Tighe&Bond

L0700-026
September 27, 2023

Mr. Rick Chellman, Chair
City of Portsmouth Planning Board
1 Junkins Avenue
Portsmouth NH, 03801

Re: **Lonza Biologics – Proposed Industrial Development**
Amended Site Plan Review Application

Dear Chairman Chellman:

On behalf of Lonza Biologics, Inc. (Lonza), we are pleased to submit one (1) set of hard copies and one electronic file (.pdf) of the following information to support a request to the Planning Board for a recommendation for approval to the Pease Development Authority (PDA) for Amended Site Plan Review for a proposed industrial development located at 36, 46, 52, 70 and 80 Corporate Drive on Pease International Tradeport:

- PDA Application for Site Review, dated June 12, 2023;
- Third Party Stormwater Review Response Letter, dated September 27, 2023;
- Site Plan Set, last revised September 27, 2023;
- Drainage Analysis, last revised September 27, 2023;
- Operations & Maintenance Manual, last revised July 17, 2023;
- Traffic Impact Study, last revised July 17, 2023;
- PB Stipulations of Approval Letter, dated July 17, 2023;
- Wastewater Correspondence Letter by DTC Lawyers, dated February 14, 2023;
- Architectural Renderings;

PROJECT SUMMARY

Background

The proposed project will expand Lonza's facility to support its growing product development services to the pharmaceutical and biologic industries. The project was granted Site Plan approval on January 17, 2019, and amended by administrative approvals on September 27, 2019, and January 27, 2023, with seven (7) Conditions Subsequent. Per Condition Subsequent 2.8 the Planning Board's recommended approval applied only to Phases 1A and 1B. Subsequent phases of development shall require submission of updated plans and supporting documents and noticed public hearings with the City's Technical Advisory Committee and Planning Board for amended site plan approval.

Currently Phase 1A construction is complete, and Phase 1B work will be broke ground in mid-July. Accordingly, this amended site review application is submitted to allow Lonza to proceed to Phase 2 of the project which includes the fit up of Building #1 and the construction of a temporary surface parking lot to support the employees of Building #1.

Existing Condition

The project is located on the vacant portion of Lonza's 46-acre parcel, refered to as the Iron Parcel, that once consisted of military housing and streets for Pease Air Force Base. The houses and roads were removed in the mid to late 1990's as part of the Civil Redevelopment Plan for Pease after the closure of the Air Force Base. The Iron Parcel was merged with Lonza's original parcel at 101 International Drive as part of the 2019 subdivision approval.

The existing 101 International Drive facility is approximately 800,000 SF in gross floor area and includes approximately 900 employees. Site work is ongoing on the Iron Parcel for the final completion of Phase 1A and the commecment of Phase 1B. The following summarizes the work completed during Phase 1A and to be completed during Phase 1B:

Phase 1A

- Daylighting of Hodgson Brook on the Iron Parcel
- Removal of the existing Hodgson Brook culvert
- Construction of the sidewalk and landscaping along Corporate Drive
- Completion of Soils Management Plan

Phase 1B

- Construction of building #1 shell
- Construction site improvements for building #1 such as drive aisles, fire lanes, utilities, lighting, sidewalks and stormwater management including Gravel Wetland #1
- Construction of the utility building shell
- Temporary gravel area for construction trailers, parking and laydown in approximate location of Proposed Building #3
- Intermittent grading between stream and Building #1
- Temporary sedimentation basins at locations of Gravel Wetland #2 and Rain Garden #1

Amended Site Plan

The total master plan build-out of the proposed industrial development is depicted in the enclosed Site Plan set. The master plan includes three (3) new buildings totaling approximately 800,000 square feet of gross floor area, a central utility building, and a new parking garage. The full master plan build-out has the potential to create approximately 800 new jobs. The project's site improvements consist of drive aisles, sidewalks, fire lanes, utilities, lighting and landscaping. The site improvements will constist of new stormwater management systems that include two (2) gravel wetlands and one (1) rain garden. The project has already received Alteration of Terrain Permit from the New Hampshire Department of Environmental Services (NHDES) for the the stormwater management design.

This master plan will be constructed in phases. Full-buildout will take several years and must be completed in phases as Lonza identifies clients and fits out the buildings to meet their needs. Phase 2 plans for the development are included in the Site Plan set that is enclosed with this letter, along with the amended master plan. The following summarizes the work to be completed during Phase 2:

Phase 2

- Final fit-up of Building #1
- Final fit-up of Utility Building
- Construction of the temporary surface parking lot

- Temporary gravel area for construction trailers, parking and laydown in approximate location of Proposed Building #2

The enclosed plans and supplemental materials have been provided to address feedback from the Technical Advisory Committee (TAC) at their meeting held on August 1, 2023. Additionally, the applicant has addressed additional coordination items between the building design and the utility and drainage design plans enclosed in this package. Below is a list of items that were modified to either address TAC feedback or the building coordination items;

- Added a fire service connection to the parking garage as depicted on the Master Utility plans Sheet C-111 & C-112.
- A 10" valve has been added after the reducer on the water main connection to Corporate Drive on Sheet C-111 & C-161.
- Added site note #24 stating that all gates shall be equipped with Knox boxes as depicted on sheets C-105 & C-165.
- Corrected the City of Portsmouth DPW references in notes 1 & 2 on the Manhole Joints Detail on sheet C-505.
- Added Exterior Electrical and Building equipment for the utility yards of Building 1 and the CUB as depicted on the Master and Phase 2 Utility plans C-112, C-113, C-172, & C-173.
- Adjusted Roof Drain, Under Slab Drainage and Foundation drain tie-in location for both Building 1 and the CUB as depicted on the Grading and Drainage plans C-109, C-110, C-169, & C-170.

We respectfully request to be placed on the Planning Board meeting agenda for October 19, 2023. If you have any questions or need any additional information, please contact Neil Hansen by phone at (603) 294-9213 or by email at nahansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.

Neil Han

Neil A. Hansen, PE
Project Manager

Colter J. Krzcuik, EIT
Staff Engineer

Copy: Lonza Biologics (via email)
Pease Development Authority

J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Report_Evaluations\Applications\City of Portsmouth\20230925_PB Submission\L0700-026 PB Cover Letter.docx

Pease Development Authority

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

PEASE
INTERNATIONAL
TRADEPORT
PORTSMOUTH NH

Application for Site Review

For PDA Use Only

Date Submitted:________ Municipal Review:________ Fee:________

Application Complete:________ Date Forwarded:________ Paid:________ Check #:________

Applicant Information

Applicant: Lonza Biologics, Inc.	Agent: Tighe & Bond, Inc.
Address: 101 International Drive Portsmouth, NH 03801	Address: 177 Corporate Drive Portsmouth, NH 03801
Business Phone: 603-570-3625	Business Phone: 603-433-8818
Mobile Phone:	Mobile Phone:
Fax:	Fax:

Site Information

Portsmouth Tax Map: 305	Lot #: 006	Zone: Airport, Business, Commercial
Site Address / Location : 101 International Drive, Portsmouth, NH 03801		
Site Address / Location :		Area of On-site Wetlands: 4,087 SF

Activity Information

Change of Use: **Yes [ ]** **No [X]**

Existing Use: Office/Research/Manufacturing

Proposed Use: Office/Research/Manufacturing

Description of Project:

The total master plan build-out of the proposed industrial development is depicted in the enclosed Site Plan set. The master plan includes three (3) new buildings totaling approximately 800,000 square feet of gross floor area, a central utility building, and a new parking garage. Phase 1A construction is nearing completion, and Phase 1B work will be breaking ground in early July. Accordingly, this amended site review application is submitted to allow Lonza to proceed to Phase 2 of the project which includes the fit up of Building #1 and the construction of a temporary surface parking lot to support the employees of Building #1. Per a condition of approval subsequent phases beyond 1A & 1B require submission of updated plans and supporting documents.

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.

David J. Wach
Signature of Applicant

12 JUN 2023
Date

DAVID J. WACH
Printed Name

N:\Engineer\ ApplicationforSiteReview.xlsx

Tighe&Bond

L0700-026
September 27, 2023

Mr. Eric D. Weinrieb, PE, President
Altus Engineering, Inc.
133 Court Street
Portsmouth, New Hampshire 03801

Re: **Response to Third Party Review**
Lonza Biologics – Iron Parcel Development
70 & 80 Corporate Drive, Tax Map 305, Lot 6
Altus Project 5483

Dear Eric:

On behalf of Lonza Biologics (applicant), we are pleased to submit revised Site Plans and Drainage Analysis for the above referenced project. The enclosed plans have been revised in response to the four (4) Plan Review Comments and eight (8) recommendations received from Altus in a letter dated September 22, 2023. The following are responses (in **bold**) to the recommendations from your review letter:

Plan Review Comments:

1. Title Sheet - The Plan Set Index refers to Phase 1B plan, but the Plans are Phase 2. This is confusing when initially reviewing for project phasing.

   Plan Set Index on Cover Sheet has been revised to remove references to Phase 1B.

2. Phase 2 Overall Site Plan (C-164) – The temporary laydown area in the location of Building #2 that is to be constructed during Phase 1B is not shown. Please provide laydown area to be utilized during this Phase 2. It is understood that the laydown area will be removed at the completion of Phase 2 for the planting of the lawn as provided in Landscape Plan C-175 and 176.

   Sheet C-163.1 shows the location of the gravel construction laydown area in the location of building #2. Confirmed the intent is for the laydown area to be removed at the completion of Phase 2 for the planting of the lawn as provided in Landscape Plan C-175 and 176.

3. Temporary Sediment Basin #1 – This basin is identified as a temporary basin on the Phase 2 development plans. Please indicate when the temporary basin is to be removed and if it is intended to remain at the completion of Phase 2.

   The intent is for sediment basin 1 to remain in place until the construction of Building 2 as part of a future phase of development. At that time sediment basin 1 will be removed, and raingarden 1 will be constructed in its place to treat runoff from Building 2 and associated impervious surfaces.

4. Details Sheet C-510 – The temporary Sediment Basin detail provided shows a sand filter and underdrain. The location of the filter fabric is not shown on the detail. The filter fabric should be shown between the sand and rock layers so that sand does not migrate to the rock. It should be noted that this is a temporary BMP and should be removed at the completion of Phase 2. As this is in the location of the future

raingarden, all rock and sand shall be removed to native soil for construction of the raingarden.

Temporary sediment basin 1 is already constructed per the detail on sheet C-510, which calls for the basin to be lined with geotextile. A line for the location of the fabric has been added to the detail for clarity. The intent is for sediment basin 1 to remain in place until the construction of Building 2 as part of a future phase of development.

Recommendations:

1. The applicant should maintain the SWPPP, monitoring, and maintenance with strong oversight by the engineer of record.
    a. Clean and maintain Catch Basin filters along Goose Bay Drive.
    b. Fix filter fabric in inlet pond at Goose Bay Drive.

   Tighe & Bond is performing the SWPPP monitoring for the project as well as the Environmental Monitoring required by the Alteration of Terrain Permit. The applicants contractor is responsible for performing all maintenance items noted

2. The applicant should verify if an amendment to the existing NHDES Alteration of Terrain Permit is required, per Env-Wq 1503.22, and process amendment if required.

   The NHDES Alteration of Terrain Permit for this project is for the full master plan build out of the site. The changes to the plans proposed do not trigger the need for an amended permit at this time.

3. The applicant should revise the detail for the temporary sediment basin with clarification on filter fabric locations.

   Temporary sediment basin 1 is already constructed per the detail on sheet C-510, which calls for the basin to be lined with geotextile. A line for the location of the fabric has been added to the for clarity.

4. The applicant should provide the proposed layout and details (approximate size and section) for the gravel construction laydown area in the location of Building #2.

   Sheet C-163.1 shows the location of the gravel construction laydown area in the location of building #2. Gravel parking area section is on Detail Sheet C-502.

5. The applicant should remove the temporary gravel laydown area for Phase 2 in the location Building #2 upon completion of Phase 2 and the area shall be restored per the planting plans.

   This is the intent shown on the Phase 2 plan set.

6. The applicant should revise the stormwater modeling to include the gravel laydown area for Phase 2 for the sizing of the temporary sediment basin.

   The Phase 2 calculations included in the previous version of the Drainage Analysis are for the post-phase 2 construction condition of the site. The gravel laydown area was included in the Phase 1B drainage calculations and used to size sediment basin 1. These calculations have been included in the revised drainage analysis, and peak flow rate comparison table. In order to provide

conservative sizing of the sediment basin, the entire watershed area was modelled as gravel.

7. The City should consider previously tabled items for inclusion in the Phase 2 work.

   No Response Required

8. The applicant shall submit for approval any additional work not included in Phases 1A-1B and Phase 2.

   No Response Required

If you have any questions or require any additional information, please feel free to contact me.

Sincerely,

TIGHE & BOND, INC.

Neil A. Hansen, PE
Project Manager

Patrick M. Crimmins, PE
Vice President

Enclosures
Cc: City of Portsmouth
Lonza Biologics (via email)
Pease Development Authority (via email)

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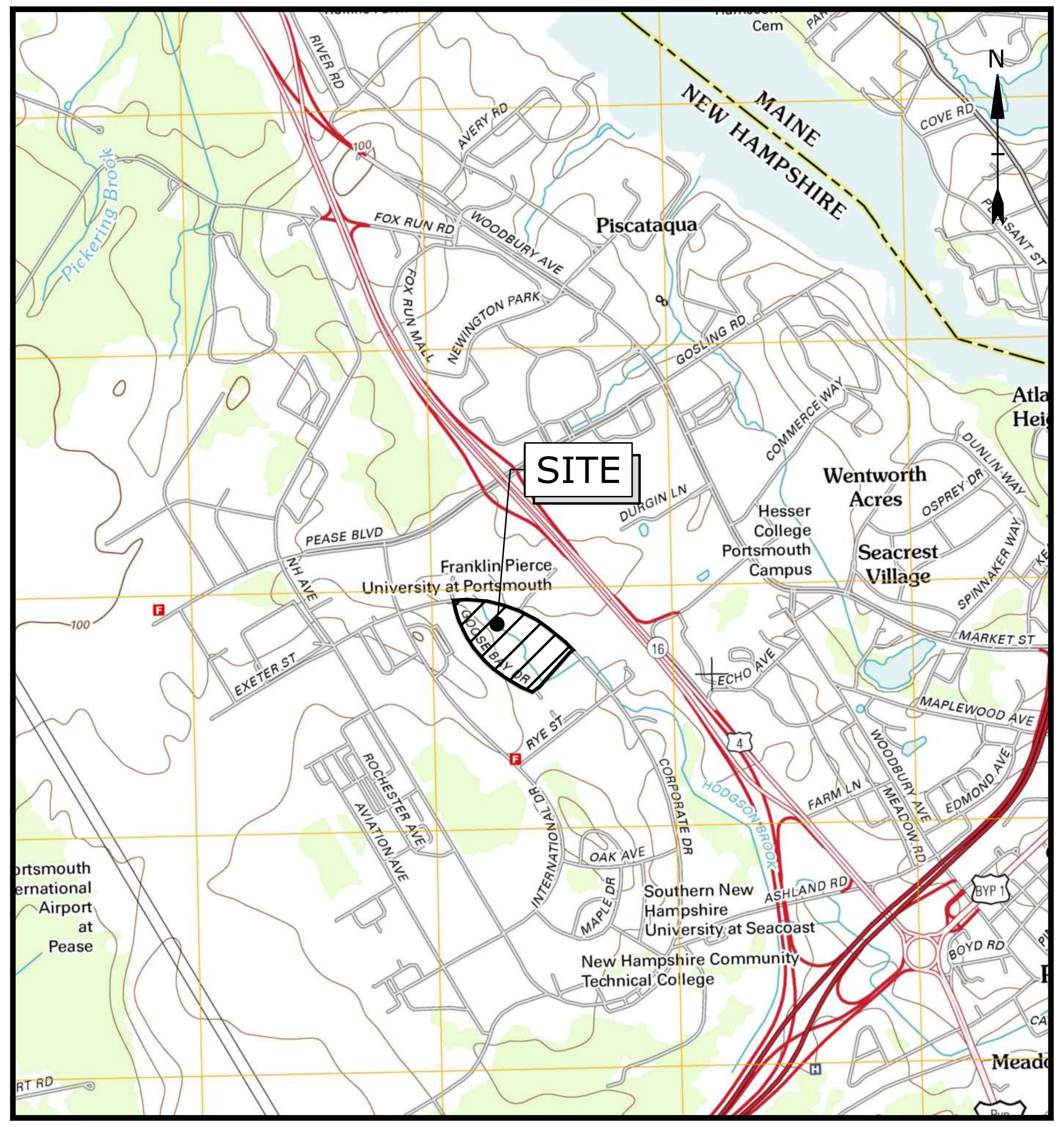
PROPOSED INDUSTRIAL DEVELOPMENT

70 & 80 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE
PROJECT NO: L-0700-13
APRIL 3, 2018

LAST REVISED: SEPTEMBER 27, 2023

PLAN SET INDEX		
SHEET TITLE	# OF SHEETS	LAST REVISED
COVER SHEET	1	9/27/2023
SHEET INDEX	1	9/27/2023
EXISTING CONDITIONS & SUBDIVISION PLANS COVER SHEET	1	11/2/2021
EXISTING CONDITIONS & SUBDIVISION PLANS	6	11/2/2021
MASTER PLAN COVER SHEET	1	9/27/2023
MASTER PLAN SET	19	9/27/2023
PHASE 2 COVER SHEET	1	9/27/2023
PHASE 2 PLAN SET	27	9/27/2023
DETAILS COVER SHEET	1	9/27/2023
EROSION CONTROL NOTES & DETAILS SHEETS	12	9/27/2023

LIST OF PERMITS		
LOCAL	STATUS	DATE
SITE PLAN REVIEW PERMIT	APPROVED	1/17/2019
AMENDED SITE PLAN REVIEW PERMIT	PENDING	
STATE		
NHDES - ALTERATION OF TERRAIN PERMIT	ISSUED: AOT-1498	10/02/2018
NHDES - WETLANDS PERMIT	ISSUED: #2018-01731	12/21/2018
FEDERAL		
PHASE 1A - EPA - NPDES CGP	ISSUED: NHR1001EU	2/24/2022
PHASE 1B - EPA - NPDES CGP	ISSUED:NHR1001SK	7/21/2023
	ISSUED:NHR1001SL	7/24/2023



LOCATION MAP
SCALE: 1" = 2,000'

LESSOR: PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DRIVE
PORTSMOUTH, NEW HAMPSHIRE 03801

APPLICANT/OWNER: LONZA BIOLOGICS
101 INTERNATIONAL DRIVE
PORTSMOUTH, NH 03801

CIVIL ENGINEER: Tighe&Bond
177 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE 03801

SURVEYOR: DOUCET SURVEY, INC.
102 KENT PLACE
NEWMARKET, NEW HAMPSHIRE 03857

WETLAND SCIENTIST: GOVE ENVIRONMENTAL SERVICES, INC.
8 CONTINENTAL DRIVE, UNIT H
EXETER, NEW HAMPSHIRE 03833

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

PLANNING BOARD SUBMISSION
COMPLETE SET 70 SHEETS

Last Save Date: September 25, 2023 5:16 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
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EXISTING CONDITIONS & SUBDIVISION PLANS SHEET INDEX

SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	11/2/2021
1 of 4	EXISTING CONDITIONS PLAN	08/16/2018
2 of 4	EXISTING CONDITIONS PLAN	08/16/2018
3 of 4	EXISTING CONDITIONS PLAN	08/16/2018
4 of 4	EXISTING CONDITIONS PLAN	08/16/2018
1 of 2	SUBDIVISION PLAN	11/2/2021
2 of 2	SUBDIVISION PLAN	11/2/2021

MASTER PLAN SET SHEET INDEX

SHEET NO.	SHEET TITLE	LAST REVISED
	MASTER PLAN SET COVER SHEET	9/27/2023
C-101	DEMOLITION PLAN	9/27/2023
C-102	DEMOLITION PLAN	9/27/2023
C-103	DEMOLITION PLAN	9/27/2023
C-104	OVERALL SITE PLAN	9/27/2023
C-105	SITE PLAN	9/27/2023
C-106	SITE PLAN	9/27/2023
C-107	SITE PLAN	9/27/2023
C-108	GRADING, DRAINAGE & EROSION CONTROL PLAN	9/27/2023
C-109	GRADING, DRAINAGE & EROSION CONTROL PLAN	9/27/2023
C-110	GRADING, DRAINAGE & EROSION CONTROL PLAN	9/27/2023
C-111	UTILITIES PLAN	9/27/2023
C-112	UTILITIES PLAN	9/27/2023
C-113	UTILITIES PLAN	9/27/2023
C-114	LANDSCAPE PLAN	9/27/2023
C-115	LANDSCAPE PLAN	9/27/2023
C-116	LANDSCAPE PLAN	9/27/2023
C-117	PHOTOMETRIC LIGHTING PLAN	9/27/2023
C-118	PHOTOMETRIC LIGHTING PLAN	9/27/2023
C-119	PHOTOMETRIC LIGHTING PLAN	9/27/2023

PHASE 2 PLAN SET SHEET INDEX

SHEET NO.	SHEET TITLE	LAST REVISED
	PHASE 2 PLAN SET COVER SHEET	9/27/2023
C-161	PHASE 2 DEMOLITION PLAN	9/27/2023
C-162	PHASE 2 DEMOLITION PLAN	9/27/2023
C-163	PHASE 2 DEMOLITION PLAN	9/27/2023
C-163.1	PHASE 2 PRE-CONSTRUCTION LAYOUT PLAN	9/27/2023
C-164	PHASE 2 OVERALL SITE PLAN	9/27/2023
C-165	PHASE 2 SITE PLAN	9/27/2023
C-166	PHASE 2 SITE PLAN	9/27/2023
C-167	PHASE 2 SITE PLAN	9/27/2023
C-168	PHASE 2 GRADING, DRAINAGE & EROSION CONTROL PLAN	9/27/2023
C-169	PHASE 2 GRADING, DRAINAGE & EROSION CONTROL PLAN	9/27/2023
C-170	PHASE 2 GRADING, DRAINAGE & EROSION CONTROL PLAN	9/27/2023
C-171	PHASE 2 UTILITIES PLAN	9/27/2023
C-172	PHASE 2 UTILITIES PLAN	9/27/2023
C-173	PHASE 2 UTILITIES PLAN	9/27/2023
C-174	PHASE 2 LANDSCAPE PLAN	9/27/2023
C-175	PHASE 2 LANDSCAPE PLAN	9/27/2023
C-176	PHASE 2 LANDSCAPE PLAN	9/27/2023
C-177	PHASE 2 PHOTOMETRIC LIGHTING PLAN	9/27/2023
C-178	PHASE 2 PHOTOMETRIC LIGHTING PLAN	9/27/2023
C-179	PHASE 2 PHOTOMETRIC LIGHTING PLAN	9/27/2023
8-046-1-1110	FIRST FLOOR PLAN - CUB	8/24/2023
8-046-1-2002	BUILDING ELEVATIONS (E-W) - CUB	8/24/2023
8-046-1-2003	BUILDING ELEVATIONS (N-S) - CUB	9/18/2023
8-070-1-1110	FIRST FLOOR PLAN - BL1	8/24/2023
8-070-1-2001	OVERALL BUILDINGS ELEVATIONS	7/12/2023
8-070-1-2002	BUILDING ELEVATIONS (E-W) - BL1	8/24/2023
8-070-1-2003	BUILDING ELEVATIONS (N-S) - BL1	8/24/2023

DETAILS SHEET INDEX

SHEET NO.	SHEET TITLE	LAST REVISED
	DETAILS COVER SHEET	9/27/2023
C-501	EROSION CONTROL NOTES & DETAILS SHEET	9/27/2023
C-502	DETAILS SHEET	9/27/2023
C-503	DETAILS SHEET	9/27/2023
C-504	DETAILS SHEET	9/27/2023
C-505	DETAILS SHEET	9/27/2023
C-506	DETAILS SHEET	9/27/2023
C-507	DETAILS SHEET	9/27/2023
C-508	DETAILS SHEET	9/27/2023
C-509	DETAILS SHEET	9/27/2023
C-510	DETAILS SHEET	9/27/2023
C-511	DETAILS SHEET	9/27/2023
C-512	DETAILS SHEET	9/27/2023

Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
M	9/27/2023	P.B. Submission
L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
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

PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-COVR.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

SHEET INDEX

SCALE: AS SHOWN

C-100

Last Save Date: September 27, 2023 2:37 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-COVR.dwg Layout Tab: C-100

EXISTING CONDITIONS & SUBDIVISION PLANS

APRIL 3, 2018

REVISED: NOVEMBER 2, 2021

LIST OF DRAWINGS

SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	11/2/2021
1 of 4	EXISTING CONDITIONS PLAN	11/2/2021
2 of 4	EXISTING CONDITIONS PLAN	08/16/2018
3 of 4	EXISTING CONDITIONS PLAN	08/16/2018
4 of 4	EXISTING CONDITIONS PLAN	08/16/2018
1 of 2	SUBDIVISION PLAN	11/2/2021
2 of 2	SUBDIVISION PLAN	11/2/2021

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER
NEIL
A.
HANSEN
No. 15227
LICENSED
9/27/2023

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER
PATRICK
CRIMMINS
No. 12378
LICENSED
9/27/2023

COMPLETE SET 7 SHEETS

Last Save Date: September 25, 2023 5:16 PM By: CKRZCUIK
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T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-COVR.dwg Layout Tab: EX-CS

DRAINAGE STRUCTURE TABLE

CB #1013
RIM ELEV.=68.4'
(1019) 18" HDPE INV.=64.4'
(A) 18" HDPE INV.=64.4'

CB #1019
RIM ELEV.=68.5'
(A) 18" HDPE INV.=65.1'
(1013) 18" HDPE INV.=64.7'

CB #1088
RIM ELEV.=66.6'
(A) 6" HDPE INV.=62.0'
(1111) 12" RCP INV.=61.6'
(1095) 12" RCP INV.=61.6'

DMH #1095
RIM ELEV.=65.2'
(1088) 12" RCP INV.=60.0'
(1137) 12" RCP INV.=59.7'

CB #1111
RIM ELEV.=66.8'
(1088) 12" RCP INV.=61.9'

CB #1137
RIM ELEV.=60.7'
(1095) 12" RCP INV.=57.3'
(1285) 15" RCP INV.=56.8'
(1141) 15" RCP INV.=56.8'

DMH #1141
RIM ELEV.=61.1'
(1300) 12" RCP INV.=57.2'
(1137) 15" RCP INV.=56.9'
(1147) 15" RCP INV.=56.6'
(A) 15" RCP INV.=56.4'
(B) 18" ASB INV.=56.3'

CB #1147
RIM ELEV.=61.5'
(A) 15" RCP INV.=57.2'
(1141) 15" RCP INV.=57.1'

CB #1183
RIM ELEV.=60.1'
(1212) 15" RCP INV.=55.7'

CB #1212
RIM ELEV.=57.5'
(1183) 15" RCP INV.=54.8'
(1381) 15" RCP INV.=54.6'

CB #1285
RIM ELEV.=60.7'
(1137) 15" RCP INV.=57.0'

CBR #1305
RIM ELEV.=56.7'
(1311) 12" RCP INV.=52.8'
(A) 15" RCP INV.=52.7'
(1324) 15" RCP INV.=52.7'

CB #1311
RIM ELEV.=57.1'
(1381) 15" RCP INV.=53.4'
(1305) 12" RCP INV.=53.0'

CBR #1324
RIM ELEV.=55.7'
(A) 12" RCP INV.=52.3'
(1325) 12" RCP INV.=51.9'
(1305) 15" RCP INV.=51.9'
(B) 22" RCP INV.=51.7'

CB #1325
RIM ELEV.=55.7'
(1399) 15" RCP INV.=51.9'
(1324) 12" RCP INV.=51.8'

DMH #1338
RIM ELEV.=57.7'
(SUMP)=49.9' (LARGE VAULT)

CB #1345
RIM ELEV.=58.1'
(1420) 12" RCP INV.=53.9'

CB #1381
RIM ELEV.=57.2'
(1212) 15" RCP INV.=54.3'
(1311) 15" RCP INV.=54.4'

CB #1399
RIM ELEV.=55.5'
(1325) 15" RCP INV.=52.3'

DMH #1401
RIM ELEV.=58.3'
NOT OPENED – OFF SITE

DMH #1408
RIM ELEV.=56.8'
NOT OPENED – OFF SITE

CB #1420
RIM ELEV.=58.1'
(1345) 12" RCP INV.=54.4'
(1421) 12" HDPE INV.=54.1'

DMH #1421
RIM ELEV.=57.4'
(1420) 12" RCP INV.=54.3'
SUMP=53.4' (FULL OF SILT)

DMH #1438
RIM ELEV.=50.2'
(A) 12" RCP INV.=44.6'
(1439) 12" RCP INV.=44.6'
(B) UNK. CMP INV.=42.9'
(C) UNK. CMP INV.=42.9'

CBR #1439
RIM ELEV.=47.4'
(1438) 12" RCP INV.=45.2'

CBR #1444
RIM ELEV.=48.3'
12" HDPE INV.=46.4'
(SUMP) INV.=42.8'

CB #1456
RIM ELEV.=58.1'
(1460) 12" RCP INV.=52.5'

DMH #1460
RIM ELEV.=58'
(1461) 12" RCP INV.=51.6'
(1456) 12" RCP INV.=51.5'
(A) 15" RCP INV.=50.7'

CB #1461
RIM ELEV.=57.9'
(1460) 12" RCP INV.=53.2'

CB #1478
RIM ELEV.=54.2'
(1515) 12" RCP INV.=47.2'

CB #1484
RIM ELEV.=49.0'
BROKEN GRATE – NOT OPENED

CB #1504
RIM ELEV.=48.9'
(A) 12" RCP INV.=42.7'
(1484) 12" RCP INV.=42.6'

CB #1515
RIM ELEV.=54.1'
BROKEN GRATE – NOT OPENED

CB #1542
RIM ELEV.=44.4'
(1651) 12" RCP INV.=41.0'

CB #1570
RIM ELEV.=40.7'
(A) 18" RCP INV.=36.2'
(B) 18" RCP INV.=36.2'

CB #1572
RIM ELEV.=42.2'
(1611) 12" RCP INV.=38.2'

CB #1580
RIM ELEV.=41.7'
(1586) 15" RCP INV.=36.8'

CB #1586
RIM ELEV.=41.9'
(1580) 15" RCP INV.=36.4'
(A) 15" RCP INV.=36.6'

CB #1611
RIM ELEV.=42.4'
(1572) 12" RCP INV.=37.8'
(A) 12" RCP INV.=37.5'

CB #1651
RIM ELEV.=44.6'
(1542) 12" RCP INV.=39.5'
(A) 12" RCP INV.=39.5'

CB #1678
RIM ELEV.=39.2'
(TOP OF WATER) INV.=36.5'
(A) 12" RCP INV.=35.4'

CB #1685
RIM ELEV.=39.2'
(TOP OF WATER) INV.=36.6'
(2330) 12" RCP INV.=36.4'

DMH #1695
RIM ELEV.=42.8'
(1732) 10" RCP INV.=36.4'
(A) 48" RCP INV.=35.9'
(B) NOT MEASURED
(RECESSED – LARGE VAULT)

CB #1732
RIM ELEV.=39.1'
(1695) 10" RCP INV.=37.3'

CBR #1733
RIM ELEV.=39.1'
STRUCTURE DAMAGED

DMH #1755
RIM ELEV.=42'
(A) 24" RCP INV.=37.2'
(B) 24" RCP INV.=37.1'

CB #1756
RIM ELEV.=42.5'
(1769) 12" RCP INV.=39.2'

CB #1769
RIM ELEV.=42.5'
(1756) 12" RCP INV.=38.1'
(A) 12" RCP INV.=33.5'

CB #1935
RIM ELEV.=49.7'
NOT OPENED – SILT SOCK

CB #2031
RIM ELEV.=59.0'
NOT OPENED – SILT SOCK

DMH #2142
RIM ELEV.=62.8'
(A) 24" HDPE INV.=58.2'
(B) 24" HDPE INV.=56.8'

CB #2152
RIM ELEV.=64.3'
NOT OPENED – SILT SOCK

DMH #2153
RIM ELEV.=64.5'
(SUMP) INV.=53.9'
FULL OF WATER

CB #2170
RIM ELEV.=65.7'
NOT OPENED – SILT SOCK

CB #2246
RIM ELEV.=65.5'
NOT OPENED – SILT SOCK

CBR #2327
RIM ELEV.=40.2'
(A) 12" RCP INV.=38.3'

CBR #2329
RIM ELEV.=47.4'
(A) 12" RCP INV.=42.0'
SILT=41.9'

DMH #2330
RIM ELEV.=40.4'
(1685) 12" RCP INV.=36.5'
(A) 12" RCP INV.=36.3'
(B) 15" RCP INV.=36.1'

DMH #2336
RIM ELEV.=39.7'
(A) 18" RCP INV.=36.1'
(B) 24" RCP INV.=35.4'

SEWER STRUCTURE TABLE

SMH #1062
RIM ELEV.=69.8'
(A) 6" CLAY INV.=63.9'
(B) 6" CLAY INV.=63.7'
(1067) 8" CLAY INV.=62.6'

SMH #1067
RIM ELEV.=68.6'
(1062) 8" CLAY INV.=60.4'
(2242) 8" UNK. INV.=60.3'

SMH #1078
RIM ELEV.=69.0'
COULD NOT OPEN

SMH #1123
RIM ELEV.=64'
(1295) 8" PVC INV.=55.8'

SMH #1169
RIM ELEV.=65.2'
(1184) 15" STEEL INV.=53.8'
(A) 15" STEEL INV.=53.8'

SMH #1184
RIM ELEV.=60.4'
(1296) 8" CLAY INV.=54.2'
(1217) 15" STEEL INV.=52.7'
(1169) 15" STEEL INV.=52.7'

SMH #1217
RIM ELEV.=57.9'
(1184) 15" STEEL INV.=52.3'
(1400) 15" STEEL INV.=52.2'

SMH #1296
RIM ELEV.=63.7'
(1123) 8" PVC INV.=55.5'
(2326) 8" UNK. INV.=55.0'
(1184) 8" UNK. INV.=55.0'

SMH #1400
RIM ELEV.=55.6'
(1217) 15" ASB INV.=49.3'
(1415) 15" ASB INV.=49.3'

SMH #1415
RIM ELEV.=57.9'
(A) 12" PVC INV.=48.3'
(1400) 18" UNK. INV.=47.9'
(1450) 18" PVC INV.=48.0'

SMH #1450
RIM ELEV.=60.5'
(1415) 18" PVC INV.=47.6'
(1459) 18" PVC INV.=47.5'

SMH #1459
RIM ELEV.=58.8'
(A) 8" PVC INV.=48.4'
(1450) 18" PVC INV.=47.1'
(B) 18" PVC INV.=47.1'

SMH #1551
RIM ELEV.=43.6'
(A) 8" PVC INV.=35.6'
(B) 12" UNK. INV.=34.2'
(C) 12" UNK. INV.=34.1'

SMH #1691
RIM ELEV.=39.9'
(1784) UNK. INV.=34.2'
(1722) UNK. INV.=34.1'

SMH #1722
RIM ELEV.=41.1'
(A) 6" CLAY INV.=33.2'
(1691) UNK. CLAY INV.=33.1'

SMH #1784
RIM ELEV.=41.1'
(1921) 10" UNK. INV.=35.4'
(1691) 10" UNK. INV.=35.5'

SMH #1921
RIM ELEV.=44.8'
(1953) UNK. INV.=37'
(1784) UNK. INV.=36.9'

SMH #1953
RIM ELEV.=50.1'
(A) 6" CLAY INV.=42.4'
(2080) UNK. INV.=42.2'
(1921) UNK. INV.=42.2'

SMH #2080
RIM ELEV.=57.9'
(A) 8" UNK. INV.=50.1'
2187) 8" UNK. INV.=50.1'
(1953) 8" UNK. INV.=49.9'

SMH #2187
RIM ELEV.=63'
(A) 6" PVC INV.=54.9'
(2242) 8" PVC INV.=54.9'
(2080) 8" PVC INV.=54.9'

SMH #2242
RIM ELEV.=65.0'
(1067) 8" CLAY INV.=56.8'
(2187) 8" CLAY INV.=57.0'

SMH #2326
RIM ELEV.=68.1'
(1078) 8" PVC INV.=62.2'
(1296) 8" ASB INV.=62.1'

SMH #2328
RIM ELEV.=43.1'
(1551) 12" UNK INV.=32.3'
(A) 18" UNK INV.=32.3'

PURSUANT TO RSA 676:18, III:

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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."

Jeffrey A. Goldknopf L.L.S. #964
8-16-18 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.

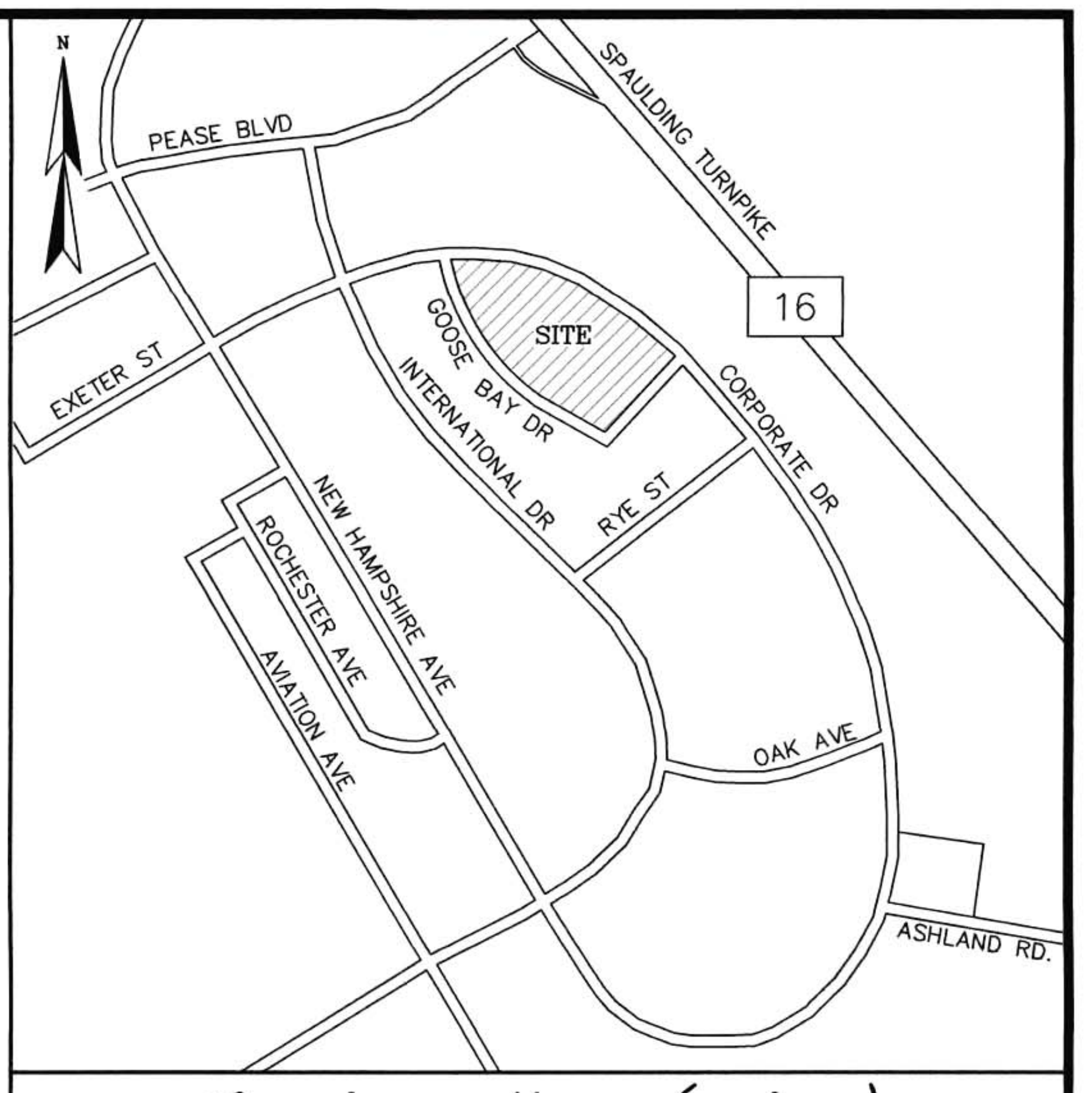
No. 964
JEFFREY A. GOLDKNOPF
SIGNATURE

REFERENCE PLANS:

1. "R.O.W. WORKSHEET, CORPORATE DRIVE PREPARED FOR PEASE DEVELOPMENT AUTHORITY" DATED DEC. 21, 1992 BY RICHARD D. BARTLETT & ASSOCIATES, INC. SHEETS 1 AND 2.
2. "PEASE A.F.B. / PORTSMOUTH, N.H. REPAVE BASE STREETS, PORTSMOUTH AVE, ROCKINGHAM AVE." DATED 7 DEC 82 BY STRATETIC AIR COMMAND CIVIL ENGINEERING. SHEET 4 OF 5
3. "PORTSMOUTH AIR FORCE BASE, PORTSMOUTH, N.H. ROADS AND STORAGE AREA FY-56" DATED DEC 1955 BY WHITMAN & HOWARD ENGINEERS. INDEX PAGE AND SHEETS 2 – 5 OF 11.
4. "PEASE INTERNATIONAL TRADEPORT SUBDIVISION PLAT, INTERNATIONAL DRIVE LOTS BC11-001 & BC11-002, PORTSMOUTH, N.H." DATED FEBRUARY 5, 1993 BY RICHARD D. BARTLETT & ASSOCIATES INC. R.C.R.D. PLAN #D22536.
5. "SUBDIVISION PLAN OF LAND FOR REDHOOK ALE BREWERY, INC. CORPORATE DRIVE, COUNTY OF ROCKINGHAM, PORTSMOUTH, N.H." DATED DECEMBER 10, 1994 BY RICHARD P. MILLETTE AND ASSOCIATES. R.C.R.D. PLAN #D-23978.
6. "ALTA/ACSM LAND TITLE SURVEY FOR RESPORT, LLC, ONE INTERNATIONAL DRIVE, COUNTY OF ROCKINGHAM, PORTSMOUTH, N.H." DATED FEBRUARY 27, 1998 BY MILLETTE, SPRAGUE & COLWELL, INC. R.C.R.D. PLAN #D-26125.
7. "FRANKLIN PIERCE COLLEGE, PEASE INTERNATIONAL TRADEPORT, 73 CORPORATE DRIVE, PORTSMOUTH, NH" DATED JANUARY 15, 1998 BY RONALD R. BURD. R.C.R.D. PLAN #D-26427.
8. "SUBDIVISION PLAN FOR LAND LEASED BY PEASE DEVELOPMENT AUTHORITY & KNOWN AS #119 INTERNATIONAL DRIVE LOCATED AT PEASE INTERNATIONAL TRADEPORT, PORTSMOUTH, N.H." DATED MARCH 1, 2000 BY KNIGHT HILL LAND SURVEYING SERVICES, INC. R.C.R.D. PLAN #D-28059.
9. "SUBDIVISION PLAT PREPARED FOR 80 CORPORATE DRIVE LLC C/O BOULOS PROPERTY MANAGEMENT, LOCATION CORPORATE & GOOSE BAY DRIVES, PEASE INTERNATIONAL TRADEPORT – PORTSMOUTH, NH" DATED APRIL 11, 2000 BY FWS LAND SURVEYING P.L.L.C. R.C.R.D. PLAN #D-28447.
10. "LEASE LINE REVISION PLAN FOR LONZA BIOLOGICS, INC. 101 INTERNATIONAL DRIVE, PORTSMOUTH, NEW HAMPSHIRE" DATED FEB. 5, 2001 BY DOUCET SURVEY, INC. R.C.R.D. PLAN #D-28955.
11. "LEASE LINE REVISION PLAN FOR LONZA BIOLOGICS, INC. 101 INTERNATIONAL DRIVE, PORTSMOUTH, NEW HAMPSHIRE" DATED SEPT. 17, 2001 BY DOUCET SURVEY, INC. R.C.R.D. PLAN #D-29538.
12. "SUBDIVISION PLAN OF LAND OF PEASE DEVELOPMENT AUTHORITY TO BE LEASED TO NORTHEAST REHABILITATION (A PORTION OF TAX MAP 303, LOT 6) 105 & 121 CORPORATE DRIVE, PEASE TRADEPORT, PORTSMOUTH, NEW HAMPSHIRE" DATED NOV. 5, 2008 BY DOUCET SURVEY, INC. R.C.R.D. PLAN #D-35869.
13. "CONDOMINIUM SITE & FLOOR PLAN PREPARED FOR PIONEER NEW HAMPSHIRE, LLC, LAND OF PEASE DEVELOPMENT AUTHORITY, TAX MAP PARCEL 305-3 (108, 110, 112 & 114 CORPORATE DRIVE) PORTSMOUTH, NEW HAMPSHIRE" DATED APRIL 12, 2013 BY FIELDSTONE LAND CONSULTANTS, PLLC. SHEET 1 OF 5. R.C.R.D. PLAN #D-37765.
14. "SUBDIVISION PLAN FOR PEASE DEVELOPMENT AUTHORITY, (TAX MAP 303, LOT 4) 67 CORPORATE DRIVE, PEASE TRADEPORT, PORTSMOUTH NEW HAMPSHIRE" DATED MAY 29, 2009 BY DOUCET SURVEY, INC. (NOT RECORDED)
15. "EXISTING CONDITIONS, BUILDING A, 80 CORPORATE DRIVE AND BUILDING B, 70 CORPORATE DRIVE, PORTSMOUTH, NH" DATED 4/14/2000 AND REVISED 6/05/2000 BY OPECHEE CONSTRUCTION CORPORATION. (NOT RECORDED)

LEGEND

━━━━	EXISTING LEASE/R.O.W. LINES
— o — o —	CHAIN LINK FENCE
— OHW —	OVERHEAD WIRES
— S —	SEWER LINE
— D —	DRAIN LINE
— G —	GAS LINE
— W —	WATER LINE
— E —	UNDERGROUND ELECTRIC LINE
— XS —	SEWER LINE PER REF. PLAN #15
— XD —	DRAIN LINE PER REF. PLAN #15
— XG —	GAS LINE PER REF. PLAN #15
— XW —	WATER LINE PER REF. PLAN #15
— 100 —	MAJOR CONTOUR LINE
– – 98 – –	MINOR CONTOUR LINE
⌒⌒⌒⌒	TREE LINE
— · · — · · —	EDGE OF WETLAND (SEE NOTE #6)
────	HISS LINE (SEE NOTE #6)
	UTILITY POLE
	SIGN
⊡	GRANITE BOUND FOUND
◉	DRILL HOLE FOUND
○	IRON PIPE/ROD FOUND
■	4"X4" GRANITE BOUND TO BE SET
●	5/8" REBAR W/ ID CAP TO BE SET
•	BOLLARD
	FIRE HYDRANT
WV ⋈	WATER GATE VALVE
GV ⋈	GAS GATE VALVE
T	PAD MOUNTED TRANSFORMER
E	ELECTRIC BOX
TB	TELEPHONE BOX
U	UTILITY BOX
C	CABLE BOX
⊕	CATCH BASIN
▤	CATCH BASIN
⌓	CATCH BASIN
Ⓓ	DRAIN MANHOLE
	FLARED END SECTION
Ⓔ	ELECTRIC MANHOLE
Ⓣ	TELEPHONE MANHOLE
Ⓢ	SEWER MANHOLE
CO	CLEANOUT
XD	CATCH BASIN PER REF. PLAN #15
XD	DRAIN MANHOLE PER REF. PLAN #15
XS	SEWER MANHOLE PER REF. PLAN #15
HH	HAND HOLE
	WETLAND AREA
	CONIFEROUS TREE
	DECIDUOUS TREE
	CONCRETE
	RIP RAP
	GRAVEL AREA
	LEDGE OUTCROP
BND. FND.	BOUND FOUND
D.H.F.	DRILL HOLE FOUND
EP	EDGE OF PAVEMENT
SWL	SINGLE WHITE LINE
DYL	DOUBLE YELLOW LINE
VGC	VERTICAL GRANITE CURB
	HISS SOIL TYPE



Location Map (n.t.s.)

NOTES:

1. REFERENCE: TAX MAP 305, LOT 1
   PHYSICAL ADDRESS: 70 CORPORATE DRIVE
   TAX MAP 305, LOT 2
   PHYSICAL ADDRESS: 80 CORPORATE DRIVE
2. TOTAL PARCEL AREA: TAX MAP 305, LOT 1: 443,578 SQ. FT. OR 10.183 AC.
   TAX MAP 305, LOT 2: 604,273 SQ. FT. OR 13.872 AC.
   TOTAL AREA: 1,047,851 SQ. FT. OR 24.055 AC.
3. OWNER OF RECORD: TAX MAP 305, LOTS 1 & 2
   PEASE DEVELOPMENT AUTHORITY
   55 INTERNATIONAL DRIVE
   PORTSMOUTH, NEW HAMPSHIRE 03801
   R.C.R.D. BOOK 4227, PAGE 001
4. ZONE: AIRPORT, BUSINESS & COMMERCIAL (ABC)
5. FIELD SURVEY PERFORMED BY J.M.L, E.J.S., J.P.E., J.F.K., AND N.J.M. DURING NOVEMBER 2015 USING A TRIMBLE R8 SURVEY GRADE GPS UNIT AND A TRIMBLE S6 ROBOTIC TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR.
6. JURISDICTIONAL WETLANDS DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC. DURING FALL 2014 IN ACCORDANCE WITH 1987 CORPS OF ENGINEERS WETLANDS DELINEATIONS MANUAL, TECHNICAL REPORT Y-87-1. HISS/SITE SPECIFIC SOILS MAPPING COMPLETED BY GOVE ENVIRONMENTAL SERVICES DURING DECEMBER 2015.
7. FLOOD HAZARD ZONE:"X", PER FIRM MAP #33015C0260E, DATED MAY 17, 2005.
8. HORIZONTAL DATUM BASED ON NH STATE PLANE 2800(NAD83/86) PER REFERENCE PLANS #10, #11, & #12.
9. VERTICAL DATUM IS BASED ON NGVD29 PER REFERENCE PLANS #10, #11, & #12.
10. PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT 2' INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA, AND DOUCET SURVEY, INC. WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.
11. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVABLE PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE. THE SITE WAS NOT MARKED FOR THE PURPOSES OF THIS SURVEY. SOME UTILITIES ARE SHOWN PER REFERENCE PLANS AS NOTED IN THE LEGEND.
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. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH AND IN RELATION TO THE CURRENT LEGAL DESCRIPTION, AND IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.
14. TAX MAP 305, LOTS 1 & 2 ARE EITHER SUBJECT TO OR IN BENEFIT OF, BUT NOT LIMITED TO, THE FOLLOWING EASEMENTS/RIGHTS OF RECORD:
    - 14.A. 50' WIDE ACCESS EASEMENT FOR THE BENEFIT OF LOT 305-2. (SHOWN PER REFERENCE PLAN #9)
    - 14.B. APPROXIMATE LOCATION OF 20' WIDE LICENSE TO THE CITY OF PORTSMOUTH FOR THE PURPOSES OF MAINTAINING A DRAINAGE LINE. (SHOWN PER REFERENCE PLAN #9)
15. FINAL MONUMENTATION MAY BE DIFFERENT THAN THE PROPOSED MONUMENTATION SHOWN HEREON, DUE TO THE FACT THAT SITE CONDITIONS WILL DICTATE THE ACTUAL LOCATION AND TYPE OF MONUMENTS INSTALLED IN THE FIELD. PLEASE REFER TO EITHER THE "MONUMENTATION LOCATION PLAN" TO BE RECORDED OR CONTACT DOUCET SURVEY, INC. FOR CLARIFICATION OF MONUMENTS SET. (A RECORDED PLAN WILL BE PRODUCED AT THE DISCRETION OF DOUCET SURVEY, INC.).

LUKE D. HURLEY
NO. 095
8/16/18

LUKE D. HURLEY
No. 232
8/16/18

NO.	DATE	DESCRIPTION	BY
2	8/16/18	MOD. DRAINAGE	J.A.G.
		MOD. SOIL TYPES PER G.E.S.	
1	8/3/16	GENERAL EDITS AND	J.A.G.
		ADDED WETLANDS BUFFER	

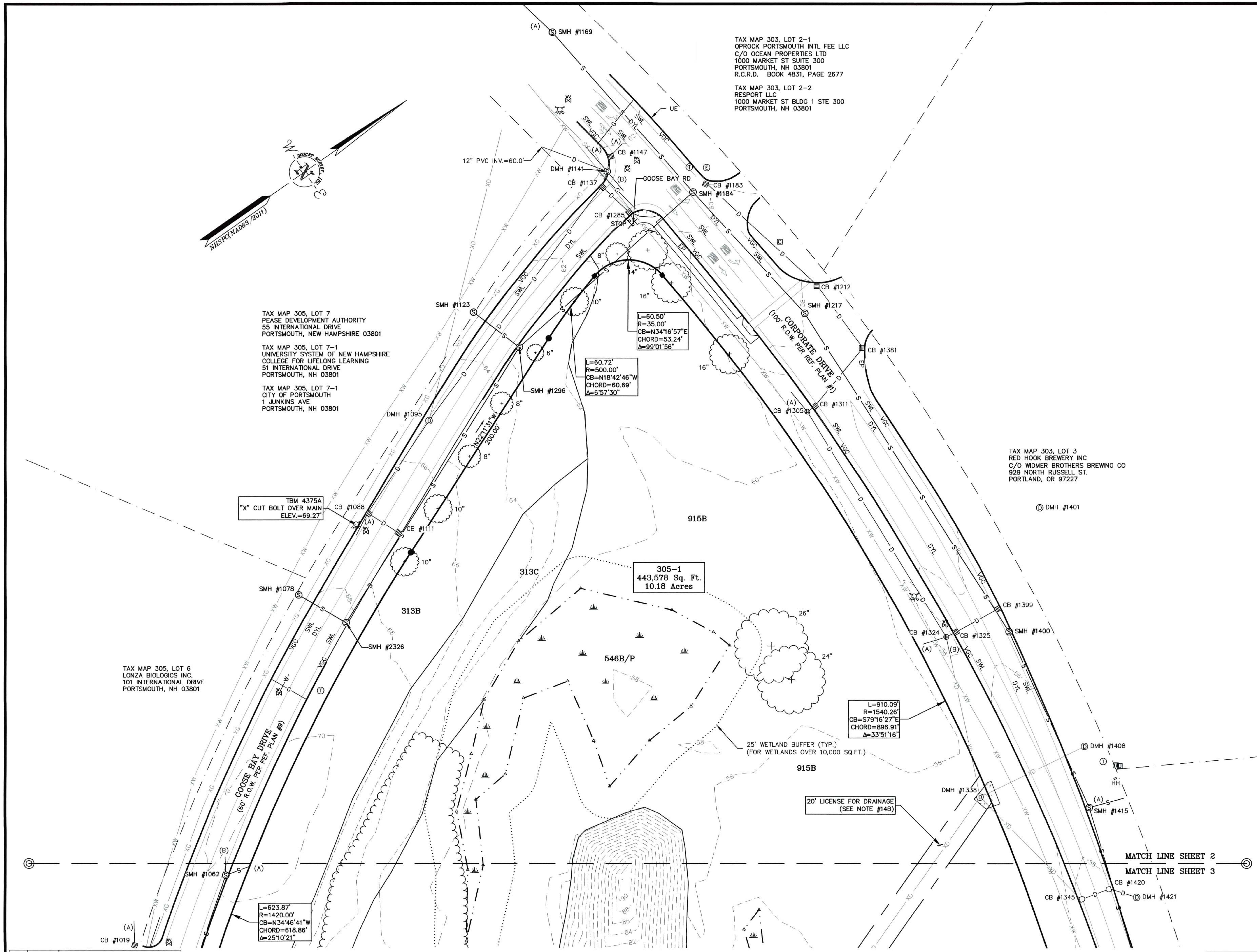
NOTE:
ALL ELECTRIC, GAS, TEL. WATER, SEWER AND DRAIN SERVICES ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN ON THIS SITE USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE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

EXISTING CONDITIONS PLAN
FOR
TIGHE & BOND AND LONZA
LAND OF
PEASE DEVELOPMENT AUTHORITY
(TAX MAP 305, LOTS 1 & 2)
GOOSE BAY DRIVE & CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE

DRAWN BY:	K.C.W.	DATE:	DEC. 23, 2015
CHECKED BY:	J.A.G.	DRAWING NO.:	4375A
JOB NO.:	4375	SHEET	1 OF 4

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

FILE NAME: C:\Users\Jeff\appdata\local\temp\AcPublish_8524\4375A.dwg LAYOUT NAME: 05) 22x34 (1) PLOTTED: Thursday, August 16, 2018 - 3:18pm



SOIL IDENTIFICATION LEGEND

SYMBOL	SOIL TAXONOMIC NAME, SLOPE RATING
89C	CHATFIELD, 8 TO 15 PERCENT SLOPES
313B	DEERFIELD, 0 TO 8 PERCENT SLOPES
313C	DEERFIELD, 8 TO 15 PERCENT SLOPES
915B	DEERFIELD VARIANT, 0 TO 8 PERCENT SLOPES
546B/P	WALPOLE POORLY DRAINED, 0 TO 8 PERCENT SLOPES
799B	UDORTHENTS URBAN LAND, 0 TO 8 PERCENT SLOPES
799E	UDORTHENTS URBAN LAND, >25 PERCENT SLOPES

LUKE D. HURLEY
8/16/18
No. 005

LUKE D. HURLEY
8/16/18
No. 232

No. 964
JEFFREY A. GOLDKNOPF
SIGNATURE

PURSUANT TO RSA 676:18, III:

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Jeffrey A. Goldknopf L.L.S. #964

8-16-18 DATE

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EXISTING CONDITIONS PLAN
FOR
TIGHE & BOND AND LONZA
LAND OF
PEASE DEVELOPMENT AUTHORITY
(TAX MAP 305, LOTS 1 & 2)
GOOSE BAY DRIVE & CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE

DRAWN BY:	K.C.W.	DATE:	DEC. 23, 2015
CHECKED BY:	J.A.G.	DRAWING NO.:	4375A
JOB NO.:	4375	SHEET	2 OF 4

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102 Kent Place, Newmarket, NH 03857 (603) 659-6560
10 Storer Street (Riverview Suite) Kennebunk, ME (207) 502-7005
http://www.doucetsurvey.com

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

NO.	DATE	DESCRIPTION	BY
2	8/16/18	MOD. DRAINAGE MOD. SOIL TYPES PER G.E.S.	J.A.G.
1	8/3/16	GENERAL EDITS AND ADDED WETLANDS BUFFER	J.A.G.

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

FILE NAME: C:\Users\Jeff\appdata\local\temp\AcPublish_8524\4375A.dwg LAYOUT NAME: DSI 22X34 (2) PLOTTED: Thursday, August 16, 2018 - 3:18pm

PURSUANT TO RSA 676:18, III:

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

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."

No. 964 JEFFREY A. GOLDKNOPF

SIGNATURE

L.L.S. #964

8-16-18 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.

LUKE D. HURLEY 8/16/18

LUKE D. HURLEY 8/16/18 No. 232

EXISTING CONDITIONS PLAN
FOR
TIGHE & BOND AND LONZA
LAND OF
PEASE DEVELOPMENT AUTHORITY
(TAX MAP 305, LOTS 1 & 2)
GOOSE BAY DRIVE & CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE

2	8/16/18	MOD. DRAINAGE	J.A.G.
		MOD. SOIL TYPES PER G.E.S.	
1	8/3/16	GENERAL EDITS AND	J.A.G.
		ADDED WETLANDS BUFFER	
NO.	DATE	DESCRIPTION	BY

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

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

DRAWN BY:	K.C.W.	DATE:	DEC. 23, 2015
CHECKED BY:	J.A.G.	DRAWING NO.:	4375A
JOB NO.:	4375	SHEET 3 OF 4	

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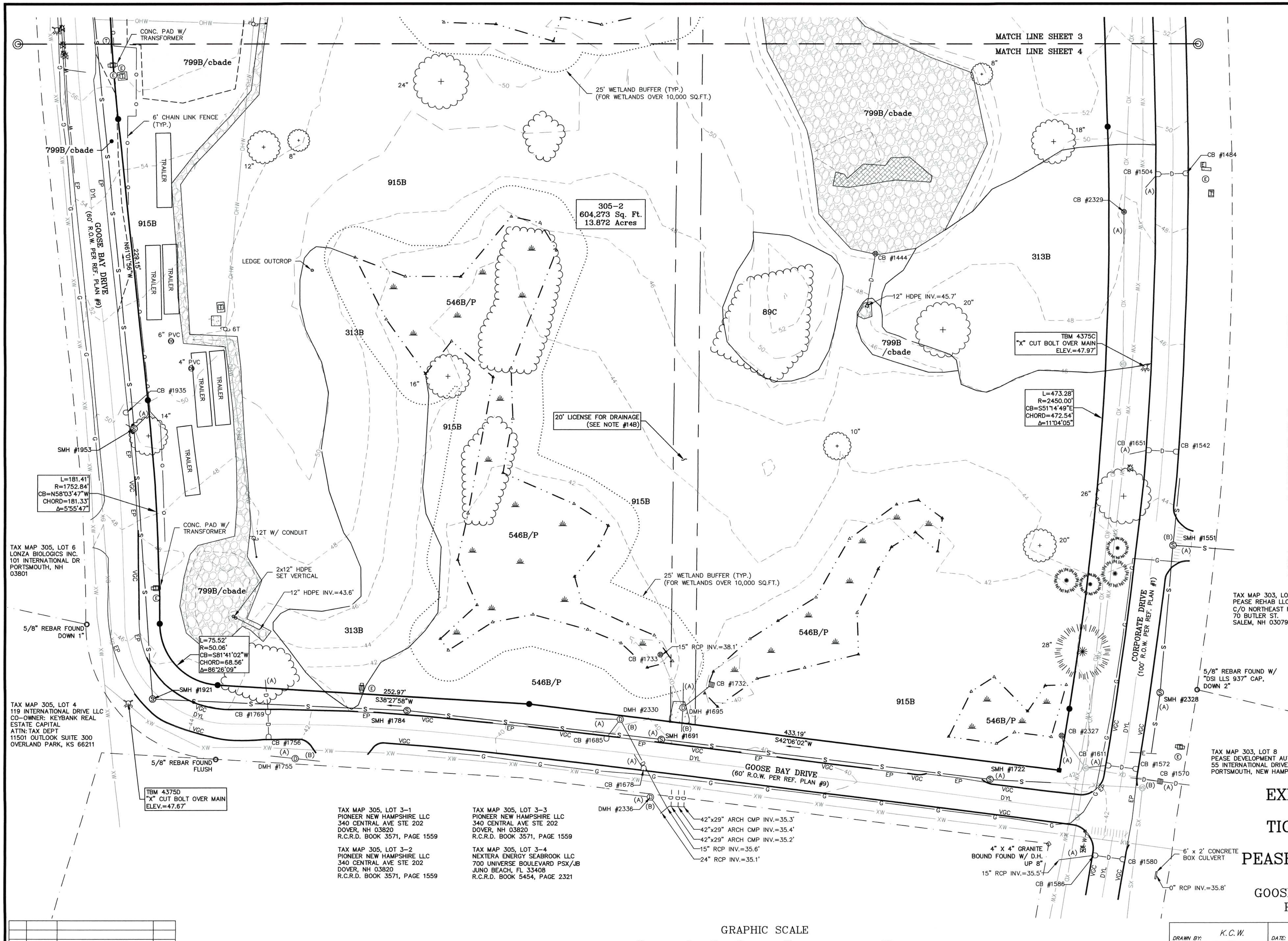
FILE NAME: C:\Users\Jeff\appdata\local\temp\AcPublish_8524\4375A.dwg LAYOUT NAME: DSI 22X34 (3) PLOTTED: Thursday, August 16, 2018 - 3:18pm



No. 964 JEFFREY A. GOLDKNOPF

SIGNATURE

PURSUANT TO RSA 676:18, III:

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

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Jeffrey A. Goldknopf L.L.S. #964

8-16-18 DATE

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LUKE D. HURLEY No. 095 8/16/18

LUKE D. HURLEY No. 232 8/16/18

EXISTING CONDITIONS PLAN
FOR
TIGHE & BOND AND LONZA
LAND OF
PEASE DEVELOPMENT AUTHORITY
(TAX MAP 305, LOTS 1 & 2)
GOOSE BAY DRIVE & CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE

2	8/16/18	MOD. DRAINAGE	J.A.G.
		MOD. SOIL TYPES PER G.E.S.	
1	8/3/16	GENERAL EDITS AND	J.A.G.
		ADDED WETLANDS BUFFER	
NO.	DATE	DESCRIPTION	BY

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

DRAWN BY:	K.C.W.	DATE:	DEC. 23, 2015
CHECKED BY:	J.A.G.	DRAWING NO.:	4375A
JOB NO.:	4375	SHEET 4	OF 4

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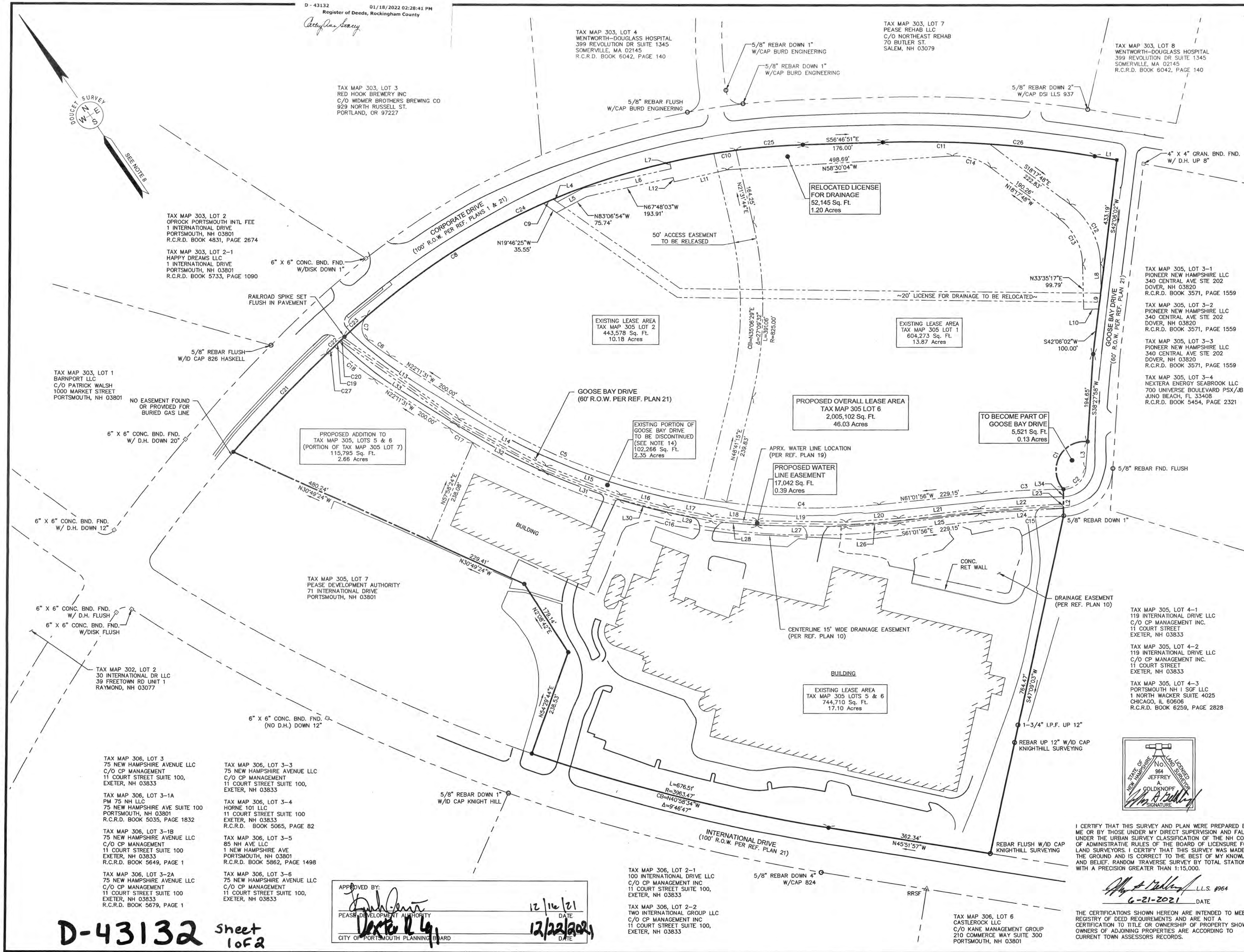
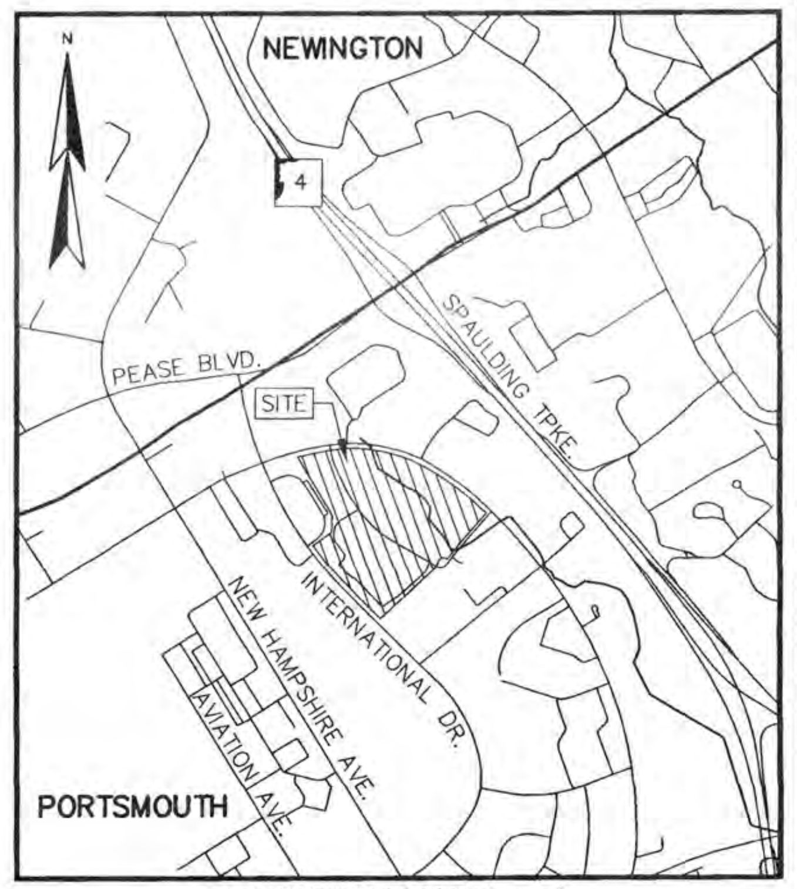
D - 43132 01/18/2022 02:28:41 PM
Register of Deeds, Rockingham County
Cathy Ann Stacey

LAN NUMBER 43132 SHEET 001.PTR - 6/29/2023 - 16:33





LOCATION MAP (n.t.s.)

LEGEND

━━━━━━	LEASE LINE
━━ ▪ ━━ ▪ ━━	PROPOSED LEASE LINE
——— - - - ———	PROPOSED EASEMENT/LICENSE
- - - ——— - - -	LEASE/ROW/EASEMENT/LICENSE LINE TO BE ABANDONED
——— — — ———	APPROXIMATE ABUTTERS LOT LINE
——— ——— ———	EASEMENT LINE
⊡	BOUND FOUND
◉	DRILL HOLE FOUND
○	IRON PIPE/ROD FOUND
TYP.	TYPICAL
GRAN.	GRANITE
CONC.	CONCRETE
BND. FND.	BOUND FOUND
D.H.F.	DRILL HOLE FOUND
I.P.F.	IRON PIPE FOUND
■	4"X4" GRANITE BOUND SET FLUSH (10/28/2021)
●	5/8" REBAR W/ ID CAP SET FLUSH (10/28/2021)

100 0 100 200
SCALE: 1 INCH = 100 FT.

SUBDIVISION PLAN

LAND OF
PEASE DEVELOPMENT AUTHORITY
LEASED TO
LONZA BIOLOGICS, INC.
OF
TAX MAP 305 LOTS 1, 2, 5, 6, & 7
AND
GOOSE BAY DRIVE
INTERNATIONAL DRIVE - CORPORATE DRIVE
GOOSE BAY DRIVE
PORTSMOUTH, NEW HAMPSHIRE

1	11/02/21	ADDED MONUMENTS SET	J.A.G.
NO.	DATE	DESCRIPTION	BY

DRAWN BY: W.D.C.	DATE: JUNE 21, 2021
CHECKED BY: J.A.G.	DRAWING NO.: 6228B
JOB NO.: 6228	SHEET 1 OF 2

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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

No. 964
JEFFREY A. GOLDKNOPF

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

L.L.S. #964
6-21-2021 DATE

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APPROVED BY:
PEASE DEVELOPMENT AUTHORITY 12/16/21 DATE
Dexter R Legg
CITY OF PORTSMOUTH PLANNING BOARD 12/22/2021 DATE

D-43132 Sheet 1 of 2

FILE NAME: Y:\PROJECTS\6822 C3D\DWG\6822B LLR (5518A).dwg LAYOUT NAME: 5518 SUBDIVISION PLAN (SHEET 1) PLOTTED: Tuesday, December 14, 2021 - 4:01pm

D - 43132 01/18/2022 02:28:41 PM
Register of Deeds, Rockingham County
Cathy Ann Stacey

NOTES:

1. REFERENCE: TAX MAP 305, LOTS 5 & 6
PHYSICAL ADDRESS: 101 INTERNATIONAL DRIVE
TAX MAP 305, LOTS 1 & 2
PHYSICAL ADDRESS: 70 CORPORATE DRIVE
TAX MAP 305, LOT 7
PHYSICAL ADDRESS: 71 INTERNATIONAL DRIVE

2. PROPOSED LEASE AREA: TAX MAP 305, LOT 6: 1,889,305 SQ. FT. OR 4

3. OWNER OF RECORD: PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DRIVE
PORTSMOUTH, NEW HAMPSHIRE 03801
R.C.R.D. BOOK 4227, PAGE 001

4. LESSEE OF RECORD: TAX MAP 305. LOTS 5 & 6
LONZA BIOLOGICS, INC.
101 INTERNATIONAL DRIVE
PORTSMOUTH, NEW HAMPSHIRE 03801
R.C.R.D. BOOK 3015, PAGE 2559
(LEASE EXTENSIONS AND MODIFICATIONS
HAVE NOT BEEN RECORDED, BUT HAVE
BEEN PROVIDED BY THE LESSEE)
SEE REFERENCE PLAN 10

5. ZONE: AIRPORT, BUSINESS, AND COMMERCIAL (ABC)
DIMENSIONAL REQUIREMENTS:

MINIMUM LOT AREA	217,800 sq.ft. OR 5.0 AC.
MINIMUM STREET FRONTAGE	200 ft.
FRONT YARD SETBACK	70 ft.
SIDE SETBACK	30 ft.
REAR SETBACK	50 ft.
MINIMUM OPEN SPACE	25 %

MAXIMUM STRUCTURE HEIGHT SHALL NOT EXCEED FAA CRITERIA

WETLAND BUFFER 25 ft. (PER PDA REGULATIONS: WETLANDS LESS THAN 1/4 ACRE DO NOT HAVE A BUFFER)

ZONING INFORMATION LISTED HEREON WAS PROVIDED BY TIGHE & BOND. 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.

6. FIELD SURVEY PERFORMED BY B.T. & J.C.M. DURING MARCH 2018 USING A TRIMBLE S6 ROBOTIC TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.

7. FLOOD HAZARD ZONE:"X", PER FIRM MAP #33015C0260F, MAP REVISED JANUARY 29, 2021.

8. HORIZONTAL DATUM BASED ON NH STATE PLANE 2800(NAD83/86) PER REFERENCE PLANS 10, 11, & 12.

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

10. TAX MAP 305, LOTS 1 & 2 ARE EITHER SUBJECT TO OR IN BENEFIT OF, BUT NOT LIMITED TO, THE FOLLOWING EASEMENTS/RIGHTS OF RECORD:
10.A. 50' WIDE ACCESS EASEMENT FOR THE BENEFIT OF LOT 305-2. (SHOWN PER REFERENCE PLAN 9)
10.B. APPROXIMATE LOCATION OF 20' WIDE LICENSE TO THE CITY OF PORTSMOUTH FOR THE PURPOSES OF MAINTAINING A DRAINAGE LINE. (SHOWN PER REFERENCE PLAN 9)

11. TAX MAP 305, LOTS 5 & 6 ARE EITHER SUBJECT TO OR IN BENEFIT OF, BUT NOT LIMITED TO, THE FOLLOWING EASEMENTS/RIGHTS OF RECORD:
11.A. 15' WIDE DRAINAGE EASEMENT. (SHOWN PER REFERENCE PLAN 10)
11.B. DRAINAGE EASEMENT. (SHOWN PER REFERENCE PLAN 10)

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

13. IMPROVEMENTS SHOWN HEREON ARE APPROXIMATE.

14. REGARDING THE PORTION GOOSE BAY DRIVE TO BECOME PART OF THE PROPOSED LEA[illegible] AREA:
14.A. THE PEASE DEVELOPMENT AUTHORITY REPORTS THAT THE OWNERSHIP UNDERLYING [illegible]ADWAYS WITHIN THE TRADEPORT REMAINS VESTED IN THE PEASE DEVELOPMENT AUTHORITY.
14.B. THE PEASE DEVELOPMENT AUTHORITY REPORTS THAT THERE ARE UNDER[illegible]T UTILITY EASEMENTS ON LANDS IN THEIR OWNERSHIP. THIS MAY INCLUDE, BUT [illegible] BURIED [illegible] OVERHEAD ELECTRIC, TELECOMMUNICATIONS, GAS, WATER, AND SEW[illegible]

15. THE APPLICANT WILL BE REQUESTING THE FOLLOWING WAIVER FROM T[illegible] BOARD REGARDING SECTION IV;3;I. CUL-DE-SACS:
15.A. MAXIMUM LENGTH OF CUL-DE-SAC OF 500'
15.B. MINIMUM RADIUS OF CUL-DE-SAC PAVEMENT OF 50'

REFERENCE PLANS:

1. "R.O.W. WORKSHEET, CORPORATE DRIVE PREPARED FOR PEASE DEVELOPMENT AUTHORITY" DATED DEC. 21, 1992 BY RICHARD D. BARTLETT & ASSOCIATES, INC. SHEETS 1 AND 2. (NOT RECORDED)
2. "PEASE A.F.B. / PORTSMOUTH, N.H. REPAVE BASE STREETS, PORTSMOUTH AVE, ROCKINGHAM AVE." DATED 7 DEC 82 BY STRATETIC AIR COMMAND CIVIL ENGINEERING. SHEET 4 OF 5. (NOT RECORDED)
3. "PORTSMOUTH AIR FORCE BASE, PORTSMOUTH, N.H. ROADS AND STORAGE AREA FY-56" DATED DEC 1955 BY WHITMAN & HOWARD ENGINEERS. INDEX PAGE AND SHEETS 2 - 5 OF 11. (NOT RECORDED)
4. "PEASE INTERNATIONAL TRADEPORT SUBDIVISION PLAT, INTERNATIONAL DRIVE LOTS BC11-001 & BC11-002, PORTSMOUTH, N.H." DATED FEBRUARY 5, 1993 BY RICHARD D. BARTLETT & ASSOCIATES INC. R.C.R.D. PLAN D-22536.
5. "SUBDIVISION PLAN OF LAND FOR REDHOOK ALE BREWERY, INC. CORPORATE DRIVE, COUNTY OF ROCKINGHAM, PORTSMOUTH, N.H." DATED DECEMBER 10, 1994 BY RICHARD P. MILLETTE AND ASSOCIATES. R.C.R.D. PLAN D-23978.
6. "ALTA/ACSM LAND TITLE SURVEY FOR RESPORT, LLC, ONE INTERNATIONAL DRIVE, COUNTY OF ROCKINGHAM, PORTSMOUTH, N.H." DATED FEBRUARY 27, 1998 BY MILLETTE, SPRAGUE & COLWELL, INC. R.C.R.D. PLAN D-26125.
7. "FRANKLIN PIERCE COLLEGE, PEASE INTERNATIONAL TRADEPORT, 73 CORPORATE DRIVE, PORTSMOUTH, NH" DATED JANUARY 15, 1998 BY RONALD R. BURD. R.C.R.D. PLAN D-26427.
8. "SUBDIVISION PLAN FOR LAND LEASED BY PEASE DEVELOPMENT AUTHORITY & KNOWN AS 119 INTERNATIONAL DRIVE LOCATED AT PEASE INTERNATIONAL TRADEPORT, PORTSMOUTH, N.H." DATED MARCH 1, 2000 BY KNIGHT HILL LAND SURVEYING SERVICES, INC. R.C.R.D. PLAN D-28059.
9. "SUBDIVISION PLAT PREPARED FOR 80 CORPORATE DRIVE LLC C/O BOULOS PROPERTY MANAGEMENT, LOCATION CORPORATE & GOOSE BAY DRIVES, PEASE INTERNATIONAL TRADEPORT - PORTSMOUTH, NH" DATED APRIL 11, 2000 BY FWS LAND SURVEYING P.L.L.C. R.C.R.D. PLAN D-28447.
10. "LEASE LINE REVISION PLAN FOR LONZA BIOLOGICS, INC. 101 INTERNATIONAL DRIVE, PORTSMOUTH, NEW HAMPSHIRE" DATED SEPT. 17, 2001 BY DOUCET SURVEY, INC. R.C.R.D. PLAN D-29538.
11. "SUBDIVISION PLAN OF LAND OF PEASE DEVELOPMENT AUTHORITY TO BE LEASED TO NORTHEAST REHABILITATION (A PORTION OF TAX MAP 303, LOT 6) 105 & 121 CORPORATE DRIVE, PEASE TRADEPORT, PORTSMOUTH, NEW HAMPSHIRE" DATED NOV. 5, 2008 BY DOUCET SURVEY, INC. R.C.R.D. PLAN D-35869.
12. "CONDOMINIUM SITE & FLOOR PLAN PREPARED FOR PIONEER NEW HAMPSHIRE, LLC, LAND OF PEASE DEVELOPMENT AUTHORITY, TAX MAP PARCEL 305-3 (108, 110, 112 & 114 CORPORATE DRIVE) PORTSMOUTH, NEW HAMPSHIRE" DATED APRIL 12, 2013 BY FIELDSTONE LAND CONSULTANTS, PLLC. SHEET 1 OF 5. R.C.R.D. PLAN D-37765.
13. "SUBDIVISION PLAN FOR PEASE DEVELOPMENT AUTHORITY, (TAX MAP 303, LOT 4) 67 CORPORATE DRIVE, PEASE TRADEPORT, PORTSMOUTH NEW HAMPSHIRE" DATED MAY 29, 2009 BY DOUCET SURVEY, INC. (NOT RECORDED)
14. "EXISTING CONDITIONS, BUILDING A, 80 CORPORATE DRIVE AND BUILDING B, 70 CORPORATE DRIVE, PORTSMOUTH, NH" DATED 4/14/2000 AND REVISED 6/05/2000 BY OPECHEE CONSTRUCTION CORPORATION. (NOT RECORDED)
15. "EXISTING CONDITIONS PLAN FOR TIGHE & BOND AND LONZA, LAND OF PEASE DEVELOPMENT AUTHORITY, (TAX MAP 305, LOTS 1 & 2), GOOSE BAY DRIVE & CORPORATE DRIVE, PORTSMOUTH, NEW HAMPSHIRE" DATED DECEMBER 23, 2015 BY DOUCET SURVEY, INC. (NOT RECORDED)
16. "119 INTERNATIONAL DRIVE CONDOMINIUM, CONDOMINIUM SITE PLAN, FOR PROPERTY OWNED BY PEASE DEVELOPMENT AUTHORITY, LEASED TO 119 INTERNATIONAL DRIVE, LLC, KNOWN AS PORTSMOUTH TAX MAP 305, LOT 4, PORTSMOUTH, NH" DATED OCT. 10, 2017 BY KNIGHT HILL LAND SURVEYING SERVICES, INC. R.C.R.D. PLAN 40449
17. "ALTA/NSPS LAND TITLE SURVEY FOR 130 INTERNATIONAL DRIVE, LLC AND PEASE DEVELOPMENT AUTHORITY, 130 INTERNATIONAL DRIVE, PORTSMOUTH, NH" DATED JULY 2017 AND REVISED THROUGH 8/9/17 BY DOUCET SURVEY, INC. (NOT RECORDED)
18. "ALTA/ACSM LAND TITLE SURVEY FOR 100 INTERNATIONAL DRIVE, LLC, 100 INTERNATIONAL DRIVE, PEASE INTERNATIONAL TRADEPORT, PORTSMOUTH, NH" DATED MARCH 30, 2006 BY DOUCET SURVEY, INC. (NOT RECORDED)
19. "CITY OF PORTSMOUTH, NEW HAMPSHIRE, FOR CONSTRUCTION, CORPORATE DRIVE AND GOOSE BAY DRIVE SEWER IMPROVEMENTS" DATED JULY 28, 2017 BY UNDERWOOD ENGINEERS, INC. (NOT RECORDED)
20. "SUBDIVISION PLAN FOR LONZA BIOLOGICS, INC. AND THE PEASE DEVELOPMENT AUTHORITY OF TAX MAP 305, LOTS 1, 2, 5 & 6 AND GOOSE BAY DRIVE, INTERNATIONAL DRIVE - CORPORATE DRIVE - GOOSE BAY DRIVE, PORTSMOUTH, NEW HAMPSHIRE" DATED APRIL 16, 2018 BY DOUCET SURVEY, INC (NOT RECORDED)
21. "APPENDIX VI, MUNICIPAL SERVICES AGREEMENT BETWEEN CITY OF PORTSMOUTH, TOWN OF NEWINGTON AND PEASE DEVELOPMENT AUTHORITY" EFFECTIVE AS OF JULY 1, 1998 (ROADWAY WIDTHS) (NOT RECORDED)
22. "THIRD AMENDED SITE/FLOOR PLAN ADDENDUM FOR 75 NEW HAMPSHIRE CONDOMINIUM SHOWING BUILDING 5 - UNIT 6 - LIMITED COMMON AREA" DATED JULY 2019 BY KNIGHT HILL LAND SURVEYING SERVICES, INC. R.C.R.D. PLAN D-41611
23. "LEASE LINE DISCONTINUANCE & EXISTING BUILDING UPDATE PLAN, 25, 29 RETAIL CONDOMINIUM" DATED DECEMBER 2018 AND REVISED JULY 20, 2017 BY KNIGHT HILL LAND SURVEYING SERVICES. R.C.R.D. PLAN D-40388
24. "SUBDIVISION PLAN AT 30 INTERNATIONAL DRIVE AT PEASE INTERNATIONAL TRADEPORT, PORTSMOUTH, NEW HAMPSHIRE" DATED JANUARY 1997 BY CLD CONSULTING ENGINEERS & SURVEYORS R.C.R.D. PLAN D-25370
25. "LEASE LINE REVISION FOR BARNPORT, LLC AND PEASE DEVELOPMENT AUTHORITY, 27 INTERNATIONAL DRIVE, PORTSMOUTH, NEW HAMPSHIRE" DATED APRIL 11, 2000 BY DOUCET SURVEY, INC. R.C.R.D. PLAN D-28254

LINE TABLE

LINE	BEARING	DISTANCE
L1	S45°42'46"E	50.48'
L2	S34°54'07"W	60.00'
L3	S38°27'58"W	58.32'
L4	N19°46'25"W	11.01'
L5	N83°06'54"W	66.09'
L6	N67°48'03"W	196.60'
L7	S22°03'02"W	14.87'
L8	S33°35'17"W	57.08'
L9	S42°06'02"W	43.59'
L10	N55°44'33"W	33.55'
L11	N67°48'03"W	122.22'
L12	N22°11'57"E	10.00'
L13	N19°52'39"W	313.89'
L14	N27°09'05"W	222.06'
L15	N33°51'22"W	175.26'
L16	N40°07'36"W	107.83'
L17	N43°37'13"W	99.98'

LINE TABLE

LINE	BEARING	DISTANCE
L18	N49°42'47"W	102.16'
L19	N54°07'45"W	195.64'
L20	N59°11'41"W	116.15'
L21	N61°40'21"W	179.46'
L22	N58°20'21"W	187.76'
L23	S34°54'07"W	10.02'
L24	N58°20'21"W	186.91'
L25	N61°40'21"W	179.39'
L26	N59°11'41"W	116.81'
L27	N54°07'45"W	196.47'
L28	N49°42'47"W	103.08'
L29	N43°37'13"W	100.81'
L30	N40°07'36"W	108.68'
L31	N33°51'22"W	176.39'
L32	N27°09'05"W	223.29'
L33	N19°52'39"W	316.47'
L34	S34°54'07"W	32.65'

CURVE TABLE

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	152.83'	63.00'	138°59'47"	S61°54'24"W	118.02'
C2	75.52'	50.06'	86°26'09"	S81°41'02"W	68.56'
C3	181.41'	1752.84'	5°55'47"	N58°03'47"W	181.33'
C4	338.74'	1420.00'	13°40'04"	S54°11'54"E	337.94'
C5	623.87'	1420.00'	25°10'21"	S34°46'41"E	618.86'
C6	60.72'	500.00'	6°57'30"	S18°42'46"E	60.69'
C7	60.50'	35.00'	99°01'56"	S34°16'57"W	53.24'
C8	466.96'	1540.26'	17°22'14"	N87°30'58"W	465.18'
C9	23.43'	1540.26'	0°52'17"	N78°23'43"W	23.43'
C10	300.24'	1540.26'	11°10'07"	N62°21'55"W	299.77'
C11	237.27'	2450.00'	5°32'56"	N54°00'23"W	237.18'
C12	153.95'	170.00'	51°53'06"	N7°38'44"E	148.74'
C13	117.72'	130.00'	51°53'06"	N7°38'44"E	113.74'
C14	91.22'	130.00'	40°12'15"	N38°23'56"W	89.36'
C15	175.20'	1692.80'	5°55'47"	N58°03'47"W	175.12'
C16	942.18'	1480.00'	36°28'30"	S42°47'41"E	926.35'
C17	61.10'	1480.00'	2°21'56"	N23°22'29"W	61.10'
C18	115.23'	560.00'	11°47'23"	N16°17'50"W	115.03'
C19	18.12'	3710.06'	0°16'48"	S80°54'45"W	18.12'
C20	10.19'	3710.06'	0°09'26"	N81°07'52"E	10.19'
C21	298.54'	3710.06'	4°36'38"	N78°05'40"E	298.46'
C22	54.86'	3710.06'	0°50'50"	N80°49'24"E	54.86'
C23	68.59'	1540.26'	2°33'06"	N82°31'22"E	68.59'
C24	910.09'	1540.26'	33°51'16"	S79°16'27"E	896.91'
C25	149.63'	1540.26'	5°33'58"	S59°33'50"E	149.57'
C26	473.28'	2450.00'	11°04'05"	S51°14'49"E	472.54'
C27	24.14'	3710.06'	0°22'22"	N80°35'10"E	24.14'

SUBDIVISION PLAN
LAND OF
PEASE DEVELOPMENT AUTHORITY
LEASED TO
LONZA BIOLOGICS, INC.
OF
TAX MAP 305 LOTS 1, 2, 5, 6, & 7
AND
GOOSE BAY DRIVE
INTERNATIONAL DRIVE - CORPORATE DRIVE
GOOSE BAY DRIVE
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	11/02/21	ADDED MONUMENTS SET	J.A.G.

DRAWN BY: W.D.C.
DATE: JUNE 21, 2021
CHECKED BY: J.A.G.
DRAWING NO.: 6228B
JOB NO.: 6228
SHEET 2 OF 2

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

L.L.S. #964
6-21-2021 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.

No. 964
JEFFREY A. GOLDKNOPF
SIGNATURE

APPROVED BY:
PEASE DEVELOPMENT AUTHORITY 12/16/21 DATE
CITY OF PORTSMOUTH PLANNING BOARD 12/22/2021 DATE

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

D-43132 Sheet 2 of 2

FILE NAME: Y:\PROJECTS\6822 C3D\DWG\6822B LLR (5518A).dwg LAYOUT NAME: 5518 SUBDIVISION PLAN (SHEET 2) PLOTTED: Tuesday, December 14, 2021 - 2:41pm

MASTER PLAN SET

APRIL 3, 2018

REVISED: SEPTEMBER 27, 2023

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	MASTER PLAN SET COVER SHEET	9/27/2023
C-101	DEMOLITION PLAN	9/27/2023
C-102	DEMOLITION PLAN	9/27/2023
C-103	DEMOLITION PLAN	9/27/2023
C-104	OVERALL SITE PLAN	9/27/2023
C-105	SITE PLAN	9/27/2023
C-106	SITE PLAN	9/27/2023
C-107	SITE PLAN	9/27/2023
C-108	GRADING, DRAINAGE & EROSION CONTROL PLAN	9/27/2023
C-109	GRADING, DRAINAGE & EROSION CONTROL PLAN	9/27/2023
C-110	GRADING, DRAINAGE & EROSION CONTROL PLAN	9/27/2023
C-111	UTILITIES PLAN	9/27/2023
C-112	UTILITIES PLAN	9/27/2023
C-113	UTILITIES PLAN	9/27/2023
C-114	LANDSCAPE PLAN	9/27/2023
C-115	LANDSCAPE PLAN	9/27/2023
C-116	LANDSCAPE PLAN	9/27/2023
C-117	PHOTOMETRIC LIGHTING PLAN	9/27/2023
C-118	PHOTOMETRIC LIGHTING PLAN	9/27/2023
C-119	PHOTOMETRIC LIGHTING PLAN	9/27/2023

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER
NEIL A. HANSEN
No. 15227
LICENSED
9/27/2023

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER
PATRICK CRIMMINS
No. 12378
LICENSED
9/27/2023

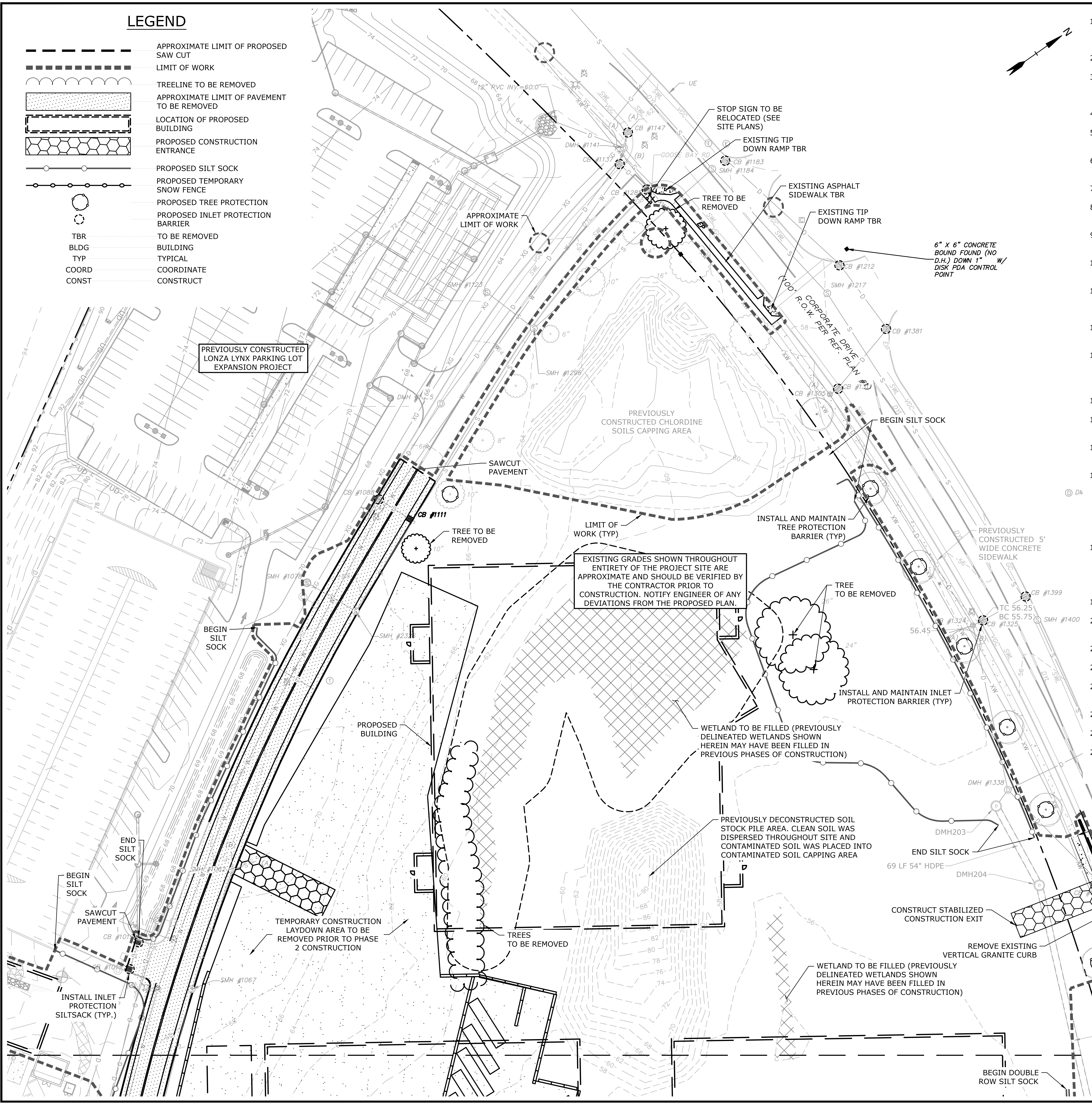
COMPLETE SET 20 SHEETS

Last Save Date: September 25, 2023 5:16 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-COVR.dwg Layout Tab: MASTER-CS

LEGEND

- APPROXIMATE LIMIT OF PROPOSED SAW CUT
- LIMIT OF WORK
- TREELINE TO BE REMOVED
- APPROXIMATE LIMIT OF PAVEMENT TO BE REMOVED
- LOCATION OF PROPOSED BUILDING
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED SILT SOCK
- PROPOSED TEMPORARY SNOW FENCE
- PROPOSED TREE PROTECTION
- PROPOSED INLET PROTECTION BARRIER

TBR — TO BE REMOVED
BLDG — BUILDING
TYP — TYPICAL
COORD — COORDINATE
CONST — CONSTRUCT



DEMOLITION NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
3. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES EXCEPT AS SPECIFIED IN NOTE #25.
4. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
5. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
6. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
8. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS AND AS SPECIFIED IN NOTE #25.
10. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND THE CITY OF PORTSMOUTH STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK.
11. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
12. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
13. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, LIGHTING, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, STAIRS, SIGNS, FENCES, RAMPS, WALLS, BOLLARDS, BUILDING SLABS, FOUNDATION, TREES AND LANDSCAPING.
14. COORDINATE ALL WORK WITHIN THE PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
15. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
16. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
17. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT MAY RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
18. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
19. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
20. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
21. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
22. THE CONTRACTOR SHALL ACQUIRE A PDA DIG PERMIT BEFORE ANY EARTH DISTURBANCE CAN TAKE PLACE. ALLOW 7 CALENDAR DAYS FOR PROCESSING.
23. ALL MONITORING WELLS WITHIN LIMIT OF WORK SHALL BE PROTECTED DURING CONSTRUCTION. IF ANY MONITORING WELL NEEDS TO BE REMOVED OR ADJUSTED THIS WORK SHALL BE COORDINATED WITH THE PEASE DEVELOPMENT AUTHORITY.
24. CONTRACTOR SHALL COORDINATE WITH THE PROJECT SURVEYOR FOR BENCHMARK AND CONTROL POINTS PRIOR TO CONSTRUCTION.
25. ALL EXCESS SOIL RESULTING FROM THE CONSTRUCTION SHALL REMAIN ON SITE. COORDINATE WITH OWNER AND PEASE DEVELOPMENT AUTHORITY ON FINAL LOCATION OF EXCESS MATERIALS.
26. BEFORE ANY DEWATERING IS PERFORMED, COORDINATION BETWEEN THE OWNER, CONTRACTOR, PDA, NHDES AND THE AIR FORCE IS REQUIRED TO DETERMINE PROPER PROCEDURES AND PERMITTING REQUIRED. AT A MINIMUM A NHDES TEMPORARY DISCHARGE PERMIT IS REQUIRED.

Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
M	9/27/2023	P.B. Submission
L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
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

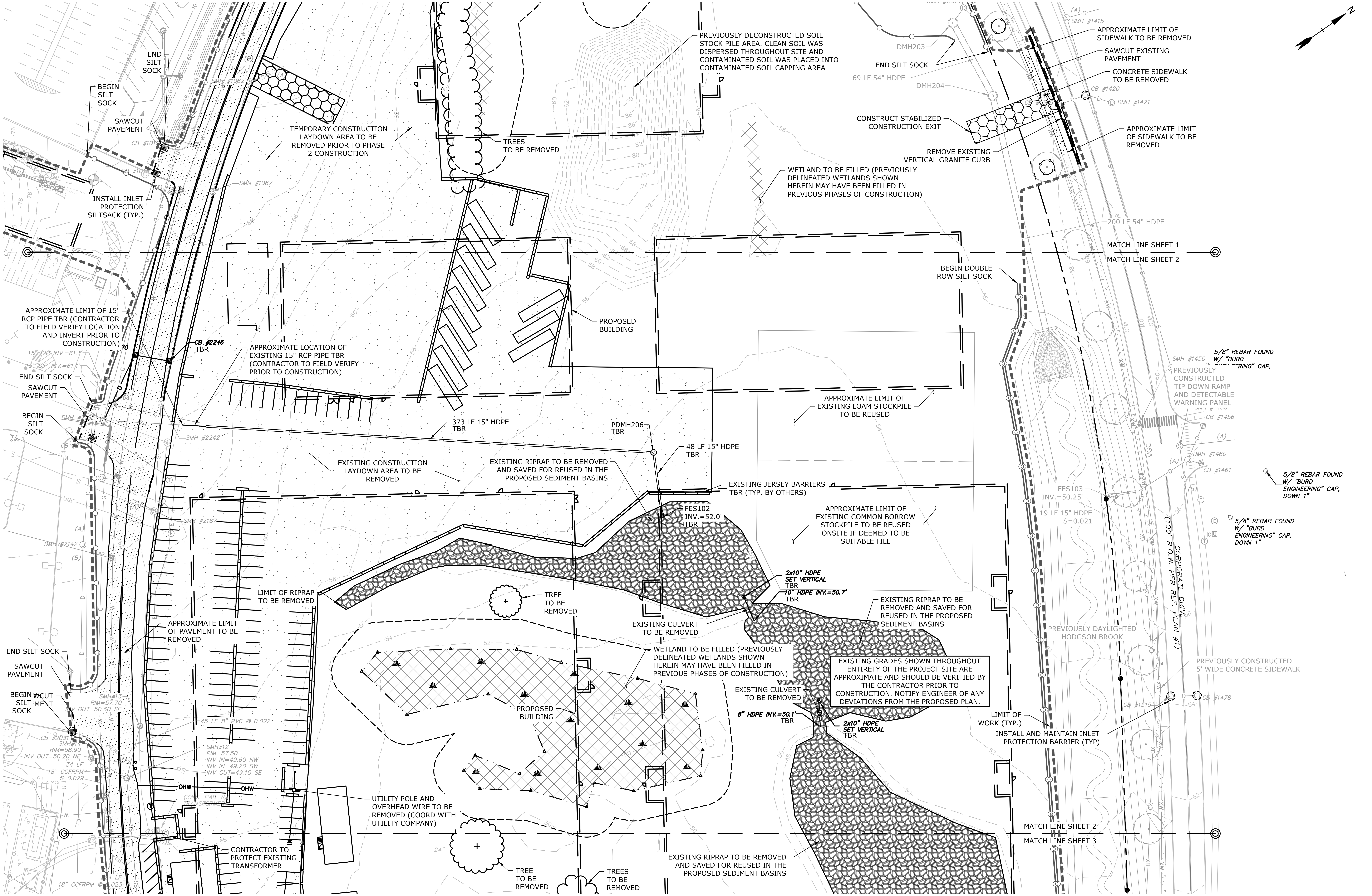
PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

DEMOLITION PLAN

SCALE: AS SHOWN

C-101

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-101



SEE SHEET C-101 FOR LEGEND AND DEMOLITION NOTES

Tighe&Bond

NEIL A. HANSEN No. 15227 9/27/2023

PATRICK CRIMMINS No. 12378 9/27/2023

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

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PROJECT NO: L-0700-013
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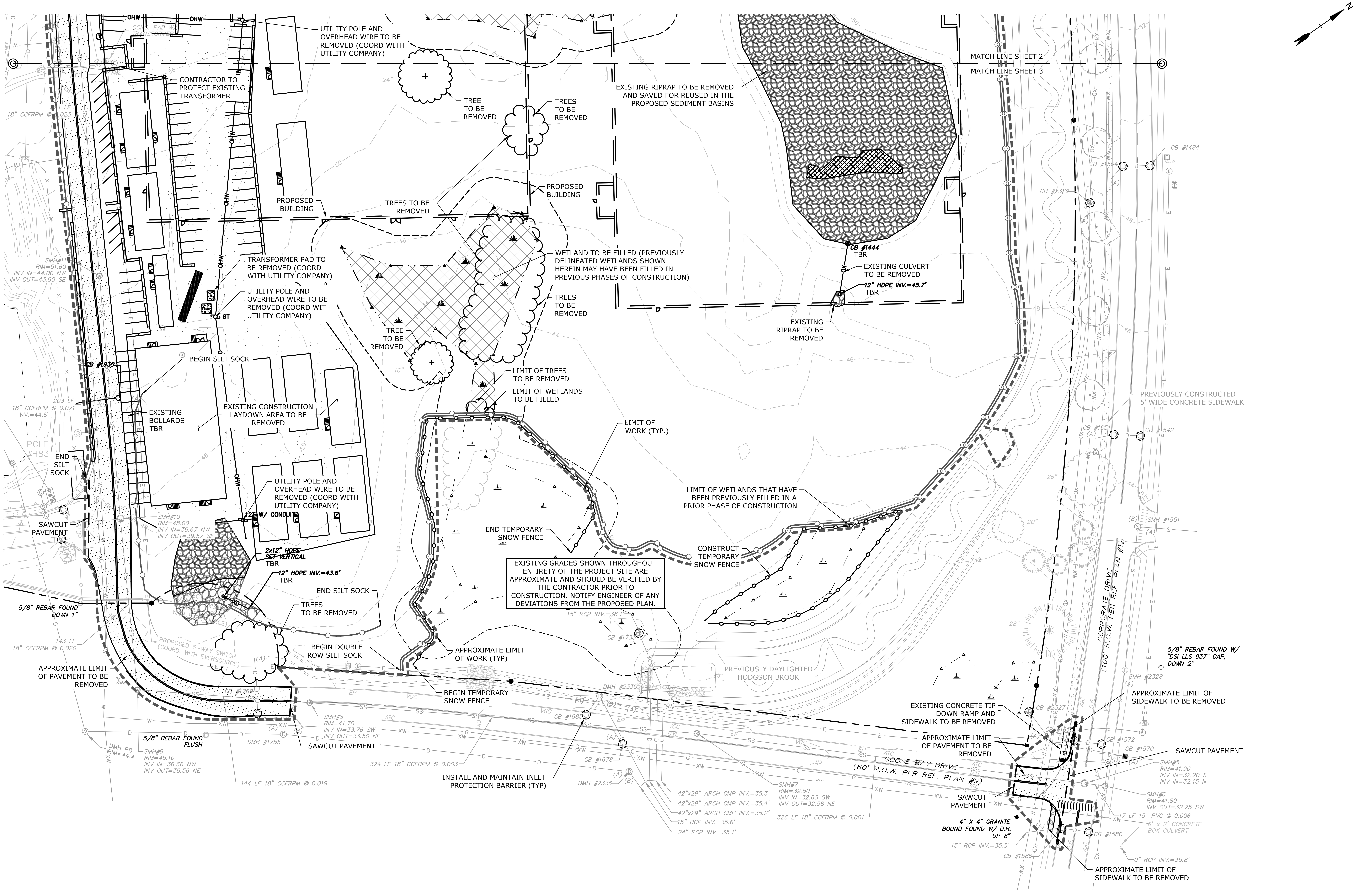
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

DEMOLITION PLAN

SCALE: AS SHOWN

C-102

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-102



SEE SHEET C-101 FOR LEGEND AND DEMOLITION NOTES

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-103

Tighe&Bond

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
9/27/2023

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
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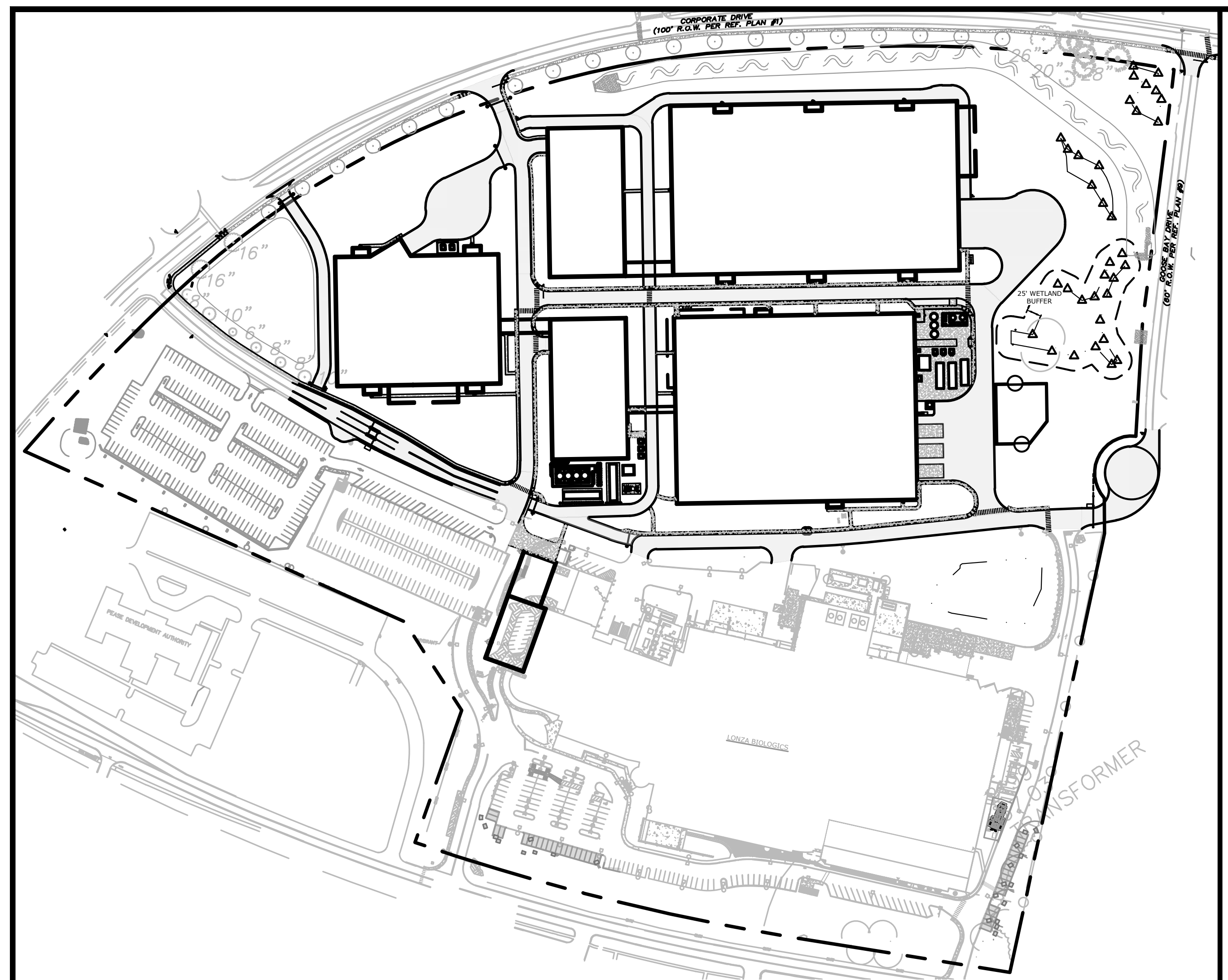
PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

DEMOLITION PLAN

SCALE: AS SHOWN

C-103


OVERALL LOT AREA PLAN
SCALE : 1" = 250'

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)

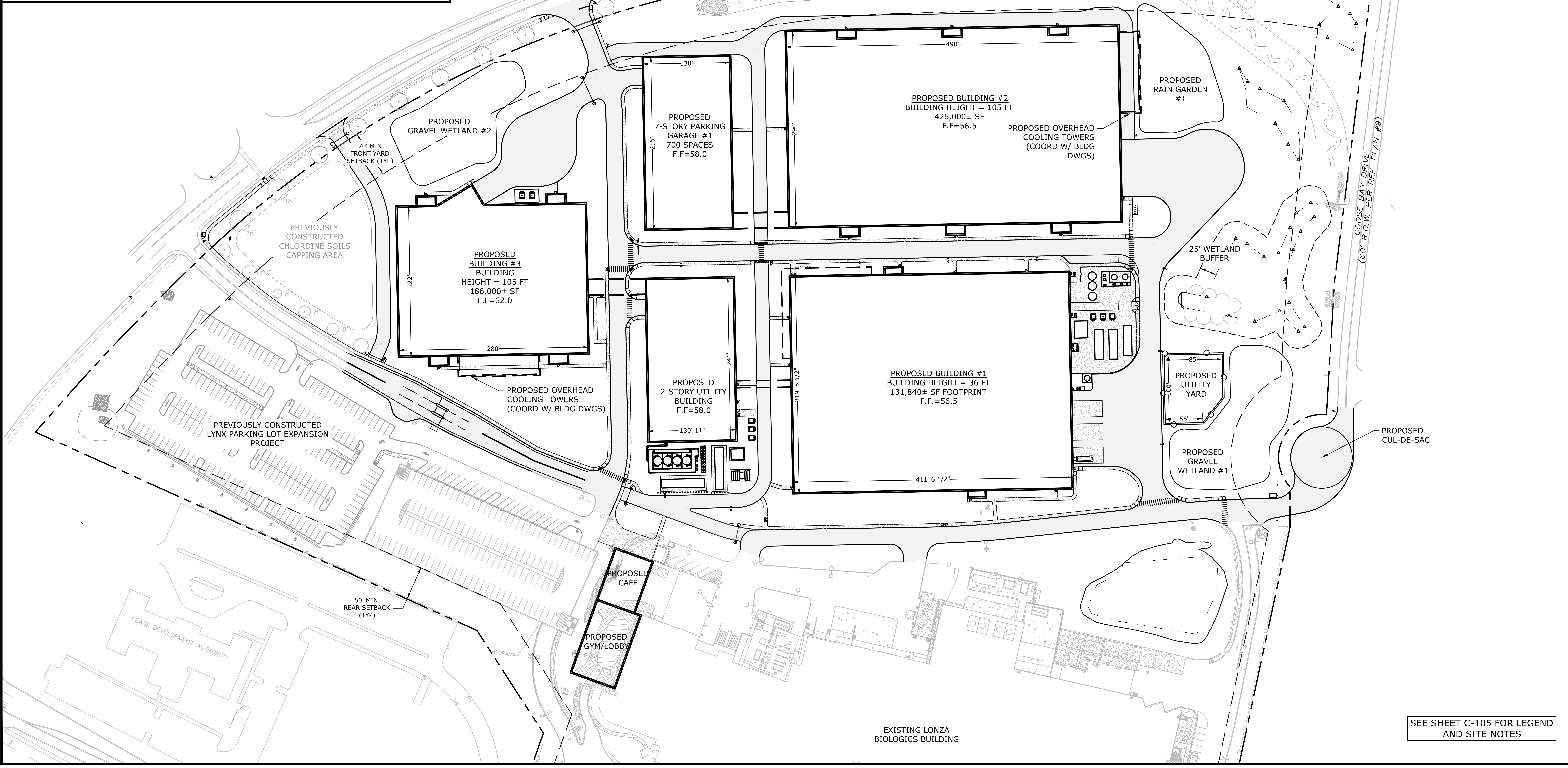
DIMENSIONAL REQUIREMENTS:

	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	
990 EXISTING EMPLOYEES	660 SPACES
1000 ANTICIPATED EMPLOYEES	666 SPACES
TOTAL REQUIRED:	1,326 SPACES
PARKING PROVIDED	
EXISTING SPACES:	801 SPACES
PROPOSED PARKING GARAGE #1:	700 SPACES
TOTAL:	1,501 SPACES



SEE SHEET C-105 FOR LEGEND AND SITE NOTES

Tighe&Bond

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

SCALE IN FEET
0 80' 160'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
M	9/27/2023	P.B. Submission
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F	11/6/2018	P.B. 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

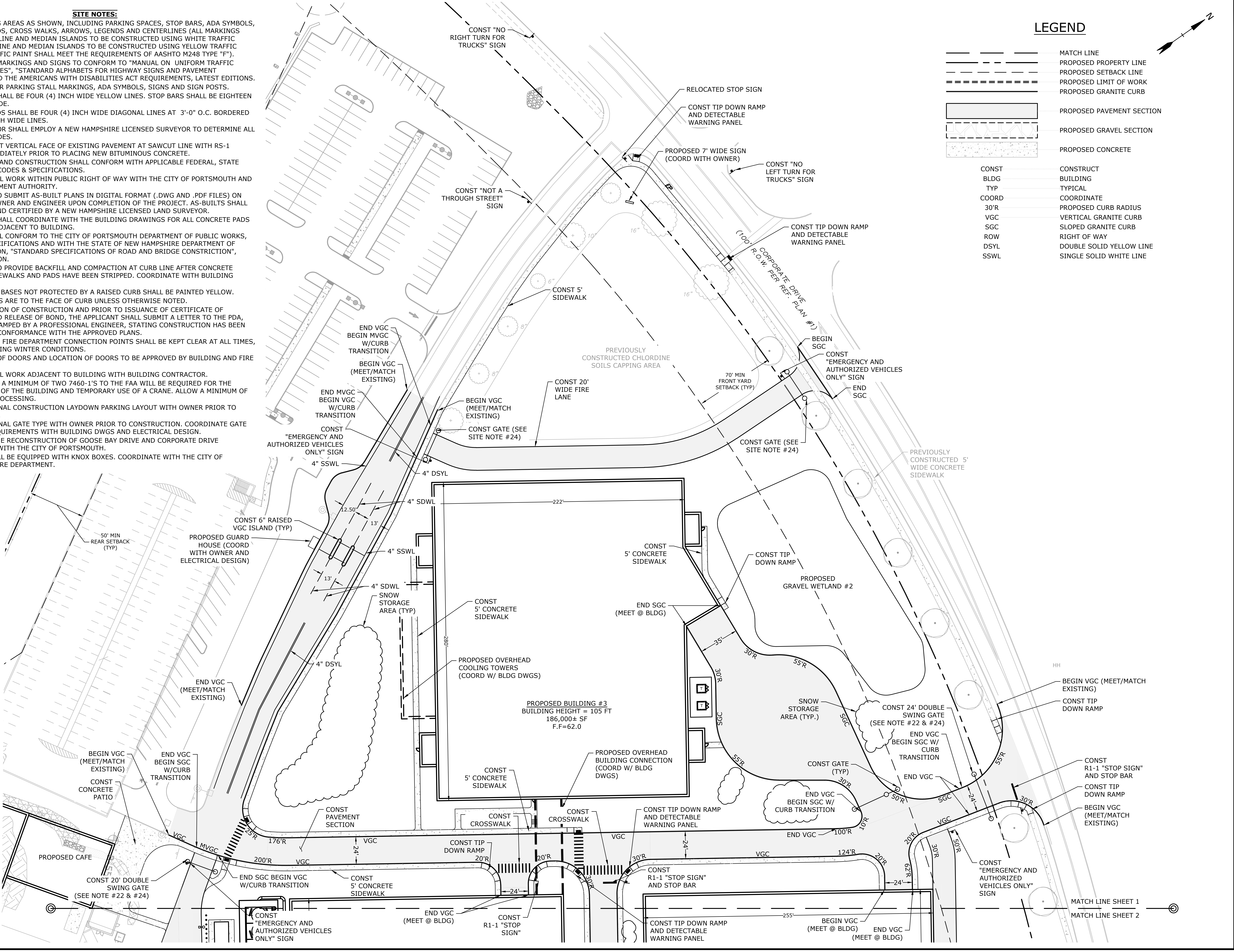
SCALE: AS SHOWN

C-104

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-104

SITE NOTES:

1. STRIPE PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES (ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT. CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F").
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PARKING STALL MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO DETERMINE ALL LINES AND GRADES.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE AND/OR TOWN CODES & SPECIFICATIONS.
9. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAY WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. CONTRACTOR SHALL COORDINATE WITH THE BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
12. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRICTION", CURRENT EDITION.
13. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
14. ALL LIGHT POLE BASES NOT PROTECTED BY A RAISED CURB SHALL BE PAINTED YELLOW.
15. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
16. UPON COMPLETION OF CONSTRUCTION AND PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY AND RELEASE OF BOND, THE APPLICANT SHALL SUBMIT A LETTER TO THE PDA, SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER, STATING CONSTRUCTION HAS BEEN COMPLETED IN CONFORMANCE WITH THE APPROVED PLANS.
17. FIRE LANES AND FIRE DEPARTMENT CONNECTION POINTS SHALL BE KEPT CLEAR AT ALL TIMES, INCLUDING DURING WINTER CONDITIONS.
18. FINAL NUMBER OF DOORS AND LOCATION OF DOORS TO BE APPROVED BY BUILDING AND FIRE DEPARTMENTS.
19. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
20. SUBMISSION OF A MINIMUM OF TWO 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.
21. COORDINATE FINAL CONSTRUCTION LAYDOWN PARKING LAYOUT WITH OWNER PRIOR TO CONSTRUCTION.
22. COORDINATE FINAL GATE TYPE WITH OWNER PRIOR TO CONSTRUCTION. COORDINATE GATE ELECTRICAL REQUIREMENTS WITH BUILDING DWGS AND ELECTRICAL DESIGN.
23. COORDINATE THE RECONSTRUCTION OF GOOSE BAY DRIVE AND CORPORATE DRIVE INTERSECTION WITH THE CITY OF PORTSMOUTH.
24. ALL GATES SHALL BE EQUIPPED WITH KNOX BOXES. COORDINATE WITH THE CITY OF PORTSMOUTH FIRE DEPARTMENT.



LEGEND

— — — —	MATCH LINE
——— - ———	PROPOSED PROPERTY LINE
— — — —	PROPOSED SETBACK LINE
━ ━ ━ ━	PROPOSED LIMIT OF WORK
━━━━	PROPOSED GRANITE CURB
▭	PROPOSED PAVEMENT SECTION
▨	PROPOSED GRAVEL SECTION
▒	PROPOSED CONCRETE
CONST	CONSTRUCT
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
30'R	PROPOSED CURB RADIUS
VGC	VERTICAL GRANITE CURB
SGC	SLOPED GRANITE CURB
ROW	RIGHT OF WAY
DSYL	DOUBLE SOLID YELLOW LINE
SSWL	SINGLE SOLID WHITE LINE

Tighe&Bond

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
M	9/27/2023	P.B. Submission
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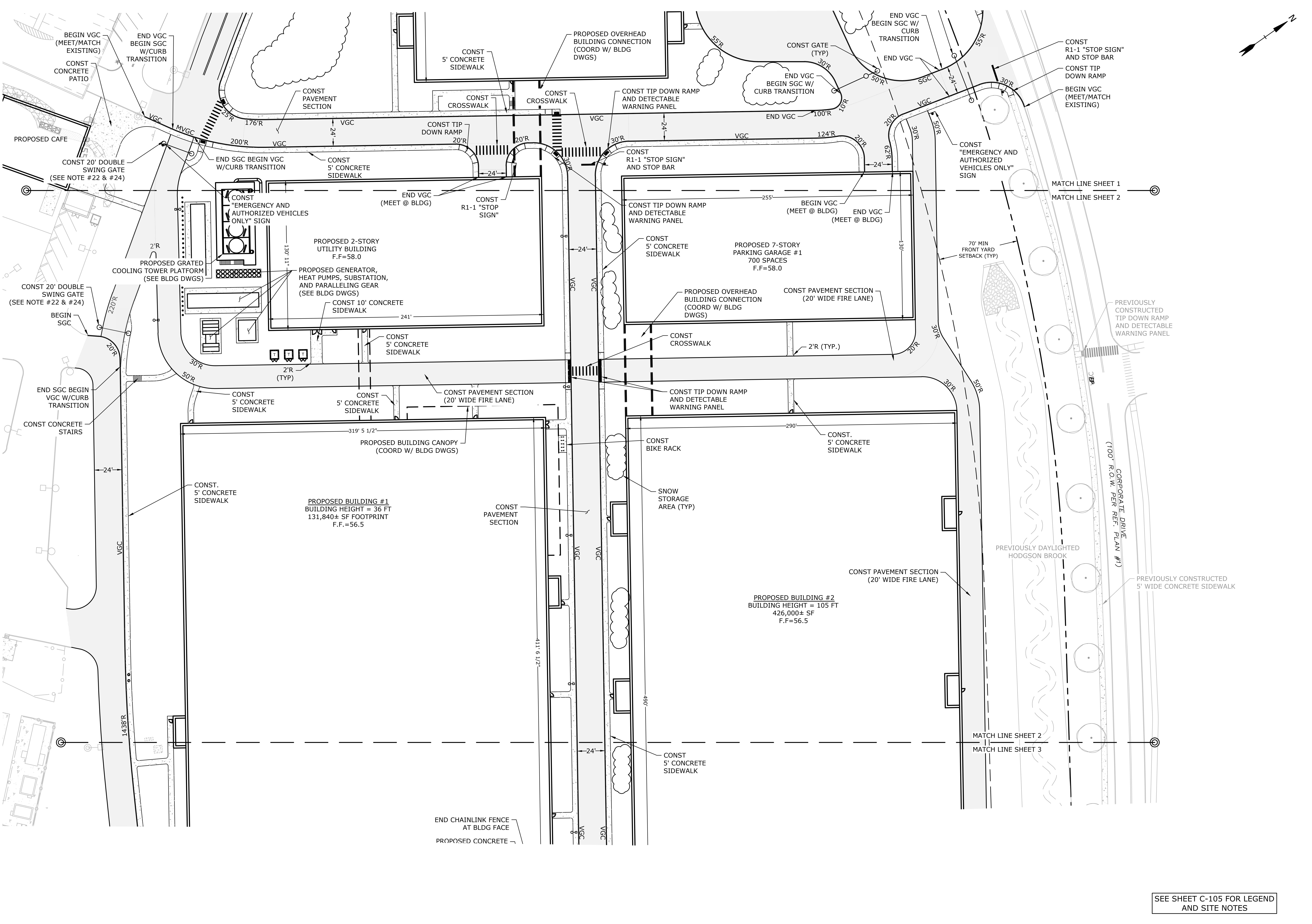
PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

SITE PLAN

SCALE: AS SHOWN

C-105

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-105



SEE SHEET C-105 FOR LEGEND AND SITE NOTES

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
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Tighe&Bond

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9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

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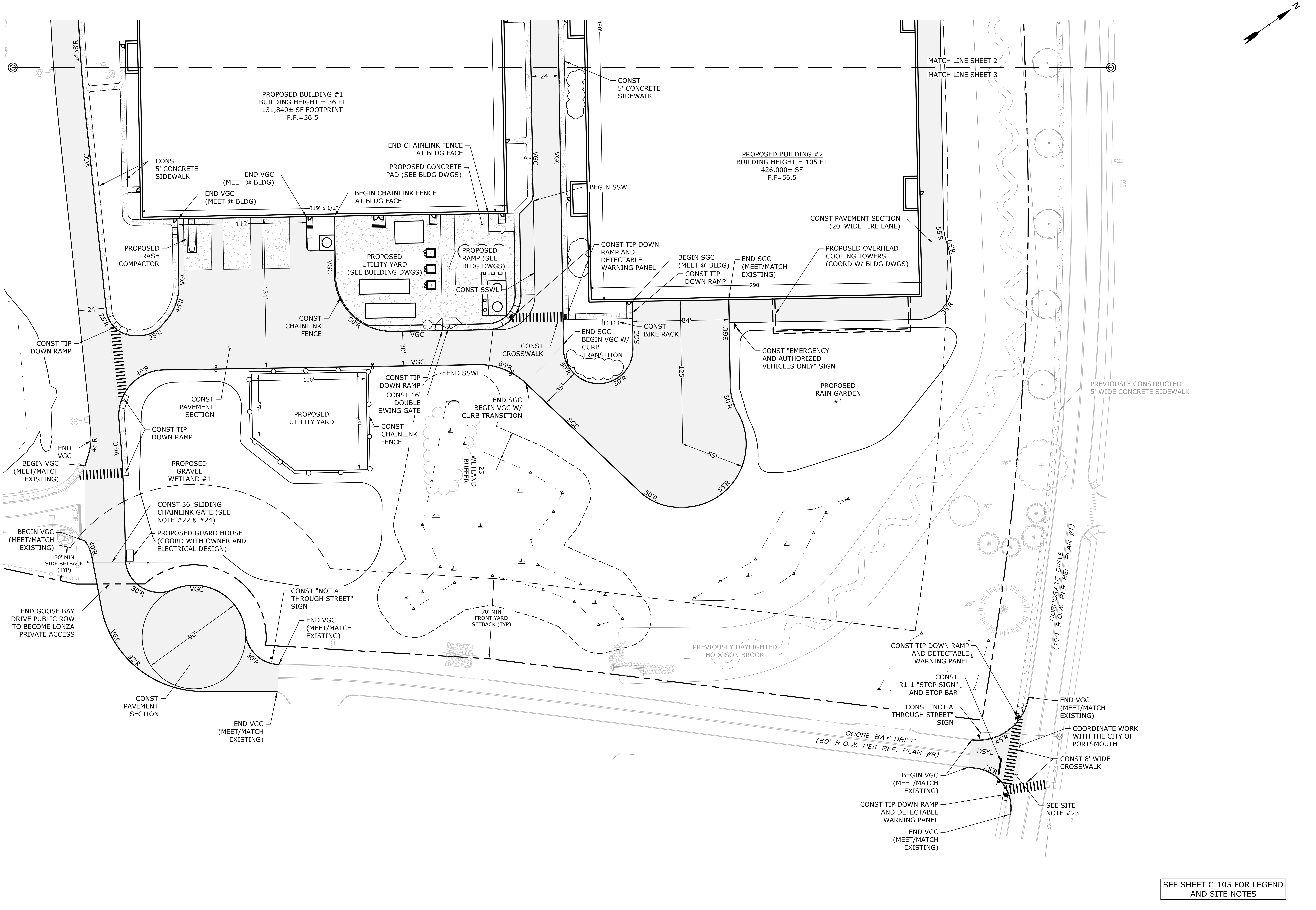
SITE PLAN

SCALE: AS SHOWN

C-106



SEE SHEET C-105 FOR LEGEND AND SITE NOTES

Tighe&Bond

NEIL A. HANSEN No. 15227 9/27/2023

PATRICK CRIMMINS No. 12378 9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed Industrial Development

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Portsmouth,
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DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

SITE PLAN

SCALE: AS SHOWN

C-107

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-107

PCB100
RIM=49.50
INV.IN=43.95 NE
INV.OUT=43.85 SW

PCB101
RIM=50.30
INV.OUT=45.70 W

PCB102
RIM=51.20
INV.OUT=46.50 SW

PCB103
RIM=54.00
INV.IN=49.00 NE
INV.IN=49.00 NW
INV.OUT=48.90 SE

PCB104
RIM=54.00
INV.OUT=49.20 SW

PCB105
RIM=57.00
INV.IN=50.95 NE
INV.IN=50.95 NW
INV.OUT=50.85 SE

PCB106
RIM=57.00
INV.IN=51.15 NE
INV.OUT=51.05 SW

PCB107
RIM=56.00
INV.IN=51.80 NE
INV.IN=51.80 NW
INV.IN=51.80 SW
INV.OUT=51.70 SE

PCB108
RIM=56.00
INV.OUT=51.95 SW

PCB109
RIM=56.00
INV.OUT=52.00 SE

PCB110
RIM=49.40
INV.IN=44.50 W
INV.OUT=44.40 E

PCB112
RIM=49.30
INV.IN=43.25 SW
INV.OUT=43.15 NE

PCB113
RIM=42.85
INV.OUT=38.20 S

PCB204
RIM=66.75
INV.OUT=61.65 W

PCB205
RIM=53.60
INV.IN=46.55 SW
INV.OUT=46.45 NE

PCB206
RIM=53.60
INV.OUT=46.65 NE

PCB207
RIM=49.30
INV.OUT=43.35 NE

PCB300
RIM=55.25
INV.OUT=51.50 SW

PCB301
RIM=56.00
INV.IN=51.65 SE
INV.OUT=51.55 NW

PCB302
RIM=56.00
INV.OUT=51.75 NW

PCB303
RIM=56.65
INV.IN=51.80 E
INV.OUT=51.70 W

PCB304
RIM=56.65
INV.OUT=51.90 W

PCB305
RIM=55.65
INV.OUT=51.65 E

PCB306
RIM=53.50
INV.OUT=49.50 NE

PCB307
RIM=52.25
INV.OUT=48.25 E

PCB308
RIM=50.60
INV.OUT=46.60 N

PDMH100
RIM=49.00
INV.IN=44.00 W
INV.IN=43.20 NE
INV.OUT=43.20 SE

PDMH101
RIM=50.65
INV.IN=45.50 NW
INV.IN=45.50 E
INV.OUT=45.40 SW

PDMH102
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INV.IN=46.00 NW
INV.IN=46.00 NE
INV.OUT=45.90 SE

PDMH103
RIM=54.95
INV.IN=47.00 NW
INV.IN=49.20 SW
INV.OUT=46.90 SE

PDMH104
RIM=56.55
INV.IN=49.40 NW
INV.IN=51.60 SW
INV.OUT=48.50 SE

PDMH105
RIM=55.05
INV.IN=47.00 NW
INV.IN=50.65 SW
INV.OUT=49.30 SE

PDMH106
RIM=53.70
INV.IN=46.70 NW
INV.IN=46.30 SW
INV.IN=49.35 NE
INV.OUT=46.10 SE

PDMH109
RIM=57.50
INV.IN=48.15 NW
INV.IN=51.25 NE
INV.OUT=48.05 SE

PDMH110
RIM=58.50
INV.IN=48.70 NW
INV.IN=48.70 NE
INV.OUT=48.60 SE

PDMH111
RIM=56.15
INV.IN=50.05 NE
INV.IN=53.70 SE
INV.IN=51.50 E
INV.OUT=49.95 SW

PDMH112
RIM=55.90
INV.IN=49.75 NE
INV.IN=51.85 NW
INV.OUT=49.65 SW

PDMH113
RIM=60.20
INV.IN=55.00 NW
INV.IN=52.95 SW
INV.OUT=51.30 SE

PDMH114
RIM=53.80
INV.IN=46.50 NW
INV.OUT=46.40 SE

PDMH115
RIM=59.50
INV.IN=52.55 SW
INV.IN=52.55 SE
INV.OUT=52.45 NE

PDMH116
RIM=56.40
INV.IN=47.05 NW
INV.IN=53.00 NE
INV.IN=49.25 N
INV.IN=51.10 NE
INV.OUT=46.95 SE

PDMH200
RIM=56.55
INV.IN=50.85 SE
INV.IN=50.85 E
INV.IN=50.85 SW
INV.OUT=50.75 NW

PDMH201
RIM=63.15
INV.IN=56.35 NE
INV.OUT=56.25 SE

PDMH300
RIM=56.00
INV.IN=51.30 SE
INV.IN=51.30 S
INV.IN=51.30 NE
INV.OUT=51.20 NW

PDMH301
RIM=60.25
INV.IN=53.35 SW
INV.OUT=53.25 N

PDMH302
RIM=54.45
INV.IN=50.65 SW
INV.IN=50.65 W
INV.OUT=50.55 SE

PDMH303
RIM=53.60
INV.IN=49.45 SW
INV.IN=49.45 NW
INV.OUT=49.35 SE

PDMH304
RIM=55.00
INV.IN=48.65 NW
INV.IN=48.65 SW
INV.OUT=48.55 SE

PDMH305
RIM=51.42
INV.IN=46.70 NW
INV.IN=47.00 W
INV.OUT=46.60 S

PDMH306
RIM=51.50
INV.IN=46.30 S
INV.IN=46.30 NW
INV.OUT=46.20 NE

POS101
RIM=47.00
INV.OUT=41.35 E

POS200
RIM=56.50
INV.OUT=49.85 E

POS300
RIM=47.15
INV.OUT=42.42 E

PYD100
RIM=56.00
INV.IN=52.00 NW
INV.IN=50.35 NE
INV.OUT=50.25 SW

PYD101
RIM=55.00
INV.IN=49.30 NE
INV.IN=50.00 NW
INV.OUT=49.20 SW

PYD102
RIM=55.50
INV.IN=47.70 NW
INV.OUT=47.60 SE

PYD103
RIM=51.25
INV.IN=45.65 NW
INV.OUT=45.55 E

PYD104
RIM=59.00
INV.OUT=52.65 NE

PYD201
RIM=62.50
INV.OUT=57.00 SW

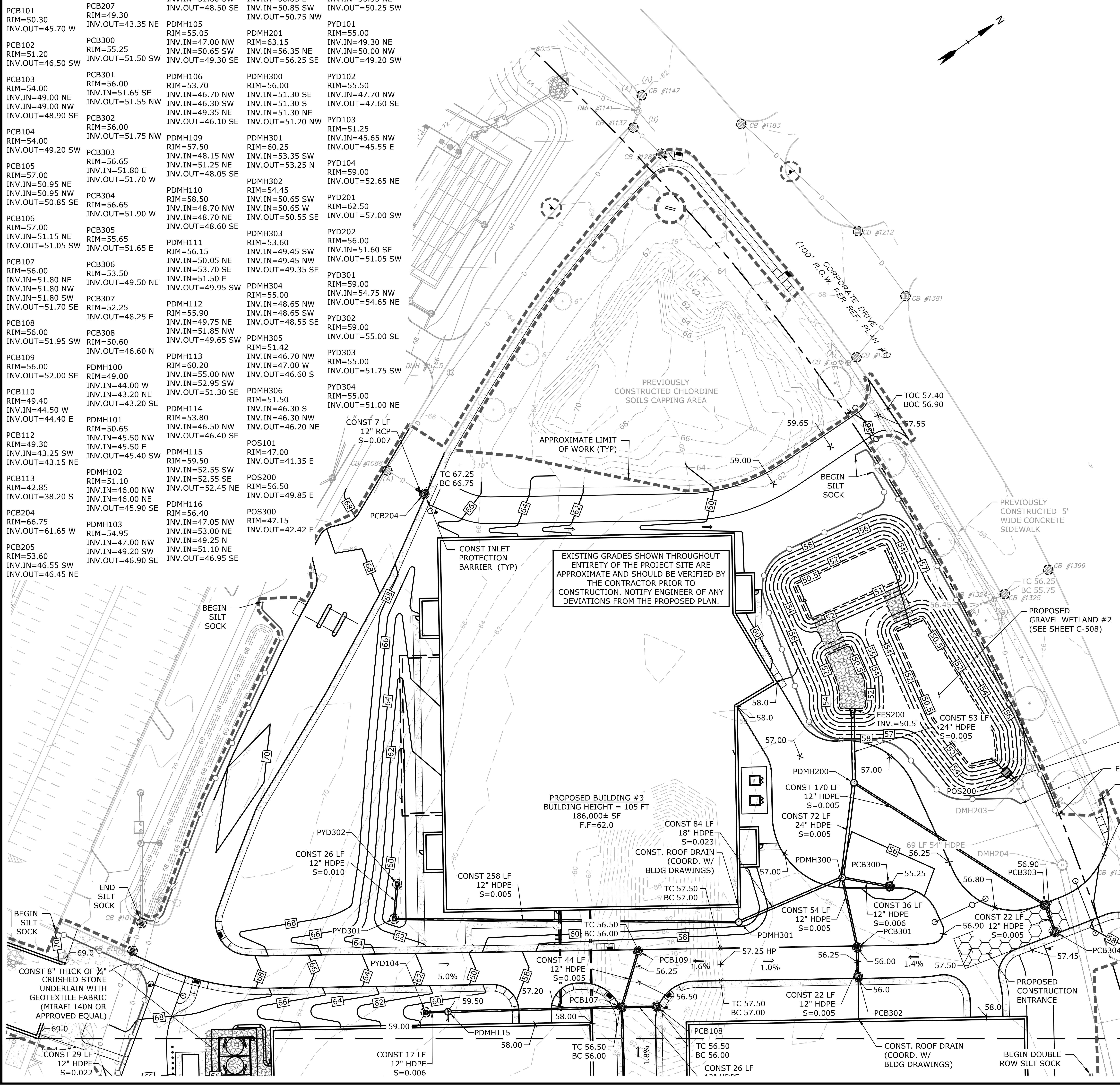
PYD202
RIM=56.00
INV.IN=51.60 SE
INV.OUT=51.05 SW

PYD301
RIM=59.00
INV.IN=54.75 NW
INV.OUT=54.65 NE

PYD302
RIM=59.00
INV.OUT=55.00 SE

PYD303
RIM=55.00
INV.OUT=51.75 SW

PYD304
RIM=55.00
INV.OUT=51.00 NE



GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

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

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

2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR APPROVED EQUAL), UNLESS OTHERWISE SPECIFIED.
3. SEE UTILITIES PLAN FOR ALL SITE UTILITY INFORMATION.
4. ADJUST ALL MANHOLES, CATCHBASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
5. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
6. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCHBASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
7. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES.
8. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
9. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
10. ALL PROPOSED CATCHBASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.
11. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
12. CONTRACTOR SHALL COORDINATE WITH THE PROJECT SURVEYOR FOR BENCHMARK AND CONTROL POINTS PRIOR TO CONSTRUCTION.
13. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS, AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
14. PER COORDINATION WITH THE PDA, GROUNDWATER DISCHARGE FROM THE PROPOSED FOUNDATION DRAIN AND UNDER-SLAB DRAIN OF BUILDING 1 AND THE CENTRAL UTILITY BUILDING WILL BE CONNECTED TO THE ONSITE DRAINAGE SYSTEM. IF TREATMENT OF THE GROUNDWATER DISCHARGE IS DETERMINED TO BE REQUIRED DURING THE BUILDING PERMITTING PROCESS AND RE-INFILTRATION IS NOT PERMITTED, A CARBON FILTRATION SYSTEM WILL BE NEEDED.

EROSION CONTROL NOTES:

1. INSTALL EROSION CONTROL BARRIERS AS SHOWN AS FIRST ORDER OF WORK.
2. SEE GENERAL EROSION CONTROL NOTES ON DETAIL SHEETS.
3. PROVIDE INLET PROTECTION AROUND ALL EXISTING AND PROPOSED CATCHBASIN INLETS WITHIN THE WORK LIMITS. MAINTAIN FOR THE DURATION OF THE PROJECT UNTIL PAVEMENT HAS BEEN INSTALLED.
4. INSTALL STABILIZED CONSTRUCTION ENTRANCES.
5. INSPECT INLET PROTECTION AND SILT FENCES DAILY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
6. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER AND MULCH.
7. CONSTRUCT EXCELSIOR MAT ON ALL SLOPES STEEPER THAN 3:1.
8. PRIOR TO ANY WORK OR SOIL DISTURBANCE COMMENCING ON THE SUBJECT PROPERTY, INCLUDING MOVING OF EARTH, THE APPLICANT SHALL INSTALL ALL EROSION AND SILTATION MITIGATION AND CONTROL MEASURES AS REQUIRED BY STATE AND LOCAL PERMITS AND APPROVALS.
9. CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST AND WIND EROSION THROUGHOUT THE CONSTRUCTION PERIOD. DUST CONTROL MEASURES SHALL INCLUDE, BUT NOT LIMITED TO, SPRINKLING WATER ON UNSTABLE SOILS SUBJECT TO ARID CONDITIONS.
10. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION AND FINAL STABALIZATION.
11. ALL CATCHBASIN SUMPS AND PIPING SHALL BE THOROUGHLY CLEANED TO REMOVE ALL SEDIMENT AND DEBRIS AFTER THE PROJECT HAS BEEN PAVED.
12. TEMPORARY SOIL STOCKPILE SHALL BE SURROUNDED BY SILT FENCE AND SHALL BE STABILIZED BY TEMPORARY EROSION CONTROL SEEDING. STOCKPILE AREAS TO BE LOCATED AS FAR AS POSSIBLE FROM THE DELINEATED EDGE OF WETLAND.
13. SAFETY FENCING SHALL BE PROVIDED AROUND STOCKPILES OVER 10 FT.
14. CONCRETE TRUCKS WILL BE REQUIRED TO WASH OUT (IF NECESSARY) SHOOTS ONLY WITHIN AREAS WHERE CONCRETE HAS BEEN PLACED. NO OTHER WASH OUT WILL BE ALLOWED.

LEGEND

— — —	MATCH LINE
—— - - ——	PROPOSED PROPERTY LINE
——56——	PROPOSED CONTOUR LINE
═══	PROPOSED DRAIN LINE (TYP)
—○—○—	PROPOSED SILT SOCK
◌	INLET PROTECTION SILT SACK
⊘	PROPOSED CATCHBASIN
⊠	PROPOSED DOUBLE GRATE CATCHBASIN
Ⓓ	PROPOSED DRAIN MANHOLE
CONST	CONSTRUCT
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
RD	ROOF DRAIN
VIF	VERIFY IN FIELD
TC	TOP OF CURB
BC	BOTTOM OF CURB

Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

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GRADING, DRAINAGE &
EROSION CONTROL PLAN

SCALE: AS SHOWN

C-108

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
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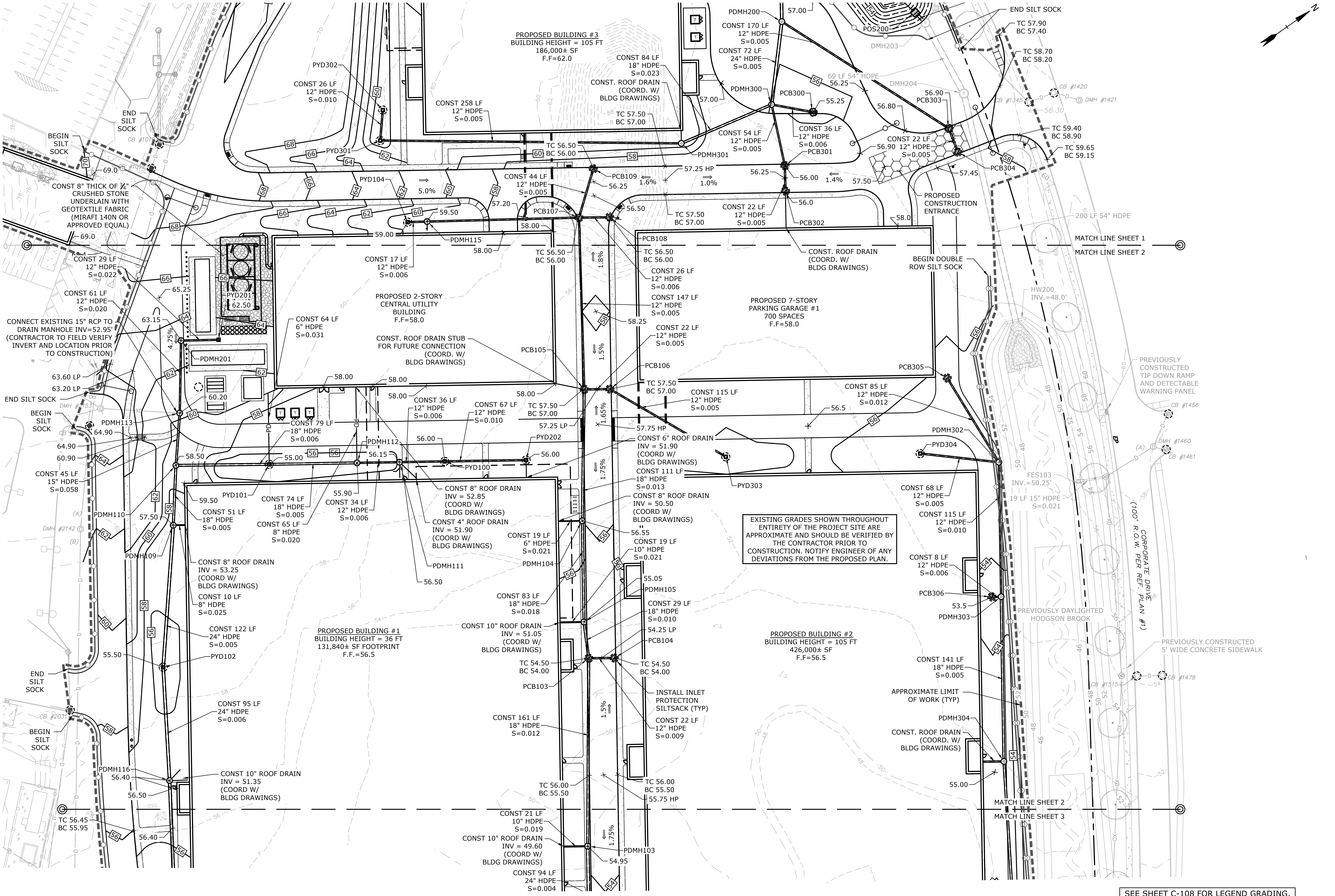
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-108



SEE SHEET C-108 FOR LEGEND GRADING, DRAINAGE & EROSION CONTROL NOTES, & DRAINAGE STRUCTURE TABLE

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Tighe&Bond

NEIL A. HANSEN No. 15227 9/27/2023

PATRICK CRIMMINS No. 12378 9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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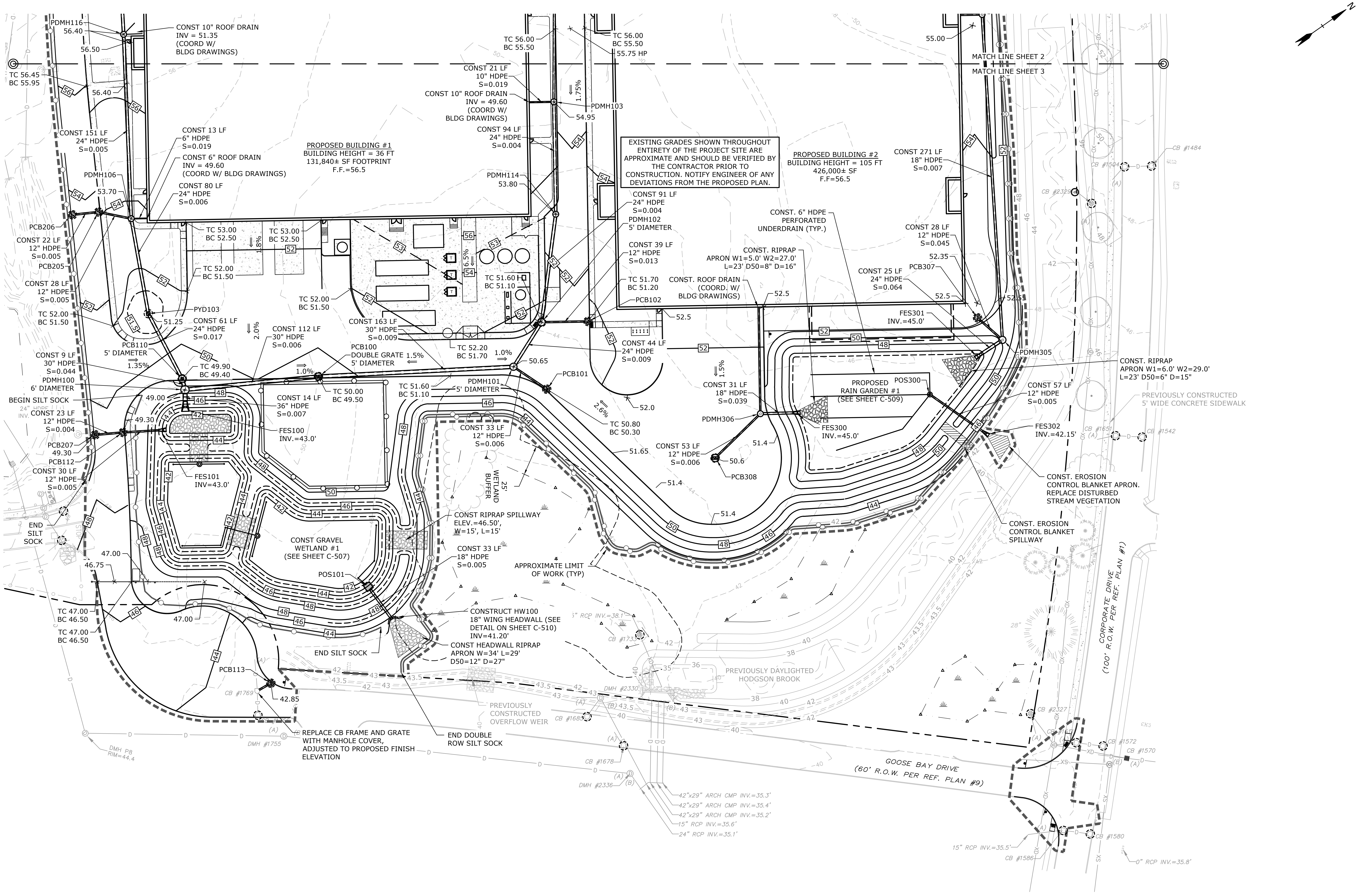
GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: AS SHOWN

C-109



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9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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GRADING, DRAINAGE &
EROSION CONTROL PLAN

SCALE: AS SHOWN

C-110

SEE SHEET C-108 FOR LEGEND GRADING,
DRAINAGE & EROSION CONTROL NOTES, &
DRAINAGE STRUCTURE TABLE

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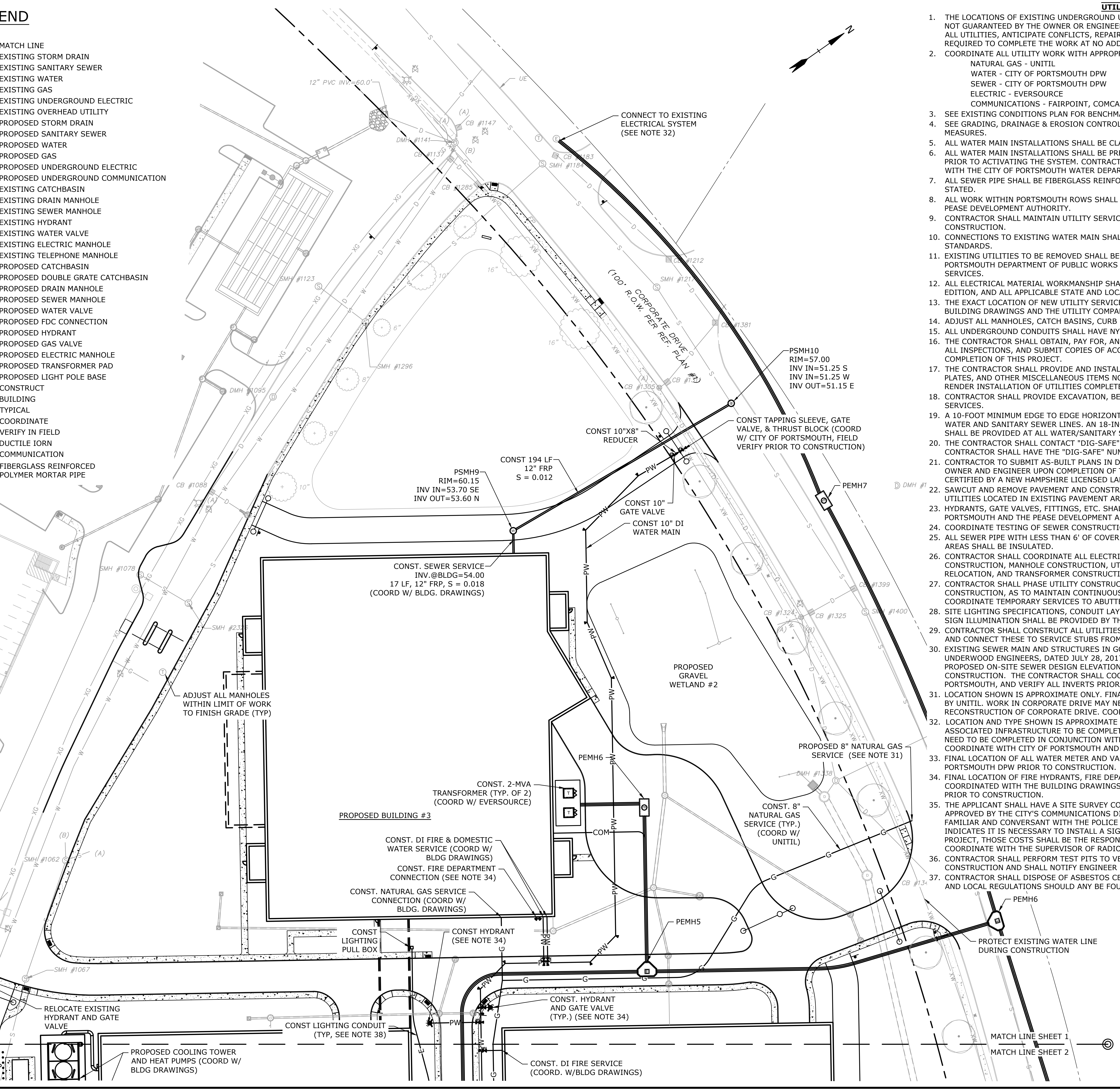
LEGEND

— — —	MATCH LINE
D	EXISTING STORM DRAIN
SS	EXISTING SANITARY SEWER
W	EXISTING WATER
G	EXISTING GAS
E	EXISTING UNDERGROUND ELECTRIC
OHW	EXISTING OVERHEAD UTILITY
━━	PROPOSED STORM DRAIN
━━	PROPOSED SANITARY SEWER
PW	PROPOSED WATER
G	PROPOSED GAS
━━	PROPOSED UNDERGROUND ELECTRIC
COM	PROPOSED UNDERGROUND COMMUNICATION
▣	EXISTING CATCHBASIN
◎	EXISTING DRAIN MANHOLE
◎	EXISTING SEWER MANHOLE
⊕	EXISTING HYDRANT
⋈	EXISTING WATER VALVE
◎	EXISTING ELECTRIC MANHOLE
◎	EXISTING TELEPHONE MANHOLE
●	PROPOSED CATCHBASIN
●	PROPOSED DOUBLE GRATE CATCHBASIN
D	PROPOSED DRAIN MANHOLE
S	PROPOSED SEWER MANHOLE
⋈	PROPOSED WATER VALVE
⋈	PROPOSED FDC CONNECTION
⊕	PROPOSED HYDRANT
⋈	PROPOSED GAS VALVE
▣	PROPOSED ELECTRIC MANHOLE
T	PROPOSED TRANSFORMER PAD
○	PROPOSED LIGHT POLE BASE
CONST	CONSTRUCT
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
VIF	VERIFY IN FIELD
DI	DUCTILE IORN
COM	COMMUNICATION
FRP	FIBERGLASS REINFORCED POLYMER MORTAR PIPE



UTILITY NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
2. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
    NATURAL GAS - UNITIL
    WATER - CITY OF PORTSMOUTH DPW
    SEWER - CITY OF PORTSMOUTH DPW
    ELECTRIC - EVERSOURCE
    COMMUNICATIONS - FAIRPOINT, COMCAST, FIRSTLIGHT
3. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
4. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
5. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
6. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT.
7. ALL SEWER PIPE SHALL BE FIBERGLASS REINFORCED POLYMER MORTAR (FRP) PIPE UNLESS OTHERWISE STATED.
8. ALL WORK WITHIN PORTSMOUTH ROWS SHALL BE COORDINATED WITH CITY OF PORTSMOUTH AND THE PEASE DEVELOPMENT AUTHORITY.
9. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
10. CONNECTIONS TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS.
11. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
12. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
13. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE UTILITY COMPANIES.
14. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
15. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
16. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
17. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
18. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
19. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
20. THE CONTRACTOR SHALL CONTACT "DIG-SAFE" 72 HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL HAVE THE "DIG-SAFE" NUMBER ON SITE AT ALL TIMES.
21. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
22. SAWCUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
23. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH AND THE PEASE DEVELOPMENT AUTHORITY.
24. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
25. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAN 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
26. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
27. CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION, AS TO MAINTAIN CONTINUOUS SERVICE TO ABUTTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
28. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
29. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
30. EXISTING SEWER MAIN AND STRUCTURES IN GOOSE BAY DRIVE ARE BASED ON A PROPOSED DESIGN BY UNDERWOOD ENGINEERS, DATED JULY 28, 2017, AND WAS CONSTRUCTED IN SUMMER 2018. THE PROPOSED ON-SITE SEWER DESIGN ELEVATIONS ARE BASED ON THE UNDERWOOD PLAN DURING CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH, AND VERIFY ALL INVERTS PRIOR TO CONSTRUCTION.
31. LOCATION SHOWN IS APPROXIMATE ONLY. FINAL DESIGN OF NATURAL GAS SERVICE TO BE COMPLETED BY UNITIL. WORK IN CORPORATE DRIVE MAY NEED TO BE COMPLETED IN CONJUNCTION WITH FUTURE RECONSTRUCTION OF CORPORATE DRIVE. COORDINATE WITH CITY OF PORTSMOUTH AND UNITIL.
32. LOCATION AND TYPE SHOWN IS APPROXIMATE ONLY. FINAL DESIGN OF ELECTRIC SERVICE AND ASSOCIATED INFRASTRUCTURE TO BE COMPLETED BY EVERSOURCE. WORK IN CORPORATE DRIVE MAY NEED TO BE COMPLETED IN CONJUNCTION WITH FUTURE RECONSTRUCTION OF CORPORATE DRIVE. COORDINATE WITH CITY OF PORTSMOUTH AND EVERSOURCE.
33. FINAL LOCATION OF ALL WATER METER AND VALVES SHALL BE COORDINATED WITH THE CITY OF PORTSMOUTH DPW PRIOR TO CONSTRUCTION.
34. FINAL LOCATION OF FIRE HYDRANTS, FIRE DEPARTMENT CONNECTIONS AND DRY STAND PIPES WILL BE COORDINATED WITH THE BUILDING DRAWINGS AND APPROVED BY THE PORTSMOUTH FIRE DEPARTMENT PRIOR TO CONSTRUCTION.
35. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATIONS DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY.
36. CONTRACTOR SHALL PERFORM TEST PITS TO VERIFY INVERT ELEVATIONS IN FIELD PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER IF ELEVATION DIFFERS FROM PLAN.
37. CONTRACTOR SHALL DISPOSE OF ASBESTOS CEMENT PIPES IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS SHOULD ANY BE FOUND DURING CONSTRUCTION.

Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

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FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

UTILITIES PLAN

SCALE: AS SHOWN

C-111

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
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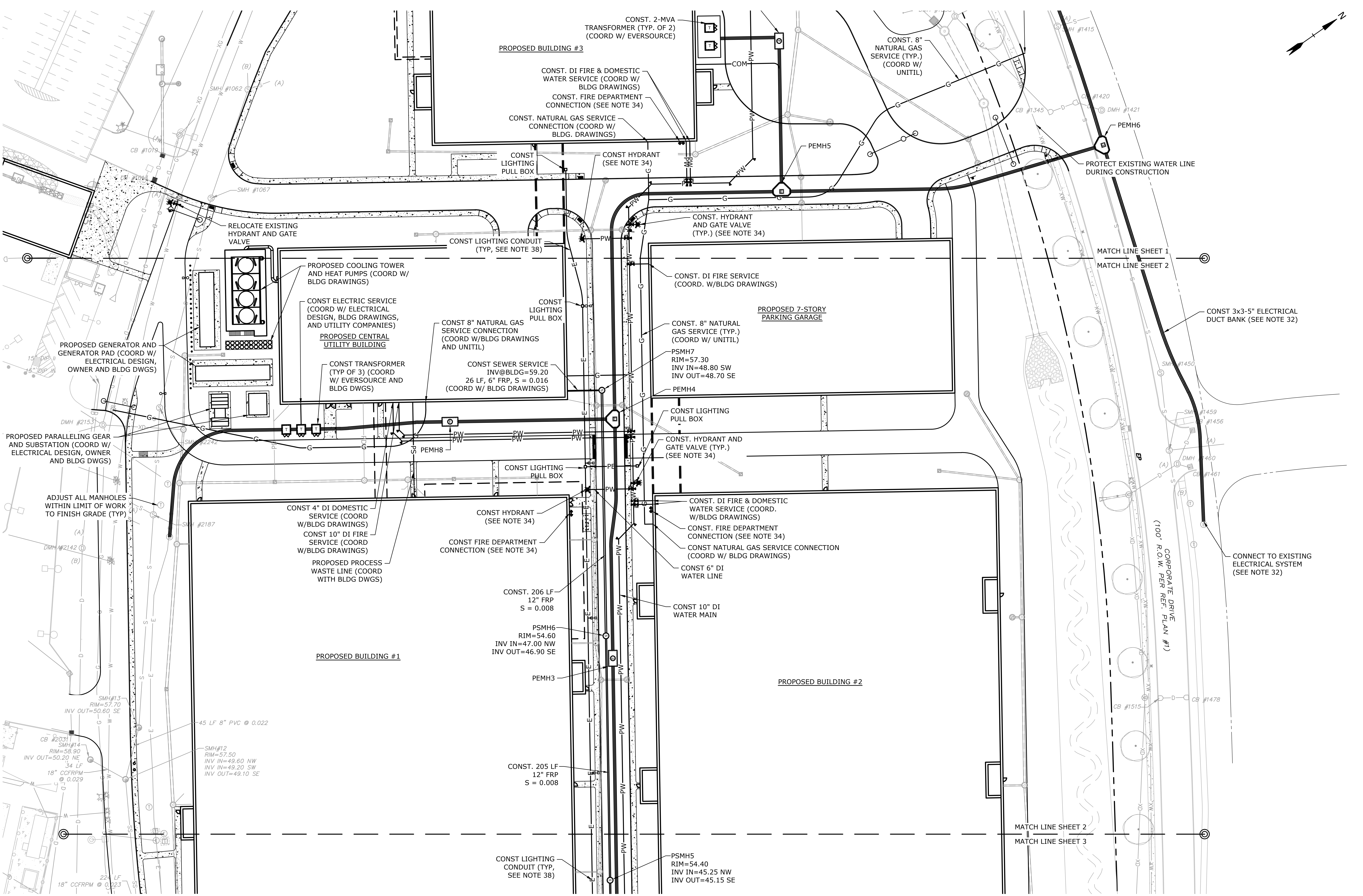

SEE SHEET C-111 FOR UTILITY NOTES AND LEGEND

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NEIL A. HANSEN No. 15227 9/27/2023

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UTILITIES PLAN

SCALE: AS SHOWN

C-112

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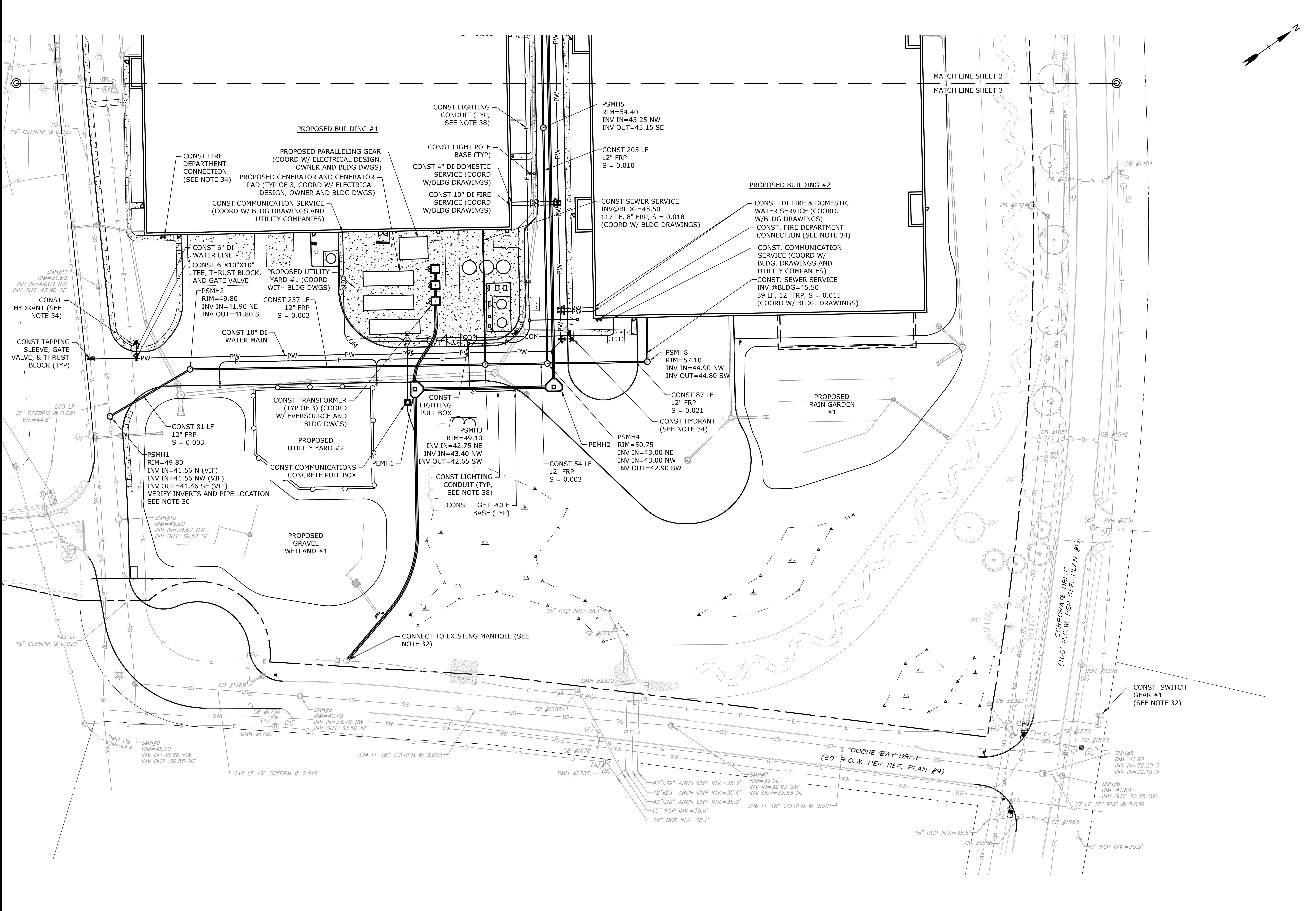

SEE SHEET C-111 FOR UTILITY NOTES AND LEGEND

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PATRICK CRIMMINS No. 12378 9/27/2023

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UTILITIES PLAN

SCALE: AS SHOWN

C-113

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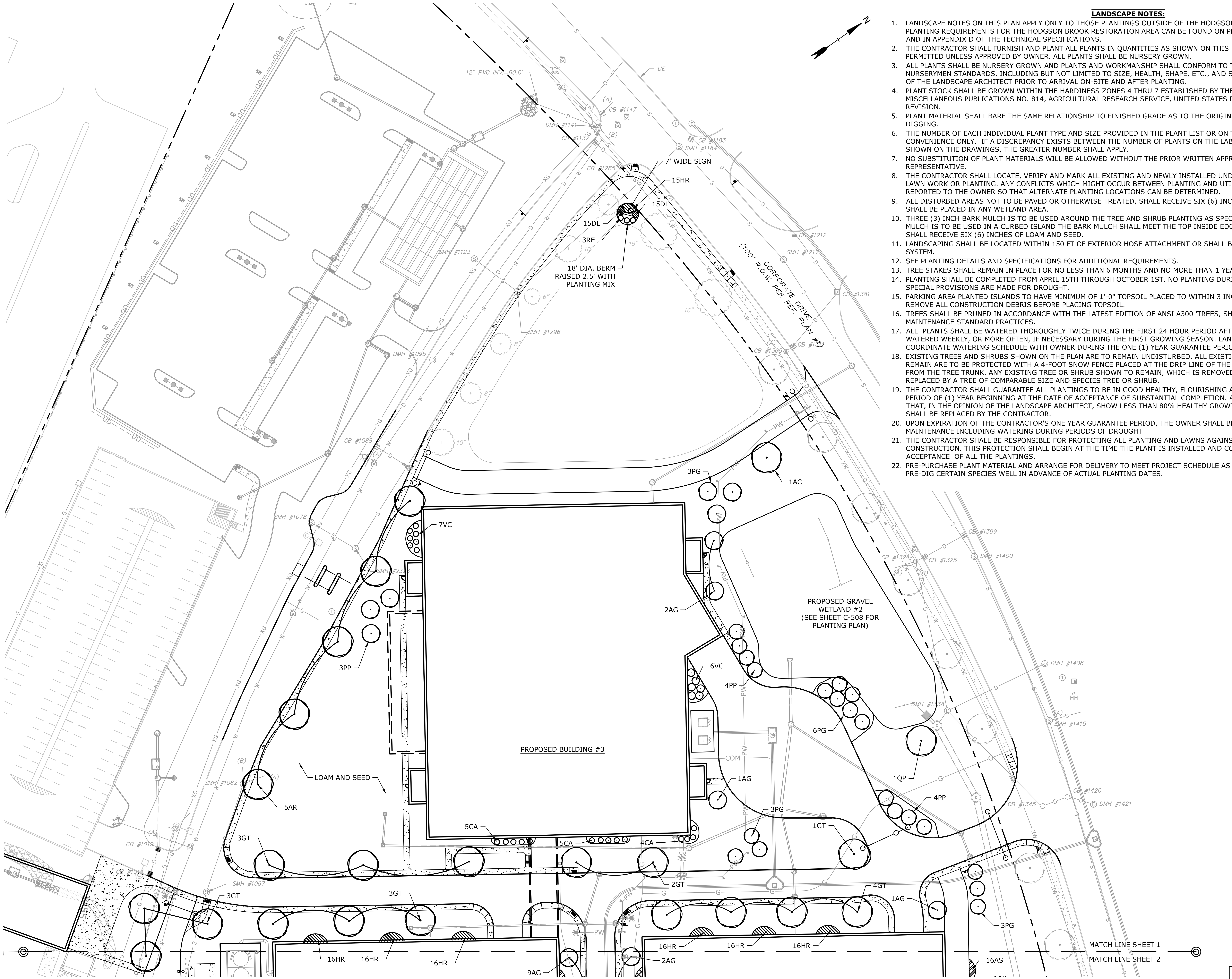

LANDSCAPE NOTES:

1. LANDSCAPE NOTES ON THIS PLAN APPLY ONLY TO THOSE PLANTINGS OUTSIDE OF THE HODGSON BROOK RESTORATION AREA. PLANTING REQUIREMENTS FOR THE HODGSON BROOK RESTORATION AREA CAN BE FOUND ON PLAN SHEETS C-701 THROUGH C-714 AND IN APPENDIX D OF THE TECHNICAL SPECIFICATIONS.
2. THE CONTRACTOR SHALL FURNISH AND PLANT ALL PLANTS IN QUANTITIES AS SHOWN ON THIS PLAN. NO SUBSTITUTIONS WILL BE PERMITTED UNLESS APPROVED BY OWNER. ALL PLANTS SHALL BE NURSERY GROWN.
3. ALL PLANTS SHALL BE NURSERY GROWN AND PLANTS AND WORKMANSHIP SHALL CONFORM TO THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS, INCLUDING BUT NOT LIMITED TO SIZE, HEALTH, SHAPE, ETC., AND SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO ARRIVAL ON-SITE AND AFTER PLANTING.
4. PLANT STOCK SHALL BE GROWN WITHIN THE HARDINESS ZONES 4 THRU 7 ESTABLISHED BY THE PLANT HARDINESS ZONE MAP, MISCELLANEOUS PUBLICATIONS NO. 814, AGRICULTURAL RESEARCH SERVICE, UNITED STATES DEPARTMENT AGRICULTURE, LATEST REVISION.
5. PLANT MATERIAL SHALL BARE THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE PRIOR TO DIGGING.
6. THE NUMBER OF EACH INDIVIDUAL PLANT TYPE AND SIZE PROVIDED IN THE PLANT LIST OR ON THE PLAN IS FOR THE CONTRACTOR'S CONVENIENCE ONLY. IF A DISCREPANCY EXISTS BETWEEN THE NUMBER OF PLANTS ON THE LABEL AND THE NUMBER OF SYMBOLS SHOWN ON THE DRAWINGS, THE GREATER NUMBER SHALL APPLY.
7. NO SUBSTITUTION OF PLANT MATERIALS WILL BE ALLOWED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
8. THE CONTRACTOR SHALL LOCATE, VERIFY AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWN WORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTING AND UTILITIES SHALL IMMEDIATELY BE REPORTED TO THE OWNER SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.
9. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED, SHALL RECEIVE SIX (6) INCHES OF LOAM AND SEED. NO FILL SHALL BE PLACED IN ANY WETLAND AREA.
10. THREE (3) INCH BARK MULCH IS TO BE USED AROUND THE TREE AND SHRUB PLANTING AS SPECIFIED IN THE DETAILS. WHERE BARK MULCH IS TO BE USED IN A CURBED ISLAND THE BARK MULCH SHALL MEET THE TOP INSIDE EDGE OF THE CURB. ALL OTHER AREAS SHALL RECEIVE SIX (6) INCHES OF LOAM AND SEED.
11. LANDSCAPING SHALL BE LOCATED WITHIN 150 FT OF EXTERIOR HOSE ATTACHMENT OR SHALL BE PROVIDED WITH AN IRRIGATION SYSTEM.
12. SEE PLANTING DETAILS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
13. TREE STAKES SHALL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR.
14. PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 1ST. NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT.
15. PARKING AREA PLANTED ISLANDS TO HAVE MINIMUM OF 1'-0" TOPSOIL PLACED TO WITHIN 3 INCHES OF THE TOP OF CURB ELEVATION REMOVE ALL CONSTRUCTION DEBRIS BEFORE PLACING TOPSOIL.
16. TREES SHALL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 'TREES, SHRUBS AND OTHER WOOD PLANT MAINTENANCE STANDARD PRACTICES.
17. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24 HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN, IF NECESSARY DURING THE FIRST GROWING SEASON. LANDSCAPE CONTRACTOR SHALL COORDINATE WATERING SCHEDULE WITH OWNER DURING THE ONE (1) YEAR GUARANTEE PERIOD.
18. EXISTING TREES AND SHRUBS SHOWN ON THE PLAN ARE TO REMAIN UNDISTURBED. ALL EXISTING TREES AND SHRUBS SHOWN TO REMAIN ARE TO BE PROTECTED WITH A 4-FOOT SNOW FENCE PLACED AT THE DRIP LINE OF THE BRANCHES OR AT 8 FEET MINIMUM FROM THE TREE TRUNK. ANY EXISTING TREE OR SHRUB SHOWN TO REMAIN, WHICH IS REMOVED DURING CONSTRUCTION, SHALL BE REPLACED BY A TREE OF COMPARABLE SIZE AND SPECIES TREE OR SHRUB.
19. THE CONTRACTOR SHALL GUARANTEE ALL PLANTINGS TO BE IN GOOD HEALTHY, FLOURISHING AND ACCEPTABLE CONDITION FOR A PERIOD OF (1) YEAR BEGINNING AT THE DATE OF ACCEPTANCE OF SUBSTANTIAL COMPLETION. ALL GRASSES, TREES AND SHRUBS THAT, IN THE OPINION OF THE LANDSCAPE ARCHITECT, SHOW LESS THAN 80% HEALTHY GROWTH AT THE END OF ONE YEAR PERIOD SHALL BE REPLACED BY THE CONTRACTOR.
20. UPON EXPIRATION OF THE CONTRACTOR'S ONE YEAR GUARANTEE PERIOD, THE OWNER SHALL BE RESPONSIBLE FOR LANDSCAPE MAINTENANCE INCLUDING WATERING DURING PERIODS OF DROUGHT
21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PLANTING AND LAWNS AGAINST DAMAGE FROM ONGOING CONSTRUCTION. THIS PROTECTION SHALL BEGIN AT THE TIME THE PLANT IS INSTALLED AND CONTINUE UNTIL THE FORMAL ACCEPTANCE OF ALL THE PLANTINGS.
22. PRE-PURCHASE PLANT MATERIAL AND ARRANGE FOR DELIVERY TO MEET PROJECT SCHEDULE AS REQUIRED IT MAY BE NECESSARY TO PRE-DIG CERTAIN SPECIES WELL IN ADVANCE OF ACTUAL PLANTING DATES.

SEE SHEET C-116 FOR PLANT SCHEDULE

Tighe&Bond

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
9/27/2023

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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Portsmouth,
New Hampshire

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LANDSCAPE PLAN

SCALE: AS SHOWN

C-114

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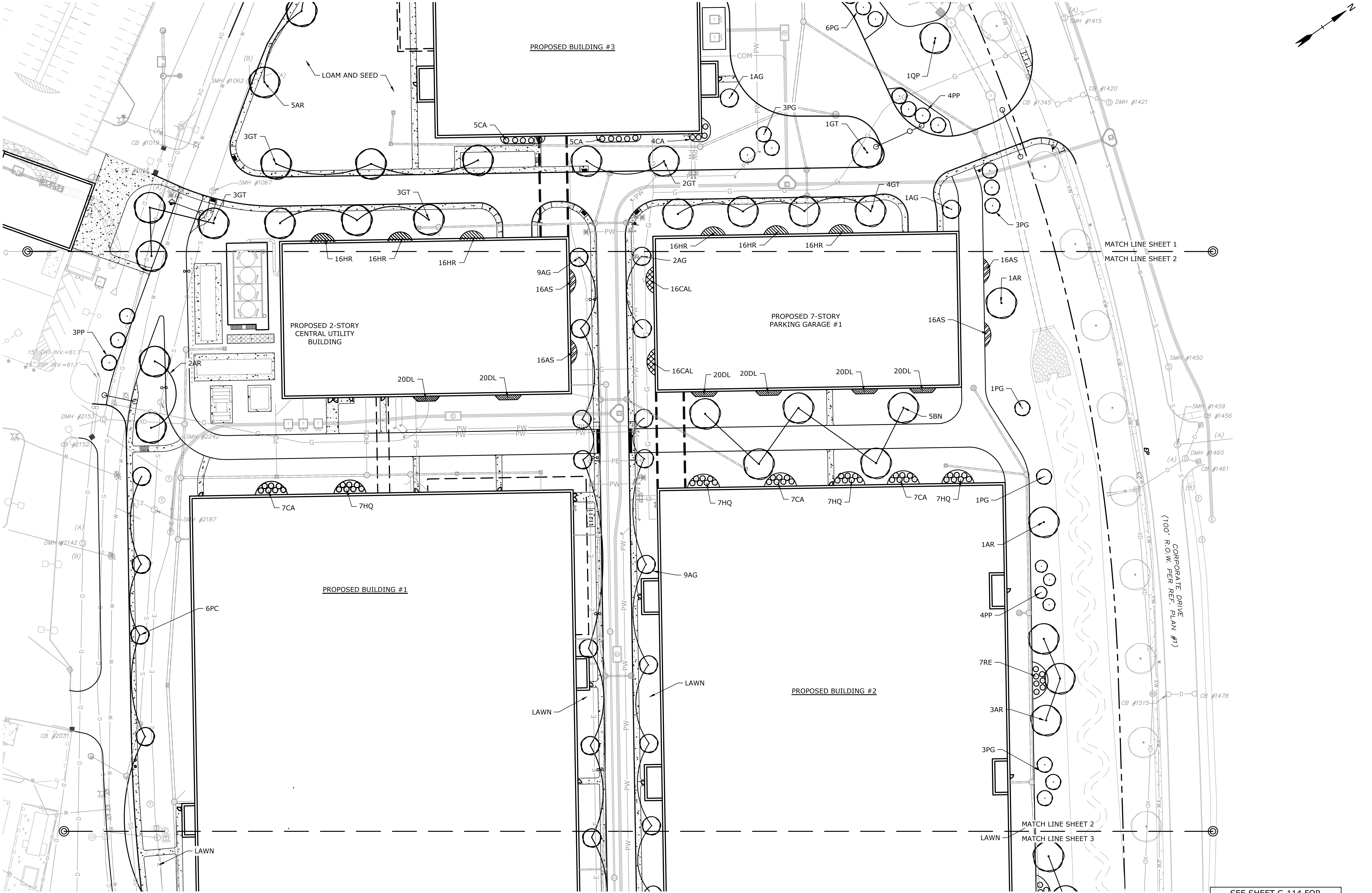

SEE SHEET C-114 FOR LANDSCAPING NOTES

SEE SHEET C-116 FOR PLANT SCHEDULE

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NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

SCALE IN FEET
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C-115

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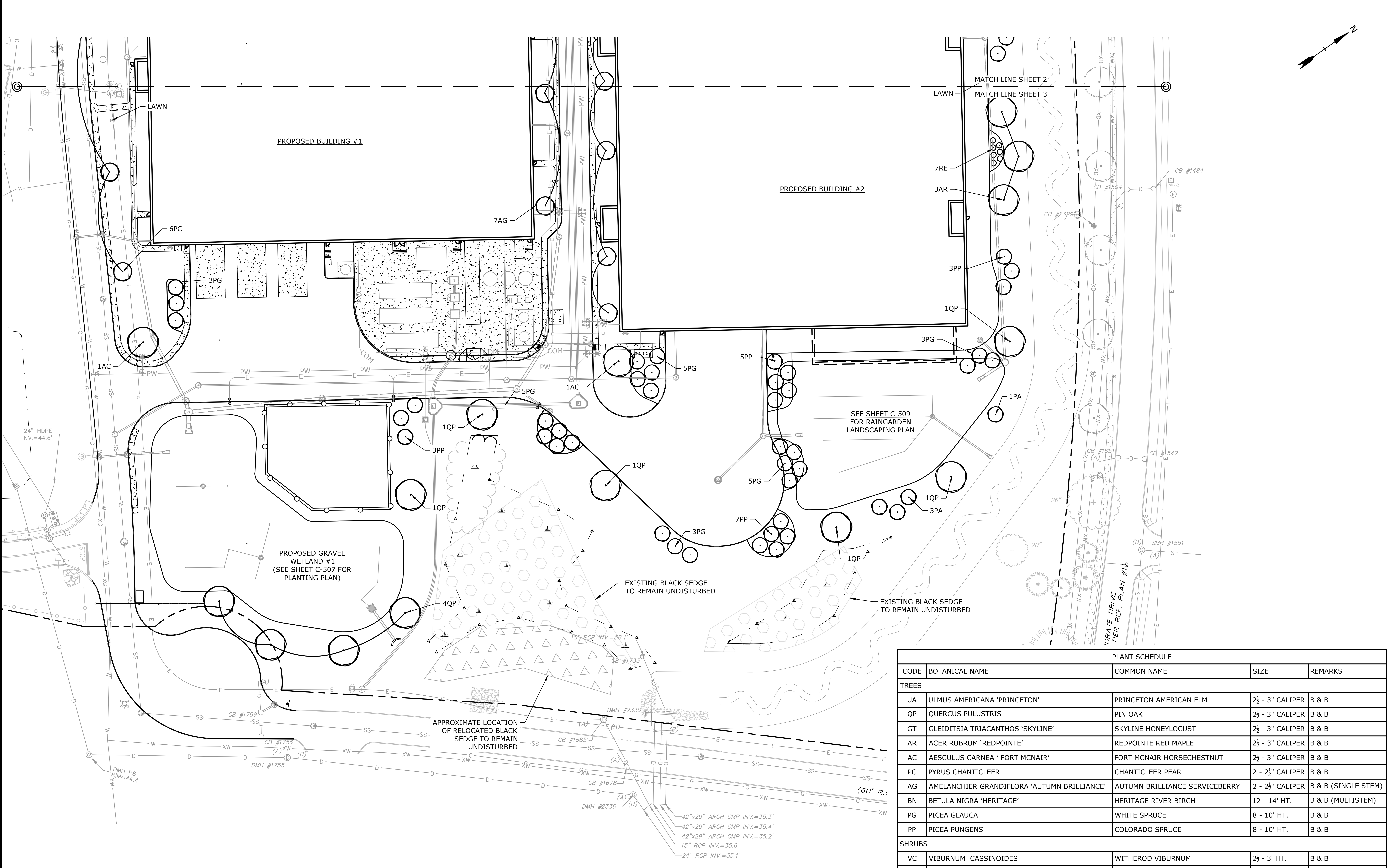
NEIL A. HANSEN No. 15227 9/27/2023

PATRICK CRIMMINS No. 12378 9/27/2023



SEE SHEET C-114 FOR LANDSCAPING NOTES

PLANT SCHEDULE				
CODE	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES				
UA	ULMUS AMERICANA 'PRINCETON'	PRINCETON AMERICAN ELM	$2\frac{1}{2}$ - 3" CALIPER	B & B
QP	QUERCUS PULUSTRIS	PIN OAK	$2\frac{1}{2}$ - 3" CALIPER	B & B
GT	GLEIDITSIA TRIACANTHOS 'SKYLINE'	SKYLINE HONEYLOCUST	$2\frac{1}{2}$ - 3" CALIPER	B & B
AR	ACER RUBRUM 'REDPOINTE'	REDPOINTE RED MAPLE	$2\frac{1}{2}$ - 3" CALIPER	B & B
AC	AESCULUS CARNEA ' FORT MCNAIR'	FORT MCNAIR HORSECHESTNUT	$2\frac{1}{2}$ - 3" CALIPER	B & B
PC	PYRUS CHANTICLEER	CHANTICLEER PEAR	2 - $2\frac{1}{2}$" CALIPER	B & B
AG	AMELANCHIER GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	2 - $2\frac{1}{2}$" CALIPER	B & B (SINGLE STEM)
BN	BETULA NIGRA 'HERITAGE'	HERITAGE RIVER BIRCH	12 - 14' HT.	B & B (MULTISTEM)
PG	PICEA GLAUCA	WHITE SPRUCE	8 - 10' HT.	B & B
PP	PICEA PUNGENS	COLORADO SPRUCE	8 - 10' HT.	B & B
SHRUBS				
VC	VIBURNUM CASSINOIDES	WITHEROD VIBURNUM	$2\frac{1}{2}$ - 3' HT.	B & B
RE	RHODODENDRON 'ENGLISH ROSEUM'	ENGLISH ROSEUM RHODODENDRON	$2\frac{1}{2}$ - 3' HT.	B & B
CA	CLETHERA ALNIFOLIA	SUMMERSWEET CLETHERA	7 GALLON	CONTAINER
HQ	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN'	SNOW QUEEN OAKLEAF HYDRANGEA	$2\frac{1}{2}$ - 3' HT.	B & B
GROUNDCOVERS & PERENNIALS				
DL	HEMEROCALLIS 'STELLA DORO'	STELLA DORO DAYLILY	2 GALLON	CONTAINER
HR	HOSTA 'ROYAL STANDARD'	ROYAL STANDARD HOSTA	2 GALLON	CONTAINER
AS	ASTILBE 'VISIONS IN PINK'	VISIONS IN PINK ASTILBE	2 GALLON	CONTAINER
CAL	CALAMAGROSTIS 'KARL FOERSTER'	KARL FOERSTER FEATHER REED GRASS	3 GALLON	CONTAINER

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SCALE: AS SHOWN

C-116

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
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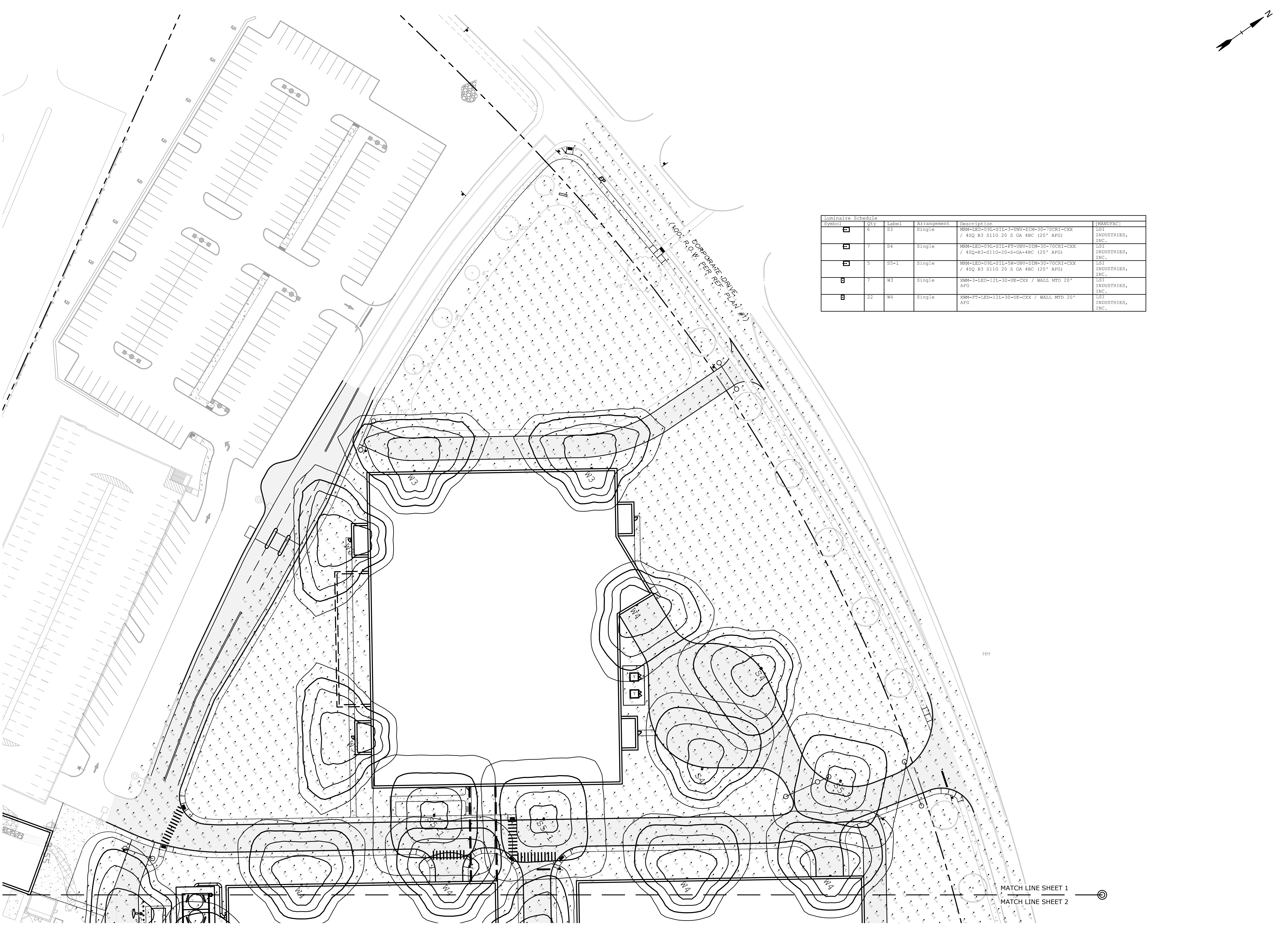

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	[MANUFAC]
⊟	6	S3	Single	MRM-LED-09L-SIL-3-UNV-DIM-30-70CRI-CXX / 4SQ B3 S11G 20 S GA 4BC (20' AFG)	LSI INDUSTRIES, INC.
⊟	7	S4	Single	MRM-LED-09L-SIL-FT-UNV-DIM-30-70CRI-CXX / 4SQ-B3-S11G-20-S-GA-4BC (20' AFG)	LSI INDUSTRIES, INC.
⊟	5	S5-1	Single	MRM-LED-09L-SIL-5W-UNV-DIM-30-70CRI-CXX / 4SQ B3 S11G 20 S GA 4BC (20' AFG)	LSI INDUSTRIES, INC.
⊡	7	W3	Single	XWM-3-LED-12L-30-UE-CXX / WALL MTD 20' AFG	LSI INDUSTRIES, INC.
⊡	22	W4	Single	XWM-FT-LED-12L-30-UE-CXX / WALL MTD 20' AFG	LSI INDUSTRIES, INC.

Tighe&Bond

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
M	9/27/2023	P.B. Submission
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K	5/5/2023	Phase 1B Issued for Bid
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PROJECT NO: L-0700-013
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CHECKED: NAH
APPROVED: PMC

PHOTOMETRIC LIGHTING PLAN

SCALE: AS SHOWN

C-117

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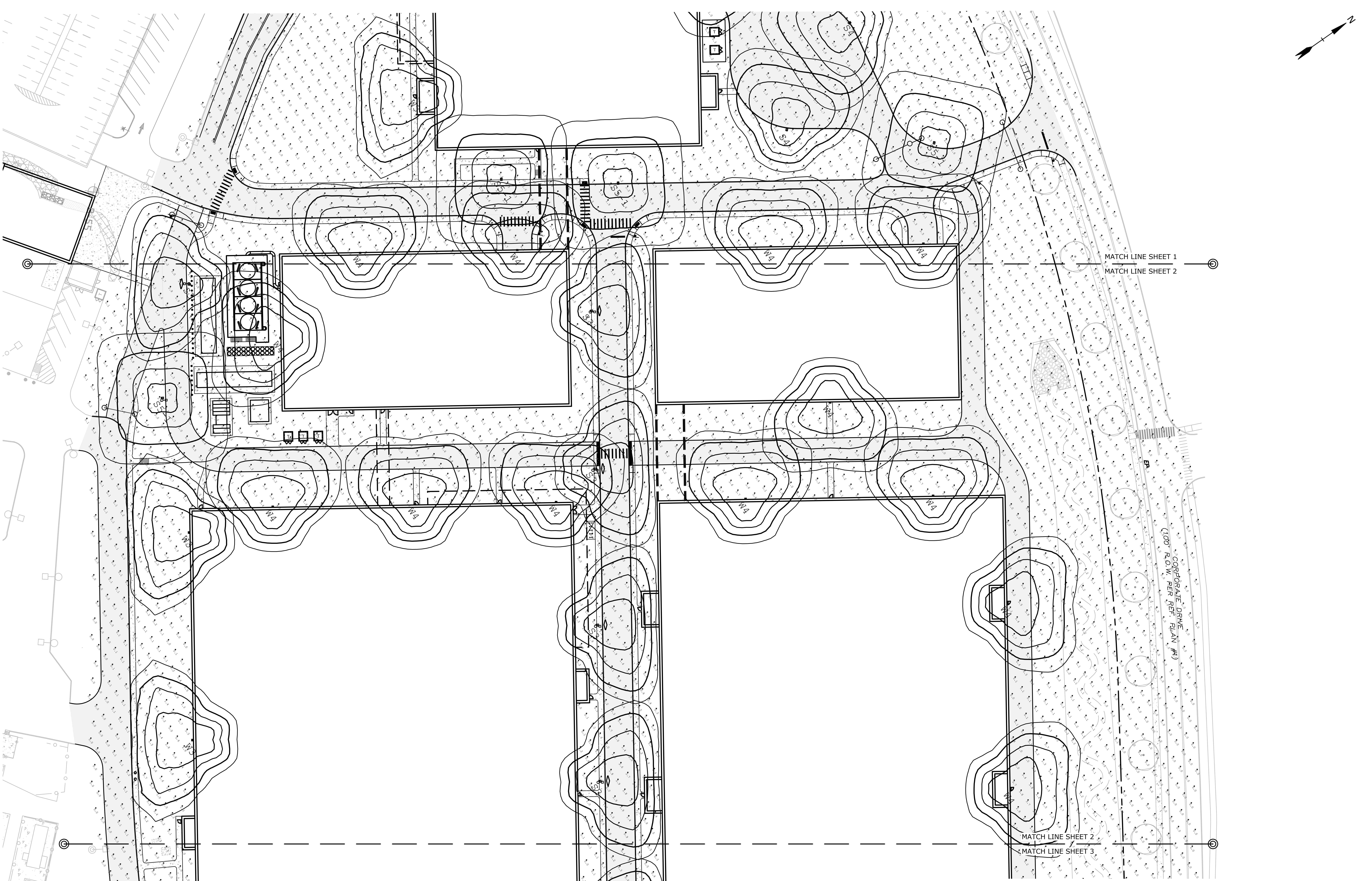

NEIL A. HANSEN No. 15227 9/27/2023

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PHOTOMETRIC LIGHTING PLAN

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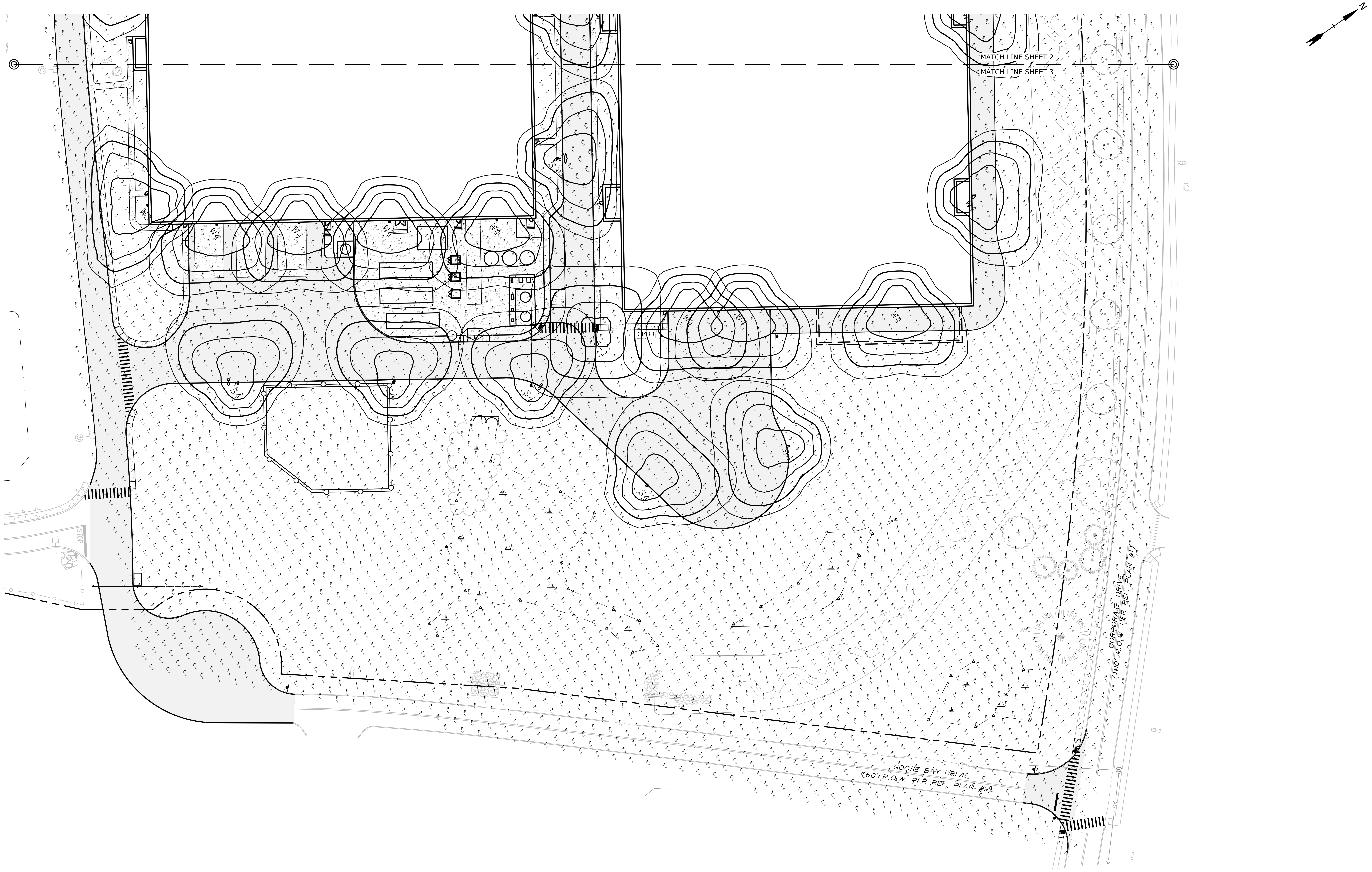

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Tighe&Bond

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PHOTOMETRIC LIGHTING PLAN

SCALE: AS SHOWN

C-119

PHASE 2 PLAN SET

APRIL 3, 2018

REVISED: SEPTEMBER 27, 2023

LIST OF DRAWINGS

SHEET NO.	SHEET TITLE	LAST REVISED
	PHASE 2 PLAN SET COVER SHEET	9/27/2023
C-161	PHASE 2 DEMOLITION PLAN	9/27/2023
C-162	PHASE 2 DEMOLITION PLAN	9/27/2023
C-163	PHASE 2 DEMOLITION PLAN	9/27/2023
C-163.1	PHASE 2 PRE-CONSTRUCTION LAYOUT PLAN	9/27/2023
C-164	PHASE 2 OVERALL SITE PLAN	9/27/2023
C-165	PHASE 2 SITE PLAN	9/27/2023
C-166	PHASE 2 SITE PLAN	9/27/2023
C-167	PHASE 2 SITE PLAN	9/27/2023
C-168	PHASE 2 GRADING, DRAINAGE & EROSION CONTROL PLAN	9/27/2023
C-169	PHASE 2 GRADING, DRAINAGE & EROSION CONTROL PLAN	9/27/2023
C-170	PHASE 2 GRADING, DRAINAGE & EROSION CONTROL PLAN	9/27/2023
C-171	PHASE 2 UTILITIES PLAN	9/27/2023
C-172	PHASE 2 UTILITIES PLAN	9/27/2023
C-173	PHASE 2 UTILITIES PLAN	9/27/2023
C-174	PHASE 2 LANDSCAPE PLAN	9/27/2023
C-175	PHASE 2 LANDSCAPE PLAN	9/27/2023
C-176	PHASE 2 LANDSCAPE PLAN	9/27/2023
C-177	PHASE 2 PHOTOMETRIC LIGHTING PLAN	9/27/2023
C-178	PHASE 2 PHOTOMETRIC LIGHTING PLAN	9/27/2023
C-179	PHASE 2 PHOTOMETRIC LIGHTING PLAN	9/27/2023
8-046-1-1110	FIRST FLOOR PLAN - CUB	8/24/2023
8-046-1-2002	BUILDING ELEVATIONS (E-W) - CUB	8/24/2023
8-046-1-2003	BUILDING ELEVATIONS (N-S) - CUB	9/18/2023
8-070-1-1110	FIRST FLOOR PLAN - BL1	8/24/2023
8-070-1-2001	OVERALL BUILDINGS ELEVATIONS	7/12/2023
8-070-1-2002	BUILDING ELEVATIONS (E-W) - BL1	8/24/2023
8-070-1-2003	BUILDING ELEVATIONS (N-S) - BL1	8/24/2023

STATE OF NEW HAMPSHIRE
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LICENSED
PROFESSIONAL ENGINEER
9/27/2023

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COMPLETE SET 28 SHEETS

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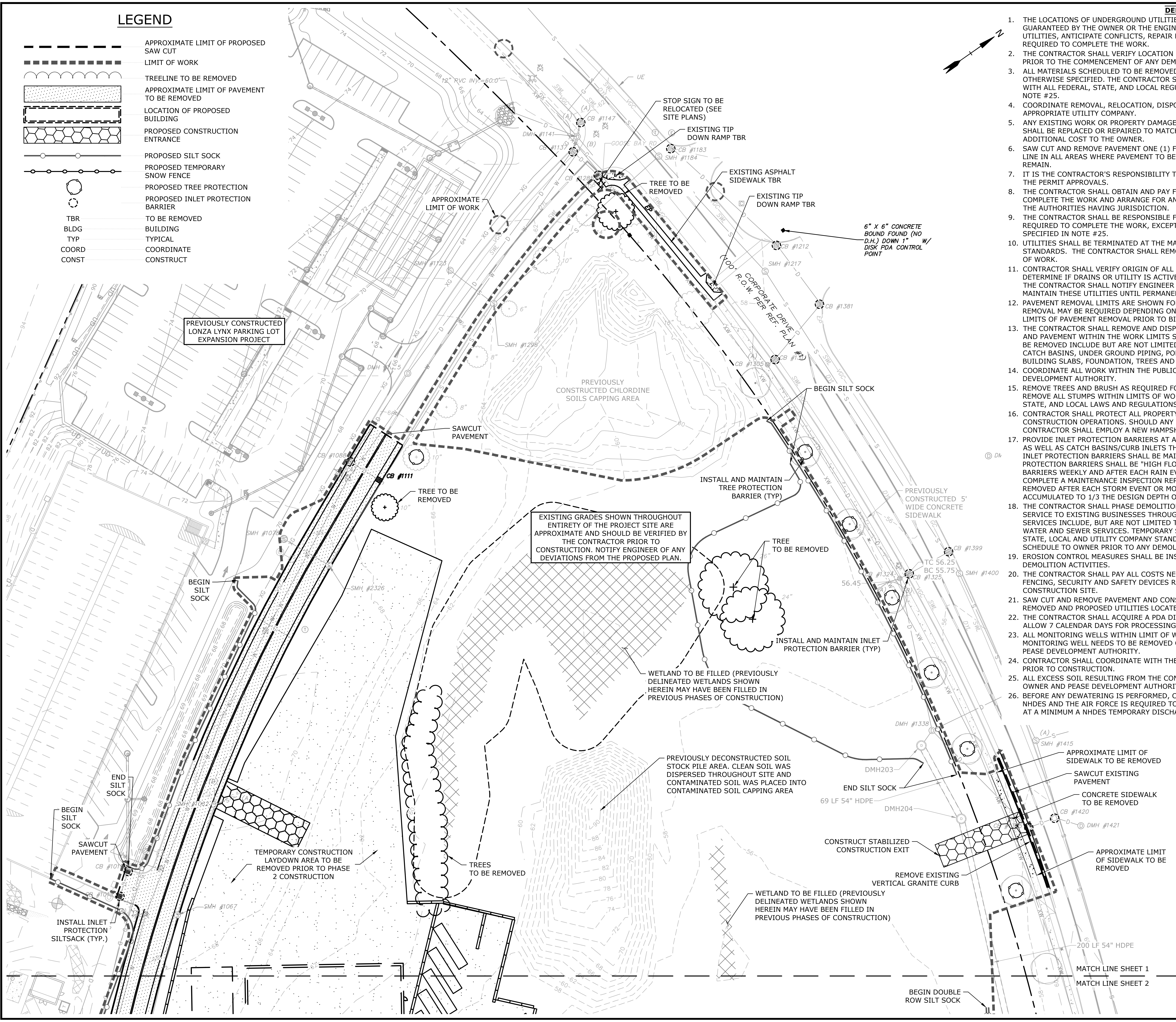
LEGEND

APPROXIMATE LIMIT OF PROPOSED SAW CUT
LIMIT OF WORK
TREELINE TO BE REMOVED
APPROXIMATE LIMIT OF PAVEMENT TO BE REMOVED
LOCATION OF PROPOSED BUILDING
PROPOSED CONSTRUCTION ENTRANCE
PROPOSED SILT SOCK
PROPOSED TEMPORARY SNOW FENCE
PROPOSED TREE PROTECTION
PROPOSED INLET PROTECTION BARRIER

TBR	TO BE REMOVED
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
CONST	CONSTRUCT



DEMOLITION NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
3. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES EXCEPT AS SPECIFIED IN NOTE #25.
4. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
5. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
6. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
8. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS AND AS SPECIFIED IN NOTE #25.
10. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND THE CITY OF PORTSMOUTH STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK.
11. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
12. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
13. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, LIGHTING, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, STAIRS, SIGNS, FENCES, RAMPS, WALLS, BOLLARDS, BUILDING SLABS, FOUNDATION, TREES AND LANDSCAPING.
14. COORDINATE ALL WORK WITHIN THE PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
15. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
16. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
17. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT MAY RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
18. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
19. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
20. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
21. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
22. THE CONTRACTOR SHALL ACQUIRE A PDA DIG PERMIT BEFORE ANY EARTH DISTURBANCE CAN TAKE PLACE. ALLOW 7 CALENDAR DAYS FOR PROCESSING.
23. ALL MONITORING WELLS WITHIN LIMIT OF WORK SHALL BE PROTECTED DURING CONSTRUCTION. IF ANY MONITORING WELL NEEDS TO BE REMOVED OR ADJUSTED THIS WORK SHALL BE COORDINATED WITH THE PEASE DEVELOPMENT AUTHORITY.
24. CONTRACTOR SHALL COORDINATE WITH THE PROJECT SURVEYOR FOR BENCHMARK AND CONTROL POINTS PRIOR TO CONSTRUCTION.
25. ALL EXCESS SOIL RESULTING FROM THE CONSTRUCTION SHALL REMAIN ON SITE. COORDINATE WITH OWNER AND PEASE DEVELOPMENT AUTHORITY ON FINAL LOCATION OF EXCESS MATERIALS.
26. BEFORE ANY DEWATERING IS PERFORMED, COORDINATION BETWEEN THE OWNER, CONTRACTOR, PDA, NHDES AND THE AIR FORCE IS REQUIRED TO DETERMINE PROPER PROCEDURES AND PERMITTING REQUIRED. AT A MINIMUM A NHDES TEMPORARY DISCHARGE PERMIT IS REQUIRED.

Tighe&Bond

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No. 15227
9/27/2023

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GRAPHIC SCALE

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PHASE 2
DEMOLITION PLAN

SCALE: AS SHOWN

C-161

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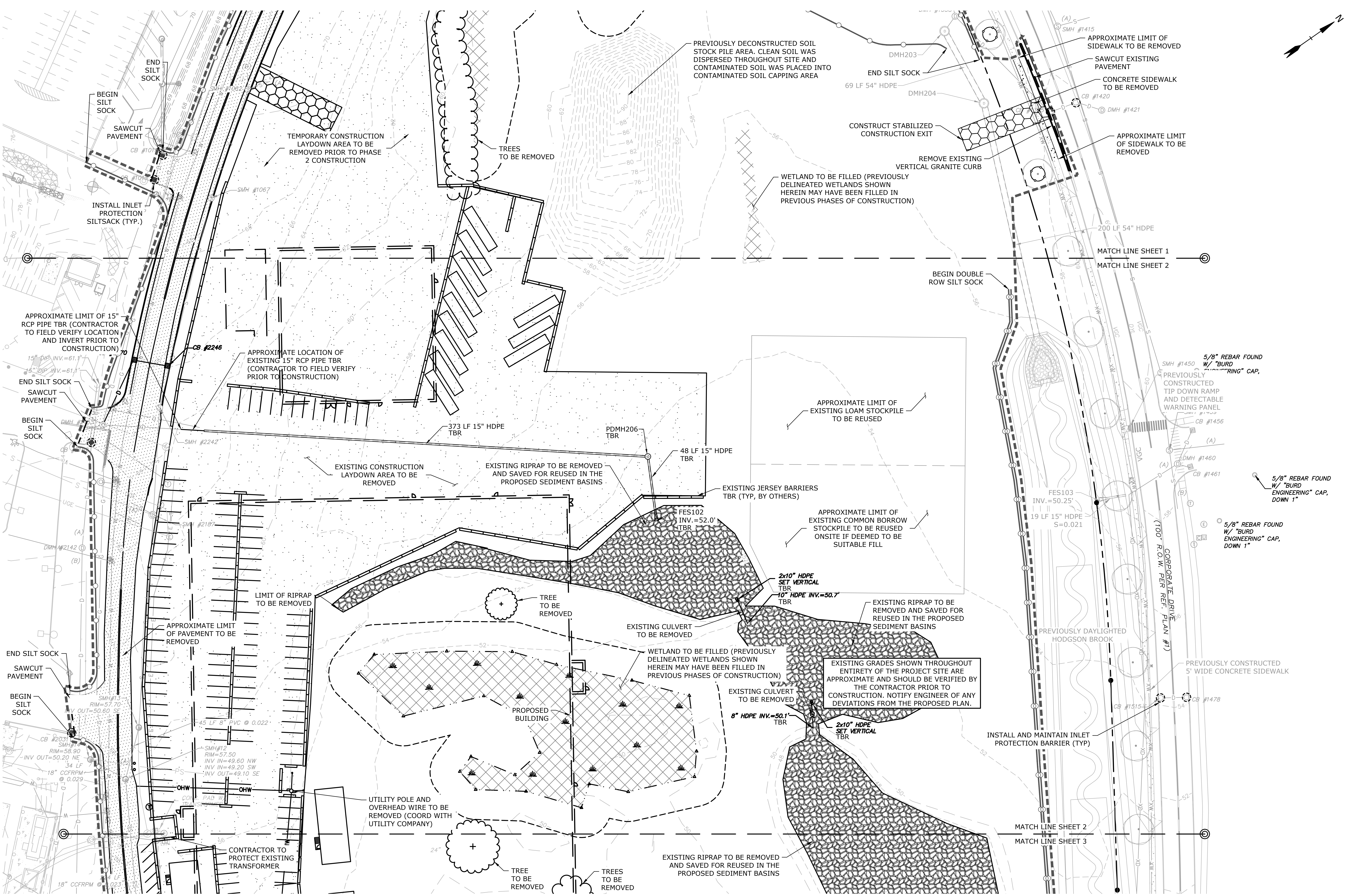

SEE SHEET C-161 FOR LEGEND AND DEMOLITION NOTES

Tighe&Bond

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PHASE 2
DEMOLITION PLAN

SCALE: AS SHOWN

C-162

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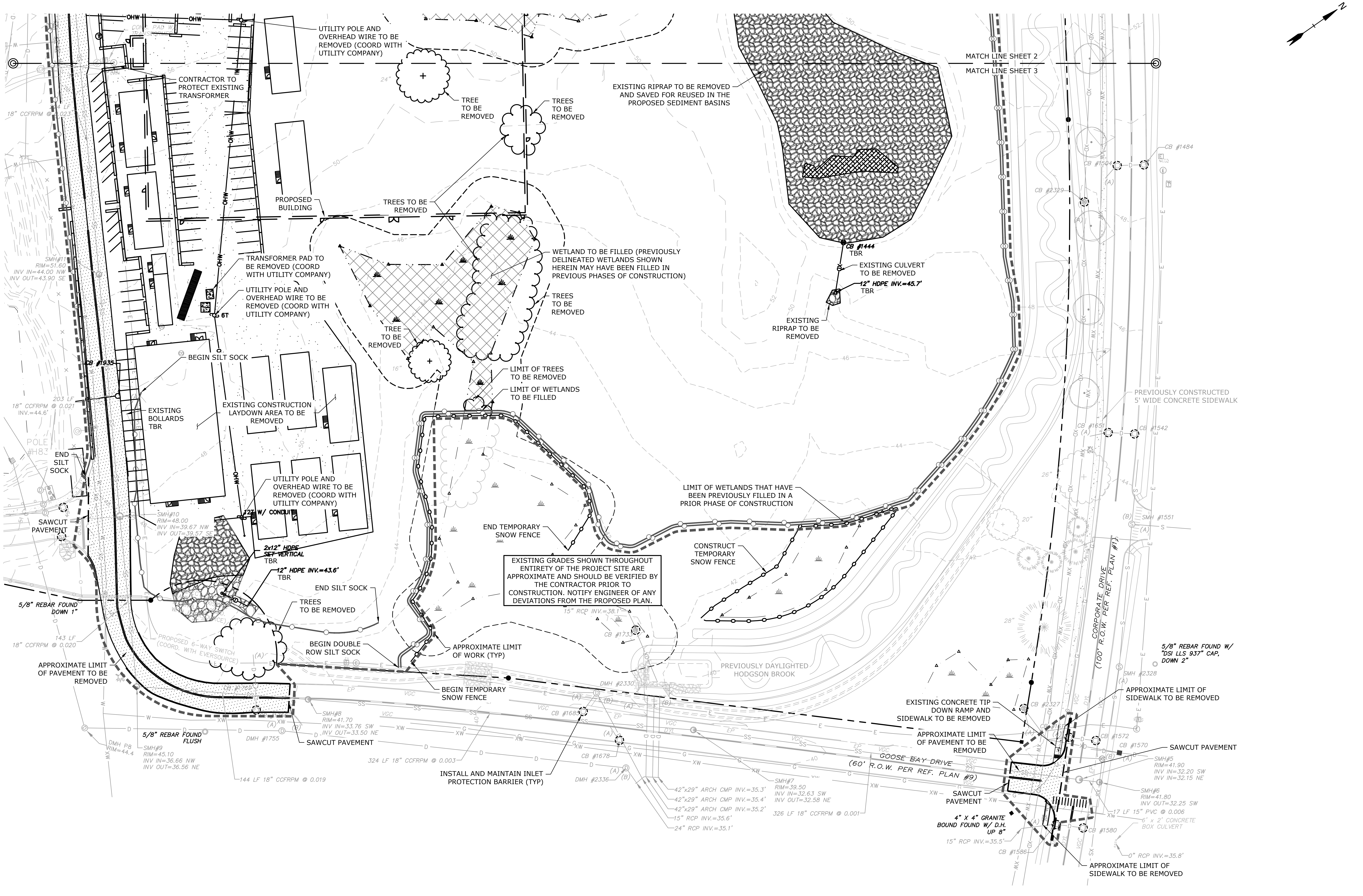

EXISTING GRADES SHOWN THROUGHOUT ENTIRETY OF THE PROJECT SITE ARE APPROXIMATE AND SHOULD BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF ANY DEVIATIONS FROM THE PROPOSED PLAN.

SEE SHEET C-161 FOR LEGEND AND DEMOLITION NOTES

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9/27/2023

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9/27/2023

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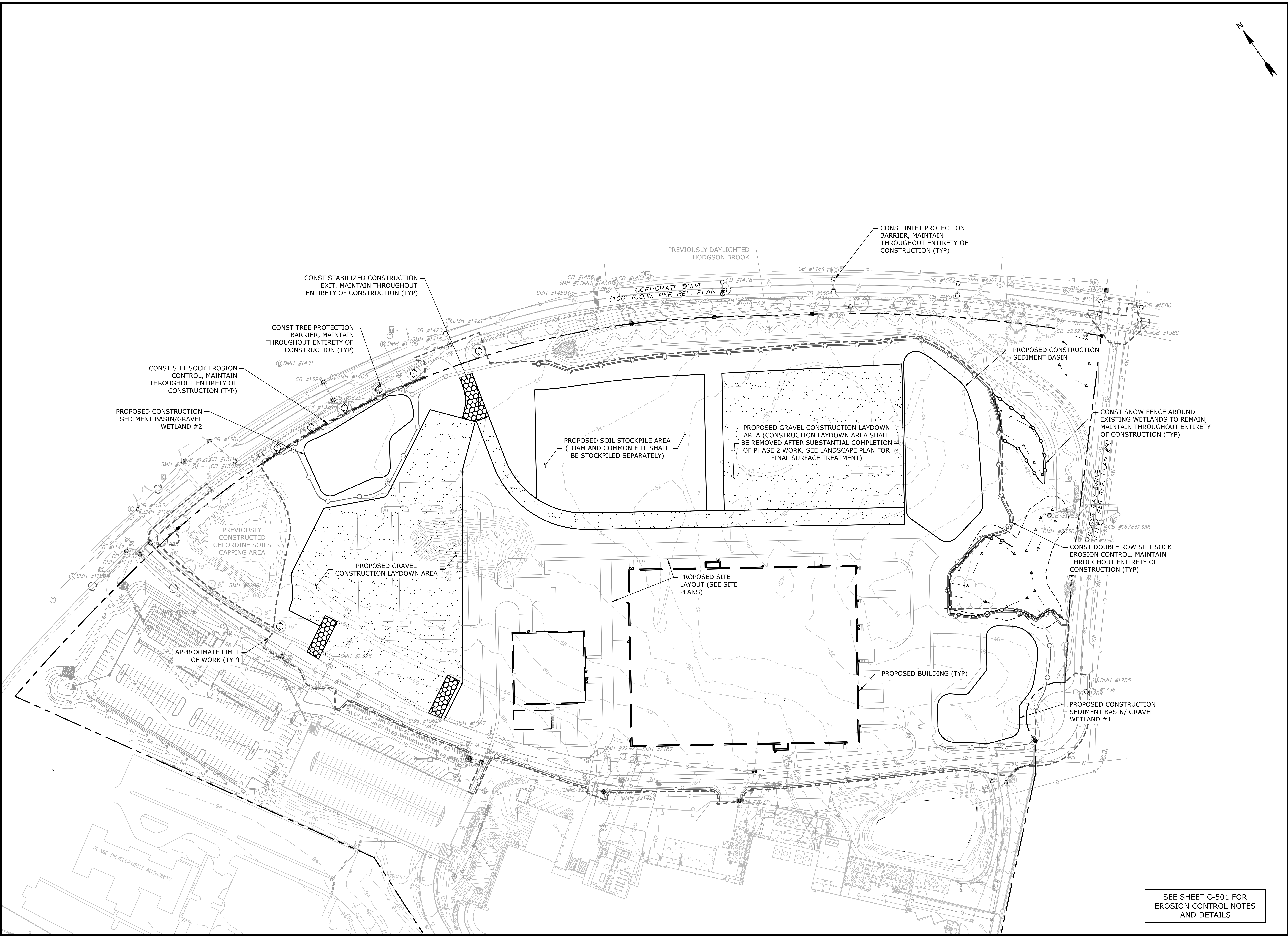
PHASE 2
DEMOLITION PLAN

SCALE: AS SHOWN

C-163



SEE SHEET C-501 FOR
EROSION CONTROL NOTES
AND DETAILS

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No. 15227
9/27/2023

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No. 12378
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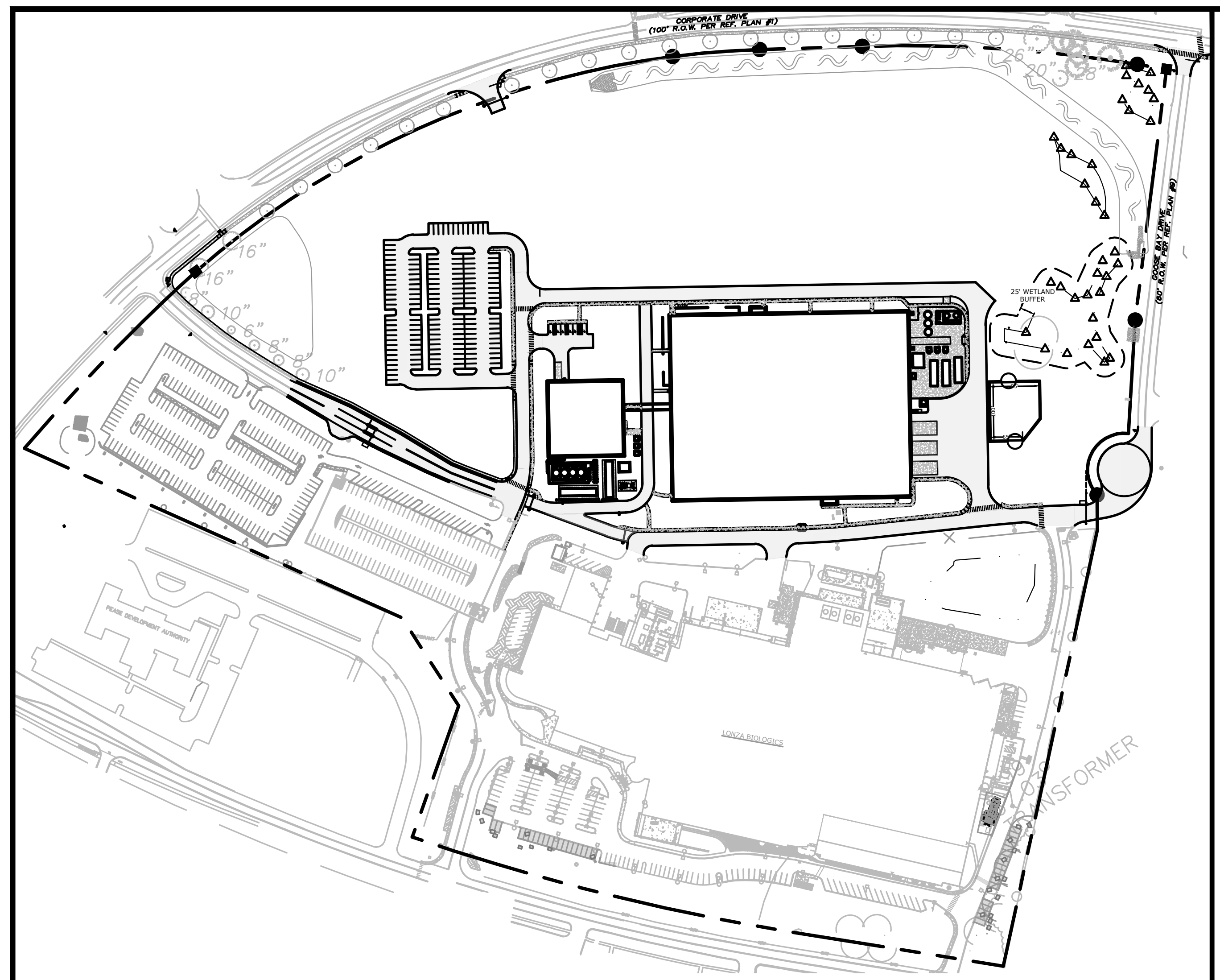
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

PHASE 2
PRE-CONSTRUCTION
LAYOUT PLAN

SCALE: AS SHOWN

C-163.1



OVERALL LOT AREA PLAN
SCALE : 1" = 250'

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 %	59.9± %

MAXIMUM STRUCTURE HEIGHT SHALL NOT EXCEED FAA CRITERIA.

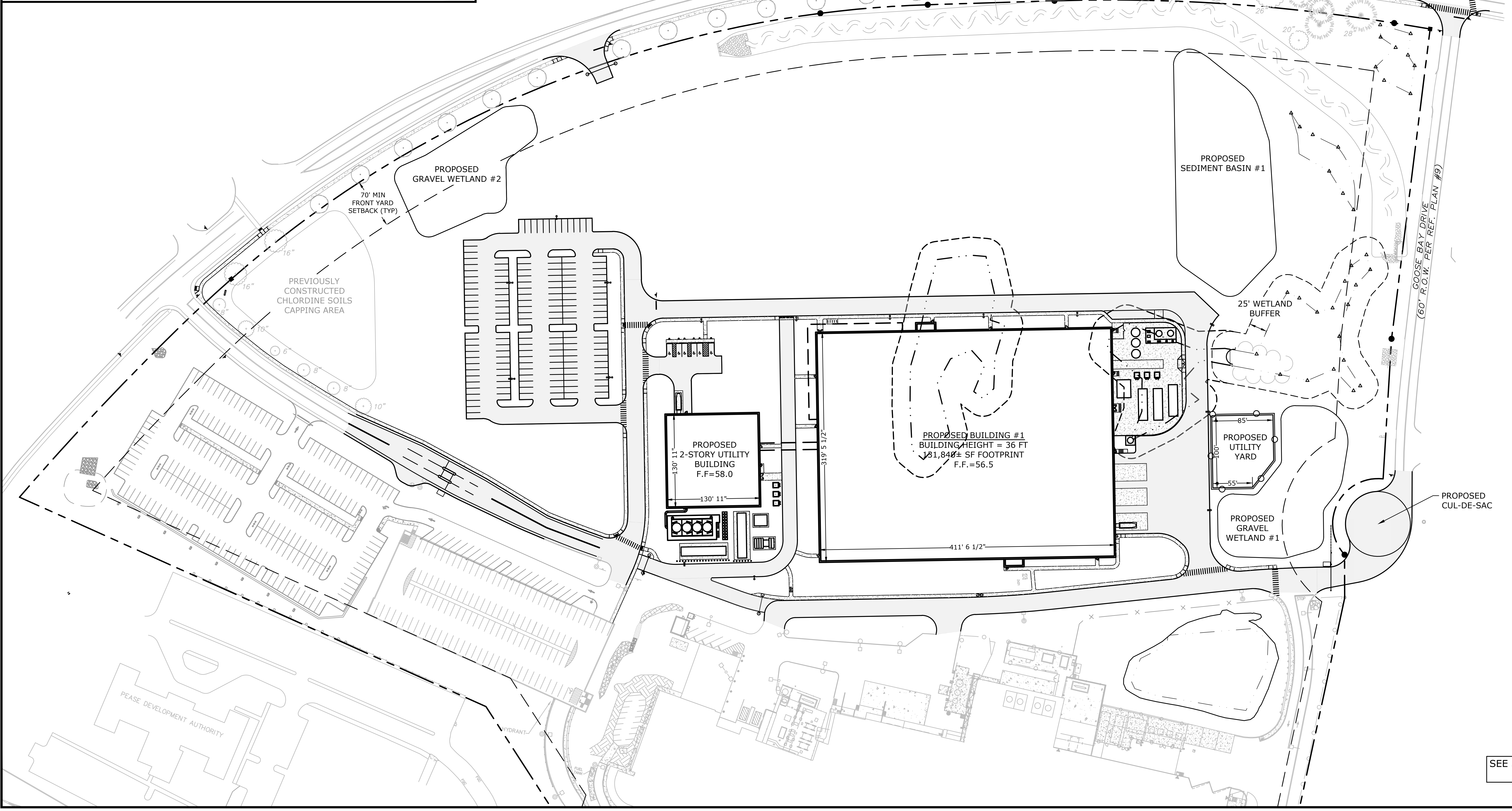
PARKING REQUIREMENTS:

REQUIRED PARKING
2 SPACES PER 3 EMPLOYEES ON LARGEST SHIFT

990 EXISTING EMPLOYEES	660 SPACES
180 ANTICIPATED EMPLOYEES	120 SPACES
TOTAL REQUIRED:	880 SPACES

PARKING PROVIDED

EXISTING SPACES:	801 SPACES
PROPOSED SURFACE PARKING:	156 SPACES
TOTAL:	957 SPACES



SEE SHEET C-165 FOR LEGEND AND SITE NOTES

N

SCALE IN FEET
0 80' 160'
GRAPHIC SCALE

Tighe&Bond

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
M	9/27/2023	P.B. Submission
L	7/17/2023	Amended Site Plan Review
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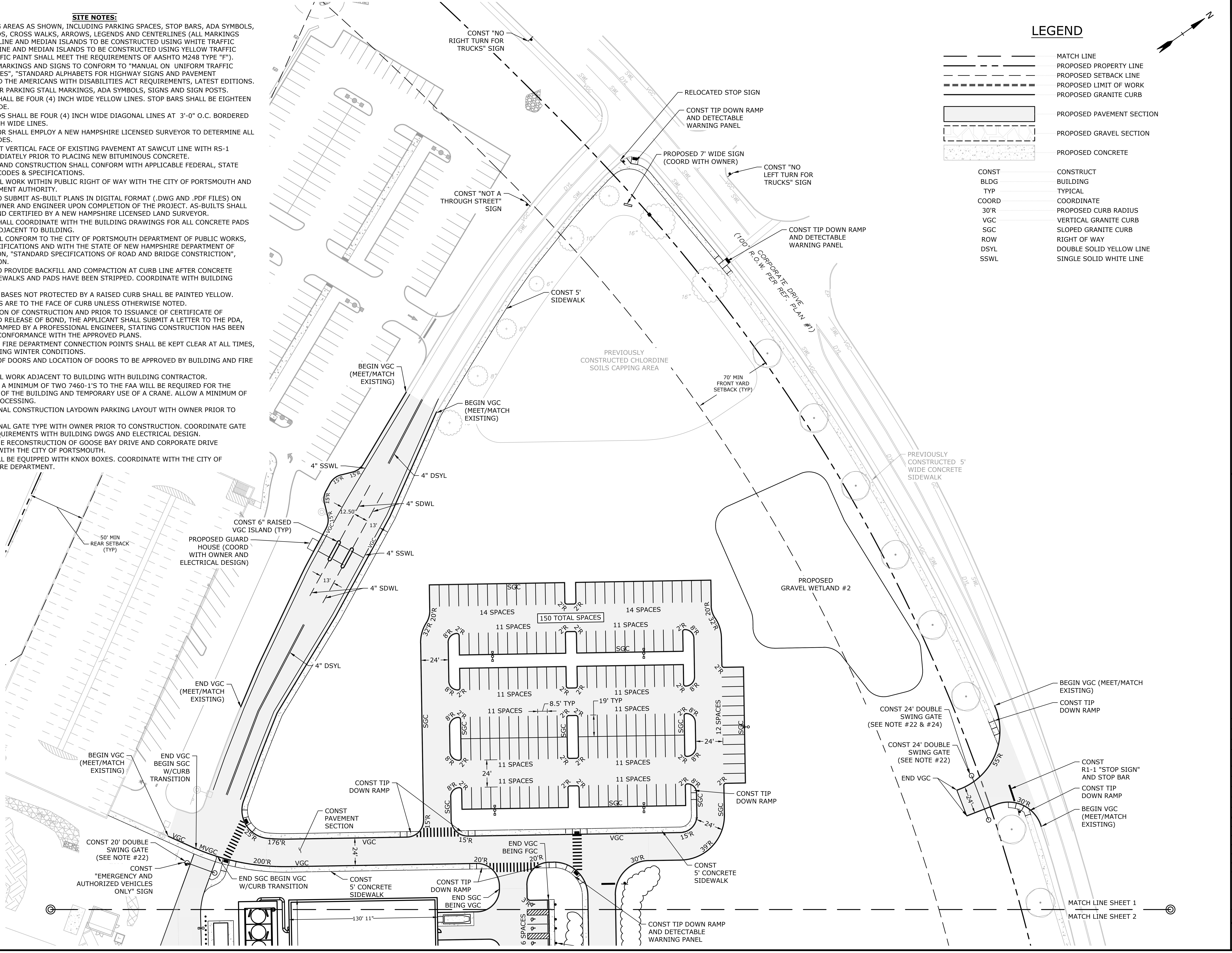
PHASE 2 OVERALL
SITE PLAN

SCALE: AS SHOWN

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-164

SITE NOTES:

1. STRIPE PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES (ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT. CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F").
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PARKING STALL MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO DETERMINE ALL LINES AND GRADES.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE AND/OR TOWN CODES & SPECIFICATIONS.
9. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAY WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. CONTRACTOR SHALL COORDINATE WITH THE BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
12. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRICTION", CURRENT EDITION.
13. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
14. ALL LIGHT POLE BASES NOT PROTECTED BY A RAISED CURB SHALL BE PAINTED YELLOW.
15. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
16. UPON COMPLETION OF CONSTRUCTION AND PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY AND RELEASE OF BOND, THE APPLICANT SHALL SUBMIT A LETTER TO THE PDA, SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER, STATING CONSTRUCTION HAS BEEN COMPLETED IN CONFORMANCE WITH THE APPROVED PLANS.
17. FIRE LANES AND FIRE DEPARTMENT CONNECTION POINTS SHALL BE KEPT CLEAR AT ALL TIMES, INCLUDING DURING WINTER CONDITIONS.
18. FINAL NUMBER OF DOORS AND LOCATION OF DOORS TO BE APPROVED BY BUILDING AND FIRE DEPARTMENTS.
19. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
20. SUBMISSION OF A MINIMUM OF TWO 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.
21. COORDINATE FINAL CONSTRUCTION LAYDOWN PARKING LAYOUT WITH OWNER PRIOR TO CONSTRUCTION.
22. COORDINATE FINAL GATE TYPE WITH OWNER PRIOR TO CONSTRUCTION. COORDINATE GATE ELECTRICAL REQUIREMENTS WITH BUILDING DWGS AND ELECTRICAL DESIGN.
23. COORDINATE THE RECONSTRUCTION OF GOOSE BAY DRIVE AND CORPORATE DRIVE INTERSECTION WITH THE CITY OF PORTSMOUTH.
24. ALL GATES SHALL BE EQUIPPED WITH KNOX BOXES. COORDINATE WITH THE CITY OF PORTSMOUTH FIRE DEPARTMENT.



LEGEND

— — — —	MATCH LINE
— - —	PROPOSED PROPERTY LINE
— — —	PROPOSED SETBACK LINE
- - - -	PROPOSED LIMIT OF WORK
▬▬	PROPOSED GRANITE CURB
▭	PROPOSED PAVEMENT SECTION
▨	PROPOSED GRAVEL SECTION
▒	PROPOSED CONCRETE
CONST	CONSTRUCT
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
30'R	PROPOSED CURB RADIUS
VGC	VERTICAL GRANITE CURB
SGC	SLOPED GRANITE CURB
ROW	RIGHT OF WAY
DSYL	DOUBLE SOLID YELLOW LINE
SSWL	SINGLE SOLID WHITE LINE

Tighe&Bond

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

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PHASE 2
SITE PLAN

SCALE: AS SHOWN

C-165

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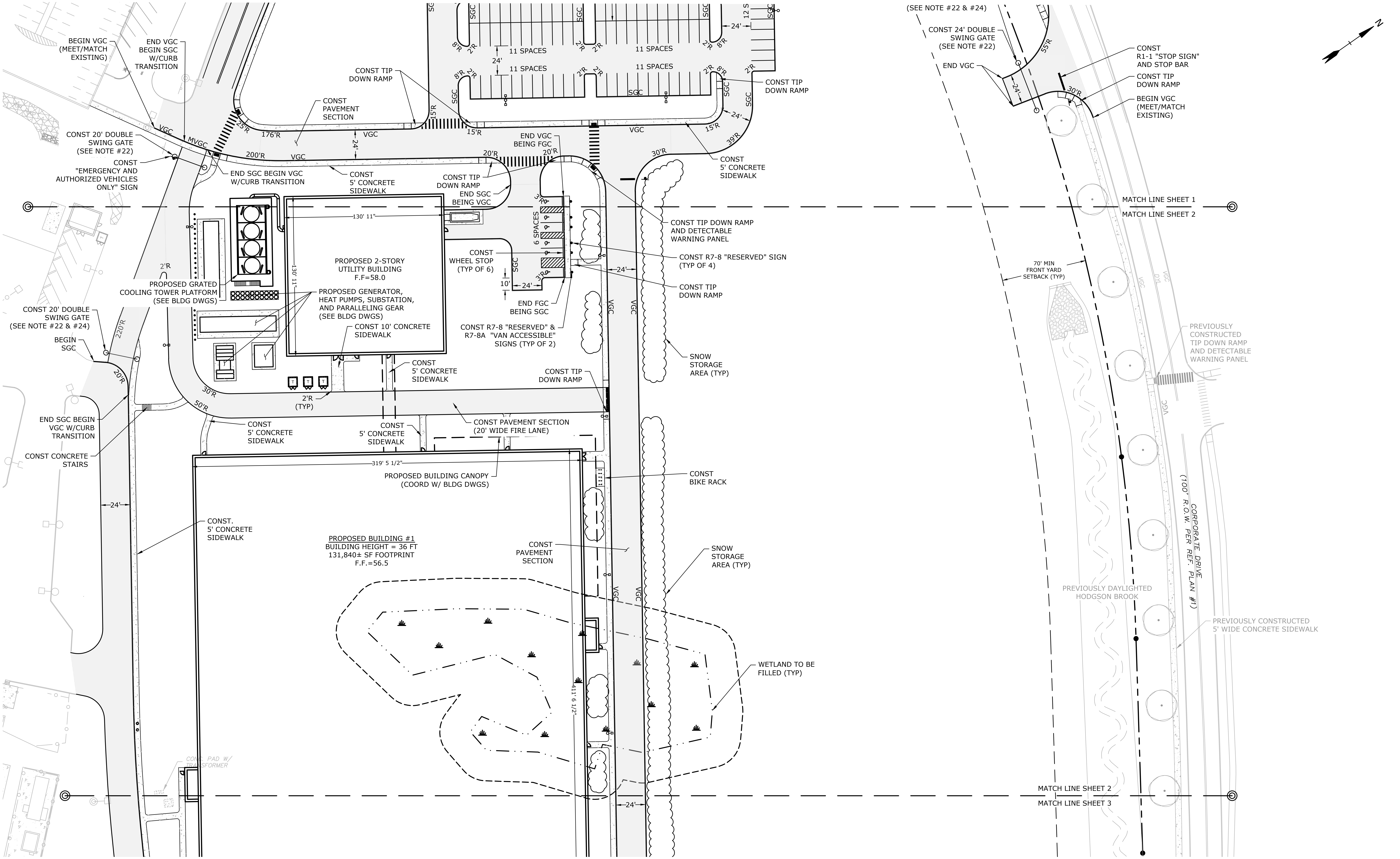

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Tighe&Bond

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PHASE 2 SITE PLAN

SCALE: AS SHOWN

C-166

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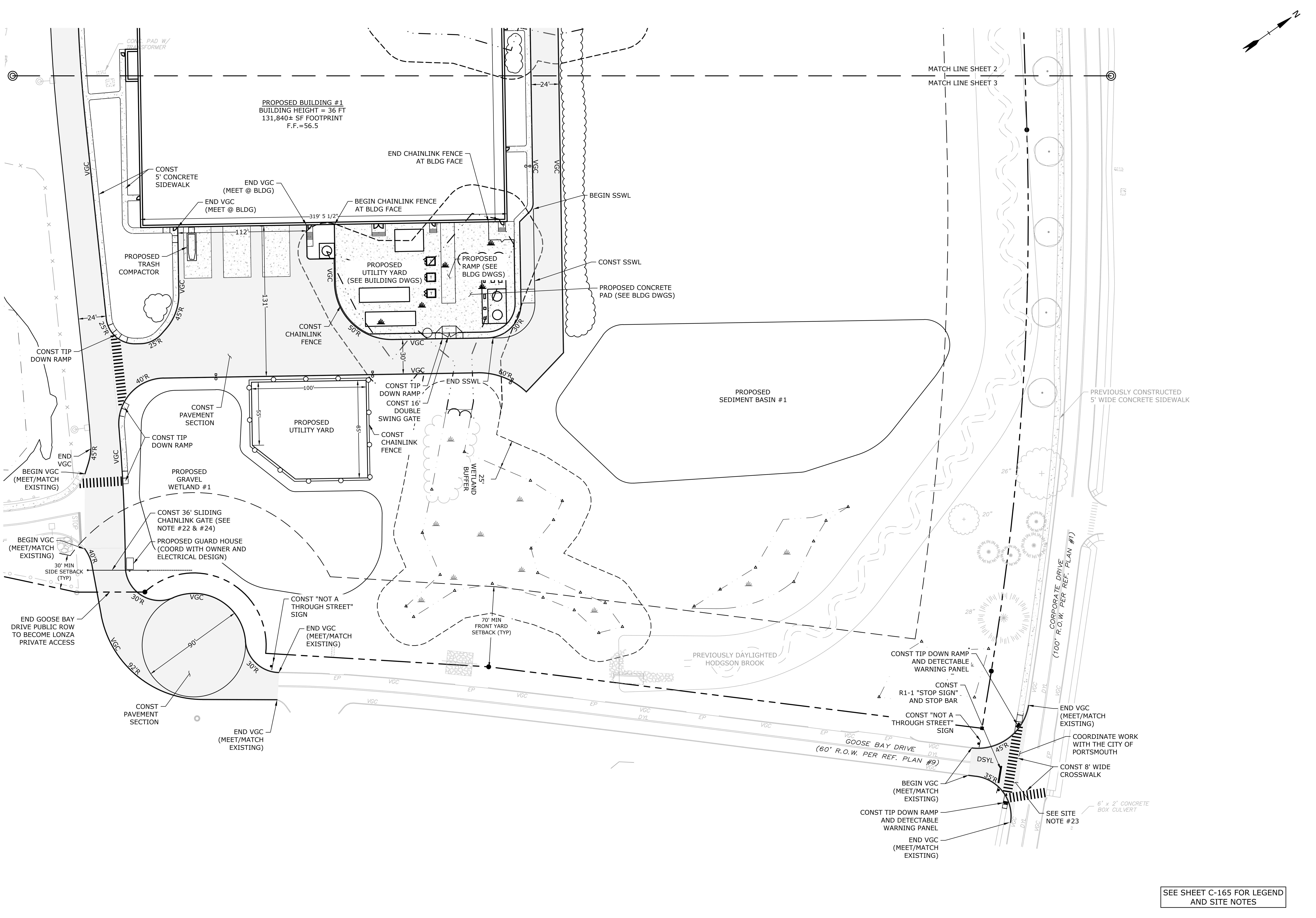

SEE SHEET C-165 FOR LEGEND AND SITE NOTES

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Tighe&Bond

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed Industrial Development

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Portsmouth,
New Hampshire

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PHASE 2
SITE PLAN

SCALE: AS SHOWN

C-167

PCB100
RIM=49.50
INV.IN=43.95 NE
INV.OUT=43.85 SW

PCB101
RIM=50.30
INV.OUT=45.70 W

PCB102
RIM=51.20
INV.OUT=46.50 SW

PCB103
RIM=54.00
INV.IN=49.00 NE
INV.IN=49.00 NW
INV.OUT=48.90 SE

PCB104
RIM=54.00
INV.OUT=49.20 SW

PCB105
RIM=57.00
INV.IN=50.95 NE
INV.IN=50.95 NW
INV.OUT=50.85 SE

PCB106
RIM=57.00
INV.OUT=51.05 SW

PCB107
RIM=56.00
INV.IN=51.80 NE
INV.IN=51.80 NW
INV.IN=51.80 SW
INV.OUT=51.70 SE

PCB108
RIM=56.00
INV.OUT=51.95 SW

PCB109
RIM=56.00
INV.OUT=52.00 SE

PCB110
RIM=49.40
INV.IN=44.50 W
INV.OUT=44.40 E

PCB111
RIM=56.80
INV.OUT=52.65 SE

PCB112
RIM=49.30
INV.IN=43.25 SW
INV.OUT=43.15 NE

PCB113
RIM=42.85
INV.OUT=38.20 S

PCB200
RIM=58.00
INV.IN=51.40 SW
INV.IN=51.40 NW
INV.OUT=51.30 NE

PCB201
RIM=57.50
INV.OUT=51.55 SE

PCB202
RIM=59.85
INV.IN=52.00 NW
INV.OUT=51.90 NE

PCB203
RIM=59.25
INV.OUT=52.40 SE

PCB204
RIM=66.75
INV.OUT=61.65 W

PCB205
RIM=53.60
INV.IN=46.55 SW
INV.OUT=46.45 NE

PCB206
RIM=53.60
INV.OUT=46.65 NE

PCB207
RIM=49.30
INV.OUT=43.35 NE

PDMH100
RIM=49.00
INV.IN=44.00 W
INV.IN=43.20 NE
INV.OUT=43.20 SE

PDMH101
RIM=50.65
INV.IN=45.50 NW
INV.IN=45.50 E
INV.OUT=45.40 SW

PDMH102
RIM=51.10
INV.IN=46.00 NW
INV.IN=46.00 NE
INV.OUT=45.90 SE

PDMH103
RIM=54.95
INV.IN=47.00 NW
INV.IN=49.20 SW
INV.OUT=46.90 SE

PDMH104
RIM=56.55
INV.IN=49.40 NW
INV.IN=51.60 SW
INV.OUT=48.50 SE

PDMH105
RIM=55.05
INV.IN=47.00 NW
INV.IN=50.65 SW
INV.OUT=49.30 SE

PDMH106
RIM=53.70
INV.IN=46.70 NW
INV.IN=46.30 SW
INV.IN=49.35 NE
INV.OUT=46.10 SE

PDMH109
RIM=57.50
INV.IN=48.15 NW
INV.IN=51.25 NE
INV.OUT=48.05 SE

PDMH110
RIM=58.50
INV.IN=48.70 NW
INV.IN=48.70 NE
INV.OUT=48.60 SE

PDMH111
RIM=56.50
INV.IN=50.05 NE
INV.IN=53.70 SE
INV.IN=51.50 E
INV.OUT=49.95 SW

PDMH112
RIM=55.90
INV.IN=49.75 NE
INV.IN=51.85 NW
INV.OUT=49.65 SW

PDMH113
RIM=60.20
INV.IN=55.00 NW
INV.IN=52.95 SW
INV.OUT=51.30 SE

PDMH114
RIM=53.80
INV.IN=46.50 NW
INV.OUT=46.40 SE

PDMH115
RIM=59.50
INV.IN=52.55 SW
INV.IN=52.55 SE
INV.OUT=52.45 NE

PDMH116
RIM=56.40
INV.IN=47.05 NW
INV.IN=53.00 NE
INV.IN=49.25 N
INV.IN=51.10 NE
INV.OUT=46.95 SE

PDMH200
RIM=59.10
INV.IN=50.85 SW
INV.OUT=50.75 NW

PDMH201
RIM=63.15
INV.IN=56.35 NE
INV.OUT=56.25 SE

POS101
RIM=47.00
INV.OUT=41.35 E

POS102
RIM=46.80
INV.OUT=42.75 S

POS200
RIM=56.50
INV.OUT=49.85 E

PYD100
RIM=56.00
INV.IN=52.00 NW
INV.IN=50.35 NE
INV.OUT=50.25 SW

PYD101
RIM=55.00
INV.IN=49.30 NE
INV.IN=50.00 NW
INV.OUT=49.20 SW

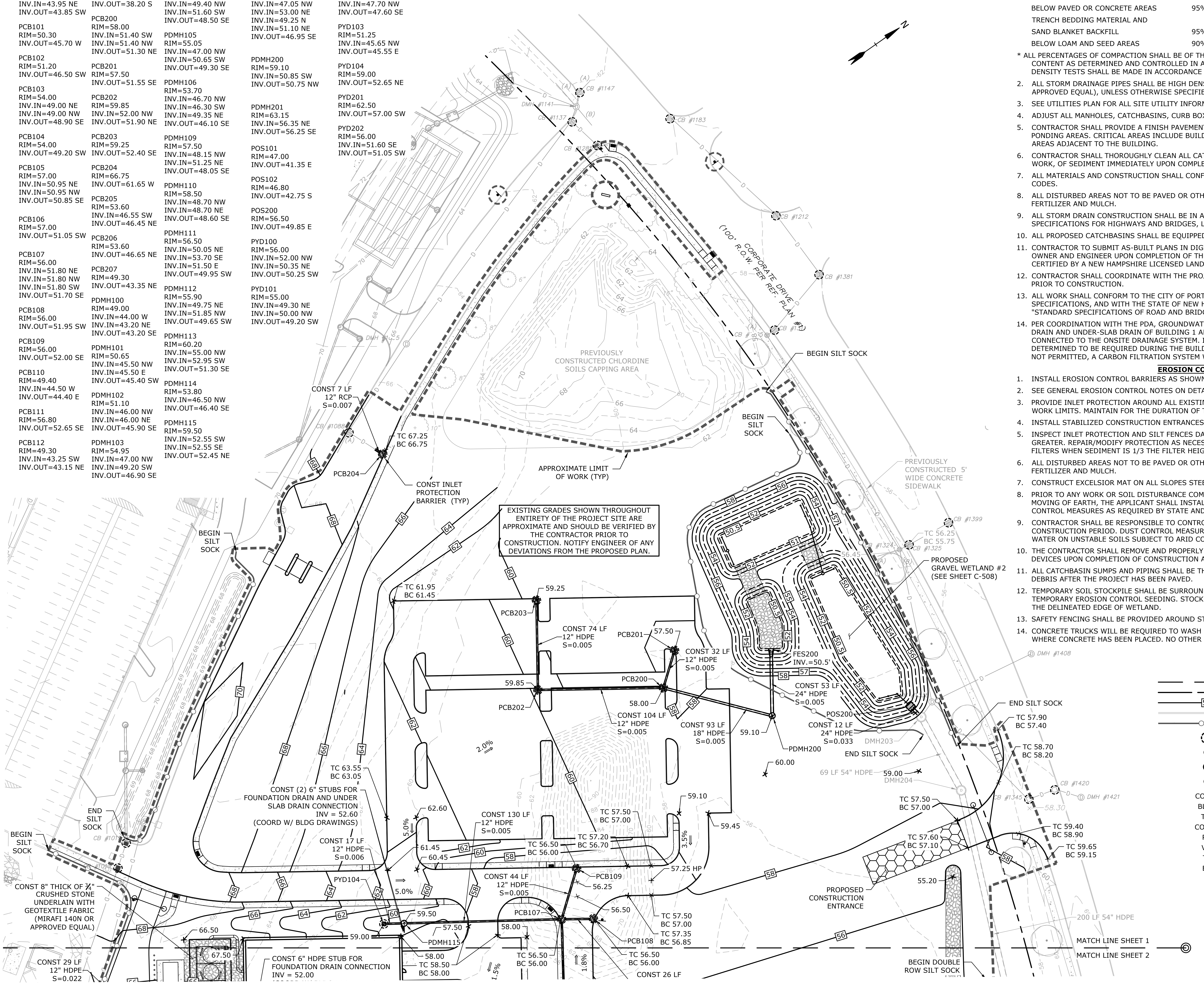
PYD102
RIM=55.50
INV.IN=47.70 NW
INV.OUT=47.60 SE

PYD103
RIM=51.25
INV.IN=45.65 NW
INV.OUT=45.55 E

PYD104
RIM=59.00
INV.OUT=52.65 NE

PYD201
RIM=62.50
INV.OUT=57.00 SW

PYD202
RIM=56.00
INV.IN=51.60 SE
INV.OUT=51.05 SW



GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

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

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

2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR APPROVED EQUAL), UNLESS OTHERWISE SPECIFIED.
3. SEE UTILITIES PLAN FOR ALL SITE UTILITY INFORMATION.
4. ADJUST ALL MANHOLES, CATCHBASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
5. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
6. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCHBASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
7. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES.
8. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
9. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
10. ALL PROPOSED CATCHBASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.
11. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
12. CONTRACTOR SHALL COORDINATE WITH THE PROJECT SURVEYOR FOR BENCHMARK AND CONTROL POINTS PRIOR TO CONSTRUCTION.
13. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS, AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
14. PER COORDINATION WITH THE PDA, GROUNDWATER DISCHARGE FROM THE PROPOSED FOUNDATION DRAIN AND UNDER-SLAB DRAIN OF BUILDING 1 AND THE CENTRAL UTILITY BUILDING WILL BE CONNECTED TO THE ONSITE DRAINAGE SYSTEM. IF TREATMENT OF THE GROUNDWATER DISCHARGE IS DETERMINED TO BE REQUIRED DURING THE BUILDING PERMITTING PROCESS AND RE-INFILTRATION IS NOT PERMITTED, A CARBON FILTRATION SYSTEM WILL BE NEEDED.

EROSION CONTROL NOTES:

1. INSTALL EROSION CONTROL BARRIERS AS SHOWN AS FIRST ORDER OF WORK.
2. SEE GENERAL EROSION CONTROL NOTES ON DETAIL SHEETS.
3. PROVIDE INLET PROTECTION AROUND ALL EXISTING AND PROPOSED CATCHBASIN INLETS WITHIN THE WORK LIMITS. MAINTAIN FOR THE DURATION OF THE PROJECT UNTIL PAVEMENT HAS BEEN INSTALLED.
4. INSTALL STABILIZED CONSTRUCTION ENTRANCES.
5. INSPECT INLET PROTECTION AND SILT FENCES DAILY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
6. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER AND MULCH.
7. CONSTRUCT EXCELSIOR MAT ON ALL SLOPES STEEPER THAN 3:1.
8. PRIOR TO ANY WORK OR SOIL DISTURBANCE COMMENCING ON THE SUBJECT PROPERTY, INCLUDING MOVING OF EARTH, THE APPLICANT SHALL INSTALL ALL EROSION AND SILTATION MITIGATION AND CONTROL MEASURES AS REQUIRED BY STATE AND LOCAL PERMITS AND APPROVALS.
9. CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST AND WIND EROSION THROUGHOUT THE CONSTRUCTION PERIOD. DUST CONTROL MEASURES SHALL INCLUDE, BUT NOT LIMITED TO, SPRINKLING WATER ON UNSTABLE SOILS SUBJECT TO ARID CONDITIONS.
10. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION AND FINAL STABALIZATION.
11. ALL CATCHBASIN SUMPS AND PIPING SHALL BE THOROUGHLY CLEANED TO REMOVE ALL SEDIMENT AND DEBRIS AFTER THE PROJECT HAS BEEN PAVED.
12. TEMPORARY SOIL STOCKPILE SHALL BE SURROUNDED BY SILT FENCE AND SHALL BE STABILIZED BY TEMPORARY EROSION CONTROL SEEDING. STOCKPILE AREAS TO BE LOCATED AS FAR AS POSSIBLE FROM THE DELINEATED EDGE OF WETLAND.
13. SAFETY FENCING SHALL BE PROVIDED AROUND STOCKPILES OVER 10 FT.
14. CONCRETE TRUCKS WILL BE REQUIRED TO WASH OUT (IF NECESSARY) SHOOTS ONLY WITHIN AREAS WHERE CONCRETE HAS BEEN PLACED. NO OTHER WASH OUT WILL BE ALLOWED.

LEGEND

MATCH LINE
PROPOSED PROPERTY LINE
56 PROPOSED CONTOUR LINE
PROPOSED DRAIN LINE (TYP)
PROPOSED SILT SOCK
INLET PROTECTION SILT SACK
PROPOSED CATCHBASIN
PROPOSED DOUBLE GRATE CATCHBASIN
PROPOSED DRAIN MANHOLE

CONST	CONSTRUCT
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
RD	ROOF DRAIN
VIF	VERIFY IN FIELD
TC	TOP OF CURB
BC	BOTTOM OF CURB

Tighe&Bond

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
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0 40' 80'
GRAPHIC SCALE

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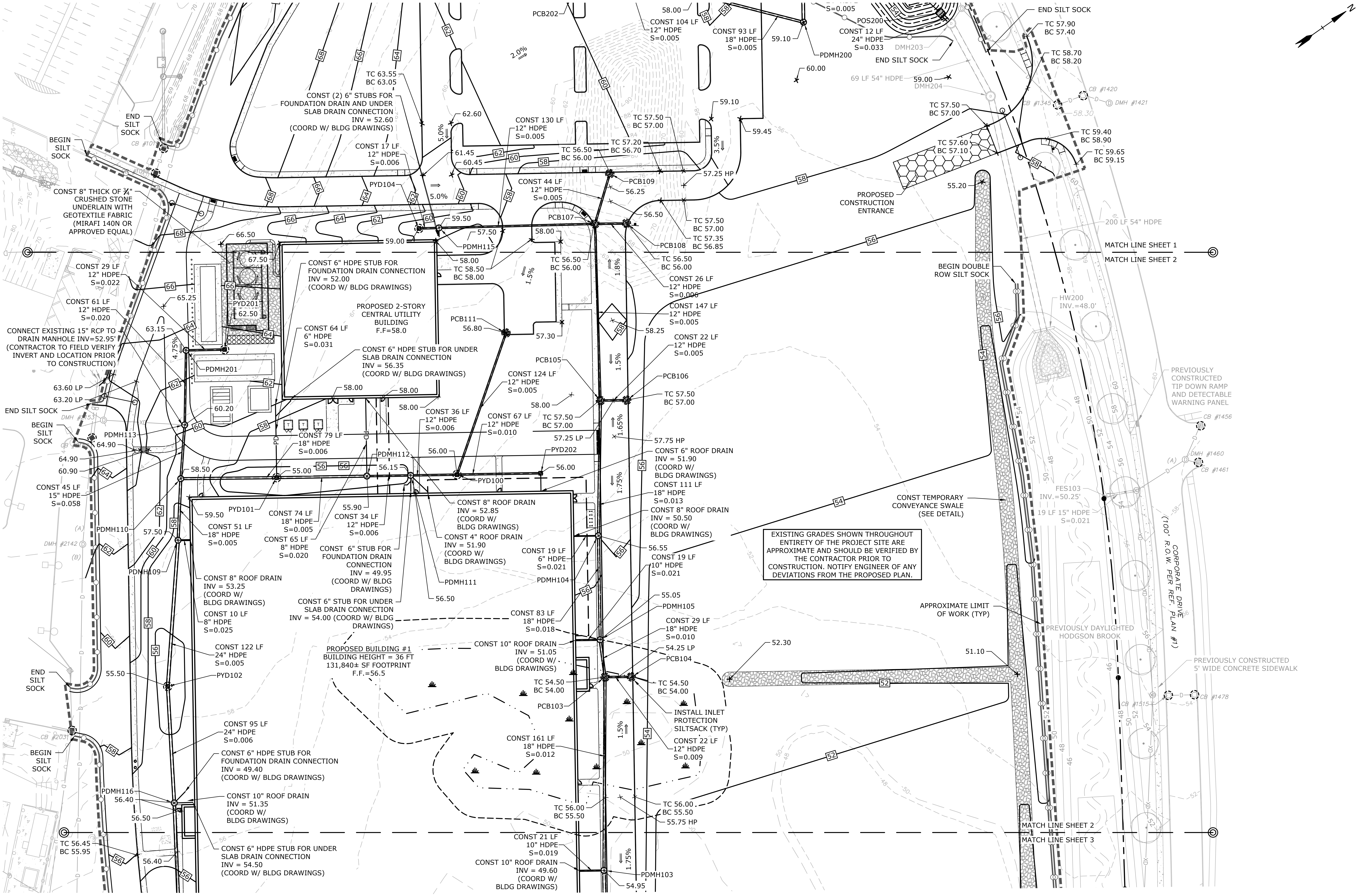
APPROVED: PMC

PHASE 2 GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: AS SHOWN

C-168

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-168



EXISTING GRADES SHOWN THROUGHOUT ENTIRETY OF THE PROJECT SITE ARE APPROXIMATE AND SHOULD BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF ANY DEVIATIONS FROM THE PROPOSED PLAN.

SEE SHEET C-168 FOR LEGEND GRADING, DRAINAGE & EROSION CONTROL NOTES, & DRAINAGE STRUCTURE TABLE

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

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PROJECT NO: L-0700-013
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PHASE 2
GRADING, DRAINAGE &
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SCALE: AS SHOWN

C-169

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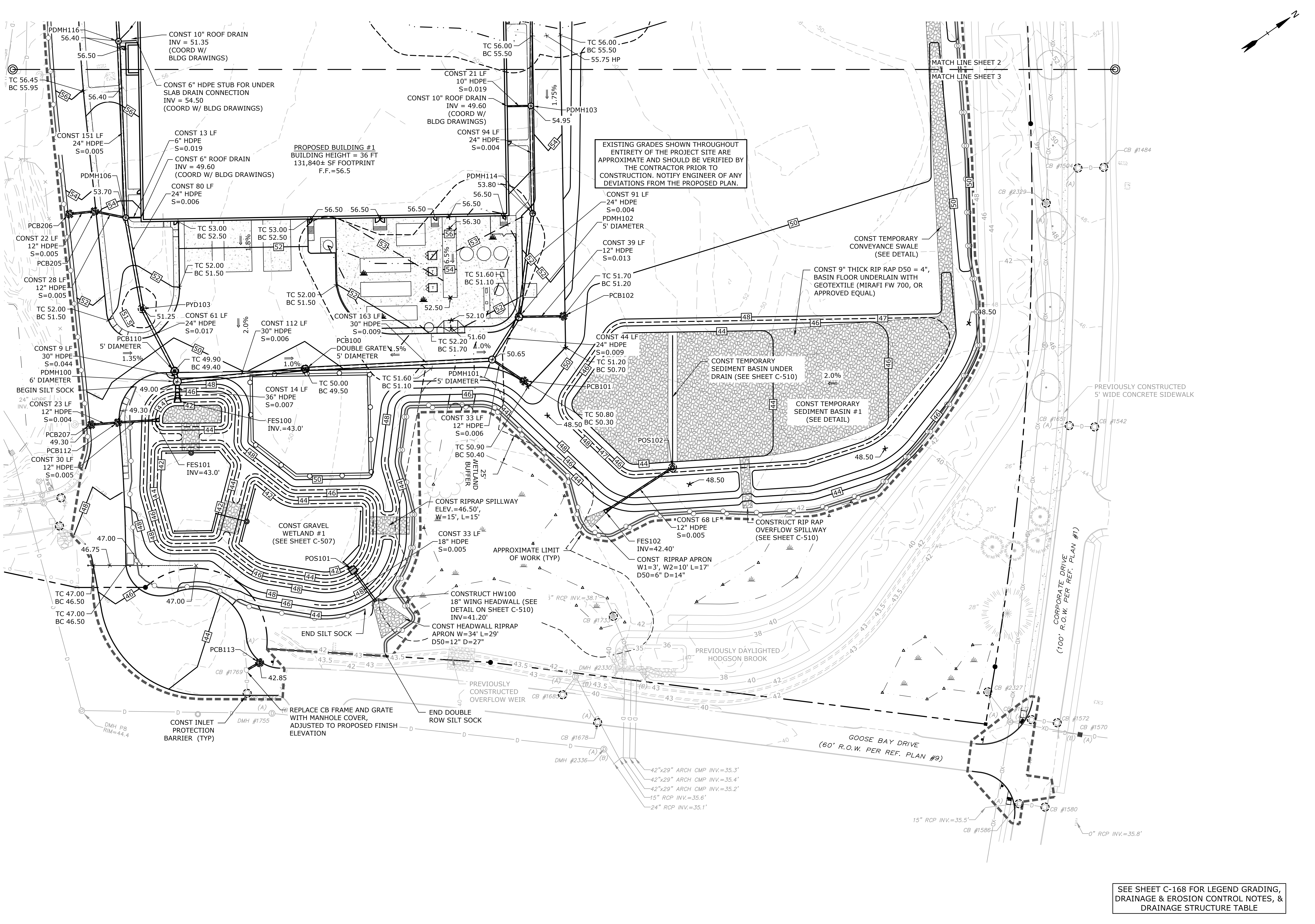

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SEE SHEET C-168 FOR LEGEND GRADING, DRAINAGE & EROSION CONTROL NOTES, & DRAINAGE STRUCTURE TABLE

Tighe&Bond

NEIL A. HANSEN No. 15227 9/27/2023

PATRICK CRIMMINS No. 12378 9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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CHECKED:	NAH
APPROVED:	PMC

PHASE 2
GRADING, DRAINAGE &
EROSION CONTROL PLAN

SCALE: AS SHOWN

C-170

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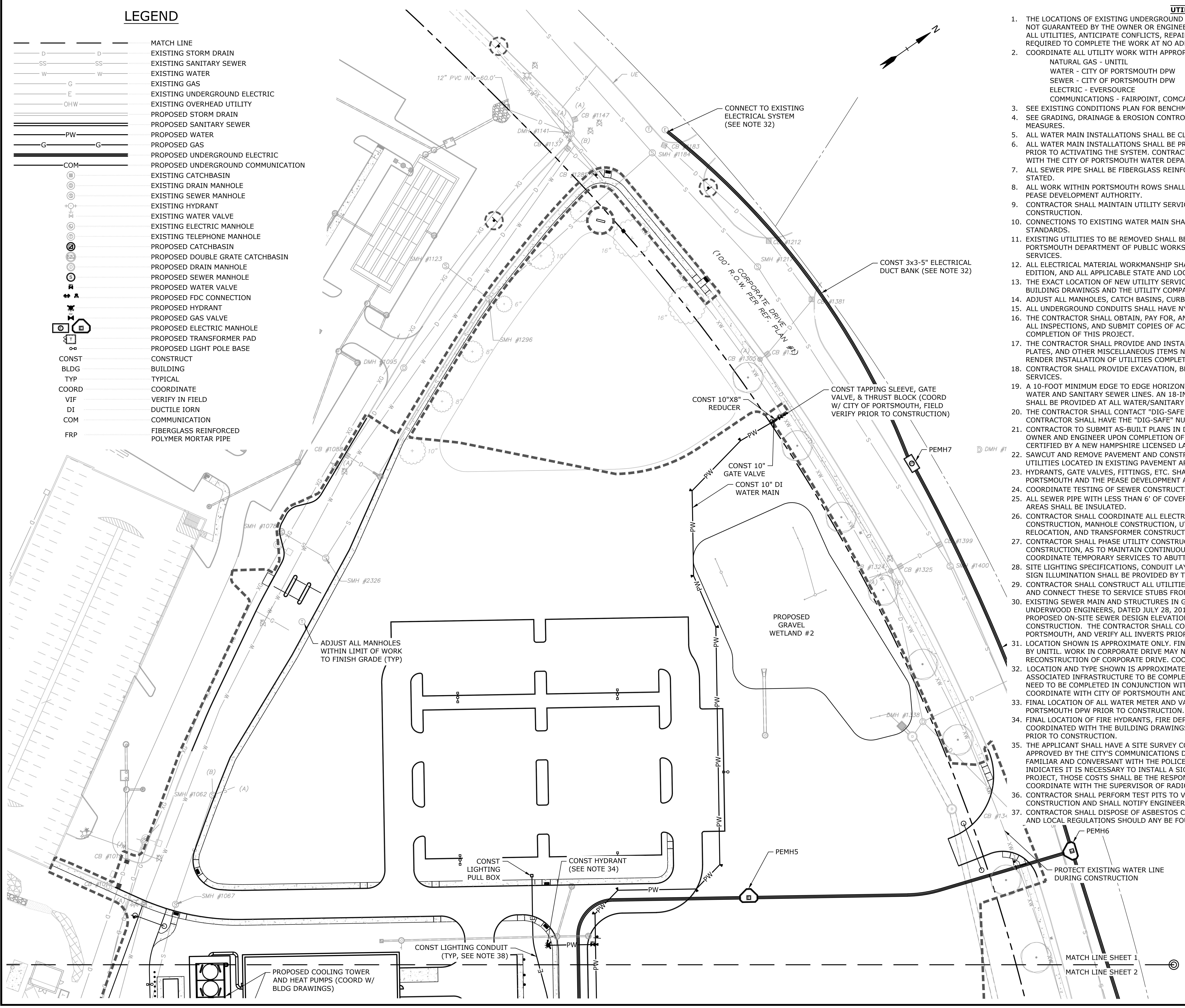
LEGEND

— — —	MATCH LINE
D	EXISTING STORM DRAIN
SS	EXISTING SANITARY SEWER
W	EXISTING WATER
G	EXISTING GAS
E	EXISTING UNDERGROUND ELECTRIC
OHW	EXISTING OVERHEAD UTILITY
	PROPOSED STORM DRAIN
	PROPOSED SANITARY SEWER
PW	PROPOSED WATER
G	PROPOSED GAS
	PROPOSED UNDERGROUND ELECTRIC
COM	PROPOSED UNDERGROUND COMMUNICATION
	EXISTING CATCHBASIN
	EXISTING DRAIN MANHOLE
	EXISTING SEWER MANHOLE
	EXISTING HYDRANT
	EXISTING WATER VALVE
	EXISTING ELECTRIC MANHOLE
	EXISTING TELEPHONE MANHOLE
	PROPOSED CATCHBASIN
	PROPOSED DOUBLE GRATE CATCHBASIN
D	PROPOSED DRAIN MANHOLE
S	PROPOSED SEWER MANHOLE
	PROPOSED WATER VALVE
	PROPOSED FDC CONNECTION
	PROPOSED HYDRANT
	PROPOSED GAS VALVE
	PROPOSED ELECTRIC MANHOLE
T	PROPOSED TRANSFORMER PAD
	PROPOSED LIGHT POLE BASE
CONST	CONSTRUCT
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
VIF	VERIFY IN FIELD
DI	DUCTILE IORN
COM	COMMUNICATION
FRP	FIBERGLASS REINFORCED POLYMER MORTAR PIPE



UTILITY NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
2. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
    - NATURAL GAS - UNITIL
    - WATER - CITY OF PORTSMOUTH DPW
    - SEWER - CITY OF PORTSMOUTH DPW
    - ELECTRIC - EVERSOURCE
    - COMMUNICATIONS - FAIRPOINT, COMCAST, FIRSTLIGHT
3. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
4. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
5. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
6. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT.
7. ALL SEWER PIPE SHALL BE FIBERGLASS REINFORCED POLYMER MORTAR (FRP) PIPE UNLESS OTHERWISE STATED.
8. ALL WORK WITHIN PORTSMOUTH ROWS SHALL BE COORDINATED WITH CITY OF PORTSMOUTH AND THE PEASE DEVELOPMENT AUTHORITY.
9. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
10. CONNECTIONS TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS.
11. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
12. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
13. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE UTILITY COMPANIES.
14. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
15. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
16. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
17. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
18. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
19. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
20. THE CONTRACTOR SHALL CONTACT "DIG-SAFE" 72 HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL HAVE THE "DIG-SAFE" NUMBER ON SITE AT ALL TIMES.
21. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
22. SAWCUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
23. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH AND THE PEASE DEVELOPMENT AUTHORITY.
24. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
25. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAN 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
26. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
27. CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION, AS TO MAINTAIN CONTINUOUS SERVICE TO ABUTTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
28. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
29. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
30. EXISTING SEWER MAIN AND STRUCTURES IN GOOSE BAY DRIVE ARE BASED ON A PROPOSED DESIGN BY UNDERWOOD ENGINEERS, DATED JULY 28, 2017, AND WAS CONSTRUCTED IN SUMMER 2018. THE PROPOSED ON-SITE SEWER DESIGN ELEVATIONS ARE BASED ON THE UNDERWOOD PLAN DURING CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH, AND VERIFY ALL INVERTS PRIOR TO CONSTRUCTION.
31. LOCATION SHOWN IS APPROXIMATE ONLY. FINAL DESIGN OF NATURAL GAS SERVICE TO BE COMPLETED BY UNITIL. WORK IN CORPORATE DRIVE MAY NEED TO BE COMPLETED IN CONJUNCTION WITH FUTURE RECONSTRUCTION OF CORPORATE DRIVE. COORDINATE WITH CITY OF PORTSMOUTH AND UNITIL.
32. LOCATION AND TYPE SHOWN IS APPROXIMATE ONLY. FINAL DESIGN OF ELECTRIC SERVICE AND ASSOCIATED INFRASTRUCTURE TO BE COMPLETED BY EVERSOURCE. WORK IN CORPORATE DRIVE MAY NEED TO BE COMPLETED IN CONJUNCTION WITH FUTURE RECONSTRUCTION OF CORPORATE DRIVE. COORDINATE WITH CITY OF PORTSMOUTH AND EVERSOURCE.
33. FINAL LOCATION OF ALL WATER METER AND VALVES SHALL BE COORDINATED WITH THE CITY OF PORTSMOUTH DPW PRIOR TO CONSTRUCTION.
34. FINAL LOCATION OF FIRE HYDRANTS, FIRE DEPARTMENT CONNECTIONS AND DRY STAND PIPES WILL BE COORDINATED WITH THE BUILDING DRAWINGS AND APPROVED BY THE PORTSMOUTH FIRE DEPARTMENT PRIOR TO CONSTRUCTION.
35. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATIONS DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY.
36. CONTRACTOR SHALL PERFORM TEST PITS TO VERIFY INVERT ELEVATIONS IN FIELD PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER IF ELEVATION DIFFERS FROM PLAN.
37. CONTRACTOR SHALL DISPOSE OF ASBESTOS CEMENT PIPES IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS SHOULD ANY BE FOUND DURING CONSTRUCTION.

Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
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0 40' 80'
GRAPHIC SCALE

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PHASE 2 UTILITIES PLAN

SCALE: AS SHOWN

C-171

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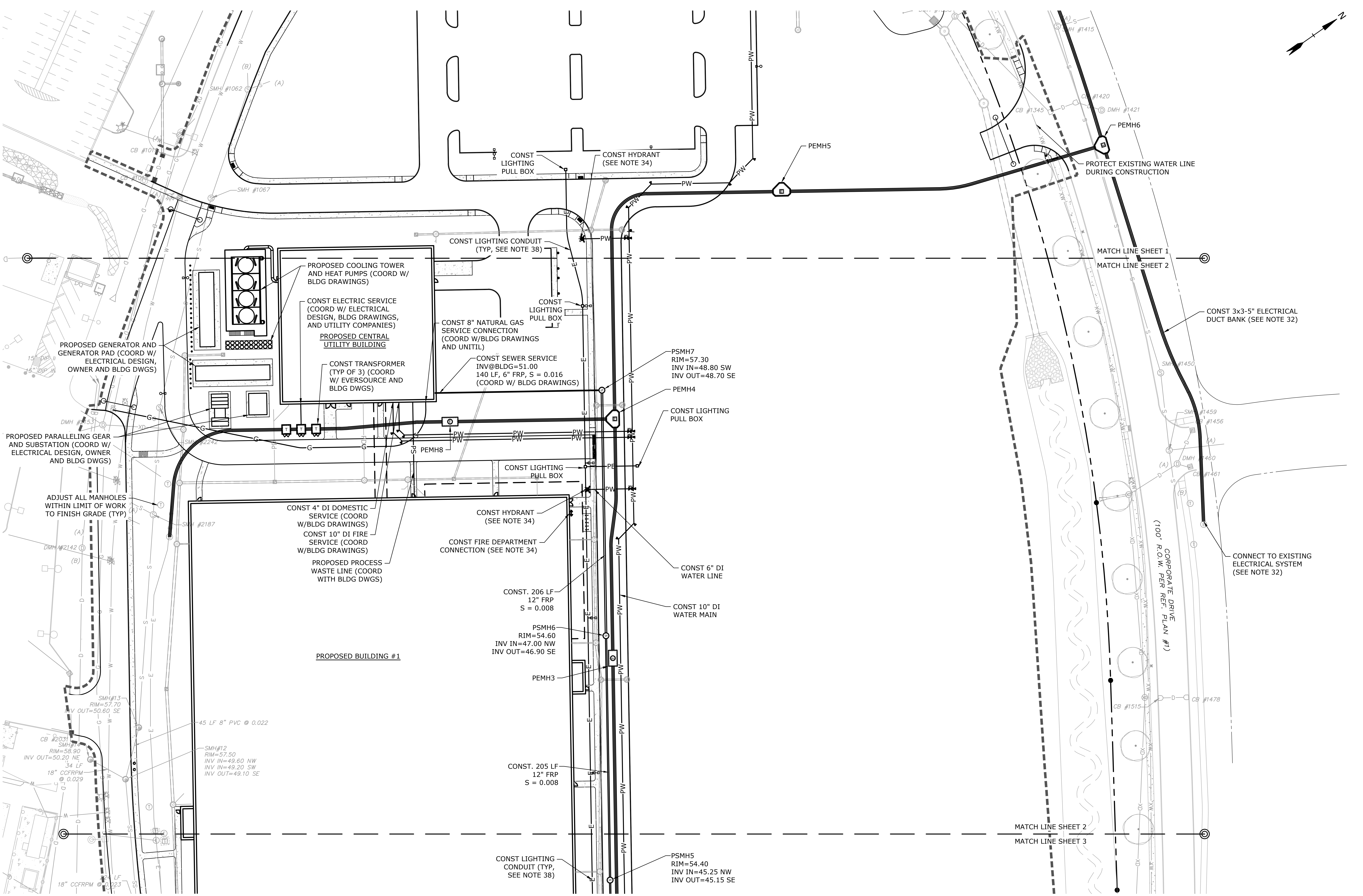

SEE SHEET C-171 FOR UTILITY NOTES AND LEGEND

Tighe&Bond

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PHASE 2
UTILITIES PLAN

SCALE: AS SHOWN

C-172

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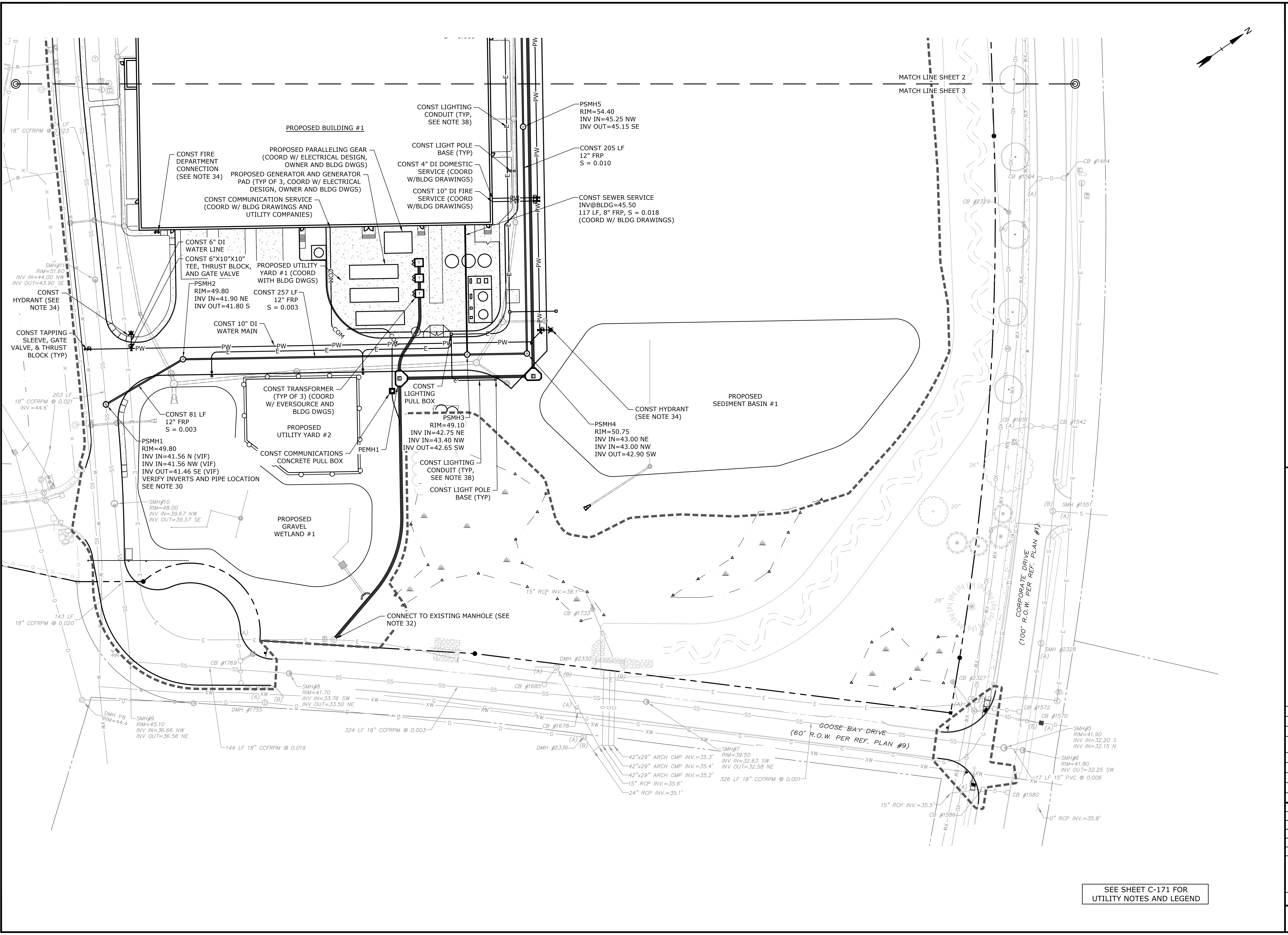

SEE SHEET C-171 FOR UTILITY NOTES AND LEGEND

Tighe&Bond

STATE OF NEW HAMPSHIRE NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER

9/27/2023

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER

9/27/2023

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PHASE 2
UTILITIES PLAN

SCALE: AS SHOWN

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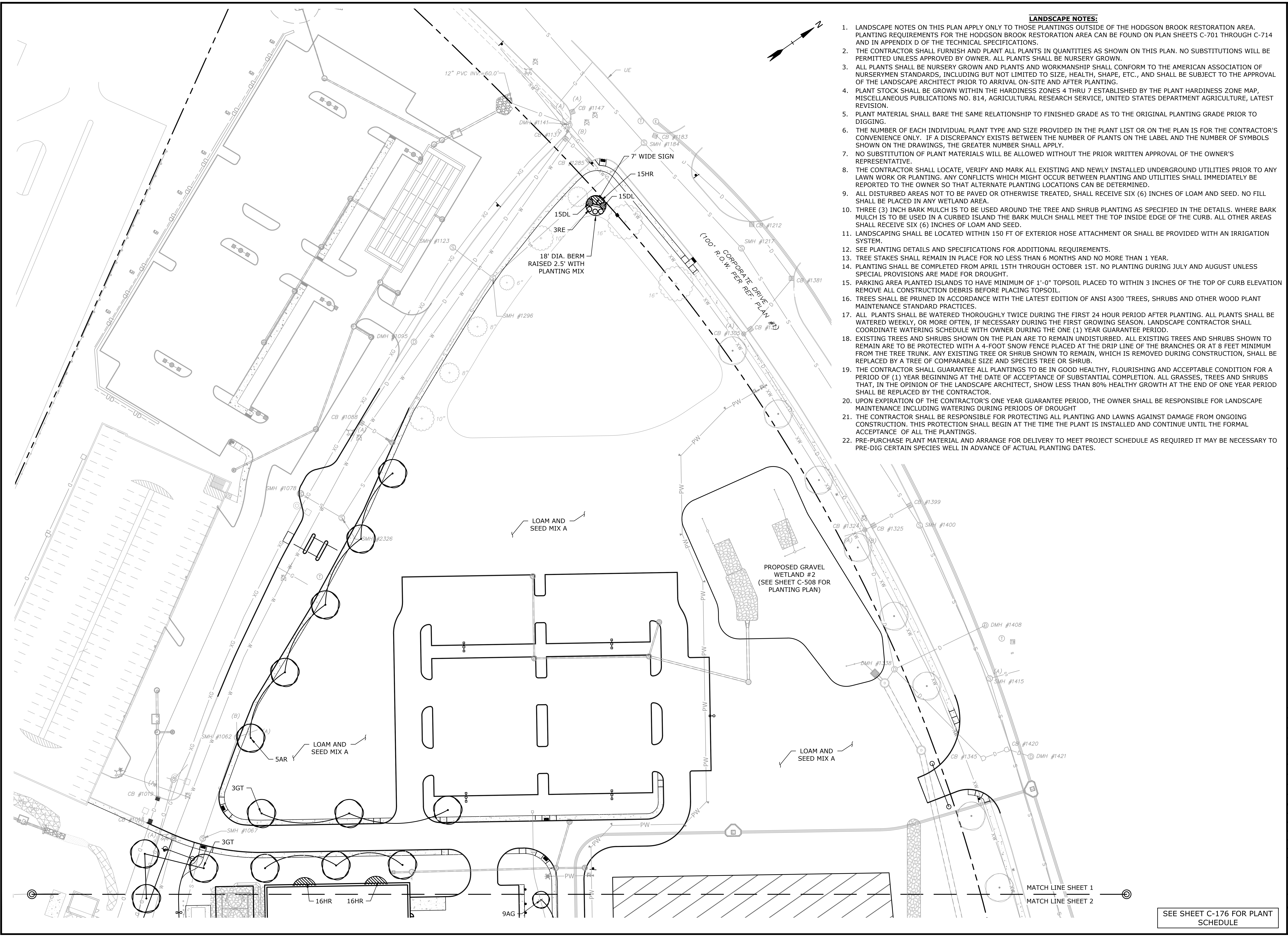

LANDSCAPE NOTES:

1. LANDSCAPE NOTES ON THIS PLAN APPLY ONLY TO THOSE PLANTINGS OUTSIDE OF THE HODGSON BROOK RESTORATION AREA. PLANTING REQUIREMENTS FOR THE HODGSON BROOK RESTORATION AREA CAN BE FOUND ON PLAN SHEETS C-701 THROUGH C-714 AND IN APPENDIX D OF THE TECHNICAL SPECIFICATIONS.
2. THE CONTRACTOR SHALL FURNISH AND PLANT ALL PLANTS IN QUANTITIES AS SHOWN ON THIS PLAN. NO SUBSTITUTIONS WILL BE PERMITTED UNLESS APPROVED BY OWNER. ALL PLANTS SHALL BE NURSERY GROWN.
3. ALL PLANTS SHALL BE NURSERY GROWN AND PLANTS AND WORKMANSHIP SHALL CONFORM TO THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS, INCLUDING BUT NOT LIMITED TO SIZE, HEALTH, SHAPE, ETC., AND SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO ARRIVAL ON-SITE AND AFTER PLANTING.
4. PLANT STOCK SHALL BE GROWN WITHIN THE HARDINESS ZONES 4 THRU 7 ESTABLISHED BY THE PLANT HARDINESS ZONE MAP, MISCELLANEOUS PUBLICATIONS NO. 814, AGRICULTURAL RESEARCH SERVICE, UNITED STATES DEPARTMENT AGRICULTURE, LATEST REVISION.
5. PLANT MATERIAL SHALL BARE THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE PRIOR TO DIGGING.
6. THE NUMBER OF EACH INDIVIDUAL PLANT TYPE AND SIZE PROVIDED IN THE PLANT LIST OR ON THE PLAN IS FOR THE CONTRACTOR'S CONVENIENCE ONLY. IF A DISCREPANCY EXISTS BETWEEN THE NUMBER OF PLANTS ON THE LABEL AND THE NUMBER OF SYMBOLS SHOWN ON THE DRAWINGS, THE GREATER NUMBER SHALL APPLY.
7. NO SUBSTITUTION OF PLANT MATERIALS WILL BE ALLOWED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
8. THE CONTRACTOR SHALL LOCATE, VERIFY AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWN WORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTING AND UTILITIES SHALL IMMEDIATELY BE REPORTED TO THE OWNER SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.
9. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED, SHALL RECEIVE SIX (6) INCHES OF LOAM AND SEED. NO FILL SHALL BE PLACED IN ANY WETLAND AREA.
10. THREE (3) INCH BARK MULCH IS TO BE USED AROUND THE TREE AND SHRUB PLANTING AS SPECIFIED IN THE DETAILS. WHERE BARK MULCH IS TO BE USED IN A CURBED ISLAND THE BARK MULCH SHALL MEET THE TOP INSIDE EDGE OF THE CURB. ALL OTHER AREAS SHALL RECEIVE SIX (6) INCHES OF LOAM AND SEED.
11. LANDSCAPING SHALL BE LOCATED WITHIN 150 FT OF EXTERIOR HOSE ATTACHMENT OR SHALL BE PROVIDED WITH AN IRRIGATION SYSTEM.
12. SEE PLANTING DETAILS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
13. TREE STAKES SHALL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR.
14. PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 1ST. NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT.
15. PARKING AREA PLANTED ISLANDS TO HAVE MINIMUM OF 1'-0" TOPSOIL PLACED TO WITHIN 3 INCHES OF THE TOP OF CURB ELEVATION REMOVE ALL CONSTRUCTION DEBRIS BEFORE PLACING TOPSOIL.
16. TREES SHALL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 'TREES, SHRUBS AND OTHER WOOD PLANT MAINTENANCE STANDARD PRACTICES.
17. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24 HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN, IF NECESSARY DURING THE FIRST GROWING SEASON. LANDSCAPE CONTRACTOR SHALL COORDINATE WATERING SCHEDULE WITH OWNER DURING THE ONE (1) YEAR GUARANTEE PERIOD.
18. EXISTING TREES AND SHRUBS SHOWN ON THE PLAN ARE TO REMAIN UNDISTURBED. ALL EXISTING TREES AND SHRUBS SHOWN TO REMAIN ARE TO BE PROTECTED WITH A 4-FOOT SNOW FENCE PLACED AT THE DRIP LINE OF THE BRANCHES OR AT 8 FEET MINIMUM FROM THE TREE TRUNK. ANY EXISTING TREE OR SHRUB SHOWN TO REMAIN, WHICH IS REMOVED DURING CONSTRUCTION, SHALL BE REPLACED BY A TREE OF COMPARABLE SIZE AND SPECIES TREE OR SHRUB.
19. THE CONTRACTOR SHALL GUARANTEE ALL PLANTINGS TO BE IN GOOD HEALTHY, FLOURISHING AND ACCEPTABLE CONDITION FOR A PERIOD OF (1) YEAR BEGINNING AT THE DATE OF ACCEPTANCE OF SUBSTANTIAL COMPLETION. ALL GRASSES, TREES AND SHRUBS THAT, IN THE OPINION OF THE LANDSCAPE ARCHITECT, SHOW LESS THAN 80% HEALTHY GROWTH AT THE END OF ONE YEAR PERIOD SHALL BE REPLACED BY THE CONTRACTOR.
20. UPON EXPIRATION OF THE CONTRACTOR'S ONE YEAR GUARANTEE PERIOD, THE OWNER SHALL BE RESPONSIBLE FOR LANDSCAPE MAINTENANCE INCLUDING WATERING DURING PERIODS OF DROUGHT
21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PLANTING AND LAWNS AGAINST DAMAGE FROM ONGOING CONSTRUCTION. THIS PROTECTION SHALL BEGIN AT THE TIME THE PLANT IS INSTALLED AND CONTINUE UNTIL THE FORMAL ACCEPTANCE OF ALL THE PLANTINGS.
22. PRE-PURCHASE PLANT MATERIAL AND ARRANGE FOR DELIVERY TO MEET PROJECT SCHEDULE AS REQUIRED IT MAY BE NECESSARY TO PRE-DIG CERTAIN SPECIES WELL IN ADVANCE OF ACTUAL PLANTING DATES.

SEE SHEET C-176 FOR PLANT SCHEDULE

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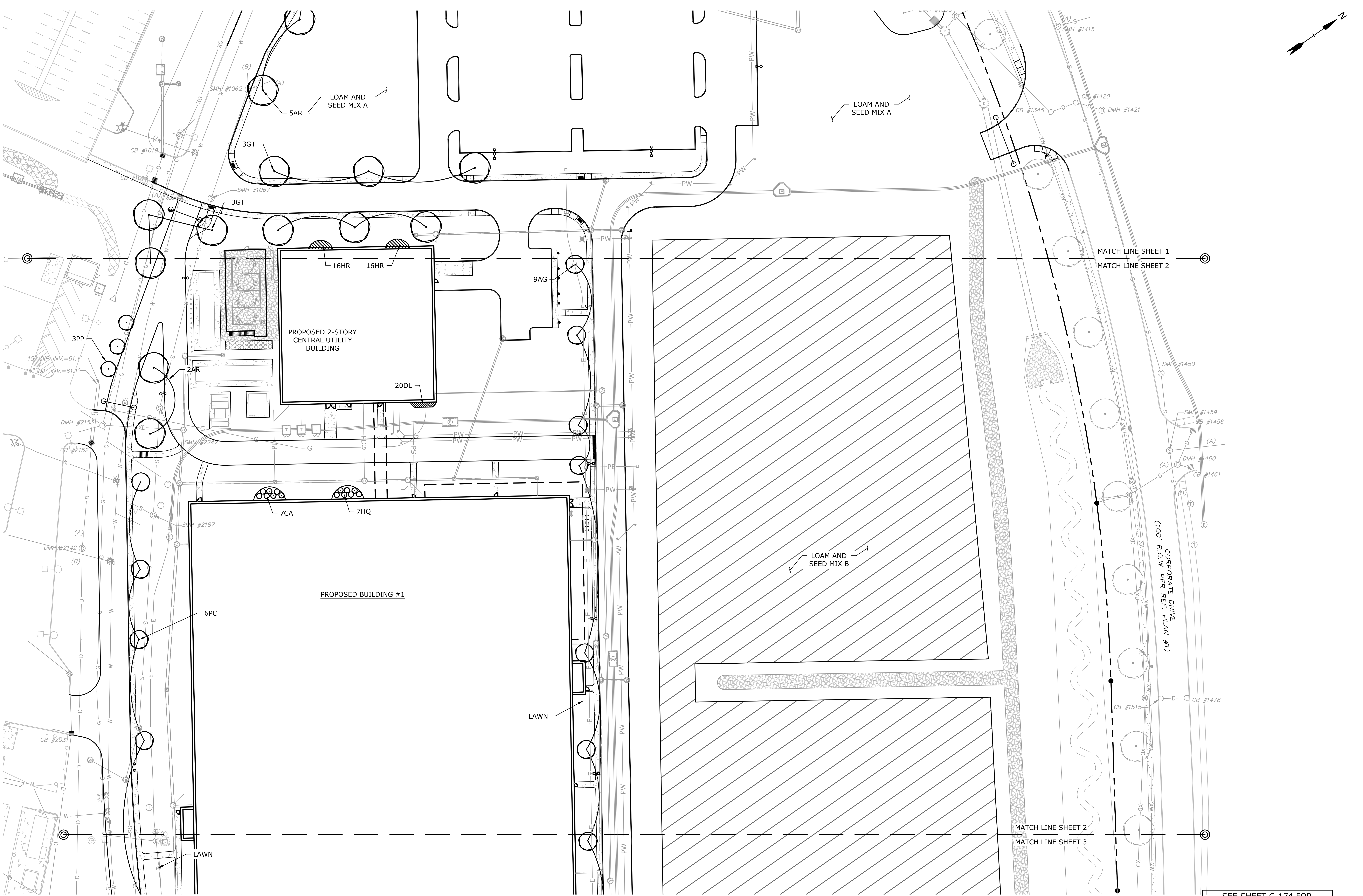
PHASE 2
LANDSCAPE PLAN

SCALE: AS SHOWN

C-174



SEE SHEET C-174 FOR LANDSCAPING NOTES

SEE SHEET C-176 FOR PLANT SCHEDULE

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-175

Tighe&Bond

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
M	9/27/2023	P.B. Submission
L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
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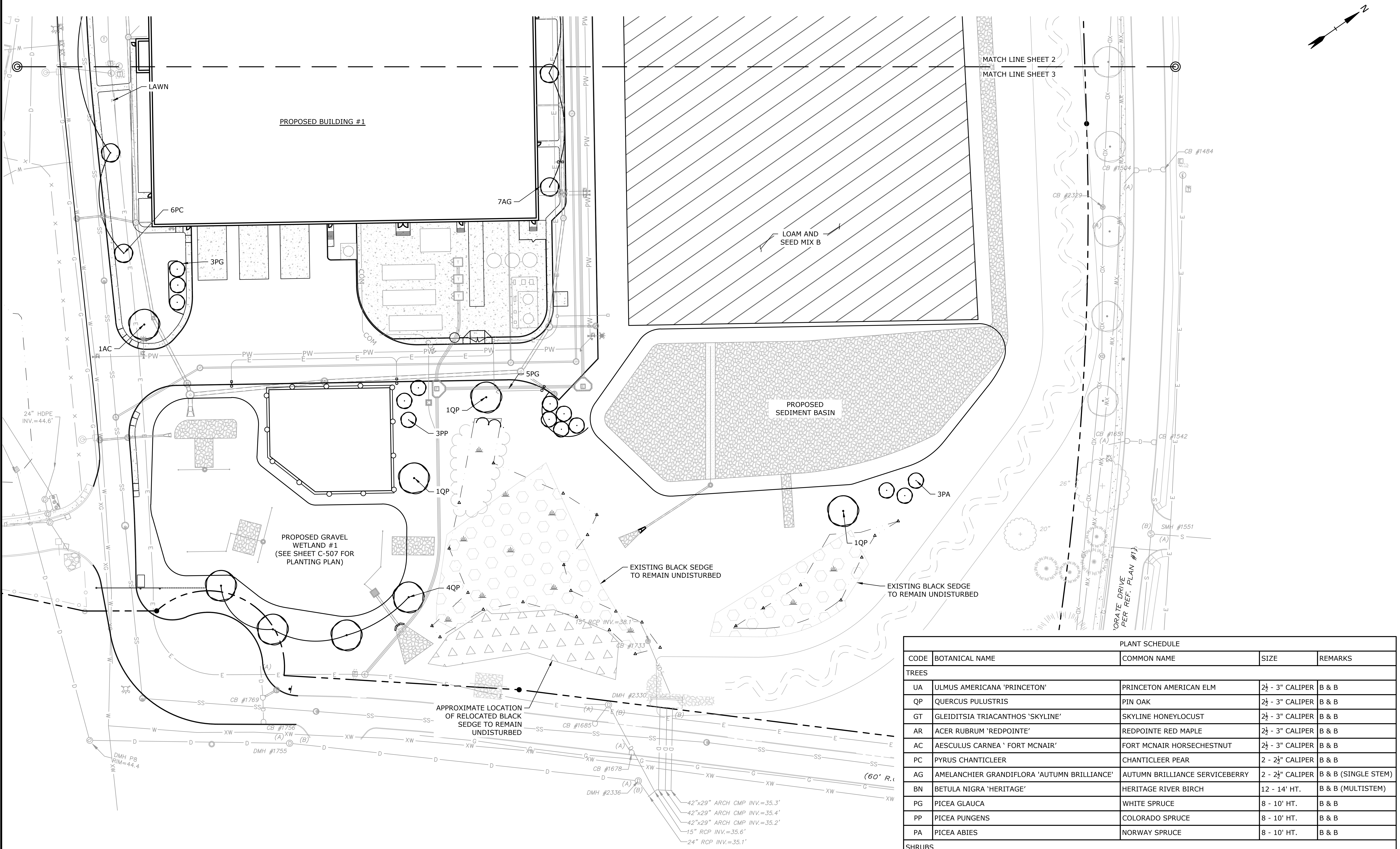
H	12/10/2021	Planning Board Stipulation
G	8/19/2019	Admin. Approval Submission
F	11/6/2018	P.B. Submission

PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

PHASE 2
LANDSCAPE PLAN

SCALE: AS SHOWN

C-175



SEED MIX NOTES

1. SEED MIX "A" SHALL CONTAIN THE FOLLOWING SEED REQUIREMENTS AND BE APPLIED AT A RATE OF 40LB/AC OR APPROVED EQUAL.

SEED MIX	% BY WEIGHT
"REBEL II" TALL FESCUE	70%
"PALMER" PERENNIAL RYEGRASS	20%
"BARON" KENTUCKEY BLUEGRASS	10%

2. SEED MIX "B" SHALL BE NEW ENGLAND CONSERVATION/WILDLIFE MIX OR APPROVED EQUAL APPLIED AT A RATE OF 25LB/AC.

SEE SHEET C-174 FOR LANDSCAPING NOTES

PLANT SCHEDULE

CODE	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES				
UA	ULMUS AMERICANA 'PRINCETON'	PRINCETON AMERICAN ELM	2½ - 3" CALIPER	B & B
QP	QUERCUS PULUSTRIS	PIN OAK	2½ - 3" CALIPER	B & B
GT	GLEIDITSIA TRIACANTHOS ‘SKYLINE’	SKYLINE HONEYLOCUST	2½ - 3" CALIPER	B & B
AR	ACER RUBRUM ‘REDPOINTE’	REDPOINTE RED MAPLE	2½ - 3" CALIPER	B & B
AC	AESCULUS CARNEA ‘ FORT MCNAIR’	FORT MCNAIR HORSECHESTNUT	2½ - 3" CALIPER	B & B
PC	PYRUS CHANTICLEER	CHANTICLEER PEAR	2 - 2½" CALIPER	B & B
AG	AMELANCHIER GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	2 - 2½" CALIPER	B & B (SINGLE STEM)
BN	BETULA NIGRA ‘HERITAGE’	HERITAGE RIVER BIRCH	12 - 14' HT.	B & B (MULTISTEM)
PG	PICEA GLAUCA	WHITE SPRUCE	8 - 10' HT.	B & B
PP	PICEA PUNGENS	COLORADO SPRUCE	8 - 10' HT.	B & B
PA	PICEA ABIES	NORWAY SPRUCE	8 - 10' HT.	B & B
SHRUBS				
VC	VIBURNUM CASSINOIDES	WITHEROD VIBURNUM	2½ - 3' HT.	B & B
RE	RHODODENDRON ‘ENGLISH ROSEUM’	ENGLISH ROSEUM RHODODENDRON	2½ - 3' HT.	B & B
CA	CLETHERA ALNIFOLIA	SUMMERSWEET CLETHERA	7 GALLON	CONTAINER
HQ	HYDRANGEA QUERCIFOLIA ‘SNOW QUEEN’	SNOW QUEEN OAKLEAF HYDRANGEA	2½ - 3' HT.	B & B
GROUNDCOVERS & PERENNIALS				
DL	HEMEROCALLIS ‘STELLA DORO’	STELLA DORO DAYLILY	2 GALLON	CONTAINER
HR	HOSTA ‘ROYAL STANDARD’	ROYAL STANDARD HOSTA	2 GALLON	CONTAINER
AS	ASTILBE ‘VISIONS IN PINK’	VISIONS IN PINK ASTILBE	2 GALLON	CONTAINER
CAL	CALAMAGROSTIS ‘KARL FOERSTER’	KARL FOERSTER FEATHER REED GRASS	3 GALLON	CONTAINER

Tighe&Bond

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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Lonza Biologics

Portsmouth,
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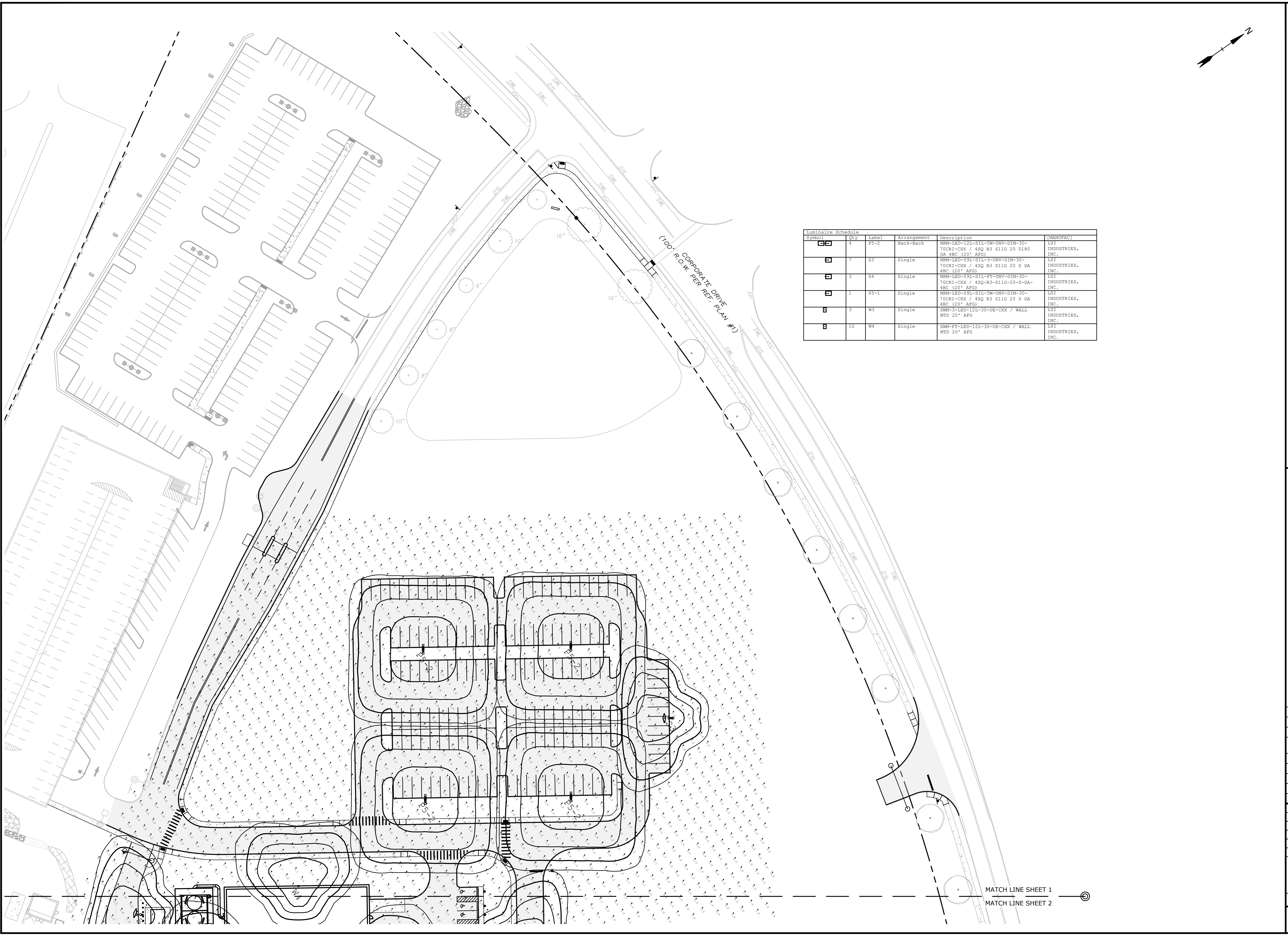
PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

PHASE 2
LANDSCAPE PLAN

SCALE: AS SHOWN

C-176

Last Save Date: September 27, 2023 1:36 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-176



Luminaire Schedule					
Symbol	Qty	Label	Arrangement	Description	[MANUFAC]
⊟⊟	4	P5-2	Back-Back	MRM-LED-12L-SIL-5W-UNV-DIM-30-70CRI-CXX / 4SQ B3 S11G 20 D180 GA 4BC (20' AFG)	LSI INDUSTRIES, INC.
⊟	7	S3	Single	MRM-LED-09L-SIL-3-UNV-DIM-30-70CRI-CXX / 4SQ B3 S11G 20 S GA 4BC (20' AFG)	LSI INDUSTRIES, INC.
⊟	3	S4	Single	MRM-LED-09L-SIL-FT-UNV-DIM-30-70CRI-CXX / 4SQ-B3-S11G-20-S-GA-4BC (20' AFG)	LSI INDUSTRIES, INC.
⊟	1	S5-1	Single	MRM-LED-09L-SIL-5W-UNV-DIM-30-70CRI-CXX / 4SQ B3 S11G 20 S GA 4BC (20' AFG)	LSI INDUSTRIES, INC.
▣	3	W3	Single	XWM-3-LED-12L-30-UE-CXX / WALL MTD 20' AFG	LSI INDUSTRIES, INC.
▣	10	W4	Single	XWM-FT-LED-12L-30-UE-CXX / WALL MTD 20' AFG	LSI INDUSTRIES, INC.

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Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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Lonza Biologics

Portsmouth,
New Hampshire

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MARK	DATE	DESCRIPTION

PROJECT NO: L-0700-013
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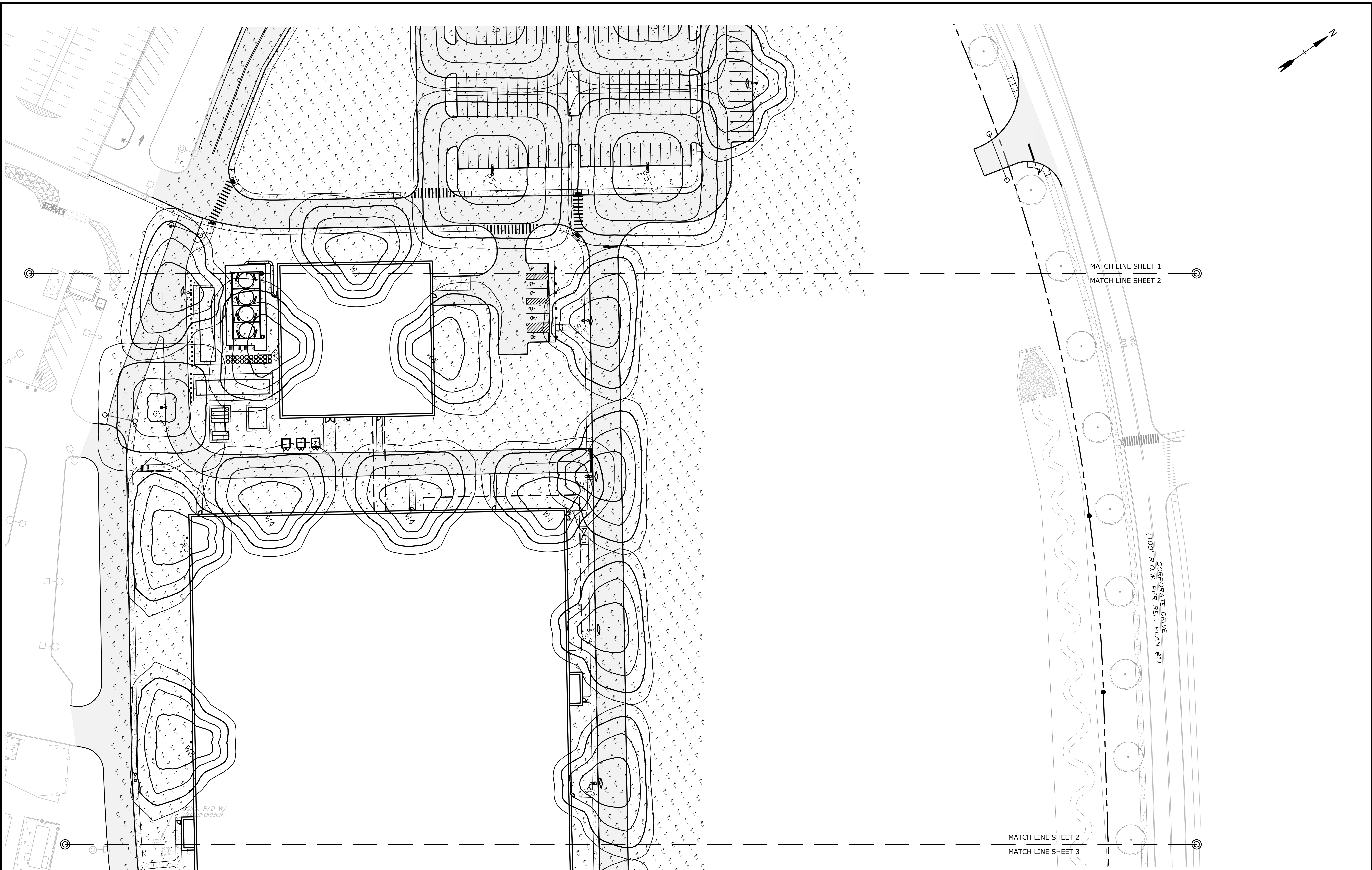
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

PHASE 2 PHOTOMETRIC
LIGHTING PLAN

SCALE: AS SHOWN

C-177



Tighe&Bond

NEIL A. HANSEN No. 15227 9/27/2023

PATRICK CRIMMINS No. 12378 9/27/2023

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DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

PHASE 2 PHOTOMETRIC LIGHTING PLAN

SCALE: AS SHOWN

C-178

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	[MANUFAC]
⊟⊟	4	P5-2	Back-Back	MRM-LED-12L-SIL-5W-UNV-DIM-30-70CRI-CXX / 4SQ B3 S11G 20 D180 GA 4BC (20' AFG)	LSI INDUSTRIES, INC.
⊟	7	S3	Single	MRM-LED-09L-SIL-3-UNV-DIM-30-70CRI-CXX / 4SQ B3 S11G 20 S GA 4BC (20' AFG)	LSI INDUSTRIES, INC.
⊟	3	S4	Single	MRM-LED-09L-SIL-FT-UNV-DIM-30-70CRI-CXX / 4SQ-B3-S11G-20-S-GA-4BC (20' AFG)	LSI INDUSTRIES, INC.
⊟	1	S5-1	Single	MRM-LED-09L-SIL-5W-UNV-DIM-30-70CRI-CXX / 4SQ B3 S11G 20 S GA 4BC (20' AFG)	LSI INDUSTRIES, INC.
⊡	3	W3	Single	XWM-3-LED-12L-30-UE-CXX / WALL MTD 20' AFG	LSI INDUSTRIES, INC.
⊡	10	W4	Single	XWM-FT-LED-12L-30-UE-CXX / WALL MTD 20' AFG	LSI INDUSTRIES, INC.

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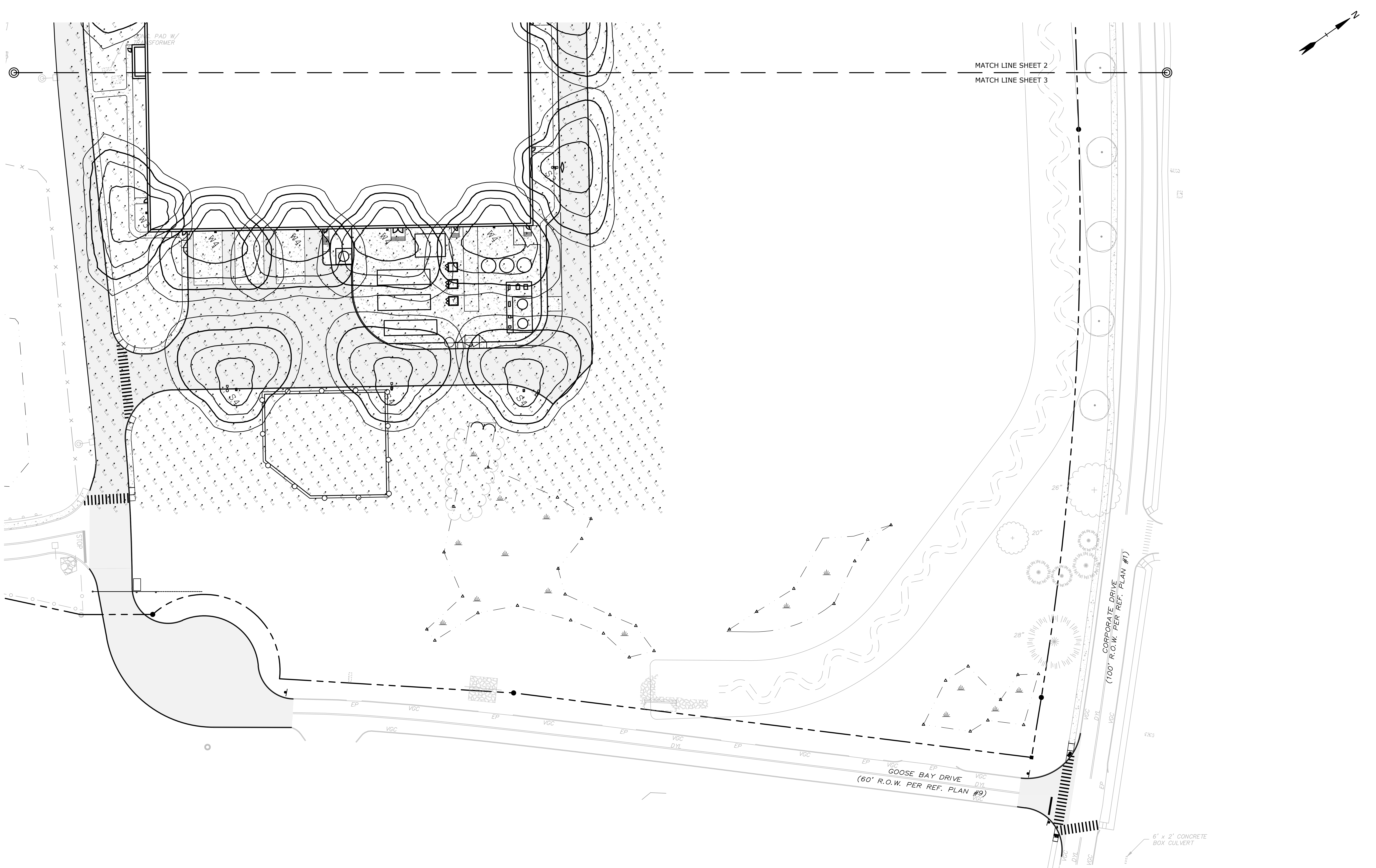

Tighe&Bond

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9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

SCALE IN FEET
0 40' 80'
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Portsmouth,
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MARK	DATE	DESCRIPTION

PROJECT NO: L-0700-013
DATE: 04/03/2018
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DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

PHASE 2 PHOTOMETRIC LIGHTING PLAN

SCALE: AS SHOWN

C-179

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	[MANUFAC]
⊟⊟	4	P5-2	Back-Back	MRM-LED-12L-SIL-5W-UNV-DIM-30-70CRI-CXX / 4SQ B3 S11G 20 D180 GA 4BC (20' AFG)	LSI INDUSTRIES, INC.
⊟	7	S3	Single	MRM-LED-09L-SIL-3-UNV-DIM-30-70CRI-CXX / 4SQ B3 S11G 20 S GA 4BC (20' AFG)	LSI INDUSTRIES, INC.
⊟	3	S4	Single	MRM-LED-09L-SIL-FT-UNV-DIM-30-70CRI-CXX / 4SQ-B3-S11G-20-S-GA-4BC (20' AFG)	LSI INDUSTRIES, INC.
⊟	1	S5-1	Single	MRM-LED-09L-SIL-5W-UNV-DIM-30-70CRI-CXX / 4SQ B3 S11G 20 S GA 4BC (20' AFG)	LSI INDUSTRIES, INC.
▣	3	W3	Single	XWM-3-LED-12L-30-UE-CXX / WALL MTD 20' AFG	LSI INDUSTRIES, INC.
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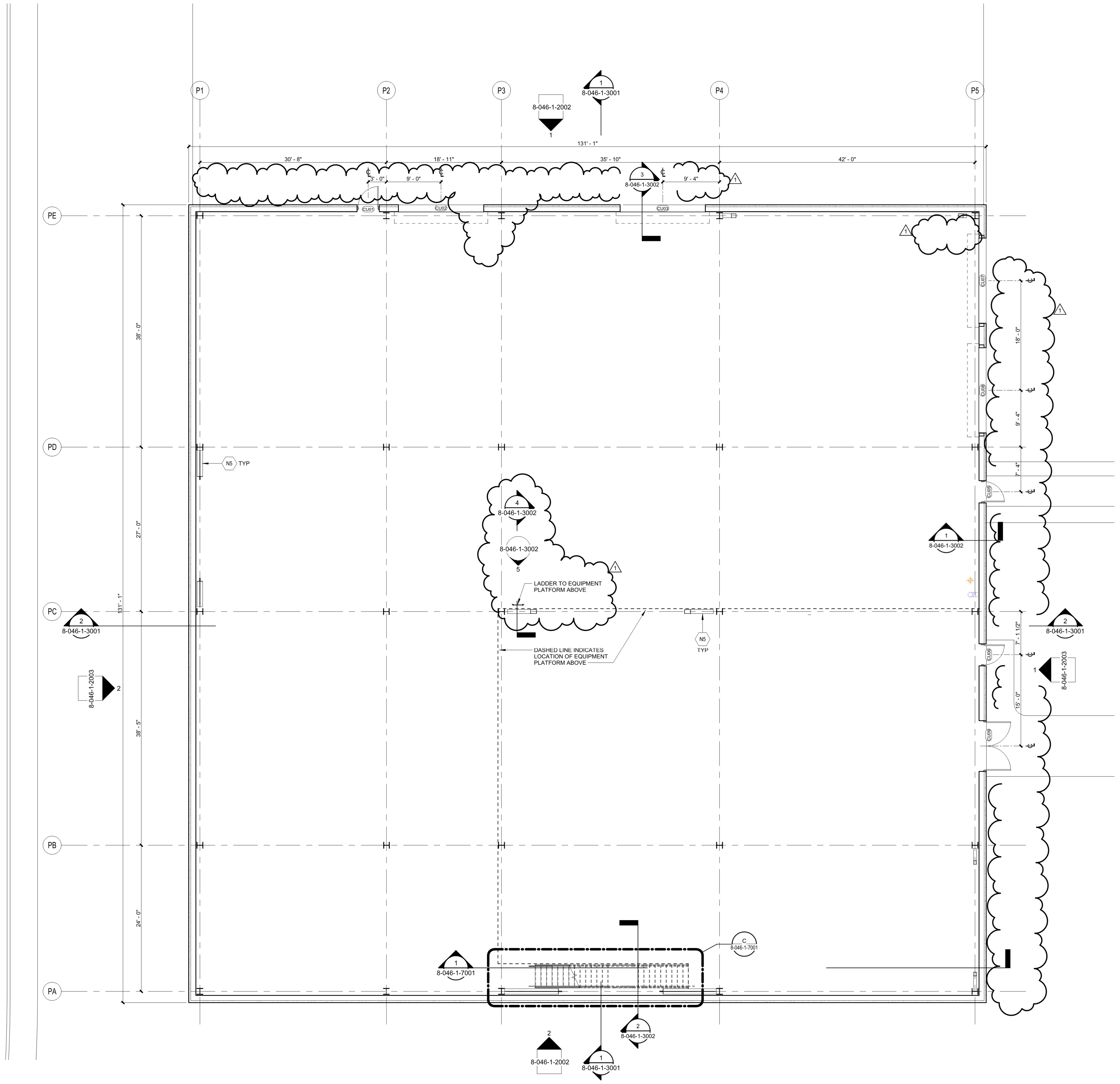
NEW WORK SHEET NOTES

N5 CROSS BRACING (TYP).



A FIRST FLOOR PLAN - CUB

8-046-1-1110 1/8" = 1'-0"

8/24/2023 7:32:25 AM

Autodesk Docs://22435_23047_Lonza_Albacore/22435_ARCH_Lonza.rvt

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Burlington, MA 01803
PHONE: (603) 570-3650
FAX: (781) 848-5508
www.ipsdb.com

IPS Professional Engineers and Architects, PC.

REVISION	DATE	DESCRIPTION	BY
A	15-MAR-23	DESIGN BUILD BID ISSUE (30% DD)	SnS
B	16-JUNE-23	CUB BID ISSUE (90% DD)	SnS
C	30-JUNE-23	PERMIT ISSUE	SnS
0	12-JULY-23	CONSTRUCTION ISSUE	SnS
1	24-AUG-23	BULLETIN NO. 1	SC

CLIENT

**LONZA
ALBACORE PROJECT**

SCALE
1" = 1'-0" 3/8" = 1'-0" 6" = 1'-0"
0 1/2" = 1'-0" 1/8" = 1'-0"
3/16" = 1'-0" 1/16" = 1'-0" 3" = 1'-0"
0 3/32" = 1'-0" 1/32" = 1'-0"
1 1/2" = 1'-0" 1/4" = 1'-0"
0 3/4" = 1'-0" 3" = 1'-0"

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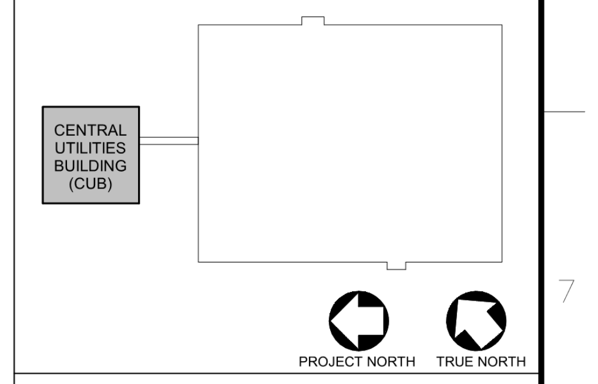
XREF FILE(S)

ENGINEER

ARCHITECT

DESIGNER

KEY PLAN



NOTE: APPLY SPRAYED-ON CEMENTITIOUS FIREPROOFING TO ALL STRUCTURAL FRAMING ELEMENTS (COLUMNS, CROSS BRACINGS AND BEAMS.)

Reserved for Master Stamp Block

ISSUED FOR
CONSTRUCTION

SEAL

STEPHEN R. FRANEY
No. 04187
Stephen R. Franey

DATE: 24-AUG-23

Lonza
Lonza Biologics, Inc.
101 International Drive
Portsmouth, NH USA
T: 1 (603) 334-6100
F: 1 (603) 334-6262
www.lonza.com

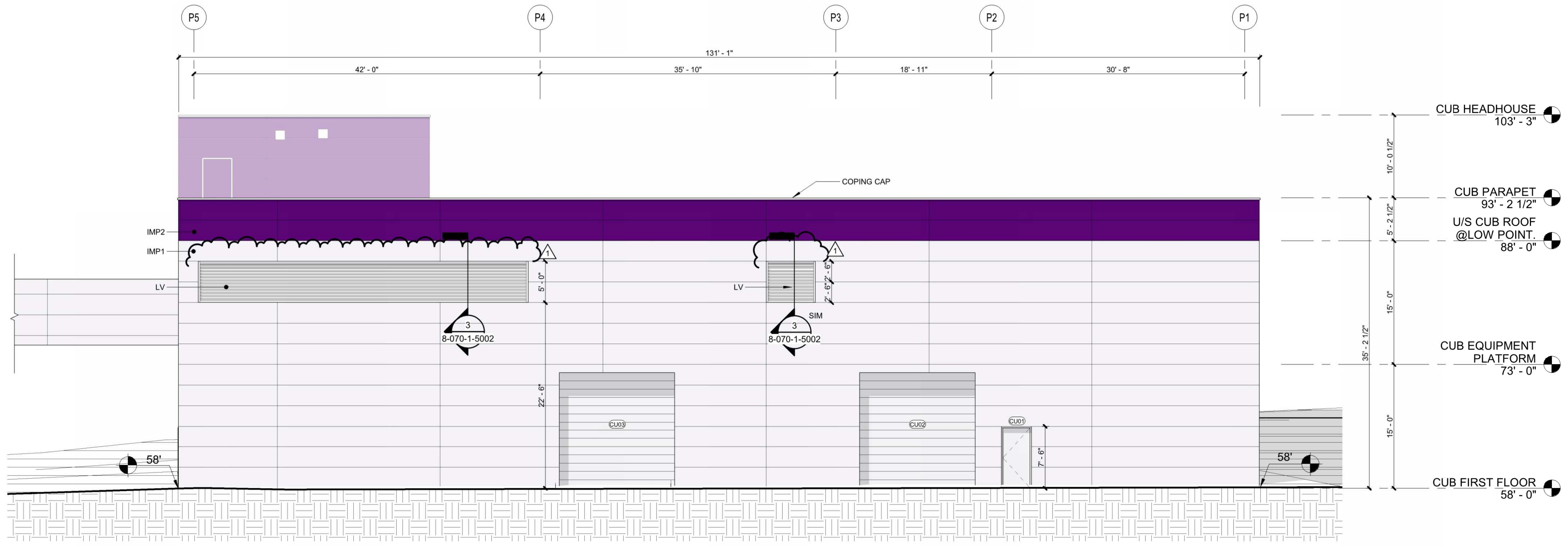
DRAWING TITLE

FIRST FLOOR PLAN - CUB

Tags

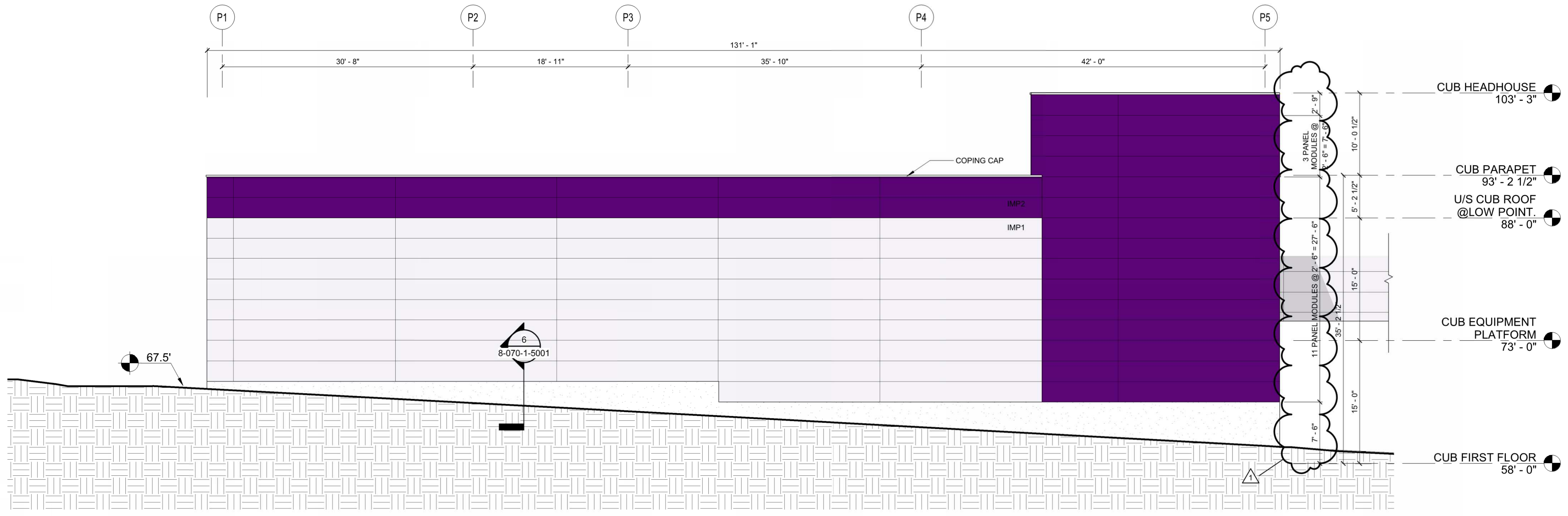
Drawn By	Date Drawn	Project Number	P&ID Number	DWG Filename	Revision
AD		MAD23047.01			1

Checked By	Date Checked	Scale	Drawing Number
JIMJ		AS NOTED	8-046-1-1110



1 EAST ELEVATION - CUB.

8-046-1-2002
1/8" = 1'-0"



2 WEST ELEVATION - CUB.

8-046-1-2002
1/8" = 1'-0"

LEGEND

IMP1 :

4" THICK INSULATED METAL PANELS TO HAVE MIN. R VALUE OF 33.5
COLOR: MATT PURPLE, R153 G148 B176, **15% TINT -** EMBOSSED EXTERIOR FINISH OF 22-GAUGE G-90 GALVANIZED STEEL WITH PVDF AND SMP ZINC EXTERIOR COATINGS

IMP2 :

4" THICK INSULATED METAL PANELS TO HAVE MIN. R VALUE OF 33.5
COLOR: MATT PURPLE, R153 G148 B176, **150% TINT -** EMBOSSED EXTERIOR FINISH OF 22-GAUGE G-90 GALVANIZED STEEL WITH PVDF AND SMP ZINC EXTERIOR COATINGS

LV :

- 4" STORM-RESISTANT LOUVER - SEE SHEET 8-046-A-5002

GL1 :

1" THICK IMPACT RESISTANT INSULATED LAMINATED GLASS OB: ¼" BLUE SOLARBAN 60 #2 SURFACE 1/2 INCH (W/90% ARGON FILL) INTERLAYER 1/4" CLEAR AS MANUFACTURED BY VITRO AMERICA OR APPROVED EQUAL. . PRIOR FABRICATION AND INSTALLATION THE CONTRACTOR SHALL SUBMIT SAMPLES FOR ARCHITECT APPROVAL. U VALUE:0.25

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IPS Professional Engineers and Architects, PC.

REVISION	DATE	DESCRIPTION	BY
A	15-MAR-23	DESIGN BUILD BID ISSUE (30% DD)	SnS
B	16-JUNE-23	CUB BID ISSUE (90% DD)	SnS
C	30-JUNE-23	PERMIT ISSUE	SnS
0	12-JULY-23	CONSTRUCTION ISSUE	SnS
1	24-AUG-23	BULLETIN NO. 1	SC

CLIENT

**LONZA
ALBACORE PROJECT**

SCALE
1" = 1'-0"
3/8" = 1'-0"
6" = 1'-0"
0
1/2" = 1'-0"
1/8" = 1'-0"
3/16" = 1'-0"
1/16" = 1'-0"
3" = 1'-0"
0
3/32" = 1'-0"
1/32" = 1'-0"
1 1/2" = 1'-0"
1/4" = 1'-0"
0
3/4" = 1'-0"
3" = 1'-0"

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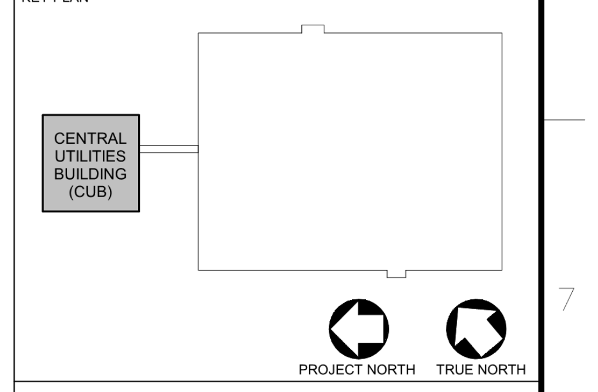
XREF FILE(S)
ENGINEER
ARCHITECT
DESIGNER

PARE

KEY PLAN



ISSUED FOR CONSTRUCTION

SEAL
STEPHEN R. FRANEY
No. 04187
Stephen R. Franey
DATE: 24-AUG-23

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DRAWING TITLE

BUILDING ELEVATIONS - CUB

Tags

Drawn By	Date Drawn	Project Number	P&ID Number	DWG Filename	Revision
AD		MAD23047.01			1
Checked By	**Date Checked**	**Scale**	**Drawing Number**		
JIMJ		AS NOTED	8-046-1-2002		

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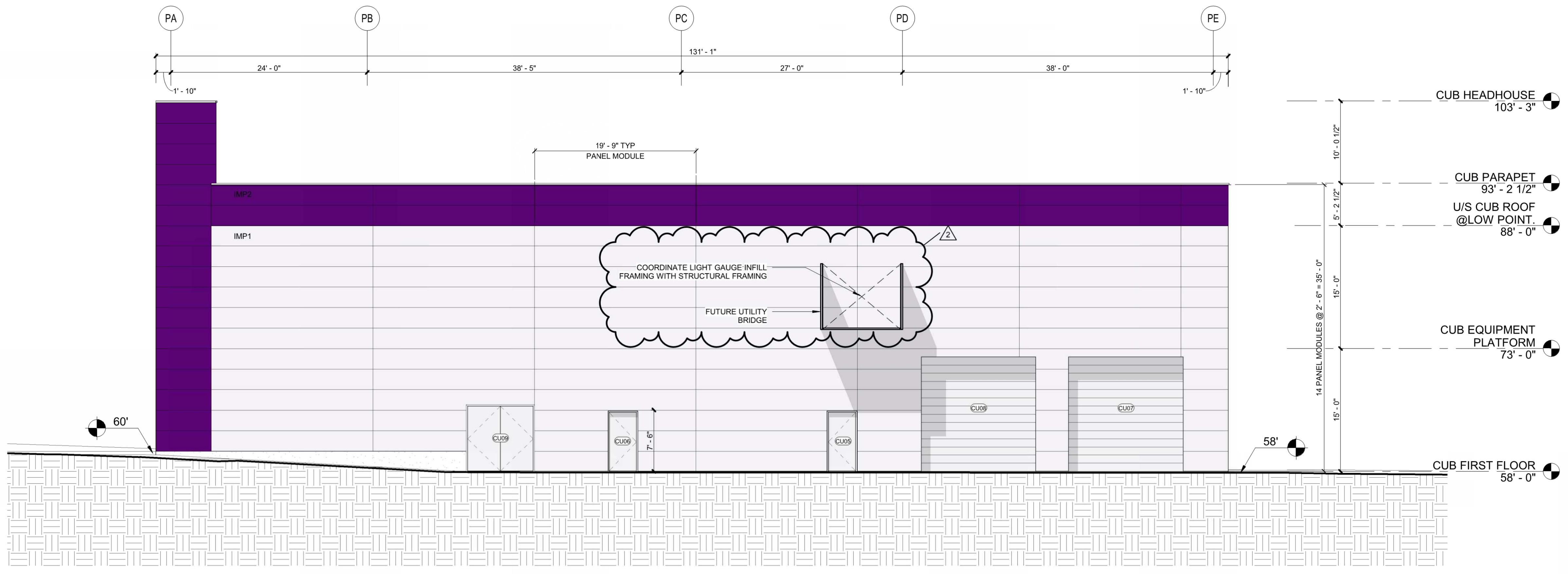
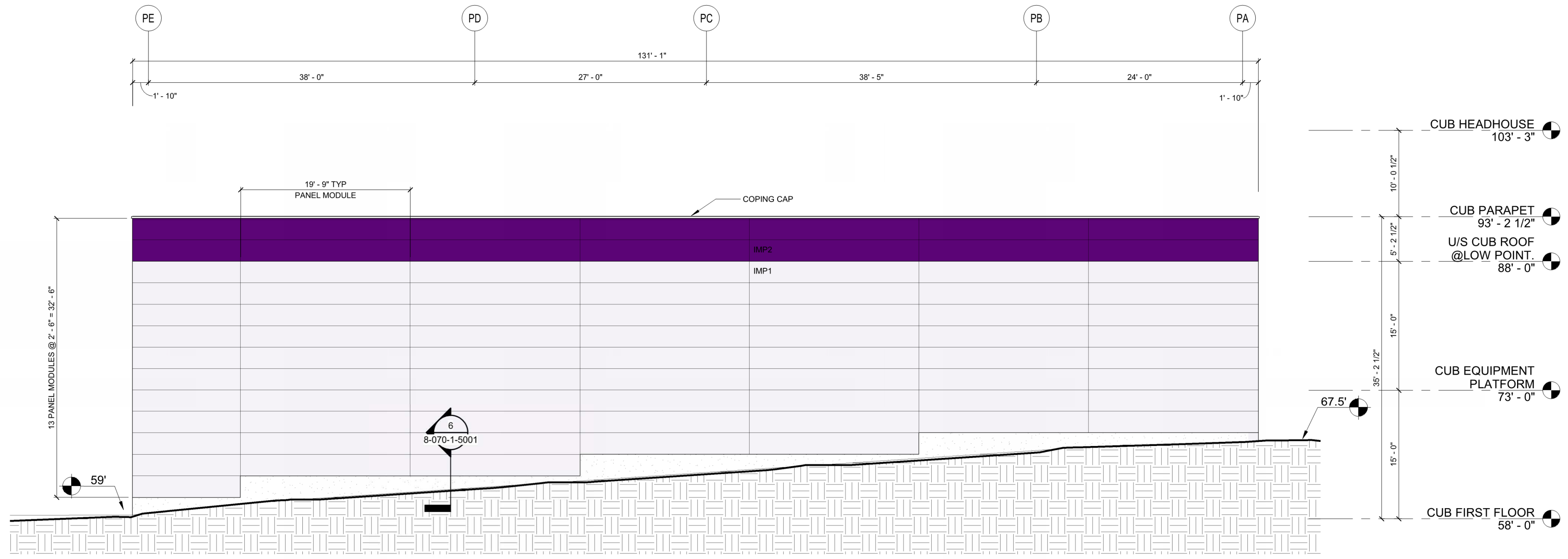


1 SOUTH ELEVATION - CUB
8-046-1-2003 1/8" = 1'-0"



2 NORTH ELEVATION - CUB
8-046-1-2003 1/8" = 1'-0"

LEGEND

IMP1 :

4" THICK INSULATED METAL PANELS TO HAVE MIN. R VALUE OF 33.5
COLOR: PURPLE, R245 G243 B248 (5% TINT OF R56 G5 B119)

IMP2 :

4" THICK INSULATED METAL PANELS TO HAVE MIN. R VALUE OF 33.5
COLOR: DEEP PURPLE, R56 G5 B119.

LV :

- 4" STORM-RESISTANT LOUVER - SEE SHEET 8-046-A-5002

GL1 :

1” THICK IMPACT RESISTANT INSULATED LAMINATED GLASS OB: ¼” BLUE SOLARBAN 70 XL SURFACE 1/2 INCH (W/90% ARGON FILL) INTERLAYER 1/4” CLEAR AS MANUFACTURED BY VITRO AMERICA OR APPROVED EQUAL. . PRIOR FABRICATION AND INSTALLATION THE CONTRACTOR SHALL SUBMIT SAMPLES FOR ARCHITECT APPROVAL. U VALUE:0.25

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C	30-JUNE-23	PERMIT ISSUE	SnS
D	10-JULY-23	ADDENDUM NO. 2	SnS
0	12-JULY-23	CONSTRUCTION ISSUE	SnS
1	24-AUG-23	BULLETIN NO. 1	SC
2	18-SEP-23	BULLETIN NO. 2	SC

CLIENT

LONZA
ALBACORE PROJECT

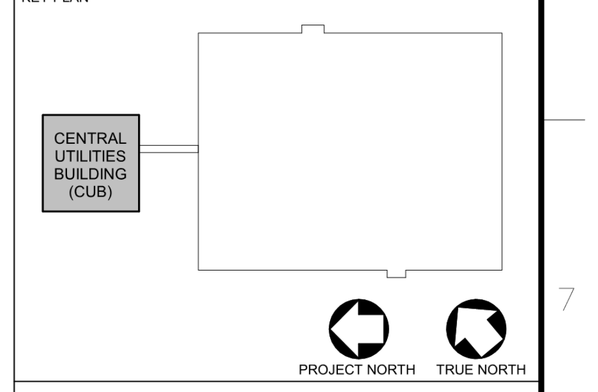
SCALE
1" = 1'-0"
3/8" = 1'-0"
6" = 1'-0"
1/2" = 1'-0"
1/8" = 1'-0"
3/16" = 1'-0"
1/16" = 1'-0"
3" = 1'-0"
3/32" = 1'-0"
1/32" = 1'-0"
1 1/2" = 1'-0"
1/4" = 1'-0"
3/4" = 1'-0"
3" = 1'-0"

CONFIDENTIAL

XREF FILE(S)
ENGINEER
ARCHITECT
DESIGNER

PARE

KEY PLAN



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ISSUED FOR CONSTRUCTION

SEAL
Stephen R. Franey
STEPHEN R. FRANEY
No. 04187
DATE: 18-SEP-23

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DRAWING TITLE

BUILDING ELEVATIONS - CUB

Tags

Drawn By	Date Drawn	Project Number	P&ID Number	DWG Filename	Revision
AD		MAD22435.01			2

Checked By	Date Checked	Scale	Drawing Number
JIMJ		AS NOTED	8-046-1-2003

9/18/2023 9:53:21 AM
Autodesk Docs://22435_23047_Lonza_Albacore/22435_ARCH_Lonza.rvt

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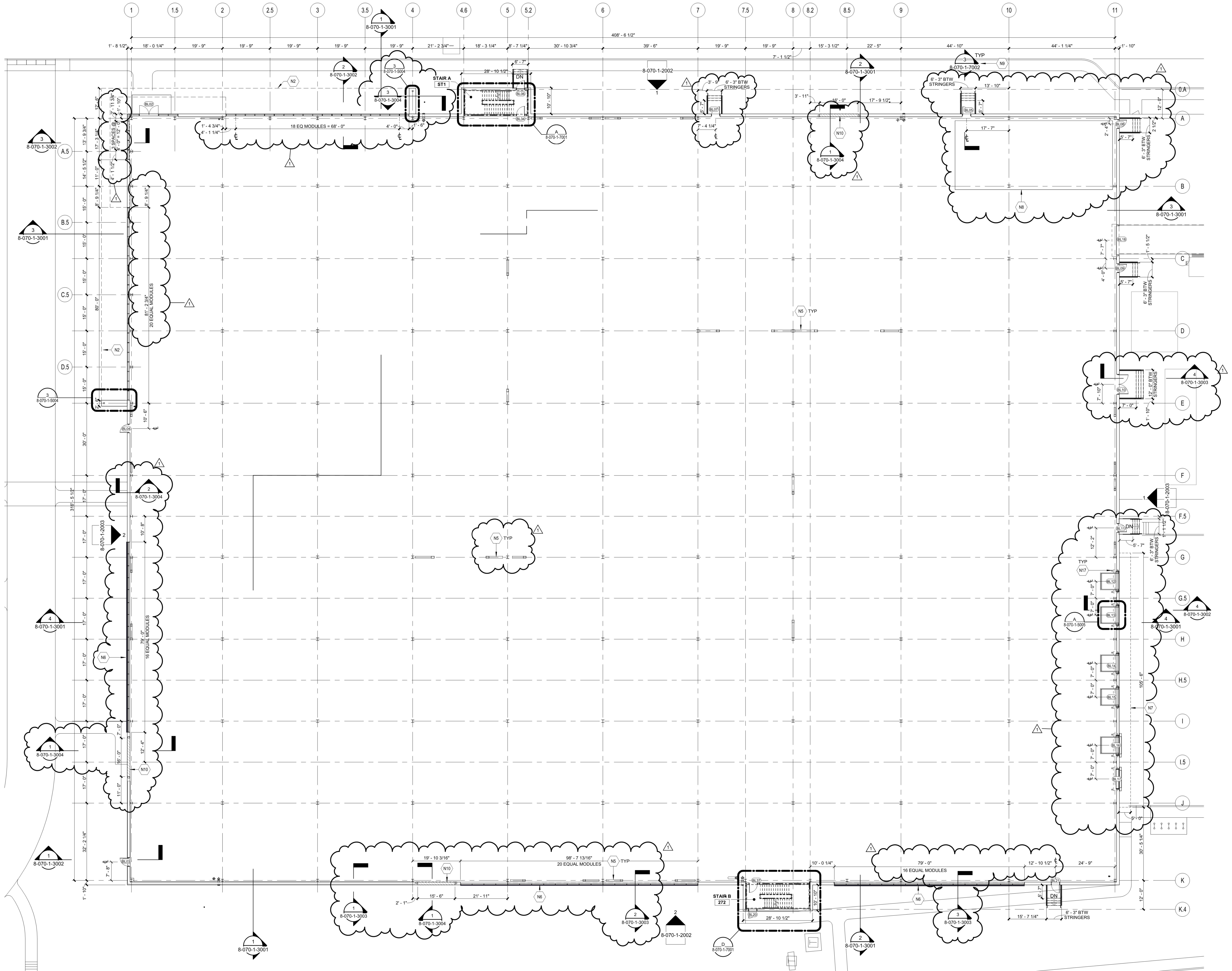

A FIRST FLOOR PLAN - BL1

8-070-1-1110 1/16" = 1'-0"

NEW WORK SHEET NOTES

#	
N2	UPPER CANOPY - REFER TO SHEET 8-070-A-5004.
N5	CROSS BRACING (TYP).
N6	FOR WINDOW DETAILS REFER TO ELEVATIONS AND SHEET 8-046-A-5001.
N7	LOADING DOCK CANOPY ABOVE - REFER TO SHEET 8-070-A-5005.
N8	BIOWASTE PIT, 22FT DEEP - REFER TO STRUCTURAL DRAWINGS FOR MORE INFORMATION.
N9	TYP. DETAIL FOR ALL EXTERIOR STAIRS.
N10	REMOVABLE PANELS.
N17	OVERFLOW ROOF SCUPPER.

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FAX: (781) 848-5508
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REVISION	DATE	DESCRIPTION	BY
A	15-MAR-23	DESIGN BUILD BID ISSUE (30% DD)	SnS
B	02-JUNE-23	BID ISSUE (90% DD)	SnS
C	30-JUNE-23	PERMIT ISSUE	SnS
D	10-JULY-23	ADDENDUM NO. 2	SnS
0	12-JULY-23	CONSTRUCTION ISSUE	SnS
1	24-AUG-23	BULLETIN NO. 1	SC

CLIENT

LONZA
ALBACORE PROJECT

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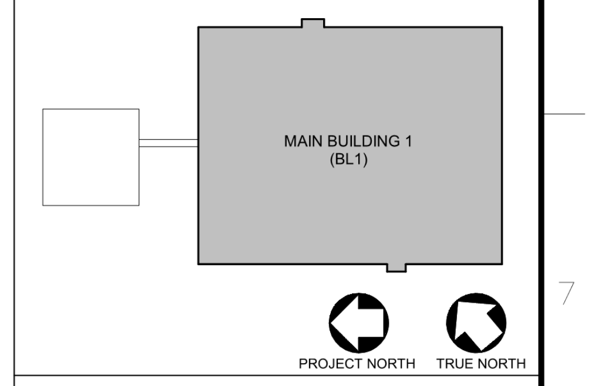
XREF FILE(S)
ENGINEER
ARCHITECT
DESIGNER

PARE

KEY PLAN



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SEAL
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Stephen R. Franey
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DRAWING TITLE

FIRST FLOOR PLAN - BL1

Tags
Drawn By: AD
Date Drawn:
Checked By: JIMJ
Date Checked:
Project Number: MAD23047.01
P&ID Number:
DWG Filename:
Scale: AS NOTED
Drawing Number: **8-070-1-1110**
Revision: 1

8/24/2023 7:32:20 AM

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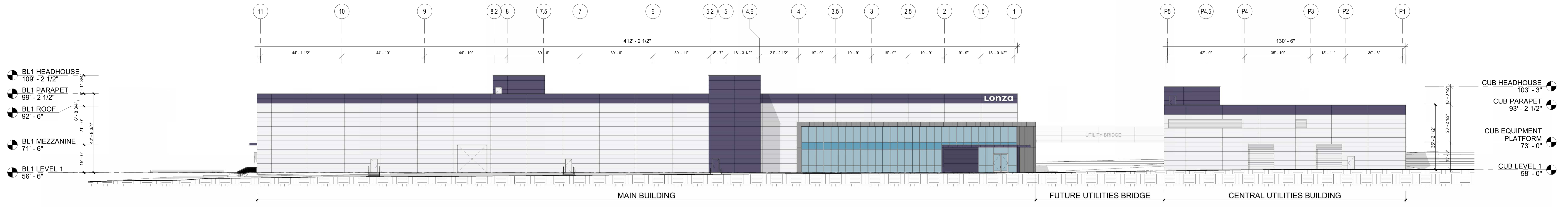
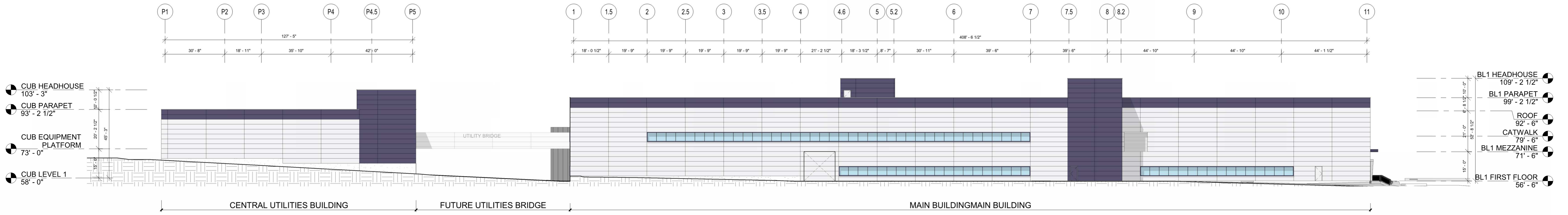
NOTE: FOR THE ELEVATION'S DESCRIPTION REFER TO NEXT TWO SHEETS - 8-070-A-2002 AND 8-070-A-2003



1 EAST BUILDINGS ELEVATIONS

8-070-1-2001
3/64" = 1'-0"



2 WEST BUILDINGS ELEVATIONS

8-070-1-2001
3/64" = 1'-0"

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REVISION	DATE	DESCRIPTION	BY
A	15-MAR-23	DESIGN BUILD BID ISSUE (30% DD)	SnS
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C	30-JUNE-23	PERMIT ISSUE	SnS
0	12-JULY-23	CONSTRUCTION ISSUE	SnS

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**LONZA
ALBACORE PROJECT**

SCALE

3/64" = 1' - 0"
0' 4' 16' 32' 64'

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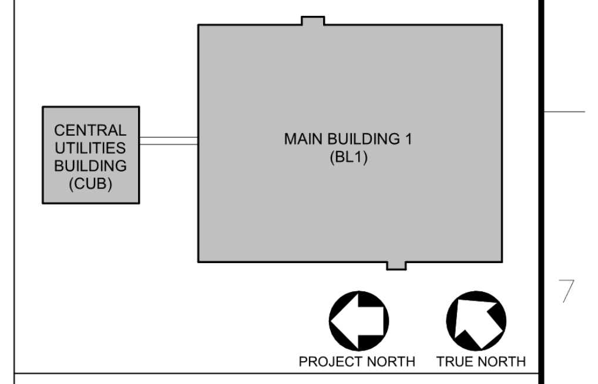
XREF FILE(S)
ENGINEER
ARCHITECT
DESIGNER

PARE

KEY PLAN



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SEAL
Stephen R. Franey
STEPHEN R. FRANEY No. 04187
DATE: 12-07-2023

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DRAWING TITLE

OVERALL BUILDINGS ELEVATIONS

Tags
Revision: 0
Drawn By: AD
Date Drawn:
Checked By: JIMJ
Date Checked:
Project Number: MAD23047.01
P&ID Number:
DWG Filename:
Scale: 3/64" = 1'-0"
Drawing Number: 8-070-1-2001

7/12/2023 1:59:45 PM
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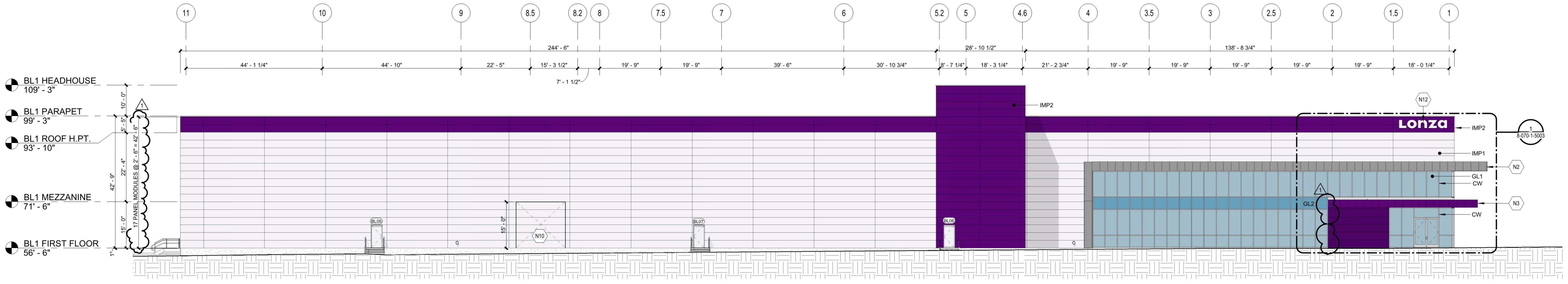
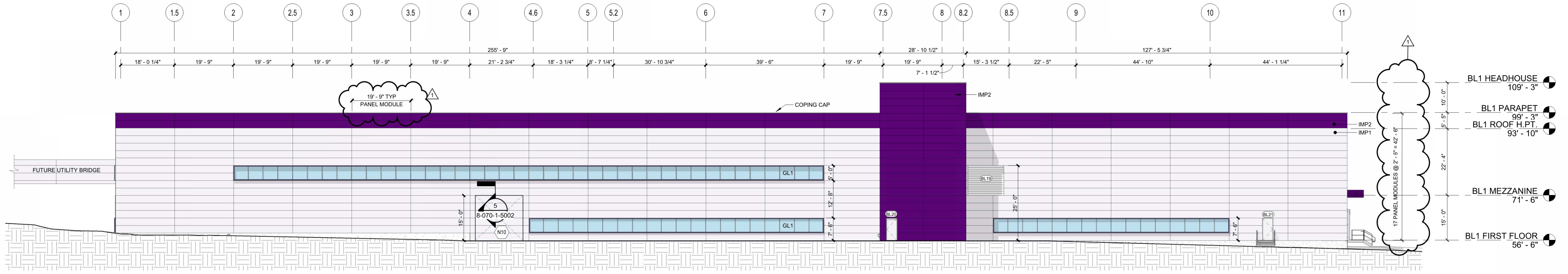


1 EAST ELEVATION - BL1

8-070-1-2002 1/16" = 1'-0"



2 WEST ELEVATION - BL1

8-070-1-2002 1/16" = 1'-0"

LEGEND

IMP1 :

4" THICK INSULATED METAL PANELS TO HAVE MIN. R VALUE OF 33.5
COLOR: PURPLE, R245 G243 B248 (5% TINT OF R56 G5 B119)

IMP2 :

4" THICK INSULATED METAL PANELS TO HAVE MIN. R VALUE OF 33.5
COLOR: DEEP PURPLE, R56 G5 B119.

CW :

THERMALLY BROKEN CURTAIN WALL SYSTEM EQUAL TO 1600 WALL SYSTEM 1 BY KAWNEER OR APPROVED EQUAL (HURRICANE IMPACT RESISTANT).

GL1 :

1" THICK IMPACT RESISTANT INSULATED LAMINATED GLASS OB: ¼" BLUE SOLARBAN 70 XL SURFACE 1/2 INCH (W/90% ARGON FILL) INTERLAYER 1/4" CLEAR AS MANUFACTURED BY VITRO AMERICA OR APPROVED EQUAL. . PRIOR FABRICATION AND INSTALLATION THE CONTRACTOR SHALL SUBMIT SAMPLES FOR ARCHITECT APPROVAL. U VALUE:0.25

GL2 :

1" THICK IMPACT RESISTANT INSULATED (INSULATION & BACKPAN ARE REQUIRED) LAMINATED SPANDREL GLASS 3-1870 OB: ¼" SOLAR GRAY + 1/2 INCH (W/90% ARGON FILL) INTERLAYER 1/4" CLEAR AS MANUFACTURED BY VITRO AMERICA OR APPROVED EQUAL. PRIOR FABRICATION AND INSTALLATION THE CONTRACTOR SHALL SUBMIT SAMPLES FOR ARCHITECT APPROVAL.
U VALUE:0.25

ROOF: WHITE EPDM ROOF SYSTEM - R VALUE OF 44

1

NEW WORK SHEET NOTES

#	
N2	UPPER CANOPY - REFER TO SHEET 8-070-A-5004.
N3	LOWER CANOPY - REFER TO SHEET 8-070-A-5004.
N10	REMOVABLE PANELS.
N12	CLEAR FINISH, CORROSION-PROOF WHITE ALUMINUM SIGN .

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C	30-JUNE-23	PERMIT ISSUE	SnS
D	10-JULY-23	ADDENDUM NO. 2	SnS
0	12-JULY-23	CONSTRUCTION ISSUE	SnS
1	24-AUG-23	BULLETIN NO. 1	SC

CLIENT

LONZA
ALBACORE PROJECT

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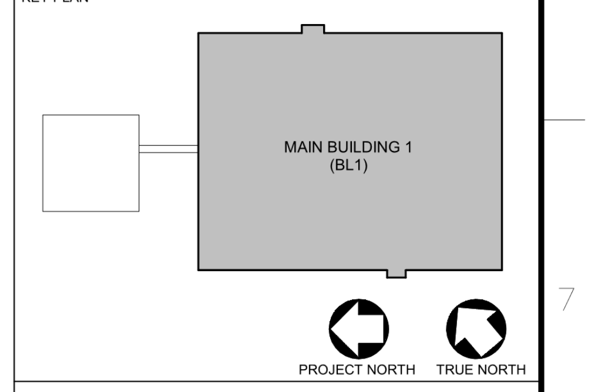
XREF FILE(S)
ENGINEER
ARCHITECT
DESIGNER

PARE

KEY PLAN



Reserved for Master Stamp Block

ISSUED FOR
CONSTRUCTION

SEAL
STEPHEN R. FRANEY
No. 04187
Stephen R. Franey
DATE: 24-AUG-23

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www.lonza.com

DRAWING TITLE
BUILDING ELEVATIONS - BL1

Tags
Drawn By: AD
Date Drawn:
Checked By: JIMJ
Date Checked:
Project Number: MAD23047.01
P&ID Number:
DWG Filename:
Scale: AS NOTED
Drawing Number: **8-070-1-2002**
Revision: 1

8/24/2023 7:32:30 AM
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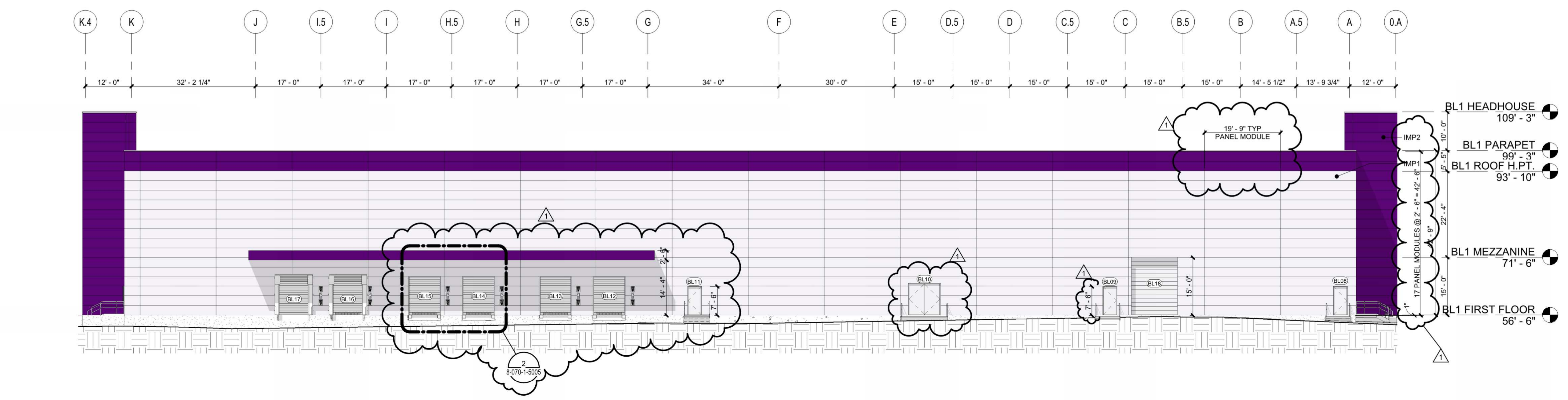
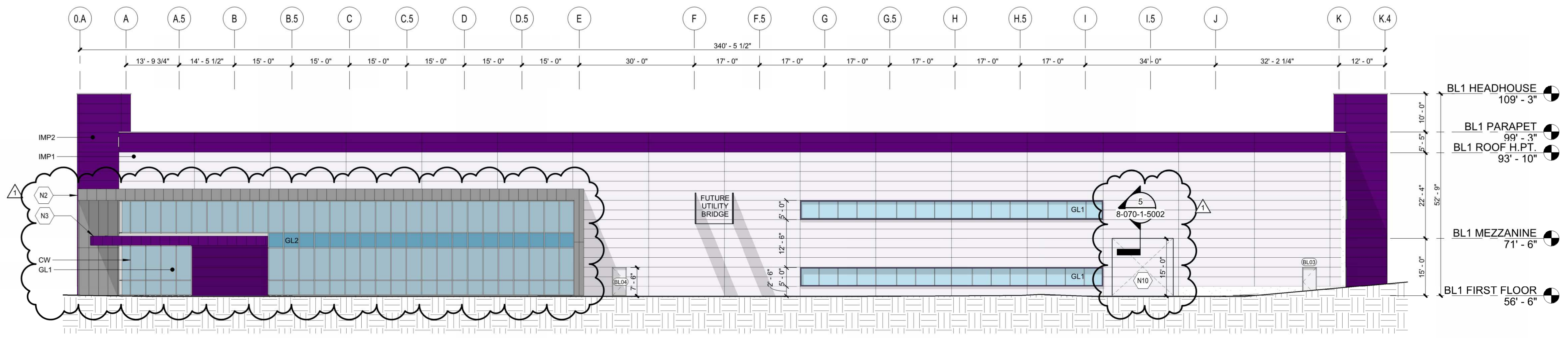


1 SOUTH ELEVATION - BL1.

8-070-1-2003 1/16" = 1'-0"



2 NORTH ELEVATION - BL1.

8-070-1-2003 1/16" = 1'-0"

LEGEND

IMP1 :

4" THICK INSULATED METAL PANELS TO HAVE MIN. R VALUE OF 33.5
COLOR: PURPLE, R245 G243 B248 (5% TINT OF R56 G5 B119)

IMP2 :

4" THICK INSULATED METAL PANELS TO HAVE MIN. R VALUE OF 33.5
COLOR: DEEP PURPLE, R56 G5 B119.

CW :

THERMALLY BROKEN CURTAIN WALL SYSTEM EQUAL TO 1600 WALL SYSTEM 1 BY KAWNEER OR APPROVED EQUAL (HURRICANE IMPACT RESISTANT).

GL1 :

1” THICK IMPACT RESISTANT INSULATED LAMINATED GLASS OB: ¼” BLUE SOLARBAN 70 XL SURFACE 1/2 INCH (W/90% ARGON FILL) INTERLAYER 1/4” CLEAR AS MANUFACTURED BY VITRO AMERICA OR APPROVED EQUAL. . PRIOR FABRICATION AND INSTALLATION THE CONTRACTOR SHALL SUBMIT SAMPLES FOR ARCHITECT APPROVAL. U VALUE:0.25

GL2 :

1” THICK IMPACT RESISTANT INSULATED (INSULATION & BACKPAN ARE REQUIRED) LAMINATED SPANDREL GLASS 3-1870 OB: ¼” SOLAR GRAY + 1/2 INCH (W/90% ARGON FILL) INTERLAYER 1/4” CLEAR AS MANUFACTURED BY VITRO AMERICA OR APPROVED EQUAL. PRIOR FABRICATION AND INSTALLATION THE CONTRACTOR SHALL SUBMIT SAMPLES FOR ARCHITECT APPROVAL.
U VALUE:0.25

ROOF: WHITE EPDM ROOF SYSTEM - R VALUE OF 44

1

NEW WORK SHEET NOTES

#	
N2	UPPER CANOPY - REFER TO SHEET 8-070-A-5004.
N3	LOWER CANOPY - REFER TO SHEET 8-070-A-5004.
N10	REMOVABLE PANELS.

1

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**LONZA
ALBACORE PROJECT**

SCALE
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XREF FILE(S)

ENGINEER

ARCHITECT

DESIGNER

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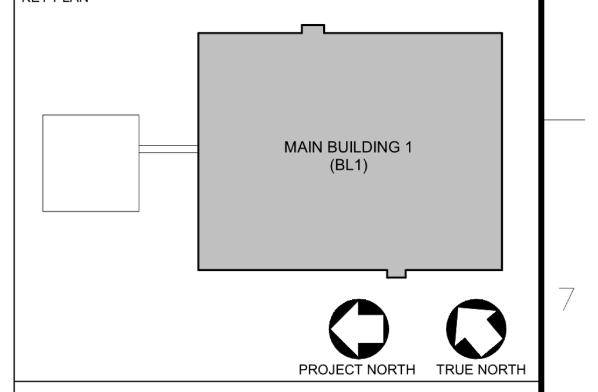

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CONSTRUCTION

SEAL

STEPHEN R. FRANEY No. 04187

Stephen R. Franey

DATE: 24-AUG-23

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DRAWING TITLE

BUILDING ELEVATIONS - BL1

Tags

Drawn By	Date Drawn	Project Number	P&ID Number	DWG Filename	Revision
AD		MAD23047.01			1

Checked By	Date Checked	Scale	Drawing Number
JIMJ		AS NOTED	**8-070-1-2003**

8/24/2023 7:32:33 AM

Autodesk Docs://22405_22047_Lonza_Albacore/22405_ARCH_Lonza.rvt

DETAILS PLAN SET

APRIL 3, 2018

REVISED: SEPTEMBER 27, 2023

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	DETAILS COVER SHEET	9/27/2023
C-501	EROSION CONTROL NOTES & DETAILS SHEET	9/27/2023
C-502	DETAILS SHEET	9/27/2023
C-503	DETAILS SHEET	9/27/2023
C-504	DETAILS SHEET	9/27/2023
C-505	DETAILS SHEET	9/27/2023
C-506	DETAILS SHEET	9/27/2023
C-507	DETAILS SHEET	9/27/2023
C-508	DETAILS SHEET	9/27/2023
C-509	DETAILS SHEET	9/27/2023
C-510	DETAILS SHEET	9/27/2023
C-511	DETAILS SHEET	9/27/2023
C-512	DETAILS SHEET	9/27/2023

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER - LICENSED
NEIL A. HANSEN
No. 15227
9/27/2023

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER - LICENSED
PATRICK CRIMMINS
No. 12378
9/27/2023

COMPLETE SET 13 SHEETS

Last Save Date: September 25, 2023 5:16 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-COVR.dwg Layout Tab: DETAILS-CS

GENERAL PROJECT INFORMATION

PROJECT LESSOR:	PEASE DEVELOPMENT AUTHORITY 55 INTERNATIONAL DRIVE PORTSMOUTH, NH 03801
PROJECT OWNER/ APPLICANT:	LONZA BIOLOGICS 101 INTERNATIONAL DRIVE PORTSMOUTH, NH 03801
PROJECT ADDRESS:	70 & 80 CORPORATE DRIVE PORTSMOUTH, NH 03801
PROJECT LATITUDE:	43°-04'-59.0"N
PROJECT LONGITUDE:	71°-48'-09.7"W

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE EXPANSION OF LONZA BIOLOGICS, WHICH INCLUDES THE CONSTRUCTION OF 4 PROPOSED BUILDINGS, 1 PARKING GARAGE, AND ASSOCIATED SITE IMPROVEMENTS.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 21.3 ACRES.

SOIL CHARACTERISTICS

BASED ON THE HIGH INTENSITY SOIL SURVEY PREPARED BY GOVE ENVIRONMENTAL SERVICES, INC. IN DECEMBER 2015, THE SITE SOILS VARY FROM WELL DRAINED TO VERY POORLY DRAINED AND PRIMARILY CONSIST OF SOMEWHAT POORLY DRAINED SOILS.

NAME OF RECEIVING WATERS

THE STORM WATER RUNOFF WILL ULTIMATELY DISCHARGE INTO HODGSON BROOK

CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:

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

SPECIAL CONSTRUCTION NOTES:

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

EROSION CONTROL NOTES:

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

STABILIZATION:

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

DUST CONTROL:

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

STOCKPILES:

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

OFF SITE VEHICLE TRACKING:

1. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S) PRIOR TO ANY EXCAVATION ACTIVITIES.

VEGETATION:

1. TEMPORARY GRASS COVER:
    A. SEEDBED PREPARATION:
        a. APPLY FERTILIZER AT THE RATE OF 600 POUNDS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF THREE (3) TONS PER ACRE;
    B. SEEDING:
        a. UTILIZE ANNUAL RYE GRASS AT A RATE OF 40 LBS/ACRE;
        b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF TWO (2) INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED;
        c. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). HYDROSEEDINGS, WHICH INCLUDE MULCH, MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING;
    C. MAINTENANCE:
        a. TEMPORARY SEEDING SHALL BE PERIODICALLY INSPECTED. AT A MINIMUM, 95% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER BARRIERS, CHECK DAMS, ETC.).
2. VEGETATIVE PRACTICE:
    A. FOR PERMANENT MEASURES AND PLANTINGS:
        a. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF THREE (3) TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 6.5;
        b. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 800 POUNDS PER ACRE OF 10-20-20 FERTILIZER;
        c. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4-1/2 POUNDS AND 5-1/2 POUNDS PER INCH OF WIDTH;
        d. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH;
        e. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE;
        f. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED;
        g. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
        h. A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE APPLIED AT A RATE OF 40 LB/AC OR APPROVED EUQAL:

SEED MIX	APPLICATION RATE
"REBEL II" TALL FESCUE	70%
"PALMER" PERENNIAL RYEGRASS	20%
"BARON" KENTUCKEY BLUEGRASS	10%

IN NO CASE SHALL THE WEED CONTENT EXCEED ONE (1) PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. SEEDING SHALL BE DONE NO LATER THAN SEPTEMBER 15. IN NO CASE SHALL SEEDING TAKE PLACE OVER SNOW.

3. DORMANT SEEDING (SEPTEMBER 15 TO FIRST SNOWFALL):
    A. FOLLOW PERMANENT MEASURES SLOPE, LIME, FERTILIZER AND GRADING REQUIREMENTS. APPLY SEED MIXTURE AT TWICE THE INDICATED RATE. APPLY MULCH AS INDICATED FOR PERMANENT MEASURES.

CONCRETE WASHOUT AREA:

1. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FACILITY;
2. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
3. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
4. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

ALLOWABLE NON-STORMWATER DISCHARGES:

1. THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
    A. FIRE-FIGHTING ACTIVITIES;
    B. FIRE HYDRANT FLUSHING;
    C. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
    D. WATER USED TO CONTROL DUST;
    E. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
    F. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
    G. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
    H. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
    I. UNCONTAMINATED GROUND WATER OR SPRING WATER;
    J. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
    K. LANDSCAPE IRRIGATION.

WASTE DISPOSAL:

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

SPILL PREVENTION:

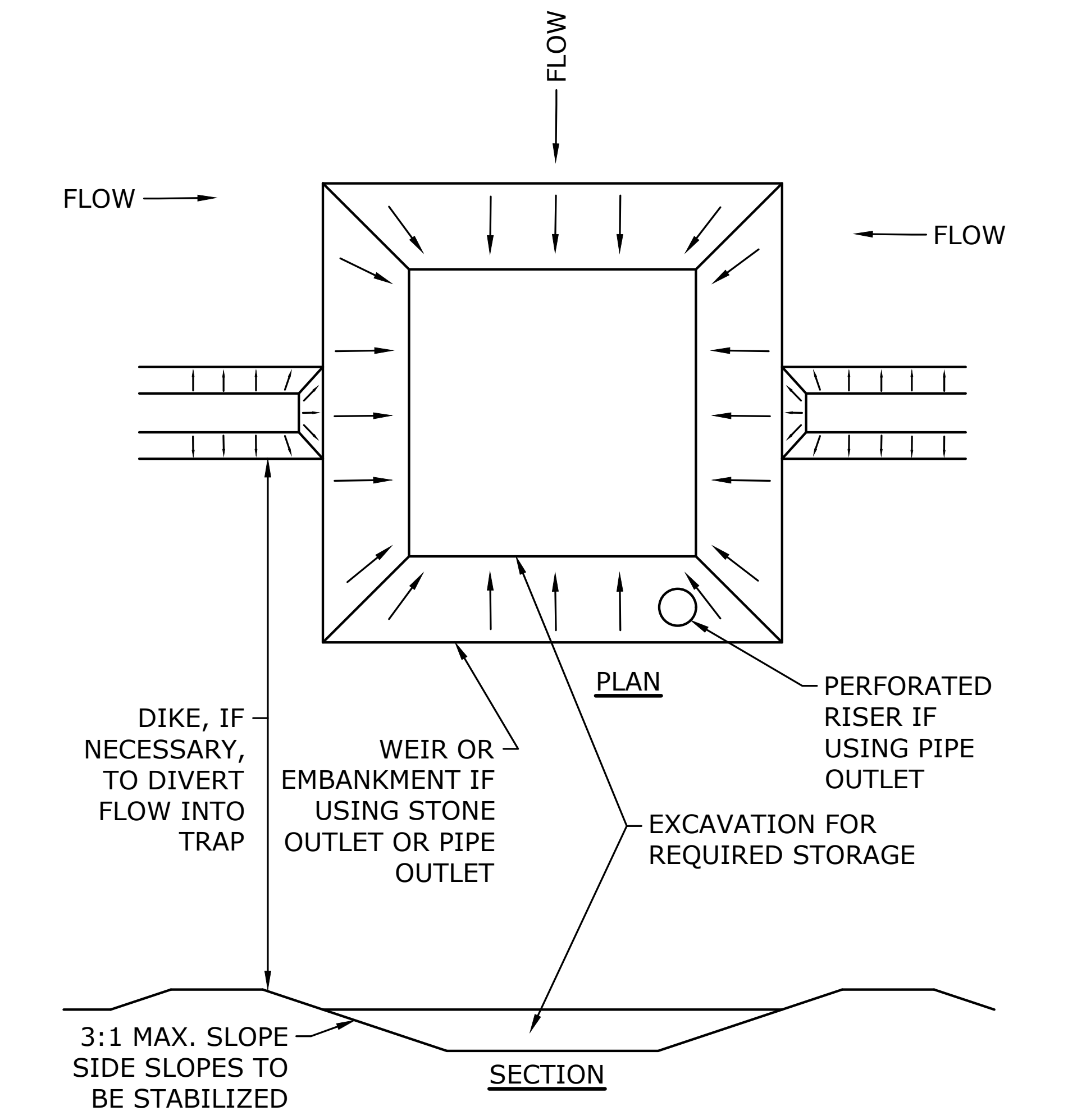
1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK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

EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES

THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A SWPPP. THE SWPPP SHALL BE PREPARED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SWPPP AND KEEP AN UPDATED COPY OF THE SWPPP ONSITE AT ALL TIMES.

THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:

1. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE SWPPP SHALL BE MADE BY THE CONTRACTOR AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF A STORM 0.25 INCHES OR GREATER;
2. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
3. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
4. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.

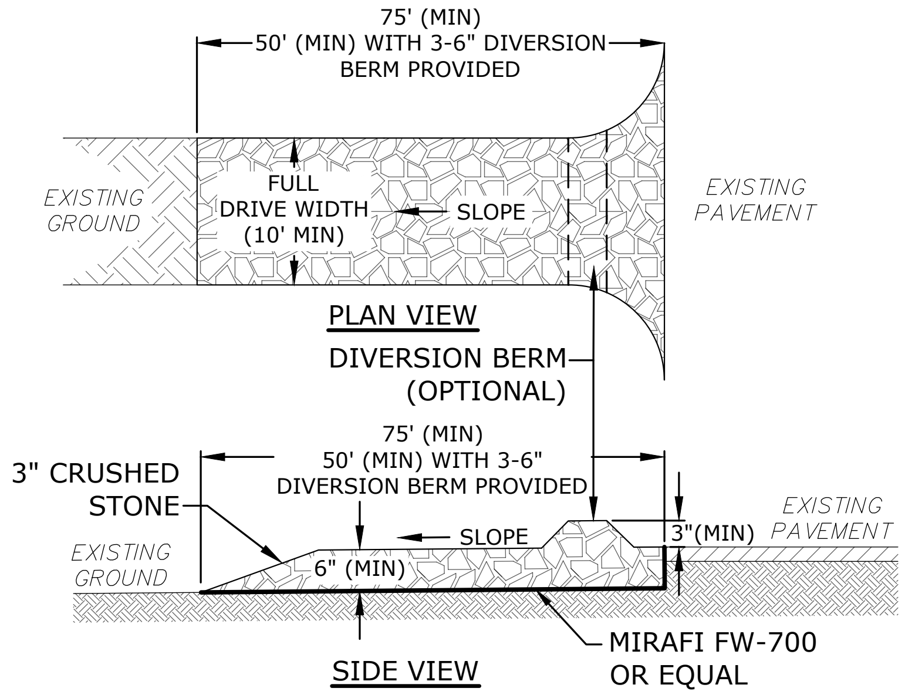


NOTES:

1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING AREA TO A SINGLE 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. TRAP OUTLET SHALL BE MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP.
5. TRAP SHALL DISCHARGE TO A STABILIZED AREA.
6. TRAP SHALL BE CLEANED WHEN 50 PERCENT OF THE ORIGINAL VOLUME IS FILLED.
7. MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.

SEDIMENT TRAP

NO SCALE

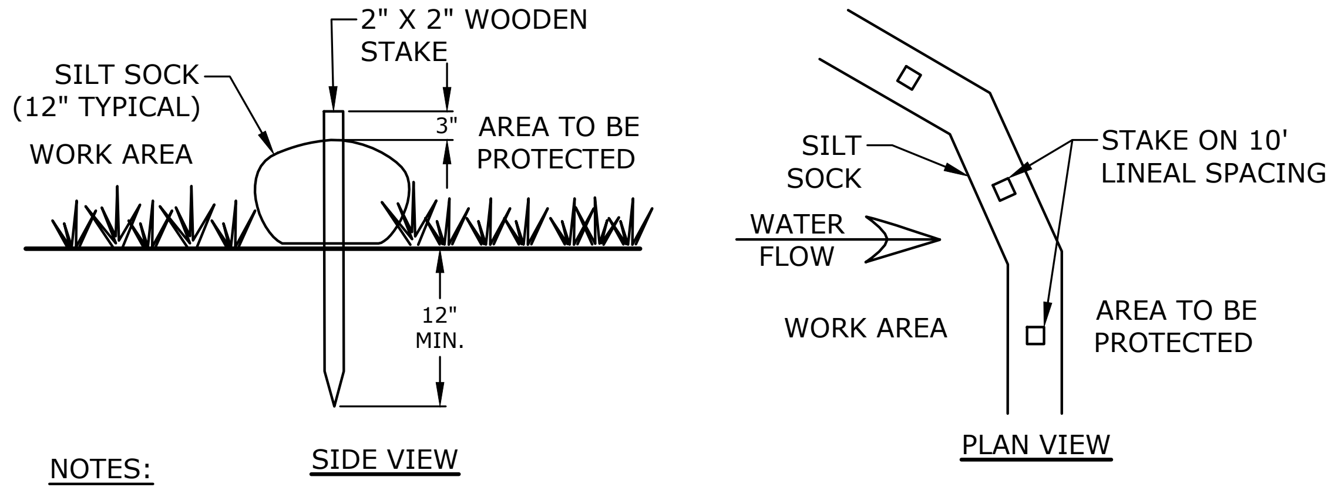


NOTES:

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

STABILIZED CONSTRUCTION ENTRANCE

NO SCALE

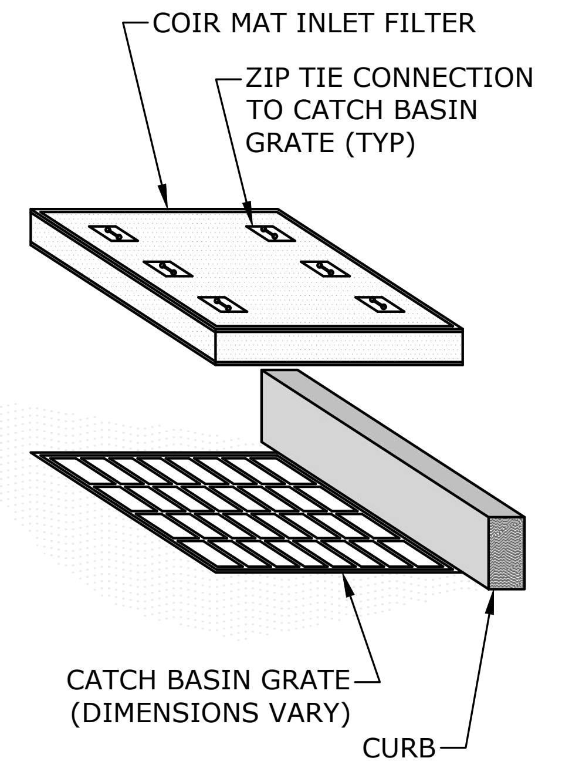


NOTES:

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

SILT SOCK

NO SCALE



NOTES:

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

INLET PROTECTION

NO SCALE

Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
M	9/27/2023	P.B. Submission
L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
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

PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DTLS.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

EROSION CONTROL NOTES & DETAILS SHEET

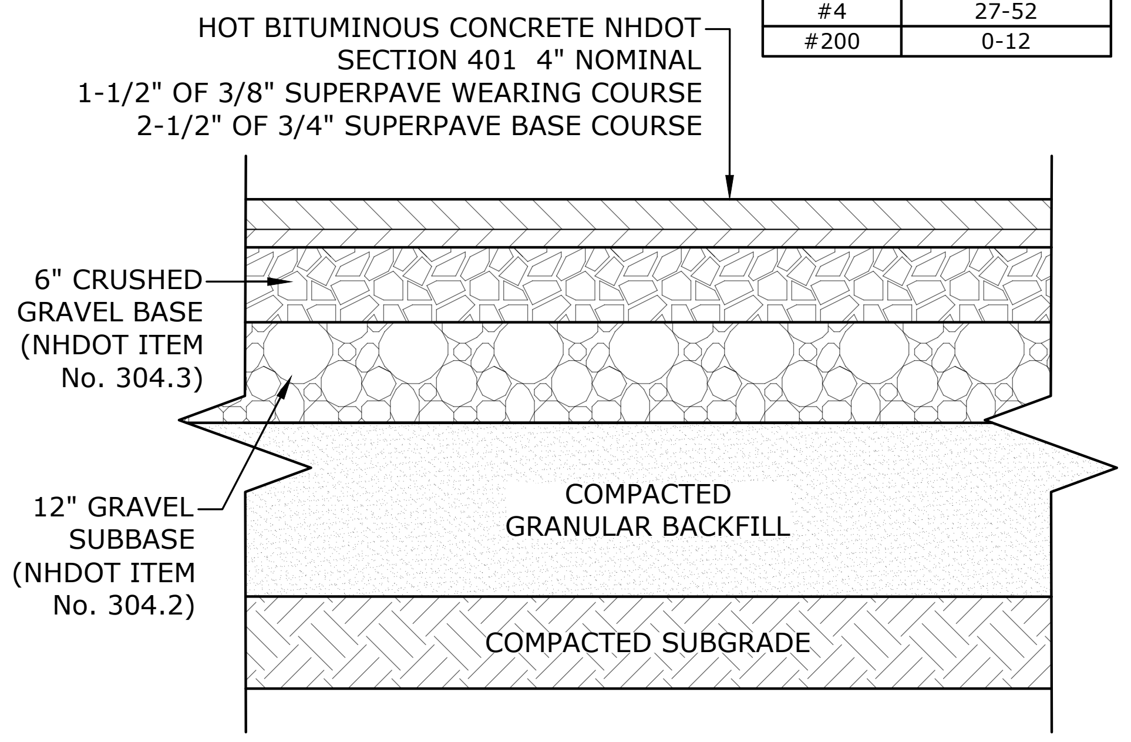
SCALE: AS SHOWN

C-501

Last Save Date: September 27, 2023 1:49 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DTLS.dwg Layout Tab: C-501

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

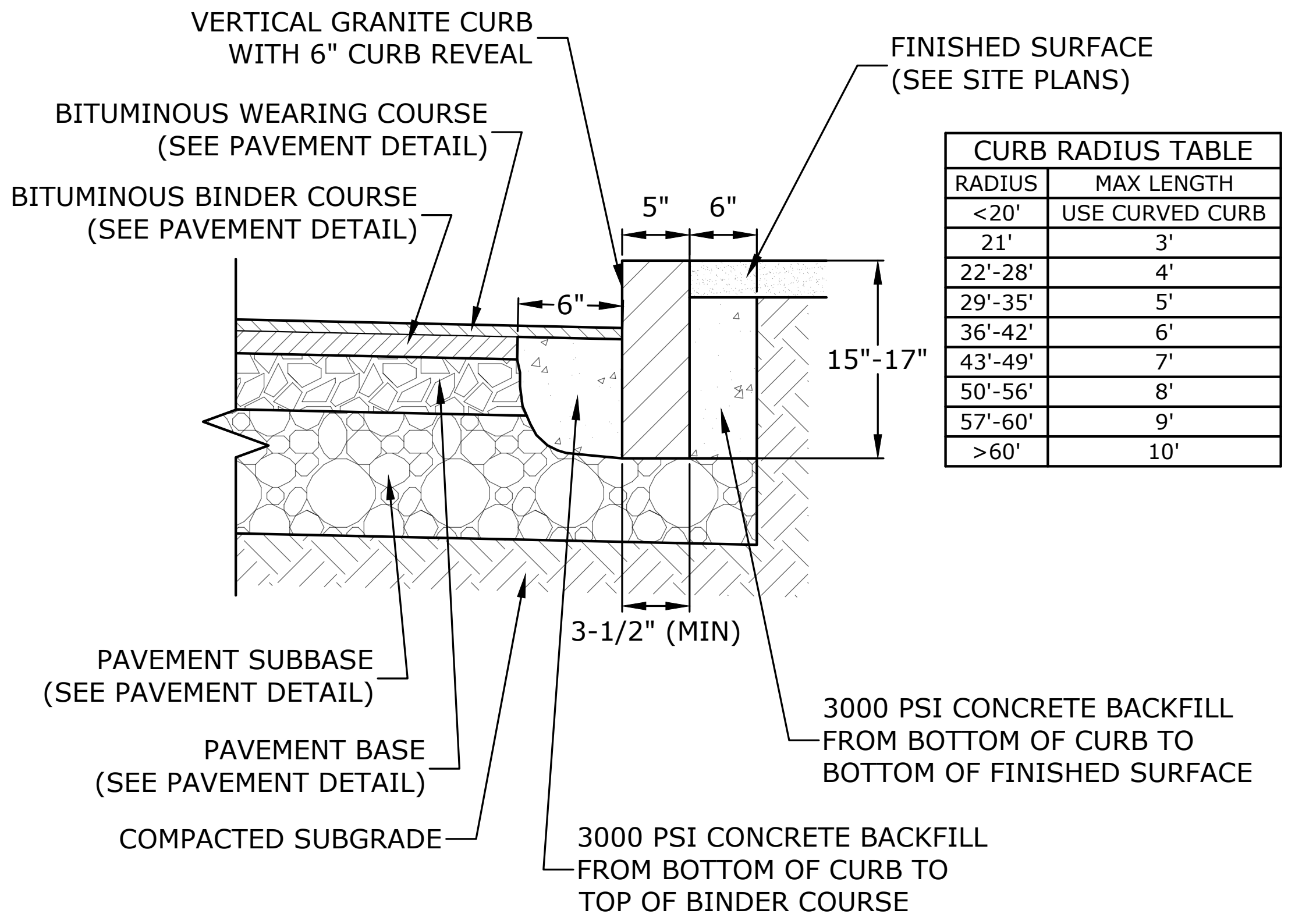
NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12



NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
4. FINAL PAVEMENT DESIGN TO BE DETERMINED BY GEOTECHNICAL ENGINEER.
5. NHDOT ITEM No. 304.2 MAY BE SUBSTITUTED FOR NHDOT ITEM No. 304.4, IF NHDOT ITEM No. 304.2 CAN NOT BE ACQUIRED.

TYPICAL PAVEMENT SECTION

NO SCALE

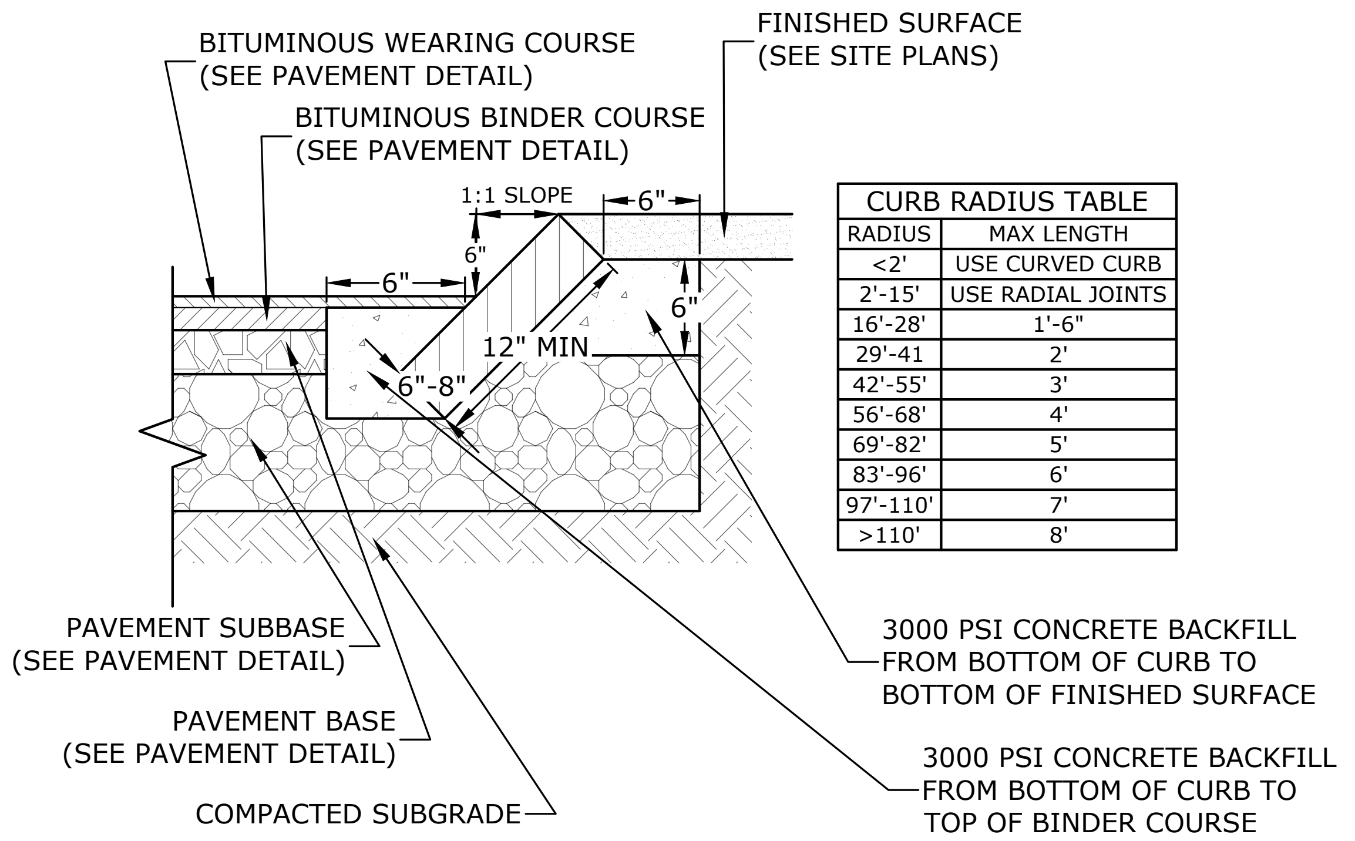


CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

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

VERTICAL GRANITE CURB

NO SCALE

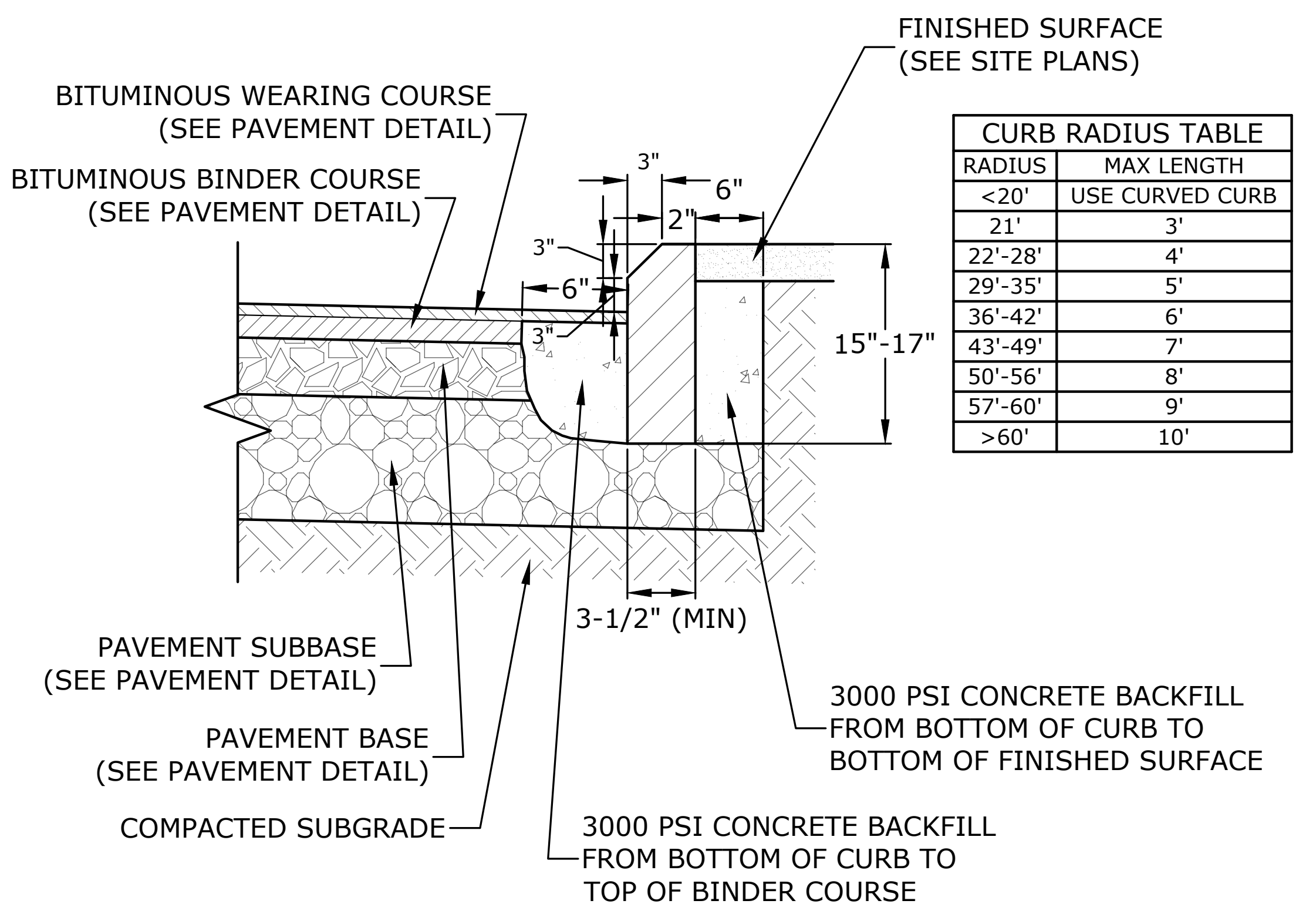


CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-6"
29'-41	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

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

SLOPED GRANITE CURB

NO SCALE



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

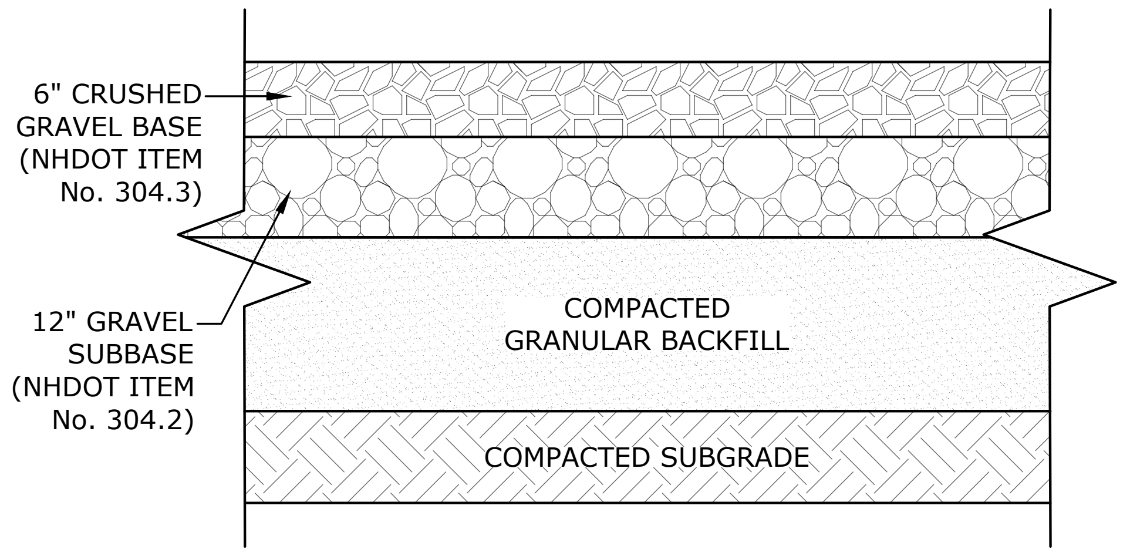
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF MOUNTABLE VERTICAL GRANITE CURB (MVGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES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

MOUNTABLE VERTICAL GRANITE CURB

NO SCALE

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

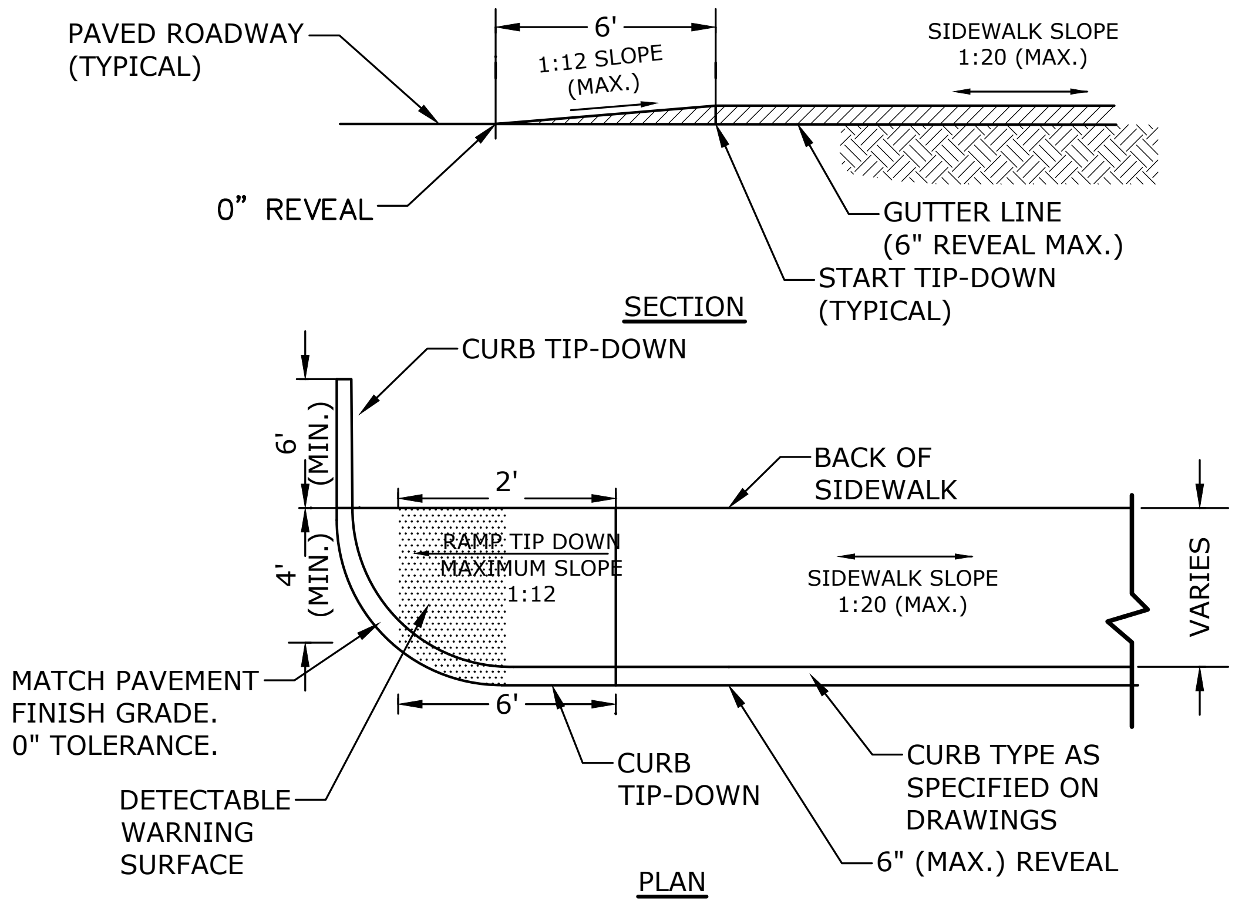
NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12



NOTES:
1. SEE SITE PLAN FOR GRAVEL WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. GRAVEL PARKING AREA DESIGN TO BE DETERMINED BY GEOTECHNICAL ENGINEER.
4. NHDOT ITEM No. 304.2 MAY BE SUBSTITUTED FOR NHDOT ITEM No. 304.4, IF NHDOT ITEM No. 304.2 CAN NOT BE ACQUIRED.

GRAVEL PARKING AREA SECTION

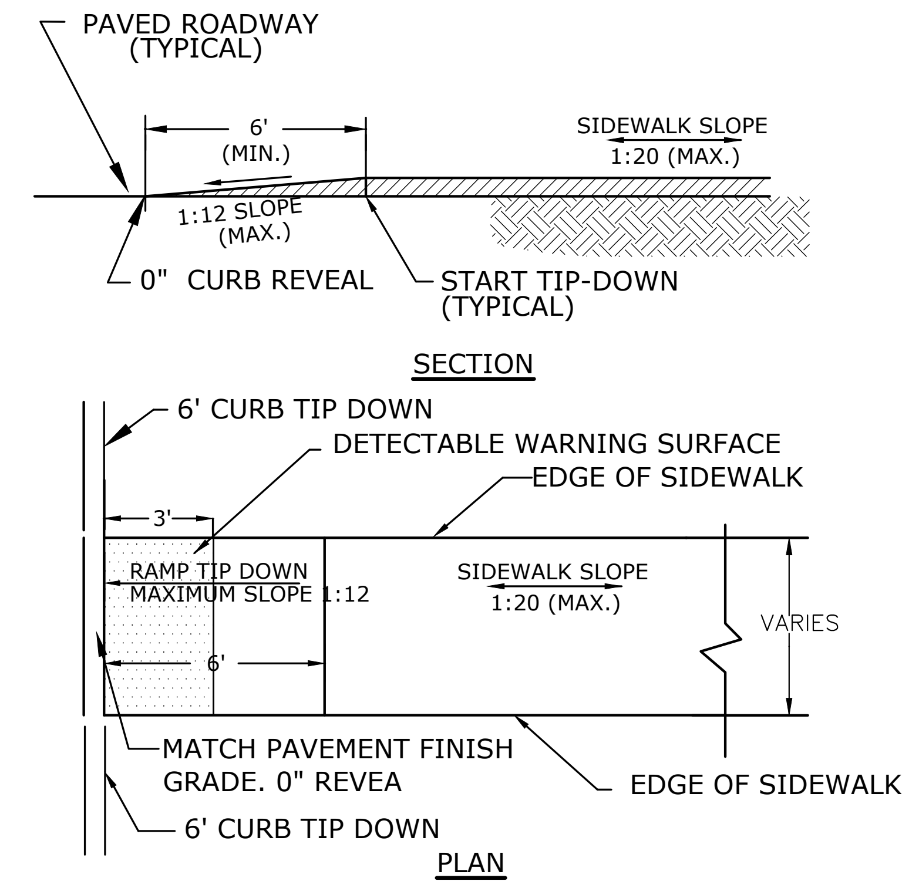
NO SCALE



NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS
2. PROVIDE 6" COMPACTED CRUSHED GRAVEL BASE BENEATH RAMPS.
3. DETECTABLE WARNING STRIP SHALL BE NEENAH R-4984-36B-R4984007 24" X 36" CAST IRON ADA PLATE. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

CORNER TIP DOWN RAMP

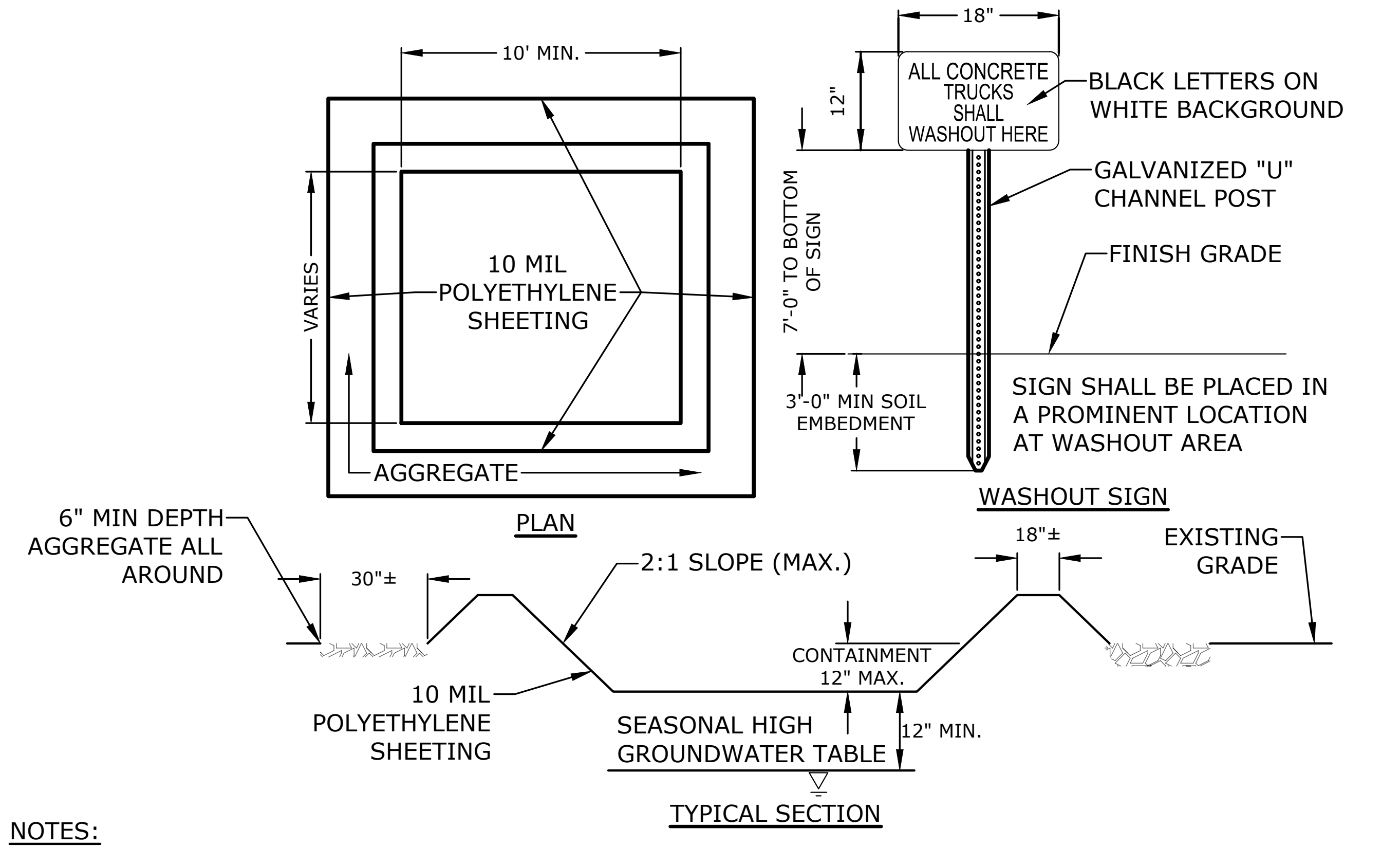
NO SCALE



NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS
2. PROVIDE 6" COMPACTED CRUSHED GRAVEL BASE BENEATH RAMPS.
3. DETECTABLE WARNING STRIP SHALL BE NEENAH R-4984-36B-R4984007 24" X 36" CAST IRON ADA PLATE. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

SIDEWALK TIP-DOWN RAMP

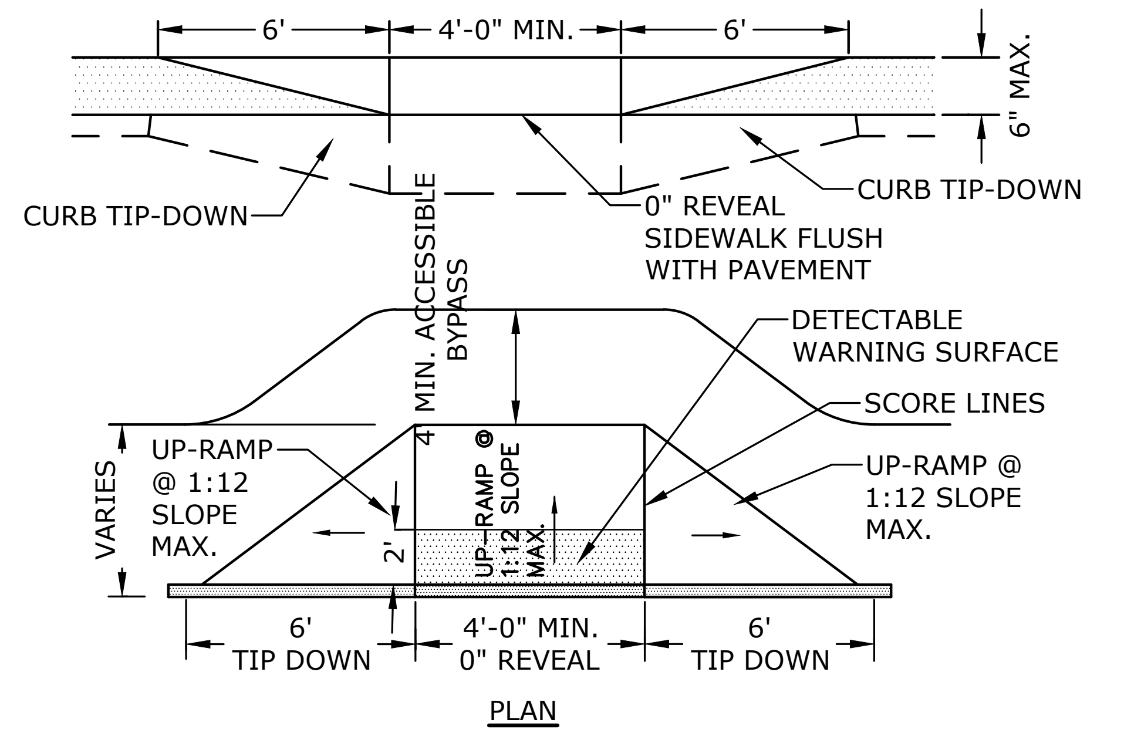
NO SCALE



NOTES:
1. CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
3. WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75% FULL.
4. WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS.
5. ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
6. AT LEAST WEEKLY REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

CONCRETE WASHOUT AREA

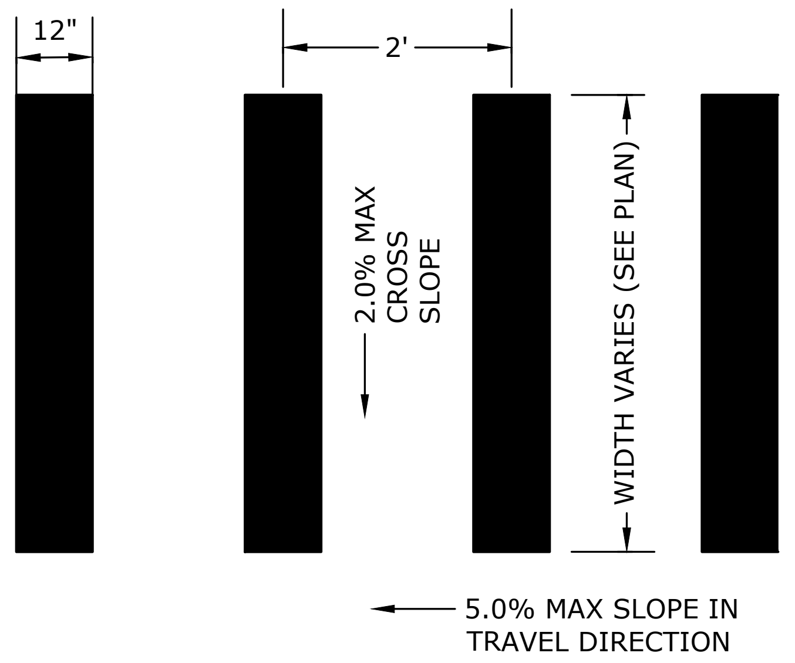
NO SCALE



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

CONCRETE WHEELCHAIR ACCESSIBLE RAMP

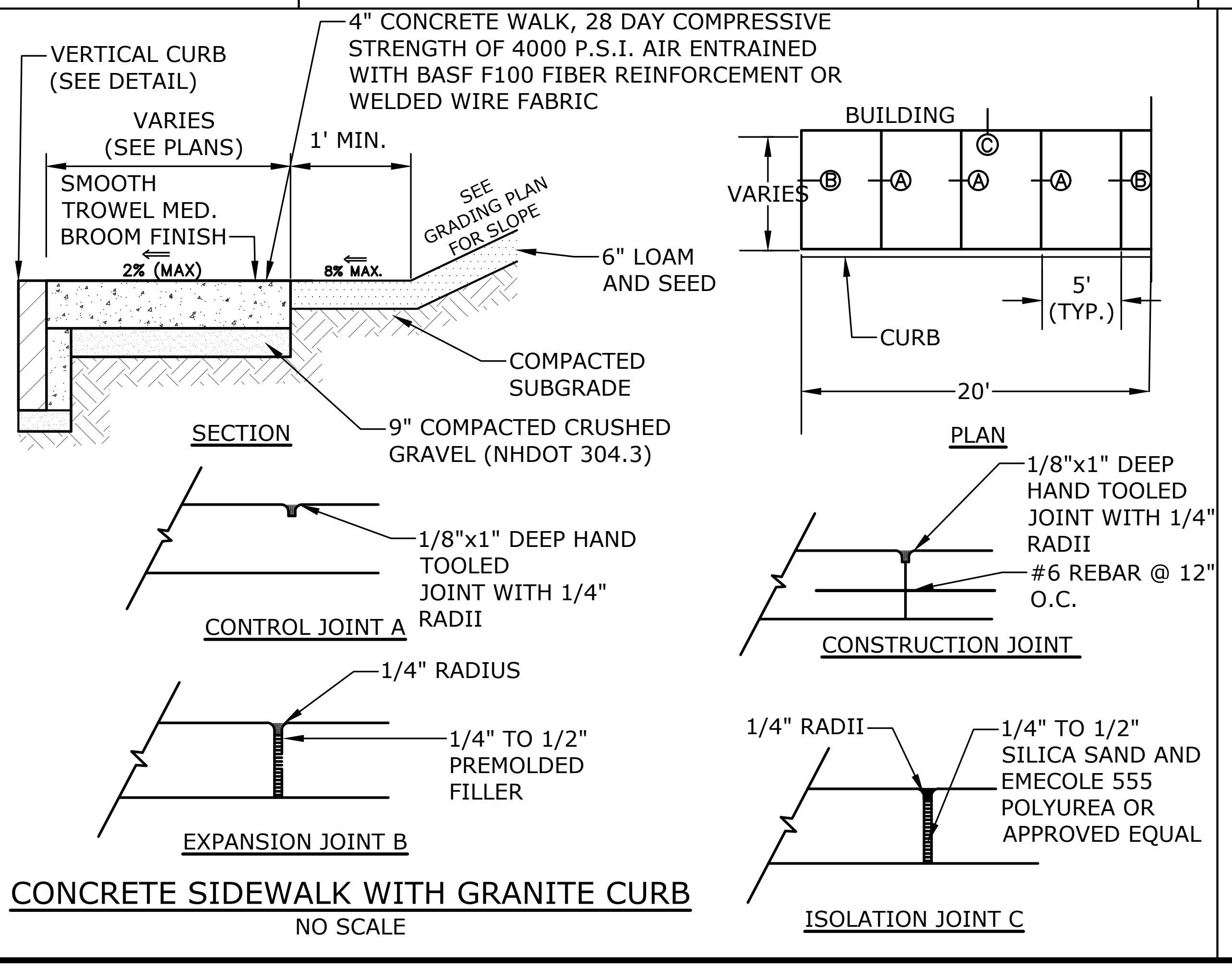
NO SCALE



NOTE:
STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

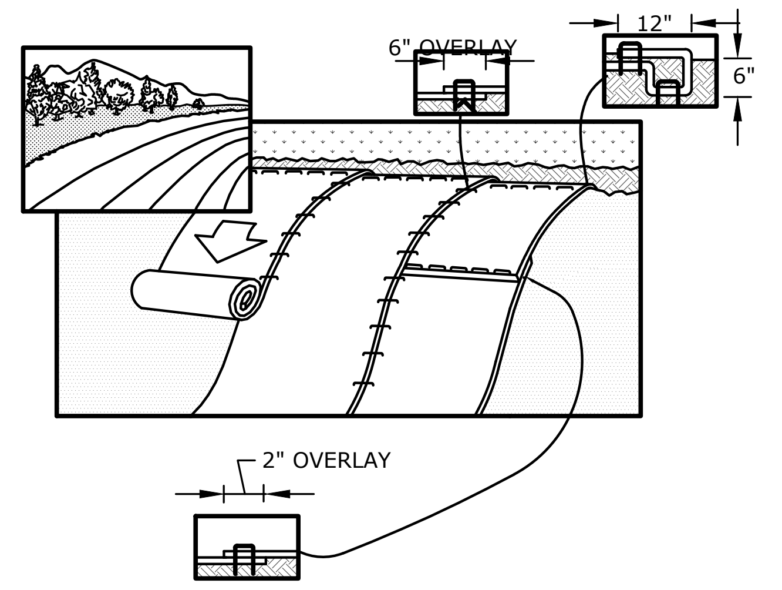
CROSSWALK STRIPING

NO SCALE



CONCRETE SIDEWALK WITH GRANITE CURB

NO SCALE



NOTES:
1. EROSION CONTROL BLANKET SHALL BE AN ALL NATURAL PRODUCT WITH NO PHOTO DEGRADABLE COMPONENTS, NORTH AMERICAN GREEN SC150BN OR APPROVED EQUAL.
2. STAKES SHALL BE BIODEGRADABLE BIOSTAKES OR ALL NATURAL WOOD ECOSTAKES OR APPROVED EQUAL. THE LENGTH OF STAKES SHALL BE BASED OFF OF THE MANUFACTURERS RECOMMENDATION.
3. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, COMPOST AND SEED.
4. INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTION.

EROSION CONTROL BLANKET

NO SCALE

Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
M	9/27/2023	P.B. Submission
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H	12/10/2021	Planning Board Stipulation
G	8/19/2019	Admin. Approval Submission
F	11/6/2018	P.B. Submission

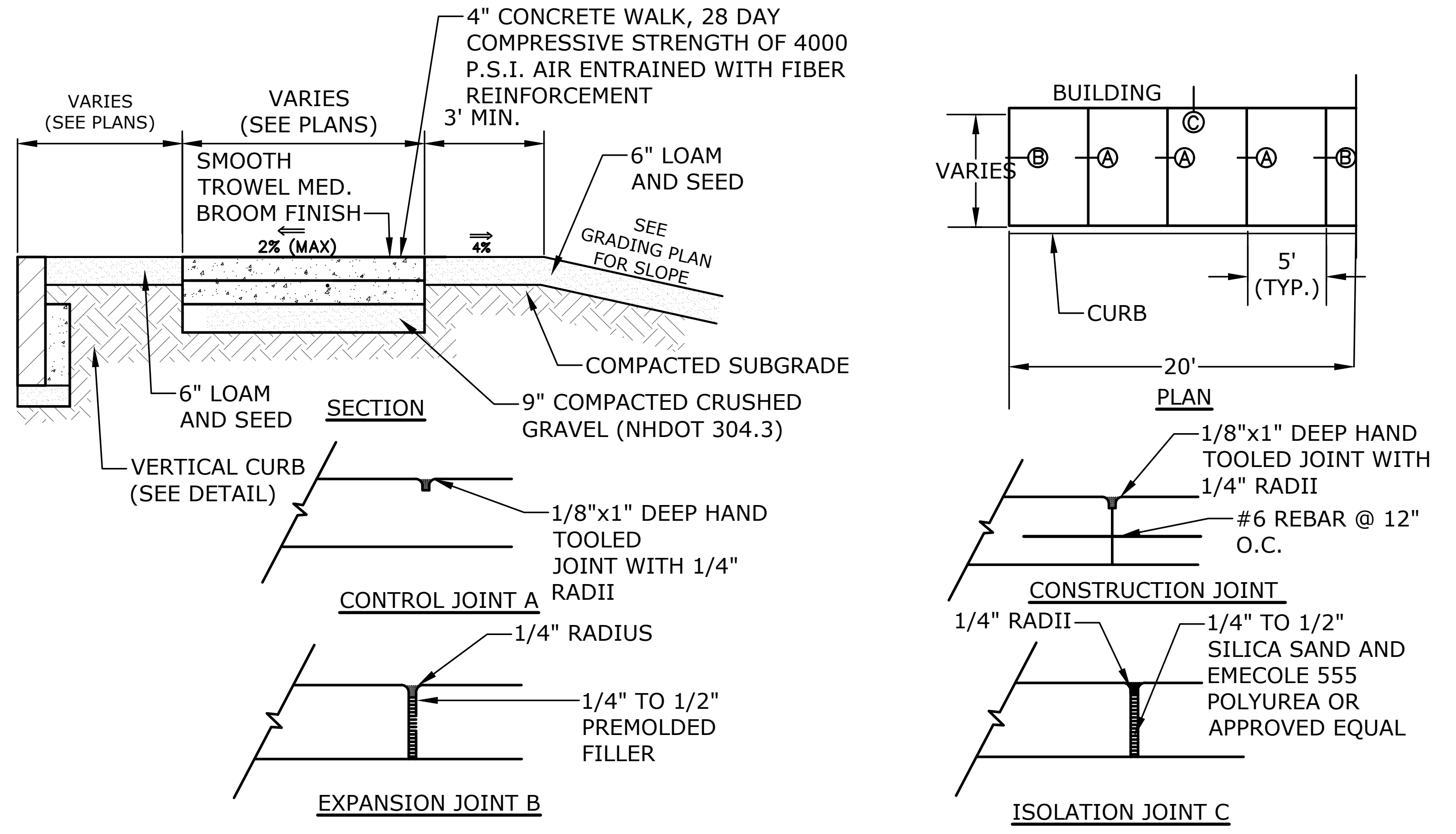
PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DTLS.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

DETAILS SHEET

SCALE: AS SHOWN

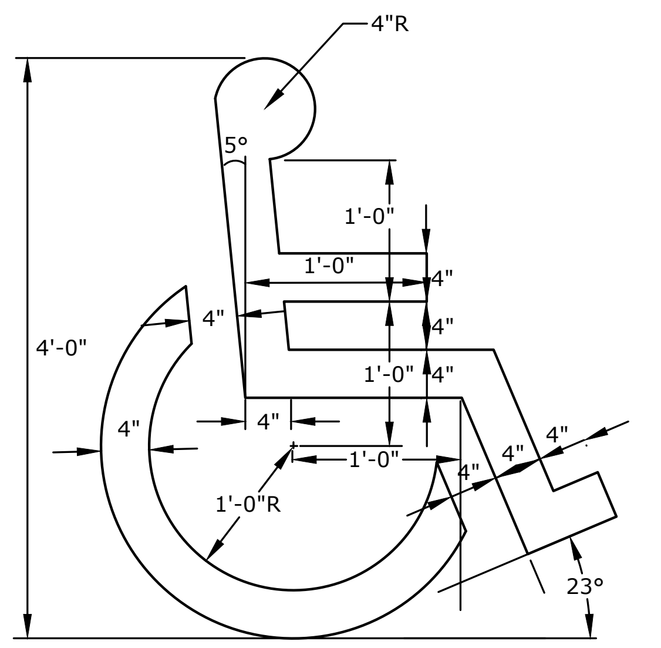
C-502

Last Save Date: September 27, 2023 1:49 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DTLS.dwg Layout Tab: C-502



CONCRETE SIDEWALK WITH GRANITE CURB ALONG CORPORATE DRIVE

NO SCALE

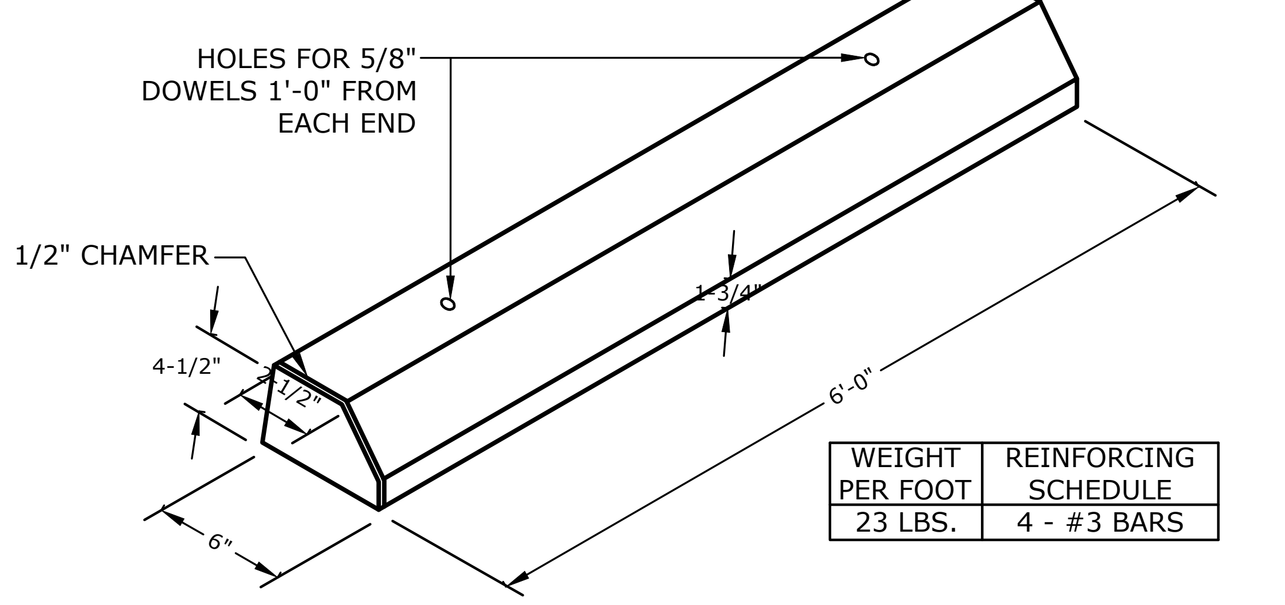


NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING WHITE THERMOPLASTIC, REFLECTORIZED PAVEMENT PARKING MATERAL MEETING THE REQUIREMENTS OF ASTM D 4505.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL

NO SCALE

QUALITY CONTROLLED - AIR ENTRAINED CONCRETE



WEIGHT PER FOOT	REINFORCING SCHEDULE
23 LBS.	4 - #3 BARS

NOTE:
1. CURBING TO BE PINNED THROUGH ASPHALT PAVEMENT.

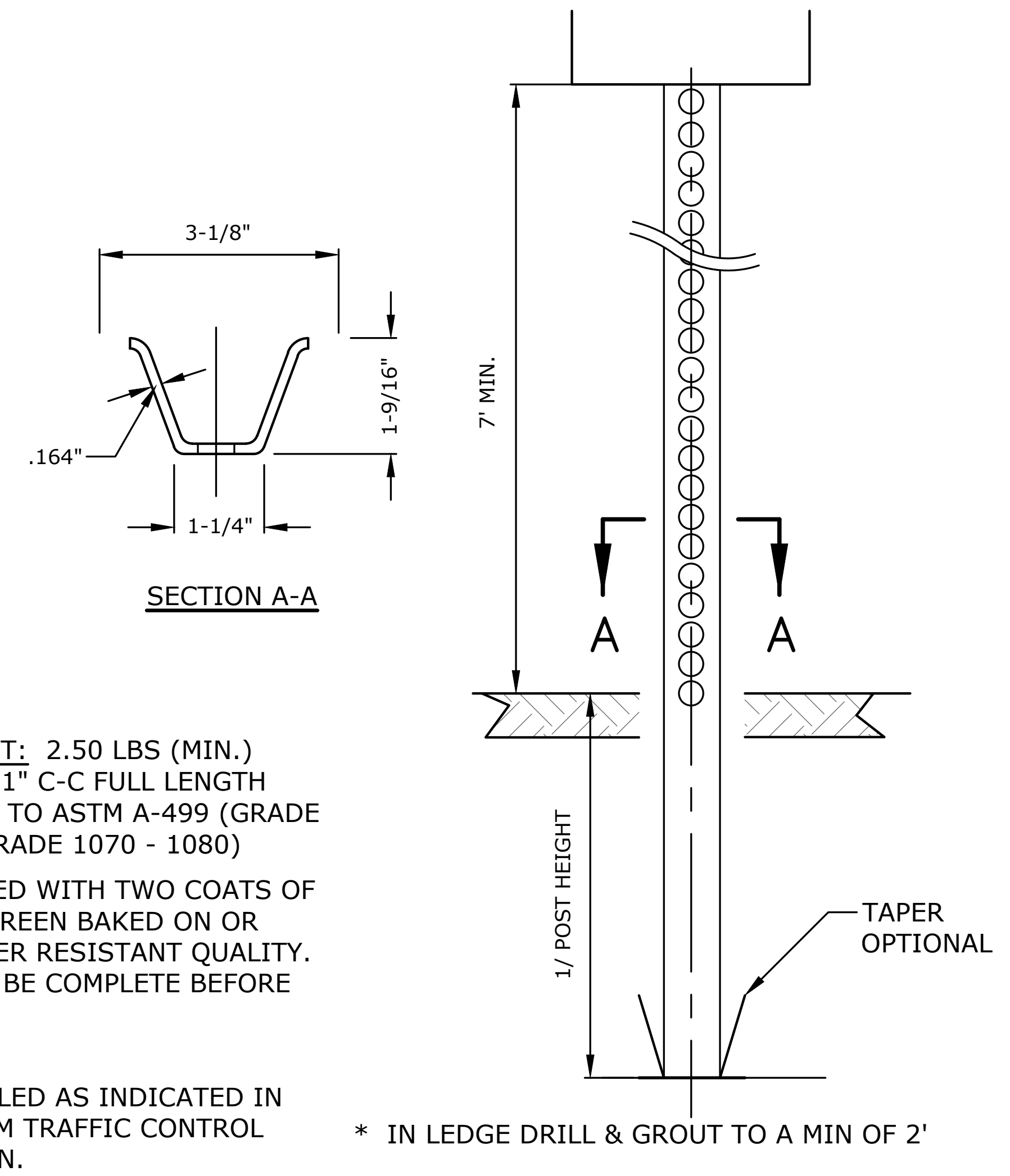
CONCRETE WHEEL STOP

NO SCALE

R1-1
30" X 30"
WHITE ON RED

R7-8
12" X 18"
BLUE AND GREEN
ON WHITE

R7-8P
18" X 9"
GREEN ON WHITE



LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASSTM A-576 (GRADE 1070 - 1080)

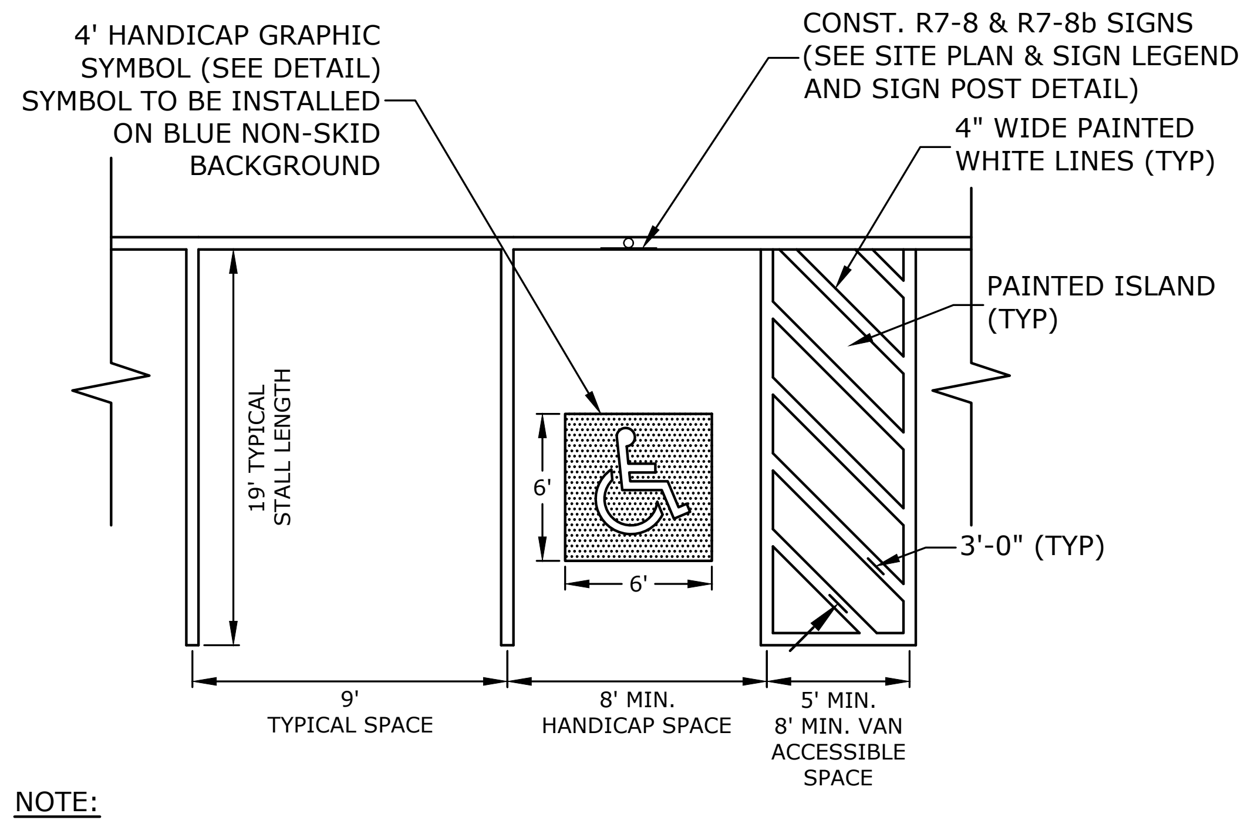
FINISH: SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN BAKED ON OR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

NOTE:
ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

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

SIGN LEGEND & SIGN POST

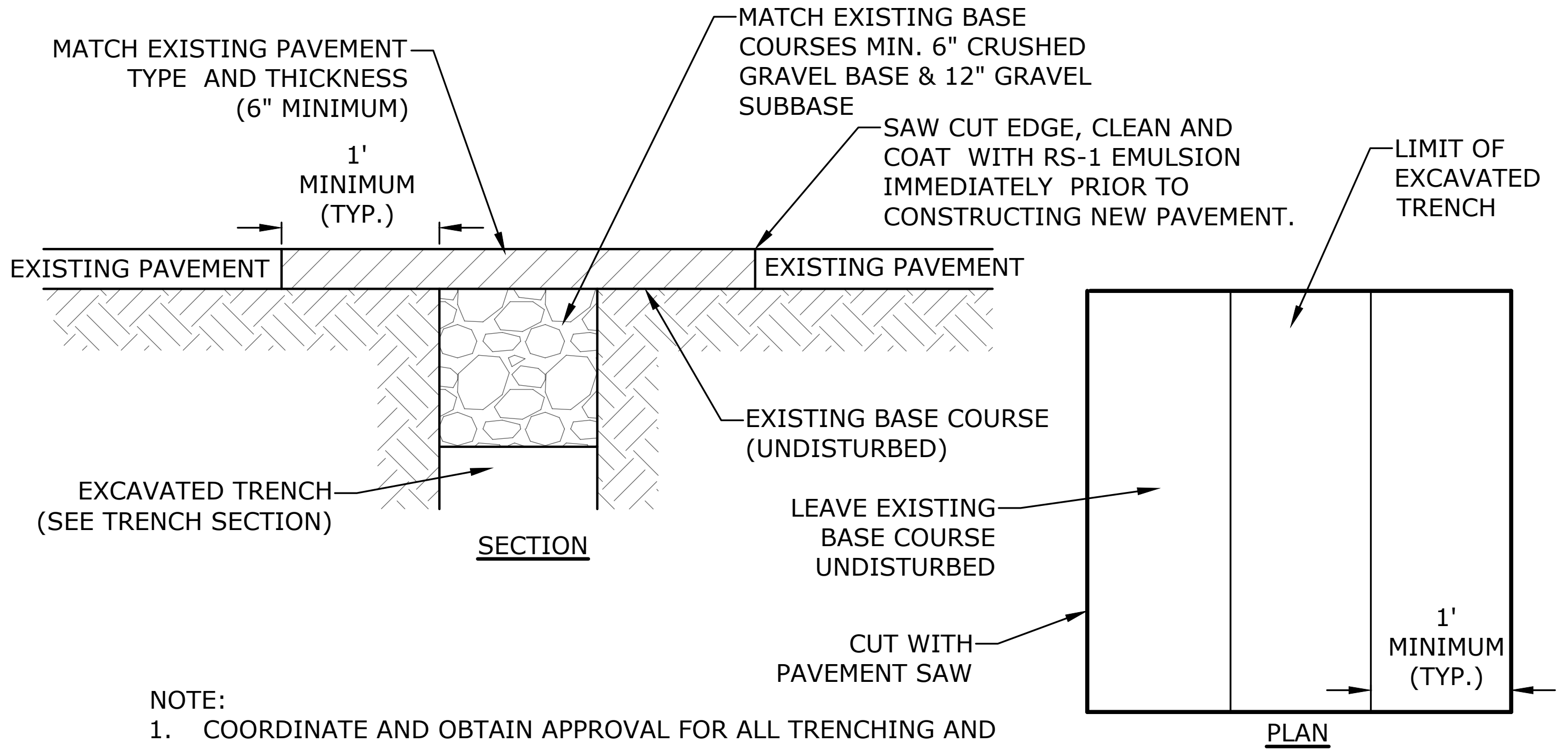
NO SCALE



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

STALL STRIPING-SINGLE STRIPE

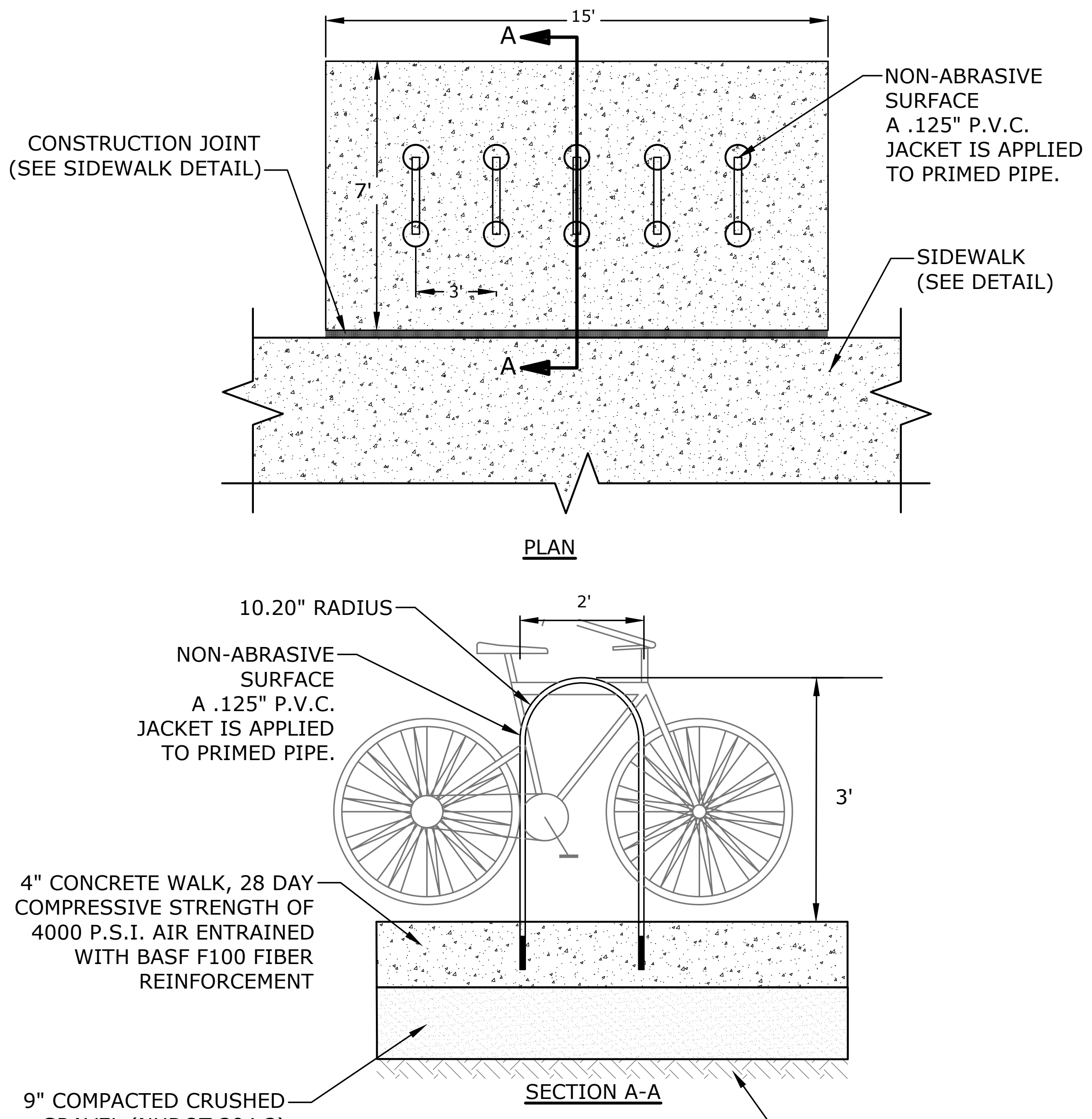
NO SCALE



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

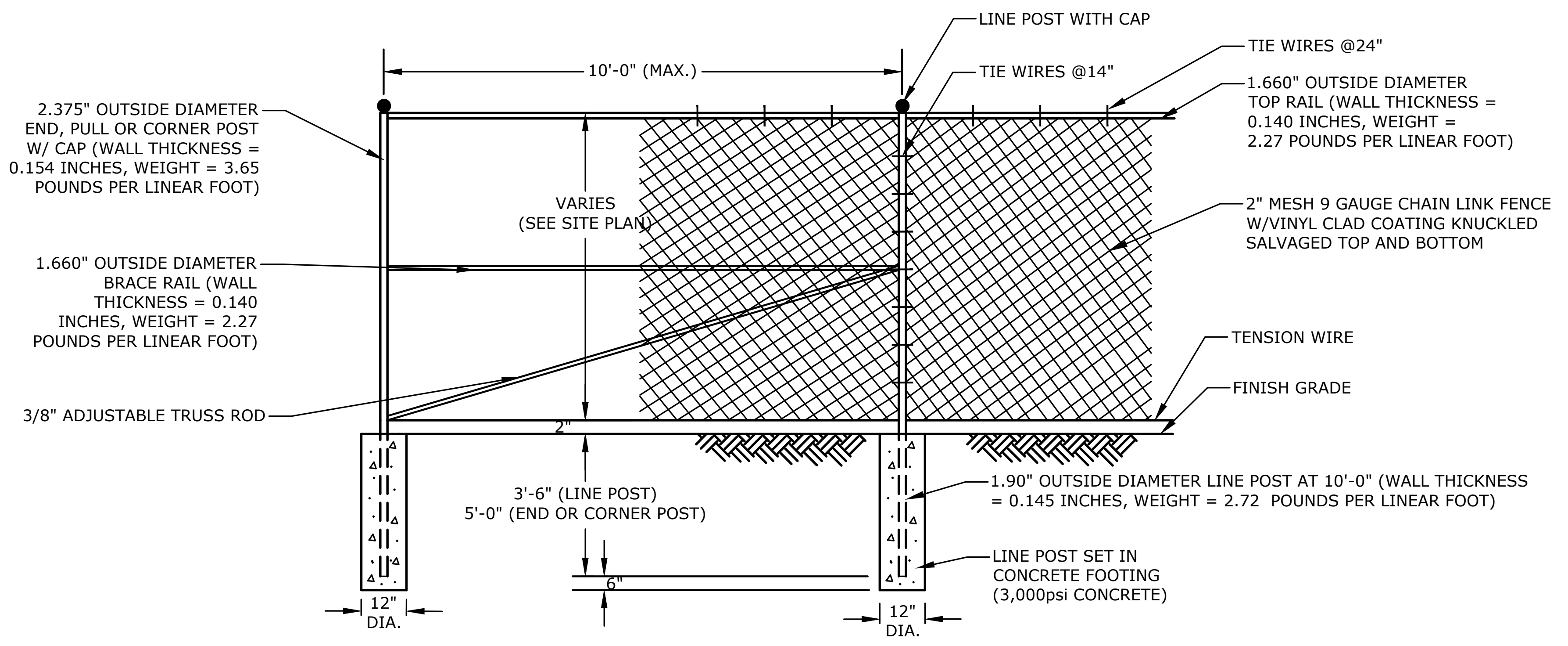
ROADWAY TRENCH PATCH

NO SCALE



BIKE RACK

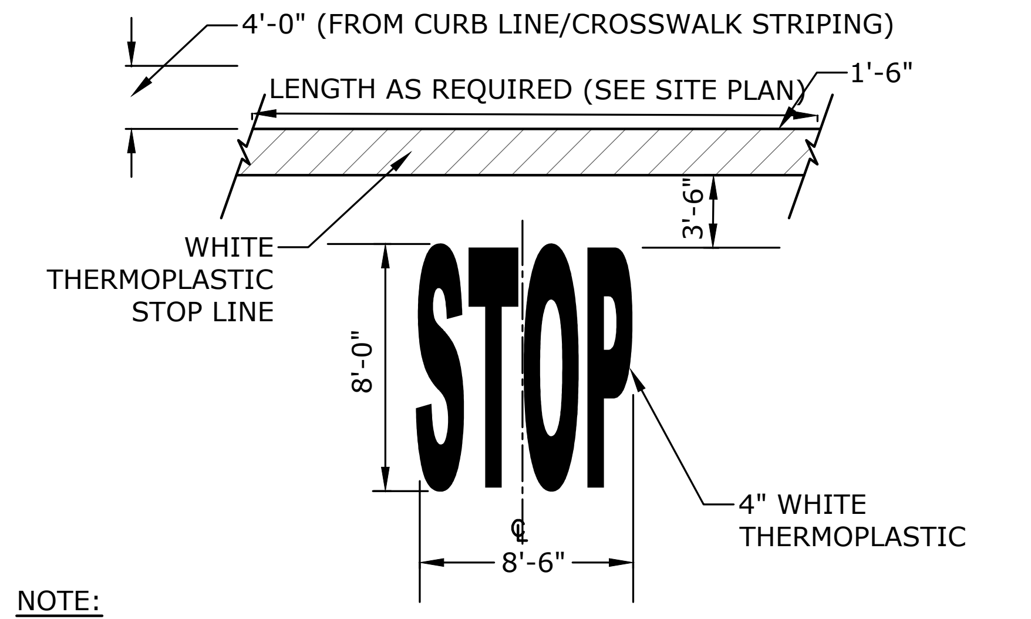
NO SCALE



NOTES:
1. CORNER POSTS SHALL BE USED AT SHARP BREAKS IN GRADE AND CHANGES IN HORIZONTAL ALIGNMENT OF 15' OR MORE.
2. POSTS, RAILS & BRACES SHALL BE TYPE I, SCHEDULE 40 BLACK VINYL COATED PIPE.
3. FABRIC TO BE BLACK VINYL COATED.
4. TIE WIRES SHALL BE 9 GAUGE GALVANIZED STEEL WIRE FOR ATTACHMENT OF FABRIC TO LINE POSTS.
5. TIE WIRES SHALL BE 13 GAUGE GALVANIZED STEEL WIRE FOR ATTACHMENT OF FABRIC TO RAILS AND BRACES.
6. HOG RING TIES SHALL BE 12- 1/2 GAUGE GALVANIZED STEEL WIRE FOR ATTACHMENT OF FABRIC TO TENSION WIRE.
7. COORDINATE FINAL CHAIN LINK FENCE DESIGN WITH BUILDING DRAWINGS AND UTILITY YARD CONCRETE SLAB DESIGN.

CHAIN LINK FENCE

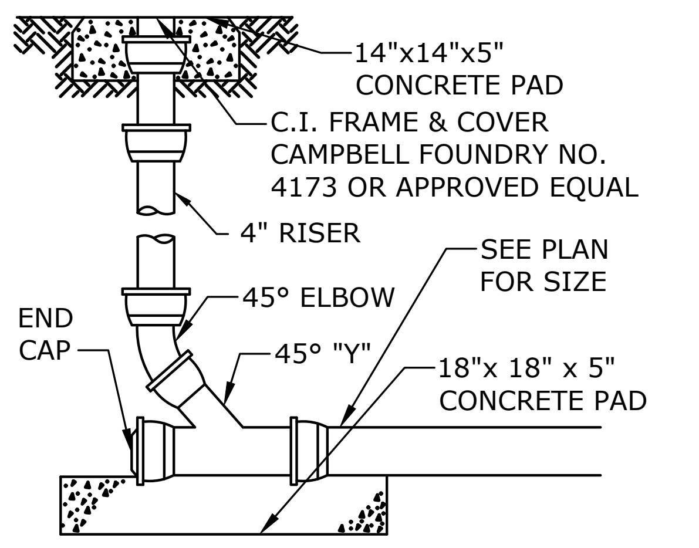
NO SCALE



NOTE:
1. PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.
2. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

STOP BAR AND LEGEND

NO SCALE



CLEAN-OUT

NO SCALE

Tighe&Bond

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

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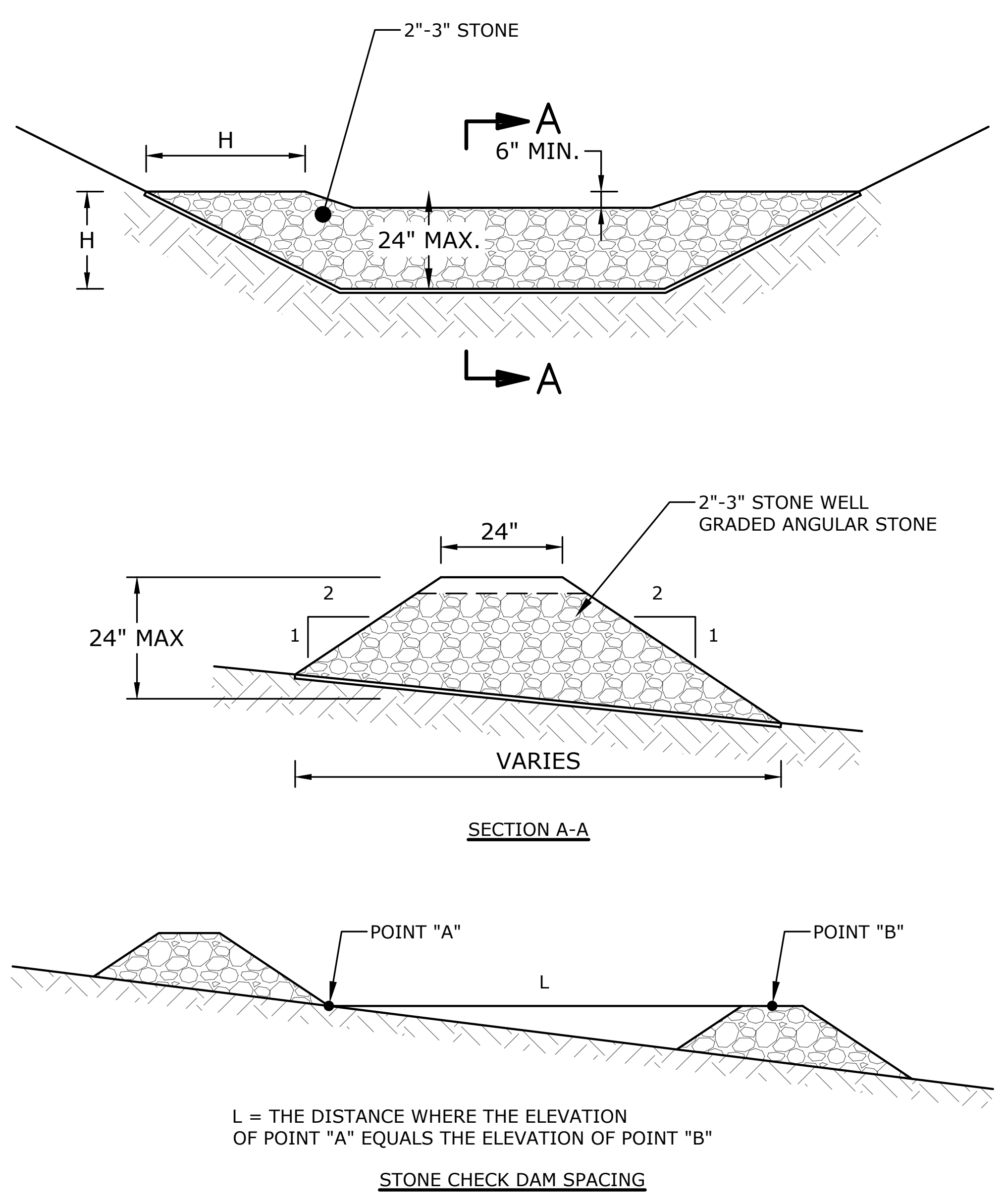
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

DETAILS SHEET

SCALE: AS SHOWN

C-503

Last Save Date: September 27, 2023 1:49 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DTLS.dwg Layout Tab: C-503

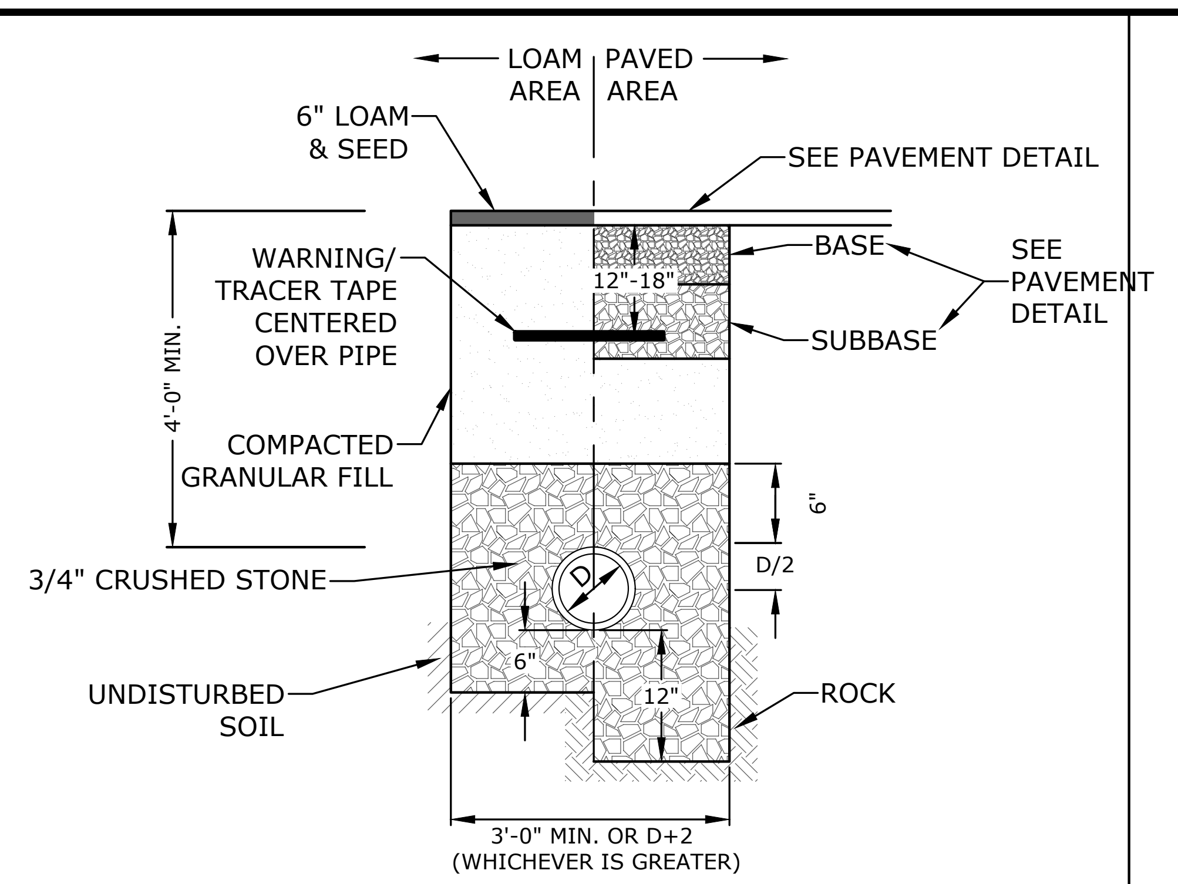


BERM STONE SIZE	
SIEVE DESIGNATION (US CUSTOMARY)	PERCENT BY WEIGHT PASSING SQUARE MESH SIEVES
12 IN	100
6 IN	84-100
3 IN	68-83
1 IN	42-55
NO. 4	8-12

NOTES:

1. CHECK DAMS SHOULD BE INSTALLED BEFORE RUNOFF IS DIRECTED TO THE SWALE OR DRAINAGE DITCH.
2. THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE DAM SHOULD BE LESS THAN ONE ACRE.
3. THE CHECK DAM SHOULD NOT BE USED IN A FLOWING STREAM.
4. CHECK DAMS SHOWN ON THE DRAWINGS SHALL BE LEFT IN PLACE PERMANENTLY.
5. CHECK DAMS INSTALLED AS PART OF TEMPORARY EROSION CONTROL MEASURE SHALL BE REMOVED ONCE THE SWALE OR DITCH HAS BEEN STABILIZED:
   a. IN TEMPORARY DITCHES AND SWALES, CHECK DAMS SHOULD BE REMOVED AND THE DITCH FILLED IN WHEN IT IS NO LONGER NEEDED
   b. IN PERMANENT STRUCTURES, CHECK DAMS SHOULD BE REMOVED WHEN PERMANENT LINING HAS BEEN ESTABLISHED. IF THE PERMANENT LINING IS VEGETATION, THEN THE CHECK DAM SHOULD BE RETAINED UNTIL THE GRASS HAS MATURED TO PROTECT THE DITCH OR SWALE. THE AREA BENEATH THE CHECK DAM MUST BE SEEDED AND MULCHED IMMEDIATELY AFTER REMOVAL.

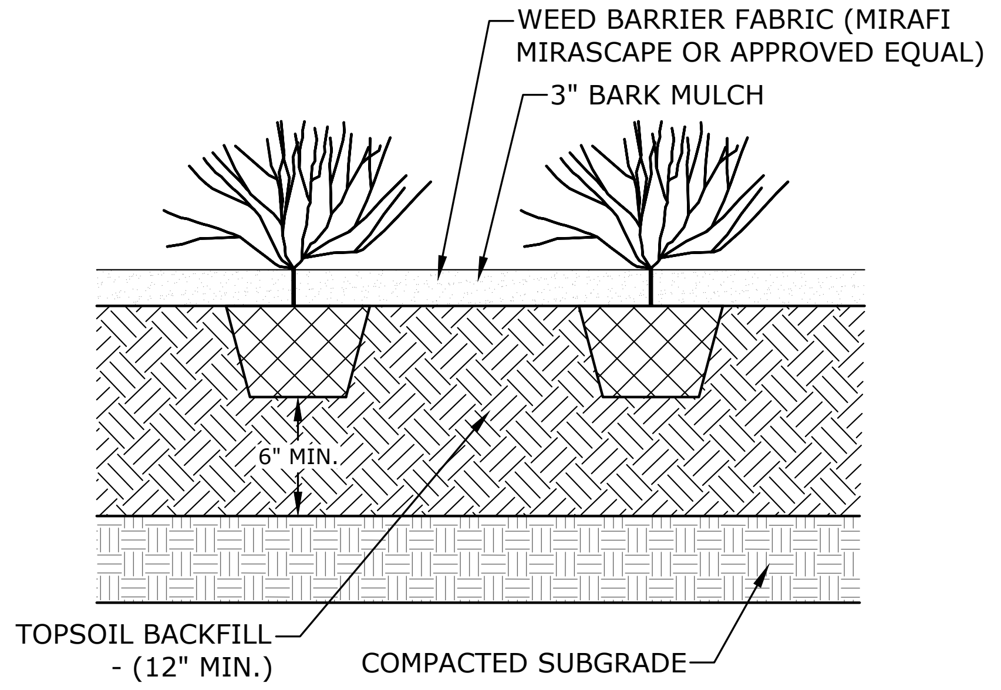
STONE CHECK DAM
NO SCALE



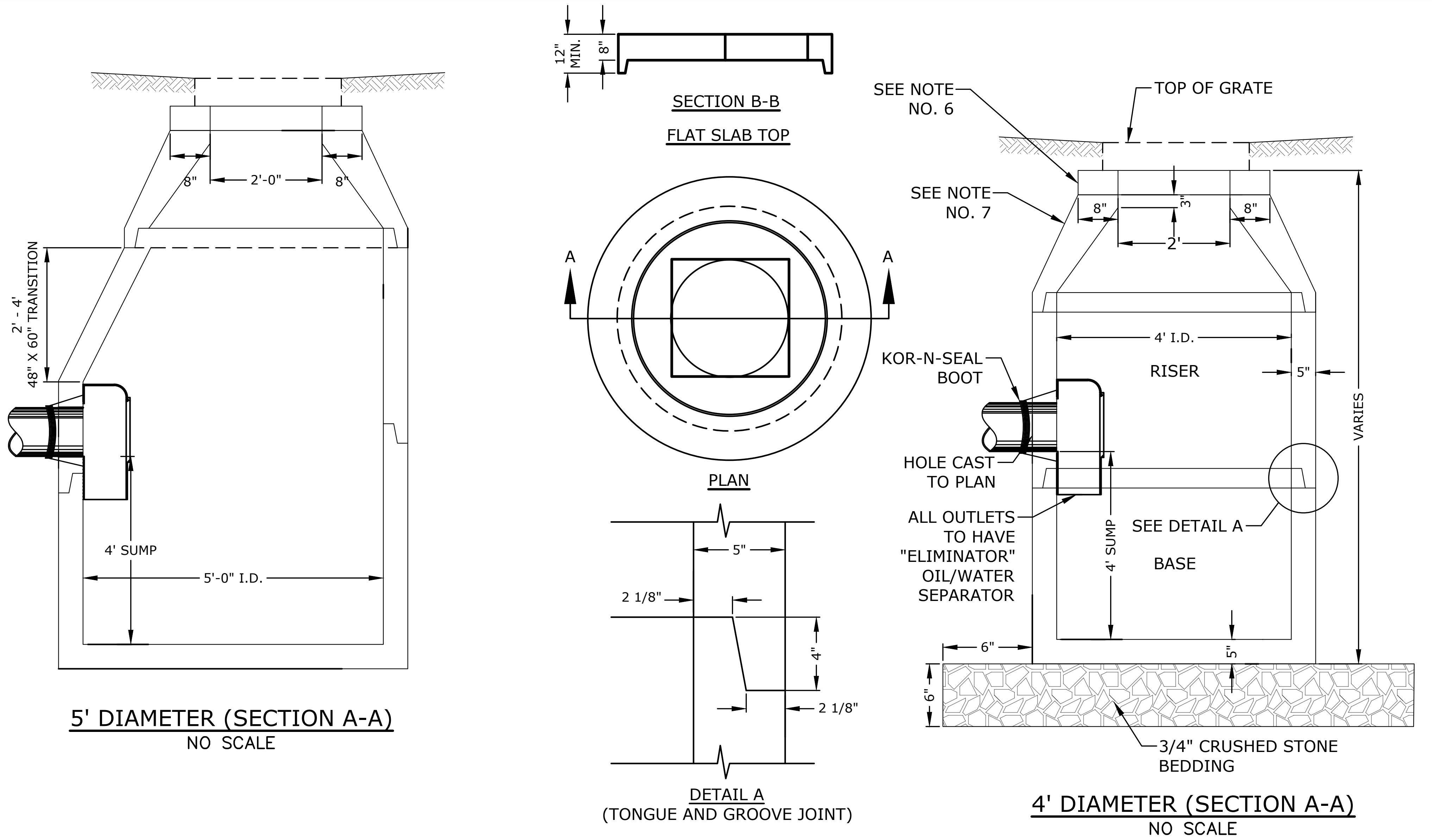
NOTE:

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

STORM DRAIN TRENCH
NO SCALE



PERENNIAL PLANTING
NO SCALE



5' DIAMETER (SECTION A-A)
NO SCALE

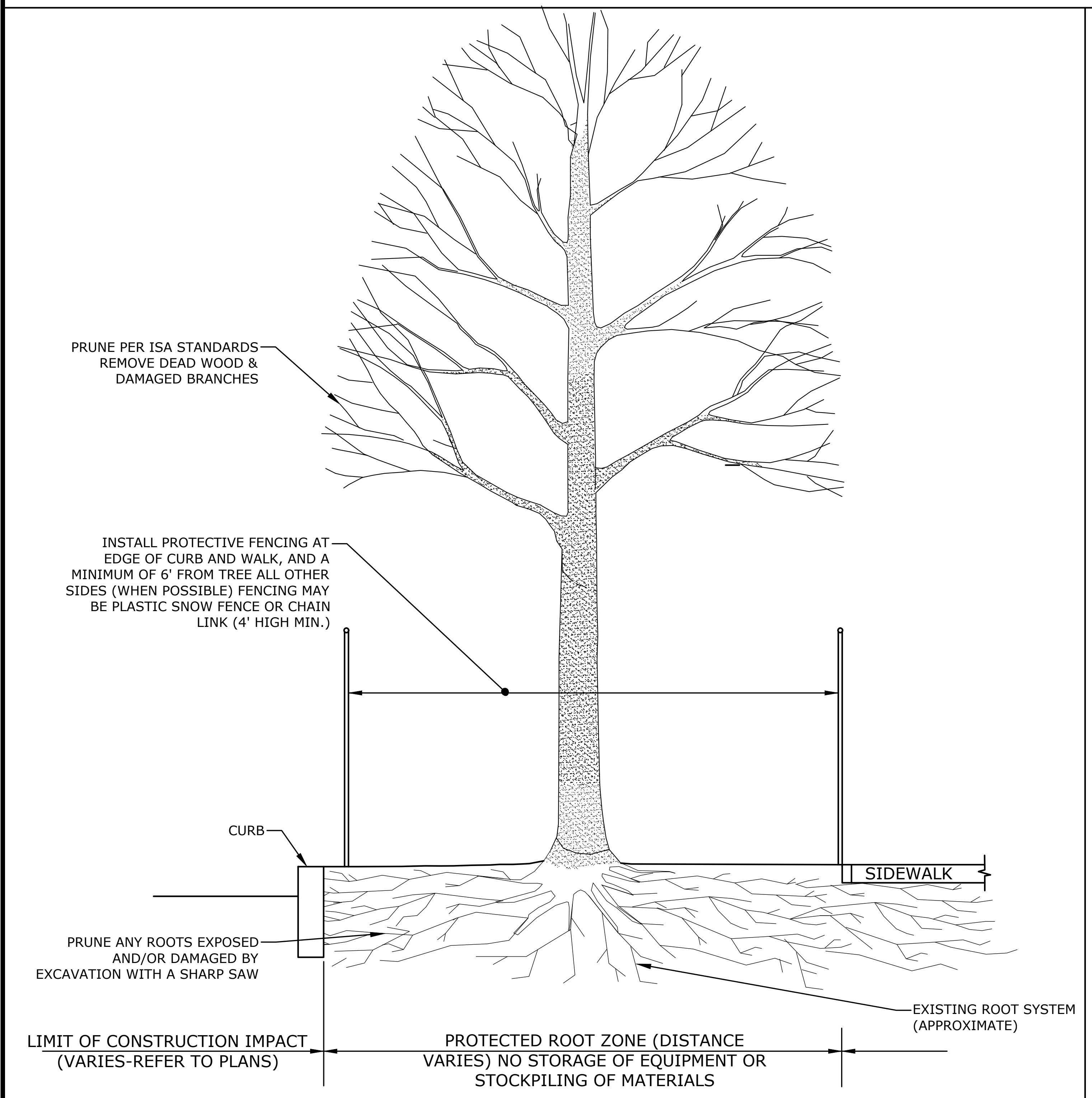
DETAIL A
(TONGUE AND GROOVE JOINT)

4' DIAMETER (SECTION A-A)
NO SCALE

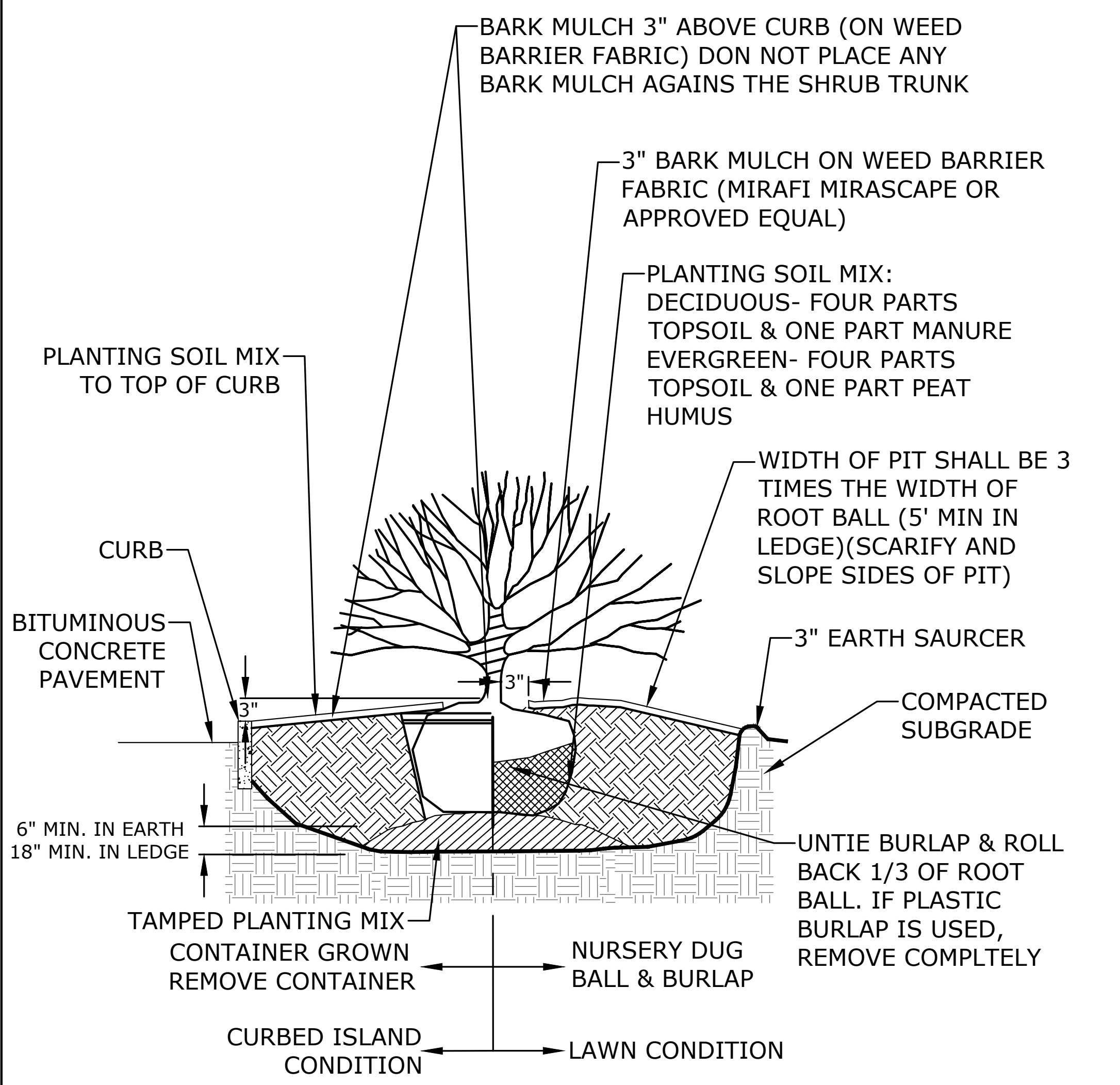
NOTES:

1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. CONE SECTIONS MAY BE EITHER CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

CATCH BASIN DETAIL
NO SCALE

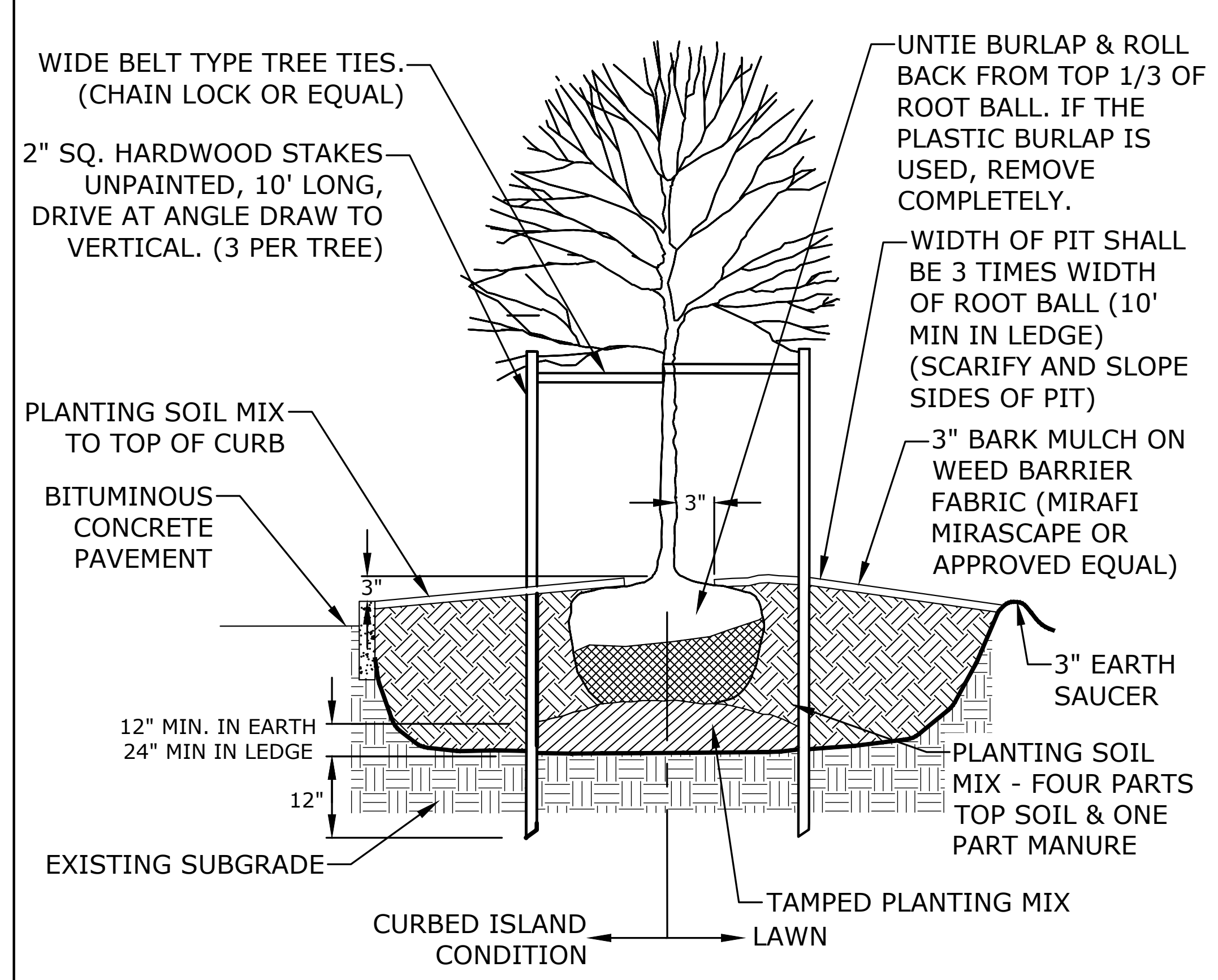


TREE PROTECTION FOR EXISTING TREE
NO SCALE



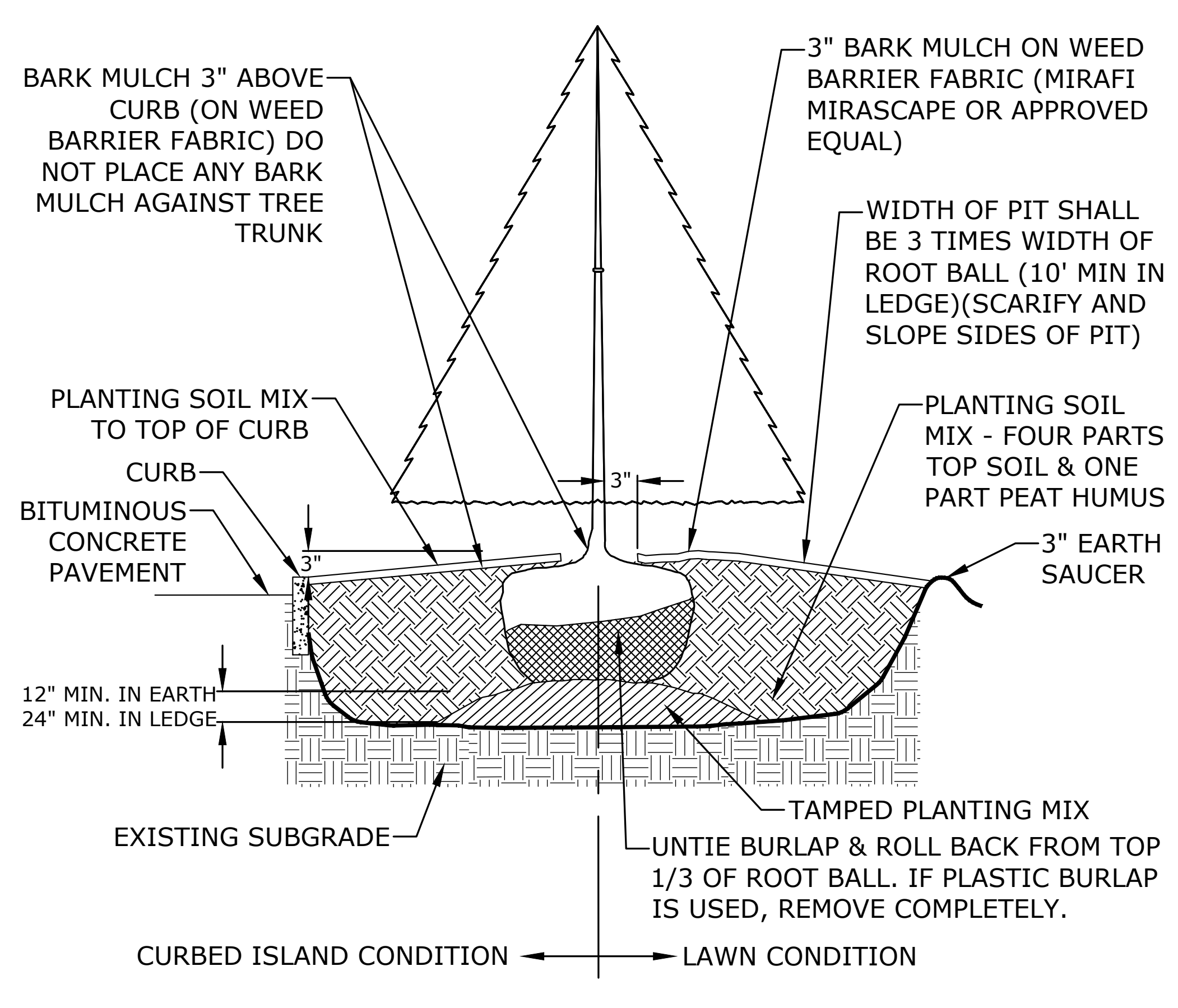
SHRUB PLANTING
NO SCALE

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



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

DECIDUOUS TREE PLANTING
NO SCALE



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

EVERGREEN TREE PLANTING
NO SCALE

Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
M	9/27/2023	P.B. Submission
L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
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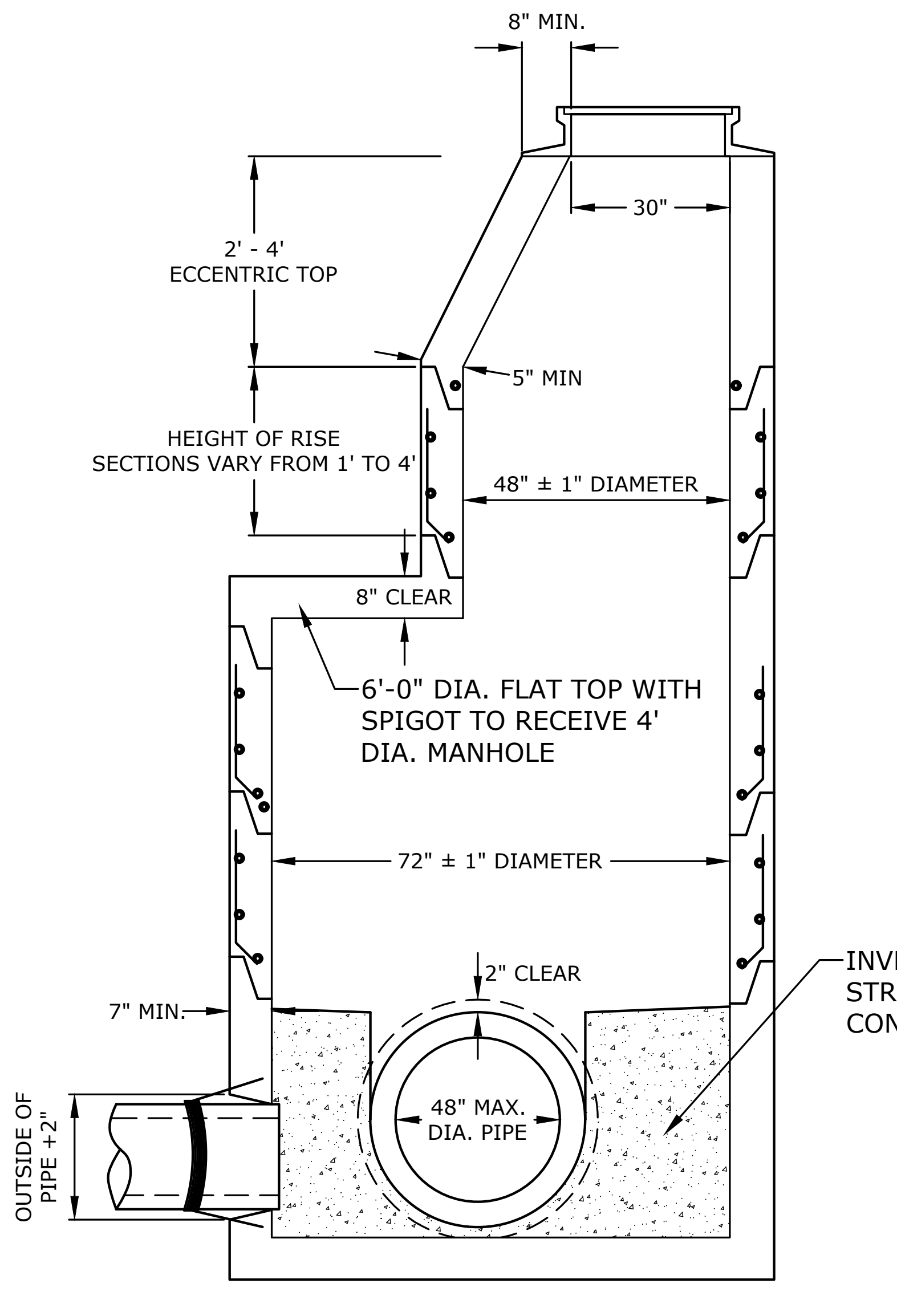
PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DTLS.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

DETAILS SHEET

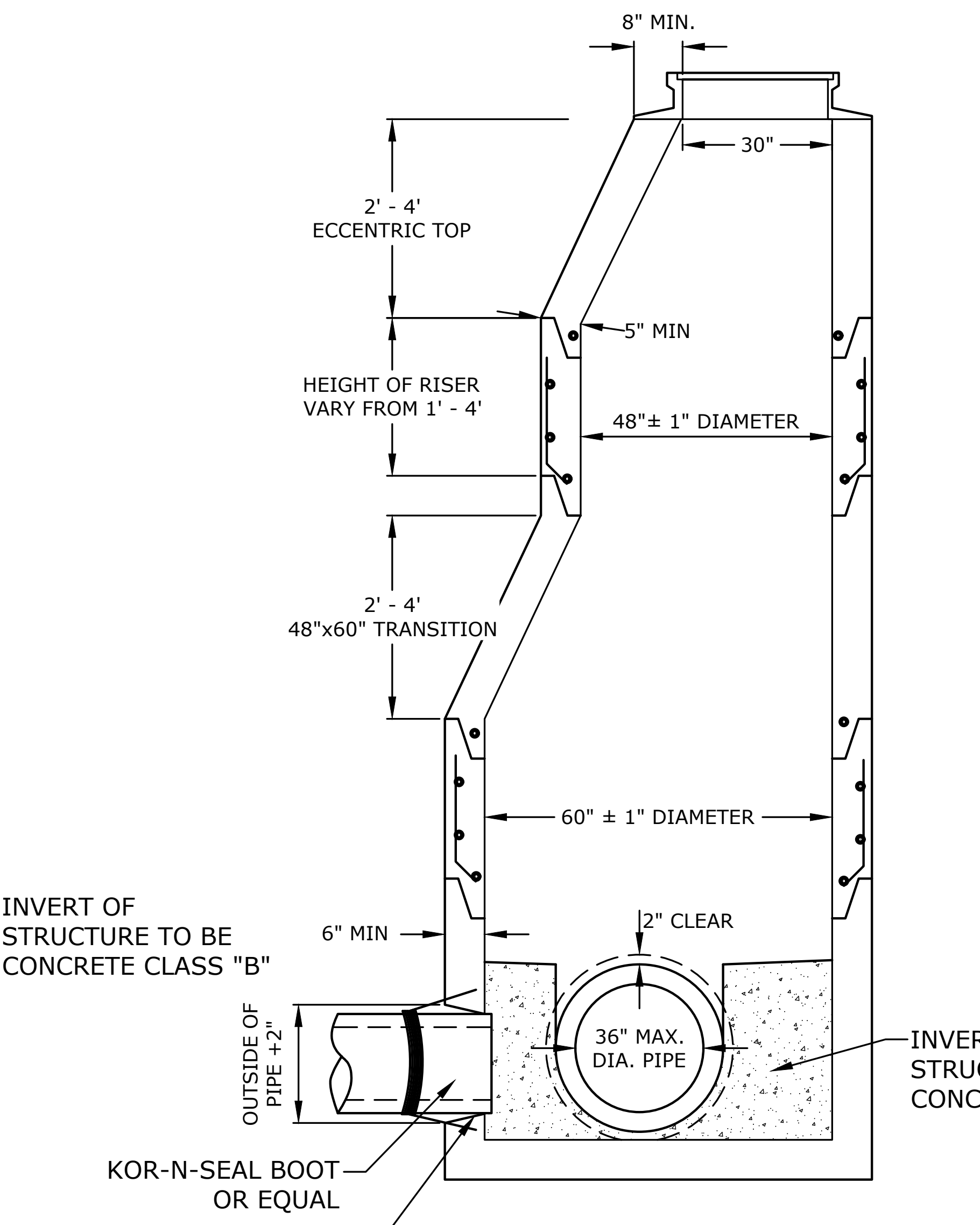
SCALE: AS SHOWN

C-504

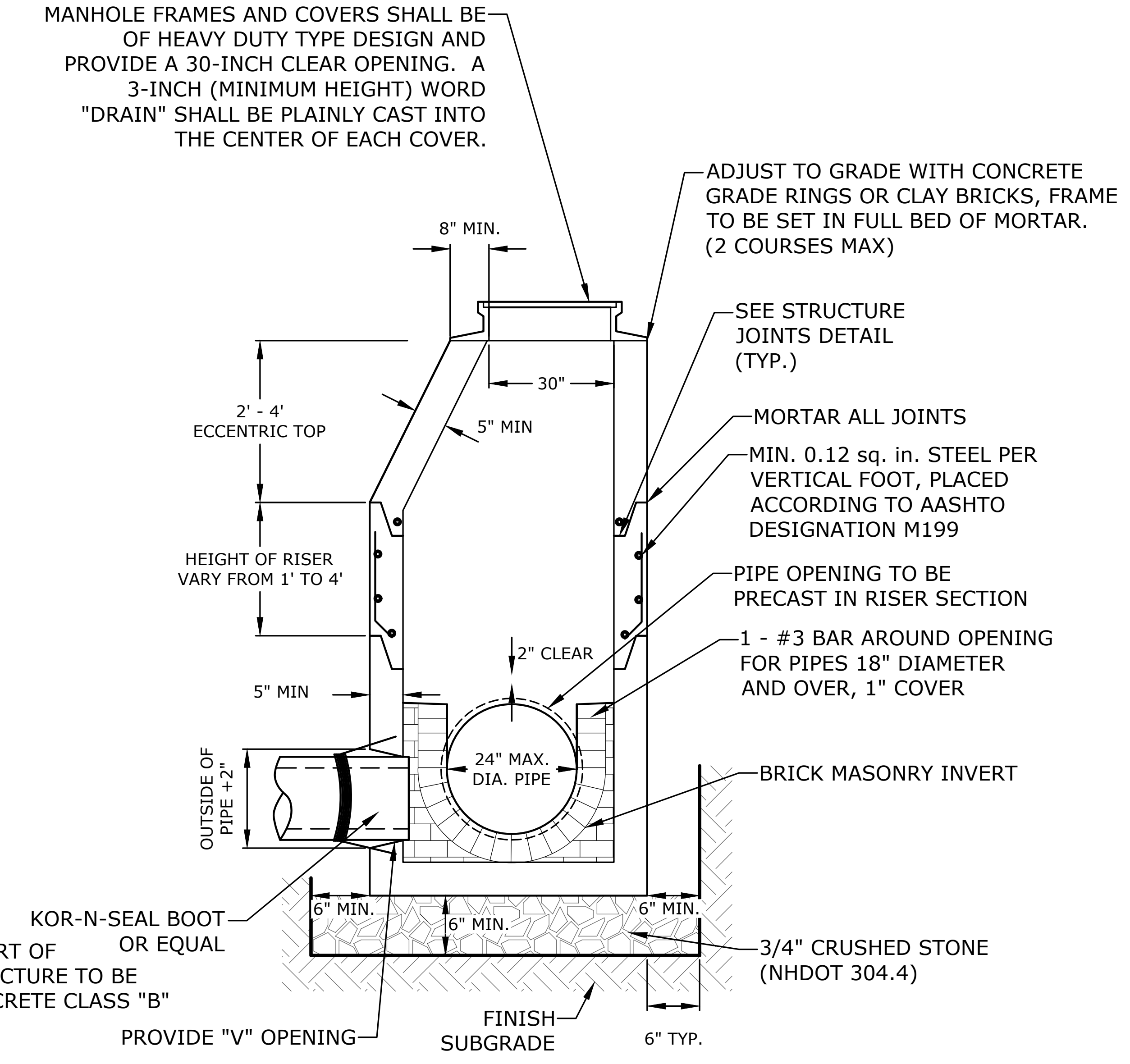
Last Save Date: September 27, 2023 1:49 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DTLS.dwg Layout Tab: C-504



6' DIAMETER DRAIN MANHOLE
NO SCALE



5' DIAMETER DRAIN MANHOLE
NO SCALE



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

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

SEE STRUCTURE JOINTS DETAIL (TYP.)

MORTAR ALL JOINTS

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

PIPE OPENING TO BE PRECAST IN RISER SECTION

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

BRICK MASONRY INVERT

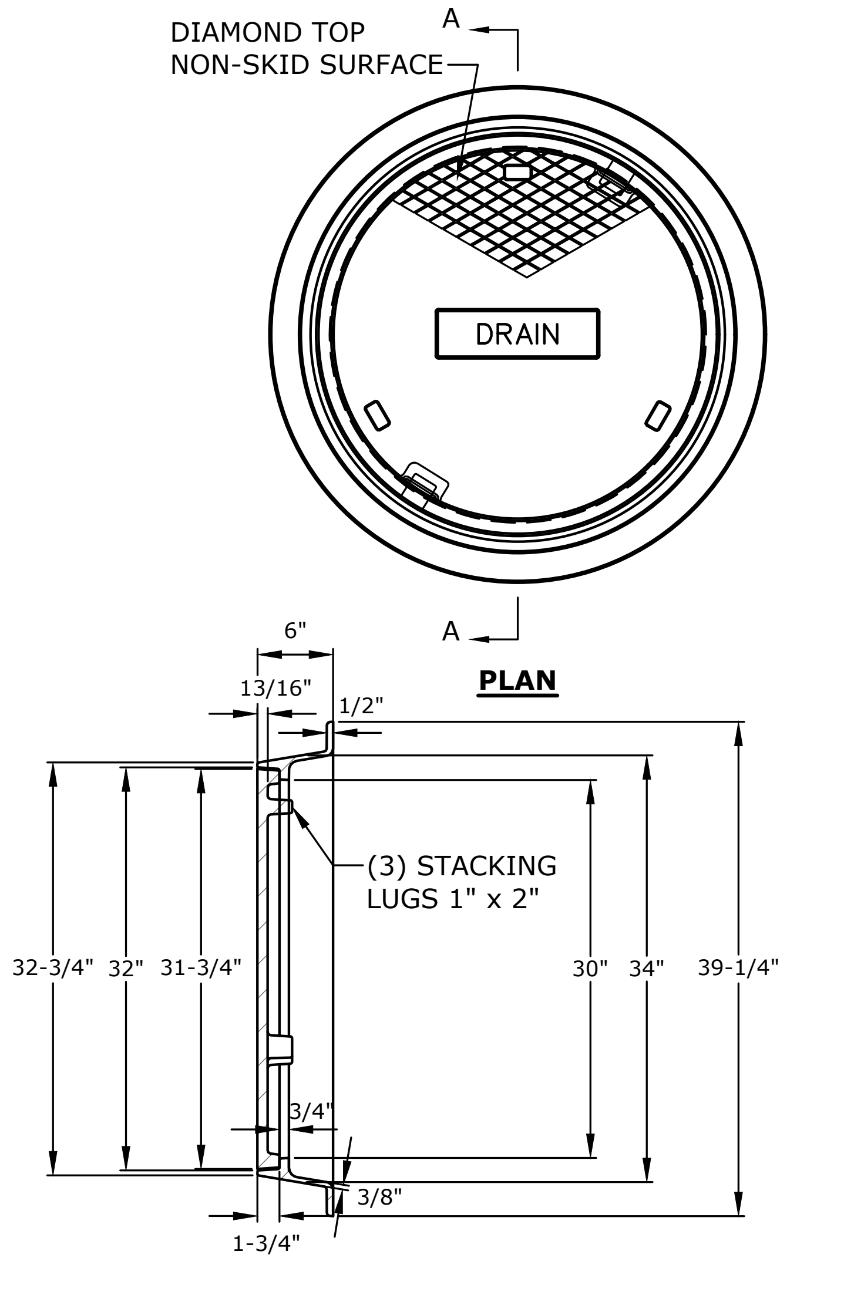
3/4" CRUSHED STONE (NHDOT 304.4)

4' DIAMETER DRAIN MANHOLE
NO SCALE

NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. CONSTRUCT CRUSHED STONE BEDDING AND BACKFILL UNDER (6" MINIMUM THICKNESS)
6. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
7. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
8. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
9. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
10. ALL STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 12" OF INSIDE SURFACE BETWEEN HOLES, NO MORE THAN 75% OF A HORIZNTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINTS.

CORE HOLE SIZE				
PIPE SIZE	RCP CORE HOLE DIA.		PLASTIC CORE HOLE DIA.	
INCHES	INCHES	FEET	INCHES	FEET
6			7	0.6
12	18	1.5	18	1.5
15	22	1.8	20	1.7
18	26	2.2	24	2.0
24	34	2.8	32	2.7
30	42	3.5	42	3.5
36	48	4.0	48	4.0

DIAMETER	WALL THICKNESS (MIN.)	FLOOR THICKNESS (MIN.)
4'	5"	6"
5'	6"	8"
6'	7"	8"



SECTION A-A

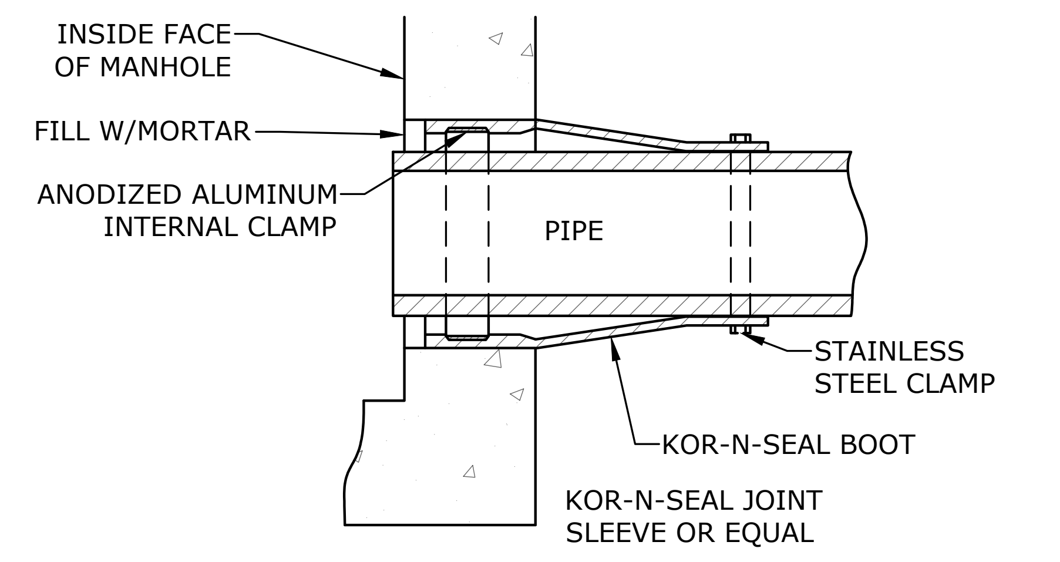
NOTES:
1. ALL DIMENSIONS ARE NOMINAL.
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS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

DRAIN MANHOLE FRAME & COVER
NO SCALE

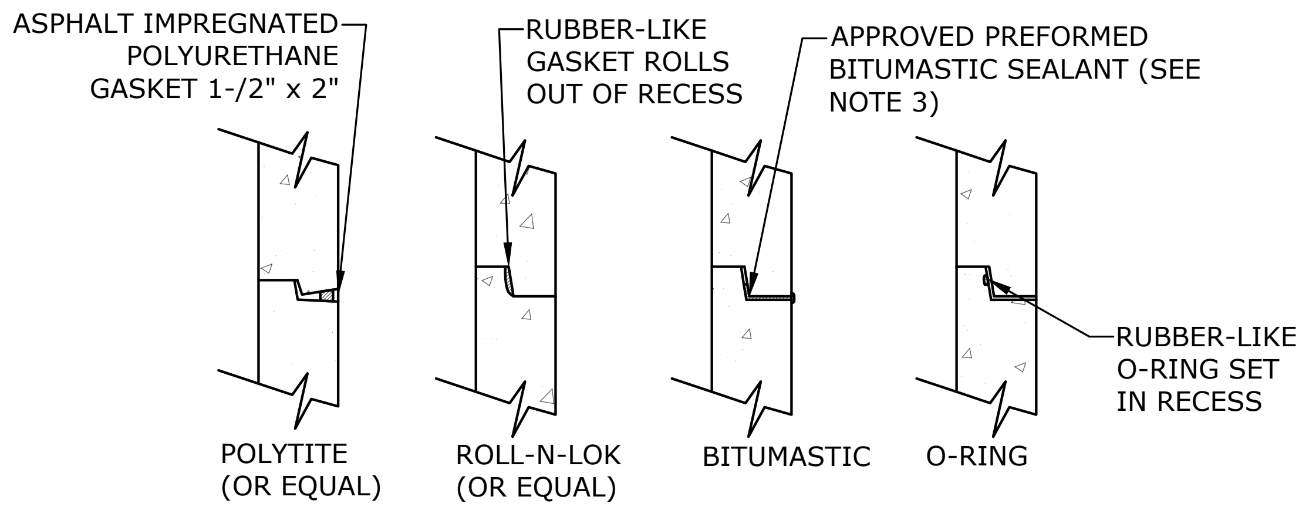
Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023



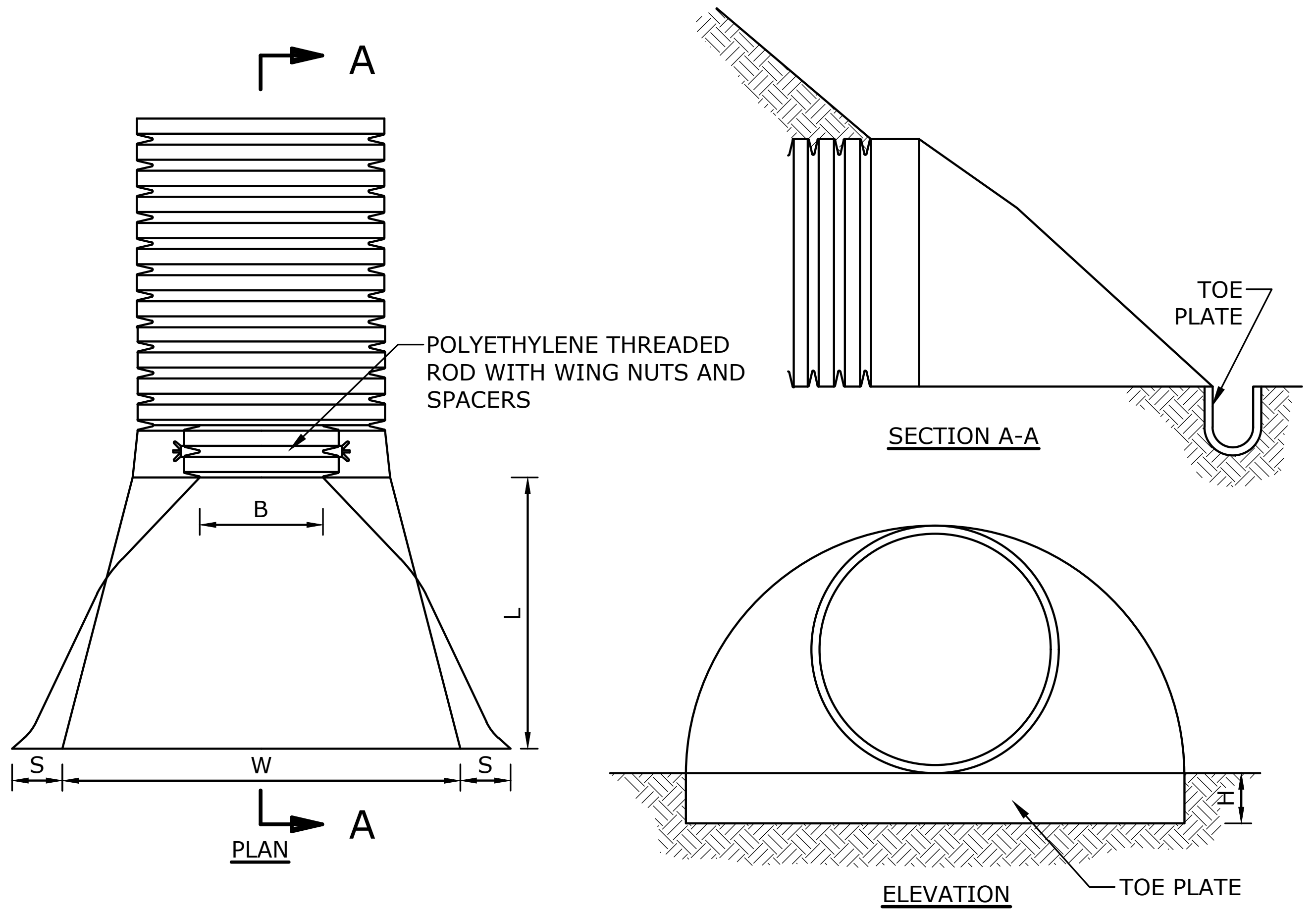
PIPE TO MANHOLE JOINTS



HORIZONTAL JOINTS

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

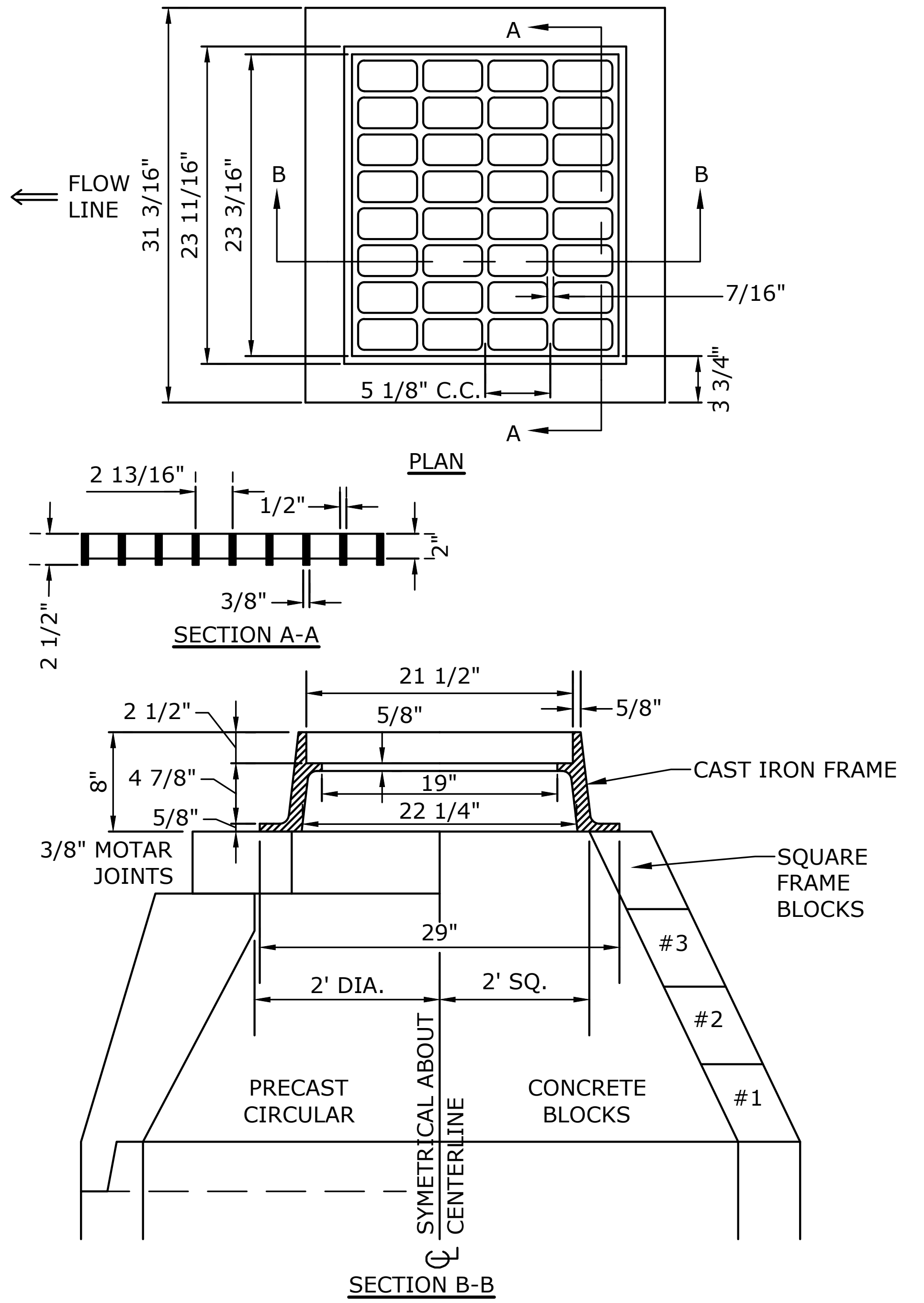
MANHOLE JOINTS
NO SCALE



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

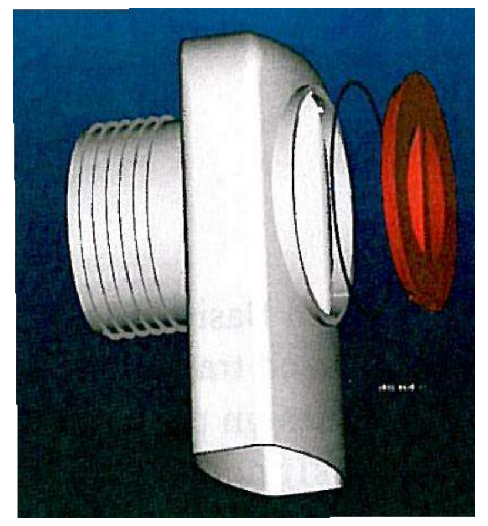
NOTE:
1. END SECTIONS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, COLUMBUS, OHIO. END SECTIONS TO BE WELDED TO PIPE AS PER MANUFACTURER'S RECOMMENDATIONS.

HDPE END SECTION
NO SCALE



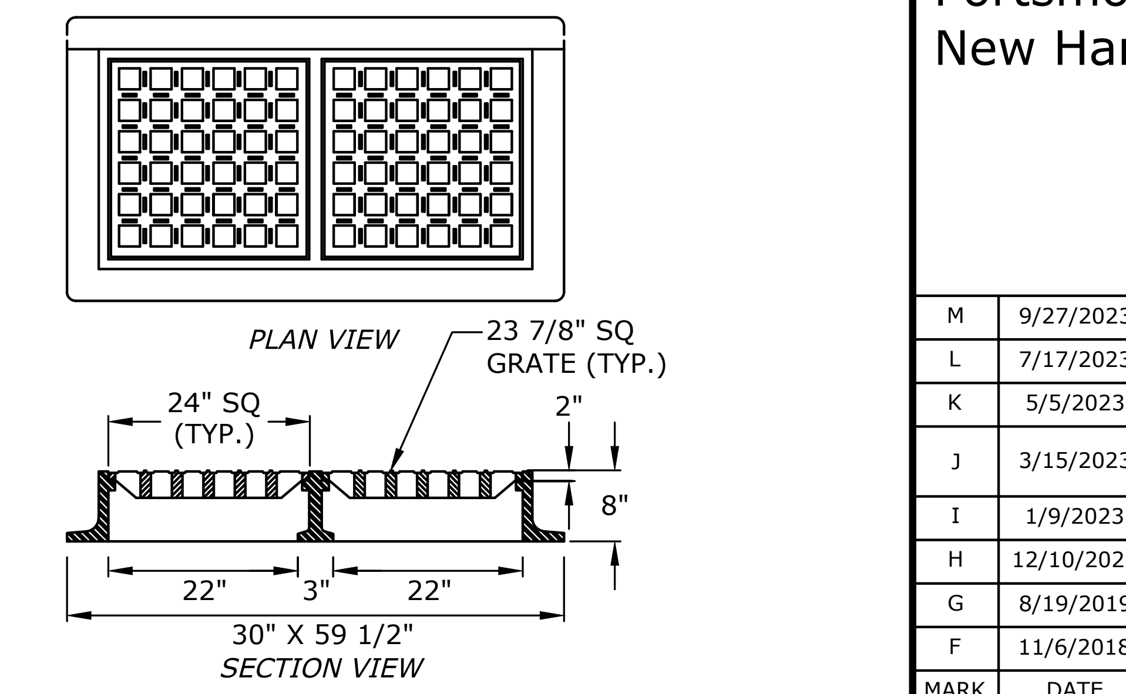
NOTE:
1. GRATE TO BE CAST IRON (NHDOT TYPE B)
2. FRAME AND GRATE TO BE MANUFACTURED IN THE USA

CATCH BASIN FRAME & GRATE
NO SCALE



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

"ELIMINATOR" OIL FLOATING DEBRIS TRAP
NO SCALE



FRAME: EJ FOUNDRY 5448Z
GRATE: EJ FOUNDRY 5520M5

AT DOUBLE CATCH BASINS

NOTES:
1. FRAME AND GRATES SHALL BE EJ FOUNDRY OR APPROVED EQUAL.
2. MATERIAL SHALL BE CLASS 30B GRAY IRON AND SHALL COMPLY WITH ALTEST ASTM A48.
3. FRAME AND GRATES SHALL BE HEAVY DUTY AND RATED FOR H-20 LOADING.
4. 3 FLANGE FRAMES TO BE USED WITH CURB INLET.

DOUBLE CATCHBASIN FRAME & GRATE
NO SCALE

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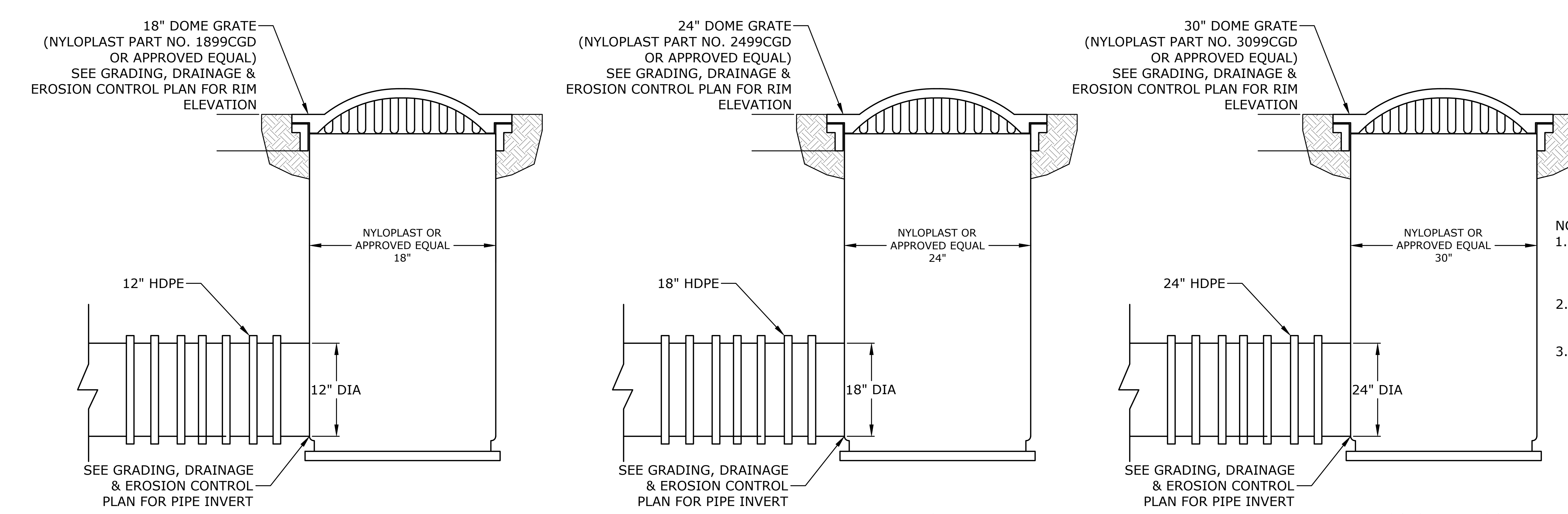


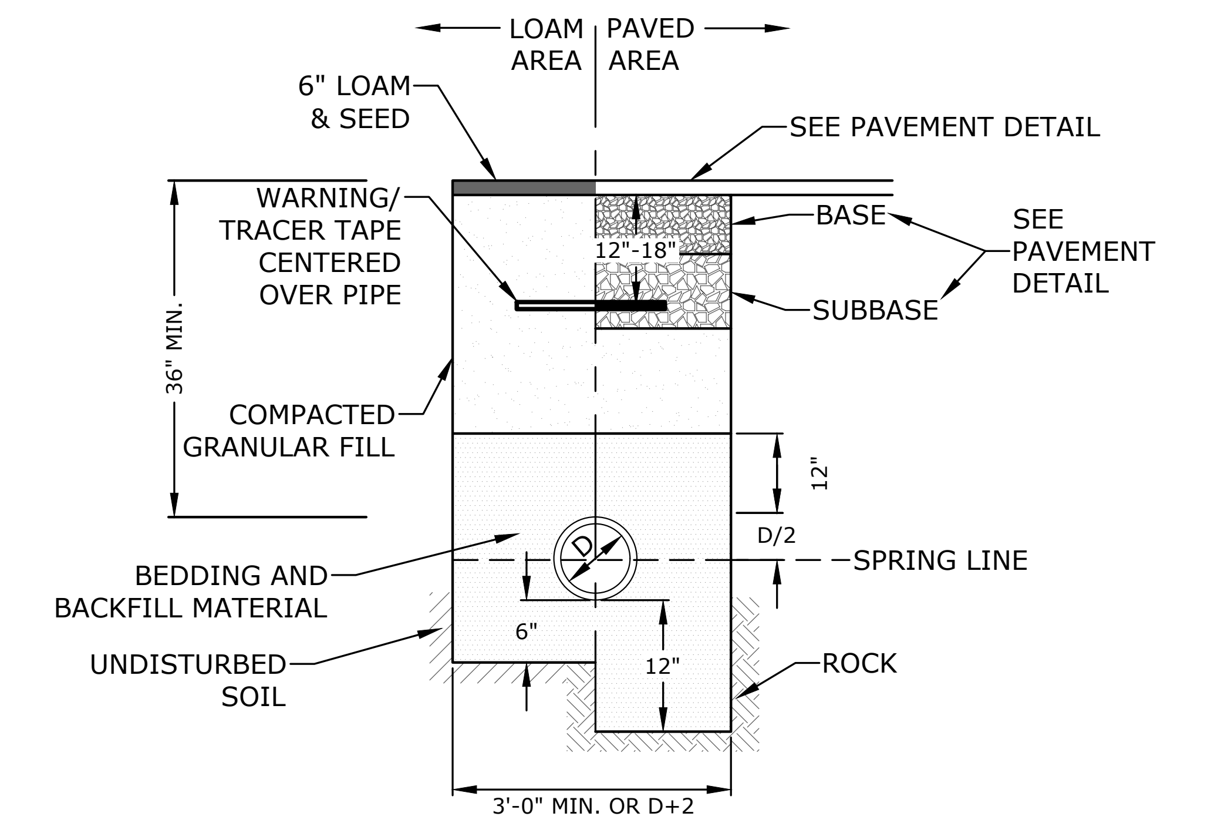
PYD100, PYD104, PYD104,PYD200, PYD201, PYD301, PYD302, PYD303, & PYD304
NO SCALE

PYD101
NO SCALE

PYD102 & PYD103
NO SCALE

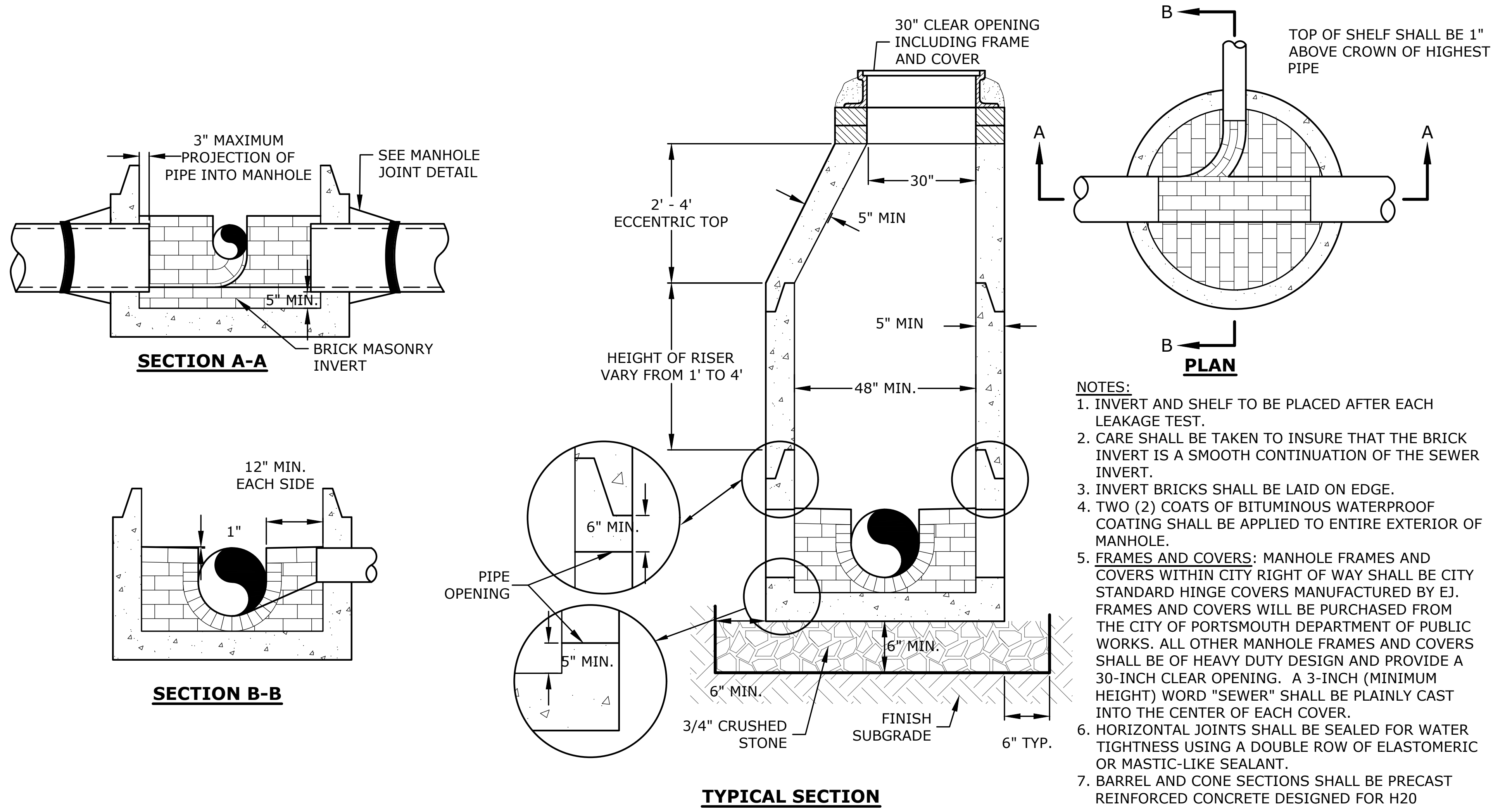
NOTES:
1. GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR LOCATION.

PROPOSED YARD DRAINS
NO SCALE



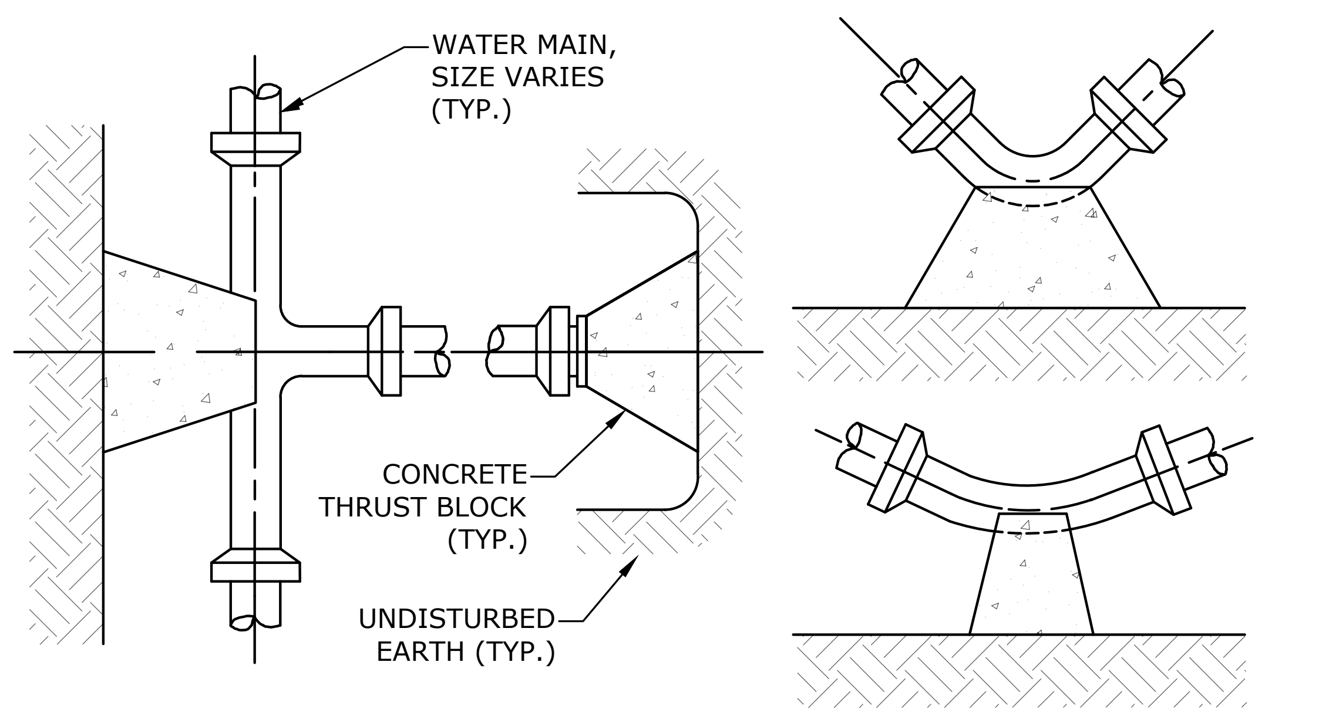
NOTE:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS SHALL BE INSTALLED PER UNITIL STANDARDS. COORDINATE ALL INSTALLATIONS WITH UNITIL AND THE CITY OF PORTSMOUTH.

GAS TRENCH
NO SCALE



NOTES:
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICKS SHALL BE LAID ON EDGE.
4. TWO (2) COATS OF BITUMINOUS WATERPROOF COATING SHALL BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
5. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS WITHIN CITY RIGHT OF WAY SHALL BE CITY STANDARD HINGE COVERS MANUFACTURED BY EJ. FRAMES AND COVERS WILL BE PURCHASED FROM THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS. ALL OTHER MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) WORD "SEWER" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
6. HORIZONTAL JOINTS SHALL BE SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF ELASTOMERIC OR MASTIC-LIKE SEALANT.
7. BARREL AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE DESIGNED FOR H20 LOADING, AND CONFORMING TO ASTM C478-06.
8. INTERIOR OF SEWER MANHOLE SHALL BE LINED IN ACCORDANCE WITH SECTION 02952.

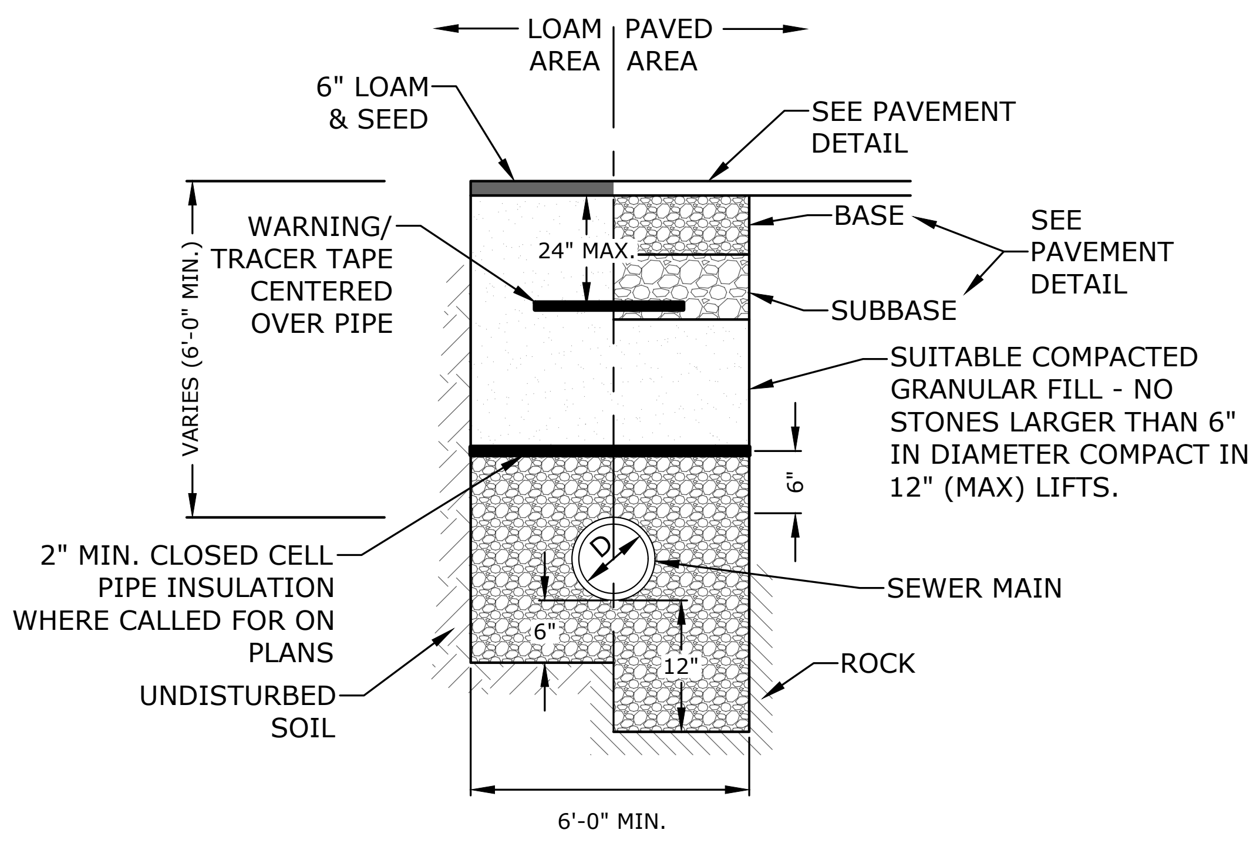
SEWER MANHOLE
NO SCALE



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

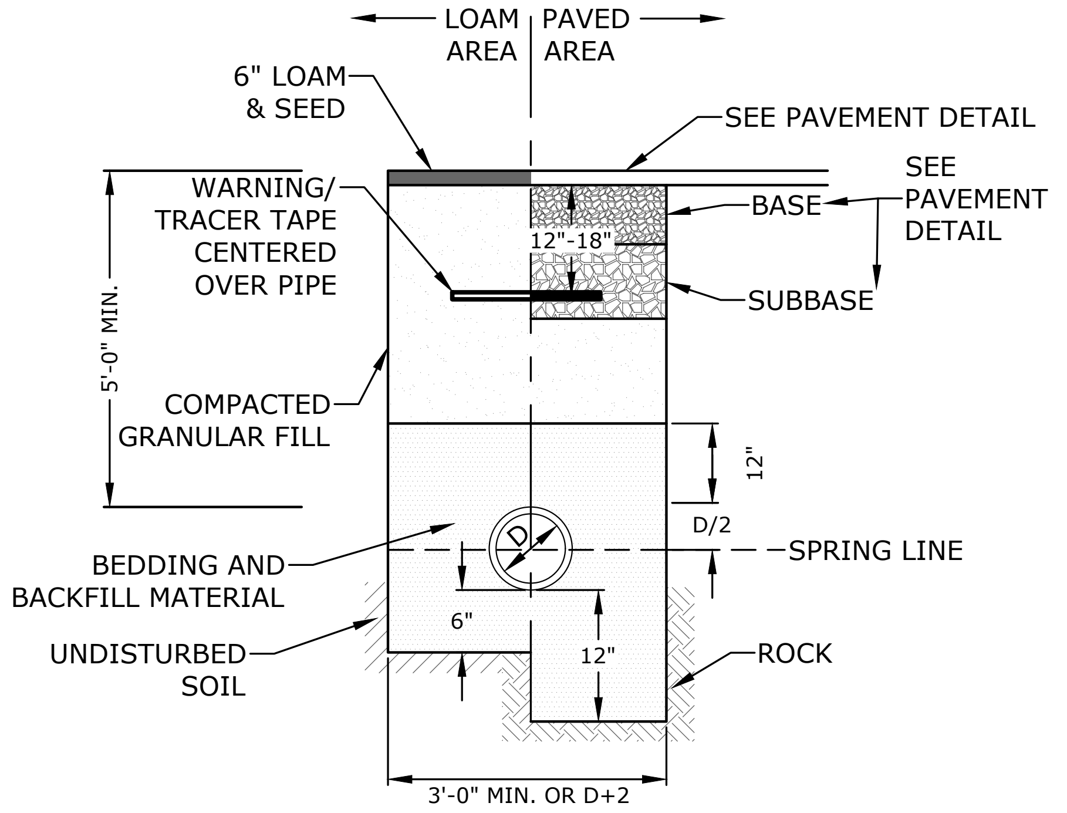
NOTES:
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT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

THRUST BLOCKING DETAIL
NO SCALE



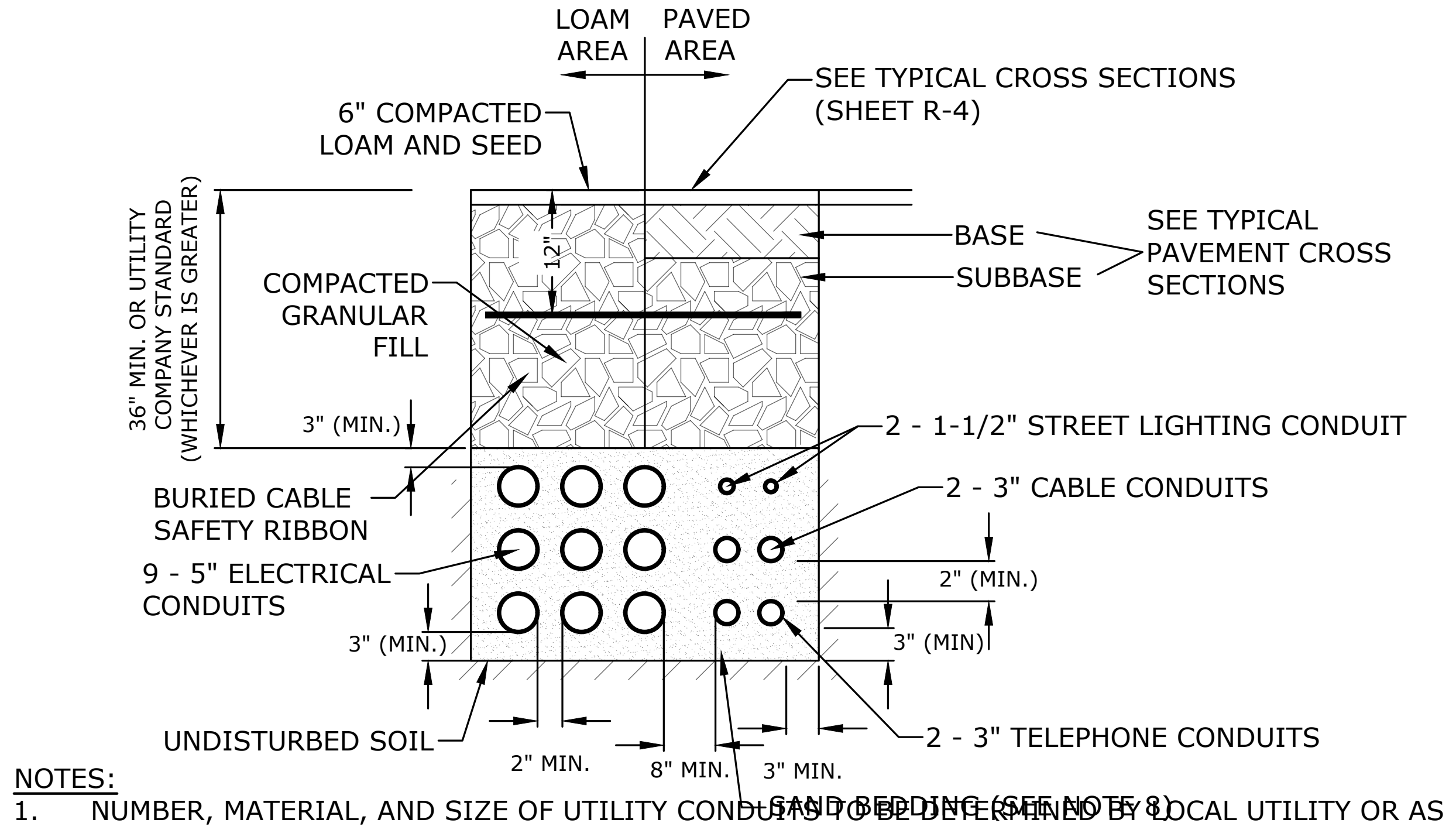
NOTE:
1. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

SEWER TRENCH
NO SCALE



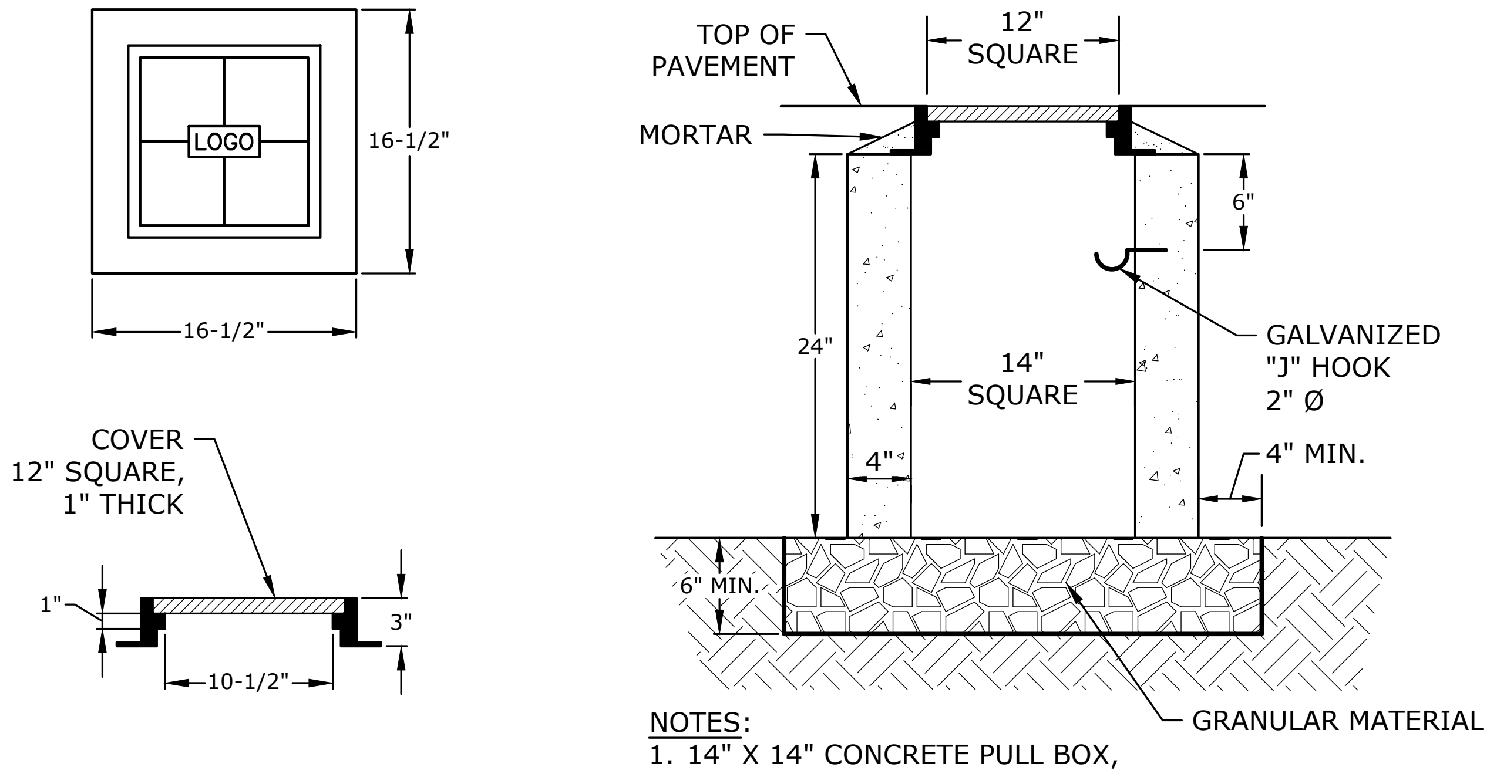
NOTE:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. WATER MAIN SHALL BE INSTALLED PER CITY OF PORTSMOUTH STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

WATER TRENCH
NO SCALE



NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT SHALL NOT BE LESS THAN THOSE SHOWN.
3. NO CONDUIT RUN SHALL EXCEED 360 DEGREES IN TOTAL BENDS.
4. A SUITABLE PULLING STRING, CAPABLE OF 200 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE UTILITY COMPANY IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT.
5. UTILITY COMPANY MUST BE GIVEN THE OPPORTUNITY TO INSPECT THE CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD THE UTILITY COMPANY BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND, WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE.
7. ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 36 TO 48 INCH RADIUS.
8. SAND BEDDING TO BE REPLACED WITH CONCRETE ENCASEMENT WHERE COVER IS LESS THAN 3 FEET, WHEN LOCATED BELOW PAVEMENT, OR WHERE SHOWN ON THE UTILITIES PLAN. COORDINATE LIMITS OF CONCRETE ENCASEMENT WITH EVERSOURCE.

ELECTRICAL AND COMMUNICATION CONDUIT
NO SCALE



NOTES:
1. 14" X 14" CONCRETE PULL BOX, NHDOT ITEM 614.511

CONCRETE LIGHTING CONDUIT PULL BOX
NO SCALE

Tighe&Bond

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
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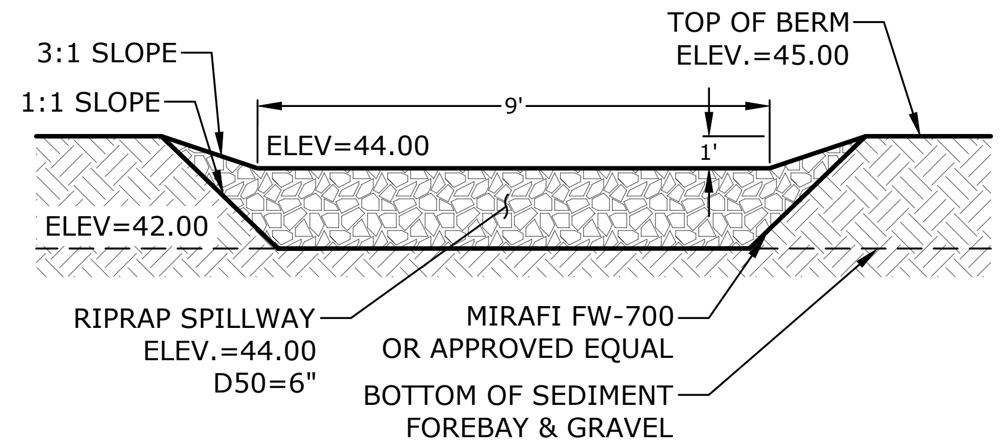
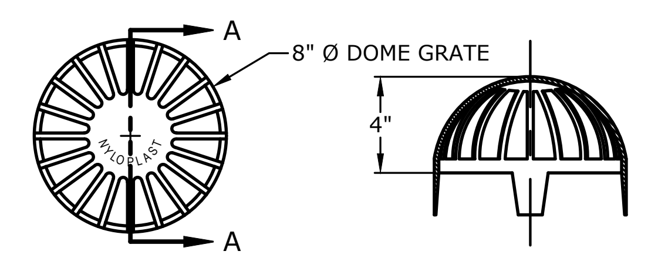


NOTE:
1. SEE GRAVEL WETLAND #1 DETAIL FOR LOCATION.

SEDIMENT FOREBAY RIPRAP SPILLWAY

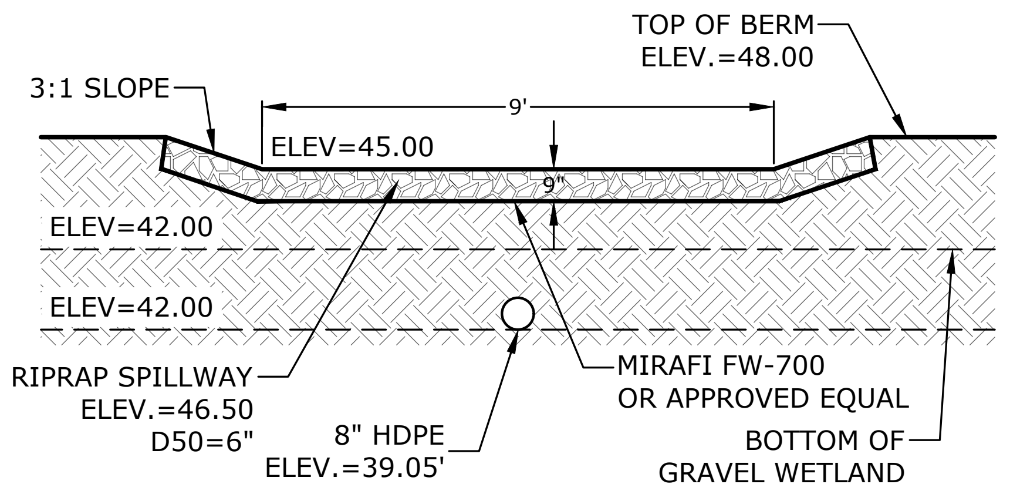
NO SCALE



NOTE:
1. 8" DOME GRATE SHALL BE ADS NYLOPLAST, 8 IN DOME GRATE MODEL NUMBER 0899CGD, OR APPROVED EQUAL.

8" DOME GRATE DETAIL

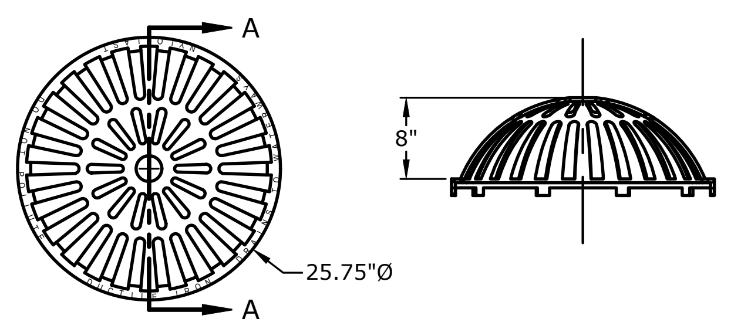
NO SCALE



NOTE:
1. SEE GRAVEL WETLAND #1 DETAIL FOR LOCATION.

GRAVEL WETLAND #1 RIPRAP SPILLWAY

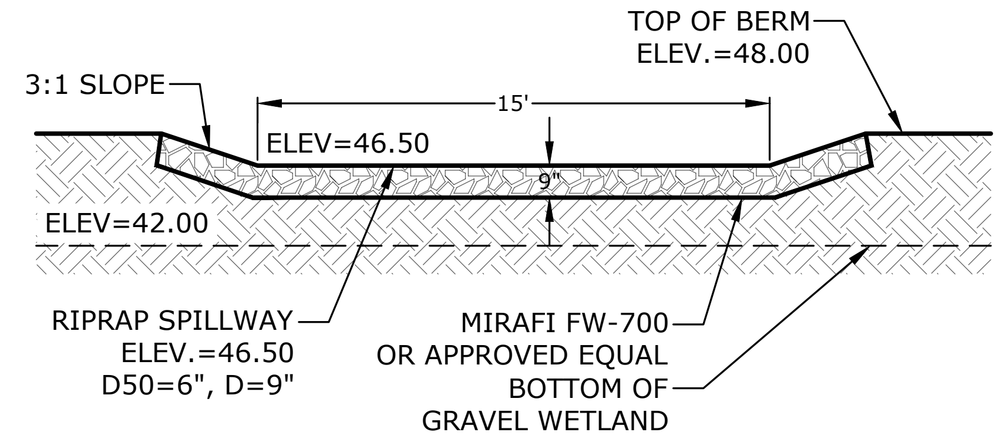
NO SCALE



NOTE:
1. 24" DOME GRATE SHALL BE ADS NYLOPLAST, 24 IN DOME GRATE MODEL NUMBER 2499CGD, OR APPROVED EQUAL.

24" DOME GRATE DETAIL

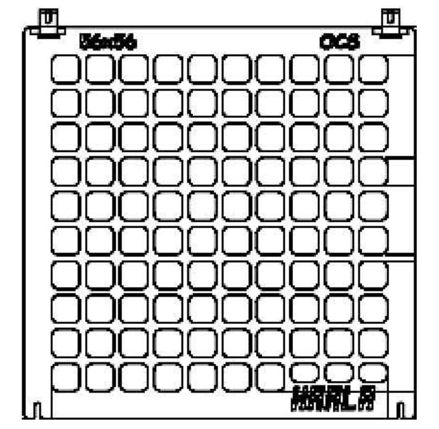
NO SCALE



NOTE:
1. SEE GRAVEL WETLAND #1 DETAIL FOR LOCATION.

GRAVEL WETLAND #1 RIPRAP OVERFLOW SPILLWAY

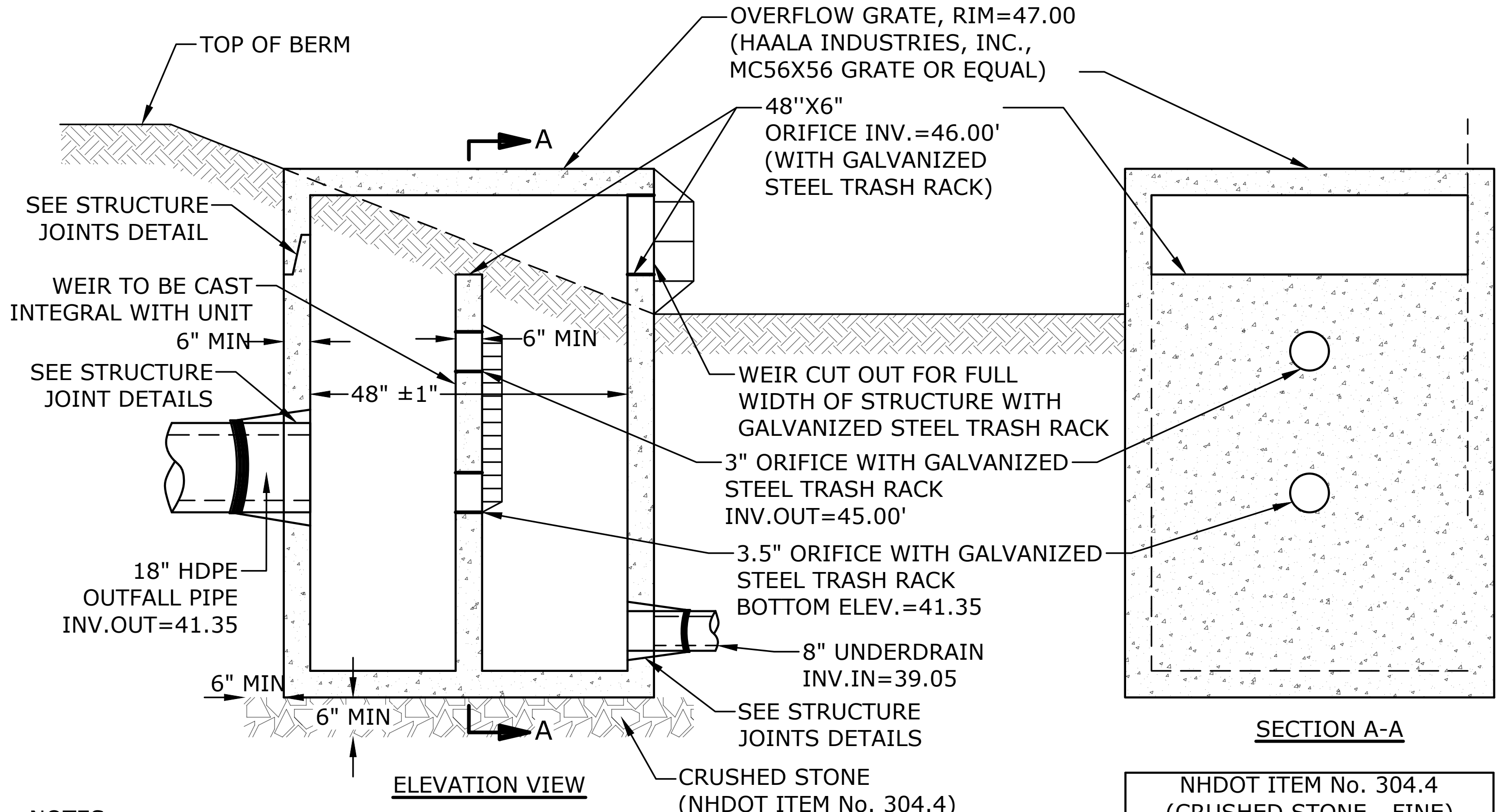
NO SCALE



NOTES:
1. OUTLET STRUCTURE GRATE SHALL BE HAALA INDUSTRIES, INC. MC56X56 TOP MOUNT GRATE OR EQUAL.
2. GRATE TO BE SECURED TO CONCRETE STRUCTURE.

HAALA MC56X56 GRATE

NO SCALE



ELEVATION VIEW

SECTION A-A

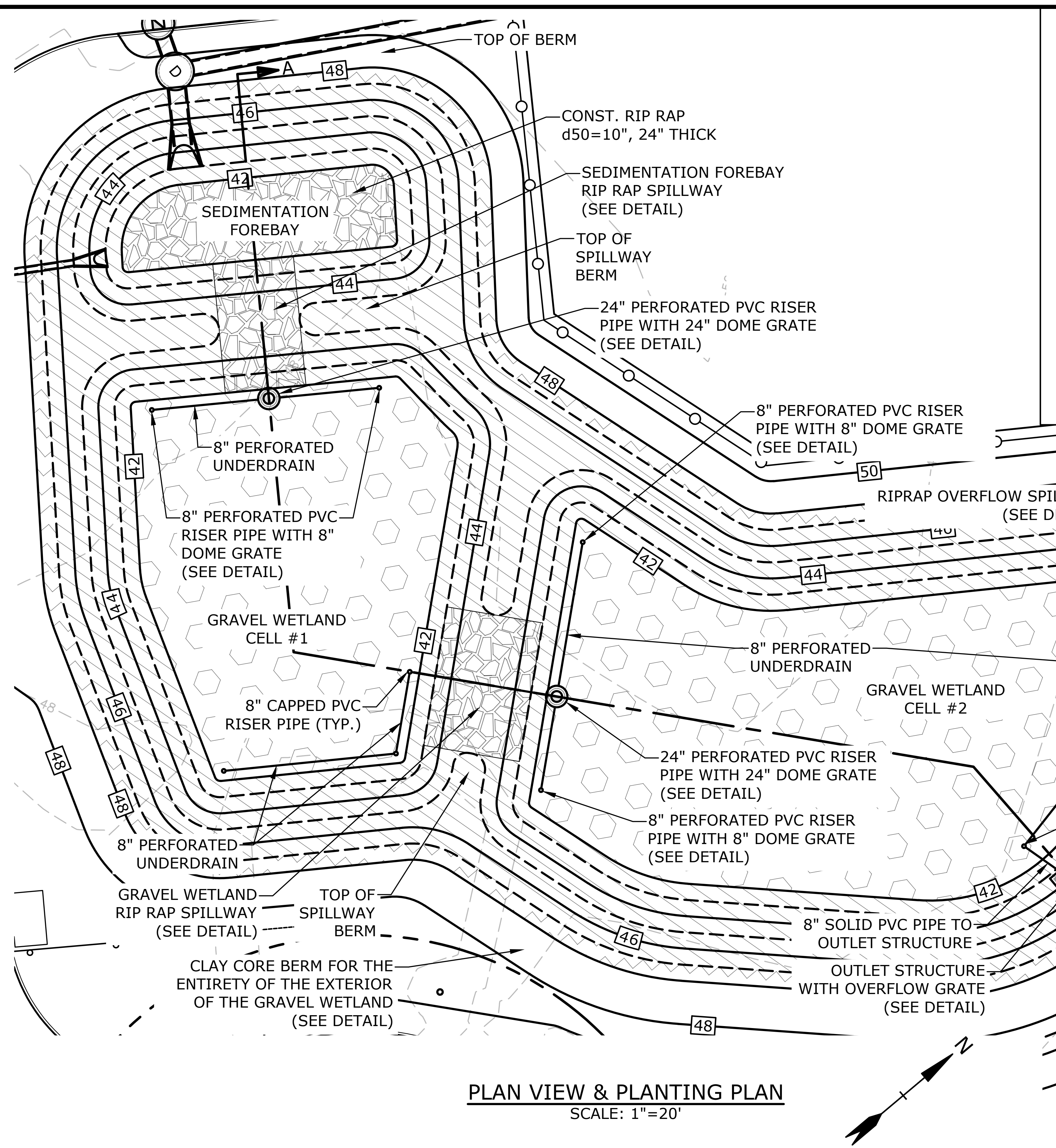
NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER OF THE THIRDE WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT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

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)

SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5

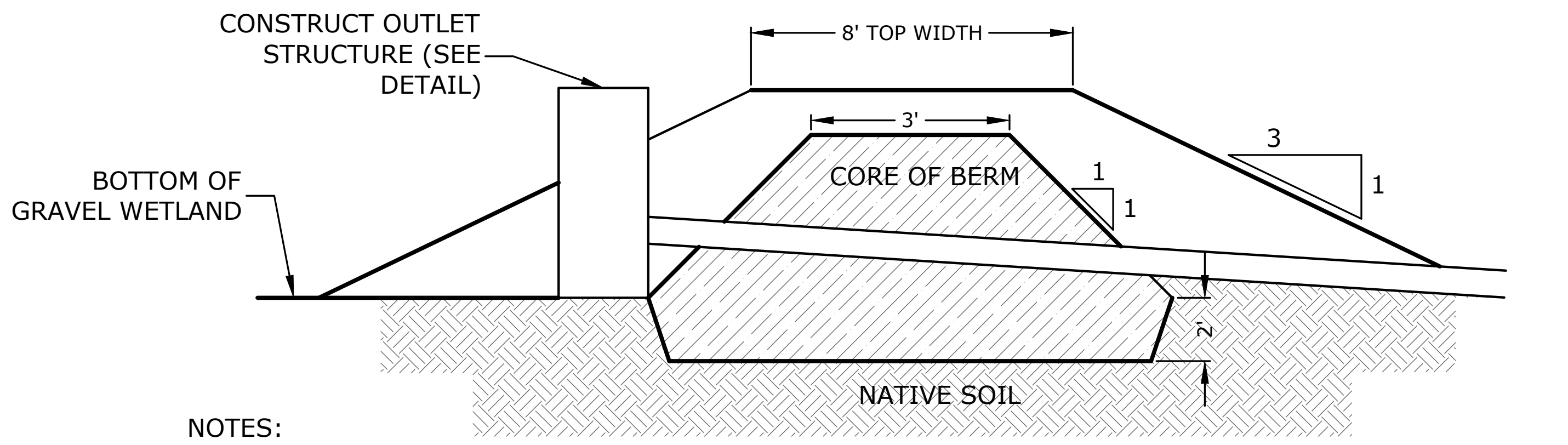
OUTLET STRUCTURE (POS101)

NO SCALE



PLAN VIEW & PLANTING PLAN

SCALE: 1"=20'



NOTES:
1. CORE MATERIAL SHALL MEET USGS CLASSIFICATION SC, SM, CL OR ML AND HAVE A MAXIMUM PARTICLE SIZE OF 3" AND A PERMEABILITY LESS THAN 0.000005 CM/S, AND MEET THE FOLLOWING GRADATION

SIEVE SIZE	PERCENT FINER BY WEIGHT
3 INCH	100
No. 200	50 -100.

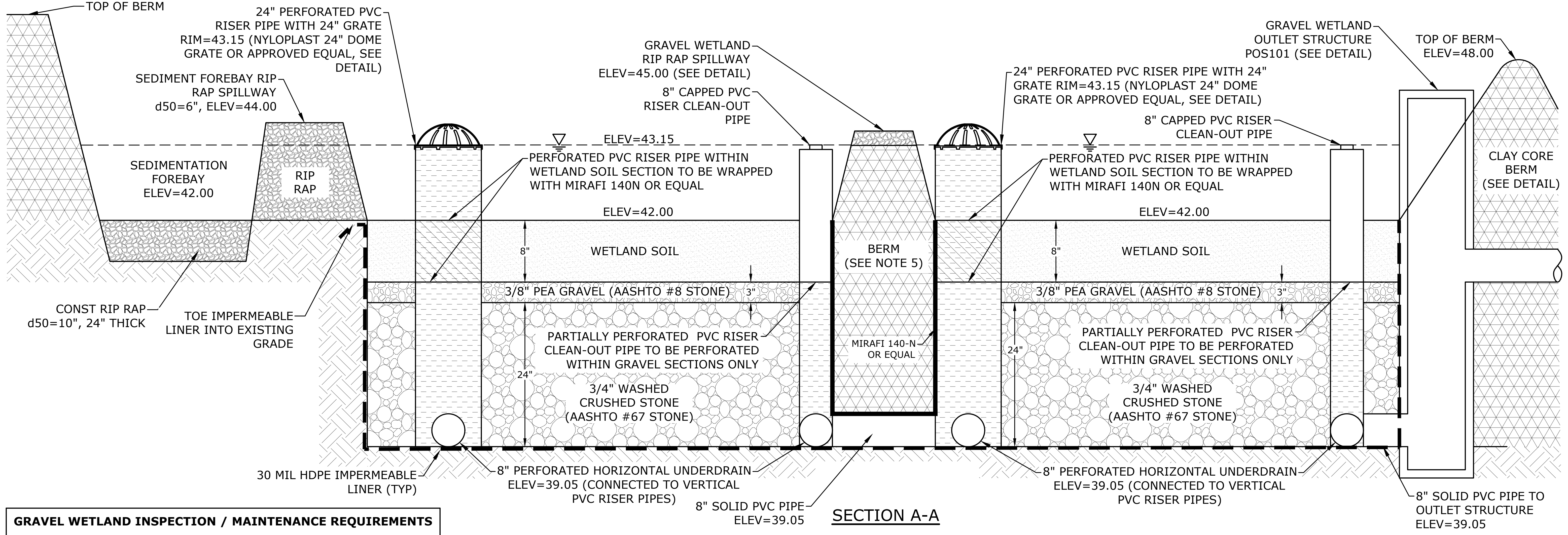
2. PIPE SHALL BE FULLY EMBEDDED IN CORE TO ELIMINATE SEEPAGE

CLAY CORE BERM

NO SCALE

GRAVEL WETLAND PLANTING PLAN

	SPECIES	PLANT SIZE	QUANTITY/ SPACING
⬡	NEW ENGLAND WETMIX, WETLAND SEED MIX OR EQUIVALENT		18 LB/ACRE
	NEW ENGLAND EROSION CONTROL/RESTORATION MIX OR EQUIVALENT		35 LB/ACRE
▨	"RED OSIER DOGWOOD" CORNUS SERICEA AND "SUMMERSWEET CLETHRA" CLETHRA ALNIFOLIA	2'-3'	8'-10' ON CENTER
	NEW ENGLAND EROSION CONTROL/RESTORATION MIX OR EQUIVALENT		35 LB/ACRE
▦	"SILKY DOGWOOD" CORNUS AMOMUM AND "HIGHBUSH BLUEBERRY" VACCINIUM CORYMBOSUM AND "WINTERBERRY" ILEX VERTICILLATA	2'-3'	8'-10' ON CENTER



SECTION A-A

GRAVEL WETLAND INSPECTION / MAINTENANCE REQUIREMENTS

INSPECTION / MAINTENANCE	FREQUENCY	ACTION
MONITOR TO ENSURE THAT GRAVEL WETLAND FUNCTIONS EFFECTIVELY AFTER STORMS	FOUR (4) TIMES ANNUALLY (QUARTERLY) AND AFTER ANY RAINFALL EVENT EXCEEDING 2.5” IN A 24-HR PERIOD	- TRASH AND DEBRIS TO BE REMOVED - ANY REQUIRED MAINTENANCE SHALL BE ADDRESSED - INSPECT SOIL AND REPAIR ERODED AREAS, ESPECIALLY ON SLOPES. - CHECK INLETS, OUTLETS, AND OVERFLOW SPILLWAY FOR BLOCKAGE, STRUCTURAL INTEGRITY AND EVIDENCE OF EROSION.
INSPECT VEGETATION	ANNUALLY	- INSPECT THE CONDITION OF ALL GRAVEL WETLAND VEGETATION - PRUNE BACK OVERGROWTH - REPLACE DEAD VEGETATION - REMOVE ANY INVASIVE SPECIES - COORDINATE WITH UNH STORMWATER CENTER FOR FURTHER VEGETATION MANAGEMENT GUIDELINES
INSPECT DRAWDOWN TIME - THE SYSTEM SHALL DRAWDOWN WITHIN 48-HOURS FOLLOWING A RAINFALL EVENT.	ANNUALLY	- HIRE QUALIFIED PROFESSIONAL TO ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE THE FILTRATION FUNCTION, INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER.

NOTES:
1. WETLAND SOIL SHALL BE A SANDY CLAY LOAM WITH A HYDRAULIC CONDUCTIVITY OF 0.1-0.01 FT/DAY. ORGANIC CONTENT SHALL BE GREATER THAN 15% BY VOLUME. CLAY CONTENT SHALL BE LESS THAN 15% BY VOLUME.
2. CONTRACTOR MAY REUSE EXISTING ON-SITE WETLAND SOILS. TESTING MUST BE PERFORMED BY THE CONTRACTOR PRIOR TO SOIL REUSE TO DETERMINE IF THE EXISTING WETLAND SOILS MEET THE CRITERIA LISTED IN NOTE 1. IF THE EXISTING SOILS DO NOT MEET THE CRITERIA OF WETLAND SOILS AS DEFINED IN NOTE 1 THEY MAY NOT BE REUSED.
3. PERFORATED PVC RISERS SHALL HAVE VERTICAL SLOTS CUT INTO PVC RISERS ABOVE GRADE MEASURING 3"x1/8".
4. GRAVEL WETLAND SOIL SHALL BE SEEDED WITH NEW ENGLAND EROSION CONTROL/RESTORATION MIX OR EQUIVALENT AT A RATE OF 35 LB/ACRE.
5. BERM MATERIAL SHALL CONSIST OF NATIVE SOIL OR COMMON FILL.
6. A PRE-INSTALL MEETING SHALL BE HELD WITH THE CONTRACTOR RESPONSIBLE FOR GRAVEL WETLAND CONSTRUCTION AND THE DESIGN ENGINEER.
7. GRAVEL WETLAND TREATMENT CELLS SHALL BE LINED WITH AN IMPERMEABLE LINER.
8. IT IS THE DESIGN ENGINEERS RECOMMENDATION THAT THE GRAVEL WETLAND BE CONSTRICTED IN THE DRY TO ACHIEVE THE ANTICIPATED TREATMENT QUALITY STANDARDS.
9. THE SLOPED SIDES OF THE GRAVEL WETLAND SHALL RECEIVE EROSION CONTROL MATTING. SEE DETAIL EROSION CONTROL BLANKET DETAIL.

AASHTO #8 STONE (#8 to 3/8")

SIEVE SIZE	% PASSING
1/2"	100
3/8"	85-100
#4	10-30
#8	0-10
#16	0-5

AASHTO #67 STONE (#4 to 3/4")

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

GRAVEL WETLAND #1

NO SCALE

Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

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DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

DETAILS SHEETS

SCALE: AS SHOWN

C-507

Last Save Date: September 27, 2023 1:49 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
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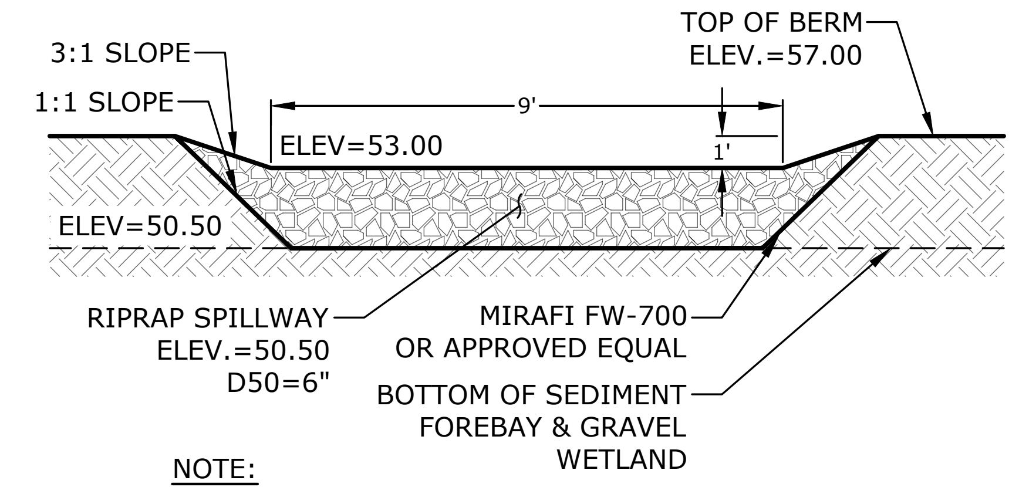
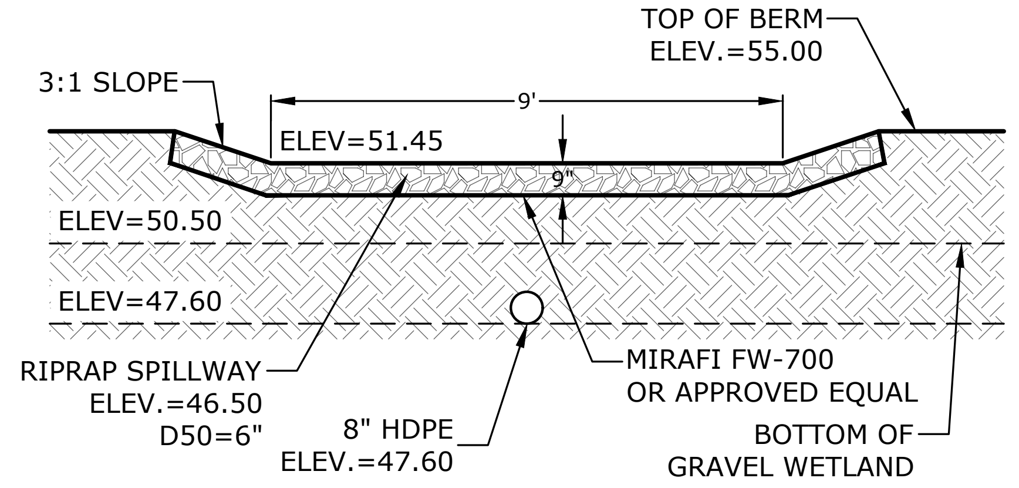


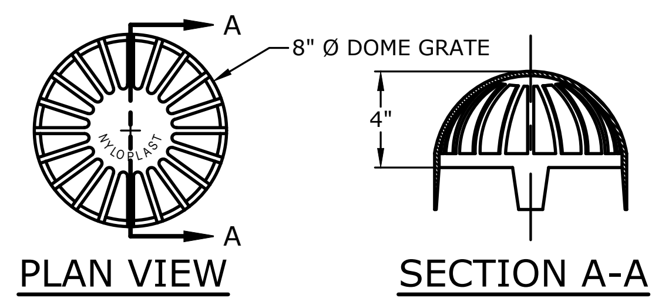
NOTE:
1. SEE GRAVEL WETLAND #1 DETAIL FOR LOCATION.

SEDIMENT FOREBAY RIPRAP SPILLWAY
NO SCALE



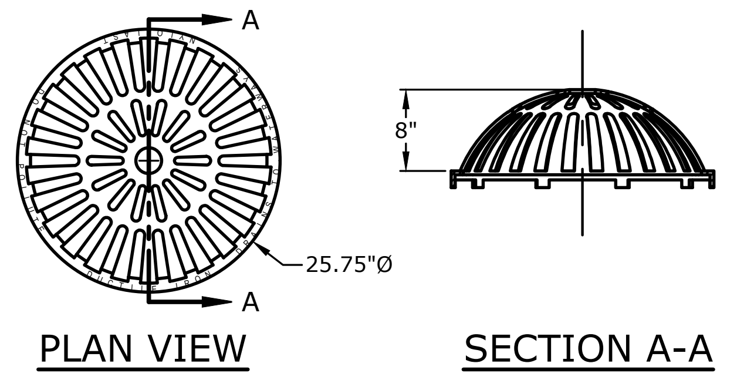
NOTE:
1. SEE GRAVEL WETLAND #1 DETAIL FOR LOCATION.

GRAVEL WETLAND #2 RIPRAP SPILLWAY
NO SCALE



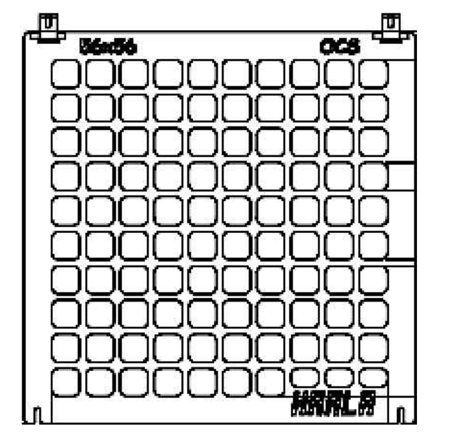
NOTE:
1. 8" DOME GRATE SHALL BE ADS NYLOPLAST, 8 IN DOME GRATE MODEL NUMBER 0899CGD, OR APPROVED EQUAL.

8" DOME GRATE DETAIL
NO SCALE



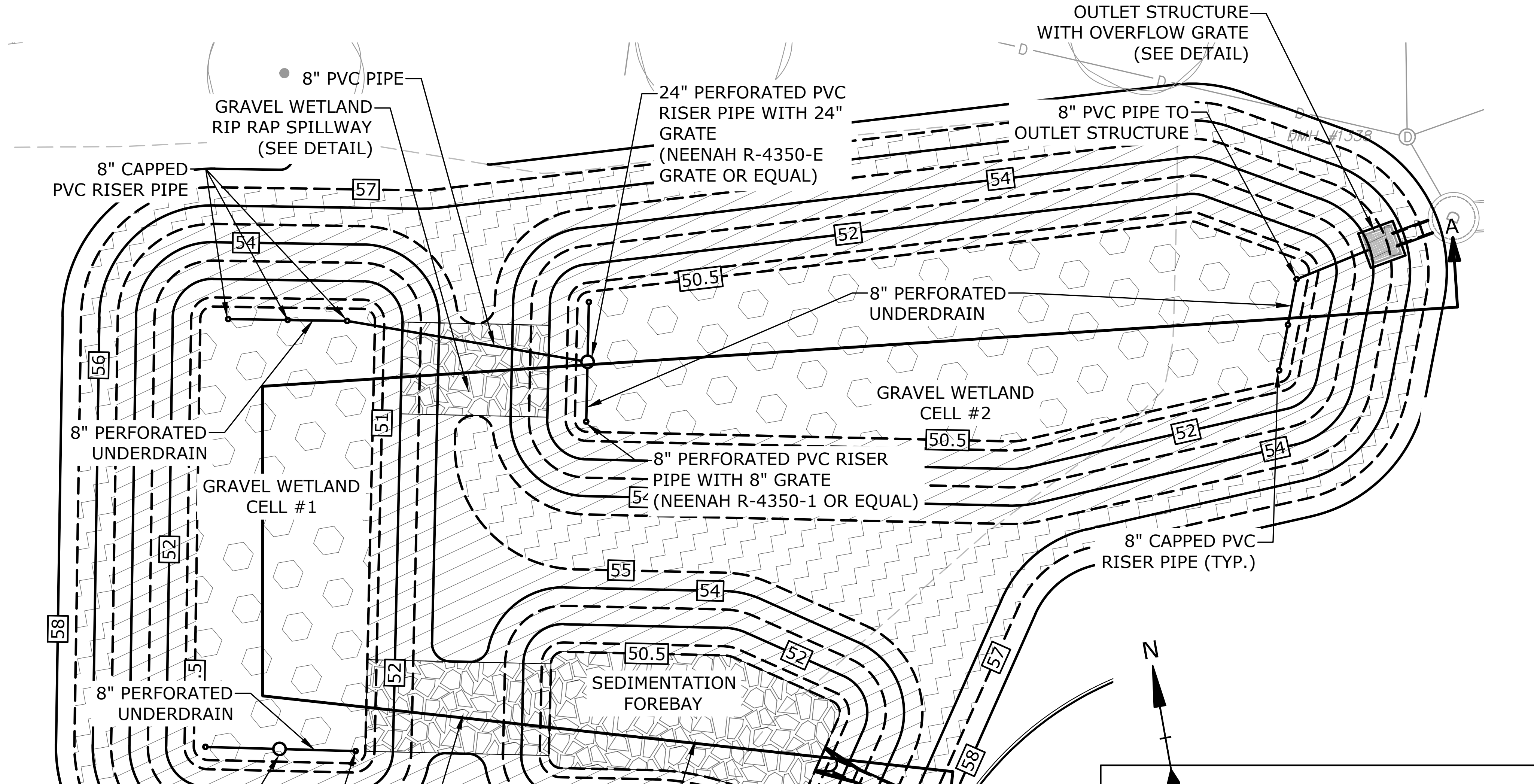
NOTE:
1. 24" DOME GRATE SHALL BE ADS NYLOPLAST, 24 IN DOME GRATE MODEL NUMBER 2499CGD, OR APPROVED EQUAL.

24" DOME GRATE DETAIL
NO SCALE



NOTES:
1. OUTLET STRUCTURE GRATE SHALL BE HAALA INDUSTRIES, INC. MC56X56 TOP MOUNT GRATE OR EQUAL.
2. GRATE TO BE SECURED TO CONCRETE STRUCTURE.

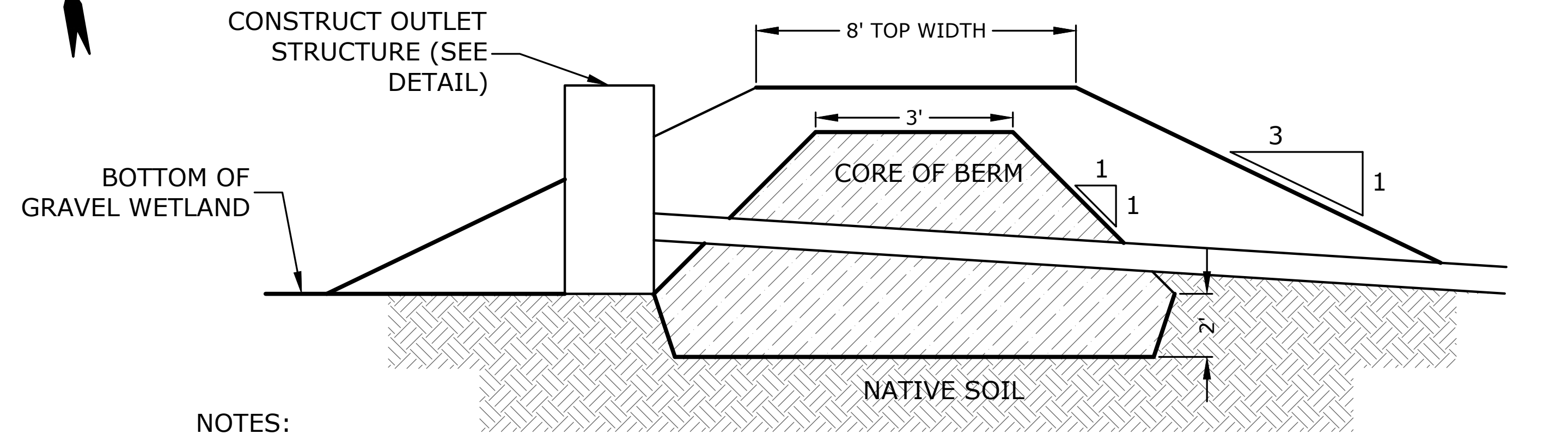
HAALA MC56X56 GRATE
NO SCALE



GRAVEL WETLAND #2 PLANTING PLAN
SCALE: 1" = 20'

GRAVEL WETLAND PLANTING PLAN

	SPECIES	PLANT SIZE	QUANTITY/ SPACING
⬡	NEW ENGLAND WETMIX, WETLAND SEED MIX OR EQUIVALENT		18 LB/ACRE
	NEW ENGLAND EROSION CONTROL/RESTORATION MIX OR EQUIVALENT		35 LB/ACRE
▨	"RED OSIER DOGWOOD" CORNUS SERICEA AND "SUMMERSWEET CLETHRA" CLETHRA ALNIFOLIA	2'-3'	8'-10' ON CENTER
	NEW ENGLAND EROSION CONTROL/RESTORATION MIX OR EQUIVALENT		35 LB/ACRE
▦	"SILKY DOGWOOD" CORNUS AMOMUM AND "HIGHBUSH BLUEBERRY" VACCINIUM CORYMBOSUM AND "WINTERBERRY" ILEX VERTICILLATA	2'-3'	8'-10' ON CENTER

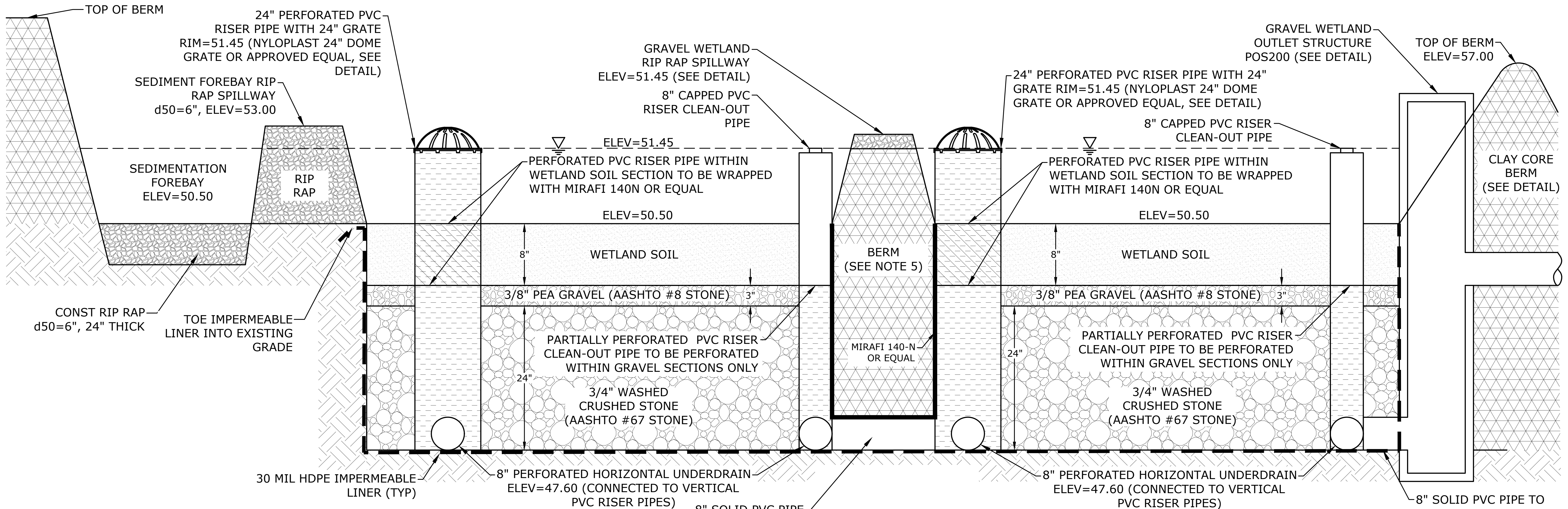


NOTES:
1. CORE MATERIAL SHALL MEET USGS CLASSIFICATION SC, SM, CL OR ML AND HAVE A MAXIMUM PARTICLE SIZE OF 3" AND A PERMEABILITY LESS THAN 0.000005 CM/S, AND MEET THE FOLLOWING GRADATION

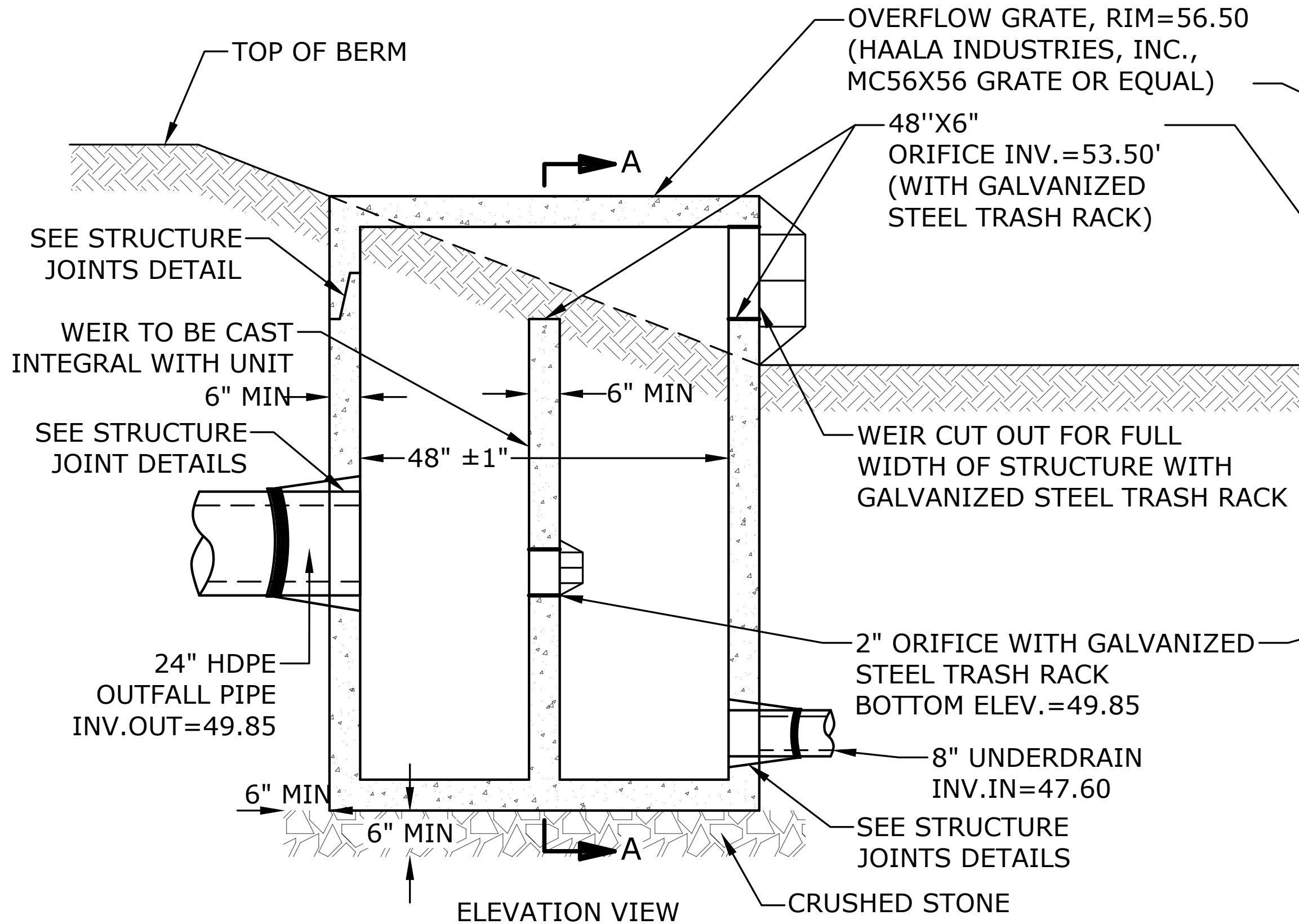
SIEVE SIZE	PERCENT FINER BY WEIGHT
3 INCH	100
No. 200	50 -100.

2. PIPE SHALL BE FULLY EMBEDDED IN CORE TO ELIMINATE SEEPAGE

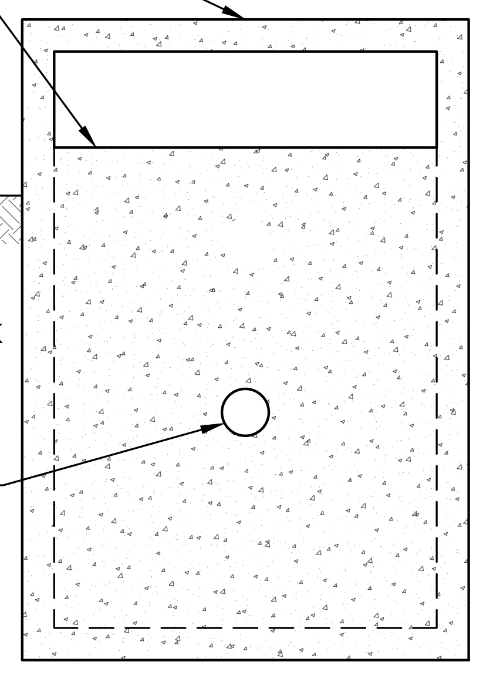
CLAY CORE BERM
NO SCALE



SECTION A-A



ELEVATION VIEW



SECTION A-A

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

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

OUTLET STRUCTURE (POS200)
NO SCALE

GRAVEL WETLAND INSPECTION / MAINTENANCE REQUIREMENTS

INSPECTION / MAINTENANCE	FREQUENCY	ACTION
MONITOR TO ENSURE THAT GRAVEL WETLAND FUNCTIONS EFFECTIVELY AFTER STORMS	FOUR (4) TIMES ANNUALLY (QUARTERLY) AND AFTER ANY RAINFALL EVENT EXCEEDING 2.5" IN A 24-HR PERIOD	- TRASH AND DEBRIS TO BE REMOVED - ANY REQUIRED MAINTENANCE SHALL BE ADDRESSED - INSPECT SOIL AND REPAIR ERODED AREAS, ESPECIALLY ON SLOPES. - CHECK INLETS, OUTLETS, AND OVERFLOW SPILLWAY FOR BLOCKAGE, STRUCTURAL INTEGRITY AND EVIDENCE OF EROSION.
INSPECT VEGETATION	ANNUALLY	- INSPECT THE CONDITION OF ALL GRAVEL WETLAND VEGETATION - PRUNE BACK OVERGROWTH - REPLACE DEAD VEGETATION - REMOVE ANY INVASIVE SPECIES - COORDINATE WITH UNH STORMWATER CENTER FOR FURTHER VEGETATION MANAGEMENT GUIDELINES
INSPECT DRAWDOWN TIME - THE SYSTEM SHALL DRAWDOWN WITHIN 48-HOURS FOLLOWING A RAINFALL EVENT.	ANNUALLY	- HIRE QUALIFIED PROFESSIONAL TO ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE THE FILTRATION FUNCTION, INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER.

NOTES:
1. WETLAND SOIL SHALL BE A SANDY CLAY LOAM WITH A HYDRAULIC CONDUCTIVITY OF 0.1-0.01 FT/DAY. ORGANIC CONTENT SHALL BE GREATER THAN 15% BY VOLUME. CLAY CONTENT SHALL BE LESS THAN 15% BY VOLUME.
2. CONTRACTOR MAY REUSE EXISTING ON-SITE WETLAND SOILS. TESTING MUST BE PERFORMED BY THE CONTRACTOR PRIOR TO SOIL REUSE TO DETERMINE IF THE EXISTING WETLAND SOILS MEET THE CRITERIA LISTED IN NOTE 1. IF THE EXISTING SOILS DO NOT MEET THE CRITERIA OF WETLAND SOILS AS DEFINED IN NOTE 1 THEY MAY NOT BE REUSED.
3. PERFORATED PVC RISERS SHALL HAVE VERTICAL SLOTS CUT INTO PVC RISERS ABOVE GRADE MEASURING 3"x1/8".
4. GRAVEL WETLAND SOIL SHALL BE SEEDED WITH NEW ENGLAND EROSION CONTROL/RESTORATION MIX OR EQUIVALENT AT A RATE OF 35 LB/ACRE.
5. BERM MATERIAL SHALL CONSIST OF NATIVE SOIL OR COMMON FILL.
6. A PRE-INSTALL MEETING SHALL BE HELD WITH THE CONTRACTOR RESPONSIBLE FOR GRAVEL WETLAND CONSTRUCTION AND THE DESIGN ENGINEER.
7. GRAVEL WETLAND TREATMENT CELLS SHALL BE LINED WITH AN IMPERMEABLE LINER.
8. IT IS THE DESIGN ENGINEERS RECOMMENDATION THAT THE GRAVEL WETLAND BE CONSTRICTED IN THE DRY TO ACHIEVE THE ANTICIPATED TREATMENT QUALITY STANDARDS.
9. THE SLOPED SIDES OF THE GRAVEL WETLAND SHALL RECEIVE EROSION CONTROL MATTING. SEE DETAIL EROSION CONTROL BLANKET DETAIL.

GRAVEL WETLAND #2
NO SCALE

AASHTO #8 STONE (#8 to 3/8")	
SIEVE SIZE	% PASSING
1/2"	100
3/8"	85-100
#4	10-30
#8	0-10
#16	0-5

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

Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

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DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

DETAILS SHEETS

SCALE: AS SHOWN

C-508

Last Save Date: September 27, 2023 1:49 PM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
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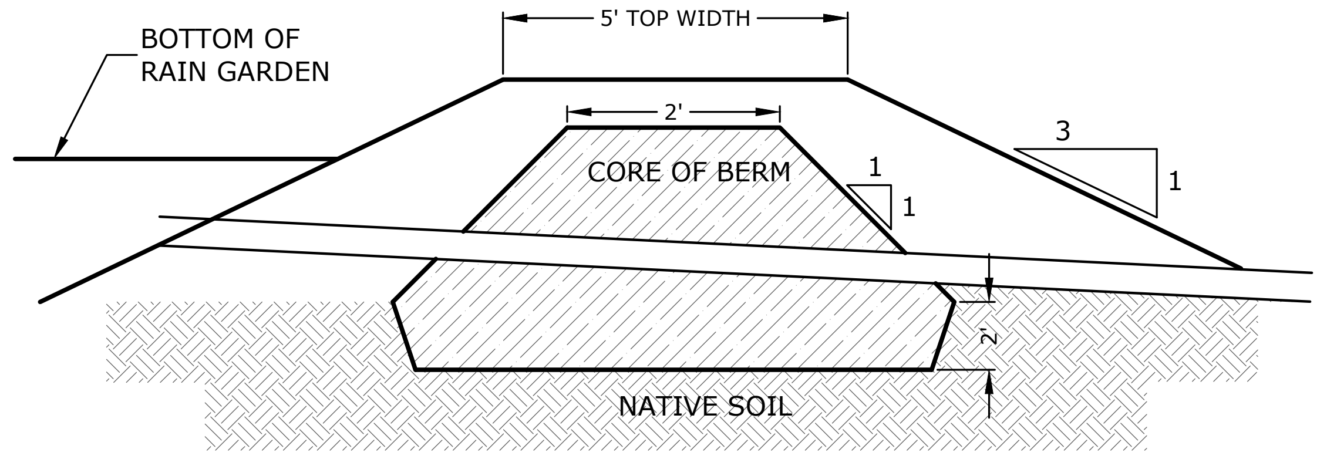
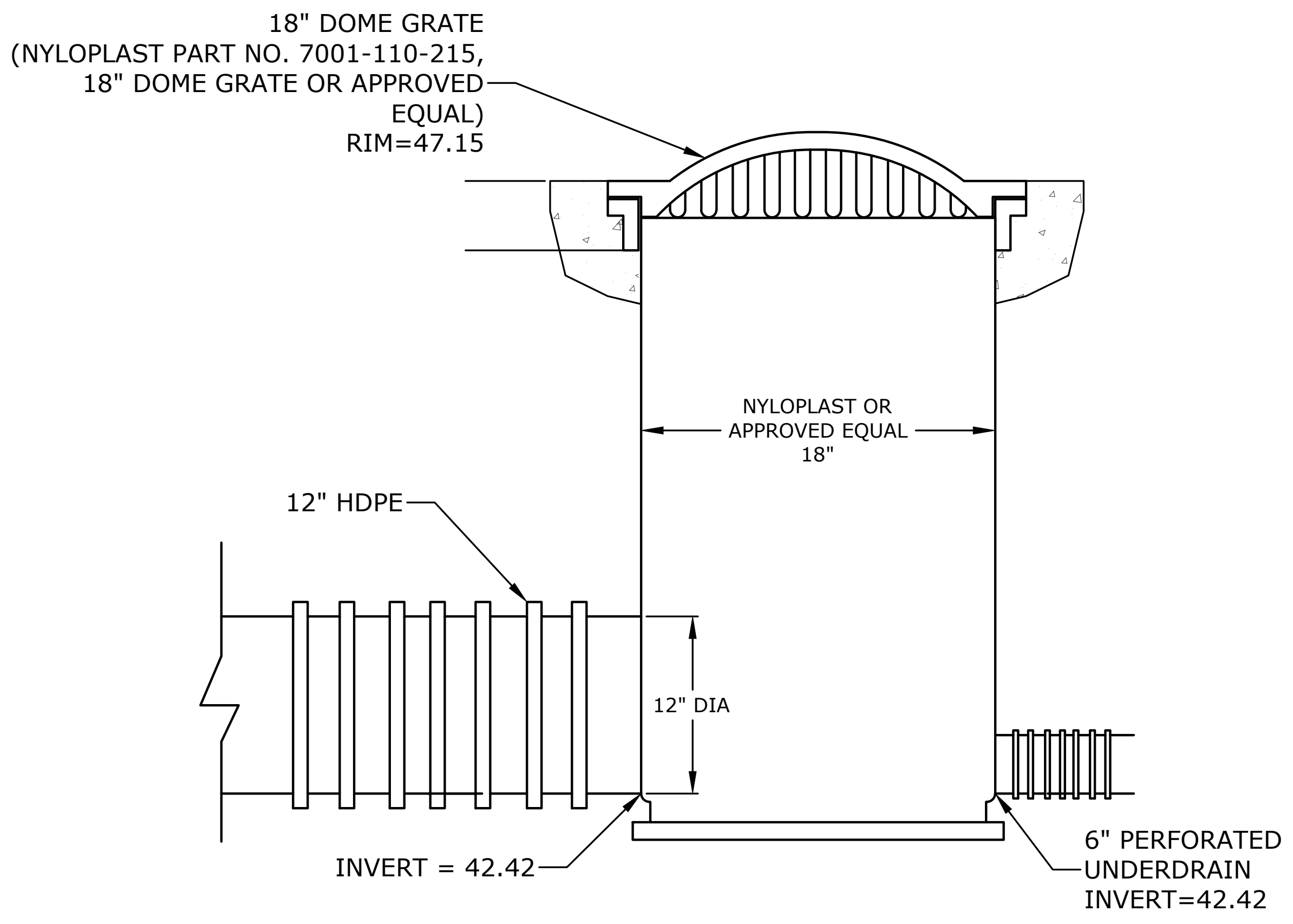


NOTES:
1. CORE MATERIAL SHALL MEET USGS CLASSIFICATION SC, SM, CL OR ML AND HAVE A MAXIMUM PARTICLE SIZE OF 3" AND A PERMEABILITY LESS THAN 0.000005 CM/S, AND MEET THE FOLLOWING GRADATION

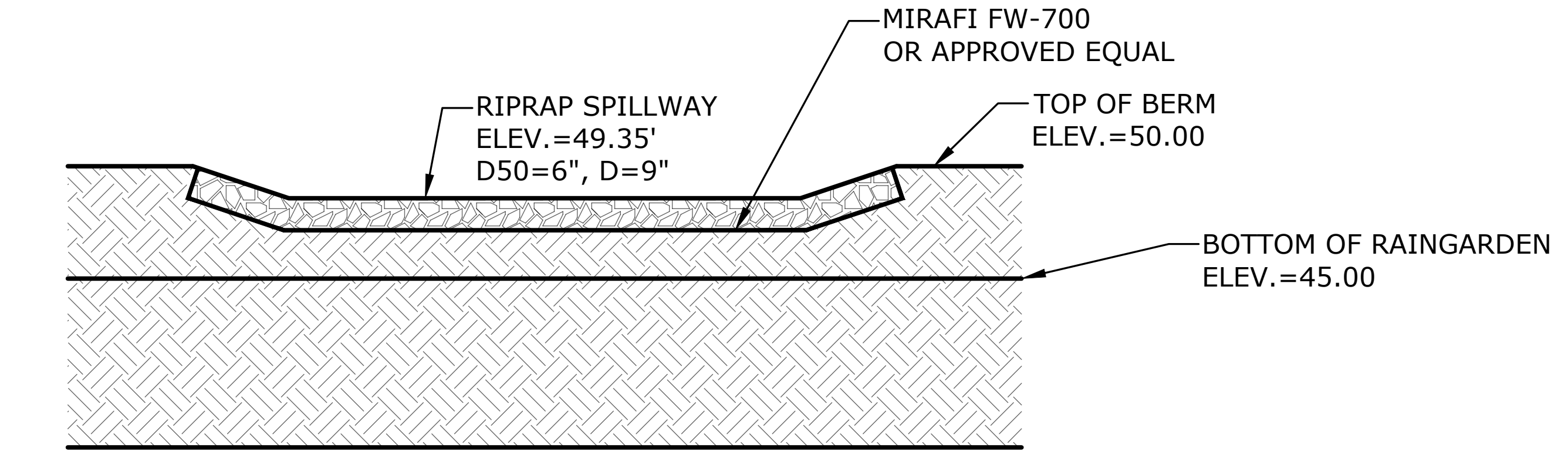
SIEVE SIZE	PERCENT FINER BY WEIGHT
3 INCH	100
No. 200	50 -100.

2. PIPE SHALL BE FULLY EMBEDDED IN CORE TO ELIMINATE SEEPAGE

CLAY CORE BERM
NO SCALE



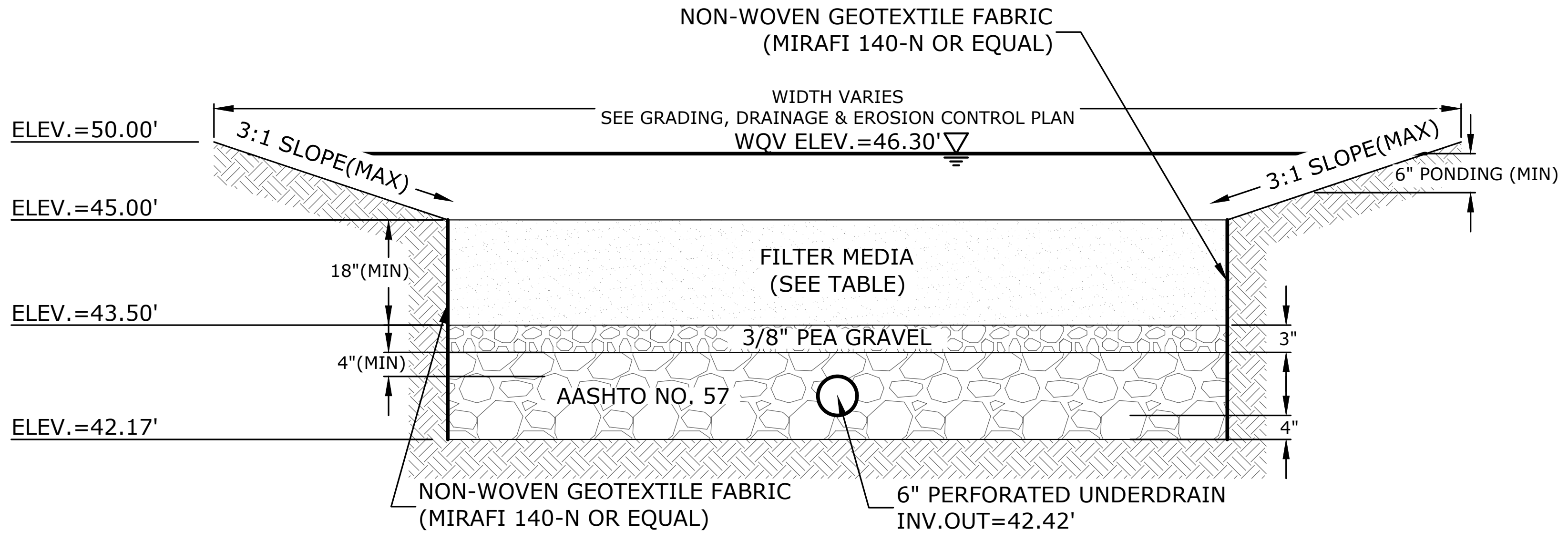
OUTLET STRUCTURE DETAIL (POS300)
NO SCALE



NOTE:
SEE GRADING, DRAINAGE & EROSION CONTROL PLANS, SHEET C-110, FOR LOCATIONS AND ELEVATIONS.

RIPRAP OVERFLOW SPILLWAY
NO SCALE

RAINGARDEN PLANT SCHEDULE				
CODE	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES				
BN	BETULA NIGRA	RIVER BIRCH	12 - 14' HT	B & B (CLUMP)
AC	AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY	6 - 7' HT	B & B (CLUMP)
SHRUBS				
VD	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	5 GALLON	CONTAINER
CA	CLETHRA ALNIFOLIA	SUMMERSWEET CLETHERA	5 GALLON	CONTAINER
PERENNIALS				
PV	PANICUM VIRGATUM 'SHENANDOAH'	SHENANDOAH SWITCH GRASS	3 GALLON	CONTAINER
EM	EUPATORIUM MACULATUM	JOE PYE WEED	2 GALLON	CONTAINER
AI	ASCLEPIAS INCARNATA	MARSH MILKWEED	2 GALLON	CONTAINER
RG	RUDBECKIA 'GOLDSTURM'	GOLDSTURM BLACKEYED SUSAN	1 GALLON	CONTAINER
EP	ECHINACEA 'PURPUREA'	PURPLE CONEFLOWER	1 GALLON	CONTAINER



SECTION VIEW

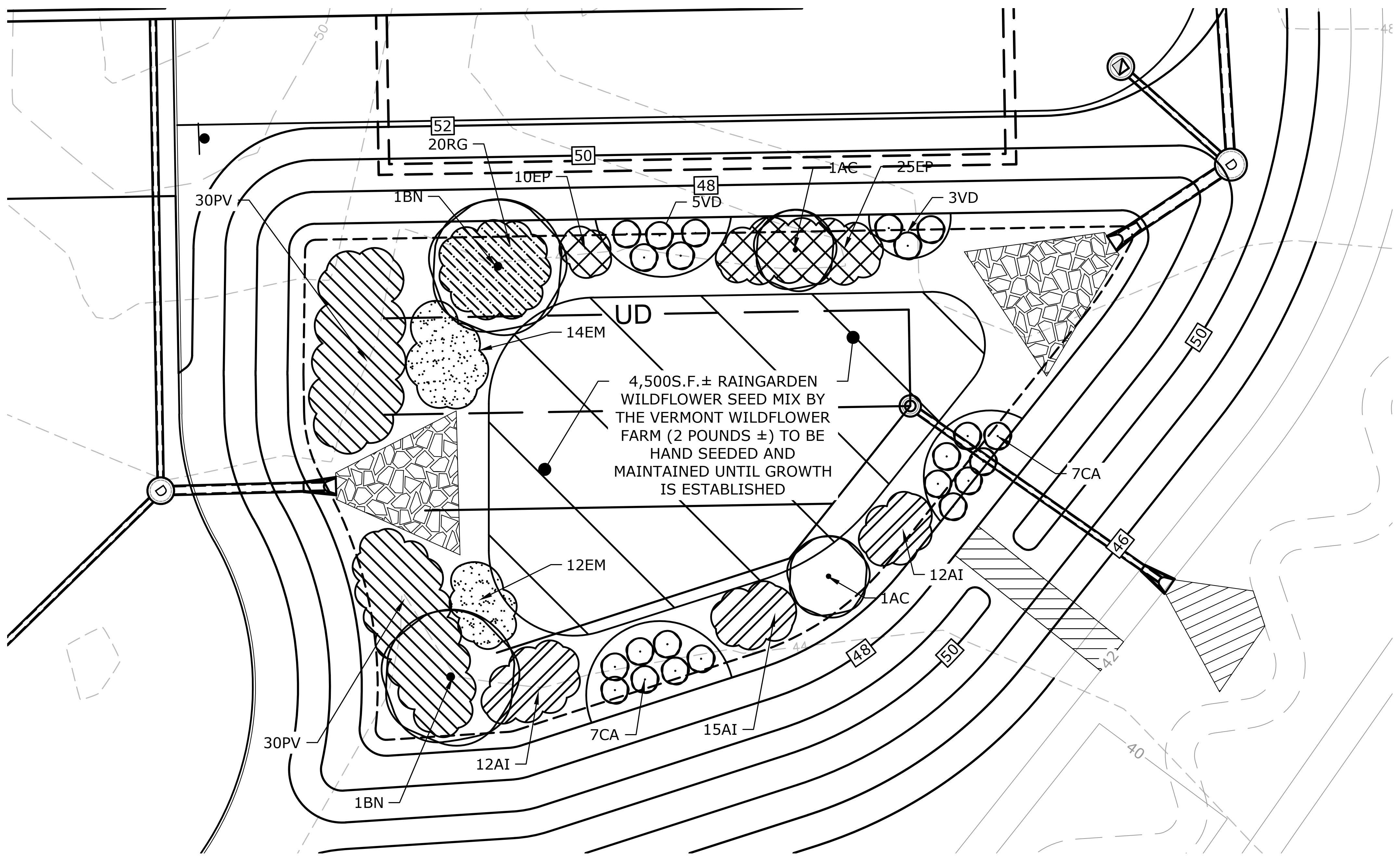
FILTER MEDIA COMPOSITION:

COMPONENT MATERIAL	PERCENT OF MIXTURE BY VOLUME	GRADATION OF MATERIAL SIEVE NO.	PERCENT PASSING
ASTM C-33 CONCRETE SAND	50-55	SEE NOTE #5	
LOAMY SAND TOPSOIL	20-30	200	15-25
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH	20-30	200	5 MAX.

NOTES:
1. RAIN GARDENS SHALL NOT BE PLACED INTO SERVICE UNTIL THE PRACTICE HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT TRAFFIC EXPOSED SOIL SURFACES WITH CONSTRUCTION EQUIPMENT. CONTRACTOR SHALL KEEP ALL EXCAVATION EQUIPMENT OUTSIDE OF THE LIMIT OF THE RAIN GARDEN.
3. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR LOCATIONS, LAYOUTS, AND ELEVATIONS.
4. THE SAND PORTION OF THE FILTER MEDIA SHALL MEET THE FOLLOWING GRADATION (ASTM C-33):

SIEVE SIZE	PERCENT PASSING
3/8"	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#50	5-30
#100	0-10

RAIN GARDEN
NO SCALE



RAIN GARDEN PLANTING PLAN
SCALE: 1" = 20'

Tighe&Bond

NEIL A. HANSEN No. 15227
9/27/2023

PATRICK CRIMMINS No. 12378
9/27/2023

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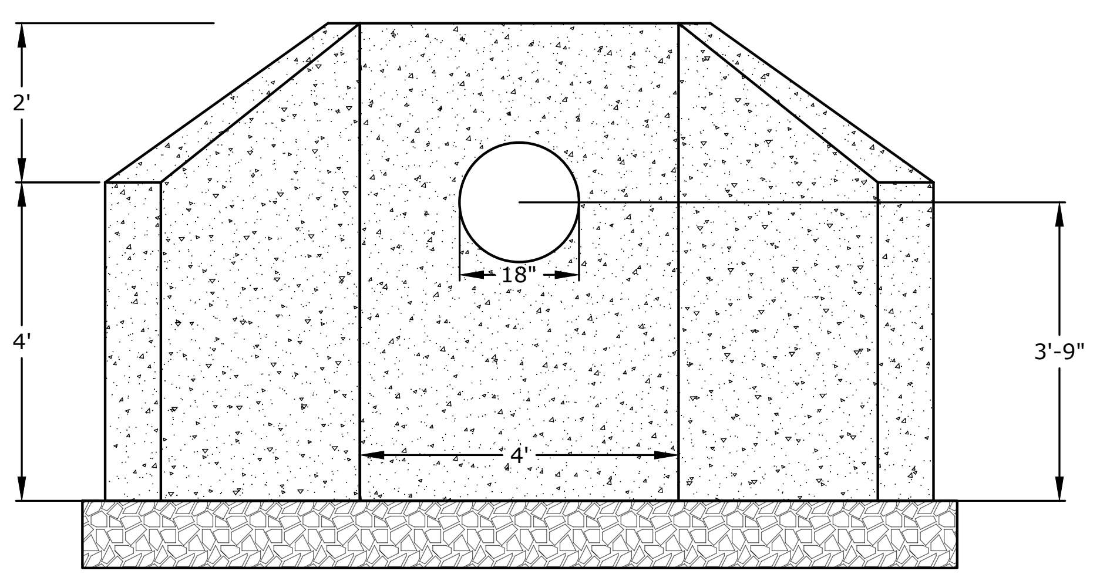
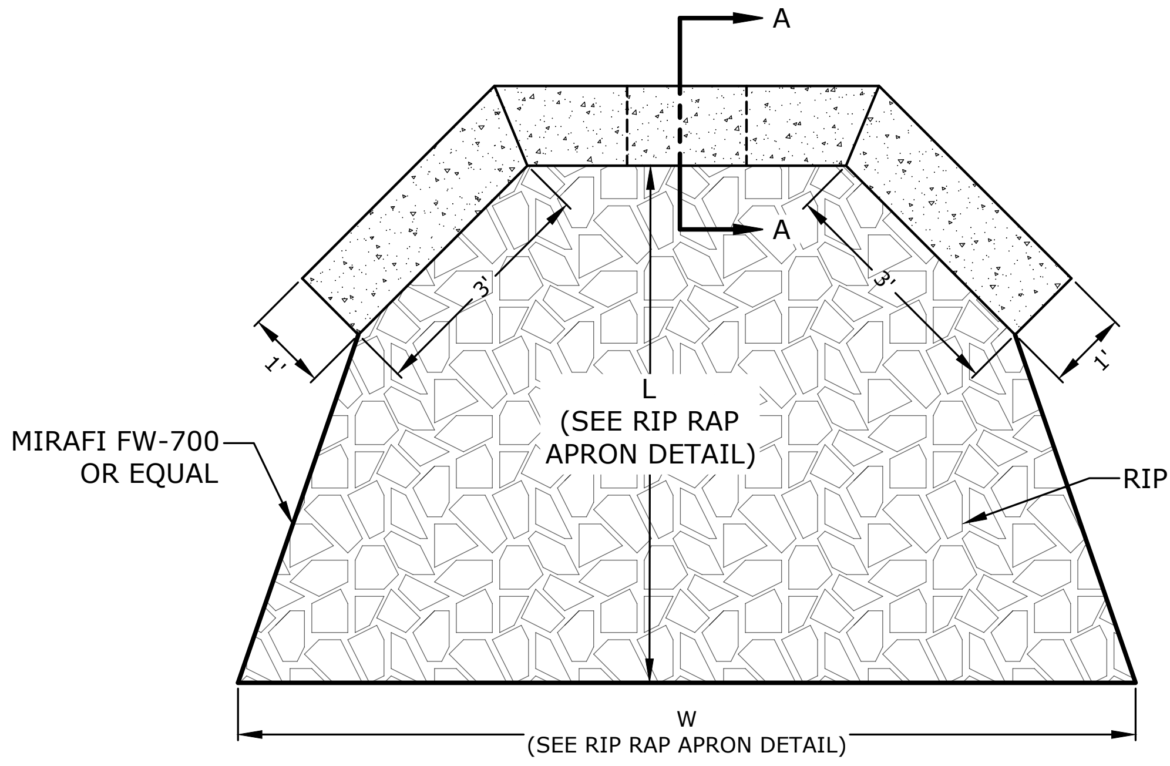
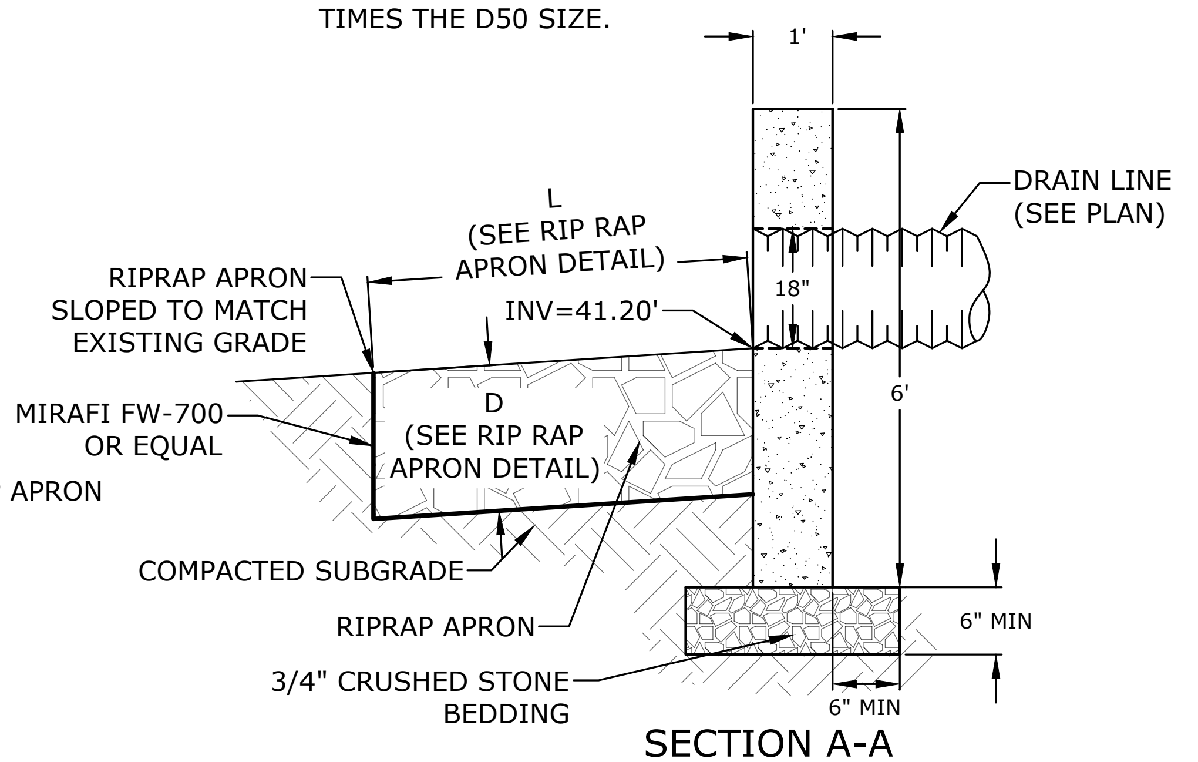


ELEVATION VIEW



PLAN VIEW

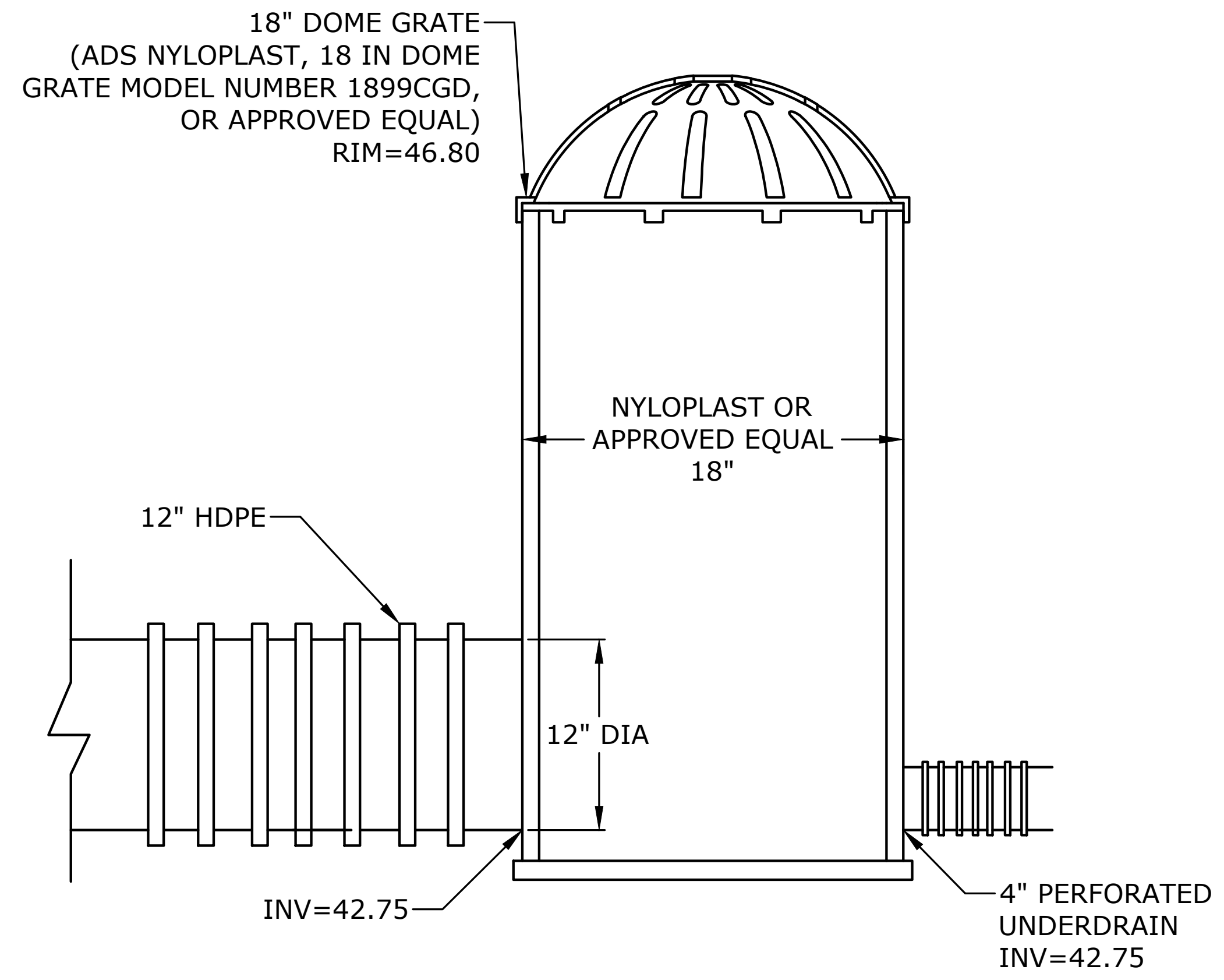
NOTES:
1. HEADWALL SHALL BE 5,000 PSI CONCRETE.
2. HEADWALL REINFORCEMENT SHALL BE 0.18 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. SEE GRADING, DRAINAGE, & EROSION CONTROL PLAN FOR STONE SIZE AND APRON DIMENSIONS.
4. STONE SHALL CONSIST OF SUB-ANGULAR FIELD STONE OR ROUGH UNHEWN QUARRY STONE OF APPROXIMATELY RECTANGULAR SHAPE. FLAT OR ROUND ROCKS ARE NOT ACCEPTABLE. THE STONE SHALL BE HARD AND OF SUCH QUALITY THAT IT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING, BE CHEMICALLY STABLE AND IT SHALL BE SUITABLE IN ALL OTHER RESPECTS FOR THE PURPOSE INTENDED. THE BULK SPECIFIC GRAVITY (SATURATED SURFACE-DRY BASIS) OF THE INDIVIDUAL STONES SHALL BE AT LEAST 2.5.
5. THE STONE SHALL BE COMPOSED OF A WELL-GRADED MIXTURE DOWN TO THE ONE-INCH SIZE PARTICLE SUCH THAT 50 PERCENT OF THE MIXTURE BY WEIGHT SHALL BE LARGER THAN THE D50 SIZE SPECIFIED. A WELL-GRADED MIXTURE IS DEFINED AS A MIXTURE COMPOSED PRIMARILY OF THE LARGER STONE SIZE BUT WITH A SUFFICIENT MIXTURE OF OTHER SIZES TO FILL THE PROGRESSIVELY SMALLER VOIDS BETWEEN THE STONES. THE DIAMETER OF THE LARGEST STONE SIZE IN SUCH A MIXTURE SHALL BE 1.5 TIMES THE D50 SIZE.



SECTION A-A

PRECAST CONCRETE HEADWALL WITH WING WALLS (HW100)

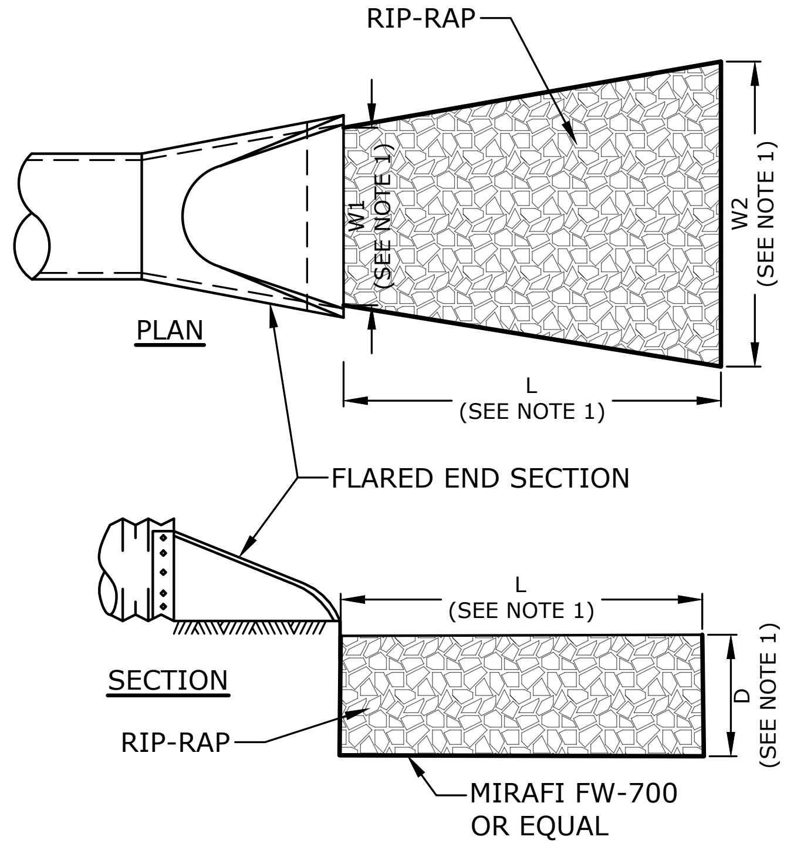
NO SCALE



OUTLET STRUCTURE DETAIL (POS102)

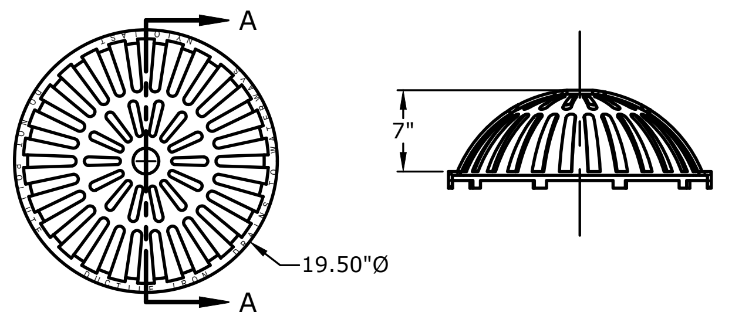
NO SCALE

NOTES:
1. STONE SIZE AND MAT DIMENSIONS DETAILED ON PLANS.
2. STONE SHALL CONSIST OF SUB-ANGULAR FIELD STONE OR ROUGH UNHEWN QUARRY STONE OF APPROXIMATELY RECTANGULAR SHAPE. FLAT OR ROUND ROCKS ARE NOT ACCEPTABLE. THE STONE SHALL BE HARD AND OF SUCH QUALITY THAT IT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING, BE CHEMICALLY STABLE AND IT SHALL BE SUITABLE IN ALL OTHER RESPECTS FOR THE PURPOSE INTENDED. THE BULK SPECIFIC GRAVITY (SATURATED SURFACE-DRY BASIS) OF THE INDIVIDUAL STONES SHALL BE AT LEAST 2.5.
3. THE STONE SHALL BE COMPOSED OF A WELL-GRADED MIXTURE DOWN TO THE ONE-INCH SIZE PARTICLE SUCH THAT 50 PERCENT OF THE MIXTURE BY WEIGHT SHALL BE LARGER THAN THE D50 SIZE SPECIFIED. A WELL-GRADED MIXTURE IS DEFINED AS A MIXTURE COMPOSED PRIMARILY OF THE LARGER STONE SIZE BUT WITH A SUFFICIENT MIXTURE OF OTHER SIZES TO FILL THE PROGRESSIVELY SMALLER VOIDS BETWEEN THE STONES. THE DIAMETER OF THE LARGEST STONE SIZE IN SUCH A MIXTURE SHALL BE 1.5 TIMES THE D50 SIZE.



RIP-RAP APRON DETAIL

NO SCALE



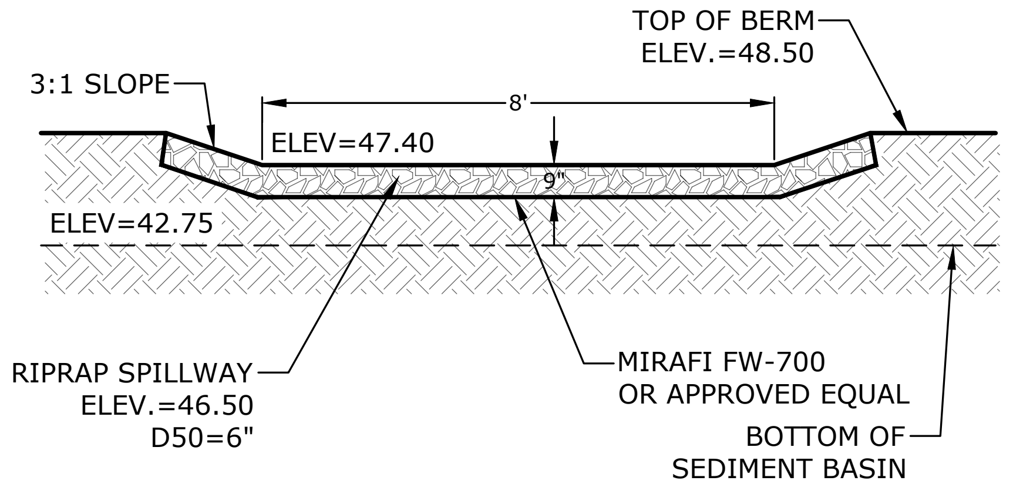
PLAN VIEW

SECTION A-A

NOTE:
1. 18" DOME GRATE SHALL BE ADS NYLOPLAST, 18 IN DOME GRATE MODEL NUMBER 1899CGD, OR APPROVED EQUAL.

18" DOME GRATE DETAIL

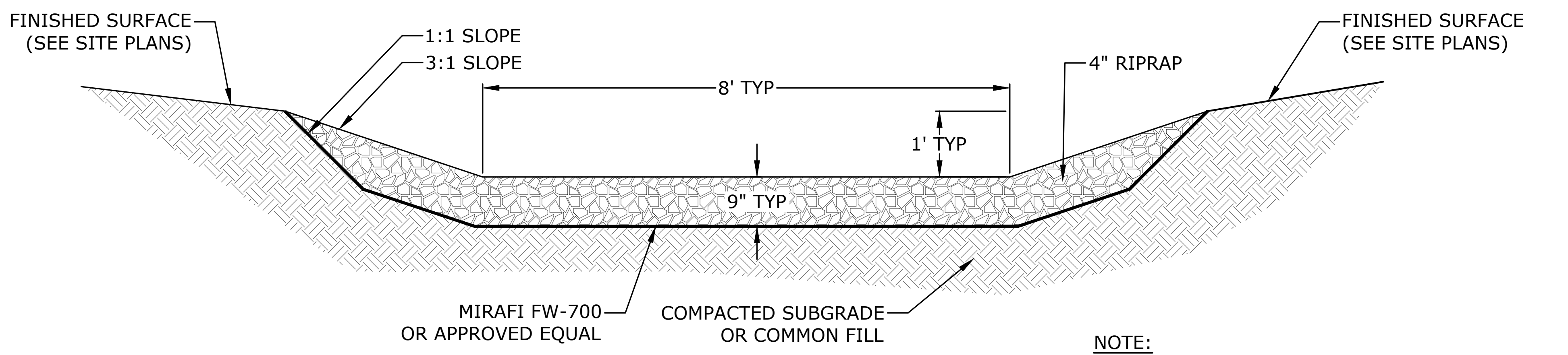
NO SCALE



NOTE:
1. SEE SEDIMENT BASIN #1 DETAIL FOR LOCATION.

SEDIMENT BASIN #1 RIPRAP SPILLWAY

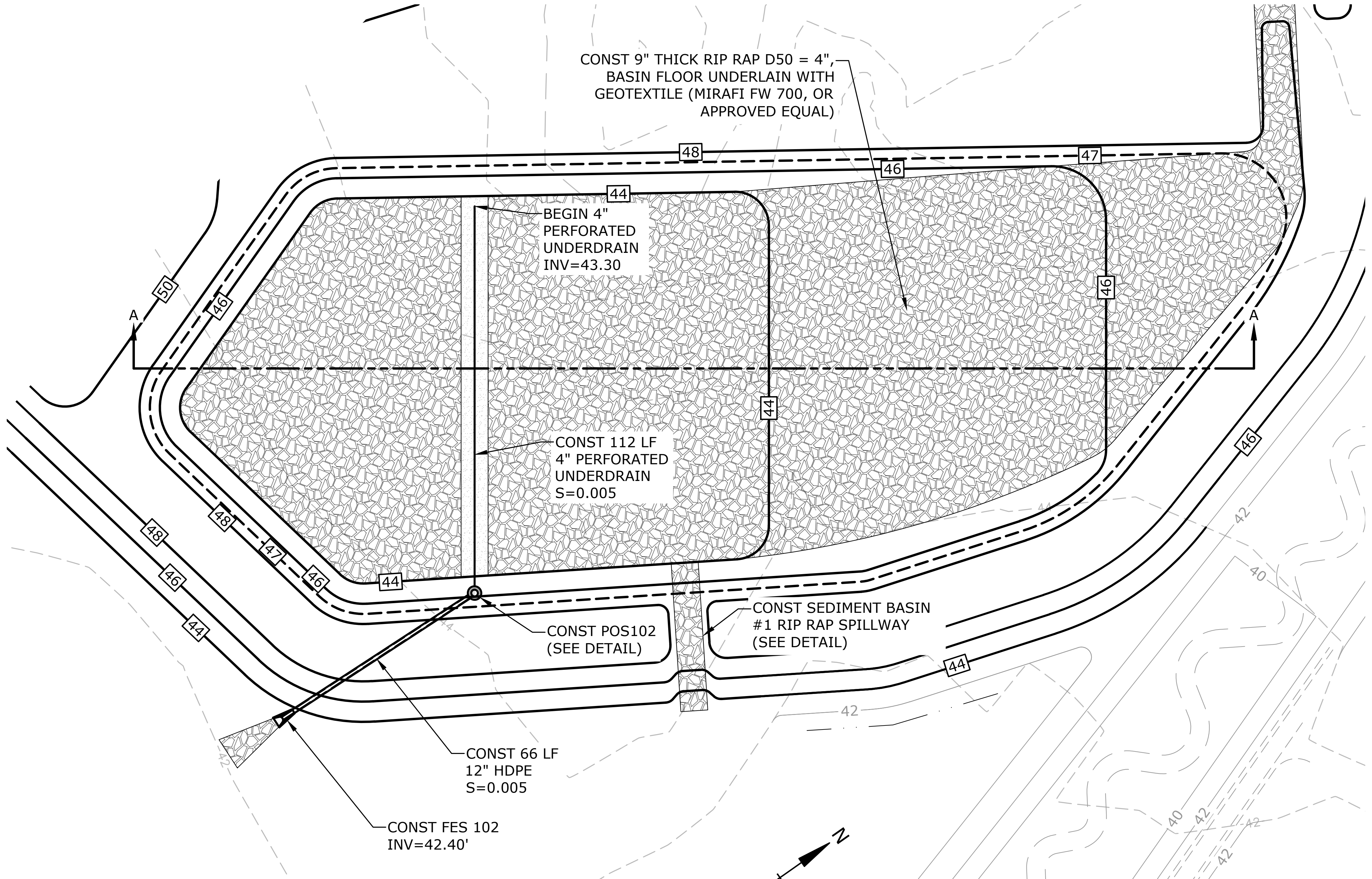
NO SCALE



TEMPORARY CONVEYANCE SWALE

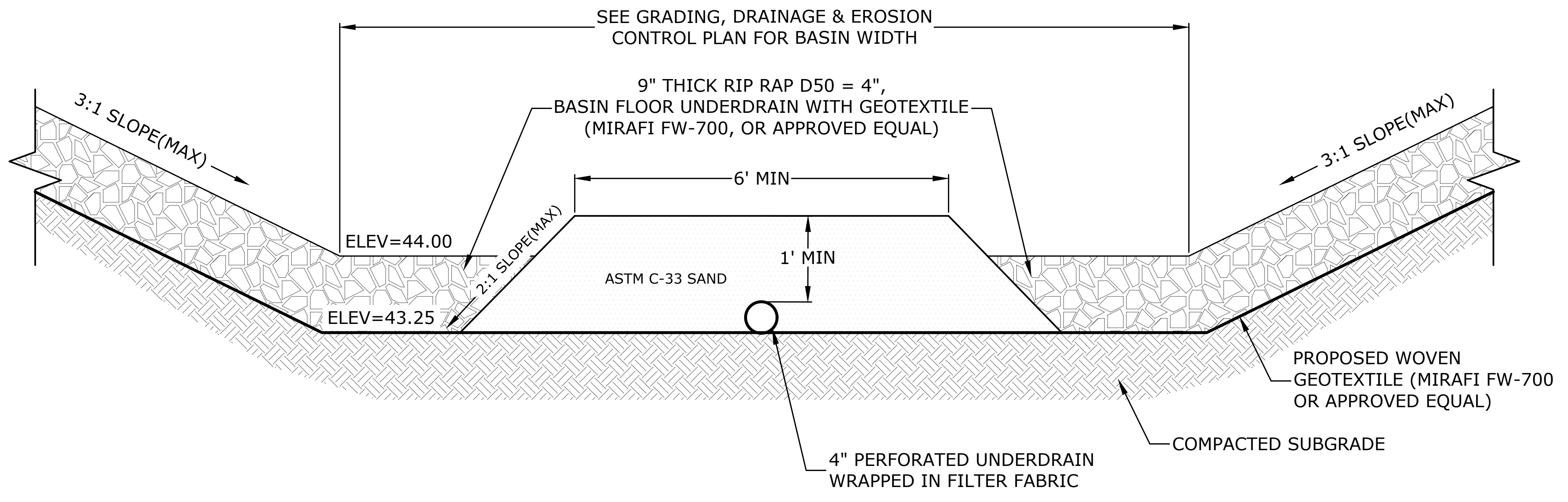
NO SCALE

NOTE:
1. CONTRACTOR TO INSTALL TEMPORARY CHECK DAMS AS NEEDED IN ACCORDANCE WITH NHDES REGULATIONS.



PLAN VIEW

SCALE: 1"=30'



SECTION A-A

NOTES:
1. UNDERDRAIN SAND SHALL BE ASTM C-33 CONCRETE SAND.
2. 4" PERFORATED UNDERDRAIN SHALL BE ADS SB2 LEACH BED PIPE OR APPROVED EQUAL.

TEMPORARY SEDIMENT BASIN 1

NO SCALE

Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

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Lonza Biologics

Portsmouth,
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DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

DETAILS SHEETS

SCALE: AS SHOWN

C-510

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Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
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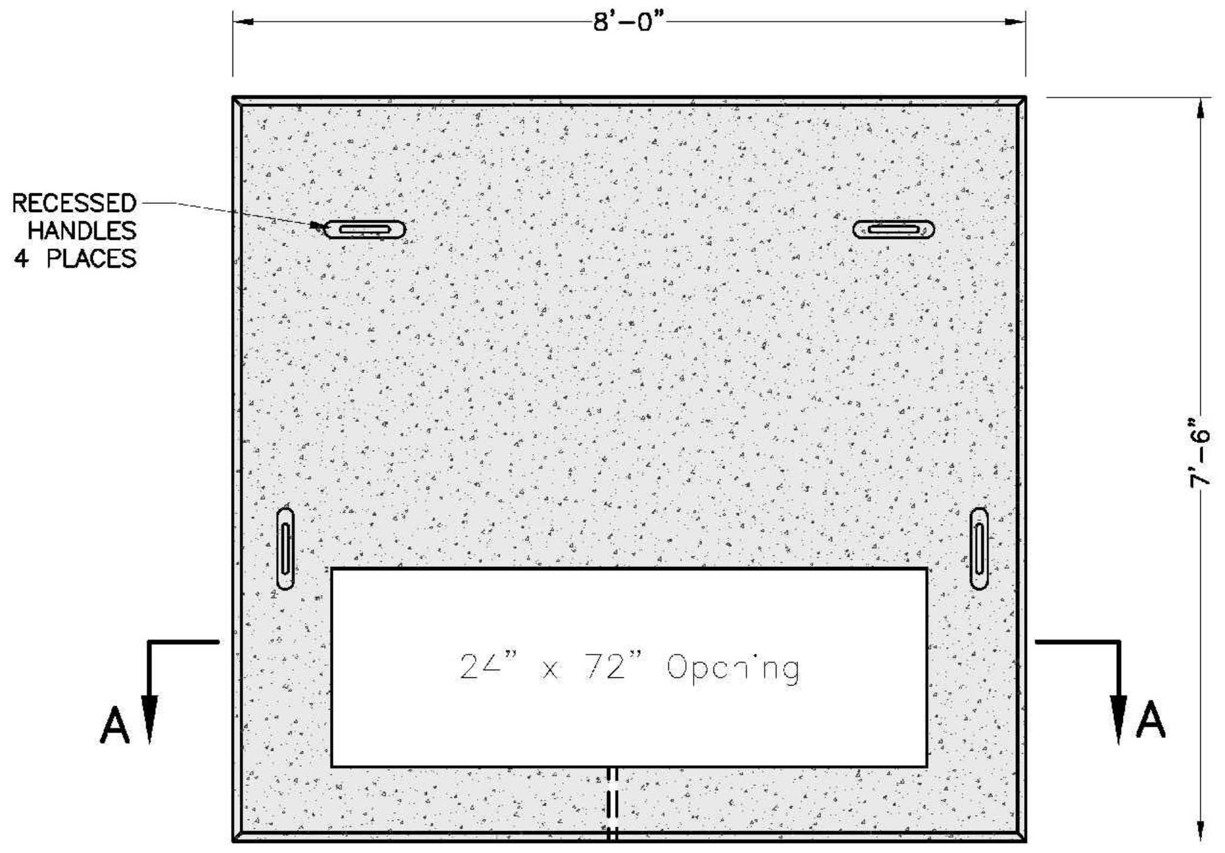
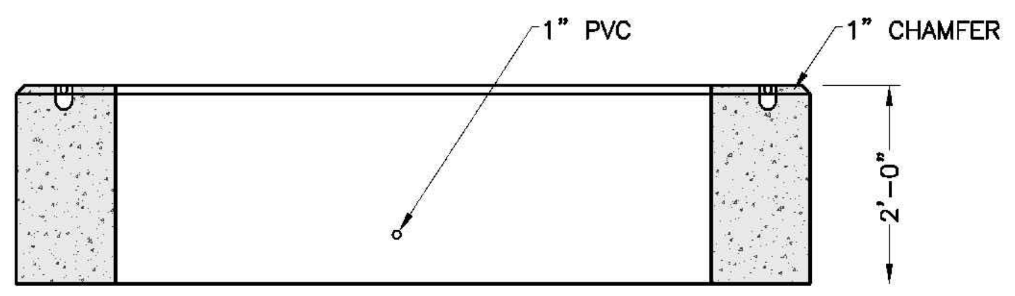


PLAN

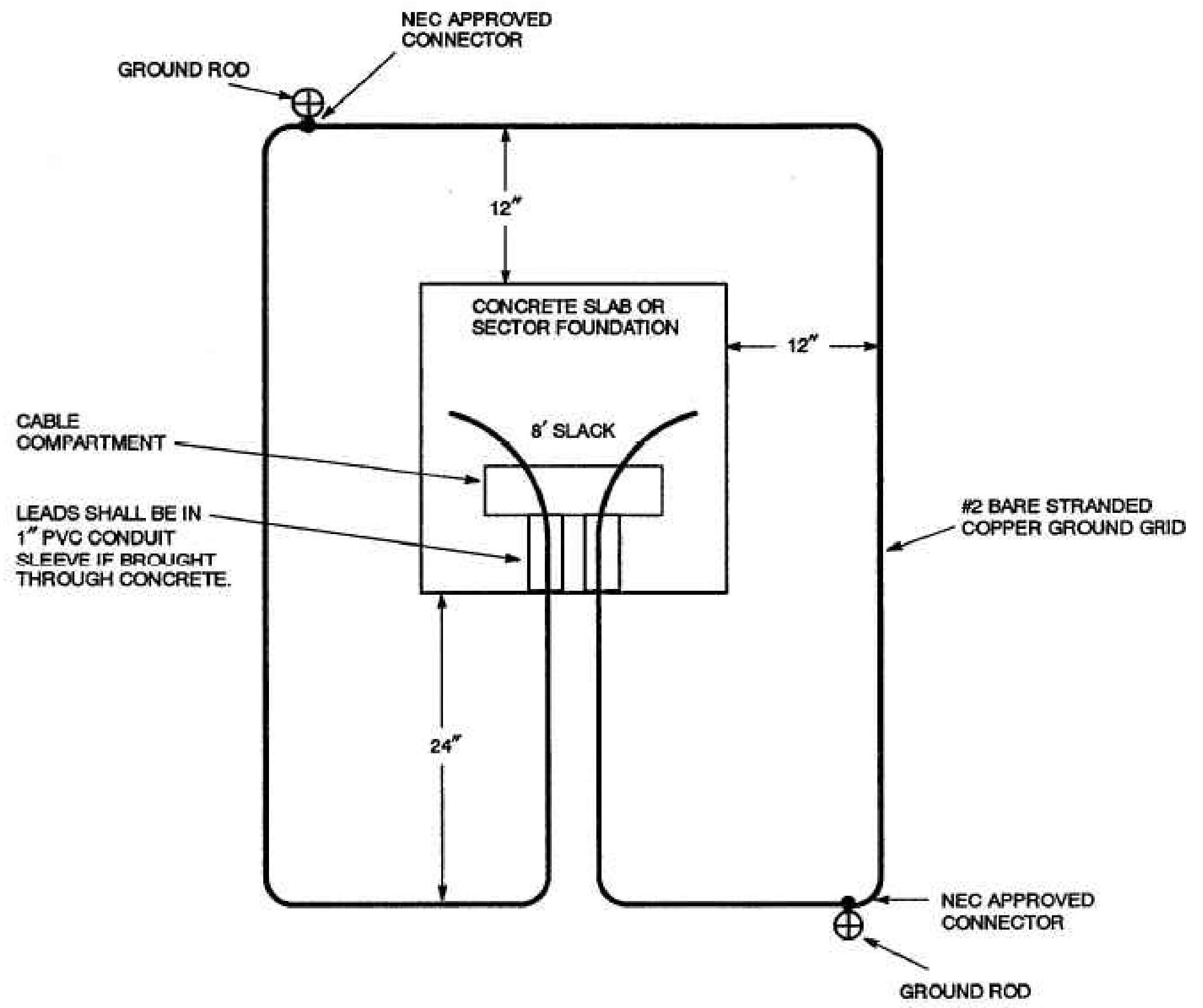


SECTION A–A

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

TRANSFORMER PAD DETAIL

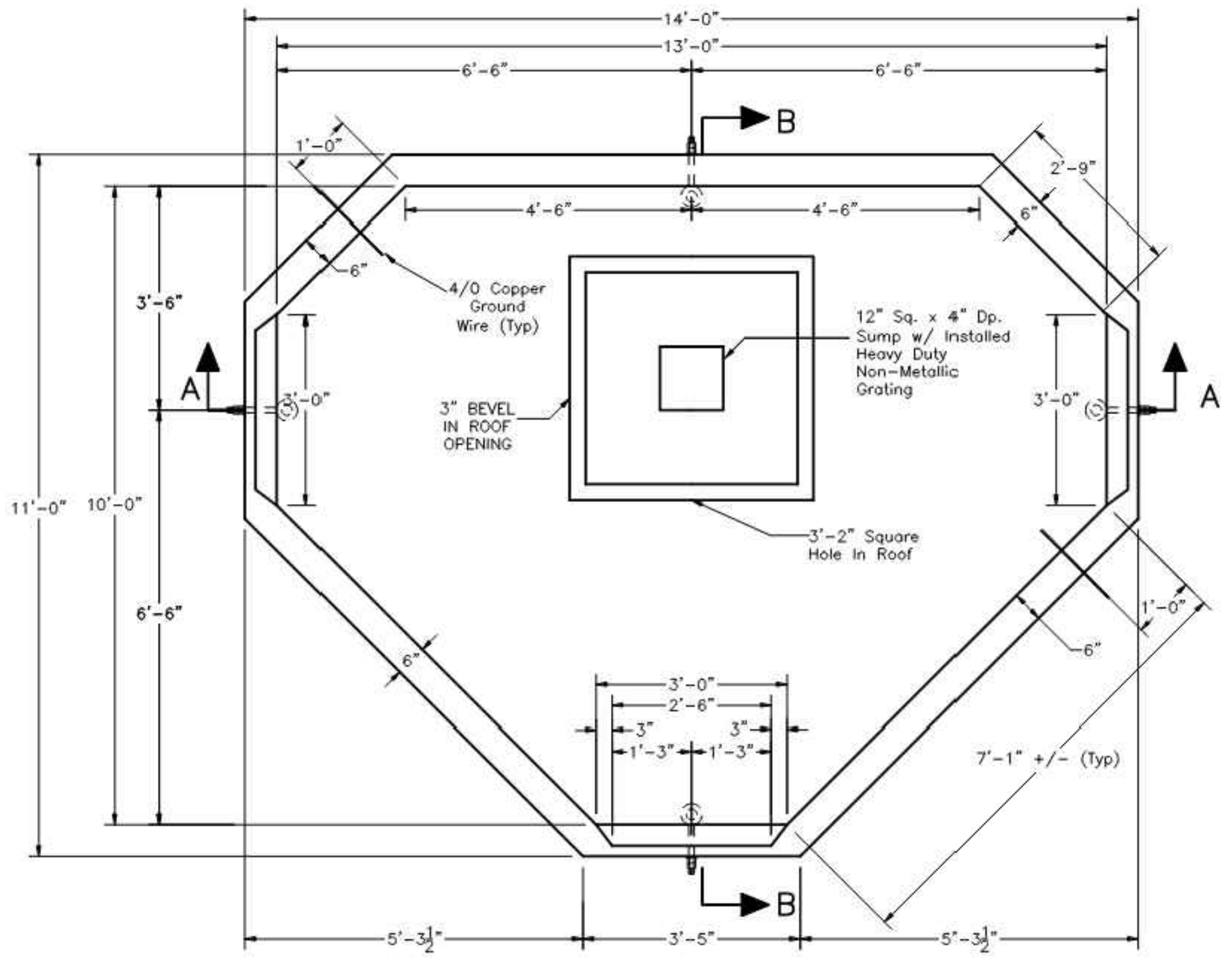
NO SCALE



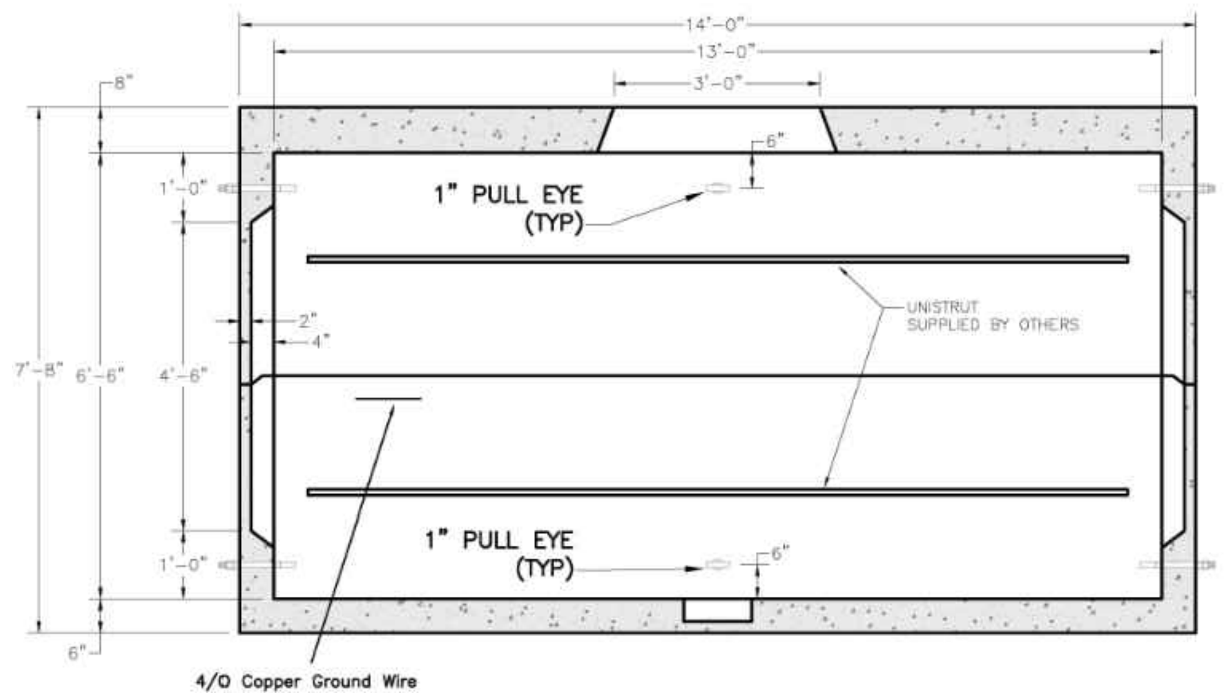
NOTES:
1. THE GROUND GRID SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR AND IS TO BE BURIED AT LEAST 12 INCHES BELOW GRADE. EIGHT FEET OF EXTRA WIRE FOR EACH GROUND GRID LEG SHALL BE LEFT EXPOSED IN THE CABLE COMPARTMENT TO ALLOW FOR THE CONNECTION TO THE TRANSFORMER. THE TWO 8-FOOT GROUND RODS MAY BE EITHER GALVANIZED STEEL OR COPPERWELD AND THEY SHALL BE CONNECTED TO THE GRID WITH NEC APPROVED CONNECTORS.

TYPICAL PAD-MOUNTED EQUIPMENT GROUNDING GRID DETAIL

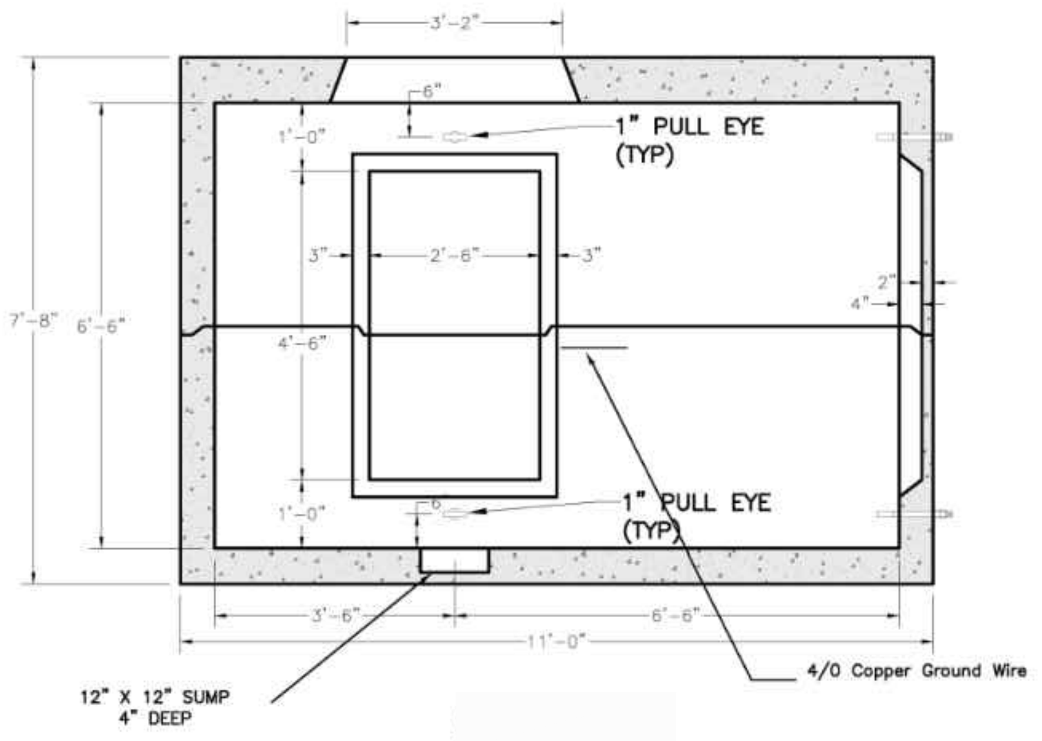
NO SCALE



PLAN



SECTION A-A

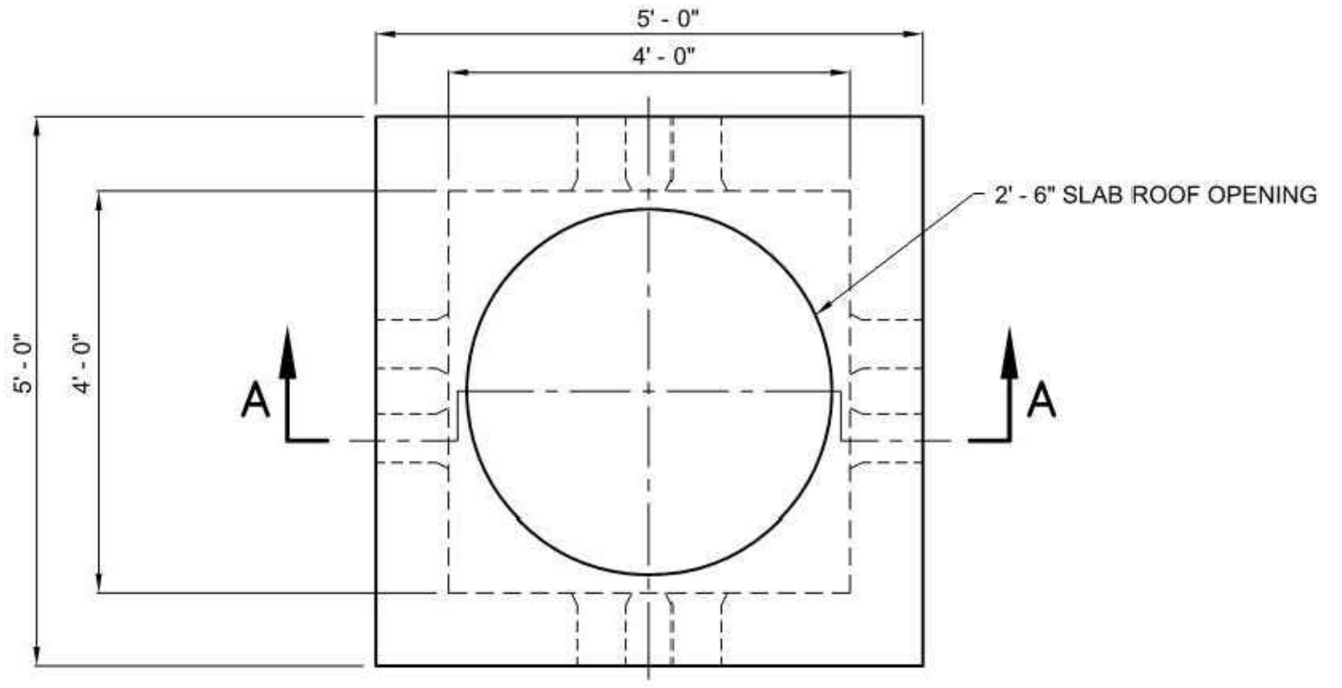


SECTION B-B

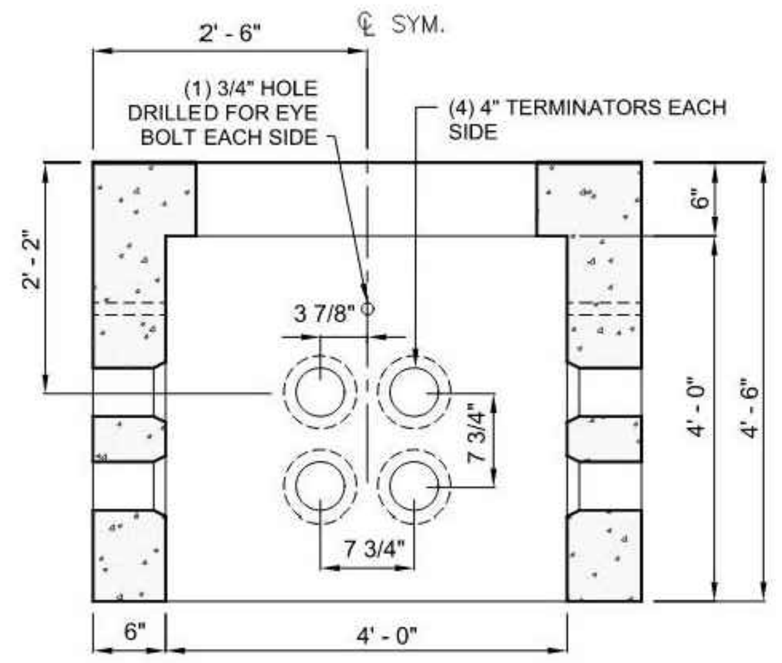
NOTES:
1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION
2. CONCRETE MINIMUM STRENGTH - 5,000 PSI @ 28 DAYS
3. STEEL REINFORCEMENT - ASTM A615, GRADE 60
4. MINIMUM STEEL COVER - 1 INCH
5. DESIGN LOADING - AASHTO HS20-44
6. EXTERIOR COATING PROVIDED
7. ELECTRIC MANHOLE SHALL BE REVIEWED AND APPROVED BY EVERSOURCE PRIOR TO CONSTRUCTION.

3-WAY ELECTRIC MANHOLE

NO SCALE



PLAN

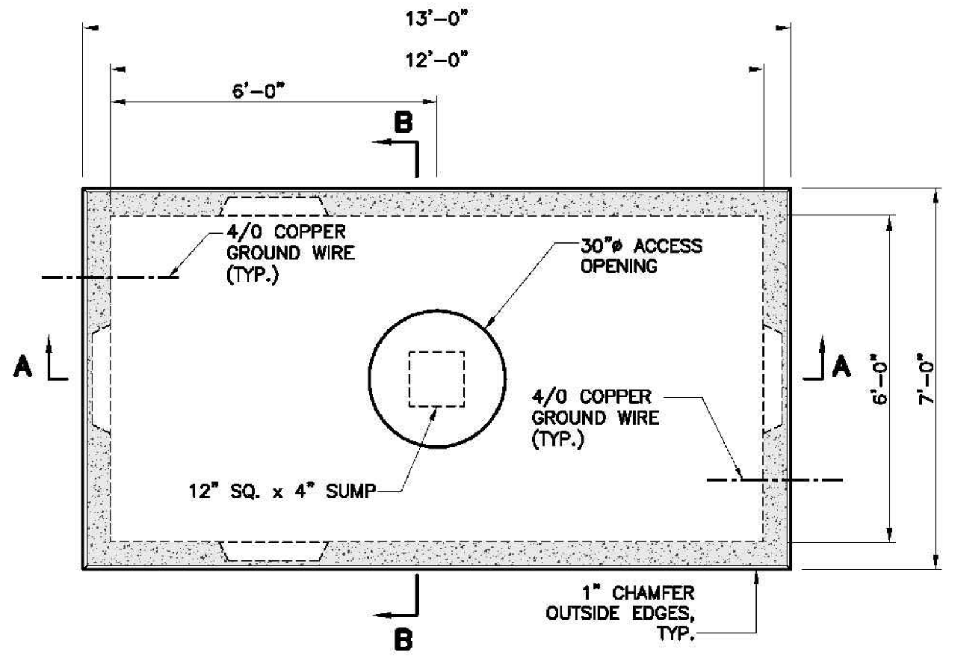


SECTION A-A

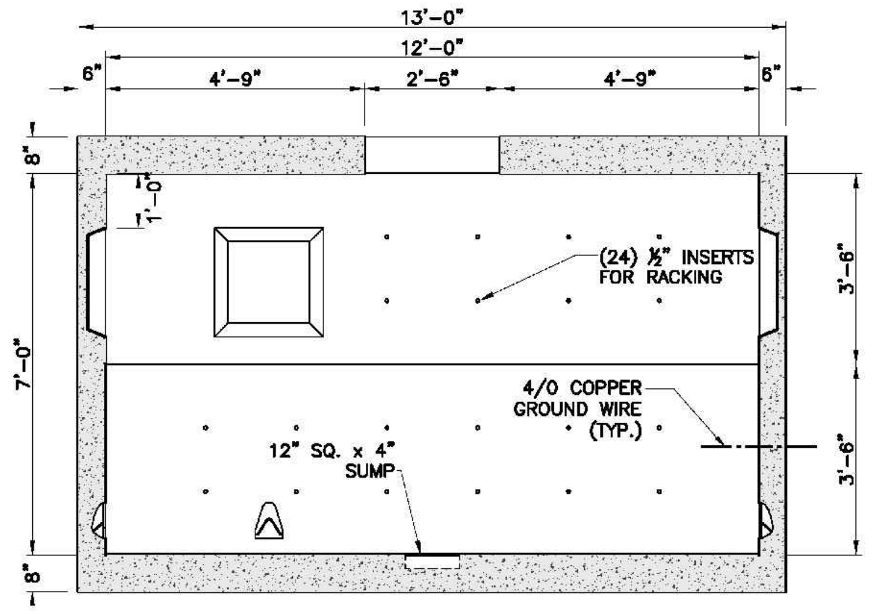
NOTES:
1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. HAND HOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH THE UTILITY COMPANY TO CONSTRUCTION.
2. CONCRETE MINIMUM STRENGTH - 5,000 PSI @ 28 DAYS
3. STEEL REINFORCEMENT - ASTM A615, GRADE 60
4. HAND HOLE SHALL BE REVIEWED AND APPROVED BY THE UTILITY COMPANY PRIOR TO CONSTRUCTION.

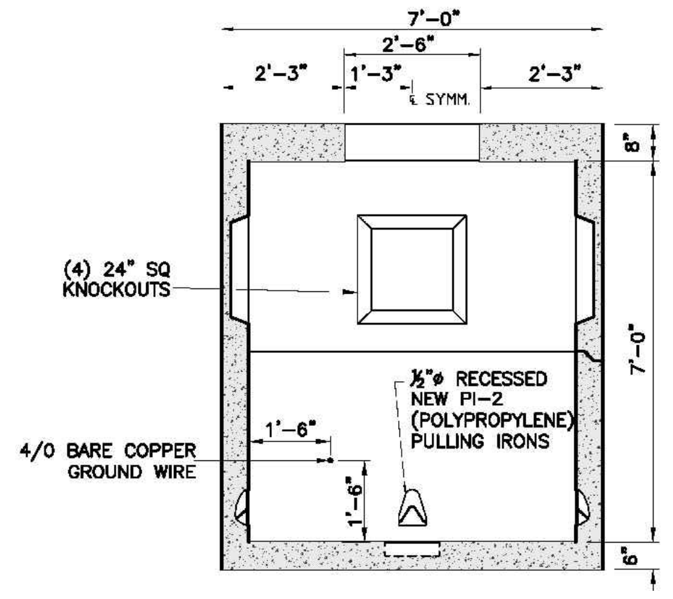
COMMUNICATIONS HAND HOLE DETAIL

NO SCALE



PLAN



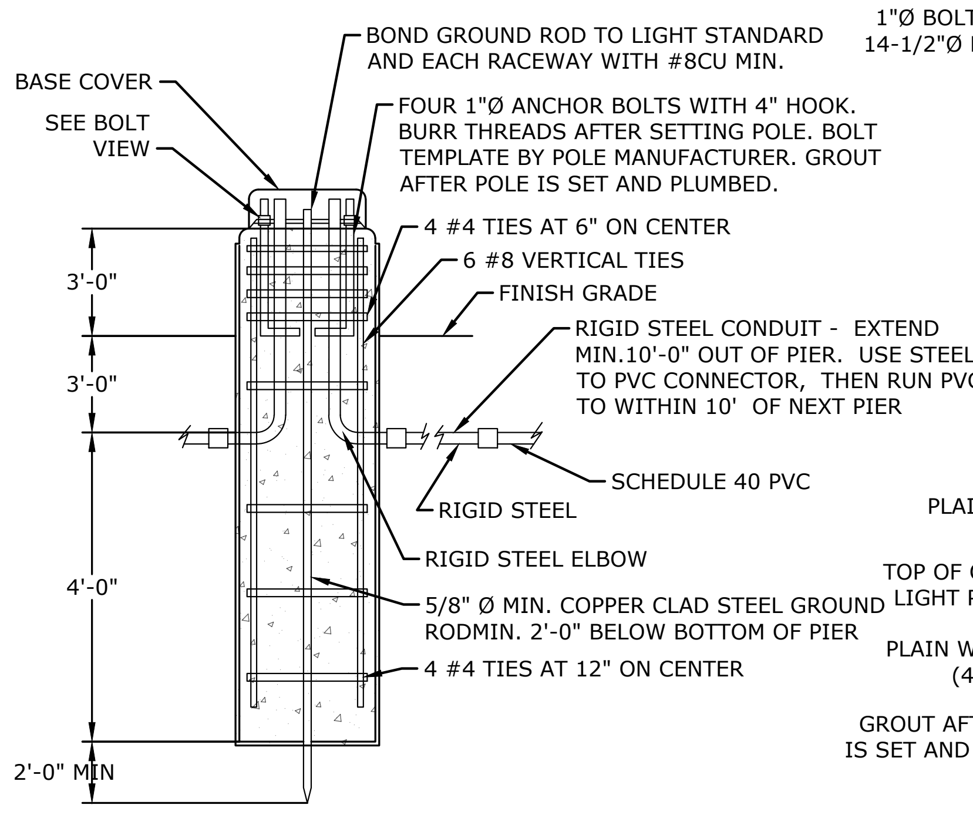


SECTION B-B

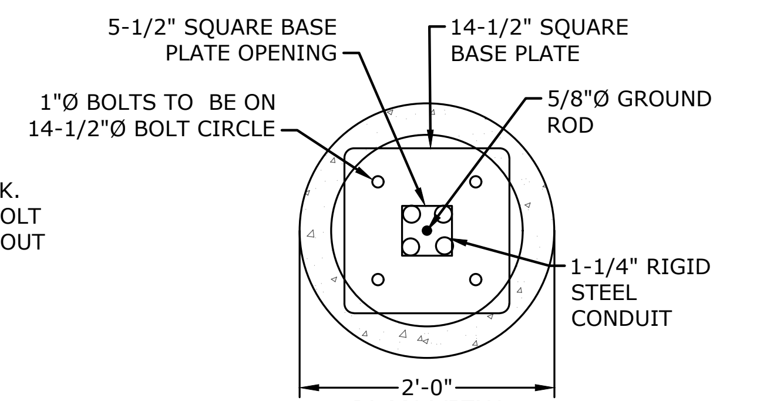
NOTES:
1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION
2. CONCRETE MINIMUM STRENGTH - 5,000 PSI @ 28 DAYS
3. STEEL REINFORCEMENT - ASTM A615, GRADE 60
4. MINIMUM STEEL COVER - 1 INCH
5. DESIGN LOADING - AASHTO HS20-44
6. EXTERIOR COATING PROVIDED
7. ELECTRIC MANHOLE SHALL BE REVIEWED AND APPROVED BY EVERSOURCE PRIOR TO CONSTRUCTION.

TYPICAL ELECTRIC MANHOLE

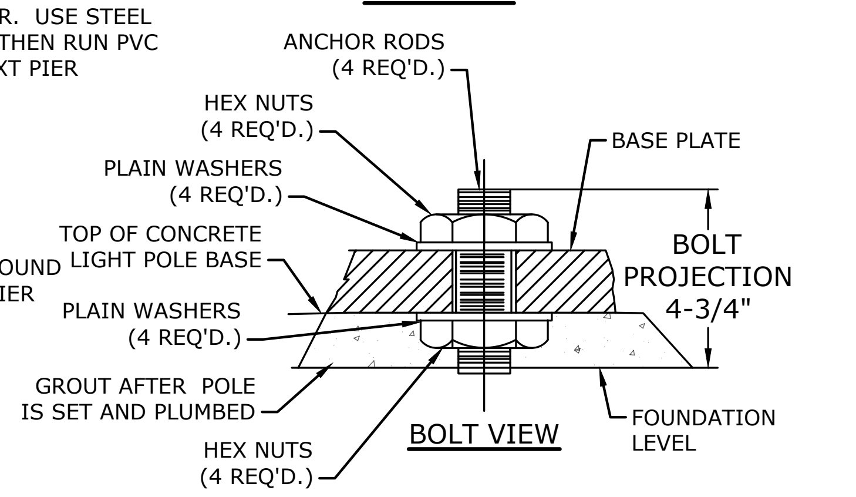
NO SCALE



SECTION VIEW



PLAN VIEW



BOLT VIEW

NOTES:
1. PAINT BASE SAFETY YELLOW (UNLESS PROTECTED BY CURBED ISLAND).
2. CONCRETE TO BE CLASS A, 4000 PSI, AIR ENTRAINED STEEL TO BE 60 KSI
3. REFER TO ELECTRICAL PLANS FOR WIRING DETAILS.
4. LIGHT POLE BASE DETAIL FOR BIDDING PURPOSES ONLY. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL, TO INCLUDE PERFORMANCE SPECIFICATIONS, CALCULATIONS AND NH LICENSED STRUCTURAL ENGINEER'S STAMP FOR LIGHT POLE FOUNDATION.

TYPICAL LIGHT POLE BASE

NO SCALE

Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

Proposed Industrial Development

Lonza Biologics

Portsmouth,
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DRAWN BY: CJK
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DETAILS SHEETS

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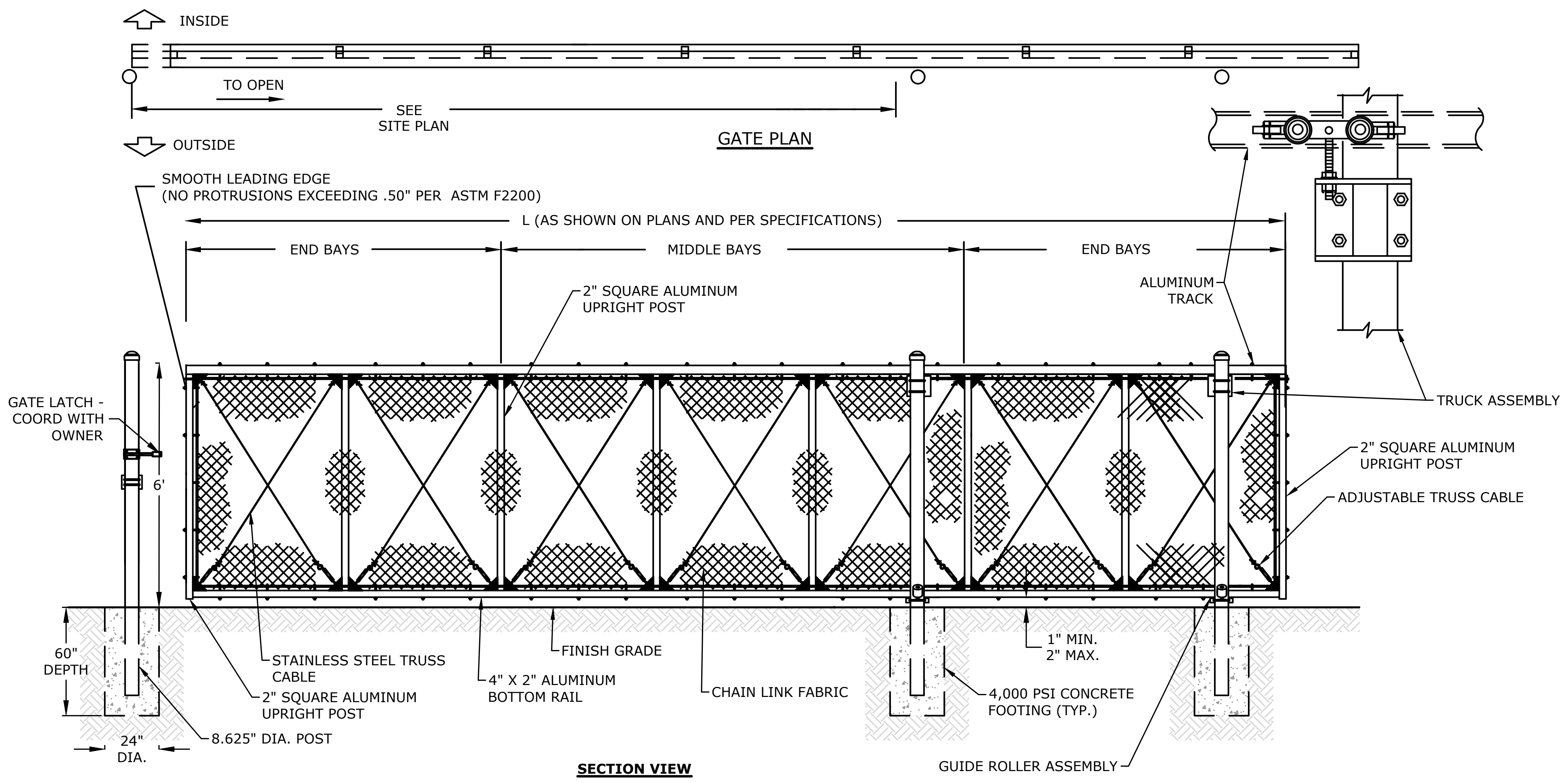
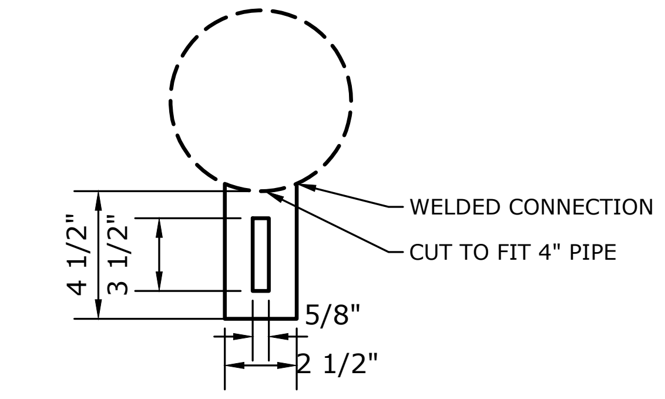
C-511



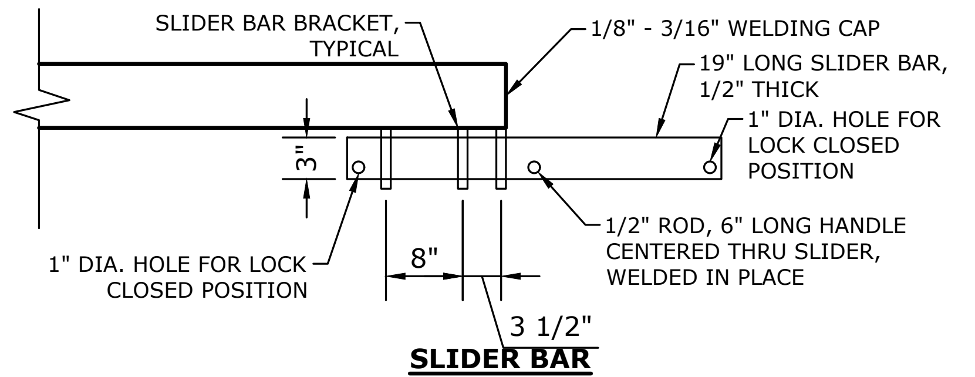
NOTES:

1. ALL GATE FRAMES SHALL BE A MINIMUM 1.90" NOMINAL (ROUND) OR 2.00" NOMINAL (SQUARE). GATE FRAMES SHALL BE OF WELDED CONSTRUCTION OR SHALL BE ASSEMBLED USING HEAVY FITTINGS. AT CONTRACTOR'S OPTION A WELDED HORIZONTAL BRACE MAY BE USED IN LIEU OF TRUSS RODS TO BRACE ALL-WELDED GATE FRAMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER RIGID CONSTRUCTION OF ALL GATES SUPPLIED.
2. CONTRACTOR TO VERIFY REQUIRED NUMBER OF GUIDE ROLLERS WITH MANUFACTURER PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL VERIFY CANTILEVER POST SPACING WITH MANUFACTURER PRIOR TO CONSTRUCTION TO ENSURE SMOOTH OPERATION.

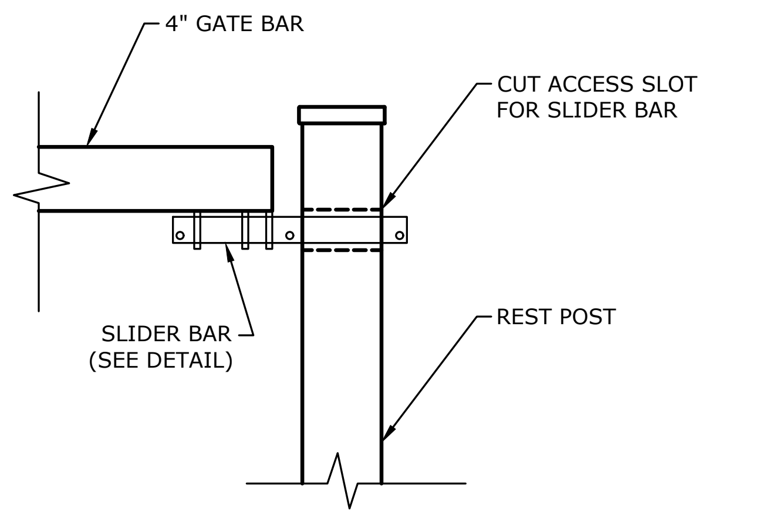
CANTILEVERED SLIDING GATE
NO SCALE



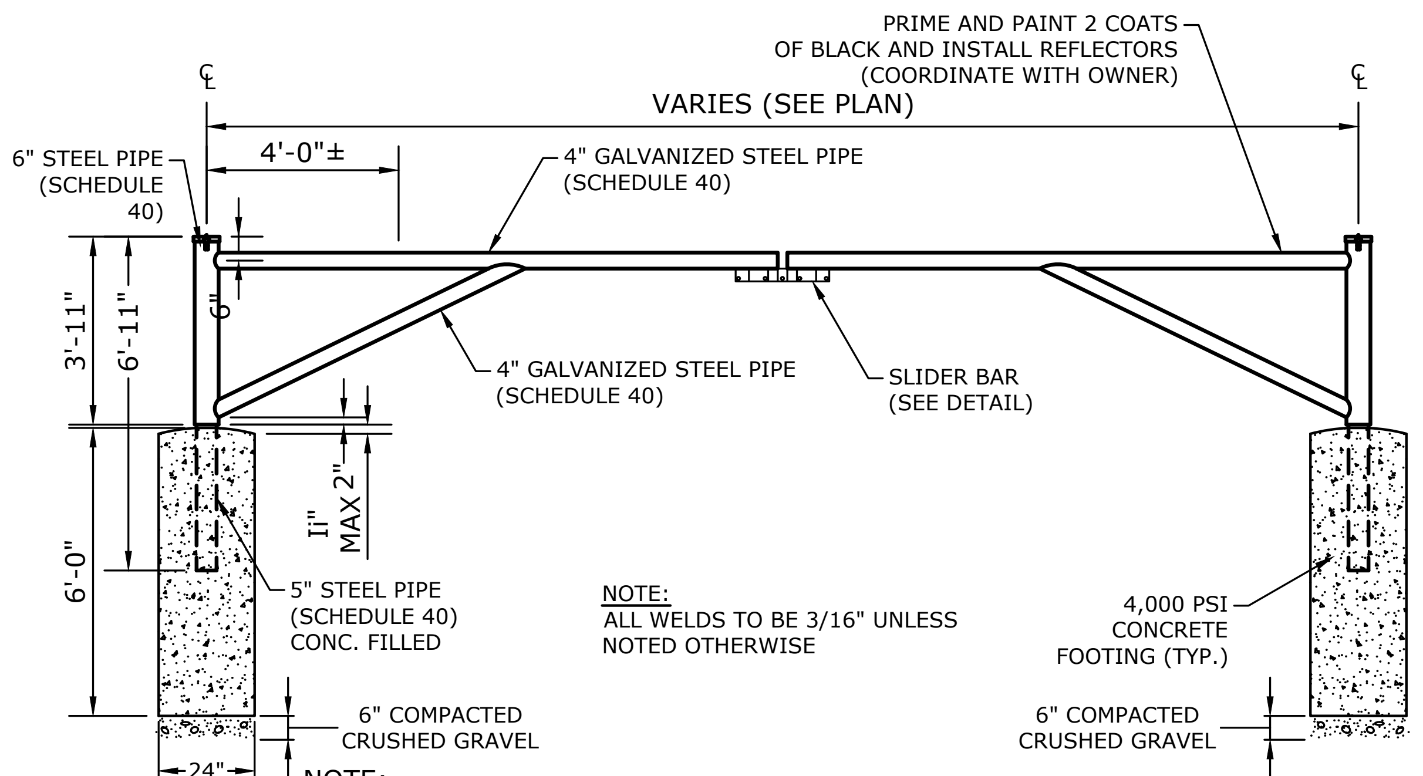
SLIDER BAR BRACKET



SLIDER BAR



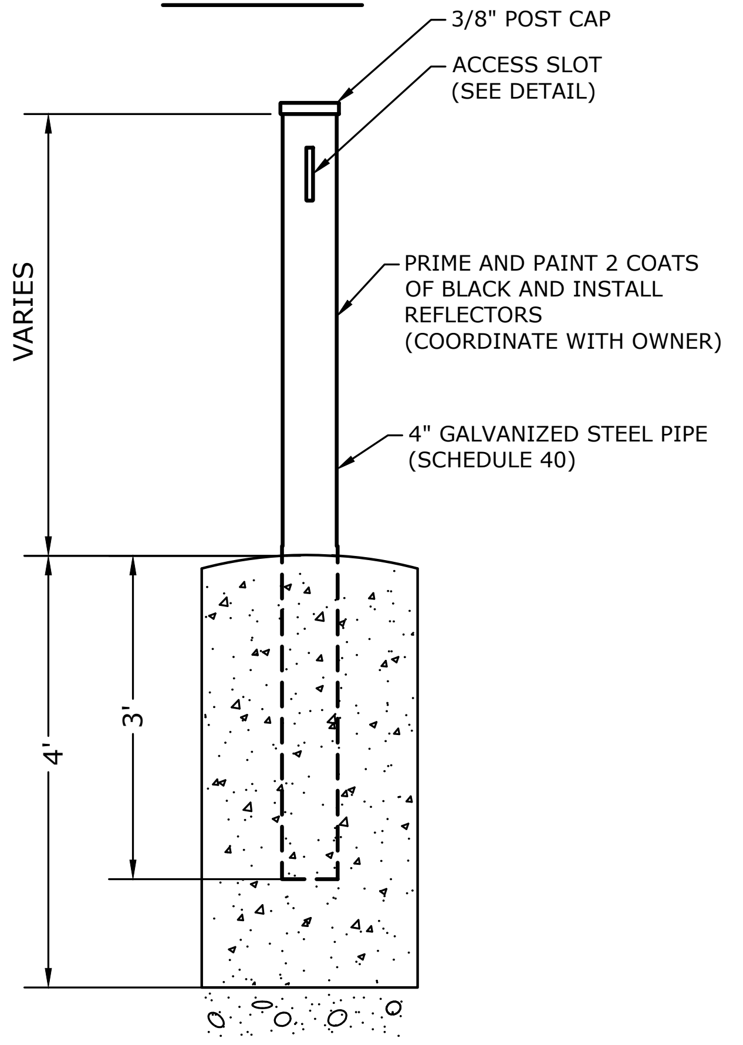
ACCESS SLOT



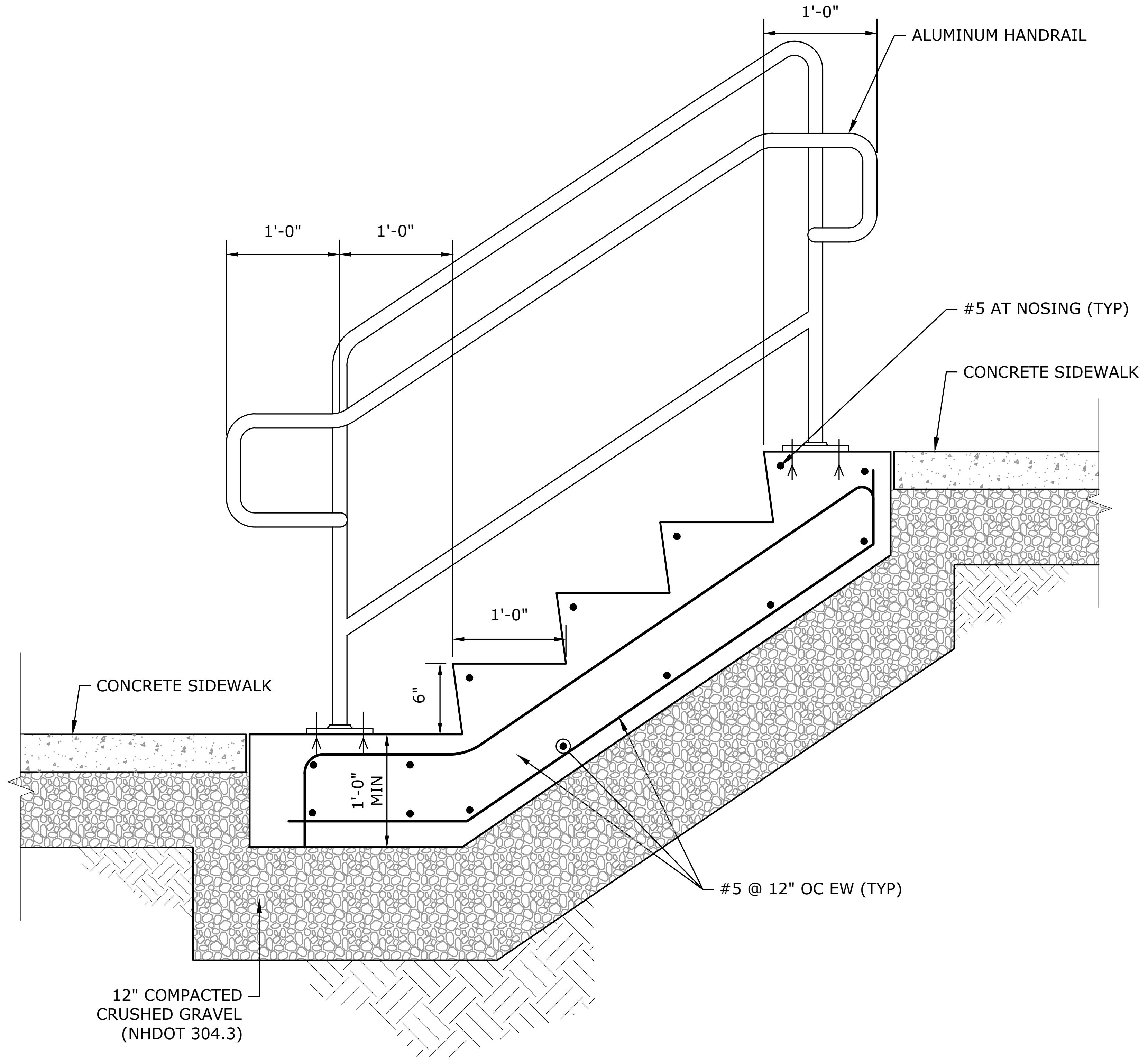
NOTE:
ALL WELDS TO BE 3/16" UNLESS NOTED OTHERWISE

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

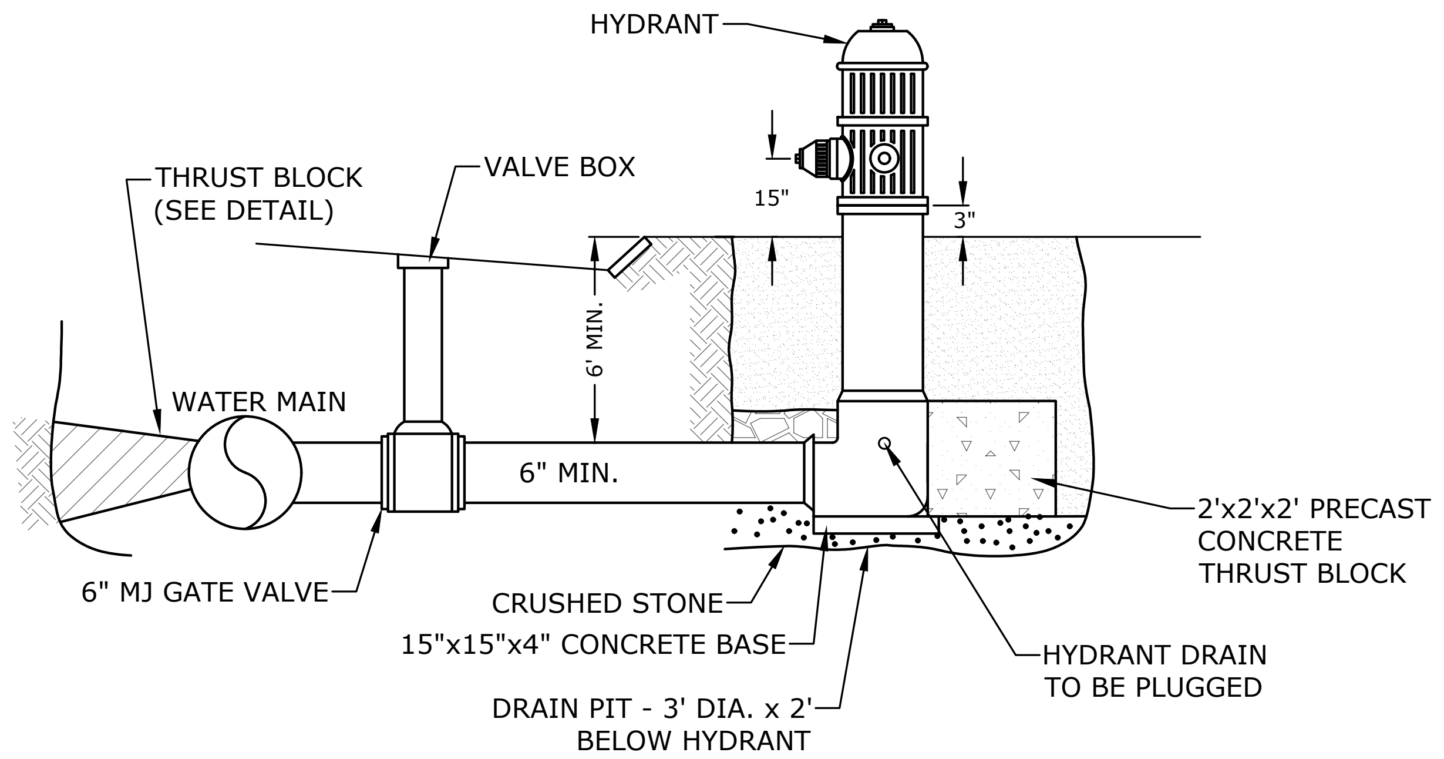
DOUBLE SWING GATE
NO SCALE



REST POST



CONCRETE STAIRS AND HANDRAIL
NO SCALE



NOTES:

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

FIRE HYDRANT
NO SCALE

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Tighe&Bond

NEIL A. HANSEN
No. 15227
9/27/2023

PATRICK CRIMMINS
No. 12378
9/27/2023

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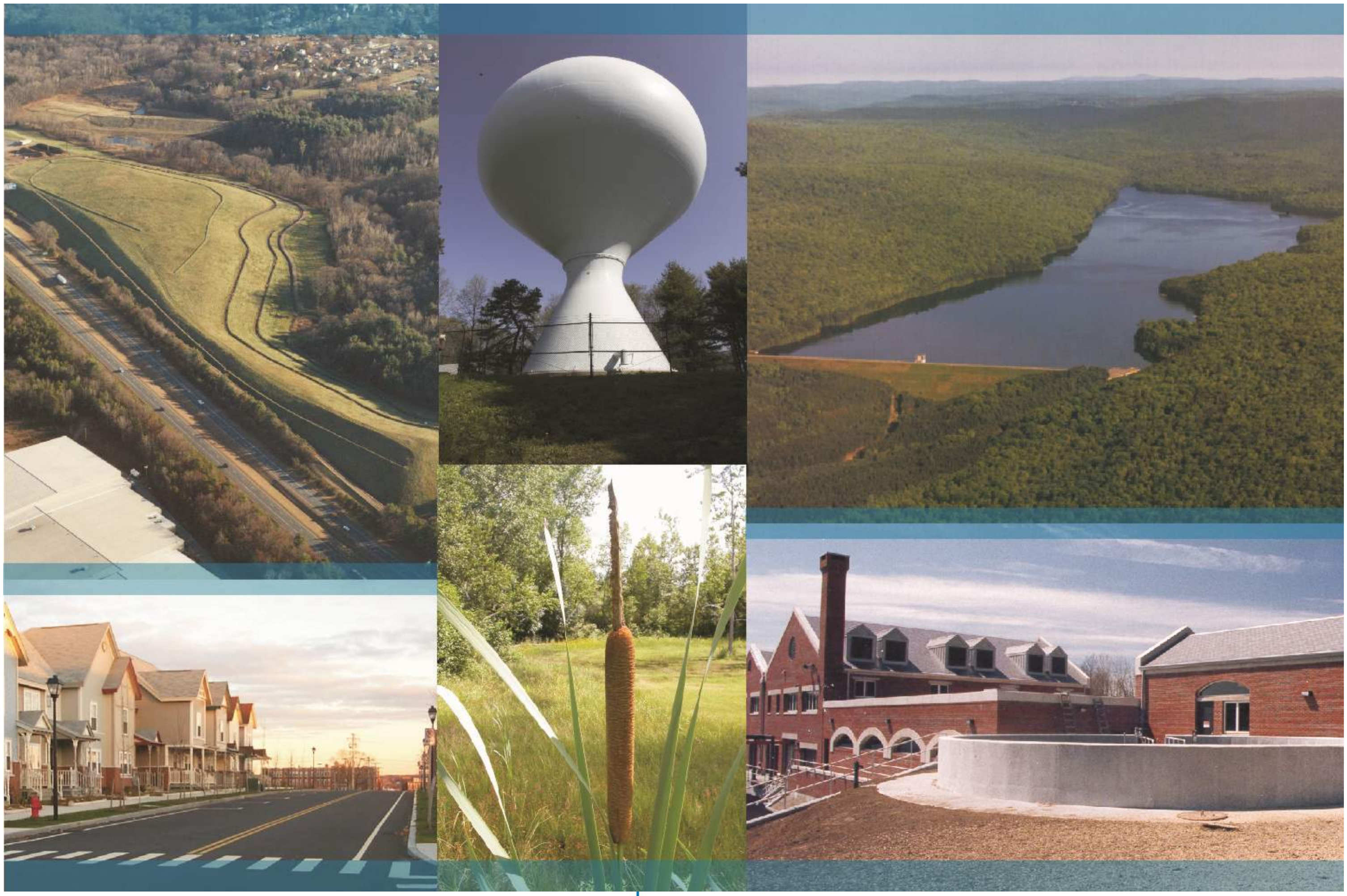
C-512



STATE OF NEW HAMPSHIRE
NEIL
A.
HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
9/27/2023

STATE OF NEW HAMPSHIRE
PATRICK
CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
9/27/2023

Tighe&Bond

Iron Parcel Redevelopment
70 & 80 Corporate Drive
Portsmouth, New Hampshire

Drainage Analysis

Prepared For:

Lonza Biologics
101 International Drive
Portsmouth, New Hampshire

June 18, 2018
Last Revised: September 27, 2023

Section 1 Drainage Analysis

Appendices

J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Report_Evaluations\Applications\City of Portsmouth\20230616 TAC Submission\Drainage\Working Files\L-0700-026_Drainage Analysis.docx

Section 1
Drainage Analysis

The proposed project is to expand Lonza Biologics facility to support its growing product development services to the pharmaceutical and biologic industries. The project is located on the vacant portion of Lonza's 46-acre parcel, referred to as the Iron Parcel, that once consisted of military housing and streets for Pease Air Force Base. The houses and roads were removed in the mid to late 1990's as part of the Civil Redevelopment Plan for Pease after the closure of the Air Force Base.

The total master plan build-out of the proposed industrial development is depicted in the enclosed Site Plan set. The master plan includes three (3) new buildings totaling approximately 800,000 square feet of gross floor area, a central utility building, and a new parking garage. The project's site improvements consist of drive aisles, sidewalks, fire lanes, utilities, lighting and landscaping. The site improvements will consist of new stormwater management systems that include two (2) gravel wetlands and one (1) rain garden. The project has already received an Alteration of Terrain Permit from the New Hampshire Department of Environmental Services (NHDES) for the stormwater management design.

This master plan will be constructed in phases. Full-buildout will take several years and must be completed in phases as Lonza identifies clients and fits out the buildings to meet their needs. The master plan has been broken out into three phases, Phase 1A, Phase 1B, and Phase 2. Currently, Phase 1A construction is nearing completion, and Phase 1B work broke ground in mid-July 2023. Both Phase 1A and Phase 1B received site plan approvals in 2019, however, the drainage analysis of Phase 1B has been included in this analysis for demonstrative purpose of sizing the temporary Sediment Basins 1 & 2. The following summarizes the work completed during Phase 1A and to be completed during Phase 1B:

Phase 1A

- Construction of the stream
- Removal of the existing culvert
- Construction of the sidewalk and landscaping along Corporate Drive
- Completion of Soils Management Plan

Phase 1B

- Construction of building #1 shell
- Construction site improvements for building #1 such as drive aisles, fire lanes, utilities, lighting, sidewalks and stormwater management including Gravel Wetland #1
- Construction utility building shell
- Temporary gravel area for construction trailers, parking, and laydown in the approximate location of Proposed Building #3
- Intermittent grading between stream and Building #1
- Temporary sedimentation basins at locations of Gravel Wetland #2 and Rain Garden #1

Accordingly, this drainage analysis is submitted to analyze the Phase 2 and Master plan portions of the project in conjunction with the site plan review permitting of these phases. The stormwater design of the master plan has not changed from the 2019 approvals and the Alteration of Terrain Permit Approvals. Phase 2 of the project includes the internal fit-up of Building #1 and Central Utility Building, the construction of a temporary surface parking lot to support the employees of Building #1, the construction of Gravel Wetland #2, and their associated miscellaneous site improvements.

The pre-development conditions analyzed in this analysis are the 2018 pre-construction conditions. These pre-development conditions are the same pre-development conditions that were included in the drainage analysis for the 2018 site review permit application for Phase 1A, Phase 1B, and the Master Plan.

1.1 Calculation Methods

The design storms analyzed in this study are the 2-year, 10-year, 25-year and 50-year 24-hour duration storm events. The pre-development 1-year, 24-hour duration storm was also analyzed for channel protection requirements. The stormwater modeling system, HydroCAD 10.0 was utilized to predict the peak runoff rates from these storm events. The peak discharge rates were determined by analyzing Type III 24-hour storm events. The rainfall data for these storm events was obtained from the data published by the Northeast Regional Climate Center at Cornell University, with an additional 15% added factor of safety as required by Env-Wq 1503.08(l).

TABLE 1.1 – EXTREME PRECIPITATION ESTIMATES (NRCC)

YEAR	24-hr Estimate (inches)	+ 15% (inches)
1	2.65	3.05
2	3.20	3.68
10	4.85	5.58
25	6.15	7.07
50	7.36	8.46

Tailwater conditions in the inlet structure PDMH203 and at the outlet of the existing triple arch culverts into the road side swale on Goose Bay Drive have been included in these calculations to account for any surcharging that may occur due to the tailwater condition. These tailwater elevations were determined by Streamworks, PLLC as part of their overall watershed analysis.

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

References:

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

1.2 Pre-Development Conditions

In order to analyze the pre-development condition, the site has been divided into three watershed areas modeled at two points of analysis. These points of analysis and watersheds are depicted on the plan entitled "Pre-Development Watershed Plan", Sheet C-801.

Each of the points of analysis and their contributing watershed areas are described below:

Point of Analysis (PA1)

PRE 1.0 makes up almost the entire area to be developed. This area consists of the entire undeveloped parcel, as well as, a portion of Corporate Drive that drains onto the parcel via a closed drainage system. The pre-development conditions of the watershed was an undeveloped field area that with a portion of the site being used as a temporary construction parking area with associated stormwater management controls near the center of the parcel. Runoff from this area travels southeast via overland flow to Point of Analysis 1 located at the existing Hodgson Brook outlet headwall.

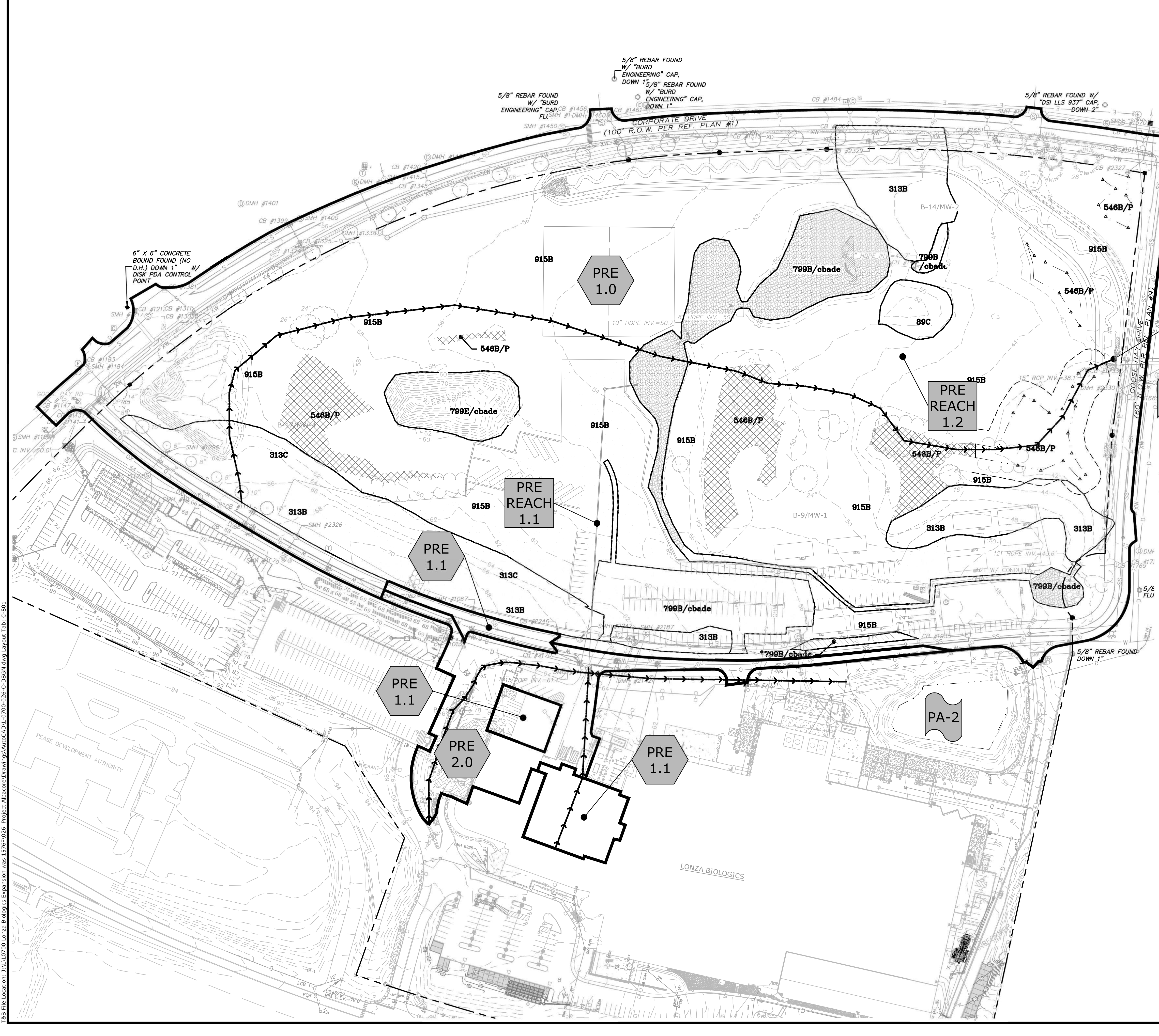
PRE 1.1 includes roof drain runoff from the existing Lonza facility located at 101 International Drive that is connected into the existing Hodgson Brook Culvert. There was also a small portion of Goose Bay Drive that enters this culvert.

The existing tailwater elevations for the road side swale along Goose Bay Drive were determined by Streamworks, PLLC as a part of their overall watershed analysis.

Point of Analysis (PA2)

PRE 2.0 is comprised mostly of runoff from Goose Bay Drive that is located between the undeveloped parcel and the existing Lonza facility. Runoff from this area travels via overland flow to the existing stormwater basin located at the existing Lonza facility. Point of Analysis 2 (PA2) is located at the existing basin.

1.2.1 Pre-Development Watershed Plan



LEGEND

	PRE-DEVELOPMENT WATERSHED BOUNDARY
	SOIL SURVEY BOUNDARIES
	LONGEST FLOW PATH
PRE 1.0	PRE-DEVELOPMENT WATERSHED AREA DESIGNATION
PRE POND 1	PRE-DEVELOPMENT POND DESIGNATION
PA-1	POINT OF ANALYSIS
PRE REACH 1	PRE-DEVELOPMENT REACH DESIGNATION

NOTES:

1. SOIL SURVEY WAS PERFORMED BY GOVE ENVIRONMENTAL SERVICES.

SOIL IDENTIFICATION LEGEND

SYMBOL	SOIL TAXONOMIC NAME, SLOPE RATING
89C	CHATFIELD, 8 TO 15 PERCENT SLOPES
313B	DEERFIELD, 0 TO 8 PERCENT SLOPES
313C	DEERFIELD, 8 TO 15 PERCENT SLOPES
915B	DEERFIELD VARIANT, 0 TO 8 PERCENT SLOPES
546B/P	WALPOLE POORLY DRAINED, 0 TO 8 PERCENT SLOPES
799B	UDORTHENTS URBAN LAND, 0 TO 8 PERCENT SLOPES
799E	UDORTHENTS URBAN LAND, >25 PERCENT SLOPES

Tighe&Bond

SCALE IN FEET
0 80' 160'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
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
MARK	DATE	DESCRIPTION

PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

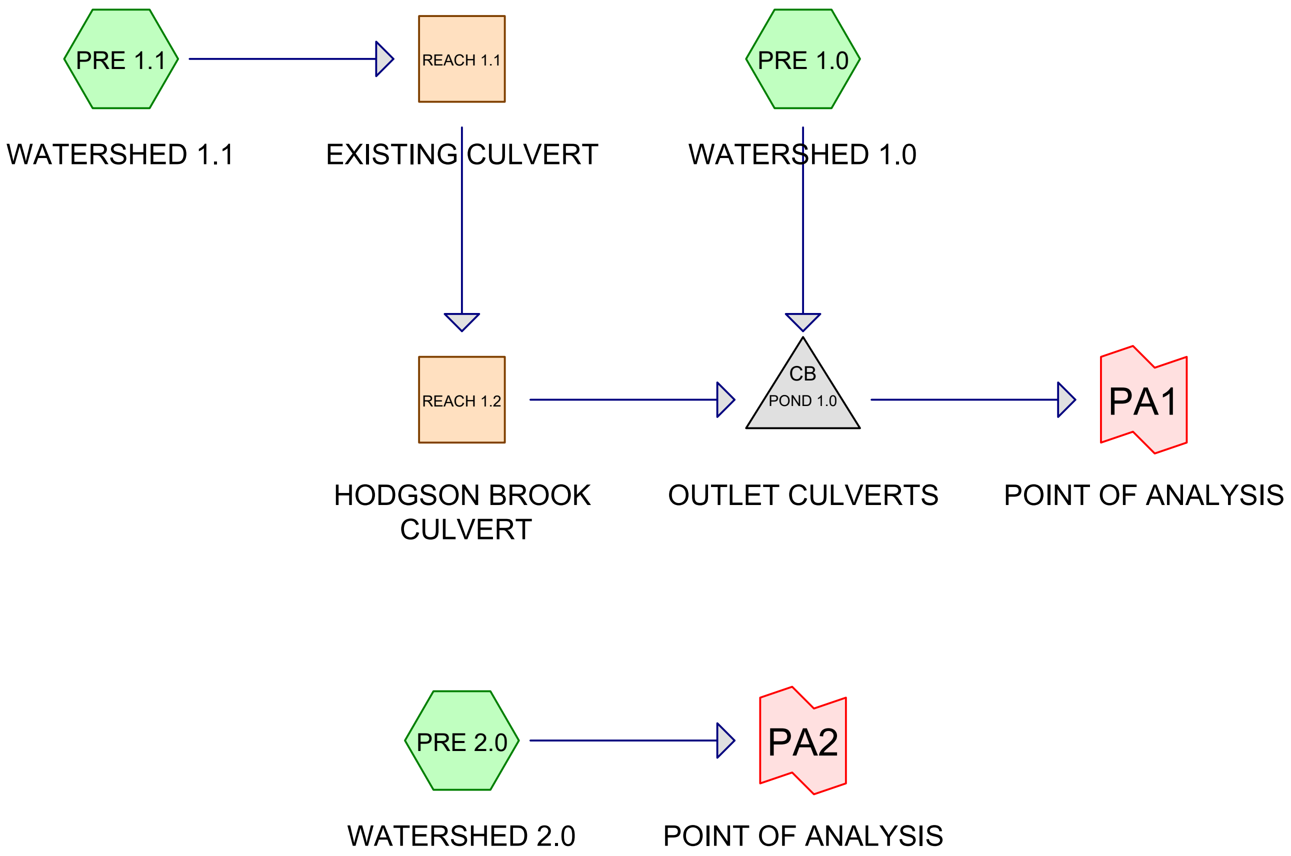
PRE-DEVELOPMENT
WATERSHED AREA PLAN

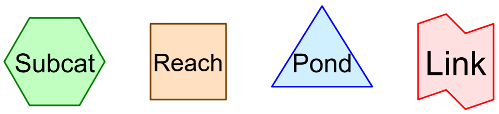
SCALE: AS SHOWN

C-801

Last Save Date: July 13, 2023 3:42 PM By: CKRZCUIK
Plot Date: Thursday, July 13, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-801

1.2.2 Pre-Development Calculations





Routing Diagram for L-0700-26 PRE
Prepared by Tighe & Bond, Printed 6/6/2023
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.736	74	>75% Grass cover, Good, HSG C (PRE 1.1, PRE 2.0)
2.274	91	Gravel roads, HSG D (PRE 1.0)
3.289	58	Meadow, non-grazed, HSG B (PRE 1.0)
19.420	71	Meadow, non-grazed, HSG C (PRE 1.0)
0.044	78	Meadow, non-grazed, HSG D (PRE 1.0)
3.668	98	Paved parking, HSG C (PRE 1.0, PRE 1.1, PRE 2.0)
0.758	98	Roofs, HSG C (PRE 1.1, PRE 2.0)
0.297	55	Woods, Good, HSG B (PRE 1.0)
1.123	70	Woods, Good, HSG C (PRE 1.0)
31.609	**75**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
3.586	HSG B	PRE 1.0
25.705	HSG C	PRE 1.0, PRE 1.1, PRE 2.0
2.318	HSG D	PRE 1.0
0.000	Other	
31.609		**TOTAL AREA**

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

SubcatchmentPRE 1.0: WATERSHED1.0 Runoff Area=1,275,727 sf 9.69% Impervious Runoff Depth>1.35"
Flow Length=1,805' Tc=34.4 min CN=74 Runoff=24.04 cfs 3.305 af

SubcatchmentPRE 1.1: WATERSHED1.1 Runoff Area=33,611 sf 90.29% Impervious Runoff Depth>3.22"
Flow Length=305' Tc=5.0 min CN=96 Runoff=2.71 cfs 0.207 af

SubcatchmentPRE 2.0: WATERSHED2.0 Runoff Area=67,564 sf 57.38% Impervious Runoff Depth>2.43"
Flow Length=872' Tc=5.0 min CN=88 Runoff=4.41 cfs 0.314 af

Reach REACH 1.1: EXISTING CULVERT Avg. Flow Depth=0.47' Max Vel=6.37 fps Inflow=2.71 cfs 0.207 af
15.0" Round Pipe n=0.012 L=515.0' S=0.0165 '/' Capacity=8.99 cfs Outflow=2.66 cfs 0.207 af

Reach REACH 1.2: HODGSON BROOK Avg. Flow Depth=0.34' Max Vel=4.72 fps Inflow=2.66 cfs 0.207 af
48.0" Round Pipe n=0.012 L=825.0' S=0.0112 '/' Capacity=164.33 cfs Outflow=2.46 cfs 0.207 af

Pond POND 1.0: OUTLET CULVERTS Peak Elev=38.24' Inflow=24.73 cfs 3.511 af
42.0" x 29.0", R=21.5"/66.1" Pipe Arch Culvert x 3.00 n=0.025 L=68.0' S=0.0044 '/' Outflow=24.86 cfs 3.511 af

Link PA1: POINT OF ANALYSIS Inflow=24.86 cfs 3.511 af
Primary=24.86 cfs 3.511 af

Link PA2: POINT OF ANALYSIS Inflow=4.41 cfs 0.314 af
Primary=4.41 cfs 0.314 af

Total Runoff Area = 31.609 ac Runoff Volume = 3.826 af Average Runoff Depth = 1.45"
86.00% Pervious = 27.184 ac 14.00% Impervious = 4.426 ac

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

SubcatchmentPRE 1.0: WATERSHED1.0 Runoff Area=1,275,727 sf   9.69% Impervious   Runoff Depth>2.81"
                                   Flow Length=1,805'   Tc=34.4 min   CN=74   Runoff=51.44 cfs  6.869 af

SubcatchmentPRE 1.1: WATERSHED1.1    Runoff Area=33,611 sf   90.29% Impervious   Runoff Depth>5.11"
                                     Flow Length=305'   Tc=5.0 min   CN=96   Runoff=4.19 cfs  0.328 af

SubcatchmentPRE 2.0: WATERSHED2.0    Runoff Area=67,564 sf   57.38% Impervious   Runoff Depth>4.22"
                                     Flow Length=872'   Tc=5.0 min   CN=88   Runoff=7.49 cfs  0.545 af

Reach REACH 1.1: EXISTING CULVERT  Avg. Flow Depth=0.59'   Max Vel=7.16 fps   Inflow=4.19 cfs  0.328 af
       15.0"  Round Pipe   n=0.012   L=515.0'   S=0.0165 '/'   Capacity=8.99 cfs   Outflow=4.12 cfs  0.328 af

Reach REACH 1.2: HODGSON BROOK     Avg. Flow Depth=0.42'   Max Vel=5.42 fps   Inflow=4.12 cfs  0.328 af
     48.0"  Round Pipe   n=0.012   L=825.0'   S=0.0112 '/'   Capacity=164.33 cfs   Outflow=3.88 cfs  0.328 af

Pond POND 1.0: OUTLET CULVERTS                          Peak Elev=39.02'   Inflow=52.53 cfs  7.196 af
42.0" x 29.0", R=21.5"/66.1"  Pipe Arch Culvert x 3.00  n=0.025  L=68.0'  S=0.0044 '/'   Outflow=52.69 cfs  7.195 af

Link PA1: POINT OF ANALYSIS                                                      Inflow=52.69 cfs  7.195 af
                                                                                Primary=52.69 cfs  7.195 af

Link PA2: POINT OF ANALYSIS                                                       Inflow=7.49 cfs  0.545 af
                                                                                 Primary=7.49 cfs  0.545 af

            Total Runoff Area = 31.609 ac   Runoff Volume = 7.742 af   Average Runoff Depth = 2.94"
                                     86.00% Pervious = 27.184 ac     14.00% Impervious = 4.426 ac
```

Summary for Subcatchment PRE 1.0: WATERSHED 1.0

Runoff = 51.44 cfs @ 12.49 hrs, Volume= 6.869 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
143,279	58	Meadow, non-grazed, HSG B
12,922	55	Woods, Good, HSG B
845,939	71	Meadow, non-grazed, HSG C
123,662	98	Paved parking, HSG C
48,932	70	Woods, Good, HSG C
1,932	78	Meadow, non-grazed, HSG D
99,061	91	Gravel roads, HSG D
1,275,727	74	Weighted Average
1,152,065		90.31% Pervious Area
123,662		9.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0400	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.1	11	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	70	0.0290	1.19		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.4	1,089	0.0147	0.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.6	120	0.0330	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.2	368	0.0160	1.90		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	47	0.0050	4.03	4.95	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
34.4	1,805	Total			

Summary for Subcatchment PRE 1.1: WATERSHED 1.1

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

Runoff = 4.19 cfs @ 12.07 hrs, Volume= 0.328 af, Depth> 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
22,865	98	Roofs, HSG C
3,263	74	>75% Grass cover, Good, HSG C
7,483	98	Paved parking, HSG C
33,611	96	Weighted Average
3,263		9.71% Pervious Area
30,348		90.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.0050	0.85		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
1.2	205	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	305	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment PRE 2.0: WATERSHED 2.0

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

Runoff = 7.49 cfs @ 12.07 hrs, Volume= 0.545 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
10,145	98	Roofs, HSG C
28,794	74	>75% Grass cover, Good, HSG C
28,625	98	Paved parking, HSG C
67,564	88	Weighted Average
28,794		42.62% Pervious Area
38,770		57.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0650	2.36		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
1.5	320	0.0560	3.55		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	42	0.0050	3.72	4.57	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Cast iron, coated
1.3	410	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
3.7	872	Total, Increased to minimum Tc = 5.0 min			

Summary for Reach REACH 1.1: EXISTING CULVERT

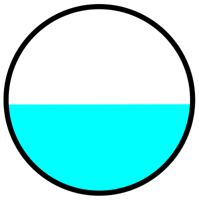
[52] Hint: Inlet/Outlet conditions not evaluated

```
Inflow Area =         0.772 ac,  90.29% Impervious,  Inflow Depth >   5.11"    for  10 Year event
Inflow      =         4.19 cfs @   12.07 hrs,  Volume=            0.328 af
Outflow     =         4.12 cfs @   12.09 hrs,  Volume=            0.328 af,  Atten= 2%,  Lag= 1.2 min
```

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.16 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 2.41 fps, Avg. Travel Time= 3.6 min

Peak Storage= 296 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 8.99 cfs

15.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 515.0' Slope= 0.0165 '/'
Inlet Invert= 53.60', Outlet Invert= 45.10'



Summary for Reach REACH 1.2: HODGSON BROOK CULVERT

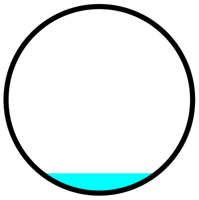
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach REACH 1.1 outlet invert by 0.42' @ 12.10 hrs

```
Inflow Area =         0.772 ac,  90.29% Impervious,  Inflow Depth >   5.10"    for  10 Year event
Inflow      =         4.12 cfs @   12.09 hrs,  Volume=            0.328 af
Outflow     =         3.88 cfs @   12.12 hrs,  Volume=            0.328 af,  Atten= 6%,  Lag= 1.7 min
```

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.42 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 1.85 fps, Avg. Travel Time= 7.4 min

Peak Storage= 588 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 164.33 cfs

48.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 825.0' Slope= 0.0112 '/'
Inlet Invert= 45.10', Outlet Invert= 35.90'



Summary for Pond POND 1.0: OUTLET CULVERTS

```
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=123)
[62] Hint: Exceeded Reach REACH 1.2 OUTLET depth by 2.89' @ 12.55 hrs

Inflow Area =      30.058 ac,  11.76% Impervious,  Inflow Depth >   2.87"    for  10 Year event
Inflow      =      52.53 cfs @   12.48 hrs,  Volume=          7.196 af
Outflow     =      52.69 cfs @   12.47 hrs,  Volume=          7.195 af,  Atten= 0%,  Lag= 0.0 min
Primary     =      52.69 cfs @   12.47 hrs,  Volume=          7.195 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 39.02' @ 12.47 hrs
Flood Elev= 41.00'

Device  Routing           Invert  Outlet Devices
   #1   Primary           35.60'  42.0" W x 29.0" H, R=21.5"/66.1"  Pipe Arch CMP_Arch_1/2  42x29 X 3.00
                                  L= 68.0'   CMP, end-section conforming to fill,  Ke= 0.500
                                  Inlet / Outlet Invert= 35.60' / 35.30'   S= 0.0044 '/'   Cc= 0.900
                                  n= 0.025  Corrugated metal,  Flow Area= 6.72 sf

Primary OutFlow Max=52.41 cfs @ 12.47 hrs  HW=39.01'  TW=38.65'   (Dynamic Tailwater)
└─1=CMP_Arch_1/2  42x29 (Outlet Controls 52.41 cfs @ 2.60 fps)
```

Summary for Link PA1: POINT OF ANALYSIS

This link takes into account the tailwater condition in roadside swale along Goose Bay Drive which the existing culverts discharge into. These tailwater elevations were determined by Streamworks, PLLC as part of the overall watershed analysis they performed.

```
[80] Warning: Exceeded Pond POND 1.0 by 3.05' @ 0.00 hrs (92.51 cfs 19.754 af)

Inflow Area =      30.058 ac,  11.76% Impervious,  Inflow Depth >   2.87"    for  10 Year event
Inflow      =      52.69 cfs @   12.47 hrs,  Volume=          7.195 af
Primary     =      52.69 cfs @   12.47 hrs,  Volume=          7.195 af,  Atten= 0%,  Lag= 0.0 min

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

10 Year  2 Point manual elevation table,  To= 0.00 hrs,  dt= 24.00 hrs,  feet =
     38.65      38.65
```

Summary for Link PA2: POINT OF ANALYSIS

```
Inflow Area =         1.551 ac,  57.38% Impervious,  Inflow Depth >   4.22"    for  10 Year event
Inflow       =        7.49 cfs @   12.07 hrs,  Volume=            0.545 af
Primary      =        7.49 cfs @   12.07 hrs,  Volume=            0.545 af,  Atten= 0%,  Lag= 0.0 min
```

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

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

SubcatchmentPRE 1.0: WATERSHED1.0 Runoff Area=1,275,727 sf   9.69% Impervious   Runoff Depth>4.08"
                                  Flow Length=1,805'   Tc=34.4 min   CN=74   Runoff=74.64 cfs  9.946 af

SubcatchmentPRE 1.1: WATERSHED1.1   Runoff Area=33,611 sf   90.29% Impervious   Runoff Depth>6.59"
                                  Flow Length=305'   Tc=5.0 min   CN=96   Runoff=5.34 cfs  0.424 af

SubcatchmentPRE 2.0: WATERSHED2.0   Runoff Area=67,564 sf   57.38% Impervious   Runoff Depth>5.66"
                                  Flow Length=872'   Tc=5.0 min   CN=88   Runoff=9.90 cfs  0.731 af

Reach REACH 1.1: EXISTING CULVERT  Avg. Flow Depth=0.69'   Max Vel=7.60 fps   Inflow=5.34 cfs  0.424 af
          15.0"  Round Pipe   n=0.012   L=515.0'   S=0.0165 '/'   Capacity=8.99 cfs   Outflow=5.26 cfs  0.423 af

Reach REACH 1.2: HODGSON BROOK     Avg. Flow Depth=0.48'   Max Vel=5.85 fps   Inflow=5.26 cfs  0.423 af
        48.0"  Round Pipe   n=0.012   L=825.0'   S=0.0112 '/'   Capacity=164.33 cfs   Outflow=4.99 cfs  0.423 af

Pond POND 1.0: OUTLET CULVERTS                         Peak Elev=39.52'   Inflow=76.06 cfs  10.369 af
42.0" x 29.0", R=21.5"/66.1"  Pipe Arch Culvert x 3.00  n=0.025  L=68.0'  S=0.0044 '/'   Outflow=76.06 cfs  10.369 af

Link PA1: POINT OF ANALYSIS                                                  Inflow=76.06 cfs  10.369 af
                                                                            Primary=76.06 cfs  10.369 af

Link PA2: POINT OF ANALYSIS                                                    Inflow=9.90 cfs  0.731 af
                                                                              Primary=9.90 cfs  0.731 af

              Total Runoff Area = 31.609 ac   Runoff Volume = 11.102 af   Average Runoff Depth = 4.21"
                                       86.00% Pervious = 27.184 ac     14.00% Impervious = 4.426 ac
```

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

SubcatchmentPRE 1.0: WATERSHED1.0 Runoff Area=1,275,727 sf 9.69% Impervious Runoff Depth>5.30"
Flow Length=1,805' Tc=34.4 min CN=74 Runoff=96.90 cfs 12.947 af

SubcatchmentPRE 1.1: WATERSHED1.1 Runoff Area=33,611 sf 90.29% Impervious Runoff Depth>7.98"
Flow Length=305' Tc=5.0 min CN=96 Runoff=6.41 cfs 0.513 af

SubcatchmentPRE 2.0: WATERSHED2.0 Runoff Area=67,564 sf 57.38% Impervious Runoff Depth>7.01"
Flow Length=872' Tc=5.0 min CN=88 Runoff=12.13 cfs 0.907 af

Reach REACH 1.1: EXISTING CULVERT Avg. Flow Depth=0.77' Max Vel=7.92 fps Inflow=6.41 cfs 0.513 af
15.0" Round Pipe n=0.012 L=515.0' S=0.0165 '/' Capacity=8.99 cfs Outflow=6.32 cfs 0.513 af

Reach REACH 1.2: HODGSON BROOK Avg. Flow Depth=0.52' Max Vel=6.19 fps Inflow=6.32 cfs 0.513 af
48.0" Round Pipe n=0.012 L=825.0' S=0.0112 '/' Capacity=164.33 cfs Outflow=6.02 cfs 0.512 af

Pond POND 1.0: OUTLET CULVERTS Peak Elev=40.14' Inflow=98.61 cfs 13.459 af
42.0" x 29.0", R=21.5"/66.1" Pipe Arch Culvert x 3.00 n=0.025 L=68.0' S=0.0044 '/' Outflow=98.61 cfs 13.459 af

Link PA1: POINT OF ANALYSIS Inflow=98.61 cfs 13.459 af
Primary=98.61 cfs 13.459 af

Link PA2: POINT OF ANALYSIS Inflow=12.13 cfs 0.907 af
Primary=12.13 cfs 0.907 af

Total Runoff Area = 31.609 ac Runoff Volume = 14.366 af Average Runoff Depth = 5.45"
86.00% Pervious = 27.184 ac 14.00% Impervious = 4.426 ac

1.3 Post-Development Conditions

1.3.1 Master Post-Development Conditions

The post-development condition was analyzed by dividing the watersheds into six sub-catchment areas. Stormwater runoff from these sub-catchment areas flow to two gravel wetlands and one rain garden for treatment prior to discharging to the existing Hodgson Brook outlet. Flows from these sub-catchment areas are modeled at the same two points of analysis that were modeled in the pre-development analysis, PA1 and PA2. These points of analysis and sub-catchment areas are depicted on the plan entitled "Post-Development Watershed Plan", Sheet C-802.

Each of the points of analysis and their contributing watershed areas are described below:

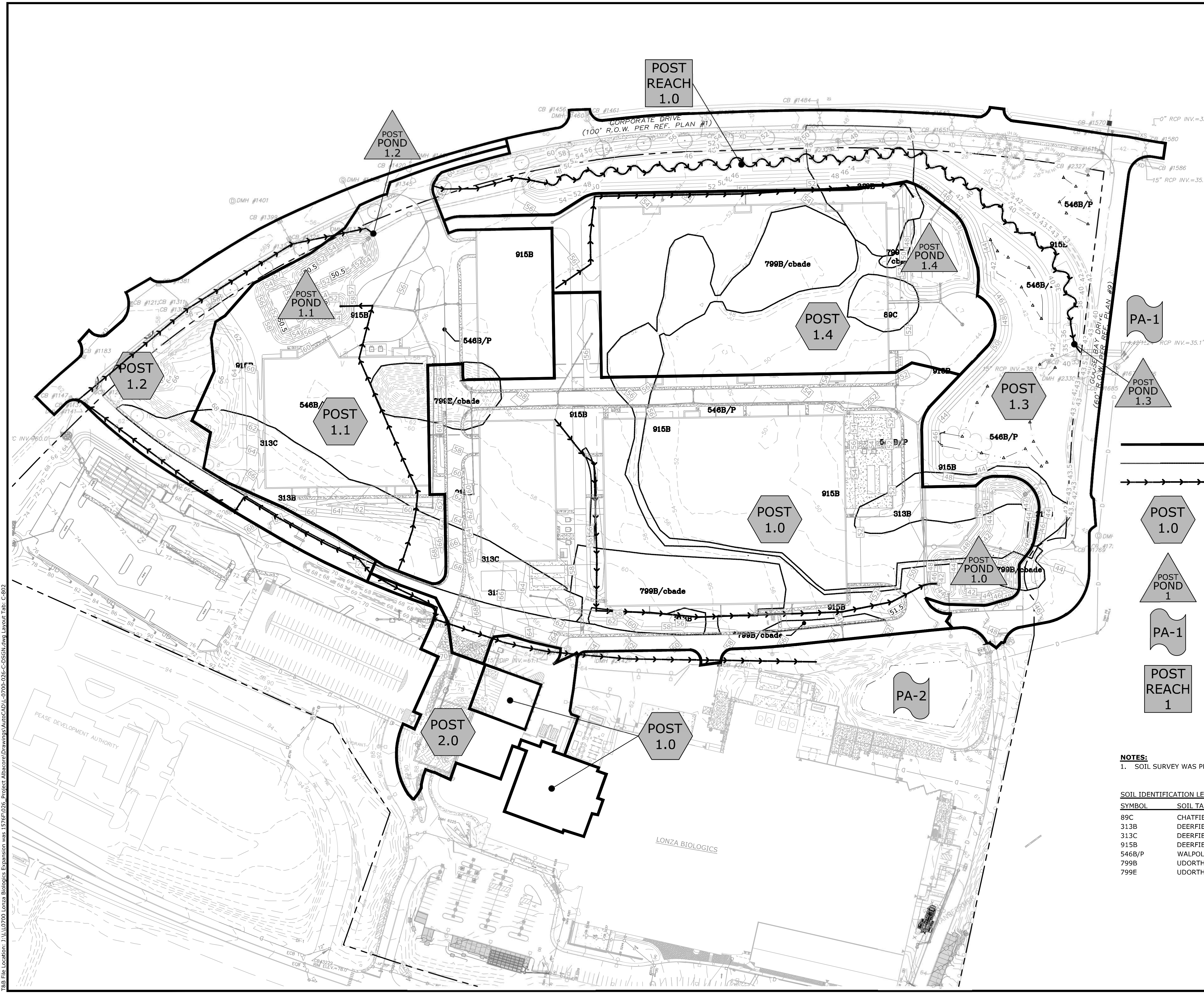
Point of Analysis (PA1)

Point of Analysis 1 (PA1) is located at the existing Hodgson Brook outlet headwall. For the purposes of this analysis, the area contributing to Point of Analysis 1 (PA1) has been divided into five sub-catchment areas (see plan C-802). Sub-catchments POST 1.0, POST 1.1, POST 1.2, POST 1.3 and POST 1.4 contribute to this point of analysis and consist of grass, paved parking lots, concrete sidewalks, and roof areas. Runoff generated in these sub-catchment areas is collected via one (1) rain garden and two (2) gravel wetlands which treat and discharge stormwater runoff either to infiltration or to PA1. Runoff from sub-catchments POST 1.0, 1.1 and 1.4 flow via overland flow to the closed drainage then flows via underground piping to one of the gravel wetlands or rain garden. Flows from sub-catchment POST 1.2 flows via overland flow to the Hodgson Brook restoration area (REACH 1.0) then flows via the brook until reach PA1. Runoff from POND 1.1 also flows via REACH 1.0 to PA1. LINK 1.0 has been added to the calculations between gravel wetland 2 (POND 1.1) and PDMH203 (POND 1.2) to account for the tailwater elevation in PDMH203 caused by the Hodgson Brook inflow to PDMH203. Tailwater elevations at the road side swale on Goose Bay Drive (PA1) have also been included in these calculations to account for any surcharging that may occur due to the tailwater condition. These tailwater elevations were determined by Streamworks, PLLC as part of their overall watershed analysis. Runoff from sub-catchment area POST 1.3 flows via overland flow to PA1. PA1 is shown on the Post-Development Watershed Plan (C-802).

Point of Analysis (PA2)

POST 2.0 is comprised mostly of runoff from Goose Bay Drive that is located between the undeveloped parcel and the existing Lonza facility. Runoff from this area travels via overland flow to the existing stormwater basin located at the existing Lonza facility. Point of Analysis 2 (PA2) is located at the existing basin.

1.3.1.1 Master Post-Development Watershed Plan



LEGEND

- POST-DEVELOPMENT WATERSHED BOUNDARY
- SOIL SURVEY BOUNDARIES
- LONGEST FLOW PATH
- POST 1.0 — POST-DEVELOPMENT WATERSHED AREA DESIGNATION
- POST POND 1 — POST-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS
- POST REACH 1 — POST-DEVELOPMENT REACH DESIGNATION

NOTES:

1. SOIL SURVEY WAS PERFORMED BY GOVE ENVIRONMENTAL SERVICES.

SOIL IDENTIFICATION LEGEND

SYMBOL	SOIL TAXONOMIC NAME, SLOPE RATING
89C	CHATFIELD, 8 TO 15 PERCENT SLOPES
313B	DEERFIELD, 0 TO 8 PERCENT SLOPES
313C	DEERFIELD, 8 TO 15 PERCENT SLOPES
915B	DEERFIELD VARIANT, 0 TO 8 PERCENT SLOPES
546B/P	WALPOLE POORLY DRAINED, 0 TO 8 PERCENT SLOPES
799B	UDORTHENTS URBAN LAND, 0 TO 8 PERCENT SLOPES
799E	UDORTHENTS URBAN LAND, >25 PERCENT SLOPES

Tighe&Bond

SCALE IN FEET
0 80' 160'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
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

PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

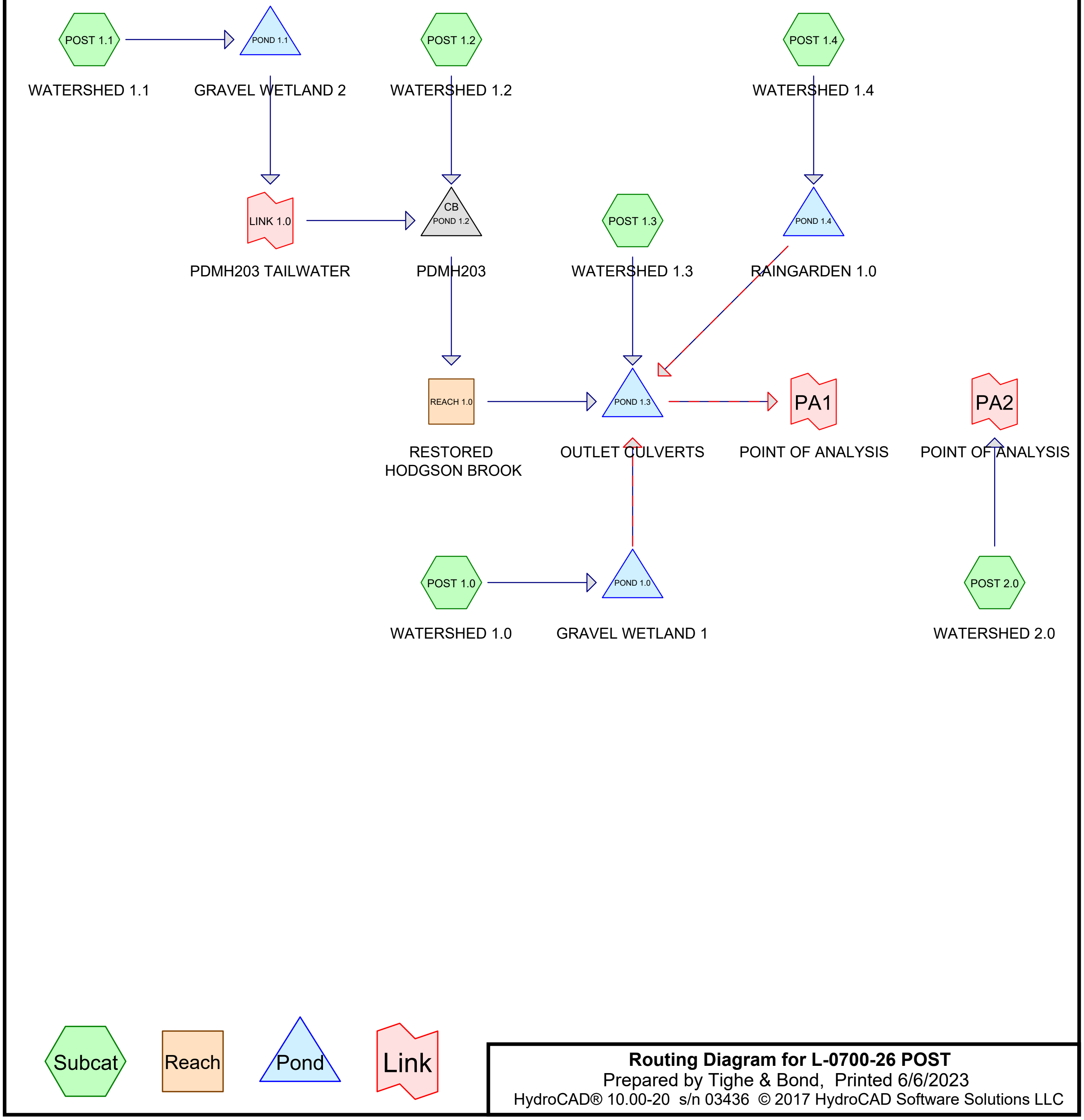
POST-DEVELOPMENT
WATERSHED AREA PLAN

SCALE: AS SHOWN

C-802

Last Save Date: July 13, 2023 3:42 PM By: CKRZCUIK
Plot Date: Thursday, July 13, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-802

1.3.1.2 Master Post-Development Calculations



Routing Diagram for L-0700-26 POST
Prepared by Tighe & Bond, Printed 6/6/2023
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.776	61	>75% Grass cover, Good, HSG B (POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4)
6.801	74	>75% Grass cover, Good, HSG C (POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4, POST 2.0)
0.436	80	>75% Grass cover, Good, HSG D (POST 1.0, POST 1.3, POST 1.4)
0.323	58	Meadow, non-grazed, HSG B (POST 1.3)
3.143	71	Meadow, non-grazed, HSG C (POST 1.3)
0.799	98	Paved parking, HSG B (POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4)
7.546	98	Paved parking, HSG C (POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4, POST 2.0)
0.146	98	Paved parking, HSG D (POST 1.0, POST 1.3, POST 1.4)
0.688	98	Roofs, HSG B (POST 1.0, POST 1.1, POST 1.4)
8.166	98	Roofs, HSG C (POST 1.0, POST 1.1, POST 1.4, POST 2.0)
1.737	98	Roofs, HSG D (POST 1.0, POST 1.4)
0.049	76	Woods/grass comb., Fair, HSG C (POST 1.3)
31.609	**87**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
3.586	HSG B	POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4
25.705	HSG C	POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4, POST 2.0
2.318	HSG D	POST 1.0, POST 1.3, POST 1.4
0.000	Other	
31.609		**TOTAL AREA**

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

SubcatchmentPOST 1.0: WATERSHED Runoff Area=462,599 sf 72.19% Impervious Runoff Depth>2.71"
Flow Length=933' Tc=11.4 min CN=91 Runoff=27.46 cfs 2.396 af

SubcatchmentPOST 1.1: WATERSHED Runoff Area=242,496 sf 58.73% Impervious Runoff Depth>2.25"
Flow Length=750' Tc=10.3 min CN=86 Runoff=12.60 cfs 1.046 af

SubcatchmentPOST 1.2: WATERSHED Runoff Area=101,204 sf 62.15% Impervious Runoff Depth>2.43"
Flow Length=1,191' Tc=6.4 min CN=88 Runoff=6.37 cfs 0.471 af

SubcatchmentPOST 1.3: WATERSHED Runoff Area=306,549 sf 22.64% Impervious Runoff Depth>1.55"
Flow Length=1,525' Tc=45.9 min CN=77 Runoff=5.81 cfs 0.908 af

SubcatchmentPOST 1.4: WATERSHED Runoff Area=214,764 sf 85.05% Impervious Runoff Depth>3.01"
Flow Length=717' Tc=7.5 min CN=94 Runoff=15.51 cfs 1.236 af

SubcatchmentPOST 2.0: WATERSHED2.0 Runoff Area=49,290 sf 80.99% Impervious Runoff Depth>2.91"
Flow Length=758' Tc=5.0 min CN=93 Runoff=3.72 cfs 0.274 af

Reach REACH 1.0: RESTORED Avg. Flow Depth=0.60' Max Vel=2.03 fps Inflow=6.37 cfs 0.617 af
n=0.040 L=1,309.0' S=0.0092 '/' Capacity=2,720.29 cfs Outflow=4.54 cfs 0.608 af

Pond POND 1.0: GRAVEL WETLAND 1 Peak Elev=46.16' Storage=70,734 cf Inflow=27.46 cfs 2.396 af
Primary=1.57 cfs 1.041 af Secondary=0.00 cfs 0.000 af Outflow=1.57 cfs 1.041 af

Pond POND 1.1: GRAVEL WETLAND 2 Peak Elev=53.90' Storage=39,230 cf Inflow=12.60 cfs 1.046 af
Outflow=0.40 cfs 0.146 af

Pond POND 1.2: PDMH203 Peak Elev=50.33' Inflow=6.37 cfs 0.617 af
48.0" Round Culvert n=0.013 L=269.0' S=0.0050 '/' Outflow=6.37 cfs 0.617 af

Pond POND 1.3: OUTLET CULVERTS Peak Elev=38.16' Storage=8,984 cf Inflow=9.25 cfs 3.255 af
Primary=9.41 cfs 3.050 af Secondary=0.00 cfs 0.000 af Outflow=9.41 cfs 3.050 af

Pond POND 1.4: RAINGARDEN1.0 Peak Elev=47.27' Storage=34,235 cf Inflow=15.51 cfs 1.236 af
Primary=1.31 cfs 0.699 af Secondary=0.00 cfs 0.000 af Outflow=1.31 cfs 0.699 af

Link LINK 1.0: PDMH203 TAILWATER Inflow=0.40 cfs 0.146 af
Primary=0.40 cfs 0.146 af

Link PA1: POINT OF ANALYSIS Inflow=9.41 cfs 3.050 af
Primary=9.41 cfs 3.050 af

Link PA2: POINT OF ANALYSIS Inflow=3.72 cfs 0.274 af
Primary=3.72 cfs 0.274 af

Total Runoff Area = 31.609 ac Runoff Volume = 6.331 af Average Runoff Depth = 2.40"
39.63% Pervious = 12.527 ac 60.37% Impervious = 19.083 ac

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

SubcatchmentPOST 1.0: WATERSHED Runoff Area=462,599 sf 72.19% Impervious Runoff Depth>4.54"
Flow Length=933' Tc=11.4 min CN=91 Runoff=44.88 cfs 4.017 af

SubcatchmentPOST 1.1: WATERSHED Runoff Area=242,496 sf 58.73% Impervious Runoff Depth>4.01"
Flow Length=750' Tc=10.3 min CN=86 Runoff=22.02 cfs 1.858 af

SubcatchmentPOST 1.2: WATERSHED Runoff Area=101,204 sf 62.15% Impervious Runoff Depth>4.22"
Flow Length=1,191' Tc=6.4 min CN=88 Runoff=10.81 cfs 0.817 af

SubcatchmentPOST 1.3: WATERSHED Runoff Area=306,549 sf 22.64% Impervious Runoff Depth>3.09"
Flow Length=1,525' Tc=45.9 min CN=77 Runoff=11.76 cfs 1.810 af

SubcatchmentPOST 1.4: WATERSHED Runoff Area=214,764 sf 85.05% Impervious Runoff Depth>4.88"
Flow Length=717' Tc=7.5 min CN=94 Runoff=24.45 cfs 2.004 af

SubcatchmentPOST 2.0: WATERSHED2.0 Runoff Area=49,290 sf 80.99% Impervious Runoff Depth>4.77"
Flow Length=758' Tc=5.0 min CN=93 Runoff=5.94 cfs 0.449 af

Reach REACH 1.0: RESTORED Avg. Flow Depth=0.81' Max Vel=2.20 fps Inflow=10.81 cfs 1.367 af
n=0.040 L=1,309.0' S=0.0092 '/' Capacity=2,720.29 cfs Outflow=6.07 cfs 1.355 af

Pond POND 1.0: GRAVEL WETLAND 1 Peak Elev=46.94' Storage=86,832 cf Inflow=44.88 cfs 4.017 af
Primary=7.09 cfs 2.106 af Secondary=11.63 cfs 0.435 af Outflow=18.72 cfs 2.541 af

Pond POND 1.1: GRAVEL WETLAND 2 Peak Elev=55.08' Storage=57,197 cf Inflow=22.02 cfs 1.858 af
Outflow=1.76 cfs 0.550 af

Pond POND 1.2: PDMH203 Peak Elev=50.65' Inflow=10.81 cfs 1.367 af
48.0" Round Culvert n=0.013 L=269.0' S=0.0050 '/' Outflow=10.81 cfs 1.367 af

Pond POND 1.3: OUTLET CULVERTS Peak Elev=38.86' Storage=14,364 cf Inflow=40.12 cfs 7.107 af
Primary=39.92 cfs 6.819 af Secondary=0.00 cfs 0.000 af Outflow=39.92 cfs 6.819 af

Pond POND 1.4: RAINGARDEN1.0 Peak Elev=48.07' Storage=45,635 cf Inflow=24.45 cfs 2.004 af
Primary=6.60 cfs 1.401 af Secondary=0.00 cfs 0.000 af Outflow=6.60 cfs 1.401 af

Link LINK 1.0: PDMH203 TAILWATER Inflow=1.76 cfs 0.550 af
Primary=1.76 cfs 0.550 af

Link PA1: POINT OF ANALYSIS Inflow=39.92 cfs 6.819 af
Primary=39.92 cfs 6.819 af

Link PA2: POINT OF ANALYSIS Inflow=5.94 cfs 0.449 af
Primary=5.94 cfs 0.449 af

Total Runoff Area = 31.609 ac Runoff Volume = 10.955 af Average Runoff Depth = 4.16"
39.63% Pervious = 12.527 ac 60.37% Impervious = 19.083 ac

Summary for Subcatchment POST 1.0: WATERSHED 1.0

Runoff = 44.88 cfs @ 12.15 hrs, Volume= 4.017 af, Depth> 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
5,235	98	Roofs, HSG B
22,410	61	>75% Grass cover, Good, HSG B
19,146	98	Paved parking, HSG B
157,967	98	Roofs, HSG C
90,117	74	>75% Grass cover, Good, HSG C
114,873	98	Paved parking, HSG C
31,357	98	Roofs, HSG D
16,138	80	>75% Grass cover, Good, HSG D
5,356	98	Paved parking, HSG D
462,599	91	Weighted Average
128,665		27.81% Pervious Area
333,934		72.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	70	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	19	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	162	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.4	84	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.5	113	0.0050	3.72	4.57	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.2	299	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.4	94	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.1	46	0.0240	11.16	35.05	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.0	5	0.0800	7.16	0.98	**Pipe Channel,** 5.0" Round Area= 0.1 sf Perim= 1.3' r= 0.10' n= 0.013
0.0	9	0.0110	9.90	69.95	**Pipe Channel,**

					36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013
11.4	933	Total			

Summary for Subcatchment POST 1.1: WATERSHED 1.1

Runoff = 22.02 cfs @ 12.14 hrs, Volume= 1.858 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
13,692	98	Roofs, HSG B
32,710	61	>75% Grass cover, Good, HSG B
2,729	98	Paved parking, HSG B
88,019	98	Roofs, HSG C
67,375	74	>75% Grass cover, Good, HSG C
37,971	98	Paved parking, HSG C
242,496	86	Weighted Average
100,085		41.27% Pervious Area
142,411		58.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0380	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.2	163	0.0245	2.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.5	283	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.1	81	0.0240	9.21	16.27	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.4	123	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
10.3	750	Total			

Summary for Subcatchment POST 1.2: WATERSHED 1.2

Runoff = 10.81 cfs @ 12.09 hrs, Volume= 0.817 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
6,874	61	>75% Grass cover, Good, HSG B
4,785	98	Paved parking, HSG B
31,436	74	>75% Grass cover, Good, HSG C
58,109	98	Paved parking, HSG C
101,204	88	Weighted Average
38,310		37.85% Pervious Area
62,894		62.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
1.0	153	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	343	0.0050	3.47	2.73	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	13	0.0050	3.72	4.57	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	453	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.4	129	0.0050	5.91	29.00	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Corrugated PE, smooth interior
6.4	1,191	Total			

Summary for Subcatchment POST 1.3: WATERSHED 1.3

Runoff = 11.76 cfs @ 12.63 hrs, Volume= 1.810 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
11,450	61	>75% Grass cover, Good, HSG B
14,068	58	Meadow, non-grazed, HSG B
908	98	Paved parking, HSG B
70,956	74	>75% Grass cover, Good, HSG C
136,905	71	Meadow, non-grazed, HSG C
2,120	76	Woods/grass comb., Fair, HSG C
68,005	98	Paved parking, HSG C
1,638	80	>75% Grass cover, Good, HSG D
499	98	Paved parking, HSG D
306,549	77	Weighted Average
237,137		77.36% Pervious Area
69,412		22.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0130	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.1	52	0.0130	0.80		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	27	0.2720	7.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
33.8	1,346	0.0090	0.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
45.9	1,525	Total			

Summary for Subcatchment POST 1.4: WATERSHED 1.4

Runoff = 24.45 cfs @ 12.10 hrs, Volume= 2.004 af, Depth> 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
11,051	98	Roofs, HSG B
3,902	61	>75% Grass cover, Good, HSG B
7,241	98	Paved parking, HSG B
86,748	98	Roofs, HSG C
26,995	74	>75% Grass cover, Good, HSG C
32,822	98	Paved parking, HSG C
44,300	98	Roofs, HSG D
1,206	80	>75% Grass cover, Good, HSG D
499	98	Paved parking, HSG D
214,764	94	Weighted Average
32,103		14.95% Pervious Area
182,661		85.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	40	0.0150	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.3	53	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	65	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.4	115	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.7	140	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.9	275	0.0070	4.97	8.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013

0.0	29	0.0550	13.94	24.63	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
7.5	717	Total			

Summary for Subcatchment POST 2.0: WATERSHED 2.0

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

Runoff = 5.94 cfs @ 12.07 hrs, Volume= 0.449 af, Depth> 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
22,995	98	Roofs, HSG C
9,368	74	>75% Grass cover, Good, HSG C
16,927	98	Paved parking, HSG C
49,290	93	Weighted Average
9,368		19.01% Pervious Area
39,922		80.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0164	1.36		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.3	48	0.0164	2.60		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	130	0.0140	7.03	12.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.5	70	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.3	410	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
3.6	758	Total, Increased to minimum Tc = 5.0 min			

Summary for Reach REACH 1.0: RESTORED HODGSON BROOK

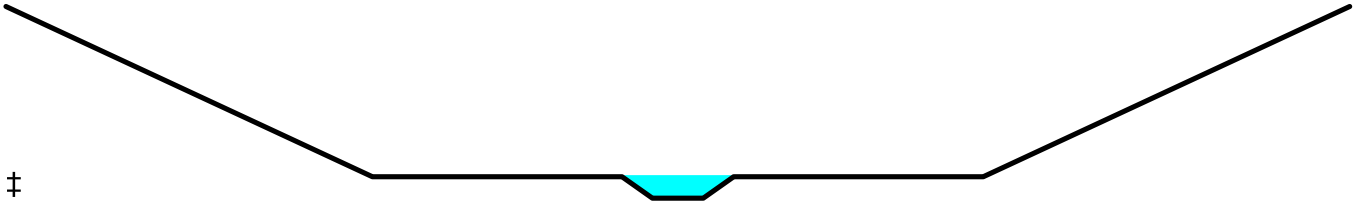
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 7.890 ac, 59.73% Impervious, Inflow Depth > 2.08" for 10 Year event
Inflow = 10.81 cfs @ 12.09 hrs, Volume= 1.367 af
Outflow = 6.07 cfs @ 12.81 hrs, Volume= 1.355 af, Atten= 44%, Lag= 42.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.20 fps, Min. Travel Time= 9.9 min
Avg. Velocity = 1.04 fps, Avg. Travel Time= 21.0 min

Peak Storage= 6,364 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.81'
Bank-Full Depth= 6.75' Flow Area= 291.0 sf, Capacity= 2,720.29 cfs

Custom cross-section, Length= 1,309.0' Slope= 0.0092 '/' (101 Elevation Intervals)
Constant n= 0.040 Winding stream, pools & shoals
Inlet Invert= 48.00', Outlet Invert= 36.00'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Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	12.00	0.00
18.00	6.00	6.00
30.25	6.00	6.00
31.75	5.25	6.75
34.25	5.25	6.75
35.75	6.00	6.00
48.00	6.00	6.00
66.00	12.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	2.5	0	0.00
0.75	3.0	30.4	3,927	2.28
6.75	291.0	68.3	380,919	2,720.29

Summary for Pond POND 1.0: GRAVEL WETLAND 1

[95] Warning: Outlet Device #4 rise exceeded

Inflow Area = 10.620 ac, 72.19% Impervious, Inflow Depth > 4.54" for 10 Year event
Inflow = 44.88 cfs @ 12.15 hrs, Volume= 4.017 af
Outflow = 18.72 cfs @ 12.45 hrs, Volume= 2.541 af, Atten= 58%, Lag= 18.0 min
Primary = 7.09 cfs @ 12.45 hrs, Volume= 2.106 af
Secondary = 11.63 cfs @ 12.45 hrs, Volume= 0.435 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 46.94' @ 12.45 hrs Surf.Area= 21,544 sf Storage= 86,832 cf
Flood Elev= 48.00' Surf.Area= 23,557 sf Storage= 110,845 cf

Plug-Flow detention time= 216.6 min calculated for 2.536 af (63% of inflow)
Center-of-Mass det. time= 118.8 min (906.1 - 787.3)

```
Volume        Invert    Avail.Storage   Storage Description
   #1         39.05'       110,845 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation         Surf.Area   Voids          Inc.Store        Cum.Store
    (feet)           (sq-ft)     (%)        (cubic-feet)     (cubic-feet)
     39.05             9,855     0.0                  0                0
     41.35             9,855    30.0              6,800            6,800
     42.00             9,855    45.0              2,883            9,683
     43.00            11,943   100.0             10,899           20,582
     44.00            14,202   100.0             13,073           33,654
     45.00            16,891   100.0             15,547           49,201
     46.00            19,752   100.0             18,322           67,522
     47.00            21,668   100.0             20,710           88,232
     48.00            23,557   100.0             22,613          110,845

Device   Routing           Invert   Outlet Devices
   #1    Primary           41.35'   18.0"  Round Culvert
                                    L= 30.0'   CPP, square edge headwall,  Ke= 0.500
                                    Inlet / Outlet Invert= 41.35' / 41.20'   S= 0.0050 '/'   Cc= 0.900
                                    n= 0.013  Corrugated PE, smooth interior,  Flow Area= 1.77 sf
   #2    Device 1          41.35'   3.5" Vert. Orifice/Grate   C= 0.600
   #3    Device 1          45.00'   3.0" Vert. Orifice/Grate   C= 0.600
   #4    Device 1          46.00'   3.0' long x 0.50' rise Sharp-Crested Rectangular Weir
                                    2 End Contraction(s)   4.0' Crest Height
   #5    Device 1          47.00'   4.0" x 4.0" Horiz. Orifice/Grate X 106.00  C= 0.600
                                    Limited to weir flow at low heads
   #6    Secondary         46.50'   15.0' long  x 15.0' breadth Broad-Crested Rectangular Weir
                                    Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                    Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow Max=7.09 cfs @ 12.45 hrs  HW=46.93'  TW=38.85'   (Dynamic Tailwater)
↑
└─1=Culvert  (Passes 7.09 cfs of 18.71 cfs potential flow)
   ↑
   ├─2=Orifice/Grate  (Orifice Controls 0.75 cfs @ 11.23 fps)
   ├─3=Orifice/Grate  (Orifice Controls 0.32 cfs @ 6.48 fps)
   ├─4=Sharp-Crested Rectangular Weir (Orifice Controls 6.02 cfs @ 4.15 fps)
   └─5=Orifice/Grate  ( Controls 0.00 cfs)

Secondary OutFlow Max=11.59 cfs @ 12.45 hrs  HW=46.93'  TW=38.85'   (Dynamic Tailwater)
↑
└─6=Broad-Crested Rectangular Weir (Weir Controls 11.59 cfs @ 1.78 fps)
```

Summary for Pond POND 1.1: GRAVEL WETLAND 2

```
Inflow Area =         5.567 ac,  58.73% Impervious,  Inflow Depth >   4.01"    for  10 Year event
Inflow       =       22.02 cfs @   12.14 hrs,  Volume=            1.858 af
Outflow      =        1.76 cfs @   13.65 hrs,  Volume=            0.550 af,  Atten= 92%,  Lag= 90.5 min
Primary      =        1.76 cfs @   13.65 hrs,  Volume=            0.550 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 55.08' @ 13.65 hrs   Surf.Area= 16,909 sf   Storage= 57,197 cf
Flood Elev= 57.00'   Surf.Area= 21,643 sf   Storage= 94,743 cf
```

Plug-Flow detention time= 357.2 min calculated for 0.550 af (30% of inflow)
Center-of-Mass det. time= 218.3 min (1,021.7 - 803.4)

Volume	Invert	Avail.Storage	Storage Description
#1	47.55'	117,304 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.55	6,269	0.0	0	0
49.85	6,269	30.0	4,326	4,326
50.50	6,269	45.0	1,834	6,159
51.00	7,199	100.0	3,367	9,526
52.00	9,187	100.0	8,193	17,719
53.00	11,345	100.0	10,266	27,985
54.00	13,814	100.0	12,580	40,565
55.00	16,645	100.0	15,230	55,794
56.00	19,805	100.0	18,225	74,019
58.00	23,480	100.0	43,285	117,304

Device	Routing	Invert	Outlet Devices
#1	Primary	49.85'	**24.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 49.85' / 49.45' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	49.85'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	53.50'	**4.0' long x 2.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	56.50'	**4.0" x 4.0" Horiz. Orifice/Grate X 106.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.76 cfs @ 13.65 hrs HW=55.08' TW=55.07' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.76 cfs @ 0.56 fps)
  ├─**2=Orifice/Grate** (Passes < 0.01 cfs potential flow)
  ├─**3=Sharp-Crested Rectangular Weir** (Passes < 3.33 cfs potential flow)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond POND 1.2: PDMH203

Inflow Area = 7.890 ac, 59.73% Impervious, Inflow Depth > 2.08" for 10 Year event
Inflow = 10.81 cfs @ 12.09 hrs, Volume= 1.367 af
Outflow = 10.81 cfs @ 12.09 hrs, Volume= 1.367 af, Atten= 0%, Lag= 0.0 min
Primary = 10.81 cfs @ 12.09 hrs, Volume= 1.367 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 50.65' @ 12.09 hrs
Flood Elev= 57.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.35'	**48.0" Round Culvert** L= 269.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 49.35' / 48.00' S= 0.0050 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 12.57 sf

Primary OutFlow Max=10.64 cfs @ 12.09 hrs HW=50.64' TW=48.75' (Dynamic Tailwater)
⮤**1=Culvert** (Inlet Controls 10.64 cfs @ 3.05 fps)

Summary for Pond POND 1.3: OUTLET CULVERTS

[62] Hint: Exceeded Reach REACH 1.0 OUTLET depth by 2.50' @ 23.95 hrs

Inflow Area = 30.478 ac, 59.60% Impervious, Inflow Depth > 2.80" for 10 Year event
Inflow = 40.12 cfs @ 12.47 hrs, Volume= 7.107 af
Outflow = 39.92 cfs @ 12.50 hrs, Volume= 6.819 af, Atten= 0%, Lag= 1.8 min
Primary = 39.92 cfs @ 12.50 hrs, Volume= 6.819 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 38.86' @ 12.50 hrs Surf.Area= 9,266 sf Storage= 14,364 cf
Flood Elev= 43.50' Surf.Area= 95,977 sf Storage= 236,017 cf

Plug-Flow detention time= 32.3 min calculated for 6.819 af (96% of inflow)
Center-of-Mass det. time= 11.6 min (905.1 - 893.5)

Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	236,017 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	960	0	0
36.00	1,428	1,194	1,194
38.00	5,418	6,846	8,040
40.00	14,354	19,772	27,812
42.00	66,884	81,238	109,050
43.00	92,707	79,796	188,846
43.50	95,977	47,171	236,017

Device	Routing	Invert	Outlet Devices
#1	Primary	35.60'	**42.0" W x 29.0" H, R=21.5"/66.1" Pipe Arch CMP_Arch_1/2 42x29 X 3.00** L= 68.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.60' / 35.30' S= 0.0044 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 6.72 sf
#2	Secondary	43.00'	**143.1 deg x 18.0' long x 0.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.47 (C= 3.09)

Primary OutFlow Max=39.88 cfs @ 12.50 hrs HW=38.86' TW=38.65' (Dynamic Tailwater)
⮤**1=CMP_Arch_1/2 42x29** (Outlet Controls 39.88 cfs @ 1.98 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.00' TW=38.65' (Dynamic Tailwater)
⮤**2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond POND 1.4: RAINGARDEN 1.0

```
Inflow Area =       4.930 ac,  85.05% Impervious,  Inflow Depth >  4.88"   for  10 Year event
Inflow      =      24.45 cfs @  12.10 hrs,  Volume=          2.004 af
Outflow     =       6.60 cfs @  12.48 hrs,  Volume=          1.401 af,  Atten= 73%,  Lag= 22.2 min
Primary     =       6.60 cfs @  12.48 hrs,  Volume=          1.401 af
Secondary   =       0.00 cfs @   0.00 hrs,  Volume=          0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 48.07' @ 12.48 hrs   Surf.Area= 14,774 sf   Storage= 45,635 cf
Flood Elev= 50.00'   Surf.Area= 17,790 sf   Storage= 77,050 cf

Plug-Flow detention time= 233.7 min calculated for 1.398 af (70% of inflow)
Center-of-Mass det. time= 143.1 min ( 914.3 - 771.2 )

Volume      Invert    Avail.Storage   Storage Description
   #1       42.17'        77,050 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation         Surf.Area   Voids          Inc.Store        Cum.Store
    (feet)            (sq-ft)    (%)        (cubic-feet)     (cubic-feet)
     42.17            10,418     0.0                  0                0
     43.50            10,418    40.0              5,542            5,542
     45.00            10,418    10.0              1,563            7,105
     46.00            11,745   100.0             11,082           18,187
     48.00            14,664   100.0             26,409           44,596
     50.00            17,790   100.0             32,454           77,050

Device   Routing            Invert   Outlet Devices
   #1    Primary            42.42'   12.0"  Round Culvert
                                     L= 48.0'   CPP, projecting, no headwall,  Ke= 0.900
                                     Inlet / Outlet Invert= 42.42' / 42.20'   S= 0.0046 '/'   Cc= 0.900
                                     n= 0.013  Corrugated PE, smooth interior,  Flow Area= 0.79 sf
   #2    Device 1           42.42'   6.0" Vert. Orifice/Grate   C= 0.600
   #3    Device 2           45.00'   10.000 in/hr Exfiltration over Surface area above 45.00'
                                     Excluded Surface area = 10,418 sf
   #4    Device 1           47.15'   13.2" x 13.2" Horiz. Orifice/Grate  C= 0.600
                                     Limited to weir flow at low heads
   #5    Secondary          49.35'   7.0' long  x 8.9' 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)  2.46  2.55  2.70  2.69  2.68  2.68  2.67  2.64  2.64
                                     2.64  2.65  2.64  2.65  2.65  2.66  2.67  2.69

Primary OutFlow Max=6.59 cfs @ 12.48 hrs  HW=48.07'  TW=38.86'   (Dynamic Tailwater)
└─1=Culvert  (Passes 6.59 cfs of 6.77 cfs potential flow)
   ├─2=Orifice/Grate  (Passes 1.01 cfs of 2.20 cfs potential flow)
   │  └─3=Exfiltration  (Exfiltration Controls 1.01 cfs)
   └─4=Orifice/Grate  (Orifice Controls 5.58 cfs @ 4.62 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs  HW=42.17'  TW=35.00'   (Dynamic Tailwater)
└─5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)
```

Summary for Link LINK 1.0: PDMH203 TAILWATER

This link takes into account the tailwater condition in PDMH203 which the outlet of gravel wetland 2 connects. The purpose of this is to determine the effects of any surcharging caused by the tailwater of Hodgson Brook entering the structure. These tailwater elevations were determined by Streamworks, PLLC as part of the overall watershed analysis they performed.

```
[80] Warning: Exceeded Pond POND 1.1 by 7.52' @ 0.00 hrs (23.95 cfs 25.099 af)

Inflow Area =      5.567 ac, 58.73% Impervious, Inflow Depth >  1.19"   for 10 Year event
Inflow      =      1.76 cfs @  13.65 hrs, Volume=        0.550 af
Primary     =      1.76 cfs @  13.65 hrs, Volume=        0.550 af, Atten= 0%, Lag= 0.0 min

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

10 Year 25 Point manual elevation table, To= 0.00 hrs, dt= 1.00 hrs, feet =
     55.07   55.07   55.07   55.07   55.07   55.07   55.07   55.07   55.07
     55.07   55.07   55.07   55.07   55.07   55.07   55.07   55.07   55.07
     55.07   55.07   55.07   55.07   55.07   55.07   55.07
```

Summary for Link PA1: POINT OF ANALYSIS

This link takes into account the tailwater condition in roadside swale along Goose Bay Drive which the existing culverts discharge into. These tailwater elevations were determined by Streamworks, PLLC as part of the overall watershed analysis they performed.

```
[80] Warning: Exceeded Pond POND 1.3 by 3.65' @ 0.00 hrs (92.51 cfs 86.028 af)

Inflow Area =     30.478 ac, 59.60% Impervious, Inflow Depth >  2.69"   for 10 Year event
Inflow      =     39.92 cfs @  12.50 hrs, Volume=        6.819 af
Primary     =     39.92 cfs @  12.50 hrs, Volume=        6.819 af, Atten= 0%, Lag= 0.0 min

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

10 Year 2 Point manual elevation table, To= 0.00 hrs, dt= 24.00 hrs, feet =
     38.65   38.65
```

Summary for Link PA2: POINT OF ANALYSIS

```
Inflow Area =      1.132 ac, 80.99% Impervious, Inflow Depth >  4.77"   for 10 Year event
Inflow      =      5.94 cfs @  12.07 hrs, Volume=        0.449 af
Primary     =      5.94 cfs @  12.07 hrs, Volume=        0.449 af, Atten= 0%, Lag= 0.0 min

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

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

SubcatchmentPOST 1.0: WATERSHED Runoff Area=462,599 sf 72.19% Impervious Runoff Depth>6.00"
Flow Length=933' Tc=11.4 min CN=91 Runoff=58.40 cfs 5.309 af

SubcatchmentPOST 1.1: WATERSHED Runoff Area=242,496 sf 58.73% Impervious Runoff Depth>5.43"
Flow Length=750' Tc=10.3 min CN=86 Runoff=29.42 cfs 2.517 af

SubcatchmentPOST 1.2: WATERSHED Runoff Area=101,204 sf 62.15% Impervious Runoff Depth>5.66"
Flow Length=1,191' Tc=6.4 min CN=88 Runoff=14.27 cfs 1.095 af

SubcatchmentPOST 1.3: WATERSHED Runoff Area=306,549 sf 22.64% Impervious Runoff Depth>4.39"
Flow Length=1,525' Tc=45.9 min CN=77 Runoff=16.72 cfs 2.574 af

SubcatchmentPOST 1.4: WATERSHED Runoff Area=214,764 sf 85.05% Impervious Runoff Depth>6.35"
Flow Length=717' Tc=7.5 min CN=94 Runoff=31.40 cfs 2.610 af

SubcatchmentPOST 2.0: WATERSHED2.0 Runoff Area=49,290 sf 80.99% Impervious Runoff Depth>6.24"
Flow Length=758' Tc=5.0 min CN=93 Runoff=7.66 cfs 0.588 af

Reach REACH 1.0: RESTORED Avg. Flow Depth=0.86' Max Vel=2.20 fps Inflow=14.27 cfs 2.076 af
n=0.040 L=1,309.0' S=0.0092 '/' Capacity=2,720.29 cfs Outflow=7.67 cfs 2.061 af

Pond POND 1.0: GRAVEL WETLAND 1 Peak Elev=47.21' Storage=92,932 cf Inflow=58.40 cfs 5.309 af
Primary=19.23 cfs 2.787 af Secondary=24.16 cfs 0.988 af Outflow=43.41 cfs 3.776 af

Pond POND 1.1: GRAVEL WETLAND 2 Peak Elev=55.71' Storage=68,356 cf Inflow=29.42 cfs 2.517 af
Outflow=4.20 cfs 0.981 af

Pond POND 1.2: PDMH203 Peak Elev=50.86' Inflow=14.27 cfs 2.076 af
48.0" Round Culvert n=0.013 L=269.0' S=0.0050 '/' Outflow=14.27 cfs 2.076 af

Pond POND 1.3: OUTLET CULVERTS Peak Elev=39.33' Storage=19,198 cf Inflow=67.56 cfs 10.378 af
Primary=66.14 cfs 10.071 af Secondary=0.00 cfs 0.000 af Outflow=66.14 cfs 10.071 af

Pond POND 1.4: RAINGARDEN1.0 Peak Elev=48.89' Storage=58,248 cf Inflow=31.40 cfs 2.610 af
Primary=7.29 cfs 1.966 af Secondary=0.00 cfs 0.000 af Outflow=7.29 cfs 1.966 af

Link LINK 1.0: PDMH203 TAILWATER Inflow=4.20 cfs 0.981 af
Primary=4.20 cfs 0.981 af

Link PA1: POINT OF ANALYSIS Inflow=66.14 cfs 10.071 af
Primary=66.14 cfs 10.071 af

Link PA2: POINT OF ANALYSIS Inflow=7.66 cfs 0.588 af
Primary=7.66 cfs 0.588 af

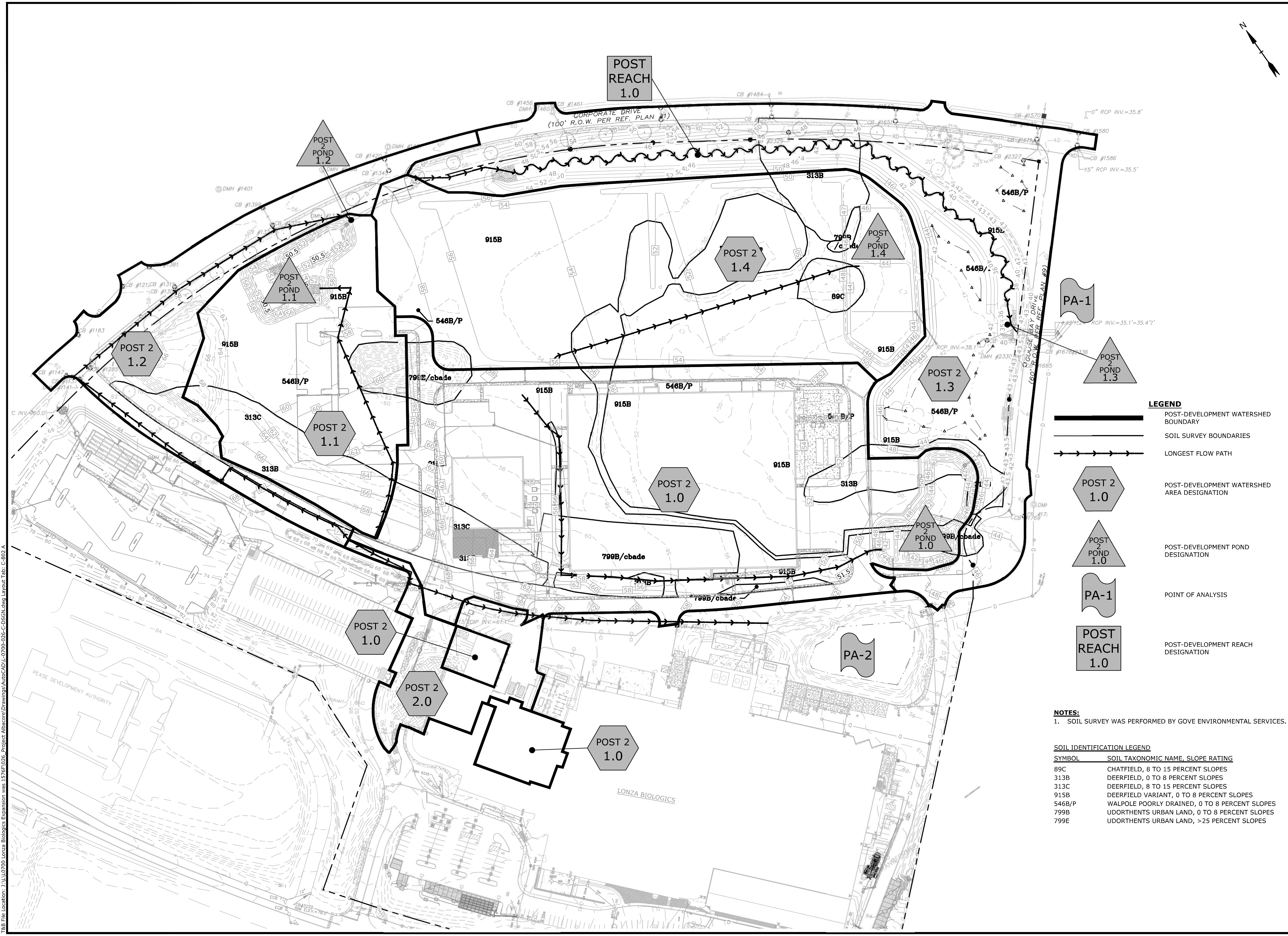
Total Runoff Area = 31.609 ac Runoff Volume = 14.693 af Average Runoff Depth = 5.58"
39.63% Pervious = 12.527 ac 60.37% Impervious = 19.083 ac

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

SubcatchmentPOST 1.0: WATERSHED     Runoff Area=462,599 sf  72.19% Impervious  Runoff Depth>7.37"
                                   Flow Length=933'  Tc=11.4 min  CN=91  Runoff=70.91 cfs  6.521 af

SubcatchmentPOST 1.1: WATERSHED     Runoff Area=242,496 sf  58.73% Impervious  Runoff Depth>6.77"
                                   Flow Length=750'  Tc=10.3 min  CN=86  Runoff=36.28 cfs  3.140 af

SubcatchmentPOST 1.2: WATERSHED     Runoff Area=101,204 sf  62.15% Impervious  Runoff Depth>7.01"
                                  Flow Length=1,191'  Tc=6.4 min  CN=88  Runoff=17.48 cfs  1.358 af

SubcatchmentPOST 1.3: WATERSHED     Runoff Area=306,549 sf  22.64% Impervious  Runoff Depth>5.65"
                                 Flow Length=1,525'  Tc=45.9 min  CN=77  Runoff=21.42 cfs  3.313 af

SubcatchmentPOST 1.4: WATERSHED     Runoff Area=214,764 sf  85.05% Impervious  Runoff Depth>7.73"
                                    Flow Length=717'  Tc=7.5 min  CN=94  Runoff=37.84 cfs  3.177 af

SubcatchmentPOST 2.0: WATERSHED2.0  Runoff Area=49,290 sf  80.99% Impervious  Runoff Depth>7.62"
                                     Flow Length=758'  Tc=5.0 min  CN=93  Runoff=9.25 cfs  0.718 af

Reach REACH 1.0: RESTORED        Avg. Flow Depth=0.90'  Max Vel=2.19 fps  Inflow=17.48 cfs  2.679 af
                   n=0.040  L=1,309.0'  S=0.0092 '/'  Capacity=2,720.29 cfs  Outflow=10.33 cfs  2.662 af

Pond POND 1.0: GRAVEL WETLAND 1       Peak Elev=47.48'  Storage=98,793 cf  Inflow=70.91 cfs  6.521 af
                  Primary=19.73 cfs  3.345 af  Secondary=38.14 cfs  1.616 af  Outflow=57.87 cfs  4.961 af

Pond POND 1.1: GRAVEL WETLAND 2       Peak Elev=56.45'  Storage=83,107 cf  Inflow=36.28 cfs  3.140 af
                                                                             Outflow=6.58 cfs  1.321 af

Pond POND 1.2: PDMH203                                   Peak Elev=51.03'  Inflow=17.48 cfs  2.679 af
                      48.0"  Round Culvert  n=0.013  L=269.0'  S=0.0050 '/'  Outflow=17.48 cfs  2.679 af

Pond POND 1.3: OUTLET CULVERTS       Peak Elev=39.77'  Storage=24,643 cf  Inflow=87.04 cfs  13.437 af
                 Primary=83.35 cfs  13.109 af  Secondary=0.00 cfs  0.000 af  Outflow=83.35 cfs  13.109 af

Pond POND 1.4: RAINGARDEN 1.0         Peak Elev=49.56'  Storage=69,290 cf  Inflow=37.84 cfs  3.177 af
                      Primary=7.69 cfs  2.462 af  Secondary=1.60 cfs  0.039 af  Outflow=9.29 cfs  2.500 af

Link LINK 1.0: PDMH203 TAILWATER                                              Inflow=6.58 cfs  1.321 af
                                                                             Primary=6.58 cfs  1.321 af

Link PA1: POINT OF ANALYSIS                                                 Inflow=83.35 cfs  13.109 af
                                                                           Primary=83.35 cfs  13.109 af

Link PA2: POINT OF ANALYSIS                                                   Inflow=9.25 cfs  0.718 af
                                                                             Primary=9.25 cfs  0.718 af

          Total Runoff Area = 31.609 ac   Runoff Volume = 18.227 af   Average Runoff Depth = 6.92"
                                       39.63% Pervious = 12.527 ac     60.37% Impervious = 19.083 ac
```

1.3.2 Phase 2 Post-Development Conditions

Phase 2 includes the fit up of Building #1’s shell, central utility building, surface parking lot, temporary gravel construction laydown area, as well as the associated site improvement including drive aisles, utilities, lighting and sidewalks. The Phase 2 post-development condition was analyzed by dividing the watersheds into six sub-catchment areas. Stormwater runoff from these sub-catchment areas flow to either one of the two gravel wetlands, temporary sediment basin or the reconstructed Hodgson Brook prior to discharging to the existing Hodgson Brook outlet. Flows from these sub-catchment areas are modeled at the same two points of analysis that were modeled in the pre-development analysis, PA1 and PA2. These points of analysis and sub-catchment areas are depicted on the plan entitled “Phase 2 Post-Development Watershed Plan”, Sheet C-802 A.

1.3.2.1 Phase 2 Post-Development Watershed Plan



Tighe&Bond

SCALE IN FEET
0 80' 160'
GRAPHIC SCALE

LEGEND

▬	POST-DEVELOPMENT WATERSHED BOUNDARY
—	SOIL SURVEY BOUNDARIES
→→→	LONGEST FLOW PATH
POST 2 1.0	POST-DEVELOPMENT WATERSHED AREA DESIGNATION
POST 2 POND 1.0	POST-DEVELOPMENT POND DESIGNATION
PA-1	POINT OF ANALYSIS
POST REACH 1.0	POST-DEVELOPMENT REACH DESIGNATION

NOTES:

1. SOIL SURVEY WAS PERFORMED BY GOVE ENVIRONMENTAL SERVICES.

SOIL IDENTIFICATION LEGEND

SYMBOL	SOIL TAXONOMIC NAME, SLOPE RATING
89C	CHATFIELD, 8 TO 15 PERCENT SLOPES
313B	DEERFIELD, 0 TO 8 PERCENT SLOPES
313C	DEERFIELD, 8 TO 15 PERCENT SLOPES
915B	DEERFIELD VARIANT, 0 TO 8 PERCENT SLOPES
546B/P	WALPOLE POORLY DRAINED, 0 TO 8 PERCENT SLOPES
799B	UDORTHENTS URBAN LAND, 0 TO 8 PERCENT SLOPES
799E	UDORTHENTS URBAN LAND, >25 PERCENT SLOPES

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
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

PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

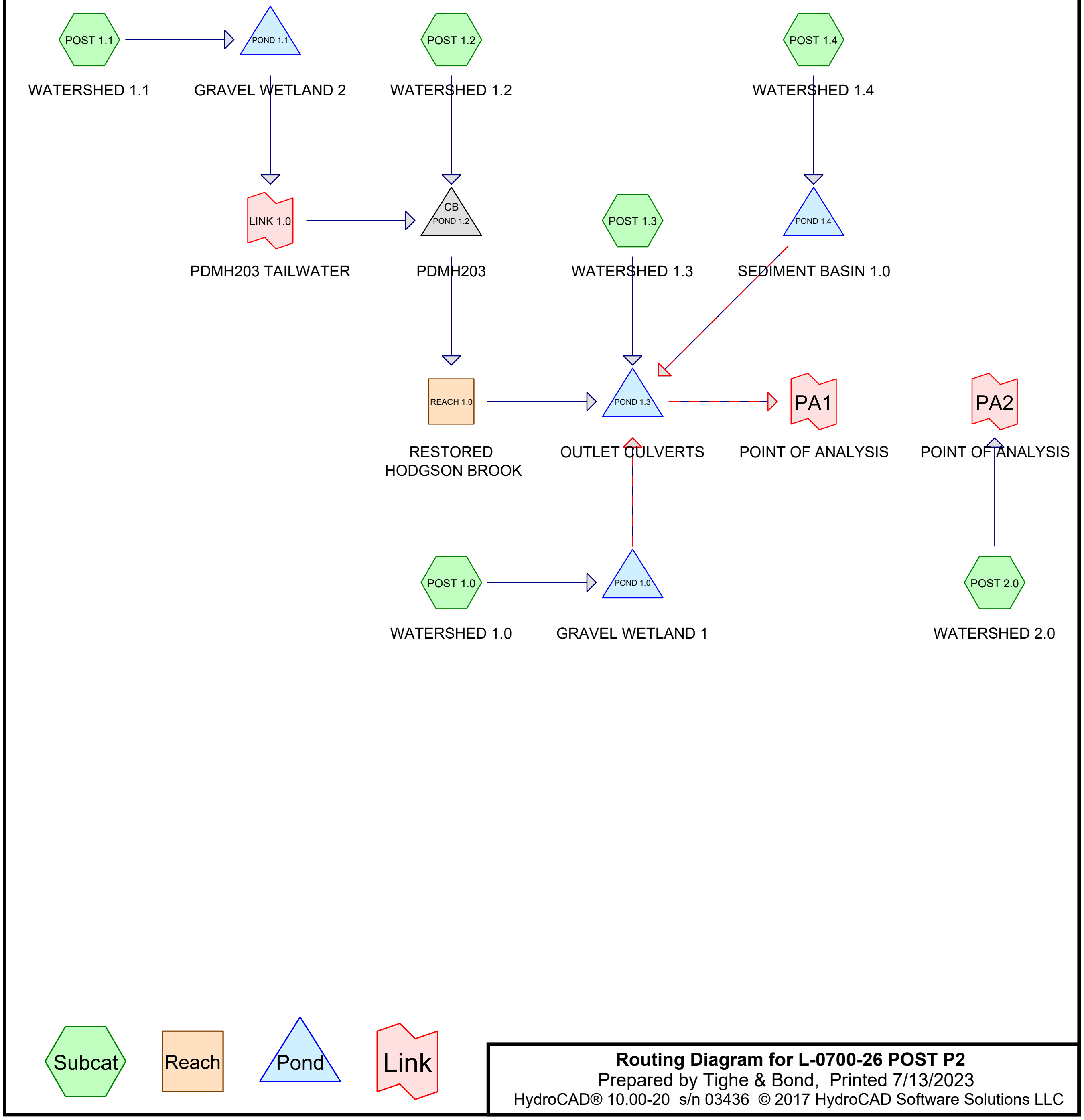
PHASE 2
POST-DEVELOPMENT
WATERSHED AREA PLAN

SCALE: AS SHOWN

C-802 A

Last Save Date: July 13, 2023 3:42 PM By: CKRZCUIK
Plot Date: Thursday, July 13, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-802 A

1.3.2.2 Phase 2 Post-Development Calculations



Routing Diagram for L-0700-26 POST P2
Prepared by Tighe & Bond, Printed 7/13/2023
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.312	61	>75% Grass cover, Good, HSG B (POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4)
13.558	74	>75% Grass cover, Good, HSG C (POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4, POST 2.0)
1.467	80	>75% Grass cover, Good, HSG D (POST 1.0, POST 1.3, POST 1.4)
0.514	58	Meadow, non-grazed, HSG B (POST 1.3)
1.662	71	Meadow, non-grazed, HSG C (POST 1.3)
0.639	98	Paved parking, HSG B (POST 1.0, POST 1.1, POST 1.2, POST 1.3)
6.959	98	Paved parking, HSG C (POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4, POST 2.0)
0.137	98	Paved parking, HSG D (POST 1.0, POST 1.3)
0.120	98	Roofs, HSG B (POST 1.0)
3.526	98	Roofs, HSG C (POST 1.0, POST 2.0)
0.714	98	Roofs, HSG D (POST 1.0)
31.609	**82**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
3.586	HSG B	POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4
25.705	HSG C	POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4, POST 2.0
2.318	HSG D	POST 1.0, POST 1.3, POST 1.4
0.000	Other	
31.609		**TOTAL AREA**

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

Subcatchment POST 1.0: WATERSHED Runoff Area=440,332 sf 71.42% Impervious Runoff Depth>2.61"
Flow Length=933' Tc=11.4 min CN=90 Runoff=25.38 cfs 2.201 af

Subcatchment POST 1.1: WATERSHED Runoff Area=157,428 sf 30.68% Impervious Runoff Depth>1.63"
Flow Length=464' Tc=8.3 min CN=78 Runoff=6.25 cfs 0.492 af

Subcatchment POST 1.2: WATERSHED Runoff Area=113,979 sf 58.28% Impervious Runoff Depth>2.34"
Flow Length=1,191' Tc=6.4 min CN=87 Runoff=6.94 cfs 0.511 af

Subcatchment POST 1.3: WATERSHED Runoff Area=300,100 sf 23.27% Impervious Runoff Depth>1.62"
Flow Length=1,525' Tc=45.9 min CN=78 Runoff=5.96 cfs 0.929 af

Subcatchment POST 1.4: WATERSHED 1.4 Runoff Area=315,727 sf 0.42% Impervious Runoff Depth>1.36"
Flow Length=585' Tc=13.5 min CN=74 Runoff=8.76 cfs 0.822 af

Subcatchment POST 2.0: WATERSHED 2.0 Runoff Area=49,336 sf 53.76% Impervious Runoff Depth>2.34"
Flow Length=758' Tc=5.0 min CN=87 Runoff=3.10 cfs 0.221 af

Reach REACH 1.0: RESTORED Avg. Flow Depth=0.63' Max Vel=2.08 fps Inflow=6.94 cfs 0.511 af
n=0.040 L=1,309.0' S=0.0092 '/' Capacity=2,720.29 cfs Outflow=4.97 cfs 0.507 af

Pond POND 1.0: GRAVEL WETLAND 1 Peak Elev=46.02' Storage=67,987 cf Inflow=25.38 cfs 2.201 af
Primary=0.96 cfs 0.874 af Secondary=0.00 cfs 0.000 af Outflow=0.96 cfs 0.874 af

Pond POND 1.1: GRAVEL WETLAND 2 Peak Elev=52.38' Storage=21,415 cf Inflow=6.25 cfs 0.492 af
Outflow=0.00 cfs 0.000 af

Pond POND 1.2: PDMH203 Peak Elev=50.38' Inflow=6.94 cfs 0.511 af
48.0" Round Culvert n=0.013 L=269.0' S=0.0050 '/' Outflow=6.94 cfs 0.511 af

Pond POND 1.3: OUTLET CULVERTS Peak Elev=38.16' Storage=8,981 cf Inflow=9.25 cfs 3.060 af
Primary=9.25 cfs 2.856 af Secondary=0.00 cfs 0.000 af Outflow=9.25 cfs 2.856 af

Pond POND 1.4: SEDIMENT BASIN 1.0 Peak Elev=44.62' Storage=21,007 cf Inflow=8.76 cfs 0.822 af
Primary=0.51 cfs 0.751 af Secondary=0.00 cfs 0.000 af Outflow=0.51 cfs 0.751 af

Link LINK 1.0: PDMH203 TAILWATER Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link PA1: POINT OF ANALYSIS Inflow=9.25 cfs 2.856 af
Primary=9.25 cfs 2.856 af

Link PA2: POINT OF ANALYSIS Inflow=3.10 cfs 0.221 af
Primary=3.10 cfs 0.221 af

Total Runoff Area = 31.609 ac Runoff Volume = 5.176 af Average Runoff Depth = 1.96"
61.73% Pervious = 19.513 ac 38.27% Impervious = 12.096 ac

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

SubcatchmentPOST 1.0: WATERSHED     Runoff Area=440,332 sf  71.42% Impervious  Runoff Depth>4.43"
                                 Flow Length=933'  Tc=11.4 min  CN=90  Runoff=42.01 cfs  3.732 af

SubcatchmentPOST 1.1: WATERSHED     Runoff Area=157,428 sf  30.68% Impervious  Runoff Depth>3.21"
                                  Flow Length=464'  Tc=8.3 min  CN=78  Runoff=12.40 cfs  0.966 af

SubcatchmentPOST 1.2: WATERSHED     Runoff Area=113,979 sf  58.28% Impervious  Runoff Depth>4.11"
                                Flow Length=1,191'  Tc=6.4 min  CN=87  Runoff=11.94 cfs  0.897 af

SubcatchmentPOST 1.3: WATERSHED     Runoff Area=300,100 sf  23.27% Impervious  Runoff Depth>3.18"
                               Flow Length=1,525'  Tc=45.9 min  CN=78  Runoff=11.87 cfs  1.826 af

SubcatchmentPOST 1.4: WATERSHED1.4  Runoff Area=315,727 sf  0.42% Impervious  Runoff Depth>2.83"
                                 Flow Length=585'  Tc=13.5 min  CN=74  Runoff=18.77 cfs  1.708 af

SubcatchmentPOST 2.0: WATERSHED2.0  Runoff Area=49,336 sf  53.76% Impervious  Runoff Depth>4.11"
                                   Flow Length=758'  Tc=5.0 min  CN=87  Runoff=5.36 cfs  0.388 af

Reach REACH 1.0: RESTORED        Avg. Flow Depth=0.82'  Max Vel=2.20 fps  Inflow=11.94 cfs  0.897 af
                  n=0.040  L=1,309.0'  S=0.0092 '/'  Capacity=2,720.29 cfs  Outflow=6.12 cfs  0.891 af

Pond POND 1.0: GRAVEL WETLAND 1        Peak Elev=46.78'  Storage=83,438 cf  Inflow=42.01 cfs  3.732 af
                 Primary=9.22 cfs  2.105 af  Secondary=5.86 cfs  0.170 af  Outflow=15.08 cfs  2.275 af

Pond POND 1.1: GRAVEL WETLAND 2        Peak Elev=54.11'  Storage=42,049 cf  Inflow=12.40 cfs  0.966 af
                                                                         Outflow=0.00 cfs  0.000 af

Pond POND 1.2: PDMH203                                     Peak Elev=50.72'  Inflow=11.94 cfs  0.897 af
                     48.0" Round Culvert  n=0.013  L=269.0'  S=0.0050 '/'  Outflow=11.94 cfs  0.897 af

Pond POND 1.3: OUTLET CULVERTS         Peak Elev=38.77'  Storage=13,560 cf  Inflow=31.34 cfs  5.942 af
                Primary=31.22 cfs  5.655 af  Secondary=0.00 cfs  0.000 af  Outflow=31.22 cfs  5.655 af

Pond POND 1.4: SEDIMENT BASIN 1.0      Peak Elev=45.79'  Storage=50,580 cf  Inflow=18.77 cfs  1.708 af
                   Primary=0.68 cfs  0.950 af  Secondary=0.00 cfs  0.000 af  Outflow=0.68 cfs  0.950 af

Link LINK 1.0: PDMH203 TAILWATER                                                  Inflow=0.00 cfs  0.000 af
                                                                                 Primary=0.00 cfs  0.000 af

Link PA1: POINT OF ANALYSIS                                                      Inflow=31.22 cfs  5.655 af
                                                                                Primary=31.22 cfs  5.655 af

Link PA2: POINT OF ANALYSIS                                                       Inflow=5.36 cfs  0.388 af
                                                                                 Primary=5.36 cfs  0.388 af

           Total Runoff Area = 31.609 ac   Runoff Volume = 9.517 af   Average Runoff Depth = 3.61"
                                     61.73% Pervious = 19.513 ac     38.27% Impervious = 12.096 ac
```

Summary for Subcatchment POST 1.0: WATERSHED 1.0

Runoff = 42.01 cfs @ 12.16 hrs, Volume= 3.732 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
5,235	98	Roofs, HSG B
29,148	61	>75% Grass cover, Good, HSG B
18,966	98	Paved parking, HSG B
143,455	98	Roofs, HSG C
82,022	74	>75% Grass cover, Good, HSG C
110,236	98	Paved parking, HSG C
31,119	98	Roofs, HSG D
14,671	80	>75% Grass cover, Good, HSG D
5,480	98	Paved parking, HSG D
440,332	90	Weighted Average
125,841		28.58% Pervious Area
314,491		71.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	70	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	19	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	162	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.4	84	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.5	113	0.0050	3.72	4.57	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.2	299	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.4	94	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.1	46	0.0240	11.16	35.05	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.0	5	0.0800	7.16	0.98	**Pipe Channel,** 5.0" Round Area= 0.1 sf Perim= 1.3' r= 0.10' n= 0.013
0.0	9	0.0110	9.90	69.95	**Pipe Channel,**

36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75'
n= 0.013

11.4	933	Total

Summary for Subcatchment POST 1.1: WATERSHED 1.1

Runoff = 12.40 cfs @ 12.12 hrs, Volume= 0.966 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
36,403	61	>75% Grass cover, Good, HSG B
3,210	98	Paved parking, HSG B
72,719	74	>75% Grass cover, Good, HSG C
45,096	98	Paved parking, HSG C
157,428	78	Weighted Average
109,122		69.32% Pervious Area
48,306		30.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.0625	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
2.2	312	0.0220	2.39		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	33	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.0	19	0.3300	8.62		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.3	464	Total			

Summary for Subcatchment POST 1.2: WATERSHED 1.2

Runoff = 11.94 cfs @ 12.09 hrs, Volume= 0.897 af, Depth> 4.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
9,848	61	>75% Grass cover, Good, HSG B
4,784	98	Paved parking, HSG B
37,701	74	>75% Grass cover, Good, HSG C
61,646	98	Paved parking, HSG C
113,979	87	Weighted Average
47,549		41.72% Pervious Area
66,430		58.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
1.0	153	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	343	0.0050	3.47	2.73	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	13	0.0050	3.72	4.57	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	453	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.4	129	0.0050	5.91	29.00	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Corrugated PE, smooth interior
6.4	1,191	Total			

Summary for Subcatchment POST 1.3: WATERSHED 1.3

Runoff = 11.87 cfs @ 12.63 hrs, Volume= 1.826 af, Depth> 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
1,830	61	>75% Grass cover, Good, HSG B
22,404	58	Meadow, non-grazed, HSG B
896	98	Paved parking, HSG B
131,991	74	>75% Grass cover, Good, HSG C
68,446	98	Paved parking, HSG C
72,396	71	Meadow, non-grazed, HSG C
1,638	80	>75% Grass cover, Good, HSG D
499	98	Paved parking, HSG D
300,100	78	Weighted Average
230,259		76.73% Pervious Area
69,841		23.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0130	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.1	52	0.0130	0.80		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	27	0.2720	7.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
33.8	1,346	0.0090	0.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
45.9	1,525	Total			

Summary for Subcatchment POST 1.4: WATERSHED 1.4

Runoff = 18.77 cfs @ 12.19 hrs, Volume= 1.708 af, Depth> 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
23,477	61	>75% Grass cover, Good, HSG B
243,330	74	>75% Grass cover, Good, HSG C
1,334	98	Paved parking, HSG C
47,586	80	>75% Grass cover, Good, HSG D
0	96	Gravel surface, HSG D
315,727	74	Weighted Average
314,393		99.58% Pervious Area
1,334		0.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.0245	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
5.1	465	0.0103	1.52		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.0	20	0.3300	8.62		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
13.5	585	Total			

Summary for Subcatchment POST 2.0: WATERSHED 2.0

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

Runoff = 5.36 cfs @ 12.07 hrs, Volume= 0.388 af, Depth> 4.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
10,145	98	Roofs, HSG C
22,815	74	>75% Grass cover, Good, HSG C
16,376	98	Paved parking, HSG C
49,336	87	Weighted Average
22,815		46.24% Pervious Area
26,521		53.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0164	1.36		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.3	48	0.0164	2.60		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	130	0.0140	7.03	12.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.5	70	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.3	410	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
3.6	758	Total, Increased to minimum Tc = 5.0 min			

Summary for Reach REACH 1.0: RESTORED HODGSON BROOK

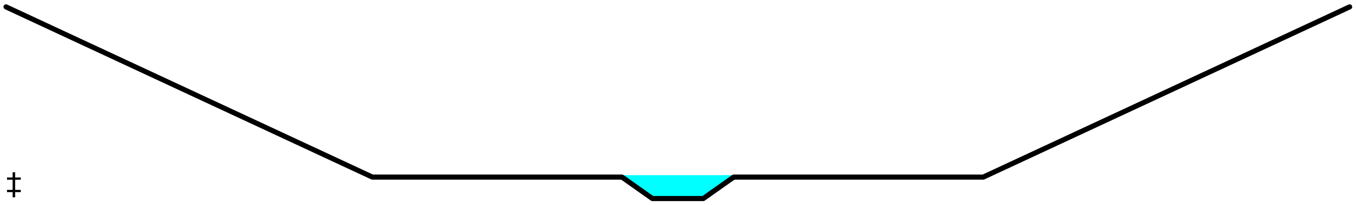
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 6.231 ac, 42.27% Impervious, Inflow Depth > 1.73" for 10 Year event
Inflow = 11.94 cfs @ 12.09 hrs, Volume= 0.897 af
Outflow = 6.12 cfs @ 12.86 hrs, Volume= 0.891 af, Atten= 49%, Lag= 45.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.20 fps, Min. Travel Time= 9.9 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 25.6 min

Peak Storage= 6,846 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.82'
Bank-Full Depth= 6.75' Flow Area= 291.0 sf, Capacity= 2,720.29 cfs

Custom cross-section, Length= 1,309.0' Slope= 0.0092 '/' (101 Elevation Intervals)
Constant n= 0.040 Winding stream, pools & shoals
Inlet Invert= 48.00', Outlet Invert= 36.00'



Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	12.00	0.00
18.00	6.00	6.00
30.25	6.00	6.00
31.75	5.25	6.75
34.25	5.25	6.75
35.75	6.00	6.00
48.00	6.00	6.00
66.00	12.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	2.5	0	0.00
0.75	3.0	30.4	3,927	2.28
6.75	291.0	68.3	380,919	2,720.29

Summary for Pond POND 1.0: GRAVEL WETLAND 1

[95] Warning: Outlet Device #4 rise exceeded

```
Inflow Area =       10.109 ac, 71.42% Impervious,  Inflow Depth >  4.43"   for  10 Year event
Inflow      =       42.01 cfs @  12.16 hrs,  Volume=          3.732 af
Outflow     =       15.08 cfs @  12.50 hrs,  Volume=          2.275 af,  Atten= 64%,  Lag= 20.8 min
Primary     =        9.22 cfs @  12.50 hrs,  Volume=          2.105 af
Secondary =          5.86 cfs @  12.50 hrs,  Volume=          0.170 af
```

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 46.78' @ 12.50 hrs Surf.Area= 21,240 sf Storage= 83,438 cf
Flood Elev= 48.00' Surf.Area= 23,557 sf Storage= 110,845 cf

Plug-Flow detention time= 226.3 min calculated for 2.275 af (61% of inflow)
Center-of-Mass det. time= 125.2 min (916.2 - 791.0)

Volume	Invert	Avail.Storage	Storage Description
#1	39.05'	110,845 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.05	9,855	0.0	0	0
41.35	9,855	30.0	6,800	6,800
42.00	9,855	45.0	2,883	9,683
43.00	11,943	100.0	10,899	20,582
44.00	14,202	100.0	13,073	33,654
45.00	16,891	100.0	15,547	49,201
46.00	19,752	100.0	18,322	67,522
47.00	21,668	100.0	20,710	88,232
48.00	23,557	100.0	22,613	110,845

Device	Routing	Invert	Outlet Devices
#1	Primary	41.35'	**18.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.35' / 41.20' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	41.35'	**3.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	45.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	46.00'	**4.0' long x 0.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s) 0.5' Crest Height
#5	Device 1	47.00'	**4.0" x 4.0" Horiz. Orifice/Grate X 106.00** C= 0.600 Limited to weir flow at low heads
#6	Secondary	46.50'	**15.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.22 cfs @ 12.50 hrs HW=46.78' TW=38.77' (Dynamic Tailwater)
└─**1=Culvert** (Passes 9.22 cfs of 18.40 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.74 cfs @ 11.06 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 0.30 cfs @ 6.19 fps)
  ├─**4=Sharp-Crested Rectangular Weir** (Orifice Controls 8.17 cfs @ 4.19 fps)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=5.85 cfs @ 12.50 hrs HW=46.78' TW=38.77' (Dynamic Tailwater)
└─**6=Broad-Crested Rectangular Weir** (Weir Controls 5.85 cfs @ 1.41 fps)

Summary for Pond POND 1.1: GRAVEL WETLAND 2

Inflow Area = 3.614 ac, 30.68% Impervious, Inflow Depth > 3.21" for 10 Year event
Inflow = 12.40 cfs @ 12.12 hrs, Volume= 0.966 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 54.11' @ 24.00 hrs Surf.Area= 14,115 sf Storage= 42,049 cf
Flood Elev= 57.00' Surf.Area= 21,643 sf Storage= 94,743 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	47.55'	117,304 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.55	6,269	0.0	0	0
49.85	6,269	30.0	4,326	4,326
50.50	6,269	45.0	1,834	6,159
51.00	7,199	100.0	3,367	9,526
52.00	9,187	100.0	8,193	17,719
53.00	11,345	100.0	10,266	27,985
54.00	13,814	100.0	12,580	40,565
55.00	16,645	100.0	15,230	55,794
56.00	19,805	100.0	18,225	74,019
58.00	23,480	100.0	43,285	117,304

Device	Routing	Invert	Outlet Devices
#1	Primary	49.85'	**24.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 49.85' / 49.45' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	49.85'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	53.50'	**4.0' long x 2.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	56.50'	**4.0" x 4.0" Horiz. Orifice/Grate X 106.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.55' TW=55.07' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  ├─**3=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond POND 1.2: PDMH203

Inflow Area = 6.231 ac, 42.27% Impervious, Inflow Depth > 1.73" for 10 Year event
Inflow = 11.94 cfs @ 12.09 hrs, Volume= 0.897 af
Outflow = 11.94 cfs @ 12.09 hrs, Volume= 0.897 af, Atten= 0%, Lag= 0.0 min
Primary = 11.94 cfs @ 12.09 hrs, Volume= 0.897 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 50.72' @ 12.09 hrs
Flood Elev= 57.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.35'	**48.0" Round Culvert** L= 269.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 49.35' / 48.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 12.57 sf

Primary OutFlow Max=11.76 cfs @ 12.09 hrs HW=50.71' TW=48.76' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 11.76 cfs @ 3.13 fps)

Summary for Pond POND 1.3: OUTLET CULVERTS

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=12)
[62] Hint: Exceeded Reach REACH 1.0 OUTLET depth by 2.58' @ 23.95 hrs

Inflow Area = 30.477 ac, 37.69% Impervious, Inflow Depth > 2.34" for 10 Year event
Inflow = 31.34 cfs @ 12.51 hrs, Volume= 5.942 af
Outflow = 31.22 cfs @ 12.53 hrs, Volume= 5.655 af, Atten= 0%, Lag= 1.3 min
Primary = 31.22 cfs @ 12.53 hrs, Volume= 5.655 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 38.77' @ 12.53 hrs Surf.Area= 8,870 sf Storage= 13,560 cf
Flood Elev= 43.50' Surf.Area= 95,977 sf Storage= 236,017 cf

Plug-Flow detention time= 56.2 min calculated for 5.642 af (95% of inflow)
Center-of-Mass det. time= 29.8 min (900.3 - 870.4)

Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	236,017 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	960	0	0
36.00	1,428	1,194	1,194
38.00	5,418	6,846	8,040
40.00	14,354	19,772	27,812
42.00	66,884	81,238	109,050
43.00	92,707	79,796	188,846
43.50	95,977	47,171	236,017

Device	Routing	Invert	Outlet Devices
#1	Primary	35.60'	**42.0" W x 29.0" H, R=21.5"/66.1" Pipe Arch CMP_Arch_1/2 42x29 X 3.00** L= 68.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.60' / 35.30' S= 0.0044 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 6.72 sf
#2	Secondary	43.00'	**143.1 deg x 18.0' long x 0.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.47 (C= 3.09)

Primary OutFlow Max=31.11 cfs @ 12.53 hrs HW=38.77' TW=38.65' (Dynamic Tailwater)
↑—**1=CMP_Arch_1/2 42x29** (Outlet Controls 31.11 cfs @ 1.55 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.04' TW=38.65' (Dynamic Tailwater)
↑—**2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond POND 1.4: SEDIMENT BASIN 1.0

```
Inflow Area =      7.248 ac,   0.42% Impervious,  Inflow Depth >  2.83"   for 10 Year event
Inflow      =     18.77 cfs @  12.19 hrs,  Volume=        1.708 af
Outflow     =      0.68 cfs @  17.24 hrs,  Volume=        0.950 af,  Atten= 96%,  Lag= 303.1 min
Primary     =      0.68 cfs @  17.24 hrs,  Volume=        0.950 af
Secondary   =      0.00 cfs @   0.00 hrs,  Volume=        0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Starting Elev= 44.15'  Surf.Area= 18,132 sf  Storage= 11,702 cf
Peak Elev= 45.79' @ 17.24 hrs  Surf.Area= 29,244 sf  Storage= 50,580 cf  (38,878 cf above start)
Flood Elev= 48.50'  Surf.Area= 38,802 sf  Storage= 127,441 cf  (115,739 cf above start)

Plug-Flow detention time= 356.9 min calculated for 0.681 af (40% of inflow)
Center-of-Mass det. time= 9.2 min ( 846.8 - 837.5 )

Volume      Invert     Avail.Storage   Storage Description
  #1        43.00'       127,441 cf    Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation       Surf.Area       Inc.Store       Cum.Store
    (feet)         (sq-ft)    (cubic-feet)    (cubic-feet)
     43.00           1,000               0               0
     44.00          17,117           9,059           9,059
     46.00          30,657          47,774          56,833
     47.00          35,879          33,268          90,101
     48.00          38,802          37,341         127,441

Device   Routing          Invert   Outlet Devices
  #1     Primary          42.75'   12.0"  Round Culvert  L= 66.0'   Ke= 0.500
                                   Inlet / Outlet Invert= 42.75' / 42.40'   S= 0.0053 '/'   Cc= 0.900
                                   n= 0.013,  Flow Area= 0.79 sf
  #2     Device 1         43.00'   4.0" Vert. Orifice/Grate   C= 0.600
  #3     Device 1         46.80'   10.0" x 17.5" Horiz. Orifice/Grate  C= 0.600
                                   Limited to weir flow at low heads
  #4     Secondary        47.40'   Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
                                   Head (feet)  0.00  1.10
                                   Width (feet)  8.00  14.60

Primary OutFlow Max=0.68 cfs @ 17.24 hrs  HW=45.79'  TW=38.65'   (Dynamic Tailwater)
└─1=Culvert  (Passes 0.68 cfs of 5.16 cfs potential flow)
   ├─2=Orifice/Grate  (Orifice Controls 0.68 cfs @ 7.80 fps)
   └─3=Orifice/Grate  ( Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs  HW=44.15'  TW=35.04'   (Dynamic Tailwater)
└─4=Custom Weir/Orifice ( Controls 0.00 cfs)
```

Summary for Link LINK 1.0: PDMH203 TAILWATER

This link takes into account the tailwater condition in PDMH203 which the outlet of gravel wetland 2 connects. The purpose of this is to determine the effects of any surcharging caused by the tailwater of Hodgson Brook entering the structure. These tailwater elevations were determined by Streamworks, PLLC as part of the overall watershed analysis they performed.

```
[80] Warning: Exceeded Pond POND 1.1 by 7.52' @ 0.00 hrs (23.95 cfs 41.618 af)

Inflow Area =      3.614 ac, 30.68% Impervious, Inflow Depth =  0.00"   for 10 Year event
Inflow      =      0.00 cfs @   0.00 hrs, Volume=         0.000 af
Primary     =      0.00 cfs @   0.00 hrs, Volume=         0.000 af, Atten= 0%, Lag= 0.0 min

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

10 Year 25 Point manual elevation table, To= 0.00 hrs, dt= 1.00 hrs, feet =
     55.07    55.07    55.07    55.07    55.07    55.07    55.07    55.07    55.07
     55.07    55.07    55.07    55.07    55.07    55.07    55.07    55.07    55.07
     55.07    55.07    55.07    55.07    55.07    55.07    55.07
```

Summary for Link PA1: POINT OF ANALYSIS

This link takes into account the tailwater condition in roadside swale along Goose Bay Drive which the existing culverts discharge into. These tailwater elevations were determined by Streamworks, PLLC as part of the overall watershed analysis they performed.

```
[80] Warning: Exceeded Pond POND 1.3 by 3.61' @ 0.00 hrs (92.51 cfs 60.023 af)

Inflow Area =     30.477 ac, 37.69% Impervious, Inflow Depth >  2.23"   for 10 Year event
Inflow      =     31.22 cfs @  12.53 hrs, Volume=         5.655 af
Primary     =     31.22 cfs @  12.53 hrs, Volume=         5.655 af, Atten= 0%, Lag= 0.0 min

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

10 Year 2 Point manual elevation table, To= 0.00 hrs, dt= 24.00 hrs, feet =
     38.65    38.65
```

Summary for Link PA2: POINT OF ANALYSIS

```
Inflow Area =      1.133 ac, 53.76% Impervious, Inflow Depth >  4.11"   for 10 Year event
Inflow      =      5.36 cfs @  12.07 hrs, Volume=         0.388 af
Primary     =      5.36 cfs @  12.07 hrs, Volume=         0.388 af, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment POST 1.0: WATERSHED Runoff Area=440,332 sf 71.42% Impervious Runoff Depth>5.88"
Flow Length=933' Tc=11.4 min CN=90 Runoff=54.93 cfs 4.956 af

Subcatchment POST 1.1: WATERSHED Runoff Area=157,428 sf 30.68% Impervious Runoff Depth>4.53"
Flow Length=464' Tc=8.3 min CN=78 Runoff=17.44 cfs 1.365 af

Subcatchment POST 1.2: WATERSHED Runoff Area=113,979 sf 58.28% Impervious Runoff Depth>5.54"
Flow Length=1,191' Tc=6.4 min CN=87 Runoff=15.85 cfs 1.209 af

Subcatchment POST 1.3: WATERSHED Runoff Area=300,100 sf 23.27% Impervious Runoff Depth>4.50"
Flow Length=1,525' Tc=45.9 min CN=78 Runoff=16.75 cfs 2.583 af

Subcatchment POST 1.4: WATERSHED 1.4 Runoff Area=315,727 sf 0.42% Impervious Runoff Depth>4.09"
Flow Length=585' Tc=13.5 min CN=74 Runoff=27.23 cfs 2.472 af

Subcatchment POST 2.0: WATERSHED 2.0 Runoff Area=49,336 sf 53.76% Impervious Runoff Depth>5.54"
Flow Length=758' Tc=5.0 min CN=87 Runoff=7.12 cfs 0.523 af

Reach REACH 1.0: RESTORED Avg. Flow Depth=0.87' Max Vel=2.22 fps Inflow=15.85 cfs 1.209 af
n=0.040 L=1,309.0' S=0.0092 '/' Capacity=2,720.29 cfs Outflow=8.65 cfs 1.202 af

Pond POND 1.0: GRAVEL WETLAND 1 Peak Elev=47.10' Storage=90,424 cf Inflow=54.93 cfs 4.956 af
Primary=19.03 cfs 2.766 af Secondary=18.86 cfs 0.671 af Outflow=37.88 cfs 3.437 af

Pond POND 1.1: GRAVEL WETLAND 2 Peak Elev=55.22' Storage=59,446 cf Inflow=17.44 cfs 1.365 af
Outflow=0.00 cfs 0.000 af

Pond POND 1.2: PDMH203 Peak Elev=50.94' Inflow=15.85 cfs 1.209 af
48.0" Round Culvert n=0.013 L=269.0' S=0.0050 '/' Outflow=15.85 cfs 1.209 af

Pond POND 1.3: OUTLET CULVERTS Peak Elev=39.17' Storage=17,433 cf Inflow=57.33 cfs 8.292 af
Primary=56.26 cfs 7.985 af Secondary=0.00 cfs 0.000 af Outflow=56.26 cfs 7.985 af

Pond POND 1.4: SEDIMENT BASIN 1.0 Peak Elev=46.65' Storage=77,792 cf Inflow=27.23 cfs 2.472 af
Primary=0.78 cfs 1.070 af Secondary=0.00 cfs 0.000 af Outflow=0.78 cfs 1.070 af

Link LINK 1.0: PDMH203 TAILWATER Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link PA1: POINT OF ANALYSIS Inflow=56.26 cfs 7.985 af
Primary=56.26 cfs 7.985 af

Link PA2: POINT OF ANALYSIS Inflow=7.12 cfs 0.523 af
Primary=7.12 cfs 0.523 af

Total Runoff Area = 31.609 ac Runoff Volume = 13.108 af Average Runoff Depth = 4.98"
61.73% Pervious = 19.513 ac 38.27% Impervious = 12.096 ac

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

SubcatchmentPOST 1.0: WATERSHED Runoff Area=440,332 sf 71.42% Impervious Runoff Depth>7.25"
Flow Length=933' Tc=11.4 min CN=90 Runoff=66.89 cfs 6.105 af

SubcatchmentPOST 1.1: WATERSHED Runoff Area=157,428 sf 30.68% Impervious Runoff Depth>5.81"
Flow Length=464' Tc=8.3 min CN=78 Runoff=22.21 cfs 1.750 af

SubcatchmentPOST 1.2: WATERSHED Runoff Area=113,979 sf 58.28% Impervious Runoff Depth>6.89"
Flow Length=1,191' Tc=6.4 min CN=87 Runoff=19.47 cfs 1.503 af

SubcatchmentPOST 1.3: WATERSHED Runoff Area=300,100 sf 23.27% Impervious Runoff Depth>5.77"
Flow Length=1,525' Tc=45.9 min CN=78 Runoff=21.37 cfs 3.312 af

SubcatchmentPOST 1.4: WATERSHED1.4 Runoff Area=315,727 sf 0.42% Impervious Runoff Depth>5.33"
Flow Length=585' Tc=13.5 min CN=74 Runoff=35.32 cfs 3.218 af

SubcatchmentPOST 2.0: WATERSHED2.0 Runoff Area=49,336 sf 53.76% Impervious Runoff Depth>6.89"
Flow Length=758' Tc=5.0 min CN=87 Runoff=8.76 cfs 0.651 af

Reach REACH 1.0: RESTORED Avg. Flow Depth=0.92' Max Vel=2.24 fps Inflow=19.47 cfs 1.503 af
n=0.040 L=1,309.0' S=0.0092 '/' Capacity=2,720.29 cfs Outflow=11.76 cfs 1.495 af

Pond POND 1.0: GRAVEL WETLAND 1 Peak Elev=47.39' Storage=96,897 cf Inflow=66.89 cfs 6.105 af
Primary=19.58 cfs 3.347 af Secondary=33.37 cfs 1.209 af Outflow=52.94 cfs 4.556 af

Pond POND 1.1: GRAVEL WETLAND 2 Peak Elev=56.11' Storage=76,209 cf Inflow=22.21 cfs 1.750 af
Outflow=0.00 cfs 0.000 af

Pond POND 1.2: PDMH203 Peak Elev=51.13' Inflow=19.47 cfs 1.503 af
48.0" Round Culvert n=0.013 L=269.0' S=0.0050 '/' Outflow=19.47 cfs 1.503 af

Pond POND 1.3: OUTLET CULVERTS Peak Elev=39.58' Storage=22,150 cf Inflow=76.91 cfs 10.982 af
Primary=74.09 cfs 10.655 af Secondary=0.00 cfs 0.000 af Outflow=74.09 cfs 10.655 af

Pond POND 1.4: SEDIMENT BASIN 1.0 Peak Elev=47.02' Storage=90,878 cf Inflow=35.32 cfs 3.218 af
Primary=2.39 cfs 1.619 af Secondary=0.00 cfs 0.000 af Outflow=2.39 cfs 1.619 af

Link LINK 1.0: PDMH203 TAILWATER Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link PA1: POINT OF ANALYSIS Inflow=74.09 cfs 10.655 af
Primary=74.09 cfs 10.655 af

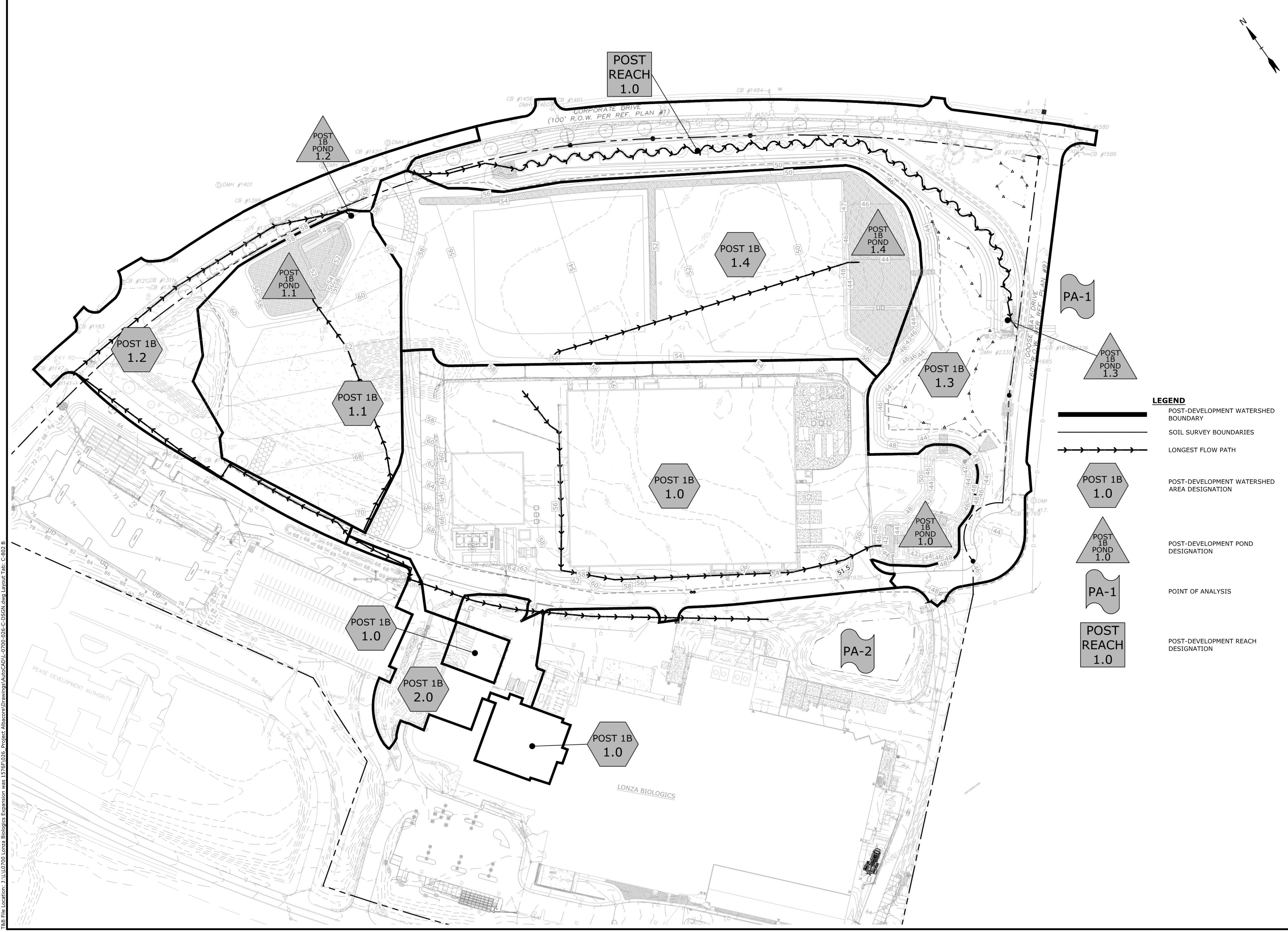
Link PA2: POINT OF ANALYSIS Inflow=8.76 cfs 0.651 af
Primary=8.76 cfs 0.651 af

Total Runoff Area = 31.609 ac Runoff Volume = 16.539 af Average Runoff Depth = 6.28"
61.73% Pervious = 19.513 ac 38.27% Impervious = 12.096 ac

1.3.3 Phase 1B Post-Development Conditions

Phase 1B is currently under construction and is includes the construction of the shells of Building 1 and the central utility building, temporary gravel construction laydown area, as well as the associated site improvement including drive aisles, utilities, lighting and sidewalks. Phase 1B also includes the construction of two (2) temporary sediment basins as well as Gravel Wetland #1. Phase 1B post-development condition was analyzed by dividing the watersheds into six sub-catchment areas. Stormwater runoff from these sub-catchment areas flow to either one of the two temporary sediment basin, gravel wetland, or the reconstructed Hodgson Brook prior to discharging to the existing Hodgson Brook outlet. Flows from these sub-catchment areas are modeled at the same two points of analysis that were modeled in the pre-development analysis, PA1 and PA2. These points of analysis and sub-catchment areas are depicted on the plan entitled “Phase 1B Post-Development Watershed Plan”, Sheet C-802 B.

1.3.3.1 Phase 1B Post-Development Watershed Plan



LEGEND

▬	POST-DEVELOPMENT WATERSHED BOUNDARY
—	SOIL SURVEY BOUNDARIES
→→→→	LONGEST FLOW PATH
POST 1B 1.0	POST-DEVELOPMENT WATERSHED AREA DESIGNATION
POST 1B POND 1.0	POST-DEVELOPMENT POND DESIGNATION
PA-1	POINT OF ANALYSIS
POST REACH 1.0	POST-DEVELOPMENT REACH DESIGNATION

Tighe&Bond

SCALE IN FEET
0 80' 160'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
M	9/27/2023	P.B. Submission
L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
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

PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

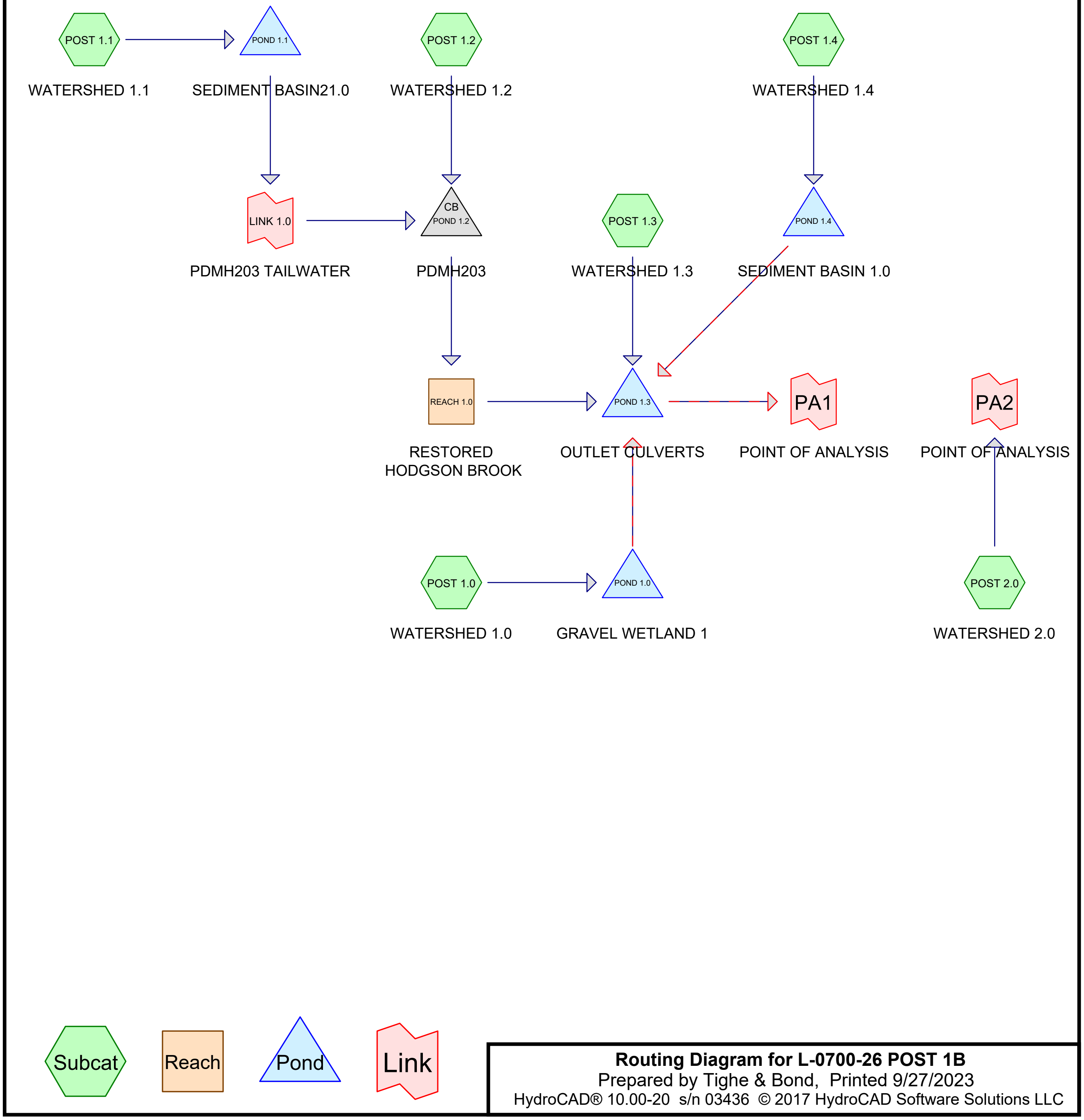
PHASE 1B
POST-DEVELOPMENT
WATERSHED AREA PLAN

SCALE: AS SHOWN

C-802 B

Last Save Date: September 27, 2023 10:50 AM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-802 B

1.3.3.2 Phase 1B Post-Development Calculations



Routing Diagram for L-0700-26 POST 1B
Prepared by Tighe & Bond, Printed 9/27/2023
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.282	61	>75% Grass cover, Good, HSG B (POST 1.0, POST 1.1, POST 1.2, POST 1.3)
8.331	74	>75% Grass cover, Good, HSG C (POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 2.0)
0.403	80	>75% Grass cover, Good, HSG D (POST 1.0, POST 1.3)
1.703	96	Gravel surface, HSG B (POST 1.1, POST 1.4)
7.437	96	Gravel surface, HSG C (POST 1.1, POST 1.4)
1.056	96	Gravel surface, HSG D (POST 1.4)
0.504	71	Meadow, non-grazed, HSG C (POST 1.3)
0.440	98	Paved parking, HSG B (POST 1.0, POST 1.3)
5.365	98	Paved parking, HSG C (POST 1.0, POST 1.2, POST 1.3, POST 2.0)
0.132	98	Paved parking, HSG D (POST 1.0, POST 1.3)
0.161	98	Roofs, HSG B (POST 1.0)
4.068	98	Roofs, HSG C (POST 1.0, POST 2.0)
0.727	98	Roofs, HSG D (POST 1.0)
31.609	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
3.586	HSG B	POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4
25.705	HSG C	POST 1.0, POST 1.1, POST 1.2, POST 1.3, POST 1.4, POST 2.0
2.318	HSG D	POST 1.0, POST 1.3, POST 1.4
0.000	Other	
31.609		**TOTAL AREA**

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

SubcatchmentPOST 1.0: WATERSHED Runoff Area=436,500 sf 73.49% Impervious Runoff Depth>2.71"
Flow Length=933' Tc=11.4 min CN=91 Runoff=25.91 cfs 2.261 af

SubcatchmentPOST 1.1: WATERSHED1.1 Runoff Area=169,765 sf 0.00% Impervious Runoff Depth>2.52"
Flow Length=464' Tc=8.3 min CN=89 Runoff=10.39 cfs 0.819 af

SubcatchmentPOST 1.2: WATERSHED1.2 Runoff Area=87,646 sf 68.04% Impervious Runoff Depth>2.61"
Flow Length=1,191' Tc=6.4 min CN=90 Runoff=5.88 cfs 0.438 af

SubcatchmentPOST 1.3: WATERSHED Runoff Area=311,579 sf 22.08% Impervious Runoff Depth>1.62"
Flow Length=1,525' Tc=45.9 min CN=78 Runoff=6.19 cfs 0.964 af

SubcatchmentPOST 1.4: WATERSHED1.4 Runoff Area=321,295 sf 0.00% Impervious Runoff Depth>3.22"
Flow Length=585' Tc=13.5 min CN=96 Runoff=20.19 cfs 1.978 af

SubcatchmentPOST 2.0: WATERSHED2.0 Runoff Area=50,117 sf 50.42% Impervious Runoff Depth>2.26"
Flow Length=758' Tc=5.0 min CN=86 Runoff=3.04 cfs 0.216 af

Reach REACH 1.0: RESTORED Avg. Flow Depth=0.59' Max Vel=2.01 fps Inflow=6.13 cfs 0.893 af
n=0.040 L=1,309.0' S=0.0092 '/' Capacity=2,720.29 cfs Outflow=4.37 cfs 0.879 af

Pond POND 1.0: GRAVEL WETLAND 1 Peak Elev=46.08' Storage=69,171 cf Inflow=25.91 cfs 2.261 af
Primary=1.15 cfs 0.924 af Secondary=0.00 cfs 0.000 af Outflow=1.15 cfs 0.924 af

Pond POND 1.1: SEDIMENT BASIN21.0 Peak Elev=55.32' Storage=24,357 cf Inflow=10.39 cfs 0.819 af
Outflow=0.50 cfs 0.454 af

Pond POND 1.2: PDMH203 Peak Elev=50.28' Inflow=6.13 cfs 0.893 af
54.0" Round Culvert n=0.013 L=269.0' S=0.0050 '/' Outflow=6.13 cfs 0.893 af

Pond POND 1.3: OUTLET CULVERTS Peak Elev=38.16' Storage=8,990 cf Inflow=9.74 cfs 3.827 af
Primary=9.74 cfs 3.622 af Secondary=0.00 cfs 0.000 af Outflow=9.74 cfs 3.622 af

Pond POND 1.4: SEDIMENT BASIN 1.0 Peak Elev=46.13' Storage=60,724 cf Inflow=20.19 cfs 1.978 af
Primary=0.72 cfs 1.059 af Secondary=0.00 cfs 0.000 af Outflow=0.72 cfs 1.059 af

Link LINK 1.0: PDMH203 TAILWATER Inflow=0.50 cfs 0.454 af
Primary=0.50 cfs 0.454 af

Link PA1: POINT OF ANALYSIS Inflow=9.74 cfs 3.622 af
Primary=9.74 cfs 3.622 af

Link PA2: POINT OF ANALYSIS Inflow=3.04 cfs 0.216 af
Primary=3.04 cfs 0.216 af

Total Runoff Area = 31.609 ac Runoff Volume = 6.676 af Average Runoff Depth = 2.53"
65.54% Pervious = 20.717 ac 34.46% Impervious = 10.892 ac

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

SubcatchmentPOST 1.0: WATERSHED Runoff Area=436,500 sf 73.49% Impervious Runoff Depth>4.54"
Flow Length=933' Tc=11.4 min CN=91 Runoff=42.35 cfs 3.791 af

SubcatchmentPOST 1.1: WATERSHED1.1 Runoff Area=169,765 sf 0.00% Impervious Runoff Depth>4.32"
Flow Length=464' Tc=8.3 min CN=89 Runoff=17.43 cfs 1.405 af

SubcatchmentPOST 1.2: WATERSHED1.2 Runoff Area=87,646 sf 68.04% Impervious Runoff Depth>4.43"
Flow Length=1,191' Tc=6.4 min CN=90 Runoff=9.71 cfs 0.743 af

SubcatchmentPOST 1.3: WATERSHED Runoff Area=311,579 sf 22.08% Impervious Runoff Depth>3.18"
Flow Length=1,525' Tc=45.9 min CN=78 Runoff=12.32 cfs 1.896 af

SubcatchmentPOST 1.4: WATERSHED1.4 Runoff Area=321,295 sf 0.00% Impervious Runoff Depth>5.10"
Flow Length=585' Tc=13.5 min CN=96 Runoff=31.26 cfs 3.135 af

SubcatchmentPOST 2.0: WATERSHED2.0 Runoff Area=50,117 sf 50.42% Impervious Runoff Depth>4.01"
Flow Length=758' Tc=5.0 min CN=86 Runoff=5.34 cfs 0.384 af

Reach REACH 1.0: RESTORED Avg. Flow Depth=0.79' Max Vel=2.23 fps Inflow=9.88 cfs 1.234 af
n=0.040 L=1,309.0' S=0.0092 '/' Capacity=2,720.29 cfs Outflow=6.44 cfs 1.219 af

Pond POND 1.0: GRAVEL WETLAND 1 Peak Elev=46.86' Storage=85,206 cf Inflow=42.35 cfs 3.791 af
Primary=6.71 cfs 2.014 af Secondary=8.72 cfs 0.316 af Outflow=15.43 cfs 2.329 af

Pond POND 1.1: SEDIMENT BASIN21.0 Peak Elev=56.53' Storage=46,294 cf Inflow=17.43 cfs 1.405 af
Outflow=0.61 cfs 0.491 af

Pond POND 1.2: PDMH203 Peak Elev=50.54' Inflow=9.88 cfs 1.234 af
54.0" Round Culvert n=0.013 L=269.0' S=0.0050 '/' Outflow=9.88 cfs 1.234 af

Pond POND 1.3: OUTLET CULVERTS Peak Elev=38.79' Storage=13,754 cf Inflow=33.80 cfs 7.286 af
Primary=33.69 cfs 6.999 af Secondary=0.00 cfs 0.000 af Outflow=33.69 cfs 6.999 af

Pond POND 1.4: SEDIMENT BASIN 1.0 Peak Elev=46.78' Storage=82,212 cf Inflow=31.26 cfs 3.135 af
Primary=0.80 cfs 1.163 af Secondary=4.13 cfs 0.679 af Outflow=4.92 cfs 1.842 af

Link LINK 1.0: PDMH203 TAILWATER Inflow=0.61 cfs 0.491 af
Primary=0.61 cfs 0.491 af

Link PA1: POINT OF ANALYSIS Inflow=33.69 cfs 6.999 af
Primary=33.69 cfs 6.999 af

Link PA2: POINT OF ANALYSIS Inflow=5.34 cfs 0.384 af
Primary=5.34 cfs 0.384 af

Total Runoff Area = 31.609 ac Runoff Volume = 11.354 af Average Runoff Depth = 4.31"
65.54% Pervious = 20.717 ac 34.46% Impervious = 10.892 ac

Summary for Subcatchment POST 1.0: WATERSHED 1.0

Runoff = 42.35 cfs @ 12.15 hrs, Volume= 3.791 af, Depth> 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
7,015	98	Roofs, HSG B
21,062	61	>75% Grass cover, Good, HSG B
18,252	98	Paved parking, HSG B
156,340	98	Roofs, HSG C
78,742	74	>75% Grass cover, Good, HSG C
102,238	98	Paved parking, HSG C
31,671	98	Roofs, HSG D
15,928	80	>75% Grass cover, Good, HSG D
5,252	98	Paved parking, HSG D
436,500	91	Weighted Average
115,732		26.51% Pervious Area
320,768		73.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	70	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	19	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	162	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.4	84	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.5	113	0.0050	3.72	4.57	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.2	299	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.4	94	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.1	46	0.0240	11.16	35.05	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.0	5	0.0800	7.16	0.98	**Pipe Channel,** 5.0" Round Area= 0.1 sf Perim= 1.3' r= 0.10' n= 0.013
0.0	9	0.0110	9.90	69.95	**Pipe Channel,**

36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75'
n= 0.013

11.4	933	Total

Summary for Subcatchment POST 1.1: WATERSHED 1.1

Runoff = 17.43 cfs @ 12.11 hrs, Volume= 1.405 af, Depth> 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
42,748	96	Gravel surface, HSG B
6,173	61	>75% Grass cover, Good, HSG B
80,105	96	Gravel surface, HSG C
40,739	74	>75% Grass cover, Good, HSG C
169,765	89	Weighted Average
169,765		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.0625	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
2.2	312	0.0220	2.39		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	33	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.0	19	0.3300	8.62		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.3	464	Total			

Summary for Subcatchment POST 1.2: WATERSHED 1.2

Runoff = 9.71 cfs @ 12.09 hrs, Volume= 0.743 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
3,104	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
24,907	74	>75% Grass cover, Good, HSG C
59,635	98	Paved parking, HSG C
87,646	90	Weighted Average
28,011		31.96% Pervious Area
59,635		68.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
1.0	153	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	343	0.0050	3.47	2.73	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.1	13	0.0050	3.72	4.57	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	453	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.4	129	0.0050	5.91	29.00	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Corrugated PE, smooth interior
6.4	1,191	Total			

Summary for Subcatchment POST 1.3: WATERSHED 1.3

Runoff = 12.32 cfs @ 12.63 hrs, Volume= 1.896 af, Depth> 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
25,523	61	>75% Grass cover, Good, HSG B
903	98	Paved parking, HSG B
193,641	74	>75% Grass cover, Good, HSG C
67,403	98	Paved parking, HSG C
21,971	71	Meadow, non-grazed, HSG C
1,639	80	>75% Grass cover, Good, HSG D
499	98	Paved parking, HSG D
311,579	78	Weighted Average
242,774		77.92% Pervious Area
68,805		22.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.0130	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.1	52	0.0130	0.80		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	27	0.2720	7.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
33.8	1,346	0.0090	0.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
45.9	1,525	Total			

Summary for Subcatchment POST 1.4: WATERSHED 1.4

Runoff = 31.26 cfs @ 12.18 hrs, Volume= 3.135 af, Depth> 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
31,421	96	Gravel surface, HSG B
243,870	96	Gravel surface, HSG C
46,004	96	Gravel surface, HSG D
321,295	96	Weighted Average
321,295		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.0245	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
5.1	465	0.0103	1.52		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.0	20	0.3300	8.62		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
13.5	585	Total			

Summary for Subcatchment POST 2.0: WATERSHED 2.0

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

Runoff = 5.34 cfs @ 12.07 hrs, Volume= 0.384 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.58"

Area (sf)	CN	Description
20,850	98	Roofs, HSG C
24,850	74	>75% Grass cover, Good, HSG C
4,417	98	Paved parking, HSG C
50,117	86	Weighted Average
24,850		49.58% Pervious Area
25,267		50.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0164	1.36		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.3	48	0.0164	2.60		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	130	0.0140	7.03	12.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
0.5	70	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.3	410	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
3.6	758	Total, Increased to minimum Tc = 5.0 min			

Summary for Reach REACH 1.0: RESTORED HODGSON BROOK

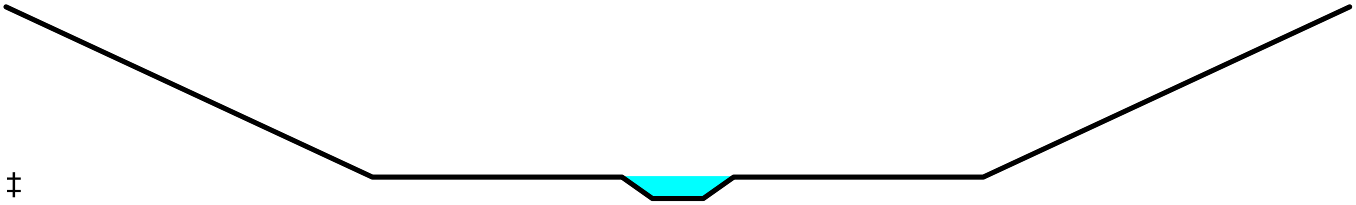
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 5.909 ac, 23.17% Impervious, Inflow Depth > 2.51" for 10 Year event
Inflow = 9.88 cfs @ 12.10 hrs, Volume= 1.234 af
Outflow = 6.44 cfs @ 12.09 hrs, Volume= 1.219 af, Atten= 35%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.23 fps, Min. Travel Time= 9.8 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 21.7 min

Peak Storage= 5,663 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.79'
Bank-Full Depth= 6.75' Flow Area= 291.0 sf, Capacity= 2,720.29 cfs

Custom cross-section, Length= 1,309.0' Slope= 0.0092 '/' (101 Elevation Intervals)
Constant n= 0.040 Winding stream, pools & shoals
Inlet Invert= 48.00', Outlet Invert= 36.00'



Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	12.00	0.00
18.00	6.00	6.00
30.25	6.00	6.00
31.75	5.25	6.75
34.25	5.25	6.75
35.75	6.00	6.00
48.00	6.00	6.00
66.00	12.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	2.5	0	0.00
0.75	3.0	30.4	3,927	2.28
6.75	291.0	68.3	380,919	2,720.29

Summary for Pond POND 1.0: GRAVEL WETLAND 1

[95] Warning: Outlet Device #4 rise exceeded

Inflow Area = 10.021 ac, 73.49% Impervious, Inflow Depth > 4.54" for 10 Year event
Inflow = 42.35 cfs @ 12.15 hrs, Volume= 3.791 af
Outflow = 15.43 cfs @ 12.50 hrs, Volume= 2.329 af, Atten= 64%, Lag= 20.5 min
Primary = 6.71 cfs @ 12.50 hrs, Volume= 2.014 af
Secondary = 8.72 cfs @ 12.50 hrs, Volume= 0.316 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 46.86' @ 12.50 hrs Surf.Area= 21,399 sf Storage= 85,206 cf
Flood Elev= 48.00' Surf.Area= 23,557 sf Storage= 110,845 cf

Plug-Flow detention time= 228.0 min calculated for 2.325 af (61% of inflow)
Center-of-Mass det. time= 128.3 min (915.6 - 787.3)

Volume	Invert	Avail.Storage	Storage Description
#1	39.05'	110,845 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.05	9,855	0.0	0	0
41.35	9,855	30.0	6,800	6,800
42.00	9,855	45.0	2,883	9,683
43.00	11,943	100.0	10,899	20,582
44.00	14,202	100.0	13,073	33,654
45.00	16,891	100.0	15,547	49,201
46.00	19,752	100.0	18,322	67,522
47.00	21,668	100.0	20,710	88,232
48.00	23,557	100.0	22,613	110,845

Device	Routing	Invert	Outlet Devices
#1	Primary	41.35'	**18.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.35' / 41.20' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	41.35'	**3.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	45.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	46.00'	**3.0' long x 0.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s) 4.0' Crest Height
#5	Device 1	47.00'	**4.0" x 4.0" Horiz. Orifice/Grate X 106.00** C= 0.600 Limited to weir flow at low heads
#6	Secondary	46.50'	**15.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

```
Primary OutFlow Max=6.71 cfs @ 12.50 hrs  HW=46.86'  TW=38.78'   (Dynamic Tailwater)
└─1=Culvert  (Passes 6.71 cfs of 18.56 cfs potential flow)
   ├─2=Orifice/Grate (Orifice Controls 0.75 cfs @ 11.15 fps)
   ├─3=Orifice/Grate (Orifice Controls 0.31 cfs @ 6.34 fps)
   ├─4=Sharp-Crested Rectangular Weir(Orifice Controls 5.65 cfs @ 3.90 fps)
   └─5=Orifice/Grate ( Controls 0.00 cfs)

Secondary OutFlow Max=8.69 cfs @ 12.50 hrs  HW=46.86'  TW=38.78'   (Dynamic Tailwater)
└─6=Broad-Crested Rectangular Weir(Weir Controls 8.69 cfs @ 1.61 fps)
```

Summary for Pond POND 1.1: SEDIMENT BASIN21.0

Inflow Area = 3.897 ac, 0.00% Impervious, Inflow Depth > 4.32" for 10 Year event
Inflow = 17.43 cfs @ 12.11 hrs, Volume= 1.405 af
Outflow = 0.61 cfs @ 15.87 hrs, Volume= 0.491 af, Atten= 97%, Lag= 225.6 min
Primary = 0.61 cfs @ 15.87 hrs, Volume= 0.491 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Starting Elev= 52.20' Surf.Area= 4,580 sf Storage= 898 cf
Peak Elev= 56.53' @ 15.87 hrs Surf.Area= 19,981 sf Storage= 46,294 cf (45,396 cf above start)
Flood Elev= 58.50' Surf.Area= 23,331 sf Storage= 88,825 cf (87,927 cf above start)

Plug-Flow detention time= 441.0 min calculated for 0.469 af (33% of inflow)
Center-of-Mass det. time= 289.1 min (1,081.2 - 792.0)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	88,825 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	4,402	0	0
54.00	6,183	10,585	10,585
56.00	19,079	25,262	35,847
58.00	22,453	41,532	77,379
58.50	23,331	11,446	88,825

Device	Routing	Invert	Outlet Devices
#1	Primary	50.35'	**12.0" Round Culvert** L= 27.0' Ke= 0.500 Inlet / Outlet Invert= 50.35' / 49.45' S= 0.0333 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	56.50'	**10.0" x 17.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	52.00'	**4.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.61 cfs @ 15.87 hrs HW=56.53' TW=55.07' (Dynamic Tailwater)
├─**1=Culvert** (Passes 0.10 cfs of 4.58 cfs potential flow)
│ └─**2=Orifice/Grate** (Weir Controls 0.10 cfs @ 0.61 fps)
└─**3=Orifice/Grate** (Orifice Controls 0.51 cfs @ 5.83 fps)

Summary for Pond POND 1.2: PDMH203

Inflow Area = 5.909 ac, 23.17% Impervious, Inflow Depth > 2.51" for 10 Year event
Inflow = 9.88 cfs @ 12.10 hrs, Volume= 1.234 af
Outflow = 9.88 cfs @ 12.10 hrs, Volume= 1.234 af, Atten= 0%, Lag= 0.0 min
Primary = 9.88 cfs @ 12.10 hrs, Volume= 1.234 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 50.54' @ 12.10 hrs
Flood Elev= 57.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.35'	**54.0" Round Culvert** L= 269.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 49.35' / 48.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 15.90 sf

Primary OutFlow Max=9.77 cfs @ 12.10 hrs HW=50.53' TW=48.71' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 9.77 cfs @ 2.92 fps)

Summary for Pond POND 1.3: OUTLET CULVERTS

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=14)
[62] Hint: Exceeded Reach REACH 1.0 OUTLET depth by 2.56' @ 8.65 hrs

Inflow Area = 30.459 ac, 33.86% Impervious, Inflow Depth > 2.87" for 10 Year event
Inflow = 33.80 cfs @ 12.56 hrs, Volume= 7.286 af
Outflow = 33.69 cfs @ 12.58 hrs, Volume= 6.999 af, Atten= 0%, Lag= 1.4 min
Primary = 33.69 cfs @ 12.58 hrs, Volume= 6.999 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 38.79' @ 12.58 hrs Surf.Area= 8,967 sf Storage= 13,754 cf
Flood Elev= 43.50' Surf.Area= 95,977 sf Storage= 236,017 cf

Plug-Flow detention time= 46.7 min calculated for 6.998 af (96% of inflow)
Center-of-Mass det. time= 25.3 min (906.0 - 880.7)

Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	236,017 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	960	0	0
36.00	1,428	1,194	1,194
38.00	5,418	6,846	8,040
40.00	14,354	19,772	27,812
42.00	66,884	81,238	109,050
43.00	92,707	79,796	188,846
43.50	95,977	47,171	236,017

Device	Routing	Invert	Outlet Devices
#1	Primary	35.60'	**42.0" W x 29.0" H, R=21.5"/66.1" Pipe Arch CMP_Arch_1/2 42x29 X 3.00** L= 68.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.60' / 35.30' S= 0.0044 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 6.72 sf
#2	Secondary	43.00'	**143.1 deg x 18.0' long x 0.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.47 (C= 3.09)

Primary OutFlow Max=33.59 cfs @ 12.58 hrs HW=38.79' TW=38.65' (Dynamic Tailwater)
└─**1=CMP_Arch_1/2 42x29** (Outlet Controls 33.59 cfs @ 1.67 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.04' TW=38.65' (Dynamic Tailwater)
└─**2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond POND 1.4: SEDIMENT BASIN 1.0

Inflow Area = 7.376 ac, 0.00% Impervious, Inflow Depth > 5.10" for 10 Year event
Inflow = 31.26 cfs @ 12.18 hrs, Volume= 3.135 af
Outflow = 4.92 cfs @ 12.81 hrs, Volume= 1.842 af, Atten= 84%, Lag= 38.1 min
Primary = 0.80 cfs @ 12.81 hrs, Volume= 1.163 af
Secondary = 4.13 cfs @ 12.81 hrs, Volume= 0.679 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Starting Elev= 44.15' Surf.Area= 18,132 sf Storage= 11,702 cf
Peak Elev= 46.78' @ 12.81 hrs Surf.Area= 34,712 sf Storage= 82,212 cf (70,510 cf above start)
Flood Elev= 48.50' Surf.Area= 38,802 sf Storage= 127,441 cf (115,739 cf above start)

Plug-Flow detention time= 297.1 min calculated for 1.570 af (50% of inflow)
Center-of-Mass det. time= 75.8 min (841.4 - 765.6)

Volume	Invert	Avail.Storage	Storage Description
#1	43.00'	127,441 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.00	1,000	0	0
44.00	17,117	9,059	9,059
46.00	30,657	47,774	56,833
47.00	35,879	33,268	90,101
48.00	38,802	37,341	127,441

Device	Routing	Invert	Outlet Devices
#1	Primary	42.75'	**12.0" Round Culvert** L= 66.0' Ke= 0.500 Inlet / Outlet Invert= 42.75' / 42.40' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	43.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	46.80'	**10.0" x 17.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	46.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.00 Width (feet) 8.00 20.00

```
Primary OutFlow Max=0.80 cfs @ 12.81 hrs  HW=46.78'  TW=38.75'   (Dynamic Tailwater)
└─1=Culvert  (Passes 0.80 cfs of 6.13 cfs potential flow)
   ├─2=Orifice/Grate  (Orifice Controls 0.80 cfs @ 9.15 fps)
   └─3=Orifice/Grate  ( Controls 0.00 cfs)

Secondary OutFlow Max=4.12 cfs @ 12.81 hrs  HW=46.78'  TW=38.75'   (Dynamic Tailwater)
└─4=Custom Weir/Orifice  (Weir Controls 4.12 cfs @ 1.69 fps)
```

Summary for Link LINK 1.0: PDMH203 TAILWATER

This link takes into account the tailwater condition in PDMH203 which the outlet of gravel wetland 2 connects. The purpose of this is to determine the effects of any surcharging caused by the tailwater of Hodgson Brook entering the structure. These tailwater elevations were determined by Streamworks, PLLC as part of the overall watershed analysis they performed. These findings are discussed in the seperate memo prepared by Streamworks, PLLC.

```
[80] Warning: Exceeded Pond POND 1.1 by 2.87' @ 0.00 hrs (0.71 cfs 0.656 af)

Inflow Area =       3.897 ac,   0.00% Impervious,  Inflow Depth >   1.51"    for  10 Year event
Inflow      =       0.61 cfs @   15.87 hrs,  Volume=          0.491 af
Primary     =       0.61 cfs @   15.87 hrs,  Volume=          0.491 af,  Atten= 0%,  Lag= 0.0 min

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

10 Year  25 Point manual elevation table,  To= 0.00 hrs,  dt= 1.00 hrs,  feet =
     55.07      55.07      55.07      55.07      55.07      55.07      55.07      55.07      55.07
     55.07      55.07      55.07      55.07      55.07      55.07      55.07      55.07      55.07
     55.07      55.07      55.07      55.07      55.07      55.07      55.07
```

Summary for Link PA1: POINT OF ANALYSIS

This link takes into account the tailwater condition in roadside swale along Goose Bay Drive which the existing culverts discharge into. These tailwater elevations were determined by Streamworks, PLLC as part of the overall watershed analysis they performed. These findings are discussed in the seperate memo prepared by Streamworks, PLLC.

```
[80] Warning: Exceeded Pond POND 1.3 by 3.61' @ 0.00 hrs (92.51 cfs 55.001 af)

Inflow Area =      30.459 ac,  33.86% Impervious,  Inflow Depth >   2.76"    for  10 Year event
Inflow      =      33.69 cfs @   12.58 hrs,  Volume=        6.999 af
Primary     =      33.69 cfs @   12.58 hrs,  Volume=        6.999 af,  Atten= 0%,  Lag= 0.0 min

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

10 Year  2 Point manual elevation table,  To= 0.00 hrs,  dt= 24.00 hrs,  feet =
       38.65       38.65
```

Summary for Link PA2: POINT OF ANALYSIS

```
Inflow Area =       1.151 ac,  50.42% Impervious,  Inflow Depth >   4.01"    for  10 Year event
Inflow      =       5.34 cfs @   12.07 hrs,  Volume=        0.384 af
Primary     =       5.34 cfs @   12.07 hrs,  Volume=        0.384 af,  Atten= 0%,  Lag= 0.0 min

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

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

SubcatchmentPOST 1.0: WATERSHED Runoff Area=436,500 sf 73.49% Impervious Runoff Depth>6.00"
Flow Length=933' Tc=11.4 min CN=91 Runoff=55.10 cfs 5.009 af

SubcatchmentPOST 1.1: WATERSHED1.1 Runoff Area=169,765 sf 0.00% Impervious Runoff Depth>5.77"
Flow Length=464' Tc=8.3 min CN=89 Runoff=22.90 cfs 1.874 af

SubcatchmentPOST 1.2: WATERSHED1.2 Runoff Area=87,646 sf 68.04% Impervious Runoff Depth>5.89"
Flow Length=1,191' Tc=6.4 min CN=90 Runoff=12.69 cfs 0.987 af

SubcatchmentPOST 1.3: WATERSHED Runoff Area=311,579 sf 22.08% Impervious Runoff Depth>4.50"
Flow Length=1,525' Tc=45.9 min CN=78 Runoff=17.39 cfs 2.682 af

SubcatchmentPOST 1.4: WATERSHED1.4 Runoff Area=321,295 sf 0.00% Impervious Runoff Depth>6.58"
Flow Length=585' Tc=13.5 min CN=96 Runoff=39.87 cfs 4.046 af

SubcatchmentPOST 2.0: WATERSHED2.0 Runoff Area=50,117 sf 50.42% Impervious Runoff Depth>5.43"
Flow Length=758' Tc=5.0 min CN=86 Runoff=7.13 cfs 0.521 af

Reach REACH 1.0: RESTORED Avg. Flow Depth=0.83' Max Vel=2.25 fps Inflow=12.86 cfs 1.860 af
n=0.040 L=1,309.0' S=0.0092 '/' Capacity=2,720.29 cfs Outflow=6.61 cfs 1.845 af

Pond POND 1.0: GRAVEL WETLAND 1 Peak Elev=47.16' Storage=91,694 cf Inflow=55.10 cfs 5.009 af
Primary=19.11 cfs 2.623 af Secondary=21.50 cfs 0.864 af Outflow=41.78 cfs 3.488 af

Pond POND 1.1: SEDIMENT BASIN21.0 Peak Elev=56.80' Storage=51,566 cf Inflow=22.90 cfs 1.874 af
Outflow=2.87 cfs 0.873 af

Pond POND 1.2: PDMH203 Peak Elev=50.72' Inflow=12.86 cfs 1.860 af
54.0" Round Culvert n=0.013 L=269.0' S=0.0050 '/' Outflow=12.86 cfs 1.860 af

Pond POND 1.3: OUTLET CULVERTS Peak Elev=39.31' Storage=18,991 cf Inflow=67.85 cfs 10.710 af
Primary=65.09 cfs 10.403 af Secondary=0.00 cfs 0.000 af Outflow=65.09 cfs 10.403 af

Pond POND 1.4: SEDIMENT BASIN 1.0 Peak Elev=47.07' Storage=92,522 cf Inflow=39.87 cfs 4.046 af
Primary=2.90 cfs 1.275 af Secondary=13.10 cfs 1.420 af Outflow=16.00 cfs 2.696 af

Link LINK 1.0: PDMH203 TAILWATER Inflow=2.87 cfs 0.873 af
Primary=2.87 cfs 0.873 af

Link PA1: POINT OF ANALYSIS Inflow=65.09 cfs 10.403 af
Primary=65.09 cfs 10.403 af

Link PA2: POINT OF ANALYSIS Inflow=7.13 cfs 0.521 af
Primary=7.13 cfs 0.521 af

Total Runoff Area = 31.609 ac Runoff Volume = 15.118 af Average Runoff Depth = 5.74"
65.54% Pervious = 20.717 ac 34.46% Impervious = 10.892 ac

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

SubcatchmentPOST 1.0: WATERSHED Runoff Area=436,500 sf 73.49% Impervious Runoff Depth>7.37"
Flow Length=933' Tc=11.4 min CN=91 Runoff=66.91 cfs 6.153 af

SubcatchmentPOST 1.1: WATERSHED1.1 Runoff Area=169,765 sf 0.00% Impervious Runoff Depth>7.13"
Flow Length=464' Tc=8.3 min CN=89 Runoff=27.97 cfs 2.316 af

SubcatchmentPOST 1.2: WATERSHED1.2 Runoff Area=87,646 sf 68.04% Impervious Runoff Depth>7.25"
Flow Length=1,191' Tc=6.4 min CN=90 Runoff=15.44 cfs 1.216 af

SubcatchmentPOST 1.3: WATERSHED Runoff Area=311,579 sf 22.08% Impervious Runoff Depth>5.77"
Flow Length=1,525' Tc=45.9 min CN=78 Runoff=22.18 cfs 3.439 af

SubcatchmentPOST 1.4: WATERSHED1.4 Runoff Area=321,295 sf 0.00% Impervious Runoff Depth>7.97"
Flow Length=585' Tc=13.5 min CN=96 Runoff=47.87 cfs 4.897 af

SubcatchmentPOST 2.0: WATERSHED2.0 Runoff Area=50,117 sf 50.42% Impervious Runoff Depth>6.77"
Flow Length=758' Tc=5.0 min CN=86 Runoff=8.79 cfs 0.650 af

Reach REACH 1.0: RESTORED Avg. Flow Depth=0.89' Max Vel=2.22 fps Inflow=15.50 cfs 2.490 af
n=0.040 L=1,309.0' S=0.0092 '/' Capacity=2,720.29 cfs Outflow=9.65 cfs 2.475 af

Pond POND 1.0: GRAVEL WETLAND 1 Peak Elev=47.41' Storage=97,358 cf Inflow=66.91 cfs 6.153 af
Primary=19.61 cfs 3.173 af Secondary=34.51 cfs 1.427 af Outflow=54.13 cfs 4.600 af

Pond POND 1.1: SEDIMENT BASIN21.0 Peak Elev=57.24' Storage=60,879 cf Inflow=27.97 cfs 2.316 af
Outflow=4.17 cfs 1.273 af

Pond POND 1.2: PDMH203 Peak Elev=50.86' Inflow=15.50 cfs 2.490 af
54.0" Round Culvert n=0.013 L=269.0' S=0.0050 '/' Outflow=15.50 cfs 2.490 af

Pond POND 1.3: OUTLET CULVERTS Peak Elev=40.06' Storage=28,728 cf Inflow=100.24 cfs 14.026 af
Primary=95.55 cfs 13.698 af Secondary=0.00 cfs 0.000 af Outflow=95.55 cfs 13.698 af

Pond POND 1.4: SEDIMENT BASIN 1.0 Peak Elev=47.28' Storage=100,085 cf Inflow=47.87 cfs 4.897 af
Primary=4.89 cfs 1.415 af Secondary=22.04 cfs 2.096 af Outflow=26.93 cfs 3.511 af

Link LINK 1.0: PDMH203 TAILWATER Inflow=4.17 cfs 1.273 af
Primary=4.17 cfs 1.273 af

Link PA1: POINT OF ANALYSIS Inflow=95.55 cfs 13.698 af
Primary=95.55 cfs 13.698 af

Link PA2: POINT OF ANALYSIS Inflow=8.79 cfs 0.650 af
Primary=8.79 cfs 0.650 af

Total Runoff Area = 31.609 ac Runoff Volume = 18.670 af Average Runoff Depth = 7.09"
65.54% Pervious = 20.717 ac 34.46% Impervious = 10.892 ac

1.4 Peak Rate Comparisons

The following table summarizes and compares the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 50-year storm events at each point of analysis. The pre-development 1-year storm event is also included for channel protection requirements.

Table 1.4.1 – Peak Flow Rate Comparison

Point of Analysis	Phase	Pre 1-Year Storm (cfs)	Pre/**Post** 2-Year Storm (cfs)	Pre/**Post** 10-Year Storm (cfs)	Pre/**Post** 25-Year Storm (cfs)	Pre/**Post** 50-Year Storm (cfs)
PA1	1B	16.58	24.86/**9.74**	52.70/**33.69**	76.06/**65.09**	98.56/**95.55**
	2	16.58	24.86/**9.25**	52.70/**31.22**	76.06/**56.26**	98.56/**74.09**
	Master	16.58	24.89/**9.41**	52.70/**39.92**	76.06/**66.14**	98.56/**83.35**
PA2	1B	3.38	4.41/**3.04**	7.49/**5.34**	9.90/**7.13**	12.13/**8.79**
	2	3.38	4.41/**3.10**	7.49/**5.36**	9.90/**7.12**	12.13/**8.76**
	Master	3.38	4.41/**3.72**	7.49/**5.94**	9.90/**7.66**	12.13/**9.25**

The Peak Runoff Control Requirements of Env-Wq 1507.06 are required to be met for the point of analysis. As shown in Table 1.4 the Post-Development flows are decreased from the Pre-Development flows for PA1 and PA2.

1.5 Mitigation Description

1.5.1 Mitigation Calculations

The proposed project area has been evaluated to treat the required water quality flow (WQF) per the requirements of Env-Wq 1500. These calculations have been provided in Appendix E of this report. The water quality volumes (WQV) have been provided below outlets.

1.5.2 Pre-Treatment Methods for Protecting Water Quality

Pre-treatment for the two (2) proposed gravel wetlands is provided by a sediment forebay. Pre-treatment for the raingarden consists of deep sump catchbasins.

	Table 1.5 – Pollutant Removal Efficiencies		
BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Sediment Forebay[1]	TBA	TBA	TBA
Deep Sump Catch Basin w/Hood[1]	15%	85%	5%

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.

1.5.3 Treatment Methods for Protecting Water Quality

Treatment for the increased impervious area comes from one rain gardens/bio-retention basins and two gravel wetlands.

The BMP Worksheets for each treatment practice have been included in Appendix E of this report.

	Table 1.6 – Pollutant Removal Efficiencies		
BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Rain Garden/Bio-Retention Basin[1]	90%	65%	65%
Gravel Wetland[1]	95%	85%	64%

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.

APPENDIX A

(Bound Separately)

APPENDIX B

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.802 degrees West
Latitude	43.085 degrees North
Elevation	0 feet
Date/Time	Tue, 06 Feb 2018 11:48:23 -0500

Extreme Precipitation Estimates

	5min	**10min**	**15min**	**30min**	**60min**	**120min**		**1hr**	**2hr**	**3hr**	**6hr**	**12hr**	**24hr**	**48hr**		**1day**	**2day**	**4day**	**7day**	**10day**	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.02	2.65	2.91	**1yr**	2.35	2.79	3.20	3.92	4.52	**1yr**
2yr	0.32	0.49	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.51	1.93	2.48	3.20	3.55	**2yr**	2.83	3.42	3.92	4.66	5.30	**2yr**
5yr	0.37	0.58	0.72	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.42	3.13	4.05	4.56	**5yr**	3.59	4.38	5.01	5.91	6.67	**5yr**
10yr	0.41	0.64	0.81	1.11	1.44	1.87	**10yr**	1.24	1.71	2.21	2.87	3.73	4.85	5.50	**10yr**	4.29	5.29	6.04	7.07	7.94	**10yr**
25yr	0.47	0.75	0.96	1.32	1.75	2.31	**25yr**	1.51	2.12	2.75	3.60	4.71	6.15	7.06	**25yr**	5.44	6.79	7.74	8.97	10.01	**25yr**
50yr	0.53	0.85	1.09	1.52	2.04	2.72	**50yr**	1.76	2.50	3.25	4.28	5.62	7.36	8.54	**50yr**	6.51	8.21	9.34	10.75	11.93	**50yr**
100yr	0.60	0.96	1.24	1.75	2.38	3.20	**100yr**	2.05	2.95	3.84	5.09	6.71	8.82	10.33	**100yr**	7.80	9.93	11.28	12.88	14.23	**100yr**
200yr	0.66	1.08	1.40	2.01	2.78	3.78	**200yr**	2.40	3.47	4.55	6.06	8.02	10.57	12.49	**200yr**	9.35	12.01	13.62	15.45	16.97	**200yr**
500yr	0.78	1.29	1.68	2.43	3.41	4.68	**500yr**	2.94	4.32	5.67	7.61	10.13	13.43	16.07	**500yr**	11.89	15.46	17.47	19.64	21.43	**500yr**

Lower Confidence Limits

	5min	**10min**	**15min**	**30min**	**60min**	**120min**		**1hr**	**2hr**	**3hr**	**6hr**	**12hr**	**24hr**	**48hr**		**1day**	**2day**	**4day**	**7day**	**10day**	
1yr	0.23	0.36	0.44	0.59	0.73	0.89	**1yr**	0.63	0.87	0.92	1.31	1.66	2.23	2.50	**1yr**	1.97	2.41	2.83	3.17	3.88	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.36	1.82	2.34	3.05	3.44	**2yr**	2.70	3.31	3.81	4.53	5.05	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.13	2.74	3.78	4.18	**5yr**	3.34	4.02	4.69	5.51	6.22	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.41	3.08	4.36	4.86	**10yr**	3.86	4.67	5.42	6.39	7.18	**10yr**
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.34	1.86	2.10	2.78	3.57	4.69	5.90	**25yr**	4.15	5.67	6.63	7.78	8.67	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.17	**50yr**	1.52	2.12	2.35	3.11	3.98	5.30	6.82	**50yr**	4.69	6.56	7.71	9.02	10.00	**50yr**
100yr	0.53	0.81	1.01	1.46	2.01	2.47	**100yr**	1.73	2.42	2.63	3.46	4.41	5.95	7.88	**100yr**	5.27	7.58	8.97	10.48	11.53	**100yr**
200yr	0.59	0.89	1.13	1.63	2.28	2.82	**200yr**	1.96	2.76	2.93	3.85	4.88	6.67	9.10	**200yr**	5.90	8.75	10.43	12.19	13.33	**200yr**
500yr	0.69	1.02	1.31	1.91	2.71	3.37	**500yr**	2.34	3.30	3.40	4.41	5.58	7.75	11.02	**500yr**	6.86	10.59	12.73	14.91	16.12	**500yr**

Upper Confidence Limits

	5min	**10min**	**15min**	**30min**	**60min**	**120min**		**1hr**	**2hr**	**3hr**	**6hr**	**12hr**	**24hr**	**48hr**		**1day**	**2day**	**4day**	**7day**	**10day**	
1yr	0.28	0.44	0.53	0.72	0.88	1.08	**1yr**	0.76	1.06	1.25	1.75	2.21	2.99	3.13	**1yr**	2.65	3.01	3.57	4.36	5.02	**1yr**
2yr	0.33	0.52	0.63	0.86	1.06	1.26	**2yr**	0.91	1.23	1.48	1.96	2.51	3.41	3.68	**2yr**	3.02	3.53	4.06	4.81	5.61	**2yr**
5yr	0.40	0.61	0.76	1.04	1.33	1.61	**5yr**	1.15	1.57	1.88	2.53	3.24	4.32	4.92	**5yr**	3.82	4.73	5.34	6.33	7.11	**5yr**
10yr	0.46	0.71	0.88	1.23	1.59	1.96	**10yr**	1.38	1.92	2.27	3.09	3.93	5.31	6.15	**10yr**	4.70	5.91	6.74	7.78	8.68	**10yr**
25yr	0.57	0.87	1.08	1.54	2.02	2.54	**25yr**	1.74	2.48	2.93	4.04	5.09	7.73	8.25	**25yr**	6.84	7.94	9.02	10.25	11.33	**25yr**
50yr	0.66	1.01	1.25	1.80	2.42	3.09	**50yr**	2.09	3.02	3.56	4.96	6.23	9.67	10.34	**50yr**	8.56	9.94	11.25	12.61	13.86	**50yr**
100yr	0.77	1.17	1.47	2.12	2.91	3.75	**100yr**	2.51	3.67	4.33	6.10	7.63	12.09	12.94	**100yr**	10.70	12.45	14.03	15.54	16.96	**100yr**
200yr	0.90	1.36	1.72	2.50	3.48	4.57	**200yr**	3.00	4.47	5.28	7.50	9.34	15.15	16.23	**200yr**	13.41	15.60	17.53	19.14	20.77	**200yr**
500yr	1.12	1.66	2.14	3.11	4.42	5.91	**500yr**	3.81	5.78	6.84	9.88	12.24	20.44	21.88	**500yr**	18.09	21.04	23.53	25.23	27.17	**500yr**

Coastal and Great Bay Region Precipitation Increase		
	24-hr Storm Event (in.)	24-hr Storm Event + 15% (in.)
1 Year	2.65	3.05
2 Year	3.20	3.68
10 Year	4.85	5.58
25 Year	6.15	7.07
50 Year	7.36	8.46
100 Year	8.82	10.14

APPENDIX C

Tighe&Bond
Engineers | Environmental Specialists

Project/Site Information

Proposed Industrial Development
101 International Drive
Portsmouth, NH

Test Pit No. **TP-1**
Page No. 1 of 1
File No. L-0700-013
Checked By: D. Brogan

T&B Rep. M. Trovato
Weather 30 Degrees - Cloudy

Contractor New England Boring Contractors
Operator Ben Cross
Make Kubota Model KX080
Capacity 0.3 yd^3 Reach 15.1 ft.

Date 03/21/18
Ground Elev. ± 48'
Time Started 7:50
Time Completed 9:05

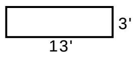
Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulder Count/ Class	Note No.
0	Dark brown fine to coarse SAND and fine to coarse GRAVEL, little Silt (FILL) 0.5'		0.0	D	5-10%/A	1
1'	Brown, fine to coarse SAND and fine to coarse GRAVEL, some Silt, trace Brick, Wood, Clay Pipe (FILL) 3.5'	S-1		E	5-10%/A	
2'				E	5-10%/A	
3'				E	5-10%/A	
4'	Grayish-brown, fine to coarse SAND and SILT, with thin seems of Silty Clay (FILL) 6'	S-2	0.0	E	5%/A	
5'				E	5%/A	
6'	Grayish-brown, fine to medium SAND, some Silty Clay, some fine to coarse Gravel 8.5'	S-3		E	5%/A	
7'				M	5%/A	
8'			0.0	M	5%/A	2
9'	Bottom of exploration at 8.5 feet due to bedrock refusal					
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1) Frost layer observed to be approximately 6-inches thick.

2) Groundwater observed to infiltrate test pit at approximately 8.5 feet.

Test Pit Plan



Volume = ________ cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" +

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
(   ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water
0.25	8.5'

Tighe&Bond
Engineers | Environmental Specialists

Project/Site Information

Proposed Industrial Development
101 International Drive
Portsmouth, NH

Test Pit No.	**TP-6**
Page No.	1 of 1
File No.	L-0700-013
Checked By:	D. Brogan

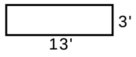
T&B Rep.	M. Trovato	Contractor	New England Boring Contractors			Date	03/21/18
		Operator	Ben Cross			Ground Elev.	± 44'
Weather	36 Degrees - Cloudy	Make	Kubota	Model	KX080	Time Started	13:55
		Capacity	0.3 yd^3	Reach	15.1 ft.	Time Completed	14:35

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulder Count/ Class	Note No.
0	Dark brown, fine to coarse SAND and SILT, little fine to coarse Gravel, trace Brick, Wood (FILL) 2'			E	5%/A	
1'				E	5%/A-B	
2'	Light gray, Silty CLAY, trace Wood (FILL) 5'			E	5%/A	
3'				E	5%/A	
4'				E	5%/A	
5'	Light gray, Silty CLAY, trace fine to coarse Gravel 7.5'			E	5%/A	1
6'				E	0%	
7'	Bottom of exploration at 7.5 feet due to bedrock refusal			E	0%	
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1) Groundwater observed to infiltrate test pit sidewalls at approximately 5 feet below grade.

Test Pit Plan



Volume = ____________ cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" +

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used	
TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
(   ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water
0.25	5'

J:\L\L0700 Lonza Biologics Expansion was 1576F\013 Iron Parcel Redevelopment\Geo-Environmental\Explorations\[Test Pit Logs.xls]TP-6

Tighe&Bond
Engineers | Environmental Specialists

Project/Site Information

Proposed Industrial Development
101 International Drive
Portsmouth, NH

Test Pit No. **TP-17**
Page No. 1 of 1
File No. L-0700-013
Checked By: D. Brogan

T&B Rep. M. Trovato
Weather 36 Degrees - Sunny

Contractor New England Boring Contractors
Operator Ben Cross
Make Kubota Model KX080
Capacity 0.3 yd^3 Reach 15.1 ft.

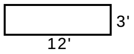
Date 03/23/18
Ground Elev. ± 57'
Time Started 9:10
Time Completed 10:00

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulder Count/ Class	Note No.
0	Brown, fine to coarse SAND, some fine to coarse Gravel, some Silt, trace Clay Pipe, Trash (FILL)		0.0	E	5%/A	
1'	2'			E	5%/A	
2'	Gray, fine to medium SAND and SILT 2.8'	S-1	0.0	E	5%/A	
3'	Gray, Silty CLAY	S-2		E	0%	1
4'				E	0%	
5'				E	0%	
6'	6.5'			E	5%/A	
7'	Grayish-brown, fine to medium SAND and SILT	S-3	0.0	E	0%	
8'				E	0%	
9'				E	0%	
10'	11'			E	0%	
11'	Bottom of exploration at 11 feet					
12'						
13'						
14'						
15'						
16'						

Notes:

1) 4-inch metal pipe encountered at approximately 3 feet below grade running perpendicular with test pit.

Test Pit Plan



Volume = ________ cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" +

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Tighe&Bond
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Project/Site Information

Proposed Industrial Development
101 International Drive
Portsmouth, NH

Test Pit No.	**TP-18**
Page No.	1 of 1
File No.	L-0700-013
Checked By:	D. Brogan

T&B Rep.	M. Trovato	Contractor	New England Boring Contractors			Date	03/23/18
		Operator	Ben Cross			Ground Elev.	± 59'
Weather	38 Degrees - Sunny	Make	Kubota	Model	KX080	Time Started	10:10
		Capacity	0.3 yd^3	Reach	15.1 ft.	Time Completed	11:15

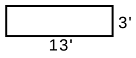
Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulder Count/ Class	Note No.
0	Brown, fine to coarse SAND and fine to coarse GRAVEL, some Silt, trace Trash, Clay Pipe, Brick (FILL) 1.5'			E	5-10%/A	
1'	Light brown, fine to coarse SAND, some Silt, little fine to coarse Gravel, trace Brick (FILL) 3.5'			E	5-10%/A	1
2'				E	10%/A	
3'	Brown, fine to coarse SAND, some Silt, little fine to coarse Gravel (FILL) 7.4'	S-1		E	10%/A	
4'				E	10-15%/A	
5'				E	10-15%/A	
6'				E	10%/A	
7'	Light brown, fine to coarse SAND, some fine to coarse Gravel, little Silt 11'	S-2		E	10%/A	
8'				E	10%/A	
9'				E	10%/A	
10'				E	10%/A	
11'	WEATHERED ROCK Bottom of exploration at 11.4 feet			M	10%/A	2
12'						
13'						
14'						
15'						
16'						

Notes:

1) Metal pipe encountered at approximately 1 foot below grade.

2) Groundwater observed to infiltrate test pit at approximately 11 feet below grade.

Test Pit Plan



Volume = ________ cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" +

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

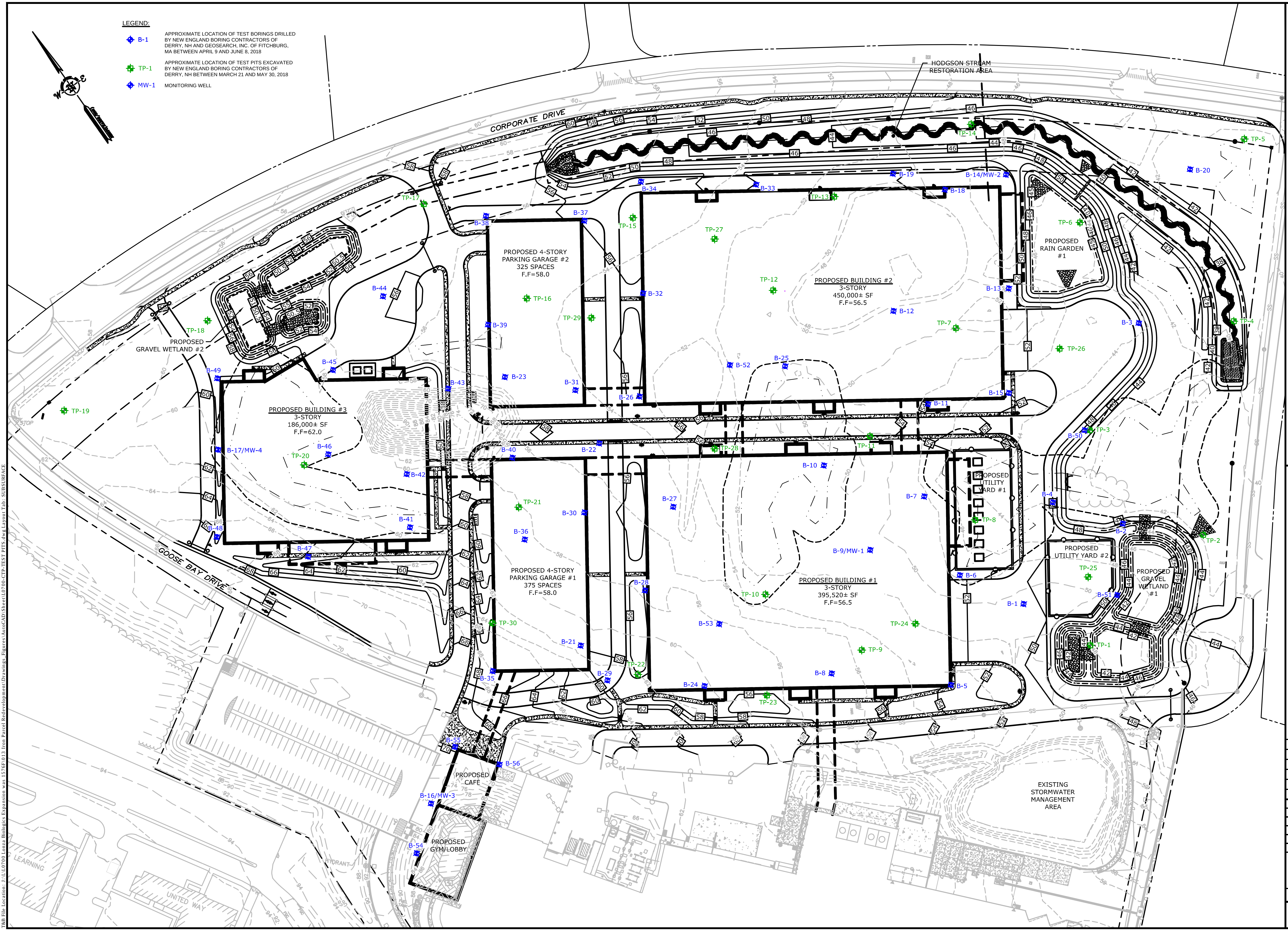
TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
(   ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water
0.25	11'

J:\L\L0700 Lonza Biologics Expansion was 1576F\013 Iron Parcel Redevelopment\Geo-Environmental\Explorations\[Test Pit Logs.xls]TP-18



Tighe&Bond
Engineers | Environmental Specialists

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

July 19, 2018

MARK	DATE	DESCRIPTION

PROJECT NO: L-0700-13
DATE: 07/19/2018
FILE: L0700-CTP-TEST PITS.dwg
DRAWN BY: BJL
CHECKED: DRB
APPROVED: DRB

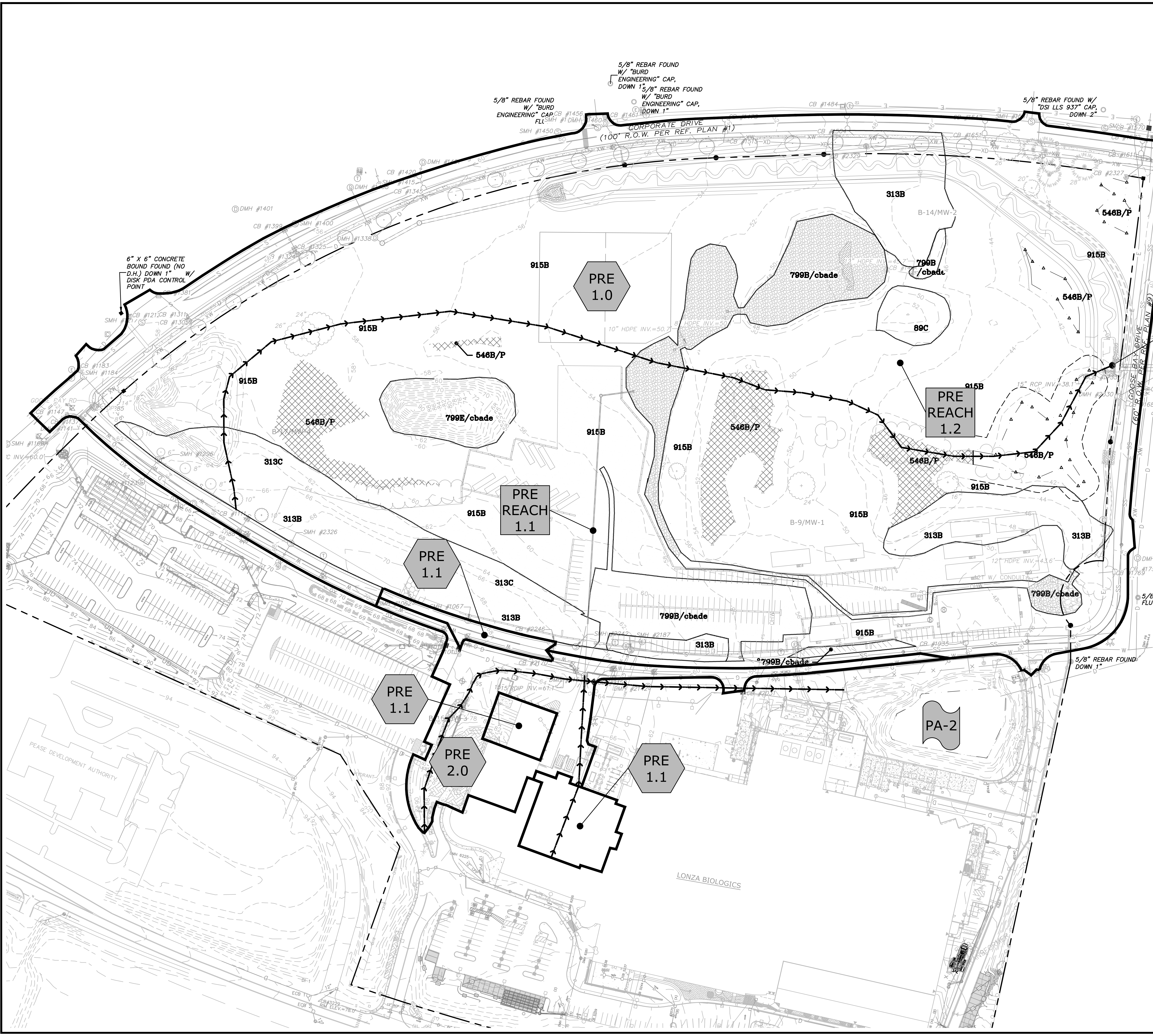
SUBSURFACE EXPLORATION PLAN

SCALE: AS SHOWN

FIGURE 2

Last Save Date: August 2, 2018 3:22 PM By: BJL
Plot Date: Tuesday, August 21, 2018 Plotted By: Neil A. Hansen
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\013 Iron Parcel Redevelopment\Drawings_Figures\AutoCAD\Sheet\L0700-CTP-TEST PITS.dwg Layout Tab: SUBSURFACE

APPENDIX D



LEGEND

▬	PRE-DEVELOPMENT WATERSHED BOUNDARY
—	SOIL SURVEY BOUNDARIES
→→→	LONGEST FLOW PATH
PRE 1.0	PRE-DEVELOPMENT WATERSHED AREA DESIGNATION
PRE POND 1	PRE-DEVELOPMENT POND DESIGNATION
PA-1	POINT OF ANALYSIS
PRE REACH 1	PRE-DEVELOPMENT REACH DESIGNATION

SCALE IN FEET
0 80' 160'
GRAPHIC SCALE

NOTES:

1. SOIL SURVEY WAS PERFORMED BY GOVE ENVIRONMENTAL SERVICES.

SOIL IDENTIFICATION LEGEND

SYMBOL	SOIL TAXONOMIC NAME, SLOPE RATING
89C	CHATFIELD, 8 TO 15 PERCENT SLOPES
313B	DEERFIELD, 0 TO 8 PERCENT SLOPES
313C	DEERFIELD, 8 TO 15 PERCENT SLOPES
915B	DEERFIELD VARIANT, 0 TO 8 PERCENT SLOPES
546B/P	WALPOLE POORLY DRAINED, 0 TO 8 PERCENT SLOPES
799B	UDORTHENTS URBAN LAND, 0 TO 8 PERCENT SLOPES
799E	UDORTHENTS URBAN LAND, >25 PERCENT SLOPES

Tighe&Bond

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
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

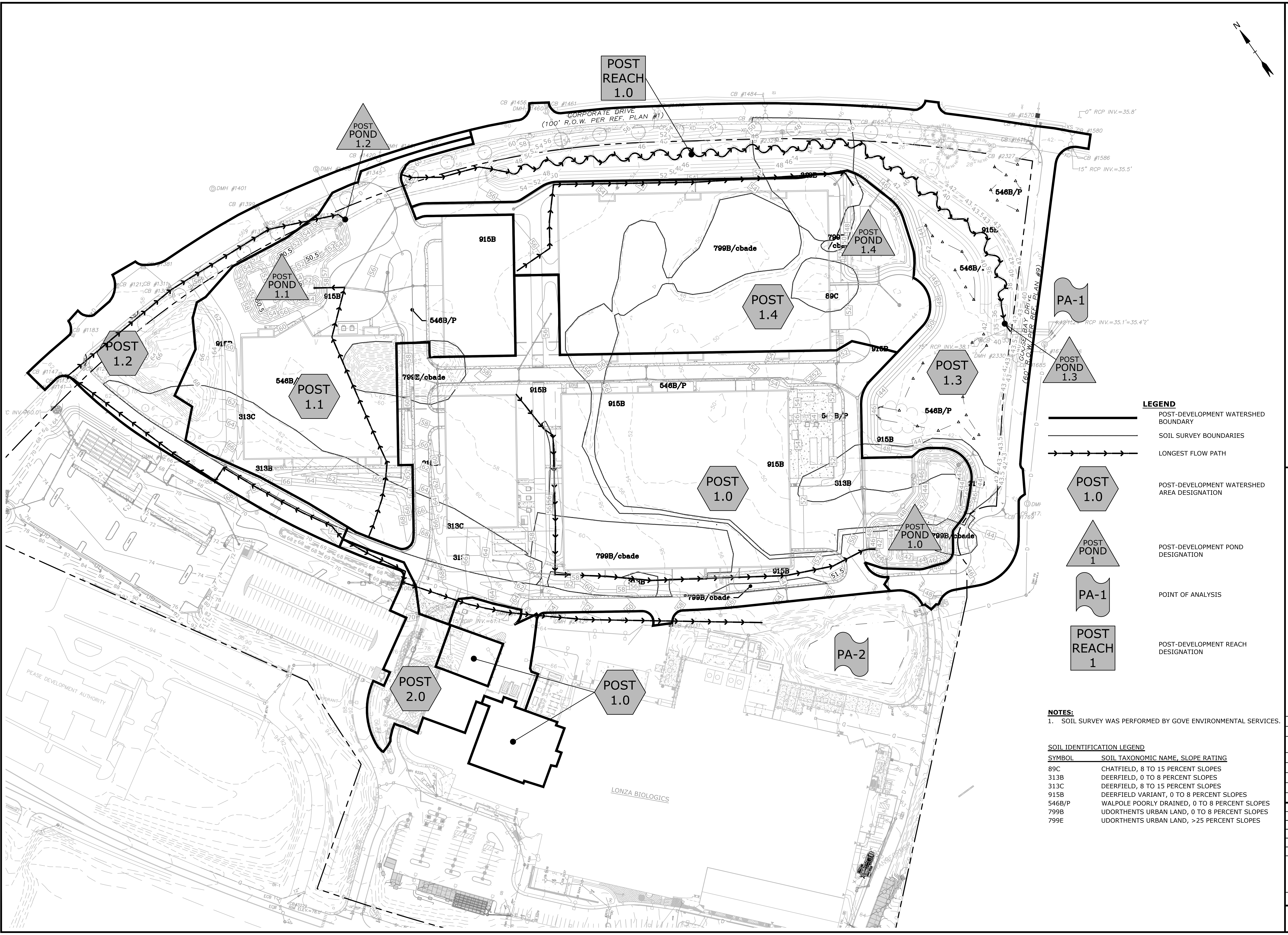
PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

PRE-DEVELOPMENT WATERSHED AREA PLAN

SCALE: AS SHOWN

C-801

Last Save Date: July 13, 2023 3:42 PM By: CKRZCUIK
Plot Date: Thursday, July 13, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-801



LEGEND

▬	POST-DEVELOPMENT WATERSHED BOUNDARY
┈	SOIL SURVEY BOUNDARIES
→→→	LONGEST FLOW PATH
POST 1.0	POST-DEVELOPMENT WATERSHED AREA DESIGNATION
POST POND 1	POST-DEVELOPMENT POND DESIGNATION
PA-1	POINT OF ANALYSIS
POST REACH 1	POST-DEVELOPMENT REACH DESIGNATION

NOTES:

1. SOIL SURVEY WAS PERFORMED BY GOVE ENVIRONMENTAL SERVICES.

SOIL IDENTIFICATION LEGEND

SYMBOL	SOIL TAXONOMIC NAME, SLOPE RATING
89C	CHATFIELD, 8 TO 15 PERCENT SLOPES
313B	DEERFIELD, 0 TO 8 PERCENT SLOPES
313C	DEERFIELD, 8 TO 15 PERCENT SLOPES
915B	DEERFIELD VARIANT, 0 TO 8 PERCENT SLOPES
546B/P	WALPOLE POORLY DRAINED, 0 TO 8 PERCENT SLOPES
799B	UDORTHENTS URBAN LAND, 0 TO 8 PERCENT SLOPES
799E	UDORTHENTS URBAN LAND, >25 PERCENT SLOPES

Last Save Date: July 13, 2023 3:42 PM By: CKRZCUIK
Plot Date: Thursday, July 13, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-802

Tighe&Bond

SCALE IN FEET
0 80' 160'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

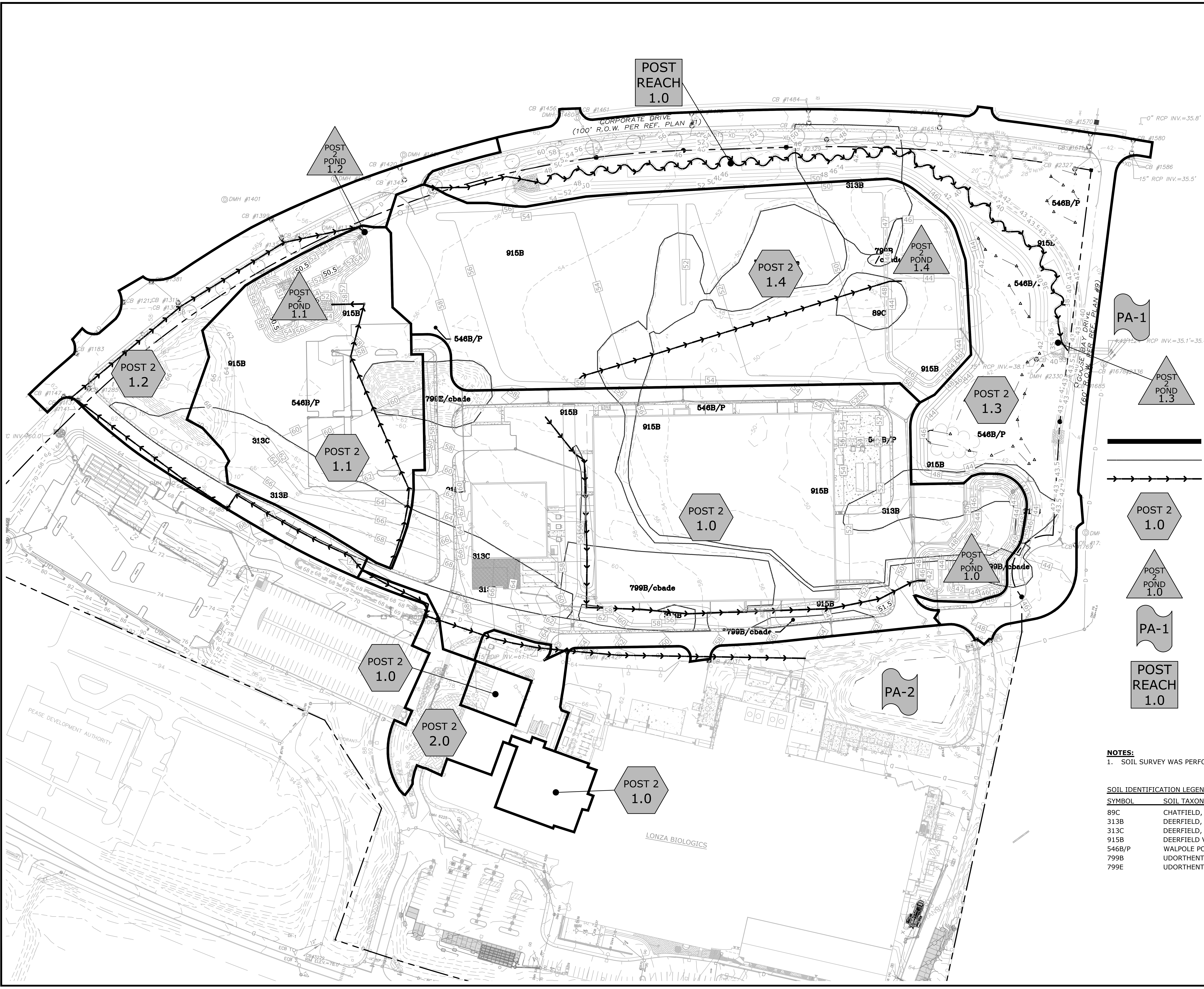
MARK	DATE	DESCRIPTION
L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
I	1/9/2023	Admin. Approval Submission
H	12/10/2021	Planning Board Stipulation
G	8/19/2019	Admin. Approval Submission
F	11/6/2018	P.B. Submission

PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

POST-DEVELOPMENT
WATERSHED AREA PLAN

SCALE: AS SHOWN

C-802



LEGEND

▬	POST-DEVELOPMENT WATERSHED BOUNDARY
┈	SOIL SURVEY BOUNDARIES
→→→	LONGEST FLOW PATH
POST 2 1.0	POST-DEVELOPMENT WATERSHED AREA DESIGNATION
POST 2 POND 1.0	POST-DEVELOPMENT POND DESIGNATION
PA-1	POINT OF ANALYSIS
POST REACH 1.0	POST-DEVELOPMENT REACH DESIGNATION

NOTES:

1. SOIL SURVEY WAS PERFORMED BY GOVE ENVIRONMENTAL SERVICES.

SOIL IDENTIFICATION LEGEND

SYMBOL	SOIL TAXONOMIC NAME, SLOPE RATING
89C	CHATFIELD, 8 TO 15 PERCENT SLOPES
313B	DEERFIELD, 0 TO 8 PERCENT SLOPES
313C	DEERFIELD, 8 TO 15 PERCENT SLOPES
915B	DEERFIELD VARIANT, 0 TO 8 PERCENT SLOPES
546B/P	WALPOLE POORLY DRAINED, 0 TO 8 PERCENT SLOPES
799B	UDORTHENTS URBAN LAND, 0 TO 8 PERCENT SLOPES
799E	UDORTHENTS URBAN LAND, >25 PERCENT SLOPES

Tighe&Bond

SCALE IN FEET
0 80' 160'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
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

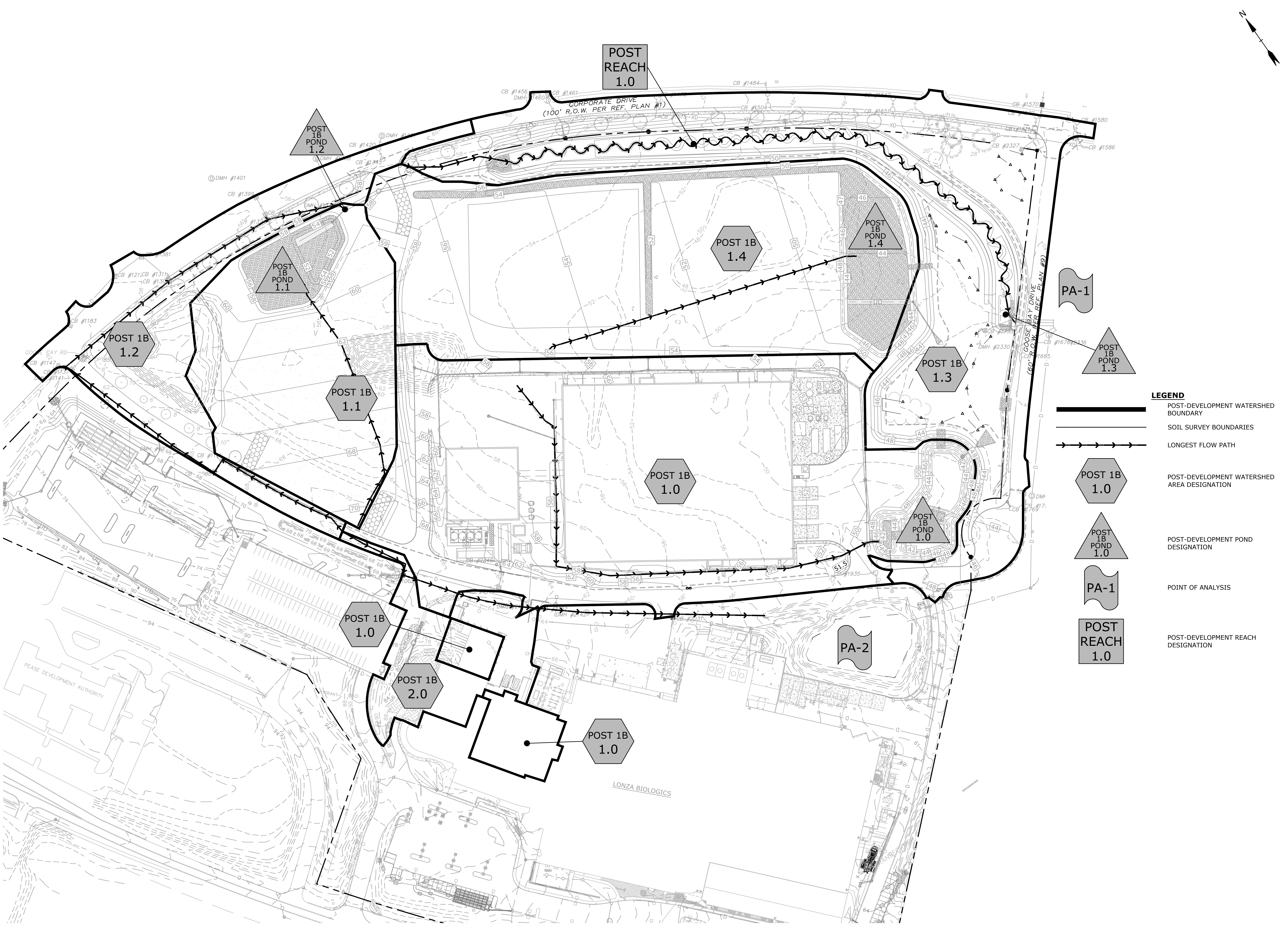
PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

PHASE 2
POST-DEVELOPMENT
WATERSHED AREA PLAN

SCALE: AS SHOWN

C-802 A

Last Save Date: July 13, 2023 3:42 PM By: CKRZCUIK
Plot Date: Thursday, July 13, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-802 A



Tighe&Bond

SCALE IN FEET
0 80' 160'
GRAPHIC SCALE

Proposed Industrial Development

Lonza Biologics

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
M	9/27/2023	P.B. Submission
L	7/17/2023	Amended Site Plan Review
K	5/5/2023	Phase 1B Issued for Bid
J	3/15/2023	Phase 1B Issued for Preliminary Pricing
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

PROJECT NO: L-0700-013
DATE: 04/03/2018
FILE: L-0700-026-C-DSGN.dwg
DRAWN BY: CJK
CHECKED: NAH
APPROVED: PMC

PHASE 1B
POST-DEVELOPMENT
WATERSHED AREA PLAN

SCALE: AS SHOWN

C-802 B

Last Save Date: September 27, 2023 10:50 AM By: CKRZCUIK
Plot Date: Wednesday, September 27, 2023 Plotted By: Colter Krzcuik
T&B File Location: J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-802 B

APPENDIX E

GRAVEL WETLAND DESIGN CRITERIA
(Env-Wq 1508.05)

Type/Node Name: **Gravel Wetland 1 (POND 1.0)**

Enter the node name in the drainage analysis if applicable.

10.62	ac	A = Area draining to the practice	
7.66	ac	A_I = Impervious area draining to the practice	
0.72	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.70	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
7.43	ac-in	WQV= 1” x Rv x A	
26,953	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	
2,695	cf	10% x WQV (check calc for sediment forebay)	
12,129	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
3,205	cf	V_{SED} = Sediment forebay volume	**$\geq$ 10%WQV**
14,269	cf	V_{TB1} = Volume of treatment bay 1 [1]	**$\geq$ 45%WQV**
20,912	cf	V_{TB2} = Volume of treatment bay 2 [1]	**$\geq$ 45%WQV**
0.62	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec) [2]	
44.23	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.53	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{avg}$**
28.25	hours	T_{ED} = Drawdown time of extended detention = $2WQV/Q_{WQV}$	**$\geq$ 24-hrs**
3.00	:1	Pond side slopes	**$\geq$ 3:1**
39.50	ft	Elevation of SHWT	
37.50	ft	SHWT - 2 feet	
41.35	ft	Epp = Elevation of the permanent pool (elevation of lowest orifice) [3]	**$\leq E_{SHWT}$ - 2 ft**
85.00	ft	Length of the flow path between the inlet and outlet in each cell	**$\geq$ 15 ft**
Trash Rack		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of $\leq$6”)?	
47.48	ft	Peak elevation of the 50-year storm event (E_{50})	
48.00	ft	Berm elevation of the pond	
YES		$E_{50} \leq$ the berm elevation?	**← yes**

Qualified professional that developed the planting plan

Name, Profession:

1. Volume stored above the wetland soil and below the high flow by-pass.
2. To ensure orifice is sized so that WQV is released at a relatively stable rate.
3. 4" to 8" below the wetland soil. If lowest orifice is higher than (SHWT - 2 feet), and saturated hydraulic conductivity (Ksat) is greater than 0.015 in/hr, the system must be lined.

Designer's Notes:

Stage-Area-Storage for Pond POND 1.0: GRAVEL WETLAND 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
39.05	9,855	0
39.15	9,855	296
39.25	9,855	591
39.35	9,855	887
39.45	9,855	1,183
39.55	9,855	1,478
39.65	9,855	1,774
39.75	9,855	2,070
39.85	9,855	2,365
39.95	9,855	2,661
40.05	9,855	2,957
40.15	9,855	3,252
40.25	9,855	3,548
40.35	9,855	3,843
40.45	9,855	4,139
40.55	9,855	4,435
40.65	9,855	4,730
40.75	9,855	5,026
40.85	9,855	5,322
40.95	9,855	5,617
41.05	9,855	5,913
41.15	9,855	6,209
41.25	9,855	6,504
41.35	9,855	6,800
41.45	9,855	7,243
41.55	9,855	7,687
41.65	9,855	8,130
41.75	9,855	8,574
41.85	9,855	9,017
41.95	9,855	9,461
42.05	9,959	10,178
42.15	10,168	11,184
42.25	10,377	12,212
42.35	10,586	13,260
42.45	10,795	14,329
42.55	11,003	15,419
42.65	11,212	16,529
42.75	11,421	17,661
42.85	11,630	18,814
42.95	11,839	19,987
43.05	12,056	21,182
43.15	12,282	22,398
43.25	12,508	23,638
43.35	12,734	24,900
43.45	12,960	26,185
43.55	13,185	27,492
43.65	13,411	28,822
43.75	13,637	30,174
43.85	13,863	31,549
43.95	14,089	32,947
44.05	14,336	34,367
44.15	14,605	35,815
44.25	14,874	37,289
44.35	15,143	38,789
44.45	15,412	40,317
44.55	15,681	41,872
44.65	15,950	43,453
44.75	16,219	45,062
44.85	16,488	46,697
44.95	16,757	48,359
45.05	17,034	50,049
45.15	17,320	51,766
45.25	17,606	53,513
45.35	17,892	55,288
45.45	18,178	57,091
45.55	18,465	58,923
45.65	18,751	60,784
45.75	19,037	62,673
45.85	19,323	64,591
45.95	19,609	66,538
46.05	19,848	68,512
46.15	20,039	70,506
46.25	20,231	72,520
46.35	20,423	74,553
46.45	20,614	76,604
46.55	20,806	78,675
46.65	20,997	80,766
46.75	21,189	82,875
46.85	21,381	85,003
46.95	21,572	87,151
47.05	21,762	89,318
47.15	21,951	91,503
47.25	22,140	93,708
47.35	22,329	95,932
47.45	22,518	98,174
47.55	22,707	100,435
47.65	22,896	102,715
47.75	23,085	105,014
47.85	23,274	107,332
47.95	**23,463**	**109,669**

Stage-Discharge for Pond POND 1.0: GRAVEL WETLAND 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
39.05	0.00	0.00	0.00
39.15	0.00	0.00	0.00
39.25	0.00	0.00	0.00
39.35	0.00	0.00	0.00
39.45	0.00	0.00	0.00
39.55	0.00	0.00	0.00
39.65	0.00	0.00	0.00
39.75	0.00	0.00	0.00
39.85	0.00	0.00	0.00
39.95	0.00	0.00	0.00
40.05	0.00	0.00	0.00
40.15	0.00	0.00	0.00
40.25	0.00	0.00	0.00
40.35	0.00	0.00	0.00
40.45	0.00	0.00	0.00
40.55	0.00	0.00	0.00
40.65	0.00	0.00	0.00
40.75	0.00	0.00	0.00
40.85	0.00	0.00	0.00
40.95	0.00	0.00	0.00
41.05	0.00	0.00	0.00
41.15	0.00	0.00	0.00
41.25	0.00	0.00	0.00
41.35	0.00	0.00	0.00
41.45	0.02	0.02	0.00
41.55	0.07	0.07	0.00
41.65	0.13	0.13	0.00
41.75	0.16	0.16	0.00
41.85	0.19	0.19	0.00
41.95	0.22	0.22	0.00
42.05	0.24	0.24	0.00
42.15	0.26	0.26	0.00
42.25	0.28	0.28	0.00
42.35	0.30	0.30	0.00
42.45	0.31	0.31	0.00
42.55	0.33	0.33	0.00
42.65	0.35	0.35	0.00
42.75	0.36	0.36	0.00
42.85	0.37	0.37	0.00
42.95	0.39	0.39	0.00
43.05	0.40	0.40	0.00
43.15	0.41	0.41	0.00
43.25	0.43	0.43	0.00
43.35	0.44	0.44	0.00
43.45	0.45	0.45	0.00
43.55	0.46	0.46	0.00
43.65	0.47	0.47	0.00
43.75	0.48	0.48	0.00
43.85	0.49	0.49	0.00
43.95	0.50	0.50	0.00
44.05	0.51	0.51	0.00
44.15	0.52	0.52	0.00
44.25	0.53	0.53	0.00
44.35	0.54	0.54	0.00
44.45	0.55	0.55	0.00
44.55	0.56	0.56	0.00
44.65	0.57	0.57	0.00
44.75	0.58	0.58	0.00
44.85	0.59	0.59	0.00
44.95	0.60	0.60	0.00
45.05	0.61	0.61	0.00
45.15	0.66	0.66	0.00
45.25	0.71	0.71	0.00
45.35	0.74	0.74	0.00
45.45	0.77	0.77	0.00
45.55	0.80	0.80	0.00
45.65	0.83	0.83	0.00
45.75	0.85	0.85	0.00
45.85	0.87	0.87	0.00
45.95	0.89	0.89	0.00
46.05	1.02	1.02	0.00
46.15	1.50	1.50	0.00
46.25	2.17	2.17	0.00
46.35	2.98	2.98	0.00
46.45	3.90	3.90	0.00
46.55	5.28	4.83	0.45
46.65	7.86	5.53	2.34
46.75	11.16	6.13	5.03
46.85	15.04	6.66	8.37
46.95	19.39	7.16	12.23
47.05	29.31	12.79	16.52
47.15	40.23	19.12	21.11
47.25	45.18	19.31	25.87
47.35	50.50	19.50	31.00
47.45	56.24	19.68	36.56
47.55	62.35	19.86	42.49
47.65	68.84	20.05	48.79
47.75	75.57	20.23	55.34
47.85	82.52	20.40	62.11
47.95	**89.66**	**20.58**	**69.08**

GRAVEL WETLAND DESIGN CRITERIA
(Env-Wq 1508.05)

Type/Node Name: **Gravel Wetland 2 (POND 1.1)**

Enter the node name in the drainage analysis if applicable.

5.57	ac	A = Area draining to the practice	
3.27	ac	A_I = Impervious area draining to the practice	
0.59	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.58	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
3.22	ac-in	WQV= 1” x Rv x A	
11,694	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	
1,169	cf	10% x WQV (check calc for sediment forebay)	
5,262	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
3,510	cf	V_{SED} = Sediment forebay volume	**$\geq$ 10%WQV**
11,448	cf	V_{TB1} = Volume of treatment bay 1 [1]	**$\geq$ 45%WQV**
17,112	cf	V_{TB2} = Volume of treatment bay 2 [1]	**$\geq$ 45%WQV**
0.27	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec) [2]	
52.03	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.13	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**$< 2Q_{avg}$**
49.97	hours	T_{ED} = Drawdown time of extended detention = $2WQV/Q_{WQV}$	**$\geq$ 24-hrs**
3.00	:1	Pond side slopes	**$\geq$ 3:1**
46.00	ft	Elevation of SHWT	
44.00	ft	SHWT - 2 feet	
49.85	ft	Epp = Elevation of the permanent pool (elevation of lowest orifice) [3]	**$\leq E_{SHWT}$ - 2 ft**
105.00	ft	Length of the flow path between the inlet and outlet in each cell	**$\geq$ 15 ft**
Trash Rack		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of $\leq$6”)?	
56.45	ft	Peak elevation of the 50-year storm event (E_{50})	
57.00	ft	Berm elevation of the pond	
YES		$E_{50} \leq$ the berm elevation?	**← yes**

Qualified professional that developed the planting plan

Name, Profession:

1. Volume stored above the wetland soil and below the high flow by-pass.
2. To ensure orifice is sized so that WQV is released at a relatively stable rate.
3. 4" to 8" below the wetland soil. If lowest orifice is higher than (SHWT - 2 feet), and saturated hydraulic conductivity (Ksat) is greater than 0.015 in/hr, the system must be lined.

Designer's Notes:

Stage-Area-Storage for Pond POND 1.1: GRAVEL WETLAND 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
47.55	6,269	0
47.70	6,269	282
47.85	6,269	564
48.00	6,269	846
48.15	6,269	1,128
48.30	6,269	1,411
48.45	6,269	1,693
48.60	6,269	1,975
48.75	6,269	2,257
48.90	6,269	2,539
49.05	6,269	2,821
49.20	6,269	3,103
49.35	6,269	3,385
49.50	6,269	3,667
49.65	6,269	3,949
49.80	6,269	4,232
49.95	6,269	4,608
50.10	6,269	5,031
50.25	6,269	5,454
50.40	6,269	5,877
50.55	6,362	6,475
50.70	6,641	7,450
50.85	6,920	8,467
51.00	7,199	9,526
51.15	7,497	10,629
51.30	7,795	11,775
51.45	8,094	12,967
51.60	8,392	14,204
51.75	8,690	15,485
51.90	8,988	16,811
52.05	9,295	18,181
52.20	9,619	19,600
52.35	9,942	21,067
52.50	10,266	22,583
52.65	10,590	24,147
52.80	10,913	25,759
52.95	11,237	27,421
53.10	11,592	29,132
53.25	11,962	30,899
53.40	12,333	32,721
53.55	12,703	34,598
53.70	13,073	36,532
53.85	13,444	38,520
54.00	13,814	40,565
54.15	14,239	42,669
54.30	14,663	44,836
54.45	15,088	47,068
54.60	15,513	49,363
54.75	15,937	51,722
54.90	16,362	54,144
55.05	16,803	56,630
55.20	17,277	59,186
55.35	17,751	61,814
55.50	18,225	64,512
55.65	18,699	67,281
55.80	19,173	70,121
55.95	19,647	73,033
56.10	19,989	76,009
56.25	20,264	79,028
56.40	20,540	82,088
56.55	20,816	85,190
56.70	21,091	88,333
56.85	21,367	91,517
57.00	21,643	94,743
57.15	21,918	98,010
57.30	22,194	101,318
57.45	22,469	104,668
57.60	22,745	108,059
57.75	23,021	111,492
57.90	**23,296**	**114,965**

Stage-Discharge for Pond POND 1.1: GRAVEL WETLAND 2

Elevation (feet)	Primary (cfs)
47.55	0.00
47.61	0.00
47.67	0.00
47.73	0.00
47.79	0.00
47.85	0.00
47.91	0.00
47.97	0.00
48.03	0.00
48.09	0.00
48.15	0.00
48.21	0.00
48.27	0.00
48.33	0.00
48.39	0.00
48.45	0.00
48.51	0.00
48.57	0.00
48.63	0.00
48.69	0.00
48.75	0.00
48.81	0.00
48.87	0.00
48.93	0.00
48.99	0.00
49.05	0.00
49.11	0.00
49.17	0.00
49.23	0.00
49.29	0.00
49.35	0.00
49.41	0.00
49.47	0.00
49.53	0.00
49.59	0.00
49.65	0.00
49.71	0.00
49.77	0.00
49.83	0.00
49.89	0.00
49.95	0.00
50.01	0.00
50.07	0.00
50.13	0.00
50.19	0.00
50.25	0.00
50.31	0.00
50.37	0.00
50.43	0.00
50.49	0.00
50.55	0.00
50.61	0.03
50.67	0.04
50.73	0.04
50.79	0.05
50.85	0.06
50.91	0.06
50.97	0.07
51.03	0.07
51.09	0.08
51.15	0.08
51.21	0.09
51.27	0.09
51.33	0.09
51.39	0.10
51.45	0.10
51.51	0.10
51.57	0.11
51.63	0.11
51.69	0.11
51.75	0.12
51.81	0.12
51.87	0.12
51.93	0.12
51.99	0.13
52.05	0.13
52.11	0.13
52.17	0.13
52.23	0.14
52.29	0.14
52.35	0.14
52.41	0.14
52.47	0.15
52.53	0.15
52.59	0.15
52.65	0.15
52.71	0.15
52.77	0.16
52.83	0.16
52.89	0.16
52.95	0.16
53.01	0.16
53.07	0.17
53.13	0.17
53.19	0.17
53.25	0.17
53.31	0.17
53.37	0.18
53.43	0.18
53.49	0.18
53.55	0.33
53.61	0.66
53.67	1.09
53.73	1.61
53.79	2.20
53.85	2.85
53.91	3.56
53.97	4.31
54.03	5.11
54.09	5.95
54.15	6.83
54.21	7.75
54.27	8.70
54.33	9.68
54.39	10.70
54.45	11.74
54.51	12.82
54.57	13.91
54.63	15.04
54.69	16.18
54.75	17.35
54.81	18.54
54.87	19.76
54.93	20.99
54.99	22.24
55.05	23.51
55.11	24.79
55.17	26.10
55.23	27.42
55.29	28.75
55.35	30.10
55.41	31.46
55.47	32.51
55.53	32.72
55.59	32.93
55.65	33.14
55.71	33.35
55.77	33.55
55.83	33.76
55.89	33.96
55.95	34.16
56.01	34.36
56.07	34.56
56.13	34.76
56.19	34.96
56.25	35.15
56.31	35.35
56.37	35.54
56.43	35.73
56.49	35.92
56.55	36.11
56.61	36.30
56.67	36.49
56.73	36.68
56.79	36.87
56.85	37.05
56.91	37.24
56.97	37.42
57.03	37.60
57.09	37.79
57.15	37.97
57.21	38.15
57.27	38.33
57.33	38.51
57.39	38.68
57.45	38.86
57.51	39.04
57.57	39.21
57.63	39.39
57.69	39.56
57.75	39.73
57.81	39.91
57.87	40.08
57.93	40.25
57.99	**40.42**

NEW HAMPSHIRE DEPARTMENT OF **Environmental Services**

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Rain Garden 1.0 (POND 1.4)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
4.93	ac	A = Area draining to the practice	
4.19	ac	A_I = Impervious area draining to the practice	
0.85	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.81	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
4.02	ac-in	WQV= 1” x Rv x A	
14,584	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	
3,646	cf	25% x WQV (check calc for sediment forebay volume)	
10,938	cf	75% x WQV (check calc for surface sand filter volume)	
Deep Sump		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**$\geq$ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
10,418	sf	A_{SA} = Surface area of the practice	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
Yes	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
56.0	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**$\leq$ 72-hrs**
Calculate time to drain if system IS underdrained:			
46.31	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.41	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
19.76	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**$\leq$ 72-hrs**
43.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
42.42	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
39.00	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
36.50	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.08	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**$\geq$ 1'**
7.00	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**$\geq$ 1'**
4.50	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**$\geq$ 1'**
49.56	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
50.00	ft	Elevation of the top of the practice	
YES		50 peak elevation $\leq$ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**$\geq$ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	**← yes**
25,499	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	C-509	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	C-509	Note what sheet in the plan set contains the planting plans and surface cover	

If porous pavement is proposed:

		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Stage-Area-Storage for Pond POND 1.4: RAINGARDEN 1.0

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
42.17	10,418	0
42.27	10,418	417
42.37	10,418	833
42.47	10,418	1,250
42.57	10,418	1,667
42.67	10,418	2,084
42.77	10,418	2,500
42.87	10,418	2,917
42.97	10,418	3,334
43.07	10,418	3,750
43.17	10,418	4,167
43.27	10,418	4,584
43.37	10,418	5,001
43.47	10,418	5,417
43.57	10,418	5,615
43.67	10,418	5,719
43.77	10,418	5,824
43.87	10,418	5,928
43.97	10,418	6,032
44.07	10,418	6,136
44.17	10,418	6,240
44.27	10,418	6,345
44.37	10,418	6,449
44.47	10,418	6,553
44.57	10,418	6,657
44.67	10,418	6,761
44.77	10,418	6,865
44.87	10,418	6,970
44.97	10,418	7,074
45.07	10,511	7,838
45.17	10,644	8,895
45.27	10,776	9,966
45.37	10,909	11,051
45.47	11,042	12,148
45.57	11,174	13,259
45.67	11,307	14,383
45.77	11,440	15,520
45.87	11,572	16,671
45.97	11,705	17,835
46.07	11,847	19,012
46.17	11,993	20,204
46.27	12,139	21,411
46.37	12,285	22,632
46.47	12,431	23,868
46.57	12,577	25,118
46.67	12,723	26,383
46.77	12,869	27,663
46.87	13,015	28,957
46.97	13,161	30,266
47.07	13,307	31,589
47.17	13,453	32,927
47.27	13,599	34,280
47.37	13,745	35,647
47.47	13,890	37,029
47.57	14,036	38,425
47.67	14,182	39,836
47.77	14,328	41,261
47.87	14,474	42,702
47.97	14,620	44,156
48.07	14,773	45,626
48.17	14,930	47,111
48.27	15,086	48,612
48.37	15,242	50,128
48.47	15,399	51,660
48.57	15,555	53,208
48.67	15,711	54,771
48.77	15,868	56,350
48.87	16,024	57,945
48.97	16,180	59,555
49.07	16,336	61,181
49.17	16,493	62,822
49.27	16,649	64,479
49.37	16,805	66,152
49.47	16,962	67,840
49.57	17,118	69,544
49.67	17,274	71,264
49.77	17,431	72,999
49.87	17,587	74,750
49.97	**17,743**	**76,517**

Stage-Discharge for Pond POND 1.4: RAINGARDEN 1.0

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
42.17	0.00	0.00	0.00
42.27	0.00	0.00	0.00
42.37	0.00	0.00	0.00
42.47	0.00	0.00	0.00
42.57	0.00	0.00	0.00
42.67	0.00	0.00	0.00
42.77	0.00	0.00	0.00
42.87	0.00	0.00	0.00
42.97	0.00	0.00	0.00
43.07	0.00	0.00	0.00
43.17	0.00	0.00	0.00
43.27	0.00	0.00	0.00
43.37	0.00	0.00	0.00
43.47	0.00	0.00	0.00
43.57	0.00	0.00	0.00
43.67	0.00	0.00	0.00
43.77	0.00	0.00	0.00
43.87	0.00	0.00	0.00
43.97	0.00	0.00	0.00
44.07	0.00	0.00	0.00
44.17	0.00	0.00	0.00
44.27	0.00	0.00	0.00
44.37	0.00	0.00	0.00
44.47	0.00	0.00	0.00
44.57	0.00	0.00	0.00
44.67	0.00	0.00	0.00
44.77	0.00	0.00	0.00
44.87	0.00	0.00	0.00
44.97	0.00	0.00	0.00
45.07	0.02	0.02	0.00
45.17	0.05	0.05	0.00
45.27	0.08	0.08	0.00
45.37	0.11	0.11	0.00
45.47	0.14	0.14	0.00
45.57	0.18	0.18	0.00
45.67	0.21	0.21	0.00
45.77	0.24	0.24	0.00
45.87	0.27	0.27	0.00
45.97	0.30	0.30	0.00
46.07	0.33	0.33	0.00
46.17	0.36	0.36	0.00
46.27	0.40	0.40	0.00
46.37	0.43	0.43	0.00
46.47	0.47	0.47	0.00
46.57	0.50	0.50	0.00
46.67	0.53	0.53	0.00
46.77	0.57	0.57	0.00
46.87	0.60	0.60	0.00
46.97	0.63	0.63	0.00
47.07	0.67	0.67	0.00
47.17	0.74	0.74	0.00
47.27	1.33	1.33	0.00
47.37	2.25	2.25	0.00
47.47	3.41	3.41	0.00
47.57	4.61	4.61	0.00
47.67	5.07	5.07	0.00
47.77	5.49	5.49	0.00
47.87	5.88	5.88	0.00
47.97	6.25	6.25	0.00
48.07	6.60	6.60	0.00
48.17	6.84	6.84	0.00
48.27	6.91	6.91	0.00
48.37	6.97	6.97	0.00
48.47	7.03	7.03	0.00
48.57	7.10	7.10	0.00
48.67	7.16	7.16	0.00
48.77	7.22	7.22	0.00
48.87	7.28	7.28	0.00
48.97	7.34	7.34	0.00
49.07	7.40	7.40	0.00
49.17	7.46	7.46	0.00
49.27	7.52	7.52	0.00
49.37	7.63	7.58	0.05
49.47	8.36	7.64	0.72
49.57	9.48	7.70	1.78
49.67	10.94	7.76	3.19
49.77	12.70	7.81	4.89
49.87	14.80	7.87	6.93
49.97	**17.15**	**7.93**	**9.22**

APPENDIX F

Tighe&Bond
Engineers | Environmental Specialists

Project: Lonza Biologics
Location: Portsmouth, NH
T&B #: L-0700-026
Calculations By: CJK
Checked By: NAH
Date: 6/5/2023

APRON DESIGN

Terms:	HW100	
length of apron (ft.)	L_a	
discharge from pipe (cfs)	Q	(25 YR STORM EVENT)
pipe dia. or channel width (ft.)	Do	
tailwater depth (ft.)	T_w	
width of apron (at outlet)(ft)	W1	
width of apron (downstream)(ft)	W2	
median stone diameter (ft.)	d_{50}	

Equations Used:

Length of Apron (L_a)

when Tw < .5*Do

$$L_a = \frac{1.8(Q)}{Do^{(3/2)}} + 7Do$$

when Tw >= .5*Do

$$L_a = \frac{3(Q)}{Do^{(3/2)}} + 7Do$$

Width of Apron (W1)

$$W1 = 3Do$$

Width of Apron (W2)

when Tw < .5*Do

$$W2 = 3Do + La$$

when Tw >= .5*Do

$$W2 = 3Do + 0.4La$$

Median Diameter

$$d_{50} = \frac{0.02 * Q^{(1.3)}}{(Tw * Do)}$$

Input:		
Q (cfs)	19.23	cfs
Do (ft.)	1.50	ft
T_w (ft.)	0.60	ft

Output:		
Width of Apron (W1)	5	ft.
Width of Apron (W2)	34	ft.
Length of Apron (L_a)	29	ft.
Median Diameter	1.04	ft.
Riprap min. depth	2.33	ft.

Tighe&Bond
Engineers | Environmental Specialists

Project: Lonza Biologics
Location: Portsmouth, NH
T&B #: L-0700-026
Calculations By: CJK
Checked By: NAH
Date: 6/5/2023

APRON DESIGN

Terms:	FES300	
length of apron (ft.)	L_a	
discharge from pipe (cfs)	Q	(25 YR STORM EVENT)
pipe dia. or channel width (ft.)	Do	
tailwater depth (ft.)	T_w	
width of apron (at outlet)(ft)	W1	
width of apron (downstream)(ft)	W2	
median stone diameter (ft.)	d_{50}	

Equations Used:

Length of Apron (L_a)

when Tw < .5*Do $L_a = \frac{1.8(Q)}{Do^{(3/2)}} + 7Do$

when Tw >= .5*Do $L_a = \frac{3(Q)}{Do^{(3/2)}} + 7Do$

Width of Apron (W1)

W1= 3Do

Width of Apron (W2)

when Tw < .5*Do W2= 3Do + La

when Tw >= .5*Do W2= 3Do + 0.4La

Median Diameter $d_{50} = \frac{0.02 * Q^{(1.3)}}{(Tw * Do)}$

Input:		
Q (cfs)	12.67	cfs
Do (ft.)	1.50	ft
T_w (ft.)	0.60	ft

Output:		
Width of Apron (W1)	5	ft.
Width of Apron (W2)	27	ft.
Length of Apron (L_a)	23	ft.
Median Diameter	0.60	ft.
Riprap min. depth	1.36	ft.

Project: Lonza Biologics
Location: Portsmouth, NH
T&B #: L-0700-026
Calculations By: CJK
Checked By: NAH
Date: 6/5/2023

APRON DESIGN

Terms:	FES301	
length of apron (ft.)	L_a	
discharge from pipe (cfs)	Q	(25 YR STORM EVENT)
pipe dia. or channel width (ft.)	Do	
tailwater depth (ft.)	T_w	
width of apron (at outlet)(ft)	W1	
width of apron (downstream)(ft)	W2	
median stone diameter (ft.)	d_{50}	

Equations Used:

Length of Apron (L_a)

when Tw < .5*Do L_a= $$\frac{1.8(Q)}{Do^{(3/2)}} + 7Do$$

when Tw >= .5*Do L_a= $$\frac{3(Q)}{Do^{(3/2)}} + 7Do$$

Width of Apron (W1)

W1= 3Do

Width of Apron (W2)

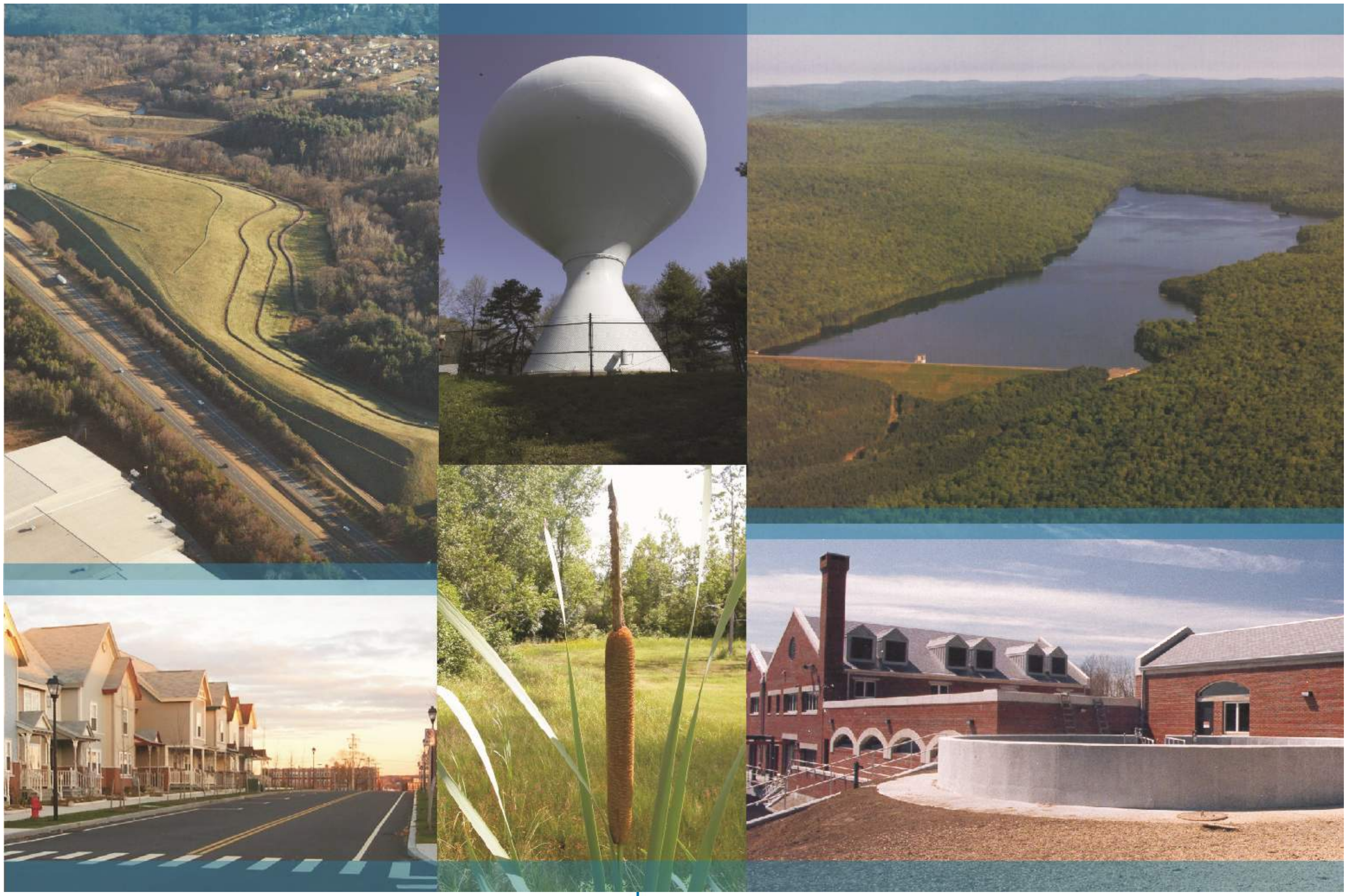
when Tw < .5*Do W2= 3Do + La

when Tw >= .5*Do W2= 3Do + 0.4La

Median Diameter d_{50}= $$\frac{0.02 * Q^{(1.3)}}{(Tw * Do)}$$

Input:		
Q (cfs)	13.54	cfs
Do (ft.)	2.00	ft
T_w (ft.)	0.80	ft

Output:		
Width of Apron (W1)	6	ft.
Width of Apron (W2)	29	ft.
Length of Apron (L_a)	23	ft.
Median Diameter	0.50	ft.
Riprap min. depth	1.13	ft.



Tighe&Bond

Iron Parcel Redevelopment
70 & 80 Corporate Drive
Portsmouth, New Hampshire

Operations & Maintenance Manual

Prepared For:

Lonza Biologics
101 International Drive
Portsmouth, New Hampshire

June 18, 2018
Last Revised: July 17, 2023

Table of Contents

Section 1 Long-Term Operation & Maintenance Plan

Section 2 Chloride Management Plan

Section 3 Invasive Species

Section 4 Annual Updates and Log Requirements

Section 1
Long-Term Operation & Maintenance Plan

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

1.1 Contact/Responsible Party

Lonza Biologics
101 International Drive
Portsmouth, NH 03801

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

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Landscaping
- Catchbasin Cleaning
- Pavement Sweeping
- Gravel Wetland Maintenance
- Rain Garden Maintenance
- Stream Maintenance

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

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

1.3 Overall Site Operation & Maintenance Schedule

Overall Site Operation and Maintenance Schedule

Maintenance Item	Frequency of Maintenance	Operation
Litter/Debris Removal - Trash and debris to be removed including long the full length of the stream.	Weekly	Management Company
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually	Parking Lot Sweeper
Sediment Forebay - Trash and debris to be removed including at check dam. - Embankment to be mowed. - Any required maintenance shall be addressed. - Inspect sediment accumulation and clean as needed.	Periodically (At least two (2) times annually)	Management Company
Gravel wetland - Trash and debris to be removed including at outlet structure. - Embankment to be mowed. - Any required maintenance shall be addressed.	Periodically (At least two (2) times annually)	Management Company
Rain Gardens/Infiltration Basin - Trash and debris to be removed. - Any required maintenance shall be addressed.	Two (2) times annually and after any rainfall event exceeding 2.5” in a 24-hr period	Management Company
Rip Rap Aprons - Trash and debris to be removed. - Any required maintenance shall be addressed.	Annually	Management Company
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually	Vacuum Truck

Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring	Management Company

Sediment Forebay Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor Sediment Accumulation	Annually	- Install and maintain a staff gage or other measuring devise, to indicate depth of sediment accumulation and level at which clean-out is required
Visual inspection	Annually	- Remove trash and debris as needed - Remove any woody vegetation - Inspect and repair embankments - Inspect check dam
Mowing	Periodically (At least two (2) times annually)	- Embankments shall be mowed

Gravel Wetland Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning.	Annually, more frequently in the first year of operation	Repair or replace any damaged structural parts, inlets and outlets. Clear or remove debris or restrictions.
Check for internal erosion, evidence of short circuiting, and animal burrows.	Annually, more frequently in the first year of operation	Soil erosion from short-circuiting or animal boroughs should be repaired when they occur.
Monitor to ensure that Gravel Wetland functions effectively after storms	Four (4) times annually (quarterly) and after any rainfall event exceeding 2.5” in a 24-hr period	- Trash and debris to be removed - Any required maintenance shall be addressed

Inspect Vegetation	Annually	- Inspect the condition of all gravel wetland vegetation -Vegetation should cover >75% of the system and should be reseeded and cared for as needed. - Prune back overgrowth - Replace dead vegetation - Remove any invasive species -Coordinate with UNH Stormwater Center for further vegetation management guidelines
Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance.	Once every 3 years	- The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.
Inspect Drawdown Time - The system shall drawdown between 24 and 48-hours following a rainfall event.	Annually, more frequently in the first year of operation	- Hire qualified professional to assess the condition of the facility to determine measures required to restore the filtration function, including but not limited to removal of accumulated sediments or reconstruction of the filter.

Additional Gravel Wetland Operation and Maintenance Requirements:

- ***1st Year Post-Construction:*** Inspection frequency shall be after every storm in the first year following construction.
- Inspect to be certain system drains within 24 - 48 hours (within the design period, but also not so quickly as to minimize stormwater treatment).
- Watering plants as necessary during the first growing season.
- Re-vegetating poorly established areas as necessary.
- Treating diseased vegetation as necessary.
- Inspect soil and repair eroded areas, especially on slopes, at a minimum quarterly.
- Check inlets, outlets, and overflow spillway for blockage, structural integrity and evidence of erosion.

Cleaning Criteria for Gravel Wetland Treatment Cells: Sediment shall be removed from the gravel wetland surface when it accumulates to a depth of several inches (>10 cm) across the wetland surface. Materials shall be removed with rakes rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment may be used if the equipment is located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments shall be dewatered (if necessary) and disposed of in accordance with all local, state and federal requirements. Removal of vegetation within the gravel wetland shall occur every three (3) growing seasons, or the end of the summer of the third year. This is to prevent decay and release of nutrients from accumulated biomass.

Rain Garden Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor to ensure that Rain Gardens function effectively after storms	Two (2) times annually and after any rainfall event exceeding 2.5” in a 24-hr period	- Trash and debris to be removed - Any required maintenance shall be addressed
Inspect Vegetation	Annually	- Inspect the condition of all Rain Garden vegetation - Prune back overgrowth - Replace dead vegetation - Remove any invasive species
Inspect Drawdown Time - The system shall drawdown within 48-hours following a rainfall event.	Annually	- Assess the condition of the facility to determine measures required to restore the filtration function, including but not limited to removal of accumulated sediments or reconstruction of the filter.

Rip Rap Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Visual Inspection	Annually	- Visually inspect for damage and deterioration - Repair damages immediately

Stream Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Visual Inspection	Annually	- Visually inspect for damage and deterioration - Repair damages immediately
Litter/Debris Removal - Trash and debris to be removed including long	Weekly	Management Company

the full length of the stream.		

Stream Restoration Operation and Maintenance Requirements:

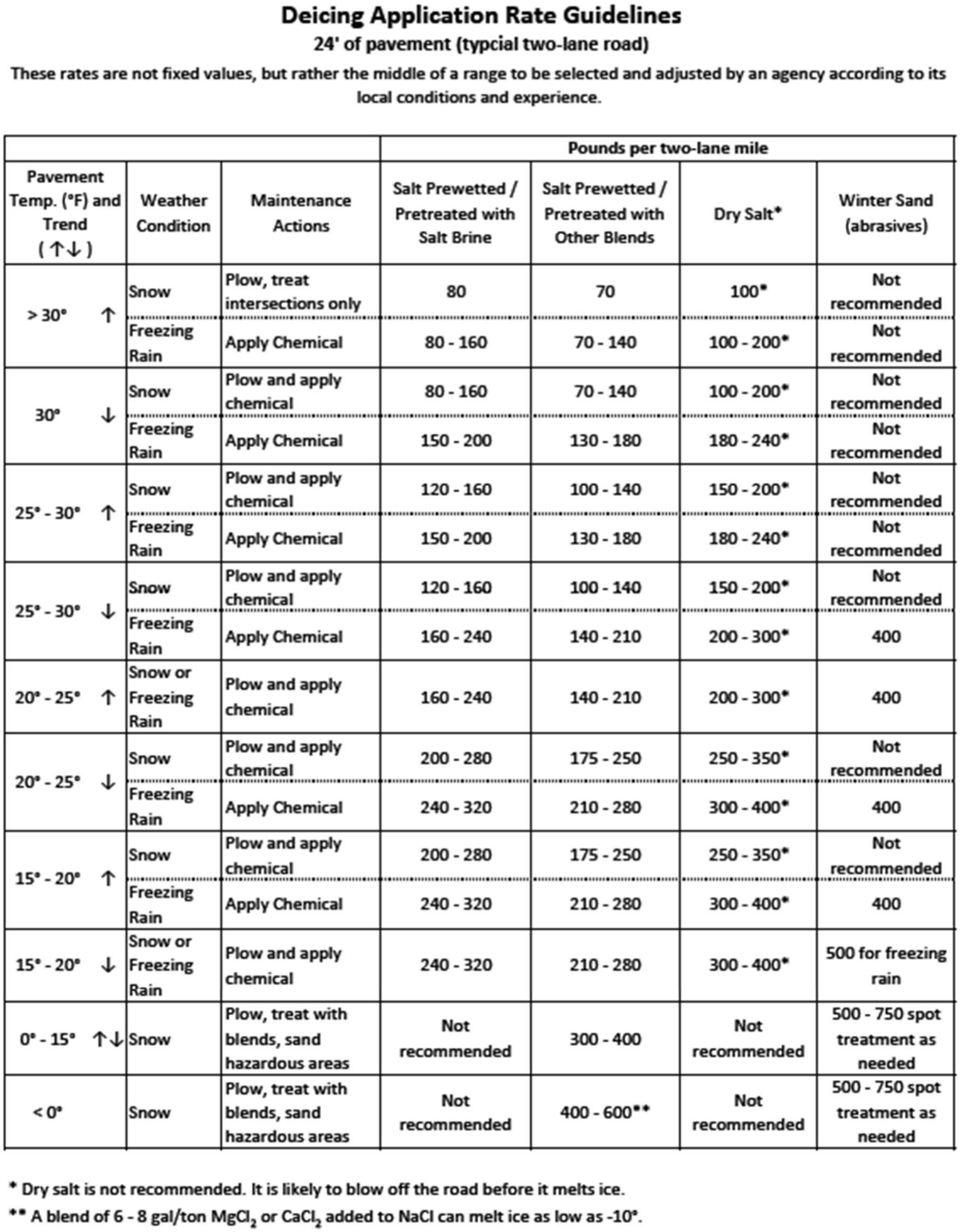
Stream restoration operation and maintenance requirements are detailed in the Stream Restoration report prepared by Streamworks PLLC, and in the NHDES Hodgson Brook Watershed Management Plan.

1.3.1 Disposal Requirements

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

1.4 Snow & Ice Management for Standard Asphalt and Walkways

Snow storage areas shall be located such that no direct untreated discharges are possible to receiving waters from the storage site (snow storage areas have been shown on the Site Plan). Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume 2,).



Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

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

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

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

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

Anti-icing Route Data Form

Truck Station:

Date:

Air Temperature	Pavement Temperature	Relative Humidity	Dew Point	Sky

Reason for applying:

Route:

Chemical:

Application Time:

Application Amount:

Observation (first day):

Observation (after event):

Observation (before next application):

Name:

Section 2
Chloride Management Plan

Winter Operational Guidelines

The following Chloride Management Plan is for the Lonza Biologics – Iron Parcel Redevelopment in Portsmouth, New Hampshire. The Plan includes operational guidelines including: winter operator certification requirements, weather monitoring, equipment calibration requirements, mechanical removal, and salt usage evaluation and monitoring. Due to the evolving nature of chloride management efforts, the Chlorides Management Plan will be reviewed annually, in advance of the winter season, to reflect the current management standards.

2.1 Background Information

The Lonza Biologics – Iron Parcel Redevelopment located within the Upper Hodgson Brook Watershed in Newington and Portsmouth, New Hampshire. The Upper Hodgson Brook is identified as a chloride-impaired waterbody.

2.2 Operational Guidelines – Chloride Management

All Lonza Biologics private contractors engaged at the Lonza Biologics premises for the purposes of winter operational snow removal and surface maintenance, are responsible for assisting in meeting compliance for the following protocols. Lonza Biologics private contractors are expected to minimize the effects of the use of de-icing, anti-icing and pretreatment materials by adhering to the strict guidelines outlined below.

The Lonza Biologics winter operational de-icing, anti-icing and pretreatment materials will adhere to the following protocols:

2.2.1 Winter Operator Certification Requirements

All private contractors engaged at the Lonza Biologics premises for the purpose of winter operational snow removal and surface maintenance must be current UNHT2 Green SnowPro Certified operators or equivalent and will use only pre-approved methods for spreading abrasives on private roadways and parking lots. All private contractors engaged at the Lonza Biologics premises for the purpose of winter operational snow removal and surface maintenance shall provide to Lonza Biologics management two copies of the annual UNHT2 Green SnowPro certificate or equivalent for each operator utilized on the Lonza Biologics premises. The annual UNHT2 Green SnowPro certificate or equivalent for each operator will be available on file in the Lonza Biologics Facilities Management office and be present in the vehicle/carrier at all times.

2.2.2 Improved Weather Monitoring

Lonza Biologics will coordinate weather information for use by winter maintenance contractors. This information in conjunction with site specific air/ground surface temperature monitoring will ensure that private contractors engaged at the Lonza Biologics premises for the purpose of winter operational snow removal and surface maintenance will make more informed decisions as to when and to what extent de-icing, anti-icing and pretreatment materials are applied to private roadways, sidewalks, and parking lots.

2.2.3 Equipment Calibration Requirements

All equipment utilized on the Lonza Biologics premises for the purpose of winter operational snow removal and surface maintenance will conform to the following calibration requirements.

2.2.3.1 Annual Calibration Requirements

All private contractors engaged at the Lonza Biologics premises for the purpose of winter operational snow removal and surface maintenance shall provide two copies of the annual calibration report for each piece of equipment utilized on the Lonza Biologics premises. Each calibration report shall include the vehicle/carrier VIN number and the serial numbers for each component including, but not limited to, spreader control units, salt aggregate spreader equipment, brining/pre-wetting equipment, ground speed orientation unit, and air/ground surface temperature monitor. Annual calibration reports will be available on file in the Lonza Biologics Facilities Management office and be present in the vehicle/carrier at all times.

Prior to each use, each vehicle/carrier operator will perform a systems check to verify that unit settings remain within the guidelines established by the Lonza Biologics Management Team in order to accurately dispense material. All private contractors engaged at the Lonza Biologics premises for the purpose of winter operational snow removal and surface maintenance will be subject to spot inspections by members of the Lonza Biologics Management Team to ensure that each vehicle/carrier is operating in a manner consistent with the guidelines set herein or State and Municipal regulations. All units will be recalibrated, and the updated calibration reports will be provided each time repairs or maintenance procedures affect the hydraulic system of the vehicle/carrier.

2.2.4 Increased Mechanical Removal Capabilities

All private contractors engaged at the Lonza Biologics premises will endeavor to use mechanical removal means on a more frequent basis for roadways, parking lots and sidewalks. Dedicating more manpower and equipment to increase snow removal frequencies prevents the buildup of snow and the corresponding need for de-icing, anti-icing and pretreatment materials. Shortened maintenance routes, with shorter service intervals, will be used to stay ahead of snowfall. Minimized snow and ice packing will reduce the need for abrasives, salt aggregates, and/or brining solution to restore surfaces back to bare surface states after winter precipitation events.

After storm events the Lonza Biologics management team will be responsible for having the streets swept to recapture un-melted de-icing materials, when practical.

2.3 Salt Usage Evaluation and Monitoring

All private contractors engaged at the Lonza Biologics premises for the purpose of winter operational snow removal and surface maintenance shall provide two copies of a storm report, which includes detailed information regarding treatment areas and the use of de-icing, anti- icing and pretreatment materials applied for the removal of snow and surface maintenance on the Lonza Biologics premises. Lonza Biologics will maintain copies of Summary Documents, including copies of the Storm Reports, operator certifications, equipment used for roadway and sidewalk winter maintenance, calibration reports and amount of de-icing materials used.

2.4 Summary

The above-described methodologies are incorporated into the Lonza Biologics Operational Manual and are to be used to qualify and retain all private contractors engaged at the Lonza Biologics premises for the purpose of winter operational snow removal and surface maintenance. This section of the Manual, is intended to be an adaptive management document that is modified as required based on experience gained from past practices and technological advancements that reflect chloride BMP standards. All Lonza Biologics employees directly involved with winter operational activities are required to review this document and the current standard Best Management Practices published by the UNH Technology Transfer (T2) program annually. All Lonza Biologics employees directly involved with winter operational activities, and all private contractors engaged at the Lonza Biologics premises for the purposes of winter operational snow removal and surface maintenance, must be current UNHT2 Green SnowPro Certified operators or equivalent and undergo the necessary requirements to maintain this certification annually.

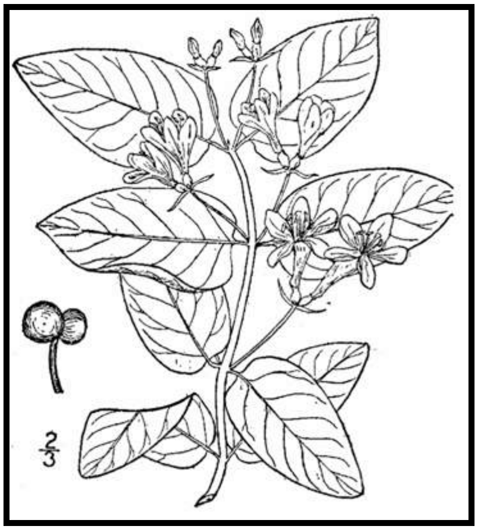
Section 3
Invasive Species

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

UNIVERSITY of NEW HAMPSHIRE
COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

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



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

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

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

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

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

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

New Hampshire Regulations

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

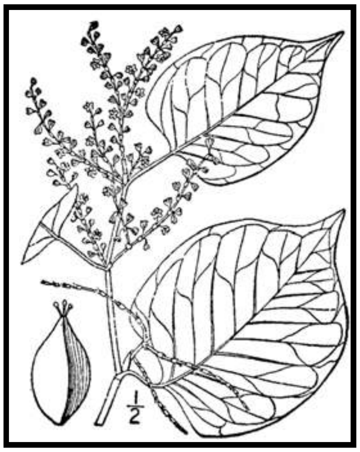
No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.



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

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

Woody Plants	**Method of Reproducing**	**Methods of Disposal**
Norway maple *(Acer platanoides)* European barberry *(Berberis vulgaris)* Japanese barberry *(Berberis thunbergii)* autumn olive *(Elaeagnus umbellata)* burning bush *(Euonymus alatus)* Morrow's honeysuckle *(Lonicera morrowii)* Tatarian honeysuckle *(Lonicera tatarica)* showy bush honeysuckle *(Lonicera x bella)* common buckthorn *(Rhamnus cathartica)* glossy buckthorn *(Frangula alnus)*	**Fruit and Seeds**	**Prior to fruit/seed ripening** Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Use as firewood. ▪ Make a brush pile. ▪ Chip. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip once all fruit has dropped from branches. ▪ Leave resulting chips on site and monitor.
oriental bittersweet *(Celastrus orbiculatus)* multiflora rose *(Rosa multiflora)*	**Fruits, Seeds, Plant Fragments**	**Prior to fruit/seed ripening** Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Make a brush pile. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds** ↕	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
		During and following flowering Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

Managing Invasive Plants

Methods of Control

by Christopher Mattrick

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

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

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

PLAN OF ATTACK

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

Spraying chemicals to control invasive plants.

MECHANICAL CONTROL METHODS

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

Pulling and digging

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

Using tools to remove woody stems.

Volunteers hand pulling invasive plants.

Suffocation

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

Cutting or mowing

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

CHEMICAL CONTROL METHODS

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

Foliar applications

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

Cut stem treatments

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

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

Cut stem treatment tools.

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

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

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

Hollow stem injection tools.

Biological controls—still on the horizon

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

DISPOSAL OF INVASIVE PLANTS

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

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

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

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

Injecting herbicide into the hollow stem of phragmites.

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

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

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

Controlling Invasive Plants in Wetlands

Special concerns; special precautions

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

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

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

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

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

   MA: Consult your local town conservation commission

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

   CT: Consult your local town Inland Wetland and Conservation Commission

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

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

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

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

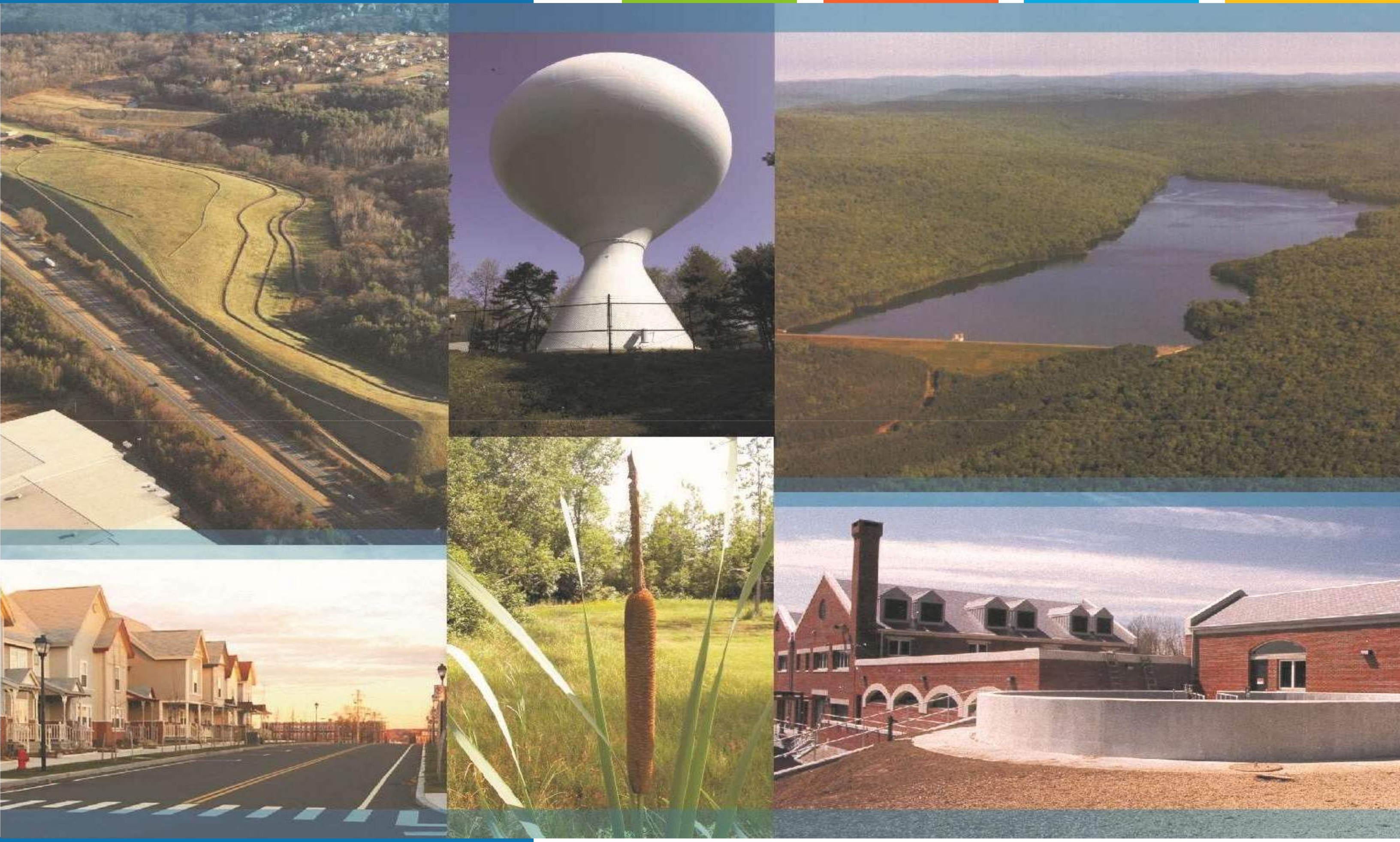
Section 4
Annual Updates and Log Requirements

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

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

Copies of the Stormwater Maintenance report shall be submitted to the Pease Development Authority on an annual basis.

Stormwater Management Report						
Project Name		**Lonza – Iron Parcel**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
			☐Yes ☐No			
			☐Yes ☐No			
			☐Yes ☐No			
			☐Yes ☐No			
			☐Yes ☐No			
			☐Yes ☐No			
			☐Yes ☐No			
			☐Yes ☐No			
			☐Yes ☐No			
			☐Yes ☐No			
			☐Yes ☐No			
			☐Yes ☐No			



Lonza Biologics Industrial Development

TRAFFIC IMPACT ASSESSMENT

Lonza Biologics

June 1, 2023
Last Revised: July 17, 2023

Tighe&Bond

100% Recyclable

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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)																															
Corportate 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

	Lane Use	Weekday Morning Peak Hour															Weekday Afternoon Peak Hour														
		2023 Existing			2025 No Build			2025 Build			2035 No Build			2035 Build			2023 Existing			2025 No Build			2025 Build			2035 No Build			2035 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
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)

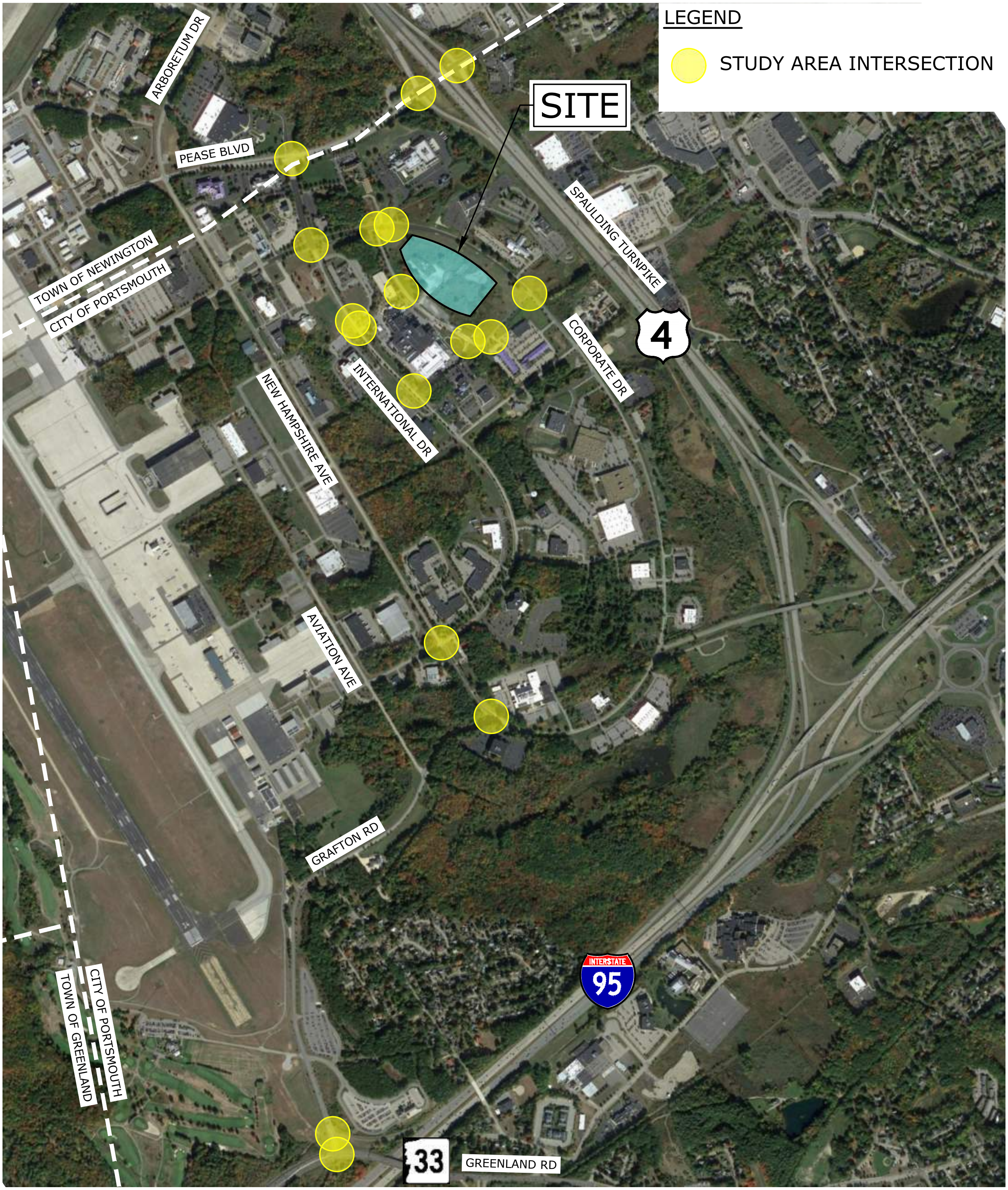
			Weekday Morning Peak Hour										Weekday Afternoon Peak Hour									
	Lane Use	Available Storage	2023 Existing		2025 No Build		2025 Build		2035 No Build		2035 Build		2023 Existing		2025 No Build		2025 Build		2035 No Build		2035 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Pease Boulevard at International Drive																						
Pease Boulevard	EBL	290	2	9	2	9	2	9	2	9	2	9	0	0	0	0	0	0	0	0	0	0
	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
International Drive	NBT	840	7	25	7	25	7	25	9	27	9	27	4	18	4	19	4	18	5	22	5	22
	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																						
Pease Boulevard	EBT	>1000	41	52	45	55	50	61	56	67	61	72	204	225	220	242	236	258	252	274	269	291
	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 Ramps	SBL	520	242	248	248	253	248	253	282	284	282	284	124	172	126	175	126	175	142	194	142	194
	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																						
Pease Boulevard	EBL	375	28	32	29	34	36	42	33	40	39	47	243	293	258	314	282	351	290	365	326	414
	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 Ramps	NBL	360	387	404	401	416	432	444	499	505	530	532	65	99	66	101	67	102	74	111	75	111
	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																						
Greenland Road (State Route 33)	EBL	400	422	632	440	643	454	656	516	705	529	717	205	334	211	341	211	341	239	373	240	374
	EBT	>1000	526	671	552	689	553	689	668	785	670	785	391	497	405	512	405	512	484	591	484	591
	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																						
Corporate Drive	EBL	300	--	--	--	--	--	--	47	97	60	97	--	--	--	--	--	--	59	94	59	94
	EBTR	>1000	--	--	--	--	--	--	36	82	47	82	--	--	--	--	--	--	2	13	2	13
	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
International Drive	NBL	175	--	--	--	--	--	--	5	22	6	22	--	--	--	--	--	--	7	26	8	26
	NBTR	>1000	--	--	--	--	--	--	54	106	70	106	--	--	--	--	--	--	171	275	204	275
	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																						
Corporate Drive	EBL	300	--	23	--	23	--	--	--	--	--	--	--	55	--	57	--	57	--	--	--	--
	EBR	>1000	--	20	--	23	--	23	--	--	--	--	--	5	--	5	--	5	--	--	--	--
	WBL	175	--	3	--	3	--	3	--	--	--	--	--	3	--	3	--	3	--	--	--	--
	WBT	525	--	3	--	3	--	3	--	--	--	--	--	5	--	5	--	5	--	--	--	--
	WBR	675	--	20	--	20	--	40	--	--	--	--	--	735	--	785	--	1165	--	--	--	--
International Drive	NBL	175	--	3	--	3	--	3	--	--	--	--	--	3	--	3	--	3	--	--	--	--
	NBT	>1000	--	18	--	18	--	18	--	--	--	--	--	270	--	285	--	280	--	--	--	--
	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)

	Lane Use	Available Storage	Weekday Morning Peak Hour										Weekday Afternoon Peak Hour									
			2023 Existing		2025 No Build		2025 Build		2035 No Build		2035 Build		2023 Existing		2025 No Build		2025 Build		2035 No Build		2035 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
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

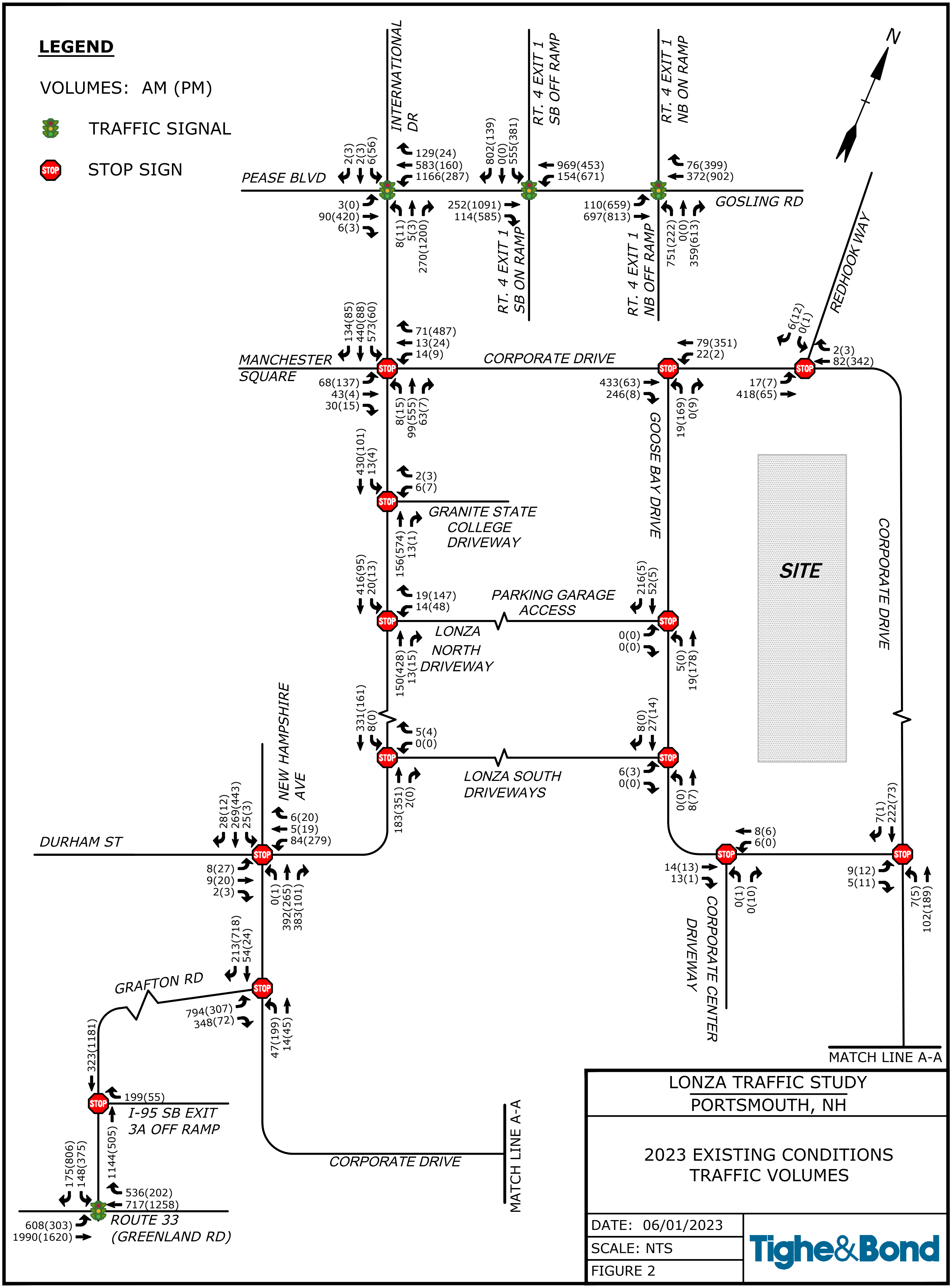
NORTH

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



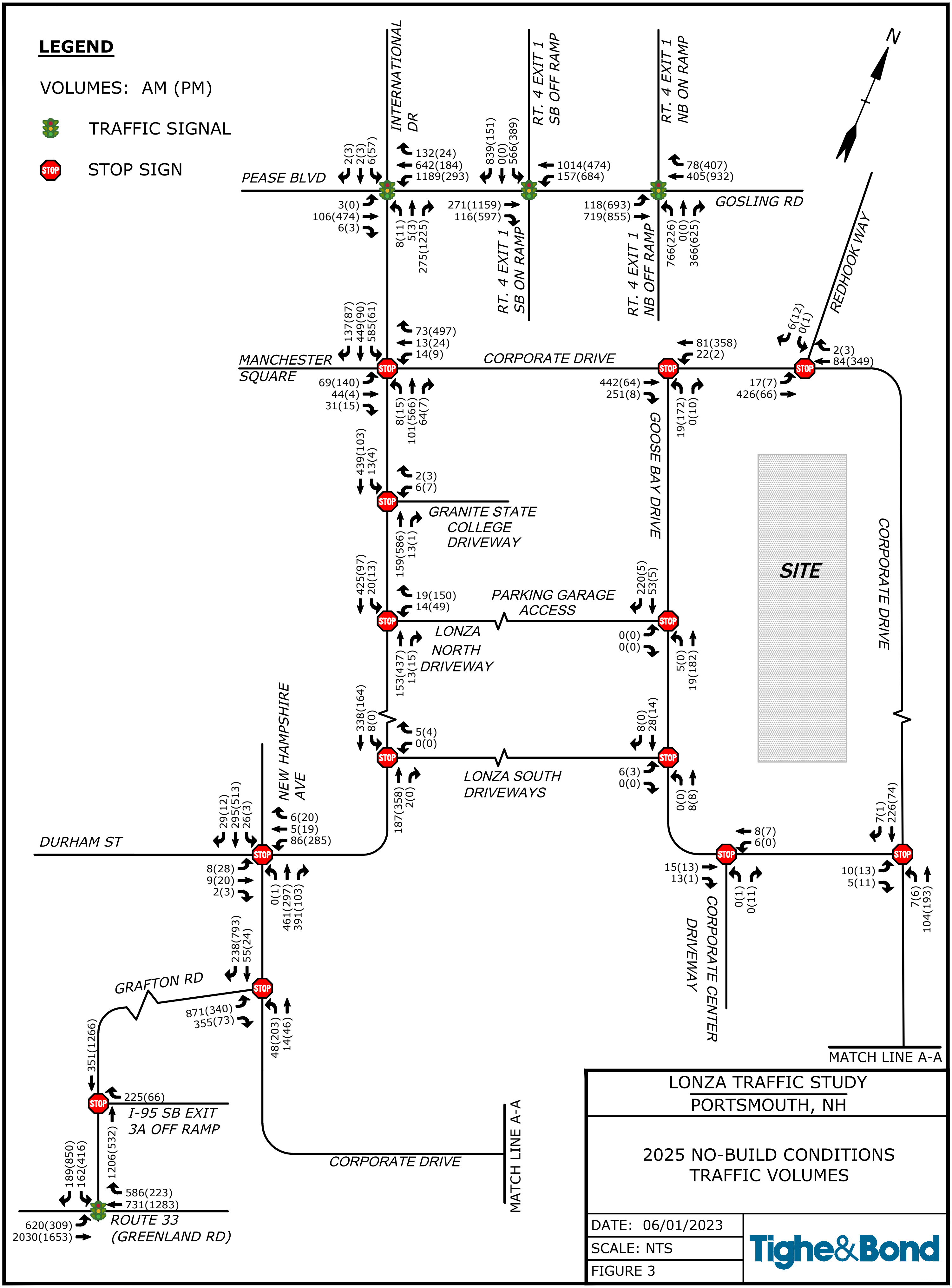
LONZA TRAFFIC STUDY
PORTSMOUTH, NH

2023 EXISTING CONDITIONS
TRAFFIC VOLUMES

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

Tighe&Bond

Jun 01, 2023-10:33am Plotted By: RCase
Tighe & Bond, Inc. J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\Figures\L0700-026 Traffic Volume Figures.dwg



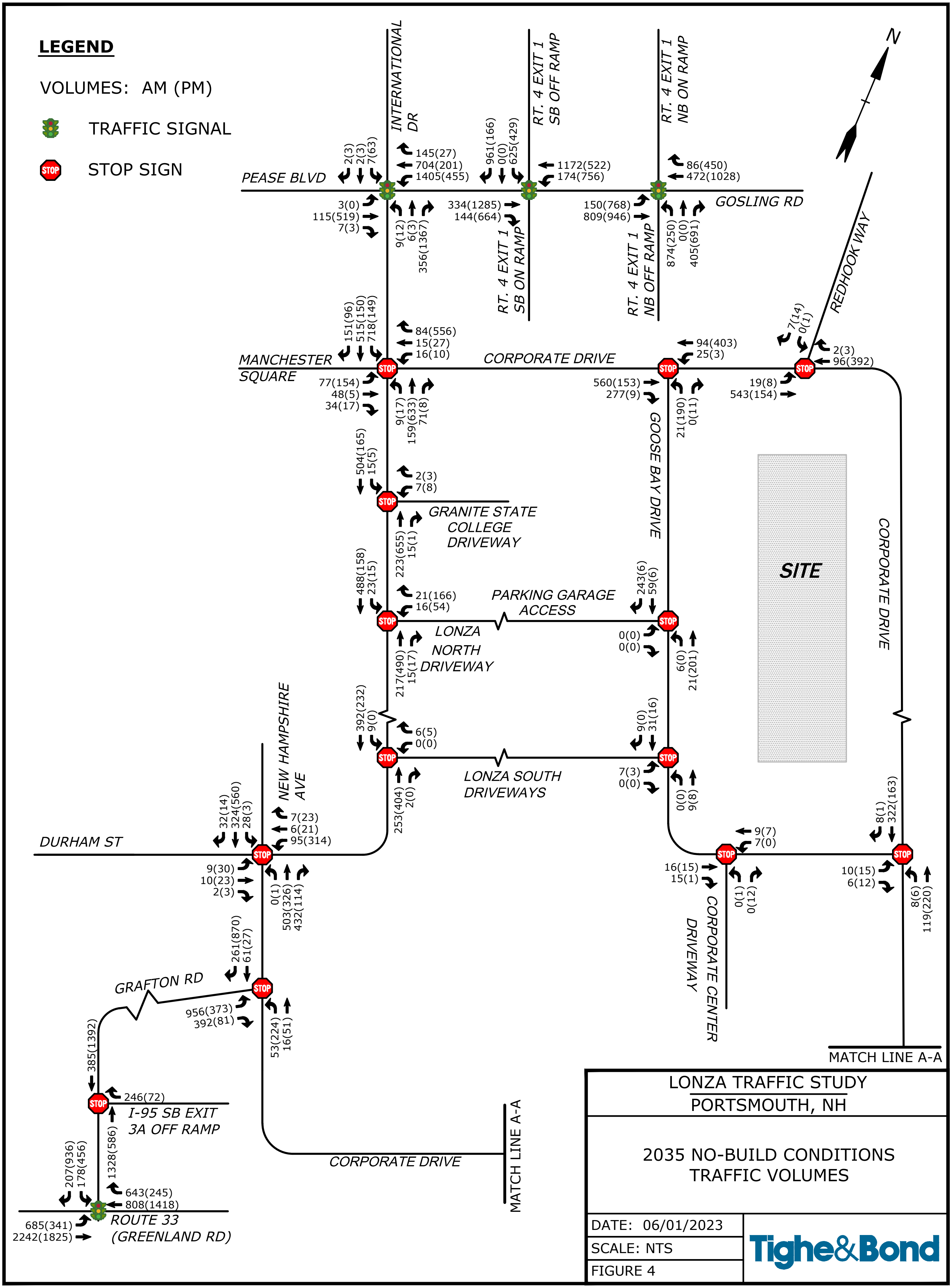
LONZA TRAFFIC STUDY
PORTSMOUTH, NH

2025 NO-BUILD CONDITIONS
TRAFFIC VOLUMES

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

Tighe&Bond

Jun 01, 2023-10:34am Plotted By: RCase
Tighe & Bond, Inc. J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\Figures\L0700-026 Traffic Volume Figures.dwg

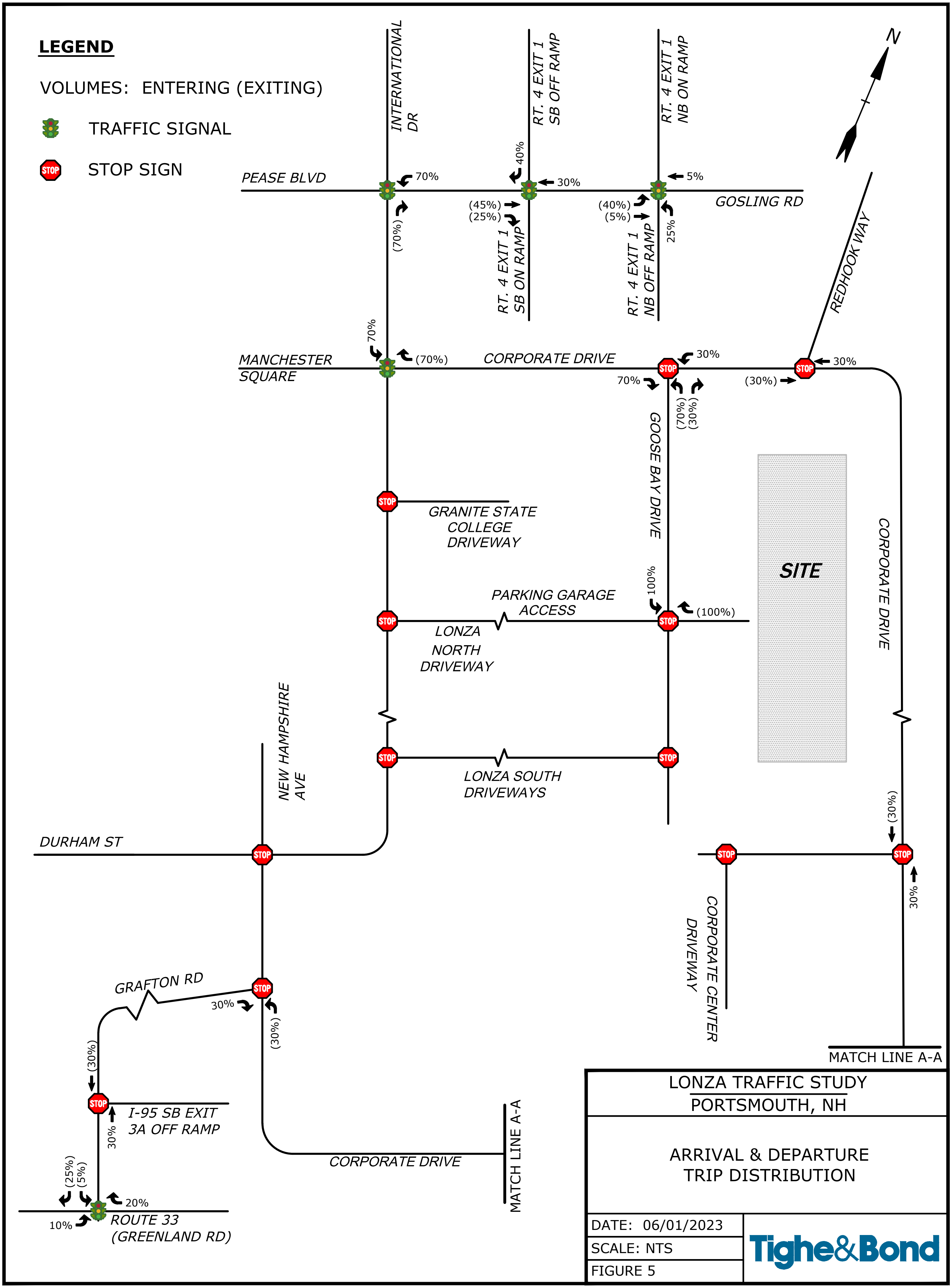


LONZA TRAFFIC STUDY
PORTSMOUTH, NH

2035 NO-BUILD CONDITIONS
TRAFFIC VOLUMES

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

Tighe&Bond



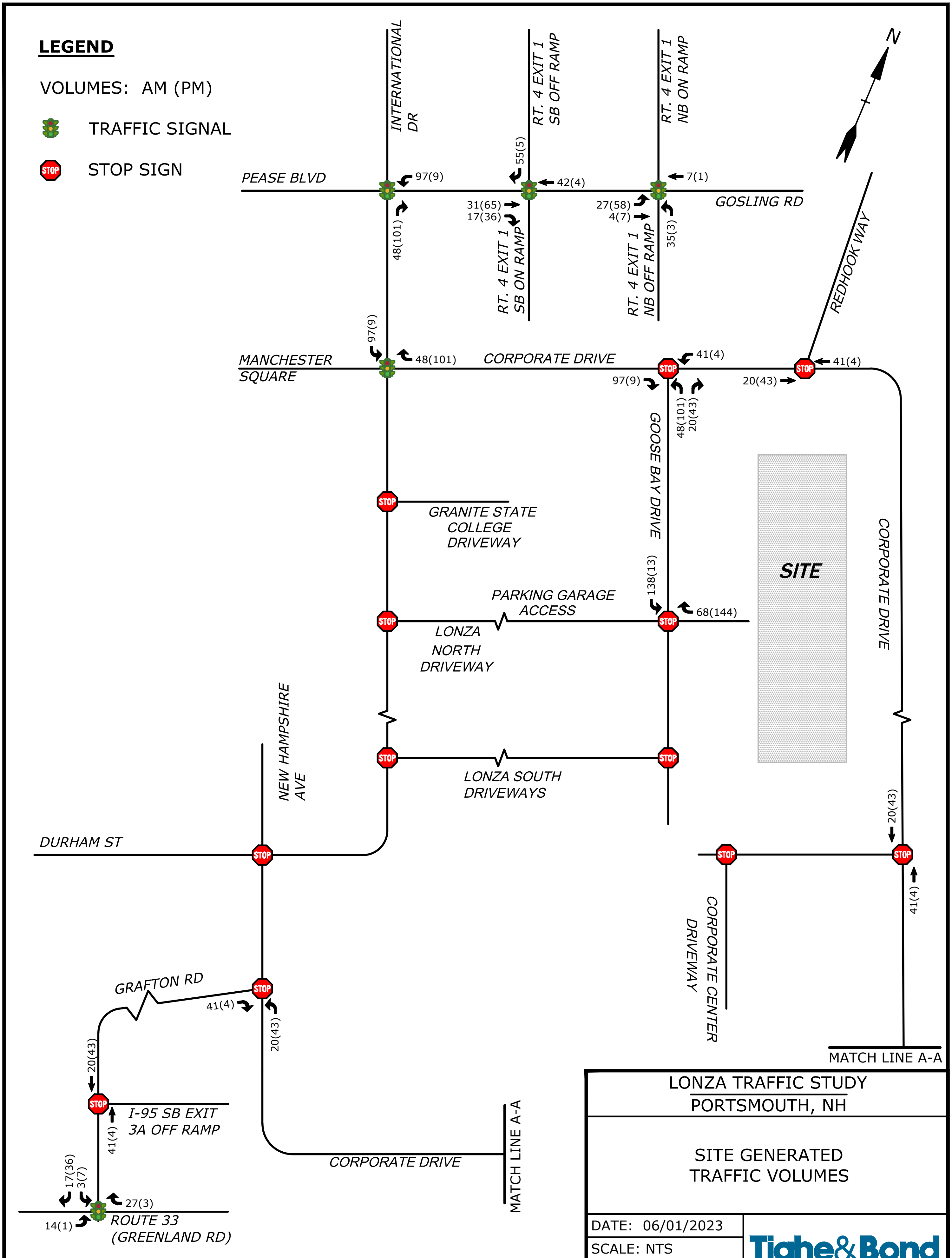
LONZA TRAFFIC STUDY
PORTSMOUTH, NH

ARRIVAL & DEPARTURE
TRIP DISTRIBUTION

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

Tighe&Bond

Jun 01, 2023-10:34am Plotted By: RCase
Tighe & Bond, Inc. J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\Figures\L0700-026 Traffic Volume Figures.dwg



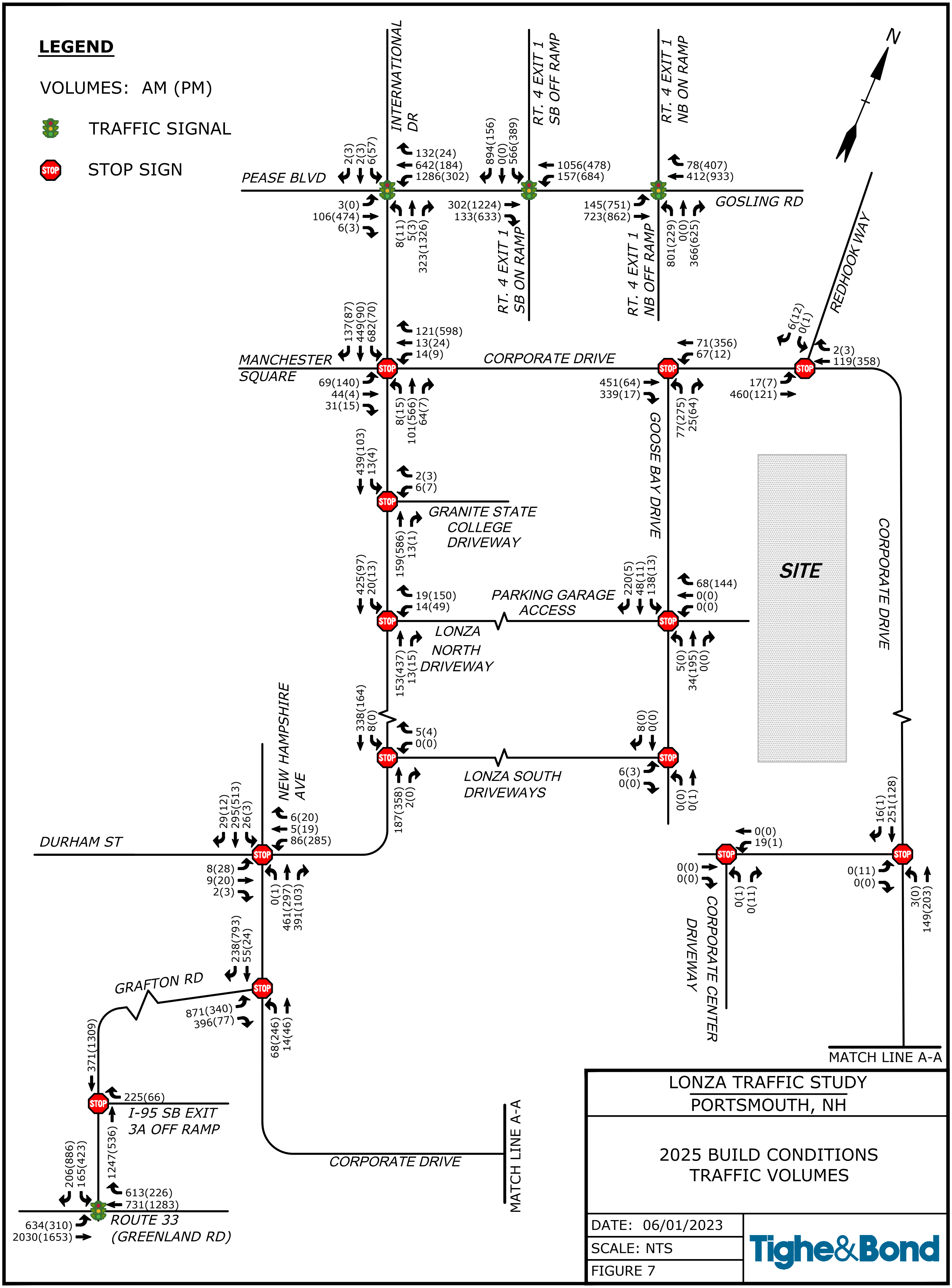
LONZA TRAFFIC STUDY
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES

DATE: 06/01/2023
SCALE: NTS
FIGURE 6

Tighe&Bond

Jun 01, 2023-10:34am Plotted By: RCase
Tighe & Bond, Inc. J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\Figures\L0700-026 Traffic Volume Figures.dwg



LONZA TRAFFIC STUDY
PORTSMOUTH, NH

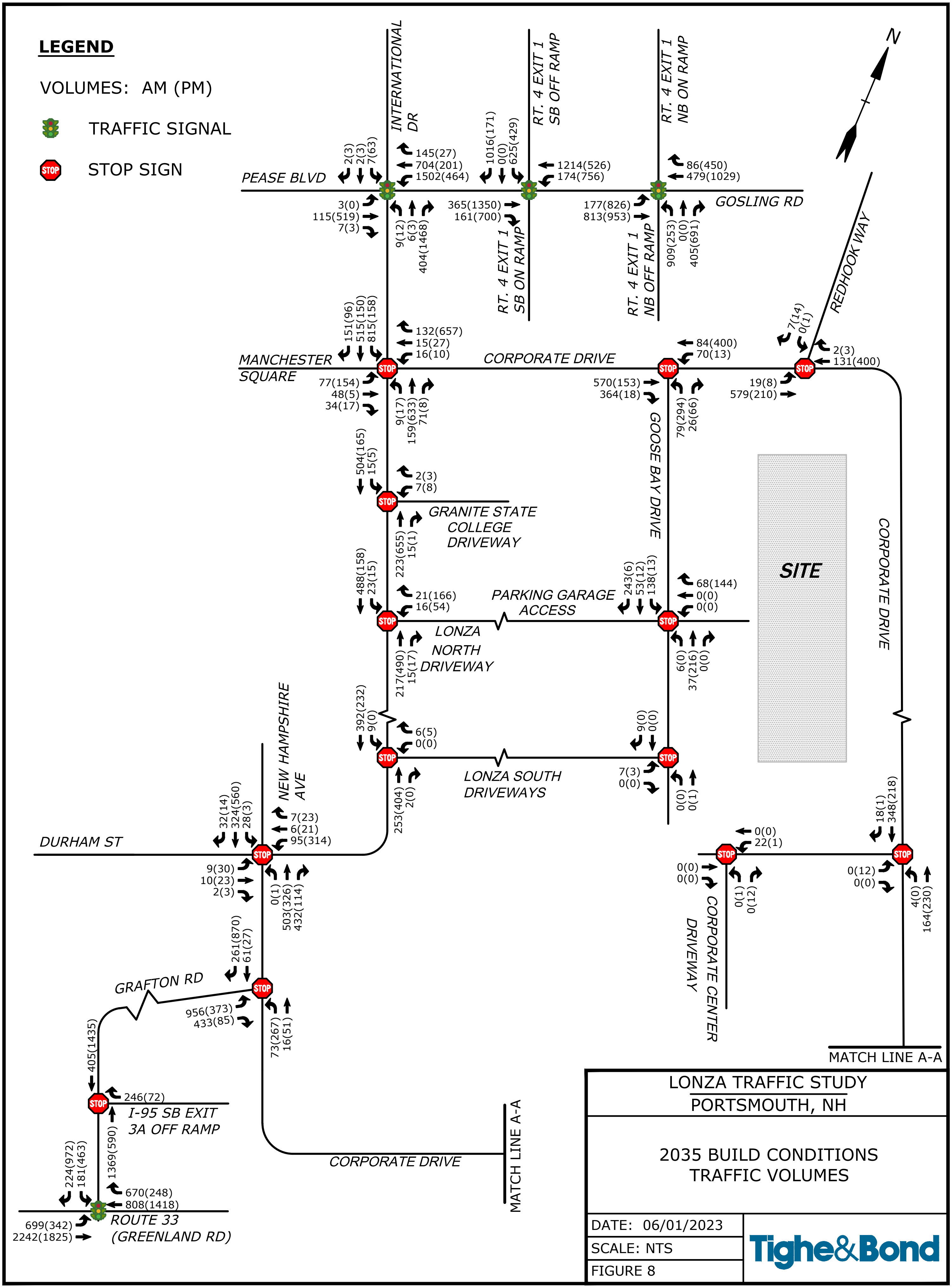
2025 BUILD CONDITIONS
TRAFFIC VOLUMES

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

Jun 01, 2023-10:34am Plotted By: RCase
Tighe & Bond, Inc. J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\Figures\L0700-026 Traffic Volume Figures.dwg

The Engineering Corp

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Peter M. Stith, AICP
Planning Manager
City of Portsmouth
Planning & Sustainability Department
1 Junkins Avenue
Portsmouth, NH 03801

October 3, 2023

Ref. T1399

Re: Proposed Lonza Biologics Expansion
Traffic Engineering Peer Review

Dear Mr. Stith:

On behalf of the City of Portsmouth, TEC, Inc. (TEC) has reviewed documents as part of the traffic engineering peer review for the proposed expansion of the Lonza Biologics, Inc. ("the Applicant") manufacturing campus along Corporate Drive in Portsmouth ("the Project"). The Project consists of constructing approximately 800,000 square feet of gross floor area supporting manufacturing, utility, and office space needs; and a new parking structure on a mainly undeveloped parcel as part of the Applicant's master plan. A portion of the Project was previously permitted and approved by the Planning Board in January 2019 with several conditions. The proposed expansion proposal includes one new full-access driveway that will utilize the former Goose Bay Drive right-of-way. The following documents were considered as part of our review:

- *Transportation Impact Assessment – Lonza Biologics*; prepared by Tighe & Bond, dated July 17, 2023;
- *Site Plans – Proposed Industrial Development – 70 & 80 Corporate Drive*, Portsmouth, NH; prepared by Tighe & Bond, dated July 17, 2023; and
- Other project related correspondence.

TEC completed a review of the Applicant's documents on behalf of the City of Portsmouth and provides the following transportation-related comments that we compiled during our review.

Traffic Impact Assessment

1. The Traffic Impact and Access Study (TIAS) prepared by Tighe & Bond (T&B) included the intersections that provide key access to the Project site and following supplemental intersections within the study area as requested by the Planning Board in Condition 2.11:

    - Gosling Road/ Spaulding Turnpike Intersection
    - International Drive/Corporate Drive/Manchester Square Intersection
    - International Drive/Pease Blvd Intersection
    - New Hampshire Ave/International Dr./Corporate Dr./Durham St. Intersection
    - Corporate Drive/Grafton Drive Intersection
    - NH 33/ Grafton Drive Intersection

    TEC concurs with the Applicant's expanded study area. *No response required.*

2. Traffic volume counts, including Turning Movement Counts (TMCs) and Automatic Traffic Recorder (ATR) data, were conducted at the study area intersections in February 2022 and March 2023. The recorded volumes for both periods were found to be below the peak monthly conditions based on historical traffic-volume data obtained from NHDOT records, and therefore T&B applied an appropriate adjustment factor. The data was also further adjusted to reflect a COVID adjustment factor of 16% to 53% based on current NHDOT protocols. We believe these adjustments will result in a *highly conservative* assessment of the future No-Build scenario (without the influence of the trips associated with the Project). *No response required*.

3. The weekday morning and weekday evening peak “commuter” hours were studied to determine the project’s overall effect on the roadway. TEC concurs that these selected time periods are appropriate as the peak hours of the industrial development typically overlap with the peak hours of the adjacent street system. We understand that the Applicant currently manages their employee shift times to avoid the actual peak traffic hours. *No response required*.

4. The TIA presents motor vehicle crash data for each study area intersection. The crash data indicates the number, type, and severity of crashes at the study area intersections between 2019 and 2021 obtained from the City of Portsmouth Police Department. The TIA summarizes the general crash statistics. Given the influence of the pandemic, the data from 2020 and 2021 may not provide the most accurate data given the depressed traffic volumes during that time. However, given the data compiled for 2019, TEC concurs with the crash analysis methodology and findings based on the compiled data. *No response required.*

5. The background growth rate of 1.0 percent per year was applied to the 2022/2023 existing volumes to generate the 2025 and 2035 future year volumes per NHDOT guidelines. The traffic projections also included estimated trips associated with other remaining development parcels in the Pease Development Authority (PDA) master plan, including 100 New Hampshire Avenue. Given the COVID adjustments noted in Comment #2, the ambient traffic growth and other background trips, TEC believes the traffic projections are highly conservative. *No response required.*

6. The Project’s trip generation calculations for the proposed expansion of 800,000 square feet were based on the estimated 1,020 new employees and a prorated relationship to the traffic that was generated by the 1,139 existing employees as of 2018. This estimate of new trips may be based on the older data for the Lonza site during a time when they had a predominant in-person work environment. The T&B trip projections however fall well below the calculations based on the ITE *Trip Generation Manual, 11th Edition,* Land Use Codes (LUCs) 110 (General Light Industrial) and 140 (Manufacturing) when using floor area as the independent variable. This may be the result of the Applicant’s proactive management of the employee shift times. If the shift times overlap with the actual peak hours for the adjacent street system, the Applicant’s traffic impacts will be greater. The Planning Board should consider a condition of approval that mandates that the Applicant maintains shift times that do not overlap with the documented morning and evening peak hours for Corporate Drive and International Drive unless otherwise approved by the Board after considering updated traffic data and trip generation information. TEC further recommends that the Board request a daily traffic count for the proposed site access point to better understand the hourly distribution of traffic over the course of several weekdays.

7. The TIA included a distribution analysis for the new trips that was based on the zip code data for the current Lonza employees' place of residence. Given the significant number of new employees, TEC recommends that the Applicant perform a supplemental sensitivity analysis using U.S. Census data and limited travel time runs to confirm the percentage of traffic that is expected to use each gateway to the Pease Tradeport.

8. The Build traffic volumes were grown to 2025 and 2035 to cover an opening year and 10-year planning horizon from time of data collection (2022/2023). TEC concurs with this methodology as these scenarios align with NHDOT Transportation Impact Assessment (TIA) Guidelines. *No response required.*

9. Although the projections may be conservative, TEC generally concurs with the results of the capacity and queue analysis provided as part of the TIA utilizing Highway Capacity Manual (HCM) 6th Edition methodology for the study area intersections. The 2035 Build condition shows some concerning levels of service with high delays for certain traffic movements that are acutely related to the commuter traffic into Pease Tradeport in the morning and departing in the late afternoon and evening peak hours.

10. The Applicant should provide a queue analysis for the proposed driveway gate system to ensure that entering traffic will not queue onto Corporate Drive.

11. The TIA documents substantial delays for the exiting employee traffic during the evening peak hour within the single departure lane. The Applicant should consider separate left- and right-turn lanes at the driveway intersection with Corporate Drive.

12. TEC recommends that the Applicant coordinate with PDA to perform supplemental all-way stop control (AWSC) and traffic signal warrant analysis for the following intersections:
    a. Corporate Drive at Grafton Road
    b. International Drive at New Hampshire Avenue / Durham Street
    c. International Drive / Corporate Drive (for the 2025 Opening Build condition)

13. The TIA states that the intersection of International Drive / Corporate Drive is programmed for NHDOT funding for intersection reconstruction and signalization within the State's 10-year plan. Depending on the actual timing of the project, the Applicant should coordinate with PDA and consider measures for the temporary signalization of this intersection. This should be closely coordinated with a potential condition of approval related to the Applicant's responsibility to provide updated traffic data following the occupancy of Building 1 (and other subsequent buildings) and assess the actual delays and queuing for this key gateway intersection.

14. The intersection of Greenland Road (Route 33) / Grafton Road, a State-controlled intersection, is currently overcapacity for different traffic movements during the peak hours. Although TEC does not believe that direct physical mitigation is warranted for the Applicant at this intersection, the City and PDA should work with NHDOT to identify long-range improvements to add capacity to this intersection.

15. Based on the results of the capacity and warrant analyses listed above, the Applicant should coordinate with PDA and other applicants within Pease Tradeport to develop a fair-share cost assessment for mitigation measures based on the number of new trips.

16. Corporate Drive currently accommodates an exclusive left-turn lane for the Residence Inn and Redhook Way that traverses the opening for Goose Bay Drive (site driveway). The

Applicant should review the potential for lane use changes within Corporate Drive that may consider an exclusive left-turn lane for Lonza's entering traffic. Any planned improvements should consider an enhanced pedestrian crossing between the Lonza site and the existing COAST bus stop on the opposite side of Corporate Drive in the vicinity of Redhook Way, including a new bus shelter to provide additional accommodations for existing and future transit riders.

17. The TIA does not include any parking occupancy data for the existing Lonza site and does not provide an analysis of the proposed parking supply in relation to the projected number of employees in Phase 2 and the Site Master Plan. The supply may indeed be appropriate based on the number of employees on each shift but should be confirmed with a reasonable level of parking analysis in relation to the zoning requirements.

18. The Applicant should coordinate with the City, PDA, and COAST to review the current ridership along Bus Route 42 related to the Lonza facility and identify opportunities for coordinated service schedules and potential bus route changes for Route 13 (Dover) and Route 14 (Rochester) to further reduce single-occupancy vehicle trips for several PDA employers.

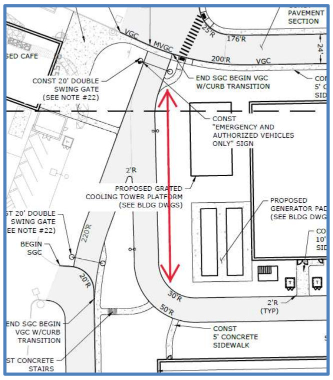
<u>Site Plans</u>

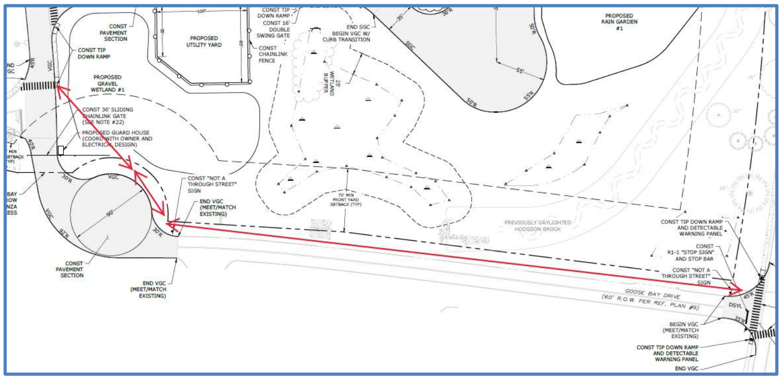
19. The site plan currently depicts enclosed truck and trailer staging for deliveries. The Applicant should confirm that they do not require any exterior trailer parking as none is currently shown. TEC recommends that the Board considers a condition that prohibits exterior trailer storage in areas that are not specifically identified on the plan.

20. One trash compactor is located near the southerly corner of Building #1. The Applicant should confirm that they do not need additional exterior dumpsters for each building and confirm the truck circulation for any newly proposed locations.

21. The plans should include additional details for the signs and striping for the gated access points to the site. This may include additional roadway striping at the end of the Goose Bay Drive cul de sac to delineate the transition to the proposed private way.

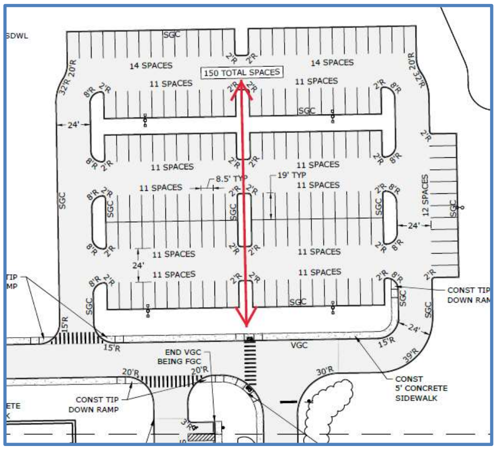
22. TEC recommends the construction of additional sections of on-site sidewalks within the Phase 2 area to provide a sidewalk circuit for employees that desire to walk during breaks without unnecessarily traversing the busier on-site driveway aisles. This may include a new sidewalk along the northwesterly edge of Goose Bay Drive to connect to the recently constructed sidewalk along Corporate Drive and another segment south of the proposed 3-story utility building (shown in red below).





23. Pedestrian warning signs should be provided at the major on-site crosswalks that would cross the major routes to and from the existing and proposed parking structures. The crosswalk widths should be noted on the plans and in the construction details.

24. The 150-stall surface parking for Phase 2 should include a defined sidewalk connection from the outlying parking aisle to the currently proposed sidewalk. This could be considered within a wider landscape island in the middle of the parking lot as shown below.



25. One proposed bike rack is depicted near the southerly corner of Building #2 in the Site Master Plan. The Applicant should consider additional bike racks at the major entrances to the proposed buildings, such as Building #1 in Phase 2, and covered bicycle parking on the ground floor of the proposed 700-stall parking structure in the site master plan.

Please do not hesitate to contact me if you have any questions concerning our peer review at 603-601-8154. Thank you for your consideration.

Sincerely,
TEC, Inc.
*"**T**he **E**ngineering **C**orporation"*

Kevin R. Dandrade, P.E., PTOE
Principal

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

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TRAFFIC DATA
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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				Route 4 Southbound Off-Ramp				Newington Street				Newington Street			
	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	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				Route 4 Southbound Off-Ramp				Newington Street				Newington Street			
	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	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 7:15 AM to 8:15 AM	Route 4 Southbound On-Ramp				Route 4 Southbound Off-Ramp				Newington Street				Newington Street			
	Northbound				Southbound				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**	**3**	**0**	**6**	**0**	**0**	**4**	**6**	**0**	**10**	**8**	**0**
PHF	**0.00**				**0.45**				**0.63**				**0.50**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Route 4 Southbound On-Ramp				Route 4 Southbound Off-Ramp				Newington Street				Newington Street			
	Northbound				Southbound				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**	**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				Route 4 Southbound Off-Ramp				Newington Street				Newington Street			
	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	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				Route 4 Southbound Off-Ramp				Newington Street				Newington Street			
	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	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				Route 4 Southbound Off-Ramp				Newington Street				Newington Street			
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	1	0	0	0	0	0	0	0	3

PM PEAK HOUR[1]	Route 4 Southbound On-Ramp				Route 4 Southbound Off-Ramp				Newington Street				Newington Street			
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	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				Route 4 Northbound On-Ramp				Newington Street				Newington Street			
	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	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				Route 4 Northbound On-Ramp				Newington Street				Newington Street			
	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	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	Route 4 Northbound Off-Ramp				Route 4 Northbound On-Ramp				Newington Street				Newington Street			
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**	**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	Route 4 Northbound Off-Ramp				Route 4 Northbound On-Ramp				Newington Street				Newington Street			
4:15 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
5:15 PM	**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				Route 4 Northbound On-Ramp				Newington Street				Newington Street			
	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	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				Route 4 Northbound On-Ramp				Newington Street				Newington Street			
	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	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 Northbound Off-Ramp				Route 4 Northbound On-Ramp				Newington Street				Newington Street			
7:45 AM	Northbound				Southbound				Eastbound				Westbound			
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	Route 4 Northbound Off-Ramp				Route 4 Northbound On-Ramp				Newington Street				Newington Street			
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	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

					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	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

					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	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					Grafton Road				Greenland Road (Route 33)				Greenland Road (Route 33)			
7:30 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
8:30 AM	**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					Grafton Road				Greenland Road (Route 33)				Greenland Road (Route 33)			
4:30 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
5:30 PM	**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 7:45 AM to 8:45 AM					Grafton Road				Greenland Road (Route 33)				Greenland Road (Route 33)			
	Northbound				Southbound				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**	**3**	**0**	**4**	**0**	**3**	**46**	**0**	**0**	**0**	**34**	**7**
PHF	**0.00**				**0.88**				**0.77**				**0.73**			

PM PEAK HOUR 4:00 PM to 5:00 PM					Grafton Road				Greenland Road (Route 33)				Greenland Road (Route 33)			
	Northbound				Southbound				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**	**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] 7:30 AM to 8:30 AM	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) 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] 4:30 PM to 5:30 PM	Northbound				Grafton Road Southbound				Greenland Road (Route 33) Eastbound				Greenland Road (Route 33) 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 #:	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				International Drive				Manchester Square				Corporate Drive			
	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	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				International Drive				Manchester Square				Corporate Drive			
	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	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				International Drive				Manchester Square				Corporate Drive			
	Northbound				Southbound				Eastbound				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				International Drive				Manchester Square				Corporate Drive			
	Northbound				Southbound				Eastbound				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				International Drive				Manchester Square				Corporate Drive			
	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	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				International Drive				Manchester Square				Corporate Drive			
	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	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				International Drive				Manchester Square				Corporate Drive			
	Northbound				Southbound				Eastbound				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				International Drive				Manchester Square				Corporate Drive			
	Northbound				Southbound				Eastbound				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] 7:30 AM to 8:30 AM	International Drive Northbound				International Drive Southbound				Manchester Square 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	International Drive Northbound				International Drive Southbound				Manchester Square 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

[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)								Corporate Drive				Corporate Drive			
	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	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)								Corporate Drive				Corporate Drive			
	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	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] 7:15 AM to 8:15 AM	Goose Bay Drive (West)								Corporate Drive				Corporate Drive			
	Northbound				Southbound				Eastbound				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

PM PEAK HOUR[1] 4:00 PM to 5:00 PM	Goose Bay Drive (West)								Corporate Drive				Corporate Drive			
	Northbound				Southbound				Eastbound				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 #: 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

					Redhook Way				Corporate Drive				Corporate Drive			
	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	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

					Redhook Way				Corporate Drive				Corporate Drive			
	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	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					Redhook Way				Corporate Drive				Corporate Drive			
	Northbound				Southbound				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**	**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					Redhook Way				Corporate Drive				Corporate Drive			
	Northbound				Southbound				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**	**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

					Redhook Way				Corporate Drive				Corporate Drive			
	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	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

					Redhook Way				Corporate Drive				Corporate Drive			
	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	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					Redhook Way				Corporate Drive				Corporate Drive			
8:00 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
9:00 AM	**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					Redhook Way				Corporate Drive				Corporate Drive			
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**	**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

					Redhook Way				Corporate Drive				Corporate Drive			
	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	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

					Redhook Way				Corporate Drive				Corporate Drive			
	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	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					Redhook Way				Corporate Drive				Corporate Drive			
	Northbound				Southbound				Eastbound				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					Redhook Way				Corporate Drive				Corporate Drive			
	Northbound				Southbound				Eastbound				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				Corporate Drive				Goose Bay Drive (East)							
	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	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				Corporate Drive				Goose Bay Drive (East)							
	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	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	Corporate Drive				Corporate Drive				Goose Bay Drive (East)							
7:15 AM	~~Northbound~~ WB				~~Southbound~~ EB				~~Eastbound~~ NB				Westbound			
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**	**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	Corporate Drive				Corporate Drive				Goose Bay Drive (East)							
4:00 PM	~~Northbound~~ WB				~~Southbound~~ EB				~~Eastbound~~ NB				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**	**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				Corporate Drive				Goose Bay Drive (East)							
	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	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				Corporate Drive				Goose Bay Drive (East)							
	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	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				Corporate Drive				Goose Bay Drive (East)							
7:15 AM	Northbound				Southbound				Eastbound				Westbound			
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]	Corporate Drive				Corporate Drive				Goose Bay Drive (East)							
4:00 PM	Northbound				Southbound				Eastbound				Westbound			
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 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

HEAVY VEHICLES

	Corporate Center Driveway								Goose Bay Drive				Goose Bay Drive			
	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	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								Goose Bay Drive				Goose Bay Drive			
	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	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								Goose Bay Drive				Goose Bay Drive			
7:00 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
8:00 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								Goose Bay Drive				Goose Bay Drive			
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**	**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								Goose Bay Drive				Goose Bay Drive			
	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	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								Goose Bay Drive				Goose Bay Drive			
	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	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] 7:15 AM to 8:15 AM	Corporate Center Driveway								Goose Bay Drive				Goose Bay Drive			
	Northbound				Southbound				Eastbound				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	40

PM PEAK HOUR[1] 4:00 PM to 5:00 PM	Corporate Center Driveway								Goose Bay Drive				Goose Bay Drive			
	Northbound				Southbound				Eastbound				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	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				Goose Bay Drive				Lonza Biologics Driveway (South)							
	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	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				Goose Bay Drive				Lonza Biologics Driveway (South)							
	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	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	Goose Bay Drive				Goose Bay Drive				Lonza Biologics Driveway (South)							
7:15 AM	~~Northbound~~ WB				~~Southbound~~ EB				~~Eastbound~~ NB				Westbound			
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**	**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	Goose Bay Drive				Goose Bay Drive				Lonza Biologics Driveway (South)							
4:00 PM	~~Northbound~~ WB				~~Southbound~~ EB				~~Eastbound~~ NB				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**	**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				Goose Bay Drive				Lonza Biologics Driveway (South)							
	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	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				Goose Bay Drive				Lonza Biologics Driveway (South)							
	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	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] 7:15 AM to 8:15 AM	Goose Bay Drive				Goose Bay Drive				Lonza Biologics Driveway (South)							
	Northbound				Southbound				Eastbound				Westbound			
	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] 4:00 PM to 5:00 PM	Goose Bay Drive				Goose Bay Drive				Lonza Biologics Driveway (South)							
	Northbound				Southbound				Eastbound				Westbound			
	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				Goose Bay Drive				Lonza Parking Garage Entrance Driveway							
	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	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				Goose Bay Drive				Lonza Parking Garage Entrance Driveway							
	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	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	Goose Bay Drive				Goose Bay Drive				Lonza Parking Garage Entrance Driveway							
7:15 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
8:15 AM	**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	Goose Bay Drive				Goose Bay Drive				Lonza Parking Garage Entrance Driveway							
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**	**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				Goose Bay Drive				Lonza Parking Garage Entrance Driveway							
	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	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				Goose Bay Drive				Lonza Parking Garage Entrance Driveway							
	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	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	Goose Bay Drive				Goose Bay Drive				Lonza Parking Garage Entrance Driveway							
8:00 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
9:00 AM	**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	Goose Bay Drive				Goose Bay Drive				Lonza Parking Garage Entrance Driveway							
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**	**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				Goose Bay Drive				Lonza Parking Garage Entrance Driveway							
	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	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				Goose Bay Drive				Lonza Parking Garage Entrance Driveway							
	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	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] 7:15 AM to 8:15 AM	Goose Bay Drive				Goose Bay Drive				Lonza Parking Garage Entrance Driveway							
	Northbound				Southbound				Eastbound				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	Goose Bay Drive				Goose Bay Drive				Lonza Parking Garage Entrance Driveway							
	Northbound				Southbound				Eastbound				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 #: 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				International Drive								Granite State College Driveway (South)			
	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	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				International Drive								Granite State College Driveway (South)			
	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	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	International Drive				International Drive								Granite State College Driveway (South)			
7:30 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
8:30 AM	**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	International Drive				International Drive								Granite State College Driveway (South)			
4:15 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
5:15 PM	**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				International Drive								Granite State College Driveway (South)			
	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	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				International Drive								Granite State College Driveway (South)			
	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	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				International Drive								Granite State College Driveway (South)			
	Northbound				Southbound				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**	**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				International Drive								Granite State College Driveway (South)			
	Northbound				Southbound				Eastbound				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				International Drive								Granite State College Driveway (South)			
	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	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				International Drive								Granite State College Driveway (South)			
	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	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] 7:30 AM to 8:30 AM	International Drive				International Drive								Granite State College Driveway (South)			
	Northbound				Southbound				Eastbound				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	International Drive				International Drive								Granite State College Driveway (South)			
	Northbound				Southbound				Eastbound				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 #: 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				International Drive								Lonza Biologics Driveway (North)			
	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	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				International Drive								Lonza Biologics Driveway (North)			
	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	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	International Drive				International Drive								Lonza Biologics Driveway (North)			
7:30 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
8:30 AM	**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	International Drive				International Drive								Lonza Biologics Driveway (North)			
4:15 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
5:15 PM	**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				International Drive								Lonza Biologics Driveway (North)			
	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	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				International Drive								Lonza Biologics Driveway (North)			
	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	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	International Drive				International Drive								Lonza Biologics Driveway (North)			
7:00 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
8:00 AM	**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	International Drive				International Drive								Lonza Biologics Driveway (North)			
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**	**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] 7:30 AM to 8:30 AM	International Drive				International Drive								Lonza Biologics Driveway (North)			
	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	46	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:15 PM to 5:15 PM	International Drive				International Drive								Lonza Biologics Driveway (North)			
	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	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				International Drive								Lonza Biologics Driveway (South)			
	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	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				International Drive								Lonza Biologics Driveway (South)			
	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	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				International Drive								Lonza Biologics Driveway (South)			
	Northbound				Southbound				Eastbound				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				International Drive								Lonza Biologics Driveway (South)			
	Northbound				Southbound				Eastbound				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				International Drive								Lonza Biologics Driveway (South)			
	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	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				International Drive								Lonza Biologics Driveway (South)			
	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	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	International Drive				International Drive								Lonza Biologics Driveway (South)			
7:00 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
8:00 AM	**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	International Drive				International Drive								Lonza Biologics Driveway (South)			
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**	**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] 7:30 AM to 8:30 AM	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) 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	International Drive Northbound				International Drive Southbound				Eastbound				Lonza Biologics Driveway (South) 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 #: 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				New Hampshire Avenue				Durham Street				International Drive			
	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	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				New Hampshire Avenue				Durham Street				International Drive			
	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	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]	Corporate Drive				New Hampshire Avenue				Durham Street				International Drive			
7:45 AM	Northbound				Southbound				Eastbound				Westbound			
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	Corporate Drive				New Hampshire Avenue				Durham Street				International Drive			
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	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				Corporate Drive				Grafton Road							
	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	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				Corporate Drive				Grafton Road							
	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	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				Corporate Drive				Grafton Road							
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**	**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				Corporate Drive				Grafton Road							
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**	**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] 7:45 AM to 8:45 AM	Corporate Drive Northbound				Corporate Drive Southbound				Grafton Road Eastbound				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				Corporate Drive Southbound				Grafton Road Eastbound				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 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				Grafton Road								I-95 Southbound Off-Ramp			
	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	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				Grafton Road								I-95 Southbound Off-Ramp			
	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	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	Grafton Road				Grafton Road								I-95 Southbound Off-Ramp			
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**	**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	Grafton Road				Grafton Road								I-95 Southbound Off-Ramp			
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**	**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

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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 7:00 AM to 8:00 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**	**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 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**	**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				Grafton Road								I-95 Southbound Off-Ramp			
	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	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				Grafton Road								I-95 Southbound Off-Ramp			
	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	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				Grafton Road								I-95 Southbound Off-Ramp			
	Northbound				Southbound				Eastbound				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				Grafton Road								I-95 Southbound Off-Ramp			
	Northbound				Southbound				Eastbound				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

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Tuesday, March 7, 2023

Time	Total		EB			
0000	57		57		0	
0015	27		27		0	
0030	48		48		0	
0045	10	142	10	142	0	0
0100	13		13		0	
0115	9		9		0	
0130	5		5		0	
0145	9	36	9	36	0	0
0200	4		4		0	
0215	2		2		0	
0230	7		7		0	
0245	4	17	4	17	0	0
0300	1		1		0	
0315	4		4		0	
0330	7		7		0	
0345	5	17	5	17	0	0
0400	6		6		0	
0415	7		7		0	
0430	6		6		0	
0445	9	28	9	28	0	0
0500	8		8		0	
0515	10		10		0	
0530	13		13		0	
0545	18	49	18	49	0	0
0600	24		24		0	
0615	16		16		0	
0630	26		26		0	
0645	37	103	37	103	0	0
0700	48		48		0	
0715	41		41		0	
0730	42		42		0	
0745	52	183	52	183	0	0
0800	51		51		0	
0815	61		61		0	
0830	60		60		0	
0845	70	242	70	242	0	0
0900	78		78		0	
0915	87		87		0	
0930	93		93		0	
0945	88	346	88	346	0	0
1000	98		98		0	
1015	104		104		0	
1030	109		109		0	
1045	111	422	111	422	0	0
1100	137		137		0	
1115	143		143		0	
1130	150		150		0	
1145	185	615	185	615	0	0
1200	221		221		0	
1215	171		171		0	
1230	146		146		0	
1245	126	664	126	664	0	0
1300	132		132		0	
1315	111		111		0	
1330	130		130		0	
1345	153	526	153	526	0	0
1400	150		150		0	
1415	142		142		0	
1430	243		243		0	
1445	193	728	193	728	0	0
1500	223		223		0	
1515	165		165		0	
1530	281		281		0	
1545	202	871	202	871	0	0
1600	325		325		0	
1615	307		307		0	
1630	325		325		0	
1645	250	1207	250	1207	0	0
1700	339		339		0	
1715	238		238		0	
1730	165		165		0	
1745	146	888	146	888	0	0
1800	137		137		0	
1815	92		92		0	
1830	78		78		0	
1845	58	365	58	365	0	0
1900	85		85		0	
1915	43		43		0	
1930	41		41		0	
1945	34	203	34	203	0	0
2000	50		50		0	
2015	17		17		0	
2030	28		28		0	
2045	17	112	17	112	0	0
2100	12		12		0	
2115	17		17		0	
2130	15		15		0	
2145	18	62	18	62	0	0
2200	21		21		0	
2215	9		9		0	
2230	7		7		0	
2245	19	56	19	56	0	0
2300	20		20		0	
2315	16		16		0	
2330	60		60		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

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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				Time	Total		WB			
0000	6		6		0		1200	142		142		0	
0015	6		6		0		1215	157		157		0	
0030	3		3		0		1230	150		150		0	
0045	5	20	5	20	0	0	1245	196	645	196	645	0	0
0100	3		3		0		1300	151		151		0	
0115	1		1		0		1315	128		128		0	
0130	4		4		0		1330	139		139		0	
0145	0	8	0	8	0	0	1345	121	539	121	539	0	0
0200	8		8		0		1400	120		120		0	
0215	3		3		0		1415	116		116		0	
0230	4		4		0		1430	113		113		0	
0245	2	17	2	17	0	0	1445	121	470	121	470	0	0
0300	4		4		0		1500	89		89		0	
0315	3		3		0		1515	113		113		0	
0330	7		7		0		1530	98		98		0	
0345	6	20	6	20	0	0	1545	80	380	80	380	0	0
0400	3		3		0		1600	79		79		0	
0415	7		7		0		1615	89		89		0	
0430	19		19		0		1630	88		88		0	
0445	33	62	33	62	0	0	1645	84	340	84	340	0	0
0500	77		77		0		1700	63		63		0	
0515	132		132		0		1715	50		50		0	
0530	178		178		0		1730	56		56		0	
0545	202	589	202	589	0	0	1745	45	214	45	214	0	0
0600	130		130		0		1800	54		54		0	
0615	150		150		0		1815	61		61		0	
0630	163		163		0		1830	35		35		0	
0645	245	688	245	688	0	0	1845	27	177	27	177	0	0
0700	180		180		0		1900	24		24		0	
0715	219		219		0		1915	26		26		0	
0730	260		260		0		1930	35		35		0	
0745	313	972	313	972	0	0	1945	28	113	28	113	0	0
0800	275		275		0		2000	19		19		0	
0815	241		241		0		2015	31		31		0	
0830	184		184		0		2030	14		14		0	
0845	193	893	193	893	0	0	2045	16	80	16	80	0	0
0900	146		146		0		2100	14		14		0	
0915	126		126		0		2115	11		11		0	
0930	90		90		0		2130	8		8		0	
0945	114	476	114	476	0	0	2145	7	40	7	40	0	0
1000	89		89		0		2200	4		4		0	
1015	108		108		0		2215	7		7		0	
1030	104		104		0		2230	5		5		0	
1045	105	406	105	406	0	0	2245	7	23	7	23	0	0
1100	89		89		0		2300	7		7		0	
1115	106		106		0		2315	2		2		0	
1130	114		114		0		2330	5		5		0	
1145	128	437	128	437	0	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
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Wednesday, March 8, 2023

Time	Total		WB			
0000	4		4		0	
0015	3		3		0	
0030	0		0		0	
0045	0	7	0	7	0	0
0100	6		6		0	
0115	2		2		0	
0130	5		5		0	
0145	4	17	4	17	0	0
0200	5		5		0	
0215	3		3		0	
0230	1		1		0	
0245	3	12	3	12	0	0
0300	0		0		0	
0315	0		0		0	
0330	7		7		0	
0345	7	14	7	14	0	0
0400	8		8		0	
0415	11		11		0	
0430	21		21		0	
0445	37	77	37	77	0	0
0500	68		68		0	
0515	127		127		0	
0530	162		162		0	
0545	206	563	206	563	0	0
0600	137		137		0	
0615	151		151		0	
0630	170		170		0	
0645	259	717	259	717	0	0
0700	179		179		0	
0715	224		224		0	
0730	264		264		0	
0745	335	1002	335	1002	0	0
0800	262		262		0	
0815	274		274		0	
0830	221		221		0	
0845	248	1005	248	1005	0	0
0900	133		133		0	
0915	135		135		0	
0930	114		114		0	
0945	119	501	119	501	0	0
1000	102		102		0	
1015	122		122		0	
1030	112		112		0	
1045	124	460	124	460	0	0
1100	97		97		0	
1115	124		124		0	
1130	149		149		0	
1145	133	503	133	503	0	0
1200	145		145		0	
1215	196		196		0	
1230	161		161		0	
1245	178	680	178	680	0	0
1300	164		164		0	
1315	136		136		0	
1330	158		158		0	
1345	124	582	124	582	0	0
1400	123		123		0	
1415	106		106		0	
1430	125		125		0	
1445	130	484	130	484	0	0
1500	99		99		0	
1515	102		102		0	
1530	91		91		0	
1545	93	385	93	385	0	0
1600	54		54		0	
1615	78		78		0	
1630	87		87		0	
1645	90	309	90	309	0	0
1700	65		65		0	
1715	67		67		0	
1730	57		57		0	
1745	57	246	57	246	0	0
1800	41		41		0	
1815	44		44		0	
1830	44		44		0	
1845	24	153	24	153	0	0
1900	38		38		0	
1915	32		32		0	
1930	28		28		0	
1945	33	131	33	131	0	0
2000	21		21		0	
2015	22		22		0	
2030	12		12		0	
2045	22	77	22	77	0	0
2100	26		26		0	
2115	19		19		0	
2130	14		14		0	
2145	8	67	8	67	0	0
2200	8		8		0	
2215	0		0		0	
2230	7		7		0	
2245	4	19	4	19	0	0
2300	5		5		0	
2315	3		3		0	
2330	7		7		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

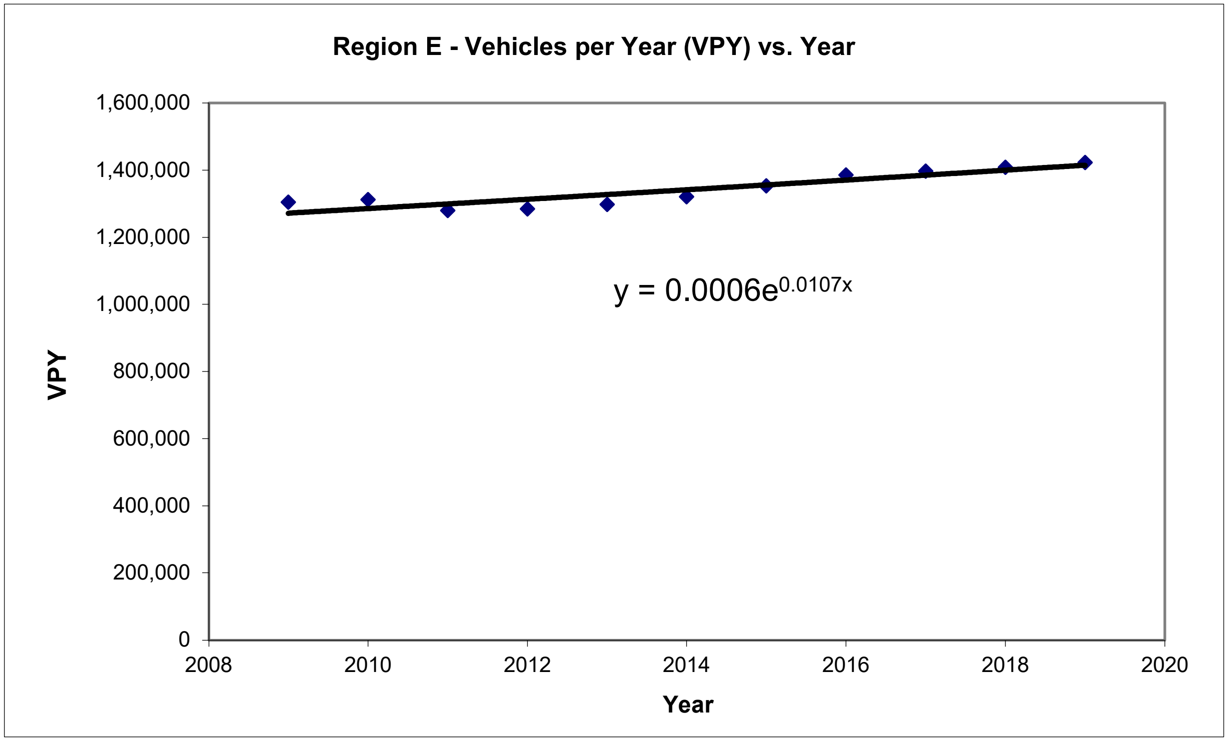
Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265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

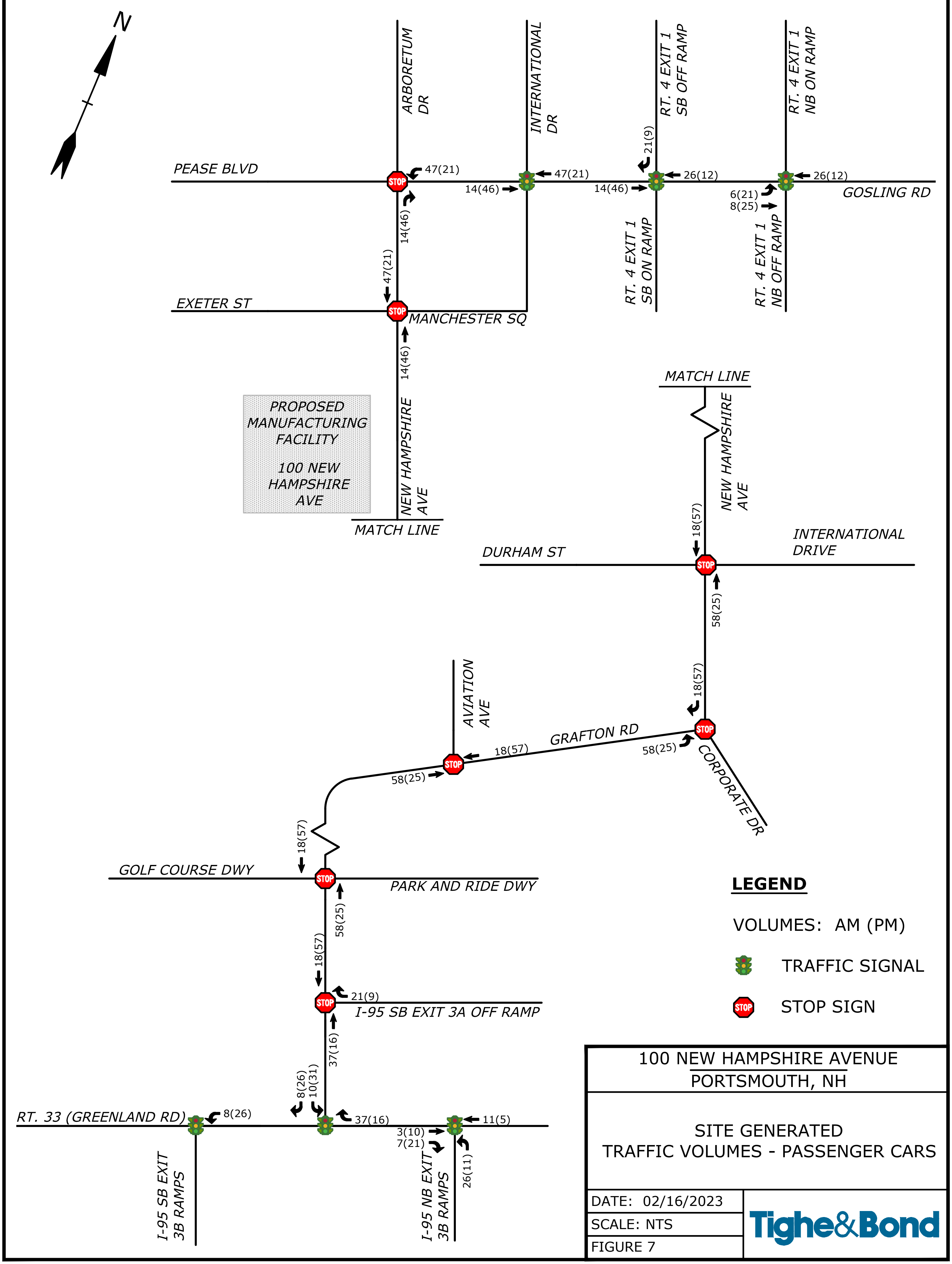
Traffic Volume Adjustment Factor Calculation

					NHDOT Count Station Data (Loc ID 82379024) - Pease Blvd, West of Route 4 SB Ramps				
Peak Hour	**Feb 2022**	**2022 Seasonally Adjust to Peak[1]**	**March 2023**	**2023 Seasonally Adjust to Peak[2]**	**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



LEGEND

VOLUMES: AM (PM)

🚦 TRAFFIC SIGNAL

🛑 STOP SIGN

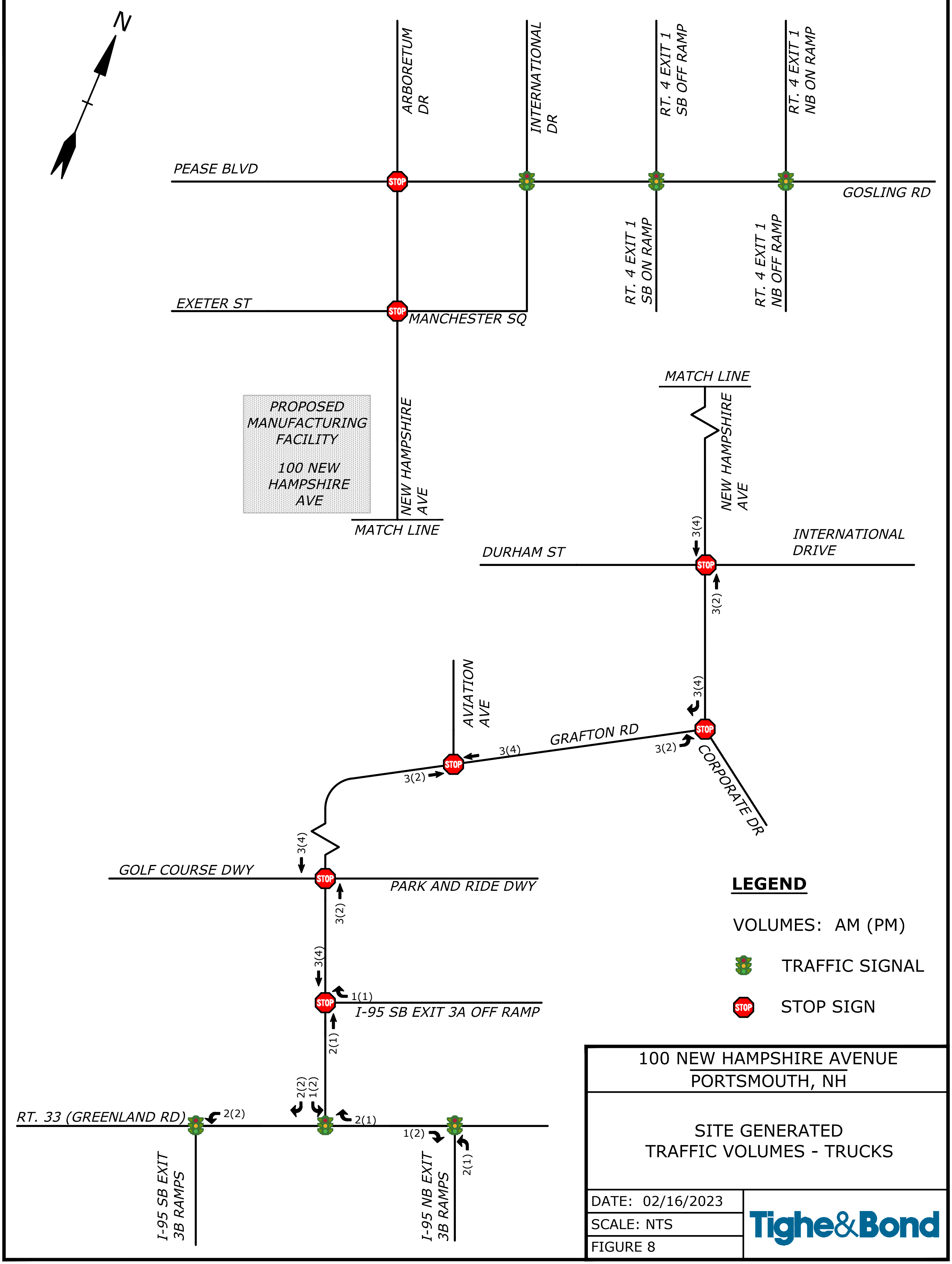
100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES - PASSENGER CARS

DATE: 02/16/2023
SCALE: NTS
FIGURE 7

Tighe&Bond

Feb 16, 2023-9:09am Plotted By: RCase
Tighe & Bond, Inc. \\tighebond.com\data\Data\Projects\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Figures\Traffic Volume Figures.dwg



LEGEND

VOLUMES: AM (PM)

🚦 TRAFFIC SIGNAL

🛑 STOP SIGN

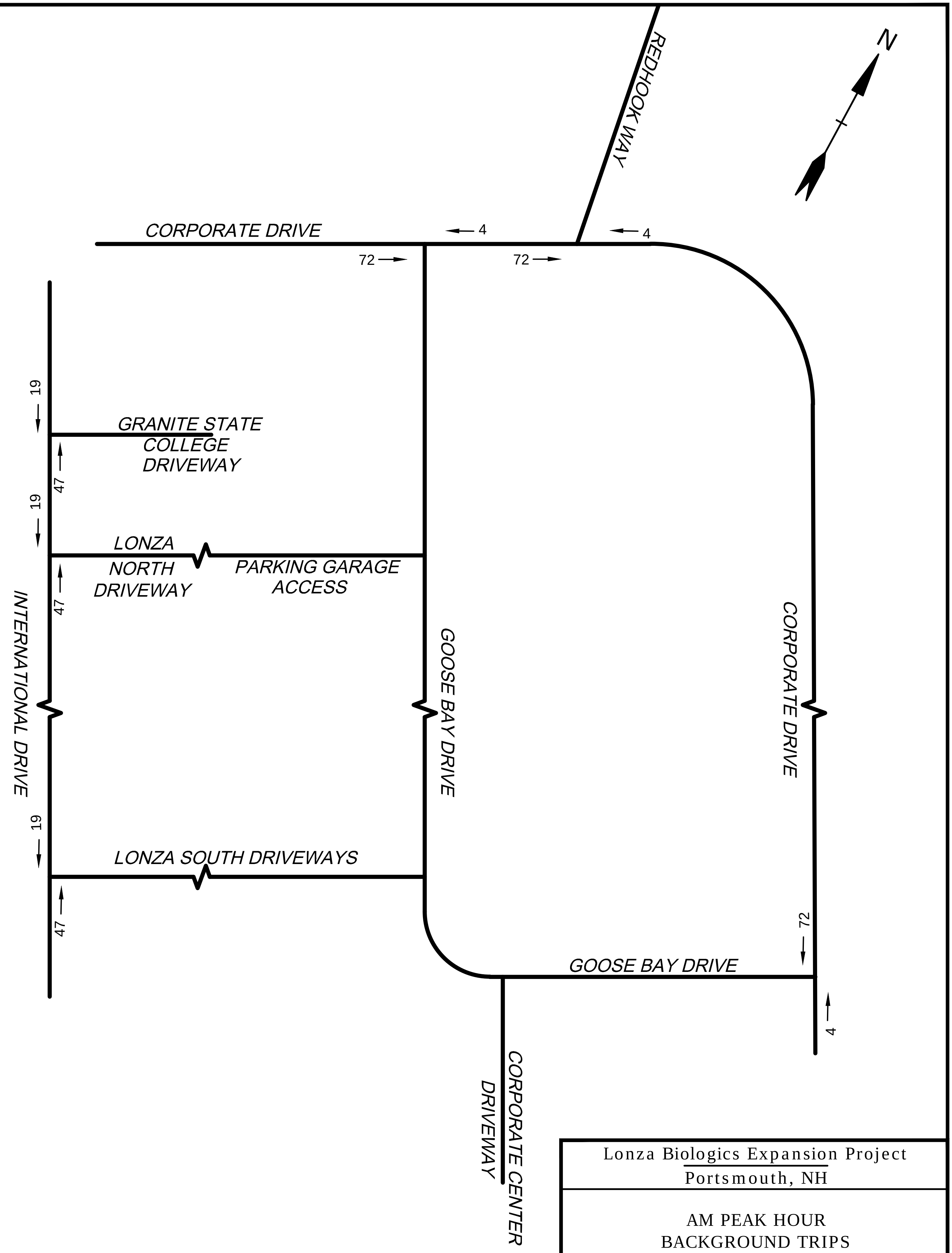
100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES - TRUCKS

DATE: 02/16/2023
SCALE: NTS
FIGURE 8

Tighe&Bond

Feb 16, 2023-9:10am Plotted By: RCase
Tighe & Bond, Inc. \\tighebond.com\data\Data\Projects\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Figures\Traffic Volume Figures.dwg

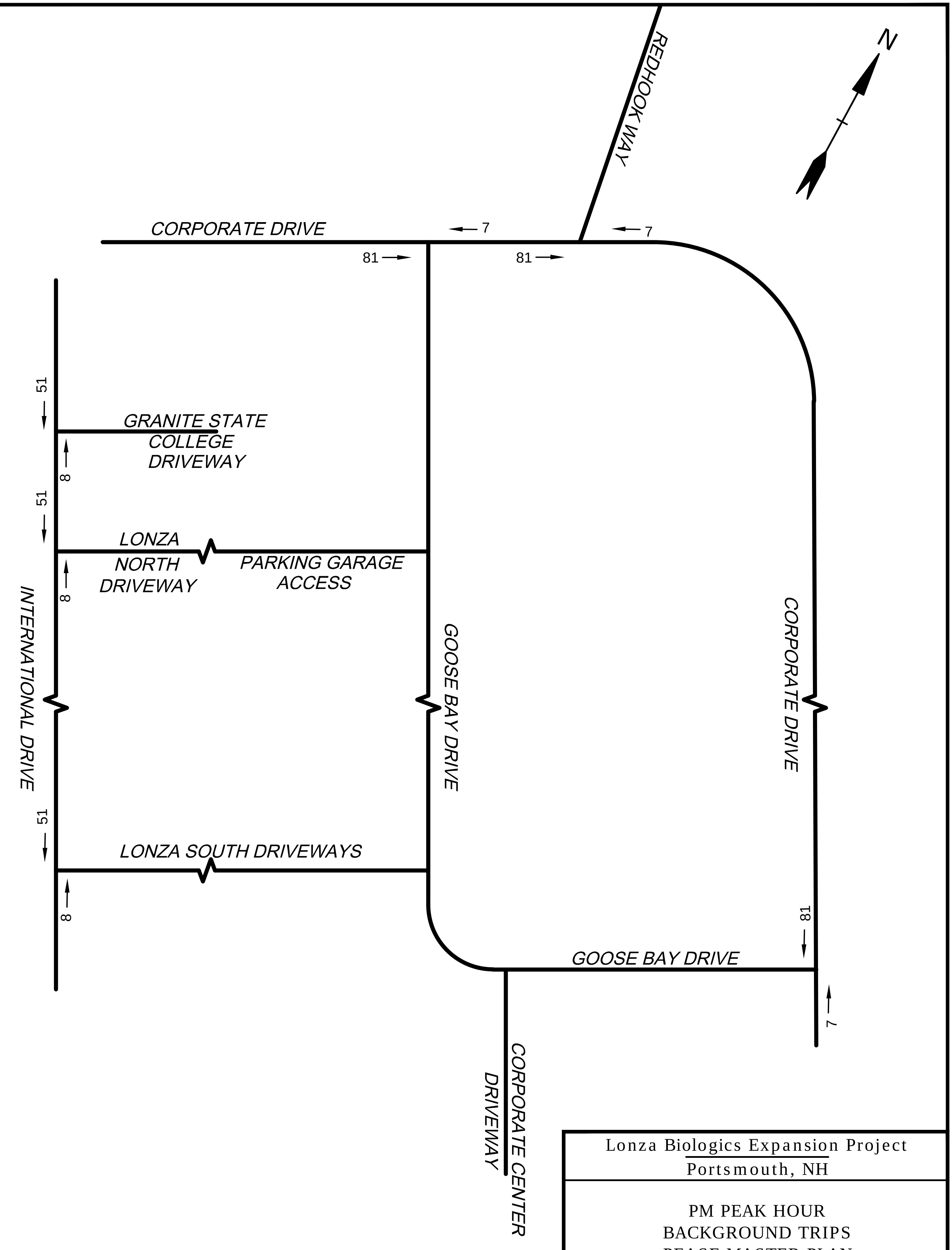


Lonza Biologics Expansion Project
Portsmouth, NH

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

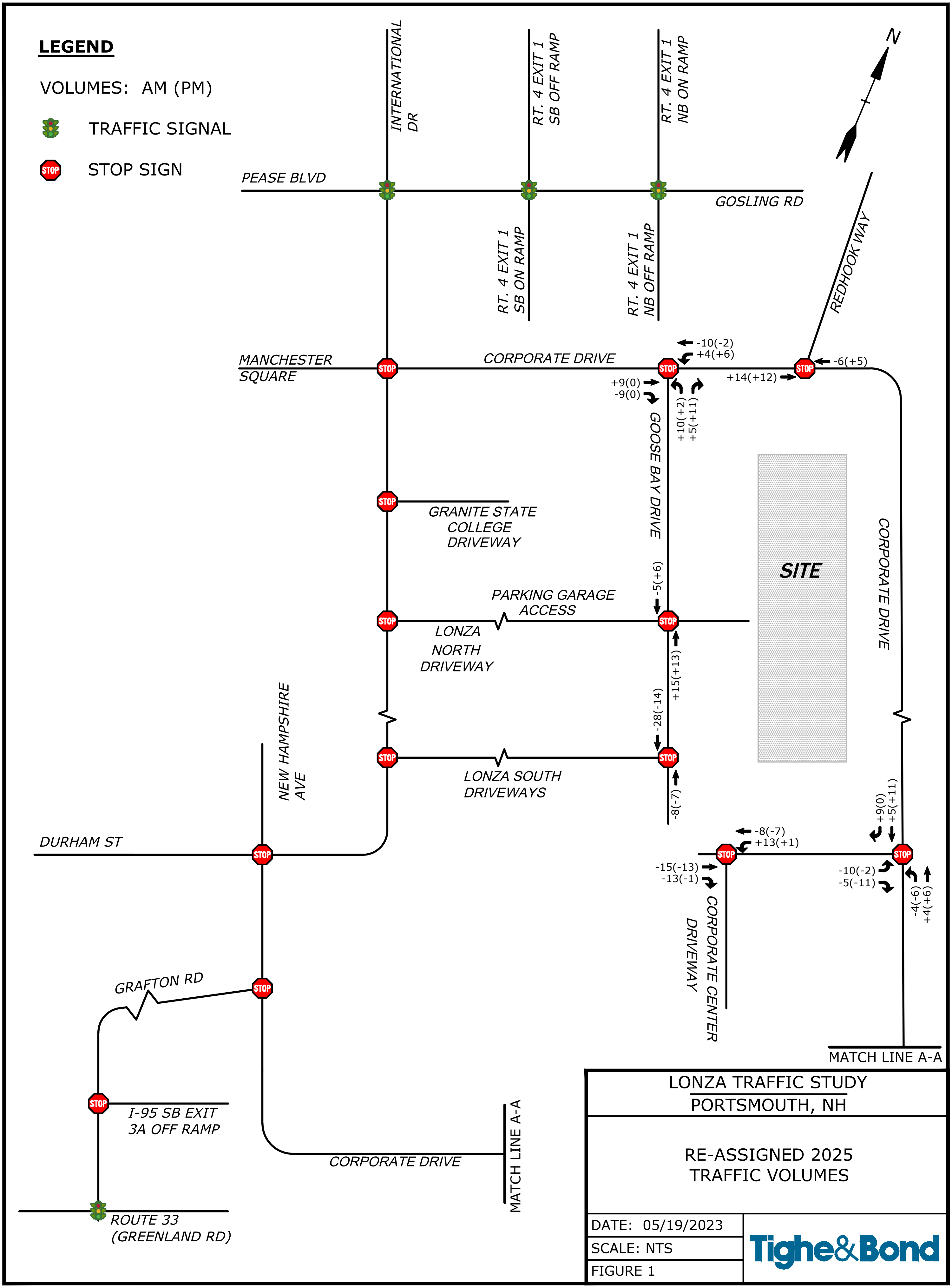
PM PEAK HOUR
BACKGROUND TRIPS
PEASE MASTER PLAN

DATE: 02/26/18
SCALE: NO SCALE
FIGURE A2

Tighe&Bond
www.tighebond.com

APPENDIX E

Reassigned Traffic Volumes



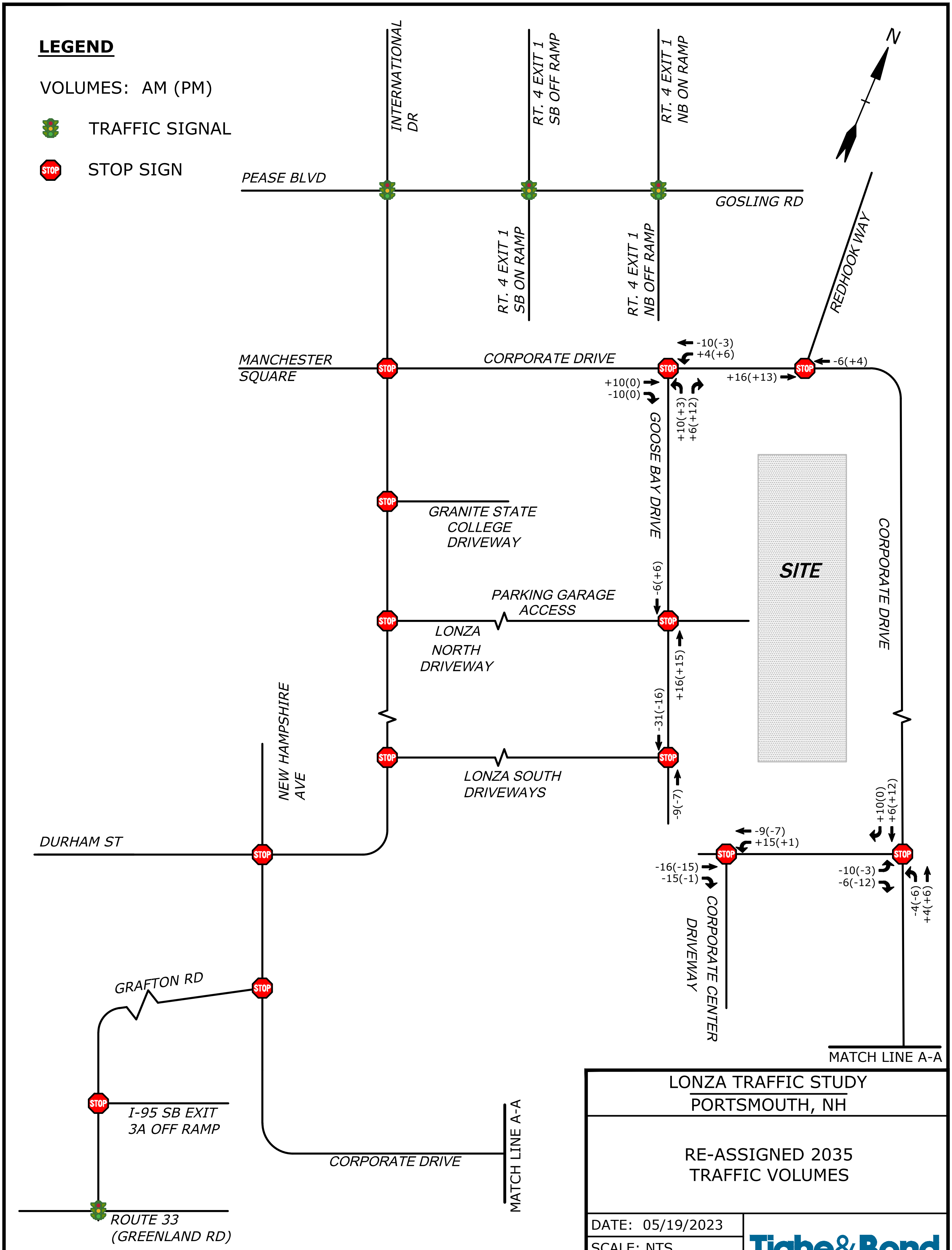
LONZA TRAFFIC STUDY
PORTSMOUTH, NH

RE-ASSIGNED 2025
TRAFFIC VOLUMES

DATE: 05/19/2023
SCALE: NTS
FIGURE 1

Tighe&Bond

May 19, 2023-10:49am Plotted By: MStoutz
Tighe & Bond, Inc. J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\Figures\L0700-026 Traffic Volume Figures.dwg



LONZA TRAFFIC STUDY
PORTSMOUTH, NH

RE-ASSIGNED 2035
TRAFFIC VOLUMES

DATE: 05/19/2023
SCALE: NTS
FIGURE 2

Tighe&Bond

May 19, 2023-10:49am Plotted By: MStoutz
Tighe & Bond, Inc. J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Drawings\AutoCAD\Figures\L0700-026 Traffic Volume Figures.dwg

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.

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[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

101: International Dr & Pease Blvd
2023 Existing Conditions Weekday AM Peak

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

102: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2023 Existing Conditions Weekday AM Peak

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

104: Route 33 (Greenland Rd) & Grafton Rd
2023 Existing Conditions Weekday AM Peak

	↗	→	←	↖	↘	↙
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			

201: International Drive & Corporate Drive
2023 Existing Conditions Weekday AM Peak

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

202: Goose Bay Drive & Corporate Drive
2023 Existing Conditions Weekday AM Peak

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	-

203: Corporate Drive & Redhook Way
2023 Existing Conditions Weekday AM Peak

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		Y	
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

204: Goose Bay Drive & Corporate Drive
2023 Existing Conditions Weekday AM Peak

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	-

205: Goose Bay Drive & Corporate Center Dwy
2023 Existing Conditions Weekday AM Peak

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

206: Goose Bay Drive & Lonza South Dwy
2023 Existing Conditions Weekday AM Peak

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↰	↱	
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	-	-

207: Lonza Parking Garage & Goose Bay Drive
2023 Existing Conditions Weekday AM Peak

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	-	-

208: Granite State Driveway & International Drive
2023 Existing Conditions Weekday AM Peak

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

209: International Drive & Lonza North Driveway
2023 Existing Conditions Weekday AM Peak

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

210: International Drive & Lonza South Driveway
2023 Existing Conditions Weekday AM Peak

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

211: Corporate Dr/New Hampshire Ave & Durham St/International Dr
2023 Existing Conditions Weekday AM Peak

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

101: International Dr & Pease Blvd
2023 Existing Conditions Weekday PM Peak

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

103: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd
2023 Existing Conditions Weekday PM Peak

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

104: Route 33 (Greenland Rd) & Grafton Rd
2023 Existing Conditions Weekday PM Peak

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			

201: International Drive & Corporate Drive
2023 Existing Conditions Weekday PM Peak

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

202: Goose Bay Drive & Corporate Drive
2023 Existing Conditions Weekday PM Peak

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	-

203: Corporate Drive & Redhook Way
2023 Existing Conditions Weekday PM Peak

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		Y	
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

204: Goose Bay Drive & Corporate Drive
2023 Existing Conditions Weekday PM Peak

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	-

205: Goose Bay Drive & Corporate Center Dwy
2023 Existing Conditions Weekday PM Peak

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	Y			↰	↱	
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	-	-

207: Lonza Parking Garage & Goose Bay Drive
2023 Existing Conditions Weekday PM Peak

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	-	-

208: Granite State Driveway & International Drive
2023 Existing Conditions Weekday PM Peak

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

209: International Drive & Lonza North Driveway
2023 Existing Conditions Weekday PM Peak

Intersection	
Int Delay, s/veh	6.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

210: International Drive & Lonza South Driveway
2023 Existing Conditions Weekday PM Peak

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

211: Corporate Dr/New Hampshire Ave & Durham St/International Dr
2023 Existing Conditions Weekday PM Peak

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

213: Grafton Rd & I-95 SB Off-ramp
2023 Existing Conditions Weekday PM Peak

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	-

101: International Dr & Pease Blvd
2025 No Build Condition Weekday AM Peak

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
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

102: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2025 No Build Condition Weekday AM Peak

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

103: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd
2025 No Build Condition Weekday AM Peak

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
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

104: Route 33 (Greenland Rd) & Grafton Rd
2025 No Build Condition Weekday AM Peak

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			

201: International Drive & Corporate Drive
2025 No Build Condition Weekday AM Peak

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

202: Goose Bay Drive & Corporate Drive
2025 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	-

203: Corporate Drive & Redhook Way
2025 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		Y	
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

204: Goose Bay Drive & Corporate Drive
2025 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	-

205: Goose Bay Drive & Corporate Center Dwy
2025 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

206: Goose Bay Drive & Lonza South Dwy
2025 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↰	↱	
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	-	-

207: Lonza Parking Garage & Goose Bay Drive
2025 No Build Condition Weekday AM Peak

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	-	-

208: Granite State Driveway & International Drive
2025 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

209: International Drive & Lonza North Driveway
2025 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

210: International Drive & Lonza South Driveway
2025 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

211: Corporate Dr/New Hampshire Ave & Durham St/International Dr
2025 No Build Condition Weekday AM Peak

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	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

101: International Dr & Pease Blvd
2025 No Build Condition Weekday PM Peak

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
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

102: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2025 No Build Condition Weekday PM Peak

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

103: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd
2025 No Build Condition Weekday PM Peak

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

104: Route 33 (Greenland Rd) & Grafton Rd
2025 No Build Condition Weekday PM Peak

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			

201: International Drive & Corporate Drive
2025 No Build Condition Weekday PM Peak

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	↱			↰	Y	
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	-

203: Corporate Drive & Redhook Way
2025 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		Y	
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

204: Goose Bay Drive & Corporate Drive
2025 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	-

205: Goose Bay Drive & Corporate Center Dwy
2025 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

206: Goose Bay Drive & Lonza South Dwy
2025 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↰	↱	
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	-	-

207: Lonza Parking Garage & Goose Bay Drive
2025 No Build Condition Weekday PM Peak

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	-	-

208: Granite State Driveway & International Drive
2025 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	Y		↱			↰
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 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

211: Corporate Dr/New Hampshire Ave & Durham St/International Dr
2025 No Build Condition Weekday PM Peak

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

213: Grafton Rd & I-95 SB Off-ramp
2025 No Build Condition Weekday PM Peak

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

103: US Route 4 NB Off-ramp/US Route 4 NB On-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)	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

104: Route 33 (Greenland Rd) & Grafton Rd
2025 Build Condition Weekday AM Peak

	↗	→	←	↖	↘	↙
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			

201: International Drive & Corporate Drive
2025 Build Condition Weekday AM Peak

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	-

203: Corporate Drive & Redhook Way
2025 Build Condition Weekday AM Peak

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

204: Goose Bay Drive & Corporate Drive
2025 Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	-

205: Goose Bay Drive & Corporate Center Dwy
2025 Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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)	-	-	-	-	-

206: Goose Bay Drive & Lonza South Dwy
2025 Build Condition Weekday AM Peak

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	-	-

207: Lonza Parking Garage & Goose Bay Drive
2025 Build Condition Weekday AM Peak

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	-	-

208: Granite State Driveway & International Drive
2025 Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

209: International Drive & Lonza North Driveway
2025 Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

210: International Drive & Lonza South Driveway
2025 Build Condition Weekday AM Peak

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	-

211: Corporate Dr/New Hampshire Ave & Durham St/International Dr
2025 Build Condition Weekday AM Peak

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	-	-

212: Corporate Dr & Grafton Rd
2025 Build Condition Weekday AM Peak

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

213: Grafton Rd & I-95 SB Off-ramp
2025 Build Condition Weekday AM Peak

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

101: International Dr & Pease Blvd
2025 Build Condition Weekday PM Peak

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
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

102: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2025 Build Condition Weekday PM Peak

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

103: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd
2025 Build Condition Weekday PM Peak

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

104: Route 33 (Greenland Rd) & Grafton Rd
2025 Build Condition Weekday PM Peak

	↗	→	←	↖	↘	↙
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			

201: International Drive & Corporate Drive
2025 Build Condition Weekday PM Peak

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

202: Goose Bay Drive & Corporate Drive
2025 Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	201

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	↰	↑	↱		Y	
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

204: Goose Bay Drive & Corporate Drive
2025 Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	-

205: Goose Bay Drive & Corporate Center Dwy
2025 Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	Y			↰	↱	
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	-	-

207: Lonza Parking Garage & Goose Bay Drive
2025 Build Condition Weekday PM Peak

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	-	-

208: Granite State Driveway & International Drive
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	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 Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	7.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	Y		↱			↰
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	-

211: Corporate Dr/New Hampshire Ave & Durham St/International Dr
2025 Build Condition Weekday PM Peak

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

212: Corporate Dr & Grafton Rd
2025 Build Condition Weekday PM Peak

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

213: Grafton Rd & I-95 SB Off-ramp
2025 Build Condition Weekday PM Peak

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	-

101: International Dr & Pease Blvd
2035 No Build Condition Weekday AM Peak

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

102: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2035 No Build Condition Weekday AM Peak

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
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

103: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd
2035 No Build Condition Weekday AM Peak

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

104: Route 33 (Greenland Rd) & Grafton Rd
2035 No Build Condition Weekday AM Peak

	↗	→	←	↖	↘	↙
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			

202: Goose Bay Drive & Corporate Drive
2035 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	-

203: Corporate Drive & Redhook Way
2035 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		Y	
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

204: Goose Bay Drive & Corporate Drive
2035 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	-

205: Goose Bay Drive & Corporate Center Dwy
2035 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

206: Goose Bay Drive & Lonza South Dwy
2035 No Build Condition Weekday AM Peak

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	-	-

207: Goose Bay Drive & Lonza Parking Garage/Proposed Dwy
2035 No Build Condition Weekday AM Peak

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	-	-

208: Granite State Driveway & International Drive
2035 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

209: International Drive & Lonza North Driveway
2035 No Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

211: Corporate Dr/New Hampshire Ave & Durham St/International Dr
2035 No Build Condition Weekday AM Peak

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

212: Corporate Dr & Grafton Rd
2035 No Build Condition Weekday AM Peak

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

213: Grafton Rd & I-95 SB Off-ramp
2035 No Build Condition Weekday AM Peak

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

102: US Route 4 SB On-Ramp/US Route 4 SB Off-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)	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

104: Route 33 (Greenland Rd) & Grafton Rd
2035 No Build Condition Weekday PM Peak

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			

105: International Drive & Corporate Drive
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)	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			

202: Goose Bay Drive & Corporate Drive
2035 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	78.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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

203: Corporate Drive & Redhook Way
2035 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		Y	
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

204: Goose Bay Drive & Corporate Drive
2035 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	-

205: Goose Bay Drive & Corporate Center Dwy
2035 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

206: Goose Bay Drive & Lonza South Dwy
2035 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↰	↱	
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	-	-

207: Goose Bay Drive & Lonza Parking Garage/Proposed Dwy
2035 No Build Condition Weekday PM Peak

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	-	-

208: Granite State Driveway & International Drive
2035 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

209: International Drive & Lonza North Driveway
2035 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	12.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

210: International Drive & Lonza South Driveway
2035 No Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

211: Corporate Dr/New Hampshire Ave & Durham St/International Dr
2035 No Build Condition Weekday PM Peak

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

213: Grafton Rd & I-95 SB Off-ramp
2035 No Build Condition Weekday PM Peak

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

102: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2035 Build Condition Weekday AM Peak

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
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

103: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd
2035 Build Condition Weekday AM Peak

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

104: Route 33 (Greenland Rd) & Grafton Rd
2035 Build Condition Weekday AM Peak

	↗	→	←	↖	↘	↙
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			

202: Goose Bay Drive & Corporate Drive
2035 Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	14.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
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	-

203: Corporate Drive & Redhook Way
2035 Build Condition Weekday AM Peak

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

204: Goose Bay Drive & Corporate Drive
2035 Build Condition Weekday AM Peak

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	-

205: Goose Bay Drive & Corporate Center Dwy
2035 Build Condition Weekday AM Peak

Intersection						
Int Delay, s/veh	0					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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)	-	-	-	-	-

206: Goose Bay Drive & Lonza South Dwy
2035 Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↰	↱	
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	-	-

207: Goose Bay Drive & Lonza Parking Garage/Proposed Dwy
2035 Build Condition Weekday AM Peak

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	-	-

208: Granite State Driveway & International Drive
2035 Build Condition Weekday AM Peak

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	-

209: International Drive & Lonza North Driveway
2035 Build Condition Weekday AM Peak

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	-

210: International Drive & Lonza South Driveway
2035 Build Condition Weekday AM Peak

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	-

211: Corporate Dr/New Hampshire Ave & Durham St/International Dr
2035 Build Condition Weekday AM Peak

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

213: Grafton Rd & I-95 SB Off-ramp
2035 Build Condition Weekday AM Peak

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

101: International Dr & Pease Blvd
2035 Build Condition Weekday PM Peak

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

102: US Route 4 SB On-Ramp/US Route 4 SB Off-Ramp & Pease Blvd
2035 Build Condition Weekday PM Peak

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

103: US Route 4 NB Off-ramp/US Route 4 NB On-Ramp & Pease Blvd
2035 Build Condition Weekday PM Peak

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			

105: International Drive & Corporate Drive
2035 Build Condition Weekday PM Peak

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	↰	↑	↱		Y	
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

204: Goose Bay Drive & Corporate Drive
2035 Build Condition Weekday PM Peak

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	-

205: Goose Bay Drive & Corporate Center Dwy
2035 Build Condition Weekday PM Peak

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
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	Y			↰	↱	
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	-	-

207: Goose Bay Drive & Lonza Parking Garage/Proposed Dwy
2035 Build Condition Weekday PM Peak

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	-	-

208: Granite State Driveway & International Drive
2035 Build Condition Weekday PM Peak

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	-

209: International Drive & Lonza North Driveway
2035 Build Condition Weekday PM Peak

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	-

211: Corporate Dr/New Hampshire Ave & Durham St/International Dr
2035 Build Condition Weekday PM Peak

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

212: Corporate Dr & Grafton Rd
2035 Build Condition Weekday PM Peak

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

213: Grafton Rd & I-95 SB Off-ramp
2035 Build Condition Weekday PM Peak

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.

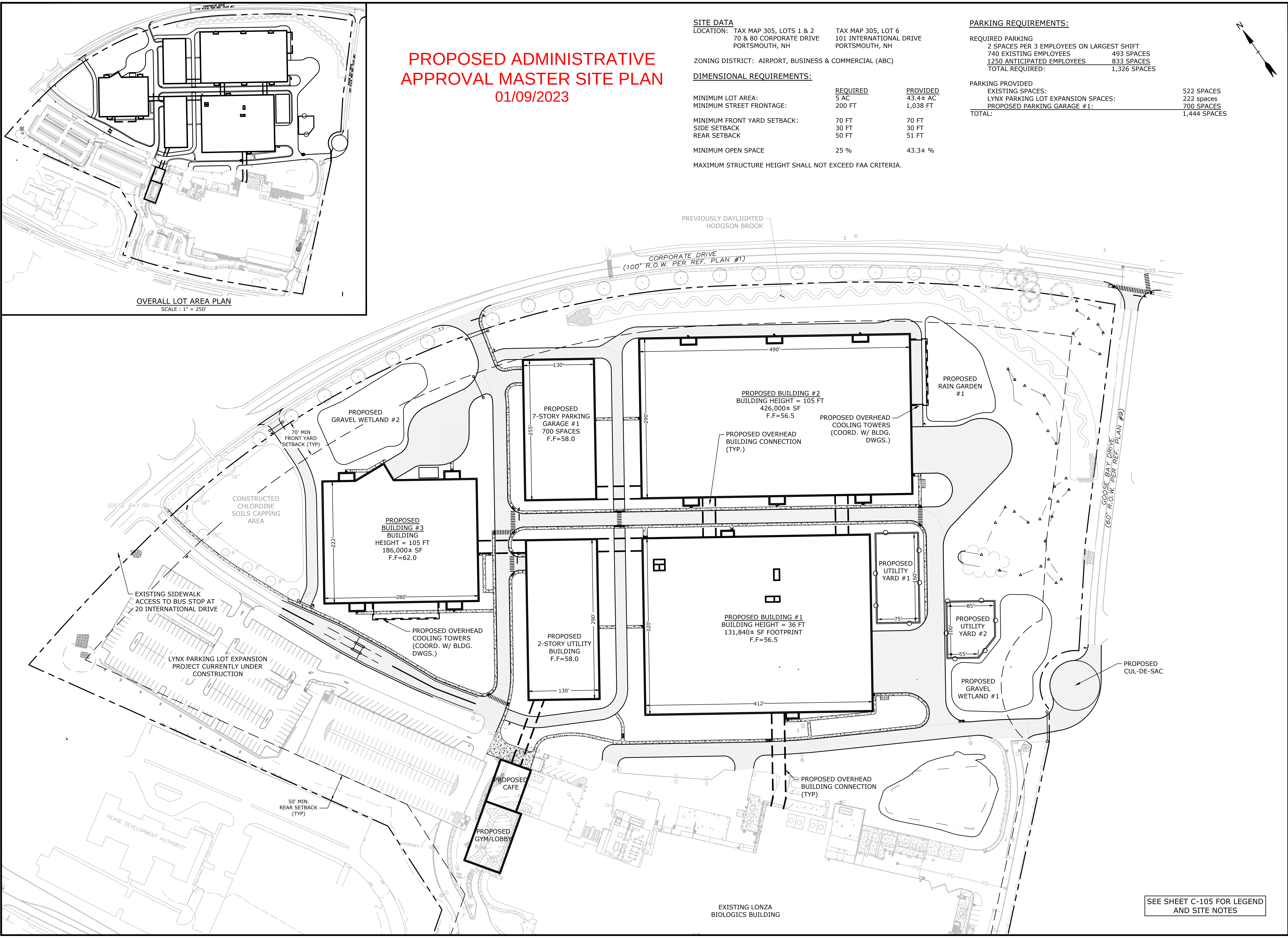
PARKING REQUIREMENTS:

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



SEE SHEET C-105 FOR LEGEND AND SITE NOTES

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 1576F\026_Project Albacore\Drawings\AutoCAD\L-0700-026-C-DSGN.dwg Layout Tab: C-104

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

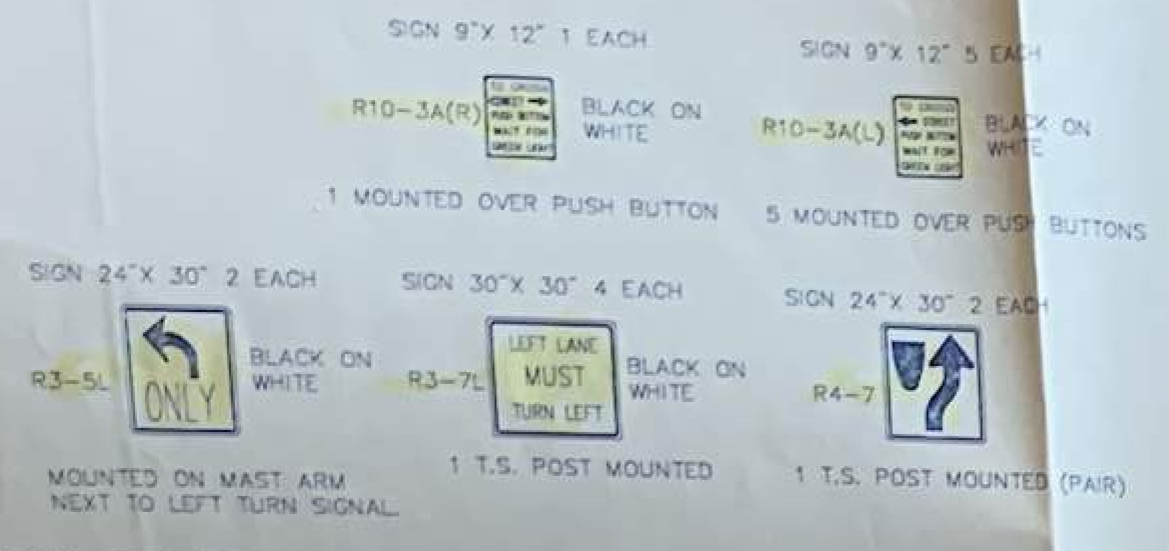
MASTER SITE PLAN

SCALE: AS SHOWN

C-104

APPENDIX J

Traffic Control Signal Plans

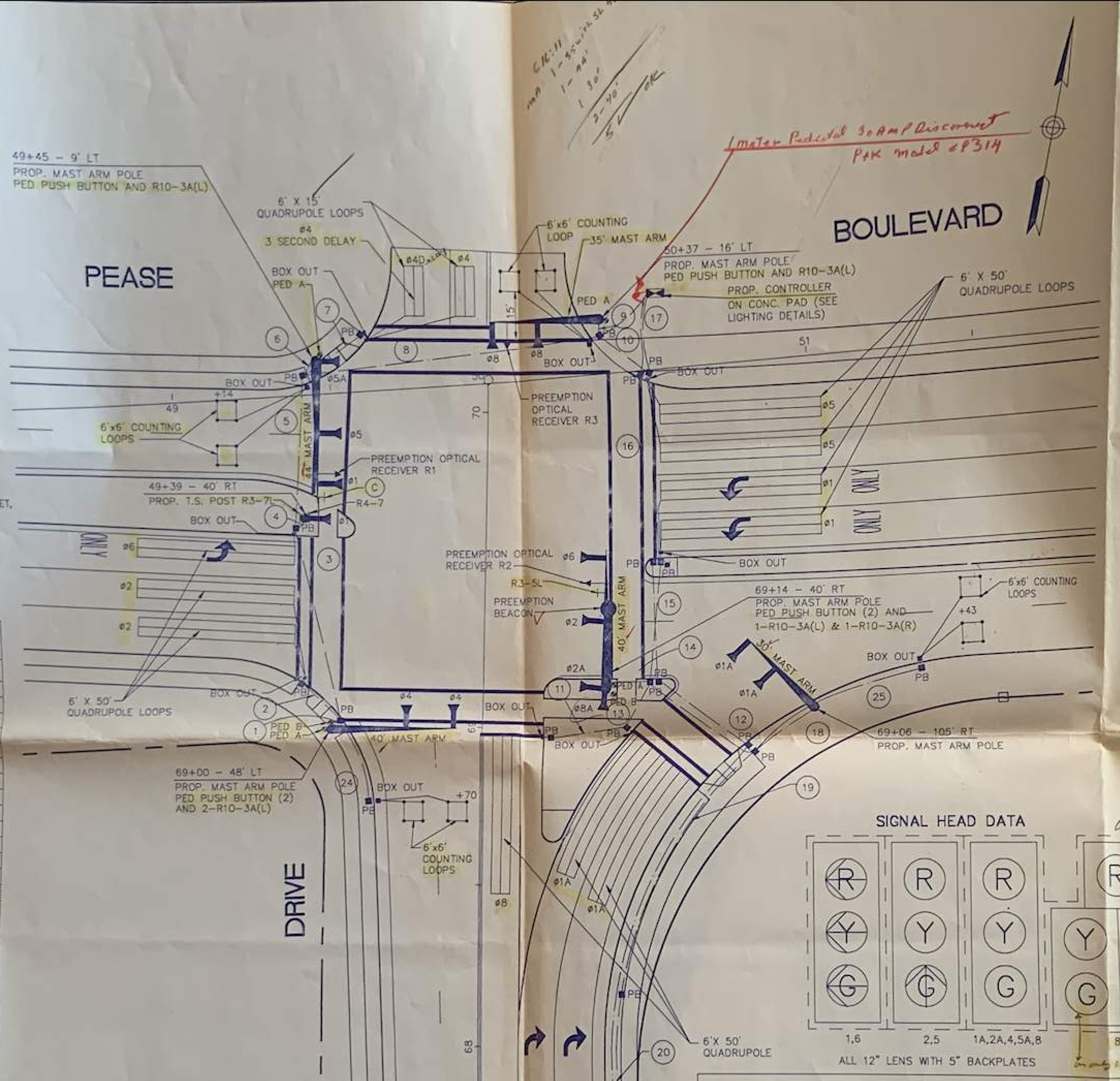


PULL BOX SCHEDULE

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.



20 0 20 40
SCALE IN FEET
TO CORPORATE DRIVE

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	40	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				
						RECORD FIELD MEASUREMENTS HERE			

C – COUNTING LOOP

PRE-EMPTION PHASING & PRIORITY

RECEIVER & PRIORITY	PREEMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
R1	1		1 + 5
R2	2		2 + 6
R3	3		8

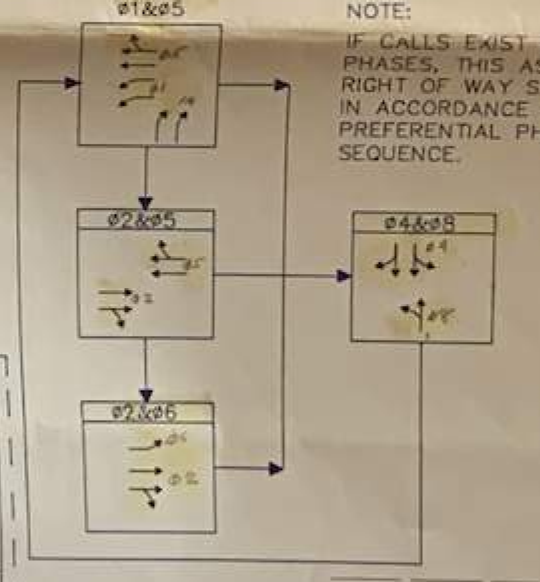
If you preempt ø8 ø4 will also be called

EMERGENCY VEHICLE PRE-EMPTION OPERATION

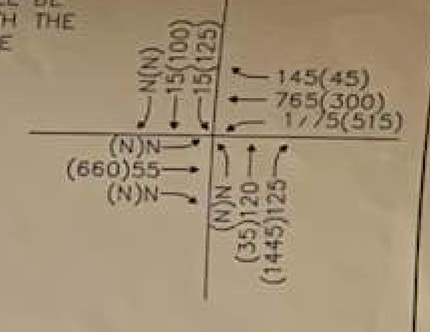
1. PRE-EMPTION OPERATION UTILIZES AVAILABLE PHASES IN 8 PHASE TIMER THROUGH THE MSD PRE-EMPT INPUTS TO EFFECT APPROPRIATE SIGNAL DISPLAYS FOR SINGLE APPROACH MOVEMENTS AS SHOWN IN THE PRE-EMPTION PHASING AND PRIORITY CHART.
2. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL 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 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

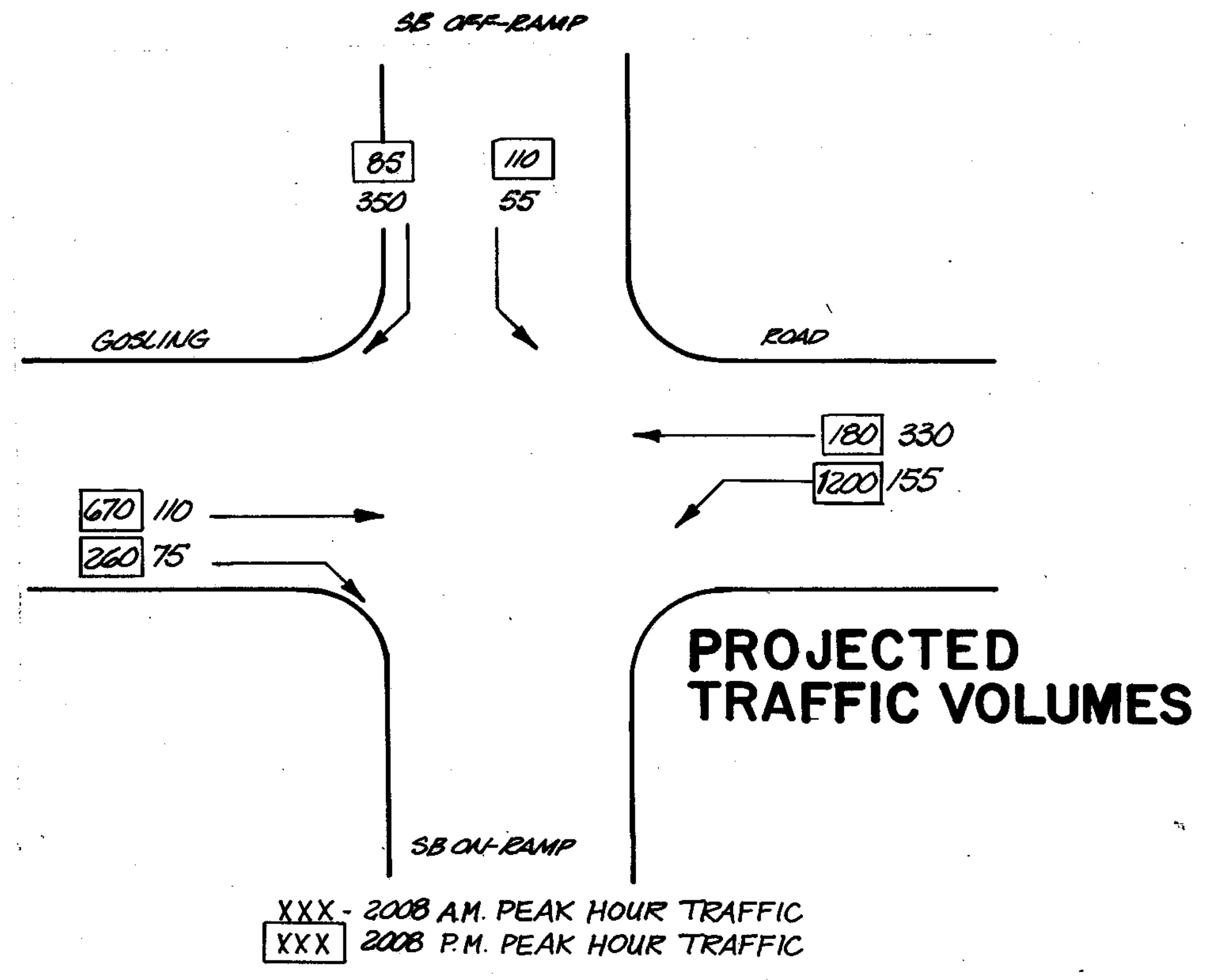
616:11

Designed by: Drawn by: Checked by:
Scale: 1" = 20'
Date: March 18, 1994
Sheet of

EXISTING DETAIL		DATE
PROPOSED DESIGN	P. Konieczka	DATE 10-6-89
SHEET CHECKED		DATE 10-6-89
AS BUILT DETAILS		DATE

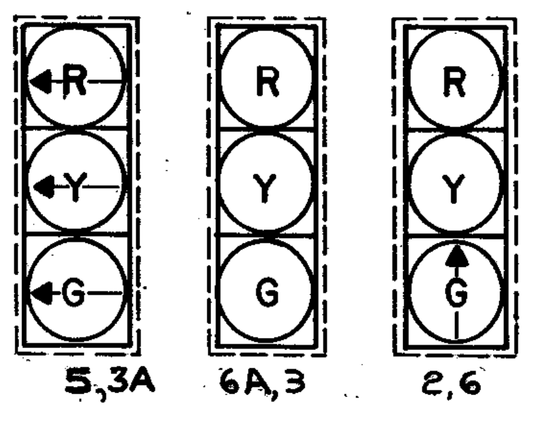
NOTEBOOKS	
BOOK	PAGE
BOOK	PAGE
BOOK	PAGE

REVISIONS AFTER PROPOSAL				
NUMBER	DATE	STATION	STATION	DESCRIPTION



SIGNAL HEADS

12" LENSES
5"(NOMINAL) BACKPLATES



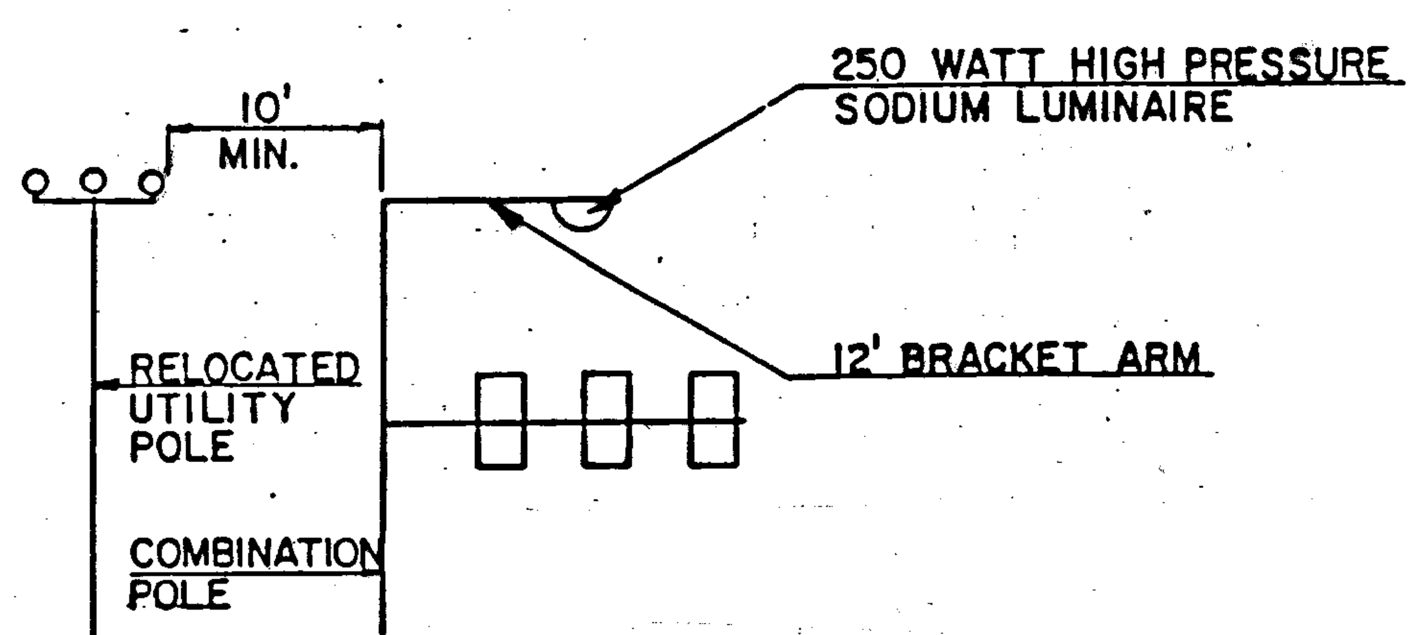
(C) = NO TURN ON RED ARROW — TO BE PLACED ADJACENT TO LEFT TURN SIGNALS 3A, 1A, 5

DETECTOR			AMPLIFIER	
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

INDUCT μH	RESIST. OF LOOP Ω	RESIST. LOOP/GND MEG. Ω	RESIST. SHIELD/GND MEG. Ω

RECORD FIELD MEASUREMENTS HERE

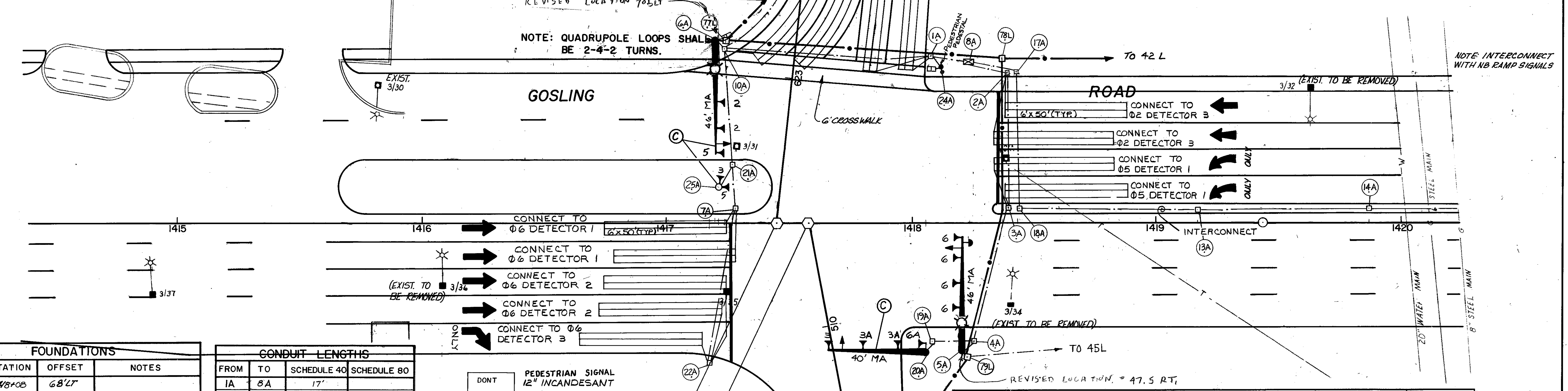
SCHEMATIC COMBINATION POLES



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.



NOTE: QUADRUPOLE LOOPS SHALL BE 2-4-2 TURNS.

FOUNDATIONS				
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

SB ON-RAMP

PUSH
BUTTON
FOR
WALK
SIGNAL

R10-4
9" x 12"

SIGNAL PHASING								
PHASE	1+5	2+6	3	4				
SOUTHBOUND RAMP INTERSECTION MOVEMENTS	PED Φ5	PED Φ2 Φ6	Φ3 Φ3					
NORTHBOUND RAMP INTERSECTION MOVEMENTS	Φ1 Φ6	PED Φ2 Φ6	Φ3 Φ3					

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
- =θ·•θ= 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

EXISTING DETAIL	DATE
PROPOSED DESIGN P. Konieczka	DATE 10-6-89
SHEET CHECKED	DATE 10-6-89
AS BUILT DETAILS	DATE

NOTEBOOKS

BOOK	PAGE
BOOK	PAGE
BOOK	PAGE

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	STATION	DESCRIPTION

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

DETECTOR			AMPLIFIER	
STREET	DIRECTION	LANE	NO.	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			

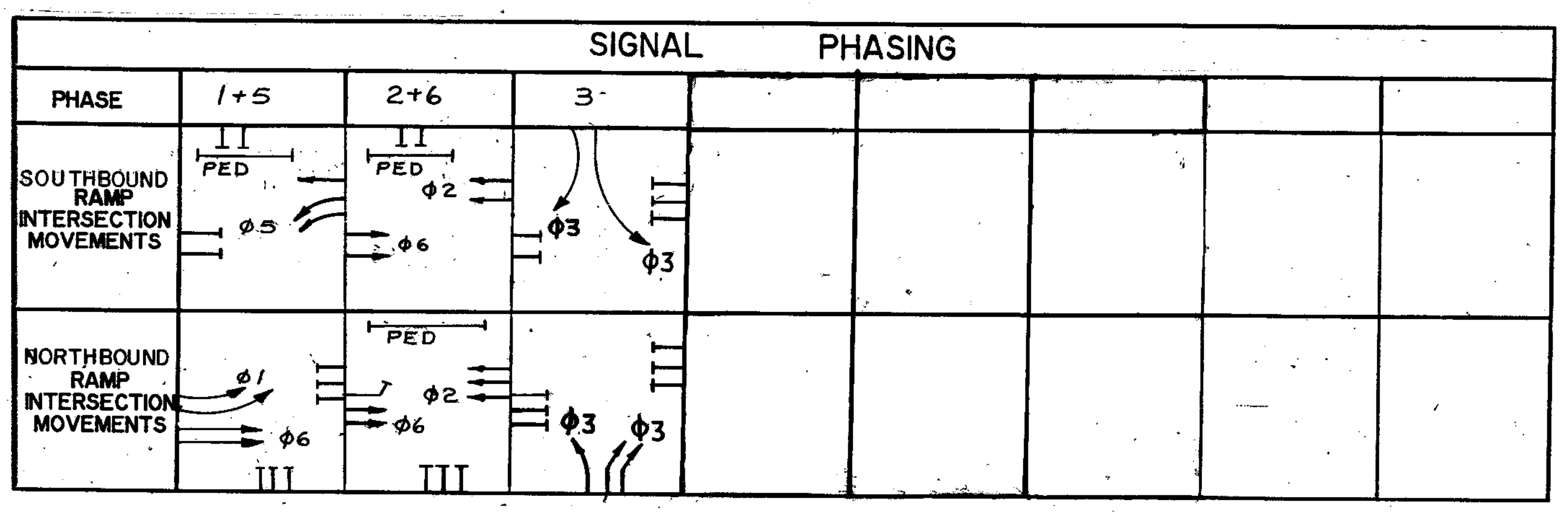
NOTE: QUADRUPOLE LOOPS SHALL BE 2-4-2 TURNS.

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.

SIGNAL PHASING



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.	

KEY

—•—	LIGHTING CONDUIT
—·—	SIGNAL CONDUIT
●	BOX OUT
☒	CONTROLLER CABINET
○	METER PEDESTAL
◫	PEDESTRIAN SIGNAL
=ϴ•ϴ=	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

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

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	–

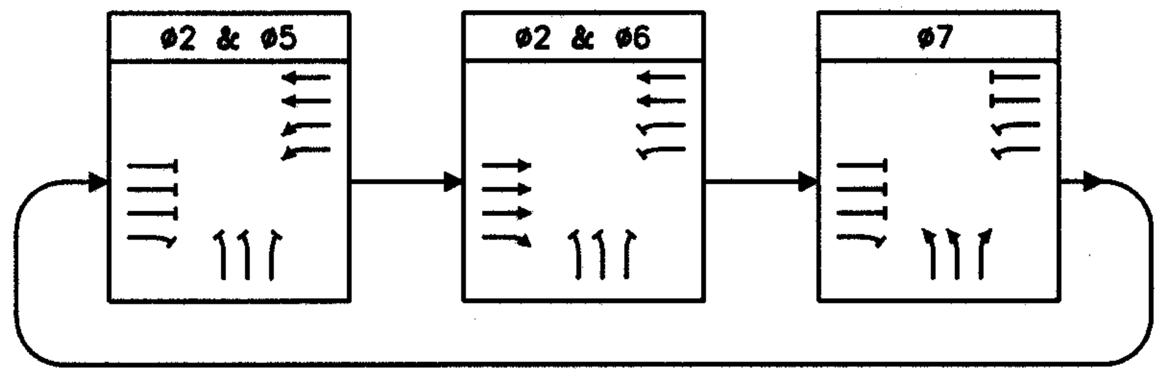
SYSTEM TO MAXIMUM 2 UNDER COORDINATION

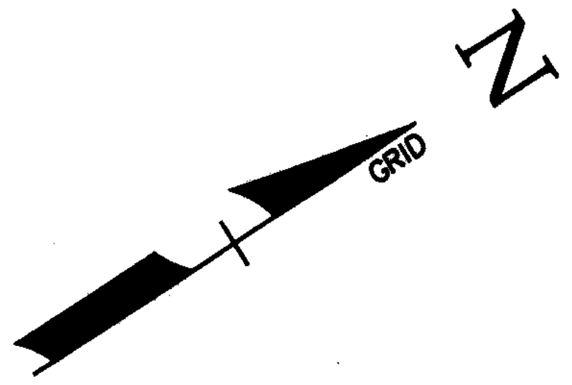
SIGNAL HEAD DATA

EXISTING		
5	2, 6, 7	6A
R Y G	R Y G	R Y G
12" LENS	12" LENS	12" LENS
WITH 5" LOUVERED BACKPLATES		

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.

2004 DESIGN YEAR
VOLUMES AM(PM)[WDMD]<SAT>

← 315 (1000) [605] <490>
← 240 (530) [170] <160>
<920> [795] (1070) 1155 →
<65> [95] (115) 105 →
<465> [445] (700) 600
<65> [95] (145) 325

2013 DESIGN YEAR
VOLUMES AM(PM)[WDMD]<SAT>

← 340 (1095) [665] <535>
← 265 (580) [190] <175>
<1005> [865] (1170) 1265 →
<70> [105] (125) 115 →
<510> [485] (770) 655
<70> [105] (160) 355

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.

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				
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

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

FIRE PREEMPTION

PREEMPT 1	CALLS ø1 & ø6
PREEMPT 2	CALLS ø2
PREEMPT 3	CALLS ø3

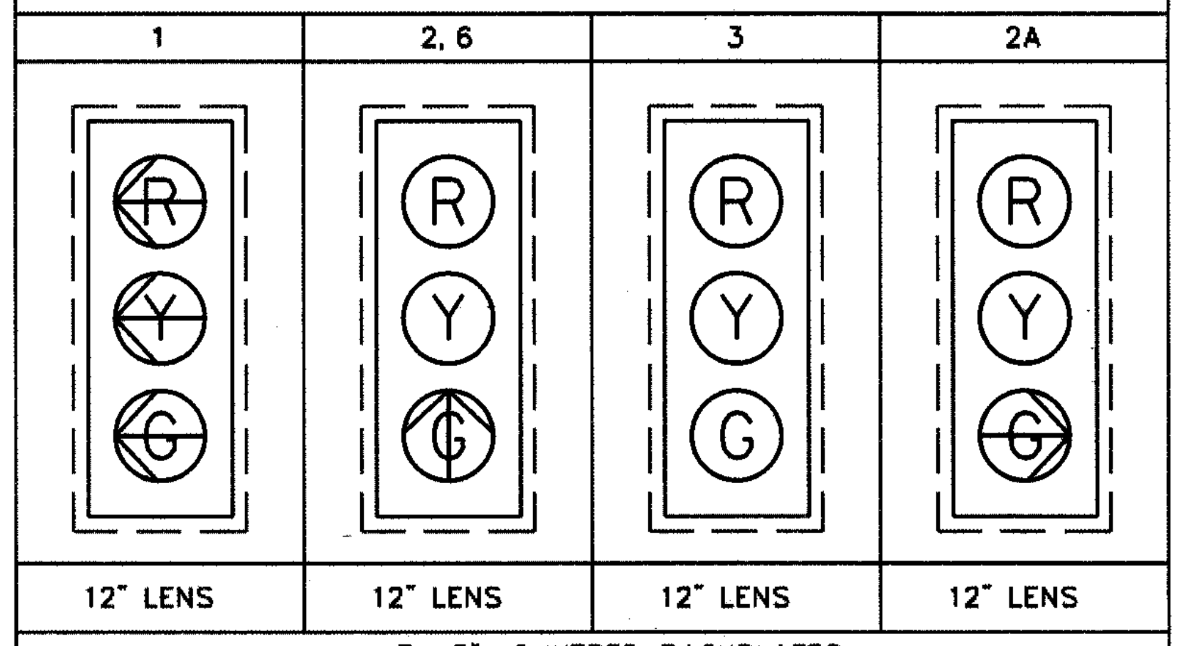
FIRE PREEMPTION NOTES:

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.

N.E.M.A.
PHASE SEQUENCE

SIGNAL HEAD DATA

EXISTING			
1	2, 6	3	2A
12" LENS	12" LENS	12" LENS	12" LENS
WITH 5" LOUVERED BACKPLATES			

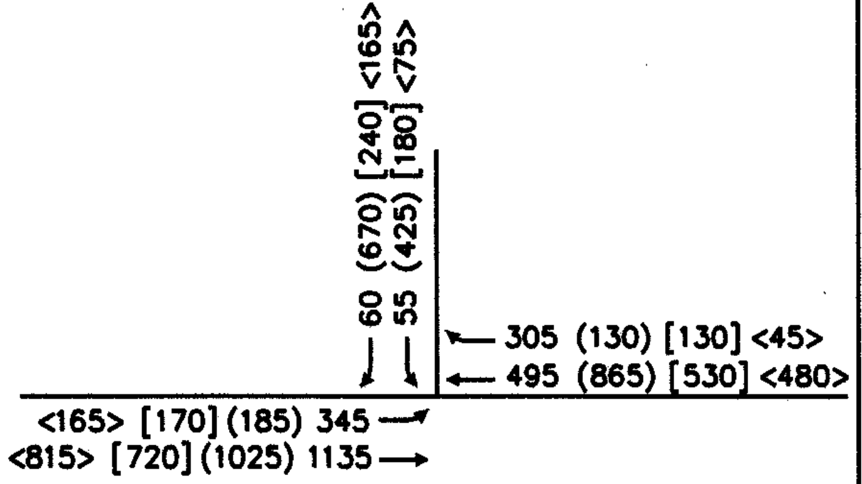


NOTE: ALL SIGNAL HEADS TO BE EQUIPPED WITH NEW L.E.D. MODULES.

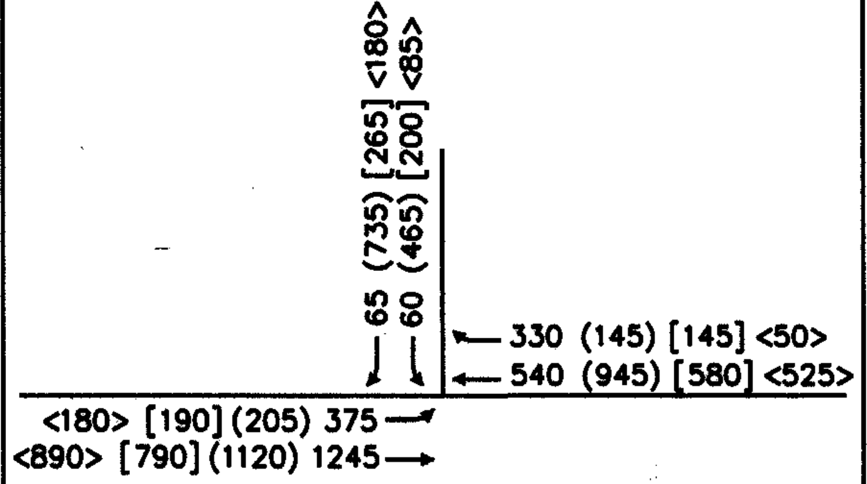
SIGNAL CONSTRUCTION NOTES:

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)

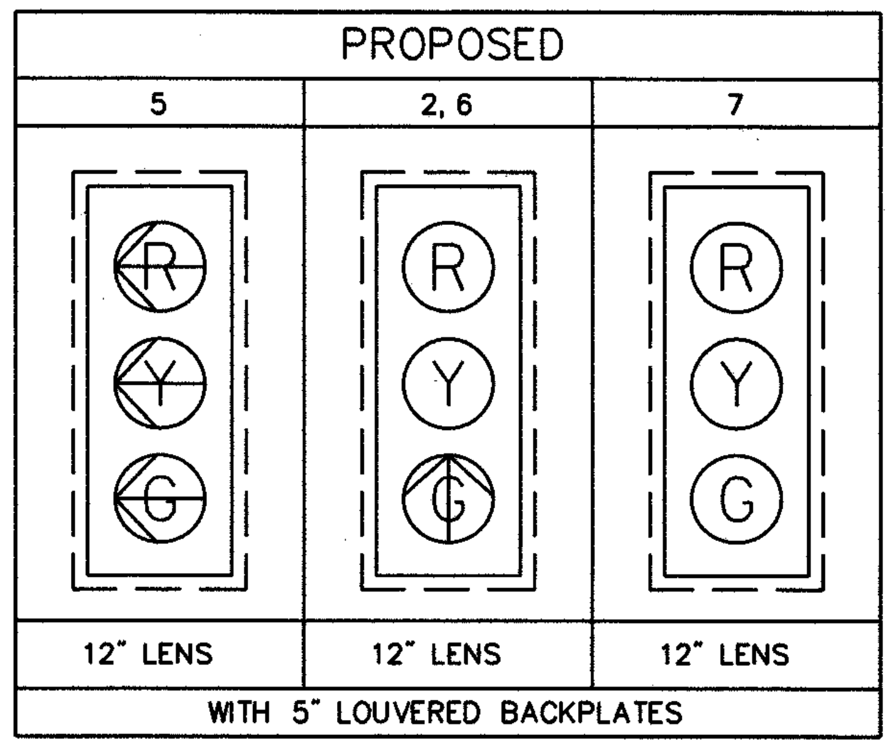
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
A-X000(179)	13879	9	14

REVISIONS AFTER PROPOSAL				
NUMBER	DATE	STATION	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



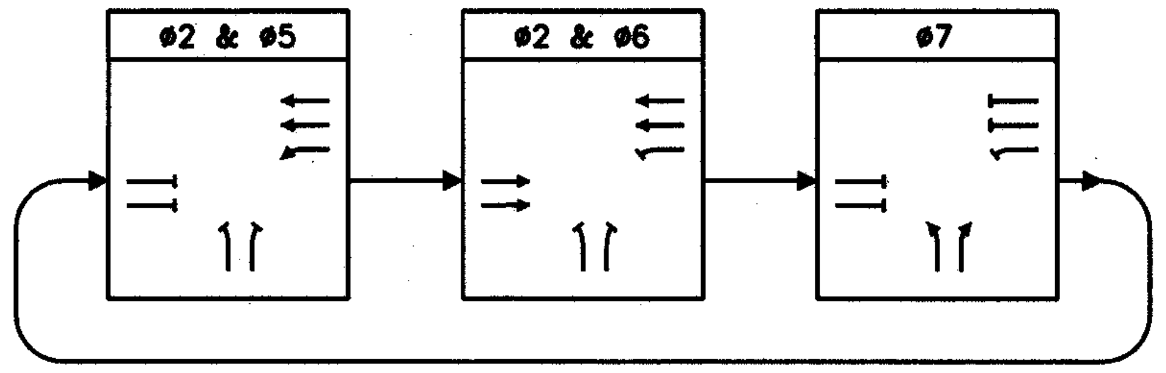
NOTE: ALL SIGNAL HEADS SHALL BE EQUIPPED WITH NEW L.E.D. MODULES.

FIRE PREEMPTION	
PREEMPT 1	CALLS ø6
PREEMPT 2	CALLS ø2 & ø5
PREEMPT 3	CALLS ø7

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.

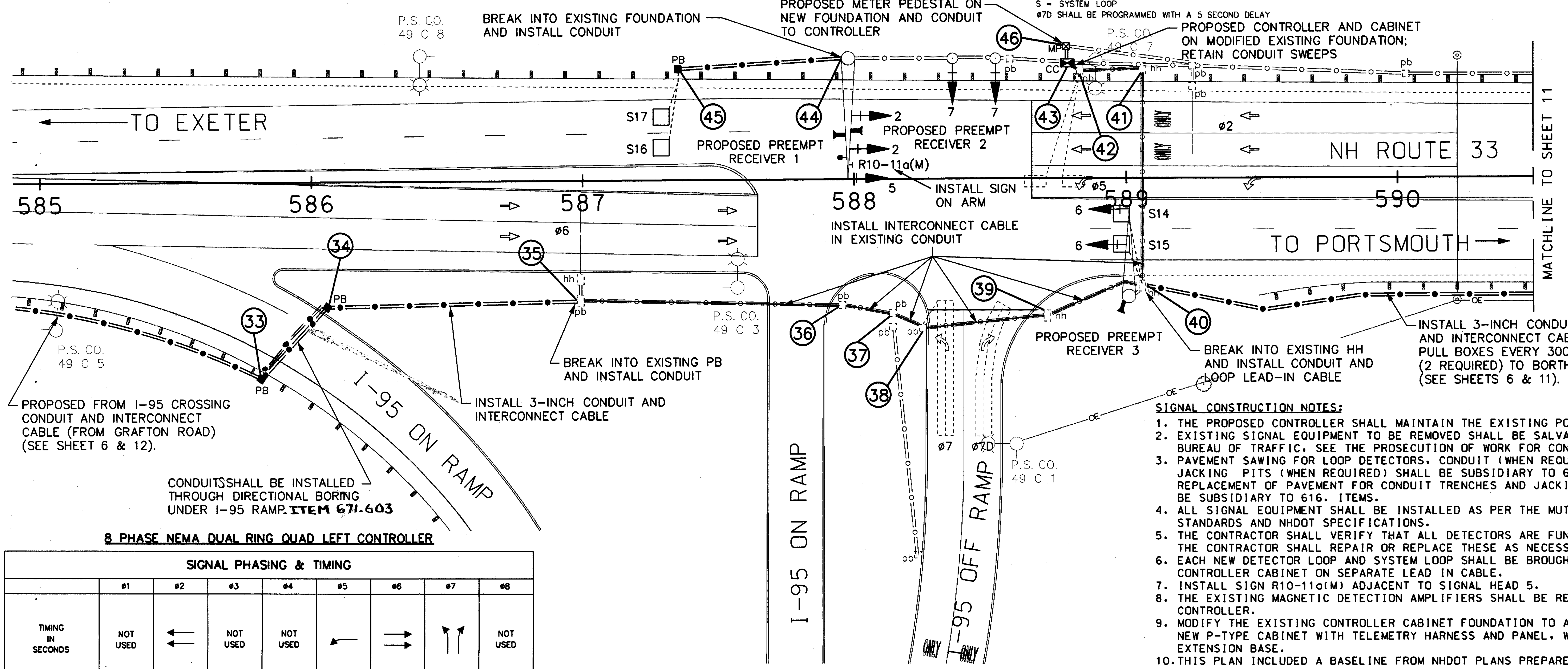
N.E.M.A. PHASE SEQUENCE



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 (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
ø7D 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.
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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.

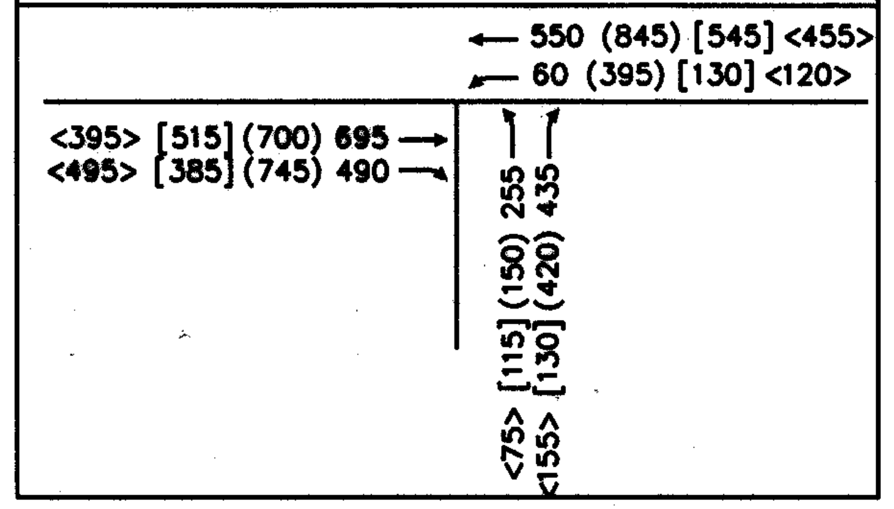
8 PHASE NEMA DUAL RING QUAD LEFT CONTROLLER

SIGNAL PHASING & TIMING

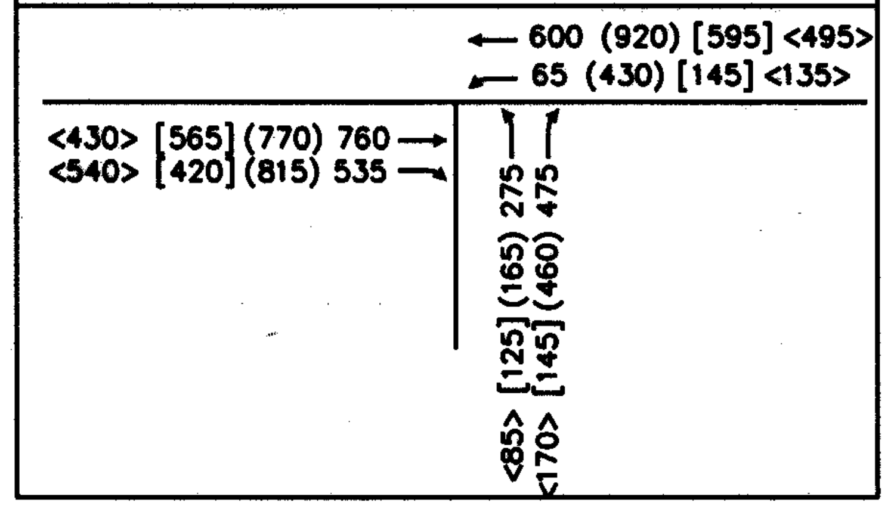
	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
TIMING IN SECONDS	NOT USED	← ←	NOT USED	NOT USED	↙	→ →	↰ ↱	NOT USED
INITIAL INTERVAL	-	10	-	-	5	10	8	-
VEHICLE EXTENSION	-	4	-	-	4	4	4	-
MAXIMUM 1	-	25	-	-	40	25	50	-
MAXIMUM 2	-	40	-	-	40	40	40	-
YELLOW	-	4	-	-	4	4	4	-
ALL RED	-	2	-	-	2	2	2	-
PEDESTRIAN WALK	-	-	-	-	-	-	-	-
PEDESTRIAN CLEAR	-	-	-	-	-	-	-	-
FLASH	-	FY	-	-	FRA	FY	FR	-
RECALL	-	SOFT	-	-	OFF	SOFT	OFF	-
DETECTOR	-	LOCK	-	-	NL	LOCK	NL	-
PRE-EMPT PRIORITY	-	2	-	-	2	1	3	-

ø4 & ø8 DUAL ENTRY
SYSTEM TO MAXIMUM 2 UNDER COORDINATION

2004 DESIGN YEAR
VOLUMES AM(PM)[WDMD]<SAT>



2013 DESIGN YEAR
VOLUMES AM(PM)[WDMD]<SAT>



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

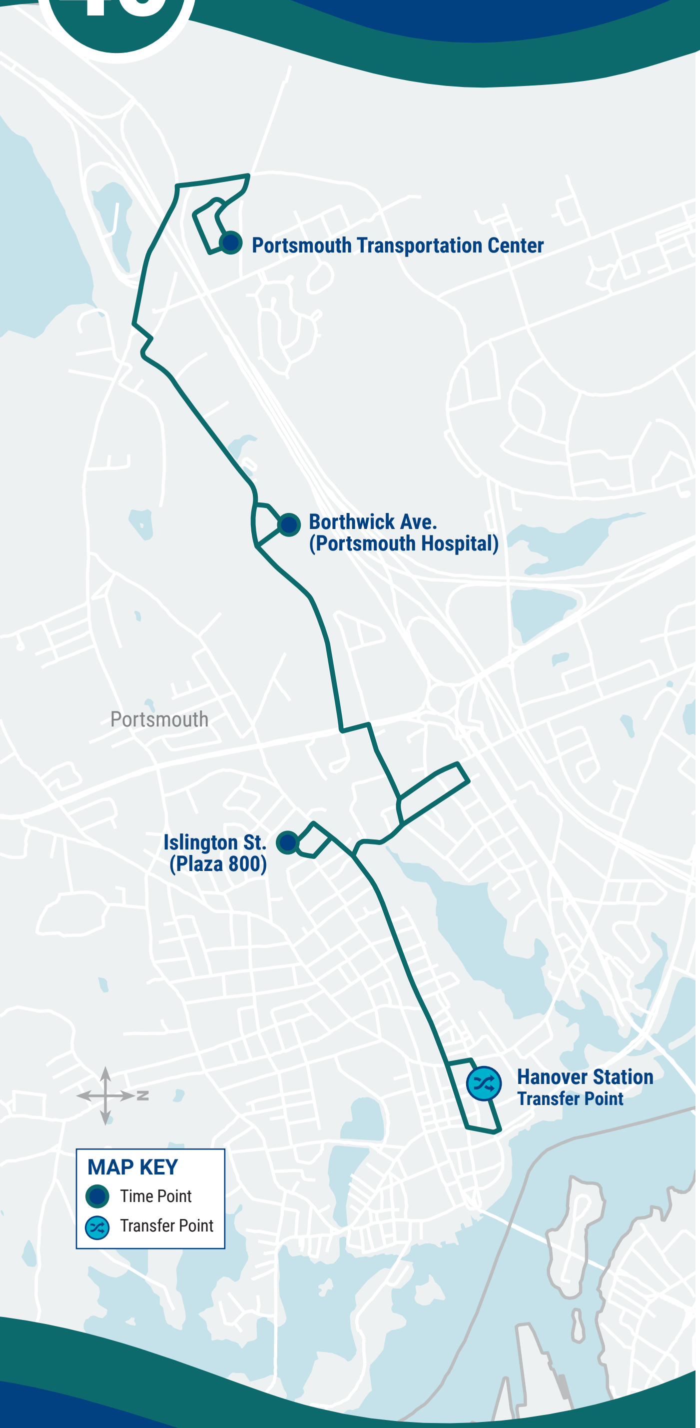
APPENDIX K

COAST Bus Schedule & Map

40

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

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 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

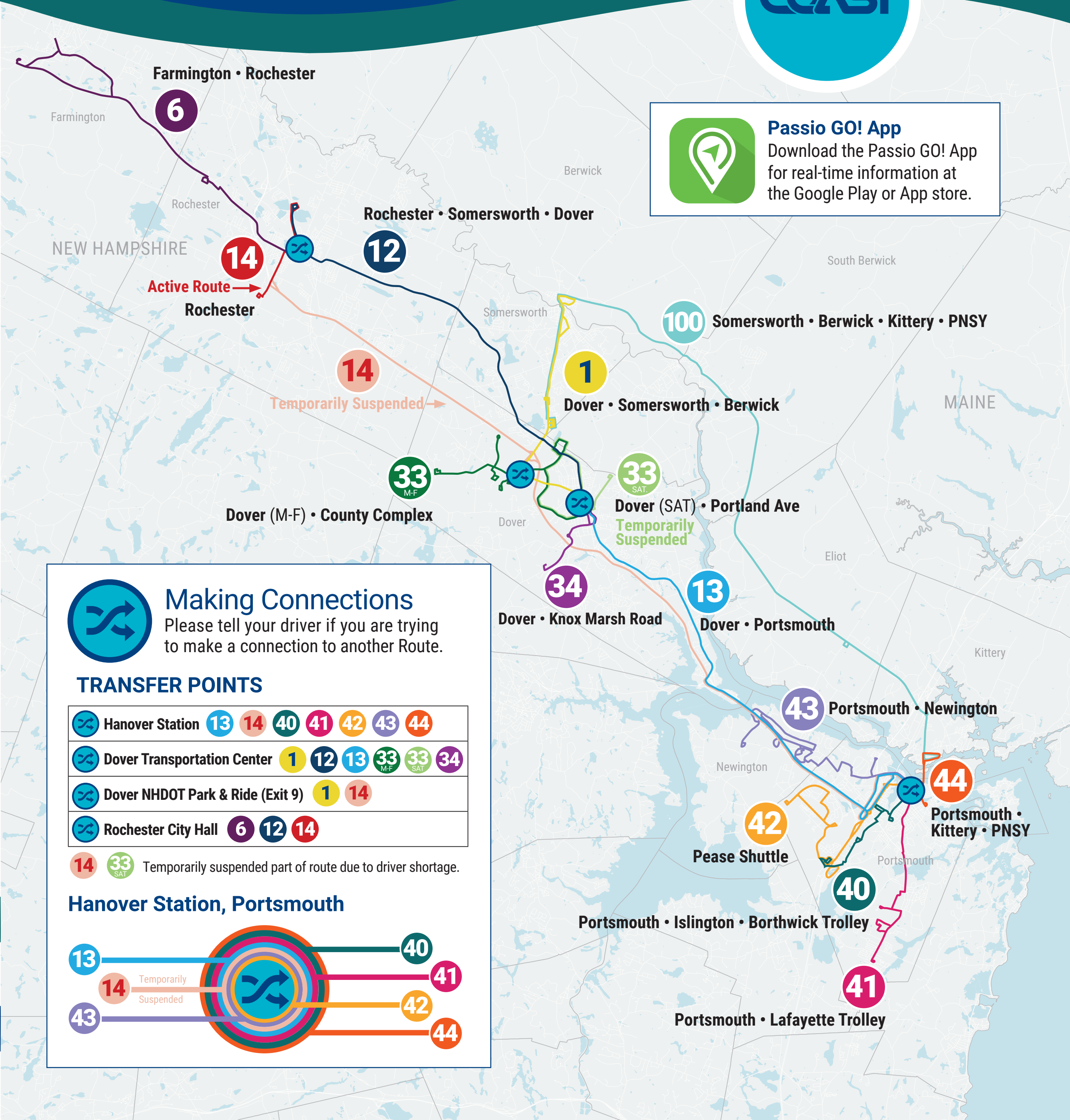
**No Service during the hour of 3pm.*

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.

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

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- New Year's Day
- 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

OUTBOUND • INBOUND

Route 42 Portsmouth • Pease Shuttle

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-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.

COAST SYSTEM MAP

Passio GO! App
Download the Passio GO! App for real-time information at the Google Play or App store.

Making Connections

Please tell your driver if you are trying to make a connection to another Route.

TRANSFER POINTS

Hanover Station	13 14 40 41 42 43 44
Dover Transportation Center	1 12 13 33 M-F 33 SAT 34
Dover NHDOT Park & Ride (Exit 9)	1 14
Rochester City Hall	6 12 14

14 33 SAT Temporarily suspended part of route due to driver shortage.

Hanover Station, Portsmouth

APPENDIX 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

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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	
78	3280.00	Washington	NH	1	0.013125		100.00%								OK	1	0	0	0	0	0	0	0	
79	3281.00	Weare	NH	1	0.017189		50.00%						50.00%		OK	0.5	0	0	0	0	0	0.5	0	
80	3290.00	Nottingham	NH	18	0.013032		50.00%						50.00%		OK	9	0	0	0	0	0	9	0	
81	3301.00	Concord	NH	2	0.014821		50.00%						50.00%		OK	1	0	0	0	0	0	1	0	
82	3303.00	Concord	NH	1	0.020526		50.00%						50.00%		OK	0.5	0	0	0	0	0	0.5	0	
83	3570.00	Berlin	NH	1	0.023446								100.00%		OK	0	0	0	0	0	0	1	0	
84	3576.00	Colebrook	NH	1	0.057233			34.00%	33.00%				33.00%		OK	0	0.34	0.33	0	0	0	0.33	0	
85	3801.00	Portsmouth	NH	116	0.008103				20.00%	20.00%	20.00%		20.00%	20.00%	OK	0	0	23.2	23.2	23.2	0	23.2	23.2	
86	3809.00	Alton	NH	1	0.014804								100.00%		OK	0	0	0	0	0	0	1	0	
87	3810.00	Alton Bay	NH	3	0.008575								100.00%		OK	0	0	0	0	0	0	3	0	
88	3811.00	Atkinson	NH	2	0.003295		100.00%								OK	2	0	0	0	0	0	0	0	
89	3812.00	Bartlett	NH	1	0.02191								100.00%		OK	0	0	0	0	0	0	1	0	
90	3819.00	Danville	NH	3	0.003186		50.00%						50.00%		OK	1.5	0	0	0	0	0	1.5	0	
91	3820.00	Dover	NH	116	0.00875								100.00%		OK	0	0	0	0	0	0	116	0	
92	3823.00	Madbury	NH	5	0.003217								100.00%		OK	0	0	0	0	0	0	5	0	
93	3824.00	Durham	NH	7	0.007376								100.00%		OK	0	0	0	0	0	0	7	0	
94	3825.00	Barrington	NH	20	0.014117								100.00%		OK	0	0	0	0	0	0	20	0	
95	3826.00	East Hampstead	NH	2	0.001192		100.00%								OK	2	0	0	0	0	0	0	0	
96	3827.00	East Kingston	NH	3	0.00496		100.00%								OK	3	0	0	0	0	0	0	0	
97	3830.00	East Wakefield	NH	2	0.003238								100.00%		OK	0	0	0	0	0	0	2	0	
98	3833.00	Exeter	NH	39	0.013793		50.00%		50.00%						OK	19.5	0	19.5	0	0	0	0	0	
99	3835.00	Farmington	NH	15	0.010892								100.00%		OK	0	0	0	0	0	0	15	0	
100	3839.00	Rochester	NH	9	0.002018								100.00%		OK	0	0	0	0	0	0	9	0	
101	3840.00	Greenland	NH	24	0.003048				100.00%						OK	0	0	24	0	0	0	0	0	
102	3841.00	Hampstead	NH	7	0.003098		100.00%								OK	7	0	0	0	0	0	0	0	
103	3842.00	Hampton	NH	27	0.003921		100.00%								OK	27	0	0	0	0	0	0	0	
104	3844.00	Hampton Falls	NH	4	0.003506		100.00%								OK	4	0	0	0	0	0	0	0	
105	3848.00	Kingston	NH	3	0.005907		100.00%								OK	3	0	0	0	0	0	0	0	
106	3851.00	Milton	NH	10	0.008272								100.00%		OK	0	0	0	0	0	0	10	0	
107	3852.00	Milton Mills	NH	1	0.001669								100.00%		OK	0	0	0	0	0	0	1	0	
108	3855.00	New Durham	NH	9	0.012785								100.00%		OK	0	0	0	0	0	0	9	0	
109	3856.00	Newfields	NH	5	0.00225				100.00%						OK	0	0	5	0	0	0	0	0	
110	3857.00	Newmarket	NH	25	0.004782		50.00%						50.00%		OK	12.5	0	0	0	0	0	12.5	0	
111	3858.00	Newton	NH	1	0.002836		100.00%								OK	1	0	0	0	0	0	0	0	
112	3861.00	Lee	NH	7	0.005561								100.00%		OK	0	0	0	0	0	0	7	0	
113	3862.00	North Hampton	NH	9	0.003932				100.00%						OK	0	0	9	0	0	0	0	0	
114	3864.00	Ossipee	NH	2	0.01136								100.00%		OK	0	0	0	0	0	0	2	0	
115	3865.00	Plaistow	NH	4	0.002967		100.00%								OK	4	0	0	0	0	0	0	0	
116	3867.00	Rochester	NH	58	0.009024								100.00%		OK	0	0	0	0	0	0	58	0	
117	3868.00	Rochester	NH	15	0.002244								100.00%		OK	0	0	0	0	0	0	15	0	
118	3869.00	Rollinsford	NH	5	0.001979			50.00%				50.00%			OK	0	2.5	0	0	0	2.5	0	0	
119	3870.00	Rye	NH	10	0.003512		50.00%		50.00%						OK	5	0	5	0	0	0	0	0	
120	3872.00	Sanbornville	NH	3	0.012299								100.00%		OK	0	0	0	0	0	0	3	0	
121	3873.00	Sandown	NH	4	0.004147		50.00%		50.00%						OK	2	0	2	0	0	0	0	0	
122	3874.00	Seabrook	NH	5	0.002676		100.00%								OK	5	0	0	0	0	0	0	0	
123	3878.00	Somersworth	NH	50	0.002836								100.00%		OK	0	0	0	0	0	0	50	0	
124	3882.00	Effingham	NH	2	0.011411								100.00%		OK	0	0	0	0	0	0	2	0	
125	3884.00	Strafford	NH	5	0.014538								100.00%		OK	0	0	0	0	0	0	5	0	
126	3885.00	Stratham	NH	24	0.004492				100.00%						OK	0	0	24	0	0	0	0	0	
127	3887.00	Union	NH	7	0.006041								100.00%		OK	0	0	0	0	0	0	7	0	
128	3894.00	Wolfeboro	NH	1	0.020419								100.00%		OK	0	0	0	0	0	0	1	0	
129	3901.00	Berwick	ME	10	0.0107			100.00%							OK	0	10	0	0	0	0	0	0	
130	3902.00	Cape Neddick	ME	9	0.005456			100.00%							OK	0	9	0	0	0	0	0	0	
131	3903.00	Eliot	ME	13	0.006136			100.00%							OK	0	13	0	0	0	0	0	0	
132	3904.00	Kittery	ME	10	0.003178			100.00%							OK	0	10	0	0	0	0	0	0	
133	3905.00	Kittery Point	ME	3	0.002057			100.00%							OK	0	3	0	0	0	0	0	0	
134	3906.00	North Berwick	ME	7	0.011124			100.00%							OK	0	7	0	0	0	0	0	0	
135	3907.00	Ogunquit	ME	1	0.0011			100.00%							OK	0	1	0	0	0	0	0	0	
136	3908.00	South Berwick	ME	13	0.009329			100.00%							OK	0	13	0	0	0	0	0	0	
137	3909.00	York	ME	9	0.010628			100.00%							OK	0	9	0	0	0	0	0	0	
138	4005.00	Biddeford	ME	2	0.014128			100.00%							OK	0	2	0	0	0	0	0	0	
139	4009.00	Bridgton	ME	1	0.018959			100.00%							OK	0	1	0	0	0	0	0	0	
140	4021.00	Cumberland Center	ME	1	0.005747			100.00%							OK	0	1	0	0	0	0	0	0	
141	4027.00	Lebanon	ME	5	0.016093			100.00%							OK	0	5	0	0	0	0	0	0	
142	4038.00	Gorham	ME	1	0.014925			100.00%							OK	0	1	0	0	0	0	0	0	
143	4042.00	Hollis Center	ME	2	0.009715			100.00%							OK	0	2	0	0	0	0	0	0	
144	4043.00	Kennebunk	ME	9	0.009994			100.00%							OK	0	9	0	0	0	0	0	0	
145	4046.00	Kennebunkport	ME	2	0.013092			100.00%							OK	0	2	0	0	0	0	0	0	
146	4061.00	North Waterboro	ME	1	0.005735			100.00%							OK	0	1	0	0	0	0	0	0	
147	4062.00	Windham	ME	3	0.014431			100.00%							OK	0	3	0	0	0	0	0	0	
148	4072.00	Saco	ME	2	0.011271			100.00%							OK	0	2	0	0	0	0	0	0	
149	4073.00	Sanford	ME	4	0.010941			100.00%							OK	0	4	0	0	0	0	0	0	
150	4076.00	Shapleigh	ME	3	0.011892			100.00%							OK	0	3	0	0	0	0	0	0	
151	4083.00	Springvale	ME	2	0.002897			100.00%							OK	0	2	0	0	0	0	0	0	
152	4087.00	Waterboro	ME	1	0.005467			100.00%							OK	0	1	0	0	0	0	0	0	
153	4090.00	Wells	ME	2	0.016786			100.00%							OK	0	2	0	0	0	0	0	0	
154	4105.00	Falmouth	ME	1	0.008846			100.00%							OK	0	1	0	0	0	0	0	0	
155	4281.00	South Paris	ME	1	0.012843			100.00%							OK	0	1	0	0	0	0	0	0	
156	4938.00	Farmington	ME	1	0.036329			100.00%							OK	0	1	0	0	0	0	0	0	1020
			SUM	1020												285.65	122.34	114.78	23.2	23.2	2.5	425.13	23.2	
				0												28%	12%	11%	2%	2%	0%	42%	2%	
																30%	10%	10%	3%	3%	1%	40%	3%	

Tighe&Bond

L0700-026
July 17, 2023

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

Re: **Lonza Biologics – Proposed Industrial Development**
Site Plan Review Permit – Stipulations of Approval, Conditions Subsequent

Dear Peter:

On behalf of Lonza, we are pleased to submit Amended Site Plans and Drainage Analysis for the above referenced project. The project was granted Site Plan approval on January 17, 2019, and amended by administrative approvals on September 27, 2019 and January 27, 2023, with seven (7) Conditions Subsequent. The enclosed Site Plans, Drainage Analysis, and Traffic Impact Study have been revised to address these Conditions, and the following is an update on the status of those conditions:

2.5 *PDA staff and Board may review and address any outstanding issues raised by the third party peer review and have the third party peer reviewer do a final review of the plans prior to construction. Any revisions to drainage plans and reports which may result should be provided to the City's Planning Department.*

Prior to the commencement of Phase 1A construction coordination was completed between the applicant and the peer reviewer. Additional administrative and amended approvals were also granted by the PDA and PDA Board in January 2023 for Phase 1B construction to commence.

2.6 *Applicant shall not proceed to Phase 2 until the project has been issued an approved application for water service(s) associated with the expansion.*

The applicant acknowledges that an application for water service will be required prior to commencing Phase 2 construction.

2.7 *The applicant shall not proceed to Phase 2 until the project has been issued an Industrial User Permit by the City for the increased wastewater flows and loads associated with the expansion.*

The applicant acknowledges that an approved application for an Industrial User Permit by the City will be required prior to commencing Phase 2 construction. The applicants expected development on the Iron Parcel for the foreseeable future will not necessitate additional capacity for increased wastewater flows beyond its existing permits. This has been previously communicated to the City in the enclosed letter from DTC Lawyers dated February 14, 2023.

2.8 *The Planning Board's recommended approval applies only to Phase 1A and Phase 1B as depicted on the approved site and grading plans. Any changes to said plans, as well as subsequent phases of development shall require submission of updated plans and supporting documents and noticed public hearings with the City's Technical Advisory Committee and Planning Board for amended site plan approval.*

Acknowledged.

2.9 *For the purpose of this site plan approval, the term "active and substantial development or building" shall mean the construction of the stream restoration and associated site improvements included in Phase 1(A). The term "substantial completion of the improvements as shown on the subdivision plat or site plan" shall mean the completion of all site improvements depicted in Phase 1(B), to include drive aisles, fire lanes, utilities, lighting, sidewalks, stormwater management, as well as the construction of a temporary gravel area for construction trailers, parking and laydown in the approximate location of proposed building #3, intermittent grading between stream and building #1 and temporary sedimentation basins at locations of gravel wetland #2 and rain garden #1, and construction of the shell of building #1, but not final fit-out of building #1.*

Acknowledged.

2.10 *For subsequent phases of development (beyond Phase 1A and Phase IB), applicant shall update the Traffic Analysis to include the following intersections:*

- *Gosling Road/ Spaulding Turnpike Intersection*
- *International Drive/Corporate Drive/Manchester Square Intersection*
- *International Drive/Pease Blvd Intersection*
- *New Hampshire Ave/International Dr./Corporate Dr./Durham St. Intersection*
- *Corporate Drive/Grafton Drive Intersection*
- *NH 33/ Grafton Drive Intersection*

The Traffic Impact Study has been updated to include the requested additional intersections, as well as for the updated size of building #1. The updated Traffic Study is enclosed as part of this submission.

2.11 *Applicant shall verify how fertilizer will be applied as part of the stream restoration.*

Fertilizer was not used as part of the construction of the stream.

If you have any questions or need any additional information, please contact Neil Hansen by phone at (603) 294-9213 or by email at nahansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.

Neil Hansen

Neil A. Hansen, PE
Project Manager

Patrick M. Crimmins, PE
Vice President

Copy: Lonza Biologics Inc. (via email)
Pease Development Authority

J:\L\L0700 Lonza Biologics Expansion was 1576F\026_Project Albacore\Report_Evaluations\Applications\City of Portsmouth\20230717 TAC Submission\L0700-026 PB Stipulation Response.docx

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14 February 2023

Via email: smwoodland@cityofportsmouth.com
and U.S. Mail

Suzanne M. Woodland, Esquire
Deputy City Manager/Deputy City Attorney
City of Portsmouth
City Hall
1 Junkins Avenue
Portsmouth, NH 03801

Re: Pease Wastewater Treatment Facility Improvements Design Effort

Dear Suzanne:

This letter follows the productive meeting between representatives of Lonza Biologics, Inc. ("Lonza") and representatives of the of City of Portsmouth and its Public Works and Engineering Departments on Monday, 6 February, and responds to your letter dated 13 December 2022, all of which pertain to the City's anticipated Pease Wastewater Treatment Facility ("PWWTF") improvement project. We understand that the City is in the process of working with AECOM Engineering ("AECOM") to determine the central purpose of that project as one rooted in addressing infrastructure obsolescence and reliability issues at the PWWTF, and potentially one which also incorporates improvements to account for increased demand for capacity by Lonza associated with development of the Iron Parcel, which is now a part of Lonza's leased property at 101 International Drive (the "Iron Parcel").

Executive Summary

Lonza is excited to inform you that it is finalizing a pending growing collaboration with a customer that, if and when completed, will require manufacturing space that Lonza intends to provide in Building 1 of its approved site plan for the Iron Parcel, thus advancing Lonza's long-standing investment in Portsmouth and the state of New Hampshire. However, based on Lonza's progressing sustainability initiatives as well as the unique requirements of the customer, Lonza anticipates being able to stay within the parameters of its existing water and wastewater permits. As a result, Lonza's current development plans for the Iron Parcel do not justify capital planning or budgeting for infrastructure improvements to the PWWTF to accommodate additional capacity demand by Lonza, at this time.

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Lonza looks forward to beginning construction of the shell of Building 1 on the Iron Parcel and to beginning the local review process for the fit-up and occupation of that building with the City's staff, Technical Review Committee and Planning Board in the near future.

Analysis

By way of brief background, in 2019, Lonza obtained land use permitting approvals to facilitate the phased construction of three industrial buildings and related site improvements on the Iron Parcel (the "Iron Parcel Approvals" or the "Iron Parcel Project" or the "Project"). More specifically, as originally approved, the phased development contemplated proposed building #1 with a 132,000 sf footprint ("Building 1"), proposed building #2 with a 150,000 sf footprint, and proposed building #3 with a 62,000 sf footprint. Over the subsequent years, Lonza obtained successive extensions of the Iron Parcel Approvals and a renewed Conditional Use Permit approval, all of which approvals are now vested by virtue of certain site work Lonza has performed at the Iron Parcel to include, among other things, the "day-lighting" and restoration of Hodgson Brook which resulted in approximately 42,500 sf of wetland creation.

While Lonza worked to vest its Iron Parcel Approvals to preserve its ability to develop the Iron Parcel, it was also expanding its investment in Lonza's existing facility. Specifically, in an effort to enhance its mammalian drug substance manufacturing capabilities in both Visp, Switzerland and Portsmouth, Lonza fit-up formerly unoccupied space in the existing building at Lonza's Portsmouth facility to support late-phase clinical and commercial development and manufacturing of pharmaceuticals, which initiative will help address increasing market demand for small to mid-scale mammalian-derived biologics (the "Lynx Project"). Lonza's investment in the Lynx Project includes state-of-the-art technologies in perfusion, purification and automation and is projected, once fully operational, to create 250 new jobs.

Additionally, over the last few years, Lonza has been focused on improving its existing operations at the Portsmouth facility and on establishing and implementing new sustainability initiatives, and continues to do so within the context of water reuse efforts, all to decrease its operational footprint and water usage.

Lonza greatly appreciates all of the efforts made by the City, and other regulatory agencies, over the last several years regarding the recently issued National Pollutant Discharge Elimination System Permit (the "NPDES Permit"). With the finalization of the NPDES Permit and the corresponding appeal, Lonza is happy to share with the City news that Lonza recently began working with a customer who has an immediate need for manufacturing space which Lonza intends to accommodate in Building 1 of the Iron Parcel Project (the "Customer"). Towards that end, last month, Lonza obtained minor site plan amendment approvals from the Pease Development Authority's Board of Directors ("PDA") for several minor changes to the Iron Parcel Project's site plan that are required to accommodate the Customer. Should Lonza finalize a deal with the Customer, these approvals will clear the way for Lonza to begin construction of the shell of Building 1 and associated site improvements on the Iron Parcel. Further, these minor site plan amendments from the PDA clear the path for Lonza to initiate the City of Portsmouth's review, through its City Staff, the Technical Review Committee and ultimately the Planning Board, of Phase II of the Project, which pertains to the fit-up and eventual occupation of Building 1 by the Customer ("Phase II"). Lonza anticipates that should it finalize a deal with the Customer and obtain the necessary land use permits, the new operation on the Iron Parcel will create many additional jobs, further cementing Lonza's continuing investment in Portsmouth, in New Hampshire, and in the surrounding region.

As the City is well-aware, part of the Phase II review and approval process requires a review of the anticipated water and wastewater needs and the implications of same on Lonza's existing water and wastewater permits. Fortunately, and as we discussed at our meeting on 6 February, based on Lonza's progressing sustainability initiatives and the unique requirements of the Customer, Lonza anticipates being able to work within the parameters of its existing permits such that no increased wastewater flows are anticipated at this time. Lonza looks forward to discussing this issue further with the City's Public Works and Engineering Departments.

Finally, as currently contemplated, Lonza's expected development on the Iron Parcel for the foreseeable future will not necessitate additional capacity for increased wastewater flows beyond its existing permits. Accordingly, the City does not need to, and should not, incorporate expansion improvements by Lonza within its capital improvement budgeting and planning for the PWWTF project, which it is currently undertaking with AECOM.

Conclusion

Lonza continues to appreciate the collaboration with and support from the City of Portsmouth which it has enjoyed over the years and Lonza looks forward to advancing its investment in Portsmouth through the development of the Iron Parcel as summarized in this letter.

Thank you very much for your time, and please do not hesitate to reach out to me with comments or questions that you may have.

Yours truly,

DONAHUE, TUCKER & CIANDELLA, PLLC

Justin L. Pasay, Esq.
jpasay@dtclawyers.com
JLP:LH
cc: Lonza Biologics, Inc.
Pease Development Authority
Tighe & Bond

Lonza
BUILDING 1