Town of Reading
16 Lowell Street, Reading, MA 01867

Community Planning & Development Commission
Andrew MacNichol *Community Development Director*
Direct: 781-942-6670
amacnichol@ci.reading.ma.us
readingma.gov/community-planning-and-development-commission

August 23, 2023

Re: Sign Package & Photometric Plan - McDonald's 413 Main St, Reading, MA

The Sign Program Book and the Sign Permit Application submitted as part of the Site Plan Review Application for the McDonald's located at 413 Main St in Reading, MA contain many signs that are not allowed in the specified zoning district. We wanted to clarify with you what signs are allowable and prohibited within the Business-B zoning district.

- Prohibited signs include: internally illuminated signs
- Allowable signs include: 2 wall-mounted signs, externally illuminated or halo-lit signs
- Unlit instructional signs such as those for the specific parking spaces or "order here" are allowed in unlimited number but they must be less than 1SF each
- By Special permit you are allowed 1 free-standing sign; this is in line with the special permit application for the one monument sign included in the sign package

Please revise your sign package and sign permit application accordingly.

Please add sheet numbers to the sign program book for easier discussion and reference.

Regarding the plans submitted, the sign package plan sheet 2 indicating which signs would be where on the property doesn't specify which size digital menu boards will be placed where. Please clarify on this plan sheet.

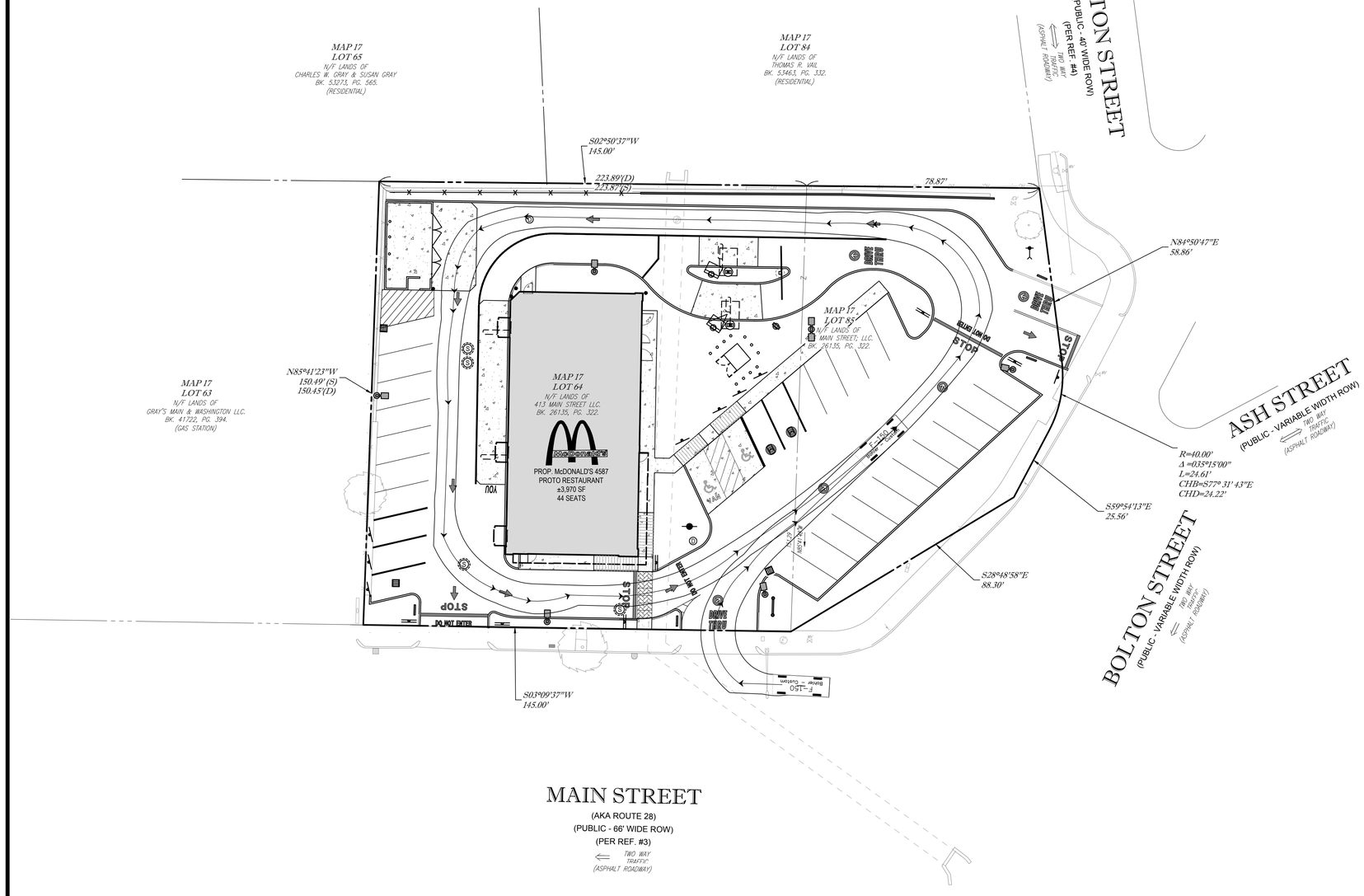
Additionally, several of the items included in the sign package appear to be lights, but do not appear to have been included in the photometric lighting plan. The sign package plans are cut off on the top, there are a number of arrows with no labels and as such it's also unclear if there are additional lights proposed on the top of the building. Please ascertain that all lights, including any on the building and order points are included in the photometric plan.

SITE INFORMATION

1. APPLICANT:
   McDONALD'S USA, LLC
   110 N CARPENTER STREET
   CHICAGO, IL 60607

2. OWNER:
   413 MAIN STREET, LLC
   10 JEAN AVE #2
   CHELMSFORD, MA 01824

3. PARCEL:
   MAP 17, LOTS 64 & 85
   413 MAIN STREET
   READING, MA 01867



811 Know what's **below.** **Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

COMMONWEALTH OF MASSACHUSETTS
JOHN J. KUCZARSKI
CIVIL
No. 41530
PROFESSIONAL ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NEW HAMPSHIRE LICENSE No. 15424
RHODE ISLAND LICENSE No. 9610
MAINE LICENSE No. 12455

McDonald's

BOSTON REGION
110 N CARPENTER ST
CHICAGO, IL 60607
OFFICE
ADDRESS

PLAN APPROVALS

	DATE
SIGNATURE	
APPROVED McDONALD'S AGENT	

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK DATE

CONSTRUCTION CHECK DATE

CONSTRUCTION CHECK DATE

PROJECT No.:
W222000

CAD I.D. #:
W222000-SPPD-3a.dwg

-

STREET ADDRESS
413 MAIN STREET

CITY
READING

STATE
MA

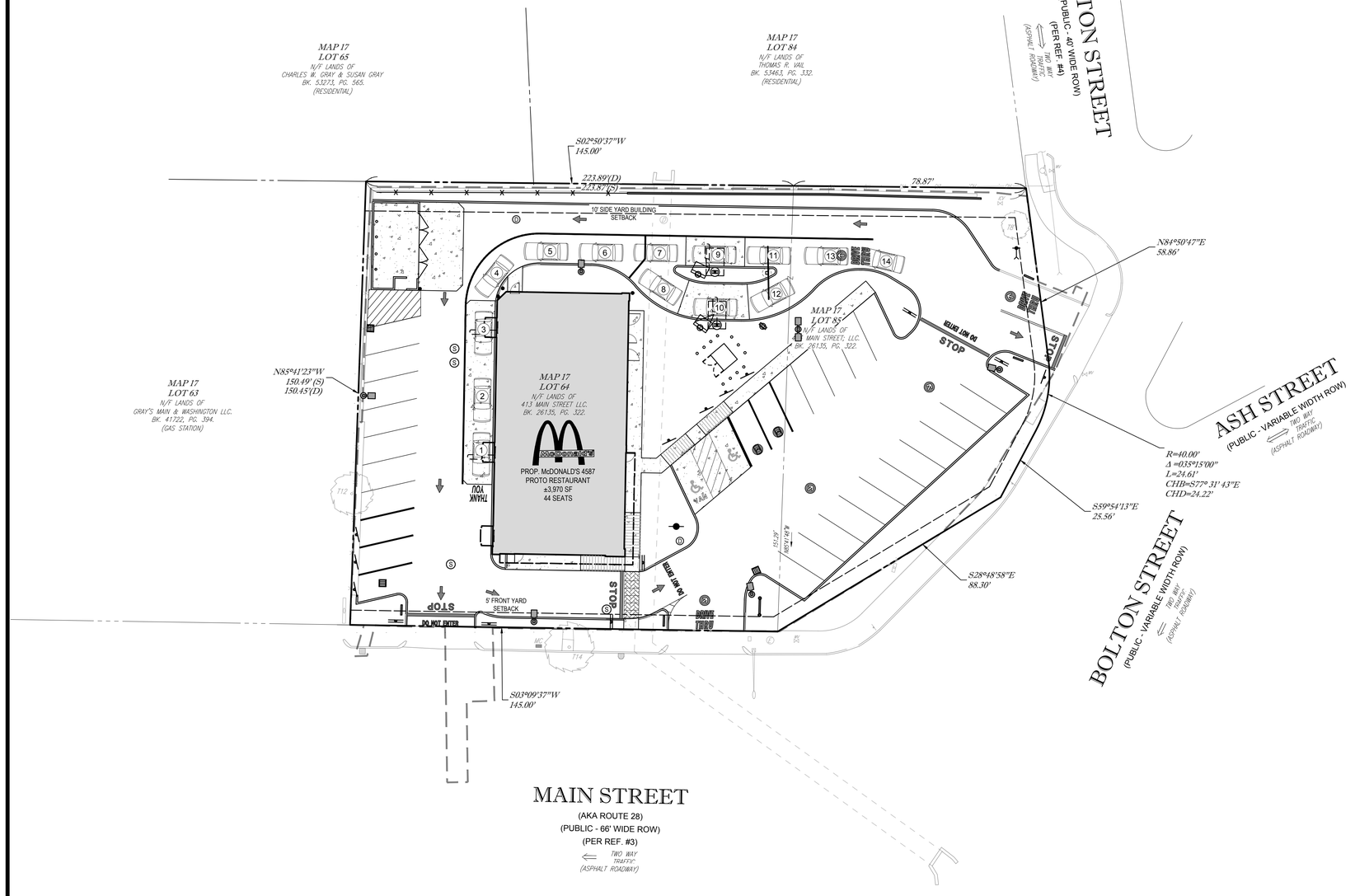
COUNTY
MIDDLESEX

SITE I.D.
20-0015

PLAN DESCRIPTION
F-150 TRUCK TURN EXHIBIT

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.
1
OF 15



20 10 5 0 20

1"= 20'

811 Know what's **below.** **Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

COMMONWEALTH OF MASSACHUSETTS
JOHN J. KUCZARSKI
CIVIL
No. 41530
PROFESSIONAL ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NEW HAMPSHIRE LICENSE No. 15474
COMMONWEALTH OF MASSACHUSETTS LICENSE No. 41530
RHODE ISLAND LICENSE No. 9810
MAINE LICENSE No. 12455

McDonald's

BOSTON REGION
110 N CARPENTER ST
CHICAGO, IL 60607
OFFICE
ADDRESS

PLAN APPROVALS

SIGNATURE	DATE

APPROVED McDONALD'S AGENT

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK	DATE
CONSTRUCTION CHECK	DATE
CONSTRUCTION CHECK	DATE
PROJECT No.:	W222000
CAD I.D. #:	W222000-SPPD-3a.dwg

-

STREET ADDRESS
413 MAIN STREET

CITY: **READING** STATE: **MA**

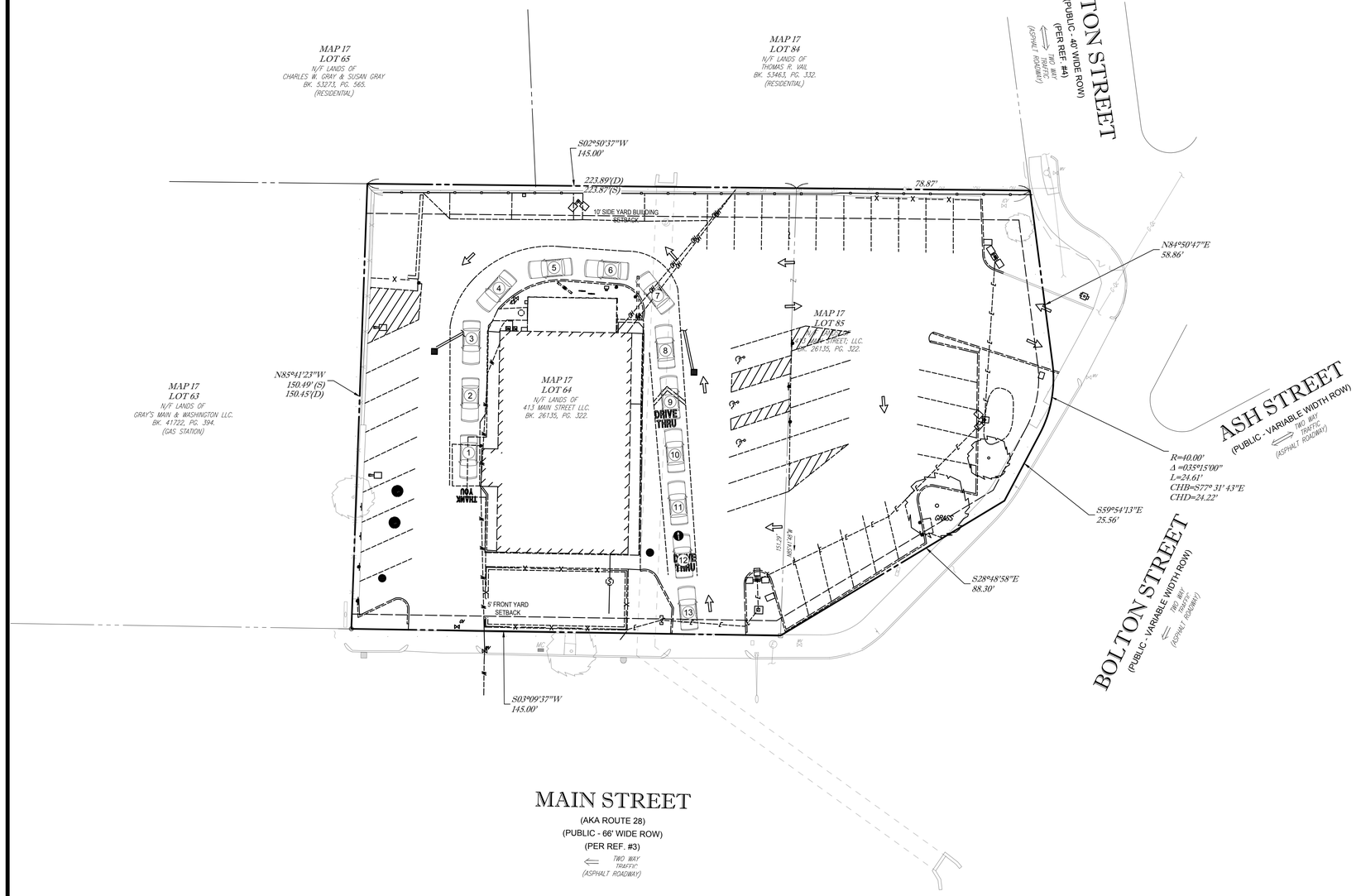
COUNTY
MIDDLESEX

SITE I.D.
20-0015

PLAN DESCRIPTION
PROPOSED DRIVE-THRU STACKING EXHIBIT

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.
1
OF 15



20 10 5 0 20
1"= 20'

Know what's **below.**
Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

COMMONWEALTH OF MASSACHUSETTS
JOHN J. KUCZARSKI
CIVIL
No. 41530
PROFESSIONAL ENGINEER
NEW HAMPSHIRE LICENSE No. 15424
CONNECTICUT LICENSE No. 28979
RHODE ISLAND LICENSE No. 9810
MAINE LICENSE No. 12455

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK	DATE
CONSTRUCTION CHECK	DATE
CONSTRUCTION CHECK	DATE
PROJECT No.: W222000	
CAD I.D. #: W222000-SPPD-3a.dwg	

-

STREET ADDRESS
413 MAIN STREET

CITY
READING

STATE
MA

COUNTY
MIDDLESEX

SITE I.D.
20-0015

PLAN DESCRIPTION
EXISTING DRIVE-THRU STACKING EXHIBIT

McDonald's

OFFICE
BOSTON REGION
ADDRESS
110 N CARPENTER ST
CHICAGO, IL 60607

PLAN APPROVALS

SIGNATURE	DATE
APPROVED McDONALD'S AGENT	

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.
1
OF 15

SECTION

10 5 2.5 0 10
1"= 10'

KEY PLAN

30 15 7.5 0 30
1"= 30'

McDonald's®

MCDONALD'S

413 MAIN STREET,

TOWN OF READING, MASSACHUSETTS

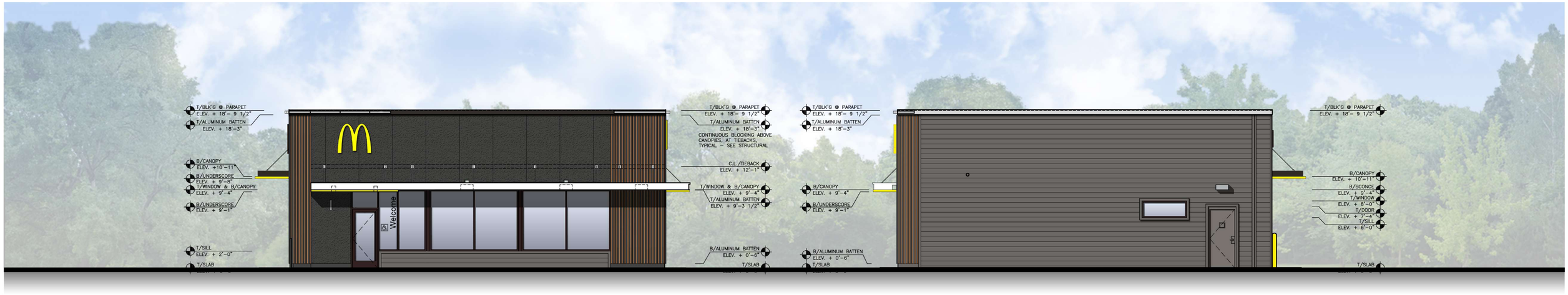
SECTION EXHIBIT

DATE: 10/02/2023

PROJECT #: W222000

M.J. MRVA
REGISTERED LANDSCAPE ARCHITECT
MASSACHUSETTS No. 1217
RHODE ISLAND No. 419
NEW YORK No. 002359
NEW HAMPSHIRE No. 109
CONNECTICUT No. 1359
MAINE No. 4248
VERMONT No. 01337
OHIO No. 250433

BOHLER//
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
Phone: (508) 480-9900
www.BohlerEngineering.com



Front Elevation

Rear Elevation

Non-Drive-Thru Side Elevation

Drive-Thru Side Elevation

SCHEME: STEEL

Materials Legend:

- Fiber Cement Panel: Hardie Plank by James Hardie Aged Pewter
- Feature Wall: EIFS/Stuco - SW 7069 "Iron Ore"
- Drive-Thru - Metal Panel: Alpolic Metal Panel by Alpolic RAL 7022
- 2x2 Aluminum Battens
- Gold Underscore
- Aluminum Canopy (Metal)
- Glazing (Windows + Storefront)
- Bronze Metal (Coping)
- Metal (Coping)
- Radial Sconce Light Fixture Color: Platinum Silver
- Sherwin Williams SW-7019 Color: Gauntlet Gray

AECOM

06 SEPT 2023

Proposed McDonald's Restaurant

Rendered Elevations

020-0015 - Reading, MA

Town of Reading
Engineering Division

Memo

To: Andrew MacNichol, Community Development Director
From: Ryan A. Percival, P.E., Town Engineer;
CC: Community Planning and Development Commission;

Date: August 31, 2023
Re: Proposed Site Re-development 413 Main Street - McDonald's

---

Materials reviewed:

- Proposed Site Plan entitled; "McDonald's – 413 Main Street", 413 Main Street Reading, Massachusetts; prepared by Bohler Engineering; dated April 28, 2023
- Drainage Report; prepared by Bohler Engineering; dated July 28, 2023

The Engineering Division has reviewed the proposed site application for the proposed project and offers the following comments:

- The Town's sidewalk is shown to be within the property lines of the existing site. The Applicant shall confirm layouts and location of the Town's sidewalk and travel way. In the event the property lines are correct the Applicant shall provide either an easement to the Town or give land to the Town so the sidewalk is not on private property.
- The internal traffic patterns appear to send traffic crossing over itself and should be reconsidered. Large trucks will have issues making the turning movements.
- Thought should be given to the placement of the crosswalk in front of the building to provide better protection to pedestrians. The stop bar is after the crosswalk allowing vehicles to stop on the crosswalk, the stop bar and/or crosswalk should be relocated.
- There are three driveways on this site. The applicant should consider closing one of the entrances.
- The drainage report indicates the use of NOAA Atlas 14 Rainfall data and shows a reduction in post-development runoff volumes and flows for the 2, 10, 25 and 100-year storms.
- The site has reduced impervious area by 3,775 square feet but shows very limited water qualities BMP's with only the addition of deep sump catch basins result in in only 33% TSS removal. The applicant shall make an effort to provide more detention and recharge on site and increase TSS removal to 80%, instead of directly discharging into the Towns drainage system. The applicant shall include phosphorus removal calculations.
- The applicant shall CCTV inspect the Town's box culvert prior to construction.
- The size and type of all existing and proposed utilities shall be labeled on the plan.
- Fire flow test shall be performed.
- Sewer flow study shall be performed.
- There should be more of a natural buffer from the properties in the rear. Apllicant should consider plantings to screen the site.
- Trench paving in the Town ROW shall meet Town Standards for this area.
- The site may be subject to a Sewer Connection Fee.
- All utilities shall be approved materials and installed in accordance with the Department of Public Works Standards.
- Engineering Division shall be notified 72 hours in advance to mark out Town utilities.
- All water, sewer, curb cut, street opening, and Jackie's Law excavation permits shall be obtained at the Engineering Division prior to any excavations.
- All site work shall be inspected by the Engineering Division. The Applicant/Owner's contractor shall submit a construction schedule of proposed work. All inspections shall be scheduled 48 hours in advance.
- An approved site as-built shall be submitted to the Engineering Division within 60 days of certificate of occupancy. The as-built shall be submitted in mylar and electronic ACAD format.

PROPOSED SITE PLAN DOCUMENTS

FOR

PROPOSED

McDonald's

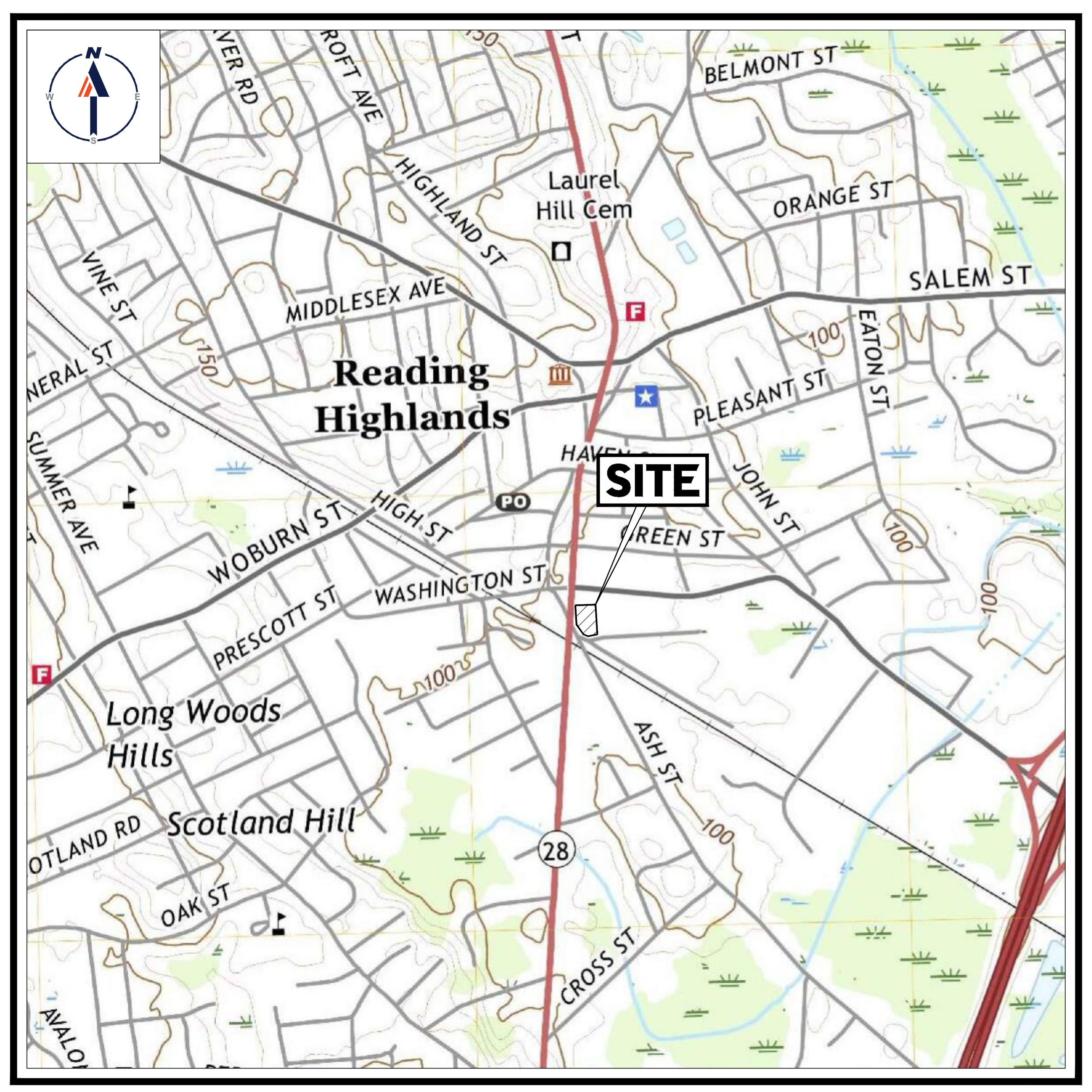
WITH DRIVE-THRU

LOCATION OF SITE
413 MAIN STREET, TOWN OF READING
MIDDLESEX COUNTY, MASSACHUSETTS
MAP #17, LOT #64 & #85

REFERENCES

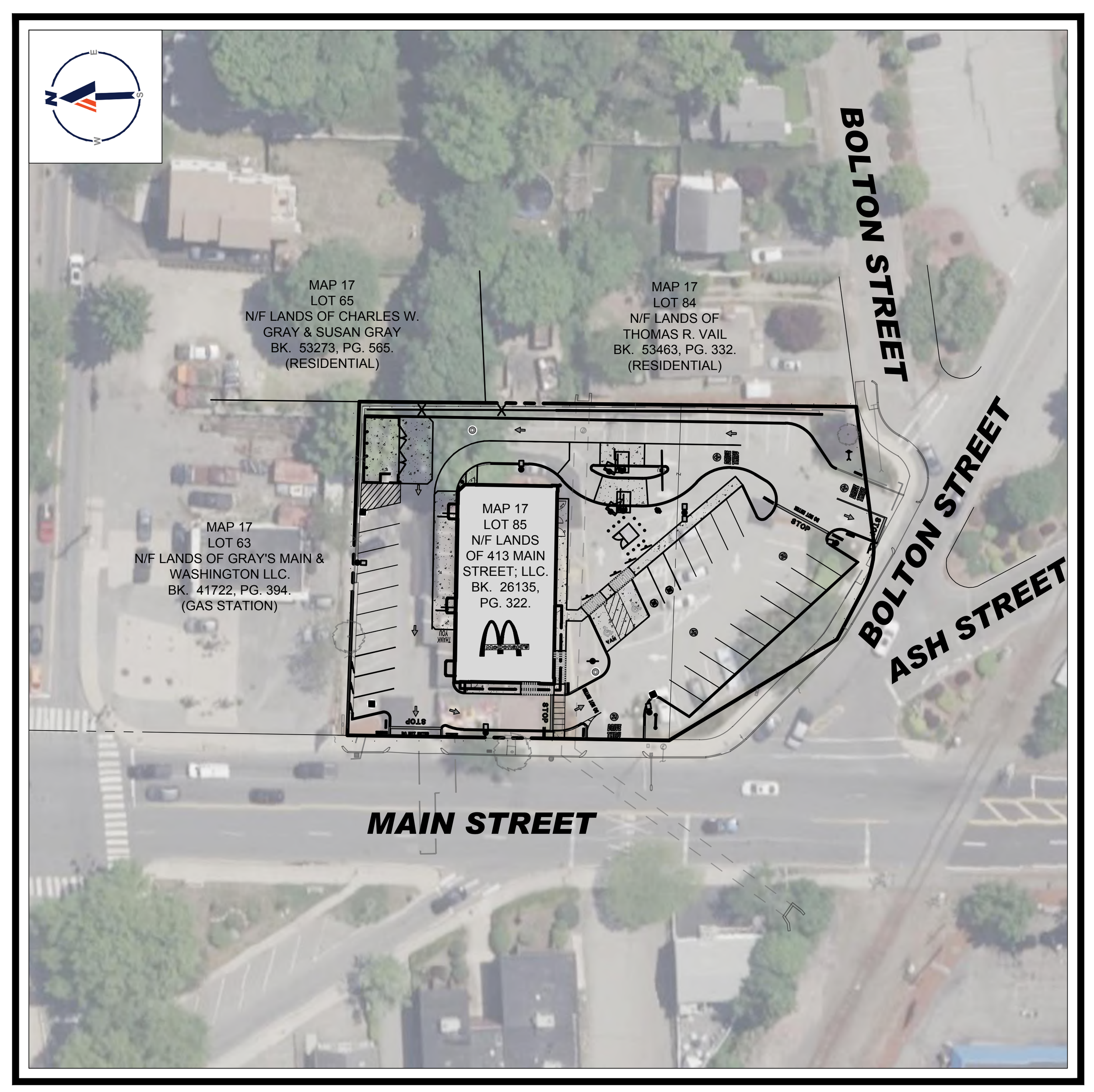
BOUNDARY & TOPOGRAPHIC SURVEY:
CONTROL POINT ASSOCIATES, INC.
352 TURNPIKE RD, SOUTHBOROUGH, MA 01772
DATE: 10/10/2022
REVISED: 11/30/2022

* THE ABOVE REFERENCED DOCUMENTS ARE INCORPORATED BY REFERENCE AS PART OF THESE PLANS, HOWEVER, BOHLER ENGINEERING DOES NOT CERTIFY THE ACCURACY OF THE WORK REFERENCED OR DERIVED FROM THESE DOCUMENTS, BY OTHERS.



USGS MAP

SCALE: 1" = 1,000'
SOURCE: USGS READING QUADRANGLE



SITE MAP

SCALE: 1" = 60'
SOURCE: GOOGLE EARTH AERIAL

DRAWING SHEET INDEX

SHEET TITLE	SHEET NUMBER
COVER SHEET	C-101
GENERAL NOTES SHEET	C-102
DEMOLITION PLAN	C-201
SITE LAYOUT PLAN	C-301
GRADING & DRAINAGE PLAN	C-401
UTILITY PLAN	C-501
EROSION AND SEDIMENT CONTROL PLAN	C-601
EROSION AND SEDIMENT CONTROL NOTES & DETAILS	C-602
LANDSCAPE PLAN	C-701
LANDSCAPE NOTES & DETAILS	C-702
LIGHTING PLAN	C-703
DETAIL SHEET	C-901
DETAIL SHEET	C-902
DETAIL SHEET	C-903
DETAIL SHEET	C-904
BOUNDARY, TOPOGRAPHIC & UTILITY SURVEY	1 SHEET
ARCHITECTURAL FLOOR PLAN (BY OTHERS)	1 SHEET
ARCHITECTURAL ELEVATIONS (BY OTHERS)	2 SHEETS

GENERAL NOTES:

1. BASES, ANCHOR BOLTS, CONDUIT, AND WIRING FOR ALL OTHER SIGNS ARE BY THE GENERAL CONTRACTOR.
2. 3/4" EMPTY CONDUIT TO LOCATIONS SHOWN AT THE LOT PERIMETER FOR LOT LIGHTING IS BY THE GENERAL CONTRACTOR. LIGHTING FIXTURES, BASES, POLES, CONDUIT, AND WIRING ARE BY THE OWNER/OPERATOR.
3. BASES FOR FLAGPOLES ARE BY THE GENERAL CONTRACTOR. ANCHOR BOLTS ARE BY THE FLAGPOLE SUPPLIER.
4. PROPOSED UTILITIES ARE SHOWN IN SCHEMATIC ONLY. EXACT LOCATIONS SHALL BE DETERMINED TO ALLOW FOR THE MOST ECONOMICAL INSTALLATION.
5. THE CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES TO DETERMINE EXACT POINT OF SERVICE CONNECTION AT EXISTING UTILITY. REFER TO THE BUILDING ELECTRICAL AND PLUMBING DRAWINGS FOR UTILITY SERVICE ENTRANCE LOCATIONS, SIZES, AND CIRCUITING.
6. ALL ELEVATIONS SHOWN ARE BASED UPON, NAVD 88 PER SURVEY NOTE #7.
7. ALL LANDSCAPE AREAS SHALL BE ROUGH GRADED TO 6" BELOW TOP OF ALL WALKS AND CURBS. FINISH GRADING, LANDSCAPING, AND SPRINKLER SYSTEMS ARE BY THE OWNER/OPERATOR.
8. LOT LIGHTING CONCRETE FOOTINGS TO CONFORM WITH THE SOILS REPORT RECOMMENDATIONS FOR THIS PARTICULAR SITE. FOUNDATION DESIGN AND CONSTRUCTION IS BY THE GENERAL CONTRACTOR.

PAVING SPECIFICATION

(SEE PAVEMENT DETAIL)

FLEXIBLE PAVEMENT SECTION:
-1.5" M.04.02- CLASS 2 TOP COURSE
-1.5" M.04.02- CLASS 1 BASE COURSE
-12.0" M.02.06 TYPE C PROCESSED GRAVEL SUBBASE

RIGID PAVEMENT SECTION:
-6.0" 4500 PSI AIR-ENTRAINED CONCRETE
-8.0" 4500 PSI AIR-ENTRAINED CONCRETE AT TRASH ENCLOSURE
-12.0" M.02.06 TYPE C PROCESSED GRAVEL SUBBASE

NOTE: FINAL PAVEMENT SPECIFICATIONS TO BE COORDINATED WITH GEOTECHNICAL REPORT RECOMMENDATIONS. McDONALD'S ENGINEER RESERVES THE RIGHT TO REQUEST A COMPACTION TEST AND/OR A CORE SAMPLE. IF TESTS PROVE CORRECT, PER ABOVE SPECIFICATION, TESTS WILL BE AT THE EXPENSE OF McDONALD'S, OTHERWISE, G.C. WILL BE CHARGED.

LOT LIGHTING SUPPLIED BY

SECURITY LIGHTING SYSTEMS
2100 GOLD ROAD
ROLLING MEADOWS, IL 60008
1(800) 544 4848
NOTE: ELECTRICAL CONTRACTOR TO CIRCUIT LOT LIGHTING AS NOTED.

PARKING INFORMATION

TOTAL SPACES			
30	28 PROPOSED SPACES		9.0' x 18.0' @ 75°
	2 PROPOSED	HANDICAPPED SPACES	8.0'x 18.0' @ 75°

UTILITY INFORMATION

	SIZE	TYPE	LOCATION
SANITARY SEWER	8"	UG / TBD	MAIN ST
WATER	TBD	TBD	MAIN ST
STORM SEWER	VARIES	CONCRETE CULVERT	ON-SITE UG CULVERT / MAIN ST
ELECTRIC	TBD	OH	ON-SITE UP / OH
GAS	TBD	UG	MAIN ST

SURVEY INFORMATION

PREPARED BY: CONTROL POINT ASSOCIATES, INC.
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
JOB #: 03-180087-00
DATE: OCTOBER 10, 2022
REVISED: NOVEMBER 30, 2022

TYPICAL LEGEND

EXISTING		PROPOSED
	PROPERTY LINE	
	SETBACK	
	EASEMENT	
	CURB	
	STORM MANHOLE	
	SEWER MANHOLE	
	CATCH BASIN	
WF#5	WETLAND FLAG	
	WETLAND LINE	
× 54.83	SPOT ELEVATION	
× TC 54.58 G 53.78	TOP & BOTTOM OF CURB	
53	CONTOUR	50
	FLOW ARROW	5%
	PAINTED ARROW	
OH OH OH	OVERHEAD WIRE	OH OH
G G G	GAS LINE	G G
T T T	TELEPHONE LINE	T T
E E E	ELECTRIC LINE	E E
W W W	WATER LINE	W W

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

J.A. KUCICH
COMMONWEALTH OF MASSACHUSETTS
JOHN A. KUCICH
CIVIL
No. 41530
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE No. 41530
NEW HAMPSHIRE LICENSE No. 15476
CONNECTICUT LICENSE No. 26177
RHODE ISLAND LICENSE No. 9616
MAINE LICENSE No. 12553

McDonald's®

OFFICE: BOSTON REGION
ADDRESS: 110 N CARPENTER ST
CHICAGO, IL 60607

PLAN APPROVALS
DATE
SIGNATURE
APPROVED McDONALD'S AGENT

BOHLER//™
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK DATE
CONSTRUCTION CHECK DATE
CONSTRUCTION CHECK DATE

PROJECT No.: W222000

CAD I.D. #: W222000-SPPD-3a.dwg

-

STREET ADDRESS
413 MAIN STREET

CITY: READING
STATE: MA

COUNTY: MIDDLESEX

SITE I.D.: 20-0015

PLAN DESCRIPTION: COVER SHEET

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.
C-101
OF 15

P:\2022\W222000\CAD\Drawings\Plan Sets\Civil Site Plans\W222000-SPPD-3a.dwg, C-101-Covr, 4/23/2010, 10:17:14 AM, cennis, XeroxX510-1.pc3, User634, 1:1

GENERAL NOTES

1. THESE PLANS ARE SOLELY BASED ON INFORMATION THE OWNER AND OTHERS PROVIDED TO BOHLER ENGINEERING, (HEREIN "BOHLER") PRIOR TO THE DATE ON WHICH THE ENGINEER OF RECORD AND BOHLER PREPARED THESE PLANS. THE CONTRACTOR MUST FIELD VERIFY ALL EXISTING CONDITIONS AND IMMEDIATELY NOTIFY BOHLER , IN WRITING, IF ANY ACTUAL SITE CONDITIONS DIFFER FROM THOSE SHOWN ON THESE PLANS, OR IF THE PROPOSED WORK CONFLICTS WITH ANY OTHER SITE FEATURES.

2. THE CONTRACTOR MUST STRICTLY COMPLY WITH THESE NOTES AND ALL SPECIFICATIONS/REPORTS CONTAINED HEREIN. THE CONTRACTOR MUST ENSURE THAT ALL SUBCONTRACTORS FULLY AND COMPLETELY CONFORM TO AND COMPLY WITH THESE REQUIREMENTS, THESE NOTES, AND THE REQUIREMENTS ARTICULATED IN THE NOTES CONTAINED IN ALL THE OTHER DRAWINGS THAT COMPRISE THE PLAN SET OF DRAWINGS. ADDITIONAL NOTES AND SPECIFIC PLAN NOTES MAY BE FOUND ON THE INDIVIDUAL PLANS. THESE GENERAL NOTES APPLY TO THIS ENTIRE DOCUMENT PACKAGE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW ALL CONSTRUCTION CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO, ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THE PROJECT WORK SCOPE, PRIOR TO THE INITIATION AND COMMENCEMENT OF CONSTRUCTION.

3. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR MUST CONFIRM WITH THE ENGINEER OF RECORD AND BOHLER THAT THE LATEST EDITION OF THE DOCUMENTS AND/OR REPORTS REFERENCED WITHIN THE PLAN REFERENCES ARE BEING USED FOR CONSTRUCTION. THIS IS THE CONTRACTOR'S SOLE AND COMPLETE RESPONSIBILITY.

4. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR MUST ENSURE THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION IS TO BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED THE CONDITIONS OF APPROVAL TO ALL PLANS AND OTHER DOCUMENTS REVIEWED AND APPROVED BY THE PERMITTING AUTHORITIES AND HAS ALSO CONFIRMED THAT ALL NECESSARY AND REQUIRED PERMITS HAVE BEEN OBTAINED. THE CONTRACTOR MUST HAVE COPIES OF ALL PERMITS AND APPROVALS ON SITE AT ALL TIMES.

5. THE CONTRACTOR MUST ENSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH THESE PLANS, SPECIFICATIONS/REPORTS AND CONDITIONS OF APPROVAL, AND ALL APPLICABLE REQUIREMENTS, RULES, REGULATIONS, STATUTORY REQUIREMENTS, CODES, LAWS AND STANDARDS OF ALL GOVERNMENTAL ENTITIES WITH JURISDICTION OVER THIS PROJECT, AND ALL PROVISIONS IN AND CONDITIONS OF THE CONSTRUCTION CONTRACT WITH THE OWNER/DEVELOPER INCLUDING ALL EXHIBITS, ATTACHMENTS AND ADDENDA TO SAME.

6. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR MUST COORDINATE THE BUILDING LAYOUT BY CAREFULLY REVIEWING THE MOST CURRENT ARCHITECTURAL, CIVIL AND STRUCTURAL CONSTRUCTION DOCUMENTS (INCLUDING, BUT NOT LIMITED TO, MECHANICAL, ELECTRICAL, PLUMBING AND FIRE SUPPRESSION PLANS, WHERE APPLICABLE). THE CONTRACTOR MUST IMMEDIATELY NOTIFY OWNER, ARCHITECT AND ENGINEER OF RECORD AND BOHLER, IN WRITING, OF ANY CONFLICTS, DISCREPANCIES OR AMBIGUITIES WHICH EXIST BETWEEN THESE PLANS AND ANY OTHER PLANS THAT COMPRISE THE CONSTRUCTION DOCUMENTS.

7. CONTRACTOR MUST REFER TO AND ENSURE COMPLIANCE WITH THE APPROVED ARCHITECTURAL/BUILDING PLANS OF RECORD FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRY/EXIT POINTS, ELEVATIONS, PRECISE BUILDING DIMENSIONS, AND EXACT BUILDING UTILITY LOCATIONS.

8. THE CONTRACTOR MUST FIELD VERIFY ALL DIMENSIONS AND MEASUREMENTS SHOWN ON THESE PLANS, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR MUST IMMEDIATELY NOTIFY ENGINEER OF RECORD AND BOHLER, IN WRITING, IF ANY CONFLICTS, DISCREPANCIES, OR AMBIGUITIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION. NO EXTRA COMPENSATION WILL BE PAID TO THE CONTRACTOR FOR WORK WHICH HAS TO BE RE-DONE OR REPAIRED DUE TO DIMENSIONS, MEASUREMENTS OR GRADES SHOWN INCORRECTLY ON THESE PLANS PRIOR TO BOTH (A) THE CONTRACTOR GIVING ENGINEER OF RECORD AND BOHLER WRITTEN NOTIFICATION OF SAME AND (B) ENGINEER OF RECORD AND BOHLER, THEREAFTER, PROVIDING THE CONTRACTOR WITH WRITTEN AUTHORIZATION TO PROCEED WITH SUCH ADDITIONAL WORK.

9. THE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND MEASUREMENTS INCLUDED ON DESIGN DOCUMENTS HEREIN AND MUST NOT SCALE OFF THE DRAWINGS DUE TO POTENTIAL PRINTING INACCURACIES. ALL DIMENSIONS AND MEASUREMENTS ARE TO BE CHECKED AND CONFIRMED BY THE GENERAL CONTRACTOR PRIOR TO PREPARATION OF SHOP DRAWINGS, FABRICATION/ORDERING OF PARTS AND MATERIALS AND COMMENCEMENT OF SITE WORK. SITE PLAN DRAWINGS ARE NOT INTENDED AS SURVEY DOCUMENTS. DIMENSIONS SUPERSEDE GRAPHICAL REPRESENTATIONS. THE CONTRACTOR MUST MAKE CONTRACTOR'S OWN MEASUREMENTS FOR LAYOUT OF IMPROVEMENTS.

10. THE OWNER AND CONTRACTOR MUST BE FAMILIAR WITH AND RESPONSIBLE FOR THE PROCUREMENT OF ANY AND ALL CERTIFICATIONS REQUIRED FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.

11. WHEN INCLUDED AS ONE OF THE REFERENCED DOCUMENTS, THE GEOTECHNICAL REPORT, SPECIFICATIONS AND RECOMMENDATIONS SET FORTH THEREIN ARE A PART OF THE REQUIRED CONSTRUCTION DOCUMENTS AND, IN CASE OF CONFLICT, DISCREPANCY OR AMBIGUITY, THE MORE STRINGENT REQUIREMENTS AND/OR RECOMMENDATIONS CONTAINED IN: (A) THE PLANS; AND (B) THE GEOTECHNICAL REPORT AND RECOMMENDATIONS, MUST TAKE PRECEDENCE UNLESS SPECIFICALLY NOTED OTHERWISE ON THE PLANS. THE CONTRACTOR MUST NOTIFY THE ENGINEER OF RECORD AND BOHLER, IN WRITING, OF ANY SUCH CONFLICT, DISCREPANCY OR AMBIGUITY BETWEEN THE GEOTECHNICAL REPORT AND PLANS AND SPECIFICATIONS, PRIOR TO PROCEEDING WITH ANY FURTHER WORK. IF A GEOTECHNICAL REPORT WAS NOT CREATED, THEN THE CONTRACTOR MUST FOLLOW AND COMPLY WITH ALL OF THE REQUIREMENTS OF ANY AND ALL MUNICIPAL, COUNTY, STATE, AND FEDERAL LAWS AND APPLICABLE SPECIFICATIONS WHICH HAVE JURISDICTION OVER THIS PROJECT.

12. ENGINEER OF RECORD AND BOHLER ARE NEITHER LIABLE NOR RESPONSIBLE FOR ANY SUBSURFACE CONDITIONS AND FURTHER, HAS NO LIABILITY FOR ANY HAZARDOUS MATERIALS, HAZARDOUS SUBSTANCES, OR POLLUTANTS ON, ABOUT OR UNDER THE PROPERTY.

13. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING WHEN AND WHERE SHORING IS REQUIRED AND FOR INSTALLING ALL SHORING REQUIRED DURING EXCAVATION (TO BE PERFORMED IN ACCORDANCE WITH CURRENT OSHA STANDARDS) AND ANY ADDITIONAL PRECAUTIONS TO BE TAKEN TO ASSURE THE STABILITY OF ADJACENT, NEARBY AND CONTIGUOUS STRUCTURES AND PROPERTIES. ALL OF THIS WORK IS TO BE PERFORMED AT CONTRACTOR'S SOLE COST AND EXPENSE.

14. THE CONTRACTOR MUST EXERCISE EXTREME CAUTION WHEN PERFORMING ANY WORK ACTIVITIES ADJACENT TO PAVEMENT, STRUCTURES, ETC. WHICH ARE TO REMAIN EITHER FOR AN INITIAL PHASE OF THE PROJECT OR AS PART OF THE FINAL CONDITION. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ALL APPROPRIATE MEASURES REQUIRED TO ENSURE THE STRUCTURAL STABILITY OF SIDEWALKS AND PAVEMENT, UTILITIES, BUILDINGS, AND INFRASTRUCTURE WHICH ARE TO REMAIN, AND TO PROVIDE A SAFE WORK AREA FOR THIRD PARTIES, PEDESTRIANS AND ANYONE INVOLVED WITH THE PROJECT.

15. DEBRIS MUST NOT BE BURIED ON THE SUBJECT SITE. ALL DEMOLITION AND CONSTRUCTION WASTES, UNSUITABLE EXCAVATED MATERIAL, EXCESS SOIL AND DEBRIS (SOLID WASTE) MUST BE DISPOSED OF IN ACCORDANCE WITH THE REQUIREMENTS OF ANY AND ALL MUNICIPAL, COUNTY, STATE, AND FEDERAL LAWS AND APPLICABLE CODES WHICH HAVE JURISDICTION OVER THIS PROJECT OR OVER THE CONTRACTOR.

16. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO MAINTAIN RECORDS TO DEMONSTRATE PROPER AND FULLY COMPLIANT DISPOSAL ACTIVITIES, TO BE PROMPTLY PROVIDED TO THE OWNER UPON REQUEST.

17. THE CONTRACTOR MUST REPAIR, AT CONTRACTOR'S SOLE COST, ALL DAMAGE DONE TO ANY NEW OR EXISTING CONSTRUCTION OR PROPERTY DURING THE COURSE OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. AND MUST BEAR ALL COSTS ASSOCIATED WITH SAME TO INCLUDE, BUT NOT BE LIMITED TO, REDESIGN, RE-SURVEY, RE-PERMITTING AND CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR AND MUST REPLACE ALL SIGNAL INTERCONNECTION CABLE, WIRING CONDUITS, AND ANY UNDERGROUND ACCESSORY EQUIPMENT DAMAGED DURING CONSTRUCTION AND MUST BEAR ALL COSTS ASSOCIATED WITH SAME. THE REPAIR OF ANY SUCH NEW OR EXISTING CONSTRUCTION OR PROPERTY MUST RESTORE SUCH CONSTRUCTION OR PROPERTY TO A CONDITION EQUIVALENT TO OR BETTER THAN THE CONDITIONS PRIOR TO COMMENCEMENT OF THE CONSTRUCTION, AND IN CONFORMANCE WITH APPLICABLE CODES, LAWS, RULES, REGULATIONS, STATUTORY REQUIREMENTS AND STATUTES. THE CONTRACTOR MUST BEAR ALL COSTS ASSOCIATED WITH SAME. THE CONTRACTOR MUST, PROMPTLY, DOCUMENT ALL EXISTING DAMAGE AND NOTIFY, IN WRITING, THE OWNER AND THE CONSTRUCTION MANAGER PRIOR TO THE START OF CONSTRUCTION.

18. THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR AND HAVE NO CONTRACTUAL, LEGAL OR OTHER RESPONSIBILITIES FOR JOB SITE SAFETY JOB SITE SUPERVISION, OR ANYTHING RELATED TO SAME. THE ENGINEER OF RECORD AND BOHLER HAVE NOT BEEN RETAINED TO PERFORM OR TO BE RESPONSIBLE FOR JOB SITE SAFETY, SAME BEING WHOLLY OUTSIDE OF ENGINEER OF RECORD'S AND BOHLER SERVICES AS RELATED TO THE PROJECT. THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE TO IDENTIFY OR REPORT ANY JOB SITE SAFETY ISSUES OR ANY JOB SITE CONDITIONS, AT ANY TIME.

19. THE CONTRACTOR MUST IMMEDIATELY IDENTIFY IN WRITING, TO THE ENGINEER OF RECORD AND BOHLER , ANY DISCREPANCIES THAT MAY OR COULD AFFECT THE PUBLIC SAFETY, HEALTH OR GENERAL WELFARE, OR PROJECT COST. IF THE CONTRACTOR PROCEEDS WITH CONSTRUCTION WITHOUT PROVIDING PROPER WRITTEN NOTIFICATION AS DESCRIBED ABOVE, IT WILL BE AT THE CONTRACTOR'S OWN RISK AND, FURTHER, THE CONTRACTOR MUST INDEMNIFY, DEFEND AND HOLD HARMLESS THE ENGINEER OF RECORD AND BOHLER FOR ANY AND ALL DAMAGES, COSTS, INJURIES, ATTORNEY'S FEES AND THE LIKE WHICH RESULT FROM OR ARE IN ANY WAY RELATED TO SAME INCLUDING, BUT NOT LIMITED TO, ANY THIRD PARTY AND FIRST PARTY CLAIMS.

20. THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR ANY INJURY OR DAMAGES RESULTING FROM THE CONTRACTOR'S FAILURE TO BUILD OR CONSTRUCT IN STRICT ACCORDANCE WITH THE APPROVED PLANS, AND CURRENT CODES, RULES, STATUTES AND THE LIKE. IF THE CONTRACTOR AND/OR OWNER FAIL TO BUILD OR CONSTRUCT IN STRICT ACCORDANCE WITH APPROVED PLANS, RULES, STATUTES, CODES AND THE LIKE, THE CONTRACTOR AND/OR OWNER AGREE TO AND MUST JOINTLY, INDEPENDENTLY, SEPARATELY, AND SEVERALLY INDEMNIFY AND HOLD THE ENGINEER OF RECORD AND BOHLER HARMLESS FOR AND FROM ALL INJURIES, CLAIMS AND DAMAGES THAT ENGINEER AND BOHLER SUFFER AND ANY AND ALL COSTS THAT ENGINEER AND BOHLER INCUR AS RELATED TO SAME.

21. ALL CONTRACTORS MUST CARRY AT LEAST THE MINIMUM AMOUNT OF THE SPECIFIED AND COMMERCIALLY REASONABLE STATUTORY WORKER'S COMPENSATION INSURANCE, EMPLOYER'S LIABILITY INSURANCE AND COMMERCIAL GENERAL LIABILITY INSURANCE (CGL) INCLUDING ALSO ALL UMBRELLA COVERAGES. ALL CONTRACTORS MUST HAVE THEIR CGL POLICIES ENDORSED TO NAME BOHLER , AND ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AS ADDITIONAL NAMED INSUREDS AND TO PROVIDE CONTRACTUAL LIABILITY COVERAGE SUFFICIENT TO INSURE (DEFEND, IF APPLICABLE) AND HOLD HARMLESS AND INDEMNITY OBLIGATIONS ASSUMED AND AGREED TO BY THE CONTRACTOR HEREIN. ALL CONTRACTORS MUST FURNISH BOHLER WITH CERTIFICATIONS OF INSURANCE OR CERTIFICATES OF INSURANCE AS EVIDENCE OF THE REQUIRED INSURANCE COVERAGES PRIOR TO COMMENCING ANY WORK AND UPON RENEWAL OF EACH POLICY DURING THE ENTIRE PERIOD OF CONSTRUCTION AND FOR TWO YEARS AFTER THE COMPLETION OF CONSTRUCTION AND AFTER ALL PERMITS ARE ISSUED, WHICHEVER DATE IS LATER. IN ADDITION, ALL CONTRACTORS AGREE THAT THEY WILL, TO THE FULLEST EXTENT PERMITTED UNDER THE LAW, INDEMNIFY, DEFEND AND HOLD HARMLESS BOHLER AND ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS FROM AND AGAINST ANY DAMAGES, INJURIES, CLAIMS, ACTIONS, PENALTIES, EXPENSES, PUNITIVE DAMAGES, TORT DAMAGES, STATUTORY CLAIMS, STATUTORY CAUSES OF ACTION, LOSSES, CAUSES OF ACTION, LIABILITIES OR COSTS, INCLUDING, BUT NOT LIMITED TO, REASONABLE ATTORNEYS' FEES AND DEFENSE COSTS, ARISING OUT OF OR IN ANY WAY CONNECTED WITH OR TO THE PROJECT, INCLUDING ALL CLAIMS BY EMPLOYEES OF THE CONTRACTOR(S), ALL CLAIMS BY THIRD PARTIES AND ALL CLAIMS RELATED TO THE PROJECT. THE CONTRACTOR MUST NOTIFY ENGINEER, IN WRITING, AT LEAST THIRTY (30) DAYS PRIOR TO ANY TERMINATION, SUSPENSION OR CHANGE OF ITS INSURANCE HEREUNDER.

22. THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR CONSTRUCTION METHODS, MEANS, TECHNIQUES OR PROCEDURES, GENERALLY OR FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES OR PROCEDURES FOR COMPLETION OF THE WORK DEPICTED BOTH ON THESE PLANS, AND FOR ANY CONFLICTS IN SCOPE AND REVISIONS THAT RESULT FROM SAME. THE CONTRACTOR IS FULLY AND SOLELY RESPONSIBLE FOR DETERMINING THE MEANS AND METHODS FOR COMPLETION OF THE WORK, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

23. NEITHER THE PROFESSIONAL ACTIVITIES OF BOHLER, NOR THE PRESENCE OF BOHLER AND/OR ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AT A CONSTRUCTION/PROJECT SITE (HEREIN "BOHLER PARTIES"), RELIEVES OR WILL RELIEVE THE CONTRACTOR OF AND FROM CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, OVERSEEING, SUPERINTENDING AND COORDINATING THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND COMPLIANCE WITH ALL HEALTH AND SAFETY PRECAUTIONS REQUIRED BY ANY REGULATORY AGENCIES WITH JURISDICTION OVER THE PROJECT AND/OR PROPERTY. BOHLER PARTIES HAVE NO AUTHORITY TO EXERCISE ANY CONTROL OVER (OR ANY RESPONSIBILITY FOR) ANY CONSTRUCTION, THE CONTRACTOR OR ITS EMPLOYEES RELATING TO THEIR WORK AND ANY AND ALL HEALTH AND SAFETY PROGRAMS OR PROCEDURES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SITE SAFETY. THE CONTRACTOR MUST INDEMNIFY, DEFEND, PROTECT AND HOLD HARMLESS BOHLER PARTIES FOR AND FROM ANY LIABILITY TO BOHLER PARTIES RESULTING FROM THE CONTRACTOR'S WORK, SERVICES AND/OR VIOLATIONS OF THIS NOTE, THESE NOTES OR ANY NOTES IN THE PLAN SET AND, FURTHER, THE CONTRACTOR MUST NAME BOHLER AS AN ADDITIONAL INSURED UNDER THE GENERAL CONTRACTOR'S POLICIES OF GENERAL LIABILITY INSURANCE AS DESCRIBED ABOVE.

24. WHEN IT IS CLEARLY AND SPECIFICALLY WITHIN BOHLER'S SCOPE OF SERVICES CONTRACT WITH THE OWNER/DEVELOPER, BOHLER WILL REVIEW OR TAKE OTHER APPROPRIATE ACTION ON THE CONTRACTOR SUBMITTALS, SUCH AS SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND OTHER DATA, WHICH THE CONTRACTOR IS REQUIRED TO SUBMIT, BUT ONLY FOR THE LIMITED PURPOSE OF EVALUATING CONFORMANCE WITH THE DESIGN INTENT AND THE INFORMATION SHOWN IN THE CONSTRUCTION CONTRACT DOCUMENTS. CONSTRUCTION MEANS AND METHODS AND/OR TECHNIQUES OR PROCEDURES, COORDINATION OF THE WORK WITH OTHER TRADES, AND CONSTRUCTION SAFETY PRECAUTIONS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND BOHLER HAS NO RESPONSIBILITY OR LIABILITY FOR SAME. BOHLER WILL PERFORM ITS SHOP DRAWING REVIEW WITH REASONABLE PROMPTNESS, AS CONDITIONS PERMIT. ANY DOCUMENT, DOCUMENTING BOHLER'S REVIEW OF A SPECIFIC ITEM OR LIMITED SCOPE, MUST NOT INDICATE THAT BOHLER HAS REVIEWED THE ENTIRE ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. BOHLER IS NOT RESPONSIBLE FOR ANY DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR MUST, IN WRITING, PROMPTLY AND IMMEDIATELY BRING ANY DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS TO BOHLER'S ATTENTION. BOHLER IS NOT REQUIRED TO REVIEW PARTIAL SUBMISSIONS OR THOSE FOR WHICH SUBMISSIONS OF CORRELATED ITEMS HAVE NOT BEEN RECEIVED.

25. IF THE CONTRACTOR DEVIATES FROM THESE PLANS AND/OR SPECIFICATIONS, INCLUDING THE NOTES CONTAINED HEREIN, WITHOUT FIRST OBTAINING THE PRIOR WRITTEN AUTHORIZATION OF THE ENGINEER OF RECORD AND BOHLER FOR ALL DEVIATIONS WITHIN ENGINEER'S SCOPE, THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PAYMENT OF ALL COSTS INCURRED IN CORRECTING ANY WORK PERFORMED WHICH DEVIATES FROM THE PLANS, ALL FINES AND/OR PENALTIES ASSESSED WITH RESPECT THERETO AND ALL COMPENSATORY OR PUNITIVE DAMAGES RESULTING THEREFROM AND, FURTHER, MUST DEFEND, INDEMNIFY, PROTECT, AND HOLD HARMLESS THE ENGINEER OF RECORD AND BOHLER PARTIES TO THE FULLEST EXTENT PERMITTED UNDER THE LAW, FOR AND FROM ALL FEES, ATTORNEYS' FEES, DAMAGES, COSTS, JUDGMENTS, CLAIMS, INJURIES, PENALTIES AND THE LIKE RELATED TO SAME.

26. THE CONTRACTOR IS RESPONSIBLE FOR A MAINTAINING AND PROTECTING THE TRAFFIC CONTROL PLAN AND ELEMENTS IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REQUIREMENTS, FOR ALL WORK THAT AFFECTS PUBLIC TRAVEL EITHER IN THE RIGHT OF WAY OR ON SITE. THE COST FOR THIS ITEM MUST BE INCLUDED IN THE CONTRACTOR'S PRICE AND IS THE CONTRACTOR'S SOLE RESPONSIBILITY.

27. OWNER MUST MAINTAIN AND PRESERVE ALL PHYSICAL SITE FEATURES AND DESIGN FEATURES DEPICTED ON THE PLANS AND RELATED DOCUMENTS IN STRICT ACCORDANCE WITH THE APPROVED PLAN(S) AND DESIGN; AND, FURTHER, THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR ANY FAILURE TO SO MAINTAIN OR PRESERVE SITE AND/OR DESIGN FEATURES. IF OWNER FAILS TO MAINTAIN AND/OR PRESERVE ALL PHYSICAL SITE FEATURES AND/OR DESIGN FEATURES DEPICTED ON THE PLANS AND RELATED DOCUMENTS, OWNER AGREES TO INDEMNIFY AND HOLD THE ENGINEER OF RECORD AND BOHLER PARTIES, HARMLESS FOR ALL INJURIES, DAMAGES AND COSTS THAT ENGINEER OF RECORD AND BOHLER INCUR AS A RESULT OF SAID FAILURE OR FAILURE TO PRESERVE.

28. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION ACTIVITIES AND MATERIALS COMPLY WITH AND CONFORM TO APPLICABLE FEDERAL, STATE AND LOCAL RULES AND REGULATIONS, LAWS, ORDINANCES, AND CODES, AND ALL APPLICABLE REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, (29 U.S.C. 651 ET SEQ.) AS AMENDED, AND ANY MODIFICATIONS, AMENDMENTS OR REVISIONS TO SAME.

29. THE CONTRACTOR MUST STRICTLY COMPLY WITH THE LATEST AND CURRENT OSHA STANDARDS AND REGULATIONS, AND/OR ANY OTHER AGENCY WITH JURISDICTION OVER EXCAVATION AND TRENCHING PROCEDURES. ENGINEER OF RECORD AND BOHLER HAS NO RESPONSIBILITY FOR OR AS RELATED TO EXCAVATION AND TRENCHING PROCEDURES AND WORK.

30. THE CONTRACTOR AND THE OWNER MUST INSTALL ALL ELEMENTS AND COMPONENTS IN STRICT COMPLIANCE WITH AND IN ACCORDANCE WITH MANUFACTURER'S STANDARDS AND RECOMMENDED INSTALLATION CRITERIA AND SPECIFICATIONS. IF THE CONTRACTOR AND/OR OWNER FAIL TO DO SO, THEY AGREE TO JOINTLY, INDEPENDENTLY, SEPARATELY, COLLECTIVELY, AND SEVERALLY INDEMNIFY, DEFEND, PROTECT AND HOLD ENGINEER OF RECORD AND BOHLER PARTIES HARMLESS FOR ANY AND ALL INJURIES AND DAMAGES THAT ENGINEER SUFFERS AND COSTS THAT ENGINEER INCURS AS A RESULT OF SAID FAILURE.

31. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN AN ON-SITE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN COMPLIANCE WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) REQUIREMENTS OR LOCAL GOVERNING AGENCY FOR SITES WHERE ONE (1) ACRE OR MORE IS DISTURBED BY CONSTRUCTION ACTIVITIES (UNLESS THE LOCAL JURISDICTION REQUIRES A DIFFERENT THRESHOLD). THE CONTRACTOR MUST ENSURE THAT ALL ACTIVITIES, INCLUDING THOSE OF ALL SUBCONTRACTORS, ARE IN COMPLIANCE WITH THE SWPPP, INCLUDING BUT NOT LIMITED TO LOGGING ACTIVITIES (MINIMUM ONCE PER WEEK AND AFTER RAINFALL EVENTS) AND CORRECTIVE MEASURES, AS APPROPRIATE AND FURTHER, THE CONTRACTOR IS SOLELY AND COMPLETELY RESPONSIBLE FOR FAILING TO DO SO.

32. AS CONTAINED IN THESE DRAWINGS AND ASSOCIATED DOCUMENTS PREPARED BY THE ENGINEER OF RECORD AND BOHLER, THE USE OF THE WORDS 'CERTIFY' OR 'CERTIFICATION' CONSTITUTE(S) AN EXPRESSION ONLY OF PROFESSIONAL OPINION REGARDING THE INFORMATION WHICH IS THE SUBJECT OF THE ENGINEER OF RECORD'S AND BOHLER KNOWLEDGE OR BELIEF AND IN ACCORDANCE WITH COMMON AND ACCEPTED PROCEDURE CONSISTENT WITH THE APPLICABLE STANDARDS OF PRACTICE, AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE OF ANY NATURE OR TYPE, EITHER EXPRESSED OR IMPLIED, UNDER ANY CIRCUMSTANCES.

GENERAL DEMOLITION NOTES

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.

2. THE CONTRACTOR MUST CONDUCT DEMOLITION/REMOVALS ACTIVITIES IN SUCH A MANNER AS TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, SIDEWALKS, WALKWAYS, AND ALL OTHER ADJACENT FACILITIES. THE CONTRACTOR MUST OBTAIN ALL APPLICABLE PERMITS FROM THE APPROPRIATE GOVERNMENTAL AUTHORITY(IES) PRIOR TO THE COMMENCEMENT OF ANY ROAD OPENING OR DEMOLITION ACTIVITIES IN OR ADJACENT TO THE RIGHT-OF-WAY.

3. WHEN DEMOLITION-RELATED ACTIVITIES IMPACT ROADWAYS AND/OR ROADWAY RIGHT-OF-WAY, THE CONTRACTOR MUST PROVIDE TRAFFIC CONTROL AND GENERALLY ACCEPTED SAFE PRACTICES IN CONFORMANCE WITH THE CURRENT FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), AND THE FEDERAL, STATE, AND LOCAL REGULATIONS.

4. THE DEMOLITION (AND/OR REMOVALS) PLAN IS INTENDED TO PROVIDE GENERAL INFORMATION AND TO IDENTIFY ONLY CONDITIONS REGARDING ITEMS TO BE DEMOLISHED, REMOVED, AND/OR TO REMAIN.
   - 4.1. THE CONTRACTOR MUST ALSO REVIEW ALL CONSTRUCTION DOCUMENTS AND INCLUDE WITHIN THE DEMOLITION ACTIVITIES ALL INCIDENTAL WORK NECESSARY FOR THE CONSTRUCTION OF THE NEW SITE IMPROVEMENTS.
   - 4.2. THIS PLAN IS NOT INTENDED TO AND DOES NOT PROVIDE DIRECTION REGARDING THE MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE EMPLOYED TO ACCOMPLISH THE WORK. ALL MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE USED MUST BE IN STRICT ACCORDANCE AND CONFORMANCE WITH ALL STATE, FEDERAL, LOCAL, AND JURISDICTIONAL REQUIREMENTS. THE CONTRACTOR MUST COMPLY WITH ALL OSHA AND OTHER SAFETY PRECAUTIONS NECESSARY TO PROVIDE A SAFE WORK SITE FOR THE CONTRACTOR AND THE PUBLIC.

5. THE CONTRACTOR MUST PROVIDE ALL "METHODS AND MEANS" NECESSARY TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF EXISTING STRUCTURES, AND ANY OTHER IMPROVEMENTS THAT ARE REMAINING ON OR OFF SITE. THE CONTRACTOR, AT THE CONTRACTOR'S SOLE COST, MUST REPAIR ALL DAMAGE TO ALL ITEMS AND FEATURES THAT ARE TO REMAIN. CONTRACTOR MUST USE NEW MATERIAL FOR ALL REPAIRS. CONTRACTOR'S REPAIRS MUST INCLUDE THE RESTORATION OF ALL ITEMS AND FEATURES REPAIRED TO THEIR PRE-DEMOLITION CONDITION, OR BETTER. CONTRACTOR MUST PERFORM ALL REPAIRS AT THE CONTRACTOR'S SOLE EXPENSE.

6. ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR JOB SITE SAFETY OR SUPERVISION. THE CONTRACTOR MUST PROCEED WITH THE DEMOLITION IN A SYSTEMATIC AND SAFE MANNER, COMPLYING WITH ALL OSHA REQUIREMENTS, TO ENSURE PUBLIC AND CONTRACTOR SAFETY AND SAFETY TO ALL PROPERTY ON THE SITE OR ADJACENT OR NEAR TO THE SAME.

7. THE CONTRACTOR IS RESPONSIBLE FOR JOB SITE SAFETY, WHICH MUST INCLUDE, BUT IS NOT LIMITED TO, THE INSTALLATION AND MAINTENANCE OF BARRIERS, FENCING, OTHER APPROPRIATE AND/OR NECESSARY SAFETY FEATURES AND ITEMS NECESSARY TO PROTECT THE PUBLIC FROM AREAS OF CONSTRUCTION AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR MUST SAFEGUARD THE SITE AS NECESSARY TO PERFORM THE DEMOLITION IN SUCH A MANNER AS TO PREVENT THE ENTRY OF ALL UNAUTHORIZED PERSONS AT ANY TIME, TO OR NEAR THE DEMOLITION AREA.

8. PRIOR TO THE COMMENCEMENT OF ANY SITE ACTIVITY AND ANY DEMOLITION ACTIVITY, THE CONTRACTOR MUST, IN WRITING, RAISE ANY QUESTIONS CONCERNING THE ACCURACY OR INTENT OF THESE PLANS AND/OR SPECIFICATIONS, ALL CONCERNS OR QUESTIONS REGARDING THE APPLICABLE SAFETY STANDARDS, AND/OR THE SAFETY OF THE CONTRACTOR AND/OR THIRD PARTIES IN PERFORMING THE WORK ON THIS PROJECT. ANY SUCH CONCERNS MUST BE CONVEYED TO THE ENGINEER OF RECORD AND BOHLER , IN WRITING AND MUST ADDRESS ALL ISSUES AND ITEMS RESPONDED TO, BY THE ENGINEER OF RECORD AND BY BOHLER, IN WRITING. ALL DEMOLITION ACTIVITIES MUST BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THESE PLANS AND SPECIFICATIONS AND ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, RULES, REQUIREMENTS, STATUTES, ORDINANCES AND CODES.

9. THE CONTRACTOR MUST BECOME FAMILIAR WITH THE APPLICABLE UTILITY SERVICE PROVIDER REQUIREMENTS AND IS RESPONSIBLE FOR ALL COORDINATION REGARDING UTILITY DEMOLITION AND/OR DISCONNECTION AS IDENTIFIED OR REQUIRED FOR THE PROJECT. THE CONTRACTOR MUST PROVIDE THE OWNER WITH WRITTEN NOTIFICATION THAT THE EXISTING UTILITIES AND SERVICES HAVE BEEN TERMINATED, REMOVED AND/OR ABANDONED IN ACCORDANCE WITH THE JURISDICTION AND UTILITY COMPANY REQUIREMENTS AND ALL OTHER APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES.

10. PRIOR TO COMMENCING ANY DEMOLITION, THE CONTRACTOR MUST:
   - 10.1. OBTAIN ALL REQUIRED PERMITS AND MAINTAIN THE SAME ON SITE FOR REVIEW BY THE ENGINEER AND ALL PUBLIC AGENCIES WITH JURISDICTION THROUGHOUT THE DURATION OF THE PROJECT, SITE WORK, AND DEMOLITION WORK.
   - 10.2. NOTIFY, AT A MINIMUM, THE MUNICIPAL ENGINEER, DESIGN ENGINEER, AND LOCAL SOIL CONSERVATION JURISDICTION, AT LEAST 72 BUSINESS HOURS PRIOR TO THE COMMENCEMENT OF WORK.
   - 10.3. INSTALL THE REQUIRED SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO SITE DISTURBANCE, AND MAINTAIN SAID CONTROLS UNTIL SITE IS STABILIZED
   - 10.4. IN ACCORDANCE WITH STATE LAW, THE CONTRACTOR MUST CALL THE STATE ONE-CALL DAMAGE PROTECTION SYSTEM FOR UTILITY MARK OUT, IN ADVANCE OF ANY EXCAVATION.
   - 10.5. LOCATE AND PROTECT ALL UTILITIES AND SERVICES, INCLUDING BUT NOT LIMITED TO GAS, WATER, ELECTRIC, SANITARY AND STORM SEWER, TELEPHONE, CABLE, FIBER OPTIC CABLE, ETC. WITHIN AND ADJACENT TO THE LIMITS OF PROJECT ACTIVITIES. THE CONTRACTOR MUST USE AND COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE UTILITY NOTIFICATION SYSTEM TO LOCATE ALL UNDERGROUND UTILITIES.
   - 10.6. PROTECT AND MAINTAIN IN OPERATION, ALL ACTIVE UTILITIES AND SYSTEMS THAT ARE NOT BEING REMOVED DURING ANY DEMOLITION ACTIVITIES.
   - 10.7. ARRANGE FOR AND COORDINATE WITH THE APPLICABLE UTILITY SERVICE PROVIDER(S) FOR THE TEMPORARY OR PERMANENT TERMINATION OF SERVICE REQUIRED BY THE PROJECT PLANS AND SPECIFICATIONS REGARDING THE METHODS AND MEANS TO CONSTRUCT SAME. THESE ARE NOT THE ENGINEER OF RECORD'S RESPONSIBILITY. IN THE EVENT OF ABANDONMENT, THE CONTRACTOR MUST PROVIDE THE UTILITY ENGINEER AND OWNER WITH IMMEDIATE WRITTEN NOTIFICATION THAT THE EXISTING UTILITIES AND SERVICES HAVE BEEN TERMINATED AND ABANDONED IN ACCORDANCE WITH JURISDICTIONAL AND UTILITY COMPANY REQUIREMENTS.
   - 10.8. ARRANGE FOR AND COORDINATE WITH THE APPLICABLE UTILITY SERVICE PROVIDER(S) REGARDING WORKING "OFF-PEAK" HOURS OR ON WEEKENDS AS NECESSARY OR AS REQUIRED TO MINIMIZE THE IMPACT ON, OF, AND TO THE AFFECTED PARTIES. WORK REQUIRED TO BE PERFORMED "OFF-PEAK" IS TO BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
   - 10.9. IN THE EVENT THE CONTRACTOR DISCOVERS ANY HAZARDOUS MATERIAL, THE REMOVAL OF WHICH IS NOT ADDRESSED IN THE PROJECT PLANS AND SPECIFICATIONS OR THE CONTRACT WITH THE OWNER/DEVELOPER, THE CONTRACTOR MUST IMMEDIATELY CEASE ALL WORK IN THE AREA OF DISCOVERY, AND IMMEDIATELY NOTIFY, IN WRITING AND VERBALLY, THE OWNER AND ENGINEER OF RECORD AND BOHLER, THE DISCOVERY OF SUCH MATERIALS TO PURSUE PROPER AND COMPLIANT REMOVAL OF SAME.

11. THE CONTRACTOR MUST NOT PERFORM ANY EARTH MOVEMENT ACTIVITIES, DEMOLITION OR REMOVAL OF FOUNDATION WALLS, FOOTINGS, OR OTHER MATERIALS WITHIN THE LIMITS OF DISTURBANCE, UNLESS SAME IS IN STRICT ACCORDANCE AND CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS, OR PURSUANT TO THE WRITTEN DIRECTION OF THE OWNER'S STRUCTURAL OR GEOTECHNICAL ENGINEER.

12. DEMOLITION ACTIVITIES AND EQUIPMENT MUST NOT USE OR INCLUDE AREAS OUTSIDE THE DEFINED PROJECT LIMIT LINE, WITHOUT SPECIFIC WRITTEN PERMISSION AND AUTHORITY OF AND FROM THE OWNER AND ALL GOVERNMENTAL AGENCIES WITH JURISDICTION.

13. THE CONTRACTOR MUST BACKFILL ALL EXCAVATION RESULTING FROM, OR INCIDENTAL TO, DEMOLITION ACTIVITIES. BACKFILL MUST BE ACCOMPLISHED WITH APPROVED BACKFILL MATERIALS AND MUST BE SUFFICIENTLY COMPACTED TO SUPPORT ALL NEW IMPROVEMENTS AND MUST BE PERFORMED IN COMPLIANCE WITH THE RECOMMENDATIONS AND GUIDANCE ARTICULATED IN THE GEOTECHNICAL REPORT. BACKFILLING MUST OCCUR IMMEDIATELY AFTER DEMOLITION ACTIVITIES AND MUST BE PERFORMED SO AS TO PREVENT WATER ENTERING THE EXCAVATION. FINISHED SURFACES MUST BE GRADED TO PROMOTE POSITIVE DRAINAGE. THE CONTRACTOR IS RESPONSIBLE FOR COMPACTION TESTING AND MUST SUBMIT SUCH REPORTS AND RESULTS TO THE ENGINEER OF RECORD AND THE OWNER.

14. EXPLOSIVES MUST NOT BE USED WITHOUT PRIOR WRITTEN CONSENT FROM BOTH THE OWNER AND ALL APPLICABLE, NECESSARY AND REQUIRED GOVERNMENTAL AUTHORITIES. PRIOR TO COMMENCING ANY EXPLOSIVE PROGRAM AND/OR ANY DEMOLITION ACTIVITIES, THE CONTRACTOR MUST ENSURE AND OVERSEE THE INSTALLATION OF ALL OF THE REQUIRED PERMIT AND EXPLOSIVE CONTROL MEASURES THAT THE FEDERAL, STATE, AND LOCAL GOVERNMENTS REQUIRE. THE CONTRACTOR IS ALSO RESPONSIBLE TO CONDUCT AND PERFORM ALL INSPECTION AND SEISMIC VIBRATION TESTING THAT IS REQUIRED TO MONITOR THE EFFECTS ON ALL LOCAL STRUCTURES AND THE LIKE.

15. IN ACCORDANCE WITH FEDERAL, STATE, AND/OR LOCAL STANDARDS, THE CONTRACTOR MUST USE DUST CONTROL MEASURES TO LIMIT AIRBORNE DUST AND DIRT RISING AND SCATTERING IN THE AIR. AFTER THE DEMOLITION IS COMPLETE, THE CONTRACTOR MUST CLEAN ALL ADJACENT STRUCTURES AND IMPROVEMENTS TO REMOVE ALL DUST AND DEBRIS WHICH THE DEMOLITION OPERATIONS CAUSE. THE CONTRACTOR IS RESPONSIBLE FOR RETURNING ALL ADJACENT AREAS TO THEIR "PRE-DEMOLITION" CONDITION AT CONTRACTOR'S SOLE COST.

16. PAVEMENT MUST BE SAW CUT IN STRAIGHT LINES. ALL DEBRIS FROM REMOVAL OPERATIONS MUST BE REMOVED FROM THE SITE AT THE TIME OF EXCAVATION. STOCKPILING OF DEBRIS OUTSIDE OF APPROVED AREAS WILL NOT BE PERMITTED, INCLUDING BUT NOT LIMITED TO, THE PUBLIC RIGHT-OF-WAY.

17. THE CONTRACTOR MUST MAINTAIN A RECORD SET OF PLANS WHICH INDICATES THE LOCATION OF EXISTING UTILITIES THAT ARE CAPPED, ABANDONED IN PLACE, OR RELOCATED DUE TO DEMOLITION ACTIVITIES. THIS RECORD DOCUMENT MUST BE PREPARED IN A NEAT AND WORKMAN-LIKE MANNER AND TURNED OVER TO THE OWNER/DEVELOPER UPON COMPLETION OF THE WORK, ALL OF WHICH IS AT THE CONTRACTOR'S SOLE COST.

18. THE CONTRACTOR MUST EMPTY, CLEAN AND REMOVE FROM THE SITE ALL UNDERGROUND STORAGE TANKS, IF ENCOUNTERED, IN ACCORDANCE WITH FEDERAL, STATE, COUNTY AND LOCAL REQUIREMENTS, PRIOR TO CONTINUING CONSTRUCTION IN THE AREA AROUND THE TANK WHICH EMPTYING, CLEANING AND REMOVAL ARE AT THE CONTRACTOR'S SOLE COST.

19. THE CONTRACTOR MUST LOCATE AND CLEARLY DEFINE VERTICALLY AND HORIZONTALLY ALL ACTIVE AND INACTIVE UTILITY AND/OR SERVICE SYSTEMS THAT ARE TO BE REMOVED. THE CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN ALL ACTIVE SYSTEMS THAT ARE NOT BEING REMOVED/RELOCATED DURING SITE ACTIVITY.

20. CONTRACTOR SHALL FIELD LOCATE EXISTING UTILITIES PRIOR TO CONSTRUCTION AND IF REQUIRED, DIG EXPLORATORY TEST PITS TO CONFIRM EXACT LOCATION AND DEPTH OF UTILITIES. CONTRACTOR SHALL NOTIFY DESIGN ENGINEER WITH ANY CONFLICTS AS NEEDED TO COORDINATE FINAL LOCATION OF ALL PROPOSED IMPROVEMENTS.

21. CONTRACTOR SHALL INSPECT ALL EXISTING UTILITY STRUCTURES THAT ARE TO REMAIN FOR THE PROJECTS RE-USE TO VERIFY SUITABILITY FOR SAME. IF STRUCTURES CAN NOT BE REUSED THEN THE CONTRACTOR SHALL PROVIDE A NEW STRUCTURE. THE CONTRACTOR SHALL COORDINATE SUCH WORK WITH THE APPLICABLE UTILITY PROVIDER.

22. CONTRACTOR TO REMOVE ANY BUILDING FOUNDATION REMAINS OR ASSOCIATED IMPROVEMENTS, DELETERIOUS MATERIALS, AND/OR DEBRIS THAT IMPEDE THE WORK SHOWN ON THESE PLANS.

23. THE CONTRACTOR SHALL REVIEW THE PLANS VERSUS THE LOCATION OF EXISTING STRUCTURES, UTILITIES AND APPURTENANCES IN THE FIELD TO CONFIRM ACCURACY OF SAME AND VERIFY ITEMS TO BE REMOVED. THE CONTRACTOR SHALL CARRY COSTS FOR REMOVAL OF ANY EXISTING STRUCTURES, APPURTENANCES, AND UNDERGROUND UTILITIES, INCLUDING BUT NOT LIMITED TO, DRAIN, WATER, SEWER, STEAM, IRRIGATION, GAS, TELECOM AND ELECTRIC.

24. THE CONTRACTOR SHALL MAINTAIN, ADJUST OR ABANDON EXISTING MONITORING WELLS IN ACCORDANCE WITH THE DIRECTION OF THE ENVIRONMENTAL CONSULTANT (TYP.)

25. WHERE THE LIMIT OF WORK COINCIDES WITH PROPERTY LINE, TREE LINE, PROPOSED SAWCUT OR COMBINATION THEREOF IT IS SHOWN ADJACENT TO THESE FEATURES FOR GRAPHICAL CLARITY.

26. EXISTING TREES TO REMAIN ARE TO BE PROTECTED DURING CONSTRUCTION UNLESS CLEARLY INDICATED OTHERWISE. REASONABLE CARE AND CAUTION SHALL BE TAKEN DURING CONSTRUCTION TO PREVENT DAMAGE AND SELECTIVE PRUNING MAY BE REQUIRED TO ENSURE THAT TREES DO NOT CONFLICT WITH THE DEVELOPMENT.

27. CONTRACTOR SHALL REPAIR/REPLACE ANY TRAFFIC LOOP DETECTORS THAT ARE DAMAGED DURING CONSTRUCTION WITHIN EXISTING OR PROPOSED RIGHTS OF WAYS. ANY SUCH WORK SHALL BE PERFORMED BY A LICENSED / DOT APPROVED SIGNAL CONTRACTOR. ANY DAMAGED LOOPS OR OTHER SIGNAL EQUIPMENT SHALL BE REPAIRED IMMEDIATELY AFTER THE WORK IS COMPLETE. THE SIGNAL CONTRACTOR SHALL BE AVAILABLE TO MAKE ANY TEMPORARY SIGNAL CHANGES IF REQUESTED BY DOT AND/OR THE MUNICIPALITY.

28. THE CONTRACTOR MUST FIELD VERIFY THE LOCATIONS WHERE PROPOSED UTILITIES CROSS EXISTING UNDERGROUND UTILITIES BY USING A TEST PIT TO DETERMINE THE EXACT SIZE, DEPTH AND LOCATION, PRIOR TO COMMENCEMENT OF CONSTRUCTION.

29. CONTRACTOR SHALL LOCATE ANY EXISTING UTILITY SERVICES THAT ARE TO BE TERMINATED AT THE EXISTING MAIN AND/OR PROPERTY LINE. THESE SERVICES ARE TO BE TERMINATED IN ACCORDANCE WITH MUNICIPAL / STATE TRANSPORTATION DEPARTMENT REQUIREMENTS.

GENERAL SITE NOTES

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.

2. PRIOR TO THE COMMENCEMENT OF GENERAL CONSTRUCTION, THE CONTRACTOR MUST INSTALL SOIL EROSION CONTROL AND ANY STORMWATER POLLUTION PREVENTION PLAN (SWPPP) MEASURES NECESSARY, AS INDICATED ON THE APPROVED SOIL EROSION AND SEDIMENT CONTROL PLAN AND IN ACCORDANCE WITH APPLICABLE AND/OR APPROPRIATE AGENCIES' GUIDELINES TO PREVENT SEDIMENT AND/OR LOOSE DEBRIS FROM WASHING ONTO ADJACENT PROPERTIES OR THE RIGHT OF WAY.

3. ALL DIRECTIONAL/TRAFFIC SIGNING AND PAVEMENT STRIPING MUST CONFORM TO THE LATEST STANDARDS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND ANY APPLICABLE STATE OR LOCALLY APPROVED SUPPLEMENTS, GUIDELINES, RULES, REGULATIONS, STANDARDS AND THE LIKE.

4. THE LOCATIONS OF PROPOSED UTILITY POLES AND TRAFFIC SIGNS SHOWN ON THE PLANS ARE SCHEMATIC AND PRELIMINARY. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR FIELD-VERIFYING THEIR LOCATION. THE CONTRACTOR MUST COORDINATE THE RELOCATION OF TRAFFIC SIGNS WITH THE ENTITY WITH JURISDICTION OVER THE PROJECT.

5. ALL DIMENSIONS SHOWN ARE TO BOTTOM FACE OF CURB, EDGE OF PAVEMENT, OR EDGE OF BUILDING, EXCEPT WHEN DIMENSION IS TO A PROPERTY LINE, STAKE OUT OF LOCATIONS OF INLETS, LIGHT POLES, ETC. MUST BE PERFORMED IN STRICT ACCORDANCE WITH THE DETAILS, UNLESS NOTED CLEARLY OTHERWISE.

6. WHEN APPLICABLE, OWNER/ OPERATOR MUST FILE THE NOI FOR NPDES PERMITS AT APPROPRIATE AND/OR REQUIRED TIMEFRAMES BASED UPON THE DESIRED START OF CONSTRUCTION. LAND DISTURBING ACTIVITIES MUST NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED FROM GOVERNING AUTHORITIES (INCLUDING STORMWATER POLLUTION PREVENTION PLAN). THE CONTRACTOR MUST STRICTLY ADHERE TO THE APPROVED SWPPP PLAN DURING CONSTRUCTION OPERATIONS (IF PROVIDED).

7. ALL CONCRETE MUST BE AIR ENTRAINED AND INCLUDE THE MINIMUM COMPRESSIVE STRENGTH OF JURISDICTIONAL STANDARD PSI AT 28 DAYS (OR 4,000 PSI) UNLESS OTHERWISE NOTED ON THE PLANS, DETAILS AND/OR GEOTECHNICAL REPORT.

8. THE CONTRACTOR MUST FILE SITE SIGNAGE APPLICATION OR PERMIT UNDER SEPARATE APPLICATION UNLESS DONE SO AS PART OF JURISDICTIONAL PERMITTING PROCEDURES.

9. THE CONTRACTOR MUST REPAIR OR REPLACE, AT THE CONTRACTOR'S SOLE COST AND EXPENSE, ALL SIDEWALKS, CURBS, PAVEMENT MARKINGS, AND PAVEMENT DAMAGED BY CONSTRUCTION ACTIVITIES WHETHER SPECIFIED ON THIS PLAN OR NOT.

10. WORK WITHIN THE RIGHT-OF-WAY MUST BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS AND STANDARDS OF THE DEPARTMENT OF PUBLIC WORKS, ENGINEERING DEPARTMENT, HIGHWAY DIVISION, AND/OR STATE DOT HIGHWAY DEPARTMENT.

11. WHERE RETAINING WALLS ARE IDENTIFIED ON THE PLANS, TOP AND BOTTOM OF WALL WIDTHS DO NOT REPRESENT THE ACTUAL WIDTH OF THE PROPOSED WALL, RATHER THEY ARE AN ASSUMPTION BASED ON WALL TYPE AND WALL HEIGHT. WALL FOOTINGS AND /OR FOUNDATIONS ARE NOT IDENTIFIED HEREIN AND ARE TO BE SET/DETERMINED BY THE CONTRACTOR OR WALL DESIGNER, AND MUST BE SET BASED UPON FINAL STRUCTURAL DESIGN SHOP DRAWINGS PREPARED BY THE APPROPRIATE PROFESSIONAL LICENSED IN THE STATE WHERE THE CONSTRUCTION OCCURS. THE CONTRACTOR MUST ENSURE THAT AN APPROPRIATELY LICENSED PROFESSIONAL DESIGNS ALL WALLS SHOWN HEREON AND PRIOR TO CONSTRUCTION. REFER TO GRADING NOTES REGARDING RETAINING WALL DESIGN.

12. CONTRACTOR IS CAUTIONED OF EXISTING UTILITY SERVICES TO REMAIN IN PROXIMITY TO PROPOSED BOLLARDS AND SIGNS. CONTRACTOR SHALL PROVIDE FIELD MODIFICATION LOCATIONS OF BOLLARDS AND BOLLARDS WITH SIGNAGE AS NEEDED TO AVOID CONFLICTS WITH EXISTING UTILITY SERVICES TO REMAIN.

GENERAL GRADING NOTES

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.

2. SITE GRADING MUST BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL REPORT AS REFERENCED IN THIS PLAN SET. IF NO GEOTECHNICAL REPORT HAS BEEN REFERENCED, THE CONTRACTOR MUST HAVE A GEOTECHNICAL ENGINEER PROVIDE WRITTEN SPECIFICATIONS AND RECOMMENDATIONS PRIOR TO THE CONTRACTOR COMMENCING THE GRADING WORK. THE CONTRACTOR MUST FOLLOW THE REQUIREMENTS OF ALL MUNICIPAL, COUNTY, STATE, AND FEDERAL LAWS, WHICH HAVE JURISDICTION OVER THIS PROJECT.

3. THE CONTRACTOR IS REQUIRED TO SECURE ALL NECESSARY AND/OR REQUIRED PERMITS AND APPROVALS FOR ALL OFF-SITE MATERIAL SOURCES AND DISPOSAL FACILITIES. THE CONTRACTOR MUST SUPPLY A COPY OF APPROVALS TO THE ENGINEER OF RECORD AND THE OWNER PRIOR TO THE CONTRACTOR COMMENCING ANY WORK.
4. THE CONTRACTOR IS FULLY RESPONSIBLE FOR VERIFYING EXISTING TOPOGRAPHIC INFORMATION AND UTILITY INVERT ELEVATIONS PRIOR TO COMMENCING ANY CONSTRUCTION. SHOULD DISCREPANCIES BETWEEN THE PLANS AND INFORMATION OBTAINED THROUGH FIELD VERIFICATIONS BE IDENTIFIED OR EXIST, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER OF RECORD, IN WRITING.

5. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING AND REPLACING ALL UNSUITABLE MATERIALS WITH SUITABLE MATERIALS AS SPECIFIED IN THE GEOTECHNICAL REPORT. THE CONTRACTOR MUST COMPACT ALL EXCAVATED OR FILLED AREAS IN STRICT ACCORDANCE WITH THE GEOTECHNICAL REPORT'S GUIDANCE. MOISTURE CONTENT AT TIME OF PLACEMENT MUST BE SUBMITTED IN A COMPACTION REPORT PREPARED BY A QUALIFIED GEOTECHNICAL ENGINEER, REGISTERED WITH THE STATE WHERE THE WORK IS PERFORMED. THIS REPORT MUST VERIFY THAT ALL FILLED AREAS AND SUBGRADE AREAS WITHIN THE BUILDING PAD AREA AND AREAS TO BE PAVED HAVE BEEN COMPACTED IN ACCORDANCE WITH THESE PLANS, SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL REPORT AND ALL APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES WHICH ARE IN EFFECT AND WHICH ARE APPLICABLE TO THE PROJECT. SUBBASE MATERIAL FOR SIDEWALKS, CURB, OR ASPHALT MUST BE FREE OF ORGANICS AND OTHER UNSUITABLE MATERIALS. SHOULD SUBBASE BE DEEMED UNSUITABLE BY OWNER/DEVELOPER, OR OWNER/DEVELOPER'S REPRESENTATIVE, SUBBASE MUST BE REMOVED AND FILLED WITH APPROVED FILL MATERIAL, COMPACTED AS THE GEOTECHNICAL REPORT DIRECTS. EARTHWORK ACTIVITIES INCLUDING, BUT NOT LIMITED TO, EXCAVATION, BACKFILL, AND COMPACTING MUST COMPLY WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT AND ALL APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES. EARTHWORK ACTIVITIES MUST COMPLY WITH THE STANDARD STATE DOT SPECIFICATIONS FOR ROADWAY CONSTRUCTION (LATEST EDITION) AND ANY AMENDMENTS OR REVISIONS THERETO.

6. IN THE EVENT OF A DISCREPANCY(IES) AND/OR A CONFLICT(S) BETWEEN PLANS, OR RELATIVE TO OTHER PLANS, THE GRADING PLAN TAKES PRECEDENCE AND CONTROLS. THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER OF RECORD, IN WRITING, OF ANY DISCREPANCY(IES) AND/OR CONFLICT(S).

7. THE CONTRACTOR IS RESPONSIBLE TO IMPORT FILL OR EXPORT EXCESS MATERIAL AS NECESSARY TO CONFORM TO THE PROPOSED GRADING, AND TO BACKFILL EXCAVATIONS FOR THE INSTALLATION OF UNDERGROUND IMPROVEMENTS.

8. PROPOSED TOP OF CURB ELEVATIONS ARE GENERALLY 6" ABOVE PAVEMENT GRADE UNLESS OTHERWISE NOTED.

9. THE CONTRACTOR MUST CONFIRM AND ENSURE THAT AS CONSTRUCTED IMPROVEMENTS CREATE THE FOLLOWING MINIMUM SLOPES (EXCEPT WHERE ADA REQUIREMENTS LIMIT THEM): 1.0% ON ALL CONCRETE SURFACES, 1.5% ON ASPHALT SURFACES, 1.5% IN LANDSCAPED AREAS AND 0.75% SLOPE AGAINST ALL ISLANDS, GUTTERS, AND CURBS TO PROVIDE POSITIVE DRAINAGE.

10. WHERE RETAINING WALLS ARE IDENTIFIED ON THE PLANS, TOP AND BOTTOM OF WALL ELEVATIONS (TW & BW) REPRESENT THE PROPOSED FINISHED GRADE AT THE FACE OF THE TOP AND BOTTOM OF THE WALL AND DO NOT REPRESENT THE ELEVATION OF THE PROPOSED WALL (INCLUDING THE CAP UNIT OR FOOTING). WALL FOOTINGS/FOUNDATION ELEVATIONS ARE NOT IDENTIFIED HEREIN AND ARE TO BE SET/DETERMINED BY THE CONTRACTOR OR WALL DESIGNER, AND MUST BE SET BASED UPON FINAL STRUCTURAL DESIGN SHOP DRAWINGS PREPARED BY THE APPROPRIATE PROFESSIONAL LICENSED IN THE STATE WHERE THE CONSTRUCTION OCCURS. THE CONTRACTOR MUST ENSURE THAT THERE ARE NO UTILITIES ON THE PASSIVE SIDE OF THE RETAINING WALL. NO EXCAVATION MAY BE PERFORMED ON THE PASSIVE SIDE OF THE RETAINING WALL WITHOUT APPROPRIATELY AND SAFELY SUPPORTING THE WALL IN ACCORDANCE WITH THE STANDARD OF CARE AND ALL APPLICABLE RULES, REGULATIONS, CODES, ORDINANCES, LAWS AND STATUTES.

11. MSE OR GRAVITY BLOCK WALLS SHALL BE CONSTRUCTED SUCH THAT UPON COMPLETION OF CONSTRUCTION THERE IS NO UNFINISHED SURFACE OR LIFTING RINGS VISIBLE (E.G. USE OF FINISHED TOP BLOCK OR CAP STONES)

12. STORMWATER RUNOFF WITHIN PROPERTY MUST BE COLLECTED ON-SITE WITH NO OVERLAND RUNOFF ONTO THE RIGHT-OF-WAY OR ADJACENT PROPERTIES TO THE MAXIMUM EXTENT POSSIBLE OR IN THE MANNER SHOWN ON THE CONSTRUCTION DRAWINGS. STORMWATER RUNOFF ONTO ADJACENT PROPERTIES SHALL BE CONTROLLED AS TO NOT ADVERSLY IMPACT SAID PROPERTIES.

13. BEFORE COMMENCING GRADING WORK, CONTRACTOR SHALL SUBMIT SAMPLES OF ALL NATIVE AND IMPORTED MATERIALS WITH THEIR INTENDED FOR STRUCTURAL USES TO THE GEOTECHNICAL ENGINEER OF RECORD.

14. REFER TO GENERAL NOTES SHEET FOR ADDITIONAL ADA GUIDELINES AND REQUIREMENTS.

15. FOR ALL RETAINING WALLS (CT USE 3, ALL OTHER OFFICES USE 4) FEET OR GREATER IN HEIGHT:
   - 15.1. THE OWNER OR THE OWNER'S CONTRACTOR IS TO PROVIDE A SITE-SPECIFIC RETAINING WALL DESIGN PREPARED BY THE APPROPRIATE PROFESSIONAL LICENSED (E.G. STRUCTURAL ENGINEER) IN THE STATE WHERE THE CONSTRUCTION OCCURS. SOIL TYPES, WATER TABLE ELEVATION, EXISTING & PROPOSED SURROUNDING IMPROVEMENTS/CONDITIONS (INCLUDING BUT NOT LIMITED TO SLOPES, DRIVE AISLES, ROADS, FENCING, GUIDERAILS, UTILITIES, DRAINAGE FACILITIES, STRUCTURES, FOUNDATIONS), LIVE LOADS AND OTHER SITE AMENITIES THAT COULD HAVE AN INFLUENCE OR IMPACT ON THE RETAINING WALL(S) CONSTRUCTABILITY AND/OR LONGEVITY SHALL BE CONSIDERED AND INCORPORATED INTO THE RETAINING WALL DESIGN AS WELL AS THE GLOBAL STABILITY ANALYSIS.
   - 15.2. PEER REVIEW AND GLOBAL STABILITY ANALYSIS OF THE RETAINING WALL DESIGN MUST BE COMPLETED BY THE OWNER'S GEOTECHNICAL ENGINEER TO CERTIFY THE DESIGN MEETS INDUSTRY STANDARDS FOR FACTOR OF SAFETY. SOIL TYPES, WATER TABLE ELEVATION AND DESIGN PROPERTIES AS NOTED ABOVE SHALL BE FIELD CONFIRMED AND APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO WALL CONSTRUCTION.

16. CONTRACTOR SHALL INSTALL CONCRETE CURB ALONG FACE OF BUILDING / WALL AS SHOWN TO PROVIDE CONSISTENT WIDTH ALONG LENGTH OF PROPOSED ACCESSIBLE RAMP AND RAMP LANDING TO MEET ADA/AAB REQUIREMENTS.

17. CONTRACTOR SHALL REVIEW RETAINING WALL LOCATIONS VERSUS APPLICABLE STATE AND LOCAL CODES AND PROVIDE FALL PROTECTION (E.G. FENCING OR RAILING) IN ACCORDANCE WITH SAID CODE.

18. CONTRACTOR SHALL COORDINATE WITH OWNER/OPERATOR TO REVIEW EXISTING DEPRESSIONS WITHIN EXISTING PAVEMENT AREAS TO REMAIN AND SHALL CONFIRM THAT THE SCOPE OF WORK SHALL PROVIDE POSITIVE DRAINAGE BY FIXING ANY EXISTING AREAS OF PONDING.

19. BEFORE COMMENCING GRADING WORK, CONTRACTOR SHALL SUBMIT SAMPLES OF ALL NATIVE AND IMPORTED MATERIALS WITH THEIR INTENDED FOR STRUCTURAL USES TO THE GEOTECHNICAL ENGINEER OF RECORD.

GENERAL DRAINAGE & UTILITY NOTES

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.

2. LOCATIONS OF ALL EXISTING AND PROPOSED SERVICES ARE APPROXIMATE, AND THE CONTRACTOR MUST INDEPENDENTLY VERIFY AND CONFIRM THOSE LOCATIONS AND SERVICES WITH LOCAL UTILITY COMPANIES PRIOR TO COMMENCING ANY CONSTRUCTION OR EXCAVATION. THE CONTRACTOR MUST INDEPENDENTLY VERIFY AND CONFIRM ALL SANITARY CONNECTION POINTS AND ALL OTHER UTILITY SERVICE CONNECTION POINTS IN THE FIELD, PRIOR TO COMMENCING ANY CONSTRUCTION. THE CONTRACTOR MUST REPORT ALL DISCREPANCIES, ERRORS AND OMISSIONS IN WRITING, TO THE ENGINEER OF RECORD.

3. THE CONTRACTOR MUST VERTICALLY AND HORIZONTALLY LOCATE ALL UTILITIES AND SERVICES INCLUDING, BUT NOT LIMITED TO, GAS, WATER, ELECTRIC, SANITARY AND STORM, TELEPHONE, CABLE, FIBER OPTIC CABLE, ETC. WITHIN THE LIMITS OF DISTURBANCE OR WORK SPACE, WHICHEVER IS GREATER. THE CONTRACTOR MUST USE, REFER TO, AND COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE UTILITY NOTIFICATION SYSTEM TO LOCATE ALL OF THE UNDERGROUND UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL DAMAGE TO ANY EXISTING UTILITIES WHICH OCCUR DURING CONSTRUCTION, AT NO COST TO THE OWNER AND AT CONTRACTOR'S SOLE COST AND EXPENSE. THE CONTRACTOR MUST BEAR ALL COSTS ASSOCIATED WITH DAMAGE TO ANY EXISTING UTILITIES WHICH OCCURS DURING CONSTRUCTION.

4. THE CONTRACTOR MUST FIELD VERIFY THE PROPOSED INTERFACE POINTS (CROSSINGS) WITH EXISTING UNDERGROUND UTILITIES BY USING A TEST PIT TO CONFIRM EXACT DEPTH, PRIOR TO COMMENCEMENT OF CONSTRUCTION.

5. STORMWATER ROOF DRAIN LOCATIONS ARE BASED ON ARCHITECTURAL PLANS. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING LOCATIONS OF SAME BASED UPON FINAL ARCHITECTURAL PLANS.

6. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING SITE PLAN DOCUMENTS AND ARCHITECTURAL PLANS FOR EXACT BUILDING UTILITY CONNECTION LOCATIONS; GREASE TRAP REQUIREMENTS; AND DETAILS, DOOR ACCESS, AND EXTERIOR GRADING. THE ARCHITECT WILL DETERMINE THE UTILITY SERVICE SIZES. THE CONTRACTOR MUST COORDINATE INSTALLATION OF UTILITY SERVICES WITH THE INDIVIDUAL COMPANIES TO AVOID CONFLICTS AND TO ENSURE THAT PROPER DEPTHS ARE ACHIEVED. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT INSTALLATION OF ALL IMPROVEMENTS COMPLIES WITH ALL UTILITY REQUIREMENTS OF THE APPLICABLE JURISDICTION AND REGULATORY AGENCIES AND ALL OTHER APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES AND, FURTHER, IS RESPONSIBLE FOR COORDINATING THE UTILITY TIE-INS/CONNECTIONS PRIOR TO CONNECTING TO THE EXISTING UTILITY/SERVICE. WHERE A CONFLICT(S) EXISTS BETWEEN THESE DOCUMENTS AND THE ARCHITECTURAL PLANS, OR WHERE ARCHITECTURAL PLAN UTILITY CONNECTION POINTS DIFFER, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER OF RECORD, IN WRITING, AND PRIOR TO CONSTRUCTION, MUST RESOLVE SAME.

7. ALL FILL, COMPACTION, AND BACKFILL MATERIALS REQUIRED FOR UTILITY INSTALLATION MUST BE EXACTLY AS PER THE RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT AND THE CONTRACTOR MUST COORDINATE SAME WITH THE APPLICABLE UTILITY COMPANY SPECIFICATIONS. WHEN THE PROJECT DOES NOT HAVE GEOTECHNICAL RECOMMENDATIONS, FILL AND COMPACTION MUST COMPLY WITH APPLICABLE REQUIREMENTS AND SPECIFICATIONS. ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR DESIGN OF TRENCH BACKFILL OR FOR COMPACTION REQUIREMENTS

8. DURING THE INSTALLATION OF SANITARY, STORM, AND ALL UTILITIES, THE CONTRACTOR MUST MAINTAIN A CONTEMPORANEOUS AND THOROUGH RECORD OF CONSTRUCTION TO IDENTIFY THE AS-INSTALLED LOCATIONS OF ALL UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR MUST CAREFULLY NOTE ANY INSTALLATIONS THAT DEVIATE, IN ANY RESPECT, FROM THE INFORMATION CONTAINED IN THESE PLANS. THIS RECORD MUST BE KEPT ON A CLEAN COPY OF THE APPROPRIATE PLAN(S), WHICH THE CONTRACTOR MUST PROMPTLY PROVIDE TO THE OWNER IMMEDIATELY UPON THE COMPLETION OF WORK.

9. THE CONTRACTOR MUST ENSURE THAT ALL UTILITY TRENCHES LOCATED IN EXISTING PAVED ROADWAYS INCLUDING SANITARY, WATER AND STORM SYSTEMS, ARE REPAIRED IN ACCORDANCE WITH REFERENCED MUNICIPAL, COUNTY AND OR STATE DOT DETAILS AS APPLICABLE. THE CONTRACTOR MUST COORDINATE INSPECTION AND APPROVAL OF COMPLETED WORK WITH THE AGENCY WITH JURISDICTION OVER SAME.

10. FINAL LOCATIONS OF PROPOSED UTILITY POLES, AND/ OR POLES TO BE RELOCATED ARE AT THE SOLE DISCRETION OF THE RESPECTIVE UTILITY COMPANY, REGARDLESS OF WHAT THIS PLAN DEPICTS.

11. WATER SERVICE MATERIALS, BURIAL DEPTH, AND COVER REQUIREMENTS MUST BE SPECIFIED BY THE LOCAL UTILITY COMPANY. THE CONTRACTOR MUST CONTACT THE APPLICABLE MUNICIPALITY TO CONFIRM THE PROPER WATER METER AND VAULT, PRIOR TO COMMENCING CONSTRUCTION.

12. THE TOPS OF EXISTING MANHOLES, INLET STRUCTURES, AND SANITARY CLEANOUT MUST BE ADJUSTED, AS NECESSARY, TO MATCH PROPOSED FINISHED GRADES WITH NO TRIPPING OR SAFETY HAZARD IN ACCORDANCE WITH ALL APPLICABLE STANDARDS, REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES.

13. THE CONTRACTOR'S PRICE FOR WATER AND SEWER SERVICE INSTALLATIONS MUST INCLUDE ALL FEES, COSTS, AND APPURTENANCES REQUIRED BY THE UTILITY PROVIDER (AND OTHER AGENCIES HAVING JURISDICTION OVER THE WORK) TO PROVIDE FULL AND COMPLETE WORKING SERVICE, INCLUDING (BUT NOT LIMITED TO) NECESSARY FEES, TESTING, DISINFECTING, INSPECTIONS, ROAD OPENING & BACKFILL REQUIREMENTS, TRAFFIC CONTROL AND SURETY BONDS AS DEFINED BY THE PROVIDER (AND OTHER AGENCIES HAVING JURISDICTION OVER THE WORK).

14. ALL WORK ASSOCIATED WITH UTILITY POLES, OVERHEAD WIRES AND ANY/ALL APPURTENANCES SHALL BE COORDINATED BY THE GC WITH THE LOCAL UTILITY COMPANIES PRIOR TO THE ORDERING OF ANY MATERIALS. THIS MAY INCLUDE BUT IS NOT LIMITED TO THE REMOVAL, INSTALLATION, RELOCATION OR PROTECTION OF ANY BRACING, GUY WIRES, OVERHEAD WIRES, ETC. AS MAY BE REQUIRED TO ACCOMMODATE THE PROJECT.

15. SEWERS CONVEYING SANITARY FLOW, OR INDUSTRIAL FLOW MUST BE SEPARATED FROM WATER MAINS BY A DISTANCE OF AT LEAST 10 FEET HORIZONTALLY. IF SUCH LATERAL SEPARATION IS NOT POSSIBLE, THE PIPES MUST, AT A MINIMUM, BE IN SEPARATE TRENCHES WITH THE AT LEAST 18 INCHES OF VERTICAL SEPARATION FROM THE BOTTOM OF THE WATER MAIN TO THE TOP OF THE SEWER LINE. WHERE APPROPRIATE SEPARATION FROM A WATER MAIN IS NOT POSSIBLE, THE SEWER MUST BE ENCASED IN CONCRETE, OR CONSTRUCTED OF DUCTILE IRON PIPE USING MECHANICAL OR SLIP-ON JOINTS FOR A DISTANCE OF AT LEAST 10 FEET ON EITHER SIDE OF THE CROSSING. IN ADDITION, ONE FULL LENGTH OF SEWER PIPE SHOULD BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE WATER LINE AS POSSIBLE. WHERE A WATER MAIN CROSSES UNDER A SANITARY SEWER, ADEQUATE STRUCTURAL SUPPORT FOR THE SANITARY SEWER MUST BE PROVIDED. ALL CROSSINGS SHALL BE IN ACCORDANCE WITH JURISDICTIONAL PERMITTING/UTILITY AUTHORITIES REGULATIONS.

16. WHEN THESE PLANS INVOLVE MULTIPLE BUILDINGS, SOME OF WHICH MAY BE BUILT AT A LATER DATE, THE CONTRACTOR MUST EXTEND ALL UTILITY SERVICES, INCLUDING BUT NOT LIMITED TO STORM, SANITARY, UTILITIES, AND IRRIGATION LINES, TO A POINT AT LEAST FIVE (5) FEET BEYOND THE PAVED AREAS FOR WHICH THE CONTRACTOR IS RESPONSIBLE. THE CONTRACTOR MUST CAP ENDS OF INSTALLED UTILITIES AS APPROPRIATE, MARK UTILITY ENDS WITH MAGENTIC TRACER TAPE, MARK TERMINOUS LOCATIONS WITH A 2X4 STAKE, AND MUST NOTE THE LOCATION OF ALL UTILITY STUBS ON A CLEAN COPY OF THE PLAN. THIS RECORD DOCUMENT MUST BE PREPARED IN A NEAT AND WORKMAN-LIKE MANNER AND TURNED OVER TO THE OWNER/DEVELOPER UPON COMPLETION OF THE WORK, ALL OF WHICH IS AT THE CONTRACTOR'S SOLE COST.

17. STORM AND SANITARY PIPE LENGTHS INDICATED ARE NOMINAL AND ARE MEASURED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE UNLESS INDICATED ON THE PLANS OTHERWISE.

18. UNLESS INDICATED OTHERWISE, ALL NEW UTILITIES/SERVICES, INCLUDING ELECTRIC, TELEPHONE, CABLE TV, ETC., MUST BE INSTALLED UNDERGROUND. ALL NEW UTILITY SERVICES MUST BE INSTALLED IN ACCORDANCE WITH THE UTILITY SERVICE PROVIDER INSTALLATION SPECIFICATIONS AND STANDARDS.
19. SANITARY PIPE MUST BE POLYVINYL CHLORIDE (PVC) SDR 35 EXCEPT WHERE CLEARLY INDICATED OTHERWISE. SANITARY LATERAL(S) MUST BE PVC SDR 26 UNLESS CLEARLY INDICATED OTHERWISE.

20. UNLESS CLEARLY INDICATED OTHERWISE, ALL STORM PIPE MUST BE REINFORCED CONCRETE PIPE (RCP) CLASS III WITH SILT/SOIL TIGHT JOINTS. WHEN HIGH-DENSITY POLYETHYLENE PIPE (HDPE) IS CALLED FOR ON THE PLANS, IT MUST CONFORM TO AASHTO M252 FOR PIPES 4" TO 10" AND TO AASHTO M294 FOR PIPES 12" TO 60" AND TYPE S (SMOOTH INTERIOR WITH ANGULAR CORRUGATIONS) WITH GASKET FOR SILT/SOIL TIGHT JOINT. PIPE FOR ROOF DRAIN CONNECTION MUST BE HDPE SDR 26 OR PVC SCHEDULE 40 UNLESS INDICATED OTHERWISE. HDPE PIPE JOINT GASKETS MUST BE PROVIDED AND CONFORM TO ASTM F477. DRAIN PIPE INSTALLED WITH OVER TEN (10) FEET OVER COVER AND/OR IN HIGH GROUNDWATER CONDITIONS SHALL BE SANITITE HP POLYPROPOPYLENE PIPE (PP), OR APPROVED EQUIVALENT.

21. UNLESS CLEARLY INDICATED OTHERWISE ALL SANITARY PIPE MUST BE:
   - 21.1. FOR PIPES LESS THAN 12 FEET DEEP: POLYVINYL CHLORIDE (PVC) SDR 35 PER ASTM D3034.
   - 21.2. FOR PIPES GREATER THAN 12 FEET DEEP: POLYVINYL CHLORIDE (PVC) SDR 26 PER ASTM D3034.
   - 21.3. UNLESS LOCAL OR STATE BUILDING / PLUMBING CODE CLEARLY SPECIFIES DIFFERENTLY, SANITARY LATERALS MUST BE PVC SDR 26.
   - 21.4. FOR ALL UTILITY PIPING (INCLUDING DRAIN) WITHIN 10 FT OF A BUILDING, PIPE MATERIAL SHALL COMPLY WITH APPLICABLE LOCAL OR STATE BUILDING AND PLUMBING CODES. CONTRACTOR SHALL REFER TO PLUMBING ENGINEERING PLANS AND VERIFY PIPE MATERIAL WITH LOCAL OFFICIAL PRIOR TO ORDERING OF MATERIALS.
   - 21.5. CONTRACTOR SHALL VERIFY THE CONNECTION OF EXTERIOR PIPING TO ANY FIXTURES (SUCH AS AN EXTERIOR GREASE INTERCEPTOR) OR OTHER DRAINAGE SYSTEMS WITH LOCAL OFFICIALS FOR COMPLIANCE WITH APPLICABLE LOCAL OR STATE BUILDING AND PLUMBING CODES PRIOR TO ORDERING OF MATERIALS.

22. WATER MAIN PIPING MUST BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS AND SPECIFICATIONS OF THE LOCAL WATER COMPANY. IN THE ABSENCE OF SUCH REQUIREMENTS, WATER MAIN PIPING MUST BE CEMENT-LINED DUCTILE IRON (DIP) MINIMUM CLASS 52 THICKNESS. ALL PIPE AND APPURTENANCES MUST COMPLY WITH THE APPLICABLE AWWA STANDARDS IN EFFECT AT THE TIME OF APPLICATION.

23. GAS METERS MUST BE PROTECTED AS REQUIRED BY THE JURISDICTIONAL GAS PROVIDER.

ADA INSTRUCTIONS TO CONTRACTOR:

1. ALL ACCESSIBLE (A.K.A. ADA) COMPONENTS AND ACCESSIBLE ROUTES MUST BE CONSTRUCTED TO MEET, AT A MINIMUM, THE MORE STRINGENT OF: (A) THE REQUIREMENTS OF THE "AMERICANS WITH DISABILITIES ACT" (ADA) CODE (42 U.S.C. § 12101 ET SEQ. AND 42 U.S.C. § 4151 ET SEQ.); AND (B) ANY APPLICABLE LOCAL AND STATE GUIDELINES, AND ANY AND ALL AMENDMENTS TO BOTH, WHICH ARE IN EFFECT WHEN THESE PLANS WERE COMPLETED.
2. THE CONTRACTOR MUST REVIEW ALL DOCUMENTS REFERENCED IN THESE NOTES FOR ACCURACY, COMPLIANCE AND CONSISTENCY WITH INDUSTRY GUIDELINES.
3. THE CONTRACTOR MUST EXERCISE APPROPRIATE CARE AND PRECISION IN CONSTRUCTION OF ACCESSIBLE (ADA) COMPONENTS AND ACCESSIBLE ROUTES FOR THE SITE. FINISHED SURFACES ALONG THE ACCESSIBLE ROUTE OF TRAVEL FROM PARKING SPACES, PUBLIC TRANSPORTATION, PEDESTRIAN ACCESS, AND INTER-BUILDING ACCESS, TO POINTS OF ACCESSIBLE BUILDING ENTRANCE/EXIT, MUST COMPLY WITH THE ACCESSIBLE GUIDELINES AND REQUIREMENTS WHICH INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
   - 3.1. ACCESSIBLE PARKING SPACES AND ACCESS AISLES SLOPES MUST NOT EXCEED 1:50 (2.0%) IN ANY DIRECTION.
   - 3.2. PATH OF TRAVEL ALONG ACCESSIBLE ROUTE MUST PROVIDE A 36-INCHES MINIMUM WIDTH (48-INCHES PREFERRED), OR AS SPECIFIED BY THE GOVERNING AGENCY. UNOBSTRUCTED WIDTH OF TRAVEL (CAR OVERHANGS AND/OR HANDRAILS) MUST NOT REDUCE THIS MINIMUM WIDTH. THE SLOPE MUST NOT EXCEED 1:20 (5.0%) IN THE DIRECTION OF TRAVEL AND MUST NOT EXCEED 1:50 (2.0%) IN CROSS SLOPE. WHERE ACCESSIBLE PATH OF TRAVEL IS GREATER THAN 1:20 (5.0%), AN ACCESSIBLE RAMP MUST BE PROVIDED. ALONG THE ACCESSIBLE PATH OF TRAVEL, OPENINGS MUST NOT EXCEED 1/2-INCH IN WIDTH. VERTICAL CHANGES OF UP TO 1/2-INCH ARE PERMITTED ONLY IF THEY INCLUDES A 1/4-INCH BEVEL AT A SLOPE NOT STEEPER THAN 1:2. NO VERTICAL CHANGES OVER 1/4-INCH ARE PERMITTED.
   - 3.3. ACCESSIBLE RAMPS MUST NOT EXCEED A SLOPE OF 1:12 (8.3%) AND A RISE OF 30-INCHES. LEVEL LANDINGS MUST BE PROVIDED AT EACH END OF ACCESSIBLE RAMPS. LANDING MUST PROVIDE POSITIVE DRAINAGE AWAY FROM STRUCTURES, AND MUST NOT EXCEED 1:50 (2.0%) SLOPE IN ANY DIRECTION. RAMPS THAT CHANGE DIRECTION BETWEEN RUNS AT LANDINGS MUST HAVE A CLEAR LANDING OF A MINIMUM OF 60-INCHES BY 60-INCHES. HAND RAILS ON BOTH SIDES OF THE RAMP MUST BE PROVIDED ON AN ACCESSIBLE RAMP WITH A RISE GREATER THAN 6-INCHES.
   - 3.4. ACCESSIBLE CURB RAMPS MUST NOT EXCEED A SLOPE OF 1:12 (8.3%). WHERE FLARED SIDES ARE PROVIDED, THEY MUST NOT EXCEED 1:10 (10%) SLOPE. LEVEL LANDING MUST BE PROVIDED AT RAMPS TOP AT A MINIMUM OF 36-INCHES LONG (48-INCHES PREFERRED). IN ALTERATIONS, WHEN THERE IS NO LANDING AT THE TOP, FLARE SIDES SLOPES MUST NOT EXCEED A SLOPE OF 1:12 (8.3%).
   - 3.5. DOORWAY LANDINGS AREAS MUST BE PROVIDED ON THE EXTERIOR SIDE OF ANY DOOR LEADING TO AN ACCESSIBLE PATH OF TRAVEL. THIS LANDING MUST BE SLOPED AWAY FROM THE DOOR NO MORE THAN 1:50 (2.0%) FOR POSITIVE DRAINAGE. THIS LANDING AREA MUST BE NO FEWER THAN 60-INCHES (5 FEET) LONG, EXCEPT WHERE OTHERWISE CLEARLY PERMITTED BY ACCESSIBLE STANDARDS FOR ALTERNATIVE DOORWAY OPENING CONDITIONS. (SEE ICC/ANSI A117.1-2009 AND OTHER REFERENCES INCORPORATED BY CODE).
   - 3.6. WHEN THE PROPOSED CONSTRUCTION INVOLVES RECONSTRUCTION, MODIFICATION, REVISION OR EXTENSION OF OR TO ACCESSIBLE COMPONENTS FROM EXISTING DOORWAYS OR SURFACES, THE CONTRACTOR MUST VERIFY ALL EXISTING ELEVATIONS SHOWN ON THE PLAN. NOTE THAT TABLE 405.2 OF THE DEPARTMENT OF JUSTICE'S ADA STANDARDS FOR ACCESSIBLE DESIGN ALLOWS FOR STEEPER RAMP SLOPES, IN RARE CIRCUMSTANCES. THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER OF RECORD, IN WRITING, OF ANY DISCREPANCIES AND/OR FIELD CONDITIONS THAT DIFFER IN ANY WAY OR IN ANY RESPECT FROM WHAT IS SHOWN ON THE PLANS BEFORE COMMENCING ANY WORK. CONSTRUCTED IMPROVEMENTS MUST FALL WITHIN THE MAXIMUM AND MINIMUM LIMITATIONS IMPOSED BY THE BARRIER FREE REGULATIONS AND THE ACCESSIBLE GUIDELINES.
   - 3.7. THE CONTRACTOR MUST VERIFY ALL OF THE SLOPES OF THE CONTRACTOR'S FORMS PRIOR TO POURING CONCRETE. IF ANY NON-CONFORMANCE EXISTS OR IS OBSERVED OR DISCOVERED, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER OF RECORD, IN WRITING, PRIOR TO POURING CONCRETE. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL COSTS TO REMOVE, REPAIR AND/OR REPLACE NON-CONFORMING CONCRETE AND/OR PAVEMENT SURFACES.
4. IT IS STRONGLY RECOMMENDED THAT THE CONTRACTOR REVIEW THE INTENDED CONSTRUCTION TO ENSURE SAME IS CONSISTENT WITH THE LOCAL BUILDING CODE PRIOR TO COMMENCING CONSTRUCTION.

5. IN ADDITION TO THE ABOVE, THE CONTRACTOR MUST ALSO ENSURE THAT ALL ACCESSIBLE COMPONENTS AND ACCESSIBLE ROUTES ARE CONSTRUCTED IN STRICT ACCORDANCE WITH THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD REGULATIONS 521 CMR. THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER OF RECORD, IN WRITING, OF ANY DISCREPANCIES BETWEEN THE "AMERICANS WITH DISABILITIES ACT" (ADA) CODE AND STATE BUILDING CODE AS IT RELATES TO ANY ACCESSIBLE IMPROVEMENTS BEING CONSTRUCTED PRIOR TO COMMENCING THE WORK.

ABBREVIATIONS

KEY	DESCRIPTION
ARCH	ARCHITECT
BC	BACK OF CURB
BM	BENCHMARK
BOC	BOTTOM OF CURB
BW	BOTTOM OF WALL
BLDG	BUILDING
CONC.	CONCRETE
DEC	DECORATIVE
°	DEGREE
DEP	DEPRESSED
Ø / DIA	DIAMETER
DMH	DRAIN MANHOLE
DIP	DUCTILE IRON PIPE
EOP	EDGE OF PAVEMENT
ELEV	ELEVATION
EXIST.	EXISTING
FF	FINISH FLOOR
FFE	FINISH FLOOR ELEVATION
GC	GENERAL CONTRACTOR
GRT	GRATE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HP	HIGH POINT
INT	INTERSECTION
INV	INVERT
L.S.A.	LANDSCAPE AREA
LOD	LIMIT OF DISTURBANCE
LOW	LIMIT OF WORK
LF	LINEAR FOOT / FEET
LP	LOW POINT
MAX	MAXIMUM
MEP	MECHANICAL, ELECTRICAL, PLUMBING
ME	MEET OR MATCH EXISTING
MIN	MINIMUM
No. / #	NUMBER
±	PLUS OR MINUS
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
PT	POINT OF TANGENCY
PVI	POINT OF VERTICAL INTERSECTION
PVC	POLYVINYL CHLORIDE PIPE
PROP.	PROPOSED
R	RADIUS OR RADII
RCP	REINFORCED CONCRETE PIPE
R.O.W.	RIGHT-OF-WAY
SAN	SANITARY
SMH	SEWER MANHOLE
S	SLOPE
SF	SQUARE FOOT
STA	STATION
STM	STORM
TBR	TO BE REMOVED
TBR/R	TO BE REMOVED AND REPLACED
TC	TOP OF CURB
TW	TOP OF WALL
TPF	TREE PROTECTION FENCE
TYP.	TYPICAL
UNG	UNDERGROUND
V.I.F.	VERIFY IN FIELD
W	WIDTH

TYPICAL LINE TYPE LEGEND

LINE TYPE	STATUS	LINE LABEL
PROPERTY LINE	EXISTING	
	PROPOSED	
ADJACENT PROPERTY LINE	EXISTING	
	PROPOSED	
RIGHT-OF-WAY LINE	EXISTING	
	PROPOSED	
SETBACK OR BUFFER	EXISTING	
	PROPOSED	
EASEMENT LINE	EXISTING	
	PROPOSED	
WETLAND BOUNDARY	EXISTING	
	PROPOSED	
WETLAND BUFFER	EXISTING	
	PROPOSED	
WATER WAY BOUNDARY	EXISTING	
	PROPOSED	
WATERWAY BUFFER	EXISTING	
	PROPOSED	
WETLAND OR WATERWAY FLAG	EXISTING	
	PROPOSED	
RIGHT-OF-WAY CENTER OR BASE LINE	EXISTING	
	PROPOSED	
APPROX. LIMIT OF WORK OR DISTURBANCE	EXISTING	
	PROPOSED	
APPROX. SAWCUT LINE	EXISTING	
	PROPOSED	
TREE LINE	EXISTING	
	PROPOSED	
SURFACE OR SUBSURFACE BASIN	EXISTING	
	PROPOSED	
OVERHEAD WIRES	EXISTING	OH
	PROPOSED	OH
CURBING	EXISTING	
	PROPOSED	CONC/BIT MONOLITHIC SLOPED / VERT GRAN TRANSITION CAPE COD
FENCE OR RAILING	EXISTING	
	PROPOSED	CHAIN LINK STOCKADE RAILING
RETAINING WALL	EXISTING	
	PROPOSED	
CONTOURS	EXISTING	
	PROPOSED	49 50
SWALE	EXISTING	
	PROPOSED	
BERM	EXISTING	
	PROPOSED	
RIDGE	EXISTING	
	PROPOSED	
DRAIN PIPE	EXISTING	D-Qa
	PROPOSED	
SEWER PIPE	EXISTING	S S S-Qa
	PROPOSED	S SL
SEWER FORCE MAIN	EXISTING	FM FM FM-Qa
	PROPOSED	FM FM FM
ELECTRIC	EXISTING	E E E-Qa
	PROPOSED	E E E
TELECOMMUNICATIONS	EXISTING	T T T-Qa
	PROPOSED	T T T
CABLE TV	EXISTING	C C C-Qa
	PROPOSED	C C C
GAS	EXISTING	G G G-Qa
	PROPOSED	G G G
WATER	EXISTING	W W W-Qa
	PROPOSED	W W W

REFER TO SITE LAYOUT PLAN FOR ZONING ANALYSIS TABLE AND LAND USE / ZONING INFORMATION & NOTES

REFER TO EROSION AND SEDIMENT CONTROL NOTES & DETAILS SHEET FOR TYPICAL EROSION NOTES AND DETAILS

REFER TO LANDSCAPE NOTES & DETAILS SHEET FOR TYPICAL LANDSCAPE NOTES AND DETAILS

REFER TO LIGHTING PLAN FOR TYPICAL LIGHTING NOTES AND TABLES

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

J.A. KUCICH
COMMONWEALTH OF MASSACHUSETTS
JOHN A. KUCICH
CIVIL
No. 41530
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE No. 41530
NEW HAMPSHIRE LICENSE No. 15476
CONNECTICUT LICENSE No. 26177
RHODE ISLAND LICENSE No. 9616
MAINE LICENSE No. 12553

McDonald's®

OFFICE: BOSTON REGION
ADDRESS: 110 N CARPENTER ST, CHICAGO, IL 60607

PLAN APPROVALS
DATE
SIGNATURE
APPROVED McDONALD'S AGENT

BOHLER//™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

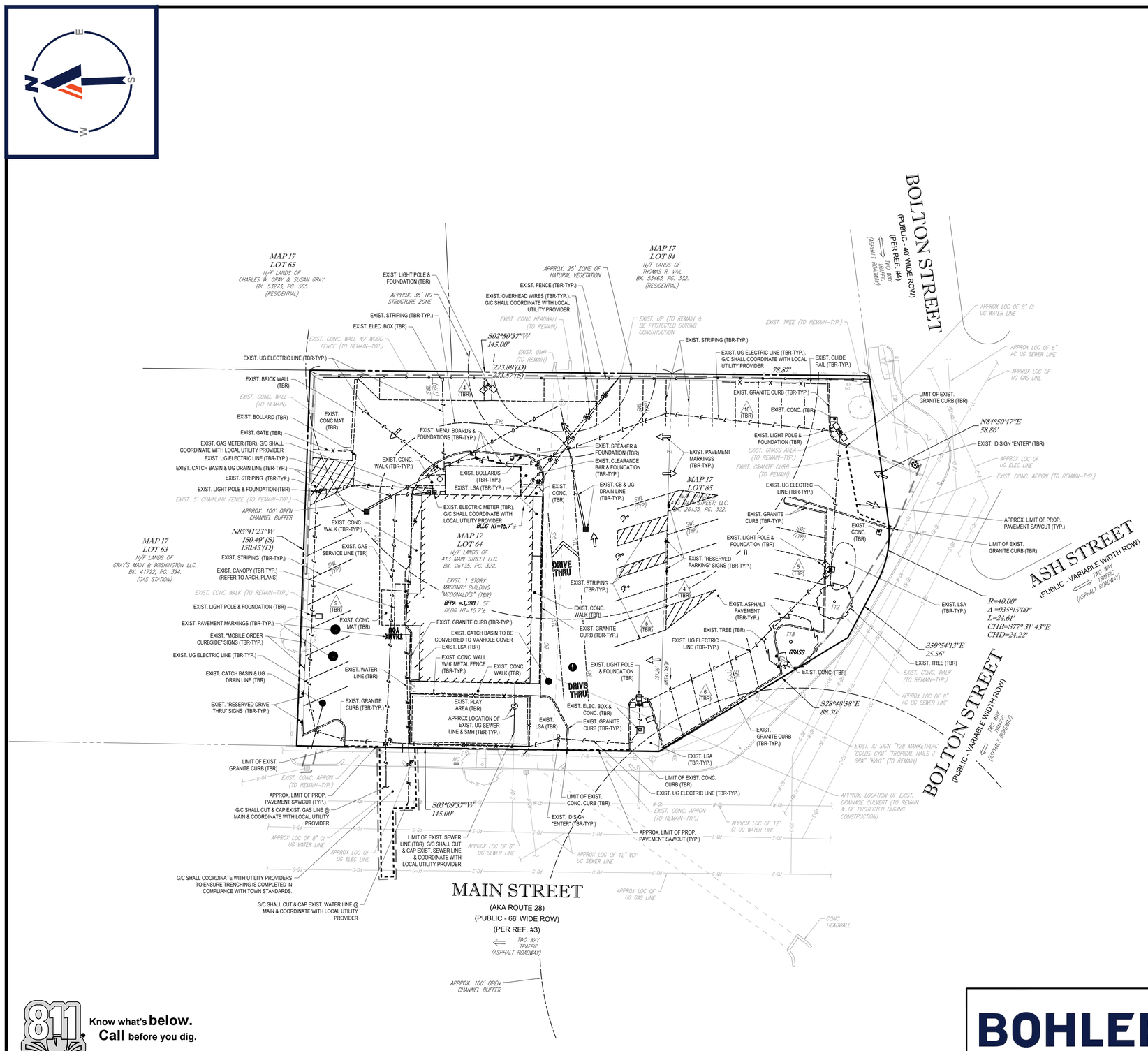
COMPLIANCE CHECK — DATE
CONSTRUCTION CHECK — DATE
CONSTRUCTION CHECK — DATE
PROJECT No.: W222000
CAD I.D. #: W222000-SPPD-3a.dwg

-
STREET ADDRESS: 413 MAIN STREET
CITY: READING
STATE: MA
COUNTY: MIDDLESEX
SITE I.D.: 20-0015
PLAN DESCRIPTION: GENERAL NOTES SHEET

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO. C-102
OF 15

P:\2022\W222000\CAD\Drawings\Plan Sets\Civil Site Plans\W222000-SPPD-3a.dwg, C-102-Note, 4/23/2010, 10:17:14 AM, cennis, XeroX510-1.pc3, User634, 1:1



ALL EXISTING ITEMS ARE TO BE REMOVED WITHIN THE LIMIT OF WORK\DISTURBANCE UNLESS OTHERWISE NOTED

CONTRACTOR SHALL CONFIRM ALL UTILITY & DRAINAGE LOCATIONS PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER IN WRITING IF ANY CONFLICTS OCCUR.

REFER TO GENERAL NOTES SHEET FOR DEMOLITION NOTES

THIS PLAN TO BE UTILIZED FOR DEMOLITION\ REMOVAL PURPOSES ONLY

20 10 5 0 20
1"= 20'

Know what's **below.**
Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

COMMONWEALTH OF MASSACHUSETTS
JOHN V. KUCZEWSKI
CIVIL
No. 41530
PROFESSIONAL ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NEW HAMPSHIRE LICENSE No. 15424
CONNECTICUT LICENSE No. 29017
RHODE ISLAND LICENSE No. 20019
MAINE LICENSE No. 12455

McDonald's

OFFICE
BOSTON REGION
ADDRESS
110 N CARPENTER ST
CHICAGO, IL 60607

PLAN APPROVALS

SIGNATURE	DATE
APPROVED McDONALD'S AGENT	

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK	DATE
CONSTRUCTION CHECK	DATE
CONSTRUCTION CHECK	DATE
PROJECT No.:	W222000
CAD I.D. #:	W222000-SPPD-3a.dwg

-

STREET ADDRESS
413 MAIN STREET

CITY
READING

STATE
MA

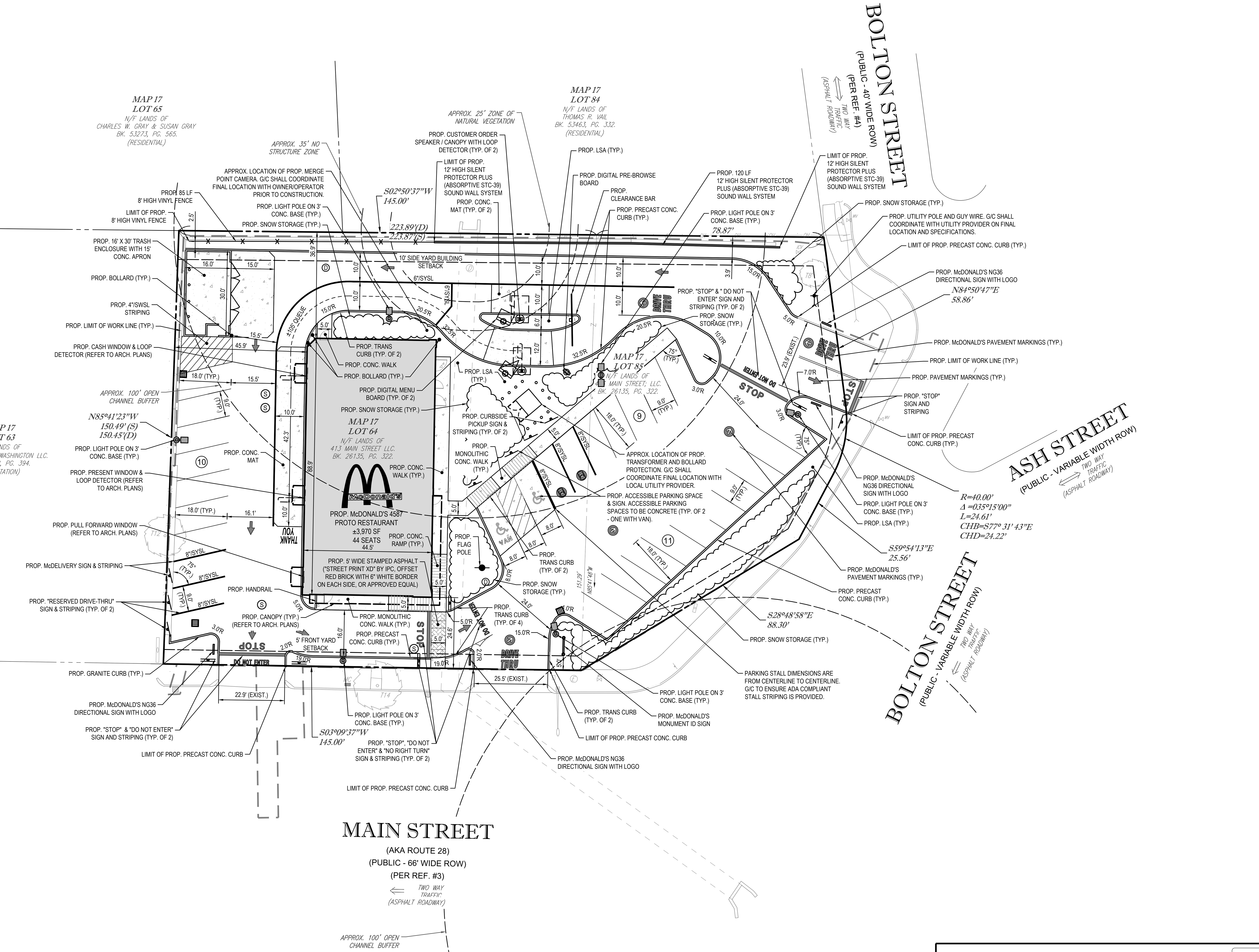
COUNTY
MIDDLESEX

SITE I.D.
20-0015

PLAN DESCRIPTION
DEMOLITION PLAN

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.
C-201
OF 15



SITE INFORMATION

1. APPLICANT:
   McDONALD'S USA, LLC
   110 N CARPENTER STREET
   CHICAGO, IL 60607
2. OWNER:
   413 MAIN STREET, LLC
   10 JEAN AVE #2
   CHELMSFORD, MA 01824
3. PARCEL:
   MAP 17, LOT 64 & 85
   413 MAIN STREET
   READING, MA 01867

ZONING ANALYSIS TABLE

N/A - NOT APPLICABLE
N/S - NOT SPECIFIED
(V) - VARIANCE LIKELY REQUIRED
(W) - WAIVER REQUESTED
(E) - EXIST. NON-CONFORMANCE

ZONING DISTRICT	BUSINESS B DISTRICT
OVERLAY DISTRICT	DOWNTOWN SMART GROWTH DISTRICT
REQUIRED PERMIT	ZBA USE VARIANCE; CPDC SITE PLAN REVIEW; CONSERVATION COMMISSION NOTICE OF INTENT

ZONE CRITERIA	REQUIRED	EXISTING	PROPOSED
MIN. LOT AREA	N/A	±32,378 SF	NO CHANGE
MIN. LOT FRONTAGE	N/A	±342.33 FT	NO CHANGE
MAX. BLDG COVERAGE	85%	10.5%	12.3%
MIN. FRONT SETBACK	5 FT	26.6 FT	22.6 FT
MIN. SIDE SETBACK	N/A	41.8 FT	36.9 FT
MIN. SIDE SETBACK (ABUTTING RESIDENTIAL LOT)	10 FT	41.8 FT	38.7 FT
MIN. REAR SETBACK	20 FT	N/A	N/A
MAX. BUILDING HEIGHT	45 FT	±15.7 FT	< 45 FT
MIN. DRIVE-THRU STACKING	198 FT	±242 FT	±295.9 FT *
MIN. DRIVE-THRU STACKING; ORDER POINT TO PICKUP	90 FT	±105.8 FT	±187.3 FT
MIN. DRIVE-THRU STACKING; EXITING ONTO ROAD	54 FT	±55.2 FT	±58.4 FT
PARKING SPACES	23	43	30
ACCESS. PARKING SPACES	2	3	2

PARKING STALL CRITERIA STANDARD: 9 FT x 18 FT COMPACT: 8 FT x 16 FT	USE/CATEGORY: RESTAURANT REQUIRED PARKING: 1 SPACE PER 4 SEATS PLUS ONE SPACE PER EMPLOYEE ON THE LARGEST SHIFT CALCULATION: (1 SPACE / 4 SEATS) X 44 SEATS = 11 = 11 SPACES (1 SPACE / EMPLOYEE) X 12 EMPLOYEES = 12 11+ 12 = 23 = 23 SPACES
ACCESSIBLE PARKING CRITERIA STANDARD: 8 FT x 18 FT STALL (MIN.) 5 FT x 18 FT AISLE (MIN.) VAN: 8 FT x 18 FT STALL (MIN.) 8 FT x 18 FT AISLE (MIN.)	26-50 SPACES = 2 MIN. ACCESSIBLE SPACES 1 ACCESSIBLE VAN SPACE PER 6 STANDARD ACCESSIBLE SPACES (MIN.)

* - ADDITIONAL ±225 LF OF STACKING FROM DRIVE-THRU ENTRANCE TO MAIN STREET AND BOLTON STREET RIGHT-OF-WAY

SIGN SUMMARY TABLE

TYPE	ALLOWED	EXISTING	PROPOSED
SITE SIGNAGE			
FREESTANDING I.D. SIGN	1 SIGN @ MAX. 35 SF, MAX. 10.5 FT IN HEIGHT, SIDEYARD SETBACK OF 20 FT	NONE	1 "5' MAIN ID" MONUMENT SIGN @ 25 SF, 7 FT IN HEIGHT (SP)
BUILDING SIGNAGE			
FRONT WALL SIGN	2 WALL MOUNTED SIGNS @ 2 SF PER LF OF FACADE	1 "McDONALD'S" SIGN @ 34 SF	1 "M" LOGO @ 14 SF
NON DRIVE THRU WALL SIGN		NONE	1 "M" LOGO @ 14 SF
DRIVE THRU WALL SIGN		NONE	NONE
REAR WALL SIGN		NONE	NONE
TOTAL BUILDING SIGNAGE	2 SIGNS @ ±265 SF	1 SIGN @ 34 SF	2 SIGNS @ 24 SF
DRIVE-THRU SIGNAGE			
DRIVE-THRU SIGNAGE	3 MENU BOARDS PERMITTED	3 EXISTING	2 DIGITAL MENU BOARDS @ ±20 SF 1 DIGITAL PRE-BROWSE BOARD @ ±10 SF (V)

NOTE: ALL SIGNS AREAS ARE "BOXED" FOR CALCULATIONS
(SP) - SPECIAL PERMIT REQUIRED
(V) - VARIANCE APPROVED 7/25/2023

PAVEMENT STRIPING LEGEND

4"/DYSL = 4" DOUBLE YELLOW SOLID LINE
6"/SYSL = 6" SINGLE YELLOW SOLID LINE
8"/SYSL = 8" SINGLE YELLOW SOLID LINE
4"/SWSL = 4" SINGLE WHITE SOLID LINE

MAINTENANCE OF A CLEAR SIGHT LINE IS THE RESPONSIBILITY OF THE PROPERTY OWNER

THIS PLAN TO BE UTILIZED FOR SITE LAYOUT PURPOSES ONLY. REFER TO GENERAL NOTES SHEET FOR ADDITIONAL NOTES

20 10 5 0 20
1"= 20'

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

COMMONWEALTH OF MASSACHUSETTS
JOHN A. KUCICH
CIVIL
No. 41530
REGISTERED PROFESSIONAL ENGINEER
J.A. KUCICH
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE No. 41530
NEW HAMPSHIRE LICENSE No. 15476
CONNECTICUT LICENSE No. 26177
RHODE ISLAND LICENSE No. 9616
MAINE LICENSE No. 12553

McDonald's®

OFFICE: BOSTON REGION
ADDRESS: 110 N CARPENTER ST, CHICAGO, IL 60607

PLAN APPROVALS
DATE
SIGNATURE
APPROVED McDONALD'S AGENT

811 Know what's **below.** **Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

BOHLER//™
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

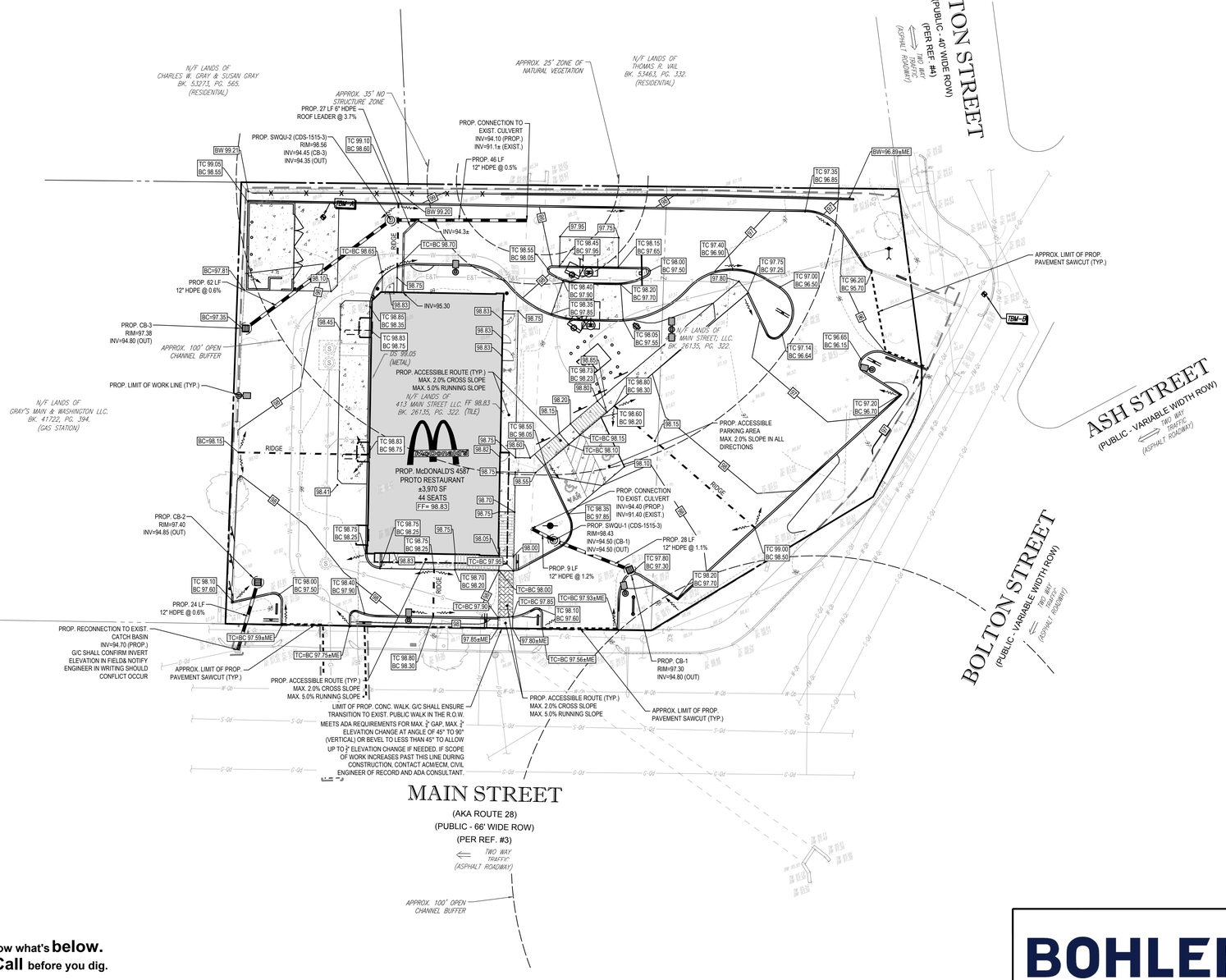
COMPLIANCE CHECK DATE
CONSTRUCTION CHECK DATE
CONSTRUCTION CHECK DATE
PROJECT No.: W222000
CAD I.D. #: W222000-SPPD-3a.dwg

-
STREET ADDRESS: 413 MAIN STREET
CITY: READING
STATE: MA
COUNTY: MIDDLESEX
SITE I.D.: 20-0015
PLAN DESCRIPTION: **SITE LAYOUT PLAN**

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO. **C-301**
OF 15

P:\2022\W222000\CAD\Drawings\Plan Sets\Civil Site Plans\W222000-SPPD-3a.dwg, C-301-Site, 4/23/2010, 10:17:14 AM, cennis, XeroX510-1.pc3, User634, 1:1



CONTRACTOR SHALL CONFIRM ALL UTILITY & DRAINAGE LOCATIONS PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER IN WRITING IF ANY CONFLICTS OCCUR.

5.0' X 5.0' (MIN.) LEVEL LANDING (<2.0% SLOPE IN ANY DIRECTION) AREA TO BE PROVIDED AT ALL DOORS & TOP & BOTTOM OF ALL RAMPS.

THIS PLAN TO BE UTILIZED FOR SITE GRADING PURPOSES ONLY. REFER TO GENERAL NOTES SHEET FOR ADDITIONAL GRADING & UTILITY NOTES

20 10 5 0 20
1"= 20'

811 Know what's **below.** **Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

COMMONWEALTH OF MASSACHUSETTS
JOHN V. KUCZARSKI
CIVIL
No. 41530
REGISTERED PROFESSIONAL ENGINEER
NEW YORK LICENSE No. 104274
RHODE ISLAND LICENSE No. 20010
FLORIDA LICENSE No. 77453

McDonald's

BOSTON REGION
110 N CARPENTER ST
CHICAGO, IL 60607

PLAN APPROVALS

	SIGNATURE	DATE
APPROVED McDONALD'S AGENT		

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

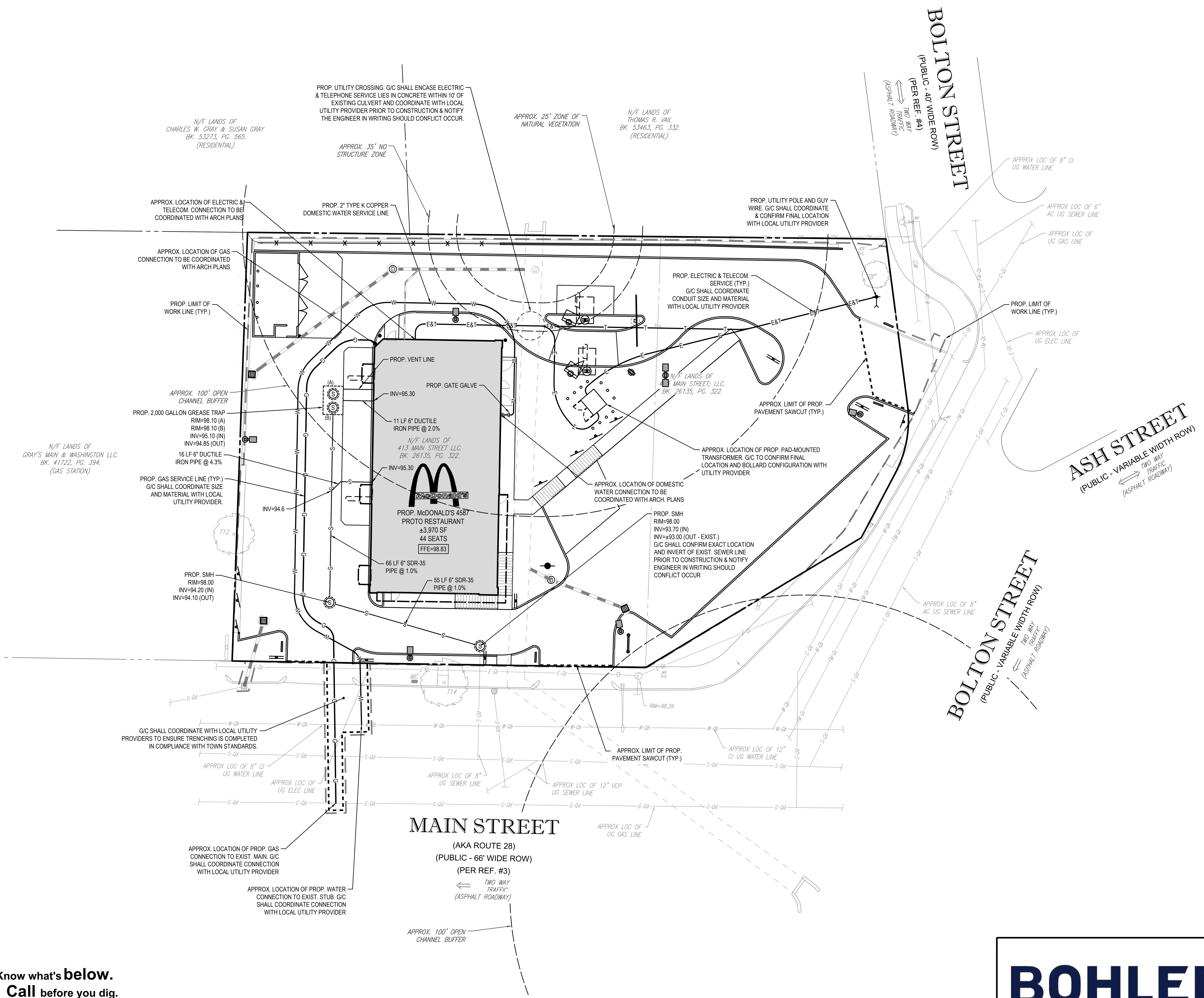
COMPLIANCE CHECK DATE
CONSTRUCTION CHECK DATE
CONSTRUCTION CHECK DATE
PROJECT No.: W222000
CAD I.D. #: W222000-SPPD-3a.dwg

-
STREET ADDRESS
413 MAIN STREET
CITY READING
STATE MA
COUNTY MIDDLESEX
SITE I.D. 20-0015
PLAN DESCRIPTION **GRADING & DRAINAGE PLAN**

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO. **C-401** OF 15

P:\2022\W222000\CAD\Drawings\Plan Sets\Civil Site Plans\W222000-SPPD-3a.dwg, C-401-Grad_Drain, 4/23/2010, 10:17:14 AM, osmis, Xerox5510-1.pc3, Used%34, 1:1



CONTRACTOR SHALL CONFIRM ALL UTILITY & DRAINAGE LOCATIONS PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER IN WRITING IF ANY CONFLICTS OCCUR.

THIS PLAN TO BE UTILIZED FOR UTILITIES PURPOSES ONLY. REFER TO GENERAL NOTES SHEET FOR ADDITIONAL GRADING & UTILITY NOTES

20 10 5 0 20
1"= 20'

Know what's **below.** **Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

P:\2022\W222000\CAD\Drawings\Plan Sets\Civil Site Plans\W222000-SPPD-3a.dwg, C-501-Util, 4/23/2010, 10:17:14 AM, cennis, XeroX510-1.pc3, User634, 1:1

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

J.A. KUCICH
PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS JOHN A. KUCICH CIVIL No. 41530 REGISTERED PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE No. 41530
NEW HAMPSHIRE LICENSE No. 15476
CONNECTICUT LICENSE No. 26177
RHODE ISLAND LICENSE No. 9616
MAINE LICENSE No. 12553

McDonald's®

OFFICE: BOSTON REGION
ADDRESS: 110 N CARPENTER ST CHICAGO, IL 60607

PLAN APPROVALS
DATE | SIGNATURE
APPROVED McDONALD'S AGENT

BOHLER //™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK | DATE
CONSTRUCTION CHECK | DATE
CONSTRUCTION CHECK | DATE

PROJECT No.: W222000

CAD I.D. #: W222000-SPPD-3a.dwg

-

STREET ADDRESS
413 MAIN STREET

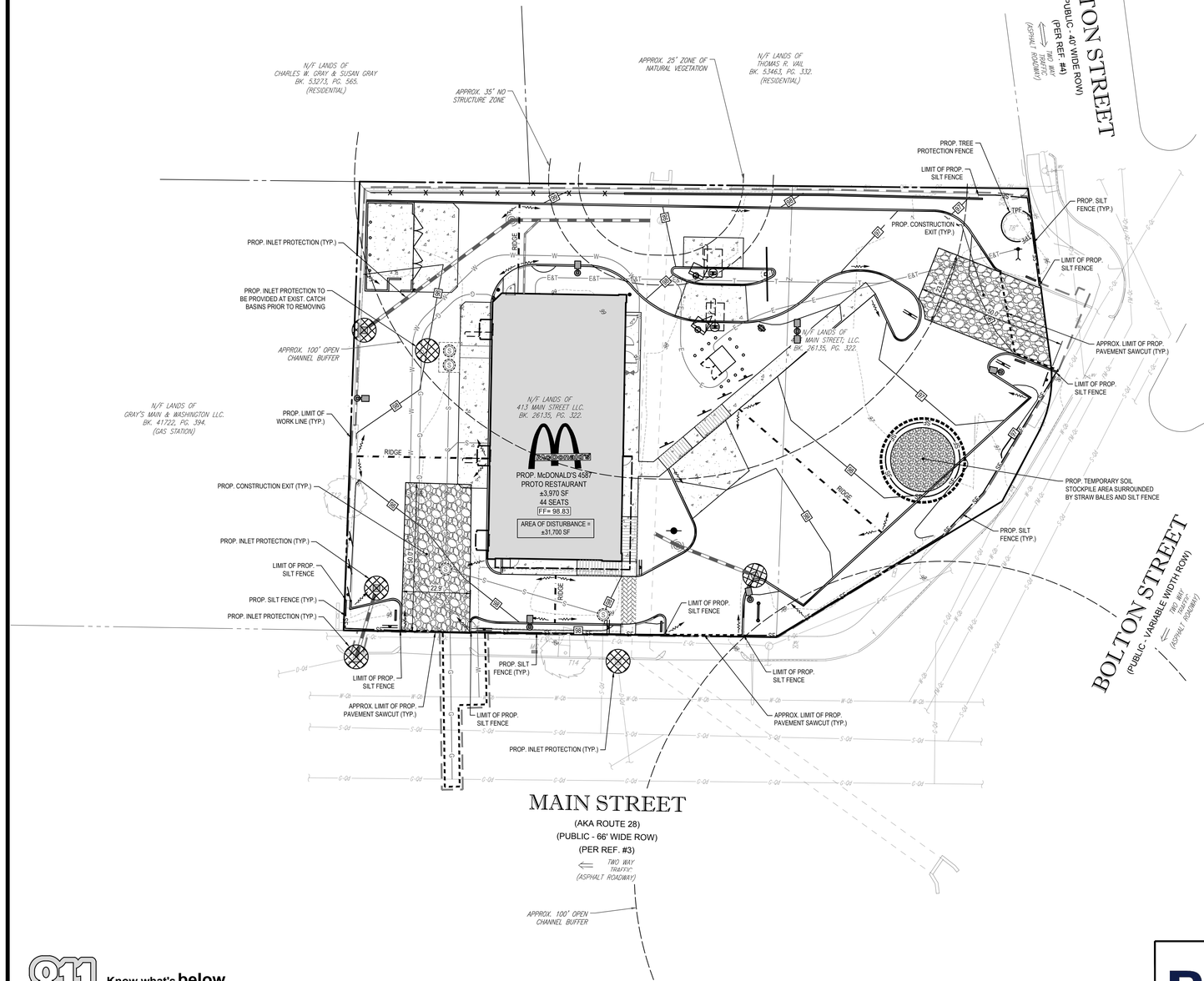
CITY	STATE
READING	MA

COUNTY
MIDDLESEX

SITE I.D.	PLAN DESCRIPTION
20-0015	UTILITY PLAN

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.
C-501
OF 15



THIS PLAN TO BE UTILIZED FOR SITE SOIL AND EROSION CONTROL PURPOSES ONLY

REFER TO SOIL EROSION CONTROL NOTES & DETAIL SHEET FOR EROSION NOTES AND DETAILS

20 10 5 0 20
1"= 20'

Know what's **below.** **Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

COMMONWEALTH OF MASSACHUSETTS
JOHN A. KUCZARSKI
CIVIL
No. 41530
PROFESSIONAL ENGINEER
REGISTERED PROFESSIONAL ENGINEER
NEW HAMPSHIRE LICENSE No. 15424
RHODE ISLAND LICENSE No. 20019
MAINE LICENSE No. 12453

McDonald's

OFFICE: BOSTON REGION
ADDRESS: 110 N CARPENTER ST, CHICAGO, IL 60607

PLAN APPROVALS

SIGNATURE	DATE
APPROVED MCDONALD'S AGENT	

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK DATE
CONSTRUCTION CHECK DATE
CONSTRUCTION CHECK DATE

PROJECT No.: W222000
CAD I.D. #: W222000-SPPD-3a.dwg

-
STREET ADDRESS: 413 MAIN STREET
CITY: READING
STATE: MA
COUNTY: MIDDLESEX
SITE I.D.: 20-0015
PLAN DESCRIPTION: SOIL EROSION & SEDIMENT CONTROL PLAN

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.: C-601
OF 15

EROSION AND SEDIMENT CONTROL NOTES

1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE AS SET FORTH IN THE MOST CURRENT STATE SEDIMENT AND EROSION CONTROL MANUAL.

2. THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE LEFT IN AN UNTREATED OR UNVEGETATED CONDITION FOR A MINIMUM TIME. AREAS SHALL BE PERMANENTLY STABILIZED IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS. AT A MINIMUM, AREAS SHALL BE PERMANENTLY STABILIZED ACCORDING TO THE CURRENT EDITION OF THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP), OR IN THE ABSENCE OF A SWPPP, THEY SHALL BE PERMANENTLY STABILIZED WITHIN 14 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF THE SOIL. IF THE DISTURBANCE IS WITHIN 100 FEET OF A STREAM OR POND, THE AREA SHALL BE STABILIZED WITHIN 7 DAYS OR PRIOR TO ANY STORM EVENT (THIS WOULD INCLUDE WETLANDS).

3. SEDIMENT BARRIERS (SILT FENCE, STRAW BARRIERS, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 8%.

4. INSTALL SILTATION BARRIER AT TOE OF SLOPE TO FILTER SILT FROM RUNOFF. SEE SILTATION BARRIER DETAILS FOR PROPER INSTALLATION. SILTATION BARRIER WILL REMAIN IN PLACE PER NOTE #5.

5. ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE PERMANENTLY STABILIZED. FOR SEDIMENT CONTROL DEVICES THAT ARE WITHIN AREAS SUBJECT TO CONSERVATION COMMISSION JURISDICTION, THE DEVICES SHALL REMAIN IN PLACE AND BE REMOVED IN ACCORDANCE WITH THE ORDER OF CONDITIONS.

6. NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO TO ONE (2:1) UNLESS OTHERWISE INDICATED ON THE PLANS. SLOPE PROTECTION FOR SLOPES GREATER THAN 2:1 SHALL BE DESIGNED BY A GEOTECHNICAL ENGINEER.

7. IF FINAL SEEDING OF THE DISTURBED AREAS IS NOT COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST, USE TEMPORARY MULCH (DORMANT SEEDING MAY BE ATTEMPTED AS WELL) TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.

8. TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINAL GRADED SHALL BE COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST TO PROTECT FROM SPRING RUNOFF PROBLEMS.

9. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL STANDARDS.

10. REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND PREPARED FOR FINAL SEEDING AS FOLLOWS:
    10.1. SIX INCHES, OR DEPTH SPECIFIED ON THE LANDSCAPE PLAN, OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND SMOOTHED TO A UNIFORM SURFACE.
    10.2. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 800 LB PER ACRE OR 18.4 LB PER 1,000 SF USING 10-20-20 OR EQUIVALENT. APPLY GROUND LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE (138 LB PER1,000 SF).
    10.3. FOLLOWING SEED BED PREPARATION, DITCHES AND BACK SLOPES WILL BE SEEDED TO A MIXTURE OF 47% CREEPING RED FESCUE, 5% REDTOP, AND 48% TALL FESCUE. THE LAWN AREAS WILL BE SEEDED TO A PREMIUM TURF MIXTURE OF 44% KENTUCKY BLUE-GRASS, 44% CREEPING RED FESCUE, AND 12% PERENNIAL RYEGRASS: SEEDING RATE IS 1.03 LBS PER 1,000 SF LAWN. QUALITY SOD MAY BE SUBSTITUTED FOR SEED WHERE SLOPES DO NOT EXCEED 2:1, SOD ON SLOPES STEEPER THAN 3:1 SHOULD BE PEGGED.
    10.4. STRAW MULCH AT THE RATE OF 70-90 LBS PER 1,000 SF. A HYDRO-APPLICATION OF WOOD OR PAPER FIBER SHALL BE APPLIED FOLLOWING SEEDING. A SUITABLE NON-TOXIC BINDER WILL BE USED ON STRAW MULCH FOR WIND CONTROL.

11. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS 70% STABILIZED. FOR EROSION CONTROL MEASURES THAT ARE WITHIN AREAS SUBJECT TO CONSERVATION COMMISSION JURISDICTION, THE MEASURES SHALL REMAIN IN PLACE AND BE REMOVED IN ACCORDANCE WITH THE ORDER OF CONDITIONS.

12. WETLANDS WILL BE PROTECTED WITH BARRIERS CONSISTING OF STRAW BALES, COMPOST TUBES, SILT FENCE OR A COMBINATION THEREOF.

13. ALL AREAS WITHIN 100 FEET OF A FLAGGED WETLAND OR STREAM SHALL HAVE AN EXPOSURE WINDOW OF NOT MORE THAN 7 DAYS.

14. ALL AREAS WITHIN 100 FEET OF A FLAGGED WETLAND OR STREAM SHALL FOLLOW APPROPRIATE EROSION CONTROL MEASURES PRIOR TO EACH STORM IF NOT BEING ACTIVELY WORKED:

LOCATION	MULCH	MULCH RATE (1000 SF)
PROTECTED AREA	STRAW	100 POUNDS
WINDY AREA	SHREDDED OR CHOPPED CORNSTALKS STRAW (ANCHORED)*	185-275 POUNDS 100 POUNDS
MODERATE TO HIGH VELOCITY AREAS OR STEEP SLOPES GREATER THAN 3:1	JUTE MESH OR EXCELSIOR MAT	AS REQUIRED
GREATER THAN 3:1	(REFER TO GEOTECHNICAL REPORT FOR FINAL DESIGN REQUIREMENT)	

* A HYDRO-APPLICATION OF WOOD OR PAPER FIBER MAY BE APPLIED FOLLOWING SEEDING. A SUITABLE NON-TOXIC BINDER SHALL BE USED TO ADDITIONAL WIND CONTROL.

* MULCH ANCHORING: ANCHOR MULCH WITH PEG AND TWINE (1 SQ. YD/BLOCK); MULCH NETTING (AS PER MANUFACTURER); WOOD CELLULOSE FIBER (750 LBS/ACRE); CHEMICAL TACK (AS PER MANUFACTURER'S SPECIFICATIONS); USE OF A SERRATED STRAIGHT DISK. WETTING FOR SMALL AREAS AND ROAD DITCHES MAY BE PERMITTED.

15. PROPOSED LOCATIONS OF SURFACE STORMWATER MANAGEMENT BASINS CAN BE UTILIZED AS A TEMPORARY SEDIMENT TRAP DURING CONSTRUCTION.SEDIMENT TRAPS SHALL BE SIZED AND CONSTRUCTED IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REQUIREMENTS.
    15.1. TEMPORARY SEDIMENT TRAPS SHALL BE SIZED PER THE CURRENT EDITION OF THE "MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS" AND PROVIDE A MINIMUM OF 1,800 CF PER ACRE OF TRIBUTARY AREA WITH A MAXIMUM TRIBUTARY AREA OF 5 ACRES, MAINTAIN A 2:1 LENGTH TO WIDTH RATIO, AND NOT EXCEED 5 FT IN HEIGHT. UPON SITE STABILIZATION, ACCUMULATED SEDIMENT SHALL BE REMOVED AND THE TEMPORARY SEDIMENT TRAP EXCAVATED TO 1 FOOT BELOW THE TRAP. THE AREA SHALL THEN BE SCARIFIED TO PREVENT COMPACTION AND PROMOTE INFILTRATION, AND GRADED AND STABILIZED IN ACCORDANCE WITH THE GRADING AND LANDSCAPE PLANS.

16. STOCKPILING OF MATERIALS (DIRT, WOOD, CONSTRUCTION MATERIALS, ETC.) MUST REMAIN COVERED AT ALL TIMES TO MINIMIZE ANY DUST PROBLEMS THAT MAY OCCUR WITH ADJACENT PROPERTIES AND TO PROVIDE MAXIMUM PROTECTION AGAINST EROSION RUNOFF.

17. EXISTING CATCH BASIN STRUCTURES SHALL BE PROTECTED UNTIL SUCH TIME AS THEY ARE REMOVED.

18. THE CONTRACTOR MUST PERFORM DEWATERING (IF REQUIRED), IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AND PAY FOR THE COSTS ASSOCIATED WITH ANY AND ALL NECESSARY DISCHARGE PERMITS ASSOCIATED WITH SAME.

19. THE CONTRACTOR MUST LOCATE CONSTRUCTION WASTE MATERIAL STORAGE AREAS TO MINIMIZE EXPOSURE TO STORMWATER. THE CONTRACTOR MUST IMMEDIATELY PLACE CONSTRUCTION WASTE IN ON-SITE STORAGE CONTAINERS UNTIL THAT CONSTRUCTION WASTE IS READY FOR OFF-SITE DISPOSAL. THE CONTRACTOR MUST MAINTAIN SPILL PREVENTION AND RESPONSE EQUIPMENT AND MAKE SAME CONTINUOUSLY AVAILABLE ON-SITE FOR USE BY THE CONTRACTOR'S EMPLOYEES WHO MUST BE PROPERLY TRAINED IN THE APPLICATION OF SPILL PREVENTION AND RESPONSE PROCEDURES.

20. EROSION CONTROL NOTES DURING WINTER CONSTRUCTION

21. WINTER CONSTRUCTION PERIOD: NOVEMBER 1 THROUGH APRIL 15.

22. WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT THE AMOUNT OF AREA OPEN AT ONE TIME IS MINIMIZED TO THE MAXIMUM EXTENT PRACTICABLE AND IN CONFORMANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN SUCH THAT ADEQUATE PROVISIONS ARE EMPLOYED TO CONTROL STORMWATER RUNOFF.

23. CONTINUATION OF EARTHWORK OPERATION ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.

24. AN AREA SHALL BE CONSIDERED TO HAVE BEEN TEMPORARILY STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW OR STRAW AT A RATE OF 100 LB. PER 1,000 SQUARE FEET (WITH OR WITHOUT SEEDING) OR DORMANT SEEDED, MULCHED AND ADEQUATELY ANCHORED BY AN APPROVED ANCHORING TECHNIQUE.

25. FOR AREAS WHERE CONSTRUCTION ACTIVITIES HAVE CEASED FOR A PERIOD EXCEEDING 14 DAYS BETWEEN THE DATES OF NOVEMBER 1ST AND APRIL 1ST, LOAM OR SEED WILL NOT BE REQUIRED. THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED. IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED AND IS SMOOTH, THEN THE AREA MAY BE DORMANT SEEDED AT A RATE OF 200-300% HIGHER THAN SPECIFIED FOR PERMANENT SEED AND THEN MULCHED AS APPLICABLE. SLOPES SHALL NOT BE LEFT UNSTABILIZED OVER THE WINTER OR IN AREAS WHERE WORK HAS CEASED FOR MORE THAN 14 DAYS UNLESS TREATED IN THE ABOVE MANNER. UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT, EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF SEDIMENT BARRIERS OR STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS.

26. MULCHING REQUIREMENTS:
    26.1. BETWEEN THE DATES OF NOVEMBER 1ST AND APRIL 15TH ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING OR WOOD CELLULOSE FIBER.
    26.2. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPE EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%.
    26.3. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15%. AFTER OCTOBER 1ST THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.

27. ALL DISTURBED AREAS SHALL BE STABILIZED IN ACCORDANCE WITH THE STORMWATER PREVENTION PLAN.

28. DURING THE WINTER CONSTRUCTION PERIOD ALL SNOW SHALL BE REMOVED FROM AREAS OF SEEDING AND MULCHING PRIOR TO PLACEMENT.

GENERAL EROSION AND SEDIMENT CONTROL NOTES

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.

2. EROSION CONTROL MEASURES MUST CONFORM TO THE STATE, LOCAL, AND FEDERAL GUIDELINES FOR URBAN EROSION AND SEDIMENT CONTROL UNLESS OTHERWISE NOTED, OR UNLESS ENGINEER CLEARLY AND SPECIFICALLY, IN WRITING, DIRECTS OTHERWISE. INSTALLATION OF EROSION CONTROL, CLEARING, AND SITE WORK MUST BE PERFORMED EXACTLY AS INDICATED IN THE EROSION CONTROL CONSTRUCTION NOTES.

3. THE DISTURBED LAND AREA OF THIS SITE IS APPROXIMATELY 0.728 ACRES.

4. THE FOLLOWING EROSION CONTROL MEASURES ARE PROPOSED FOR THIS SITE:
    4.1. STABILIZED CONSTRUCTION ENTRANCE/ EXIT - A TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT IS TO BE INSTALLED AT THE DESIGNATED LOCATION SHOWN ON THE PLAN. THIS AREA MUST BE GRADED SO THAT RUNOFF WATER WILL BE RETAINED ON-SITE.
    4.2. SEDIMENT FENCE - INSTALL SILT FENCE(S) AND/OR SILT SOCK AROUND ALL OF THE DOWNSLOPE PERIMETERS OF THE SITE, TEMPORARY FILL AND SOIL STOCKPILES.
    4.3. INSTALL FILTER FABRIC DROP INLET PROTECTION AROUND EACH DRAINAGE INLET AS DRAINAGE STRUCTURES ARE INSTALLED TO REDUCE THE QUANTITY OF SEDIMENT. INSTALL TEMPORARY INLET PROTECTION ON INLETS DOWNSLOPE FROM DISTURBANCE, WHICH MAY BE BEYOND THE LIMITS OF DISTURBED AREA.

5. INSTALLATION OF EROSION CONTROL DEVICES MUST BE IN ACCORDANCE WITH ALL OF THE MANUFACTURER'S RECOMMENDATIONS.

6. THE CONTRACTOR MUST INSPECT EROSION CONTROL MEASURES WEEKLY. THE CONTRACTOR MUST REMOVE ANY SILT DEPOSITS GREATER THAN 6" OR HALF THE OF THE EROSION CONTROL BARRIER'S HEIGHT COLLECTED ON THE FILTER FABRIC AND/OR SILT SOCK BARRIERS AND EXCAVATE AND REMOVE ANY SILT FROM DROP INLET PROTECTION.

7. THE CONTRACTOR MUST APPLY TEMPORARY SEED AND MULCH TO ALL DISTURBED AREAS THAT WILL NOT BE BROUGHT TO FINISHED GRADE AND VEGETATED WITHIN 7 DAYS. WHEN AREAS ARE DISTURBED AFTER THE GROWING SEASON, THE CONTRACTOR MUST STABILIZE SAME WITH GEOTEXTILE FABRIC AND MAINTAIN SAME IN STRICT ACCORDANCE WITH BEST MANAGEMENT PRACTICES.

8. THE CONTRACTOR MUST INSTALL ADDITIONAL EROSION CONTROL MEASURES IF ENGINEER SO REQUIRES, TO PREVENT ANY, INCLUDING THE INCIDENTAL, DISCHARGE OF SILT-LADEN RUNOFF FROM EXITING THE SITE.

9. THE CONTRACTOR MUST BE RESPONSIBLE FOR INSPECTING AND MAINTAINING ALL EROSION CONTROL MEASURES ON THE SITE UNTIL PERMANENT PAVING AND TURF/LANDSCAPING IS ESTABLISHED. THE COSTS OF INSTALLING AND MAINTAINING THE EROSION CONTROL MEASURES MUST BE INCLUDED IN THE BID PRICE FOR THE SITE WORK AND THE CONTRACTOR IS RESPONSIBLE FOR ALL SUCH COSTS.

10. THE CONTRACTOR MUST CONTINUE TO MAINTAIN ALL EROSION CONTROL MEASURES UNTIL THE COMPLETION OF CONSTRUCTION AND THE ESTABLISHMENT OF VEGETATION.

11. THE CONTRACTOR MUST REMOVE EROSION CONTROL MEASURES, SILT AND DEBRIS AFTER ESTABLISHING PERMANENT VEGETATION COVER OR OTHER INSTALLING A DIFFERENT, SPECIFIED METHOD OF STABILIZATION.

12. THIS PLAN REPRESENTS THE MINIMUM LEVEL OF IMPLEMENTATION OF TEMPORARY EROSION AND SEDIMENTATION CONTROL FACILITIES, MEASURES AND STRUCTURES. ADDITIONAL FACILITIES, MEASURES AND STRUCTURES MUST BE INSTALLED WHERE NECESSARY TO COMPLY WITH ALL APPLICABLE CODES AND STANDARDS AND/OR TO PREVENT ANY, INCLUDING THE INCIDENTAL DISCHARGE OF SILT-LADEN RUNOFF FROM EXITING THE SITE.

13. THE CONTRACTOR MUST PROTECT ALL EXISTING TREES AND SHRUBS. THE CONTRACTOR MUST REFER TO THE LANDSCAPE AND/OR DEMOLITION PLAN(S) FOR TREE PROTECTION, FENCE LOCATIONS AND DETAILS.

14. THE CONTRACTOR MUST REFER TO GRADING PLANS FOR ADDITIONAL INFORMATION.

15. THE CONTRACTOR MUST CLEAN EXISTING AND PROPOSED DRAINAGE STRUCTURES AND INTERCONNECTING PIPES ON OR OFF-SITE AS THE JURISDICTIONAL AGENCY REQUIRES, BOTH AT THE TIME OF SITE STABILIZATION AND AT END OF PROJECT.

16. SOIL EROSION CONTROL MEASURES MUST BE ADJUSTED OR RELOCATED BY THE CONTRACTOR AS IDENTIFIED DURING SITE OBSERVATION IN ORDER TO MAINTAIN THE COMPLETE EFFECTIVENESS OF ALL CONTROL MEASURES.

17. THE CONTRACTOR MUST IDENTIFY, ON THE PLAN, THE LOCATION OF WASTE CONTAINERS, FUEL STORAGE TANKS, CONCRETE WASHOUT AREAS AND ANY OTHER LOCATIONS WHERE HAZARDOUS MATERIALS ARE STORED.

RECOMMENDED CONSTRUCTION SEQUENCE

N.T.S.

THE FOLLOWING CONSTRUCTION SEQUENCE IS RECOMMENDED:

-INSTALLATION OF STABILIZED CONSTRUCTION ENTRANCE/EXIT (AS SHOWN)

-INSTALLATION OF EROSION CONTROL BARRIER (STRAW BALES AND SILT FENCE) (AS SHOWN)

-INSTALLATION OF INLET PROTECTION IN STREET (AS SHOWN)

-DEMOLITION OF EXISTING SITE STRUCTURES (SEE DEMOLITION PLAN)

-DEMOLITION OF EXISTING SITE PAVEMENT AND AMENITIES (SEE DEMOLITION PLAN)

-CLEARING AND GRUBBING

-EARTHWORK AND EXCAVATION/FILLING AS NECESSARY

-CONSTRUCTION OF UTILITIES

-STABILIZE PERMANENT LAWN AREAS AND SLOPES WITH TEMPORARY SEEDING

-INSTALLATION OF INLET PROTECTION OF ON-SITE UTILITIES (AS SHOWN)

-CONSTRUCTION OF BUILDINGS

-CONSTRUCTION OF ALL CURBING AND LANDSCAPE ISLANDS AS INDICATED ON THE PLANS

-SPREAD TOPSOIL ON SLOPED AREAS AND SEED AND MULCH

-FINAL GRADING OF ALL SLOPED AREAS

-PLACE 6" TOPSOIL ON SLOPES AFTER FINAL GRADING COMPLETED. FERTILIZE, SEED, AND MULCH SEED MIXTURE TO BE INSTALLED AS REQUIRED.

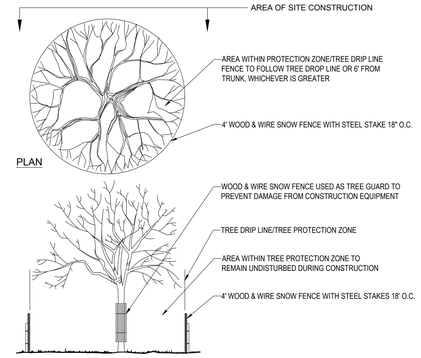
-PAVE PARKING LOT

-LANDSCAPING PER LANDSCAPING PLAN

-REMOVE EROSION CONTROLS AS DISTURBED AREAS BECOME STABILIZED TO 70% STABILIZATION OR GREATER

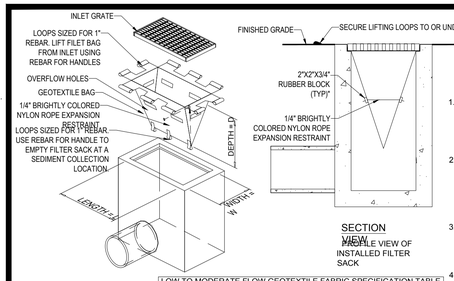
TREE PROTECTION DURING SITE CONSTRUCTION

N.T.S.



FILTER SACS (GRATED INLETS)

N.T.S.



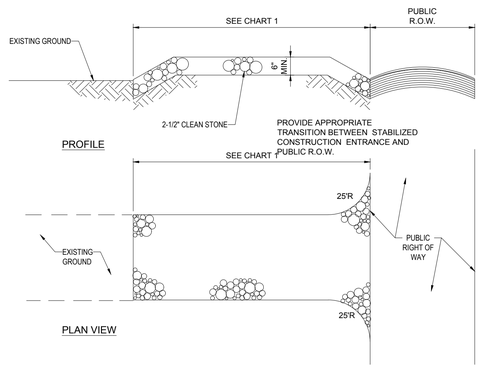
LOW TO MODERATE FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20%
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	800 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80%
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	0.55 SEC $^{-1}$
MODERATE TO HIGH FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20%
PUNCTURE	ASTM D-4833	135 LBS
MULLEN BURST	ASTM D-3786	420 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90%
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC $^{-1}$

NOTE:
DO NOT USE IN PAVED AREAS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

1. REMOVE TRAPPED SEDIMENT WHEN BRIGHTLY COLORED EXPANSION RESTRAINT CAN NO LONGER BE SEEN.
2. GEOTEXTILE SHALL BE A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS REQUIREMENTS IN THE SPECIFICATIONS TABLE.
3. PLACE AN OIL ADSORBENT PAD OR PILLOW OVER INLET GRATE WHEN OIL SPILLS ARE A CONCERN.
4. INSPECT PER REGULATORY REQUIREMENTS.
5. THE WIDTH, "W", OF THE FILTER SACK SHALL MATCH THE INSIDE WIDTH OF THE GRATED INLET BOX.
6. THE DEPTH, "D", OF THE FILTER SACK SHALL BE BETWEEN 18 INCHES AND 36 INCHES.
7. THE LENGTH, "L", OF THE FILTER SACK SHALL MATCH THE INSIDE LENGTH OF THE GRATED INLET BOX.

STABILIZED CONSTRUCTION ENTRANCE

N.T.S.



PERCENT SLOPE OF ROADWAY	LENGTH OF STONE REQUIRED	
	COARSE GRAINED SOILS	FINE GRAINED SOILS
0 TO 2%	50 FT	100 FT
2% TO 5%	100 FT	200FT
>5%	ENTIRE ENTRANCE STABILIZED WITH FABC BASE COURSE (1)	

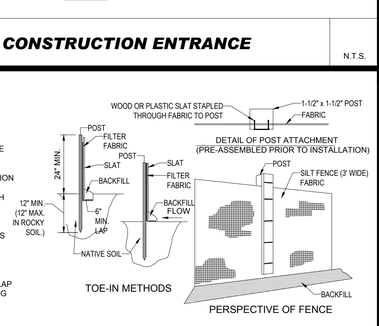
(1) AS PRESCRIBED BY LOCAL ORDINANCE OR OTHER GOVERNING AUTHORITY.

CHART 1

TYP. SILTATION FENCE

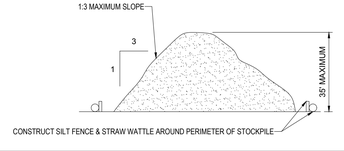
N.T.S.

NOTES:
1. EXCAVATE A 6"x6" TRENCH ALONG THE LINE OF EROSION CONTROL OF THE SITE.
2. UNROLL SILTATION FENCE AND POSITION THE POSTS AGAINST THE BACK (DOWNSTREAM) WALL OF THE TRENCH (NET SIDE AWAY FROM FLOW DIRECTION).
3. DRIVE THE POST INTO THE GROUND UNTIL THE NETTING IS LAYING ACROSS THE TRENCH BOTTOM.
4. LAY THE TOE-IN FLAP OF THE FABRIC ONTO THE UNDISTURBED BOTTOM OF THE TRENCH. BACKFILL ALSO BE ACCOMPLISHED BY LAYING FABRIC FLAP ON UNDISTURBED GROUND AND PILING & TAMPING FILL AT THE BASE.



TEMPORARY STOCKPILE

N.T.S.



REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

JOHN KUCEWICZ CIVIL No. 41530 REGISTERED PROFESSIONAL ENGINEER — COMMONWEALTH OF MASSACHUSETTS — NEW HAMPSHIRE No. 15476 — CONNECTICUT No. PEN.0029737 — RHODE ISLAND LICENSE No. 24010 — MAINE LICENSE No. 24561

BOSTON REGION
110 N CARPENTER ST
CHICAGO, IL 60607

OFFICE
ADDRESS

PLAN APPROVALS

APPROVED MCDONALD'S AGENT	SIGNATURE	DATE

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK DATE

CONSTRUCTION CHECK DATE

CONSTRUCTION CHECK DATE

PROJECT No.: W222000

CAD I.D. #: W222000-SPPD-3a.dwg

-

STREET ADDRESS
413 MAIN STREET

CITY: READING
STATE: MA

COUNTY
MIDDLESEX

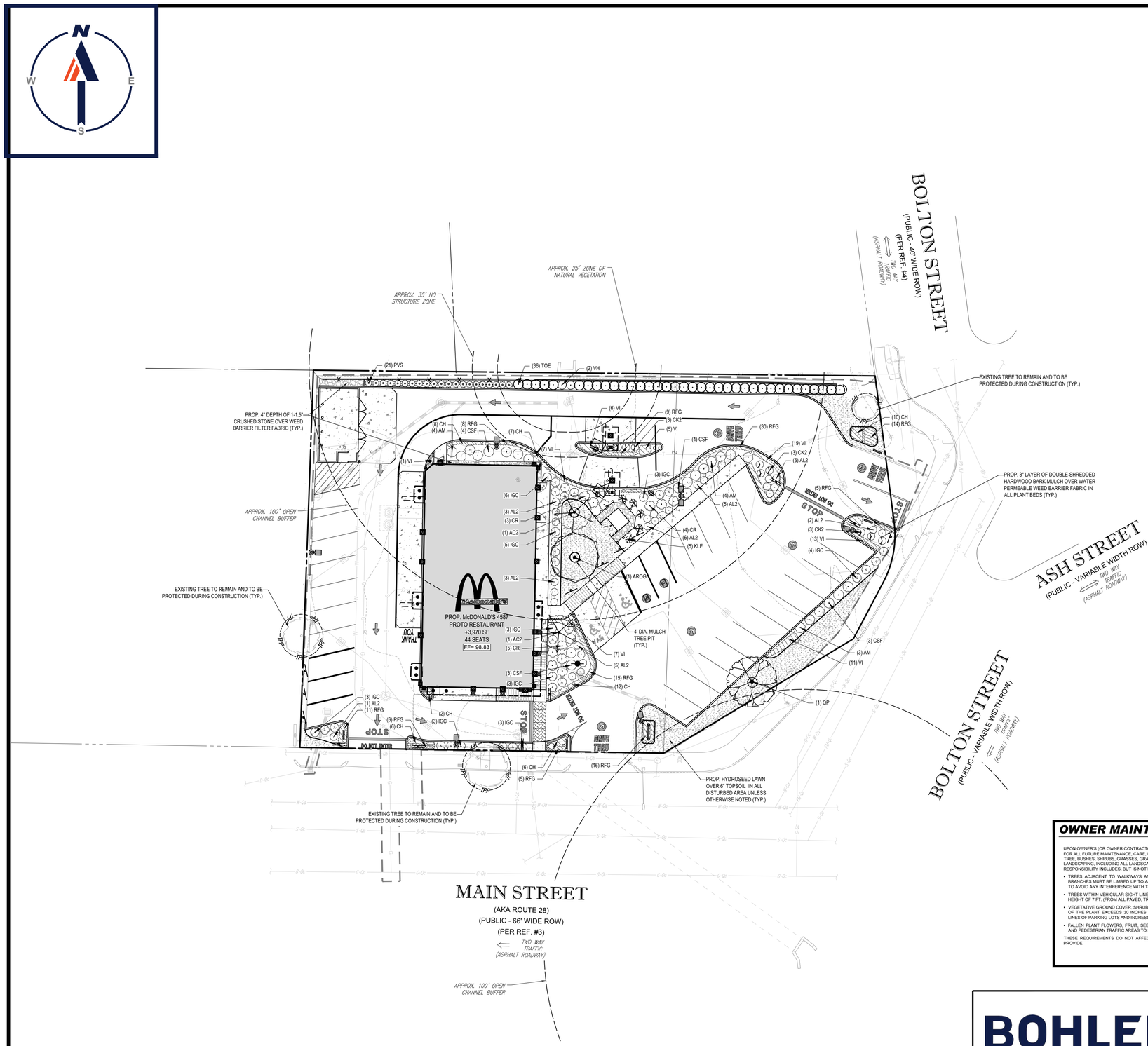
SITE I.D.
20-0015

PLAN DESCRIPTION
SOIL EROSION & SEDIMENT CONTROL NOTES & DETAILS

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.
C-602
OF 15

P:\2022\W222000\CAD\Drawings\Plan Sets\Civil Site Plans\W222000-SPPD-3a.dwg, C-602-Efstate, 4/23/2010, 10:17:14 AM, cennis, Xerox5510-1.pc3, User\534, 1:1



TOWN OF READING, MASSACHUSETTS
LANDSCAPE REQUIREMENTS

SECTION	REQUIREMENTS	CALCULATIONS/PROPOSED
6.5 LANDSCAPE STANDARDS	SIDE YARDS REQUIRED BY THE INTENSITY REGULATIONS SET FORTH IN SECTION 6.0 OF THE ZONING BYLAW SHALL BE LANDSCAPED. SUCH SIDE YARDS SHALL BE PLANTED WITH A COMBINATION OF GRASS, SHRUBS OF APPROPRIATE HEIGHT AND SHADE TREES. IF THERE IS NOT AN ADEQUATE AMOUNT OF SIDE YARD AREA TO LANDSCAPE, A FENCE MAY BE ALLOWED AS AN ALTERNATIVE; PROVIDED, HOWEVER, THAT CHAIN LINK FENCING SHALL NOT BE PERMITTED. NO PARKING AREA OR DRIVEWAY SHALL BE ALLOWED WITHIN SUCH SIDE YARD.	EXISTING FENCE ALONG SIDE YARDS TO REMAIN
	NO MORE THAN 50 PERCENT (50%) OF THE TREES, APPROVED TO BE PLANTED, SHALL BE OF ANY ONE SPECIES AND NO LESS THAN 25 PERCENT (25%) OF THE TOTAL TREES PLANTED SHALL BE OF ANY ONE SPECIES. TREES SHALL BE CHOSEN FROM A LIST PROVIDED BY THE TREE WARDEN, UNLESS AN ALTERNATIVE IS SPECIFICALLY APPROVED BY THE CPDC.	PROVIDED
	TREES ALONG A PUBLIC WAY SHALL BE SPACED AT INTERVALS OF FIFTY (50) FEET; PROVIDED, HOWEVER, THAT NO TREES SHALL BE PLANTED WITHIN FIFTY (50) FEET OF AN INTERSECTION OR FUTURE INTERSECTION. TREES ON ONE (1) SIDE OF A STREET MAY BE SET EITHER OPPOSITE OR DIAGONALLY TO TREES ON THE OPPOSITE SIDE. TREES SHALL BE PLANTED TWO AND A HALF (2½) FEET BEHIND THE SIDEWALK OR SIX (6) FEET BEHIND THE GUTTER LINE AND ALWAYS WITHIN THE RIGHT-OF-WAY. THE LOCATION OF ALL THE PROPOSED TREES MUST BE REVIEWED BY THE TREE WARDEN ON SITE AND APPROVED PRIOR TO INSTALLATION.	WAIVER REQUESTED
	THE MINIMUM ACCEPTABLE SIZE OF TREE TO BE PLANTED ALONG A PUBLIC WAY SHALL BE THREE (3) INCH TRUNK CALIPER AT FOUR (4) FEET ABOVE THE GRADE. AT THE TIME OF DELIVERY, THE TREE WARDEN MUST APPROVE THE PROPOSED TREES. EVERGREEN TREES SHALL BE AT LEAST EIGHT (8) FEET TALL AT THE TIME OF PLANTING.	PROVIDED TO EXTENT POSSIBLE

PLANT SCHEDULE

CANOPY TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
AROG	1	ACER RUBRUM `OCTOBER GLORY`	OCTOBER GLORY RED MAPLE	3" CAL.	B&B
QP	1	QUERCUS PALUSTRIS	PIN OAK	3" CAL.	B&B
EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
TOE	36	THUJA OCCIDENTALIS 'SMARAGD'	EMERALD GREEN ARBORVITAE	6-8`	B&B
SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
AC2	2	AMELANCHIER CANADENSIS	CANADIAN SERVICEBERRY	8-10`	B&B
AL2	30	ARONIA MELANOCARPA 'UCONNAM165'	LOW SCAPE MOUND® BLACK CHOKEBERRY	18-24" HT.	CONTAINER
AM	11	ARONIA MELANOCARPA 'MORTON'	IROQUOIS BEAUTY™ BLACK CHOKEBERRY	24-30"	CONTAINER
CK2	9	CORNUS SERICEA 'KELSEYI'	KELSEY'S DWARF RED TWIG DOGWOOD	18-24" HT.	CONTAINER
CR	12	CLETHRA ALNIFOLIA 'RUBY SPICE'	RUBY SPICE SUMMERSWEET	24-30"	CONTAINER
CSF	14	CORNUS STOLONIFERA 'FARROW'	ARCTIC FIRE RED TWIG DOGWOOD	2-3`	CONTAINER
IGC	33	ILEX GLABRA `COMPACTA`	COMPACT INKBERRY	24-30"	CONTAINER
KLE	5	KALMIA LATIFOLIA `ELF`	DWARF MOUNTAIN LAUREL	24-30"	CONTAINER
VH	2	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	24-30"	B&B
GRASSES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
PVS	21	PANICUM VIRGATUM `SHENANDOAH`	SHENANDOAH SWITCH GRASS	1 GAL.	CONTAINER
GROUND COVERS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
VI	69	VACCINIUM ANGUSTIFOLIUM 'RUBY CARPET'	RUBY CARPET LOWBUSH BLUEBERRY	1 GAL.	CONTAINER
PERENNIALS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
CH	51	COREOPSIS ROSEA 'HEAVENS GATE'	PINK COREOPSIS	1 GAL.	CONTAINER
RFG	119	RUDBECKIA FULGIDA SULLIVANTII 'GOLDSTURM'	GOLDSTURM CONEFLOWER	1 GAL.	CONTAINER

SEED MIX KEY

PROPOSED HYDROSEED

OWNER MAINTENANCE RESPONSIBILITIES

UPON OWNER'S (OR OWNER CONTRACTOR'S) COMPLETION OF LANDSCAPING WORK, THE OWNER IS FULLY RESPONSIBLE FOR ALL FUTURE MAINTENANCE, CARE, UPKEEP, WATERING, AND TRIMMING OF ALL INSTALLED VEGETATION, PLANTS, TREE, BUSHES, SHRUBS, GRASSES, GRASS, ORNAMENTAL PLANTS AND FLOWERS, FLOWERS, GROUND COVER, AND LANDSCAPING, INCLUDING ALL LANDSCAPE ISLANDS AND AREAS ADJACENT OR PART OF THE LANDSCAPED AREAS. THIS RESPONSIBILITY INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING:

- TREES ADJACENT TO WALKWAYS AND AREAS OF PEDESTRIAN TRAFFIC MUST BE MAINTAINED TO ASSURE THAT ANY BRANCHES MUST BE LIMBED UP TO A CLEARANCE HEIGHT OF 7 FT. (FROM ALL PEDESTRIAN SURFACES) OR PRUNED BACK TO AVOID ANY INTERFERENCE WITH THE TYPICAL PATH OF TRAVEL.
- TREES WITHIN VEHICULAR SIGHT LINES, AS ILLUSTRATED ON THE LANDSCAPE PLAN, ARE TO BE TRIMMED TO A CLEARANCE HEIGHT OF 7 FT. (FROM ALL PAVED, TRAVELED SURFACES), OR AS OTHERWISE INDICATED ON THE PLANS.
- VEGETATIVE GROUND COVER, SHRUBS AND ORNAMENTAL PLANTS AND GRASSES MUST BE TRIMMED SO THAT NO PORTION OF THE PLANT EXCEEDS 30 INCHES ABOVE GRADE (OF ALL PAVED, TRAVEL SURFACES) ALONG AND WITHIN THE SIGHT LINES OF PARKING LOTS AND INGRESS-EGRESS WAYS.
- FALLEN PLANT FLOWERS, FRUIT, SEEDS AND DEBRIS DROPPINGS ARE TO BE REMOVED IMMEDIATELY FROM VEHICULAR AND PEDESTRIAN TRAFFIC AREAS TO PREVENT TRIPPING, SLIPPING OR ANY OTHER HAZARDS.

THESE REQUIREMENTS DO NOT AFFECT THE PLANT LIFE GUARANTEES THE LANDSCAPE CONTRACTOR IS REQUIRED TO PROVIDE.

THIS PLAN TO BE UTILIZED FOR LANDSCAPE PURPOSES ONLY

REFER LANDSCAPE NOTES & DETAILS SHEET FOR LANDSCAPE NOTES AND DETAILS

20 10 5 0 20
1"= 20'

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

COMMONWEALTH OF MASSACHUSETTS
MATTHEW C. MAIN
REGISTERED LANDSCAPE ARCHITECT
NO. 1211
REGISTERED LANDSCAPE ARCHITECT
MAIN, MATTHEW C.

McDonald's

OFFICE
BOSTON REGION
ADDRESS
110 N CARPENTER ST
CHICAGO, IL 60607

PLAN APPROVALS

SIGNATURE	DATE
APPROVED McDONALD'S AGENT	

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK DATE

CONSTRUCTION CHECK DATE

CONSTRUCTION CHECK DATE

PROJECT No.: W222000

CAD I.D. #: W222000-SPPD-3a.dwg

-

STREET ADDRESS
413 MAIN STREET

CITY
READING

STATE
MA

COUNTY
MIDDLESEX

SITE I.D.
20-0015

PLAN DESCRIPTION
LANDSCAPE PLAN

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.
C-701
OF 15

LANDSCAPE SPECIFICATIONS

1. SCOPE OF WORK:

1.1. THE LANDSCAPE CONTRACTOR SHALL BE REQUIRED TO PERFORM ALL CLEARING, FINISHED GRADING, SOIL PREPARATION, PERMANENT SEEDING OR SODDING, PLANTING AND MULCHING INCLUDING ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT NECESSARY FOR THE COMPLETION OF THIS PROJECT, UNLESS OTHERWISE CONTRACTED BY THE GENERAL CONTRACTOR.

2. MATERIALS

2.1. GENERAL - ALL HARDSCAPE MATERIALS SHALL MEET OR EXCEED SPECIFICATIONS AS OUTLINED IN THE STATE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.

2.2. TOPSOIL - NATURAL, FRIABLE, LOAMY SILT SOIL HAVING AN ORGANIC CONTENT NOT LESS THAN 5%, A PH RANGE BETWEEN 4.5-7.0. IT SHALL BE FREE OF DEBRIS, ROCKS LARGER THAN ONE INCH (1"), WOOD, ROOTS, VEGETABLE MATTER AND CLAY CLODS.

2.3. LAWN - ALL DISTURBED AREAS ARE TO BE TREATED WITH A MINIMUM 6" THICK LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, AND SEEDED OR SODDED IN ACCORDANCE WITH THE PERMANENT STABILIZATION METHODS INDICATED ON THE LANDSCAPE PLAN

2.3.1. LAWN SEED MIXTURE SHALL BE FRESH, CLEAN NEW CROP SEED.

2.3.2. SOD SHALL BE STRONGLY ROOTED, WEED AND DISEASE/PEST FREE WITH A UNIFORM THICKNESS. SOD INSTALLED ON SLOPES GREATER THAN 4:1 SHALL BE PEGGED TO HOLD SOD IN PLACE.

2.4. MULCH - ALL PLANTING BEDS SHALL BE MULCHED WITH A 3" THICK LAYER OF DOUBLE SHREDDED HARDWOOD BARK MULCH, UNLESS OTHERWISE STATED ON THE LANDSCAPE PLAN AND/OR LANDSCAPE PLAN NOTES /DETAILS.

2.5. FERTILIZER

2.5.1. FERTILIZER SHALL BE DELIVERED TO THE SITE MIXED AS SPECIFIED IN THE ORIGINAL UNOPENED STANDARD BAGS SHOWING WEIGHT, ANALYSIS AND NAME OF MANUFACTURER. FERTILIZER SHALL BE STORED IN A WEATHERPROOF PLACE SO THAT IT CAN BE KEPT DRY PRIOR TO USE.

2.5.2. FOR THE PURPOSE OF BIDDING, ASSUME THAT FERTILIZER SHALL BE 10% NITROGEN, 6% PHOSPHORUS AND 4% POTASSIUM BY WEIGHT. A FERTILIZER SHOULD NOT BE SELECTED WITHOUT A SOIL TEST PERFORMED BY A CERTIFIED SOIL LABORATORY.

2.6. PLANT MATERIAL

2.6.1. ALL PLANTS SHALL IN ALL CASES CONFORM TO THE REQUIREMENTS OF THE "AMERICAN STANDARD FOR NURSERY STOCK" (ANSI Z60.1), LATEST EDITION, AS PUBLISHED BY THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION (FORMERLY THE AMERICAN ASSOCIATION OF NURSERYMEN).

2.6.2. IN ALL CASES, BOTANICAL NAMES SHALL TAKE PRECEDENCE OVER COMMON NAMES FOR ANY AND ALL PLANT MATERIAL.

2.6.3. PLANTS SHALL BE LEGIBLY TAGGED WITH THE PROPER NAME AND SIZE. TAGS ARE TO REMAIN ON AT LEAST ONE PLANT OF EACH SPECIES FOR VERIFICATION PURPOSES DURING THE FINAL INSPECTION.

2.6.4. TREES WITH ABRASION OF THE BARK, SUN SCALDS, DISFIGURATION OR FRESH CUTS OF LIMBS OVER 1¼", WHICH HAVE NOT BEEN COMPLETELY CALLUSED, SHALL BE REJECTED. PLANTS SHALL NOT BE BOUND WITH WIRE OR ROPE AT ANY TIME SO AS TO DAMAGE THE BARK OR BREAK BRANCHES.

2.6.5. ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY AND SHALL HAVE A NORMAL HABIT OF GROWTH: WELL DEVELOPED BRANCHES, DENSELY FOLIATED, VIGOROUS ROOT SYSTEMS AND BE FREE OF DISEASE, INSECTS, PESTS, EGGS OR LARVAE.

2.6.6. CALIPER MEASUREMENTS OF NURSERY GROWN TREES SHALL BE TAKEN AT A POINT ON THE TRUNK SIX INCHES (6") ABOVE THE NATURAL GRADE FOR TREES UP TO AND INCLUDING A FOUR INCH (4") CALIPER SIZE. IF THE CALIPER AT SIX INCHES (6") ABOVE THE GROUND EXCEEDS FOUR INCHES (4") IN CALIPER, THE CALIPER SHOULD BE MEASURED AT A POINT 12" ABOVE THE NATURAL GRADE.

2.6.7. SHRUBS SHALL BE MEASURED TO THE AVERAGE HEIGHT OR SPREAD OF THE SHRUB, AND NOT TO THE LONGEST BRANCH.

2.6.8. TREES AND SHRUBS SHALL BE HANDLED WITH CARE BY THE ROOT BALL.

3. GENERAL WORK PROCEDURES

3.1. CONTRACTOR TO UTILIZE WORKMANLIKE INDUSTRY STANDARDS IN PERFORMING ALL LANDSCAPE CONSTRUCTION. THE SITE IS TO BE LEFT IN A CLEAN STATE AT THE END OF EACH WORKDAY. ALL DEBRIS, MATERIALS AND TOOLS SHALL BE PROPERLY STORED, STOCKPILED OR DISPOSED OF.

3.2. WASTE MATERIALS AND DEBRIS SHALL BE COMPLETELY DISPOSED OF AT THE CONTRACTOR'S EXPENSE. DEBRIS SHALL NOT BE BURIED, INCLUDING ORGANIC MATERIALS, BUT SHALL BE REMOVED COMPLETELY FROM THE SITE.

4. SITE PREPARATIONS

4.1. BEFORE AND DURING PRELIMINARY GRADING AND FINISHED GRADING, ALL WEEDS AND GRASSES SHALL BE DUG OUT BY THE ROOTS AND DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES OUTLINED HEREIN.

4.2. ALL EXISTING TREES TO REMAIN SHALL BE PRUNED TO REMOVE ANY DAMAGED BRANCHES. THE ENTIRE LIMB OF ANY DAMAGED BRANCH SHALL BE CUT OFF AT THE BRANCH COLLAR. CONTRACTOR SHALL ENSURE THAT CUTS ARE SMOOTH AND STRAIGHT. ANY EXPOSED ROOTS SHALL BE CUT BACK WITH CLEAN, SHARP TOOLS AND TOPSOIL SHALL BE PLACED AROUND THE REMAINDER OF THE ROOTS. EXISTING TREES SHALL BE MONITORED ON A REGULAR BASIS FOR ADDITIONAL ROOT OR BRANCH DAMAGE AS A RESULT OF CONSTRUCTION. ROOTS SHALL NOT BE LEFT EXPOSED FOR MORE THAN ONE (1) DAY. CONTRACTOR SHALL WATER EXISTING TREES AS NEEDED TO PREVENT SHOCK OR DECLINE.

4.3. CONTRACTOR SHALL ARRANGE TO HAVE A UTILITY STAKE-OUT TO LOCATE ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY LANDSCAPE MATERIAL. UTILITY COMPANIES SHALL BE CONTACTED THREE (3) DAYS PRIOR TO THE BEGINNING OF WORK.

5. TREE PROTECTION

5.1. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING TREES TO REMAIN. A TREE PROTECTION ZONE SHALL BE ESTABLISHED AT THE DRIP LINE OR AT THE LIMIT OF CONSTRUCTION DISTURBANCE, WHICHEVER IS GREATER. LOCAL STANDARDS THAT MAY REQUIRE A MORE STRICT TREE PROTECTION ZONE SHALL BE HONORED.

5.2. A FORTY-EIGHT INCH (48") HIGH WOODEN SNOW FENCE OR ORANGE COLORED HIGH-DENSITY 'VISI-FENCE', OR APPROVED EQUAL, MOUNTED ON STEEL POSTS SHALL BE PLACED ALONG THE BOUNDARY OF THE TREE PROTECTION ZONE. POSTS SHALL BE LOCATED AT A MAXIMUM OF EIGHT FEET (8') ON CENTER OR AS INDICATED WITHIN THE TREE PROTECTION DETAIL.

5.3. WHEN THE TREE PROTECTION FENCING HAS BEEN INSTALLED, IT SHALL BE INSPECTED BY THE APPROVING AGENCY PRIOR TO DEMOLITION, GRADING, TREE CLEARING OR ANY OTHER CONSTRUCTION. THE FENCING ALONG THE TREE PROTECTION ZONE SHALL BE REGULARLY INSPECTED BY THE LANDSCAPE CONTRACTOR AND MAINTAINED UNTIL ALL CONSTRUCTION ACTIVITY HAS BEEN COMPLETED.

5.4. AT NO TIME SHALL MACHINERY, DEBRIS, FALLEN TREES OR OTHER MATERIALS BE PLACED, STOCKPILED OR LEFT STANDING IN THE TREE PROTECTION ZONE.

6. SOIL MODIFICATIONS

6.1. CONTRACTOR SHALL ATTAIN A SOIL TEST FOR ALL AREAS OF THE SITE PRIOR TO CONDUCTING ANY PLANTING. SOIL TESTS SHALL BE PERFORMED BY A CERTIFIED SOIL LABORATORY.

6.2. LANDSCAPE CONTRACTOR SHALL REPORT ANY SOIL OR DRAINAGE CONDITIONS CONSIDERED DETRIMENTAL TO THE GROWTH OF PLANT MATERIAL. SOIL MODIFICATIONS, AS SPECIFIED HEREIN, MAY NEED TO BE CONDUCTED BY THE LANDSCAPE CONTRACTOR DEPENDING ON SITE CONDITIONS.

6.3. THE FOLLOWING AMENDMENTS AND QUANTITIES ARE APPROXIMATE AND ARE FOR BIDDING PURPOSES ONLY. COMPOSITION OF AMENDMENTS SHOULD BE REVISED DEPENDING ON THE OUTCOME OF A TOPSOIL ANALYSIS PERFORMED BY A CERTIFIED SOIL LABORATORY.

6.3.1. TO INCREASE A SANDY SOIL'S ABILITY TO RETAIN WATER AND NUTRIENTS, THOROUGHLY TILL ORGANIC MATTER INTO THE TOP 6-12". USE COMPOSTED BARK, COMPOSTED LEAF MULCH OR PEAT MOSS. ALL PRODUCTS SHOULD BE COMPOSTED TO A DARK COLOR AND BE FREE OF PIECES WITH IDENTIFIABLE LEAF OR WOOD STRUCTURE. AVOID MATERIAL WITH A PH HIGHER THAN 7.5.

6.3.2. TO INCREASE DRAINAGE, MODIFY HEAVY CLAY OR SILT (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) AND/OR AGRICULTURAL GYPSUM. COARSE SAND MAY BE USED IF ENOUGH IS ADDED TO BRING THE SAND CONTENT TO MORE THAN 60% OF THE TOTAL MIX. SUBSURFACE DRAINAGE LINES MAY NEED TO BE ADDED TO INCREASE DRAINAGE.

6.3.3. MODIFY EXTREMELY SANDY SOILS (MORE THAN 85%) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX.

7. FINISHED GRADING

7.1. UNLESS OTHERWISE CONTRACTED, THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF TOPSOIL AND THE ESTABLISHMENT OF FINE-GRADING WITHIN THE DISTURBANCE AREA OF THE SITE.

7.2. LANDSCAPE CONTRACTOR SHALL VERIFY THAT SUBGRADE FOR INSTALLATION OF TOPSOIL HAS BEEN ESTABLISHED. THE SUBGRADE OF THE SITE MUST MEET THE FINISHED GRADE LESS THE REQUIRED TOPSOIL THICKNESS (1"±).

7.3. ALL LAWN AND PLANTING AREAS SHALL BE GRADED TO A SMOOTH, EVEN AND UNIFORM PLANE WITH NO ABRUPT CHANGE OF SURFACE AS DEPICTED WITHIN THIS SET OF CONSTRUCTION PLANS, UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER OR LANDSCAPE ARCHITECT.

7.4. ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED TO ALLOW FREE FLOW OF SURFACE WATER IN AND AROUND THE PLANTING BEDS. STANDING WATER SHALL NOT BE PERMITTED IN PLANTING BEDS.

8. TOPSOILING

8.1. CONTRACTOR SHALL PROVIDE A 6" THICK MINIMUM LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, IN ALL PLANTING AREAS. TOPSOIL SHOULD BE SPREAD OVER A PREPARED SURFACE IN A UNIFORM LAYER TO ACHIEVE THE DESIRED COMPACTED THICKNESS.

8.2. ON-SITE TOPSOIL MAY BE USED TO SUPPLEMENT THE TOTAL AMOUNT REQUIRED. TOPSOIL FROM THE SITE MAY BE REJECTED IF IT HAS NOT BEEN PROPERLY REMOVED, STORED AND PROTECTED PRIOR TO CONSTRUCTION.

8.3. CONTRACTOR SHALL FURNISH TO THE APPROVING AGENCY AN ANALYSIS OF BOTH IMPORTED AND ON-SITE TOPSOIL TO BE UTILIZED IN ALL PLANTING AREAS. THE PH AND NUTRIENT LEVELS MAY NEED TO BE ADJUSTED THROUGH SOIL MODIFICATIONS AS NEEDED TO ACHIEVE THE REQUIRED LEVELS AS SPECIFIED IN THE MATERIALS SECTION ABOVE.

8.4. ALL LAWN AREAS ARE TO BE CULTIVATED TO A DEPTH OF SIX INCHES (6"). ALL DEBRIS EXPOSED FROM EXCAVATION AND CULTIVATION SHALL BE DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES SECTION ABOVE. THE FOLLOWING SHALL BE TILLED INTO THE TOP FOUR INCHES (4") IN TWO DIRECTIONS (QUANTITIES BASED ON A 1,000 SQUARE FOOT AREA - FOR BID PURPOSES ONLY [SEE SPECIFICATION 6.A.]):

8.4.1. 20 POUNDS 'GRO-POWER' OR APPROVED SOIL CONDITIONER/FERTILIZER

8.4.2. 20 POUNDS NITRO-FORM (COURSE) 38-0-0 BLUE CHIP OR APPROVED NITROGEN FERTILIZER

8.5. THE SPREADING OF TOPSOIL SHALL NOT BE CONDUCTED UNDER MUDDY OR FROZEN CONDITIONS.

9. PLANTING

9.1. INSOFAR THAT IT IS FEASIBLE, PLANT MATERIAL SHALL BE PLANTED ON THE DAY OF DELIVERY. IN THE EVENT THAT THIS IS NOT POSSIBLE, LANDSCAPE CONTRACTOR SHALL PROTECT UNINSTALLED PLANT MATERIAL. PLANTS SHALL NOT REMAIN UNPLANTED FOR LONGER THAN A THREE DAY PERIOD AFTER DELIVERY. PLANTS THAT WILL NOT BE PLANTED FOR A PERIOD OF TIME GREATER THAN THREE DAYS SHALL BE HEALED IN WITH TOPSOIL OR MULCH TO HELP PRESERVE ROOT MOISTURE.

9.2. PLANTING OPERATIONS SHALL BE PERFORMED DURING PERIODS WITHIN THE PLANTING SEASON WHEN WEATHER AND SOIL CONDITIONS ARE SUITABLE AND IN ACCORDANCE WITH ACCEPTED LOCAL PRACTICE. PLANTS SHALL NOT BE INSTALLED IN TOPSOIL THAT IS IN A MUDDY OR FROZEN CONDITION.

9.3. ANY INJURED ROOTS OR BRANCHES SHALL BE PRUNED TO MAKE CLEAN-CUT ENDS PRIOR TO PLANTING UTILIZING CLEAN, SHARP TOOLS. ONLY INJURED OR DISEASED BRANCHING SHALL BE REMOVED.

9.4. ALL PLANTING CONTAINERS, BASKETS AND NON-BIODEGRADABLE MATERIALS SHALL BE REMOVED FROM ROOT BALLS DURING PLANTING. NATURAL FIBER BURLAP MUST BE CUT FROM AROUND THE TRUNK OF THE TREE AND FOLDED DOWN AGAINST THE ROOT BALL PRIOR TO BACKFILLING.

9.5. POSITION TREES AND SHRUBS AT THEIR INTENDED LOCATIONS AS PER THE PLANS AND SECURE THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO EXCAVATING PITS, MAKING NECESSARY ADJUSTMENTS AS DIRECTED.

9.6. PRIOR TO THE ISSUANCE OF ANY CERTIFICATE OF OCCUPANCY, THE PROPOSED LANDSCAPE, AS SHOWN ON THE APPROVED LANDSCAPE PLAN, MUST BE INSTALLED, INSPECTED AND APPROVED BY THE APPROVING AGENCY. THE APPROVING AGENCY SHALL TAKE INTO ACCOUNT SEASONAL CONSIDERATIONS IN THIS REGARD AS FOLLOWS. THE PLANTING OF TREES, SHRUBS, VINES OR GROUND COVER SHALL OCCUR ONLY DURING THE FOLLOWING PLANTING SEASONS:

9.6.1. PLANTS: MARCH 15 TO DECEMBER 15

9.6.2. LAWN: MARCH 15 TO JUNE 15 OR SEPT. 1 TO DECEMBER 1

9.6.3. PLANTINGS REQUIRED FOR A CERTIFICATE OF OCCUPANCY SHALL BE PROVIDED DURING THE NEXT APPROPRIATE SEASON AT THE MUNICIPALITY'S DISCRETION. CONTRACTOR SHOULD CONTACT APPROVING AGENCY FOR POTENTIAL SUBSTITUTIONS.

9.7. FURTHERMORE, THE FOLLOWING TREE VARIETIES ARE UNUSUALLY SUSCEPTIBLE TO WINTER DAMAGE. WITH TRANSPLANT SHOCK AND THE SEASONAL LACK OF NITROGEN AVAILABILITY, THE RISK OF PLANT DEATH IS GREATLY INCREASED. IT IS NOT RECOMMENDED THAT THESE SPECIES BE PLANTED DURING THE FALL PLANTING SEASON:

ACER RUBRUM	PLATANUS X ACERIFOLIA
BETULA VARIETIES	POPULUS VARIETIES
CARPINUS VARIETIES	PRUNUS VARIETIES
CRATAEGUS VARIETIES	PYRUS VARIETIES
KOELREUTERIA	QUERCUS VARIETIES
LIQUIDAMBAR STYRACIFLUA	TILIA TOMENTOSA
LIRIODENDRON TULIPIFERA	ZELKOVA VARIETIES

9.8. PLANTING PITS SHALL BE DUG WITH LEVEL BOTTOMS, WITH THE WIDTH TWICE THE DIAMETER OF ROOT BALL. THE ROOT BALL SHALL REST ON UNDISTURBED GRADE. EACH PLANT PIT SHALL BE BACKFILLED IN LAYERS WITH THE FOLLOWING PREPARED SOIL MIXED THOROUGHLY:

9.8.1. 1 PART PEAT MOSS

9.8.2. 1 PART COMPOSTED COW MANURE BY VOLUME

9.8.3. 3 PARTS TOPSOIL BY VOLUME

9.8.4. 21 GRAMS 'AGRIFORM' PLANTING TABLETS (OR APPROVED EQUAL) AS FOLLOWS:

9.8.4.1. 2 TABLETS PER 1 GALLON PLANT

9.8.4.2. 3 TABLETS PER 5 GALLON PLANT

9.8.4.3. 4 TABLETS PER 15 GALLON PLANT

9.8.4.4. LARGER PLANTS: 2 TABLETS PER ½" CALIPER OF TRUNK

9.9. FILL PREPARED SOIL AROUND BALL OF PLANT HALF-WAY AND INSERT PLANT TABLETS. COMPLETE BACKFILL AND WATER THOROUGHLY.

9.10. ALL PLANTS SHALL BE PLANTED SO THAT THE TOP OF THE ROOT BALL, THE POINT AT WHICH THE ROOT FLARE BEGINS, IS SET AT GROUND LEVEL AND IN THE CENTER OF THE PIT. NO SOIL IS TO BE PLACED DIRECTLY ON TOP OF THE ROOT BALL.

9.11. ALL PROPOSED TREES DIRECTLY ADJACENT TO WALKWAYS OR DRIVEWAYS SHALL BE PRUNED AND MAINTAINED TO A MINIMUM BRANCHING HEIGHT OF 7' FROM GRADE.

9.12. GROUND COVER AREAS SHALL RECEIVE A ¼" LAYER OF HUMUS RAKED INTO THE TOP 1" OF PREPARED SOIL PRIOR TO PLANTING. ALL GROUND COVER AREAS SHALL BE WEEDED AND TREATED WITH A PRE-EMERGENT CHEMICAL AS PER MANUFACTURER'S RECOMMENDATION.

9.13. NO PLANT, EXCEPT GROUND COVERS, GRASSES OR VINES, SHALL BE PLANTED LESS THAN TWO FEET (2') FROM EXISTING STRUCTURES AND SIDEWALKS.

9.14. ALL PLANTING AREAS AND PLANTING PITS SHALL BE MULCHED AS SPECIFIED HEREIN TO FILL THE ENTIRE BED AREA OR SAUCER. NO MULCH IS TO TOUCH THE TRUNK OF THE TREE OR SHRUB.

9.15. ALL PLANTING AREAS SHALL BE WATERED IMMEDIATELY UPON INSTALLATION IN ACCORDANCE WITH THE WATERING SPECIFICATIONS AS LISTED HEREIN.

10. TRANSPLANTING (WHEN REQUIRED)

10.1. ALL TRANSPLANTS SHALL BE DUG WITH INTACT ROOT BALLS CAPABLE OF SUSTAINING THE PLANT.

10.2. IF PLANTS ARE TO BE STOCKPILED BEFORE REPLANTING, THEY SHALL BE HEALED IN WITH MULCH OR SOIL, ADEQUATELY WATERED AND PROTECTED FROM EXTREME HEAT, SUN AND WIND.

10.3. PLANTS SHALL NOT BE DUG FOR TRANSPLANTING BETWEEN APRIL 10 AND JUNE 30.

10.4. UPON REPLANTING, BACKFILL SOIL SHALL BE AMENDED WITH FERTILIZER AND ROOT GROWTH HORMONE.

10.5. TRANSPLANTS SHALL BE GUARANTEED FOR THE LENGTH OF THE GUARANTEE PERIOD SPECIFIED HEREIN.

10.6. F TRANSPLANTS DIE, SHRUBS AND TREES LESS THAN SIX INCHES (6") DBH SHALL BE REPLACED IN KIND. TREES GREATER THAN SIX INCHES (6") DBH MAY BE REQUIRED TO BE REPLACED IN ACCORDANCE WITH THE MUNICIPALITY'S TREE REPLACEMENT GUIDELINES.

11. WATERING

11.1. NEW PLANTINGS OR LAWN AREAS SHALL BE ADEQUATELY IRRIGATED BEGINNING IMMEDIATELY AFTER PLANTING. WATER SHALL BE APPLIED TO EACH TREE AND SHRUB IN SUCH MANNER AS NOT TO DISTURB BACKFILL AND TO THE EXTENT THAT ALL MATERIALS IN THE PLANTING HOLE ARE THOROUGHLY SATURATED. WATERING SHALL CONTINUE AT LEAST UNTIL PLANTS ARE ESTABLISHED.

11.2. SITE OWNER SHALL PROVIDE WATER IF AVAILABLE ON SITE AT TIME OF PLANTING. IF WATER IS NOT AVAILABLE ON SITE, CONTRACTOR SHALL SUPPLY ALL NECESSARY WATER. THE USE OF WATERING BAGS IS RECOMMENDED FOR ALL NEWLY PLANTED TREES.

11.3. IF AN IRRIGATION SYSTEM HAS BEEN INSTALLED ON THE SITE, IT SHALL BE USED TO WATER PROPOSED PLANT MATERIAL, BUT ANY FAILURE OF THE SYSTEM DOES NOT ELIMINATE THE CONTRACTOR'S RESPONSIBILITY OF MAINTAINING THE DESIRED MOISTURE LEVEL FOR VIGOROUS, HEALTHY GROWTH.

12. GUARANTEE

12.1. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANTS FOR A PERIOD OF 1 YEAR FROM APPROVAL OF LANDSCAPE INSTALLATION BY THE APPROVING AGENCY. CONTRACTOR SHALL SUPPLY THE OWNER WITH A MAINTENANCE BOND FOR TEN PERCENT (10%) OF THE VALUE OF THE LANDSCAPE INSTALLATION WHICH WILL BE RELEASED AT THE CONCLUSION OF THE GUARANTEE PERIOD AND WHEN A FINAL INSPECTION HAS BEEN COMPLETED AND APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.

12.2. ANY DEAD OR DYING PLANT MATERIAL SHALL BE REPLACED FOR THE LENGTH OF THE GUARANTEE PERIOD. REPLACEMENT OF PLANT MATERIAL SHALL BE CONDUCTED AT THE FIRST SUCCEEDING PLANTING SEASON. ANY DEBRIS SHALL BE DISPOSED OF OFF-SITE, WITHOUT EXCEPTION.

12.3. TREES AND SHRUBS SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION AND THROUGHOUT THE 90 DAY MAINTENANCE PERIOD AS SPECIFIED HEREIN. CULTIVATION, WEEDING, WATERING AND THE PREVENTATIVE TREATMENTS SHALL BE PERFORMED AS NECESSARY TO KEEP PLANT MATERIAL IN GOOD CONDITION AND FREE OF INSECTS AND DISEASE.

12.4. LAWNS SHALL BE MAINTAINED THROUGH WATERING, FERTILIZING, WEEDING, MOWING, TRIMMING AND OTHER OPERATIONS SUCH AS ROLLING, REGARDING AND REPLANTING AS REQUIRED TO ESTABLISH A SMOOTH, ACCEPTABLE LAWN, FREE OF ERODED OR BARE AREAS.

13. CLEANUP

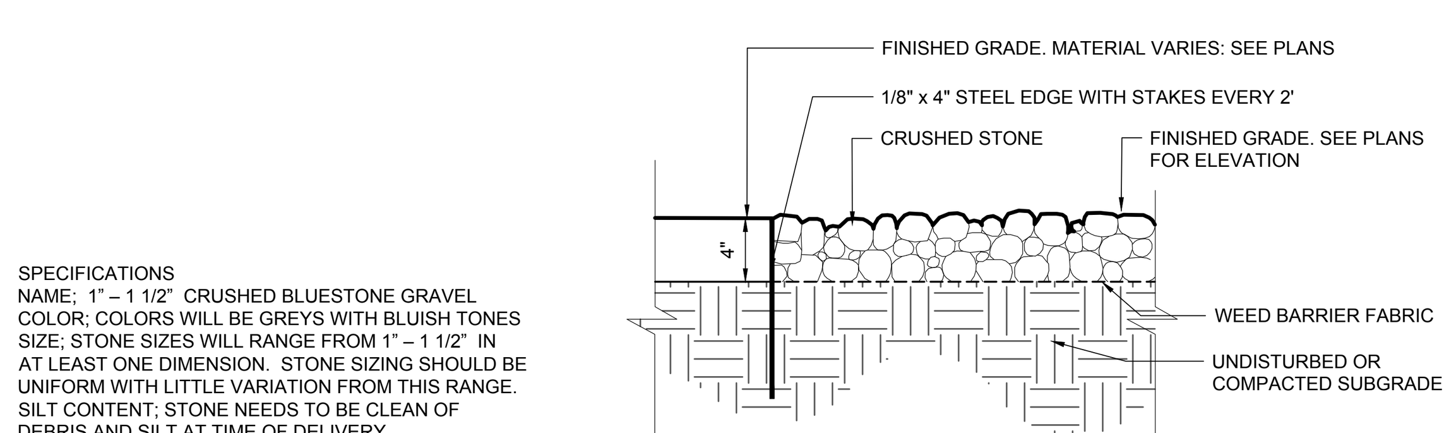
13.1. UPON THE COMPLETION OF ALL LANDSCAPE INSTALLATION AND BEFORE THE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL UNUSED MATERIALS, EQUIPMENT AND DEBRIS FROM THE SITE. ALL PAVED AREAS ARE TO BE CLEANED.

13.2. THE SITE SHALL BE CLEANED AND LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.

14. MAINTENANCE (ALTERNATIVE BID):

14.1. A 90 DAY MAINTENANCE PERIOD SHALL COMMENCE AT THE END OF ALL LANDSCAPE INSTALLATION OPERATIONS. THE 90 DAY MAINTENANCE PERIOD ENSURES TO THE OWNER/OPERATOR THAT THE NEWLY INSTALLED LANDSCAPING HAS BEEN MAINTAINED AS SPECIFIED ON THE APPROVED LANDSCAPE PLAN. ONCE THE INITIAL 90 DAY MAINTENANCE PERIOD HAS EXPIRED, THE OWNER/OPERATOR MAY REQUEST THAT BIDDERS SUBMIT AN ALTERNATE MAINTENANCE BID FOR A MONTHLY MAINTENANCE CONTRACT. THE ALTERNATE MAINTENANCE CONTRACT WILL ENCOMPASS ANY WORK THAT IS CONSIDERED APPROPRIATE TO ENSURE THAT PLANT AND LAWN AREAS ARE HEALTHY AND MANICURED TO THE APPROVAL OF THE OWNER/OPERATOR.

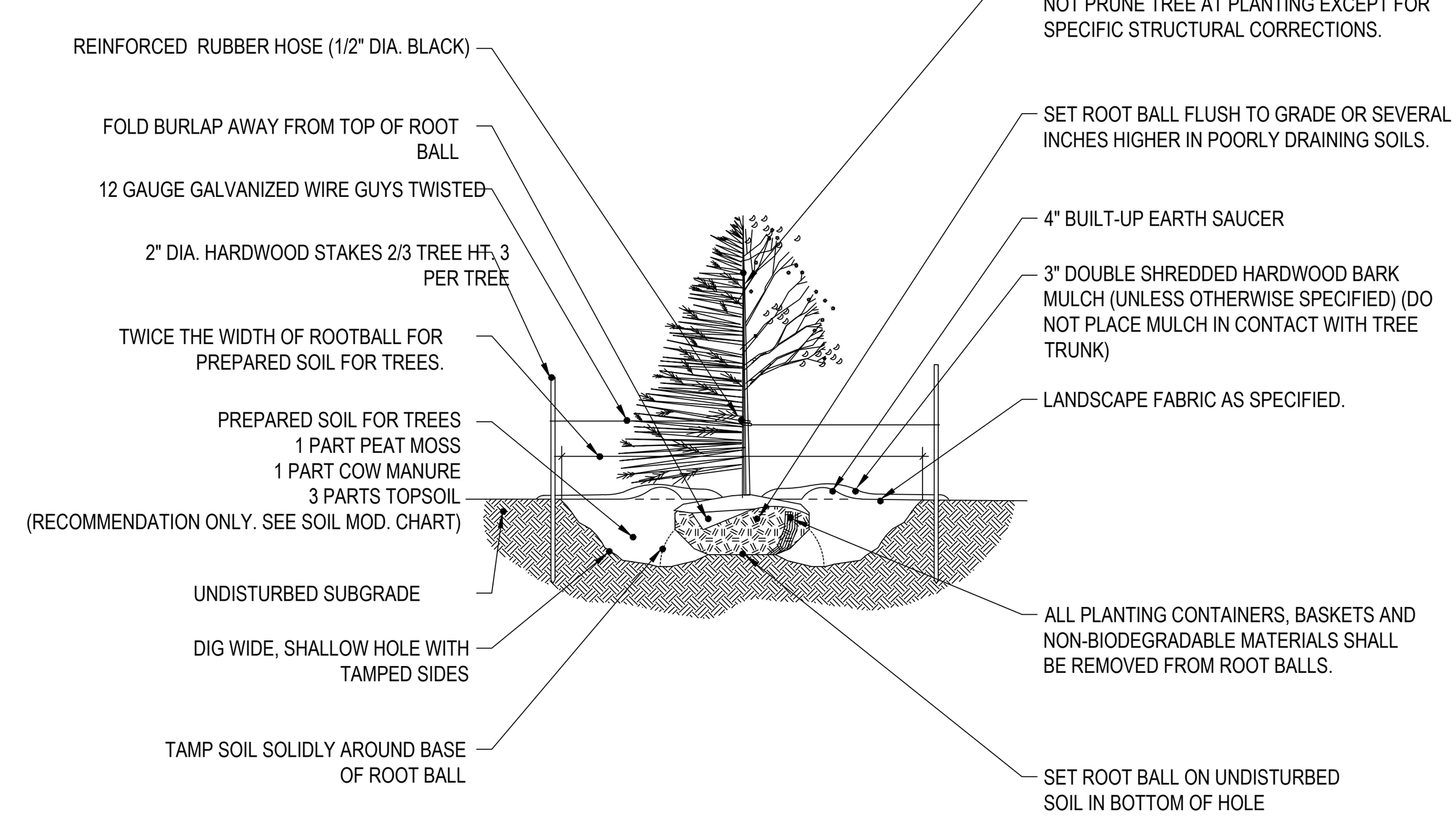
SPECIFICATIONS
NAME; 1" – 1 1/2" CRUSHED BLUESTONE GRAVEL
COLOR; COLORS WILL BE GREYS WITH BLUISH TONES
SIZE; STONE SIZES WILL RANGE FROM 1" – 1 1/2" IN AT LEAST ONE DIMENSION. STONE SIZING SHOULD BE UNIFORM WITH LITTLE VARIATION FROM THIS RANGE.
SILT CONTENT; STONE NEEDS TO BE CLEAN OF DEBRIS AND SILT AT TIME OF DELIVERY.



CRUSHED STONE DRIP EDGE

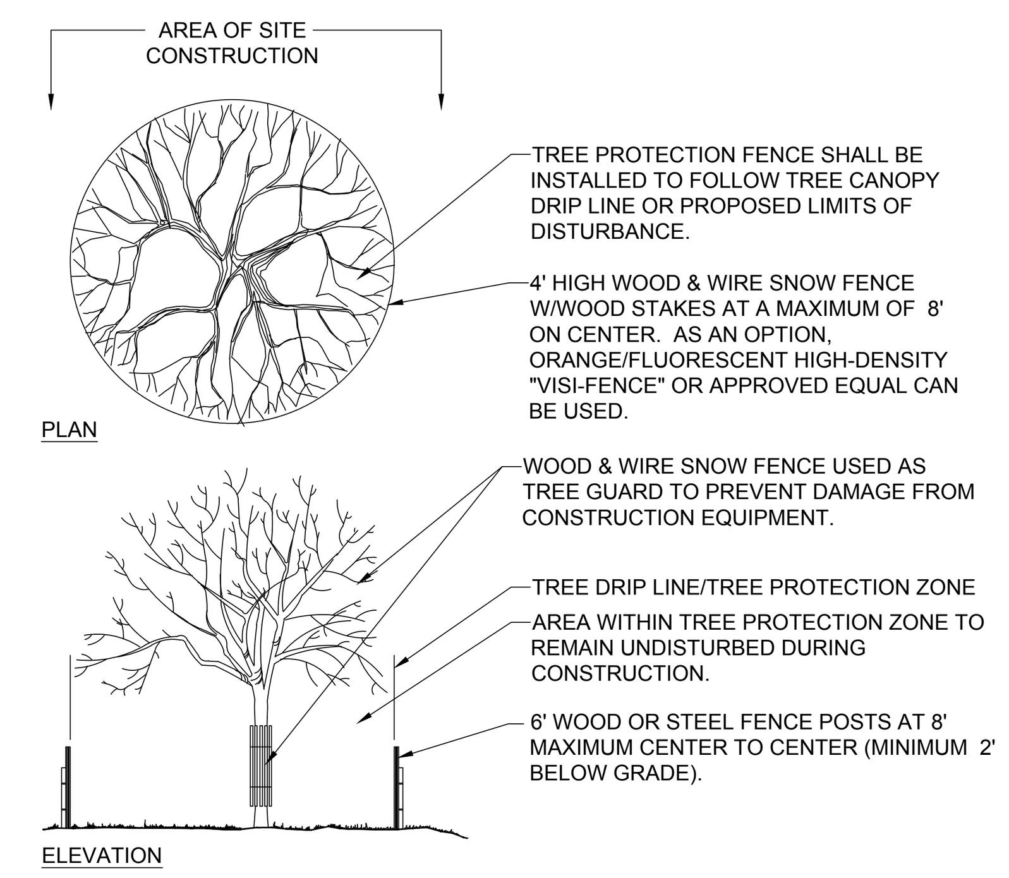
N.T.S.

NOTES:
1.) NO SOIL OR MULCH SHALL BE PLACED AGAINST ROOT COLLAR OF PLANT.
2.) REMOVE ALL NON-BIODEGRADABLE MATERIAL AND ROPE FROM TRUNK & TOP OF ROOT BALL. FOLD BURLAP BACK 1/3 FROM ROOT BALL.
3.) PLANTING DEPTH SHALL BE THE SAME AS GROWN IN NURSERY.
4.) THOROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH
AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
5.) THE BOTTOM OF PLANTING PIT EXCAVATIONS SHOULD BE ROUGH TO AVOID MATTING OF SOIL LAYERS AS
NEW SOIL IS ADDED. IT IS PREFERABLE TO TILL THE FIRST LIFT (2 TO 3 IN.) OF PLANTING SOIL INTO THE SUBSOIL.
6.) REFER TO THE CHART "GENERAL RANGE OF SOIL MODIFICATIONS & VOLUMES FOR VARIOUS SOIL CONDITIONS" TO DETERMINE MINIMUM WIDTH OF PREPARED SOIL.
7.) SUBSTITUTE ARBORVITAE STAKING SYSTEM WHEN SPECIFIED.



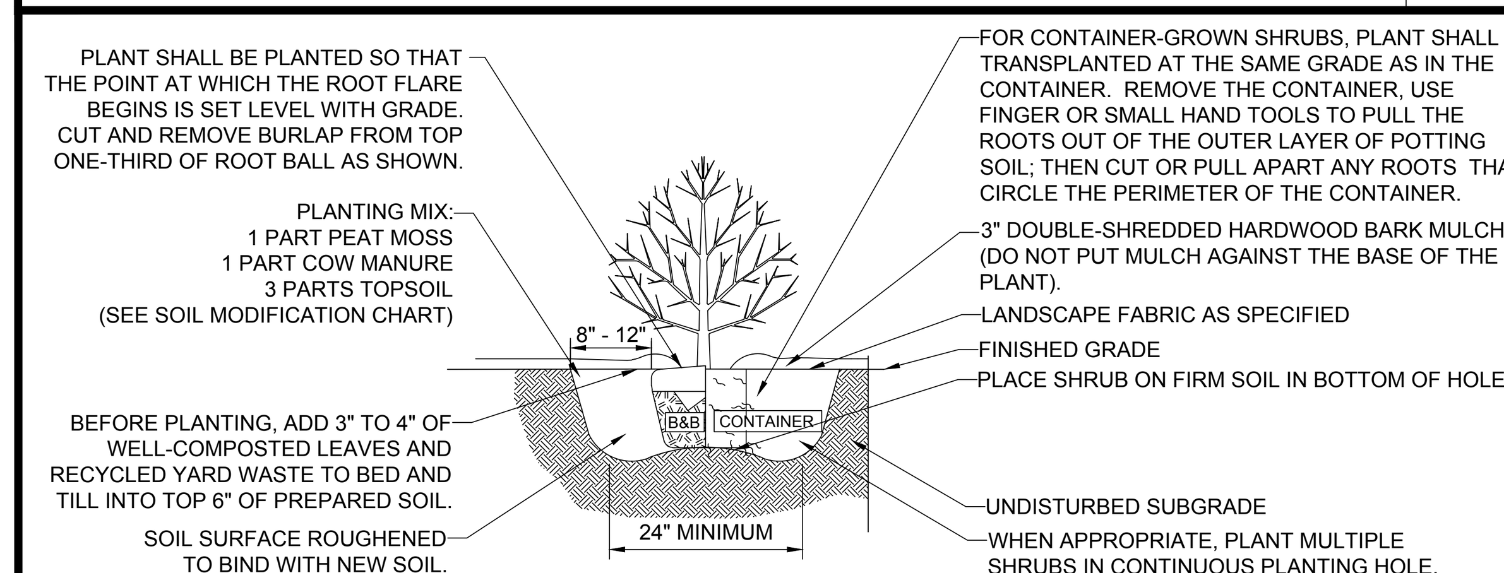
TREE PLANTING DETAIL

N.T.S.



TREE PROTECTION DURING SITE CONSTRUCTION

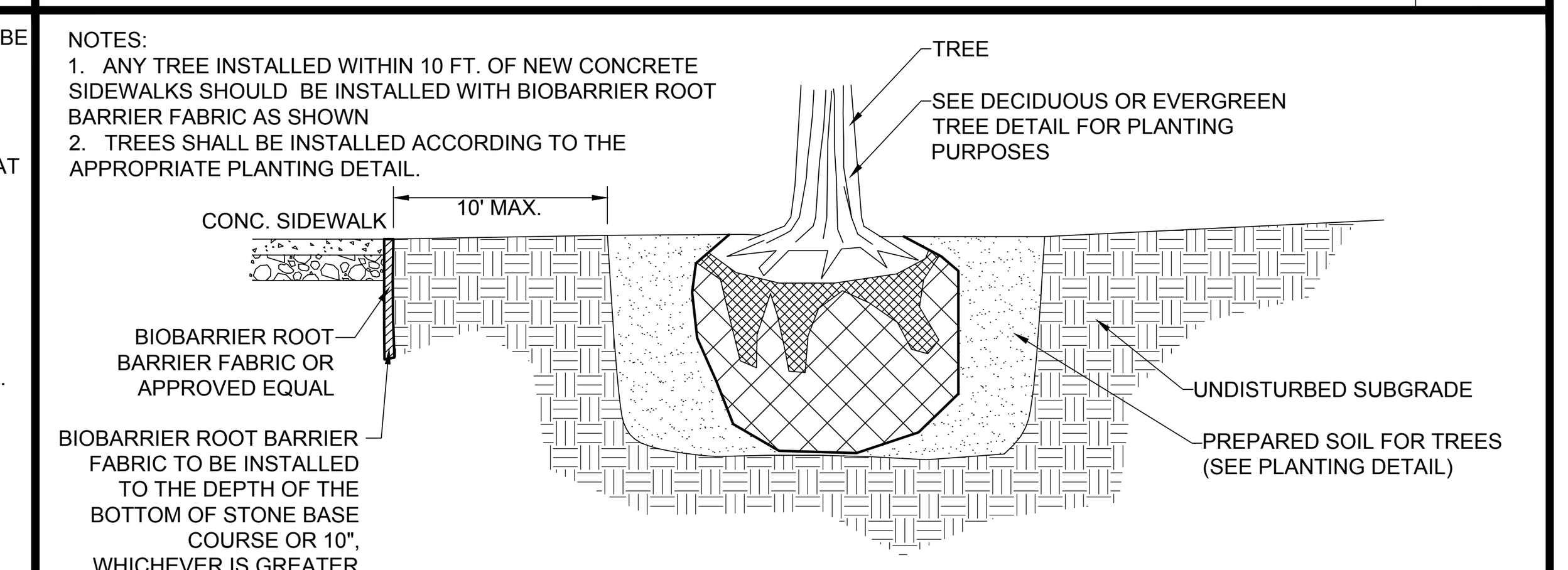
N.T.S.



SHRUB PLANTING DETAIL

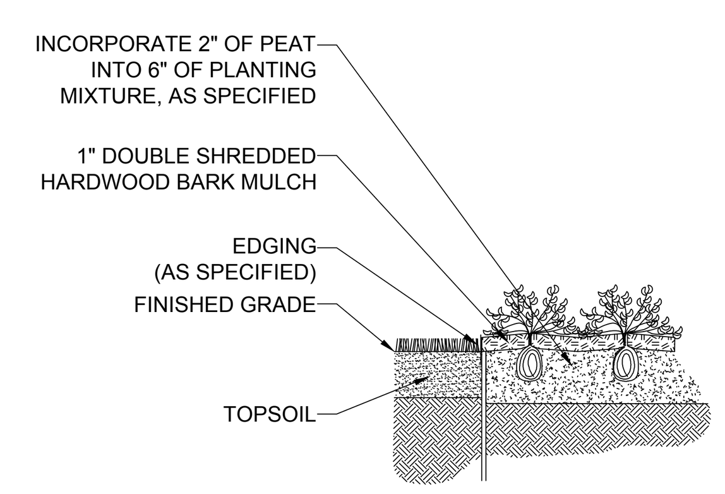
N.T.S.

NOTES:
1. ANY TREE INSTALLED WITHIN 10 FT. OF NEW CONCRETE SIDEWALKS SHOULD BE INSTALLED WITH BIOBARRIER ROOT BARRIER FABRIC AS SHOWN
2. TREES SHALL BE INSTALLED ACCORDING TO THE APPROPRIATE PLANTING DETAIL.



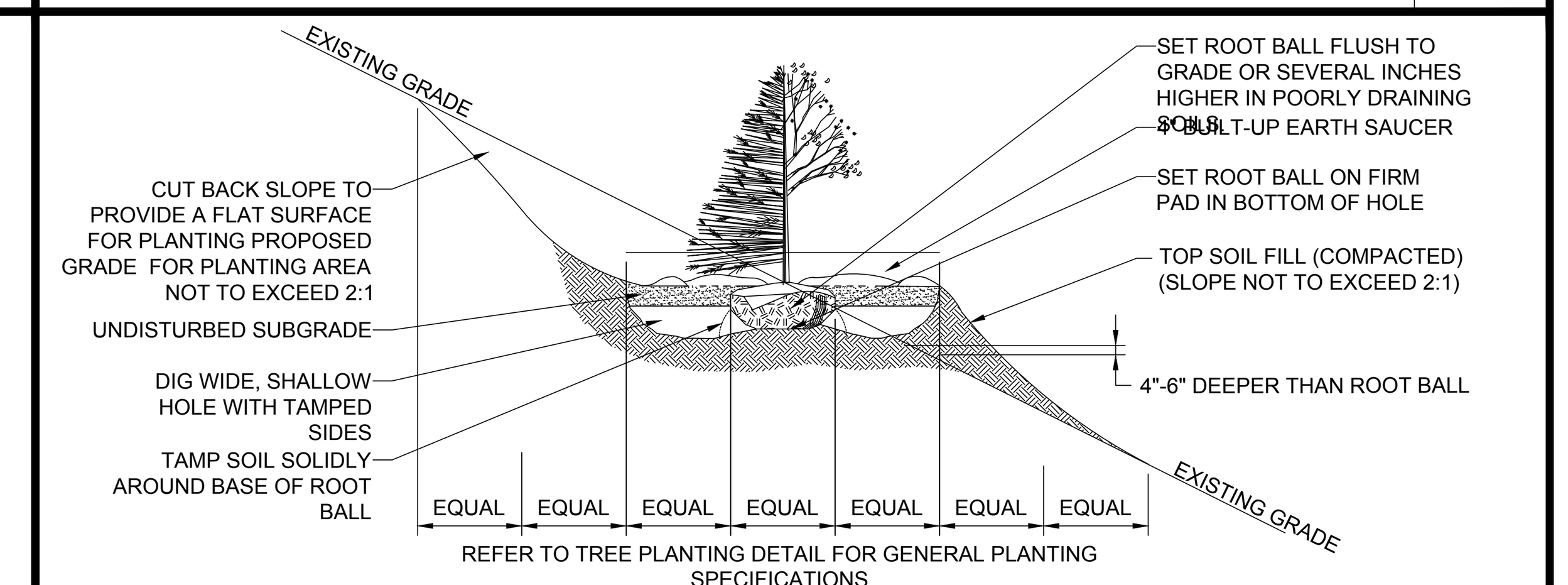
BIOBARRIER ROOT BARRIER DETAIL

N.T.S.



GROUNDCOVER PLANTING

N.T.S.



TREE PLANTING DETAIL - ON SLOPE

N.T.S.

1. PRIOR TO SEEDING, AREA IS TO BE TOPSOILED, FINE GRADED, AND RAKED OF ALL DEBRIS LARGER THAN 2" DIAMETER.

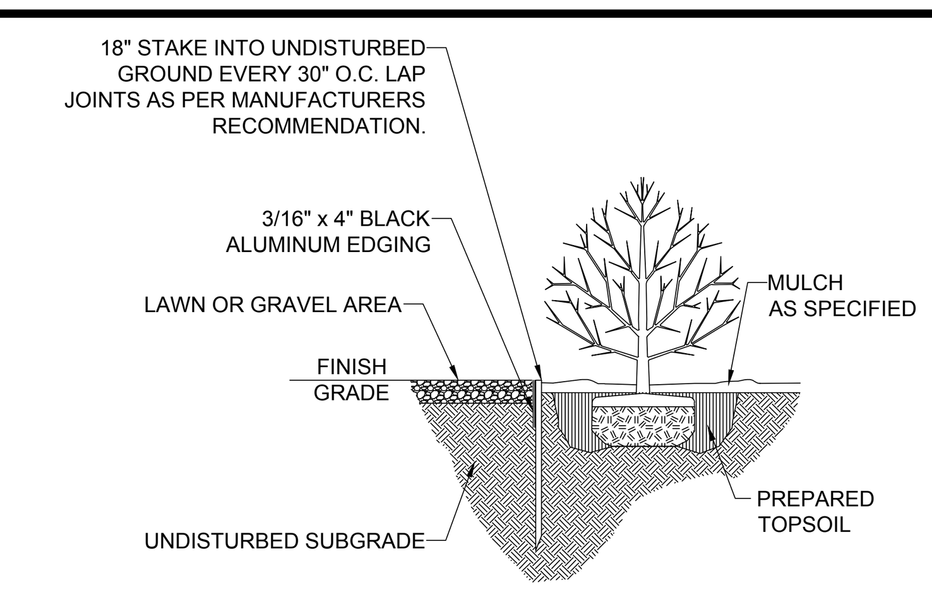
2. PRIOR TO SEEDING, CONSULT MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.

3. SEEDING RATES:

• PERENNIAL RYEGRASS	1/2 LB/1000 SQ FT
• KENTUCKY BLUEGRASS	1 LB/1000 SQ FT
• RED FESCUE	1/2 LB/1000 SQ FT
• SPREADING FESCUE	1/2 LB/1000 SQ FT
• FERTILIZER (16.32.16)	2 LB/1000 SQ FT
• LIQUID LIME	1 GAL/800 GAL.
• TANK TACKIFIER	35 LB/800 GAL.
• TANK FIBER MULCH	30 LB/1000 SQ FT

4. GERMINATION RATES WILL VARY AS TO TIME OF YEAR FOR SOWING. CONTRACTOR TO IRRIGATE SEEDED AREA UNTIL AN ACCEPTABLE STAND OF COVER IS ESTABLISHED BY OWNER.

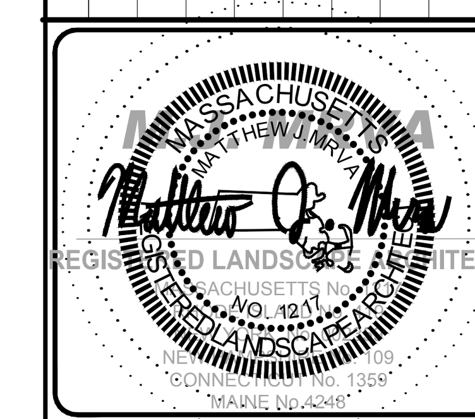
HYDROSEED SPECIFICATIONS



BLACK ALUMINUM EDGING

N.T.S.

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE



McDonald's®

OFFICE: BOSTON REGION
ADDRESS: 110 N CARPENTER ST, CHICAGO, IL 60607

PLAN APPROVALS
DATE
SIGNATURE
APPROVED McDONALD'S AGENT

BOHLER™
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

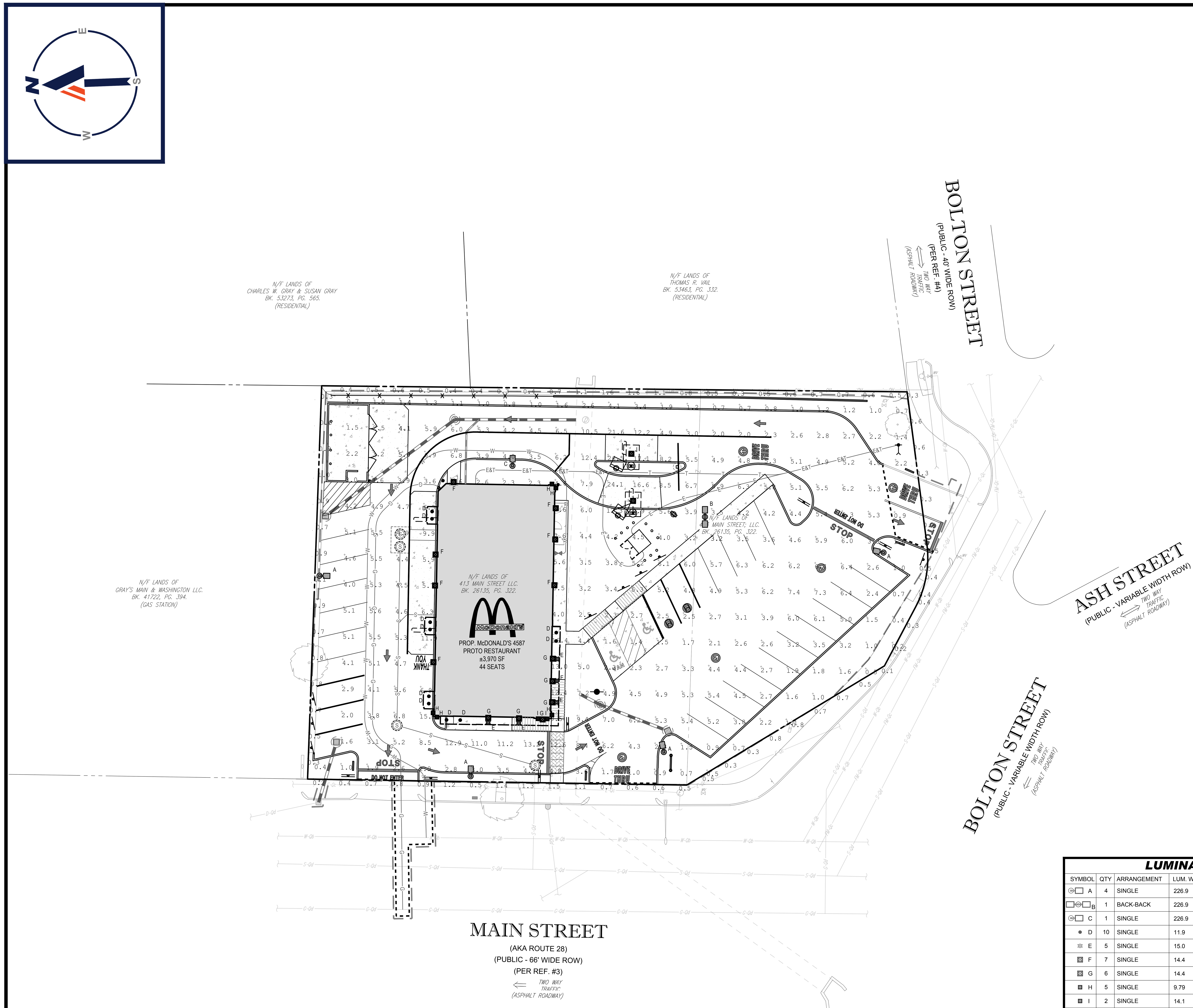
COMPLIANCE CHECK — DATE
CONSTRUCTION CHECK — DATE
CONSTRUCTION CHECK — DATE
PROJECT No.: W222000
CAD I.D. #: W222000-SPPD-3a.dwg

-
STREET ADDRESS: 413 MAIN STREET
CITY: READING — STATE: MA
COUNTY: MIDDLESEX
SITE I.D.: 20-0015
PLAN DESCRIPTION: LANDSCAPE NOTES & DETAILS

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO. C-702 OF 15

P:\2022\W222000\CAD\Drawings\Plan Sets\Civil Site Plans\W222000-LSCP-2a.dwg, C-702 LNote, 4/23/2010, 10:17:14 AM, cennis, XeroX510-1.pc3, User634, 1:1



LIGHTING NOTES

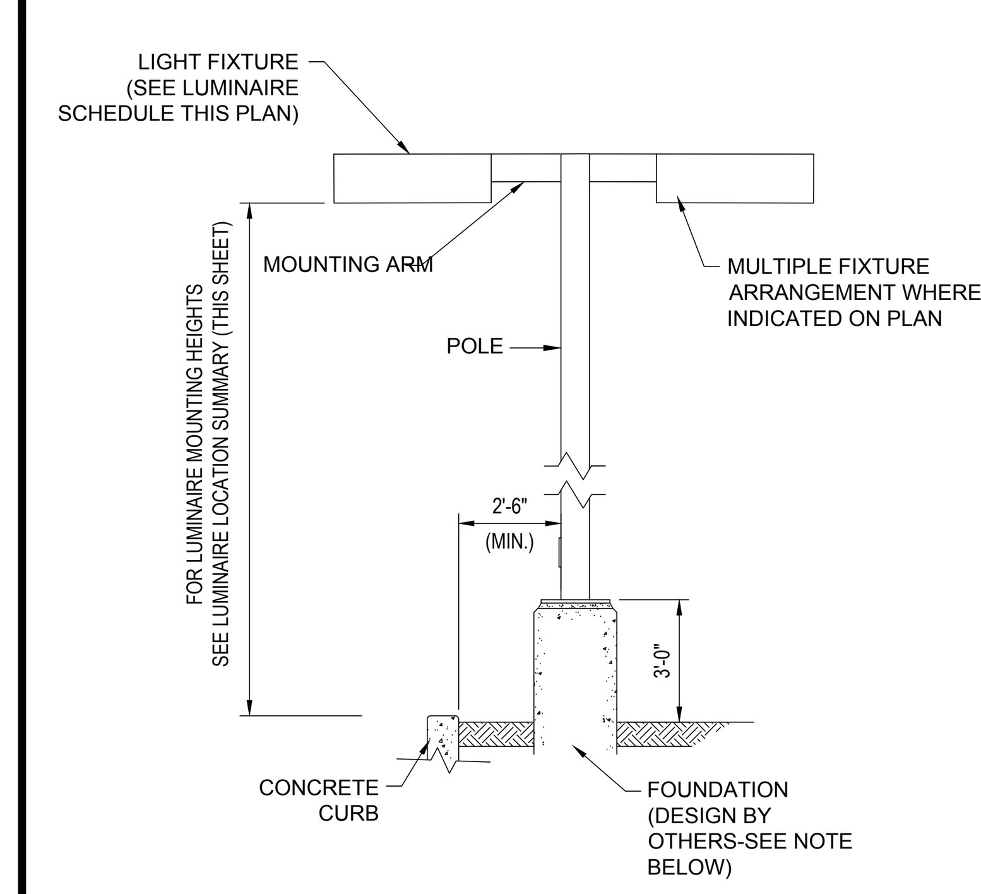
1. THIS LIGHTING PLAN DEPICTS PROPOSED SUSTAINED ILLUMINATION LEVELS CALCULATED USING DATA PROVIDED BY THE NOTED MANUFACTURER(S). ACTUAL SUSTAINED SITE ILLUMINATION LEVELS AND PERFORMANCE OF LUMINAIRES MAY VARY DUE TO VARIATIONS IN WEATHER, ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, THE SERVICE LIFE OF EQUIPMENT AND LUMINAIRES AND OTHER RELATED VARIABLE FIELD CONDITIONS.
2. THE LIGHT LOSS FACTORS USED IN THESE LIGHTING CALCULATIONS ARE 0.90 FOR ALL LED LUMINAIRES, 0.80 FOR ALL HIGH PRESSURE SODIUM LUMINAIRES OR 0.72 FOR ALL METAL HALIDE LUMINAIRES UNLESS OTHERWISE SPECIFIED. THESE FACTORS ARE INDICATIVE OF TYPICAL LIGHTING INDUSTRY MODELING STANDARDS.
3. THE LIGHTING VALUES AND CALCULATION POINTS DEPICTED ON THIS PLAN ARE ALL ANALYZED ON A HORIZONTAL GEOMETRIC PLANE AT ELEVATION ZERO (GROUND LEVEL) UNLESS OTHERWISE NOTED. THE VALUES DEPICTED ON THIS PLAN ARE IN FOOTCANDLES.
4. THE LUMINAIRES, LAMPS AND LENSES MUST BE REGULARLY INSPECTED/MAINTAINED TO ENSURE THAT THEY FUNCTION PROPERLY. THIS WORK SHOULD INCLUDE, BUT NOT BE LIMITED TO, FREQUENT VISUAL INSPECTIONS, CLEANING OF LENSES, AND RELAMPING (IF NECESSARY) AT LEAST ONCE EVERY SIX (6) MONTHS. FAILURE TO FOLLOW THE ABOVE STEPS COULD CAUSE THE LUMINAIRES, LAMPS AND LENSES TO FAIL PROPERLY TO FUNCTION.
5. WHERE APPLICABLE, THE EXISTING CONDITION LIGHT LEVELS ILLUSTRATED ARE REPRESENTATIVE OF AN APPROXIMATION UTILIZING LABORATORY DATA FOR SIMILAR FIXTURES, UNLESS ACTUAL FIELD MEASUREMENTS ARE TAKEN WITH A LIGHT METER AND ARE, CONSEQUENTLY, APPROXIMATIONS ONLY. DUE TO FACTORS SUCH AS FIXTURE MAINTENANCE, EQUIPMENT TOLERANCES, WEATHER CONDITIONS, ETC, ACTUAL LIGHT LEVELS MAY DIFFER. EXISTING LIGHT LEVELS DEPICTED ON THIS PLAN SHOULD BE CONSIDERED APPROXIMATE.
6. THIS LIGHTING PLAN IS INTENDED TO SHOW THE LOCATIONS AND TYPE OF LUMINAIRES, ONLY. POWER SYSTEM, CONDUITS, WIRING, VOLTAGES AND OTHER ELECTRICAL COMPONENTS ARE THE RESPONSIBILITY OF THE ARCHITECT, MEP AND/OR LIGHTING CONTRACTOR, AS INDICATED IN THE CONSTRUCTION CONTRACT DOCUMENTS. THESE ITEMS MUST BE INSTALLED AS REQUIRED BY STATE AND LOCAL REGULATIONS. LIGHT POLE BASES ARE THE RESPONSIBILITY OF THE STRUCTURAL ENGINEER, AS INDICATED IN THE CONSTRUCTION CONTRACT DOCUMENTS. CONTRACTOR IS RESPONSIBLE FOR INSTALLING LIGHTING FIXTURES AND APPURTENANCES IN ACCORDANCE WITH ALL APPLICABLE BUILDING AND ELECTRICAL CODES AND ALL OTHER APPLICABLE RULES, REGULATIONS, LAWS AND STATUTES.
7. CONTRACTOR MUST BRING TO DESIGNER'S ATTENTION, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, ANY LIGHT LOCATIONS THAT CONFLICT WITH DRAINAGE, UTILITIES, OR OTHER STRUCTURES.
8. IT IS THE LIGHTING CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE PROJECT ARCHITECT OR OWNER REGARDING THE POWER SOURCE(S) FROM WITHIN THE BUILDING, AND TIMING DEVICES NECESSARY TO MEET THE DESIGN INTENT.
9. THE LIGHTING CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CONTRACTOR REQUIREMENTS INDICATED IN THE SITE PLAN, INCLUDING BUT NOT LIMITED TO, GENERAL NOTES, GRADING AND UTILITY NOTES, SITE SAFETY, AND ALL GOVERNMENTAL RULES, LAWS, ORDINANCES, REGULATIONS AND THE LIKE.
10. THE CONTRACTOR MUST VERIFY THAT INSTALLATION OF LIGHTING FIXTURES COMPLIES WITH THE REQUIREMENTS FOR SEPARATION FROM OVERHEAD ELECTRICAL WIRES PER STATE REGULATIONS.
11. WHEN A BANK ATM IS INCLUDED IN THE PLAN, THE LIGHTING DESIGN REPRESENTS BOHLER'S UNDERSTANDING AND INTERPRETATION OF THE REGULATORY LIGHTING LEVELS INTENDED BY PUBLISHED STANDARDS.
12. UPON OWNER'S ACCEPTANCE OF THE COMPLETED PROJECT, THE OWNER SHALL BE RESPONSIBLE FOR ALL MAINTENANCE, SERVICING, REPAIR AND INSPECTION OF THE LIGHTING SYSTEM AND ALL OF ITS COMPONENTS AND RELATED SYSTEMS, TO ENSURE ADEQUATE LIGHTING LEVELS ARE PRESENT AND FUNCTIONING AT ALL TIMES.

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

NUMERIC SUMMARY

LABEL	CALCTYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
PAVED SURFACE READINGS	ILLUMINANCE	FC	3.97	8.5	0.7	5.67	12.14
PROPERTY LINE READINGS	ILLUMINANCE	FC	0.64	1.6	0.1	6.40	16.00

J.A. KUCICH
COMMONWEALTH OF MASSACHUSETTS
JOHN A. KUCICH
CIVIL
No. 41530
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE No. 41530
NEW HAMPSHIRE LICENSE No. 15476
CONNECTICUT LICENSE No. 26177
RHODE ISLAND LICENSE No. 9616
MAINE LICENSE No. 12553



AREA LIGHT DETAIL N.T.S.

NOTE: THIS DETAIL IS FOR BID AND BUDGETARY PURPOSES ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING A FOUNDATION DESIGN PREPARED BY A QUALIFIED STRUCTURAL ENGINEER CONSIDERING LIGHTING MANUFACTURER REQUIREMENTS, LOCAL WIND LOADS AND SITE SPECIFIC SOIL PARAMETERS.

- SOME SITE CONDITIONS AND/OR LOCATIONS MAY REQUIRE VIBRATION DAMPENING MEASURES AS DETERMINED BY A STRUCTURAL ENGINEER.
- THE STRUCTURAL ENGINEER SHALL BE NOTIFIED OF THE INTENT TO MOUNT ANYTHING TO THE POLE, ASIDE FROM THE LIGHT FIXTURES, INCLUDING BUT NOT LIMITED TO CAMERAS, BANNERS, FLAGS, SIGNAGE, ETC. AS IT WILL IMPACT THE POLE AND FOUNDATION DESIGN.

McDonald's®

AND SHALL NOT BE REPRODUCED WITHOUT THEIR WRITTEN PERMISSION. THESE PLANS AND SPECIFICATIONS ARE THE PROPERTY OF McDONALD'S CORPORATION

OFFICE: BOSTON REGION
ADDRESS: 110 N CARPENTER ST, CHICAGO, IL 60607

LUMINAIRE SCHEDULE

SYMBOL	QTY	ARRANGEMENT	LUM. WATTS	LLF	DESCRIPTION	MOUNTING HEIGHT
A	4	SINGLE	226.9	0.85	RAR2-480L-240-5K7-4W-BC SES-18-40-1-TA-GL-XX (4") POLE	21'
B	1	BACK-BACK	226.9	0.85	RAR2-480L-240-5K7-4W-BC SES-18-40-1-TA-GL-XX (4") POLE	21'
C	1	SINGLE	226.9	0.85	RAR2-480L-240-5K7-2-BC SES-18-40-1-TA-GL-XX (4") POLE	21'
D	10	SINGLE	11.9	0.90	LB6-10LDM-50K9GD	9.08' & 10.67'
E	5	SINGLE	15.0	0.90	EL218WF5-8L5K	11'
F	7	SINGLE	14.4	0.90	RWSC-36L-5K-DO-U-PS	9.33' & 10.92'
G	6	SINGLE	14.4	0.90	RWSC-36L-5K-DO-U-WH	9.33'
H	5	SINGLE	9.79	0.90	SLED-HE-24-DO-4K-UNV	18.83'
I	2	SINGLE	14.1	0.90	SLED-HE-36-DO-4K-UNV	18.83'
J	2	SINGLE	65	0.90	LCG-CP-65W-U-50K-XX-D1	10.75'

THIS PLAN TO BE UTILIZED FOR LIGHTING PURPOSES ONLY

20 10 5 0 20
1"= 20'

PLAN APPROVALS

DATE	SIGNATURE	APPROVED McDONALD'S AGENT

Know what's **below.** **Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

BOHLER//™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK ____ DATE ____
CONSTRUCTION CHECK ____ DATE ____
CONSTRUCTION CHECK ____ DATE ____

PROJECT No.: W222000

CAD I.D. #: W222000-SPPD-3a.dwg

-

STREET ADDRESS: 413 MAIN STREET

CITY: READING | STATE: MA

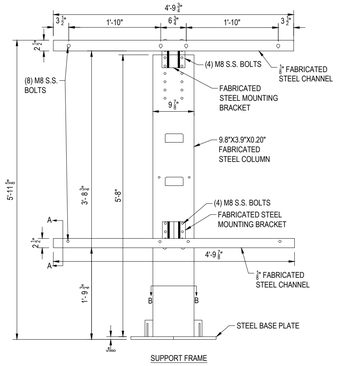
COUNTY: MIDDLESEX

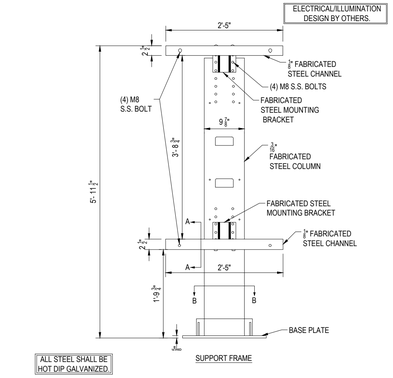
SITE I.D.: 20-0015

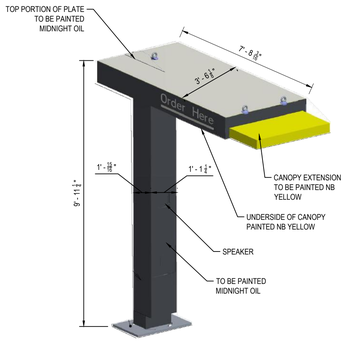
PLAN DESCRIPTION: **LIGHTING PLAN**

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO. **C-703** OF 15



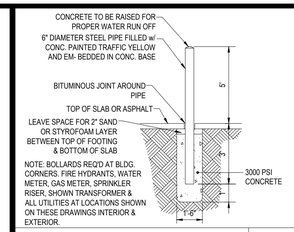




(NOTE: FOUNDATION DESIGN TO BE PROVIDED BY CONTRACTOR.
CONTRACTOR SHALL OBTAIN FINAL SPECIFICATIONS FROM SIGN VENDOR)

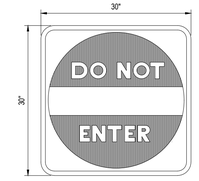
DRIVE-THRU CANOPY/SPEAKER DETAIL

N.T.S.



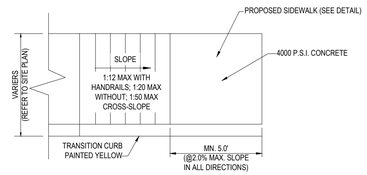
BOLLARD DETAIL

N.T.S.



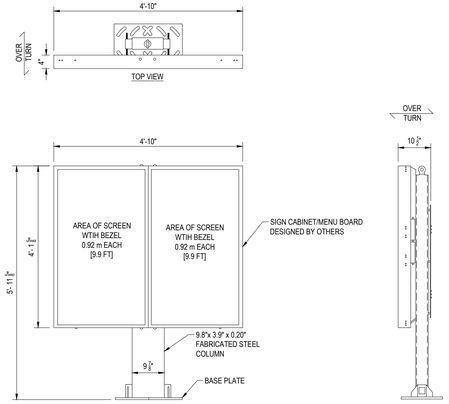
'DO NOT ENTER' SIGN

N.T.S.



ADA COMPLIANT SLOPED SIDEWALK

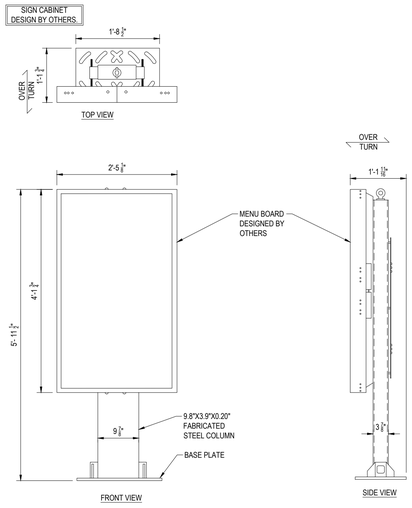
N.T.S.



(NOTE: FOUNDATION DESIGN TO BE PROVIDED BY CONTRACTOR.
CONTRACTOR SHALL OBTAIN FINAL SPECIFICATIONS FROM SIGN VENDOR)

DIGITAL MENU BOARD DETAIL

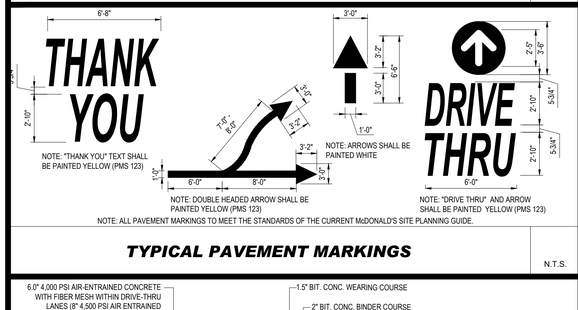
N.T.S.



(NOTE: FOUNDATION DESIGN TO BE PROVIDED BY CONTRACTOR.
CONTRACTOR SHALL OBTAIN FINAL SPECIFICATIONS FROM SIGN VENDOR)

DIGITAL PRE-BROWSE BOARD DETAIL

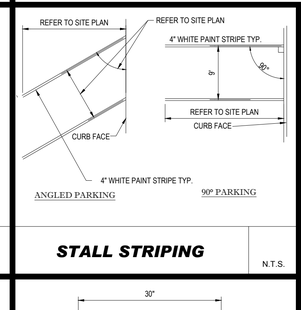
N.T.S.



NOTE: ALL PAVEMENT MARKINGS TO MEET THE STANDARDS OF THE CURRENT McDONALD'S SITE PLANNING GUIDE.

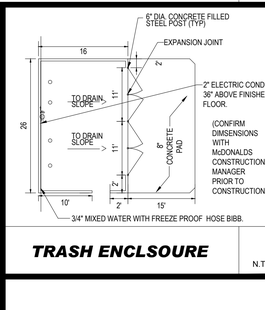
TYPICAL PAVEMENT MARKINGS

N.T.S.



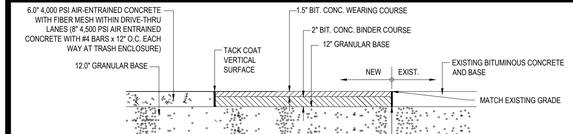
STALL STRIPING

N.T.S.



TRASH ENCLSOURE

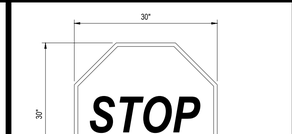
N.T.S.



NOTE: FINAL PAVEMENT SPECIFICATIONS TO BE COORDINATED WITH GEOTECHNICAL REPORT RECOMMENDATIONS. McDONALD'S ENGINEER RESERVES THE RIGHT TO REQUEST A COMPACTION TEST AND/OR A CORE SAMPLE. IF TESTS PROVE CORRECT, PER ABOVE SPECIFICATION, TESTS WILL BE AT THE EXPENSE OF McDONALD'S, OTHERWISE, G.C. WILL BE CHARGED.

CONCRETE & BITUMINOUS CONCRETE PAVING DETAIL

N.T.S.

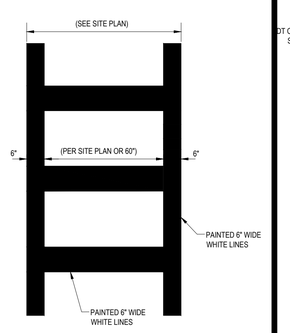


'STOP' SIGN

N.T.S.

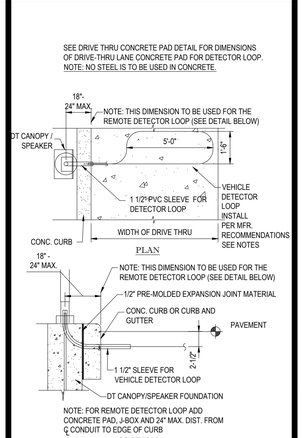
'NO RIGHT TURN' SIGN

N.T.S.



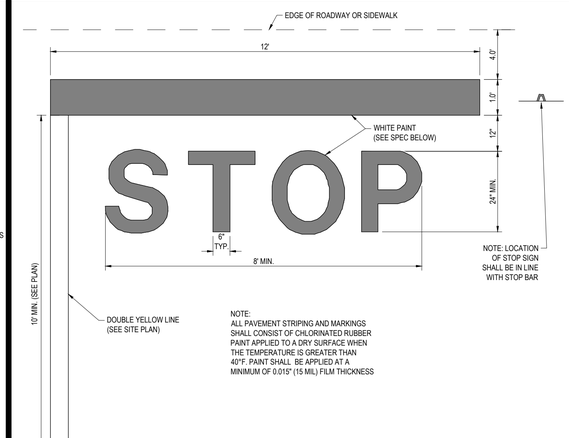
CROSSWALK DETAIL

N.T.S.



AUTO DETECTOR LOOP DETAIL

N.T.S.

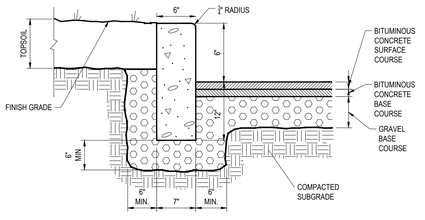


NOTE:
ALL PAVEMENT STRIPING AND MARKINGS SHALL CONSIST OF CHLORINATED RUBBER PAINT APPLIED TO A DRY SURFACE WHEN THE TEMPERATURE IS GREATER THAN 40°F. PAINT SHALL BE APPLIED AT A MINIMUM OF 0.015" (15 MIL) FILM THICKNESS

'STOP' BAR DETAIL

N.T.S.

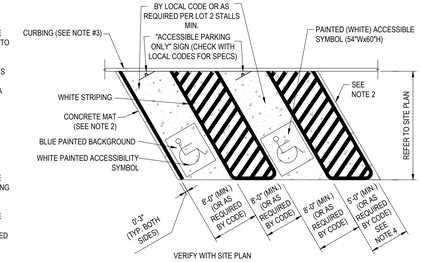
NOTE:
1. CURB SHALL CONSIST OF 4,000 PSI AIR ENTRAINED CONCRETE, EXPOSED EDGES TO HAVE RUBBED FINISH AND SURFACE SHALL BE TREATED WITH A CONCRETE PENETRANT/SEALER.
2. THE ENDS OF CURB SECTIONS SHALL BE CHAMFERED 1/4 INCH.
3. CURBS, CURB CORNERS OR EDGING SHALL BE FITTED TOGETHER AS CLOSELY AS POSSIBLE.
4. EXPANSION JOINTS SHALL BE INSTALLED AT A MAXIMUM OF TWENTY FEET (20') ON CENTER USING PREFORMED EXPANSION JOINT FILLER HAVING A THICKNESS OF 1/2 INCH.
5. THE CORNERS OF CURB SECTIONS SHALL MATCH THE ADJACENT CURB IN SIZE, COLOR AND FINISH.



PRECAST CONCRETE CURB DETAIL

N.T.S.

NOTES:
1. ALL MINIMUM DIMENSIONS ARE FROM CENTERLINE OF STRIPE TO CENTERLINE OF STRIPE OR INSIDE FACE OF CURB.
2. POUR CONCRETE MAT 3-INCHES WIDER ON BOTH SIDES TO ENSURE ENTIRE WIDTH OF ADA PARKING SPACE STRIPE IS LOCATED ENTIRELY WITHIN CONCRETE MAT.
3. TOP OF CURB AND FACE OF CURB SHALL BE PAINTED YELLOW WHERE SIDEWALK CURBING ABUTS ADA STALLS.
4. A DESIGNATED 5-FOOT WIDE STRIPED AISLE SHALL ONLY BE REQUIRED IF A 3RD ADA PARKING SPACE IS PROVIDED.
5. ENSURE ACCESSIBLE VAN PARKING SPACE WILL PROVIDE ACCESS AISLE ON THE PASSENGER SIDE WHEN ANGLED PARKING IS USED.



ACCESSIBLE STALL MARKING

N.T.S.

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

JOHN A. KUCEWICZ
COMMONWEALTH OF MASSACHUSETTS
JOHN A. KUCEWICZ
No. 41530
CIVIL
REGISTERED PROFESSIONAL ENGINEER
NEW HAMPSHIRE LICENSE No. 15476
RHODE ISLAND LICENSE No. 20110
MAINE LICENSE No. 12167

OFFICE: BOSTON REGION
ADDRESS: 110 N CARPENTER ST, CHICAGO, IL 60607

PLAN APPROVALS

SIGNATURE	DATE

APPROVED MCDONALD'S AGENT

BOHLER™
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK	DATE
CONSTRUCTION CHECK	DATE
CONSTRUCTION CHECK	DATE
PROJECT No.: W222000	
CAD I.D. #: W222000-SPPD-3a.dwg	

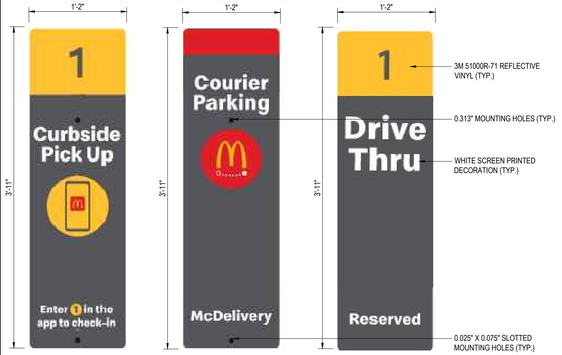
-

STREET ADDRESS: 413 MAIN STREET
CITY: READING
STATE: MA
COUNTY: MIDDLESEX
SITE I.D.: 20-0015
PLAN DESCRIPTION: DETAIL SHEET

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.: C-901
OF 15

P:\2022\W222000\CAD\Drawings\Plan Sets\Civil Site Plans\W222000-SPPD-3a.dwg, C-901 Det1, 4/23/2010, 10:17:14 AM, dennis, Xerox5510-3.pc3, User534, 1:1



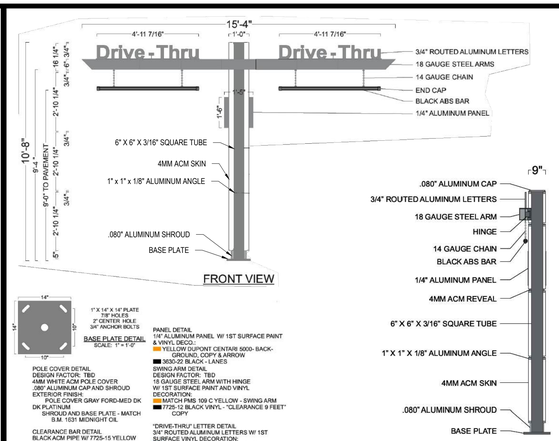
DESIGN FACTOR: TBD
ILLUMINATION: N/A
FACE DETAILS:
- PIGMENTED ABS PANEL TO MATCH PMS 425C NG CHARCOAL WITH MATTE FINISH
- SCREENED COPY AND GRAPHICS
- YELLOW SECTION AT TOP TO BE REFLECTIVE VINYL 3M 5100R-71

POLE: BLACK 72' POLE (PROVIDED BY OTHERS)
BASE: YELLOW ROLL-A-POST BASE (PROVIDED BY OTHERS)
SIGN AREA: 4.57 SQUARE FEET

(NOTE: FOUNDATION DESIGN TO BE PROVIDED BY CONTRACTOR.
CONTRACTOR SHALL OBTAIN FINAL SPECIFICATIONS FROM SIGN VENDOR)

CURBSIDE PICKUP, McDELIVERY & DRIVE-THRU RESERVED SIGNS

N.T.S.



POLE COVER DETAIL
DESIGN FACTOR: TBD
.4MM WHITE ACM POLE COVER
.080" ALUMINUM CAP AND SHROUD
EXTERIOR FINISH:
POLE COVER GRAY FORD-MED DK
DK PLATINUM
SHROUD AND BASE PLATE - MATCH
B.M. 1031 MIDNIGHT OIL

CLEARANCE BAR DETAIL
BLACK ACM PIPE W/ 7725-15 YELLOW VINYL STRIPES APPLIED TO 1ST SURFACE
SQUARE FEET: BOXED = 163.56
ACTUAL = 20.22

PANEL DETAIL
1/4" ALUMINUM PANEL W/ 1ST SURFACE PAINT & VINYL DECO.:
YELLOW DUPONT CENTAR® 5000- BACK-PAINTED COPY & ARROW
3630-32 BLACK - LANES

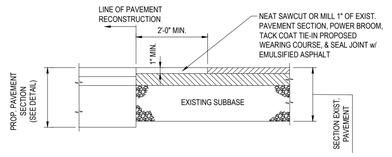
SWING ARM DETAIL
DESIGN FACTOR: TBD
18 GAUGE STEEL ARM WITH HINGE W/ 1ST SURFACE PAINT AND VINYL DECORATION:
MATCH PMS 109 C YELLOW - SWING ARM
7725-12 BLACK VINYL - "CLEARANCE 9 FEET" COPY

"DRIVE-THRU" LETTER DETAIL
3/4" ROUTED ALUMINUM LETTERS W/ 1ST SURFACE VINYL DECORATION:
180-19 BRIGHT YELLOW (OPAQUE) - "DRIVE-THRU" COPY
BLACK - COPY OUTLINE

(NOTE: FOUNDATION DESIGN TO BE PROVIDED BY CONTRACTOR.
CONTRACTOR SHALL OBTAIN FINAL SPECIFICATIONS FROM SIGN VENDOR)

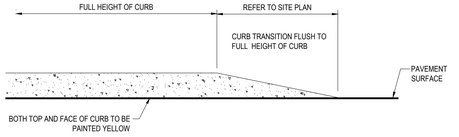
GATEWAY CLEARANCE BAR

N.T.S.



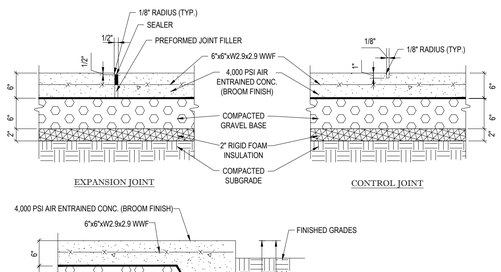
PAVEMENT TIE-IN DETAIL

N.T.S.



TRANSITION CURB DETAIL

N.T.S.



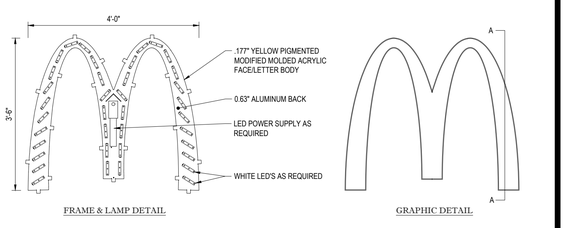
NOTES: TO BE USED FOR BUILDING SURROUND AND OTHER CONCRETE WALKS. USE CHAIRS TO SUPPORT REINFORCING STEEL DURING POUR. VARIES SEE PLAN

1. SEE SITE PLAN FOR WIDTH AND GRADES
2. PROVIDE MINIMUM 1/8"/FT. CROSS-SLOPE
3. PROVIDE CONTROL JOINTS 5'-0" O.C. MIN.
4. PROVIDE EXPANSION JOINTS 20'-0" O.C. MIN.
5. PROVIDE 2" RIGID FOAM IN NEW HAMPSHIRE & MAINE.
6. PIN SIDEWALK AT DOOR LANDINGS W/ #4 REBAR 12" O.C. IN NEW HAMPSHIRE & MAINE.

MONOLITHIC CONC. SIDEWALK DETAILS

N.T.S.

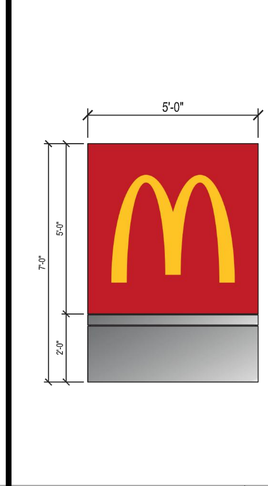
REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE



FRAME DETAIL:
DESIGN FACTOR: TBD
.177" FORMED YELLOW PIGMENTED (PMS 123 C) MODIFIED ACRYLIC FACE/LETTER BODY
EXTERIOR FINISH: PAINTED TO MATCH PMS 877 C SILVER (OPAQUE)
INTERIOR FINISH: PAINTED STARBRIGHT WHITE (OPAQUE)
.063" ALUMINUM BACK - PAINTED STARBRIGHT WHITE
LETTER BODY REMOVABLE FOR SERVICE ACCESS
U.L. APPROVED
ELECTRICAL: 0.85 AMPS, 120 VOLTS
SQUARE FOOTAGE:
BOXED = 14.00
ACTUAL = 4.90

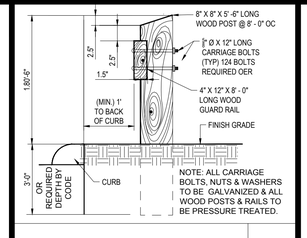
MCD WALL ARCH DETAIL

N.T.S.



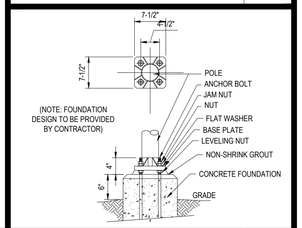
MCD "5' MAIN ID" MONUMENT SIGN

N.T.S.



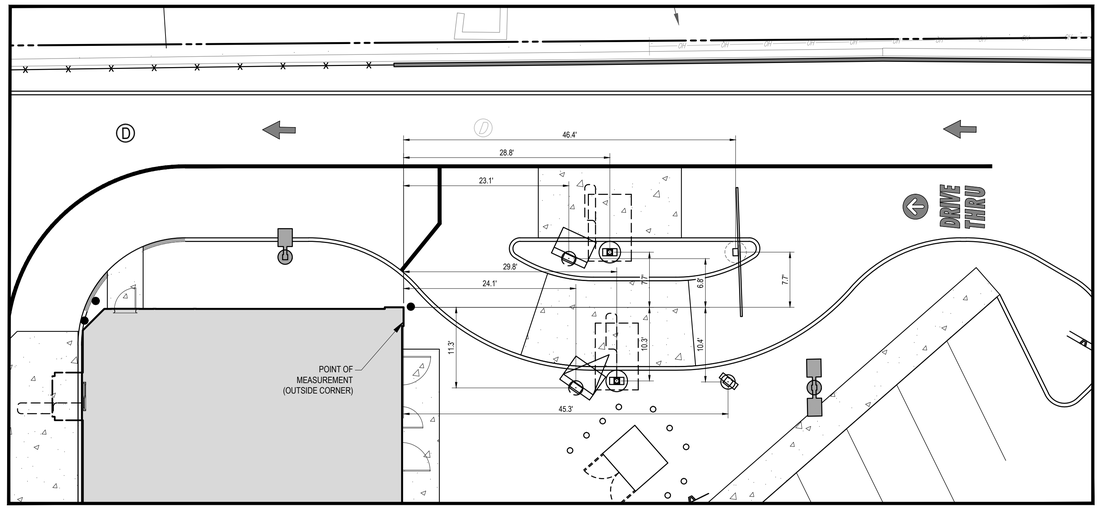
WOOD GUIDERAIL

N.T.S.



FLAG POLE BASE

N.T.S.



SIDE-BY-SIDE STANDARDS & DESIGN TOLERANCES:

1) DISTANCE FROM CENTER OF OPEN PRESENT WINDOW TO CENTER OF OPEN CASH WINDOW STANDARD IN 42'-45' AND IS SPECIFIC TO EACH BUILDING CONFIGURATION. ACCEPTABLE TOLERANCE IS 40' MIN ON REMODELS ONLY.

2) DISTANCE FROM CENTER OF OPEN CASH WINDOW TO CENTER OF PRIMARY LANE DT CANOPY/SPEAKER IS 100' OPTIMUM, 80' OR 60' MIN. ACCEPTABLE TOLERANCE IS PLUS OR MINUS 5' FOR 100' OR 80' QUEUES.

3) THE CENTER OF THE DIGITAL MENU BOARD FOUNDATION IS TO BE 5'-9" (5'-6" MIN. AND 6'-0" MAX.) FROM THE CENTER OF THE DT CANOPY/SPEAKER FOUNDATION. IT SHOULD BE AT AN ANGLE OF APPROXIMATELY 25° TO 35° (35° PREFERRED) FROM A CAR POSITIONED AT THE DT CANOPY/SPEAKER AND WITH 100% VISIBILITY.

4) THE CRITICAL HOLD DISTANCE FROM CENTER OF THE PRIMARY LANE DT CANOPY/SPEAKER TO THE TIP OF THE CURBED ISLAND IS 15'-0".

5) THE CRITICAL HOLD DISTANCE FROM TIP OF ISLAND TO CENTER OF SECONDARY LANE DT CANOPY/SPEAKER IS 14'-0",

6) THE CENTER OF THE SECONDARY LANE DIGITAL MENU BOARD FOUNDATION SHALL BE 5'-9" (5'-6" MIN. AND 6'-0" MAX.) FROM THE CENTER OF THE DT CANOPY/SPEAKER FOUNDATION WITH THE END CAP OF THE SECONDARY MENU BOARD NOT BE LESS THAN 12' FROM FACE OF CURB. IT SHOULD BE AT AN ANGLE OF APPROXIMATELY 25° FROM A VEHICLE POSITIONED AT THE DT CANOPY/SPEAKER AND WITH 100% VISIBILITY.

7) THE ISLAND WIDTH IS 6'-0" STANDARD FROM FACE OF CURB TO CURB.

8) DIGITAL PRE-BROWSE BOARD IN THE PRIMARY LANE MUST BE 18'-24" FROM FACE OF CURB. THE DISTANCE BETWEEN THE PRIMARY DT CANOPY/SPEAKER AND PRE-BROWSE BOARD IS TO BE 15' AS MEASURED ALONG THE FACE OF CURB. THIS IS MEASURED FROM THE CENTER OF THE PRE-BROWSE BOARD FOUNDATION TO THE CENTER OF THE DT CANOPY/SPEAKER FOUNDATION. THE ANGLE (APPROXIMATELY 50°) OF THE PRE-BROWSE BOARD SHOULD MAXIMIZE VISIBILITY FROM THE SECOND CAR TO DT CANOPY/SPEAKER.

9) DIGITAL PRE-BROWSE BOARD IN THE SECONDARY LANE MUST BE MIN. 12" FROM FACE OF CURB. THE PRE-BROWSE BOARD IS TO BE 15' AS MEASURED ALONG THE FACE OF THE CURB. THIS IS MEASURED FROM THE POINT PERPENDICULAR TO THE CENTER OF THE PRE-BROWSE BOARD FOUNDATION TO THE POINT PERPENDICULAR TO THE CENTER OF THE DT CANOPY/SPEAKER FOUNDATION. THE ANGLE OF THE PRE-BROWSE BOARD SHOULD MAXIMIZE VISIBILITY TO THE SECOND CAR FROM THE DT CANOPY/SPEAKER (PREFERRED 35°)

10) A GATEWAY IS REQUIRED AND PLACED AT THE DRIVE-THRU LANE ENTRANCE.

11) EVERY SBS SHOULD HAVE BOTH DT CANOPY/SPEAKER IN BOTH LANES.

THE REGIONAL CONSTRUCTION MANAGER IS TO REVIEW AND APPROVE ALL DRIVE-THRU LAYOUTS. A DRIVE-THRU IS FINAL, AND CONSIDERED "RED", ONCE APPROVED. NO CHANGES ARE TO BE MADE AFTER THIS POINT.

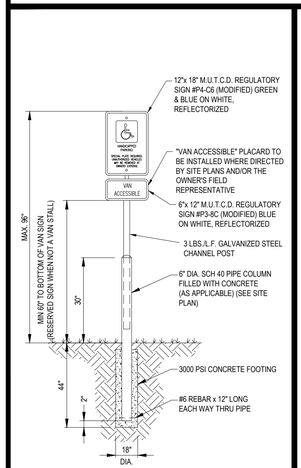
NOTE: THE PLACEMENT OF THE DT CANOPY/SPEAKER SHOULD BE SUCH THAT IT PREVENTS, OR MINIMIZES, BLOCKING THE CUSTOMER'S VIEW OF THE MENU BOARD WHILE ORDERING.

NOTE: LINEAR DIMENSIONS ARE MEASURED PERPENDICULAR TO THE BUILDING FACES SHOWN UNLESS OTHERWISE NOTED.

NOTE: ALL SIGN BOLLARDS ARE TO BE 18"-24" FROM FACE OF CURB, THIS IS MEASURED FROM THE CLOSEST POINT ON THE SIGN.

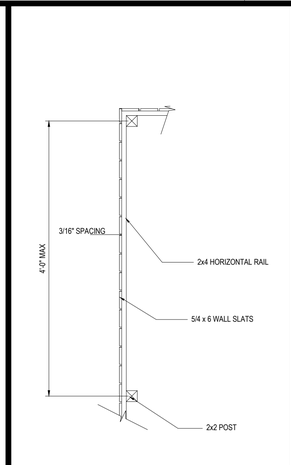
DRIVE-THRU

SCALE: 1"=10'



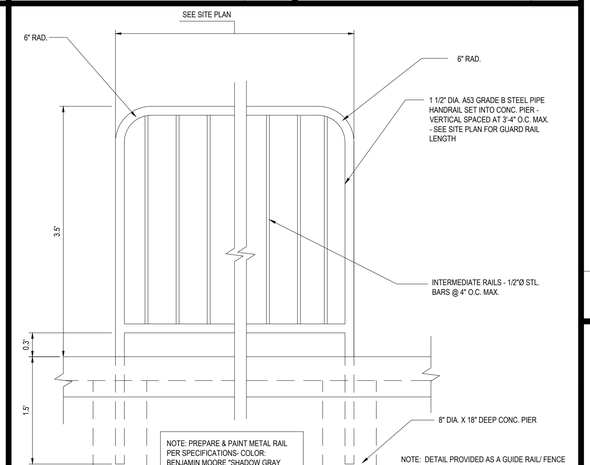
ACCESSIBLE PARKING SIGN ON CONCRETE BOLLARD

N.T.S.



TRASH ENCLOSURE TYP. PLAN ELEV.

N.T.S.



HANDRAIL DETAIL

N.T.S.

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK	DATE
CONSTRUCTION CHECK	DATE
CONSTRUCTION CHECK	DATE
PROJECT No.: W222000	
CAD I.D. #: W222000-SPPD-3a.dwg	

-

STREET ADDRESS
413 MAIN STREET

CITY: READING
STATE: MA
COUNTY: MIDDLESEX

SITE I.D.: 20-0015
PLAN DESCRIPTION: DETAIL SHEET

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

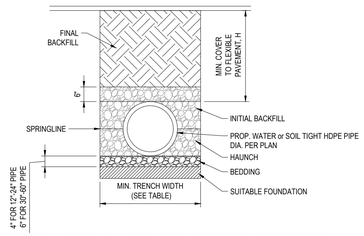
SHEET NO.
C-902
OF 15

JOHN J. KUCZEK
COMMONWEALTH OF MASSACHUSETTS
CIVIL
No. 41530
REGISTERED PROFESSIONAL ENGINEER

PLAN APPROVALS

SIGNATURE	DATE	OFFICE
		ADDRESS
APPROVED McDONALD'S AGENT		

BOSTON REGION
110 N CARPENTER ST
CHICAGO, IL 60607



RECOMMENDED MIN. TRENCH WIDTH	
PIPE DIA.	MIN. TRANCH WIDTH
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
48"	80"
60"	96"

NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321 , "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION.

2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.

3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.

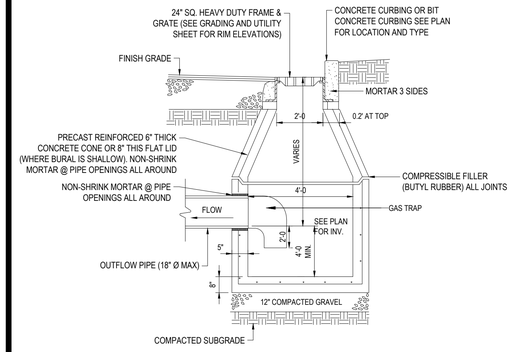
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (750mm-900mm).

5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

HDPE STORM DRAINAGE TRENCH

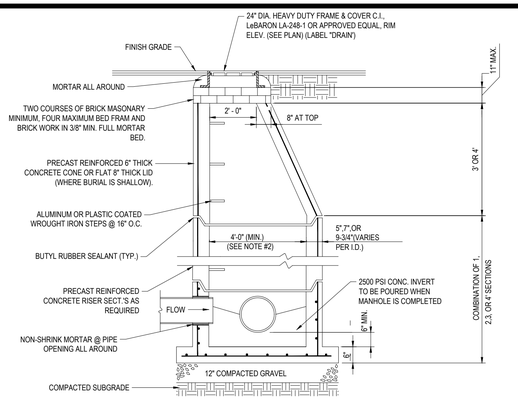
N.T.S.



NOTES:
1. ALL STRUCTURES SHALL BE SUITABLE FOR H-20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.
2. USE PRECAST FLAT SLAB TOP FOR SHALLOW INVERT APPLICATIONS

PRECAST CONCRETE DEEP SUMP CATCH BASIN

N.T.S.

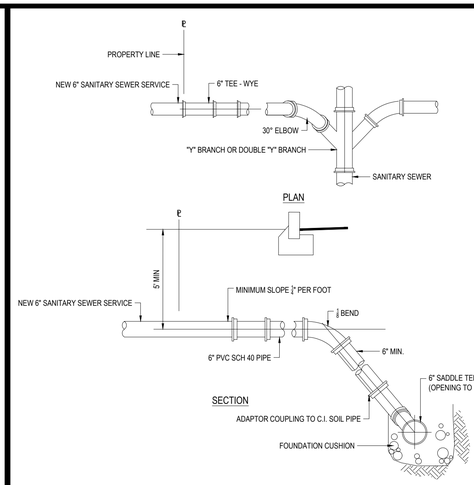


NOTES:
1. ALL STRUCTURES SHALL BE SUITABLE FOR H-20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.

2. CONTRACTOR SHALL SIZE MANHOLE AS NECESSARY TO ACCOMMODATE THE PIPE SIZING AND ORIENTATION USING THE GEOMETRY SHOWN ON THE GRADING AND DRAINAGE PLANS.

PRECAST CONCRETE STORM DRAIN MANHOLE

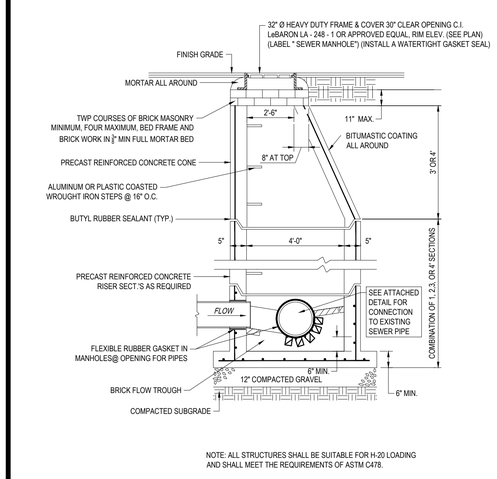
N.T.S.



STANDARD SEWER CONNECTION

N.T.S.

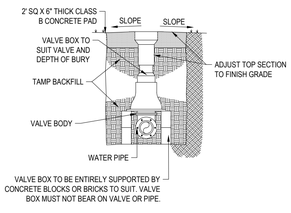
REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE



NOTE: ALL STRUCTURES SHALL BE SUITABLE FOR H-20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.

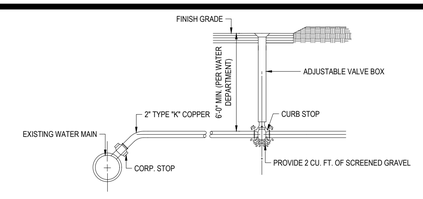
TYPICAL PRECAST CONCRETE SANITARY MANHOLE

N.T.S.



GATE VALVE

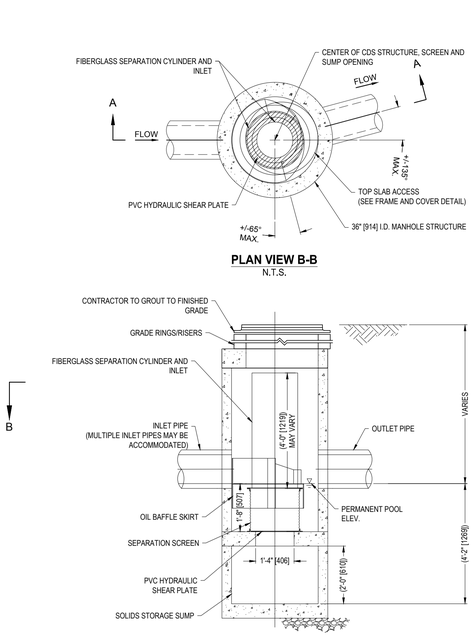
N.T.S.



(DETAIL FOR GENERAL PURPOSES. GC TO COORDINATE CONNECTION W/ WATER COMPANY)

WATER SERVICE CONSTRUCTION

N.T.S.



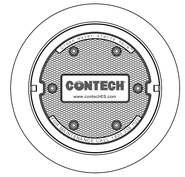
PLAN VIEW B-B
N.T.S.

ELEVATION A-A
N.T.S.

CDS1515-3-C DESIGN NOTES

CDS1515-3-C RATED TREATMENT CAPACITY IS 1.0 CFS, OR PER LOCAL REGULATIONS.

THE STANDARD CDS1515-3-C CONFIGURATION IS SHOWN.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			

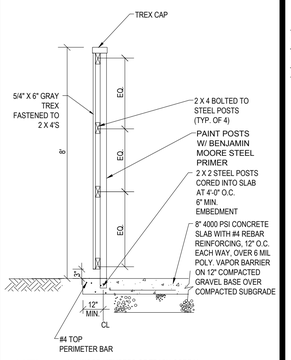
* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO..
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CDS1515-3-C ONLINE CDS STANDARD DETAIL

N.T.S.

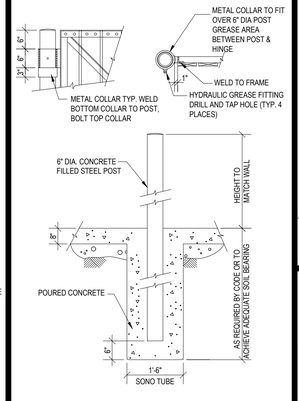


NOTES: 1. ALL WOOD MEMBERS OF TRASH CORRAL ARE TO BE PRESSURE TREATED. ALL FASTENERS ARE TO BE GALVANIZED.

(NOTE: FOUNDATION DESIGN TO BE PROVIDED BY CONTRACTOR)

TRASH ENCLOSURE WALL SECTION

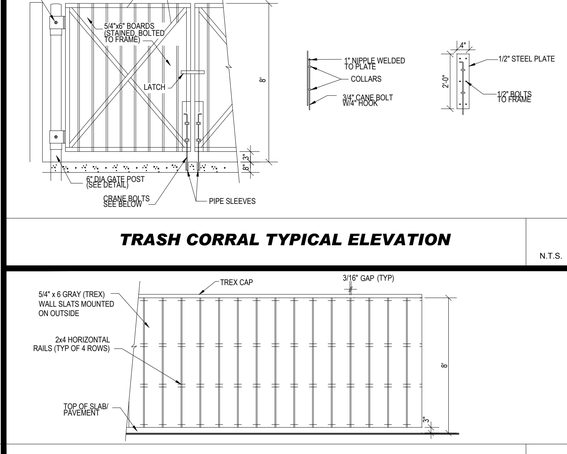
N.T.S.



(NOTE: FOUNDATION DESIGN TO BE PROVIDED BY CONTRACTOR)

TRASH ENCLOSURE GATE POST DETAILS

N.T.S.



TRASH CORRAL TYPICAL ELEVATION

N.T.S.

TRASH ENCLOSURE GATE & MOUNTING

N.T.S.

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK DATE

CONSTRUCTION CHECK DATE

CONSTRUCTION CHECK DATE

PROJECT No.: W222000

CAD I.D. #: W222000-SPPD-3a.dwg

-

STREET ADDRESS
413 MAIN STREET

CITY
READING

STATE
MA

COUNTY
MIDDLESEX

SITE I.D.
20-0015

PLAN DESCRIPTION
DETAIL SHEET

McDonald's
BOSTON REGION
110 N CARPENTER ST
CHICAGO, IL 60607

OFFICE
ADDRESS

PLAN APPROVALS

SIGNATURE	DATE
APPROVED MCDONALD'S AGENT	

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.
C-903
OF 15

P:\2022\W222000\CAD\Drawings\Plan Sets\Civil Site Plans\W222000-SPPD-3a.dwg, C-903 Detl, 4/23/2010, 10:17:14 AM, ammis, Xerox5510-1.pc3, User\534, 1:1

NOTES:

1. SIGN SHALL BE MANUFACTURED BY PERSONA.
2. CONTRACTOR SHALL COORDINATE FINAL GRAPHIC TEXT OPTION WITH ACM AND OWNER/OPERATOR.
3. FOUNDATION DESIGN TO BE PROVIDED BY CONTRACTOR. CONTRACTOR SHALL OBTAIN FINAL SPECIFICATIONS FROM SIGN VENDOR.

MCD-NGNORARCHWEL-S

MCD-NGNORARCHTY-S

MCD-NGNORARCHENT-S

MCD-NGNORARCHEXT-S

MCD-NGNORARCHDT-S

MCD 36" NEXT GEN DIRECTIONAL SIGN

N.T.S.

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE
2	08/09/2023	REV. FOR CPDC SUBMITTAL	CSE
3	10/03/2023	REV. FOR CPDC SUBMITTAL	CSE

JOHN A. KUCZARSKI
COMMONWEALTH OF MASSACHUSETTS
JOHN A. KUCZARSKI
CIVIL
No. 41530
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
NEW HAMPSHIRE LICENSE No. 15476
CONNECTICUT LICENSE No. 28979
RHODE ISLAND LICENSE No. 20010
MAINE LICENSE No. 12454

McDonald's

BOSTON REGION
110 N CARPENTER ST
CHICAGO, IL 60607

OFFICE
ADDRESS

PLAN APPROVALS

SIGNATURE	DATE
APPROVED McDONALD'S AGENT	

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK DATE

CONSTRUCTION CHECK DATE

CONSTRUCTION CHECK DATE

PROJECT No.:
W222000

CAD I.D. #:
W222000-SPPD-3a.dwg

-

STREET ADDRESS
413 MAIN STREET

CITY
READING

STATE
MA

COUNTY
MIDDLESEX

SITE I.D.
20-0015

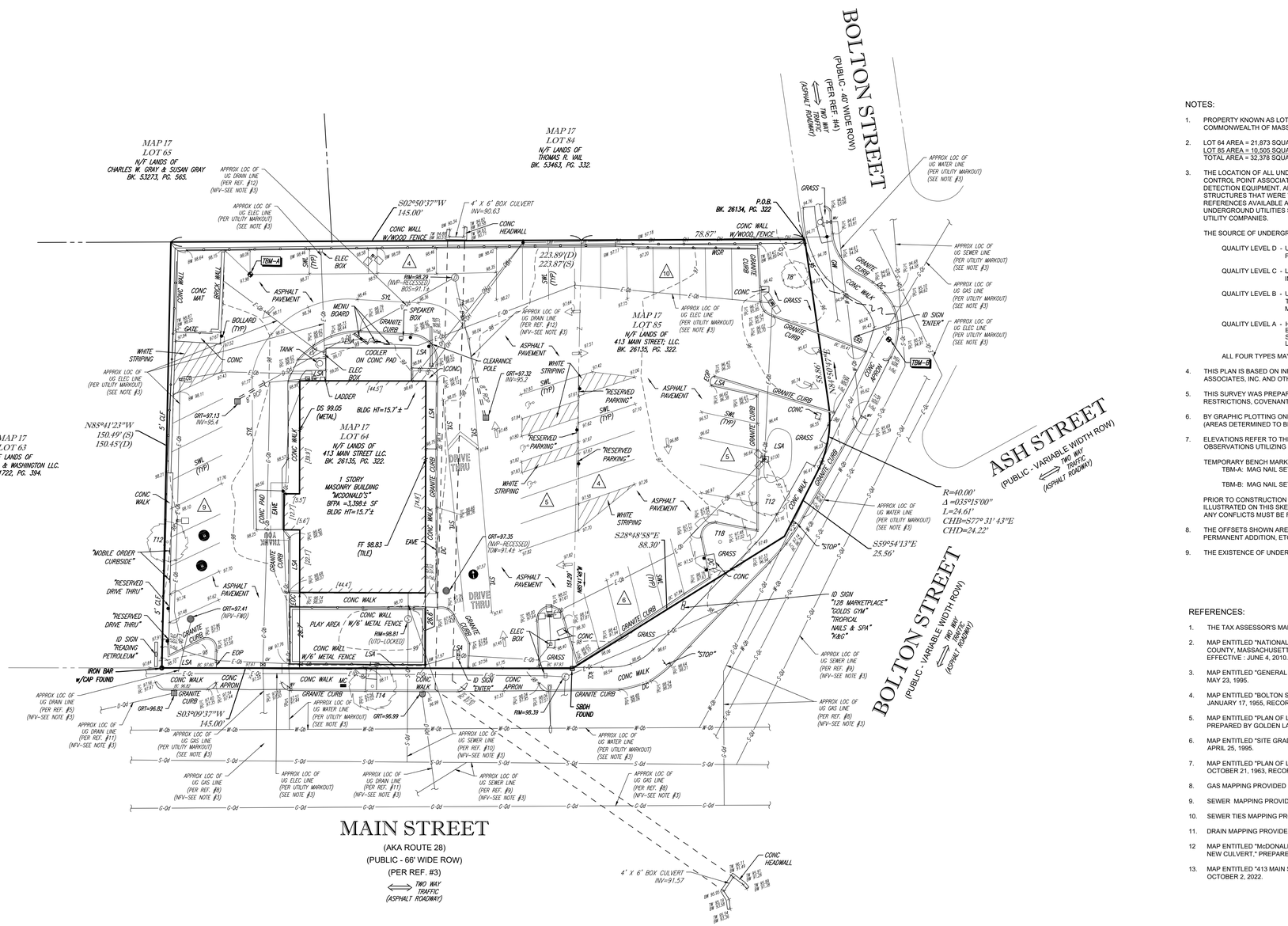
PLAN DESCRIPTION
DETAIL SHEET

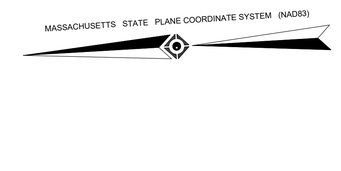
STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

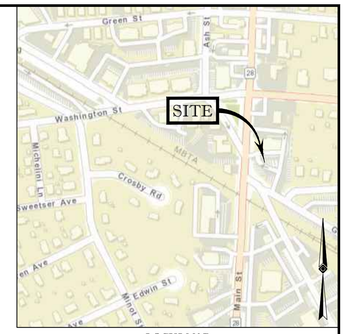
SHEET NO.
C-904
OF 15

LEGEND

124	EXISTING CONTOUR
125	
× 123.45	EXISTING SPOT ELEVATION
× TC 123.45	EXIST. TOP OF CURB ELEVATION
× BC 122.95	EXIST. BOTTOM OF CURB ELEVATION
× TW 123.45	EXIST. TOP OF WALL ELEVATION
× BW 122.95	EXIST. BOTTOM OF WALL ELEVATION
× FF 123.45	EXIST. FINISHED FLOOR ELEVATION
× DS 123.45	EXIST. DOOR SILL ELEVATION
OH	OVERHEAD WIRES
E	APPROX. LOC. UNDERGROUND ELECTRIC LINE
G	APPROX. LOC. UNDERGROUND NATURAL GAS LINE
W	APPROX. LOC. UNDERGROUND WATER LINE
D	APPROX. LOC. UNDERGROUND DRAINAGE LINE
S	APPROX. LOC. UNDERGROUND SANITARY / SEWER LINE
	DEPRESSED CURB
	HYDRANT
WV	WATER VALVE
GV	GAS VALVE
GM	GAS METER
EM	ELECTRIC METER
EMH	ELECTRIC MANHOLE
DMH	DRAINAGE/STORM MANHOLE
SMH	SANITARY/SEWER MANHOLE
	CATCH BASINS
UP	UTILITY POLE
	GUY WIRE
	STREET LIGHT
	PAINTED HANDICAPPED
	PAINTED ARROWS
	METAL COVERS
	SIGN
	BOLLARD
	CLEARANCE BAR
	MENU BOARD
	SPEAKER BOX
	AREA LIGHT
TF	DECIDUOUS TREE & TRUNK SIZE
10	PARKING SPACE COUNT
CLF	CHAIN LINK FENCE
DC	DEPRESSED CURB
EOP	EDGE OF PAVEMENT
LSA	LANDSCAPED AREA
MC	METAL COVER
(TYP)	TYPICAL
SWL	SOLID WHITE LINE
SYL	SOLID YELLOW LINE
HT	HEIGHT
BLDG	BUILDING
BFPA	BUILDING FOOTPRINT AREA
NVP	NO VISIBLE PIPE
UTO	UNABLE TO OPEN
FWD	FILLED w/DIRT
TOW	TOP OF WATER
MON	MONUMENT
DHF	DRILL HOLE FOUND
FWD	FILLED w/DEBRIS
SBDH	STONE BOUND w/DRILL HOLE
INV	INVERT ELEVATION
GRT	GRATE ELEVATION
RCP	REINFORCED CONCRETE PIPE
	STONE BOUND DRILL HOLE
	EVIDENCE FOUND
	UNKNOWN TERMINUS
–Qc	SUBSURFACE UTILITY QUALITY LEVEL C
–Qd	SUBSURFACE UTILITY QUALITY LEVEL D
–Qb	SUBSURFACE UTILITY QUALITY LEVEL B
BOS	BOTTOM OF STRUCTURE
(S)	SURVEY DIMENSION
(D)	DEED DIMENSION







LOCUS MAP

NOTES:

1. PROPERTY KNOWN AS LOT 64 & 85 AS SHOWN ON THE TOWN OF READING, MIDDLESEX COUNTY, COMMONWEALTH OF MASSACHUSETTS; MAP No. 17.
2. LOT 64 AREA = 21,873 SQUARE FEET OR 0.502 ACRES
   LOT 85 AREA = 10,505 SQUARE FEET OR 0.241 ACRES
   TOTAL AREA = 32,378 SQUARE FEET OR 0.743 ACRES
3. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN ARE BASED UPON MARKOUT PROVIDED BY CONTROL POINT ASSOCIATES,INC. USING GROUND PENETRATING RADAR AND ELECTROMAGNETIC DETECTION EQUIPMENT. ALL LOCATIONS AND SIZES ARE BASED ON UTILITY MARK-OUTS. ABOVE GROUND STRUCTURES THAT WERE VISIBLE & ACCESSIBLE IN THE FIELD, AND THE MAPS AS LISTED IN THE REFERENCES AVAILABLE AT THE TIME OF SURVEY. BEFORE ANY EXCAVATION IS TO BEING, ALL UNDERGROUND UTILITIES SHOULD BE VERIFIED AS TO THEIR LOCATION, SIZE, AND TYPE BY THE PROPER UTILITY COMPANIES.

   THE SOURCE OF UNDERGROUND UTILITIES ARE SHOWN UTILIZING A QUALITY LEVEL SYSTEM:

   QUALITY LEVEL D - UTILITIES SHOWN BASED UPON REFERENCE MAPPING OR ORAL HISTORY. NOT FIELD VERIFIED.

   QUALITY LEVEL C - LOCATION OF UTILITY SURFACE FEATURES SUPPLEMENTS REFERENCE MAPPING. INCLUDES MARKOUT BY OTHERS.

   QUALITY LEVEL B - UTILITY LOCATION DATA IS COLLECTED THROUGH GEOPHYSICAL SENSING TECHNOLOGY TO SUPPLEMENT SURFACE FEATURES AND OR REFERENCE MAPPING. INCLUDES MARKOUT BY CONTROL POINT ASSOCIATES, INC.

   QUALITY LEVEL A - HORIZONTAL AND VERTICAL LOCATION OF UTILITIES ARE OBTAINED USING VACUUM EQUIPMENT EXCAVATION OR OTHER METHODS TO EXPOSE THE UTILITY. LOCATION SHOWN AT SINGLE POINT WHERE EXCAVATION OCCURRED UNLESS UTILITY WAS LOCATED PRIOR TO FILLING.

   ALL FOUR TYPES MAY NOT BE PRESENT ON THIS SURVEY
4. THIS PLAN IS BASED ON INFORMATION PROVIDED BY A SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC. AND OTHER REFERENCE MATERIAL AS LISTED HEREON.
5. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO THE RESTRICTIONS, COVENANTS AND/OR EASEMENTS THAT MAY BE CONTAINED THEREIN.
6. BY GRAPHIC PLOTTING ONLY PROPERTY IS PARTIALLY LOCATED IN FLOOD HAZARD ZONE X- UNSHADED (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN), PER REF. #2
7. ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED ON GPS OBSERVATIONS UTILIZING THE KEYSTONE VRS NETWORK (KEYNETGPS).

   TEMPORARY BENCH MARKS SET:
   TBM-A: MAG NAIL SET IN ASPHALT PAVEMENT. ELEVATION = 98.29'

   TBM-B: MAG NAIL SET IN CONCRETE SIDEWALK ELEVATION = 95.37'

   PRIOR TO CONSTRUCTION IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THE BENCHMARKS ILLUSTRATED ON THIS SKETCH HAVE NOT BEEN DISTURBED AND THEIR ELEVATIONS HAVE BEEN CONFIRMED. ANY CONFLICTS MUST BE REPORTED PRIOR TO CONSTRUCTION.
8. THE OFFSETS SHOWN ARE NOT TO BE USED FOR THE CONSTRUCTION OF ANY STRUCTURE, FENCE, PERMANENT ADDITION, ETC.
9. THE EXISTENCE OF UNDERGROUND STORAGE TANKS, IF ANY, WAS NOT KNOWN AT THE TIME OF THE FIELD.

REFERENCES:

1. THE TAX ASSESSOR'S MAP OF THE TOWN OF READING, MIDDLESEX COUNTY, MAP 17.
2. MAP ENTITLED "NATIONAL FLOOD INSURANCE PROGRAM, FIRM, FLOOD INSURANCE RATE MAP, MIDDLESEX COUNTY, MASSACHUSETTS (ALL JURISDICTIONS), PANEL 313 OF 656", MAP NUMBER 25017C0313E, MAP EFFECTIVE : JUNE 4, 2010.
3. MAP ENTITLED "GENERAL & LOCATION PLAN," PREPARED BY GOLDEN LAND SURVEY, INC, REVISED DATED MAY 23, 1995.
4. MAP ENTITLED "BOLTON STREET READING, MASSACHUSETTS," PREPARED BY JAMES T. PUTNAM, DATED JANUARY 17, 1955, RECORDED IN MIDDLESEX REGISTRY OF DEEDS AS PLAN NUMBER 861 OF 1955.
5. MAP ENTITLED "PLAN OF LAND IN READING, MASSACHUSETTS, PREPARED FOR McDONALD'S CORPORATION", PREPARED BY GOLDEN LAND SURVEYING, INC., DATED OCTOBER 13, 1994.
6. MAP ENTITLED "SITE GRADING & DRAINAGE PLAN," PREPARED BY RALPH A. CATALDO ENGINEERING, DATED APRIL 25, 1995.
7. MAP ENTITLED "PLAN OF LAND READING, MASSACHUSETTS," PREPARED BY L.G. BRACKETT & CO., INC., DATED OCTOBER 21, 1963, RECORDED IN MIDDLESEX REGISTRY OF DEEDS AS PLAN NUMBER 1773 OF 1963.
8. GAS MAPPING PROVIDED BY NATIONAL GRID.
9. SEWER MAPPING PROVIDED BY GIS UTILITIES.
10. SEWER TIES MAPPING PROVIDED BY DEPARTMENT OF PUBLIC WORKS, SEWER DIVISION.
11. DRAIN MAPPING PROVIDED BY GIS UTILITIES.
12. MAP ENTITLED "McDONALD'S SYSTEM INCORPORATED, READING, MASSACHUSETTS, SITE PLAN SHOWING NEW CULVERT," PREPARED BY RAY FITZMAURICE - CONSULTING ENGINEER, REVISED DATED JULY 16, 1963.
13. MAP ENTITLED "413 MAIN STREET, READING", PREPARED BY CONTROL POINT ASSOCIATES, INC., DATED OCTOBER 2, 2022.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

No.	DESCRIPTION OF REVISION	FIELD CREW	DRAWN:	APPROVED:	DATE
1	REVISED PER CULVERT LOCATIONS	B.S.B.	R.J.K.	G.L.H.	11-30-2022

THIS SURVEY HAS BEEN PERFORMED IN THE FIELD UNDER MY SUPERVISION, AND TO THE BEST OF MY KNOWLEDGE, BELIEF, AND INFORMATION, THIS SURVEY HAS BEEN PERFORMED IN ACCORDANCE WITH CURRENTLY ACCEPTED ACCURACY STANDARDS.

NOT A VALID ORIGINAL DOCUMENT UNLESS EMBOSSED WITH RAISED IMPRESSION OR STAMPED WITH A BLUE INK SEAL

GERRY L. HOLDRIGHT, PLS
MASSACHUSETTS PROFESSIONAL LAND SURVEYOR #49211

11-30-2022
DATE

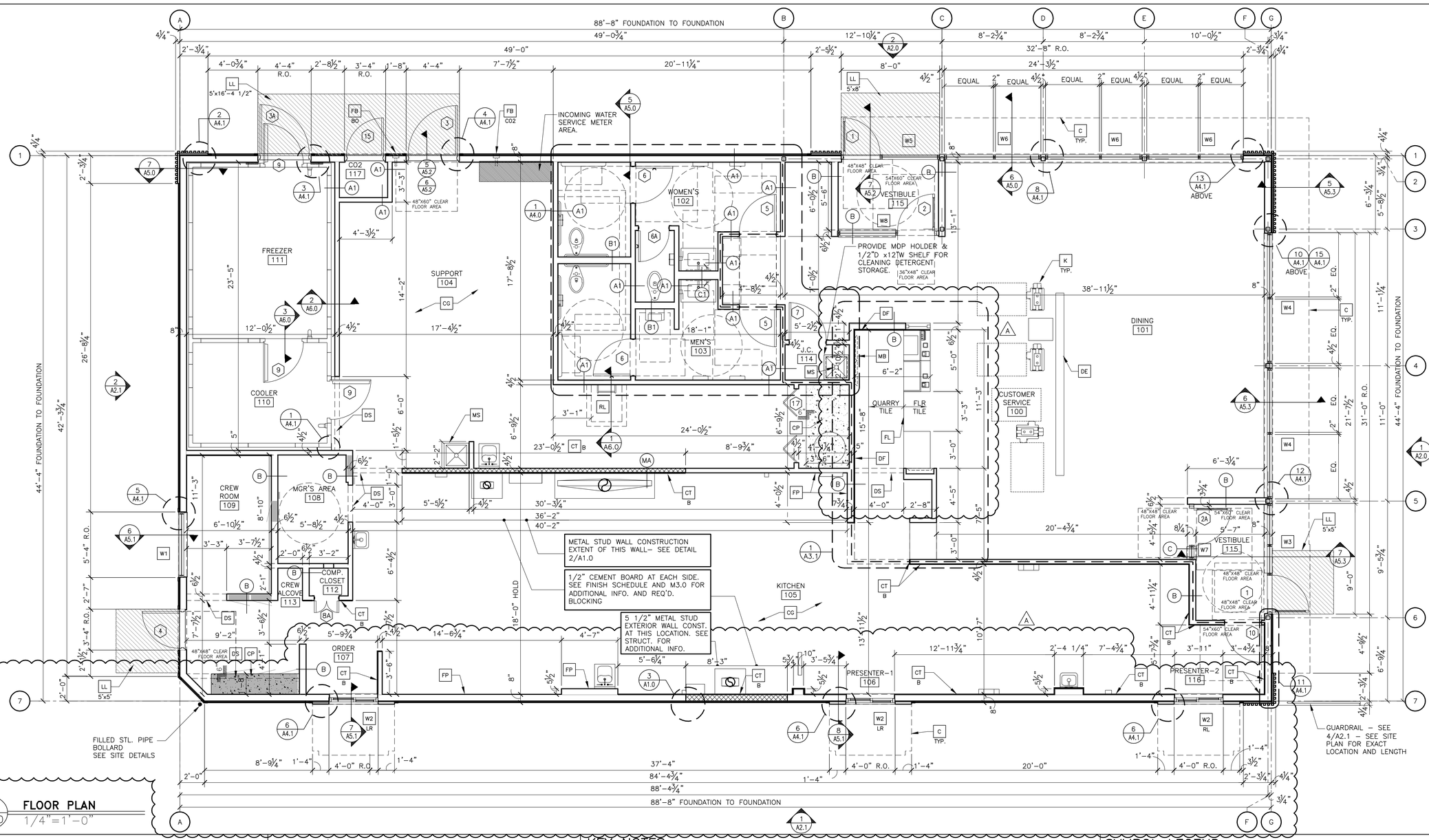
FIELD DATE	10-04-2022
FIELD BOOK NO.	22-15 MA
FIELD BOOK PG.	21 & 22
FIELD CREW	B.S.B.
DRAWN:	J.P.M.
REVIEWED:	R.J.K.

BOUNDARY, TOPOGRAPHIC & UTILITY SURVEY
McDONALD'S USA, LLC
413 MAIN STREET
LOT 64 & 85, MAP 17
TOWN OF READING, MIDDLESEX COUNTY
COMMONWEALTH OF MASSACHUSETTS
L/C# 020-015

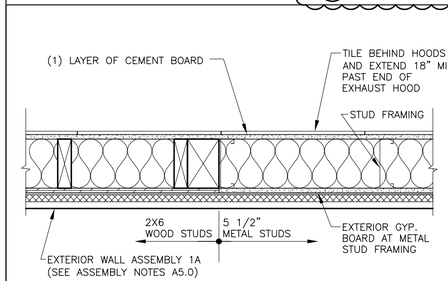
CONTROL POINT ASSOCIATES, INC.
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
508.948.3000 - 508.948.3003 FAX
ALBANY, NY 518-217-5010
CHALFONT, PA 215-712-9800
HAUPPAUGE, NY 631-580-2645
MANHATTAN, NY 646-780-0411
MT LAUREL, NJ 609-857-2099
WARREN, NJ 908-668-0099

APPROVED:	DATE	SCALE	FILE NO.	DWG. NO.
G.L.H.	10-10-2022	1"=20'	03-180087-00	1 OF 1

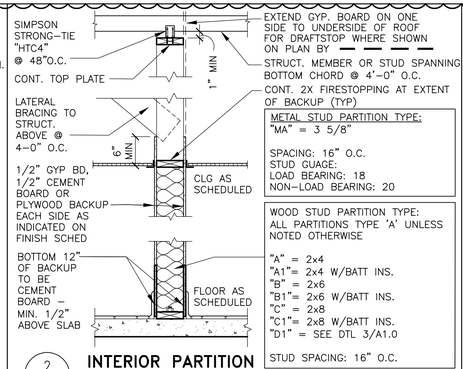
THE COMMONWEALTH OF MASSACHUSETTS REQUIRES NOTIFICATION BY EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE COMMONWEALTH.



1 A1.0 **FLOOR PLAN**
1/4"=1'-0"



3 A1.0 **TRANSITION DETAIL**
1 1/2"=1'-0"



2 A1.0 **INTERIOR PARTITION**
3/4"=1'-0"

KEY NOTES

- C – ALUMINUM CANOPY SYSTEM ABOVE – SEE 4/A5.0 FOR NOTES – SEE ROOF PLAN FOR DIMENSIONS, SEE ELEVATION FOR COLORS AND FASCIA LOCATIONS
- CG – G.C. TO PROVIDE 4"x4"x5'–0" HIGH STAINLESS STEEL CORNER GUARDS AT ALL EXPOSED LOCATIONS IN KITCHEN/SUPPORT AREA. CORNER GUARDS TO START AT FINISH FLOOR. ATTACH WITH WOOD SCREWS INTO WOOD BLOCKING BULLNOSE COVE BASE WHERE TILE MEETS STAINLESS STEEL CORNER – SEE DETAIL 4/A6.0
- CP – CONCRETE EQMT PAD – SEE STRUCTURAL & DETAIL 5/A6.0
- CT B – WALL TILE: CROSSVILLE – COLOR BY NUMBERS, COLOR: AFTERNOON SPRAY, SIZE: 4"x12", PATTERN: RUNNING BOND, GROUT: MAPEI 02 PEWTER – JOINT TO BE 1/16" MAX. USE THIS TILE WHEN HIGH LRV IS REQUIRED COORDINATE WITH McDONALD'S AREA CONSTRUCTION MANAGER
- DE – DECOR ELEMENT– VERIFY SIZE AND PLACEMENT WITH DECOR PLANS
- DF – DECOR FINISH TO BE ORDERED/INSTALLED BY GC AND MANUFACTURED BY DECOR; REFER TO PORTFOLIO.
- DS – DROPPED SOFFIT ABOVE – SEE REFLECTED CEILING PLAN
- FB CO2 – CO2 FILL BOX (EQUIPMENT SCHEDULE ITEM 49.00)
- FB BO – OPTIONAL BULK OIL FILL BOX (EQPM SCHEDULE ITEM 700.18) CONFIRM USE WITH MCDONALD'S AREA CONSTRUCTION MANAGER
- FL – FLOOR LINE – CHANGE IN MATERIAL – SEE DECOR DRAWINGS
- FP – FIBERGLASS REINFORCED PLASTIC (FRP) – PANOLAM, GRAY SMOOTH, CLASS C, .075. REFER TO ROOM FINISH SCHEDULE SHEET A6.1 FOR INSTALLATION LOCATIONS. FOR ORDERING, CONTACT KIMBERLY LAWSON Kimberly_Lawson@panolam.com 1–866–925–4377
- LL 5'x5' – LEVEL LANDING @ EXT. DOOR W/ MAX. 2% RUNNING/CROSS SLOPE AWAY FROM BUILDING – SIZE OF LANDING
- K – SELF–ORDER KIOSK – POWER & DATA FROM CEILING, FOR FURNITURE (COORDINATE FINISH LOCATION WITH DECOR)
- MB – MENU BOARD WITH BEZELS BY OTHERS UNDER SEPARATE PERMIT – SEE ELEC PLANS
- MS – MOP SINK – SEE DETAIL 8/A6.1 AND PLUMBING DRAWINGS.
- RL – ROOF ACCESS LADDER W/HATCH ABOVE SEE STRUCTURAL FRAMING PLAN FOR LOCATING DIMENSIONS
- Wx – EXTERIOR WINDOW ASSEMBLY – SEE A2.0, A2.1 & 4/A5.0 FOR ADDITIONAL NOTES

SYMBOL LEGEND

- A – PARTITION TYPE TAG SEE 2/A1.0
- A A – DOUBLE STUD WALL SEE 4/A4.2 AND 6/A4.2
- EXTENT OF WALL TILE – SEE A1.0, A3.1 & A6.1
- X – KEY NOTE
- DRAFT STOPPING – SEE 2/A1.0
- 7 – DOOR TAG – SEE DOOR SCHEDULE ON A6.0
- LEVEL LANDING @ EXT. DOOR
- SLAB LEVEL
- METAL STUD PARTITION

GENERAL NOTES

1. EXTERIOR DIMENSIONS ARE TO COLUMN REFERENCE LINES AND EXTERIOR FACE OF FINISH UNLESS OTHERWISE NOTED. INTERIOR DIMENSIONS ARE TO FACE OF INTERIOR WALL BOARD.
2. SEE 4/A5.0 FOR EXTERIOR WALL ASSEMBLY TYPES. SEE 2/A1.0 FOR INTERIOR PARTITION TYPES. INTERIOR PARTITIONS ARE TYPE 'A' UNLESS NOTED OTHERWISE.
3. SEE EXTERIOR ELEVATIONS FOR WINDOW TYPES.
4. SEE SHEET A6.0 FOR DOOR SCHEDULE AND SHEET A6.1 FOR ROOM FINISH SCHEDULES.
5. SEE SITE PLAN FOR SIDEWALKS, RAMPS, ETC.
6. GC TO PROVIDE ADA SIGNAGE PACKAGE AND INSTALL SIGNS AT LOCATIONS AND POSITIONS INDICATED IN PACKAGE OR AS REQUIRED BY LOCAL CODES. SIGNAGE PACKAGE SUPPLIED BY: FRANKE S2K. CONTACT JOSH BRAVO <JOSHUA.BRAVO@S2KGRAPHICS.COM> PH: 818–812–7605. COORDINATE WITH ACM.
7. MAXIMUM OCCUPANCY SIGN TO BE POSTED PER LOCAL CODE. SIGN FURNISHED AND INSTALLED BY GENERAL CONTRACTOR.
8. ALL HANDSINK LOCATIONS SHALL HAVE CEMENT BOARD BACKING 48" IN HEIGHT A.F.F.
9. GC TO COORDINATE ALL REQUIRED BLOCKING FOR WALL HUNG EQUIPMENT, SHELVES, ETC. FOR PROPER INSTALLATION HEIGHTS.
10. KNOX BOX TO BE INSTALLED BY GENERAL CONTRACTOR PER LOCAL CODE AS REQUIRED. MODEL AND LOCATION TO BE COORDINATED WITH FIRE MARSHALL.
11. DASHED LINES @ DOORS, RESTROOMS, & FIXTURES REPRESENT CLEAR FLOOR MANEUVERING CLEARANCES AS REQUIRED BY THE ACCESSIBILITY CODE. CLEARANCES MUST BE MAINTAINED WITHOUT EXCEPTION. IF CONDITIONS PREVENT ANY CLEAR FLOOR SPACE FROM BEING MAINTAINED, CONTACT THE ARCHITECT FOR RESOLUTION.

REV	DATE	DESCRIPTION	BY
A	8/10/2023	ADJUST DT WINDOW DIMENSIONS AND EQUIPMENT + REMOVE BGC	

DATE: 8/10/2023

PREPARED BY:
AECOM TECHNICAL SERVICES
ARCHITECTS / ENGINEERS, INC.
1255 Broad Street, Suite 201
Clifton, NJ 07013-3988
973.883.8570 fax 973.883.8501
http://www.aecom.com

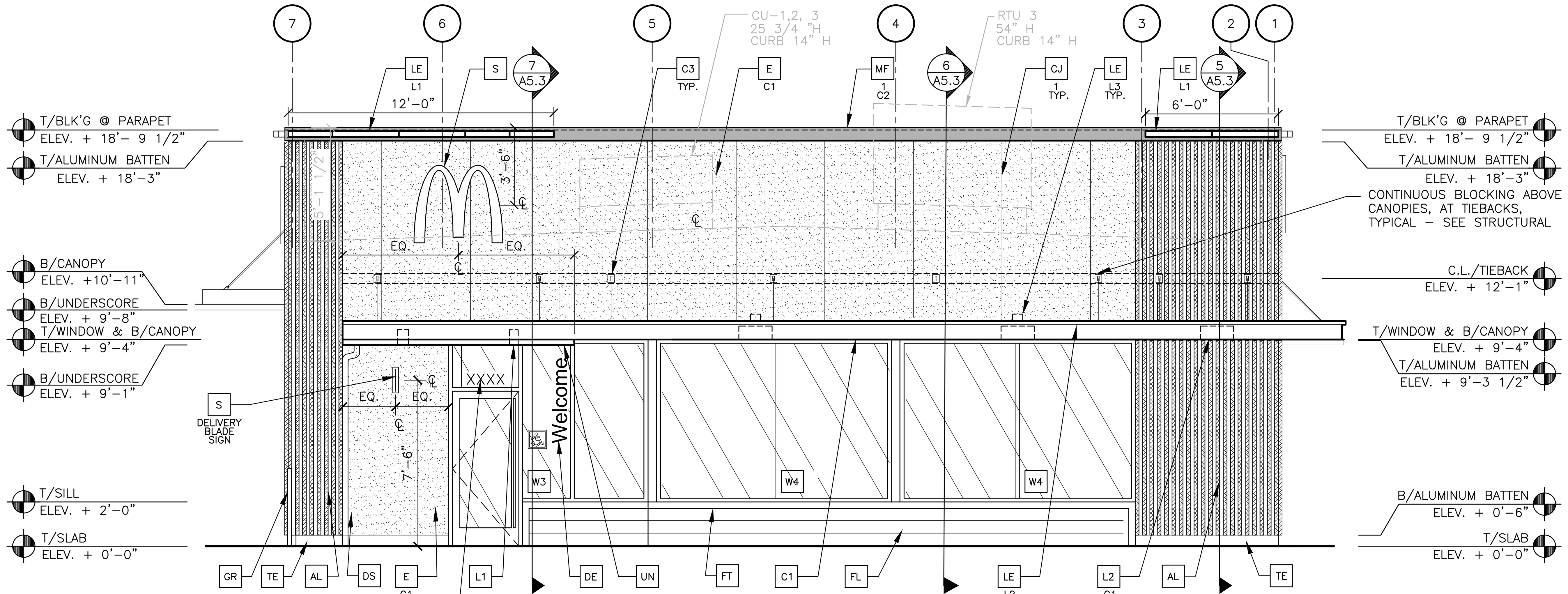
DRAWN BY: RM | STD ISSUE DATE: 2022_09 | REVIEWED BY: WL | DATE ISSUED: 04-25-2023 | READING, MA

TITLE: 2022 STANDARD BUILDING – BB20
4587–WOOD/WOOD

DESCRIPTION	SITE ID	SITE ADDRESS
WOOD BEARING WALLS W/ HARDIE BOARD SIDING & CI		
WOOD ROOF TRUSS FRAMING		
EFS/BATTEN/ALPOLIC PANEL/HARDIE BOARD SIDING	020–0015	413 MAIN ST.

SHEET NO.: A1.0
FLOOR PLAN

PROJECT No. 60704457 Task: 020–0015

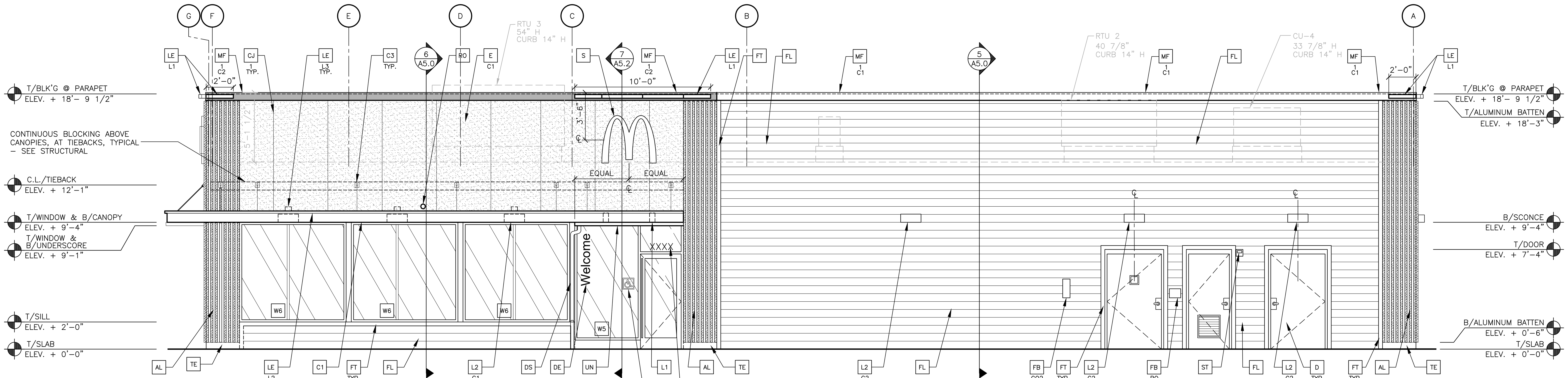


BUILDING ADDRESS 6"H. CHARACTERS AND 3/4" STROKE FONT: AKZIDENZ GROTESK PRO BOLD

ACCESSIBILITY SIGNAGE SEE GEN NOTE #6 ON A1.0

1/A2.0 FRONT ELEVATION
1/4" = 1'–0"

3/A2.0 NOT USED
–



BUILDING ADDRESS 6"H. CHARACTERS AND 3/4" STROKE FONT: AKZIDENZ GROTESK PRO BOLD

ACCESSIBILITY SIGNAGE SEE GEN NOTE #6 ON A1.0

2/A2.0 NON–DRIVE–THRU ELEVATION
1/4" = 1'–0"

BUILDING SIGNAGE SCHEDULE

FACADE		SIGN ELEMENT	S.F.
FRONT	1	McDONALD'S "M" ARCH LOGO	14
		TOTAL:	**14**
NON–DRIVE THRU SIDE	1	McDONALD'S "M" ARCH LOGO	14
		TOTAL:	**14**
		TOTAL BUILDING SIGNAGE	**28**

KEY NOTES:

- **AL** ALUMINUM BATTEN SYSTEM
  MFR: B+N INDUSTRIES
  SIZE: 2"X2" PROFILE
  COLOR: WOOD GRAIN, BACKRAIL UNFINISHED, ENDCAP PAINTED TO MATCH
  SUBSTRATE: 1/2" EXTERIOR HIGH DENSITY OVERLAY (HDO) PLYWOOD, BB, GROUP 1, HDO BOTH FACES, APA TRADEMARKED. COURSE GRIT SAND SURFACES PRIOR TO PRIMING. PRIME AND PAINT BOTH SIDES AND ALL EDGES PRIOR TO INSTALLATION.
  SUBSTRATE COLOR: "IRON ORE" SW7069 BY SHERWIN WILLIAMS
- **AP** ALPOLIC METAL PANEL (COLOR: RAL 7022)
- **C1** ALUMINUM CANOPY SYSTEM W/FASCIA
  COLOR: WHITE
- **C2** ALUMINUM CANOPY SYSTEM
  COLOR: RAL 7022
- **C3** ALUMINUM CANOPY TIEBACK
  COLOR: RAL 7022
  GC TO PROVIDE CONTINUOUS BLOCKING ON WALL BEHIND TIEBACKS
- **CJ** CONTROL JOINT
  1 —TYPE: 1 = EIFS
- **D** HOLLOW METAL DOOR
  PAINT: SHERWIN WILLIAMS SW–7019 GAUNTLET GRAY
- **DE** DECAL BY GRAPHICS SUPPLIER
  SURFACE APPLIED, FIELD INSTALLED, PRE CUT, PRE SPACED.
  SUPPLIERS:
  VOMELA (865) 330–7337, ann.bowen@vomela.com
  GFX INTERNATIONAL (847) 543–4600, mcdonaldsdecor@gfxi.com
- **DS** DOWNSPOUT PAINT TO MATCH SURROUNDING MATERIAL. CONNECT TO STORM LINE REFER PLUMBING & CIVIL
- **E** EXTERIOR INSULATION FINISH SYSTEM (E.I.F.S.)
  C1—COLOR:
  C1 = "IRON ORE" SW 7069 BY SHERWIN WILLIAMS
- **FB** FILL BOX
  CO2 — CO2 = BULK CO2 FILL BOX (EQPM SCHEDULE ITEM 49.00)
  BO = BULK OIL FILL BOX (EQPM SCHEDULE ITEM 700.18)
- **FL** FIBER CEMENT LAP SIDING: HARDIEPLANK LAP SIDING, SMOOTH, 8 1/4" WIDTH, 7" EXPOSURE, HZ5, COLOR SCHEME–STEEL: AGED PEWTER
- **FT** FIBER CEMENT TRIM: HARDIETRIM BOARDS, 4/4 SMOOTH, 1 5/8" & 3 1/2" WIDTH, 3/4" THICK, HZ5, COLOR: AGED PEWTER (CHECK 1 5/8" PRE–PAINT AVAILIBLITY)
- **GR** GUARD RAIL –SEE SITE PLAN FOR EXACT LOCATION AND LENGTHSEE 4/A2.1 FOR DETAILS
  PAINT: "IRON ORE" SW 7069 BY SHERWIN WILLIAMS
- **L1** RECESSED DOWN LIGHT FIXTURE – SEE ELECTRICAL
  COLOR: GOLD
- **L2** RADIAL SCONCE LIGHT FIXTURE – SEE ELECTRICAL
  C1—COLOR:
  C1= WHITE
  C2= PLATINUM SILVER
- **LE** ACCENT LIGHTING – SEE ELECTRICAL
  L1—LED LIGHT:
  L1 = SLIM LED (DOWN ONLY)
  L2 = INTEGRAL CANOPY FIXTURE
  L3 = UP ONLY FLOOD FIXTURE
- **PB** PIPE BOLLARD – PAINTED YELLOW
- **PT** (RMHC) COIN COLLECTOR
  UNIT: APERTURE WPT, #DTA2013
  CALL 1–877–766–7642 TO ORDER
- **MF** METAL FASCIA
  1 — TYPE:
  C1 1 = PRE–FAB ANCHOR–TITE FASCIA
  2 = BOTTOM TRIM AT METAL REVEAL PANEL
  3 = VERTICAL TRIM AT METAL REVEAL PANEL CORNERS, CLOSURES
  COLOR:
  C1= CITYSCAPE
  C2= RAL 7022
- **RO** ROOF DRAIN OVERFLOW PIPE PAINT TO MATCH SURROUNDING MATERIAL
- **S** McDONALD'S SIGNAGE BY OTHERS – UNDER SEPARATE PERMIT.
  C1— COLOR:
  C1= WEATHERED ZINC RACEWAY
  C2= RAL 7022 RACEWAY
- **ST** CO2 STROBE/ALARM. SEE MECHANICAL DRAWINGS FOR SPECIFICATION.
- **TE** TRU EXTERIOR 1"X6" TRIM, PAINTED ON SITE
  COLOR: "IRON ORE" SW 7069 BY SHERWIN WILLIAMS
- **UN** METAL UNDERSCORE
  COLOR: GOLD
- **W1** EXTERIOR WINDOW ASSEMBLY – TEMPERED GLASS
  COLOR: EXTRA DARK BRONZE – SEE ASSEMBLY NOTES ON 4/A5.0 & FRAME TYPES ON SHEET A6.0
- **W2** DRIVE–THRU WINDOW BY READY ACCESS
  XX MODEL: 600 SERIES, 36" SERVICE HEIGHT WITH TRANSOM, MANUAL OPEN; ELECTRONIC RELEASE
  COLOR: DEEP BRONZE
  SLIDE DIRECTION: RL = RIGHT TO LEFT, LR = LEFT TO RIGHT

REV	DATE	DESCRIPTION	BY

DATE: ....

PREPARED BY:
AECOM TECHNICAL SERVICES
ARCHITECTS / ENGINEERS, INC.
1255 Broad Street, Suite 201
Clifton, NJ 07013-3988
973.883.8570 fax 973.883.8501
http://www.aecom.com

PREPARED FOR:
McDonald's USA, LLC

DRAWN BY: RM
STD ISSUE DATE: 2022_09
REVIEWED BY: WL
DATE ISSUED: 04–25–2023
READING, MA

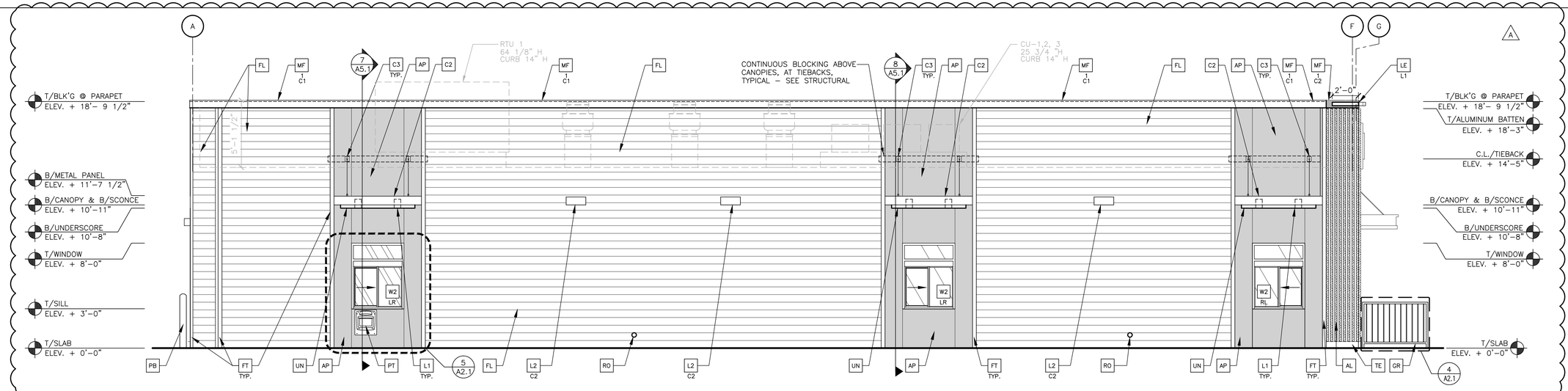
TITLE: 2022 STANDARD BUILDING – BB20 4587–WOOD/WOOD

DESCRIPTION: WOOD BEARING WALLS W/ HARDIE BOARD SIDING & Ci; WOOD ROOF TRUSS FRAMING; EFIS/BATTEN/ALPOLIC PANEL/HARDIE BOARD SIDING

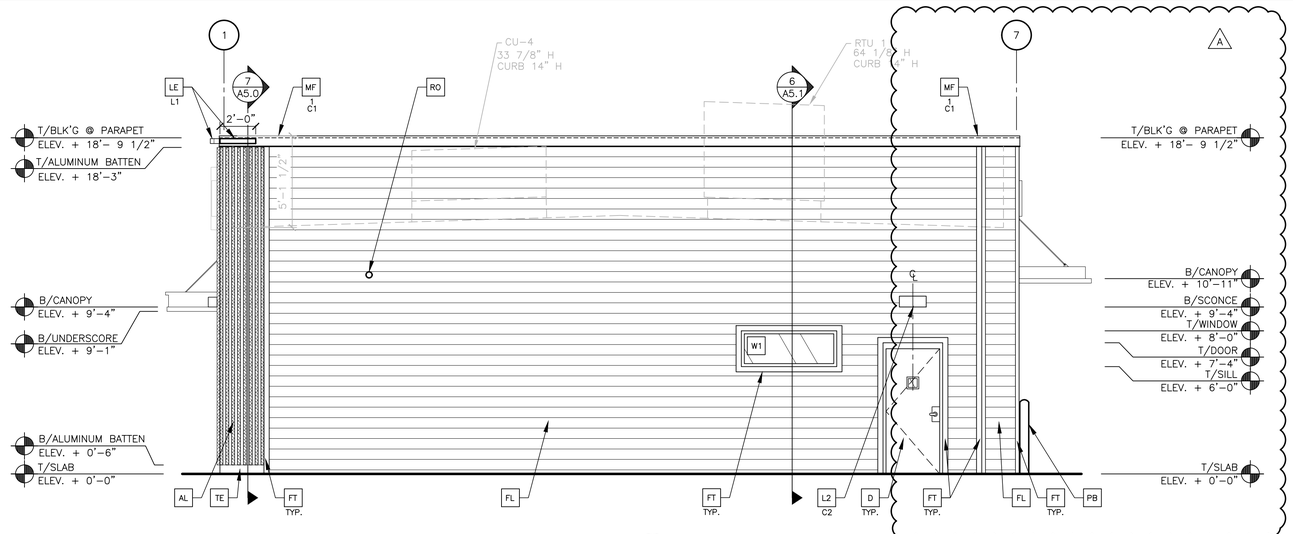
SITE ID: 020–0015
SITE ADDRESS: 413 MAIN ST.

SHEET NO. 020–0015.00.0
A2.0
ELEVATIONS

PROJECT No. 60704457 Task: 020–0015

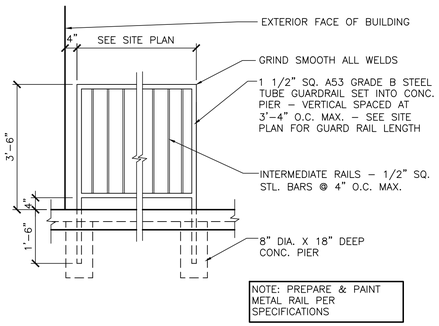


1 A2.1 **DRIVE THRU ELEVATION**
1/4" = 1'-0"

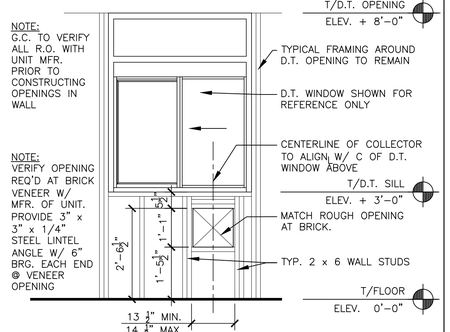


2 A2.1 **REAR ELEVATION**
1/4" = 1'-0"

3 A2.1 **NOT USED**
-



4 A2.1 **GUARD RAIL DETAIL**
1/2"=1'-0"



5 A2.1 **(RMHC) COIN COLLECTOR @ FRAMED WALL**
1/2" = 1'-0" INTERIOR ELEVATON

6 A2.1 **DETAIL NOT USED**
-

KEY NOTES:

- AL — ALUMINUM BATTEN SYSTEM
  MFR: B+N INDUSTRIES
  SIZE: 2"x2" PROFILE
  COLOR: WOOD GRAIN, BACKRAIL UNFINISHED, ENDCAP PAINTED TO MATCH
  SUBSTRATE: 1/2" EXTERIOR HIGH DENSITY OVERLAY (HDO) PLYWOOD, BB, GROUP 1, HDO BOTH FACES, APA TRADEMARKED. COURSE GRIT SAND SURFACES PRIOR TO PRIMING. PRIME AND PAINT BOTH SIDES AND ALL EDGES PRIOR TO INSTALLATION.
  SUBSTRATE COLOR: "IRON ORE" SW7069 BY SHERWIN WILLIAMS
- AP — ALPOLIC METAL PANEL (COLOR: RAL 7022)
- C1 — ALUMINUM CANOPY SYSTEM W/FASCIA
  COLOR: WHITE
- C2 — ALUMINUM CANOPY SYSTEM
  COLOR: RAL 7022
- C3 — ALUMINUM CANOPY TIEBACK
  COLOR: RAL 7022
  GC TO PROVIDE CONTINUOUS BLOCKING ON WALL BEHIND TIEBACKS
- CJ — CONTROL JOINT
  1 — TYPE: 1 = EIFS
- D — HOLLOW METAL DOOR
  PAINT: SHERWIN WILLIAMS SW-7019 GAUNTLET GRAY
- DE — DECAL BY GRAPHICS SUPPLIER
  SURFACE APPLIED, FIELD INSTALLED, PRE CUT, PRE SPACED.
  SUPPLIERS:
  VOMELA (865) 330-7337, ann.bowen@vomela.com
  GFX INTERNATIONAL (847) 543-4600, mcdonaldsdecor@gfxi.com
- DS — DOWNSPOUT PAINT TO MATCH SURROUNDING MATERIAL. CONNECT TO STORM LINE REFER PLUMBING & CIVIL
- E — EXTERIOR INSULATION FINISH SYSTEM (E.I.F.S.)
  C1 — COLOR:
  C1 = "IRON ORE" SW 7069 BY SHERWIN WILLIAMS
- FB — FILL BOX
  C02 — C02 = BULK CO2 FILL BOX (EQPM SCHEDULE ITEM 49.00)
  BO = BULK OIL FILL BOX (EQPM SCHEDULE ITEM 700.18)
- FL — FIBER CEMENT LAP SIDING: HARDIEPLANK LAP SIDING, SMOOTH, 8 1/4" WIDTH, 7" EXPOSURE, HZ5, COLOR SCHEME-STEEL: AGED PEWTER
- FT — FIBER CEMENT TRIM: HARDIETRIM BOARDS, 4/4 SMOOTH, 1 5/8" & 3 1/2" WIDTH, 3/4" THICK, HZ5, COLOR: AGED PEWTER (CHECK 1 5/8" PRE-PAINT AVAILIBLITY)
- GR — GUARD RAIL -SEE SITE PLAN FOR EXACT LOCATION AND LENGTHSEE 4/A2.1 FOR DETAILS
  PAINT: "IRON ORE" SW 7069 BY SHERWIN WILLIAMS
- L1 — RECESSED DOWN LIGHT FIXTURE - SEE ELECTRICAL
  COLOR: GOLD
- L2 — RADIAL SCONCE LIGHT FIXTURE - SEE ELECTRICAL
  C1 — COLOR:
  C1= WHITE
  C2= PLATINUM SILVER
- LE — ACCENT LIGHTING - SEE ELECTRICAL
  L1 — LED LIGHT:
  L1 = SLIM LED (DOWN ONLY)
  L2 = INTEGRAL CANOPY FIXTURE
  L3 = UP ONLY FLOOD FIXTURE
- PB — PIPE BOLLARD - PAINTED YELLOW
- PT — (RMHC) COIN COLLECTOR
  UNIT: APERTURE WPT, #DTA2013
  CALL 1-877-766-7642 TO ORDER
- MF — METAL FASCIA
  C1 — TYPE:
  1 = PRE-FAB ANCHOR-TITE FASCIA
  2 = BOTTOM TRIM AT METAL REVEAL PANEL
  3 = VERTICAL TRIM AT METAL REVEAL PANEL CORNERS, CLOSURES
  COLOR:
  C1= CITYSCAPE
  C2= RAL 7022
- RO — ROOF DRAIN OVERFLOW PIPE PAINT TO MATCH SURROUNDING MATERIAL
- S — McDONALD'S SIGNAGE BY OTHERS - UNDER SEPARATE PERMIT.
  C1 — COLOR:
  C1= WEATHERED ZINC RACEWAY
  C2= RAL 7022 RACEWAY
- ST — CO2 STROBE/ALARM. SEE MECHANICAL DRAWINGS FOR SPECIFICATION.
- TE — TRU EXTERIOR 1"X6" TRIM, PAINTED ON SITE
  COLOR: "IRON ORE" SW 7069 BY SHERWIN WILLIAMS
- UN — METAL UNDERSCORE
  COLOR: GOLD
- W1 — EXTERIOR WINDOW ASSEMBLY - TEMPERED GLASS
  COLOR: EXTRA DARK BRONZE - SEE ASSEMBLY NOTES ON 4/A5.0 & FRAME TYPES ON SHEET A6.0
- W2 — DRIVE-THRU WINDOW BY READY ACCESS
  MODEL: 600 SERIES, 36" SERVICE HEIGHT WITH TRANSOM, MANUAL OPEN; ELECTRONIC RELEASE
  XX — COLOR: DEEP BRONZE
  SLIDE DIRECTION: RL = RIGHT TO LEFT
  LR = LEFT TO RIGHT

BY	DESCRIPTION	DATE	REV
	ADJUST DT WINDOW DIMENSIONS AND EQUIPMENT + REMOVE BGC	8/10/2023	A

DATE: .....

PREPARED BY:

AECOM TECHNICAL SERVICES
ARCHITECTS / ENGINEERS, INC.
1255 Broad Street, Suite 201
Clifton, NJ 07013-3988
973.883.8570 fax 973.883.8501
http://www.aecom.com

PREPARED FOR: **McDonald's USA, LLC**

DRAWN BY	STD ISSUE DATE
RM	2022_09
REVIEWED BY	DATE ISSUED
WL	04-25-2023

READING, MA

TITLE: 2022 STANDARD BUILDING - BB20
4587-WOOD/WOOD
DESCRIPTION: WOOD BEARING WALLS W/ HARDIE BOARD SIDING & CI
WOOD ROOF TRUSS FRAMING
EFIS/BATTEN/ALPOLIC PANEL/HARDIE BOARD SIDING

SITE ID: 020-0015
SITE ADDRESS: 413 MAIN ST.

SHEET NO.: 020-0015.00.0
A2.1
ELEVATIONS

PROJECT No. 60704457 Task: 020-0015

352 Turnpike Road
Southborough, MA 01772
508.480.9900

McDonald's
413 Main Street, Reading, MA
Project Narrative & Impact Statement

Project Narrative:

McDonald's is proposing a substantial investment into the above-mentioned property to redevelop the existing McDonald's restaurant which has been in existence and operation since 1963. The parcel is located along the easterly side of Main Street in Reading and is identified as Map #17 and Lots #64 and #85 which contains approximately ±0.74 acres of land.

Under existing conditions, the site features a ±3,745 SF restaurant with an outdoor playground area and single lane, single order point drive-thru. The site has a total of three access drives, including one entrance only and one exit only access to Main Street, and one two-way drive to Bolton Street. The proposed redevelopment project consists of a raze and rebuild for a new ±3,970 SF McDonald's restaurant with drive-thru along with new parking areas, landscaping, utilities, and stormwater management improvements.

In an effort to improve their existing drive-thru operations, which exist today as a single order point and single lane drive-thru, McDonald's is proposing a side-by-side drive-thru layout with two (2) lanes and two (2) order points. The proposed side-by-side layout includes two (2) new digital menu board and one (1) new digital pre-browse boards. To accommodate the proposed layout, the parking count will be reduced by 13 spaces (43 existing vs 30 proposed). A recirculation lane is also proposed at the front of the building which allows vehicles needing to recirculate the site to do so without having to exit out and re-enter the site from the Main Street right-of-way. No changes to the existing site access drives are proposed.

The proposed building layout is similar to the existing as there is a large 4'x6' underground box culvert running east to west across the middle of the property that is proposed to be maintained, constraining potential layouts. A culvert assessment was conducted by Whitestone Associates who completed an inspection of the existing culvert and did not identify any significant issues with the existing condition.

In addition to the Site Plan Review and Special Permit applications the proposed project requires a Zoning Board of Appeals Special Permit to modify the existing non-conforming restaurant with drive-through window use within the Bus B Zoning district and a Variance for the proposed digital drive-through menu boards that are considered electronic signs which are prohibited. This application was submitted and approved by the Zoning Board of Appeals (ZBA) at a 7/25/23 Hearing. During this hearing, a direct abutter at 4 Bolton Street, voiced potential concerns regarding negative impacts to sound pollution on their property. The ZBA approved the site plan with a 12' high Tuf-Barrier Sound Reflective Wall with an STC rating of 31. However, through additional discussions with the abutter after the ZBA approval McDonald's has agreed to upgraded the wall to a Silent Protector Plus (STC-39 rated) model to address the abutters concern. The remaining fence line proposes an 8' high vinyl fence. To provide further mitigation, the layout had been revised to provide an additional landscape buffer in front of the fence containing shrubs and McDonald's will close the outside drive-thru lane at 9 PM. The lane will be closed by turning off the order speaker and placing a sign in front of the lane which will state this lane closes at 9 PM daily. Indoor dining and the primary drive-thru lane will remain open until 12 am. Under existing conditions there is only a 6' wooden fence existing today directly against the existing parking lot and as such the abutter has agreed this should be a significant improvement and did not have any further concerns with the proposed project at the time of the issuance of this letter.

The project will also require a Notice of Intent from the Conservation Commission for work within 100' of an open channel. This application will be submitted concurrently with the CPDC applications.

Municipal Services:

The site has been operating with an existing McDonald's restaurant since 1963 and no changes to the existing use are proposed as part of the project. Therefore, it is anticipated that the water and sewer demand will not increase under proposed conditions. In addition, the proposed building will have upgraded technology and utilities in the kitchen and bathroom facilities which will be an improvement from existing conditions.

Stormwater runoff generated from the proposed project will also be reduced from pre-development conditions. Under existing conditions, runoff from the majority of the northern portion of the site sheet flows to one of three existing catch basins on-site. These catch basins convey stormwater to an existing underground box culvert which flows West to East through the site. A smaller area at the northwest corner of the property drains to a catch basin which connects directly to the municipal system within Main Street. Stormwater generated under proposed conditions has been designed to drain to deep-sump, hooded catch basins to the maximum extent practicable based on the existing topography and drainage conditions. The catch basins will capture and convey stormwater runoff, via an underground pipe system and drainage manholes, to the existing stormwater management system. Pretreatment of stormwater runoff will be provided to the maximum extent practicable by a combination of the deep-sump and hooded catch basins and a stormwater quality unit prior to discharge into the existing underground culvert and municipal stormwater management system. The existing underground culvert is proposed to be maintained which has constrained the proposed site layout and stormwater management system design. In addition to the stormwater management system improvements, the proposed site improvements result in a reduction of the overall impervious area on the site by approximately 3,775 square feet.

Hours of Operation:

The hours of operation are expected to be maintained with lobby and drive-through open 6:00 AM – 12:00 AM Monday-Friday.

Landscaping and Lighting:

As part of the proposed project, the landscaping will be significantly improved over the existing condition. Under existing conditions, there is very little vegetation on site. The proposed project will reduce the overall impervious area on site by approximately 3,775 square feet, and a total of 40 canopy and evergreen trees and approximately 116 shrubs are proposed as part of the project. Please refer to Sheet C-701 of the "Proposed Site Plan Documents" for additional information.

Lighting will also be improved through the installations of new light poles and dark sky compliant, shielded, LED light fixtures. The project proposes six (6) pole mounted lights at a height of 21-ft. Please refer to Sheet C-703 of the "Proposed Site Plan Documents" for additional information.

Traffic & Parking:

Under existing conditions, the site has one (1) enter only and one (1) exit only driveway along Main street and one (1) full-access driveway along Bolton Street. The project proposes to maintain the existing curb cuts and access with one-way circulation is proposed around the site. To accommodate the proposed layout, the parking count is proposed to be reduced by 13 space (43 existing vs 30 proposed). A recirculation lane is also proposed at the front of the building which allows vehicles needing to recirculate the site to do so without having to exit out to re-enter the site within the Main Street right-of-way.

Please refer to the Traffic Assessment prepared by McMahon Associates included in this submittal Package for additional information.

Trash Removal & Hazardous Materials Storage:

There is an existing trash enclosure at the northeast corner of the property that is proposed to be reconstrued with a new 16'x30' trash enclosure. McDonald's has control over their trash pickup schedules which are designed to happen during off-peak hours to avoid potential impacts to restaurant operations. No hazardous material are anticipated to be stored on the property.

Resource Areas – Wetlands/Rivers/Floodplains/Habitats:

There is an open brook channel which is routed into an underground 4' x 6' concrete culvert at the center of the east property line and flows underground through the middle of the property into another open channel across main street. Based on discussions with the Conservation Agent, the open channel is considered a resource area with a 100' buffer which a large portion of the property is located in.

The existing culvert was inspected by Whitestone Associates who determined that there were no significant concerns with its condition. The culvert is proposed be maintained and protected during construction. Runoff from a portion of the existing site is routed into the existing culvert. Under proposed conditions a portion of the site will continue to drain to the culvert with no increase in flow rates or volumes. Two (2) stormwater quality units are proposed to treat runoff prior to discharge into the culvert at the two proposed locations which will be an improvement over existing conditions. It is notable that the proposed project is anticipated to result in a ±3,210 square foot reduction in impervious area within the 100' resource area buffer. Please refer to sheet C-401 and the Drainage Report for more information.

Construction Impacts & Anticipated Schedule:

All construction activities will be limited to within the parcel limits with the exception of any utility connections and proposed soil erosion and sediment control measures.

Construction is proposed to begin in the Spring of 2024 with a potential restaurant opening in Fall 2024.

Town of Reading

16 Lowell Street
Reading, MA 01867-2683
Phone: 781-942-6670
Email: amacnichol@ci.reading.ma.us

Community Planning and Development Commission

NOTICE OF PUBLIC HEARING

Notice is hereby given that, under M.G.L. Ch. 40A §9 and Sections 4.3, 4.4, 4.6, and 8.0 of the Reading Zoning Bylaw, the Community Planning and Development Commission (CPDC) will hold a Public Hearing on **Monday, September 11, 2023 at 7:45 PM, in the Select Board Room at Town Hall, 16 Lowell Street, Reading MA, and through the remote and online measures below,** to hear the Site Plan Review and Special Permit application submitted by McDonald's USA, LLC c/o Bohler, for the property located at **413 Main Street** (Assessors Map 17, Lots 64 & 85). The Applicant is proposing to raze the existing McDonald's restaurant and build a 3,970 SF McDonald's restaurant with new parking, landscaping, and a new side-by-side drive-thru with two lanes. A Special Permit is being sought for proposed signage. A copy of the application and accompanying plans are available to the public at Town Hall by appointment and on the Town website the Thursday prior to the hearing.

Join Zoom Meeting
https://us06web.zoom.us/j/83720541665

Meeting ID: 837 2054 1665

Dial by your location
+1 646 558 8656 US (New York)

Find your local number:
https://us06web.zoom.us/u/kILHjldo5

If you have any questions, comments, or difficulty accessing the meeting, please email Community Development Director Andrew MacNichol at amacnichol@ci.reading.ma.us.

Reading Community Planning & Development Commission

352 Turnpike Road
Southborough, MA 01772
508.480.9900

October 2nd, 2023

Town of Reading
Community Planning & Development Commission
Attn: Andrew MacNichol
16 Lowell Street
Reading, MA 01867

Re: Site Plan Review, Special Permit, & Sign Application
McDonald's Restaurant
413 Main Street
Reading, MA

Dear Mr. MacNichol,

On behalf of McDonald's USA, LLC, please find the enclosed application for Site Plan Review, request for Special Permit for a proposed monument sign, and site signage applications as part of the proposed site improvements of the McDonald's Restaurant located at 413 Main Street. In support of this application, please find enclosed the following documents:

- One (1) copy of the Site Plan Review Application & Check List;
- One (1) copy of the owner authorization letter;
- Two (2) copies of the Project Narrative & Impact statement;
- Two (2) 24"x36" copies of the "Proposed Site Plan Documents" prepared by Bohler Engineering, dated 4/28/2023, revised 8/9/2023;
- Three (3) 11"x17" copies of the "Proposed Site Plan Documents" prepared by Bohler Engineering, dated 4/28/2023, revised 8/9/2023;
- Two (2) 24"x36" copies of the Building Elevations and Floor Plan prepared by AECOM, dated 4/25/2023;
- Three (3) 11"x17" copies of the Building Elevations and Floor Plan prepared by AECOM, dated 4/25/2023;
- Three (3) 11"x17" copies of the Colored Building Elevations;
- Three (3) 11"x17" copies of the Fence Section Rendering;
- Three (3) copies of the Existing and Proposed Stacking Exhibits;
- Three (3) copies of the Truck Circulation Plan;
- Two (2) copies of the Drainage Report, prepared by Bohler dated July 28, 2023;
- Two (2) copies of the Traffic Assessment prepared by McMahon Associates, dated 4/26/2023;
- Seven (7) copies of the sign applications;
- Seven (7) copies of the sign program book;
- Three (3) copies of the Sewer Memo;
- Plain white envelopes labeled with abutters' addresses, postage stamp, & no return address; and
- Check in the amount of $7,500 made out to the Town of Reading for the application fee

McDonald's is proposing a substantial investment into the above-mentioned property to redevelop the existing McDonald's restaurant which has been in existence and operation since 1963. The parcel is located along the easterly side of Main Street in Reading and is identified as Map #17 and Lot #64 and #85 which contains approximately ±0.74 acres of land.

Under existing conditions, the site features a ±3,745 SF restaurant with an outdoor playground area and single lane, single order point drive-thru. The site has a total of three access drives, including one entrance only and one exit only access to Main Street, and one two-way drive to Bolton Street. The proposed redevelopment project consists of a raze and rebuild for a new ±3,970 SF McDonald's restaurant with drive-thru along with new parking areas, landscaping, utilities, and stormwater management improvements.

McDonald's operating hours for indoor dining and drive-thru operations are anticipated to be 6am-12am while the outside drive-thru lane will be closed at 9 pm daily. The lane will be closed by turning off the order speaker and placing a sign in front of the lane which will state this lane closes at 9 PM daily.

In an effort to improve their existing drive-thru operations, which exist today as a single order point and single lane drive-thru, McDonald's is proposing a side-by-side drive-thru layout with two (2) lanes and two (2) order points. The proposed side-by-side layout includes two (2) new digital menu board and one (1) new digital pre-browse boards. To accommodate the proposed layout, the parking count will be reduced by 13 spaces (43 existing vs 30 proposed). A recirculation lane is also proposed at the front of the building which allows vehicles needing to recirculate the site to do so without having to exit out and re-enter the site from the Main Street right-of-way. No changes to the existing site access drives are proposed.

The proposed building layout is similar to the existing as there is a large 4'x6' underground box culvert running east to west across the middle of the property that is proposed to be maintained, constraining potential layouts. A culvert assessment was conducted by Whitestone Associates who completed an inspection of the existing culvert and did not identify any significant issues with the existing condition.

In addition to the Site Plan Review and Special Permit applications the proposed project requires a Zoning Board of Appeals Special Permit to modify the existing non-conforming restaurant with drive-through window use within the Bus B Zoning district and a Variance for the proposed digital drive-through menu boards that are considered electronic signs which are prohibited. This application was submitted and approved by the Zoning Board of Appeals (ZBA) at a 7/25/23 Hearing. During this hearing, a direct abutter at 4 Bolton Street, voiced potential concerns regarding negative impacts to sound pollution on their property. The ZBA approved the site plan with a 12' high Tuf-Barrier Sound Reflective Wall with an STC rating of 31. However, through additional discussions with the abutter after the ZBA approval McDonald's has agreed to upgraded the wall to a Silent Protector Plus (STC-39 rated) model to address the abutters concern. The remaining fence line proposes an 8' high vinyl fence. To provide further mitigation, the layout had been revised to provide an additional landscape buffer in front of the fence containing shrubs and McDonald's will close the outside drive-thru lane at 9 PM. Under existing conditions there is only a 6' wooden fence existing today directly against the existing parking lot and as such the abutter has agreed this should be a significant improvement and did not have any further concerns with the proposed project at the time of the issuance of this letter.

The project will also require a Notice of Intent from the Conservation Commission for work within 100' of an open channel. This application will be submitted concurrently with the CPDC applications.

The Applicant is requesting a Special Permit per Section 8.6 of the Town of Reading Zoning Bylaws to construct a 25 SF monument sign 7' in height. Regulations require the sign to be setback 20' but due to site layout constraints the sign is proposed to be setback 5' from the property line. The majority of quick serve restaurants business come from pass-by traffic. That said having adequate signage is imperative not only to their business but also for matter of safety to ensure vehicles have sufficient time to recognize the restaurant with enough time to safely react and make a safe turning movement to the property. Not having a monument sign as proposed would reduce pass-by customer recognition time of the property and therefore could result in less safe vehicle movements. Pursuant to Section 4.4.5 of the Town of Reading Zoning Bylaw, we believe the proposed site improvements are in line with the required conditions for a Special Permit:

- *4.4.5.1 The proposed use will be suitably located in the neighborhood in which it is proposed and in relation to the entire Town.*

  No changes to the existing use, which has been in existence since 1963, are proposed as it will remain as a restaurant with drive-through service. The proposed monument sign is anticipated to be in consistent character in relation to the entire Town and neighborhood. There are freestanding pole mounted signs which exist for other uses south along Main

Street while the proposed monument sign will be aligned with the sign type preferred by the town.

- *4.4.5.2 The proposed use will be compatible with existing uses and other uses permitted by right in the same district.*

  No changes to the existing use, which has been in existence since 1963, are proposed as it will remain as a restaurant with drive-through service. The proposed monument sign is anticipated to be compatible with the other existing commercial businesses within the Bus B district.

- *4.4.5.3 The proposed use will not constitute a nuisance due to air and water pollution, flood, noise, dust, vibration, lights, or visually offensive structures and accessories.*

  No changes to the existing use of the property are proposed. The proposed monument sign is not anticipated to constitute a nuisance due to air and water pollution, flood, noise, dust, vibration, lights, or visually offensive structures and accessories.

- *4.4.5.4 The proposed use will not be a substantial inconvenience or hazard to abutters, vehicles, or pedestrians.*

  The proposed monument sign is not anticipated to be a substantial inconvenience or hazard to abutters, vehicles, or pedestrians. In fact, the majority of quick serve restaurants business come from pass-by traffic. That said having adequate signage is imperative not only to their business but also for matter of safety to ensure vehicles have sufficient time to recognize the restaurant with enough time to safely react and make a safe turning movement to the property. Not having a monument sign as proposed would reduce pass-by customer recognition time of the property and therefore could result in less safe vehicle movements.

- *4.4.5.5 Adequate and appropriate facilities will be provided for the proper operation of the proposed use.*

  Adequate and appropriate facilities will be provided for the proper operation of the proposed McDonald's restaurant. The proposed monument sign has no moving or digital parts, and landscaping will be maintained on site and in proximity to the proposed monument sign. Therefore, it is anticipated proper operation will be provided for the proposed monument sign.

- *4.4.5.6 Adjoining premises will be reasonably protected against any possible detrimental or offensive uses on the site, including unsightly or obnoxious appearance.*

  Adjoining premises will be reasonably protected against any possible detrimental or offensive uses on it. A 12' high sound wall is proposed along the east property line to provide improved sound mitigation to the abutting property where only a 6' high wooden fence exists today. The proposed monument sign is not anticipated to be unsightly or obnoxious in appearance.

- *4.4.5.7 The proposed use will be in conformance with the sign regulations of Section 8 of the Zoning Bylaw.*

  The proposed monument sign is to have a sign face area of 25 SF and be 7' in height in conformance with the sign regulations of Section 8 of the Zoning Bylaws. Refer to Sheet C-301 of the "Proposed Site Plan Documents" for additional information.

- *4.4.5.8 The proposed use will provide convenient and safe vehicular and pedestrian movement within the site in relation to adjacent streets, property or improvements.*

  The location of the proposed monument sign is outside of the site lines of vehicles entering and exiting the site. Therefore, it is not anticipated that the proposed monument sign will be detrimental to the convenient and safe vehicular and pedestrian movement within the site and in relation to adjacent streets.

- *4.4.5.9 Adequate space will be provided for the off-street loading and unloading of vehicles, goods, products, materials, and equipment incidental to the normal operation of the proposed use.*

  The proposed monument sign is not anticipated to have an effect on off-street loading operations.

- *4.4.5.10 Adequate methods of disposal and storage will be provided for sewage, refuse and other wastes resulting from the proposed uses, and adequate methods of drainage will be provided for surface water.*

  The proposed monument sign is not anticipated to have an effect on methods of disposal and storage of sewage, refuse, and other wastes from the proposed use.

- *4.4.5.11 The proposed uses will ensure protection from flood hazards, considering such factors as elevation of buildings, drainage, adequacy of sewage disposal, erosion and sedimentation control, equipment location, refuse disposal, storage of buoyant materials, extent of paving, effect of fill, roadways, or other encroachments on flood runoff and flow.*

  The proposed monument sign is not anticipated to have an effect on flood hazard protection.

- *4.4.5.12 The proposed use will ensure protection of water quality in both public and private supplies.*

  The proposed monument sign is not anticipated to have an effect on water quality in both public and private supplies.

We trust that the provided information will be sufficient for the Community Planning & Development Commission's review, however, should you have any questions or need additional information, please do not hesitate to contact us at 508-480-9900. Otherwise, we appreciate the Community Planning & Development Commission's consideration of this matter and look forward to discussing this at the next available Community Planning & Development Commission meeting.

Sincerely,

BOHLER ENGINEERING

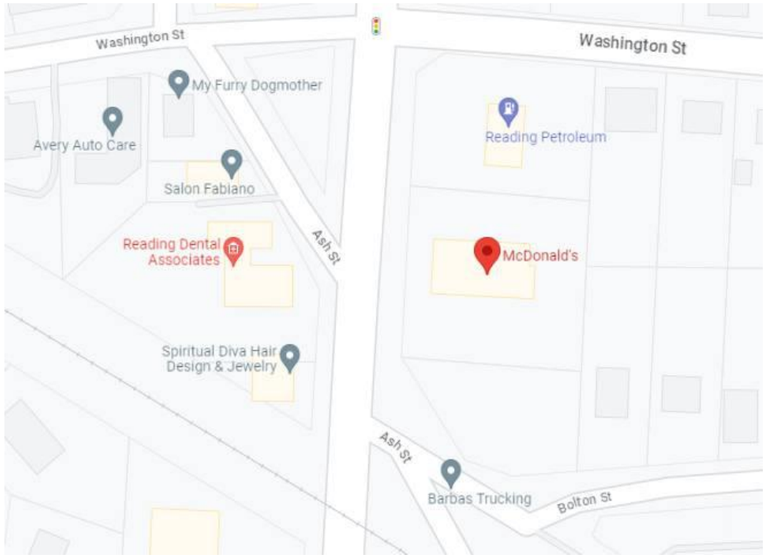
Eric G. Dubrule, PE

Daniel Allen, PE

McDonald's

413 MAIN ST - READING, MA 01867

SIGN PROGRAM BOOK



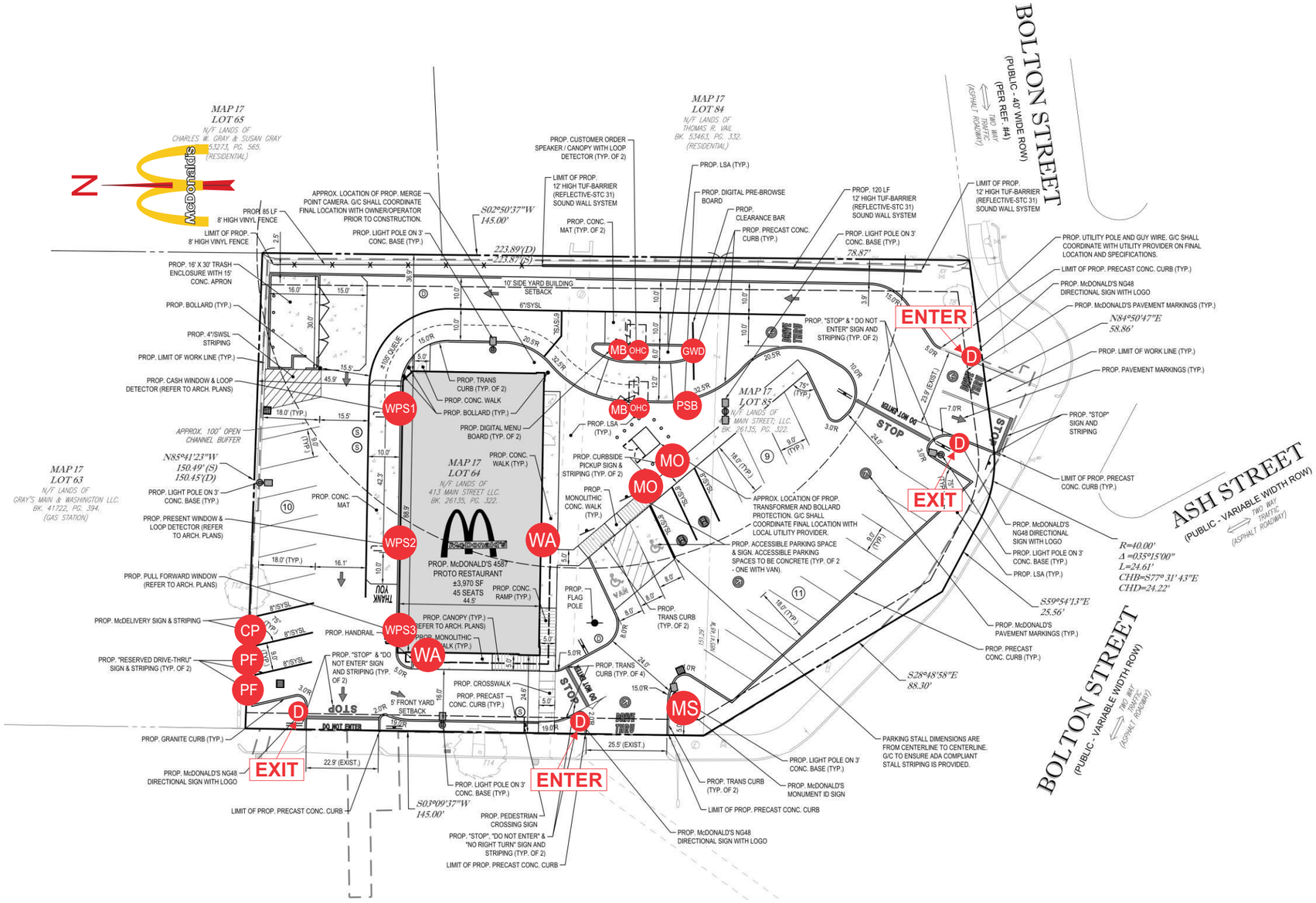
VICINITY MAP
NTS

persona
SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

Customer: MCDONALD'S	Project No.: 396498	Request No.: 48800	
Location: READING, MA	Prepared By: QP		
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA	Date: 08/03/23	Revision: 5	

Customer Approval (Please Initial):

Approval Date:

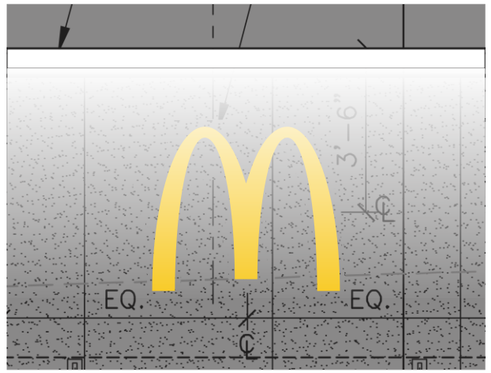


- PSB ···· DIGITAL PRE-SELL BOARD
- GWD ···· DOUBLE ARM GATEWAY
- OHC ···· ORDER HERE CANOPY (QTY 2)
- MB ···· DIGITAL MENU BOARD (QTY 2)
- WPS1 ···· WINDOW POSITION SIGN 1
- WPS2 ···· WINDOW POSITION SIGN 2
- WPS3 ···· WINDOW POSITION SIGN 3
- PF ···· PULL FORWARD SIGN (QTY 2)
- MO ···· MOBILE ORDER SIGN (QTY 2)
- CP ···· COURIER PARKING SIGN (QTY 1)
- WA ···· WALL ARCH (QTY 2)
- D ···· DIRECTIONAL (QTY 4)
- MS ···· MONUMENT SIGN

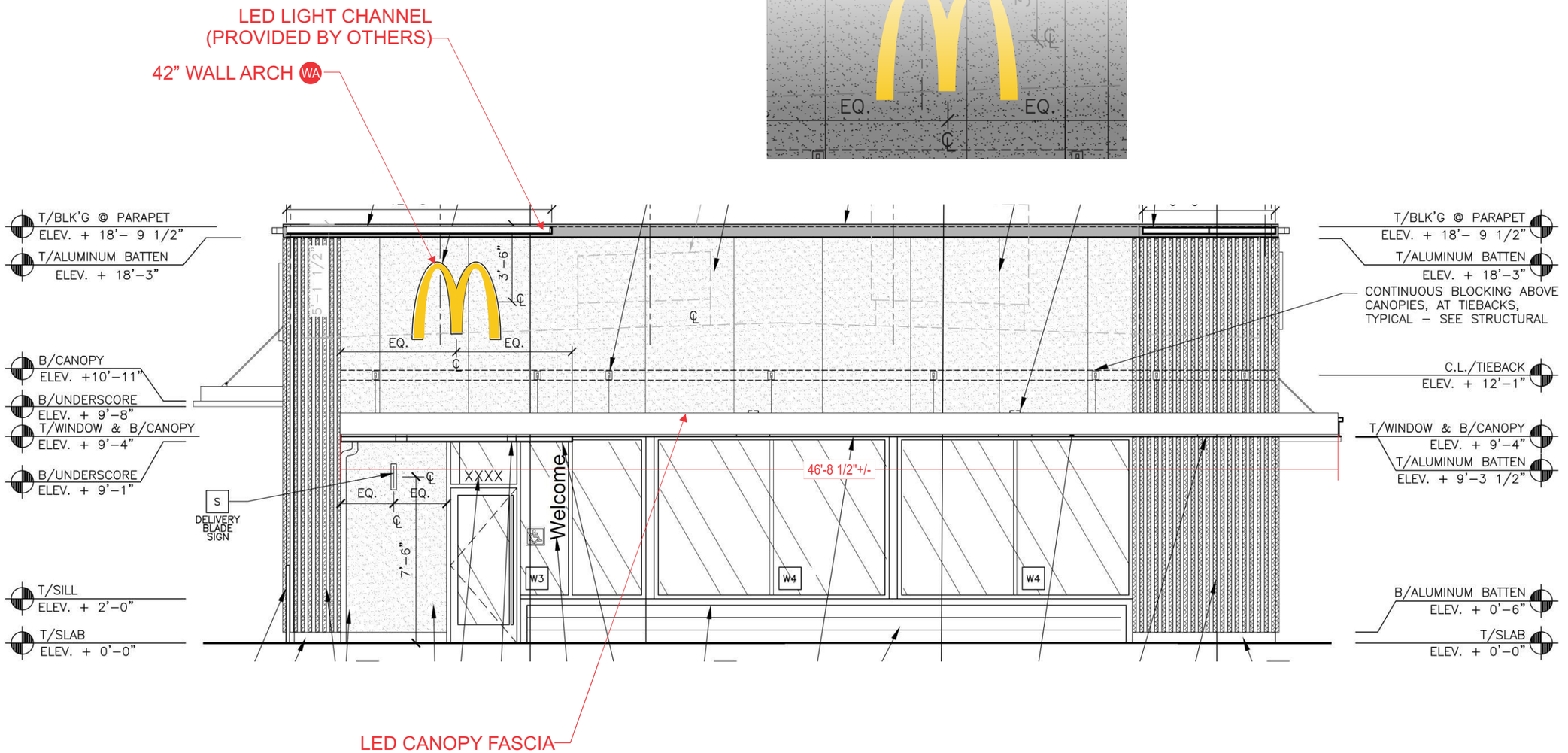
persona SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

Customer: MCDONALD'S	Project No.: 396498	Request No.: 48800	Customer Approval (Please Initial):
Location: READING, MA	Prepared By: QP		
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA	Date: 09/07/23	Revision: 5	Approval Date:

NIGHT VIEW - NTS



WEST (FRONT) ELEVATION
SCALE: 3/16" = 1'-0"



persona
SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

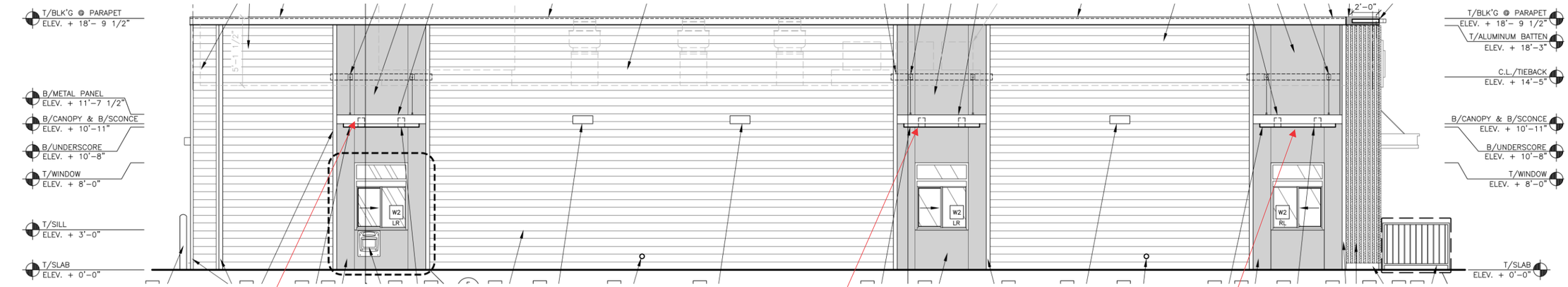
Customer: MCDONALD'S	Project No.: 396498	Request No.: 48800	
Location: READING, MA	Prepared By: QP/JR		
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA	Date: 09/11/23	Revision: 5	

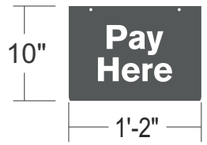
Customer Approval (Please Initial):

Approval Date:

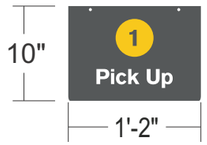
SOUTH (DRIVE-THRU) ELEVATION

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

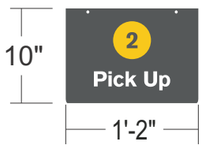




WINDOW POSITION SIGN 1 WPS1



WINDOW POSITION SIGN 2 WPS2



WINDOW POSITION SIGN 3 WPS3

persona
SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

Customer: MCDONALD'S	*Project No.:* 396498	*Request No.:* 48800	
Location: READING, MA	*Prepared By:* QP/JR/CTM		
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA	*Date:* 09/26/23	*Revision:* 5	

Customer Approval (Please Initial):

Approval Date:

EAST (NON DRIVE-THRU) ELEVATION
SCALE: 1/8" = 1'-0"

NIGHT VIEW - NTS

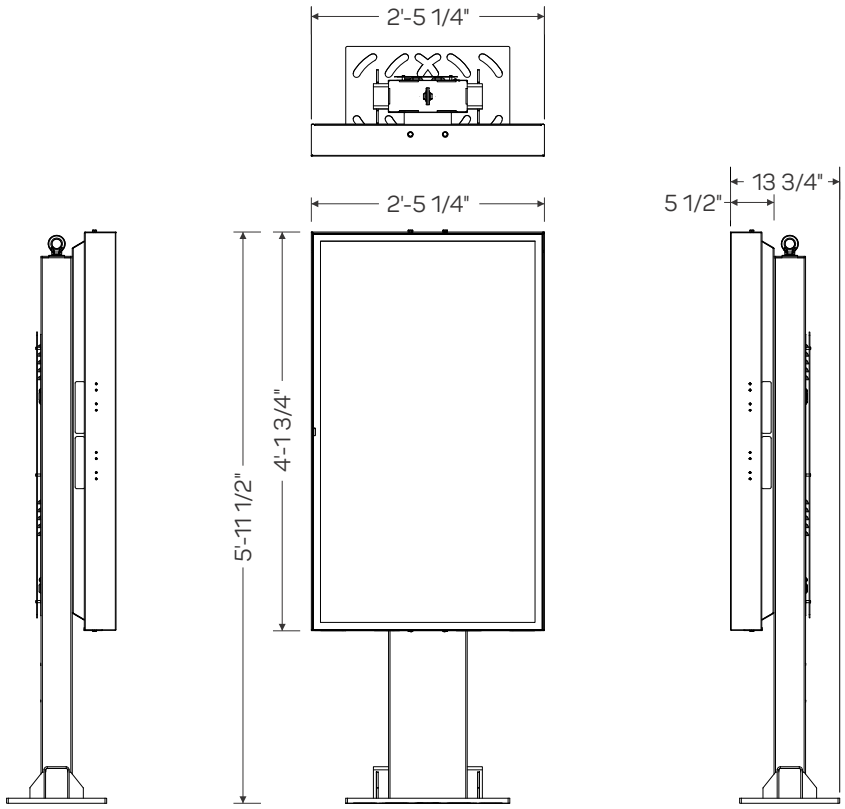
persona
SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

Customer: MCDONALD'S	*Project No.:* 396498	*Request No.:* 48800	*Customer Approval (Please Initial):*
Location: READING, MA	*Prepared By:* QP/JR		*Approval Date:*
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA	*Date:* 09/11/23	*Revision:* 5	

Frame	**Hot dip galvanized + anti-graffiti powder coated steel**
Brackets	**Hot dip galvanized**
Panels	**Aluminium + anti-graffiti powdercoat**
Access fasteners	**Security Torx**
Media player access	**Dual camlock**
Eyebolt	**Stainless crane on**
Baseplate	**McDonalds spec triple mounting pattern option**

ODMB 02 SINGLE

Displays	**Samsung OH55F**
Hardware	**Stratacache Spectra NG**
Heating/Cooling	**Watlow 100W Heater** **Sunon 120mm AC Fan**
Power Supply Units	**60W DC Media Player Power Supply**
Power Cables	**1 x IEC Power Cable**
Electrical Components	**Isolated Ground** **2 x IG Receptacles** **20A Circuit Breaker**
Communication Cables	**2 x HDMI** **1 x RS232**
Certification	**UL Certified**



SCALE: 1/2" = 1'-0"

GRAPHIC DETAIL
NOT TO SCALE

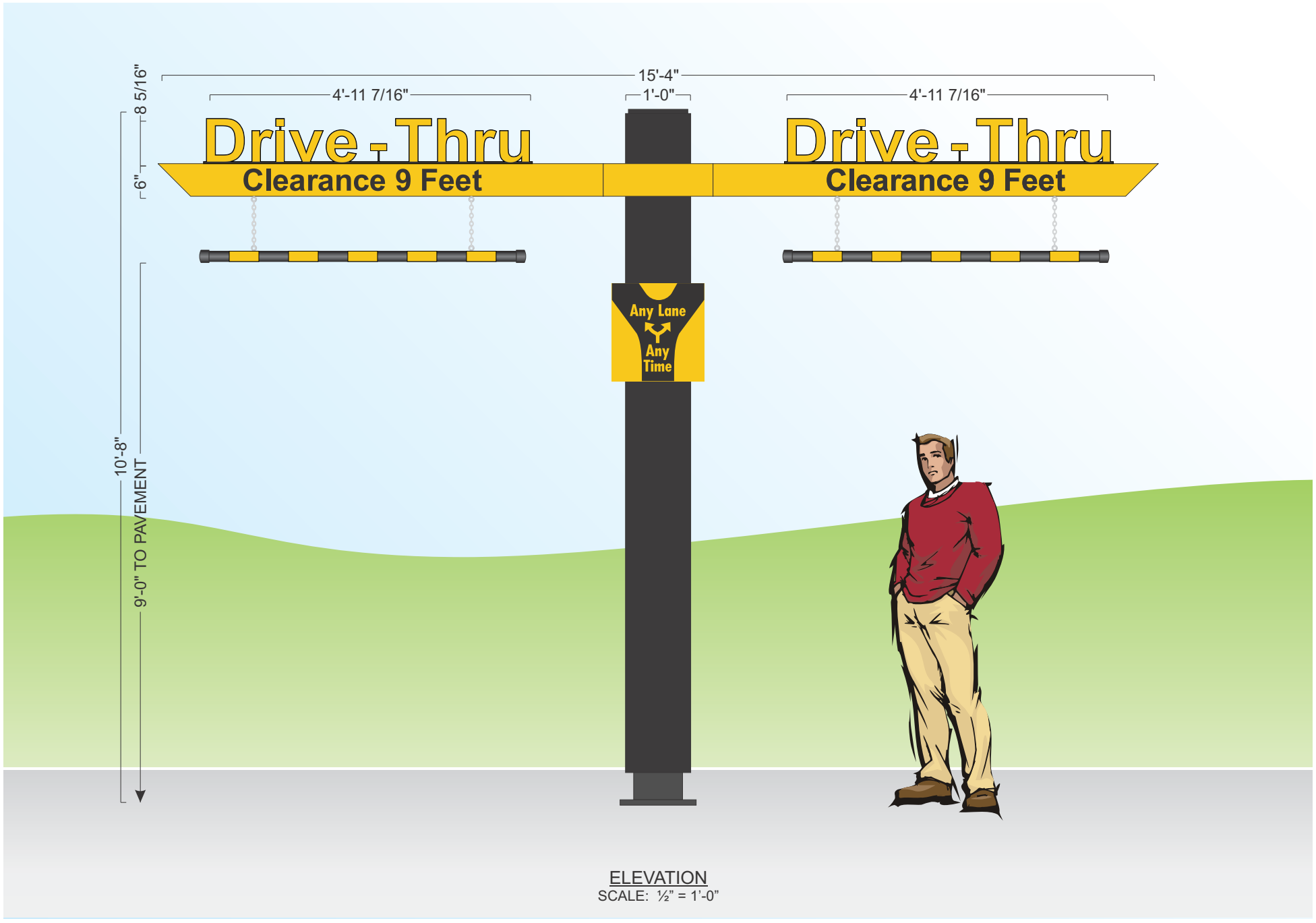
persona
SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 · www.personasigns.com

Customer: MCDONALD'S		Project No.: 396498	Request No.: 48800
Location: READING, MA		Prepared By: QP	
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA		Date: 08/03/23	Revision: 5

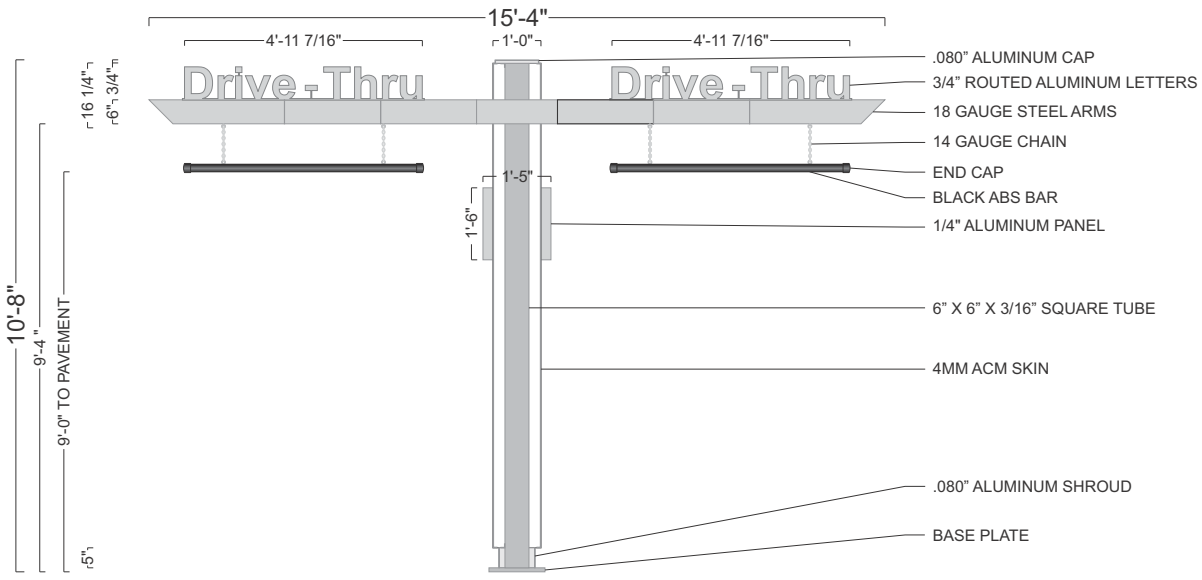
This sign is intended to be installed in accordance with the requirements of Article 600 of the National Electric Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

Customer Approval (Please Initial):

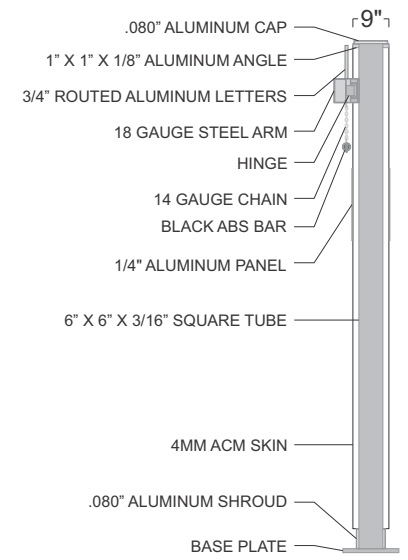
Approval Date:



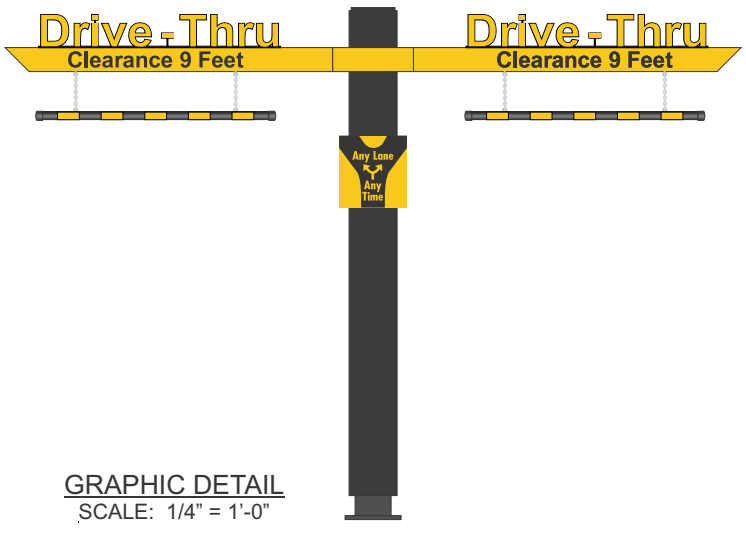
ELEVATION
SCALE: ½" = 1'-0"



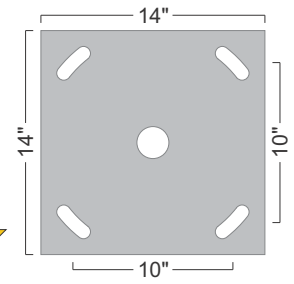
FRONT VIEW
SCALE: 1/4" = 1'-0"



END VIEW
SCALE: 1/4" = 1'-0"



GRAPHIC DETAIL
SCALE: 1/4" = 1'-0"



1" X 14" X 14" PLATE
7/8" HOLES
2" CENTER HOLE
3/4" ANCHOR BOLTS

BASE PLATE DETAIL
SCALE: 1" = 1'-0"

POLE COVER DETAIL
DESIGN FACTOR: TBD
4MM CHARCOAL ACM POLE COVER
.080" ALUMINUM CAP AND SHROUD
EXTERIOR FINISH:
POLE COVER - PRE-FINISHED CHARCOAL
SHROUD AND BASE PLATE - MATCH B.M. 1631 MIDNIGHT OIL

CLEARANCE BAR DETAIL
BLACK ACM PIPE W/ 180-25 GOLD
VINYL STRIPES APPLIED 1ST SURFACE

SQUARE FEET: BOXED = 163.56
ACTUAL = 20.22

PANEL DETAIL
1/4" ALUMINUM PANEL W/ 1ST SURFACE PAINT & VINYL DECO.:
MATCH PMS 123 C GOLD - BACK-GROUND, COPY & ARROW
3630-22 BLACK - LANES

SWING ARM DETAIL
DESIGN FACTOR: TBD
18 GAUGE STEEL ARM WITH HINGE W/ 1ST SURFACE PAINT AND VINYL DECORATION:
MATCH PMS 123 C GOLD - SWING ARM
7725-12 BLACK - "CLEARANCE 9 FEET" COPY

"DRIVE-THRU" LETTER DETAIL
3/4" ROUTED ALUMINUM LETTERS W/ 1ST SURFACE VINYL DECORATION:
180-25 GOLD - "DRIVE-THRU" COPY
BLACK - COPY OUTLINE

persona SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

Customer: MCDONALD'S	Project No.: 396498	Request No.: 48800	
Location: READING, MA	Prepared By: QP		
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA	Date: 08/03/23	Revision: 5	

This sign is intended to be installed in accordance with the requirements of Article 600 of the National Electric Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

Customer Approval (Please Initial):

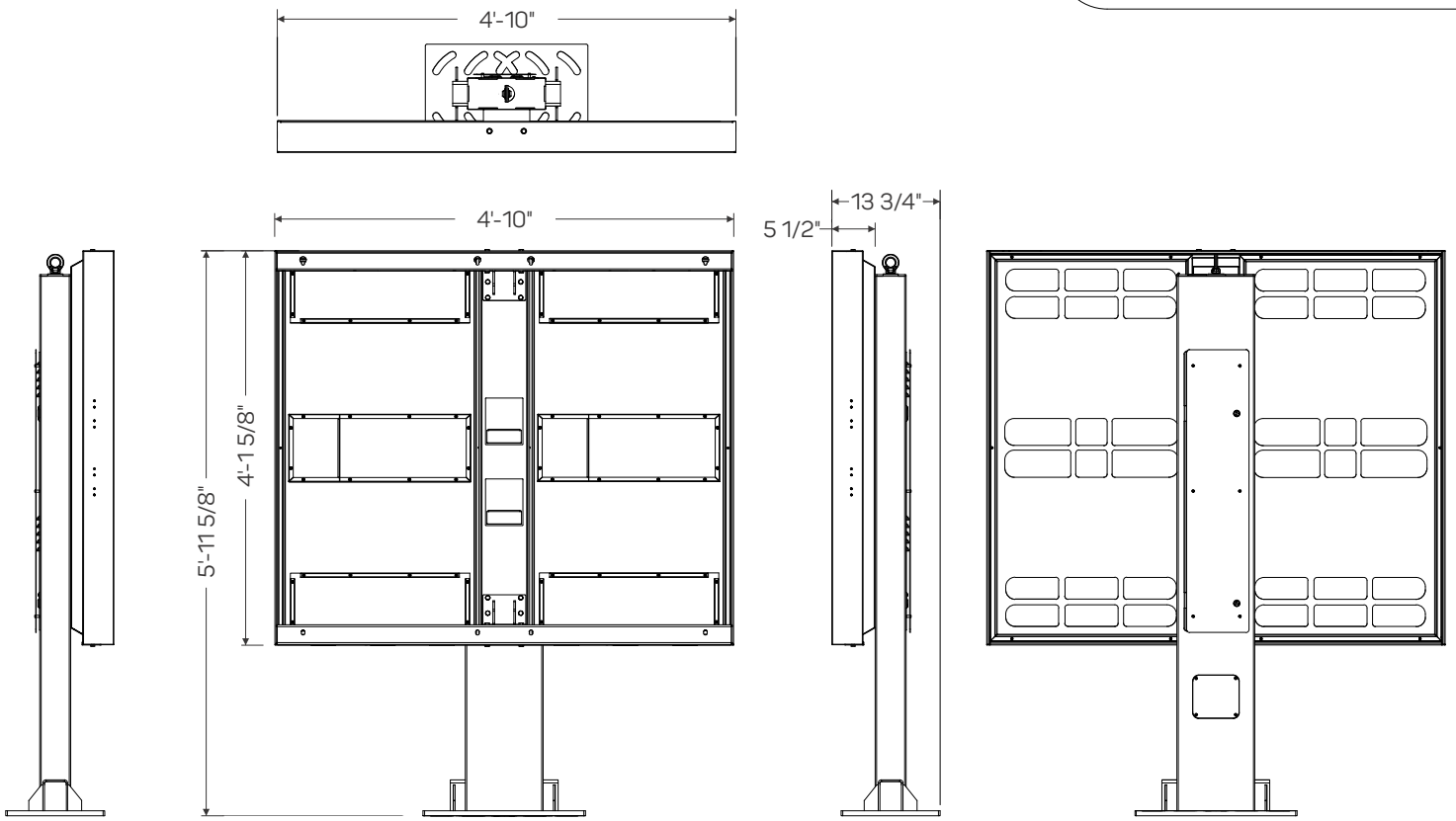
Approval Date:

MB

Frame	**Hot dip galvanized + anti-graffiti powder coated steel**
Brackets	**Hot dip galvanized**
Panels	**Aluminium + anti-graffiti powdercoat**
Access fasteners	**Security Torx**
Media player access	**Dual camlock**
Eyebolt	**Stainless crane on**
Baseplate	**McDonalds spec triple mounting pattern option**

ODMB 02 DOUBLE

Displays	**2 x Samsung OH55F**
Hardware	**2 x Stratacache Spectra NG**
Heating/Cooling	**Watlow 100W Heater** **Sunon 120mm AC Fan**
Power Supply Units	**2 x 60W DC Media Player Power Supply**
Power Cables	**2 x IEC Power Cables**
Electrical Components	**Isolated Ground** **2 x IG Receptacles** **20A Circuit Breaker**
Communication Cables	**4 x HDMI** **2 x RS232**
Certification	**UL Certified**



SCALE: 1/2" = 1'-0"

GRAPHIC DETAIL
NOT TO SCALE

persona
SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 · www.personasigns.com

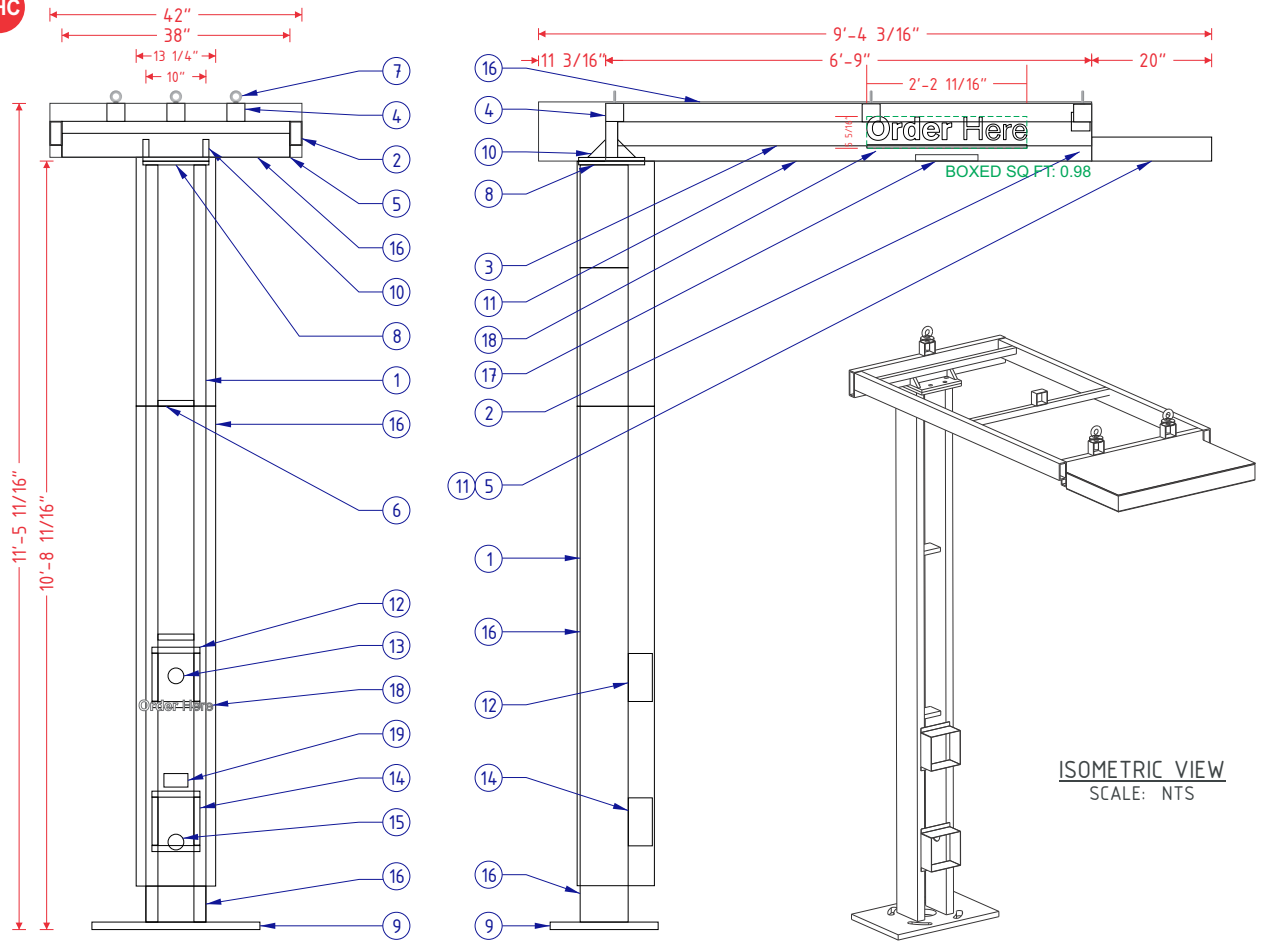
Customer: MCDONALD'S		Project No.: 396498	Request No.: 48800
Location: READING, MA		Prepared By: QP	
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA		Date: 08/03/23	Revision: 5

This sign is intended to be installed in accordance with the requirements of Article 600 of the National Electric Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

Customer Approval (Please Initial):

Approval Date:

OHC



ISOMETRIC VIEW
SCALE: NTS

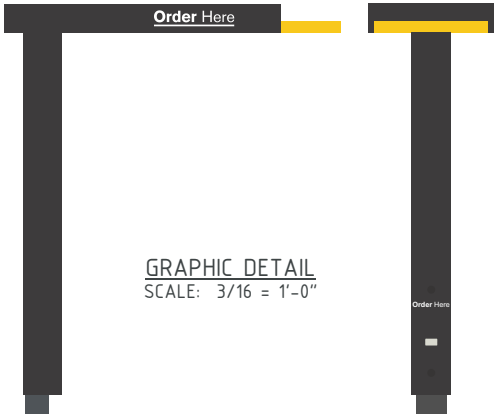
MCDONALD'S SPRINGBOARD OHC SPECIFICATIONS	
NO.	PART/DESCRIPTION
1	2" X 8" X 3/16" RECTANGULAR TUBE
2	2" X 6" X 1/4" RECTANGULAR TUBE
3	2" X 4" X 1/4" RECTANGULAR TUBE
4	3" X 3" X 3/16" SQUARE TUBE
5	1" X 4" X 1/8" RECTANGULAR TUBE
6	C4 ALUMINUM C-CHANNEL
7	1/2" EYEBOLTS (3)
8	11" X 11" X 5/8" TOP PLATES (2) (SEE PLATE DETAILS)
9	18" X 28" X 1 1/4" BASE PLATE (SEE PLATE DETAILS)
10	3" X 3" X 3/4" GUSSETS
11	.063" ALUMINUM SKIN
12	.063" ALUMINUM BENT SP10 SPEAKER BOX HOLDER
13	SPEAKER OPENING
14	.063" ALUMINUM BENT DM 4/DM 5 MICROPHONE BOX HOLDER
15	MICROPHONE OPENING
16	ACM CLADDING
17	SLOAN LED LIGHT WITH POWER SUPPLY
18	REFLECTIVE WHITE 680-10 VINYL
19	ADA STICKER

NOTES:

- DESIGN FACTOR: TO BE DETERMINED
- 2" X 8" X 3/16 RECTANGULAR TUBE FRAME
- ACM AND .063" ALUMINUM SKIN
- EXTERIOR FINISH:
  - BASE PLATE - PAINT BM 1631 MIDNIGHT OIL
  - TUBE AND TOP ACM - PAINT CHARCOAL
  - SPRINGBOARD TIP AND UNDERSIDE - PAINT PMS 123 C GOLD
- ACM/SKIN REMOVABLE FOR SERVICE
- U.L. LISTED
- ELECTRICAL: 0.64 AMPS/120 VOLTS

FRAME & LAMP DETAIL
SCALE: 3/8" = 1'-0"

CROSS SECTION A-A
SCALE: 3/8" = 1'-0"



GRAPHIC DETAIL
SCALE: 3/16 = 1'-0"

18" X 18" X 1" PLATE
1 1/8" SLOTTED HOLES
1" BOLTS

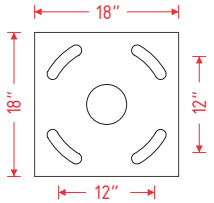


PLATE DETAIL
SCALE: 1/2 = 1'-0"

11" X 11" X 5/8" PLATE
3/4" HOLES
5/8" BOLTS

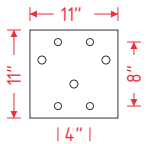


PLATE DETAIL
SCALE: 1/2 = 1'-0"

persona
SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 · www.personasigns.com

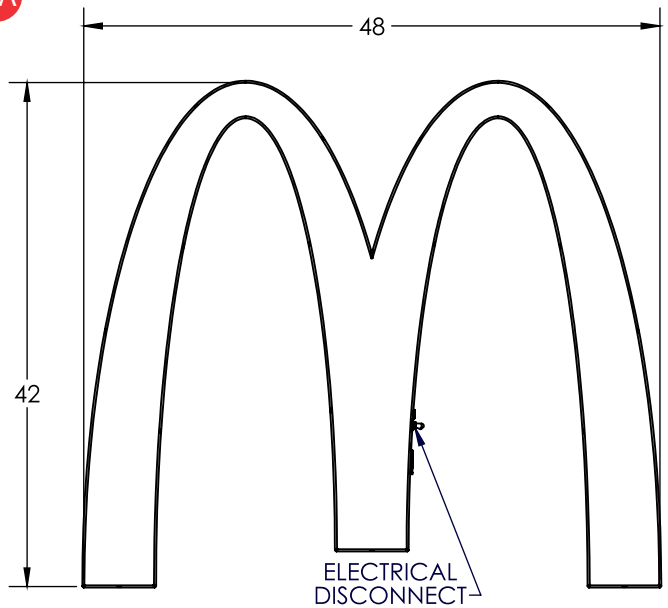
Customer: MCDONALD'S		Project No.: 396498	Request No.: 48800
Location: READING, MA		Prepared By: QP/CTM	
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA		Date: 09/26/23	Revision: 5

This sign is intended to be installed in accordance with the requirements of Article 600 of the National Electric Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

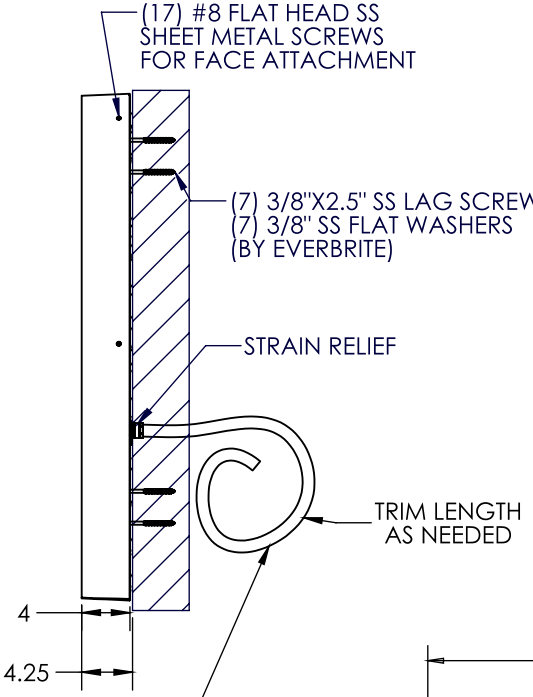
Customer Approval (Please Initial):

Approval Date:

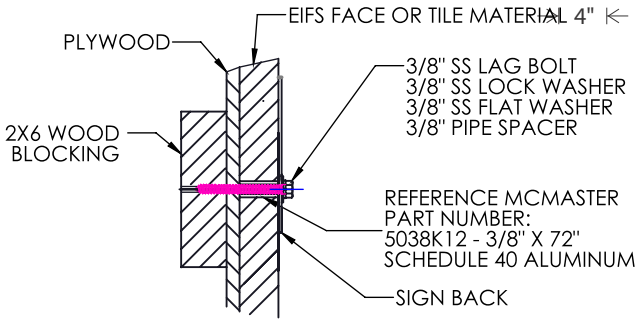
WA



MOUNTING HOLE PATTERN



UL LISTED CONDUIT AND 120VAC PRIMARY POWER TO CONNECT TO PROVIDED CONDUIT AND WIRING BY ELECTRICAL CONTRACTOR PER LOCAL AND NATIONAL CODES



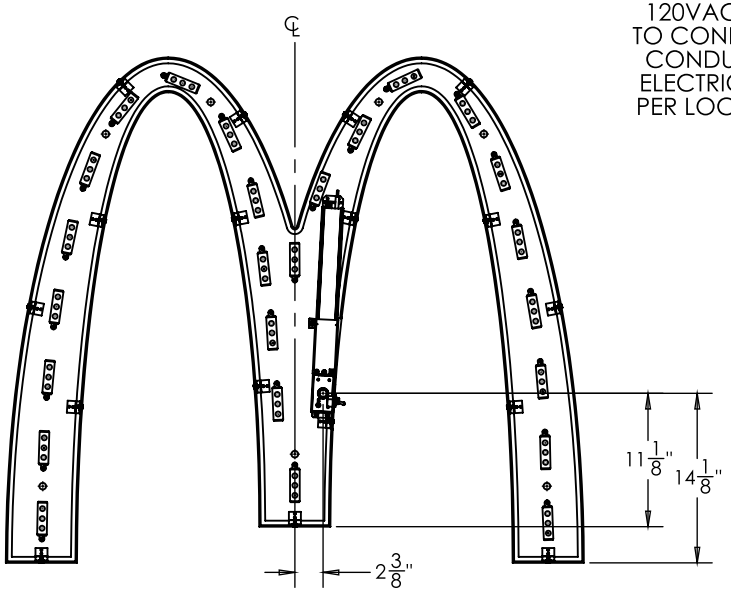
INPUT: 120 VAC, 60Hz, 0.8 AMPS MAX

OUTPUT: 12VDC, VOLTAGE REGULATED, 20.5 WATT, APPROX 1.7 AMP. OPERATING ENVIRONMENT: WET, DAMP, DAY -35 DEG C TO +70 DEC C

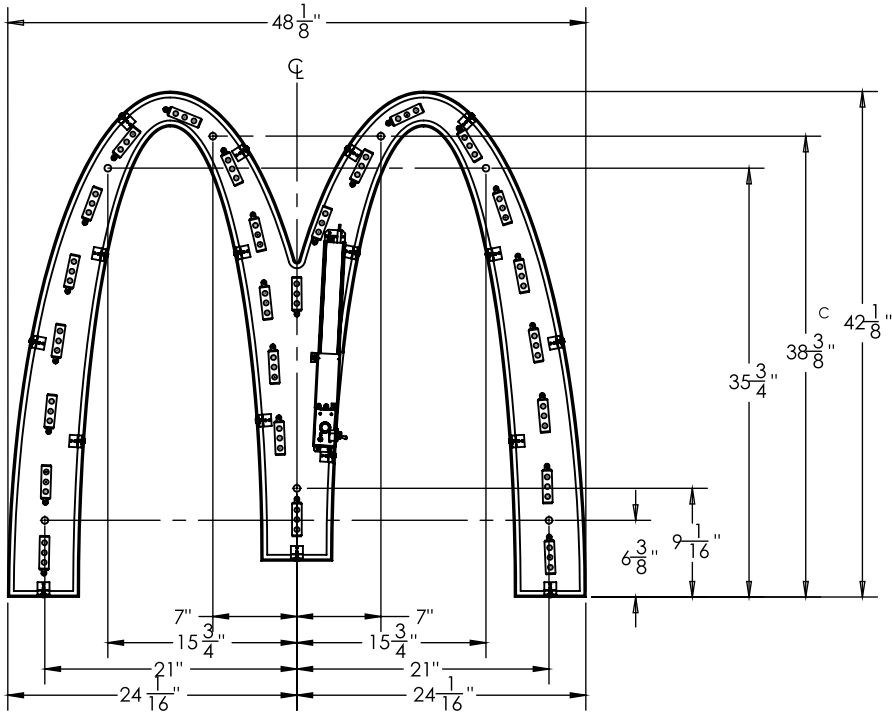
WIRING: SIGN IS TO BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 600 OF THE NATIONAL ELECTRICAL CODE AND ALL OTHER APPLICABLE LOCAL CODES. THIS INCLUDES THE PROPER GROUNDING OF THE SIGN.

SQUARE FOOT AREA: ACTUAL: 5 SQ FT. BOXED: 14SQ FT.

DESIGNED WINDLOAD: 150 MPH WIND SPEED 3-SECOND GUST EXPOSURE. COMPLIANT



ELECTRICAL INPUT LOCATION D



MOUNTING HOLE LOCATIONS D

persona SIGNS | LIGHTING | IMAGE

Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

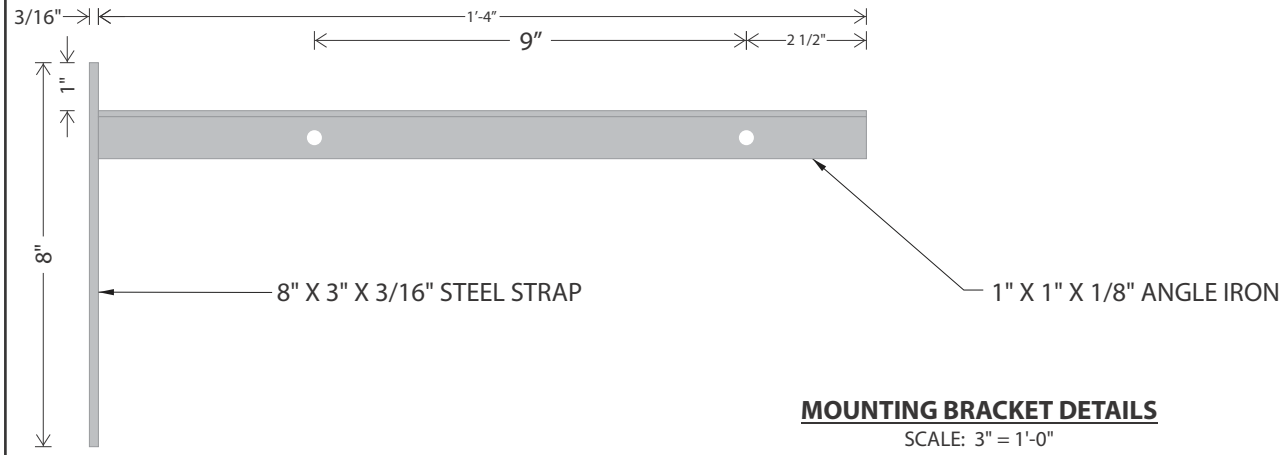
Customer: MCDONALD'S		Project No.: 396498	Request No.: 48800
Location: READING, MA		Prepared By: QP	
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA	Date: 08/03/23	Revision: 5	

UL This sign is intended to be installed in accordance with the requirements of Article 600 of the National Electric Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

Customer Approval (Please Initial):

Approval Date:

WPS1 WPS2 WPS3



MOUNTING BRACKET DETAILS
SCALE: 3" = 1'-0"

THREE MOUNTING BRACKETS
INCLUDED IN THIS ITEM NUMBER

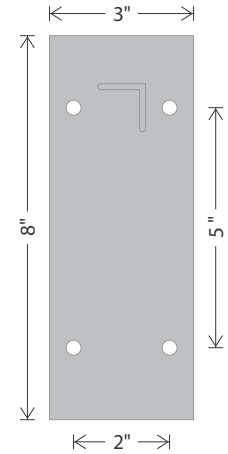
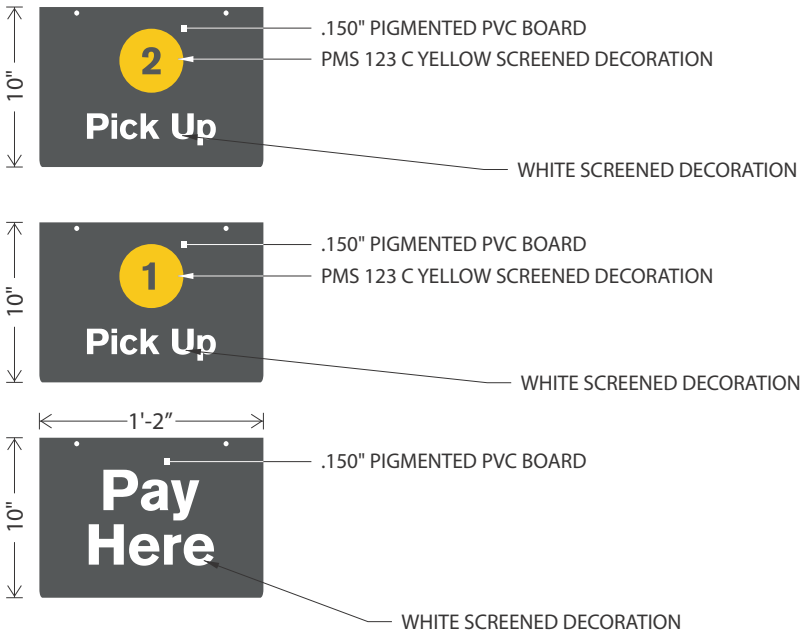


PLATE DETAILS
SCALE: 3" = 1'-0"



WINDOW POSITION SIGN DETAILS
SCALE: 1" = 1'-0"

BRACKET DETAILS
DESIGN FACTOR: TBD
3/16" X 3" STEEL STRAP
1" X 1" X 1/8" ANGLE IRON ARM
EXTERIOR FINISH: PAINTED PMS
877 C SILVER
5/16" HOLES PUNCHED IN ANGLE
AND PLATE FOR MOUNTING

WINDOW POSITION SIGNS DETAIL
DESIGN FACTOR: TBD
.150" PIGMENTED PVC BOARD TO
MATCH GREY FORD - MED DK
PLATINUM
WHITE SCREENED COPY 1ST SURFACE
PMS 123 C YELLOW - NUMERAL BACKGROUND
2.50 SQUARE FEET
* ALL THREE WINDOW POSITION SIGNS
ARE INCLUDED IN THIS ITEM.

persona
SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

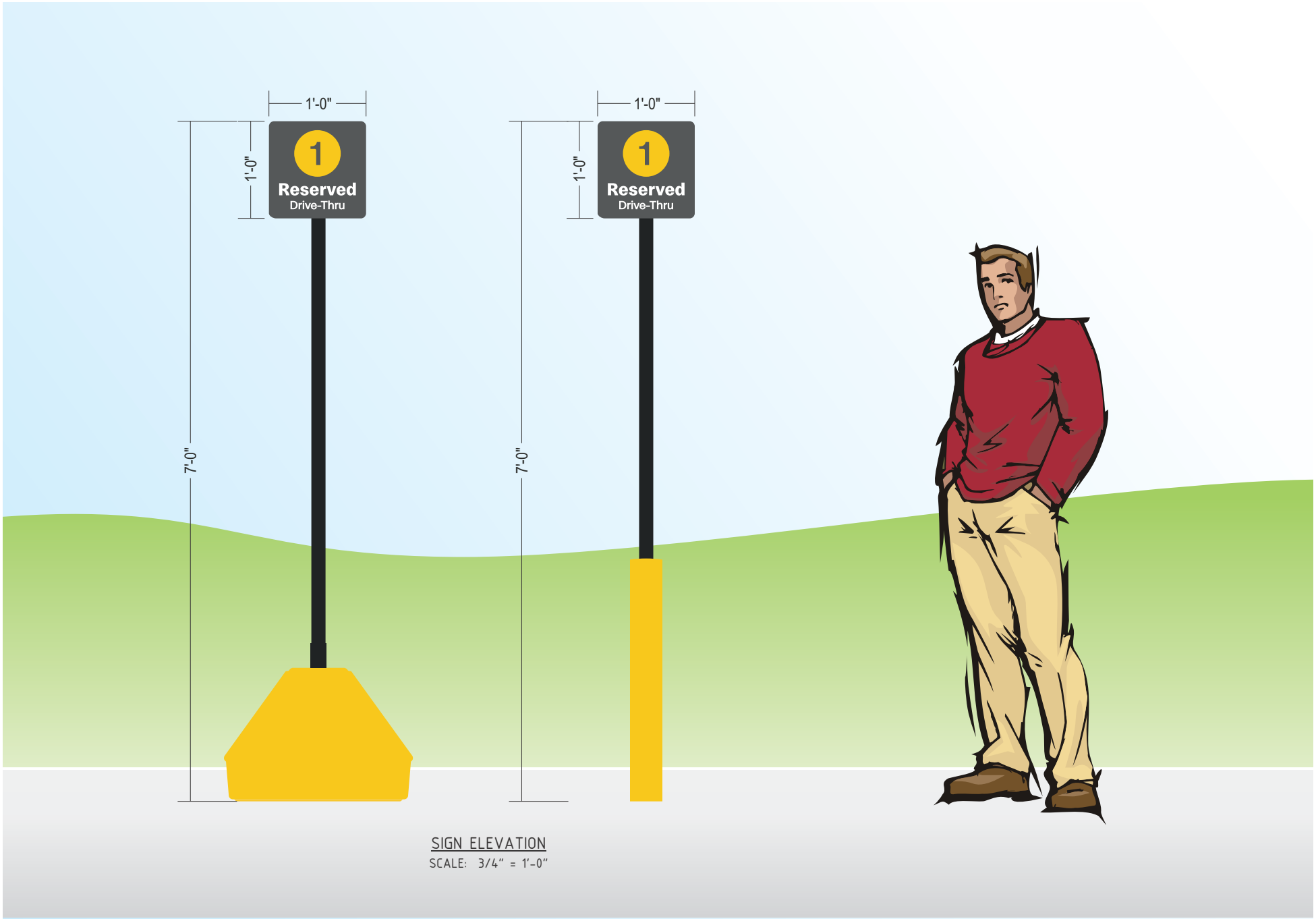
Customer: MCDONALD'S	Project No.: 396498	Request No.: 48800	
Location: READING, MA	Prepared By: QP/CTM		
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA	Date: 09/26/23	Revision: 5	

This sign is intended to be installed in accordance with the requirements of Article 600 of the National Electric Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

Customer Approval (Please Initial):

Approval Date:

PF



SIGN ELEVATION

SCALE: 3/4" = 1'-0"

persona
SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

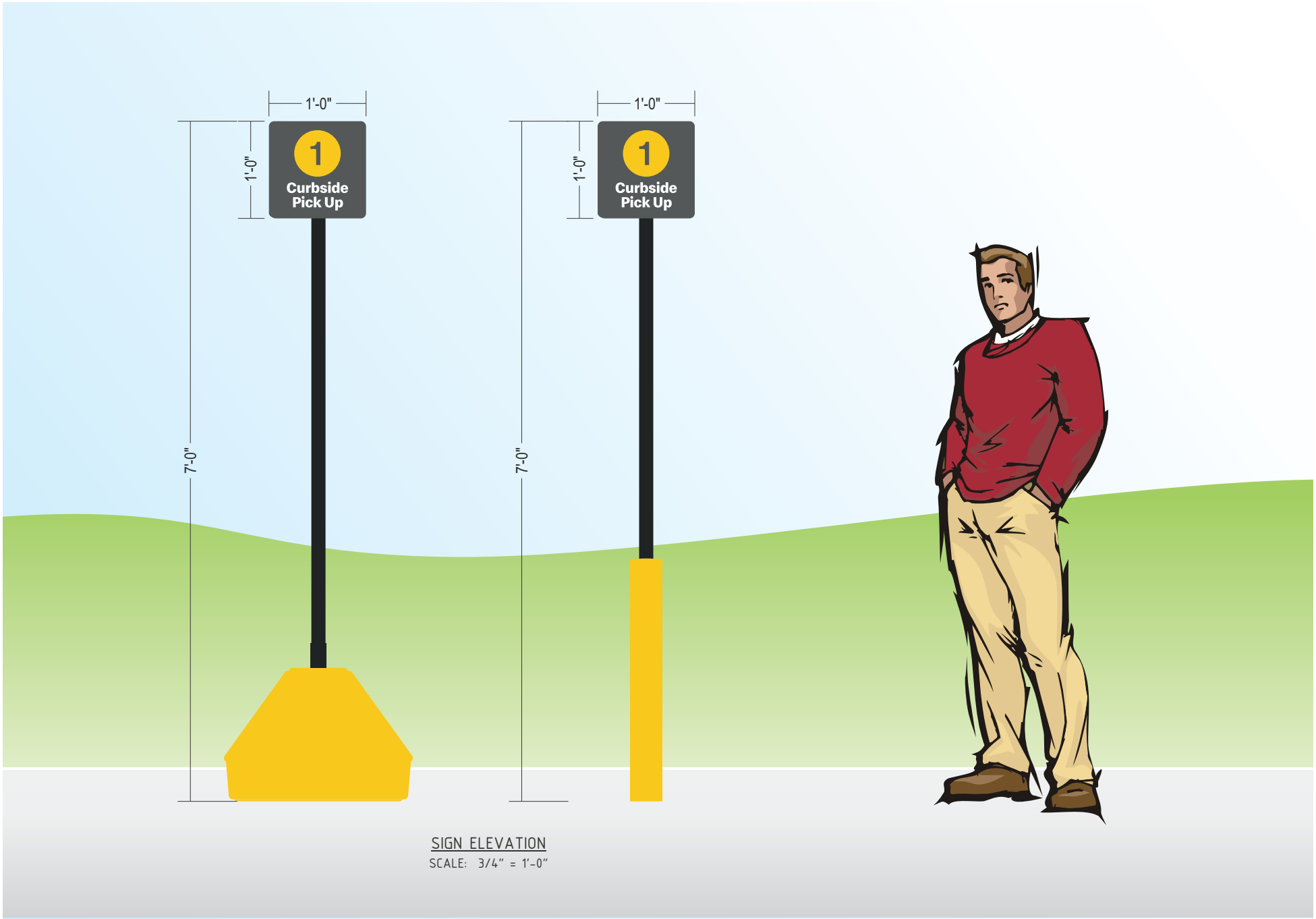
Customer: MCDONALD'S	Project No.: 396498	Request No.: 48800	
Location: READING, MA	Prepared By: QP		
File Name: 396498 - R5- 413 MAIN ST, READING - READING, MA	Date: 08/03/23	Revision: 5	

UL This sign is intended to be installed in accordance with the requirements of Article 600 of the National Electric Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

Customer Approval (Please Initial):

Approval Date:

MO



SIGN ELEVATION

SCALE: 3/4" = 1'-0"

persona
SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

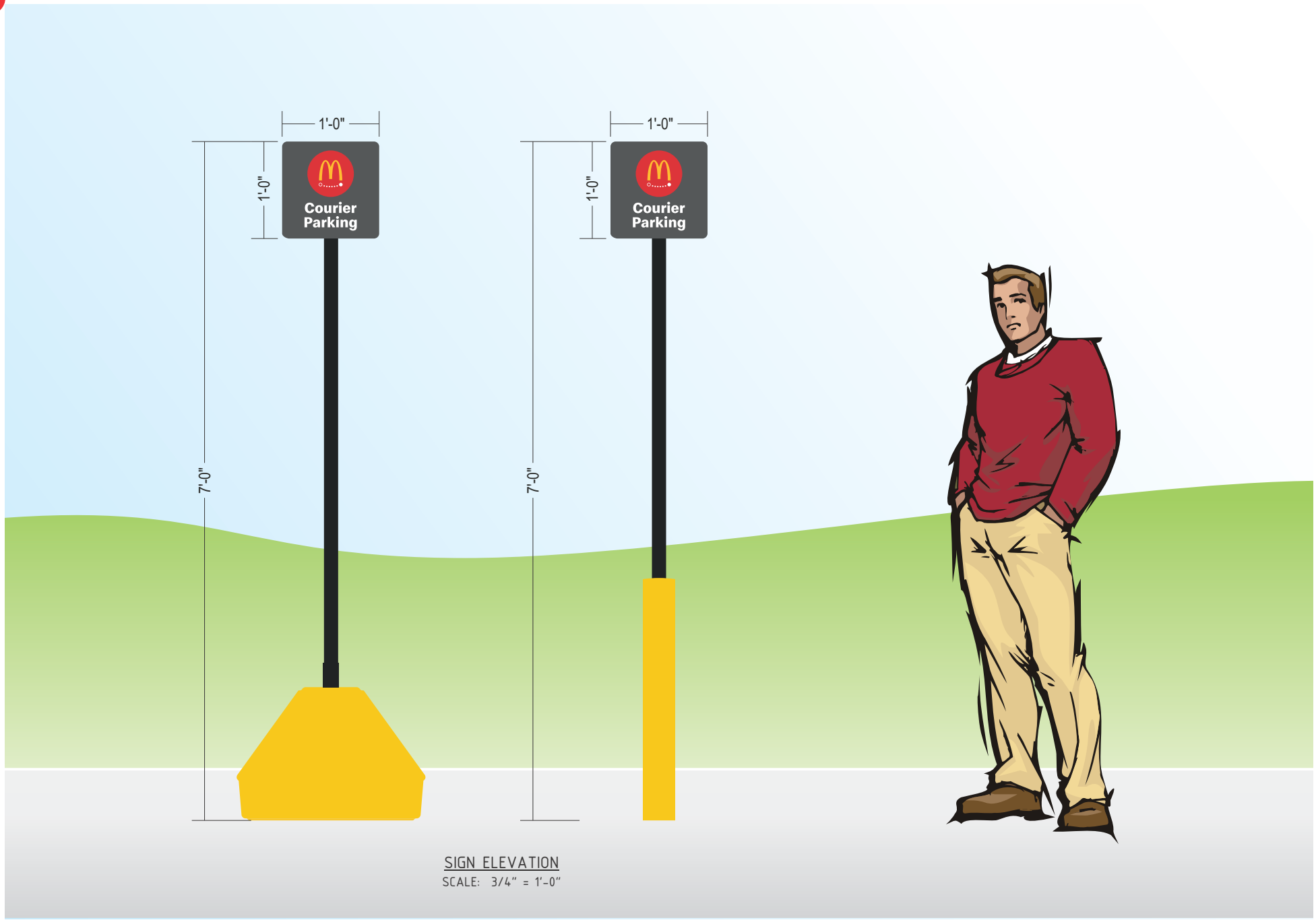
Customer: MCDONALD'S		Project No.: 396498	Request No.: 48800
Location: READING, MA		Prepared By: QP	
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA		Date: 08/03/23	Revision: 5

This sign is intended to be installed in accordance with the requirements of Article 600 of the National Electric Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

Customer Approval (Please Initial):

Approval Date:

CP



SIGN ELEVATION

SCALE: 3/4" = 1'-0"

persona
SIGNS | LIGHTING | IMAGE

Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

Customer: MCDONALD'S	Project No.: 396498	Request No.: 48800	
Location: READING, MA	Prepared By: QP/CTM		
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA	Date: 09/08/23	Revision: 5	

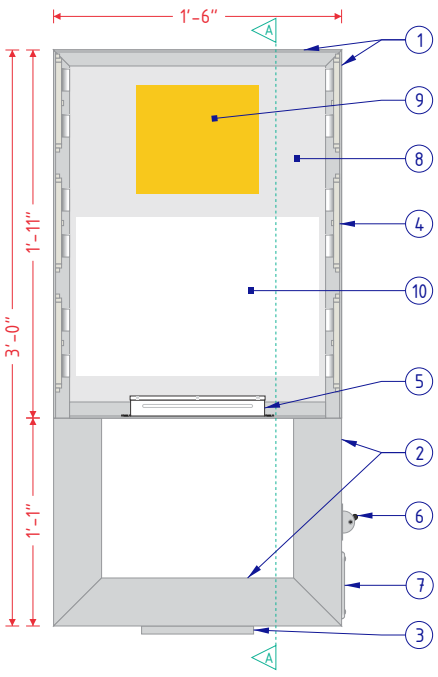
This sign is intended to be installed in accordance with the requirements of Article 600 of the National Electric Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

Customer Approval (Please Initial):

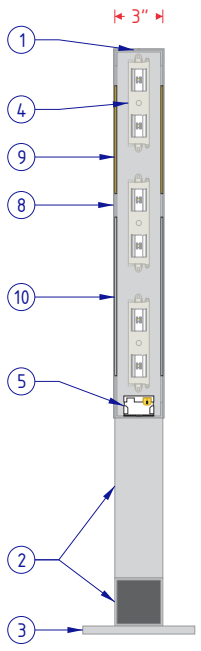
Approval Date:

DIR

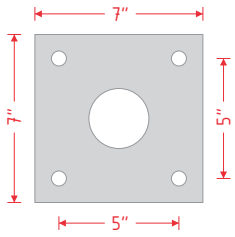
DIRECTIONAL ELEVATION
SCALE: 1" = 1'-0"



FRAME & LAMP DETAIL
SCALE: 1" = 1'-0"



CROSS SECTION A-A
SCALE: 1" = 1'-0"



1/2" X 7" X 7" ALUMINUM PLATE
5/8" BOLT HOLES
2 1/2" CENTER HOLE

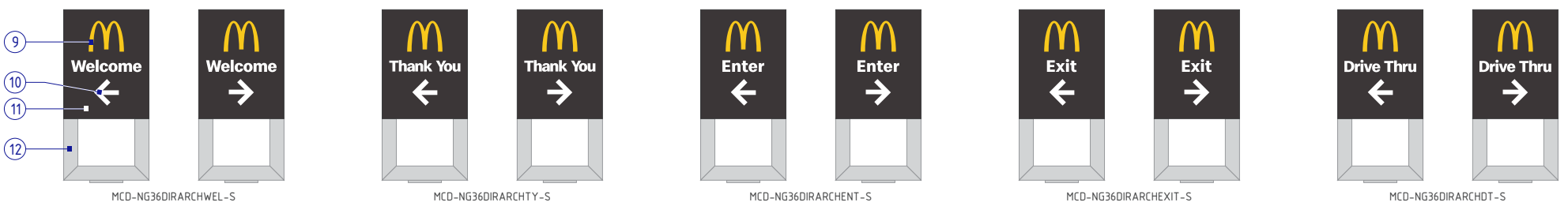
PLATE DETAIL
SCALE: 1 1/2" = 1'-0"

MCDONALD'S 36" NEXT GEN DIRECTIONAL SPECIFICATIONS	
NO.	PART/DESCRIPTION
1	3" X 1" X 1/8" ALUMINUM C-CHANNEL
2	3" X 3" X 1/8" ALUMINUM TUBE
3	MOUNTING PLATE (SEE PLATE DETAILS)
4	WHITE LED'S AS REQUIRED
5	LED POWER SUPPLIES AS REQUIRED
6	DISCONNECT SWITCH
7	ELECTRICAL CONNECTION ACCESS THROUGH COVER
8	.080" ROUTED ALUMINUM SHOEBOX FACES
9	.118" NG YELLOW SOLAR GRADE POLYCARBONATE BACKER PANEL
10	.118" NG WHITE SOLAR GRADE POLYCARBOANTE BACKER PANEL
11	POWDERCOAT HENTZEN #P90353APC (OR PAINT TO MATCH)
12	PANT TO MATCH SILVER OR METALLIC GRAY

NOTES:

- DESIGN FACTOR: TO BE DETERMINED
- 3" X 1/8" ALUMINUM C-CHANNEL FRAME
- ROUTED ALUMINUM SHOEBOX FACES
- EXTERIOR FINISH:
  FACES - POWDERCOAT HENTZEN #90353APC (OR PAINT TO MATCH)
  TUBES AND PLATE - PAINT SILVER OR METALLIC GRAY
- INTERIOR FINISH: PAINT REFLECTIVE WHITE
- FACES REMOVABLE FOR SERVICE ACCESS
- U.L. LISTED
- ELECTRICAL: 0.30 AMPS/120 VOLTS
- SQUARE FOOTAGE:
  FACE = 2.88
  DISPLAY = 4.50

NOTE: DIRECTIONAL SIGNS ARE TO BE EXTERNALLY ILLUMINATED.



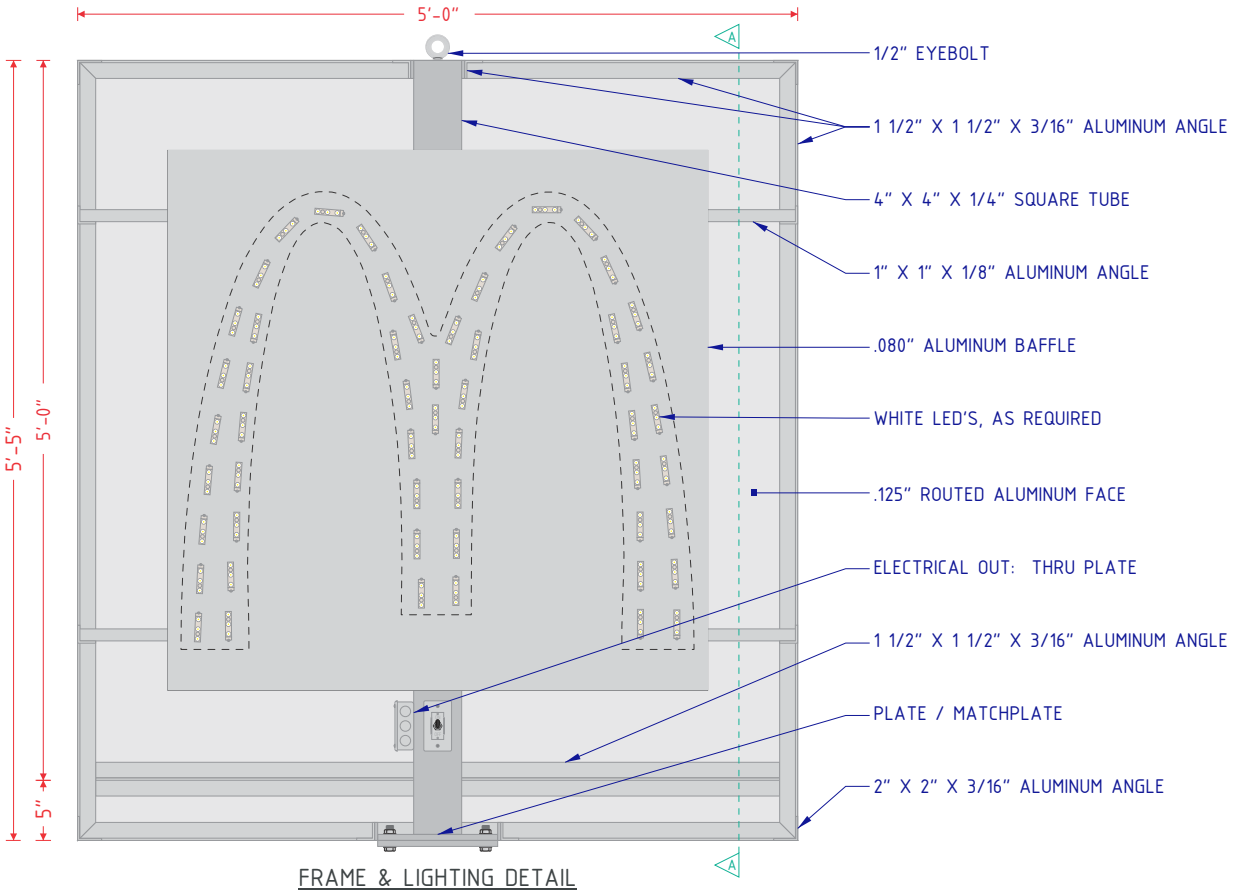
MCD-NG36DIRARCHWEL-S | MCD-NG36DIRARCHTY-S | MCD-NG36DIRARCHENT-S | MCD-NG36DIRARCHEXIT-S | MCD-NG36DIRARCHDT-S

GRAPHIC DETAIL
SCALE: 3/8" = 1'-0"

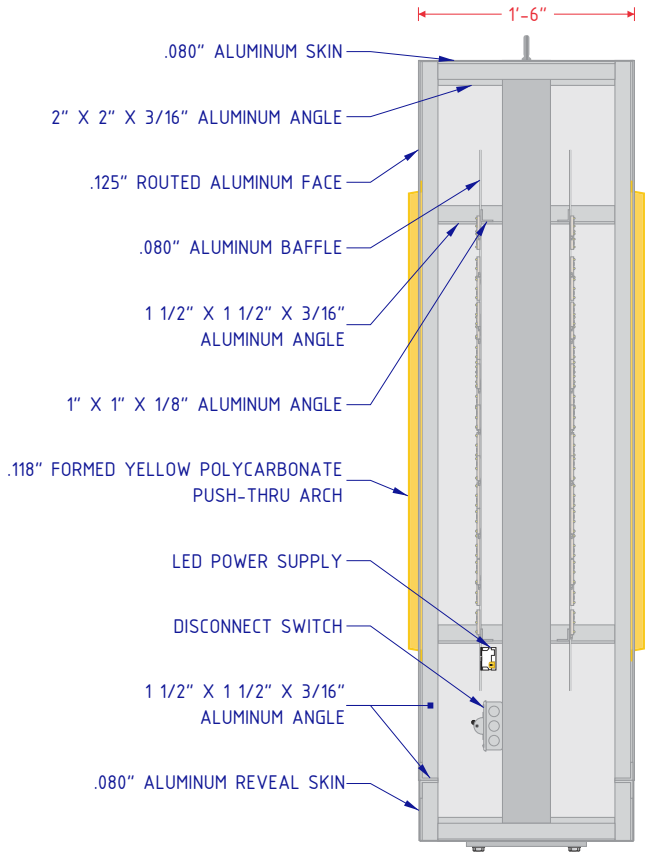
persona SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

Customer: MCDONALD'S	Project No.: 396498	Request No.: 48800	Customer Approval (Please Initial):
Location: READING, MA	Prepared By: QP/CTM		
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA	Date: 09/26/23	Revision: 5	Approval Date:

MS



FRAME & LIGHTING DETAIL
SCALE: 3/4" = 1'-0"

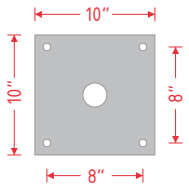


CROSS SECTION A-A
SCALE: 3/4" = 1'-0"

FRAME DETAILS
DESIGN FACTOR: TBD
1 1/2" X 3/16" ALUMINUM ANGLE FRAME
BLEED FACE, NO VISIBLE FASTENERS
EXTERIOR FINISH:
FRAME - MATCH NG RED
REVEAL - MATCH NG SILVER
INTERIOR FINISH: REFLECTIVE WHITE
SKINS REMOVABLE FOR SERVICE
U.L. LISTED
ELECTRICAL: 120 VOLTS / 0.65 AMPS
SQUARE FOOTAGE: 25.00

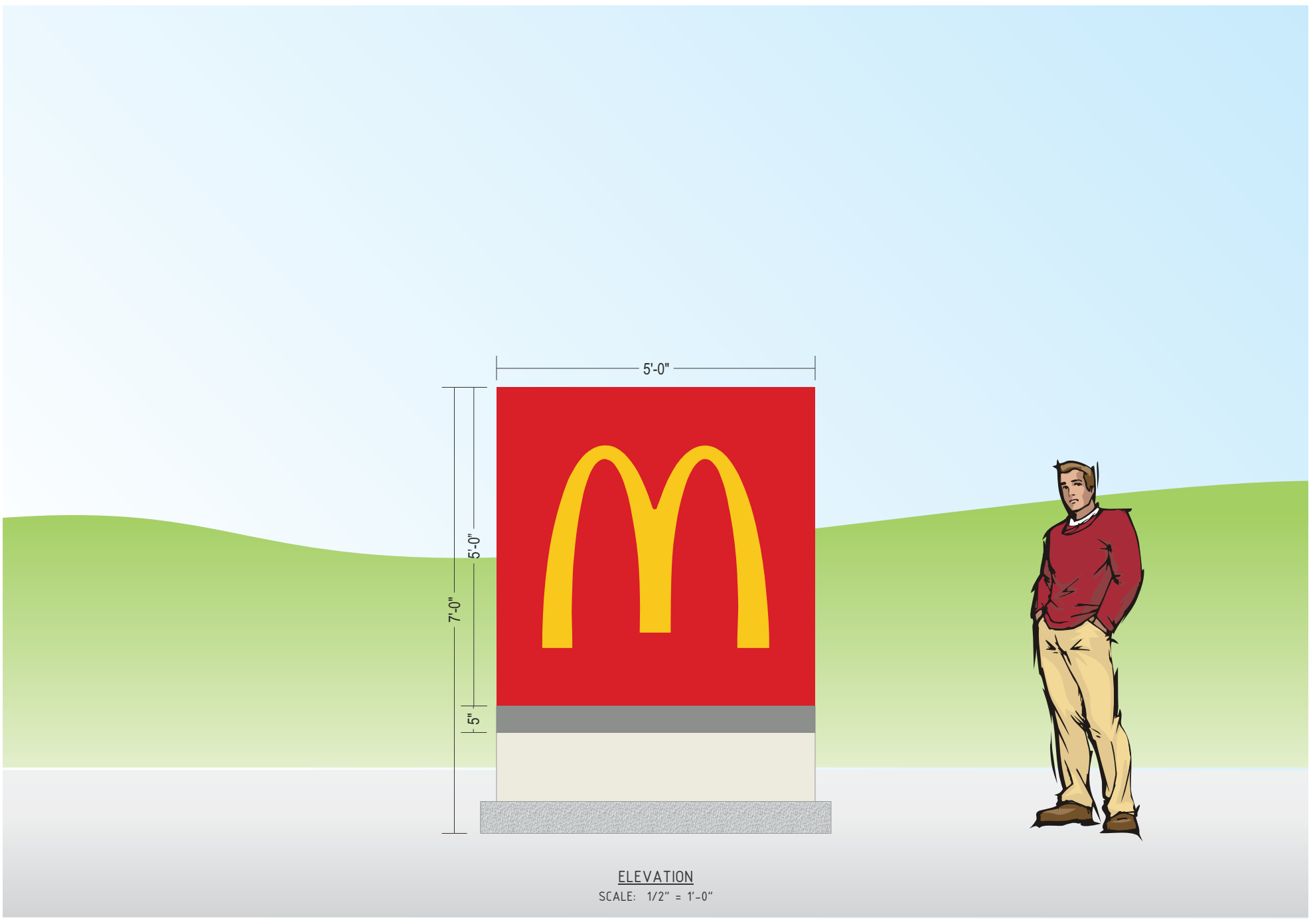
FACE DETAILS
.125" ROUTED ALUMINUM PAINTED TO MATCH NG RED
.118" FORMED NG YELLOW POLYCARBONATE PUSH-THRU ARCH

GRAPHIC DETAIL
SCALE: 3/8" = 1'-0"



1/2" X 10" X 10" PLATES
5/8" HOLES
1/2" A325 BOLTS
PLATE WILL ACCEPT:
8" PIPE
6" TUBE

PLATE DETAIL
SCALE: 3/4" = 1'-0"



ELEVATION
SCALE: 1/2" = 1'-0"

persona
SIGNS | LIGHTING | IMAGE
Persona Signs, LLC
700 21st Street Southwest
PO Box 210
Watertown, SD 57201-0210
1.800.843.9888 • www.personasigns.com

Customer: MCDONALD'S	Project No.: 396498	Request No.: 48800	
Location: READING, MA	Prepared By: QP		
File Name: 396498 - R5 - 413 MAIN ST, READING - READING, MA	Date: 08/03/23	Revision: 5	

This sign is intended to be installed in accordance with the requirements of Article 600 of the National Electric Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

Customer Approval (Please Initial):

Approval Date:

Town of Reading
16 Lowell Street
Reading, MA 01867

PUBLIC SERVICES DEPARTMENT
Mon - Wed - Thu 7:00 AM – 5:30 PM
Tues 7:00 AM – 7:00 PM ~ Fri Closed
Phone 781-942-6613 ~ Fax 781-942-9071
www.readingma.gov

APPLICATION FOR PERMIT TO ERECT A SIGN

All signs shall comply with Section 8.0 of the Reading Zoning By-Laws and any State Requirements

The undersigned hereby applies for a permit to: Erect Alter Repair a sign at the following location:

Property Address: 413 Main Street **Name of Business**: McDonald's

Is there an approved Master Signage Plan? (Y) (please attach) N Program Book Attached Total Number of Signs Proposed: 21

Zoning District: Residential_____ Business A___ B_X_ C___ Industrial___ Overlay Downtown Smart Growth

Property Owner: 412 Main Street LLC c/o Burton Faulkner Address: 425 Broadway, Unit 25 Somerville, MA

Telephone: 617-212-9942 Email:_____

Business Owner:_____ Address:_____

Telephone:_____ Email:_____

Sign Mechanic: TBD Address:_____

Telephone:_____ Email:_____

Sign 1 – Type: Ground	Sign 2 – Type: Ground	Sign 3 – Type: Ground
10sf Digital Pre-Browse Board (QTY 1)	20sf Digital Menu Board (QTY 2)	Double Arm Gateway (Qty 1)
Sign Material: See attached program book.	Sign Material: See attached program book.	Sign Material: See attached program book.
Sign Dimensions: Length: 4'-1 3/4" Width: 2'-5 1/4" Depth: 5 1/2" Total Area: 10SF Illuminated: (Y) N Type of Illumination: Internal	Sign Dimensions: Length: 4'-1 5/8" Width: 4'-10" Depth: 5 1/2" Total Area: 20SF Illuminated: (Y) N Type of Illumination: Internal	Sign Dimensions: Length: 10' 8" Width: 15' 4" Depth: 9" Total Area: 12 SF Illuminated: Y (N) Type of Illumination: N/A

Estimated Cost of Sign(s): $ 32,650 Display Dates of Temporary/Banner Sign: N/A

Total Sign Area of All Signs: 158.9 Total length of front façade on which wall sign will be affixed: Non DT - 1682.18 SF Front - 847.1 SF

***Awning and Projecting/Blade Sign** - projection/height over sidewalk (at least 8-feet): N/A

Free-Standing Sign:
Distance from ground to bottom of sign: 2' To top of sign 7' Side Yard Setback: 41.8'

Business Owner Signature: Agent : _____ Date: 10/3/23

Property Owner Signature: See authorization letter Date:_____

***An awning requires a commercial building permit**

Town of Reading
16 Lowell Street
Reading, MA 01867

PUBLIC SERVICES DEPARTMENT
Mon - Wed - Thu 7:00 AM – 5:30 PM
Tues 7:00 AM – 7:00 PM ~ Fri Closed
Phone 781-942-6613 ~ Fax 781-942-9071
www.readingma.gov

PAGE 2 CONT SIGN TYPES ONLY

APPLICATION FOR PERMIT TO ERECT A SIGN

All signs shall comply with Section 8.0 of the Reading Zoning By-Laws and any State Requirements

The undersigned hereby applies for a permit to: Erect Alter Repair a sign at the following location:

Property Address: 413 Main Street **Name of Business**: McDonald's

Is there an approved Master Signage Plan? (Y) (please attach) N Program Book Attached Total Number of Signs Proposed: 21

Zoning District: Residential_____ Business A___ B_X_ C___ Industrial___ Overlay Downtown Smart Growth

Property Owner: 412 Main Street LLC c/o Burton Faulkner Address: 425 Broadway, Unit 25 Somerville, MA

Telephone: 617-212-9942 Email:_____

Business Owner:_____ Address:_____

Telephone:_____ Email:_____

Sign Mechanic: TBD Address:_____

Telephone:_____ Email:_____

Sign 1 – Type: Ground	Sign 2 – Type: Wall	Sign 3 – Type: Ground
Order Here Canopy (Qty 2)	Window Position Signs (Qty 3) Pick up 1, Pick up 2, and Pay Here	Pull Forward (Qty 2)
Sign Material: See attached program book.	Sign Material: See attached program book.	Sign Material: See attached program book.
Sign Dimensions: Length: 11- 5 11/16" Width: 42" Depth: 9'-4 3/16" Total Area: 4 SF Illuminated: (Y) N ("ORDER HERE" = 0.98 SF) Type of Illumination: N/A	Sign Dimensions: Length: 10" Width: 1'- 2" Depth: .150" Total Area: 0.97 SF Illuminated: Y (N) Type of Illumination: N/A	Sign Dimensions: Length: 1' Width: 1' Depth:_____ Total Area: 1 SF Illuminated: Y (N) Type of Illumination: N/A

(LED LIT DOWN FOR ORDER POINT NOT SIGN)

Estimated Cost of Sign(s): $_____ Display Dates of Temporary/Banner Sign:_____

Total Sign Area of All Signs:_____ Total length of front façade on which wall sign will be affixed:_____

***Awning and Projecting/Blade Sign** - projection/height over sidewalk (at least 8-feet):_____

Free-Standing Sign:
Distance from ground to bottom of sign:_____ To top of sign_____ Side Yard Setback:_____

Business Owner Signature: Agent : _____ Date: 10/3/23

Property Owner Signature: See authorization letter Date:_____

***An awning requires a commercial building permit**

Town of Reading
16 Lowell Street
Reading, MA 01867

PUBLIC SERVICES DEPARTMENT
Mon - Wed - Thu 7:00 AM – 5:30 PM
Tues 7:00 AM – 7:00 PM ~ Fri Closed
Phone 781-942-6613 ~ Fax 781-942-9071
www.readingma.gov

PAGE 3 CONT SIGN TYPES ONLY

APPLICATION FOR PERMIT TO ERECT A SIGN

All signs shall comply with Section 8.0 of the Reading Zoning By-Laws and any State Requirements

The undersigned hereby applies for a permit to: Erect Alter Repair a sign at the following location:

Property Address: 413 Main Street **Name of Business**: McDonald's

Is there an approved Master Signage Plan? (Y) (please attach) N Program Book Attached Total Number of Signs Proposed: 21

Zoning District: Residential_____ Business A___ B_X_ C___ Industrial___ Overlay Downtown Smart Growth

Property Owner: 412 Main Street LLC c/o Burton Faulkner Address: 425 Broadway, Unit 25 Somerville, MA

Telephone: 617-212-9942 Email:_____

Business Owner:_____ Address:_____

Telephone:_____ Email:_____

Sign Mechanic: TBD Address:_____

Telephone:_____ Email:_____

Sign 1 – Type: Ground	Sign 2 – Type: Ground	Sign 3 – Type: Wall
Mobile Order (Qty 2)	Courier Parking (Qty 1)	Wall Arch (Qty 2)
Sign Material: See attached program book.	Sign Material: See attached program book.	Sign Material: See attached program book.
Sign Dimensions: Length: 1' Width: 1' Depth:_____ Total Area: 1 SF Illuminated: Y (N) Type of Illumination: N/A	Sign Dimensions: Length: 1' Width: 1' Depth:_____ Total Area: 1 SF Illuminated: Y (N) Type of Illumination: N/A	Sign Dimensions: Length: 42" Width: 48" Depth: 4" Total Area: 28 SF Illuminated: (Y) N Type of Illumination: External

Estimated Cost of Sign(s): $_____ Display Dates of Temporary/Banner Sign:_____

Total Sign Area of All Signs:_____ Total length of front façade on which wall sign will be affixed:_____

***Awning and Projecting/Blade Sign** - projection/height over sidewalk (at least 8-feet):_____

Free-Standing Sign:
Distance from ground to bottom of sign:_____ To top of sign_____ Side Yard Setback:_____

Business Owner Signature: Agent : _____ Date: 10/3/23

Property Owner Signature: See authorization letter Date:_____

***An awning requires a commercial building permit**

Town of Reading
16 Lowell Street
Reading, MA 01867

PUBLIC SERVICES DEPARTMENT
Mon - Wed - Thu 7:00 AM – 5:30 PM
Tues 7:00 AM – 7:00 PM ~ Fri Closed
Phone 781-942-6613 ~ Fax 781-942-9071
www.readingma.gov

PAGE 4 CONT SIGN TYPES ONLY

APPLICATION FOR PERMIT TO ERECT A SIGN

All signs shall comply with Section 8.0 of the Reading Zoning By-Laws and any State Requirements

The undersigned hereby applies for a permit to: Erect Alter Repair a sign at the following location:

Property Address: 413 Main Street **Name of Business**: McDonald's

Is there an approved Master Signage Plan? (Y) (please attach) N Program Book Attached Total Number of Signs Proposed: 21

Zoning District: Residential_____ Business A___ B_X_ C___ Industrial___ Overlay Downtown Smart Growth

Property Owner: 412 Main Street LLC c/o Burton Faulkner Address: 425 Broadway, Unit 25 Somerville, MA

Telephone: 617-212-9942 Email:_____

Business Owner:_____ Address:_____

Telephone:_____ Email:_____

Sign Mechanic: TBD Address:_____

Telephone:_____ Email:_____

Sign 1 – Type: Ground	Sign 2 – Type: Ground	Sign 3 – Type:
Directional (Qty 4)	Monument Sign (Qty 1)	
Sign Material: See attached program book.	Sign Material: See attached program book.	Sign Material: See attached program book.
Sign Dimensions: Length: 1'-11" Width: 1'-6" Depth: 3" Total Area: 2.9 SF Illuminated: (Y) N Type of Illumination: External	Sign Dimensions: Length: 7' Width: 5' Depth: 1'-6" Total Area: 25 SF Illuminated: Y (N) Type of Illumination: N/A	Sign Dimensions: Length:_____ Width:_____ Depth:_____ Total Area:_____ Illuminated: Y N Type of Illumination:

Estimated Cost of Sign(s): $_____ Display Dates of Temporary/Banner Sign:_____

Total Sign Area of All Signs:_____ Total length of front façade on which wall sign will be affixed:_____

***Awning and Projecting/Blade Sign** - projection/height over sidewalk (at least 8-feet):_____

Free-Standing Sign:
Distance from ground to bottom of sign:_____ To top of sign_____ Side Yard Setback:_____

Business Owner Signature: Agent : _____ Date: 10/3/23

Property Owner Signature: See authorization letter Date:_____

***An awning requires a commercial building permit**

The following are required to be submitted with the sign application:

- Dimensioned designs of each sign;
- Building elevation(s);
- Proposed sign location(s);
- Photographs or mock-ups;
- Sign colors & materials;
- Installation details;
    - A side view of how the sign will be attached for wall & blade signs;
    - Foundation details for free-standing signs;
- Internally illuminated signs must have an opaque sign board background. If the illumination shines through more than the letters and graphics, you will be asked to replace the sign. A sample of the sign material must be submitted to the Planning Division for approval; and
- Other information upon request.

All signs in the Business-B Zoning District (downtown and the commercial area on Salem Street), and applications for Master Signage Plans, require approval from the Community Planning & Development Commission (CPDC).

WHAT TO SUBMIT TO THE CPDC (through the Community Development Director):
Seven (7) copies and an electronic copy (jpeg, PDF, or word doc) of the following materials:

- A completed sign permit application;
- The required documentation listed above; and
- Specification sheets for any proposed external light fixtures.

The CPDC meets monthly. To be placed on a CPDC meeting agenda please contact the Planning Division.

- The sign permit fee is $12 per $1,000 total value of construction, with a minimum fee of $110.
- Temporary banner signs are $30 and are allowed for 56 days total per calendar year.
- An electrical permit is required for illuminated signs
- After the CPDC approves the proposed sign, the application will be forwarded to the Building Inspector for review and approval.

- **A building permit must be obtained before work commences.**

352 Turnpike Road
Southborough, MA 01772
508.480.9900

September 8, 2023

McDonald's USA, LLC
110 N Carpenter Street
Chicago, IL 60607

Re: **McDonald's Restaurant**
413 Main Street
Reading, MA
Sewer Impact Memo

Dear Mr. Cahoon:

Please find below, an analysis of the anticipated impacts of the proposed redevelopment for a new ±3,970 square-foot McDonald's restaurant with Drive-Through connecting to the existing sewer main in Main Street. The new building is considered a fast food restaurant use with 44 seats, resulting in a slight decrease in sewage discharge per 310 CMR 15 as outlined in the calculations below:

Daily Flow Rate Calculations:

Existing McDonald's Restaurant with Drive-thru Use:

- Fast Food Restaurant Use (McDonald's) – 20 GPD per Seat (1,000 GPD Min) = (20 GPD / 1 Seat) x 62 Seats = **1,240 GPD**

Proposed McDonald's Restaurant with Drive-thru Use:

- Fast Food Restaurant Use (McDonald's) – 20 GPD per Seat (1,000 GPD Min) = (20 GPD / 1 Seat) x 44 Seats = 880 GPD = **1,000 GPD**

Per the above calculations, the proposed restaurant improvements is anticipated to result in a 240 GPD decrease in sewage flow into the municipal system, but design flows will be maintained at the minimum 1,000 GPD.

Should you have any questions or need additional information, please do not hesitate to contact either of us at 508-480-9900.

Sincerely,

BOHLER

Daniel Allen, PE

352 Turnpike Road
Southborough, MA 01772
508.480.9900

October 3rd, 2023

Town of Reading
Community Planning & Development Commission
Attn: Andrew MacNichol
16 Lowell Street
Reading, MA 01867

Re: Response to Comments Letter
McDonald's Restaurant
413 Main Street
Reading, MA

Dear Mr. MacNichol,

Please find below our responses to Planning Division comments provided via email from Mary Benedetto, Senior Planner, on August 23, 2023 and a Memo provided by the Town of Reading Engineering Division dated August 31, 2023. For clarity, the comments are in italics, while our responses are directly below in normal font. This response letter references plans by Bohler Engineering revised through 8/15/2023.

Planning Division comments via email dated August 23rd, 2023

Comment 1: ***Parcels:*** *The project site is actually two lots, Map 17, Lots 64 & 85. Please revise this information in your cover letter and project narrative.*

Response 1: The cover letter, project narrative, and plans have been revised to include Map 17, Lots 64 & 85.

Comment 2: ***Parking:*** *Please include the parking calculation information for the 32 new spaces proposed. How many seats are proposed inside the restaurant and what will be a max employee count?*

- *Please revise your documents to consistently refer to the parking as 43 current and 32 proposed spaces in your cover letter and project narrative, we consider the handicapped spaces part of the total.*
- *Please clarify if the loading/unloading spaces included in your parking total? None are indicated on the site layout plan.*

Response 2: Parking calculations have been provided in the Zoning Analysis Table on Sheet C-301 of the "Proposed Site Plan Documents". 44 Seats are proposed within the restaurant and the max employee count is 12 employees. Based on the required parking for a restaurant use (1 space per 4 seats plus 1 space per employee on the max shift), the minimum required parking is calculated as 23 spaces. 30 parking spaces are proposed as part of the redevelopment project and is reflected in the cover letter, project narrative, and plans accordingly.

There is no designated loading space proposed on the plan or included in the total parking calculation. McDonald's has control over their loading operations where delivery times are schedule during off-peak and non-business hours, to avoid impacts to business operations, where loading vehicles will pull around the building and into the row of parking on the North side of the building.

Comment 3: ***Drive-thru stacking capacity:*** *Please provide the total lane stacking capability in feet of both the existing drive-thru and the new proposed dual order point. Our bylaw requires 198ft in length, of which at least 90ft are for ordering and transacting, and at least 54ft stacking capacity exiting onto the road.*

- *Separately, under current conditions approximately how many cars could stack up behind the order point in the drive-thru lane before running out onto the road, has this changed under the new proposed layout?*

Response 3: The total lane stacking capacity for the existing drive-thru is 105 FT (approx. 6 vehicles) from the present window to the order point, and 137 FT (approx. 8 vehicles) from the order point to drive-thru lane entrance at the Main Street ROW. The distance between the existing present window and the exit drive is 55.2 FT.

Under proposed conditions, the stacking capacity for the side-by-side drive-thru layout is to be 187 FT (approx. 10 vehicles) from the present window to the order points and 108 FT (approx. 6 vehicles) from the order points to the drive-thru lane entrance. It is notable there is an additional 225 LF of stacking to the Bolton Street and Main Street ROW (approx. 10 vehicles). The distance between the proposed present window exit and the roadway is 58.4 FT. The zoning analysis table on sheet C-301 has been updated with this information and existing and proposed drive-thru stacking exhibits have also been included as part of this resubmittal.

Comment 4: **Elevations / Renderings:** Please provide renderings of all sides of the building.

Response 4: Elevations and rendering of all sides of the building have been included as part of this resubmittal.

Comment 5: ***Screening:*** *Please provide images, samples, or renderings of the proposed screening on the east side abutting the residential neighbor. Particularly given that the fencing will transition between two types, please provide a mock-up of what that will look like, ideally with the proposed landscaping in front of it.*

Response 5: Renderings of the proposed screening along the east property line showing the proposed fence types and landscaping has been included as part of this resubmittal

Comment 6: ***Lighting Plan:*** *The lighting plan doesn't include the photometric information out over the landscaped areas of the site, please include it. It also doesn't seem to include any lighting on the building. In the sign package there is an LED light in the canopy fascia and potentially what looks like other lights at the top of the building that should all be included in the lighting/photometric plan and info if they are indeed lights.*

Response 6: The lighting plan has been updated to include building lighting and the photometric information over the landscaped areas of the site. Please refer to Sheet C-703 of the "Proposed Site Plan Documents" for additional information.

Comment 7: ***Hours of Operation:*** *The hours are listed as being fully open until midnight even though you state that the operator will not use the outside drive-thru lane past 9pm. Please clarify the hours in the cover letter and please explain how they plan to "close" the outside drive-thru lane.*

Response 7: The cover letter has been updated to clarify that the McDonald's restaurant will be open until midnight, and only the outside drive-thru lane will close at 9 PM daily. The outside

lane will be closed by turning off the speaker in the lane, and the outside lane will have of a freestanding sign in front of the lane which will state this lane closes at 9 PM daily. The outside lane is being closed at 9pm as offered by the applicant through the Zoning Board application process and issued Decision.

Comment 8: ***Sign Package:*** *Please see attached memo for comments and revise and resubmit the sign application and program book, only including the wall mounted and free-standing signs that require CPDC approval.*

Response 8: The proposed sign package and permit application has been revised per the comments included in the staff memo. Please refer to the "Sign Program Book" prepared by Persona for additional information.

Comment 9: ***Sidewalk treatment****: Should the front recirculation lane be maintained, the outstanding comment from the DRT that a stronger treatment of the crosswalk that crosses that front circulation lane will be required before approval. The stop bar should be located before the crosswalk.*

Response 9: The plans have been updated to show that the proposed crosswalk within the recirculation lane will be treated with red stamped asphalt in contrast to the asphalt surface previously proposed. The stop bar has also been relocated prior to the crosswalk. Please refer to the "Proposed Site Plan Documents" for additional information.

Comment 10: ***Drainage:*** *We'll defer to the Town Engineer for forthcoming detailed comments, but unless I missed it I do not see the pre-treatment infrastructure noted on the plan sheet?*

Response 10: Two (2) stormwater quality pre-treatment units (CDS-1515-3) are proposed along each of the two drainage lines prior to discharge of stormwater into the underground culvert. Labels have been updated to "SWQU-1/2" on sheet C-401 for clarity.

Comment 11: ***TIA:*** *Please provide data from a site with a similar context to Reading for pre- and post-addition of a second drive-thru lane. We'd like to know what level of induced demand there is for a dual lane when built.*

Response 11: McDonald's customer transaction data is proprietary information of McDonald's and we do not have any available traffic study data from a site following the implementation of a side-by-side drive-thru. A traffic assessment, prepared by Traffic Engineering Consultant McMahon Associates, for the proposed McDonald's redevelopment was submitted with the application. Their findings were based on current Institute of Transportation Engineers' (ITE) publication, Trip Generation Manual, 11th Edition which establishes trip rates based on traffic counts conducted at similar types of existing land uses. In the case of a fast-food restaurant with drive-thru use, demand is driven by building square footage, seating, and pass by traffic, not how many menu boards or order points are on a site. As seen in the report, the proposed redevelopment is anticipated to result in up to 13 additional trips during peak hours, but a significant portion of these are pass-by trips from traffic already on the roadway**.** The proposed redevelopment is not anticipated to significantly generate additional vehicular demand to the site and is more intended to better manage the existing volume of traffic with more efficient drive-thru operations resulting in reduced customer wait times.

Comment 12: ***Lot Line Adjustment:*** *We would ask that the Applicant consider an 81X, or other plan as necessary, to adjust the lot lines so that the property limits are not extended into the Town sidewalk. This would be a benefit for both parties.*

Response 12: McDonald's is agreeable to adjusting the lot lines and transferring the area of the property extending into the Town sidewalk through an 81X plan or other similar process with the City.

Comment 13: ***Sustainability:*** *Please provide a statement from McDonald's on how this redevelopment achieves its sustainability goals. Especially in relation to the company's Net Zero 2050 initiative and how this building, and the traffic generated that will idle in a downtown with residential use, is achieved. While many of the company's goals are focused on its food and package processing this auto-centric development is seemingly at odds with current and future Town objectives of pedestrian centered development, reduction of single-vehicle traffic generation, and GHG emission reduction.*

Response 13: The proposed project will result in a brand new restaurant facility with new energy efficient systems including LED lighting, refrigeration and heating, and ventilation and air conditioning systems. McDonald's has been investing in building and site improvements across their footprint from 2019–2023. As these new and remodeled restaurants become operational, the energy generated is expected to contribute to a 33% reduction in GHG emissions associated with their U.S. restaurant electricity usage from their 2015 baseline. McDonald's portion of these renewable energy projects is expected to help prevent approximately 3,500,000 metric tons of CO2e emissions annually.

Relative to the site improvements the new side-by-side drive thru is not intended to generate more vehicle traffic to the site but instead to better manage their existing traffic. The dual order point configuration, second drive-thru window, and new kitchen equipment will optimize the drive-thru efficiency resulting in reduced customer wait time and reduced vehicle idling time. As it exists today there is only a single order point and a single window for payment/order pickup. Under proposed conditions the second order point will allow for drive-thru orders to continue processing should a patrons be taking time for a larger order or reviewing the menu.

McDonald's has been operating their business since the restaurant was first constructed in 1963 and with drive-thru operations since 1994 which has become the preference for the majority of their customer base to complete transactions through. Furthermore given the impact of the COVID-19 pandemic more customers have chosen to stay in their vehicle in the drive-thru for safety and contact purposes which is why the drive-thru layouts have been critical to the businesses success through the pandemic. The proposed modifications and improvements to the existing restaurant are important because of the protection they will continue to provide to public health, safety, and welfare concerns.

Town of Reading Engineering Division Memo dated August 31st, 2023

Comment 1: *The Town's sidewalk is shown to be within the property lines of the existing site. The Applicant shall confirm layouts and location of the Town's sidewalk and travel way. In the event the property lines are correct the Applicant shall provide either an easement to the Town or give land to the Town so the sidewalk is not on private property.*

Response 1: McDonald's is agreeable to adjusting the lot lines and transferring the area of the property extending into the Town sidewalk through an 81X plan or other similar process with the City.

Comment 2: *The internal traffic patterns appear to send traffic crossing over itself and should be reconsidered. Large trucks will have issues making the turning movements.*

Response 2: The recirculation lane allows vehicles entering from the Bolton Street driveway to access the parking area on the South side of the building without having to exit onto Main Street and turn back into the Main Street entrance driveway. The recirculation lane is a significant aspect operationally for McDonald's to allow for customer's circulating the restaurant to stay on site and is a design priority for new and redevelopment sites. Larger passenger vehicles can make this maneuver as seen in the vehicle turning exhibit modeling a F-150 truck included in this resubmittal. Loading vehicle will not make this maneuver through the recirculation lane and instead will exit out the Main Street Exit only driveway.

Comment 3: *Thought should be given to the placement of the crosswalk in front of the building to provide better protection to pedestrians. The stop bar is after the crosswalk allowing vehicles to stop on the crosswalk, the stop bar and/or crosswalk should be relocated.*

Response 3: The crosswalk location has been proposed in order to provide an accessible connection from the public sidewalk as required by ADA/AAB regulations and also the furthest point away from vehicles making the turn into the recirculation lane. The plans have been revised to relocate the stop bar and signage before the pedestrian crosswalk and the crosswalk will be treated with red stamped asphalt in contrast to the asphalt surface for improved visibility. A "Pedestrian Warning" for vehicles is also now proposed prior to the crosswalk. Please refer to Sheet C-301 of the "Proposed Site Plan Documents".

Comment 4: *There are three driveways on this site. The applicant should consider closing one of the entrances.*

Response 4: The three (3) driveways on site is an existing condition and McDonald's would prefer as proposed that these driveways be maintained for business operations. The entrance-only and exit-only driveways to Main Street allow for more efficient vehicles movements accessing and egressing the site while the full access driveway to Bolton Street allows vehicles to avoid having to turn to/from Main Street.

Comment 5: *The drainage report indicates the use of NOAA Atlas 14 Rainfall data and shows a reduction in post-development runoff volumes and flows for the 2, 10, 25 and 100-year storms.*

Response 5: Comment acknowledged.

Comment 6: *The site has reduced impervious area by 3,775 square feet but shows very limited water qualities BMP's with only the addition of deep sump catch basins result in in only 33% TSS removal. The applicant shall make an effort to provide more detention and recharge on site and increase TSS removal to 80%, instead of directly discharging into the Towns drainage system. The applicant shall include phosphorus removal calculations.*

Response 6: In addition to the deep-sump and hooded catch basin, two (2) stormwater quality pre-treatment units (CDS-1515-3) are proposed along each of the two drainage lines prior to discharge of stormwater into the underground culvert. Labels have been updated to "SWQU-1/2" on sheet C-401 for clarity. Due to the existing topography, lot configuration, and proposing to maintain the underground culvert a portion of the property is proposed to continue to sheet flow to Bolton while TSS removal has been implemented to the maximum extent practicable to treat stormwater being captured and routed on-site.

The proposed redevelopment project is anticipated to result in less the 1 acre of disturbance and therefor will not require a stormwater management permit which phosphorus removal is required for. As such, the stormwater management system has been designed to meet the MADEP stormwater regulations to the maximum extent practicable for a redevelopment and no phosphorus treatment proposed as part of the stormwater management infrastructure.

Comment 7: *The applicant shall CCTV inspect the Town's box culvert prior to construction.*

Response 7: A culvert assessment was conducted by Whitestone Associates who completed a CCTV inspection of the existing culvert and did not identify any significant issues with the existing condition.

Comment 8: *The size and type of all existing and proposed utilities shall be labeled on the plan.*

Response 8: Size and type of all available existing utility information and proposed have been labeled on the plan. Please refer to Sheet C-401 and C-501 of the "Proposed Site Plan Documents" for additional information.

Comment 9: *Fire flow test shall be performed.*

Response 9: There is an existing domestic water line servicing the current building. A fire service line is not proposed as part of this project nor is it required for the proposed building. As such, we would respectfully request that a fire flow test not be required.

Comment 10: *Sewer flow study shall be performed.*

Response 10: Please refer to the "Sewer Memo" prepared by Bohler, dated 9/8/2023 which is included as part of this resubmittal.

Comment 11: *There should be more of a natural buffer from the properties in the rear. Applicant should consider plantings to screen the site.*

Response 11: Under existing conditions, the area along the easterly property line has been previously developed and consists primarily of a paved parking area, drive-aisle, concrete retaining wall, light pole, and stockade fence with no natural buffer. The project proposed to replace the existing fence along the property line a portion go which will be a 12' high sound barrier wall and providing a 3'-4' landscape buffer with plantings which is a significant improvement upon existing conditions. A rendering of this area illustrating the improvements has been included in the resubmittal. It is notable the project is anticipated to result in a 3,775 square-feet reduction of impervious area on-site.

Comment 12: *Trench paving in the Town ROW shall meet Town Standards for this area.*

Response 12: Comment acknowledged. Plans have been revised to specify trenching within ROW shall meet Town standard as seen on the Plan sheets C-301 and C-501.

Comment 13: *The site may be subject to a Sewer Connection Fee.*

Response 13: Comment acknowledged.

Comment 14: *All utilities shall be approved materials and installed in accordance with the Department of Public Works Standards.*

Response 14: Comment acknowledged.

Comment 15: *Engineering Division shall be notified 72 hours in advance to mark out Town utilities.*

Response 15: Comment acknowledged.

Comment 16: *All water, sewer, curb cut, street opening, and Jackie's Law excavation permits shall be obtained at the Engineering Division prior to any excavations.*

Response 16: Comment acknowledged.

Comment 17: *All site work shall be inspected by the Engineering Division. The Applicant/Owner's contractor shall submit a construction schedule of proposed work. All inspections shall be scheduled 48 hours in advance.*

Response 17: Comment acknowledged.

Comment 18: *An approved site as-built shall be submitted to the Engineering Division within 60 days of certificate of occupancy. The as-built shall be submitted in mylar and electronic ACAD format.*

Response 18: Comment acknowledged.

We trust the provided information is sufficient for your needs at this time and look forward to discussing the project at the October 16th Community Planning & Development Commission Meeting. Should you have any questions or require additional information, please do not hesitate to contact either of us at 508-480-9900.

Sincerely,

BOHLER

Eric G. Dubrule , PE

Daniel Allen, PE

April 26, 2023

Eric Dubrule
Bohler Engineering
352 Turnpike Road
Southborough, MA 01772

RE: Traffic Assessment
McDonald's Redevelopment
413 Main Street, Reading, MA

McMahon, a Bowman company, has completed a traffic assessment for the proposed McDonald's redevelopment located at 413 Main Street (Route 28) in Reading, Massachusetts. The proposed redevelopment would demolish the existing McDonald's building and construct a new McDonald's with additional drive-thru queuing space. As part of the redevelopment, 11 parking spaces would be removed to accommodate the additional drive-thru space.

This assessment includes a review of estimated trip generation, drive-thru operations, and internal site circulation with the existing and proposed McDonald's. The findings are summarized below.

Project Description
The project site is located at 413 Main Street in Reading, Massachusetts. Access is provided via three driveways: one enter-only driveway on Main Street, one exit-only driveway on Main Street, and one full-access driveway on Bolton Street. The site is bounded by commercial land uses to the north, Bolton Street to the south, residential properties to the east, and Main Street to the west. The existing drive-thru is a single lane circulating counterclockwise around the McDonald's building from the south of the building to the north. The order board is located to the east of the building, and the pickup window is located at the north of the building. A total of 43 parking spaces are provided on the site. Three spaces are accessible, two parking spaces are marked for mobile order pickup, and two spaces are marked for drive-thru pull-up parking.

The existing building is approximately 3,398 square feet (sf) with a single drive-thru lane. The proposed redevelopment would replace the existing building with an approximately 3,922 sf McDonald's with two order boards and additional drive-thru queueing space. The redeveloped site would provide 32 parking spaces including two accessible spaces, two mobile order pick-up spaces, and two drive-thru pull-up parking spaces. Access to the site is not proposed to be changed significantly with the redevelopment.

Trip Generation
To estimate the number of vehicle trips associated with the proposed redevelopment, the Institute of Transportation Engineers' (ITE) publication, *Trip Generation Manual, 11th Edition*, was referenced. ITE is a national research organization of transportation professionals, and the *Trip Generation Manual, 11th Edition* provides traffic generation information for various land uses compiled from studies conducted by members nationwide. This reference establishes vehicle trip rates (in this case expressed in trips per square foot) based on actual traffic counts conducted at similar types of existing land uses.

Vehicle trip generation estimates for the existing and proposed McDonald's sites were developed using Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window). A summary of the total trips projected to be generated by the existing and proposed McDonald's is presented in Table 1 below.

Table 1: Proposed Trip Generation

		Weekday Midday Peak Hour			Weekday PM Peak Hour			Saturday Midday Peak Hour		
Description	**Size**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Existing McDonald's Trips[1]	3,398 s.f.	88	85	173	58	54	112	96	92	188
Proposed McDonald's Trips[2]	3,922 s.f.	102	98	200	67	62	129	111	106	217
Additional Site Trips		**14**	**13**	**27**	**9**	**8**	**17**	**15**	**14**	**29**

1 ITE Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window) based on 3,398 square feet.
2 ITE Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window) based on 3,922 square feet.

As shown in Table 1, the proposed McDonald's redevelopment is estimated to generate approximately 27 additional trips (14 entering vehicles and 13 exiting vehicles) during the weekday midday peak period, approximately 17 additional trips (nine entering vehicles and eight exiting vehicles) during the weekday afternoon peak period, and approximately 29 additional trips (15 entering vehicles and 14 exiting vehicles) during the Saturday midday peak period.

Not all trips to land uses like McDonald's are new trips. In fact, a significant portion of the total trips attracted to such land uses are pass-by trips. Since pass-by traffic is already on the adjacent roadways, this portion of the total redevelopment traffic is reflected in the existing, base traffic volumes, and does not represent additional traffic on the roadway network. Therefore, the total traffic volume associated with the proposed redevelopment is reduced by the pass-by volume to estimate the "new" traffic generated by the project. The resulting new project trips for the proposed McDonald's are displayed in Table 2.

Table 2: New Project Trips

		Weekday Midday Peak Hour			Weekday PM Peak Hour			Saturday Midday Peak Hour		
Description	**Size**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Existing McDonald's Trips	3,398 s.f.	88	85	173	58	54	112	96	92	188
- Pass-by Trips[1]		-48	-48	-96	-31	-31	-62	-52	-52	-104
Proposed McDonald's Trips	3,922 s.f.	102	98	200	67	62	129	111	106	217
- Pass-by Trips[1]		-55	-55	-110	-35	-35	-70	-60	-60	-120
New Project Trips		**7**	**6**	**13**	**5**	**4**	**9**	**7**	**6**	**13**

1 Based on ITE Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window), 55% of weekday PM trips can be attributed to pass-by trips. No weekday midday or Saturday midday pass-by data are available, so the weekday PM percentage was applied to estimate pass-by trips.

As shown in Table 2 above, the proposed McDonald's redevelopment is estimated to result in 13 new trips (seven entering vehicles and six exiting vehicles) during the weekday midday peak hour, nine new

trips (five entering vehicles and four exiting vehicles) during the weekday afternoon peak hour, and 13 new trips (seven entering vehicles and six exiting vehicles) during the Saturday midday peak hour.

Drive-Thru Queue Observations

Queue observations were conducted at the existing McDonald's drive-thru on Saturday, April 1, 2023 from 11:00 AM to 2:00 PM and on Tuesday, April 4, 2023 from 11:30 AM to 1:30 PM and 4:30 PM to 6:30 PM. The queues observed during the study were separated into two categories: order board queues and pick-up queues. Order board queues were vehicles stopped beginning at the order board waiting to place orders, and pick-up queues were vehicles stopped beginning at the pick-up window waiting to pay and/or pick up orders. The total observed queues, consisting of a combination of order board queues and pick-up queues, are summarized in Table 3 below.

Table 3: Drive-Thru Queue Observations

Queue Type	Weekday Midday	Weekday Afternoon	Saturday Midday
Max Queue[1]	9	9	8
Time of Occurrence	12:35 PM	5:35 PM	1:00 PM
Average Queue[2]	4	3	3

1 Maximum observed queue in number of vehicles including pick up and ordering queues

2 Average observed queue per observation period in number of vehicles including pick up and ordering queues

As shown in Table 3 above, the maximum drive-thru queue was observed to be nine vehicles during the weekday midday peak period, nine vehicles during the weekday afternoon peak period, and eight vehicles during the Saturday midday peak period. A five-vehicle pick-up queue occurred multiple times during each of the observation periods, which would obstruct ordering operations until pick-up queues were cleared. On one occasion during the Saturday midday peak period, vehicles were queued back to the site driveway on Main Street, briefly obstructing the potential for vehicles to enter the site. All other observed queues were contained within the available drive-thru stacking space.

Parking Observations

During the weekday midday, weekday afternoon, and Saturday midday drive-thru count periods, periodic parking observations were conducted. During the observation period, the maximum parking occupancy occurred on Saturday at 11:30 AM when the parking lot was approximately 50 percent full with 20 parking spaces occupied. However, of the 20 occupied spaces, three were order pickup spaces. During the weekday midday and weekday afternoon observation periods, the maximum number of occupied parking spaces was 13 and eight, respectively.

Based on the observations conducted, the reduction to 32 total parking spaces is not anticipated to have a significant impact on operations at the site, as 32 parking spaces would be more than adequate for the needs of the site.

Site Access and Circulation

Access to the site is not proposed to be changed significantly with the redevelopment. Access would continue to be provided via an enter-only driveway on Main Street, an exit-only driveway on Main Street, and a full-access driveway on Bolton Street. With the proposed redevelopment, one-way circulation counterclockwise around the site would be accommodated. Parking would continue to be provided on both the north and south sides of the site, with 21 parking spaces on the south of the site and 11 parking spaces on the north of the site.

Vehicles accessing the site from Main Street would continue east to the parking area south of the building or the drive-thru area on the east side of the site and circulate counterclockwise to the pickup window on the north side of the site. Vehicles accessing the site from Bolton Street would continue north to the drive thru area or circulate counterclockwise around the building using the drive-thru bypass lane to the parking area north of the building or on the southern side of the site. Vehicles exiting the drive-thru would either exit directly onto Main Street via the exit-only driveway or circulate counterclockwise around the building to get back to Bolton Street.

The proposed drive-thru would provide one lane along the east side of the site, which then opens to two lanes approaching two order boards before merging to one lane to circulate the building in a counterclockwise manner. The building would provide one payment window and a second pick-up window to improve the overall efficiency of the operation. With the improvements in place, the site would provide stacking space for approximately 13 vehicles, which would be sufficient to contain the queues observed during the field observations.

With the proposed redevelopment, a new circulation lane would be constructed along the western edge of the site to allow for counterclockwise circulation around the site. The circulation would replace the existing playground on the site and would be stop-controlled at its approach to the parking lot and Main Street enter-only driveway. During the field visit, sight distance observations were conducted at the location of the proposed stop bar to ensure circulating vehicles would have adequate sight distance to see approaching southbound left-turning vehicles from Main Street. Based on these observations, the available sight distance at the stop bar is estimated to be approximately 220 feet as a vehicle on site could see back to the Washington Street signal. The site frontage at this entering driveway should be kept clear to provide necessary visibility given the new site configuration.

During the weekday midday, weekday afternoon, and Saturday midday drive-thru count periods, the vehicle queue on Main Street extending back from the signalized intersection with Washington Street was reviewed. The queue was frequently observed to extend past the McDonald's driveway and temporarily obstruct entering and exiting access. Drivers did occasionally leave gaps for access to the McDonald's driveway, but additional improvements on Main Street may be desirable. No significant vehicle delay was observed for vehicles exiting the site and turning left or right onto Main Street. The proposed project would not be expected to appreciably change the site or Main Street operations.

Findings

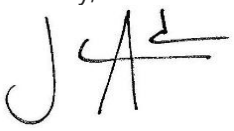
The McDonald's restaurant located at 413 Main Street in Reading, Massachusetts, is proposed to be redeveloped with expanded drive-thru operations. As part of the redevelopment, 11 parking spaces

would be removed to accommodate the additional drive-thru space. Based on parking observations completed during the weekday midday, weekday afternoon and Saturday midday peak periods, the 32 parking spaces provided as part of the redevelopment would serve the parking needs of the McDonald's.

When compared to the existing McDonald's, the proposed redevelopment is estimated to generate approximately 13 new trips (seven entering vehicles and six exiting vehicles) during the weekday midday peak hour and Saturday midday peak hour and nine new trips (five entering vehicles and four exiting vehicles) during the weekday afternoon peak hour. As such, the redevelopment is projected to result in less than one additional new trip every five minutes, and the impact of the project is anticipated to be negligible.

The maximum observed drive-through queues were nine vehicles during the weekday midday and weekday afternoon peak periods and eight vehicles during the Saturday midday peak periods. Under proposed conditions, the expanded drive-thru would allow for increased stacking capacity that would be more than adequate to serve the needs of the restaurant.

Sincerely,



Jason T. Adams, P.E., PTOE
Senior Project Manager

120 Water Street, 4th Floor, Boston, MA 02109
P: 617.556.0020
mcmahonassociates.com | bowman.com

DRAINAGE REPORT

For

PROPOSED

413 Main Street
Reading, Massachusetts
Middlesex County

Prepared by:

BOHLER ENGINEERING
352 Turnpike Road
Southborough, MA 01772
(508) 480-9900 TEL.

John A. Kucich
Massachusetts P.E. Lic. #41530

July 28, 2023
#W222000

BOHLER

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

I. EXECUTIVE SUMMARY

This report examines the changes in drainage that can be expected as the result of the proposed redevelopment for a raze and rebuild of an existing McDonald's Restaurant with Drive-Thru located at 413 Main Street in the Town of Reading, Massachusetts. The site, which consists of approximately 0.74 acres of land, contains an existing McDonald's restaurant with a playground area, drive-thru, existing paved parking areas, on-site utilities, and landscaping. The site is located within 100' of an existing open channel, however, no existing wetlands are present on-site. Furthermore, the entirety of the existing site is outside of all mapped areas of Estimated Habitat of Rare Wetlands Wildlife and Priority Habitats of Rare Species.

The proposed project includes the construction of a new ±3,970 SF McDonald's Restaurant with Drive-Thru along with new paved parking areas, landscaping, storm water management components and associated utilities. This report addresses a comparative analysis of the pre- and post-development site runoff conditions. Additionally, this report provides calculations documenting the design of the proposed stormwater conveyance/management system as illustrated within the accompanying Site Development Plans prepared by Bohler. The project will also provide erosion and sedimentation controls during the demolition and construction periods, as well as long term stabilization of the site.

For the purposes of this analysis the pre- and post-development drainage conditions were analyzed at three (3) "design points" where stormwater runoff currently drains to under existing conditions. These design points are described in further detail in **Section II** below. A summary of the existing and proposed conditions peak runoff rates for the 2-, 10-, 25-, and 100-year storms can be found in **Table 1.1** below. In addition, the project has been designed to meet or exceed the Stormwater Management Standards to the maximum extent practicable for a redevelopment as detailed herein.

Table 1.1: Design Point Peak Runoff Rate Summary

Point of Analysis	2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP#1	1.00	0.92	**-0.08**	1.64	1.53	**-0.11**	2.03	1.91	**-0.12**	2.63	2.49	**-0.14**
DP#2	0.35	0.22	**-0.13**	0.56	0.37	**-0.19**	0.69	0.46	**-0.23**	0.90	0.59	**-0.31**
DP#3	1.02	0.76	**-0.26**	1.71	1.42	**-0.29**	2.13	1.84	**-0.29**	2.78	2.47	**-0.31**

**Flows are represented in cubic feet per second (cfs)*

II. EXISTING SITE CONDITIONS

Existing Site Description

The site consists of approximately 0.74 acres of land located at 413 East Main Street in the Town of Reading, Massachusetts. The site contains an existing McDonald's restaurant, with a playground area, drive-thru, paved parking areas, on-site utilities, and landscaping. No existing wetlands are present on-site. It is notable that there is a 4'x6' underground concrete box culvert which runs east to west through the center of the property and converts into an open channel at the east property boundary. Refer to **Appendix A** for the FEMA FIRM panel.

On-Site Soil Information

Soils within the analyzed area consist of the following as classified by the Natural Resource Conservation Service (NRCS):

Table 2.1: Existing Soil Information

Soil Unit Symbol	Soil Name / Description	Hydrologic Soil Group (HSG)
602	Urban Land	C
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	A

Refer to **Appendix C** for additional information.

Existing Collection and Conveyance

Under existing conditions, runoff from the majority of the northern portion of the site sheet flows to one of three existing catch basins on-site. These catch basins convey stormwater to an existing underground box culvert which flows West to East through the site. A smaller area at the northwest corner of the property drains to a catch basin which connects directly to the municipal system within Main Street. The remaining area on the south side of the site sheet flows off-site out to Bolton Street and eventually into the existing stormwater system within Bolton Street. Slopes on the site range from 1%-8% with on-site elevations ranging from 95 adjacent to Bolton Street to 98.5 at the northeasterly portion of the property.

Existing Watersheds and Design Point Information

For the purposes of this analysis, the pre- and post-development drainage conditions were analyzed at three (3) "design points" as described below where stormwater runoff currently drains to under existing conditions. The existing site was subdivided into three (3) sub catchments, as

described below, to analyze existing and proposed flow rates at each design point. The minimum time of concentration for all proposed areas is calculated as 6 minutes (0.1 hr).

Design Point #1 (DP#1) is the existing underground culvert flowing West to East through the site that changes into on open channel past the east property boundary. Under existing conditions, this design point receives stormwater flows from approximately 0.34 acres of land, designated as watershed "EX-1". Refer to Table 2.2 below for additional detail.

Design Point #2 (DP#2) is existing municipal stormwater management system in Main Street. Under existing conditions, this design point receives stormwater flows from approximately 0.10 acres of land, designated as watershed "EX-2". Refer to Table 2.2 below for additional detail.

Design Point #3 (DP#3) is Bolton Street along the southerly property line. Under existing conditions, this design point receives stormwater flows from approximately 0.31 acres of land, designated as watershed "EX-3". Refer to Table 2.2 below for additional detail.

Table 2.2: Existing Sub-Catchment Summary

Sub-catchment Name	Total Area (acres)	Cover Description	Curve Number (CN)	Time of Concentration (Tc, minutes)
EX-1	0.34±	Rooftops, paved parking, grass	95	6.0
EX-2	0.10±	Rooftops, paved parking, grass	96	6.0
EX-3	0.31±	Paved parking, grass	93	6.0

Refer to **Table 1.1 and Table 5.1** for the existing conditions peak rates of runoff. Refer to **Appendix D** and the Drainage Area Maps in the appendices of this report for a graphical representation of the existing drainage areas.

III. PROPOSED SITE CONDITIONS

Proposed Development Description

The proposed project consists of a raze and rebuild for a new 3,970 SF McDonald's Restaurant with Drive-Thru including paved parking areas, landscaping, associated utilities, and new stormwater management system. The site has been designed to drain to deep-sump, hooded catch basins to the maximum extent practicable based on the existing topography and drainage conditions. The catch basins will capture and convey stormwater runoff, via an underground pipe system and drainage manholes, to the existing stormwater management system. Pretreatment of stormwater runoff will be provided to the maximum extent practicable by a combination of the deep-sump and hooded catch basins and a stormwater quality unit prior to discharge into the existing underground culvert and municipal stormwater management system. The existing underground culvert is proposed to be maintained which has constrained the proposed site layout and stormwater management system design.

Proposed Development Collection and Conveyance

Deep sump hooded catch basins are proposed to collect and route runoff from the paved parking areas to the existing surface basins. Pipes have been designed for the 25-year storm using Rational Method and Pipe sizing calculations are included in **Appendix F**.

The best management practices (BMPs) incorporated into the proposed stormwater management system have been designed to meet the standards set forth in the Massachusetts Department of Environmental Protection Stormwater Handbook standards for a redevelopment to the maximum extent practicable. Refer to **Section V** for additional information.

Proposed Watersheds and Design Point Information

The project has been designed to generally maintain the drainage patterns that existing on site today, with the same design points described in **Section II** above. The site was subdivided into five (5) separate sub catchments for the proposed conditions as described below. The minimum time of concentration for all proposed areas is calculated as 6 minutes (0.1 hr).

Under proposed conditions DP#1, the underground culvert, receives stormwater flows from approximately 0.32 acres of land, designated as watershed "P-1", "P-4", and "P-5". Refer to Table 3.1 below for additional detail.

Under proposed conditions DP#2, the municipal system within Main Street, receives stormwater flows from approximately 0.08 acres of land, designated as watershed "P-2". Refer to Table 3.1 below for additional detail.

Under proposed conditions DP#3, the drainage system within Bolton Street, receives stormwater flows from approximately 0.34 acres of land, designated as watershed "P-3". Refer to Table 3.1 below for additional detail.

Table 3.1: Proposed Sub-catchment Summary

Sub-catchment Name	Total Area (acres)	Cover Description	Curve Number (CN)	Time of Concentration (Tc, minutes)	Hydrologic Routing
P-1	0.10±	Paved parking, grass, landscaped areas	94	6.0	DP#1
P-2	0.08±	paved parking, grass, landscaped areas	94	6.0	DP#2
P-3	0.34±	paved parking, grass, landscaped areas	86	6.0	DP#3
P-4	0.13±	paved parking, grass, landscaped areas	90	6.0	DP#1
P-5	0.09±	Rooftops	98	6.0	DP#1

Refer to **Table 1.1 and Table 5.1** for the calculated proposed conditions peak rates of runoff. For additional hydrologic information, refer to **Appendix D** and the Drainage Area Maps in the appendices of this report for a graphical representation of the proposed drainage areas.

IV. METHODOLOGY

Peak Flow Calculations

Methodology utilized to design the proposed stormwater management system includes compliance with the guidelines set forth in the latest edition of the Massachusetts DEP Stormwater Handbook. The pre- and post-development runoff rates being discharged from the site were computed using the HydroCAD computer program. The drainage area and outlet information were entered into the program, which routes storm flows based on NRCS TR-20 and TR-55 methods. The other components of the model were determined following standard NRCS procedures for Curve Numbers (CNs) and times of concentrations documented in the appendices of this report. The rainfall data utilized and listed below in table 4.1 below for stormwater calculations is based on NOAA. Refer to **Appendix F** for more information.

Table 4.1: NOAA Rainfall Intensities

Frequency	2 year	10 year	25 year	100 year
Rainfall* (inches)	3.31	5.21	6.40	8.23

*Values derived from NOAA ATLAS on 03/28/2023

The proposed stormwater management as designed will provide a decrease in peak rates of runoff from the proposed facility for the 2-, 10-, 25- and 100-year design storm events. Additionally, the proposed project meets, or exceeds, the MADEP Stormwater Management standards. Compliance with these standards is described further below.

V. STORMWATER MANAGEMENT STANDARDS

Standard #1: No New Untreated Discharges

The proposed redevelopment is anticipated to result in a reduction of approximately 3,775± square feet of impervious coverage and no new untreated discharges are expected with the existing drainage patterns will generally be maintained.

Standard #2: Peak Rate Attenuation

As outlined in **Table 1.1** and **Table 5.1**, the redevelopment of the site and the proposed stormwater management system, have been designed so that post-development peak rates of runoff are below pre-development conditions for the 2-, 10-, 25- and 100-year storm events at all design points.

Standard #3: Recharge

The proposed project is a redevelopment and is required to meet Standard 3 to the maximum extent practicable. The project as proposed will reduce the overall impervious area on the site by approximately 3,775± square feet. As such, the annual recharge under post development conditions will exceed the annual recharge under predevelopment conditions.

Standard #4: Water Quality

The proposed redevelopment is anticipated to result in a reduction of approximately 3,775± square feet of impervious coverage. To the maximum extent practicable, water quality treatment is provided via deep-sump and hooded catch basins and proprietary water quality treatment units prior to being discharged. Stormwater runoff generate that is being routed to the existing underground culvert will be treated by one of two water quality treatment units prior to discharge. Due to the design constraints based on the existing topography, intent to maintain the existing underground culvert, and lot configuration, a 14,980± square foot area will continue to sheet flow to Bolton Street through the full access driveway as it does under existing conditions today. The proposed stormwater management system for the redevelopment is anticipated to obtain a weighted TSS removal of ±33%. TSS removal calculations are included in **Appendix F** of this report.

Standard #5: Land Use with Higher Potential Pollutant Loads

The proposed project involves a “Land Use with Higher Potential Pollutant Loads”. The existing drainage patterns are proposed to be generally maintained and the redevelopment is anticipated

to result in a reduction of approximately 3,775± square feet of impervious coverage. The project will also implement a stormwater Operations and Maintenance Plan for ongoing cleaning and parking lot sweeping to further ensure water quality standards are met for this redevelopment project to the maximum extent practicable.

Standard #6: Critical Areas

Not Applicable for this project.

Standard #7: Redevelopment

The project is a redevelopment and has been designed to meet the Massachusetts Stormwater Management regulations to the maximum extent practicable.

Standard #8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

The proposed project will provide construction period erosion and sedimentation controls as indicated within the site plan set provided for this project. This includes a proposed construction exit, protection for stormwater inlets, protection around temporary material stock piles and various other techniques as outlined on the erosion and sediment control sheets.

Standard #9: Operation and Maintenance Plan (O&M Plan)

An Operation and Maintenance (O&M) Plan for this site has been prepared and is included in **Appendix G** of this report. The O&M Plan outlines procedures and time tables for the long term operation and maintenance of the proposed site stormwater management system, including initial inspections upon completion of construction, and periodic monitoring of the system components, in accordance with established practices and the manufacturer's recommendations. The O&M Plan includes a list of responsible parties and an estimated budget for inspections and maintenance.

Standard #10: Prohibition of Illicit Discharges

The proposed stormwater system will only convey allowable non-stormwater discharges (firefighting waters, irrigation, air conditioning condensates, etc.) and will not contain any illicit discharges from prohibited sources. An Illicit Discharge Statement is included in **Appendix G** of this report.

VI. SUMMARY

In summary, the proposed stormwater management system illustrated on the drawings prepared by Bohler results in a reduction in peak rates of runoff from the subject site when compared to pre-development conditions for the 2-, 10-, 25- and 100-year storm frequencies. In addition, the proposed best management practices will result in an effective removal of total suspended solids from the post-development runoff. The pre-development versus post-development stormwater discharge comparisons are contained in **Table 5.1** below:

Table 5.1: Design Point Peak Runoff Rate Summary

Point of Analysis	2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP#1	1.00	0.92	**-0.08**	1.64	1.53	**-0.11**	2.03	1.91	**-0.12**	2.63	2.49	**-0.14**
DP#2	0.35	0.22	**-0.13**	0.56	0.37	**-0.19**	0.69	0.46	**-0.23**	0.90	0.59	**-0.31**
DP#3	1.02	0.76	**-0.26**	1.71	1.42	**-0.29**	2.13	1.84	**-0.29**	2.78	2.47	**-0.31**

**Flows are represented in cubic feet per second (cfs)*

As outlined in the table above, the proposed stormwater management system as designed will provide a decrease in peak rates of runoff from the proposed facility for the 2-, 10-, 25- and 100-year storm events. Additionally, the project meets or exceeds the MADEP Stormwater Management Standards as described further herein. The redevelopment project as proposed will reduce the overall impervious area on the site by approximately 3,775 square feet and has been designed to meet the Massachusetts Stormwater Management standards the maximum extent practicable for a redevelopment.

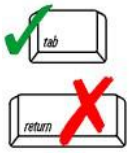
APPENDIX A: MASSACHUSETTS STORMWATER MANAGEMENT CHECKLIST

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

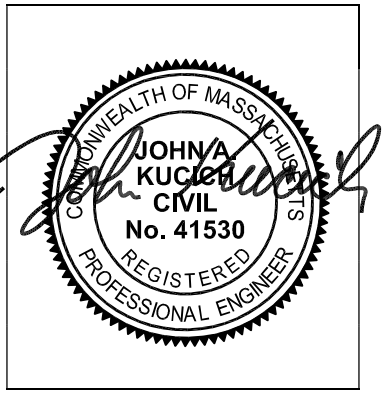
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



07/28/2023

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☒ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

☐ Site is comprised solely of C and D soils and/or bedrock at the land surface

☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000

☐ Solid Waste Landfill pursuant to 310 CMR 19.000

☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☐ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☒ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☒ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☒ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☒ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

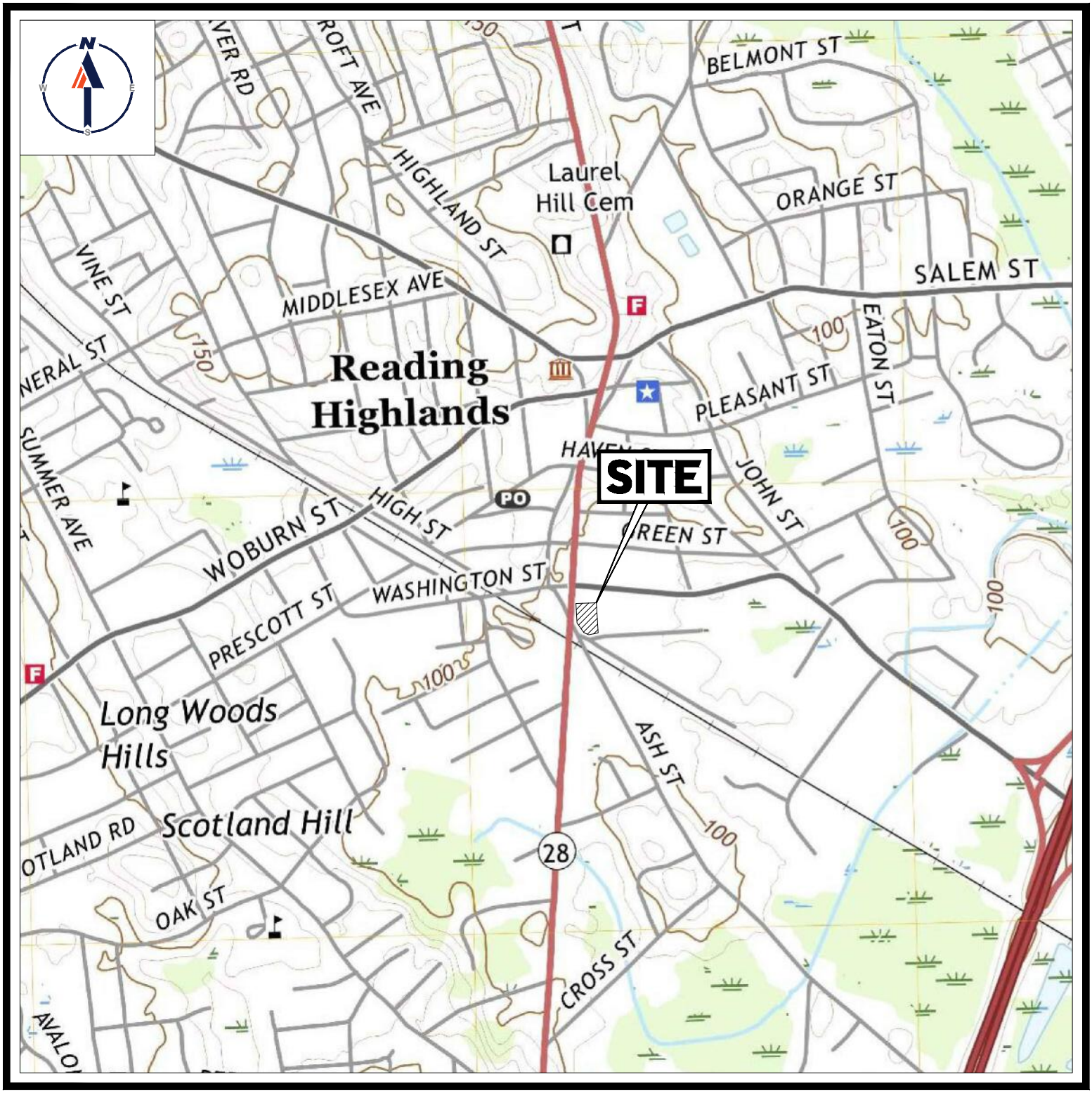
☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

APPENDIX B: PROJECT LOCATION MAPS

- *USGS MAP*
- *FEMA FIRMETTE*



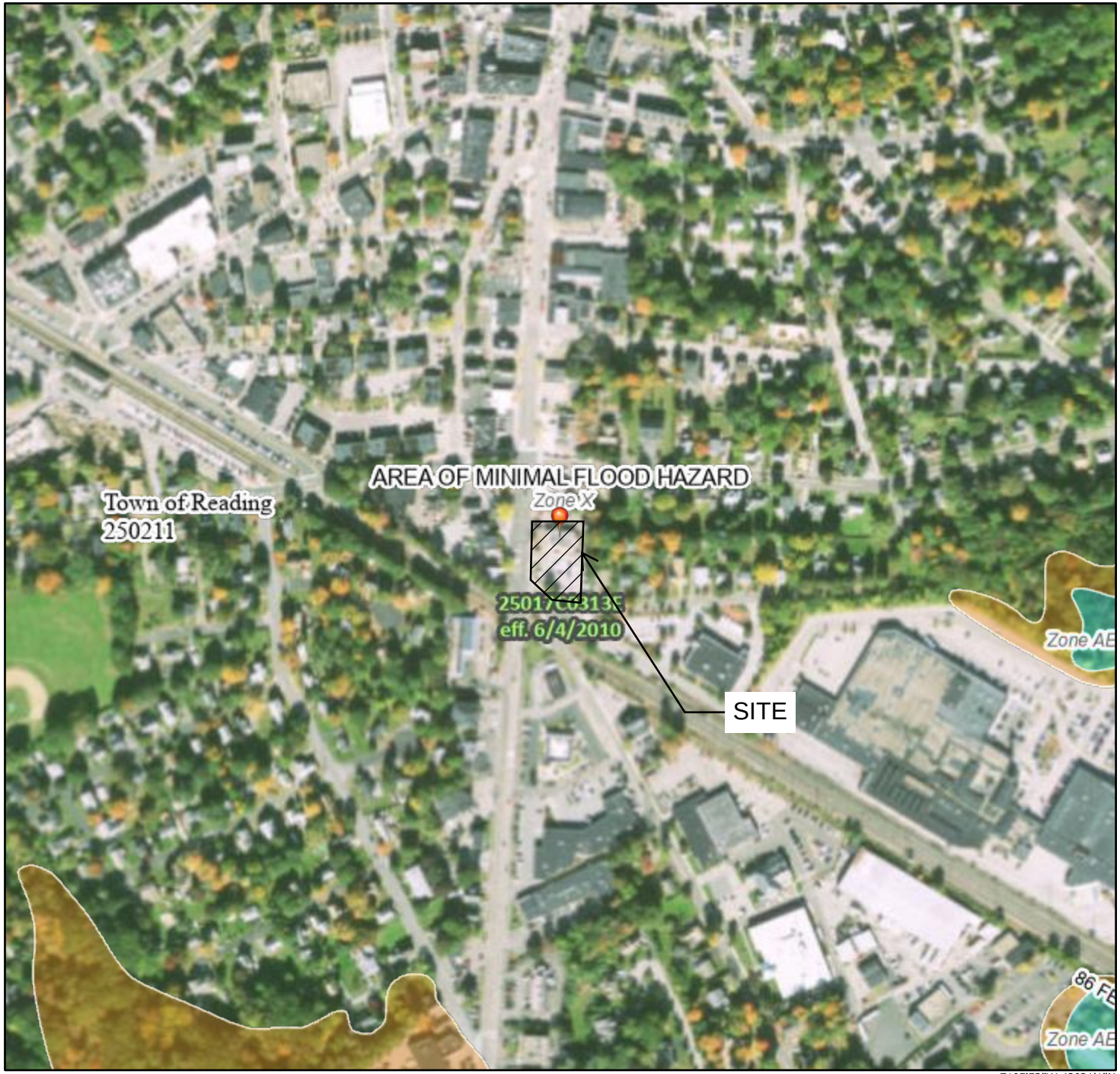
USGS MAP

SCALE: 1" = 1,000'
SOURCE: USGS READING
QUADRANGLE

National Flood Hazard Layer FIRMette

FEMA

71°6'29"W 42°31'27"N



71°5'52"W 42°31'1"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

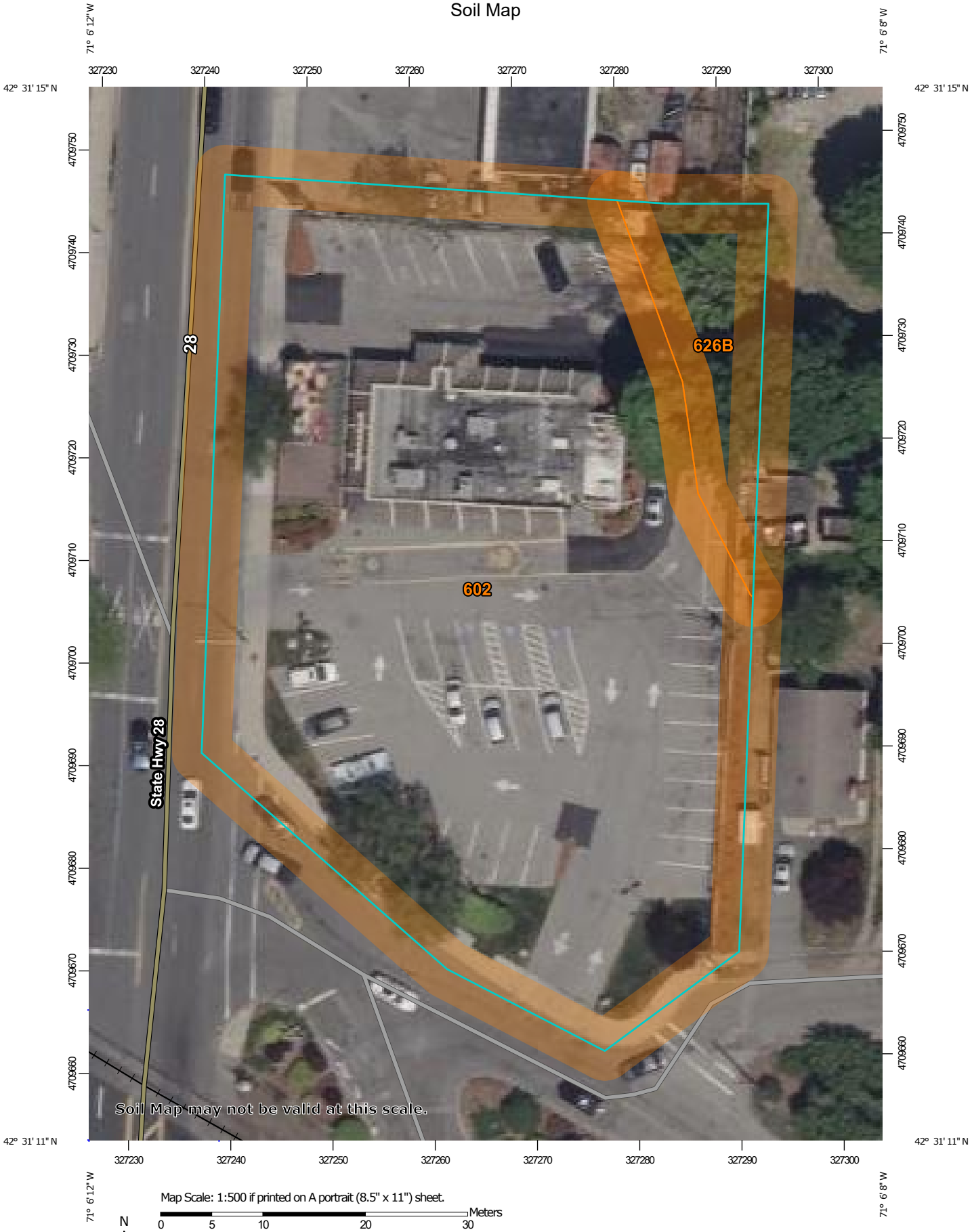
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/28/2023 at 10:19 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX C: SOIL AND WETLAND INFORMATION

- *NCRS CUSTOM SOIL RESOURCE REPORT*

Custom Soil Resource Report
Soil Map



Map Scale: 1:500 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 20 40 80 120

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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

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

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

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

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

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

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 22, Sep 9, 2022

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
602	Urban land	0.9	92.3%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	0.1	7.7%
Totals for Area of Interest		**1.0**	**100.0%**

Map Unit Descriptions

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

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

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

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

onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Middlesex County, Massachusetts

602—Urban land

Map Unit Setting

National map unit symbol: 9950
Elevation: 0 to 3,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Urban Land

Setting

Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Excavated and filled land

Minor Components

Udorthents, loamy

Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Landform: Ledges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope
Down-slope shape: Concave
Across-slope shape: Concave

Udorthents, wet substratum

Percent of map unit: 5 percent
Hydric soil rating: No

626B—Merrimac-Urban land complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyr9
Elevation: 0 to 820 feet
Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Merrimac and similar soils: 45 percent
Urban land: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Crest, side slope, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Description of Urban Land

Typical profile

M - 0 to 10 inches: cemented material

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Windsor

Percent of map unit: 5 percent
Landform: Outwash terraces, dunes, outwash plains, deltas
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Sudbury

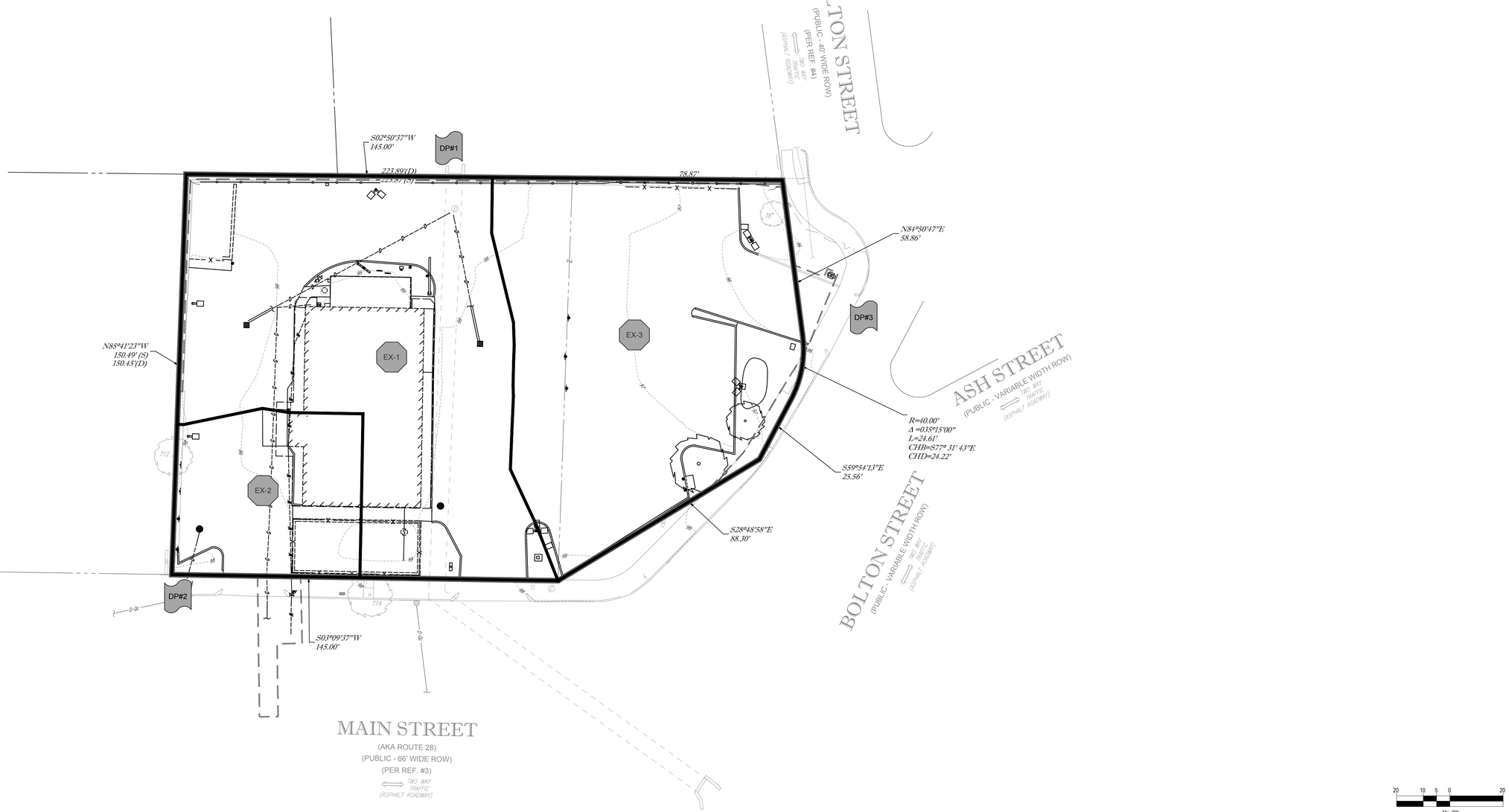
Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, crest, side slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

APPENDIX D: EXISTING CONDITIONS HYDROLOGIC ANALYSIS

- *EXISTING CONDITIONS DRAINAGE MAP*
- *EXISTING CONDITIONS HYDROCAD COMPUTATIONS*



LEGEND

- DP# — DESIGN POINT
- EX-# — EXISTING SUBCATCHMENT
- OVERALL ANALYSIS BOUNDARY
- SUBCATCHMENT BOUNDARY

20 10 5 0 20

1"= 20'

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE

J.A. KUCICH

PROFESSIONAL ENGINEER

MASSACHUSETTS LICENSE No. 41539
NEW HAMPSHIRE LICENSE No. 15426
CONNECTICUT LICENSE No. 29127
RHODE ISLAND LICENSE No. 9616
MAINE LICENSE No. 12553

McDonald's

BOSTON REGION
110 N CARPENTER ST
CHICAGO, IL 60607

OFFICE
ADDRESS

PLAN APPROVALS

SIGNATURE	DATE	APPROVED McDONALD'S AGENT

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

COMPLIANCE CHECK — DATE

CONSTRUCTION CHECK — DATE

CONSTRUCTION CHECK — DATE

PROJECT No.: W222000

CAD I.D. #: W222000-SPPD-1b.dwg

-

STREET ADDRESS
413 MAIN STREET

CITY: READING
STATE: MA

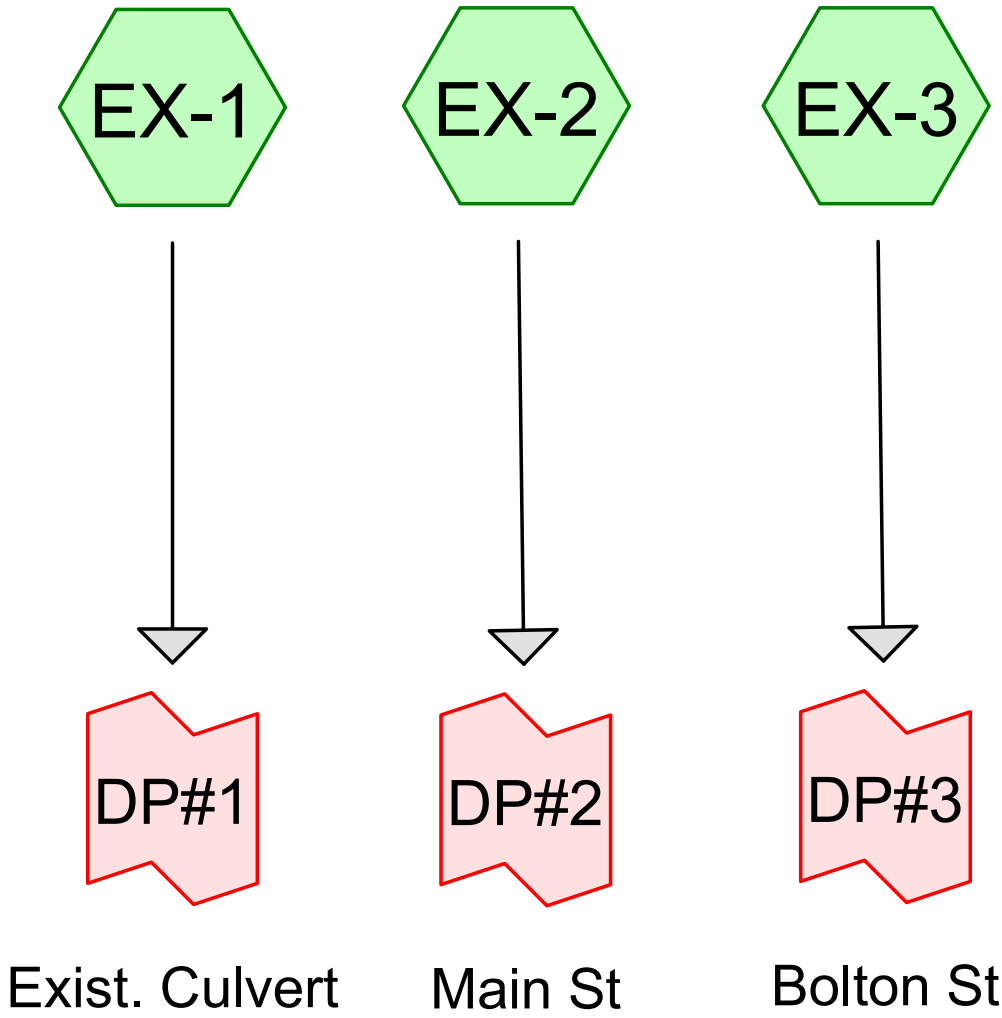
COUNTY
MIDDLESEX

SITE I.D.
20-0015

PLAN DESCRIPTION
EXISTING CONDITIONS DRAINAGE AREA MAP

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.
EXDAM
OF 14



Subcat Reach Pond Link

Routing Diagram for Pre-Development Analysis
Prepared by Bohler Engineering, Printed 4/25/2023

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.073	61	>75% Grass cover, Good, HSG B (EX-1, EX-2, EX-3)
0.592	98	Paved parking, HSG B (EX-1, EX-2, EX-3)
0.078	98	Roofs, HSG B (EX-1, EX-2)
0.743	**94**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.743	HSG B	EX-1, EX-2, EX-3
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.743		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.073	0.000	0.000	0.000	0.073	>75% Grass cover, Good	EX-1, EX-2, EX-3
0.000	0.592	0.000	0.000	0.000	0.592	Paved parking	EX-1, EX-2, EX-3
0.000	0.078	0.000	0.000	0.000	0.078	Roofs	EX-1, EX-2
0.000	**0.743**	**0.000**	**0.000**	**0.000**	**0.743**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 EX-1: Runoff Area=14,701 sf 92.23% Impervious Runoff Depth=2.75"
Tc=6.0 min CN=95 Runoff=1.00 cfs 0.077 af

Subcatchment EX-2: Runoff Area=4,256 sf 93.73% Impervious Runoff Depth=2.86"
Tc=0.0 min CN=96 Runoff=0.35 cfs 0.023 af

Subcatchment EX-3: Runoff Area=13,421 sf 86.77% Impervious Runoff Depth=2.55"
Tc=0.0 min CN=93 Runoff=1.02 cfs 0.066 af

Link DP#1: Exist. Culvert Inflow=1.00 cfs 0.077 af
Primary=1.00 cfs 0.077 af

Link DP#2: Main St Inflow=0.35 cfs 0.023 af
Primary=0.35 cfs 0.023 af

Link DP#3: Bolton St Inflow=1.02 cfs 0.066 af
Primary=1.02 cfs 0.066 af

Total Runoff Area = 0.743 ac Runoff Volume = 0.166 af Average Runoff Depth = 2.68"
9.84% Pervious = 0.073 ac 90.16% Impervious = 0.670 ac

Summary for Subcatchment EX-1:

Runoff = 1.00 cfs @ 12.09 hrs, Volume= 0.077 af, Depth= 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.31"

Area (sf)	CN	Description
11,003	98	Paved parking, HSG B
1,143	61	>75% Grass cover, Good, HSG B
2,555	98	Roofs, HSG B
14,701	95	Weighted Average
1,143		7.77% Pervious Area
13,558		92.23% Impervious Area

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

Summary for Subcatchment EX-2:

Runoff = 0.35 cfs @ 12.00 hrs, Volume= 0.023 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.31"

Area (sf)	CN	Description
267	61	>75% Grass cover, Good, HSG B
843	98	Roofs, HSG B
3,146	98	Paved parking, HSG B
4,256	96	Weighted Average
267		6.27% Pervious Area
3,989		93.73% Impervious Area

Summary for Subcatchment EX-3:

Runoff = 1.02 cfs @ 12.00 hrs, Volume= 0.066 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.31"

Area (sf)	CN	Description
1,775	61	>75% Grass cover, Good, HSG B
11,646	98	Paved parking, HSG B
13,421	93	Weighted Average
1,775		13.23% Pervious Area
11,646		86.77% Impervious Area

Summary for Link DP#1: Exist. Culvert

Inflow Area = 0.337 ac, 92.23% Impervious, Inflow Depth = 2.75" for 2 Year event
Inflow = 1.00 cfs @ 12.09 hrs, Volume= 0.077 af
Primary = 1.00 cfs @ 12.09 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#2: Main St

Inflow Area = 0.098 ac, 93.73% Impervious, Inflow Depth = 2.86" for 2 Year event
Inflow = 0.35 cfs @ 12.00 hrs, Volume= 0.023 af
Primary = 0.35 cfs @ 12.00 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#3: Bolton St

Inflow Area = 0.308 ac, 86.77% Impervious, Inflow Depth = 2.55" for 2 Year event
Inflow = 1.02 cfs @ 12.00 hrs, Volume= 0.066 af
Primary = 1.02 cfs @ 12.00 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 EX-1: Runoff Area=14,701 sf 92.23% Impervious Runoff Depth=4.63"
Tc=6.0 min CN=95 Runoff=1.64 cfs 0.130 af

Subcatchment EX-2: Runoff Area=4,256 sf 93.73% Impervious Runoff Depth=4.74"
Tc=0.0 min CN=96 Runoff=0.56 cfs 0.039 af

Subcatchment EX-3: Runoff Area=13,421 sf 86.77% Impervious Runoff Depth=4.40"
Tc=0.0 min CN=93 Runoff=1.71 cfs 0.113 af

Link DP#1: Exist. Culvert Inflow=1.64 cfs 0.130 af
Primary=1.64 cfs 0.130 af

Link DP#2: Main St Inflow=0.56 cfs 0.039 af
Primary=0.56 cfs 0.039 af

Link DP#3: Bolton St Inflow=1.71 cfs 0.113 af
Primary=1.71 cfs 0.113 af

Total Runoff Area = 0.743 ac Runoff Volume = 0.282 af Average Runoff Depth = 4.55"
9.84% Pervious = 0.073 ac 90.16% Impervious = 0.670 ac

Summary for Subcatchment EX-1:

Runoff = 1.64 cfs @ 12.09 hrs, Volume= 0.130 af, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.21"

Area (sf)	CN	Description
11,003	98	Paved parking, HSG B
1,143	61	>75% Grass cover, Good, HSG B
2,555	98	Roofs, HSG B
14,701	95	Weighted Average
1,143		7.77% Pervious Area
13,558		92.23% Impervious Area

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

Summary for Subcatchment EX-2:

Runoff = 0.56 cfs @ 12.00 hrs, Volume= 0.039 af, Depth= 4.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.21"

Area (sf)	CN	Description
267	61	>75% Grass cover, Good, HSG B
843	98	Roofs, HSG B
3,146	98	Paved parking, HSG B
4,256	96	Weighted Average
267		6.27% Pervious Area
3,989		93.73% Impervious Area

Summary for Subcatchment EX-3:

Runoff = 1.71 cfs @ 12.00 hrs, Volume= 0.113 af, Depth= 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.21"

Area (sf)	CN	Description
1,775	61	>75% Grass cover, Good, HSG B
11,646	98	Paved parking, HSG B
13,421	93	Weighted Average
1,775		13.23% Pervious Area
11,646		86.77% Impervious Area

Summary for Link DP#1: Exist. Culvert

Inflow Area = 0.337 ac, 92.23% Impervious, Inflow Depth = 4.63" for 10 Year event
Inflow = 1.64 cfs @ 12.09 hrs, Volume= 0.130 af
Primary = 1.64 cfs @ 12.09 hrs, Volume= 0.130 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#2: Main St

Inflow Area = 0.098 ac, 93.73% Impervious, Inflow Depth = 4.74" for 10 Year event
Inflow = 0.56 cfs @ 12.00 hrs, Volume= 0.039 af
Primary = 0.56 cfs @ 12.00 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#3: Bolton St

Inflow Area = 0.308 ac, 86.77% Impervious, Inflow Depth = 4.40" for 10 Year event
Inflow = 1.71 cfs @ 12.00 hrs, Volume= 0.113 af
Primary = 1.71 cfs @ 12.00 hrs, Volume= 0.113 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 EX-1: Runoff Area=14,701 sf 92.23% Impervious Runoff Depth=5.81"
Tc=6.0 min CN=95 Runoff=2.03 cfs 0.163 af

Subcatchment EX-2: Runoff Area=4,256 sf 93.73% Impervious Runoff Depth=5.93"
Tc=0.0 min CN=96 Runoff=0.69 cfs 0.048 af

Subcatchment EX-3: Runoff Area=13,421 sf 86.77% Impervious Runoff Depth=5.58"
Tc=0.0 min CN=93 Runoff=2.13 cfs 0.143 af

Link DP#1: Exist. Culvert Inflow=2.03 cfs 0.163 af
Primary=2.03 cfs 0.163 af

Link DP#2: Main St Inflow=0.69 cfs 0.048 af
Primary=0.69 cfs 0.048 af

Link DP#3: Bolton St Inflow=2.13 cfs 0.143 af
Primary=2.13 cfs 0.143 af

Total Runoff Area = 0.743 ac Runoff Volume = 0.355 af Average Runoff Depth = 5.73"
9.84% Pervious = 0.073 ac 90.16% Impervious = 0.670 ac

Summary for Subcatchment EX-1:

Runoff = 2.03 cfs @ 12.09 hrs, Volume= 0.163 af, Depth= 5.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (sf)	CN	Description
11,003	98	Paved parking, HSG B
1,143	61	>75% Grass cover, Good, HSG B
2,555	98	Roofs, HSG B
14,701	95	Weighted Average
1,143		7.77% Pervious Area
13,558		92.23% Impervious Area

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

Summary for Subcatchment EX-2:

Runoff = 0.69 cfs @ 12.00 hrs, Volume= 0.048 af, Depth= 5.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (sf)	CN	Description
267	61	>75% Grass cover, Good, HSG B
843	98	Roofs, HSG B
3,146	98	Paved parking, HSG B
4,256	96	Weighted Average
267		6.27% Pervious Area
3,989		93.73% Impervious Area

Summary for Subcatchment EX-3:

Runoff = 2.13 cfs @ 12.00 hrs, Volume= 0.143 af, Depth= 5.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (sf)	CN	Description
1,775	61	>75% Grass cover, Good, HSG B
11,646	98	Paved parking, HSG B
13,421	93	Weighted Average
1,775		13.23% Pervious Area
11,646		86.77% Impervious Area

Summary for Link DP#1: Exist. Culvert

Inflow Area = 0.337 ac, 92.23% Impervious, Inflow Depth = 5.81" for 25 Year event
Inflow = 2.03 cfs @ 12.09 hrs, Volume= 0.163 af
Primary = 2.03 cfs @ 12.09 hrs, Volume= 0.163 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#2: Main St

Inflow Area = 0.098 ac, 93.73% Impervious, Inflow Depth = 5.93" for 25 Year event
Inflow = 0.69 cfs @ 12.00 hrs, Volume= 0.048 af
Primary = 0.69 cfs @ 12.00 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#3: Bolton St

Inflow Area = 0.308 ac, 86.77% Impervious, Inflow Depth = 5.58" for 25 Year event
Inflow = 2.13 cfs @ 12.00 hrs, Volume= 0.143 af
Primary = 2.13 cfs @ 12.00 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 EX-1: Runoff Area=14,701 sf 92.23% Impervious Runoff Depth=7.63"
Tc=6.0 min CN=95 Runoff=2.63 cfs 0.215 af

Subcatchment EX-2: Runoff Area=4,256 sf 93.73% Impervious Runoff Depth=7.75"
Tc=0.0 min CN=96 Runoff=0.90 cfs 0.063 af

Subcatchment EX-3: Runoff Area=13,421 sf 86.77% Impervious Runoff Depth=7.39"
Tc=0.0 min CN=93 Runoff=2.78 cfs 0.190 af

Link DP#1: Exist. Culvert Inflow=2.63 cfs 0.215 af
Primary=2.63 cfs 0.215 af

Link DP#2: Main St Inflow=0.90 cfs 0.063 af
Primary=0.90 cfs 0.063 af

Link DP#3: Bolton St Inflow=2.78 cfs 0.190 af
Primary=2.78 cfs 0.190 af

Total Runoff Area = 0.743 ac Runoff Volume = 0.467 af Average Runoff Depth = 7.55"
9.84% Pervious = 0.073 ac 90.16% Impervious = 0.670 ac

Summary for Subcatchment EX-1:

Runoff = 2.63 cfs @ 12.09 hrs, Volume= 0.215 af, Depth= 7.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=8.23"

Area (sf)	CN	Description
11,003	98	Paved parking, HSG B
1,143	61	>75% Grass cover, Good, HSG B
2,555	98	Roofs, HSG B
14,701	95	Weighted Average
1,143		7.77% Pervious Area
13,558		92.23% Impervious Area

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

Summary for Subcatchment EX-2:

Runoff = 0.90 cfs @ 12.00 hrs, Volume= 0.063 af, Depth= 7.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=8.23"

Area (sf)	CN	Description
267	61	>75% Grass cover, Good, HSG B
843	98	Roofs, HSG B
3,146	98	Paved parking, HSG B
4,256	96	Weighted Average
267		6.27% Pervious Area
3,989		93.73% Impervious Area

Summary for Subcatchment EX-3:

Runoff = 2.78 cfs @ 12.00 hrs, Volume= 0.190 af, Depth= 7.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=8.23"

Area (sf)	CN	Description
1,775	61	>75% Grass cover, Good, HSG B
11,646	98	Paved parking, HSG B
13,421	93	Weighted Average
1,775		13.23% Pervious Area
11,646		86.77% Impervious Area

Summary for Link DP#1: Exist. Culvert

Inflow Area = 0.337 ac, 92.23% Impervious, Inflow Depth = 7.63" for 100 Year event
Inflow = 2.63 cfs @ 12.09 hrs, Volume= 0.215 af
Primary = 2.63 cfs @ 12.09 hrs, Volume= 0.215 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#2: Main St

Inflow Area = 0.098 ac, 93.73% Impervious, Inflow Depth = 7.75" for 100 Year event
Inflow = 0.90 cfs @ 12.00 hrs, Volume= 0.063 af
Primary = 0.90 cfs @ 12.00 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

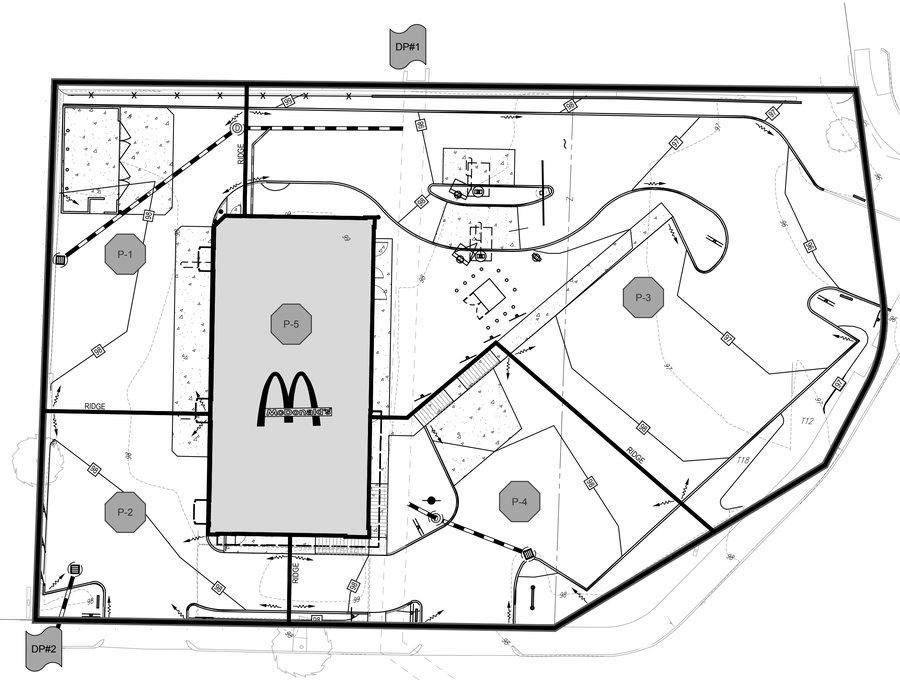
Summary for Link DP#3: Bolton St

Inflow Area = 0.308 ac, 86.77% Impervious, Inflow Depth = 7.39" for 100 Year event
Inflow = 2.78 cfs @ 12.00 hrs, Volume= 0.190 af
Primary = 2.78 cfs @ 12.00 hrs, Volume= 0.190 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

APPENDIX E: PROPOSED CONDITIONS HYDROLOGIC ANALYSIS

- *PROPOSED CONDITIONS DRAINAGE MAP*
- *PROPOSED CONDITIONS HYDROCAD CALCULATIONS*



BOLTON STREET
(PUBLIC - 40' WIDE ROW)
(PER REF. #4)
TWO WAY TRAFFIC (ASPHALT ROADWAY)

ASH STREET
(PUBLIC - VARIABLE WIDTH ROW)
TWO WAY TRAFFIC (ASPHALT ROADWAY)

BOLTON STREET
(PUBLIC - VARIABLE WIDTH ROW)
TWO WAY TRAFFIC (ASPHALT ROADWAY)

MAIN STREET
(AKA ROUTE 28)
(PUBLIC - 66' WIDE ROW)
(PER REF. #3)
TWO WAY TRAFFIC (ASPHALT ROADWAY)

LEGEND

- DP# — DESIGN POINT
- P-# — PROPOSED SUBCATCHMENT
- OVERALL ANALYSIS BOUNDARY
- SUBCATCHMENT BOUNDARY

20 10 5 0 20
1"= 20'

REV	DATE	DESCRIPTION	BY
1	06/12/2023	REV. PER ZBA & ABUTTERS FEEDBACK	CSE

J.A. KUCICH
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE No. 41539
NEW HAMPSHIRE LICENSE No. 15426
CONNECTICUT LICENSE No. 28127
RHODE ISLAND LICENSE No. 9616
MAINE LICENSE No. 12553

BOSTON REGION
OFFICE
110 N CARPENTER ST
ADDRESS
CHICAGO, IL 60607

PLAN APPROVALS

SIGNATURE	DATE
APPROVED MCDONALD'S AGENT	

BOHLER™
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

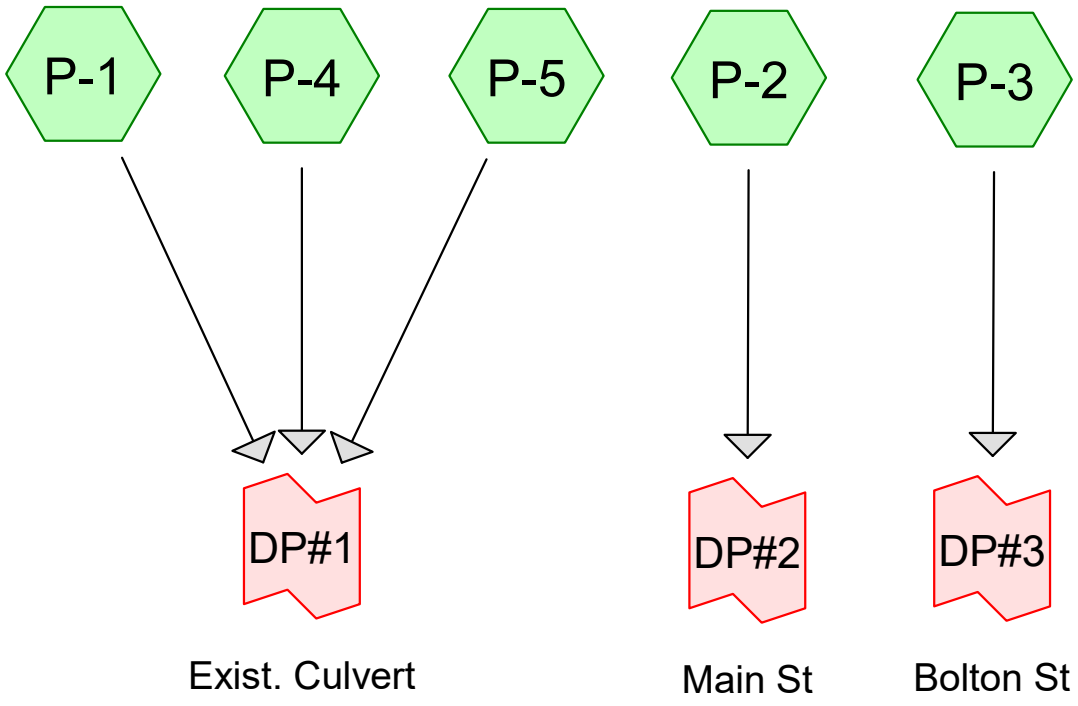
COMPLIANCE CHECK DATE
CONSTRUCTION CHECK DATE
CONSTRUCTION CHECK DATE
PROJECT No.: W222000
CAD I.D. #: W222000-SPPD-1b.dwg

-
STREET ADDRESS
413 MAIN STREET
CITY
READING
STATE
MA
COUNTY
MIDDLESEX
SITE I.D.
20-0015
PLAN DESCRIPTION
PROPOSED CONDITIONS DRAINAGE AREA MAP

STATUS	DATE	BY
DRAWN BY:	04/28/2023	CSE
PLAN CHECKED	-	-
AS-BUILT		

SHEET NO.
PRDAM
OF 14

P:\2022\W222000\CAD\Drawings\Plan Sets\Drainage Maps\W222000-DMAP-1a.dwg, PRDAM-Prop, Watersheet 24x36, 4/23/2010, 10:17:14 AM, cemrk, Xerox3010-1.pc3, User\34, 1:1



Subcat Reach Pond Link

Routing Diagram for Post-Development Analysis
Prepared by Bohler Engineers, Printed 7/28/2023

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.160	61	>75% Grass cover, Good, HSG B (P-1, P-2, P-3, P-4)
0.492	98	Paved parking, HSG B (P-1, P-2, P-3, P-4)
0.091	98	Roofs, HSG B (P-5)
0.743	**90**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.743	HSG B	P-1, P-2, P-3, P-4, P-5
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.743		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.160	0.000	0.000	0.000	0.160	>75% Grass cover, Good	P-1, P-2, P-3, P-4
0.000	0.492	0.000	0.000	0.000	0.492	Paved parking	P-1, P-2, P-3, P-4
0.000	0.091	0.000	0.000	0.000	0.091	Roofs	P-5
0.000	**0.743**	**0.000**	**0.000**	**0.000**	**0.743**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 P-1: Runoff Area=4,561 sf 89.52% Impervious Runoff Depth=2.65"
Tc=6.0 min CN=94 Runoff=0.30 cfs 0.023 af

Subcatchment P-2: Runoff Area=3,336 sf 88.34% Impervious Runoff Depth=2.65"
Tc=6.0 min CN=94 Runoff=0.22 cfs 0.017 af

Subcatchment P-3: Runoff Area=14,982 sf 67.18% Impervious Runoff Depth=1.93"
Tc=6.0 min CN=86 Runoff=0.76 cfs 0.055 af

Subcatchment P-4: Runoff Area=5,529 sf 78.68% Impervious Runoff Depth=2.27"
Tc=6.0 min CN=90 Runoff=0.33 cfs 0.024 af

Subcatchment P-5: Runoff Area=3,971 sf 100.00% Impervious Runoff Depth=3.08"
Tc=6.0 min CN=98 Runoff=0.29 cfs 0.023 af

Link DP#1: Exist. Culvert Inflow=0.92 cfs 0.071 af
Primary=0.92 cfs 0.071 af

Link DP#2: Main St Inflow=0.22 cfs 0.017 af
Primary=0.22 cfs 0.017 af

Link DP#3: Bolton St Inflow=0.76 cfs 0.055 af
Primary=0.76 cfs 0.055 af

Total Runoff Area = 0.743 ac Runoff Volume = 0.143 af Average Runoff Depth = 2.31"
21.50% Pervious = 0.160 ac 78.50% Impervious = 0.583 ac

Summary for Subcatchment P-1:

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.023 af, Depth= 2.65"
Routed to Link DP#1 : Exist. Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.31"

Area (sf)	CN	Description
4,083	98	Paved parking, HSG B
478	61	>75% Grass cover, Good, HSG B
4,561	94	Weighted Average
478		10.48% Pervious Area
4,083		89.52% Impervious Area

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

Summary for Subcatchment P-2:

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 2.65"
Routed to Link DP#2 : Main St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.31"

Area (sf)	CN	Description
389	61	>75% Grass cover, Good, HSG B
2,947	98	Paved parking, HSG B
3,336	94	Weighted Average
389		11.66% Pervious Area
2,947		88.34% Impervious Area

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

Summary for Subcatchment P-3:

Runoff = 0.76 cfs @ 12.09 hrs, Volume= 0.055 af, Depth= 1.93"
Routed to Link DP#3 : Bolton St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.31"

Area (sf)	CN	Description
4,917	61	>75% Grass cover, Good, HSG B
10,065	98	Paved parking, HSG B
14,982	86	Weighted Average
4,917		32.82% Pervious Area
10,065		67.18% Impervious Area

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

Summary for Subcatchment P-4:

Runoff = 0.33 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 2.27"
Routed to Link DP#1 : Exist. Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.31"

Area (sf)	CN	Description
4,350	98	Paved parking, HSG B
1,179	61	>75% Grass cover, Good, HSG B
5,529	90	Weighted Average
1,179		21.32% Pervious Area
4,350		78.68% Impervious Area

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

Summary for Subcatchment P-5:

Runoff = 0.29 cfs @ 12.09 hrs, Volume= 0.023 af, Depth= 3.08"
Routed to Link DP#1 : Exist. Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.31"

Area (sf)	CN	Description
3,971	98	Roofs, HSG B
3,971		100.00% Impervious Area

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

Summary for Link DP#1: Exist. Culvert

Inflow Area = 0.323 ac, 88.22% Impervious, Inflow Depth = 2.62" for 2 Year event
Inflow = 0.92 cfs @ 12.09 hrs, Volume= 0.071 af
Primary = 0.92 cfs @ 12.09 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#2: Main St

Inflow Area = 0.077 ac, 88.34% Impervious, Inflow Depth = 2.65" for 2 Year event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Primary = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#3: Bolton St

Inflow Area = 0.344 ac, 67.18% Impervious, Inflow Depth = 1.93" for 2 Year event
Inflow = 0.76 cfs @ 12.09 hrs, Volume= 0.055 af
Primary = 0.76 cfs @ 12.09 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 P-1: Runoff Area=4,561 sf 89.52% Impervious Runoff Depth=4.52"
Tc=6.0 min CN=94 Runoff=0.50 cfs 0.039 af

Subcatchment P-2: Runoff Area=3,336 sf 88.34% Impervious Runoff Depth=4.52"
Tc=6.0 min CN=94 Runoff=0.37 cfs 0.029 af

Subcatchment P-3: Runoff Area=14,982 sf 67.18% Impervious Runoff Depth=3.66"
Tc=6.0 min CN=86 Runoff=1.42 cfs 0.105 af

Subcatchment P-4: Runoff Area=5,529 sf 78.68% Impervious Runoff Depth=4.08"
Tc=6.0 min CN=90 Runoff=0.57 cfs 0.043 af

Subcatchment P-5: Runoff Area=3,971 sf 100.00% Impervious Runoff Depth=4.97"
Tc=6.0 min CN=98 Runoff=0.45 cfs 0.038 af

Link DP#1: Exist. Culvert Inflow=1.53 cfs 0.120 af
Primary=1.53 cfs 0.120 af

Link DP#2: Main St Inflow=0.37 cfs 0.029 af
Primary=0.37 cfs 0.029 af

Link DP#3: Bolton St Inflow=1.42 cfs 0.105 af
Primary=1.42 cfs 0.105 af

Total Runoff Area = 0.743 ac Runoff Volume = 0.254 af Average Runoff Depth = 4.10"
21.50% Pervious = 0.160 ac 78.50% Impervious = 0.583 ac

Summary for Subcatchment P-1:

Runoff = 0.50 cfs @ 12.09 hrs, Volume= 0.039 af, Depth= 4.52"
Routed to Link DP#1 : Exist. Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.21"

Area (sf)	CN	Description
4,083	98	Paved parking, HSG B
478	61	>75% Grass cover, Good, HSG B
4,561	94	Weighted Average
478		10.48% Pervious Area
4,083		89.52% Impervious Area

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

Summary for Subcatchment P-2:

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.029 af, Depth= 4.52"
Routed to Link DP#2 : Main St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.21"

Area (sf)	CN	Description
389	61	>75% Grass cover, Good, HSG B
2,947	98	Paved parking, HSG B
3,336	94	Weighted Average
389		11.66% Pervious Area
2,947		88.34% Impervious Area

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

Summary for Subcatchment P-3:

Runoff = 1.42 cfs @ 12.09 hrs, Volume= 0.105 af, Depth= 3.66"
Routed to Link DP#3 : Bolton St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.21"

Area (sf)	CN	Description
4,917	61	>75% Grass cover, Good, HSG B
10,065	98	Paved parking, HSG B
14,982	86	Weighted Average
4,917		32.82% Pervious Area
10,065		67.18% Impervious Area

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

Summary for Subcatchment P-4:

Runoff = 0.57 cfs @ 12.09 hrs, Volume= 0.043 af, Depth= 4.08"
Routed to Link DP#1 : Exist. Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.21"

Area (sf)	CN	Description
4,350	98	Paved parking, HSG B
1,179	61	>75% Grass cover, Good, HSG B
5,529	90	Weighted Average
1,179		21.32% Pervious Area
4,350		78.68% Impervious Area

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

Summary for Subcatchment P-5:

Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 4.97"
Routed to Link DP#1 : Exist. Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=5.21"

Area (sf)	CN	Description
3,971	98	Roofs, HSG B
3,971		100.00% Impervious Area

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

Summary for Link DP#1: Exist. Culvert

Inflow Area = 0.323 ac, 88.22% Impervious, Inflow Depth = 4.47" for 10 Year event
Inflow = 1.53 cfs @ 12.09 hrs, Volume= 0.120 af
Primary = 1.53 cfs @ 12.09 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#2: Main St

Inflow Area = 0.077 ac, 88.34% Impervious, Inflow Depth = 4.52" for 10 Year event
Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.029 af
Primary = 0.37 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#3: Bolton St

Inflow Area = 0.344 ac, 67.18% Impervious, Inflow Depth = 3.66" for 10 Year event
Inflow = 1.42 cfs @ 12.09 hrs, Volume= 0.105 af
Primary = 1.42 cfs @ 12.09 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 P-1: Runoff Area=4,561 sf 89.52% Impervious Runoff Depth=5.69"
Tc=6.0 min CN=94 Runoff=0.62 cfs 0.050 af

Subcatchment P-2: Runoff Area=3,336 sf 88.34% Impervious Runoff Depth=5.69"
Tc=6.0 min CN=94 Runoff=0.46 cfs 0.036 af

Subcatchment P-3: Runoff Area=14,982 sf 67.18% Impervious Runoff Depth=4.79"
Tc=6.0 min CN=86 Runoff=1.84 cfs 0.137 af

Subcatchment P-4: Runoff Area=5,529 sf 78.68% Impervious Runoff Depth=5.24"
Tc=6.0 min CN=90 Runoff=0.72 cfs 0.055 af

Subcatchment P-5: Runoff Area=3,971 sf 100.00% Impervious Runoff Depth=6.16"
Tc=6.0 min CN=98 Runoff=0.56 cfs 0.047 af

Link DP#1: Exist. Culvert Inflow=1.91 cfs 0.152 af
Primary=1.91 cfs 0.152 af

Link DP#2: Main St Inflow=0.46 cfs 0.036 af
Primary=0.46 cfs 0.036 af

Link DP#3: Bolton St Inflow=1.84 cfs 0.137 af
Primary=1.84 cfs 0.137 af

Total Runoff Area = 0.743 ac Runoff Volume = 0.326 af Average Runoff Depth = 5.25"
21.50% Pervious = 0.160 ac 78.50% Impervious = 0.583 ac

Summary for Subcatchment P-1:

Runoff = 0.62 cfs @ 12.09 hrs, Volume= 0.050 af, Depth= 5.69"
Routed to Link DP#1 : Exist. Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (sf)	CN	Description
4,083	98	Paved parking, HSG B
478	61	>75% Grass cover, Good, HSG B
4,561	94	Weighted Average
478		10.48% Pervious Area
4,083		89.52% Impervious Area

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

Summary for Subcatchment P-2:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.036 af, Depth= 5.69"
Routed to Link DP#2 : Main St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (sf)	CN	Description
389	61	>75% Grass cover, Good, HSG B
2,947	98	Paved parking, HSG B
3,336	94	Weighted Average
389		11.66% Pervious Area
2,947		88.34% Impervious Area

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

Summary for Subcatchment P-3:

Runoff = 1.84 cfs @ 12.09 hrs, Volume= 0.137 af, Depth= 4.79"
Routed to Link DP#3 : Bolton St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (sf)	CN	Description
4,917	61	>75% Grass cover, Good, HSG B
10,065	98	Paved parking, HSG B
14,982	86	Weighted Average
4,917		32.82% Pervious Area
10,065		67.18% Impervious Area

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

Summary for Subcatchment P-4:

Runoff = 0.72 cfs @ 12.09 hrs, Volume= 0.055 af, Depth= 5.24"
Routed to Link DP#1 : Exist. Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (sf)	CN	Description
4,350	98	Paved parking, HSG B
1,179	61	>75% Grass cover, Good, HSG B
5,529	90	Weighted Average
1,179		21.32% Pervious Area
4,350		78.68% Impervious Area

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

Summary for Subcatchment P-5:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 0.047 af, Depth= 6.16"
Routed to Link DP#1 : Exist. Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (sf)	CN	Description
3,971	98	Roofs, HSG B
3,971		100.00% Impervious Area

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

Summary for Link DP#1: Exist. Culvert

Inflow Area = 0.323 ac, 88.22% Impervious, Inflow Depth = 5.65" for 25 Year event
Inflow = 1.91 cfs @ 12.09 hrs, Volume= 0.152 af
Primary = 1.91 cfs @ 12.09 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#2: Main St

Inflow Area = 0.077 ac, 88.34% Impervious, Inflow Depth = 5.69" for 25 Year event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.036 af
Primary = 0.46 cfs @ 12.09 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#3: Bolton St

Inflow Area = 0.344 ac, 67.18% Impervious, Inflow Depth = 4.79" for 25 Year event
Inflow = 1.84 cfs @ 12.09 hrs, Volume= 0.137 af
Primary = 1.84 cfs @ 12.09 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 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 P-1: Runoff Area=4,561 sf 89.52% Impervious Runoff Depth=7.51"
Tc=6.0 min CN=94 Runoff=0.81 cfs 0.066 af

Subcatchment P-2: Runoff Area=3,336 sf 88.34% Impervious Runoff Depth=7.51"
Tc=6.0 min CN=94 Runoff=0.59 cfs 0.048 af

Subcatchment P-3: Runoff Area=14,982 sf 67.18% Impervious Runoff Depth=6.55"
Tc=6.0 min CN=86 Runoff=2.47 cfs 0.188 af

Subcatchment P-4: Runoff Area=5,529 sf 78.68% Impervious Runoff Depth=7.03"
Tc=6.0 min CN=90 Runoff=0.95 cfs 0.074 af

Subcatchment P-5: Runoff Area=3,971 sf 100.00% Impervious Runoff Depth=7.99"
Tc=6.0 min CN=98 Runoff=0.72 cfs 0.061 af

Link DP#1: Exist. Culvert Inflow=2.49 cfs 0.201 af
Primary=2.49 cfs 0.201 af

Link DP#2: Main St Inflow=0.59 cfs 0.048 af
Primary=0.59 cfs 0.048 af

Link DP#3: Bolton St Inflow=2.47 cfs 0.188 af
Primary=2.47 cfs 0.188 af

Total Runoff Area = 0.743 ac Runoff Volume = 0.436 af Average Runoff Depth = 7.05"
21.50% Pervious = 0.160 ac 78.50% Impervious = 0.583 ac

Summary for Subcatchment P-1:

Runoff = 0.81 cfs @ 12.09 hrs, Volume= 0.066 af, Depth= 7.51"
Routed to Link DP#1 : Exist. Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=8.23"

Area (sf)	CN	Description
4,083	98	Paved parking, HSG B
478	61	>75% Grass cover, Good, HSG B
4,561	94	Weighted Average
478		10.48% Pervious Area
4,083		89.52% Impervious Area

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

Summary for Subcatchment P-2:

Runoff = 0.59 cfs @ 12.09 hrs, Volume= 0.048 af, Depth= 7.51"
Routed to Link DP#2 : Main St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=8.23"

Area (sf)	CN	Description
389	61	>75% Grass cover, Good, HSG B
2,947	98	Paved parking, HSG B
3,336	94	Weighted Average
389		11.66% Pervious Area
2,947		88.34% Impervious Area

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

Summary for Subcatchment P-3:

Runoff = 2.47 cfs @ 12.09 hrs, Volume= 0.188 af, Depth= 6.55"
Routed to Link DP#3 : Bolton St

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=8.23"

Area (sf)	CN	Description
4,917	61	>75% Grass cover, Good, HSG B
10,065	98	Paved parking, HSG B
14,982	86	Weighted Average
4,917		32.82% Pervious Area
10,065		67.18% Impervious Area

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

Summary for Subcatchment P-4:

Runoff = 0.95 cfs @ 12.09 hrs, Volume= 0.074 af, Depth= 7.03"
Routed to Link DP#1 : Exist. Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=8.23"

Area (sf)	CN	Description
4,350	98	Paved parking, HSG B
1,179	61	>75% Grass cover, Good, HSG B
5,529	90	Weighted Average
1,179		21.32% Pervious Area
4,350		78.68% Impervious Area

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

Summary for Subcatchment P-5:

Runoff = 0.72 cfs @ 12.09 hrs, Volume= 0.061 af, Depth= 7.99"
Routed to Link DP#1 : Exist. Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=8.23"

Area (sf)	CN	Description
3,971	98	Roofs, HSG B
3,971		100.00% Impervious Area

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

Summary for Link DP#1: Exist. Culvert

Inflow Area = 0.323 ac, 88.22% Impervious, Inflow Depth = 7.46" for 100 Year event
Inflow = 2.49 cfs @ 12.09 hrs, Volume= 0.201 af
Primary = 2.49 cfs @ 12.09 hrs, Volume= 0.201 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#2: Main St

Inflow Area = 0.077 ac, 88.34% Impervious, Inflow Depth = 7.51" for 100 Year event
Inflow = 0.59 cfs @ 12.09 hrs, Volume= 0.048 af
Primary = 0.59 cfs @ 12.09 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Link DP#3: Bolton St

Inflow Area = 0.344 ac, 67.18% Impervious, Inflow Depth = 6.55" for 100 Year event
Inflow = 2.47 cfs @ 12.09 hrs, Volume= 0.188 af
Primary = 2.47 cfs @ 12.09 hrs, Volume= 0.188 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

APPENDIX F: STORMWATER CALCULATIONS

- *MA STANDARD #4 –TSS REMOVAL*
- *NOAA RAINFALL DATA*
- *PIPE AND INLET SIZING*

McDonald's
413 Main Street
Reading, MA
Bohler Job Number: W222000
July 28, 2023

MA DEP Standard 4: Weighted TSS Removal Rate

Design Point - Treatment Train Description(s)	TSS Removal (%)	Treated Imp. Area* (ac)	TSS Removal (%)	Untreated Imp. Area (ac)	Total Area
Deep-sump hooded CB to Water Quality Units	85	0.194	0	0.299	0.493
Weighted TSS Removal Rate	**33**				

*Excludes roof runoff

Prepared By:
BOHLER
352 Turnpike Road
Southborough, MA 01772
(508) 480-9900

NOAA Atlas 14, Volume 10, Version 3
Location name: Reading, Massachusetts, USA*
Latitude: 42.5206°, Longitude: -71.1029°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.309 (0.238-0.390)	0.373 (0.287-0.471)	0.478 (0.367-0.605)	0.565 (0.431-0.720)	0.685 (0.508-0.915)	0.774 (0.564-1.06)	0.869 (0.618-1.24)	0.980 (0.658-1.42)	1.15 (0.741-1.72)	1.28 (0.813-1.97)
10-min	0.438 (0.338-0.552)	0.529 (0.407-0.667)	0.677 (0.520-0.857)	0.800 (0.611-1.02)	0.970 (0.720-1.30)	1.10 (0.799-1.50)	1.23 (0.875-1.75)	1.39 (0.932-2.01)	1.62 (1.05-2.44)	1.82 (1.15-2.79)
15-min	0.516 (0.397-0.650)	0.622 (0.479-0.785)	0.797 (0.612-1.01)	0.942 (0.719-1.20)	1.14 (0.847-1.53)	1.29 (0.940-1.77)	1.45 (1.03-2.06)	1.63 (1.10-2.37)	1.91 (1.24-2.87)	2.14 (1.35-3.28)
30-min	0.709 (0.546-0.893)	0.856 (0.659-1.08)	1.10 (0.842-1.39)	1.30 (0.990-1.65)	1.57 (1.17-2.10)	1.78 (1.30-2.43)	2.00 (1.42-2.84)	2.25 (1.51-3.27)	2.64 (1.71-3.96)	2.96 (1.87-4.54)
60-min	0.902 (0.695-1.14)	1.09 (0.839-1.38)	1.40 (1.07-1.77)	1.65 (1.26-2.10)	2.00 (1.49-2.68)	2.26 (1.65-3.10)	2.54 (1.81-3.63)	2.87 (1.93-4.17)	3.36 (2.18-5.06)	3.78 (2.39-5.79)
2-hr	1.17 (0.906-1.46)	1.42 (1.10-1.78)	1.84 (1.42-2.31)	2.18 (1.67-2.75)	2.65 (1.98-3.53)	3.00 (2.20-4.09)	3.38 (2.43-4.82)	3.85 (2.59-5.54)	4.57 (2.96-6.82)	5.20 (3.30-7.91)
3-hr	1.36 (1.06-1.69)	1.66 (1.29-2.07)	2.14 (1.66-2.68)	2.55 (1.97-3.21)	3.11 (2.33-4.12)	3.51 (2.60-4.78)	3.96 (2.86-5.64)	4.53 (3.05-6.49)	5.40 (3.51-8.03)	6.17 (3.92-9.34)
6-hr	1.75 (1.38-2.17)	2.14 (1.68-2.66)	2.78 (2.17-3.45)	3.30 (2.56-4.13)	4.03 (3.04-5.31)	4.56 (3.39-6.16)	5.14 (3.74-7.27)	5.87 (3.98-8.36)	7.02 (4.58-10.3)	8.02 (5.11-12.0)
12-hr	2.23 (1.76-2.74)	2.73 (2.15-3.36)	3.54 (2.78-4.37)	4.21 (3.29-5.23)	5.13 (3.90-6.72)	5.82 (4.34-7.80)	6.56 (4.78-9.19)	7.48 (5.09-10.6)	8.90 (5.83-13.0)	10.1 (6.49-15.1)
24-hr	2.67 (2.13-3.27)	3.31 (2.63-4.05)	4.35 (3.44-5.34)	5.21 (4.10-6.44)	6.40 (4.90-8.33)	7.28 (5.46-9.70)	8.23 (6.04-11.5)	9.44 (6.44-13.2)	11.3 (7.43-16.4)	13.0 (8.31-19.1)
2-day	3.03 (2.43-3.68)	3.83 (3.06-4.65)	5.14 (4.09-6.26)	6.22 (4.93-7.63)	7.71 (5.94-9.99)	8.80 (6.67-11.7)	10.0 (7.43-14.0)	11.6 (7.93-16.1)	14.1 (9.29-20.3)	16.4 (10.5-24.0)
3-day	3.32 (2.67-4.01)	4.18 (3.35-5.06)	5.58 (4.47-6.78)	6.75 (5.37-8.24)	8.36 (6.47-10.8)	9.52 (7.25-12.6)	10.8 (8.07-15.1)	12.5 (8.61-17.4)	15.3 (10.1-21.9)	17.8 (11.5-25.9)
4-day	3.59 (2.90-4.33)	4.48 (3.61-5.41)	5.93 (4.76-7.18)	7.13 (5.69-8.68)	8.79 (6.82-11.3)	9.99 (7.62-13.2)	11.3 (8.47-15.7)	13.1 (9.01-18.1)	16.0 (10.6-22.8)	18.5 (12.0-26.9)
7-day	4.36 (3.54-5.23)	5.28 (4.28-6.34)	6.79 (5.48-8.18)	8.04 (6.45-9.73)	9.76 (7.60-12.5)	11.0 (8.43-14.4)	12.4 (9.28-17.0)	14.2 (9.82-19.5)	17.1 (11.4-24.3)	19.7 (12.8-28.5)
10-day	5.06 (4.12-6.05)	6.01 (4.89-7.19)	7.56 (6.12-9.07)	8.85 (7.12-10.7)	10.6 (8.29-13.5)	11.9 (9.12-15.5)	13.3 (9.96-18.1)	15.2 (10.5-20.7)	18.0 (12.0-25.5)	20.6 (13.3-29.6)
20-day	7.04 (5.77-8.35)	8.09 (6.62-9.60)	9.79 (7.98-11.7)	11.2 (9.08-13.4)	13.2 (10.3-16.4)	14.6 (11.2-18.6)	16.2 (12.0-21.4)	17.9 (12.5-24.2)	20.5 (13.7-28.7)	22.7 (14.8-32.4)
30-day	8.69 (7.15-10.3)	9.81 (8.06-11.6)	11.6 (9.53-13.8)	13.1 (10.7-15.7)	15.2 (11.9-18.9)	16.8 (12.9-21.2)	18.4 (13.6-24.1)	20.2 (14.1-27.1)	22.6 (15.1-31.4)	24.5 (15.9-34.7)
45-day	10.8 (8.91-12.7)	12.0 (9.89-14.1)	13.9 (11.5-16.5)	15.5 (12.7-18.5)	17.8 (14.0-21.8)	19.5 (14.9-24.4)	21.2 (15.6-27.3)	22.9 (16.1-30.6)	25.1 (16.9-34.7)	26.7 (17.4-37.7)
60-day	12.6 (10.4-14.8)	13.8 (11.4-16.2)	15.9 (13.1-18.7)	17.6 (14.4-20.8)	19.9 (15.7-24.3)	21.7 (16.6-27.0)	23.5 (17.2-30.0)	25.1 (17.7-33.4)	27.2 (18.3-37.4)	28.6 (18.7-40.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

McDonald's
413 Main Street
Reading, MA
Bohler Job Number: W222000
July 28, 2023

Rational Pipe Sizing Calculations

Design Period Storm:		25	Year	Design Period Intensity*			6.4	in/hr									
LOCATION		IMPERVIOUS			OTHER			SUM CA	Tc (min)	I (in/hr)	Q (cfs)	D (in)	S (ft/ft)	Material	n	Q Full (cfs)	V Full (fps)
FROM	TO	A	C	CA	A	C	CA										
CB-1	SWQU-1	0.100	0.95	0.10	0.027	0.30	0.01	0.10	6	6.4	0.66	12	0.011	HDPE	0.012	4.05	5.15
SWQU-1	Culvert	0.100	0.95	0.10	0.027	0.30	0.01	0.10	6	6.4	0.66	12	0.012	HDPE	0.012	4.23	5.38
CB-2	Exist. CB	0.070	0.95	0.07	0.007	0.30	0.00	0.07	6	6.4	0.44	12	0.006	HDPE	0.012	2.99	3.81
CB-3	SWQU-2	0.094	0.95	0.09	0.011	0.30	0.00	0.09	6	6.4	0.59	12	0.006	HDPE	0.012	2.99	3.81
ROOF	Culvert	0.091	0.95	0.09	0.000	0.30	0.00	0.09	6	6.4	0.55	8	0.037	HDPE	0.012	2.52	7.21
SWQU-2	Culvert	0.185	0.95	0.18	0.011	0.30	0.00	0.18	6	6.4	1.15	12	0.005	HDPE	0.012	2.73	3.47

*Rainfall intensity provided by NOAA Atlas 14, Volume 10, Version 3 on 3/28/2023

Prepared By:
BOHLER
352 Turnpike Road
Southborough, MA 01772
(508) 480-9900

APPENDIX G: OPERATION AND MAINTENANCE

- *STORMWATER OPERATION AND MAINTENANCE PLAN*
- *INSPECTION REPORT*
- *INSPECTION AND MAINTENANCE LOG FORM*
- *LONG-TERM POLLUTION PREVENTION PLAN*
- *ILLICIT DISCHARGE STATEMENT*
- *SPILL PREVENTION*
- *MANUFACTURER'S INSPECTION AND MAINTENANCE MANUALS*

STORMWATER OPERATION AND MAINTENANCE PLAN

McDonald's
413 Main Street
Reading, MA 01867

RESPONSIBLE PARTY DURING CONSTRUCTION:

McDonald's USA, LLC
110 N. Carpenter Street
Chicago, IL 60607

RESPONSIBLE PARTY POST CONSTRUCTION:

McDonald's USA, LLC
110 N. Carpenter Street
Chicago, IL 60607

Construction Phase

During the construction phase, all erosion control devices and measures shall be maintained in accordance with the final record plans, local/state approvals and conditions, the EPA Construction General Permit and the Stormwater Pollution Prevention Plan (SWPPP) if applicable. Additionally, the maintenance of all erosion / siltation control measures during construction shall be the responsibility of the general contractor. Contact information of the OWNER and CONTRACTOR shall be listed in the SWPPP for this site. The SWPPP also includes information regarding construction period allowable and illicit discharges, housekeeping and emergency response procedures. Upon proper notice to the property owner, the Town/City or its authorized designee shall be allowed to enter the property at a reasonable time and in a reasonable manner for the purposes of inspection.

Post Development Controls

Once construction is completed, the post development stormwater controls are to be operated and maintained in compliance with the following permanent procedures (note that the continued implementation of these procedures shall be the responsibility of the Owner or its assignee):

1. Parking lots: Sweep at least two (2) times per year and on a more frequent basis depending on sanding operations. All resulting sweepings shall be collected and properly disposed of offsite in accordance with MADEP and other applicable requirements.

2. Catch basins, yard drains, trench drains, manholes and piping: Inspect two (2) times per year and at the end of foliage and snow-removal seasons. These features shall be cleaned two (2) times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the catch basin or underground system. Accumulated sediment and hydrocarbons present must be removed and properly disposed of off-site in accordance with MADEP and other applicable requirements.

Water Quality Unit (Proprietary Separator): Follow manufacturer's recommendations (attached).

All components of the stormwater system will be accessible by the owner or their assignee.

STORMWATER MANAGEMENT SYSTEM

POST-CONSTRUCTION INSPECTION REPORT

LOCATION:

McDonald's USA, LLC
110 N. Carpenter Street
Chicago, IL 60607

RESPONSIBLE PARTY:

McDonald's USA, LLC
110 N. Carpenter Street
Chicago, IL 60607

NAME OF INSPECTOR:	INSPECTION DATE:
Note Condition of the Following (sediment depth, debris, standing water, damage, etc.):	
Catch Basins:	
Stormwater Quality Units:	
Other:	

Note Recommended Actions to be taken on the Following (sediment and/or debris removal, repairs, etc.):
Catch Basins:
Stormwater Quality Units:
Other:
Comments:

STORMWATER INSPECTION AND MAINTENANCE LOG FORM

McDonald's
413 Main Street - Reading, MA 01867

Stormwater Management Practice	Responsible Party	Date	Maintenance Activity Performed

LONG-TERM POLLUTION PREVENTION PLAN

McDonald's
413 Main Street
Reading, MA 01867

RESPONSIBLE PARTY DURING CONSTRUCTION:

McDonald's USA, LLC
110 N. Carpenter Street
Chicago, IL 60607

RESPONSIBLE PARTY POST CONSTRUCTION:

McDonald's USA, LLC
110 N. Carpenter Street
Chicago, IL 60607

For this site, the Long-Term Pollution Prevention Plan will consist of the following:

- The property owner shall be responsible for "good housekeeping" including proper periodic maintenance of building and pavement areas, curbing, landscaping, etc.
- Proper storage and removal of solid waste (dumpsters).
- Sweeping of parking lots, drive aisles and access aisles a minimum of twice per year with a commercial cleaning unit. Any sediment removed shall be disposed of in accordance with applicable local and state requirements.
- Regular inspections and maintenance of Stormwater Management System as noted in the "O&M Plan".
- Snow removal shall be the responsibility of the property owner. Snow shall not be plowed, dumped and/or placed in forebays, infiltration basins or similar stormwater controls. Salting and/or sanding of pavement / walkway areas during winter conditions shall only be done in accordance with all state/local requirements and approvals.
- Trash and other debris shall be removed from all areas of the site at least twice yearly.

OPERATON AND MAINTENANCE TRAINING PROGRAM

The Owner will coordinate an annual in-house training session to discuss the Operations and Maintenance Plan, the Long-Term Pollution Prevention Plan, and the Spill Prevention Plan and response procedures. Annual training will include the following:

Discuss the Operations and Maintenance Plan

- Explain the general operations of the stormwater management system and its BMPs
- Identify potential sources of stormwater pollution and measures / methods of reducing or eliminating that pollution
- Emphasize good housekeeping measures

Discuss the Spill Prevention and Response Procedures

- Explain the process in the event of a spill
- Identify potential sources of spills and procedures for cleanup and /or reporting and notification
- Complete a yearly inventory or Materials Safety Data sheets of all tenants and confirm that no potentially harmful chemicals are in use.

ILLICIT DISCHARGE STATEMENT

Certain types of non-stormwater discharges are allowed under the U.S. Environmental Protection Agency Construction General Permit. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures which have been outlined previously in this LTPPP will be strictly followed to ensure that no contamination of these non-storm water discharges takes place. Any existing illicit discharges, if discovered during the course of the work, will be reported to MassDEP and the local DPW, as applicable, to be addressed in accordance with their respective policies. No illicit discharges will be allowed in conjunction with the proposed improvements.

Duly Acknowledged:

_____

Name & Title Date

SPILL PREVENTION AND RESPONSE PROCEDURES (POST CONSTRUCTION)

In order to prevent or minimize the potential for a spill of Hazardous Substances or Oil or come into contact with stormwater, the following steps will be implemented:

1. All Hazardous Substances or Oil (such as pesticides, petroleum products, fertilizers, detergents, acids, paints, paint solvents, cleaning solvents, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.

2. The minimum practical quantity of all such materials will be kept on site.

3. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided on site.

4. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.

5. It is the OWNER's responsibility to ensure that all Hazardous Waste on site is disposed of properly by a licensed hazardous material disposal company. The OWNER is responsible for not exceeding Hazardous Waste storage requirements mandated by the EPA or state and local authorities.

In the event of a spill of Hazardous Substances or Oil, the following procedures should be followed:

1. All measures should be taken to contain and abate the spill and to prevent the discharge of the Hazardous Substance or Oil to stormwater or off-site. (The spill area should be kept well ventilated and personnel should wear appropriate protective clothing to prevent injury from contact with the Hazardous Substances.)

2. For spills of less than five (5) gallons of material, proceed with source control and containment, clean-up with absorbent materials or other applicable means unless an imminent hazard or other circumstances dictate that the spill should be treated by a professional emergency response contractor.

3. For spills greater than five (5) gallons of material immediately contact the MADEP at the toll-free 24-hour statewide emergency number: **1-888-304-1133**, the local fire department (**9-1-1**) and an approved emergency response contractor. Provide information on the type of material spilled, the location of the spill, the quantity spilled, and the time of the spill to the emergency response contractor or coordinator, and proceed with prevention, containment and/or clean-up if so desired. (Use the form provided, or similar).

4. If there is a Reportable Quantity (RQ) release, then the National Response Center should be notified immediately at (800) 424-8802; within 14 days a report should be submitted to the EPA regional office describing the release, the date and circumstances of the release and the steps taken to prevent another release. This Pollution Prevention Plan should be updated to reflect any such steps or actions taken and measures to prevent the same from reoccurring.

SPILL PREVENTION CONTROL AND COUNTERMEASURE FORM

McDonald's
413 Main Street
Reading, Massachusetts 01867

Where a release containing a hazardous substance occurs, the following steps shall be taken by the facility manager and/or supervisor:

1. Immediately notify The Reading Fire Department (at **9-1-1**)

2. All measures must be taken to contain and abate the spill and to prevent the discharge of the pollutant(s) to off-site locations, receiving waters, wetlands and/or resource areas.

3. Notify the Reading Public Health Department at (781) 942-9061 and the Reading Conservation Commission at (781) 942-6616.

4. Provide documentation from licensed contractor showing disposal and cleanup procedures were completed as well as details on chemicals that were spilled to the Reading Public Health Department and Reading Conservation Commission

Date of spill:_____ Time:_____ Reported By:_____

Weather Conditions:_____

Material Spilled	**Location of Spill**	**Approximate Quantity of Spill (in gallons)**	**Agency(s) Notified**	**Date of Notification**

Cause of Spill: _____

_____

Measures Taken to Clean up Spill: _____

_____

Type of equipment: _____ Make: _____ Size: _____

License or S/N: _____

Location and Method of Disposal _____

_____

Procedures, method, and precautions instituted to prevent a similar occurrence from recurring: _____

_____

_____

Additional Contact Numbers:

- DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) EMERGENCY PHONE: 1-888-304-1133
- NATIONAL RESPONSE CENTER PHONE: (800) 424-8802
- U.S. ENVIRONMENTAL PROTECTION AGENCY PHONE: (888) 372-7341

CONTECH®
ENGINEERED SOLUTIONS

CDS® Inspection and Maintenance Guide

CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y^3	m^3
CDS1515	3	0.9	3.0	0.9	0.5	0.4
CDS2015	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.3	3.0	0.9	1.3	1.0
CDS2020	5	1.3	3.5	1.1	1.3	1.0
CDS2025	5	1.3	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3025	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, earth stabilization and wastewater treament products. For information, visit www.ContechES.com or call 800.338.1122

CONTECH
ENGINEERED SOLUTIONS
800.925.5240
www.ContechES.com

CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

May 24, 2023

Town Officials
Town of Reading
16 Lowell Street
Reading, MA 01867

Re: Property Owner Authorization
McDonald's Restaurant
413 Main Street
Reading, MA 01867

To Whom It May Concern:

Please allow this letter to serve as my authorization, as the property owner, to allow Bohler Engineering to sign permitting applications on my behalf, as property owner, in connection with permitting applications submitted by or on behalf of McDonald's Corporation, as tenant, for matters relative to the McDonald's rebuild project at 413 Main Street Reading, MA 01867. Authorization is for the scope of work to be performed by or on behalf of McDonald's Corporation, as tenant, including the rebuild of the existing McDonald's Restaurant, updated wall signage, drive thru structure upgrades and site work to ensure compliance with accessibility regulations.

Sincerely,

413 MAIN STREET LLC

By: _____
Name: Paul J. Gallagher
Title: Manager

413 Main Street LLC
c/o Burton Faulkner
425 Broadway, Unit 25
Somerville, MA 02145

LEGEND:

- WETLAND FLAG (BY LEC ENVIRONMENTAL)
- EOR — EDGE OF ROAD
- BSW — BACK OF SIDEWALK
- CONIFEROUS TREE (>6" DIA.)
- DECIDUOUS TREE (>6" DIA.)
- WATER GATE
- 100 — TWO FOOT CONTOUR
- PP — PROPOSED POWER POLE

ZONING TABLE

S-20 DISTRICT	REQUIRED	EXISTING	PROPOSED LOT B-1	PROPOSED ROW EXTENSION
LOT SIZE	20,000 SQ. FT.	54,942 ±SQ. FT.	43,740± SQ. FT.	11,201± SQ. FT.
FRONTAGE	120.00'	50.03'	186.06'	---
MINIMUM LOT WIDTH	80.00'	186.06'	186.06'	---
MINIMUM FRONT SETBACK	20.0'	---	94.8'	---
MINIMUM SIDE SETBACK	15.0'	---	54.4'	---
MINIMUM REAR SETBACK	20.0'	---	106.3	---
MAX. LOT COVERAGE	25%	---	3.8%	---
HEIGHT	35'	---	LESS THAN 35'	---
WETLAND AREA		17,357± SQ. FT.	7,084± SQ. FT.	5,634± SQ. FT.
UPLAND AREA		37,585± SQ. FT.	36,656± SQ. FT.	5,567± SQ. FT.

TOTAL IMPERVIOUS AREA LOT B-1
3,407 SF/7.8%

NOTES

STORMWATER INFILTRATION SYSTEM TO CONSIST OF CULTEC 280HD CHAMBERS, OR SIMILAR, DESIGNED TO CAPTURE 100% OF IMPERVIOUS AREAS.

PROPOSED DRIVEWAY CONSTRUCTION TO MEET ACCEPTED STANDARDS IN JUDGEMENT OF THE TOWN ENGINEER TO ACCOMODATE PRIVATE AUTOMOBILES, SERVICE VEHICLES, AND EMERGENCY VEHICLES.

OWNER OF RECORD

PETER SEIBOLD
437 SUMMER AVE., READING, MA
DEED BOOK 30698 PAGE 582

ZONING DISTRICT

TAX MAP 38 PARCEL 139
S-20 DISTRICT

PLAN REFERENCES

PLAN NO. 1478 OF 1985
PLAN NO. 640 OF 1967

I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY.

JAMES J. ABELY — DATE 3/29/23

COMMONWEALTH OF MASSACHUSETTS — JAMES J. ABELY — No. 26520 — PROFESSIONAL LAND SURVEYOR

REVISIONS

NO.	DATE	REVISION	BY
1	03.28.23	ADDED 4' WIDE BY 142' LONG BOARDWALK FOR PUBLIC USE ON ANNETTE LANE EXTENSION. ADDED PROPOSED SNOW STORAGE AREAS WITH PRETREATMENT.	ACP

PRELIMINARY SUBDIVISION PLAN

ANNETTE LANE
READING, MA
SCALE 1" = 30' FEBRUARY 20, 2023
REVISED MARCH 28, 2023
PREPARED BY

VINEYARD ENGINEERING
& ENVIRONMENTAL SERVICES INC.
LAND SURVEY, CIVIL ENGINEERING
& ENVIRONMENTAL SERVICES
17 SALEM STREET
MEDFORD MA 02155
TEL. 781-933-3330 FAX. 781-933-3334
Vineyardeng.com

30 15 0 30 60 90 120

Vineyard Engineering & Environmental Services, Inc.
Land Survey, Civil Engineering and Environmental Services
Offices in Medford and Vineyard Haven, Massachusetts
www.vineyardeng.com

September 27, 2023

Andrew MacNichol, Community Development Director
Town of Reading Community Planning & Development Commission
16 Lowell Street
Reading, MA 01867

RE: Response to Request for Information
Definitive Subdivision Application - 0 Annette Lane, Reading, MA
Tax Map 38 Parcel 139

Dear Mr. MacNichol,

On behalf of Mr. Peter Seibold (the Applicant), Vineyard Engineering & Environmental Services, Inc. (Vineyard) of Medford, Massachusetts is submitting this response to a request for additional information relative to a Definitive Subdivision Application for the property located at 0 Annette Lane in Reading, Massachusetts (Tax Map 38 Parcel 139). Request for information from the Town of Reading Community Planning & Development Commission (CPDC) are presented below in italics, followed by the responses.

*1. **Driveway:** Please confirm the length of the driveway in feet and confirm that the proposed design meets the prior standard specified by public safety. The driveway shall be no less than 19-feet in width, have an overhead clearance of 13'-6", and have the ability to bear 64,000 pounds of load.*

The centerline length of the proposed driveway is 131.3 feet. The driveway has been designed and will be constructed in accordance with the prior standard specified by public safety. The driveway has been designed and will be constructed to meet the dimensional and load bearing requirements listed above.

2. ***Trees/Landscaping**: Please provide a total summary of trees being removed and trees being kept. Is any screening or landscaping proposed at the end of the driveway or around the road extension? Any new landscaping around the house?*

Approximately 30 trees will be removed in the vicinity of the proposed driveway, roadway extension, and residence. Tree removal and replacement will be conducted in accordance with the Town of Reading Conservation Commission's regulations.

A grass lawn will be installed in the immediate vicinity of the proposed residence. The Applicant intends to install screening plantings along the roadway extension. This area is located in the vicinity of the 35-foot Bordering Vegetated Buffer zone. A planting plan (number of plantings, location, species) will be developed in consultation with the wetland scientist retained by the Applicant (Lucas Environmental, LLC) and the Town of Reading Conservation Commission to ensure proposed plantings will have no adverse impact to nearby wetland areas.

*3. **Boardwalk:** No boardwalk design or rendering was submitted with this application. No details on the long-term maintenance or ownership of the boardwalk was proposed. Please provide details.*

Development of boardwalk design plans are in progress and will be submitted to the CPDC upon completion. The boardwalk will be constructed in accordance with all local and state building and wetland requirements at the expense of the Applicant. Following construction, the Applicant is proposing to provide an easement to the Town of Reading and its Inhabitants for use of the boardwalk. The Applicant is also proposing to give ownership of the boardwalk to the Town of Reading at no cost, and the Town of Reading would be responsible for long-term maintenance of the boardwalk.

*4. **Stormwater permit:** This will be required for the project. Application can be found here. Although it will be issued by the Conservation Commission, we'd like to have you go ahead and submit the application now to make sure CPDC can capture it in their decision as well. You do not need to submit additional copies of the site plans you have already submitted. If you make new plan sheets to specifically meet the checklist requirements we'll just need 2 full-size and a digital copy of those along with 1 copy of the physical application.*

A completed Stormwater Permit Application and a copy of the Permit Fee payment is attached to this letter. Details regarding proposed stormwater management were included in the Definitive Subdivision Application submitted to Reading CPDC.

*5. **Proof of Concept Plan:** Please add the proof-of-concept plan from the Preliminary Application into the plan set for this Definitive Application. We don't need any revisions to it, we just need it included in this plan set.*

The Proof-of-Concept Plan, submitted as part of the approved Preliminary Subdivision Application, and an Alternate Proof-of-Concept Plan, prepared at the request of the CPDC during the Preliminary Subdivision public hearing process, are attached to this letter.

6. Please revise the title on the current Sheet 3 from "Definitive Subdivision Plan" to "Approved Preliminary Plan" or something like that. Engineering noted that plan was slightly different the later sheets done by Somerville Engineering and retitling it would clear this up for anyone reviewing it that isn't aware of the full background of the Preliminary Plan.

The title of Sheet 3 has been changed from "Definitive Subdivision Plan" to "Approved Preliminary Plan". A stamped copy of the revised plan is attached to this letter.

If you have any questions, please feel free to contact this office.

Sincerely.

Andrew C. Pandolph
President
Vineyard Engineering and Environmental Services Inc

17 Salem Street
Medford, MA 02155
Phone: 781.933.3330
Fax: 781.933.3334

Martha's Vineyard
P.O. Box 458
Tisbury, MA 02568
508.687.9437

July 20, 2023

RE: Geotechnical Investigation
0 Annette Lane
Reading, MA

Dear Client,

The purpose of this report, as agreed, is to present the results, observations, and professional geotechnical engineering recommendations and conclusions from a subsurface investigation program which was completed.

This test pit program, as requested, is intended to address the structural implications of the subsurface materials conditions relative to the proposed 0 Annette Lane home project. The field data was utilized to draw the engineering conclusions and to formulate the professional engineering recommendations presented later in this document.

During the dates mentioned above, Mark St Fleur, an Aardvark Engineer, visited the site and monitored a limited test pit investigation consisting of three (3) test pits. It should be noted that at the time of the exploration, almost all of the proposed building footprint had already been excavated. Two more test pits were conducted 10' outside of the building footprint to the east and west to confirm the uniformity of the soils. During the construction, our firm will be onsite to further confirm uniformity of the soils. A final report will be provided once all earthwork operations are complete.

It should be noted that the test pit was limited to our visual evaluations and reflected the values shown on the original site plan regardless of the ongoing site operations and possible minor changes in contours/grade.

It should also be noted that this investigation is a limited preliminary investigation which should be supported/confirmed with a supplementary investigation or data such as torque monitoring during foundation installation or etc.

Advancement of Test Pit-2, done on the southeast of the site as shown on the plans, showed 1'± of loam, overlying 3'± of silty sand fill. Underneath there was 1'± of gray/tan, dry, medium dense, silty sand trace gravel (native). TP-2 was terminated at 5'±.

Advancement of Test Pit-7, done on the east as shown on the site plans, showed 1'± loam overlying 2'± of silty sand fill. Underneath there was 3"-6"± of organics overlying 1'± of gray/tan silty sand trace gravel (native). TP-7 was terminated at 5'±.

Advancement of Test Pit-8, done on the west as shown on the site plans, showed 1'± black loam overlying 1'± tan organic loam fill. Underneath there was 4'± gray/tan silty sand mixed fill overlying 1'± of gray silty sand trace gravel (native). TP-8 was terminated at 7'±.

It should be noted that the groundwater table fluctuates throughout the year due to precipitation, season, and other factors. As such, it is possible that, taken under different conditions, may vary from those presented in this report.

As noted in the logs, the native gray/tan silty sand trace gravel was observed at the 5'-7''± depth.

The following soil gradation specifications are suggested for Granular Fill, Gravel Base, and Dense Graded crushed stone materials are recommended:

Sieve Size	Granular Fill	Gravel Base	Dense Grade
6"	100	100	100
3"	95-100	100	100
1/2"	60-95	50-85	50-80
#4	50-80	40-75	30-55
#10	30-70	30-60	n/a
#40	10-70	10-35	10-25
#100	0-25	0-15	n/a
#200	0-10	0-8	3-10

The existing native, silty sand/gravel appears suitable to remain as subgrade material beneath pavements. The crew will have to strip the soils down to this native soil. However, the native soils are moisture/traffic sensitive and will require some protection during construction to maintain their stability. We typically recommend a minimum 1' layer of Gravel Base, topped by 4" of Dense Graded, directly beneath the pavement, for "light duty" traffic conditions. Our typically recommended pavement material cross sections are summarized in the Table below:

Pavement Courses	Heavy Duty Traffic	Light Duty Traffic
Bituminous Top Mix MHD M3.11.03 Table A	1 ½"	1"
Bituminous Binder Mix M3.11.03 Table A	2 ½ "	2"
Dense Graded Crushed Stone MHD M2.01.7	6"	4"
Gravel Borrow Subbase MHD M1.03.0	16"	12"

It should be noted that the onsite soils might be suitable (depending on the weather/season) for reuse as subgrade backfill beneath pavements. However, as mentioned previously, the soil is moderately silty and could present a moisture/frost concern. As such, an *Aardvark* technician should be onsite to monitor and confirm these conditions.

In general, the excavations showed 5'-7' of light brown silt (with sand) some peat overlying a gray silt/clay that appeared to be medium dense undisturbed soil. The soil type(s) and general suitability are addressed later in this report.

This firm also completed one (1) laboratory gradation analyses on a sample of the onsite native soils for classification and geotechnical evaluation. The soil gradation/hydrometer analyses (copies attached) are summarized below:

Sample ID	Location	Gravel (%)	Sand (%)	Silt/Clay (%)
B-B	TP-2, 4'± BEG	30.5	53.9	15

As shown above, the soil composition revealed medium silt/clay ("fines") contents of close to 20% and should be considered moderately susceptible to moisture and/or vibration. Thus, if re-used as structural subgrade backfill, the soil must be compacted at an appropriate moisture content and the earthwork performed under favorable/dry weather conditions. Further, when the soil is damp/moist is should not be exposed to heavy equipment traffic (i.e. vibration) as it can easily destabilize (weaving/pumping/etc).

Also, according to the State Building Code section 1804.3, the native/existing medium gray silt/clay (Class #9) could be assigned a maximum allowable bearing capacity of up to 1.5 TSF (3000 psf). However, any disturbed soil at the bottom of any footing excavations should be proof rolled, prior to forming the footings, to confirm stability and achieve the required 95% minimum compaction. Additional testing may increase this bearing capacity.

The State Building Code section 9.4.1.2.1 applies site classes "A/B/C/D/E" to each site. It should be noted that the site class is typically based on either shear wave velocity (V_S) or boring standard penetration numbers ("blow counts"). Although soil borings were not requested, we believe that the native silts/clays would exhibit blow counts of less than 15 blows/foot correlating to site class "D".

We recommend that all backfill be compacted/proof rolled to a minimum of 95% of the soil's maximum dry density, as required by the SBC. We also strongly suggest that the perimeter footings and pavement area be over-excavated 1' and a layer of ¾" crushed stone (and a "sump" pit) be prepared to stabilize the subgrade and provide temporary drainage. We also believe that a minimum of 1' of "gravel base course" (meeting MHD M1.03.0 gradation specifications) will have to be imported for directly beneath slabs and pavements.

In summary, we believe that it would be in your best interest to retain this firm to check that the earthwork is in accordance with our engineering guidelines. Additionally, we could provide the field testing required by the State Building Code for the soil, concrete, and/or steel construction work.

We recommend that Aardvark Geotechnical Engineering & Testing Inc. be retained to monitor aspects of the residential construction operations which are listed below:

- Monitor the initial site work and confirm that the type(s) of subgrade soil is adequate.
- Review the proposed bearing surfaces to confirm that they have been properly prepared, and that they are satisfactory for the recommended bearing pressures.
- Observe the placement and compaction of structural fill within the building areas.
- Observe the placement and compaction of fill within the proposed pavement areas.
- Check the suitability, via project specifications, of soils for use as backfill.

By monitoring these aspects of the construction, we will be able to observe compliance with the

geotechnical design concepts, assumptions, and specifications, and to facilitate the design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction. In addition, *Aardvark* could provide the SBC required field testing for the structural concrete/masonry and/or steel aspects during construction.

Basically, the subsurface fill materials, to a depth of 5' - 7'±, are not suitable for direct support of the proposed structures. Should you have questions, or require additional geotechnical services, please do not hesitate to contact me at our office.

Very truly yours,
Mark St Fleur, PE
Director of Engineering Services

Town of Reading
16 Lowell Street
Reading, MA 01867

Andrew MacNichol
Community Development Director
Phone: 781.942-6670
Fax: 781.942-9071
Website: www.readingma.gov

April 10, 2023

Preliminary Subdivision Plan
DECISION of APPROVAL

0 Annette Lane

Proposed Street Name: Annette Lane Extension

To the Town Clerk:
This is to certify, that at a public hearing of the Reading Community Planning and Development Commission (CPDC), which was opened on March 13, 2023, and closed April 10, 2023, by a motion duly made and seconded, it was voted:

"We, the CPDC, as requested by Peter Seibold, under the Town of Reading's Subdivision Rules & Regulations, and MGL Chapter 41 Sections 81K through 81GG, to consider the 1-Lot Preliminary Subdivision Plan for property located at 0 Annette Lane (Assessors Map 38, Lot 139), as shown on the plans prepared by Vineyard Engineering and Environmental Services Inc., originally dated January 3, 2023, and most recently revised March 28, 2023, in support of an application filed on January 18, 2023, do hereby vote 5-0-0 to approve the said plans, inclusive of the waivers listed herein, subject to the Findings and Conditions below."

MATERIALS:
The following documents and plans were submitted into the public record:

1. Form B: Application for Subdivision Approval, filed with the Town Clerk 1/18/23.
2. Form G: Designer Certificate, dated 1/5/23.
3. List of Requested Waivers from Reading Subdivision Regulations, dated 1/5/23.
    a. Revised List of Requested Waivers, dated 4/3/23.
4. Certified List of Abutters, dated 1/18/23.
5. Email from Staff Planner to Applicant's Engineer with a statement deeming the submission Substantially Complete, and including a list of minor revisions to be made for the next plan submission, dated 1/18/23.
6. Legal Notice, published in Daily Times Chronicle on 2/22/23 and 3/1/23.
7. Preliminary Subdivision Plan of Land for Annette Lane Extension, Reading MA, prepared for: Peter Seibold, prepared by: Vineyard Engineering and Environmental Services, Inc., including the following:
    a. Sheet 1 of 4: Cover Sheet and Location Plan, dated 1/3/23;
    b. Sheet 2 of 4: Existing Conditions Plan, dated 1/3/23;
    c. Sheet 3 of 4: Proof of Concept Plan, dated 1/3/23;

d. Sheet 4 of 4: Preliminary Subdivision Plan, dated 1/3/23; and most recently revised 3/28/23

8. Alternate Proof of Concept Plan for Annette Lane, Reading MA, prepared for: Peter Seibold, prepared by: Vineyard Engineering and Environmental Services, Inc., dated 3/28/23
9. Draft Decision, dated 4/10/23.

FINDINGS:

1. **Existing Conditions:** Annette Lane is an existing 50' wide Public Way with 30' of paved roadway width serving three single-family homes. The development tract is comprised of 0 Annette Lane, situated between Annette Lane and the 50' public way known as Applegate Lane. The tract is vacant of structures but maintains jurisdictional wetland area, as well as sewer and drain easements. The site is entirely within the S-20 Zoning District and the overlying Aquifer Protection District.
2. **Proposal:** The Applicant is proposing to subdivide the lot into one buildable tract and a second lot for the extension and layout of Annette Lane. Annette Lane is extended by approximately 187' in length, with a 50' right-of-way width, that connects to Applegate Lane. The extension would provide the necessary frontage required for a single-family dwelling on the tract. The Applicant proposes to construct approximately 30' of this extension in order to serve and access the proposed single-family dwelling. The dwelling will be accessed by a 100-125' long driveway, which is to be designed to engineering and public safety standards/requirements. The remaining portion of the way would exist on paper only. A series of waivers have been requested from the Subdivision Rules and Regulations and the application will require an Order of Conditions issued by the Conservation Commission.
3. **Zoning:** The site is within the S-20 Zoning District; of which the single house lot will comply with the bulk frontage and area requirements of the S-20 Zoning District. A minimum total of 20,000sf of area, 12,000sf of upland area, and 120' linear feet of frontage is required. It is anticipated that the proposed home will comply with the dimensional and bulk requirements of the S-20 Zoning District. There are no known Special Permits or Variances relative to the subject property.
4. **Proof of Concept:** The proposed 50' right of way would extend and connect the existing 50' right of ways of Annette Lane and Applegate Lane. The connection would be served through a 145' long bridge between the 25' buffer zone limits on each end of the right of ways.
5. **Wetlands:** An Order of Resource Area Delineation was issued by the Reading Conservation Commission in December 2019, and set to expire on December 4, 2023. Bordering Vegetated Wetlands (BVW) are present on the site and work is proposed within the 100' buffer zones.
6. **Conservation Review Restriction:** The Application will require a Notice of Intent with the Conservation Commission, and the issuance of an Order of Conditions.
7. **Upland Area:** ZBL Section 6.2.7 requires that any lot in the S-20 Zoning District must contain at least 12,000sf of upland area outside of a Wetland Resource Area; upland area for the buildable Lot 1 is calculated to be 36,656sf, which indicates compliance with this requirement.
8. **Proposed Right-of-Way:** The proposed right-of-way layout will be 50' wide and 187' long, and will include a paved roadway extension of 28' x 30'. The paved extension is to serve the proposed driveway of the single-family tract; the driveway is estimated at approximately 100-125' in length. Bituminous concrete and vertical granite curbing shall be installed as necessary for drainage design.

9. **Test Borings:** If requested waivers are approved the Applicant will complete test borings within the proposed 30' Annette Lane extension and site driveway layout. Conversely, if waivers are not approved the Applicant will be required to complete all test borings as required for roadway construction in Section 6.1.1.d.5 of the Subdivision Rules and Regulations.
10. **Traffic:** Due to the proposal of a single buildable tract, a waiver has been requested from providing a full Traffic Study.
11. **Trees/Landscaping/Screening:** Deciduous and Evergreen trees with 6" and greater diameter have been depicted on the plan set.
12. **Lighting:** No street lighting has been proposed and a waiver request has been provided for such. Typical house mounted lights will be provided at the proposed lot.
13. **Utilities:** Both Town water and sewer are proposed to be extended and connected to the proposed house lot. Electric, Telephone and Cable service shall also be provided. All utilities are proposed to be underground and extended through the proposed driveway. The existing hydrant is proposed for relocation to allow driveway access.
14. **Drainage:** Associated road and roof runoff is expected to be directed to a stormwater infiltration system behind the proposed dwelling. It is to be designed to capture 100% of the lot's 3,407sf of impervious area. Topography and grading of abutting lots will be submitted within any future Definitive Subdivision application, as required per Section 5.1.1.b.8 of the Reading Subdivision Rules and Regulations.
15. **Stormwater Permit:** A stormwater permit application will be required with a Definitive application. The Conservation Commission shall issue and oversee the Stormwater Permit.
16. **Easements:** There is existing drainage and existing sewer easements within the lot and project site.
17. **Boardwalk/Trail Connection:** The Applicant proposes 4' wide elevated boardwalk spanning 142' in length from Applegate Lane to Annette Lane and through the Bordering Vegetated Wetland (BVW) system. The boardwalk will provide a direct pedestrian access and connection for the two neighborhoods. Exiting sidewalk along Martin Road and Forest Street provide access to the Birch Meadow School Complex. The boardwalk details (i.e. footings, material, etc.) will require review and approval from the Conservation Commission and additional stakeholders as required. Necessary and required easements for public access will be provided as required.
18. **Rooftop Solar:** The Applicant shall consider orienting the homes so that future owners can benefit from potential rooftop solar installations and/or passive heating.

WAIVERS:

The Applicant has requested, and the Commission has voted the following waivers from the Town of Reading Subdivision Regulations, with guidance:

1. A waiver from Section 6.1.1.c.3 requiring detail of profile existing and proposed right of ways.
    a. *The Applicant is proposing an extension of Annette Lane by 30-feet. Due to the limited scope and because the remainder of road would exist as paper street, the Applicant request that this requirement be waived.*

The CPDC Voted to Approve the Requested Waiver from Section 6.1.1.c.3 under the condition that the Applicant provide a profile and detail for the 30-foot right of way extension proposed for pavement.

2. A waiver from Section 6.1.1.d.3 requiring a full traffic study.
    a. *The Applicant requests relief from the requirement due to the modest scope of one additional single-family home.*

3. A waiver from Section 6.1.1.d.4 requiring an Environmental Impact Study to be performed.
    a. *The Applicant requests relief of this requirement due to the limited scope of the project and the opined minimal impact of one additional home on resources.*

    This waiver shall not preclude any additional environmental studies required by the Conservation Commission.

4. A waiver from Section 7.1.1.a requiring a right of way width of 60-feet.
    a. *The existing layout of Annette Lane is 50-feet wide and the Applicant proposes to extend the layout of Annette Lane at the 50-foot width, because of such the Applicant requests relief of this requirement.*

5. A waiver from Section 7.1.8 requiring the installation of granite monuments.
    a. *The Applicant requests a waiver of this requirement due to the limited scope of the project and because the remainder of the road will exist on paper only.*

6. A waiver from Section 7.1.11 requiring the installation of street lighting.
    a. *The Applicant requests a waiver of this requirement due to the modest 30-foot extension of Annette Lane proposed.*

7. A waiver from Sections 7.1.5(c) and 7.1.5(e) requiring a turning circle and landscaped cul-de-sac island respectively.
    a. *The Applicant requests a waiver from this requirement due to the limited scope of the project and that the proposed right of way extension would be connected as a through way from Annette Lane to Applegate Lane.*

8. A waiver from Section 7.2 requiring sidewalks along both sides of the roadway.
    a. *The Applicant requests a waiver from this requirement due to the limited scope of roadway expansion proposed.*

    In consideration of the granting of this waiver the Applicant shall identify opportunity for sidewalk or street trees/landscaping within the right of way where appropriate and applicable.

9. A waiver from Section 7.6 requiring the installation of street trees.
    a. *The Applicant requests a waiver from this requirement due to the proposed extension of Annette Lane by 30-feet and the fact that the rest of the way shall remain on paper.*

    In consideration of the granting of this waiver request, the Applicant shall identify opportunities for and propose additional screening plantings within the project site.

10. A waiver from Section 8.0 requiring the construction of a way.
    a. *Due to the modest scope of the project, and the presence of wetlands in the surrounding area in which a way would be constructed, the Applicant requests a waiver of the requirement.*

    The CPDC Voted to Approve the requested waiver from Section 8.0 under the condition that the proposed 30-foot right of way extension be built to Town standards.

CONDITIONS:

General:

1. **Definitive Subdivision** – Should the Applicant wish to proceed with this project, Definitive Subdivision Plans shall be submitted to the Town within 7 months of the preliminary application filed on January 18, 2023, in conformance with Chapter 41A Section 81Q of the Subdivision Control Law.
2. **Driveway Design** – The proposed driveways shall be designed to enable Fire Department access to the homes. The driveway shall be no less than 19-feet in width, have an overhead clearance of 13'-6", and have the ability to bear 64,000 pounds of load. The Applicant shall work with the Fire Department to determine the thickness of pavement necessary to ensure that the driveway can bear a 64,000-pound load; such detail shall be provided on the plans.
3. **Drainage Design** – No drainage design is approved herein. The Definitive Plans shall include any LID or conventional stormwater management features proposed on-site, along with relevant calculations and documentation as may be required by the Town Engineer.
4. **Trees/Landscaping/Screening:** All trees proposed to be removed from within the 100' wetland buffer shall be approved by the Conservation Commission. Any proposed Street Trees will not count towards the replacement requirement.
5. **Utilities** – The Applicant shall work with the DPW and RMLD to ensure compliance with all utility extension requirements. Utilities for the new homes are required to be underground.
6. **Other Permits:** The Applicant is responsible for obtaining all other required Federal, State and Local permits, including but not limited to: Definitive Subdivision Plan Approval from the CPDC, a NPDES Permit; Stormwater Permit, utility permits for sewer, water, electric, etc.; curb cut, driveway, MassDOT and Jackie's Law excavation permits; Board of Health approvals; and an Order of Conditions from the Conservation Commission.
7. **ORAD:** As appropriate prior to submitting a Definitive Subdivision Plan, the Applicant shall ensure that any requirements of the December 2019 Order of Resource Area Delineation (ORAD) issued by the Conservation Commission are met.

8. **Notice of Intent:** As applicable the Applicant shall submit a Notice of Intent application with the Conservation Commission.
9. **Health Division:** As appropriate, prior to submitting a Definitive Subdivision Plan, the Applicant shall ensure compliance with applicable requirements of the Health Department.
10. **Snow Storage:** The Applicant shall coordinate with the Conservation Commission, Engineering Department, and DPW Department, to determine the most appropriate location on-site for snow storage.
11. **Electric Utility**: The electric utility plan shall be submitted and approved by the Reading Municipal Light Department (RMLD). Locations of light poles, transformers, etc. shall be added to the plans and approved by RMLD.
12. **Property Maintenance:** The Applicant shall maintain the property in a neat and orderly fashion while the development is pending, and during construction.

Signed as to the accuracy of the vote as reflected in the minutes:

Andrew MacNichol, Community Development Director — Date: 4/13/23

Cc: Applicant, Town Clerk, CPDC, Development Review Team, Building Inspector, planning file

Town of Reading
Engineering Division

Memo

To: Andrew MacNichol, Community Development Director

From: Ryan A. Percival, P.E., Town Engineer;

CC: Community Planning and Development Commission;

Date: September 20, 2023

Re: Annette Lane Subdivision

Materials reviewed:

- Proposed Definitive Subdivision Plan entitled; "Annette Lane", Annette Lane Reading, Massachusetts; prepared by Vinyard Engineering & Environmental Services Inc; dated August 14, 2023
- Drainage Narrative; prepared by Somerville Engineering; dated August 11, 2023
- Geotechnical Report; prepared by Aardvark Geotechnical Engineering and Testing, Inc; dated July 20, 2023

The Engineering Division has reviewed the proposed site application for the proposed project and offers the following comments:

- The Plan set appears to be submitted by Vineyard but does have plans designed by Somerville Engineering. For the purposes of this review engineering focused on the Somerville Engineering set, assuming the Vinyard set was from the preliminary submission.
- The driveway is designed with 22 inches of gravel and 4 inches of asphalt. This will accommodate any public safety vehicle.
- The drainage report indicates the use of NOAA Atlas 14 Rainfall data and shows a reduction in post-development runoff volumes and flows for the 2, 10, 25 and 100-year storms. All site Stormwater is being recharged on site.
- According to the geotechnical report soils were determined to be a soil class "D" based on engineering assumptions and soil characteristics. Borings were not performed to verify soil bearing capacity and as such a full foundation design and soil analysis shall be submitted prior to building permit.
- The size and type of all existing and proposed utilities shall be labeled on the plan.
- Fire flow test shall be performed.
- Trench paving in the Town ROW shall meet Town Standards for this area.
- All utilities shall be approved materials and installed in accordance with the Department of Public Works Standards.
- The Engineering Division shall be notified 72 hours in advance to mark out Town utilities.
- All water, sewer, curb cut, street opening, and Jackie's Law excavation permits shall be obtained at the Engineering Division prior to any excavations.
- All sitework shall be inspected by the Engineering Division. The Applicant/Owner's contractor shall submit a construction schedule of proposed work. All inspections shall be scheduled 48 hours in advance.
- An approved site as-built shall be submitted to the Engineering Division within 60 days of certificate of occupancy. The as-built shall be submitted in mylar and electronic ACAD format.

SE | SOMERVILLE ENGINEERING

519 Highland Avenue, Suite #285
Somerville, MA 02143

Andrew MacNichol
Community Development Director
16 Lowell Street
Reading, MA 01867

Date
August 11, 2023

RE: Drainage Narrative
Definitive Subdivision
Annette Land
Reading, MA

Dear Mr. MacNichol,

On behalf of our Client, Peter Seibold, Somerville Engineering (SE) has prepared this drainage narrative in support of the Definitive Subdivision for 0 Annette Lane. This letter will summarize the stormwater management system for the proposed development.

Existing Conditions

It is understood that the property at 0 Annette Lane (Assessors Map 38 Parcel 139) is a 54,942 square foot (sf) lot and is currently undeveloped, as illustrated on the Plot Plan prepared by Vineyard Engineering & Environmental Services, Inc. A review of the NRCS soil report for Middlesex County indicates that the soil onsite is considered Merrimac-Urban Land which has a Hydrologic Soil Group rating of an "A".

There is no evidence of any existing stormwater systems on the existing site. The topography of the site has a high point in the middle resulting in two watersheds, one that discharges to the northerly wetland and one that discharges to the southerly wetland. and slopes to the low point at the southeasterly corner of the site. A stormwater study point for the entire site has been modeled in HydroCAD and attached for review and a copy of the Existing Watershed Plan is included herewith.

Proposed Conditions

It is understood that the project proposes constructing a single-family home and a new driveway. The proposed project will result in a total impervious area of 4,131 sf.

There will be no significant change in the site's proposed topography.

Site improvements have been illustrated on the attached Proposed Site plan prepared and stamped by Carlton M Quinn Professional Civil Engineer, dated August 11, 2023. The proposed site improvements will result in a land disturbance of approximately 13,000 sf and a net increase of 4,131 sf of impervious area on site.

Stormwater Mitigation

Proposed stormwater mitigation has been provided by the installation of two leaching fields, one to collect the roof runoff and the second to collect the driveway runoff. Additionally, a stone trench is proposed to mitigate the conversion of surface cover from "Woods" to "Grass". These infiltration systems have been modeled in HydroCAD and the calculations are illustrated in the attached report. The infiltration systems are designed to collect and infiltrate all stormwater collected for all storm events up to and including the 100-year storm event.

The attached storm water runoff analysis was performed of the existing and proposed conditions and includes an estimate of the peak rates and volume runoffs from various rainfall events. Peak rates and volume runoffs were developed using TR55 Urban Hydrology for Small Watersheds, developed by the U.S. Department of Commerce, Engineering Division and the HydroCAD computer program. Further, the

somervilleengineering.com
info@somervilleengineering.com
(617) 356-8185

analysis has been prepared in accordance with the MassDEP and the Town of Reading requirements and standard engineering practices.

Below is a summary table of the peak rate and volumes: runoff has been estimated for each watershed during the 2, 10, 25, and 100-year storm events.

Peak Flow Rates

Study Point #1 (Northerly Flow Offsite)

	2-Year 3.22 inches	10-Year 4.89 inches	25-Year 6.22 inches	100-Year 8.94 inches
Existing Runoff (CFS)	0.00	0.00	0.01	0.12
Proposed Runoff (CFS)	0.00	0.00	0.00	0.09
% REDUCTION	No Change	No Change	100%	25%

Study Point #2 (Southerly Flow Offsite)

	2-Year 3.22 inches	10-Year 4.89 inches	25-Year 6.22 inches	100-Year 8.94 inches
Existing Runoff (CFS)	0.00	0.00	0.00	0.11
Proposed Runoff (CFS)	0.00	0.00	0.00	0.08
% REDUCTION	No Change	No Change	No Change	27.3%

Peak Volumes

Study Point #1 (Northerly Flow Offsite)

	2-Year 3.22 inches	10-Year 4.89 inches	25-Year 6.22 inches	100-Year 8.94 inches
Existing Runoff (CF)	0	4	164	1,119
Proposed Runoff (CF)	0	3	119	810
% REDUCTION	No Change	25%	27.4%	27.6%

Study Point #2(Southerly Flow Offsite)

	2-Year 3.22 inches	10-Year 4.89 inches	25-Year 6.22 inches	100-Year 8.94 inches
Existing Runoff (CF)	0	3	140	953
Proposed Runoff (CF)	0	8	116	670
% REDUCTION	No Change	Insignificant increase	17.1%	29.7%

As illustrated on the attached HydroCAD calculation sheets the infiltration systems are recharging 100% of the stormwater collected. This results in 100% of the stormwater TSS and phosphorus removal so no additional calculations are required.

Groundwater Elevation

Soil test pit logs have been provided as an attachment and are noted on the proposed site plan.

Please let me know if you have any questions.

Sincerely,

Carlton Quinn, PE
Principal

Attachments:

1. **Operation & Maintenance Plan**
2. **Existing Watershed Plan**
3. **Proposed Watershed Plan**
4. **Predevelopment HydroCAD Calculations**
5. **Post development HydroCAD Calculations**
6. **Extreme Precipitation Tables**
7. **NRCS Soil Report**
8. **Soil Test Pit Logs**

Section 2.0 Operation & Maintenance Plan

Table of Contents

- **INTRODUCTION**

In accordance with the standards set forth by the Stormwater Management Policy issued by the Department of Environmental Protection (DEP), Somerville Engineering (SE) has prepared the following Operation and Maintenance Plan for the new development of the mixed-use development located at 0 Annette Lane, Reading, MA.

The plan is broken down into three major sections. The first section describes construction-related erosion and sedimentation controls (Construction Period). The second section describes the long-term pollution prevention measures (Long Term Pollution Prevention Plan). The third section is a post-construction operation and maintenance plan designed to address the long-term maintenance needs of the stormwater management system (Long Term Maintenance Plan).

- **NOTIFICATION PROCEDURES FOR CHANGE OF RESPONSIBILITY FOR O&M**

The Stormwater Management System (SMS) for this project is owned by Peter Seibold (owner). The owner shall be legally responsible for the long-term operation and maintenance of this SMS as outlined in this Operation and Maintenance (O&M) Plan.

In the event the SMS will serve multiple lots/owners, such as the subdivision of the existing parcel or creation of lease areas, the owner(s) shall establish an association on other legally enforceable arrangements under which the association or a single party shall have legal responsibility for the operation and maintenance of the entire SMS. The legal instrument creating such responsibility shall be recorded with the Registry of Deeds and promptly following its recording, a copy thereof shall be furnished to the Commission.

- **CONTACT INFORMATION**

Stormwater Management System Owner: Peter Seibold
437 Summer Avenue
Reading, MA 01867

Emergency Contact Information:

○ Reading Public Works	Phone (781) 942-9092
○ Reading Fire Department (non-emergency line)	Phone (781) 944-3132
○ DEP Emergency Response (Mass DEP)	Phone (888) 304-1133
○ Clean Harbors Inc (24-Hour Line)	Phone (800) 645-8265

- **CONSTRUCTION PERIOD**

1. Prior to the commencement of any site work, the Applicant and general contractor shall meet with the Town Planner, Building Inspector, and the Board's Consulting Engineer to establish a construction phasing schedule and designated construction route.

2. Install Erosion Control measures as shown on the Site Preparation Plan prepared by SE. Install Construction fencing if determined to be necessary at the commencement of construction.

3. Install construction entrances, hay bales, and tubular barriers at the locations shown on the Site Preparation Plan prepared by SE.

4. Site access shall be achieved only from the designated construction entrance.

5. Stockpiles of materials subject to erosion shall be stabilized with erosion control matting or temporary seeding whenever practicable, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

6. Install silt sacks and hay bales around each drain inlet prior to any demotion and or construction activities.

7. All erosion control measures shall be inspected weekly and after every rainfall event. Records of these inspections shall be kept on site for review by the Town.

8. All erosion control measures shall be maintained, repaired or replaced as required or at the direction of the owner's engineer or the Town Engineer.

9. Sediment accumulation up-gradient of the hay bales, silt fence, and stone check dams greater than 6" in depth shall be removed and disposed of in accordance with all applicable regulations.

10. If it appears that sediment is exiting the site, silt sacks shall be installed in all catch basins adjacent to the site. Sediment accumulation on all adjacent catch basin inlets shall be removed and the silt sack replaced if torn or damaged.

11. The contractor shall comply with the Sedimentation and Erosion Control Notes as shown on the Site Development Plans and Specifications.

12. The stabilized construction entrances shall be inspected weekly and records of inspections kept. The entrances shall be maintained by adding additional clean, angular, durable stone to remove the soil from the construction vehicle's tires when exiting the site. If soil is still leaving the site via the construction vehicle tires, adjacent roadways shall be kept clean by street sweeping.

13. Dust pollution shall be controlled using on-site water trucks and or an approved soil stabilization product.

- **LONG TERM POLLUTION PREVENTION PLAN**

Standard #4 from the MA DEP Stormwater Management Handbook requires that a Long-Term Pollution Prevention Plan (LTPPP) be prepared and incorporated as part of the Operation and Maintenance of the Stormwater Management System. The purpose of the LTPPP is to identify potential sources of pollution that may affect the quality of stormwater discharges, and to describe the implementation of practices to reduce the pollutants in stormwater discharges. The following items describe the source control and proper procedures for the LTPPP.

- HOUSEKEEPING

The proposed site development will be designed to maintain a high level of water quality treatment for all stormwater discharge to the resource areas. An Operation and Maintenance (O&M) plan has been prepared and is included in this section of the report. The owner (or its designee) is responsible for adherence to the O&M plan is a strict and complete manner.

- VEHICLE WASHING

Outdoor vehicle washing has the potential to result in high loads of nutrients, metals, and hydrocarbons during dry weather conditions, as the detergent-rich water used to wash the grime off the vehicle enters the stormwater drainage system. The proposed project does not include any designated vehicle washing areas, nor is it expected that any vehicle washing will take place on-site.

- **LONG TERM MAINTENANCE PLAN – FACILITIES DESCRIPTION**

The SMS shall be inspected immediately after construction. A maintenance log will be kept (i.e. report) summarizing inspections, maintenance, and any corrective actions taken. The log will include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, the location where the sediment and debris was disposed after removal will be indicated. The log will be made accessible to department staff and a copy provided to the department upon request.

The following is a description of the stormwater management system for the project site.

Stormwater Collection System – On Site:

The stormwater collection system consists of roof drains the route to an underground infiltration system. This system consists of two leaching fields. This system shall be inspected twice per year. Perform a visual inspection of the System using the drain manhole for access (may require OSHA confined space measures). Use a Jet Vac to clean when the sediment depth reaches 3". Refer to attached manufacturer's information regarding maintenance procedures.

- **INSPECTION AND MAINTENANCE FREQUENCY AND CORRECTIVE MEASURES**

In accordance with MA DEP Stormwater Handbook: Volume 2, Chapter 2; the following areas, facilities, and measures will be inspected and the identified deficiencies will be corrected. Clean-out must include the removal and legal disposal of any accumulated sediments, trash, and debris. In any and all cases, operations, inspections, and maintenance activities shall utilize best practical measures to avoid and minimize impacts to wetland resource areas outside the foot print of the SMS.

- **SUPPLEMENTAL INFORMATION**

- Operation & Maintenance Log

0 ANNETTE LANE, READING, MA

Note all cleanouts, anomalies, degradation, and corrections.

	Structure or Task	**Maintenance Activity**	**Maintenance Cost/Unit**	**Schedule**	**Estimated Annual Maintenance Cost**	**Inspection Performed By**	
						Date:	By:
BMP	Infiltration System	Perform a visual inspection of the System using the drain manhole for access (may require OSHA confined space measures). Use a Jet Vac to clean when the sediment depth reaches 3". Refer to attached manufacturer's information regarding maintenance procedures.	$500/inspection	Twice Annually (Early spring & late fall)	$500		

GENERAL NOTES:

1. EXISTING SITE FEATURES WERE OBTAINED FROM AN ACTUAL FIELD SURVEY PERFORMED BY VINEYARD ENGINEERING & ENVIRONMENTAL SERVICES, INC.
2. TOPOGRAPHY NOTED IS BASED UPON AN ASSUMED DATUM. CONTRACTOR SHALL CONFIRM ELEVATIONS WITH BENCHMARK PROVIDED BY PROFESSIONAL LAND SURVYOR

REVISIONS

OWNER:

PETER SEIBOLD
437 SUMMER AVENUE
READING, MA 01867

PROJECT:

DEFINITIVE SUBDIVISION
ANNETTE LANE
READING, MA

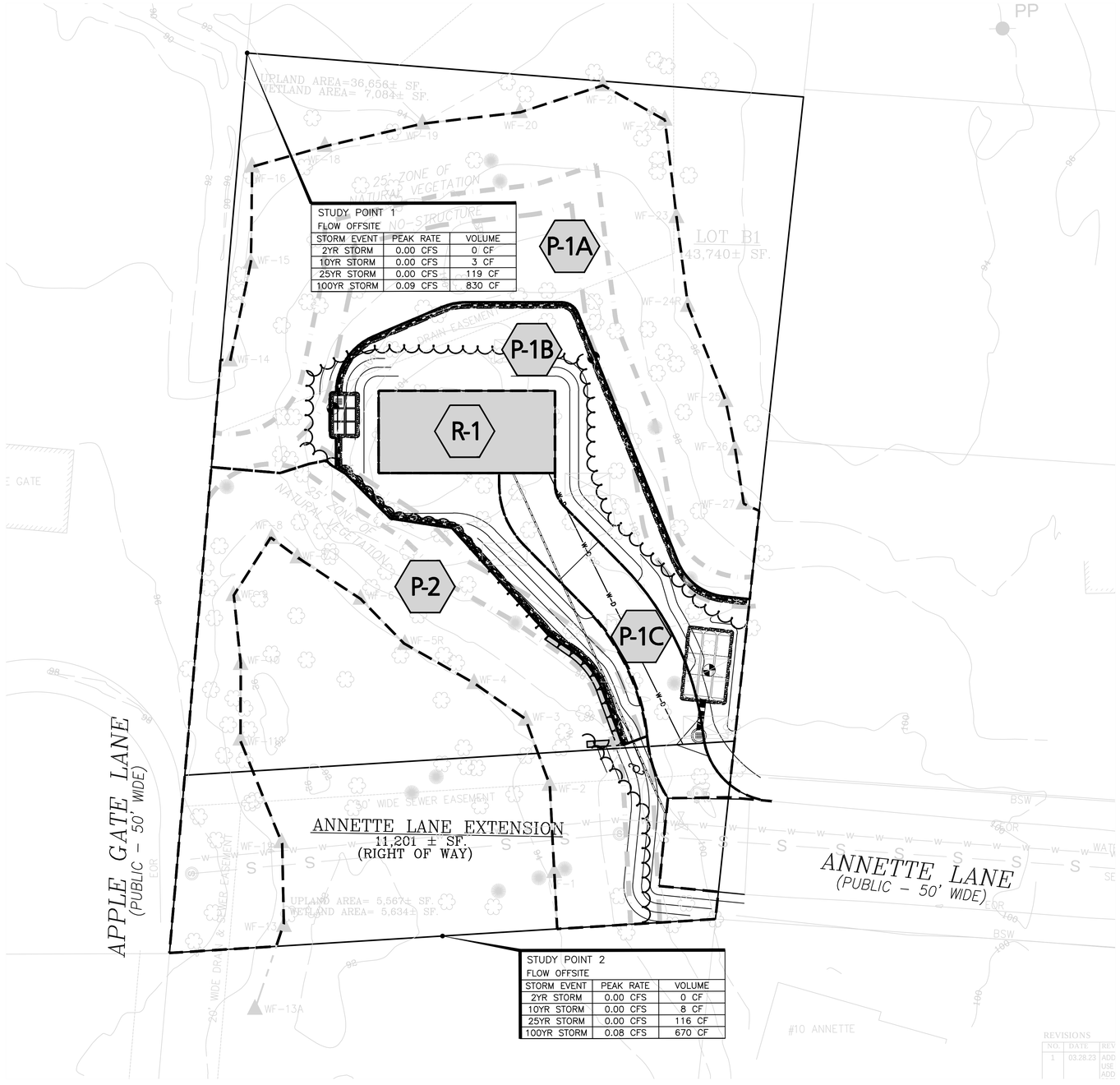
SE | SOMERVILLE ENGINEERING
519 SOMERVILLE AVENUE, SUITE #285
SOMERVILLE, MA 02144
(617)356-8185
WWW.SOMERVILLEENGINEERING.COM

DATE:	**8/11/2023**
SCALE:	**1"=20'**
PROJECT #:	**202304-01**
DRAWN BY:	**CMQ**

TITLE: **EXISTING WATERSHED PLAN**

SHEET: **EWS**

C:\USERS\COUINN\DESKTOP\PROJECT INFO\202304-01\CIVIL\DRAWINGS\202304-01_EWS.DWG



GENERAL NOTES:

1. EXISTING SITE FEATURES WERE OBTAINED FROM AN ACTUAL FIELD SURVEY PERFORMED BY VINEYARD ENGINEERING & ENVIRONMENTAL SERVICES, INC.
2. TOPOGRAPHY NOTED IS BASED UPON AN ASSUMED DATUM. CONTRACTOR SHALL CONFIRM ELEVATIONS WITH BENCHMARK PROVIDED BY PROFESSIONAL LAND SURVYOR

C:\USERS\COUINN\DESKTOP\PROJECT INFO\202304-01\CIVIL\DRAWINGS\202304-01_PWS.DWG

REVISIONS

OWNER:

PETER SEIBOLD
437 SUMMER AVENUE
READING, MA 01867

PROJECT:

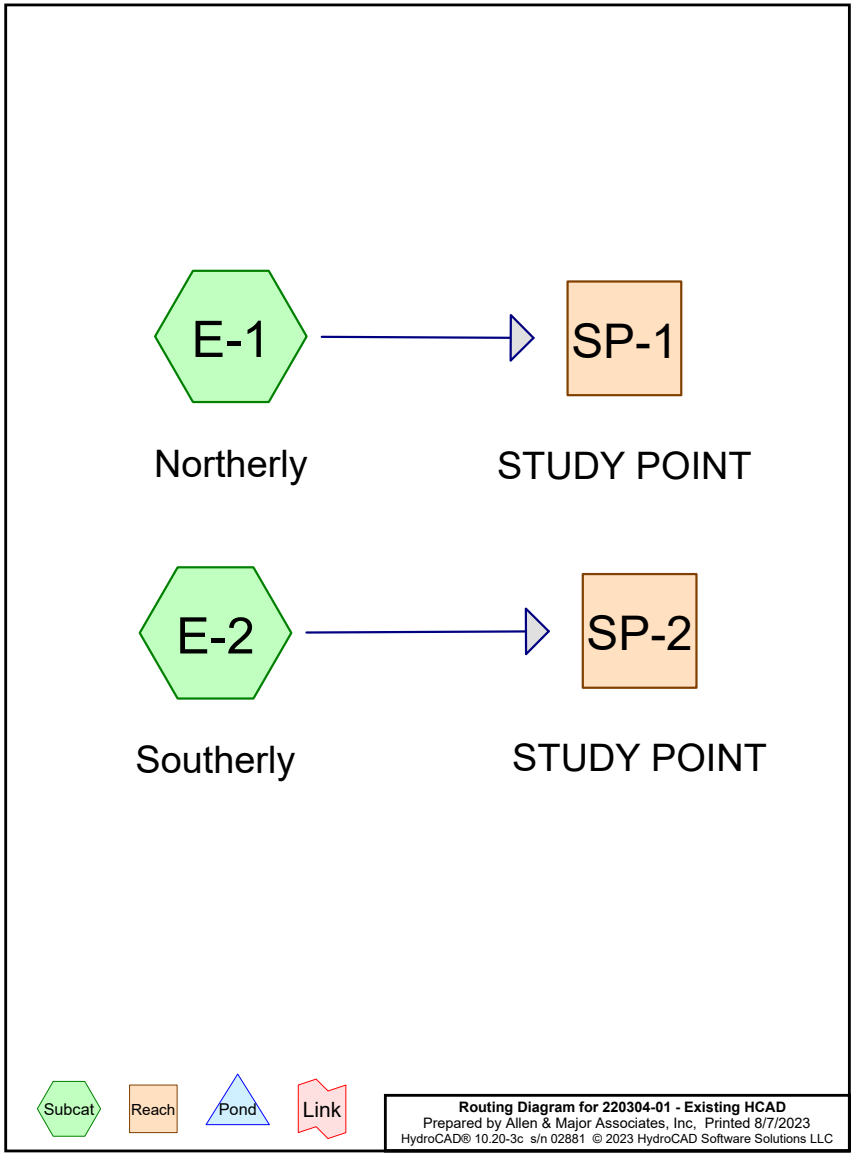
DEFINITIVE SUBDIVISION
ANNETTE LANE
READING, MA

SE | SOMERVILLE ENGINEERING
519 SOMERVILLE AVENUE, SUITE #285
SOMERVILLE, MA 02144
(617)356-8185
WWW.SOMERVILLEENGINEERING.COM

DATE:	**8/11/2023**
SCALE:	**1"=20'**
PROJECT #:	**202304-01**
DRAWN BY:	**CMQ**

TITLE: **PROPOSED WATERSHED PLAN**

SHEET: **PWS**



Summary for Subcatchment E-1: Northerly

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
20,298	30	Woods, Good, HSG A
20,298		100.00% Pervious Area

Summary for Subcatchment E-2: Southerly

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
17,281	30	Woods, Good, HSG A
17,281		100.00% Pervious Area

Summary for Reach SP-1: STUDY POINT

Inflow Area = 20,298 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-YR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach SP-2: STUDY POINT

Inflow Area = 17,281 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-YR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment E-1: Northerly

Runoff = 0.00 cfs @ 23.95 hrs, Volume= 4 cf, Depth= 0.00"
Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
20,298	30	Woods, Good, HSG A
20,298		100.00% Pervious Area

Summary for Subcatchment E-2: Southerly

Runoff = 0.00 cfs @ 23.95 hrs, Volume= 3 cf, Depth= 0.00"
Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
17,281	30	Woods, Good, HSG A
17,281		100.00% Pervious Area

Summary for Reach SP-1: STUDY POINT

Inflow Area = 20,298 sf, 0.00% Impervious, Inflow Depth = 0.00" for 10-YR event
Inflow = 0.00 cfs @ 23.95 hrs, Volume= 4 cf
Outflow = 0.00 cfs @ 23.95 hrs, Volume= 4 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach SP-2: STUDY POINT

Inflow Area = 17,281 sf, 0.00% Impervious, Inflow Depth = 0.00" for 10-YR event
Inflow = 0.00 cfs @ 23.95 hrs, Volume= 3 cf
Outflow = 0.00 cfs @ 23.95 hrs, Volume= 3 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment E-1: Northerly

Runoff = 0.01 cfs @ 15.12 hrs, Volume= 164 cf, Depth= 0.10"
Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
20,298	30	Woods, Good, HSG A
20,298		100.00% Pervious Area

Summary for Subcatchment E-2: Southerly

Runoff = 0.00 cfs @ 15.12 hrs, Volume= 140 cf, Depth= 0.10"
Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
17,281	30	Woods, Good, HSG A
17,281		100.00% Pervious Area

Summary for Reach SP-1: STUDY POINT

Inflow Area = 20,298 sf, 0.00% Impervious, Inflow Depth = 0.10" for 25-YR event
Inflow = 0.01 cfs @ 15.12 hrs, Volume= 164 cf
Outflow = 0.01 cfs @ 15.12 hrs, Volume= 164 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach SP-2: STUDY POINT

Inflow Area = 17,281 sf, 0.00% Impervious, Inflow Depth = 0.10" for 25-YR event
Inflow = 0.00 cfs @ 15.12 hrs, Volume= 140 cf
Outflow = 0.00 cfs @ 15.12 hrs, Volume= 140 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment E-1: Northerly

Runoff = 0.12 cfs @ 12.25 hrs, Volume= 1,119 cf, Depth= 0.66"
Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
20,298	30	Woods, Good, HSG A
20,298		100.00% Pervious Area

Summary for Subcatchment E-2: Southerly

Runoff = 0.11 cfs @ 12.25 hrs, Volume= 953 cf, Depth= 0.66"
Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
17,281	30	Woods, Good, HSG A
17,281		100.00% Pervious Area

Summary for Reach SP-1: STUDY POINT

Inflow Area = 20,298 sf, 0.00% Impervious, Inflow Depth = 0.66" for 100-YR event
Inflow = 0.12 cfs @ 12.25 hrs, Volume= 1,119 cf
Outflow = 0.12 cfs @ 12.25 hrs, Volume= 1,119 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach SP-2: STUDY POINT

Inflow Area = 17,281 sf, 0.00% Impervious, Inflow Depth = 0.66" for 100-YR event
Inflow = 0.11 cfs @ 12.25 hrs, Volume= 953 cf
Outflow = 0.11 cfs @ 12.25 hrs, Volume= 953 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Events for Subcatchment E-1: Northerly

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.00	0	0.00
10-YR	4.89	0.00	4	0.00
25-YR	6.22	0.01	164	0.10
100-YR	**8.94**	**0.12**	**1,119**	**0.66**

Events for Subcatchment E-2: Southerly

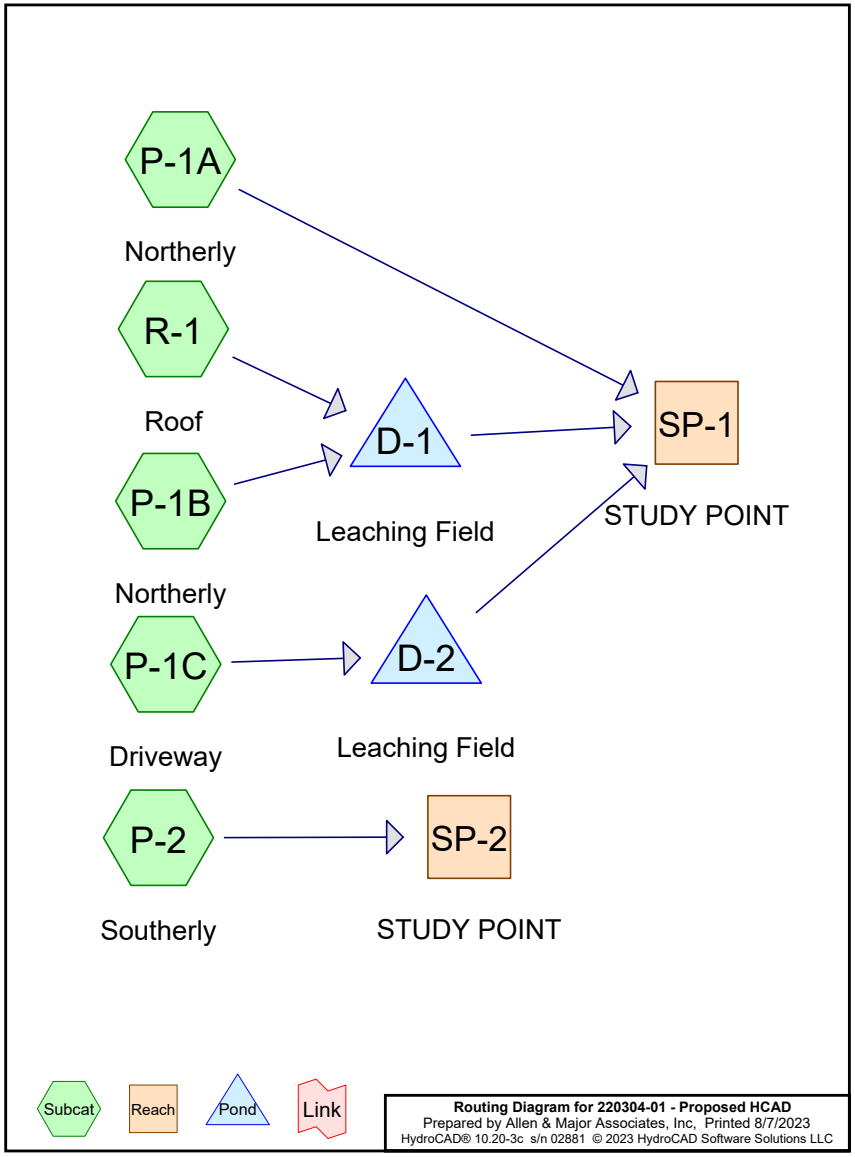
Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.00	0	0.00
10-YR	4.89	0.00	3	0.00
25-YR	6.22	0.00	140	0.10
100-YR	**8.94**	**0.11**	**953**	**0.66**

Events for Reach SP-1: STUDY POINT

Event	Inflow (cfs)	Outflow (cfs)	Volume (cubic-feet)
2-YR	0.00	0.00	0
10-YR	0.00	0.00	4
25-YR	0.01	0.01	164
100-YR	**0.12**	**0.12**	**1,119**

Events for Reach SP-2: STUDY POINT

Event	Inflow (cfs)	Outflow (cfs)	Volume (cubic-feet)
2-YR	0.00	0.00	0
10-YR	0.00	0.00	3
25-YR	0.00	0.00	140
100-YR	**0.11**	**0.11**	**953**



Routing Diagram for 220304-01 - Proposed HCAD
Prepared by Allen & Major Associates, Inc, Printed 8/7/2023
HydroCAD® 10.20-3c s/n 02881 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment P-1A: Northerly

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
14,687	30	Woods, Good, HSG A
14,687		100.00% Pervious Area

Summary for Subcatchment P-1B: Northerly

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
1,842	30	Woods, Good, HSG A
5,615	39	>75% Grass cover, Good, HSG A
7,457	37	Weighted Average
7,457		100.00% Pervious Area

Summary for Subcatchment P-1C: Driveway

Runoff = 0.17 cfs @ 12.10 hrs, Volume= 610 cf, Depth= 2.99"
Routed to Pond D-2 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.22"

	Area (sf)	CN	Description
*	2,451	98	Driveway
	2,451		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	38	0.2200	0.17		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	12	0.0100	0.68		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.16"
2.1	250	0.0100	2.03		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.6	278	0.0290	8.08	4.41	**Pipe Channel, D-E** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.011 Concrete pipe, straight & clean

6.8 578 Total

Summary for Subcatchment P-2: Southerly

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
9,907	30	Woods, Good, HSG A
761	39	>75% Grass cover, Good, HSG A
10,668	31	Weighted Average
10,668		100.00% Pervious Area

Summary for Subcatchment R-1: Roof

Runoff = 0.14 cfs @ 12.00 hrs, Volume= 418 cf, Depth= 2.99"
Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
1,680	98	Unconnected roofs, HSG A
1,680		100.00% Impervious Area
1,680		100.00% Unconnected

Summary for Reach SP-1: STUDY POINT

Inflow Area = 26,275 sf, 15.72% Impervious, Inflow Depth = 0.00" for 2-YR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach SP-2: STUDY POINT

Inflow Area = 10,668 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-YR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond D-1: Leaching Field

Inflow Area = 9,137 sf, 18.39% Impervious, Inflow Depth = 0.55" for 2-YR event
Inflow = 0.14 cfs @ 12.00 hrs, Volume= 418 cf
Outflow = 0.01 cfs @ 12.77 hrs, Volume= 418 cf, Atten= 91%, Lag= 45.9 min
Discarded = 0.01 cfs @ 12.77 hrs, Volume= 418 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
Peak Elev= 92.50' @ 12.77 hrs Surf.Area= 498 sf Storage= 194 cf

Plug-Flow detention time= 194.5 min calculated for 418 cf (100% of inflow)
Center-of-Mass det. time= 194.5 min (945.2 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.20'	145 cf	**15.50'W x 10.00'L x 4.75'H Field A** 736 cf Overall - 374 cf Embedded = 362 cf x 40.0% Voids
#2A	94.70'	278 cf	**Shea Leaching Chamber 4x4x4** x 6 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 6 Chambers in 3 Rows
#3	98.95'	3 cf	**2.00'D x 1.00'H Frame & Grate**-Impervious
#4	91.50'	196 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
#5	98.00'	590 cf	**2.00'W x 370.00'L x 2.00'H Stone Trench** 1,480 cf Overall - 4 cf Embedded = 1,476 cf x 40.0% Voids
#6	98.50'	4 cf	**6.0" Round Pipe Storage** Inside #5 L= 20.0'
		1,216 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.50	0	0.0	0	0	0
92.00	185	59.4	31	31	281
92.50	500	500.0	165	196	19,895

Device	Routing	Invert	Outlet Devices
#0	Primary	100.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	91.50'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	99.94'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 12.77 hrs HW=92.50' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.50' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D-2: Leaching Field

Inflow Area = 2,451 sf,100.00% Impervious, Inflow Depth = 2.99" for 2-YR event
Inflow = 0.17 cfs @ 12.10 hrs, Volume= 610 cf
Outflow = 0.02 cfs @ 11.65 hrs, Volume= 610 cf, Atten= 89%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.65 hrs, Volume= 610 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
Peak Elev= 96.45' @ 12.75 hrs Surf.Area= 409 sf Storage= 203 cf

Plug-Flow detention time= 72.4 min calculated for 610 cf (100% of inflow)
Center-of-Mass det. time= 72.4 min (829.4 - 757.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	95.33'	407 cf	**15.75'W x 25.98'L x 3.50'H Field A** 1,432 cf Overall - 413 cf Embedded = 1,019 cf x 40.0% Voids
#2A	96.33'	413 cf	**ADS_StormTech SC-740 +Cap** x 9 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Chambers in 3 Rows
#3	99.33'	3 cf	**2.00'D x 1.00'H Frame & Grate**-Impervious
#4	100.33'	371 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) -Impervious
#5	96.33'	36 cf	**24.0" Round Pipe Storage**-Impervious L= 11.5'
		1,231 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
100.33	0	0.0	0	0	0
101.00	185	59.4	41	41	281
102.00	500	500.0	330	371	19,897

Device	Routing	Invert	Outlet Devices
#0	Primary	102.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	95.33'	**2.040 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	101.00'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=95.40' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.33' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment P-1A: Northerly

Runoff = 0.00 cfs @ 23.95 hrs, Volume= 3 cf, Depth= 0.00"
Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
14,687	30	Woods, Good, HSG A
14,687		100.00% Pervious Area

Summary for Subcatchment P-1B: Northerly

Runoff = 0.00 cfs @ 14.63 hrs, Volume= 74 cf, Depth= 0.12"
Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
1,842	30	Woods, Good, HSG A
5,615	39	>75% Grass cover, Good, HSG A
7,457	37	Weighted Average
7,457		100.00% Pervious Area

Summary for Subcatchment P-1C: Driveway

Runoff = 0.26 cfs @ 12.10 hrs, Volume= 950 cf, Depth= 4.65"
Routed to Pond D-2 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.89"

	Area (sf)	CN	Description
*	2,451	98	Driveway
	2,451		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	38	0.2200	0.17		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	12	0.0100	0.68		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.16"
2.1	250	0.0100	2.03		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.6	278	0.0290	8.08	4.41	**Pipe Channel, D-E** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.011 Concrete pipe, straight & clean

6.8 578 Total

Summary for Subcatchment P-2: Southerly

Runoff = 0.00 cfs @ 22.99 hrs, Volume= 8 cf, Depth= 0.01"
Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
9,907	30	Woods, Good, HSG A
761	39	>75% Grass cover, Good, HSG A
10,668	31	Weighted Average
10,668		100.00% Pervious Area

Summary for Subcatchment R-1: Roof

Runoff = 0.21 cfs @ 12.00 hrs, Volume= 651 cf, Depth= 4.65"
Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
1,680	98	Unconnected roofs, HSG A
1,680		100.00% Impervious Area
1,680		100.00% Unconnected

Summary for Reach SP-1: STUDY POINT

Inflow Area = 26,275 sf, 15.72% Impervious, Inflow Depth = 0.00" for 10-YR event
Inflow = 0.00 cfs @ 23.95 hrs, Volume= 3 cf
Outflow = 0.00 cfs @ 23.95 hrs, Volume= 3 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach SP-2: STUDY POINT

Inflow Area = 10,668 sf, 0.00% Impervious, Inflow Depth = 0.01" for 10-YR event
Inflow = 0.00 cfs @ 22.99 hrs, Volume= 8 cf
Outflow = 0.00 cfs @ 22.99 hrs, Volume= 8 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond D-1: Leaching Field

Inflow Area = 9,137 sf, 18.39% Impervious, Inflow Depth = 0.95" for 10-YR event
Inflow = 0.21 cfs @ 12.00 hrs, Volume= 725 cf
Outflow = 0.02 cfs @ 12.00 hrs, Volume= 725 cf, Atten= 93%, Lag= 0.0 min
Discarded = 0.02 cfs @ 12.00 hrs, Volume= 725 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
Peak Elev= 95.61' @ 13.08 hrs Surf.Area= 655 sf Storage= 319 cf

Plug-Flow detention time= 239.3 min calculated for 725 cf (100% of inflow)
Center-of-Mass det. time= 239.4 min (1,013.5 - 774.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.20'	145 cf	**15.50'W x 10.00'L x 4.75'H Field A** 736 cf Overall - 374 cf Embedded = 362 cf x 40.0% Voids
#2A	94.70'	278 cf	**Shea Leaching Chamber 4x4x4** x 6 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 6 Chambers in 3 Rows
#3	98.95'	3 cf	**2.00'D x 1.00'H Frame & Grate**-Impervious
#4	91.50'	196 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
#5	98.00'	590 cf	**2.00'W x 370.00'L x 2.00'H Stone Trench** 1,480 cf Overall - 4 cf Embedded = 1,476 cf x 40.0% Voids
#6	98.50'	4 cf	**6.0" Round Pipe Storage** Inside #5 L= 20.0'
		1,216 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.50	0	0.0	0	0	0
92.00	185	59.4	31	31	281
92.50	500	500.0	165	196	19,895

Device	Routing	Invert	Outlet Devices
#0	Primary	100.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	91.50'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	99.94'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 12.00 hrs HW=94.29' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.50' (Free Discharge)
↑└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D-2: Leaching Field

Inflow Area = 2,451 sf,100.00% Impervious, Inflow Depth = 4.65" for 10-YR event
Inflow = 0.26 cfs @ 12.10 hrs, Volume= 950 cf
Outflow = 0.02 cfs @ 11.20 hrs, Volume= 950 cf, Atten= 93%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.20 hrs, Volume= 950 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
Peak Elev= 96.97' @ 13.24 hrs Surf.Area= 409 sf Storage= 367 cf

Plug-Flow detention time= 144.0 min calculated for 950 cf (100% of inflow)
Center-of-Mass det. time= 143.9 min (893.0 - 749.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	95.33'	407 cf	**15.75'W x 25.98'L x 3.50'H Field A** 1,432 cf Overall - 413 cf Embedded = 1,019 cf x 40.0% Voids
#2A	96.33'	413 cf	**ADS_StormTech SC-740 +Cap** x 9 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Chambers in 3 Rows
#3	99.33'	3 cf	**2.00'D x 1.00'H Frame & Grate**-Impervious
#4	100.33'	371 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) -Impervious
#5	96.33'	36 cf	**24.0" Round Pipe Storage**-Impervious L= 11.5'
		1,231 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
100.33	0	0.0	0	0	0
101.00	185	59.4	41	41	281
102.00	500	500.0	330	371	19,897

Device	Routing	Invert	Outlet Devices
#0	Primary	102.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	95.33'	**2.040 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	101.00'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 11.20 hrs HW=95.40' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.33' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment P-1A: Northerly

Runoff = 0.00 cfs @ 15.12 hrs, Volume= 119 cf, Depth= 0.10"
Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
14,687	30	Woods, Good, HSG A
14,687		100.00% Pervious Area

Summary for Subcatchment P-1B: Northerly

Runoff = 0.02 cfs @ 12.28 hrs, Volume= 248 cf, Depth= 0.40"
Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
1,842	30	Woods, Good, HSG A
5,615	39	>75% Grass cover, Good, HSG A
7,457	37	Weighted Average
7,457		100.00% Pervious Area

Summary for Subcatchment P-1C: Driveway

Runoff = 0.33 cfs @ 12.10 hrs, Volume= 1,222 cf, Depth= 5.98"
Routed to Pond D-2 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.22"

	Area (sf)	CN	Description
*	2,451	98	Driveway
	2,451		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	38	0.2200	0.17		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	12	0.0100	0.68		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.16"
2.1	250	0.0100	2.03		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.6	278	0.0290	8.08	4.41	**Pipe Channel, D-E** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.011 Concrete pipe, straight & clean

6.8 578 Total

Summary for Subcatchment P-2: Southerly

Runoff = 0.00 cfs @ 14.80 hrs, Volume= 116 cf, Depth= 0.13"
Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
9,907	30	Woods, Good, HSG A
761	39	>75% Grass cover, Good, HSG A
10,668	31	Weighted Average
10,668		100.00% Pervious Area

Summary for Subcatchment R-1: Roof

Runoff = 0.27 cfs @ 12.00 hrs, Volume= 837 cf, Depth= 5.98"
Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
1,680	98	Unconnected roofs, HSG A
1,680		100.00% Impervious Area
1,680		100.00% Unconnected

Summary for Reach SP-1: STUDY POINT

Inflow Area = 26,275 sf, 15.72% Impervious, Inflow Depth = 0.05" for 25-YR event
Inflow = 0.00 cfs @ 15.12 hrs, Volume= 119 cf
Outflow = 0.00 cfs @ 15.12 hrs, Volume= 119 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach SP-2: STUDY POINT

Inflow Area = 10,668 sf, 0.00% Impervious, Inflow Depth = 0.13" for 25-YR event
Inflow = 0.00 cfs @ 14.80 hrs, Volume= 116 cf
Outflow = 0.00 cfs @ 14.80 hrs, Volume= 116 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond D-1: Leaching Field

Inflow Area = 9,137 sf, 18.39% Impervious, Inflow Depth = 1.43" for 25-YR event
Inflow = 0.27 cfs @ 12.00 hrs, Volume= 1,086 cf
Outflow = 0.02 cfs @ 11.90 hrs, Volume= 1,086 cf, Atten= 94%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.90 hrs, Volume= 1,086 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
Peak Elev= 97.67' @ 15.29 hrs Surf.Area= 655 sf Storage= 527 cf

Plug-Flow detention time= 366.6 min calculated for 1,085 cf (100% of inflow)
Center-of-Mass det. time= 367.0 min (1,157.8 - 790.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.20'	145 cf	**15.50'W x 10.00'L x 4.75'H Field A** 736 cf Overall - 374 cf Embedded = 362 cf x 40.0% Voids
#2A	94.70'	278 cf	**Shea Leaching Chamber 4x4x4** x 6 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 6 Chambers in 3 Rows
#3	98.95'	3 cf	**2.00'D x 1.00'H Frame & Grate**-Impervious
#4	91.50'	196 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
#5	98.00'	590 cf	**2.00'W x 370.00'L x 2.00'H Stone Trench** 1,480 cf Overall - 4 cf Embedded = 1,476 cf x 40.0% Voids
#6	98.50'	4 cf	**6.0" Round Pipe Storage** Inside #5 L= 20.0'
		1,216 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.50	0	0.0	0	0	0
92.00	185	59.4	31	31	281
92.50	500	500.0	165	196	19,895

Device	Routing	Invert	Outlet Devices
#0	Primary	100.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	91.50'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	99.94'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 11.90 hrs HW=94.26' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.50' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D-2: Leaching Field

Inflow Area = 2,451 sf,100.00% Impervious, Inflow Depth = 5.98" for 25-YR event
Inflow = 0.33 cfs @ 12.10 hrs, Volume= 1,222 cf
Outflow = 0.02 cfs @ 10.55 hrs, Volume= 1,222 cf, Atten= 94%, Lag= 0.0 min
Discarded = 0.02 cfs @ 10.55 hrs, Volume= 1,222 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
Peak Elev= 97.46' @ 13.86 hrs Surf.Area= 409 sf Storage= 520 cf

Plug-Flow detention time= 215.0 min calculated for 1,221 cf (100% of inflow)
Center-of-Mass det. time= 214.9 min (960.3 - 745.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	95.33'	407 cf	**15.75'W x 25.98'L x 3.50'H Field A** 1,432 cf Overall - 413 cf Embedded = 1,019 cf x 40.0% Voids
#2A	96.33'	413 cf	**ADS_StormTech SC-740 +Cap** x 9 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Chambers in 3 Rows
#3	99.33'	3 cf	**2.00'D x 1.00'H Frame & Grate**-Impervious
#4	100.33'	371 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) -Impervious
#5	96.33'	36 cf	**24.0" Round Pipe Storage**-Impervious L= 11.5'
		1,231 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
100.33	0	0.0	0	0	0
101.00	185	59.4	41	41	281
102.00	500	500.0	330	371	19,897

Device	Routing	Invert	Outlet Devices
#0	Primary	102.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	95.33'	**2.040 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	101.00'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 10.55 hrs HW=95.40' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.33' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment P-1A: Northerly

Runoff = 0.09 cfs @ 12.25 hrs, Volume= 810 cf, Depth= 0.66"
Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
14,687	30	Woods, Good, HSG A
14,687		100.00% Pervious Area

Summary for Subcatchment P-1B: Northerly

Runoff = 0.21 cfs @ 12.03 hrs, Volume= 844 cf, Depth= 1.36"
Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
1,842	30	Woods, Good, HSG A
5,615	39	>75% Grass cover, Good, HSG A
7,457	37	Weighted Average
7,457		100.00% Pervious Area

Summary for Subcatchment P-1C: Driveway

Runoff = 0.47 cfs @ 12.10 hrs, Volume= 1,777 cf, Depth= 8.70"
Routed to Pond D-2 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.94"

	Area (sf)	CN	Description
*	2,451	98	Driveway
	2,451		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	38	0.2200	0.17		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	12	0.0100	0.68		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.16"
2.1	250	0.0100	2.03		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.6	278	0.0290	8.08	4.41	**Pipe Channel, D-E** 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.011 Concrete pipe, straight & clean

6.8 578 Total

Summary for Subcatchment P-2: Southerly

Runoff = 0.08 cfs @ 12.22 hrs, Volume= 670 cf, Depth= 0.75"
Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
9,907	30	Woods, Good, HSG A
761	39	>75% Grass cover, Good, HSG A
10,668	31	Weighted Average
10,668		100.00% Pervious Area

Summary for Subcatchment R-1: Roof

Runoff = 0.39 cfs @ 12.00 hrs, Volume= 1,218 cf, Depth= 8.70"
Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
1,680	98	Unconnected roofs, HSG A
1,680		100.00% Impervious Area
1,680		100.00% Unconnected

Summary for Reach SP-1: STUDY POINT

Inflow Area = 26,275 sf, 15.72% Impervious, Inflow Depth = 0.37" for 100-YR event
Inflow = 0.09 cfs @ 12.25 hrs, Volume= 810 cf
Outflow = 0.09 cfs @ 12.25 hrs, Volume= 810 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach SP-2: STUDY POINT

Inflow Area = 10,668 sf, 0.00% Impervious, Inflow Depth = 0.75" for 100-YR event
Inflow = 0.08 cfs @ 12.22 hrs, Volume= 670 cf
Outflow = 0.08 cfs @ 12.22 hrs, Volume= 670 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond D-1: Leaching Field

Inflow Area = 9,137 sf, 18.39% Impervious, Inflow Depth = 2.71" for 100-YR event
Inflow = 0.59 cfs @ 12.01 hrs, Volume= 2,062 cf
Outflow = 0.03 cfs @ 12.10 hrs, Volume= 2,061 cf, Atten= 94%, Lag= 5.4 min
Discarded = 0.03 cfs @ 12.10 hrs, Volume= 2,061 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
Peak Elev= 99.34' @ 15.09 hrs Surf.Area= 1,395 sf Storage= 1,018 cf

Plug-Flow detention time= 387.9 min calculated for 2,061 cf (100% of inflow)
Center-of-Mass det. time= 387.6 min (1,191.1 - 803.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.20'	145 cf	**15.50'W x 10.00'L x 4.75'H Field A** 736 cf Overall - 374 cf Embedded = 362 cf x 40.0% Voids
#2A	94.70'	278 cf	**Shea Leaching Chamber 4x4x4** x 6 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 6 Chambers in 3 Rows
#3	98.95'	3 cf	**2.00'D x 1.00'H Frame & Grate**-Impervious
#4	91.50'	196 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
#5	98.00'	590 cf	**2.00'W x 370.00'L x 2.00'H Stone Trench** 1,480 cf Overall - 4 cf Embedded = 1,476 cf x 40.0% Voids
#6	98.50'	4 cf	**6.0" Round Pipe Storage** Inside #5 L= 20.0'
		1,216 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.50	0	0.0	0	0	0
92.00	185	59.4	31	31	281
92.50	500	500.0	165	196	19,895

Device	Routing	Invert	Outlet Devices
#0	Primary	100.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	91.50'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	99.94'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.03 cfs @ 12.10 hrs HW=98.12' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.50' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D-2: Leaching Field

Inflow Area = 2,451 sf,100.00% Impervious, Inflow Depth = 8.70" for 100-YR event
Inflow = 0.47 cfs @ 12.10 hrs, Volume= 1,777 cf
Outflow = 0.02 cfs @ 9.40 hrs, Volume= 1,777 cf, Atten= 96%, Lag= 0.0 min
Discarded = 0.02 cfs @ 9.40 hrs, Volume= 1,777 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
Peak Elev= 100.87' @ 15.05 hrs Surf.Area= 409 sf Storage= 882 cf

Plug-Flow detention time= 380.4 min calculated for 1,776 cf (100% of inflow)
Center-of-Mass det. time= 380.5 min (1,121.1 - 740.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	95.33'	407 cf	**15.75'W x 25.98'L x 3.50'H Field A** 1,432 cf Overall - 413 cf Embedded = 1,019 cf x 40.0% Voids
#2A	96.33'	413 cf	**ADS_StormTech SC-740 +Cap** x 9 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Chambers in 3 Rows
#3	99.33'	3 cf	**2.00'D x 1.00'H Frame & Grate**-Impervious
#4	100.33'	371 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) -Impervious
#5	96.33'	36 cf	**24.0" Round Pipe Storage**-Impervious L= 11.5'
		1,231 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
100.33	0	0.0	0	0	0
101.00	185	59.4	41	41	281
102.00	500	500.0	330	371	19,897

Device	Routing	Invert	Outlet Devices
#0	Primary	102.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	95.33'	**2.040 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	101.00'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 9.40 hrs HW=95.40' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.33' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Events for Subcatchment P-1A: Northerly

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.00	0	0.00
10-YR	4.89	0.00	3	0.00
25-YR	6.22	0.00	119	0.10
100-YR	**8.94**	**0.09**	**810**	**0.66**

Events for Subcatchment P-1B: Northerly

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.00	0	0.00
10-YR	4.89	0.00	74	0.12
25-YR	6.22	0.02	248	0.40
100-YR	**8.94**	**0.21**	**844**	**1.36**

Events for Subcatchment P-1C: Driveway

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.17	610	2.99
10-YR	4.89	0.26	950	4.65
25-YR	6.22	0.33	1,222	5.98
100-YR	**8.94**	**0.47**	**1,777**	**8.70**

Events for Subcatchment P-2: Southerly

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.00	0	0.00
10-YR	4.89	0.00	8	0.01
25-YR	6.22	0.00	116	0.13
100-YR	**8.94**	**0.08**	**670**	**0.75**

Events for Subcatchment R-1: Roof

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.14	418	2.99
10-YR	4.89	0.21	651	4.65
25-YR	6.22	0.27	837	5.98
100-YR	**8.94**	**0.39**	**1,218**	**8.70**

Events for Reach SP-1: STUDY POINT

Event	Inflow (cfs)	Outflow (cfs)	Volume (cubic-feet)
2-YR	0.00	0.00	0
10-YR	0.00	0.00	3
25-YR	0.00	0.00	119
100-YR	**0.09**	**0.09**	**810**

Events for Reach SP-2: STUDY POINT

Event	Inflow (cfs)	Outflow (cfs)	Volume (cubic-feet)
2-YR	0.00	0.00	0
10-YR	0.00	0.00	8
25-YR	0.00	0.00	116
100-YR	**0.08**	**0.08**	**670**

Events for Pond D-1: Leaching Field

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Volume (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
2-YR	0.14	0.01	0.01	**0.00**	**0**	92.50	194
10-YR	0.21	0.02	0.02	0.00	0	95.61	319
25-YR	0.27	0.02	0.02	0.00	0	97.67	527
100-YR	**0.59**	**0.03**	**0.03**	0.00	0	**99.34**	**1,018**

Events for Pond D-2: Leaching Field

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Volume (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
2-YR	0.17	**0.02**	**0.02**	**0.00**	**0**	96.45	203
10-YR	0.26	0.02	0.02	0.00	0	96.97	367
25-YR	0.33	0.02	0.02	0.00	0	97.46	520
100-YR	**0.47**	0.02	0.02	0.00	0	**100.87**	**882**

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	Massachusetts
Location	
Longitude	71.103 degrees West
Latitude	42.523 degrees North
Elevation	0 feet
Date/Time	Tue, 28 Apr 2020 15:58:00 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.42	0.53	0.69	0.86	1.09	**1yr**	0.74	1.03	1.27	1.62	2.08	2.68	2.94	**1yr**	2.37	2.82	3.26	3.95	4.61	**1yr**
2yr	0.34	0.53	0.66	0.87	1.09	1.38	**2yr**	0.94	1.26	1.60	2.02	2.55	3.22	3.56	**2yr**	2.85	3.42	3.93	4.67	5.32	**2yr**
5yr	0.41	0.63	0.80	1.06	1.36	1.74	**5yr**	1.18	1.58	2.02	2.56	3.23	4.08	4.53	**5yr**	3.62	4.36	4.98	5.93	6.68	**5yr**
10yr	0.46	0.72	0.91	1.24	1.61	2.07	**10yr**	1.39	1.88	2.42	3.07	3.88	4.89	5.45	**10yr**	4.33	5.24	5.96	7.10	7.93	**10yr**
25yr	0.54	0.86	1.10	1.51	2.00	2.60	**25yr**	1.73	2.36	3.06	3.90	4.94	6.22	6.95	**25yr**	5.50	6.68	7.55	9.03	9.96	**25yr**
50yr	0.61	0.98	1.25	1.76	2.37	3.12	**50yr**	2.05	2.81	3.68	4.70	5.94	7.45	8.35	**50yr**	6.60	8.03	9.04	10.82	11.85	**50yr**
100yr	0.70	1.13	1.46	2.06	2.81	3.72	**100yr**	2.42	3.35	4.39	5.63	7.12	8.94	10.05	**100yr**	7.91	9.67	10.82	12.98	14.09	**100yr**
200yr	0.80	1.30	1.68	2.41	3.33	4.44	**200yr**	2.87	3.98	5.26	6.76	8.55	10.73	12.11	**200yr**	9.50	11.64	12.97	15.58	16.77	**200yr**
500yr	0.96	1.57	2.05	2.98	4.17	5.61	**500yr**	3.60	5.02	6.68	8.60	10.90	13.66	15.48	**500yr**	12.09	14.89	16.47	19.83	21.12	**500yr**

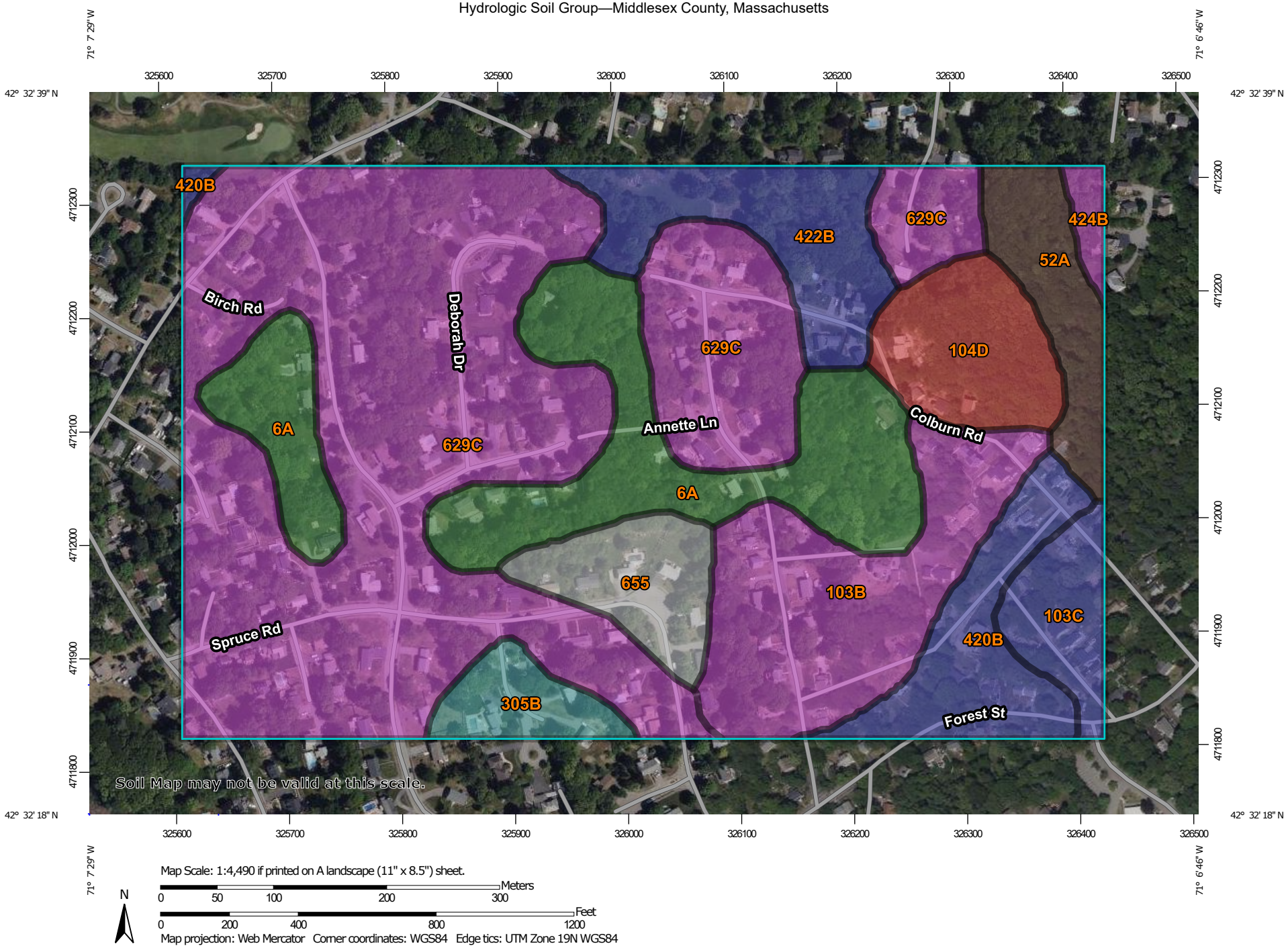
Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.25	0.38	0.46	0.63	0.77	0.87	**1yr**	0.66	0.85	1.15	1.41	1.74	2.42	2.34	**1yr**	2.15	2.25	2.75	3.51	4.12	**1yr**
2yr	0.33	0.51	0.62	0.84	1.04	1.24	**2yr**	0.90	1.21	1.43	1.89	2.43	3.07	3.40	**2yr**	2.72	3.27	3.77	4.49	5.14	**2yr**
5yr	0.38	0.59	0.73	1.00	1.28	1.49	**5yr**	1.10	1.46	1.70	2.20	2.82	3.64	4.08	**5yr**	3.22	3.93	4.50	5.36	6.08	**5yr**
10yr	0.43	0.65	0.81	1.13	1.46	1.71	**10yr**	1.26	1.67	1.94	2.48	3.16	4.11	4.66	**10yr**	3.63	4.48	5.13	6.12	6.91	**10yr**
25yr	0.49	0.75	0.93	1.32	1.74	2.03	**25yr**	1.50	1.99	2.30	2.90	3.69	4.79	5.57	**25yr**	4.24	5.35	6.11	7.25	8.18	**25yr**
50yr	0.54	0.83	1.03	1.48	1.99	2.33	**50yr**	1.72	2.28	2.62	3.27	4.14	5.36	6.40	**50yr**	4.74	6.15	6.99	8.22	9.30	**50yr**
100yr	0.61	0.92	1.15	1.67	2.29	2.65	**100yr**	1.97	2.59	2.98	3.69	4.65	5.97	7.39	**100yr**	5.29	7.10	8.02	9.32	10.59	**100yr**
200yr	0.68	1.03	1.30	1.89	2.63	3.03	**200yr**	2.27	2.96	3.38	4.15	5.24	6.62	8.55	**200yr**	5.86	8.22	9.20	10.52	12.07	**200yr**
500yr	0.80	1.19	1.53	2.23	3.17	3.60	**500yr**	2.73	3.52	4.01	4.87	6.13	7.54	10.44	**500yr**	6.67	10.04	11.06	12.28	14.32	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.30	0.47	0.57	0.77	0.95	1.11	**1yr**	0.82	1.08	1.29	1.72	2.20	2.85	3.24	**1yr**	2.52	3.12	3.54	4.28	5.06	**1yr**
2yr	0.35	0.55	0.67	0.91	1.13	1.33	**2yr**	0.97	1.30	1.54	2.03	2.61	3.38	3.75	**2yr**	2.99	3.61	4.13	4.94	5.57	**2yr**
5yr	0.44	0.68	0.85	1.16	1.48	1.74	**5yr**	1.27	1.70	2.02	2.61	3.32	4.51	5.05	**5yr**	3.99	4.85	5.56	6.57	7.33	**5yr**
10yr	0.54	0.83	1.02	1.43	1.85	2.14	**10yr**	1.59	2.09	2.48	3.17	4.00	5.62	6.33	**10yr**	4.98	6.09	6.95	8.23	9.02	**10yr**
25yr	0.70	1.06	1.32	1.88	2.48	2.81	**25yr**	2.14	2.75	3.27	4.09	5.10	7.57	8.55	**25yr**	6.70	8.22	9.32	11.04	11.89	**25yr**
50yr	0.84	1.28	1.60	2.30	3.09	3.46	**50yr**	2.67	3.39	4.04	4.97	6.14	9.51	10.72	**50yr**	8.41	10.30	11.59	13.82	14.65	**50yr**
100yr	1.03	1.56	1.95	2.82	3.87	4.26	**100yr**	3.34	4.16	4.99	6.04	7.39	11.95	13.40	**100yr**	10.58	12.89	14.45	17.35	18.07	**100yr**
200yr	1.25	1.89	2.39	3.46	4.83	5.25	**200yr**	4.17	5.13	6.18	7.33	8.88	15.05	16.74	**200yr**	13.32	16.10	18.02	21.80	22.31	**200yr**
500yr	1.64	2.43	3.13	4.55	6.47	6.91	**500yr**	5.58	6.76	8.20	9.49	11.36	20.44	22.44	**500yr**	18.09	21.58	24.12	29.49	29.43	**500yr**

Powered by ACIS Northeast Regional Climate Center



Map Scale: 1:4,490 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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

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

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

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

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

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

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 22, Sep 9, 2022

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	A/D	14.4	14.1%
52A	Freetown muck, 0 to 1 percent slopes	B/D	4.0	3.9%
103B	Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes	A	10.8	10.6%
103C	Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes	B	3.0	3.0%
104D	Hollis-Rock outcrop-Charlton complex, 15 to 25 percent slopes	D	5.0	4.9%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	C	2.4	2.4%
420B	Canton fine sandy loam, 3 to 8 percent slopes	B	5.6	5.5%
422B	Canton fine sandy loam, 0 to 8 percent slopes, extremely stony	B	6.3	6.2%
424B	Canton fine sandy loam, 3 to 8 percent slopes, extremely bouldery	A	0.7	0.7%
629C	Canton-Charlton-Urban land complex, 3 to 15 percent slopes	A	46.1	45.0%
655	Udorthents, wet substratum		3.9	3.8%
Totals for Area of Interest			**102.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Commonwealth of Massachusetts
City/Town of Reading

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Peter Seibold
Owner Name

0 Annette Land
Street Address

Map 38 Lot 39
Map/Lot #

Reading
City

MA
State

01867
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey — NRCS Webpage (Source) — 6A (Soil Map Unit) — Scarboro mucky fine sandy loam (Soil Series)

   Outwash Terrace
   Landform

   N/A
   Soil Limitations

   Sandy glaciofluvial deposits derived from schist, gneiss and/or granite
   Soil Parent material

3. Surficial Geological Report — N/A (Year Published/Source) — N/A (Map Unit)

   N/A
   Description of Geologic Map Unit:

4. Flood Rate Insurance Map — Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No — If yes, MassGIS Wetland Data Layer: N/A (Wetland Type)

7. Current Water Resource Conditions (USGS): 6/18/2023 (Month/Day/ Year) — Range: ☐ Above Normal ☒ Normal ☐ Below Normal

8. Other references reviewed: (Zone II, IWPA, Zone A, EEA Data Portal, etc.) N/A

   N/A

Commonwealth of Massachusetts
City/Town of Reading

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-1 (Hole #) | 6/18/2023 (Date) | 9:00 am (Time) | Sunny (Weather) | N/A (Latitude) | N/A (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Trees/Brush (Vegetation) | Boulders/Ledge Outcops (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 5-15% (Slope (%))

Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits

Landform | Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet | Drainage Way >100' feet | Wetlands 57' feet | Property Line 10' feet | Drinking Water Well N/A feet | Other N/A feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☒ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: _____ Depth to Weeping in Hole _____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6"	A	Sandy Loam	10YR 3/2		Cnc : Dpl:						
33-68"	B	Silty Loam	10YR 4/4		Cnc : Dpl:		10%	10%			
68"+	Ledge				Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
No evidence of ESHGT. Refusal @ 68".

Commonwealth of Massachusetts
City/Town of Reading

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-2 (Hole #) | 6/18/2023 (Date) | 9:00am (Time) | Sunny (Weather) | N/A (Latitude) | N/A (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Trees/Brush (Vegetation) | Boulders/Ledge Outcops (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 5-15% (Slope (%))

   Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits

   Landform | Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet | Drainage Way >100" feet | Wetlands 63' feet | Property Line 10' feet | Drinking Water Well N/A feet | Other N/A feet

4. Unsuitable Materials Present: ☐ Yes ☐ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☒ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: _____ Depth to Weeping in Hole _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6"	A	Sandy Loam	10YR 3/2		Cnc : Dpl:						
6-34"	B	Silty Loam	10YR 4/4		Cnc : Dpl:						
34-69"	C	Loamy Sand	10YR 4/4		Cnc : Dpl:						
69"+	Ledge				Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
No evidence of ESHGT. Refusal @ 69"

Commonwealth of Massachusetts
City/Town of Reading

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-3 (Hole #) | 6/18/2023 (Date) | 9:00 am (Time) | Sunny (Weather) | N/A (Latitude) | N/A (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Trees/Brush (Vegetation) | Boulders/Ledge Outcops (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 5-15% (Slope (%))

Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits

Landform | Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet | Drainage Way >100' feet | Wetlands 47' feet | Property Line 40' feet | Drinking Water Well N/A feet | Other N/A feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☒ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: _____ Depth to Weeping in Hole _____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-28"	A	Sandy Loam	10YR 3/2		Cnc : Dpl:						
28-34"	B	Silty Loam	10YR 4/4		Cnc : Dpl:		10%	10%			
34"+	Ledge				Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
No evidence of ESHGT. Refusal @ 34".

Commonwealth of Massachusetts
City/Town of Reading

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-4 (Hole #) | 6/18/2023 (Date) | 9:00am (Time) | Sunny (Weather) | N/A (Latitude) | N/A (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Trees/Brush (Vegetation) | Boulders/Ledge Outcops (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 5-15% (Slope (%))

   Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits

   Landform | Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet | Drainage Way >100" feet | Wetlands 43' feet | Property Line 84' feet | Drinking Water Well N/A feet | Other N/A feet

4. Unsuitable Materials Present: ☐ Yes ☐ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☒ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: _____ Depth to Weeping in Hole 70 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6"	A	Sandy Loam	10YR 3/2		Cnc : Dpl:						
6-29"	B	Silty Loam	10YR 4/4		Cnc : Dpl:						
29-72"	C	Loamy Sand	10YR 5/2	66	Cnc : Dpl: 7.5TR 3/4						
72"+	Ledge				Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
ESHGT = 66". Refusal @ 72"

Commonwealth of Massachusetts
City/Town of Reading

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-5 (Hole #) | 6/18/2023 (Date) | 9:00 am (Time) | Sunny (Weather) | N/A (Latitude) | N/A (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Trees/Brush (Vegetation) | Boulders/Ledge Outcops (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 5-15% (Slope (%))

Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits

Landform | Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet | Drainage Way >100' feet | Wetlands 52' feet | Property Line 59' feet | Drinking Water Well N/A feet | Other N/A feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☒ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: _____ Depth to Weeping in Hole _____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6""	A	Sandy Loam	10YR 3/2		Cnc : Dpl:						
6-28"	B	Silty Loam	10YR 4/4		Cnc : Dpl:		10%	10%			
28-34"	C	Sand	2.5Y 5/2		Cnc : Dpl:						
34"+	Ledge				Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
No evidence of ESHGT. Refusal @ 34".

Commonwealth of Massachusetts
City/Town of Reading

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-6 (Hole #) | 6/18/2023 (Date) | 9:00am (Time) | Sunny (Weather) | N/A (Latitude) | N/A (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Trees/Brush (Vegetation) | Boulders/Ledge Outcops (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 5-15% (Slope (%))

   Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits

   Landform | Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet | Drainage Way >100" feet | Wetlands 60' feet | Property Line 87' feet | Drinking Water Well N/A feet | Other N/A feet

4. Unsuitable Materials Present: ☐ Yes ☐ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☒ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: _____ Depth to Weeping in Hole _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-14"	A	Sandy Loam	10YR 3/2		Cnc : Dpl:						
14-28"	B	Silty Loam	10YR 4/4		Cnc : Dpl:						
28-76"	C	Loamy Sand	10YR 5/2		Cnc : Dpl:						
76"+	Ledge				Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
No evidence of ESHGT. Refusal @ 76".

Commonwealth of Massachusetts
City/Town of Reading

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-7 (Hole #) | 6/18/2023 (Date) | 9:00 am (Time) | Sunny (Weather) | N/A (Latitude) | N/A (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Trees/Brush (Vegetation) | Boulders/Ledge Outcops (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 5-15% (Slope (%))

Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits

Landform | Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet | Drainage Way >100' feet | Wetlands 34' feet | Property Line 59' feet | Drinking Water Well N/A feet | Other N/A feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☒ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: _____ Depth to Weeping in Hole _____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6""	A	Sandy Loam	10YR 3/2		Cnc : Dpl:						
6-32"	B	Silty Loam	10YR 4/4		Cnc : Dpl:		10%	10%			
32-69"	C	Sand	2.5Y 4/4		Cnc : Dpl:						
69"+	Ledge				Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
No evidence of ESHGT. Refusal @ 69".

Commonwealth of Massachusetts
City/Town of Reading

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-8 (Hole #) | 6/18/2023 (Date) | 9:00am (Time) | Sunny (Weather) | N/A (Latitude) | N/A (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Trees/Brush (Vegetation) | Boulders/Ledge Outcops (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 5-15% (Slope (%))

   Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits

   Landform | Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet | Drainage Way >100" feet | Wetlands 40' feet | Property Line 38' feet | Drinking Water Well N/A feet | Other N/A feet

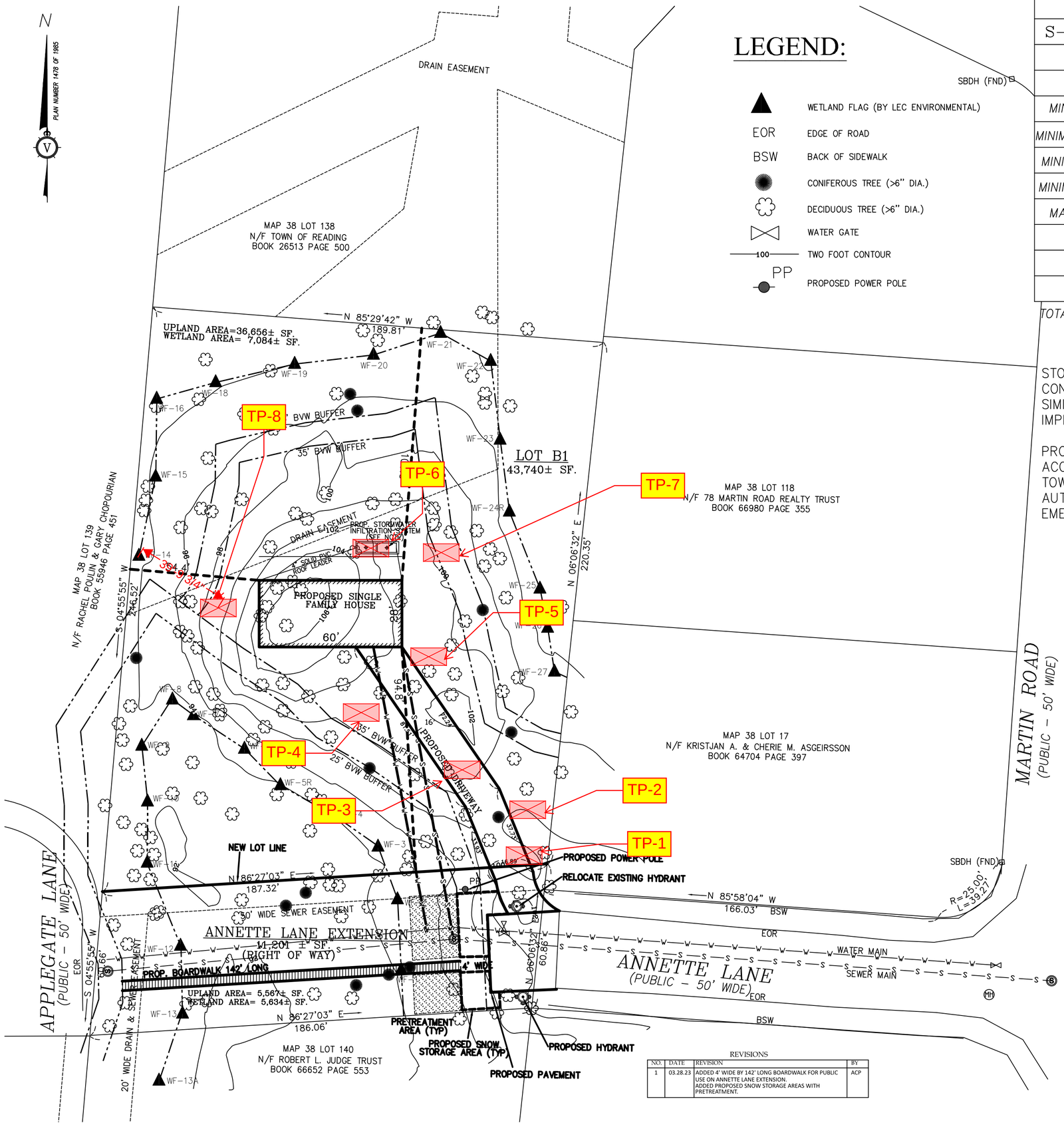
4. Unsuitable Materials Present: ☐ Yes ☐ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☒ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: _____ Depth to Weeping in Hole _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6"	A	Sandy Loam	10YR 3/2		Cnc : Dpl:						
6-36"	B	Silty Loam	10YR 4/4		Cnc : Dpl:						
36-44"	B2	Loamy Sand	10YR 3/1		Cnc : Dpl:						
44-88"	C	Loamy Sand	10YR 6/2		Cnc : Dpl:						
88"+	Ledge				Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
No evidence of ESHGT. Refusal @ 88".



LEGEND:

- WETLAND FLAG (BY LEC ENVIRONMENTAL)
- EOR — EDGE OF ROAD
- BSW — BACK OF SIDEWALK
- CONIFEROUS TREE (>6" DIA.)
- DECIDUOUS TREE (>6" DIA.)
- WATER GATE
- 100 — TWO FOOT CONTOUR
- PP — PROPOSED POWER POLE

ZONING TABLE

S-20 DISTRICT	REQUIRED	EXISTING	PROPOSED LOT B-1	PROPOSED ROW EXTENSION
LOT SIZE	20,000 SQ. FT.	54,942 ±SQ. FT.	43,740± SQ. FT.	11,201± SQ. FT.
FRONTAGE	120.00'	50.03'	186.06'	---
MINIMUM LOT WIDTH	80.00'	186.06'	186.06'	---
MINIMUM FRONT SETBACK	20.0'	---	94.8'	---
MINIMUM SIDE SETBACK	15.0'	---	54.4'	---
MINIMUM REAR SETBACK	20.0'	---	106.3	---
MAX. LOT COVERAGE	25%	---	3.8%	---
HEIGHT	35'	---	LESS THAN 35'	---
WETLAND AREA		17,357± SQ. FT.	7,084± SQ. FT.	5,634± SQ. FT.
UPLAND AREA		37,585± SQ. FT.	36,656± SQ. FT.	5,567± SQ. FT.

TOTAL IMPERVIOUS AREA LOT B-1
3,407 SF/7.8%

NOTES

STORMWATER INFILTRATION SYSTEM TO CONSIST OF CULTEC 280HD CHAMBERS, OR SIMILAR, DESIGNED TO CAPTURE 100% OF IMPERVIOUS AREAS.

PROPOSED DRIVEWAY CONSTRUCTION TO MEET ACCEPTED STANDARDS IN JUDGEMENT OF THE TOWN ENGINEER TO ACCOMODATE PRIVATE AUTOMOBILES, SERVICE VEHICLES, AND EMERGENCY VEHICLES.

OWNER OF RECORD

PETER SEIBOLD
437 SUMMER AVE., READING, MA
DEED BOOK 30698 PAGE 582

ZONING DISTRICT

TAX MAP 38 PARCEL 139
S-20 DISTRICT

PLAN REFERENCES

PLAN NO. 1478 OF 1985
PLAN NO. 640 OF 1967

I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY.

JAMES J. ABELY P.L.S. DATE

REVISIONS

NO.	DATE	REVISION	BY
1	03.28.23	ADDED 4' WIDE BY 142' LONG BOARDWALK FOR PUBLIC USE ON ANNETTE LANE EXTENSION. ADDED PROPOSED SNOW STORAGE AREAS WITH PRETREATMENT.	ACP

PRELIMINARY SUBDIVISION PLAN

ANNETTE LANE
READING, MA
SCALE 1" = 30' FEBRUARY 20, 2023
REVISED MARCH 28, 2023
PREPARED BY

VINEYARD ENGINEERING
& ENVIRONMENTAL SERVICES INC.
LAND SURVEY, CIVIL ENGINEERING
& ENVIRONMENTAL SERVICES
17 SALEM STREET
MEDFORD MA 02155
TEL. 781-933-3330 FAX. 781-933-3334
Vineyardeng.com

30 15 0 30 60 90 120

Vineyard Engineering & Environmental Services, Inc.
Land Survey, Civil Engineering and Environmental Services
Offices in Medford and Vineyard Haven, Massachusetts
www.vineyardeng.com

August 15, 2023

Andrew MacNichol, Community Development Director
Town of Reading Community Planning & Development Commission
16 Lowell Street
Reading, MA 01867

RE: Project Narrative and Requested Waivers – Definitive Subdivision
Proposed Development of 0 Annette Lane, Reading, MA
Tax Map 38 Parcel 139

Dear Mr. MacNichol,

On behalf of Mr. Peter Seibold (the Applicant), Vineyard Engineering & Environmental Services, Inc. (Vineyard) of Medford, Massachusetts is submitting the following Definitive Subdivision Application and list of requested waivers for development of the property at 0 Annette Lane in Reading, Massachusetts. The property is identified as Parcel 139 on The Town of Reading Assessor's Map 38. As shown on plans prepared by Vineyard, the property is a vacant lot located at the western end of Annette Lane. The proposed development includes subdivision of the existing parcel to create a lot for construction of a single-family home and a second lot for the extension of the layout of Annette Lane to create the required amount of lot frontage. Vineyard previously filed a Preliminary Subdivision Application on January 18, 2023, with the Town of Reading CPDC. The CPDC subsequently issued a Decision of Approval on April 13, 2023.

In support of the Definitive Subdivision Application, eight test pits were completed at various locations at the Site on June 16, 2023, to assess subsurface soil conditions. The test pits were observed by personnel from Vineyard, Somerville Engineering, and Aardvark Geotechnical Engineering & Testing, Inc. Using the results of the subsurface investigation, Somerville Engineering prepared civil engineering design plans for the site, roadway extension, and a full stormwater mitigation report with associated calculations. In addition, Aardvark Geotechnical Engineering & Testing, Inc. prepared a geotechnical report with recommendations for construction of the home, the roadway extension, and proposed driveway.

The respective reports are included as part of this Application.

REQUESTED WAIVERS

The following list of requested waivers was included, and approved, as part of the Preliminary Subdivision Application. From the Town of Reading Subdivision Rules & Regulations:

1. Section 6.1.1.(c)(3) Requires existing and proposed profile of the roadway. The applicant is proposing to extend the paved roadway of Annette Lane by 30 feet. Due to the limited scope of the project and because the remainder of the road will remain a paper road, the Applicant requests relief from this requirement.

2. Section 6.1.1.d.3 Requires a full traffic report/study. Due to the limited scope of the project and the increase in traffic to the area from one additional home, the Applicant requests relief from the requirement to provide a traffic study.

3. Section 6.1.1.d.4 Requires an environmental impact report. Due to the limited scope of the project and the minimal impact from one additional home on Town resources, the Applicant requests relief from the requirement to provide an environmental impact report. A Notice of Intent will be filed with the Town of Reading Conservation Commission for development of the Site.

4. Section 7.1.1.a Requires a right of way of width of 60 feet. The existing layout of Annette Lane is 50 feet wide. As such, the applicant is requesting relief from this requirement to extend the layout of Annette Lane at the existing 50-foot width.

5. Section 7.1.8 Requires the installation of granite monuments. granite curbing be installed. Due to the limited scope of the project and because the remainder of the road will remain a paper road, the Applicant requests relief from this requirement.

6. Section 7.1.11 Requires Street lighting. Due to the limited scope of the project and the paved right of way will only be extended approximately 30 feet, the Applicant requests relief from this requirement.

7. Sections 7.1.5.c and 7.1.5.e Requires installation of a turning circle and landscaped cul-de-sac island, respectively. Due to the limited scope of the project, and because a proposed boardwalk would provide a public benefit, while minimizing the impact to the wetland area, the applicant is requesting relief from this requirement.

8. Section 7.2 Requires installation of sidewalks along both sides of the roadway. Due to the limited scope of the roadway extension proposed, the applicant is requesting relief from this requirement.

9. Section 7.6 Requires installation of street trees. Due to the limited scope of the roadway extension proposed and that the remaining of the road will remain a paper road, the applicant is requesting relief from this requirement. The applicant agrees to work with the Town of Reading Conservation Commission to identify appropriate opportunities to install screening plantings along the roadway extension.

10. Section 8.0 Requires construction of a way. Due to the limited scope of the project and the presence of wetlands in the area in which a way would be constructed, the Applicant requests a Waiver of the requirement.

If you have any questions, please feel free to contact this office.

17 Salem Street
Medford, MA 02155
Phone: 781.933.3330
Fax: 781.933.3334

Martha's Vineyard
P.O. Box 458
Tisbury, MA 02568
508.687.9437

Sincerely,

Andrew C. Pandolph
President
Vineyard Engineering and Environmental Services Inc

Attachments:

- Form B Application for Subdivision Approval
- Form G Designer's Certificate
- Certified Abutters List
- Drainage Narrative – Somerville Engineering
- Geotechnical Investigation Report – Aardvark Geotechnical
- Definitive Subdivision Plan Set

17 Salem Street
Medford, MA 02155
Phone: 781.933.3330
Fax: 781.933.3334

Martha's Vineyard
P.O. Box 458
Tisbury, MA 02568
508.687.9437

FORM B APPLICATION

TOWN OF READING MASSACHUSETTS
COMMUNITY PLANNING AND DEVELOPMENT COMMISSION
APPLICATION FOR SUBDIVISION APPROVAL
Form B

Pursuant to the Rules and Regulations Governing the Subdivision of Land in Reading Massachusetts:

_____ Preliminary Subdivision Plan (Section 5.0)
_____ Resubmission of Preliminary Subdivision Plan
__X__ Definitive Subdivision Plan (Section 6.0)
_____ Resubmission of Definitive Subdivision Plan
_____ Modification to a Previously Approved Definitive Subdivision Plan

==========

Location of Subject Property:

Address: 0 Annette Lane

Assessors' plat and lot number: 38-139

Deed of property is recorded in the Middlesex South Registry

in Book 30698 on page 582

List of Names, Addresses, and telephone numbers of the following:

Applicant:
Peter Seibold
437 Summer Avenue
Reading, MA

__X__ Owner of the Subject Property
_____ Written evidence is attached whereby the owner has given the applicant authority to make this application

Applicant's Attorney:
Robert W. Galvin, Esq. - Galvin & Galvin, PC
10 Enterprise Street, Suite 3
Duxbury, MA
781-934-5678

Applicant's Surveyor:
James J. Abely
17 Salem Street
Medford, MA 02155
781-933-3330

Applicant's Architect:

Applicant's Engineer:
Carlton M. Quinn - Somerville Engineering
519 Highland Avenue, Suite #285
Somerville, MA 02143

Status of Subject Property:

Location and Description of the Subject Property:

Vacant parcel containing 54,942 +/- square feet of land, located at the west end of Annette Lane.

Current use of subject property:

Vacant

List of All Mortgages, Liens, Easements, Restrictions, and Other Encumbrances on the Entire Subject Property or Any Part Thereof:

Town of Reading 50' wide sewer easement, Town of Reading 20' wide sewer & drain easement, Town of Reading variable width drain easement

List of All Easement or Restrictions Appurtenant to the Subject Property over Lands of Others:

Accompanying Plans and Documents:

List of Plans Accompanying this Application:

Sheet Name:	Sheet Number:	Original Date:	Revision Date:
Cover Sheet	1	8/14/2023	
Existing Conditions Plan	2	8/14/2023	
Definitive Subdivision Plan	3	8/14/2023	
Road Improvement Plan	C-101	8/14/2023	
Site Improvement Plan	C-102	8/14/2023	
Details	C-501	8/14/2023	
Details	C-502	8/14/2023	
Details	C-503	8/14/2023	

List of Documents Accompanying this Application:

Name:	Author:	Date:
Project Narrative & List of Waivers	Vineyard Engineering	8/15/2023
Drainage Narrative	Somerville Engineering	8/11/2023
Geotechnical Investigation	Aardvark Geotechnical	7/20/2023

List of local permits and approvals required for this project; indicate which have been applied for and if so which have been already received:

Permit:	Date Applied for:	Date Received:
Abbreviated Notice of Resource Area Delineation	10/23/2019	12/11/2019 (DEP File No. 270-0726)
Preliminary Subdivision Plan Decision of Approval	01/18/2023	4/13/2023
Town of Reading Notice of Intent/Order of Conditions	Pending	

Waiver Requests:
The applicant hereby requests CPDC to consider the following waivers from the Rules and Regulations Governing the Subdivision of Land in Reading:

Section:	Nature of Requested Waiver:
6.1.1.c.3	Profile of existing and proposed right of ways
6.1.1.d.3	Traffic study
6.1.1.d.4	Environmental Impact Study
7.1.8	Installation of granite monuments
7.1.11	Installation of street lighting
7.1.5(c) & 7.1.5(e)	Installation of a turning circle and landscaped cul-de-sac island, respectively
7.2	Sidewalks on both sides of roadway
7.6	Installation of street trees
8.0	Construction of a way
7.1.1.a	60 foot right of way

Note: Attach additional letter-size pages as necessary to complete any above item

Previous Preliminary Plan:
A Preliminary Plan similar to that shown herewith was X or was not _____ submitted; if so an approval X or disapproval _____ was granted on (date) 4/13/2023

Certification of Conservation Applicability:
The Subject Property does not _____ or, does X contain wetlands
A Wetlands Resource Delineation has not been issued _____ or has been issued X
by the Conservation Commission on (date) 12/11/2019
Conservation Administrator: _____ Date: _____
Signature

Application Fee:

$ _____ Preliminary Application Fee
$ _____ Definitive Application Fee, where no Preliminary Application was filed or Resubmission Fee
$ 390 Definitive Application Fee, where a Preliminary Application was filed or Resubmission Fee
$ 1,000 Inspection Fee
$ 1,390 Total

Certifications:

1 The undersigned hereby certifies:

a That the applicant has submitted sixteen complete copies of this application and all attachments have been enclosed each in one envelope, have been delivered to the Community Development Department, and have been marked, all as stipulated in Section 3.5.1.2 paragraphs a through f of the Rules and Regulations Governing the Subdivision of Land in Reading.

b That the applicant has complied with the stipulations contained in Sections 3.5.2 3.5.3 and 3.5.4 of the Rules and Regulations Governing the Subdivision of Land in Reading.

2 That the applicant understands and agrees:

a That in addition to all other fees and charges specified herein, if the Commission in the course of review of an application, determines at its sole and absolute discretion that review of all or any part of a proposed project by (an) outside independent consultant(s) of the Commission's sole choosing is necessary for proper evaluation of the proposed project or its possible effects on any matter of public interest, then the applicant shall provide immediately to the Town, by way of the Town Planner, (a) certified check(s) payable to such consultant(s) in an amount equal to the estimated cost of the relevant services of such consultant(s), and that no Building Permit or Certificate of Occupancy shall be issued for said project until all such fees that may be so imposed have been paid in full.

b That before CPDC may act on an application filed pursuant to these Regulations, CPDC or the Town Planner shall first determine whether the application is complete and properly submitted; that in order for an application to be considered by CPDC to be complete and properly submitted, the provisions of the submission requirements and the plan form and contents requirements contained herein shall be fully complied with; and that if an application is determined not to be complete or not to be a proper submittal, it shall be denied without need of a public hearing;

c That if additional material as required herein or a request for a waiver is submitted after the original date of filing of the application, it shall not be considered by CPDC as part of the application nor shall it be considered as material perfecting the completeness of the application, unless it is accompanied by Form D, filed with CPDC and the Town Clerk, signed by the applicant agreeing and acknowledging that the date of submission of such additional material shall supersede the original date of filing for purposes of determining the date by which CPDC must take action and make notification thereof with respect to the application.

Applicant's Signature: _____ Date: 8/15/2023

==========

This Application is authorized for filing with the Town Clerk:

CPDC: _____ Date: _____
Director of Community Development

FORM G DESIGNER'S CERTIFICATE

TOWN OF READING MASSACHUSETTS
COMMUNITY PLANNING AND DEVELOPMENT COMMISSION
DESIGNER'S CERTIFICATE
Form G

Date: 8/14/2023

To the Community Planning and Development Commission:

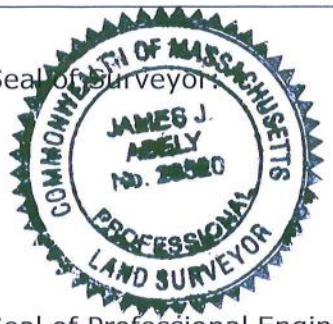
In preparing the plan entitled Definitive Subdivision Plan
and dated August 14, 2023 , I hereby certify that the above named plan and accompanying data is true and correct, to the accuracy required by the current Rules and Regulations Governing the Subdivision of Land in Reading, Massachusetts, and required by the Rules of the Massachusetts Registry of Deeds and my source of information about the location of boundaries shown on said plan were one or more of the following:

1 Deed from James Pacy Jr. to Peter Seibold
dated 9/27/1999 and recorded in the Middlesex South Registry of Deeds Book 30698 , Page 582

2 Actual measures on the ground from a starting point established by
Stone bound drill hole at the intersection of Annette Lane and Martin Road.

3 Other deeds, plans and / or sources as follows:
Plan No. 1478 of 1985
Plan No. 640 of 1967

Seal of Surveyor:



Signed:
Name and Address:

James J. Abely
17 Salem Street
Medford, MA 02155
Phone: 781-933-3330

Seal of Professional Engineer:

Signed:
Name and Address:

Phone:

DEFINITIVE SUBDIVISION

FOR REGISTRY USE ONLY

ANNETTE LANE
READING, MASSACHUSETTS

PREPARED FOR:

PETER SEIBOLD

PREPARED BY:

Vineyard Engineering & Environmental Services Inc.

Land Survey, Civil Engineering & Environmental Services
17 SALEM STREET, MEDFORD MA 02155
Tel. 781.933.3330 Fax: 781.933.3334
Vineyardeng.com

GENERAL NOTES:

CONTRACTOR SHALL COORDINATE WITH THE READING PLANNING BOARD ON ALL REQUIREMENTS FOR SITE INSPECTIONS, AS-BUILT DRAWINGS, AND FEE PAYMENT PRIOR TO CONSTRUCTION.

CONTRACTOR SHALL MAINTAIN EROSION CONTROLS THROUGHOUT CONSTRUCTION AND REPAIR OR REPLACE EROSION CONTROLS AS MAY BE REQUIRED BY THE INSPECTION ENGINEER, READING PLANNING BOARD, OR READING D.P.W.

CONTRACTOR SHALL COORDINATE WITH THE RESPECTIVE UTILITY PROVIDERS REGARDING INSTALLATION REQUIREMENTS FOR GAS, WATER, ELECTRIC, AND TELEPHONE.

REFERENCES

OWNER OF RECORD

PETER SEIBOLD
437 SUMMER AVENUE, READING, MA
DEED BOOK 30698 PAGE 582 M.S.R.D.

ZONING DISTRICT

TAX MAP 38 PARCEL 139
S-20 DISTRICT

PLAN REFERENCES

PLAN NO. 1478 OF 1985
PLAN NO. 640 OF 1967

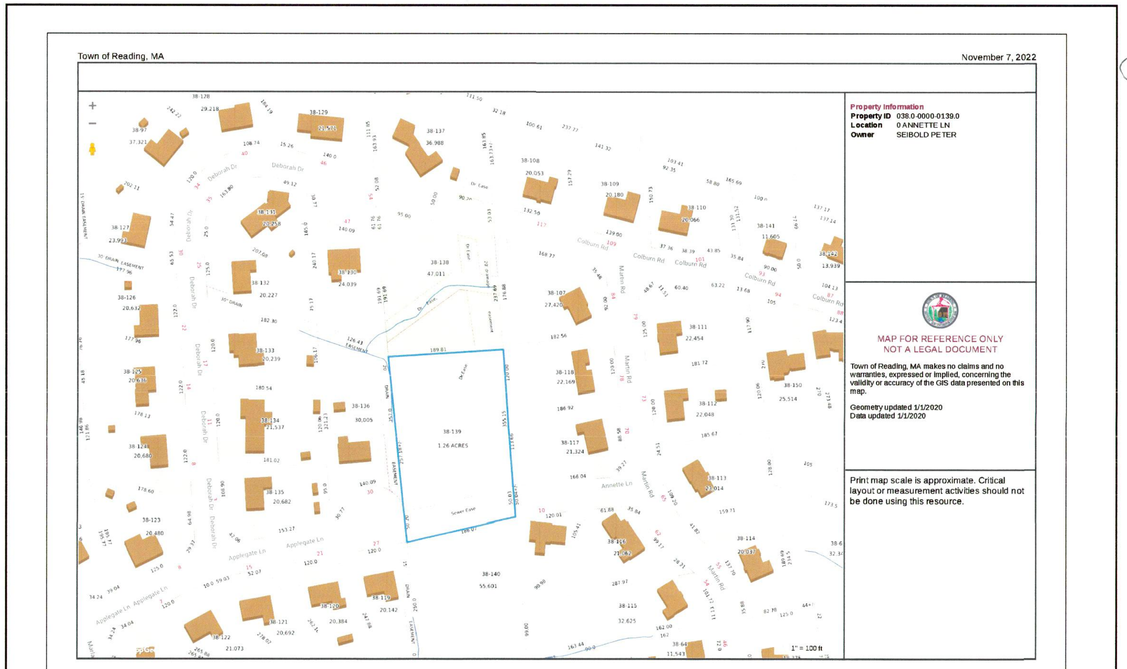
NOTES:

1. THE SUBJECT PROPERTY IS LOCATED IN ZONING DISTRICT S20.
2. THIS PLAN DOES NOT SHOW ANY UNWRITTEN OR UNRECORDED EASEMENTS WHICH MAY EXIST. A REASONABLE AND DILIGENT ATTEMPT HAS BEEN MADE TO OBSERVE ANY APPARENT, VISIBLE USES OF THE LAND; HOWEVER, THIS DOES NOT CONSTITUTE A GUARANTEE THAT NO SUCH EASEMENTS EXIST.
3. ABUTTERS REFERENCES WERE COMPILED FROM AVAILABLE TOWN RECORDS AND DO NOT INDICATE AN OPINION OF TITLE OR OWNERSHIP.

ABBREVIATED SCHEDULE OF ZONING REQUIREMENTS

ASSESSOR'S MAP 38 PARCEL 139
- ZONING DISTRICT: S20
- REQUIRED LOT FRONTAGE = 120'
- REQUIRED SETBACKS
  FRONT= 20' SIDE= 15' REAR= 20'

INDEX OF SHEETS



LOCATION PLAN

SCALE: 1"=100'

I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY. THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

COMMONWEALTH OF MASSACHUSETTS
JAMES J. ABELY
No. 39888
P.L.S.
PROFESSIONAL LAND SURVEYOR

JAMES J. ABELY — 8/15/2023 DATE

TOWN OF READING COMMUNITY PLANNING AND DEVELOPMENT COMMISSION

_____
_____
_____
_____
_____
_____

_____
DATE

NOTE

EXISTING UTILITIES SHOWN ON THESE PLANS ARE COMPILED FROM RECORD INFORMATION AND APPROXIMATE FIELD LOCATION AND THEREFORE, ARE NOT CERTIFIED FOR CONSTRUCTION. PRIOR TO EXCAVATION OR CONSTRUCTION, THE CONTRACTOR MUST NOTIFY "DIGSAFE" (1-888-344-7233) SEVENTY -TWO HOURS BEFORE COMMENCING WORK.

DATE: 8/14/2023

SHEET 1

PROJECT No. 3097 SURV

N

PLAN BOOK 151 PLAN 3

LEGEND:

- WETLAND FLAG (BY LEC ENVIRONMENTAL)
- EOR — EDGE OF ROAD
- BSW — BACK OF SIDEWALK
- CONIFEROUS TREE (>6" DIA.)
- DECIDUOUS TREE (>6" DIA.)
- WATER GATE
- 100 — EXISTING CONTOUR
- (D) — DRAIN MANHOLE
- (S) — SEWER MANHOLE
- CATCH BASIN
- SBDH (FND) — STONE BOUND DRILL HOLE

FOR REGISTRY USE ONLY

ZONING TABLE		
S-20 DISTRICT	REQUIRED	EXISTING
LOT SIZE	20,000 SQ. FT.	54,942 ±SQ. FT.
FRONTAGE	120.00'	50.03'
MINIMUM LOT WIDTH	80.00'	186.06'
MINIMUM FRONT SETBACK	20.0'	---
MINIMUM SIDE SETBACK	15.0'	---
MINIMUM REAR SETBACK	20.0'	---
MAX. LOT COVERAGE	25%	---
HEIGHT	35'	---
WETLAND AREA		17,357± SQ. FT.
UPLAND AREA		37,585± SQ. FT.

TOWN OF READING COMMUNITY PLANNING AND DEVELOPMENT COMMISSION

_____

_____

_____

_____

_____

_____

DATE

OWNER OF RECORD

PETER SEIBOLD
437 SUMMER AVE., READING, MA
DEED BOOK 30698 PAGE 582

ZONING DISTRICT

TAX MAP 38 PARCEL 139
S-20 DISTRICT

PLAN REFERENCES

PLAN NO. 1478 OF 1985
PLAN NO. 640 OF 1967

I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY. THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

COMMONWEALTH OF MASSACHUSETTS — JAMES J. ABELY — No. 28180 — PROFESSIONAL LAND SURVEYOR

JAMES J. ABELY — DATE 08/16/2023

PLAN OF LAND
EXISTING CONDITIONS
ANNETTE LANE
READING, MA

SCALE 1" = 30' AUGUST 14, 2023

PREPARED BY

VINEYARD ENGINEERING
& ENVIRONMENTAL SERVICES INC.
LAND SURVEY, CIVIL ENGINEERING
& ENVIRONMENTAL SERVICES
17 SALEM STREET
MEDFORD MA 02155
TEL. 781-933-3330 FAX. 781-933-3334
Vineyardeng.com

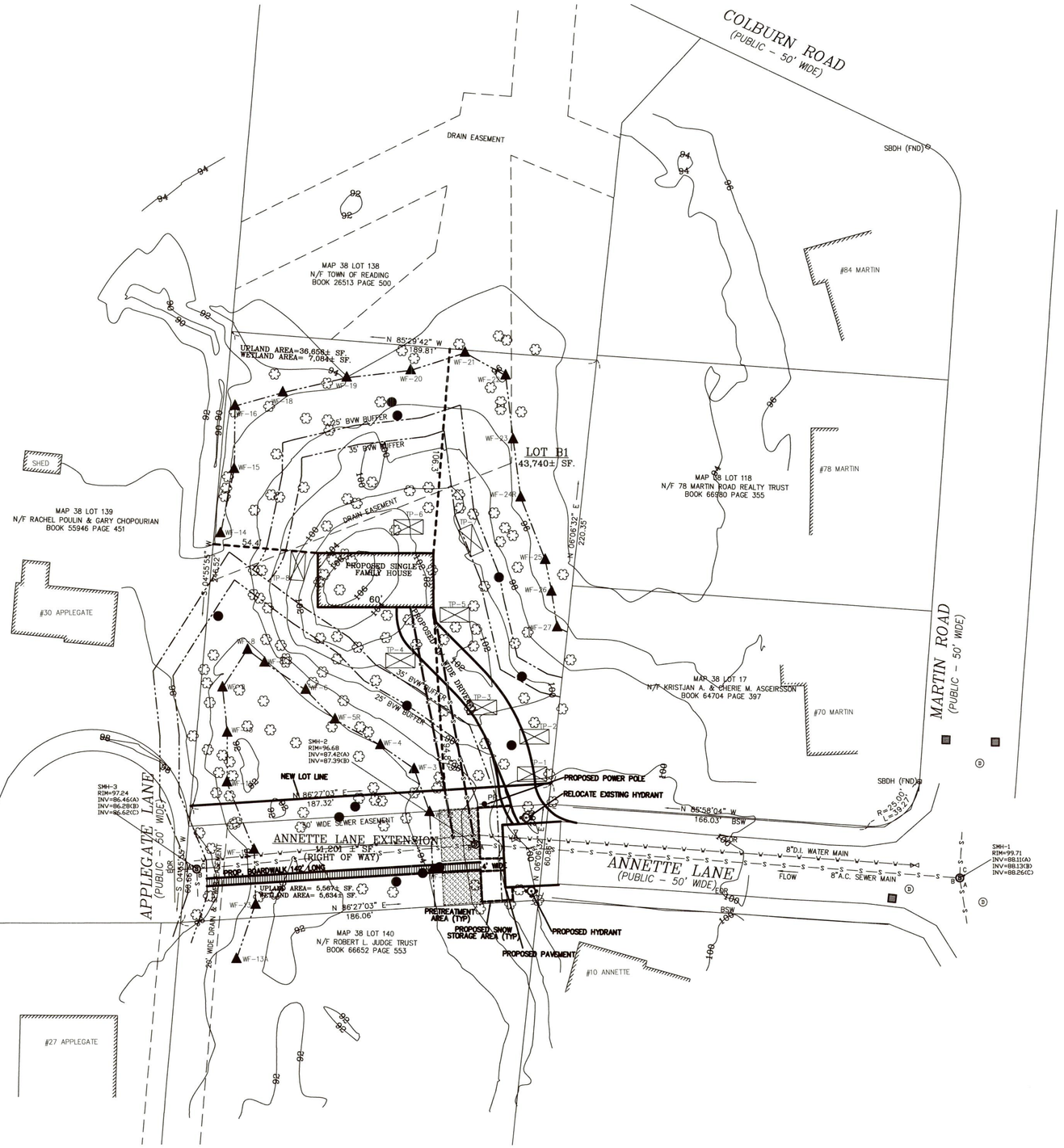
30 15 0 30 60 90 120

N

PLAN BOOK 151 PLAN 3

LEGEND:

- WETLAND FLAG (BY LEC ENVIRONMENTAL)
- EOR — EDGE OF ROAD
- BSW — BACK OF SIDEWALK
- CONIFEROUS TREE (>6" DIA.)
- DECIDUOUS TREE (>6" DIA.)
- WATER GATE
- 100 — EXISTING CONTOUR
- D — DRAIN MANHOLE
- S — SEWER MANHOLE
- CATCH BASIN
- SBDH (FND) — STONE BOUND DRILL HOLE
- TP-1 — TEST PIT



FOR REGISTRY USE ONLY

ZONING TABLE

S-20 DISTRICT	REQUIRED	EXISTING	PROPOSED LOT B-1	PROPOSED ROW EXTENSION
LOT SIZE	20,000 SQ. FT.	54,942 ±SQ. FT.	43,740± SQ. FT.	11,201± SQ. FT.
FRONTAGE	120.00'	50.03'	186.06'	---
MINIMUM LOT WIDTH	80.00'	186.06'	186.06'	---
MINIMUM FRONT SETBACK	20.0'	---	94.8'	---
MINIMUM SIDE SETBACK	15.0'	---	54.4'	---
MINIMUM REAR SETBACK	20.0'	---	106.3	---
MAX. LOT COVERAGE	25%	---	3.8%	---
HEIGHT	35'	---	LESS THAN 35'	---
WETLAND AREA		17,357± SQ. FT.	7,084± SQ. FT.	5,634± SQ. FT.
UPLAND AREA		37,585± SQ. FT.	36,656± SQ. FT.	5,567± SQ. FT.

TOTAL IMPERVIOUS AREA LOT B-1
4,131 SF/10.6%

TOWN OF READING COMMUNITY PLANNING AND DEVELOPMENT COMMISSION

_____

_____

_____

_____

_____

_____

_____
DATE

OWNER OF RECORD
PETER SEIBOLD
437 SUMMER AVE., READING, MA
DEED BOOK 30698 PAGE 582

ZONING DISTRICT

TAX MAP 38 PARCEL 139
S-20 DISTRICT

PLAN REFERENCES

PLAN NO. 1478 OF 1985
PLAN NO. 640 OF 1967

I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY. THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

JAMES J. ABELY — DATE

COMMONWEALTH OF MASSACHUSETTS — JAMES J. ABELY — P.L.S. No. 39340 — PROFESSIONAL LAND SURVEYOR

APPROVED PRELIMINARY PLAN

ANNETTE LANE
READING, MA
SCALE 1" = 30' AUGUST 14, 2023

PREPARED BY

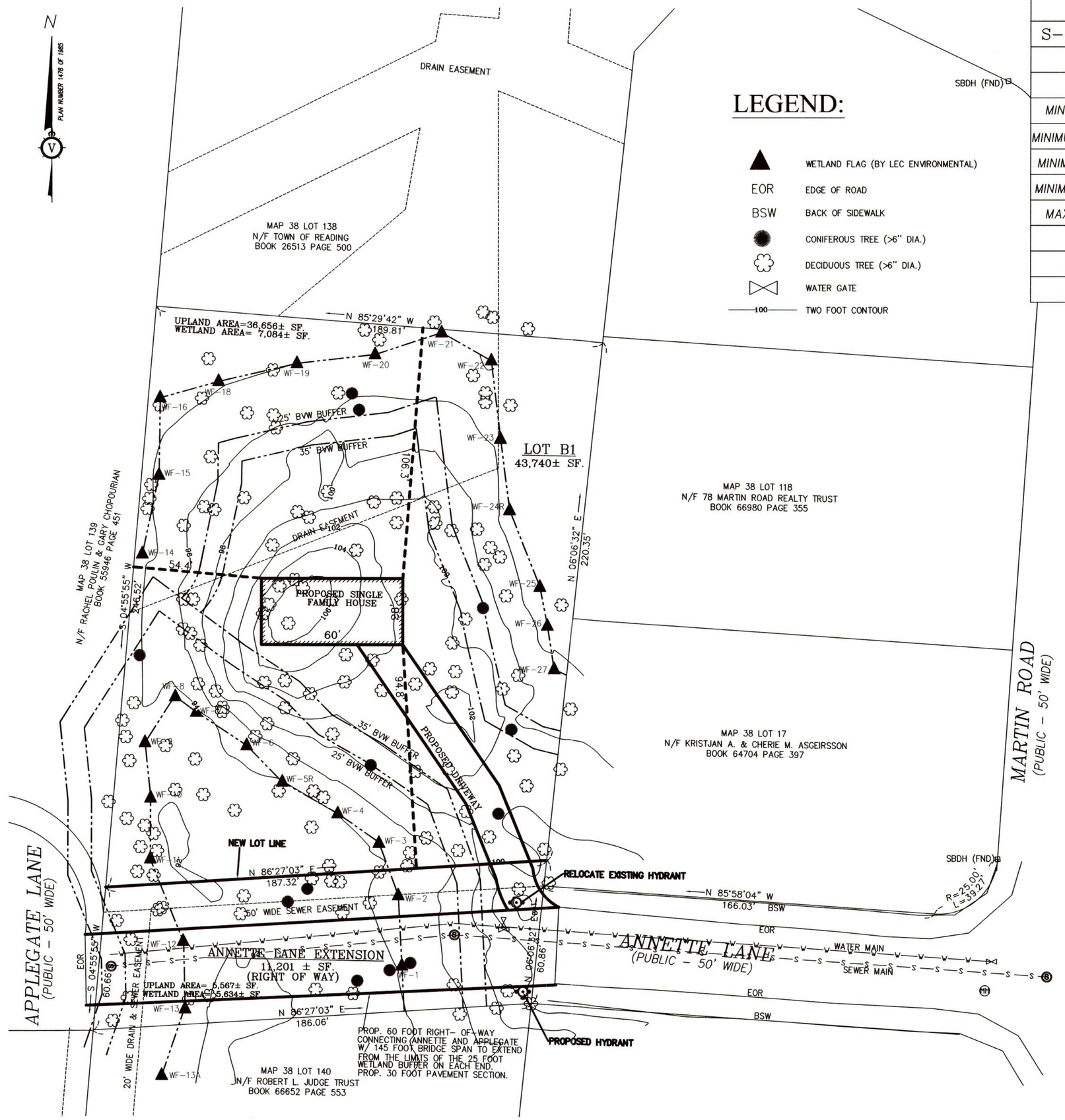
VINEYARD ENGINEERING
& ENVIRONMENTAL SERVICES INC.
LAND SURVEY, CIVIL ENGINEERING
& ENVIRONMENTAL SERVICES
17 SALEM STREET
MEDFORD MA 02155
TEL. 781-933-3330 FAX. 781-933-3334
Vineyardeng.com

30 15 0 30 60 90 120

PROJECT No. 3097 SURV SHEET 3

N

PLAN NUMBER 1478 OF 1985



LEGEND:

- WETLAND FLAG (BY LEC ENVIRONMENTAL)
- EOR — EDGE OF ROAD
- BSW — BACK OF SIDEWALK
- CONIFEROUS TREE (>6" DIA.)
- DECIDUOUS TREE (>6" DIA.)
- WATER GATE
- 100 — TWO FOOT CONTOUR

ZONING TABLE

S-20 DISTRICT	REQUIRED	EXISTING	PROPOSED LOT B-1	PROPOSED ROW EXTENSION
LOT SIZE	20,000 SQ. FT.	54,942 ±SQ. FT.	43,740± SQ. FT.	11,201± SQ. FT.
FRONTAGE	120.00'	50.03'	186.06'	186.06'
MINIMUM LOT WIDTH	80.00'	186.06'	186.06'	186.06'
MINIMUM FRONT SETBACK	20.0'	---	94.8'	---
MINIMUM SIDE SETBACK	15.0'	---	54.4'	---
MINIMUM REAR SETBACK	20.0'	---	106.3	---
MAX. LOT COVERAGE	25%	---	3.8%	---
HEIGHT	35'	---	LESS THAN 35'	---
WETLAND AREA		17,357± SQ. FT.	7,084± SQ. FT.	5,634± SQ. FT.
UPLAND AREA		37,585± SQ. FT.	36,656± SQ. FT.	5,567± SQ. FT.

OWNER OF RECORD

PETER SEIBOLD
437 SUMMER AVENUE, READING, MA
DEED BOOK 30698 PAGE 582 M.S.R.D.

ZONING DISTRICT

TAX MAP 38 PARCEL 139
S-20 DISTRICT

PLAN REFERENCES

PLAN NO. 1478 OF 1985
PLAN NO. 640 OF 1967

I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY.

JAMES J. ABELY P.L.S. — DATE 2/22/23

COMMONWEALTH OF MASSACHUSETTS — JAMES J. ABELY — NO. 28520 — REGISTERED PROFESSIONAL LAND SURVEYOR

PROOF OF CONCEPT PLAN

ANNETTE LANE
READING, MA

SCALE 1" = 30' FEBRUARY 20, 2023

PREPARED BY

VINEYARD ENGINEERING
& ENVIRONMENTAL SERVICES INC.
LAND SURVEY, CIVIL ENGINEERING
& ENVIRONMENTAL SERVICES
17 SALEM STREET
MEDFORD MA 02155
TEL. 781-933-3330 FAX. 781-933-3334
Vineyardeng.com

30 15 0 30 60 90 120

N

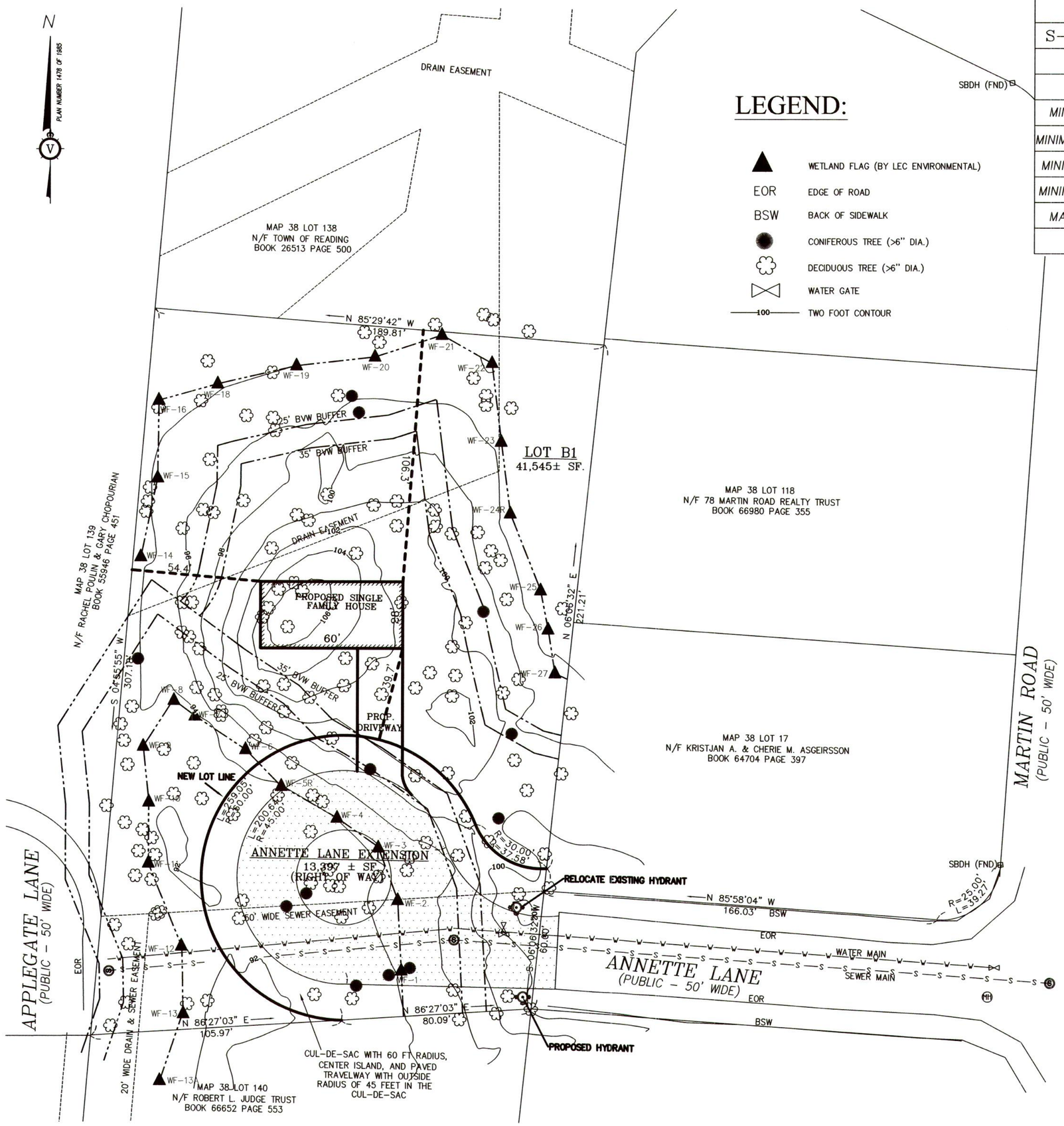
PLAN NUMBER 1478 OF 1985

LEGEND:

- WETLAND FLAG (BY LEC ENVIRONMENTAL)
- EOR — EDGE OF ROAD
- BSW — BACK OF SIDEWALK
- CONIFEROUS TREE (>6" DIA.)
- DECIDUOUS TREE (>6" DIA.)
- WATER GATE
- 100 — TWO FOOT CONTOUR

ZONING TABLE

S-20 DISTRICT	REQUIRED	EXISTING	PROPOSED LOT B-1	PROPOSED ROW EXTENSION
LOT SIZE	20,000 SQ. FT.	54,942 ±SQ. FT.	41,545± SQ. FT.	13,397± SQ. FT.
FRONTAGE	120.00'	50.03'	296.63'	---
MINIMUM LOT WIDTH	80.00'	186.06'	170.31'	---
MINIMUM FRONT SETBACK	20.0'	---	39.7'	---
MINIMUM SIDE SETBACK	15.0'	---	54.4'	---
MINIMUM REAR SETBACK	20.0'	---	106.3	---
MAX. LOT COVERAGE	25%	---	3.8%	---
HEIGHT	35'	---	LESS THAN 35'	---



PROJ NO. 3097 SURV

OWNER OF RECORD

PETER SEIBOLD
437 SUMMER AVENUE, READING, MA
DEED BOOK 30698 PAGE 582 M.S.R.D.

ZONING DISTRICT

TAX MAP 38 PARCEL 139
S-20 DISTRICT

PLAN REFERENCES

PLAN NO. 1478 OF 1985
PLAN NO. 640 OF 1967

I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY.

JAMES J. ABELY — DATE 3/28/23

COMMONWEALTH OF MASSACHUSETTS — JAMES J ABELY — No. 22320 — P.L.S. — PROFESSIONAL LAND SURVEYOR

ALTERNATE PROOF OF CONCEPT PLAN

ANNETTE LANE
READING, MA
SCALE 1" = 30' MARCH 28, 2023
PREPARED BY

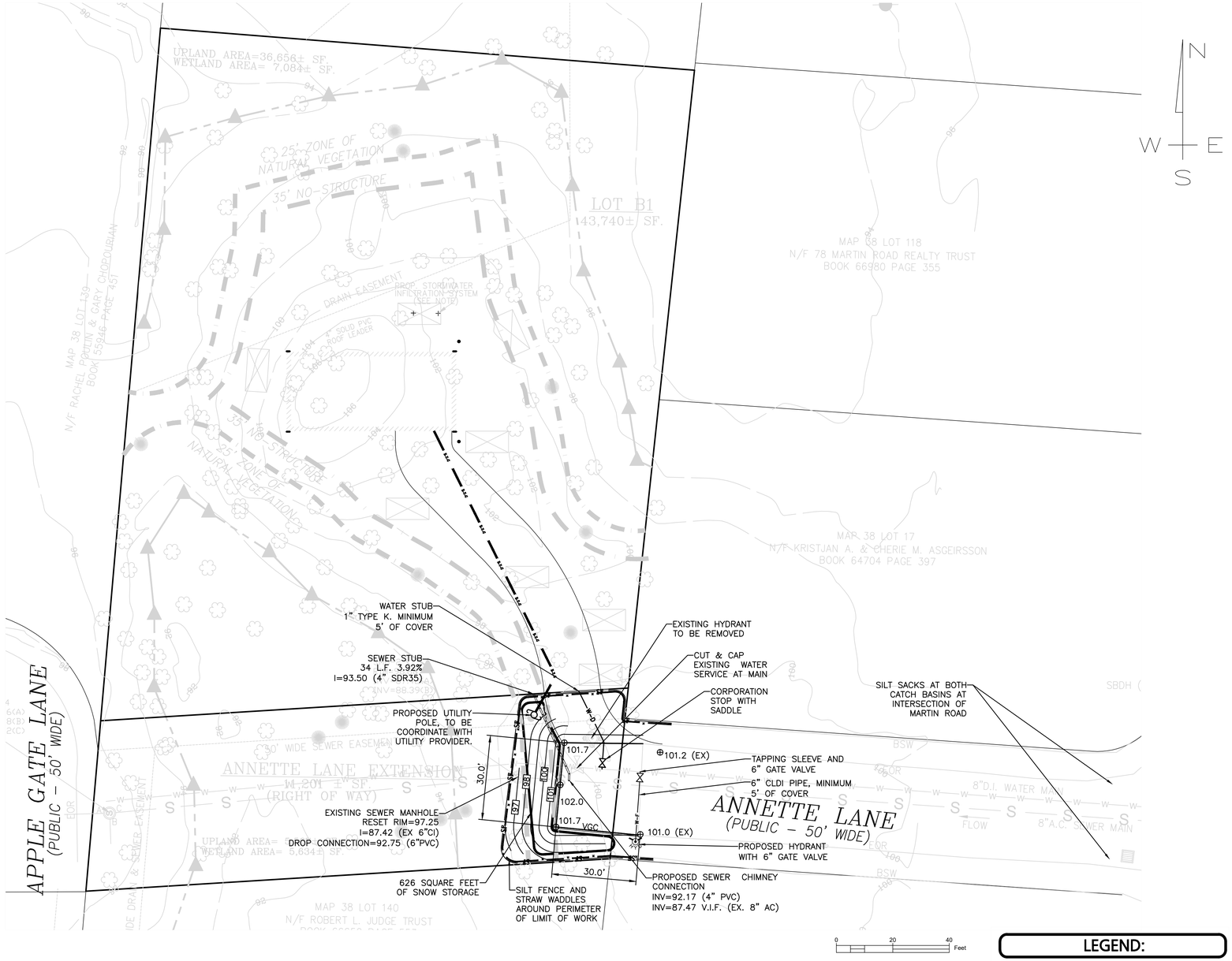
VINEYARD ENGINEERING
& ENVIRONMENTAL SERVICES INC.
LAND SURVEY, CIVIL ENGINEERING
& ENVIRONMENTAL SERVICES
17 SALEM STREET
MEDFORD MA 02155
TEL. 781-933-3330 FAX. 781-933-3334
Vineyardeng.com

30 15 0 30 60 90 120

PLAN NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR IT'S REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
2. CONTRACTOR IS RESPONSIBLE FOR DEMOLITION OF EXISTING STRUCTURES INCLUDING REMOVAL OF ANY EXISTING UTILITIES SERVING THE STRUCTURE. UTILITY CONNECTIONS SHOULD BE COORDINATED WITH THE MEP PRIOR TO CONSTRUCTION.
3. EXISTING DRAINAGE STRUCTURES TO REMAIN ARE TO BE INSPECTED AND REPAIRED AS NEEDED, AND EXISTING PIPES TO BE CLEANED OUT TO REMOVE ALL SILT AND DEBRIS.
4. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.
5. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ENSURE A SMOOTH FIT AND CONTINUOUS GRADE.
6. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL AND PAVED AREAS.
7. THE CONTRACTOR SHALL COORDINATE WITH THE ARCHITECT FOR THE FINAL LOCATIONS OF PROPOSED ROOF DRAINS. LOCATIONS ARE SHOWN HEREON FOR COORDINATION PURPOSES ONLY.
8. WRITTEN DIMENSIONS ON THIS PLAN TAKE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN THE EVENT OF A CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND/OR SPECIFICATIONS OR CONDITIONS, THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR.
9. ANY DAMAGE TO PRIVATE OR PUBLIC PROPERTIES DUE TO THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AND RESTORED BY THE CONTRACTOR AT THEIR OWN EXPENSE.
10. ALL PROPERTY MARKERS AND STREET LINE MONUMENTS SHALL BE PROPERLY PROTECTED DURING CONSTRUCTION. ANY DAMAGE TO THESE ITEMS SHALL BE REPAIRED AND RESTORED BY A LAND SURVEYOR LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS AT THE CONTRACTOR'S EXPENSE.
11. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ADDITIONAL BENCHMARK INFORMATION IF REQUIRED. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING BENCHMARKS. IF IT IS NECESSARY TO RELOCATE A BENCHMARK, IT SHALL BE RELOCATED BY A MASSACHUSETTS LAND SURVEYOR AND DONE SO AT THE CONTRACTOR'S EXPENSE.
12. ALL PERMITS AND APPROVALS NECESSARY FROM AGENCIES GOVERNING THE WORK SHALL BE OBTAINED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK.
13. CONSTRUCTION DURING WET WEATHER OR WINTER CONDITIONS IS TO BE ANTICIPATED AND PROVISIONS TO ADEQUATELY ADDRESS THESE CONDITIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
14. ALL CONSTRUCTION SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS INCLUDING THE TOWN, MADOT, MADEP, MWRA, MUTCD, AND AASHTO.
15. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY ALLEN & MAJOR ASSOCIATES DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK, OR THE OWNER'S EMPLOYEES, CUSTOMERS, OR THE GENERAL PUBLIC. THE SEAL OF THE ENGINEER AS INCLUDED IN THE PLAN SET DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PROVIDE THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), STATE, AND LOCAL REGULATIONS.
16. THE CONTRACTOR SHALL CONTACT "DIGSAFE" AND THE TOWN OF READING DEPARTMENT OF PUBLIC WORKS AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST THE LOCATION OF THE EXISTING UTILITIES.

    DIGSAFE: 1-800-344-7233
    READING DEPT. OF PUBLIC WORKS: 1-781-942-9077
17. PROPERTY LINE INFORMATION, EXISTING TOPOGRAPHY, AND EXISTING SITE DETAILS DEPICTED HEREIN WERE OBTAINED FROM A FIELD SURVEY CONDUCTED BY VINEYARD ENGINEERING & ENVIRONMENTAL SERVICES, INC.
18. THE ELEVATIONS DEPICTED HEREIN ARE BASED ON AN ASSUMED DATUM.
19. THE PARCELS OF LAND ARE NOT LOCATED WITHIN A FLOOD ZONE AS DEPICTED ON THE LATEST FLOOD INSURANCE RATE MAP.
20. THE INFORMATION SHOWN ON THIS PLAN IS THE SOLE PROPERTY OF ALLEN & MAJOR ASSOCIATES, INC. ITS INTENDED USE IS TO PROVIDE INFORMATION. ANY ALTERATION, MISUSE, OR RECALCULATION OF INFORMATION OR DATA WITHOUT THE EXPRESSED, WRITTEN CONSENT OF ALLEN & MAJOR ASSOCIATES, INC. IS STRICTLY PROHIBITED.
21. ALL UTILITIES SHALL BE APPROVED MATERIALS AND INSTALLED IN ACCORDANCE WITH THE DEPARTMENT OF PUBLIC WORKS STANDARDS AND MUST BE INSTALLED BY A LICENSED DRAIN LAYER.
22. THE CONTRACTOR SHALL PROVIDE THE TRENCH PATCHING LIMITS FOR THE ENGINEER TO APPROVE PRIOR TO ISSUANCE OF THE STREET OPENING PERMIT. PAVEMENT TYPE AND THICKNESS IN ACCORDANCE WITH TOWN STANDARDS.
23. A MINIMUM OF 18" VERTICAL CLEARANCE SHALL BE MAINTAINED WHERE WATER SERVICES CROSS STORM DRAIN AND SEWER LINES. WATER SERVICES SHALL BE SLEEVED REGARDLESS OF CLEARANCE WHEN PASSING BELOW STORM DRAIN AND SEWER LINES. SLEEVE SHALL EXTEND ALONG WATER SERVICE A MINIMUM DISTANCE OF EIGHT FEET CENTERED ON THE CROSSING POINT OF THE OTHER PIPE AS MEASURED NORMALLY FROM ALL POINTS ALONG THE PIPE.
24. ALL UTILITIES SHALL BE APPROVED MATERIALS AND INSTALLED IN ACCORDANCE WITH THE DEPARTMENT OF PUBLIC WORKS STANDARDS AND MUST BE INSTALLED BY A LICENSED DRAIN LAYER.



LEGEND:

SILT FENCE	SF
STRAW WADDLE	
SNOW STORAGE	
WETLAND BUFFER 25'	
WETLAND BUFFER 50'	
SEWER LINE	
WATER (FIRE SERVICE)	W-F
WATER (DOMESTIC SERVICE)	W-D
WATER SHUT OFF	W
WATER (FIRE SERVICE)	
UTILITY POLE	
CONTOUR	128
VERTICAL GRANITE CURB (VGC)	
SPOT GRADE	⊗101.2 (EX)

8/14/23

COMMONWEALTH OF MASSACHUSETTS
CARLTON M. QUINN
CIVIL
No.49923
REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER FOR SOMERVILLE ENGINEERING, LLC

REVISIONS

OWNER:

PETER SEIBOLD
437 SUMMER AVENUE
READING, MA 01867

PROJECT:

DEFINITIVE SUBDIVISION
ANNETTE LANE
READING, MA

SE | SOMERVILLE ENGINEERING

519 SOMERVILLE AVENUE, SUITE #285
SOMERVILLE, MA 02144
(617)356-8185

WWW.SOMERVILLEENGINEERING.COM

DATE:	**8/14/2023**
SCALE:	**1"=20'**
PROJECT #:	**202304-01**
DRAWN BY:	**CMQ**

TITLE: **ROADWAY IMPROVEMENT PLAN**

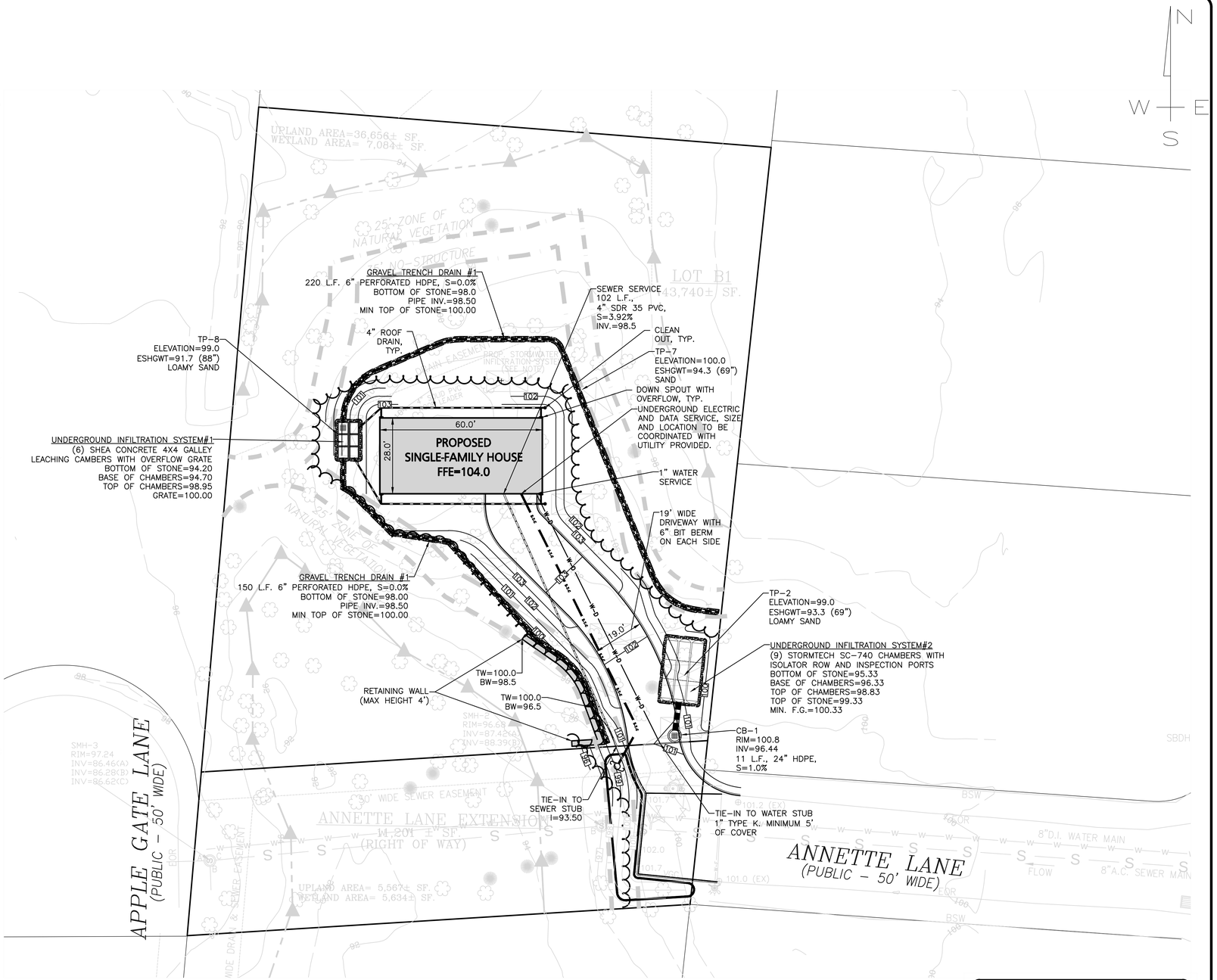
SHEET: **C-101**

C:\USERS\COUINN\DESKTOP\PROJECT INFO\202304-01\CIVIL\DRAWINGS\202304-01 - ROADWAY IMPROVEMENT PLAN.DWG

PLAN NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR IT'S REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
2. CONTRACTOR IS RESPONSIBLE FOR DEMOLITION OF EXISTING STRUCTURES INCLUDING REMOVAL OF ANY EXISTING UTILITIES SERVING THE STRUCTURE. UTILITY CONNECTIONS SHOULD BE COORDINATED WITH THE MEP PRIOR TO CONSTRUCTION.
3. EXISTING DRAINAGE STRUCTURES TO REMAIN ARE TO BE INSPECTED AND REPAIRED AS NEEDED, AND EXISTING PIPES TO BE CLEANED OUT TO REMOVE ALL SILT AND DEBRIS.
4. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.
5. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ENSURE A SMOOTH FIT AND CONTINUOUS GRADE.
6. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL AND PAVED AREAS.
7. THE CONTRACTOR SHALL COORDINATE WITH THE ARCHITECT FOR THE FINAL LOCATIONS OF PROPOSED ROOF DRAINS. LOCATIONS ARE SHOWN HEREON FOR COORDINATION PURPOSES ONLY.
8. WRITTEN DIMENSIONS ON THIS PLAN TAKE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN THE EVENT OF A CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND/OR SPECIFICATIONS OR CONDITIONS, THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR.
9. ANY DAMAGE TO PRIVATE OR PUBLIC PROPERTIES DUE TO THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AND RESTORED BY THE CONTRACTOR AT THEIR OWN EXPENSE.
10. ALL PROPERTY MARKERS AND STREET LINE MONUMENTS SHALL BE PROPERLY PROTECTED DURING CONSTRUCTION. ANY DAMAGE TO THESE ITEMS SHALL BE REPAIRED AND RESTORED BY A LAND SURVEYOR LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS AT THE CONTRACTOR'S EXPENSE.
11. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ADDITIONAL BENCHMARK INFORMATION IF REQUIRED. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING BENCHMARKS. IF IT IS NECESSARY TO RELOCATE A BENCHMARK, IT SHALL BE RELOCATED BY A MASSACHUSETTS LAND SURVEYOR AND DONE SO AT THE CONTRACTOR'S EXPENSE.
12. ALL PERMITS AND APPROVALS NECESSARY FROM AGENCIES GOVERNING THE WORK SHALL BE OBTAINED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORK.
13. CONSTRUCTION DURING WET WEATHER OR WINTER CONDITIONS IS TO BE ANTICIPATED AND PROVISIONS TO ADEQUATELY ADDRESS THESE CONDITIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
14. ALL CONSTRUCTION SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS INCLUDING THE TOWN, MADOT, MADEP, MWRA, MUTCD, AND AASHTO.
15. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY ALLEN & MAJOR ASSOCIATES DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK, OR THE OWNER'S EMPLOYEES, CUSTOMERS, OR THE GENERAL PUBLIC. THE SEAL OF THE ENGINEER AS INCLUDED IN THE PLAN SET DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PROVIDE THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), STATE, AND LOCAL REGULATIONS.
16. THE CONTRACTOR SHALL CONTACT "DIGSAFE" AND THE TOWN OF READING DEPARTMENT OF PUBLIC WORKS AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST THE LOCATION OF THE EXISTING UTILITIES.

    DIGSAFE: 1-800-344-7233
    READING DEPT. OF PUBLIC WORKS: 1-781-942-9077
17. PROPERTY LINE INFORMATION, EXISTING TOPOGRAPHY, AND EXISTING SITE DETAILS DEPICTED HEREIN WERE OBTAINED FROM A FIELD SURVEY CONDUCTED BY VINEYARD ENGINEERING & ENVIRONMENTAL SERVICES, INC.
18. THE ELEVATIONS DEPICTED HEREIN ARE BASED ON AN ASSUMED DATUM.
19. THE PARCELS OF LAND ARE NOT LOCATED WITHIN A FLOOD ZONE AS DEPICTED ON THE LATEST FLOOD INSURANCE RATE MAP.
20. THE INFORMATION SHOWN ON THIS PLAN IS THE SOLE PROPERTY OF ALLEN & MAJOR ASSOCIATES, INC. ITS INTENDED USE IS TO PROVIDE INFORMATION. ANY ALTERATION, MISUSE, OR RECALCULATION OF INFORMATION OR DATA WITHOUT THE EXPRESSED, WRITTEN CONSENT OF ALLEN & MAJOR ASSOCIATES, INC. IS STRICTLY PROHIBITED.
21. ALL UTILITIES SHALL BE APPROVED MATERIALS AND INSTALLED IN ACCORDANCE WITH THE DEPARTMENT OF PUBLIC WORKS STANDARDS AND MUST BE INSTALLED BY A LICENSED DRAIN LAYER.
22. THE CONTRACTOR SHALL PROVIDE THE TRENCH PATCHING LIMITS FOR THE ENGINEER TO APPROVE PRIOR TO ISSUANCE OF THE STREET OPENING PERMIT. PAVEMENT TYPE AND THICKNESS IN ACCORDANCE WITH TOWN STANDARDS.
23. A MINIMUM OF 18" VERTICAL CLEARANCE SHALL BE MAINTAINED WHERE WATER SERVICES CROSS STORM DRAIN AND SEWER LINES. WATER SERVICES SHALL BE SLEEVED REGARDLESS OF CLEARANCE WHEN PASSING BELOW STORM DRAIN AND SEWER LINES. SLEEVE SHALL EXTEND ALONG WATER SERVICE A MINIMUM DISTANCE OF EIGHT FEET CENTERED ON THE CROSSING POINT OF THE OTHER PIPE AS MEASURED NORMALLY FROM ALL POINTS ALONG THE PIPE.
24. ALL UTILITIES SHALL BE APPROVED MATERIALS AND INSTALLED IN ACCORDANCE WITH THE DEPARTMENT OF PUBLIC WORKS STANDARDS AND MUST BE INSTALLED BY A LICENSED DRAIN LAYER.



LEGEND:

SILT FENCE	SF
STRAW WADDLE	
SNOW STORAGE	
WETLAND BUFFER 25'	
WETLAND BUFFER 50'	
SEWER LINE	
WATER (FIRE SERVICE)	W-F
WATER (DOMESTIC SERVICE)	W-D
WATER SHUT OFF	WV
WATER (FIRE SERVICE)	
UTILITY POLE	
CONTOUR	128

COMMONWEALTH OF MASSACHUSETTS
CARLTON M. QUINN
CIVIL
No.49923
REGISTERED PROFESSIONAL ENGINEER
8/14/23
PROFESSIONAL ENGINEER FOR SOMERVILLE ENGINEERING, LLC

REVISIONS

OWNER:

PETER SEIBOLD
437 SUMMER AVENUE
READING, MA 01867

PROJECT:

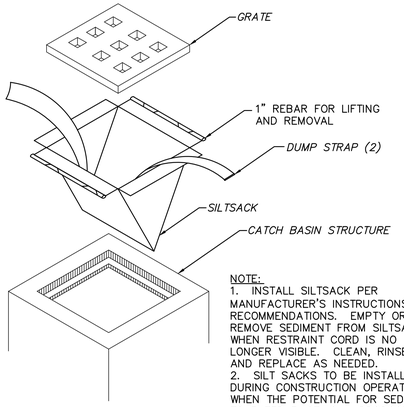
DEFINITIVE SUBDIVISION
ANNETTE LANE
READING, MA

SE | SOMERVILLE ENGINEERING
519 SOMERVILLE AVENUE, SUITE #285
SOMERVILLE, MA 02144
(617)356-8185
WWW.SOMERVILLEENGINEERING.COM

DATE:	8/14/2023
SCALE:	1"=20'
PROJECT #:	202304-01
DRAWN BY:	CMQ

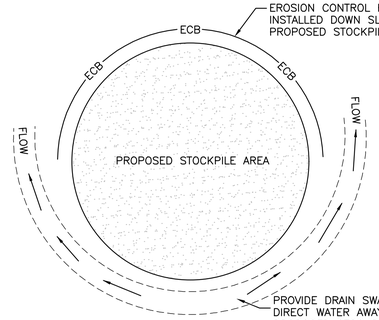
TITLE:	SHEET:
SITE IMPROVEMENT PLAN	C-102

C:\USERS\COUINN\DESKTOP\PROJECT INFO\202304-01\CIVIL\DRAWINGS\202304-01 - SITE IMPROVEMENT PLAN.DWG



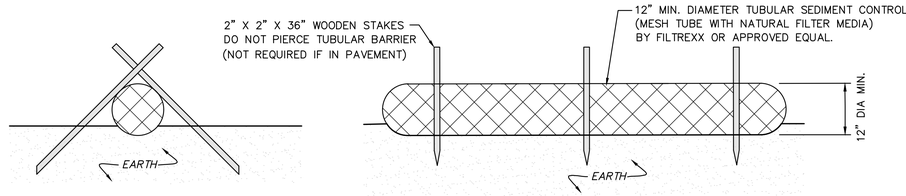
NOTE:
1. INSTALL SILTSACK PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. EMPTY OR REMOVE SEDIMENT FROM SILTSACK WHEN RESTRAINT CORD IS NO LONGER VISIBLE. CLEAN, RINSE, AND REPLACE AS NEEDED.
2. SILT SACKS TO BE INSTALLED DURING CONSTRUCTION OPERATIONS WHEN THE POTENTIAL FOR SEDIMENT TO ENTER EXISTING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

SILTSACK INLET DETAIL (1)
NOT TO SCALE



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

STOCKPILE PROTECTION DETAIL (2)
NOT TO SCALE

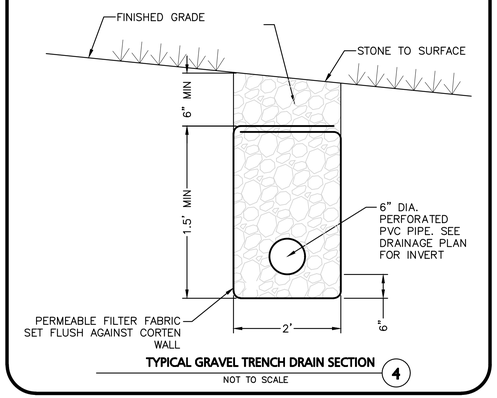


SECTION **PROFILE**

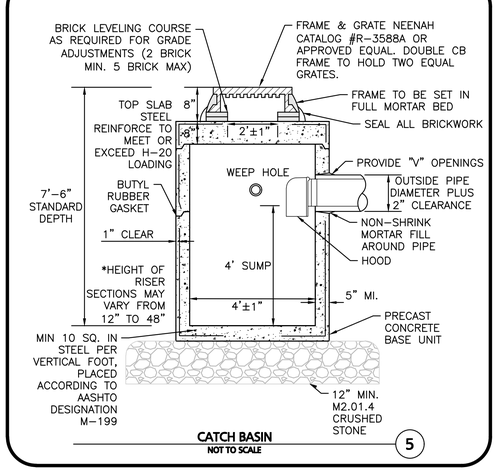
NOTES:
1. ALL MATERIALS TO MEET MANUFACTURERS SPECIFICATIONS.
2. INSTALL WOODEN STAKES IN A CRISS–CROSS PATTERN EVERY 8' ON CENTER.
2. OVERLAP TUBULAR BARRIER SEGMENTS A MINIMUM OF 12".
3. THE CONTRACTOR SHALL MAINTAIN THE TUBULAR BARRIERS IN A FUNCTIONAL CONDITION AT ALL TIMES. THE CONTROLS SHALL BE ROUTINELY INSPECTED BY THE CONTRACTOR.
4. WHERE THE TUBULAR BARRIERS REQUIRE REPAIR OR SEDIMENT REMOVAL, IT WILL BE COMPLETED BY THE CONTRACTOR AT NO ADDITIONAL COST.
5. AT A MINIMUM, THE CONTRACTOR SHALL REMOVE SEDIMENTS COLLECTED AT THE BASE WHEN THEY REACH 1/3 THE EXPOSED HEIGHT OF THE BARRIER.

TUBULAR SEDIMENT BARRIER (3)
NOT TO SCALE

CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4–2 INCH. TO MEET AASHTO M43 3, 357, 4, 467, 5, 56, 57.



TYPICAL GRAVEL TRENCH DRAIN SECTION (4)
NOT TO SCALE

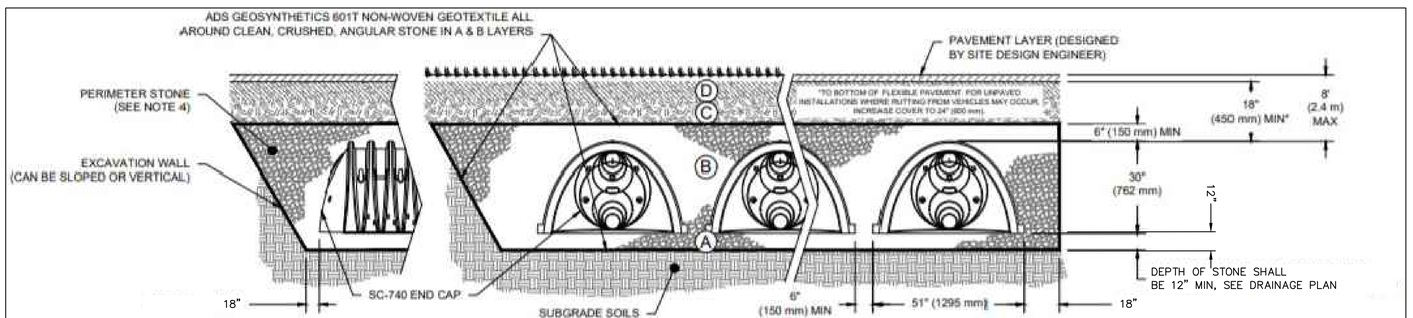


CATCH BASIN (5)
NOT TO SCALE

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

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

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



NOTES:
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

STORMTECH SC-740 CHAMBER PROFILE (6)
NOT TO SCALE

C:\USERS\CQUINN\DESKTOP\PROJECT INFO\202304-01\CIVIL\DRAWINGS\202304-01 – DETAILS.DWG

CARLTON M. QUINN CIVIL No.49923 REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
8/14/23
PROFESSIONAL ENGINEER FOR SOMERVILLE ENGINEERING, LLC

REVISIONS

OWNER:

PETER SEIBOLD
437 SUMMER AVENUE
READING, MA 01867

PROJECT:

DEFINITIVE SUBDIVISION
ANNETTE LANE
READING, MA

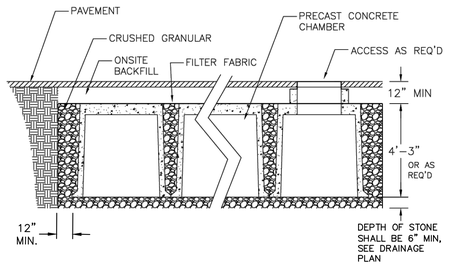
SE | SOMERVILLE ENGINEERING
519 SOMERVILLE AVENUE, SUITE #285
SOMERVILLE, MA 02144
(617)356-8185
WWW.SOMERVILLEENGINEERING.COM

DATE:	8/14/2023
SCALE:	1"=20'
PROJECT #:	202304-01
DRAWN BY:	CMQ
TITLE: DETAILS	SHEET: C-501

SHEA CONCRETE PRODUCTS — *New England's Premier Precaster* 800-696-7432 (SHEA) www.sheaconcrete.com
BILLING ADDRESS: 87 HAVERHILL RD, AMESBURY MA 01913

GALLEY 4X4 SECTION DETAIL

Typical Cross Section Detail Precast Concrete Galley Chamber (not to scale)



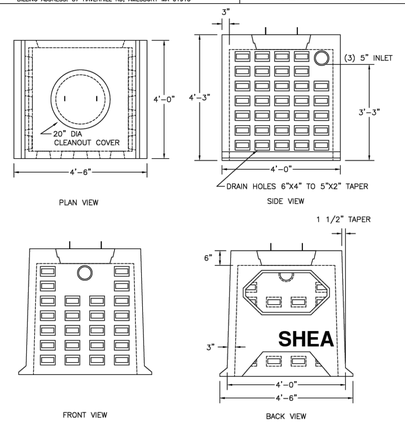
NOTES:
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGNED FOR AASHTO HS-20 LOADING, 1 TO 3 FEET COVER.
3. GALLEY AVAILABLE IN BOTH END AND CENTER SECTIONS. CENTER SECTIONS HAVE LARGE OPENING IN BOTH THE BACK AND FRONT SIDES.

SHEA PRODUCT ID:	PREPARED FOR:	FILE NAME: GalleySectDetail.dwg
WEIGHT (LBS):	DRAWN BY: ARO	DATE: 06/01/18	PAGE: E1.3

773 Salem Street–Wilmington, MA | 153 Cranberry Hwy–Rochester, MA | 87 Haverhill Road–Amesbury, MA | 160 Old Turnpike Rd–Nottingham, NH
Specifications subject to change without notice

SHEA CONCRETE PRODUCTS — *New England's Premier Precaster* 800-696-7432 (SHEA) www.sheaconcrete.com
BILLING ADDRESS: 87 HAVERHILL RD, AMESBURY MA 01913

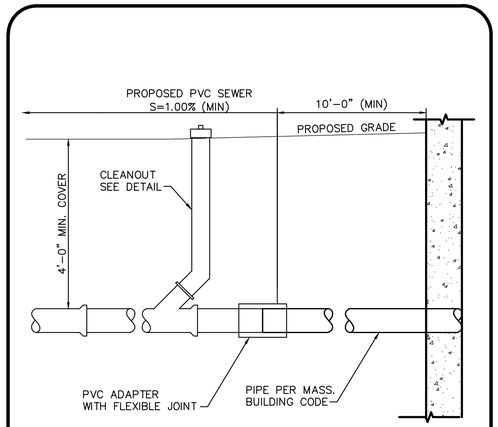
4X4 GALLEY CENTER AND END



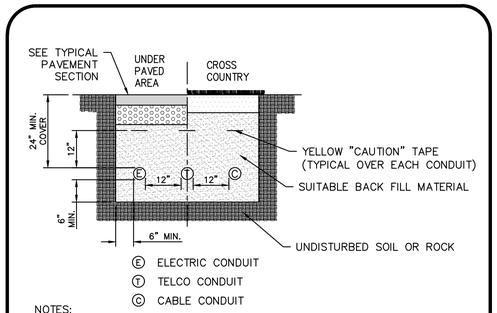
NOTES:
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGNED FOR AASHTO HS-20 LOADING, 1 TO 3 FEET COVER.
3. GALLEY AVAILABLE IN BOTH END AND CENTER SECTIONS. CENTER SECTIONS HAVE LARGE OPENING IN BOTH THE BACK AND FRONT SIDES.

SHEA PRODUCT ID: EGH/CGH	PREPARED FOR:	FILE NAME: Galley4X4.dwg
WEIGHT (LBS): 2,430#/2,300#	DRAWN BY: ARO	DATE: 03/01/2018	PAGE: E1.1

773 Salem Street–Wilmington, MA | 153 Cranberry Hwy–Rochester, MA | 87 Haverhill Road–Amesbury, MA | 160 Old Turnpike Rd–Nottingham, NH
Specifications subject to change without notice



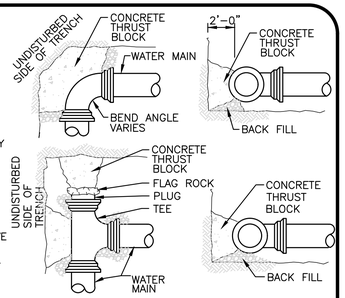
BUILDING SEWER SERVICE (1)
NOT TO SCALE



NOTES:
1. SCHEDULE 80 PVC CONDUIT REQUIRED UNDER ROAD AND DRIVEWAY SURFACES.
2. ALL UTILITY INSTALLATION REQUIREMENTS, SEPARATIONS, AND CONDUIT SIZES TO BE VERIFIED WITH EACH UTILITY COMPANY PRIOR TO INSTALLATION OF ANY UNDERGROUND UTILITY CONDUIT.
3. SEE SITE ELECTRICAL PLAN FOR SPECIFIC DETAILS

BURIED CONDUIT DETAIL (4)
NOT TO SCALE

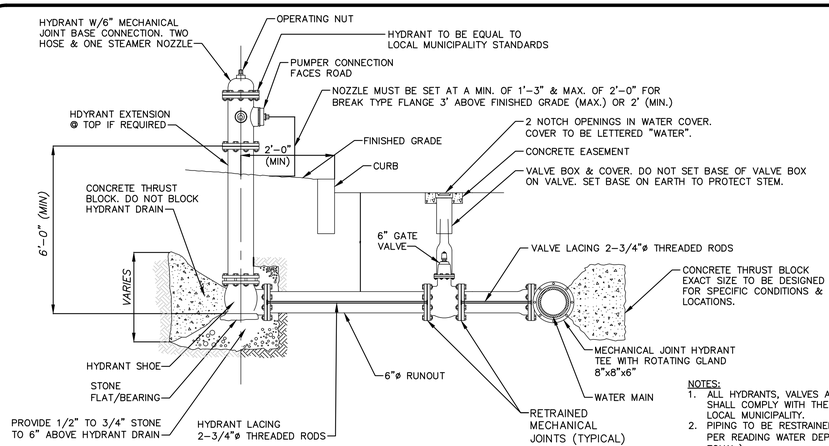
NOTES:
1. ALL WATER MAIN FITTINGS, BENDS, TEES, PLUGS ETC. SHALL BE RESTRAINED W/ THRUST BLOCKS EXCEPT WHERE NOTED.
2. ALL THRUST BLOCKS & COLLARS SHALL BE INSTALLED SO THAT THEY BEAR AGAINST UNDISTURBED EARTH.
3. SIZE OF CONCRETE THRUST BLOCKS SHALL BE AS NOTED BELOW.
4. MINIMUM COMPRESSIVE STRENGTH OF THRUST BLOCK CONCRETE SHALL BE 3,000 P.S.I.
5. KEEP CONCRETE CLEAR OF MECHANICAL JOINTS.
6. THE BELOW PRESCRIBED ON A WATER PRESSURE OF 225 PSI AND A SOIL RESISTANCE OF 2000 PSF (TILL). FOR OTHER SOILS THE VALUES IN THE ABOVE TABLE SHALL BE MULTIPLIED BY:



PLAN ELEVATION

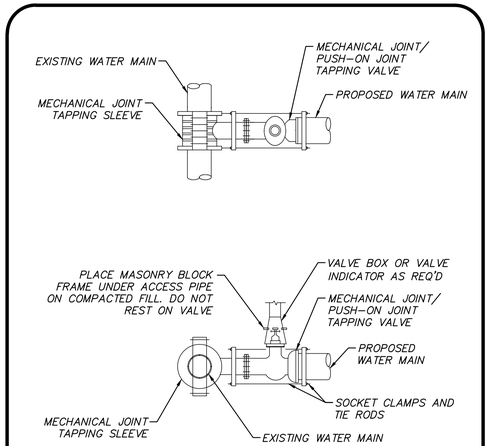
MINIMUM THRUST BLOCK BEARING AREAS				
PIPE ø	90° BEND (SQ. FT.)	45° BEND (SQ. FT.)	22.5° BEND (SQ. FT.)	TEES, PLUGS, CAPS & HYD. (SQ.FT.)
6"	5	3	3	4
8"	9	6	3	9
10"	13	7	4	12
12"	20	10	5	16

THRUST BLOCK DETAILS (5)
NOT TO SCALE



NOTES:
1. ALL HYDRANTS, VALVES AND LOCAL CONNECTIONS SHALL COMPLY WITH THE SPECIFICATIONS OF THE LOCAL MUNICIPALITY.
2. PIPING TO BE RESTRAINED WITH RETAINING GLANDS PER READING WATER DEPARTMENT (MEG-A-LUG, OR EQUAL)
3. GATE VALVE INSTALLATION IS TYPICAL FOR ALL GATES SHOWN ON THE DRAWINGS.

TYPICAL FIRE HYDRANT CONNECTION (6)
NOT TO SCALE



TAPPING SLEEVE AND VALVE (7)
NOT TO SCALE

C:\USERS\COUNN\DESKTOP\PROJECT INFO\202304-01\CIVIL\DRAWINGS\202304-01 - DETAILS.DWG

COMMONWEALTH OF MASSACHUSETTS — CARLTON M. QUINN — CIVIL — No.49923 — REGISTERED PROFESSIONAL ENGINEER — 8/14/23
PROFESSIONAL ENGINEER FOR SOMERVILLE ENGINEERING, LLC

REVISIONS

OWNER:

PETER SEIBOLD
437 SUMMER AVENUE
READING, MA 01867

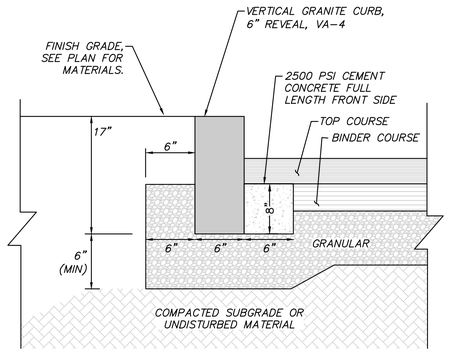
PROJECT:

DEFINITIVE SUBDIVISION
ANNETTE LANE
READING, MA

SE | SOMERVILLE ENGINEERING
519 SOMERVILLE AVENUE, SUITE #285
SOMERVILLE, MA 02144
(617)356-8185
WWW.SOMERVILLEENGINEERING.COM

DATE:	8/14/2023
SCALE:	1"=20'
PROJECT #:	202304-01
DRAWN BY:	CMQ

TITLE:	SHEET:
DETAILS	C-502

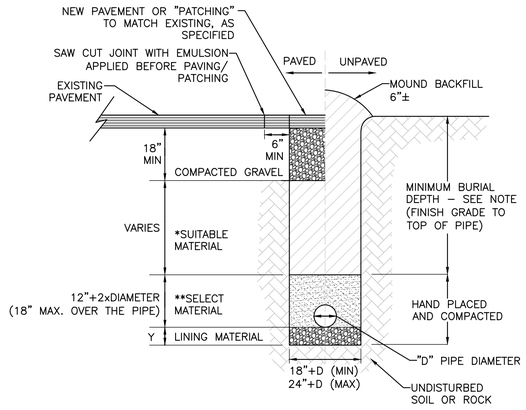


VERTICAL GRANITE CURBING (VGC)
NOT TO SCALE

11

NOTES:

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



TRENCH DETAIL
NOT TO SCALE

6

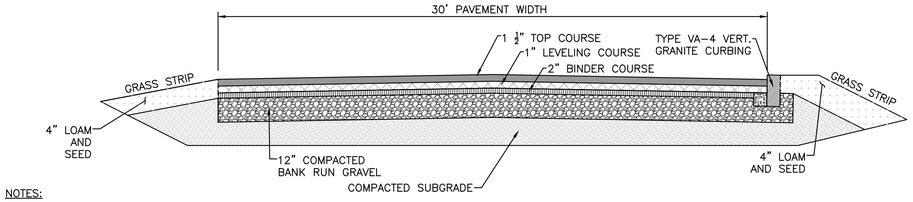
CONDITION & PIPE	**SELECT MATERIAL	LINING MATERIAL	Y–DIMENSION
DUCTILE IRON "ORDINARY SOIL"	TYPE I, II, OR III	SAND OR TYPE III	3"
RCP "ORDINARY SOIL"	TYPE II OR III	SAND OR TYPE III	3"
ALL PIPE OVER BEDROCK OR LEDGE	TYPE II OR III	SAND OR TYPE III	8"
DUCTILE IRON IN CLAY OR MUCK	TYPE II OR III	SAND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

* SUITABLE MATERIAL SHALL CONTAIN NO STONE GREATER THAN 4" IN DIAMETER, NO FROZEN LUMPS, AND ONLY MINOR AMOUNTS OF CLAY OR ORGANIC MATERIAL. ALL MATERIAL TO BE PLACED IN MAX 12" LIFTS AND COMPACTED BEFORE PLACING NEXT LIFT.

**TYPE I MATERIAL SHALL BE EITHER GRAVEL OR EXCAVATED MATERIAL CONTAINING NO STONES GREATER THAN 1.5" DIAMETER, NO FROZEN LUMPS, CLAY OR ORGANIC MATERIAL.

**TYPE II MATERIAL SHALL BE CLEAN, HARD, CRUSHED OR NATURAL STONE WITH A GRADATION BY WEIGHT OF 100% PASSING A 1.5" SQUARE OPENING, NOT MORE THAN 25% PASSING A ¾" OPENING, AND NOT MORE THAN 5% PASSING A ½" SQUARE OPENING.

**TYPE III MATERIAL SHALL BE CLEAN, HARD, CRUSHED STONE FREE FROM COATINGS AND THOROUGHLY WASHED WITH A GRADATION BY WEIGHT OF 100% PASSING A 1" SQUARE OPENING, AND 0 TO 5% PASSING A ¼" SQUARE OPENING.



NOTES:

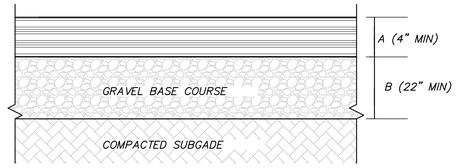
1. COMPACT SOIL SUBGRADE UNIFORMLY TO AT LEAST 95 PERCENT OF ASTM D1557 LABORATORY DENSITY.
2. PROOF–ROLL PREPARED SUBGRADE TO IDENTIFY SIFT POCKETS AND AREAS OF EXCESS YIELDING. EXCAVATE SOFT SPOTS, UNSATISFACTORY SOILS, AND AREAS OF EXCESSIVE PUMPING OR RUTTING, AS DETERMINED BY GEOTECHNICAL ENGINEER AND REPLACE WITH COMPACTED BACKFILL OR FILL AS DIRECTED.
3. CONTRACTOR SHALL COORDINATE SURFACE, BINDER, BASE, AND SUBBASE COURSES WITH GEOTECHNICAL OR SOILS REPORT. REFER TO REPORT FOR RECOMMENDATIONS FOR LOCAL SOILS OR DRAINAGE CONDITIONS AND/OR METHODS.
4. BASE COURSE SHALL EXTEND 6 INCHES BEYOND PAVEMENT EDGE WHERE PAVEMENT DOES NOT ABUT CURB, WALL, STEPS, OR FIXED OBJECT.
5. PAVEMENT EDGES SHALL BE TAMPED WHERE PAVEMENT DOES NOT ABUT CURB, WALL, STEPS, OR FIXED OBJECT

STANDARD DUTY PAVING
A = 1.50" ASPHALT CONCRETE – TOP COURSE (M3.07.00)
1.00" ASPHALT CONCRETE – LEVELING COURSE (M3.07.00)
2.50" ASPHALT CONCRETE – BINDER COURSE (M3.07.00))

B = 12" BANK RUN GRAVEL BASE COURSE – M1.03.1, PROCESSED GRAVEL FOR SUBBASE

RIGHT OF WAY PAVEMENT CROSS SECTION
NOT TO SCALE

2



NOTES:
1. SURFACE COURSE, BASE, AND SUBGRADE SHALL BE PER GEOTECHNICAL ENGINEER'S RECOMMENDATIONS FOR LOCAL SOILS OR DRAINAGE CONDITIONS AND/OR METHODS.
2. SUBGRADE SHALL BE COMPACTED TO 95% OF PROCTOR.
3. STRIP THE SOILS DOWN TO NATIVE SOILS.
4. COORDINATE PAVEMENT DETAIL WITH GEOTECH. ENGINEER.

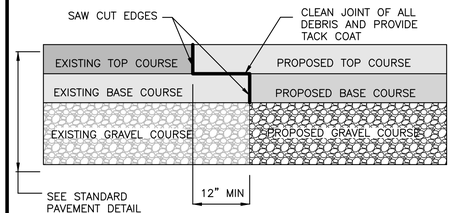
STANDARD DUTY PAVING
A = 1.5" ASPHALT CONCRETE – TOP COURSE (M3.07.00)
2.5" ASPHALT CONCRETE – BINDER COURSE (M3.07.00)

B = 6" DENSE GRADE CRUSHED STONE (M2.01.7)
16" GRAVEL BORROW SUBBASE ((M1.03.0)

DRIVEWAY ASPHALT
NOT TO SCALE

3

NOTE:
TACK COAT – PROVIDE EMULSIFIED ASPHALT WHICH CONFORMS TO THE REQUIREMENTS OF THE STATE SPECIFICATIONS, DILUTED WITH ONE PART WATER TO ONE ONE PART ASPHALT FOLLOWING AASHTO M140/ASTM D997, OR AASHTO M208/ASTM D2397, SS–1H, CSS–1, OR CSS–1H.



PAVEMENT KEY CUT DETAIL
NOT TO SCALE

7

8/14/23
COMMONWEALTH OF MASSACHUSETTS
CARLTON M. QUINN
CIVIL
No.49923
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER FOR
SOMERVILLE ENGINEERING, LLC

REVISIONS

OWNER:

PETER SEIBOLD
437 SUMMER AVENUE
READING, MA 01867

PROJECT:

DEFINITIVE SUBDIVISION
ANNETTE LANE
READING, MA

SE | SOMERVILLE ENGINEERING
519 SOMERVILLE AVENUE, SUITE #285
SOMERVILLE, MA 02144
(617)356-8185
WWW.SOMERVILLEENGINEERING.COM

DATE:	8/14/2023
SCALE:	1"=20'
PROJECT #:	202304-01
DRAWN BY:	CMQ

TITLE:	SHEET:
DETAILS	C-503

C:\USERS\QUINN\DESKTOP\PROJECT INFO\202304-01\CIVIL\DRAWINGS\202304-01 - DETAILS.DWG

Town of Reading

16 Lowell Street
Reading, MA 01867-2683
Phone: 781-942-6670
Email: amacnichol@ci.reading.ma.us

Community Planning and Development Commission

NOTICE OF PUBLIC HEARING

Notice is hereby given, that pursuant to M.G.L. Chapter 41 Section 81T, Reading Subdivision Regulations Sections 3.0 and 6.0, Reading General Bylaw Section 7.9, and Reading Stormwater Management and Erosion Control Regulations Section 4.5, the Community Planning and Development Commission (CPDC) will hold a Public Hearing on **Monday, October 16 at 7:30PM,** in the Select Board Room at Town Hall, 16 Lowell Street, Reading MA, and through the remote and online measures below, to consider the application for a **1-Lot Definitive Subdivision and Stormwater Permit,** submitted by **Peter Seibold,** for land located at **0 Annette Lane** (Assessors Map 38, Lot 139) in Reading, Massachusetts. A copy of the application and accompanying plans are available to the public at Town Hall by appointment and on the Town website the Thursday prior to the hearing.

Join Zoom Meeting
https://us06web.zoom.us/j/89927831029

Meeting ID: 899 2783 1029

Dial by your location
+1 646 558 8656 US (New York)

Find your local number:
https://us06web.zoom.us/u/kcokCz48wq

If you have any questions, comments, or difficulty accessing the meeting, please email Community Development Director Andrew MacNichol at amacnichol@ci.reading.ma.us.

Reading Community Planning & Development Commission