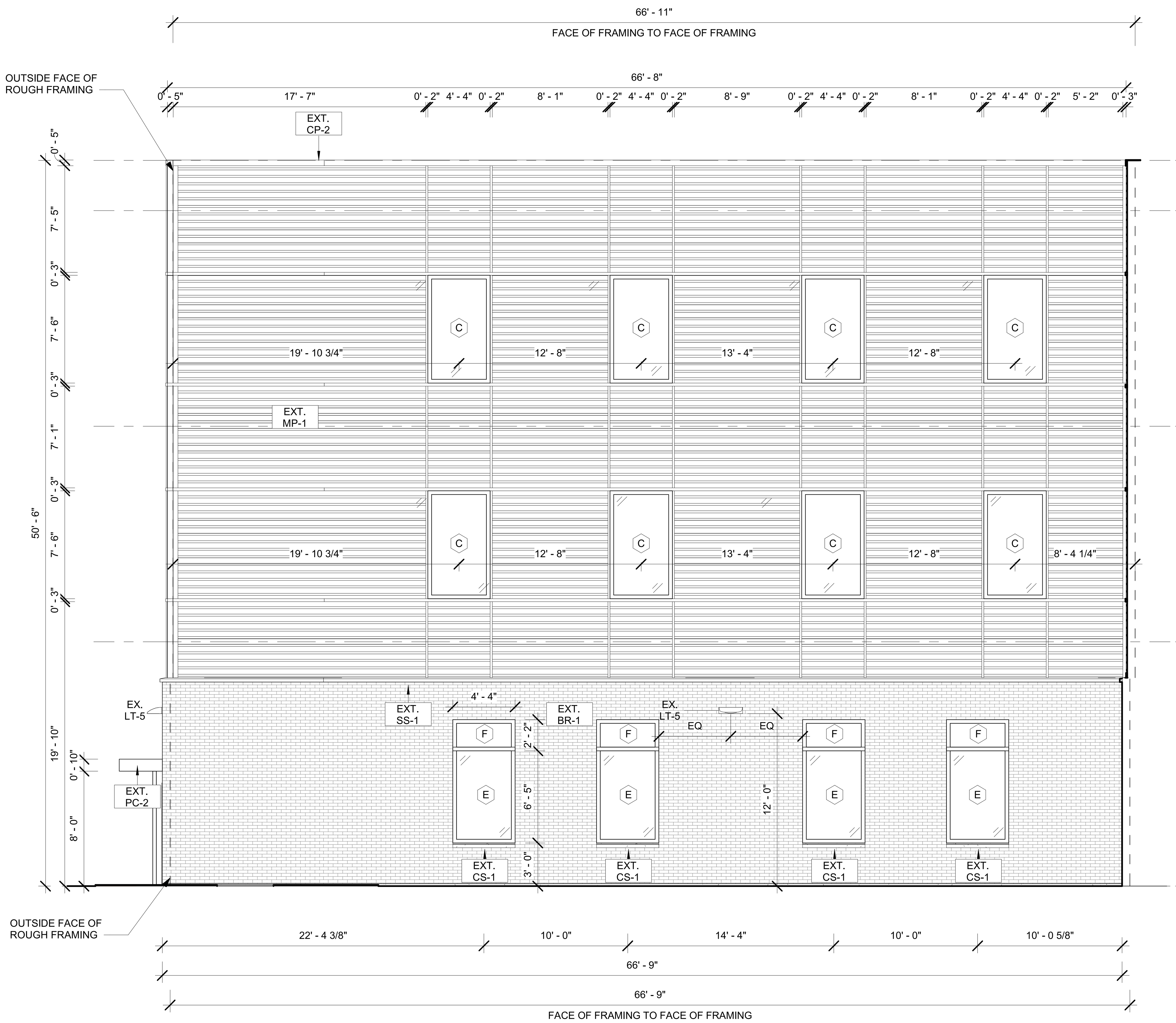
EXTERIOR ELEVATIONS

Project number	#10323
Date	10/10/2023
Drawn by	JY
Checked by	JV

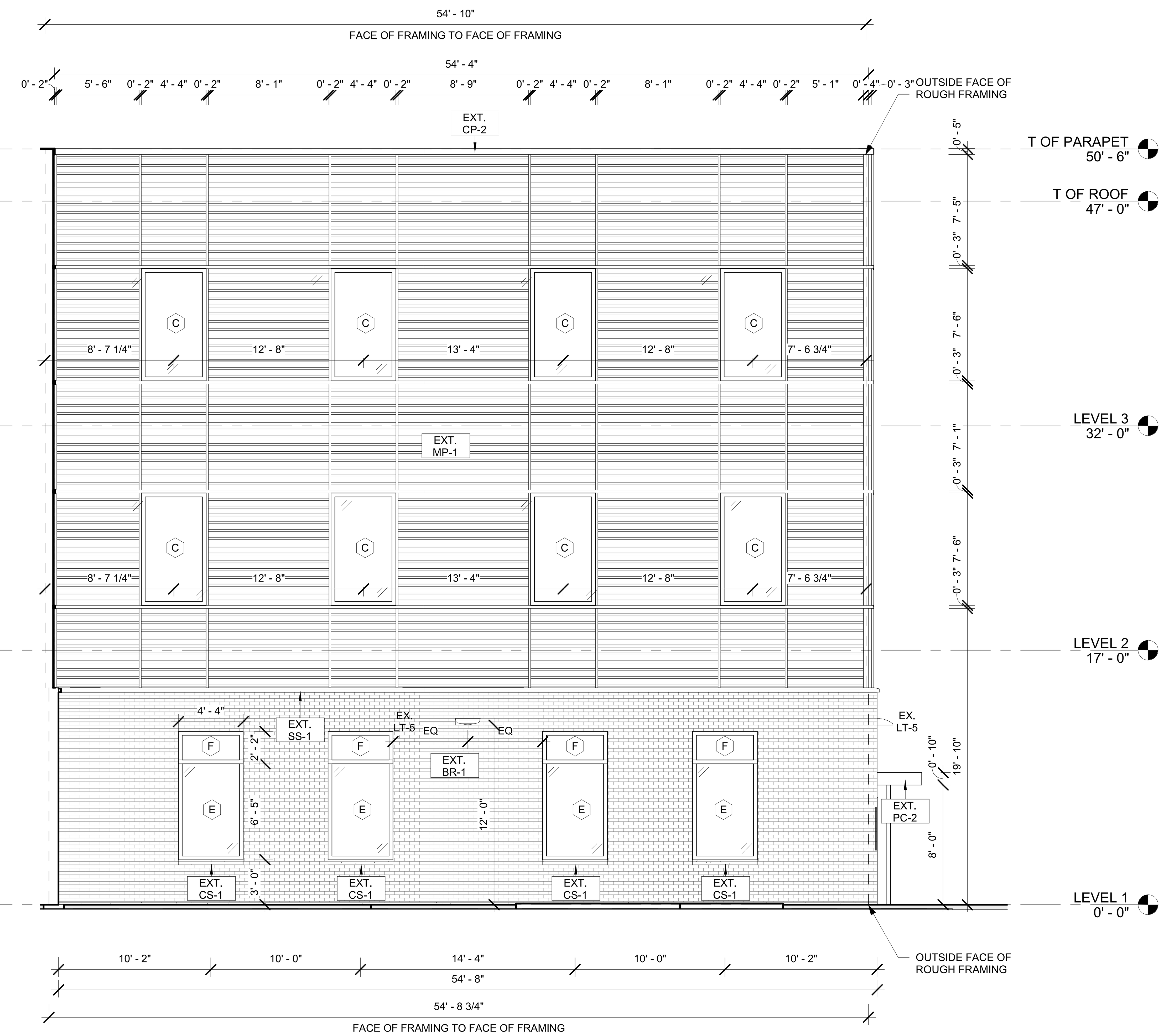
A1-4.6

Scale 3/16" = 1'-0"

10/18/2023 12:08:42 PM



1 ENLARGED ELEVATION SOUTH 2
3/16" = 1'-0"



2 ENLARGED ELEVATION NORTH 2
3/16" = 1'-0"

apex DESIGN > BUILD
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312.350.7161

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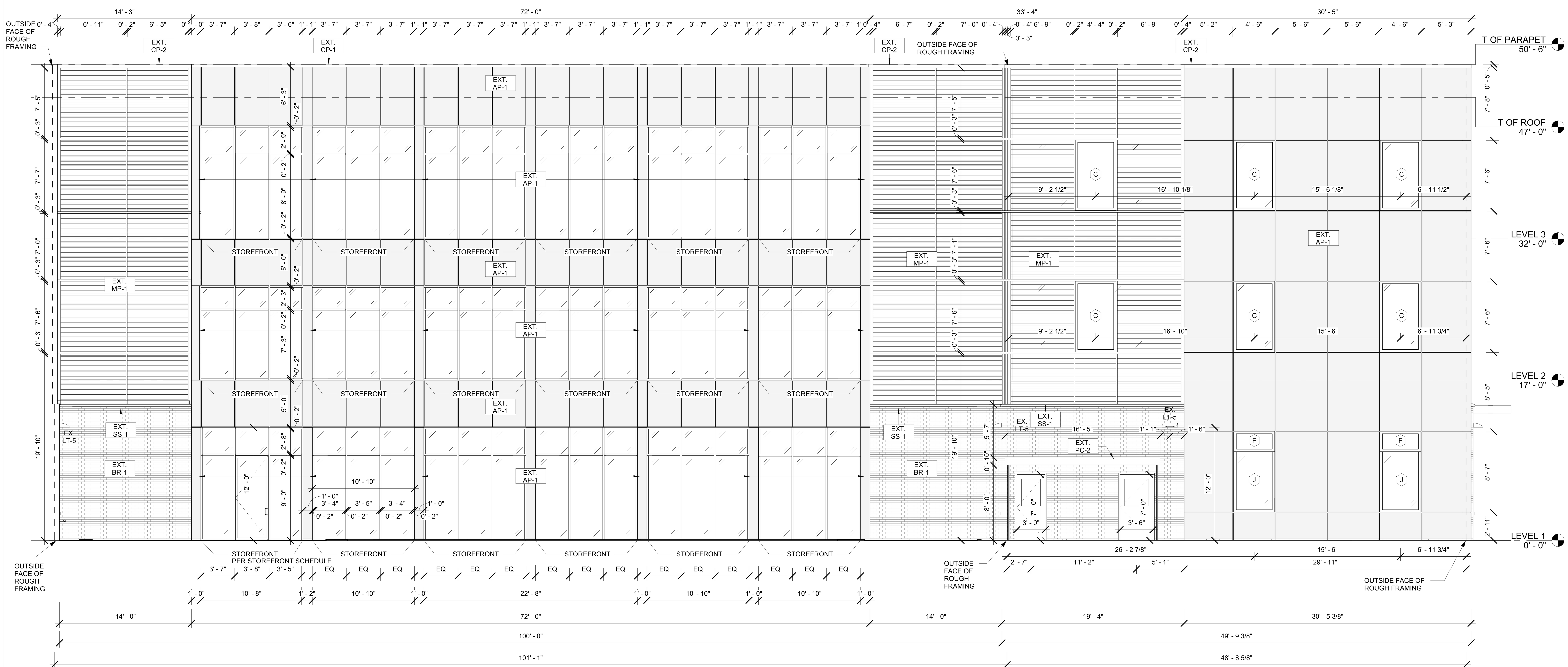
EXTERIOR ELEVATIONS

Project number #10323
Date 10/10/2023
Drawn by JY
Checked by JV

A1-4.7

Scale 3/16" = 1'-0"

10/18/2023 12:08:43 PM



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

apex DESIGN > BUILD
9550 W.Higgins Rd. 170
Rosemont, IL 60018

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360 CORPORATE DR.
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ARCHITECT OF RECORD
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312.350.7161

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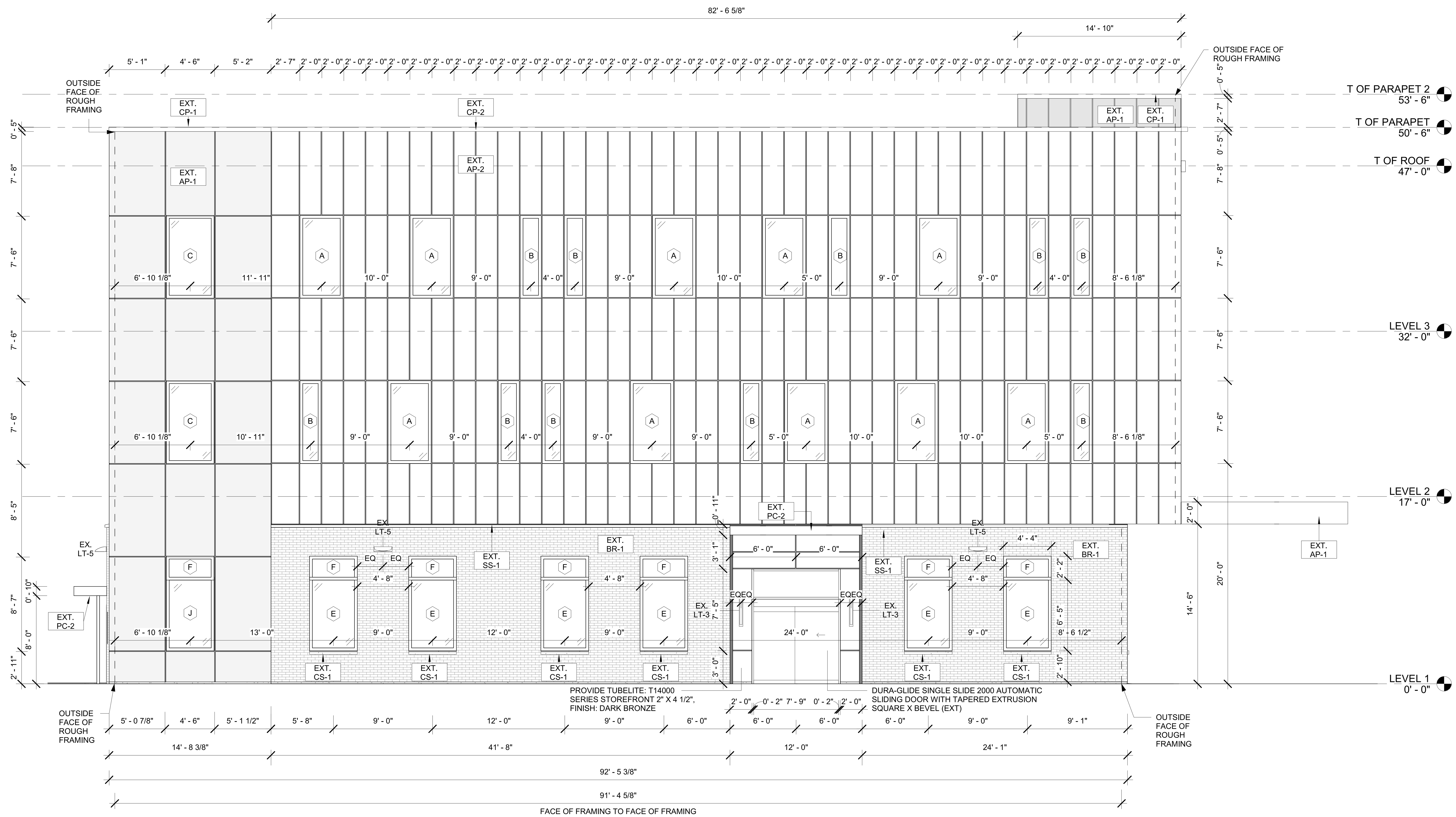
EXTERIOR ELEVATIONS

Project number	#10323
Date	10/10/2023
Drawn by	JY
Checked by	JV
	A1-4.8
Scale	3/16" = 1'-0"

10/18/2023 12:08:45 PM



1 ENLARGED ELEVATION NORTH 1
3/16" = 1'-0"

apex DESIGN > BUILD

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Rosemont, IL 60018

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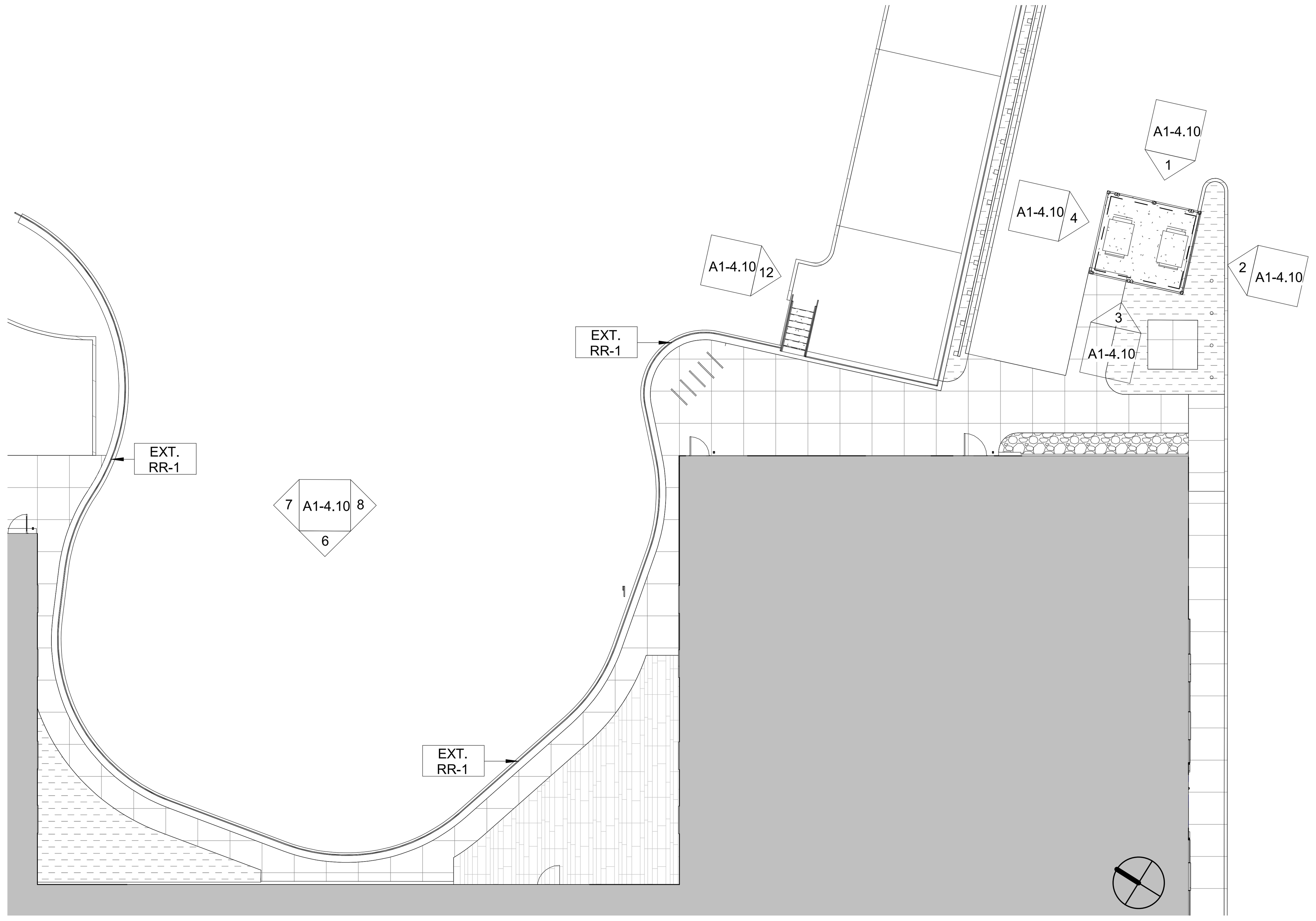
EXTERIOR ELEVATIONS

Project number	#10323
Date	10/10/2023
Drawn by	JY
Checked by	JV

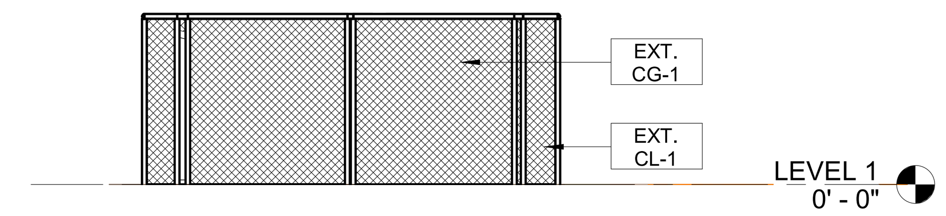
A1-4.9

Scale 3/16" = 1'-0"

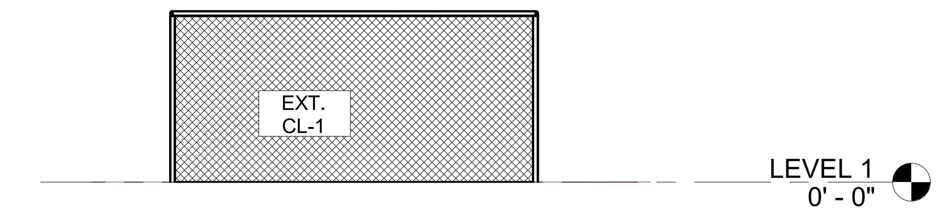
10/18/2023 12:08:46 PM



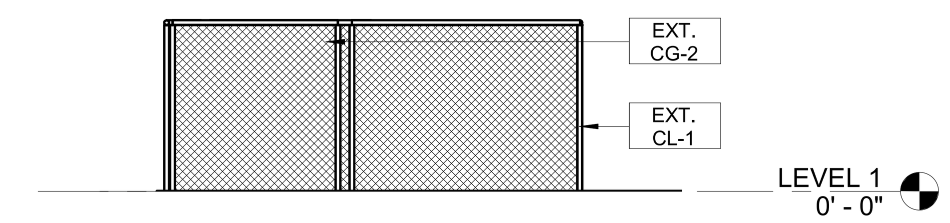
5 RAILING PLAN
1/16" = 1'-0"



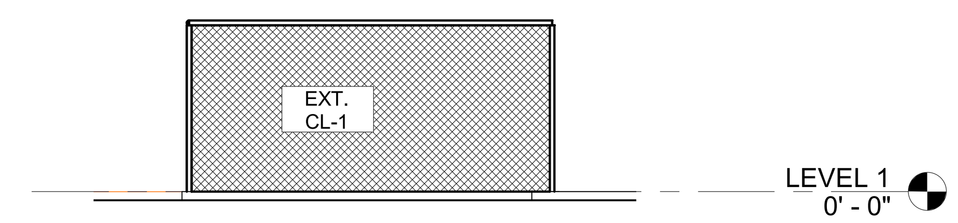
1 GARBAGE ENCLOSURE ELEVATION 1
3/16" = 1'-0"



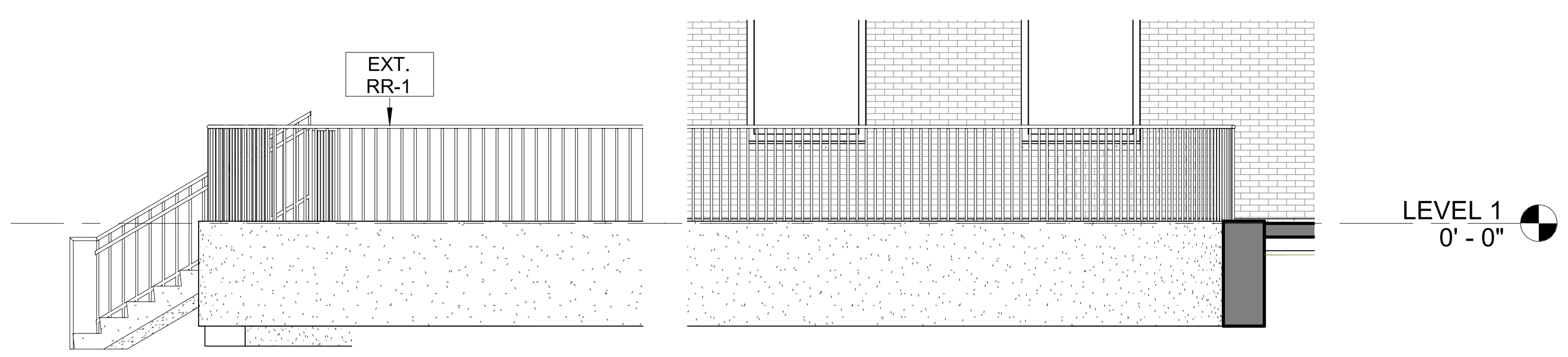
2 GARBAGE ENCLOSURE ELEVATION 2
3/16" = 1'-0"



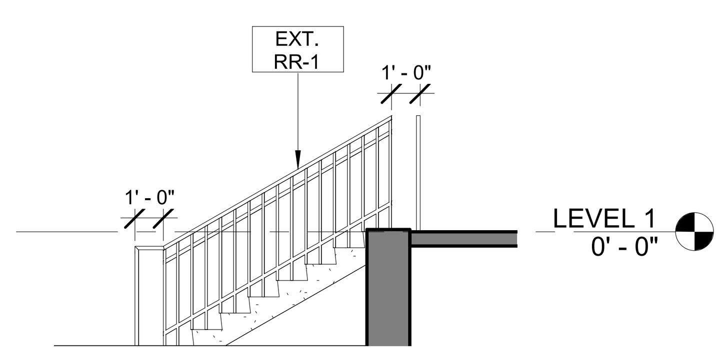
3 GARBAGE ENCLOSURE ELEVATION 3
3/16" = 1'-0"



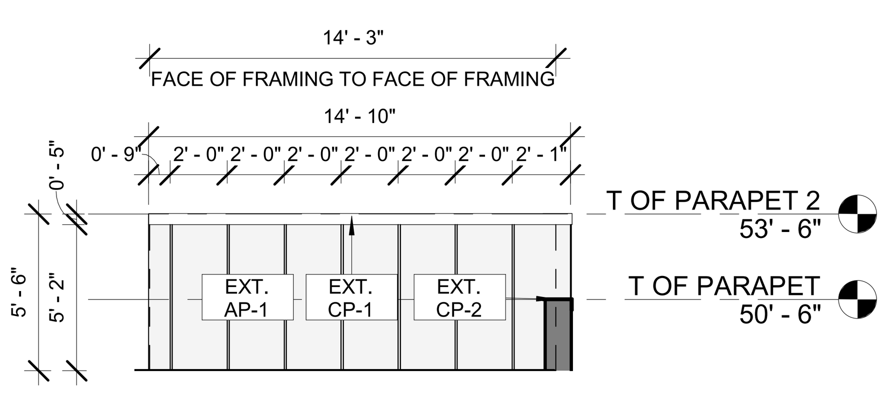
4 GARBAGE ENCLOSURE ELEVATION 4
3/16" = 1'-0"



8 FENCE ELEVATION 1
3/16" = 1'-0"

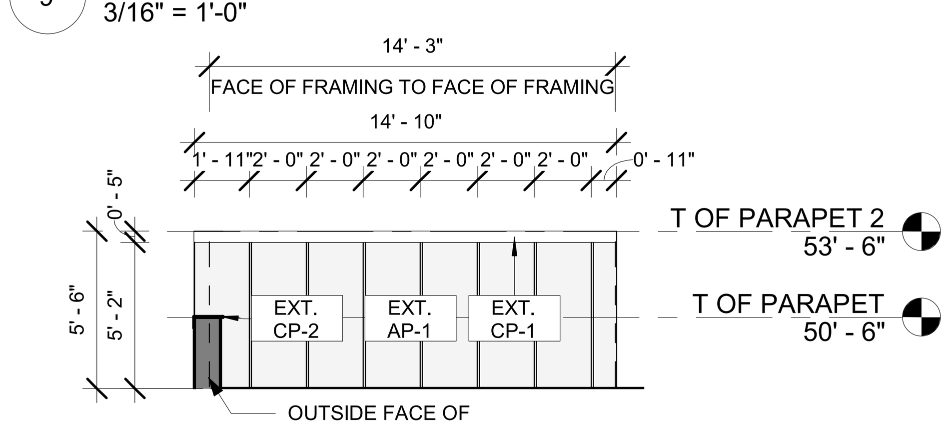


12 EXTERIOR STAIR ELEVATION
3/16" = 1'-0"

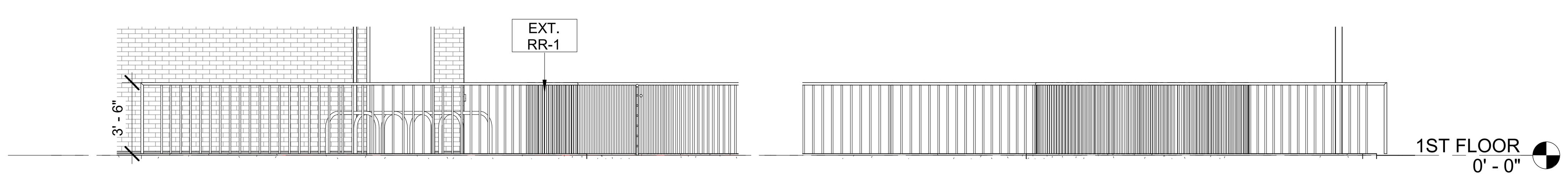


9 TOP WING WALL NORTH
3/16" = 1'-0"

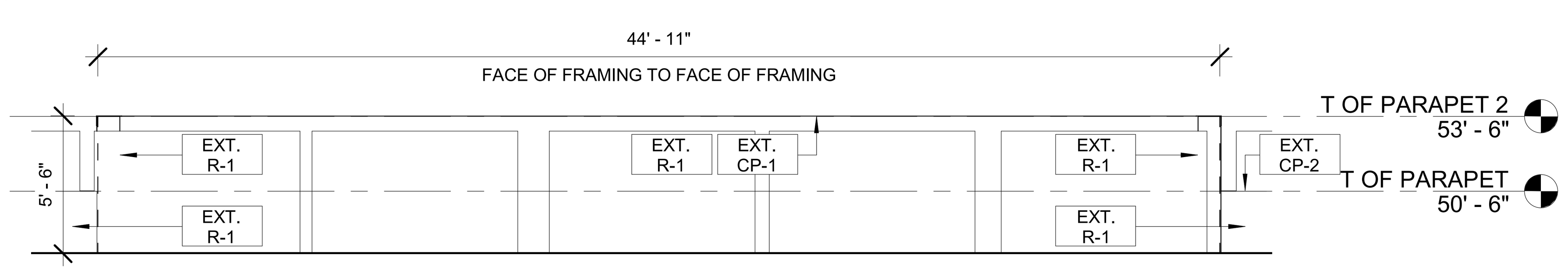
7 FENCE ELEVAITON 2
3/16" = 1'-0"



11 TOP WING WALL SOUTH
3/16" = 1'-0"



6 FENCE ELEVATION 3
3/16" = 1'-0"



10 TOP WING WALL EAST
3/16" = 1'-0"

apex
DESIGN > BUILD
9550 W.Higgins Rd. 170
Rosemont, IL 60018

ADTG, LLC

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PORTSMOUTH , NH 03801

ARCHITECT OF RECORD
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312.350.7161

SEAL:

No.	Description	Date
2	TAC PUBLIC HEARING	08/21/2023
3	PRICING SET	10/13/2023
4	TAC PUBLIC HEARING #2	10/20/2023

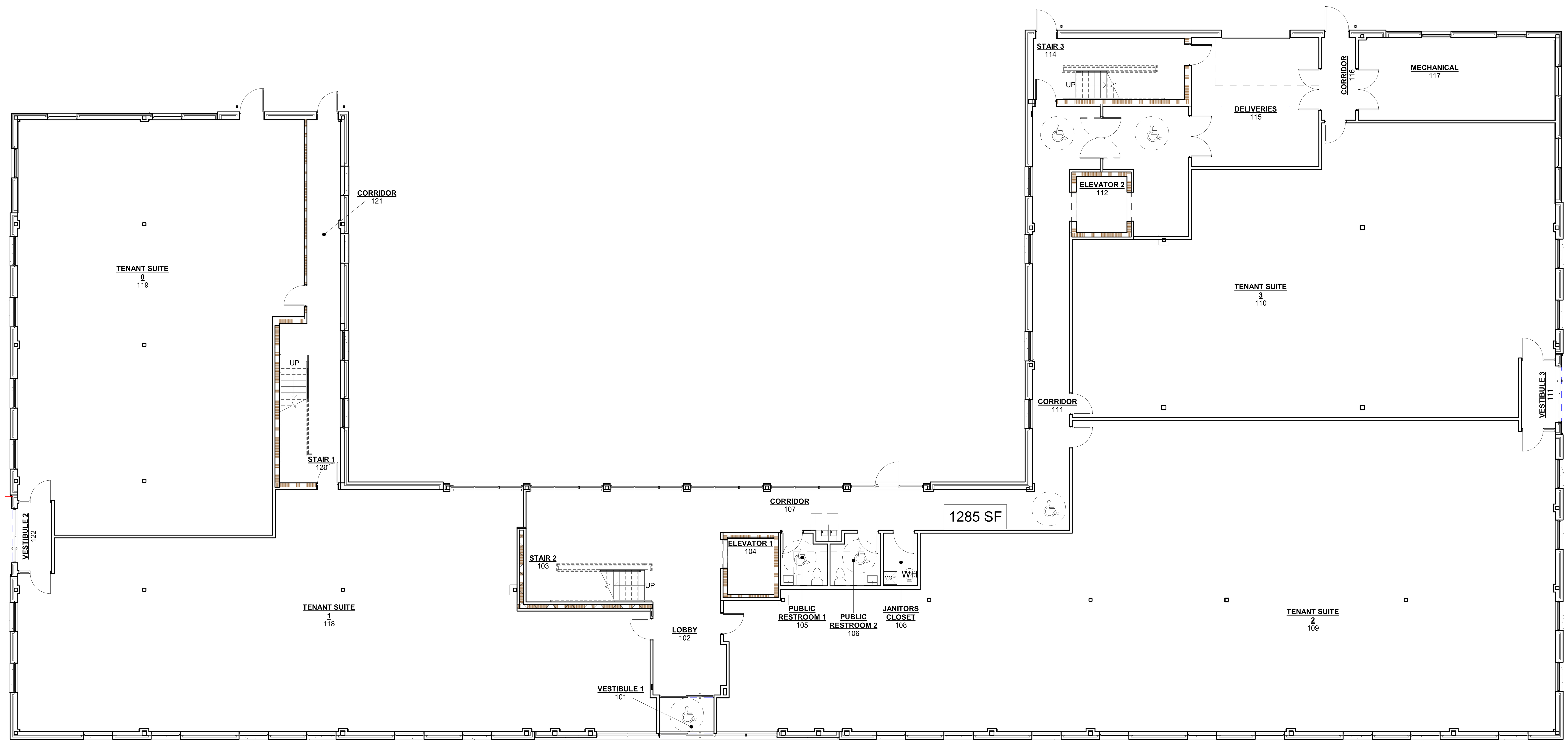
FENCE ELEVATIONS

Project number	#10323
Date	10/10/2023
Drawn by	JY
Checked by	JV
	A1-4.10
Scale	As indicated

10/18/2023 12:08:50 PM

SUBCONTRACTOR NOTES

A. SUBCONTRACTORS TO VERIFY ALL EXISTING DIMENSIONS IN FIELD PRIOR TO CONSTRUCTION. NOTIFY ARCHITECT OF DISCREPANCIES PRIOR TO COMMENCEMENT OF DEMOLITION/ CONSTRUCTION.
B. IF EXISTING BUILDING ELEMENTS WHICH WOULD OBSTRUCT THE PROPER EXECUTION OF THE DESIGN INTENT ARE FOUND, BUT ARE NOT SPECIFIED IN THE CONSTRUCTION DOCUMENTS, CONTACT INTERIOR DESIGNER/ARCHITECT & WAIT FOR INSTRUCTION.
C. ALL BUILDING COMPONENTS & FINISHES WHICH ARE TO REMAIN IN PLACE SHALL BE PROTECTED FROM DAMAGE AND, IF DAMAGED, SHALL BE REPAIRED OR REPLACED AT NO COST TO THE OWNER.
D. DRYWALL CONSTRUCTION PARTITIONS, BULKHEADS, JOINTS, & HOLES TO BE TAPED & SANDED FOR FINISHING TO LIKE-NEW CONDITION.
E. ANY WOOD FRAMING, BLOCKING, & PLYWOOD SHALL BE FIRE RETARDANT TREATED WOOD.
F. SUBCONTRACTORS SHALL INSTALL EMERGENCY LIGHTING, SPRINKLERS, EXIT SIGNS, & FIRE EXTINGUISHERS AS REQUIRED BY THE LOCAL FIRE MARSHAL.
G. SUBCONTRACTORS SHALL REVIEW & UNDERSTAND PROJECT REQUIREMENTS & DRAWINGS FOR NEW CONSTRUCTION WORK & VISIT SITE TO DETERMINE EXTENT OF DEMOLITION PRIOR TO PERFORMING ANY WORK. SUBCONTRACTORS SHALL NOTIFY ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES.
H. SUBCONTRACTORS SHALL COORDINATE WITH THE BUILDING OWNER THE MEANS OF TRASH REMOVAL FOR DEMOLITION AS WELL AS DURING BUILD OUT. SUBCONTRACTORS WILL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED DEMOLITION & CONSTRUCTION PERMITS, INSPECTIONS, & APPROVALS & COMPLY WITH ALL STANDARDS OF CONSTRUCTION.
I. SUBCONTRACTORS SHALL NOTE THAT UPON INSPECTION OF SITE, EXISTING CONDITIONS, & ACCEPTANCE OF BID, SUBCONTRACTORS ACCEPT RESPONSIBILITY TO COMPLETE ALL WORK AS DETAILED IN THE CONSTRUCTION DOCUMENTS. CHANGE ORDERS FOR ADDITIONAL WORK WILL NOT BE PERMITTED UNLESS THE WORK IS NOT CALLED OUT IN THE DOCUMENTS OR A HIDDEN CONDITION EXISTS THAT PREVENTS EXECUTING THE WORK AS DETAILED IN THE DRAWINGS. APPROVAL OF ADDITIONAL COST & SCOPE OF WORK TO BE OBTAINED FROM PROJECT MANAGER PRIOR TO EXECUTING WORK.
J. ALL PENETRATIONS THROUGH FIRE RATED & SOUND RATED WALLS SHALL BE SEALED WITH FIRE CAULK MATERIAL.
K. SUBMITTALS ARE REQUIRED ON ALL SUBCONTRACTOR SUPPLIED ITEMS TO APEX.
L. ALL MATERIAL & LABOR SHALL BE WARRANTIED FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE CERTIFICATE OF OCCUPANCY.
M. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH APPLICABLE CODES AS INTERPRETED BY THE GOVERNING AUTHORITIES.
N. SUBCONTRACTORS SHALL PROVIDE SUFFICIENT ATTACHMENT & IN-WALL/HIDDEN BLOCKING REQUIRED FOR WALL-HUNG ITEMS, EQUIPMENT, & OTHER CONSTRUCTION.
O. SUBCONTRACTORS SHALL COORDINATE THEIR WORK WITH ANY OTHER SUBCONTRACTORS ON THE JOB SO AS TO PREVENT CONFLICTS DURING CONSTRUCTION. ADDITIONAL WORK CAUSED BY A LACK OF COORDINATION BETWEEN SUBCONTRACTORS SHALL BE AT THE SUBCONTRACTORS EXPENSE.
P. IF NOT ALREADY EXISTING, PROVIDE VAPOR BARRIERS AT ALL EXISTING & EXPOSED EXTERIOR WALLS OR ATTIC INSULATION, OR ANY OTHER AREA THAT NEEDS IT BY CODE/BEST PRACTICE. IF VAPOR BARRIERS ARE DAMAGED DURING CONSTRUCTION, IT SHOULD BE REPAIRED AT THE SUBCONTRACTORS EXPENSE.
Q. REFER TO THE A5 SERIES SHEETS FOR FULL SCHEDULES.
R. IN SPRINKLED BUILDINGS THE CLEARANCE IS 18" FROM THE CEILING AND NON-SPRINKLED BUILDING THE CLEARANCE IS 24", NOTHING SHALL BE STORED/ SHELVING INSTALLED ABOVE THIS POINT.
S. AT BATHROOM WALLS WITH TILED FINISH (DESCRIBED ON PLAN), PROVIDE 1/2" WATERPROOF GYPSUM BOARD ON ROOM SIDE WITH STAGGERED JOINTS. AT ROOM WITH HOSE BIBS PROVIDE CEMENT BOARD UP 48" AFF MIN.



1 FLOOR PLAN - 1ST FLOOR OVERALL -TAGS
1/8" = 1'-0"

apex DESIGN > BUILD
9550 W.Higgins Rd. 170
Rosemont, IL 60018

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360 CORPORATE DR.
PORTSMOUTH , NH 03801

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312.350.7161

SEAL:

No.	Description	Date
3	PRICING SET	10/13/2023
4	TAC PUBLIC HEARING #2	10/20/2023

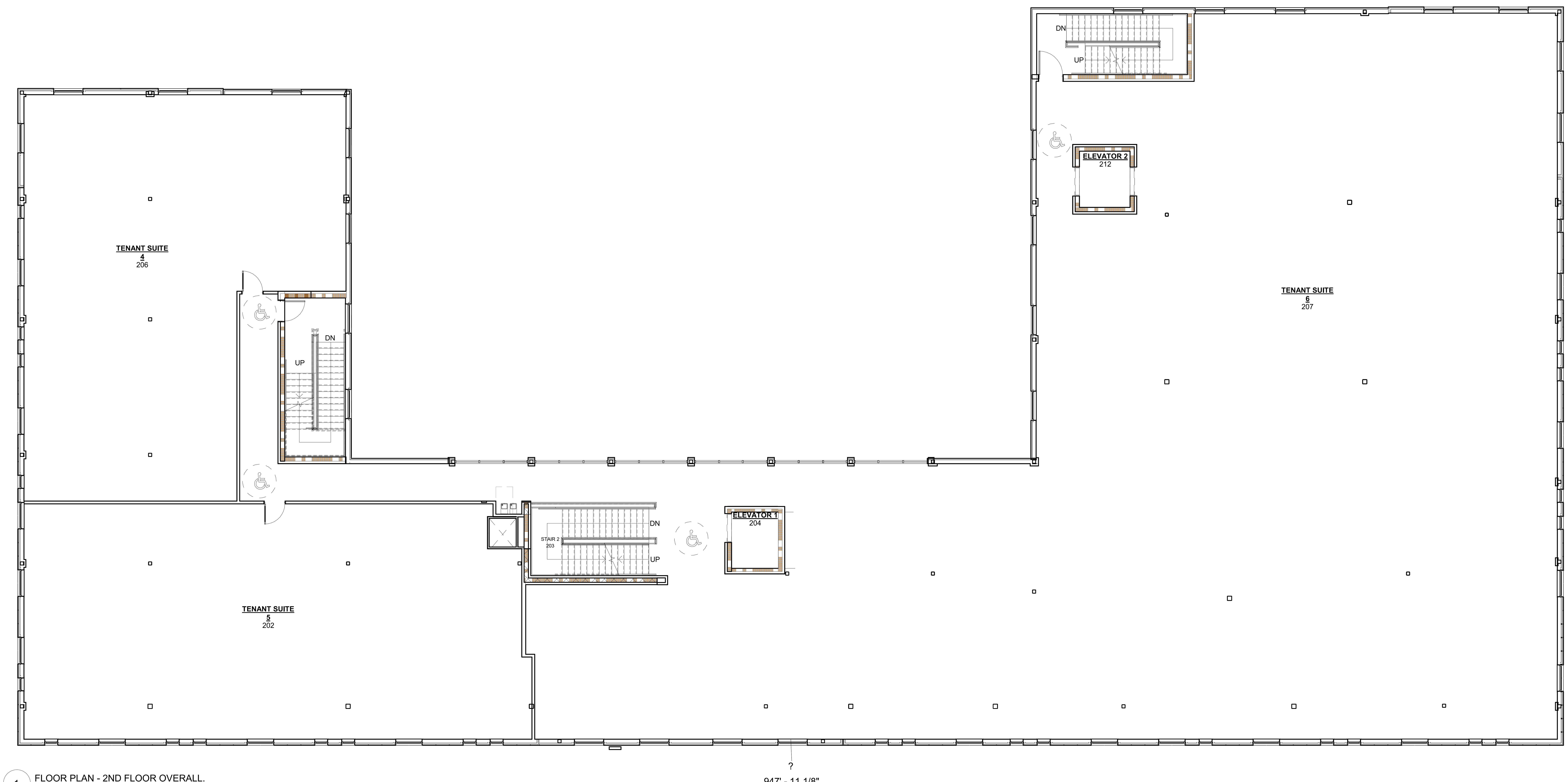
FLOOR PLAN - 1ST FLOOR OVERALL

Project number	#10323
Date	10/10/2023
Drawn by	NM
Checked by	MMS
	A2-3.1
Scale	1/8" = 1'-0"

10/19/2023 9:27:01 AM

SUBCONTRACTOR NOTES

A. SUBCONTRACTORS TO VERIFY ALL EXISTING DIMENSIONS IN FIELD PRIOR TO CONSTRUCTION. NOTIFY ARCHITECT OF DISCREPANCIES PRIOR TO COMMENCEMENT OF DEMOLITION/ CONSTRUCTION.
B. IF EXISTING BUILDING ELEMENTS WHICH WOULD OBSTRUCT THE PROPER EXECUTION OF THE DESIGN INTENT ARE FOUND, BUT ARE NOT SPECIFIED IN THE CONSTRUCTION DOCUMENTS, CONTACT INTERIOR DESIGNER/ARCHITECT & WAIT FOR INSTRUCTION.
C. ALL BUILDING COMPONENTS & FINISHES WHICH ARE TO REMAIN IN PLACE SHALL BE PROTECTED FROM DAMAGE AND, IF DAMAGED, SHALL BE REPAIRED OR REPLACED AT NO COST TO THE OWNER.
D. DRYWALL CONSTRUCTION PARTITIONS, BULKHEADS, JOINTS, & HOLES TO BE TAPED & SANDED FOR FINISHING TO LIKE-NEW CONDITION.
E. ANY WOOD FRAMING, BLOCKING, & PLYWOOD SHALL BE FIRE RETARDANT TREATED WOOD.
F. SUBCONTRACTORS SHALL INSTALL EMERGENCY LIGHTING, SPRINKLERS, EXIT SIGNS, & FIRE EXTINGUISHERS AS REQUIRED BY THE LOCAL FIRE MARSHAL.
G. SUBCONTRACTORS SHALL REVIEW & UNDERSTAND PROJECT REQUIREMENTS & DRAWINGS FOR NEW CONSTRUCTION WORK & VISIT SITE TO DETERMINE EXTENT OF DEMOLITION PRIOR TO PERFORMING ANY WORK. SUBCONTRACTORS SHALL NOTIFY ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES.
H. SUBCONTRACTORS SHALL COORDINATE WITH THE BUILDING OWNER THE MEANS OF TRASH REMOVAL FOR DEMOLITION AS WELL AS DURING BUILD OUT. SUBCONTRACTORS WILL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED DEMOLITION & CONSTRUCTION PERMITS, INSPECTIONS, & APPROVALS & COMPLY WITH ALL STANDARDS OF CONSTRUCTION.
I. SUBCONTRACTORS SHALL NOTE THAT UPON INSPECTION OF SITE, EXISTING CONDITIONS, & ACCEPTANCE OF BID, SUBCONTRACTORS ACCEPT RESPONSIBILITY TO COMPLETE ALL WORK AS DETAILED IN THE CONSTRUCTION DOCUMENTS. CHANGE ORDERS FOR ADDITIONAL WORK WILL NOT BE PERMITTED UNLESS THE WORK IS NOT CALLED OUT IN THE DOCUMENTS OR A HIDDEN CONDITION EXISTS THAT PREVENTS EXECUTING THE WORK AS DETAILED IN THE DRAWINGS. APPROVAL OF ADDITIONAL COST & SCOPE OF WORK TO BE OBTAINED FROM PROJECT MANAGER PRIOR TO EXECUTING WORK.
J. ALL PENETRATIONS THROUGH FIRE RATED & SOUND RATED WALLS SHALL BE SEALED WITH FIRE CAULK MATERIAL.
K. SUBMITTALS ARE REQUIRED ON ALL SUBCONTRACTOR SUPPLIED ITEMS TO APEX.
L. ALL MATERIAL & LABOR SHALL BE WARRANTIED FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE CERTIFICATE OF OCCUPANCY.
M. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH APPLICABLE CODES AS INTERPRETED BY THE GOVERNING AUTHORITIES.
N. SUBCONTRACTORS SHALL PROVIDE SUFFICIENT ATTACHMENT & IN-WALL/HIDDEN BLOCKING REQUIRED FOR WALL-HUNG ITEMS, EQUIPMENT, & OTHER CONSTRUCTION.
O. SUBCONTRACTORS SHALL COORDINATE THEIR WORK WITH ANY OTHER SUBCONTRACTORS ON THE JOB SO AS TO PREVENT CONFLICTS DURING CONSTRUCTION. ADDITIONAL WORK CAUSED BY A LACK OF COORDINATION BETWEEN SUBCONTRACTORS SHALL BE AT THE SUBCONTRACTORS EXPENSE.
P. IF NOT ALREADY EXISTING, PROVIDE VAPOR BARRIERS AT ALL EXISTING & EXPOSED EXTERIOR WALLS OR ATTIC INSULATION, OR ANY OTHER AREA THAT NEEDS IT BY CODE/BEST PRACTICE. IF VAPOR BARRIERS ARE DAMAGED DURING CONSTRUCTION, IT SHOULD BE REPAIRED AT THE SUBCONTRACTORS EXPENSE.
Q. REFER TO THE A5 SERIES SHEETS FOR FULL SCHEDULES.
R. IN SPRINKLED BUILDINGS THE CLEARANCE IS 18” FROM THE CEILING AND NON-SPRINKLED BUILDING THE CLEARANCE IS 24”, NOTHING SHALL BE STORED/ SHELVING INSTALLED ABOVE THIS POINT.
S. AT BATHROOM WALLS WITH TILED FINISH (DESCRIBED ON PLAN), PROVIDE 1/2" WATERPROOF GYPSUM BOARD ON ROOM SIDE WITH STAGGERED JOINTS. AT ROOM WITH HOSE BIBS PROVIDE CEMENT BOARD UP 48" AFF MIN.



1 FLOOR PLAN - 2ND FLOOR OVERALL.
1/8" = 1'-0"

apex DESIGN > BUILD
9550 W.Higgins Rd. 170
Rosemont, IL 60018

ADTG, LLC

360 CORPORATE DR.
PORTSMOUTH , NH 03801

ARCHITECT OF RECORD
SUSAN L. SKIBELL, ARCHITECT 1360 N. SANDBURG TERRACE #1902 CHICAGO, IL. 60610
312.350.7161

SEAL:

No.	Description	Date
3	PRICING SET	10/13/2023
4	TAC PUBLIC HEARING #2	10/20/2023

FLOOR PLAN - 2ND FLOOR OVERALL

Project number	#10323
Date	10/10/2023
Drawn by	NM
Checked by	MMS
	A2-3.2
Scale	1/8" = 1'-0"

10/19/2023 9:27:02 AM

SUBCONTRACTOR NOTES

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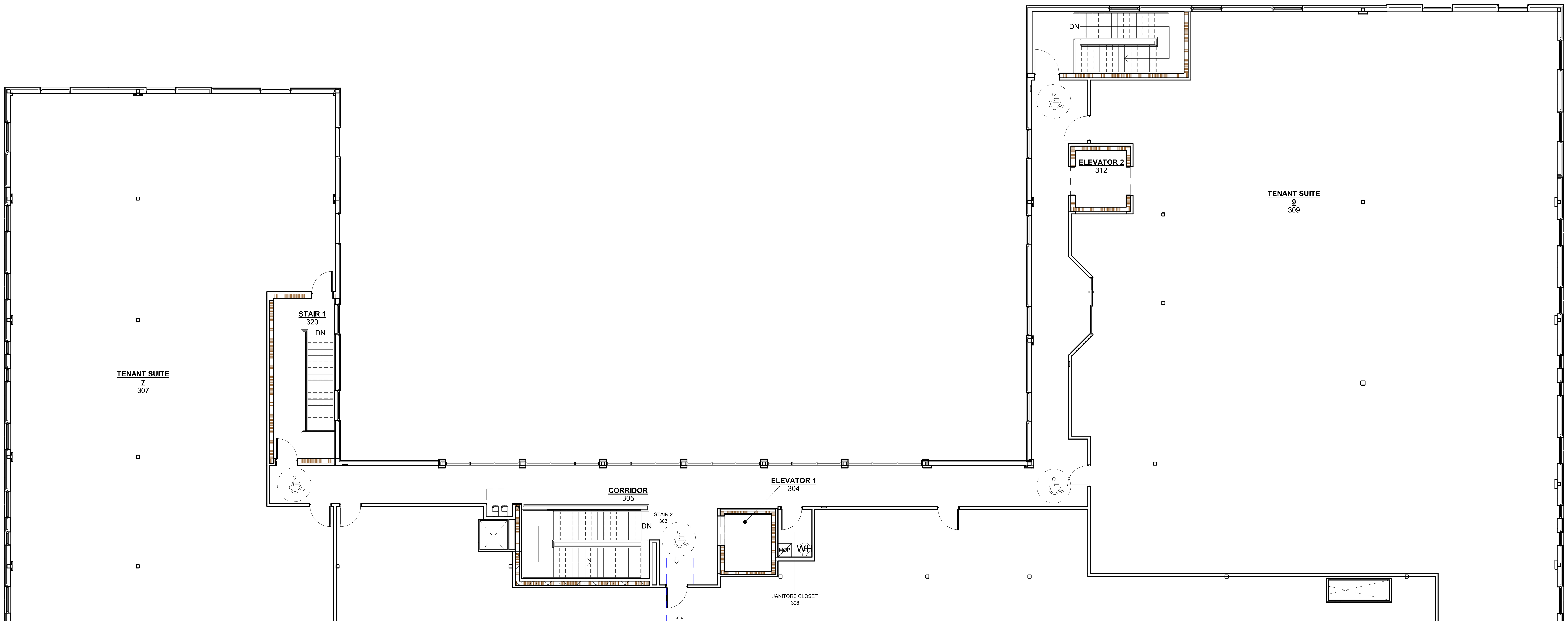


1 FLOOR PLAN - 3RD FLOOR OVERALL -TAGS
1/8" = 1'-0"

apex DESIGN > BUILD
9550 W.Higgins Rd. 170
Rosemont, IL 60018

ADTG, LLC

360 CORPORATE DR.
PORTSMOUTH , NH 03801

ARCHITECT OF RECORD
SUSAN L. SKIBELL, ARCHITECT 1360 N. SANDBURG TERRACE #1902 CHICAGO, IL. 60610
312.350.7161

SEAL:

No.	Description	Date
3	PRICING SET	10/13/2023
4	TAC PUBLIC HEARING #2	10/20/2023

FLOOR PLAN - 3RD FLOOR OVERALL

Project number	#10323
Date	10/10/2023
Drawn by	NM
Checked by	MMS

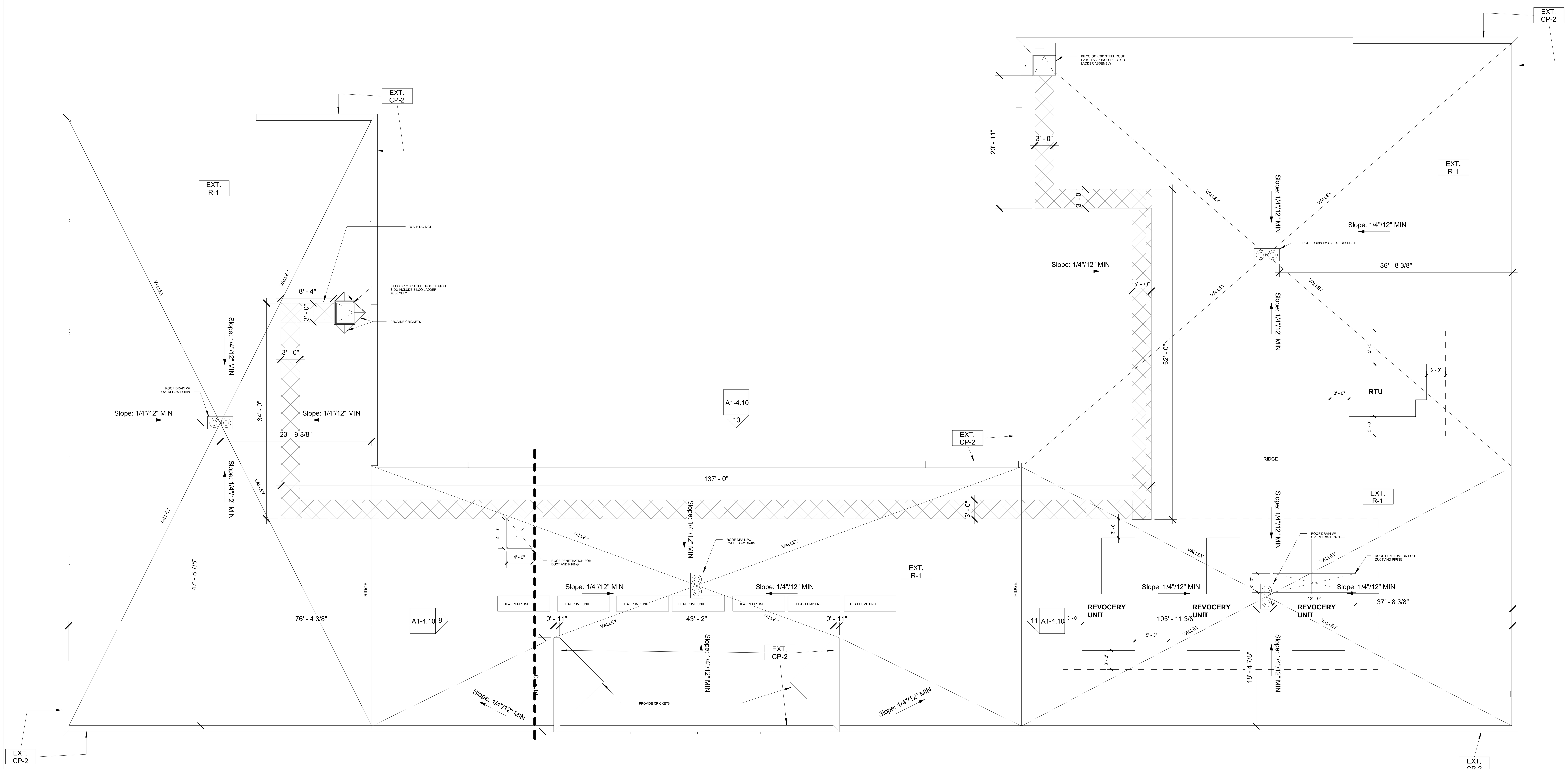
A2-3.3

Scale 1/8" = 1'-0"

10/19/2023 9:27:02 AM

GENERAL NOTES:

- SEE EXTERIOR FINISH SCHEDULE FOR MATERIAL SPECIFICATIONS
- ARROW ON PLAN DENOTES DIRECTION OF SLOPE
- SEE SHEET A1-3 FOR ROOFING MATERIALS
- FLAT ROOFS TO HAVE A MIN. 1/4:12 SLOPE, SLOPE PER ARROWS ON PLAN
- PITCHED ROOFS TO FOLLOW SLOPE AND DIRECTION PER ROOF PLAN
- INSTALL ISULATION AT ROOF TO BE MIN R-30CI
- INSTALL 60 MIL OUTPOST TPO MEMBRANE FULLY ADHERED OVER THE ENTIRE ROOF THROUGHOUT
- INSTALL TPO FLASHING AROUND ALL OF THE ROOF PENETRATIONS: SKYLIGHTS, ROOF HATCH & FLUE PIPES
- PROVIDE CANTS AT ALL LOCATIONS WHERE ROOF MEETS PARAPET WALLS
- WRAP TPO UP PARAPET WALL BELOW COPING
- INSTALL TPO WALKWAY PADS AROUND THE ROOF HATCH & ROOF TOP UNITS.
- INSTALL COPING PER A1-4.0 AT TOP OF PARAPET WALLS
- INCLUDES ALL PROPER FLASHING AROUND PERTRUSION AND TERMINATIONS BAR AS NEEDED AND ALONG THE PERIMETER AND SEAL WITH 360-S SEALENT



1 ROOF PLAN
1/8" = 1'-0"

apex DESIGN › BUILD
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SEAL:

No.	Description	Date
3	PRICING SET	10/13/2023
4	TAC PUBLIC HEARING #2	10/20/2023

ROOF PLAN

Project number	#10323
Date	10/10/2023
Drawn by	JY
Checked by	JV

A1-5

Scale 1/8" = 1'-0"

10/18/2023 12:18:48 PM

Authorization Form

I, Dr. Alexander Slocum, of ATDG, LLC, authorize Apex Design Build and Allen & Major Associates, Inc., to act as an agent on behalf of ATDG, LLC. I authorize Apex Design Build and Allen & Major Associates, Inc. to sign any permit related documents and speak on my behalf regarding the proposed Medical and Ambulatory Surgery Center Project at 360 Corporate Dr, Portsmouth, New Hampshire.

DocuSigned by:
3D12526EBF86412...

Signature

7/20/2023 | 5:49:32 AM CDT

Date

City of Portsmouth, New Hampshire

Site Plan Application Checklist

This site plan application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. 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. Walver requests must be submitted in writing with appropriate justification.

Name of Applicant: ATDG, LLC (Contact: Dr. Alexander Slocum) Date Submitted: 08 / 21 / 2023

Application # (in City's online permitting): ______________

Site Address: 360 Corporate Dr, Portsmouth, NH 03801 Map: 0315-0005-0000 Lot: 0005

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)	Application form to be submitted online.	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)	Application documents to be submitted online.	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)	See seperate attachment	
☐	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)	Sheet G0-0	N/A
☐	Tax map and lot number, and current zoning of all parcels under Site Plan Review. (2.5.3.1D)	Refer to Civil Sheets	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)	Sheet G0-0	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)	To be provided by Pease Development Authority	N/A
☐	Names, addresses and telephone numbers of all professionals involved in the site plan design. (2.5.3.1G)	Sheet G0-0	N/A
☐	List of reference plans. (2.5.3.1H)	Refer to Civil Sheets	N/A
☐	List of names and contact information of all public or private utilities servicing the site. (2.5.3.1I)	Sheet G0-0	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)	24 inches by 36 inches	Y
☐	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. (2.5.4.1B)	Noted	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)	Refer to Civil Sheets	N/A
☐	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. (2.5.4.1D)	Refer to Civil Sheets	N/A
☐	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. (2.5.4.1E)	See all applicable sheets	N/A
☐	Title (name of development project), north point, scale, legend. (2.5.4.2A)	Sheet G0-0	N/A
☐	Date plans first submitted, date and explanation of revisions. (2.5.4.2B)	See revision schedule on all sheet	N/A
☐	Individual plan sheet title that clearly describes the information that is displayed. (2.5.4.2C)	Noted	N/A
☐	Source and date of data displayed on the plan. (2.5.4.2D)	Refer to Civil 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.	Refer to Civil 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.	See A-Sheets	
☐	**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).	Refer to Civil Sheets	
☐	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Refer to Civil Sheets	
☐	**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).	Refer to Civil Sheets	
☐	**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.	Refer to Civil Sheets	

☐	**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.	Refer to Civil Sheets	
☐	**8. Solid Waste Facilities: (2.5.4.3H)**	N/A	
	• The size, type and location of solid waste facilities.	N/A	
☐	**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.	Refer to Civil Sheets	
☐	**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.	See Photometric Plan	
☐	**11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)**	See Photometric 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.	Refer to Lanscaping Plans	
☐	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Refer to Civil Sheets	
☐	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Refer to Civil Sheets	
☐	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Refer to Civil 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).	Refer to Civil Sheets	
☐	**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.	Refer to Civil 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)	See separate attachment	
☐	Indicate where Low Impact Development Design practices have been incorporated. (7.1)	Refer to Civil Sheets	
☐	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)	Refer to Civil Sheets	
☐	Inspection and Maintenance Plan (7.6.5)	Refer to Civil Sheets	

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)		
☐	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)		
☐	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)		

☑	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)		
☐	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)	Refer to Civil Sheets	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)		N/A

Applicant's Signature: DocuSigned by: Alexander H Slocum Jr 3017526EBF66412 Date: 8/18/2023 | 9:49:26 AM CDT

Pease Development Authority

55 International Drive, Portsmouth, NH 03801, (603) 433-6088

Application for Site Review

For PDA Use Only			
Date Submitted:______	Municipal Review:______	Fee:______	
Application Complete:______	Date Forwarded:______	Paid:______	Check #:______

Applicant Information

Applicant: ATDG, LLC - Contact: Dr. Alexander Slocum	Agent: Raquelle Kemnitz, Apex Design Build
Address: 1 Merrill Crossing, Bow, NH 03304	Address: 9550 W Higgins Rd, Ste 170, Rosemont, IL 60018
Business Phone: 603-777-6506	Business Phone: 847-288-0100
Mobile Phone: 603-777-6506	Mobile Phone: 708-610-5000
Fax: n/a	Fax: n/a

Site Information

Portsmouth Tax Map: 0315-0005-0000	Lot #: 0005	Zone: ABC
Site Address / Location : 360 Corporate Dr, Portsmouth, NH 03801		
Site Address / Location : n/a		Area of On-site Wetlands: 41, 526 SF

Area of On-site Wetlands + Wetlands Buffer Area: 86, 044 SF

Activity Information

Change of Use: Yes [ ] No [X]

Existing Use: 9010

Proposed Use: n/a

Description of Project: // Please see attachment //

All above information shall be shown on a site plan submitted with this application. Provide 3 full size hard copies and one PDF copy of all application materials as well as one half-size set of drawings to PDA. Applicant shall supply additional copies as may be required by applicable municipality. Refer to Chapter 400 of PDA land Use Controls for additional information.

Certification

I hereby certify under the penalties of perjury that the foregoing information and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I hereby apply for Site Review and acknowledge I will comply with all regulations and any conditions established by the Review Committee(s) and PDA Board in the development and construction of this project.

DocuSigned by:

Alexander H Slocum Jr

3D12526E...

Signature of Applicant

8/16/2023 | 2:06:01 PM CDT

Date

Dr. Alexander Slocum

Printed Name

N:\Engineer\ ApplicationforSiteReview.xlsx

Application for Site Review Cont.

Portsmouth Tax Map: 0315-0005-0000
Lot #: 0005
Site Address: 360 Corporate Dr, Portsmouth, NH 03801

Description of Project
The proposed development will be located at 360 Corporate Drive in Portsmouth, NH on a 6.12 acre lease lot created from existing Map Lot 0315-0005-0000. The project includes a three-story Healthcare Complex which will feature approximately 52,000 GSF. As proposed, the building and parking abide by all PDA setbacks and no variances are being sought. The design includes (125) vehicle parking spaces with a total of (2) loading docks. There will be a singular below grade loading dock at the eastern extent of the building (back), which will be appropriately accommodating of a WB-62 truck configuration, as well as a loading dock at grade (parallel and separated by a retaining wall) to the below grade loading dock. This area will feature a concrete sidewalk which properly allows for unloading/loading of all delivery trucks, as well as an additional area for bicycle parking. Along the same extent of the building, the emergency backup generator will be located parallel to the recessed loading dock and the primary electrical transformer will be located parallel to the at-grade loading dock. The refuse area also resides parallel to the at-grade loading dock for easy maneuverability as well as efficient proximity to the building for staff utilization.

Site access will be provided by two new driveways; one located along International Drive and the other located along Corporate Drive. Existing sidewalks are comprised of concrete with sections of asphalt; all existing asphalt sidewalks will be appropriately removed and replaced along with the proposed site development. The aforementioned site access provides adequate flow for both deliveries as well as patient/staff accessibility across the site. The International Drive entrance provides accessibility for a WB-62, and proper sizing for maneuvers in order to deliver/pickup a mobile MRI Trailer for intermittent usage at the future Imaging Practice.

Vanasse & Associates inc
Transportation Engineers & Planners

35 New England Business Center Drive
Suite 140
Andover, MA 01810

Ref: 9694

August 11, 2023

Mr. Jeff Kilbury
Apex Design Build
9550 West Higgins Road
Suite 170
Rosemont, IL 60018

Re: Trip Generation for Medical Office Building
360 Corporate Drive
Portsmouth, New Hampshire

Dear Mr. Kilbury:

Vanasse & Associates, Inc. (VAI) has identified the traffic generation associated with the proposed Medical Office Building (hereinafter, the "Project") to be located at 360 Corporate Drive in Portsmouth, New Hampshire. The Project site is bordered by International Drive to the north, areas of open and wooden space to the east and south, and Corporate Drive to the east. The Project site was previously an office building with two curb cuts; one onto International Drive, and one onto Corporate Drive.

The Project involves the construction of a three-story medical office building where 10,000 square feet (sf) of the building is a ambulatory surgery center and 42,000 sf is medical office space. A total of 125 parking spaces are proposed. Access to the site via the Corporate Drive curb cut is expected to be for patients and medical supply vehicles, while the International Drive curb cut is expected to be for employee vehicles.

In order to develop the traffic characteristics of the proposed Project, trip-generation statistics published by the Institute of Transportation Engineers (ITE)[1] for Land Use Code (LUC) 650, "Free-Standing Emergency Room" and LUC 720, "Medical-Dental Office Building" were used. Table 1 summarizes the anticipated trip generation from the proposed development.

[1] *Trip Generation,* 11th Edition; Institute of Transportation Engineers; Washington, DC; 2021.

Table 1
PROJECT TRIP GENERATION

Time Period	Office Space Trips[a] (A)	Surgery Center Trips[b] (B)	Total Trips (C=A+B)
Weekday Daily	1,698	250	1,948
Weekday Morning Peak Hour:			
Entering	87	6	93
Exiting	23	5	28
Total	110	11	121
Weekday Evening Peak Hour:			
Entering	50	7	57
Exiting	118	8	126
Total	168	15	183

[a]Based on ITE LUC 720, Medical-Dental Offic Building; 42,000 sf.
[b]Based on ITE LUC 650, Free-Standing Emergency Room; 10,000sf.

A comparison of previous and future trip generation of the site was conducted. Although the site is currently vacant, aerial images indicate that an office building was on site circa 2012. Estimates of the building size were obtained from aerial imagery. In order to develop the traffic characteristics of the previous site, trip-generation statistics published by the ITE for LUC 710, "General Office Building" was used. Table 2 summarizes the anticipated change in trip generation from the previous site to the proposed development.

Table 2
PROJECT TRIP GENERATION COMPARISON

Time Period	Previous Vehicle Trips[a]	Proposed Vehicle Trips[b]	Change (Trips)
Weekday Daily	262	1,948	+1,686
Weekday Morning Peak Hour:			
Entering	24	93	+69
Exiting	3	28	+25
Total	27	121	+94
Weekday Evening Peak Hour:			
Entering	4	57	+53
Exiting	22	126	+104
Total	26	183	+157

[a]Based on ITE LUC 710, General Office Building; 18,000 sf.
[b]Based on Table 1.

As shown in Table 1, the project is expected to generate 1,686 more vehicle trips (approximately 843 vehicles entering and exiting) on an average weekday (two-way, 24-hour volume), with 94 more vehicle trips (69 entering and 25 exiting) expected during the weekday morning peak hour and 157 more trips (53 entering and 104 exiting) during the weekday evening peak hour.

If you have any questions on the conclusions reached herein, feel free to contact us at sthornton@rdva.com thannon@rdva.com.

Sincerely,

VANASSE & ASSOCIATES, INC.

Scott W. Thornton, P.E.
Principal

Thomas J. Hannon, EIT
Transportation Engineer

cc: File

Attachment: Trip Calculations

TECHNICAL APPENDIX

Free-Standing Emergency Room
(650)

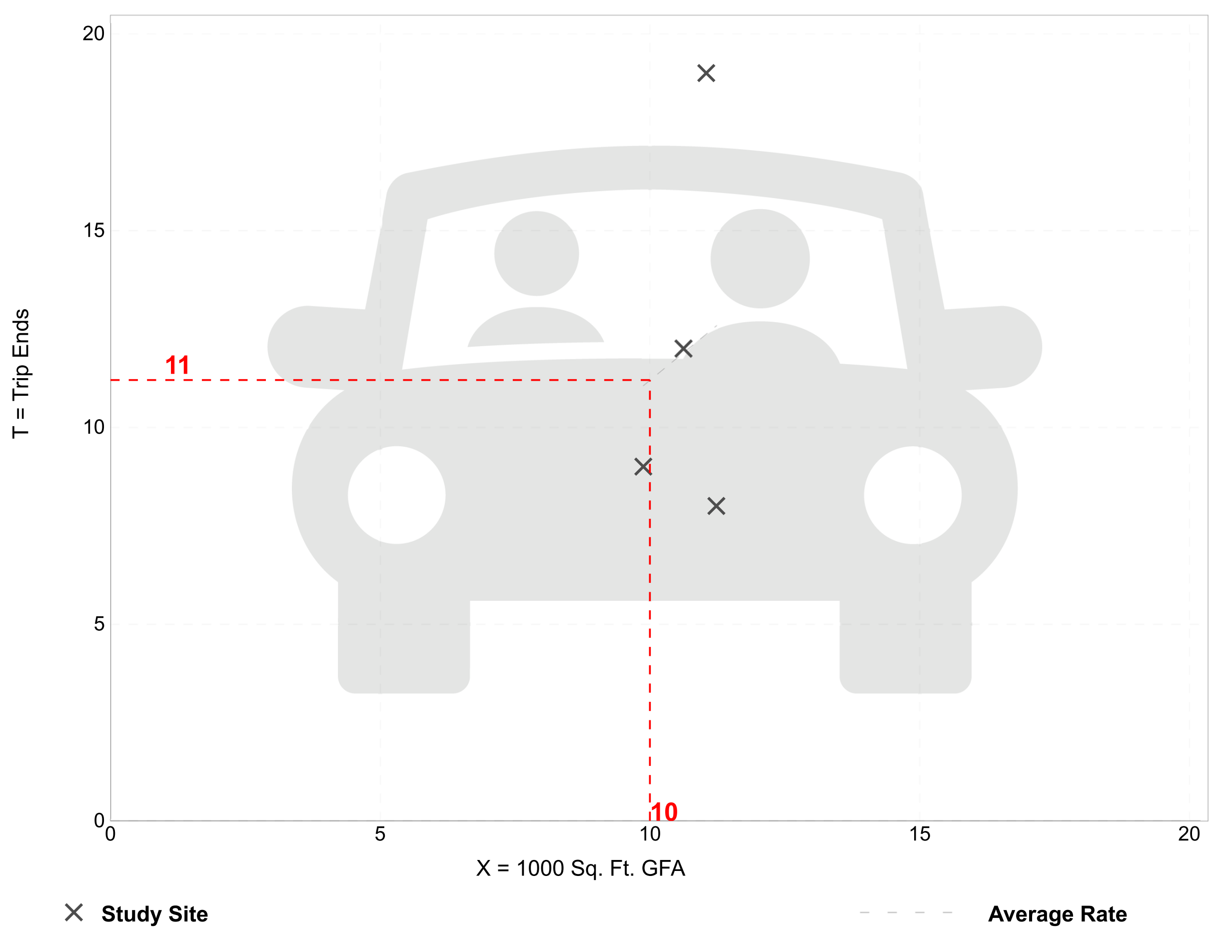
Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,** **Peak Hour of Adjacent Street Traffic,** **One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	4
Avg. 1000 Sq. Ft. GFA:	11
Directional Distribution:	50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.12	0.71 - 1.72	0.44

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ****

Free-Standing Emergency Room
(650)

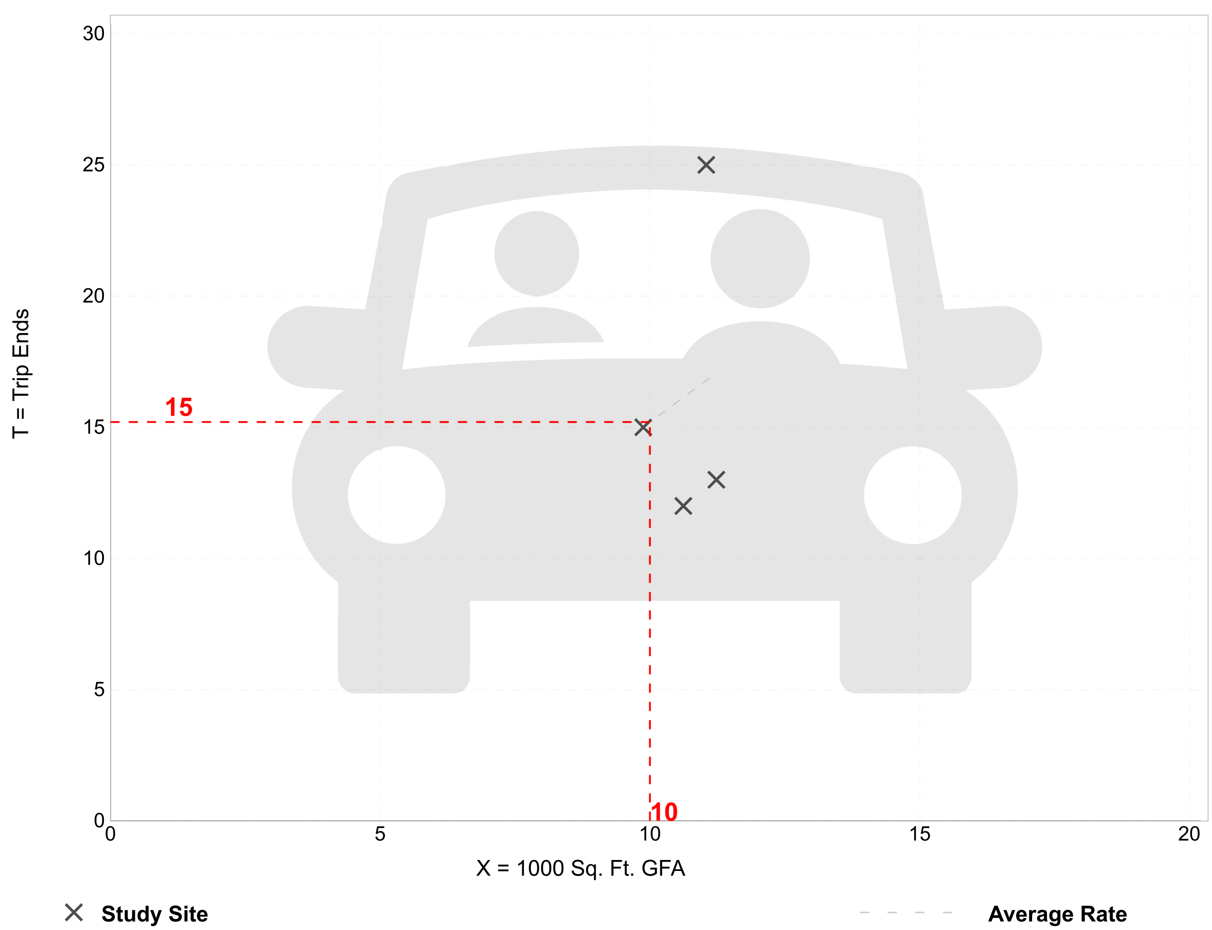
Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	4
Avg. 1000 Sq. Ft. GFA:	11
Directional Distribution:	46% entering, 54% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.52	1.13 - 2.26	0.54

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given R^2= ****

Free-Standing Emergency Room
(650)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

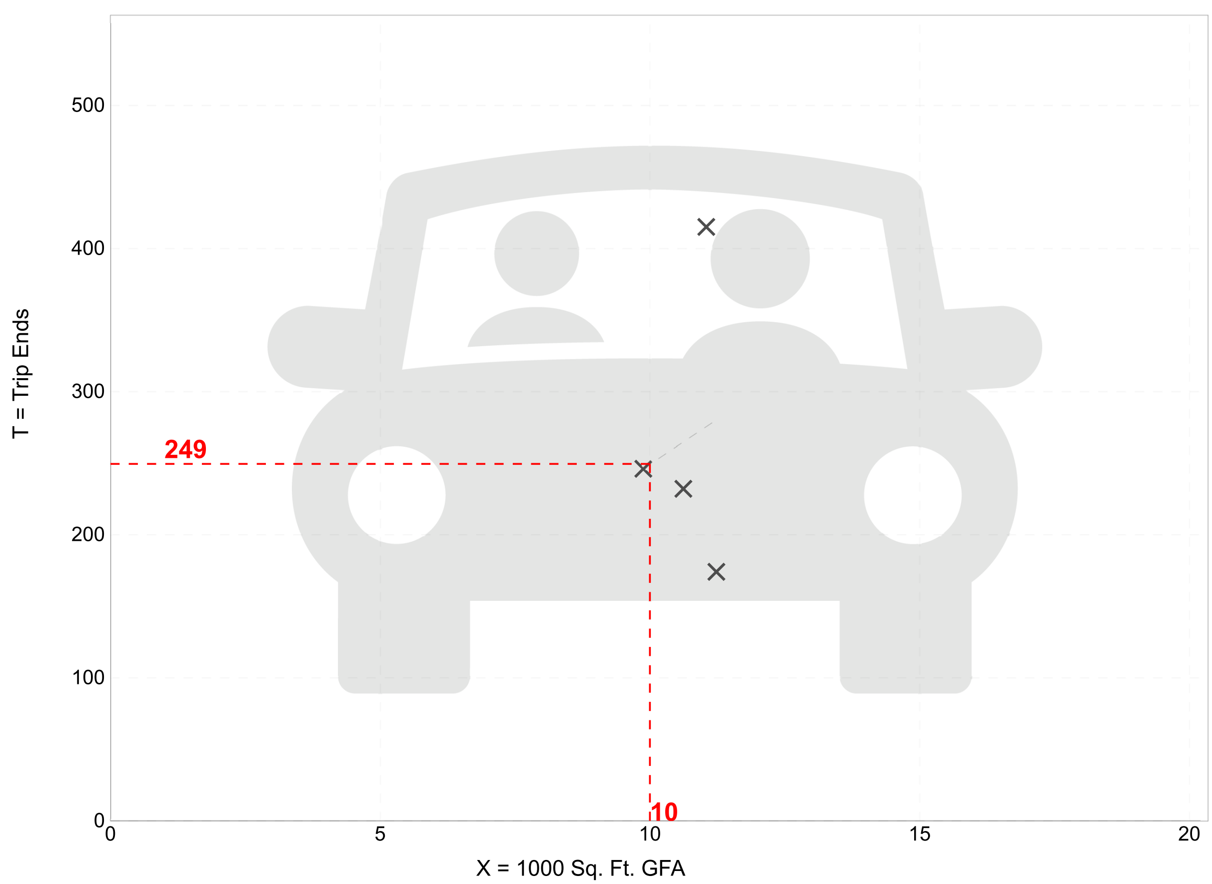
Setting/Location: **General Urban/Suburban**
Number of Studies: 4
Avg. 1000 Sq. Ft. GFA: 11
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
24.94	15.49 - 37.57	9.45

Data Plot and Equation

Caution – Small Sample Size



× **Study Site** — — — **Average Rate**

Fitted Curve Equation: Not Given **R²= ****

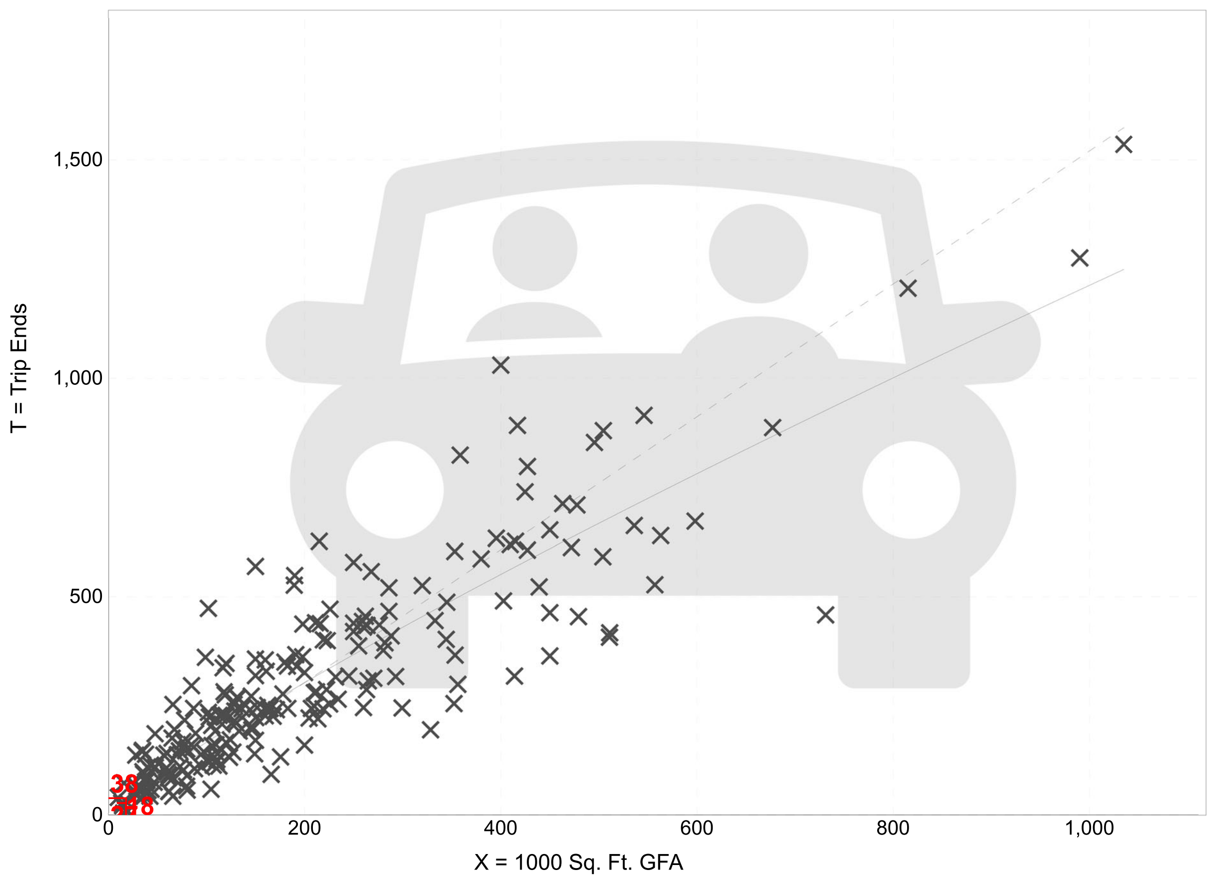
General Office Building
(710)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	221
Avg. 1000 Sq. Ft. GFA:	201
Directional Distribution:	88% entering, 12% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.52	0.32 - 4.93	0.58

Data Plot and Equation



Study Site **Fitted Curve** **Average Rate**

Fitted Curve Equation: $Ln(T) = 0.86\ Ln(X) + 1.16$ **R^2= 0.78**

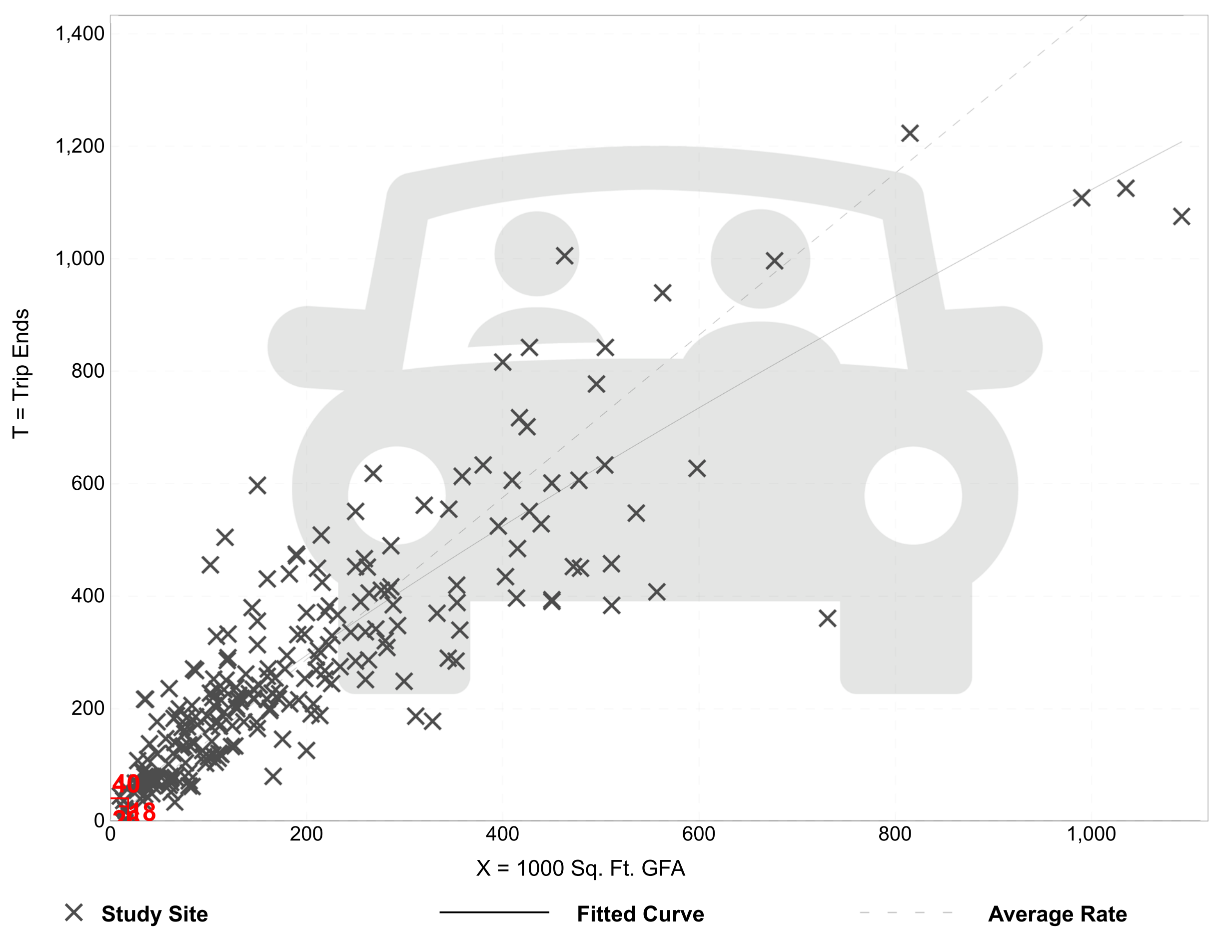
General Office Building
(710)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 232
Avg. 1000 Sq. Ft. GFA: 199
Directional Distribution: 17% entering, 83% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.44	0.26 - 6.20	0.60

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.83 Ln(X) + 1.29

R^2= 0.77

General Office Building
(710)

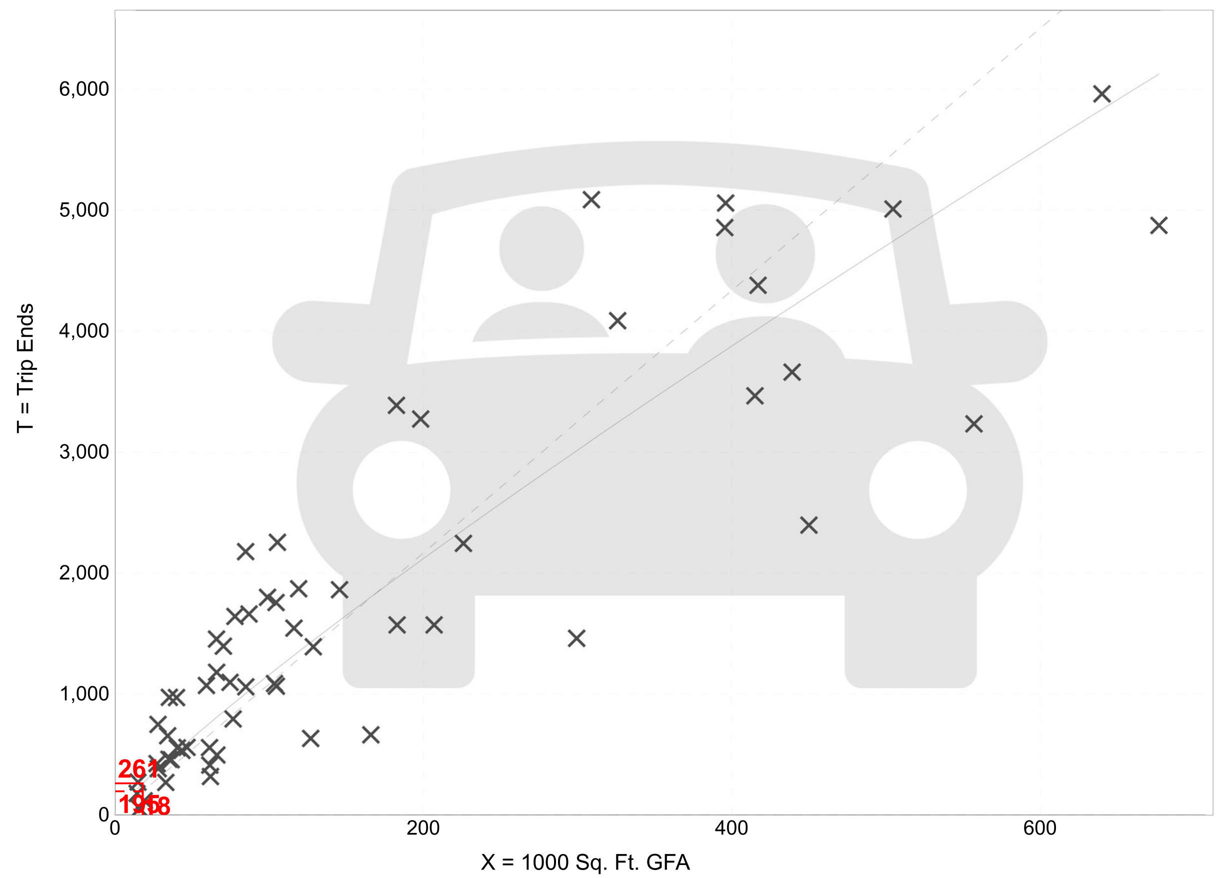
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 59
Avg. 1000 Sq. Ft. GFA: 163
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
10.84	3.27 - 27.56	4.76

Data Plot and Equation



× **Study Site** —— **Fitted Curve** - - - **Average Rate**

Fitted Curve Equation: Ln(T) = 0.87 Ln(X) + 3.05 **R^2= 0.78**

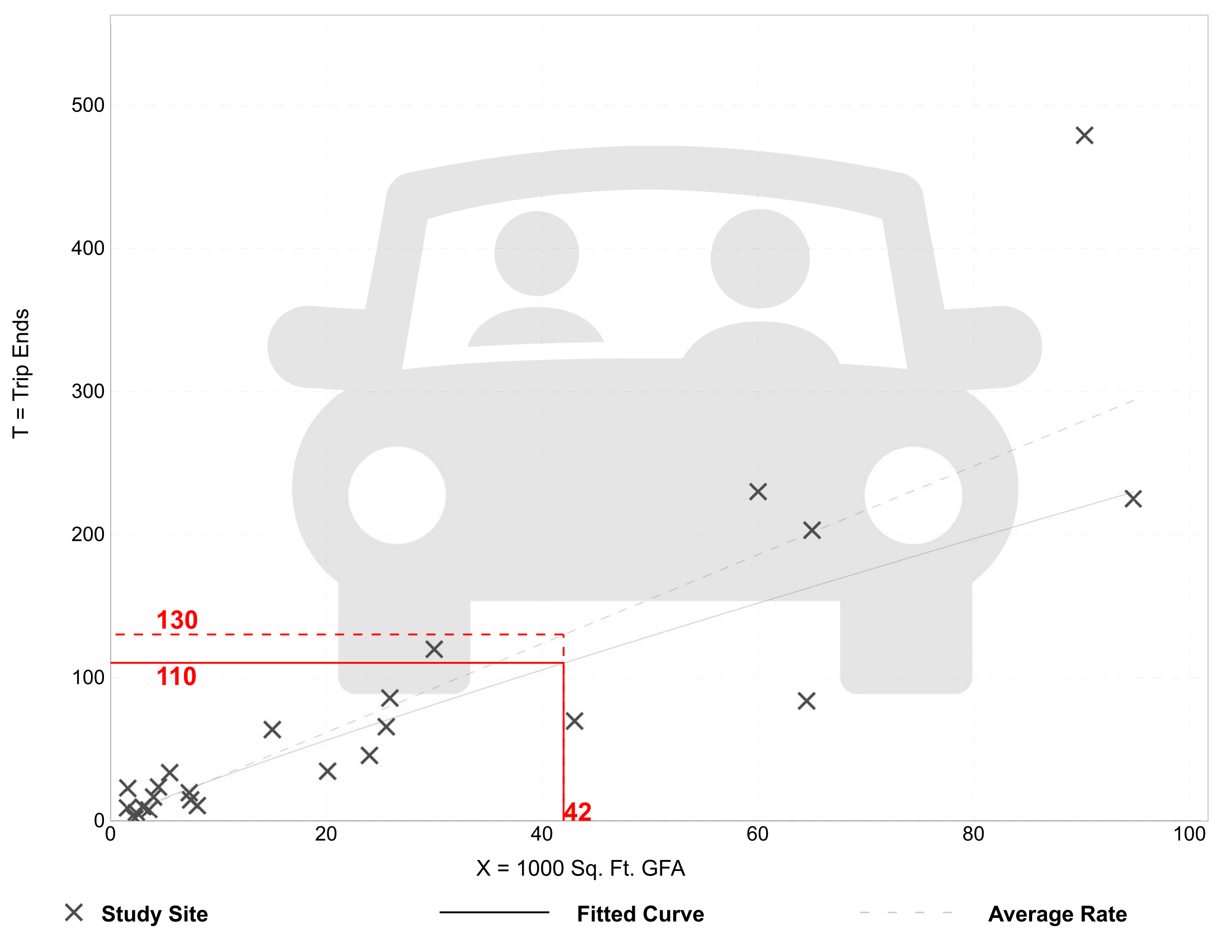
Medical-Dental Office Building - Stand-Alone
(720)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	24
Avg. 1000 Sq. Ft. GFA:	25
Directional Distribution:	79% entering, 21% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.10	0.87 - 14.30	1.49

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.90 Ln(X) + 1.34 **R^2= 0.80**

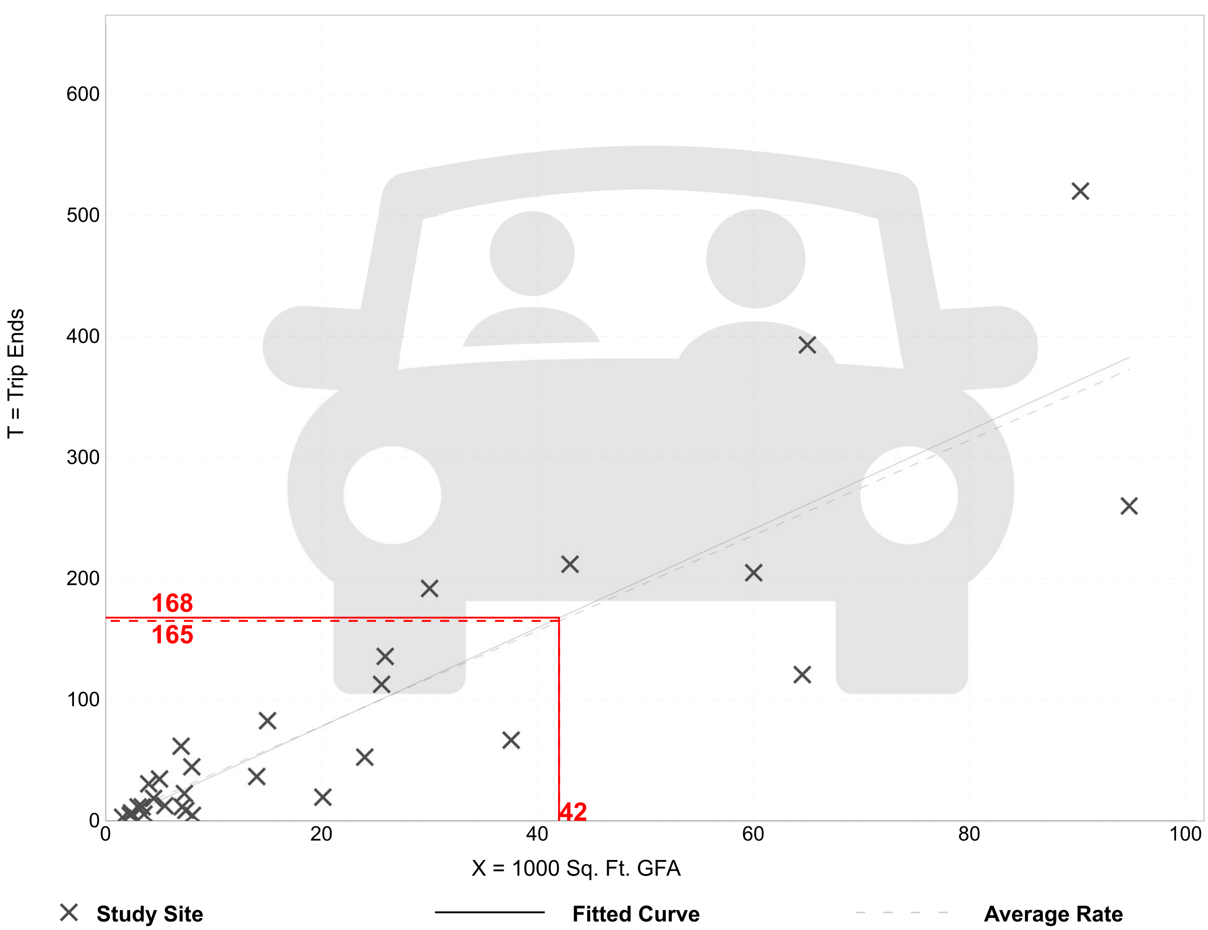
Medical-Dental Office Building - Stand-Alone
(720)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	30
Avg. 1000 Sq. Ft. GFA:	23
Directional Distribution:	30% entering, 70% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.93	0.62 - 8.86	1.86

Data Plot and Equation



Fitted Curve Equation: $T = 4.07(X) - 3.17$

$R^2 = 0.77$

Medical-Dental Office Building - Stand-Alone
(720)

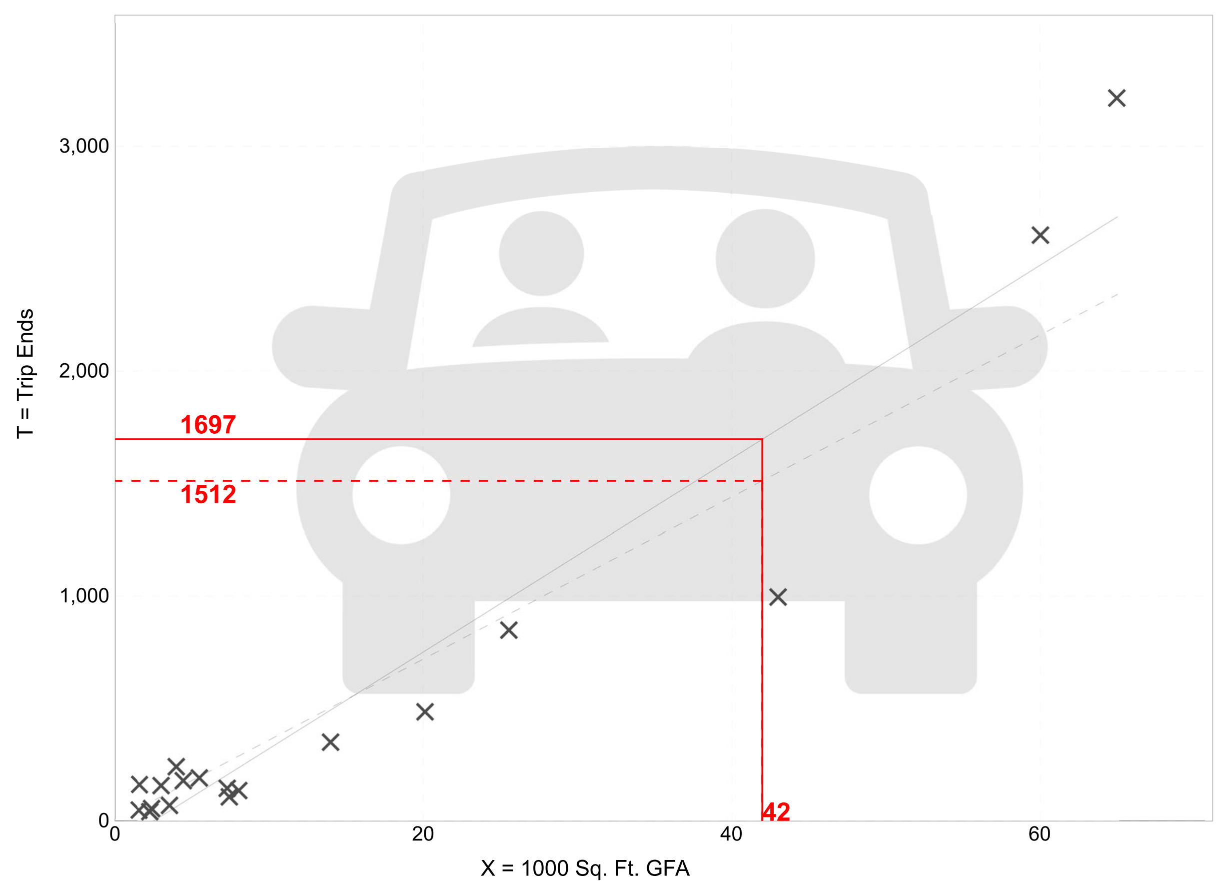
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 18
Avg. 1000 Sq. Ft. GFA: 15
Directional Distribution: 50% entering, 50% exiting

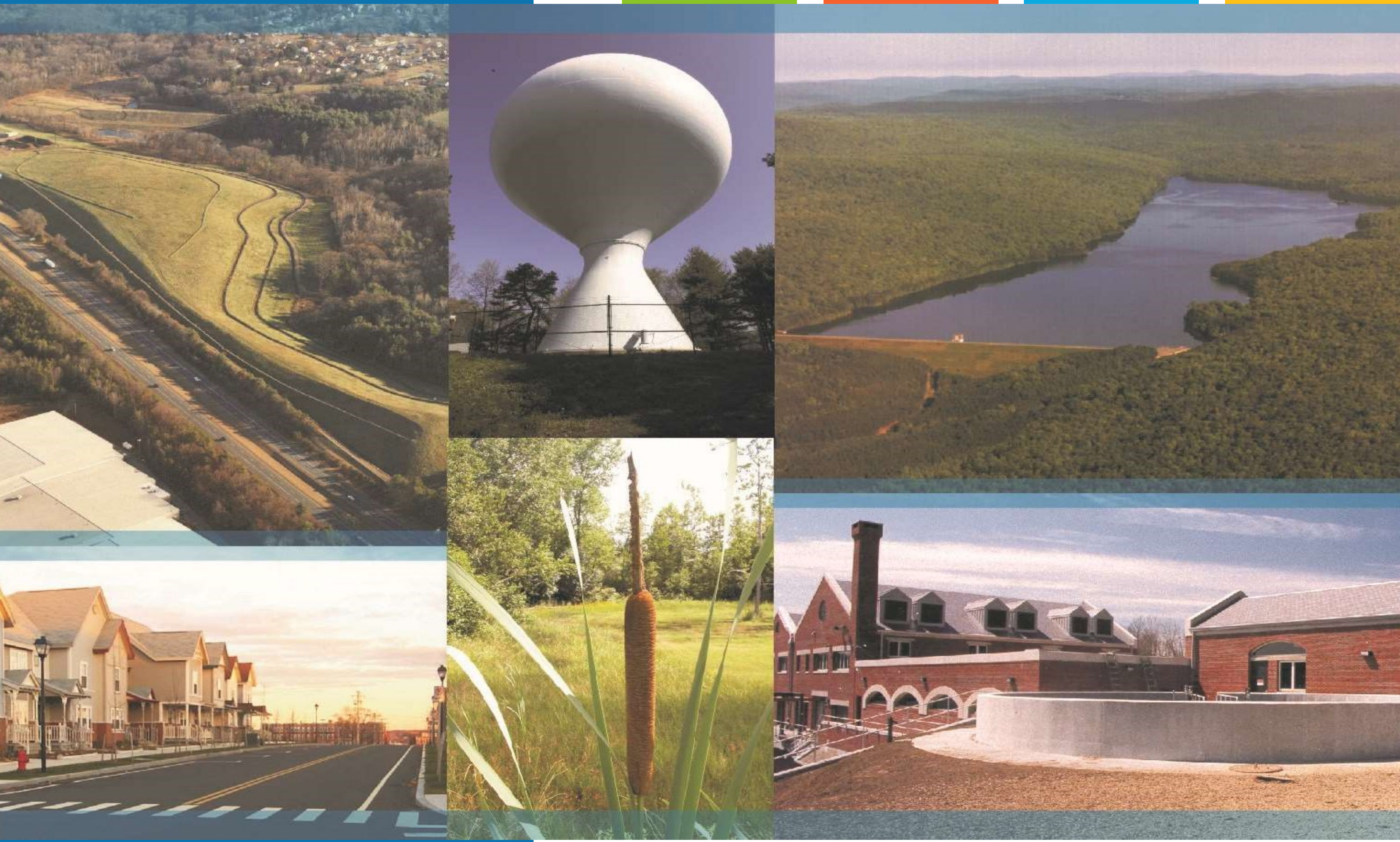
Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
36.00	14.52 - 100.75	13.38

Data Plot and Equation



Fitted Curve Equation: $T = 42.97(X) - 108.01$ **$R^2 = 0.92$**



Lonza Biologics Industrial Development

TRAFFIC IMPACT ASSESSMENT

Lonza Biologics

June 1, 2023
Last Revised: July 17, 2023

Tighe&Bond

Table of Contents

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Section 1 Introduction

This Traffic Impact Assessment (TIA) evaluates the potential traffic impact of the proposed Lonza Biologics industrial development, located along Corporate Drive and Goose Bay Drive within the Pease International Tradeport in Portsmouth, NH. The TIA is based in part on the previous *Lonza Biologics Proposed Industrial Development Traffic Evaluation*, dated April 3, 2018, completed by Tighe & Bond. This updated TIA addresses the City of Portsmouth Planning Department Site Plan Application Conditions of Approval, dated January 18, 2019, to expand the Traffic Analysis study area as stated in Condition 2.10 for subsequent phases of development for the Lonza site. This revised TIA has been prepared in accordance with NHDOT and industry standards. The Project Site is bounded by Corporate Drive to the north, and Goose Bay Drive to the west, south and east. The site is surrounded by industrial, manufacturing, medical, and office land uses, consistent with the Tradeport as a whole. The Site location is shown in Figure 1.

The existing Lonza facility currently includes 900,000+/- square feet (SF) of building space including manufacturing, research and development, office, and ancillary services with 780+/- parking spaces. The Applicant plans to construct three buildings totaling approximately 800,000+/- square foot (SF) of industrial space with 700 additional parking spaces contained in one garage. The proposed buildings will be located on currently vacant land on the north side of Goose Bay Drive. Primary access to the site will be provided via a new driveway on Goose Bay Drive opposite the existing parking garage entrance. A new curb cut is also proposed on Corporate Drive, approximately 400 feet east of Redhook Way; however, this driveway will be gated in the near-term, but is expected to be used for deliveries to the proposed Building 3 once the full build-out is complete. Roadway improvements as part of the project include the closure of Goose Bay Drive to through traffic approximately 125 feet southwest of the Corporate Center driveway, and conversion of a portion of Goose Bay Drive from a public road to be merged with the Lonza parcel. The proposed Site Plan Layout is enclosed in Appendix I. Proposed Building 1 is expected to be complete and occupied in 2025; however, for the purposes of this study, the full build-out of the site is assumed to be in 2025.

Based on the analyses conducted herein, it is the professional opinion of Tighe & Bond that while the adjustment of collected volumes to an assumed pre-pandemic condition and the addition of background growth on a 12-year horizon to the 2035 design year results in undesirable LOS at some area intersections, the traffic expected to be generated by the proposed industrial development has a negligible effect on traffic operations within the study area.

Section 2 Existing Conditions

The Project Site is bounded by Corporate Drive to north and east, and Goose Bay Drive to the south and west. The following sections describe the roadways and intersections included within the study area.

2.1 Roadways

2.1.1 Corporate Drive

Corporate Drive is a local road maintained by the City of Portsmouth. The roadway runs between International Drive and loops back around to Durham Street/ International Drive to the south. The roadway is generally 28 feet wide with a two-lane cross section and narrow shoulders. Beginning at the intersection with International Drive, the roadway cross section is four lanes with westbound dedicated left, through, and right lanes, and a single eastbound travel lane. An eastbound left-turn lane is provided at Redhook Way. Narrow 2-foot striped shoulders are present between International Drive and approximately 500 feet east of Redhook Way. The shoulders to the east of this section are not striped, providing a wide approximately 14-foot travel lane. The roadway transitions to a three-lane cross section in the vicinity of Grafton Road where an eastbound dedicated left-turn lane and westbound dedicated right-turn lane are provided.

A 5-foot sidewalk is provided on both sides of the roadway between International Drive and Redhook Way. Sidewalk is provided along at least one side of the roadway except for a short 350-foot gap between Redhook Way and the Wentworth-Douglas Hospital Outpatient Center driveway and a second 300-foot gap between Ashland Road and the 273 Corporate Drive north driveway. The posted speed limit on Corporate Drive is 35 mph.

2.1.2 Goose Bay Drive

Goose Bay Drive is a local road maintained by the City of Portsmouth. The roadway intersects International Drive 180 feet west of Redhook Way at the west end and 775 feet west of Rye Street at the east end. One travel lane is provided in each direction along the entire roadway. No sidewalks are provided except for a short 200-foot section along the south side of the roadway along the Lonza property. There is no posted speed on the roadway.

2.1.3 International Drive

International Drive is a major collector road and is maintained by the City of Portsmouth. The roadway runs north to south between Pease Boulevard and New Hampshire Avenue/ Corporate Drive. A two-lane cross section is provided between New Hampshire Avenue/ Corporate Drive and Manchester Square/ Corporate Drive. At the intersection with Manchester Square/ Corporate Drive, the roadway opens to a four-lane cross section with northbound dedicated left turn lane, through lane, and shared through/ right lane and a single southbound travel lane. A five-lane cross section (three northbound, two southbound) is provided north of Corporate Drive approaching Pease Boulevard. The posted speed is 35 mph in both directions.

Sidewalk is provided on both sides of the roadway between Pease Boulevard and Corporate Drive and the west side of the roadway only between Corporate Drive and New Hampshire Avenue.

2.1.4 Pease Boulevard

Pease Boulevard is classified as an urban major collector and is maintained by the City of Portsmouth. The roadway is located north of the site location and runs primarily in the east-west direction connecting US Route 4 On/Off Ramps to the east and Pease Air National Guard Base to the west. Between Arboretum Drive/New Hampshire Avenue and International Drive, the Pease Boulevard cross section varies. Pease Boulevard at Arboretum/New Hampshire Avenue starts as a three-lane roadway (two westbound, one eastbound) with 11-foot travel lanes and narrow shoulders. The single eastbound travel lane widens to two lanes approaching International Drive, with two 11-foot travel lanes in each direction and narrow shoulders, a dedicated eastbound left turn lane, and two westbound left turn lanes. Pease Boulevard widens to a five-lane section eastbound with four 11-foot wide through lanes and a right-turn lane to the US Route 4 southbound on-ramp, with the four travel lanes aligning with two left turn lanes and two through lanes at the US Route 4 northbound ramps. Four 11-foot travel lanes are also carried westbound under the US Route 4 overpass, with two left turn lanes to the southbound on-ramp and two through lanes. The roadway continues west of US Route 4 as Gosling Road.

A five-foot sidewalk is provided on both sides of Pease Boulevard between Arboretum Drive/New Hampshire Avenue and International Drive, with a 10-foot buffered multi-use path provided on the north side of the roadway between International Drive and the US Route 4 southbound off-ramp. A 6-foot sidewalk is provided on the north side of Pease Boulevard between the US Route 4 ramps. The speed limit is posted at 35 mph in both directions.

2.1.5 Grafton Road

Grafton Road is classified as an urban major collector and maintained by the City of Portsmouth. The roadway runs in a northeast to southwest alignment connecting Corporate Drive to the northeast and Route 33 (Greenland Road) to the southwest. Grafton Road is typically a two-lane roadway with 12-foot travel lanes, widening to provide a two-lane approach with separate left and right turn lanes at its northeastern termini at Corporate Drive and its southern termini at Route 33. Shoulder lane widths vary along the roadway. Narrow shoulder widths are found near the Aviation Avenue intersection which gradually increases to 3-foot shoulders on the west side of the roadway and 5-foot shoulder on the east side of the roadway. Near Pease Golf Course Driveway/Park & Ride Driveway, the shoulder lane width increases to 10 feet on the east side of the roadway. Between Pease Golf Course Driveway/Park & Ride Driveway and Route 33, the shoulder width on both sides of the roadway is 10 feet which reduces to 3 feet on the west side of the roadway with no marked shoulder on the east at Route 33 intersection. A 10-foot buffered multi-use path is provided on the northwest side of the roadway. The speed limit is posted at 35 mph in both directions.

2.1.6 Route 33 (Greenland Road)

Route 33 (Greenland Road) is classified as an urban minor arterial and maintained by the State of New Hampshire. The roadway runs primarily in the east to west direction connecting Route 151 (Portsmouth Avenue) and the Town of Greenland to the west of the study area and US Route 1 (Lafayette Road) to the east of the study area. Between the I-

95 Southbound ramps and Grafton Road, Route 33 is a four-lane divided roadway with 11-foot travel lanes and 8-foot-wide shoulders on both sides of the roadway. Route 33 continues as an undivided four-lane roadway east of Grafton Road, with 11-foot travel lanes and 8-foot shoulders. Shoulder widths are narrower were dedicated turn lanes are provided at Grafton Road and at the I-95 Northbound ramps. No pedestrian accommodations are provided east of Grafton Road, with a speed limit of 35 mph.

2.2 Study Area Intersections

2.2.1 Gosling Road at US Route 4 Northbound Ramps

Gosling Road intersects the US Route 4 Northbound Ramps to the east of the US Route 4 (Spaulding Turnpike) overpass at a signalized intersection, with the Northbound off-ramp approaching from the south and the Northbound on-ramp departing to the north. The Gosling Road eastbound approach provides four lanes, with two left-turn lanes and two through travel lanes. The Gosling Road westbound approach consists of three lanes, with two through lanes and one shared through/right-turn lane. The left-most westbound through lane aligns with a left-turn lane at the downstream southbound ramp intersection. The northbound off-ramp approach provides four lanes, with two left-turn lanes and two right-turn lanes. Left turn movements from Gosling Road eastbound and from the northbound off-ramp are controlled with exclusive signal phases. The northbound on-ramp provides two lanes departing the intersection. As previously described, a sidewalk is provided on the north side of Gosling Road through the intersection, with a crosswalk across the northbound on-ramp. A concurrent pedestrian traffic signal phase is provided for this crosswalk. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb or edge of roadway.

2.2.2 Pease Boulevard at US Route 4 Southbound Ramps

Pease Boulevard intersects the US Route 4 Southbound Ramps to the west of the US Route 4 (Spaulding Turnpike) overpass at a signalized intersection, with the Southbound off-ramp approaching from the north and the Southbound on-ramp departing to the south. The Pease Boulevard westbound approach provides four lanes, with two left-turn lanes and two through travel lanes. The Pease Boulevard eastbound approach consists of five lanes, with four through lanes and one exclusive right-turn lane. The two left-most eastbound through lanes align with the left-turn lanes at the downstream northbound ramp intersection. The southbound off-ramp approach provides four lanes, with two left-turn lanes and two right-turn lanes. Left turn movements from Pease Boulevard westbound and from the southbound off-ramp are controlled with exclusive signal phases. The southbound on-ramp provides two lanes departing the intersection. As previously described, a sidewalk is provided on the north side of Pease Boulevard through the intersection, with a crosswalk across the southbound off-ramp. A concurrent pedestrian traffic signal phase is provided for this crosswalk. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb or edge of roadway.

2.2.3 Pease Boulevard at International Drive

International Drive intersects Pease Boulevard from the north and south to form a 4-way, signalized intersection. Pease Boulevard is median divided, with the eastbound approach providing an exclusive left-turn lane and two through travel lanes, while the westbound approach provides two left-turn lanes and two through lanes. The north leg of International Drive is median divided and provides a wide, unmarked southbound approach, which is of adequate width to accommodate two vehicles side-by-side.

International Drive northbound provides one shared left/through lane and two channelized right turn lanes under signal control. Sidewalks are provided on both sides of Pease Boulevard west of the intersection, on both sides of International Drive to the south, on the west side of International Drive to the north, and on the north side of Pease Boulevard to the east. Crosswalks are provided across all four approaches and across the channelized northbound right-turn lanes, and concurrent pedestrian traffic signal phases are provided. Marked edge lines are provided on Pease Boulevard, with a 1-to-2-foot offset from the curb or edge of roadway. Variable width shoulders are provided on International Drive south of the intersection, ranging from 2 to 8 feet.

2.2.4 International Drive at Corporate Drive and Manchester Square

Corporate Drive and Manchester Square intersect International Drive from the east and west, respectively to form a 4-way unsignalized intersection under all-way stop control. The northbound approach provides a dedicated left-turn lane, through lane, and shared through/ right lane while the southbound approach provides dedicated left-turn, through, and right-turn lane. The westbound approach provides a dedicated left-turn, through, and right-turn lane, while the eastbound approach provides a dedicated left-turn lane and through/ right lane. Edge lines are present on the north, east, and west legs of the intersection. Crosswalks are provided across all four legs of the intersection.

2.2.5 Corporate Drive at Goose Bay Drive (West JCT)

Goose Bay Drive intersects Corporate Drive from the south to form a 3-way, T-intersection. Goose Bay Drive provides a single general purpose travel lane. A single dedicated eastbound left-turn from Corporate Drive begins west of Goose Bay Drive, which provides access to the Residence Inn just east of the intersection and to Cisco Brewers via Red Hook Way. Edge lines are provided on all approaches. A crosswalk is provided across Goose Bay Drive.

2.2.6 Corporate Drive at Redhook Way

Redhook Way intersects Corporate Drive from the north to form a 3-way, T-intersection. A dedicated left-turn lane and through lane are provided on the eastbound approach while a single general-purpose lane is provided on the westbound and southbound approaches. A crosswalk is provided on the west leg of the intersection. Edge lines are provided on the east and west approaches.

2.2.7 Corporate Drive at Goose Bay Drive (East JCT)

Goose Bay Drive intersects Corporate Drive from the west to form a 3-way, T-intersection. A single general-purpose travel lane is provided on all approaches. There are no marked shoulders on the intersection approaches. A crosswalk is provided across the south leg of the intersection, which provides connection between sidewalk segments on the east side of Corporate Drive north of the intersection and on the west side of Corporate Drive south of the intersection.

2.2.8 New Hampshire Avenue and Corporate Drive at Durham Street and International Drive

New Hampshire Avenue and Corporate Drive form the north and south legs, respectively, of a 4-way unsignalized intersection, with Durham Street approaching from the west and International Drive approaching from the east under stop control. All approaches provide single general-purpose lanes, with no marked shoulders. Sidewalks are provided on the north side of Durham Street and International Drive, on the east side of New Hampshire

Avenue, and on both sides of Corporate Drive. Crosswalks are provided across the north and west legs of the intersection.

2.2.9 Corporate Drive at Grafton Road

Grafton Road intersects Corporate Drive from the southwest under stop control at a 3-way, T-intersection. Corporate Drive southbound provides a through travel lane and a right-turn lane, while Corporate Drive northbound provides a left-turn lane and a through lane. Grafton Road widens at its approach to Corporate Drive to provide separate left and right turn lanes. No shoulders or edge lines are present. Sidewalks are provided on the south side of Grafton Road and on the east side of Corporate Drive, with a crosswalk across the south leg of the intersection.

2.2.10 Grafton Road at I-95 Southbound Off-Ramp

I-95 Southbound Exit 3A includes a direct off-ramp to Grafton Road. Grafton Road is median divided in the vicinity of the off-ramp, prohibiting left turns to Grafton Road southbound. The ramp provides a single-lane approach under stop control, while Grafton Road provides a single lane northbound through the intersection.

2.2.11 Grafton Road at Route 33 (Greenland Road)

Grafton Road intersects Route 33 (Greenland Road) from the north to form a 3-way, T-type, signalized intersection. Grafton Road southbound has a two-lane approach with exclusive left and right turn lanes. Route 33 eastbound provides an exclusive left-turn lane and two through lanes, while the westbound approach provides two through lanes and a right-turn lane. The north and west legs of the intersection are median divided. The multi-use path along the west side of Grafton Road continues adjacent to the intersection, turning towards the west and continuing on the north side of Route 33; however, no connection to the intersection is provided and no crosswalks or other pedestrian accommodations are provided. A narrow 2-foot shoulder is provided on the Grafton Road approach, with 7-to-10-foot shoulders provided on Route 33.

2.2.12 Minor Driveway Intersections

There are six additional intersections at minor driveways that are included in the study area:

- International Drive at Pease Development Authority Driveway (south location)
- International Drive at Lonza Biologics Driveway (north location)
- International Drive at Lonza Biologics Driveway (south location)
- Goose Bay Drive at Lonza Biologics Parking Garage Entrance
- Goose Bay Drive at Lonza Biologics Driveway (south location)
- Goose Bay Drive at Corporate Center Driveway

Each of these intersections provides a single general-purpose lane on all approaches. No crosswalks are provided except for the International Drive at Lonza Biologics driveway which provides a crosswalk on the north leg of the intersection.

2.3 Traffic Volumes

Turning movement counts (TMC) were collected at the study area intersections on both February 17, 2022 and March 7, 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) data was collected on Pease Boulevard, just west of the US Route 4 southbound ramps during a 48-hour period from Tuesday thru Wednesday in March 2023. The ATR location was strategically chosen to align with the NHDOT Count Station (LOC ID 82379024) to serve as a basis for comparison of existing traffic volumes to recent NHDOT traffic volumes and to traffic counts collected in 2022 to determine if adjustments to traffic volumes should be made. The historical traffic volumes on Pease Boulevard at this location are presented below in Table 1 below.

TABLE 1
Pease Boulevard Historical Traffic Volumes

		Peak Hour Traffic Volumes		
Year	**AADT**	**AM Peak**	**PM Peak**	**Source**
2015	21,000	2,160	2,272	NHDOT (October)[1]
2016	21,420	Not Available		NHDOT Growth Estimate[2]
2017	21,848	Not Available		NHDOT Growth Estimate[2]
2018	20,100	1,835	2,052	NHDOT July[3]
2019	20,341	Not Available		NHDOT Growth Estimate[2]
2020	17,168	Not Available		NHDOT Growth Estimate[2]
2021	15,807	1,212	1,558	NHDOT (August)
2022	17,175	1,211	1,428	Tighe & Bond February 2022 ATR[4]
2023	18,485	1,551	1,783	Tighe & Bond March 2023 ATR[4]

[1]Peak Hour Traffic Volumes Adjusted based on 2017 Seasonal Adjustment Factor to Peak
[2]Based on NHDOT Yearly Growth Rates
[3]Peak Hour Traffic Volumes Adjusted based on 2018 Seasonal Adjustment Factor to Peak
[4]Total Daily Traffic and Peak Hour Traffic Volumes Adjusted based on 2019 Seasonal Adjustment Factor to Peak

The variance in volumes over time, and specifically the decrease in volume between 2019 and 2022, represent the impact of the COVID-19 pandemic on work schedules and commuting patterns. Traffic volume trends nation- and region-wide confirm that traffic volumes have generally returned to pre-pandemic levels in 2023; however, current NHDOT guidance requests that 2022 and 2023 traffic volumes should be adjusted upward to assume a return to 2019 pre-pandemic volumes. This likely represents a conversative analysis but cannot be adequately confirmed as such until multiple years of data can confirm current trends in post-pandemic traffic volumes.

Based on a review of the collected traffic volumes and comparison to the 2019 traffic volumes, it was determined the 2022 existing peak hour traffic volumes should be adjusted by a factor of 53% during the weekday morning peak period, and 45% during the weekday afternoon peak period and the 2023 existing peak hour traffic volumes should be adjusted by a factor of 37% during the weekday morning peak period, and 16% during the weekday afternoon peak period. These adjustment factors were determined by reviewing the historical NHDOT traffic volume data during the peak hour time periods and comparing it to the 2022 and 2023 peak hour volumes. Because the 2019, 2022, and

2023 peak hour time periods do not align due to changes in travel patterns, the higher peak hour traffic volume for each year was used as a basis for comparison. NHDOT seasonal adjustment factors were applied to both the historical volumes and existing traffic volumes per NHDOT guidelines.

While the application of these adjustment factors aligns with NHDOT guidance on review and adjustment of post-pandemic traffic volumes, it should be understood that application of adjustment factors based on ATR data from Pease Boulevard across all turning movements within the study area may artificially inflate turning movements and overstate calculated operational delay and resultant capacity analysis results.

The raw TMC and ATR data are provided in Appendix A. The NHDOT historical traffic volumes on Pease Boulevard, seasonal adjustment factors, and historical growth rates are enclosed in Appendix B. The Traffic Volume Adjustment Factor calculation is provided in Appendix C. Adjusted 2023 Existing Peak Hour Traffic Volumes are provided in Figure 2.

2.4 Capacity and Queue Analyses - Existing Conditions

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 G. 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 4 and 5 in Section 7 summarize the capacity and queue analyses results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix H.

As shown in Table 4, the conservative application of COVID adjustment factors to represent a pre-pandemic condition creates an assumed pre-pandemic Existing condition which predicts notable operational delay throughout the study area. While many intersections and individual intersection approaches operate at LOS D or better during the peak hours, the following predict unfavorable and failing operations:

- **Pease Boulevard at International Drive:**
    - The intersection operates at overall LOS F with failing operations on the northbound right turn movement during the weekday afternoon peak hour.
- **Pease Boulevard at US Route 4 Southbound Ramps:**
    - The intersection operates at overall LOS F during the weekday morning peak hour with failing operations on the southbound right turn movement.
    - The westbound left movement operates at LOS E during the weekday afternoon peak hour.

- **Pease Boulevard at US Route 4 Northbound Ramps:**
  - The intersection operates at overall LOS E, with failing operations on the northbound left turn movement during the weekday morning peak hour.
  - Predicted 95th percentile queues exceed the available storage on the northbound left movement during the weekday morning peak hour.
- **Route 33 (Greenland Road) at Grafton Road:**
  - The intersection operates at overall LOS F during the weekday morning peak and afternoon peak hours.
  - The eastbound left and through movements operate at LOS F during the weekday morning peak hour.
  - The eastbound left, westbound through, and southbound right movements operate at LOS F during the weekday afternoon peak hour.
  - Predicted 95th percentile queues exceed the available storage on the eastbound left movement during the weekday morning peak hour.
- **Corporate Drive at International Drive:**
  - The intersection operates at overall LOS F during the weekday morning peak and afternoon peak hours.
  - The southbound left and through movements operate at LOS F during the weekday morning peak hour.
  - The westbound right and northbound through movements operate at LOS F during the weekday afternoon peak hour.
  - Predicted 95th percentile queues exceed the available storage on the southbound left movement during the weekday morning peak hour and westbound right movement during the weekday afternoon peak hour.
- **New Hampshire Avenue/Corporate Drive at International Drive/Durham Street:**
  - The stop-controlled International Drive approach operates at LOS F during the weekday morning and weekday afternoon peak hours.
- **Corporate Drive at Goose Bay Drive (West):**
  - The northbound movement operates at LOS F during the weekday afternoon peak hour.
- **Corporate Drive at Grafton Road:**
  - The eastbound left movement on Grafton Road operates at LOS F during the weekday morning and weekday afternoon peak hours.
- **Grafton Road at I-95 Southbound Off-ramp:**
  - The ramp approach operates at LOS F during the weekday morning peak hour.

2.5 Collision History

Collision data was collected from police reports from the City of Portsmouth Police Department for the most recent three-year period between January 2020 and December 2022 for the study area intersections. Table 2 on the following page provides a summary of the collisions within the study area. Appendix F includes detailed collision summaries for each of the study intersections.

As shown in Table 2, there were 42 motor vehicle collisions reported in the study area during the three-year period analyzed. Collisions occurred most frequently at the intersections of Corporate Drive at International Drive and Gosling Road at US Route 4 Northbound ramps. Both intersections experienced 11 collisions, accounting for about half of the reported total. The intersection of Pease Boulevard at US Route 4 Southbound ramps experienced the third highest number of collisions with 7, or about 17% of the reported total. The New Hampshire Avenue at International Drive intersection experienced 6 collisions, equating to approximately 14% of the total. The intersection of Route 33 (Greenland Road) at Grafton Road experienced 5 collisions, or 12% of the reported total. Finally, the intersections of Pease Boulevard at International Drive and Corporate Drive at Grafton Road each experienced one collision. The remaining study intersections did not have any reported collisions based on data provided by the City of Portsmouth.

TABLE 2
Study Area Collision History Summary

	2019	2020	2021	Total	Percent
Corporate Drive at International Drive	7	2	2	**11**	**26.2%**
Gosling Road at US Route 4 NB Ramps	0	3	8	**11**	**26.2%**
Pease Boulevard at US Route 4 SB Ramps	3	3	1	**7**	**16.7%**
New Hampshire Avenue at International Drive	3	1	2	**6**	**14.3%**
Route 33 (Greenland Road) at Graton Road	1	2	2	**5**	**11.9%**
Pease Boulevard at International Drive	0	0	1	**1**	**2.4%**
Corporate Drive at Grafton Road	1	0	0	**1**	**2.4%**
TOTAL	**15**	**11**	**16**	**42**	**100%**

More detailed collision history summary data is provided in Appendix F. The most frequent types of collision were angle and rear-end, accounting for about 45% and 31% of the total collisions within the study area, respectively. The next most frequent collision type was sideswipe – same direction, which made up about 14% of the total collisions. The remaining collisions were fixed object, overturn/ rollover, or unknown, each of which accounting for less than 3% of the total collisions.

About 76% of collisions occurred on weekdays, spread throughout the day, with the remaining 24% occurring on weekends. Eight out of the 42 reported collisions in the study area occurred when the weather was clear, one occurred in snowy conditions, and the weather was unknown for the remaining 33 collisions. Similarly, eight of the 42 reported collisions occurred when the road surface was dry, one with snow on the roadway, and an unknown road surface condition for the remaining 33 collisions.

The collision data indicates no reported fatalities. One reported serious injury was reported for an angle collision at the intersection of New Hampshire Avenue at International Drive. The remaining 41 collisions resulted in minor injuries or property damage only. There were no pedestrian or cyclist collisions reported in the three-year period.

2.6 Public Transportation

The Cooperative Alliance for Seacoast Transportation (COAST) provides transit service within the study area. Bus Route 42 is the primary bus route in the study area with stops along Corporate Drive, including at the intersection of Corporate Drive at Redhook Way which is the closest existing stop to the site. Bus Route 42 also has stops along Grafton Road to the Portsmouth Transportation Center/Park & Ride and provides service to downtown Portsmouth. The route operates from 6:43AM to 6:34PM Monday through Friday. Bus Route 40 also operates in the study area with a bus stop at the Portsmouth Transportation Center and provides access to downtown Portsmouth. The route operates from 7:24 AM to 7:46 PM Monday through Friday. Bus Route 42 and 40 map and schedule are included in Appendix K.

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 Pease Development Authority (PDA) 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:

- Pease Surface Transportation Master Plan: Traffic volumes for the full occupancy of existing buildings and projects that are planned or under construction are included in the 2025 and 2035 No-Build Condition.

- 100 New Hampshire Avenue: Traffic volumes for the approximately 209,750 square foot advanced manufacturing facility in the Pease Tradeport area are included in the 2025 and 2035 No-Build Conditions.

Traffic volumes for these projects were obtained from record studies and assigned to the study area intersections in the No-Build Conditions. Data for background development projects are included in Appendix D. It is assumed that other smaller developments or small vacancies in existing developments are captured by the background traffic growth rate.

The 2025 and 2035 No-Build traffic volumes for the weekday morning and weekday evening peak hours are shown in Figures 3 and 4, respectively.

3.2 Planned Roadway Improvements

Information obtained by NHDOT was used to identify roadway improvement projects in the area that may affect future traffic operations. A traffic signal project is proposed at the intersection of International Drive at Corporate Drive/ Manchester Square as identified in the NHDOT Ten-Year Plan (NHDOT Project No. 42612) and was considered when developing the 2035 No-Build Conditions analysis. The project is partially funded with preliminary design scheduled for 2027 and construction currently scheduled for 2030. The improvement was included in the 2035 No-Build and 2035 Build Conditions analyses.

3.3 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 4 and 5 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix H.

The increase in expected future traffic based on the one percent per year compounded growth rate and the site-specific development added to the future No-Build Conditions result in some degradation of operations when compared to existing conditions. As described in Section 3.2, the proposed traffic signal at the intersection of International Drive at Corporate Drive/ Manchester Square is included in the 2035 No-Build Condition. In the 2025 No-Build Condition, most overall intersections and individual intersection approaches operate a similar LOS to the Existing Condition, which includes adjustment to an assumed pre-pandemic traffic level. 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 or increased delay exceeding available storage between the 2022 Existing and 2025 No-Build Condition, and/or between the 2025 and 2035 No-Build Condition:

- **Pease Boulevard at US Route 4 Southbound Ramps:**
  - The intersection continues to operate at overall LOS F during the weekday morning peak hour with failing operations on the southbound right movement. Both 50th and 95th percentile queues also exceed available storage in the 2035 weekday morning peak hour.
  - The westbound left movement degrades to LOS F in the 2035 weekday afternoon peak hour. The southbound left movement degrades to LOS E in the 2035 weekday morning peak hour.
- **Pease Boulevard at US Route 4 Northbound Ramps:**
  - The intersection continues to operate at overall LOS E in the 2025 No-Build Condition but degrades to LOS F in the 2035 No-Build Condition during the weekday morning peak hour.
  - In the 2035 No-build Condition, the eastbound left turn movement degrades to LOS E during the weekday afternoon peak hour.
  - The northbound left movement experiences design queues that exceed available storage in both No-Build years during the weekday morning peak hour.
- **Route 33 (Greenland Road) at Grafton Road:**
  - The intersection continues to operate at LOS F during the weekday morning and weekday afternoon peak hours.
  - The eastbound through movement degrades to LOS E in the 2025 No-Build Condition and to LOS F in the 2035 No-Build Condition during the weekday afternoon peak hour.
  - The southbound left turn movement design queues exceed available storage in 2035 during the weekday afternoon peak hour.

- **Corporate Drive at International Drive:**
  - The intersection continues to operate at overall LOS F in the 2025 No-Build Condition during the weekday morning peak and afternoon peak hours.
  - Overall intersection operations improve to LOS B and LOS C during the weekday morning and weekday afternoon peak hours, respectively, in the 2035 No-Build Condition following the proposed signalization of the intersection.
- **Corporate Drive at Lonza North Driveway:**
  - The Lonza North driveway approach degrades to LOS F in the 2035 No-Build Condition during the weekday afternoon peak hour.
- **New Hampshire Avenue/Corporate Drive at International Drive/Durham Street:**
  - The stop-controlled Durham Street approach degrades to LOS E during the weekday morning peak hour and to LOS F during the weekday afternoon peak hour in the 2035 No-Build Condition.
- **Corporate Drive at Grafton Road:**
  - The eastbound left movement continues to operate at LOS F in the 2025 and 2035 No-Build Condition during both peak periods. 95th percentile queues are estimated to continue to exceed available storage as well in 2025 and 2035.
- **Grafton Road at I-95 Southbound Off-Ramp:**
  - The westbound right turn movement continues to operate at LOS F in both No-Build years during the weekday morning peak hour.

Section 4
Proposed Conditions

The proposed 800,000+/- SF industrial facility will include approximately 700 parking spaces located in one proposed garage. The proposed development is expected to be complete and occupied in 2025. The Site Layout Plan is presented in Appendix I.

4.1 Site Access

Access to the Site will be provided via one full access, unsignalized driveway on Goose Bay Drive. The proposed driveway is located directly opposite the one-way existing Lonza garage entrance. All employees will utilize this driveway on Goose Bay Drive to access the site. A gated driveway is proposed on Corporate Drive, east of Redhook Way. This driveway will only be utilized for occasional deliveries to Building 3 following completion of the full build-out.

Based on the reconfiguration of Goose Bay Drive as shown in the proposed Site Layout Plan, intersection sight distance was not reviewed. There will be no conflicting through traffic with vehicles exiting the proposed driveway due to the roadway reconfiguration.

4.2 Multi-Modal Accommodations

Multi-modal access is provided in the general vicinity of the proposed development. Site improvements include a sidewalk along the eastern side of the Goose Bay Drive and a sidewalk along the southern side of Corporate Drive between the two Goose Bay Drive intersections. Improvements also include a crosswalk across Corporate Drive at the Wentworth Douglass driveway and on Goose Bay Drive at Corporate Drive to provide a continuous sidewalk network on the southern side of Corporate Drive. Additionally, internal sidewalks and crosswalks are proposed on site to accommodate pedestrians. Existing sidewalks adjacent to the site connect to a multi-use path along Grafton Road and Route 33 (Greenland Road). These facilities may encourage cycling and walking to the development.

In addition, the previously mentioned COAST bus stop is located at the intersection of Corporate Drive at Redhook Way with bus connection at the Portsmouth Transportation Center to downtown Portsmouth. The proposed sidewalk infrastructure coupled with the existing infrastructure in place create a robust pedestrian network in the Tradeport Area.

4.3 Trip Generation

Site generated traffic volumes were estimated using site-specific data based on existing facility operating characteristics and the proposed development program. Because the existing facility is currently operating on a hybrid schedule, turning movement counts collected in 2018 were used as a basis for the existing trip generation estimate.

The proposed site generated traffic volumes were calculated based on both the number of proposed full-time employees and the proposed building size. The 2018 turning movement counts serve as the basis for each estimate. The existing 1,139 full-time employees and the proposed 1,020 employees serve as a basis for the estimate based on the number of employees. The existing building size of 898,000 square feet, and the proposed building size of 800,000 square feet serve as the basis for the estimate based on building size. Trip generation is based on the peak hour of the generator (site). Table 3 summarizes the trip generation estimates.

TABLE 3

Site-Generated Traffic Summary

Existing - 1,139 Employees (Site Peak Hour)			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	154	76	230
Weekday Afternoon	15	160	175
Proposed - Based on Proposed 1,020 FTE Employees			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	138	68	206
Weekday Afternoon	13	144	157
Proposed - Based on Proposed 800,000 SF Building			
Peak Hour Period	**Enter**	**Exit**	**Total**
Weekday Morning	137	68	205
Weekday Afternoon	13	144	157

Based on employees, the project is projected to generate 206 trips during the weekday morning peak hour (138 entering, 68 exiting) and 157 trips during the weekday afternoon peak hour (13 entering, 144 exiting). Based on building size, the project is expected to generate 205 trips during the weekday morning peak hour (137 entering, 68 exiting) and 157 vehicles (13 entering, 144 exiting) during the weekday afternoon peak hour. It was determined to use the higher number of trips based on proposed employees in order to present a conservative estimate of predicted trips.

As noted previously, Lonza is currently working under a hybrid work policy, currently averaging approximately 50% of employees working in the office on a typical day. However, for the purposes of this TIA, no trip reduction credit was taken for future employees working from home. Therefore, the trip generation estimate including all full-time employees is considered conservative and assumes a return to in-person work for all employees. As noted above, trip generation is based on the peak hour of the generator and applied to the peak hour of the study area network, which also results in a conservative approach.

While the nearby COAST bus stop and sidewalk facilities in the area may provide additional options for employees to travel to the proposed development, no credit was taken for mode share trips.

4.4 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 zip code data for current Lonza employees' place of residence.

Arrival and departure distribution patterns are shown in Figure 5, and are as follows:

- 40% Northwest to/from US Route 4
- 25% South to/from I-95
  - 15% via Route 33
  - 10% via US Route 4
- 10% Northeast to/from I-95 (via Route 33)
- 10% West (Local) to/from Route 33
- 5% East to/from Pease Boulevard/Gosling Road
- 5% East (Local) to/from Route 33
- 5% (Local)to/ from US Route 1 / US Route 1 Bypass (via US Route 4)

Figure 6 shows the proposed site generated traffic distributed to the study area roadways for the weekday morning and afternoon peak hours. Trip distribution based on employee zip code is included in Appendix L.

4.5 Goose Bay Drive Realignment

A portion of Goose Bay Drive is proposed to be reconfigured as part of the project. Approximately 1,700 feet of the roadway beginning at the west end of Goose Bay Drive at the intersection with Corporate Drive will be converted to a private driveway for the Lonza site. Employee-only access gates will be installed along the private roadway. The portion of Goose Bay Drive running north to south to the east of the Lonza development will remain a public road, maintaining access to Corporate Center at Pease. A gate is proposed at the southern extent of Goose Bay Drive, approximately 150 feet south of the Corporate Center driveway to restrict through traffic. A cul-de-sac is proposed at the southern extent of Goose Bay Drive to provide vehicles with a means to turn around if necessary. Existing traffic volumes on Goose Bay Drive were reassigned and incorporated into the 2025 and 2035 Build Conditions traffic volumes and analyses. The reassigned Goose Bay Drive traffic volumes are shown in Appendix E.

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 7 and 8, respectively, for the weekday morning and afternoon peaks.

5.1 Capacity and Queue Analyses – Build Conditions

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 4 and 5 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix H.

Many 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, except for the following:

- **Pease Boulevard at International Drive:**
  - The intersection continues to operate at overall LOS F with failing operations on the northbound right turn movement during the weekday afternoon peak hour.
  - The westbound left movement degrades to LOS E in the 2035 Build Condition during the weekday morning peak hour.
- **Pease Boulevard at US Route 4 Northbound Ramps:**
  - The eastbound left movement degrades to LOS E in the 2025 Build Condition and to LOS F in the 2035 Build Condition during the weekday afternoon peak hour.
  - 95th percentile queues exceed available storage on the eastbound left and through movements in the 2035 Build Condition during the weekday afternoon peak hour.
- **Corporate Drive at Goose Bay Drive (West):**
  - The Goose Bay Drive northbound approach degrades to LOS F in the 2025 and 2035 Build Condition during the weekday morning peak hour. The northbound approach continues to operate at LOS F in the 2025 and 2035 Build Conditions.
  - 95th percentile queues exceed available storage on the northbound approach in the 2025 and 2035 Build Condition during the weekday afternoon peak hour.

A review of calculated queue lengths in Table 5 reveals that the majority of queues are unchanged between the No-Build and Build Conditions for both 2025 and 2035 or increase by approximately 1-2 car lengths or fewer. However, the following increases in queues were noted:

- The westbound left movement at the intersection of Pease Boulevard at International Drive experiences an increase in predicted 95th percentile queues of two and five car lengths in 2025 and 2035, respectively, during the weekday morning peak hour.
- The northbound right movement at the intersection of Pease Boulevard at International Drive sees an increase in predicted 95th percentile queues of approximately three car lengths in the 2025 and 2035 Build Condition during the afternoon peak hour. This movement does experience failing operations.
- Large increases in queues in 2025 and 2035 are projected on the Goose Bay Drive (West) northbound approach at the intersection with Corporate Drive due to the increase in site traffic exiting the site during the weekday afternoon peak hour.
- Large increases in design queues are estimated on the southbound left movement from International Drive to Corporate Drive during the weekday morning peak period and westbound right movement from Corporate Drive to International Drive in the 2025 Build Condition, however the queueing deficiency is mitigated with the proposed traffic signal in 2035.

Section 6
Conclusions & Recommendations

1. Lonza Biologics proposes to construct a 800,000+/- square foot industrial development within three buildings on portions of the vacant lot between Goose Bay Drive and Corporate Drive in the Pease Tradeport area in Portsmouth, NH. The development will provide approximately 700 parking spaces in one proposed parking garage to accommodate employee parking. The first phase of the proposed development is expected to be complete and occupied by 2025.

2. Employee access to the Site will be provided via one full access, unsignalized driveway opposite the existing Lonza parking garage entrance. Access will be controlled with proposed gates on the existing Goose Bay Drive in advance of the proposed site driveway. A proposed driveway on Corporate Drive will be restricted with a gate and be accessed for infrequent deliveries to Building 3 following completion of later project phases.

3. The proposed land use for the project site is industrial, which will support current biotech and pharmaceutical uses for Lonza. Site-specific data including traffic counts, existing and proposed number of employees, and existing and proposed building area were used as a basis for the estimate. The estimate assumed all employees are working on site. This likely represents a conservative estimate as Lonza is currently operating under a hybrid policy, averaging approximately 50% of employees in the facility each day.

4. Based on the trip generation estimate, the project is expected to generate 206 trips during the weekday morning peak hour (138 entering, 68 exiting) and 157 trips during the weekday afternoon peak hour (13 entering, 144 exiting). Trip generation is estimated based on the peak hour of the generator (site) and applied to the peak hour of the study area network, also representing a conservative approach.

5. The project proposes internal and adjacent roadway sidewalk connections, creating and promoting connections to a robust existing sidewalk network along study area roadways.

6. Vehicle collision history, compiled from local police and historic reports, do not indicate a significant or notable pattern of collisions in the study area.

7. Consistent with NHDOT guidelines, existing traffic volumes have been adjusted based on a comparison between 2022, 2023 and 2019 data to represent a pre-pandemic condition. Application of adjustment factors based on ATR data from Pease Boulevard across all turning movements within the study area may artificially inflate turning movements and overstate calculated operational delay and resultant capacity analysis results. Existing traffic volumes adjusted to an assumed pre-pandemic condition predict notable operational delay throughout the study area.

8. The capacity analyses show that the study area intersections will continue to operate at the same LOS under Build Conditions as in No-Build Conditions for both the 2025 opening year and 2035 design year, with the following exceptions:

a. The westbound left and northbound right movements at the intersection of Pease Boulevard at International Drive degrade from LOS D to LOS E in the weekday morning peak hour between the 2035 No-Build and Build Condition.

b. The eastbound left movement at the intersection of Pease Boulevard at US Route 4 Northbound Ramps degrades from LOS D to LOS E in the 2025 Build Condition and from LOS E to LOS F in the 2035 Build Condition during the weekday afternoon peak hour.

c. The Goose Bay Drive northbound approach Corporate Drive at Goose Bay Drive (West) degrades to LOS F in the 2025 and 2035 Build Condition during the weekday morning peak hour.

9. Based on the results of the foregoing analysis, it is the professional opinion of Tighe & Bond that while the adjustment of collected volumes to an assumed pre-pandemic condition and the addition of background growth on a 12-year horizon to the 2035 design year results in undesirable LOS at some area intersections, the addition of site-generated traffic is expected to have a negligible effect on traffic operations within the study area.

Section 7
Additional Tables

TABLE 4
Intersection Operation Summary - Capacity

		Weekday Morning Peak Hour															Weekday Afternoon Peak Hour														
	Lane Use	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 - Pease Boulevard at International Drive																															
Overall		**C**	**21.9**	**0.83**	**C**	**22.4**	**0.83**	**C**	**25.5**	**0.88**	**C**	**33.4**	**0.98**	**D**	**47.9**	**1.06**	**F**	**144.3**	**1.48**	**F**	**157.7**	**1.55**	**F**	**195.7**	**1.69**	**F**	**233.6**	**1.89**	**F**	**276.0**	**2.04**
Pease Boulevard	EBL	D	39.8	0.04	D	40.9	0.04	D	43.5	0.04	D	44.1	0.04	D	44.6	0.04	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	EBTR	C	34.6	0.22	D	35.9	0.26	D	39.0	0.28	D	39.7	0.30	D	40.2	0.31	C	23.9	0.62	C	24.4	0.65	C	24.4	0.65	C	26.8	0.68	C	27.0	0.68
	WBL	C	23.2	0.83	C	23.7	0.83	C	26.8	0.88	D	40.5	0.98	E	64.6	1.06	C	23.9	0.48	C	24.5	0.49	C	24.6	0.50	C	26.5	0.62	C	26.6	0.62
	WBTR	B	10.2	0.36	B	10.5	0.39	B	11.0	0.39	B	12.0	0.43	B	12.6	0.44	A	8.6	0.11	A	8.4	0.12	A	8.4	0.12	A	7.8	0.12	A	7.7	0.12
International Drive	NBLT	C	31.2	0.05	C	32.4	0.06	C	33.6	0.05	C	33.4	0.06	C	33.0	0.05	B	15.0	0.03	B	15.8	0.03	B	15.9	0.03	B	18.7	0.04	B	18.9	0.04
	NBR	D	38.5	0.67	D	40.5	0.69	D	45.7	0.77	D	48.0	0.81	D	53.4	0.87	F	245.5	1.48	F	276.9	1.55	F	337.5	1.69	F	432.8	1.89	F	500.3	2.04
	SB	C	31.2	0.04	C	32.3	0.04	C	33.5	0.04	C	33.3	0.04	C	32.9	0.04	B	15.9	0.18	B	16.7	0.19	B	16.9	0.19	B	20.0	0.23	C	20.2	0.23
Traffic Signal - Pease Boulevard at US Route 4 SB On/Off Ramps																															
Overall		**F**	**80.7**	**1.36**	**F**	**94.1**	**1.46**	**F**	**111.5**	**1.59**	**F**	**136.4**	**1.76**	**F**	**152.5**	**1.87**	**C**	**33.6**	**0.90**	**C**	**34.3**	**0.92**	**C**	**35.0**	**0.92**	**D**	**39.6**	**1.02**	**D**	**41.5**	**1.02**
Pease Boulevard	EBT	C	24.3	0.16	C	24.3	0.17	C	24.4	0.19	C	24.4	0.21	C	24.5	0.23	C	28.6	0.62	C	29.5	0.66	C	30.2	0.69	C	31.3	0.73	C	32.4	0.77
	EBR	C	23.9	0.10	C	23.8	0.10	C	23.9	0.12	C	23.8	0.13	C	23.9	0.14	C	30.6	0.61	C	31.6	0.64	C	34.9	0.72	D	39.7	0.79	D	48.0	0.88
	WBL	C	26.8	0.27	C	27.7	0.27	C	27.5	0.27	C	28.6	0.31	C	28.4	0.31	E	61.0	0.90	E	62.6	0.92	E	62.0	0.92	F	80.3	1.02	F	81.1	1.02
	WBT	B	17.2	0.55	B	17.2	0.58	B	17.7	0.60	B	18.2	0.66	B	18.8	0.69	B	10.2	0.23	B	10.9	0.24	B	11.4	0.25	A	9.8	0.25	A	9.9	0.25
US Route 4 SB On/ Off Ramps	SBL	D	45.7	0.86	D	48.2	0.88	D	48.5	0.89	E	66.0	0.99	E	66.7	0.99	D	35.1	0.52	D	35.2	0.52	D	35.2	0.52	D	35.8	0.57	D	35.7	0.57
	SBR	F	210.6	1.36	F	254.2	1.46	F	308.9	1.59	F	387.9	1.76	F	437.3	1.87	C	30.3	0.05	C	30.3	0.06	C	30.3	0.06	C	30.2	0.07	C	30.2	0.07
Traffic Signal - Pease Boulevard at US Route 4 NB On/Off Ramps																															
Overall		**E**	**57.9**	**1.13**	**E**	**61.2**	**1.16**	**E**	**69.0**	**1.22**	**F**	**86.8**	**1.34**	**F**	**95.4**	**1.40**	**C**	**32.8**	**0.86**	**C**	**34.3**	**0.89**	**D**	**36.4**	**0.94**	**D**	**41.1**	**0.96**	**D**	**45.4**	**1.03**
Pease Boulevard	EBL	B	15.7	0.13	B	15.4	0.14	B	15.4	0.17	B	14.8	0.18	B	14.8	0.22	D	51.5	0.86	D	54.6	0.89	E	61.2	0.94	E	64.5	0.96	F	82.5	1.03
	EBT	D	41.5	0.72	D	41.2	0.73	D	40.1	0.74	D	41.9	0.81	D	41.0	0.81	C	20.1	0.79	C	20.9	0.83	C	21.2	0.84	C	27.5	0.92	C	28.5	0.93
	WBTR	C	20.0	0.25	C	20.1	0.27	C	20.1	0.27	C	20.3	0.31	C	20.3	0.31	C	31.8	0.78	C	33.6	0.82	C	34.8	0.83	D	43.0	0.93	D	43.3	0.94
US Route 4 NB On/ Off Ramps	NBL	F	111.1	1.13	F	122.9	1.16	F	146.0	1.22	F	199.5	1.34	F	224.0	1.40	C	32.5	0.29	C	32.5	0.30	C	32.6	0.30	C	32.7	0.32	C	32.6	0.33
	NBR	C	29.9	0.17	C	30.3	0.17	C	30.6	0.19	C	31.7	0.26	C	32.0	0.28	C	32.0	0.23	C	32.0	0.24	C	32.0	0.24	C	32.1	0.26	C	32.0	0.26
Traffic Signal - Greenland Road (Route 33) at Grafton Road																															
Overall		**F**	**148.3**	**2.36**	**F**	**164.2**	**2.51**	**F**	**170.7**	**2.60**	**F**	**229.6**	**3.00**	**F**	**236.9**	**3.09**	**F**	**153.2**	**2.28**	**F**	**168.7**	**2.32**	**F**	**177.2**	**2.33**	**F**	**225.7**	**2.57**	**F**	**234.3**	**2.58**
Greenland Road (State Route 33)	EBL	F	648.9	2.36	F	715.5	2.51	F	752.7	2.60	F	933.5	3.00	F	976.2	3.09	F	622.7	2.28	F	643.3	2.32	F	646.2	2.33	F	752.3	2.57	F	755.2	2.58
	EBT	F	90.8	1.16	F	107.1	1.20	F	108.7	1.20	F	174.8	1.35	F	176.7	1.36	D	54.0	1.06	E	61.7	1.08	E	61.7	1.08	F	107.7	1.19	F	107.7	1.19
	WBT	C	23.0	0.73	C	23.4	0.75	C	23.4	0.75	C	26.7	0.83	C	26.7	0.83	F	142.5	1.25	F	153.3	1.28	F	153.3	1.28	F	212.0	1.41	F	212.0	1.41
	WBR	B	18.0	0.35	B	18.5	0.39	B	18.8	0.40	B	19.1	0.42	B	19.4	0.44	B	15.5	0.14	B	15.6	0.15	B	15.6	0.15	B	15.8	0.17	B	15.8	0.17
Grafton Road	SBL	C	21.7	0.51	C	21.9	0.54	C	21.9	0.55	C	21.9	0.57	C	21.9	0.57	C	26.9	0.79	C	34.6	0.88	D	36.6	0.89	D	49.2	0.96	D	52.6	0.98
	SBR	B	18.7	0.15	B	18.5	0.16	B	18.6	0.19	B	18.3	0.21	B	18.7	0.27	F	282.6	1.56	F	328.8	1.67	F	366.1	1.75	F	419.7	1.87	F	457.3	1.95
Traffic Signal - Corporate Drive at International Drive																															
Overall		**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**B**	**19.6**	**0.92**	**C**	**24.4**	**0.95**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**C**	**24.8**	**0.84**	**C**	**31.9**	**0.93**
Corporate Drive	EBL	--	--	--	--	--	--	--	--	--	C	33.0	0.45	D	41.9	0.53	--	--	--	--	--	--	--	--	--	B	14.9	0.31	B	14.0	0.28
	EBTR	--	--	--	--	--	--	--	--	--	C	31.5	0.31	D	39.4	0.36	--	--	--	--	--	--	--	--	--	B	12.8	0.02	B	12.1	0.02
	WBL	--	--	--	--	--	--	--	--	--	C	30.0	0.10	D	37.4	0.12	--	--	--	--	--	--	--	--	--	B	12.8	0.02	B	12.1	0.02
	WBT	--	--	--	--	--	--	--	--	--	C	29.8	0.07	D	37.1	0.08	--	--	--	--	--	--	--	--	--	B	13.0	0.05	B	12.2	0.04
	WBR	--	--	--	--	--	--	--	--	--	C	29.8	0.08	D	37.4	0.12	--	--	--	--	--	--	--	--	--	C	28.7	0.84	D	39.5	0.93
International Drive	NBL	--	--	--	--	--	--	--	--	--	C	30.3	0.09	D	38.0	0.11	--	--	--	--	--	--	--	--	--	C	21.2	0.06	C	24.4	0.06
	NBTR	--	--	--	--	--	--	--	--	--	C	32.3	0.43	D	40.7	0.52	--	--	--	--	--	--	--	--	--	C	29.9	0.77	D	36.0	0.82
	SBL	--	--	--	--	--	--	--	--	--	C	24.2	0.92	C	30.1	0.95	--	--	--	--	--	--	--	--	--	B	19.3	0.59	C	28.1	0.70
	SBT	--	--	--	--	--	--	--	--	--	A	6.3	0.51	A	5.3	0.48	--	--	--	--	--	--	--	--	--	B	14.3	0.21	B	17.4	0.22
	SBR	--	--	--	--	--	--	--	--	--	A	4.3	0.12	A	3.6	0.12	--	--	--	--	--	--	--	--	--	B	13.3	0.06	B	16.2	0.06
Unsignalized AWSC - Corporate Drive at International Drive																															
Overall		**F**	**115.4**	**1.45**	**F**	**124.5**	**1.49**	**F**	**197.2**	**1.82**	**--**	**--**	**--**	**--**	**--**	**--**	**F**	**95.7**	**1.35**	**F**	**104.3**	**1.39**	**F**	**164.8**	**1.70**	**--**	**--**	**--**	**--**	**--**	**--**
Corporate Drive	EBL	B	14.7	0.23	B	14.8	0.24	C	15.6	0.25	--	--	--	--	--	--	C	20.9	0.46	C	21.5	0.48	C	22.4	0.50	--	--	--	--	--	--
	EBTR	B	13.7	0.23	B	13.9	0.24	B	14.7	0.25	--	--	--	--	--	--	B	12.5	0.06	B	12.6	0.06	B	13.1	0.06	--	--	--	--	--	--
	WBL	B	12.9	0.05	B	12.9	0.05	B	13.3	0.05	--	--	--	--	--	--	B	12.0	0.03	B	12.1	0.03	B	12.2	0.03	--	--	--	--	--	--
	WBT	B	12.5	0.04	B	12.6	0.05	B	12.9	0.05	--	--	--	--	--	--	B	12.1	0.08	B	12.2	0.08	B	12.2	0.08	--	--	--	--	--	--
	WBR	B	13.8	0.22	B	14.0	0.23	C	17.1	0.39	--	--	--	--	--	--	F	204.0	1.35	F	223.1	1.39	F	351.9	1.70	--	--	--	--	--	--
International Drive	NBL	B	12.2	0.03	B	12.3	0.03	B	13.0	0.03	--	--	--	--	--	--	B	12.7	0.05	B	12.8	0.05	B	13.4	0.05	--	--	--	--	--	--
	NBT	B	13.5	0.20	B	13.6	0.20	B	14.5	0.21	--	--	--	--	--	--	F	64.4	1.03	F	70.5	1.06	F	74.3	1.14	--	--	--	--	--	--
	NBTR	B	13.9	0.27	B	14.1	0.28	C	15.1	0.30	--	--	--	--	--	--	C	20.2	0.54	C	20.8	0.56	C	22.0	0.59	--	--	--	--	--	--
	SBL	F	240.8	1.45	F	258.4	1.49	F	412.7	1.82	--	--	--	--	--	--	C	15.8	0.20	C	16.1	0.20	C	17.3	0.24	--	--	--	--	--	--
	SBT	F	74.5	1.04	F	83.3	1.07	F	107.1	1.11	--	--	--	--	--	--	C	16.3	0.27	C	16.6	0.28	C	17.4	0.30	--	--	--	--	--	--
	SBR	B	10.9	0.29	B	11.0	0.29	B	11.7	0.31	--	--	--	--	--	--	B	14.8	0.24	C	15.1	0.25	C	15.9	0.27	--	--	--	--	--	--
Unsignalized TWSC - Corporate Drive at Goose Bay Drive (West)																															
Corporate Drive	WB	A	9.8	0.04	A	9.9	0.04	B	11.0	0.14	B	10.8	0.05	B	12.3	0.17	A	7.4	0.00	A	7.4	0.00	A	7.4	0.01	A	7.7	0.00	A	7.7	0.01
Goose Bay Drive (West)	NB	C	20.3	0.11	C	20.8	0.11	F	58.6	0.73	D	27.4	0.16	F	139.4	1.02	F	50.2	0.91	F	56.2	0.94	F	347.8	1.71	F	200.5	1.34	F	637.8	2.35
Unsignalized TWSC - Corporate Drive at Redhook Way																															
Corportate Drive	EBL	A	7.5	0.01	A	7.5	0.01	A	7.6	0.01	A	7.5	0.02	A	7.6	0.02	A	8.9	0.01	A	8.9	0.01	A	9.0	0.01	A	9.1	0.01	A	9.2	0.01
Redhook Way	SB	A	9.2	0.01	A	9.2	0.01	A	9.5	0.02	A	9.3	0.02	A	9.6	0.02	B	11.6	0.06	B	11.7	0.06	B	11.9	0.06	B	12.4	0.08	B	12.6	0.08

TABLE 4 (CONTINUED)
Intersection Operation Summary - Capacity

		Weekday Morning Peak Hour															Weekday Afternoon Peak Hour														
	Lane Use	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
Unsignalized TWSC - Corporate Drive at Goose Bay Drive (East)																															
Corportate Drive	WB	A	7.7	0.01	A	7.7	0.01	A	7.8	0.00	A	8.0	0.01	A	8.1	0.00	A	7.4	0.00	A	7.4	0.01	A	0.0	0.00	A	7.6	0.01	A	0.0	0.00
Goose Bay Drive (East)	NB	B	11.2	0.08	B	11.3	0.09	A	0.0	0.00	B	12.5	0.10	A	0.0	0.00	A	9.9	0.04	B	10.0	0.05	B	11.4	0.03	B	11.2	0.06	B	12.9	0.04
Unsignalized TWSC - Goose Bay Drive at Corporate Center Driveway																															
Corporate Center Drivew	WB	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	8.5	0.02	A	8.5	0.02	A	0.0	0.00	A	8.5	0.02	A	0.0	0.00
Goose Bay Drive (East)	SB	A	7.3	0.01	A	7.3	0.01	A	0.0	0.00	A	7.3	0.01	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Unsignalized TWSC - Goose Bay Drive at Lonza South Driveway																															
Lonza South Driveway	EB	A	9.6	0.02	A	9.7	0.02	A	9.3	0.01	A	9.7	0.02	A	9.3	0.02	A	8.7	0.01	A	8.7	0.01	A	8.6	0.01	A	8.7	0.01	A	8.6	0.01
Goose Bay Drive (West)	NB	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Unsignalized TWSC - Goose Bay Drive at Lonza Parking Garage Driveway/ Proposed Site Driveway																															
Proposed Site Driveway	WB	--	--	--	--	--	--	A	8.8	0.07	--	--	--	A	8.8	0.07	--	--	--	--	--	--	B	13.7	0.27	--	--	--	B	14.6	0.29
Goose Bay Drive	NB	A	8.1	0.01	A	8.1	0.01	A	8.1	0.01	A	8.2	0.01	A	8.2	0.01	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	--	--	--	--	--	--	A	7.5	0.10	--	--	--	A	7.5	0.10	--	--	--	--	--	--	A	8.4	0.01	--	--	--	A	8.6	0.01
Unsignalized TWSC - Corporate Drive at Granite State Driveway																															
Granite State Driveway	WB	B	13.4	0.03	B	13.6	0.03	B	13.6	0.03	C	16.0	0.04	C	16.0	0.04	C	15.9	0.03	C	16.1	0.03	C	16.1	0.03	C	19.0	0.05	C	19.0	0.05
International Drive	SB	A	7.7	0.01	A	7.7	0.01	A	7.7	0.01	A	7.9	0.01	A	7.9	0.01	A	9.1	0.01	A	9.2	0.01	A	9.2	0.01	A	9.5	0.01	A	9.5	0.01
Unsignalized TWSC - Corporate Drive at Lonza North Driveway																															
Lonza North Driveway	WB	B	12.7	0.07	B	12.8	0.08	B	12.8	0.08	B	14.8	0.10	B	14.8	0.10	D	26.7	0.63	D	28.6	0.66	D	28.6	0.66	F	50.6	0.84	F	50.6	0.84
International Drive	SB	A	7.6	0.02	A	7.6	0.02	A	7.6	0.02	A	7.8	0.02	A	7.8	0.02	A	8.9	0.02	A	9.0	0.02	A	9.0	0.02	A	9.3	0.02	A	9.3	0.02
Unsignalized TWSC - Corporate Drive at Lonza South Driveway																															
Lonza South Driveway	WB	A	9.3	0.01	A	9.4	0.01	A	9.4	0.01	A	9.8	0.01	A	9.8	0.01	B	11.6	0.03	B	11.7	0.03	B	11.7	0.03	B	12.4	0.04	B	12.4	0.04
International Drive	SB	A	7.6	0.01	A	7.6	0.01	A	7.6	0.01	A	7.8	0.01	A	7.8	0.01	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Unsignalized TWSC - New Hampshire Avenue/ Corporate Drive at International Drive/ Durham Street																															
Durham Street	EB	D	27.1	0.14	D	32.5	0.16	D	32.5	0.16	E	41.2	0.22	E	41.2	0.22	D	28.2	0.38	E	37.3	0.47	E	37.3	0.47	F	54.1	0.61	F	54.1	0.61
International Drive	WB	F	62.5	0.74	F	105.3	0.92	F	105.3	0.92	F	223.7	1.25	F	223.7	1.25	F	323.0	1.59	F	506.9	2.00	F	506.9	2.00	F	820.1	2.68	F	820.1	2.68
Corporate Drive	NB	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	8.4	0.00	A	8.6	0.00	A	8.6	0.00	A	8.8	0.00	A	8.8	0.00
New Hampshire Avenue	SB	A	9.7	0.04	B	10.1	0.04	B	10.1	0.04	B	10.6	0.05	B	10.6	0.05	A	8.2	0.00	A	8.3	0.00	A	8.3	0.00	A	8.4	0.00	A	8.4	0.00
Unsignalized TWSC - Corporate Drive at Grafton Road																															
Grafton Road	EBL	F	107.9	1.16	F	158.2	1.29	F	216.0	1.42	F	236.0	1.47	F	304.4	1.62	F	150.6	1.19	F	242.2	1.42	F	461.3	1.90	F	473.3	1.94	F	815.9	2.68
	EBR	B	10.7	0.37	B	10.7	0.38	B	11.2	0.42	B	11.2	0.42	B	11.7	0.47	A	8.7	0.08	A	8.7	0.08	A	8.8	0.09	A	8.8	0.09	A	8.8	0.10
Corporate Drive	NBL	A	8.0	0.05	A	8.1	0.06	A	8.2	0.08	A	8.2	0.06	A	8.3	0.09	B	12.2	0.34	B	13.2	0.38	B	14.3	0.46	C	15.1	0.45	C	16.9	0.54
Unsignalized - Grafton Road at I-95 SB Off Ramp																															
I-95 SB Off-ramp	WB	F	592.5	2.13	F	859.4	2.72	F	974.6	2.96	F	1366.0	3.81	F	1552	4.10	B	13.1	0.15	B	13.7	0.18	B	13.8	0.18	B	14.8	0.21	B	14.9	0.21

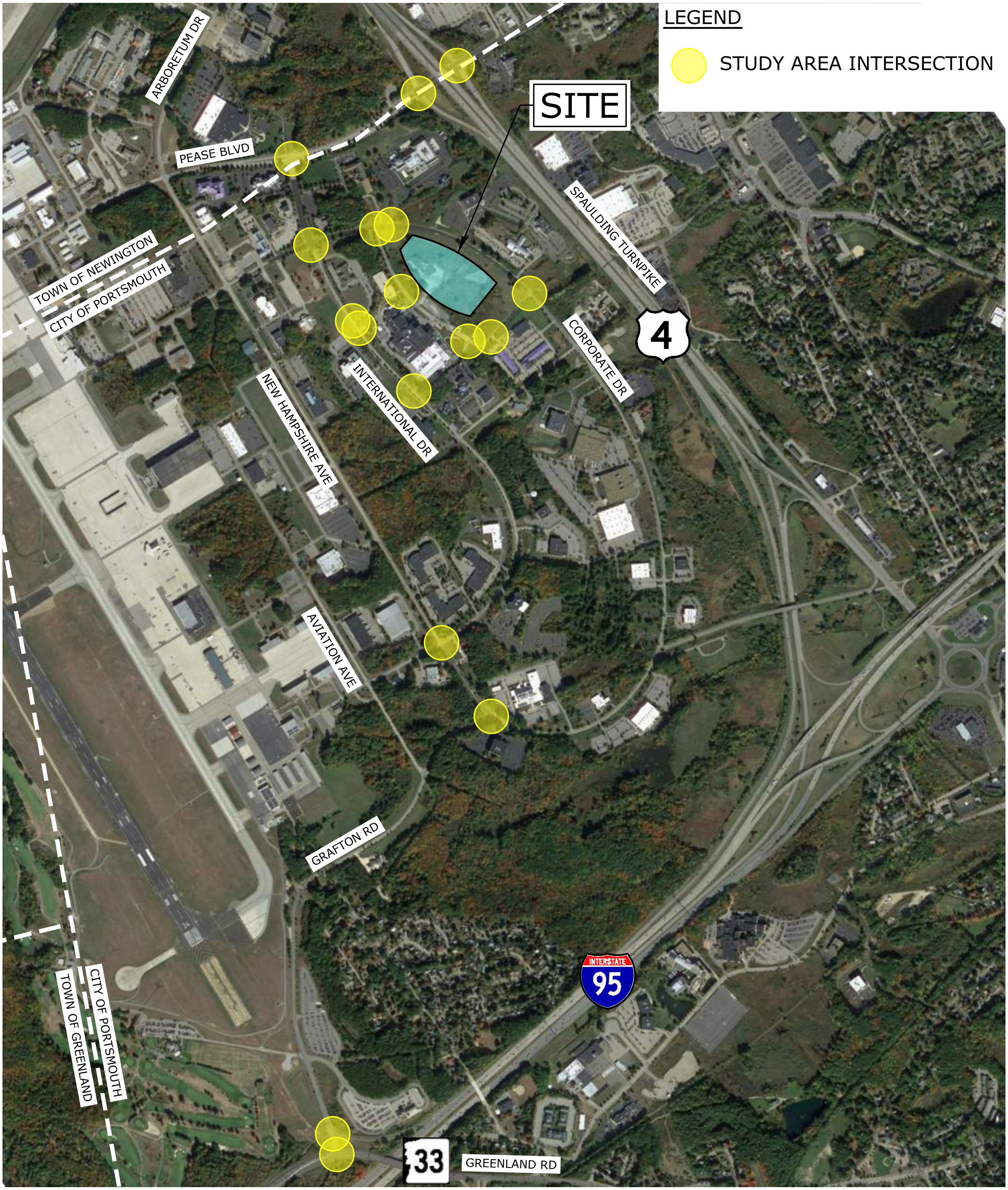
TABLE 5
Intersection Operation Summary - Queues (In Feet)

			Weekday Morning Peak Hour										Weekday Afternoon Peak Hour									
	Lane Use	Available Storage	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 - Pease Boulevard at International Drive																						
	EBL	290	2	9	2	9	2	9	2	9	2	9	0	0	0	0	0	0	0	0	0	0
Pease Boulevard	EBT	>1000	31	56	37	64	38	64	43	69	43	69	87	135	101	153	102	154	123	188	124	190
	WBL	690	304	391	320	409	397	464	488	549	576	672	53	93	56	98	58	101	96	155	98	158
	WBT	>1000	70	271	80	303	90	303	107	343	107	343	17	31	20	35	20	35	22	36	22	36
	NBT	840	7	25	7	25	7	25	9	27	9	27	4	18	4	19	4	18	5	22	5	22
International Drive	NBR	530	92	143	98	147	118	173	134	192	155	242	404	623	433	664	489	732	578	876	641	955
	SBT	>1000	6	16	6	17	7	17	7	18	7	18	24	46	26	49	26	49	33	62	33	62
Traffic Signal - Pease Boulevard at US Route 4 SB On/Off Ramps																						
	EBT	>1000	41	52	45	55	50	61	56	67	61	72	204	225	220	242	236	258	252	274	269	291
Pease Boulevard	EBR	530	0	29	0	29	0	30	0	31	0	32	63	173	74	190	113	243	154	308	203	420
	WBL	370	63	67	65	67	65	65	75	70	75	67	261	356	267	361	267	352	303	359	303	358
	WBT	370	332	307	341	310	357	314	391	324	407	328	51	94	57	95	58	95	77	94	78	95
US Route 4 SB On/ Off	SBL	520	242	248	248	253	248	253	282	284	282	284	124	172	126	175	126	175	142	194	142	194
Ramps	SBR	520	478	455	529	501	597	560	685	638	744	688	0	27	0	28	0	28	0	29	0	30
Traffic Signal - Pease Boulevard at US Route 4 NB On/Off Ramps																						
	EBL	375	28	32	29	34	36	42	33	40	39	47	243	293	258	314	282	351	290	365	326	414
Pease Boulevard	EBT	375	285	336	294	341	295	341	334	355	334	357	111	127	115	131	112	141	126	190	124	443
	WBT	460	70	106	77	116	79	117	93	135	95	138	294	355	308	371	308	371	358	464	359	464
US Route 4 NB On/ Off	NBL	360	387	404	401	416	432	444	499	505	530	532	65	99	66	101	67	102	74	111	75	111
Ramps	NBR	360	0	18	0	17	5	23	18	36	23	42	0	47	0	47	0	47	0	49	0	49
Traffic Signal - Greenland Road (Route 33) at Grafton Road																						
	EBL	400	422	632	440	643	454	656	516	705	529	717	205	334	211	341	211	341	239	373	240	374
Greenland Road (State	EBT	>1000	526	671	552	689	553	689	668	785	670	785	391	497	405	512	405	512	484	591	484	591
Route 33)	WBT	>1000	123	179	126	183	126	183	144	235	144	235	327	443	337	455	337	455	396	516	396	516
	WBR	275	0	62	0	64	0	65	0	67	0	69	0	40	0	42	0	42	0	44	0	44
Grafton Road	SBL	300	61	83	67	90	68	92	72	99	73	100	138	256	159	296	163	303	180	336	184	342
	SBR	1000	0	24	0	25	1	26	4	29	10	36	397	572	438	614	470	648	517	696	549	730
Traffic Signal - Corporate Drive at International Drive																						
	EBL	300	--	--	--	--	--	--	47	97	60	97	--	--	--	--	--	--	59	94	59	94
	EBTR	>1000	--	--	--	--	--	--	36	82	47	82	--	--	--	--	--	--	2	13	2	13
Corporate Drive	WBL	175	--	--	--	--	--	--	9	30	12	30	--	--	--	--	--	--	4	11	4	11
	WBT	525	--	--	--	--	--	--	8	28	11	28	--	--	--	--	--	--	10	22	10	22
	WBR	675	--	--	--	--	--	--	0	32	0	36	--	--	--	--	--	--	211	251	308	349
	NBL	175	--	--	--	--	--	--	5	22	6	22	--	--	--	--	--	--	7	26	8	26
	NBTR	>1000	--	--	--	--	--	--	54	106	70	106	--	--	--	--	--	--	171	275	204	275
International Drive	SBL	850	--	--	--	--	--	--	265	363	434	538	--	--	--	--	--	--	47	110	64	132
	SBT	850	--	--	--	--	--	--	128	186	134	186	--	--	--	--	--	--	49	107	61	107
	SBR	250	--	--	--	--	--	--	0	9	0	9	--	--	--	--	--	--	0	31	0	31
Unsignalized AWSC - Corporate Drive at International Drive																						
	EBL	300	--	23	--	23	--	--	--	--	--	--	--	55	--	57	--	57	--	--	--	--
	EBR	>1000	--	20	--	23	--	23	--	--	--	--	--	5	--	5	--	5	--	--	--	--
Corporate Drive	WBL	175	--	3	--	3	--	3	--	--	--	--	--	3	--	3	--	3	--	--	--	--
	WBT	525	--	3	--	3	--	3	--	--	--	--	--	5	--	5	--	5	--	--	--	--
	WBR	675	--	20	--	20	--	40	--	--	--	--	--	735	--	785	--	1165	--	--	--	--
	NBL	175	--	3	--	3	--	3	--	--	--	--	--	3	--	3	--	3	--	--	--	--
	NBT	>1000	--	18	--	18	--	18	--	--	--	--	--	270	--	285	--	280	--	--	--	--
International Drive	NBTR	175	--	25	--	25	--	28	--	--	--	--	--	65	--	68	--	70	--	--	--	--
	SBL	850	--	928	--	982	--	1443	--	--	--	--	--	15	--	15	--	20	--	--	--	--
	SBT	850	--	400	--	433	--	497	--	--	--	--	--	23	--	25	--	25	--	--	--	--
	SBR	250	--	30	--	30	--	33	--	--	--	--	--	20	--	23	--	20	--	--	--	--

TABLE 5 (CONTINUED)
Intersection Operation Summary - Queues (In Feet)

			Weekday Morning Peak Hour										Weekday Afternoon Peak Hour									
	Lane Use	**Available Storage**	**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**
Unsignalized TWSC - Corporate Drive at Goose Bay Drive (West)																						
Corportate Drive	WB	120	--	3	--	3	--	13	--	5	--	15	--	0	--	0	--	0	--	0	--	0
Goose Bay Drive (West)	NB	685	--	8	--	10	--	118	--	15	--	195	--	260	--	283	--	1258	--	598	--	1738
Unsignalized TWSC - Corporate Drive at Redhook Way																						
Corportate Drive	EB	120	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
Redhook Way	SB	320	--	0	--	0	--	0	--	3	--	3	--	5	--	5	--	5	--	8	--	8
Unsignalized TWSC - Corporate Drive at Goose Bay Drive (East)																						
Corportate Drive	WB	360	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
Goose Bay Drive (East)	NB	580	--	5	--	8	--	0	--	8	--	0	--	3	--	3	--	3	--	5	--	3
Unsignalized TWSC - Goose Bay Drive at Corporate Center Driveway																						
Corporate Center Drivewa	WB	100	--	0	--	0	--	0	--	0	--	0	--	0	--	3	--	0	--	3	--	0
Goose Bay Drive (East)	SB	580	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
Unsignalized TWSC - Goose Bay Drive at Lonza South Driveway																						
Lonza South Driveway	EB	200	--	0	--	0	--	0	--	3	--	3	--	0	--	0	--	0	--	0	--	0
Goose Bay Drive (West)	NB	250	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
Unsignalized TWSC - Goose Bay Drive at Lonza Parking Garage Driveway/ Proposed Site Driveway																						
Proposed Site Driveway	WB	300	--	--	--	--	--	5	--	--	--	5	--	--	--	--	--	28	--	--	--	30
Goose Bay Drive	NB	200	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
	SB	675	--	0	--	--	--	8	--	0	--	8	--	0	--	0	--	0	--	0	--	0
Unsignalized TWSC - Corporate Drive at Granite State Driveway																						
Granite State Driveway	WB	340	--	3	--	3	--	3	--	3	--	3	--	3	--	3	--	3	--	3	--	3
International Drive	SB	470	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
Unsignalized TWSC - Corporate Drive at Lonza North Driveway																						
Lonza North Driveway	WB	200	--	5	--	5	--	5	--	8	--	8	--	105	--	115	--	115	--	193	--	193
Corporate Drive	SB	85	--	3	--	3	--	3	--	3	--	3	--	3	--	3	--	3	--	3	--	3
Unsignalized TWSC - Corporate Drive at Lonza South Driveway																						
Lonza South Driveway	WB	100	--	0	--	0	--	0	--	0	--	0	--	3	--	3	--	3	--	3	--	3
International Drive	SB	400	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
Unsignalized TWSC - New Hampshire Avenue/ Corporate Drive at International Drive/ Durham Street																						
Durham Street	EB	860	--	13	--	15	--	15	--	20	--	20	--	43	--	55	--	55	--	83	--	83
International Drive	WB	>1000	--	123	--	168	--	168	--	255	--	255	--	585	--	718	--	718	--	932	--	932
Corporate Drive	NB	920	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
New Hampshire Avenue	SB	>1000	--	3	--	3	--	3	--	3	--	3	--	0	--	0	--	0	--	0	--	0
Unsignalized TWSC - Corporate Drive at Grafton Road																						
Grafton Road	EBL	220	--	668	--	898	--	1070	--	1223	--	1403	--	393	--	538	--	715	--	785	--	955
	EBR	220	--	43	--	45	--	53	--	53	--	63	--	8	--	8	--	8	--	8	--	8
Corporate Drive	NBL	>1000	--	5	--	5	--	8	--	5	--	8	--	38	--	45	--	60	--	60	--	83
Unsignalized TWSC - Grafton Road at I-95 SB Off Ramp																						
I-95 SB Off Ramp	WB	>1000	--	545	--	685	--	710	--	838	--	853	--	13	--	18	--	18	--	20	--	20

Section 8
Figures



LONZA BIOLOGICS INDUSTRIAL DEVELOPMENT

PORTSMOUTH, NH

SITE LOCATION MAP

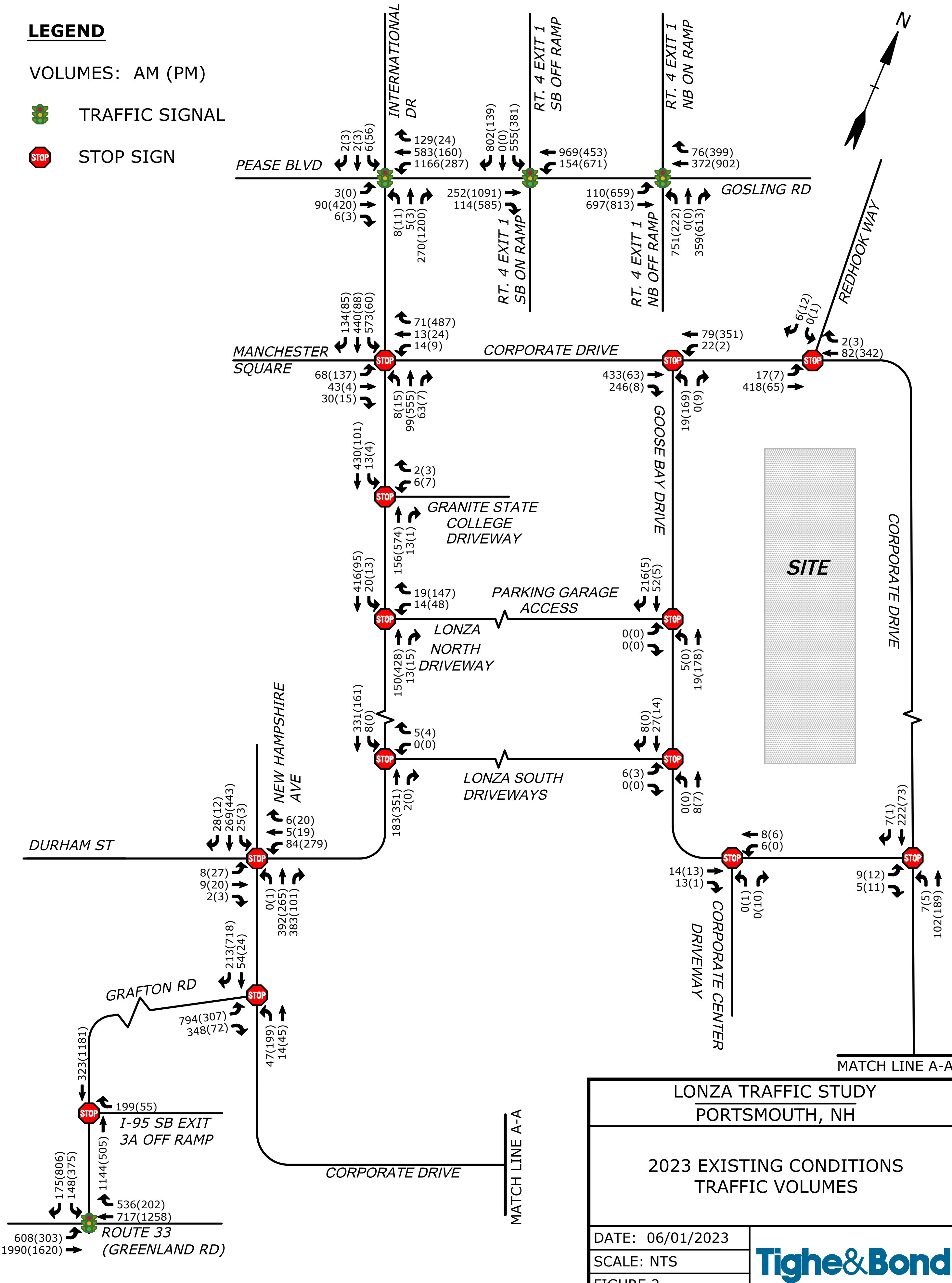
NORTH

NO SCALE

FIGURE 1

Tighe&Bond

May 19, 2023-9:48am Plotted By: MStoutz
Tighe & Bond, Inc. J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\Figures\L0700-026 Site Location Map.dwg

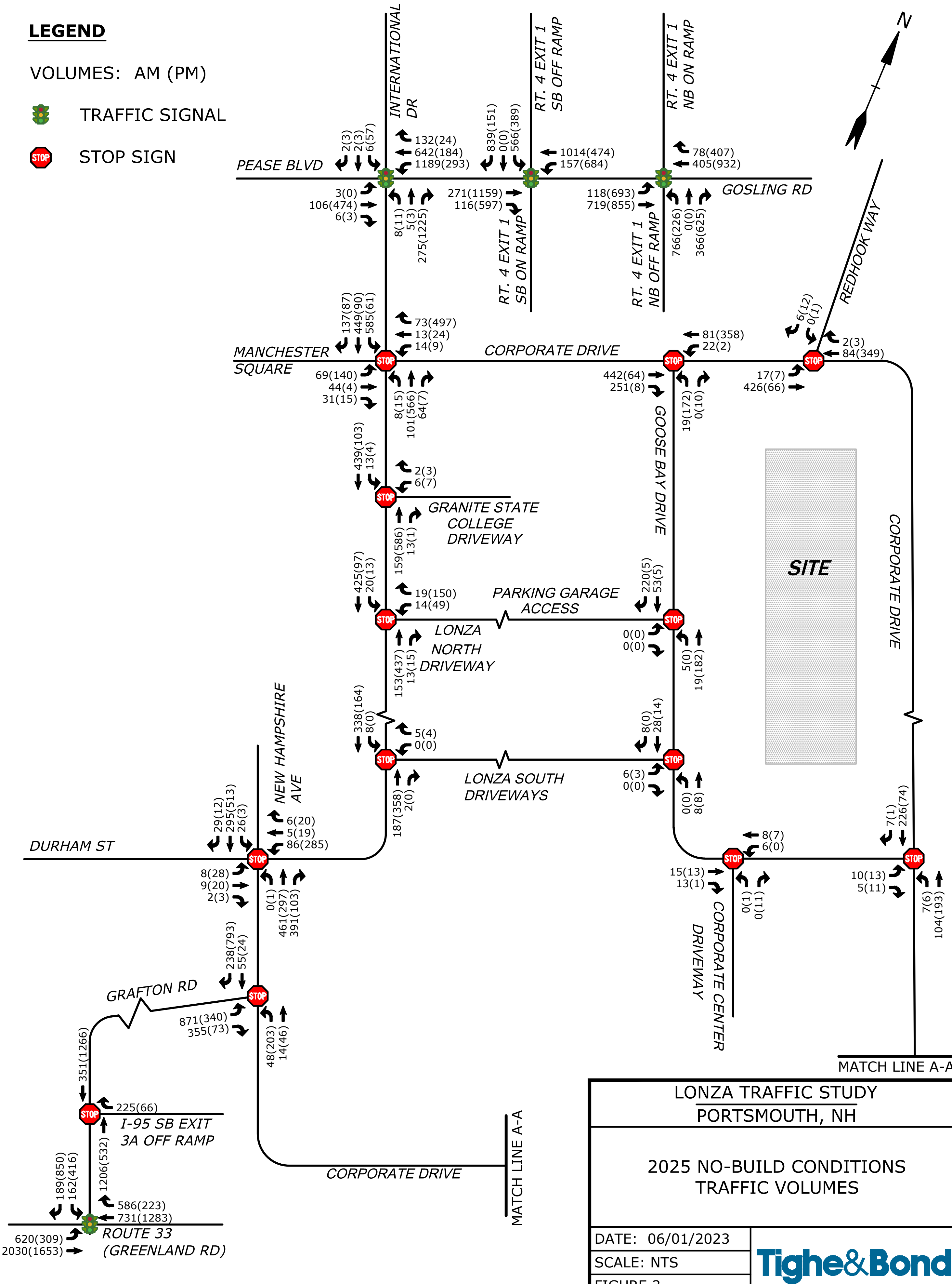


LONZA TRAFFIC STUDY
PORTSMOUTH, NH

2023 EXISTING CONDITIONS
TRAFFIC VOLUMES

DATE: 06/01/2023
SCALE: NTS
FIGURE 2

Tighe&Bond

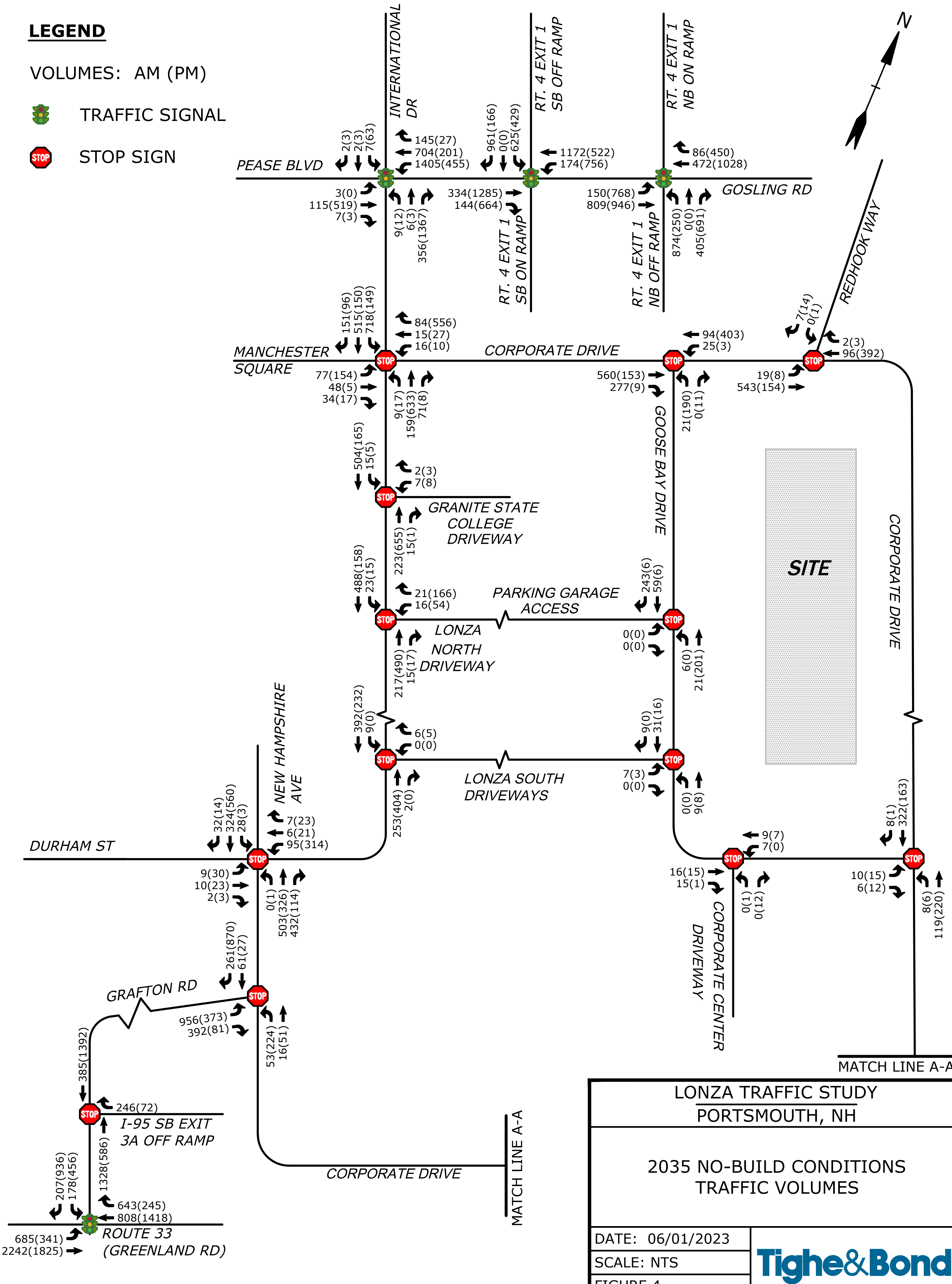


LONZA TRAFFIC STUDY
PORTSMOUTH, NH

2025 NO-BUILD CONDITIONS
TRAFFIC VOLUMES

DATE: 06/01/2023
SCALE: NTS
FIGURE 3

Tighe&Bond

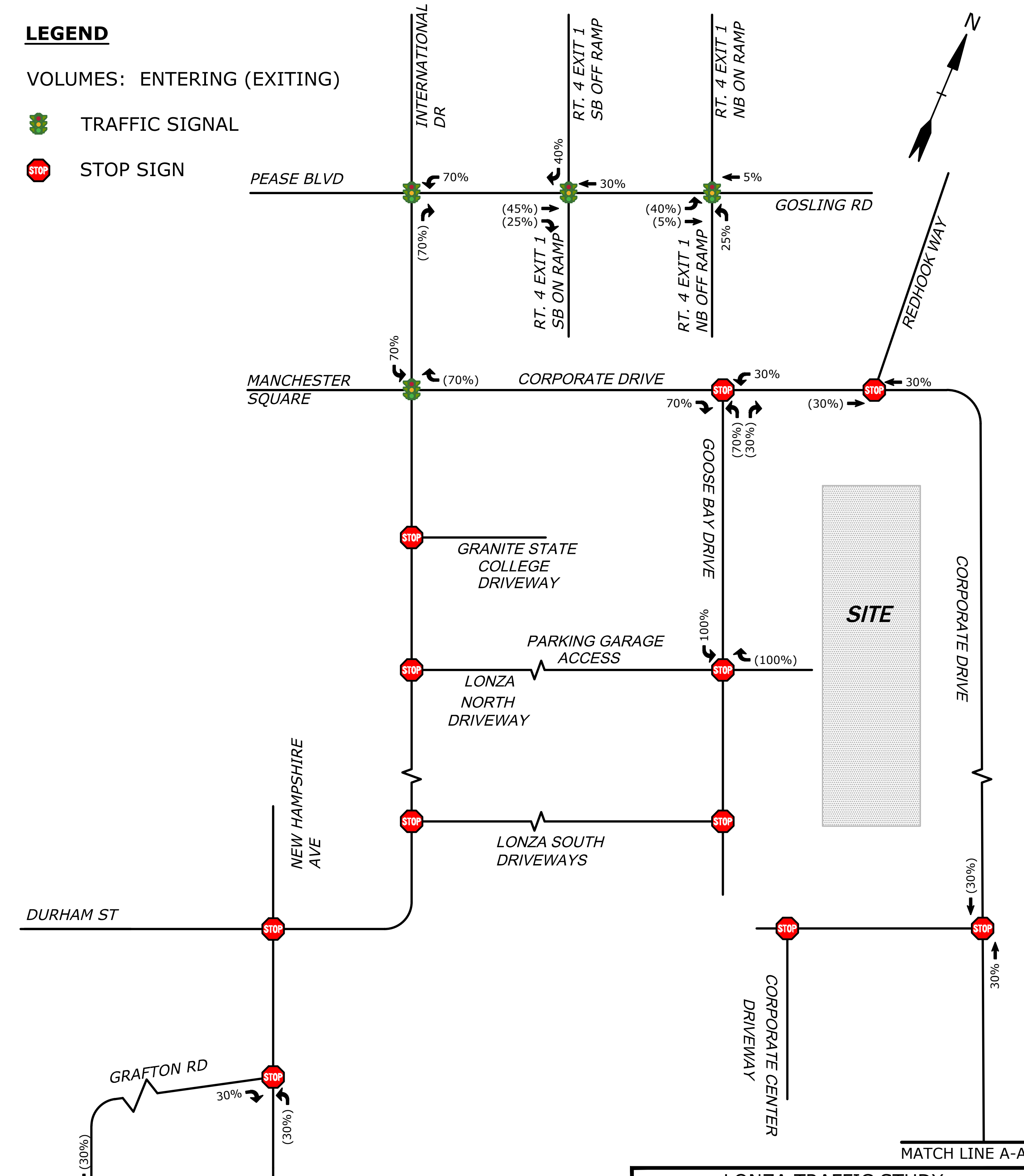


LONZA TRAFFIC STUDY
PORTSMOUTH, NH

2035 NO-BUILD CONDITIONS
TRAFFIC VOLUMES

DATE: 06/01/2023
SCALE: NTS
FIGURE 4

Tighe&Bond

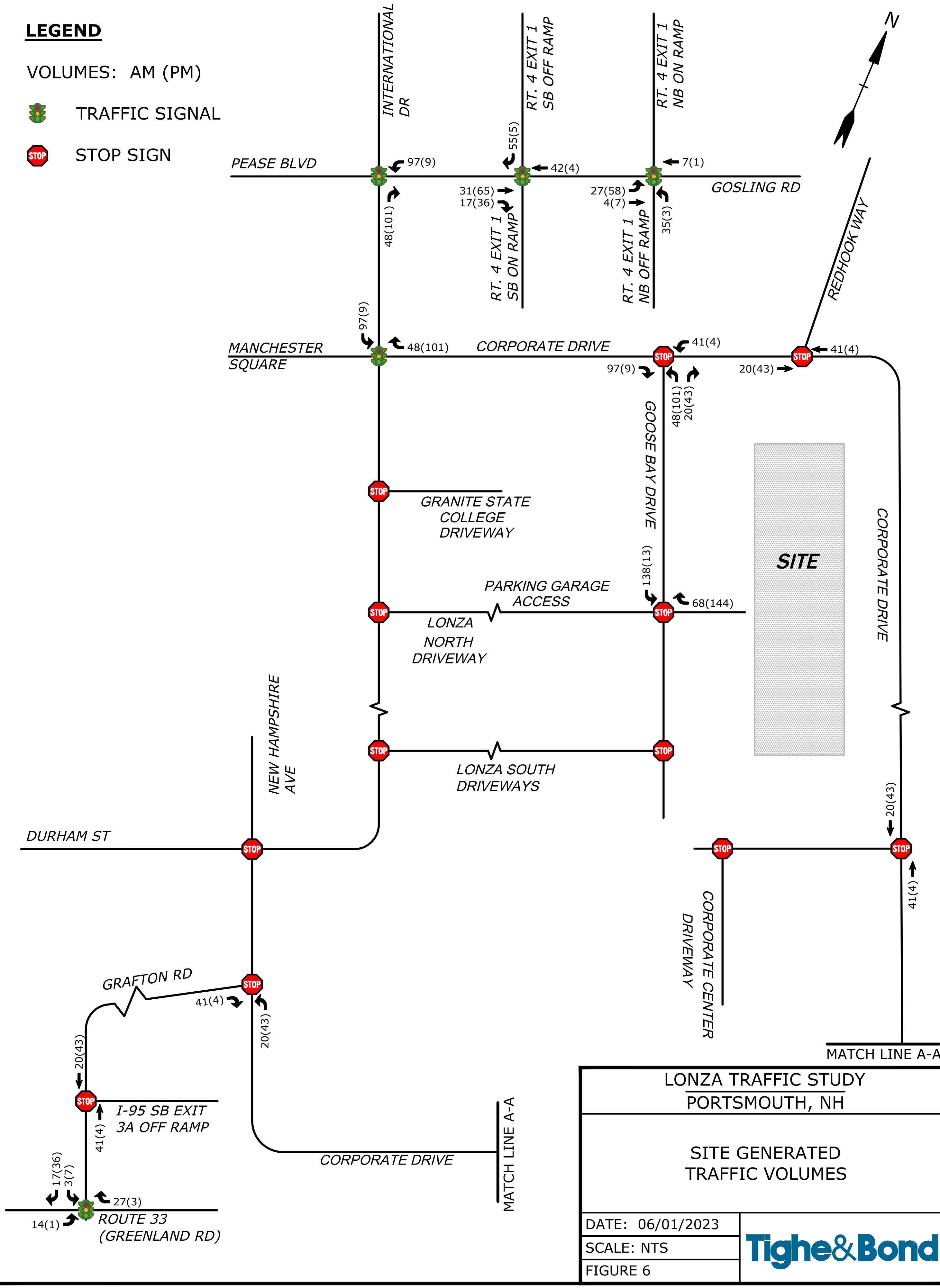


LONZA TRAFFIC STUDY
PORTSMOUTH, NH

ARRIVAL & DEPARTURE TRIP DISTRIBUTION

DATE: 06/01/2023
SCALE: NTS
FIGURE 5

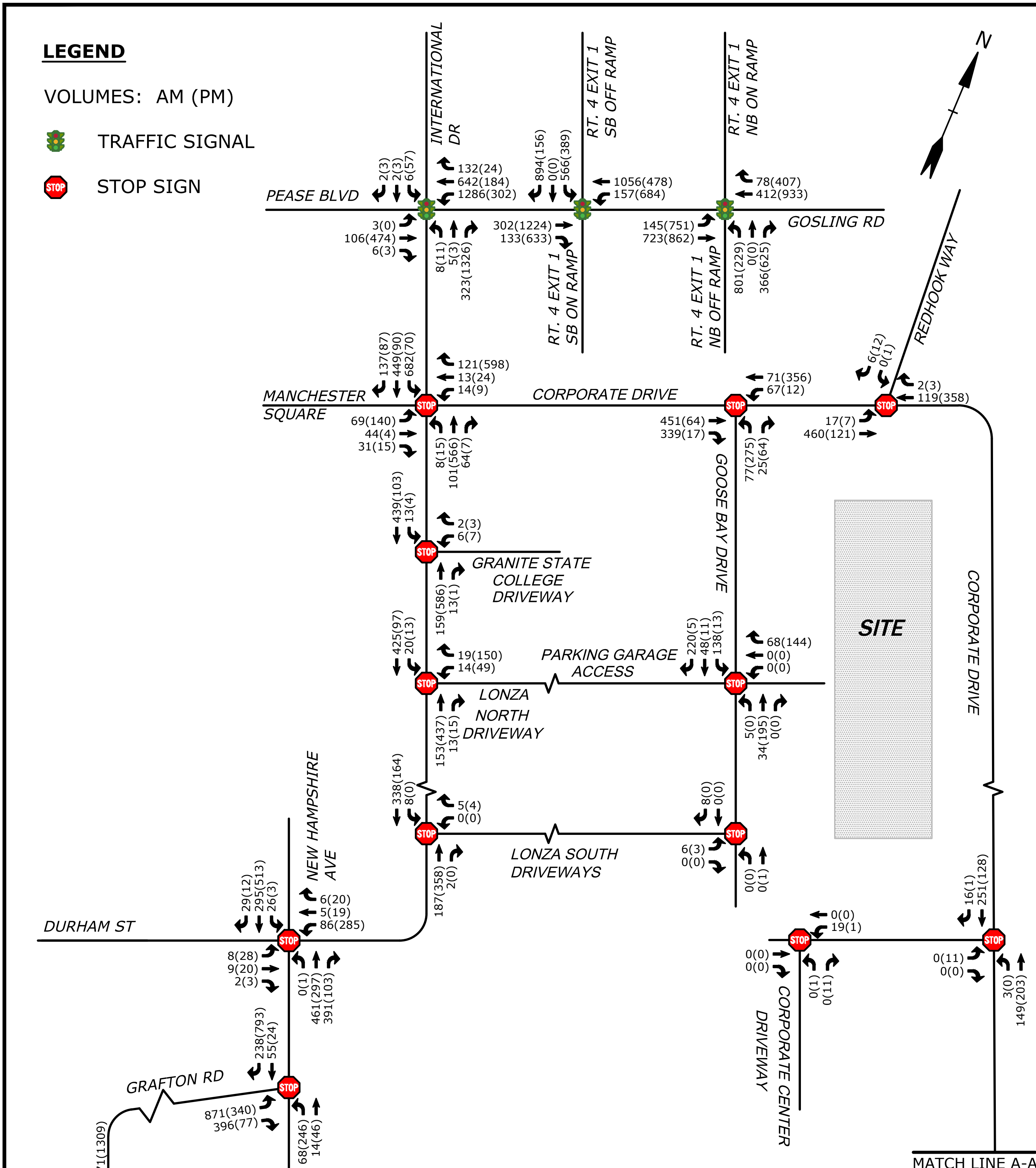
Tighe&Bond



LONZA TRAFFIC STUDY
PORTSMOUTH, NH

SITE GENERATED TRAFFIC VOLUMES

DATE: 06/01/2023	Tighe&Bond
SCALE: NTS	
FIGURE 6	

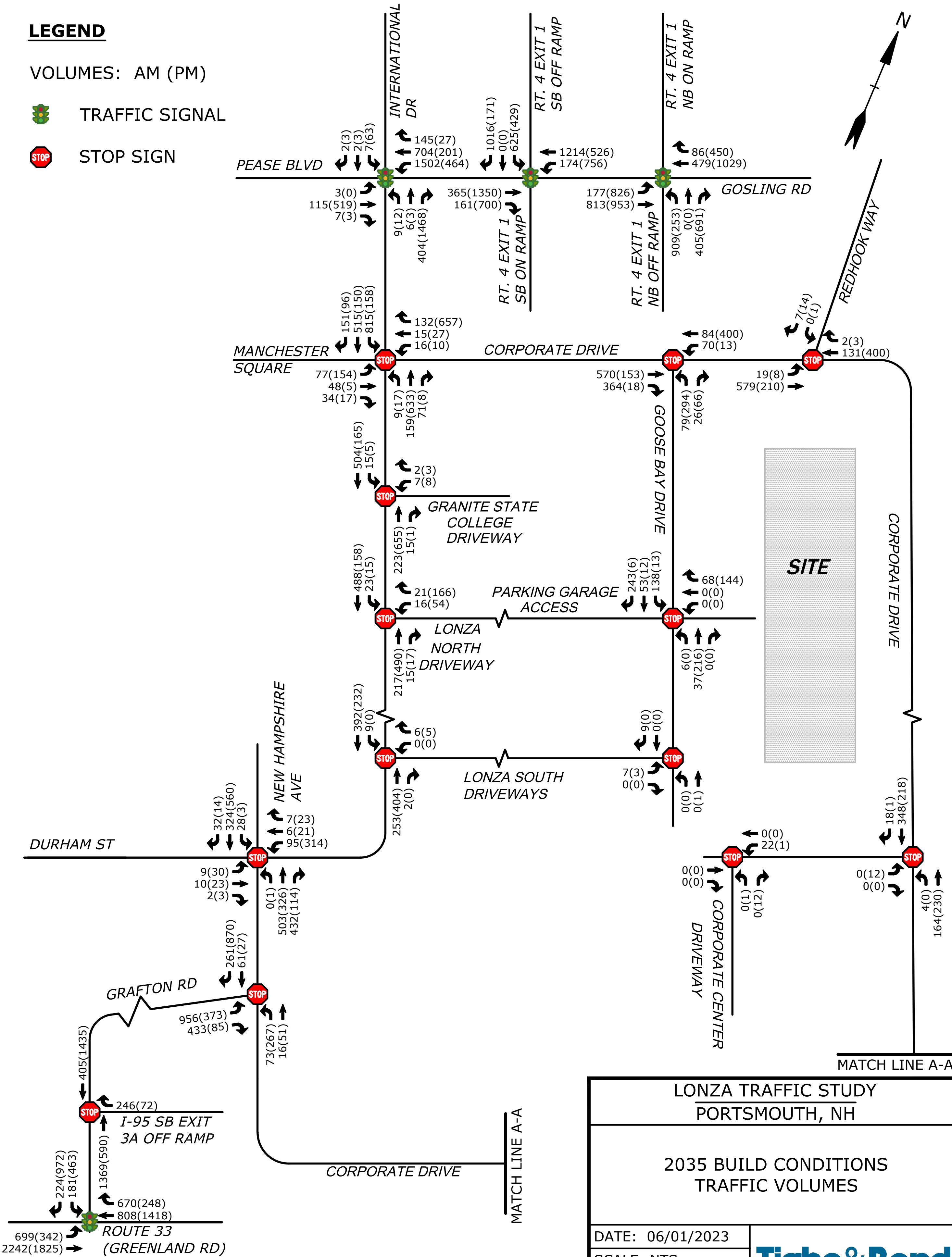


LONZA TRAFFIC STUDY
PORTSMOUTH, NH

2025 BUILD CONDITIONS
TRAFFIC VOLUMES

DATE: 06/01/2023
SCALE: NTS
FIGURE 7

Tighe&Bond



LONZA TRAFFIC STUDY
PORTSMOUTH, NH

2035 BUILD CONDITIONS
TRAFFIC VOLUMES

DATE: 06/01/2023
SCALE: NTS
FIGURE 8

Tighe&Bond

APPENDIX A

Traffic Count Data

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Pease Blvd
Street 2:	International Drive
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

PASSENGER CARS & HEAVY VEHICLES COMBINED

	International Drive Northbound				International Drive Southbound				Pease Blvd Eastbound				Pease Blvd Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	35	0	0	0	0	0	0	14	0	0	117	54	7
7:15 AM	0	0	1	29	0	1	0	0	0	0	9	1	1	150	76	8
7:30 AM	0	2	0	34	0	1	0	0	0	0	8	1	0	170	80	16
7:45 AM	0	1	0	40	0	0	1	0	0	1	14	0	0	235	110	14
8:00 AM	0	2	1	35	0	1	0	1	0	1	15	1	0	167	90	26
8:15 AM	0	0	2	44	0	1	0	0	0	0	14	2	0	168	90	26
8:30 AM	0	0	1	39	0	0	0	0	0	0	20	1	0	124	73	12
8:45 AM	0	1	0	55	0	3	0	1	0	3	14	0	0	114	83	9

	International Drive Northbound				International Drive Southbound				Pease Blvd Eastbound				Pease Blvd Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	4	0	246	0	9	0	0	0	0	90	0	0	49	32	2
4:15 PM	0	0	0	227	0	9	0	0	0	0	76	1	0	56	32	2
4:30 PM	0	2	2	242	0	14	2	1	0	0	82	1	0	56	28	4
4:45 PM	0	2	0	180	0	10	0	1	0	0	65	0	0	54	28	10
5:00 PM	0	1	0	225	0	24	0	2	0	0	107	3	0	40	25	1
5:15 PM	0	1	0	146	0	19	0	1	0	0	83	4	0	24	29	2
5:30 PM	0	0	0	104	0	13	0	2	0	0	45	0	1	28	25	2
5:45 PM	0	0	0	90	0	16	0	0	0	0	31	3	1	25	16	6

AM PEAK HOUR 7:30 AM to 8:30 AM	International Drive Northbound				International Drive Southbound				Pease Blvd Eastbound				Pease Blvd Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**5**	**3**	**153**	**0**	**3**	**1**	**1**	**0**	**2**	**51**	**4**	**0**	**740**	**370**	**82**
PHF	**0.88**				**0.63**				**0.84**				**0.83**			
HV %	**0.0%**	**0.0%**	**0.0%**	**5.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.0%**	**0.0%**	**0.0%**	**0.9%**	**1.1%**	**0.0%**

PM PEAK HOUR 4:00 PM to 5:00 PM	International Drive Northbound				International Drive Southbound				Pease Blvd Eastbound				Pease Blvd Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**8**	**2**	**895**	**0**	**42**	**2**	**2**	**0**	**0**	**313**	**2**	**0**	**215**	**120**	**18**
PHF	**0.91**				**0.68**				**0.88**				**0.96**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**1.9%**	**0.0%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 1
Location: Portsmouth, NH
Street 1: Pease Blvd
Street 2: International Drive
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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HEAVY VEHICLES

	International Drive Northbound				International Drive Southbound				Pease Blvd Eastbound				Pease Blvd Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:15 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	3	1	0
7:30 AM	0	0	0	6	0	0	0	0	0	0	1	0	0	1	3	0
7:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0	0
8:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
8:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	2	1	0
8:30 AM	0	0	0	1	0	0	0	0	0	0	1	0	0	2	1	0
8:45 AM	0	0	0	4	0	0	0	0	0	0	1	0	0	5	1	0

	International Drive Northbound				International Drive Southbound				Pease Blvd Eastbound				Pease Blvd Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
4:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	3	0	0
4:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5:15 PM	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0
5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	International Drive Northbound				International Drive Southbound				Pease Blvd Eastbound				Pease Blvd Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**8**	**4**	**0**
PHF	**0.42**				**0.00**				**0.25**				**0.75**			

PM PEAK HOUR 4:30 PM to 5:30 PM	International Drive Northbound				International Drive Southbound				Pease Blvd Eastbound				Pease Blvd Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**4**	**0**	**0**
PHF	**0.50**				**0.00**				**0.63**				**0.33**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 1
Location: Portsmouth, NH
Street 1: Pease Blvd
Street 2: International Drive
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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PEDESTRIANS & BICYCLES

	International Drive Northbound				International Drive Southbound				Pease Blvd Eastbound				Pease Blvd Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	International Drive Northbound				International Drive Southbound				Pease Blvd Eastbound				Pease Blvd Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:30 AM to 8:30 AM	International Drive Northbound				International Drive Southbound				Pease Blvd Eastbound				Pease Blvd Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:00 PM to 5:00 PM	International Drive Northbound				International Drive Southbound				Pease Blvd Eastbound				Pease Blvd Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 6
Location: Portsmouth, NH
Street 1: Newington Street
Street 2: Route 4 Southbound On/Off-Ramps
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	38	0	91	0	0	41	21	0	15	81	0
7:15 AM	0	0	0	0	0	65	0	86	0	0	23	16	0	16	105	0
7:30 AM	0	0	0	0	0	73	0	104	0	0	17	16	1	22	113	0
7:45 AM	0	0	0	0	0	96	0	152	0	0	34	19	1	17	175	0
8:00 AM	0	0	0	0	0	61	0	94	0	0	47	15	1	21	121	0
8:15 AM	0	0	0	0	0	71	0	94	0	0	38	13	0	22	126	0
8:30 AM	0	0	0	0	0	59	0	77	0	0	43	21	0	18	121	0
8:45 AM	0	0	0	0	0	64	0	72	0	0	47	16	0	35	119	0

	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	66	0	14	0	0	129	89	2	81	63	0
4:15 PM	0	0	0	0	0	55	0	21	0	0	151	74	0	90	54	0
4:30 PM	0	0	0	0	0	57	0	27	0	0	162	73	0	99	68	0
4:45 PM	0	0	0	0	0	50	1	21	0	0	133	96	3	92	77	0
5:00 PM	0	0	0	0	0	59	0	11	0	0	187	99	0	103	62	0
5:15 PM	0	0	0	0	0	64	0	23	0	0	119	57	0	88	52	0
5:30 PM	0	0	0	0	0	55	0	16	0	0	96	67	1	94	39	0
5:45 PM	0	0	0	0	0	49	0	25	1	0	79	55	0	74	50	0

AM PEAK HOUR 7:30 AM to 8:30 AM	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**301**	**0**	**444**	**0**	**0**	**136**	**63**	**3**	**82**	**535**	**0**
PHF	**0.00**				**0.75**				**0.80**				**0.80**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.0%**	**0.0%**	**1.4%**	**0.0%**	**0.0%**	**2.2%**	**9.5%**	**0.0%**	**12.2%**	**1.3%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**221**	**1**	**80**	**0**	**0**	**633**	**342**	**3**	**384**	**261**	**0**
PHF	**0.00**				**0.90**				**0.85**				**0.94**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.3%**	**0.0%**	**0.0%**	**0.5%**	**0.6%**	**0.0%**	**0.8%**	**1.1%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	Route 4 Southbound On/Off-Ramps
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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HEAVY VEHICLES

	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	1	0	0	0	0	1	1	0	2	2	0
7:15 AM	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	0
7:30 AM	0	0	0	0	0	0	0	3	0	0	0	3	0	6	3	0
7:45 AM	0	0	0	0	0	2	0	3	0	0	2	2	0	1	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	2	4	0
8:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
8:30 AM	0	0	0	0	0	2	0	1	0	0	2	0	0	3	2	0
8:45 AM	0	0	0	0	0	0	0	1	0	0	5	2	0	2	3	0

	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	3	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
4:30 PM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	1	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0

AM PEAK HOUR	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
7:15 AM to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:15 AM	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**6**	**0**	**0**	**4**	**6**	**0**	**10**	**8**	**0**
PHF	**0.00**				**0.45**				**0.63**				**0.50**			

PM PEAK HOUR	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
4:00 PM to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**3**	**0**	**5**	**3**	**0**
PHF	**0.00**				**0.25**				**0.63**				**0.50**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 6
Location: Portsmouth, NH
Street 1: Newington Street
Street 2: Route 4 Southbound On/Off-Ramps
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
7:30 AM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3

PM PEAK HOUR[1]	Route 4 Southbound On-Ramp Northbound				Route 4 Southbound Off-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
4:15 PM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	Route 4 Northbound On/Off-Ramps
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	68	0	38	0	0	0	0	0	24	56	0	0	0	27	10
7:15 AM	0	76	0	47	0	0	0	0	0	17	72	0	0	0	46	9
7:30 AM	0	71	0	47	0	0	0	0	0	4	85	0	0	0	70	12
7:45 AM	0	130	0	66	0	0	0	0	0	18	111	0	0	0	59	14
8:00 AM	0	94	0	53	0	0	0	0	0	16	91	0	0	0	48	9
8:15 AM	0	98	0	39	0	0	0	0	0	12	97	0	0	0	47	10
8:30 AM	0	94	0	41	0	0	0	0	0	15	87	0	0	0	52	9
8:45 AM	0	85	0	55	0	0	0	0	0	16	95	0	0	0	64	13

	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	29	0	86	0	0	0	0	0	79	118	0	0	0	111	51
4:15 PM	0	28	1	94	0	0	0	0	0	89	117	0	0	0	122	51
4:30 PM	0	30	0	89	0	0	0	0	0	89	120	0	0	0	140	72
4:45 PM	0	36	0	94	0	0	0	0	0	91	108	0	0	0	130	44
5:00 PM	0	36	0	80	0	0	0	0	0	116	130	0	0	0	135	66
5:15 PM	0	24	0	94	0	0	0	0	0	72	108	0	0	0	117	63
5:30 PM	0	16	0	92	0	0	0	0	0	57	91	0	0	0	114	57
5:45 PM	0	24	0	73	0	0	0	0	0	45	80	0	0	0	100	52

AM PEAK HOUR 7:45 AM to 8:45 AM	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**416**	**0**	**199**	**0**	**0**	**0**	**0**	**0**	**61**	**386**	**0**	**0**	**0**	**206**	**42**
PHF	**0.78**				**0.00**				**0.87**				**0.85**			
HV %	**0.0%**	**2.4%**	**0.0%**	**3.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**4.9%**	**1.6%**	**0.0%**	**0.0%**	**0.0%**	**2.4%**	**4.8%**

PM PEAK HOUR 4:15 PM to 5:15 PM	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**130**	**1**	**357**	**0**	**0**	**0**	**0**	**0**	**385**	**475**	**0**	**0**	**0**	**527**	**233**
PHF	**0.94**				**0.00**				**0.87**				**0.90**			
HV %	**0.0%**	**1.5%**	**0.0%**	**1.1%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Newington Street
Street 2:	Route 4 Northbound On/Off-Ramps
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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HEAVY VEHICLES

	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	2	0	5	0	0	0	0	0	0	1	0	0	0	2	0
7:15 AM	0	1	0	7	0	0	0	0	0	2	1	0	0	0	1	1
7:30 AM	0	3	0	1	0	0	0	0	0	0	0	0	0	0	8	0
7:45 AM	0	2	0	4	0	0	0	0	0	2	2	0	0	0	0	2
8:00 AM	0	5	0	1	0	0	0	0	0	0	1	0	0	0	2	0
8:15 AM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0
8:30 AM	0	3	0	1	0	0	0	0	0	1	2	0	0	0	2	0
8:45 AM	0	3	0	2	0	0	0	0	0	1	5	0	0	0	3	0

	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0
4:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:00 PM	0	1	0	1	0	0	0	0	0	0	1	0	0	0	1	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0

AM PEAK HOUR 7:00 AM to 8:00 AM	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**8**	**0**	**17**	**0**	**0**	**0**	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**11**	**3**
PHF	**0.78**				**0.00**				**0.50**				**0.44**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**2**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**6**	**0**
PHF	**0.42**				**0.00**				**0.25**				**0.50**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 7
Location: Portsmouth, NH
Street 1: Newington Street
Street 2: Route 4 Northbound On/Off-Ramps
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:15 PM to 5:15 PM	Route 4 Northbound Off-Ramp Northbound				Route 4 Northbound On-Ramp Southbound				Newington Street Eastbound				Newington Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 12
Location: Portsmouth, NH
Street 1: Grafton Road
Street 2: Greenland Road (Route 33)
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	8	0	25	0	52	142	0	0	0	67	26
7:15 AM	0	0	0	0	0	19	0	12	0	53	222	0	0	0	82	39
7:30 AM	0	0	0	0	0	12	0	19	0	68	305	0	0	0	90	70
7:45 AM	0	0	0	0	0	18	0	19	0	128	292	0	0	0	82	99
8:00 AM	0	0	0	0	0	20	0	36	0	74	269	0	0	0	117	59
8:15 AM	0	0	0	0	0	28	0	19	0	67	236	0	0	0	108	69
8:30 AM	0	0	0	0	0	14	0	25	0	80	209	0	0	0	97	57
8:45 AM	0	0	0	0	0	15	0	29	0	73	204	0	0	0	84	64

	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	63	0	122	0	32	247	0	0	0	207	43
4:15 PM	0	0	0	0	0	36	0	102	0	37	225	0	0	0	154	37
4:30 PM	0	0	0	0	0	60	0	123	0	45	265	0	0	0	179	33
4:45 PM	0	0	0	0	0	50	0	104	0	46	207	0	0	0	178	22
5:00 PM	0	0	0	0	0	58	0	140	0	34	237	0	0	0	205	18
5:15 PM	0	0	0	0	0	51	0	104	0	23	238	0	0	0	173	26
5:30 PM	0	0	0	0	0	39	0	103	0	31	185	0	0	0	145	23
5:45 PM	0	0	0	0	0	25	0	63	0	29	216	0	0	0	117	27

AM PEAK HOUR 7:30 AM to 8:30 AM	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**78**	**0**	**93**	**0**	**337**	**1102**	**0**	**0**	**0**	**397**	**297**
PHF	**0.00**				**0.76**				**0.86**				**0.96**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**5.1%**	**0.0%**	**5.4%**	**0.0%**	**0.3%**	**4.1%**	**0.0%**	**0.0%**	**0.0%**	**8.3%**	**1.7%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**219**	**0**	**471**	**0**	**148**	**947**	**0**	**0**	**0**	**735**	**99**
PHF	**0.00**				**0.87**				**0.88**				**0.93**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.4%**	**0.0%**	**1.3%**	**0.0%**	**0.7%**	**2.1%**	**0.0%**	**0.0%**	**0.0%**	**2.4%**	**2.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 12
Location:	Portsmouth, NH
Street 1:	Grafton Road
Street 2:	Greenland Road (Route 33)
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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HEAVY VEHICLES

					Grafton Road				Greenland Road (Route 33)				Greenland Road (Route 33)			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	4	0	0	7	0	0	0	6	1
7:15 AM	0	0	0	0	0	2	0	0	0	1	4	0	0	0	6	4
7:30 AM	0	0	0	0	0	1	0	2	0	0	13	0	0	0	4	1
7:45 AM	0	0	0	0	0	1	0	1	0	1	12	0	0	0	10	0
8:00 AM	0	0	0	0	0	0	0	2	0	0	8	0	0	0	8	1
8:15 AM	0	0	0	0	0	2	0	0	0	0	12	0	0	0	11	3
8:30 AM	0	0	0	0	0	0	0	1	0	2	14	0	0	0	5	3
8:45 AM	0	0	0	0	0	0	0	1	0	1	9	0	0	0	9	2

					Grafton Road				Greenland Road (Route 33)				Greenland Road (Route 33)			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	1	0	0	6	0	0	0	12	0
4:15 PM	0	0	0	0	0	2	0	0	0	0	6	0	0	0	2	2
4:30 PM	0	0	0	0	0	1	0	3	0	1	5	0	0	0	5	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	3	0	0	0	4	1
5:00 PM	0	0	0	0	0	0	0	2	0	0	7	0	0	0	4	0
5:15 PM	0	0	0	0	0	2	0	0	0	0	5	0	0	0	5	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	9	1
5:45 PM	0	0	0	0	0	0	0	2	0	0	5	0	0	0	2	2

AM PEAK HOUR					Grafton Road				Greenland Road (Route 33)				Greenland Road (Route 33)			
7:45 AM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:45 AM	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**4**	**0**	**3**	**46**	**0**	**0**	**0**	**34**	**7**
PHF	**0.00**				**0.88**				**0.77**				**0.73**			

PM PEAK HOUR					Grafton Road				Greenland Road (Route 33)				Greenland Road (Route 33)			
4:00 PM	Northbound				Southbound				Eastbound				Westbound			
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
5:00 PM	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**5**	**0**	**1**	**20**	**0**	**0**	**0**	**23**	**3**
PHF	**0.00**				**0.50**				**0.88**				**0.54**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 12
Location: Portsmouth, NH
Street 1: Grafton Road
Street 2: Greenland Road (Route 33)
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
7:30 AM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) Westbound			
4:30 PM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 2
Location: Portsmouth, NH
Street 1: International Drive
Street 2: Corporate Drive/Manchester Square
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	International Drive Northbound				International Drive Southbound				Manchester Square Eastbound				Corporate Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	23	9	0	64	52	9	0	2	1	2	0	2	1	11
7:15 AM	0	2	13	6	0	83	50	11	0	1	2	3	0	4	1	7
7:30 AM	0	1	9	8	0	84	58	17	0	12	12	5	0	3	1	10
7:45 AM	0	0	17	11	0	120	89	25	0	7	7	3	0	3	2	12
8:00 AM	0	0	18	14	0	81	57	22	0	15	3	3	0	1	3	7
8:15 AM	0	4	19	5	0	64	75	21	0	9	4	8	0	2	2	16
8:30 AM	0	2	13	4	0	54	43	15	0	11	7	5	0	1	2	17
8:45 AM	0	3	12	7	0	52	44	11	0	9	3	4	0	2	4	35

	International Drive Northbound				International Drive Southbound				Manchester Square Eastbound				Corporate Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	4	106	0	0	8	13	18	0	23	3	5	0	1	5	107
4:15 PM	0	3	90	2	0	17	14	16	0	22	0	4	0	2	5	119
4:30 PM	0	1	121	0	0	12	17	16	0	35	0	0	0	2	6	88
4:45 PM	0	3	99	3	0	8	22	14	0	23	0	2	0	2	2	50
5:00 PM	0	4	133	1	0	7	13	7	0	29	0	0	0	0	1	62
5:15 PM	0	2	82	0	0	3	9	4	0	13	1	1	0	1	2	49
5:30 PM	0	0	53	3	0	9	9	0	0	5	0	0	0	3	1	41
5:45 PM	0	1	44	0	0	4	15	0	0	12	0	0	0	1	3	24

AM PEAK HOUR 7:30 AM to 8:30 AM	International Drive Northbound				International Drive Southbound				Manchester Square Eastbound				Corporate Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**5**	**63**	**38**	**0**	**349**	**279**	**85**	**0**	**43**	**26**	**19**	**0**	**9**	**8**	**45**
PHF	**0.83**				**0.76**				**0.76**				**0.78**			
HV %	**0.0%**	**0.0%**	**0.0%**	**2.6%**	**0.0%**	**1.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.8%**	**5.3%**	**0.0%**	**0.0%**	**12.5%**	**17.8%**

PM PEAK HOUR 4:00 PM to 5:00 PM	International Drive Northbound				International Drive Southbound				Manchester Square Eastbound				Corporate Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**11**	**416**	**5**	**0**	**45**	**66**	**64**	**0**	**103**	**3**	**11**	**0**	**7**	**18**	**364**
PHF	**0.89**				**0.93**				**0.84**				**0.77**			
HV %	**0.0%**	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**4.4%**	**3.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**5.6%**	**0.8%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	International Drive
Street 2:	Corporate Drive/Manchester Square
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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HEAVY VEHICLES

	International Drive Northbound				International Drive Southbound				Manchester Square Eastbound				Corporate Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	1
7:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5
7:45 AM	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	1	0	0	0	0	1	1	0	0	1	1
8:30 AM	0	0	0	0	0	3	0	0	0	0	0	1	0	0	1	1
8:45 AM	0	0	1	1	0	4	1	1	0	0	0	0	0	0	0	3

	International Drive Northbound				International Drive Southbound				Manchester Square Eastbound				Corporate Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
4:30 PM	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
5:30 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	International Drive Northbound				International Drive Southbound				Manchester Square Eastbound				Corporate Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**1**	**1**	**0**	**9**	**1**	**1**	**0**	**0**	**1**	**2**	**0**	**0**	**2**	**6**
PHF	**0.25**				**0.46**				**0.38**				**0.67**			

PM PEAK HOUR 4:00 PM to 5:00 PM	International Drive Northbound				International Drive Southbound				Manchester Square Eastbound				Corporate Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**3**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**
PHF	**0.38**				**0.50**				**0.00**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	International Drive
Street 2:	Corporate Drive/Manchester Square
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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PEDESTRIANS & BICYCLES

	International Drive Northbound				International Drive Southbound				Manchester Square Eastbound				Corporate Drive Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	International Drive Northbound				International Drive Southbound				Manchester Square Eastbound				Corporate Drive Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0		1	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	International Drive Northbound				International Drive Southbound				Manchester Square Eastbound				Corporate Drive Westbound			
7:30 AM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	International Drive Northbound				International Drive Southbound				Manchester Square Eastbound				Corporate Drive Westbound			
4:00 PM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 3
Location: Portsmouth, NH
Street 1: Corporate Drive
Street 2: Goose Bay Drive (West)
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Goose Bay Drive (West) Northbound				Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	4	0	0	0	0	0	0	0	0	43	31	0	2	10	0
7:15 AM	0	3	0	0	0	0	0	0	0	0	63	27	0	4	9	0
7:30 AM	0	4	0	0	0	0	0	0	0	0	67	37	0	2	10	0
7:45 AM	0	2	0	0	0	0	0	0	0	0	82	57	0	5	15	0
8:00 AM	0	2	0	0	0	0	0	0	0	0	63	35	0	3	9	0
8:15 AM	0	3	0	1	0	0	0	0	0	0	49	24	0	3	17	0
8:30 AM	0	1	0	1	0	0	0	0	0	0	47	18	0	2	19	0
8:45 AM	0	15	0	0	0	0	0	0	0	0	43	19	0	0	26	0

	Goose Bay Drive (West) Northbound				Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	25	0	0	0	0	0	0	0	0	10	1	0	1	89	0
4:15 PM	0	80	0	4	0	0	0	0	0	0	18	1	0	0	46	0
4:30 PM	0	16	0	2	0	0	0	0	0	0	11	1	0	0	80	0
4:45 PM	0	6	0	1	0	0	0	0	0	0	8	3	0	0	48	0
5:00 PM	0	3	0	0	0	0	0	0	0	0	7	1	0	1	58	0
5:15 PM	0	9	0	0	0	0	0	0	0	0	3	0	0	0	45	0
5:30 PM	0	2	0	0	0	0	0	0	0	0	8	5	0	0	43	0
5:45 PM	0	6	0	0	0	0	0	0	0	0	1	3	0	1	22	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Goose Bay Drive (West) Northbound				Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**275**	**156**	**0**	**14**	**43**	**0**
PHF	**0.69**				**0.00**				**0.78**				**0.71**			
HV %	**0.0%**	**36.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**4.5%**	**0.0%**	**0.0%**	**11.6%**	**0.0%**

PM PEAK HOUR 4:00 PM to 5:00 PM	Goose Bay Drive (West) Northbound				Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**127**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**47**	**6**	**0**	**1**	**263**	**0**
PHF	**0.40**				**0.00**				**0.70**				**0.73**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**4.3%**	**0.0%**	**0.0%**	**0.0%**	**1.5%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 3
Location: Portsmouth, NH
Street 1: Corporate Drive
Street 2: Goose Bay Drive (West)
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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HEAVY VEHICLES

	Goose Bay Drive (West) Northbound				Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0
7:30 AM	0	2	0	0	0	0	0	0	0	0	0	1	0	0	3	0
7:45 AM	0	1	0	0	0	0	0	0	0	0	0	4	0	0	0	0
8:00 AM	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:15 AM	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0
8:30 AM	0	1	0	1	0	0	0	0	0	0	0	2	0	0	0	0
8:45 AM	0	3	0	0	0	0	0	0	0	0	2	3	0	0	0	0

	Goose Bay Drive (West) Northbound				Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Goose Bay Drive (West) Northbound				Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**7**	**0**	**0**	**5**	**0**
PHF	**0.50**				**0.00**				**0.50**				**0.42**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Goose Bay Drive (West) Northbound				Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**4**	**0**
PHF	**0.00**				**0.00**				**0.25**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Corporate Drive
Street 2:	Goose Bay Drive (West)
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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PEDESTRIANS & BICYCLES

	Goose Bay Drive (West) Northbound				Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Goose Bay Drive (West) Northbound				Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Goose Bay Drive (West) Northbound				Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
7:15 AM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

PM PEAK HOUR[1]	Goose Bay Drive (West) Northbound				Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
4:00 PM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Corporate Drive
Street 2:	Redhook Way
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Northbound				Redhook Way Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	2	0	1	42	0	1	0	8	2
7:15 AM	0	0	0	0	0	0	0	0	0	4	59	0	0	0	12	0
7:30 AM	0	0	0	0	0	0	0	2	0	3	66	0	0	0	11	1
7:45 AM	0	0	0	0	0	0	0	2	0	2	79	0	1	0	18	0
8:00 AM	0	0	0	0	0	0	0	0	0	2	61	0	0	0	11	0
8:15 AM	0	0	0	0	0	1	0	1	0	3	48	0	0	0	19	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	49	0	0	0	22	0
8:45 AM	0	0	0	0	0	1	0	1	0	5	38	0	0	0	25	0

	Northbound				Redhook Way Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	7	0	2	7	0	0	0	84	0
4:15 PM	0	0	0	0	0	0	0	0	0	1	21	0	0	0	46	1
4:30 PM	0	0	0	0	0	1	0	1	0	2	12	0	0	0	79	1
4:45 PM	0	0	0	0	0	0	0	1	1	0	9	0	0	0	47	0
5:00 PM	0	0	0	0	0	0	0	2	1	0	7	0	0	0	57	0
5:15 PM	0	0	0	0	0	0	0	6	0	1	3	0	0	0	39	0
5:30 PM	0	0	0	0	0	0	0	1	0	0	8	0	0	0	43	0
5:45 PM	0	0	0	0	0	0	0	3	0	0	1	0	0	0	20	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Northbound				Redhook Way Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**11**	**265**	**0**	**1**	**0**	**52**	**1**
PHF	**0.00**				**0.50**				**0.85**				**0.71**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**25.0%**	**0.0%**	**0.0%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**7.7%**	**0.0%**

PM PEAK HOUR 4:00 PM to 5:00 PM	Northbound				Redhook Way Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**1**	**0**	**9**	**1**	**5**	**49**	**0**	**0**	**0**	**256**	**2**
PHF	**0.00**				**0.36**				**0.63**				**0.77**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**11.1%**	**0.0%**	**40.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 4
Location: Portsmouth, NH
Street 1: Corporate Drive
Street 2: Redhook Way
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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HEAVY VEHICLES

	Northbound				Redhook Way Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

	Northbound				Redhook Way Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
4:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR	Northbound				Redhook Way Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
8:00 AM to 9:00 AM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**5**	**0**	**0**	**0**	**2**	**0**
PHF	**0.00**				**0.00**				**0.75**				**0.50**			

PM PEAK HOUR	Northbound				Redhook Way Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
4:00 PM to 5:00 PM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**3**	**0**
PHF	**0.00**				**0.25**				**0.25**				**0.38**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Corporate Drive
Street 2:	Redhook Way
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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PEDESTRIANS & BICYCLES

	Northbound				Redhook Way Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Northbound				Redhook Way Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0

AM PEAK HOUR[1] 7:15 AM to 8:15 AM	Northbound				Redhook Way Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:00 PM to 5:00 PM	Northbound				Redhook Way Southbound				Corporate Drive Eastbound				Corporate Drive Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Matthew Stoutz, PE, PTOE, RSP1

Project #:	1202_5_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Corporate Drive
Street 2:	Goose Bay Drive (East)
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Clouds & Sun, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Corporate Drive Northbound				Corporate Drive Southbound				Goose Bay Drive (East) Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	12	0	0	0	17	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	13	0	0	0	30	2	0	3	0	2	0	0	0	0
7:30 AM	0	1	18	0	0	0	37	1	0	1	0	1	0	0	0	0
7:45 AM	0	3	18	0	0	0	37	1	0	0	0	0	0	0	0	0
8:00 AM	0	0	16	0	0	0	37	0	0	1	0	0	0	0	0	0
8:15 AM	0	3	16	0	0	0	26	4	0	0	0	1	0	0	0	0
8:30 AM	0	0	22	0	0	0	22	0	0	1	0	0	0	0	0	0
8:45 AM	0	0	16	0	0	0	20	0	0	0	0	2	0	0	0	0

	Corporate Drive Northbound				Corporate Drive Southbound				Goose Bay Drive (East) Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	1	44	0	0	0	11	0	0	3	0	2	0	0	0	0
4:15 PM	0	0	29	0	0	0	11	0	0	2	0	4	0	0	0	0
4:30 PM	0	1	41	0	0	0	17	1	0	3	0	2	0	0	0	0
4:45 PM	0	1	28	0	0	0	16	0	0	1	0	0	0	0	0	0
5:00 PM	0	0	30	0	0	0	9	0	0	2	0	2	0	0	0	0
5:15 PM	0	0	21	0	0	0	7	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	24	0	0	0	10	0	0	2	0	0	0	0	0	0
5:45 PM	0	0	13	0	0	0	2	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Corporate Drive ~~Northbound~~ WB				Corporate Drive ~~Southbound~~ EB				Goose Bay Drive (East) ~~Eastbound~~ NB				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**4**	**65**	**0**	**0**	**0**	**141**	**4**	**0**	**5**	**0**	**3**	**0**	**0**	**0**	**0**
PHF	**0.82**				**0.95**				**0.40**				**0.00**			
HV %	**0.0%**	**0.0%**	**4.6%**	**0.0%**	**0.0%**	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**20.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:00 PM to 5:00 PM	Corporate Drive ~~Northbound~~ WB				Corporate Drive ~~Southbound~~ EB				Goose Bay Drive (East) ~~Eastbound~~ NB				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**3**	**142**	**0**	**0**	**0**	**55**	**1**	**0**	**9**	**0**	**8**	**0**	**0**	**0**	**0**
PHF	**0.81**				**0.78**				**0.71**				**0.00**			
HV %	**0.0%**	**0.0%**	**1.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**11.1%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 5
Location: Portsmouth, NH
Street 1: Corporate Drive
Street 2: Goose Bay Drive (East)
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Clouds & Sun, 40°F

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HEAVY VEHICLES

	Corporate Drive Northbound				Corporate Drive Southbound				Goose Bay Drive (East) Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0

	Corporate Drive Northbound				Corporate Drive Southbound				Goose Bay Drive (East) Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
4:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:00 AM to 8:00 AM	Corporate Drive Northbound				Corporate Drive Southbound				Goose Bay Drive (East) Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**4**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.50**				**0.25**				**0.25**				**0.00**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Corporate Drive Northbound				Corporate Drive Southbound				Goose Bay Drive (East) Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.50**				**0.00**				**0.25**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Corporate Drive
Street 2:	Goose Bay Drive (East)
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Clouds & Sun, 40°F

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PEDESTRIANS & BICYCLES

	Corporate Drive Northbound				Corporate Drive Southbound				Goose Bay Drive (East) Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Corporate Drive Northbound				Corporate Drive Southbound				Goose Bay Drive (East) Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Corporate Drive Northbound				Corporate Drive Southbound				Goose Bay Drive (East) Eastbound				Westbound			
7:15 AM to 8:15 AM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	Corporate Drive Northbound				Corporate Drive Southbound				Goose Bay Drive (East) Eastbound				Westbound			
4:00 PM to 5:00 PM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Goose Bay Drive
Street 2:	Corporate Center Driveway
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Corporate Center Driveway Northbound				Southbound				Goose Bay Drive Eastbound				Goose Bay Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	5	3	0	2	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	2	2	0	1	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	0
8:00 AM	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	6	1	0
8:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

	Corporate Center Driveway Northbound				Southbound				Goose Bay Drive Eastbound				Goose Bay Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	1	0	2	0	0	0	0	0	0	3	0	0	0	1	0
4:15 PM	0	0	0	2	0	0	0	0	0	0	4	0	0	0	0	0
4:30 PM	0	0	0	3	0	0	0	0	0	0	2	0	0	0	2	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0
5:00 PM	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Corporate Center Driveway ~~Northbound~~ WB				Southbound				Goose Bay Drive ~~Eastbound~~ NB				Goose Bay Drive ~~Westbound~~ SB			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**8**	**8**	**0**	**4**	**4**	**0**
PHF	**0.00**				**0.00**				**0.53**				**0.50**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**12.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:00 PM to 5:00 PM	Corporate Center Driveway ~~Northbound~~ WB				Southbound				Goose Bay Drive ~~Eastbound~~ NB				Goose Bay Drive ~~Westbound~~ SB			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**1**	**0**	**0**	**4**	**0**
PHF	**0.67**				**0.00**				**0.69**				**0.50**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**10.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 6
Location: Portsmouth, NH
Street 1: Goose Bay Drive
Street 2: Corporate Center Driveway
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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HEAVY VEHICLES

	Corporate Center Driveway Northbound				Southbound				Goose Bay Drive Eastbound				Goose Bay Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Corporate Center Driveway Northbound				Southbound				Goose Bay Drive Eastbound				Goose Bay Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR	Corporate Center Driveway Northbound				Southbound				Goose Bay Drive Eastbound				Goose Bay Drive Westbound			
7:00 AM to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
PHF	**0.00**				**0.00**				**0.25**				**0.00**			

PM PEAK HOUR	Corporate Center Driveway Northbound				Southbound				Goose Bay Drive Eastbound				Goose Bay Drive Westbound			
4:00 PM to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
PHF	**0.00**				**0.00**				**0.25**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Goose Bay Drive
Street 2:	Corporate Center Driveway
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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PEDESTRIANS & BICYCLES

	Corporate Center Driveway Northbound				Southbound				Goose Bay Drive Eastbound				Goose Bay Drive Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

	Corporate Center Driveway Northbound				Southbound				Goose Bay Drive Eastbound				Goose Bay Drive Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Corporate Center Driveway Northbound				Southbound				Goose Bay Drive Eastbound				Goose Bay Drive Westbound			
7:15 AM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40

PM PEAK HOUR[1]	Corporate Center Driveway Northbound				Southbound				Goose Bay Drive Eastbound				Goose Bay Drive Westbound			
4:00 PM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 7
Location: Portsmouth, NH
Street 1: Goose Bay Drive
Street 2: Lonza Biologics Driveway (South)
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Clouds & Sun, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Biologics Driveway (South) Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	8	0	0	1	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	4	2	0	0	0	0	0	0	0	0
7:45 AM	0	0	3	0	0	0	2	0	0	2	0	0	0	0	0	0
8:00 AM	0	0	1	0	0	0	3	3	0	1	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	0	0	1	0	2	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0

	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Biologics Driveway (South) Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	2	0	0	0	2	0	0	2	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Goose Bay Drive ~~Northbound~~ WB				Goose Bay Drive ~~Southbound~~ EB				Lonza Biologics Driveway (South) ~~Eastbound~~ NB				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**5**	**0**	**0**	**0**	**17**	**5**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.42**				**0.69**				**0.50**				**0.00**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**5.9%**	**80.0%**	**0.0%**	**75.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:00 PM to 5:00 PM	Goose Bay Drive ~~Northbound~~ WB				Goose Bay Drive ~~Southbound~~ EB				Lonza Biologics Driveway (South) ~~Eastbound~~ NB				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**5**	**0**	**0**	**0**	**10**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.63**				**0.63**				**0.25**				**0.00**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**10.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 7
Location: Portsmouth, NH
Street 1: Goose Bay Drive
Street 2: Lonza Biologics Driveway (South)
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Clouds & Sun, 40°F

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HEAVY VEHICLES

	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Biologics Driveway (South) Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Biologics Driveway (South) Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Biologics Driveway (South) Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.00**				**0.42**				**0.75**				**0.00**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Biologics Driveway (South) Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.00**				**0.25**				**0.00**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Goose Bay Drive
Street 2:	Lonza Biologics Driveway (South)
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Clouds & Sun, 40°F

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PEDESTRIANS & BICYCLES

	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Biologics Driveway (South) Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	3	0	0	0	4	0	0	0	0

	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Biologics Driveway (South) Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	2	0	0	0	3	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Biologics Driveway (South) Eastbound				Westbound			
7:15 AM to 8:15 AM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	7	0	0	0	5	0	0	0	0

PM PEAK HOUR[1]	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Biologics Driveway (South) Eastbound				Westbound			
4:00 PM to 5:00 PM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 8
Location: Portsmouth, NH
Street 1: Goose Bay Drive
Street 2: Lonza Parking Garage Entrance Dr
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Clouds & Sun, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Parking Garage Entrance Driveway Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	5	0	0	0	8	23	0	0	0	0	0	0	0	0
7:15 AM	0	1	3	0	0	0	7	23	0	0	0	0	0	0	0	0
7:30 AM	0	0	2	0	0	0	7	32	0	0	0	0	0	0	0	0
7:45 AM	0	1	3	0	0	0	11	50	0	0	0	0	0	0	0	0
8:00 AM	0	1	3	0	0	0	8	31	0	0	0	0	0	0	0	0
8:15 AM	0	0	4	0	0	0	3	24	0	0	0	0	0	0	0	0
8:30 AM	0	0	2	0	0	0	5	15	0	0	0	0	0	0	0	0
8:45 AM	0	1	14	0	0	0	5	14	0	0	0	0	0	0	0	0

	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Parking Garage Entrance Driveway Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	24	0	0	0	1	1	0	0	0	0	0	0	0	0
4:15 PM	0	0	84	0	0	0	2	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	17	0	0	0	0	1	0	0	0	0	0	0	0	0
4:45 PM	0	0	7	0	0	0	1	2	0	0	0	0	0	0	0	0
5:00 PM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	2	0	0	0	2	3	0	0	0	0	0	0	0	0
5:45 PM	0	0	6	0	0	0	0	4	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Parking Garage Entrance Driveway Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**3**	**11**	**0**	**0**	**0**	**33**	**136**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.88**				**0.69**				**0.00**				**0.00**			
HV %	**0.0%**	**0.0%**	**18.2%**	**0.0%**	**0.0%**	**0.0%**	**15.2%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:00 PM to 5:00 PM	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Parking Garage Entrance Driveway Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**132**	**0**	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.39**				**0.67**				**0.00**				**0.00**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 8
Location:	Portsmouth, NH
Street 1:	Goose Bay Drive
Street 2:	Lonza Parking Garage Entrance Dr
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Clouds & Sun, 40°F

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HEAVY VEHICLES

	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Parking Garage Entrance Driveway Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	1	0	0	0	2	1	0	0	0	0	0	0	0	0
8:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0

	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Parking Garage Entrance Driveway Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Parking Garage Entrance Driveway Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**6**	**0**	**0**	**0**	**6**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.75**				**0.58**				**0.00**				**0.00**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Parking Garage Entrance Driveway Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.00**				**0.00**				**0.00**				**0.00**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 8
Location: Portsmouth, NH
Street 1: Goose Bay Drive
Street 2: Lonza Parking Garage Entrance Dr
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Clouds & Sun, 40°F

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PEDESTRIANS & BICYCLES

	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Parking Garage Entrance Driveway Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Parking Garage Entrance Driveway Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Parking Garage Entrance Driveway Eastbound				Westbound			
7:15 AM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	Goose Bay Drive Northbound				Goose Bay Drive Southbound				Lonza Parking Garage Entrance Driveway Eastbound				Westbound			
4:00 PM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 9
Location:	Portsmouth, NH
Street 1:	International Drive
Street 2:	Granite State College Drive (South)
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	International Drive Northbound				International Drive Southbound				Eastbound				Granite State College Driveway (South) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	24	1	0	1	53	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	19	4	0	0	49	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	19	1	0	2	56	0	0	0	0	0	0	2	0	0
7:45 AM	0	0	25	1	0	1	82	0	0	0	0	0	0	1	0	0
8:00 AM	0	0	29	4	0	1	55	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	26	2	0	4	80	0	0	0	0	0	0	1	0	0
8:30 AM	0	0	19	3	0	1	47	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	18	1	1	1	47	0	0	0	0	0	0	0	0	0

	International Drive Northbound				International Drive Southbound				Eastbound				Granite State College Driveway (South) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	102	1	0	1	18	0	0	0	0	0	0	3	0	1
4:15 PM	0	0	87	0	0	0	19	0	0	0	0	0	0	1	0	1
4:30 PM	0	0	111	1	0	0	22	0	0	0	0	0	0	2	0	0
4:45 PM	0	0	94	0	0	2	24	0	0	0	0	0	0	1	0	1
5:00 PM	0	0	138	0	0	1	11	0	0	0	0	0	0	1	0	0
5:15 PM	0	0	77	0	0	0	11	0	0	0	0	0	0	2	0	0
5:30 PM	0	0	54	0	0	0	11	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	43	1	0	0	16	0	0	0	0	0	0	1	0	1

AM PEAK HOUR 7:30 AM to 8:30 AM	International Drive Northbound				International Drive Southbound				Eastbound				Granite State College Driveway (South) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**99**	**8**	**0**	**8**	**273**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**1**
PHF	**0.81**				**0.84**				**0.00**				**0.63**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	International Drive Northbound				International Drive Southbound				Eastbound				Granite State College Driveway (South) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**430**	**1**	**0**	**3**	**76**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**2**
PHF	**0.78**				**0.76**				**0.00**				**0.88**			
HV %	**0.0%**	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**3.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 9
Location:	Portsmouth, NH
Street 1:	International Drive
Street 2:	Granite State College Drive (South)
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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HEAVY VEHICLES

	International Drive Northbound				International Drive Southbound				Eastbound				Granite State College Driveway (South) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0

	International Drive Northbound				International Drive Southbound				Eastbound				Granite State College Driveway (South) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	International Drive Northbound				International Drive Southbound				Eastbound				Granite State College Driveway (South) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.25**				**0.25**				**0.00**				**0.00**			

PM PEAK HOUR 4:00 PM to 5:00 PM	International Drive Northbound				International Drive Southbound				Eastbound				Granite State College Driveway (South) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**3**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.38**				**0.75**				**0.00**				**0.00**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 9
Location: Portsmouth, NH
Street 1: International Drive
Street 2: Granite State College Drive (South)
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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PEDESTRIANS & BICYCLES

	International Drive Northbound				International Drive Southbound				Eastbound				Granite State College Driveway (South) Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	International Drive Northbound				International Drive Southbound				Eastbound				Granite State College Driveway (South) Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	International Drive Northbound				International Drive Southbound				Eastbound				Granite State College Driveway (South) Westbound			
7:30 AM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	International Drive Northbound				International Drive Southbound				Eastbound				Granite State College Driveway (South) Westbound			
4:15 PM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 10
Location:	Portsmouth, NH
Street 1:	International Drive
Street 2:	Lonza Biologics Driveway (North)
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (North) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	10	4	0	4	49	0	0	0	0	0	0	6	0	15
7:15 AM	0	0	18	2	0	3	46	0	0	0	0	0	0	4	0	5
7:30 AM	0	0	17	3	0	3	55	0	0	0	0	0	0	4	0	2
7:45 AM	0	0	23	3	0	5	78	0	0	0	0	0	0	2	0	4
8:00 AM	0	0	29	1	0	2	53	0	0	0	0	0	0	1	0	4
8:15 AM	0	0	26	1	0	3	78	0	0	0	0	0	0	2	0	2
8:30 AM	0	0	19	2	0	1	46	0	0	0	0	0	0	2	0	3
8:45 AM	0	0	18	4	0	1	46	0	0	0	0	0	0	2	0	1

	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (North) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	76	3	0	2	19	0	0	0	0	0	0	8	0	27
4:15 PM	0	0	61	1	0	1	19	0	0	0	0	0	0	8	0	26
4:30 PM	0	0	78	6	0	4	20	0	0	0	0	0	0	18	0	33
4:45 PM	0	0	62	1	0	4	21	0	0	0	0	0	0	5	0	33
5:00 PM	0	0	120	3	0	1	11	0	0	0	0	0	0	5	0	18
5:15 PM	0	0	61	1	0	0	13	0	0	0	0	0	0	0	0	16
5:30 PM	0	0	42	2	1	1	9	0	0	0	0	0	0	5	0	11
5:45 PM	0	0	34	0	0	3	14	0	0	0	0	0	0	2	0	10

AM PEAK HOUR 7:30 AM to 8:30 AM	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (North) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**95**	**8**	**0**	**13**	**264**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**12**
PHF	**0.86**				**0.83**				**0.00**				**0.88**			
HV %	**0.0%**	**0.0%**	**1.1%**	**62.5%**	**0.0%**	**0.0%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**44.4%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (North) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**321**	**11**	**0**	**10**	**71**	**0**	**0**	**0**	**0**	**0**	**0**	**36**	**0**	**110**
PHF	**0.67**				**0.81**				**0.00**				**0.72**			
HV %	**0.0%**	**0.0%**	**0.9%**	**45.5%**	**0.0%**	**0.0%**	**2.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**13.9%**	**0.0%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 10
Location: Portsmouth, NH
Street 1: International Drive
Street 2: Lonza Biologics Driveway (North)
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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HEAVY VEHICLES

	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (North) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	3	0	0
7:15 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0
7:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0
7:45 AM	0	0	1	2	0	0	0	0	0	0	0	0	0	1	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0
8:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0
8:45 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0

	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (North) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0
4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0
4:30 PM	0	0	1	4	0	0	0	0	0	0	0	0	0	3	0	0
4:45 PM	0	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	1
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:00 AM to 8:00 AM	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (North) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**1**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**
PHF	**0.83**				**0.00**				**0.00**				**0.67**			

PM PEAK HOUR 4:00 PM to 5:00 PM	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (North) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**3**	**7**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**
PHF	**0.50**				**0.50**				**0.00**				**0.58**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 10
Location:	Portsmouth, NH
Street 1:	International Drive
Street 2:	Lonza Biologics Driveway (North)
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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PEDESTRIANS & BICYCLES

	International Drive				International Drive								Lonza Biologics Driveway (North)			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0

	International Drive				International Drive								Lonza Biologics Driveway (North)			
	Northbound				Southbound				Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	International Drive				International Drive								Lonza Biologics Driveway (North)			
7:30 AM	Northbound				Southbound				Eastbound				Westbound			
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:30 AM	0	0	0	0	0	0	0	46	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	International Drive				International Drive								Lonza Biologics Driveway (North)			
4:15 PM	Northbound				Southbound				Eastbound				Westbound			
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:15 PM	0	0	0	0	0	0	0	38	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 11
Location: Portsmouth, NH
Street 1: International Drive
Street 2: Lonza Biologics Driveway (South)
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	17	0	0	1	38	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	23	0	0	1	42	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	22	0	0	2	48	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	32	1	0	1	65	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	32	0	0	0	41	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	30	0	0	2	56	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	24	0	0	0	38	0	0	0	0	0	0	1	0	0
8:45 AM	0	0	22	0	0	1	25	0	0	0	0	0	0	0	0	0

	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	65	0	0	1	26	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	45	0	0	0	26	0	0	0	0	0	0	0	0	3
4:30 PM	0	0	72	0	0	0	41	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	49	0	0	0	33	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	97	0	0	0	21	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	45	0	0	0	19	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	32	0	0	0	17	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	20	0	0	0	17	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:30 AM to 8:30 AM	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**116**	**1**	**0**	**5**	**210**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
PHF	**0.89**				**0.81**				**0.00**				**0.75**			
HV %	**0.0%**	**0.0%**	**5.2%**	**100.0%**	**0.0%**	**0.0%**	**1.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**263**	**0**	**0**	**0**	**121**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
PHF	**0.68**				**0.74**				**0.00**				**0.25**			
HV %	**0.0%**	**0.0%**	**3.0%**	**0.0%**	**0.0%**	**0.0%**	**6.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 11
Location: Portsmouth, NH
Street 1: International Drive
Street 2: Lonza Biologics Driveway (South)
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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HEAVY VEHICLES

	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0

	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:00 AM to 8:00 AM	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**10**	**1**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.69**				**0.67**				**0.00**				**0.00**			

PM PEAK HOUR 4:00 PM to 5:00 PM	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**10**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.63**				**0.75**				**0.00**				**0.00**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 11
Location: Portsmouth, NH
Street 1: International Drive
Street 2: Lonza Biologics Driveway (South)
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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PEDESTRIANS & BICYCLES

	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) Westbound			
7:30 AM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) Westbound			
4:15 PM to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 12
Location:	Portsmouth, NH
Street 1:	New Hampshire Ave/Corporate Dr
Street 2:	International Drive/Durham Street
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Corporate Drive Northbound				New Hampshire Avenue Southbound				Durham Street Eastbound				International Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	33	29	0	3	17	6	0	0	1	0	0	8	0	2
7:15 AM	0	0	43	40	0	5	24	4	0	2	1	0	0	8	2	1
7:30 AM	0	0	55	46	0	7	30	6	0	0	1	0	0	14	0	0
7:45 AM	0	0	55	71	0	7	43	9	0	2	2	0	0	10	1	2
8:00 AM	0	0	67	70	0	2	44	4	0	2	0	0	0	10	0	0
8:15 AM	0	0	63	45	0	2	41	3	0	1	2	0	0	21	1	1
8:30 AM	0	0	64	57	0	5	43	2	0	0	2	1	0	12	1	1
8:45 AM	0	1	50	35	0	4	47	2	0	0	1	0	0	14	0	0

	Corporate Drive Northbound				New Hampshire Avenue Southbound				Durham Street Eastbound				International Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	63	22	0	1	66	4	0	10	2	0	0	53	4	8
4:15 PM	0	0	49	13	0	1	59	2	0	2	4	2	0	39	5	1
4:30 PM	0	1	38	19	0	1	93	4	0	10	7	0	0	57	2	4
4:45 PM	0	0	55	27	0	0	84	1	0	4	1	0	0	52	2	6
5:00 PM	0	0	57	17	0	0	96	2	0	4	3	0	0	61	5	4
5:15 PM	0	0	27	18	0	0	69	3	0	1	0	1	0	48	2	5
5:30 PM	0	0	32	7	0	1	48	0	0	0	0	1	0	31	0	3
5:45 PM	0	0	28	8	0	0	40	1	0	0	2	0	0	18	1	2

AM PEAK HOUR 7:45 AM to 8:45 AM	Corporate Drive Northbound				New Hampshire Avenue Southbound				Durham Street Eastbound				International Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**249**	**243**	**0**	**16**	**171**	**18**	**0**	**5**	**6**	**1**	**0**	**53**	**3**	**4**
PHF	**0.90**				**0.87**				**0.75**				**0.65**			
HV %	**0.0%**	**0.0%**	**1.6%**	**2.5%**	**0.0%**	**0.0%**	**2.9%**	**0.0%**	**0.0%**	**20.0%**	**0.0%**	**0.0%**	**0.0%**	**3.8%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	Corporate Drive Northbound				New Hampshire Avenue Southbound				Durham Street Eastbound				International Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**199**	**76**	**0**	**2**	**332**	**9**	**0**	**20**	**15**	**2**	**0**	**209**	**14**	**15**
PHF	**0.84**				**0.88**				**0.54**				**0.85**			
HV %	**0.0%**	**0.0%**	**1.5%**	**1.3%**	**0.0%**	**0.0%**	**0.6%**	**11.1%**	**0.0%**	**0.0%**	**13.3%**	**0.0%**	**0.0%**	**0.0%**	**14.3%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 12
Location: Portsmouth, NH
Street 1: New Hampshire Ave/Corporate Dr
Street 2: International Drive/Durham Street
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Cloudy, 35°F

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HEAVY VEHICLES

	Corporate Drive Northbound				New Hampshire Avenue Southbound				Durham Street Eastbound				International Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	2	0	0	1	0	0	1	0	0	0	1	0	0
7:30 AM	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	3	0	0	0	1	0	0	1	0	0	0	1	0	0
8:15 AM	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0
8:30 AM	0	0	1	3	0	0	3	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0

	Corporate Drive Northbound				New Hampshire Avenue Southbound				Durham Street Eastbound				International Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	2	0
4:15 PM	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
4:30 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
4:45 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0
5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Corporate Drive Northbound				New Hampshire Avenue Southbound				Durham Street Eastbound				International Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**5**	**4**	**0**	**0**	**7**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**
PHF	**0.56**				**0.58**				**0.25**				**0.50**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Corporate Drive Northbound				New Hampshire Avenue Southbound				Durham Street Eastbound				International Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**3**	**2**	**0**	**0**	**2**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**4**	**0**
PHF	**0.63**				**0.50**				**0.75**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1202_5_TB
BTD #:	Location 12
Location:	Portsmouth, NH
Street 1:	New Hampshire Ave/Corporate Dr
Street 2:	International Drive/Durham Street
Count Date:	3/7/2023
Day of Week:	Tuesday
Weather:	Cloudy, 35°F

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PEDESTRIANS & BICYCLES

	Corporate Drive Northbound				New Hampshire Avenue Southbound				Durham Street Eastbound				International Drive Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

	Corporate Drive Northbound				New Hampshire Avenue Southbound				Durham Street Eastbound				International Drive Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	Corporate Drive Northbound				New Hampshire Avenue Southbound				Durham Street Eastbound				International Drive Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:15 PM to 5:15 PM	Corporate Drive Northbound				New Hampshire Avenue Southbound				Durham Street Eastbound				International Drive Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 13
Location: Portsmouth, NH
Street 1: Corporate Drive
Street 2: Grafton Road
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Clouds & Sun, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	2	0	0	0	2	21	0	64	0	27	0	0	0	0
7:15 AM	0	5	0	0	0	0	8	19	0	83	0	28	0	0	0	0
7:30 AM	0	6	1	0	0	0	1	40	0	107	0	40	0	0	0	0
7:45 AM	0	4	1	0	0	0	10	29	0	132	0	57	0	0	0	0
8:00 AM	0	12	2	0	0	0	9	36	0	141	0	54	0	0	0	0
8:15 AM	0	7	2	0	0	0	8	39	0	111	0	51	0	0	0	0
8:30 AM	0	7	4	0	0	0	7	31	0	120	0	59	0	0	0	0
8:45 AM	0	14	5	0	0	0	12	29	0	92	0	61	0	0	0	0

	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	34	7	0	0	0	4	111	0	75	0	12	0	0	0	0
4:15 PM	0	34	3	0	0	0	3	102	0	58	0	15	0	0	0	0
4:30 PM	0	44	3	0	0	0	3	147	0	52	0	7	0	0	0	0
4:45 PM	0	29	10	0	0	0	9	125	0	67	0	16	0	0	0	0
5:00 PM	0	42	18	0	0	0	3	164	0	53	0	16	0	0	0	0
5:15 PM	0	21	3	0	0	0	2	114	0	41	0	10	0	0	0	0
5:30 PM	0	20	1	0	0	0	5	71	0	37	0	10	0	0	0	0
5:45 PM	0	10	4	0	0	0	2	50	0	32	0	7	0	0	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**30**	**9**	**0**	**0**	**0**	**34**	**135**	**0**	**504**	**0**	**221**	**0**	**0**	**0**	**0**
PHF	**0.70**				**0.90**				**0.93**				**0.00**			
HV %	**0.0%**	**3.3%**	**11.1%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**4.4%**	**0.0%**	**1.4%**	**0.0%**	**1.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**149**	**34**	**0**	**0**	**0**	**18**	**538**	**0**	**230**	**0**	**54**	**0**	**0**	**0**	**0**
PHF	**0.76**				**0.83**				**0.86**				**0.00**			
HV %	**0.0%**	**0.7%**	**2.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.9%**	**0.0%**	**2.2%**	**0.0%**	**1.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 13
Location: Portsmouth, NH
Street 1: Corporate Drive
Street 2: Grafton Road
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Clouds & Sun, 40°F

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HEAVY VEHICLES

	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0
8:00 AM	0	1	0	0	0	0	0	2	0	1	0	1	0	0	0	0
8:15 AM	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	1	0	3	0	1	0	0	0	0
8:45 AM	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0

	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	3	0	2	0	0	0	0	0	0
5:00 PM	0	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				Westbound			
7:45 AM to 8:45 AM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**1**	**0**	**0**	**0**	**0**	**6**	**0**	**7**	**0**	**3**	**0**	**0**	**0**	**0**
PHF	**0.50**				**0.50**				**0.63**				**0.00**			

PM PEAK HOUR	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				Westbound			
4:00 PM to 5:00 PM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**2**	**1**	**0**	**0**	**0**	**0**	**5**	**0**	**4**	**0**	**1**	**0**	**0**	**0**	**0**
PHF	**0.25**				**0.42**				**0.63**				**0.00**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 1202_5_TB
BTD #: Location 13
Location: Portsmouth, NH
Street 1: Corporate Drive
Street 2: Grafton Road
Count Date: 3/7/2023
Day of Week: Tuesday
Weather: Clouds & Sun, 40°F

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PEDESTRIANS & BICYCLES

	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				Westbound			
7:45 AM to 8:45 AM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				Westbound			
4:15 PM to 5:15 PM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 11
Location:	Portsmouth, NH
Street 1:	Grafton Road
Street 2:	I-95 Southbound Off-Ramp
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	78	0	0	0	33	0	0	0	0	0	0	0	0	7
7:15 AM	0	0	92	0	0	0	31	0	0	0	0	0	0	0	0	26
7:30 AM	0	0	138	0	0	0	31	0	0	0	0	0	0	0	0	26
7:45 AM	0	0	227	0	0	0	37	0	0	0	0	0	0	0	0	36
8:00 AM	0	0	133	0	0	0	56	0	0	0	0	0	0	0	0	23
8:15 AM	0	0	136	0	0	0	47	0	0	0	0	0	0	0	0	23
8:30 AM	0	0	137	0	0	0	39	0	0	0	0	0	0	0	0	28
8:45 AM	0	0	137	0	0	0	44	0	0	0	0	0	0	0	0	24

	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	75	0	0	0	185	0	0	0	0	0	0	0	0	11
4:15 PM	0	0	74	0	0	0	138	0	0	0	0	0	0	0	0	2
4:30 PM	0	0	78	0	0	0	183	0	0	0	0	0	0	0	0	11
4:45 PM	0	0	68	0	0	0	154	0	0	0	0	0	0	0	0	8
5:00 PM	0	0	52	0	0	0	198	0	0	0	0	0	0	0	0	6
5:15 PM	0	0	49	0	0	0	155	0	0	0	0	0	0	0	0	6
5:30 PM	0	0	54	0	0	0	142	0	0	0	0	0	0	0	0	12
5:45 PM	0	0	56	0	0	0	88	0	0	0	0	0	0	0	0	8

AM PEAK HOUR 7:45 AM to 8:45 AM	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**633**	**0**	**0**	**0**	**179**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**110**
PHF	**0.70**				**0.80**				**0.00**				**0.76**			
HV %	**0.0%**	**0.0%**	**1.6%**	**0.0%**	**0.0%**	**0.0%**	**3.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.7%**

PM PEAK HOUR 4:00 PM to 5:00 PM	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**295**	**0**	**0**	**0**	**660**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**32**
PHF	**0.95**				**0.89**				**0.00**				**0.73**			
HV %	**0.0%**	**0.0%**	**1.4%**	**0.0%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**12.5%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	856_010_TB
BTD #:	Location 11
Location:	Portsmouth, NH
Street 1:	Grafton Road
Street 2:	I-95 Southbound Off-Ramp
Count Date:	2/17/2022
Day of Week:	Thursday
Weather:	Cloudy, 55°F

BOSTON TRAFFIC DATA

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HEAVY VEHICLES

	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	2
7:15 AM	0	0	5	0	0	0	2	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	3
8:15 AM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	1

	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0

AM PEAK HOUR	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
7:00 AM to 8:00 AM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**8**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
PHF	**0.40**				**0.69**				**0.00**				**0.38**			

PM PEAK HOUR	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
4:00 PM to 5:00 PM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**4**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**
PHF	**0.50**				**0.50**				**0.00**				**0.50**			

Client: Matthew Stoutz, PE, PTOE, RSP1
Project #: 856_010_TB
BTD #: Location 11
Location: Portsmouth, NH
Street 1: Grafton Road
Street 2: I-95 Southbound Off-Ramp
Count Date: 2/17/2022
Day of Week: Thursday
Weather: Cloudy, 55°F

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PEDESTRIANS & BICYCLES

	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:00 PM to 5:00 PM	Grafton Road Northbound				Grafton Road Southbound				Eastbound				I-95 Southbound Off-Ramp Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Volume Report

Job 1202_5_TB_ATR 1A
Area Portsmouth, NH
Location Pease Blvd (Newington St) EB, 200’ west of Rte 4 SB Ramps

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
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Tuesday, March 7, 2023

Time	Total		EB				Time	Total		EB			
0000	57		57		0		1200	221		221		0	
0015	27		27		0		1215	171		171		0	
0030	48		48		0		1230	146		146		0	
0045	10	142	10	142	0	0	1245	126	664	126	664	0	0
0100	13		13		0		1300	132		132		0	
0115	9		9		0		1315	111		111		0	
0130	5		5		0		1330	130		130		0	
0145	9	36	9	36	0	0	1345	153	526	153	526	0	0
0200	4		4		0		1400	150		150		0	
0215	2		2		0		1415	142		142		0	
0230	7		7		0		1430	243		243		0	
0245	4	17	4	17	0	0	1445	193	728	193	728	0	0
0300	1		1		0		1500	223		223		0	
0315	4		4		0		1515	165		165		0	
0330	7		7		0		1530	281		281		0	
0345	5	17	5	17	0	0	1545	202	871	202	871	0	0
0400	6		6		0		1600	325		325		0	
0415	7		7		0		1615	307		307		0	
0430	6		6		0		1630	325		325		0	
0445	9	28	9	28	0	0	1645	250	1207	250	1207	0	0
0500	8		8		0		1700	339		339		0	
0515	10		10		0		1715	238		238		0	
0530	13		13		0		1730	165		165		0	
0545	18	49	18	49	0	0	1745	146	888	146	888	0	0
0600	24		24		0		1800	137		137		0	
0615	16		16		0		1815	92		92		0	
0630	26		26		0		1830	78		78		0	
0645	37	103	37	103	0	0	1845	58	365	58	365	0	0
0700	48		48		0		1900	85		85		0	
0715	41		41		0		1915	43		43		0	
0730	42		42		0		1930	41		41		0	
0745	52	183	52	183	0	0	1945	34	203	34	203	0	0
0800	51		51		0		2000	50		50		0	
0815	61		61		0		2015	17		17		0	
0830	60		60		0		2030	28		28		0	
0845	70	242	70	242	0	0	2045	17	112	17	112	0	0
0900	78		78		0		2100	12		12		0	
0915	87		87		0		2115	17		17		0	
0930	93		93		0		2130	15		15		0	
0945	88	346	88	346	0	0	2145	18	62	18	62	0	0
1000	98		98		0		2200	21		21		0	
1015	104		104		0		2215	9		9		0	
1030	109		109		0		2230	7		7		0	
1045	111	422	111	422	0	0	2245	19	56	19	56	0	0
1100	137		137		0		2300	20		20		0	
1115	143		143		0		2315	16		16		0	
1130	150		150		0		2330	60		60		0	
1145	185	615	185	615	0	0	2345	32	128	32	128	0	0
							Total	**8010**		**8010**		**0**	

Volume Report

Job 1202_5_TB_ATR 1A
Area Portsmouth, NH
Location Pease Blvd (Newington St) EB, 200’ west of Rte 4 SB Ramps

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
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Wednesday, March 8, 2023

Time	Total		EB				Time	Total		EB			
0000	58		58		0		1200	236		236		0	
0015	24		24		0		1215	182		182		0	
0030	42		42		0		1230	195		195		0	
0045	15	139	15	139	0	0	1245	152	765	152	765	0	0
0100	16		16		0		1300	126		126		0	
0115	11		11		0		1315	117		117		0	
0130	9		9		0		1330	128		128		0	
0145	5	41	5	41	0	0	1345	144	515	144	515	0	0
0200	5		5		0		1400	153		153		0	
0215	7		7		0		1415	137		137		0	
0230	4		4		0		1430	255		255		0	
0245	3	19	3	19	0	0	1445	215	760	215	760	0	0
0300	1		1		0		1500	261		261		0	
0315	1		1		0		1515	157		157		0	
0330	13		13		0		1530	263		263		0	
0345	5	20	5	20	0	0	1545	221	902	221	902	0	0
0400	4		4		0		1600	330		330		0	
0415	9		9		0		1615	318		318		0	
0430	5		5		0		1630	352		352		0	
0445	11	29	11	29	0	0	1645	245	1245	245	1245	0	0
0500	7		7		0		1700	332		332		0	
0515	12		12		0		1715	242		242		0	
0530	14		14		0		1730	193		193		0	
0545	19	52	19	52	0	0	1745	155	922	155	922	0	0
0600	29		29		0		1800	144		144		0	
0615	21		21		0		1815	79		79		0	
0630	20		20		0		1830	74		74		0	
0645	45	115	45	115	0	0	1845	82	379	82	379	0	0
0700	56		56		0		1900	88		88		0	
0715	39		39		0		1915	49		49		0	
0730	37		37		0		1930	36		36		0	
0745	61	193	61	193	0	0	1945	39	212	39	212	0	0
0800	57		57		0		2000	44		44		0	
0815	69		69		0		2015	26		26		0	
0830	79		79		0		2030	21		21		0	
0845	75	280	75	280	0	0	2045	21	112	21	112	0	0
0900	81		81		0		2100	17		17		0	
0915	92		92		0		2115	10		10		0	
0930	85		85		0		2130	25		25		0	
0945	99	357	99	357	0	0	2145	19	71	19	71	0	0
1000	106		106		0		2200	15		15		0	
1015	116		116		0		2215	11		11		0	
1030	98		98		0		2230	10		10		0	
1045	135	455	135	455	0	0	2245	11	47	11	47	0	0
1100	161		161		0		2300	22		22		0	
1115	159		159		0		2315	5		5		0	
1130	183		183		0		2330	45		45		0	
1145	178	681	178	681	0	0	2345	32	104	32	104	0	0
							Total	**8415**		**8415**		**0**	

Volume Report

Job 1202_5_TB_ATR 1B
Area Portsmouth, NH
Location Pease Blvd (Newington St) WB, 200’ west of Rte 4 SB Ramps

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Tuesday, March 7, 2023

Time	Total		WB			
0000	6		6		0	
0015	6		6		0	
0030	3		3		0	
0045	5	20	5	20	0	0
0100	3		3		0	
0115	1		1		0	
0130	4		4		0	
0145	0	8	0	8	0	0
0200	8		8		0	
0215	3		3		0	
0230	4		4		0	
0245	2	17	2	17	0	0
0300	4		4		0	
0315	3		3		0	
0330	7		7		0	
0345	6	20	6	20	0	0
0400	3		3		0	
0415	7		7		0	
0430	19		19		0	
0445	33	62	33	62	0	0
0500	77		77		0	
0515	132		132		0	
0530	178		178		0	
0545	202	589	202	589	0	0
0600	130		130		0	
0615	150		150		0	
0630	163		163		0	
0645	245	688	245	688	0	0
0700	180		180		0	
0715	219		219		0	
0730	260		260		0	
0745	313	972	313	972	0	0
0800	275		275		0	
0815	241		241		0	
0830	184		184		0	
0845	193	893	193	893	0	0
0900	146		146		0	
0915	126		126		0	
0930	90		90		0	
0945	114	476	114	476	0	0
1000	89		89		0	
1015	108		108		0	
1030	104		104		0	
1045	105	406	105	406	0	0
1100	89		89		0	
1115	106		106		0	
1130	114		114		0	
1145	128	437	128	437	0	0
1200	142		142		0	
1215	157		157		0	
1230	150		150		0	
1245	196	645	196	645	0	0
1300	151		151		0	
1315	128		128		0	
1330	139		139		0	
1345	121	539	121	539	0	0
1400	120		120		0	
1415	116		116		0	
1430	113		113		0	
1445	121	470	121	470	0	0
1500	89		89		0	
1515	113		113		0	
1530	98		98		0	
1545	80	380	80	380	0	0
1600	79		79		0	
1615	89		89		0	
1630	88		88		0	
1645	84	340	84	340	0	0
1700	63		63		0	
1715	50		50		0	
1730	56		56		0	
1745	45	214	45	214	0	0
1800	54		54		0	
1815	61		61		0	
1830	35		35		0	
1845	27	177	27	177	0	0
1900	24		24		0	
1915	26		26		0	
1930	35		35		0	
1945	28	113	28	113	0	0
2000	19		19		0	
2015	31		31		0	
2030	14		14		0	
2045	16	80	16	80	0	0
2100	14		14		0	
2115	11		11		0	
2130	8		8		0	
2145	7	40	7	40	0	0
2200	4		4		0	
2215	7		7		0	
2230	5		5		0	
2245	7	23	7	23	0	0
2300	7		7		0	
2315	2		2		0	
2330	5		5		0	
2345	6	20	6	20	0	0
Total	**7629**		**7629**		**0**	

Volume Report

Job 1202_5_TB_ATR 1B
Area Portsmouth, NH
Location Pease Blvd (Newington St) WB, 200’ west of Rte 4 SB Ramps

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
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Wednesday, March 8, 2023

Time	Total		WB				Time	Total		WB			
0000	4		4		0		1200	145		145		0	
0015	3		3		0		1215	196		196		0	
0030	0		0		0		1230	161		161		0	
0045	0	7	0	7	0	0	1245	178	680	178	680	0	0
0100	6		6		0		1300	164		164		0	
0115	2		2		0		1315	136		136		0	
0130	5		5		0		1330	158		158		0	
0145	4	17	4	17	0	0	1345	124	582	124	582	0	0
0200	5		5		0		1400	123		123		0	
0215	3		3		0		1415	106		106		0	
0230	1		1		0		1430	125		125		0	
0245	3	12	3	12	0	0	1445	130	484	130	484	0	0
0300	0		0		0		1500	99		99		0	
0315	0		0		0		1515	102		102		0	
0330	7		7		0		1530	91		91		0	
0345	7	14	7	14	0	0	1545	93	385	93	385	0	0
0400	8		8		0		1600	54		54		0	
0415	11		11		0		1615	78		78		0	
0430	21		21		0		1630	87		87		0	
0445	37	77	37	77	0	0	1645	90	309	90	309	0	0
0500	68		68		0		1700	65		65		0	
0515	127		127		0		1715	67		67		0	
0530	162		162		0		1730	57		57		0	
0545	206	563	206	563	0	0	1745	57	246	57	246	0	0
0600	137		137		0		1800	41		41		0	
0615	151		151		0		1815	44		44		0	
0630	170		170		0		1830	44		44		0	
0645	259	717	259	717	0	0	1845	24	153	24	153	0	0
0700	179		179		0		1900	38		38		0	
0715	224		224		0		1915	32		32		0	
0730	264		264		0		1930	28		28		0	
0745	335	1002	335	1002	0	0	1945	33	131	33	131	0	0
0800	262		262		0		2000	21		21		0	
0815	274		274		0		2015	22		22		0	
0830	221		221		0		2030	12		12		0	
0845	248	1005	248	1005	0	0	2045	22	77	22	77	0	0
0900	133		133		0		2100	26		26		0	
0915	135		135		0		2115	19		19		0	
0930	114		114		0		2130	14		14		0	
0945	119	501	119	501	0	0	2145	8	67	8	67	0	0
1000	102		102		0		2200	8		8		0	
1015	122		122		0		2215	0		0		0	
1030	112		112		0		2230	7		7		0	
1045	124	460	124	460	0	0	2245	4	19	4	19	0	0
1100	97		97		0		2300	5		5		0	
1115	124		124		0		2315	3		3		0	
1130	149		149		0		2330	7		7		0	
1145	133	503	133	503	0	0	2345	5	20	5	20	0	0
							Total	**8031**		**8031**		**0**	

APPENDIX B
NHDOT Traffic Data

Location Info	
Location ID	82379024
Type	I-SECTION
Functional Class	7
Located On	Pease Blvd
Direction	2-WAY
Community	PORTSMOUTH
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	7/18/2018
End Date	7/19/2018
Start Time	12:00 AM
End Time	12:00 AM
Direction	2-WAY
Notes	nhdot
Count Source	8.2379E+11
File Name	823790243070.prn
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins

Time	Hourly Count
00:00 - 01:00	251
01:00 - 02:00	46
02:00 - 03:00	123
03:00 - 04:00	92
04:00 - 05:00	184
05:00 - 06:00	416
06:00 - 07:00	1130
07:00 - 08:00	1664
08:00 - 09:00	1817
09:00 - 10:00	1277
10:00 - 11:00	1079
11:00 - 12:00	1570
12:00 - 13:00	2098
13:00 - 14:00	1616
14:00 - 15:00	1424
15:00 - 16:00	1936
16:00 - 17:00	2032
17:00 - 18:00	1831
18:00 - 19:00	989
19:00 - 20:00	603
20:00 - 21:00	417
21:00 - 22:00	343
22:00 - 23:00	210
23:00 - 24:00	166
TOTAL	23314

Year 2018 Monthly Data

Group 4 Averages: Urban Highways

Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,282	1.13	1.24
February	11,848	1.08	1.18
March	11,828	1.08	1.18
April	12,491	1.02	1.12
May	13,587	0.94	1.03
June	13,911	0.92	1.00
July	13,765	0.93	1.01
August	13,945	0.92	1.00
September	13,168	0.97	1.06
October	13,367	0.96	1.04
November	12,215	1.05	1.14
December	11,963	1.07	1.17

Average ADT: 12,781
Peak ADT: 13,945

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 2019 Monthly Data

Group 4 Averages: Urban Highways

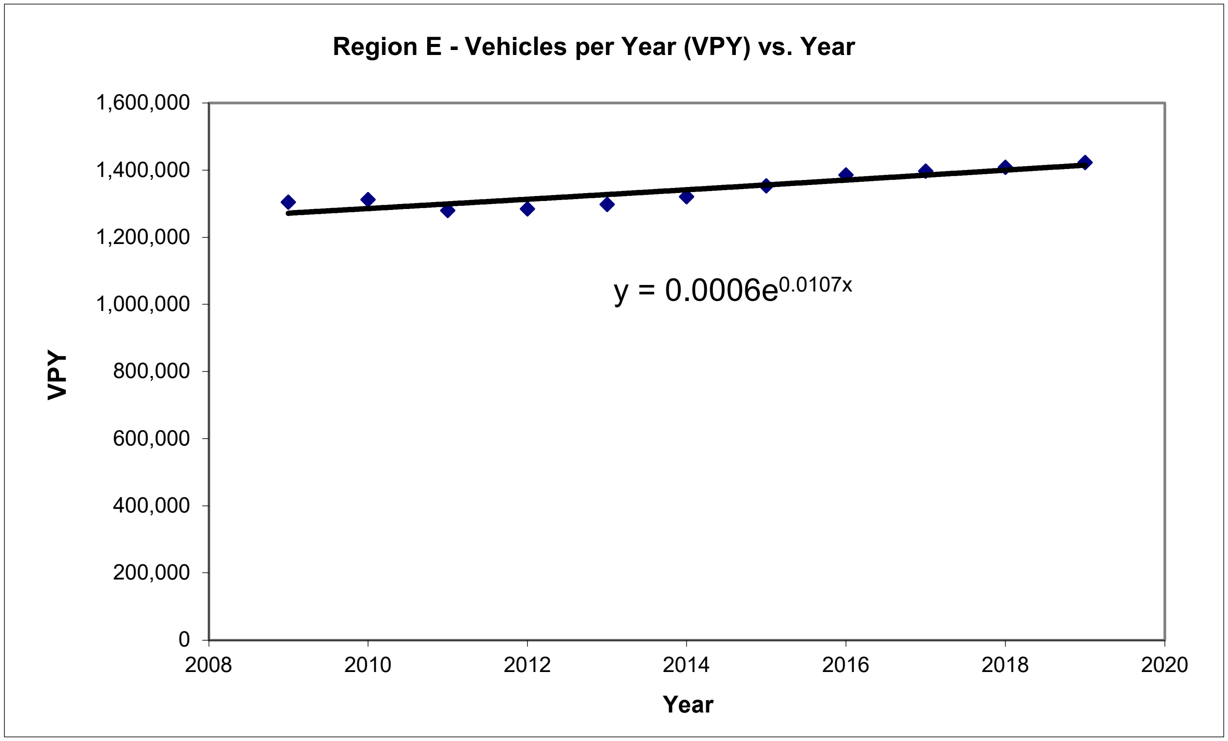
Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265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



APPENDIX C

Traffic Volume Adjustment Calculation

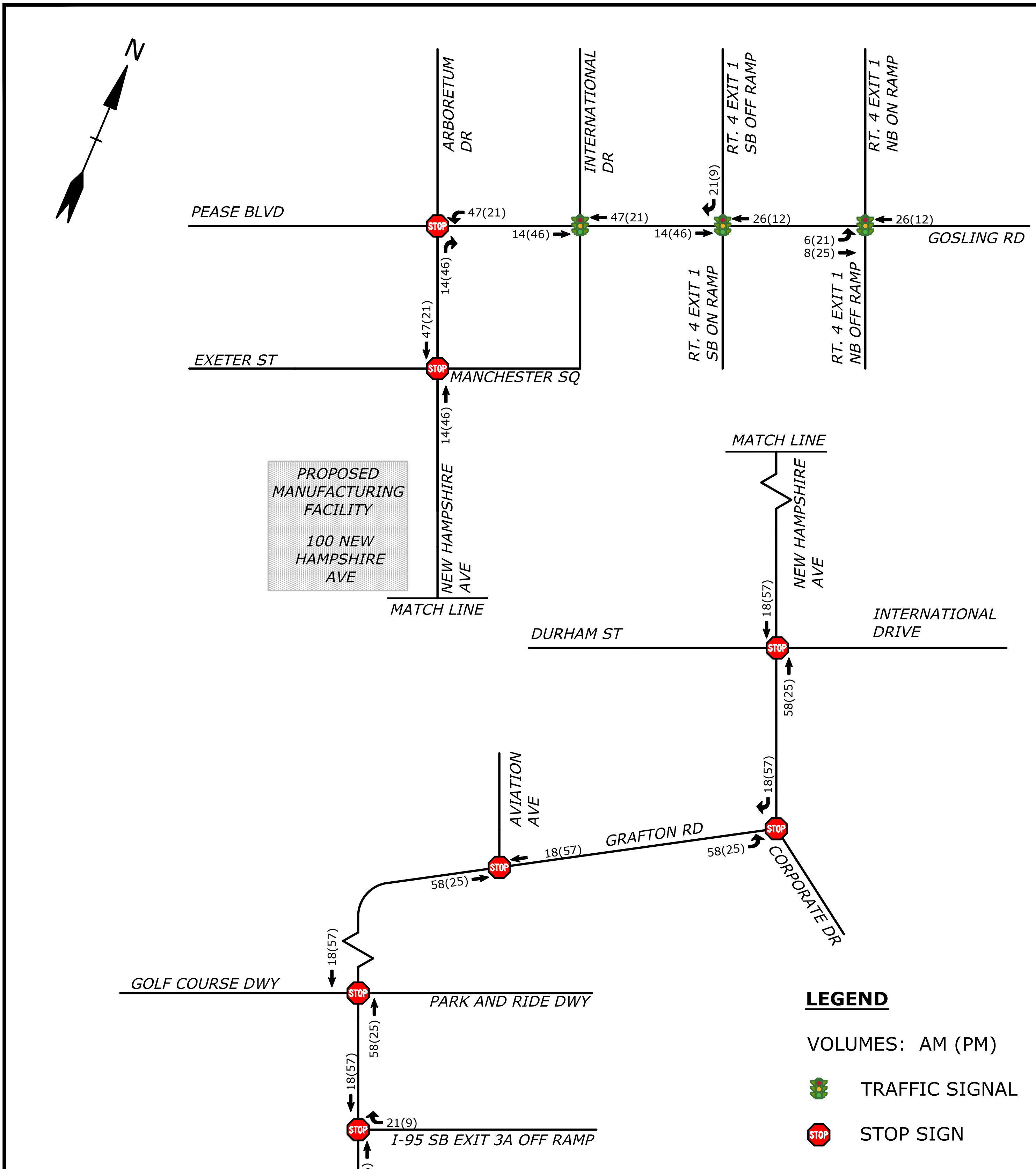
Traffic Volume Adjustment Factor Calculation

Peak Hour	Feb 2022	2022 Seasonally Adjust to Peak[1]	March 2023	2023 Seasonally Adjust to Peak[2]	NHDOT Count Station Data (Loc ID 82379024) - Pease Blvd, West of Route 4 SB Ramps July 2018	2018 Seasonally Adjusted[2]	Grown to 2019[3]	2022 Adjustment Factor (to 2019)	2023 Adjustment Factor (to 2019)
AM Peak	1027	**1212**	1175	**1351**	1817	1835	**1854**	**53%**	**37%**
PM Peak	1210	**1428**	**1551**	**1783**	2032	2052	**2073**	**45%**	**16%**

[1] 2019 Seasonal Adjustment Factor to Peak (Feb)	1.18	2019 NHDOT Group 4 Adjustment to Peak for February
[2] 2019 Seasonal Adjustment Factor to Peak (March)	1.15	2019 NHDOT Group 4 Adjustment to Peak for March
[2] 2018 Seasonal Adjustment Factor to Peak	1.01	2018 NHDOT Group 4 Adjustment to Peak for July
[2] 2019 Seasonal Adjustment Factor	1.0	2019 NHDOT Group 4 Adjustment to Peak for August
[3] 2019 Annual Growth	1.0%	Per LOC ID 82379024 growth from 2018 to 2019

APPENDIX D

Background Development Traffic Volumes

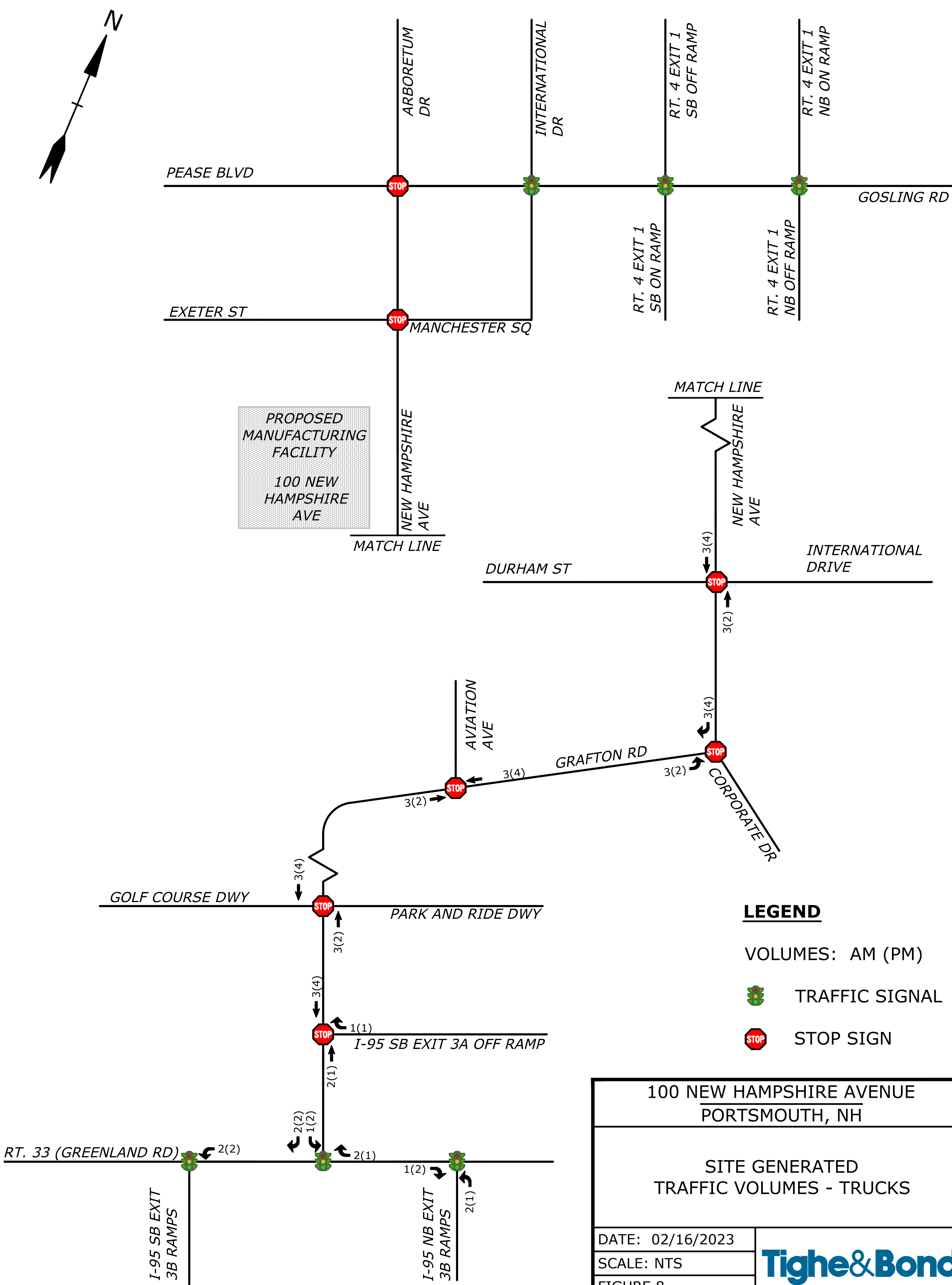


100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES - PASSENGER CARS

DATE: 02/16/2023
SCALE: NTS
FIGURE 7

Tighe&Bond

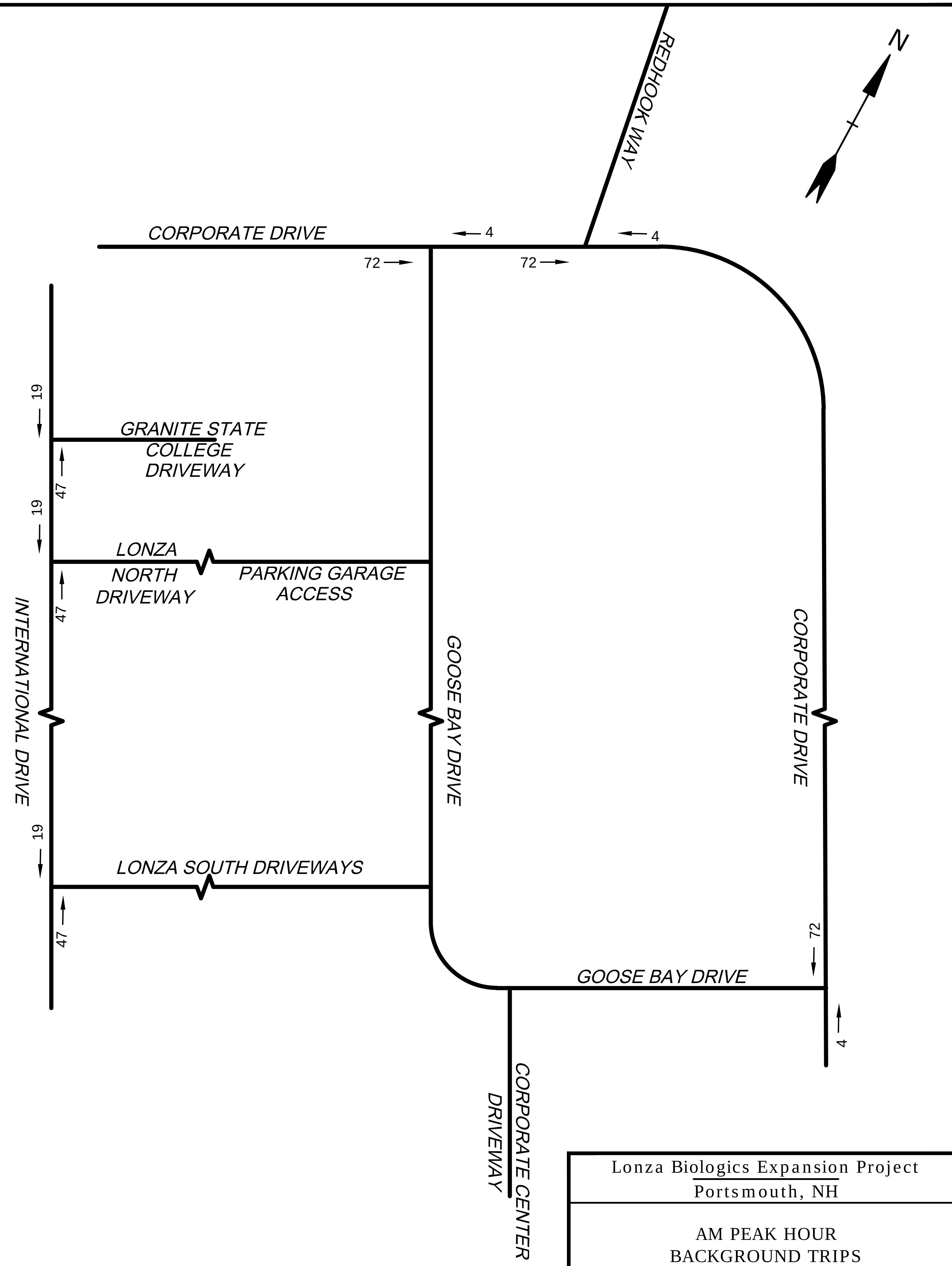


100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES - TRUCKS

DATE: 02/16/2023
SCALE: NTS
FIGURE 8

Tighe&Bond

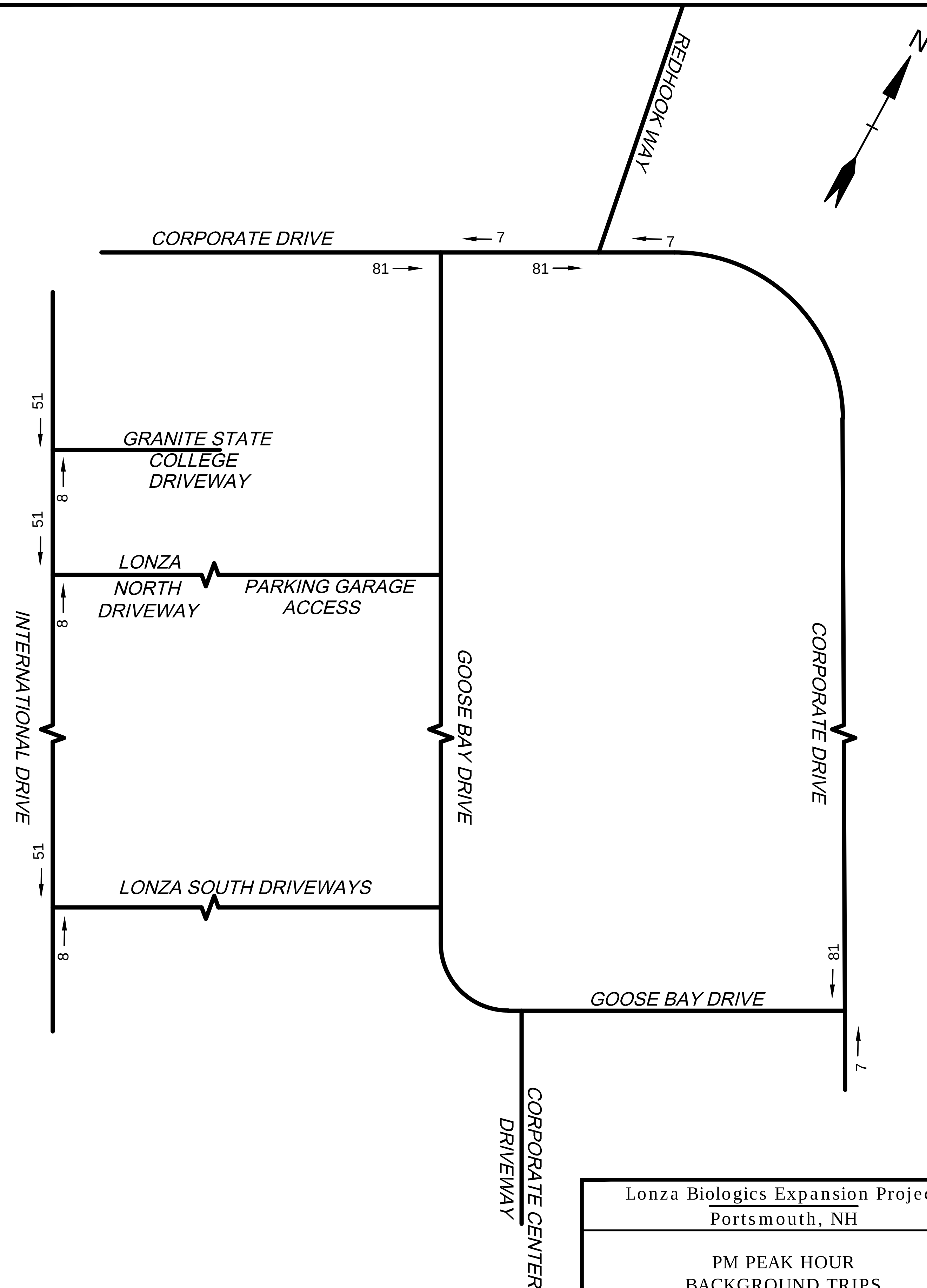


Lonza Biologics Expansion Project
Portsmouth, NH

AM PEAK HOUR
BACKGROUND TRIPS
PEASE MASTER PLAN

DATE:	02/26/18
SCALE:	NO SCALE
FIGURE A1	

Tighe&Bond
www.tighebond.com



Lonza Biologics Expansion Project
Portsmouth, NH

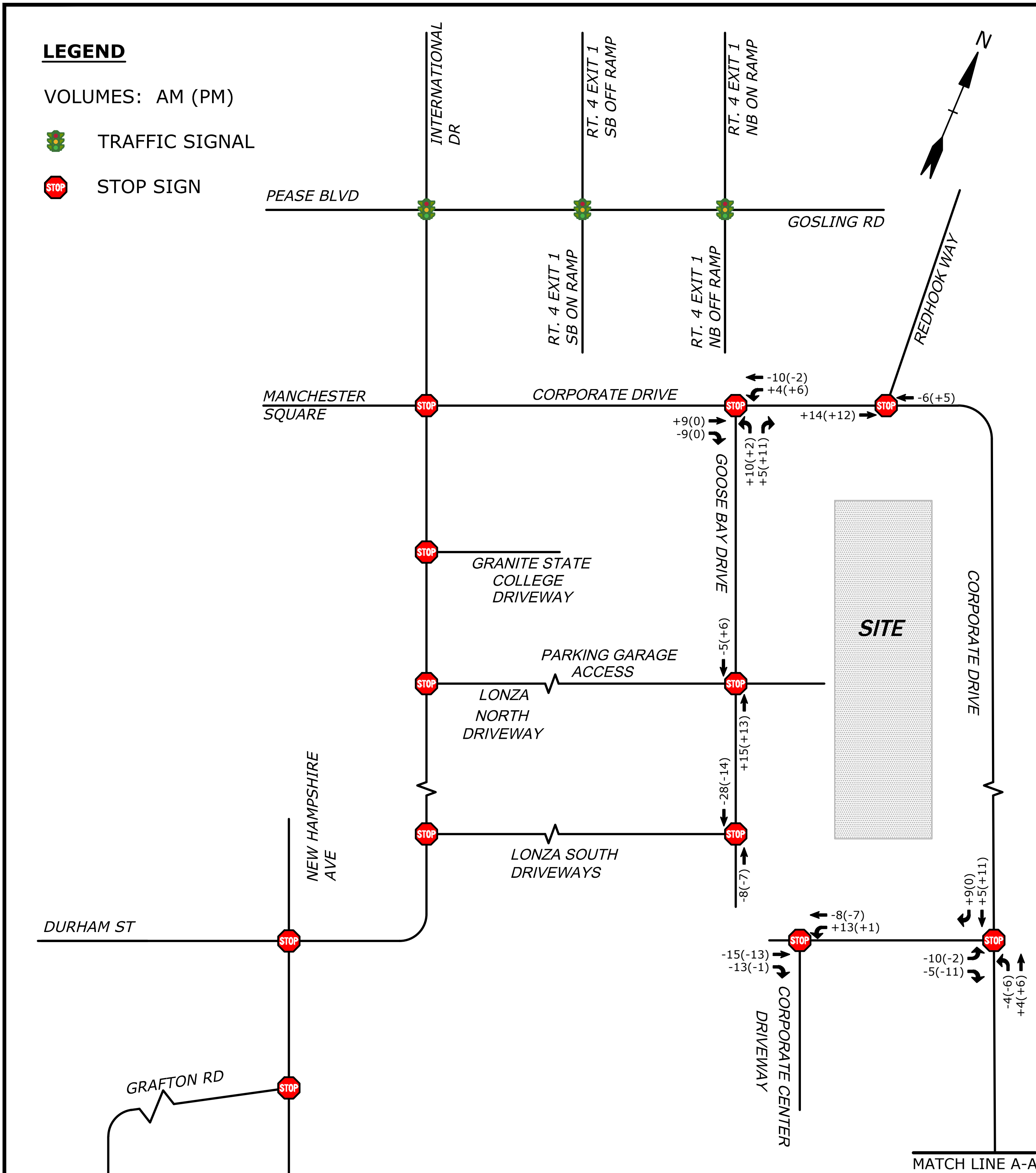
PM PEAK HOUR
BACKGROUND TRIPS
PEASE MASTER PLAN

DATE:	02/26/18
SCALE:	NO SCALE
FIGURE A2	

Tighe&Bond
www.tighebond.com

APPENDIX E

Reassigned Traffic Volumes

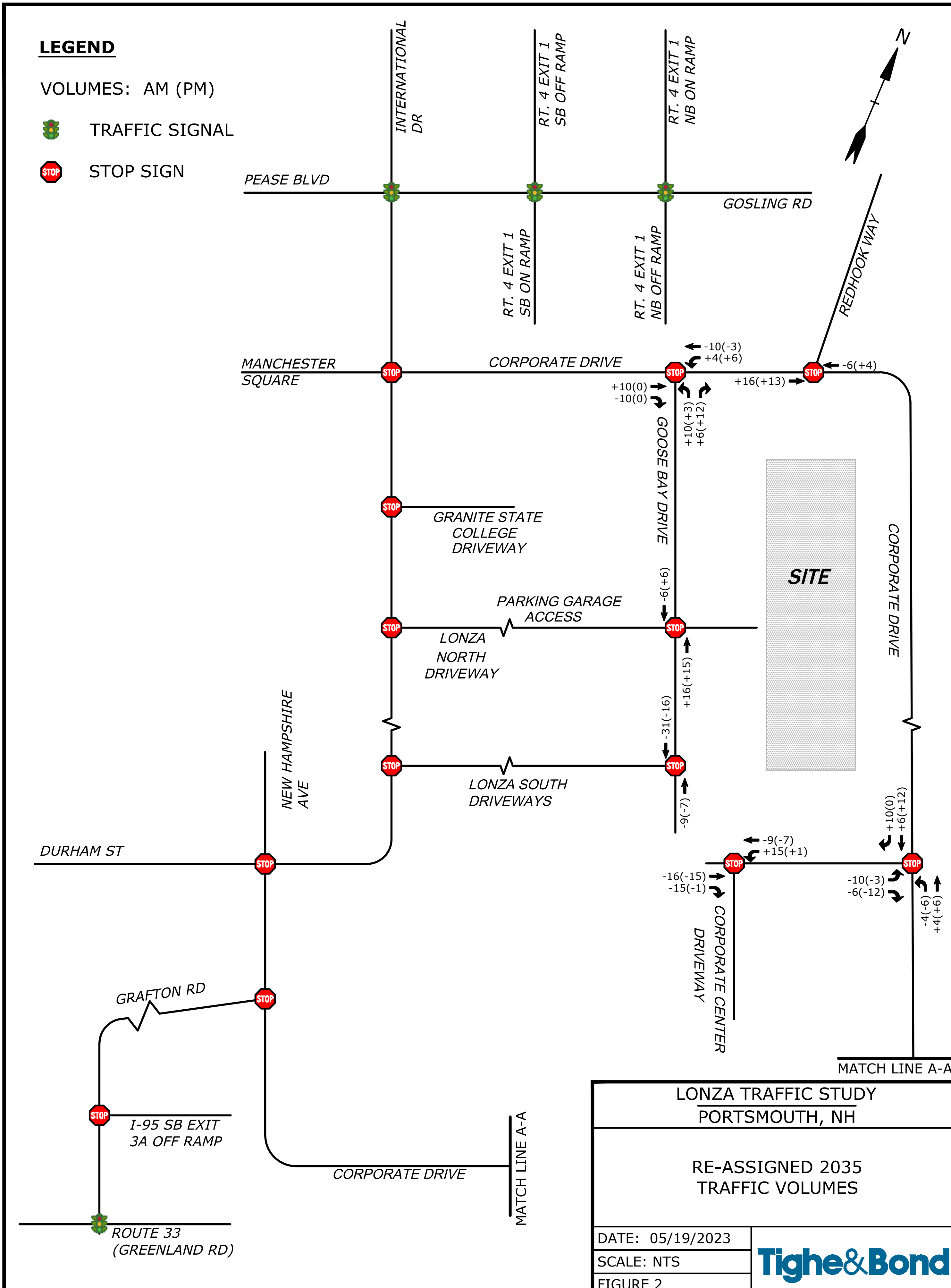


LONZA TRAFFIC STUDY
PORTSMOUTH, NH

RE-ASSIGNED 2025
TRAFFIC VOLUMES

DATE: 05/19/2023
SCALE: NTS
FIGURE 1

Tighe&Bond



LONZA TRAFFIC STUDY
PORTSMOUTH, NH

RE-ASSIGNED 2035
TRAFFIC VOLUMES

DATE: 05/19/2023	Tighe&Bond
SCALE: NTS	
FIGURE 2	

APPENDIX F
Collision History Summary

Intersection Collision History Summary

Intersection: Pease Boulevard at International Drive

COLLISION TYPE

	2020	2021	2022	Total	Percent
Fixed Object	0	1	0	**1**	**100.0%**
TOTAL	**0**	**1**	**0**	**1**	**100%**

CONTRIBUTING FACTOR

	2020	2021	2022	Total	Percent
Other/Unknown	0	1	0	**1**	**100.0%**
TOTAL	**0**	**1**	**0**	**1**	**100%**

COLLISION EVENT

	2020	2021	2022	Total	Percent
Motor Vehicle	0	1	0	**1**	**100.0%**
TOTAL	**0**	**1**	**0**	**1**	**100%**

SEVERITY

	2020	2021	2022	Total	Percent
Minor Injury / Property Damage Only (PDO)	0	1	0	**1**	**100.0%**
TOTAL	**0**	**1**	**0**	**1**	**100%**

DAY & TIME

	2020	2021	2022	Total	Percent
Weekday Off-Peak	0	1	0	**1**	**100.0%**
TOTAL	**0**	**1**	**0**	**1**	**100%**

WEATHER

	2020	2021	2022	Total	Percent
Other/Unknown	0	1	0	**1**	**100.0%**
TOTAL	**0**	**1**	**0**	**1**	**100%**

ROAD SURFACE CONDITION

	2020	2021	2022	Total	Percent
Other/Unknown	0	1	0	**1**	**100.0%**
TOTAL	**0**	**1**	**0**	**1**	**100%**

LIGHT CONDITIONS

	2020	2021	2022	Total	Percent
Other/Unknown	0	1	0	**1**	**100.0%**
TOTAL	**0**	**1**	**0**	**1**	**100%**

Intersection Collision History Summary

Intersection: Pease Boulevard at US Route 4 SB Ramps

COLLISION TYPE

	2020	2021	2022	Total	Percent
Angle	2	2	0	**4**	**57.1%**
Rear-End	0	1	0	**1**	**14.3%**
Overturn/Rollover	0	0	1	**1**	**14.3%**
Sideswipe, Same Direction	1	0	0	**1**	**14.3%**
TOTAL	**3**	**3**	**1**	**7**	**100%**

CONTRIBUTING FACTOR

	2020	2021	2022	Total	Percent
Other/Unknown	3	3	1	**7**	**100.0%**
TOTAL	**3**	**3**	**1**	**7**	**100%**

COLLISION EVENT

	2020	2021	2022	Total	Percent
Motor Vehicle	3	3	0	**6**	**100.0%**
TOTAL	**3**	**3**	**0**	**6**	**100%**

SEVERITY

	2020	2021	2022	Total	Percent
Minor Injury / Property Damage Only (PDO)	3	3	1	**7**	**100.0%**
TOTAL	**3**	**3**	**1**	**7**	**100%**

DAY & TIME

	2020	2021	2022	Total	Percent
Weekday 6-9 A.M.	1	0	0	**1**	**14.3%**
Weekday Off-Peak	2	1	0	**3**	**42.9%**
Weekend Off-Peak	0	2	1	**3**	**42.9%**
TOTAL	**3**	**3**	**1**	**7**	**100%**

WEATHER

	2020	2021	2022	Total	Percent
Clear	2	3	0	**5**	**71.4%**
Snow	1	0	0	**1**	**14.3%**
Other/Unknown	0	0	1	**1**	**14.3%**
TOTAL	**3**	**3**	**1**	**7**	**100%**

ROAD SURFACE CONDITION

	2020	2021	2022	Total	Percent
Dry	2	3	0	**5**	**71.4%**
Snow	1	0	0	**1**	**14.3%**
Other/Unknown	0	0	1	**1**	**14.3%**
TOTAL	**3**	**3**	**1**	**7**	**100%**

LIGHT CONDITIONS

	2020	2021	2022	Total	Percent
Other/Unknown	3	3	1	**7**	**100.0%**
TOTAL	**3**	**3**	**1**	**7**	**100%**

Intersection Collision History Summary

Intersection: Gosling Road/Pease Boulevard at US Route 4 NB Ramps

COLLISION TYPE

	2020	2021	2022	Total	Percent
Rear-End	0	1	3	**4**	**36.4%**
Angle	0	1	2	**3**	**27.3%**
Sideswipe, Same Direction	0	1	3	**4**	**36.4%**
TOTAL	**0**	**3**	**8**	**11**	**100%**

CONTRIBUTING FACTOR

	2020	2021	2022	Total	Percent
Other/Unknown	0	3	8	**11**	**100.0%**
TOTAL	**0**	**3**	**8**	**11**	**100%**

COLLISION EVENT

	2020	2021	2022	Total	Percent
Motor Vehicle	0	3	8	**11**	**100.0%**
TOTAL	**0**	**3**	**8**	**11**	**100%**

SEVERITY

	2020	2021	2022	Total	Percent
Minor Injury / Property Damage Only (PDO)	0	3	8	**11**	**100.0%**
TOTAL	**0**	**3**	**8**	**11**	**100%**

DAY & TIME

	2020	2021	2022	Total	Percent
Weekday 6-9 A.M.	0	0	1	**1**	**9.1%**
Weekday 3-6 P.M.	0	0	2	**2**	**18.2%**
Weekday Off-Peak	0	3	2	**5**	**45.5%**
Saturday 11 A.M. - 2 P.M.	0	0	2	**2**	**18.2%**
Weekend Off-Peak	0	0	1	**1**	**9.1%**
TOTAL	**0**	**3**	**8**	**11**	**100%**

WEATHER

	2020	2021	2022	Total	Percent
Clear	0	3	0	**3**	**27.3%**
Other/Unknown	0	0	8	**8**	**72.7%**
TOTAL	**0**	**3**	**8**	**11**	**100%**

ROAD SURFACE CONDITION

	2020	2021	2022	Total	Percent
Dry	0	3	0	**3**	**27.3%**
Other/Unknown	0	0	8	**8**	**72.7%**
TOTAL	**0**	**3**	**8**	**11**	**100%**

LIGHT CONDITIONS

	2020	2021	2022	Total	Percent
Other/Unknown	0	3	8	**11**	**100.0%**
TOTAL	**0**	**3**	**8**	**11**	**100%**

Intersection Collision History Summary

Intersection: Route 33 (Greenland Road) at Grafton Road

COLLISION TYPE

	2020	2021	2022	Total	Percent
Rear-End	1	2	2	**5**	**100.0%**
TOTAL	**1**	**2**	**2**	**5**	**100%**

CONTRIBUTING FACTOR

	2020	2021	2022	Total	Percent
Other/Unknown	1	2	2	**5**	**100.0%**
TOTAL	**1**	**2**	**2**	**5**	**100%**

COLLISION EVENT

	2020	2021	2022	Total	Percent
Motor Vehicle	1	2	2	**5**	**100.0%**
TOTAL	**1**	**2**	**2**	**5**	**100%**

SEVERITY

	2020	2021	2022	Total	Percent
Minor Injury / Property Damage Only (PDO)	1	2	2	**5**	**100.0%**
TOTAL	**1**	**2**	**2**	**5**	**100%**

DAY & TIME

	2020	2021	2022	Total	Percent
Weekday 3-6 P.M.	1	0	1	**2**	**40.0%**
Weekday Off-Peak	0	1	0	**1**	**20.0%**
Saturday 11 A.M. - 2 P.M.	0	1	0	**1**	**20.0%**
Weekend Off-Peak	0	0	1	**1**	**20.0%**
TOTAL	**1**	**2**	**2**	**5**	**100%**

WEATHER

	2020	2021	2022	Total	Percent
Other/Unknown	1	2	2	**5**	**100.0%**
TOTAL	**1**	**2**	**2**	**5**	**100%**

ROAD SURFACE CONDITION

	2020	2021	2022	Total	Percent
Other/Unknown	1	2	2	**5**	**100.0%**
TOTAL	**1**	**2**	**2**	**5**	**100%**

LIGHT CONDITIONS

	2020	2021	2022	Total	Percent
Other/Unknown	1	2	2	**5**	**100.0%**
TOTAL	**1**	**2**	**2**	**5**	**100%**

Intersection Collision History Summary

Intersection: Corporate Drive at International Drive

COLLISION TYPE

	2020	2021	2022	Total	Percent
Rear-End	2	0	1	**3**	**30.0%**
Head-On	1	0	0	**1**	**10.0%**
Angle	3	2	1	**5**	**50.0%**
Sideswipe, Same Direction	1	0	0	**1**	**10.0%**
TOTAL	**7**	**2**	**2**	**10**	**100%**

CONTRIBUTING FACTOR

	2020	2021	2022	Total	Percent
Other/Unknown	6	2	2	**10**	**100.0%**
TOTAL	**6**	**2**	**2**	**10**	**100%**

COLLISION EVENT

	2020	2021	2022	Total	Percent
Motor Vehicle	7	2	2	**11**	**100.0%**
TOTAL	**7**	**2**	**2**	**11**	**100%**

SEVERITY

	2020	2021	2022	Total	Percent
Minor Injury / Property Damage Only (PDO)	7	2	2	**11**	**100.0%**
TOTAL	**7**	**2**	**2**	**11**	**100%**

DAY & TIME

	2020	2021	2022	Total	Percent
Weekday 6-9 A.M.	1	1	1	**3**	**27.3%**
Weekday 3-6 P.M.	3	0	0	**3**	**27.3%**
Weekday Off-Peak	2	1	1	**4**	**36.4%**
Weekend Off-Peak	1	0	0	**1**	**9.1%**
TOTAL	**7**	**2**	**2**	**11**	**100%**

WEATHER

	2020	2021	2022	Total	Percent
Other/Unknown	7	2	2	**11**	**100.0%**
TOTAL	**7**	**2**	**2**	**11**	**100%**

ROAD SURFACE CONDITION

	2020	2021	2022	Total	Percent
Other/Unknown	7	2	2	**11**	**100.0%**
TOTAL	**7**	**2**	**2**	**11**	**100%**

LIGHT CONDITIONS

	2020	2021	2022	Total	Percent
Other/Unknown	7	2	2	**11**	**100.0%**
TOTAL	**7**	**2**	**2**	**11**	**100%**

Intersection Collision History Summary

Intersection: New Hampshire Avenue at International Drive

COLLISION TYPE

	2020	2021	2022	Total	Percent
Other/Unknown	1	0	0	**1**	**16.7%**
Angle	2	1	2	**5**	**83.3%**
TOTAL	**3**	**1**	**2**	**6**	**100%**

CONTRIBUTING FACTOR

	2020	2021	2022	Total	Percent
Other/Unknown	3	1	2	**6**	**100.0%**
TOTAL	**3**	**1**	**2**	**6**	**100%**

COLLISION EVENT

	2020	2021	2022	Total	Percent
Motor Vehicle	3	1	2	**6**	**100.0%**
TOTAL	**3**	**1**	**2**	**6**	**100%**

SEVERITY

	2020	2021	2022	Total	Percent
Serious Injury	1	0	0	**1**	**16.7%**
Minor Injury / Property Damage Only (PDO)	2	1	2	**5**	**83.3%**
TOTAL	**3**	**1**	**2**	**6**	**100%**

DAY & TIME

	2020	2021	2022	Total	Percent
Weekday 3-6 P.M.	0	0	1	**1**	**16.7%**
Weekday Off-Peak	3	1	0	**4**	**66.7%**
Weekend Off-Peak	0	0	1	**1**	**16.7%**
TOTAL	**3**	**1**	**2**	**6**	**100%**

WEATHER

	2020	2021	2022	Total	Percent
Other/Unknown	3	1	2	**6**	**100.0%**
TOTAL	**3**	**1**	**2**	**6**	**100%**

ROAD SURFACE CONDITION

	2020	2021	2022	Total	Percent
Other/Unknown	3	1	2	**6**	**100.0%**
TOTAL	**3**	**1**	**2**	**6**	**100%**

LIGHT CONDITIONS

	2020	2021	2022	Total	Percent
Other/Unknown	3	1	2	**6**	**100.0%**
TOTAL	**3**	**1**	**2**	**6**	**100%**

Intersection Collision History Summary

Intersection: Grafton Drive at Corporate Drive

COLLISION TYPE

	2020	2021	2022	Total	Percent
Angle	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

CONTRIBUTING FACTOR

	2020	2021	2022	Total	Percent
Other/Unknown	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

COLLISION EVENT

	2020	2021	2022	Total	Percent
Motor Vehicle	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

SEVERITY

	2020	2021	2022	Total	Percent
Minor Injury / Property Damage Only (PDO)	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

DAY & TIME

	2020	2021	2022	Total	Percent
Weekday Off-Peak	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

WEATHER

	2020	2021	2022	Total	Percent
Other/Unknown	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

ROAD SURFACE CONDITION

	2020	2021	2022	Total	Percent
Other/Unknown	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

LIGHT CONDITIONS

	2020	2021	2022	Total	Percent
Other/Unknown	1	0	0	**1**	**100.0%**
TOTAL	**1**	**0**	**0**	**1**	**100%**

APPENDIX G

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 H
Capacity Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	90	6	1166	583	129	8	5	270	6	2	2
Future Volume (vph)	3	90	6	1166	583	129	8	5	270	6	2	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	0.88		1.00	
Frt	1.00	0.99		1.00	0.97			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	
Satd. Flow (prot)	1805	3511		3467	3469			1783	2682		2035	
Flt Permitted	0.95	1.00		0.95	1.00			0.87	1.00		0.86	
Satd. Flow (perm)	1805	3511		3467	3469			1597	2682		1810	
Peak-hour factor, PHF	0.84	0.84	0.84	0.83	1.00	0.83	0.88	0.88	0.88	0.63	0.63	0.63
Adj. Flow (vph)	4	107	7	1405	583	155	9	6	307	10	3	3
RTOR Reduction (vph)	0	4	0	0	11	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	110	0	1405	727	0	0	15	307	0	14	0
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	6%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	5.5	12.5		44.0	52.0			15.4	15.4		15.4	
Effective Green, g (s)	5.5	12.5		44.0	52.0			15.4	15.4		15.4	
Actuated g/C Ratio	0.06	0.14		0.49	0.58			0.17	0.17		0.17	
Clearance Time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	110	488		1696	2006			273	459		310	
v/s Ratio Prot	0.00	c0.03		c0.41	c0.21							
v/s Ratio Perm								0.01	c0.11		0.01	
v/c Ratio	0.04	0.22		0.83	0.36			0.05	0.67		0.04	
Uniform Delay, d1	39.7	34.4		19.7	10.1			31.2	34.9		31.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.2		3.5	0.1			0.1	3.7		0.1	
Delay (s)	39.8	34.6		23.2	10.2			31.2	38.5		31.2	
Level of Service	D	C		C	B			C	D		C	
Approach Delay (s)		34.8			18.7			38.2			31.2	
Approach LOS		C			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	252	114	154	969	0	0	0	0	555	0	802
Future Volume (vph)	0	252	114	154	969	0	0	0	0	555	0	802
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5981	1419	2918	3455					3467		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5981	1419	2918	3455					3467		2814
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.75	0.75	0.75
Adj. Flow (vph)	0	315	142	192	1211	0	0	0	0	740	0	1069
RTOR Reduction (vph)	0	0	97	0	0	0	0	0	0	0	0	117
Lane Group Flow (vph)	0	315	46	193	1211	0	0	0	0	740	0	952
Heavy Vehicles (%)	0%	2%	10%	12%	1%	0%	2%	2%	2%	1%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		32.7	32.7	25.0	63.7					25.0		25.0
Effective Green, g (s)		32.7	32.7	25.0	63.7					25.0		25.0
Actuated g/C Ratio		0.32	0.32	0.25	0.63					0.25		0.25
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		1942	460	724	2185					860		698
v/s Ratio Prot		0.05	0.03	0.07	c0.35					0.21		c0.34
v/s Ratio Perm												
v/c Ratio		0.16	0.10	0.27	0.55					0.86		1.36
Uniform Delay, d1		24.2	23.7	30.5	10.5					36.2		37.9
Progression Factor		1.00	1.00	0.88	1.62					1.00		1.00
Incremental Delay, d2		0.1	0.2	0.1	0.3					9.5		172.7
Delay (s)		24.3	23.9	26.8	17.2					45.7		210.6
Level of Service		C	C	C	B					D		F
Approach Delay (s)		24.2			18.5			0.0			143.2	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	80.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.8%	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)	110	697	0	0	372	76	751	0	359	0	0	0
Future Volume (vph)	110	697	0	0	372	76	751	0	359	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.97		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3113	3421			4932		3433		2733			
Flt Permitted	0.45	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	1462	3421			4932		3433		2733			
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	126	801	0	0	438	89	963	0	460	0	0	0
RTOR Reduction (vph)	0	0	0	0	27	0	0	0	346	0	0	0
Lane Group Flow (vph)	126	801	0	0	500	0	963	0	114	0	0	0
Heavy Vehicles (%)	5%	2%	0%	0%	2%	5%	2%	2%	4%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	49.7	32.7			40.7		25.0		25.0			
Effective Green, g (s)	49.7	32.7			40.7		25.0		25.0			
Actuated g/C Ratio	0.49	0.32			0.40		0.25		0.25			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	1000	1110			1993		852		678			
v/s Ratio Prot	c0.02	c0.23			c0.10		c0.28		0.04			
v/s Ratio Perm	0.04											
v/c Ratio	0.13	0.72			0.25		1.13		0.17			
Uniform Delay, d1	13.5	30.0			19.9		37.9		29.7			
Progression Factor	1.16	1.31			1.00		1.00		1.00			
Incremental Delay, d2	0.1	2.2			0.1		73.3		0.2			
Delay (s)	15.7	41.5			20.0		111.1		29.9			
Level of Service	B	D			C		F		C			
Approach Delay (s)		38.0			20.0			84.9			0.0	
Approach LOS		D			C			F			A	

Intersection Summary			
HCM 2000 Control Delay	57.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	608	1990	717	536	148	175
Future Volume (vph)	608	1990	717	536	148	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3471	3343	1583	1719	1538
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3471	3343	1583	1719	1538
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.76	0.76
Adj. Flow (vph)	707	2314	747	558	195	230
RTOR Reduction (vph)	0	0	0	388	0	179
Lane Group Flow (vph)	707	2314	747	170	195	51
Heavy Vehicles (%)	1%	4%	8%	2%	5%	5%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	9.9	33.9	18.0	18.0	13.1	13.1
Effective Green, g (s)	9.9	33.9	18.0	18.0	13.1	13.1
Actuated g/C Ratio	0.17	0.57	0.31	0.31	0.22	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	299	1994	1019	482	381	341
v/s Ratio Prot	c0.40	c0.67	0.22		c0.11	0.03
v/s Ratio Perm				0.11		
v/c Ratio	2.36	1.16	0.73	0.35	0.51	0.15
Uniform Delay, d1	24.6	12.6	18.3	16.0	20.1	18.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	624.3	78.2	4.7	2.0	1.5	0.3
Delay (s)	648.9	90.8	23.0	18.0	21.7	18.7
Level of Service	F	F	C	B	C	B
Approach Delay (s)		221.4	20.9		20.1	
Approach LOS		F	C		C	

Intersection Summary			
HCM 2000 Control Delay	148.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	115.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	68	43	30	14	13	71	8	99	63	573	440	134
Future Vol, veh/h	68	43	30	14	13	71	8	99	63	573	440	134
Peak Hour Factor	0.76	0.76	0.76	0.78	0.78	0.78	0.83	0.83	0.83	0.76	0.76	0.76
Heavy Vehicles, %	0	4	5	0	13	18	0	0	3	2	0	0
Mvmt Flow	89	57	39	18	17	91	10	119	76	754	579	176
Number of Lanes	1	1	0	1	1	1	1	2	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	14.2	13.5	13.7	150.1
HCM LOS	B	B	B	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	34%	0%	59%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	66%	0%	41%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	8	66	96	68	73	14	13	71	573	440	134
LT Vol	8	0	0	68	0	14	0	0	573	0	0
Through Vol	0	66	33	0	43	0	13	0	0	440	0
RT Vol	0	0	63	0	30	0	0	71	0	0	134
Lane Flow Rate	10	80	116	89	96	18	17	91	754	579	176
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.024	0.185	0.256	0.225	0.222	0.046	0.042	0.213	1.468	1.04	0.282
Departure Headway (Hd)	9.296	8.789	8.375	9.319	8.6	9.688	9.406	8.786	7.111	6.572	5.865
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	387	411	431	387	420	372	383	411	520	556	617
Service Time	6.996	6.489	6.075	7.019	6.3	7.388	7.106	6.486	4.811	4.272	3.565
HCM Lane V/C Ratio	0.026	0.195	0.269	0.23	0.229	0.048	0.044	0.221	1.45	1.041	0.285
HCM Control Delay	12.2	13.5	13.9	14.7	13.7	12.9	12.5	13.8	240.8	74.5	10.9
HCM Lane LOS	B	B	B	B	B	B	B	B	F	F	B
HCM 95th-tile Q	0.1	0.7	1	0.9	0.8	0.1	0.1	0.8	37.1	16	1.2

Intersection						
Int Delay, s/veh	0.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	433	246	22	79	19	0
Future Vol, veh/h	433	246	22	79	19	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	71	71	69	69
Heavy Vehicles, %	1	5	0	12	36	0
Mvmt Flow	555	315	31	111	28	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	870	0	886	713
Stage 1	-	-	-	-	713	-
Stage 2	-	-	-	-	173	-
Critical Hdwy	-	-	4.1	-	6.76	6.2
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	-	-	2.2	-	3.824	3.3
Pot Cap-1 Maneuver	-	-	783	-	275	435
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	781	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	783	-	263	435
Mov Cap-2 Maneuver	-	-	-	-	263	-
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	748	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	20.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	263	-	-	783	-
HCM Lane V/C Ratio	0.105	-	-	0.04	-
HCM Control Delay (s)	20.3	-	-	9.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	418	82	2	0	6
Future Vol, veh/h	17	418	82	2	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	71	71	50	50
Heavy Vehicles, %	0	1	8	0	0	25
Mvmt Flow	20	492	115	3	0	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	118	0	-	0	649	117
Stage 1	-	-	-	-	117	-
Stage 2	-	-	-	-	532	-
Critical Hdwy	4.1	-	-	-	6.4	6.45
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.525
Pot Cap-1 Maneuver	1483	-	-	-	438	876
Stage 1	-	-	-	-	913	-
Stage 2	-	-	-	-	593	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1483	-	-	-	432	876
Mov Cap-2 Maneuver	-	-	-	-	432	-
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	593	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1483	-	-	-	876
HCM Lane V/C Ratio	0.013	-	-	-	0.014
HCM Control Delay (s)	7.5	-	-	-	9.2
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	222	7	7	102	9	5
Future Vol, veh/h	222	7	7	102	9	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	82	82	25	40
Heavy Vehicles, %	1	0	0	5	20	0
Mvmt Flow	234	7	9	124	36	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	241	0	380	238
Stage 1	-	-	-	-	238	-
Stage 2	-	-	-	-	142	-
Critical Hdwy	-	-	4.1	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.2	-	3.68	3.3
Pot Cap-1 Maneuver	-	-	1337	-	588	806
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	843	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1337	-	584	806
Mov Cap-2 Maneuver	-	-	-	-	584	-
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	837	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	629	-	-	1337	-
HCM Lane V/C Ratio	0.077	-	-	0.006	-
HCM Control Delay (s)	11.2	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	14	13	6	8
Future Vol, veh/h	0	0	14	13	6	8
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	25	25	53	53	50	50
Heavy Vehicles, %	0	0	0	13	0	0
Mvmt Flow	0	0	26	25	12	16

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	79	39	0	0	51	0
Stage 1	39	-	-	-	-	-
Stage 2	40	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	929	1038	-	-	1568	-
Stage 1	989	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	922	1038	-	-	1568	-
Mov Cap-2 Maneuver	922	-	-	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	980	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	3.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1568	-
HCM Lane V/C Ratio	-	-	-	0.008	-
HCM Control Delay (s)	-	-	0	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	0	0	8	27	8
Future Vol, veh/h	6	0	0	8	27	8
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	50	50	42	42	69	69
Heavy Vehicles, %	75	0	0	0	6	80
Mvmt Flow	12	0	0	19	39	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	64	45	51	0	-	0
Stage 1	45	-	-	-	-	-
Stage 2	19	-	-	-	-	-
Critical Hdwy	7.15	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.15	-	-	-	-	-
Critical Hdwy Stg 2	6.15	-	-	-	-	-
Follow-up Hdwy	4.175	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	788	1031	1568	-	-	-
Stage 1	819	-	-	-	-	-
Stage 2	844	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	788	1031	1568	-	-	-
Mov Cap-2 Maneuver	788	-	-	-	-	-
Stage 1	819	-	-	-	-	-
Stage 2	844	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1568	-	788	-	-
HCM Lane V/C Ratio	-	-	0.015	-	-
HCM Control Delay (s)	0	-	9.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	0	5	19	0	0	52	216
Future Vol, veh/h	0	0	0	0	0	0	5	19	0	0	52	216
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	88	88	92	92	69	69
Heavy Vehicles, %	2	2	2	2	2	2	0	18	2	2	15	1
Mvmt Flow	0	0	0	0	0	0	6	22	0	0	75	313

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	266	266	232	266	422	22	388	0	0	22	0	0
Stage 1	232	232	-	34	34	-	-	-	-	-	-	-
Stage 2	34	34	-	232	388	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	687	640	807	687	523	1055	1182	-	-	1593	-	-
Stage 1	771	713	-	982	867	-	-	-	-	-	-	-
Stage 2	982	867	-	771	609	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	684	637	807	684	520	1055	1182	-	-	1593	-	-
Mov Cap-2 Maneuver	684	637	-	684	520	-	-	-	-	-	-	-
Stage 1	767	713	-	977	863	-	-	-	-	-	-	-
Stage 2	977	863	-	771	609	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	1.7	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1182	-	-	-	-	1593	-	-
HCM Lane V/C Ratio	0.005	-	-	-	-	-	-	-
HCM Control Delay (s)	8.1	0	-	0	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	2	156	13	13	430
Future Vol, veh/h	6	2	156	13	13	430
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	63	63	81	81	84	84
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	10	3	193	16	15	512

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	743	201	0	0	209	0
Stage 1	201	-	-	-	-	-
Stage 2	542	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	386	845	-	-	1374	-
Stage 1	838	-	-	-	-	-
Stage 2	587	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	380	845	-	-	1374	-
Mov Cap-2 Maneuver	380	-	-	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	578	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	441	1374	-
HCM Lane V/C Ratio	-	-	0.029	0.011	-
HCM Control Delay (s)	-	-	13.4	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	19	150	13	20	416
Future Vol, veh/h	14	19	150	13	20	416
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	88	88	86	86	83	83
Heavy Vehicles, %	44	0	1	63	0	1
Mvmt Flow	16	22	174	15	24	501

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	731	182	0	0	189	0
Stage 1	182	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Critical Hdwy	6.84	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.896	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	333	866	-	-	1397	-
Stage 1	758	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	325	866	-	-	1397	-
Mov Cap-2 Maneuver	325	-	-	-	-	-
Stage 1	758	-	-	-	-	-
Stage 2	491	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	12.7		0		0.3	
HCM LOS	B					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	508	1397	-
HCM Lane V/C Ratio	-	-	0.074	0.017	-
HCM Control Delay (s)	-	-	12.7	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection						
Int Delay, s/veh	0.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	183	2	8	331
Future Vol, veh/h	0	5	183	2	8	331
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	75	75	89	89	81	81
Heavy Vehicles, %	0	0	5	100	0	2
Mvmt Flow	0	7	206	2	10	409

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	636	207	0	0	208	0
Stage 1	207	-	-	-	-	-
Stage 2	429	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	445	839	-	-	1375	-
Stage 1	832	-	-	-	-	-
Stage 2	661	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	441	839	-	-	1375	-
Mov Cap-2 Maneuver	441	-	-	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	655	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	839	1375	-
HCM Lane V/C Ratio	-	-	0.008	0.007	-
HCM Control Delay (s)	-	-	9.3	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	9	2	84	5	6	0	392	383	25	269	28
Future Vol, veh/h	8	9	2	84	5	6	0	392	383	25	269	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	65	65	65	90	90	90	87	87	87
Heavy Vehicles, %	20	0	0	4	0	0	0	2	3	0	3	0
Mvmt Flow	11	12	3	129	8	9	0	436	426	29	309	32

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1041	1245	325	1040	1048	649	341	0	0	862	0	0
Stage 1	383	383	-	649	649	-	-	-	-	-	-	-
Stage 2	658	862	-	391	399	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.14	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.3	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.3	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4	3.3	3.536	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	193	176	721	207	230	473	1229	-	-	789	-	-
Stage 1	605	616	-	455	469	-	-	-	-	-	-	-
Stage 2	425	375	-	629	606	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	178	168	721	188	219	473	1229	-	-	789	-	-
Mov Cap-2 Maneuver	178	168	-	188	219	-	-	-	-	-	-	-
Stage 1	605	588	-	455	469	-	-	-	-	-	-	-
Stage 2	410	375	-	586	578	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.1	62.5	0	0.8
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1229	-	-	188	197	789	-	-
HCM Lane V/C Ratio	-	-	-	0.135	0.742	0.036	-	-
HCM Control Delay (s)	0	-	-	27.1	62.5	9.7	0	-
HCM Lane LOS	A	-	-	D	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	4.9	0.1	-	-

Intersection	
Int Delay, s/veh	60

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	794	348	47	14	54	213
Future Vol, veh/h	794	348	47	14	54	213
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	70	70	90	90
Heavy Vehicles, %	1	1	3	11	0	4
Mvmt Flow	854	374	67	20	60	237

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	214	60	297	0	-	0
Stage 1	60	-	-	-	-	-
Stage 2	154	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	~ 777	1008	1259	-	-	-
Stage 1	965	-	-	-	-	-
Stage 2	877	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 736	1008	1259	-	-	-
Mov Cap-2 Maneuver	~ 736	-	-	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	877	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	78.3	6.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1259	-	736	1008	-	-
HCM Lane V/C Ratio	0.053	-	1.16	0.371	-	-
HCM Control Delay (s)	8	-	107.9	10.7	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	26.7	1.7	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	67.5					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	199	1144	0	0	323
Future Vol, veh/h	0	199	1144	0	0	323
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	76	76	70	70	80	80
Heavy Vehicles, %	2	3	2	2	2	4
Mvmt Flow	0	262	1634	0	0	404

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1634	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.245	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3285	-	-	-	-
Pot Cap-1 Maneuver	0	~ 123	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	~ 123	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 592.5	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	123	-
HCM Lane V/C Ratio	-	2.129	-
HCM Control Delay (s)	-	$ 592.5	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	21.8	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	420	3	287	160	24	11	3	1200	56	3	3
Future Volume (vph)	0	420	3	287	160	24	11	3	1200	56	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		0.95		0.97	0.95			1.00	0.88		1.00	
Frt		1.00		1.00	0.98			1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)		3571		3433	3539			1766	2814		2047	
Flt Permitted		1.00		0.95	1.00			0.83	1.00		0.74	
Satd. Flow (perm)		3571		3433	3539			1529	2814		1594	
Peak-hour factor, PHF	0.88	0.88	0.88	0.96	0.96	0.96	0.91	0.91	0.91	0.68	0.68	0.68
Adj. Flow (vph)	0	477	3	299	167	25	12	3	1319	82	4	4
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	480	0	299	185	0	0	15	1319	0	89	0
Heavy Vehicles (%)	0%	1%	0%	2%	0%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		13.9		11.6	31.5			20.1	20.1		20.1	
Effective Green, g (s)		13.9		11.6	31.5			20.1	20.1		20.1	
Actuated g/C Ratio		0.22		0.18	0.50			0.32	0.32		0.32	
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)		780		626	1752			483	889		503	
v/s Ratio Prot		c0.13		c0.09	0.05							
v/s Ratio Perm								0.01	c0.47		0.06	
v/c Ratio		0.62		0.48	0.11			0.03	1.48		0.18	
Uniform Delay, d1		22.4		23.3	8.5			15.0	21.8		15.8	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.5		0.6	0.0			0.0	223.7		0.2	
Delay (s)		23.9		23.9	8.6			15.0	245.5		15.9	
Level of Service		C		C	A			B	F		B	
Approach Delay (s)		23.9			17.9			242.9			15.9	
Approach LOS		C			B			F			B	

Intersection Summary			
HCM 2000 Control Delay	144.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	63.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.7%	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)	0	1091	585	671	453	0	0	0	0	381	0	139
Future Volume (vph)	0	1091	585	671	453	0	0	0	0	381	0	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6040	1546	3236	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		6040	1546	3236	3455					3502		2814
Peak-hour factor, PHF	0.85	0.85	0.85	0.94	0.94	0.94	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	1284	688	714	482	0	0	0	0	423	0	154
RTOR Reduction (vph)	0	0	364	0	0	0	0	0	0	0	0	118
Lane Group Flow (vph)	0	1284	324	714	482	0	0	0	0	423	0	36
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		35.0	35.0	25.0	61.4					23.8		23.8
Effective Green, g (s)		35.0	35.0	25.0	61.4					23.8		23.8
Actuated g/C Ratio		0.34	0.34	0.25	0.60					0.23		0.23
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2076	531	794	2083					818		657
v/s Ratio Prot		c0.21	0.21	c0.22	0.14					c0.12		0.01
v/s Ratio Perm												
v/c Ratio		0.62	0.61	0.90	0.23					0.52		0.05
Uniform Delay, d1		27.8	27.7	37.2	9.3					34.0		30.3
Progression Factor		1.00	1.00	1.37	1.08					1.00		1.00
Incremental Delay, d2		0.8	2.9	10.0	0.1					1.1		0.1
Delay (s)		28.6	30.6	61.0	10.2					35.1		30.3
Level of Service		C	C	E	B					D		C
Approach Delay (s)		29.3			40.5			0.0			33.8	
Approach LOS		C			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	101.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.2%	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)	659	813	0	0	902	399	222	0	613	0	0	0
Future Volume (vph)	659	813	0	0	902	399	222	0	613	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.95		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3236	3455			4914		3433		2814			
Flt Permitted	0.11	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	389	3455			4914		3433		2814			
Peak-hour factor, PHF	0.87	0.87	0.92	0.90	0.90	0.90	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	757	934	0	0	1002	443	236	0	652	0	0	0
RTOR Reduction (vph)	0	0	0	0	75	0	0	0	500	0	0	0
Lane Group Flow (vph)	757	934	0	0	1370	0	236	0	152	0	0	0
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	58.6	35.0			36.4		23.8		23.8			
Effective Green, g (s)	58.6	35.0			36.4		23.8		23.8			
Actuated g/C Ratio	0.58	0.34			0.36		0.23		0.23			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	883	1187			1757		802		657			
v/s Ratio Prot	c0.20	0.27			0.28		c0.07		0.05			
v/s Ratio Perm	c0.29											
v/c Ratio	0.86	0.79			0.78		0.29		0.23			
Uniform Delay, d1	26.5	30.0			29.1		32.1		31.6			
Progression Factor	1.68	0.56			1.00		1.00		1.00			
Incremental Delay, d2	7.1	3.3			2.6		0.4		0.4			
Delay (s)	51.5	20.1			31.8		32.5		32.0			
Level of Service	D	C			C		C		C			
Approach Delay (s)		34.1			31.8			32.1			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	101.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	303	1620	1258	202	375	806
Future Volume (vph)	303	1620	1258	202	375	806
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3539	3539	1583	1787	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3539	3539	1583	1787	1599
Peak-hour factor, PHF	0.88	0.88	0.93	0.93	0.87	0.87
Adj. Flow (vph)	344	1841	1353	217	431	926
RTOR Reduction (vph)	0	0	0	151	0	166
Lane Group Flow (vph)	344	1841	1353	66	431	760
Heavy Vehicles (%)	1%	2%	2%	2%	1%	1%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	5.0	29.0	18.0	18.0	18.0	18.0
Effective Green, g (s)	5.0	29.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.08	0.49	0.31	0.31	0.31	0.31
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	151	1739	1079	482	545	487
v/s Ratio Prot	c0.19	0.52	c0.38		0.24	c0.48
v/s Ratio Perm				0.04		
v/c Ratio	2.28	1.06	1.25	0.14	0.79	1.56
Uniform Delay, d1	27.0	15.0	20.5	14.9	18.8	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	595.7	39.0	122.0	0.6	8.1	262.1
Delay (s)	622.7	54.0	142.5	15.5	26.9	282.6
Level of Service	F	D	F	B	C	F
Approach Delay (s)		143.6	124.9		201.4	
Approach LOS		F	F		F	

Intersection Summary			
HCM 2000 Control Delay	153.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	95.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	137	4	15	9	24	487	15	555	7	60	88	85
Future Vol, veh/h	137	4	15	9	24	487	15	555	7	60	88	85
Peak Hour Factor	0.84	0.84	0.84	0.77	0.77	0.77	0.89	0.89	0.89	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	6	1	0	1	0	4	3	0
Mvmt Flow	163	5	18	12	31	632	17	624	8	65	95	91
Number of Lanes	1	1	0	1	1	1	1	2	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	19.9	191.8	48.3	15.6
HCM LOS	C	F	E	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	96%	0%	21%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	4%	0%	79%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	370	192	137	19	9	24	487	60	88	85
LT Vol	15	0	0	137	0	9	0	0	60	0	0
Through Vol	0	370	185	0	4	0	24	0	0	88	0
RT Vol	0	0	7	0	15	0	0	487	0	0	85
Lane Flow Rate	17	416	216	163	23	12	31	632	65	95	91
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.041	0.953	0.492	0.442	0.055	0.029	0.075	1.374	0.176	0.245	0.218
Departure Headway (Hd)	9.567	9.069	9.026	10.281	9.228	9.02	8.617	7.822	10.805	10.267	9.486
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	377	403	401	352	390	397	416	468	334	352	381
Service Time	7.267	6.769	6.726	7.981	6.928	6.765	6.362	5.567	8.505	7.967	7.186
HCM Lane V/C Ratio	0.045	1.032	0.539	0.463	0.059	0.03	0.075	1.35	0.195	0.27	0.239
HCM Control Delay	12.7	64.4	20.2	20.9	12.5	12	12.1	204	15.8	16.3	14.8
HCM Lane LOS	B	F	C	C	B	B	B	F	C	C	B
HCM 95th-tile Q	0.1	10.8	2.6	2.2	0.2	0.1	0.2	29.4	0.6	0.9	0.8

Intersection	
Int Delay, s/veh	21.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	63	8	2	351	169	9
Future Vol, veh/h	63	8	2	351	169	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	73	73	40	40
Heavy Vehicles, %	4	0	0	2	0	0
Mvmt Flow	90	11	3	481	423	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	101	0	583	96
Stage 1	-	-	-	-	96	-
Stage 2	-	-	-	-	487	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1504	-	478	966
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	622	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1504	-	477	966
Mov Cap-2 Maneuver	-	-	-	-	477	-
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	620	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	50.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	490	-	-	1504	-
HCM Lane V/C Ratio	0.908	-	-	0.002	-
HCM Control Delay (s)	50.2	-	-	7.4	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	10.4	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	65	342	3	1	12
Future Vol, veh/h	7	65	342	3	1	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	77	77	36	36
Heavy Vehicles, %	40	0	0	1	0	11
Mvmt Flow	11	103	444	4	3	33

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	448	0	-	0	571	446
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	125	-
Critical Hdwy	4.5	-	-	-	6.4	6.31
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.56	-	-	-	3.5	3.399
Pot Cap-1 Maneuver	938	-	-	-	486	594
Stage 1	-	-	-	-	649	-
Stage 2	-	-	-	-	906	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	938	-	-	-	480	594
Mov Cap-2 Maneuver	-	-	-	-	480	-
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	906	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	938	-	-	-	583
HCM Lane V/C Ratio	0.012	-	-	-	0.062
HCM Control Delay (s)	8.9	-	-	-	11.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	73	1	5	189	12	11
Future Vol, veh/h	73	1	5	189	12	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	81	81	71	71
Heavy Vehicles, %	0	0	0	1	11	0
Mvmt Flow	94	1	6	233	17	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	95	0	340	95
Stage 1	-	-	-	-	95	-
Stage 2	-	-	-	-	245	-
Critical Hdwy	-	-	4.1	-	6.51	6.2
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	-	-	2.2	-	3.599	3.3
Pot Cap-1 Maneuver	-	-	1512	-	638	967
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	775	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1512	-	635	967
Mov Cap-2 Maneuver	-	-	-	-	635	-
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	771	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	760	-	-	1512	-
HCM Lane V/C Ratio	0.043	-	-	0.004	-
HCM Control Delay (s)	9.9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection						
Int Delay, s/veh	2.9					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	10	13	1	0	6
Future Vol, veh/h	1	10	13	1	0	6
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	67	67	69	69	50	50
Heavy Vehicles, %	0	0	10	0	0	0
Mvmt Flow	1	15	19	1	0	12

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	32	20	0	0	20	0
Stage 1	20	-	-	-	-	-
Stage 2	12	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	987	1064	-	-	1609	-
Stage 1	1008	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	987	1064	-	-	1609	-
Mov Cap-2 Maneuver	987	-	-	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1057	1609	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	-	-	8.5	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection						
Int Delay, s/veh	2.3					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	0	7	14	0
Future Vol, veh/h	3	0	0	7	14	0
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	25	25	63	63	63	63
Heavy Vehicles, %	0	0	0	0	10	0
Mvmt Flow	12	0	0	11	22	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	33	22	22	0	-	0
Stage 1	22	-	-	-	-	-
Stage 2	11	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	986	1061	1607	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	986	1061	1607	-	-	-
Mov Cap-2 Maneuver	986	-	-	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	1017	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1607	-	986	-	-
HCM Lane V/C Ratio	-	-	0.012	-	-
HCM Control Delay (s)	0	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	0	0	178	0	0	5	5
Future Vol, veh/h	0	0	0	0	0	0	0	178	0	0	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	39	39	92	92	67	67
Heavy Vehicles, %	2	2	2	2	2	2	0	0	2	2	0	0
Mvmt Flow	0	0	0	0	0	0	0	456	0	0	7	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	467	467	11	467	470	456	14	0	0	456	0	0
Stage 1	11	11	-	456	456	-	-	-	-	-	-	-
Stage 2	456	456	-	11	14	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	506	493	1070	506	492	604	1617	-	-	1105	-	-
Stage 1	1010	886	-	584	568	-	-	-	-	-	-	-
Stage 2	584	568	-	1010	884	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	506	493	1070	506	492	604	1617	-	-	1105	-	-
Mov Cap-2 Maneuver	506	493	-	506	492	-	-	-	-	-	-	-
Stage 1	1010	886	-	584	568	-	-	-	-	-	-	-
Stage 2	584	568	-	1010	884	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1617	-	-	-	-	1105	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0	-	-

Intersection						
Int Delay, s/veh	0.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	3	574	1	4	101
Future Vol, veh/h	7	3	574	1	4	101
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	88	88	78	78	76	76
Heavy Vehicles, %	0	0	1	0	0	4
Mvmt Flow	8	3	736	1	5	133

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	880	737	0	0	737	0
Stage 1	737	-	-	-	-	-
Stage 2	143	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	320	422	-	-	878	-
Stage 1	477	-	-	-	-	-
Stage 2	889	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	318	422	-	-	878	-
Mov Cap-2 Maneuver	318	-	-	-	-	-
Stage 1	477	-	-	-	-	-
Stage 2	884	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.9	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	343	878	-
HCM Lane V/C Ratio	-	-	0.033	0.006	-
HCM Control Delay (s)	-	-	15.9	9.1	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	6.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	147	428	15	13	95
Future Vol, veh/h	48	147	428	15	13	95
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	72	72	67	67	81	81
Heavy Vehicles, %	14	0	1	46	0	3
Mvmt Flow	67	204	639	22	16	117

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	799	650	0	0	661	0
Stage 1	650	-	-	-	-	-
Stage 2	149	-	-	-	-	-
Critical Hdwy	6.54	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	339	473	-	-	937	-
Stage 1	498	-	-	-	-	-
Stage 2	850	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	333	473	-	-	937	-
Mov Cap-2 Maneuver	333	-	-	-	-	-
Stage 1	498	-	-	-	-	-
Stage 2	835	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.7	0	1.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	429	937	-
HCM Lane V/C Ratio	-	-	0.631	0.017	-
HCM Control Delay (s)	-	-	26.7	8.9	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	4.2	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	351	0	0	161
Future Vol, veh/h	0	4	351	0	0	161
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	25	25	68	68	74	74
Heavy Vehicles, %	0	0	3	0	0	7
Mvmt Flow	0	16	516	0	0	218

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	734	516	0	0	516	0
Stage 1	516	-	-	-	-	-
Stage 2	218	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	390	563	-	-	1060	-
Stage 1	603	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	390	563	-	-	1060	-
Mov Cap-2 Maneuver	390	-	-	-	-	-
Stage 1	603	-	-	-	-	-
Stage 2	823	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	563	1060	-
HCM Lane V/C Ratio	-	-	0.028	-	-
HCM Control Delay (s)	-	-	11.6	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	86.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	20	3	279	19	20	1	265	101	3	443	12
Future Vol, veh/h	27	20	3	279	19	20	1	265	101	3	443	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	85	85	85	84	84	84	88	88	88
Heavy Vehicles, %	0	13	0	0	14	0	0	2	1	0	1	11
Mvmt Flow	50	37	6	328	22	24	1	315	120	3	503	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	916	953	510	915	900	375	517	0	0	435	0	0
Stage 1	516	516	-	377	377	-	-	-	-	-	-	-
Stage 2	400	437	-	538	523	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.63	6.2	7.1	6.64	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.63	-	6.1	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.63	-	6.1	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.117	3.3	3.5	4.126	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	255	248	567	~ 256	266	676	1059	-	-	1135	-	-
Stage 1	546	517	-	649	595	-	-	-	-	-	-	-
Stage 2	630	561	-	531	511	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	230	247	567	~ 223	265	676	1059	-	-	1135	-	-
Mov Cap-2 Maneuver	230	247	-	~ 223	265	-	-	-	-	-	-	-
Stage 1	545	515	-	648	594	-	-	-	-	-	-	-
Stage 2	585	560	-	486	509	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	28.2	$ 323	0	0.1
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1059	-	-	246	235	1135	-	-
HCM Lane V/C Ratio	0.001	-	-	0.376	1.592	0.003	-	-
HCM Control Delay (s)	8.4	0	-	28.2	$ 323	8.2	0	-
HCM Lane LOS	A	A	-	D	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.7	23.4	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	34.8					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	307	72	199	45	24	718
Future Vol, veh/h	307	72	199	45	24	718
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	76	76	83	83
Heavy Vehicles, %	2	2	1	3	0	1
Mvmt Flow	357	84	262	59	29	865

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	612	29	894	0	-	0
Stage 1	29	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	456	1046	763	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	558	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 300	1046	763	-	-	-
Mov Cap-2 Maneuver	~ 300	-	-	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	558	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	123.6	9.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	763	-	300	1046	-	-
HCM Lane V/C Ratio	0.343	-	1.19	0.08	-	-
HCM Control Delay (s)	12.2	-	150.6	8.7	-	-
HCM Lane LOS	B	-	F	A	-	-
HCM 95th %tile Q(veh)	1.5	-	15.7	0.3	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s   +: Computation Not Defined   *: All major volume in platoon

Intersection						
Int Delay, s/veh	0.5					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑			↑↑
Traffic Vol, veh/h	0	55	505	0	0	1181
Future Vol, veh/h	0	55	505	0	0	1181
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	73	73	95	95	89	89
Heavy Vehicles, %	0	13	0	1	0	1
Mvmt Flow	0	75	532	0	0	1327

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	532	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.395	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4235	-	-	-	-
Pot Cap-1 Maneuver	0	521	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	521	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	521	-
HCM Lane V/C Ratio	-	0.145	-
HCM Control Delay (s)	-	13.1	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.5	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	106	6	1189	642	132	8	5	275	6	2	2
Future Volume (vph)	3	106	6	1189	642	132	8	5	275	6	2	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	0.88		1.00	
Frt	1.00	0.99		1.00	0.97			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	
Satd. Flow (prot)	1805	3515		3467	3475			1783	2682		2035	
Flt Permitted	0.95	1.00		0.95	1.00			0.87	1.00		0.86	
Satd. Flow (perm)	1805	3515		3467	3475			1598	2682		1811	
Peak-hour factor, PHF	0.84	0.84	0.84	0.83	1.00	0.83	0.88	0.88	0.88	0.63	0.63	0.63
Adj. Flow (vph)	4	126	7	1433	642	159	9	6	312	10	3	3
RTOR Reduction (vph)	0	4	0	0	10	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	129	0	1433	791	0	0	15	313	0	14	0
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	6%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	5.8	13.0		46.0	54.2			15.7	15.7		15.7	
Effective Green, g (s)	5.8	13.0		46.0	54.2			15.7	15.7		15.7	
Actuated g/C Ratio	0.06	0.14		0.50	0.58			0.17	0.17		0.17	
Clearance Time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	112	492		1720	2031			270	454		306	
v/s Ratio Prot	0.00	c0.04		c0.41	c0.23							
v/s Ratio Perm								0.01	c0.12		0.01	
v/c Ratio	0.04	0.26		0.83	0.39			0.06	0.69		0.04	
Uniform Delay, d1	40.8	35.6		20.1	10.4			32.3	36.2		32.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.3		3.6	0.1			0.1	4.3		0.1	
Delay (s)	40.9	35.9		23.7	10.5			32.4	40.5		32.3	
Level of Service	D	D		C	B			C	D		C	
Approach Delay (s)		36.0			18.9			40.2			32.3	
Approach LOS		D			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	92.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.3%	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)	0	271	116	157	1014	0	0	0	0	566	0	839
Future Volume (vph)	0	271	116	157	1014	0	0	0	0	566	0	839
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5981	1419	2918	3455					3467		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5981	1419	2918	3455					3467		2814
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.75	0.75	0.75
Adj. Flow (vph)	0	339	145	196	1268	0	0	0	0	755	0	1119
RTOR Reduction (vph)	0	0	97	0	0	0	0	0	0	0	0	104
Lane Group Flow (vph)	0	339	48	196	1268	0	0	0	0	755	0	1015
Heavy Vehicles (%)	0%	2%	10%	12%	1%	0%	2%	2%	2%	1%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		33.3	33.3	25.0	64.3					25.0		25.0
Effective Green, g (s)		33.3	33.3	25.0	64.3					25.0		25.0
Actuated g/C Ratio		0.33	0.33	0.25	0.63					0.25		0.25
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		1966	466	720	2193					855		694
v/s Ratio Prot		0.06	0.03	0.07	c0.37					0.22		c0.36
v/s Ratio Perm												
v/c Ratio		0.17	0.10	0.27	0.58					0.88		1.46
Uniform Delay, d1		24.2	23.6	30.8	10.7					36.7		38.1
Progression Factor		1.00	1.00	0.90	1.58					1.00		1.00
Incremental Delay, d2		0.1	0.2	0.1	0.3					11.4		216.1
Delay (s)		24.3	23.8	27.7	17.2					48.2		254.2
Level of Service		C	C	C	B					D		F
Approach Delay (s)		24.1			18.6			0.0			171.2	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	94.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	101.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.4%	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)	118	719	0	0	405	78	766	0	366	0	0	0
Future Volume (vph)	118	719	0	0	405	78	766	0	366	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3113	3421			4938		3433		2733			
Flt Permitted	0.43	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	1402	3421			4938		3433		2733			
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	136	826	0	0	476	92	982	0	469	0	0	0
RTOR Reduction (vph)	0	0	0	0	25	0	0	0	353	0	0	0
Lane Group Flow (vph)	136	826	0	0	543	0	982	0	116	0	0	0
Heavy Vehicles (%)	5%	2%	0%	0%	2%	5%	2%	2%	4%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	50.3	33.3			41.3		25.0		25.0			
Effective Green, g (s)	50.3	33.3			41.3		25.0		25.0			
Actuated g/C Ratio	0.50	0.33			0.41		0.25		0.25			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	983	1124			2013		847		674			
v/s Ratio Prot	c0.02	c0.24			c0.11		c0.29		0.04			
v/s Ratio Perm	0.05											
v/c Ratio	0.14	0.73			0.27		1.16		0.17			
Uniform Delay, d1	13.4	30.1			20.0		38.1		30.0			
Progression Factor	1.14	1.29			1.00		1.00		1.00			
Incremental Delay, d2	0.1	2.3			0.2		84.8		0.3			
Delay (s)	15.4	41.2			20.1		122.9		30.3			
Level of Service	B	D			C		F		C			
Approach Delay (s)		37.6			20.1			93.0			0.0	
Approach LOS		D			C			F			A	

Intersection Summary			
HCM 2000 Control Delay	61.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	101.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	620	2030	731	586	162	189
Future Volume (vph)	620	2030	731	586	162	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3471	3343	1583	1719	1538
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3471	3343	1583	1719	1538
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.76	0.76
Adj. Flow (vph)	721	2360	761	610	213	249
RTOR Reduction (vph)	0	0	0	424	0	192
Lane Group Flow (vph)	721	2360	761	186	213	57
Heavy Vehicles (%)	1%	4%	8%	2%	5%	5%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	9.5	33.5	18.0	18.0	13.5	13.5
Effective Green, g (s)	9.5	33.5	18.0	18.0	13.5	13.5
Actuated g/C Ratio	0.16	0.57	0.31	0.31	0.23	0.23
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	287	1970	1019	482	393	351
v/s Ratio Prot	c0.40	c0.68	0.23		c0.12	0.04
v/s Ratio Perm				0.12		
v/c Ratio	2.51	1.20	0.75	0.39	0.54	0.16
Uniform Delay, d1	24.8	12.8	18.4	16.1	20.0	18.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	690.8	94.3	5.0	2.3	1.9	0.3
Delay (s)	715.5	107.1	23.4	18.5	21.9	18.5
Level of Service	F	F	C	B	C	B
Approach Delay (s)		249.4	21.2		20.1	
Approach LOS		F	C		C	

Intersection Summary			
HCM 2000 Control Delay	164.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	124.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	44	31	14	13	73	8	101	64	585	449	137
Future Vol, veh/h	69	44	31	14	13	73	8	101	64	585	449	137
Peak Hour Factor	0.76	0.76	0.76	0.78	0.78	0.78	0.83	0.83	0.83	0.76	0.76	0.76
Heavy Vehicles, %	0	4	5	0	13	18	0	0	3	2	0	0
Mvmt Flow	91	58	41	18	17	94	10	122	77	770	591	180
Number of Lanes	1	1	0	1	1	1	1	2	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	14.3	13.7	13.8	162.3
HCM LOS	B	B	B	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	34%	0%	59%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	66%	0%	41%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	8	67	98	69	75	14	13	73	585	449	137
LT Vol	8	0	0	69	0	14	0	0	585	0	0
Through Vol	0	67	34	0	44	0	13	0	0	449	0
RT Vol	0	0	64	0	31	0	0	73	0	0	137
Lane Flow Rate	10	81	118	91	99	18	17	94	770	591	180
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.024	0.188	0.26	0.227	0.228	0.046	0.042	0.218	1.509	1.069	0.291
Departure Headway (Hd)	9.374	8.867	8.453	9.385	8.663	9.761	9.48	8.859	7.056	6.517	5.81
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	384	407	427	385	417	369	380	408	516	555	613
Service Time	7.074	6.567	6.153	7.085	6.363	7.461	7.18	6.559	4.843	4.304	3.597
HCM Lane V/C Ratio	0.026	0.199	0.276	0.236	0.237	0.049	0.045	0.23	1.492	1.065	0.294
HCM Control Delay	12.3	13.6	14.1	14.8	13.9	12.9	12.6	14	258.4	83.3	11
HCM Lane LOS	B	B	B	B	B	B	B	B	F	F	B
HCM 95th-tile Q	0.1	0.7	1	0.9	0.9	0.1	0.1	0.8	39.3	17.3	1.2

Intersection						
Int Delay, s/veh	0.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	442	251	22	81	19	0
Future Vol, veh/h	442	251	22	81	19	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	71	71	69	69
Heavy Vehicles, %	1	5	0	12	36	0
Mvmt Flow	567	322	31	114	28	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	889	0	904	728
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	176	-
Critical Hdwy	-	-	4.1	-	6.76	6.2
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	-	-	2.2	-	3.824	3.3
Pot Cap-1 Maneuver	-	-	771	-	268	427
Stage 1	-	-	-	-	422	-
Stage 2	-	-	-	-	779	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	771	-	256	427
Mov Cap-2 Maneuver	-	-	-	-	256	-
Stage 1	-	-	-	-	422	-
Stage 2	-	-	-	-	746	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	20.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	256	-	-	771	-
HCM Lane V/C Ratio	0.108	-	-	0.04	-
HCM Control Delay (s)	20.8	-	-	9.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection						
Int Delay, s/veh	0.4					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	426	84	2	0	6
Future Vol, veh/h	17	426	84	2	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	71	71	50	50
Heavy Vehicles, %	0	1	8	0	0	25
Mvmt Flow	20	501	118	3	0	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	121	0	-	0	661	120
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	541	-
Critical Hdwy	4.1	-	-	-	6.4	6.45
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.525
Pot Cap-1 Maneuver	1479	-	-	-	431	873
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	588	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1479	-	-	-	425	873
Mov Cap-2 Maneuver	-	-	-	-	425	-
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	588	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1479	-	-	-	873
HCM Lane V/C Ratio	0.014	-	-	-	0.014
HCM Control Delay (s)	7.5	-	-	-	9.2
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	1.5					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	226	7	7	104	10	5
Future Vol, veh/h	226	7	7	104	10	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	82	82	25	40
Heavy Vehicles, %	1	0	0	5	20	0
Mvmt Flow	238	7	9	127	40	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	245	0	387	242
Stage 1	-	-	-	-	242	-
Stage 2	-	-	-	-	145	-
Critical Hdwy	-	-	4.1	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.2	-	3.68	3.3
Pot Cap-1 Maneuver	-	-	1333	-	583	802
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	840	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1333	-	579	802
Mov Cap-2 Maneuver	-	-	-	-	579	-
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	834	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	620	-	-	1333	-
HCM Lane V/C Ratio	0.085	-	-	0.006	-
HCM Control Delay (s)	11.3	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	15	13	6	8
Future Vol, veh/h	0	0	15	13	6	8
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	25	25	53	53	50	50
Heavy Vehicles, %	0	0	0	13	0	0
Mvmt Flow	0	0	28	25	12	16

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	81	41	0	0	53	0
Stage 1	41	-	-	-	-	-
Stage 2	40	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	926	1036	-	-	1566	-
Stage 1	987	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	919	1036	-	-	1566	-
Mov Cap-2 Maneuver	919	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	980	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	3.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1566	-
HCM Lane V/C Ratio	-	-	-	0.008	-
HCM Control Delay (s)	-	-	0	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	0	0	8	28	8
Future Vol, veh/h	6	0	0	8	28	8
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	50	50	42	42	69	69
Heavy Vehicles, %	75	0	0	0	6	80
Mvmt Flow	12	0	0	19	41	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	66	47	53	0	-	0
Stage 1	47	-	-	-	-	-
Stage 2	19	-	-	-	-	-
Critical Hdwy	7.15	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.15	-	-	-	-	-
Critical Hdwy Stg 2	6.15	-	-	-	-	-
Follow-up Hdwy	4.175	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	786	1028	1566	-	-	-
Stage 1	818	-	-	-	-	-
Stage 2	844	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	786	1028	1566	-	-	-
Mov Cap-2 Maneuver	786	-	-	-	-	-
Stage 1	818	-	-	-	-	-
Stage 2	844	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1566	-	786	-	-
HCM Lane V/C Ratio	-	-	0.015	-	-
HCM Control Delay (s)	0	-	9.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	0	5	19	0	0	53	220
Future Vol, veh/h	0	0	0	0	0	0	5	19	0	0	53	220
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	88	88	92	92	69	69
Heavy Vehicles, %	2	2	2	2	2	2	0	18	2	2	15	1
Mvmt Flow	0	0	0	0	0	0	6	22	0	0	77	319

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	271	271	237	271	430	22	396	0	0	22	0	0
Stage 1	237	237	-	34	34	-	-	-	-	-	-	-
Stage 2	34	34	-	237	396	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	682	636	802	682	518	1055	1174	-	-	1593	-	-
Stage 1	766	709	-	982	867	-	-	-	-	-	-	-
Stage 2	982	867	-	766	604	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	679	633	802	679	515	1055	1174	-	-	1593	-	-
Mov Cap-2 Maneuver	679	633	-	679	515	-	-	-	-	-	-	-
Stage 1	762	709	-	977	863	-	-	-	-	-	-	-
Stage 2	977	863	-	766	604	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	1.7	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1174	-	-	-	-	1593	-	-
HCM Lane V/C Ratio	0.005	-	-	-	-	-	-	-
HCM Control Delay (s)	8.1	0	-	0	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	2	159	13	13	439
Future Vol, veh/h	6	2	159	13	13	439
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	63	63	81	81	84	84
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	10	3	196	16	15	523

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	757	204	0	0	212	0
Stage 1	204	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	378	842	-	-	1370	-
Stage 1	835	-	-	-	-	-
Stage 2	580	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	372	842	-	-	1370	-
Mov Cap-2 Maneuver	372	-	-	-	-	-
Stage 1	835	-	-	-	-	-
Stage 2	571	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	432	1370	-
HCM Lane V/C Ratio	-	-	0.029	0.011	-
HCM Control Delay (s)	-	-	13.6	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	19	153	13	20	425
Future Vol, veh/h	14	19	153	13	20	425
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	88	88	86	86	83	83
Heavy Vehicles, %	44	0	1	63	0	1
Mvmt Flow	16	22	178	15	24	512

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	746	186	0	0	193	0
Stage 1	186	-	-	-	-	-
Stage 2	560	-	-	-	-	-
Critical Hdwy	6.84	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.896	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	326	861	-	-	1392	-
Stage 1	754	-	-	-	-	-
Stage 2	497	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	318	861	-	-	1392	-
Mov Cap-2 Maneuver	318	-	-	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	485	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	499	1392	-
HCM Lane V/C Ratio	-	-	0.075	0.017	-
HCM Control Delay (s)	-	-	12.8	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	187	2	8	338
Future Vol, veh/h	0	5	187	2	8	338
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	75	75	89	89	81	81
Heavy Vehicles, %	0	0	5	100	0	2
Mvmt Flow	0	7	210	2	10	417

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	648	211	0	0	212	0
Stage 1	211	-	-	-	-	-
Stage 2	437	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	438	834	-	-	1370	-
Stage 1	829	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	434	834	-	-	1370	-
Mov Cap-2 Maneuver	434	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	648	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	834	1370	-
HCM Lane V/C Ratio	-	-	0.008	0.007	-
HCM Control Delay (s)	-	-	9.4	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	11.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	9	2	86	5	6	0	461	391	26	295	29
Future Vol, veh/h	8	9	2	86	5	6	0	461	391	26	295	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	65	65	65	90	90	90	87	87	87
Heavy Vehicles, %	20	0	0	4	0	0	0	2	3	0	3	0
Mvmt Flow	11	12	3	132	8	9	0	512	434	30	339	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1154	1362	356	1152	1161	729	372	0	0	946	0	0
Stage 1	416	416	-	729	729	-	-	-	-	-	-	-
Stage 2	738	946	-	423	432	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.14	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.3	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.3	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4	3.3	3.536	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	160	149	693	173	197	426	1198	-	-	734	-	-
Stage 1	580	595	-	411	431	-	-	-	-	-	-	-
Stage 2	383	343	-	605	586	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	146	141	693	155	187	426	1198	-	-	734	-	-
Mov Cap-2 Maneuver	146	141	-	155	187	-	-	-	-	-	-	-
Stage 1	580	564	-	411	431	-	-	-	-	-	-	-
Stage 2	368	343	-	559	556	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.5	105.3	0	0.8
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1198	-	-	156	163	734	-	-
HCM Lane V/C Ratio	-	-	-	0.162	0.916	0.041	-	-
HCM Control Delay (s)	0	-	-	32.5	105.3	10.1	0	-
HCM Lane LOS	A	-	-	D	F	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	6.7	0.1	-	-

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Intersection	
Int Delay, s/veh	88.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	871	355	48	14	55	238
Future Vol, veh/h	871	355	48	14	55	238
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	70	70	90	90
Heavy Vehicles, %	1	1	3	11	0	4
Mvmt Flow	937	382	69	20	61	264

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	219	61	325	0	-	0
Stage 1	61	-	-	-	-	-
Stage 2	158	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	~ 771	1007	1229	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	~ 873	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 728	1007	1229	-	-	-
Mov Cap-2 Maneuver	~ 728	-	-	-	-	-
Stage 1	~ 910	-	-	-	-	-
Stage 2	~ 873	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	115.5	6.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1229	-	728	1007	-	-
HCM Lane V/C Ratio	0.056	-	1.286	0.379	-	-
HCM Control Delay (s)	8.1	-	158.2	10.7	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	35.9	1.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	103.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	225	1206	0	0	351
Future Vol, veh/h	0	225	1206	0	0	351
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	76	76	70	70	80	80
Heavy Vehicles, %	2	3	2	2	2	4
Mvmt Flow	0	296	1723	0	0	439

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1723	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.245	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3285	-	-	-	-
Pot Cap-1 Maneuver	0	~ 109	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	~ 109	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 859.4	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	109	-
HCM Lane V/C Ratio	-	2.716	-
HCM Control Delay (s)	-	$ 859.4	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	27.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	474	3	293	184	24	11	3	1225	57	3	3
Future Volume (vph)	0	474	3	293	184	24	11	3	1225	57	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		0.95		0.97	0.95			1.00	0.88		1.00	
Frt		1.00		1.00	0.98			1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)		3571		3433	3548			1766	2814		2047	
Flt Permitted		1.00		0.95	1.00			0.83	1.00		0.74	
Satd. Flow (perm)		3571		3433	3548			1526	2814		1587	
Peak-hour factor, PHF	0.88	0.88	0.88	0.96	0.96	0.96	0.91	0.91	0.91	0.68	0.68	0.68
Adj. Flow (vph)	0	539	3	305	192	25	12	3	1346	84	4	4
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	542	0	305	212	0	0	15	1346	0	91	0
Heavy Vehicles (%)	0%	1%	0%	2%	0%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		15.2		11.9	33.1			20.1	20.1		20.1	
Effective Green, g (s)		15.2		11.9	33.1			20.1	20.1		20.1	
Actuated g/C Ratio		0.23		0.18	0.51			0.31	0.31		0.31	
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)		832		626	1801			470	867		489	
v/s Ratio Prot		c0.15		c0.09	0.06							
v/s Ratio Perm								0.01	c0.48		0.06	
v/c Ratio		0.65		0.49	0.12			0.03	1.55		0.19	
Uniform Delay, d1		22.6		23.9	8.4			15.8	22.6		16.5	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.8		0.6	0.0			0.0	254.3		0.2	
Delay (s)		24.4		24.5	8.4			15.8	276.9		16.7	
Level of Service		C		C	A			B	F		B	
Approach Delay (s)		24.4			17.8			274.0			16.7	
Approach LOS		C			B			F			B	

Intersection Summary			
HCM 2000 Control Delay	157.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.1%	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)	0	1159	597	684	474	0	0	0	0	389	0	151
Future Volume (vph)	0	1159	597	684	474	0	0	0	0	389	0	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6040	1546	3236	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		6040	1546	3236	3455					3502		2814
Peak-hour factor, PHF	0.85	0.85	0.85	0.94	0.94	0.94	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	1364	702	728	504	0	0	0	0	432	0	168
RTOR Reduction (vph)	0	0	365	0	0	0	0	0	0	0	0	128
Lane Group Flow (vph)	0	1364	337	728	504	0	0	0	0	432	0	40
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		35.0	35.0	25.0	60.9					24.0		24.0
Effective Green, g (s)		35.0	35.0	25.0	60.9					24.0		24.0
Actuated g/C Ratio		0.34	0.34	0.25	0.60					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2072	530	793	2062					824		662
v/s Ratio Prot		c0.23	0.22	c0.22	0.15					c0.12		0.01
v/s Ratio Perm												
v/c Ratio		0.66	0.64	0.92	0.24					0.52		0.06
Uniform Delay, d1		28.4	28.2	37.5	9.7					34.0		30.2
Progression Factor		1.00	1.00	1.37	1.12					1.00		1.00
Incremental Delay, d2		1.0	3.5	11.4	0.1					1.1		0.1
Delay (s)		29.5	31.6	62.6	10.9					35.2		30.3
Level of Service		C	C	E	B					D		C
Approach Delay (s)		30.2			41.5			0.0			33.8	
Approach LOS		C			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	102.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
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)	693	855	0	0	932	407	226	0	625	0	0	0
Future Volume (vph)	693	855	0	0	932	407	226	0	625	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.95		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3236	3455			4916		3433		2814			
Flt Permitted	0.11	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	389	3455			4916		3433		2814			
Peak-hour factor, PHF	0.87	0.87	0.92	0.90	0.90	0.90	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	797	983	0	0	1036	452	240	0	665	0	0	0
RTOR Reduction (vph)	0	0	0	0	75	0	0	0	509	0	0	0
Lane Group Flow (vph)	797	983	0	0	1413	0	240	0	156	0	0	0
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	59.1	35.0			35.9		24.0		24.0			
Effective Green, g (s)	59.1	35.0			35.9		24.0		24.0			
Actuated g/C Ratio	0.58	0.34			0.35		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	898	1185			1730		807		662			
v/s Ratio Prot	c0.21	0.28			0.29		c0.07		0.06			
v/s Ratio Perm	c0.30											
v/c Ratio	0.89	0.83			0.82		0.30		0.24			
Uniform Delay, d1	27.4	30.8			30.1		32.1		31.6			
Progression Factor	1.67	0.54			1.00		1.00		1.00			
Incremental Delay, d2	8.8	4.4			3.5		0.4		0.4			
Delay (s)	54.6	20.9			33.6		32.5		32.0			
Level of Service	D	C			C		C		C			
Approach Delay (s)		36.0			33.6			32.1			0.0	
Approach LOS		D			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	102.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	309	1653	1283	223	416	850
Future Volume (vph)	309	1653	1283	223	416	850
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3539	3539	1583	1787	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3539	3539	1583	1787	1599
Peak-hour factor, PHF	0.88	0.88	0.93	0.93	0.87	0.87
Adj. Flow (vph)	351	1878	1380	240	478	977
RTOR Reduction (vph)	0	0	0	167	0	166
Lane Group Flow (vph)	351	1878	1380	73	478	811
Heavy Vehicles (%)	1%	2%	2%	2%	1%	1%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	5.0	29.0	18.0	18.0	18.0	18.0
Effective Green, g (s)	5.0	29.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.08	0.49	0.31	0.31	0.31	0.31
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	151	1739	1079	482	545	487
v/s Ratio Prot	c0.20	0.53	c0.39		0.27	c0.51
v/s Ratio Perm				0.05		
v/c Ratio	2.32	1.08	1.28	0.15	0.88	1.67
Uniform Delay, d1	27.0	15.0	20.5	14.9	19.5	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	616.3	46.7	132.8	0.7	15.1	308.3
Delay (s)	643.3	61.7	153.3	15.6	34.6	328.8
Level of Service	F	E	F	B	C	F
Approach Delay (s)		153.3	132.9		232.1	
Approach LOS		F	F		F	

Intersection Summary			
HCM 2000 Control Delay	168.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	104.3
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	140	4	15	9	24	497	15	566	7	61	90	87
Future Vol, veh/h	140	4	15	9	24	497	15	566	7	61	90	87
Peak Hour Factor	0.84	0.84	0.84	0.77	0.77	0.77	0.89	0.89	0.89	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	6	1	0	1	0	4	3	0
Mvmt Flow	167	5	18	12	31	645	17	636	8	66	97	94
Number of Lanes	1	1	0	1	1	1	1	2	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	20.4	210	52.5	15.9
HCM LOS	C	F	F	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	96%	0%	21%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	4%	0%	79%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	377	196	140	19	9	24	497	61	90	87
LT Vol	15	0	0	140	0	9	0	0	61	0	0
Through Vol	0	377	189	0	4	0	24	0	0	90	0
RT Vol	0	0	7	0	15	0	0	497	0	0	87
Lane Flow Rate	17	424	220	167	23	12	31	645	66	97	94
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.041	0.977	0.504	0.455	0.055	0.03	0.075	1.419	0.18	0.252	0.225
Departure Headway (Hd)	9.697	9.199	9.155	10.415	9.363	9.112	8.708	7.913	10.964	10.426	9.643
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	371	399	396	348	385	393	412	465	329	346	375
Service Time	7.397	6.899	6.855	8.115	7.063	6.854	6.451	5.655	8.664	8.126	7.343
HCM Lane V/C Ratio	0.046	1.063	0.556	0.48	0.06	0.031	0.075	1.387	0.201	0.28	0.251
HCM Control Delay	12.8	70.5	20.8	21.5	12.6	12.1	12.2	223.1	16.1	16.6	15.1
HCM Lane LOS	B	F	C	C	B	B	B	F	C	C	C
HCM 95th-tile Q	0.1	11.4	2.7	2.3	0.2	0.1	0.2	31.4	0.6	1	0.9

Intersection						
Int Delay, s/veh	24.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	64	8	2	358	172	10
Future Vol, veh/h	64	8	2	358	172	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	73	73	40	40
Heavy Vehicles, %	4	0	0	2	0	0
Mvmt Flow	91	11	3	490	430	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	102	0	593	97
Stage 1	-	-	-	-	97	-
Stage 2	-	-	-	-	496	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1503	-	472	965
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	616	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1503	-	471	965
Mov Cap-2 Maneuver	-	-	-	-	471	-
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	614	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	56.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	485	-	-	1503	-
HCM Lane V/C Ratio	0.938	-	-	0.002	-
HCM Control Delay (s)	56.2	-	-	7.4	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	11.3	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	66	349	3	1	12
Future Vol, veh/h	7	66	349	3	1	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	77	77	36	36
Heavy Vehicles, %	40	0	0	1	0	11
Mvmt Flow	11	105	453	4	3	33

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	457	0	-	0	582	455
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	127	-
Critical Hdwy	4.5	-	-	-	6.4	6.31
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.56	-	-	-	3.5	3.399
Pot Cap-1 Maneuver	930	-	-	-	479	587
Stage 1	-	-	-	-	643	-
Stage 2	-	-	-	-	904	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	930	-	-	-	473	587
Mov Cap-2 Maneuver	-	-	-	-	473	-
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	904	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	930	-	-	-	576
HCM Lane V/C Ratio	0.012	-	-	-	0.063
HCM Control Delay (s)	8.9	-	-	-	11.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	74	1	6	193	13	11
Future Vol, veh/h	74	1	6	193	13	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	81	81	71	71
Heavy Vehicles, %	0	0	0	1	11	0
Mvmt Flow	95	1	7	238	18	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	96	0	348	96
Stage 1	-	-	-	-	96	-
Stage 2	-	-	-	-	252	-
Critical Hdwy	-	-	4.1	-	6.51	6.2
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	-	-	2.2	-	3.599	3.3
Pot Cap-1 Maneuver	-	-	1510	-	631	966
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	769	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1510	-	628	966
Mov Cap-2 Maneuver	-	-	-	-	628	-
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	765	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	748	-	-	1510	-
HCM Lane V/C Ratio	0.045	-	-	0.005	-
HCM Control Delay (s)	10	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	11	13	1	0	7
Future Vol, veh/h	1	11	13	1	0	7
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	67	67	69	69	50	50
Heavy Vehicles, %	0	0	10	0	0	0
Mvmt Flow	1	16	19	1	0	14

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	34	20	0	0	20	0
Stage 1	20	-	-	-	-	-
Stage 2	14	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	984	1064	-	-	1609	-
Stage 1	1008	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	984	1064	-	-	1609	-
Mov Cap-2 Maneuver	984	-	-	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	1014	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1057	1609	-
HCM Lane V/C Ratio	-	-	0.017	-	-
HCM Control Delay (s)	-	-	8.5	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection						
Int Delay, s/veh	2.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	0	8	14	0
Future Vol, veh/h	3	0	0	8	14	0
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	25	25	63	63	63	63
Heavy Vehicles, %	0	0	0	0	10	0
Mvmt Flow	12	0	0	13	22	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	35	22	22	0	-	0
Stage 1	22	-	-	-	-	-
Stage 2	13	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	983	1061	1607	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	983	1061	1607	-	-	-
Mov Cap-2 Maneuver	983	-	-	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	1015	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1607	-	983	-	-
HCM Lane V/C Ratio	-	-	0.012	-	-
HCM Control Delay (s)	0	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	0	0	182	0	0	5	5
Future Vol, veh/h	0	0	0	0	0	0	0	182	0	0	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	39	39	92	92	67	67
Heavy Vehicles, %	2	2	2	2	2	2	0	0	2	2	0	0
Mvmt Flow	0	0	0	0	0	0	0	467	0	0	7	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	478	478	11	478	481	467	14	0	0	467	0	0
Stage 1	11	11	-	467	467	-	-	-	-	-	-	-
Stage 2	467	467	-	11	14	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	498	486	1070	498	485	596	1617	-	-	1094	-	-
Stage 1	1010	886	-	576	562	-	-	-	-	-	-	-
Stage 2	576	562	-	1010	884	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	498	486	1070	498	485	596	1617	-	-	1094	-	-
Mov Cap-2 Maneuver	498	486	-	498	485	-	-	-	-	-	-	-
Stage 1	1010	886	-	576	562	-	-	-	-	-	-	-
Stage 2	576	562	-	1010	884	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1617	-	-	-	-	1094	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0	-	-

Intersection						
Int Delay, s/veh	0.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	3	586	1	4	103
Future Vol, veh/h	7	3	586	1	4	103
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	88	88	78	78	76	76
Heavy Vehicles, %	0	0	1	0	0	4
Mvmt Flow	8	3	751	1	5	136

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	898	752	0	0	752	0
Stage 1	752	-	-	-	-	-
Stage 2	146	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	312	413	-	-	867	-
Stage 1	469	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	310	413	-	-	867	-
Mov Cap-2 Maneuver	310	-	-	-	-	-
Stage 1	469	-	-	-	-	-
Stage 2	881	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.1	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	335	867	-
HCM Lane V/C Ratio	-	-	0.034	0.006	-
HCM Control Delay (s)	-	-	16.1	9.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

209: International Drive & Lonza North Driveway
2025 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	7.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	49	150	437	15	13	97
Future Vol, veh/h	49	150	437	15	13	97
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	72	72	67	67	81	81
Heavy Vehicles, %	14	0	1	46	0	3
Mvmt Flow	68	208	652	22	16	120

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	815	663	0	0	674	0
Stage 1	663	-	-	-	-	-
Stage 2	152	-	-	-	-	-
Critical Hdwy	6.54	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	331	465	-	-	927	-
Stage 1	491	-	-	-	-	-
Stage 2	847	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	325	465	-	-	927	-
Mov Cap-2 Maneuver	325	-	-	-	-	-
Stage 1	491	-	-	-	-	-
Stage 2	832	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.6	0	1.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	420	927	-
HCM Lane V/C Ratio	-	-	0.658	0.017	-
HCM Control Delay (s)	-	-	28.6	9	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	4.6	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	358	0	0	164
Future Vol, veh/h	0	4	358	0	0	164
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	25	25	68	68	74	74
Heavy Vehicles, %	0	0	3	0	0	7
Mvmt Flow	0	16	526	0	0	222

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	748	526	0	0	526	0
Stage 1	526	-	-	-	-	-
Stage 2	222	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	383	556	-	-	1051	-
Stage 1	597	-	-	-	-	-
Stage 2	820	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	383	556	-	-	1051	-
Mov Cap-2 Maneuver	383	-	-	-	-	-
Stage 1	597	-	-	-	-	-
Stage 2	820	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	556	1051	-
HCM Lane V/C Ratio	-	-	0.029	-	-
HCM Control Delay (s)	-	-	11.7	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	126.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	20	3	285	19	20	1	297	103	3	513	12
Future Vol, veh/h	28	20	3	285	19	20	1	297	103	3	513	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	85	85	85	84	84	84	88	88	88
Heavy Vehicles, %	0	13	0	0	14	0	0	2	1	0	1	11
Mvmt Flow	52	37	6	335	22	24	1	354	123	3	583	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1037	1075	590	1036	1021	416	597	0	0	477	0	0
Stage 1	596	596	-	418	418	-	-	-	-	-	-	-
Stage 2	441	479	-	618	603	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.63	6.2	7.1	6.64	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.63	-	6.1	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.63	-	6.1	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.117	3.3	3.5	4.126	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	211	210	511	~ 212	225	641	989	-	-	1096	-	-
Stage 1	494	475	-	616	570	-	-	-	-	-	-	-
Stage 2	599	537	-	480	470	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	187	209	511	~ 180	224	641	989	-	-	1096	-	-
Mov Cap-2 Maneuver	187	209	-	~ 180	224	-	-	-	-	-	-	-
Stage 1	494	473	-	615	569	-	-	-	-	-	-	-
Stage 2	554	536	-	436	468	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.3	$ 506.9	0	0
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	989	-	-	203	191	1096	-	-
HCM Lane V/C Ratio	0.001	-	-	0.465	1.996	0.003	-	-
HCM Control Delay (s)	8.6	0	-	37.3	$ 506.9	8.3	0	-
HCM Lane LOS	A	A	-	E	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.2	28.7	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	55.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	340	73	203	46	24	793
Future Vol, veh/h	340	73	203	46	24	793
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	76	76	83	83
Heavy Vehicles, %	2	2	1	3	0	1
Mvmt Flow	395	85	267	61	29	955

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	624	29	984	0	-	0
Stage 1	29	-	-	-	-	-
Stage 2	595	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	449	1046	706	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 279	1046	706	-	-	-
Mov Cap-2 Maneuver	~ 279	-	-	-	-	-
Stage 1	618	-	-	-	-	-
Stage 2	551	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	200.9	10.7	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	706	-	279	1046	-	-
HCM Lane V/C Ratio	0.378	-	1.417	0.081	-	-
HCM Control Delay (s)	13.2	-	242.2	8.7	-	-
HCM Lane LOS	B	-	F	A	-	-
HCM 95th %tile Q(veh)	1.8	-	21.5	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.6					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑			↑↑
Traffic Vol, veh/h	0	66	532	0	0	1266
Future Vol, veh/h	0	66	532	0	0	1266
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	73	73	95	95	89	89
Heavy Vehicles, %	0	13	0	1	0	1
Mvmt Flow	0	90	560	0	0	1422

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	560	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.395	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4235	-	-	-	-
Pot Cap-1 Maneuver	0	502	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	502	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	502	-
HCM Lane V/C Ratio	-	0.18	-
HCM Control Delay (s)	-	13.7	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.7	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	106	6	1286	642	132	8	5	323	6	2	2
Future Volume (vph)	3	106	6	1286	642	132	8	5	323	6	2	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	0.88		1.00	
Frt	1.00	0.99		1.00	0.97			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	
Satd. Flow (prot)	1805	3515		3467	3475			1783	2682		2035	
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.87	
Satd. Flow (perm)	1805	3515		3467	3475			1609	2682		1824	
Peak-hour factor, PHF	0.84	0.84	0.84	0.83	1.00	0.83	0.88	0.88	0.88	0.63	0.63	0.63
Adj. Flow (vph)	4	126	7	1549	642	159	9	6	367	10	3	3
RTOR Reduction (vph)	0	4	0	0	10	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	129	0	1549	791	0	0	15	367	0	14	0
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	6%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	6.1	12.8		50.1	57.8			17.6	17.6		17.6	
Effective Green, g (s)	6.1	12.8		50.1	57.8			17.6	17.6		17.6	
Actuated g/C Ratio	0.06	0.13		0.51	0.59			0.18	0.18		0.18	
Clearance Time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	111	456		1763	2039			287	479		325	
v/s Ratio Prot	0.00	c0.04		c0.45	c0.23							
v/s Ratio Perm								0.01	c0.14		0.01	
v/c Ratio	0.04	0.28		0.88	0.39			0.05	0.77		0.04	
Uniform Delay, d1	43.4	38.7		21.5	10.9			33.5	38.5		33.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.3		5.3	0.1			0.1	7.2		0.1	
Delay (s)	43.5	39.0		26.8	11.0			33.6	45.7		33.5	
Level of Service	D	D		C	B			C	D		C	
Approach Delay (s)		39.2			21.4			45.2			33.5	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	98.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

102: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2025 Build Condition Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	302	133	157	1056	0	0	0	0	566	0	894
Future Volume (vph)	0	302	133	157	1056	0	0	0	0	566	0	894
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5981	1419	2918	3455					3467		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5981	1419	2918	3455					3467		2814
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.75	0.75	0.75
Adj. Flow (vph)	0	378	166	196	1320	0	0	0	0	755	0	1192
RTOR Reduction (vph)	0	0	111	0	0	0	0	0	0	0	0	93
Lane Group Flow (vph)	0	378	55	196	1320	0	0	0	0	755	0	1099
Heavy Vehicles (%)	0%	2%	10%	12%	1%	0%	2%	2%	2%	1%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		33.5	33.5	25.0	64.5					25.0		25.0
Effective Green, g (s)		33.5	33.5	25.0	64.5					25.0		25.0
Actuated g/C Ratio		0.33	0.33	0.25	0.64					0.25		0.25
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		1974	468	718	2195					853		693
v/s Ratio Prot		0.06	0.04	0.07	c0.38					0.22		c0.39
v/s Ratio Perm												
v/c Ratio		0.19	0.12	0.27	0.60					0.89		1.59
Uniform Delay, d1		24.3	23.7	30.9	10.9					36.9		38.2
Progression Factor		1.00	1.00	0.89	1.59					1.00		1.00
Incremental Delay, d2		0.1	0.2	0.1	0.3					11.6		270.7
Delay (s)		24.4	23.9	27.5	17.7					48.5		308.9
Level of Service		C	C	C	B					D		F
Approach Delay (s)		24.3			18.9			0.0			207.9	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	111.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	101.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.2%	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)	145	723	0	0	412	78	801	0	366	0	0	0
Future Volume (vph)	145	723	0	0	412	78	801	0	366	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3113	3421			4941		3433		2733			
Flt Permitted	0.42	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	1390	3421			4941		3433		2733			
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	167	831	0	0	485	92	1027	0	469	0	0	0
RTOR Reduction (vph)	0	0	0	0	24	0	0	0	339	0	0	0
Lane Group Flow (vph)	167	831	0	0	553	0	1027	0	130	0	0	0
Heavy Vehicles (%)	5%	2%	0%	0%	2%	5%	2%	2%	4%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	50.5	33.5			41.5		25.0		25.0			
Effective Green, g (s)	50.5	33.5			41.5		25.0		25.0			
Actuated g/C Ratio	0.50	0.33			0.41		0.25		0.25			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	980	1129			2020		845		673			
v/s Ratio Prot	c0.03	c0.24			c0.11		c0.30		0.05			
v/s Ratio Perm	0.06											
v/c Ratio	0.17	0.74			0.27		1.22		0.19			
Uniform Delay, d1	13.5	30.1			20.0		38.2		30.3			
Progression Factor	1.13	1.26			1.00		1.00		1.00			
Incremental Delay, d2	0.1	2.3			0.2		107.7		0.3			
Delay (s)	15.4	40.1			20.1		146.0		30.6			
Level of Service	B	D			C		F		C			
Approach Delay (s)		36.0			20.1			109.8			0.0	
Approach LOS		D			C			F			A	

Intersection Summary			
HCM 2000 Control Delay	69.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	101.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	634	2030	731	613	165	206
Future Volume (vph)	634	2030	731	613	165	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3471	3343	1583	1719	1538
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3471	3343	1583	1719	1538
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.76	0.76
Adj. Flow (vph)	737	2360	761	639	217	271
RTOR Reduction (vph)	0	0	0	444	0	205
Lane Group Flow (vph)	737	2360	761	195	217	66
Heavy Vehicles (%)	1%	4%	8%	2%	5%	5%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	9.4	33.4	18.0	18.0	13.6	13.6
Effective Green, g (s)	9.4	33.4	18.0	18.0	13.6	13.6
Actuated g/C Ratio	0.16	0.57	0.31	0.31	0.23	0.23
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	284	1964	1019	482	396	354
v/s Ratio Prot	c0.41	c0.68	0.23		c0.13	0.04
v/s Ratio Perm				0.12		
v/c Ratio	2.60	1.20	0.75	0.40	0.55	0.19
Uniform Delay, d1	24.8	12.8	18.4	16.3	20.0	18.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	727.9	95.9	5.0	2.5	1.9	0.3
Delay (s)	752.7	108.7	23.4	18.8	21.9	18.6
Level of Service	F	F	C	B	C	B
Approach Delay (s)		262.0	21.3		20.1	
Approach LOS		F	C		C	

Intersection Summary			
HCM 2000 Control Delay	170.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	197.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	44	31	14	13	121	8	101	64	682	449	137
Future Vol, veh/h	69	44	31	14	13	121	8	101	64	682	449	137
Peak Hour Factor	0.76	0.76	0.76	0.78	0.78	0.78	0.83	0.83	0.83	0.76	0.76	0.76
Heavy Vehicles, %	0	4	5	0	13	18	0	0	3	2	0	0
Mvmt Flow	91	58	41	18	17	155	10	122	77	897	591	180
Number of Lanes	1	1	0	1	1	1	1	2	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	15.1	16.4	14.8	261.2
HCM LOS	C	C	B	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	34%	0%	59%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	66%	0%	41%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	8	67	98	69	75	14	13	121	682	449	137
LT Vol	8	0	0	69	0	14	0	0	682	0	0
Through Vol	0	67	34	0	44	0	13	0	0	449	0
RT Vol	0	0	64	0	31	0	0	121	0	0	137
Lane Flow Rate	10	81	118	91	99	18	17	155	897	591	180
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.025	0.195	0.27	0.234	0.235	0.047	0.042	0.364	1.86	1.136	0.311
Departure Headway (Hd)	9.996	9.488	9.073	9.913	9.192	10.089	9.808	9.187	7.461	6.921	6.212
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	360	380	399	365	393	357	367	394	494	532	582
Service Time	7.696	7.188	6.773	7.613	6.892	7.789	7.508	6.887	5.161	4.621	3.912
HCM Lane V/C Ratio	0.028	0.213	0.296	0.249	0.252	0.05	0.046	0.393	1.816	1.111	0.309
HCM Control Delay	13	14.5	15.1	15.6	14.7	13.3	12.9	17.1	412.7	107.1	11.7
HCM Lane LOS	B	B	C	C	B	B	B	C	F	F	B
HCM 95th-tile Q	0.1	0.7	1.1	0.9	0.9	0.1	0.1	1.6	57.7	19.9	1.3

Intersection	
Int Delay, s/veh	7.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	451	339	67	71	77	25
Future Vol, veh/h	451	339	67	71	77	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	71	71	69	69
Heavy Vehicles, %	1	5	0	12	36	0
Mvmt Flow	578	435	94	100	112	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1013	0	1084	796
Stage 1	-	-	-	-	796	-
Stage 2	-	-	-	-	288	-
Critical Hdwy	-	-	4.1	-	6.76	6.2
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	-	-	2.2	-	3.824	3.3
Pot Cap-1 Maneuver	-	-	692	-	207	390
Stage 1	-	-	-	-	390	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	692	-	177	390
Mov Cap-2 Maneuver	-	-	-	-	177	-
Stage 1	-	-	-	-	390	-
Stage 2	-	-	-	-	590	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.4	58.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	204	-	-	692	-
HCM Lane V/C Ratio	0.725	-	-	0.136	-
HCM Control Delay (s)	58.6	-	-	11	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	4.7	-	-	0.5	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	460	119	2	0	6
Future Vol, veh/h	17	460	119	2	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	71	71	50	50
Heavy Vehicles, %	0	1	8	0	0	25
Mvmt Flow	20	541	168	3	0	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	171	0	-	0	751	170
Stage 1	-	-	-	-	170	-
Stage 2	-	-	-	-	581	-
Critical Hdwy	4.1	-	-	-	6.4	6.45
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.525
Pot Cap-1 Maneuver	1418	-	-	-	381	818
Stage 1	-	-	-	-	865	-
Stage 2	-	-	-	-	563	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1418	-	-	-	376	818
Mov Cap-2 Maneuver	-	-	-	-	376	-
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	563	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1418	-	-	-	818
HCM Lane V/C Ratio	0.014	-	-	-	0.015
HCM Control Delay (s)	7.6	-	-	-	9.5
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	251	16	3	149	0	0
Future Vol, veh/h	251	16	3	149	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	82	82	25	40
Heavy Vehicles, %	1	0	0	5	20	0
Mvmt Flow	264	17	4	182	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	281	0	463	273
Stage 1	-	-	-	-	273	-
Stage 2	-	-	-	-	190	-
Critical Hdwy	-	-	4.1	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.2	-	3.68	3.3
Pot Cap-1 Maneuver	-	-	1293	-	525	771
Stage 1	-	-	-	-	733	-
Stage 2	-	-	-	-	801	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1293	-	523	771
Mov Cap-2 Maneuver	-	-	-	-	523	-
Stage 1	-	-	-	-	733	-
Stage 2	-	-	-	-	799	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1293	-
HCM Lane V/C Ratio	-	-	-	0.003	-
HCM Control Delay (s)	0	-	-	7.8	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection						
Int Delay, s/veh	0					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	19	0
Future Vol, veh/h	0	0	0	0	19	0
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	25	25	53	53	50	50
Heavy Vehicles, %	0	0	0	13	0	0
Mvmt Flow	0	0	0	0	38	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	76	0	0	0	0	0
Stage 1	0	-	-	-	-	-
Stage 2	76	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	932	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	952	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	932	-	-	-	-	-
Mov Cap-2 Maneuver	932	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	952	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	-	-
HCM Lane LOS	-	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-

Intersection						
Int Delay, s/veh	4.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	0	0	0	0	8
Future Vol, veh/h	6	0	0	0	0	8
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	50	50	42	42	69	69
Heavy Vehicles, %	75	0	0	0	6	80
Mvmt Flow	12	0	0	0	0	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	6	6	12	0	-	0
Stage 1	6	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	7.15	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.15	-	-	-	-	-
Critical Hdwy Stg 2	6.15	-	-	-	-	-
Follow-up Hdwy	4.175	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	855	1083	1620	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	855	1083	1620	-	-	-
Mov Cap-2 Maneuver	855	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1620	-	855	-	-
HCM Lane V/C Ratio	-	-	0.014	-	-
HCM Control Delay (s)	0	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	68	5	34	0	138	48	220
Future Vol, veh/h	0	0	0	0	0	68	5	34	0	138	48	220
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	88	88	92	92	69	69
Heavy Vehicles, %	2	2	2	2	2	2	0	18	2	2	15	1
Mvmt Flow	0	0	0	0	0	74	6	39	0	150	70	319

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	618	581	230	581	740	39	389	0	0	39	0	0
Stage 1	530	530	-	51	51	-	-	-	-	-	-	-
Stage 2	88	51	-	530	689	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	402	425	809	425	345	1033	1181	-	-	1571	-	-
Stage 1	533	527	-	962	852	-	-	-	-	-	-	-
Stage 2	920	852	-	533	446	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	335	369	809	382	299	1033	1181	-	-	1571	-	-
Mov Cap-2 Maneuver	335	369	-	382	299	-	-	-	-	-	-	-
Stage 1	530	460	-	957	848	-	-	-	-	-	-	-
Stage 2	850	848	-	465	389	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	8.8	1	2.1
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1181	-	-	-	1033	1571	-	-
HCM Lane V/C Ratio	0.005	-	-	-	0.072	0.095	-	-
HCM Control Delay (s)	8.1	0	-	0	8.8	7.5	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.3	-	-

Intersection						
Int Delay, s/veh	0.4					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	2	159	13	13	439
Future Vol, veh/h	6	2	159	13	13	439
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	63	63	81	81	84	84
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	10	3	196	16	15	523

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	757	204	0	0	212	0
Stage 1	204	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	378	842	-	-	1370	-
Stage 1	835	-	-	-	-	-
Stage 2	580	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	372	842	-	-	1370	-
Mov Cap-2 Maneuver	372	-	-	-	-	-
Stage 1	835	-	-	-	-	-
Stage 2	571	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	432	1370	-
HCM Lane V/C Ratio	-	-	0.029	0.011	-
HCM Control Delay (s)	-	-	13.6	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection						
Int Delay, s/veh	0.8					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	19	153	13	20	425
Future Vol, veh/h	14	19	153	13	20	425
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	88	88	86	86	83	83
Heavy Vehicles, %	44	0	1	63	0	1
Mvmt Flow	16	22	178	15	24	512

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	746	186	0	0	193	0
Stage 1	186	-	-	-	-	-
Stage 2	560	-	-	-	-	-
Critical Hdwy	6.84	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.896	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	326	861	-	-	1392	-
Stage 1	754	-	-	-	-	-
Stage 2	497	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	318	861	-	-	1392	-
Mov Cap-2 Maneuver	318	-	-	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	485	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	499	1392	-
HCM Lane V/C Ratio	-	-	0.075	0.017	-
HCM Control Delay (s)	-	-	12.8	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection						
Int Delay, s/veh	0.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	187	2	8	338
Future Vol, veh/h	0	5	187	2	8	338
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	75	75	89	89	81	81
Heavy Vehicles, %	0	0	5	100	0	2
Mvmt Flow	0	7	210	2	10	417

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	648	211	0	0	212	0
Stage 1	211	-	-	-	-	-
Stage 2	437	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	438	834	-	-	1370	-
Stage 1	829	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	434	834	-	-	1370	-
Mov Cap-2 Maneuver	434	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	648	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	834	1370	-
HCM Lane V/C Ratio	-	-	0.008	0.007	-
HCM Control Delay (s)	-	-	9.4	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	11.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	9	2	86	5	6	0	461	391	26	295	29
Future Vol, veh/h	8	9	2	86	5	6	0	461	391	26	295	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	65	65	65	90	90	90	87	87	87
Heavy Vehicles, %	20	0	0	4	0	0	0	2	3	0	3	0
Mvmt Flow	11	12	3	132	8	9	0	512	434	30	339	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1154	1362	356	1152	1161	729	372	0	0	946	0	0
Stage 1	416	416	-	729	729	-	-	-	-	-	-	-
Stage 2	738	946	-	423	432	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.14	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.3	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.3	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4	3.3	3.536	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	160	149	693	173	197	426	1198	-	-	734	-	-
Stage 1	580	595	-	411	431	-	-	-	-	-	-	-
Stage 2	383	343	-	605	586	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	146	141	693	155	187	426	1198	-	-	734	-	-
Mov Cap-2 Maneuver	146	141	-	155	187	-	-	-	-	-	-	-
Stage 1	580	564	-	411	431	-	-	-	-	-	-	-
Stage 2	368	343	-	559	556	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.5	105.3	0	0.8
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1198	-	-	156	163	734	-	-
HCM Lane V/C Ratio	-	-	-	0.162	0.916	0.041	-	-
HCM Control Delay (s)	0	-	-	32.5	105.3	10.1	0	-
HCM Lane LOS	A	-	-	D	F	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	6.7	0.1	-	-

Intersection	
Int Delay, s/veh	115.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	871	396	68	14	55	238
Future Vol, veh/h	871	396	68	14	55	238
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	70	70	90	90
Heavy Vehicles, %	1	1	3	11	0	4
Mvmt Flow	937	426	97	20	61	264

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	275	61	325	0	-	0
Stage 1	61	-	-	-	-	-
Stage 2	214	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	~ 717	1007	1229	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	~ 824	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 660	1007	1229	-	-	-
Mov Cap-2 Maneuver	~ 660	-	-	-	-	-
Stage 1	~ 888	-	-	-	-	-
Stage 2	~ 824	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	152	6.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1229	-	660	1007	-	-
HCM Lane V/C Ratio	0.079	-	1.419	0.423	-	-
HCM Control Delay (s)	8.2	-	216	11.2	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.3	-	42.8	2.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	113.5					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	225	1247	0	0	371
Future Vol, veh/h	0	225	1247	0	0	371
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	76	76	70	70	80	80
Heavy Vehicles, %	2	3	2	2	2	4
Mvmt Flow	0	296	1781	0	0	464

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1781	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.245	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3285	-	-	-	-
Pot Cap-1 Maneuver	0	~ 100	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	~ 100	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 974.6	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	100	-
HCM Lane V/C Ratio	-	2.961	-
HCM Control Delay (s)	-	$ 974.6	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	28.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	474	3	302	184	24	11	3	1326	57	3	3
Future Volume (vph)	0	474	3	302	184	24	11	3	1326	57	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		0.95		0.97	0.95			1.00	0.88		1.00	
Frt		1.00		1.00	0.98			1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)		3571		3433	3548			1766	2814		2047	
Flt Permitted		1.00		0.95	1.00			0.83	1.00		0.74	
Satd. Flow (perm)		3571		3433	3548			1525	2814		1586	
Peak-hour factor, PHF	0.88	0.88	0.88	0.96	0.96	0.96	0.91	0.91	0.91	0.68	0.68	0.68
Adj. Flow (vph)	0	539	3	315	192	25	12	3	1457	84	4	4
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	542	0	315	212	0	0	15	1457	0	91	0
Heavy Vehicles (%)	0%	1%	0%	2%	0%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		15.3		12.1	33.4			20.1	20.1		20.1	
Effective Green, g (s)		15.3		12.1	33.4			20.1	20.1		20.1	
Actuated g/C Ratio		0.23		0.18	0.51			0.31	0.31		0.31	
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)		834		634	1809			467	863		486	
v/s Ratio Prot		c0.15		c0.09	0.06							
v/s Ratio Perm								0.01	c0.52		0.06	
v/c Ratio		0.65		0.50	0.12			0.03	1.69		0.19	
Uniform Delay, d1		22.7		24.0	8.4			15.9	22.7		16.7	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.8		0.6	0.0			0.0	314.8		0.2	
Delay (s)		24.4		24.6	8.4			15.9	337.5		16.9	
Level of Service		C		C	A			B	F		B	
Approach Delay (s)		24.4			18.0			334.2			16.9	
Approach LOS		C			B			F			B	

Intersection Summary			
HCM 2000 Control Delay	195.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	65.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.6%	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)	0	1224	633	684	478	0	0	0	0	389	0	156
Future Volume (vph)	0	1224	633	684	478	0	0	0	0	389	0	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6040	1546	3236	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		6040	1546	3236	3455					3502		2814
Peak-hour factor, PHF	0.85	0.85	0.85	0.94	0.94	0.94	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	1440	745	728	509	0	0	0	0	432	0	173
RTOR Reduction (vph)	0	0	365	0	0	0	0	0	0	0	0	132
Lane Group Flow (vph)	0	1440	380	728	509	0	0	0	0	432	0	41
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		35.0	35.0	25.0	60.2					24.0		24.0
Effective Green, g (s)		35.0	35.0	25.0	60.2					24.0		24.0
Actuated g/C Ratio		0.34	0.34	0.25	0.59					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2072	530	793	2039					824		662
v/s Ratio Prot		0.24	c0.25	c0.22	0.15					c0.12		0.01
v/s Ratio Perm												
v/c Ratio		0.69	0.72	0.92	0.25					0.52		0.06
Uniform Delay, d1		28.9	29.2	37.5	10.0					34.0		30.3
Progression Factor		1.00	1.00	1.35	1.12					1.00		1.00
Incremental Delay, d2		1.3	5.7	11.2	0.1					1.1		0.1
Delay (s)		30.2	34.9	62.0	11.4					35.2		30.3
Level of Service		C	C	E	B					D		C
Approach Delay (s)		31.8			41.2			0.0			33.8	
Approach LOS		C			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	102.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
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)	751	862	0	0	933	407	229	0	625	0	0	0
Future Volume (vph)	751	862	0	0	933	407	229	0	625	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.95		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3236	3455			4917		3433		2814			
Flt Permitted	0.11	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	389	3455			4917		3433		2814			
Peak-hour factor, PHF	0.87	0.87	0.92	0.90	0.90	0.90	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	863	991	0	0	1037	452	244	0	665	0	0	0
RTOR Reduction (vph)	0	0	0	0	76	0	0	0	509	0	0	0
Lane Group Flow (vph)	863	991	0	0	1413	0	244	0	156	0	0	0
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	59.8	35.0			35.2		24.0		24.0			
Effective Green, g (s)	59.8	35.0			35.2		24.0		24.0			
Actuated g/C Ratio	0.59	0.34			0.35		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	920	1185			1696		807		662			
v/s Ratio Prot	c0.23	0.29			0.29		c0.07		0.06			
v/s Ratio Perm	c0.32											
v/c Ratio	0.94	0.84			0.83		0.30		0.24			
Uniform Delay, d1	28.5	30.9			30.7		32.1		31.6			
Progression Factor	1.67	0.54			1.00		1.00		1.00			
Incremental Delay, d2	13.6	4.5			4.1		0.4		0.4			
Delay (s)	61.2	21.2			34.8		32.6		32.0			
Level of Service	E	C			C		C		C			
Approach Delay (s)		39.8			34.8			32.1			0.0	
Approach LOS		D			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	102.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	310	1653	1283	226	423	886
Future Volume (vph)	310	1653	1283	226	423	886
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3539	3539	1583	1787	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3539	3539	1583	1787	1599
Peak-hour factor, PHF	0.88	0.88	0.93	0.93	0.87	0.87
Adj. Flow (vph)	352	1878	1380	243	486	1018
RTOR Reduction (vph)	0	0	0	169	0	166
Lane Group Flow (vph)	352	1878	1380	74	486	852
Heavy Vehicles (%)	1%	2%	2%	2%	1%	1%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	5.0	29.0	18.0	18.0	18.0	18.0
Effective Green, g (s)	5.0	29.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.08	0.49	0.31	0.31	0.31	0.31
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	151	1739	1079	482	545	487
v/s Ratio Prot	c0.20	0.53	c0.39		0.27	c0.53
v/s Ratio Perm				0.05		
v/c Ratio	2.33	1.08	1.28	0.15	0.89	1.75
Uniform Delay, d1	27.0	15.0	20.5	14.9	19.6	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	619.2	46.7	132.8	0.7	17.0	345.6
Delay (s)	646.2	61.7	153.3	15.6	36.6	366.1
Level of Service	F	E	F	B	D	F
Approach Delay (s)		154.0	132.7		259.6	
Approach LOS		F	F		F	

Intersection Summary			
HCM 2000 Control Delay	177.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.61		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	100.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	164.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	140	4	15	9	24	598	15	566	7	70	90	87
Future Vol, veh/h	140	4	15	9	24	598	15	566	7	70	90	87
Peak Hour Factor	0.84	0.84	0.84	0.77	0.77	0.77	0.89	0.89	0.89	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	6	1	0	1	0	4	3	0
Mvmt Flow	167	5	18	12	31	777	17	636	8	75	97	94
Number of Lanes	1	1	0	1	1	1	1	2	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	2
HCM Control Delay	21.3	334.1	55.3	16.8
HCM LOS	C	F	F	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	96%	0%	21%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	4%	0%	79%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	377	196	140	19	9	24	598	70	90	87
LT Vol	15	0	0	140	0	9	0	0	70	0	0
Through Vol	0	377	189	0	4	0	24	0	0	90	0
RT Vol	0	0	7	0	15	0	0	598	0	0	87
Lane Flow Rate	17	424	220	167	23	12	31	777	75	97	94
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.041	0.982	0.507	0.456	0.055	0.03	0.076	1.718	0.207	0.253	0.225
Departure Headway (Hd)	10.284	9.784	9.74	10.904	9.851	9.161	8.757	7.962	11.565	11.023	10.236
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	350	373	374	333	366	391	410	458	312	328	353
Service Time	7.984	7.484	7.44	8.604	7.551	6.905	6.501	5.705	9.265	8.723	7.936
HCM Lane V/C Ratio	0.049	1.137	0.588	0.502	0.063	0.031	0.076	1.697	0.24	0.296	0.266
HCM Control Delay	13.4	74.3	22	22.4	13.1	12.2	12.2	351.9	17.3	17.4	15.9
HCM Lane LOS	B	F	C	C	B	B	B	F	C	C	C
HCM 95th-tile Q	0.1	11.2	2.8	2.3	0.2	0.1	0.2	46.6	0.8	1	0.8

Intersection	
Int Delay, s/veh	201

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	64	17	12	356	275	64
Future Vol, veh/h	64	17	12	356	275	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	73	73	40	40
Heavy Vehicles, %	4	0	0	2	0	0
Mvmt Flow	91	24	16	488	688	160

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	115	0	623	103
Stage 1	-	-	-	-	103	-
Stage 2	-	-	-	-	520	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1487	-	~ 453	957
Stage 1	-	-	-	-	926	-
Stage 2	-	-	-	-	~ 601	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1487	-	~ 446	957
Mov Cap-2 Maneuver	-	-	-	-	~ 446	-
Stage 1	-	-	-	-	926	-
Stage 2	-	-	-	-	~ 592	-

Approach	EB		WB		NB
HCM Control Delay, s	0		0.2		$ 347.8
HCM LOS					F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	496	-	-	1487	-
HCM Lane V/C Ratio	1.709	-	-	0.011	-
HCM Control Delay (s)	$ 347.8	-	-	7.4	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	50.3	-	-	0	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	121	358	3	1	12
Future Vol, veh/h	7	121	358	3	1	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	77	77	36	36
Heavy Vehicles, %	40	0	0	1	0	11
Mvmt Flow	11	192	465	4	3	33

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	469	0	-	0	681	467
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	214	-
Critical Hdwy	4.5	-	-	-	6.4	6.31
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.56	-	-	-	3.5	3.399
Pot Cap-1 Maneuver	920	-	-	-	419	578
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	826	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	920	-	-	-	414	578
Mov Cap-2 Maneuver	-	-	-	-	414	-
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	826	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	920	-	-	-	561
HCM Lane V/C Ratio	0.012	-	-	-	0.064
HCM Control Delay (s)	9	-	-	-	11.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	0.4					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	128	1	0	203	11	0
Future Vol, veh/h	128	1	0	203	11	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	81	81	71	71
Heavy Vehicles, %	0	0	0	1	11	0
Mvmt Flow	164	1	0	251	15	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	165	0	416	165
Stage 1	-	-	-	-	165	-
Stage 2	-	-	-	-	251	-
Critical Hdwy	-	-	4.1	-	6.51	6.2
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	-	-	2.2	-	3.599	3.3
Pot Cap-1 Maneuver	-	-	1426	-	576	885
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	770	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1426	-	576	885
Mov Cap-2 Maneuver	-	-	-	-	576	-
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	770	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	576	-	-	1426	-
HCM Lane V/C Ratio	0.027	-	-	-	-
HCM Control Delay (s)	11.4	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	11	0	0	1	0
Future Vol, veh/h	1	11	0	0	1	0
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	67	67	69	69	50	50
Heavy Vehicles, %	0	0	10	0	0	0
Mvmt Flow	1	16	0	0	2	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	4	0	0	0	0	0
Stage 1	0	-	-	-	-	-
Stage 2	4	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	1023	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1024	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1023	-	-	-	-	-
Mov Cap-2 Maneuver	1023	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1024	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		0	
HCM LOS	-		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	-	-	-
HCM Lane LOS	-	-	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-

Intersection						
Int Delay, s/veh	6.8					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	0	1	0	0
Future Vol, veh/h	3	0	0	1	0	0
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	25	25	63	63	63	63
Heavy Vehicles, %	0	0	0	0	10	0
Mvmt Flow	12	0	0	2	0	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	4	2	2	0	-	0
Stage 1	2	-	-	-	-	-
Stage 2	2	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	1023	1088	1634	-	-	-
Stage 1	1026	-	-	-	-	-
Stage 2	1026	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1023	1088	1634	-	-	-
Mov Cap-2 Maneuver	1023	-	-	-	-	-
Stage 1	1026	-	-	-	-	-
Stage 2	1026	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1634	-	1023	-	-
HCM Lane V/C Ratio	-	-	0.012	-	-
HCM Control Delay (s)	0	-	8.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection												
Int Delay, s/veh	3.3											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	144	0	195	0	13	11	5
Future Vol, veh/h	0	0	0	0	0	144	0	195	0	13	11	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	39	39	92	92	67	67
Heavy Vehicles, %	2	2	2	2	2	2	0	0	2	2	0	0
Mvmt Flow	0	0	0	0	0	157	0	500	0	14	16	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	627	548	20	548	551	500	23	0	0	500	0	0
Stage 1	48	48	-	500	500	-	-	-	-	-	-	-
Stage 2	579	500	-	48	51	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	396	444	1058	447	442	571	1605	-	-	1064	-	-
Stage 1	965	855	-	553	543	-	-	-	-	-	-	-
Stage 2	501	543	-	965	852	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	285	438	1058	443	436	571	1605	-	-	1064	-	-
Mov Cap-2 Maneuver	285	438	-	443	436	-	-	-	-	-	-	-
Stage 1	965	844	-	553	543	-	-	-	-	-	-	-
Stage 2	364	543	-	952	841	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			13.7			0			3.1		
HCM LOS	A			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1605	-	-	-	571	1064	-	-
HCM Lane V/C Ratio	-	-	-	-	0.274	0.013	-	-
HCM Control Delay (s)	0	-	-	0	13.7	8.4	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	1.1	0	-	-

Intersection						
Int Delay, s/veh	0.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	3	586	1	4	103
Future Vol, veh/h	7	3	586	1	4	103
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	88	88	78	78	76	76
Heavy Vehicles, %	0	0	1	0	0	4
Mvmt Flow	8	3	751	1	5	136

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	898	752	0	0	752	0
Stage 1	752	-	-	-	-	-
Stage 2	146	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	312	413	-	-	867	-
Stage 1	469	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	310	413	-	-	867	-
Mov Cap-2 Maneuver	310	-	-	-	-	-
Stage 1	469	-	-	-	-	-
Stage 2	881	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.1	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	335	867	-
HCM Lane V/C Ratio	-	-	0.034	0.006	-
HCM Control Delay (s)	-	-	16.1	9.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection						
Int Delay, s/veh	7.4					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	49	150	437	15	13	97
Future Vol, veh/h	49	150	437	15	13	97
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	72	72	67	67	81	81
Heavy Vehicles, %	14	0	1	46	0	3
Mvmt Flow	68	208	652	22	16	120

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	815	663	0	0	674	0
Stage 1	663	-	-	-	-	-
Stage 2	152	-	-	-	-	-
Critical Hdwy	6.54	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	331	465	-	-	927	-
Stage 1	491	-	-	-	-	-
Stage 2	847	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	325	465	-	-	927	-
Mov Cap-2 Maneuver	325	-	-	-	-	-
Stage 1	491	-	-	-	-	-
Stage 2	832	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.6	0	1.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	420	927	-
HCM Lane V/C Ratio	-	-	0.658	0.017	-
HCM Control Delay (s)	-	-	28.6	9	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	4.6	0.1	-

210: International Drive & Lonza South Driveway
2025 Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	358	0	0	164
Future Vol, veh/h	0	4	358	0	0	164
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	25	25	68	68	74	74
Heavy Vehicles, %	0	0	3	0	0	7
Mvmt Flow	0	16	526	0	0	222

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	748	526	0	0	526	0
Stage 1	526	-	-	-	-	-
Stage 2	222	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	383	556	-	-	1051	-
Stage 1	597	-	-	-	-	-
Stage 2	820	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	383	556	-	-	1051	-
Mov Cap-2 Maneuver	383	-	-	-	-	-
Stage 1	597	-	-	-	-	-
Stage 2	820	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	556	1051	-
HCM Lane V/C Ratio	-	-	0.029	-	-
HCM Control Delay (s)	-	-	11.7	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	126.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	20	3	285	19	20	1	297	103	3	513	12
Future Vol, veh/h	28	20	3	285	19	20	1	297	103	3	513	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	85	85	85	84	84	84	88	88	88
Heavy Vehicles, %	0	13	0	0	14	0	0	2	1	0	1	11
Mvmt Flow	52	37	6	335	22	24	1	354	123	3	583	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1037	1075	590	1036	1021	416	597	0	0	477	0	0
Stage 1	596	596	-	418	418	-	-	-	-	-	-	-
Stage 2	441	479	-	618	603	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.63	6.2	7.1	6.64	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.63	-	6.1	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.63	-	6.1	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.117	3.3	3.5	4.126	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	211	210	511	~ 212	225	641	989	-	-	1096	-	-
Stage 1	494	475	-	616	570	-	-	-	-	-	-	-
Stage 2	599	537	-	480	470	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	187	209	511	~ 180	224	641	989	-	-	1096	-	-
Mov Cap-2 Maneuver	187	209	-	~ 180	224	-	-	-	-	-	-	-
Stage 1	494	473	-	615	569	-	-	-	-	-	-	-
Stage 2	554	536	-	436	468	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.3	$ 506.9	0	0
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	989	-	-	203	191	1096	-	-
HCM Lane V/C Ratio	0.001	-	-	0.465	1.996	0.003	-	-
HCM Control Delay (s)	8.6	0	-	37.3	$ 506.9	8.3	0	-
HCM Lane LOS	A	A	-	E	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.2	28.7	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	101.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	340	77	246	46	24	793
Future Vol, veh/h	340	77	246	46	24	793
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	76	76	83	83
Heavy Vehicles, %	2	2	1	3	0	1
Mvmt Flow	395	90	324	61	29	955

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	738	29	984	0	-	0
Stage 1	29	-	-	-	-	-
Stage 2	709	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	~ 385	1046	706	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 208	1046	706	-	-	-
Mov Cap-2 Maneuver	~ 208	-	-	-	-	-
Stage 1	538	-	-	-	-	-
Stage 2	488	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 377.7	12.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	706	-	208	1046	-	-
HCM Lane V/C Ratio	0.458	-	1.901	0.086	-	-
HCM Control Delay (s)	14.3	-	$ 461.3	8.8	-	-
HCM Lane LOS	B	-	F	A	-	-
HCM 95th %tile Q(veh)	2.4	-	28.6	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.6					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑			↑↑
Traffic Vol, veh/h	0	66	536	0	0	1309
Future Vol, veh/h	0	66	536	0	0	1309
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	73	73	95	95	89	89
Heavy Vehicles, %	0	13	0	1	0	1
Mvmt Flow	0	90	564	0	0	1471

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	564	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.395	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4235	-	-	-	-
Pot Cap-1 Maneuver	0	499	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	499	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	499	-
HCM Lane V/C Ratio	-	0.181	-
HCM Control Delay (s)	-	13.8	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.7	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	115	7	1405	704	145	9	6	356	7	2	2
Future Volume (vph)	3	115	7	1405	704	145	9	6	356	7	2	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	0.88		1.00	
Frt	1.00	0.99		1.00	0.97			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	
Satd. Flow (prot)	1805	3514		3467	3474			1784	2682		2036	
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.87	
Satd. Flow (perm)	1805	3514		3467	3474			1613	2682		1819	
Peak-hour factor, PHF	0.84	0.84	0.84	0.83	1.00	0.83	0.88	0.88	0.88	0.63	0.63	0.63
Adj. Flow (vph)	4	137	8	1693	704	175	10	7	405	11	3	3
RTOR Reduction (vph)	0	4	0	0	11	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	141	0	1693	868	0	0	17	405	0	15	0
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	6%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	6.3	13.2		50.1	58.0			18.8	18.8		18.8	
Effective Green, g (s)	6.3	13.2		50.1	58.0			18.8	18.8		18.8	
Actuated g/C Ratio	0.06	0.13		0.50	0.58			0.19	0.19		0.19	
Clearance Time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	113	463		1735	2012			302	503		341	
v/s Ratio Prot	0.00	c0.04		c0.49	c0.25							
v/s Ratio Perm								0.01	c0.15		0.01	
v/c Ratio	0.04	0.30		0.98	0.43			0.06	0.81		0.04	
Uniform Delay, d1	44.0	39.3		24.4	11.8			33.4	38.9		33.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.4		16.1	0.1			0.1	9.1		0.1	
Delay (s)	44.1	39.7		40.5	12.0			33.4	48.0		33.3	
Level of Service	D	D		D	B			C	D		C	
Approach Delay (s)		39.8			30.7			47.4			33.3	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.7%	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)	0	334	144	174	1172	0	0	0	0	625	0	961
Future Volume (vph)	0	334	144	174	1172	0	0	0	0	625	0	961
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5981	1419	2918	3455					3467		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5981	1419	2918	3455					3467		2814
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.75	0.75	0.75
Adj. Flow (vph)	0	418	180	218	1465	0	0	0	0	833	0	1281
RTOR Reduction (vph)	0	0	119	0	0	0	0	0	0	0	0	72
Lane Group Flow (vph)	0	418	61	218	1465	0	0	0	0	833	0	1209
Heavy Vehicles (%)	0%	2%	10%	12%	1%	0%	2%	2%	2%	1%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		34.5	34.5	25.0	65.5					25.0		25.0
Effective Green, g (s)		34.5	34.5	25.0	65.5					25.0		25.0
Actuated g/C Ratio		0.34	0.34	0.24	0.64					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2013	477	711	2207					845		686
v/s Ratio Prot		0.07	0.04	0.07	c0.42					0.24		c0.43
v/s Ratio Perm												
v/c Ratio		0.21	0.13	0.31	0.66					0.99		1.76
Uniform Delay, d1		24.3	23.6	31.7	11.6					38.6		38.8
Progression Factor		1.00	1.00	0.90	1.55					1.00		1.00
Incremental Delay, d2		0.1	0.3	0.1	0.2					27.4		349.1
Delay (s)		24.4	23.8	28.6	18.2					66.0		387.9
Level of Service		C	C	C	B					E		F
Approach Delay (s)		24.2			19.6			0.0			261.0	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	136.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
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)	150	809	0	0	472	86	874	0	405	0	0	0
Future Volume (vph)	150	809	0	0	472	86	874	0	405	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3113	3421			4945		3433		2733			
Flt Permitted	0.39	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	1282	3421			4945		3433		2733			
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	172	930	0	0	555	101	1121	0	519	0	0	0
RTOR Reduction (vph)	0	0	0	0	22	0	0	0	345	0	0	0
Lane Group Flow (vph)	172	930	0	0	634	0	1121	0	174	0	0	0
Heavy Vehicles (%)	5%	2%	0%	0%	2%	5%	2%	2%	4%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	51.5	34.5			42.5		25.0		25.0			
Effective Green, g (s)	51.5	34.5			42.5		25.0		25.0			
Actuated g/C Ratio	0.50	0.34			0.41		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	947	1151			2050		837		666			
v/s Ratio Prot	c0.03	c0.27			c0.13		c0.33		0.06			
v/s Ratio Perm	0.06											
v/c Ratio	0.18	0.81			0.31		1.34		0.26			
Uniform Delay, d1	13.4	31.0			20.1		38.8		31.3			
Progression Factor	1.10	1.25			1.00		1.00		1.00			
Incremental Delay, d2	0.1	3.3			0.2		160.8		0.4			
Delay (s)	14.8	41.9			20.3		199.5		31.7			
Level of Service	B	D			C		F		C			
Approach Delay (s)		37.7			20.3			146.4			0.0	
Approach LOS		D			C			F			A	

Intersection Summary			
HCM 2000 Control Delay	86.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	685	2242	808	643	178	207
Future Volume (vph)	685	2242	808	643	178	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3471	3343	1583	1719	1538
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3471	3343	1583	1719	1538
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.76	0.76
Adj. Flow (vph)	797	2607	842	670	234	272
RTOR Reduction (vph)	0	0	0	466	0	195
Lane Group Flow (vph)	797	2607	842	204	234	77
Heavy Vehicles (%)	1%	4%	8%	2%	5%	5%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	8.8	32.8	18.0	18.0	14.2	14.2
Effective Green, g (s)	8.8	32.8	18.0	18.0	14.2	14.2
Actuated g/C Ratio	0.15	0.56	0.31	0.31	0.24	0.24
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	266	1929	1019	482	413	370
v/s Ratio Prot	c0.45	c0.75	0.25		c0.14	0.05
v/s Ratio Perm				0.13		
v/c Ratio	3.00	1.35	0.83	0.42	0.57	0.21
Uniform Delay, d1	25.1	13.1	19.0	16.4	19.7	17.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	908.4	161.7	7.7	2.7	2.2	0.4
Delay (s)	933.5	174.8	26.7	19.1	21.9	18.3
Level of Service	F	F	C	B	C	B
Approach Delay (s)		352.4	23.3		19.9	
Approach LOS		F	C		B	

Intersection Summary			
HCM 2000 Control Delay	229.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
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)	77	48	34	16	15	84	9	159	71	718	515	151
Future Volume (vph)	77	48	34	16	15	84	9	159	71	718	515	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	1706		1805	1681	1369	1805	3411		1770	1900	1615
Flt Permitted	0.75	1.00		0.69	1.00	1.00	0.41	1.00		0.42	1.00	1.00
Satd. Flow (perm)	1416	1706		1306	1681	1369	774	3411		791	1900	1615
Peak-hour factor, PHF	0.76	0.76	0.76	0.78	0.78	0.78	0.83	0.83	0.83	0.76	0.76	0.76
Adj. Flow (vph)	101	63	45	21	19	108	11	192	86	945	678	199
RTOR Reduction (vph)	0	24	0	0	0	91	0	47	0	0	0	61
Lane Group Flow (vph)	101	84	0	21	19	17	11	231	0	945	678	138
Heavy Vehicles (%)	0%	4%	5%	0%	13%	18%	0%	0%	3%	2%	0%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	13.3	13.3		13.3	13.3	13.3	13.0	13.0		57.8	57.8	57.8
Effective Green, g (s)	13.3	13.3		13.3	13.3	13.3	13.0	13.0		57.8	57.8	57.8
Actuated g/C Ratio	0.16	0.16		0.16	0.16	0.16	0.16	0.16		0.70	0.70	0.70
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		4.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	226	273		209	269	219	121	533		1024	1321	1123
v/s Ratio Prot		0.05			0.01			0.07		c0.45	0.36	
v/s Ratio Perm	c0.07			0.02		0.01	0.01			c0.19		0.09
v/c Ratio	0.45	0.31		0.10	0.07	0.08	0.09	0.43		0.92	0.51	0.12
Uniform Delay, d1	31.6	30.8		29.8	29.6	29.7	30.0	31.7		10.9	6.0	4.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	0.6		0.2	0.1	0.2	0.3	0.6		13.3	0.3	0.0
Delay (s)	33.0	31.5		30.0	29.8	29.8	30.3	32.3		24.2	6.3	4.3
Level of Service	C	C		C	C	C	C	C		C	A	A
Approach Delay (s)		32.2			29.9			32.2			15.4	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	83.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection						
Int Delay, s/veh	1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	560	277	25	94	21	0
Future Vol, veh/h	560	277	25	94	21	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	71	71	69	69
Heavy Vehicles, %	1	5	0	12	36	0
Mvmt Flow	718	355	35	132	30	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1073	0	1098	896
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	202	-
Critical Hdwy	-	-	4.1	-	6.76	6.2
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	-	-	2.2	-	3.824	3.3
Pot Cap-1 Maneuver	-	-	657	-	203	342
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	757	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	657	-	191	342
Mov Cap-2 Maneuver	-	-	-	-	191	-
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	713	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	27.4
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	191	-	-	657	-
HCM Lane V/C Ratio	0.159	-	-	0.054	-
HCM Control Delay (s)	27.4	-	-	10.8	0
HCM Lane LOS	D	-	-	B	A
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-

Intersection						
Int Delay, s/veh	0.4					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	543	96	2	0	7
Future Vol, veh/h	19	543	96	2	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	71	71	50	50
Heavy Vehicles, %	0	1	8	0	0	25
Mvmt Flow	22	639	135	3	0	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	138	0	-	0	820	137
Stage 1	-	-	-	-	137	-
Stage 2	-	-	-	-	683	-
Critical Hdwy	4.1	-	-	-	6.4	6.45
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.525
Pot Cap-1 Maneuver	1458	-	-	-	347	854
Stage 1	-	-	-	-	895	-
Stage 2	-	-	-	-	505	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1458	-	-	-	342	854
Mov Cap-2 Maneuver	-	-	-	-	342	-
Stage 1	-	-	-	-	882	-
Stage 2	-	-	-	-	505	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1458	-	-	-	854
HCM Lane V/C Ratio	0.015	-	-	-	0.016
HCM Control Delay (s)	7.5	-	-	-	9.3
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	1.4					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	322	8	8	119	10	6
Future Vol, veh/h	322	8	8	119	10	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	82	82	25	40
Heavy Vehicles, %	1	0	0	5	20	0
Mvmt Flow	339	8	10	145	40	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	347	0	508	343
Stage 1	-	-	-	-	343	-
Stage 2	-	-	-	-	165	-
Critical Hdwy	-	-	4.1	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.2	-	3.68	3.3
Pot Cap-1 Maneuver	-	-	1223	-	494	704
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	822	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1223	-	490	704
Mov Cap-2 Maneuver	-	-	-	-	490	-
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	815	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	534	-	-	1223	-
HCM Lane V/C Ratio	0.103	-	-	0.008	-
HCM Control Delay (s)	12.5	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	16	15	7	9
Future Vol, veh/h	0	0	16	15	7	9
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	25	25	53	53	50	50
Heavy Vehicles, %	0	0	0	13	0	0
Mvmt Flow	0	0	30	28	14	18

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	90	44	0	0	58	0
Stage 1	44	-	-	-	-	-
Stage 2	46	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	915	1032	-	-	1559	-
Stage 1	984	-	-	-	-	-
Stage 2	982	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	907	1032	-	-	1559	-
Mov Cap-2 Maneuver	907	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	973	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	0		0		3.2	
HCM LOS	A					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1559	-
HCM Lane V/C Ratio	-	-	-	0.009	-
HCM Control Delay (s)	-	-	0	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection						
Int Delay, s/veh	1.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	0	0	9	31	9
Future Vol, veh/h	7	0	0	9	31	9
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	50	50	42	42	69	69
Heavy Vehicles, %	75	0	0	0	6	80
Mvmt Flow	14	0	0	21	45	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	73	52	58	0	-	0
Stage 1	52	-	-	-	-	-
Stage 2	21	-	-	-	-	-
Critical Hdwy	7.15	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.15	-	-	-	-	-
Critical Hdwy Stg 2	6.15	-	-	-	-	-
Follow-up Hdwy	4.175	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	778	1021	1559	-	-	-
Stage 1	813	-	-	-	-	-
Stage 2	842	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	778	1021	1559	-	-	-
Mov Cap-2 Maneuver	778	-	-	-	-	-
Stage 1	813	-	-	-	-	-
Stage 2	842	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1559	-	778	-	-
HCM Lane V/C Ratio	-	-	0.018	-	-
HCM Control Delay (s)	0	-	9.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	0	6	21	0	0	59	243
Future Vol, veh/h	0	0	0	0	0	0	6	21	0	0	59	243
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	88	88	92	92	69	69
Heavy Vehicles, %	2	2	2	2	2	2	0	18	2	2	15	1
Mvmt Flow	0	0	0	0	0	0	7	24	0	0	86	352

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	300	300	262	300	476	24	438	0	0	24	0	0
Stage 1	262	262	-	38	38	-	-	-	-	-	-	-
Stage 2	38	38	-	262	438	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	652	612	777	652	488	1052	1133	-	-	1591	-	-
Stage 1	743	691	-	977	863	-	-	-	-	-	-	-
Stage 2	977	863	-	743	579	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	649	608	777	649	485	1052	1133	-	-	1591	-	-
Mov Cap-2 Maneuver	649	608	-	649	485	-	-	-	-	-	-	-
Stage 1	739	691	-	971	858	-	-	-	-	-	-	-
Stage 2	971	858	-	743	579	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	1.8	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1133	-	-	-	-	1591	-	-
HCM Lane V/C Ratio	0.006	-	-	-	-	-	-	-
HCM Control Delay (s)	8.2	0	-	0	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	2	223	15	15	504
Future Vol, veh/h	7	2	223	15	15	504
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	63	63	81	81	84	84
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	11	3	275	19	18	600

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	921	285	0	0	294	0
Stage 1	285	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	303	759	-	-	1279	-
Stage 1	768	-	-	-	-	-
Stage 2	531	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	297	759	-	-	1279	-
Mov Cap-2 Maneuver	297	-	-	-	-	-
Stage 1	768	-	-	-	-	-
Stage 2	520	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	343	1279	-
HCM Lane V/C Ratio	-	-	0.042	0.014	-
HCM Control Delay (s)	-	-	16	7.9	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection						
Int Delay, s/veh	0.9					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	21	217	15	23	488
Future Vol, veh/h	16	21	217	15	23	488
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	88	88	86	86	83	83
Heavy Vehicles, %	44	0	1	63	0	1
Mvmt Flow	18	24	252	17	28	588

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	905	261	0	0	269	0
Stage 1	261	-	-	-	-	-
Stage 2	644	-	-	-	-	-
Critical Hdwy	6.84	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.896	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	260	783	-	-	1306	-
Stage 1	695	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	252	783	-	-	1306	-
Mov Cap-2 Maneuver	252	-	-	-	-	-
Stage 1	695	-	-	-	-	-
Stage 2	437	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.8	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	410	1306	-
HCM Lane V/C Ratio	-	-	0.103	0.021	-
HCM Control Delay (s)	-	-	14.8	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	6	253	2	9	392
Future Vol, veh/h	0	6	253	2	9	392
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	75	75	89	89	81	81
Heavy Vehicles, %	0	0	5	100	0	2
Mvmt Flow	0	8	284	2	11	484

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	791	285	0	0	286	0
Stage 1	285	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	361	759	-	-	1288	-
Stage 1	768	-	-	-	-	-
Stage 2	610	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	357	759	-	-	1288	-
Mov Cap-2 Maneuver	357	-	-	-	-	-
Stage 1	768	-	-	-	-	-
Stage 2	603	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	759	1288	-
HCM Lane V/C Ratio	-	-	0.011	0.009	-
HCM Control Delay (s)	-	-	9.8	7.8	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	23.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	10	2	95	6	7	0	503	432	28	324	32
Future Vol, veh/h	9	10	2	95	6	7	0	503	432	28	324	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	65	65	65	90	90	90	87	87	87
Heavy Vehicles, %	20	0	0	4	0	0	0	2	3	0	3	0
Mvmt Flow	12	13	3	146	9	11	0	559	480	32	372	37

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1264	1494	391	1262	1272	799	409	0	0	1039	0	0
Stage 1	455	455	-	799	799	-	-	-	-	-	-	-
Stage 2	809	1039	-	463	473	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.14	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.3	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.3	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4	3.3	3.536	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	134	124	662	~ 145	169	389	1161	-	-	677	-	-
Stage 1	552	572	-	376	401	-	-	-	-	-	-	-
Stage 2	349	310	-	575	562	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	119	116	662	~ 126	159	389	1161	-	-	677	-	-
Mov Cap-2 Maneuver	119	116	-	~ 126	159	-	-	-	-	-	-	-
Stage 1	552	537	-	376	401	-	-	-	-	-	-	-
Stage 2	332	310	-	524	528	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	41.2	223.7	0	0.8
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1161	-	-	127	133	677	-	-
HCM Lane V/C Ratio	-	-	-	0.22	1.249	0.048	-	-
HCM Control Delay (s)	0	-	-	41.2	223.7	10.6	0	-
HCM Lane LOS	A	-	-	E	F	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.8	10.2	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	130.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	956	392	53	16	61	261
Future Vol, veh/h	956	392	53	16	61	261
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	70	70	90	90
Heavy Vehicles, %	1	1	3	11	0	4
Mvmt Flow	1028	422	76	23	68	290

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	243	68	358	0	-	0
Stage 1	68	-	-	-	-	-
Stage 2	175	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	~ 748	998	1195	-	-	-
Stage 1	~ 957	-	-	-	-	-
Stage 2	~ 858	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 700	998	1195	-	-	-
Mov Cap-2 Maneuver	~ 700	-	-	-	-	-
Stage 1	~ 896	-	-	-	-	-
Stage 2	~ 858	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	170.6	6.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1195	-	700	998	-	-
HCM Lane V/C Ratio	0.063	-	1.469	0.422	-	-
HCM Control Delay (s)	8.2	-	236	11.2	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	48.9	2.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	163.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	246	1328	0	0	385
Future Vol, veh/h	0	246	1328	0	0	385
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	76	76	70	70	80	80
Heavy Vehicles, %	2	3	2	2	2	4
Mvmt Flow	0	324	1897	0	0	481

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1897	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.245	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3285	-	-	-	-
Pot Cap-1 Maneuver	0	~ 85	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	~ 85	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 1366	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	85	-
HCM Lane V/C Ratio	-	3.808	-
HCM Control Delay (s)	-	$ 1366	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	33.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	519	3	455	201	27	12	3	1367	63	3	3
Future Volume (vph)	0	519	3	455	201	27	12	3	1367	63	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		0.95		0.97	0.95			1.00	0.88		1.00	
Frt		1.00		1.00	0.98			1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)		3572		3433	3546			1765	2814		2048	
Flt Permitted		1.00		0.95	1.00			0.82	1.00		0.73	
Satd. Flow (perm)		3572		3433	3546			1502	2814		1566	
Peak-hour factor, PHF	0.88	0.88	0.88	0.96	0.96	0.96	0.91	0.91	0.91	0.68	0.68	0.68
Adj. Flow (vph)	0	590	3	474	209	28	13	3	1502	93	4	4
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	593	0	474	232	0	0	16	1502	0	100	0
Heavy Vehicles (%)	0%	1%	0%	2%	0%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		17.4		16.0	39.4			20.2	20.2		20.2	
Effective Green, g (s)		17.4		16.0	39.4			20.2	20.2		20.2	
Actuated g/C Ratio		0.24		0.22	0.55			0.28	0.28		0.28	
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)		868		767	1951			423	793		441	
v/s Ratio Prot		c0.17		c0.14	0.07							
v/s Ratio Perm								0.01	c0.53		0.06	
v/c Ratio		0.68		0.62	0.12			0.04	1.89		0.23	
Uniform Delay, d1		24.6		25.0	7.7			18.6	25.7		19.7	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		2.2		1.5	0.0			0.0	407.1		0.3	
Delay (s)		26.8		26.5	7.8			18.7	432.8		20.0	
Level of Service		C		C	A			B	F		B	
Approach Delay (s)		26.8			20.3			428.4			20.0	
Approach LOS		C			C			F			B	

Intersection Summary			
HCM 2000 Control Delay	233.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	71.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
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)	0	1285	664	756	522	0	0	0	0	429	0	166
Future Volume (vph)	0	1285	664	756	522	0	0	0	0	429	0	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6040	1546	3236	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		6040	1546	3236	3455					3502		2814
Peak-hour factor, PHF	0.85	0.85	0.85	0.94	0.94	0.94	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	1512	781	804	555	0	0	0	0	477	0	184
RTOR Reduction (vph)	0	0	363	0	0	0	0	0	0	0	0	140
Lane Group Flow (vph)	0	1512	418	804	555	0	0	0	0	477	0	44
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		35.0	35.0	25.0	66.0					24.5		24.5
Effective Green, g (s)		35.0	35.0	25.0	66.0					24.5		24.5
Actuated g/C Ratio		0.34	0.34	0.24	0.64					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2062	527	789	2224					837		672
v/s Ratio Prot		0.25	c0.27	c0.25	0.16					c0.14		0.02
v/s Ratio Perm												
v/c Ratio		0.73	0.79	1.02	0.25					0.57		0.07
Uniform Delay, d1		29.6	30.5	38.8	7.7					34.4		30.1
Progression Factor		1.00	1.00	1.33	1.26					1.00		1.00
Incremental Delay, d2		1.7	9.2	28.5	0.1					1.5		0.1
Delay (s)		31.3	39.7	80.3	9.8					35.8		30.2
Level of Service		C	D	F	A					D		C
Approach Delay (s)		34.2			51.5			0.0			34.3	
Approach LOS		C			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

103: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd
2035 No Build Condition Weekday PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	768	946	0	0	1028	450	250	0	691	0	0	0
Future Volume (vph)	768	946	0	0	1028	450	250	0	691	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.95		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3236	3455			4916		3433		2814			
Flt Permitted	0.11	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	389	3455			4916		3433		2814			
Peak-hour factor, PHF	0.87	0.87	0.92	0.90	0.90	0.90	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	883	1087	0	0	1142	500	266	0	735	0	0	0
RTOR Reduction (vph)	0	0	0	0	76	0	0	0	559	0	0	0
Lane Group Flow (vph)	883	1087	0	0	1566	0	266	0	176	0	0	0
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	60.0	35.0			35.0		24.5		24.5			
Effective Green, g (s)	60.0	35.0			35.0		24.5		24.5			
Actuated g/C Ratio	0.59	0.34			0.34		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	922	1179			1678		820		672			
v/s Ratio Prot	c0.23	0.31			0.32		c0.08		0.06			
v/s Ratio Perm	c0.33											
v/c Ratio	0.96	0.92			0.93		0.32		0.26			
Uniform Delay, d1	29.4	32.4			32.6		32.2		31.7			
Progression Factor	1.65	0.56			1.00		1.00		1.00			
Incremental Delay, d2	15.9	9.3			10.3		0.5		0.4			
Delay (s)	64.5	27.5			43.0		32.7		32.1			
Level of Service	E	C			D		C		C			
Approach Delay (s)		44.0			43.0			32.2			0.0	
Approach LOS		D			D			C			A	

Intersection Summary			
HCM 2000 Control Delay	41.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	341	1825	1418	245	456	936
Future Volume (vph)	341	1825	1418	245	456	936
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3539	3539	1583	1787	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3539	3539	1583	1787	1599
Peak-hour factor, PHF	0.88	0.88	0.93	0.93	0.87	0.87
Adj. Flow (vph)	388	2074	1525	263	524	1076
RTOR Reduction (vph)	0	0	0	183	0	165
Lane Group Flow (vph)	388	2074	1525	80	524	911
Heavy Vehicles (%)	1%	2%	2%	2%	1%	1%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	5.0	29.0	18.0	18.0	18.0	18.0
Effective Green, g (s)	5.0	29.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.08	0.49	0.31	0.31	0.31	0.31
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	151	1739	1079	482	545	487
v/s Ratio Prot	c0.22	0.59	c0.43		0.29	c0.57
v/s Ratio Perm				0.05		
v/c Ratio	2.57	1.19	1.41	0.17	0.96	1.87
Uniform Delay, d1	27.0	15.0	20.5	15.0	20.2	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	725.3	92.7	191.5	0.7	29.1	399.2
Delay (s)	752.3	107.7	212.0	15.8	49.2	419.7
Level of Service	F	F	F	B	D	F
Approach Delay (s)		209.3	183.2		298.4	
Approach LOS		F	F		F	

Intersection Summary			
HCM 2000 Control Delay	225.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.75		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	107.2%	ICU Level of Service	G
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)	154	5	17	10	27	556	17	633	8	149	150	96
Future Volume (vph)	154	5	17	10	27	556	17	633	8	149	150	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	1681		1805	1792	1599	1805	3568		1736	1845	1615
Flt Permitted	0.73	1.00		0.74	1.00	1.00	0.66	1.00		0.17	1.00	1.00
Satd. Flow (perm)	1395	1681		1407	1792	1599	1245	3568		310	1845	1615
Peak-hour factor, PHF	0.84	0.84	0.84	0.77	0.77	0.77	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	183	6	20	13	35	722	19	711	9	160	161	103
RTOR Reduction (vph)	0	12	0	0	0	153	0	1	0	0	0	60
Lane Group Flow (vph)	183	14	0	13	35	569	19	719	0	160	161	43
Heavy Vehicles (%)	0%	0%	0%	0%	6%	1%	0%	1%	0%	4%	3%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	32.5	32.5		32.5	32.5	32.5	20.1	20.1		32.1	32.1	32.1
Effective Green, g (s)	32.5	32.5		32.5	32.5	32.5	20.1	20.1		32.1	32.1	32.1
Actuated g/C Ratio	0.42	0.42		0.42	0.42	0.42	0.26	0.26		0.42	0.42	0.42
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		4.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	591	713		596	760	678	326	936		269	773	676
v/s Ratio Prot		0.01			0.02			c0.20		c0.06	0.09	
v/s Ratio Perm	0.13			0.01		c0.36	0.02			0.19		0.03
v/c Ratio	0.31	0.02		0.02	0.05	0.84	0.06	0.77		0.59	0.21	0.06
Uniform Delay, d1	14.6	12.8		12.8	12.9	19.7	21.2	26.1		15.8	14.2	13.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.0		0.0	0.0	9.0	0.1	3.8		3.5	0.1	0.0
Delay (s)	14.9	12.8		12.8	13.0	28.7	21.2	29.9		19.3	14.3	13.3
Level of Service	B	B		B	B	C	C	C		B	B	B
Approach Delay (s)		14.7			27.7			29.7			16.0	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	76.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	78.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	153	9	3	403	190	11
Future Vol, veh/h	153	9	3	403	190	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	73	73	40	40
Heavy Vehicles, %	4	0	0	2	0	0
Mvmt Flow	219	13	4	552	475	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	232	0	786	226
Stage 1	-	-	-	-	226	-
Stage 2	-	-	-	-	560	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1348	-	~ 364	818
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	576	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1348	-	~ 363	818
Mov Cap-2 Maneuver	-	-	-	-	~ 363	-
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	574	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	200.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	374	-	-	1348	-
HCM Lane V/C Ratio	1.344	-	-	0.003	-
HCM Control Delay (s)	200.5	-	-	7.7	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	23.9	-	-	0	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	0.8					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	154	392	3	1	14
Future Vol, veh/h	8	154	392	3	1	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	77	77	36	36
Heavy Vehicles, %	40	0	0	1	0	11
Mvmt Flow	13	244	509	4	3	39

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	513	0	-	0	781	511
Stage 1	-	-	-	-	511	-
Stage 2	-	-	-	-	270	-
Critical Hdwy	4.5	-	-	-	6.4	6.31
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.56	-	-	-	3.5	3.399
Pot Cap-1 Maneuver	884	-	-	-	366	545
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	780	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	884	-	-	-	361	545
Mov Cap-2 Maneuver	-	-	-	-	361	-
Stage 1	-	-	-	-	597	-
Stage 2	-	-	-	-	780	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	884	-	-	-	527
HCM Lane V/C Ratio	0.014	-	-	-	0.079
HCM Control Delay (s)	9.1	-	-	-	12.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	163	1	6	220	15	12
Future Vol, veh/h	163	1	6	220	15	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	81	81	71	71
Heavy Vehicles, %	0	0	0	1	11	0
Mvmt Flow	209	1	7	272	21	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	210	0	496	210
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	286	-
Critical Hdwy	-	-	4.1	-	6.51	6.2
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	-	-	2.2	-	3.599	3.3
Pot Cap-1 Maneuver	-	-	1373	-	517	835
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	742	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1373	-	514	835
Mov Cap-2 Maneuver	-	-	-	-	514	-
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	738	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	620	-	-	1373	-
HCM Lane V/C Ratio	0.061	-	-	0.005	-
HCM Control Delay (s)	11.2	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	2.9					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	12	15	1	0	7
Future Vol, veh/h	1	12	15	1	0	7
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	67	67	69	69	50	50
Heavy Vehicles, %	0	0	10	0	0	0
Mvmt Flow	1	18	22	1	0	14

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	37	23	0	0	23	0
Stage 1	23	-	-	-	-	-
Stage 2	14	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	981	1060	-	-	1605	-
Stage 1	1005	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	981	1060	-	-	1605	-
Mov Cap-2 Maneuver	981	-	-	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	1014	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1053	1605	-
HCM Lane V/C Ratio	-	-	0.018	-	-
HCM Control Delay (s)	-	-	8.5	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection						
Int Delay, s/veh	2.1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	0	8	16	0
Future Vol, veh/h	3	0	0	8	16	0
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	25	25	63	63	63	63
Heavy Vehicles, %	0	0	0	0	10	0
Mvmt Flow	12	0	0	13	25	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	38	25	25	0	-	0
Stage 1	25	-	-	-	-	-
Stage 2	13	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	979	1057	1603	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	979	1057	1603	-	-	-
Mov Cap-2 Maneuver	979	-	-	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	1015	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	8.7		0		0	
HCM LOS	A					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1603	-	979	-	-
HCM Lane V/C Ratio	-	-	0.012	-	-
HCM Control Delay (s)	0	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	0	0	201	0	0	6	6
Future Vol, veh/h	0	0	0	0	0	0	0	201	0	0	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	39	39	92	92	67	67
Heavy Vehicles, %	2	2	2	2	2	2	0	0	2	2	0	0
Mvmt Flow	0	0	0	0	0	0	0	515	0	0	9	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	529	529	14	529	533	515	18	0	0	515	0	0
Stage 1	14	14	-	515	515	-	-	-	-	-	-	-
Stage 2	515	515	-	14	18	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	460	455	1066	460	453	560	1612	-	-	1051	-	-
Stage 1	1006	884	-	543	535	-	-	-	-	-	-	-
Stage 2	543	535	-	1006	880	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	460	455	1066	460	453	560	1612	-	-	1051	-	-
Mov Cap-2 Maneuver	460	455	-	460	453	-	-	-	-	-	-	-
Stage 1	1006	884	-	543	535	-	-	-	-	-	-	-
Stage 2	543	535	-	1006	880	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1612	-	-	-	-	1051	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0	-	-

Intersection						
Int Delay, s/veh	0.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	3	655	1	5	165
Future Vol, veh/h	8	3	655	1	5	165
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	88	88	78	78	76	76
Heavy Vehicles, %	0	0	1	0	0	4
Mvmt Flow	9	3	840	1	7	217

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1072	841	0	0	841	0
Stage 1	841	-	-	-	-	-
Stage 2	231	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	246	368	-	-	803	-
Stage 1	426	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	244	368	-	-	803	-
Mov Cap-2 Maneuver	244	-	-	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	804	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	269	803	-
HCM Lane V/C Ratio	-	-	0.046	0.008	-
HCM Control Delay (s)	-	-	19	9.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	12.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	166	490	17	15	158
Future Vol, veh/h	54	166	490	17	15	158
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	72	72	67	67	81	81
Heavy Vehicles, %	14	0	1	46	0	3
Mvmt Flow	75	231	731	25	19	195

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	977	744	0	0	756	0
Stage 1	744	-	-	-	-	-
Stage 2	233	-	-	-	-	-
Critical Hdwy	6.54	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	264	418	-	-	864	-
Stage 1	449	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	257	418	-	-	864	-
Mov Cap-2 Maneuver	257	-	-	-	-	-
Stage 1	449	-	-	-	-	-
Stage 2	759	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	50.6	0	0.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	362	864	-
HCM Lane V/C Ratio	-	-	0.844	0.021	-
HCM Control Delay (s)	-	-	50.6	9.3	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	7.7	0.1	-

Intersection						
Int Delay, s/veh	0.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	404	0	0	232
Future Vol, veh/h	0	5	404	0	0	232
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	25	25	68	68	74	74
Heavy Vehicles, %	0	0	3	0	0	7
Mvmt Flow	0	20	594	0	0	314

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	908	594	0	0	594	0
Stage 1	594	-	-	-	-	-
Stage 2	314	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	308	509	-	-	992	-
Stage 1	555	-	-	-	-	-
Stage 2	745	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	308	509	-	-	992	-
Mov Cap-2 Maneuver	308	-	-	-	-	-
Stage 1	555	-	-	-	-	-
Stage 2	745	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	509	992	-
HCM Lane V/C Ratio	-	-	0.039	-	-
HCM Control Delay (s)	-	-	12.4	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	205.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	23	3	314	21	23	1	326	114	3	560	14
Future Vol, veh/h	30	23	3	314	21	23	1	326	114	3	560	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	85	85	85	84	84	84	88	88	88
Heavy Vehicles, %	0	13	0	0	14	0	0	2	1	0	1	11
Mvmt Flow	56	43	6	369	25	27	1	388	136	3	636	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1134	1176	644	1133	1116	456	652	0	0	524	0	0
Stage 1	650	650	-	458	458	-	-	-	-	-	-	-
Stage 2	484	526	-	675	658	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.63	6.2	7.1	6.64	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.63	-	6.1	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.63	-	6.1	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.117	3.3	3.5	4.126	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	181	182	476	~ 182	197	609	944	-	-	1053	-	-
Stage 1	461	448	-	587	547	-	-	-	-	-	-	-
Stage 2	568	511	-	447	443	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	155	181	476	~ 147	196	609	944	-	-	1053	-	-
Mov Cap-2 Maneuver	155	181	-	~ 147	196	-	-	-	-	-	-	-
Stage 1	460	446	-	586	546	-	-	-	-	-	-	-
Stage 2	517	510	-	398	441	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	54.1	$ 820.1	0	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	944	-	-	171	157	1053	-	-
HCM Lane V/C Ratio	0.001	-	-	0.606	2.683	0.003	-	-
HCM Control Delay (s)	8.8	0	-	54.1	$ 820.1	8.4	0	-
HCM Lane LOS	A	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	3.3	37.3	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	106.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	373	81	224	51	27	870
Future Vol, veh/h	373	81	224	51	27	870
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	76	76	83	83
Heavy Vehicles, %	2	2	1	3	0	1
Mvmt Flow	434	94	295	67	33	1048

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	690	33	1081	0	-	0
Stage 1	33	-	-	-	-	-
Stage 2	657	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	~ 411	1041	649	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 224	1041	649	-	-	-
Mov Cap-2 Maneuver	~ 224	-	-	-	-	-
Stage 1	539	-	-	-	-	-
Stage 2	516	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 390.4	12.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	649	-	224	1041	-	-
HCM Lane V/C Ratio	0.454	-	1.936	0.09	-	-
HCM Control Delay (s)	15.1	-	$ 473.3	8.8	-	-
HCM Lane LOS	C	-	F	A	-	-
HCM 95th %tile Q(veh)	2.4	-	31.4	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.6					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	72	586	0	0	1392
Future Vol, veh/h	0	72	586	0	0	1392
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	73	73	95	95	89	89
Heavy Vehicles, %	0	13	0	1	0	1
Mvmt Flow	0	99	617	0	0	1564

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	617	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.395	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4235	-	-	-	-
Pot Cap-1 Maneuver	0	465	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	465	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	465	-
HCM Lane V/C Ratio	-	0.212	-
HCM Control Delay (s)	-	14.8	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.8	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	115	7	1502	704	145	9	6	404	7	2	2
Future Volume (vph)	3	115	7	1502	704	145	9	6	404	7	2	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	0.88		1.00	
Frt	1.00	0.99		1.00	0.97			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	
Satd. Flow (prot)	1805	3514		3467	3474			1784	2682		2036	
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.87	
Satd. Flow (perm)	1805	3514		3467	3474			1619	2682		1826	
Peak-hour factor, PHF	0.84	0.84	0.84	0.83	1.00	0.83	0.88	0.88	0.88	0.63	0.63	0.63
Adj. Flow (vph)	4	137	8	1810	704	175	10	7	459	11	3	3
RTOR Reduction (vph)	0	4	0	0	11	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	141	0	1810	868	0	0	17	459	0	15	0
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	6%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	6.4	13.3		50.0	57.9			20.0	20.0		20.0	
Effective Green, g (s)	6.4	13.3		50.0	57.9			20.0	20.0		20.0	
Actuated g/C Ratio	0.06	0.13		0.49	0.57			0.20	0.20		0.20	
Clearance Time (s)	5.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	114	461		1711	1985			319	529		360	
v/s Ratio Prot	0.00	c0.04		c0.52	c0.25							
v/s Ratio Perm								0.01	c0.17		0.01	
v/c Ratio	0.04	0.31		1.06	0.44			0.05	0.87		0.04	
Uniform Delay, d1	44.6	39.8		25.6	12.4			33.0	39.4		32.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.4		38.9	0.2			0.1	14.0		0.0	
Delay (s)	44.6	40.2		64.6	12.6			33.0	53.4		32.9	
Level of Service	D	D		E	B			C	D		C	
Approach Delay (s)		40.3			47.6			52.7			32.9	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	101.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.4%	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)	0	365	161	174	1214	0	0	0	0	625	0	1016
Future Volume (vph)	0	365	161	174	1214	0	0	0	0	625	0	1016
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5981	1419	2918	3455					3467		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5981	1419	2918	3455					3467		2814
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.75	0.75	0.75
Adj. Flow (vph)	0	456	201	218	1518	0	0	0	0	833	0	1355
RTOR Reduction (vph)	0	0	133	0	0	0	0	0	0	0	0	72
Lane Group Flow (vph)	0	456	68	218	1518	0	0	0	0	833	0	1283
Heavy Vehicles (%)	0%	2%	10%	12%	1%	0%	2%	2%	2%	1%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		34.7	34.7	25.0	65.7					25.0		25.0
Effective Green, g (s)		34.7	34.7	25.0	65.7					25.0		25.0
Actuated g/C Ratio		0.34	0.34	0.24	0.64					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2020	479	710	2210					843		685
v/s Ratio Prot		0.08	0.05	0.07	c0.44					0.24		c0.46
v/s Ratio Perm												
v/c Ratio		0.23	0.14	0.31	0.69					0.99		1.87
Uniform Delay, d1		24.4	23.6	31.8	11.9					38.7		38.9
Progression Factor		1.00	1.00	0.89	1.57					1.00		1.00
Incremental Delay, d2		0.1	0.3	0.0	0.1					28.0		398.5
Delay (s)		24.5	23.9	28.4	18.8					66.7		437.3
Level of Service		C	C	C	B					E		F
Approach Delay (s)		24.3			20.0			0.0			296.2	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	152.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	102.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
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)	177	813	0	0	479	86	909	0	405	0	0	0
Future Volume (vph)	177	813	0	0	479	86	909	0	405	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3113	3421			4947		3433		2733			
Flt Permitted	0.39	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	1270	3421			4947		3433		2733			
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	203	934	0	0	564	101	1165	0	519	0	0	0
RTOR Reduction (vph)	0	0	0	0	22	0	0	0	331	0	0	0
Lane Group Flow (vph)	203	934	0	0	643	0	1165	0	188	0	0	0
Heavy Vehicles (%)	5%	2%	0%	0%	2%	5%	2%	2%	4%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	51.7	34.7			42.7		25.0		25.0			
Effective Green, g (s)	51.7	34.7			42.7		25.0		25.0			
Actuated g/C Ratio	0.50	0.34			0.42		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	944	1155			2056		835		665			
v/s Ratio Prot	c0.04	c0.27			c0.13		c0.34		0.07			
v/s Ratio Perm	0.07											
v/c Ratio	0.22	0.81			0.31		1.40		0.28			
Uniform Delay, d1	13.5	31.0			20.1		38.9		31.6			
Progression Factor	1.09	1.22			1.00		1.00		1.00			
Incremental Delay, d2	0.1	3.4			0.2		185.2		0.5			
Delay (s)	14.8	41.0			20.3		224.0		32.0			
Level of Service	B	D			C		F		C			
Approach Delay (s)		36.4			20.3			164.8			0.0	
Approach LOS		D			C			F			A	

Intersection Summary			
HCM 2000 Control Delay	95.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	102.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	699	2242	808	670	181	224
Future Volume (vph)	699	2242	808	670	181	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3471	3343	1583	1719	1538
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3471	3343	1583	1719	1538
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.76	0.76
Adj. Flow (vph)	813	2607	842	698	238	295
RTOR Reduction (vph)	0	0	0	485	0	195
Lane Group Flow (vph)	813	2607	842	213	238	100
Heavy Vehicles (%)	1%	4%	8%	2%	5%	5%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	8.7	32.7	18.0	18.0	14.3	14.3
Effective Green, g (s)	8.7	32.7	18.0	18.0	14.3	14.3
Actuated g/C Ratio	0.15	0.55	0.31	0.31	0.24	0.24
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	263	1923	1019	482	416	372
v/s Ratio Prot	c0.45	c0.75	0.25		c0.14	0.07
v/s Ratio Perm				0.13		
v/c Ratio	3.09	1.36	0.83	0.44	0.57	0.27
Uniform Delay, d1	25.1	13.1	19.0	16.5	19.7	18.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	951.1	163.6	7.7	2.9	2.3	0.5
Delay (s)	976.2	176.7	26.7	19.4	21.9	18.7
Level of Service	F	F	C	B	C	B
Approach Delay (s)		366.8	23.4		20.1	
Approach LOS		F	C		C	

Intersection Summary			
HCM 2000 Control Delay	236.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.53		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

105: International Drive & Corporate Drive
2035 Build Condition Weekday AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	48	34	16	15	132	9	159	71	815	515	151
Future Volume (vph)	77	48	34	16	15	132	9	159	71	815	515	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	1706		1805	1681	1369	1805	3411		1770	1900	1615
Flt Permitted	0.75	1.00		0.69	1.00	1.00	0.41	1.00		0.38	1.00	1.00
Satd. Flow (perm)	1416	1706		1306	1681	1369	774	3411		703	1900	1615
Peak-hour factor, PHF	0.76	0.76	0.76	0.78	0.78	0.78	0.83	0.83	0.83	0.76	0.76	0.76
Adj. Flow (vph)	101	63	45	21	19	169	11	192	86	1072	678	199
RTOR Reduction (vph)	0	24	0	0	0	146	0	49	0	0	0	51
Lane Group Flow (vph)	101	84	0	21	19	23	11	229	0	1072	678	148
Heavy Vehicles (%)	0%	4%	5%	0%	13%	18%	0%	0%	3%	2%	0%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Prot
Protected Phases		4			8			2		1	6	6
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	13.3	13.3		13.3	13.3	13.3	12.7	12.7		72.5	72.5	72.5
Effective Green, g (s)	13.3	13.3		13.3	13.3	13.3	12.7	12.7		72.5	72.5	72.5
Actuated g/C Ratio	0.14	0.14		0.14	0.14	0.14	0.13	0.13		0.74	0.74	0.74
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		4.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	192	232		177	228	186	100	442		1124	1408	1197
v/s Ratio Prot		0.05			0.01			0.07		c0.54	0.36	0.09
v/s Ratio Perm	c0.07			0.02		0.02	0.01			c0.17		
v/c Ratio	0.53	0.36		0.12	0.08	0.12	0.11	0.52		0.95	0.48	0.12
Uniform Delay, d1	39.3	38.4		37.1	36.9	37.1	37.6	39.7		13.3	5.1	3.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	1.0		0.3	0.2	0.3	0.5	1.0		16.8	0.3	0.0
Delay (s)	41.9	39.4		37.4	37.1	37.4	38.0	40.7		30.1	5.3	3.6
Level of Service	D	D		D	D	D	D	D		C	A	A
Approach Delay (s)		40.6			37.4			40.6			18.8	
Approach LOS		D			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	97.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection						
Int Delay, s/veh	14.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	570	364	70	84	79	26
Future Vol, veh/h	570	364	70	84	79	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	71	71	69	69
Heavy Vehicles, %	1	5	0	12	36	0
Mvmt Flow	731	467	99	118	114	38

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1198	0	1281	965
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	316	-
Critical Hdwy	-	-	4.1	-	6.76	6.2
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	-	-	2.2	-	3.824	3.3
Pot Cap-1 Maneuver	-	-	590	-	155	312
Stage 1	-	-	-	-	321	-
Stage 2	-	-	-	-	668	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	590	-	127	312
Mov Cap-2 Maneuver	-	-	-	-	127	-
Stage 1	-	-	-	-	321	-
Stage 2	-	-	-	-	548	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.6	139.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	149	-	-	590	-
HCM Lane V/C Ratio	1.021	-	-	0.167	-
HCM Control Delay (s)	139.4	-	-	12.3	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	7.8	-	-	0.6	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	579	131	2	0	7
Future Vol, veh/h	19	579	131	2	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	71	71	50	50
Heavy Vehicles, %	0	1	8	0	0	25
Mvmt Flow	22	681	185	3	0	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	188	0	-	0	912	187
Stage 1	-	-	-	-	187	-
Stage 2	-	-	-	-	725	-
Critical Hdwy	4.1	-	-	-	6.4	6.45
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.525
Pot Cap-1 Maneuver	1398	-	-	-	307	799
Stage 1	-	-	-	-	850	-
Stage 2	-	-	-	-	483	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1398	-	-	-	302	799
Mov Cap-2 Maneuver	-	-	-	-	302	-
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	483	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1398	-	-	-	799
HCM Lane V/C Ratio	0.016	-	-	-	0.018
HCM Control Delay (s)	7.6	-	-	-	9.6
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	0.1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	348	18	4	164	0	0
Future Vol, veh/h	348	18	4	164	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	82	82	25	40
Heavy Vehicles, %	1	0	0	5	20	0
Mvmt Flow	366	19	5	200	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	385	0	586	376
Stage 1	-	-	-	-	376	-
Stage 2	-	-	-	-	210	-
Critical Hdwy	-	-	4.1	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.2	-	3.68	3.3
Pot Cap-1 Maneuver	-	-	1185	-	444	675
Stage 1	-	-	-	-	656	-
Stage 2	-	-	-	-	784	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1185	-	442	675
Mov Cap-2 Maneuver	-	-	-	-	442	-
Stage 1	-	-	-	-	656	-
Stage 2	-	-	-	-	780	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1185	-
HCM Lane V/C Ratio	-	-	-	0.004	-
HCM Control Delay (s)	0	-	-	8.1	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection						
Int Delay, s/veh	0					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	22	0
Future Vol, veh/h	0	0	0	0	22	0
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	25	25	53	53	50	50
Heavy Vehicles, %	0	0	0	13	0	0
Mvmt Flow	0	0	0	0	44	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	88	0	0	0	0	0
Stage 1	0	-	-	-	-	-
Stage 2	88	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	918	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	918	-	-	-	-	-
Mov Cap-2 Maneuver	918	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	940	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	-	-
HCM Lane LOS	-	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-

Intersection						
Int Delay, s/veh	4.8					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	0	0	0	0	9
Future Vol, veh/h	7	0	0	0	0	9
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	50	50	42	42	69	69
Heavy Vehicles, %	75	0	0	0	6	80
Mvmt Flow	14	0	0	0	0	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	7	7	13	0	-	0
Stage 1	7	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	7.15	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.15	-	-	-	-	-
Critical Hdwy Stg 2	6.15	-	-	-	-	-
Follow-up Hdwy	4.175	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	854	1081	1619	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	854	1081	1619	-	-	-
Mov Cap-2 Maneuver	854	-	-	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1619	-	854	-	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	0	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	68	6	37	0	138	53	243
Future Vol, veh/h	0	0	0	0	0	68	6	37	0	138	53	243
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	88	88	92	92	69	69
Heavy Vehicles, %	2	2	2	2	2	2	0	18	2	2	15	1
Mvmt Flow	0	0	0	0	0	74	7	42	0	150	77	352

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	646	609	253	609	785	42	429	0	0	42	0	0
Stage 1	553	553	-	56	56	-	-	-	-	-	-	-
Stage 2	93	56	-	553	729	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	385	410	786	407	325	1029	1141	-	-	1567	-	-
Stage 1	517	514	-	956	848	-	-	-	-	-	-	-
Stage 2	914	848	-	517	428	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	320	354	786	364	280	1029	1141	-	-	1567	-	-
Mov Cap-2 Maneuver	320	354	-	364	280	-	-	-	-	-	-	-
Stage 1	514	446	-	950	843	-	-	-	-	-	-	-
Stage 2	843	843	-	449	372	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	8.8	1.1	2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1141	-	-	-	1029	1567	-	-
HCM Lane V/C Ratio	0.006	-	-	-	0.072	0.096	-	-
HCM Control Delay (s)	8.2	0	-	0	8.8	7.5	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.3	-	-

Intersection						
Int Delay, s/veh	0.4					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	2	223	15	15	504
Future Vol, veh/h	7	2	223	15	15	504
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	63	63	81	81	84	84
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	11	3	275	19	18	600

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	921	285	0	0	294	0
Stage 1	285	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	303	759	-	-	1279	-
Stage 1	768	-	-	-	-	-
Stage 2	531	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	297	759	-	-	1279	-
Mov Cap-2 Maneuver	297	-	-	-	-	-
Stage 1	768	-	-	-	-	-
Stage 2	520	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	343	1279	-
HCM Lane V/C Ratio	-	-	0.042	0.014	-
HCM Control Delay (s)	-	-	16	7.9	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	21	217	15	23	488
Future Vol, veh/h	16	21	217	15	23	488
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	88	88	86	86	83	83
Heavy Vehicles, %	44	0	1	63	0	1
Mvmt Flow	18	24	252	17	28	588

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	905	261	0	0	269	0
Stage 1	261	-	-	-	-	-
Stage 2	644	-	-	-	-	-
Critical Hdwy	6.84	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.896	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	260	783	-	-	1306	-
Stage 1	695	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	252	783	-	-	1306	-
Mov Cap-2 Maneuver	252	-	-	-	-	-
Stage 1	695	-	-	-	-	-
Stage 2	437	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.8	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	410	1306	-
HCM Lane V/C Ratio	-	-	0.103	0.021	-
HCM Control Delay (s)	-	-	14.8	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	6	253	2	9	392
Future Vol, veh/h	0	6	253	2	9	392
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	75	75	89	89	81	81
Heavy Vehicles, %	0	0	5	100	0	2
Mvmt Flow	0	8	284	2	11	484

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	791	285	0	0	286	0
Stage 1	285	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	361	759	-	-	1288	-
Stage 1	768	-	-	-	-	-
Stage 2	610	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	357	759	-	-	1288	-
Mov Cap-2 Maneuver	357	-	-	-	-	-
Stage 1	768	-	-	-	-	-
Stage 2	603	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	9.8		0		0.2	
HCM LOS	A					

Minor Lane/Major Mvmt		NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)		-	-	759	1288	-
HCM Lane V/C Ratio		-	-	0.011	0.009	-
HCM Control Delay (s)		-	-	9.8	7.8	0
HCM Lane LOS		-	-	A	A	A
HCM 95th %tile Q(veh)		-	-	0	0	-

Intersection	
Int Delay, s/veh	23.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	10	2	95	6	7	0	503	432	28	324	32
Future Vol, veh/h	9	10	2	95	6	7	0	503	432	28	324	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	65	65	65	90	90	90	87	87	87
Heavy Vehicles, %	20	0	0	4	0	0	0	2	3	0	3	0
Mvmt Flow	12	13	3	146	9	11	0	559	480	32	372	37

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1264	1494	391	1262	1272	799	409	0	0	1039	0	0
Stage 1	455	455	-	799	799	-	-	-	-	-	-	-
Stage 2	809	1039	-	463	473	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.14	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.3	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.3	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4	3.3	3.536	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	134	124	662	~ 145	169	389	1161	-	-	677	-	-
Stage 1	552	572	-	376	401	-	-	-	-	-	-	-
Stage 2	349	310	-	575	562	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	119	116	662	~ 126	159	389	1161	-	-	677	-	-
Mov Cap-2 Maneuver	119	116	-	~ 126	159	-	-	-	-	-	-	-
Stage 1	552	537	-	376	401	-	-	-	-	-	-	-
Stage 2	332	310	-	524	528	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	41.2	223.7	0	0.8
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1161	-	-	127	133	677	-	-
HCM Lane V/C Ratio	-	-	-	0.22	1.249	0.048	-	-
HCM Control Delay (s)	0	-	-	41.2	223.7	10.6	0	-
HCM Lane LOS	A	-	-	E	F	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.8	10.2	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	161.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	956	433	73	16	61	261
Future Vol, veh/h	956	433	73	16	61	261
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	70	70	90	90
Heavy Vehicles, %	1	1	3	11	0	4
Mvmt Flow	1028	466	104	23	68	290

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	299	68	358	0	-	0
Stage 1	68	-	-	-	-	-
Stage 2	231	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	~ 694	998	1195	-	-	-
Stage 1	~ 957	-	-	-	-	-
Stage 2	~ 810	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 634	998	1195	-	-	-
Mov Cap-2 Maneuver	~ 634	-	-	-	-	-
Stage 1	~ 874	-	-	-	-	-
Stage 2	~ 810	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	213.2	6.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1195	-	634	998	-	-
HCM Lane V/C Ratio	0.087	-	1.621	0.467	-	-
HCM Control Delay (s)	8.3	-	$ 304.4	11.7	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.3	-	56.1	2.5	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	174.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	246	1369	0	0	405
Future Vol, veh/h	0	246	1369	0	0	405
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	76	76	70	70	80	80
Heavy Vehicles, %	2	3	2	2	2	4
Mvmt Flow	0	324	1956	0	0	506

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1956	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.245	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3285	-	-	-	-
Pot Cap-1 Maneuver	0	~ 79	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	~ 79	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 1502.2	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	79	-
HCM Lane V/C Ratio	-	4.097	-
HCM Control Delay (s)		$ 1502.2	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	34.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	519	3	464	201	27	12	3	1468	63	3	3
Future Volume (vph)	0	519	3	464	201	27	12	3	1468	63	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	16	12
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		0.95		0.97	0.95			1.00	0.88		1.00	
Frt		1.00		1.00	0.98			1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)		3572		3433	3546			1765	2814		2048	
Flt Permitted		1.00		0.95	1.00			0.82	1.00		0.73	
Satd. Flow (perm)		3572		3433	3546			1501	2814		1566	
Peak-hour factor, PHF	0.88	0.88	0.88	0.96	0.96	0.96	0.91	0.91	0.91	0.68	0.68	0.68
Adj. Flow (vph)	0	590	3	483	209	28	13	3	1613	93	4	4
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	593	0	483	232	0	0	16	1613	0	100	0
Heavy Vehicles (%)	0%	1%	0%	2%	0%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	6	2		1	5			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		17.5		16.3	39.8			20.2	20.2		20.2	
Effective Green, g (s)		17.5		16.3	39.8			20.2	20.2		20.2	
Actuated g/C Ratio		0.24		0.23	0.55			0.28	0.28		0.28	
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)		868		777	1960			421	789		439	
v/s Ratio Prot		c0.17		c0.14	0.07							
v/s Ratio Perm								0.01	c0.57		0.06	
v/c Ratio		0.68		0.62	0.12			0.04	2.04		0.23	
Uniform Delay, d1		24.7		25.1	7.7			18.8	25.9		19.9	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		2.2		1.6	0.0			0.0	474.4		0.3	
Delay (s)		27.0		26.6	7.7			18.9	500.3		20.2	
Level of Service		C		C	A			B	F		C	
Approach Delay (s)		27.0			20.4			495.6			20.2	
Approach LOS		C			C			F			C	

Intersection Summary			
HCM 2000 Control Delay	276.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
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)	0	1350	700	756	526	0	0	0	0	429	0	171
Future Volume (vph)	0	1350	700	756	526	0	0	0	0	429	0	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	11	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	6.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6040	1546	3236	3455					3502		2814
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		6040	1546	3236	3455					3502		2814
Peak-hour factor, PHF	0.85	0.85	0.85	0.94	0.94	0.94	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	1588	824	804	560	0	0	0	0	477	0	190
RTOR Reduction (vph)	0	0	363	0	0	0	0	0	0	0	0	144
Lane Group Flow (vph)	0	1588	461	804	560	0	0	0	0	477	0	46
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Prot		Prot
Protected Phases		6	6	5	2 5					3		3
Permitted Phases												
Actuated Green, G (s)		35.0	35.0	25.0	66.0					24.7		24.7
Effective Green, g (s)		35.0	35.0	25.0	66.0					24.7		24.7
Actuated g/C Ratio		0.34	0.34	0.24	0.64					0.24		0.24
Clearance Time (s)		6.0	6.0	6.0						6.0		6.0
Vehicle Extension (s)		5.0	5.0	4.0						5.0		5.0
Lane Grp Cap (vph)		2058	526	787	2220					842		676
v/s Ratio Prot		0.26	c0.30	c0.25	0.16					c0.14		0.02
v/s Ratio Perm												
v/c Ratio		0.77	0.88	1.02	0.25					0.57		0.07
Uniform Delay, d1		30.3	31.8	38.9	7.8					34.3		30.1
Progression Factor		1.00	1.00	1.33	1.25					1.00		1.00
Incremental Delay, d2		2.2	16.2	29.2	0.1					1.4		0.1
Delay (s)		32.4	48.0	81.1	9.9					35.7		30.2
Level of Service		C	D	F	A					D		C
Approach Delay (s)		37.8			51.8			0.0			34.2	
Approach LOS		D			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	41.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	102.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
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)	826	953	0	0	1029	450	253	0	691	0	0	0
Future Volume (vph)	826	953	0	0	1029	450	253	0	691	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0		6.0		6.0			
Lane Util. Factor	0.97	0.95			0.91		0.97		0.88			
Frt	1.00	1.00			0.95		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3236	3455			4916		3433		2814			
Flt Permitted	0.11	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	389	3455			4916		3433		2814			
Peak-hour factor, PHF	0.87	0.87	0.92	0.90	0.90	0.90	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	949	1095	0	0	1143	500	269	0	735	0	0	0
RTOR Reduction (vph)	0	0	0	0	76	0	0	0	558	0	0	0
Lane Group Flow (vph)	949	1095	0	0	1567	0	269	0	177	0	0	0
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA		Prot		Prot			
Protected Phases	1	6			2		3		3			
Permitted Phases	6											
Actuated Green, G (s)	60.0	35.0			35.0		24.7		24.7			
Effective Green, g (s)	60.0	35.0			35.0		24.7		24.7			
Actuated g/C Ratio	0.58	0.34			0.34		0.24		0.24			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	5.0			5.0		5.0		5.0			
Lane Grp Cap (vph)	920	1177			1675		825		676			
v/s Ratio Prot	c0.25	0.32			0.32		c0.08		0.06			
v/s Ratio Perm	c0.35											
v/c Ratio	1.03	0.93			0.94		0.33		0.26			
Uniform Delay, d1	30.4	32.7			32.8		32.1		31.6			
Progression Factor	1.63	0.57			1.00		1.00		1.00			
Incremental Delay, d2	32.9	9.8			10.6		0.5		0.4			
Delay (s)	82.5	28.5			43.3		32.6		32.0			
Level of Service	F	C			D		C		C			
Approach Delay (s)		53.6			43.3			32.2			0.0	
Approach LOS		D			D			C			A	

Intersection Summary			
HCM 2000 Control Delay	45.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	102.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	342	1825	1418	248	463	972
Future Volume (vph)	342	1825	1418	248	463	972
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3539	3539	1583	1787	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3539	3539	1583	1787	1599
Peak-hour factor, PHF	0.88	0.88	0.93	0.93	0.87	0.87
Adj. Flow (vph)	389	2074	1525	267	532	1117
RTOR Reduction (vph)	0	0	0	186	0	165
Lane Group Flow (vph)	389	2074	1525	81	532	952
Heavy Vehicles (%)	1%	2%	2%	2%	1%	1%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	1	6	2		3	3
Permitted Phases				2		
Actuated Green, G (s)	5.0	29.0	18.0	18.0	18.0	18.0
Effective Green, g (s)	5.0	29.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.08	0.49	0.31	0.31	0.31	0.31
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	151	1739	1079	482	545	487
v/s Ratio Prot	c0.22	0.59	c0.43		0.30	c0.60
v/s Ratio Perm				0.05		
v/c Ratio	2.58	1.19	1.41	0.17	0.98	1.95
Uniform Delay, d1	27.0	15.0	20.5	15.0	20.3	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	728.2	92.7	191.5	0.8	32.3	436.8
Delay (s)	755.2	107.7	212.0	15.8	52.6	457.3
Level of Service	F	F	F	B	D	F
Approach Delay (s)		210.0	182.8		326.7	
Approach LOS		F	F		F	

Intersection Summary			
HCM 2000 Control Delay	234.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.79		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	109.4%	ICU Level of Service	H
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)	154	5	17	10	27	657	17	633	8	158	150	96
Future Volume (vph)	154	5	17	10	27	657	17	633	8	158	150	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	1681		1805	1792	1599	1805	3568		1736	1845	1615
Flt Permitted	0.73	1.00		0.74	1.00	1.00	0.66	1.00		0.16	1.00	1.00
Satd. Flow (perm)	1395	1681		1407	1792	1599	1245	3568		289	1845	1615
Peak-hour factor, PHF	0.84	0.84	0.84	0.77	0.77	0.77	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	183	6	20	13	35	853	19	711	9	170	161	103
RTOR Reduction (vph)	0	11	0	0	0	156	0	1	0	0	0	63
Lane Group Flow (vph)	183	15	0	13	35	697	19	719	0	170	161	40
Heavy Vehicles (%)	0%	0%	0%	0%	6%	1%	0%	1%	0%	4%	3%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	39.5	39.5		39.5	39.5	39.5	20.8	20.8		32.9	32.9	32.9
Effective Green, g (s)	39.5	39.5		39.5	39.5	39.5	20.8	20.8		32.9	32.9	32.9
Actuated g/C Ratio	0.47	0.47		0.47	0.47	0.47	0.25	0.25		0.39	0.39	0.39
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		4.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	652	786		658	838	748	306	879		242	719	629
v/s Ratio Prot		0.01			0.02			c0.20		c0.06	0.09	
v/s Ratio Perm	0.13			0.01		c0.44	0.02			0.21		0.02
v/c Ratio	0.28	0.02		0.02	0.04	0.93	0.06	0.82		0.70	0.22	0.06
Uniform Delay, d1	13.7	12.1		12.1	12.2	21.2	24.3	30.0		19.3	17.2	16.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0		0.0	0.0	18.3	0.1	6.0		8.9	0.2	0.0
Delay (s)	14.0	12.1		12.1	12.2	39.5	24.4	36.0		28.1	17.4	16.2
Level of Service	B	B		B	B	D	C	D		C	B	B
Approach Delay (s)		13.7			38.0			35.7			21.3	
Approach LOS		B			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	84.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	335.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	153	18	13	400	294	66
Future Vol, veh/h	153	18	13	400	294	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	73	73	40	40
Heavy Vehicles, %	4	0	0	2	0	0
Mvmt Flow	219	26	18	548	735	165

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	245	0	816	232
Stage 1	-	-	-	-	232	-
Stage 2	-	-	-	-	584	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1333	-	~ 349	812
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	~ 561	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1333	-	~ 342	812
Mov Cap-2 Maneuver	-	-	-	-	~ 342	-
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	~ 550	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	$ 637.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	383	-	-	1333	-
HCM Lane V/C Ratio	2.35	-	-	0.013	-
HCM Control Delay (s)	$ 637.8	-	-	7.7	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	69.5	-	-	0	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.7					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	210	400	3	1	14
Future Vol, veh/h	8	210	400	3	1	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	77	77	36	36
Heavy Vehicles, %	40	0	0	1	0	11
Mvmt Flow	13	333	519	4	3	39

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	523	0	-	0	880	521
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	359	-
Critical Hdwy	4.5	-	-	-	6.4	6.31
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.56	-	-	-	3.5	3.399
Pot Cap-1 Maneuver	876	-	-	-	320	538
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	711	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	876	-	-	-	315	538
Mov Cap-2 Maneuver	-	-	-	-	315	-
Stage 1	-	-	-	-	591	-
Stage 2	-	-	-	-	711	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	876	-	-	-	514
HCM Lane V/C Ratio	0.014	-	-	-	0.081
HCM Control Delay (s)	9.2	-	-	-	12.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	218	1	0	230	12	0
Future Vol, veh/h	218	1	0	230	12	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	81	81	71	71
Heavy Vehicles, %	0	0	0	1	11	0
Mvmt Flow	279	1	0	284	17	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	280	0	564	280
Stage 1	-	-	-	-	280	-
Stage 2	-	-	-	-	284	-
Critical Hdwy	-	-	4.1	-	6.51	6.2
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	-	-	2.2	-	3.599	3.3
Pot Cap-1 Maneuver	-	-	1294	-	472	764
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	744	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1294	-	472	764
Mov Cap-2 Maneuver	-	-	-	-	472	-
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	744	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	472	-	-	1294	-
HCM Lane V/C Ratio	0.036	-	-	-	-
HCM Control Delay (s)	12.9	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	12	0	0	1	0
Future Vol, veh/h	1	12	0	0	1	0
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	67	67	69	69	50	50
Heavy Vehicles, %	0	0	10	0	0	0
Mvmt Flow	1	18	0	0	2	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	4	0	0	0	0	0
Stage 1	0	-	-	-	-	-
Stage 2	4	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	1023	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1024	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1023	-	-	-	-	-
Mov Cap-2 Maneuver	1023	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1024	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s			0			
HCM LOS	-					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	-	-	-
HCM Lane LOS	-	-	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-

206: Goose Bay Drive & Lonza South Dwy
2035 Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	0	1	0	0
Future Vol, veh/h	3	0	0	1	0	0
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	25	25	63	63	63	63
Heavy Vehicles, %	0	0	0	0	10	0
Mvmt Flow	12	0	0	2	0	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	4	2	2	0	-	0
Stage 1	2	-	-	-	-	-
Stage 2	2	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	1023	1088	1634	-	-	-
Stage 1	1026	-	-	-	-	-
Stage 2	1026	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1023	1088	1634	-	-	-
Mov Cap-2 Maneuver	1023	-	-	-	-	-
Stage 1	1026	-	-	-	-	-
Stage 2	1026	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1634	-	1023	-	-
HCM Lane V/C Ratio	-	-	0.012	-	-
HCM Control Delay (s)	0	-	8.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	144	0	216	0	13	12	6
Future Vol, veh/h	0	0	0	0	0	144	0	216	0	13	12	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	39	39	92	92	67	67
Heavy Vehicles, %	2	2	2	2	2	2	0	0	2	2	0	0
Mvmt Flow	0	0	0	0	0	157	0	554	0	14	18	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	684	605	23	605	609	554	27	0	0	554	0	0
Stage 1	51	51	-	554	554	-	-	-	-	-	-	-
Stage 2	633	554	-	51	55	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	363	412	1054	410	410	532	1600	-	-	1016	-	-
Stage 1	962	852	-	517	514	-	-	-	-	-	-	-
Stage 2	468	514	-	962	849	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	253	406	1054	405	404	532	1600	-	-	1016	-	-
Mov Cap-2 Maneuver	253	406	-	405	404	-	-	-	-	-	-	-
Stage 1	962	840	-	517	514	-	-	-	-	-	-	-
Stage 2	330	514	-	949	837	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	14.6	0	3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1600	-	-	-	532	1016	-	-
HCM Lane V/C Ratio	-	-	-	-	0.294	0.014	-	-
HCM Control Delay (s)	0	-	-	0	14.6	8.6	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	1.2	0	-	-

Intersection						
Int Delay, s/veh	0.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	3	655	1	5	165
Future Vol, veh/h	8	3	655	1	5	165
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	88	88	78	78	76	76
Heavy Vehicles, %	0	0	1	0	0	4
Mvmt Flow	9	3	840	1	7	217

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1072	841	0	0	841	0
Stage 1	841	-	-	-	-	-
Stage 2	231	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	246	368	-	-	803	-
Stage 1	426	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	244	368	-	-	803	-
Mov Cap-2 Maneuver	244	-	-	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	804	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	269	803	-
HCM Lane V/C Ratio	-	-	0.046	0.008	-
HCM Control Delay (s)	-	-	19	9.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection						
Int Delay, s/veh	12.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	166	490	17	15	158
Future Vol, veh/h	54	166	490	17	15	158
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	72	72	67	67	81	81
Heavy Vehicles, %	14	0	1	46	0	3
Mvmt Flow	75	231	731	25	19	195

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	977	744	0	0	756	0
Stage 1	744	-	-	-	-	-
Stage 2	233	-	-	-	-	-
Critical Hdwy	6.54	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	264	418	-	-	864	-
Stage 1	449	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	257	418	-	-	864	-
Mov Cap-2 Maneuver	257	-	-	-	-	-
Stage 1	449	-	-	-	-	-
Stage 2	759	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	50.6	0	0.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	362	864	-
HCM Lane V/C Ratio	-	-	0.844	0.021	-
HCM Control Delay (s)	-	-	50.6	9.3	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	7.7	0.1	-

Intersection						
Int Delay, s/veh	0.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	404	0	0	232
Future Vol, veh/h	0	5	404	0	0	232
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	25	25	68	68	74	74
Heavy Vehicles, %	0	0	3	0	0	7
Mvmt Flow	0	20	594	0	0	314

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	908	594	0	0	594	0
Stage 1	594	-	-	-	-	-
Stage 2	314	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	308	509	-	-	992	-
Stage 1	555	-	-	-	-	-
Stage 2	745	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	308	509	-	-	992	-
Mov Cap-2 Maneuver	308	-	-	-	-	-
Stage 1	555	-	-	-	-	-
Stage 2	745	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	509	992	-
HCM Lane V/C Ratio	-	-	0.039	-	-
HCM Control Delay (s)	-	-	12.4	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	205.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	23	3	314	21	23	1	326	114	3	560	14
Future Vol, veh/h	30	23	3	314	21	23	1	326	114	3	560	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	85	85	85	84	84	84	88	88	88
Heavy Vehicles, %	0	13	0	0	14	0	0	2	1	0	1	11
Mvmt Flow	56	43	6	369	25	27	1	388	136	3	636	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1134	1176	644	1133	1116	456	652	0	0	524	0	0
Stage 1	650	650	-	458	458	-	-	-	-	-	-	-
Stage 2	484	526	-	675	658	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.63	6.2	7.1	6.64	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.63	-	6.1	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.63	-	6.1	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.117	3.3	3.5	4.126	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	181	182	476	~ 182	197	609	944	-	-	1053	-	-
Stage 1	461	448	-	587	547	-	-	-	-	-	-	-
Stage 2	568	511	-	447	443	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	155	181	476	~ 147	196	609	944	-	-	1053	-	-
Mov Cap-2 Maneuver	155	181	-	~ 147	196	-	-	-	-	-	-	-
Stage 1	460	446	-	586	546	-	-	-	-	-	-	-
Stage 2	517	510	-	398	441	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	54.1	$ 820.1	0	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	944	-	-	171	157	1053	-	-
HCM Lane V/C Ratio	0.001	-	-	0.606	2.683	0.003	-	-
HCM Control Delay (s)	8.8	0	-	54.1	$ 820.1	8.4	0	-
HCM Lane LOS	A	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	3.3	37.3	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	177.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	373	85	267	51	27	870
Future Vol, veh/h	373	85	267	51	27	870
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	290	100	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	76	76	83	83
Heavy Vehicles, %	2	2	1	3	0	1
Mvmt Flow	434	99	351	67	33	1048

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	802	33	1081	0	-	0
Stage 1	33	-	-	-	-	-
Stage 2	769	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	~ 353	1041	649	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	457	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 162	1041	649	-	-	-
Mov Cap-2 Maneuver	~ 162	-	-	-	-	-
Stage 1	454	-	-	-	-	-
Stage 2	457	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 666.1	14.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	649	-	162	1041	-	-
HCM Lane V/C Ratio	0.541	-	2.677	0.095	-	-
HCM Control Delay (s)	16.9	-	$ 815.9	8.8	-	-
HCM Lane LOS	C	-	F	A	-	-
HCM 95th %tile Q(veh)	3.3	-	38.2	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	72	590	0	0	1435
Future Vol, veh/h	0	72	590	0	0	1435
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	73	73	95	95	89	89
Heavy Vehicles, %	0	13	0	1	0	1
Mvmt Flow	0	99	621	0	0	1612

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	621	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.395	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4235	-	-	-	-
Pot Cap-1 Maneuver	0	462	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	462	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

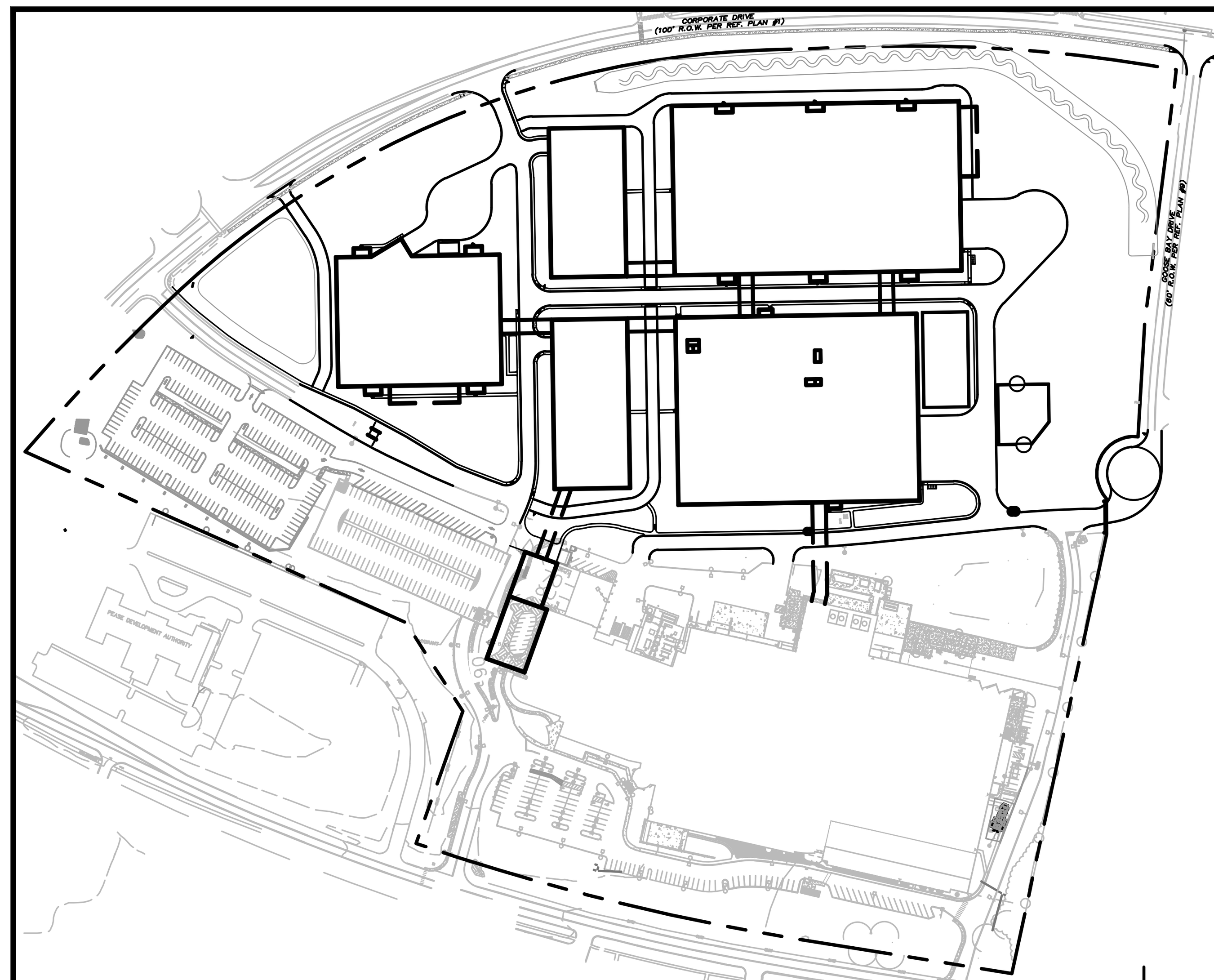
Approach	WB	NB	SB
HCM Control Delay, s	14.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	462	-
HCM Lane V/C Ratio	-	0.213	-
HCM Control Delay (s)	-	14.9	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.8	-

APPENDIX I

Site Development Plan

PROPOSED ADMINISTRATIVE APPROVAL MASTER SITE PLAN
01/09/2023



SITE DATA

LOCATION: TAX MAP 305, LOTS 1 & 2, 70 & 80 CORPORATE DRIVE, PORTSMOUTH, NH; TAX MAP 305, LOT 6, 101 INTERNATIONAL DRIVE, PORTSMOUTH, NH

ZONING DISTRICT: AIRPORT, BUSINESS & COMMERCIAL (ABC)

DIMENSIONAL REQUIREMENTS:

	REQUIRED	PROVIDED
MINIMUM LOT AREA:	5 AC	43.4± AC
MINIMUM STREET FRONTAGE:	200 FT	1,038 FT
MINIMUM FRONT YARD SETBACK:	70 FT	70 FT
SIDE SETBACK	30 FT	30 FT
REAR SETBACK	50 FT	51 FT
MINIMUM OPEN SPACE	25 %	43.3± %

MAXIMUM STRUCTURE HEIGHT SHALL NOT EXCEED FAA CRITERIA.

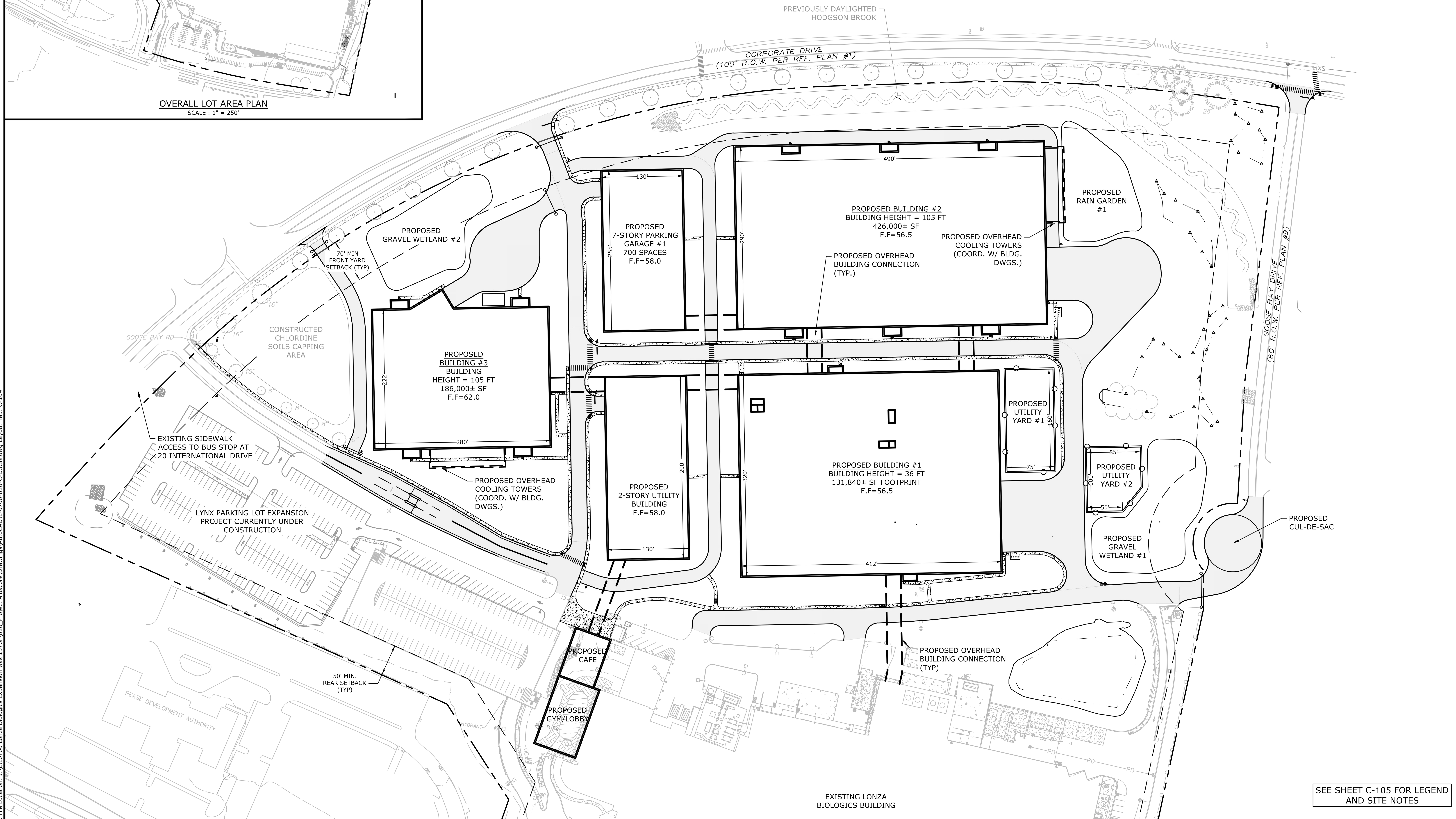
PARKING REQUIREMENTS:

REQUIRED PARKING
2 SPACES PER 3 EMPLOYEES ON LARGEST SHIFT

740 EXISTING EMPLOYEES	493 SPACES
1250 ANTICIPATED EMPLOYEES	833 SPACES
TOTAL REQUIRED:	1,326 SPACES

PARKING PROVIDED

EXISTING SPACES:	522 SPACES
LYNX PARKING LOT EXPANSION SPACES:	222 spaces
PROPOSED PARKING GARAGE #1:	700 SPACES
TOTAL:	1,444 SPACES



Tighe&Bond

SCALE IN FEET 0 80' 160'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
I	1/9/2023	Admin. Approval Submission
H	12/10/2021	Planning Board Stipulation
G	8/19/2019	Admin. Approval Submission
F	11/6/2018	P.B. Submission
E	8/30/2018	Revised AoT Submission

PROJECT NO:	L-0700-013
DATE:	04/03/2018
FILE:	L-0700-026-C-DSGN.dwg
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

MASTER SITE PLAN

SCALE: AS SHOWN

C-104

Last Save Date: January 6, 2023 3:51 PM By: CKRZCUIK
Plot Date: Monday, January 09, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576\P\026_Project Albacore\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-104

APPENDIX J
Traffic Control Signal Plans

SIGN 9"X 12" 1 EACH

R10-3A(R) BLACK ON WHITE

1 MOUNTED OVER PUSH BUTTON

SIGN 9"X 12" 5 EACH

R10-3A(L) BLACK ON WHITE

5 MOUNTED OVER PUSH BUTTONS

SIGN 24"X 30" 2 EACH

R3-5L BLACK ON WHITE

MOUNTED ON MAST ARM NEXT TO LEFT TURN SIGNAL

SIGN 30"X 30" 4 EACH

R3-7L LEFT LANE MUST TURN LEFT BLACK ON WHITE

1 T.S. POST MOUNTED

SIGN 24"X 30" 2 EACH

R4-7

1 T.S. POST MOUNTED (PAIR)

SIGN 30"X 30" 1 EACH

ONLY ONLY

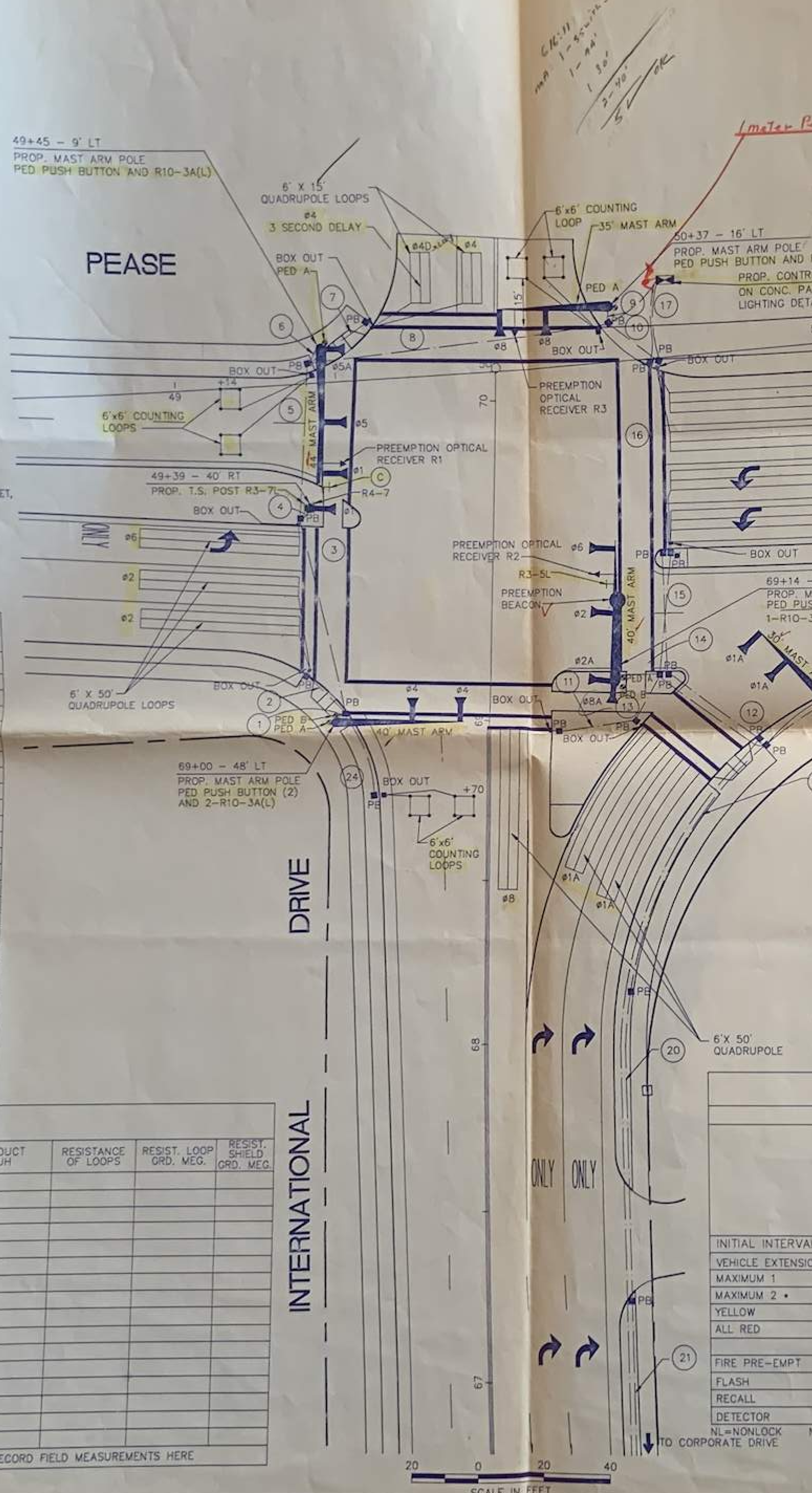
MAST ARM MOUNTED

PULL BOX SCHEDULE

49+36 – 42' RT
49+42 – 05' LT
49+61 – 17' LT
50+36 – 11' LT
50+51 – 01' RT (2)
64+55 – 44' RT (SHEET 36)
65+45 – 44' RT (SHEET 34)
66+35 – 44' RT (SHEET 34)
67+25 – 44' RT
68+15 – 44' RT
68+70 – 35' LT
68+93 – 22' RT
68+95 – 85' RT (2)
69+02 – 45' LT
69+01 – 46' RT
69+20 – 54' RT (2)
69+54 – 56' RT (2)

NOTES:

1. SIGNS MOUNTED ON MAST ARMS AND T.S. POSTS SHOWN ON THIS SHEET, OTHER POST MOUNTED SIGNS SHOWN ON SHEET 41.
2. FOR PAVEMENT MARKINGS SEE SHEET 41.
3. QUADRUPLE LOOPS TO HAVE 2-4-2 LOOP WIRE CONFIGURATION; 6'x6' LOOPS TO HAVE 3 TURNS.



CONDUIT SCHEDULE

I.D.	STATION TO STATION	NO.	LENGTH	SCHEDULE TYPE	REMARKS
1	69+00 – 48' LT — 69+02 – 45' LT	1	4'	40	FROM MAST ARM
2	69+02 – 45' LT — 69+14 – 58' LT	1	16'	40	
3	69+02 – 45' LT — 49+36 – 42' RT	1	61'	80	
4	49+36 – 42' RT — 49+39 – 40' RT	1	4'	40	TO TS POST
5	49+39 – 40' RT — 49+42 – 05' LT	1	46'	80	
6	49+42 – 05' LT — 49+45 – 09' LT	1	5'	40	TO MAST ARM
7	49+42 – 05' LT — 49+61 – 17' LT	1	21'	40	
8	49+42 – 05' LT — 50+36 – 11' LT	1	94'	80	
9	50+37 – 16' LT — 50+36 – 11' LT	1	4'	40	FROM MAST ARM
10	50+36 – 11' LT — 50+64 – 22' LT	1	20'	40	TO CONTROLLER
11	68+97 – 22' RT — 69+01 – 46' RT	1	23'	40	
12	68+95 – 85 RT — 69+20 – 54' RT	2	40'	80	1 POWER SERVICE
13	69+01 – 46' RT — 69+20 – 54' RT	1	20'	40	
14	69+17 – 40' RT — 69+20 – 54' RT	1	13'	40	
15	69+20 – 54' RT — 69+54 – 56' RT	2	32'	80	1 POWER SERVICE
16	69+54 – 56' RT — 50+51 – 01' RT	2	59'	80	1 POWER SERVICE
17	50+51 – 01' RT — 50+64 – 22' LT	2	26'	40	1 POWER SERVICE
18	68+95 – 85 RT — 69+06 – 105' RT	1	23'	40	TO MAST ARM
19	68+95 – 85' RT — 68+15 – 44' RT	1	90'	40	
20	68+15 – 44' RT — 67+25 – 44' RT	1•	90'	80	•SEE SHT. 8 TRNCH DTL.
21	67+25 – 44' RT — 66+35 – 44' RT	1•	90'	40	•SEE SHT. 8 TRNCH DTL.
22	66+35 – 44' RT — 65+45 – 44' RT	1•	90'	40	•SEE SHT. 8 TRNCH DTL.
23	65+45 – 44' RT — 64+55 – 44' RT	1•	90'	40	•SEE SHT. 8 TRNCH DTL.
24	68+70 – 35' LT — 69+02 – 45' LT	1	35'	40	
25	68+95 – 85' RT — 51+30 – 98' RT	1	60'	40	

DETECTOR SCHEDULE

DETECTOR				AMPLIFIER		INDUCT UH	RESISTANCE OF LOOPS	RESIST. LOOP GRD. MEG.	RESIST. SHIELD GRD. MEG.
STREET	DIRECTION	LANE	Ø	NO.	CHANNEL				
PEASE BOULEVARD	EASTBOUND	LEFT	6	1	1				
PEASE BOULEVARD	EASTBOUND	CENTER & RIGHT	2	1	2				
PEASE BOULEVARD	WESTBOUND	LEFT & CENTER	1	2	1				
PEASE BOULEVARD	WESTBOUND	CENTER & RIGHT	5	2	2				
INTERNATIONAL DRIVE	NORTHBOUND	LEFT	8	3	1				
INTERNATIONAL DRIVE	NORTHBOUND	CENTER & RIGHT	1	3	2				
DRIVE	SOUTHBOUND	LEFT	4	4	1				
DRIVE	SOUTHBOUND	RIGHT	4D	5	2				
PEASE BOULEVARD	EB EGRESS	LEFT	C	6	1				
PEASE BOULEVARD	EB EGRESS	RIGHT	C	6	2				
PEASE BOULEVARD	WB EGRESS	LEFT	C	7	1				
PEASE BOULEVARD	WB EGRESS	RIGHT	C	7	2				
INTERNATIONAL DRIVE	SB EGRESS	LEFT	C	8	1				
INTERNATIONAL DRIVE	SB EGRESS	RIGHT	C	8	2				
DRIVE	NB EGRESS	LEFT	C	9	1				
DRIVE	NB EGRESS	RIGHT	C	9	2				

C – COUNTING LOOP

RECORD FIELD MEASUREMENTS HERE

PRE-EMPTION PHASING & PRIORITY

RECEIVER & PRIORITY	PREEMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
R1	1		1 + 5
R2	2		2 + 6
R3	3		8

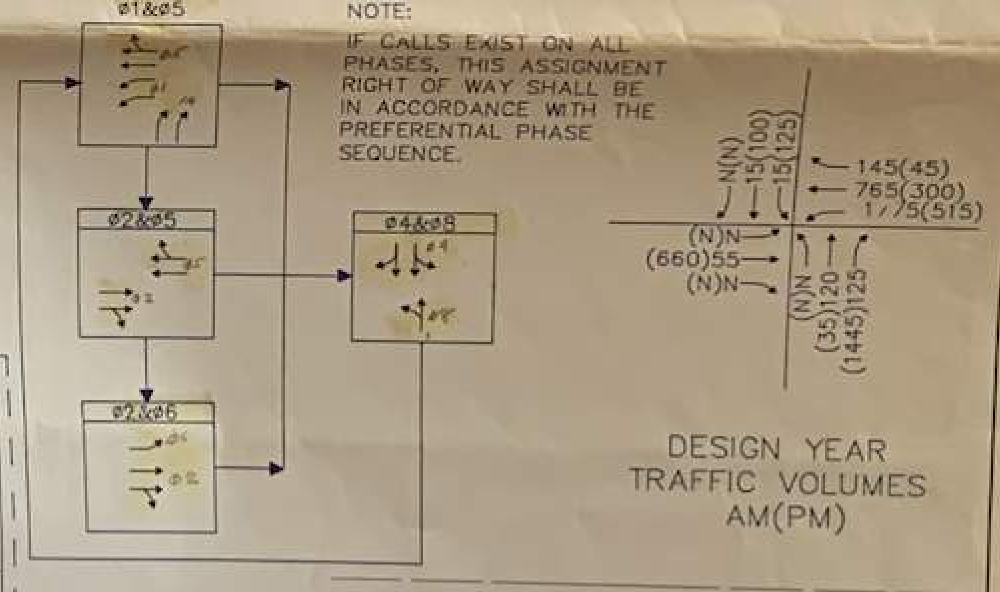
ø4 Pre-empt ø4 will also be called

EMERGENCY VEHICLE PRE-EMPTION OPERATION

1. PRE-EMPTION OPERATION UTILIZES AVAILABLE PHASES IN 8 PHASE TIMER THROUGH THE MSD PRE-EMPT INPUTS TO EFFECT APPROPRIATE SIGNAL DISPLAYS FOR SINGLE APPROACH MOVEMENTS AS SHOWN IN THE PRE-EMPTION PHASING AND PRIORITY CHART.
2. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
3. PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH RECEIVERS 1, 2, OR 3 ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (1 HIGHEST AND 3 LOWEST)
4. IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR # 1 (OR #2, #3) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2, #3) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 1 SECOND: ALL RED) AND SERVICE EMERGENCY VEHICLE PRE-EMPTION PHASE #2 (OR #1) IF NECESSARY, THEN TIME PHASE PRE-EMPTION CLEARANCE AND RESUME NORMAL SIGNAL OPERATION. EMERGENCY VEHICLE PRE-EMPTION PHASES #3 SHALL BE SIMILARLY SERVED.
5. MINIMUM GREEN & NORMAL VEHICLE CLEARANCE, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
6. EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.

NO COORDINATION

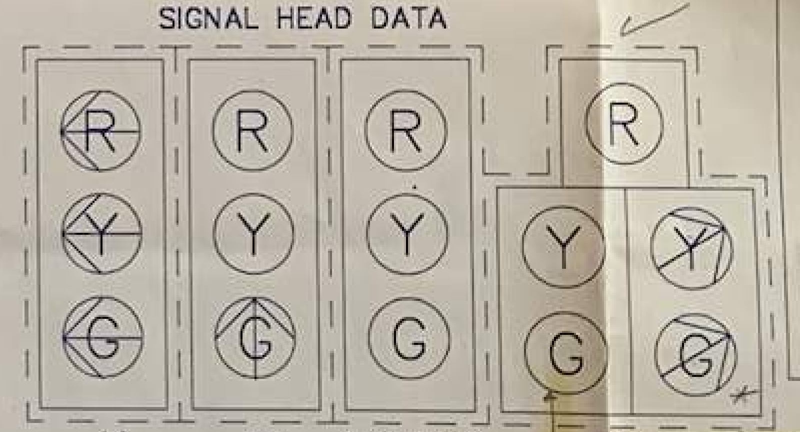
PREFERENTIAL PHASE SEQUENCE



NOTE: IF CALLS EXIST ON ALL PHASES, THIS ASSIGNMENT RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.

DESIGN YEAR TRAFFIC VOLUMES AM(PM)

SIGNAL HEAD DATA



ALL 12" LENS WITH 5" BACKPLATES

SIGNAL PHASING

NO COORD

	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
			NOT USED				NOT USED	
INITIAL INTERVAL	10	6	–	6	10	6	–	6
VEHICLE EXTENSION	3	3	–	3	3	2	–	3
MAXIMUM 1	50	15	–	10	20	10	–	10
MAXIMUM 2 •	50	30	–	20	30	15	–	20
YELLOW	4	4	–	4	4	3	–	4
ALL RED	2	2	–	2	2	2	–	2
FIRE PRE-EMPT	SEE EMERGENCY VEHICLE PRE-EMPTION OPERATION							
FLASH	F←R-, FR	FY	–	FR	FY	F←R-	–	FR
RECALL	OFF	ON	–	OFF	ON	OFF	–	OFF
DETECTOR	NL	NL	–	NL	NL	NL	–	NL

NL=NONLOCK

NOTES: 1.• MAXIMUM 2 = 7-9AM & 4-6PM
2. ø1 OMIT ø6
PED A = PUSH BUTTON ACTUATION CALLS ø4 MAX 2
PED B = PUSH BUTTON ACTUATION CALLS ø2 MAX 1

Rev. No.	Date	Description	Made by	Chk. by	Appd. by

Pease Development Authority
Portsmouth, New Hampshire

Pease International Tradeport
Portsmouth, New Hampshire
E.D.A. No. 01-49-03235

Pease Boulevard and International Drive Signalization Plan

Vanasse Hangen Brustlin, Inc.
Engineers • Planners • Scientists
Bedford, New Hampshire 03110
Six Bedford Farms, Kilton Road
603 644 0888 • FAX 603 644 2385

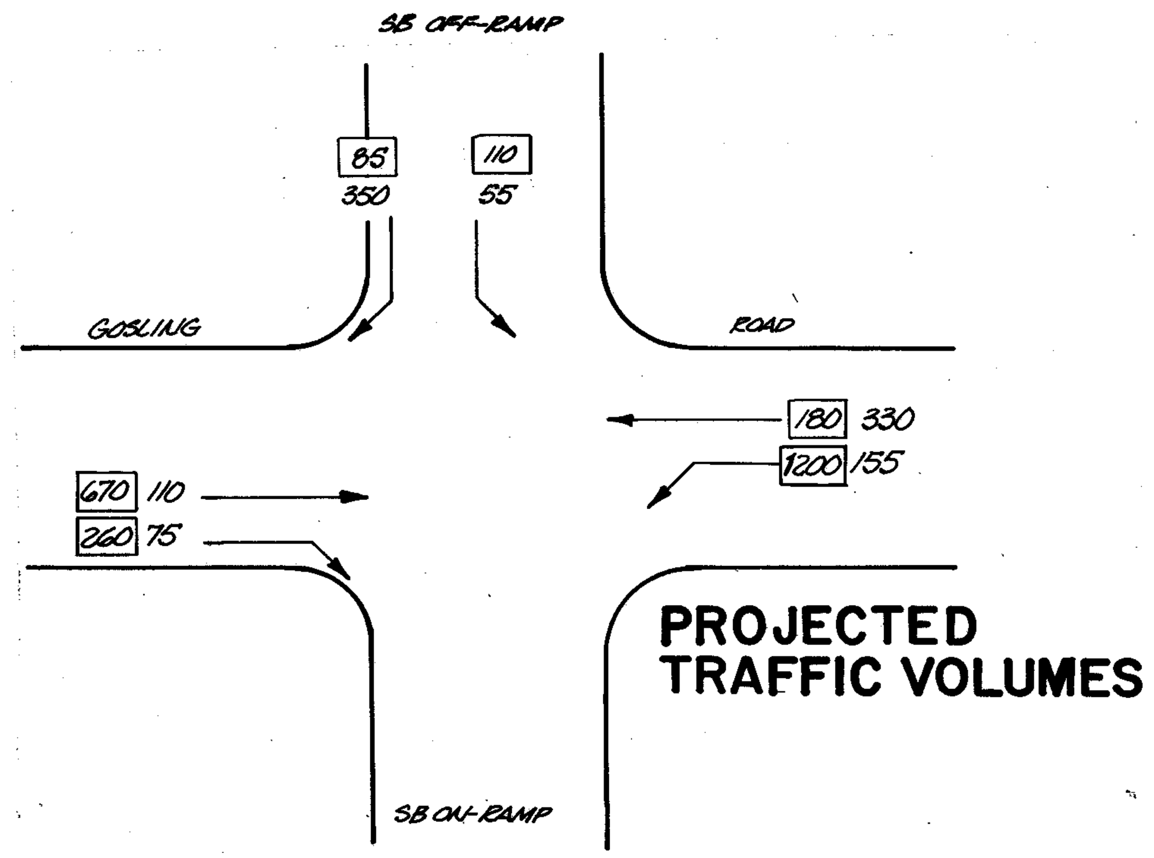
G16:11

Designed by: Drawn by: Checked by:

Scale: 1" = 20'

Date: March 18, 1994

Sheet of

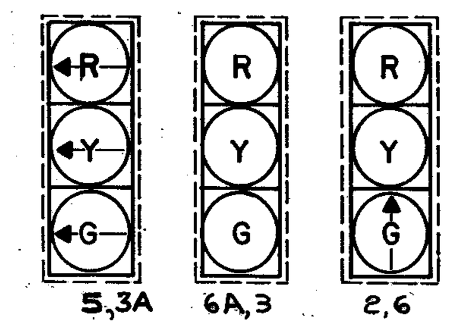


PROJECTED TRAFFIC VOLUMES

XXX - 2008 A.M. PEAK HOUR TRAFFIC
[XXX] 2008 P.M. PEAK HOUR TRAFFIC

SIGNAL HEADS

12" LENSES
5" (NOMINAL) BACKPLATES

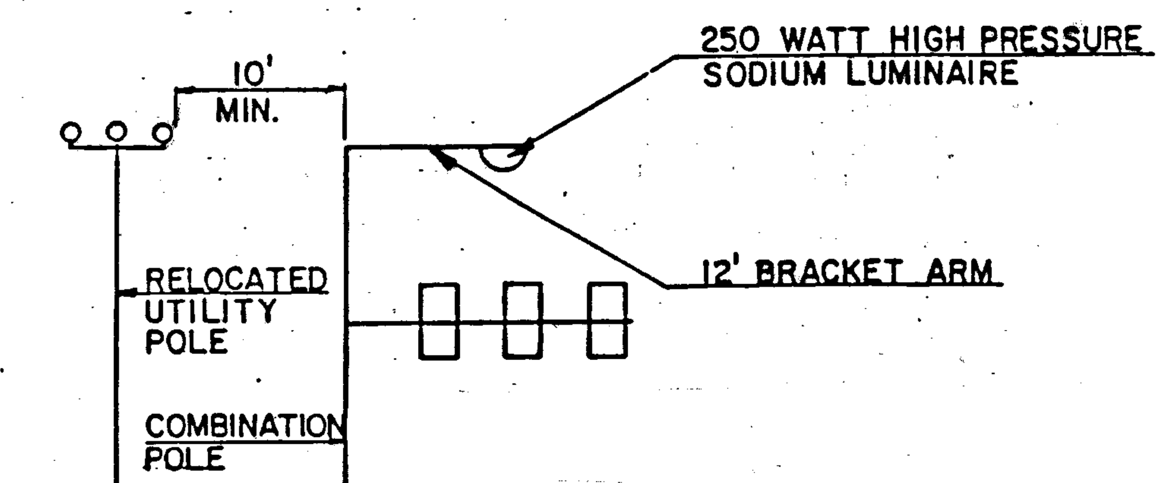


(C) = NO TURN ON RED ARROW — TO BE PLACED ADJACENT TO LEFT TURN SIGNALS 3A, 1A, 5

DETECTOR			AMPLIFIER		INDUCT µH	RESIST. OF LOOP	RESIST. LOOP/GND MEG.	RESIST. SHIELD/GND MEG.
STREET	DIRECTION	LANE	NO.	CHANNEL				
GOSLING RD.	Ø3 SO. BD.	LEFT TURN	1	1				
GOSLING RD.	Ø1 W BD.	THRU	2	1				
GOSLING RD.	Ø1 E BD.	THRU (2)	3	1				
S-B OFF-RAMP	Ø2 SO. BD.	LEFT TURN	4	1				

RECORD FIELD MEASUREMENTS HERE

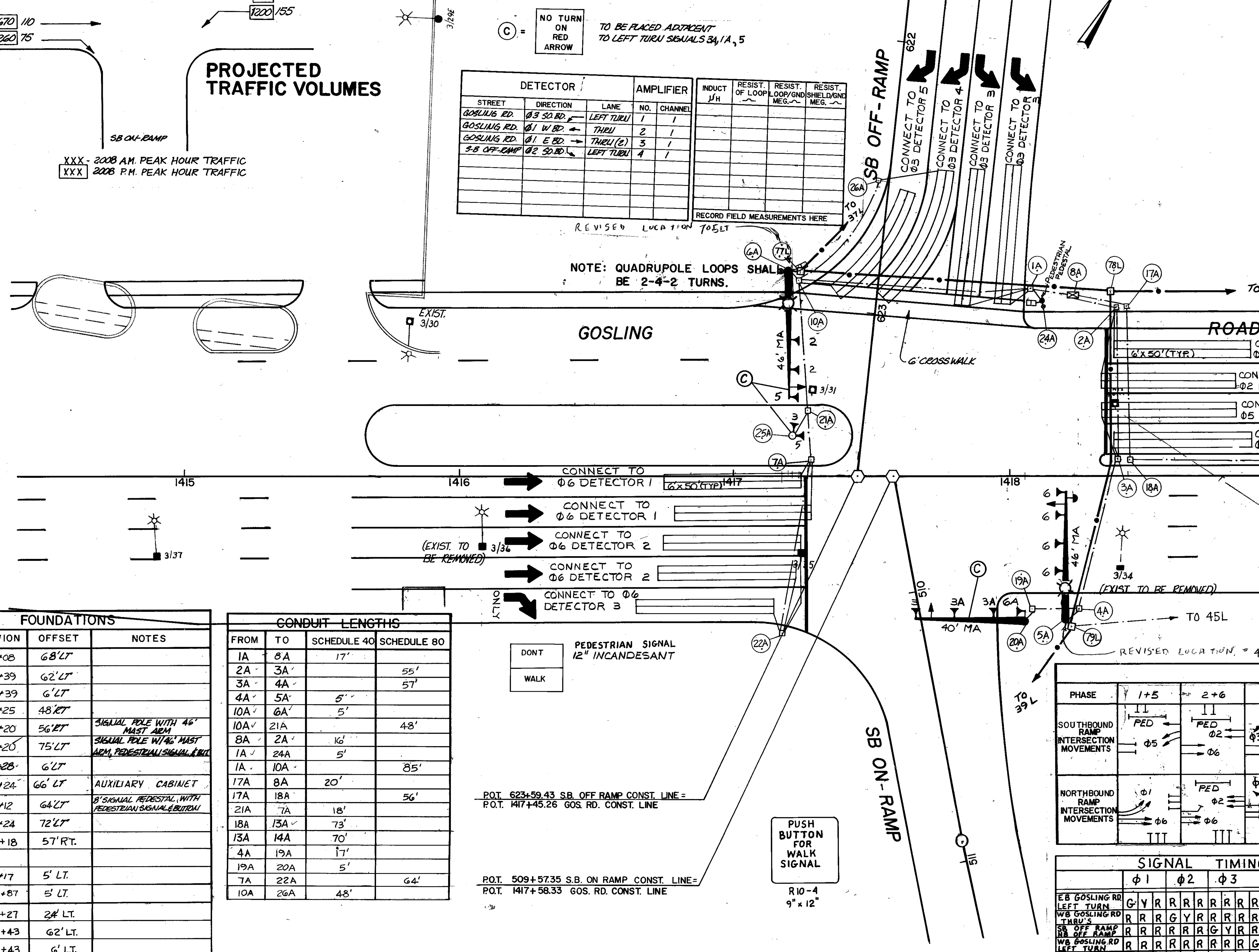
SCHEMATIC COMBINATION POLES



INSTALL 250-WATT HIGH PRESSURE SODIUM LUMINAIRE (G.E. M-400A TYPE II OR APPROVED EQUAL) ON COMBINATION TRAFFIC SIGNAL/STREET LIGHT STANDARD WITH 40-FOOT MOUNTING HEIGHT AND 12-FOOT BRACKET ARM.

RELOCATED AERIAL LINES MUST BE PLACED AT A MINIMUM OF 10 FEET FROM COMBINATION TRAFFIC SIGNAL/STREET LIGHT STANDARD.

POWER SOURCE MUST BE DETERMINED FOR THE LUMINAIRE AND ADDITIONAL CONDUIT MAY BE REQUIRED.



FOUNDATION LOC.	FOUNDATION TYPE	STATION	OFFSET	NOTES
1A	PB	1418+08	68' LT	
2A	PB	1418+39	62' LT	
3A	PB	1418+39	6' LT	
4A	PB	1418+25	48' RT	
5A	MA	1418+20	56' RT	SIGNAL POLE WITH 46' MAST ARM
6A	SP	1417+20	75' LT	SIGNAL POLE W/46' MAST ARM, PEDESTRIAN SIGNAL & BUT.
7A	PB	1417+28	6' LT	
8A	CC	1418+24	66' LT	AUXILIARY CABINET
24A	SP	1418+12	64' LT	8' SIGNAL PEDESTAL, WITH PEDESTRIAN SIGNAL & BUTTON
10A	PB	1417+24	72' LT	
22A	PB	1417+18	57' RT.	
13A	PB	1419+17	5' LT.	
14A	PB	1419+87	5' LT.	
21A	PB	1417+27	24' LT.	
17A	PB	1418+43	62' LT.	
18A		1418+43	6' LT.	
20A	SP	1418+05	53' RT.	SIGNAL POLE W/40' M.A.
26A	PB	622+52	4' RT.	

CONDUIT LENGTHS

FROM	TO	SCHEDULE 40	SCHEDULE 80
1A	8A	17'	
2A	3A		55'
3A	4A		57'
4A	5A	5'	
10A	6A	5'	
10A	21A		48'
8A	2A	16'	
1A	24A	5'	
1A	10A		85'
17A	8A	20'	
17A	18A		56'
21A	7A	18'	
18A	13A	73'	
13A	14A	70'	
4A	19A	17'	
19A	20A	5'	
7A	22A		64'
10A	26A	48'	

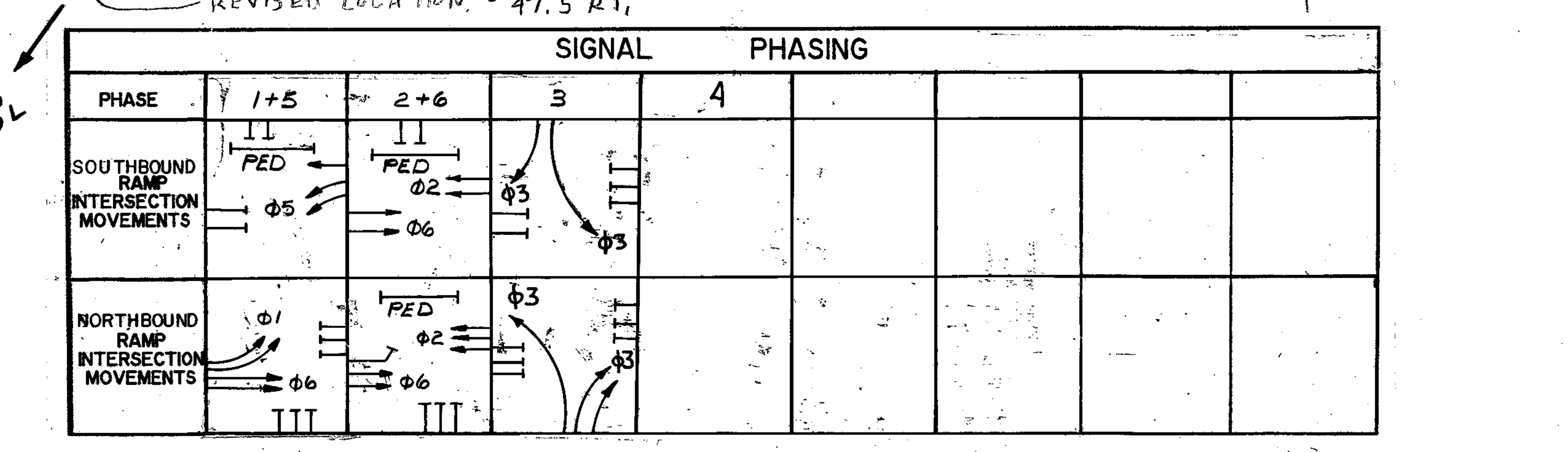
DONT / WALK — PEDESTRIAN SIGNAL 12" INCANDESANT

P.O.T. 623+59.43 S.B. OFF RAMP CONST. LINE =
P.O.T. 1417+45.26 GOS. RD. CONST. LINE

P.O.T. 509+57.35 S.B. ON RAMP CONST. LINE =
P.O.T. 1417+58.33 GOS. RD. CONST. LINE

PUSH BUTTON FOR WALK SIGNAL
R10-4
9" x 12"

SIGNAL PHASING



SIGNAL TIMING	Φ1			Φ2			Φ3			Φ5			Φ6			FLASH
EB GOSLING RD LEFT TURN	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R
WB GOSLING RD THRU'S	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	Y
SB OFF RAMP NB OFF RAMP	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R
WB GOSLING RD LEFT TURN	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R
EB GOSLING RD THRU'S	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	Y
MIN GREEN	15			8			8			5			8			
EXTENTION	4			5			5			4			5			
YELLOW		4			4			4			4			4		
RED			2			2			2			2			2	
MAX. I	25			35			25			25			35			
WALK	7			7												OUT
DON'T WALK	18			18												OUT

KEY

- LIGHTING CONDUIT
- SIGNAL CONDUIT
- BOX OUT
- CONTROLLER CABINET
- METER PEDESTAL
- PEDESTRIAN SIGNAL
- 2 DUCT CONDUIT

ITEM NO. 616,101

SIGNAL PLANS

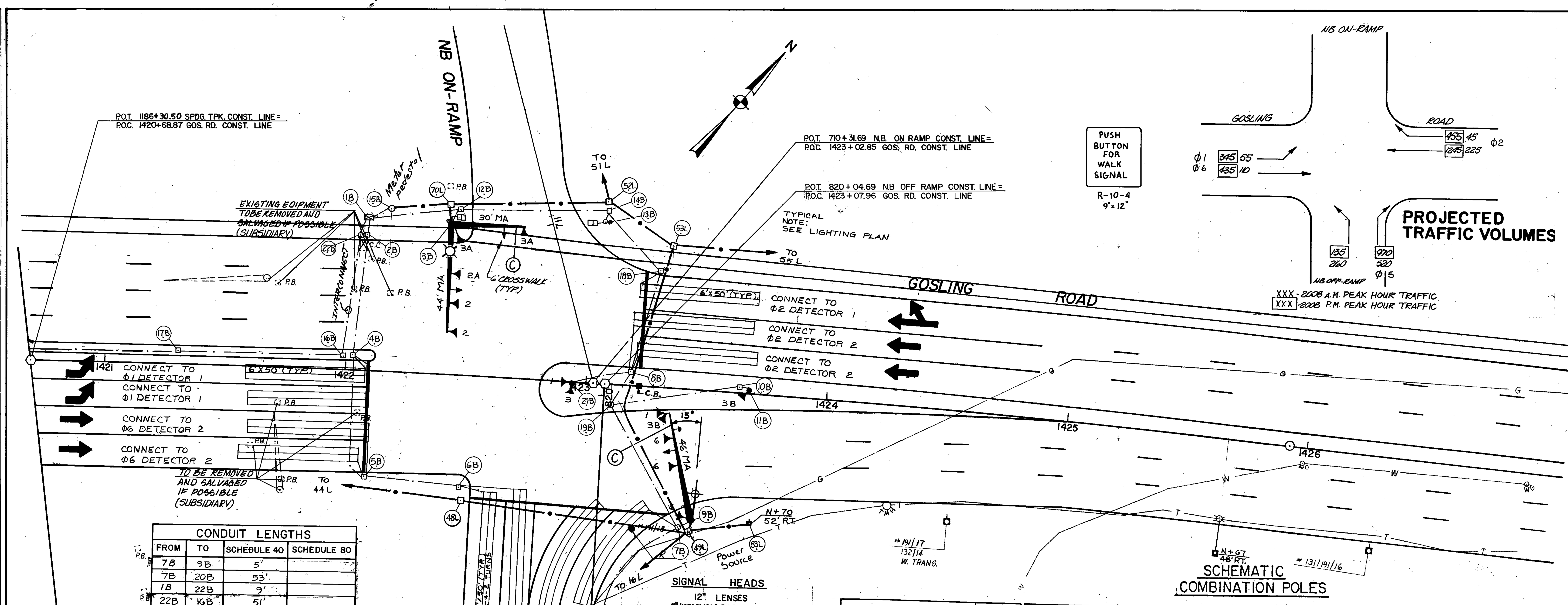
"AS-BUILT PLANS"

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
	10102	107	277

REVISIONS AFTER PROPOSAL				
NUMBER	DATE	STATION	STATION	DESCRIPTION

NOTEBOOKS	
BOOK	PAGE
BOOK	PAGE
BOOK	PAGE

DETAIL		DATE
EXISTING DETAIL		
PROPOSED DESIGN	P. Konjevcka	DATE 10-6-89
SHEET CHECKED	Smith	DATE 10-6-89
AS BUILT DETAILS		DATE



CONDUIT LENGTHS

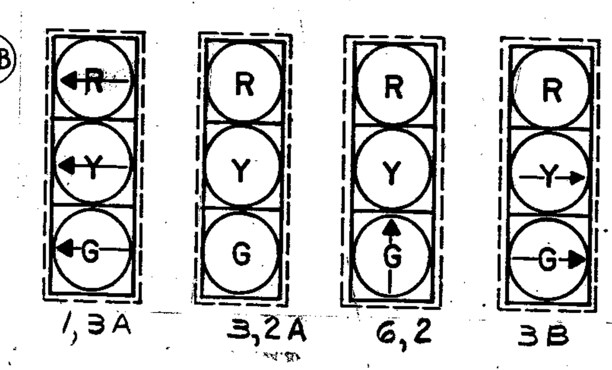
FROM	TO	SCHEDULE 40	SCHEDULE 80
7B	9B	5'	
7B	20B	53'	
1B	22B	9'	
22B	16B	51'	
1B	15B	10'	
1B	12B	38'	
2B	4B		50'
4B	5B		53'
5B	6B	40'	
12B	14B		61'
14B	13B	5'	
12B	3B	8'	
14B	18B	33'	
18B	8B		44
8B	21B	25'	
8B	19B	16'	
19B	10B	54'	
10B	11B	5'	
7B	19B		58'

FOUNDATIONS

FOUNDATION LOC.	FOUNDATION TYPE	STATION	OFFSET	NOTES
1B	CONT.	1422+08	68' LT.	RELOCATED CABINET
2B	PB	1422+07	56' LT	
3B	MA	1422+41	63' LT	SIGNAL POLE W/44' MAST ARM AND PEDESTRIAN SIGNAL & BUTTON
4B	PB	1422+04	6' LT	
5B	PB	1422+10	43' RT	
6B	PB	1422+50	46' RT	
7B	PB	1423+42	57' RT	
8B	PB	1423+18	5' LT	
9B	MA	1423+47	54' RT	SIGNAL POLE W/46' MAST ARM
10B	PB	1423+64	3' LT	
11B	SP	1423+68	2' LT	8' SIGNAL POLE
12B	PB	1422+45	68' LT	
13B	SP	1423+04	67' LT.	8' SIGNAL POLE W/ PEDESTRIAN SIGNAL & BUTTON
14B	PB	1423+06	72' LT.	
16B	PB	1421+99	6' LT.	
17B	PB	1421+30	6' LT.	
15B	MP	1422+16	68' LT.	METER PEDESTAL

SIGNAL HEADS

12" LENSES
5" (NOMINAL) BACKPLATES



Ⓒ = NO TURN ON RED ARROW — TO BE ADJACENT TO LEFT TURN SIGNAL 3A, 1

DON'T WALK — PEDESTRIAN SIGNAL 12" INCANDESANT

DETECTOR STREET	DETECTOR DIRECTION	DETECTOR LANE	AMPLIFIER NO.	AMPLIFIER CHANNEL
GOSLING RD.	ϕ6 W.BOUND	THRU (3)	1	1
GOSLING RD.	ϕ6 E.BOUND	THRU (2)	2	1
GOSLING RD.	ϕ5 E.BND.	LEFT TURN	3	1
NB OFF-RAMP	ϕ7 N.BND.	LEFT TURN	4	1
NB OFF-RAMP	ϕ4 N.BND.	RT. TURN (2)	5	1

INDUCT µH	RESIST. OF LOOP Ω	RESIST. LOOP/GND MEG. Ω	RESIST. SHIELD/GND MEG. Ω
RECORD FIELD MEASUREMENTS HERE			

NOTE: QUADRUPOLE LOOPS SHALL BE 2-4-2 TURNS.

SIGNAL PHASING

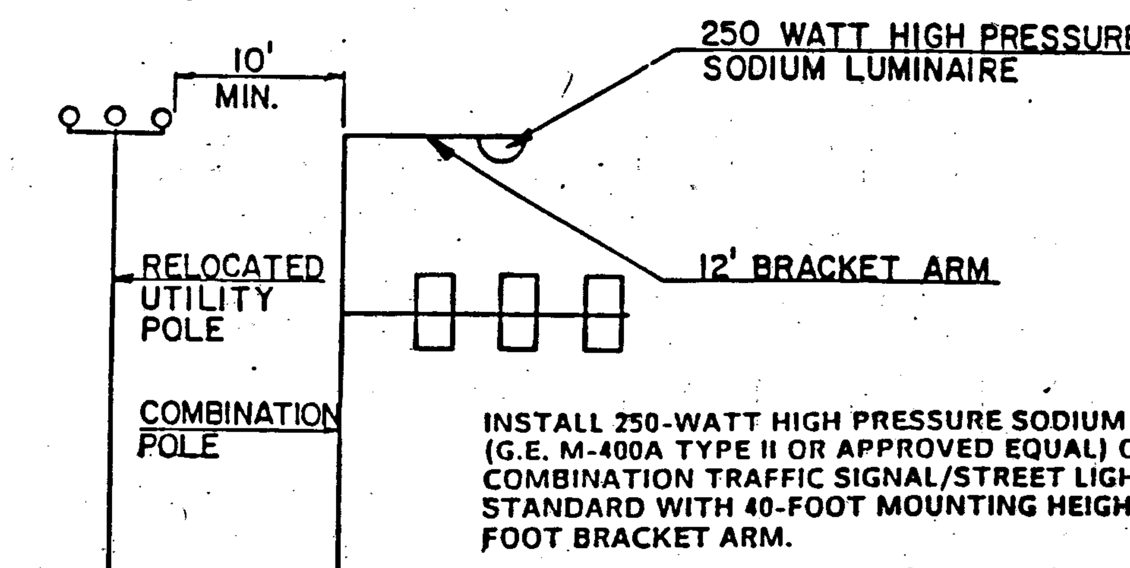
PHASE	1+5	2+6	3					
SOUTHBOUND RAMP INTERSECTION MOVEMENTS	PED ϕ5	PED ϕ2 ϕ6	ϕ3 ϕ3					
NORTHBOUND RAMP INTERSECTION MOVEMENTS	ϕ1 ϕ6	PED ϕ2 ϕ6	ϕ3 ϕ3					

CONDUIT LENGTHS

FROM	TO	SCHEDULE 40	SCHEDULE 80
16B	17B	69'	
17B	14A	143'	

FOUNDATIONS

FOUNDATION LOC.	FOUNDATION TYPE	STATION	OFFSET	NOTES
18B	PB	1423+28	48' LT.	
19B	PB	1423+11	8' RT.	
20B	PB	819+06	4' RT.	
21B	SP	1422+94	1' RT.	SIGNAL POLE
22B	PB	1422+04	56' LT.	



INSTALL 250-WATT HIGH PRESSURE SODIUM LUMINAIRE (G.E. M-400A TYPE II OR APPROVED EQUAL) ON COMBINATION TRAFFIC SIGNAL/STREET LIGHT STANDARD WITH 40-FOOT MOUNTING HEIGHT AND 12-FOOT BRACKET ARM.

RELOCATED AERIAL LINES MUST BE PLACED AT A MINIMUM OF 10 FEET FROM COMBINATION TRAFFIC SIGNAL/STREET LIGHT STANDARD.

POWER SOURCE MUST BE DETERMINED FOR THE LUMINAIRE AND ADDITIONAL CONDUIT MAY BE REQUIRED.

KEY

- LIGHTING CONDUIT
- SIGNAL CONDUIT
- BOX OUT
- CONTROLLER CABINET
- METER PEDESTAL
- PEDESTRIAN SIGNAL
- 2 DUCT CONDUIT

ITEM NO. 616.102

SIGNAL PLANS

"AS-BUILT PLANS"

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
	10102	108	277

REVISIONS AFTER PROPOSAL				
NUMBER	DATE	STATION	STATION	DESCRIPTION

NOTEBOOKS: BOOK PAGE / BOOK PAGE / BOOK PAGE

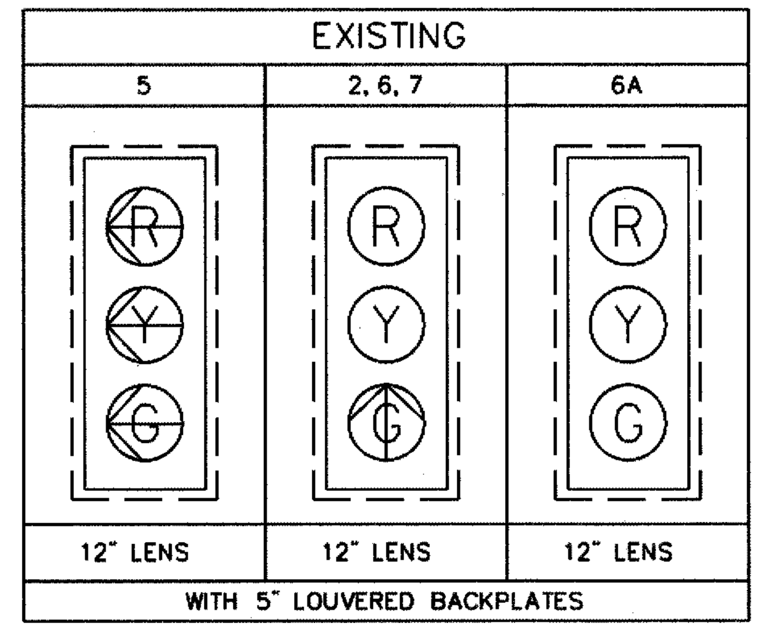
EXISTING DETAIL — DATE
PROPOSED DESIGN P. Krajewski — DATE 10-6-89
SHEET CHECKED — DATE 10-6-89
AS BUILT DETAILS — DATE

8 PHASE NEMA DUAL RING QUAD LEFT CONTROLLER

SIGNAL PHASING & TIMING								
	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
TIMING IN SECONDS	NOT USED		NOT USED	NOT USED				NOT USED
INITIAL INTERVAL	–	8	–	–	5	8	5	–
VEHICLE EXTENSION	–	4	–	–	4	4	4	–
MAXIMUM 1	–	30	–	–	20	30	25	–
MAXIMUM 2	–	30	–	–	20	30	25	–
YELLOW	–	4	–	–	4	4	4	–
ALL RED	–	2	–	–	2	2	2	–
PEDESTRIAN WALK	–	–	–	–	–	–	–	–
PEDESTRIAN CLEAR	–	–	–	–	–	–	–	–
FLASH	–	FY	–	–	FRA	FY	FR	–
RECALL	–	SOFT	–	–	OFF	SOFT	OFF	–
DETECTOR	–	NL	–	–	NL	NL	NL	–
PRE-EMPT PRIORITY	–	2	–	–	2	1	3	–

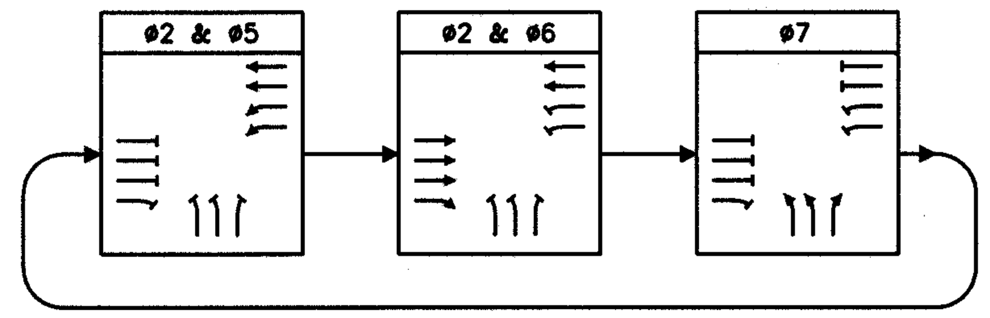
SYSTEM TO MAXIMUM 2 UNDER COORDINATION

SIGNAL HEAD DATA



NOTE: ALL SIGNAL HEADS ARE EQUIPPED WITH L.E.D. MODULES.

N.E.M.A. PHASE SEQUENCE



DETECTOR SCHEDULE

DETECTOR				AMPLIFIER		INDUCT UH	RESISTANCE OF LOOPS	RESIST. LOOP GRD. MEG.	RESIST. SHIELD GRD. MEG.
STREET	DIRECTION	LANE	ø	NO.	CHANNEL				
NH ROUTE 33	EASTBOUND	THRU (MEDIAN)	6	1	1				
NH ROUTE 33	EASTBOUND	THRU (CEN-LEFT)	6	1	2				
NH ROUTE 33	EASTBOUND	THRU (CEN-RIGHT)	6	2	1				
NH ROUTE 33	EASTBOUND	RIGHT	6D	2	2				
NH ROUTE 33	EASTBOUND	THRU-BACK (MEDIAN)	6	3	1				
NH ROUTE 33	EASTBOUND	THRU-BACK (CEN-LEFT)	6	3	2				
NH ROUTE 33	EASTBOUND	THRU-BACK (CEN-RIGHT)	6	4	1				
NH ROUTE 33	**EASTBOUND**	**THRU-DEPART (MEDIAN)**	**S5**	**10**	**1**				
NH ROUTE 33	**EASTBOUND**	**THRU-DEPART (CENTER)**	**S6**	**10**	**2**				
NH ROUTE 33	**EASTBOUND**	**THRU-DEPART (RIGHT)**	**S7**	**11**	**1**				
NH ROUTE 33	WESTBOUND	LEFT (MEDIAN)	5	5	1				
NH ROUTE 33	WESTBOUND	LEFT (CEN-LEFT)	5	5	2				
NH ROUTE 33	WESTBOUND	THRU (CEN-RIGHT)	2	6	1				
NH ROUTE 33	WESTBOUND	THRU (RIGHT)	2	6	2				
NH ROUTE 33	WESTBOUND	THRU-BACK (CEN-RIGHT)	2	7	1				
NH ROUTE 33	WESTBOUND	THRU-BACK (CEN-LEFT)	2	7	2				
NH ROUTE 33	**WESTBOUND**	**THRU-DEPART (LEFT)**	**S8**	**12**	**1**				
NH ROUTE 33	**WESTBOUND**	**THRU-DEPART (RIGHT)**	**S9**	**12**	**2**				
I-95 SB RAMP	NORTHBOUND	LEFT (MEDIAN)	7	8	1				
I-95 SB RAMP	NORTHBOUND	LEFT (CENTER)	7	8	2				
I-95 SB RAMP	NORTHBOUND	RIGHT	7D	9	1				
						RECORD FIELD MEASUREMENTS HERE			

S = SYSTEM LOOP
ø6D & ø7D SHALL BE PROGRAMMED WITH 5 SECOND DELAY

FIRE PREEMPTION	
PREEMPT 1	CALLS ø6
PREEMPT 2	CALLS ø2 & ø5
PREEMPT 3	CALLS ø7

FIRE PREEMPTION NOTES:

1. PROGRAM PREEMPTION PRIORITY TO MATCH PHASING CHANGE.
2. PREEMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH OPTICAL RECEIVERS ASSIGNED WITH DESCENDING PRIORITIES AS FOLLOWS: #1 HIGHEST TO #3 LOWEST.
3. MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE TIMES SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PREEMPTION DEMAND.

SIGNAL CONSTRUCTION NOTES:

1. THE PROPOSED CONTROLLER SHALL MAINTAIN THE EXISTING POWER SUPPLY.
2. EXISTING SIGNAL EQUIPMENT TO BE REMOVED SHALL BE SALVAGED TO THE BUREAU OF TRAFFIC. SEE THE PROSECUTION OF WORK FOR CONTACT NAMES.
3. PAVEMENT SAWING FOR LOOP DETECTORS, CONDUIT (WHEN REQUIRED), AND JACKING PITS (WHEN REQUIRED) SHALL BE SUBSIDIARY TO 616. ITEMS. REPLACEMENT OF PAVEMENT FOR CONDUIT TRENCHES AND JACKING PITS WILL BE SUBSIDIARY TO 616. ITEMS.
4. ALL SIGNAL EQUIPMENT SHALL BE INSTALLED AS PER THE MUTCD STANDARDS AND NHDOT SPECIFICATIONS.
5. THE CONTRACTOR SHALL VERIFY THAT ALL DETECTORS ARE FUNCTIONAL; THE CONTRACTOR SHALL REPAIR OR REPLACE THESE AS NECESSARY.
6. EACH NEW DETECTOR LOOP AND SYSTEM LOOP SHALL BE BROUGHT BACK TO THE CONTROLLER CABINET ON SEPARATE LEAD IN CABLE.
7. THIS PLAN HAS AN APPROXIMATE ENGLISH STATIONING BASED ON A METRIC SURVEY WEST OF I-95 BRIDGE. ALL UTILITY LOCATIONS ARE APPROXIMATE.

2004 DESIGN YEAR
VOLUMES AM(PM)[WDMD]<SAT>

←315 (1000) [605] <490>
←240 (530) [170] <160>
<920> [795] (1070) 1155 →
<65> [95] (115) 105 →
600 (700) [445] <465>
325 (145) [95] <65>

2013 DESIGN YEAR
VOLUMES AM(PM)[WDMD]<SAT>

←340 (1095) [665] <535>
←265 (580) [190] <175>
<1005> [865] (1170) 1265 →
<70> [105] (125) 115 →
655 (770) [485] <510>
355 (160) [105] <70>

20 0 20 40
SCALE IN FEET

ALTERATIONS TO TRAFFIC SIGNALS
ITEM 616.192

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF TRAFFIC

SIGNALIZATION PLAN
NH ROUTE 33/I-95 SB OFF RAMP

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
A-X000(179)	13879	8	14

REVISIONS AFTER PROPOSAL					
SDR PROCESSED	CMB	DATE 7/7/03			
NEW DESIGN	DJD	DATE 8/11/03			
SHEET CHECKED	CMB	DATE 8/21/03			
AS BUILT DETAILS		DATE			
NUMBER	DATE	STATION	STATION	DESCRIPTION	

8 PHASE NEMA DUAL RING QUAD LEFT CONTROLLER

SIGNAL PHASING & TIMING								
	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
TIMING IN SECONDS	→	←	↓↓	NOT USED	NOT USED	→	NOT USED	NOT USED
INITIAL INTERVAL	5	8	5	–	–	8	–	–
VEHICLE EXTENSION	4	4	4	–	–	4	–	–
MAXIMUM 1	20	35	20	–	–	35	–	–
MAXIMUM 2	20	35	20	–	–	35	–	–
YELLOW	4	4	4	–	–	4	–	–
ALL RED	2	2	2	–	–	2	–	–
PEDESTRIAN WALK	–	–	–	–	–	–	–	–
PEDESTRIAN CLEAR	–	–	–	–	–	–	–	–
FLASH	FRA	FY	FR	–	–	FY	–	–
RECALL	OFF	SOFT	OFF	–	–	SOFT	–	–
DETECTOR	NL	NL	NL	–	–	NL	–	–
PRE-EMPT PRIORITY	1	2	3	–	–	1	–	–

SYSTEM TO MAXIMUM 2 UNDER COORDINATION

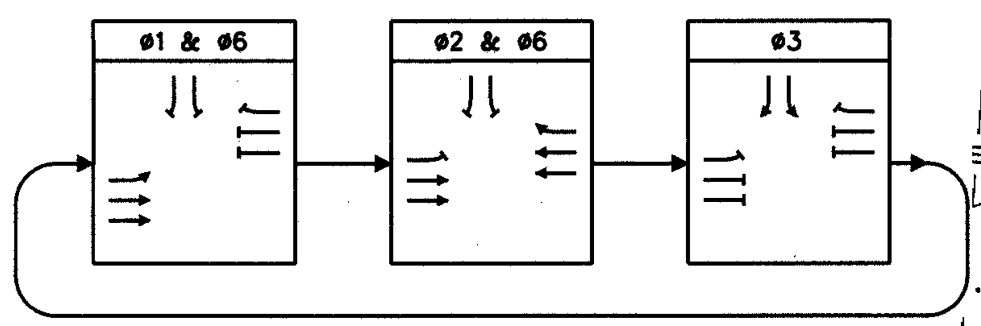
DETECTOR SCHEDULE

DETECTOR				AMPLIFIER		INDUCT UH	RESISTANCE OF LOOPS	RESIST. LOOP GRD. MEG.	RESIST. SHIELD GRD. MEG.
STREET	DIRECTION	LANE	ø	NO.	CHANNEL				
NH ROUTE 33	EASTBOUND	LEFT	1	1	1				
NH ROUTE 33	EASTBOUND	THRU (CENTER)	6	2	1				
NH ROUTE 33	EASTBOUND	THRU (RIGHT)	6	2	2				
NH ROUTE 33	EASTBOUND	THRU-BACK (CENTER)	6	3	1				
NH ROUTE 33	EASTBOUND	THRU-BACK (RIGHT)	6	3	2				
NH ROUTE 33	EASTBOUND	THRU-DEPART (LEFT)	S10	8	1				
NH ROUTE 33	EASTBOUND	THRU-DEPART (RIGHT)	S11	8	2				
NH ROUTE 33	WESTBOUND	THRU (MEDIAN)	2	4	1				
NH ROUTE 33	WESTBOUND	THRU (CENTER)	2	4	2				
NH ROUTE 33	WESTBOUND	RIGHT	2	5	1				
NH ROUTE 33	WESTBOUND	THRU-BACK (MEDIAN)	2	6	1				
NH ROUTE 33	WESTBOUND	THRU-BACK (CENTER)	2	6	2				
NH ROUTE 33	WESTBOUND	THRU-DEPART (MEDIAN)	S12	9	1				
NH ROUTE 33	WESTBOUND	THRU-DEPART (RIGHT)	S13	9	2				
GRAFTON ROAD	SOUTHBOUND	LEFT	3	7	1				
GRAFTON ROAD	SOUTHBOUND	RIGHT	3D	7	2				
						RECORD FIELD MEASUREMENTS HERE			

S = SYSTEM LOOP

ø3D SHALL BE PROGRAMMED WITH A 5 SECOND DELAY

N.E.M.A. PHASE SEQUENCE

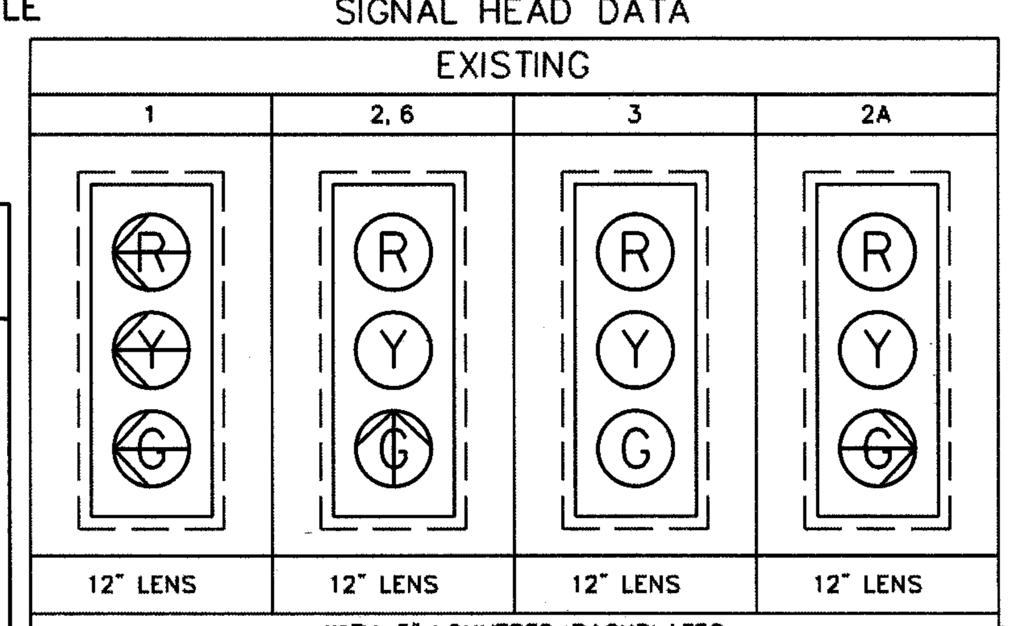


FIRE PREEMPTION	
PREEMPT 1	CALLS ø1 & ø6
PREEMPT 2	CALLS ø2
PREEMPT 3	CALLS ø3

FIRE PREEMPTION NOTES:

1. PROGRAM PREEMPTION PRIORITY TO MATCH PHASING CHANGE.
2. PREEMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH OPTICAL RECEIVERS ASSIGNED WITH DESCENDING PRIORITIES AS FOLLOWS: #1 HIGHEST TO #3 LOWEST.
3. MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE TIMES SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PREEMPTION DEMAND.

SIGNAL HEAD DATA

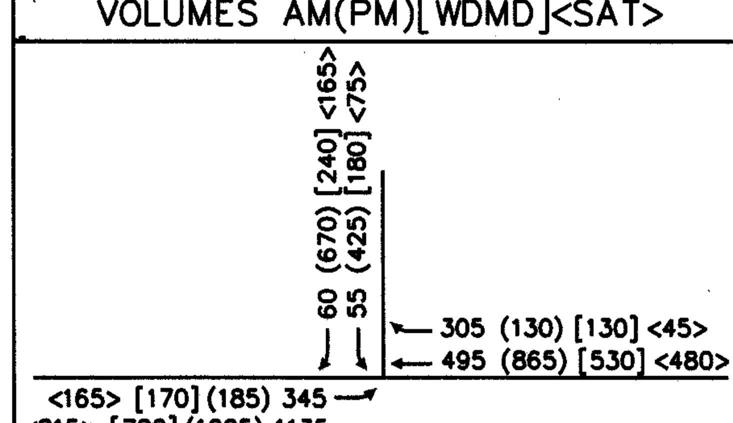


NOTE: ALL SIGNAL HEADS TO BE EQUIPPED WITH NEW L.E.D. MODULES.

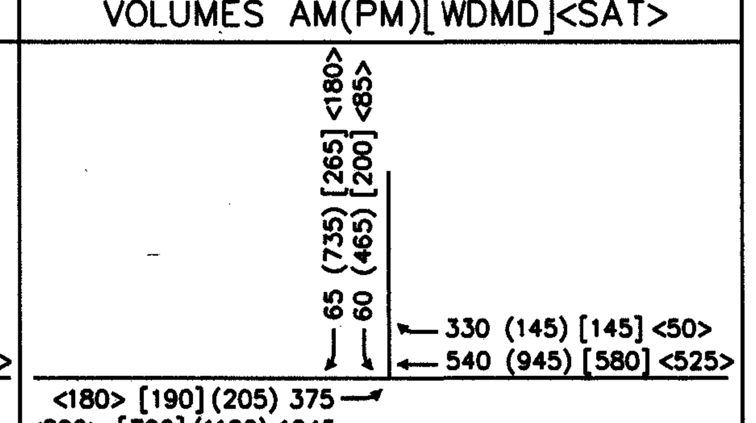
SIGNAL CONSTRUCTION NOTES:

1. THE PROPOSED CONTROLLER SHALL MAINTAIN THE EXISTING POWER SUPPLY.
2. EXISTING SIGNAL EQUIPMENT TO BE REMOVED SHALL BE SALVAGED TO THE BUREAU OF TRAFFIC. SEE THE PROSECUTION OF WORK FOR CONTACT NAMES.
3. PAVEMENT SAWING FOR LOOP DETECTORS, CONDUIT (WHEN REQUIRED), AND JACKING PITS (WHEN REQUIRED) SHALL BE SUBSIDIARY TO 616. ITEMS. REPLACEMENT OF PAVEMENT FOR CONDUIT TRENCHES AND JACKING PITS WILL BE SUBSIDIARY TO 616. ITEMS.
4. ALL SIGNAL EQUIPMENT SHALL BE INSTALLED AS PER THE MUTCD STANDARDS AND NHDOT SPECIFICATIONS.
5. THE CONTRACTOR SHALL VERIFY THAT ALL DETECTORS ARE FUNCTIONAL; THE CONTRACTOR SHALL REPAIR OR REPLACE THESE AS NECESSARY.
6. EACH NEW DETECTOR LOOP AND SYSTEM LOOP SHALL BE BROUGHT BACK TO THE CONTROLLER CABINET ON SEPARATE LEAD IN CABLE.
7. THIS PLAN HAS AN APPROXIMATE ENGLISH STATIONING BASED ON A METRIC SURVEY WEST OF I-95 BRIDGE. ALL UTILITY LOCATIONS ARE APPROXIMATE.

2004 DESIGN YEAR VOLUMES AM(PM)[WDMD]<SAT>



2013 DESIGN YEAR VOLUMES AM(PM)[WDMD]<SAT>



ALTERATIONS TO TRAFFIC SIGNALS
ITEM 616.193

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF TRAFFIC

SIGNALIZATION PLAN
NH ROUTE 33/GRAFTON ROAD (PEASE S. ENTRANCE)

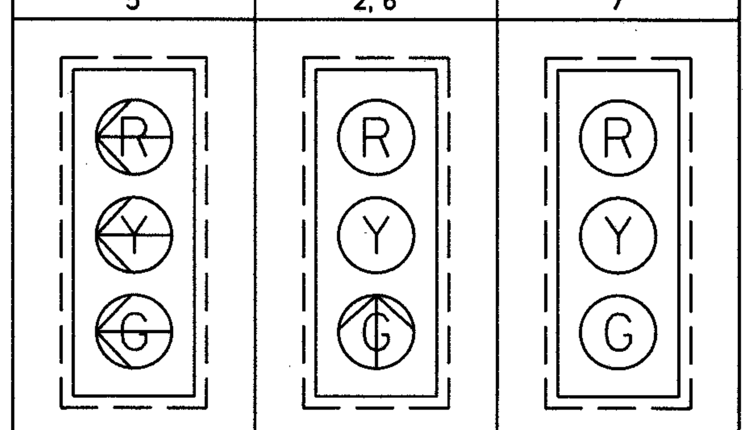
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
A-X000(179)	13879	9	14

REVISIONS AFTER PROPOSAL			
NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED CMB	DATE 7/7/03	
NEW DESIGN DJD	DATE 8/11/03	
SHEET CHECKED CMB	DATE 8/21/03	
AS BUILT DETAILS	DATE	

SIGNAL HEAD DATA

PROPOSED		
5	2, 6	7
12" LENS	12" LENS	12" LENS
WITH 5" LOUVERED BACKPLATES		



NOTE: ALL SIGNAL HEADS SHALL BE EQUIPPED WITH NEW L.E.D. MODULES.

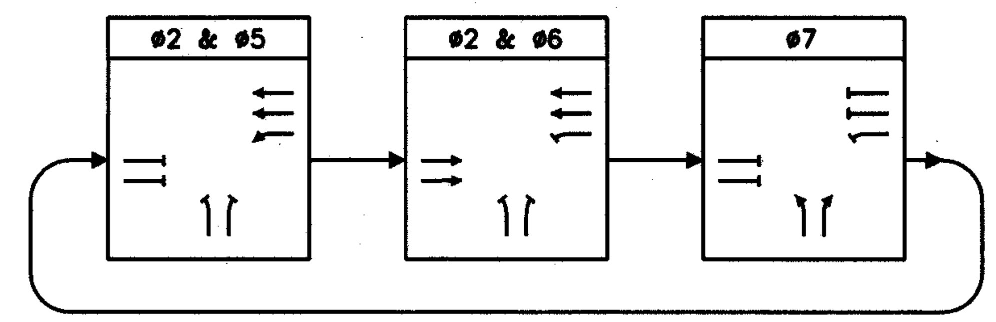
FIRE PREEMPTION

PREEMPT 1	CALLS #6
PREEMPT 2	CALLS #2 & #5
PREEMPT 3	CALLS #7

FIRE PREEMPTION NOTES:

1. PREEMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH OPTICAL RECEIVERS ASSIGNED WITH DESCENDING PRIORITIES AS FOLLOWS: #1 HIGHEST TO #3 LOWEST.
2. MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE TIMES SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PREEMPTION DEMAND.

N.E.M.A. PHASE SEQUENCE



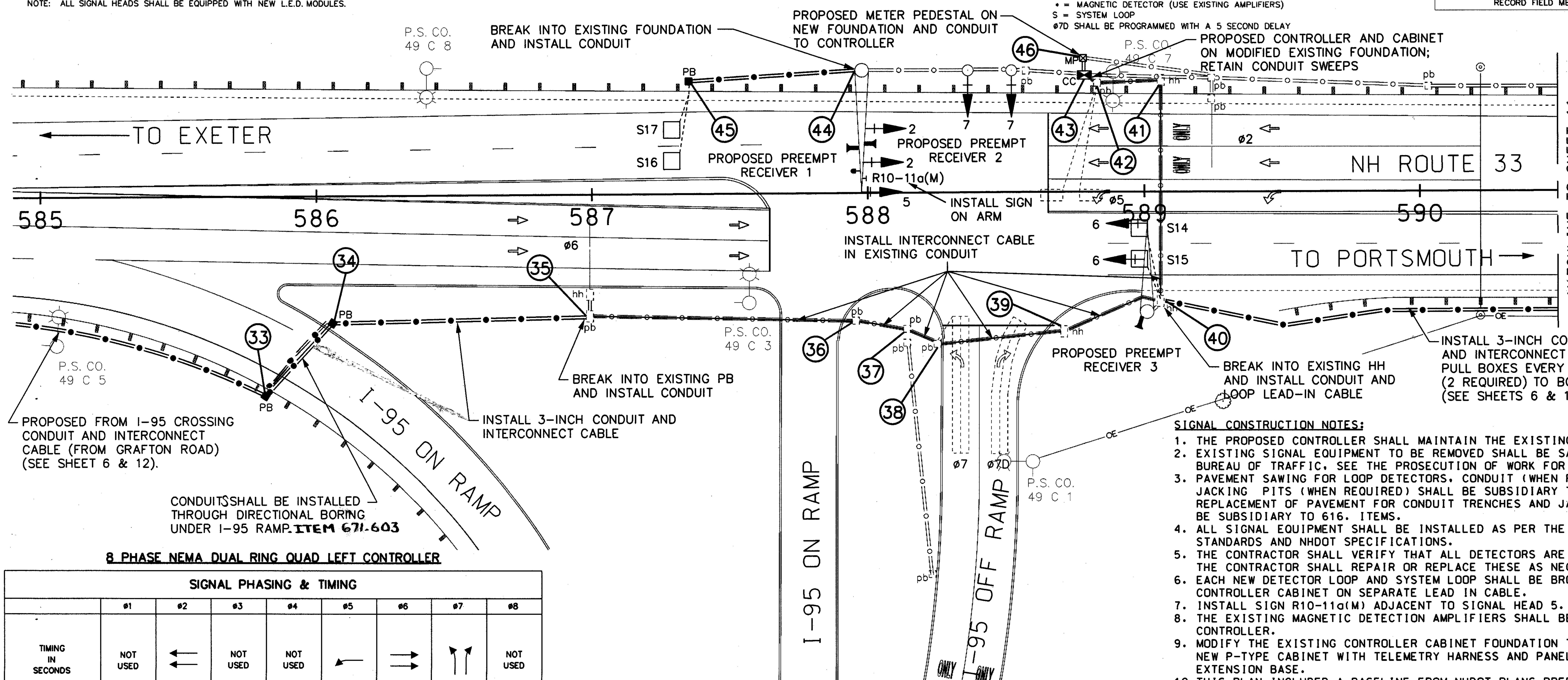
N

GRID

DETECTOR SCHEDULE

DETECTOR				AMPLIFIER		INDUCT UH	RESISTANCE OF LOOPS	RESIST. LOOP GRD. MEG.	RESIST. SHIELD GRD. MEG.
STREET	DIRECTION	LANE	φ	NO.	CHANNEL				
NH ROUTE 33	EASTBOUND	THRU (LEFT)	6•	•	•				
NH ROUTE 33	EASTBOUND	THRU (RIGHT)	6•	•	•				
NH ROUTE 33	EASTBOUND	THRU-DEPART (LEFT)	S14	3	1				
NH ROUTE 33	EASTBOUND	THRU-DEPART (RIGHT)	S15	3	2				
NH ROUTE 33	WESTBOUND	LEFT (2)	5	1	1				
NH ROUTE 33	WESTBOUND	THRU (CENTER)	2•	•	•				
NH ROUTE 33	WESTBOUND	THRU (RIGHT)	2•	•	•				
NH ROUTE 33	WESTBOUND	THRU-DEPART (LEFT)	S16	4	1				
NH ROUTE 33	WESTBOUND	THRU-DEPART (RIGHT)	S17	4	2				
I-95 OFF RAMP	NORTHBOUND	LEFT	7	2	1				
I-95 OFF RAMP	NORTHBOUND	RIGHT	7D	2	2				
						RECORD FIELD MEASUREMENTS HERE			

• = MAGNETIC DETECTOR (USE EXISTING AMPLIFIERS)
S = SYSTEM LOOP
#7D SHALL BE PROGRAMMED WITH A 5 SECOND DELAY



SIGNAL CONSTRUCTION NOTES:

1. THE PROPOSED CONTROLLER SHALL MAINTAIN THE EXISTING POWER SUPPLY.
2. EXISTING SIGNAL EQUIPMENT TO BE REMOVED SHALL BE SALVAGED TO THE BUREAU OF TRAFFIC. SEE THE PROSECUTION OF WORK FOR CONTACT NAMES.
3. PAVEMENT SAWING FOR LOOP DETECTORS, CONDUIT (WHEN REQUIRED), AND JACKING PITS (WHEN REQUIRED) SHALL BE SUBSIDIARY TO 616. ITEMS. REPLACEMENT OF PAVEMENT FOR CONDUIT TRENCHES AND JACKING PITS WILL BE SUBSIDIARY TO 616. ITEMS.
4. ALL SIGNAL EQUIPMENT SHALL BE INSTALLED AS PER THE MUTCD STANDARDS AND NHDOT SPECIFICATIONS.
5. THE CONTRACTOR SHALL VERIFY THAT ALL DETECTORS ARE FUNCTIONAL; THE CONTRACTOR SHALL REPAIR OR REPLACE THESE AS NECESSARY.
6. EACH NEW DETECTOR LOOP AND SYSTEM LOOP SHALL BE BROUGHT BACK TO THE CONTROLLER CABINET ON SEPARATE LEAD IN CABLE.
7. INSTALL SIGN R10-11a(M) ADJACENT TO SIGNAL HEAD 5.
8. THE EXISTING MAGNETIC DETECTION AMPLIFIERS SHALL BE REUSED IN THE NEW CONTROLLER.
9. MODIFY THE EXISTING CONTROLLER CABINET FOUNDATION TO ACCOMODATE THE NEW P-TYPE CABINET WITH TELEMETRY HARNESS AND PANEL, WITH A 12-INCH EXTENSION BASE.
10. THIS PLAN INCLUDED A BASELINE FROM NHDOT PLANS PREPARED IN 1982. THIS BASELINE EXTENDS EAST FROM THE I-95 BRIDGE. THE LOCATIONS OF UTILITES ARE APPROXIMATE.

8 PHASE NEMA DUAL RING QUAD LEFT CONTROLLER

SIGNAL PHASING & TIMING

TIMING IN SECONDS	#1	#2	#3	#4	#5	#6	#7	#8
	NOT USED		NOT USED	NOT USED				NOT USED
INITIAL INTERVAL	–	10	–	–	5	10	8	–
VEHICLE EXTENSION	–	4	–	–	4	4	4	–
MAXIMUM 1	–	25	–	–	40	25	50	–
MAXIMUM 2	–	40	–	–	40	40	40	–
YELLOW	–	4	–	–	4	4	4	–
ALL RED	–	2	–	–	2	2	2	–
PEDESTRIAN WALK	–	–	–	–	–	–	–	–
PEDESTRIAN CLEAR	–	–	–	–	–	–	–	–
FLASH	–	FY	–	–	FRA	FY	FR	–
RECALL	–	SOFT	–	–	OFF	SOFT	OFF	–
DETECTOR	–	LOCK	–	–	NL	LOCK	NL	–
PRE-EMPT PRIORITY	–	2	–	–	2	1	3	–

#4 & #8 DUAL ENTRY
SYSTEM TO MAXIMUM 2 UNDER COORDINATION

2004 DESIGN YEAR
VOLUMES AM(PM)[WDMD]<SAT>

← 550 (845) [545] <455>
← 60 (395) [130] <120>
<395> [515] (700) 695 →
<495> [385] (745) 490 →
<75> [115] (150) 255
<155> [130] (420) 435

2013 DESIGN YEAR
VOLUMES AM(PM)[WDMD]<SAT>

← 600 (920) [595] <495>
← 65 (430) [145] <135>
<430> [565] (770) 760 →
<540> [420] (815) 535 →
<85> [125] (165) 275
<170> [145] (460) 475

PROPOSED SIGN

NO TURN ON RED ARROW

24" X 30"
R10-11a(M)

20 0 20 40
SCALE IN FEET

ALTERATIONS TO TRAFFIC SIGNALS
ITEM 616.194

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF TRAFFIC

SIGNALIZATION PLAN
NH ROUTE 33/I-95 NB OFF RAMP

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
A-X000(179)	13879	10	14

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	STATION	DESCRIPTION

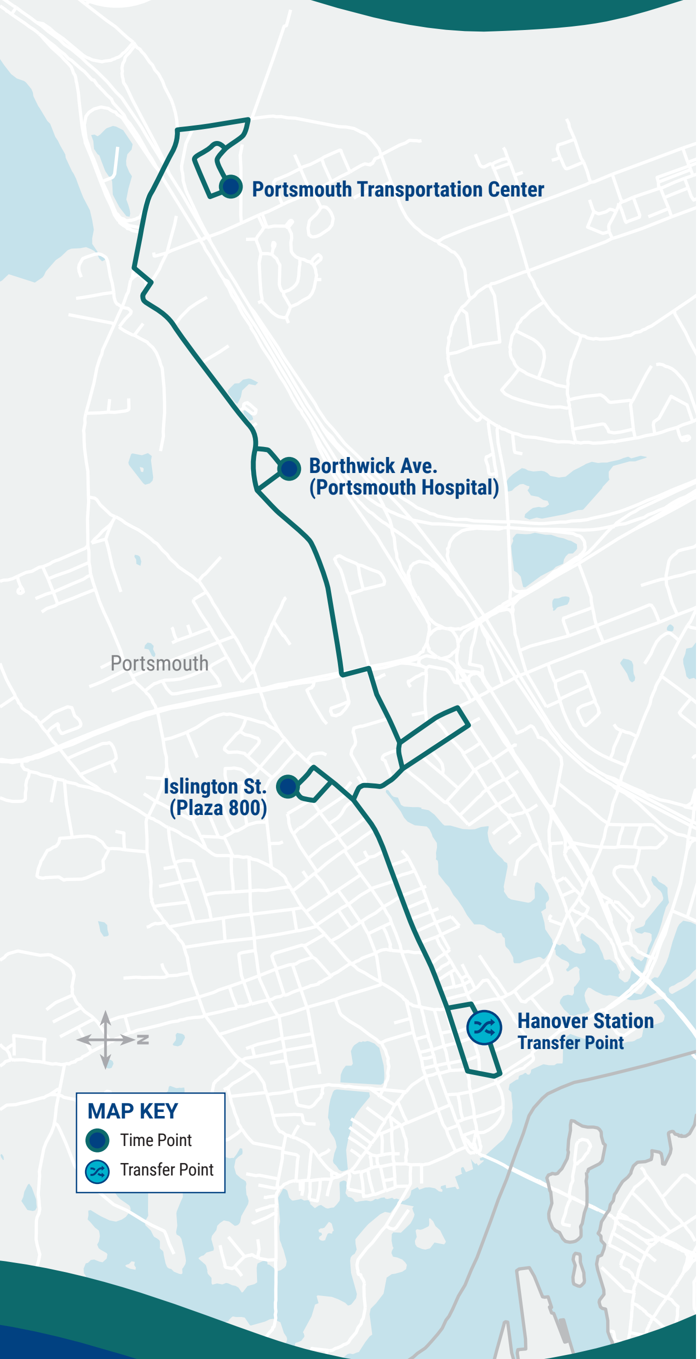
SDR PROCESSED	CMB	DATE	7/7/03
NEW DESIGN	DJD	DATE	8/11/03
SHEET CHECKED	CMB	DATE	8/21/03
AS BUILT DETAILS		DATE	

APPENDIX K

COAST Bus Schedule & Map

Route 40 Map

Portsmouth • Islington • Borthwick



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 40

COAST

Effective 09.17.22

ROUTE 40

Portsmouth • Islington • Borthwick

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 40 Portsmouth • Islington • Borthwick

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 - Portsmouth Transportation Center	First Bus	Minutes Past Hour	Last Bus
● Hanover Station	6:00am	:00*	7:00pm
● Islington St. (Plaza 800)	6:07am	:07*	7:07pm
● Borthwick Ave. (Ports. Hospital)	6:15am	:15*	7:15pm
● Portsmouth Transportation Center	6:23am	:23*	7:23pm

No Service during the hour of 3pm.

INBOUND (M-Sat)	Service On Every Hour		
Portsmouth Transportation Center- Hanover Station	First Bus	Minutes Past Hour	Last Bus
● Portsmouth Transportation Center	6:24am	:24*	7:24pm
● Borthwick Ave. (Ports. Hospital)	6:31am	:31*	7:31pm
● Islington St. (Plaza 800)	6:39am	:39*	7:39pm
● Hanover Station	6:47am	:47*	7:47pm

No Service during the hour of 3pm.

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

42 Route 42 Map

Portsmouth • Pease Shuttle

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.

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- Martin Luther King Jr./ Civil Rights Day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Christmas Eve Day
- Christmas Day

COAST

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 42

COAST

Effective 07.01.22

ROUTE 42

Portsmouth • Pease Shuttle

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 42 Portsmouth • Pease Shuttle

How to Read the Schedule

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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-F)	Service On Every Hour		
Hanover Station - Pease Airline Terminal	First Bus	Minutes Past Hour	Last Bus
● Hanover Station	6:22am	:00*	6:00pm
● Portsmouth Transportation Center	6:33am	:11*	6:11pm
● Pease Airline Terminal	6:42am	:20*	6:20pm

**Regular hourly schedule starts during the hour of 7am and No Service during the hour of 10am.*

INBOUND (M-F)	Service On Every Hour		
Pease Airline Terminal - Hanover Station	First Bus	Minutes Past Hour	Last Bus
● Pease Airline Terminal	6:43am	:21*	6:21pm
● Portsmouth Transportation Center	6:47am	:25*	6:25pm
● Hanover Station	6:57am	:35*	6:35pm

**Regular hourly schedule starts during the hour of 7am and No Service during the hour of 10am.*

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

Transfer Point	Routes
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

13 14 Temporarily Suspended 43 40 41 42 44

APPENDIX L

Lonza Employee Residential Zip Code
Based Trip Distribution Analysis

LONZA BIOLOGICS

EMPLOYEE RESIDENTIAL ZIP CODE BASED TRIP DISTRIBUTION ANALYSIS

OBJECTID	ZIP_CODE	PO_NAME	STATE	employeeCount	Shape_Area	Direction	I-95 South	I-95 North	Route 33 South	Route 33 East	Route 1 East	Route 1 North	Route 4 West	Gosling Road North	check	I-95 South	I-95 North	Route 33 South	Route 33 East	Route 1 East	Route 1 North	Route 4 West	Gosling Road North
1	1010.00	Brimfield	MA	1	0.010514		100.00%								OK	1	0	0	0	0	0	0	0
2	1451.00	Harvard	MA	1	0.006399		100.00%								OK	1	0	0	0	0	0	0	0
3	1507.00	Charlton	MA	1	0.012443		100.00%								OK	1	0	0	0	0	0	0	0
4	1522.00	Jefferson	MA	1	0.00476		100.00%								OK	1	0	0	0	0	0	0	0
5	1581.00	Westborough	MA	1	0.005997		100.00%								OK	1	0	0	0	0	0	0	0
6	1730.00	Bedford	MA	2	0.003859		100.00%								OK	2	0	0	0	0	0	0	0
7	1772.00	Southborough	MA	1	0.004393		100.00%								OK	1	0	0	0	0	0	0	0
8	1801.00	Woburn	MA	1	0.00367		100.00%								OK	1	0	0	0	0	0	0	0
9	1810.00	Andover	MA	2	0.009116		100.00%								OK	2	0	0	0	0	0	0	0
10	1826.00	Dracut	MA	2	0.006115		100.00%								OK	2	0	0	0	0	0	0	0
11	1830.00	Haverhill	MA	6	0.004248		100.00%								OK	6	0	0	0	0	0	0	0
12	1832.00	Haverhill	MA	2	0.003408		100.00%								OK	2	0	0	0	0	0	0	0
13	1833.00	Georgetown	MA	1	0.003762		100.00%								OK	1	0	0	0	0	0	0	0
14	1835.00	Haverhill	MA	1	0.002461		100.00%								OK	1	0	0	0	0	0	0	0
15	1844.00	Methuen	MA	10	0.006546		100.00%								OK	10	0	0	0	0	0	0	0
16	1845.00	North Andover	MA	2	0.007855		100.00%								OK	2	0	0	0	0	0	0	0
17	1852.00	Lowell	MA	1	0.001495		100.00%								OK	1	0	0	0	0	0	0	0
18	1854.00	Lowell	MA	2	0.001247		100.00%								OK	2	0	0	0	0	0	0	0
19	1860.00	Merrimac	MA	2	0.002536		100.00%								OK	2	0	0	0	0	0	0	0
20	1876.00	Tewksbury	MA	2	0.006037		100.00%								OK	2	0	0	0	0	0	0	0
21	1880.00	Wakefield	MA	1	0.00226		100.00%								OK	1	0	0	0	0	0	0	0
22	1886.00	Westford	MA	1	0.008731		100.00%								OK	1	0	0	0	0	0	0	0
23	1907.00	Swampscott	MA	1	0.00085		100.00%								OK	1	0	0	0	0	0	0	0
24	1913.00	Amesbury	MA	5	0.003893		100.00%								OK	5	0	0	0	0	0	0	0
25	1915.00	Beverly	MA	1	0.00446		100.00%								OK	1	0	0	0	0	0	0	0
26	1921.00	Boxford	MA	2	0.006996		100.00%								OK	2	0	0	0	0	0	0	0
27	1938.00	Ipswich	MA	1	0.009451		100.00%								OK	1	0	0	0	0	0	0	0
28	1950.00	Newburyport	MA	7	0.003159		100.00%								OK	7	0	0	0	0	0	0	0
29	1951.00	Newbury	MA	2	0.005088		100.00%								OK	2	0	0	0	0	0	0	0
30	1952.00	Salisbury	MA	3	0.004937		100.00%								OK	3	0	0	0	0	0	0	0
31	1960.00	Peabody	MA	1	0.004791		100.00%								OK	1	0	0	0	0	0	0	0
32	1970.00	Salem	MA	1	0.002453		100.00%								OK	1	0	0	0	0	0	0	0
33	1985.00	West Newbury	MA	1	0.004183		100.00%								OK	1	0	0	0	0	0	0	0
34	2127.00	Boston	MA	1	0.000853		100.00%								OK	1	0	0	0	0	0	0	0
35	2145.00	Somerville	MA	1	0.000407		100.00%								OK	1	0	0	0	0	0	0	0
36	2176.00	Melrose	MA	1	0.001348		100.00%								OK	1	0	0	0	0	0	0	0
37	2180.00	Stoneham	MA	1	0.001849		100.00%								OK	1	0	0	0	0	0	0	0
38	2461.00	Newton Highlands	MA	1	0.000427		100.00%								OK	1	0	0	0	0	0	0	0
39	2472.00	Watertown	MA	3	0.001181		100.00%								OK	3	0	0	0	0	0	0	0
40	2492.00	Needham	MA	1	0.00267		100.00%								OK	1	0	0	0	0	0	0	0
41	3031.00	Amherst	NH	5	0.010143		100.00%								OK	5	0	0	0	0	0	0	0
42	3032.00	Auburn	NH	1	0.008167		100.00%								OK	1	0	0	0	0	0	0	0
43	3034.00	Candia	NH	3	0.01063		100.00%								OK	3	0	0	0	0	0	0	0
44	3037.00	Deerfield	NH	4	0.014317		100.00%								OK	4	0	0	0	0	0	0	0
45	3038.00	Derry	NH	8	0.010857		100.00%								OK	8	0	0	0	0	0	0	0
46	3042.00	Epping	NH	11	0.007973		50.00%						50.00%		OK	5.5	0	0	0	0	0	5.5	0
47	3044.00	Fremont	NH	4	0.004945		50.00%		50.00%						OK	2	0	2	0	0	0	0	0
48	3045.00	Goffstown	NH	2	0.010311		100.00%								OK	2	0	0	0	0	0	0	0
49	3047.00	Greenfield	NH	1	0.008001		100.00%								OK	1	0	0	0	0	0	0	0
50	3051.00	Hudson	NH	1	0.008357		100.00%								OK	1	0	0	0	0	0	0	0
51	3052.00	Litchfield	NH	1	0.004289		100.00%								OK	1	0	0	0	0	0	0	0
52	3053.00	Londonderry	NH	10	0.011616		100.00%								OK	10	0	0	0	0	0	0	0
53	3054.00	Merrimack	NH	1	0.009547		100.00%								OK	1	0	0	0	0	0	0	0
54	3055.00	Milford	NH	1	0.007092		75.00%		25.00%						OK	0.75	0	0.25	0	0	0	0	0
55	3062.00	Nashua	NH	1	0.003368		100.00%								OK	1	0	0	0	0	0	0	0
56	3070.00	New Boston	NH	2	0.012502		75.00%		25.00%						OK	1.5	0	0.5	0	0	0	0	0
57	3076.00	Pelham	NH	3	0.007647		100.00%								OK	3	0	0	0	0	0	0	0
58	3077.00	Raymond	NH	8	0.008318		100.00%								OK	8	0	0	0	0	0	0	0
59	3079.00	Salem	NH	6	0.007438		100.00%								OK	6	0	0	0	0	0	0	0
60	3101.00	Manchester	NH	1	0.000226		90.00%						10.00%		OK	0.9	0	0	0	0	0	0.1	0
61	3102.00	Manchester	NH	9	0.002627		90.00%						10.00%		OK	8.1	0	0	0	0	0	0.9	0
62	3103.00	Manchester	NH	6	0.002887		90.00%						10.00%		OK	5.4	0	0	0	0	0	0.6	0
63	3104.00	Manchester	NH	9	0.002441		90.00%						10.00%		OK	8.1	0	0	0	0	0	0.9	0
64	3106.00	Hooksett	NH	3	0.010556		100.00%								OK	3	0	0	0	0	0	0	0
65	3109.00	Manchester	NH	1	0.002277		90.00%						10.00%		OK	0.9	0	0	0	0	0	0.1	0
66	3110.00	Bedford	NH	4	0.009428		100.00%								OK	4	0	0	0	0	0	0	0
67	3225.00	Center Barnstead	NH	1	0.008176								100.00%		OK	0	0	0	0	0	0	1	0
68	3234.00	Epsom	NH	1	0.009624								100.00%		OK	0	0	0	0	0	0	1	0
69	3235.00	Franklin	NH	1	0.009122			50.00%					50.00%		OK	0	0.5	0	0	0	0	0.5	0
70	3244.00	Hillsborough	NH	1	0.024593		100.00%								OK	1	0	0	0	0	0	0	0
71	3245.00	Holderness	NH	1	0.010031								100.00%		OK	0	0	0	0	0	0	1	0
72	3253.00	Meredith	NH	1	0.014683								100.00%		OK	0	0	0	0	0	0	1	0
73	3255.00	Newbury	NH	1	0.010912		50.00%						50.00%		OK	0.5	0	0	0	0	0	0.5	0
74	3258.00	Chichester	NH	3	0.005796								100.00%		OK	0	0	0	0	0	0	3	0
75	3261.00	Northwood	NH	9	0.008624								100.00%		OK	0	0	0	0	0	0	9	0
76	3263.00	Pittsfield	NH	1	0.007336								100.00%		OK	0	0	0	0	0	0	1	0
77	3275.00	Suncook	NH	1	0.011764		50.00%						50.00%		OK	0.5	0	0	0	0	0	0.5	0

LONZA BIOLOGICS
EMPLOYEE RESIDENTIAL ZIP CODE BASED TRIP DISTRIBUTION ANALYSIS

OBJECTID	ZIP_CODE	PO_NAME	STATE	employeeCount	Shape_Area	Direction	I-95 South	I-95 North	Route 33 South	Route 33 East	Route 1 East	Route 1 North	Route 4 West	Gosling Road North	check
78	3280.00	Washington	NH	1	0.013125		100.00%								OK
79	3281.00	Weare	NH	1	0.017189		50.00%						50.00%		OK
80	3290.00	Nottingham	NH	18	0.013032		50.00%						50.00%		OK
81	3301.00	Concord	NH	2	0.014821		50.00%						50.00%		OK
82	3303.00	Concord	NH	1	0.020526		50.00%						50.00%		OK
83	3570.00	Berlin	NH	1	0.023446								100.00%		OK
84	3576.00	Colebrook	NH	1	0.057233			34.00%	33.00%				33.00%		OK
85	3801.00	Portsmouth	NH	116	0.008103				20.00%	20.00%	20.00%		20.00%	20.00%	OK
86	3809.00	Alton	NH	1	0.014804								100.00%		OK
87	3810.00	Alton Bay	NH	3	0.008575								100.00%		OK
88	3811.00	Atkinson	NH	2	0.003295		100.00%								OK
89	3812.00	Bartlett	NH	1	0.02191								100.00%		OK
90	3819.00	Danville	NH	3	0.003186		50.00%						50.00%		OK
91	3820.00	Dover	NH	116	0.00875								100.00%		OK
92	3823.00	Madbury	NH	5	0.003217								100.00%		OK
93	3824.00	Durham	NH	7	0.007376								100.00%		OK
94	3825.00	Barrington	NH	20	0.014117								100.00%		OK
95	3826.00	East Hampstead	NH	2	0.001192		100.00%								OK
96	3827.00	East Kingston	NH	3	0.00496		100.00%								OK
97	3830.00	East Wakefield	NH	2	0.003238								100.00%		OK
98	3833.00	Exeter	NH	39	0.013793		50.00%		50.00%						OK
99	3835.00	Farmington	NH	15	0.010892								100.00%		OK
100	3839.00	Rochester	NH	9	0.002018								100.00%		OK
101	3840.00	Greenland	NH	24	0.003048				100.00%						OK
102	3841.00	Hampstead	NH	7	0.003098		100.00%								OK
103	3842.00	Hampton	NH	27	0.003921		100.00%								OK
104	3844.00	Hampton Falls	NH	4	0.003506		100.00%								OK
105	3848.00	Kingston	NH	3	0.005907		100.00%								OK
106	3851.00	Milton	NH	10	0.008272								100.00%		OK
107	3852.00	Milton Mills	NH	1	0.001669								100.00%		OK
108	3855.00	New Durham	NH	9	0.012785								100.00%		OK
109	3856.00	Newfields	NH	5	0.00225				100.00%						OK
110	3857.00	Newmarket	NH	25	0.004782		50.00%						50.00%		OK
111	3858.00	Newton	NH	1	0.002836		100.00%								OK
112	3861.00	Lee	NH	7	0.005561								100.00%		OK
113	3862.00	North Hampton	NH	9	0.003932				100.00%						OK
114	3864.00	Ossipee	NH	2	0.01136								100.00%		OK
115	3865.00	Plaistow	NH	4	0.002967		100.00%								OK
116	3867.00	Rochester	NH	58	0.009024								100.00%		OK
117	3868.00	Rochester	NH	15	0.002244								100.00%		OK
118	3869.00	Rollinsford	NH	5	0.001979			50.00%				50.00%			OK
119	3870.00	Rye	NH	10	0.003512		50.00%		50.00%						OK
120	3872.00	Sanbornville	NH	3	0.012299								100.00%		OK
121	3873.00	Sandown	NH	4	0.004147		50.00%		50.00%						OK
122	3874.00	Seabrook	NH	5	0.002676		100.00%								OK
123	3878.00	Somersworth	NH	50	0.002836								100.00%		OK
124	3882.00	Effingham	NH	2	0.011411								100.00%		OK
125	3884.00	Strafford	NH	5	0.014538								100.00%		OK
126	3885.00	Stratham	NH	24	0.004492				100.00%						OK
127	3887.00	Union	NH	7	0.006041								100.00%		OK
128	3894.00	Wolfeboro	NH	1	0.020419								100.00%		OK
129	3901.00	Berwick	ME	10	0.0107			100.00%							OK
130	3902.00	Cape Neddick	ME	9	0.005456			100.00%							OK
131	3903.00	Eliot	ME	13	0.006136			100.00%							OK
132	3904.00	Kittery	ME	10	0.003178			100.00%							OK
133	3905.00	Kittery Point	ME	3	0.002057			100.00%							OK
134	3906.00	North Berwick	ME	7	0.011124			100.00%							OK
135	3907.00	Ogunquit	ME	1	0.0011			100.00%							OK
136	3908.00	South Berwick	ME	13	0.009329			100.00%							OK
137	3909.00	York	ME	9	0.010628			100.00%							OK
138	4005.00	Biddeford	ME	2	0.014128			100.00%							OK
139	4009.00	Bridgton	ME	1	0.018959			100.00%							OK
140	4021.00	Cumberland Center	ME	1	0.005747			100.00%							OK
141	4027.00	Lebanon	ME	5	0.016093			100.00%							OK
142	4038.00	Gorham	ME	1	0.014925			100.00%							OK
143	4042.00	Hollis Center	ME	2	0.009715			100.00%							OK
144	4043.00	Kennebunk	ME	9	0.009994			100.00%							OK
145	4046.00	Kennebunkport	ME	2	0.013092			100.00%							OK
146	4061.00	North Waterboro	ME	1	0.005735			100.00%							OK
147	4062.00	Windham	ME	3	0.014431			100.00%							OK
148	4072.00	Saco	ME	2	0.011271			100.00%							OK
149	4073.00	Sanford	ME	4	0.010941			100.00%							OK
150	4076.00	Shapleigh	ME	3	0.011892			100.00%							OK
151	4083.00	Springvale	ME	2	0.002897			100.00%							OK
152	4087.00	Waterboro	ME	1	0.005467			100.00%							OK
153	4090.00	Wells	ME	2	0.016786			100.00%							OK
154	4105.00	Falmouth	ME	1	0.008846			100.00%							OK
155	4281.00	South Paris	ME	1	0.012843			100.00%							OK
156	4938.00	Farmington	ME	1	0.036329			100.00%							OK
			SUM	1020											
				0											

OBJECTID	I-95 South	I-95 North	Route 33 South	Route 33 East	Route 1 East	Route 1 North	Route 4 West	Gosling Road North	
78	1	0	0	0	0	0	0	0	
79	0.5	0	0	0	0	0	0.5	0	
80	9	0	0	0	0	0	9	0	
81	1	0	0	0	0	0	1	0	
82	0.5	0	0	0	0	0	0.5	0	
83	0	0	0	0	0	0	1	0	
84	0	0.34	0.33	0	0	0	0.33	0	
85	0	0	23.2	23.2	23.2	0	23.2	23.2	
86	0	0	0	0	0	0	1	0	
87	0	0	0	0	0	0	3	0	
88	2	0	0	0	0	0	0	0	
89	0	0	0	0	0	0	1	0	
90	1.5	0	0	0	0	0	1.5	0	
91	0	0	0	0	0	0	116	0	
92	0	0	0	0	0	0	5	0	
93	0	0	0	0	0	0	7	0	
94	0	0	0	0	0	0	20	0	
95	2	0	0	0	0	0	0	0	
96	3	0	0	0	0	0	0	0	
97	0	0	0	0	0	0	2	0	
98	19.5	0	19.5	0	0	0	0	0	
99	0	0	0	0	0	0	15	0	
100	0	0	0	0	0	0	9	0	
101	0	0	24	0	0	0	0	0	
102	7	0	0	0	0	0	0	0	
103	27	0	0	0	0	0	0	0	
104	4	0	0	0	0	0	0	0	
105	3	0	0	0	0	0	0	0	
106	0	0	0	0	0	0	10	0	
107	0	0	0	0	0	0	1	0	
108	0	0	0	0	0	0	9	0	
109	0	0	5	0	0	0	0	0	
110	12.5	0	0	0	0	0	12.5	0	
111	1	0	0	0	0	0	0	0	
112	0	0	0	0	0	0	7	0	
113	0	0	9	0	0	0	0	0	
114	0	0	0	0	0	0	2	0	
115	4	0	0	0	0	0	0	0	
116	0	0	0	0	0	0	58	0	
117	0	0	0	0	0	0	15	0	
118	0	2.5	0	0	0	2.5	0	0	
119	5	0	5	0	0	0	0	0	
120	0	0	0	0	0	0	3	0	
121	2	0	2	0	0	0	0	0	
122	5	0	0	0	0	0	0	0	
123	0	0	0	0	0	0	50	0	
124	0	0	0	0	0	0	2	0	
125	0	0	0	0	0	0	5	0	
126	0	0	24	0	0	0	0	0	
127	0	0	0	0	0	0	7	0	
128	0	0	0	0	0	0	1	0	
129	0	10	0	0	0	0	0	0	
130	0	9	0	0	0	0	0	0	
131	0	13	0	0	0	0	0	0	
132	0	10	0	0	0	0	0	0	
133	0	3	0	0	0	0	0	0	
134	0	7	0	0	0	0	0	0	
135	0	1	0	0	0	0	0	0	
136	0	13	0	0	0	0	0	0	
137	0	9	0	0	0	0	0	0	
138	0	2	0	0	0	0	0	0	
139	0	1	0	0	0	0	0	0	
140	0	1	0	0	0	0	0	0	
141	0	5	0	0	0	0	0	0	
142	0	1	0	0	0	0	0	0	
143	0	2	0	0	0	0	0	0	
144	0	9	0	0	0	0	0	0	
145	0	2	0	0	0	0	0	0	
146	0	1	0	0	0	0	0	0	
147	0	3	0	0	0	0	0	0	
148	0	2	0	0	0	0	0	0	
149	0	4	0	0	0	0	0	0	
150	0	3	0	0	0	0	0	0	
151	0	2	0	0	0	0	0	0	
152	0	1	0	0	0	0	0	0	
153	0	2	0	0	0	0	0	0	
154	0	1	0	0	0	0	0	0	
155	0	1	0	0	0	0	0	0	
156	0	1	0	0	0	0	0	0	1020
	285.65	122.34	114.78	23.2	23.2	2.5	425.13	23.2	
	28%	12%	11%	2%	2%	0%	42%	2%	
	30%	10%	10%	3%	3%	1%	40%	3%	

NOTICE OF ACCEPTANCE OF PERMIT APPLICATION
LAND RESOURCES MANAGEMENT
ALTERATION OF TERRAIN BUREAU

September 5, 2023

PORTSMOUTH MUNICIPAL CLERK
1 JUNKINS AVE
PORTSMOUT NH 03801

Re: Alteration of Terrain (AoT) Bureau Permit Application (RSA 485-A:17); NHDES File Number: 230901-190
Project Name: ASC/Medical Office
Subject Property: Tax Map# 315, Lot# 5

Dear Sir or Madam:

Pursuant to RSA 541-A:39, please be advised that the New Hampshire Department of Environmental Services (NHDES) AoT Bureau accepted an application on September 5, 2023 for the permit program and subject property referenced above. The application requests a permit to disturb approximately 181,000 square feet of earth at the subject property.

Pursuant to Env-Wq 1503.05 (f), the applicant is required to provide a copy of the application and plans to the municipality. If you have not received the required information, please contact the agent: **ALLEN & MAJOR ASSOCIATES, INC C/O BRIAN D JONES PE, 400 HARVEY ROAD, SUITE D, MANCHESTER NH 03103**.

If you wish to comment on the application, please submit your comments by **September 19, 2023**. All comments should reference the NHDES file number, and mailed to the following address: **NHDES ALTERATION OF TERRAIN BUREAU, PO BOX 95, CONCORD NH 03302-0095**.

Please provide a copy of this notice to all interested departments, boards and commissions. Also note that under current state law and regulations, NHDES is not authorized to consider local zoning and regulatory issues pertaining to a project; these must be addressed at the local level.

If you have any questions, please contact the NHDES Alteration of Terrain Bureau at (603) 271-3568.

Sincerely,
Alteration of Terrain Bureau
Land Resources Management

cc: Dr. Alex Slocum, ATDG, LLC
Raquelle Kemnitz, Apex Design Build
Paul Brean, Pease Development Suthority
Brian Jones, Allen & Major Associates, Inc.

“Green” Statement
360 Corporate Dr.
Portsmouth, NH

Pursuant to Section 2.5.3.1(a) of the Site Plan Review Regulations, Apex Design Build Respectfully submits the following list of the project’s “green” components for the new construction at 360 Corporate Dr., Portsmouth, NH:

- The project will meet or exceed all applicable current energy codes.

- All features, rooms, pathways, and means of conveyance will be installed to meet or exceed ADA requirements.

- The project and tenants are located with intent to maximize the usage of the public transit bus stop.

- All collected stormwater runoff is being directed, managed, and stored on-site, limiting the impact on the city stormwater system and limiting sheet flow towards the street.

- The footprint of the proposed developed area has been strategically and meticulously designed to avoid disruption of any existing Wet Lands.

- All landscaping to use native or adaptive species to limit the use of additional resources to maintain the landscaping.

DRAINAGE REPORT

ALLEN & MAJOR
ASSOCIATES, INC.

ASC / Medical Office
360 Corporate Drive
Portsmouth, New Hampshire

APPLICANT:
ATDG, LLC
7 Sinclair Drive
Exeter, NH 03833

PREPARED BY:
Allen & Major Associates, Inc.
400 Harvey Road
Manchester, New Hampshire 03103

DRAINAGE REPORT
ASC / Medical Office
360 Corporate Drive
Portsmouth, New Hampshire

APPLICANT:
ATDG, LLC
7 Sinclair Drive
Exeter, NH 03833

STATE OF NEW HAMPSHIRE
BRIAN D. JONES
No. 13809
LICENSED
PROFESSIONAL ENGINEER

10·20·23

PREPARED BY:
Allen & Major Associates, Inc.
400 Harvey Road, Suite D
Manchester, New Hampshire 03103

ISSUED:
August 14, 2023

REVISED:
August 17, 2023
August 28, 2023
October 20, 2023

A&M PROJECT NO.:
3250-01

TABLE OF CONTENTS

SECTION 1.0 -
OVERVIEW

Executive Summary

The purpose of this drainage report is to provide a detailed review of the stormwater runoff, both quality and quantity, as it pertains to the existing and proposed developed conditions. This report will show by means of narrative, calculations and exhibits that appropriate best management practices have been implemented into the design to mitigate the impacts from the proposed development. This report and following tables demonstrate that there is no increase in total peak rate of runoff from the site for all design storm events.

Study Point #1 - Wetlands				
	2-Year	10-Year	25-Year	50-Year
Existing Flow (CFS)	1.46	5.06	8.52	12.08
Proposed Flow (CFS)	1.00	4.73	8.44	11.68
Change (CFS)	**-0.46**	**-0.33**	**-0.08**	**-0.40**
Existing Volume (CF)	8,284	22,410	35,999	50,076
Proposed Volume (CF)	7,305	21,904	36,451	52,368
Change (CF)	**-979**	**-506**	**452**	**2,292**

Study Point #2 - Abutter				
	2-Year	10-Year	25-Year	50-Year
Existing Flow (CFS)	0.12	0.46	0.79	1.14
Proposed Flow (CFS)	0.12	0.38	0.63	0.89
Change (CFS)	**0.00**	**-0.08**	**-0.16**	**-0.25**
Existing Volume (CF)	612	1,747	2,860	4,025
Proposed Volume (CF)	487	1,286	2,046	2,831
Change (CF)	**-125**	**-461**	**-814**	**-1,194**

Study Point #3 - Corporate Drive				
	2-Year	10-Year	25-Year	50-Year
Existing Flow (CFS)	0.63	1.76	2.77	3.78
Proposed Flow (CFS)	0.27	1.72	2.56	3.23
Change (CFS)	**-0.36**	**-0.04**	**-0.21**	**-0.55**
Existing Volume (CF)	2,479	5,996	9,234	12,516
Proposed Volume (CF)	985	3,661	5,978	8,284
Change (CF)	**-1,494**	**-2,335**	**-3,256**	**-4,232**

Study Point #4 - International Drive				
	2-Year	10-Year	25-Year	50-Year
Existing Flow (CFS)	0.07	0.34	0.62	0.92
Proposed Flow (CFS)	0.06	0.21	0.34	0.48
Change (CFS)	**-0.01**	**-0.13**	**-0.28**	**-0.44**
Existing Volume (CF)	491	1,541	2,606	3,738
Proposed Volume (CF)	298	786	1,251	1,731
Change (CF)	**-193**	**-755**	**-1,355**	**-2,007**

Site Location and Description

The overall project site is comprised of one parcel totaling approximately 6.11± acres. The parcel is listed on the City of Portsmouth's Assessors 315, as Lot 5, and is located at 360 Corporate Drive. The project proposes to develop the site into a 3-story surgical center.

The site is located east of Portsmouth International Airport, north of Great Bay Community College, and west of Hodgson Brook and Route 16. The property was previously developed for the Greater Portsmouth Transportation Management Association; to date, the building has been razed. Currently, the parcel is unoccupied and comprised of 2 existing curb cuts, a paved parking area, lawn, wetlands, and woodlands. The existing tract of land is clear-cut along its frontage on Corporate Drive, with woods and wetlands extending from the centralized portion of the parcel to the rear property line. Elevations on-site range from elevation 61 at the northwest property corner along Corporate Drive to elevation 52 at the southeast property corner, adjacent to the wetland area.

The proposed development consists of the construction of a 3-story surgical center with associated parking. The proposed building has a footprint of 16,700± square feet with gross floor area of 52,400± square feet. The proposed sitework incorporates various walls to protect the existing wetland resources on site and utilize the developable area. A total of 124 spaces are provided for the building. The proposed condition of the site accommodates loading and delivery areas for building operations.

The underlying soils were identified using the USDA Natural Resources Conservation Service (NRCS) soil survey for Rockingham County. The site is shown to primarily have a soil type of Urban Land which does not have a classified Hydrologic Soil Group. A copy of the NRCS Soil Report is included in the Appendix of this report.

Symbol	Soil Taxonomic Name	Hydrologic Soil Group
699	Urban Land	-
799	Urban Land-Canton Complex, 3 to 15 percent slopes	-

The saturated hydraulic conductivity (Ksat) rate assigned in the NRCS Report for Chatfield-Hollis-Canton Complex soils, which are soils identified adjacent to the site in the NRCS report, were utilized for the design infiltration rate on the site. These soils are consistent in composition with what was observed in the test pits performed by A&M and during the site-specific survey, described below. The Ksat value of this soil is 10.19 micrometers per second. This value was converted to 1.44 inches per hour which was assigned a 2x safety factor to achieve the design infiltration rate of 0.72 inches per hour. Additional soil information is provided in the NRCS Soil Report within the appendix of this report.

A site-specific soil survey was performed by TES Environmental Consultants, on August 9, 2023, to determine the on-site soil classification. It was determined that the uplands on site are predominantly hydrologic soil group "B", and include Canton fine sandy loam, Newfields fine sandy loam, and Udorthents, loamy soils. The wetland soils are hydrologic soil type "C" and are classified as Squamscott fine sandy loam. The site-specific soil survey was used for determining the Hydrologic Soil Group for the development. Please see the appendix section for the Hydrologic Soil Plans used for the drainage design. The TES Environmental Consultants survey classified the onsite soils as the following:

SITE SPECIFIC SOIL MAP UNIT KEY

Symbol*	Map Unit	Slope Class	Drainage Class	HISS Symbol	Hydrologic Soil Group
42B	Canton fine sandy loam	0-8%	Well	221BH	B
42C	Canton fine sandy loam	8-15%	Well	221CH	B
444B	Newfields fine sandy loam	0-8%	Moderately well	321BH	B
444C	Newfields fine sandy loam	8-15%	Moderately well	321CH	B
500B/ccabb	Udorthents, loamy	0-8%	Well	261BH	B
500C/ccabb	Udorthents, loamy	8-15%	Well	261CH	B
500D/ccabb	Udorthents, loamy	15-25%	Well	261DH	B
500E/ccabb	Udorthents, loamy	25% +	Well	261EH	B
500B/hchbb	Udorthents, loamy	0-8%	Undeterminable	761BH**	B**
538B	Squamscott fine sandy loam	0-8%	Poorly	551BH	C
921B	Newfields Variant (SPD)	0-8%	Somewhat poorly	421BH	C

* Refer to accompanying report for 5-unit supplemental symbol explanation.

** Assumed based upon adjacent soils without impervious surfaces.

A stormwater analysis has been performed for two project site situations. The first analysis consists of the existing site conditions and the second consists of the proposed site conditions. There are four study points where the stormwater flows were analyzed. The study points and contributing watersheds are further outlined in the accompanying text and calculations.

<u>Site Data for Stormwater Modeling</u>
The proposed project will disturb approximately 181,000 square feet. This disturbance includes the construction of the proposed building, parking and drive aisles, utility improvements, and stormwater management BMP's.

The proposed watershed is comprised of approximately **92,068** square feet of impervious an increase of **74,926** square feet from the existing conditions. This impervious area includes roof cover, pavement, and sidewalks. Rainfall data used for modeling the stormwater runoff was derived from the "Extreme Precipitation Tables" from the Northeast Regional Climate Center at Cornell University. The design storm events utilized in this analysis are the 2, 10, 25, and 50-year storms. Per Env-Wq 1503.08(l), a 15% multiplier was applied to the storm events because the site is within a Coastal and Great Bay Community.

Existing Site Conditions
Stormwater runoff exits the site to four (4) different study point locations. To exhibit no increase in runoff to these points, stormwater runoff flows were analyzed at these four "Study Points." The included Existing Watershed Plan (EWS-1) outlines the boundaries and contributing watershed for the Study Points.

1. Study Point 1: This study point is located at the existing wetland. It is examining the contributing flow from the centralized portion of the site that discharges to the wetland area on site.

2. Study Point 2: This study point is located at the 320 Corporate Drive property. It is examining the contributing flow from the southern portion of the site which travels off site, to the abutter. The stormwater which flows to this study point will be captured within the drainage network of the abutting parcel.

3. Study Point 3: This study point is located at the Corporate Drive roadway. It is examining the contributing flow from the western portion of the site along the frontage of the property. The stormwater which flows to this study point will be managed by the existing stormwater management facilities within the Corporate Drive

right-of-way.

4. Study Point 4: This study point is located at the International Drive roadway. It is examining the contributing flow from the northeastern portion of the site. The stormwater which flows to this study point will be managed by the existing stormwater management facilities within the International Drive right-of-way.

Proposed Site Conditions

The project proposes to construct a 16,700± square foot surgical center with associated parking, lighting, utilities, and stormwater infrastructure. The proposed stormwater management facilities have been designed to control the runoff using a combination of structural and non-structural best management practices (BMPs). Runoff from the rear parking lots will be collected by deep sump catch basins, and Nyloplast drains, and directed to Infiltration System #1 or #2. These systems are comprised of Stormtech SC-310 chambers which are backfilled and surrounded with coarse washed stone. The runoff is pretreated when entering these systems through the isolator row, which is lined with filter fabric to trap sediment and debris. The majority of the roof runoff is also directed to these two systems which have been designed to infiltrate the water quality volume per Env-Wq 1504.10. Runoff beyond the water quality volume will overflow to a rip rap apron. Runoff from the front roof canopy and a portion of the front parking lot will be directed to Infiltration System #3. This system is comprised of Stormtech SC-160LP chambers and backfilled with coarse washed stone. This system is designed to infiltrate the water quality volume. Due to the location of this system, it has not been designed with an overflow. Therefore, the system has been designed to infiltrate all runoff which is directed to it, up to and including the 50-year storm event. Runoff from the remainder of the parking lot will sheet flow over the pavement to one of several Rain Guardian Turret devices before entering one of four sediment forebays which overflow to one of four bioretention systems. The Turret is a precast concrete curb inlet structure with a grate and filter screen which traps trash and large debris. The sediment forebays provide pretreatment of the runoff before entering the bioretention systems. The bioretention systems have been designed to infiltrate the required water quality volume. Runoff from the loading dock area will be collected by a deep sump catch basin and treated by a proprietary filter (Jellyfish) before discharge to a rip rap apron.

A hydrologic study of the site was conducted to determine the impact of the proposed development on the existing stormwater runoff. The study determined the rate of runoff at these study points have decreased or remain unchanged. The Proposed Watershed Plan (PWS-1) outlines the boundaries and contributing watershed for the Study Points.

SECTION 2.0 - DISCUSSION

Methodology

The peak discharge rates were determined using techniques and data found in the following:

1. Urban Hydrology for Small Watersheds – Technical Release 55 by the United States Department of Agriculture Soils Conservation Service, June 1986. Runoff curve numbers and 24-hour precipitation values were obtained from this reference.
2. HydroCAD© Stormwater Modeling System by HydroCAD Software Solutions, LLC, version 10.20-3c. The HydroCAD program was used to generate the runoff hydrographs for the watershed areas, to determine discharge, stage, and storage characteristics for the bioretention system, to perform drainage routing and to combine the results of the runoff hydrographs.
3. Soil Survey of Rockingham County, New Hampshire by the United States Department of Agriculture, Natural Resources Conservation Services (NRCS). Soil types and boundaries were obtained from this reference.

Peak Discharge Rates

The stormwater runoff analysis of the existing and proposed conditions includes an estimation of the peak discharge rate from various rainfall events. Peak discharge rates were developed using TR-55 Urban Hydrology for Small Watersheds, developed by the United States Department of Commerce, Engineering Division and the HydroCAD 10.20 computer program. Further, the analysis has been prepared in accordance with the New Hampshire Stormwater Management Manual and standard engineering practices. The peak discharge rate has been estimated for each watershed during the 2, 10, 25, and 50-year storm events.

The stormwater runoff model shows that the proposed site design results in no increase in the total rate of runoff during all storm events. This is accomplished through the construction of the three infiltration systems and four bioretention systems. The table in *Section 1: Executive Summary* provides a summary of the estimated peak discharge rates for each study point during each of the design storm events. The HydroCAD worksheets for the existing and proposed drainage conditions are included within Sections 5 and 6 of this report.

Performance Standards

Stormwater performance standards have been implemented as part of the overall stormwater management plan for the proposed development. The goal of these standards is to improve water quality and protect the waters of New Hampshire from adverse impacts due to development. The performance standards are met by implementing appropriate Best Management Practices (BMPs). BMPs were designed in accordance with the NH Stormwater Management Manual and Env.Wq. 1500.

BMPs implemented in the design include:

- Deep sump catch basins
- Subsurface infiltration systems
- Rain Guardian Turret curb inlets
- Sediment Forebays
- Bioretention Systems
- Proprietary filter device (Jellyfish)
- Specific maintenance schedule

<u>Water Quality Volume (WQV)</u>

The Water Quality Volume (WQV) is the amount of stormwater runoff from a rainfall event that should be captured and treated to remove the majority of stormwater pollutants on an average annual basis. The recommended WQV is the volume of runoff associated with the first one-inch of rainfall, which is equivalent to capturing and treating the runoff from the 90th percentile of all rainfall.

The WQV has been calculated for the proposed site development and adequate treatment is proposed within the Infiltration System. Refer to Appendix Section 7.8 for *NHDES BMP Worksheets* for specific requirements.

<u>Water Quality Flow (WQF)</u>

The Water Quality Flow (WQF) is used to determine a flow rate associated with the WQV, for sizing flow-based treatment and pre-treatment practices.

The WQF has been calculated for the treatment train for the proposed work. Refer to Appendix Section 7.8 for *NHDES BMP Worksheets* for specific requirements.

Groundwater Recharge Volume (GRV)

The purpose of the groundwater recharge volume criterion is to protect groundwater resources by minimizing the loss of annual pre-development groundwater recharge as a result of the proposed development.
The required Groundwater Recharge Volume (GRV) should be based on the site soils and the following equation:

$$\mathbf{GRV = (A_I)(Rd)}$$

Where:
A_I = the total effective area of impervious surfaces that will exist on the site after development
Rd = the groundwater recharge depth based on the USDA/NRCS hydrologic soil group, as follows:

HSG	Impervious Area For GRV				AoT Requirement	
	Existing Area (SF)	Proposed Area (SF)	**A_I**, Change (SF)	**Rd**, Recharge Depth (inches)	**Rd**, Recharge Depth (feet)	Recharge Required (CF)
A	0	0	0	0.40	0.0333	0
B	17,142	92,033	74,891	0.25	0.0208	1,560.2
C	0	35	35	0.10	0.0083	0.3
D	0	0	0	0.00	0.0000	0
Total	17,142	92,068	74,926			1,560.5

Recharge required = 1,561 ft^3

Provided

Recharge provided:
1,582 ft^3 (IS1) + 3,340 ft^3 (IS2) + 2,057 ft^3 (IS3) + 969 ft^3 (Bioretention 1) + 436 ft^3 (Bioretention 2) + 5,898 ft^3 (Bioretention 3) + 1,089 ft^3 (Bioretention 4)
= 15,371 ft^3 (provided) > 1,561 ft^3 (required)

See stage storage plots within the calculation pages in the appendix of this report.

Explanation of Drainage System

References:
1. **New Hampshire Stormwater Management Manual, Volumes 2 & 3, December 2008 and Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas In New Hampshire**
2. **SCS - TR55** *(Second Ed., 1986) - for runoff curve numbers.*

Stormwater runoff is collected in various catch basins, curb inlet structures, and roof drains that are placed throughout the site. Runoff is then routed to an infiltration or bioretention system before recharge or discharge. The 2, 10, 25, and 50-year storm events were analyzed for existing versus proposed conditions (see Drainage Summary). See complete results in the Appendix.

Deep Sump Catch Basin & Nyloplast Drains:
Deep sump catch basins are proposed on site in order to catch and route runoff to various stormwater systems.

Roof Drain:
Roof drains are located on the buildings to capture and route clean stormwater runoff.

Infiltration Systems:
Two Stormtech SC-310 and one SC-160LP infiltration systems by ADS will be utilized to capture, treat, and infiltrate stormwater.

Rain Guardian – Turret:
The Rain Guardian – Turret is a concrete structure with inlet grate to capture trash and debris prior to discharge to the bioretention systems.

Sediment Forebay:
Sediment forebays are shallow depressions which receive runoff from the Turret structures and are placed upstream of the bioretention systems to provide pretreatment.

Bioretention System:
Four bioretention systems are proposed to collect and filter stormwater runoff using conditioned planting soil beds, gravel beds and vegetation within a shallow depression.

Proprietary Filter Device (Jellyfish):
The Jellyfish filtering device uses high flow rate membrane filtration to remove a high level and a wide variety of stormwater pollutants.

SECTION 3.0 -
OPERATION AND MAINTENANCE PLAN

General Information

Allen & Major Associates, Inc. has prepared the following Operation and Maintenance Plan for the ASC / Medical Office project located at 360 Corporate Drive, Portsmouth, NH. The plan is broken down into the following major sections. The first section gives general information about ownership and responsibility (General Information). The next section describes the erosion and sediment control measures used during construction (Construction Period). The third section describes the long-term pollution prevention measures (Long Term Pollution Prevention Plan). The last section describes the maintenance requirements for the stormwater management practices (Maintenance Plan).

Contact Information

Stormwater Management System Owner:

ATDG, LLC
7 Sinclair Drive
Exeter, NH 03833
603-799-6787

Notification Procedures for Change of Responsibility for O&M

The Stormwater Management System (SMS) for this project is owned by ATDG, LLC. The owner shall be legally responsible for the long-term operation and maintenance of this SMS as outlined in this Operation and Maintenance (O&M) Plan. Should ownership of the SMS change, the owner will continue to be responsible until the succeeding owner shall notify the City and Pease Development Authority (PDA) that the succeeding owner has assumed such responsibility. Upon subsequent transfers, the responsibility shall continue to be that of transferring owner until the transferee owner notifies the City of Portsmouth and Pease Development Authority of its assumption of responsibility.

In the event the SMS will serve multiple lots/owners, such as the subdivision of the existing parcel, the owner(s) shall establish an association or other legally enforceable arrangements under which the association or a single party shall have legal responsibility for the operation and maintenance of the entire SMS.

Construction Period

1. Contact the City of Portsmouth's Engineering Department and Pease Development Authority at least two (2) weeks prior to start of construction.

2. Install the catch basin filters (silt sacks) and tubular barriers as shown on the Site Preparation Plan.

3. Site access shall be achieved only from the designated construction entrances.

4. All erosion control measures shall be inspected weekly and after all rainfall events exceeding 0.25" and shall be maintained, repaired, or replaced as required or at the direction of the owner's engineer, the City's Engineer, or the Pease Development Authority's Engineer.

5. Sediment accumulation up-gradient of the tubular sediment barrier greater than 6" in depth shall be removed and disposed of in accordance with all applicable regulations.

6. Catch basin filters shall be installed in all catch basins adjacent to the site. Sediment accumulation on all adjacent catch basin inlets shall be removed and the silt sacks shall be replaced if torn or damaged.

7. The contractor shall comply with the General and Erosion Notes listed on the Site Development Plans.

Post-Development Activities

1. Upon completion of all terrain alteration activities that direct stormwater to a particular practice, the responsible party shall initiate the O&M activities.

2. Paved Areas – Paved areas should be swept as part of the routine site maintenance. Pavement sweeping is an excellent source control for sedimentation to the existing drainage system and is typically performed in the spring of each year following the snow melt.

3. Paved Areas – Salt for de-icing on the paved areas during the winter months shall be limited to the minimum amount practicable. Sand containing the minimum amount of calcium chloride (or approved equivalent) needed for handling may be applied as part of the routine winter maintenance activities.

4. All sediments removed from site drainage facilities shall be disposed of properly, and in accordance with applicable local and state regulations.

5. All vegetated areas on the site shall be stabilized and maintained to control erosion. Any disturbed areas shall be re-seeded as soon as practicable.

6. Work within any drainage structures shall be performed in accordance with the latest OSHA regulations, and only by individuals with appropriate OSHA certification.

7. Maintenance Responsibilities – All post-construction maintenance activities shall be documented and kept on file and made available to the proper City, PDA, and State authorities upon request.

8. If ownership of the property is transferred, the new owner(s) shall become the responsible party.

Long-Term Pollution Prevention Plan
The Long-Term Pollution Prevention Plan (LTPPP) has been prepared and incorporated as part of the Operation and Maintenance of the Stormwater Management System. The purpose of the LTPPP is to identify potential sources of pollution that may affect the quality of stormwater discharges, and to describe the implementation of practices to reduce the pollutants in stormwater discharges. The following items describe the source control and proper procedures for the LTPPP.

Housekeeping
The proposed site development has been designed to maintain a high level of water quality treatment for all stormwater discharge and groundwater. An Operation and Maintenance (O&M) plan has been prepared and is included in this section of the report. The Owner (or its designee) is responsible for adherence to the O&M plan in a strict and complete manner.

Storing of Materials and Waste Products
There are no proposed exterior (un-covered) storage areas. The trash and waste program for the site includes a dedicated space adjacent to the building for waste & recyclables.

Vehicle Washing
Outdoor vehicle washing has the potential to result in high loads of nutrients, metals, and hydrocarbons during dry weather conditions, as the detergent-rich water used to wash the grime off the vehicle enters the stormwater drainage system. The proposed site

improvements do not have accommodations for outdoor car washing. Vehicle washing is not an allowable stormwater discharge under PDA's NPDES Permit with the EPA.

Maintenance of Lawns, Gardens and other Landscaped Areas
It should be recognized that this is a general guideline towards achieving high quality and well-groomed landscaped areas. The grounds staff / landscape contractor must recognize the shortcomings of a general maintenance plan such as this and modify and/or augment it based on weekly, monthly, and yearly observations. In order to ensure the highest quality conditions, the staff must also recognize and appreciate the need to be aware of the constantly changing conditions of the landscaping and be able to respond to them on a proactive basis. No trash or landscape debris (including lawn clippings) shall be stored or dumped within the landscaped or naturalized areas.

Fertilizer
Maintenance practices should be aimed at reducing environmental, mechanical and pest stresses to promote healthy and vigorous growth. When necessary, pest outbreaks should be treated with the most sensitive control measures available. Synthetic chemical controls should be used only as a last resort to organic and biological control methods. Fertilizer, synthetic chemical controls, and pest management applications (when necessary) shall be performed only by licensed applicators in accordance with the manufacturer's label instructions when environmental conditions are conducive to controlled product application.

Only slow-release organic fertilizers should be used in the landscaped areas to limit the amount of nutrients that could enter downstream resource areas. Fertilization of developed areas on site will be performed within manufacturers labeling instructions and shall not exceed an NPK ratio of 1:1:1 (i.e. Triple 10 fertilizer mix), considered a low nitrogen mixture. Additionally, the fertilizer will include a slow release element.

Suggested Aeration program
In-season aeration of lawn areas is good cultural practice and is recommended whenever feasible. It should be accomplished with a solid thin tine aeration method to reduce disruption to the use of the area. The depth of solid tine aeration is similar to core type but should be performed when the soil is somewhat drier for a greater overall effect.

Depending on the intensity of use, it can be expected that all landscaped lawn areas will need aeration to reduce compaction at least once per year. The first operation should occur in late May following the spring season. Methods of reducing compaction will vary based on the nature of the compaction. Compaction on newly established landscaped areas is generally limited to the top 2-3" and can be alleviated using hollow core or thin tine aeration methods.

Landscape Maintenance Program Practices:

- **Lawn**
    1. Mow a minimum of once a week in spring, to a height of 2" to 2 1/2" high. Mowing should be frequent enough so that no more than 1/3 of the grass blade is removed at each mowing. The top growth supports the roots; the shorter the grass is cut, the less the roots will grow. Short cutting also dries out the soil and encourages weeds to germinate.
    2. Mow approximately once every two weeks from July 1st to August 15th depending on lawn growth.
    3. Mow on a ten-day cycle in fall, when growth is stimulated by cooler nights and increased moisture.
    4. Do not remove grass clippings after mowing.
    5. Keep mower blades sharp to prevent ragged cuts on grass leaves, which cause a brownish appearance and increase the chance for disease to enter a leaf.
- **Shrubs**
    1. Mulch not more than 3" depth with shredded pine or fir bark.
    2. Hand prune annually, immediately after blooming, to remove 1/3 of the above-ground biomass (older stems). Stem removals are to occur within 6" of the ground to open up shrub and maintain two-year wood (the blooming wood).
    3. Hand-prune evergreen shrubs only as needed to remove dead and damaged wood and to maintain the naturalistic form of the shrub. Never mechanically shear evergreen shrubs.
    4. Fertilize with ½ lb. slow-release fertilizer (see above section on Fertilizer) every second year.
- **Trees**
    1. Provide aftercare of new tree plantings for the first three years.
    2. Do not fertilize trees, it artificially stimulates them (unless tree health warrants).
    3. Water once a week for the first year; twice a month for the second; once a month for the third year.
    4. Prune trees on a four-year cycle.

Management of Deicing Chemicals and Snow

Snow shall only be stockpiled on site. If the stockpiles of snow do not fit then snow will be disposed off-site. It will be the responsibility of the snow removal contractor to properly dispose of transported snow according NHDES. It will be the responsibility of the snow removal contractor to follow these guidelines and all applicable laws and regulations.

The owner (or its designee) will be responsible for the clearing of the sidewalk and building entrances. The Owner may be required to use a de-icing agent such as potassium chloride to maintain a safe walking surface; however, these are to be used at the minimum amount practicable. The de-icing agent for the walkways and building entrances will be kept within the storage rooms located within the buildings. De-icing agents will not be stored outside.

To address the concerns associated with the application of chlorides and other deicing materials, NHDES recommends the development of a Road Salt and Deicing Minimization Plan when a development will create one acre or more of pavement, including parking lots and roadways. A component of the plan should include tracking the use of salt and other deicers for each storm event and compiling salt use data annually. Snow and ice management operators shall be Green SnowPro certified, trained and certified as a New Hampshire salt applicator, in accordance with Env-Wq 2203, and the UNH Technology Transfer Center online tool (http://www.roadsalt.unh.edu/Salt/).

In the spring, following snow melt, the pavement on site should be swept, with special attention paid to locations where snow was stockpiled. Snow stockpiles can contain higher sediment loads to due sanding and plowing operations, so these areas may require more sweeping than other areas. In addition to sweeping, following the snow melt, the grounds should be inspected for sediment and debris, with special attention paid to the landscaping along the perimeter of the parking areas as well as along the toe of slopes adjacent to parking areas, where debris might collect.

Maintenance Plan

Documentation

Maintenance documents shall include a completed maintenance checklist (attached) that will include any applicable notes or other documents as described in this section.

Operation and Maintenance Schedule Summary

The following is a summary of the maintenance schedule for each of the stormwater BMPs. Note all anomalies, signs of degradation, or corrective actions on the annual Maintenance Checklist.

Rain Guardian - Turret:

The Rain Guardian Turret is a concrete curb-inlet device that discharges to a bioretention system. It is recommended that the Rain Guardian - Turret be inspected at least twice per year. If observed, remove trash and debris at each inspection. Replace the grate if damaged.

Deep Sump Catch Basins and Nyloplast Drains:

These consist of a man-hole type structure that contains inlet and or outlet pipes to further advance stormwater through the proposed drainage system. The size of the pipes and invert elevations vary throughout the project site. The catch basins utilize an inlet grate that is flush to grade to capture runoff and sediment, passing the water through the system and capturing the sediment to be removed. The sediment that accumulates within the bottom of the structures needs to be cleaned periodically, before it reaches a depth of 2’ or 50% of its capacity.

Sediment Forebays:

The design proposes four sediment forebays which discharge to the bioretention systems. Maintenance of sediment forebays includes:

- Inspection at least annually
- Conduct periodic mowing of embankments (generally two times per year) to control growth of woody vegetation on embankments
- Remove debris from outlet structures at least once annually
- Remove and dispose of accumulated sediment based on inspection

Bioretention Area:

It is recommended that the bioretention systems and their overflow devices be inspected at least twice per year and with any rainfall event exceeding 2.5 inches in a 24-hour period. Trash and debris observed in the bioretention area (if any) shall be removed.

The Owner or its designee shall keep records of the maintenance of the Stormwater BMPs on a yearly basis. Maintenance documents shall include a completed maintenance checklist.

Proprietary Filter Device (Jellyfish)

It is recommended that the Jellyfish be inspected quarterly during the first year of operation. The frequency of inspections during subsequent years shall be based on the plan developed during that first year. It is recommended the device be inspected after any rainfall event exceeding 2.5 inches in a 24-hour period. The device shall be cleaned as directed by the manufacturer. An inspection and maintenance document is provided herewith.

Supplemental Information

- Operation and Maintenance Plan Schedule
- Operation and Maintenance Plan Log Form (During Construction)
- Operation & Maintenance Figure
- Anti-Icing Log Form
- UNH Extension - Mechanical Control of Terrestrial Invasive Plants
- Isolator® Row Plus O&M Manual
- Jellfish® Filter Maintenance Guide

OPERATION AND MAINTENANCE PLAN SCHEDULE

ALLEN & MAJOR ASSOCIATES, INC.

Project: 3250-01
Project Address: Surgical Center - 360 Corporate Drive, Portsmouth, NH

Responsible for O&M Plan: ATDG, LLC
Address: 7 Sinclair Drive, Exeter, NH 03833
Phone: (603) 799-6787

All information within table is derived from New Hampshire Stormwater Manual: Chapter 4, Sections 3 and 4

BMP CATEGORY	BMP OR MAINTENANCE ACTIVITY	SCHEDULE/ FREQUENCY	NOTES	ESTIMATED ANNUAL MAINTENANCE COST	INSPECTION PERFORMED	
					DATE:	BY:
PRETREATMENT PRACTICES	PROPRIETARY FILTER DEVICE (JELLYFISH)	Inspect quarterly, or more frequently as recommended by manufacturer. It is recommended that the unit be cleaned at least once per year.	Remove and legally dispose of floating debris at each inspection. Remove sediment when it reaches level specified by manufacturer. Remove floating hydrocarbons immediately whenever detected by inspection.	$2,000		
PRETREATMENT PRACTICES	DEEP SUMP CATCH BASINS & NYLOPLAST DRAINS	May require frequent maintenance. It is recommended that catch basins be inspected at least twice annually.	Sediment should be removed when it approaches half the sump depth. If floating hydrocarbons are observed the material should be removed immediately. Damaged hoods should be replaced when noted by inspection.	$1,000		
TREATMENT PRACTICES	UNDERGROUND INFILTRATION SYSTEMS	Inspect at least twice annually and with any rainfall event exceeding 2.5 inches in a 24-hour period.	Removal of debris from inlet and outlet structures. Removal of accumulated sediment. Inspection and repair of outlet structures and appurtenances. If system does not drain within a 72-hour period following a rainfall event, a professional should assess the facility's condition.	$1,000		
TREATMENT PRACTICES	BIORETENTION SYSTEM (includes Turret curb-inlets & sediment forebays)	Inspect at least twice annually and with any rainfall event exceeding 2.5 inches in a 24-hour period.	Pretreatment measures should be inspected at least twice annually, and cleaned of accumulated sediment as warranted by inspection. Annually the system should be inspected for drawdown time. Trash and debris should be removed at each inspection.	$2,000		
OTHER MAINTENANCE	SNOW STORAGE	Clear and remove snow to approved storage locations as necessary to ensure systems are working properly and are protected from meltwater pollutants.	Carefully select snow disposal sites before winter. Avoid dumping removed snow over catch basins, or in detention ponds, sediment forebays, rivers, wetlands, and flood plains. It is also prohibited to dump snow in the bioretention basins or gravel swales.	$500		
OTHER MAINTENANCE	STREET SWEEPING	Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring.	Sweep, power broom or vacuum paved areas. Submit information that confirms that all street sweepings have been completed in accordance with state and local requirements	$2,000		

SURGICAL CENTER
360 CORPORATE DRIVE
PORTSMOUTH, NH

MAINTENANCE LOG FORM

INSPECTOR:_________________________

DATE MAINTENANCE PERFORMED:____________________________

INSPECTOR'S QUALIFICATIONS:____

____

____

MAINTENANCE LOG

TYPE OF MAINTENANCE PERFORMED	DATE SINCE LAST MAINTENANCE	STAFF MEMBER OR CONTRACTOR WHO PERFORMED MAINTENANCE	CONDITION	ISSUE RESOLVED (YES/NO)

FOLLOW-UP REQUIRED:
____

____

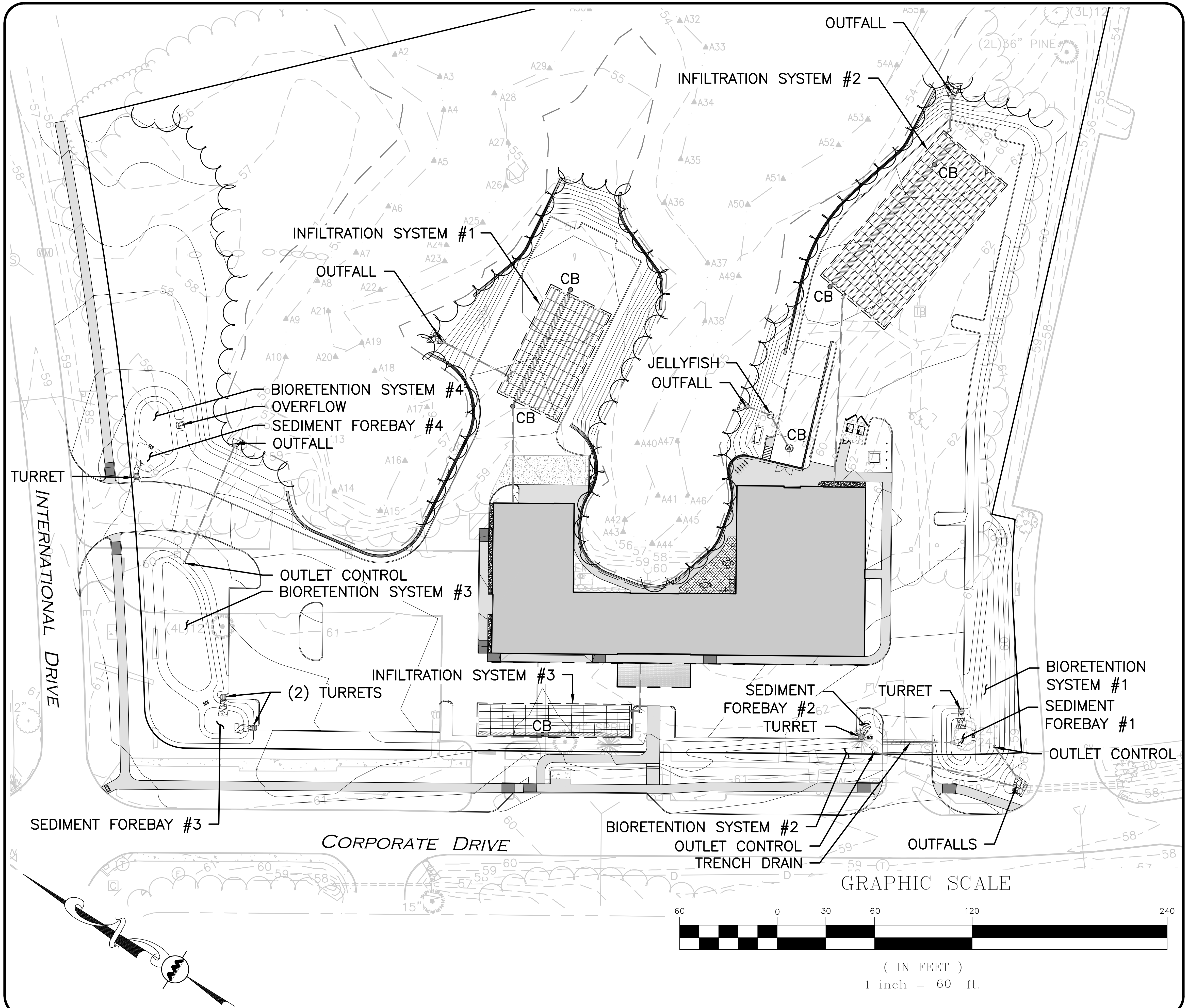
TO BE PERFORMED BY:_____________________ ON OR BEFORE:_________________________

NOTES:
1. Attach copies of maintenance work orders.
2. Owner must keep a minimum of the past 7 years of inspections / operations and maintenance records onsite.

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:				

Figure 4-2. Example Documentation Form for Anti-Icing



R:\PROJECTS\3250-01\WP\REPORTS\DRAINAGE\SECTION 4.0 - FIGURES\DATA\C-3250-01_AOT FIGURE.DWG

REV	DATE	DESCRIPTION
2	09-18-23	REVS PER TAC COMMENTS
1	08-28-23	ISSUED TO AOT

APPLICANT/LESSEE:

ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
PORTSMOUTH, NH

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	1" = 60'	DWG. NAME:	C3250-01-FIGURES
DESIGNED BY:	SM	CHECKED BY:	BDJ

PREPARED BY:

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environmental consulting ◆ landscape architecture
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DRAWING TITLE:

OPERATION & MAINTENANCE FIGURE

SHEET No.

5

Mechanical Control of Terrestrial Invasives Plants

Mechanical control strategies for managing terrestial invasive plants.

It's important to begin a project with a goal in mind, in this case clearing a treeline to allow native shrubs and seedlings to thrive.

The best tools and techniques for controlling invasive plants will be determined by a site's characteristics, the type of plants present, the size of the infestation, and the resources available to implement a control plan. Since each invasive plant species responds to a given control method differently, it is important to determine which methods are best suited to a situation. Often a combination of control techniques is needed, including mechanical, chemical or biological techniques.

Here we focus on prevention and mechanical methods, which are common techniques used at the start of a project, and techniques that can work on a range of projects from small to large.

Prevention

Preventing invasive plants from getting a foothold is always the best strategy of control. It is fairly easy to snuff out a small population of invasive plants, but once the infestation spreads, the cost and effort needed to control the plants escalates and they become harder to remove. This is the idea behind "early detection and rapid response."

A major avenue for invasive plants spreading is via materials moved around by humans. A seed or fragment of an invasive plant can stow away in a potted plant or in haybales, in mulch, soil, gravel or other material, or on boots or clothing. Invasive plants can be inadvertently moved along roadsides by mowers, graders, or plows.

Here are some strategies to prevent invasive plants from hitching a ride to new areas:

- Know the source of purchased plants to ensure the soil is free of invasive plant material
- Compost food waste, leaves, and grass clippings and make your own wood chips to reduce the need to buy mulch, which may contain invasive seeds
- When buying or selling haybales, ask the farmer about invasive plants in their fields
- When building trails, use on-site rocks, soil, sand, and gravel whenever possible
- Consult with your town's Department of Public Works to ensure they use local materials when possible, have roadside mowing protocols for invasive plants, and employ other best practices to prevent invasive plant spread
- Consult with your town planner to ensure zoning ordinances require developers to pay attention to invasive plants
- When working around invasive plants, clean off tools and shoes before moving to another location, and avoid wearing clothing (such as fleece) that enables seeds to stick to you and catch a ride

Before embarking on the physical removal or treatment of invasive plants, recognize that it will require a long-term plan and a multi-year effort. Once an invasive plant infestation spreads, the cost and effort escalate.

Mechanical Control

Mechanical removal can be very labor intensive and may create significant site disturbance. Before embarking on the physical removal or treatment of invasive plants, recognize that it will require a long-term plan and a multi-year effort. Otherwise, efforts may not succeed and may even get worse. “Picking Our Battles: A Guide to Planning Successful Invasive Plant Projects” published by the New Hampshire Fish and Game Department is helpful in crafting a plan. Mechanical methods for controlling invasive plants usually do not require special permits or licensing. However, there are a few situations, such as around historical foundations or in wetland areas, where mechanical control requires special care and in some cases a permit if disturbing soil in sensitive areas.

Your on-site project goal when conducting mechanical control will usually be to halt seed production of the invasive plants, which can remain viable for years. The seed bank in the soil already dictates a multi-year project. Without halting seed production, the project timeframe will continue to stretch into the future. There is a lot to consider even before pulling or digging any plants. Have a vison for the future and find incremental successes along the way.

Plants that are pulled, dug, or cut should be piled on site. Depending on the size of the project, you can pile the material on a tarp or pallet or directly on the ground if there is little chance that the plants will take root. Create “weed drying stations” where non-viable, seed-free plants are piled to desiccate in the sun. Pile plants that contain seeds or other viable plant parts in separate “hot spots,” where any resprouts can be easily contained. See “Methods for Disposing Non-Native Invasive Plants,” by UNH Cooperative Extension for more information.

Recognize that repeat visits are almost always needed whether you use mechanical techniques, herbicides, or a combination of methods. The number of repeat treatments may depend on site conditions as well as the species of plant.

Safety is an important consideration when working with invasive plants. Woodchuck holes, barbed wire, wasp nests, poison ivy, dehydration, thorns, ticks, and skin rashes are all potential hazards. Additional care is needed when pulling plants, such as wild parsnip or giant hogweed, that can cause a severe rash if skin comes in contact with the plant sap; consider getting guidance from a professional before trying to handle these plants. Be prepared for field work: wear eye protection, long-sleeved shirt and pants, gloves, sturdy shoes, and a sun hat; carry water and a first aid kit; consider using a white 5-gallon bucket to carry your gear.

Sturdy hoes and similar tools are useful for digging out roots.

Make sure to remove the entire root system when hand pulling, which is easiest in moist soil.

When smothering a woody stem, the covering should left in place for at least one year.

Methods

Hand Pulling & Digging

Gloved hands work amazingly well on soft or small stems. Rubber kitchen gloves offer protection when pulling plants that exude sap that can cause a rash, such as wild parsnip. Soft, well-fitting garden gloves work well for pulling soft-stemmed plants such as garlic mustard or small seedlings of woody plants. Thicker work gloves are a must for larger shrubs, especially when pulling plants with thorns, such as barberry and multiflora rose.

The best approach to hand pulling is slow and steady. Reach down to the base of the plant and pull with both hands. This will help ensure that you pull up all or most of the roots. Hand-pulling is most effective if the ground is somewhat moist. Dry, hard-packed ground will often result in plants snapping off before the entire root system is extracted. Plants should be pulled when viable fruits or seeds are not present on the plant, to avoid spreading the fruits to a new spot.

Plants that are less than 2-3 inches in diameter, but too large to hand pull, can be removed by digging. Dig using traditional gardening tools, such as a mattock, hoe, or soil knife, or try specialized invasive plant tools available on the market today. Some tools use body weight to lever the root system out of the ground. When selecting a tool, consider the weight and size, as some may be cumbersome to carry around a large project area.

Areas of disturbed soil provide ideal conditions for invasive plant and weed germination. After a plant is pulled or dug up, tamp down the soil and replace any leaf litter or other native plant material. Repeat visits are essential to check for resprouts or sprouts from the soil seed bank.

Smothering

The smothering or suffocating of small seedlings or herbaceous plants may be effective with some infestations. This technique is also used with some stands of Japanese knotweed, but it requires vigilance and patience to maintain a heavy plastic layer for five continuous years. This technique will kill all vegetation in the affected area such that replanting will be required when plastic is removed.

Another smothering technique involves cutting a woody stem at six inches above ground and covering with a heavy plastic bag, tying it closed with a zip-tie. The covering should be left in place for at least one year before removing.

Cutting*

Repeated cutting of invasive shrubs and vines can help stop seed production of large plants. This may be accomplished with loppers or hand saws. With some training or supervision, weed trimmers, brush saws and chain saws may also be used.

Woody invasive shrubs will need to be cut multiple times over several years. The number of repeat treatments may depend on the site conditions as well as the species of plant. The goal is to initially stop seed production and then with each subsequent cut to reduce the plant's energy reserves. Time the first cut for late spring or early summer (before July 4th), followed by a second cut in late summer or fall (as late as November), and do the third cut the following spring.

Cut the stems at ground level or at waist height. The latter technique allows you to find the plants for the repeat treatments and it is easier on your body. Large bittersweet vines should be cut as close to the ground as possible and then cut off another 4 to 5 feet along the stem to create a gap between the ground and the treetop vines. Again, monitoring is important, so check back every year for a while.

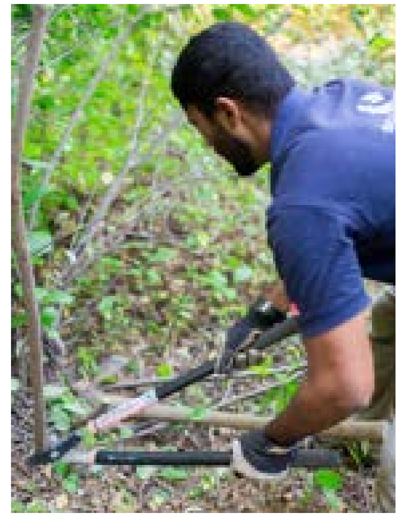
Girdling*

Girdling can be used on large invasive shrubs if other techniques are not viable. At waist height, cut into the bark approximately ¼ - ½" and all the way around the tree. Repeat 6 inches above that cut, then strip off all the bark in between. This severs the phloem, which is the living tissue just under the bark, and cuts off the flow of sugars from the leaves to the roots. While the portion of the plant above the cut will die back it may sprout below the cut, so you will need to check back to see if there are any new sprouts. If so, just strip them off with gloved hands or use clippers and continue removing any new sprouts until the entire plant is dead. Girdling can be done with hand tools including an ax, hand saw or specialized tool. Similar to cutting, spring and early summer are the best time to girdle a plant after it has used energy from its reserves for leaf production. The bark is also more easily removed at this time of year.

Mowing/Shredding*

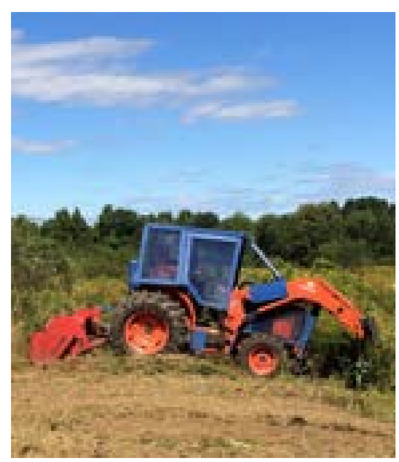
Some large invasive plant infestations may require large equipment, such as tractors with brush or rotary mowers or excavators with special attachments (such as a "brontosaurus"). It is best to use this equipment before seed production (usually before July 4th) to avoid disturbing the soil when the plants have viable seeds. Some contractors have the ability to uproot and shred large shrubs. Others can grind shrubs down to the ground. As long as some of the root system remains in the ground, repeat visits with hand tools or other methods will be needed. When plants are top-killed, the size of the root system increases, resulting in more vigorous re-spouting after the initial mowing. In order to deplete the energy reserves, repeat

*Cutting, girdling and mowing are sometimes used in combination with herbicide treatments. Cutting and mowing can be used to reduce the above-ground biomass and foliage, thus reducing the amount of herbicide needed as well as improving access to the site.

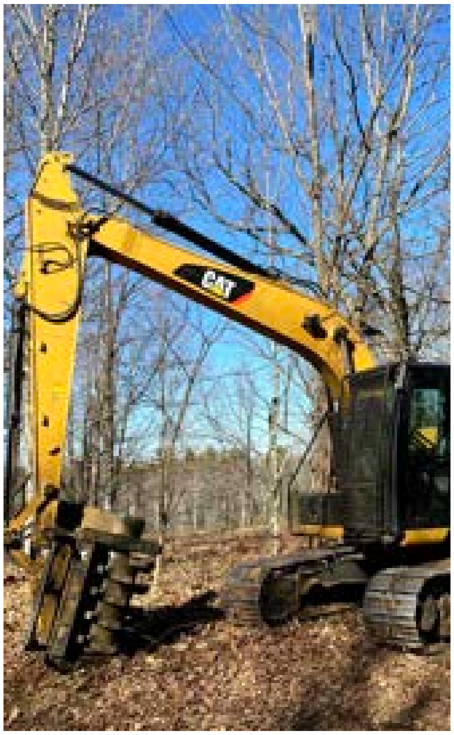


Cut woody invasives at ground level or waist height, best done late spring to early summer.

Girdling is best done in spring and early summer after a plant has used energy to produce leaves.



Use mowing equipment before seeds are produced, and avoid disturbing soil after plants have viable seeds.



Mechanical equipment has the potential to spread invasives. Inspection and cleaning is essential.

A "weed drying station"

mowing is necessary. This can mean re-mowing 3-4 times a year for multiple years following the initial mow.

Mowing or shredding have the benefit of halting seed production over a large area. Make sure to ask the contractor details about their equipment, technique, and expected outcomes before embarking on a project. While it can increase the complexity of a project, depending on the plant composition on the site, you can flag and retain mature native plants during mowing projects. Skilled operators will be able to maneuver around retained plants. All mechanical equipment used in treating invasive plant infestation has the potential to transport seeds, roots, rhizomes, and spores to other sites. Equipment inspection and cleaning is essential to stop subsequent invasive plant spread.

Monitoring

Persistence and monitoring are key for all invasive plant projects to be successful. A monitoring schedule should be built into your project plan. It may be necessary to adapt your plan based on the results of your monitoring.

It's important to wear appropriate protective equipment when managing invasive plants, including work gloves.

Always map and monitor your invasive plant control efforts.

References

Invasive Species Outreach Group. *Methods for Disposing Non-Native Invasive Plants*. UNH Extension, 2010.

Invasive Plant Working Group. *Picking Our Battles: A Guide to Planning Successful Invasive Plant Management Projects*. NH Fish and Game, 2015.

Learn More

For more information on invasive plants and management options, see UNH Extension's webpage *nhinvasives.org.*

Photo Credits

Many of the photos are courtesy of Ellen Snyder.

About the Author

Ellen Snyder is a certified wildlife biologist and sole owner of Ibis Wildlife Consulting.

She specializes in habitat management, invasive plant control, land stewardship planning, biodiversity conservation, and ecological writing

Ellen served as the Land Stewardship Coordinator for the Town of Durham from 2017-2021. From 1993-2003 she was the Wildlife Specialist for UNH Cooperative Extension. Ellen currently serves on her Conservation Commission in Newmarket, NH.

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Editing Assitance

Mike Bald, Got Weeds?

Isolator® Row Plus
O&M Manual

ADS
StormTech™

The Isolator® Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS) and Total Phosphorus (TP) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-7200 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow stormwater to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

ADS geotextile fabric is placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the chamber's sidewall. The non-woven fabric is not required over the SC-160, DC-780, MC-3500 or MC-7200 models as these chambers do not have perforated side walls.

The Isolator Row Plus is designed to capture the "first flush" runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

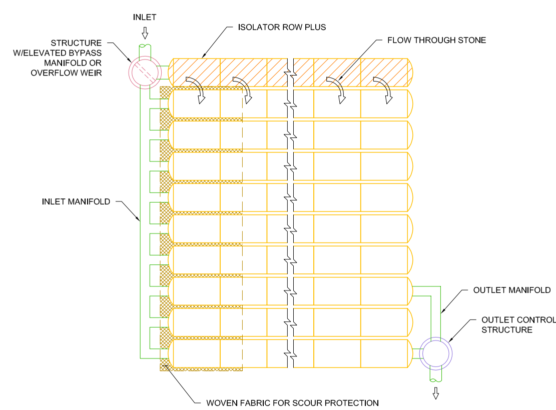
The Isolator Row FLAMP™ (patent pending) is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

Note: *See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.*

Looking down the Isolator Row PLUS from the manhole opening, ADS PLUS Fabric is shown between the chamber and stone base.

StormTech Isolator Row PLUS with Overflow Spillway (not to scale)



Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

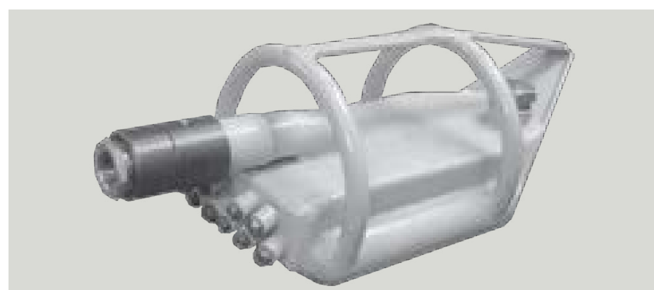
The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row Plus, clean-out should be performed.

Maintenance

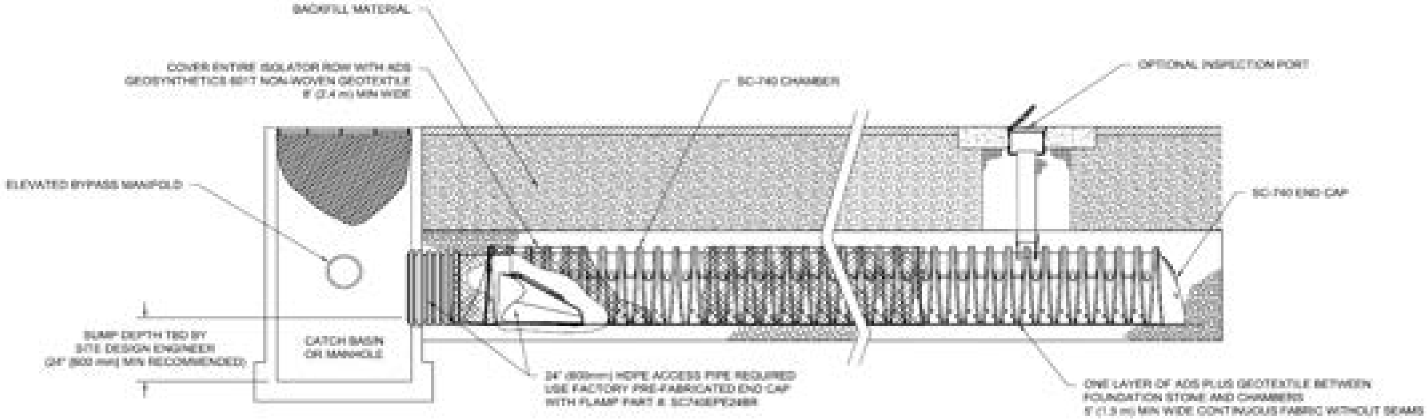
The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By “isolating” sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45” are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**



StormTech Isolator Row PLUS (*not to scale*)

Note: *Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-7200 chamber models and is not required over the entire Isolator Row PLUS.*



Isolator Row Plus Step By Step Maintenance Procedures

Step 1

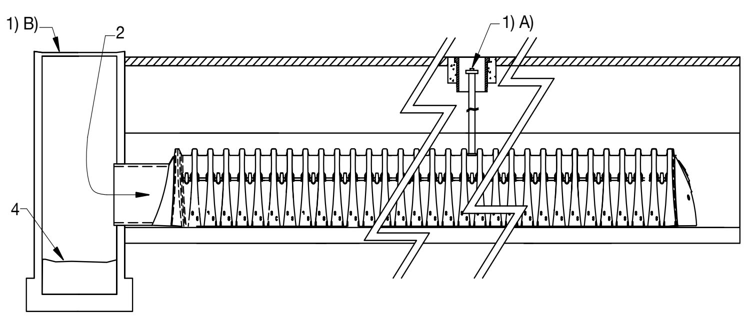
Inspect Isolator Row Plus for sediment.
A) Inspection ports (if present)
i. Remove lid from floor box frame
ii. Remove cap from inspection riser
iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.
B) All Isolator Row Plus
i. Remove cover from manhole at upstream end of Isolator Row Plus
ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
1. Mirrors on poles or cameras may be used to avoid a confined space entry
2. Follow OSHA regulations for confined space entry if entering manhole
iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.
If not, proceed to Step 3.

Step 2

Clean out Isolator Row Plus using the JetVac process.
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

Step 3
Replace all caps, lids and covers, record observations and actions.

Step 4
Inspect & clean catch basins and manholes upstream of the StormTech system.



Sample Maintenance Log

Date	Stadia Rod Readings: Fixed point to chamber bottom (1)	Stadia Rod Readings: Fixed point to top of sediment (2)	Sediment Depth (1)–(2)	Observations/Actions	Inspector
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row PLUS, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

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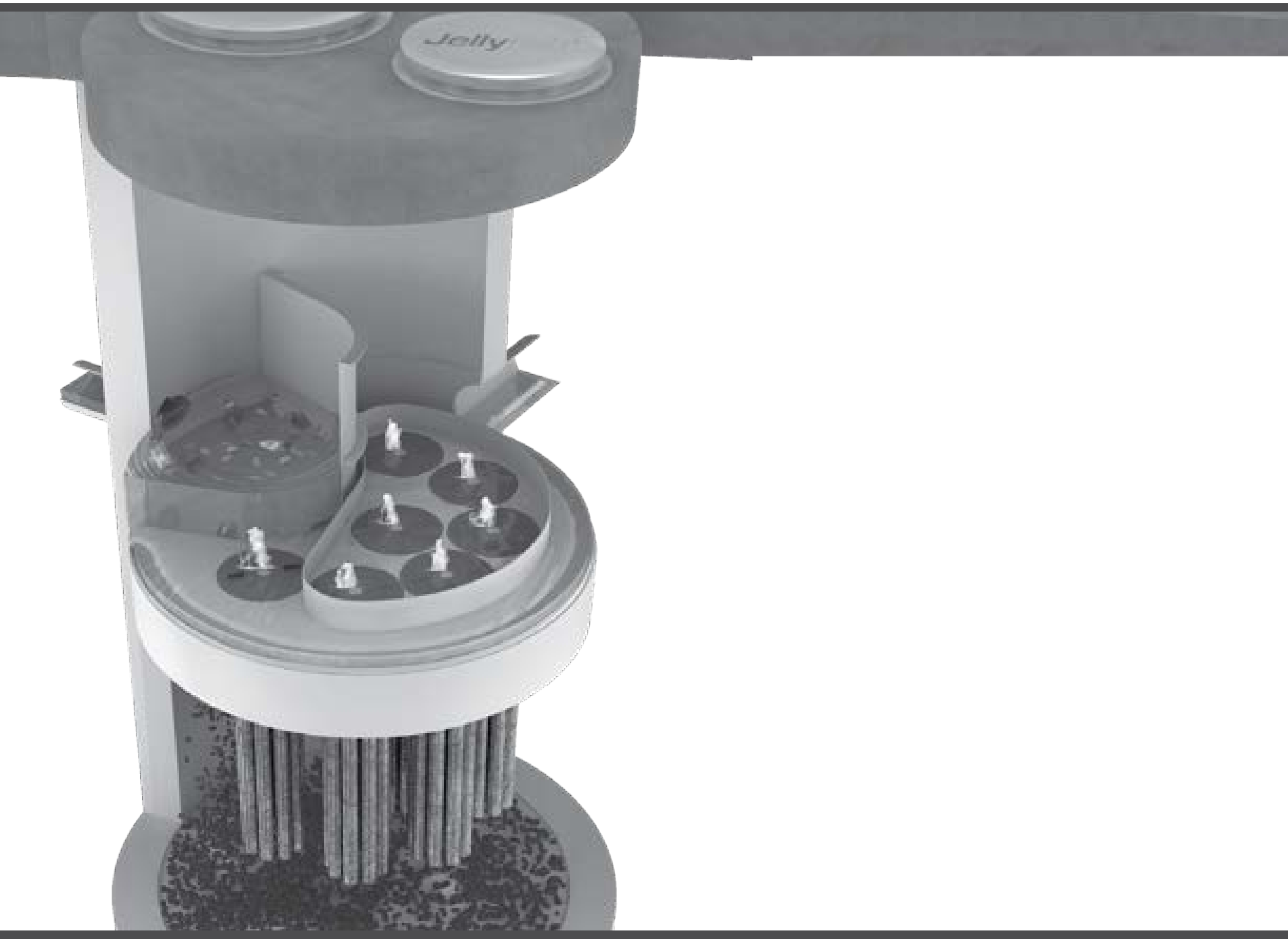
Jellyfish® Filter Maintenance Guide



Jellyfish®

Jellyfish®

JELLYFISH® FILTER
INSPECTION & MAINTENANCE GUIDE

Jellyfish units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the Jellyfish filter to be successful, it is imperative that all other components be properly maintained. The maintenance and repair of upstream facilities should be carried out prior to Jellyfish maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

TABLE OF CONTENTS

1.0 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.

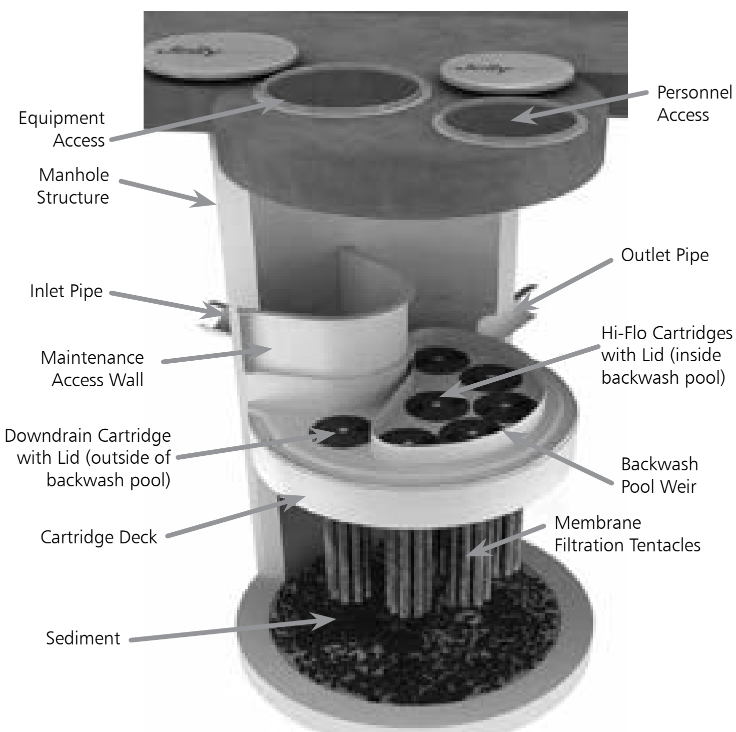
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion 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



Note: Separator Skirt not shown

2.0 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*.

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.

3.0 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.

3.1 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.

3.2 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.

4.0 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.

5.0 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.

5.1 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.

5.2 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.

Cartridge Removal & Lifting Device

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.
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.

5.3 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.

Vacuuming Sump Through MAW

3. Pressure wash cartridge deck and receptacles to remove all 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.

Vacuuming Sump Through MAW

6. For larger diameter Jellyfish Filter manholes (≥8-ft) and some 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.

5.4 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.

5.5 Chemical Spills

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

5.6 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

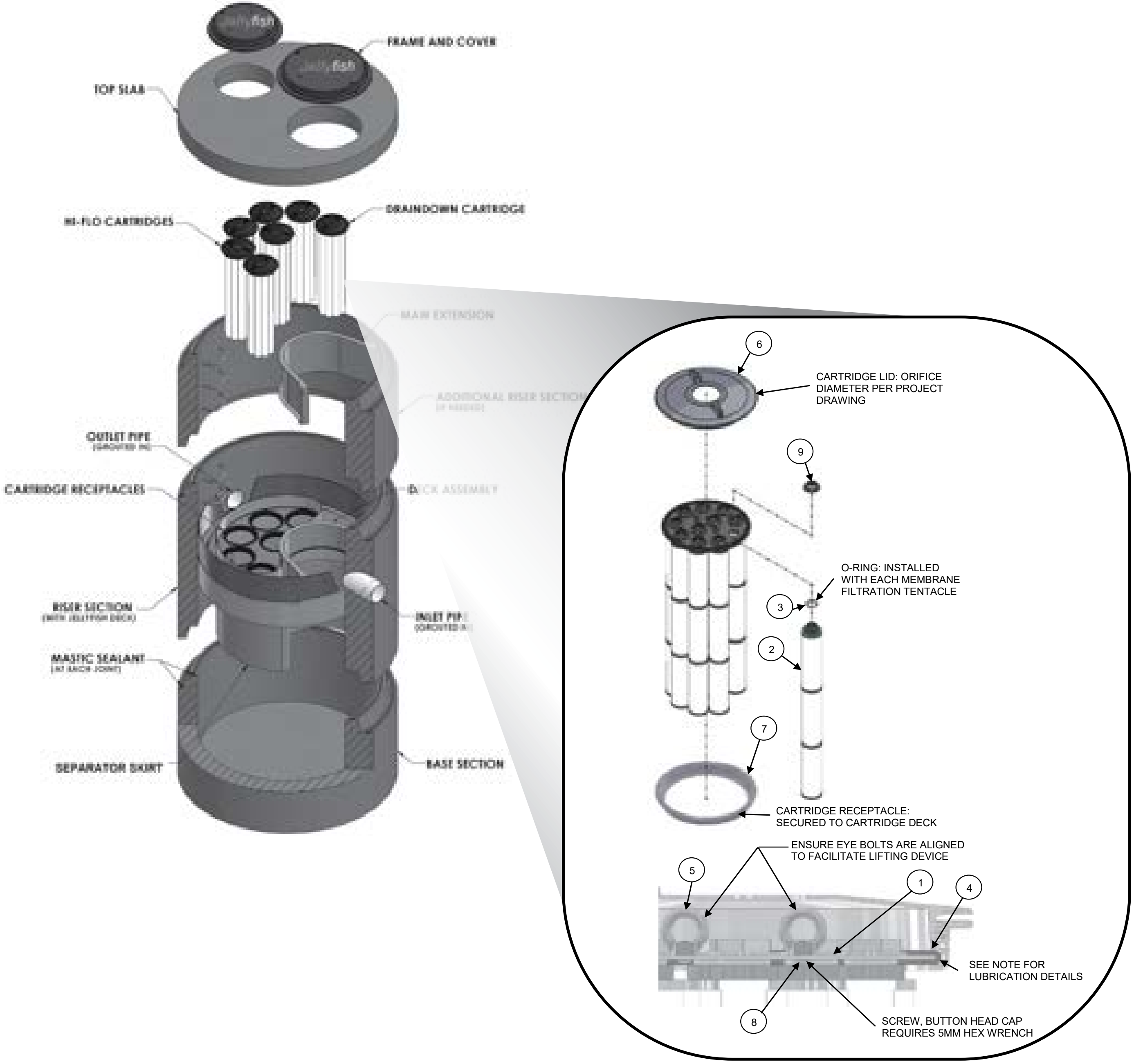


TABLE 1: BOM

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 Lide (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:	
	Roadway/Highway:		Airport:		Residential:	

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						
Draindown Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Draindown Cartridges: (Y/N)						
Hi-Flo Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Hi-Flo 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:						

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Support

- Drawings and specifications are available at www.conteches.com/jellyfish.
- Site-specific design support is available from Contech Engineered Solutions.
- Find a Certified Maintenance Provider at www.conteches.com/ccmp

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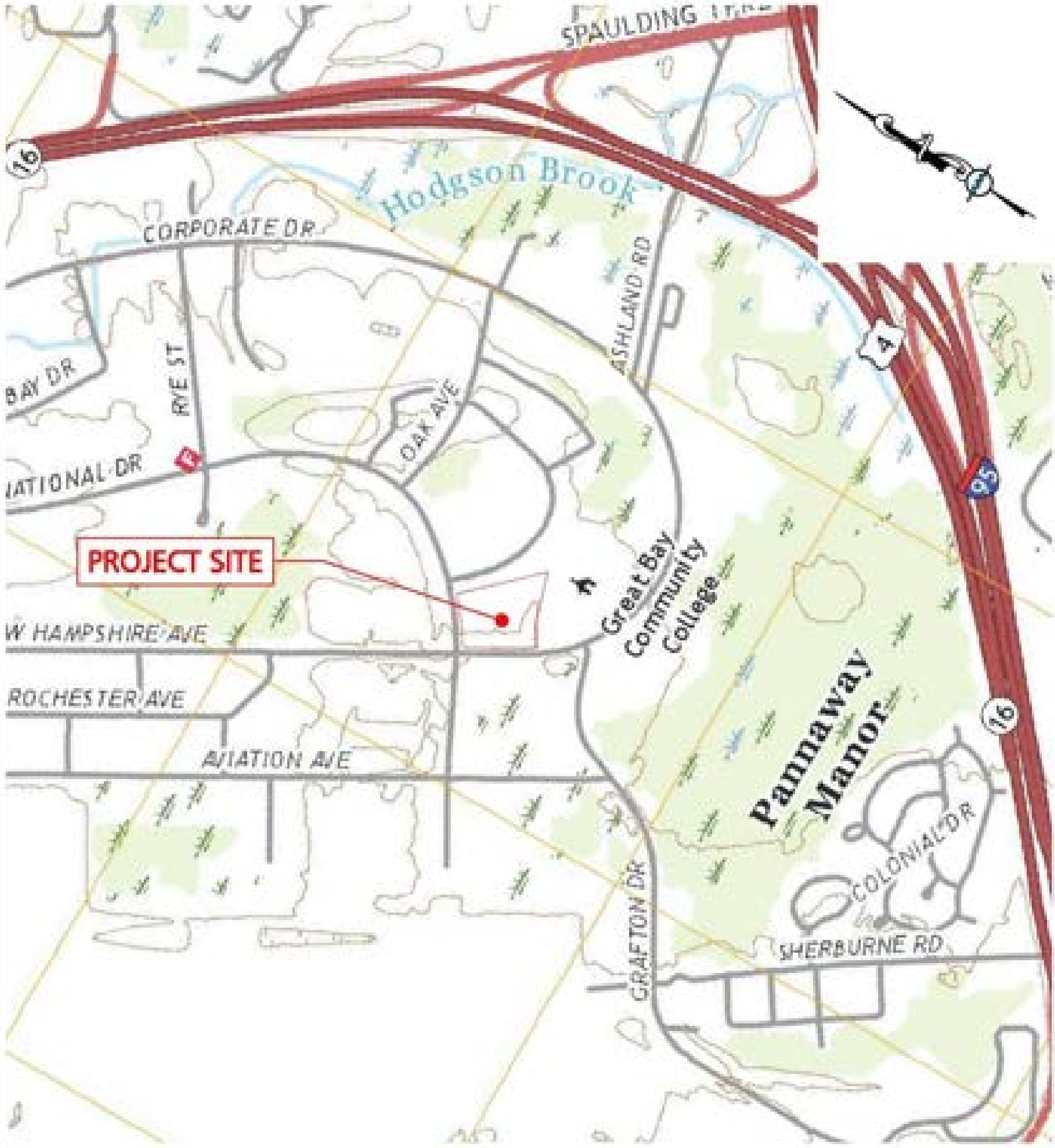
SECTION 4.0 - FIGURES

USGS Map



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360 CORPORATE DRIVE
PORTSMOUTH, NH 03801

USGS SITE LOCUS MAP			
PROJECT NO. 3250-01		DATE: 08-14-2023	
SCALE: 1"=1000'		DWG. NAME: EXHIBITS	
DESIGNED BY: JRG		CHECKED BY: BDJ	

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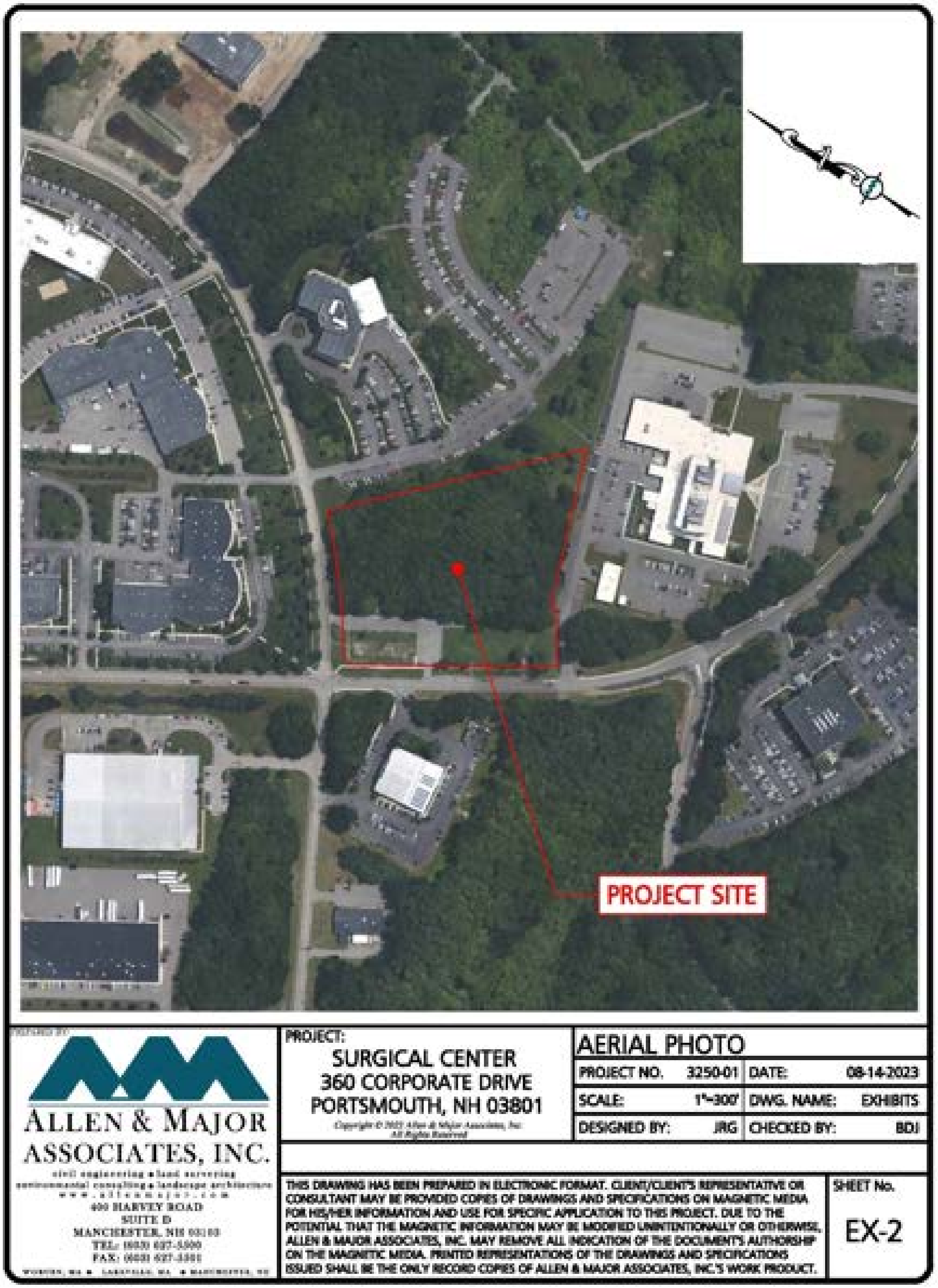
Aerial Map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PROJECT NO. 3250-01
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EX-2

NRCS Soils Map

LEGEND

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
699	Urban land	0.9	6.3%
799	Urban land-Canton complex, 3 to 15 percent slopes	13.5	93.7%
Totals for Area of Interest		14.4	100.0%

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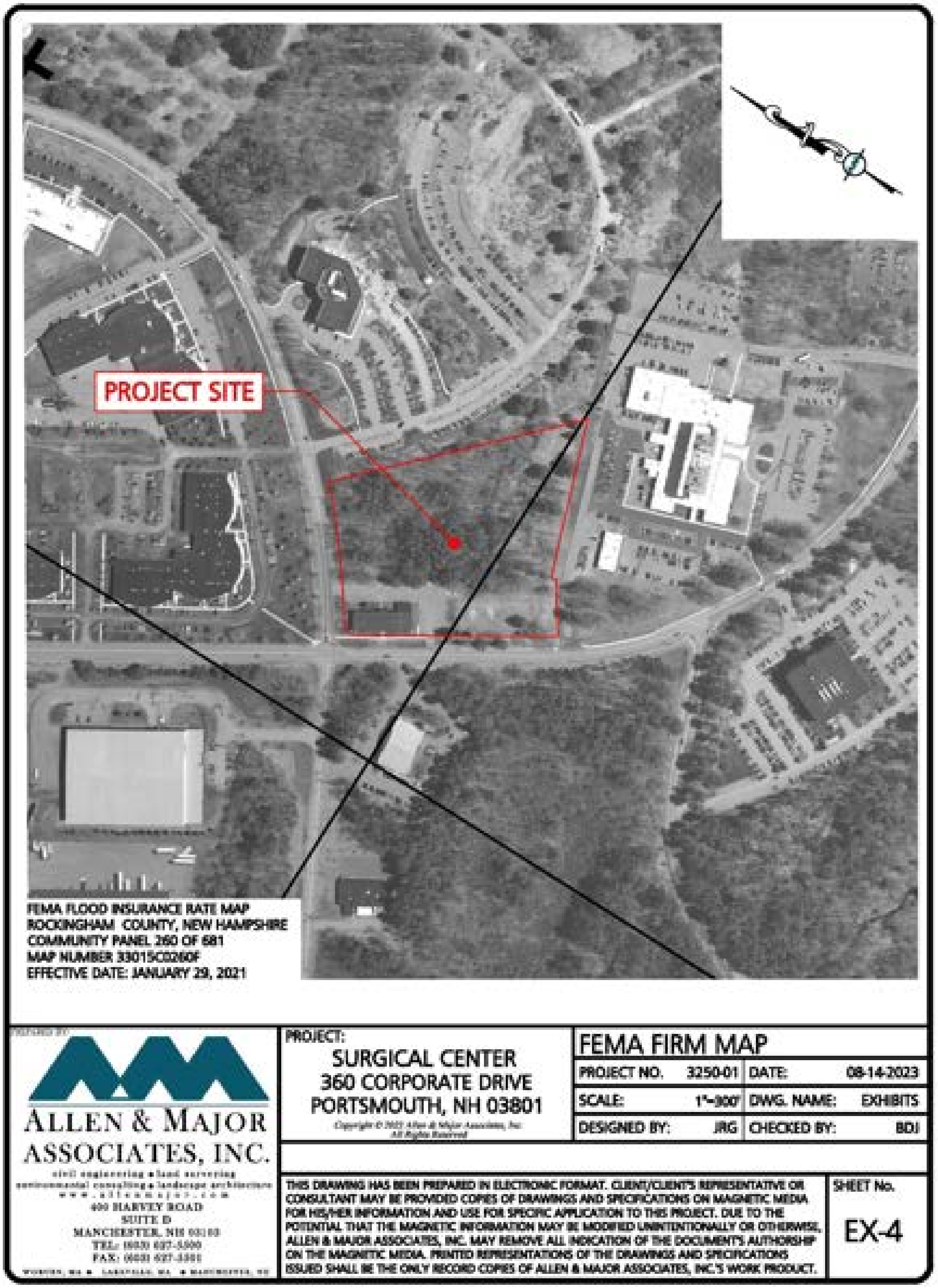
NRCS SOILS MAP

PROJECT NO.	3250-01	DATE:	08-14-2023
SCALE:	1"=200'	DWG. NAME:	EXHIBITS
DESIGNED BY:	JRG	CHECKED BY:	BDJ

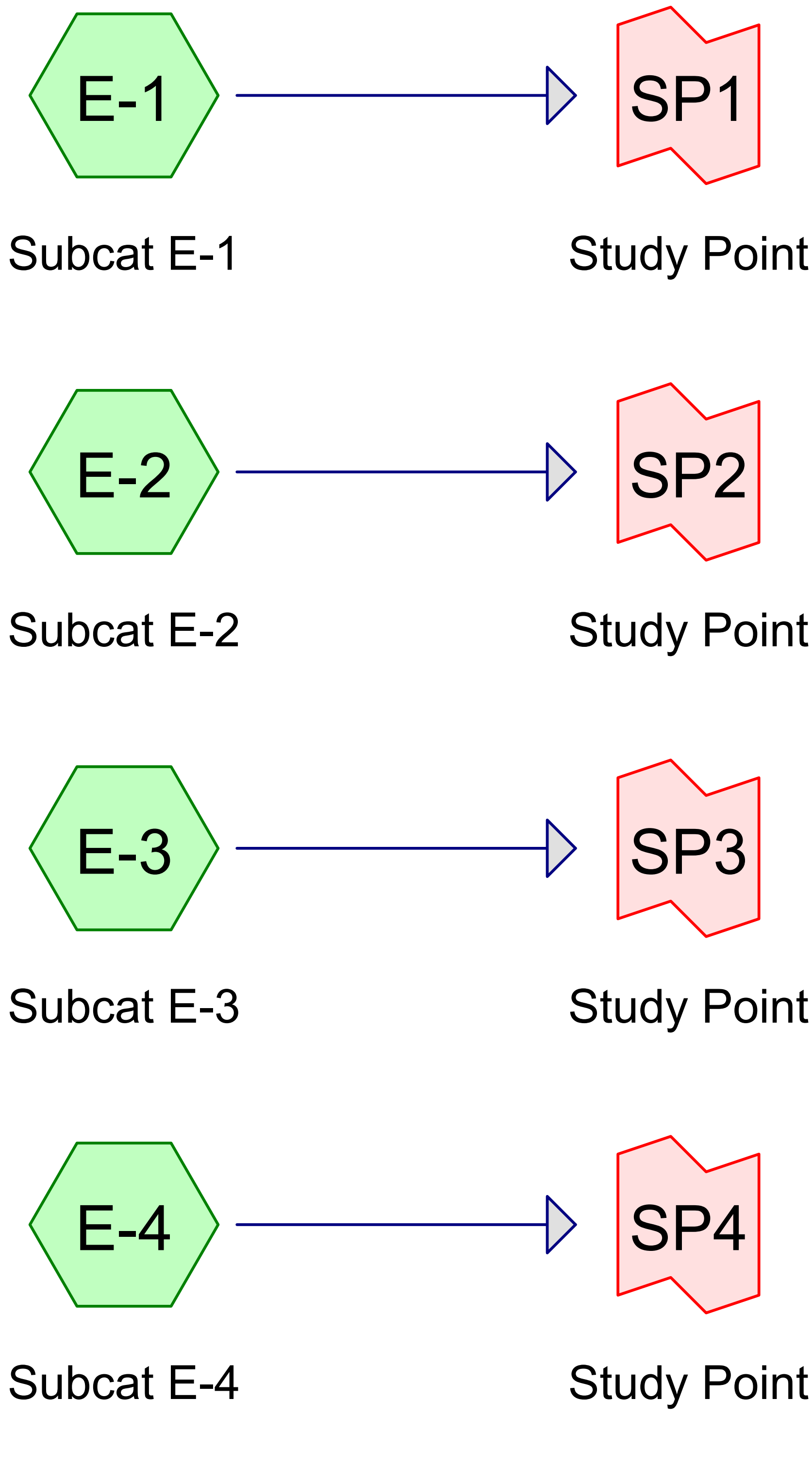
SHEET No.
EX-3

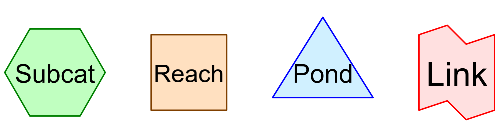
Flood Insurance Rate (FIRM) Map



SECTION 5.0 -
EXISTING DRAINAGE ANALYSIS

Existing HydroCAD





Routing Diagram for 3250-01 - Existing HydroCAD
Prepared by Allen & Major Associates, Inc, Printed 8/10/2023
HydroCAD® 10.20-3c s/n 02881 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	3.69	2
2	10-year	Type III 24-hr		Default	24.00	1	5.60	2
3	25-year	Type III 24-hr		Default	24.00	1	7.10	2
4	50-year	Type III 24-hr		Default	24.00	1	8.51	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
66,856	61	>75% Grass cover, Good, HSG B (E-1, E-2, E-3, E-4)
16,949	98	Paved parking, HSG B (E-1, E-3)
193	98	Roofs, HSG B (E-1)
134,965	55	Woods, Good, HSG B (E-1, E-2, E-3, E-4)
5,544	70	Woods, Good, HSG C (E-1)
224,507	**60**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
218,963	HSG B	E-1, E-2, E-3, E-4
5,544	HSG C	E-1
0	HSG D	
0	Other	
224,507		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	66,856	0	0	0	66,856	>75% Grass cover, Good	
0	16,949	0	0	0	16,949	Paved parking	
0	193	0	0	0	193	Roofs	
0	134,965	5,544	0	0	140,509	Woods, Good	
0	**218,963**	**5,544**	**0**	**0**	**224,507**	**TOTAL AREA**	

Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	For Coastal and Great Bay Communities, a 15% increase was added to each storm event per Env-Wq 1503.08(l).

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-1: Subcat E-1 Runoff Area=161,512 sf 8.19% Impervious Runoff Depth=0.62"
Flow Length=178' Tc=14.8 min CN=60 Runoff=1.46 cfs 8,284 cf

Subcatchment E-2: Subcat E-2 Runoff Area=13,855 sf 0.00% Impervious Runoff Depth=0.53"
Flow Length=67' Tc=8.5 min CN=58 Runoff=0.12 cfs 612 cf

Subcatchment E-3: Subcat E-3 Runoff Area=34,845 sf 11.24% Impervious Runoff Depth=0.85"
Flow Length=151' Tc=7.5 min CN=65 Runoff=0.63 cfs 2,479 cf

Subcatchment E-4: Subcat E-4 Runoff Area=14,295 sf 0.00% Impervious Runoff Depth=0.41"
Flow Length=134' Tc=13.0 min CN=55 Runoff=0.07 cfs 491 cf

Link SP1: Study Point Inflow=1.46 cfs 8,284 cf
Primary=1.46 cfs 8,284 cf

Link SP2: Study Point Inflow=0.12 cfs 612 cf
Primary=0.12 cfs 612 cf

Link SP3: Study Point Inflow=0.63 cfs 2,479 cf
Primary=0.63 cfs 2,479 cf

Link SP4: Study Point Inflow=0.07 cfs 491 cf
Primary=0.07 cfs 491 cf

Total Runoff Area = 224,507 sf Runoff Volume = 11,866 cf Average Runoff Depth = 0.63"
92.36% Pervious = 207,365 sf 7.64% Impervious = 17,142 sf

Summary for Subcatchment E-1: Subcat E-1

Runoff = 1.46 cfs @ 12.27 hrs, Volume= 8,284 cf, Depth= 0.62"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
5,544	70	Woods, Good, HSG C
114,320	55	Woods, Good, HSG B
28,424	61	>75% Grass cover, Good, HSG B
13,031	98	Paved parking, HSG B
193	98	Roofs, HSG B
161,512	60	Weighted Average
148,288		91.81% Pervious Area
13,224		8.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
2.6	128	0.0270	0.82		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
14.8	178	Total			

Summary for Subcatchment E-2: Subcat E-2

Runoff = 0.12 cfs @ 12.17 hrs, Volume= 612 cf, Depth= 0.53"
Routed to Link SP2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
6,956	61	>75% Grass cover, Good, HSG B
6,899	55	Woods, Good, HSG B
13,855	58	Weighted Average
13,855		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0500	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
0.1	17	0.0400	3.00		**Shallow Concentrated Flow, B-C** Grassed Waterway Kv= 15.0 fps
8.5	67	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 0.63 cfs @ 12.13 hrs, Volume= 2,479 cf, Depth= 0.85"
Routed to Link SP3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
3,918	98	Paved parking, HSG B
169	55	Woods, Good, HSG B
30,757	61	>75% Grass cover, Good, HSG B
34,845	65	Weighted Average
30,927		88.76% Pervious Area
3,918		11.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.28"
1.9	101	0.0300	0.87		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
7.5	151	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 0.07 cfs @ 12.34 hrs, Volume= 491 cf, Depth= 0.41"
Routed to Link SP4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
718	61	>75% Grass cover, Good, HSG B
13,577	55	Woods, Good, HSG B
14,295	55	Weighted Average
14,295		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0300	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
2.6	84	0.0120	0.55		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
13.0	134	Total			

Summary for Link SP1: Study Point

Inflow Area = 161,512 sf, 8.19% Impervious, Inflow Depth = 0.62" for 2-year event
Inflow = 1.46 cfs @ 12.27 hrs, Volume= 8,284 cf
Primary = 1.46 cfs @ 12.27 hrs, Volume= 8,284 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP2: Study Point

Inflow Area = 13,855 sf, 0.00% Impervious, Inflow Depth = 0.53" for 2-year event
Inflow = 0.12 cfs @ 12.17 hrs, Volume= 612 cf
Primary = 0.12 cfs @ 12.17 hrs, Volume= 612 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP3: Study Point

Inflow Area = 34,845 sf, 11.24% Impervious, Inflow Depth = 0.85" for 2-year event
Inflow = 0.63 cfs @ 12.13 hrs, Volume= 2,479 cf
Primary = 0.63 cfs @ 12.13 hrs, Volume= 2,479 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP4: Study Point

Inflow Area = 14,295 sf, 0.00% Impervious, Inflow Depth = 0.41" for 2-year event
Inflow = 0.07 cfs @ 12.34 hrs, Volume= 491 cf
Primary = 0.07 cfs @ 12.34 hrs, Volume= 491 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-1: Subcat E-1 Runoff Area=161,512 sf 8.19% Impervious Runoff Depth=1.67"
Flow Length=178' Tc=14.8 min CN=60 Runoff=5.06 cfs 22,410 cf

Subcatchment E-2: Subcat E-2 Runoff Area=13,855 sf 0.00% Impervious Runoff Depth=1.51"
Flow Length=67' Tc=8.5 min CN=58 Runoff=0.46 cfs 1,747 cf

Subcatchment E-3: Subcat E-3 Runoff Area=34,845 sf 11.24% Impervious Runoff Depth=2.06"
Flow Length=151' Tc=7.5 min CN=65 Runoff=1.76 cfs 5,996 cf

Subcatchment E-4: Subcat E-4 Runoff Area=14,295 sf 0.00% Impervious Runoff Depth=1.29"
Flow Length=134' Tc=13.0 min CN=55 Runoff=0.34 cfs 1,541 cf

Link SP1: Study Point Inflow=5.06 cfs 22,410 cf
Primary=5.06 cfs 22,410 cf

Link SP2: Study Point Inflow=0.46 cfs 1,747 cf
Primary=0.46 cfs 1,747 cf

Link SP3: Study Point Inflow=1.76 cfs 5,996 cf
Primary=1.76 cfs 5,996 cf

Link SP4: Study Point Inflow=0.34 cfs 1,541 cf
Primary=0.34 cfs 1,541 cf

Total Runoff Area = 224,507 sf Runoff Volume = 31,694 cf Average Runoff Depth = 1.69"
92.36% Pervious = 207,365 sf 7.64% Impervious = 17,142 sf

Summary for Subcatchment E-1: Subcat E-1

Runoff = 5.06 cfs @ 12.22 hrs, Volume= 22,410 cf, Depth= 1.67"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
5,544	70	Woods, Good, HSG C
114,320	55	Woods, Good, HSG B
28,424	61	>75% Grass cover, Good, HSG B
13,031	98	Paved parking, HSG B
193	98	Roofs, HSG B
161,512	60	Weighted Average
148,288		91.81% Pervious Area
13,224		8.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
2.6	128	0.0270	0.82		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
14.8	178	Total			

Summary for Subcatchment E-2: Subcat E-2

Runoff = 0.46 cfs @ 12.14 hrs, Volume= 1,747 cf, Depth= 1.51"
Routed to Link SP2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
6,956	61	>75% Grass cover, Good, HSG B
6,899	55	Woods, Good, HSG B
13,855	58	Weighted Average
13,855		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0500	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
0.1	17	0.0400	3.00		**Shallow Concentrated Flow, B-C** Grassed Waterway Kv= 15.0 fps
8.5	67	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 1.76 cfs @ 12.12 hrs, Volume= 5,996 cf, Depth= 2.06"
Routed to Link SP3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
3,918	98	Paved parking, HSG B
169	55	Woods, Good, HSG B
30,757	61	>75% Grass cover, Good, HSG B
34,845	65	Weighted Average
30,927		88.76% Pervious Area
3,918		11.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.28"
1.9	101	0.0300	0.87		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
7.5	151	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 0.34 cfs @ 12.21 hrs, Volume= 1,541 cf, Depth= 1.29"
Routed to Link SP4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
718	61	>75% Grass cover, Good, HSG B
13,577	55	Woods, Good, HSG B
14,295	55	Weighted Average
14,295		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0300	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
2.6	84	0.0120	0.55		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
13.0	134	Total			

Summary for Link SP1: Study Point

Inflow Area =	161,512 sf,	8.19% Impervious,	Inflow Depth = 1.67"	for 10-year event
Inflow =	5.06 cfs @	12.22 hrs, Volume=	22,410 cf	
Primary =	5.06 cfs @	12.22 hrs, Volume=	22,410 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP2: Study Point

Inflow Area =	13,855 sf,	0.00% Impervious,	Inflow Depth = 1.51"	for 10-year event
Inflow =	0.46 cfs @	12.14 hrs, Volume=	1,747 cf	
Primary =	0.46 cfs @	12.14 hrs, Volume=	1,747 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP3: Study Point

Inflow Area =	34,845 sf,	11.24% Impervious,	Inflow Depth = 2.06"	for 10-year event
Inflow =	1.76 cfs @	12.12 hrs, Volume=	5,996 cf	
Primary =	1.76 cfs @	12.12 hrs, Volume=	5,996 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP4: Study Point

Inflow Area =	14,295 sf,	0.00% Impervious,	Inflow Depth = 1.29"	for 10-year event
Inflow =	0.34 cfs @	12.21 hrs, Volume=	1,541 cf	
Primary =	0.34 cfs @	12.21 hrs, Volume=	1,541 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-1: Subcat E-1 Runoff Area=161,512 sf 8.19% Impervious Runoff Depth=2.67"
Flow Length=178' Tc=14.8 min CN=60 Runoff=8.52 cfs 35,999 cf

Subcatchment E-2: Subcat E-2 Runoff Area=13,855 sf 0.00% Impervious Runoff Depth=2.48"
Flow Length=67' Tc=8.5 min CN=58 Runoff=0.79 cfs 2,860 cf

Subcatchment E-3: Subcat E-3 Runoff Area=34,845 sf 11.24% Impervious Runoff Depth=3.18"
Flow Length=151' Tc=7.5 min CN=65 Runoff=2.77 cfs 9,234 cf

Subcatchment E-4: Subcat E-4 Runoff Area=14,295 sf 0.00% Impervious Runoff Depth=2.19"
Flow Length=134' Tc=13.0 min CN=55 Runoff=0.62 cfs 2,606 cf

Link SP1: Study Point Inflow=8.52 cfs 35,999 cf
Primary=8.52 cfs 35,999 cf

Link SP2: Study Point Inflow=0.79 cfs 2,860 cf
Primary=0.79 cfs 2,860 cf

Link SP3: Study Point Inflow=2.77 cfs 9,234 cf
Primary=2.77 cfs 9,234 cf

Link SP4: Study Point Inflow=0.62 cfs 2,606 cf
Primary=0.62 cfs 2,606 cf

Total Runoff Area = 224,507 sf Runoff Volume = 50,699 cf Average Runoff Depth = 2.71"
92.36% Pervious = 207,365 sf 7.64% Impervious = 17,142 sf

Summary for Subcatchment E-1: Subcat E-1

Runoff = 8.52 cfs @ 12.22 hrs, Volume= 35,999 cf, Depth= 2.67"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
5,544	70	Woods, Good, HSG C
114,320	55	Woods, Good, HSG B
28,424	61	>75% Grass cover, Good, HSG B
13,031	98	Paved parking, HSG B
193	98	Roofs, HSG B
161,512	60	Weighted Average
148,288		91.81% Pervious Area
13,224		8.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
2.6	128	0.0270	0.82		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
14.8	178	Total			

Summary for Subcatchment E-2: Subcat E-2

Runoff = 0.79 cfs @ 12.13 hrs, Volume= 2,860 cf, Depth= 2.48"
Routed to Link SP2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
6,956	61	>75% Grass cover, Good, HSG B
6,899	55	Woods, Good, HSG B
13,855	58	Weighted Average
13,855		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0500	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
0.1	17	0.0400	3.00		**Shallow Concentrated Flow, B-C** Grassed Waterway Kv= 15.0 fps
8.5	67	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 2.77 cfs @ 12.11 hrs, Volume= 9,234 cf, Depth= 3.18"
Routed to Link SP3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
3,918	98	Paved parking, HSG B
169	55	Woods, Good, HSG B
30,757	61	>75% Grass cover, Good, HSG B
34,845	65	Weighted Average
30,927		88.76% Pervious Area
3,918		11.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow, A-B**
					Grass: Short n= 0.150 P2= 3.28"
1.9	101	0.0300	0.87		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
7.5	151	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 0.62 cfs @ 12.20 hrs, Volume= 2,606 cf, Depth= 2.19"
Routed to Link SP4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
718	61	>75% Grass cover, Good, HSG B
13,577	55	Woods, Good, HSG B
14,295	55	Weighted Average
14,295		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0300	0.08		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.28"
2.6	84	0.0120	0.55		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
13.0	134	Total			

Summary for Link SP1: Study Point

Inflow Area = 161,512 sf, 8.19% Impervious, Inflow Depth = 2.67" for 25-year event
Inflow = 8.52 cfs @ 12.22 hrs, Volume= 35,999 cf
Primary = 8.52 cfs @ 12.22 hrs, Volume= 35,999 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP2: Study Point

Inflow Area = 13,855 sf, 0.00% Impervious, Inflow Depth = 2.48" for 25-year event
Inflow = 0.79 cfs @ 12.13 hrs, Volume= 2,860 cf
Primary = 0.79 cfs @ 12.13 hrs, Volume= 2,860 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP3: Study Point

Inflow Area = 34,845 sf, 11.24% Impervious, Inflow Depth = 3.18" for 25-year event
Inflow = 2.77 cfs @ 12.11 hrs, Volume= 9,234 cf
Primary = 2.77 cfs @ 12.11 hrs, Volume= 9,234 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP4: Study Point

Inflow Area = 14,295 sf, 0.00% Impervious, Inflow Depth = 2.19" for 25-year event
Inflow = 0.62 cfs @ 12.20 hrs, Volume= 2,606 cf
Primary = 0.62 cfs @ 12.20 hrs, Volume= 2,606 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-1: Subcat E-1 Runoff Area=161,512 sf 8.19% Impervious Runoff Depth=3.72"
Flow Length=178' Tc=14.8 min CN=60 Runoff=12.08 cfs 50,076 cf

Subcatchment E-2: Subcat E-2 Runoff Area=13,855 sf 0.00% Impervious Runoff Depth=3.49"
Flow Length=67' Tc=8.5 min CN=58 Runoff=1.14 cfs 4,025 cf

Subcatchment E-3: Subcat E-3 Runoff Area=34,845 sf 11.24% Impervious Runoff Depth=4.31"
Flow Length=151' Tc=7.5 min CN=65 Runoff=3.78 cfs 12,516 cf

Subcatchment E-4: Subcat E-4 Runoff Area=14,295 sf 0.00% Impervious Runoff Depth=3.14"
Flow Length=134' Tc=13.0 min CN=55 Runoff=0.92 cfs 3,738 cf

Link SP1: Study Point Inflow=12.08 cfs 50,076 cf
Primary=12.08 cfs 50,076 cf

Link SP2: Study Point Inflow=1.14 cfs 4,025 cf
Primary=1.14 cfs 4,025 cf

Link SP3: Study Point Inflow=3.78 cfs 12,516 cf
Primary=3.78 cfs 12,516 cf

Link SP4: Study Point Inflow=0.92 cfs 3,738 cf
Primary=0.92 cfs 3,738 cf

Total Runoff Area = 224,507 sf Runoff Volume = 70,356 cf Average Runoff Depth = 3.76"
92.36% Pervious = 207,365 sf 7.64% Impervious = 17,142 sf

Summary for Subcatchment E-1: Subcat E-1

Runoff = 12.08 cfs @ 12.21 hrs, Volume= 50,076 cf, Depth= 3.72"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
5,544	70	Woods, Good, HSG C
114,320	55	Woods, Good, HSG B
28,424	61	>75% Grass cover, Good, HSG B
13,031	98	Paved parking, HSG B
193	98	Roofs, HSG B
161,512	60	Weighted Average
148,288		91.81% Pervious Area
13,224		8.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
2.6	128	0.0270	0.82		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
14.8	178	Total			

Summary for Subcatchment E-2: Subcat E-2

Runoff = 1.14 cfs @ 12.13 hrs, Volume= 4,025 cf, Depth= 3.49"
Routed to Link SP2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
6,956	61	>75% Grass cover, Good, HSG B
6,899	55	Woods, Good, HSG B
13,855	58	Weighted Average
13,855		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0500	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
0.1	17	0.0400	3.00		**Shallow Concentrated Flow, B-C** Grassed Waterway Kv= 15.0 fps
8.5	67	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 3.78 cfs @ 12.11 hrs, Volume= 12,516 cf, Depth= 4.31"
Routed to Link SP3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
3,918	98	Paved parking, HSG B
169	55	Woods, Good, HSG B
30,757	61	>75% Grass cover, Good, HSG B
34,845	65	Weighted Average
30,927		88.76% Pervious Area
3,918		11.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.28"
1.9	101	0.0300	0.87		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
7.5	151	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 0.92 cfs @ 12.19 hrs, Volume= 3,738 cf, Depth= 3.14"
Routed to Link SP4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
718	61	>75% Grass cover, Good, HSG B
13,577	55	Woods, Good, HSG B
14,295	55	Weighted Average
14,295		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0300	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
2.6	84	0.0120	0.55		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
13.0	134	Total			

Summary for Link SP1: Study Point

Inflow Area =	161,512 sf, 8.19% Impervious,	Inflow Depth = 3.72"	for 50-year event
Inflow =	12.08 cfs @ 12.21 hrs, Volume=	50,076 cf	
Primary =	12.08 cfs @ 12.21 hrs, Volume=	50,076 cf, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP2: Study Point

Inflow Area =	13,855 sf, 0.00% Impervious,	Inflow Depth = 3.49"	for 50-year event
Inflow =	1.14 cfs @ 12.13 hrs, Volume=	4,025 cf	
Primary =	1.14 cfs @ 12.13 hrs, Volume=	4,025 cf, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP3: Study Point

Inflow Area =	34,845 sf, 11.24% Impervious,	Inflow Depth = 4.31"	for 50-year event
Inflow =	3.78 cfs @ 12.11 hrs, Volume=	12,516 cf	
Primary =	3.78 cfs @ 12.11 hrs, Volume=	12,516 cf, Atten= 0%, Lag= 0.0 min	

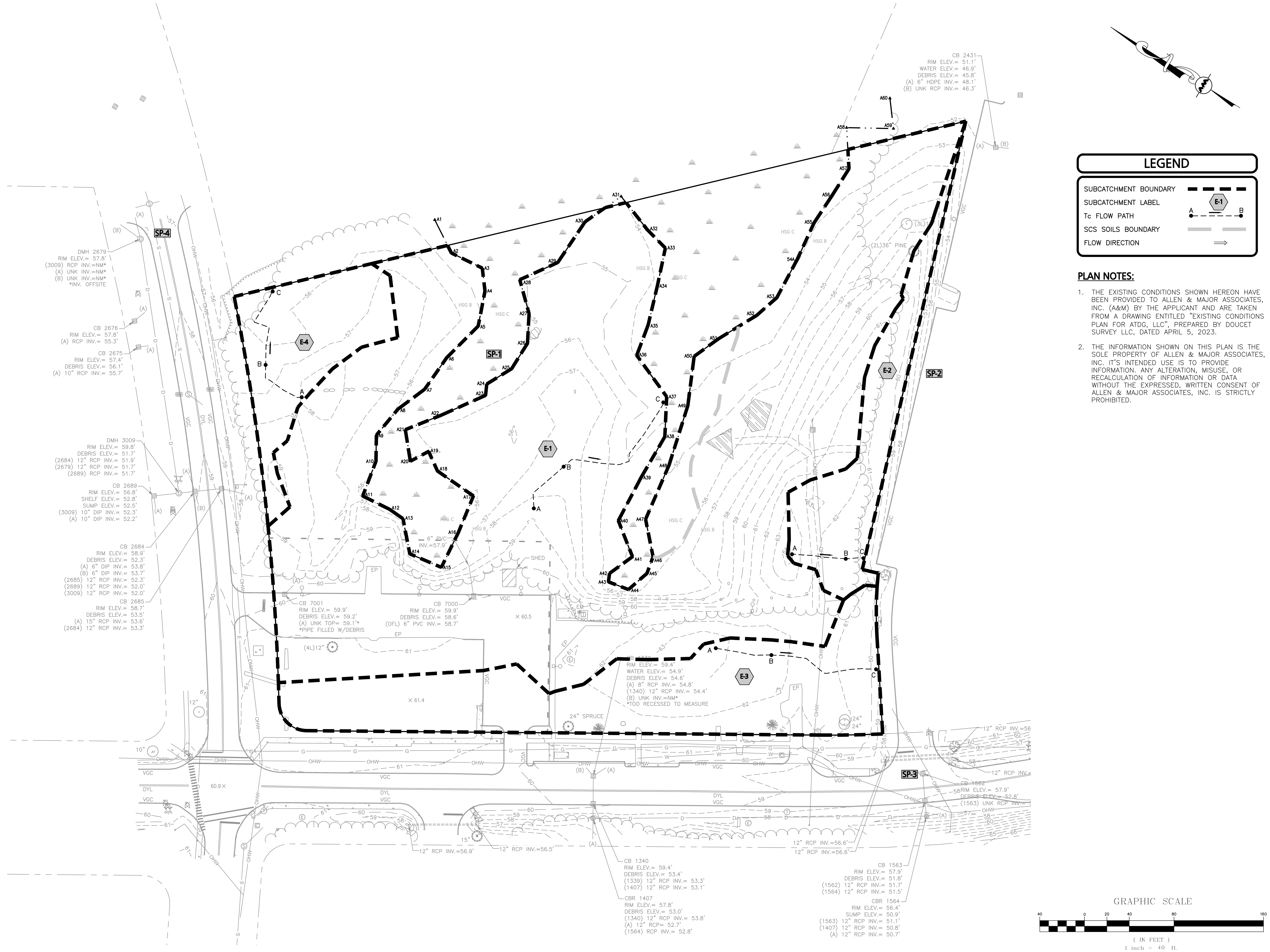
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP4: Study Point

Inflow Area =	14,295 sf, 0.00% Impervious,	Inflow Depth = 3.14"	for 50-year event
Inflow =	0.92 cfs @ 12.19 hrs, Volume=	3,738 cf	
Primary =	0.92 cfs @ 12.19 hrs, Volume=	3,738 cf, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Existing Watershed Plan



LEGEND

SUBCATCHMENT BOUNDARY	
SUBCATCHMENT LABEL	E-1
Tc FLOW PATH	A — B
SCS SOILS BOUNDARY	
FLOW DIRECTION	⟹

PLAN NOTES:

1. THE EXISTING CONDITIONS SHOWN HEREON HAVE BEEN PROVIDED TO ALLEN & MAJOR ASSOCIATES, INC. (A&M) BY THE APPLICANT AND ARE TAKEN FROM A DRAWING ENTITLED "EXISTING CONDITIONS PLAN FOR ATDG, LLC", PREPARED BY DOUCET SURVEY LLC, DATED APRIL 5, 2023.
2. THE INFORMATION SHOWN ON THIS PLAN IS THE SOLE PROPERTY OF ALLEN & MAJOR ASSOCIATES, INC. IT'S INTENDED USE IS TO PROVIDE INFORMATION. ANY ALTERATION, MISUSE, OR RECALCULATION OF INFORMATION OR DATA WITHOUT THE EXPRESSED, WRITTEN CONSENT OF ALLEN & MAJOR ASSOCIATES, INC. IS STRICTLY PROHIBITED.

REV	DATE	DESCRIPTION
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:

ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	1" = 40'	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
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WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

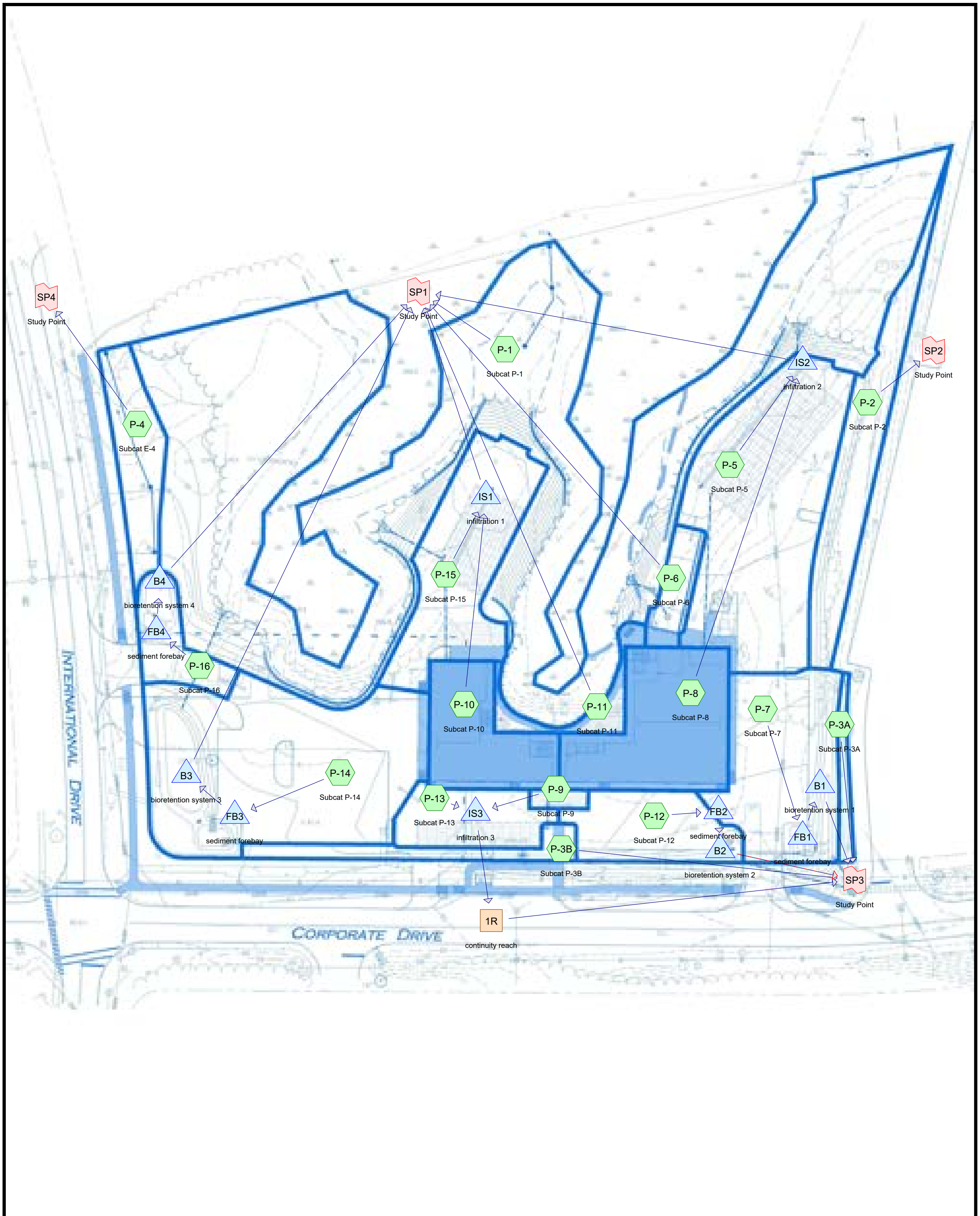
DRAWING TITLE: EXISTING WATERSHED PLAN

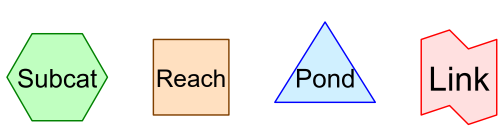
SHEET No. EWS-1

R:\PROJECTS\3250-01\CIVIL\DRAWINGS\CURRENT\C-3250-01_WATERSHED-EXISTING.DWG

SECTION 6.0 -
PROPOSED DRAINAGE ANALYSIS

Proposed HydroCAD





Routing Diagram for 3250-01 - Proposed HydroCAD
Prepared by Allen & Major Associates, Inc, Printed 9/20/2023
HydroCAD® 10.20-3c s/n 02881 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	3.69	2
2	10-year	Type III 24-hr		Default	24.00	1	5.60	2
3	25-year	Type III 24-hr		Default	24.00	1	7.10	2
4	50-year	Type III 24-hr		Default	24.00	1	8.51	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
69,200	61	>75% Grass cover, Good, HSG B (P-1, P-11, P-12, P-13, P-14, P-15, P-16, P-2, P-3A, P-3B, P-4, P-5, P-6, P-7, P-8)
478	74	>75% Grass cover, Good, HSG C (P-1)
73,447	98	Paved parking, HSG B (P-1, P-11, P-12, P-13, P-14, P-15, P-16, P-3B, P-5, P-6, P-7, P-8)
35	98	Paved parking, HSG C (P-11)
18,586	98	Roofs, HSG B (P-10, P-11, P-5, P-6, P-7, P-8, P-9)
57,731	55	Woods, Good, HSG B (P-1)
5,030	70	Woods, Good, HSG C (P-1)
224,507	**75**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
218,963	HSG B	P-1, P-10, P-11, P-12, P-13, P-14, P-15, P-16, P-2, P-3A, P-3B, P-4, P-5, P-6, P-7, P-8, P-9
5,544	HSG C	P-1, P-11
0	HSG D	
0	Other	
224,507		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	69,200	478	0	0	69,678	>75% Grass cover, Good	
0	73,447	35	0	0	73,482	Paved parking	
0	18,586	0	0	0	18,586	Roofs	
0	57,731	5,030	0	0	62,761	Woods, Good	
0	**218,963**	**5,544**	**0**	**0**	**224,507**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	B1	58.22	57.50	22.0	0.0327	0.013	0.0	8.0	0.0	
2	B2	58.00	57.50	88.0	0.0057	0.013	0.0	8.0	0.0	
3	B3	58.40	57.00	77.0	0.0182	0.013	0.0	8.0	0.0	
4	IS1	59.50	57.25	32.0	0.0703	0.013	0.0	8.0	0.0	
5	IS2	58.65	58.00	19.0	0.0342	0.013	0.0	10.0	0.0	

Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	For Coastal and Great Bay Communities, a 15% increase was added to each storm event per Env-Wq 1503.08(l).
2	B1	GW from TP4
3		NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.
4	B2	GW from TP4
5		NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.
6	B3	GW from TP1
7		NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.
8	B4	GW assumed based on surrounding data. confirmatory TP to be performed.
9		NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.
10	IS1	GW elevation from TP8
11		NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.
12	IS2	GW from TP5
13		NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.
14	IS3	GW from TP2
15		NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: Subcat P-1 Runoff Area=96,465 sf 0.06% Impervious Runoff Depth=0.53"
Flow Length=85' Tc=13.7 min CN=58 Runoff=0.69 cfs 4,260 cf

Subcatchment P-10: Subcat P-10 Runoff Area=7,046 sf 100.00% Impervious Runoff Depth=3.46"
Tc=6.0 min CN=98 Runoff=0.57 cfs 2,029 cf

Subcatchment P-11: Subcat P-11 Runoff Area=2,310 sf 85.16% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=93 Runoff=0.17 cfs 562 cf

Subcatchment P-12: Subcat P-12 Runoff Area=6,287 sf 75.97% Impervious Runoff Depth=2.53"
Tc=6.0 min CN=89 Runoff=0.41 cfs 1,327 cf

Subcatchment P-13: Subcat P-13 Runoff Area=4,999 sf 98.84% Impervious Runoff Depth=3.46"
Tc=6.0 min CN=98 Runoff=0.40 cfs 1,440 cf

Subcatchment P-14: Subcat P-14 Runoff Area=24,922 sf 65.24% Impervious Runoff Depth=2.18"
Tc=6.0 min CN=85 Runoff=1.43 cfs 4,533 cf

Subcatchment P-15: Subcat P-15 Runoff Area=11,933 sf 98.06% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=97 Runoff=0.95 cfs 3,324 cf

Subcatchment P-16: Subcat P-16 Runoff Area=3,691 sf 53.10% Impervious Runoff Depth=1.86"
Tc=6.0 min CN=81 Runoff=0.18 cfs 573 cf

Subcatchment P-2: Subcat P-2 Runoff Area=8,852 sf 0.00% Impervious Runoff Depth=0.66"
Tc=6.0 min CN=61 Runoff=0.12 cfs 487 cf

Subcatchment P-3A: Subcat P-3A Runoff Area=1,190 sf 0.00% Impervious Runoff Depth=0.66"
Tc=6.0 min CN=61 Runoff=0.02 cfs 65 cf

Subcatchment P-3B: Subcat P-3B Runoff Area=3,169 sf 7.20% Impervious Runoff Depth=0.80"
Tc=6.0 min CN=64 Runoff=0.06 cfs 212 cf

Subcatchment P-4: Subcat E-4 Runoff Area=5,412 sf 0.00% Impervious Runoff Depth=0.66"
Flow Length=162' Tc=9.6 min CN=61 Runoff=0.06 cfs 298 cf

Subcatchment P-5: Subcat P-5 Runoff Area=21,847 sf 97.06% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=97 Runoff=1.74 cfs 6,087 cf

Subcatchment P-6: Subcat P-6 Runoff Area=2,391 sf 88.45% Impervious Runoff Depth=3.02"
Tc=6.0 min CN=94 Runoff=0.18 cfs 602 cf

Subcatchment P-7: Subcat P-7 Runoff Area=12,459 sf 66.41% Impervious Runoff Depth=2.27"
Tc=6.0 min CN=86 Runoff=0.74 cfs 2,354 cf

Subcatchment P-8: Subcat P-8 Runoff Area=10,876 sf 99.99% Impervious Runoff Depth=3.46"
Tc=6.0 min CN=98 Runoff=0.88 cfs 3,132 cf

Subcatchment P-9: Subcat P-9 Runoff Area=657 sf 100.00% Impervious Runoff Depth=3.46"
Tc=6.0 min CN=98 Runoff=0.05 cfs 189 cf

Reach 1R: continuity reach Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond B1: bioretention system 1 Peak Elev=60.05' Storage=1,024 cf Inflow=0.72 cfs 2,218 cf
Discarded=0.03 cfs 1,845 cf Primary=0.14 cfs 373 cf Outflow=0.17 cfs 2,218 cf

Pond B2: bioretention system 2 Peak Elev=60.66' Storage=531 cf Inflow=0.41 cfs 1,273 cf
Discarded=0.02 cfs 939 cf Primary=0.12 cfs 334 cf Outflow=0.14 cfs 1,273 cf

Pond B3: bioretention system 3 Peak Elev=59.67' Storage=2,288 cf Inflow=1.39 cfs 4,335 cf
Discarded=0.09 cfs 4,335 cf Primary=0.00 cfs 0 cf Outflow=0.09 cfs 4,335 cf

Pond B4: bioretention system 4 Peak Elev=58.99' Storage=231 cf Inflow=0.18 cfs 529 cf
Discarded=0.02 cfs 529 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 529 cf

Pond FB1: sediment forebay Peak Elev=59.71' Storage=209 cf Inflow=0.74 cfs 2,354 cf
Outflow=0.72 cfs 2,218 cf

Pond FB2: sediment forebay Peak Elev=60.84' Storage=71 cf Inflow=0.41 cfs 1,327 cf
Outflow=0.41 cfs 1,273 cf

Pond FB3: sediment forebay Peak Elev=59.82' Storage=355 cf Inflow=1.43 cfs 4,533 cf
Outflow=1.39 cfs 4,335 cf

Pond FB4: sediment forebay Peak Elev=59.88' Storage=58 cf Inflow=0.18 cfs 573 cf
Outflow=0.18 cfs 529 cf

Pond IS1: infiltration 1 Peak Elev=59.78' Storage=2,198 cf Inflow=1.52 cfs 5,354 cf
Discarded=0.07 cfs 4,298 cf Primary=0.24 cfs 1,055 cf Outflow=0.31 cfs 5,354 cf

Pond IS2: infiltration 2 Peak Elev=58.82' Storage=4,106 cf Inflow=2.62 cfs 9,219 cf
Discarded=0.13 cfs 8,393 cf Primary=0.12 cfs 826 cf Outflow=0.25 cfs 9,219 cf

Pond IS3: infiltration 3 Peak Elev=60.25' Storage=616 cf Inflow=0.46 cfs 1,629 cf
Discarded=0.04 cfs 1,629 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 1,629 cf

Link SP1: Study Point Inflow=1.00 cfs 7,305 cf
Primary=1.00 cfs 7,305 cf

Link SP2: Study Point Inflow=0.12 cfs 487 cf
Primary=0.12 cfs 487 cf

Link SP3: Study Point Inflow=0.27 cfs 985 cf
Primary=0.27 cfs 985 cf

Link SP4: Study Point Inflow=0.06 cfs 298 cf
Primary=0.06 cfs 298 cf

Total Runoff Area = 224,507 sf Runoff Volume = 31,476 cf Average Runoff Depth = 1.68"
58.99% Pervious = 132,439 sf 41.01% Impervious = 92,068 sf

Summary for Subcatchment P-1: Subcat P-1

Runoff = 0.69 cfs @ 12.27 hrs, Volume= 4,260 cf, Depth= 0.53"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
33,163	61	>75% Grass cover, Good, HSG B
478	74	>75% Grass cover, Good, HSG C
57,731	55	Woods, Good, HSG B
5,030	70	Woods, Good, HSG C
63	98	Paved parking, HSG B
96,465	58	Weighted Average
96,403		99.94% Pervious Area
63		0.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0200	0.07		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.28"
1.5	35	0.0060	0.39		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
13.7	85	Total			

Summary for Subcatchment P-10: Subcat P-10

Runoff = 0.57 cfs @ 12.09 hrs, Volume= 2,029 cf, Depth= 3.46"
Routed to Pond IS1 : infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
7,046	98	Roofs, HSG B
7,046		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-11: Subcat P-11

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 562 cf, Depth= 2.92"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
35	98	Paved parking, HSG C
343	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
1,932	98	Paved parking, HSG B
2,310	93	Weighted Average
343		14.84% Pervious Area
1,967		85.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-12: Subcat P-12

Runoff = 0.41 cfs @ 12.09 hrs, Volume= 1,327 cf, Depth= 2.53"
Routed to Pond FB2 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
4,776	98	Paved parking, HSG B
1,511	61	>75% Grass cover, Good, HSG B
6,287	89	Weighted Average
1,511		24.03% Pervious Area
4,776		75.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-13: Subcat P-13

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 1,440 cf, Depth= 3.46"
Routed to Pond IS3 : infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
4,941	98	Paved parking, HSG B
58	61	>75% Grass cover, Good, HSG B
4,999	98	Weighted Average
58		1.16% Pervious Area
4,941		98.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-14: Subcat P-14

Runoff = 1.43 cfs @ 12.09 hrs, Volume= 4,533 cf, Depth= 2.18"
Routed to Pond FB3 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
8,662	61	>75% Grass cover, Good, HSG B
16,259	98	Paved parking, HSG B
24,922	85	Weighted Average
8,662		34.76% Pervious Area
16,259		65.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-15: Subcat P-15

Runoff = 0.95 cfs @ 12.09 hrs, Volume= 3,324 cf, Depth= 3.34"
Routed to Pond IS1 : infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
231	61	>75% Grass cover, Good, HSG B
11,702	98	Paved parking, HSG B
11,933	97	Weighted Average
231		1.94% Pervious Area
11,702		98.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-16: Subcat P-16

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 573 cf, Depth= 1.86"
Routed to Pond FB4 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
1,960	98	Paved parking, HSG B
1,731	61	>75% Grass cover, Good, HSG B
3,691	81	Weighted Average
1,731		46.90% Pervious Area
1,960		53.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-2: Subcat P-2

Runoff = 0.12 cfs @ 12.11 hrs, Volume= 487 cf, Depth= 0.66"
Routed to Link SP2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
8,852	61	>75% Grass cover, Good, HSG B
8,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 min**

Summary for Subcatchment P-3A: Subcat P-3A

Runoff = 0.02 cfs @ 12.11 hrs, Volume= 65 cf, Depth= 0.66"
Routed to Link SP3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
1,190	61	>75% Grass cover, Good, HSG B
1,190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-3B: Subcat P-3B

Runoff = 0.06 cfs @ 12.11 hrs, Volume= 212 cf, Depth= 0.80"
Routed to Link SP3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
2,941	61	>75% Grass cover, Good, HSG B
228	98	Paved parking, HSG B
3,169	64	Weighted Average
2,941		92.80% Pervious Area
228		7.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-4: Subcat E-4

Runoff = 0.06 cfs @ 12.17 hrs, Volume= 298 cf, Depth= 0.66"
Routed to Link SP4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
5,412	61	>75% Grass cover, Good, HSG B
5,412		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0200	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.28"
1.5	112	0.0310	1.23		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
9.6	162	Total			

Summary for Subcatchment P-5: Subcat P-5

Runoff = 1.74 cfs @ 12.09 hrs, Volume= 6,087 cf, Depth= 3.34"
Routed to Pond IS2 : infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
643	61	>75% Grass cover, Good, HSG B
21,197	98	Paved parking, HSG B
7	98	Roofs, HSG B
21,847	97	Weighted Average
643		2.94% Pervious Area
21,204		97.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-6: Subcat P-6

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 602 cf, Depth= 3.02"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
276	61	>75% Grass cover, Good, HSG B
1	98	Roofs, HSG B
2,114	98	Paved parking, HSG B
2,391	94	Weighted Average
276		11.55% Pervious Area
2,115		88.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-7: Subcat P-7

Runoff = 0.74 cfs @ 12.09 hrs, Volume= 2,354 cf, Depth= 2.27"
Routed to Pond FB1 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
9	98	Roofs, HSG B
8,265	98	Paved parking, HSG B
4,185	61	>75% Grass cover, Good, HSG B
12,459	86	Weighted Average
4,185		33.59% Pervious Area
8,274		66.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-8: Subcat P-8

Runoff = 0.88 cfs @ 12.09 hrs, Volume= 3,132 cf, Depth= 3.46"
Routed to Pond IS2 : infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
1	61	>75% Grass cover, Good, HSG B
10,865	98	Roofs, HSG B
10	98	Paved parking, HSG B
10,876	98	Weighted Average
1		0.01% Pervious Area
10,875		99.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-9: Subcat P-9

Runoff = 0.05 cfs @ 12.09 hrs, Volume= 189 cf, Depth= 3.46"
Routed to Pond IS3 : infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.69"

Area (sf)	CN	Description
657	98	Roofs, HSG B
657		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Reach 1R: continuity reach

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Routed to Link SP3 : Study Point

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Pond B1: bioretention system 1

GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

[81] Warning: Exceeded Pond FB1 by 0.48' @ 12.65 hrs

Inflow Area = 12,459 sf, 66.41% Impervious, Inflow Depth = 2.14" for 2-year event
Inflow = 0.72 cfs @ 12.11 hrs, Volume= 2,218 cf
Outflow = 0.17 cfs @ 12.54 hrs, Volume= 2,218 cf, Atten= 76%, Lag= 25.8 min
Discarded = 0.03 cfs @ 12.54 hrs, Volume= 1,845 cf
Primary = 0.14 cfs @ 12.54 hrs, Volume= 373 cf
Routed to Link SP3 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.05' @ 12.54 hrs Surf.Area= 318 sf Storage= 1,024 cf
Flood Elev= 61.00' Surf.Area= 318 sf Storage= 2,822 cf

Plug-Flow detention time= 323.3 min calculated for 2,218 cf (100% of inflow)
Center-of-Mass det. time= 323.2 min (1,156.8 - 833.5)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	2,632 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	56.50'	191 cf	**media storage (Irregular)**Listed below (Recalc) 636 cf Overall x 30.0% Voids
		2,822 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
58.50	118	118.0	0	0	118
59.00	318	140.0	105	105	574
60.00	1,109	299.0	674	779	6,133
61.00	2,715	349.0	1,853	2,632	8,732

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.50	318	140.0	0	0	318
58.50	318	140.0	636	636	598

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.50'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.20' Phase-In= 0.01'
#2	Device 3	60.00'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	58.22'	**8.0" Round Culvert** L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 58.22' / 57.50' S= 0.0327 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.03 cfs @ 12.54 hrs HW=60.05' (Free Discharge)
└─**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.13 cfs @ 12.54 hrs HW=60.05' (Free Discharge)
└─**3=Culvert** (Passes 0.13 cfs of 2.05 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 0.13 cfs @ 0.71 fps)

Summary for Pond B2: bioretention system 2

GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 6,287 sf, 75.97% Impervious, Inflow Depth = 2.43" for 2-year event
Inflow = 0.41 cfs @ 12.10 hrs, Volume= 1,273 cf
Outflow = 0.14 cfs @ 12.40 hrs, Volume= 1,273 cf, Atten= 66%, Lag= 18.3 min
Discarded = 0.02 cfs @ 12.40 hrs, Volume= 939 cf
Primary = 0.12 cfs @ 12.40 hrs, Volume= 334 cf
Routed to Link SP3 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.66' @ 12.40 hrs Surf.Area= 258 sf Storage= 531 cf
Flood Elev= 61.00' Surf.Area= 258 sf Storage= 800 cf

Plug-Flow detention time= 244.2 min calculated for 1,272 cf (100% of inflow)
Center-of-Mass det. time= 244.5 min (1,063.0 - 818.6)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	645 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	57.50'	155 cf	**media storage (Irregular)**Listed below (Recalc) 516 cf Overall x 30.0% Voids
		800 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	98	88.0	0	0	98
60.00	258	114.0	86	86	519
61.00	930	204.0	559	645	2,802

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.50	258	114.0	0	0	258
59.50	258	114.0	516	516	486

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.50'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.20' Phase-In= 0.01'
#2	Device 3	60.50'	**15.0" Vert. overflow orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	58.00'	**8.0" Round Culvert** L= 88.0' Ke= 0.500 Inlet / Outlet Invert= 58.00' / 57.50' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.02 cfs @ 12.40 hrs HW=60.66' (Free Discharge)
└─**1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.12 cfs @ 12.40 hrs HW=60.66' (Free Discharge)
└─**3=Culvert** (Passes 0.12 cfs of 1.77 cfs potential flow)
  └─**2=overflow orifice** (Orifice Controls 0.12 cfs @ 1.35 fps)

Summary for Pond B3: bioretention system 3

GW from TP1

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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[81] Warning: Exceeded Pond FB3 by 0.12' @ 14.45 hrs

Inflow Area = 24,922 sf, 65.24% Impervious, Inflow Depth = 2.09" for 2-year event
Inflow = 1.39 cfs @ 12.11 hrs, Volume= 4,335 cf
Outflow = 0.09 cfs @ 14.20 hrs, Volume= 4,335 cf, Atten= 94%, Lag= 125.0 min
Discarded = 0.09 cfs @ 14.20 hrs, Volume= 4,335 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.67' @ 14.20 hrs Surf.Area= 1,639 sf Storage= 2,288 cf
Flood Elev= 61.00' Surf.Area= 1,639 sf Storage= 6,870 cf

Plug-Flow detention time= 304.2 min calculated for 4,329 cf (100% of inflow)
Center-of-Mass det. time= 304.2 min (1,138.5 - 834.3)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	5,886 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	57.00'	983 cf	**media storage (Irregular)**Listed below (Recalc) 3,278 cf Overall x 30.0% Voids
		6,870 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.00	1,639	184.0	0	0	1,639
60.00	2,580	217.0	2,092	2,092	2,711
61.00	5,156	323.0	3,794	5,886	7,274

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.00	1,639	184.0	0	0	1,639
59.00	1,639	184.0	3,278	3,278	2,007

Device	Routing	Invert	Outlet Devices
#1	Device 2	60.80'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	58.40'	**8.0" Round Culvert** L= 77.0' Ke= 0.500 Inlet / Outlet Invert= 58.40' / 57.00' S= 0.0182 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Discarded	57.00'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.50' Phase-In= 0.01'

Discarded OutFlow Max=0.09 cfs @ 14.20 hrs HW=59.67' (Free Discharge)
└─**3=Exfiltration** (Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=57.00' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)
  └─**1=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B4: bioretention system 4

GW assumed based on surrounding data. confirmatory TP to be performed.

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 1.72" for 2-year event
Inflow = 0.18 cfs @ 12.11 hrs, Volume= 529 cf
Outflow = 0.02 cfs @ 13.10 hrs, Volume= 529 cf, Atten= 90%, Lag= 59.5 min
Discarded = 0.02 cfs @ 13.10 hrs, Volume= 529 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 58.99' @ 13.10 hrs Surf.Area= 516 sf Storage= 231 cf
Flood Elev= 61.00' Surf.Area= 516 sf Storage= 1,358 cf

Plug-Flow detention time= 151.3 min calculated for 529 cf (100% of inflow)
Center-of-Mass det. time= 151.2 min (1,001.4 - 850.3)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	1,049 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	57.50'	310 cf	**media storage (Irregular)**Listed below (Recalc) 1,032 cf Overall x 30.0% Voids
		1,358 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	391	79.0	0	0	391
60.00	516	88.0	226	226	518
61.00	1,174	135.0	823	1,049	1,359

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.50	516	88.0	0	0	516
59.50	516	88.0	1,032	1,032	692

Device	Routing	Invert	Outlet Devices
#1	Primary	60.75'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	57.50'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.50' Phase-In= 0.10'

Discarded OutFlow Max=0.02 cfs @ 13.10 hrs HW=58.99' (Free Discharge)
└**2=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=57.50' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond FB1: sediment forebay

Inflow Area = 12,459 sf, 66.41% Impervious, Inflow Depth = 2.27" for 2-year event
Inflow = 0.74 cfs @ 12.09 hrs, Volume= 2,354 cf
Outflow = 0.72 cfs @ 12.11 hrs, Volume= 2,218 cf, Atten= 3%, Lag= 1.2 min
Primary = 0.72 cfs @ 12.11 hrs, Volume= 2,218 cf
Routed to Pond B1 : bioretention system 1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.71' @ 12.11 hrs Surf.Area= 374 sf Storage= 209 cf
Flood Elev= 61.00' Surf.Area= 448 sf Storage= 328 cf

Plug-Flow detention time= 47.9 min calculated for 2,215 cf (94% of inflow)
Center-of-Mass det. time= 17.1 min (833.5 - 816.5)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	328 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.00	222	64.0	0	0	222
60.00	448	84.0	328	328	469

Device	Routing	Invert	Outlet Devices
#1	Primary	59.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.71 cfs @ 12.11 hrs HW=59.70' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.71 cfs @ 1.15 fps)

Summary for Pond FB2: sediment forebay

Inflow Area = 6,287 sf, 75.97% Impervious, Inflow Depth = 2.53" for 2-year event
Inflow = 0.41 cfs @ 12.09 hrs, Volume= 1,327 cf
Outflow = 0.41 cfs @ 12.10 hrs, Volume= 1,273 cf, Atten= 0%, Lag= 0.5 min
Primary = 0.41 cfs @ 12.10 hrs, Volume= 1,273 cf
Routed to Pond B2 : bioretention system 2

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.84' @ 12.10 hrs Surf.Area= 128 sf Storage= 71 cf
Flood Elev= 61.00' Surf.Area= 152 sf Storage= 93 cf

Plug-Flow detention time= 35.9 min calculated for 1,272 cf (96% of inflow)
Center-of-Mass det. time= 13.1 min (818.6 - 805.5)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	93 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	1	1.0	0	0	1
60.00	34	25.0	7	7	51
61.00	152	51.0	86	93	213

Device	Routing	Invert	Outlet Devices
#1	Primary	60.70'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.41 cfs @ 12.10 hrs HW=60.84' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.41 cfs @ 0.96 fps)

Summary for Pond FB3: sediment forebay

Inflow Area = 24,922 sf, 65.24% Impervious, Inflow Depth = 2.18" for 2-year event
Inflow = 1.43 cfs @ 12.09 hrs, Volume= 4,533 cf
Outflow = 1.39 cfs @ 12.11 hrs, Volume= 4,335 cf, Atten= 3%, Lag= 1.3 min
Primary = 1.39 cfs @ 12.11 hrs, Volume= 4,335 cf
Routed to Pond B3 : bioretention system 3

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.82' @ 12.11 hrs Surf.Area= 536 sf Storage= 355 cf
Flood Elev= 61.00' Surf.Area= 586 sf Storage= 457 cf

Plug-Flow detention time= 38.5 min calculated for 4,329 cf (96% of inflow)
Center-of-Mass det. time= 14.4 min (834.3 - 819.9)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	457 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.00	340	70.0	0	0	340
60.00	586	91.0	457	457	621

Device	Routing	Invert	Outlet Devices
#1	Primary	59.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.35 cfs @ 12.11 hrs HW=59.81' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.35 cfs @ 1.44 fps)

Summary for Pond FB4: sediment forebay

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 1.86" for 2-year event
Inflow = 0.18 cfs @ 12.09 hrs, Volume= 573 cf
Outflow = 0.18 cfs @ 12.11 hrs, Volume= 529 cf, Atten= 2%, Lag= 1.0 min
Primary = 0.18 cfs @ 12.11 hrs, Volume= 529 cf
Routed to Pond B4 : bioretention system 4

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.88' @ 12.11 hrs Surf.Area= 184 sf Storage= 58 cf
Flood Elev= 60.00' Surf.Area= 205 sf Storage= 81 cf

Plug-Flow detention time= 56.6 min calculated for 529 cf (92% of inflow)
Center-of-Mass det. time= 17.7 min (850.3 - 832.6)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	81 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	124	42.0	0	0	124
60.00	205	56.0	81	81	236

Device	Routing	Invert	Outlet Devices
#1	Primary	59.80'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.17 cfs @ 12.11 hrs HW=59.88' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.17 cfs @ 0.72 fps)

Summary for Pond IS1: infiltration 1

GW elevation from TP8

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 18,979 sf, 98.78% Impervious, Inflow Depth = 3.39" for 2-year event
Inflow = 1.52 cfs @ 12.09 hrs, Volume= 5,354 cf
Outflow = 0.31 cfs @ 12.51 hrs, Volume= 5,354 cf, Atten= 80%, Lag= 25.4 min
Discarded = 0.07 cfs @ 12.51 hrs, Volume= 4,298 cf
Primary = 0.24 cfs @ 12.51 hrs, Volume= 1,055 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.78' @ 12.51 hrs Surf.Area= 3,088 sf Storage= 2,198 cf
Flood Elev= 60.93' Surf.Area= 3,088 sf Storage= 3,939 cf

Plug-Flow detention time= 205.6 min calculated for 5,346 cf (100% of inflow)
Center-of-Mass det. time= 205.5 min (964.6 - 759.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	58.60'	2,174 cf	**41.50'W x 74.40'L x 2.33'H Field A** 7,204 cf Overall - 1,769 cf Embedded = 5,435 cf x 40.0% Voids
#2A	59.10'	1,769 cf	**ADS_StormTech SC-310 +Cap** x 120 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 120 Chambers in 12 Rows
		3,943 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	58.60'	**0.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 54.60' Phase-In= 0.01'
#2	Primary	59.50'	**8.0" Round Culvert** L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 59.50' / 57.25' S= 0.0703 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.07 cfs @ 12.51 hrs HW=59.78' (Free Discharge)
1=Exfiltration (Controls 0.07 cfs)

Primary OutFlow Max=0.24 cfs @ 12.51 hrs HW=59.78' (Free Discharge)
2=Culvert (Inlet Controls 0.24 cfs @ 1.79 fps)

Summary for Pond IS2: infiltration 2

GW from TP5

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 32,723 sf, 98.03% Impervious, Inflow Depth = 3.38" for 2-year event
Inflow = 2.62 cfs @ 12.09 hrs, Volume= 9,219 cf
Outflow = 0.25 cfs @ 12.92 hrs, Volume= 9,219 cf, Atten= 91%, Lag= 50.2 min
Discarded = 0.13 cfs @ 12.92 hrs, Volume= 8,393 cf
Primary = 0.12 cfs @ 12.92 hrs, Volume= 826 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 58.82' @ 12.92 hrs Surf.Area= 6,032 sf Storage= 4,106 cf
Flood Elev= 60.03' Surf.Area= 6,032 sf Storage= 7,744 cf

Plug-Flow detention time= 245.7 min calculated for 9,206 cf (100% of inflow)
Center-of-Mass det. time= 245.6 min (1,005.1 - 759.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	57.70'	4,214 cf	**51.50'W x 117.12'L x 2.33'H Field A** 14,074 cf Overall - 3,538 cf Embedded = 10,536 cf x 40.0% Voids
#2A	58.20'	3,538 cf	**ADS_StormTech SC-310 +Cap** x 240 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 240 Chambers in 15 Rows
		7,752 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.70'	**0.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 53.70' Phase-In= 0.01'
#2	Primary	58.65'	**10.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 58.65' / 58.00' S= 0.0342 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Discarded OutFlow Max=0.13 cfs @ 12.92 hrs HW=58.82' (Free Discharge)
└**1=Exfiltration** (Controls 0.13 cfs)

Primary OutFlow Max=0.12 cfs @ 12.92 hrs HW=58.82' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.12 cfs @ 1.42 fps)

Summary for Pond IS3: infiltration 3

GW from TP2

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 3.46" for 2-year event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 1,629 cf
Outflow = 0.04 cfs @ 13.02 hrs, Volume= 1,629 cf, Atten= 92%, Lag= 56.3 min
Discarded = 0.04 cfs @ 13.02 hrs, Volume= 1,629 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach 1R : continuity reach

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.25' @ 13.02 hrs Surf.Area= 1,972 sf Storage= 616 cf
Flood Elev= 61.60' Surf.Area= 1,972 sf Storage= 2,057 cf

Plug-Flow detention time= 123.9 min calculated for 1,629 cf (100% of inflow)
Center-of-Mass det. time= 123.8 min (877.3 - 753.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	1,257 cf	**20.75'W x 95.03'L x 2.00'H Field A** 3,944 cf Overall - 800 cf Embedded = 3,144 cf x 40.0% Voids
#2A	60.10'	800 cf	**ADS_StormTech SC-160LP +Cap** x 117 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 117 Chambers in 9 Rows
		2,057 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#0	Primary	61.60'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	59.60'	**0.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 55.60' Phase-In= 0.01'

Discarded OutFlow Max=0.04 cfs @ 13.02 hrs HW=60.25' (Free Discharge)
└─**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.60' (Free Discharge)

Summary for Link SP1: Study Point

Inflow Area = 181,482 sf, 40.33% Impervious, Inflow Depth = 0.48" for 2-year event
Inflow = 1.00 cfs @ 12.38 hrs, Volume= 7,305 cf
Primary = 1.00 cfs @ 12.38 hrs, Volume= 7,305 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP2: Study Point

Inflow Area = 8,852 sf, 0.00% Impervious, Inflow Depth = 0.66" for 2-year event
Inflow = 0.12 cfs @ 12.11 hrs, Volume= 487 cf
Primary = 0.12 cfs @ 12.11 hrs, Volume= 487 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP3: Study Point

Inflow Area = 28,761 sf, 65.63% Impervious, Inflow Depth = 0.41" for 2-year event
Inflow = 0.27 cfs @ 12.51 hrs, Volume= 985 cf
Primary = 0.27 cfs @ 12.51 hrs, Volume= 985 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP4: Study Point

Inflow Area = 5,412 sf, 0.00% Impervious, Inflow Depth = 0.66" for 2-year event
Inflow = 0.06 cfs @ 12.17 hrs, Volume= 298 cf
Primary = 0.06 cfs @ 12.17 hrs, Volume= 298 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: Subcat P-1 Runoff Area=96,465 sf 0.06% Impervious Runoff Depth=1.51"
Flow Length=85' Tc=13.7 min CN=58 Runoff=2.75 cfs 12,162 cf

Subcatchment P-10: Subcat P-10 Runoff Area=7,046 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.87 cfs 3,149 cf

Subcatchment P-11: Subcat P-11 Runoff Area=2,310 sf 85.16% Impervious Runoff Depth=4.79"
Tc=6.0 min CN=93 Runoff=0.27 cfs 922 cf

Subcatchment P-12: Subcat P-12 Runoff Area=6,287 sf 75.97% Impervious Runoff Depth=4.35"
Tc=6.0 min CN=89 Runoff=0.69 cfs 2,278 cf

Subcatchment P-13: Subcat P-13 Runoff Area=4,999 sf 98.84% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.61 cfs 2,234 cf

Subcatchment P-14: Subcat P-14 Runoff Area=24,922 sf 65.24% Impervious Runoff Depth=3.93"
Tc=6.0 min CN=85 Runoff=2.54 cfs 8,155 cf

Subcatchment P-15: Subcat P-15 Runoff Area=11,933 sf 98.06% Impervious Runoff Depth=5.25"
Tc=6.0 min CN=97 Runoff=1.46 cfs 5,216 cf

Subcatchment P-16: Subcat P-16 Runoff Area=3,691 sf 53.10% Impervious Runoff Depth=3.52"
Tc=6.0 min CN=81 Runoff=0.34 cfs 1,083 cf

Subcatchment P-2: Subcat P-2 Runoff Area=8,852 sf 0.00% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=61 Runoff=0.38 cfs 1,286 cf

Subcatchment P-3A: Subcat P-3A Runoff Area=1,190 sf 0.00% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=61 Runoff=0.05 cfs 173 cf

Subcatchment P-3B: Subcat P-3B Runoff Area=3,169 sf 7.20% Impervious Runoff Depth=1.98"
Tc=6.0 min CN=64 Runoff=0.16 cfs 524 cf

Subcatchment P-4: Subcat E-4 Runoff Area=5,412 sf 0.00% Impervious Runoff Depth=1.74"
Flow Length=162' Tc=9.6 min CN=61 Runoff=0.21 cfs 786 cf

Subcatchment P-5: Subcat P-5 Runoff Area=21,847 sf 97.06% Impervious Runoff Depth=5.25"
Tc=6.0 min CN=97 Runoff=2.67 cfs 9,550 cf

Subcatchment P-6: Subcat P-6 Runoff Area=2,391 sf 88.45% Impervious Runoff Depth=4.90"
Tc=6.0 min CN=94 Runoff=0.28 cfs 977 cf

Subcatchment P-7: Subcat P-7 Runoff Area=12,459 sf 66.41% Impervious Runoff Depth=4.03"
Tc=6.0 min CN=86 Runoff=1.30 cfs 4,185 cf

Subcatchment P-8: Subcat P-8 Runoff Area=10,876 sf 99.99% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=1.34 cfs 4,860 cf

Subcatchment P-9: Subcat P-9 Runoff Area=657 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.08 cfs 294 cf

Reach 1R: continuity reach Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond B1: bioretention system 1 Peak Elev=60.19' Storage=1,199 cf Inflow=1.27 cfs 4,049 cf
Discarded=0.03 cfs 2,183 cf Primary=1.03 cfs 1,866 cf Outflow=1.07 cfs 4,049 cf

Pond B2: bioretention system 2 Peak Elev=60.83' Storage=657 cf Inflow=0.69 cfs 2,224 cf
Discarded=0.02 cfs 1,125 cf Primary=0.52 cfs 1,099 cf Outflow=0.54 cfs 2,224 cf

Pond B3: bioretention system 3 Peak Elev=60.54' Storage=4,814 cf Inflow=2.47 cfs 7,957 cf
Discarded=0.10 cfs 7,829 cf Primary=0.00 cfs 0 cf Outflow=0.10 cfs 7,829 cf

Pond B4: bioretention system 4 Peak Elev=59.98' Storage=526 cf Inflow=0.34 cfs 1,039 cf
Discarded=0.02 cfs 1,039 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 1,039 cf

Pond FB1: sediment forebay Peak Elev=59.80' Storage=244 cf Inflow=1.30 cfs 4,185 cf
Outflow=1.27 cfs 4,049 cf

Pond FB2: sediment forebay Peak Elev=60.90' Storage=79 cf Inflow=0.69 cfs 2,278 cf
Outflow=0.69 cfs 2,224 cf

Pond FB3: sediment forebay Peak Elev=59.96' Storage=436 cf Inflow=2.54 cfs 8,155 cf
Outflow=2.47 cfs 7,957 cf

Pond FB4: sediment forebay Peak Elev=59.93' Storage=67 cf Inflow=0.34 cfs 1,083 cf
Outflow=0.34 cfs 1,039 cf

Pond IS1: infiltration 1 Peak Elev=60.15' Storage=2,919 cf Inflow=2.33 cfs 8,364 cf
Discarded=0.07 cfs 5,058 cf Primary=0.95 cfs 3,307 cf Outflow=1.02 cfs 8,364 cf

Pond IS2: infiltration 2 Peak Elev=59.23' Storage=5,685 cf Inflow=4.01 cfs 14,410 cf
Discarded=0.14 cfs 9,872 cf Primary=1.04 cfs 4,537 cf Outflow=1.18 cfs 14,410 cf

Pond IS3: infiltration 3 Peak Elev=60.59' Storage=1,112 cf Inflow=0.70 cfs 2,528 cf
Discarded=0.04 cfs 2,528 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 2,528 cf

Link SP1: Study Point Inflow=4.73 cfs 21,904 cf
Primary=4.73 cfs 21,904 cf

Link SP2: Study Point Inflow=0.38 cfs 1,286 cf
Primary=0.38 cfs 1,286 cf

Link SP3: Study Point Inflow=1.72 cfs 3,661 cf
Primary=1.72 cfs 3,661 cf

Link SP4: Study Point Inflow=0.21 cfs 786 cf
Primary=0.21 cfs 786 cf

Total Runoff Area = 224,507 sf Runoff Volume = 57,831 cf Average Runoff Depth = 3.09"
58.99% Pervious = 132,439 sf 41.01% Impervious = 92,068 sf

Summary for Subcatchment P-1: Subcat P-1

Runoff = 2.75 cfs @ 12.21 hrs, Volume= 12,162 cf, Depth= 1.51"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
33,163	61	>75% Grass cover, Good, HSG B
478	74	>75% Grass cover, Good, HSG C
57,731	55	Woods, Good, HSG B
5,030	70	Woods, Good, HSG C
63	98	Paved parking, HSG B
96,465	58	Weighted Average
96,403		99.94% Pervious Area
63		0.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
1.5	35	0.0060	0.39		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
13.7	85	Total			

Summary for Subcatchment P-10: Subcat P-10

Runoff = 0.87 cfs @ 12.09 hrs, Volume= 3,149 cf, Depth= 5.36"
Routed to Pond IS1 : infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
7,046	98	Roofs, HSG B
7,046		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-11: Subcat P-11

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 922 cf, Depth= 4.79"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
35	98	Paved parking, HSG C
343	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
1,932	98	Paved parking, HSG B
2,310	93	Weighted Average
343		14.84% Pervious Area
1,967		85.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-12: Subcat P-12

Runoff = 0.69 cfs @ 12.09 hrs, Volume= 2,278 cf, Depth= 4.35"
Routed to Pond FB2 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
4,776	98	Paved parking, HSG B
1,511	61	>75% Grass cover, Good, HSG B
6,287	89	Weighted Average
1,511		24.03% Pervious Area
4,776		75.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-13: Subcat P-13

Runoff = 0.61 cfs @ 12.09 hrs, Volume= 2,234 cf, Depth= 5.36"
Routed to Pond IS3 : infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
4,941	98	Paved parking, HSG B
58	61	>75% Grass cover, Good, HSG B
4,999	98	Weighted Average
58		1.16% Pervious Area
4,941		98.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-14: Subcat P-14

Runoff = 2.54 cfs @ 12.09 hrs, Volume= 8,155 cf, Depth= 3.93"
Routed to Pond FB3 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
8,662	61	>75% Grass cover, Good, HSG B
16,259	98	Paved parking, HSG B
24,922	85	Weighted Average
8,662		34.76% Pervious Area
16,259		65.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-15: Subcat P-15

Runoff = 1.46 cfs @ 12.09 hrs, Volume= 5,216 cf, Depth= 5.25"
Routed to Pond IS1 : infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
231	61	>75% Grass cover, Good, HSG B
11,702	98	Paved parking, HSG B
11,933	97	Weighted Average
231		1.94% Pervious Area
11,702		98.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-16: Subcat P-16

Runoff = 0.34 cfs @ 12.09 hrs, Volume= 1,083 cf, Depth= 3.52"
Routed to Pond FB4 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
1,960	98	Paved parking, HSG B
1,731	61	>75% Grass cover, Good, HSG B
3,691	81	Weighted Average
1,731		46.90% Pervious Area
1,960		53.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-2: Subcat P-2

Runoff = 0.38 cfs @ 12.10 hrs, Volume= 1,286 cf, Depth= 1.74"
Routed to Link SP2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
8,852	61	>75% Grass cover, Good, HSG B
8,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 min**

Summary for Subcatchment P-3A: Subcat P-3A

Runoff = 0.05 cfs @ 12.10 hrs, Volume= 173 cf, Depth= 1.74"
Routed to Link SP3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
1,190	61	>75% Grass cover, Good, HSG B
1,190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-3B: Subcat P-3B

Runoff = 0.16 cfs @ 12.10 hrs, Volume= 524 cf, Depth= 1.98"
Routed to Link SP3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
2,941	61	>75% Grass cover, Good, HSG B
228	98	Paved parking, HSG B
3,169	64	Weighted Average
2,941		92.80% Pervious Area
228		7.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-4: Subcat E-4

Runoff = 0.21 cfs @ 12.15 hrs, Volume= 786 cf, Depth= 1.74"
Routed to Link SP4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
5,412	61	>75% Grass cover, Good, HSG B
5,412		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0200	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.28"
1.5	112	0.0310	1.23		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
9.6	162	Total			

Summary for Subcatchment P-5: Subcat P-5

Runoff = 2.67 cfs @ 12.09 hrs, Volume= 9,550 cf, Depth= 5.25"
Routed to Pond IS2 : infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
643	61	>75% Grass cover, Good, HSG B
21,197	98	Paved parking, HSG B
7	98	Roofs, HSG B
21,847	97	Weighted Average
643		2.94% Pervious Area
21,204		97.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-6: Subcat P-6

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 977 cf, Depth= 4.90"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
276	61	>75% Grass cover, Good, HSG B
1	98	Roofs, HSG B
2,114	98	Paved parking, HSG B
2,391	94	Weighted Average
276		11.55% Pervious Area
2,115		88.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-7: Subcat P-7

Runoff = 1.30 cfs @ 12.09 hrs, Volume= 4,185 cf, Depth= 4.03"
Routed to Pond FB1 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
9	98	Roofs, HSG B
8,265	98	Paved parking, HSG B
4,185	61	>75% Grass cover, Good, HSG B
12,459	86	Weighted Average
4,185		33.59% Pervious Area
8,274		66.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-8: Subcat P-8

Runoff = 1.34 cfs @ 12.09 hrs, Volume= 4,860 cf, Depth= 5.36"
Routed to Pond IS2 : infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
1	61	>75% Grass cover, Good, HSG B
10,865	98	Roofs, HSG B
10	98	Paved parking, HSG B
10,876	98	Weighted Average
1		0.01% Pervious Area
10,875		99.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-9: Subcat P-9

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 294 cf, Depth= 5.36"
Routed to Pond IS3 : infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.60"

Area (sf)	CN	Description
657	98	Roofs, HSG B
657		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Reach 1R: continuity reach

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 0.00" for 10-year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Routed to Link SP3 : Study Point

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Pond B1: bioretention system 1

GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

[81] Warning: Exceeded Pond FB1 by 0.48' @ 16.10 hrs

Inflow Area = 12,459 sf, 66.41% Impervious, Inflow Depth = 3.90" for 10-year event
Inflow = 1.27 cfs @ 12.11 hrs, Volume= 4,049 cf
Outflow = 1.07 cfs @ 12.17 hrs, Volume= 4,049 cf, Atten= 16%, Lag= 4.0 min
Discarded = 0.03 cfs @ 12.17 hrs, Volume= 2,183 cf
Primary = 1.03 cfs @ 12.17 hrs, Volume= 1,866 cf
Routed to Link SP3 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.19' @ 12.17 hrs Surf.Area= 318 sf Storage= 1,199 cf
Flood Elev= 61.00' Surf.Area= 318 sf Storage= 2,822 cf

Plug-Flow detention time= 218.9 min calculated for 4,049 cf (100% of inflow)
Center-of-Mass det. time= 218.9 min (1,032.3 - 813.4)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	2,632 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	56.50'	191 cf	**media storage (Irregular)**Listed below (Recalc) 636 cf Overall x 30.0% Voids
		2,822 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
58.50	118	118.0	0	0	118
59.00	318	140.0	105	105	574
60.00	1,109	299.0	674	779	6,133
61.00	2,715	349.0	1,853	2,632	8,732

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.50	318	140.0	0	0	318
58.50	318	140.0	636	636	598

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.50'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.20' Phase-In= 0.01'
#2	Device 3	60.00'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	58.22'	**8.0" Round Culvert** L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 58.22' / 57.50' S= 0.0327 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.03 cfs @ 12.17 hrs HW=60.18' (Free Discharge)
└─**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.98 cfs @ 12.17 hrs HW=60.18' (Free Discharge)
└─**3=Culvert** (Passes 0.98 cfs of 2.14 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 0.98 cfs @ 1.39 fps)

Summary for Pond B2: bioretention system 2

GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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[79] Warning: Submerged Pond FB2 Primary device # 1 by 0.13'

Inflow Area = 6,287 sf, 75.97% Impervious, Inflow Depth = 4.25" for 10-year event
Inflow = 0.69 cfs @ 12.10 hrs, Volume= 2,224 cf
Outflow = 0.54 cfs @ 12.17 hrs, Volume= 2,224 cf, Atten= 23%, Lag= 4.4 min
Discarded = 0.02 cfs @ 12.17 hrs, Volume= 1,125 cf
Primary = 0.52 cfs @ 12.17 hrs, Volume= 1,099 cf
Routed to Link SP3 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.83' @ 12.17 hrs Surf.Area= 258 sf Storage= 657 cf
Flood Elev= 61.00' Surf.Area= 258 sf Storage= 800 cf

Plug-Flow detention time= 176.8 min calculated for 2,221 cf (100% of inflow)
Center-of-Mass det. time= 177.2 min (977.8 - 800.6)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	645 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	57.50'	155 cf	**media storage (Irregular)**Listed below (Recalc) 516 cf Overall x 30.0% Voids
		800 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	98	88.0	0	0	98
60.00	258	114.0	86	86	519
61.00	930	204.0	559	645	2,802

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.50	258	114.0	0	0	258
59.50	258	114.0	516	516	486

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.50'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.20' Phase-In= 0.01'
#2	Device 3	60.50'	**15.0" Vert. overflow orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	58.00'	**8.0" Round Culvert** L= 88.0' Ke= 0.500 Inlet / Outlet Invert= 58.00' / 57.50' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.02 cfs @ 12.17 hrs HW=60.83' (Free Discharge)
└─**1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.50 cfs @ 12.17 hrs HW=60.83' (Free Discharge)
└─**3=Culvert** (Passes 0.50 cfs of 1.83 cfs potential flow)
  └─**2=overflow orifice** (Orifice Controls 0.50 cfs @ 1.95 fps)

Summary for Pond B3: bioretention system 3

GW from TP1

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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[81] Warning: Exceeded Pond FB3 by 0.99' @ 15.75 hrs

Inflow Area = 24,922 sf, 65.24% Impervious, Inflow Depth = 3.83" for 10-year event
Inflow = 2.47 cfs @ 12.11 hrs, Volume= 7,957 cf
Outflow = 0.10 cfs @ 15.34 hrs, Volume= 7,829 cf, Atten= 96%, Lag= 193.5 min
Discarded = 0.10 cfs @ 15.34 hrs, Volume= 7,829 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.54' @ 15.34 hrs Surf.Area= 1,639 sf Storage= 4,814 cf
Flood Elev= 61.00' Surf.Area= 1,639 sf Storage= 6,870 cf

Plug-Flow detention time= 511.0 min calculated for 7,829 cf (98% of inflow)
Center-of-Mass det. time= 501.2 min (1,315.5 - 814.3)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	5,886 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	57.00'	983 cf	**media storage (Irregular)**Listed below (Recalc) 3,278 cf Overall x 30.0% Voids
		6,870 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.00	1,639	184.0	0	0	1,639
60.00	2,580	217.0	2,092	2,092	2,711
61.00	5,156	323.0	3,794	5,886	7,274

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.00	1,639	184.0	0	0	1,639
59.00	1,639	184.0	3,278	3,278	2,007

Device	Routing	Invert	Outlet Devices
#1	Device 2	60.80'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	58.40'	**8.0" Round Culvert** L= 77.0' Ke= 0.500 Inlet / Outlet Invert= 58.40' / 57.00' S= 0.0182 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Discarded	57.00'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.50' Phase-In= 0.01'

Discarded OutFlow Max=0.10 cfs @ 15.34 hrs HW=60.54' (Free Discharge)
└─**3=Exfiltration** (Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=57.00' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)
  └─**1=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B4: bioretention system 4

GW assumed based on surrounding data. confirmatory TP to be performed.

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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[81] Warning: Exceeded Pond FB4 by 0.16' @ 13.85 hrs

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 3.38" for 10-year event
Inflow = 0.34 cfs @ 12.10 hrs, Volume= 1,039 cf
Outflow = 0.02 cfs @ 13.76 hrs, Volume= 1,039 cf, Atten= 93%, Lag= 99.1 min
Discarded = 0.02 cfs @ 13.76 hrs, Volume= 1,039 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.98' @ 13.76 hrs Surf.Area= 516 sf Storage= 526 cf
Flood Elev= 61.00' Surf.Area= 516 sf Storage= 1,358 cf

Plug-Flow detention time= 253.4 min calculated for 1,038 cf (100% of inflow)
Center-of-Mass det. time= 253.3 min (1,080.6 - 827.3)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	1,049 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	57.50'	310 cf	**media storage (Irregular)**Listed below (Recalc) 1,032 cf Overall x 30.0% Voids
		1,358 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	391	79.0	0	0	391
60.00	516	88.0	226	226	518
61.00	1,174	135.0	823	1,049	1,359

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.50	516	88.0	0	0	516
59.50	516	88.0	1,032	1,032	692

Device	Routing	Invert	Outlet Devices
#1	Primary	60.75'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	57.50'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.50' Phase-In= 0.10'

Discarded OutFlow Max=0.02 cfs @ 13.76 hrs HW=59.98' (Free Discharge)
└─**2=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=57.50' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond FB1: sediment forebay

Inflow Area = 12,459 sf, 66.41% Impervious, Inflow Depth = 4.03" for 10-year event
Inflow = 1.30 cfs @ 12.09 hrs, Volume= 4,185 cf
Outflow = 1.27 cfs @ 12.11 hrs, Volume= 4,049 cf, Atten= 2%, Lag= 1.0 min
Primary = 1.27 cfs @ 12.11 hrs, Volume= 4,049 cf
Routed to Pond B1 : bioretention system 1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.80' @ 12.11 hrs Surf.Area= 397 sf Storage= 244 cf
Flood Elev= 61.00' Surf.Area= 448 sf Storage= 328 cf

Plug-Flow detention time= 31.9 min calculated for 4,043 cf (97% of inflow)
Center-of-Mass det. time= 13.2 min (813.4 - 800.2)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	328 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.00	222	64.0	0	0	222
60.00	448	84.0	328	328	469

Device	Routing	Invert	Outlet Devices
#1	Primary	59.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.25 cfs @ 12.11 hrs HW=59.80' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.25 cfs @ 1.40 fps)

Summary for Pond FB2: sediment forebay

Inflow Area = 6,287 sf, 75.97% Impervious, Inflow Depth = 4.35" for 10-year event
Inflow = 0.69 cfs @ 12.09 hrs, Volume= 2,278 cf
Outflow = 0.69 cfs @ 12.10 hrs, Volume= 2,224 cf, Atten= 0%, Lag= 0.5 min
Primary = 0.69 cfs @ 12.10 hrs, Volume= 2,224 cf
Routed to Pond B2 : bioretention system 2

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.90' @ 12.10 hrs Surf.Area= 137 sf Storage= 79 cf
Flood Elev= 61.00' Surf.Area= 152 sf Storage= 93 cf

Plug-Flow detention time= 24.4 min calculated for 2,224 cf (98% of inflow)
Center-of-Mass det. time= 10.1 min (800.6 - 790.5)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	93 cf	**surface storage (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	1	1.0	0	0	1
60.00	34	25.0	7	7	51
61.00	152	51.0	86	93	213

Device	Routing	Invert	Outlet Devices
#1	Primary	60.70'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.69 cfs @ 12.10 hrs HW=60.90' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.69 cfs @ 1.14 fps)

Summary for Pond FB3: sediment forebay

Inflow Area = 24,922 sf, 65.24% Impervious, Inflow Depth = 3.93" for 10-year event
Inflow = 2.54 cfs @ 12.09 hrs, Volume= 8,155 cf
Outflow = 2.47 cfs @ 12.11 hrs, Volume= 7,957 cf, Atten= 3%, Lag= 1.2 min
Primary = 2.47 cfs @ 12.11 hrs, Volume= 7,957 cf
Routed to Pond B3 : bioretention system 3

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.96' @ 12.11 hrs Surf.Area= 576 sf Storage= 436 cf
Flood Elev= 61.00' Surf.Area= 586 sf Storage= 457 cf

Plug-Flow detention time= 25.6 min calculated for 7,957 cf (98% of inflow)

Center-of-Mass det. time= 11.1 min (814.3 - 803.2)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	457 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.00	340	70.0	0	0	340
60.00	586	91.0	457	457	621

Device	Routing	Invert	Outlet Devices
#1	Primary	59.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=2.42 cfs @ 12.11 hrs HW=59.96' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 2.42 cfs @ 1.76 fps)

Summary for Pond FB4: sediment forebay

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 3.52" for 10-year event
Inflow = 0.34 cfs @ 12.09 hrs, Volume= 1,083 cf
Outflow = 0.34 cfs @ 12.10 hrs, Volume= 1,039 cf, Atten= 1%, Lag= 0.8 min
Primary = 0.34 cfs @ 12.10 hrs, Volume= 1,039 cf
Routed to Pond B4 : bioretention system 4

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.93' @ 12.11 hrs Surf.Area= 192 sf Storage= 67 cf
Flood Elev= 60.00' Surf.Area= 205 sf Storage= 81 cf

Plug-Flow detention time= 35.8 min calculated for 1,039 cf (96% of inflow)
Center-of-Mass det. time= 13.0 min (827.3 - 814.4)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	81 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	124	42.0	0	0	124
60.00	205	56.0	81	81	236

Device	Routing	Invert	Outlet Devices
#1	Primary	59.80'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.33 cfs @ 12.10 hrs HW=59.92' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.33 cfs @ 0.90 fps)

Summary for Pond IS1: infiltration 1

GW elevation from TP8

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area =	18,979 sf, 98.78% Impervious,	Inflow Depth = 5.29" for 10-year event		
Inflow =	2.33 cfs @	12.09 hrs, Volume=	8,364 cf	
Outflow =	1.02 cfs @	12.27 hrs, Volume=	8,364 cf,	Atten= 56%, Lag= 11.3 min
Discarded =	0.07 cfs @	12.27 hrs, Volume=	5,058 cf	
Primary =	0.95 cfs @	12.27 hrs, Volume=	3,307 cf	

Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.15' @ 12.27 hrs Surf.Area= 3,088 sf Storage= 2,919 cf
Flood Elev= 60.93' Surf.Area= 3,088 sf Storage= 3,939 cf

Plug-Flow detention time= 167.8 min calculated for 8,353 cf (100% of inflow)
Center-of-Mass det. time= 167.9 min (918.7 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	58.60'	2,174 cf	**41.50'W x 74.40'L x 2.33'H Field A** 7,204 cf Overall - 1,769 cf Embedded = 5,435 cf x 40.0% Voids
#2A	59.10'	1,769 cf	**ADS_StormTech SC-310 +Cap** x 120 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 120 Chambers in 12 Rows
		3,943 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	58.60'	**0.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 54.60' Phase-In= 0.01'
#2	Primary	59.50'	**8.0" Round Culvert** L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 59.50' / 57.25' S= 0.0703 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.07 cfs @ 12.27 hrs HW=60.14' (Free Discharge)
└─**1=Exfiltration** (Controls 0.07 cfs)

Primary OutFlow Max=0.94 cfs @ 12.27 hrs HW=60.14' (Free Discharge)
└─**2=Culvert** (Inlet Controls 0.94 cfs @ 2.73 fps)

Summary for Pond IS2: infiltration 2

GW from TP5

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 32,723 sf, 98.03% Impervious, Inflow Depth = 5.28" for 10-year event
Inflow = 4.01 cfs @ 12.09 hrs, Volume= 14,410 cf
Outflow = 1.18 cfs @ 12.41 hrs, Volume= 14,410 cf, Atten= 71%, Lag= 19.5 min
Discarded = 0.14 cfs @ 12.41 hrs, Volume= 9,872 cf
Primary = 1.04 cfs @ 12.41 hrs, Volume= 4,537 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.23' @ 12.41 hrs Surf.Area= 6,032 sf Storage= 5,685 cf
Flood Elev= 60.03' Surf.Area= 6,032 sf Storage= 7,744 cf

Plug-Flow detention time= 202.4 min calculated for 14,410 cf (100% of inflow)
Center-of-Mass det. time= 202.2 min (953.3 - 751.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	57.70'	4,214 cf	**51.50'W x 117.12'L x 2.33'H Field A** 14,074 cf Overall - 3,538 cf Embedded = 10,536 cf x 40.0% Voids
#2A	58.20'	3,538 cf	**ADS_StormTech SC-310 +Cap** x 240 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 240 Chambers in 15 Rows
		7,752 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.70'	**0.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 53.70' Phase-In= 0.01'
#2	Primary	58.65'	**10.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 58.65' / 58.00' S= 0.0342 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Discarded OutFlow Max=0.14 cfs @ 12.41 hrs HW=59.23' (Free Discharge)
└─**1=Exfiltration** (Controls 0.14 cfs)

Primary OutFlow Max=1.04 cfs @ 12.41 hrs HW=59.23' (Free Discharge)
└─**2=Culvert** (Inlet Controls 1.04 cfs @ 2.58 fps)

Summary for Pond IS3: infiltration 3

GW from TP2

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 5.36" for 10-year event
Inflow = 0.70 cfs @ 12.09 hrs, Volume= 2,528 cf
Outflow = 0.04 cfs @ 13.80 hrs, Volume= 2,528 cf, Atten= 94%, Lag= 102.8 min
Discarded = 0.04 cfs @ 13.80 hrs, Volume= 2,528 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach 1R : continuity reach

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.59' @ 13.80 hrs Surf.Area= 1,972 sf Storage= 1,112 cf
Flood Elev= 61.60' Surf.Area= 1,972 sf Storage= 2,057 cf

Plug-Flow detention time= 230.6 min calculated for 2,528 cf (100% of inflow)
Center-of-Mass det. time= 230.5 min (976.7 - 746.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	1,257 cf	**20.75'W x 95.03'L x 2.00'H Field A** 3,944 cf Overall - 800 cf Embedded = 3,144 cf x 40.0% Voids
#2A	60.10'	800 cf	**ADS_StormTech SC-160LP +Cap** x 117 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 117 Chambers in 9 Rows
		2,057 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#0	Primary	61.60'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	59.60'	**0.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 55.60' Phase-In= 0.01'

Discarded OutFlow Max=0.04 cfs @ 13.80 hrs HW=60.59' (Free Discharge)
└─**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.60' (Free Discharge)

Summary for Link SP1: Study Point

Inflow Area = 181,482 sf, 40.33% Impervious, Inflow Depth = 1.45" for 10-year event
Inflow = 4.73 cfs @ 12.24 hrs, Volume= 21,904 cf
Primary = 4.73 cfs @ 12.24 hrs, Volume= 21,904 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP2: Study Point

Inflow Area =	8,852 sf,	0.00% Impervious,	Inflow Depth = 1.74"	for 10-year event	
Inflow =	0.38 cfs @	12.10 hrs,	Volume=	1,286 cf	
Primary =	0.38 cfs @	12.10 hrs,	Volume=	1,286 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP3: Study Point

Inflow Area =	28,761 sf,	65.63% Impervious,	Inflow Depth = 1.53"	for 10-year event	
Inflow =	1.72 cfs @	12.17 hrs,	Volume=	3,661 cf	
Primary =	1.72 cfs @	12.17 hrs,	Volume=	3,661 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP4: Study Point

Inflow Area =	5,412 sf,	0.00% Impervious,	Inflow Depth = 1.74"	for 10-year event	
Inflow =	0.21 cfs @	12.15 hrs,	Volume=	786 cf	
Primary =	0.21 cfs @	12.15 hrs,	Volume=	786 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: Subcat P-1 Runoff Area=96,465 sf 0.06% Impervious Runoff Depth=2.48"
Flow Length=85' Tc=13.7 min CN=58 Runoff=4.78 cfs 19,916 cf

Subcatchment P-10: Subcat P-10 Runoff Area=7,046 sf 100.00% Impervious Runoff Depth=6.86"
Tc=6.0 min CN=98 Runoff=1.10 cfs 4,029 cf

Subcatchment P-11: Subcat P-11 Runoff Area=2,310 sf 85.16% Impervious Runoff Depth=6.27"
Tc=6.0 min CN=93 Runoff=0.35 cfs 1,207 cf

Subcatchment P-12: Subcat P-12 Runoff Area=6,287 sf 75.97% Impervious Runoff Depth=5.81"
Tc=6.0 min CN=89 Runoff=0.91 cfs 3,042 cf

Subcatchment P-13: Subcat P-13 Runoff Area=4,999 sf 98.84% Impervious Runoff Depth=6.86"
Tc=6.0 min CN=98 Runoff=0.78 cfs 2,858 cf

Subcatchment P-14: Subcat P-14 Runoff Area=24,922 sf 65.24% Impervious Runoff Depth=5.35"
Tc=6.0 min CN=85 Runoff=3.41 cfs 11,107 cf

Subcatchment P-15: Subcat P-15 Runoff Area=11,933 sf 98.06% Impervious Runoff Depth=6.74"
Tc=6.0 min CN=97 Runoff=1.86 cfs 6,704 cf

Subcatchment P-16: Subcat P-16 Runoff Area=3,691 sf 53.10% Impervious Runoff Depth=4.90"
Tc=6.0 min CN=81 Runoff=0.47 cfs 1,507 cf

Subcatchment P-2: Subcat P-2 Runoff Area=8,852 sf 0.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=61 Runoff=0.63 cfs 2,046 cf

Subcatchment P-3A: Subcat P-3A Runoff Area=1,190 sf 0.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=61 Runoff=0.09 cfs 275 cf

Subcatchment P-3B: Subcat P-3B Runoff Area=3,169 sf 7.20% Impervious Runoff Depth=3.08"
Tc=6.0 min CN=64 Runoff=0.25 cfs 813 cf

Subcatchment P-4: Subcat E-4 Runoff Area=5,412 sf 0.00% Impervious Runoff Depth=2.77"
Flow Length=162' Tc=9.6 min CN=61 Runoff=0.34 cfs 1,251 cf

Subcatchment P-5: Subcat P-5 Runoff Area=21,847 sf 97.06% Impervious Runoff Depth=6.74"
Tc=6.0 min CN=97 Runoff=3.40 cfs 12,274 cf

Subcatchment P-6: Subcat P-6 Runoff Area=2,391 sf 88.45% Impervious Runoff Depth=6.39"
Tc=6.0 min CN=94 Runoff=0.37 cfs 1,273 cf

Subcatchment P-7: Subcat P-7 Runoff Area=12,459 sf 66.41% Impervious Runoff Depth=5.46"
Tc=6.0 min CN=86 Runoff=1.73 cfs 5,671 cf

Subcatchment P-8: Subcat P-8 Runoff Area=10,876 sf 99.99% Impervious Runoff Depth=6.86"
Tc=6.0 min CN=98 Runoff=1.70 cfs 6,218 cf

Subcatchment P-9: Subcat P-9 Runoff Area=657 sf 100.00% Impervious Runoff Depth=6.86"
Tc=6.0 min CN=98 Runoff=0.10 cfs 376 cf

Reach 1R: continuity reach Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond B1: bioretention system 1 Peak Elev=60.24' Storage=1,275 cf Inflow=1.71 cfs 5,535 cf
Discarded=0.03 cfs 2,391 cf Primary=1.52 cfs 3,143 cf Outflow=1.56 cfs 5,534 cf

Pond B2: bioretention system 2 Peak Elev=60.91' Storage=716 cf Inflow=0.91 cfs 2,988 cf
Discarded=0.02 cfs 1,241 cf Primary=0.75 cfs 1,747 cf Outflow=0.77 cfs 2,988 cf

Pond B3: bioretention system 3 Peak Elev=60.85' Storage=6,151 cf Inflow=3.75 cfs 10,909 cf
Discarded=0.11 cfs 9,059 cf Primary=0.17 cfs 1,128 cf Outflow=0.28 cfs 10,187 cf

Pond B4: bioretention system 4 Peak Elev=60.42' Storage=800 cf Inflow=0.47 cfs 1,463 cf
Discarded=0.03 cfs 1,463 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 1,463 cf

Pond FB1: sediment forebay Peak Elev=59.86' Storage=270 cf Inflow=1.73 cfs 5,671 cf
Outflow=1.71 cfs 5,535 cf

Pond FB2: sediment forebay Peak Elev=60.94' Storage=84 cf Inflow=0.91 cfs 3,042 cf
Outflow=0.91 cfs 2,988 cf

Pond FB3: sediment forebay Peak Elev=60.11' Storage=457 cf Inflow=3.41 cfs 11,107 cf
Outflow=3.75 cfs 10,909 cf

Pond FB4: sediment forebay Peak Elev=59.96' Storage=72 cf Inflow=0.47 cfs 1,507 cf
Outflow=0.47 cfs 1,463 cf

Pond IS1: infiltration 1 Peak Elev=60.55' Storage=3,472 cf Inflow=2.96 cfs 10,733 cf
Discarded=0.08 cfs 5,525 cf Primary=1.42 cfs 5,208 cf Outflow=1.50 cfs 10,733 cf

Pond IS2: infiltration 2 Peak Elev=59.61' Storage=6,720 cf Inflow=5.10 cfs 18,493 cf
Discarded=0.15 cfs 10,773 cf Primary=1.93 cfs 7,719 cf Outflow=2.08 cfs 18,493 cf

Pond IS3: infiltration 3 Peak Elev=60.97' Storage=1,549 cf Inflow=0.88 cfs 3,234 cf
Discarded=0.04 cfs 3,234 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 3,234 cf

Link SP1: Study Point Inflow=8.44 cfs 36,451 cf
Primary=8.44 cfs 36,451 cf

Link SP2: Study Point Inflow=0.63 cfs 2,046 cf
Primary=0.63 cfs 2,046 cf

Link SP3: Study Point Inflow=2.56 cfs 5,978 cf
Primary=2.56 cfs 5,978 cf

Link SP4: Study Point Inflow=0.34 cfs 1,251 cf
Primary=0.34 cfs 1,251 cf

Total Runoff Area = 224,507 sf Runoff Volume = 80,567 cf Average Runoff Depth = 4.31"
58.99% Pervious = 132,439 sf 41.01% Impervious = 92,068 sf

Summary for Subcatchment P-1: Subcat P-1

Runoff = 4.78 cfs @ 12.20 hrs, Volume= 19,916 cf, Depth= 2.48"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
33,163	61	>75% Grass cover, Good, HSG B
478	74	>75% Grass cover, Good, HSG C
57,731	55	Woods, Good, HSG B
5,030	70	Woods, Good, HSG C
63	98	Paved parking, HSG B
96,465	58	Weighted Average
96,403		99.94% Pervious Area
63		0.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.28"
1.5	35	0.0060	0.39		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
13.7	85	Total			

Summary for Subcatchment P-10: Subcat P-10

Runoff = 1.10 cfs @ 12.09 hrs, Volume= 4,029 cf, Depth= 6.86"
Routed to Pond IS1 : infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
7,046	98	Roofs, HSG B
7,046		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-11: Subcat P-11

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 1,207 cf, Depth= 6.27"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
35	98	Paved parking, HSG C
343	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
1,932	98	Paved parking, HSG B
2,310	93	Weighted Average
343		14.84% Pervious Area
1,967		85.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-12: Subcat P-12

Runoff = 0.91 cfs @ 12.09 hrs, Volume= 3,042 cf, Depth= 5.81"
Routed to Pond FB2 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
4,776	98	Paved parking, HSG B
1,511	61	>75% Grass cover, Good, HSG B
6,287	89	Weighted Average
1,511		24.03% Pervious Area
4,776		75.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-13: Subcat P-13

Runoff = 0.78 cfs @ 12.09 hrs, Volume= 2,858 cf, Depth= 6.86"
Routed to Pond IS3 : infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
4,941	98	Paved parking, HSG B
58	61	>75% Grass cover, Good, HSG B
4,999	98	Weighted Average
58		1.16% Pervious Area
4,941		98.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-14: Subcat P-14

Runoff = 3.41 cfs @ 12.09 hrs, Volume= 11,107 cf, Depth= 5.35"
Routed to Pond FB3 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
8,662	61	>75% Grass cover, Good, HSG B
16,259	98	Paved parking, HSG B
24,922	85	Weighted Average
8,662		34.76% Pervious Area
16,259		65.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-15: Subcat P-15

Runoff = 1.86 cfs @ 12.09 hrs, Volume= 6,704 cf, Depth= 6.74"
Routed to Pond IS1 : infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
231	61	>75% Grass cover, Good, HSG B
11,702	98	Paved parking, HSG B
11,933	97	Weighted Average
231		1.94% Pervious Area
11,702		98.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-16: Subcat P-16

Runoff = 0.47 cfs @ 12.09 hrs, Volume= 1,507 cf, Depth= 4.90"
Routed to Pond FB4 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
1,960	98	Paved parking, HSG B
1,731	61	>75% Grass cover, Good, HSG B
3,691	81	Weighted Average
1,731		46.90% Pervious Area
1,960		53.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-2: Subcat P-2

Runoff = 0.63 cfs @ 12.10 hrs, Volume= 2,046 cf, Depth= 2.77"
Routed to Link SP2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
8,852	61	>75% Grass cover, Good, HSG B
8,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 min**

Summary for Subcatchment P-3A: Subcat P-3A

Runoff = 0.09 cfs @ 12.10 hrs, Volume= 275 cf, Depth= 2.77"
Routed to Link SP3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
1,190	61	>75% Grass cover, Good, HSG B
1,190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-3B: Subcat P-3B

Runoff = 0.25 cfs @ 12.10 hrs, Volume= 813 cf, Depth= 3.08"
Routed to Link SP3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
2,941	61	>75% Grass cover, Good, HSG B
228	98	Paved parking, HSG B
3,169	64	Weighted Average
2,941		92.80% Pervious Area
228		7.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-4: Subcat E-4

Runoff = 0.34 cfs @ 12.15 hrs, Volume= 1,251 cf, Depth= 2.77"
Routed to Link SP4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
5,412	61	>75% Grass cover, Good, HSG B
5,412		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0200	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.28"
1.5	112	0.0310	1.23		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
9.6	162	Total			

Summary for Subcatchment P-5: Subcat P-5

Runoff = 3.40 cfs @ 12.09 hrs, Volume= 12,274 cf, Depth= 6.74"
Routed to Pond IS2 : infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
643	61	>75% Grass cover, Good, HSG B
21,197	98	Paved parking, HSG B
7	98	Roofs, HSG B
21,847	97	Weighted Average
643		2.94% Pervious Area
21,204		97.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-6: Subcat P-6

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 1,273 cf, Depth= 6.39"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
276	61	>75% Grass cover, Good, HSG B
1	98	Roofs, HSG B
2,114	98	Paved parking, HSG B
2,391	94	Weighted Average
276		11.55% Pervious Area
2,115		88.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-7: Subcat P-7

Runoff = 1.73 cfs @ 12.09 hrs, Volume= 5,671 cf, Depth= 5.46"
Routed to Pond FB1 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
9	98	Roofs, HSG B
8,265	98	Paved parking, HSG B
4,185	61	>75% Grass cover, Good, HSG B
12,459	86	Weighted Average
4,185		33.59% Pervious Area
8,274		66.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-8: Subcat P-8

Runoff = 1.70 cfs @ 12.09 hrs, Volume= 6,218 cf, Depth= 6.86"
Routed to Pond IS2 : infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
1	61	>75% Grass cover, Good, HSG B
10,865	98	Roofs, HSG B
10	98	Paved parking, HSG B
10,876	98	Weighted Average
1		0.01% Pervious Area
10,875		99.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-9: Subcat P-9

Runoff = 0.10 cfs @ 12.09 hrs, Volume= 376 cf, Depth= 6.86"
Routed to Pond IS3 : infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=7.10"

Area (sf)	CN	Description
657	98	Roofs, HSG B
657		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Reach 1R: continuity reach

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 0.00" for 25-year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Routed to Link SP3 : Study Point

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Pond B1: bioretention system 1

GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

[81] Warning: Exceeded Pond FB1 by 0.48' @ 17.20 hrs

Inflow Area = 12,459 sf, 66.41% Impervious, Inflow Depth = 5.33" for 25-year event
Inflow = 1.71 cfs @ 12.10 hrs, Volume= 5,535 cf
Outflow = 1.56 cfs @ 12.15 hrs, Volume= 5,534 cf, Atten= 9%, Lag= 2.6 min
Discarded = 0.03 cfs @ 12.15 hrs, Volume= 2,391 cf
Primary = 1.52 cfs @ 12.15 hrs, Volume= 3,143 cf
Routed to Link SP3 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.24' @ 12.15 hrs Surf.Area= 318 sf Storage= 1,275 cf
Flood Elev= 61.00' Surf.Area= 318 sf Storage= 2,822 cf

Plug-Flow detention time= 179.9 min calculated for 5,534 cf (100% of inflow)
Center-of-Mass det. time= 179.8 min (983.0 - 803.3)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	2,632 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	56.50'	191 cf	**media storage (Irregular)**Listed below (Recalc) 636 cf Overall x 30.0% Voids
		2,822 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
58.50	118	118.0	0	0	118
59.00	318	140.0	105	105	574
60.00	1,109	299.0	674	779	6,133
61.00	2,715	349.0	1,853	2,632	8,732

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.50	318	140.0	0	0	318
58.50	318	140.0	636	636	598

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.50'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.20' Phase-In= 0.01'
#2	Device 3	60.00'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	58.22'	**8.0" Round Culvert** L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 58.22' / 57.50' S= 0.0327 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.03 cfs @ 12.15 hrs HW=60.24' (Free Discharge)
1=Exfiltration (Controls 0.03 cfs)

Primary OutFlow Max=1.51 cfs @ 12.15 hrs HW=60.24' (Free Discharge)
3=Culvert (Passes 1.51 cfs of 2.18 cfs potential flow)
2=Orifice/Grate (Weir Controls 1.51 cfs @ 1.60 fps)

Summary for Pond B2: bioretention system 2

GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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[81] Warning: Exceeded Pond FB2 by 0.01' @ 12.20 hrs

Inflow Area = 6,287 sf, 75.97% Impervious, Inflow Depth = 5.70" for 25-year event
Inflow = 0.91 cfs @ 12.10 hrs, Volume= 2,988 cf
Outflow = 0.77 cfs @ 12.15 hrs, Volume= 2,988 cf, Atten= 16%, Lag= 3.4 min
Discarded = 0.02 cfs @ 12.15 hrs, Volume= 1,241 cf
Primary = 0.75 cfs @ 12.15 hrs, Volume= 1,747 cf
Routed to Link SP3 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.91' @ 12.15 hrs Surf.Area= 258 sf Storage= 716 cf
Flood Elev= 61.00' Surf.Area= 258 sf Storage= 800 cf

Plug-Flow detention time= 150.1 min calculated for 2,984 cf (100% of inflow)
Center-of-Mass det. time= 150.6 min (942.1 - 791.4)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	645 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	57.50'	155 cf	**media storage (Irregular)**Listed below (Recalc) 516 cf Overall x 30.0% Voids
		800 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	98	88.0	0	0	98
60.00	258	114.0	86	86	519
61.00	930	204.0	559	645	2,802

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.50	258	114.0	0	0	258
59.50	258	114.0	516	516	486

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.50'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.20' Phase-In= 0.01'
#2	Device 3	60.50'	**15.0" Vert. overflow orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	58.00'	**8.0" Round Culvert** L= 88.0' Ke= 0.500 Inlet / Outlet Invert= 58.00' / 57.50' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.02 cfs @ 12.15 hrs HW=60.90' (Free Discharge)
└—**1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.74 cfs @ 12.15 hrs HW=60.90' (Free Discharge)
└—**3=Culvert** (Passes 0.74 cfs of 1.85 cfs potential flow)
  └—**2=overflow orifice** (Orifice Controls 0.74 cfs @ 2.17 fps)

Summary for Pond B3: bioretention system 3

GW from TP1

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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[81] Warning: Exceeded Pond FB3 by 1.25' @ 14.15 hrs

Inflow Area = 24,922 sf, 65.24% Impervious, Inflow Depth = 5.25" for 25-year event
Inflow = 3.75 cfs @ 12.10 hrs, Volume= 10,909 cf
Outflow = 0.28 cfs @ 13.15 hrs, Volume= 10,187 cf, Atten= 92%, Lag= 62.9 min
Discarded = 0.11 cfs @ 13.15 hrs, Volume= 9,059 cf
Primary = 0.17 cfs @ 13.15 hrs, Volume= 1,128 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.85' @ 13.15 hrs Surf.Area= 1,639 sf Storage= 6,151 cf
Flood Elev= 61.00' Surf.Area= 1,639 sf Storage= 6,870 cf

Plug-Flow detention time= 512.2 min calculated for 10,187 cf (93% of inflow)
Center-of-Mass det. time= 476.9 min (1,281.1 - 804.2)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	5,886 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	57.00'	983 cf	**media storage (Irregular)**Listed below (Recalc) 3,278 cf Overall x 30.0% Voids
		6,870 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.00	1,639	184.0	0	0	1,639
60.00	2,580	217.0	2,092	2,092	2,711
61.00	5,156	323.0	3,794	5,886	7,274

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.00	1,639	184.0	0	0	1,639
59.00	1,639	184.0	3,278	3,278	2,007

Device	Routing	Invert	Outlet Devices
#1	Device 2	60.80'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	58.40'	**8.0" Round Culvert** L= 77.0' Ke= 0.500 Inlet / Outlet Invert= 58.40' / 57.00' S= 0.0182 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Discarded	57.00'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.50' Phase-In= 0.01'

Discarded OutFlow Max=0.11 cfs @ 13.15 hrs HW=60.85' (Free Discharge)
└─**3=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=0.16 cfs @ 13.15 hrs HW=60.85' (Free Discharge)
└─**2=Culvert** (Passes 0.16 cfs of 2.10 cfs potential flow)
  └─**1=Orifice/Grate** (Weir Controls 0.16 cfs @ 0.76 fps)

Summary for Pond B4: bioretention system 4

GW assumed based on surrounding data. confirmatory TP to be performed.

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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[81] Warning: Exceeded Pond FB4 by 0.60' @ 14.35 hrs

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 4.76" for 25-year event
Inflow = 0.47 cfs @ 12.10 hrs, Volume= 1,463 cf
Outflow = 0.03 cfs @ 14.25 hrs, Volume= 1,463 cf, Atten= 94%, Lag= 129.0 min
Discarded = 0.03 cfs @ 14.25 hrs, Volume= 1,463 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.42' @ 14.25 hrs Surf.Area= 516 sf Storage= 800 cf
Flood Elev= 61.00' Surf.Area= 516 sf Storage= 1,358 cf

Plug-Flow detention time= 343.6 min calculated for 1,461 cf (100% of inflow)
Center-of-Mass det. time= 343.7 min (1,159.8 - 816.1)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	1,049 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	57.50'	310 cf	**media storage (Irregular)**Listed below (Recalc) 1,032 cf Overall x 30.0% Voids
		1,358 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	391	79.0	0	0	391
60.00	516	88.0	226	226	518
61.00	1,174	135.0	823	1,049	1,359

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.50	516	88.0	0	0	516
59.50	516	88.0	1,032	1,032	692

Device	Routing	Invert	Outlet Devices
#1	Primary	60.75'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	57.50'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.50' Phase-In= 0.10'

Discarded OutFlow Max=0.03 cfs @ 14.25 hrs HW=60.42' (Free Discharge)
└─**2=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=57.50' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond FB1: sediment forebay

Inflow Area = 12,459 sf, 66.41% Impervious, Inflow Depth = 5.46" for 25-year event
Inflow = 1.73 cfs @ 12.09 hrs, Volume= 5,671 cf
Outflow = 1.71 cfs @ 12.10 hrs, Volume= 5,535 cf, Atten= 1%, Lag= 1.0 min
Primary = 1.71 cfs @ 12.10 hrs, Volume= 5,535 cf
Routed to Pond B1 : bioretention system 1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.86' @ 12.11 hrs Surf.Area= 413 sf Storage= 270 cf
Flood Elev= 61.00' Surf.Area= 448 sf Storage= 328 cf

Plug-Flow detention time= 25.7 min calculated for 5,527 cf (97% of inflow)
Center-of-Mass det. time= 11.5 min (803.3 - 791.8)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	328 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.00	222	64.0	0	0	222
60.00	448	84.0	328	328	469

Device	Routing	Invert	Outlet Devices
#1	Primary	59.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.69 cfs @ 12.10 hrs HW=59.86' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.69 cfs @ 1.56 fps)

Summary for Pond FB2: sediment forebay

Inflow Area = 6,287 sf, 75.97% Impervious, Inflow Depth = 5.81" for 25-year event
Inflow = 0.91 cfs @ 12.09 hrs, Volume= 3,042 cf
Outflow = 0.91 cfs @ 12.10 hrs, Volume= 2,988 cf, Atten= 0%, Lag= 0.5 min
Primary = 0.91 cfs @ 12.10 hrs, Volume= 2,988 cf
Routed to Pond B2 : bioretention system 2

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.94' @ 12.10 hrs Surf.Area= 143 sf Storage= 84 cf
Flood Elev= 61.00' Surf.Area= 152 sf Storage= 93 cf

Plug-Flow detention time= 19.5 min calculated for 2,984 cf (98% of inflow)
Center-of-Mass det. time= 8.7 min (791.4 - 782.7)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	93 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	1	1.0	0	0	1
60.00	34	25.0	7	7	51
61.00	152	51.0	86	93	213

Device	Routing	Invert	Outlet Devices
#1	Primary	60.70'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.90 cfs @ 12.10 hrs HW=60.94' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.90 cfs @ 1.25 fps)

Summary for Pond FB3: sediment forebay

[93] Warning: Storage range exceeded by 0.11'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 24,922 sf, 65.24% Impervious, Inflow Depth = 5.35" for 25-year event
Inflow = 3.41 cfs @ 12.09 hrs, Volume= 11,107 cf
Outflow = 3.75 cfs @ 12.10 hrs, Volume= 10,909 cf, Atten= 0%, Lag= 0.5 min
Primary = 3.75 cfs @ 12.10 hrs, Volume= 10,909 cf
Routed to Pond B3 : bioretention system 3

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 60.11' @ 12.10 hrs Surf.Area= 586 sf Storage= 457 cf
Flood Elev= 61.00' Surf.Area= 586 sf Storage= 457 cf

Plug-Flow detention time= 20.4 min calculated for 10,894 cf (98% of inflow)
Center-of-Mass det. time= 9.6 min (804.2 - 794.6)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	457 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.00	340	70.0	0	0	340
60.00	586	91.0	457	457	621

Device	Routing	Invert	Outlet Devices
#1	Primary	59.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=3.70 cfs @ 12.10 hrs HW=60.11' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 3.70 cfs @ 2.03 fps)

Summary for Pond FB4: sediment forebay

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 4.90" for 25-year event
Inflow = 0.47 cfs @ 12.09 hrs, Volume= 1,507 cf
Outflow = 0.47 cfs @ 12.10 hrs, Volume= 1,463 cf, Atten= 1%, Lag= 0.8 min
Primary = 0.47 cfs @ 12.10 hrs, Volume= 1,463 cf
Routed to Pond B4 : bioretention system 4

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.96' @ 12.10 hrs Surf.Area= 197 sf Storage= 72 cf
Flood Elev= 60.00' Surf.Area= 205 sf Storage= 81 cf

Plug-Flow detention time= 28.2 min calculated for 1,463 cf (97% of inflow)
Center-of-Mass det. time= 11.1 min (816.1 - 805.0)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	81 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	124	42.0	0	0	124
60.00	205	56.0	81	81	236

Device	Routing	Invert	Outlet Devices
#1	Primary	59.80'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50

Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88
2.85 3.07 3.20 3.32

Primary OutFlow Max=0.46 cfs @ 12.10 hrs HW=59.95' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.46 cfs @ 1.00 fps)

Summary for Pond IS1: infiltration 1

GW elevation from TP8

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 18,979 sf, 98.78% Impervious, Inflow Depth = 6.79" for 25-year event
Inflow = 2.96 cfs @ 12.09 hrs, Volume= 10,733 cf
Outflow = 1.50 cfs @ 12.23 hrs, Volume= 10,733 cf, Atten= 49%, Lag= 8.8 min
Discarded = 0.08 cfs @ 12.23 hrs, Volume= 5,525 cf
Primary = 1.42 cfs @ 12.23 hrs, Volume= 5,208 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.55' @ 12.23 hrs Surf.Area= 3,088 sf Storage= 3,472 cf
Flood Elev= 60.93' Surf.Area= 3,088 sf Storage= 3,939 cf

Plug-Flow detention time= 151.5 min calculated for 10,733 cf (100% of inflow)
Center-of-Mass det. time= 151.3 min (898.1 - 746.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	58.60'	2,174 cf	**41.50'W x 74.40'L x 2.33'H Field A** 7,204 cf Overall - 1,769 cf Embedded = 5,435 cf x 40.0% Voids
#2A	59.10'	1,769 cf	**ADS_StormTech SC-310 +Cap** x 120 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 120 Chambers in 12 Rows
		3,943 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	58.60'	**0.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 54.60' Phase-In= 0.01'
#2	Primary	59.50'	**8.0" Round Culvert** L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 59.50' / 57.25' S= 0.0703 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.08 cfs @ 12.23 hrs HW=60.55' (Free Discharge)
└─**1=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=1.42 cfs @ 12.23 hrs HW=60.55' (Free Discharge)
└─**2=Culvert** (Inlet Controls 1.42 cfs @ 4.07 fps)

Summary for Pond IS2: infiltration 2

GW from TP5

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 32,723 sf, 98.03% Impervious, Inflow Depth = 6.78" for 25-year event
Inflow = 5.10 cfs @ 12.09 hrs, Volume= 18,493 cf
Outflow = 2.08 cfs @ 12.30 hrs, Volume= 18,493 cf, Atten= 59%, Lag= 12.9 min
Discarded = 0.15 cfs @ 12.30 hrs, Volume= 10,773 cf
Primary = 1.93 cfs @ 12.30 hrs, Volume= 7,719 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.61' @ 12.30 hrs Surf.Area= 6,032 sf Storage= 6,720 cf
Flood Elev= 60.03' Surf.Area= 6,032 sf Storage= 7,744 cf

Plug-Flow detention time= 180.3 min calculated for 18,467 cf (100% of inflow)
Center-of-Mass det. time= 180.5 min (927.5 - 747.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	57.70'	4,214 cf	**51.50'W x 117.12'L x 2.33'H Field A** 14,074 cf Overall - 3,538 cf Embedded = 10,536 cf x 40.0% Voids
#2A	58.20'	3,538 cf	**ADS_StormTech SC-310 +Cap** x 240 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 240 Chambers in 15 Rows
		7,752 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.70'	**0.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 53.70' Phase-In= 0.01'
#2	Primary	58.65'	**10.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 58.65' / 58.00' S= 0.0342 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Discarded OutFlow Max=0.15 cfs @ 12.30 hrs HW=59.61' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.15 cfs)

Primary OutFlow Max=1.93 cfs @ 12.30 hrs HW=59.61' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 1.93 cfs @ 3.53 fps)

Summary for Pond IS3: infiltration 3

GW from TP2

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 6.86" for 25-year event
Inflow = 0.88 cfs @ 12.09 hrs, Volume= 3,234 cf
Outflow = 0.04 cfs @ 14.23 hrs, Volume= 3,234 cf, Atten= 95%, Lag= 128.3 min
Discarded = 0.04 cfs @ 14.23 hrs, Volume= 3,234 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach 1R : continuity reach

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.97' @ 14.23 hrs Surf.Area= 1,972 sf Storage= 1,549 cf
Flood Elev= 61.60' Surf.Area= 1,972 sf Storage= 2,057 cf

Plug-Flow detention time= 314.5 min calculated for 3,229 cf (100% of inflow)
Center-of-Mass det. time= 314.5 min (1,057.2 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	1,257 cf	**20.75'W x 95.03'L x 2.00'H Field A** 3,944 cf Overall - 800 cf Embedded = 3,144 cf x 40.0% Voids
#2A	60.10'	800 cf	**ADS_StormTech SC-160LP +Cap** x 117 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 117 Chambers in 9 Rows
		2,057 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#0	Primary	61.60'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	59.60'	**0.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 55.60' Phase-In= 0.01'

Discarded OutFlow Max=0.04 cfs @ 14.23 hrs HW=60.97' (Free Discharge)
└─**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.60' (Free Discharge)

Summary for Link SP1: Study Point

Inflow Area = 181,482 sf, 40.33% Impervious, Inflow Depth = 2.41" for 25-year event
Inflow = 8.44 cfs @ 12.21 hrs, Volume= 36,451 cf
Primary = 8.44 cfs @ 12.21 hrs, Volume= 36,451 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP2: Study Point

Inflow Area =	8,852 sf,	0.00% Impervious,	Inflow Depth = 2.77"	for 25-year event
Inflow =	0.63 cfs @	12.10 hrs, Volume=	2,046 cf	
Primary =	0.63 cfs @	12.10 hrs, Volume=	2,046 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP3: Study Point

Inflow Area =	28,761 sf,	65.63% Impervious,	Inflow Depth = 2.49"	for 25-year event
Inflow =	2.56 cfs @	12.14 hrs, Volume=	5,978 cf	
Primary =	2.56 cfs @	12.14 hrs, Volume=	5,978 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP4: Study Point

Inflow Area =	5,412 sf,	0.00% Impervious,	Inflow Depth = 2.77"	for 25-year event
Inflow =	0.34 cfs @	12.15 hrs, Volume=	1,251 cf	
Primary =	0.34 cfs @	12.15 hrs, Volume=	1,251 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: Subcat P-1 Runoff Area=96,465 sf 0.06% Impervious Runoff Depth=3.49"
Flow Length=85' Tc=13.7 min CN=58 Runoff=6.90 cfs 28,027 cf

Subcatchment P-10: Subcat P-10 Runoff Area=7,046 sf 100.00% Impervious Runoff Depth=8.27"
Tc=6.0 min CN=98 Runoff=1.32 cfs 4,856 cf

Subcatchment P-11: Subcat P-11 Runoff Area=2,310 sf 85.16% Impervious Runoff Depth=7.67"
Tc=6.0 min CN=93 Runoff=0.42 cfs 1,476 cf

Subcatchment P-12: Subcat P-12 Runoff Area=6,287 sf 75.97% Impervious Runoff Depth=7.19"
Tc=6.0 min CN=89 Runoff=1.11 cfs 3,766 cf

Subcatchment P-13: Subcat P-13 Runoff Area=4,999 sf 98.84% Impervious Runoff Depth=8.27"
Tc=6.0 min CN=98 Runoff=0.94 cfs 3,445 cf

Subcatchment P-14: Subcat P-14 Runoff Area=24,922 sf 65.24% Impervious Runoff Depth=6.71"
Tc=6.0 min CN=85 Runoff=4.22 cfs 13,928 cf

Subcatchment P-15: Subcat P-15 Runoff Area=11,933 sf 98.06% Impervious Runoff Depth=8.15"
Tc=6.0 min CN=97 Runoff=2.23 cfs 8,104 cf

Subcatchment P-16: Subcat P-16 Runoff Area=3,691 sf 53.10% Impervious Runoff Depth=6.22"
Tc=6.0 min CN=81 Runoff=0.59 cfs 1,915 cf

Subcatchment P-2: Subcat P-2 Runoff Area=8,852 sf 0.00% Impervious Runoff Depth=3.84"
Tc=6.0 min CN=61 Runoff=0.89 cfs 2,831 cf

Subcatchment P-3A: Subcat P-3A Runoff Area=1,190 sf 0.00% Impervious Runoff Depth=3.84"
Tc=6.0 min CN=61 Runoff=0.12 cfs 381 cf

Subcatchment P-3B: Subcat P-3B Runoff Area=3,169 sf 7.20% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=64 Runoff=0.35 cfs 1,107 cf

Subcatchment P-4: Subcat E-4 Runoff Area=5,412 sf 0.00% Impervious Runoff Depth=3.84"
Flow Length=162' Tc=9.6 min CN=61 Runoff=0.48 cfs 1,731 cf

Subcatchment P-5: Subcat P-5 Runoff Area=21,847 sf 97.06% Impervious Runoff Depth=8.15"
Tc=6.0 min CN=97 Runoff=4.08 cfs 14,838 cf

Subcatchment P-6: Subcat P-6 Runoff Area=2,391 sf 88.45% Impervious Runoff Depth=7.79"
Tc=6.0 min CN=94 Runoff=0.44 cfs 1,552 cf

Subcatchment P-7: Subcat P-7 Runoff Area=12,459 sf 66.41% Impervious Runoff Depth=6.83"
Tc=6.0 min CN=86 Runoff=2.14 cfs 7,088 cf

Subcatchment P-8: Subcat P-8 Runoff Area=10,876 sf 99.99% Impervious Runoff Depth=8.27"
Tc=6.0 min CN=98 Runoff=2.04 cfs 7,495 cf

Subcatchment P-9: Subcat P-9 Runoff Area=657 sf 100.00% Impervious Runoff Depth=8.27"
Tc=6.0 min CN=98 Runoff=0.12 cfs 453 cf

Reach 1R: continuity reach Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond B1: bioretention system 1 Peak Elev=60.28' Storage=1,332 cf Inflow=2.11 cfs 6,952 cf
Discarded=0.03 cfs 2,529 cf Primary=1.90 cfs 4,411 cf Outflow=1.93 cfs 6,940 cf

Pond B2: bioretention system 2 Peak Elev=60.96' Storage=760 cf Inflow=1.12 cfs 3,712 cf
Discarded=0.02 cfs 1,326 cf Primary=0.93 cfs 2,386 cf Outflow=0.95 cfs 3,712 cf

Pond B3: bioretention system 3 Peak Elev=60.97' Storage=6,723 cf Inflow=4.22 cfs 13,730 cf
Discarded=0.11 cfs 9,415 cf Primary=0.92 cfs 3,403 cf Outflow=1.03 cfs 12,818 cf

Pond B4: bioretention system 4 Peak Elev=60.74' Storage=1,082 cf Inflow=0.59 cfs 1,871 cf
Discarded=0.03 cfs 1,871 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 1,871 cf

Pond FB1: sediment forebay Peak Elev=59.92' Storage=292 cf Inflow=2.14 cfs 7,088 cf
Outflow=2.11 cfs 6,952 cf

Pond FB2: sediment forebay Peak Elev=60.98' Storage=89 cf Inflow=1.11 cfs 3,766 cf
Outflow=1.12 cfs 3,712 cf

Pond FB3: sediment forebay Peak Elev=60.16' Storage=457 cf Inflow=4.22 cfs 13,928 cf
Outflow=4.22 cfs 13,730 cf

Pond FB4: sediment forebay Peak Elev=59.98' Storage=78 cf Inflow=0.59 cfs 1,915 cf
Outflow=0.59 cfs 1,871 cf

Pond IS1: infiltration 1 Peak Elev=60.93' Storage=3,942 cf Inflow=3.55 cfs 12,960 cf
Discarded=0.08 cfs 5,893 cf Primary=1.76 cfs 7,067 cf Outflow=1.84 cfs 12,960 cf

Pond IS2: infiltration 2 Peak Elev=60.03' Storage=7,743 cf Inflow=6.12 cfs 22,333 cf
Discarded=0.16 cfs 11,491 cf Primary=2.58 cfs 10,842 cf Outflow=2.74 cfs 22,333 cf

Pond IS3: infiltration 3 Peak Elev=61.49' Storage=1,974 cf Inflow=1.06 cfs 3,898 cf
Discarded=0.05 cfs 3,898 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 3,898 cf

Link SP1: Study Point Inflow=11.68 cfs 52,368 cf
Primary=11.68 cfs 52,368 cf

Link SP2: Study Point Inflow=0.89 cfs 2,831 cf
Primary=0.89 cfs 2,831 cf

Link SP3: Study Point Inflow=3.23 cfs 8,284 cf
Primary=3.23 cfs 8,284 cf

Link SP4: Study Point Inflow=0.48 cfs 1,731 cf
Primary=0.48 cfs 1,731 cf

Total Runoff Area = 224,507 sf Runoff Volume = 102,992 cf Average Runoff Depth = 5.50"
58.99% Pervious = 132,439 sf 41.01% Impervious = 92,068 sf

Summary for Subcatchment P-1: Subcat P-1

Runoff = 6.90 cfs @ 12.20 hrs, Volume= 28,027 cf, Depth= 3.49"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
33,163	61	>75% Grass cover, Good, HSG B
478	74	>75% Grass cover, Good, HSG C
57,731	55	Woods, Good, HSG B
5,030	70	Woods, Good, HSG C
63	98	Paved parking, HSG B
96,465	58	Weighted Average
96,403		99.94% Pervious Area
63		0.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0200	0.07		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.28"
1.5	35	0.0060	0.39		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
13.7	85	Total			

Summary for Subcatchment P-10: Subcat P-10

Runoff = 1.32 cfs @ 12.09 hrs, Volume= 4,856 cf, Depth= 8.27"
Routed to Pond IS1 : infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
7,046	98	Roofs, HSG B
7,046		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-11: Subcat P-11

Runoff = 0.42 cfs @ 12.09 hrs, Volume= 1,476 cf, Depth= 7.67"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
35	98	Paved parking, HSG C
343	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
1,932	98	Paved parking, HSG B
2,310	93	Weighted Average
343		14.84% Pervious Area
1,967		85.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-12: Subcat P-12

Runoff = 1.11 cfs @ 12.09 hrs, Volume= 3,766 cf, Depth= 7.19"
Routed to Pond FB2 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
4,776	98	Paved parking, HSG B
1,511	61	>75% Grass cover, Good, HSG B
6,287	89	Weighted Average
1,511		24.03% Pervious Area
4,776		75.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-13: Subcat P-13

Runoff = 0.94 cfs @ 12.09 hrs, Volume= 3,445 cf, Depth= 8.27"
Routed to Pond IS3 : infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
4,941	98	Paved parking, HSG B
58	61	>75% Grass cover, Good, HSG B
4,999	98	Weighted Average
58		1.16% Pervious Area
4,941		98.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-14: Subcat P-14

Runoff = 4.22 cfs @ 12.09 hrs, Volume= 13,928 cf, Depth= 6.71"
Routed to Pond FB3 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
8,662	61	>75% Grass cover, Good, HSG B
16,259	98	Paved parking, HSG B
24,922	85	Weighted Average
8,662		34.76% Pervious Area
16,259		65.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-15: Subcat P-15

Runoff = 2.23 cfs @ 12.09 hrs, Volume= 8,104 cf, Depth= 8.15"
Routed to Pond IS1 : infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
231	61	>75% Grass cover, Good, HSG B
11,702	98	Paved parking, HSG B
11,933	97	Weighted Average
231		1.94% Pervious Area
11,702		98.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-16: Subcat P-16

Runoff = 0.59 cfs @ 12.09 hrs, Volume= 1,915 cf, Depth= 6.22"
Routed to Pond FB4 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
1,960	98	Paved parking, HSG B
1,731	61	>75% Grass cover, Good, HSG B
3,691	81	Weighted Average
1,731		46.90% Pervious Area
1,960		53.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-2: Subcat P-2

Runoff = 0.89 cfs @ 12.10 hrs, Volume= 2,831 cf, Depth= 3.84"
Routed to Link SP2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
8,852	61	>75% Grass cover, Good, HSG B
8,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 min**

Summary for Subcatchment P-3A: Subcat P-3A

Runoff = 0.12 cfs @ 12.10 hrs, Volume= 381 cf, Depth= 3.84"
Routed to Link SP3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
1,190	61	>75% Grass cover, Good, HSG B
1,190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-3B: Subcat P-3B

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 1,107 cf, Depth= 4.19"
Routed to Link SP3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
2,941	61	>75% Grass cover, Good, HSG B
228	98	Paved parking, HSG B
3,169	64	Weighted Average
2,941		92.80% Pervious Area
228		7.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-4: Subcat E-4

Runoff = 0.48 cfs @ 12.14 hrs, Volume= 1,731 cf, Depth= 3.84"
Routed to Link SP4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
5,412	61	>75% Grass cover, Good, HSG B
5,412		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0200	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.28"
1.5	112	0.0310	1.23		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
9.6	162	Total			

Summary for Subcatchment P-5: Subcat P-5

Runoff = 4.08 cfs @ 12.09 hrs, Volume= 14,838 cf, Depth= 8.15"
Routed to Pond IS2 : infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
643	61	>75% Grass cover, Good, HSG B
21,197	98	Paved parking, HSG B
7	98	Roofs, HSG B
21,847	97	Weighted Average
643		2.94% Pervious Area
21,204		97.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-6: Subcat P-6

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 1,552 cf, Depth= 7.79"
Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
276	61	>75% Grass cover, Good, HSG B
1	98	Roofs, HSG B
2,114	98	Paved parking, HSG B
2,391	94	Weighted Average
276		11.55% Pervious Area
2,115		88.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-7: Subcat P-7

Runoff = 2.14 cfs @ 12.09 hrs, Volume= 7,088 cf, Depth= 6.83"
Routed to Pond FB1 : sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
9	98	Roofs, HSG B
8,265	98	Paved parking, HSG B
4,185	61	>75% Grass cover, Good, HSG B
12,459	86	Weighted Average
4,185		33.59% Pervious Area
8,274		66.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-8: Subcat P-8

Runoff = 2.04 cfs @ 12.09 hrs, Volume= 7,495 cf, Depth= 8.27"
Routed to Pond IS2 : infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
1	61	>75% Grass cover, Good, HSG B
10,865	98	Roofs, HSG B
10	98	Paved parking, HSG B
10,876	98	Weighted Average
1		0.01% Pervious Area
10,875		99.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Subcatchment P-9: Subcat P-9

Runoff = 0.12 cfs @ 12.09 hrs, Volume= 453 cf, Depth= 8.27"
Routed to Pond IS3 : infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=8.51"

Area (sf)	CN	Description
657	98	Roofs, HSG B
657		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 MIN**

Summary for Reach 1R: continuity reach

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 0.00" for 50-year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Routed to Link SP3 : Study Point

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Pond B1: bioretention system 1

GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

[81] Warning: Exceeded Pond FB1 by 0.48' @ 17.95 hrs

Inflow Area = 12,459 sf, 66.41% Impervious, Inflow Depth = 6.70" for 50-year event
Inflow = 2.11 cfs @ 12.10 hrs, Volume= 6,952 cf
Outflow = 1.93 cfs @ 12.14 hrs, Volume= 6,940 cf, Atten= 8%, Lag= 2.4 min
Discarded = 0.03 cfs @ 12.14 hrs, Volume= 2,529 cf
Primary = 1.90 cfs @ 12.14 hrs, Volume= 4,411 cf
Routed to Link SP3 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.28' @ 12.14 hrs Surf.Area= 318 sf Storage= 1,332 cf
Flood Elev= 61.00' Surf.Area= 318 sf Storage= 2,822 cf

Plug-Flow detention time= 153.4 min calculated for 6,930 cf (100% of inflow)
Center-of-Mass det. time= 153.0 min (949.1 - 796.1)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	2,632 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	56.50'	191 cf	**media storage (Irregular)**Listed below (Recalc) 636 cf Overall x 30.0% Voids
		2,822 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
58.50	118	118.0	0	0	118
59.00	318	140.0	105	105	574
60.00	1,109	299.0	674	779	6,133
61.00	2,715	349.0	1,853	2,632	8,732

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.50	318	140.0	0	0	318
58.50	318	140.0	636	636	598

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.50'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.20' Phase-In= 0.01'
#2	Device 3	60.00'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	58.22'	**8.0" Round Culvert** L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 58.22' / 57.50' S= 0.0327 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.03 cfs @ 12.14 hrs HW=60.28' (Free Discharge)
└─**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=1.88 cfs @ 12.14 hrs HW=60.28' (Free Discharge)
└─**3=Culvert** (Passes 1.88 cfs of 2.21 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 1.88 cfs @ 1.72 fps)

Summary for Pond B2: bioretention system 2

GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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[81] Warning: Exceeded Pond FB2 by 0.04' @ 12.20 hrs

Inflow Area = 6,287 sf, 75.97% Impervious, Inflow Depth = 7.08" for 50-year event
Inflow = 1.12 cfs @ 12.10 hrs, Volume= 3,712 cf
Outflow = 0.95 cfs @ 12.15 hrs, Volume= 3,712 cf, Atten= 15%, Lag= 3.3 min
Discarded = 0.02 cfs @ 12.15 hrs, Volume= 1,326 cf
Primary = 0.93 cfs @ 12.15 hrs, Volume= 2,386 cf
Routed to Link SP3 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.96' @ 12.15 hrs Surf.Area= 258 sf Storage= 760 cf
Flood Elev= 61.00' Surf.Area= 258 sf Storage= 800 cf

Plug-Flow detention time= 132.7 min calculated for 3,707 cf (100% of inflow)
Center-of-Mass det. time= 133.3 min (918.3 - 784.9)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	645 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	57.50'	155 cf	**media storage (Irregular)**Listed below (Recalc) 516 cf Overall x 30.0% Voids
		800 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	98	88.0	0	0	98
60.00	258	114.0	86	86	519
61.00	930	204.0	559	645	2,802

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.50	258	114.0	0	0	258
59.50	258	114.0	516	516	486

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.50'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.20' Phase-In= 0.01'
#2	Device 3	60.50'	**15.0" Vert. overflow orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	58.00'	**8.0" Round Culvert** L= 88.0' Ke= 0.500 Inlet / Outlet Invert= 58.00' / 57.50' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.02 cfs @ 12.15 hrs HW=60.96' (Free Discharge)
└─**1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.93 cfs @ 12.15 hrs HW=60.96' (Free Discharge)
└─**3=Culvert** (Passes 0.93 cfs of 1.87 cfs potential flow)
  └─**2=overflow orifice** (Orifice Controls 0.93 cfs @ 2.30 fps)

Summary for Pond B3: bioretention system 3

GW from TP1

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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[81] Warning: Exceeded Pond FB3 by 1.27' @ 12.70 hrs

Inflow Area = 24,922 sf, 65.24% Impervious, Inflow Depth = 6.61" for 50-year event
Inflow = 4.22 cfs @ 12.09 hrs, Volume= 13,730 cf
Outflow = 1.03 cfs @ 12.50 hrs, Volume= 12,818 cf, Atten= 76%, Lag= 24.8 min
Discarded = 0.11 cfs @ 12.50 hrs, Volume= 9,415 cf
Primary = 0.92 cfs @ 12.50 hrs, Volume= 3,403 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.97' @ 12.50 hrs Surf.Area= 1,639 sf Storage= 6,723 cf
Flood Elev= 61.00' Surf.Area= 1,639 sf Storage= 6,870 cf

Plug-Flow detention time= 425.0 min calculated for 12,818 cf (93% of inflow)
Center-of-Mass det. time= 389.5 min (1,186.6 - 797.1)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	5,886 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	57.00'	983 cf	**media storage (Irregular)**Listed below (Recalc) 3,278 cf Overall x 30.0% Voids
		6,870 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.00	1,639	184.0	0	0	1,639
60.00	2,580	217.0	2,092	2,092	2,711
61.00	5,156	323.0	3,794	5,886	7,274

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.00	1,639	184.0	0	0	1,639
59.00	1,639	184.0	3,278	3,278	2,007

Device	Routing	Invert	Outlet Devices
#1	Device 2	60.80'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	58.40'	**8.0" Round Culvert** L= 77.0' Ke= 0.500 Inlet / Outlet Invert= 58.40' / 57.00' S= 0.0182 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Discarded	57.00'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.50' Phase-In= 0.01'

Discarded OutFlow Max=0.11 cfs @ 12.50 hrs HW=60.97' (Free Discharge)
└─**3=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=0.91 cfs @ 12.50 hrs HW=60.97' (Free Discharge)
└─**2=Culvert** (Passes 0.91 cfs of 2.14 cfs potential flow)
  └─**1=Orifice/Grate** (Weir Controls 0.91 cfs @ 1.35 fps)

Summary for Pond B4: bioretention system 4

GW assumed based on surrounding data. confirmatory TP to be performed.

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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[81] Warning: Exceeded Pond FB4 by 0.92' @ 14.95 hrs

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 6.08" for 50-year event
Inflow = 0.59 cfs @ 12.10 hrs, Volume= 1,871 cf
Outflow = 0.03 cfs @ 14.81 hrs, Volume= 1,871 cf, Atten= 95%, Lag= 162.5 min
Discarded = 0.03 cfs @ 14.81 hrs, Volume= 1,871 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
  Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.74' @ 14.81 hrs Surf.Area= 516 sf Storage= 1,082 cf
Flood Elev= 61.00' Surf.Area= 516 sf Storage= 1,358 cf

Plug-Flow detention time= 429.4 min calculated for 1,868 cf (100% of inflow)
Center-of-Mass det. time= 429.6 min (1,237.8 - 808.2)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	1,049 cf	**surface storage (Irregular)**Listed below (Recalc) -Impervious
#2	57.50'	310 cf	**media storage (Irregular)**Listed below (Recalc) 1,032 cf Overall x 30.0% Voids
		1,358 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	391	79.0	0	0	391
60.00	516	88.0	226	226	518
61.00	1,174	135.0	823	1,049	1,359

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
57.50	516	88.0	0	0	516
59.50	516	88.0	1,032	1,032	692

Device	Routing	Invert	Outlet Devices
#1	Primary	60.75'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	57.50'	**0.720 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 55.50' Phase-In= 0.10'

Discarded OutFlow Max=0.03 cfs @ 14.81 hrs HW=60.74' (Free Discharge)
└—**2=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=57.50' (Free Discharge)
└—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond FB1: sediment forebay

Inflow Area = 12,459 sf, 66.41% Impervious, Inflow Depth = 6.83" for 50-year event
Inflow = 2.14 cfs @ 12.09 hrs, Volume= 7,088 cf
Outflow = 2.11 cfs @ 12.10 hrs, Volume= 6,952 cf, Atten= 1%, Lag= 0.9 min
Primary = 2.11 cfs @ 12.10 hrs, Volume= 6,952 cf
Routed to Pond B1 : bioretention system 1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.92' @ 12.10 hrs Surf.Area= 426 sf Storage= 292 cf
Flood Elev= 61.00' Surf.Area= 448 sf Storage= 328 cf

Plug-Flow detention time= 22.2 min calculated for 6,952 cf (98% of inflow)
Center-of-Mass det. time= 10.3 min (796.1 - 785.8)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	328 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.00	222	64.0	0	0	222
60.00	448	84.0	328	328	469

Device	Routing	Invert	Outlet Devices
#1	Primary	59.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=2.09 cfs @ 12.10 hrs HW=59.91' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 2.09 cfs @ 1.68 fps)

Summary for Pond FB2: sediment forebay

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 6,287 sf, 75.97% Impervious, Inflow Depth = 7.19" for 50-year event
Inflow = 1.11 cfs @ 12.09 hrs, Volume= 3,766 cf
Outflow = 1.12 cfs @ 12.10 hrs, Volume= 3,712 cf, Atten= 0%, Lag= 0.5 min
Primary = 1.12 cfs @ 12.10 hrs, Volume= 3,712 cf
Routed to Pond B2 : bioretention system 2

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.98' @ 12.09 hrs Surf.Area= 148 sf Storage= 89 cf
Flood Elev= 61.00' Surf.Area= 152 sf Storage= 93 cf

Plug-Flow detention time= 16.7 min calculated for 3,712 cf (99% of inflow)
Center-of-Mass det. time= 7.7 min (784.9 - 777.2)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	93 cf	**surface storage (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	1	1.0	0	0	1
60.00	34	25.0	7	7	51
61.00	152	51.0	86	93	213

Device	Routing	Invert	Outlet Devices
#1	Primary	60.70'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.10 cfs @ 12.10 hrs HW=60.97' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.10 cfs @ 1.34 fps)

Summary for Pond FB3: sediment forebay

[93] Warning: Storage range exceeded by 0.16'

Inflow Area = 24,922 sf, 65.24% Impervious, Inflow Depth = 6.71" for 50-year event
Inflow = 4.22 cfs @ 12.09 hrs, Volume= 13,928 cf
Outflow = 4.22 cfs @ 12.09 hrs, Volume= 13,730 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.22 cfs @ 12.09 hrs, Volume= 13,730 cf
Routed to Pond B3 : bioretention system 3

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 60.16' @ 12.09 hrs Surf.Area= 586 sf Storage= 457 cf
Flood Elev= 61.00' Surf.Area= 586 sf Storage= 457 cf

Plug-Flow detention time= 17.4 min calculated for 13,711 cf (98% of inflow)
Center-of-Mass det. time= 8.7 min (797.1 - 788.4)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	457 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.00	340	70.0	0	0	340
60.00	586	91.0	457	457	621

Device	Routing	Invert	Outlet Devices
#1	Primary	59.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=4.12 cfs @ 12.09 hrs HW=60.15' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 4.12 cfs @ 2.11 fps)

Summary for Pond FB4: sediment forebay

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 6.22" for 50-year event
Inflow = 0.59 cfs @ 12.09 hrs, Volume= 1,915 cf
Outflow = 0.59 cfs @ 12.10 hrs, Volume= 1,871 cf, Atten= 0%, Lag= 0.7 min
Primary = 0.59 cfs @ 12.10 hrs, Volume= 1,871 cf
Routed to Pond B4 : bioretention system 4

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 59.98' @ 12.10 hrs Surf.Area= 202 sf Storage= 78 cf
Flood Elev= 60.00' Surf.Area= 205 sf Storage= 81 cf

Plug-Flow detention time= 23.5 min calculated for 1,868 cf (98% of inflow)
Center-of-Mass det. time= 9.9 min (808.2 - 798.3)

Volume	Invert	Avail.Storage	Storage Description
#1	59.50'	81 cf	**surface storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.50	124	42.0	0	0	124
60.00	205	56.0	81	81	236

Device	Routing	Invert	Outlet Devices
#1	Primary	59.80'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50

Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88
2.85 3.07 3.20 3.32

Primary OutFlow Max=0.59 cfs @ 12.10 hrs HW=59.98' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.59 cfs @ 1.08 fps)

Summary for Pond IS1: infiltration 1

GW elevation from TP8

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 18,979 sf, 98.78% Impervious, Inflow Depth = 8.19" for 50-year event
Inflow = 3.55 cfs @ 12.09 hrs, Volume= 12,960 cf
Outflow = 1.84 cfs @ 12.23 hrs, Volume= 12,960 cf, Atten= 48%, Lag= 8.4 min
Discarded = 0.08 cfs @ 12.23 hrs, Volume= 5,893 cf
Primary = 1.76 cfs @ 12.23 hrs, Volume= 7,067 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.93' @ 12.23 hrs Surf.Area= 3,088 sf Storage= 3,942 cf
Flood Elev= 60.93' Surf.Area= 3,088 sf Storage= 3,939 cf

Plug-Flow detention time= 139.9 min calculated for 12,942 cf (100% of inflow)
Center-of-Mass det. time= 140.2 min (884.2 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	58.60'	2,174 cf	**41.50'W x 74.40'L x 2.33'H Field A** 7,204 cf Overall - 1,769 cf Embedded = 5,435 cf x 40.0% Voids
#2A	59.10'	1,769 cf	**ADS_StormTech SC-310 +Cap** x 120 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 120 Chambers in 12 Rows
		3,943 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	58.60'	**0.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 54.60' Phase-In= 0.01'
#2	Primary	59.50'	**8.0" Round Culvert** L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 59.50' / 57.25' S= 0.0703 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.08 cfs @ 12.23 hrs HW=60.93' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=1.76 cfs @ 12.23 hrs HW=60.93' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 1.76 cfs @ 5.03 fps)

Summary for Pond IS2: infiltration 2

GW from TP5

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 32,723 sf, 98.03% Impervious, Inflow Depth = 8.19" for 50-year event
Inflow = 6.12 cfs @ 12.09 hrs, Volume= 22,333 cf
Outflow = 2.74 cfs @ 12.27 hrs, Volume= 22,333 cf, Atten= 55%, Lag= 10.9 min
Discarded = 0.16 cfs @ 12.27 hrs, Volume= 11,491 cf
Primary = 2.58 cfs @ 12.27 hrs, Volume= 10,842 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 60.03' @ 12.27 hrs Surf.Area= 6,032 sf Storage= 7,743 cf
Flood Elev= 60.03' Surf.Area= 6,032 sf Storage= 7,744 cf

Plug-Flow detention time= 166.7 min calculated for 22,333 cf (100% of inflow)
Center-of-Mass det. time= 166.6 min (910.8 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	57.70'	4,214 cf	**51.50'W x 117.12'L x 2.33'H Field A** 14,074 cf Overall - 3,538 cf Embedded = 10,536 cf x 40.0% Voids
#2A	58.20'	3,538 cf	**ADS_StormTech SC-310 +Cap** x 240 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 240 Chambers in 15 Rows
		7,752 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.70'	**0.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 53.70' Phase-In= 0.01'
#2	Primary	58.65'	**10.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 58.65' / 58.00' S= 0.0342 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Discarded OutFlow Max=0.16 cfs @ 12.27 hrs HW=60.02' (Free Discharge)
└**1=Exfiltration** (Controls 0.16 cfs)

Primary OutFlow Max=2.57 cfs @ 12.27 hrs HW=60.02' (Free Discharge)
└**2=Culvert** (Inlet Controls 2.57 cfs @ 4.71 fps)

Summary for Pond IS3: infiltration 3

GW from TP2

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 8.27" for 50-year event
Inflow = 1.06 cfs @ 12.09 hrs, Volume= 3,898 cf
Outflow = 0.05 cfs @ 14.57 hrs, Volume= 3,898 cf, Atten= 95%, Lag= 149.1 min
Discarded = 0.05 cfs @ 14.57 hrs, Volume= 3,898 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach 1R : continuity reach

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 61.49' @ 14.57 hrs Surf.Area= 1,972 sf Storage= 1,974 cf
Flood Elev= 61.60' Surf.Area= 1,972 sf Storage= 2,057 cf

Plug-Flow detention time= 382.6 min calculated for 3,893 cf (100% of inflow)
Center-of-Mass det. time= 382.7 min (1,123.2 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	1,257 cf	**20.75'W x 95.03'L x 2.00'H Field A** 3,944 cf Overall - 800 cf Embedded = 3,144 cf x 40.0% Voids
#2A	60.10'	800 cf	**ADS_StormTech SC-160LP +Cap** x 117 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 117 Chambers in 9 Rows
		2,057 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#0	Primary	61.60'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	59.60'	**0.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 55.60' Phase-In= 0.01'

Discarded OutFlow Max=0.05 cfs @ 14.57 hrs HW=61.49' (Free Discharge)
└─**1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.60' (Free Discharge)

Summary for Link SP1: Study Point

Inflow Area = 181,482 sf, 40.33% Impervious, Inflow Depth = 3.46" for 50-year event
Inflow = 11.68 cfs @ 12.20 hrs, Volume= 52,368 cf
Primary = 11.68 cfs @ 12.20 hrs, Volume= 52,368 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP2: Study Point

Inflow Area =	8,852 sf,	0.00% Impervious,	Inflow Depth = 3.84"	for 50-year event	
Inflow =	0.89 cfs @	12.10 hrs,	Volume=	2,831 cf	
Primary =	0.89 cfs @	12.10 hrs,	Volume=	2,831 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP3: Study Point

Inflow Area =	28,761 sf,	65.63% Impervious,	Inflow Depth = 3.46"	for 50-year event	
Inflow =	3.23 cfs @	12.14 hrs,	Volume=	8,284 cf	
Primary =	3.23 cfs @	12.14 hrs,	Volume=	8,284 cf,	Atten= 0%, Lag= 0.0 min

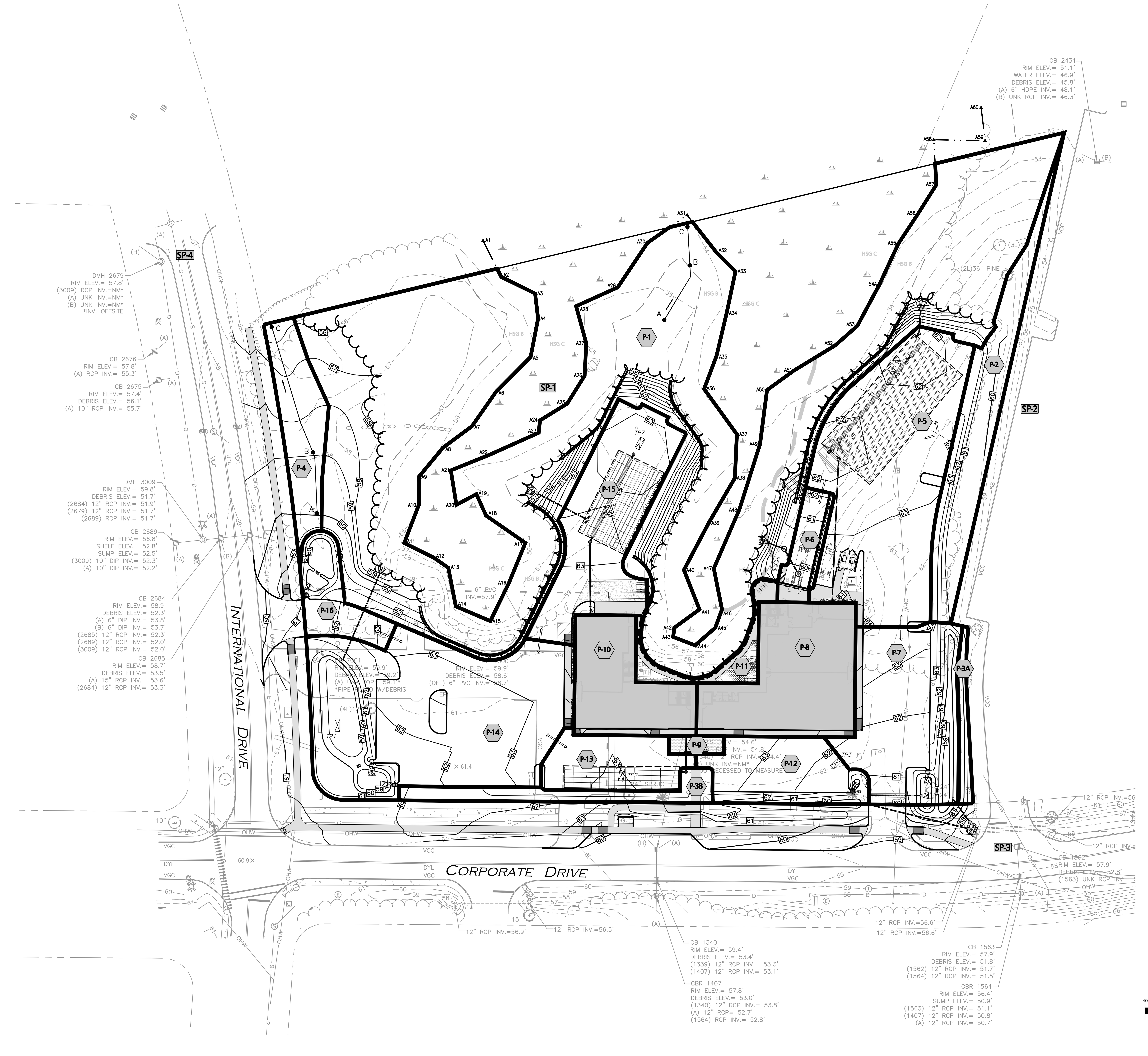
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link SP4: Study Point

Inflow Area =	5,412 sf,	0.00% Impervious,	Inflow Depth = 3.84"	for 50-year event	
Inflow =	0.48 cfs @	12.14 hrs,	Volume=	1,731 cf	
Primary =	0.48 cfs @	12.14 hrs,	Volume=	1,731 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Proposed Watershed Plan



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

LEGEND

SUBCATCHMENT BOUNDARY	
SUBCATCHMENT LABEL	P-1
Tc FLOW PATH	A B
SCS SOILS BOUNDARY	
FLOW DIRECTION	⟹

PLAN NOTES:

1. THE EXISTING CONDITIONS SHOWN HEREON HAVE BEEN PROVIDED TO ALLEN & MAJOR ASSOCIATES, INC. (A&M) BY THE APPLICANT AND ARE TAKEN FROM A DRAWING ENTITLED "EXISTING CONDITIONS PLAN FOR ATDG, LLC", PREPARED BY DOUCET SURVEY LLC, DATED APRIL 5, 2023.
2. THE INFORMATION SHOWN ON THIS PLAN IS THE SOLE PROPERTY OF ALLEN & MAJOR ASSOCIATES, INC. IT'S INTENDED USE IS TO PROVIDE INFORMATION. ANY ALTERATION, MISUSE, OR RECALCULATION OF INFORMATION OR DATA WITHOUT THE EXPRESSED, WRITTEN CONSENT OF ALLEN & MAJOR ASSOCIATES, INC. IS STRICTLY PROHIBITED.

REV	DATE	DESCRIPTION
3	09-18-23	REVISED PER TAC COMMENTS
2	08-28-23	ISSUED FOR AOT PERMIT APPLICATION
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:

ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE

360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	1" = 40'	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501

WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: PROPOSED WATERSHED PLAN

SHEET No. PWS-1

R:\PROJECTS\3250-01\CIVIL\DRAWINGS\CURRENT\C-3250-01_WATERSHED-PROPOSED.DWG

SECTION 7.0 - APPENDIX

AoT Application & AoT Permit

NHDES-W-01-003

ALTERATION OF TERRAIN PERMIT APPLICATION

Water Division/ Alteration of Terrain Bureau/ Land Resources Management
Check the Status of your Application: www.des.nh.gov/onestop

RSA/ Rule: RSA 485-A:17, Env-Wq 1500

Administrative Use Only	Administrative Use Only	Administrative Use Only	File Number: Check No. Amount: Initials:

1. APPLICANT INFORMATION (INTENDED PERMIT HOLDER)		
Applicant Name: ATDG, LLC	Contact Name: Dr. Alex Slocum	
Email: ahslocum@gmail.com	Daytime Telephone: (603) 777-6506	
Mailing Address: 1 Merrill Crossing		
Town/City: Bow	State: NH	Zip Code: 03304
2. APPLICANT'S AGENT INFORMATION If none, check here: ☐		
Business Name: Apex Design Build	Contact Name: Raquelle Kemnitz, Project Coordinator	
Email: raquellek@apexdesignbuild.net	Daytime Telephone: (708) 610-5000	
Address: 9550 W. Higgins Road, Ste 170		
Town/City: Rosemont	State: IL	Zip Code: 60018
3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)		
Applicant Name: Pease Development Authority	Contact Name: Paul Brean	
Email: p. brean@peasedev.org	Daytime Telephone: (603) 766-9230	
Mailing Address: 55 International Drive		
Town/City: Portsmouth	State: NH	Zip Code: 03801
4. PROPERTY OWNER'S AGENT INFORMATION If none, check here: ☒		
Business Name:	Contact Name:	
Email:	Daytime Telephone:	
Address:		
Town/City:	State:	Zip Code:
5. CONSULTANT INFORMATION If none, check here: ☐		
Engineering Firm: Allen & Major Associates, Inc.	Contact Name: Brian D. Jones, PE	
Email: bjones@allenmajor.com	Daytime Telephone: (603) 627-5500	
Address: 400 Harvey Road, Suite D		
Town/City: Manchester	State: NH	Zip Code: 03103

6. PROJECT TYPE

☐ Excavation Only ☐ Residential ☒ Commercial ☐ Golf Course ☐ School ☐ Municipal
☐ Agricultural ☐ Land Conversion ☐ Other:

7. PROJECT LOCATION INFORMATION

Project Name: ASC / Medical Office

Street/Road Address: 360 Corporate Drive

Town/City: Portsmouth	County: Rockingham

Tax Map: 315	Block:	Lot Number: 5	Unit:

Location Coordinates: 43.073484, -70.80109 ☒ Latitude/Longitude ☐ UTM ☐ State Plane

Post-development, will the proposed project withdraw from or directly discharge to any of the following? If yes, identify the purpose.

1. Stream or Wetland Purpose: Treated, stormwater discharge	☒ Yes ☐ No	☐ Withdrawal	☒ Discharge
2. Man-made pond created by impounding a stream or wetland Purpose:	☐ Yes ☒ No	☐ Withdrawal	☐ Discharge
3. Unlined pond dug into the water table Purpose:	☐ Yes ☒ No	☐ Withdrawal	☐ Discharge

Post-development, will the proposed project discharge to:

- A surface water impaired for phosphorus and/or nitrogen? ☒ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen**
- A Class A surface water or Outstanding Resource Water? ☒ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen**
- A lake or pond not covered previously? ☒ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond**

Is the project a High Load area? ☐ Yes ☒ No
If yes, specify the type of high load land use or activity: _____

Is the project within a Water Supply Intake Protection Area (WSIPA)? ☐ Yes ☒ No
Is the project within a Groundwater Protection Area (GPA)? ☒ Yes ☐ No
Will the well setbacks identified in Env-Wq 1508.02 be met? ☒ Yes ☐ No
Note: Guidance document titled "*Using NHDES's OneStop WebGIS to Locate Protection Areas*" is available online. For more details on the restrictions in these areas, read Chapter 3.1 in Volume 2 of the NH Stormwater Manual.

Is any part of the property within the 100-year floodplain? ☐ Yes ☒ No
If yes: Cut volume: ______ cubic feet within the 100-year floodplain
Fill volume: ______ cubic feet within the 100-year floodplain

☐ Project **IS** within **¼ mile of a designated river** Name of River:
☒ Project is **NOT** within ¼ mile of a designated river

☒ Project **IS** within **a Coastal/Great Bay Region community - include info required by Env-Wq 1503.08(l) if applicable**
☐ Project is **NOT** within a Coastal/Great Bay Region community

8. BRIEF PROJECT DESCRIPTION (PLEASE DO NOT REPLY "SEE ATTACHED")

The project proposes to construct a 3-story surgical center with associated parking. The proposed building has a footprint of 16,700± square feet with a gross floor area of 52,400± square feet. The proposed sitework incorporates various walls to protect the existing wetland resources on site and utilize the developable area.

9. IF APPLICABLE, DESCRIBE ANY WORK STARTED PRIOR TO RECEIVING PERMIT

N/A

10. ADDITIONAL REQUIRED INFORMATION

A. Date a copy of the application was sent to the municipality as required by Env-Wq 1503.05(e)[1]: 08/29/2023.
(Attach proof of delivery)

B. Date a copy of the application was sent to the local river advisory committee if required by Env-Wq 1503.05(e)[2]: __/__/____.
(Attach proof of delivery)

C. Type of plan required: ☐ Land Conversion ☒ Detailed Development ☐ Excavation, Grading & Reclamation ☐ Steep Slope

D. Additional plans required: ☒ Stormwater Drainage & Hydrologic Soil Groups ☐ Source Control ☐ Chloride Management

E. Total area of disturbance: 181,000 square feet

F. Additional impervious cover as a result of the project: 72,916 square feet (use the "-" symbol to indicate a net reduction in impervious coverage).
Total final impervious cover: 90,058 square feet

G. Total undisturbed cover: 116,074 square feet

H. Number of lots proposed: 0

I. Total length of roadway: 0 linear feet

J. Name(s) of receiving water(s): Wetland

K. Identify all other NHDES permits required for the project, and for each indicate whether an application has been filed and is pending, or if the required approval has been issued provide the permit number, registration date, or approval letter number, as applicable.

Type of Approval	Application Filed?	Status	
		Pending	If Issued:
1. Water Supply Approval	☐ Yes ☐ No ☒ N/A	☐	Permit number:
2. Wetlands Permit	☐ Yes ☐ No ☒ N/A	☐	Permit number:
3. Shoreland Permit	☐ Yes ☐ No ☒ N/A	☐	Permit number:
4. UIC Registration	☐ Yes ☐ No ☒ N/A	☐	Registration date:
5. Large/Small Community Well Approval	☐ Yes ☐ No ☒ N/A	☐	Approval letter date:
6. Large Groundwater Withdrawal Permit	☐ Yes ☐ No ☒ N/A	☐	Permit number:
7. Other:	☐ Yes ☐ No	☐	Permit number:

L. List all species identified by the Natural Heritage Bureau as threatened or endangered or of concern: N/A

M. Using NHDES's Web GIS OneStop program (www2.des.state.nh.us/gis/onestop/), with the Surface Water Impairment layer turned on, list the impairments identified for each receiving water. If no pollutants are listed, enter "N/A."
N/A

N. Did the applicant/applicant's agent have a pre-application meeting with AOT staff? ☐ Yes ☒ No
If yes, name of staff member: N/A

O. Will blasting of bedrock be required? ☐ Yes ☒ No If yes, estimated quantity of blast rock: _____ cubic yards
If yes, standard blasting BMP notes must be placed on the plans, available at:
http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf

NOTE: If greater than 5,000 cubic yards of blast rock will be generated, a groundwater monitoring program must be developed and submitted to NHDES. Contact AOT staff for additional detail.

[1] Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the governing body of each municipality in which the project is proposed.

[2] Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the Local River Advisory Committee, if the project is within ¼ mile of a designated river.

11. CHECK ALL APPLICATION ATTACHMENTS THAT APPLY (SUBMIT WITH APPLICATION IN ORDER LISTED)

LOOSE:

- ☒ Signed application form: des.nh.gov/organization/divisions/water/aot/index.htm (with attached proof(s) of delivery)
- ☒ Check for the application fee: des.nh.gov/organization/divisions/water/aot/fees.htm
- ☒ Color copy of a USGS map with the property boundaries outlined (1" = 2,000' scale)
- ☒ If Applicant is not the property owner, proof that the applicant will have a legal right to undertake the project on the property if a permit is issued to the applicant.

BIND IN A REPORT IN THE FOLLOWING ORDER:

- ☒ Copy of the signed application form & application checklist (des.nh.gov/organization/divisions/water/aot/index.htm)
- ☒ Copy of the check
- ☒ Copy of the USGS map with the property boundaries outlined (1" = 2,000' scale)
- ☒ Narrative of the project with a summary table of the peak discharge rate for the off-site discharge points
- ☒ Web GIS printout with the "Surface Water Impairments" layer turned on - http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx
- ☒ Web GIS printouts with the AOT screening layers turned on - http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx
- ☒ NHB letter using DataCheck Tool – www.nhdfl.org/about-forests-and-lands/bureaus/natural-heritage-bureau/
- ☒ The Web Soil Survey Map with project's watershed outlined – websoilsurvey.nrcs.usda.gov
- ☒ Aerial photograph (1" = 2,000' scale with the site boundaries outlined)
- ☒ Photographs representative of the site
- ☒ Groundwater Recharge Volume calculations (one worksheet for each permit application): des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls
- ☒ BMP worksheets (one worksheet for each treatment system): des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls
- ☒ Drainage analysis, stamped by a professional engineer (see Application Checklist for details)
- ☒ Riprap apron or other energy dissipation or stability calculations
- ☒ Site Specific Soil Survey report, stamped and with a certification note prepared by the soil scientist that the survey was done in accordance with the Site Specific Soil Mapping standards, *Site-Specific Soil Mapping Standards for NH & VT, SSSNNE Special Publication No. 3.*
- ☒ Infiltration Feasibility Report (example online) [Env-Wq 1503.08(f)(3)]
- ☒ Registration and Notification Form for Storm Water Infiltration to Groundwater (UIC Registration-for underground systems only, including drywells and trenches): (http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw_discharge)
- ☒ Inspection and maintenance manual with, if applicable, long term maintenance agreements [Env-Wq 1503.08(g)]
- ☒ Source control plan

PLANS:

- ☒ One set of design plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)
- ☒ Pre & post-development color coded soil plans on 11" x 17" (see Application Checklist for details)
- ☒ Pre & post-development drainage area plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)

100-YEAR FLOODPLAIN REPORT:

- ☐ All information required in Env-Wq 1503.09, submitted as a separate report.

ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE

- ☐ See Checklist for Details

☐ **REVIEW APPLICATION FOR COMPLETENESS & CONFIRM INFORMATION LISTED ON THE APPLICATION IS INCLUDED WITH SUBMITTAL.**

12. REQUIRED SIGNATURES

_____ By initialing here, I acknowledge that I am required by Env-Wq 1503.20(e) to submit a copy of all approved documents to the department in PDF format on a CD within one week after permit approval.

By signing below, I certify that:

- The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief;
- I understand that the submission of false, incomplete, or misleading information constitutes grounds for the department to deny the application, revoke any permit that is granted based on the information, and/or refer the matter to the board of professional engineers established by RSA 310-A:3 if I am a professional engineer; and
- I understand that I am subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.

☐ APPLICANT ☒ APPLICANT'S AGENT:

Signature: ______________________ Date: 08/22/2023

Name (print or type): Raquelle Kemnitz Title: Project Coordinator

☒ PROPERTY OWNER ☐ PROPERTY OWNER'S AGENT:

Signature: ______________________ Date: 8/25/2023

Name (print or type): Paul Brean, C.M. Title: PDA Executive Director

ATTACHMENT A:
ALTERATION OF TERRAIN PERMIT APPLICATION CHECKLIST

Check the box to indicate the item has been provided or provide an explanation why the item does not apply.

DESIGN PLANS

☒ Plans printed on 34 - 36" by 22 - 24" white paper

☒ PE stamp

☒ Wetland delineation

☒ Temporary erosion control measures

☒ Treatment for all stormwater runoff from impervious surfaces such as roadways (including gravel roadways), parking areas, and non-residential roof runoff. Guidance on treatment BMPs can be found in Volume 2, Chapter 4 of the NH Stormwater Management Manual.

☒ Pre-existing 2-foot contours

☒ Proposed 2-foot contours

☐ Drainage easements protecting the drainage/treatment structures

☒ Compliance with the Wetlands Bureau, RSA 482- A http://des.nh.gov/organization/divisions/water/wetlands/index.htm. Note that artificial detention in wetlands is not allowed.

☐ Compliance with the Comprehensive Shoreland Protection Act, RSA 483-B. http://des.nh.gov/organization/divisions/water/wetlands/cspa

☐ Benches. Benching is needed if you have more than 20 feet change in elevation on a 2:1 slope, 30 feet change in elevation on a 3:1 slope, 40 feet change in elevation on a 4:1 slope.

☒ Check to see if any proposed ponds need state Dam permits. http://des.nh.gov/organization/divisions/water/dam/documents/damdef.pdf

DETAILS

☐ Typical roadway x-section

☐ Detention basin with inverts noted on the outlet structure

☐ Stone berm level spreader

☒ Outlet protection – riprap aprons

☒ A general installation detail for an erosion control blanket

☒ Silt fences or mulch berm

☒ Storm drain inlet protection. Note that since hay bales must be embedded 4 inches into the ground, they are not to be used on hard surfaces such as pavement.

☐ Hay bale barriers

☒ Stone check dams

☒ Gravel construction exit

☒ Temporary sediment trap

☒ The treatment BMP's proposed

☒ Any innovative BMP's proposed

CONSTRUCTION SEQUENCE/EROSION CONTROL

☒ Note that 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.

☒ Note that perimeter controls shall be installed prior to earth moving operations.

☒ Note that temporary water diversion (swales, basins, etc) must be used as necessary until areas are stabilized.

☒ Note that ponds and swales shall be installed early on in the construction sequence (before rough grading the site).

☒ Note that all ditches and swales shall be stabilized prior to directing runoff to them.

☒ Note that all roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.

☒ Note that all cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade

☒ Note that all erosion controls shall be inspected weekly AND after every half-inch of rainfall.

☒ Note the limits on the open area allowed, see Env-Wq 1505.02 for detailed information.

Example note: The smallest practical area shall be disturbed during construction, but in no case shall exceed 5 acres at any one time before disturbed areas are stabilized.

☒ Note the definition of the word "stable"

Example note: An area shall be considered stable if one of the following has occurred:

- Base course gravels have been installed in areas to be paved.
- A minimum of 85 percent vegetated growth has been established.
- A minimum of 3 inches of non-erosive material such stone or riprap has been installed.
- Or, erosion control blankets have been properly installed.

☒ Note the limit of time an area may be exposed
Example note: All areas shall be stabilized within 45 days of initial disturbance.

☒ Provide temporary and permanent seeding specifications. (Reed canary grass is listed in the Green Book; however, this is a problematic species according to the Wetlands Bureau and therefore should not be specified)

☒ Provide winter construction notes that meet or exceed our standards.

Standard Winter Notes:

- 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.
- 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.
- 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.

☐ Note at the end of the construction sequence that "Lot disturbance, other than that shown on the approved plans, shall not commence until after the roadway has the base course to design elevation and the associated drainage is complete and stable." – This note is applicable to single/duplex family subdivisions, when lot development is not part of the permit.

DRAINAGE ANALYSES

Please double-side 8 ½" × 11" sheets where possible but, **do not** reduce the text such that more than one page fits on one side.

☒ PE stamp

☒ Rainfall amount obtained from the Northeast Regional Climate Center- http://precip.eas.cornell.edu/. Include extreme precipitation table as obtained from the above referenced website.

☒ Drainage analyses, in the following order:

- Pre-development analysis: Drainage diagram.
- Pre-development analysis: Area Listing and Soil Listing.
- Pre-development analysis: Node listing 1-year (if applicable), 2-year, 10-year and 50-year.
- Pre-development analysis: Full summary of the 10-year storm.
- Post-development analysis: Drainage diagram.
- Post-development analysis: Area Listing and Soil Listing.
- Post-development analysis: Node listing for the 2-year, 10-year and 50-year.
- Post-development analysis: Full summary of the 10-year storm.

☒ Review the Area Listing and Soil Listing reports

- Hydrologic soil groups (HSG) match the HSGs on the soil maps provided.
- There is the same or less HSG A soil area after development (check for each HSG).
- There is the same or less "woods" cover in the post-development.
- Undeveloped land was assumed to be in "good" condition.
- The amount of impervious cover in the analyses is correct.

Note: A good check is to subtract the total impervious area used in the pre analysis from the total impervious area used in the post-analysis. For residential projects without demolition occurring, a good check is to take this change in impervious area, subtract out the roadway and divide the remaining by the number of houses/units proposed. Do these numbers make sense?

☒ Check the storage input used to model the ponds.

☒ Check to see if the artificial berms pass the 50-year storm, i.e., make sure the constructed berms on ponds are not overtopped.

☒ Check the outlet structure proposed and make sure it matches that modeled.

☒ Check to see if the total areas in the pre and post analyses are same.

☒ Confirm the correct NRCS storm type was modeled (Coos, Carroll & Grafton counties are Type II, all others Type III).

PRE- AND POST-DEVELOPMENT DRAINAGE AREA PLANS

☒ Plans printed on 34 - 36" by 22 - 24" on white paper.

☒ Submit these plans separate from the soil plans.

☒ A north arrow.

☒ A scale.

☒ Labeled subcatchments, reaches and ponds.

☒ Tc lines.

☒ A clear delineation of the subcatchment boundaries.

☐ Roadway station numbers.

☐ Culverts and other conveyance structures.

PRE AND POST-DEVELOPMENT COLOR-CODED SOIL PLANS

- [ ] 11" × 17"sheets suitable, as long as it is readable.
- [x] Submit these plans separate from the drainage area plans.
- [x] A north arrow.
- [x] A scale.
- [x] Name of the soil scientist who performed the survey and date the soil survey took place.
- [x] 2-foot contours (5-foot contours if application is for a gravel pit) as well as other surveyed features.
- [x] Delineation of the soil boundaries and wetland boundaries.
- [x] Delineation of the subcatchment boundaries.
- [x] Soil series symbols (e.g., 26).
- [x] A key or legend which identifies each soil series symbol and its associated soil series name (e.g., 26 = Windsor).
- [x] The hydrologic soil group color coding (A = Green, B = yellow, C= orange, D=red, Water=blue, & Impervious = gray).

Please note that excavation projects (e.g., gravel pits) have similar requirements to that above, however the following are common exceptions/additions:

- [ ] Drainage report is not needed if site does not have off-site flow.
- [ ] 5 foot contours allowed rather than 2 foot.
- [ ] No PE stamp needed on the plans.
- [ ] Add a note to the plans that the applicant must submit to the Department of Environmental Services a written update of the project and revised plans documenting the project status every five years from the date of the Alteration of Terrain permit.
- [ ] Add reclamation notes.

See NRCS publication titled: *Vegetating New Hampshire Sand and Gravel Pits* for a good resource, it is posted online at: http://des.nh.gov/organization/divisions/water/aot/categories/publications.

ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE

- [ ] If project will discharge stormwater to a surface water impaired for phosphorus and/or nitrogen, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.
- [ ] If project will discharge stormwater to a Class A surface water or Outstanding Resource Water, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.
- [ ] If project will discharge stormwater to a lake or pond not covered previously, include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond.
- [ ] If project is within a Coastal/Great Bay Region community, include info required by Env-Wq 1503.08(l) if applicable.

28552

APEX DESIGN BUILD
9550 W HIGGINS RD SUITE 170
ROSEMONT, IL 60018

CHASE
JPMorgan Chase Bank, N.A.
www.Chase.com
2-1/710

08/22/2023

PAY TO THE ORDER OF Treasurer State of New Hampshire $ **3,125.00

Three thousand one hundred twenty-five and 00/100*** DOLLARS

Security features. Details on back.

Treasurer State of New Hampshire
NHDES Land Resources Management, Alteration of
29 Hazen Drive (PO Box 95)
Concord, NH 03302-0095

MEMO

AUTHORIZED SIGNATURE

⑈028552⑈ ⑆071000013⑆ 898202259⑈

APEX DESIGN BUILD 28552

08/22/2023 **Treasurer State of New Hampshire**

Date	Type	Reference	Original Amount	Balance Due	Payment
08/15/2023	Bill	NHDES Alteration of T	3,125.00	3,125.00	3,125.00
		Check Amount			3,125.00

Chase - Checking 3,125.00

Surface Water Impairment Map

Surface Waters with Impairments Map

Legend

Surface Waters with Impairn
with Quarter Mile Buffer

Map Scale

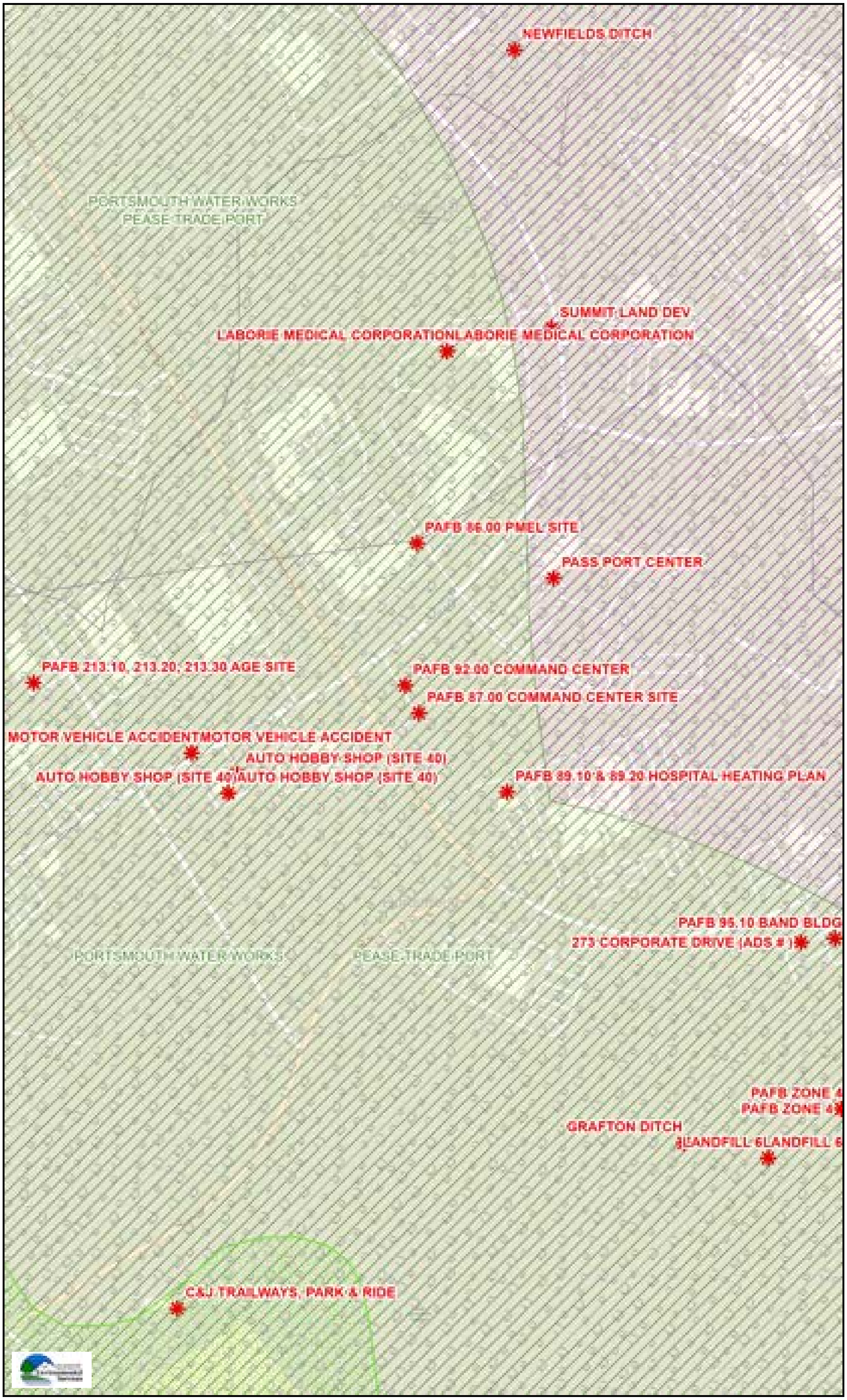
1: 6,494

Map Generated: 7/6/2023

Notes

AoT Screening Layers Map

AoT Screening Layers



Legend

- Remediation Sites
- Coastal and Great Bay Regi Communities
- Designated Rivers Quarterm Buffer
- Public Water Supply Wells
- Groundwater Classification / GA1
- Groundwater Classification / GA2
- Water Supply Intake Protect Areas
- Wellhead Protection Areas
- Class A Lakes with a Quarte Buffer
- Class A - All Features
- All Lakes, with a Quarter Mil Buffer
- Outstanding Resource Wate Watersheds
- Watersheds with Chloride Impairments

Map Scale

1: 6,494

Map Generated: 7/6/2023

Notes

Natural Heritage Data Check

New Hampshire Natural Heritage Bureau
NHB DataCheck Results Letter

To: steven mayer
250 Commercial Street
Manchester, NH 03101

From: NH Natural Heritage Bureau

Date: 6/29/2023 (This letter is valid through 6/29/2024)

Re: Review by NH Natural Heritage Bureau of request dated 6/29/2023

Permit Types: Alteration of Terrain Permit
Sewer Connection Permit
Stormwater Pollution Prevention
Portsmouth

NHB ID: NHB23-1980

Applicant: steven mayer

Location: Portsmouth
Tax Map: 315, Tax Lot: 5
Address: 360 Corporate Drive

Proj. Description: The project includes the construction of a 3 story medical use building with a footprint of approximately 15,754 square feet. The project will construct approximately 125 parking spaces, required utilities, lighting, and stormwater infrastructure.

The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

MAP OF PROJECT BOUNDARIES FOR: NHB23-1980

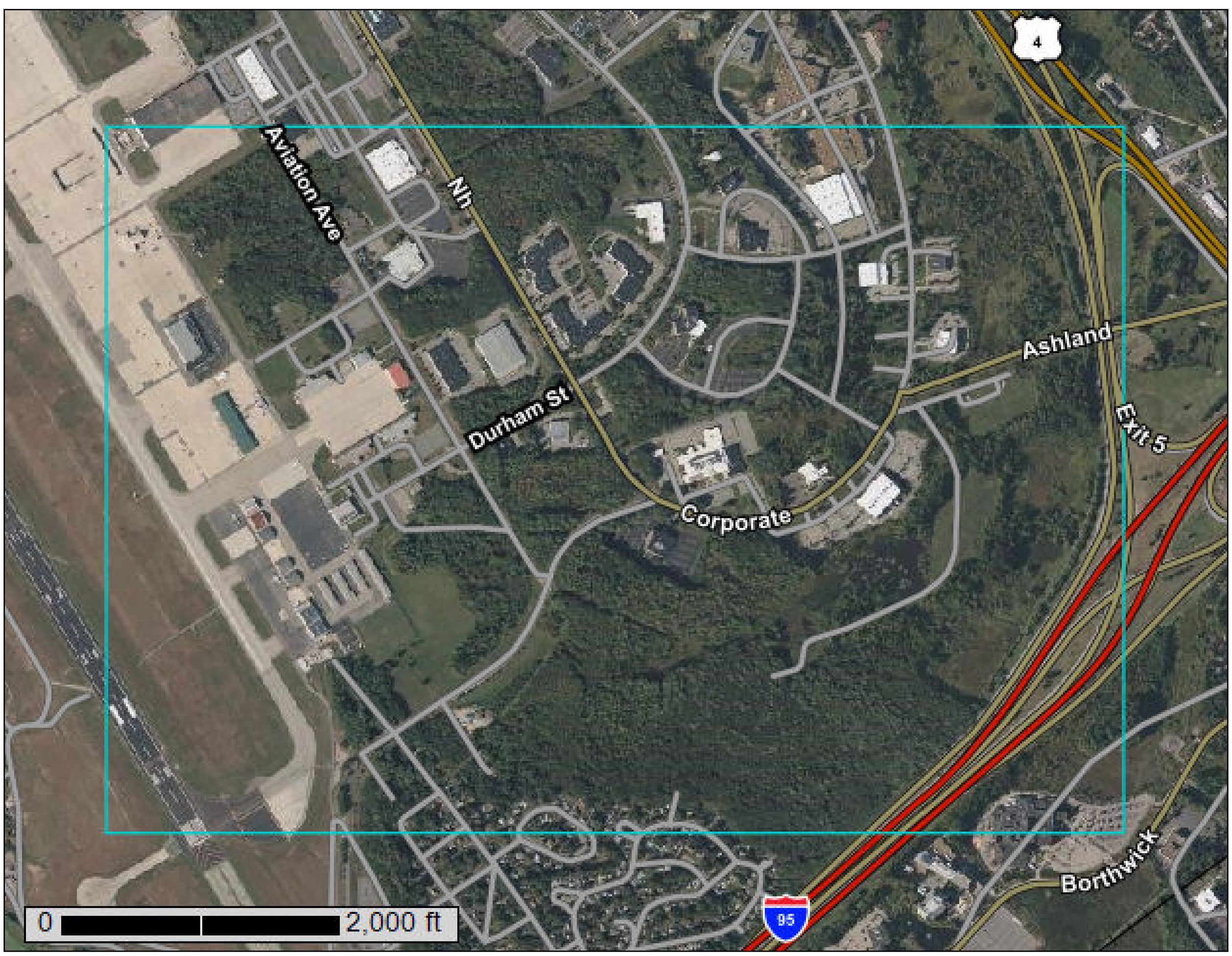
NRCS Web Soil Survey

United States Department of Agriculture

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



July 3, 2023

Soil Map

Map Scale: 1:13,100 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 150, 300, 600, 900

Feet: 0, 500, 1000, 2000, 3000

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 25, Sep 12, 2022

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
38A	Eldridge fine sandy loam, 0 to 3 percent slopes	15.2	1.8%
134	Maybid silt loam	27.2	3.2%
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	24.6	2.9%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	2.5	0.3%
299	Udorthents, smoothed	129.9	15.3%
314A	Pipestone sand, 0 to 5 percent slopes	36.8	4.3%
495	Natchaug mucky peat, 0 to 2 percent slopes	9.1	1.1%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	161.0	18.9%
599	Urban land-Hoosic complex, 3 to 15 percent slopes	26.6	3.1%
657B	Ridgebury fine sandy loam, 3 to 8 percent slopes, very stony	12.6	1.5%
699	Urban land	224.0	26.3%
799	Urban land-Canton complex, 3 to 15 percent slopes	182.2	21.4%
Totals for Area of Interest		**851.8**	**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.

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

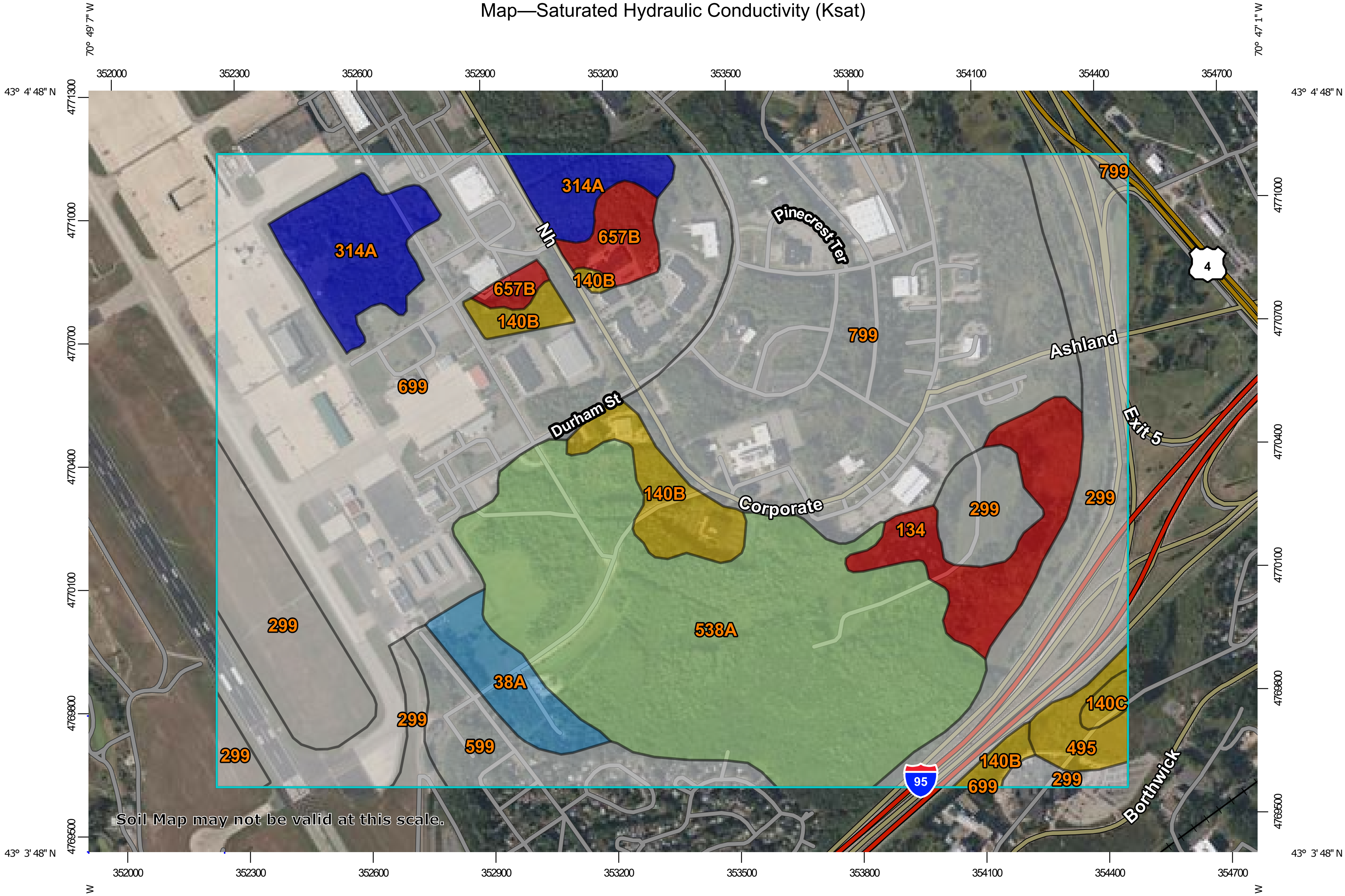
Saturated Hydraulic Conductivity (Ksat)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Map—Saturated Hydraulic Conductivity (Ksat)



Map Scale: 1:13,100 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 150, 300, 600, 900

Feet: 0, 500, 1000, 2000, 3000

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 Rating Polygons

- <= 4.5628
- > 4.5628 and <= 10.1993
- > 10.1993 and <= 28.6840
- > 28.6840 and <= 35.3528
- > 35.3528 and <= 91.7222
- Not rated or not available

Soil Rating Lines

- <= 4.5628
- > 4.5628 and <= 10.1993
- > 10.1993 and <= 28.6840
- > 28.6840 and <= 35.3528
- > 35.3528 and <= 91.7222
- Not rated or not available

Soil Rating Points

- <= 4.5628
- > 4.5628 and <= 10.1993
- > 10.1993 and <= 28.6840
- > 28.6840 and <= 35.3528
- > 35.3528 and <= 91.7222
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 25, Sep 12, 2022

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.

Table—Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
38A	Eldridge fine sandy loam, 0 to 3 percent slopes	35.3528	15.2	1.8%
134	Maybid silt loam	1.0099	27.2	3.2%
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	10.1993	24.6	2.9%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	10.1993	2.5	0.3%
299	Udorthents, smoothed		129.9	15.3%
314A	Pipestone sand, 0 to 5 percent slopes	91.7222	36.8	4.3%
495	Natchaug mucky peat, 0 to 2 percent slopes	7.3000	9.1	1.1%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	28.6840	161.0	18.9%
599	Urban land-Hoosic complex, 3 to 15 percent slopes		26.6	3.1%
657B	Ridgebury fine sandy loam, 3 to 8 percent slopes, very stony	4.5628	12.6	1.5%
699	Urban land		224.0	26.3%
799	Urban land-Canton complex, 3 to 15 percent slopes		182.2	21.4%
Totals for Area of Interest			**851.8**	**100.0%**

Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 0

Bottom Depth: 100

Units of Measure: Inches

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

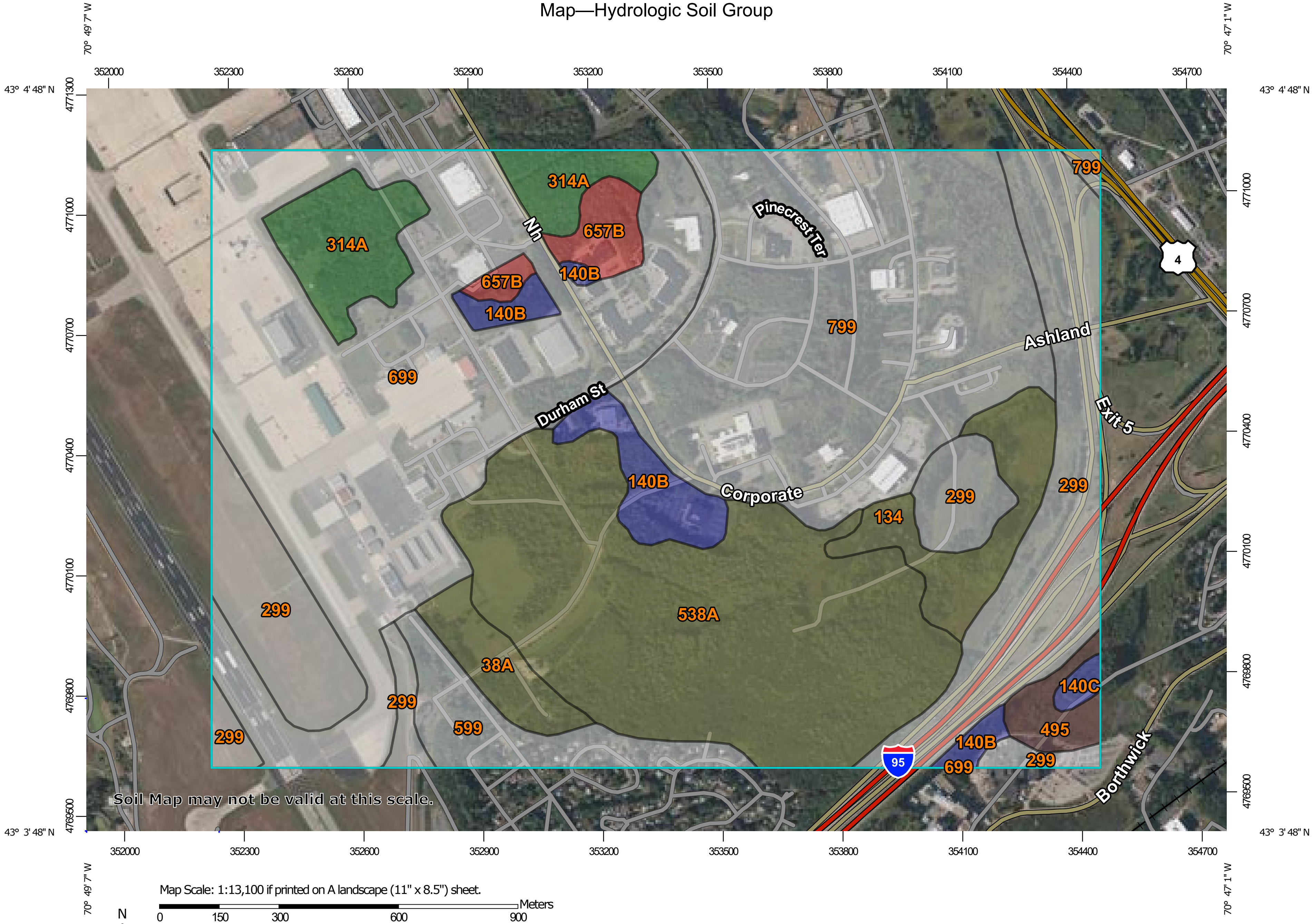
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Map—Hydrologic Soil Group



Map Scale: 1:13,100 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 150, 300, 600, 900

Feet: 0, 500, 1000, 2000, 3000

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 Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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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

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Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
38A	Eldridge fine sandy loam, 0 to 3 percent slopes	C/D	15.2	1.8%
134	Maybid silt loam	C/D	27.2	3.2%
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	B	24.6	2.9%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	B	2.5	0.3%
299	Udorthents, smoothed		129.9	15.3%
314A	Pipestone sand, 0 to 5 percent slopes	A/D	36.8	4.3%
495	Natchaug mucky peat, 0 to 2 percent slopes	B/D	9.1	1.1%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	C/D	161.0	18.9%
599	Urban land-Hoosic complex, 3 to 15 percent slopes		26.6	3.1%
657B	Ridgebury fine sandy loam, 3 to 8 percent slopes, very stony	D	12.6	1.5%
699	Urban land		224.0	26.3%
799	Urban land-Canton complex, 3 to 15 percent slopes		182.2	21.4%
Totals for Area of Interest			**851.8**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Site Photographs

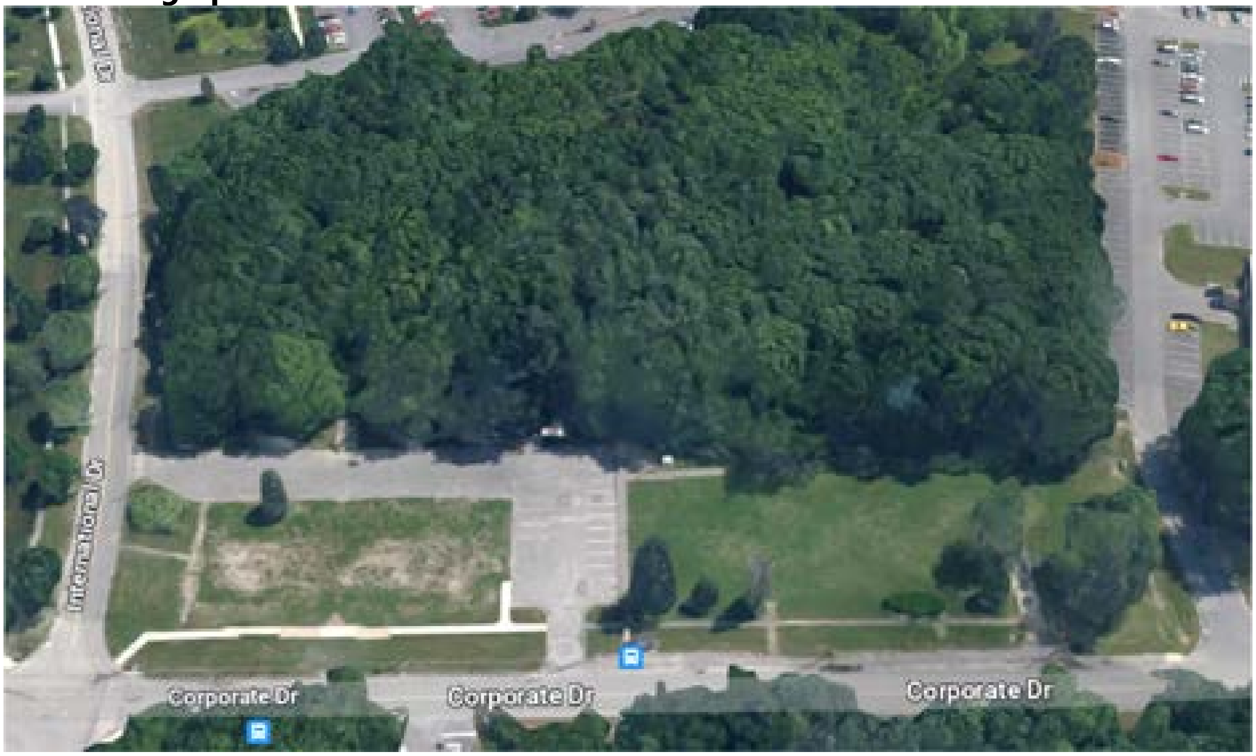


Image 1 - Aerial Image

Image 2 - View from Corporate & International Intersection

Image 3 - View from 320 Corporate Drive

NHDES Groundwater Recharge Volume Calculations

GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION
(Env-Wq 1507.04)

	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
1.72	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
0.00	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.25	inches	Rd = Weighted groundwater recharge depth	
0.4299	ac-in	GRV = AI * Rd	
1,561	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

Provided:

Bioretention System 1 = 969 cf

Bioretention System 2 = 436 cf

Bioretention System 3 = 5,898 cf

Bioretention System 4 = 1,089 cf

Infiltration System 1 = 1,582 cf

Infiltration System 2 = 3,340 cf

Infiltration System 3 = 2,057 cf

Total Provided = 15,371 cf > 1,561 cf required

see stage storage spreadsheets in following appendix section

NHDES BMP Worksheets

BIORETENTION SYSTEM WITH INTERNAL STORAGE RESERVOIR
(UNH Stormwater Center Specification)

Type/Node Name: **Bioretention System 1**

Enter the node name in the drainage analysis if applicable.

0.29	ac	A = Area draining to the practice	
0.19	ac	A_I = Impervious area draining to the practice	
0.66	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.65	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.19	ac-in	WQV= 1” x Rv x A	
672	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	
67	cf	10% x WQV (check calc for sediment forebay)	
168	cf	25% x WQV (check calc for water stored in saturated zone)	
Sediment Forebay		Method of Pretreatment	
136	cf	If pretrt is sed forebay: V_{SED} (sediment forebay volume)	**≥ 10%WQV**
969	cf	Volume below lowest orifice[1]	**≥ 100%WQV**
191	cf	Water stored in voids of saturated zone	**≥ 26%WQV**
0.02	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec)[2]	
59.65	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.03	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{WQV}$**
12.45	hours	T_{ED} = Drawdown time of extended detention = $2WQV/Q_{WQV}$	**≥ 24-hrs**
24.00	in	Depth of Filter Media	**≥ 18"**
3.00	:1	Pond side slopes	**≥ 3:1**
N/A		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6”)?	
60.28	ft	Peak elevation of the 50-year storm event (E_{50})	
61.00	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**

1. Volume stored above the wetland soil and below the high flow by-pass.

Designer's Notes:

Stage-Area-Storage for Pond FB1: sediment forebay

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
59.00	222	0	60.06	448	328
59.02	226	4	60.08	448	328
59.04	230	9	60.10	448	328
59.06	233	14	60.12	448	328
59.08	237	18	60.14	448	328
59.10	241	23	60.16	448	328
59.12	245	28	60.18	448	328
59.14	249	33	60.20	448	328
59.16	253	38	60.22	448	328
59.18	257	43	60.24	448	328
59.20	261	48	60.26	448	328
59.22	265	53	60.28	448	328
59.24	269	59	60.30	448	328
59.26	273	64	60.32	448	328
59.28	277	70	60.34	448	328
59.30	282	75	60.36	448	328
59.32	286	81	60.38	448	328
59.34	290	87	60.40	448	328
59.36	294	93	60.42	448	328
59.38	299	99	60.44	448	328
59.40	303	105	60.46	448	328
59.42	307	111	60.48	448	328
59.44	312	117	60.50	448	328
59.46	316	123	60.52	448	328
59.48	321	130	60.54	448	328
59.50	325	136	60.56	448	328
59.52	330	143	60.58	448	328
59.54	334	149	60.60	448	328
59.56	339	156	60.62	448	328
59.58	344	163	60.64	448	328
59.60	348	170	60.66	448	328
59.62	353	177	60.68	448	328
59.64	358	184	60.70	448	328
59.66	362	191	60.72	448	328
59.68	367	198	60.74	448	328
59.70	372	206	60.76	448	328
59.72	377	213	60.78	448	328
59.74	382	221	60.80	448	328
59.76	387	228	60.82	448	328
59.78	392	236	60.84	448	328
59.80	397	244	60.86	448	328
59.82	402	252	60.88	448	328
59.84	407	260	60.90	448	328
59.86	412	268	60.92	448	328
59.88	417	277	60.94	448	328
59.90	422	285	60.96	448	328
59.92	427	293	60.98	448	328
59.94	432	302	61.00	448	328
59.96	437	311			
59.98	443	320			
60.00	**448**	**328**			
60.02	448	328			
60.04	448	328			

Stage-Area-Storage for Pond B1: bioretention system 1

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
56.50	318	0
56.55	325	5
56.60	332	10
56.65	339	14
56.70	346	19
56.75	353	24
56.80	360	29
56.85	367	33
56.90	374	38
56.95	381	43
57.00	388	48
57.05	395	52
57.10	402	57
57.15	409	62
57.20	416	67
57.25	423	72
57.30	430	76
57.35	437	81
57.40	444	86
57.45	451	91
57.50	458	95
57.55	465	100
57.60	472	105
57.65	479	110
57.70	486	114
57.75	493	119
57.80	500	124
57.85	507	129
57.90	514	134
57.95	521	138
58.00	528	143
58.05	535	148
58.10	542	153
58.15	549	157
58.20	556	162
58.25	563	167
58.30	570	172
58.35	577	176
58.40	584	181
58.45	591	186
58.50	**598**	191
58.55	598	197
58.60	598	204
58.65	598	212
58.70	598	221
58.75	598	231
58.80	598	242
58.85	598	253
58.90	598	266
58.95	598	280
59.00	598	296
59.05	598	312
59.10	598	330
59.15	598	350
59.20	598	371
59.25	598	394
59.30	598	418
59.35	598	444
59.40	598	472
59.45	598	502
59.50	598	534
59.55	598	567
59.60	598	603
59.65	598	641
59.70	598	681
59.75	598	723
59.80	598	768
59.85	598	814
59.90	598	864
59.95	598	915
60.00	598	969
60.05	598	1,026
60.10	598	1,087
60.15	598	1,150
60.20	598	1,217
60.25	598	1,288
60.30	598	1,362
60.35	598	1,439
60.40	598	1,521
60.45	598	1,606
60.50	598	1,695
60.55	598	1,788
60.60	598	1,886
60.65	598	1,987
60.70	598	2,093
60.75	598	2,203
60.80	598	2,318
60.85	598	2,437
60.90	598	2,561
60.95	598	2,689
61.00	598	**2,822**

Stage-Discharge for Pond B1: bioretention system 1

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
56.50	0.00	0.00	0.00
56.55	0.01	0.01	0.00
56.60	0.01	0.01	0.00
56.65	0.01	0.01	0.00
56.70	0.01	0.01	0.00
56.75	0.01	0.01	0.00
56.80	0.01	0.01	0.00
56.85	0.01	0.01	0.00
56.90	0.01	0.01	0.00
56.95	0.01	0.01	0.00
57.00	0.01	0.01	0.00
57.05	0.01	0.01	0.00
57.10	0.01	0.01	0.00
57.15	0.01	0.01	0.00
57.20	0.01	0.01	0.00
57.25	0.01	0.01	0.00
57.30	0.01	0.01	0.00
57.35	0.01	0.01	0.00
57.40	0.01	0.01	0.00
57.45	0.01	0.01	0.00
57.50	0.01	0.01	0.00
57.55	0.01	0.01	0.00
57.60	0.01	0.01	0.00
57.65	0.01	0.01	0.00
57.70	0.01	0.01	0.00
57.75	0.01	0.01	0.00
57.80	0.01	0.01	0.00
57.85	0.02	0.02	0.00
57.90	0.02	0.02	0.00
57.95	0.02	0.02	0.00
58.00	0.02	0.02	0.00
58.05	0.02	0.02	0.00
58.10	0.02	0.02	0.00
58.15	0.02	0.02	0.00
58.20	0.02	0.02	0.00
58.25	0.02	0.02	0.00
58.30	0.02	0.02	0.00
58.35	0.02	0.02	0.00
58.40	0.02	0.02	0.00
58.45	0.02	0.02	0.00
58.50	0.02	0.02	0.00
58.55	0.02	0.02	0.00
58.60	0.02	0.02	0.00
58.65	0.02	0.02	0.00
58.70	0.02	0.02	0.00
58.75	0.02	0.02	0.00
58.80	0.02	0.02	0.00
58.85	0.02	0.02	0.00
58.90	0.02	0.02	0.00
58.95	0.02	0.02	0.00
59.00	0.02	0.02	0.00
59.05	0.02	0.02	0.00
59.10	0.02	0.02	0.00
59.15	0.02	0.02	0.00
59.20	0.02	0.02	0.00
59.25	0.03	0.03	0.00
59.30	0.03	0.03	0.00
59.35	0.03	0.03	0.00
59.40	0.03	0.03	0.00
59.45	0.03	0.03	0.00
59.50	0.03	0.03	0.00
59.55	0.03	0.03	0.00
59.60	0.03	0.03	0.00
59.65	0.03	0.03	0.00
59.70	0.03	0.03	0.00
59.75	0.03	0.03	0.00
59.80	0.03	0.03	0.00
59.85	0.03	0.03	0.00
59.90	0.03	0.03	0.00
59.95	0.03	0.03	0.00
60.00	0.03	0.03	0.00
60.05	0.17	0.03	0.14
60.10	0.44	0.03	0.41
60.15	0.78	0.03	0.75
60.20	1.18	0.03	1.15
60.25	1.64	0.03	1.61
60.30	2.14	0.03	2.11
60.35	2.29	0.03	2.25
60.40	2.32	0.03	2.28
60.45	2.35	0.03	2.31
60.50	2.38	0.03	2.35
60.55	2.41	0.03	2.37
60.60	2.44	0.03	2.40
60.65	2.47	0.03	2.43
60.70	2.50	0.03	2.46
60.75	2.53	0.03	2.49
60.80	2.55	0.03	2.52
60.85	2.58	0.04	2.55
60.90	2.61	0.04	2.57
60.95	2.64	0.04	2.60
61.00	**2.67**	**0.04**	**2.63**

BIORETENTION SYSTEM WITH INTERNAL STORAGE RESERVOIR
(UNH Stormwater Center Specification)

Type/Node Name: **Bioretention System 2**

Enter the node name in the drainage analysis if applicable.

0.14	ac	A = Area draining to the practice	
0.11	ac	A_I = Impervious area draining to the practice	
0.76	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.73	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.11	ac-in	WQV= 1" x Rv x A	
384	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
38	cf	10% x WQV (check calc for sediment forebay)	
96	cf	25% x WQV (check calc for water stored in saturated zone)	
Sediment Forebay		Method of Pretreatment	
54	cf	If pretrt is sed forebay: V_{SED} (sediment forebay volume)	**$\geq$ 10%WQV**
436	cf	Volume below lowest orifice[1]	**$\geq$ 100%WQV**
155	cf	Water stored in voids of saturated zone	**$\geq$ 26%WQV**
0.01	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec)[2]	
60.40	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.02	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{WQV}$**
10.68	hours	T_{ED} = Drawdown time of extended detention = $2WQV/Q_{WQV}$	**$\geq$ 24-hrs**
24.00	in	Depth of Filter Media	**$\geq$ 18"**
3.00	:1	Pond side slopes	**$\geq$ 3:1**
N/A		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of $\leq$6")?	
60.96	ft	Peak elevation of the 50-year storm event (E_{50})	
61.00	ft	Berm elevation of the pond	
YES		$E_{50} \leq$ the berm elevation?	**← yes**

1. Volume stored above the wetland soil and below the high flow by-pass.

Designer's Notes:

Stage-Area-Storage for Pond FB2: sediment forebay

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
59.50	1	0
59.52	1	0
59.54	2	0
59.56	2	0
59.58	3	0
59.60	4	0
59.62	5	0
59.64	6	0
59.66	6	1
59.68	8	1
59.70	9	1
59.72	10	1
59.74	11	1
59.76	12	1
59.78	14	2
59.80	15	2
59.82	17	2
59.84	18	3
59.86	20	3
59.88	22	3
59.90	24	4
59.92	26	4
59.94	28	5
59.96	30	6
59.98	32	6
60.00	34	7
60.02	36	8
60.04	37	8
60.06	39	9
60.08	40	10
60.10	42	11
60.12	44	11
60.14	45	12
60.16	47	13
60.18	49	14
60.20	51	15
60.22	53	16
60.24	55	17
60.26	57	18
60.28	59	20
60.30	61	21
60.32	63	22
60.34	65	23
60.36	67	25
60.38	69	26
60.40	71	27
60.42	73	29
60.44	76	30
60.46	78	32
60.48	80	33
60.50	82	35
60.52	85	37
60.54	87	38
60.56	90	40
60.58	92	42
60.60	95	44
60.62	97	46
60.64	100	48
60.66	102	50
60.68	105	52
60.70	108	54
60.72	110	56
60.74	113	58
60.76	116	61
60.78	119	63
60.80	122	65
60.82	125	68
60.84	127	70
60.86	130	73
60.88	133	76
60.90	136	78
60.92	139	81
60.94	143	84
60.96	146	87
60.98	149	90
61.00	**152**	**93**

Stage-Area-Storage for Pond B2: bioretention system 2

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
57.50	258	0
57.55	264	4
57.60	269	8
57.65	275	12
57.70	281	15
57.75	287	19
57.80	292	23
57.85	298	27
57.90	304	31
57.95	309	35
58.00	315	39
58.05	321	43
58.10	326	46
58.15	332	50
58.20	338	54
58.25	344	58
58.30	349	62
58.35	355	66
58.40	361	70
58.45	366	74
58.50	372	77
58.55	378	81
58.60	383	85
58.65	389	89
58.70	395	93
58.75	401	97
58.80	406	101
58.85	412	104
58.90	418	108
58.95	423	112
59.00	429	116
59.05	435	120
59.10	440	124
59.15	446	128
59.20	452	132
59.25	458	135
59.30	463	139
59.35	469	143
59.40	475	147
59.45	480	151
59.50	**486**	155
59.55	486	160
59.60	486	166
59.65	486	172
59.70	486	180
59.75	486	188
59.80	486	197
59.85	486	206
59.90	486	217
59.95	486	228
60.00	486	241
60.05	486	254
60.10	486	269
60.15	486	285
60.20	486	302
60.25	486	321
60.30	486	341
60.35	486	362
60.40	486	385
60.45	486	410
60.50	486	436
60.55	486	464
60.60	486	494
60.65	486	525
60.70	486	559
60.75	486	594
60.80	486	631
60.85	486	670
60.90	486	711
60.95	486	755
61.00	486	**800**
61.05	486	800
61.10	486	800
61.15	486	800
61.20	486	800
61.25	486	800
61.30	486	800
61.35	486	800
61.40	486	800
61.45	486	800
61.50	486	800
61.55	486	800
61.60	486	800
61.65	486	800
61.70	486	800
61.75	486	800

Stage-Discharge for Pond B2: bioretention system 2

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
57.50	0.00	0.00	0.00
57.55	0.00	0.00	0.00
57.60	0.00	0.00	0.00
57.65	0.00	0.00	0.00
57.70	0.01	0.01	0.00
57.75	0.01	0.01	0.00
57.80	0.01	0.01	0.00
57.85	0.01	0.01	0.00
57.90	0.01	0.01	0.00
57.95	0.01	0.01	0.00
58.00	0.01	0.01	0.00
58.05	0.01	0.01	0.00
58.10	0.01	0.01	0.00
58.15	0.01	0.01	0.00
58.20	0.01	0.01	0.00
58.25	0.01	0.01	0.00
58.30	0.01	0.01	0.00
58.35	0.01	0.01	0.00
58.40	0.01	0.01	0.00
58.45	0.01	0.01	0.00
58.50	0.01	0.01	0.00
58.55	0.01	0.01	0.00
58.60	0.01	0.01	0.00
58.65	0.01	0.01	0.00
58.70	0.01	0.01	0.00
58.75	0.01	0.01	0.00
58.80	0.01	0.01	0.00
58.85	0.01	0.01	0.00
58.90	0.01	0.01	0.00
58.95	0.01	0.01	0.00
59.00	0.01	0.01	0.00
59.05	0.01	0.01	0.00
59.10	0.01	0.01	0.00
59.15	0.01	0.01	0.00
59.20	0.01	0.01	0.00
59.25	0.01	0.01	0.00
59.30	0.01	0.01	0.00
59.35	0.01	0.01	0.00
59.40	0.01	0.01	0.00
59.45	0.01	0.01	0.00
59.50	0.01	0.01	0.00
59.55	0.01	0.01	0.00
59.60	0.01	0.01	0.00
59.65	0.01	0.01	0.00
59.70	0.01	0.01	0.00
59.75	0.01	0.01	0.00
59.80	0.01	0.01	0.00
59.85	0.01	0.01	0.00
59.90	0.01	0.01	0.00
59.95	0.01	0.01	0.00
60.00	0.01	0.01	0.00
60.05	0.01	0.01	0.00
60.10	0.01	0.01	0.00
60.15	0.02	0.02	0.00
60.20	0.02	0.02	0.00
60.25	0.02	0.02	0.00
60.30	0.02	0.02	0.00
60.35	0.02	0.02	0.00
60.40	0.02	0.02	0.00
60.45	0.02	0.02	0.00
60.50	0.02	0.02	0.00
60.55	0.03	0.02	0.01
60.60	0.07	0.02	0.05
60.65	0.13	0.02	0.11
60.70	0.21	0.02	0.19
60.75	0.31	0.02	0.30
60.80	0.44	0.02	0.42
60.85	0.58	0.02	0.57
60.90	0.75	0.02	0.73
60.95	0.93	0.02	0.91
61.00	1.12	0.02	1.10
61.05	1.33	0.02	1.31
61.10	1.55	0.02	1.54
61.15	1.79	0.02	1.77
61.20	1.89	0.02	1.87
61.25	1.91	0.02	1.89
61.30	1.92	0.02	1.90
61.35	1.94	0.02	1.92
61.40	1.95	0.02	1.93
61.45	1.97	0.02	1.95
61.50	1.98	0.02	1.96
61.55	2.00	0.02	1.98
61.60	2.01	0.02	1.99
61.65	2.03	0.02	2.01
61.70	2.04	0.02	2.02
61.75	**2.06**	**0.02**	**2.04**

BIORETENTION SYSTEM WITH INTERNAL STORAGE RESERVOIR
(UNH Stormwater Center Specification)

Type/Node Name: **Bioretention System 3**

Enter the node name in the drainage analysis if applicable.

0.57	ac	A = Area draining to the practice	
0.37	ac	A_I = Impervious area draining to the practice	
0.65	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.64	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.36	ac-in	WQV= 1" x Rv x A	
1,324	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
132	cf	10% x WQV (check calc for sediment forebay)	
331	cf	25% x WQV (check calc for water stored in saturated zone)	
Sediment Forebay		Method of Pretreatment	
198	cf	If pretrt is sed forebay: V_{SED} (sediment forebay volume)	**$\geq$ 10%WQV**
5,898	cf	Volume below lowest orifice[1]	**$\geq$ 100%WQV**
983	cf	Water stored in voids of saturated zone	**$\geq$ 26%WQV**
0.03	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec)[2]	
59.20	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.08	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{WQV}$**
9.19	hours	T_{ED} = Drawdown time of extended detention = $2WQV/Q_{WQV}$	**$\geq$ 24-hrs**
24.00	in	Depth of Filter Media	**$\geq$ 18"**
3.00	:1	Pond side slopes	**$\geq$ 3:1**
N/A		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of $\leq$6")?	
60.97	ft	Peak elevation of the 50-year storm event (E_{50})	
61.00	ft	Berm elevation of the pond	
YES		$E_{50} \leq$ the berm elevation?	**← yes**

1. Volume stored above the wetland soil and below the high flow by-pass.

Designer's Notes:

Stage-Area-Storage for Pond FB3: sediment forebay

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
59.00	340	0	60.06	586	457
59.02	344	7	60.08	586	457
59.04	349	14	60.10	586	457
59.06	353	21	60.12	586	457
59.08	357	28	60.14	586	457
59.10	362	35	60.16	586	457
59.12	366	42	60.18	586	457
59.14	370	50	60.20	586	457
59.16	375	57	60.22	586	457
59.18	379	65	60.24	586	457
59.20	384	72	60.26	586	457
59.22	388	80	60.28	586	457
59.24	393	88	60.30	586	457
59.26	398	96	60.32	586	457
59.28	402	104	60.34	586	457
59.30	407	112	60.36	586	457
59.32	411	120	60.38	586	457
59.34	416	128	60.40	586	457
59.36	421	137	60.42	586	457
59.38	426	145	60.44	586	457
59.40	430	154	60.46	586	457
59.42	435	162	60.48	586	457
59.44	440	171	60.50	586	457
59.46	445	180	60.52	586	457
59.48	450	189	60.54	586	457
59.50	455	198	60.56	586	457
59.52	460	207	60.58	586	457
59.54	465	216	60.60	586	457
59.56	470	226	60.62	586	457
59.58	475	235	60.64	586	457
59.60	480	245	60.66	586	457
59.62	485	254	60.68	586	457
59.64	490	264	60.70	586	457
59.66	495	274	60.72	586	457
59.68	500	284	60.74	586	457
59.70	505	294	60.76	586	457
59.72	510	304	60.78	586	457
59.74	516	314	60.80	586	457
59.76	521	325	60.82	586	457
59.78	526	335	60.84	586	457
59.80	531	346	60.86	586	457
59.82	537	356	60.88	586	457
59.84	542	367	60.90	586	457
59.86	548	378	60.92	586	457
59.88	553	389	60.94	586	457
59.90	558	400	60.96	586	457
59.92	564	411	60.98	586	457
59.94	569	423	61.00	586	457
59.96	575	434			
59.98	580	446			
60.00	**586**	**457**			
60.02	586	457			
60.04	586	457			

Stage-Area-Storage for Pond B3: bioretention system 3

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
57.00	1,639	0
57.05	1,648	25
57.10	1,657	49
57.15	1,667	74
57.20	1,676	98
57.25	1,685	123
57.30	1,694	148
57.35	1,703	172
57.40	1,713	197
57.45	1,722	221
57.50	1,731	246
57.55	1,740	270
57.60	1,749	295
57.65	1,759	320
57.70	1,768	344
57.75	1,777	369
57.80	1,786	393
57.85	1,795	418
57.90	1,805	443
57.95	1,814	467
58.00	1,823	492
58.05	1,832	516
58.10	1,841	541
58.15	1,851	565
58.20	1,860	590
58.25	1,869	615
58.30	1,878	639
58.35	1,887	664
58.40	1,897	688
58.45	1,906	713
58.50	1,915	738
58.55	1,924	762
58.60	1,933	787
58.65	1,943	811
58.70	1,952	836
58.75	1,961	860
58.80	1,970	885
58.85	1,979	910
58.90	1,989	934
58.95	1,998	959
59.00	**2,007**	983
59.05	2,007	1,066
59.10	2,007	1,152
59.15	2,007	1,239
59.20	2,007	1,328
59.25	2,007	1,420
59.30	2,007	1,514
59.35	2,007	1,610
59.40	2,007	1,708
59.45	2,007	1,809
59.50	2,007	1,912
59.55	2,007	2,017
59.60	2,007	2,125
59.65	2,007	2,235
59.70	2,007	2,347
59.75	2,007	2,462
59.80	2,007	2,580
59.85	2,007	2,700
59.90	2,007	2,822
59.95	2,007	2,947
60.00	2,007	3,075
60.05	2,007	3,207
60.10	2,007	3,344
60.15	2,007	3,487
60.20	2,007	3,635
60.25	2,007	3,789
60.30	2,007	3,949
60.35	2,007	4,115
60.40	2,007	4,287
60.45	2,007	4,466
60.50	2,007	4,650
60.55	2,007	4,842
60.60	2,007	5,039
60.65	2,007	5,244
60.70	2,007	5,455
60.75	2,007	5,673
60.80	2,007	5,898
60.85	2,007	6,130
60.90	2,007	6,369
60.95	2,007	6,616
61.00	2,007	**6,870**

Stage-Discharge for Pond B3: bioretention system 3

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
57.00	0.00	0.00	0.00
57.05	0.03	0.03	0.00
57.10	0.03	0.03	0.00
57.15	0.03	0.03	0.00
57.20	0.03	0.03	0.00
57.25	0.03	0.03	0.00
57.30	0.03	0.03	0.00
57.35	0.03	0.03	0.00
57.40	0.04	0.04	0.00
57.45	0.04	0.04	0.00
57.50	0.04	0.04	0.00
57.55	0.04	0.04	0.00
57.60	0.04	0.04	0.00
57.65	0.04	0.04	0.00
57.70	0.04	0.04	0.00
57.75	0.04	0.04	0.00
57.80	0.04	0.04	0.00
57.85	0.05	0.05	0.00
57.90	0.05	0.05	0.00
57.95	0.05	0.05	0.00
58.00	0.05	0.05	0.00
58.05	0.05	0.05	0.00
58.10	0.05	0.05	0.00
58.15	0.05	0.05	0.00
58.20	0.05	0.05	0.00
58.25	0.06	0.06	0.00
58.30	0.06	0.06	0.00
58.35	0.06	0.06	0.00
58.40	0.06	0.06	0.00
58.45	0.06	0.06	0.00
58.50	0.06	0.06	0.00
58.55	0.06	0.06	0.00
58.60	0.06	0.06	0.00
58.65	0.06	0.06	0.00
58.70	0.07	0.07	0.00
58.75	0.07	0.07	0.00
58.80	0.07	0.07	0.00
58.85	0.07	0.07	0.00
58.90	0.07	0.07	0.00
58.95	0.07	0.07	0.00
59.00	0.07	0.07	0.00
59.05	0.07	0.07	0.00
59.10	0.07	0.07	0.00
59.15	0.08	0.08	0.00
59.20	0.08	0.08	0.00
59.25	0.08	0.08	0.00
59.30	0.08	0.08	0.00
59.35	0.08	0.08	0.00
59.40	0.08	0.08	0.00
59.45	0.08	0.08	0.00
59.50	0.08	0.08	0.00
59.55	0.08	0.08	0.00
59.60	0.09	0.09	0.00
59.65	0.09	0.09	0.00
59.70	0.09	0.09	0.00
59.75	0.09	0.09	0.00
59.80	0.09	0.09	0.00
59.85	0.09	0.09	0.00
59.90	0.09	0.09	0.00
59.95	0.09	0.09	0.00
60.00	0.09	0.09	0.00
60.05	0.09	0.09	0.00
60.10	0.10	0.10	0.00
60.15	0.10	0.10	0.00
60.20	0.10	0.10	0.00
60.25	0.10	0.10	0.00
60.30	0.10	0.10	0.00
60.35	0.10	0.10	0.00
60.40	0.10	0.10	0.00
60.45	0.10	0.10	0.00
60.50	0.10	0.10	0.00
60.55	0.11	0.11	0.00
60.60	0.11	0.11	0.00
60.65	0.11	0.11	0.00
60.70	0.11	0.11	0.00
60.75	0.11	0.11	0.00
60.80	0.11	0.11	0.00
60.85	0.25	0.11	0.14
60.90	0.52	0.11	0.41
60.95	0.86	0.11	0.75
61.00	**1.26**	**0.11**	**1.15**

BIORETENTION SYSTEM WITH INTERNAL STORAGE RESERVOIR
(UNH Stormwater Center Specification)

Type/Node Name: **Bioretention System 4**

Enter the node name in the drainage analysis if applicable.

0.08	ac	A = Area draining to the practice	
0.04	ac	A_I = Impervious area draining to the practice	
0.53	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.53	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.04	ac-in	WQV= 1" x Rv x A	
162	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
16	cf	10% x WQV (check calc for sediment forebay)	
41	cf	25% x WQV (check calc for water stored in saturated zone)	
Sediment Forebay		Method of Pretreatment	
44	cf	If pretrt is sed forebay: V_{SED} (sediment forebay volume)	**$\geq$ 10%WQV**
1,089	cf	Volume below lowest orifice[1]	**$\geq$ 100%WQV**
310	cf	Water stored in voids of saturated zone	**$\geq$ 26%WQV**
0.00	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec)[2]	
58.55	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.01	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**$< 2Q_{WQV}$**
9.02	hours	T_{ED} = Drawdown time of extended detention = $2WQV/Q_{WQV}$	**$\geq$ 24-hrs**
24.00	in	Depth of Filter Media	**$\geq$ 18"**
3.00	:1	Pond side slopes	**$\geq$ 3:1**
N/A		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of $\leq$6")?	
60.74	ft	Peak elevation of the 50-year storm event (E_{50})	
61.00	ft	Berm elevation of the pond	
YES		$E_{50} \leq$ the berm elevation?	**← yes**

1. Volume stored above the wetland soil and below the high flow by-pass.

Designer's Notes:

Stage-Area-Storage for Pond FB4: sediment forebay

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
59.50	124	0
59.51	125	1
59.52	127	3
59.53	128	4
59.54	130	5
59.55	131	6
59.56	133	8
59.57	134	9
59.58	136	10
59.59	137	12
59.60	139	13
59.61	140	15
59.62	142	16
59.63	143	17
59.64	145	19
59.65	146	20
59.66	148	22
59.67	149	23
59.68	151	25
59.69	152	26
59.70	154	28
59.71	156	29
59.72	157	31
59.73	159	32
59.74	160	34
59.75	162	36
59.76	164	37
59.77	165	39
59.78	167	41
59.79	169	42
59.80	170	44
59.81	172	46
59.82	174	47
59.83	175	49
59.84	177	51
59.85	179	53
59.86	180	54
59.87	182	56
59.88	184	58
59.89	185	60
59.90	187	62
59.91	189	64
59.92	191	66
59.93	192	67
59.94	194	69
59.95	196	71
59.96	198	73
59.97	200	75
59.98	201	77
59.99	203	79
60.00	**205**	**81**

Stage-Area-Storage for Pond B4: bioretention system 4

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
57.50	516	0	58.03	563	82
57.51	517	2	58.04	564	84
57.52	518	3	58.05	564	85
57.53	519	5	58.06	565	87
57.54	520	6	58.07	566	88
57.55	520	8	58.08	567	90
57.56	521	9	58.09	568	91
57.57	522	11	58.10	569	93
57.58	523	12	58.11	570	94
57.59	524	14	58.12	571	96
57.60	525	15	58.13	571	98
57.61	526	17	58.14	572	99
57.62	527	19	58.15	573	101
57.63	527	20	58.16	574	102
57.64	528	22	58.17	575	104
57.65	529	23	58.18	576	105
57.66	530	25	58.19	577	107
57.67	531	26	58.20	578	108
57.68	532	28	58.21	578	110
57.69	533	29	58.22	579	111
57.70	534	31	58.23	580	113
57.71	534	33	58.24	581	115
57.72	535	34	58.25	582	116
57.73	536	36	58.26	583	118
57.74	537	37	58.27	584	119
57.75	538	39	58.28	585	121
57.76	539	40	58.29	586	122
57.77	540	42	58.30	586	124
57.78	541	43	58.31	587	125
57.79	542	45	58.32	588	127
57.80	542	46	58.33	589	128
57.81	543	48	58.34	590	130
57.82	544	50	58.35	591	132
57.83	545	51	58.36	592	133
57.84	546	53	58.37	593	135
57.85	547	54	58.38	593	136
57.86	548	56	58.39	594	138
57.87	549	57	58.40	595	139
57.88	549	59	58.41	596	141
57.89	550	60	58.42	597	142
57.90	551	62	58.43	598	144
57.91	552	63	58.44	599	146
57.92	553	65	58.45	600	147
57.93	554	67	58.46	600	149
57.94	555	68	58.47	601	150
57.95	556	70	58.48	602	152
57.96	556	71	58.49	603	153
57.97	557	73	58.50	604	155
57.98	558	74	58.51	605	156
57.99	559	76	58.52	606	158
58.00	560	77	58.53	607	159
58.01	561	79	58.54	608	161
58.02	562	80	58.55	608	163

Stage-Area-Storage for Pond B4: bioretention system 4 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
58.56	609	164	59.09	656	246
58.57	610	166	59.10	657	248
58.58	611	167	59.11	658	249
58.59	612	169	59.12	659	251
58.60	613	170	59.13	659	252
58.61	614	172	59.14	660	254
58.62	615	173	59.15	661	255
58.63	615	175	59.16	662	257
58.64	616	176	59.17	663	259
58.65	617	178	59.18	664	260
58.66	618	180	59.19	665	262
58.67	619	181	59.20	666	263
58.68	620	183	59.21	666	265
58.69	621	184	59.22	667	266
58.70	622	186	59.23	668	268
58.71	622	187	59.24	669	269
58.72	623	189	59.25	670	271
58.73	624	190	59.26	671	272
58.74	625	192	59.27	672	274
58.75	626	194	59.28	673	276
58.76	627	195	59.29	674	277
58.77	628	197	59.30	674	279
58.78	629	198	59.31	675	280
58.79	630	200	59.32	676	282
58.80	630	201	59.33	677	283
58.81	631	203	59.34	678	285
58.82	632	204	59.35	679	286
58.83	633	206	59.36	680	288
58.84	634	207	59.37	681	289
58.85	635	209	59.38	681	291
58.86	636	211	59.39	682	293
58.87	637	212	59.40	683	294
58.88	637	214	59.41	684	296
58.89	638	215	59.42	685	297
58.90	639	217	59.43	686	299
58.91	640	218	59.44	687	300
58.92	641	220	59.45	688	302
58.93	642	221	59.46	688	303
58.94	643	223	59.47	689	305
58.95	644	224	59.48	690	307
58.96	644	226	59.49	691	308
58.97	645	228	59.50	**692**	310
58.98	646	229	59.51	692	314
58.99	647	231	59.52	692	317
59.00	648	232	59.53	692	321
59.01	649	234	59.54	692	325
59.02	650	235	59.55	692	329
59.03	651	237	59.56	692	333
59.04	652	238	59.57	692	338
59.05	652	240	59.58	692	342
59.06	653	241	59.59	692	346
59.07	654	243	59.60	692	350
59.08	655	245	59.61	692	354

Stage-Area-Storage for Pond B4: bioretention system 4 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
59.62	692	358	60.15	692	619
59.63	692	362	60.16	692	625
59.64	692	367	60.17	692	631
59.65	692	371	60.18	692	637
59.66	692	375	60.19	692	643
59.67	692	379	60.20	692	650
59.68	692	384	60.21	692	656
59.69	692	388	60.22	692	662
59.70	692	393	60.23	692	669
59.71	692	397	60.24	692	675
59.72	692	401	60.25	692	682
59.73	692	406	60.26	692	688
59.74	692	410	60.27	692	695
59.75	692	415	60.28	692	702
59.76	692	419	60.29	692	708
59.77	692	424	60.30	692	715
59.78	692	428	60.31	692	722
59.79	692	433	60.32	692	729
59.80	692	438	60.33	692	736
59.81	692	442	60.34	692	743
59.82	692	447	60.35	692	750
59.83	692	452	60.36	692	757
59.84	692	456	60.37	692	765
59.85	692	461	60.38	692	772
59.86	692	466	60.39	692	779
59.87	692	471	60.40	692	787
59.88	692	476	60.41	692	794
59.89	692	480	60.42	692	802
59.90	692	485	60.43	692	810
59.91	692	490	60.44	692	817
59.92	692	495	60.45	692	825
59.93	692	500	60.46	692	833
59.94	692	505	60.47	692	841
59.95	692	510	60.48	692	849
59.96	692	515	60.49	692	857
59.97	692	520	60.50	692	865
59.98	692	525	60.51	692	873
59.99	692	530	60.52	692	881
60.00	692	536	60.53	692	889
60.01	692	541	60.54	692	898
60.02	692	546	60.55	692	906
60.03	692	551	60.56	692	915
60.04	692	557	60.57	692	923
60.05	692	562	60.58	692	932
60.06	692	568	60.59	692	941
60.07	692	573	60.60	692	949
60.08	692	579	60.61	692	958
60.09	692	584	60.62	692	967
60.10	692	590	60.63	692	976
60.11	692	596	60.64	692	985
60.12	692	601	60.65	692	994
60.13	692	607	60.66	692	1,003
60.14	692	613	60.67	692	1,012

Stage-Area-Storage for Pond B4: bioretention system 4 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
60.68	692	1,022
60.69	692	1,031
60.70	692	1,041
60.71	692	1,050
60.72	692	1,060
60.73	692	1,069
60.74	692	1,079
60.75	692	1,089
60.76	692	1,099
60.77	692	1,109
60.78	692	1,119
60.79	692	1,129
60.80	692	1,139
60.81	692	1,149
60.82	692	1,160
60.83	692	1,170
60.84	692	1,181
60.85	692	1,191
60.86	692	1,202
60.87	692	1,212
60.88	692	1,223
60.89	692	1,234
60.90	692	1,245
60.91	692	1,256
60.92	692	1,267
60.93	692	1,278
60.94	692	1,289
60.95	692	1,301
60.96	692	1,312
60.97	692	1,324
60.98	692	1,335
60.99	692	1,347
61.00	692	**1,358**

Stage-Discharge for Pond B4: bioretention system 4

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
57.50	0.00	0.00	0.00	58.03	0.01	0.01	0.00
57.51	0.00	0.00	0.00	58.04	0.01	0.01	0.00
57.52	0.00	0.00	0.00	58.05	0.01	0.01	0.00
57.53	0.00	0.00	0.00	58.06	0.01	0.01	0.00
57.54	0.00	0.00	0.00	58.07	0.01	0.01	0.00
57.55	0.00	0.00	0.00	58.08	0.01	0.01	0.00
57.56	0.01	0.01	0.00	58.09	0.01	0.01	0.00
57.57	0.01	0.01	0.00	58.10	0.01	0.01	0.00
57.58	0.01	0.01	0.00	58.11	0.01	0.01	0.00
57.59	0.01	0.01	0.00	58.12	0.01	0.01	0.00
57.60	0.01	0.01	0.00	58.13	0.01	0.01	0.00
57.61	0.01	0.01	0.00	58.14	0.01	0.01	0.00
57.62	0.01	0.01	0.00	58.15	0.01	0.01	0.00
57.63	0.01	0.01	0.00	58.16	0.01	0.01	0.00
57.64	0.01	0.01	0.00	58.17	0.01	0.01	0.00
57.65	0.01	0.01	0.00	58.18	0.01	0.01	0.00
57.66	0.01	0.01	0.00	58.19	0.01	0.01	0.00
57.67	0.01	0.01	0.00	58.20	0.01	0.01	0.00
57.68	0.01	0.01	0.00	58.21	0.01	0.01	0.00
57.69	0.01	0.01	0.00	58.22	0.01	0.01	0.00
57.70	0.01	0.01	0.00	58.23	0.01	0.01	0.00
57.71	0.01	0.01	0.00	58.24	0.01	0.01	0.00
57.72	0.01	0.01	0.00	58.25	0.01	0.01	0.00
57.73	0.01	0.01	0.00	58.26	0.01	0.01	0.00
57.74	0.01	0.01	0.00	58.27	0.01	0.01	0.00
57.75	0.01	0.01	0.00	58.28	0.01	0.01	0.00
57.76	0.01	0.01	0.00	58.29	0.01	0.01	0.00
57.77	0.01	0.01	0.00	58.30	0.01	0.01	0.00
57.78	0.01	0.01	0.00	58.31	0.01	0.01	0.00
57.79	0.01	0.01	0.00	58.32	0.01	0.01	0.00
57.80	0.01	0.01	0.00	58.33	0.01	0.01	0.00
57.81	0.01	0.01	0.00	58.34	0.01	0.01	0.00
57.82	0.01	0.01	0.00	58.35	0.01	0.01	0.00
57.83	0.01	0.01	0.00	58.36	0.01	0.01	0.00
57.84	0.01	0.01	0.00	58.37	0.01	0.01	0.00
57.85	0.01	0.01	0.00	58.38	0.01	0.01	0.00
57.86	0.01	0.01	0.00	58.39	0.01	0.01	0.00
57.87	0.01	0.01	0.00	58.40	0.01	0.01	0.00
57.88	0.01	0.01	0.00	58.41	0.01	0.01	0.00
57.89	0.01	0.01	0.00	58.42	0.01	0.01	0.00
57.90	0.01	0.01	0.00	58.43	0.01	0.01	0.00
57.91	0.01	0.01	0.00	58.44	0.01	0.01	0.00
57.92	0.01	0.01	0.00	58.45	0.01	0.01	0.00
57.93	0.01	0.01	0.00	58.46	0.01	0.01	0.00
57.94	0.01	0.01	0.00	58.47	0.01	0.01	0.00
57.95	0.01	0.01	0.00	58.48	0.01	0.01	0.00
57.96	0.01	0.01	0.00	58.49	0.01	0.01	0.00
57.97	0.01	0.01	0.00	58.50	0.01	0.01	0.00
57.98	0.01	0.01	0.00	58.51	0.01	0.01	0.00
57.99	0.01	0.01	0.00	58.52	0.01	0.01	0.00
58.00	0.01	0.01	0.00	58.53	0.01	0.01	0.00
58.01	0.01	0.01	0.00	58.54	0.01	0.01	0.00
58.02	0.01	0.01	0.00	58.55	0.01	0.01	0.00

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **Infiltration System 1**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← yes
0.44	ac	A = Area draining to the practice	
0.43	ac	A_I = Impervious area draining to the practice	
0.99	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.94	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.41	ac-in	WQV= 1” x Rv x A	
1,485	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	
371	cf	25% x WQV (check calc for sediment forebay volume)	
Isolator Row		Method of pretreatment? (not required for clean or roof runoff)	
*	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
1,582	cf	V = Volume[1] (attach a stage-storage table)	≥ WQV
3,088	sf	A_{SA} = Surface area of the bottom of the pond	
0.72	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
8.0	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
58.60	feet	E_{BTM} = Elevation of the bottom of the basin	
54.60	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
51.60	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
4.00	feet	D_{SHWT} = Separation from SHWT	≥ * [3]
7.0	feet	D_{ROCK} = Separation from bedrock	≥ * [3]
N/A	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	≥ 24"
N/A	ft	D_T = Depth of trench, if trench proposed	4 - 10 ft
yes	Yes/No	If a trench or underground system is proposed, has observation well been provided?	←yes
N/A		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	← yes
N/A	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
N/A	:1	If a basin is proposed, pond side slopes.	≥3:1
60.15	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
60.93	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
60.93	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes: *All pavement runoff is pretreated by the isolator row

Stage-Area-Storage for Pond IS1: infiltration 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
58.60	**3,088**	0
58.65	3,088	62
58.70	3,088	124
58.75	3,088	185
58.80	3,088	247
58.85	3,088	309
58.90	3,088	371
58.95	3,088	432
59.00	3,088	494
59.05	3,088	556
59.10	3,088	618
59.15	3,088	741
59.20	3,088	864
59.25	3,088	986
59.30	3,088	1,108
59.35	3,088	1,228
59.40	3,088	1,347
59.45	3,088	1,465
59.50	3,088	1,582
59.55	3,088	1,697
59.60	3,088	1,811
59.65	3,088	1,923
59.70	3,088	2,034
59.75	3,088	2,143
59.80	3,088	2,250
59.85	3,088	2,355
59.90	3,088	2,457
59.95	3,088	2,557
60.00	3,088	2,654
60.05	3,088	2,749
60.10	3,088	2,839
60.15	3,088	2,925
60.20	3,088	3,005
60.25	3,088	3,080
60.30	3,088	3,151
60.35	3,088	3,219
60.40	3,088	3,284
60.45	3,088	3,346
60.50	3,088	3,408
60.55	3,088	3,470
60.60	3,088	3,532
60.65	3,088	3,593
60.70	3,088	3,655
60.75	3,088	3,717
60.80	3,088	3,779
60.85	3,088	3,840
60.90	3,088	**3,902**

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

New Hampshire Department of Environmental Services

Type/Node Name: **Infiltration System 2**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← yes
0.75	ac	A = Area draining to the practice	
0.74	ac	A_I = Impervious area draining to the practice	
0.98	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.93	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.70	ac-in	WQV= 1" x Rv x A	
2,542	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
636	cf	25% x WQV (check calc for sediment forebay volume)	
Isolator Row		Method of pretreatment? (not required for clean or roof runoff)	
*	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
3,340	cf	V = Volume[1] (attach a stage-storage table)	**≥ WQV**
6,032	sf	A_{SA} = Surface area of the bottom of the pond	
0.72	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
7.0	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
57.70	feet	E_{BTM} = Elevation of the bottom of the basin	
53.70	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
49.73	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
4.00	feet	D_{SHWT} = Separation from SHWT	**≥ *[3]**
8.0	feet	D_{ROCK} = Separation from bedrock	**≥ *[3]**
N/A	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	**≥ 24"**
N/A	ft	D_T = Depth of trench, if trench proposed	**4 - 10 ft**
yes	Yes/No	If a trench or underground system is proposed, has observation well been provided?	**←yes**
N/A		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	**← yes**
N/A	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	**← yes**
N/A	:1	If a basin is proposed, pond side slopes.	**≥3:1**
59.22	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
60.01	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
60.03	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	**← yes**
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	**← yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes: *All pavement runoff is pretreated by the isolator row

Stage-Area-Storage for Pond IS2: infiltration 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
57.70	**6,032**	0
57.75	6,032	121
57.80	6,032	241
57.85	6,032	362
57.90	6,032	483
57.95	6,032	603
58.00	6,032	724
58.05	6,032	844
58.10	6,032	965
58.15	6,032	1,086
58.20	6,032	1,206
58.25	6,032	1,450
58.30	6,032	1,693
58.35	6,032	1,935
58.40	6,032	2,175
58.45	6,032	2,413
58.50	6,032	2,649
58.55	6,032	2,882
58.60	6,032	3,112
58.65	6,032	3,340
58.70	6,032	3,565
58.75	6,032	3,786
58.80	6,032	4,005
58.85	6,032	4,220
58.90	6,032	4,431
58.95	6,032	4,638
59.00	6,032	4,840
59.05	6,032	5,037
59.10	6,032	5,228
59.15	6,032	5,414
59.20	6,032	5,592
59.25	6,032	5,761
59.30	6,032	5,919
59.35	6,032	6,066
59.40	6,032	6,204
59.45	6,032	6,337
59.50	6,032	6,464
59.55	6,032	6,586
59.60	6,032	6,707
59.65	6,032	6,828
59.70	6,032	6,948
59.75	6,032	7,069
59.80	6,032	7,189
59.85	6,032	7,310
59.90	6,032	7,431
59.95	6,032	7,551
60.00	6,032	**7,672**

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **Infiltration System 3**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← **yes**
0.13	ac	A = Area draining to the practice	
0.13	ac	A_I = Impervious area draining to the practice	
0.99	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.94	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.12	ac-in	WQV= 1” x Rv x A	
443	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	
111	cf	25% x WQV (check calc for sediment forebay volume)	
Isolator Row		Method of pretreatment? (not required for clean or roof runoff)	
*	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
2,057	cf	V = Volume[1] (attach a stage-storage table)	**≥ WQV**
1,972	sf	A_{SA} = Surface area of the bottom of the pond	
0.72	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
3.7	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
59.60	feet	E_{BTM} = Elevation of the bottom of the basin	
55.60	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
53.40	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
4.00	feet	D_{SHWT} = Separation from SHWT	**≥ *[3]**
6.2	feet	D_{ROCK} = Separation from bedrock	**≥ *[3]**
N/A	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	**≥ 24"**
N/A	ft	D_T = Depth of trench, if trench proposed	**4 - 10 ft**
yes	Yes/No	If a trench or underground system is proposed, has observation well been provided?	**←yes**
N/A		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	**← yes**
N/A	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	**← yes**
N/A	:1	If a basin is proposed, pond side slopes.	**≥3:1**
60.59	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
61.49	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
61.60	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	**← yes**
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	**← yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes: *All pavement runoff is pretreated by the isolator row

Stage-Area-Storage for Pond IS3: infiltration 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
59.60	**1,972**	0	60.66	1,972	1,202
59.62	1,972	16	60.68	1,972	1,228
59.64	1,972	32	60.70	1,972	1,254
59.66	1,972	47	60.72	1,972	1,279
59.68	1,972	63	60.74	1,972	1,303
59.70	1,972	79	60.76	1,972	1,328
59.72	1,972	95	60.78	1,972	1,352
59.74	1,972	110	60.80	1,972	1,375
59.76	1,972	126	60.82	1,972	1,398
59.78	1,972	142	60.84	1,972	1,421
59.80	1,972	158	60.86	1,972	1,443
59.82	1,972	174	60.88	1,972	1,464
59.84	1,972	189	60.90	1,972	1,485
59.86	1,972	205	60.92	1,972	1,505
59.88	1,972	221	60.94	1,972	1,524
59.90	1,972	237	60.96	1,972	1,543
59.92	1,972	252	60.98	1,972	1,561
59.94	1,972	268	61.00	1,972	1,579
59.96	1,972	284	61.02	1,972	1,597
59.98	1,972	300	61.04	1,972	1,614
60.00	1,972	315	61.06	1,972	1,630
60.02	1,972	331	61.08	1,972	1,647
60.04	1,972	347	61.10	1,972	1,663
60.06	1,972	363	61.12	1,972	1,679
60.08	1,972	379	61.14	1,972	1,695
60.10	1,972	394	61.16	1,972	1,710
60.12	1,972	425	61.18	1,972	1,726
60.14	1,972	456	61.20	1,972	1,742
60.16	1,972	486	61.22	1,972	1,758
60.18	1,972	517	61.24	1,972	1,773
60.20	1,972	548	61.26	1,972	1,789
60.22	1,972	578	61.28	1,972	1,805
60.24	1,972	608	61.30	1,972	1,821
60.26	1,972	638	61.32	1,972	1,837
60.28	1,972	668	61.34	1,972	1,852
60.30	1,972	698	61.36	1,972	1,868
60.32	1,972	728	61.38	1,972	1,884
60.34	1,972	757	61.40	1,972	1,900
60.36	1,972	786	61.42	1,972	1,915
60.38	1,972	816	61.44	1,972	1,931
60.40	1,972	845	61.46	1,972	1,947
60.42	1,972	873	61.48	1,972	1,963
60.44	1,972	902	61.50	1,972	1,979
60.46	1,972	930	61.52	1,972	1,994
60.48	1,972	959	61.54	1,972	2,010
60.50	1,972	987	61.56	1,972	2,026
60.52	1,972	1,015	61.58	1,972	2,042
60.54	1,972	1,042	61.60	1,972	**2,057**
60.56	1,972	1,069			
60.58	1,972	1,097			
60.60	1,972	1,123			
60.62	1,972	1,150			
60.64	1,972	1,176			

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)

0.05	ac	A = Area draining to the practice
0.05	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)
0.05	ac-in	WQV= 1" x Rv x A
169	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

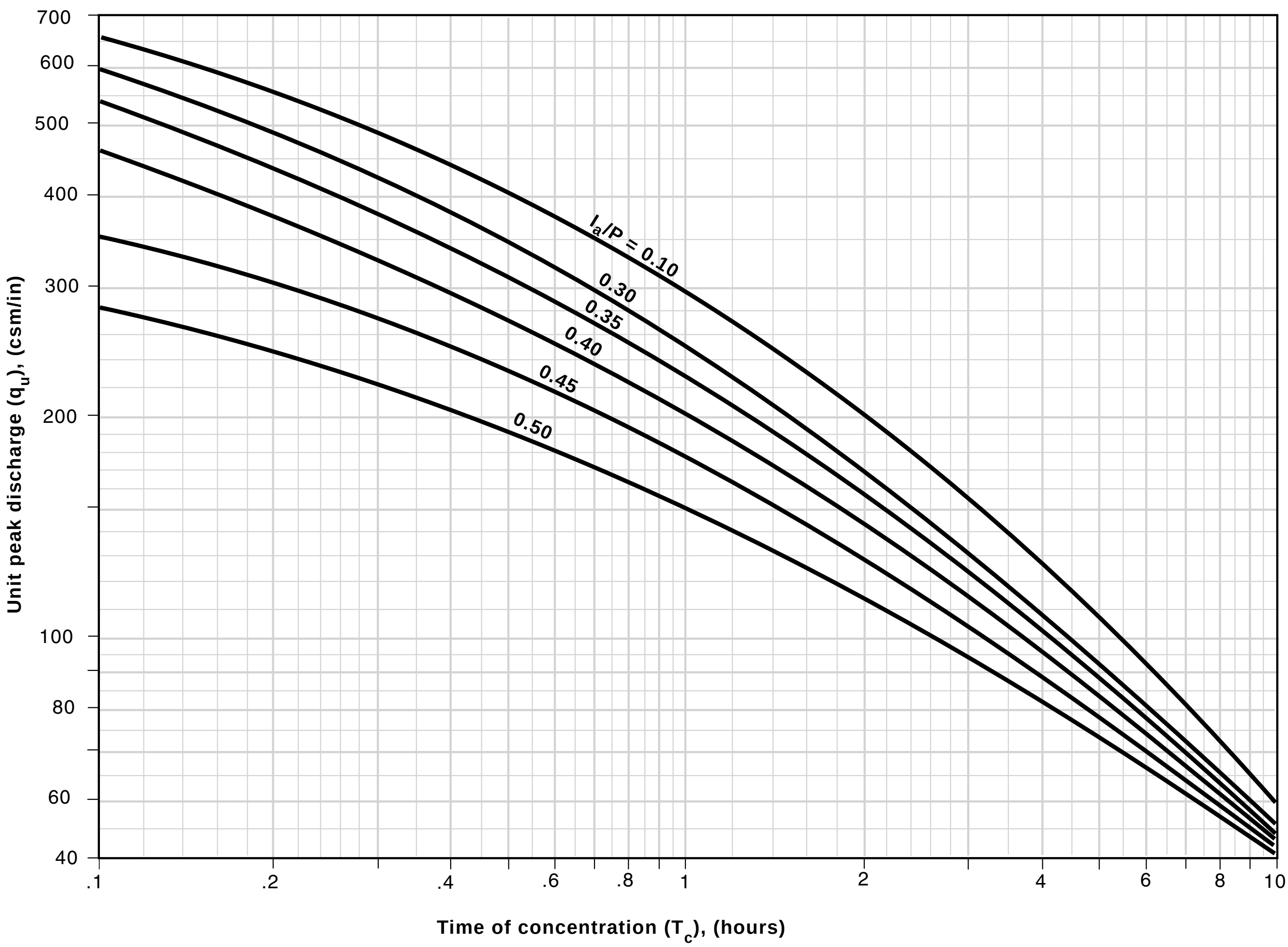
Water Quality Flow (WQF)

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
6.0	minutes	T_c = Time of Concentration
700.0	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
0.051	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: Calculations for WQ-01

The Jellyfish JF4 with 15" cartridges has a treatment capacity of 0.05 cfs

Exhibit 4-III Unit peal discharge (q_u) for NRCS (SCS) type III rainfall distribution



Rip-Rap Apron / Energy Dissipation / Stability Calculations

Outlet # FES-01 (from HydroCAD IS1)

Q10 = 0.95 cfs T_w = 0.33 feet

D_o = 8 inches

Design Criteria

Apron Dimensions

The dimensions of the apron at the outlet of the pipe shall be determined as follows:

1.) The width of the apron at the outlet of the pipe or channel shall be 3 times the diameter of the pipe of width of the channel.

W= **2** feet

2.) The length of the apron shall be determined from the following formula when the tailwater depth at the outlet of the pipe or channel is less than one-half the diameter of the pipe or one-half the width of the channel:

La=1.8*Q/ Do^3/2+ 7Do

La= **7.81** feet

Where:

La is the length of the apron

Q is the discharge from the pipe or channel

D_o is the diameter of pipe of width of channel

3.) When the depth of the tailwater at the outlet of the pipe or channel is equal to or greater than one-half the diameter of the pipe or the width of the channel. Then the following formula applies:

La=3.0*Qo/ Do^1.5 +7D_o

USE THIS ONE

La= **9.90** feet

4.) Where there is no well defined channel downstream of the outlet, the width of the downstream end of the apron shall be determined as follows:

a. For minimum tailwater conditions where the tailwater depth is less than the elevation of the center of the pipe:

W=3*Do+La

USE THIS ONE

W= **9.81** feet

b. For maximum tailwater conditions where the tailwater depth is greater than the elevation of the center of the pipe:

W=3*Do+0.4*La

W= **5.96** feet

5.) Where there is a stable well-defined channel downstream of the apron, the bottom of the apron shall be equal to the width of the channel.

6.) The side of the apron in a well-defined channel shall be 2:1 (horizontal to vertical) or flatter. The height of the structural lining along the channel sides shall begin at the elevation equal to the top of conduit and taper down to the channel bottom through the length of the apron.

7.) The bottom grade of the apron shall be level (0% grade). No overfall is allowable at the end of the apron.

8.) The apron shall be located so that there are no bends in the horizontal alignment of the apron.

Rock Riprap

The following criteria shall be used to determine the dimensions of the rock riprap used for the apron:

1.) The median stone diameter shall be determined using the formula:

d_{50}=0.02*Q^4/3/(Tw*D_o)

d_{50}= **1.02** inches **USE 3** inches

d_{50} minimum 3 inches

Where:

d_{50} is the median stone diameter in feet

Tw is the tailwater depth above the invert of the pipe channel in feet

Q is the discharge from the pipe or channel in cubic feet per second

D_o is the diameter of the pipe or width of the channel in feet

2.) Fifty percent by weight of the riprap mixture shall be smaller the than median size stone designated as d_{50}. The largest stone size in the mixture shall be 1.5 times the d_{50} size.

3.) The quality and gradation of the rock, the thickness of the riprap lining, filter material and the quality of the stone shall meet the requirements in the Rock Riprap BMP. The minimum depth shall be 6 inches or 1.5 times the largest stone size in the mixture whichever is larger (d).

Thickness of the riprap

d = 1.5*(1.5*d_{50}(largest stone size))

d = **7** inches*

* must use a minimum of 6"

Rock Rip Rap Gradation

% of weight smaller than the given size	size of stone in inches		
100	**4.5**	to	**6.0**
85	**3.9**	to	**5.4**
50	**3.0**	to	**4.5**
15	**0.9**	to	**1.5**

Formulas Used (Reference NHDES Handbook, Pages 7-114, 7-115)

Outlet # FES-02 (from HydroCAD IS2)

Q10 = 1.04 cfs T_w = 0.5 feet

D_o = 10 inches

Design Criteria

Apron Dimensions

The dimensions of the apron at the outlet of the pipe shall be determined as follows:

1.) The width of the apron at the outlet of the pipe or channel shall be 3 times the diameter of the pipe of width of the channel.

W= **2.5** feet

2.) The length of the apron shall be determined from the following formula when the tailwater depth at the outlet of the pipe or channel is less than one-half the diameter of the pipe or one-half the width of the channel:

La=1.8*Q/ Do^3/2+ 7Do

La= **8.29** feet

Where:

La is the length of the apron

Q is the discharge from the pipe or channel

D_o is the diameter of pipe of width of channel

3.) When the depth of the tailwater at the outlet of the pipe or channel is equal to or greater than one-half the diameter of the pipe or the width of the channel. Then the following formula applies:

La=3.0*Qo/ Do^1.5 +7D_o

USE THIS ONE La= **9.93** feet

4.) Where there is no well defined channel downstream of the outlet, the width of the downstream end of the apron shall be determined as follows:

a. For minimum tailwater conditions where the tailwater depth is less than the elevation of the center of the pipe:

W=3*Do+La

USE THIS ONE W= **10.79** feet

b. For maximum tailwater conditions where the tailwater depth is greater than the elevation of the center of the pipe:

W=3*Do+0.4*La

W= **6.47** feet

5.) Where there is a stable well-defined channel downstream of the apron, the bottom of the apron shall be equal to the width of the channel.

6.) The side of the apron in a well-defined channel shall be 2:1 (horizontal to vertical) or flatter. The height of the structural lining along the channel sides shall begin at the elevation equal to the top of conduit and taper down to the channel bottom through the length of the apron.

7.) The bottom grade of the apron shall be level (0% grade). No overfall is allowable at the end of the apron.

8.) The apron shall be located so that there are no bends in the horizontal alignment of the apron.

Rock Riprap
The following criteria shall be used to determine the dimensions of the rock riprap used for the apron:

1.) The median stone diameter shall be determined using the formula:

d_{50}=0.02*Q^4/3/(Tw*D_o)

d_{50}= **0.61** inches **USE 3** inches

d_{50} minimum 3 inches

Where:
d_{50} is the median stone diameter in feet
Tw is the tailwater depth above the invert of the pipe channel in feet
Q is the discharge from the pipe or channel in cubic feet per second
D_o is the diameter of the pipe or width of the channel in feet

2.) Fifty percent by weight of the riprap mixture shall be smaller the than median size stone designated as d_{50}. The largest stone size in the mixture shall be 1.5 times the d_{50} size.

3.) The quality and gradation of the rock, the thickness of the riprap lining, filter material and the quality of the stone shall meet the requirements in the Rock Riprap BMP. The minimum depth shall be 6 inches or 1.5 times the largest stone size in the mixture whichever is larger (d).

Thickness of the riprap
d = 1.5*(1.5*d_{50}(largest stone size))
d = **7** inches*

* must use a minimum of 6"

Rock Rip Rap Gradation

% of weight smaller than the given size	size of stone in inches		
100	**4.5**	to	**6.0**
85	**3.9**	to	**5.4**
50	**3.0**	to	**4.5**
15	**0.9**	to	**1.5**

Formulas Used (Reference NHDES Handbook, Pages 7-114, 7-115)

Outlet # FES-03 (from HydroCAD P-6)

Q10 = 0.28 cfs T_w = 0.33 feet

D_o = 8 inches

Design Criteria

Apron Dimensions

The dimensions of the apron at the outlet of the pipe shall be determined as follows:

1.) The width of the apron at the outlet of the pipe or channel shall be 3 times the diameter of the pipe of width of the channel.

W= **2** feet

2.) The length of the apron shall be determined from the following formula when the tailwater depth at the outlet of the pipe or channel is less than one-half the diameter of the pipe or one-half the width of the channel:

La=1.8*Q/ Do^3/2+ 7Do

La= **5.59** feet

Where:

La is the length of the apron

Q is the discharge from the pipe or channel

D_o is the diameter of pipe of width of channel

3.) When the depth of the tailwater at the outlet of the pipe or channel is equal to or greater than one-half the diameter of the pipe or the width of the channel. Then the following formula applies:

La=3.0*Qo/ Do^1.5 +7D_o

USE THIS ONE La= **6.21** feet

4.) Where there is no well defined channel downstream of the outlet, the width of the downstream end of the apron shall be determined as follows:

a. For minimum tailwater conditions where the tailwater depth is less than the elevation of the center of the pipe:

W=3*Do+La

USE THIS ONE W= **7.59** feet

b. For maximum tailwater conditions where the tailwater depth is greater than the elevation of the center of the pipe:

W=3*Do+0.4*La

W= **4.48** feet

5.) Where there is a stable well-defined channel downstream of the apron, the bottom of the apron shall be equal to the width of the channel.

6.) The side of the apron in a well-defined channel shall be 2:1 (horizontal to vertical) or flatter. The height of the structural lining along the channel sides shall begin at the elevation equal to the top of conduit and taper down to the channel bottom through the length of the apron.

7.) The bottom grade of the apron shall be level (0% grade). No overfall is allowable at the end of the apron.

8.) The apron shall be located so that there are no bends in the horizontal alignment of the apron.

Rock Riprap

The following criteria shall be used to determine the dimensions of the rock riprap used for the apron:

1.) The median stone diameter shall be determined using the formula:

d_{50}=0.02*Q^4/3/(Tw*D_o)

d_{50}= **0.20** inches **USE 3** inches

d_{50} minimum 3 inches

Where:

d_{50} is the median stone diameter in feet

Tw is the tailwater depth above the invert of the pipe channel in feet

Q is the discharge from the pipe or channel in cubic feet per second

D_o is the diameter of the pipe or width of the channel in feet

2.) Fifty percent by weight of the riprap mixture shall be smaller the than median size stone designated as d_{50}. The largest stone size in the mixture shall be 1.5 times the d_{50} size.

3.) The quality and gradation of the rock, the thickness of the riprap lining, filter material and the quality of the stone shall meet the requirements in the Rock Riprap BMP. The minimum depth shall be 6 inches or 1.5 times the largest stone size in the mixture whichever is larger (d).

Thickness of the riprap

d = 1.5*(1.5*d_{50}(largest stone size))

d = **7** inches*

* must use a minimum of 6"

Rock Rip Rap Gradation

% of weight smaller than the given size	size of stone in inches		
100	**4.5**	to	**6.0**
85	**3.9**	to	**5.4**
50	**3.0**	to	**4.5**
15	**0.9**	to	**1.5**

Formulas Used (Reference NHDES Handbook, Pages 7-114, 7-115)

Outlet # FES-04 (from HydroCAD B2)

Q10 = 0.52 cfs T_w = 0.33 feet

D_o = 8 inches

Design Criteria

Apron Dimensions

The dimensions of the apron at the outlet of the pipe shall be determined as follows:

1.) The width of the apron at the outlet of the pipe or channel shall be 3 times the diameter of the pipe of width of the channel.

W= **2** feet

2.) The length of the apron shall be determined from the following formula when the tailwater depth at the outlet of the pipe or channel is less than one-half the diameter of the pipe or one-half the width of the channel:

La=1.8*Q/ Do^3/2+ 7Do

La= **6.39** feet

Where:

La is the length of the apron

Q is the discharge from the pipe or channel

D_o is the diameter of pipe of width of channel

3.) When the depth of the tailwater at the outlet of the pipe or channel is equal to or greater than one-half the diameter of the pipe or the width of the channel. Then the following formula applies:

La=3.0*Qo/ Do^1.5 +7D_o

USE THIS ONE La= **7.53** feet

4.) Where there is no well defined channel downstream of the outlet, the width of the downstream end of the apron shall be determined as follows:

a. For minimum tailwater conditions where the tailwater depth is less than the elevation of the center of the pipe:

W=3*Do+La

USE THIS ONE W= **8.39** feet

b. For maximum tailwater conditions where the tailwater depth is greater than the elevation of the center of the pipe:

W=3*Do+0.4*La

W= **5.01** feet

5.) Where there is a stable well-defined channel downstream of the apron, the bottom of the apron shall be equal to the width of the channel.

6.) The side of the apron in a well-defined channel shall be 2:1 (horizontal to vertical) or flatter. The height of the structural lining along the channel sides shall begin at the elevation equal to the top of conduit and taper down to the channel bottom through the length of the apron.

7.) The bottom grade of the apron shall be level (0% grade). No overfall is allowable at the end of the apron.

8.) The apron shall be located so that there are no bends in the horizontal alignment of the apron.

Rock Riprap

The following criteria shall be used to determine the dimensions of the rock riprap used for the apron:

1.) The median stone diameter shall be determined using the formula:

d_{50}=0.02*Q^4/3/(Tw*D_o)

d_{50}= **0.46** inches **USE 3** inches

d_{50} minimum 3 inches

Where:

d_{50} is the median stone diameter in feet

Tw is the tailwater depth above the invert of the pipe channel in feet
Q is the discharge from the pipe or channel in cubic feet per second
D_o is the diameter of the pipe or width of the channel in feet

2.) Fifty percent by weight of the riprap mixture shall be smaller the than median size stone designated as d_{50}. The largest stone size in the mixture shall be 1.5 times the d_{50} size.

3.) The quality and gradation of the rock, the thickness of the riprap lining, filter material and the quality of the stone shall meet the requirements in the Rock Riprap BMP. The minimum depth shall be 6 inches or 1.5 times the largest stone size in the mixture whichever is larger (d).

Thickness of the riprap
d = 1.5*(1.5*d_{50}(largest stone size))
d = **7** inches*

* must use a minimum of 6"

Rock Rip Rap Gradation

% of weight smaller than the given size	size of stone in inches		
100	**4.5**	to	**6.0**
85	**3.9**	to	**5.4**
50	**3.0**	to	**4.5**
15	**0.9**	to	**1.5**

Formulas Used (Reference NHDES Handbook, Pages 7-114, 7-115)

Outlet # FES-05 (from HydroCAD B3)

Q10 = 0.00 cfs T_w = 0.00 feet

D_o = 8 inches

Design Criteria

Apron Dimensions

The dimensions of the apron at the outlet of the pipe shall be determined as follows:

1.) The width of the apron at the outlet of the pipe or channel shall be 3 times the diameter of the pipe of width of the channel.

W= **2** feet

2.) The length of the apron shall be determined from the following formula when the tailwater depth at the outlet of the pipe or channel is less than one-half the diameter of the pipe or one-half the width of the channel:

La=1.8*Q/ Do^3/2+ 7Do

La= **4.67** feet

Where:

La is the length of the apron

Q is the discharge from the pipe or channel

D_o is the diameter of pipe of width of channel

3.) When the depth of the tailwater at the outlet of the pipe or channel is equal to or greater than one-half the diameter of the pipe or the width of the channel. Then the following formula applies:

La=3.0*Qo/ Do^1.5 +7D_o

USE THIS ONE La= **4.67** feet

4.) Where there is no well defined channel downstream of the outlet, the width of the downstream end of the apron shall be determined as follows:

a. For minimum tailwater conditions where the tailwater depth is less than the elevation of the center of the pipe:

W=3*Do+La

USE THIS ONE W= **6.67** feet

b. For maximum tailwater conditions where the tailwater depth is greater than the elevation of the center of the pipe:

W=3*Do+0.4*La

W= **3.87** feet

5.) Where there is a stable well-defined channel downstream of the apron, the bottom of the apron shall be equal to the width of the channel.

6.) The side of the apron in a well-defined channel shall be 2:1 (horizontal to vertical) or flatter. The height of the structural lining along the channel sides shall begin at the elevation equal to the top of conduit and taper down to the channel bottom through the length of the apron.

7.) The bottom grade of the apron shall be level (0% grade). No overfall is allowable at the end of the apron.

8.) The apron shall be located so that there are no bends in the horizontal alignment of the apron.

Rock Riprap

The following criteria shall be used to determine the dimensions of the rock riprap used for the apron:

1.) The median stone diameter shall be determined using the formula:

d_{50}=0.02*Q^4/3/(Tw*D_o)

d_{50}= **0.00** inches **USE 3** inches

d_{50} minimum 3 inches

Where:

d_{50} is the median stone diameter in feet

Tw is the tailwater depth above the invert of the pipe channel in feet
Q is the discharge from the pipe or channel in cubic feet per second
D_o is the diameter of the pipe or width of the channel in feet

2.) Fifty percent by weight of the riprap mixture shall be smaller the than median size stone designated as d_{50}. The largest stone size in the mixture shall be 1.5 times the d_{50} size.

3.) The quality and gradation of the rock, the thickness of the riprap lining, filter material and the quality of the stone shall meet the requirements in the Rock Riprap BMP. The minimum depth shall be 6 inches or 1.5 times the largest stone size in the mixture whichever is larger (d).

Thickness of the riprap
d = 1.5*(1.5*d_{50}(largest stone size))
d = **7** inches*

* must use a minimum of 6"

Rock Rip Rap Gradation

% of weight smaller than the given size	size of stone in inches		
100	**4.5**	to	**6.0**
85	**3.9**	to	**5.4**
50	**3.0**	to	**4.5**
15	**0.9**	to	**1.5**

Formulas Used (Reference NHDES Handbook, Pages 7-114, 7-115)

Outlet # FES-06 (from HydroCAD B1)

Q10 = 1.03 cfs T_w = 0.33 feet

D_o = 8 inches

Design Criteria

Apron Dimensions

The dimensions of the apron at the outlet of the pipe shall be determined as follows:

1.) The width of the apron at the outlet of the pipe or channel shall be 3 times the diameter of the pipe of width of the channel.

W= **2** feet

2.) The length of the apron shall be determined from the following formula when the tailwater depth at the outlet of the pipe or channel is less than one-half the diameter of the pipe or one-half the width of the channel:

La=1.8*Q/ Do^3/2+ 7Do

La= **8.07** feet

Where:

La is the length of the apron

Q is the discharge from the pipe or channel

D_o is the diameter of pipe of width of channel

3.) When the depth of the tailwater at the outlet of the pipe or channel is equal to or greater than one-half the diameter of the pipe or the width of the channel. Then the following formula applies:

La=3.0*Qo/ Do^1.5 +7D_o

USE THIS ONE La= **10.34** feet

4.) Where there is no well defined channel downstream of the outlet, the width of the downstream end of the apron shall be determined as follows:

a. For minimum tailwater conditions where the tailwater depth is less than the elevation of the center of the pipe:

W=3*Do+La

USE THIS ONE W= **10.07** feet

b. For maximum tailwater conditions where the tailwater depth is greater than the elevation of the center of the pipe:

W=3*Do+0.4*La

W= **6.14** feet

5.) Where there is a stable well-defined channel downstream of the apron, the bottom of the apron shall be equal to the width of the channel.

6.) The side of the apron in a well-defined channel shall be 2:1 (horizontal to vertical) or flatter. The height of the structural lining along the channel sides shall begin at the elevation equal to the top of conduit and taper down to the channel bottom through the length of the apron.

7.) The bottom grade of the apron shall be level (0% grade). No overfall is allowable at the end of the apron.

8.) The apron shall be located so that there are no bends in the horizontal alignment of the apron.

Rock Riprap

The following criteria shall be used to determine the dimensions of the rock riprap used for the apron:

1.) The median stone diameter shall be determined using the formula:

d_{50}=0.02*Q^4/3/(Tw*D_o)

d_{50}= **1.12** inches **USE 3** inches

d_{50} minimum 3 inches

Where:

d_{50} is the median stone diameter in feet

Tw is the tailwater depth above the invert of the pipe channel in feet

Q is the discharge from the pipe or channel in cubic feet per second

D_o is the diameter of the pipe or width of the channel in feet

2.) Fifty percent by weight of the riprap mixture shall be smaller the than median size stone designated as d_{50}. The largest stone size in the mixture shall be 1.5 times the d_{50} size.

3.) The quality and gradation of the rock, the thickness of the riprap lining, filter material and the quality of the stone shall meet the requirements in the Rock Riprap BMP. The minimum depth shall be 6 inches or 1.5 times the largest stone size in the mixture whichever is larger (d).

Thickness of the riprap

d = 1.5*(1.5*d_{50}(largest stone size))

d = **7** inches*

* must use a minimum of 6"

Rock Rip Rap Gradation

% of weight smaller than the given size	size of stone in inches		
100	**4.5**	to	**6.0**
85	**3.9**	to	**5.4**
50	**3.0**	to	**4.5**
15	**0.9**	to	**1.5**

Formulas Used (Reference NHDES Handbook, Pages 7-114, 7-115)

Site Specific Soil Survey Report

TES ENVIRONMENTAL CONSULTANTS, L.L.C.

Environmental Planning and Permitting
Soil and Wetlands Investigation

SITE-SPECIFIC SOIL SURVEY REPORT

performed at

ATDG, LLC
Tax Map 315, Lot 5
360 Corporate Drive
Portsmouth, New Hampshire

prepared for

Allen & Major Associates, Inc.
250 Commercial Street
Manchester, New Hampshire

TES Project # 23-0031

1494 Route 3A, Unit 1
Bow, NH 03304
(603) 856-8925

tom@tesenviro.comcastbiz.net

STATE OF NEW HAMPSHIRE
THOMAS
E.
SOKOLOSKI
No. 083
8/9/2023
CERTIFIED SOIL SCIENTIST

August 9, 2023

Mr. Brian D. Jones, P.E.
Allen & Major Associates, Inc.
400 Harvey Road
Manchester, New Hampshire 03103

RE: Site Specific Soil Map for ATDG, LLC
Tax Map 315, Lot 5; 360 Corporate Drive, Portsmouth, New Hampshire

Dear Mr. Jones:

On August 9, 2023 I performed field work on the above-referenced property for a Site Specific Soil Survey as you requested. This parcel was depicted on an Existing Conditions Plan and surveyed boundary map printed at a scale of 1" = 40', with a 1-foot contour interval, which served as the field base map for the soil survey. Ample ground control for the soil survey was provided by the flagged wetland boundaries, tree lines, a stone wall, trails, individual trees and boulders and development features on and adjacent to the site including edge of pavement, a shed, utility poles, storm drains, concrete piers and property boundary markers.

This Site Specific Soil Survey was completed utilizing SSSNNE Special Publication No. 3; Site Specific Soil Mapping Standards for New Hampshire and Vermont, Version 7.0, March 2021. The soil legend used for this soil map conforms to the New Hampshire State-Wide Numerical Soils Legend, Issue #10, January 2011 established and maintained by the Natural Resources Conservation Service.

The purpose of this soil survey was to provide information for an Alteration of Terrain permit application related to planned site development. Field work for this survey included the examination of numerous soil profiles via hand dug spade pits and soil auger borings taken at intervals sufficient to delineate the boundaries between soil map units. The NRCS Soil Survey of Rockingham County, New Hampshire was reviewed to determine the soils that have been mapped on and in the vicinity of the site, which were entirely Urban Land-Canton complex (799). As would be expected, Site Specific Soil mapping observations revealed discrepancies with the broad-scaled NRCS mapping. Altered soils are present, mainly in the western portion of the mapping area, moderately well drained soils exist adjacent to and between site wetlands, and poorly drained soils are present within wetlands in the central portion of the site. All New Hampshire-jurisdictional wetlands on the parcel were previously delineated by others, and I concurred with the delineation.

The following report includes a Site Specific Soil Map Key with accompanying Hydrologic Soil Groups and High Intensity Soil Survey codes, as well as soil map unit descriptions. The general soil conditions on the site consist of nearly level to moderately sloping lands having soils formed in loamy glacial till deposits. As noted in the above paragraph, altered soils are found along the lot frontage along Corporate Drive, consisting of regraded land extending approximately 140-160 feet east from Corporate Drive. Most of this area is lawn, although an asphalt-paved parking lot exists in the northwest corner of the site. The remainder of the site is forested, with two wetland drainageways originating at the rear of the regraded portion of the site to the eastern property boundary. Site soils were mostly found to be derived from loamy, loose glacial till deposits, with the poorly drained soils in the wetlands having a loam to silt loam substratum likely derived from glaciomarine deposits

.

If you have any questions regarding the soils on this site and the accompanying report, please contact our office.

Very truly yours,

Thomas E. Sokoloski
New Hampshire Certified Soil Scientist No. 63

STATE OF NEW HAMPSHIRE
THOMAS
E.
SOKOLOSKI
No. 063
8/9/2003
CERTIFIED SOIL SCIENTIST

SITE SPECIFIC SOIL MAP UNIT KEY

Symbol*	Map Unit	Slope Class	Drainage Class	HISS Symbol	Hydrologic Soil Group
42B	Canton fine sandy loam	0-8%	Well	221BH	B
42C	Canton fine sandy loam	8-15%	Well	221CH	B
444B	Newfields fine sandy loam	0-8%	Moderately well	321BH	B
444C	Newfields fine sandy loam	8-15%	Moderately well	321CH	B
500B/ccabb	Udorthents, loamy	0-8%	Well	261BH	B
500C/ccabb	Udorthents, loamy	8-15%	Well	261CH	B
500D/ccabb	Udorthents, loamy	15-25%	Well	261DH	B
500E/ccabb	Udorthents, loamy	25% +	Well	261EH	B
500B/hchbb	Udorthents, loamy	0-8%	Undeterminable	761BH**	B**
538B	Squamscott fine sandy loam	0-8%	Poorly	551BH	C
921B	Newfields Variant (SPD)	0-8%	Somewhat poorly	421BH	C

* Refer to accompanying report for 5-unit supplemental symbol explanation.

** Assumed based upon adjacent soils without impervious surfaces.

This detailed Site-Specific Soil Map, prepared on August 9, 2023 by Thomas E. Sokoloski, Certified Soil Scientist #063 of TES Environmental Consultants, L.L.C. in Bow, New Hampshire, conforms to the standards of SSSNNE Publication No. 3, Version 7.0, "Site-Specific Soil Mapping Standards for New Hampshire and Vermont", March 2021. This map has been prepared to comply with soil mapping requirements of RSA 485 A: 17 and NHDES Env-Wq 1500, Alteration of Terrain. See accompanying report for methodology, map symbol legend, and interpretations. Use of the map symbol denominators for disturbed or altered soils, where given, is at the discretion of the Certified Soil Scientist.

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for use in support of a New Hampshire Alteration Terrain permit application. It was produced by a certified Soil Scientist, and is not a product of the USDA Natural Resources Conservation Service. There is a narrative report that accompanies this map.

Supplemental Symbols

The five components of the Disturbed Soil Mapping Unit Supplement are as follows:

Symbol 1: Drainage Class
a-Excessively Well Drained
b-Somewhat Excessively Drained
c-Well Drained
d-Moderately Well Drained
e-Somewhat Poorly Drained
f-Poorly Drained
g-Very Poorly Drained
h-Not Determined

Symbol 2 -: Parent Material (of naturally formed soil only, if present)
a-No natural soil within 60"
b-Glaciofluvial Deposits (outwash/terraces of sand or sand and gravel)
c-Glacial Till Material (active ice)
d-Glaciolacustrine very fine sand and silt deposits (glacial lakes)
e-Loamy/sandy over silt/clay deposits
f-Marine Silt and clay deposits (ocean waters)
g-Alluvial Deposits (floodplains)
h-Organic Materials-Fresh water Bogs, etc
i- Organic Materials-Tidal Marsh

Symbol 3: Restrictive/Impervious Layers
a-None
b-Bouldery surface with more than 15% of the surface covered with boulders
c-Mineral restrictive layer(s) are present in the soil profile less than 40 inches below the soil surface such as hardpan, platy structure or clayey texture with consistence of at least firm, i.e. more than 20 newtons. For other examples of soil characteristics that qualify for restrictive layer, see "Soil Manual for Site evaluations in NH" 2nd Ed., page 3-17, figure 2-14
d-Bedrock in the soil profile 0-20 inches
e-Bedrock in the soil profile 20-60 inches
f-Areas where depth to bedrock is so variable that a single soil type cannot be applied, will be mapped as a complex of soil types
g-Subject to Flooding
h –man-made impervious surface including pavement, concrete, or built-up surfaces (i.e. buildings) with no morphological restrictive layer within control section

Symbol 4 Estimated Ksat* (most restrictive layer excluding symbol 3h above).
a- High
b-Moderate
c-Low
d-Not determined
*See "Guidelines for Ksat Class Placement" in Chapter 3 of the Soil Survey Manual, USDA

Symbol 5: Hydrologic Soil Group*
a-Group A
b-Group B
c-Group C
d-Group D
e-Not determined

*excluding man-made impervious/restrictive layers

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 42

Map Unit Name: Canton fine sandy loam

Landscape Settings: Upland slopes and crests, forests or fields

Surface Features: None

Drainage Class: Well

Parent Material: Loamy glacial till material with no mineral restrictive features (hardpan)

Complex: Yes ( ) No (**X**)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None.

Additional Notes: Typical observed soil profile description:

Depth	Horizon	Color	Texture	Structure	Consistency	Redox	Notes
0-2"	Oe	10YR 2/2	--	--	--	--	Forest duff
2-10"	Ap	10YR 2/2	Sandy loam	Granular	Very friable	None	
10-28"	Bw	10YR 5/6	Sandy loam	Blocky	Friable	None	
28-40"+	C	2.5Y 6/4	Loamy sand	Single grain	Loose	None within 40"	

Groundwater not encountered. SHWT below 40".

Southern portion of Tax Map 315, Lot 5.

Thomas E. Sokoloski August 9, 2023

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 444

Map Unit Name: Newfields fine sandy loam

Landscape Settings: Lower slopes of glacial till uplands, forests or fields

Surface Features: None

Drainage Class: Moderately well

Parent Material: Loamy glacial till material with no mineral restrictive features (hardpan)

Complex: Yes ( ) No (**X**)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

Small inclusions of somewhat poorly drained soils along wetland boundaries, mostly in northern and eastern portions of site, less than 5% of map unit.

Additional Notes: Typical observed soil profile description:

Depth	Horizon	Color	Texture	Structure	Consistency	Redox	Notes
0-2"	Oe	10YR 2/2	--	--	--	--	Forest duff
2-8"	A	10YR 2/2	Sandy loam	Granular	Very friable	None	
10-22"	Bw	10YR 5/6	Sandy loam	Blocky	Friable	None	
22-40"+	C	2.5Y 5/3	Loamy sand	Single grain	Loose	10YR 5/6	

Groundwater not encountered. SHWT 15-40".

Across most of forested uplands adjacent to site wetlands on Tax Map 315, Lot 5.

Thomas E. Sokoloski August 9, 2023

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 500BE/ccabb

Map Unit Name: Udorthents, loamy

Landscape Settings: Regraded or filled land surfaces

Surface Features: Fill material

Drainage Class: Well

Parent Material: Filled or regraded glacial till material with no mineral restrictive features

Complex: Yes ( ) No (**X**)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None.

Additional Notes: Typical observed soil profile description:

Depth	Horizon	Color	Texture	Structure	Consistency	Redox	Notes
0-8"	Af	10YR 3/3	Sandy loam	Granular	Very friable	None	Fill
8-18"	Bw	10YR 5/6	Sandy loam	Blocky	Friable	None	
18-40"+	C	2.5Y 6/4	Loamy sand	Single grain	Loose	None within 40"	

Groundwater not encountered. SHWT below 40".

Western and southern portions of Tax Map 315, Lot 5.

Thomas E. Sokoloski August 9, 2023

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol:	500B/hchbb
Map Unit Name:	Udorthents, loamy
Landscape Settings:	Developed, impervious land surfaces (buildings, pavement)
Surface Features:	Buildings and pavement
Drainage Class:	Undeterminable (assumed to be well drained as are adjacent soils)
Parent Material:	Filled or regraded glacial till material with no mineral restrictive features (hardpan)
Complex:	Yes ( ) No (**X**)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None.

Additional Notes: Typical observed soil profile description:

<u>Soil not observed due to impervious surface.</u>

Western portion of Tax Map 315, Lot 5.

Thomas E. Sokoloski August 9, 2023

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 538

Map Unit Name: Squamscott fine sandy loam

Landscape Settings: Low-lying portions of forests or fields; wetlands

Surface Features: None

Drainage Class: Poorly

Parent Material: Loamy glacial till material with silty substrata (glaciomarine deposits)

Complex: Yes ( ) No (**X**)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None.

Additional Notes: Typical observed soil profile description:

Depth	Horizon	Color	Texture	Structure	Consistency	Redox	Notes
0-1"	Oa	10YR 2/1	--	--	--	--	Muck
1-6"	A	10YR 2/1	Sandy loam	Granular	Very friable	None	
6-15" +	Bg	10YR 5/2	Sandy loam	Blocky	Friable	10YR 5/6	
15-30"+	Cg	2.5Y 5/2	Loam/silt loam	Massive	Friable	10YR 5/6	

Groundwater at 14". SHWT above surface.

Central portion of Tax Map 315, Lot 5.

Thomas E. Sokoloski August 9, 2023

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 921

Map Unit Name: Newfields Variant (Somewhat Poorly Drained)

Landscape Settings: Low-lying portions of forests or fields; adjacent to wetlands

Surface Features: None

Drainage Class: Somewhat poorly

Parent Material: Loamy glacial till material with no mineral restrictive features (hardpan)

Complex: Yes ( ) No (**X**)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

Additional Notes: Typical observed soil profile description:

Depth	Horizon	Color	Texture	Structure	Consistency	Redox	Notes
0-2"	Oe	10YR 2/2	--	--	--	--	Forest duff
2-10"	A	10YR 2/2	Sandy loam	Granular	Very friable	None	
10-20"	Bw	10YR 5/4	Sandy loam	Blocky	Friable	10YR 5/6	
20-28"+	C1	2.5Y 6/3	Loamy sand	Single grain	Loose	10YR 5/6 & 2.5Y 5/2	
28-40"	C2	2.5Y 5/2	Silt loam	Massive	Friable	10YR 5/8	

Groundwater at 25". SHWT between 12-15".

Southern portion of Tax Map 315, Lot 5.

Thomas E. Sokoloski August 9, 2023

Infiltration Feasibility Report

Infiltration Feasibility Report

The project proposes seven systems that require infiltration to function properly. These systems are identified on the plans as Infiltration System 1, 2, and 3, as well as a bioretention system 1, 2, 3, and 4.

Infiltration System 1

1. Location of the practice

Infiltration System 1 – This system is located in the center of the site, behind the proposed building, below the proposed parking lot.

2. Existing topography at the location of the practice

The existing topography within the area of Infiltration System 1 is relatively flat. Existing elevations where the system is proposed range from 57 to 58.

3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of the bottom of Infiltration System 1 is 3,087± S.F. and 2 test pits were dug in the vicinity of the proposed practice. These pits are identified on the plans as TP7 and TP8.

4. Seasonal high-water table (SHWT) and bedrock elevations

The seasonal high-water table was observed in TP7 at 40″ below grade, or elevation 54.5. Bedrock/refusal was not encountered in TP7, which was advanced to a depth of 72″ below grade.
The seasonal high-water table was observed in TP8 at 36″ below grade, or elevation 54.6. Bedrock/refusal was not encountered in TP8, which was advanced to a depth of 72″ below grade.

5. Profile Description

Test pits were completed on 07-17-2023 and observed by Allen & Major Associates.

Test Pit 7 (TP7) Existing Ground Elevation: 57.8 Date: 07-17-2023	
Depth	Description
0-3″	Leaf litter
3-8″	Sandy loam, massive friable, dry
8-14″	Sandy loam, massive friable, dry
14-72″	Sandy loam, massive friable, dry to moist
ESHWT: 40″ (Elevation 54.5) Weep: None Bedrock/Refusal: None	

Test Pit 8 (TP8) Existing Ground Elevation: 57.6 Date: 07-17-2023	
Depth	Description
0-3″	Leaf litter
3-6″	Sandy loam, massive friable, dry
6-12″	Sandy loam, massive friable, dry
12-72″	Sandy loam, massive friable, dry to moist
ESHWT: 36″ (Elevation 54.6) Weep: None Bedrock/Refusal: None	

6. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Infiltration System 2

1. Location of the practice

Infiltration System 2 – This system is located on the southeast side of the site, behind the proposed building and below the proposed parking lot.

2. Existing topography at the location of the practice

The existing topography within the area of Infiltration System 2 is moderately sloped. Existing elevations where the system is proposed range from 55 to 61.

3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of the bottom of Infiltration System 2 is 6,031± S.F. and 2 test pits were dug in the vicinity of the proposed practice. These pits are identified on the plans as TP5 and TP6.

4. Seasonal high-water table (SHWT) and bedrock elevations

The seasonal high-water table was observed in TP5 at 36" below grade, or elevation 53.7. Bedrock/refusal was not encountered in TP5, which was advanced to a depth of 72" below grade.
The seasonal high-water table was observed in TP6 at 34" below grade, or elevation 53.6. Bedrock/refusal was not encountered in TP6, which was advanced to a depth of 80" below grade.

5. Profile Description

Test pits were completed on 07-17-2023 and observed by Allen & Major Associates.

Test Pit 5 (TP5) Existing Ground Elevation: 56.7 Date: 07-17-2023	
Depth	Description
0-3"	Leaf litter
3-9"	Sandy loam, massive friable, dry
9-14"	Sandy loam, massive friable, dry
14-72"	Sandy loam, massive friable, dry to moist
ESHWT: 36" (Elevation 53.7) Weep: None Bedrock/Refusal: None	

Test Pit 6 (TP6) Existing Ground Elevation: 56.4 Date: 07-17-2023	
Depth	Description
0-3"	Leaf litter
3-10"	Sandy loam, massive friable, dry
10-16"	Sandy loam, massive friable, dry
16-80"	Sandy loam, massive friable, dry to moist
ESHWT: 34" (Elevation 53.6) Weep: None Bedrock/Refusal: None	

6. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Infiltration System 3

1. Location of the practice

Infiltration System 3 – This system is located on the west side of the site, between the proposed building and Corporate Drive, below the proposed parking lot.

2. Existing topography at the location of the practice

The existing topography within the area of Infiltration System 3 is relatively flat. Existing elevations where the system is proposed range from 61 to 62.

3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of the bottom of Infiltration System 3 is 1,971± S.F. and 1 test pit was dug in the vicinity of the proposed practice. This pit is identified on the plans as TP2.

4. Seasonal high-water table (SHWT) and bedrock elevations

The seasonal high-water table was observed in TP2 at 70″ below grade, or elevation 55.6. Bedrock/refusal was not encountered in TP2, which was advanced to a depth of 96″ below grade.

5. Profile Description

Test pits were completed on 07-17-2023 and observed by Allen & Major Associates.

Test Pit 2 (TP2) Existing Ground Elevation: 61.4 Date: 07-17-2023	
Depth	Description
0-80”	Loamy sand (fill), dry to moist
80-82”	Buried organics
82-96”	Fine sandy loam, massive, firm, moist
ESHWT: 70” (Elevation 55.6) Weep: None Bedrock/Refusal: None	

6. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Bioretention System 1

1. Location of the practice

Bioretention System 1 – This system is located on the south side of the site, between the parking lot and the southerly property line.

2. Existing topography at the location of the practice

The existing topography within the area of Bioretention System 1 is relatively flat. Existing elevations where the system is proposed range from 60 to 61.

3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of Bioretention System 1 is 571± S.F. and 1 test pit was dug in the vicinity of the proposed practice. The pit is identified on the plans as TP4.

4. Seasonal high-water table (SHWT) and bedrock elevations

The seasonal high-water table was observed in TP4 at 67″ below grade, or elevation 55.2. Bedrock/refusal was not encountered in TP4, which was advanced to a depth of 96″ below grade.

5. Profile Description

Test pits were completed on 07-17-2023 and observed by Allen & Major Associates.

Test Pit 4 (TP4) Existing Ground Elevation: 60.8 Date: 07-17-2023	
Depth	Description
0-18”	Loamy sand (fill), dry
18-24”	Sandy loam, massive friable, dry
24-32”	Sandy loam, massive friable, dry
32-48”	Sandy loam, massive friable, dry
48-96”	Sandy loam, massive firm, dry to moist
ESHWT: 67” (Elevation 55.2) Weep: None Bedrock/Refusal: None	

6. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Bioretention System 2

1. Location of the practice

Bioretention System 2 – This system is located on the west side of the site, between the parking lot and Corporate Drive.

2. Existing topography at the location of the practice

The existing topography within the area of Bioretention System 2 is relatively flat. Existing elevations where the system is proposed range from 61 to 61.5.

3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of the system which uses infiltration is 258± S.F. and 1 test pit was dug in the vicinity of the proposed practice. The pit is identified on the plans as TP3.

4. Seasonal high-water table (SHWT) and bedrock elevations

The seasonal high-water table was observed in TP3 at 76" below grade, or elevation 55.9. Bedrock/refusal was not encountered in TP3, which was advanced to a depth of 94" below grade.

5. Profile Description

Test pits were completed on 07-17-2023 and observed by Allen & Major Associates.

Test Pit 3 (TP3) Existing Ground Elevation: 62.2 Date: 07-17-2023	
Depth	Description
0-60”	Loamy sand (fill), dry, some construction debris
60-94”	Sandy loam, massive, firm, dry to moist
ESHWT: 76” (Elevation 55.9) Weep: None Bedrock/Refusal: None	

6. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Bioretention System 3

1. Location of the practice

Bioretention System 3 – This system is located in the northwest corner of the site, near the intersection of Corporate Drive and International Drive.

2. Existing topography at the location of the practice

The existing topography within the area of Bioretention System 3 is relatively flat. Existing elevations where the system is proposed range from 60 to 61.5.

3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of the system which uses infiltration is 1,639± S.F. and 1 test pit was dug in the vicinity of the proposed practice. The pit is identified on the plans as TP1.

4. Seasonal high-water table (SHWT) and bedrock elevations

The seasonal high-water table was observed in TP1 at 72″ below grade, or elevation 55.5. Bedrock/refusal was not encountered in TP1, which was advanced to a depth of 96″ below grade.

7. Profile Description

Test pits were completed on 07-17-2023 and observed by Allen & Major Associates.

Test Pit 1 (TP1) Existing Ground Elevation: 61.5 Date: 07-17-2023	
Depth	Description
0-48"	Loamy sand (fill), dry, some construction debris
48-96"	Sandy loam, massive, firm, dry to moist
ESHWT: 72" (Elevation 55.5) Weep: None Bedrock/Refusal: None	

5. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Bioretention System 4

1. Location of the practice

Bioretention System 4 – This system is located on the north side of the site, near the proposed driveway entrance to International Drive.

2. Existing topography at the location of the practice

The existing topography within the area of Bioretention System 4 is relatively flat. Existing elevations where the system is proposed range from 58.5 to 59.

3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of the system that uses infiltration is 516± S.F. At this time no test pits have been performed in the vicinity of this practice. With that said, soils and depths to SHWT on site are consistent throughout and so it is reasonable to expect this system to function properly as designed. It has been noted on the plan that one confirmatory test pit shall be performed within the footprint of the practice prior to construction.

4. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Registration and Notification Form for Storm Water Infiltration to Groundwater

NHDES-W-03-135

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

REGISTRATION AND NOTIFICATION FORM FOR STORMWATER INFILTRATION TO GROUNDWATER (5H1)

Groundwater Discharge Program

RSA/Rule: RSA 485-A:6, VII; 485:3, X; Env-Wq 402

Applicant Information

Name: ATDG, LLC	Daytime Phone: 603-799-6787	
Mailing Address: 1 Merrill Crossing		
City: Bow	State: NH	ZIP: 03304
Contact Person Name: Alexander Slocum	Email: ahslocum@gmail.com	
Contact Person Phone Number: 603-777-6506	Fax Number:	

Facility Information

Name: ASC / Medical Office		
Address: 360 Corporate Drive		
City: Portsmouth	State: NH	ZIP: 03801
Property Tax Map: 315	Lot Number: 5	
Latitude & Longitude of discharge point(s): 43.073484, -70.801090		

Facility Owner Information (complete only if different than applicant)

Owner Name: same as applicant	Daytime Phone:	
Mailing Address:		
City/Town:	State:	ZIP:
Contact Person Name:	Email:	
Contact Person Phone Number:	Fax Number:	

Property Owner (complete only if different then Applicant)

Name: Pease Development Authority	Daytime Phone:	
Mailing Address: 360 Corporate Drive		
City: Portsmouth	State: NH	ZIP: 03801
Contact Person Name:	Email:	
Contact Person Phone Number:	Fax Number:	

Facility Operator's Information (complete only if different than applicant)

Facility Operator Name: same as applicant	Daytime Phone:	
Mailing Address:		
City:	State:	ZIP:

Complete this form if you are using a drywell or other subsurface infiltration structures to recharge stormwater to the ground or groundwater. If a completed Underground Injection Control (UIC) registration form was submitted to the Alteration of Terrain Bureau for this project, then one is not required to be sent directly to the Drinking Water and Groundwater Bureau (DWGB).

REGISTRATION AND NOTIFICATION FORM FOR STORMWATER INFILTRATION TO GROUNDWATER (attach additional sheets, as necessary, for responses to questions below)

Please provide a complete description of the facility including historic uses, any former contamination and/or ongoing remedial action at the site.
The site was used as an officer's quarters on Pease Air Base when the base was operational. The AoT screening layers show two remedial actions on the site, "PAFB 92.00 Command Center", and "PAFB 87.00 Command Center Site". There is no known ongoing remedial action being performed on the site.

Please provide information concerning the location of the infiltration activity, include Locus map (i.e. USGS map).
Infiltration systems 1-3 are located on the east and west sides of the site, below the proposed parking lot. Bioretention Systems 1-4 are located around the perimeter of the site, adjacent to the proposed parking lot.

Please describe the pretreatment system, if any, and capacity of the system.
All runoff directed to the four infiltration systems enters through an isolator row lined with fabric, which prevents migration of sediment to the rest of the system. Runoff directed to the four bioretention systems will be pretreated by one of four sediment forebays.

Please describe the materials and products used for the subsurface infiltration structure (i.e., pipe and stone leachfield, plastic chamber units, concrete drywell, etc.).
The four infiltration systems are designed as ADS Stormtech SC-310 and SC-160 chambers. As mentioned above, the inlet (isolator) rows are lined with filter fabric for pretreatment. The systems are backfilled with coarse stone which provides additional storage volume. The bioretention systems include 24" of filter media, per Env-Wq 1508.07(k)(4), and underlaid with coarse gravel and pea gravel, per NH Stormwater Manual, Chapter 4.3c.

Please describe the disposal method and location. Include a site plan showing: the infiltration structure, any other on-site infiltration structures, dimensions, depth to groundwater (if known), adjacent septic system(s), and drinking water source(s).
Stormwater runoff will be infiltrated using the systems described above. There are no known existing septic systems, and the project will connect to the existing municipal sewer system. Drinking water will be provided by a municipal connection. Site plans are provided which show locations of the various systems, as well as test pit data that was used in the design.

Please provide information concerning methods and schedule for periodic inspection and/or maintenance.
A complete Operation & Maintenance Plan is included with the AoT submittal which outlines the methods and schedule of inspections.

Applicant/Owner Certification Statement and Signature

By signing this application, the signer certifies that the information contained in or otherwise submitted with this application is true, complete and not misleading to the best of the signer's knowledge and belief.

By signing this application, the signer understands that submission of false, incomplete or misleading information is grounds for:

- Denying the application;
- Revoking any application that is granted based on the information; and
- If the signer is acting as or on behalf of a listed engineer as defined in Env-C 502.10, debarring the listed engineer from the roster.

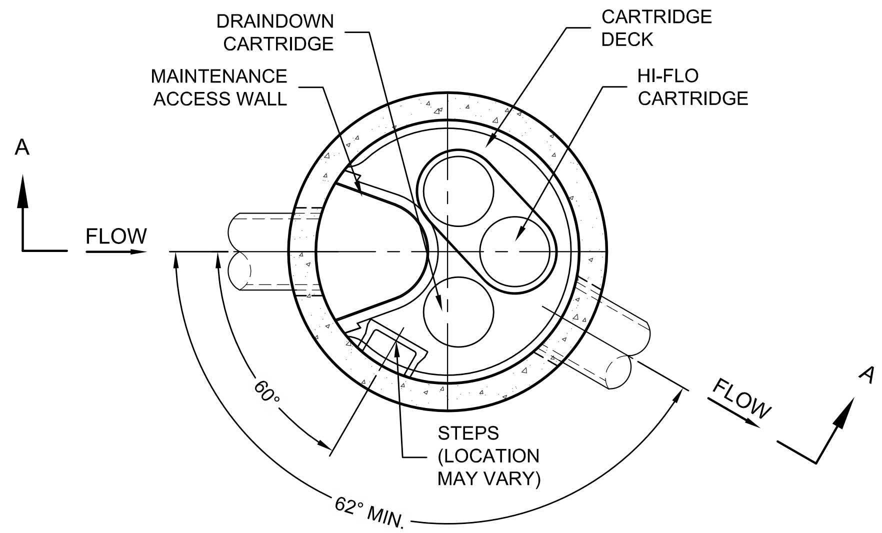
By signing the application, the signer and applicant agree to comply with all applicable rules and conditions of this permit and to not discharge to the holding tank(s) until written permission from the department has been received.

DocuSigned by:
Alexander H Slocum Jr
3D12626EBF66412

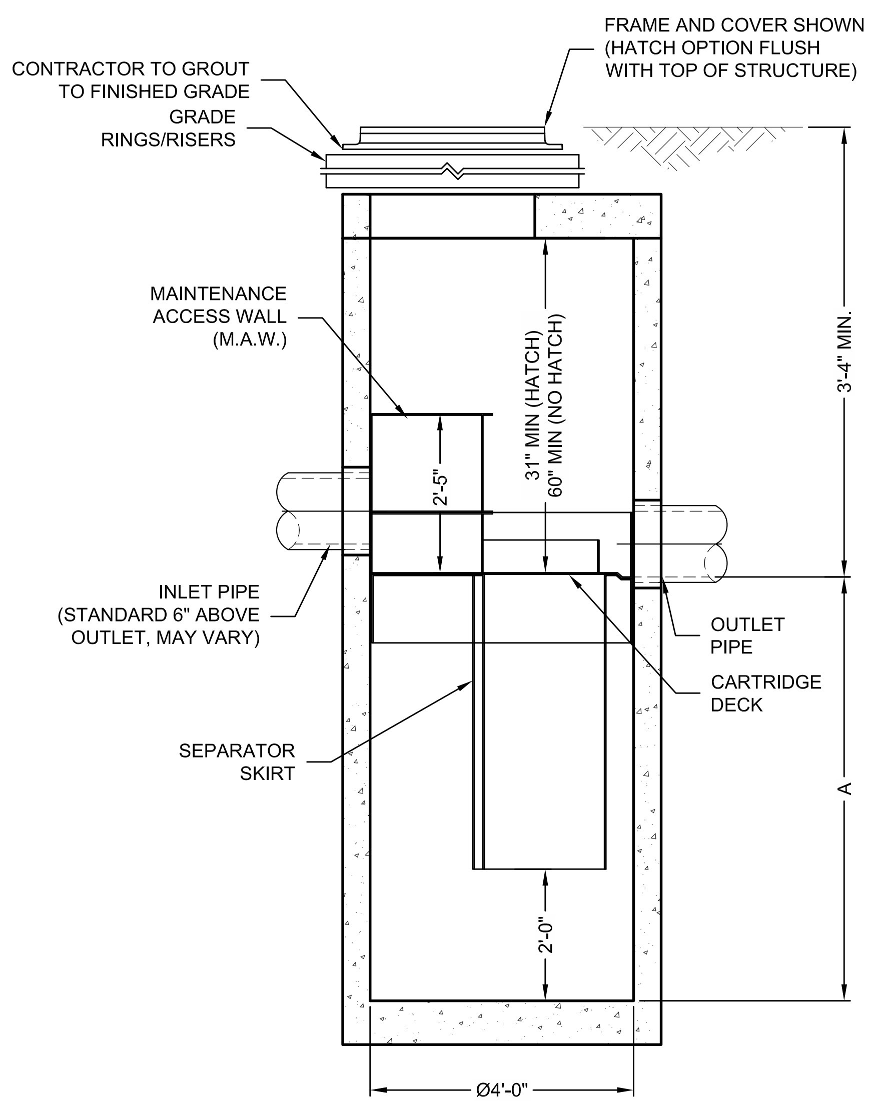
8/16/2023 | 1:59:46 PM CDT

Signature of Facility Owner or Contact | Date

Jellyfish Standard Detail Treatment Capacity



PLAN VIEW



SECTION A-A

Jellyfish® Filter

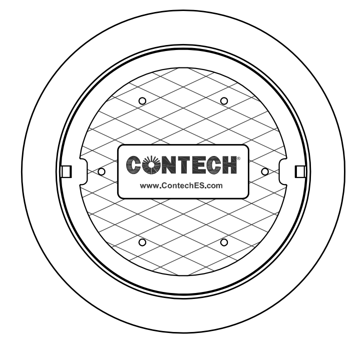
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENT NO. 8,287,726, 8,221,618 & US 8,123,935; OTHER INTERNATIONAL PATENTS PENDING

JELLYFISH DESIGN NOTES

JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN. Ø48" MANHOLE JELLYFISH PEAK TREATMENT CAPACITY IS 0.45 CFS. IF THE SITE CONDITIONS EXCEED 0.45 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

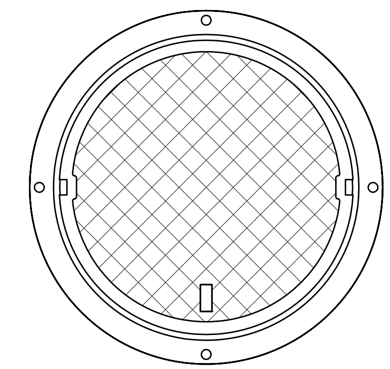
CARTRIDGE SELECTION

CARTRIDGE DEPTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-5"	5'-3"	4'-2"	3'-2"
FLOW RATE HIGH-FLO / DRAINDOWN (cfs) (per cart)	0.18 / 0.09	0.13 / 0.065	0.09 / 0.045	0.05 / 0.025
MAX. CARTS HIGH-FLO / DRAINDOWN	2 / 1			



FRAME AND COVER

(DIAMETER VARIES)
N.T.S.



HATCH

(Ø36" CAST INTO SLAB)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*		
WATER QUALITY FLOW RATE (cfs)	*		
PEAK FLOW RATE (cfs)	*		
RETURN PERIOD OF PEAK FLOW (yrs)	*		
# OF CARTRIDGES REQUIRED (HF / DD)	* / *		
CARTRIDGE SIZE	*		
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	*	*	*
INLET PIPE #2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION	*		
ANTI-FLOTATION BALLAST	WIDTH	HEIGHT	
	*	*	

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

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. 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.

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

JELLYFISH JF4
STANDARD DETAIL
OFFLINE CONFIGURATION

TSS and Nitrogen Worksheets

ALLEN & MAJOR
ASSOCIATES, INC.

Project No.	3250-01	**Sheet**	1 of 4
Project Description	Surgical Center		
Calculated By	SM	**Date**	8/10/2023
Checked By	BDJ	**Date**	8/10/2023

TSS REMOVAL CALULATIONS

The calculations provide the TSS removal rate for the treatment train with Infiltration systems

Stormwater Management BMP	TSS Removal rate
Street Sweeping	5 %
Deep Sump Catch Basins	15 %
Infiltration System	90 %

Average Annual Load	=	100%	
Street Sweeping	=	5.0	% Removal Rate
		95.0	% TSS Load Remains
TSS Load Remaining	=	95.0	%
Deep Sump Catch Basins	=	15.0	% Removal Rate
		80.8	% TSS Load Remains
TSS Load Remaining	=	80.8	%
Infiltration System	=	90.0	% Removal Rate
		8.1	% TSS Load Remains

Initial TSS Load - Percentage of TSS Remaining = Final TSS Removal Rate

100 - 8.1 = 91.9 %

Project No.	3250-01	**Sheet**	2 of 4
Project Description	Surgical Center		
Calculated By	SM	**Date**	8/10/2023
Checked By	BDJ	**Date**	8/10/2023

ALLEN & MAJOR
ASSOCIATES, INC.

TSS REMOVAL CALULATIONS

The calculations provide the TSS removal rate for the treatment train with Bioretention systems

Stormwater Management BMP	TSS Removal rate
Street Sweeping	5 %
Bioretention	90 %

Average Annual Load	=	100%	
Street Sweeping	=	5.0	% Removal Rate
		95.0	% TSS Load Remains
TSS Load Remaining	=	95.0	%
Bioretention	=	90.0	% Removal Rate
		9.5	% TSS Load Remains

Initial TSS Load - Percentage of TSS Remaining = Final TSS Removal Rate

100 - 9.5 = 90.5 %

ALLEN & MAJOR ASSOCIATES, INC.

Project No.	3250-01	**Sheet**	3 of 4
Project Description	Surgical Center		
Calculated By	SM	**Date**	8/10/2023
Checked By	BDJ	**Date**	8/10/2023

Nitrogen REMOVAL CALULATIONS

The calculations provide the Nitrogen removal rate for the treatment train with Infiltration systems

Stormwater Management BMP	Nitrogen Removal rate
Deep Sump Catch Basins	5 %
Infiltration System	60 %

Average Annual Load	=	100.0	%
Deep Sump Catch Basins	=	5.0	% Removal Rate
		95.0	% Nitrogen Load Remains
Nitrogen Load Remaining	=	95.0	%
Infiltration System	=	60.0	% Removal Rate
		38.0	% Nitrogen Load Remains

Initial Nitrogen Load - Percentage of Nitrogen Remaining = Final Removal Rate

100 - 38.0 = 62.0 %

ALLEN & MAJOR
ASSOCIATES, INC.

Project No.	3250-01	**Sheet**	4 of 4
Project Description	Surgical Center		
Calculated By	SM	**Date**	8/10/2023
Checked By	BDJ	**Date**	8/10/2023

Nitrogen REMOVAL CALULATIONS

The calculations provide the Nitrogen removal rate for the treatment train with Bioretention systems

Stormwater Management BMP	Nitrogen Removal rate
Bioretention	65 %

Nitrogen Load Remaining	=	100.0	%
Bioretention	=	65.0	% Removal Rate
		35.0	% Nitrogen Load Remains

Initial Nitrogen Load - Percentage of Nitrogen Remaining = Final Removal Rate

100 - 35.0 = 65.0 %

Pipe Sizing Calculations

ASC / Medical Office
360 Corporate Drive, Portsmouth, NH
Allen & Major Associates, Inc.
A&M Project Number: 3250-01

ALLEN & MAJOR ASSOCIATES, INC.

Drainage Pipe Design Analysis

Date: 18-Sep-23
Created By: SM
Checked By: BDJ
Approved By: BDJ

Manning's Formula

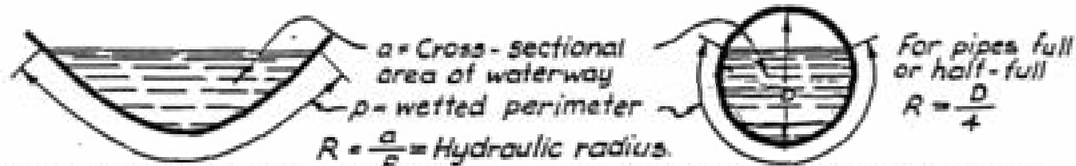
Where: V is the velocity in Ft/sec.
n is Manning's coefficient of friction
R is the Hydraulic Radius
S is the slope of the pipe

$V = 1.486/n*R\wedge^{2/3} *S\wedge^{1/2}$
*Q = V*A*
(25-Year storm)

R = Area/Wetted Perimeter

Where: Area = Pi(R/12)2*
*Wetted Perimeter = 2*Pi*R/12*

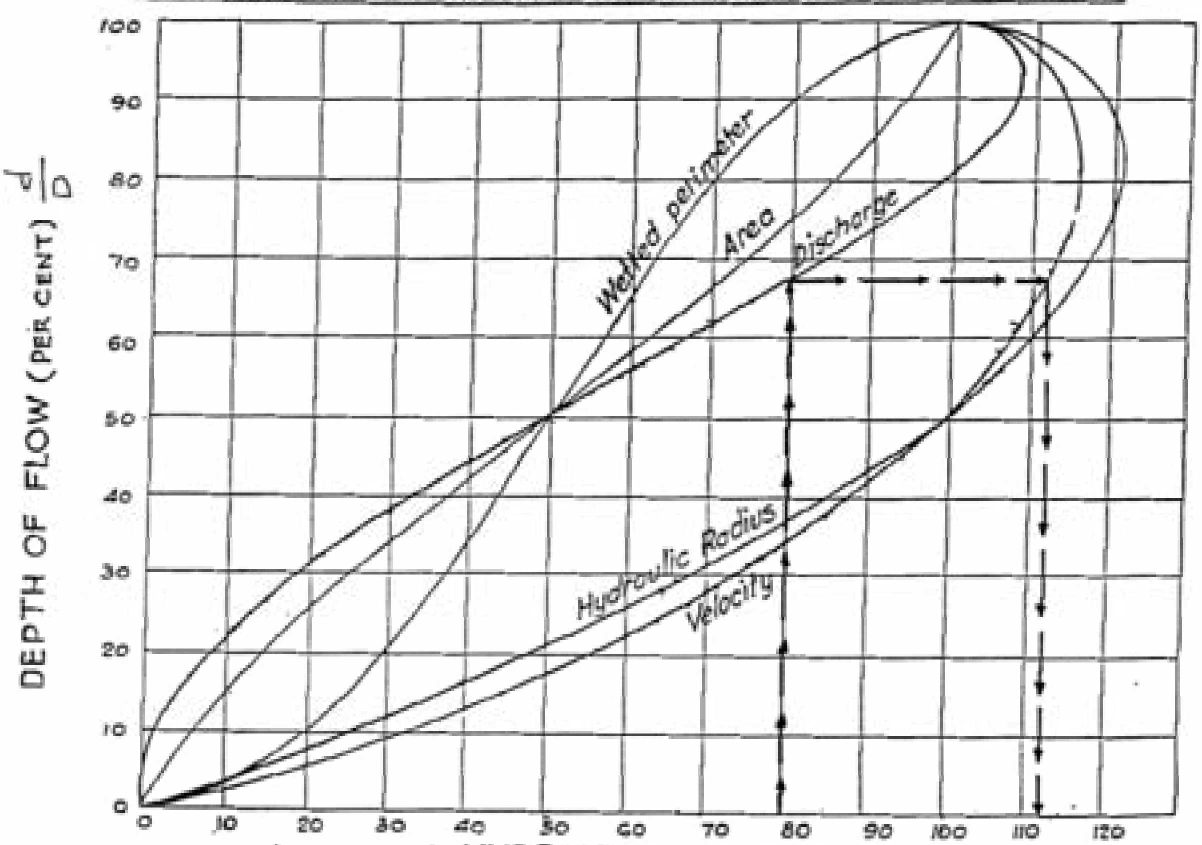
PIPE	Q_{design}	n	Diameter	A	Wp	R	S	Q_{full}	Q_{full} ³ Q_{design}	V_{full}	Q_d/Q_f	Results	V_{design}	V_{design} ≤ 12 ft/s
	(cfs)		(inches)	(ft^2)	(ft)	(ft)	(feet/foot)	(cfs)		(ft/s)		Fig. 4-4A	(ft/s)	
DMH-01	1.42	0.013	8	0.35	2.09	0.17	0.0142	1.44	OK	4.13	0.99	1.15	4.74	OK
DMH-03	1.90	0.013	10	0.55	2.62	0.21	0.0342	4.05	OK	7.43	0.47	0.97	7.21	OK
OCS-01	0.75	0.013	8	0.35	2.09	0.17	0.0057	0.91	OK	2.61	0.82	1.12	2.93	OK
OCS-02	0.17	0.013	8	0.35	2.09	0.17	0.0181	1.63	OK	4.66	0.10	0.59	2.75	OK
OCS-03	1.44	0.013	8	0.35	2.09	0.17	0.0327	2.19	OK	6.26	0.66	1.07	6.70	OK
RD-01	1.10	0.013	8	0.35	2.09	0.17	0.0145	1.46	OK	4.17	0.76	1.10	4.59	OK
RD-02	1.70	0.013	8	0.35	2.09	0.17	0.0208	1.74	OK	4.99	0.98	1.15	5.74	OK
RD-03	0.10	0.013	8	0.35	2.09	0.17	0.0113	1.28	OK	3.68	0.08	0.55	2.02	OK
WQ-01	0.37	0.013	8	0.35	2.09	0.17	0.0052	0.87	OK	2.50	0.42	0.94	2.35	OK



SECTION OF ANY OPEN CHANNEL   SECTION OF CIRCULAR PIPE

V = Average or mean velocity in feet per second.
Q = a V = Discharge of pipe or channel in cubic feet per second (c.f.s.).
n = Coefficient of roughness of pipe or channel surface, see Table A - Pg. 18-68.
S = Slope of Hydraulic Gradient (water surface in open channels or pipes not under pressure, same as slope of channel or pipe invert only when flow is uniform in constant section.

HYDRAULIC ELEMENTS OF CHANNEL SECTIONS.



HYDRAULIC ELEMENTS
PER CENT OF VALUE FOR FULL SECTION (APPROXIMATE)

EXAMPLE: Given: Discharge = 12 c.f.s. through a pipe which has capacity flowing full of 15 c.f.s. at a velocity of 7.0 ft. per sec. Required to find V for Q = 12 c.f.s. ∴ Percentage of full discharge = $\frac{12}{15}$ = 80%. Enter chart at 80% of value for full section of Hydraulic Elements, find V = 112.5% × 7 = 7.9 ft. per sec.

VALUES OF HYDRAULIC ELEMENTS OF CIRCULAR SECTION FOR VARIOUS DEPTHS OF FLOW.

Figure 4-4A

Extreme Precipitation Tables

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	43.073 degrees North
Longitude	70.802 degrees West
Elevation	10 feet
Date/Time	Mon Jul 03 2023 09:22:30 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	2.92	**1yr**	2.35	2.81	3.21
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.49	3.21	3.57	**2yr**	2.84	3.43	3.93
5yr	0.37	0.58	0.73	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.43	3.14	4.07	4.57	**5yr**	3.60	4.40	5.03
10yr	0.41	0.64	0.81	1.11	1.44	1.88	**10yr**	1.25	1.72	2.22	2.88	3.74	4.87	5.53	**10yr**	4.31	5.31	6.07
25yr	0.47	0.75	0.96	1.33	1.76	2.32	**25yr**	1.52	2.13	2.76	3.62	4.73	6.17	7.10	**25yr**	5.46	6.82	7.78
50yr	0.53	0.85	1.09	1.52	2.05	2.74	**50yr**	1.77	2.51	3.27	4.30	5.65	7.40	8.58	**50yr**	6.55	8.25	9.40
100yr	0.60	0.97	1.25	1.76	2.39	3.22	**100yr**	2.06	2.96	3.86	5.11	6.74	8.86	10.38	**100yr**	7.84	9.98	11.35
200yr	0.67	1.09	1.41	2.02	2.79	3.80	**200yr**	2.41	3.49	4.58	6.09	8.06	10.62	12.55	**200yr**	9.40	12.07	13.71
500yr	0.79	1.30	1.69	2.45	3.43	4.71	**500yr**	2.96	4.34	5.71	7.66	10.19	13.50	16.15	**500yr**	11.95	15.53	17.61

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day
1yr	0.23	0.36	0.44	0.59	0.73	0.89	**1yr**	0.63	0.87	0.92	1.32	1.66	2.23	2.53	**1yr**	1.97	2.43	2.85
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.05	3.46	**2yr**	2.70	3.32	3.82
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.13	2.74	3.80	4.21	**5yr**	3.36	4.05	4.71
10yr	0.39	0.59	0.73	1.03	1.32	1.60	**10yr**	1.14	1.56	1.81	2.40	3.07	4.38	4.89	**10yr**	3.88	4.70	5.46

Hydrologic Soil Maps

SITE SPECIFIC SOIL MAP UNIT LEGEND

SYMBOL*	MAP UNIT	SLOPE CLASS	DRAINAGE CLASS	HISS SYMBOL	HYDROLOGIC SOIL GROUP
42B	CANTON FINE SANDY LOAM	0–8%	WELL	221BH	B
42C	CANTON FINE SANDY LOAM	8–15%	WELL	221CH	B
444B	NEWFIELDS FINE SANDY LOAM	0–8%	MODERATELY WELL	321BH	B
444C	NEWFIELDS FINE SANDY LOAM	8–15%	MODERATELY WELL	321CH	B
500B/CCABB	UDORTHENTS, LOAMY	0–8%	WELL	261BH	B
500C/CCABB	UDORTHENTS, LOAMY	8–15%	WELL	261CH	B
500D/CCABB	UDORTHENTS, LOAMY	15–25%	WELL	261DH	B
500E/CCABB	UDORTHENTS, LOAMY	25% +	WELL	261EH	B
500B/HCHBB	UDORTHENTS, LOAMY	0–8%	UNDETERMINABLE	761BH**	B**
538B	SQUAMSCOTT FINE SANDY LOAM	0–8%	POORLY	551BH	C
921B	NEWFIELDS VARIANT (SPD)	0–8%	SOMEWHAT POORLY	421BH	C

* REFER TO ACCOMPANYING REPORT FOR 5–UNIT SUPPLEMENTAL SYMBOL EXPLANATION.
** ASSUMED BASED UPON ADJACENT SOILS WITHOUT IMPERVIOUS SURFACES.

LEGEND

- EX. PROPERTY LINE
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- EXISTING EDGE OF PAVEMENT
- EXISTING EDGE OF GRAVEL
- EXISTING CURB
- SITE SPECIFIC SOIL BOUNDARY
- HYDROLOGIC SOIL GROUP A
- HYDROLOGIC SOIL GROUP B
- HYDROLOGIC SOIL GROUP C
- HYDROLOGIC SOIL GROUP D
- EXISTING WETLANDS
- OPEN WATER
- IMPERVIOUS COVER

SOIL MAPPING NOTES:

1. THIS DETAILED SITE–SPECIFIC SOIL MAP, PREPARED ON AUGUST 9, 2023 BY THOMAS E. SOKOLOSKI, CERTIFIED SOIL SCIENTIST #063 OF TES ENVIRONMENTAL CONSULTANTS, L.L.C. IN BOW, NEW HAMPSHIRE, CONFORMS TO THE STANDARDS OF SSSNNE PUBLICATION NO. 3, VERSION 7.0, "SITE–SPECIFIC SOIL MAPPING STANDARDS FOR NEW HAMPSHIRE AND VERMONT", MARCH 2021.

2. THIS MAP HAS BEEN PREPARED TO COMPLY WITH SOIL MAPPING REQUIREMENTS OF RSA 485 A: 17 AND NHDES ENV–WQ 1500, ALTERATION OF TERRAIN. SEE ACCOMPANYING REPORT FOR METHODOLOGY, MAP SYMBOL LEGEND, AND INTERPRETATIONS. USE OF THE MAP SYMBOL DENOMINATORS FOR DISTURBED OR ALTERED SOILS, WHERE GIVEN, IS AT THE DISCRETION OF THE CERTIFIED SOIL SCIENTIST.

3. THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR USE IN SUPPORT OF A NEW HAMPSHIRE ALTERATION TERRAIN PERMIT APPLICATION. IT WAS PRODUCED BY A CERTIFIED SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A NARRATIVE REPORT THAT ACCOMPANIES THIS MAP.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft

R:\PROJECTS\3250-01\CIVIL\DRAWINGS\CURRENT\C-3250-01_HYDROLOGIC SOIL MAPPING.DWG

REV	DATE	DESCRIPTION
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:

ATDG, LLC
7 SINCLAIR DRIVE
EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	1" = 30'	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
400 HARVEY ROAD
MANCHESTER, NH 03103
TEL: (603) 627-5500
FAX: (603) 627-5501

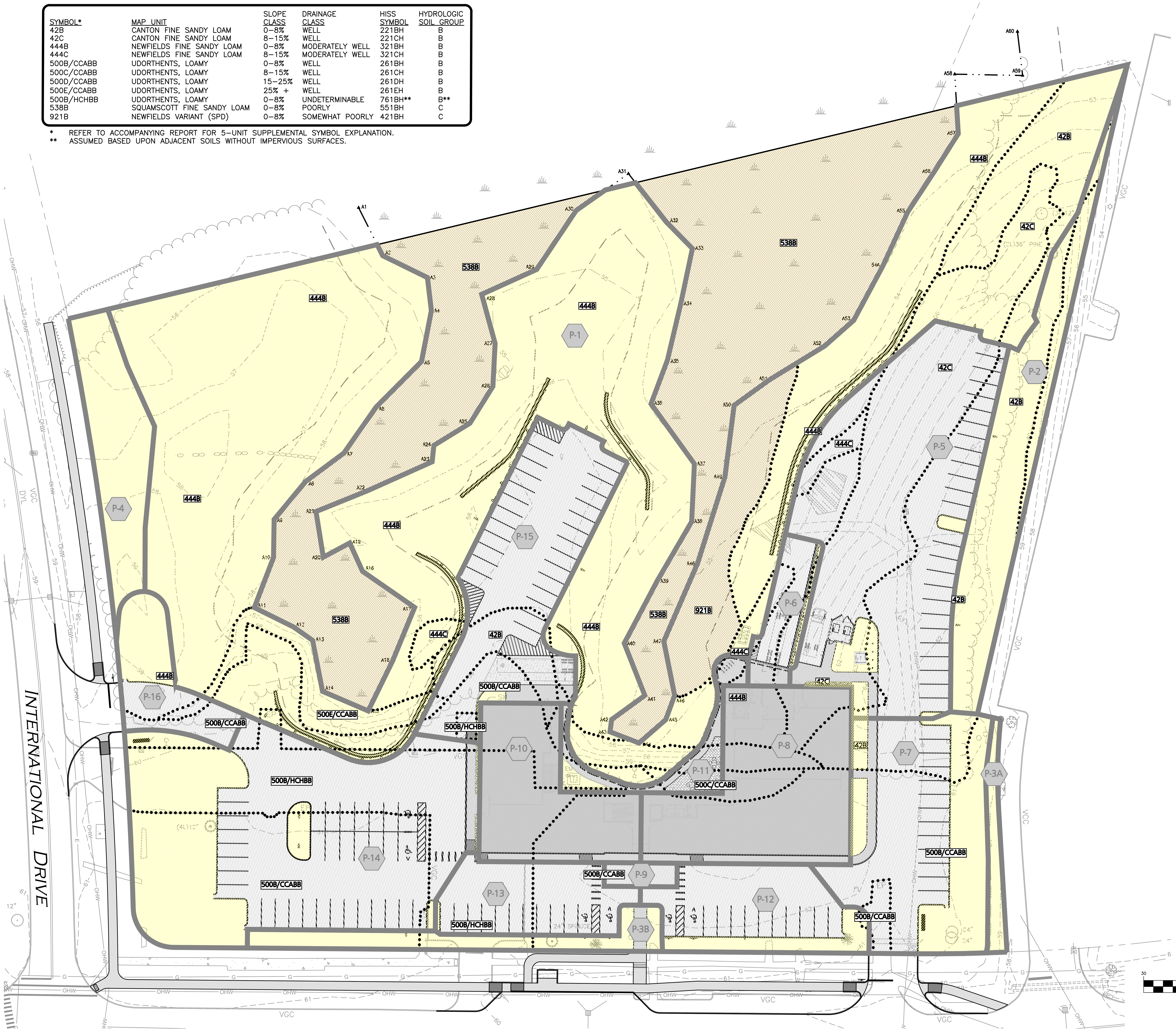
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:

PRE-CONSTRUCTION HYDROLOGIC SOIL PLAN

SHEET No.

HSP-1



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REV	DATE	DESCRIPTION
2	09-18-23	REVISED PER TAC COMMENTS
1	08-17-23	REVISED PER PDA COMMENTS

APPLICANT/LESSEE:
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7 SINCLAIR DRIVE
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360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO.	3250-01	DATE:	08-14-23
SCALE:	1" = 30'	DWG. NAME:	C-3250-01.dwg
DESIGNED BY:	BDJ	CHECKED BY:	RPC

PREPARED BY:
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environmental consulting ◆ landscape architecture
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FAX: (603) 627-5501
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:
POST-CONSTRUCTION HYDROLOGIC SOIL PLAN

SHEET No.
HSP-2

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