

# 25 HAVEN ST.

## READING, MA

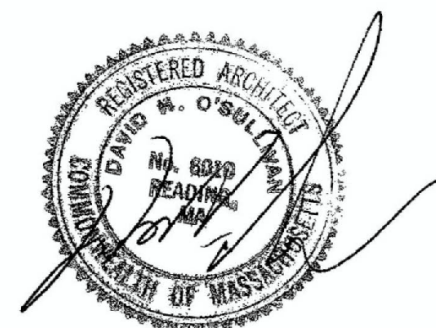


### SUBMISSION DRAWING LIST

~~REVISED: 10/24/2022~~

REVISED 2: 11/28/2022

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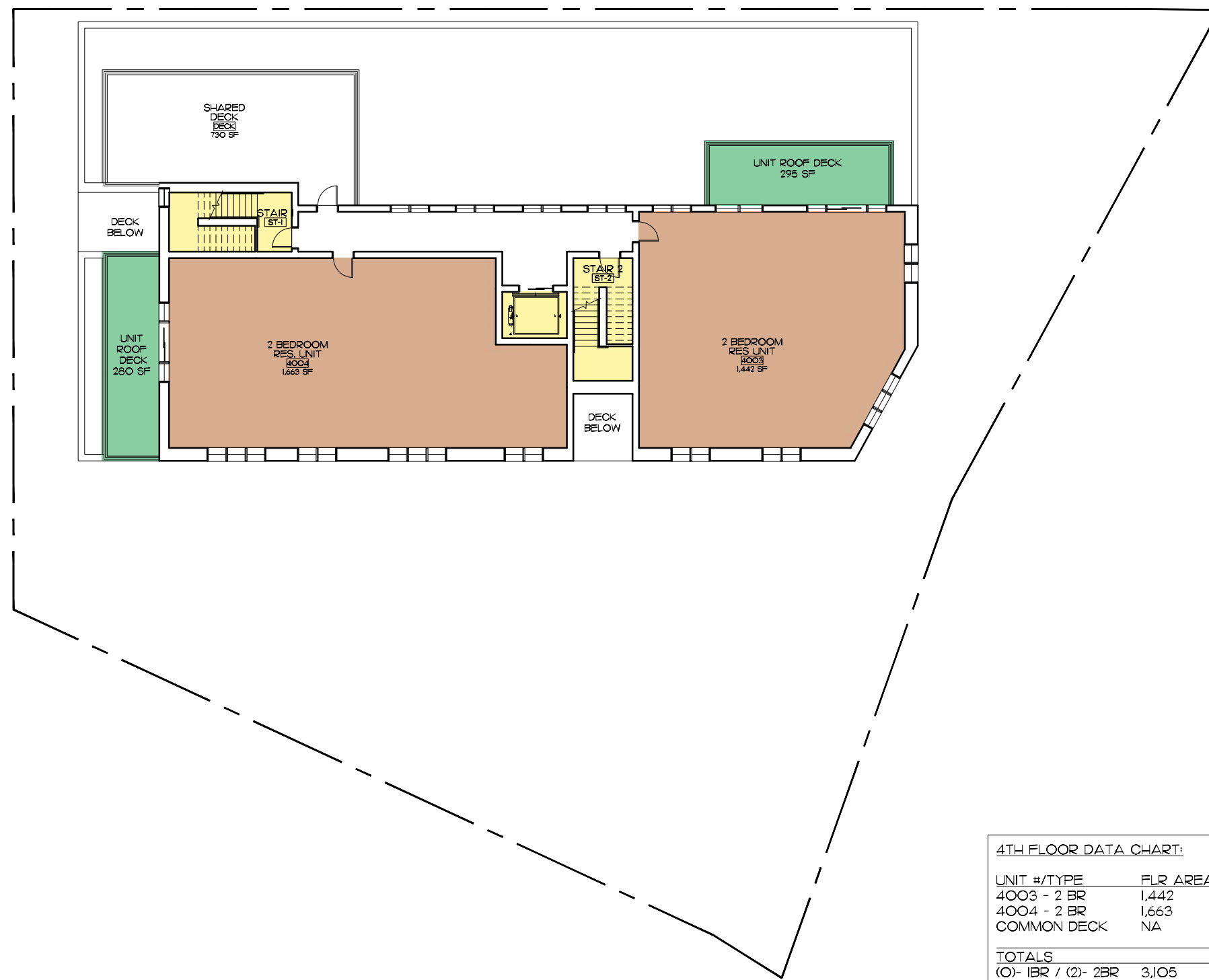


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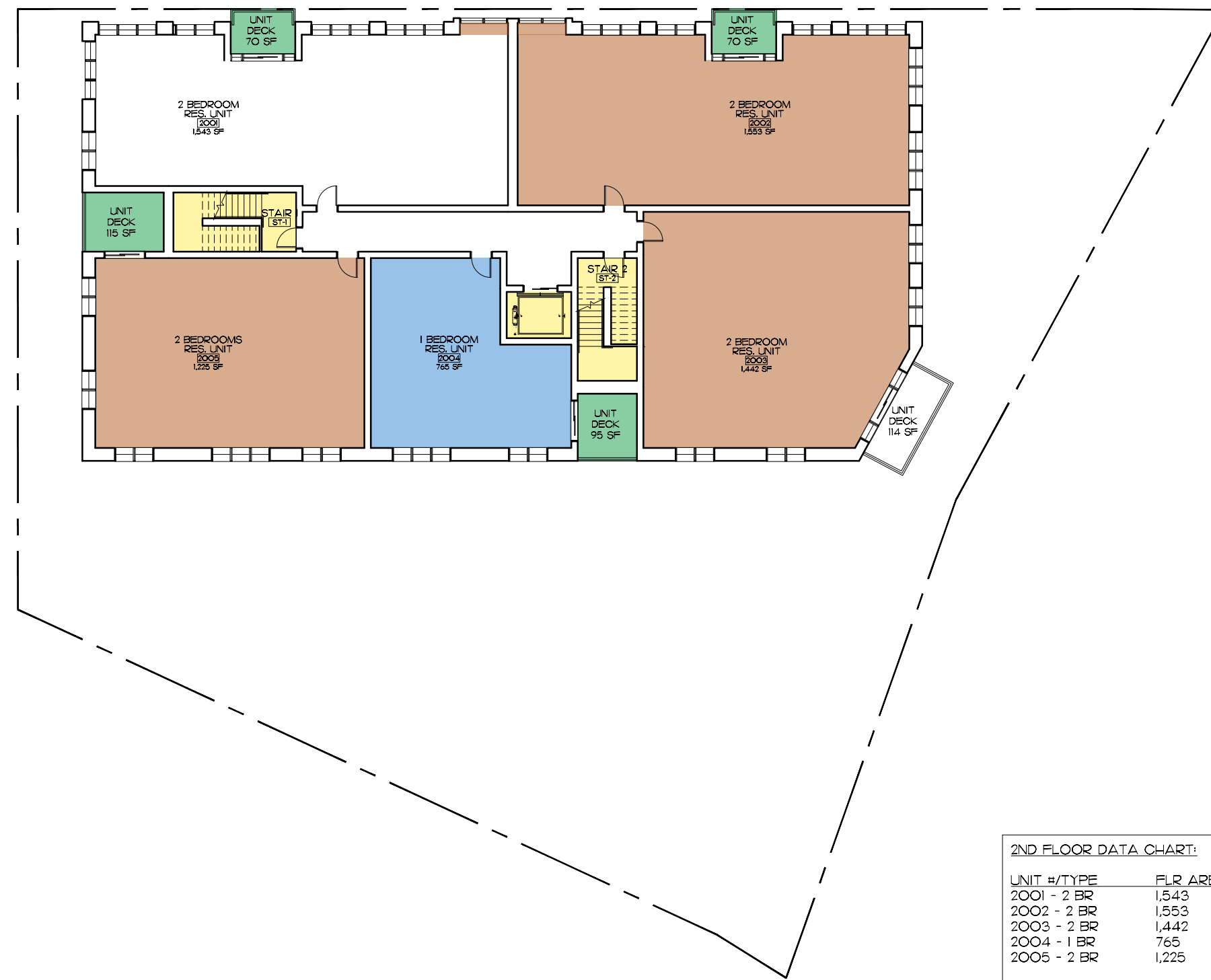
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4TH FLOOR DATA CHART:

UNIT #/TYPE	FLR. AREA NET SF	OPEN SP. SF
4003 - 2 BR	1,442	295
4004 - 2 BR	1,663	290
COMMON DECK	NA	730
<b>TOTALS</b>		
01- 1BR / 02- 2BR	3,105	1,305

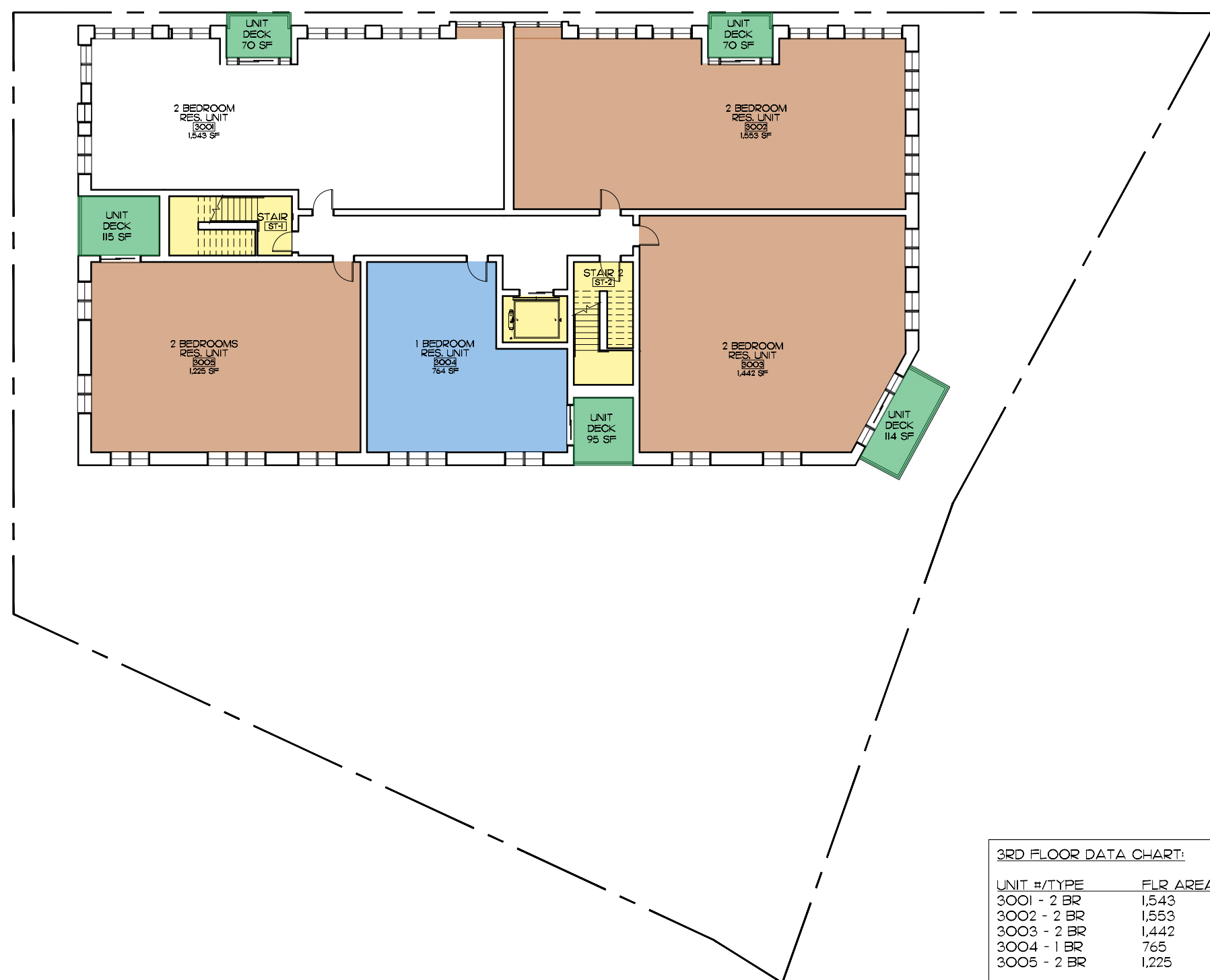
4 FOURTH FLOOR  
Scale: 1 to 20



2ND FLOOR DATA CHART:

UNIT #/TYPE	FLR. AREA NET SF	OPEN SP. SF
2001 - 2 BR	1,543	70
2002 - 2 BR	1,553	70
2003 - 2 BR	1,442	114
2004 - 1 BR	765	95
2005 - 2 BR	1,225	115
<b>TOTALS</b>		
01- 1BR / 04- 2BR	6,528	464 SF

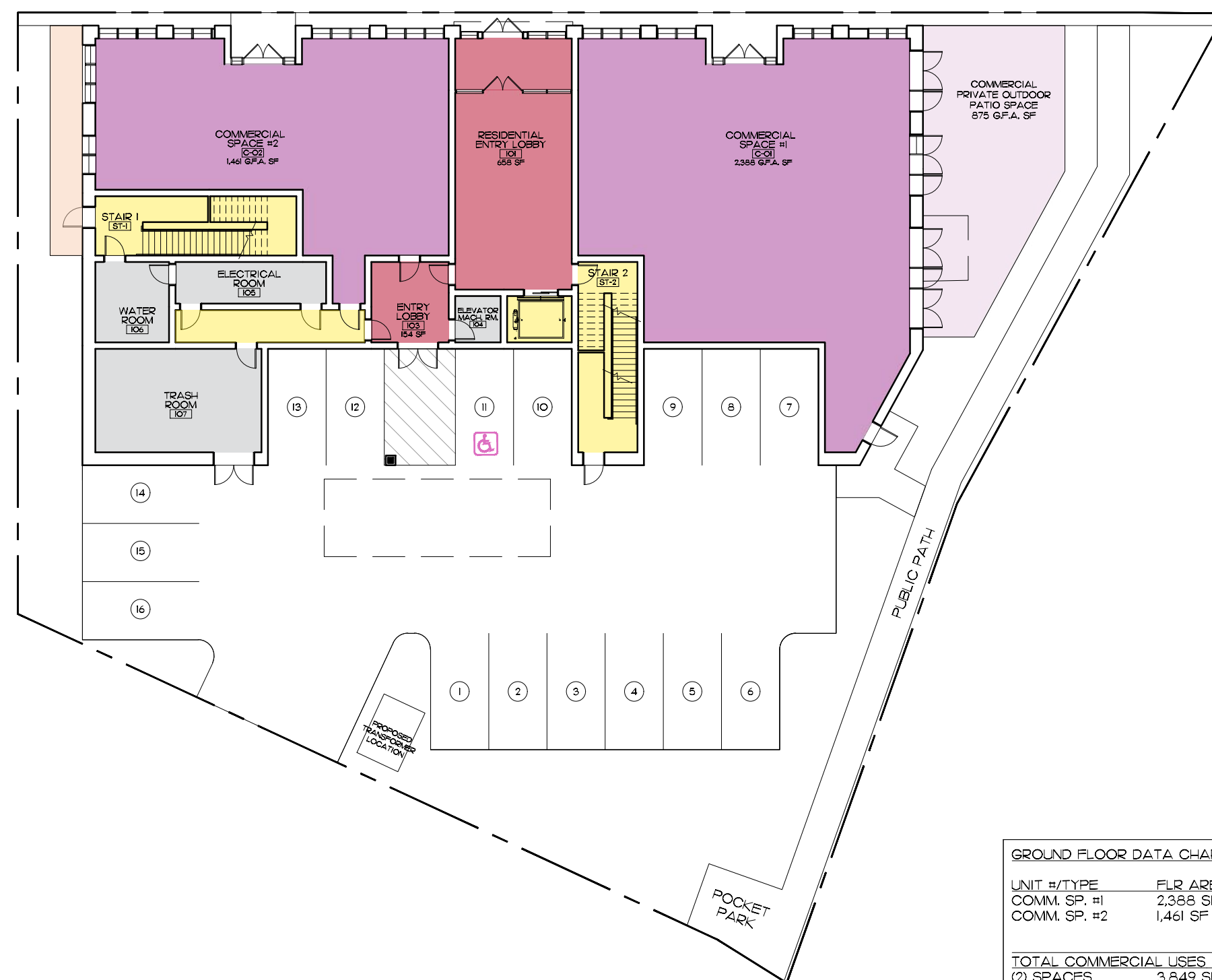
2 SECOND FLOOR  
Scale: 1 to 20



3RD FLOOR DATA CHART:

UNIT #/TYPE	FLR. AREA NET SF	OPEN SP. SF
3001 - 2 BR	1,543	70
3002 - 2 BR	1,553	70
3003 - 2 BR	1,442	114
3004 - 1 BR	765	95
3005 - 2 BR	1,225	115
<b>TOTALS</b>		
01- 1BR / 04- 2BR	6,528	464 SF

3 THIRD FLOOR  
Scale: 1 to 20



GROUND FLOOR DATA CHART:

UNIT #/TYPE	FLR. AREA NET SF	OPEN SP. SF
COMM. SP. #1	2,358 SF	875
COMM. SP. #2	1,461 SF	0
<b>TOTAL COMMERCIAL USES</b>		
(2) SPACES	3,819 SF	875
TOTAL COMMERCIAL SPACE ON SITE	4,774 SQ. FT. VS. GROSS FL. AREA	
RESIDENT LOBBY	658 SF	
<b>TOTAL FLOOR AREA NET (INCLUDING GARAGE)</b>	8,637 SF	
PUBLIC USE OPEN SPACE	1,308 SF	
PRIVATE AMENITY OPEN SPACE	875 SF	
GROUND LEVEL OPEN SPACE	3,392 SF	
<b>TOTAL OPEN SPACE</b>	5,575 SF	
PARKING	16 PROVIDED (1.33 PER UNIT)	

1 GROUND FLOOR  
Scale: 1 to 20

TOTAL BUILDING DATA CHART:

EXISTING BUILDING SIZE: +/-7,953 SF COMMERCIAL USE  
EXISTING BUILDING PARKING COUNT: 18 SPACES

NEW BUILDING:

ITEM	TOTAL FLR. AREA NET SF
GROUND	8,637
SECOND	8,416
THIRD	8,416
FOURTH	4,540
<b>TOTAL</b>	30,009 SF

FAR: 1.58 (+/-18,935 LOT AREA)

LOT COVERAGE: 13,070 SF (69%)  
(INCLUDES SURFACE PARKING)

HEIGHT: 44' PROVIDED (45' ALLOWED)

SETBACKS -  
FRONT: 2' (0' MIN - 10' MAX)  
SIDE: 10' & 16' MIN. (15' ALLOWED)  
REAR: NA OR 25' MIN. (15' ALLOWED)  
(REAR & SIDE 15' WHEN ABUTTING RESIDENT USE/ZONE)  
CUMULATIVE: 53' PROVIDED

PARKING: 16 PROVIDED (1.33 PER UNIT)

OPEN SPACE -

FLR	PRIVATE	GREEN
1	875	4,700
2	464	
3	464	
4	1,305	
<b>SUB-TOTAL:</b>	3,108	4,700
<b>TOTAL</b>	7,808 SF (651 SF/UNIT)	

UNIT DENSITY PER ACRE (20 PER ACRE REQUIRED)  
PROPOSED: 27.9 UNIT/ACRE (\*)

(\*) WAIVER REQUESTED

TOTAL UNITS: 2 (1-BR) 10 (2-BR) = 12 TOTAL

RELIEF REQUEST CHART

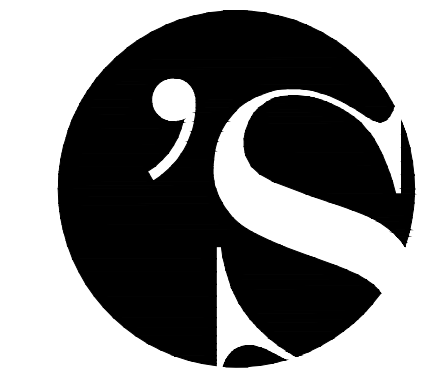
ITEM	REQUIRED	PROVIDED	RELIEF (Y/N)
MAX FAR	2.8 (MIXED USE)	1.58	N
MIN. LOT FRONTAGE	50'	156'-9"	N
MAX LOT COVERAGE	NA	69%	N
MIN. LOT AREA	NA	+/-18,935	N
MAX. BLDG FRONTAGE	300'	158'-6"	N
YARD SETBACKS:			
FRONT (MIN/MAX)	0'/0'	2'	N
MIN. SIDE	0' (OR 15')	10' /6' MIN.	N
MIN. REAR	0' (OR 15')	25' MIN.	N
INTERIOR BETWEEN BLDGS MIN.	15'	NA	N
DWELLING UNIT PER ACRE	20	27.9	Y
MIN. PARKING	1.25 (15)	1.33 (16)	N

GRAPHIC KEY:

- 2 BR UNIT TYPE
- 1 BR UNIT TYPE
- EGRESS/CIRCULATION
- COMMERCIAL SPACE
- RESIDENT LOBBY
- UTILITY/MECHANICAL SPACE

OPEN SPACE TYPES:

- PRIVATE OPEN SPACE FOR BUILDING TENANT USE
- OPEN SPACE
- SEMI-PUBLIC OPEN SPACE



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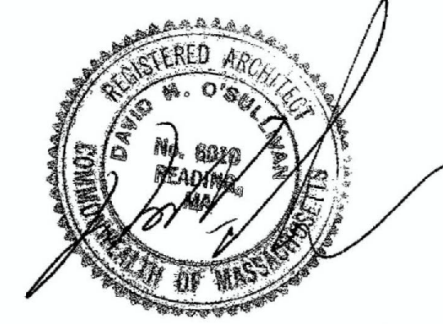
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Project Data Page



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JOB NO: 21015

SHEET NUMBER

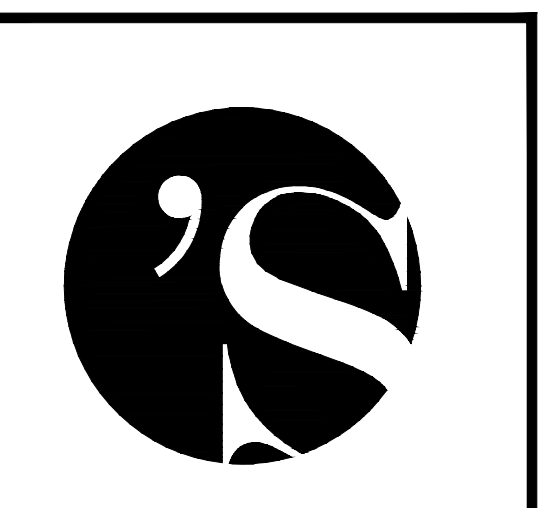
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- GENERAL LANDSCAPE NOTES
- AREAS NOT OTHERWISE DEVELOPED SHALL RECEIVE MIN. 6" COMPACTED DEPTH SCREENED LOAM. EXISTING LOAM, IF ANY, SHALL BE STOCKPILED FOR LATER USE.
  - FINISH COVER OVER PLANTING BEDS SHALL INCLUDE 3" MIN. DEPTH PINE MULCH.
  - FINISH SURFACE SHALL BE GRADED FROM A HIGH POINT AT CENTER OF ISLAND OUT TO THE BACK OF CURB. SEE GRADING, DRAINAGE, AND PAVIGN PLAN FOR FINISHES AND GRADES.
  - AT A MIN. TREES AND SHRUBS SHALL BE WATERED BY FLOODING AS FOLLOWS:  
0-3 MONTHS - ONCE PER WEEK  
3-6 MONTHS - TWICE PER MONTH  
6-12 MONTHS - ONCE PER MONTH
  - NUMBER OF PLANT TYPE AND SIZE PROVIDED IN THE PLANT LIST IS FOR CONTRACTORS CONVENIENCE ONLY. IF DISCREPANCY EXISTS BETWEEN THE NUMBER OF PLANTS ON THE LIST AND THE NUMBER SHOWN ON THE DRAWINGS, THE GREATER NUMBER SHALL APPLY.
  - ALL PLANT MATERIAL SHALL BE APPROVED THE LANDSCAPE ARCHITECT OR OWNERS REP PRIOR TO ARRIVAL ON SITE.
  - PLANT MATERIAL SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE.
  - CONTRACTORS SHALL LOCATE AND MARK ALL UTILITIES PRIOR TO PLANTING. ANY CONFLICTS BETWEEN PLANTING AND UTILITIES SHALL BE IMMEDIATELY REPORTED TO THE LANDSCAPE ARCHITECT SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.
  - NO SUBSTITUTIONS OF PLANT MATERIALS WILL BE ALLOWED WITHOUT THE WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PLANTS AGAINST DAMAGE FROM ON GOING CONSTRUCTION. PROTECTION SHALL BEGIN AT THE TIME THE PLAN IS INSTALLED AND CONTINUE UNTIL FORMAL ACCEPTANCE OF ALL PLANTING.
  - ALL DISTURBED AREAS OUTSIDE THE LIMIT OF USE AREA SHALL BE SEEDED WITH CONSERVATION SEED MIX AND 4" LOAM.

BASIS OF DESIGN PRELIMINARY PLANT SCHEDULE

QTY.	KEY	BOTANICAL NAME	COMMON NAME	SIZE
TREES				
5	RM	ACER RUBRUM 'RED SUNSET'	RED SUNSET MAPLE	2.5'-3'
6	GIN	GINKGO BILOBA 'AUTUMN GOLD'	MAIDENHAIR TREE	2.5'-3'
SHRUBS				
3	ACP	AZALEA 'CORNELL PINK'	CORNELL PINK AZALEA	2'-3'
8	GVBX	BUXUS KOREANA 'GREEN VELVET'	GREEN VELVET BOXWOOD	2'-2.5'
4	KOR	ROSA 'KNOCKOUT' (IN PLANTERS)	KNOCKOUT ROSE	2 GAL.
4	OLHY	HYDRANGEA QUERCIFOLIA	OAK LEAF HYDRANGEA	3 GAL.
PERENNIALS				
30	FG	PENNISETUM ALOPECUROIDES	FOUNTAIN GRASS	1 GAL.
28	GER	GERANIUM MACRORRHIZUM 'SPESSART'	CRANESBILL GERANIUM	1 GAL.



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Reading, MA

Schematic  
Landscape  
Layout Plan

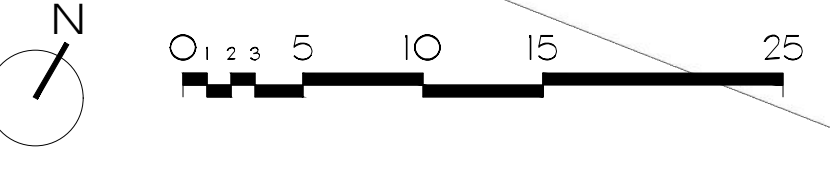


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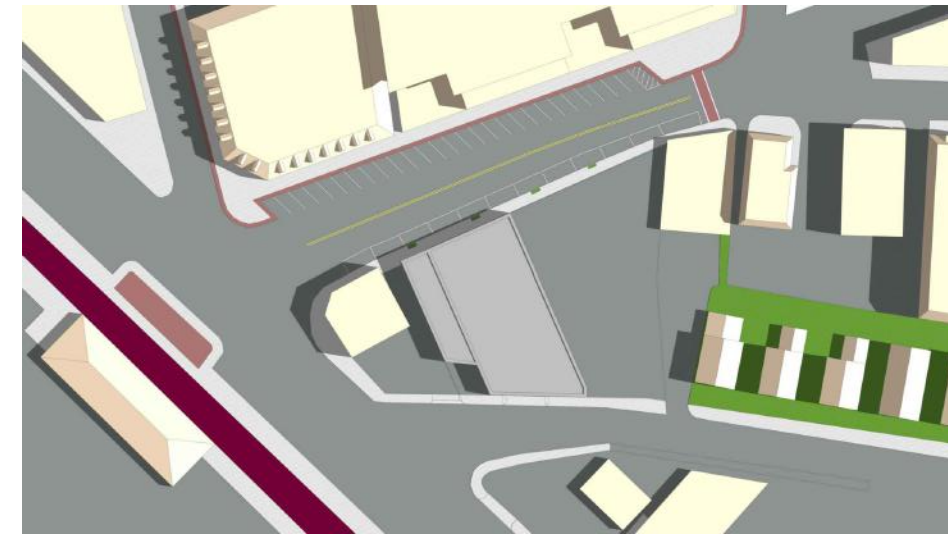
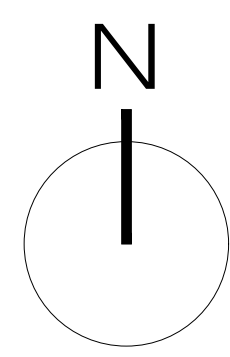
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SCHEMATIC LANDSCAPE LAYOUT PLAN  
Scale: 1/8" = 1'



SUMMER SOLSTICE



S9 EXISTING: +/- 9AM  
Scale: 1 to 20

S9 PROPOSED: +/- 9AM  
Scale: 1 to 20



S12 EXISTING: +/- NOON  
Scale: 1 to 20

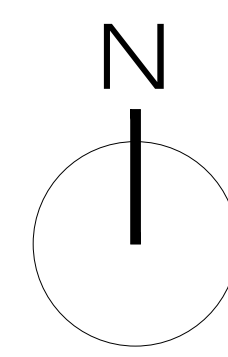
S12 PROPOSED: +/- NOON  
Scale: 1 to 20



S4 EXISTING: +/- 4 PM  
Scale: 1 to 20

S4 PROPOSED: +/- 4PM  
Scale: 1 to 20

FALL/SPRING EQUINOX



F9 EXISTING: +/- 9AM  
Scale: 1 to 20

F9 PROPOSED: +/- 9AM  
Scale: 1 to 20



F12 EXISTING: +/- NOON  
Scale: 1 to 20

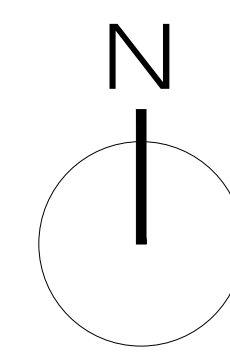
F12 PROPOSED: +/- NOON  
Scale: 1 to 20



F4 EXISTING: +/- 4 PM  
Scale: 1 to 20

F4 PROPOSED: +/- 4PM  
Scale: 1 to 20

WINTER SOLSTICE



W9 EXISTING: +/- 9AM  
Scale: 1 to 20

W9 PROPOSED: +/- 9AM  
Scale: 1 to 20



W12 EXISTING: +/- NOON  
Scale: 1 to 20

W12 PROPOSED: +/- NOON  
Scale: 1 to 20



W4 EXISTING: +/- 4 PM  
Scale: 1 to 20

W4 PROPOSED: +/- 4PM  
Scale: 1 to 20



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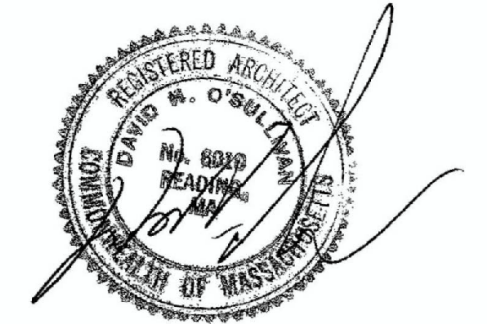
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SHADOW STUDIES



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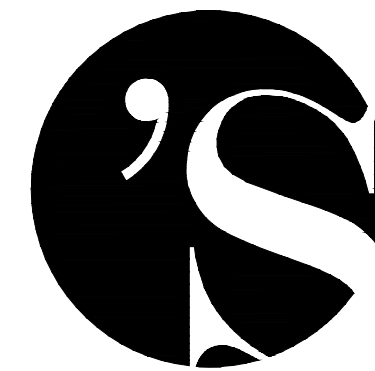
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Schematic Light  
Layout &  
Photometric

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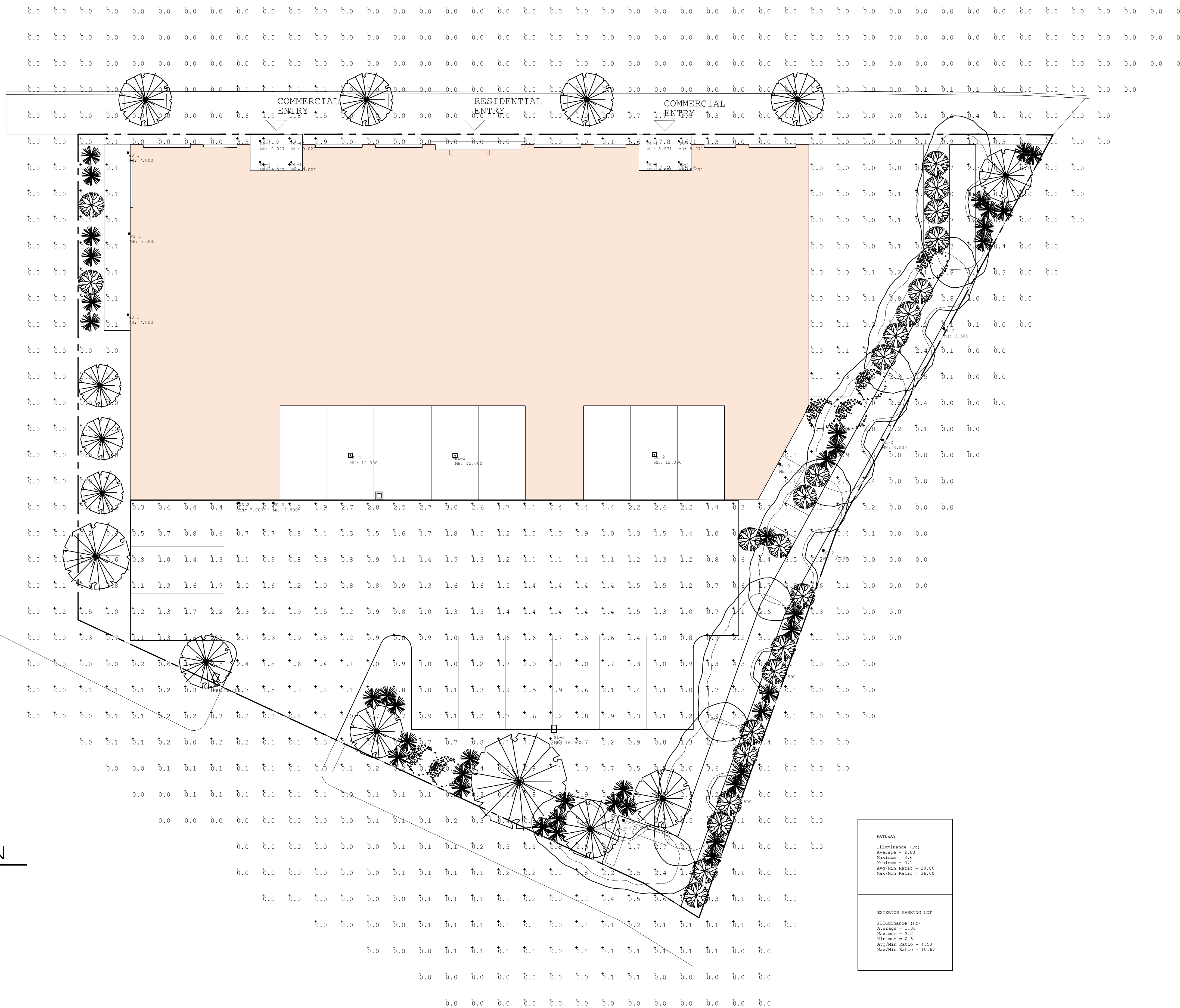
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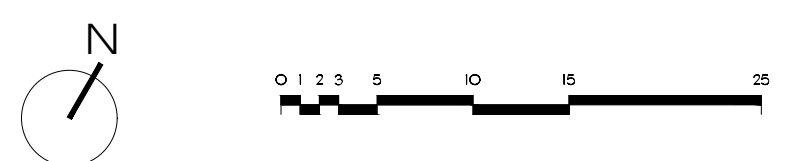
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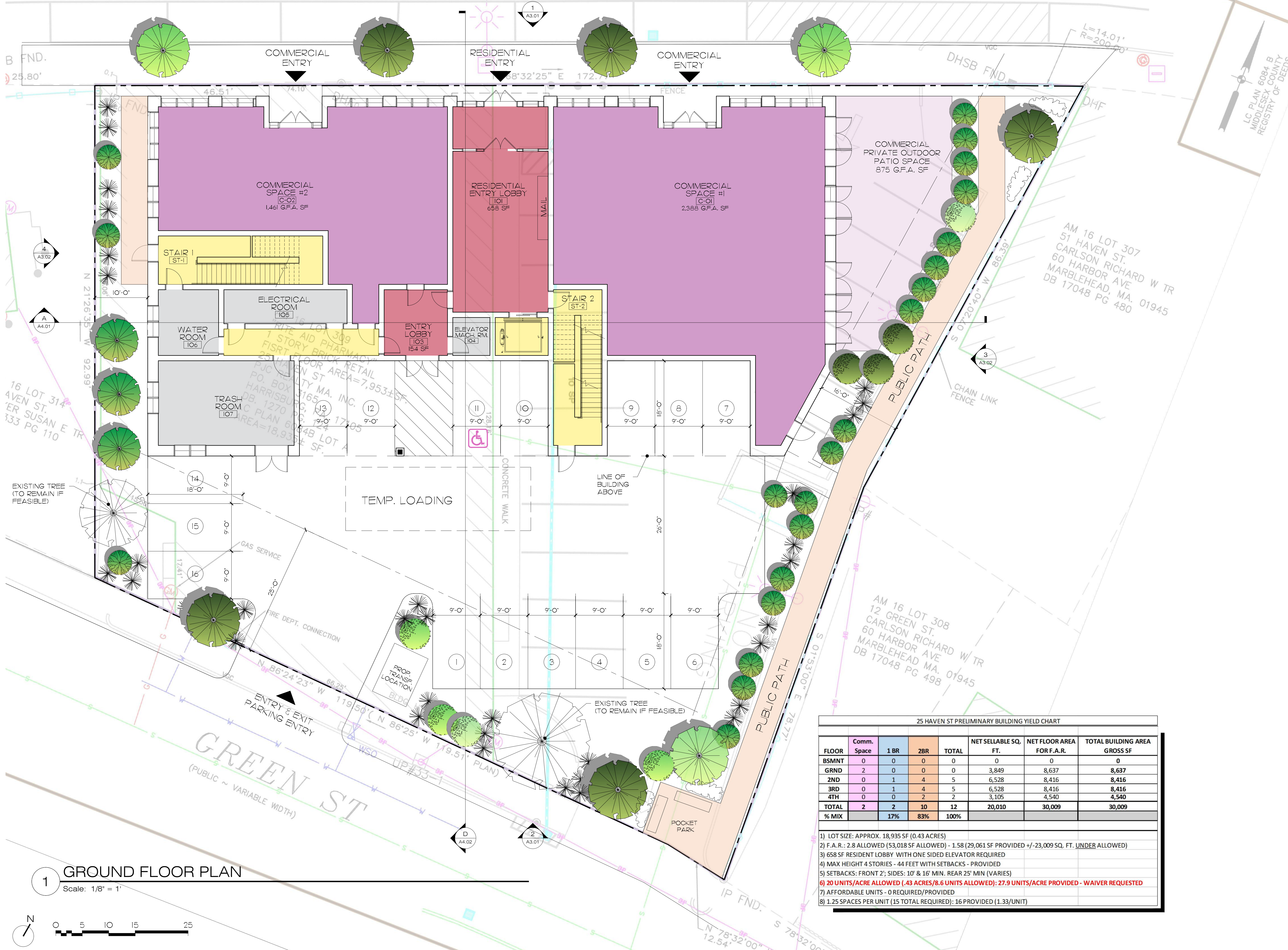
<b>PATHWAY</b>
Illuminance (Fc)
Average = 2.00
Maximum = 3.6
Minimum = 0.1
Avg/Min Ratio = 20.00
Max/Min Ratio = 36.00
<b>EXTERIOR PARKING LOT</b>
Illuminance (Fc)
Average = 1.36
Maximum = 3.2
Minimum = 0.3
Avg/Min Ratio = 4.53
Max/Min Ratio = 10.67

**L SCHEMATIC LIGHTING PLAN**  
Scale: 1 to 10'



Symbol	Tag	Qty	Label	Arrangement	LLF	Description	Lum. Watts	Lum. Lumens
		7	BL-2	Single	0.900	PA7R-NU3HS-12L-010-4K7	14	744
		8	DL-1	Single	0.900	ENCL2SF-L081, ENCL2SFD-930W-W	7.4	648
		3	DL-2	Single	0.900	LSQ1-25-4K7-UNV-X	24.3	3170
		1	SL-1	Single	0.900	VP-1-160L-35-4K7-4F-BC	34.9	2687
		1	SL-3	Single	0.900	VP-1-160L-35-4K-4F	34.9	4567
		6	WS-3	Single	0.900	BRIAN MT2	33.51	193

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min	Grid Z
GRID AT GRADE	Illuminance	Fc	0.67	18.2	0.0	N.A.	N.A.	0
EXTERIOR PARKING LOT	Illuminance	Fc	1.36	3.2	0.3	4.53	10.67	
PATHWAY	Illuminance	Fc	2.00	3.6	0.1	20.00	36.00	

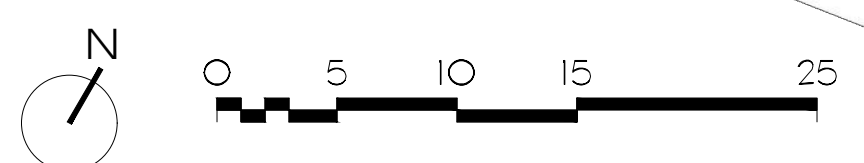


25 HAVEN ST PRELIMINARY BUILDING YIELD CHART

FLOOR	Comm. Space	1 BR	2BR	TOTAL	NET SELLABLE SQ. FT.	NET FLOOR AREA FOR F.A.R.	TOTAL BUILDING AREA GROSS SF
BSMNT	0	0	0	0	0	0	0
GRND	2	0	0	0	3,849	8,637	8,637
2ND	0	1	4	5	6,528	8,416	8,416
3RD	0	1	4	5	6,528	8,416	8,416
4TH	0	0	2	2	3,105	4,540	4,540
<b>TOTAL</b>	<b>2</b>	<b>2</b>	<b>10</b>	<b>12</b>	<b>20,010</b>	<b>30,009</b>	<b>30,009</b>
% MIX		17%	83%	100%			

- 1) LOT SIZE: APPROX. 18,935 SF (0.43 ACRES)
- 2) F.A.R.: 2.8 ALLOWED (53,018 SF ALLOWED) - 1.58 (29,061 SF PROVIDED +/- 23,009 SQ. FT. UNDER ALLOWED)
- 3) 658 SF RESIDENT LOBBY WITH ONE SIDED ELEVATOR REQUIRED
- 4) MAX HEIGHT 4 STORIES - 44 FEET WITH SETBACKS - PROVIDED
- 5) SETBACKS: FRONT 2'; SIDES: 10' & 16' MIN. REAR 25' MIN (VARIES)
- 6) 20 UNITS/ACRE ALLOWED (.43 ACRES/8.6 UNITS ALLOWED); 27.9 UNITS/ACRE PROVIDED - WAIVER REQUESTED
- 7) AFFORDABLE UNITS - 0 REQUIRED/PROVIDED
- 8) 1.25 SPACES PER UNIT (15 TOTAL REQUIRED); 16 PROVIDED (1.33/UNIT)

1 GROUND FLOOR PLAN  
Scale: 1/8" = 1'



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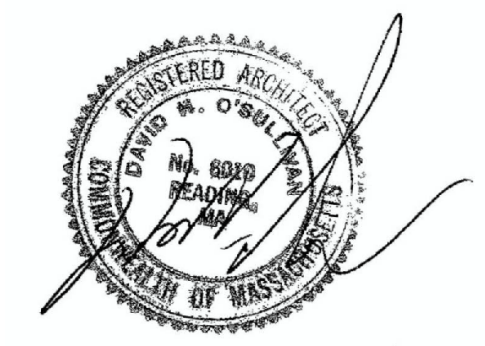
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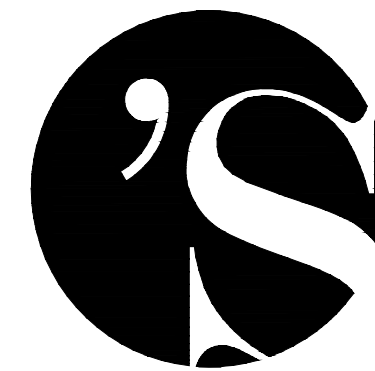
Ground Floor Plan



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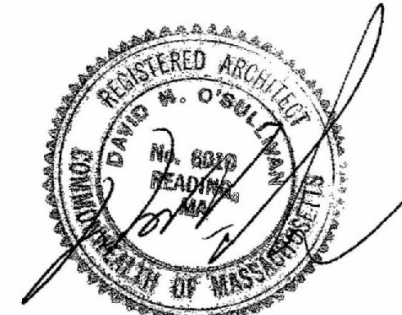
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25 Haven Street  
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Second Floor Plan



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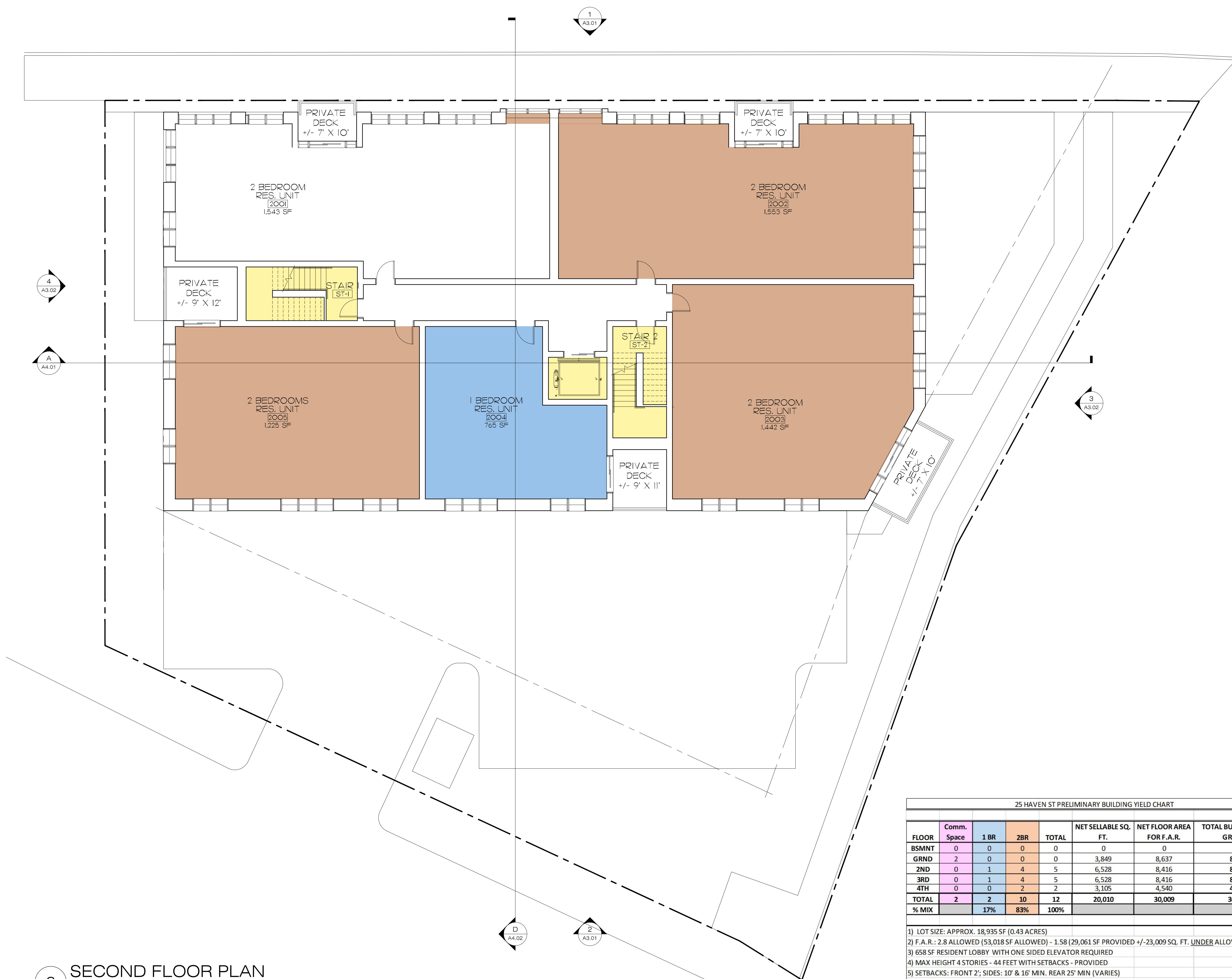
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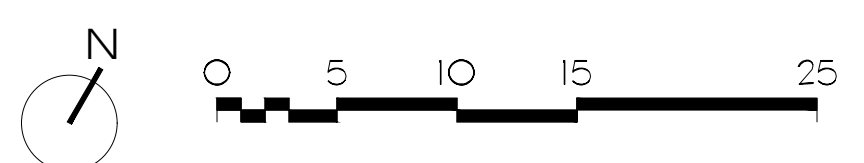


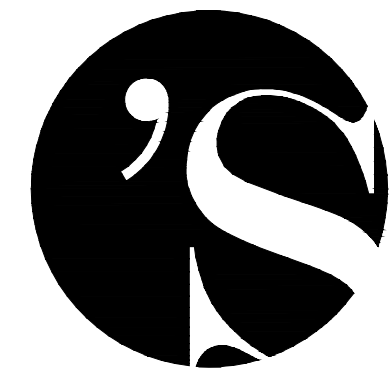
25 HAVEN ST PRELIMINARY BUILDING YIELD CHART							
FLOOR	Comm. Space	1 BR	2BR	TOTAL	NET SELLABLE SQ. FT.	NET FLOOR AREA FOR F.A.R.	TOTAL BUILDING AREA GROSS SF
BSMNT	0	0	0	0	0	0	0
GRND	2	0	0	0	3,849	8,637	8,637
2ND	0	1	4	5	6,528	8,416	8,416
3RD	0	1	4	5	6,528	8,416	8,416
4TH	0	0	2	2	3,105	4,540	4,540
<b>TOTAL</b>	<b>2</b>	<b>2</b>	<b>10</b>	<b>12</b>	<b>20,010</b>	<b>30,009</b>	<b>30,009</b>
% MIX		17%	83%	100%			

- 1) LOT SIZE: APPROX. 18,935 SF (0.43 ACRES)
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2 SECOND FLOOR PLAN

Scale: 1/8" = 1'





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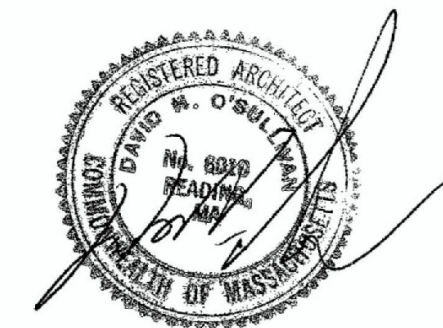
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Third Floor Plan



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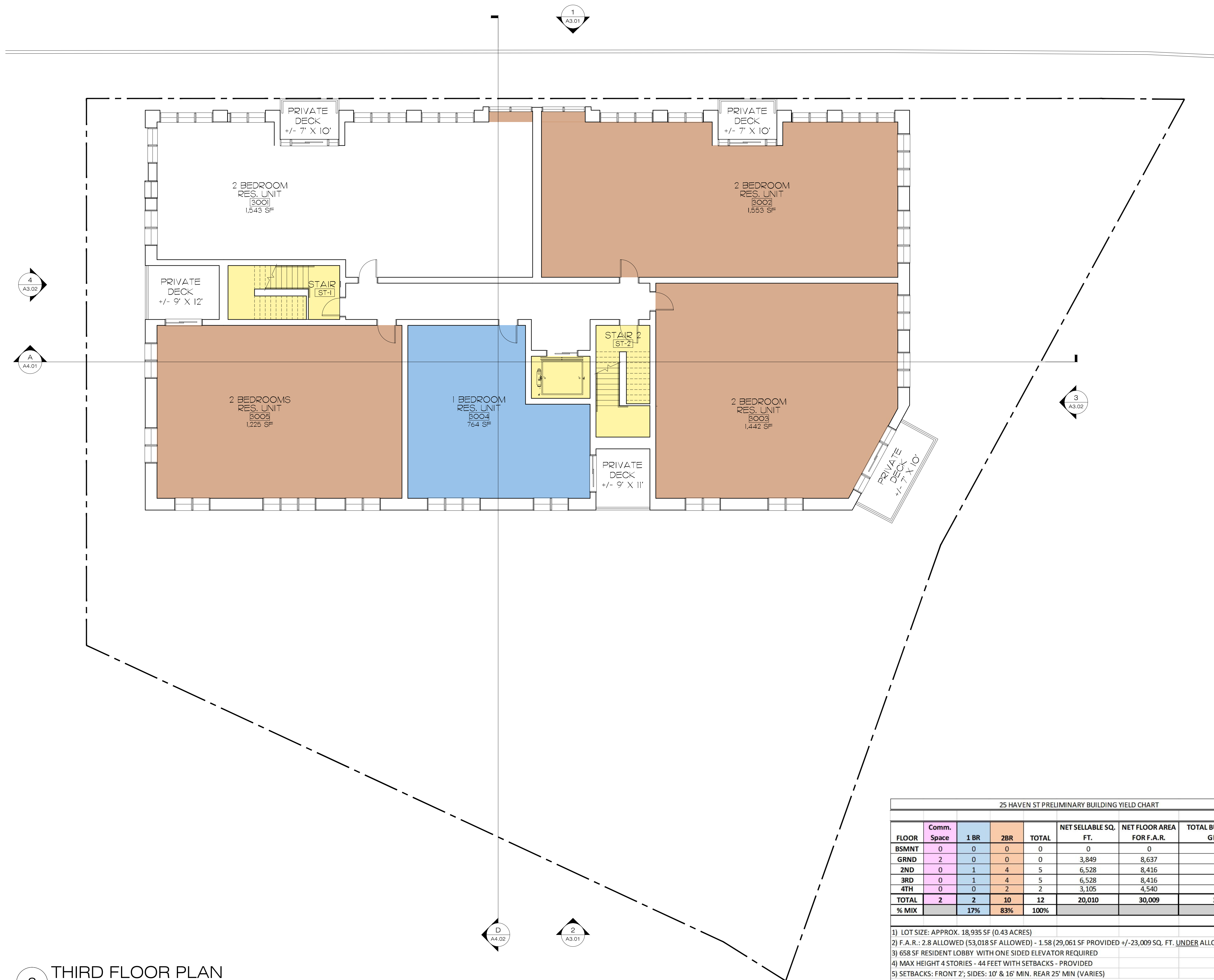
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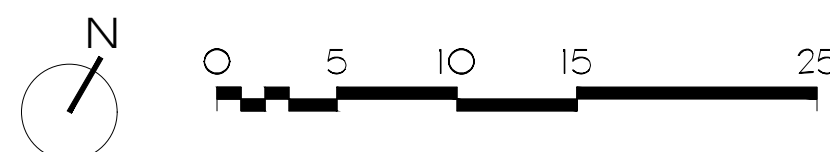


25 HAVEN ST PRELIMINARY BUILDING YIELD CHART							
FLOOR	Comm. Space	1 BR	2BR	TOTAL	NET SELLABLE SQ. FT.	NET FLOOR AREA FOR F.A.R.	TOTAL BUILDING AREA GROSS SF
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4TH	0	0	2	2	3,105	4,540	4,540
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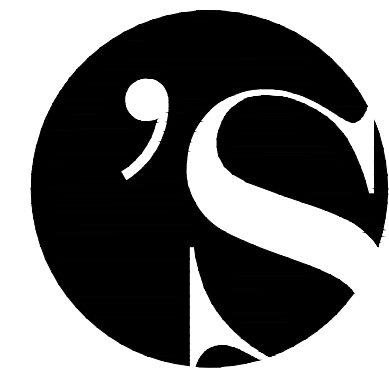
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3 THIRD FLOOR PLAN

Scale: 1/8" = 1'







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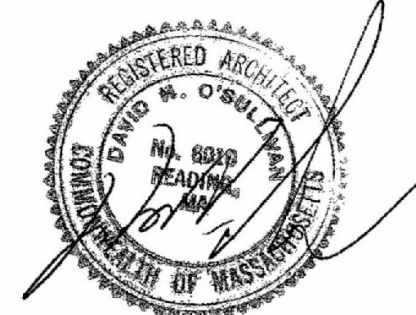
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Fourth Floor Plan



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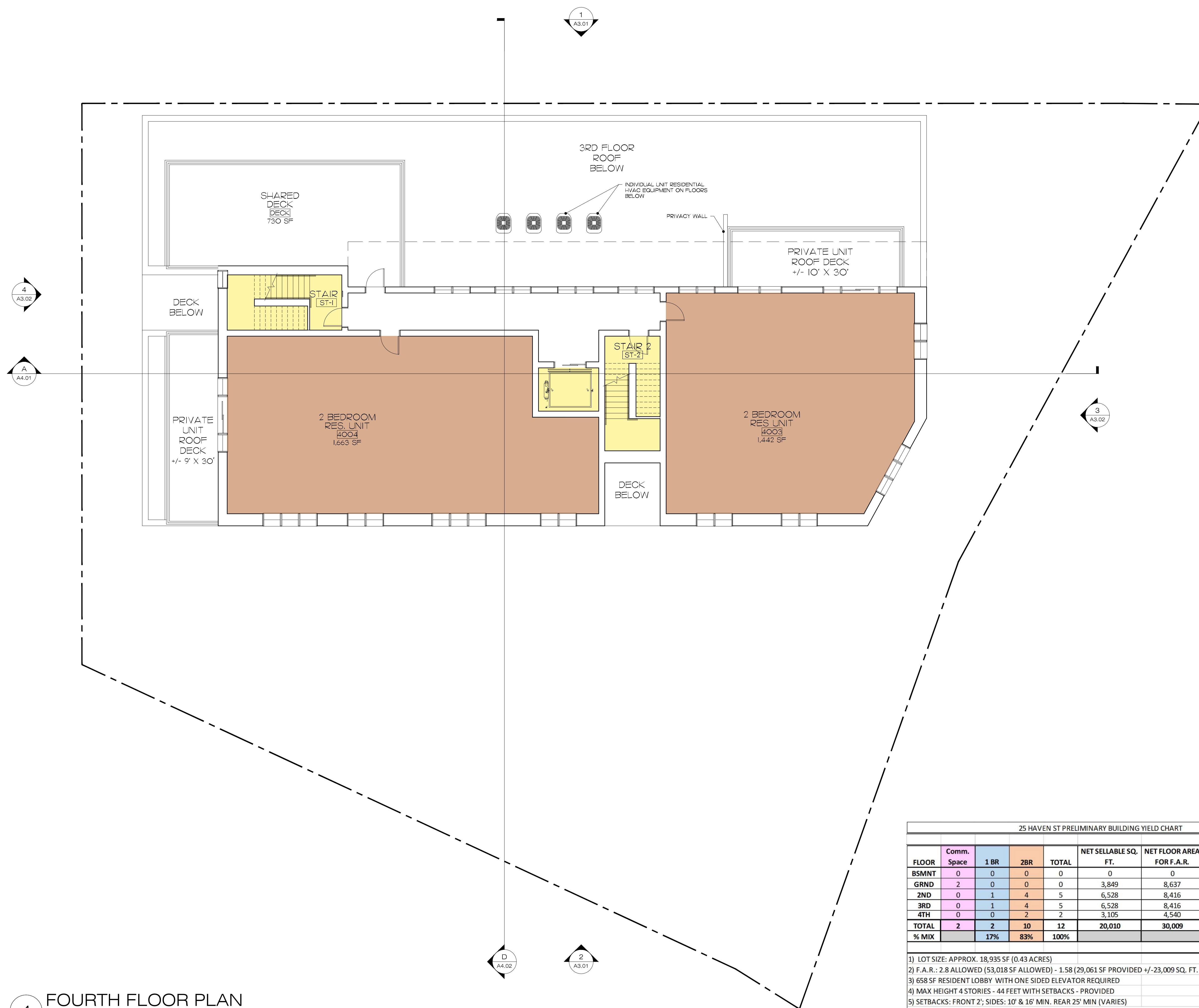
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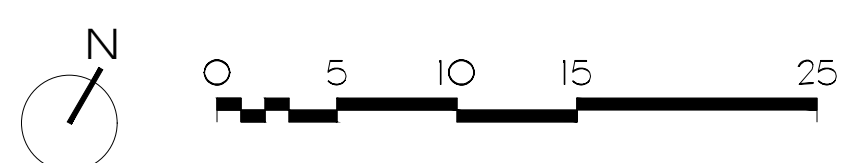
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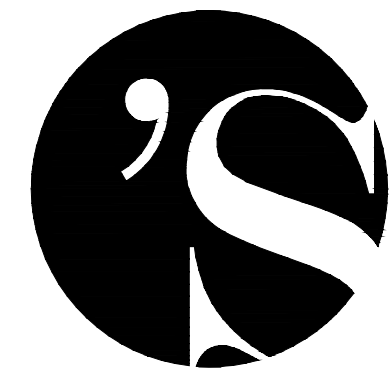


25 HAVEN ST PRELIMINARY BUILDING YIELD CHART							
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4 FOURTH FLOOR PLAN  
Scale: 1/8" = 1'





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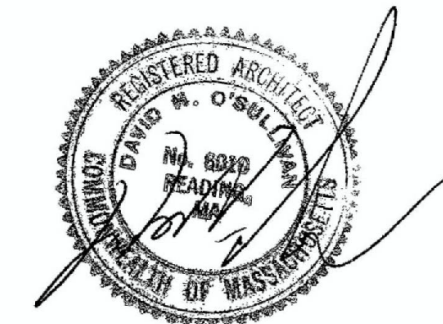
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Roof Level Plan



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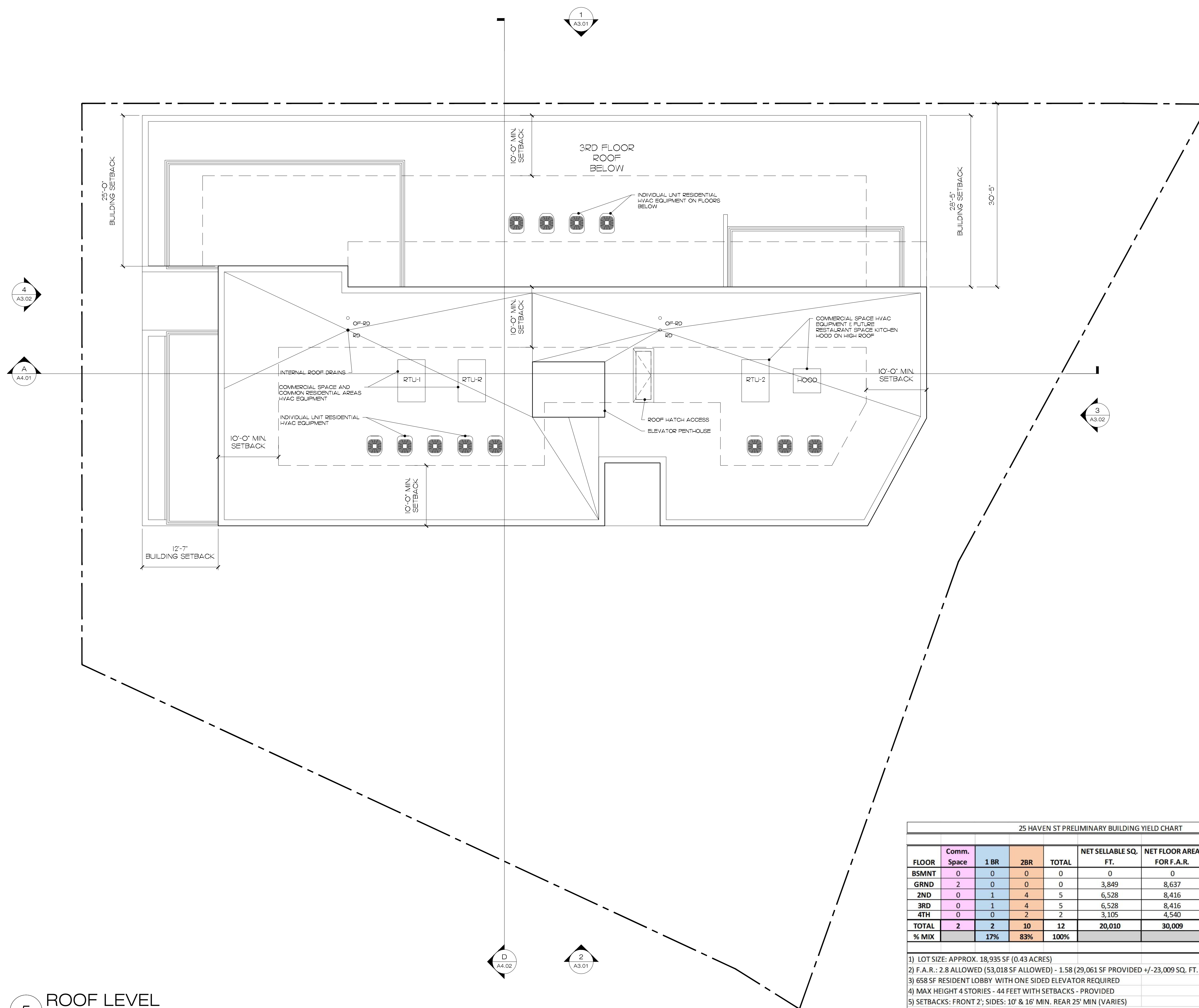
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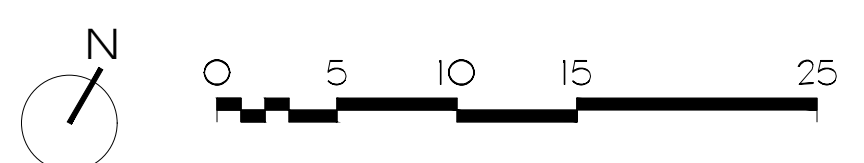


25 HAVEN ST PRELIMINARY BUILDING YIELD CHART							
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5 ROOF LEVEL

Scale: 1/8" = 1'





**1 FRONT ELEVATION (HAVEN STREET)**



**2 REAR ELEVATION (GREEN STREET)**

**EXTERIOR SIDING FINISHES KEY (AT UPPER LEVELS)**

BASIS OF DESIGN NICHIBA PANEL RAIN SCREEN SYSTEMS: SMOOTH & RIBBED PANEL SYSTEMS (EXAMPLE PHOTOS ATTACHED)

RECESSED SMOOTH

RECESSED RIDGE



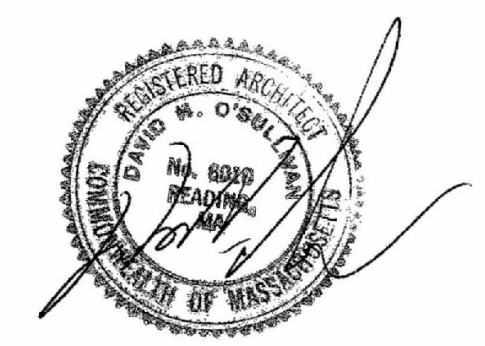
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Elevations



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**A3.01**



**3 LEFT ELEVATION**

Scale: 1/8" = 1'

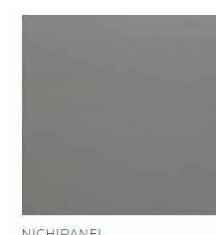


**4 RIGHT ELEVATION**

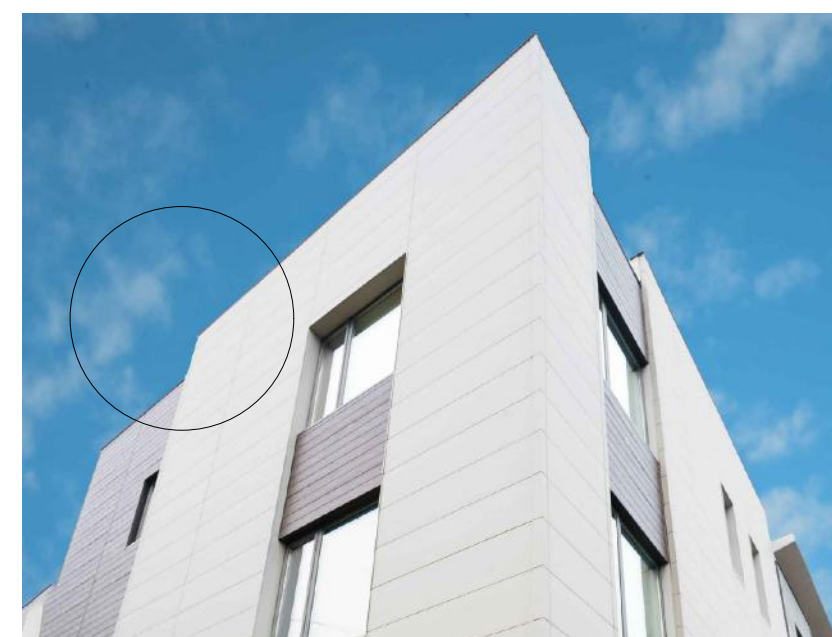
Scale: 1/8" = 1'

**EXTERIOR SIDING FINISHES KEY (AT UPPER LEVELS)**

BASIS OF DESIGN NICHHA PANEL RAIN SCREEN SYSTEMS:  
SMOOTH & RIBBED PANEL SYSTEMS  
(EXAMPLE PHOTOS ATTACHED)



NICHHA SMOOTH



RIBBED



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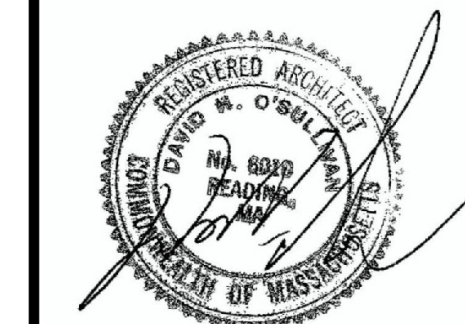
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Elevations



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**A3.02**



1 VIEW 1 FROM HAVEN ST.  
Scale: N.T.S.



2 VIEW 2 FROM HAVEN ST.  
Scale: N.T.S.



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Perspectives

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A3.10



3 VIEW 3 FROM GREEN ST. @ PUBLIC PATH  
Scale: N.T.S.



4 VIEW 4 FROM DEPOT  
Scale: N.T.S.



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Perspectives

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A3.11



5 VIEW 5 WEST SIDE ELEVATION  
Scale: N.T.S.



6 VIEW 6 FROM HAVEN  
Scale: N.T.S.



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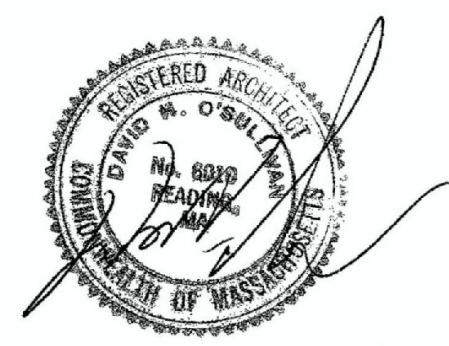
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Sections



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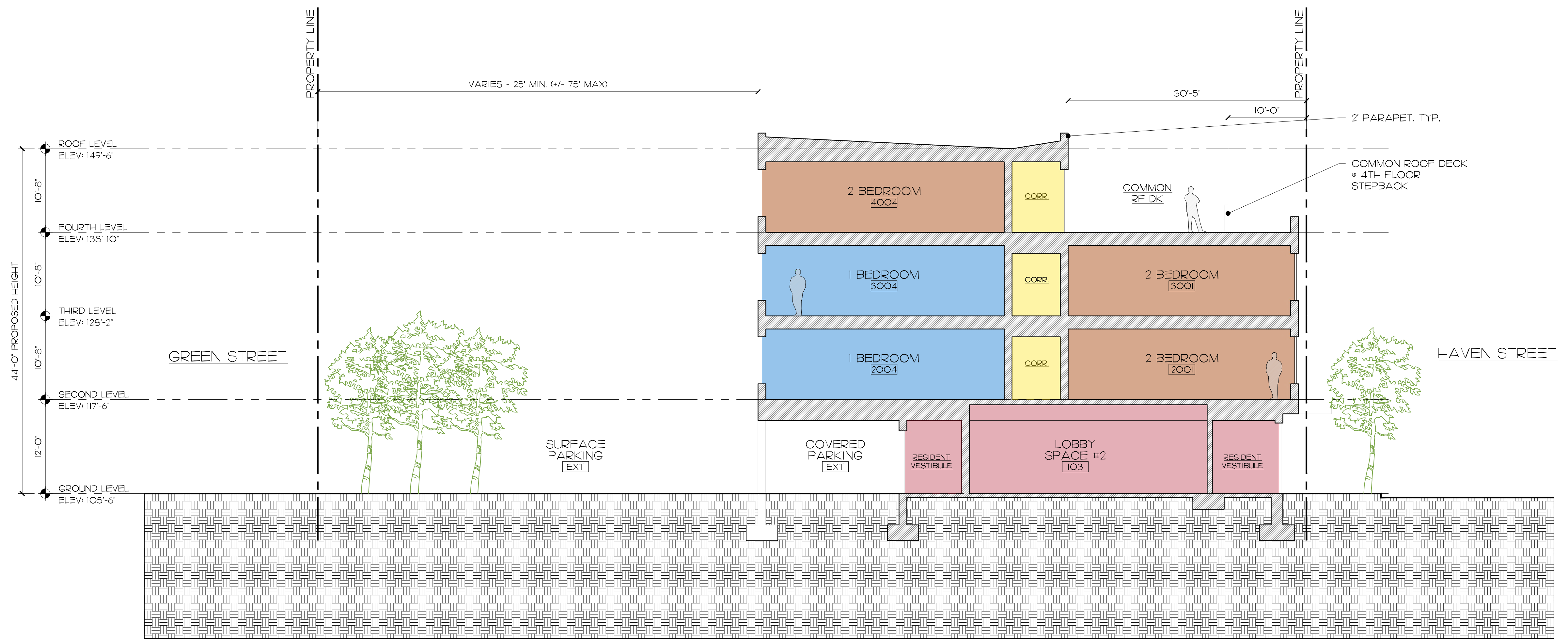
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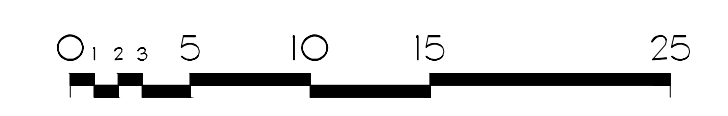
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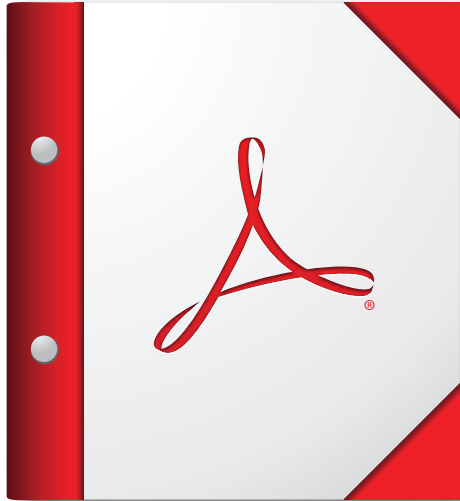
**B** SECTION  
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**A** SECTION  
Scale: 1/8" = 1'







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# Multi-family Zoning Requirement for MBTA Communities

## An Introduction to the Section 3A Program

**December 19, 2022**

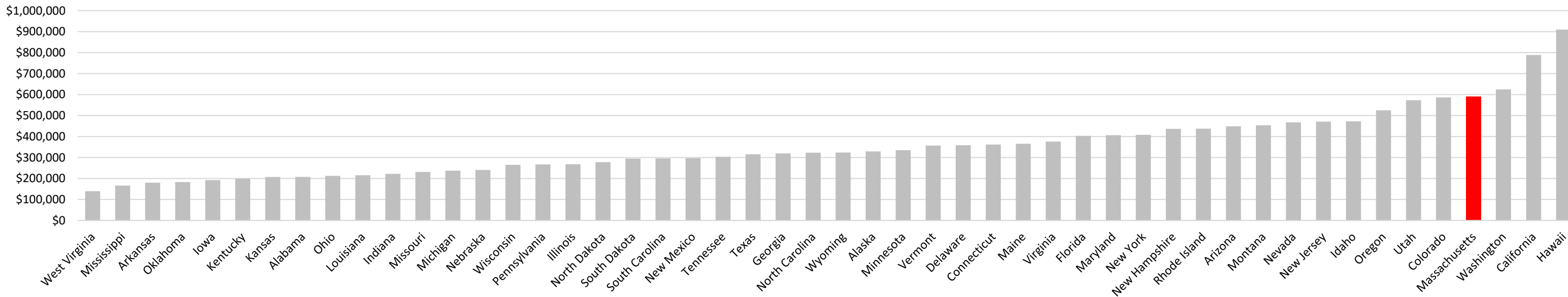
**Citizen Planner Training Collaborative (CPTC)**

# MA Housing Costs Among the Highest in the Nation



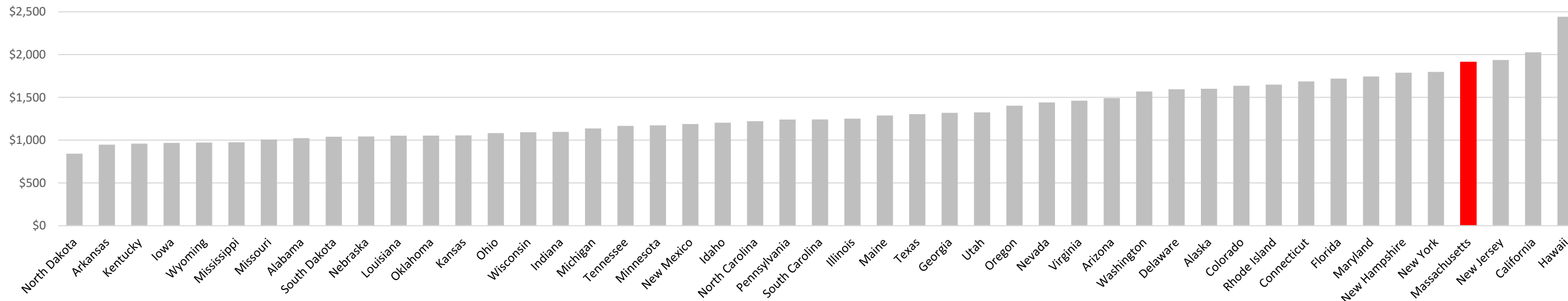
## Typical Home Value (July 2022)

Source: Zillow Home Value Index



## 2 Bedroom Rent Estimates (July 2022)

Source: Apartment List State-Level Historic Estimates



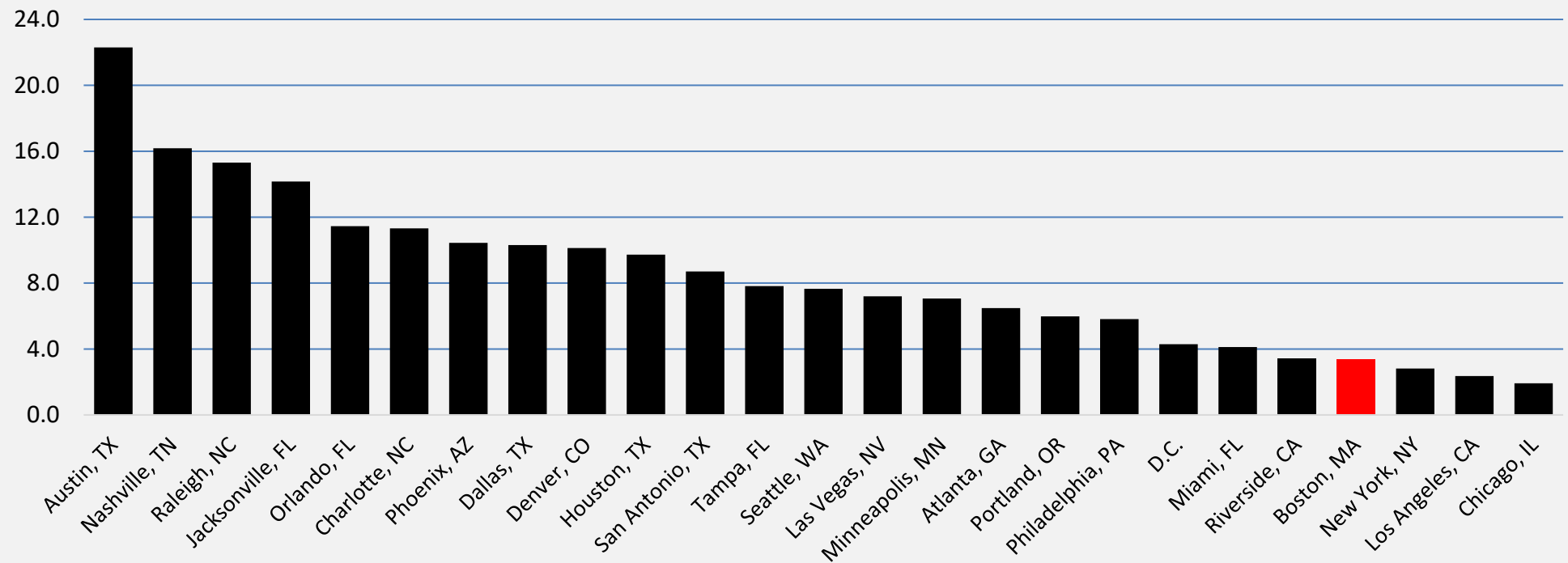


# High Housing Costs Are a Competitive Disadvantage for MA

- Massachusetts' core competitive advantage is its highly skilled workforce.
- High housing costs will make it harder for us to attract and retain talent. This weakens our economy and our employers and hurts our long-term growth and prosperity.

2021 Building Permit Rates of the 25 Largest Competing Metros per 1,000 residents

Many of the metro areas that we compete with are permitting a lot more housing than we are:



# Why This Law Is So Important



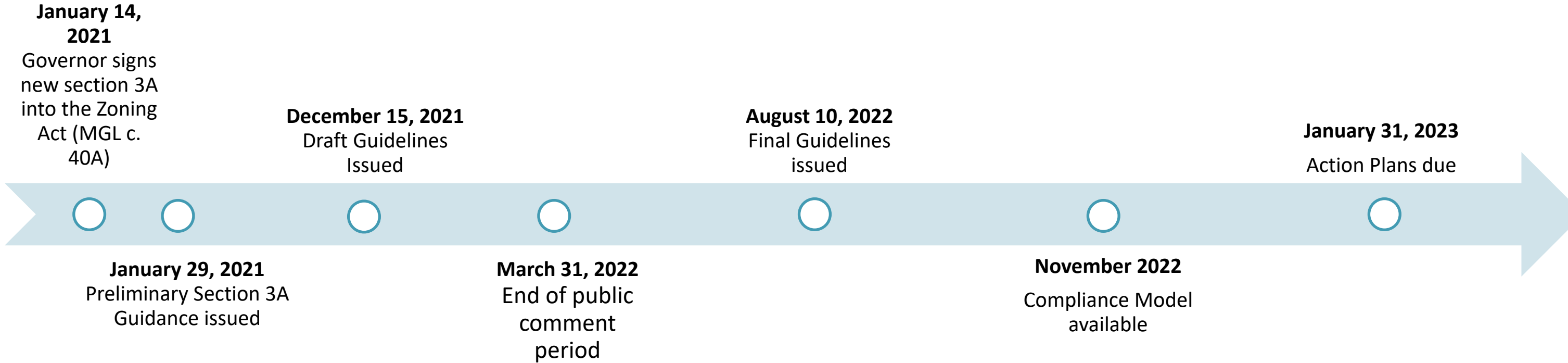
This new law removes barriers that exist in the local zoning for 175 Massachusetts communities by requiring communities to allow more transit-oriented multi-family housing in the years and decades ahead.

Communities that don't have transit stations must also allow for multi-family, but there are higher requirements for transit rich municipalities.

- **Most multi-family housing is subject to an unpredictable, time-consuming process.**
  - It often requires a special permit, rezoning, or 40B.
  - *Only 14% of multi-family units in the greater Boston area were permitted as of right from 2015-2017.*
- **This requirement establishes a new paradigm** for encouraging multi-family housing production.
- **We can create new housing in walkable neighborhoods**, by allowing multifamily housing near transit.



# Section 3A (MBTA Communities) Timeline



Outreach summary: 24 webinars, almost 400 comments in an online portal.

**Public Comments overall theme:** While policy advocates and the development community largely supported the approach outlined in the draft guidelines, municipal officials and members of the public largely submitted concerns and feedback relating to the statute, on-the-ground constraints, and the community category framework.



# **Section 3A Guidelines: Multi-Family Zoning Requirement for MBTA Communities**



# Introducing Section 3A of the Zoning Act

Section 3A. (a)(1) An MBTA community shall have a zoning ordinance or by-law that provides for at least 1 district of reasonable size in which multi-family housing is permitted as of right; provided, however, that such multi-family housing shall be without age restrictions and shall be suitable for families with children. For the purposes of this section, a district of reasonable size shall: (i) have a minimum gross density of 15 units per acre, subject to any further limitations imposed by section 40 of chapter 131 and title 5 of the state environmental code established pursuant to section 13 of chapter 21A; and (ii) be located not more than 0.5 miles from a commuter rail station, subway station, ferry terminal or bus station, if applicable.

(b) An MBTA community that fails to comply with this section shall not be eligible for funds from: (i) the Housing Choice Initiative as described by the governor in a message to the general court dated December 11, 2017; (ii) the Local Capital Projects Fund established in section 2EEEE of chapter 29; or (iii) the MassWorks infrastructure program established in section 63 of chapter 23A.

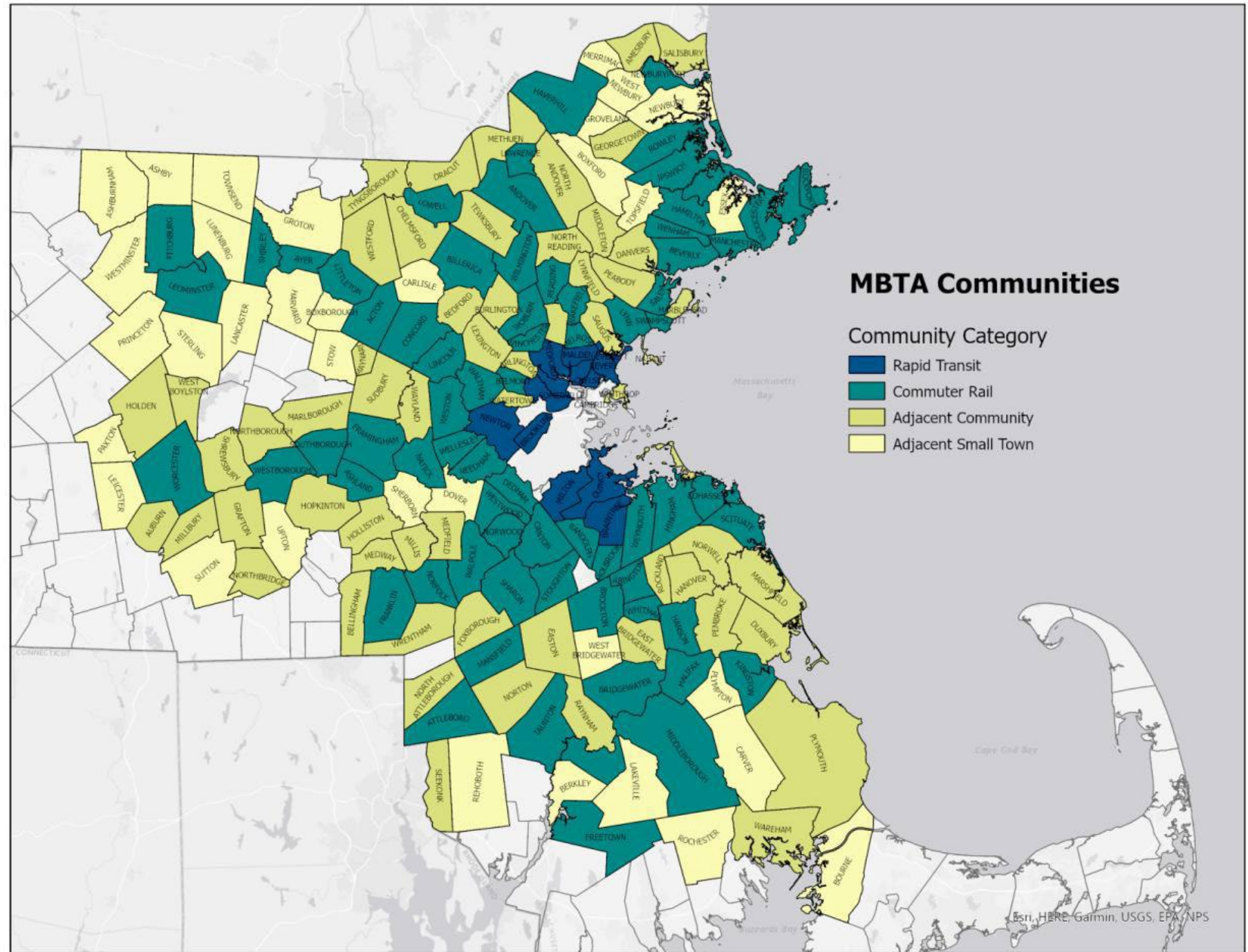
(c) The department of housing and community development, in consultation with the Massachusetts Bay Transportation Authority and the Massachusetts Department of Transportation, shall promulgate guidelines to determine if an MBTA community is in compliance with this section



# Four Community Categories



- Community categories are determined by fixed transit assets for each community
- Categories are a factor for determining local “reasonable size” requirements
- Each category has its own formula to determine minimum unit capacity



## RAPID TRANSIT COMMUNITY

## COMMUTER RAIL COMMUNITY

- 1. Rapid transit community** means an MBTA community that has within its borders at least 100 acres of developable station area associated with one or more subway stations, or MBTA Silver Line bus rapid transit stations
- 2. Commuter rail community** means an MBTA community that (i) does not meet the criteria for a rapid transit community, and (ii) has within its borders at least 100 acres of developable station area associated with one or more commuter rail stations.





## ADJACENT COMMUNITY

## ADJACENT SMALL TOWN

- 3. Adjacent community** means an MBTA community that (i) has within its boundaries less than 100 acres of developable station area, and (ii) is not an adjacent small town.
- 4. Adjacent small town** means an MBTA community that (i) has within its boundaries less than 100 acres of developable station area, and (ii) either has a population density of less than 500 persons per square mile, or a population of not more than 7,000 year-round residents as determined in the most recently published United States Decennial Census of Population and Housing.

# Four Community Categories



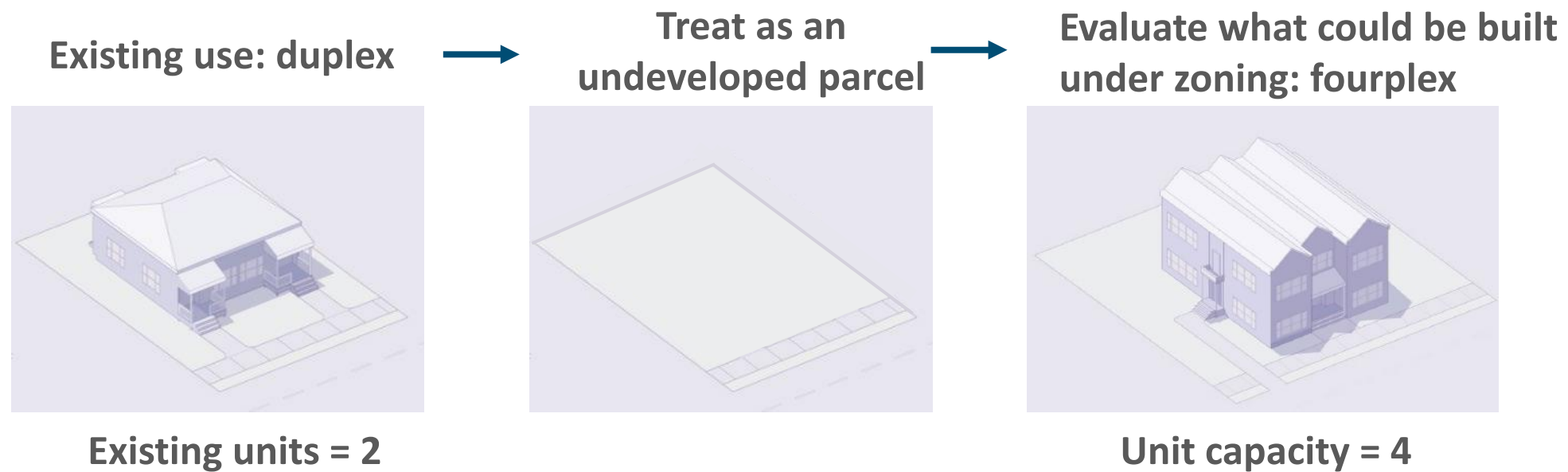
	Rapid Transit	Commuter Rail	Adjacent	Adjacent Small Town
Land Area	50 Acres	50 Acres	50 Acres	n/a
Unit Capacity <sup>1</sup>	25%	15%	10%	5%
Location	Near Transit <sup>2</sup>	Near Transit <sup>2</sup>	n/a	n/a
Deadline	12/31/2023	12/31/2024	12/31/2024	12/31/2025

1. Unit Capacity is expressed as percentage of 2020 Housing Stock. For example, Rapid Transit Unit Capacity = Housing Stock x 0.25
2. Percentage of district located near transit depends on developable land near stations

# Unit Capacity as a measurement of zoning

“Unit capacity” is a measure of the number of multi-family units that the zoning allows as of right in the district. Although some units may already exist, unit capacity for any given parcel may be higher or lower than existing development on the site.

The unit capacity of each parcel is measured as if that parcel was undeveloped:



# District Location



“located not more than 0.5 miles from a commuter rail station, subway station, ferry terminal or bus station, if applicable.”

## Guidelines Table 2: A sliding scale

Acres of Developable Station Area	Portion of MF District that must be in station area	Municipalities
0-100	0%	94
101-250	20%	17
251-400	40%	25
401-600	50%	16
601-800	75%	13
801+	90%	10

This scale requires MBTA communities with more than 100 acres of developable station area to locate some of their districts within those station areas. Communities with more developable station area offer more opportunity for housing near transit.

### Example 1: Arlington



**58** Total acres of developable station area

**0%** Percentage of minimum district land area and unit capacity that must be in developable station area



# District Location

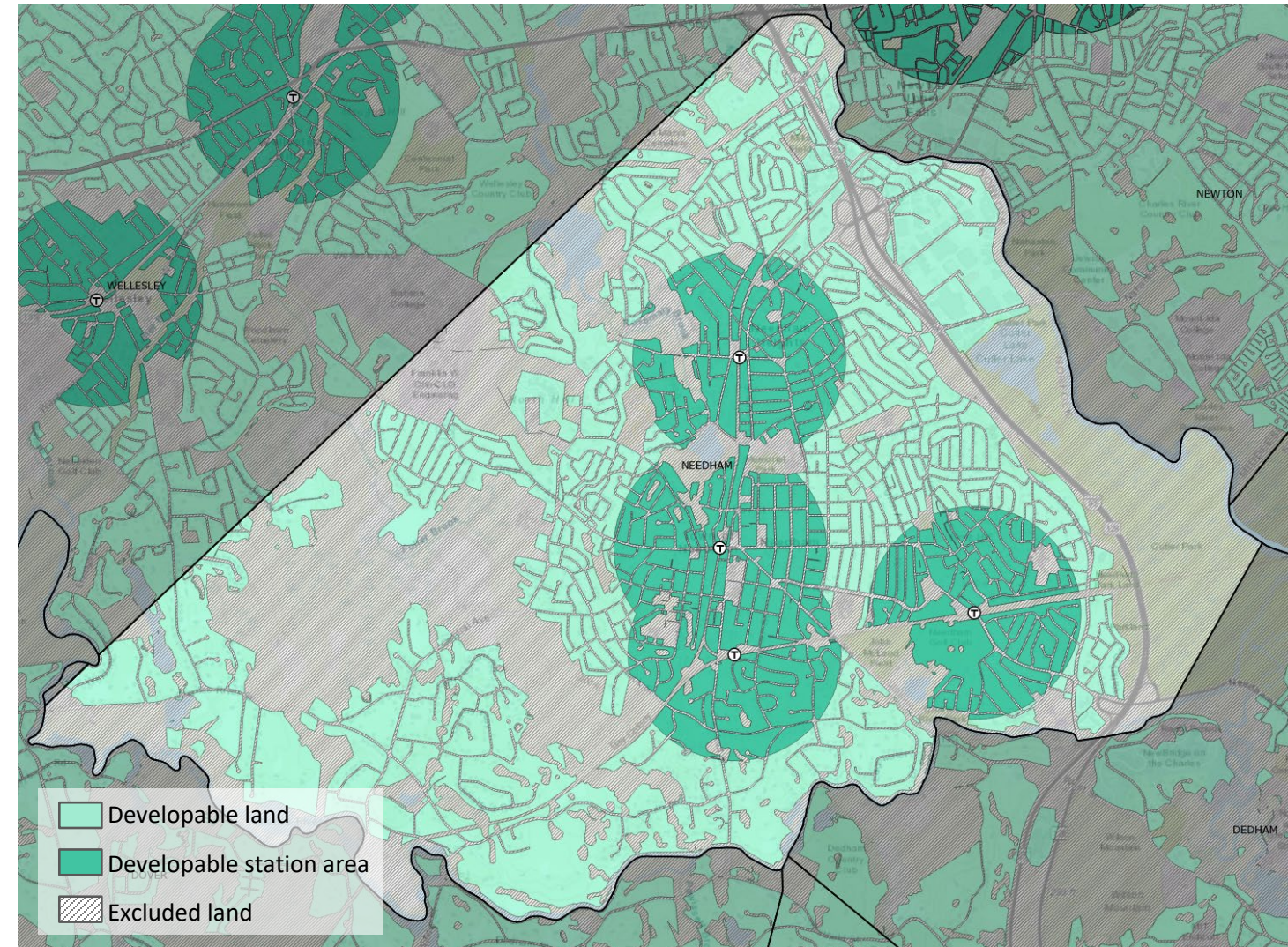
“located not more than 0.5 miles from a commuter rail station, subway station, ferry terminal or bus station, if applicable.”

Guidelines Table 2: A sliding scale

Acres of Developable Station Area	Portion of MF District that must be in station area	Municipalities
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801+	90%	10

This scale requires MBTA communities with more than 100 acres of developable station area to locate some of their districts within those station areas. Communities with more developable station area offer more opportunity for housing near transit.

## Example 2: Needham



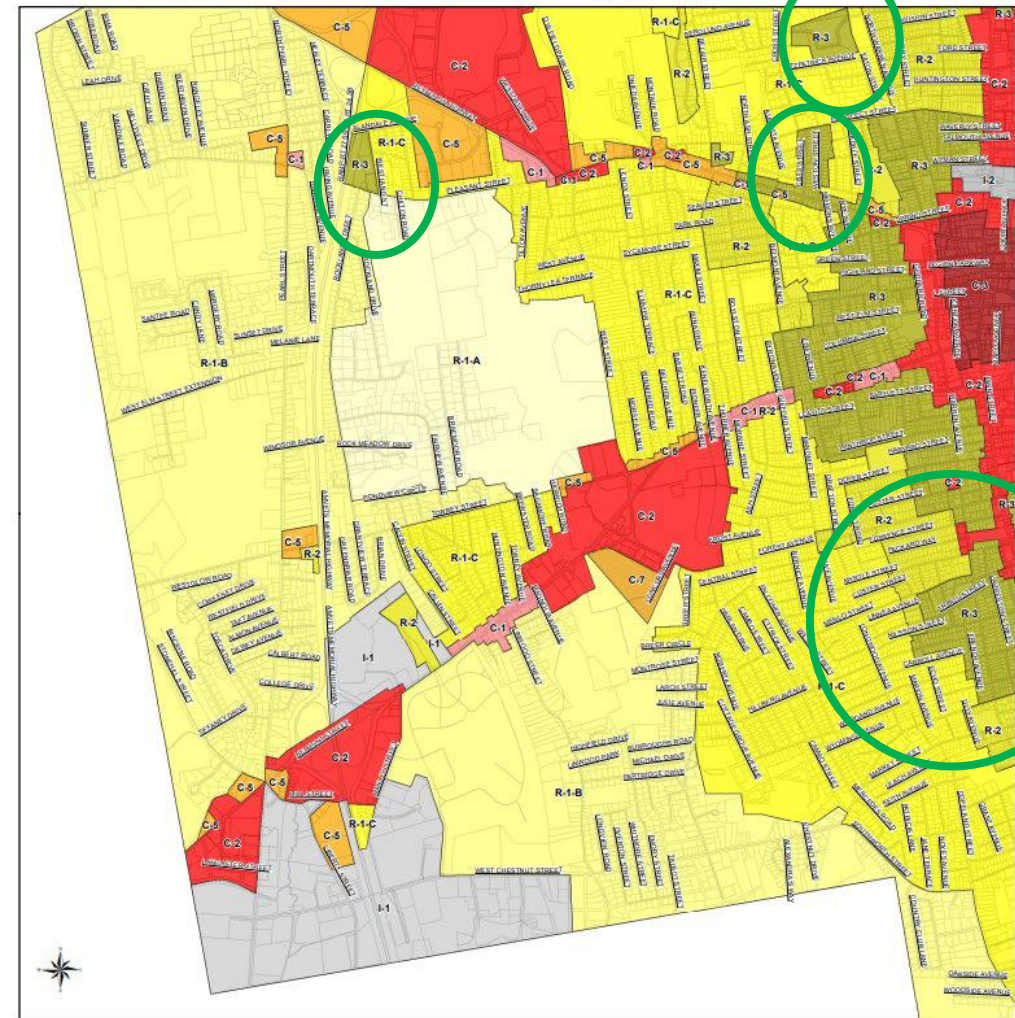
**1,233** Total acres of developable station area

**90%** Percentage of minimum district land area and unit capacity that must be in developable station area

# District Location - Contiguity

- Section 5 has Location and Contiguity requirements**
  - 50% of the district size must be contiguous (this is not the same as 50% of the minimum land area).
  - For example: if a municipality has a 50 acre minimum land area but designs an 80 acre district that will meet unit capacity/density requirements, then 40 acres of the district must be contiguous.
- If district has multiple locations, there is a 5 acre minimum size in order to count towards the minimum land area**
  - Purpose: Allow district to be located in multiple locations, and create neighborhoods, not just “project sites”
  - Exception: if a municipality can meet unit capacity in less than 5 acres, then entire district must be contiguous

City of Brockton - Zoning Map - Section 3



SWITCH TO: Section 1 | Section 2 | **Section 3** | Section 4 | Section 5

Brockton			Accurate as of 2014		
<b>Zone Designation</b>					
R-1-A (Single-Family Residential)	R-3 (Multi-Family Residential)	C-7 (Sports & Convention)	Please Contact Brockton Building Department for Zone Boundary Confirmation		
R-1-B (Single-Family Residential)	C-1 (Neighborhood Commercial)	C-8 (Highway Commercial)			
R-1-C (Single-Family Residential)	C-2 (General Commercial)	I-1 (Industrial Park)			
R-2 (Multi-Family Residential)	C-3 (Central Business)	I-2 (General Industrial)			
	C-4 (Office Commercial)	I-3 (Heavy Industrial)			





# “Multi-family housing is permitted”

Multi-family housing: “a building with 3 or more residential dwelling units or 2 or more buildings on the same lot with more than 1 residential dwelling unit in each building”  
– MGL c. 40A §1A

“Missing middle” housing types represent what Section 3A zoning requires





- **Site Plan Review**
  - Can be required for as of right multi-family uses but cannot impose unreasonable requirements or undue delay on proposed project
- **Affordability – Based on revisions made 10/21/2022**
  - Inclusionary zoning may require up to 10% at 80% AMI in all districts, in all communities
  - Exceptions are in place to allow MBTA communities to require more affordable units or deeper affordability where feasible as supported by an analysis completed by a qualified third party and approved by DHCD
  - Exceptions are also in place for DHCD programs such as c. 40R and UCH-TIF
- **Mandatory Mixed-Use Development**
  - Mixed use development may be allowed, and incentivized, but cannot be a mandatory pre-requisite to develop multi-family housing
- **Energy Efficiency**
  - Multi-family housing cannot be required to meet higher standards than other uses in the municipality



On October 21, 2021, DHCD announced limited revisions to the Section 3A Guidelines to address the extent to which MBTA communities may require affordable units in compliant multi-family zoning districts.

- IZ may require up to 10% at 80% AMI in all districts, in all communities
- DHCD programs exception (ie, 40R or UCH-TIF):
  - Up to 20%, *and below 80% AMI* if reviewed and approved by DHCD
  - *Up to 25%, and below 80% AMI* if the 40R district is pre-existing (8/10/2022)
- *Feasibility analysis exception:*
  - Up to 20% affordable units and/or AMI below 80%
  - Requires MBTA community to submit an independent third-party feasibility study supporting feasibility of MFH in the district
- Removed requirement to be eligible for SHI (allow AMI over 80%)



# Compliance Timelines

- 2022 Compliance:** All MBTA communities could achieve compliance for purposes of this year’s One-Stop by submitting a simple “Community Information Form” to DHCD. This form requested basic information about their current zoning, required a briefing of the select board/city council, and asked for feedback on technical assistance needs.
  - 166 of 175 communities are compliant for this this year (~95% compliance).

- Compliance Timelines for 2023 and Beyond:**

Transit Category (# municipalities)	Action Plan Submission Deadline (if applicable)	Full Compliance Submission Deadline
Rapid Transit (12)	January 31, 2023	December 31, 2023
Commuter Rail (69)	January 31, 2023	December 31, 2024
Adjacent (59)	January 31, 2023	December 31, 2024
Adjacent Small Town (35)	January 31, 2023	December 31, 2025

The Action Plan form and other materials are online at: [mass.gov/mbtacommunities](https://mass.gov/mbtacommunities)



# Tools and Technical Assistance Resources

# The Compliance Model:



A **geospatial (GIS) database** for each municipality that includes existing parcel boundaries, any excluded or sensitive land, and additional information such as owner name, address, and existing use.

Dimensional Standards	Value	Notes
Minimum Lot Size (in square feet)		
Base Minimum Lot Size (in square feet)		
Additional Lot Square Footage by Dwelling Unit (in square feet)		
		<i>Restricted space is allowed as part of open space requirement.</i>
Building type and density	Value	Notes
Two-family?		
Three-family?		
Four-family?		
Five or more dwelling units per lot?		
Accessory Dwelling Unit (ADU)?		

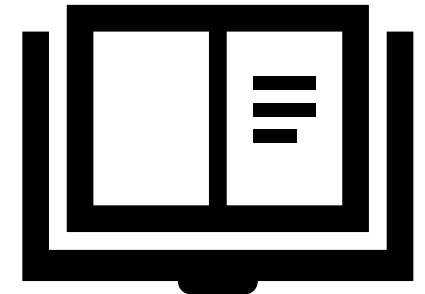
A **zoning checklist**, which will walk users through a series of questions and prompts in order to collect relevant dimensional and regulatory elements of the proposed zoning bylaw that will impact unit capacity.

Metric	Compliance Model Estimates	Town-specific Requirement	Compliant?
District acreage	62.4	50.0	Y
Estimated unit capacity	955.0	900.0	Y
Estimated gross district density	15.3	15.0	Y
% of unit capacity within station areas	63.2%	50.0%	Y

A **unit capacity estimator** that will use the imported parcel information and the information collected in the zoning checklist to derive an estimate of the unit capacity on each lot in the district as well as district-level summary information such as total district unit capacity, gross density of the district, and other helpful statistics.

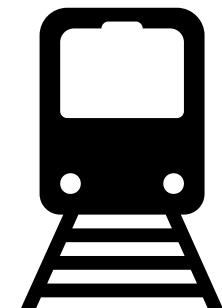
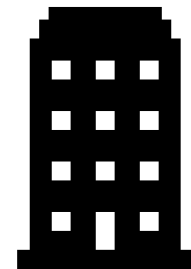
## Overview of MBTA Communities technical assistance (“3A TA”):

- *Goal:* Provide TA to every municipality that wants it. This goal will be achieved through a multi-year effort starting FY23 and carrying out over the next several years.



## Resources and TA Available to Help Municipalities Achieve Compliance:

- Upon the release of the final guidelines, HED/DHCD launched an online form to serve as an entry point for technical assistance requests from municipalities. The form requests basic information relative to the technical assistance needs which will help HED, DHCD, and MHP staff coordinate on guidance.
- How to fill out an Action Plan – MHP 10/19/22 webinar
- Sample Zoning By-Law/Ordinance
- “3A How To Guide” a narrative explanation of Guidelines



# Technical Assistance (TA)



- Assistance will be provided to communities through collaboration and coordination:
  - Mass Housing Partnership: Leveraging a variety of resources MHP is developing a comprehensive technical assistance program available to all interested MBTA Communities.

<https://www.mhp.net/community/complete-neighborhoods-initiative>

- DHCD: Via the Community One Stop, the following grant programs are available: Housing Choice Grant Program, Community Planning Grants, and the Rural and Small Town Development Fund. MBTA compliance activities eligible for bonus points.
- EEA: Land Use Planning Grant program will also prioritize MBTA municipalities.
- Regional Planning Agencies: Support from eight Regional Planning Agencies through prioritization of Commonwealth-provided District Local Technical Assistance (DLTA) funding.



COMMUNITY  
ONE STOP  
FOR GROWTH

[mass.gov/onestop](https://mass.gov/onestop)



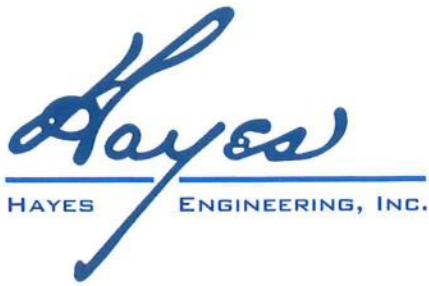




- An introduction to Section 3A, including what the legislation is and how DHCD is implementing the law with its Compliance Guidelines
- A preview of the tools being released to help MBTA communities comply with the law
- An overview of technical assistance resources available to MBTA communities

If you need more information to help others in your community to understand this legislation, please let us know!

[mass.gov/mbtacommunities](https://mass.gov/mbtacommunities) will continue to have information and resources



# Stormwater Management Report

## 25 Haven Street Mixed-Use Development Reading, Massachusetts

November 22, 2022



Prepared for: 25 Haven Street, LLC  
25 Haven Street, Reading, MA

Prepared by: Hayes Engineering, Inc.  
603 Salem Street, Wakefield, MA

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Civil Engineers & Land Surveyors  
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# Stormwater Management Report

- Introduction & Background
- Compliance with Massachusetts Stormwater Standards
  - Standard 1: No New Untreated Discharges
  - Standard 2: Peak Rate Attenuation
  - Standard 3: Recharge
  - Standard 4: Water Quality
  - Standard 5: LUHPPLs
  - Standard 6: Critical Areas
  - Standard 7: Redevelopment Projects
  - Standard 8: Construction Period Pollution Plan
  - Standard 9: Operation and Maintenance Plan
  - Standard 10: Prohibition of Illicit Discharges
- Construction Pollution Prevention Plan
- Long-term Pollution Prevention Plan
- Appendix A: HydroCAD Drainage Calculations
- Appendix B: NRCS Soil Mapping and Data
- Watershed Maps

## Introduction and Background

The Site consists of approximately 18,935 square feet in land area in Reading, Massachusetts abutting Haven Street to the North, Green Street to the South and commercial business properties to the east and west. The site is currently developed and consists of a large parking area to the east and an approximately 7,953-sf building to the west. The parcel is almost wholly impervious and drains via surface runoff and a drainage system to the existing drainage system within High Street. Site topography generally slopes to the south towards Green Street, with a small portion sloping towards a catch basin on Haven Street that then flows to a Green Streets catch basin and out to the High Street drainage system.

The Project consists of the construction of a proposed 4-story, 12-unit residential multi-family building with two commercial spaces at ground level, as well as associated parking and utilities. The Project, as proposed, represents a redevelopment project and results in a net of 1,200-sf. of impervious surface.

This Storm Water Management Report evaluates the Project's hydrologic impacts and compliance with the Massachusetts Stormwater Management Standards as identified in the Massachusetts Stormwater Handbook (MSH) for the proposed improvements described above.

### Methodology

This study evaluates the Site hydrology in accordance with the National Resource Conservation Service (NRCS), formerly the Soil Conservation Service (SCS), methodology outlined in Technical Release 55 and Technical Release 20. Precipitation volumes are summarized in Table 1, below:

**Table 1: Design Storm Events**

*NOAA, Atlas 14, Volume 10, Version 3 – Reading, Massachusetts*

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<b>Recurrence Interval</b>	<b>Precipitation</b>
2-year, 24-hour	3.31-inches
10-year, 24-hour	5.22-inches
25-year, 24-hour	6.41-inches
100-year, 24-hour	8.24-inches

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Modelling was performed using HydroCAD™ software and model parameters based on pre- and post-development hydrologic soil group, land cover conditions, and topography.

## Analysis

The selected design point of comparison for this analysis is the catch basin on Green Street that leads to the drainage system on High Street. Peak rates of runoff were evaluated in both the existing and proposed conditions using the cumulative rainfall depths for the 2, 10, 25 and 100-year, Type III, 24-hour storm events as identified above. As previously stated, the Project is a redevelopment project and reduces impervious surfaces at the Site.

## Compliance with Stormwater Management Standards

### Standard 1: No New Untreated Discharges

The Project, as proposed, will not create new untreated discharges of stormwater runoff. The project reduces impervious surface coverage at the site and collects the entire parking lot with a deep sump catch basin equipped with a ADS Barracuda Separator to enhance stormwater treatment.

### Standard 2: Peak Rate Attenuation

The Project, as proposed, does not increase peak rate of runoff in 2, 10, 25 and 100-year, Type III, 24-hour storm events to the selected design point. HydroCAD™ calculations accompany this report as Appendix A. The following table summarizes the calculated peak rate of runoff to the Design Point for the project in the existing and proposed conditions:

**Table 2: Peak Rate of Runoff**

*Tributary to Broadway Street*

<b>Storm Event</b>	<b>Existing Condition Peak Rate of Discharge</b>	<b>Proposed Condition Peak Rate of Discharge</b>
2-year, 24-hour, Type III (3.31-inches)	1.14 cfs	0.38 cfs
10-year, 24-hour, Type III (5.22-inches)	1.97 cfs	0.74 cfs
25-year, 24-hour, Type III (6.41-inches)	2.49 cfs	0.99 cfs
100-year, 24-hour, Type III (8.24-inches)	3.28 cfs	1.39 cfs

### Standard 3: Recharge

The Natural Resource Conservation Service (NRCS) does not classify the soil at the site, other than noting that it is "Urban Land." However, adjacent soils are representative of Hydrologic Soil Group (HSG) "A" which was selected for this analysis (see Appendix A – Soil Maps). The site is a redevelopment project and subject to this standard to the maximum extent practicable. The reduction in impervious surfaces will decrease the volume of surficial runoff, resulting in increased infiltration from the site. Runoff volumes in the existing and proposed conditions are summarized in Table 3, below:

**Table 3: Volume of Runoff***Tributary to Broadway Street*

<b>Storm Event</b>	<b>Existing Condition Runoff Volume</b>	<b>Proposed Condition Runoff Volume</b>
2-year, 24-hour, Type III (3.31-inches)	3,693 cf	1,419 cf
10-year, 24-hour, Type III (5.22-inches)	6,568 cf	2,647 cf
25-year, 24-hour, Type III (6.41-inches)	8,395 cf	3,483 cf
100-year, 24-hour, Type III (8.24-inches)	11,230 cf	5,182 cf

**Standard 4: Water Quality**

The Project is classified as a redevelopment project under the MSH and is required to meet the water quality standard to the maximum extent practicable. Stormwater runoff from the site is collected by deep-sump basin with an ADS Barracuda S4 swirl particle separator sized to provide a presumptive TSS removal rate of 80-percent to improve stormwater quality prior to discharge. Sizing calculations for the swirl particle separator accompany this report as Appendix C.

**Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)**

The Project is not associated with a LUHPPL. Standard 5 is not applicable to this project.

**Standard 6: Critical Areas**

The Site is not tributary to an Outstanding Resource Water (ORW) or other Critical Areas.

**Standard 7: Projects Subject to the Standards only to the maximum extent practicable**

The Project is a redevelopment and has been designed to meet the applicable Standards to the maximum extent practicable.

**Standard 8: Construction Period Pollution Prevention & Sedimentation Control**

A construction period pollution prevention plan accompanies this report. The Project is also subject to a NPDES Construction General Permit. A SWPPP will be submitted prior to the commencement of construction activities.

Standard 9: Operations and Maintenance Plan

A post-construction Operation and Maintenance Plan (Long-Term Pollution Prevention Plan) accompanies this report.

Standard 10: Prohibition of Illicit Discharges

The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges. An illicit discharge statement is also included in the plan.

## Construction Period Pollution Prevention Plan

**Project Name:** Mixed-Use Development  
25 Haven Street  
Reading, Massachusetts

**Owner's Name:** 25 Haven Street, LLC

**Applicant's Name:** 25 Haven Street, LLC

**Party Responsible for Maintenance:** 25 Haven Street, LLC

### **Project Description:**

The Applicant seeks to construct a 4-story, 12-unit multi-family residential building with 2 ground level commercial spaces, and associated parking and utilities.

### **Erosion and Sedimentation Control Measures During Construction Activities:**

#### **Storm Drain Inlet Protection**

A temporary storm inlet protection filter will be placed in all catch basin units. The purpose of the filter is to prevent the inflow of sediment into the closed drainage system(s). The filters shall remain in place until a permanent vegetative cover is established and the transport of sediment is no longer visibly apparent. The filter shall be inspected and maintained on a weekly basis and after significant storm events. Significant storm events are those having greater than one-quarter (1/4) inch of precipitation in a 24-hour period.

#### **Surface Stabilization**

The surface of all disturbed areas shall be stabilized during and after construction. Temporary measures shall be taken during construction to prevent erosion and sedimentation. No construction sediment shall be allowed to enter infiltration areas. All disturbed slopes shall be stabilized with a permanent vegetative cover. Some or all of the following measures can be used on the Project as conditions may warrant:

- Temporary Seeding
- Temporary Mulching
- Placement of Hay
- Placement of Geo-Synthetic Fabrics
- Hydroseeding
- Permanent Seeding
- Placement of Sod



### **Surface and Subsurface Infiltration Facilities**

No construction period runoff should be directed toward infiltration facilities. The performance of these facilities shall be checked weekly and after significant storm events throughout construction.

## INSPECTION SCHEDULE and EVALUATION CHECKLIST

To be completed weekly and within 24-hours of significant rainfall events (greater than 1/4-inches in a 24-hour period).

Inspector's Name: \_\_\_\_\_ Date: \_\_\_\_\_

Qualifications: \_\_\_\_\_

Days since last rainfall: \_\_\_\_\_ days      Amount of last rainfall: \_\_\_\_\_ inches

### Stabilization Measures

Sub-Catchment	Date of Last Disturbance	Date of Next Disturbance	Stabilized (Yes or No)	Stabilized With:	Condition

Stabilization required: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

To be performed by: \_\_\_\_\_ on or before: \_\_\_\_\_

## PERIMETER CONTROLS

Date of Inspection: \_\_\_\_\_

### Stabilized Construction Entrance:

<b>Location</b>	<b>Does much sediment get tracked onto roadway? (Yes or No)</b>	<b>Is gravel clean or full of sediment?</b>	<b>Is all traffic using the entrance to access/exit the site? (Yes or No)</b>	<b>Is the culvert beneath the entrance working? (Yes or No)</b>

Maintenance required for stabilized construction entrance: \_\_\_\_\_

\_\_\_\_\_

To be performed by: \_\_\_\_\_ on or before: \_\_\_\_\_



## Long-Term Pollution Prevention Plan

**Project Name:** Mixed-Use Development  
25 Haven Street  
Reading, Massachusetts

**Owner's Name:** 25 Haven Street, LLC

**Applicant's Name:** 25 Haven Street, LLC

**Party Responsible for Maintenance:** 25 Haven Street, LLC

### **Project Description:**

The Applicant seeks to construct a 4-story, 12-unit multi-family residential building with 2 ground level commercial spaces, and associated parking and utilities.

**Acknowledgement:** \_\_\_\_\_ **Date:** \_\_\_\_\_

### **Post-Construction Inspection and Maintenance Measures:**

#### **Erosion Control**

Sedimentation caused from erosion of soils can adversely affect the performance of the storm water management system. The site should be inspected annually for areas that are barren and/or showing signs of erosion and should be stabilized through immediate re-vegetation.

#### **Debris and Litter Removal**

Litter and other debris may collect in storm water best management practices (BMPs), potentially causing clogging of facilities. All debris and litter shall be removed as necessary, at a minimum of four (4) times per year in the spring, summer, fall and winter.

#### **Deep Sump Catch Basin**

*In accordance with Volume 2, Chapter 2 of the MassDEP Storm Water Handbook as summarized below:*

Inspect or clean deep sump catch basins at least four (4) times per year and at the end of the foliage and snow-removal seasons. Sediments must also be removed four (4) times per year or whenever the depth of deposits is greater than or equal to one-half (1/2) the depth from the invert of the lowest pipe in the basin to the bottom of the basin (the sump). If handling runoff from land uses with higher potential pollutant loads (LUHPPLs) or discharging near or to a critical area, more frequent cleaning may be necessary.

Deep sump catch basins should be cleaned with vacuum trucks only. Clamshell buckets shall not be used to clean hooded catch basins. Vacuum trucks remove more sediment and supernatant, and are less likely to snap the hood within the deep sump basin.

Always consider the safety of the staff cleaning deep sump catch basins. Cleaning a deep sump catch basin within a road with active traffic or even within a parking lot is dangerous, and a police detail may be necessary to safeguard workers.

Although catch basin debris often contains concentrations of oil and hazardous materials such as petroleum hydrocarbons and metals, MassDEP classifies them as solid waste. Unless there is evidence that they have been contaminated by a spill or other means, MassDEP does not routinely require catch basin cleanings to be tested before disposal. Contaminated catch basin cleanings must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

In the absence of evidence of contamination, catch basin cleanings may be taken to a landfill or other facility permitted by MassDEP to accept solid waste, without any prior approval by MassDEP. However, some landfills require catch basin cleanings to be tested before they are accepted.

With prior MassDEP approval, catch basin cleanings may be used as grading and shaping materials at landfills undergoing closure (see Revised Guidelines for Determining Closure Activities at Inactive Unlined Landfill Sites) or as daily cover at active landfills. MassDEP also encourages the beneficial reuse of catch basin cleanings whenever possible. A Beneficial Reuse Determination is required for such use.

MassDEP regulations prohibit landfills from accepting materials that contain free-draining liquids. One way to remove liquids is to use a hydraulic lift truck during cleaning operations so that the material can be decanted at the site. After loading material from several catch basins into a truck, elevate the truck so that any free-draining liquid can flow back into the structure. If there is no free water in the truck, the material may be deemed to be sufficiently dry. Otherwise the catch basin cleanings must undergo a Paint Filter Liquids Test. Go to [www.Mass.gov/dep/recycle/laws/cafacts.doc](http://www.Mass.gov/dep/recycle/laws/cafacts.doc) for information on all of the MassDEP requirements pertaining to the disposal of catch basin cleanings.

### **ADS Barracuda S4 Swirl Particle Separator<sup>1</sup>**

One of the advantages of the Barracuda is the ease of maintenance. Like any system that collects pollutants, the Barracuda must be maintained for continued effectiveness. Maintenance is a simple procedure performed using a vacuum truck or similar equipment. The systems were designed to minimize the volume of water removed during routine maintenance, reducing disposal costs.

Contractors can access the pollutants stored in the manhole through the manhole cover. This allows them to gain vacuum hose access to the bottom of the manhole to remove sediment and trash. There is no confined space entry necessary for inspection or maintenance.

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<sup>1</sup> Taken from ADS Barracuda Maintenance Guide, July 2017

The entire maintenance procedure typically takes from 2 to 4 hours, depending on the size of the system, the captured material, and the capacity of the vacuum truck.

Local regulations may apply to the maintenance procedure. Safe and legal disposal of pollutants is the responsibility of the maintenance contractor. Maintenance should be performed only by a qualified contractor.

### Inspection and Cleaning Cycle

Periodic inspection is needed to determine the need for and frequency of maintenance. You should begin inspecting as soon as construction is complete and thereafter on an annual basis. Typically, the system needs to be cleaned every 1-3 years.

Excessive oils, fuels or sediments may reduce the maintenance cycle. Periodic inspection is important.

### Determining When to Clean

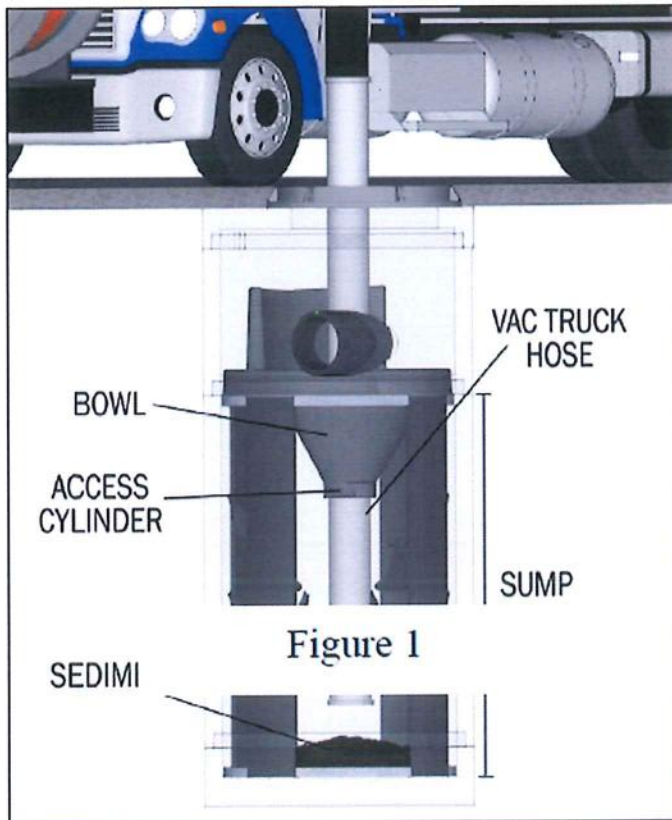
To determine the sediment depth, the maintenance contractor should lower a stadia rod into the manhole until it contacts the top of the captured sediment and mark that spot on the rod. Then push the probe through to the bottom of the sump and mark that spot to determine sediment depth.

Maintenance should occur when the sediment has reached the levels indicated in the Storage Capacity Chart.

Model	Manhole Diameter	Treatment Chamber Capacity	Standard Sediment Capacity (20" depth)	NJDEP Sediment Capacity (50% of standard depth)
S3	36"	212 gallons	0.44 cubic yards	0.22 cubic yards
S4	48"	564 gallons	0.78 cubic yards	0.39 cubic yards
S5	60"	881 gallons	1.21 cubic yards	0.61 cubic yards
S6	72"	1269 gallons	1.75 cubic yards	0.88 cubic yards
S8	96"	3835 gallons	3.10 cubic yards	1.55 cubic yards
S10	120"	7496 gallons	4.85 cubic yards	2.43 cubic yards

### Maintenance Instructions

1. Remove the manhole cover to provide access to the pollutant storage. Pollutants are stored in the sump, below the bowl assembly visible from the surface. You'll access this area through the 10" diameter access cylinder.
2. Use a vacuum truck or other similar equipment to remove all water, debris, oils and sediment. See figure 1.
3. Use a high pressure hose to clean the manhole of all the remaining sediment and debris. Then, use the vacuum truck to remove the water.
4. Fill the cleaned manhole with water until the level reaches the invert of the outlet pipe.
5. Replace the manhole cover.
6. Dispose of the polluted water, oils, sediment, and trash at an approved facility.



### **Good Housekeeping Practices:**

#### **Provisions for storing paints, cleaners, automotive waste and other potentially hazardous household waste products inside or under cover:**

- All materials stored on-site shall be in a neat, orderly manner in their appropriate containers with original manufacturer's label(s);
- Only store enough material as needed; whenever possible, all of a product shall be used prior to disposing of container;



- Manufacturer, federal, state and local recommendations for proper use and disposal shall be followed.

#### **Vehicle Washing Controls:**

- Use commercial car washes whenever possible. Car washes treat and/or recycle wash water;
- Cars shall be washed on gravel, grass or other permeable surfaces to allow filtration to occur;
- Use biodegradable soaps only;
- Use hose nozzles that automatically turn off when unattended.

#### **Routine Inspection and Maintenance of Storm Water BMPs**

- Previously addressed.

#### **Spill Prevention and Response Plans**

- Spill control practices shall be in conformance with the guidelines set forth in the National Pollutant Discharge Elimination System (NPDES) Storm Water Pollution Prevention Plan (SWPPP).

#### **Maintenance of Lawns, Gardens and Other Landscaped Areas:**

- Grass shall not be cut shorter than two (2) to three (3) inches and mulch clipping should be left on lawns as a natural fertilizer;
- Use low volume water approaches for irrigation such as drip-type or sprinkler systems. Water plants only when needed to enhance root growth and avoid runoff problems;
- Mulch shall be used wherever practicable. Mulch helps retain water and prevents erosion.

#### **Storage and Use of Fertilizers, Herbicides and Pesticides:**

- Fertilizers shall be applied in the minimum amounts recommended by the manufacturer. Once applied, fertilizer shall be worked into the soil to limit exposure to storm water. Storage will be in covered areas only. Contents of partially used bags shall be transferred into sealable plastic containers to avoid spills;
- Do not fertilize before or during rain events;
- Consider the use of organic fertilizers;
- Pesticides shall be applied only when necessary and only in the minimum amounts recommended by the manufacturer.

#### **Pet Waste Management**

- Scoop up and seal pet waste in plastic bags. Dispose of in garbage.

#### **Solid Waste Management**

- All solid waste shall be disposed of or recycled in accordance with all federal, state and local regulations.

#### **List of Emergency Contacts for Plan Implementation**

To be determined by Owner.

## **Illicit Discharges**

As required by Standard 10 of the Massachusetts Stormwater Standards, I, the undersigned, being the authorized owner/responsible party of the above referenced property do hereby certify that no illicit discharges exist on the site and that the stormwater management system, as shown on the above referenced plan, does not contain or permit any illicit discharges to enter the stormwater management system. Furthermore, discharges from interior building drains or plumbing within the buildings are prohibited.

Illicit discharges do not include discharges from the following activities or facilities: firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing and water used to clean residential buildings without detergents.

The pollution prevention plan measures in this project to prevent illicit discharges to the stormwater management system, include wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease, include:

1. Identifying the responsible personnel for the implementation of an effective Illicit Discharge Detection and Elimination [IDDE] program.
2. Identify potential sources of Illicit Discharges.
3. Implement the Spill Prevention and Control Plan contained in the property Stormwater Pollution Prevention Plan [SWPPP].

Further, I certify that the stormwater management system as shown on the referenced plan will be maintained in accordance with the conditions of the Long-Term Pollution Prevention Plan.

---

Signature

---

Date

**POST-CONSTRUCTION  
OPERATION AND MAINTENANCE LOG**

Inspector's Name: \_\_\_\_\_ Date: \_\_\_\_\_

Qualifications: \_\_\_\_\_

Inspection Type:     Routine                       Spill                       Other: \_\_\_\_\_

Post-Rainfall (Precipitation in Inches: \_\_\_\_\_)

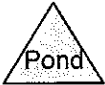
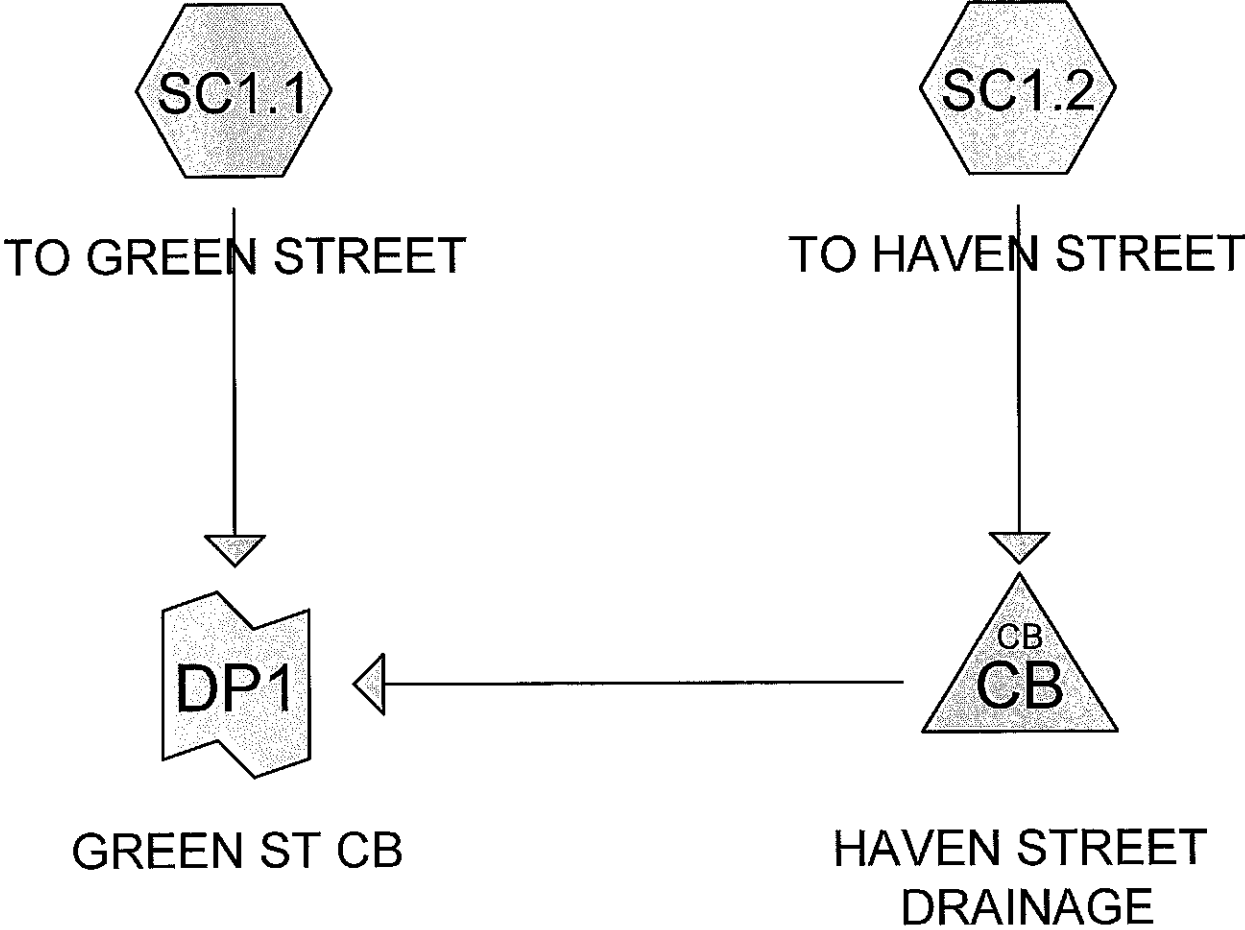
<b>BMP</b>	<b>Frequency</b>	<b>Date Last Performed</b>	<b>Comments</b>
<b>Litter and Debris Removal</b>	After Significant Rain Events		
<b>Deep Sump Catch Basin</b>	Inspect four (4) times per year		
	Maintenance as necessary		
<b>Vegetated Areas</b>	Inspect as necessary for erosion		

**Notes:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# Appendix A:

## HydroCAD™ Calculations

# EXISTING RUNOFF



**EXISTING REA0149**

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**Rainfall Events Listing**

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 Year	Type III 24-hr		Default	24.00	1	3.31	2
2	10 Year	Type III 24-hr		Default	24.00	1	5.22	2
3	25 Year	Type III 24-hr		Default	24.00	1	6.41	2
4	100 Year	Type III 24-hr		Default	24.00	1	8.24	2

**EXISTING REA0149**

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**Area Listing (all nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
2,301	39	>75% Grass cover, Good, HSG A (SC1.1, SC1.2)
913	98	Concrete, HSG A (SC1.1, SC1.2)
15	68	Crushed Stone, Poor, HSG A (SC1.1)
7,748	98	Paved parking, HSG A (SC1.1, SC1.2)
7,953	98	Unconnected roofs, HSG A (SC1.1)
<b>18,930</b>	<b>91</b>	<b>TOTAL AREA</b>

**EXISTING REA0149**

Type III 24-hr 2 Year Rainfall=3.31"

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Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 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 SC1.1: TO GREEN STREET** Runoff Area=16,070 sf 90.02% Impervious Runoff Depth=2.46"  
Tc=6.0 min CN=92 Runoff=1.01 cfs 3,288 cf

**Subcatchment SC1.2: TO HAVEN STREET** Runoff Area=2,860 sf 75.07% Impervious Runoff Depth=1.70"  
Tc=6.0 min CN=83 Runoff=0.13 cfs 405 cf

**Pond CB: HAVEN STREET DRAINAGE** Peak Elev=102.41' Inflow=0.13 cfs 405 cf  
6.0" Round Culvert n=0.013 L=156.0' S=0.0053 '/' Outflow=0.13 cfs 405 cf

**Link DP1: GREEN ST CB** Inflow=1.14 cfs 3,693 cf  
Primary=1.14 cfs 3,693 cf

**Total Runoff Area = 18,930 sf Runoff Volume = 3,693 cf Average Runoff Depth = 2.34"**  
**12.23% Pervious = 2,316 sf 87.77% Impervious = 16,614 sf**



**EXISTING REA0149**

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Type III 24-hr 2 Year Rainfall=3.31"

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**Summary for Subcatchment SC1.1: TO GREEN STREET**

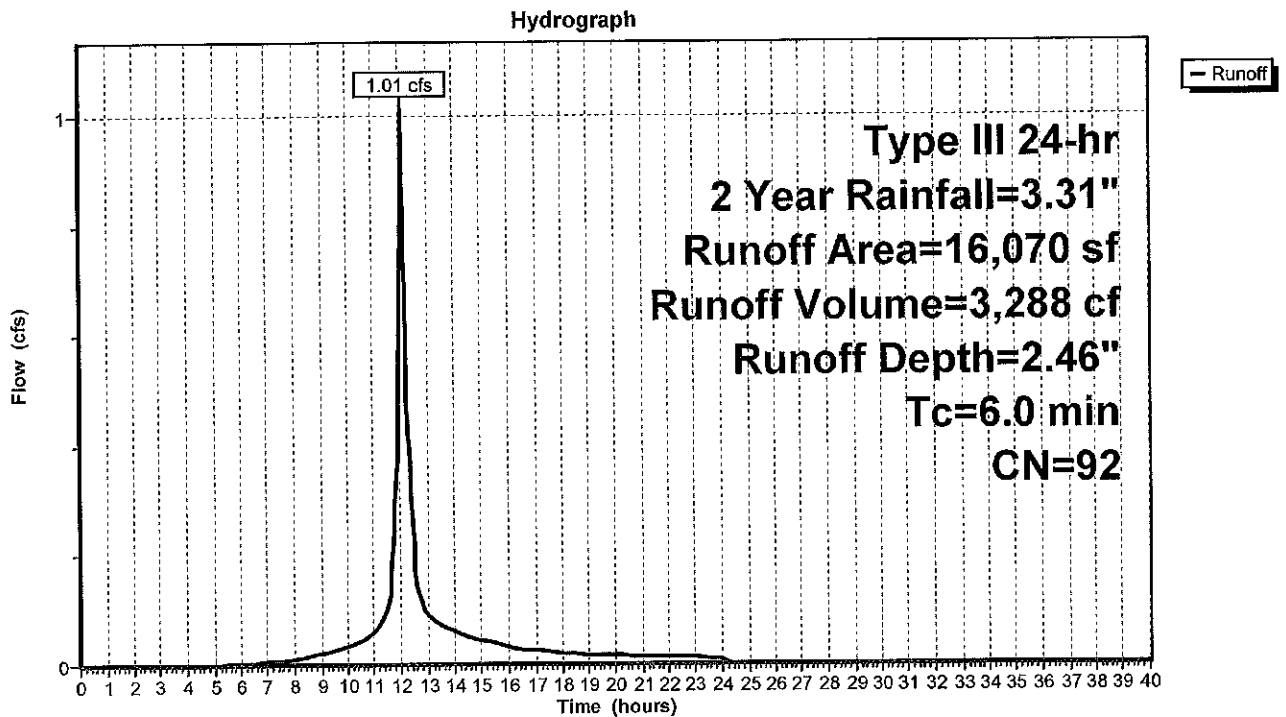
Runoff = 1.01 cfs @ 12.09 hrs, Volume= 3,288 cf, Depth= 2.46"  
 Routed to Link DP1 : GREEN ST CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2 Year Rainfall=3.31"

Area (sf)	CN	Description
1,588	39	>75% Grass cover, Good, HSG A
* 5,839	98	Paved parking, HSG A
* 675	98	Concrete, HSG A
* 15	68	Crushed Stone, Poor, HSG A
* 7,953	98	Unconnected roofs, HSG A
16,070	92	Weighted Average
1,603		9.98% Pervious Area
14,467		90.02% Impervious Area
7,953		54.97% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC1.1: TO GREEN STREET**



**EXISTING REA0149**

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Type III 24-hr 2 Year Rainfall=3.31"

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**Summary for Subcatchment SC1.2: TO HAVEN STREET**

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 405 cf, Depth= 1.70"  
 Routed to Pond CB : HAVEN STREET DRAINAGE

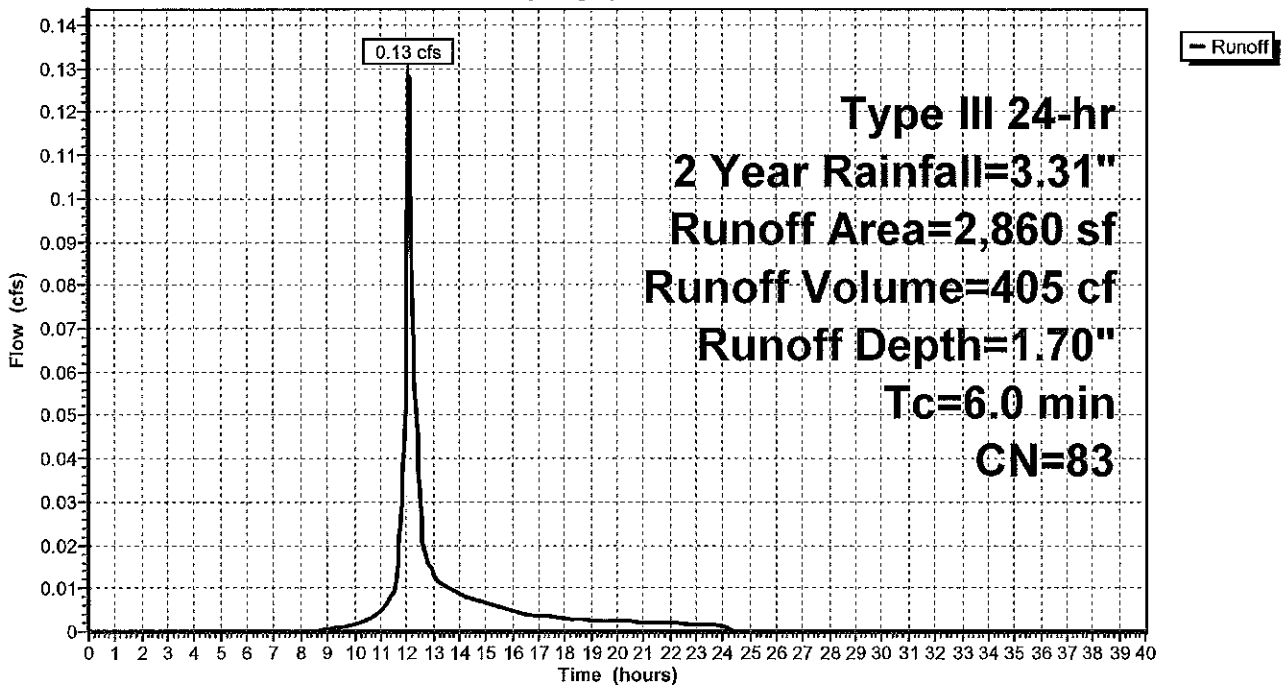
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2 Year Rainfall=3.31"

	Area (sf)	CN	Description
	713	39	>75% Grass cover, Good, HSG A
*	1,909	98	Paved parking, HSG A
*	238	98	Concrete, HSG A
	2,860	83	Weighted Average
	713		24.93% Pervious Area
	2,147		75.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC1.2: TO HAVEN STREET**

Hydrograph



**EXISTING REA0149**

Type III 24-hr 2 Year Rainfall=3.31"

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**Summary for Pond CB: HAVEN STREET DRAINAGE**

Inflow Area = 2,860 sf, 75.07% Impervious, Inflow Depth = 1.70" for 2 Year event  
 Inflow = 0.13 cfs @ 12.09 hrs, Volume= 405 cf  
 Outflow = 0.13 cfs @ 12.09 hrs, Volume= 405 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.13 cfs @ 12.09 hrs, Volume= 405 cf  
 Routed to Link DP1 : GREEN ST CB

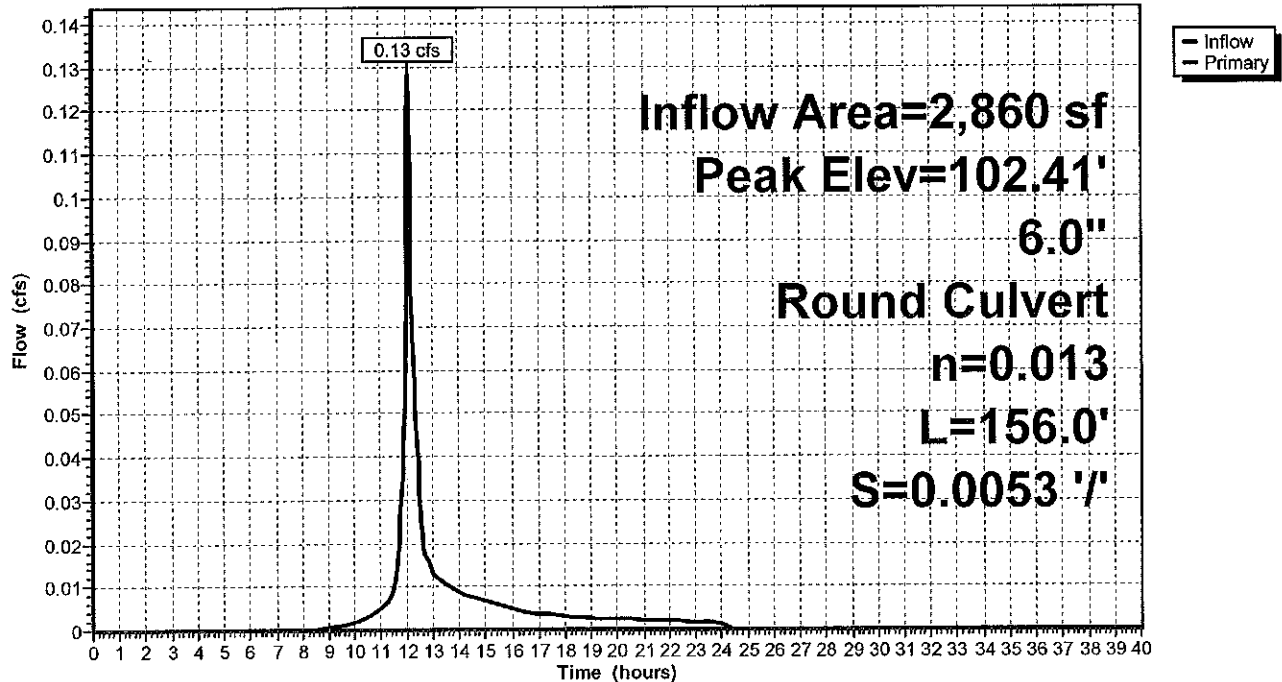
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs  
 Peak Elev= 102.41' @ 12.09 hrs  
 Flood Elev= 104.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	102.15'	<b>6.0" Round Culvert</b> L= 156.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 102.15' / 101.33' S= 0.0053 '/ Cc= 0.900 n= 0.013, Flow Area= 0.20 sf

Primary OutFlow Max=0.13 cfs @ 12.09 hrs HW=102.41' TW=0.00' (Dynamic Tailwater)  
 ↑1=Culvert (Barrel Controls 0.13 cfs @ 1.82 fps)

**Pond CB: HAVEN STREET DRAINAGE**

Hydrograph



**EXISTING REA0149**

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Type III 24-hr 2 Year Rainfall=3.31"

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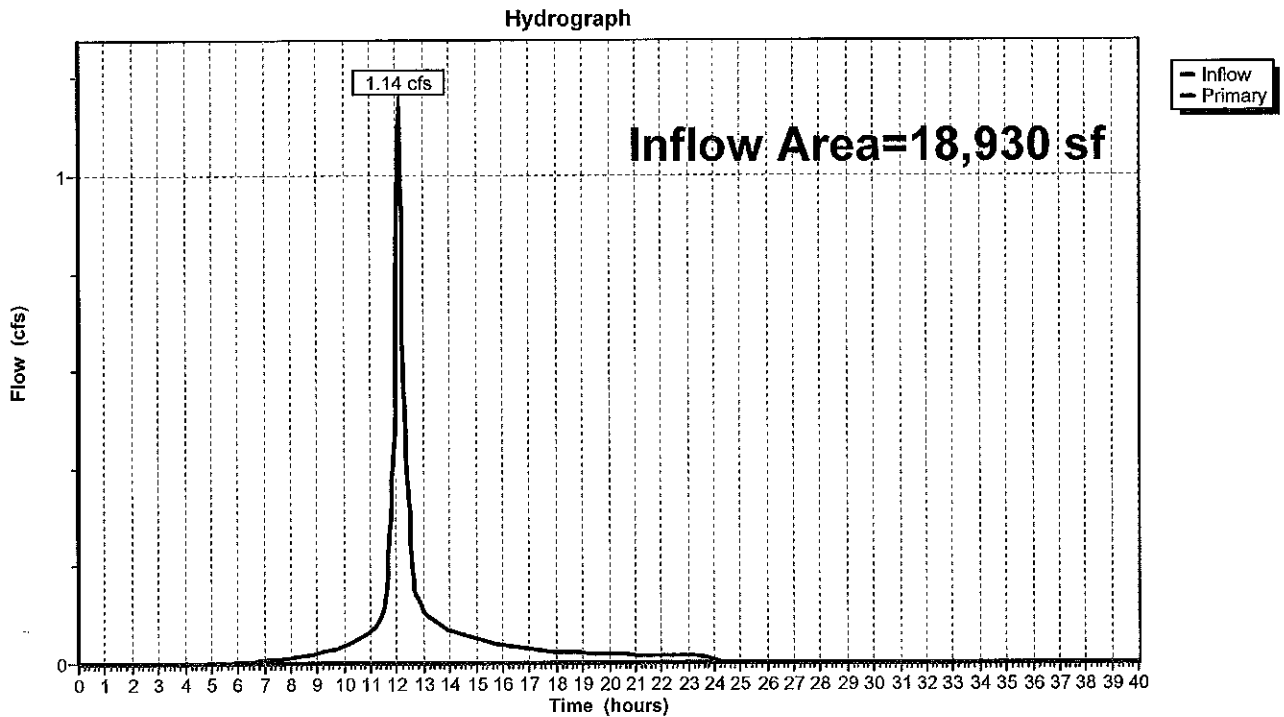
Page 8

**Summary for Link DP1: GREEN ST CB**

Inflow Area = 18,930 sf, 87.77% Impervious, Inflow Depth = 2.34" for 2 Year event  
Inflow = 1.14 cfs @ 12.09 hrs, Volume= 3,693 cf  
Primary = 1.14 cfs @ 12.09 hrs, Volume= 3,693 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

**Link DP1: GREEN ST CB**



**EXISTING REA0149**

Type III 24-hr 10 Year Rainfall=5.22"

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Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 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 SC1.1: TO GREEN STREET** Runoff Area=16,070 sf 90.02% Impervious Runoff Depth=4.30"  
Tc=6.0 min CN=92 Runoff=1.72 cfs 5,764 cf

**Subcatchment SC1.2: TO HAVEN STREET** Runoff Area=2,860 sf 75.07% Impervious Runoff Depth=3.37"  
Tc=6.0 min CN=83 Runoff=0.25 cfs 804 cf

**Pond CB: HAVEN STREET DRAINAGE** Peak Elev=102.53' Inflow=0.25 cfs 804 cf  
6.0" Round Culvert n=0.013 L=156.0' S=0.0053 '/' Outflow=0.25 cfs 804 cf

**Link DP1: GREEN ST CB** Inflow=1.97 cfs 6,568 cf  
Primary=1.97 cfs 6,568 cf

**Total Runoff Area = 18,930 sf Runoff Volume = 6,568 cf Average Runoff Depth = 4.16"**  
**12.23% Pervious = 2,316 sf 87.77% Impervious = 16,614 sf**

**EXISTING REA0149**

Type III 24-hr 10 Year Rainfall=5.22"

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**Summary for Subcatchment SC1.1: TO GREEN STREET**

Runoff = 1.72 cfs @ 12.09 hrs, Volume= 5,764 cf, Depth= 4.30"  
 Routed to Link DP1 : GREEN ST CB

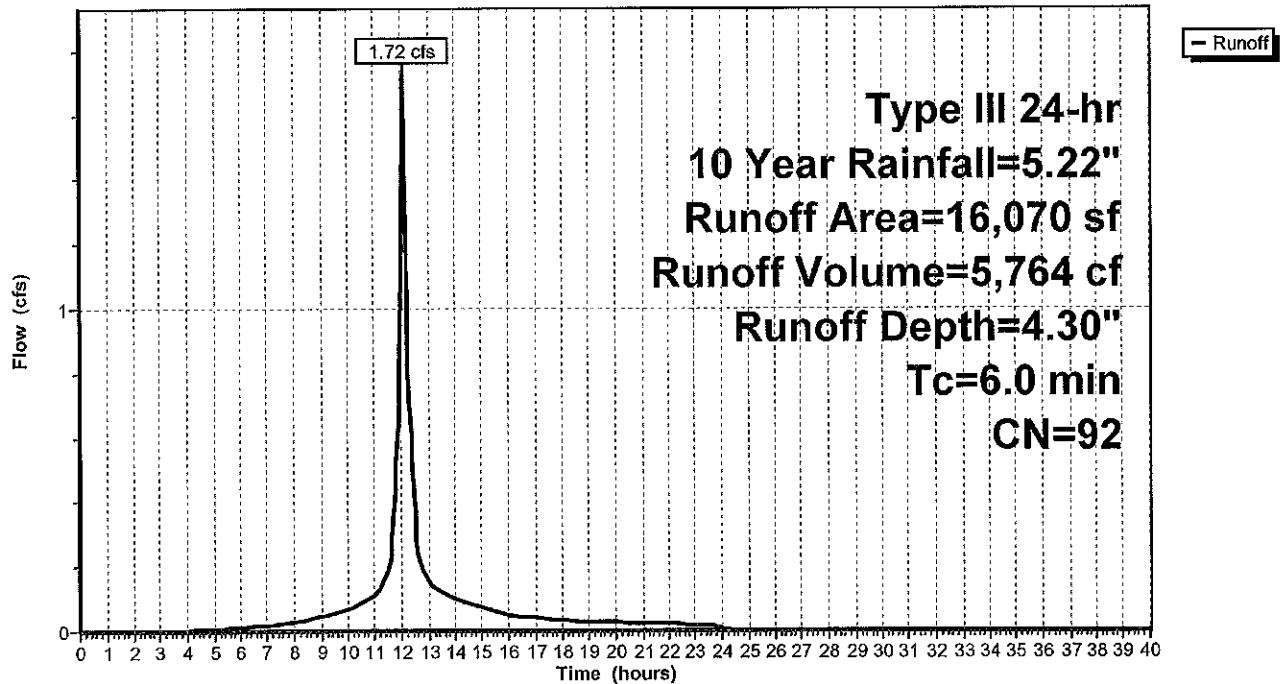
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
1,588	39	>75% Grass cover, Good, HSG A
* 5,839	98	Paved parking, HSG A
* 675	98	Concrete, HSG A
* 15	68	Crushed Stone, Poor, HSG A
* 7,953	98	Unconnected roofs, HSG A
16,070	92	Weighted Average
1,603		9.98% Pervious Area
14,467		90.02% Impervious Area
7,953		54.97% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC1.1: TO GREEN STREET**

Hydrograph



**EXISTING REA0149**

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Type III 24-hr 10 Year Rainfall=5.22"

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**Summary for Subcatchment SC1.2: TO HAVEN STREET**

Runoff = 0.25 cfs @ 12.09 hrs, Volume= 804 cf, Depth= 3.37"  
 Routed to Pond CB : HAVEN STREET DRAINAGE

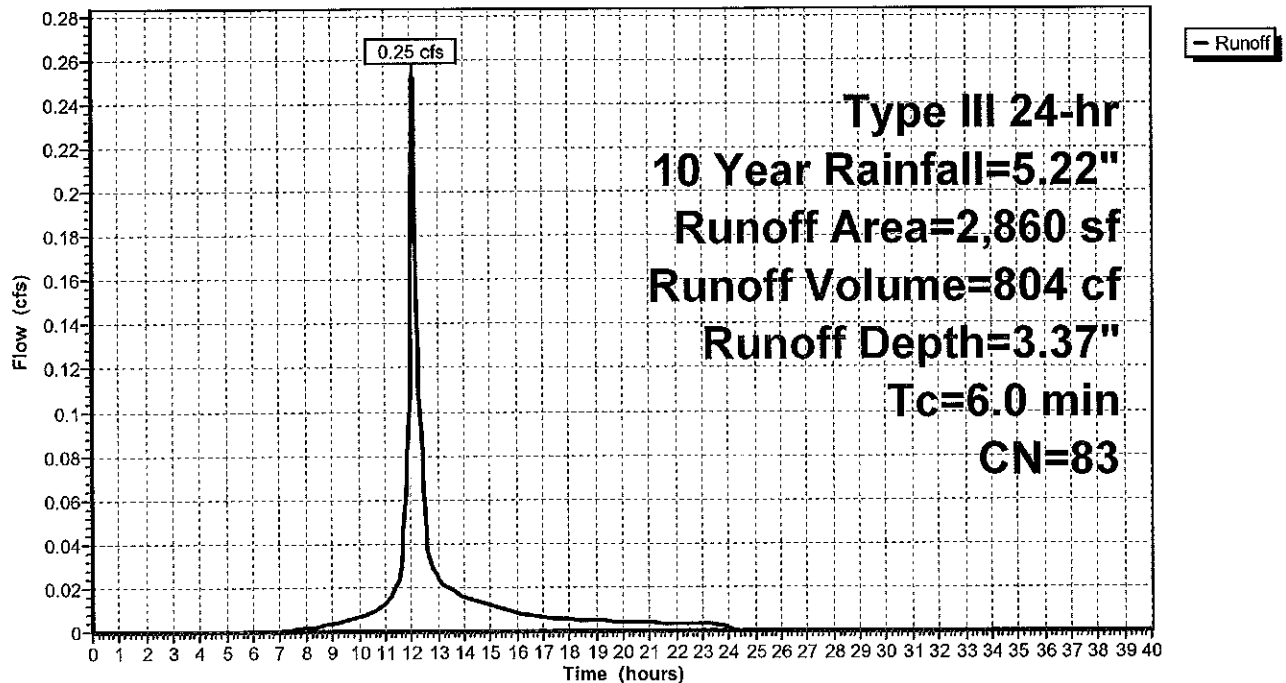
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10 Year Rainfall=5.22"

	Area (sf)	CN	Description
	713	39	>75% Grass cover, Good, HSG A
*	1,909	98	Paved parking, HSG A
*	238	98	Concrete, HSG A
	2,860	83	Weighted Average
	713		24.93% Pervious Area
	2,147		75.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC1.2: TO HAVEN STREET**

Hydrograph



**EXISTING REA0149**

Type III 24-hr 10 Year Rainfall=5.22"

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**Summary for Pond CB: HAVEN STREET DRAINAGE**

Inflow Area = 2,860 sf, 75.07% Impervious, Inflow Depth = 3.37" for 10 Year event  
 Inflow = 0.25 cfs @ 12.09 hrs, Volume= 804 cf  
 Outflow = 0.25 cfs @ 12.09 hrs, Volume= 804 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.25 cfs @ 12.09 hrs, Volume= 804 cf  
 Routed to Link DP1 : GREEN ST CB

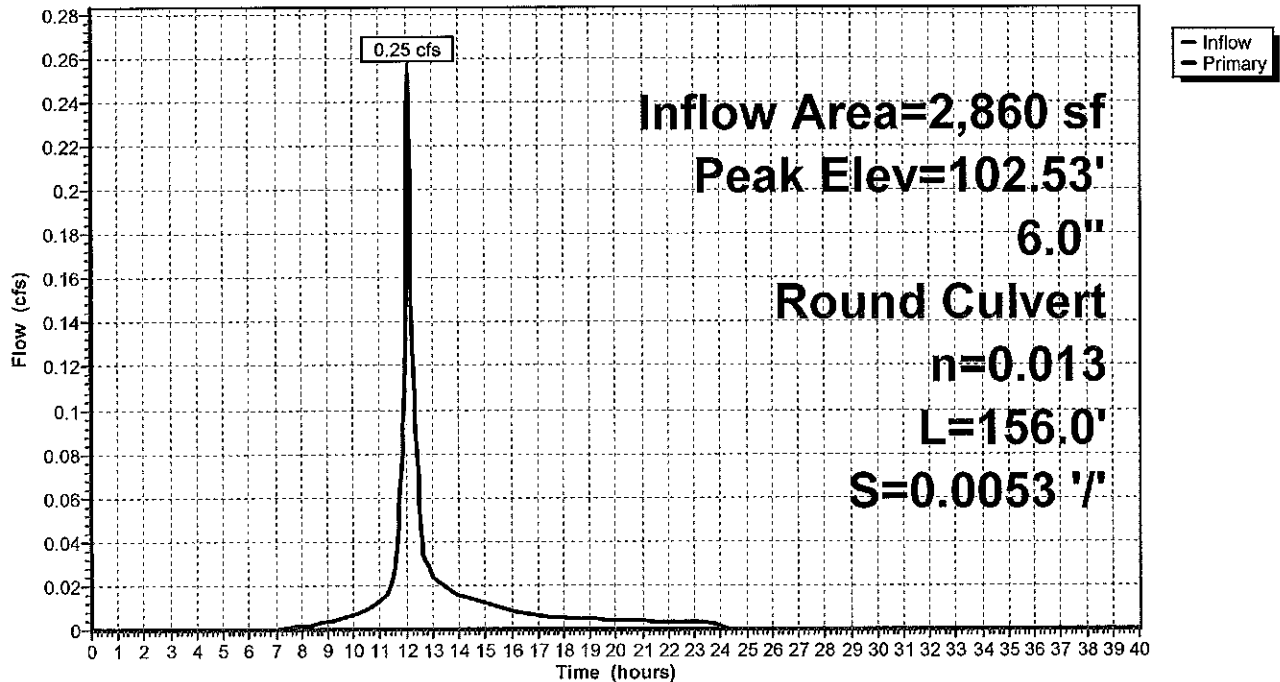
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs  
 Peak Elev= 102.53' @ 12.09 hrs  
 Flood Elev= 104.55'

Device #	Routing	Invert	Outlet Devices
#1	Primary	102.15'	<b>6.0" Round Culvert</b> L= 156.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 102.15' / 101.33' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf

Primary OutFlow Max=0.25 cfs @ 12.09 hrs HW=102.53' TW=0.00' (Dynamic Tailwater)  
 ←1=Culvert (Barrel Controls 0.25 cfs @ 2.16 fps)

**Pond CB: HAVEN STREET DRAINAGE**

Hydrograph





**EXISTING REA0149**

Type III 24-hr 10 Year Rainfall=5.22"

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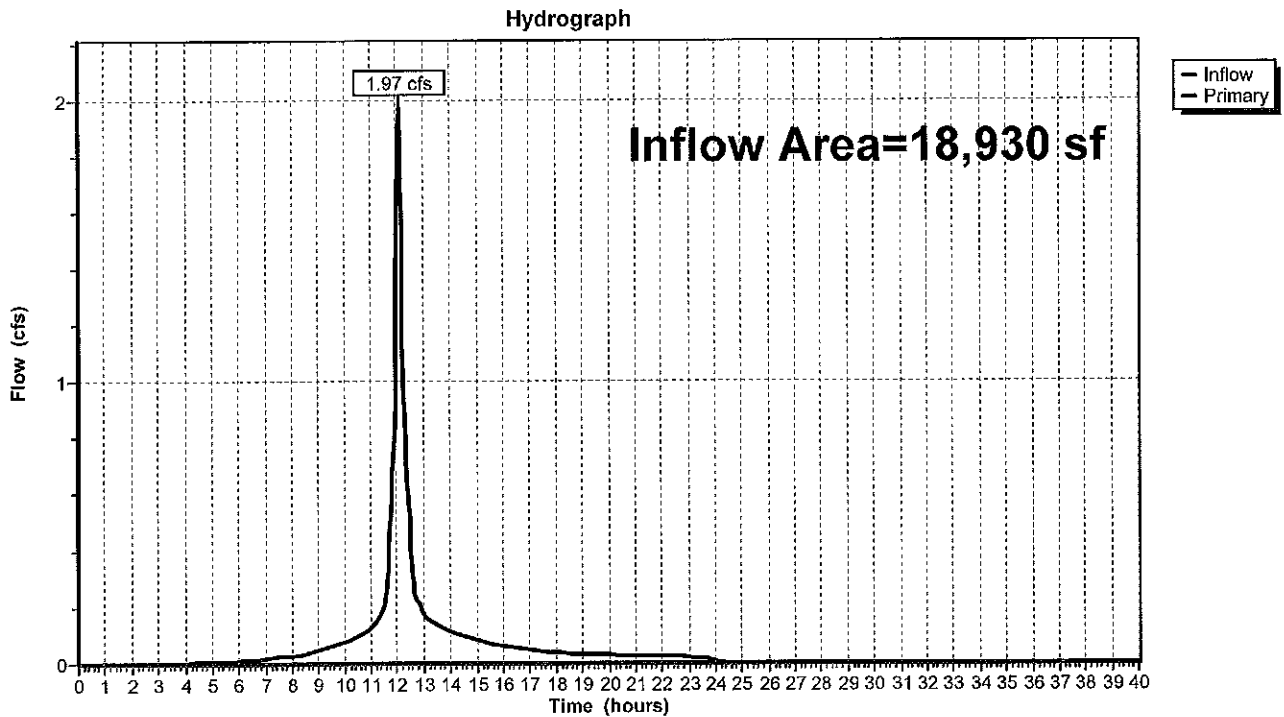
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**Summary for Link DP1: GREEN ST CB**

Inflow Area = 18,930 sf, 87.77% Impervious, Inflow Depth = 4.16" for 10 Year event  
Inflow = 1.97 cfs @ 12.09 hrs, Volume= 6,568 cf  
Primary = 1.97 cfs @ 12.09 hrs, Volume= 6,568 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

**Link DP1: GREEN ST CB**



**EXISTING REA0149**

Type III 24-hr 25 Year Rainfall=6.41"

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Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 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 SC1.1: TO GREEN STREET** Runoff Area=16,070 sf 90.02% Impervious Runoff Depth=5.47"  
Tc=6.0 min CN=92 Runoff=2.16 cfs 7,329 cf

**Subcatchment SC1.2: TO HAVEN STREET** Runoff Area=2,860 sf 75.07% Impervious Runoff Depth=4.47"  
Tc=6.0 min CN=83 Runoff=0.33 cfs 1,066 cf

**Pond CB: HAVEN STREET DRAINAGE** Peak Elev=102.61' Inflow=0.33 cfs 1,066 cf  
6.0" Round Culvert n=0.013 L=156.0' S=0.0053 '/' Outflow=0.33 cfs 1,066 cf

**Link DP1: GREEN ST CB** Inflow=2.49 cfs 8,395 cf  
Primary=2.49 cfs 8,395 cf

**Total Runoff Area = 18,930 sf Runoff Volume = 8,395 cf Average Runoff Depth = 5.32"**  
**12.23% Pervious = 2,316 sf 87.77% Impervious = 16,614 sf**

**EXISTING REA0149**

Type III 24-hr 25 Year Rainfall=6.41"

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**Summary for Subcatchment SC1.1: TO GREEN STREET**

Runoff = 2.16 cfs @ 12.09 hrs, Volume= 7,329 cf, Depth= 5.47"  
 Routed to Link DP1 : GREEN ST CB

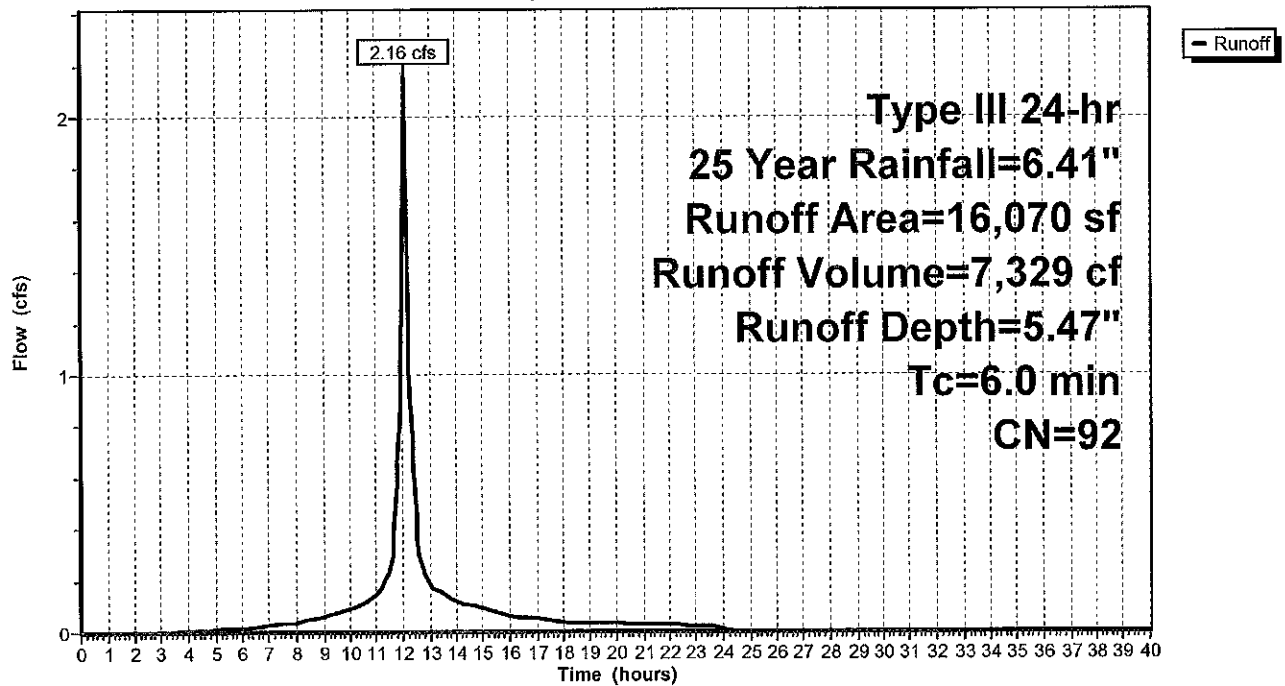
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 25 Year Rainfall=6.41"

Area (sf)	CN	Description
1,588	39	>75% Grass cover, Good, HSG A
* 5,839	98	Paved parking, HSG A
* 675	98	Concrete, HSG A
* 15	68	Crushed Stone, Poor, HSG A
* 7,953	98	Unconnected roofs, HSG A
16,070	92	Weighted Average
1,603		9.98% Pervious Area
14,467		90.02% Impervious Area
7,953		54.97% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC1.1: TO GREEN STREET**

Hydrograph



**EXISTING REA0149**

Type III 24-hr 25 Year Rainfall=6.41"

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**Summary for Subcatchment SC1.2: TO HAVEN STREET**

Runoff = 0.33 cfs @ 12.09 hrs, Volume= 1,066 cf, Depth= 4.47"  
 Routed to Pond CB : HAVEN STREET DRAINAGE

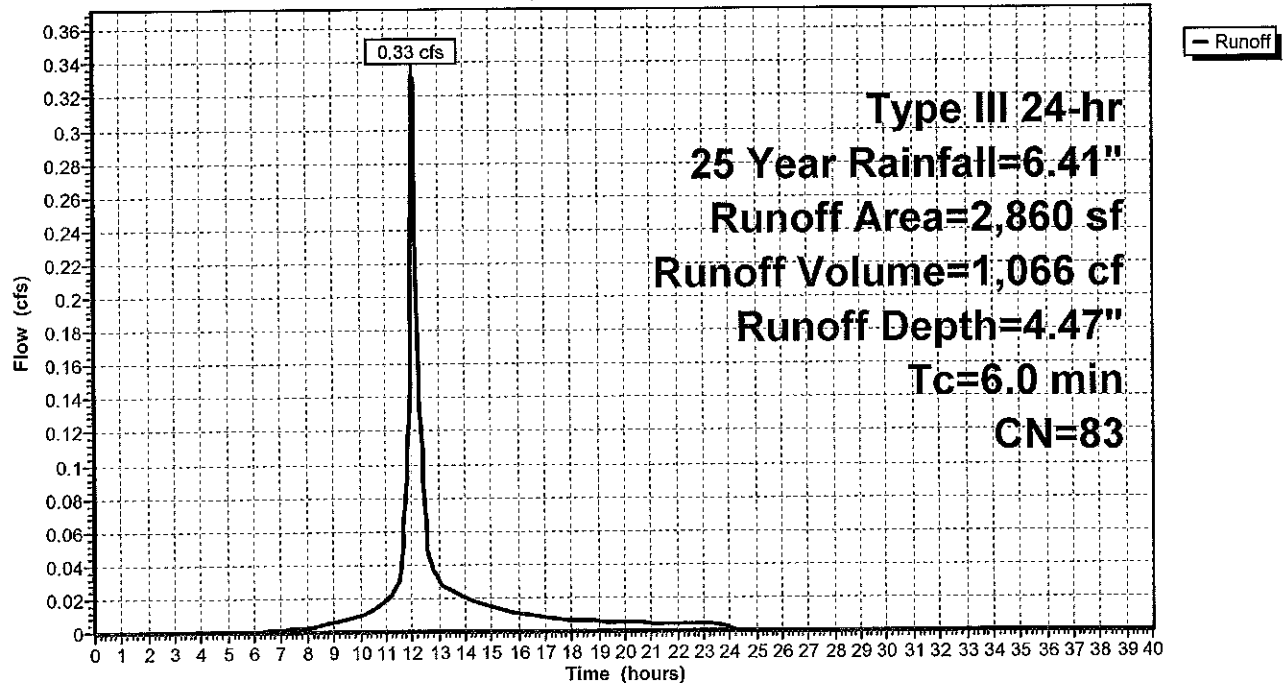
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 25 Year Rainfall=6.41"

	Area (sf)	CN	Description
	713	39	>75% Grass cover, Good, HSG A
*	1,909	98	Paved parking, HSG A
*	238	98	Concrete, HSG A
	2,860	83	Weighted Average
	713		24.93% Pervious Area
	2,147		75.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC1.2: TO HAVEN STREET**

Hydrograph



**EXISTING REA0149**

Type III 24-hr 25 Year Rainfall=6.41"

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**Summary for Pond CB: HAVEN STREET DRAINAGE**

Inflow Area = 2,860 sf, 75.07% Impervious, Inflow Depth = 4.47" for 25 Year event  
 Inflow = 0.33 cfs @ 12.09 hrs, Volume= 1,066 cf  
 Outflow = 0.33 cfs @ 12.09 hrs, Volume= 1,066 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.33 cfs @ 12.09 hrs, Volume= 1,066 cf

Routed to Link DP1 : GREEN ST CB

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Peak Elev= 102.61' @ 12.09 hrs

Flood Elev= 104.55'

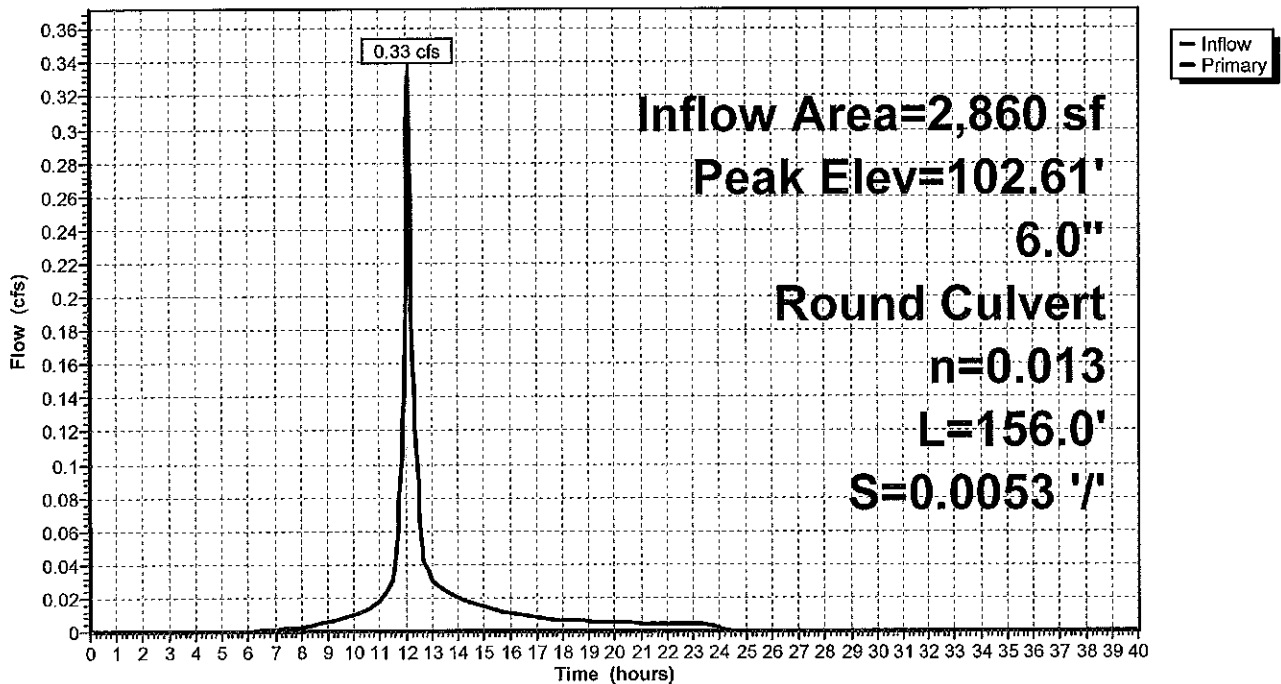
Device	Routing	Invert	Outlet Devices
#1	Primary	102.15'	<b>6.0" Round Culvert</b> L= 156.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 102.15' / 101.33' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf

Primary OutFlow Max=0.32 cfs @ 12.09 hrs HW=102.60' TW=0.00' (Dynamic Tailwater)

1=Culvert (Barrel Controls 0.32 cfs @ 2.29 fps)

**Pond CB: HAVEN STREET DRAINAGE**

Hydrograph

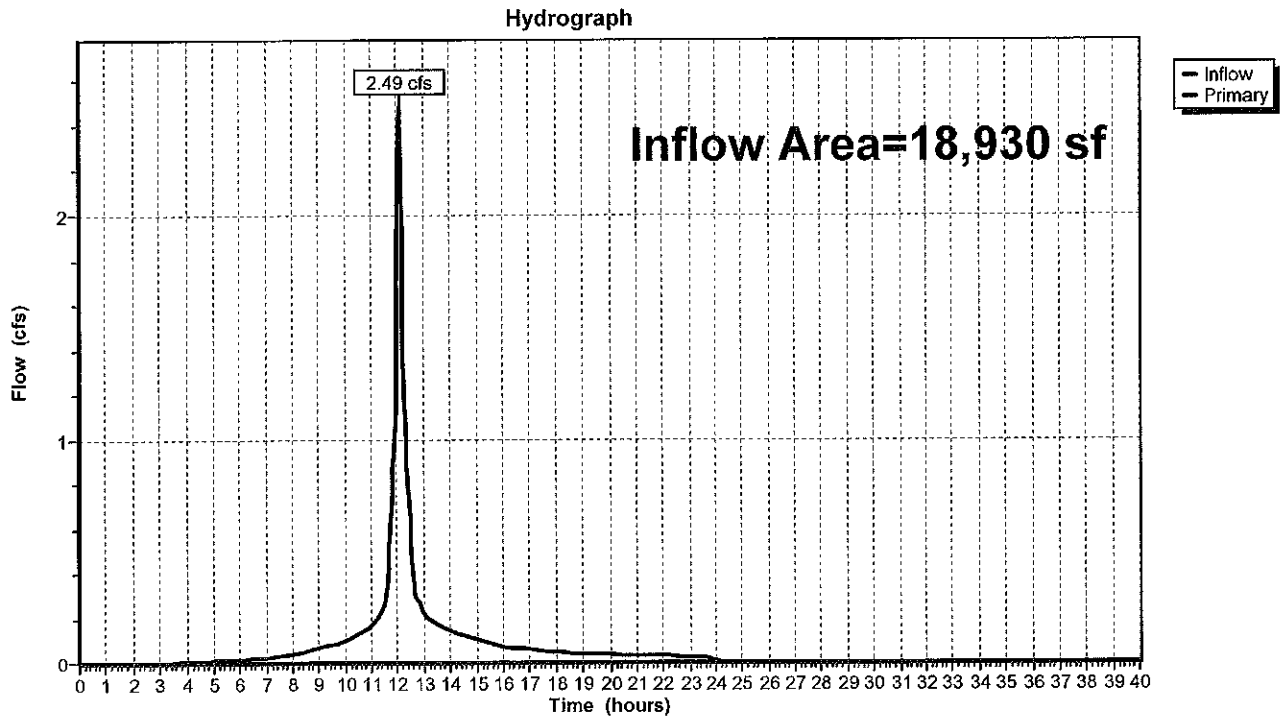


Summary for Link DP1: GREEN ST CB

Inflow Area = 18,930 sf, 87.77% Impervious, Inflow Depth = 5.32" for 25 Year event  
Inflow = 2.49 cfs @ 12.09 hrs, Volume= 8,395 cf  
Primary = 2.49 cfs @ 12.09 hrs, Volume= 8,395 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Link DP1: GREEN ST CB



**EXISTING REA0149**

Type III 24-hr 100 Year Rainfall=8.24"

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Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 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 SC1.1: TO GREEN STREET** Runoff Area=16,070 sf 90.02% Impervious Runoff Depth=7.28"  
Tc=6.0 min CN=92 Runoff=2.83 cfs 9,751 cf

**Subcatchment SC1.2: TO HAVEN STREET** Runoff Area=2,860 sf 75.07% Impervious Runoff Depth=6.21"  
Tc=6.0 min CN=83 Runoff=0.45 cfs 1,479 cf

**Pond CB: HAVEN STREET DRAINAGE** Peak Elev=102.96' Inflow=0.45 cfs 1,479 cf  
6.0" Round Culvert n=0.013 L=156.0' S=0.0053 '/' Outflow=0.45 cfs 1,479 cf

**Link DP1: GREEN ST CB** Inflow=3.28 cfs 11,230 cf  
Primary=3.28 cfs 11,230 cf

**Total Runoff Area = 18,930 sf Runoff Volume = 11,230 cf Average Runoff Depth = 7.12"**  
**12.23% Pervious = 2,316 sf 87.77% Impervious = 16,614 sf**

**EXISTING REA0149**

Type III 24-hr 100 Year Rainfall=8.24"

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**Summary for Subcatchment SC1.1: TO GREEN STREET**

Runoff = 2.83 cfs @ 12.09 hrs, Volume= 9,751 cf, Depth= 7.28"  
 Routed to Link DP1 : GREEN ST CB

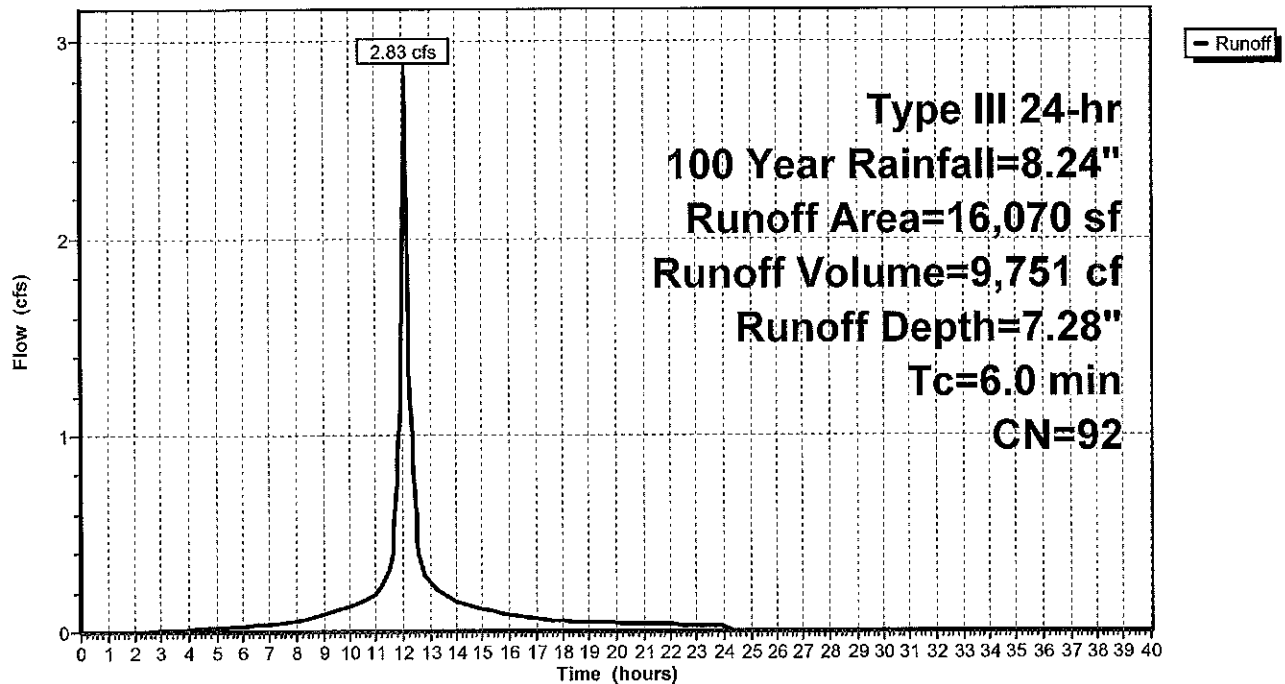
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 100 Year Rainfall=8.24"

Area (sf)	CN	Description
1,588	39	>75% Grass cover, Good, HSG A
* 5,839	98	Paved parking, HSG A
* 675	98	Concrete, HSG A
* 15	68	Crushed Stone, Poor, HSG A
* 7,953	98	Unconnected roofs, HSG A
16,070	92	Weighted Average
1,603		9.98% Pervious Area
14,467		90.02% Impervious Area
7,953		54.97% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC1.1: TO GREEN STREET**

Hydrograph





**EXISTING REA0149**

Type III 24-hr 100 Year Rainfall=8.24"

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**Summary for Subcatchment SC1.2: TO HAVEN STREET**

Runoff = 0.45 cfs @ 12.09 hrs, Volume= 1,479 cf, Depth= 6.21"  
 Routed to Pond CB : HAVEN STREET DRAINAGE

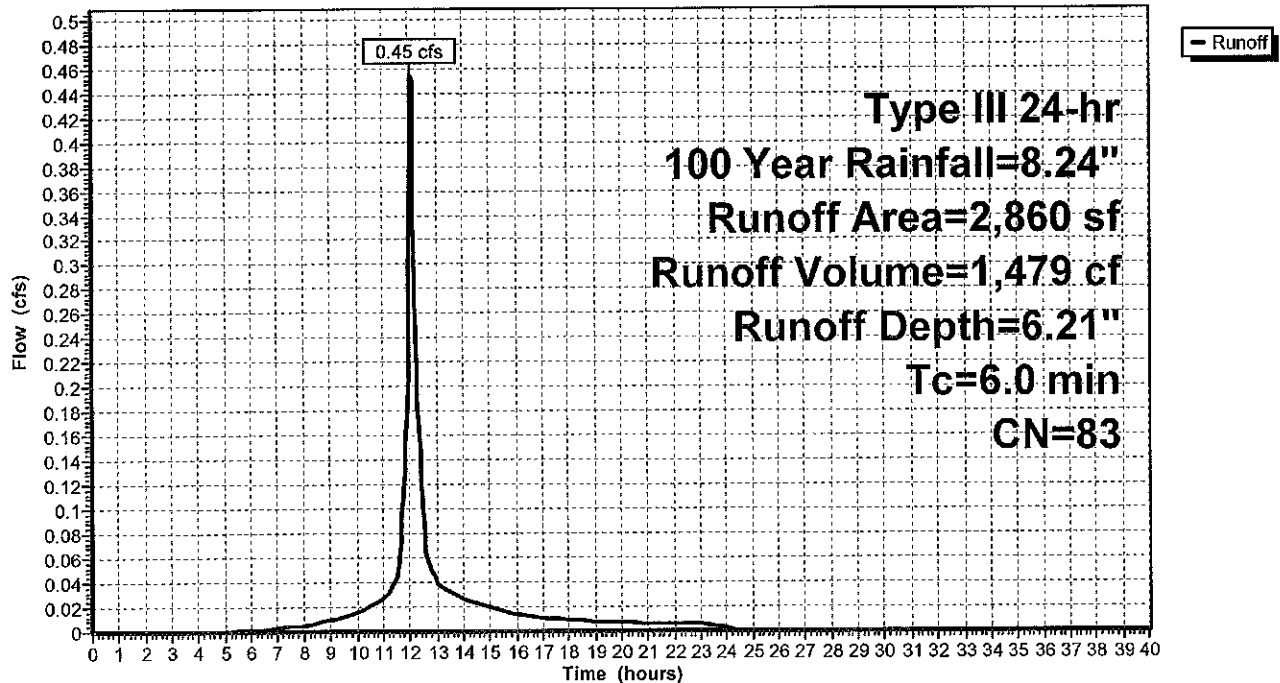
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 100 Year Rainfall=8.24"

	Area (sf)	CN	Description
	713	39	>75% Grass cover, Good, HSG A
*	1,909	98	Paved parking, HSG A
*	238	98	Concrete, HSG A
	2,860	83	Weighted Average
	713		24.93% Pervious Area
	2,147		75.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC1.2: TO HAVEN STREET**

Hydrograph



**EXISTING REA0149**

Type III 24-hr 100 Year Rainfall=8.24"

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**Summary for Pond CB: HAVEN STREET DRAINAGE**

Inflow Area = 2,860 sf, 75.07% Impervious, Inflow Depth = 6.21" for 100 Year event  
 Inflow = 0.45 cfs @ 12.09 hrs, Volume= 1,479 cf  
 Outflow = 0.45 cfs @ 12.09 hrs, Volume= 1,479 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.45 cfs @ 12.09 hrs, Volume= 1,479 cf  
 Routed to Link DP1 : GREEN ST CB

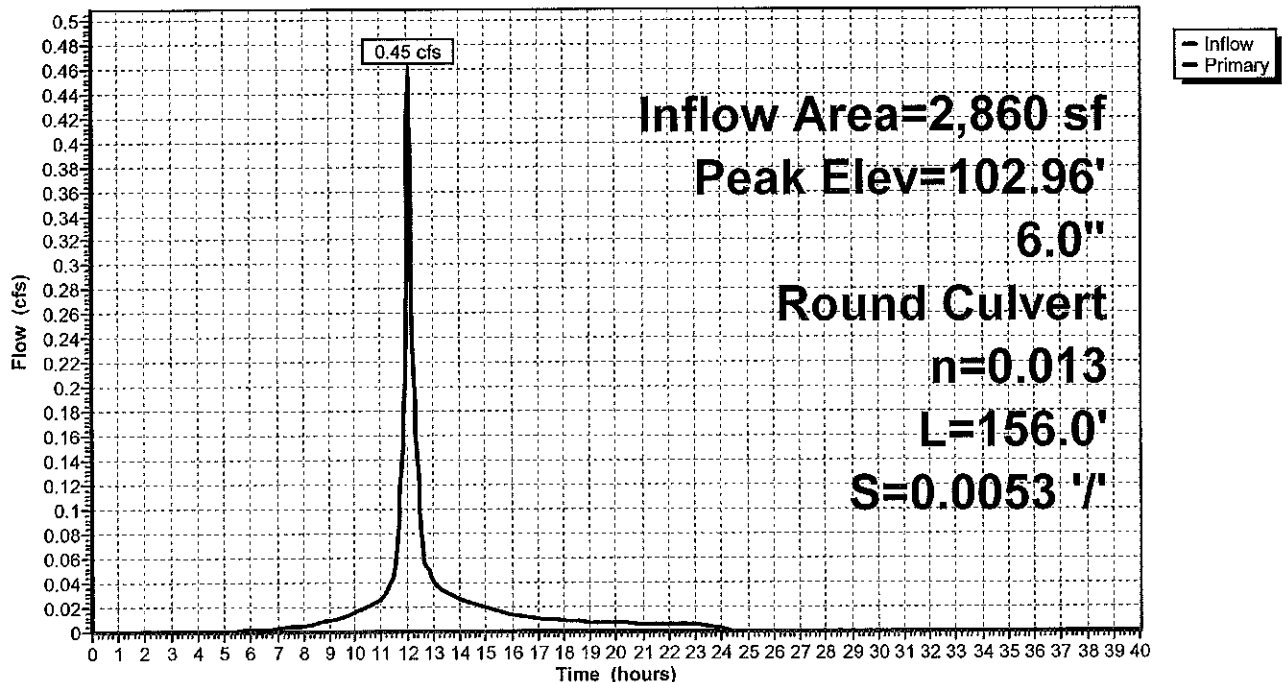
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs  
 Peak Elev= 102.96' @ 12.10 hrs  
 Flood Elev= 104.55'

Device #	Routing	Invert	Outlet Devices
#1	Primary	102.15'	<b>6.0" Round Culvert</b> L= 156.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 102.15' / 101.33' S= 0.0053 '/ Cc= 0.900 n= 0.013, Flow Area= 0.20 sf

Primary OutFlow Max=0.44 cfs @ 12.09 hrs HW=102.91' TW=0.00' (Dynamic Tailwater)  
 ↑1=Culvert (Barrel Controls 0.44 cfs @ 2.24 fps)

**Pond CB: HAVEN STREET DRAINAGE**

Hydrograph

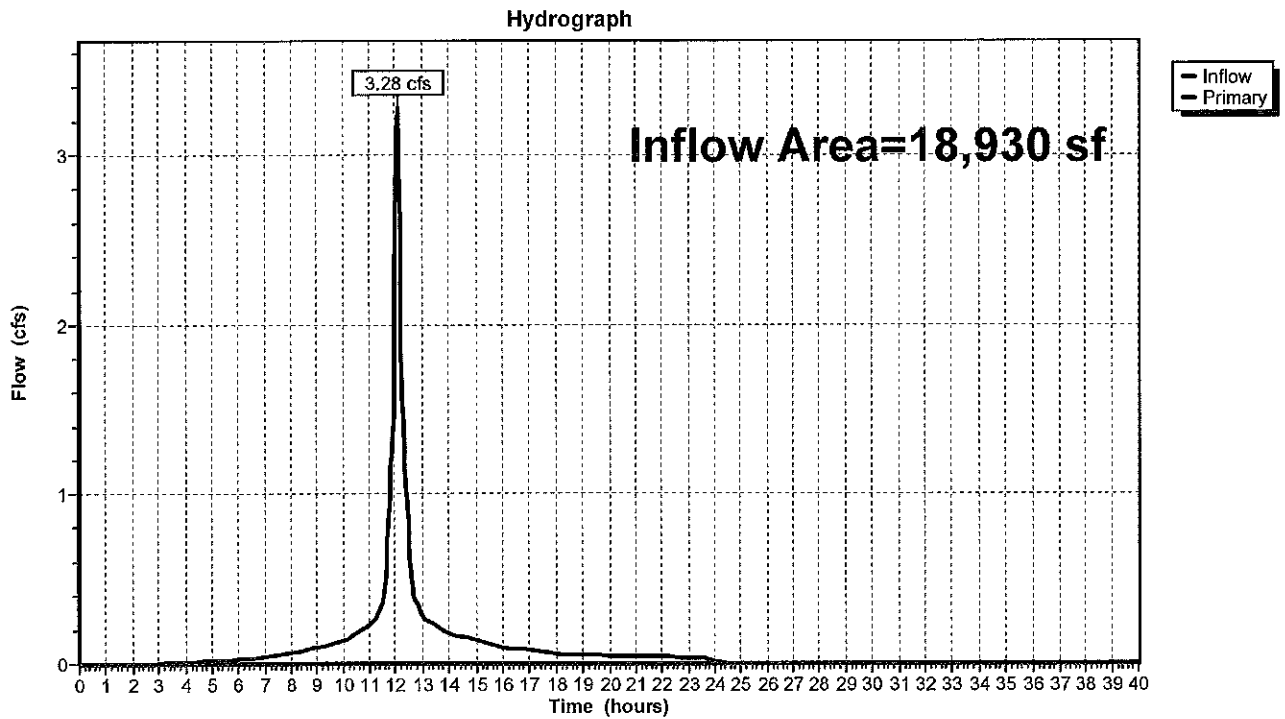


**Summary for Link DP1: GREEN ST CB**

Inflow Area = 18,930 sf, 87.77% Impervious, Inflow Depth = 7.12" for 100 Year event  
Inflow = 3.28 cfs @ 12.09 hrs, Volume= 11,230 cf  
Primary = 3.28 cfs @ 12.09 hrs, Volume= 11,230 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

**Link DP1: GREEN ST CB**



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**Events for Subcatchment SC1.1: TO GREEN STREET**

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.31	1.01	3,288	2.46
10 Year	5.22	1.72	5,764	4.30
25 Year	6.41	2.16	7,329	5.47
100 Year	<b>8.24</b>	<b>2.83</b>	<b>9,751</b>	<b>7.28</b>

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*Multi-Event Tables*

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**Events for Subcatchment SC1.2: TO HAVEN STREET**

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.31	0.13	405	1.70
10 Year	5.22	0.25	804	3.37
25 Year	6.41	0.33	1,066	4.47
100 Year	<b>8.24</b>	<b>0.45</b>	<b>1,479</b>	<b>6.21</b>

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*Multi-Event Tables*

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**Events for Pond CB: HAVEN STREET DRAINAGE**

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.13	0.13	102.41	0
10 Year	0.25	0.25	102.53	0
25 Year	0.33	0.33	102.61	0
100 Year	0.45	0.45	102.96	0

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*Multi-Event Tables*

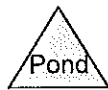
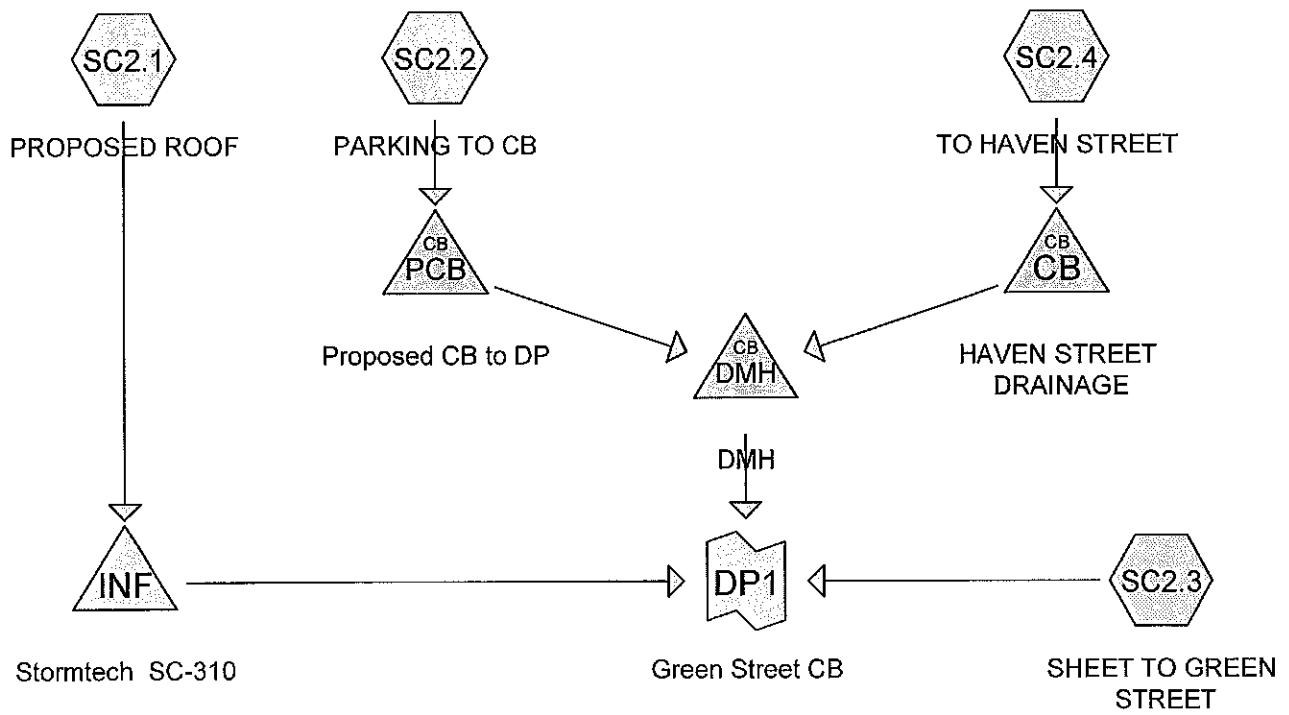
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**Events for Link DP1: GREEN ST CB**

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
2 Year	1.14	1.14	<b>0.00</b>
10 Year	1.97	1.97	0.00
25 Year	2.49	2.49	0.00
100 Year	<b>3.28</b>	<b>3.28</b>	0.00

### PROPOSED RUNOFF



**Routing Diagram for PROPOSED REA0149**  
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**Rainfall Events Listing**

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 Year	Type III 24-hr		Default	24.00	1	3.31	2
2	10 Year	Type III 24-hr		Default	24.00	1	5.22	2
3	25 Year	Type III 24-hr		Default	24.00	1	6.41	2
4	100 Year	Type III 24-hr		Default	24.00	1	8.24	2

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**Area Listing (all nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
3,523	39	>75% Grass cover, Good, HSG A (SC2.3, SC2.4)
2,493	98	Concrete, HSG A (SC2.2, SC2.3, SC2.4)
4,315	98	Paved parking, HSG A (SC2.2)
8,600	98	Unconnected roofs, HSG A (SC2.1)
<b>18,931</b>	<b>87</b>	<b>TOTAL AREA</b>

**PROPOSED REA0149**

Type III 24-hr 2 Year Rainfall=3.31"

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 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 SC2.1: PROPOSED ROOF** Runoff Area=8,600 sf 100.00% Impervious Runoff Depth=3.08"  
Tc=6.0 min CN=98 Runoff=0.62 cfs 2,205 cf

**Subcatchment SC2.2: PARKING TO CB** Runoff Area=4,532 sf 100.00% Impervious Runoff Depth=3.08"  
Tc=6.0 min CN=98 Runoff=0.33 cfs 1,162 cf

**Subcatchment SC2.3: SHEET TO GREEN** Runoff Area=5,283 sf 39.18% Impervious Runoff Depth=0.53"  
Tc=6.0 min CN=62 Runoff=0.05 cfs 233 cf

**Subcatchment SC2.4: TO HAVEN STREET** Runoff Area=516 sf 39.92% Impervious Runoff Depth=0.57"  
Tc=6.0 min CN=63 Runoff=0.01 cfs 24 cf

**Pond CB: HAVEN STREET DRAINAGE** Peak Elev=102.20' Inflow=0.01 cfs 24 cf  
6.0" Round Culvert n=0.011 L=174.0' S=0.0053 '/' Outflow=0.01 cfs 24 cf

**Pond DMH: DMH** Peak Elev=101.41' Inflow=0.33 cfs 1,187 cf  
8.0" Round Culvert n=0.011 L=89.0' S=0.0053 '/' Outflow=0.33 cfs 1,187 cf

**Pond INF: Stormtech SC-310** Peak Elev=101.51' Storage=253 cf Inflow=0.62 cfs 2,205 cf  
Discarded=0.23 cfs 2,218 cf Primary=0.00 cfs 0 cf Outflow=0.23 cfs 2,218 cf

**Pond PCB: Proposed CB to DP** Peak Elev=101.48' Inflow=0.33 cfs 1,162 cf  
8.0" Round Culvert n=0.011 L=1.0' S=0.0000 '/' Outflow=0.33 cfs 1,162 cf

**Link DP1: Green Street CB** Inflow=0.38 cfs 1,419 cf  
Primary=0.38 cfs 1,419 cf

Total Runoff Area = 18,931 sf Runoff Volume = 3,625 cf Average Runoff Depth = 2.30"  
18.61% Pervious = 3,523 sf 81.39% Impervious = 15,408 sf

**PROPOSED REA0149**

Type III 24-hr 2 Year Rainfall=3.31"

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**Summary for Subcatchment SC2.1: PROPOSED ROOF**

Runoff = 0.62 cfs @ 12.09 hrs, Volume= 2,205 cf, Depth= 3.08"  
 Routed to Pond INF : Stormtech SC-310

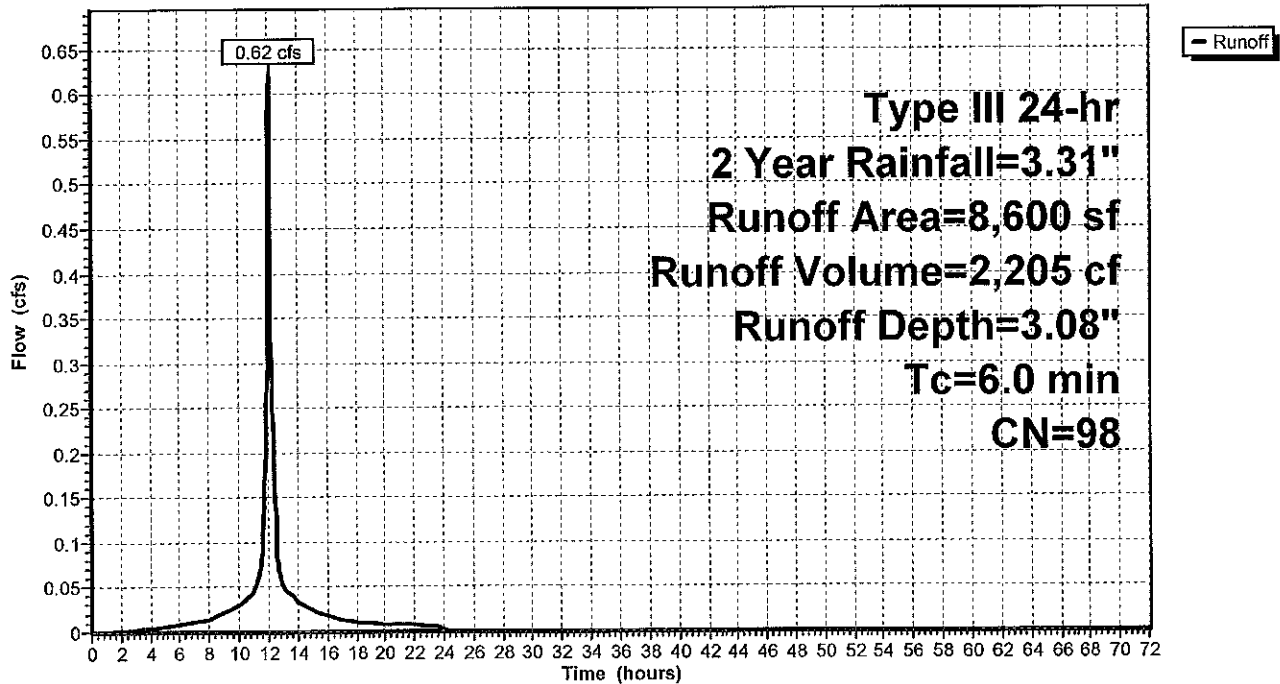
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2 Year Rainfall=3.31"

Area (sf)	CN	Description
* 8,600	98	Unconnected roofs, HSG A
8,600		100.00% Impervious Area
8,600		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.1: PROPOSED ROOF**

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 2 Year Rainfall=3.31"

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**Summary for Subcatchment SC2.2: PARKING TO CB**

Runoff = 0.33 cfs @ 12.09 hrs, Volume= 1,162 cf, Depth= 3.08"  
 Routed to Pond PCB : Proposed CB to DP

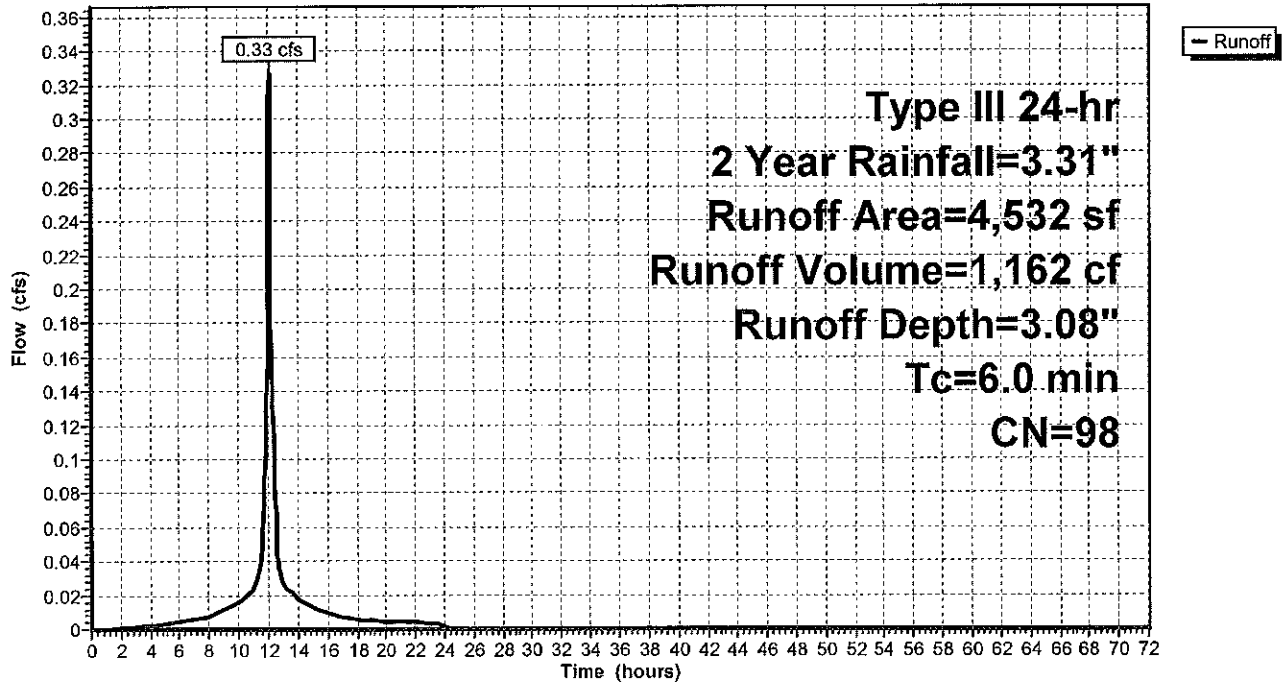
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2 Year Rainfall=3.31"

	Area (sf)	CN	Description
*	4,315	98	Paved parking, HSG A
*	217	98	Concrete, HSG A
	4,532	98	Weighted Average
	4,532		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.2: PARKING TO CB**

Hydrograph



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Type III 24-hr 2 Year Rainfall=3.31"

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**Summary for Subcatchment SC2.3: SHEET TO GREEN STREET**

Runoff = 0.05 cfs @ 12.12 hrs, Volume= 233 cf, Depth= 0.53"  
 Routed to Link DP1 : Green Street CB

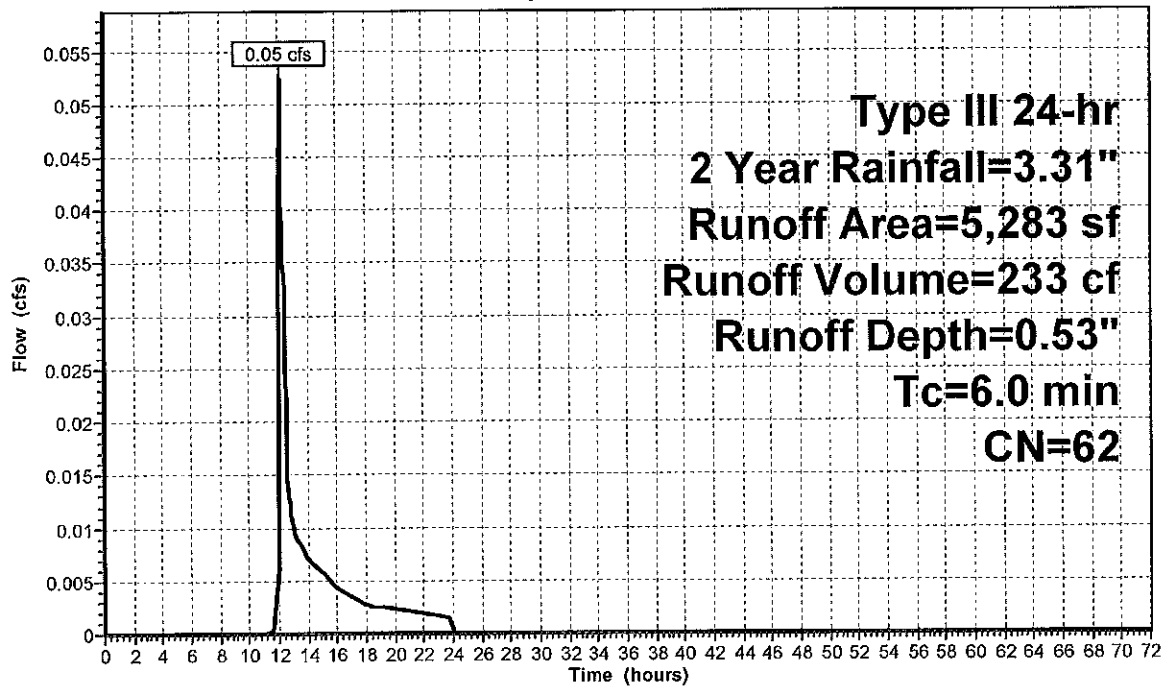
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2 Year Rainfall=3.31"

Area (sf)	CN	Description
3,213	39	>75% Grass cover, Good, HSG A
* 2,070	98	Concrete, HSG A
5,283	62	Weighted Average
3,213		60.82% Pervious Area
2,070		39.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.3: SHEET TO GREEN STREET**

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 2 Year Rainfall=3.31"

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**Summary for Subcatchment SC2.4: TO HAVEN STREET**

Runoff = 0.01 cfs @ 12.12 hrs, Volume= 24 cf, Depth= 0.57"  
Routed to Pond CB : HAVEN STREET DRAINAGE

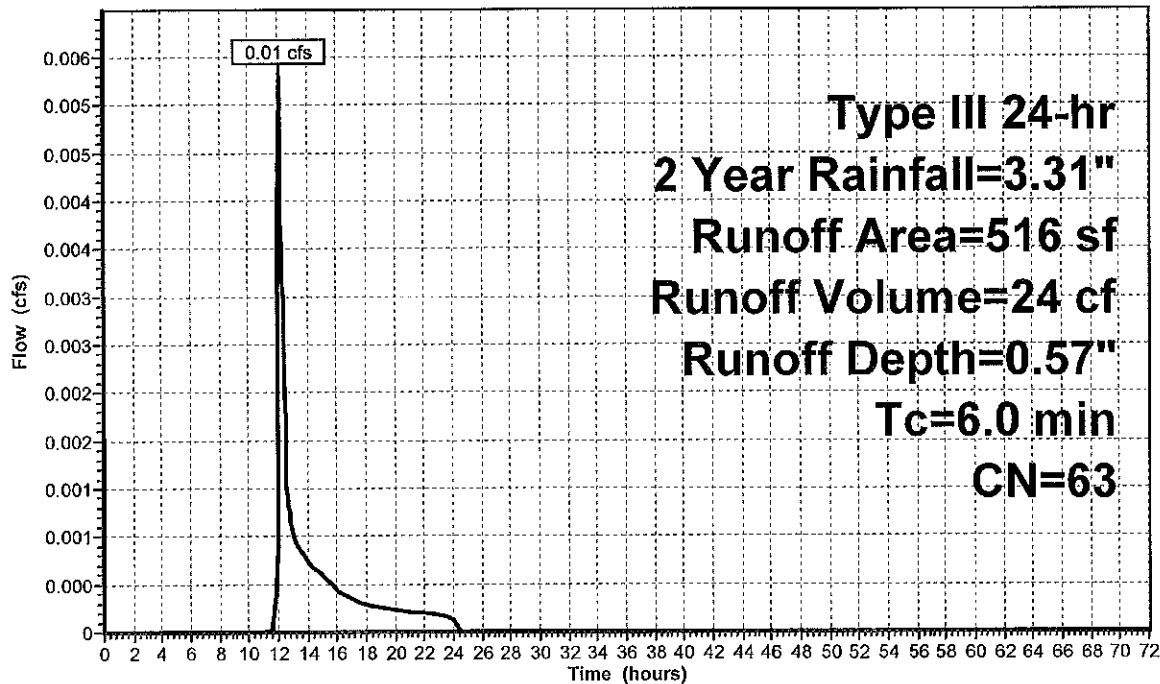
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2 Year Rainfall=3.31"

Area (sf)	CN	Description
310	39	>75% Grass cover, Good, HSG A
* 206	98	Concrete, HSG A
516	63	Weighted Average
310		60.08% Pervious Area
206		39.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.4: TO HAVEN STREET**

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 2 Year Rainfall=3.31"

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**Summary for Pond CB: HAVEN STREET DRAINAGE**

Inflow Area = 516 sf, 39.92% Impervious, Inflow Depth = 0.57" for 2 Year event  
 Inflow = 0.01 cfs @ 12.12 hrs, Volume= 24 cf  
 Outflow = 0.01 cfs @ 12.12 hrs, Volume= 24 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.01 cfs @ 12.12 hrs, Volume= 24 cf  
 Routed to Pond DMH : DMH

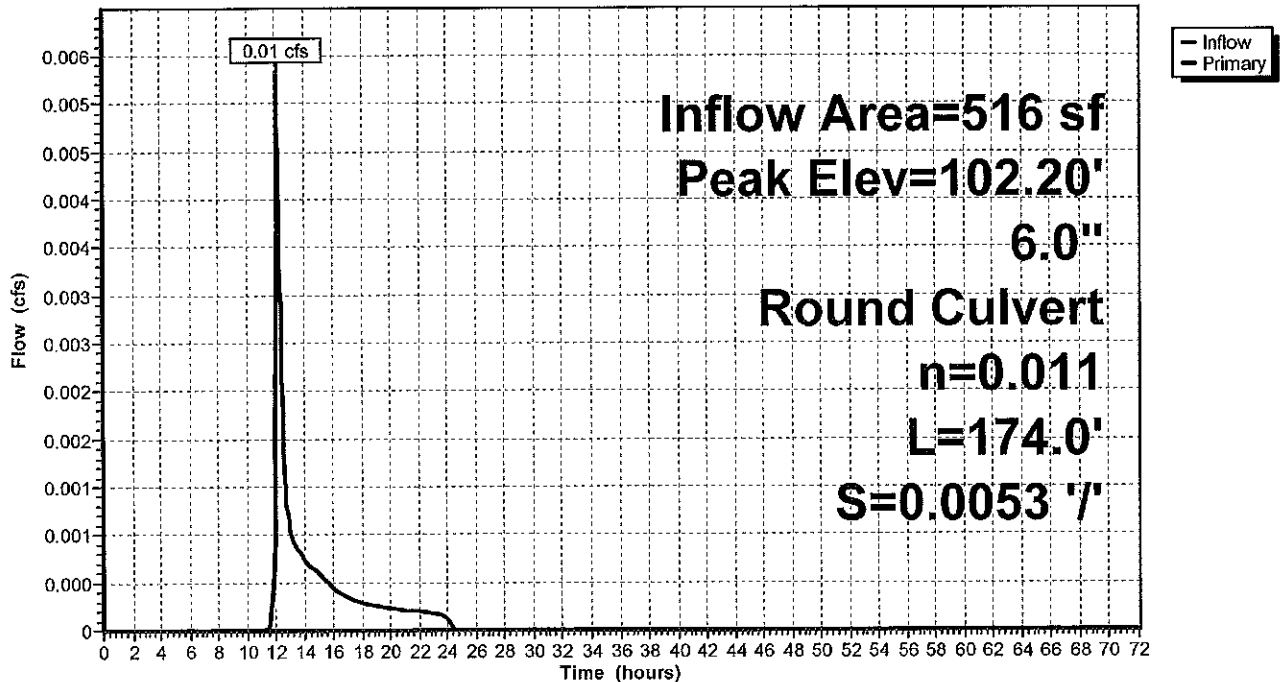
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 102.20' @ 12.12 hrs  
 Flood Elev= 104.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	102.15'	<b>6.0" Round Culvert</b> L= 174.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 102.15' / 101.22' S= 0.0053 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.01 cfs @ 12.12 hrs HW=102.20' TW=101.39' (Dynamic Tailwater)  
 ↑1=Culvert (Outlet Controls 0.01 cfs @ 0.78 fps)

**Pond CB: HAVEN STREET DRAINAGE**

Hydrograph





**PROPOSED REA0149**

Type III 24-hr 2 Year Rainfall=3.31"

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**Summary for Pond DMH: DMH**

Inflow Area = 5,048 sf, 93.86% Impervious, Inflow Depth = 2.82" for 2 Year event  
 Inflow = 0.33 cfs @ 12.09 hrs, Volume= 1,187 cf  
 Outflow = 0.33 cfs @ 12.09 hrs, Volume= 1,187 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.33 cfs @ 12.09 hrs, Volume= 1,187 cf  
 Routed to Link DP1 : Green Street CB

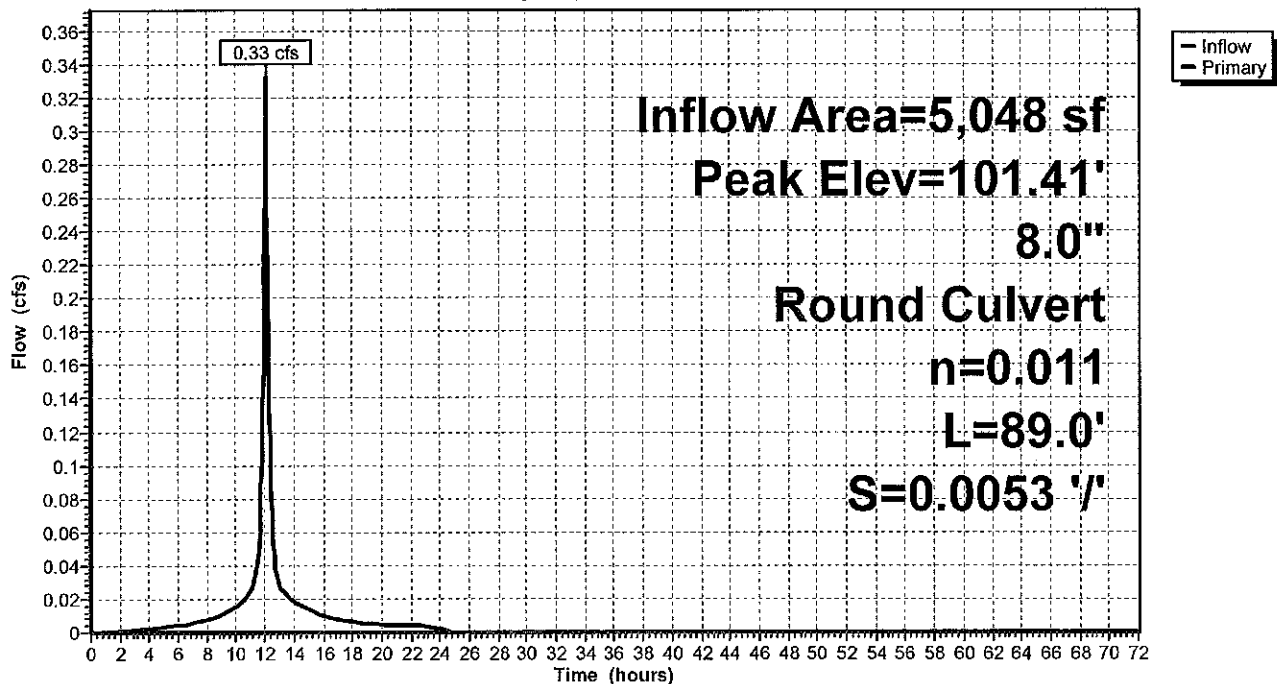
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 101.41' @ 12.09 hrs  
 Flood Elev= 105.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.05'	<b>8.0" Round Culvert</b> L= 89.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.05' / 100.58' S= 0.0053 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.32 cfs @ 12.09 hrs HW=101.40' TW=0.00' (Dynamic Tailwater)  
 ↑1=Culvert (Barrel Controls 0.32 cfs @ 2.50 fps)

**Pond DMH: DMH**

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 2 Year Rainfall=3.31"

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**Summary for Pond INF: Stormtech SC-310**

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=110)

Inflow Area = 8,600 sf, 100.00% Impervious, Inflow Depth = 3.08" for 2 Year event  
 Inflow = 0.62 cfs @ 12.09 hrs, Volume= 2,205 cf  
 Outflow = 0.23 cfs @ 12.00 hrs, Volume= 2,218 cf, Atten= 62%, Lag= 0.0 min  
 Discarded = 0.23 cfs @ 12.00 hrs, Volume= 2,218 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Link DP1 : Green Street CB

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 101.51' @ 12.33 hrs Surf.Area= 1,222 sf Storage= 253 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= 4.5 min ( 760.2 - 755.7 )

Volume	Invert	Avail.Storage	Storage Description
#1A	101.00'	875 cf	<b>18.17'W x 67.28'L x 2.33'H Field A</b> 2,852 cf Overall - 663 cf Embedded = 2,189 cf x 40.0% Voids
#2A	101.50'	663 cf	<b>ADS_StormTech SC-310 +Cap x 45 Inside #1</b> Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 45 Chambers in 5 Rows
		1,539 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	101.00'	<b>8.270 in/hr Exfiltration over Surface area</b>
#2	Primary	102.50'	<b>6.0" Round Culvert</b> L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 102.50' / 101.05' S= 0.0558 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

**Discarded OutFlow** Max=0.23 cfs @ 12.00 hrs HW=101.06' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.23 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=101.00' TW=0.00' (Dynamic Tailwater)  
 ↑2=Culvert ( Controls 0.00 cfs)

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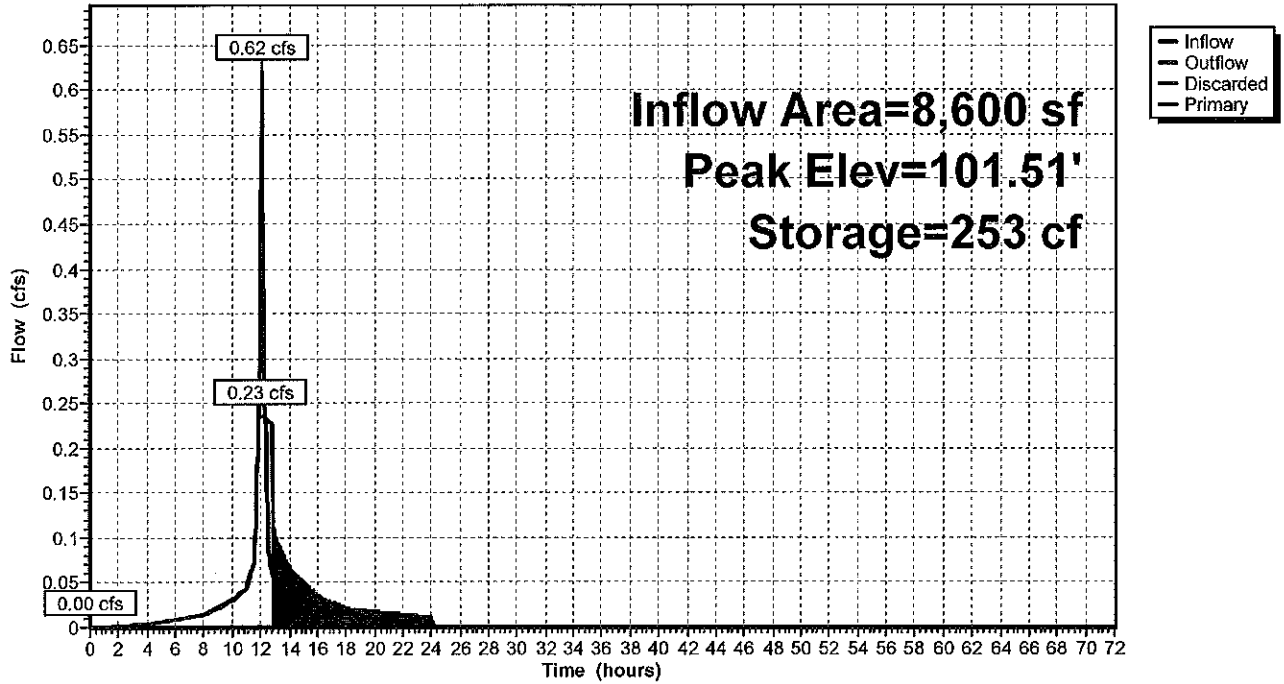
Type III 24-hr 2 Year Rainfall=3.31"

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**Pond INF: Stormtech SC-310**

Hydrograph



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Type III 24-hr 2 Year Rainfall=3.31"

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**Summary for Pond PCB: Proposed CB to DP**

Inflow Area = 4,532 sf, 100.00% Impervious, Inflow Depth = 3.08" for 2 Year event  
 Inflow = 0.33 cfs @ 12.09 hrs, Volume= 1,162 cf  
 Outflow = 0.33 cfs @ 12.09 hrs, Volume= 1,162 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.33 cfs @ 12.09 hrs, Volume= 1,162 cf  
 Routed to Pond DMH : DMH

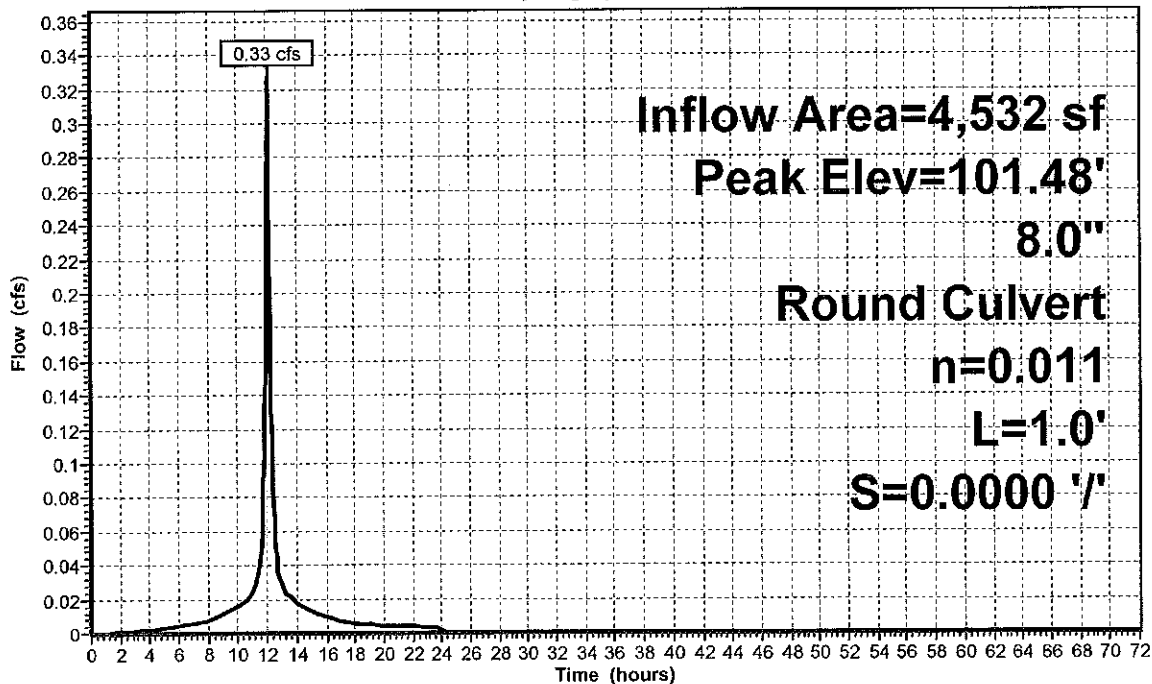
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 101.48' @ 12.11 hrs  
 Flood Elev= 104.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.05'	8.0" Round Culvert L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.05' / 101.05' S= 0.0000 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.28 cfs @ 12.09 hrs HW=101.47' TW=101.40' (Dynamic Tailwater)  
 1=Culvert (Outlet Controls 0.28 cfs @ 1.69 fps)

**Pond PCB: Proposed CB to DP**

Hydrograph



— Inflow  
 — Primary

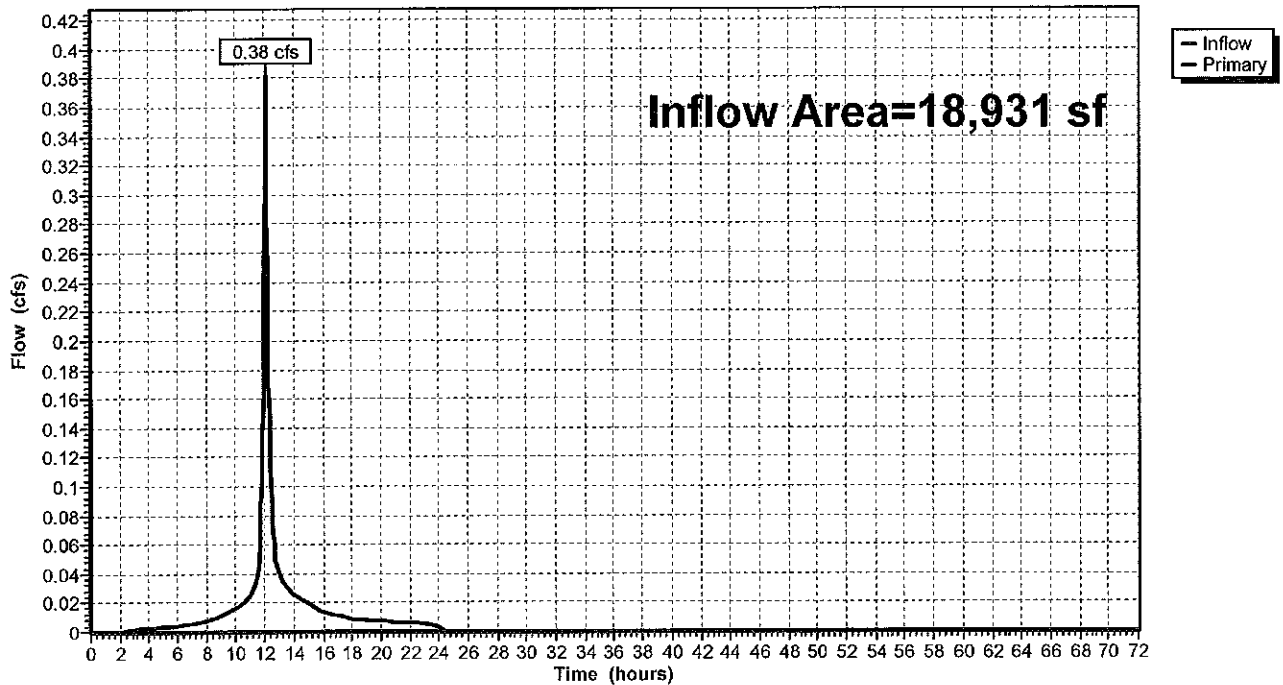
Summary for Link DP1: Green Street CB

Inflow Area = 18,931 sf, 81.39% Impervious, Inflow Depth = 0.90" for 2 Year event  
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 1,419 cf  
Primary = 0.38 cfs @ 12.09 hrs, Volume= 1,419 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP1: Green Street CB

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 10 Year Rainfall=5.22"

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 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 SC2.1: PROPOSED ROOF** Runoff Area=8,600 sf 100.00% Impervious Runoff Depth=4.98"  
Tc=6.0 min CN=98 Runoff=0.98 cfs 3,571 cf

**Subcatchment SC2.2: PARKING TO CB** Runoff Area=4,532 sf 100.00% Impervious Runoff Depth=4.98"  
Tc=6.0 min CN=98 Runoff=0.52 cfs 1,882 cf

**Subcatchment SC2.3: SHEET TO GREEN** Runoff Area=5,283 sf 39.18% Impervious Runoff Depth=1.58"  
Tc=6.0 min CN=62 Runoff=0.21 cfs 694 cf

**Subcatchment SC2.4: TO HAVEN STREET** Runoff Area=516 sf 39.92% Impervious Runoff Depth=1.65"  
Tc=6.0 min CN=63 Runoff=0.02 cfs 71 cf

**Pond CB: HAVEN STREET DRAINAGE** Peak Elev=102.25' Inflow=0.02 cfs 71 cf  
6.0" Round Culvert n=0.011 L=174.0' S=0.0053 '/' Outflow=0.02 cfs 71 cf

**Pond DMH: DMH** Peak Elev=101.53' Inflow=0.54 cfs 1,953 cf  
8.0" Round Culvert n=0.011 L=89.0' S=0.0053 '/' Outflow=0.54 cfs 1,953 cf

**Pond INF: Stormtech SC-310** Peak Elev=102.00' Storage=701 cf Inflow=0.98 cfs 3,571 cf  
Discarded=0.23 cfs 3,573 cf Primary=0.00 cfs 0 cf Outflow=0.23 cfs 3,573 cf

**Pond PCB: Proposed CB to DP** Peak Elev=101.62' Inflow=0.52 cfs 1,882 cf  
8.0" Round Culvert n=0.011 L=1.0' S=0.0000 '/' Outflow=0.52 cfs 1,882 cf

**Link DP1: Green Street CB** Inflow=0.74 cfs 2,647 cf  
Primary=0.74 cfs 2,647 cf

**Total Runoff Area = 18,931 sf Runoff Volume = 6,218 cf Average Runoff Depth = 3.94"**  
**18.61% Pervious = 3,523 sf 81.39% Impervious = 15,408 sf**

**PROPOSED REA0149**

Type III 24-hr 10 Year Rainfall=5.22"

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**Summary for Subcatchment SC2.1: PROPOSED ROOF**

Runoff = 0.98 cfs @ 12.09 hrs, Volume= 3,571 cf, Depth= 4.98"  
Routed to Pond INF : Stormtech SC-310

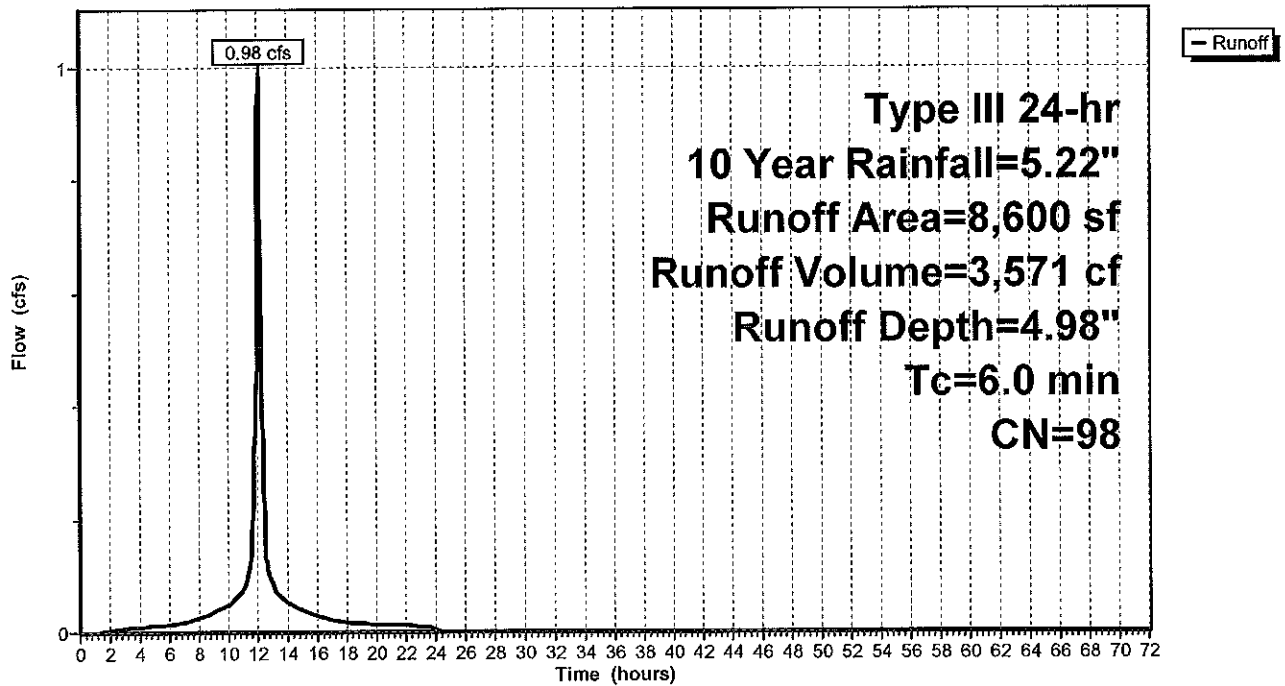
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
* 8,600	98	Unconnected roofs, HSG A
8,600		100.00% Impervious Area
8,600		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.1: PROPOSED ROOF**

Hydrograph



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Type III 24-hr 10 Year Rainfall=5.22"

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**Summary for Subcatchment SC2.2: PARKING TO CB**

Runoff = 0.52 cfs @ 12.09 hrs, Volume= 1,882 cf, Depth= 4.98"  
 Routed to Pond PCB : Proposed CB to DP

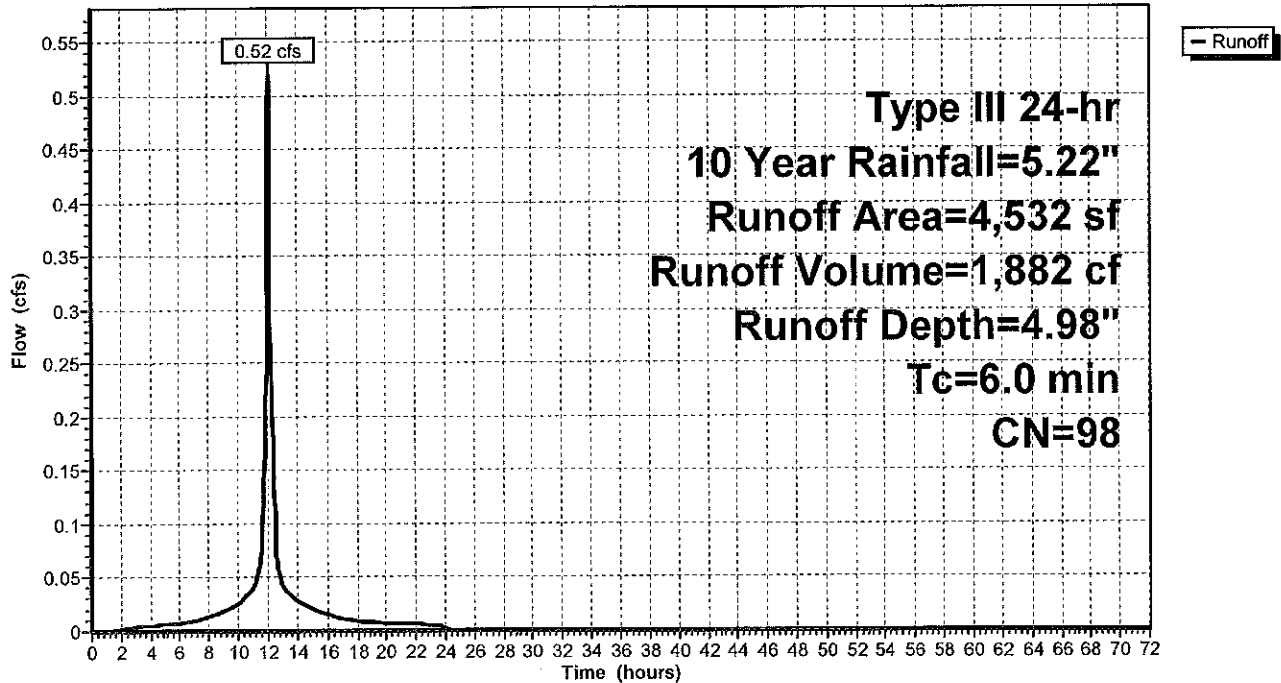
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
* 4,315	98	Paved parking, HSG A
* 217	98	Concrete, HSG A
4,532	98	Weighted Average
4,532		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.2: PARKING TO CB**

Hydrograph





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Type III 24-hr 10 Year Rainfall=5.22"

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**Summary for Subcatchment SC2.3: SHEET TO GREEN STREET**

Runoff = 0.21 cfs @ 12.10 hrs, Volume= 694 cf, Depth= 1.58"  
 Routed to Link DP1 : Green Street CB

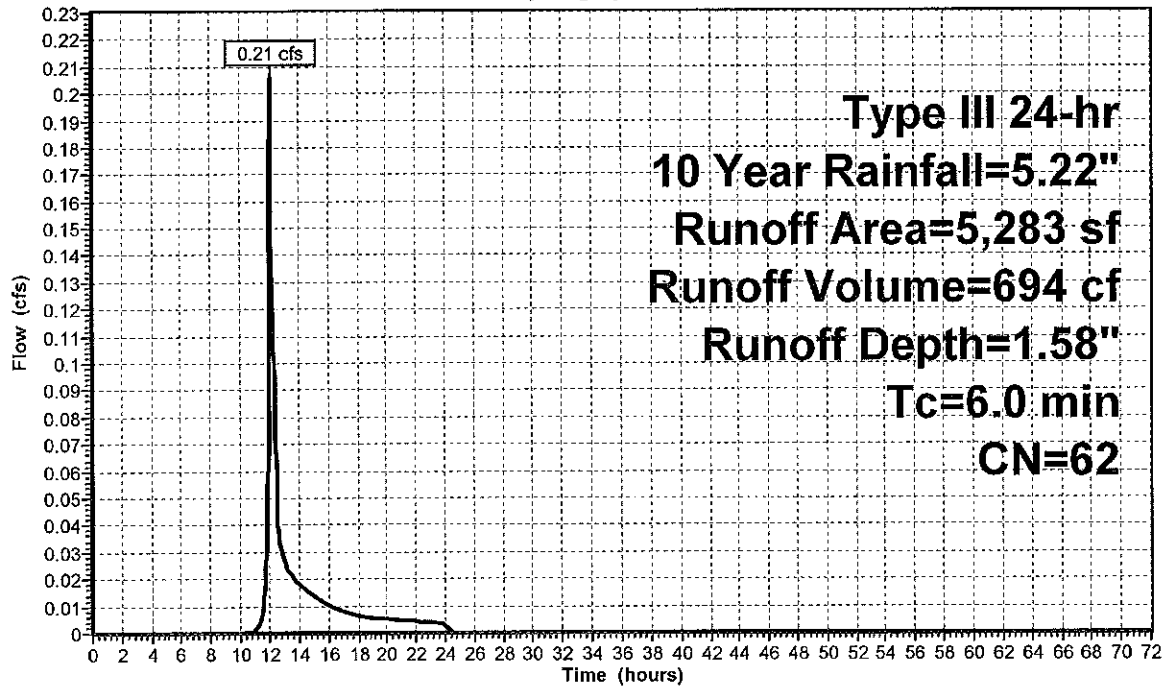
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
3,213	39	>75% Grass cover, Good, HSG A
* 2,070	98	Concrete, HSG A
5,283	62	Weighted Average
3,213		60.82% Pervious Area
2,070		39.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.3: SHEET TO GREEN STREET**

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 10 Year Rainfall=5.22"

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**Summary for Subcatchment SC2.4: TO HAVEN STREET**

Runoff = 0.02 cfs @ 12.10 hrs, Volume= 71 cf, Depth= 1.65"  
 Routed to Pond CB : HAVEN STREET DRAINAGE

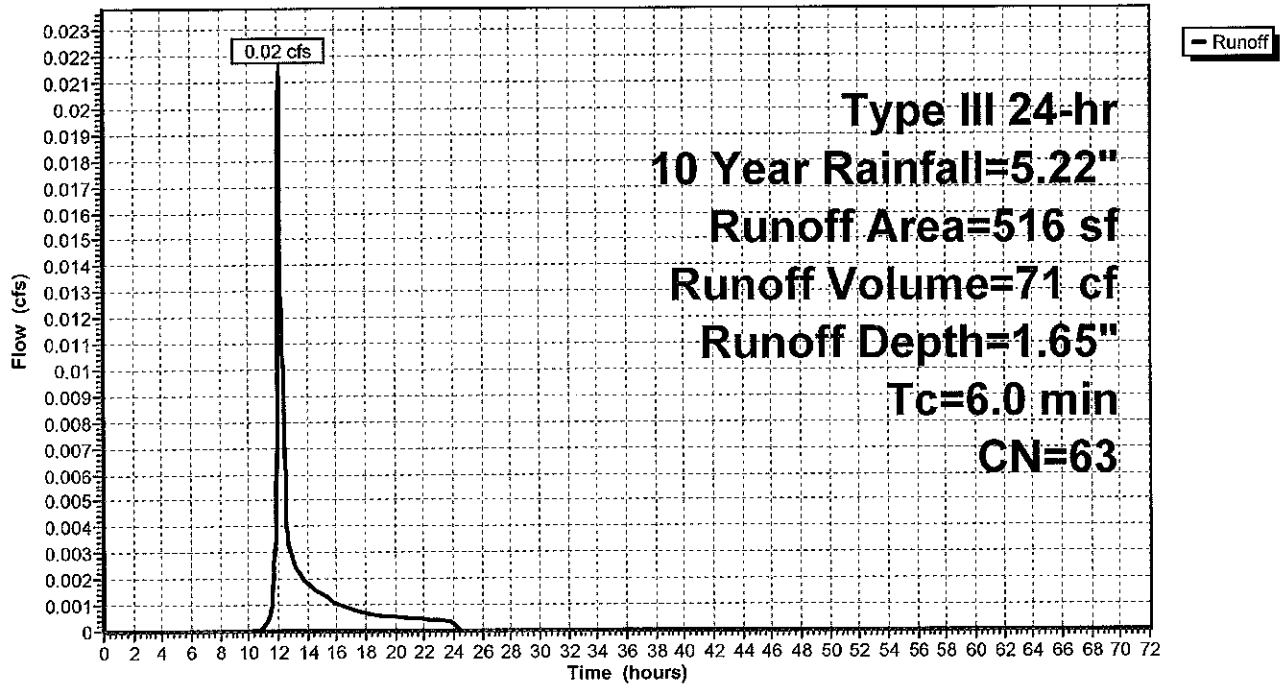
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
310	39	>75% Grass cover, Good, HSG A
* 206	98	Concrete, HSG A
516	63	Weighted Average
310		60.08% Pervious Area
206		39.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.4: TO HAVEN STREET**

Hydrograph



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Type III 24-hr 10 Year Rainfall=5.22"

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**Summary for Pond CB: HAVEN STREET DRAINAGE**

Inflow Area = 516 sf, 39.92% Impervious, Inflow Depth = 1.65" for 10 Year event  
 Inflow = 0.02 cfs @ 12.10 hrs, Volume= 71 cf  
 Outflow = 0.02 cfs @ 12.10 hrs, Volume= 71 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.02 cfs @ 12.10 hrs, Volume= 71 cf  
 Routed to Pond DMH : DMH

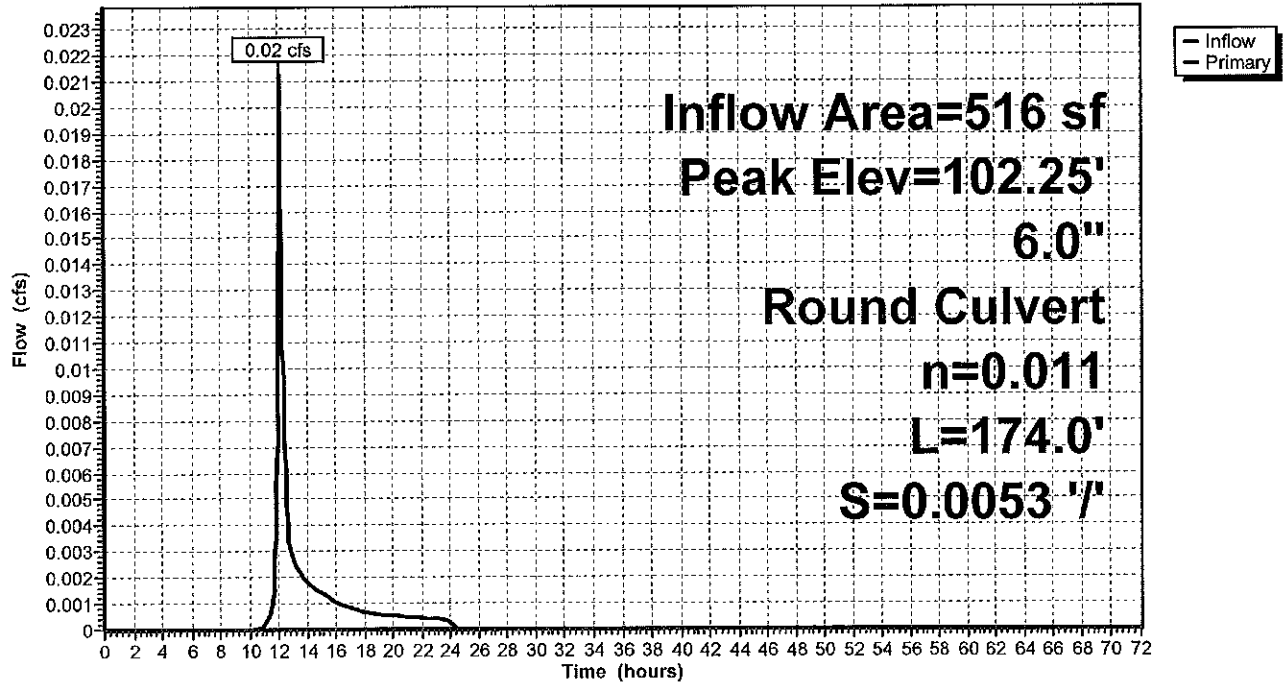
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 102.25' @ 12.11 hrs  
 Flood Elev= 104.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	102.15'	<b>6.0" Round Culvert</b> L= 174.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 102.15' / 101.22' S= 0.0053 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.02 cfs @ 12.10 hrs HW=102.25' TW=101.52' (Dynamic Tailwater)  
 ↑1=Culvert (Outlet Controls 0.02 cfs @ 1.11 fps)

**Pond CB: HAVEN STREET DRAINAGE**

Hydrograph



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Type III 24-hr 10 Year Rainfall=5.22"

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**Summary for Pond DMH: DMH**

Inflow Area = 5,048 sf, 93.86% Impervious, Inflow Depth = 4.64" for 10 Year event  
 Inflow = 0.54 cfs @ 12.09 hrs, Volume= 1,953 cf  
 Outflow = 0.54 cfs @ 12.09 hrs, Volume= 1,953 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.54 cfs @ 12.09 hrs, Volume= 1,953 cf  
 Routed to Link DP1 : Green Street CB

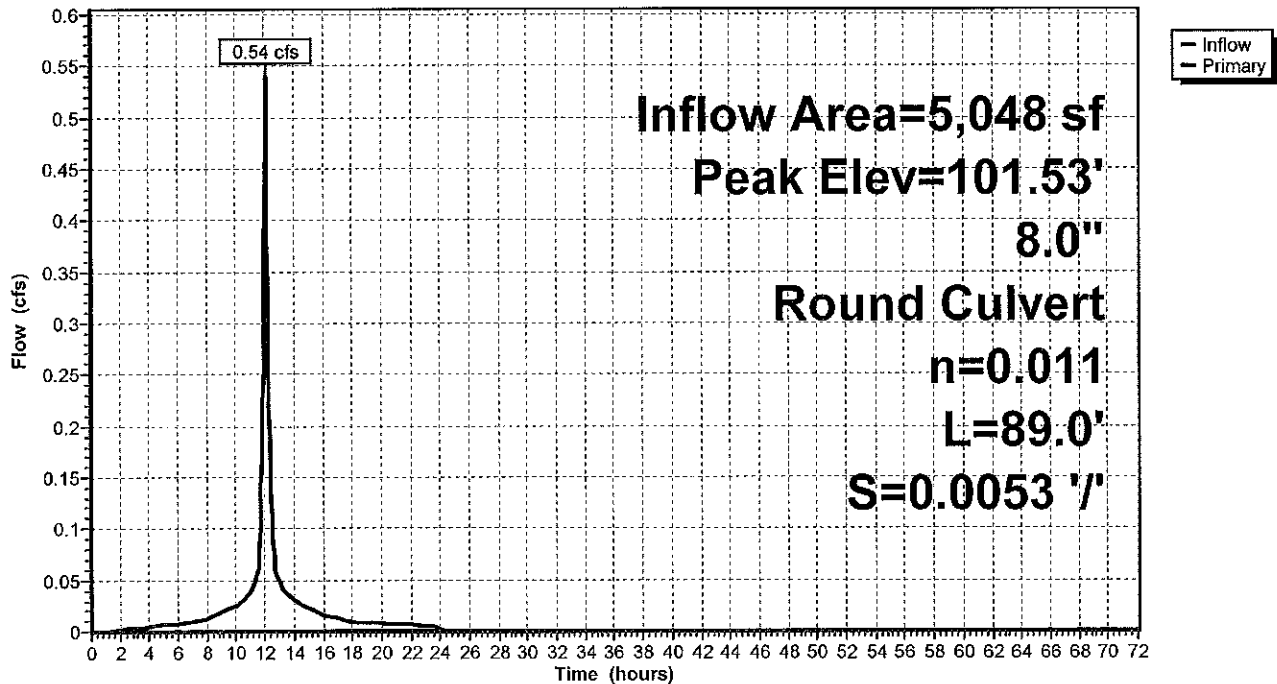
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 101.53' @ 12.09 hrs  
 Flood Elev= 105.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.05'	<b>8.0" Round Culvert</b> L= 89.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.05' / 100.58' S= 0.0053 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

**Primary OutFlow** Max=0.53 cfs @ 12.09 hrs HW=101.52' TW=0.00' (Dynamic Tailwater)  
 ↑1=Culvert (Barrel Controls 0.53 cfs @ 2.81 fps)

**Pond DMH: DMH**

Hydrograph



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**Summary for Pond INF: Stormtech SC-310**

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=102)

Inflow Area = 8,600 sf, 100.00% Impervious, Inflow Depth = 4.98" for 10 Year event  
 Inflow = 0.98 cfs @ 12.09 hrs, Volume= 3,571 cf  
 Outflow = 0.23 cfs @ 11.80 hrs, Volume= 3,573 cf, Atten= 76%, Lag= 0.0 min  
 Discarded = 0.23 cfs @ 11.80 hrs, Volume= 3,573 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Link DP1 : Green Street CB

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 102.00' @ 12.47 hrs Surf.Area= 1,222 sf Storage= 701 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= 13.7 min ( 761.0 - 747.3 )

Volume	Invert	Avail.Storage	Storage Description
#1A	101.00'	875 cf	<b>18.17'W x 67.28'L x 2.33'H Field A</b> 2,852 cf Overall - 663 cf Embedded = 2,189 cf x 40.0% Voids
#2A	101.50'	663 cf	<b>ADS_StormTech SC-310 +Cap x 45 Inside #1</b> Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 45 Chambers in 5 Rows
		1,539 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	101.00'	<b>8.270 in/hr Exfiltration over Surface area</b>
#2	Primary	102.50'	<b>6.0" Round Culvert</b> L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 102.50' / 101.05' S= 0.0558 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Discarded OutFlow Max=0.23 cfs @ 11.80 hrs HW=101.03' (Free Discharge)

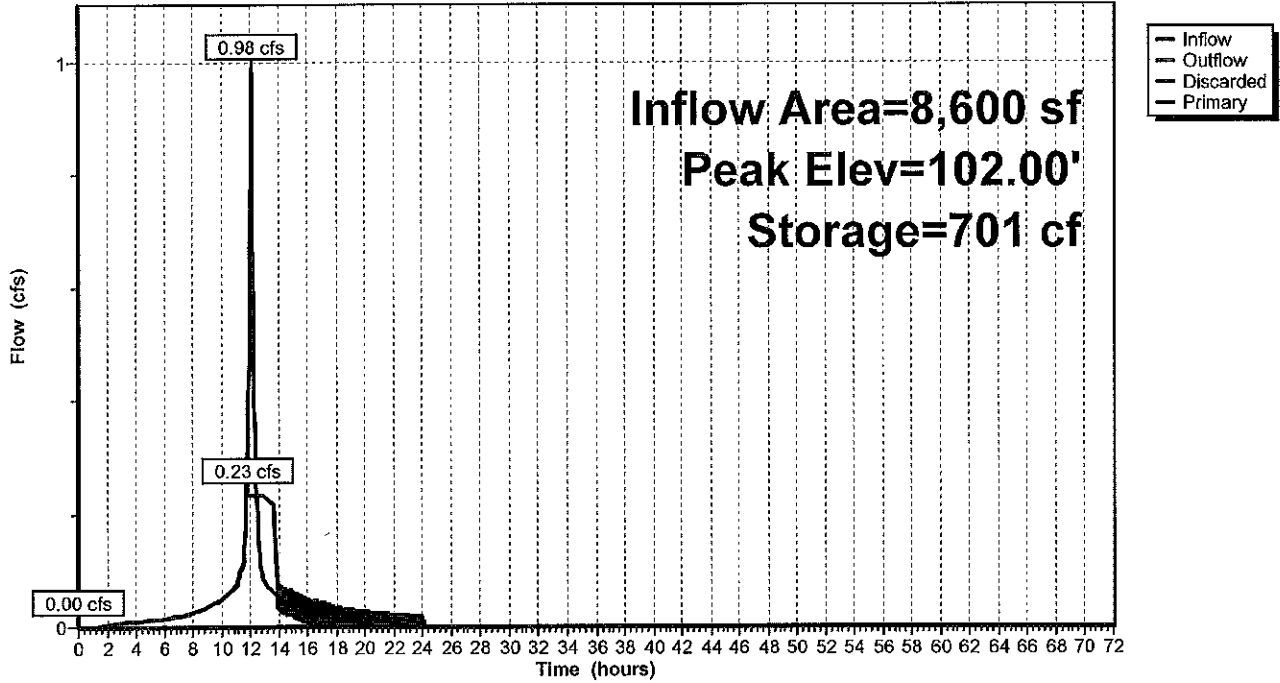
↑-1=Exfiltration (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=101.00' TW=0.00' (Dynamic Tailwater)

↑-2=Culvert ( Controls 0.00 cfs)

Pond INF: Stormtech SC-310

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 10 Year Rainfall=5.22"

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**Summary for Pond PCB: Proposed CB to DP**

Inflow Area = 4,532 sf, 100.00% Impervious, Inflow Depth = 4.98" for 10 Year event  
 Inflow = 0.52 cfs @ 12.09 hrs, Volume= 1,882 cf  
 Outflow = 0.52 cfs @ 12.09 hrs, Volume= 1,882 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.52 cfs @ 12.09 hrs, Volume= 1,882 cf  
 Routed to Pond DMH : DMH

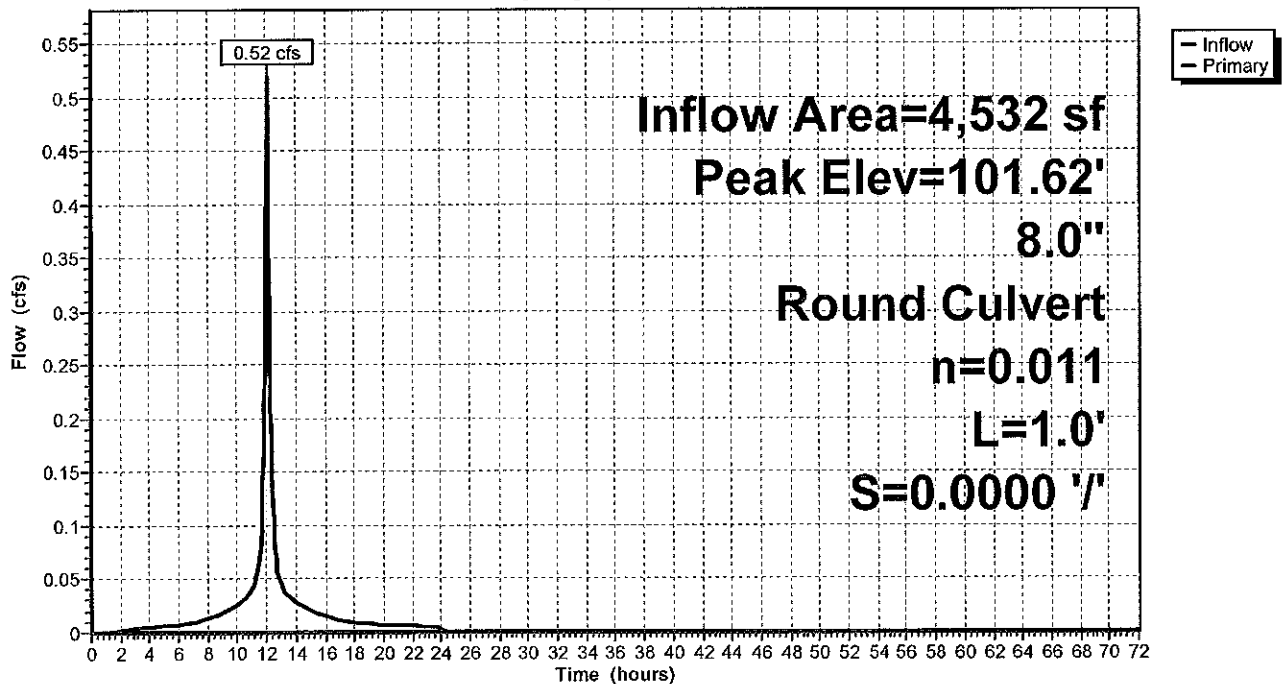
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 101.62' @ 12.11 hrs  
 Flood Elev= 104.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.05'	8.0" Round Culvert L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.05' / 101.05' S= 0.0000 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.43 cfs @ 12.09 hrs HW=101.60' TW=101.52' (Dynamic Tailwater)  
 ←1=Culvert (Outlet Controls 0.43 cfs @ 1.87 fps)

**Pond PCB: Proposed CB to DP**

Hydrograph



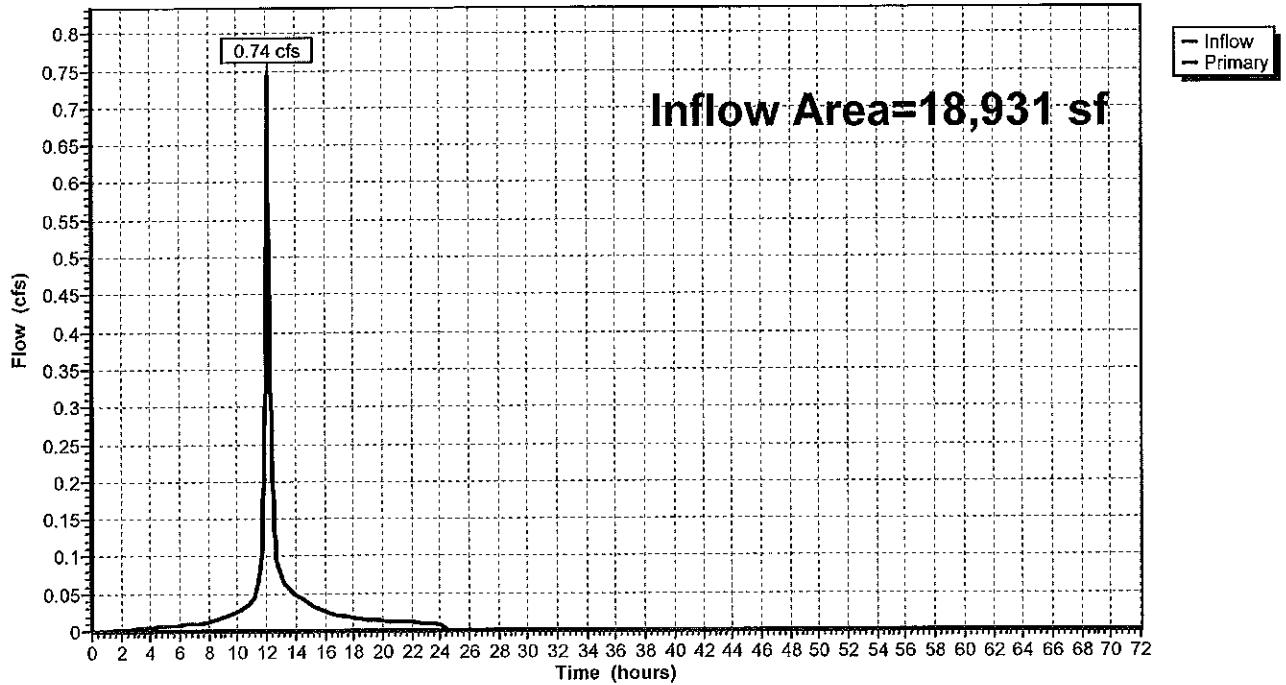
Summary for Link DP1: Green Street CB

Inflow Area = 18,931 sf, 81.39% Impervious, Inflow Depth = 1.68" for 10 Year event  
Inflow = 0.74 cfs @ 12.09 hrs, Volume= 2,647 cf  
Primary = 0.74 cfs @ 12.09 hrs, Volume= 2,647 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP1: Green Street CB

Hydrograph





**PROPOSED REA0149**

Type III 24-hr 25 Year Rainfall=6.41"

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 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 SC2.1: PROPOSED ROOF** Runoff Area=8,600 sf 100.00% Impervious Runoff Depth=6.17"  
Tc=6.0 min CN=98 Runoff=1.21 cfs 4,423 cf

**Subcatchment SC2.2: PARKING TO CB** Runoff Area=4,532 sf 100.00% Impervious Runoff Depth=6.17"  
Tc=6.0 min CN=98 Runoff=0.64 cfs 2,331 cf

**Subcatchment SC2.3: SHEET TO GREEN** Runoff Area=5,283 sf 39.18% Impervious Runoff Depth=2.38"  
Tc=6.0 min CN=62 Runoff=0.32 cfs 1,046 cf

**Subcatchment SC2.4: TO HAVEN STREET** Runoff Area=516 sf 39.92% Impervious Runoff Depth=2.47"  
Tc=6.0 min CN=63 Runoff=0.03 cfs 106 cf

**Pond CB: HAVEN STREET DRAINAGE** Peak Elev=102.28' Inflow=0.03 cfs 106 cf  
6.0" Round Culvert n=0.011 L=174.0' S=0.0053 '/' Outflow=0.03 cfs 106 cf

**Pond DMH: DMH** Peak Elev=101.60' Inflow=0.67 cfs 2,437 cf  
8.0" Round Culvert n=0.011 L=89.0' S=0.0053 '/' Outflow=0.67 cfs 2,437 cf

**Pond INF: Stormtech SC-310** Peak Elev=102.38' Storage=1,019 cf Inflow=1.21 cfs 4,423 cf  
Discarded=0.23 cfs 4,433 cf Primary=0.00 cfs 0 cf Outflow=0.23 cfs 4,433 cf

**Pond PCB: Proposed CB to DP** Peak Elev=101.72' Inflow=0.64 cfs 2,331 cf  
8.0" Round Culvert n=0.011 L=1.0' S=0.0000 '/' Outflow=0.64 cfs 2,331 cf

**Link DP1: Green Street CB** Inflow=0.99 cfs 3,483 cf  
Primary=0.99 cfs 3,483 cf

**Total Runoff Area = 18,931 sf Runoff Volume = 7,906 cf Average Runoff Depth = 5.01"**  
**18.61% Pervious = 3,523 sf 81.39% Impervious = 15,408 sf**

**PROPOSED REA0149**

Type III 24-hr 25 Year Rainfall=6.41"

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**Summary for Subcatchment SC2.1: PROPOSED ROOF**

Runoff = 1.21 cfs @ 12.09 hrs, Volume= 4,423 cf, Depth= 6.17"  
Routed to Pond INF : Stormtech SC-310

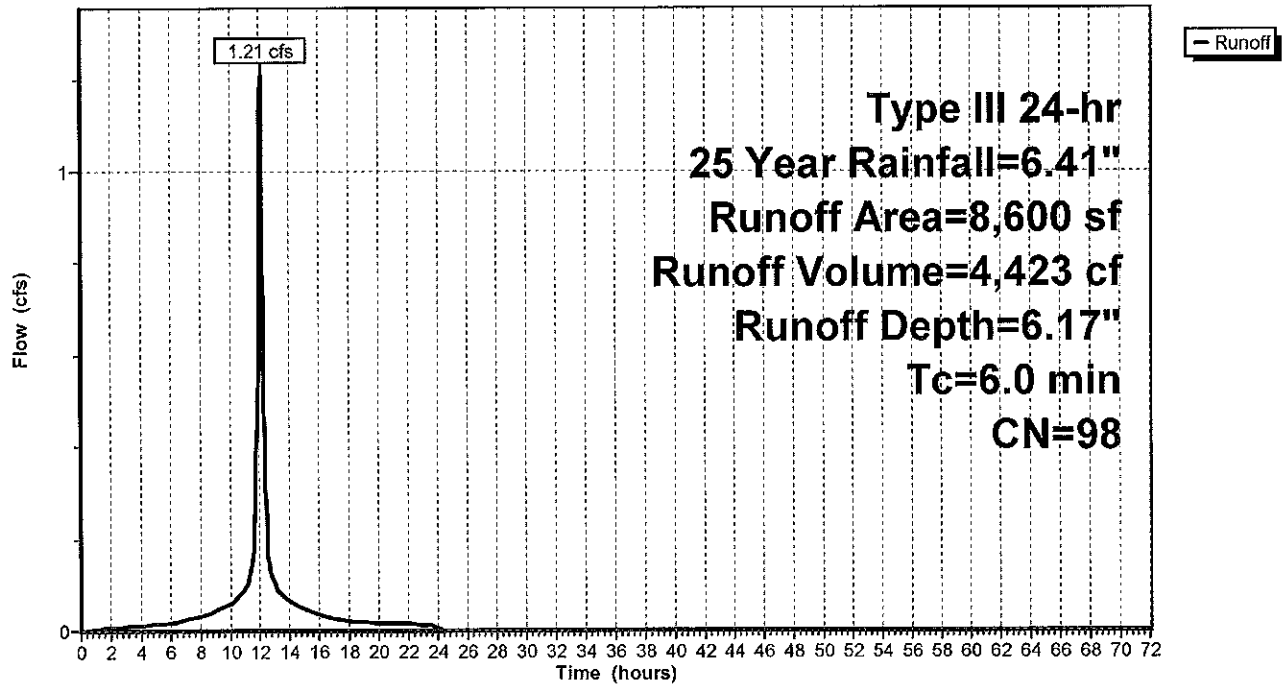
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25 Year Rainfall=6.41"

Area (sf)	CN	Description
* 8,600	98	Unconnected roofs, HSG A
8,600		100.00% Impervious Area
8,600		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.1: PROPOSED ROOF**

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 25 Year Rainfall=6.41"

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**Summary for Subcatchment SC2.2: PARKING TO CB**

Runoff = 0.64 cfs @ 12.09 hrs, Volume= 2,331 cf, Depth= 6.17"  
 Routed to Pond PCB : Proposed CB to DP

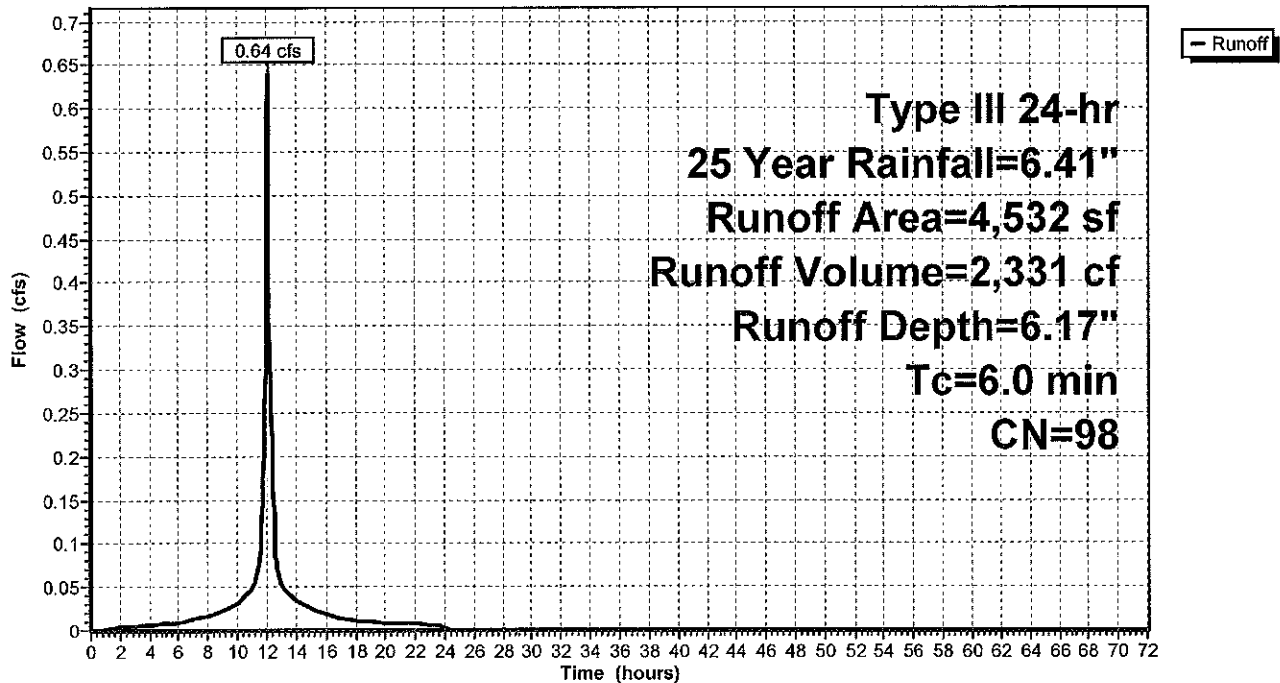
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 25 Year Rainfall=6.41"

	Area (sf)	CN	Description
*	4,315	98	Paved parking, HSG A
*	217	98	Concrete, HSG A
	4,532	98	Weighted Average
	4,532		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.2: PARKING TO CB**

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 25 Year Rainfall=6.41"

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**Summary for Subcatchment SC2.3: SHEET TO GREEN STREET**

Runoff = 0.32 cfs @ 12.10 hrs, Volume= 1,046 cf, Depth= 2.38"  
 Routed to Link DP1 : Green Street CB

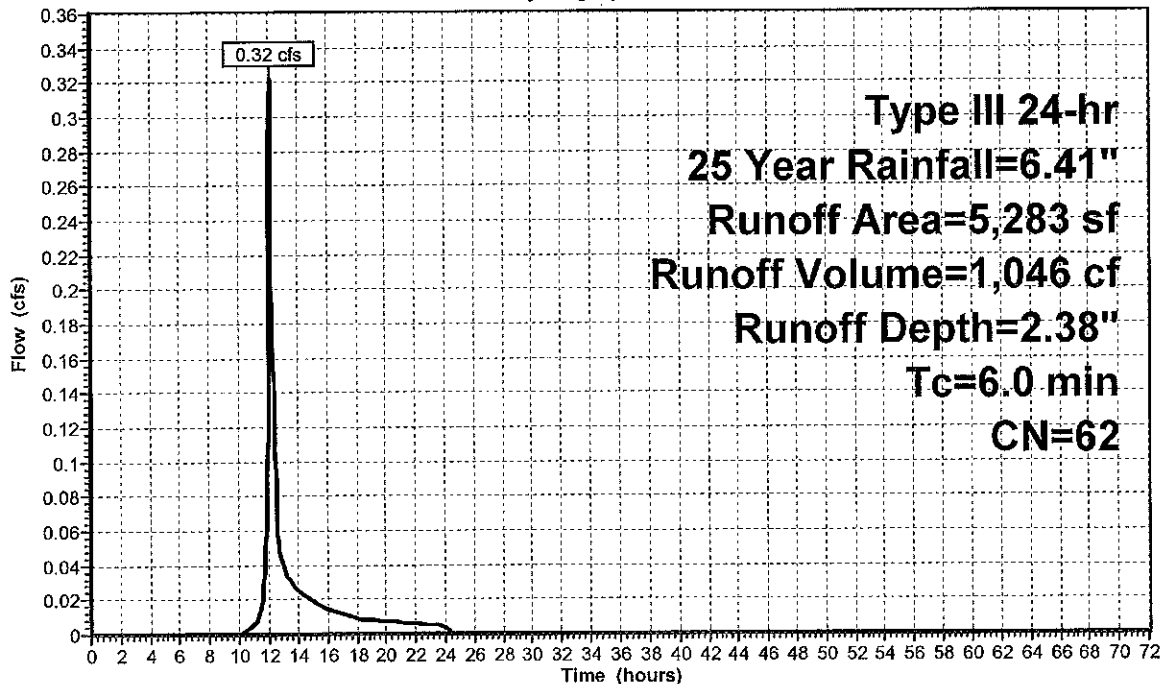
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 25 Year Rainfall=6.41"

Area (sf)	CN	Description
3,213	39	>75% Grass cover, Good, HSG A
* 2,070	98	Concrete, HSG A
5,283	62	Weighted Average
3,213		60.82% Pervious Area
2,070		39.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.3: SHEET TO GREEN STREET**

Hydrograph



Runoff

Type III 24-hr  
 25 Year Rainfall=6.41"  
 Runoff Area=5,283 sf  
 Runoff Volume=1,046 cf  
 Runoff Depth=2.38"  
 Tc=6.0 min  
 CN=62

**PROPOSED REA0149**

Type III 24-hr 25 Year Rainfall=6.41"

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**Summary for Subcatchment SC2.4: TO HAVEN STREET**

Runoff = 0.03 cfs @ 12.10 hrs, Volume= 106 cf, Depth= 2.47"  
 Routed to Pond CB : HAVEN STREET DRAINAGE

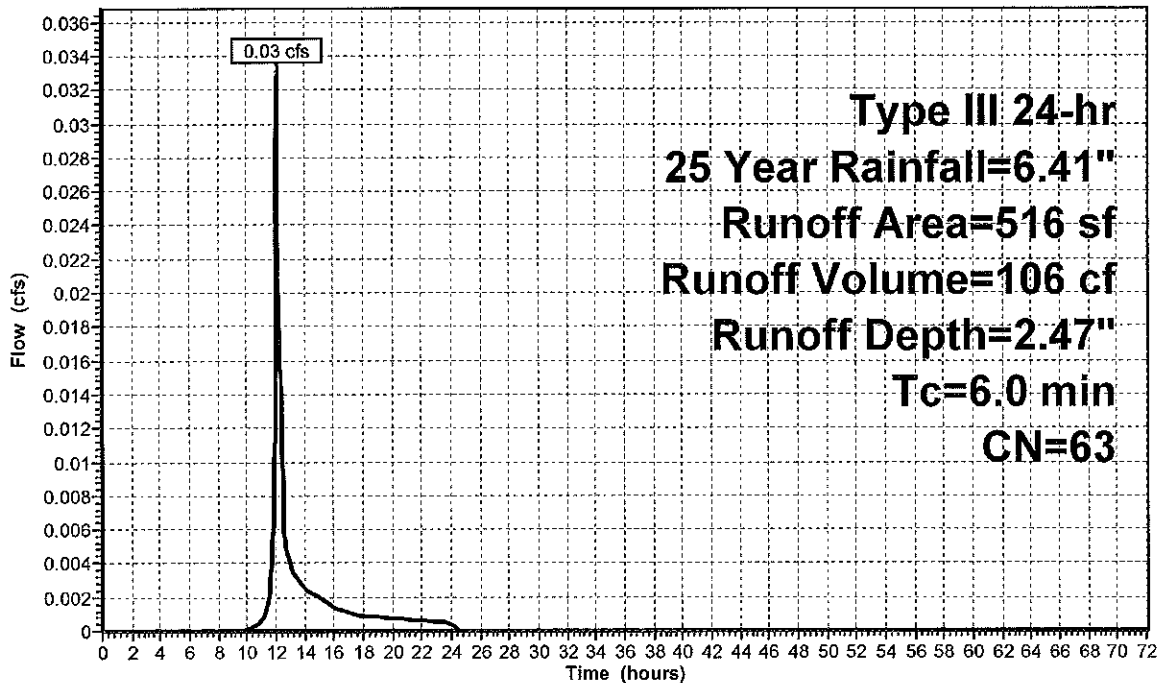
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 25 Year Rainfall=6.41"

Area (sf)	CN	Description
310	39	>75% Grass cover, Good, HSG A
* 206	98	Concrete, HSG A
516	63	Weighted Average
310		60.08% Pervious Area
206		39.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.4: TO HAVEN STREET**

Hydrograph



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Type III 24-hr 25 Year Rainfall=6.41"

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**Summary for Pond CB: HAVEN STREET DRAINAGE**

Inflow Area = 516 sf, 39.92% Impervious, Inflow Depth = 2.47" for 25 Year event  
 Inflow = 0.03 cfs @ 12.10 hrs, Volume= 106 cf  
 Outflow = 0.03 cfs @ 12.10 hrs, Volume= 106 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.03 cfs @ 12.10 hrs, Volume= 106 cf  
 Routed to Pond DMH : DMH

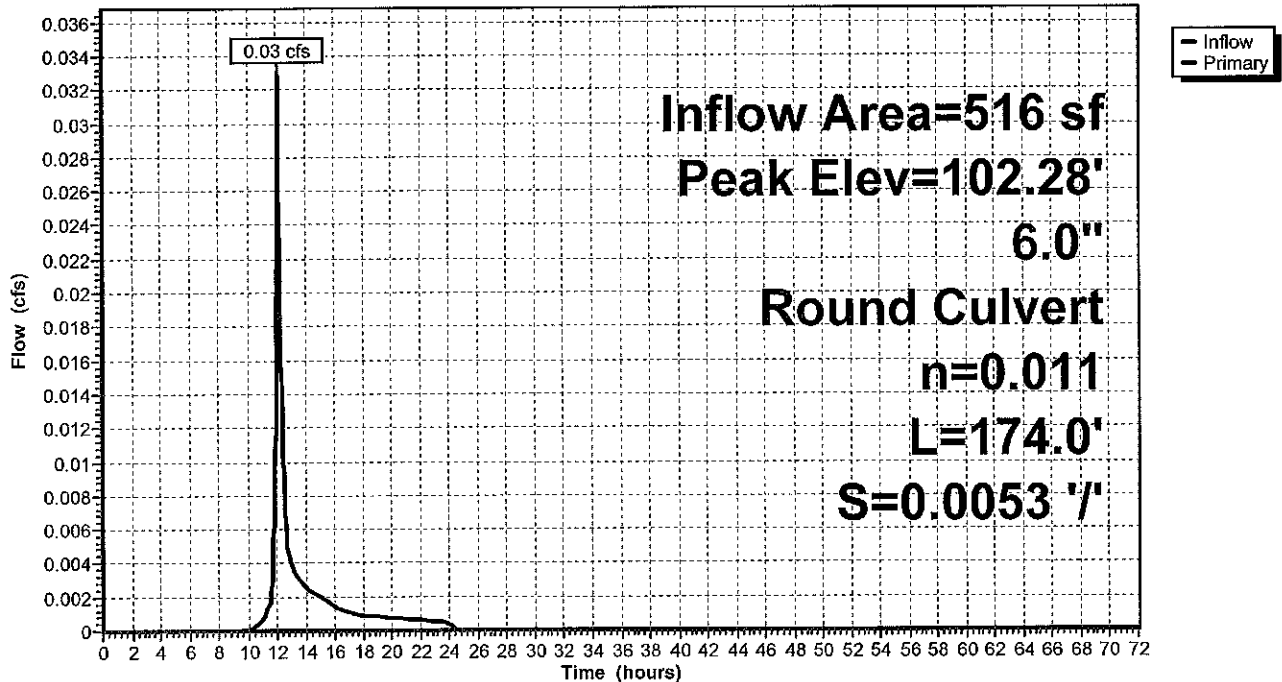
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 102.28' @ 12.10 hrs  
 Flood Elev= 104.55'

Device #	Routing	Invert	Outlet Devices
#1	Primary	102.15'	<b>6.0" Round Culvert</b> L= 174.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 102.15' / 101.22' S= 0.0053 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.03 cfs @ 12.10 hrs HW=102.28' TW=101.59' (Dynamic Tailwater)  
 ←1=Culvert (Outlet Controls 0.03 cfs @ 1.23 fps)

**Pond CB: HAVEN STREET DRAINAGE**

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 25 Year Rainfall=6.41"

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**Summary for Pond DMH: DMH**

Inflow Area = 5,048 sf, 93.86% Impervious, Inflow Depth = 5.79" for 25 Year event  
 Inflow = 0.67 cfs @ 12.09 hrs, Volume= 2,437 cf  
 Outflow = 0.67 cfs @ 12.09 hrs, Volume= 2,437 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.67 cfs @ 12.09 hrs, Volume= 2,437 cf  
 Routed to Link DP1 : Green Street CB

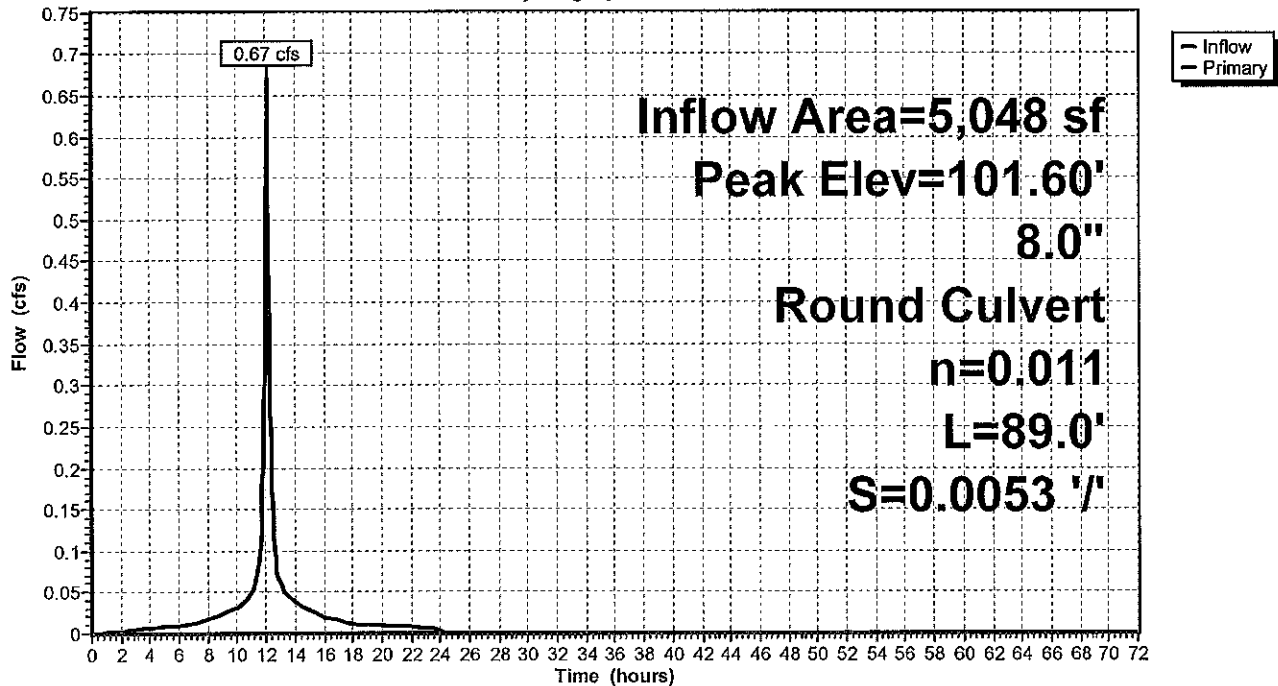
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 101.60' @ 12.09 hrs  
 Flood Elev= 105.10'

Device #	Routing	Invert	Outlet Devices
#1	Primary	101.05'	<b>8.0" Round Culvert</b> L= 89.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.05' / 100.58' S= 0.0053 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

**Primary OutFlow** Max=0.65 cfs @ 12.09 hrs HW=101.59' TW=0.00' (Dynamic Tailwater)  
 ↑1=Culvert (Barrel Controls 0.65 cfs @ 2.95 fps)

**Pond DMH: DMH**

Hydrograph



**Summary for Pond INF: Stormtech SC-310**

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=95)

Inflow Area = 8,600 sf, 100.00% Impervious, Inflow Depth = 6.17" for 25 Year event  
 Inflow = 1.21 cfs @ 12.09 hrs, Volume= 4,423 cf  
 Outflow = 0.23 cfs @ 11.75 hrs, Volume= 4,433 cf, Atten= 81%, Lag= 0.0 min  
 Discarded = 0.23 cfs @ 11.75 hrs, Volume= 4,433 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Link DP1 : Green Street CB

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 102.38' @ 12.52 hrs Surf.Area= 1,222 sf Storage= 1,019 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= 21.7 min ( 765.8 - 744.2 )

Volume	Invert	Avail.Storage	Storage Description
#1A	101.00'	875 cf	<b>18.17'W x 67.28'L x 2.33'H Field A</b> 2,852 cf Overall - 663 cf Embedded = 2,189 cf x 40.0% Voids
#2A	101.50'	663 cf	<b>ADS_StormTech SC-310 +Cap x 45 Inside #1</b> Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 45 Chambers in 5 Rows
		1,539 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	101.00'	<b>8.270 in/hr Exfiltration over Surface area</b>
#2	Primary	102.50'	<b>6.0" Round Culvert</b> L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 102.50' / 101.05' S= 0.0558 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

**Discarded OutFlow** Max=0.23 cfs @ 11.75 hrs HW=101.03' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.23 cfs)

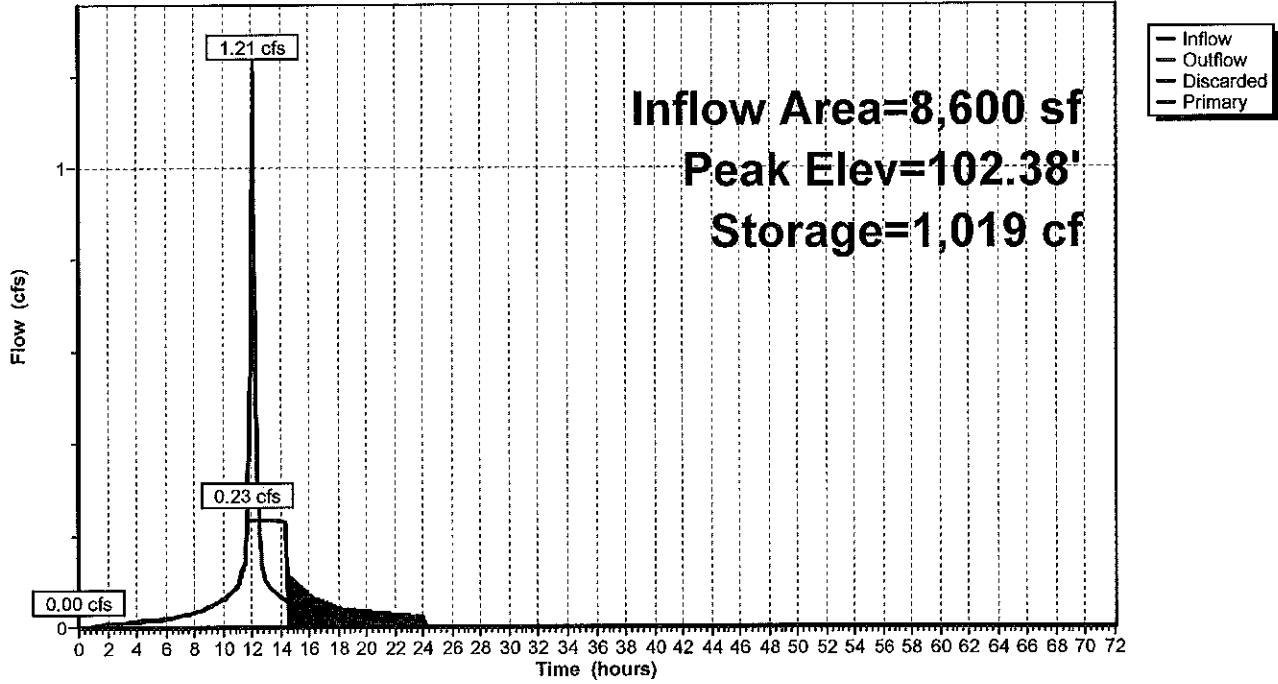
**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=101.00' TW=0.00' (Dynamic Tailwater)

↑2=Culvert ( Controls 0.00 cfs)



Pond INF: Stormtech SC-310

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 25 Year Rainfall=6.41"

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**Summary for Pond PCB: Proposed CB to DP**

Inflow Area = 4,532 sf, 100.00% Impervious, Inflow Depth = 6.17" for 25 Year event  
 Inflow = 0.64 cfs @ 12.09 hrs, Volume= 2,331 cf  
 Outflow = 0.64 cfs @ 12.09 hrs, Volume= 2,331 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.64 cfs @ 12.09 hrs, Volume= 2,331 cf  
 Routed to Pond DMH : DMH

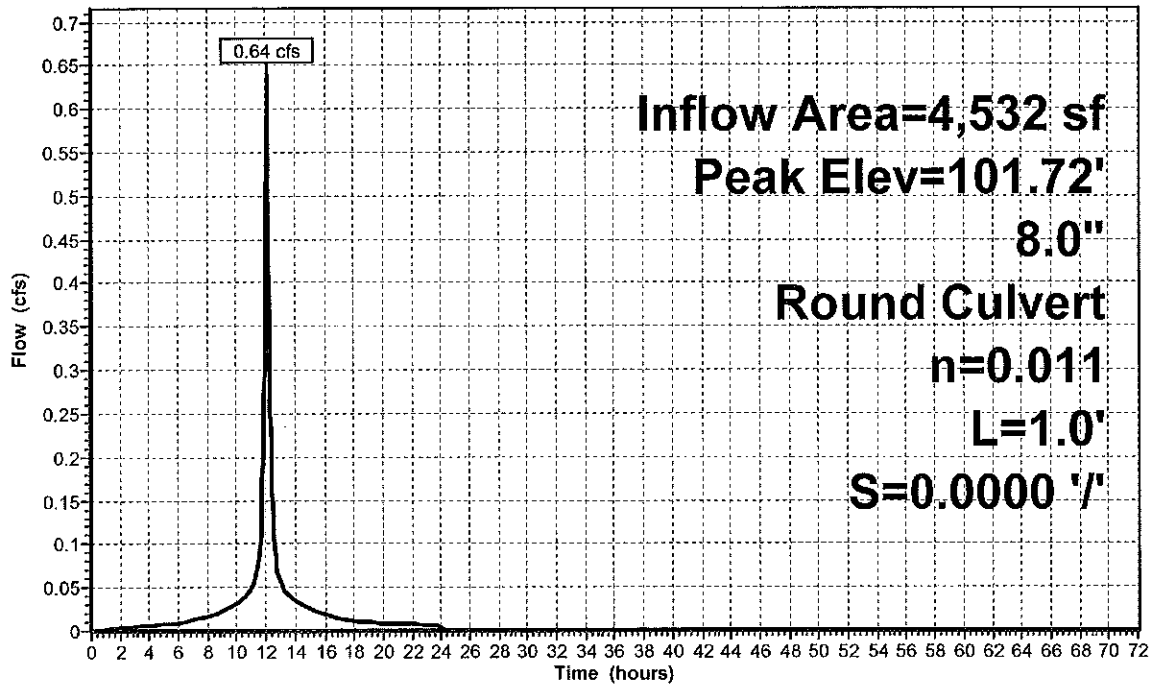
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 101.72' @ 12.11 hrs  
 Flood Elev= 104.70'

Device #	Routing	Invert	Outlet Devices
#1	Primary	101.05'	<b>8.0" Round Culvert</b> L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.05' / 101.05' S= 0.0000 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.53 cfs @ 12.09 hrs HW=101.69' TW=101.59' (Dynamic Tailwater)  
 ↑1=Culvert (Inlet Controls 0.53 cfs @ 1.53 fps)

**Pond PCB: Proposed CB to DP**

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 25 Year Rainfall=6.41"

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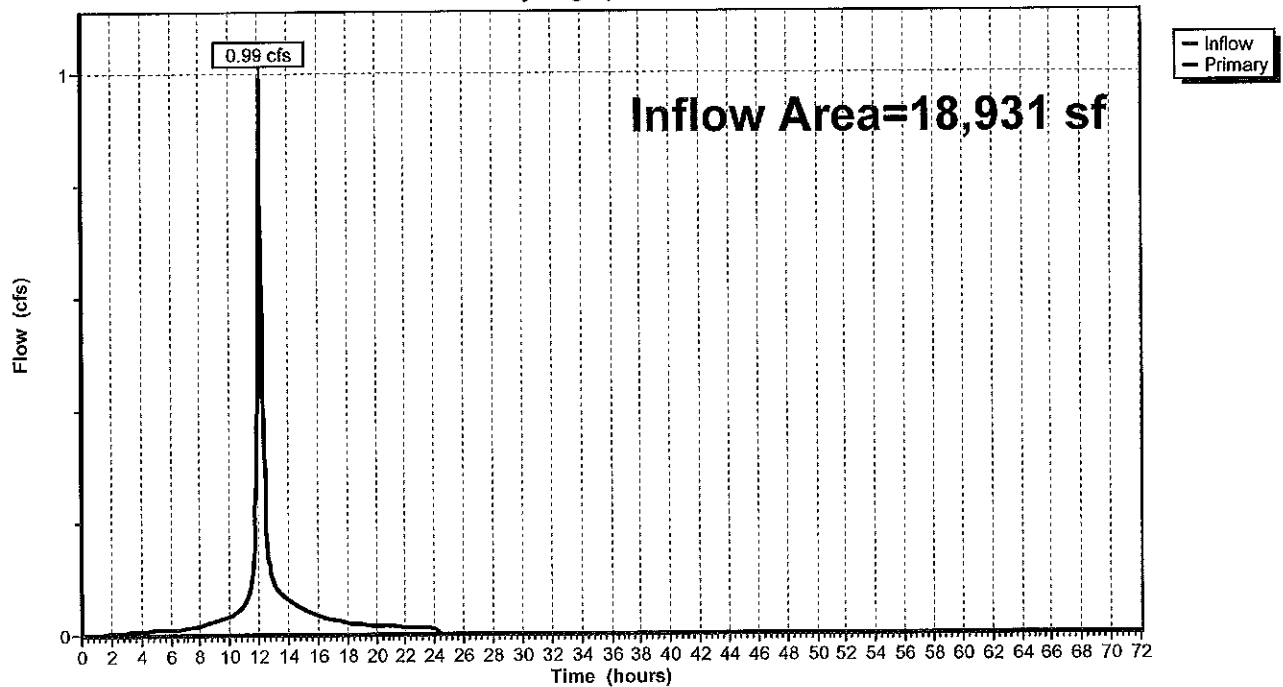
**Summary for Link DP1: Green Street CB**

Inflow Area = 18,931 sf, 81.39% Impervious, Inflow Depth = 2.21" for 25 Year event  
Inflow = 0.99 cfs @ 12.09 hrs, Volume= 3,483 cf  
Primary = 0.99 cfs @ 12.09 hrs, Volume= 3,483 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link DP1: Green Street CB**

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 100 Year Rainfall=8.24"

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 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 SC2.1: PROPOSED ROOF** Runoff Area=8,600 sf 100.00% Impervious Runoff Depth=8.00"  
Tc=6.0 min CN=98 Runoff=1.56 cfs 5,733 cf

**Subcatchment SC2.2: PARKING TO CB** Runoff Area=4,532 sf 100.00% Impervious Runoff Depth=8.00"  
Tc=6.0 min CN=98 Runoff=0.82 cfs 3,021 cf

**Subcatchment SC2.3: SHEET TO GREEN** Runoff Area=5,283 sf 39.18% Impervious Runoff Depth=3.74"  
Tc=6.0 min CN=62 Runoff=0.52 cfs 1,648 cf

**Subcatchment SC2.4: TO HAVEN STREET** Runoff Area=516 sf 39.92% Impervious Runoff Depth=3.86"  
Tc=6.0 min CN=63 Runoff=0.05 cfs 166 cf

**Pond CB: HAVEN STREET DRAINAGE** Peak Elev=102.32' Inflow=0.05 cfs 166 cf  
6.0" Round Culvert n=0.011 L=174.0' S=0.0053 '/' Outflow=0.05 cfs 166 cf

**Pond DMH: DMH** Peak Elev=101.71' Inflow=0.87 cfs 3,187 cf  
8.0" Round Culvert n=0.011 L=89.0' S=0.0053 '/' Outflow=0.87 cfs 3,187 cf

**Pond INF: Stormtech SC-310** Peak Elev=102.85' Storage=1,304 cf Inflow=1.56 cfs 5,733 cf  
Discarded=0.23 cfs 5,394 cf Primary=0.30 cfs 347 cf Outflow=0.53 cfs 5,742 cf

**Pond PCB: Proposed CB to DP** Peak Elev=101.92' Inflow=0.82 cfs 3,021 cf  
8.0" Round Culvert n=0.011 L=1.0' S=0.0000 '/' Outflow=0.82 cfs 3,021 cf

**Link DP1: Green Street CB** Inflow=1.39 cfs 5,182 cf  
Primary=1.39 cfs 5,182 cf

**Total Runoff Area = 18,931 sf Runoff Volume = 10,569 cf Average Runoff Depth = 6.70"**  
**18.61% Pervious = 3,523 sf 81.39% Impervious = 15,408 sf**

**PROPOSED REA0149**

Type III 24-hr 100 Year Rainfall=8.24"

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**Summary for Subcatchment SC2.1: PROPOSED ROOF**

Runoff = 1.56 cfs @ 12.09 hrs, Volume= 5,733 cf, Depth= 8.00"  
 Routed to Pond INF : Stormtech SC-310

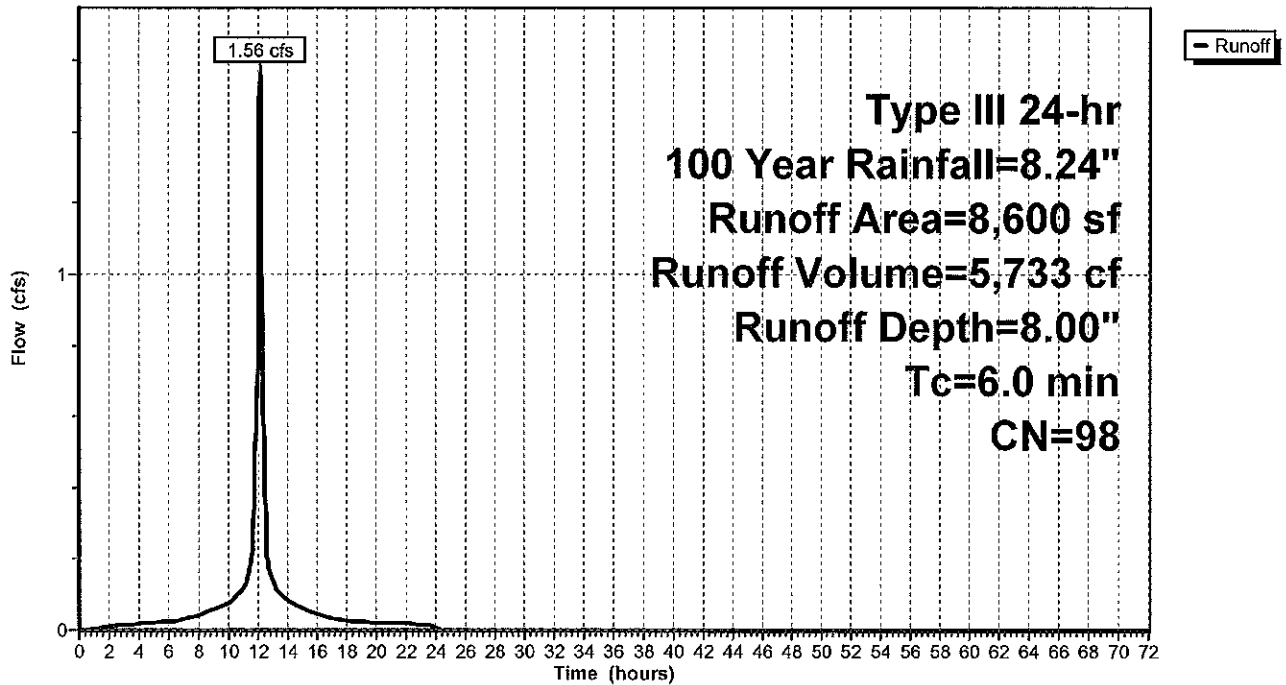
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 100 Year Rainfall=8.24"

Area (sf)	CN	Description
* 8,600	98	Unconnected roofs, HSG A
8,600		100.00% Impervious Area
8,600		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.1: PROPOSED ROOF**

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 100 Year Rainfall=8.24"

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**Summary for Subcatchment SC2.2: PARKING TO CB**

Runoff = 0.82 cfs @ 12.09 hrs, Volume= 3,021 cf, Depth= 8.00"  
 Routed to Pond PCB : Proposed CB to DP

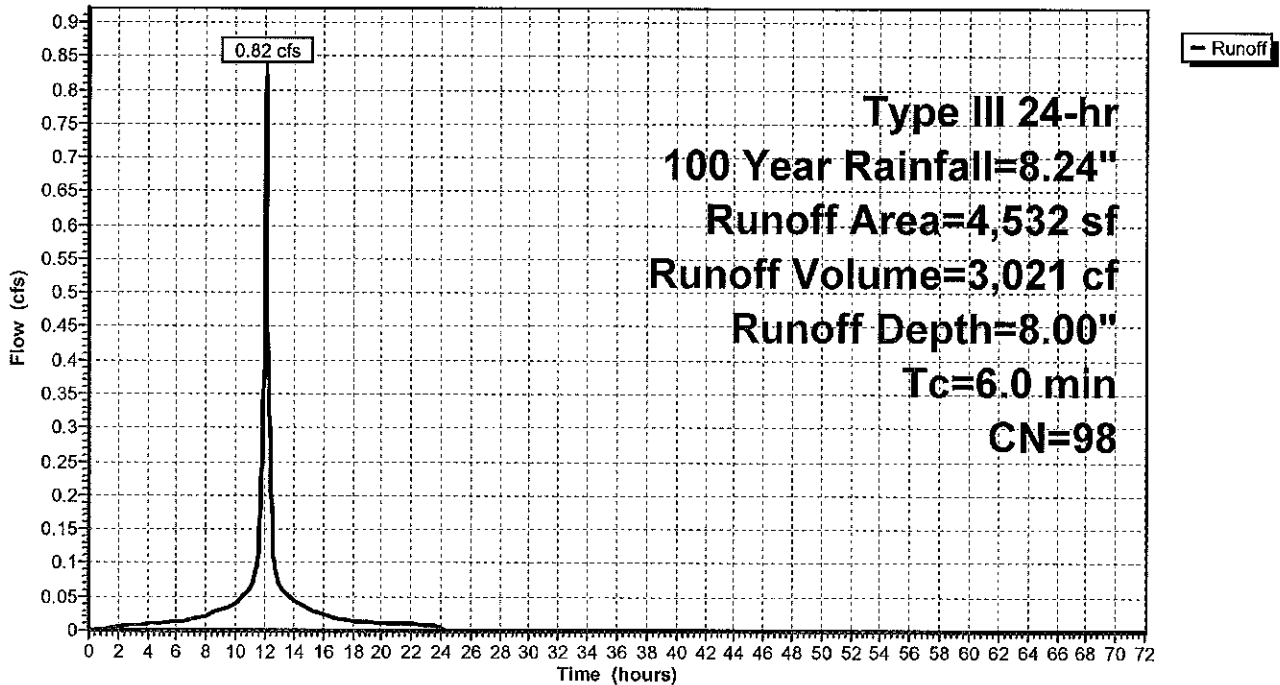
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 100 Year Rainfall=8.24"

	Area (sf)	CN	Description
*	4,315	98	Paved parking, HSG A
*	217	98	Concrete, HSG A
	4,532	98	Weighted Average
	4,532		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.2: PARKING TO CB**

Hydrograph



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Type III 24-hr 100 Year Rainfall=8.24"

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**Summary for Subcatchment SC2.3: SHEET TO GREEN STREET**

Runoff = 0.52 cfs @ 12.10 hrs, Volume= 1,648 cf, Depth= 3.74"  
 Routed to Link DP1 : Green Street CB

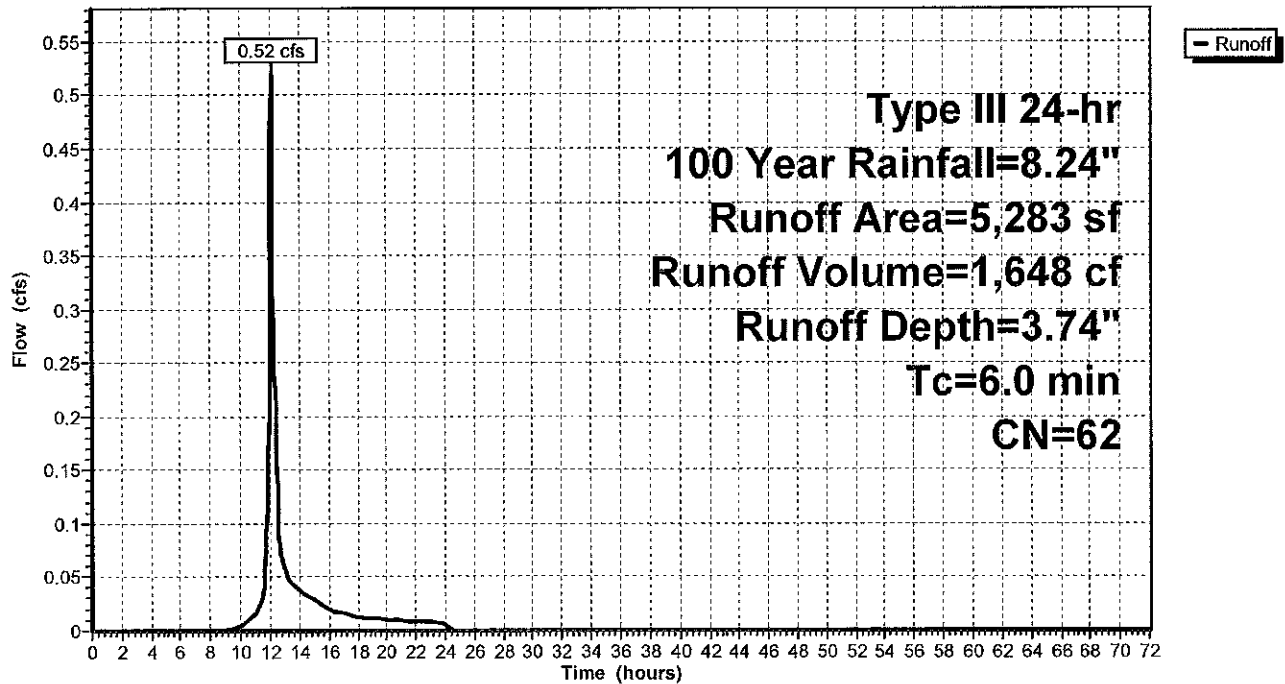
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 100 Year Rainfall=8.24"

Area (sf)	CN	Description
3,213	39	>75% Grass cover, Good, HSG A
* 2,070	98	Concrete, HSG A
5,283	62	Weighted Average
3,213		60.82% Pervious Area
2,070		39.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.3: SHEET TO GREEN STREET**

Hydrograph



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**Summary for Subcatchment SC2.4: TO HAVEN STREET**

Runoff = 0.05 cfs @ 12.09 hrs, Volume= 166 cf, Depth= 3.86"  
 Routed to Pond CB : HAVEN STREET DRAINAGE

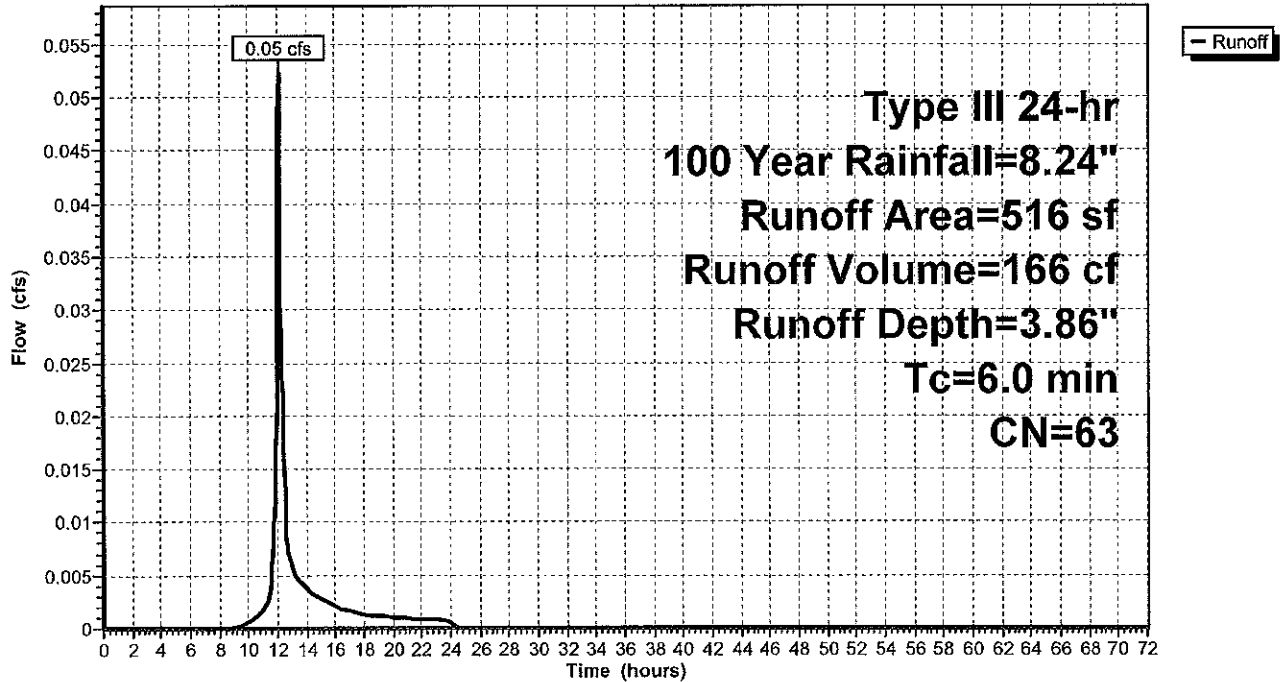
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 100 Year Rainfall=8.24"

Area (sf)	CN	Description
310	39	>75% Grass cover, Good, HSG A
* 206	98	Concrete, HSG A
516	63	Weighted Average
310		60.08% Pervious Area
206		39.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

**Subcatchment SC2.4: TO HAVEN STREET**

Hydrograph





**PROPOSED REA0149**

Type III 24-hr 100 Year Rainfall=8.24"

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**Summary for Pond CB: HAVEN STREET DRAINAGE**

Inflow Area = 516 sf, 39.92% Impervious, Inflow Depth = 3.86" for 100 Year event  
 Inflow = 0.05 cfs @ 12.09 hrs, Volume= 166 cf  
 Outflow = 0.05 cfs @ 12.09 hrs, Volume= 166 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.05 cfs @ 12.09 hrs, Volume= 166 cf  
 Routed to Pond DMH : DMH

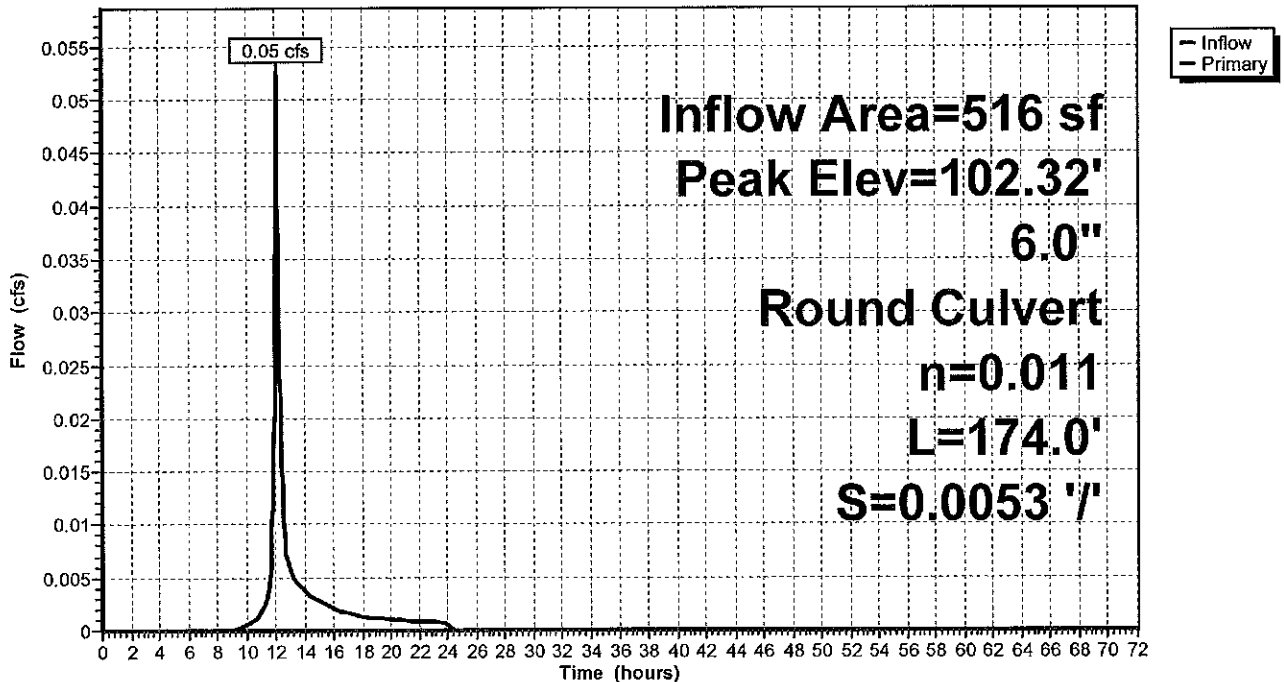
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 102.32' @ 12.10 hrs  
 Flood Elev= 104.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	102.15'	<b>6.0" Round Culvert</b> L= 174.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 102.15' / 101.22' S= 0.0053 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.05 cfs @ 12.09 hrs HW=102.31' TW=101.70' (Dynamic Tailwater)  
 1=Culvert (Outlet Controls 0.05 cfs @ 1.34 fps)

**Pond CB: HAVEN STREET DRAINAGE**

Hydrograph



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**Summary for Pond DMH: DMH**

Inflow Area = 5,048 sf, 93.86% Impervious, Inflow Depth = 7.58" for 100 Year event  
 Inflow = 0.87 cfs @ 12.09 hrs, Volume= 3,187 cf  
 Outflow = 0.87 cfs @ 12.09 hrs, Volume= 3,187 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.87 cfs @ 12.09 hrs, Volume= 3,187 cf  
 Routed to Link DP1 : Green Street CB

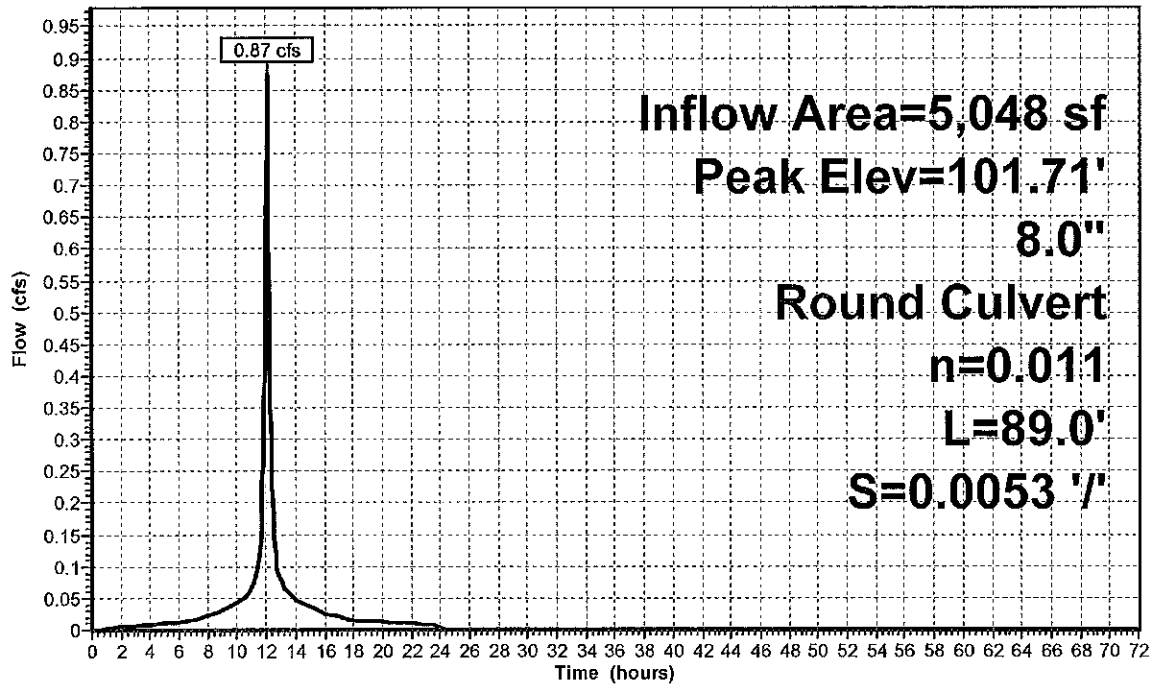
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 101.71' @ 12.09 hrs  
 Flood Elev= 105.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.05'	<b>8.0" Round Culvert</b> L= 89.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.05' / 100.58' S= 0.0053 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.85 cfs @ 12.09 hrs HW=101.70' TW=0.00' (Dynamic Tailwater)  
 ↑1=Culvert (Barrel Controls 0.85 cfs @ 3.12 fps)

**Pond DMH: DMH**

Hydrograph



**Summary for Pond INF: Stormtech SC-310**

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=89)

Inflow Area = 8,600 sf, 100.00% Impervious, Inflow Depth = 8.00" for 100 Year event  
 Inflow = 1.56 cfs @ 12.09 hrs, Volume= 5,733 cf  
 Outflow = 0.53 cfs @ 12.37 hrs, Volume= 5,742 cf, Atten= 66%, Lag= 16.7 min  
 Discarded = 0.23 cfs @ 11.70 hrs, Volume= 5,394 cf  
 Primary = 0.30 cfs @ 12.37 hrs, Volume= 347 cf  
 Routed to Link DP1 : Green Street CB

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 102.85' @ 12.37 hrs Surf.Area= 1,222 sf Storage= 1,304 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= 25.3 min ( 766.1 - 740.8 )

Volume	Invert	Avail.Storage	Storage Description
#1A	101.00'	875 cf	<b>18.17'W x 67.28'L x 2.33'H Field A</b> 2,852 cf Overall - 663 cf Embedded = 2,189 cf x 40.0% Voids
#2A	101.50'	663 cf	<b>ADS_StormTech SC-310 +Cap</b> x 45 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 45 Chambers in 5 Rows
		1,539 cf	Total Available Storage

Storage Group A created with Chamber Wizard

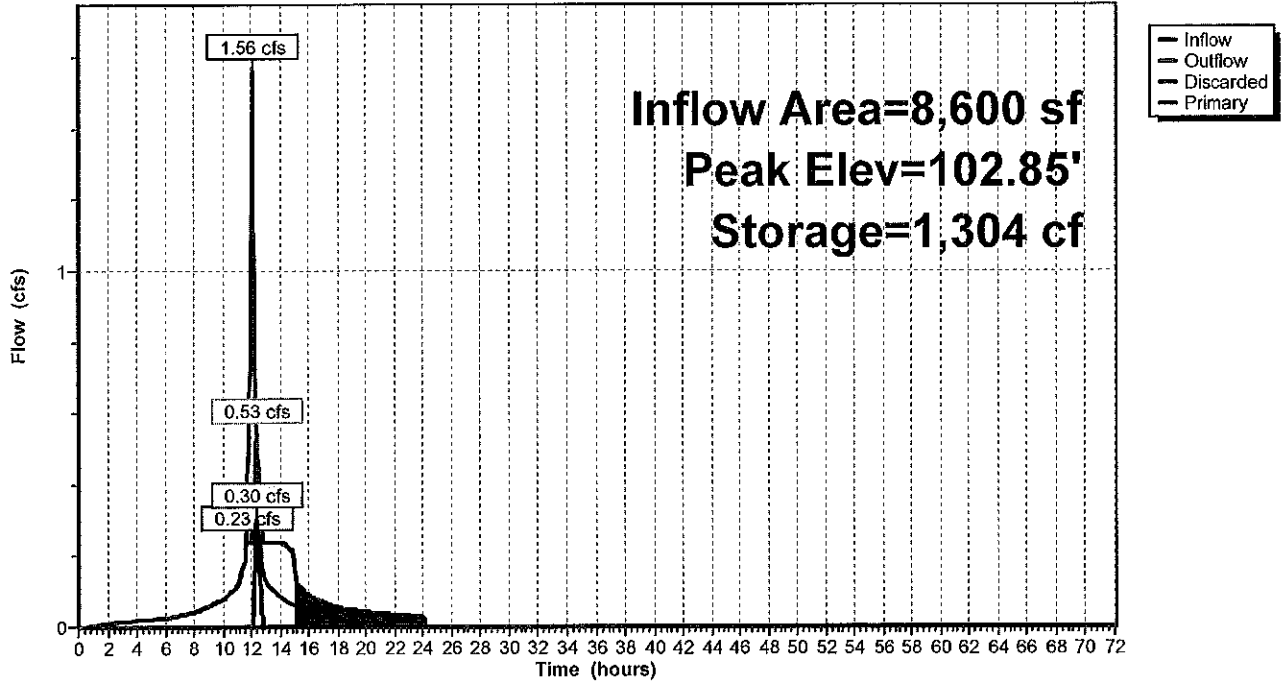
Device	Routing	Invert	Outlet Devices
#1	Discarded	101.00'	<b>8.270 in/hr Exfiltration over Surface area</b>
#2	Primary	102.50'	<b>6.0" Round Culvert</b> L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 102.50' / 101.05' S= 0.0558 ' S= 0.0558 ' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Discarded OutFlow Max=0.23 cfs @ 11.70 hrs HW=101.04' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.30 cfs @ 12.37 hrs HW=102.85' TW=0.00' (Dynamic Tailwater)  
 ↑2=Culvert (Inlet Controls 0.30 cfs @ 2.01 fps)

Pond INF: Stormtech SC-310

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 100 Year Rainfall=8.24"

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**Summary for Pond PCB: Proposed CB to DP**

Inflow Area = 4,532 sf, 100.00% Impervious, Inflow Depth = 8.00" for 100 Year event  
 Inflow = 0.82 cfs @ 12.09 hrs, Volume= 3,021 cf  
 Outflow = 0.82 cfs @ 12.09 hrs, Volume= 3,021 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.82 cfs @ 12.09 hrs, Volume= 3,021 cf  
 Routed to Pond DMH : DMH

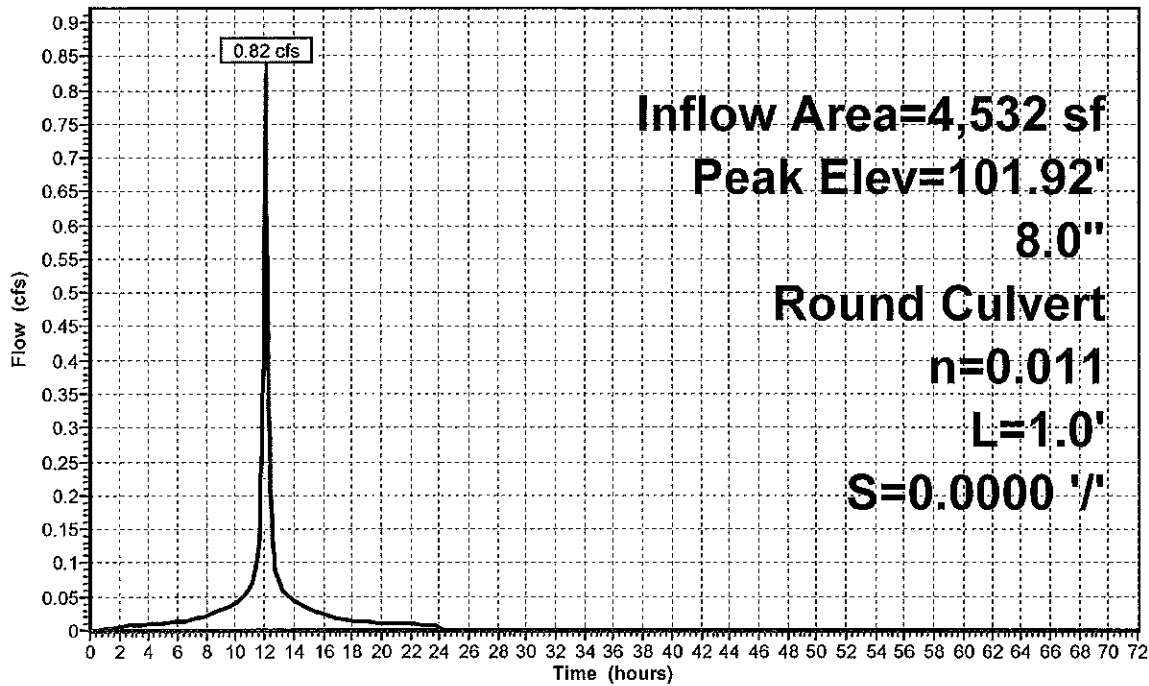
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 101.92' @ 12.11 hrs  
 Flood Elev= 104.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.05'	<b>8.0" Round Culvert</b> L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.05' / 101.05' S= 0.0000 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.68 cfs @ 12.09 hrs HW=101.86' TW=101.70' (Dynamic Tailwater)  
 ↑=Culvert (Inlet Controls 0.68 cfs @ 1.96 fps)

**Pond PCB: Proposed CB to DP**

Hydrograph



**PROPOSED REA0149**

Type III 24-hr 100 Year Rainfall=8.24"

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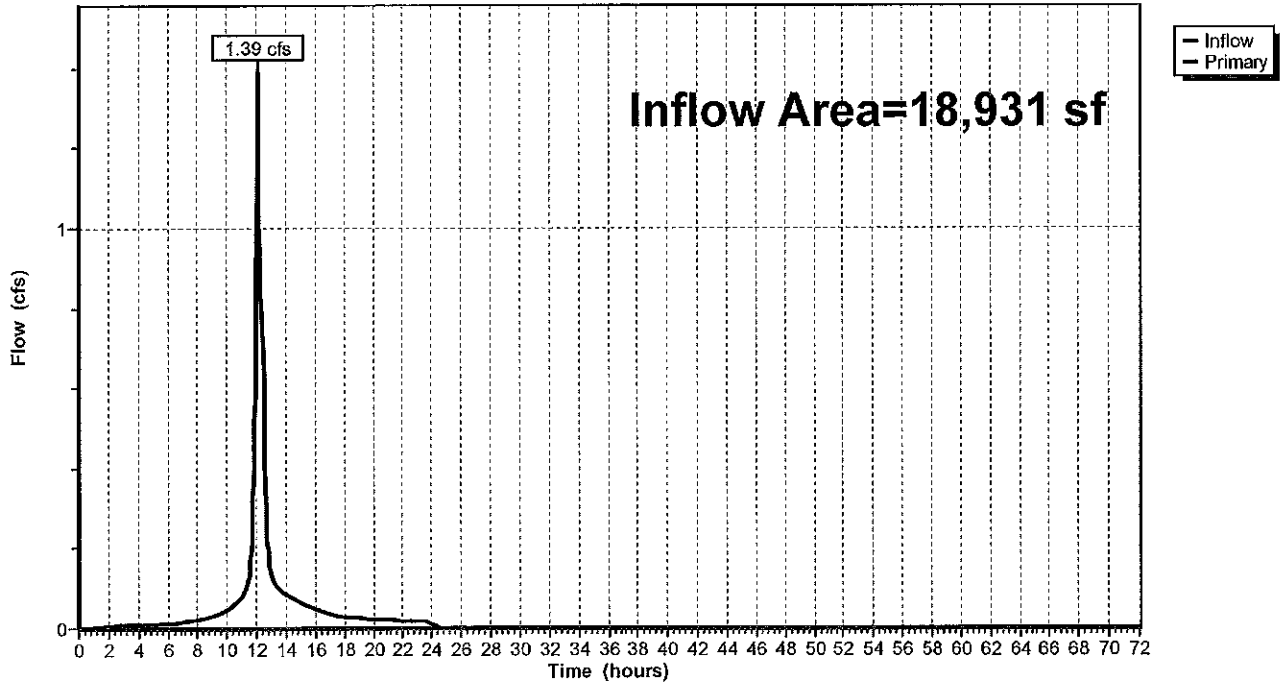
**Summary for Link DP1: Green Street CB**

Inflow Area = 18,931 sf, 81.39% Impervious, Inflow Depth = 3.29" for 100 Year event  
Inflow = 1.39 cfs @ 12.09 hrs, Volume= 5,182 cf  
Primary = 1.39 cfs @ 12.09 hrs, Volume= 5,182 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Link DP1: Green Street CB**

Hydrograph



**PROPOSED REA0149**

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*Multi-Event Tables*

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**Events for Subcatchment SC2.1: PROPOSED ROOF**

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.31	0.62	2,205	3.08
10 Year	5.22	0.98	3,571	4.98
25 Year	6.41	1.21	4,423	6.17
100 Year	<b>8.24</b>	<b>1.56</b>	<b>5,733</b>	<b>8.00</b>

**PROPOSED REA0149**

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*Multi-Event Tables*

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**Events for Subcatchment SC2.2: PARKING TO CB**

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.31	0.33	1,162	3.08
10 Year	5.22	0.52	1,882	4.98
25 Year	6.41	0.64	2,331	6.17
100 Year	<b>8.24</b>	<b>0.82</b>	<b>3,021</b>	<b>8.00</b>



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*Multi-Event Tables*

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**Events for Subcatchment SC2.3: SHEET TO GREEN STREET**

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.31	0.05	233	0.53
10 Year	5.22	0.21	694	1.58
25 Year	6.41	0.32	1,046	2.38
100 Year	<b>8.24</b>	<b>0.52</b>	<b>1,648</b>	<b>3.74</b>

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**Events for Subcatchment SC2.4: TO HAVEN STREET**

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.31	0.01	24	0.57
10 Year	5.22	0.02	71	1.65
25 Year	6.41	0.03	106	2.47
100 Year	<b>8.24</b>	<b>0.05</b>	<b>166</b>	<b>3.86</b>

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**Events for Pond CB: HAVEN STREET DRAINAGE**

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.01	0.01	102.20	0
10 Year	0.02	0.02	102.25	0
25 Year	0.03	0.03	102.28	0
100 Year	<b>0.05</b>	<b>0.05</b>	<b>102.32</b>	0

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**Events for Pond DMH: DMH**

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.33	0.33	101.41	0
10 Year	0.54	0.54	101.53	0
25 Year	0.67	0.67	101.60	0
100 Year	<b>0.87</b>	<b>0.87</b>	<b>101.71</b>	0

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*Multi-Event Tables*

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**Events for Pond INF: Stormtech SC-310**

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.62	0.23	<b>0.23</b>	0.00	101.51	253
10 Year	0.98	0.23	0.23	0.00	102.00	701
25 Year	1.21	0.23	0.23	0.00	102.38	1,019
100 Year	<b>1.56</b>	<b>0.53</b>	0.23	<b>0.30</b>	<b>102.85</b>	<b>1,304</b>

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**Events for Pond PCB: Proposed CB to DP**

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.33	0.33	101.48	0
10 Year	0.52	0.52	101.62	0
25 Year	0.64	0.64	101.72	0
100 Year	<b>0.82</b>	<b>0.82</b>	<b>101.92</b>	0

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*Multi-Event Tables*

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**Events for Link DP1: Green Street CB**

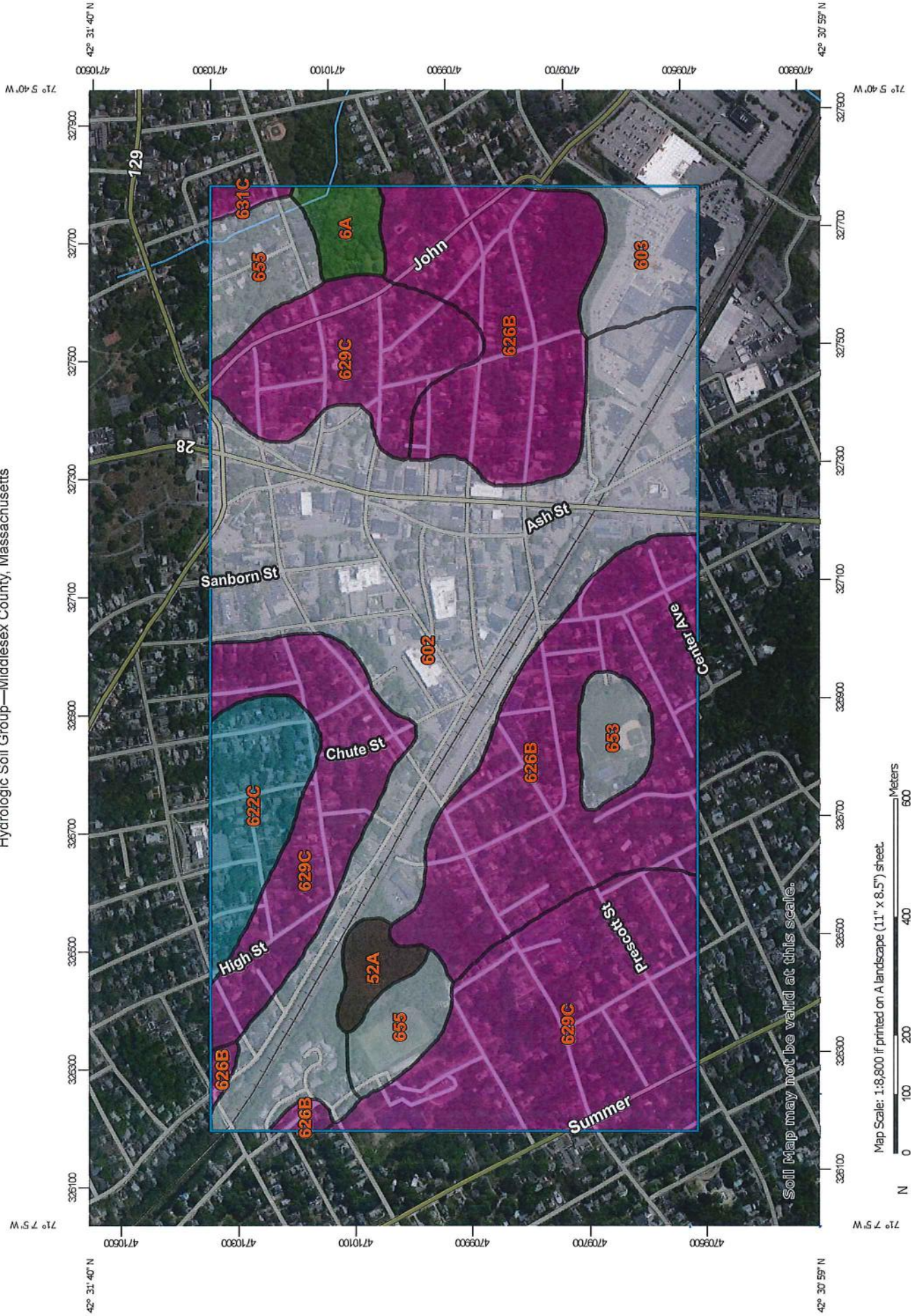
Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
2 Year	0.38	0.38	<b>0.00</b>
10 Year	0.74	0.74	0.00
25 Year	0.99	0.99	0.00
100 Year	<b>1.39</b>	<b>1.39</b>	0.00

# Appendix B:

## NRCS Soil Maps



Hydrologic Soil Group—Middlesex County, Massachusetts



Soil Map may not be valid at this scale.

Map Scale: 1:8,800 if printed on A landscape (11" x 8.5") sheet.



Natural Resources  
Conservation Service

Web Soil Survey  
National Cooperative Soil Survey

## MAP LEGEND

Area of Interest (AOI)	C
Area of Interest (AOI)	C/D
Soils	D
Soil Rating Polygons	Not rated or not available
A	Water Features
A/D	Streams and Canals
B	Transportation
B/D	Rails
C	Interstate Highways
C/D	US Routes
D	Major Roads
Not rated or not available	Local Roads
Soil Rating Lines	Background
A	Aerial Photography
A/D	
B	
B/D	
C	
C/D	
D	
Not rated or not available	
Soil Rating Points	
A	
A/D	
B	
B/D	

## 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	4.7	1.4%
52A	Freetown muck, 0 to 1 percent slopes	B/D	3.8	1.2%
602	Urban land		100.8	30.5%
603	Urban land, wet substratum		10.3	3.1%
622C	Paxton-Urban land complex, 3 to 15 percent slopes	C	13.9	4.2%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	A	84.0	25.4%
629C	Canton-Charlton-Urban land complex, 3 to 15 percent slopes	A	91.1	27.6%
631C	Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky	A	1.3	0.4%
653	Udorthents, sandy		5.8	1.8%
655	Udorthents, wet substratum		14.9	4.5%
<b>Totals for Area of Interest</b>			<b>330.8</b>	<b>100.0%</b>

## 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

# Appendix C:

## Water Quality Flow Calculations





**Water Quality Flow Calculation**  
 25 Haven Street  
 Reading, MA  
 November 22, 2022

Figure 2: For First 1/4-inch of Runoff, Table of qu values for Ia/P Curve = 0.0.058, listed by tc, for Type III Storm Distribution

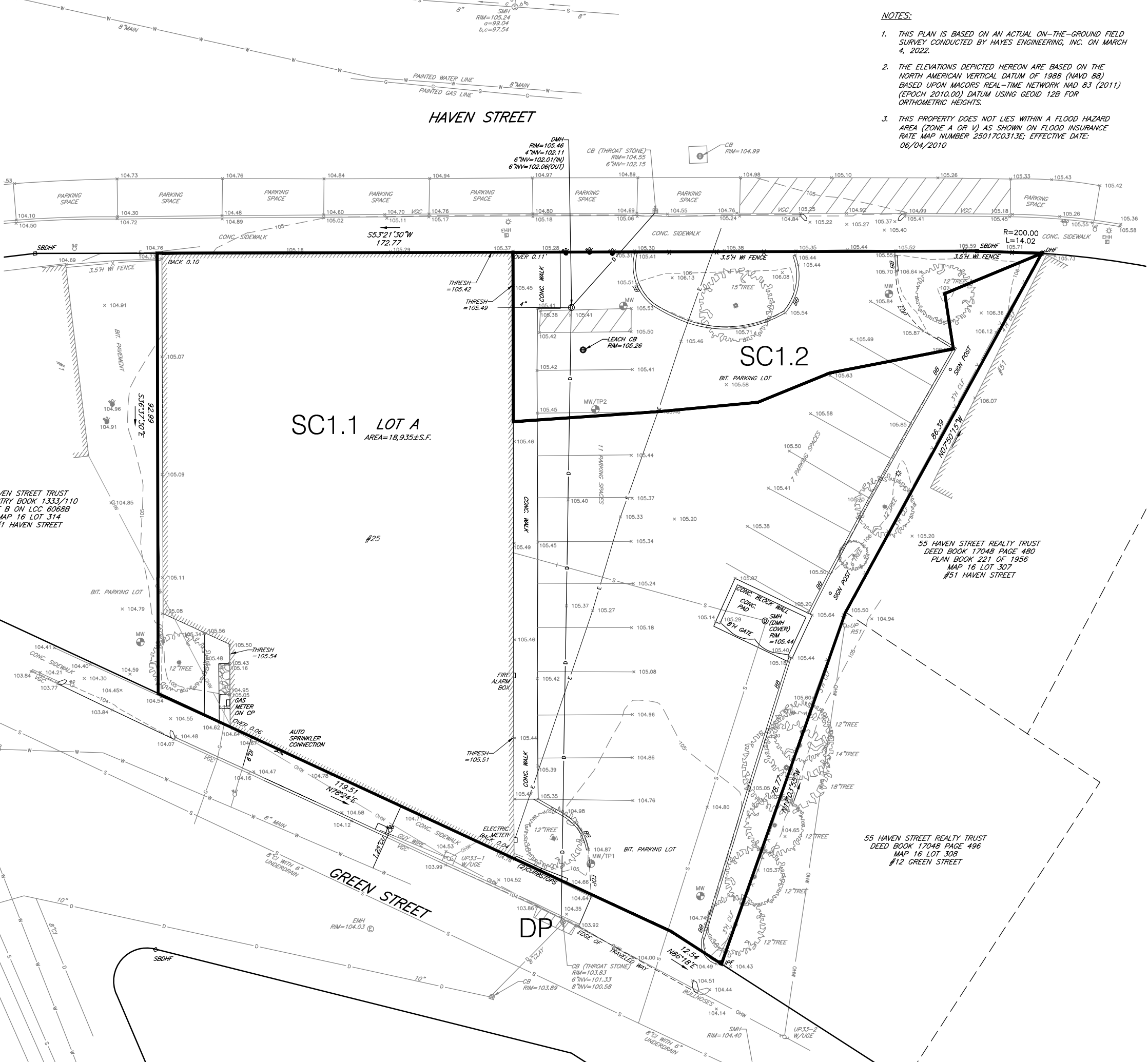


Tc (Hours)	qu (csm/in)	Tc (Hours)	qu (csm/in)	Tc (Hours)	qu (csm/in)	Tc (Hours)	qu (csm/in)
0.01	821	1.8	246	5.3	116	8.8	77
0.03	821	1.9	238	5.4	115	8.9	76
0.05	813	2	230	5.5	113	9	76
0.067	794	2.1	223	5.6	112	9.1	75
0.083	773	2.2	217	5.7	110	9.2	74
0.1	752	2.3	211	5.8	109	9.3	74
0.116	733	2.4	205	5.9	107	9.4	73
0.133	713	2.5	200	6	106	9.5	72
0.15	694	2.6	194	6.1	104	9.6	72
0.167	677	2.7	190	6.2	103	9.7	71
0.183	662	2.8	185	6.3	102	9.8	70
0.2	646	2.9	181	6.4	100	9.9	70
0.217	632	3	176	6.5	99	10	69
0.233	619	3.1	173	6.6	98		
0.25	606	3.2	169	6.7	97		
0.3	572	3.3	165	6.8	96		
0.333	552	3.4	162	6.9	94		
0.35	542	3.5	158	7	93		
0.4	516	3.6	155	7.1	92		
0.416	508	3.7	152	7.2	91		
0.5	472	3.8	149	7.3	90		
0.583	443	3.9	147	7.4	89		
0.6	437	4	144	7.5	88		
0.667	417	4.1	141	7.6	87		
0.7	408	4.2	139	7.7	86		
0.8	383	4.3	136	7.8	85		
0.9	361	4.4	134	7.9	84		
1	342	4.5	132	8	84		
1.1	325	4.6	130	8.1	83		
1.2	311	4.7	128	8.2	82		
1.3	297	4.8	126	8.3	81		
1.4	285	4.9	124	8.4	80		
1.5	274	5	122	8.5	79		
1.6	264	5.1	120	8.6	79		
1.7	254	5.2	118	8.7	78		

# Appendix D:

## Watershed Plans





**NOTES:**

1. THIS PLAN IS BASED ON AN ACTUAL ON-THE-GROUND FIELD SURVEY CONDUCTED BY HAYES ENGINEERING, INC. ON MARCH 4, 2022.
2. THE ELEVATIONS DEPICTED HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) BASED UPON MACORS REAL-TIME NETWORK NAD 83 (2011) (EPOCH 2010.00) DATUM USING GEOID 12B FOR ORTHOMETRIC HEIGHTS.
3. THIS PROPERTY DOES NOT LIE WITHIN A FLOOD HAZARD AREA (ZONE A OR V) AS SHOWN ON FLOOD INSURANCE RATE MAP NUMBER 25017C0313E; EFFECTIVE DATE: 06/04/2010

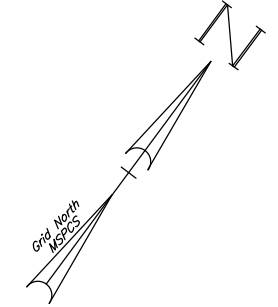
**LOCUS MAP:**  
(1"=100')  
STRUCTURES AND BOUNDARIES COMPILED FROM MASSMAPPER GIS INFORMATION

HAVEN STREET TRUST  
REGISTRY BOOK 1333/110  
LOT B ON LCC 6068B  
MAP 16 LOT 314  
#1 HAVEN STREET

**SC1.1 LOT A**  
AREA=18,935±S.F.

55 HAVEN STREET REALTY TRUST  
DEED BOOK 17048 PAGE 480  
PLAN BOOK 221 OF 1956  
MAP 16 LOT 307  
#51 HAVEN STREET

55 HAVEN STREET REALTY TRUST  
DEED BOOK 17048 PAGE 496  
MAP 16 LOT 308  
#12 GREEN STREET



- LEGEND:**
- 104 --- MINOR CONTOUR
  - 105 --- MAJOR CONTOUR
  - FENCE
  - WATER LINE
  - WATER GATE
  - WATER SHUTOFF
  - SEWER LINE
  - SEWER MANHOLE
  - DRAIN LINE
  - DRAIN MANHOLE
  - CATCH BASINS
  - GAS LINE
  - GAS GATE
  - ELECTRIC LINE
  - OVERHEAD WIRE
  - ELECTRIC MANHOLE
  - ELECTRIC HANDHOLE
  - UTILITY POLE
  - LIGHTPOLE
  - DRILL HOLE FOUND
  - STONE BOUND DRILL HOLE FOUND
  - IRON ROD/PIPE FOUND
  - DECIDUOUS TREE
  - BOLLARD
  - MONITORING WELL
  - 3' FT HIGH BITUMINOUS BERM
  - BIT. BITUMINOUS
  - CI CAST IRON
  - CLF CHAINLINK FENCE
  - CONC. CONCRETE
  - DI DUCTILE IRON
  - EOP EDGE OF PAVEMENT
  - VCC UNDERGROUND ELECTRIC
  - VCC VERTICAL GRANITE CURB
  - W PROPOSED WATER LINE
  - S PROPOSED SEWER LINE
  - G PROPOSED GREASE TRAP
  - C PROPOSED CATCH BASIN
  - D PROPOSED DRAIN LINE
  - M PROPOSED DRAIN MANHOLE
  - UH PROPOSED OVERHEAD WIRE
  - UP PROPOSED UTILITY POLE
  - 2.0% PROPOSED SPOT ELEVATION
  - PROPOSED FLOW
  - PGC PROPOSED GRANITE CURB
  - PROP. PROPOSED

Prepared For:  
25 HAVEN STREET, LLC

Prepared By:  
Hayes Engineering, Inc.  
25 HAVEN STREET  
READING, MASSACHUSETTS  
REGISTRY BOOK 1557/74  
ASSESSORS MAP 16 LOT 309

Design By: JG  
Drawn By: xxx  
Checked By: PJO  
Project File: xxx  
Comp. No: REA175  
 Issued For Permit  
 Issued For Review  
 Issued For Bid  
 Issued For Construction  
 Not For Construction

No.	Revision	Date
10		
9		
8		
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5		
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2		
1		

Date: November 22, 2022

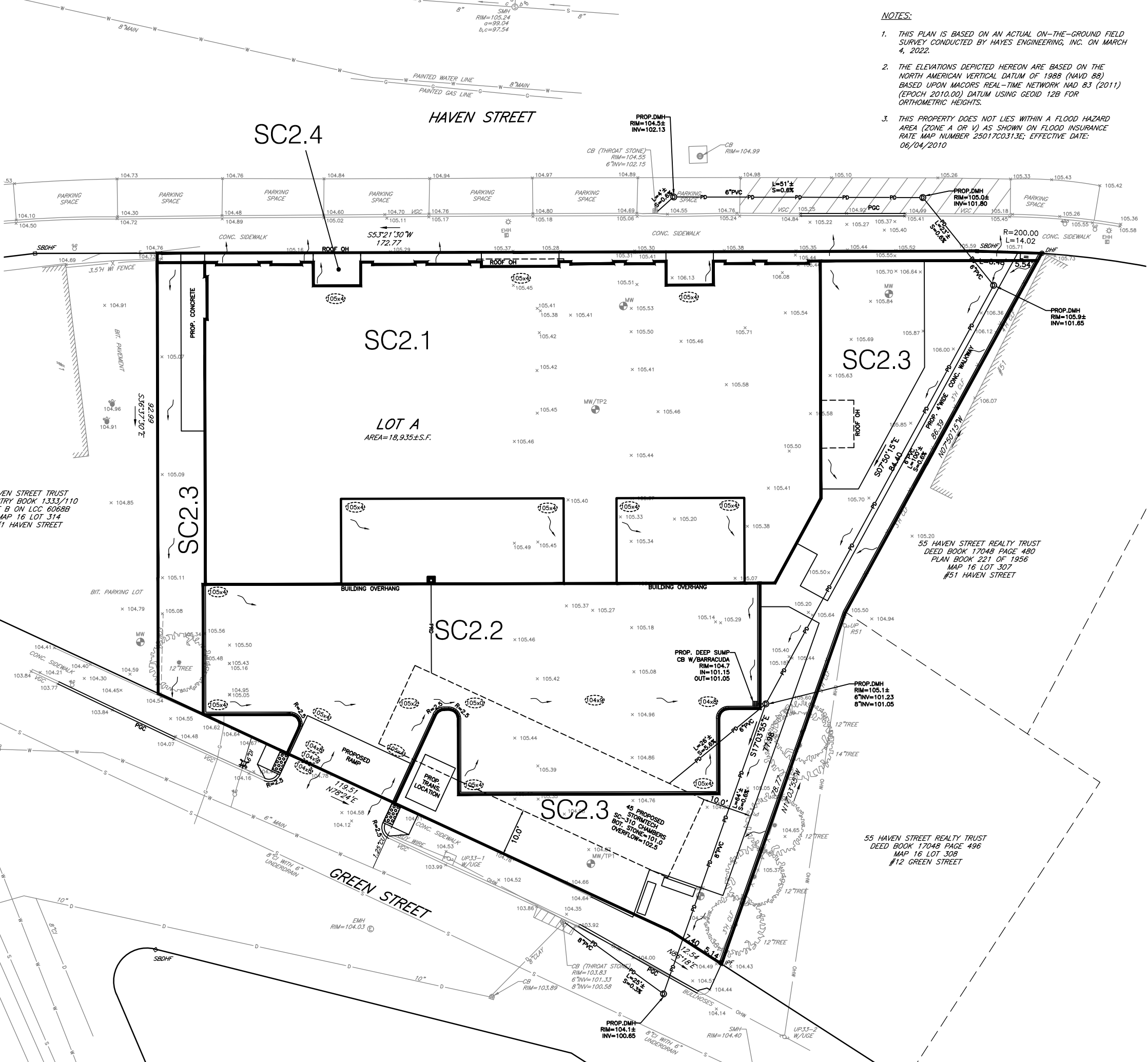
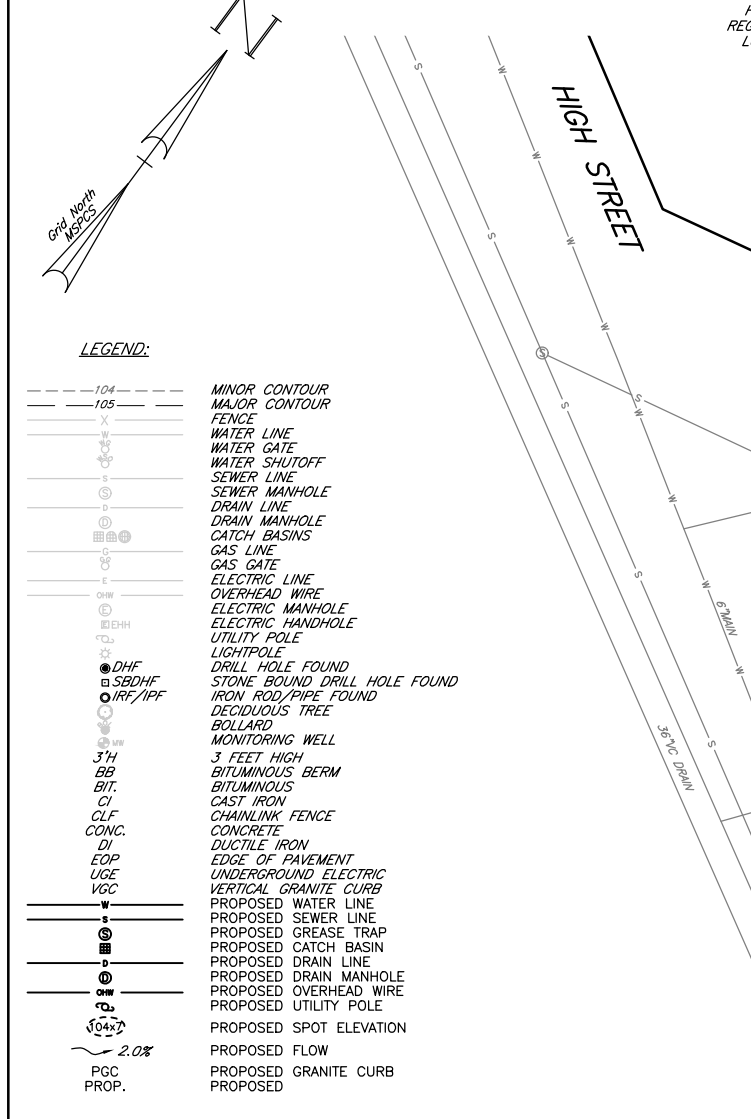
Drawing Title:  
**EXISTING WATERSHED**  
**25 HAVEN STREET**  
**READING, MASS.**

Drawing No.:  
**SW**

SHEET 1 OF 2



LOCUS MAP:  
(1"=100')  
STRUCTURES AND BOUNDARIES COMPILED FROM  
MASSMAPPER GIS INFORMATION



**NOTES:**

1. THIS PLAN IS BASED ON AN ACTUAL ON-THE-GROUND FIELD SURVEY CONDUCTED BY HAYES ENGINEERING, INC. ON MARCH 4, 2022.
2. THE ELEVATIONS DEPICTED HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) BASED UPON MACORS REAL-TIME NETWORK NAD 83 (2011) (EPOCH 2010.00) DATUM USING GEOID 12B FOR ORTHOMETRIC HEIGHTS.
3. THIS PROPERTY DOES NOT LIES WITHIN A FLOOD HAZARD AREA (ZONE A OR V) AS SHOWN ON FLOOD INSURANCE RATE MAP NUMBER 25017C0313E; EFFECTIVE DATE: 06/04/2010

Prepared For:  
25 HAVEN STREET, LLC  
25 HAVEN STREET  
READING, MASSACHUSETTS  
REGISTRY BOOK 1557/74  
ASSESSORS MAP 16 LOT 309

Prepared By:  
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www.hayeseng.com

Design By: JG  
Drawn By: xxx  
Checked By: PJO  
Project File: REA-0419  
Comp. No: REA175  
 Issued For Permit  
 Issued For Review  
 Issued For Bid  
 Issued For Construction  
 Not For Construction

No.	Revision	Date
10		
9		
8		
7		
6		
5		
4		
3		
2		
1		

Date: November 22, 2022

Drawing Title:  
**PROPOSED WATERSHED**  
**25 HAVEN STREET**  
**READING, MASS.**

Drawing No.:  
**SW**  
SHEET 2 OF 2



# Housing Production Plan Town of Reading

Prepared for the Town of Reading

**By:** Anser Advisory (Nicole Lambert, Project Manager; Andrea Lombardi, Senior Director VP)

**With the assistance from the Town of Reading:** Fidel Maltez, Town Manager; Jean Delios, Assistant Town Manager; Julie Mercier, Community Development Director; Andrew MacNichol, Senior Planner; Sudeshna Chatterjee, Director of Equity and Inclusion; Kathryn Gallant, Reading Housing Authority Director; Catrina Meyer, Community Planning and Development Commission; Jacqueline McCarthy, Reading Select Board

**Date: February 13, 2023**

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**Commented [MA1]:** Andrew and Nicole to check this meets format/sections below

## Introduction

A Housing Production Plan (HPP), defined in regulations at 760 CMR 56.03 and administered by the Department of Housing and Community Development (DHCD), is a proactive strategy for planning and developing affordable housing. The HPP identifies the housing needs of a community and the goals and strategies it will use to identify and achieve or maintain the 10% Subsidized Housing Inventory (SHI) threshold mandated by M.G.L. Chapter 40B. The Town's status relating to this 10% threshold is documented on the SHI, also administered by DHCD.

This HPP Program enables municipalities to develop a strategy to meet its affordable housing needs in a manner consistent with the MGL Chapter 40B statute, produce housing units in accordance with that plan, and demonstrate progress towards their affordable housing production. By taking a proactive approach in the adoption of a HPP, cities and towns are much more likely to achieve both their affordable housing and community planning goals. HPPs give communities that are under the 10% threshold of Chapter 40B, but are making steady progress in producing affordable housing on an annual basis, more control over comprehensive permit applications for a specified period of time. HPPs give communities over the 10% threshold a framework to maintain the statutory minima in accordance with local needs and community goals.

The Town of Reading places great importance on planning for affordable housing development through the HPP process. The Town of Reading's current Housing Production Plan was approved by DHCD on March 20, 2018 and will expire after a 5-year term on February 13, 2023, and as such, the Town of Reading has updated the Housing Production Plan ("HPP") herein, in accordance with 760 CMR 56.03(4).

Housing Production Plans can create a safe harbor for a community. When a municipality has a certified plan, decisions on comprehensive permit applications by the Zoning Board of Appeals (ZBA) to deny or approve with conditions will be deemed "consistent with local needs" under MGL Chapter 40B.

As of December 2022, Reading has achieved a 10% SHI threshold, as a result of meeting its previously planned production efforts. However, because of the fluidity of the SHI continued efforts are needed to maintain the threshold. As summarized below, a municipality may request that the DHCD certify its compliance with an approved HPP if it has created the required number of SHI Eligible Housing units in a calendar year.

Housing Production Plans are certified by the following process, as identified in the regulations:

- **Prepare the HPP:** In accordance with the regulations, write the plan, including a public process, and have the plan adopted by the Select Board and Community Planning and Development Commission

- DHCD Approval: Submit HPP to DHCD for approval
- Certify the HPP: Communities may seek DHCD certification of the HPP (safe harbor), if in a calendar year, affordable units (AFU's) are created as follows:
  - One-year Safe Harbor: – Create at least 0.5% of the total number of housing units in Reading (50 for Reading)
  - Two-year safe harbor – Create at least 1.0% of the total number of housing units in Reading (100 for Reading)
- Renew the HPP: The term of the HPP is five years from approval.

The Town of Reading’s Public Services Department updated the Housing Plan with future planned housing, completed projects, census data and other demographic information as required by DHCD. DHCD regulates Housing Production Plans under 760 CMR 56.00, promulgated on February 22, 2008. HPPs are designed to create strategies to meet affordable housing needs that are consistent with Chapter 40B requirements. In order for the HPP to qualify for approval from DHCD, the plan must be comprised of three components: (1) Comprehensive Needs Assessment; (2) Affordable Housing Goals; and (3) Implementation Strategies.

- (1) Comprehensive Needs Assessment – an evaluation of a community’s demographics, housing stock, population trends, and housing needs. The assessment will include a review of the development capacity, as well as constraints, to ensure that current and future needs can be met.
- (2) Affordable Housing Goals – defined housing goals consistent with both community character and the local housing market. This section will identify strategies that can be used to produce the required number of annual housing units needed to obtain the 10% statutory minima and safe harbor certification from DHCD.
- (3) Implementation Strategies – recommendations and targeted areas for future development that will enable a community to reach the affordable housing goals. This may include identifying sites for development or redevelopment, investigating re-zoning options to encourage the production of affordable housing units, and establishing other tools such as regional collaborations that can foster the development of affordable housing.

Once a community has achieved safe harbor certification, within 15 days of the opening of the local hearing for a Comprehensive Permit application, the Zoning Board of Appeals (ZBA) shall provide written notice to the Applicant, with a copy to DHCD, that a denial of the permit or the imposition of conditions or requirements would be consistent with local needs, the grounds that it believes have been met, and the factual basis for that position, including any necessary supporting documentation. If the Applicant wishes to challenge the ZBA's assertion, it must do so by providing written notice to the Department, with a copy to the Board, within 15 days of its receipt of the ZBA's notice, including any documentation to support its position. DHCD shall thereupon review the materials provided by both parties

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and issue a decision within 30 days of its receipt of all materials. The ZBA shall have the

burden of proving satisfaction of the grounds for asserting that a denial or approval with conditions would be consistent with local needs, provided, however, that any failure of the DHCD to issue a timely decision shall be deemed a determination in favor of the municipality. This procedure shall pause the requirement to terminate the hearing within 180 days.

### **Affordable Housing Highlights Since 2018 HPP**

- Continued lead of the Metro North Regional Housing Services Office to administer affordable requirements, including preserving existing affordable units, along with North Reading, Saugus and Wilmington. The City of Woburn joined the regional collaboration in 2019.
- Downtown Smart Growth District (DSGD) under Chapter 40R: Adopted in 2009 and expanded in 2017, five (5) 40R projects have been completed and occupied resulting in 192 total units, 43 of which (22.4%) are deeded as affordable units. A number of additional 40R development projects continue to go through permitting and construction; see Section B below for more information.
- 40B Project Approvals: In February 2017, the Zoning Board of Appeals (ZBA) approved a 68-unit rental housing project known as Reading Village, proposed next to the Reading Commuter Rail Station downtown. In July 2017, the ZBA approved a 20-unit rental housing project outside of the downtown area known as Schoolhouse Commons – an adaptive re-use of the former school building associated with St. Agnes church. In 2019 the Eaton Lakeview 40B was approved for a combination of 12 ownership units and 74 rental units.
- Through all of its planning efforts, Reading has added 177 units (and 1.77%) to its Subsidized Housing Inventory (SHI) since the 2018 HPP was implemented.

## **Executive Summary**

The Town of Reading continues to be a desirable place to live and work. It is characterized by a traditional New England center, surrounded by

**Commented [MA3]:** Can likely expand with our general language used in many other plans.



family-oriented neighborhoods. It has evolved over time from largely an outlying community with a strong agricultural presence to a modern residential suburb just north of Boston.

Reading's proximity to Boston has added to its attractiveness. The Town has worked to shape housing development and growth that complements the character of the community. The HPP identifies tools for Reading to use that will encourage the development of affordable housing while maintaining the distinct town character.

### **Summary of Demographic and Housing Characteristics**

The following summarizes the notable findings from the need's assessment section of the Housing Production Plan.

#### The Bottom Line:

Reading has grown slightly since 2010, with increases in population, the number of households, and housing units. In particular, the projected growth of the 65+ population is noted. Reading's median income has risen significantly, but 33.1% of the population is low-income.

Housing cost burdened is an indicator that a household may be unable to afford other critical and nondiscretionary costs such as health and child care, food, and transportation. Locally, a total of

- 49.4% of Renters at or below 30% AMI are Cost Burdened
- 24.5% of Renters between 30% and 50% AMI are Severely Cost Burdened
- 22.7% of Owners at or below 30% AMI are Cost Burdened
- 8.8% of Owners between 30% and 50% AMI are Severely Cost Burdened

#### Population

- As of the 2020 US Census, the population of Reading is 25,510, an increase of 3% since 2010. In 2020, the largest age group of Reading's populations was 35-59 year old's (35.8% of total population). There was a 5.4% decrease in the 60+ year- old grouping but such is expected to rise in future years as residents in the 35-59 age cohort continue to age.
- The 2020 Census illustrates that 35.7% of Reading's households have children under 18-years old, and 13.5% have persons age 65+.
- The median age increased from 41.6 years old in 2010 to 44.1 years old in 2020.
- Racial make-up is predominantly white, at (87.2%) and the largest racial minority group in Reading is the Asian population (5.1%) followed by the Hispanic or Latino population at 2.8%. Only 1.3% of the population identifies as Black or African American.; 0.1% of the population are American Indian/Alaskan Native; .8% of the population identify as other; and 3.5% of the population identifies as Hispanic or Latino.

### **Income**

- The Town of Reading's 2020, median household income was \$133,300; approximately a 25% increase from 2015, and slightly lower than the Boston-Cambridge-Quincy Metro Area (\$140,200) but 10.7% higher than the state as a whole (\$120,400). (HUD)
- An estimated 32.7% of Reading households have incomes at or below 80% of AMI (Low/Moderate Income).
- 3% of Reading's population is below the poverty line (annual income below \$27,750 for a household of 4 based on 2022 FPL Guidelines), much lower than Middlesex County (7.1%) and Massachusetts (9.4%).
- Of the 7,560 of Reading households who own their homes, 22.5% are cost-burdened (spending over 30% of their income on housing), while 49.3% of Reading's renters are cost-burdened. 64.7% of Reading's low-income households are cost-burdened.

### **Housing Stock, Sales and Prices**

- 84.6% of Reading's housing units are owner occupied, with 15.4% renter occupied.
- The Town's housing stock remains primarily single-family at 76.7% of total housing units. The remaining 23.3% is: 6.4% of units are in two to four family buildings, 6.7% of units in 5-19 unit buildings, and 10.5% of units in multi-family buildings with 20 or more units.
- Currently, 10.49% (1,044 units) of Reading's total housing stock (9,952 units) is counted as affordable on the State's Subsidized Housing Inventory (SHI), which falls just above the State's minimum affordability goal of 10% by 74 units.
- Reading's 2022 median sale price of \$825,500 would require an annual income of approximately \$150,000 to not be considered cost-burdened, over \$16,700 higher than Reading's median household income of \$133,300.
- The 2022 median price of single-family homes in Reading was \$825,500. The 2022 median price of all homes, including condos, was \$557,500. After a dip in prices during the national recession in the mid-2000's, housing prices have been rising steadily since 2012 and are now the highest they have ever been. Prices have increased by 72.2% since 2016.
- Based on the 2022 median single-family sale price, Reading's ownership affordability gap is \$258,498 for median income households, \$393,688 for low-income households, and \$568,158 for very-low-income households.
- Based on current median rents, Reading rentals are out of reach for low income households. In addition, there are not very many rentals available.

### **Goals for Affordable Housing Production**

Reading has identified housing goals that are the most appropriate and most realistic for the community. These goals were developed by reviewing previous studies and documents (including the Reading Housing Plan of 2018), analyzing the current housing situation in Reading, and through public input from town citizens and officials. The goals, and recommended strategies to achieve such, as provided in Section 2 of this report.



## Section 1: Comprehensive Housing Needs Assessment

The Housing Needs Assessment examines demographic and population data and trends from available sources such as the Census, regional planning agencies, media, etc., that illustrates the current demographic and housing characteristics for the Town of Reading. Assessing needs will provide the framework for the development of housing production strategies to meet affordable housing goals.

### A. Demographic Analysis

The purpose of analyzing demographics is to look at quantitative and qualitative trends and use the data for future planning. This section provides an overview of Reading's demographics and how they have changed over time. As the demographics change in the future, the housing needs of the community can also change. The size and type of families as well as householder age and economic status all influence the needs of the community. The analysis of the Housing Needs Assessment will provide a guide to identify goals and strategies for this plan.

#### 1. Total and Projected Populations:

In the last ten years, the Town of Reading has had a 3% increase in population. Over the next 10 years, the population is expected to experience a slight decline before having a minor increase by 2030 as well as another increase in 2040. The total number of households in Reading has increased and is expected to only have minor increases through 2030 and 2040. Similar to the national trend, Reading's average household size has decreased in the past ten years. In 1999 the average household size was 2.84 and decreased to 2.71 in 2010. In 2020 the average household size was 2.67. Smaller household size is consistent with communities experiencing slow but steady growth.

Table 1: Total and Projected Populations: 2000-2040

Year	Population	% Change	Households	% Change
2000	23,708	5%	8,688	10%
2010	24,747	4.4%	9,305	7.0%
2020	25,510	3%	9,374	.7%
2030	26,222	2.7%	10,806	8.7%
2040	28,139	6.8%	11,221	3.84%

Source: 2020 US Census and  
MAPC MetroFuture 2050

Update, January 2014, May 2022, Donahue Institute at UMASS

## 2. Household Types:

There were a total of 9,952 households in Reading in 2020, with 70.7% family households, and 28% non-family households in Reading. The non-family households include single person households or persons living in the same household who are not related. The presence of a mix of family and non-family households indicates that there is likely a need for a variety of housing types that may not fit the traditional single-family home model. The data reflects 2,789 non-family households. This may suggest a need for affordability options for non-family households who may have special housing needs.

**Table 2: Household Types: 2020**

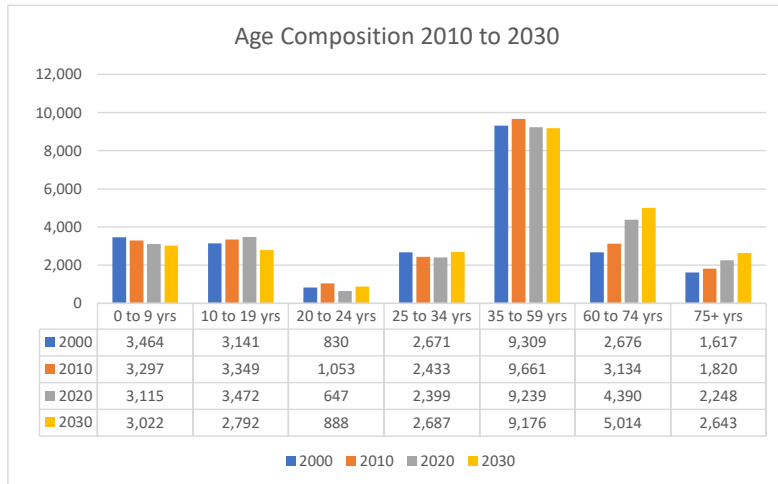
Household Type	2020	Percentage
<b>Family Households:</b>	7,032	70.7%
With own Children under 18 years	6,187	62.2%
Married, Husband-wife family:	5,580	56.1%
With own children under 18	5,560	55.9%
Male householder, no wife present	89	.9%
With own children under 18 years	31	.3%
Female householder, no husband present	365	3.7%
With own children under 18 years	341	3.4%
<b>Nonfamily households:</b>		
Householder living alone	2,789	28%
Householder 65 and over living alone	1,263	12.7%
Average household size	2.67	
Average family size	3.16	
Total Households	9,952	

Source: 2020 US Census

Other important factors to consider when assessing housing needs are household size and the age composition of residents. Household size is an important factor as it can help determine the demand for certain types of housing. Similarly, analyzing the age composition of a community over time can help develop trends for housing needs. For example, established families with children living at home have different housing needs than an empty nester and or someone who is over 65.

MetroFuture is a regional plan developed by the Metropolitan Area Planning Council (MAPC) that addresses future growth in the Boston metropolitan region until 2030. Figure 1 summarizes Reading’s age composition from 2020 and includes MetroFuture projections until 2030. Table 3 illustrates this in more detail.

**Figure 1: Age Composition of Residents, 2000 – 2030**



Source: 2020 US Census and MAPC MetroFuture 2050 Update, January 2014, May 2022, Donahue Institute at UMASS

**Table 3: Current and Projected Age Distribution of Residents: 2000-2030**

Age Cohorts	2000		2010			2020			2030			% Change from 2000-2030
	Number	%	Number	%	% Change	Number	%	% Change	Number	%	% Change	
0 to 9 years	3,464	14.6	3,297	13.3	-4.8	3,115	12.3	-5.5	3,022	11.5	-3.0	-12.8
10 to 19 years	3,141	13.2	3,349	13.5	6.2	3,472	13.8	10.5	2,792	10.6	-19.6	-11.1
20 to 24 years	830	3.5	1,053	4.3	26.9	647	2.6	-22.0	888	3.4	37.2	7.0
25 to 34 years	2,671	11.3	2,433	9.8	-9.0	2,399	9.4	-11.0	2,687	10.2	13.1	.6
35 to 59 years	9,309	39.3	9,661	39.0	3.8	9,239	36.2	-1.8	9,176	35.1	.4	-1.4
60 to 74 years	2,676	11.3	3,134	12.7	17.1	4,390	17.2	62.2	5,014	19.1	15.5	87.4
75+ years	1,617	6.8	1,820	7.4	12.6	2,248	8.5	32.8	2,643	10.1	23.0	63.5
Total Population	23,708	100	24,747	100		25,510	100		26,222	100		

Source: 2020 US Census and MAPC MetroFuture 2050 Update, January 2014, May 2022, Donahue Institute at UMASS

MAPC’s MetroFuture plan suggests that Reading’s population will have a minor increase in overall population for the next 10-20 years. However, it is anticipated that a significant change in the composition of the age groups will occur. Based on the MetroFuture projections, the youngest age groups are expected to continue to decline by 2030; ages 0-9 (-3%), and ages 10-19 (-19.6%). The age groups from 20-24 and 25-34 are expected to increase by (37.2%) and (13.1%) respectively. However, the 35-59 age group is expected to remain the largest age group in Reading and is projected to comprise 35.1% of the population in 2030, with the 60-75+ age group following close behind at approximately 29.2% of Reading’s population in 2030.

In 2020 the largest age cohort in Reading was those aged 35-59 (36.2%). People in this age group are likely to be in an established family household with a larger home than the younger age groups. The next concentration of residents was the next age group; those aged 60-74 years (17.2%) and those aged 10-19 years (13.8%) made up the third largest age cohort. The following age groups experienced a decline in 2020: 0-9 years, 20-24 years, and 25-34 year old’s between 2010 and 2020. The elderly population also increased from 2010 to 2020. Persons aged 60-74 experienced a population increase of 17.2% and those aged 75+ increased by 8.5%.

The data shows that the second largest age group in 2030 will be those aged 60-74 with an increase of 60% from 2010 to 2030. Even though the childhood age groups of 0-9 and 10-19 are expected to decrease by 2030, collectively they will make up almost one-fourth of the population (22.2%). Adults who will be aged 25-34 are expected to grow slowly by 2030, only increasing by .6%.

By contrast, the elderly population (ages 75+) which comprises 8.5% of Reading residents is expected to increase by 23% in the next 10 years. When combined with the 60-74 age group (29.2%), the 60-75+ age group will consist of approximately 38.5% of Reading's population. This is not surprising as the "baby-boomer" population is contained within this age group. It is important to be aware of this trend as this population tends to prefer smaller housing units with less upkeep. Elderly residents could have special housing needs such as nursing homes and assisted living facilities.

Adults aged 20 to 24 years and 25 to 34 years are expected to make up approximately 13.6% of the population in 2030. These age groups are more likely to make up younger families who will purchase a starter home that is smaller and more affordable. In the next twenty years, as the 35-59 age group moves into the next age group, the stock of larger traditional family homes (detached, single-family units) may become more available. This may allow the younger population to trade up or take advantage of the larger homes.

The analysis of population projections is vital for planning and determining future housing needs. With the expected increase in the older population, planning efforts should consider the need for smaller housing units with less maintenance, senior housing or assisted living facilities. As the middle-age population shifts into the older age groups the demand for larger, traditional family housing units will be reduced and will increase the opportunity for younger families looking to trade-up to more of those homes now available.

### **3. School Enrollment and Projections**

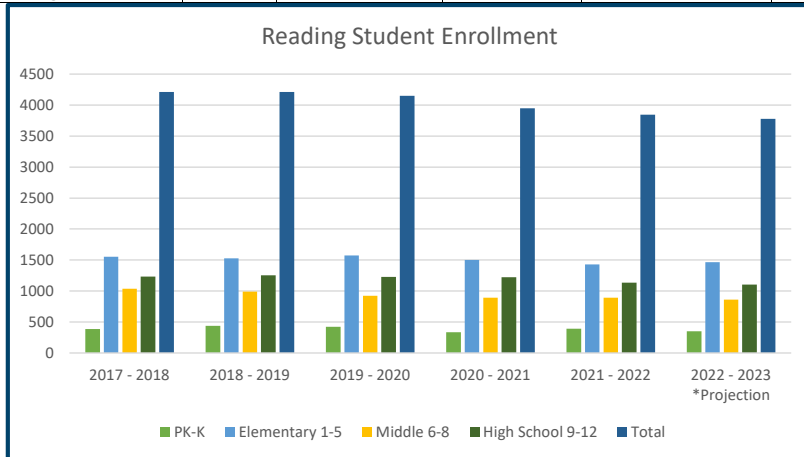
The 2018 HPP included projections on enrollment which were available at that time. Figure 2 provides six years of enrollment data which is the only data that is available for inclusion in the updated 2023 HPP.

Figure 2 illustrates public school enrollments from 2017 through 2023\* (\*projection for the current school year). Overall, Reading school enrollment numbers have remained somewhat stable in recent years with an overall decrease of 10.3% since 2017. Although total population projections predict a continuing decrease in school aged children by the year 2030, this age group will still comprise 22.2% of the total population.



**Figure 2: Reading Student Enrollment**

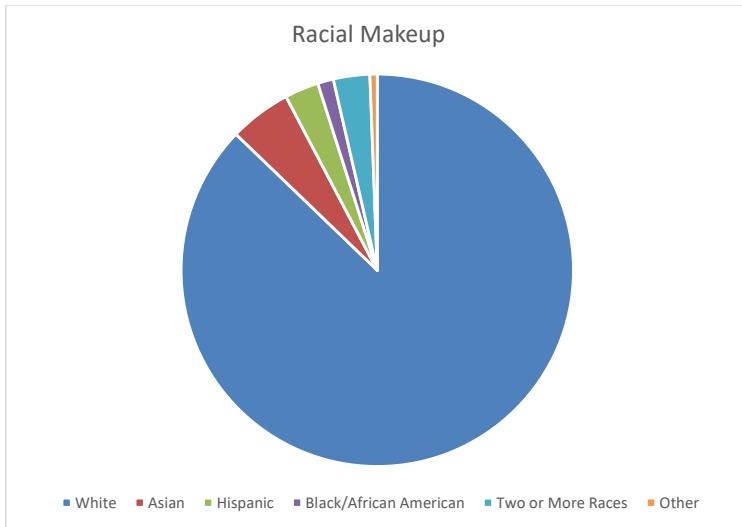
School Year	PK-K	Elementary 1-5	Middle 6-8	High School 9-12	Total
2017 - 2018	387	1,552	1,039	1,235	4213
2018 - 2019	440	1,529	990	1,251	4210
2019 - 2020	423	1,574	924	1,230	4151
2020 - 2021	335	1,500	894	1,222	3951
2021 - 2022	393	1,427	891	1,135	3846
2022 - 2023 *Projection	352	1,465	859	1,102	3778
% Change	-9%	-5.60%	-17.30%	-10.8%	



Source: Reading School Committee yearly School Budgets and FY 2022 School Budget  
 \*Reading School Department as of 8/16/2022

**4. Race and Ethnicity:**

- According to the 2020 U.S. Census, the majority of Reading residents are white (87.2%) and the largest racial minority group in Reading is the Asian population (5.1%) followed by the Hispanic or Latino population at 2.8%. Only 1.3% of the population identifies as Black or African American.
- 0.1% of the population are American Indian/Alaskan Native; .8% of the population identify as other; and 3.5% of the population identifies as Hispanic or Latino.



**5. Residents with Disabilities**

According to the 2014-2018 American Community Survey, 3,026 people in Reading reported living with a long duration condition or disability. Of those people, approximately 73.1% were aged 65 and older. As this population continues to increase, it is assumed that the number of disabled individuals within this age group will also rise. Many disabled residents require special housing needs, including certain accommodations for housing design (physical accessibility) and reasonable access to goods and services. Consideration for these types of housing options is necessary, as the demand will continue to increase.

**Table 5: Residents with Disabilities**

<b>Age</b>	<b>Number</b>	<b>Percent of All Disabled Residents</b>
5-17	350	11.6
18-64	464	15.3
65 +	2,212	73.1
Total Population of Disabled Residents	3,026	100

*Source: 2014-2018 American Community Survey*

## 6 Income Analysis:

### 1. Median Household Income:

In 2022 Reading's median household income of \$133,300 represented an increase of 42.4% from 2010. Median household income in Reading was one of the highest among adjacent neighboring communities and exceeded the median for the Boston-Cambridge-Quincy Metro area, as well as the median for the Commonwealth of Massachusetts and the US. All the adjacent neighboring communities also experienced significant increases in household income from 2010.

**Table 6: Median Household Income: 2010-2022**

Town	2010	2015	2022	% Increase 2010-2022
Reading	77,059	106,764	133,300	42.2%
North Reading	76,962	145,366	138,237	44.3%
Wilmington	70,652	116,155	114,394	38.3%
Woburn	54,897	78,242	97,895	43.9%
Stoneham	56,650	80,703	102,542	44.8%
Wakefield	66,117	85,097	107,898	38.7%
Lynnfield	80,626	120,680	143,661	43.9%
Boston-Cambridge-Quincy, MA Metro Area <sup>1</sup>	62,700	98,500	140,200	55.3%
Massachusetts	50,502	87,300	120,400	58.1%
US	41,994	56,516	67,521	37.8%

Source: 2020 US Census & 2014-2018 American Community Survey [FY 2022 Income Limits Documentation System -- Summary for Reading town, Massachusetts \(huduser.gov\)](#), Policy Map

### 2. Median Income of Senior Households:

Although Reading's overall population has experienced a large increase in income in the past 12 years and is earning in line with the surrounding communities (as displayed in Table 6 above), Reading's 65+ households are not doing nearly as well. Unfortunately, in 2022 we see that Reading's senior households have significantly lower incomes than households overall. As displayed in Table 7 below, Reading senior households earn less than all of the surrounding communities and just slightly more than Massachusetts and the country overall. In fact, households earning the median senior income of \$56,276 would qualify for certain affordable housing based on the income limit guidelines described in Section 4 below, "Area Median Income." This data makes clear that affordable housing for the senior population will be a significant need in the coming years due to the projected increase in the senior

population in Reading as demonstrated in Figure 1 and Table 3 above, and due to the limited income of this group.

**Table 7: Median Income of 65+ Households: 2020**

Town	2020
Reading	56,276
North Reading	66,321
Wilmington	69,825
Woburn	58,447
Wakefield	71,537
Lynnfield	70,859
Massachusetts	52,973
US	46,360

Source: 2020 Census

**3. Income Distribution:**

Table 8 identifies and compares the distribution of Reading household incomes from 2010 and 2020. In 2010, nearly half of all households (48.2%) earned less than the household median of \$77,059. In 2020, 41.2% of households earned less than the household median of \$133,300. Of the households earning over the median income in 2020, 64.2% of households had an income of over \$100,000 in 2020. Reading households earned much more in 2020. Approximately 46.5% earned more than \$150,000 which was over the 2020 median income of \$133,300. Of those earning more than \$100,000 approximately 29.7% are earning more than \$200,000, a 100.2% increase from 2010. By 2020, the number of households in the highest income brackets have increased, with those making between 150,000 - \$199,999 increasing by 17.7% since 2010. However, there have been significant decreases in the lower income brackets (\$15,000-\$24,999, \$25,000-\$34,999, and \$35,000-\$49,999) between 2010 and 2020. Approximately 1,520 Reading households (16.3% of all households) earned less than \$50,000 in 2020.

**Commented [MA4]:** I am a bit confused by this statement – do we mean they made \$100k over the median income? If they are over the median income of \$133,000 they would all be over \$100,000 in general, no?

**Table 8: Income Distribution: 2010, 2015, 2020**

Income Category	2010		2015		2020		% Change 2010-2020
	# of Households	Percent	# of Households	Percent	# of Households	Percent	
Less than \$10,000	231	2.4	218	2.4	67	.7	-71.0%
\$10,000 to \$14,999	251	2.8	224	2.4	30	.3	-88.0%
\$15,000 to \$24,999	386	4.3	446	4.9	369	4.1	-4.4%
\$25,000 to \$34,999	470	5.3	553	6.0	219	2.3	-53.4%
\$35,000 to \$49,999	620	7.0	623	6.8	835	8.9	-34.7%
\$50,000 to \$74,999	1,214	13.7	974	10.6	1039	11.1	-14.4%
\$75,000 to \$99,999	1,327	15.0	1,158	12.6	783	8.4	-41.0%
\$100,00 to \$149,999	2,158	24.3	2,250	24.5	1653	17.7	-27.6%
\$150,000 to \$199,999	1,086	12.2	1,345	14.7	1583	16.8	17.7%
\$200,000 or more	1,157	13.0	1,377	15.0	2757	29.7	100.2%
<b>Total Households</b>	<b>8,882</b>	<b>100.0</b>	<b>9,168</b>	<b>100.0</b>	<b>9,335</b>	<b>100.0</b>	

Source: 2020 and 2010 US Census, 2014-2018 American Community Survey

#### 4. Area Median Income

One way to determine the need for affordable housing is to evaluate the number of households that qualify as low/moderate income by the U.S. Department of Housing and Urban Development (HUD). The Area Median Income (AMI) is a number that is determined by the median family income of a Metropolitan Statistical Area (MSA) and thresholds established by HUD are a percentage of AMIs. Reading is included in the Boston-Cambridge-Quincy Metropolitan Fair Market Rent (FMR) area. FMRs are gross rent estimates that include the rent plus the cost of tenant-paid utilities<sup>2</sup>. Section 8 of the United States Housing Act of 1937 authorizes housing assistance to lower income families and the cost of rental homes are restricted by the FMR thresholds established by HUD.

<sup>2</sup> U.S. Department of Housing & Urban Development Office of Policy Development & Research July 2007 (rev.)

**Commented [MA5]:** Andrew and Nicole to review in more detail. It does use our incorrect total household number as well (not sure we can fix this though).

**Commented [NL6R5]:** There was no info on households earning over \$200K. We know from the survey results that there are quite a few households that earn above \$200K

**Commented [NL7R5]:** I was able to use Census data to come up with a number here.

Typically, thresholds are 80%, 50% and 30% of AMI and vary depending on the household size. HUD defines low/moderate income as follows:

- “low income” - households earning below 80% of AMI;
- “very low income” – households earning below 50% of AMI;
- “extremely low income” - households earning lower than 30% of AMI.

**Table 9: Income Limits by Household Size, Boston-Cambridge-Quincy, Reading:2022**

Income Limit Area	Median Income	Income Limit Category	1 Person	2 Person	3 Person	4 Person	5 Person	6 Person
Boston-Cambridge-Quincy Metropolitan MSA	\$140,200	Low (80%) Income Limit	\$78,300	\$89,500	\$100,700	\$111,850	\$120,800	\$129,750
		Very Low (50%) Income Limit	\$49,100	\$56,100	\$63,100	\$70,100	\$75,750	\$81,350
		Extremely Low (30%) Income Limit	\$29,450	\$33,650	\$37,850	\$42,050	\$45,450	\$48,800

Source: U.S. Department of Housing and Urban Development <http://www.huduser.org/portal/>

As shown in Table 9, the AMI for the Boston-Cambridge-Quincy FMR area, effective April 18, 2022, is \$140,200. Using this number, the income thresholds for various household sizes were determined. For a 3-person household, household incomes lower than \$37,850 are considered extremely low income, household incomes lower than \$63,100 are considered very low income, and household incomes lower than \$100,700 are considered low income. The Reading income category data presented in Table 8 is not available by household size, but assuming a 3-person household, as of the 2018 ACS, there were probably about 3,000, or almost one-third of households, that were likely eligible for subsidized housing according to HUD.

<sup>3</sup> AMI data for 2022 was used in this plan to compare to 2014-2018 ACS income data. AMI data for 2022 can be found at: [www.huduser.org/portaldatasets](http://www.huduser.org/portaldatasets)

## 7. Housing Stock Analysis

### 1. Housing Units and Types

The predominant housing type in Reading continues to be single-family homes. In 2015, there were approximately 9,653 total housing units, 70.7% of which were 1-unit, detached homes (single-family homes). Only 10.6% of housing structures contained 20 or more units; however, this type of housing was the second largest in Reading in 2015. Similarly, in 2020 single unit detached homes remained the predominant housing type, though the percentage of total homes dropped a bit. Meanwhile, the number of housing units in structures with 20 or more units dipped from 1,027 units (10.6% of total units) in 2015 to 1,007 units (10.5% of total units) in 2020.

**Table 10: Total Number of Housing Units by Structure: 2015 and 2020**

Housing Units Per Structure	2015		2020	
	Number	Percent	Number	Percent
1-unit, detached	6,827	70.7	7,217	72.5
1-unit, attached	395	4.1	248	2.5
2 units	535	5.5	341	3.4
3 or 4 units	192	2.0	279	2.8
5 to 9 units	280	2.9	290	2.9
10 to 19 units	397	4.1	350	3.5
20 or more units	1,027	10.6	1,227	12.4
Mobile Home	0	0	0	0
<b>Total</b>	<b>9,653</b>	<b>100.0</b>	<b>9,952</b>	<b>100.0</b>

*Source: 2020 US Census and 2014-2018 American Community Survey*



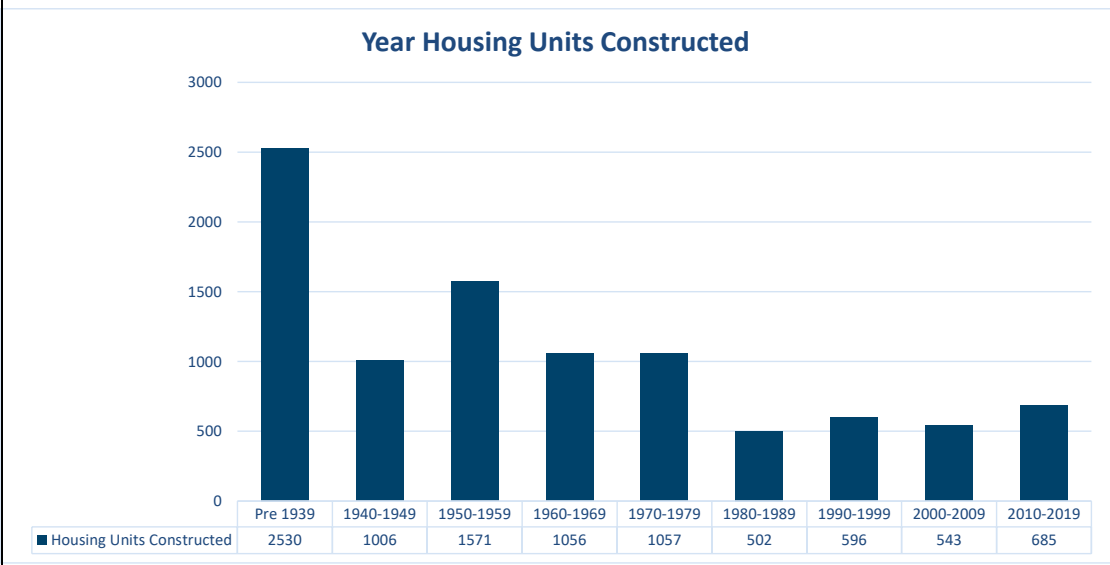
## 2. Housing Tenure

According to the 2020 US Census, there were a total of 9,584 occupied housing units, 84.6% of which were owner-occupied, and 15.4% of which were renter-occupied. By 2020, the percentage of owner-occupied housing units increased to 6.4% above the 2015 numbers, and the percentage of renter-occupied housing units have decreased by 6.4% to 15.4%. Section B of this HPP discusses household types and the prevalence of non-family households in Reading. In particular, ACS and 2020 Census data shows that non-family households, specifically elderly, non-family households are growing in number. The data also show that non-family households are more likely to be renters, so these demographic changes could provide some of the reason for the recent increase in renter-occupied units. The demand for rental housing is likely to continue increasing as the population continues aging and this aging population is likely to include many who are looking to down-size or spend less on housing related costs.

### 3. Year Housing Units Constructed

Reading has a large stock of older and historic homes. Over half of the housing units were constructed prior to 1960 and of that 33% were constructed prior to 1940. The production numbers have been on a steady decline since 1970, there was a small increase between 2000-2009 and have dipped again after the housing market crash of 2008. As these homes contribute to the town's character, many of them are also in need of repairs and renovations. Multi-generational living is now an easier option due to recently adopted zoning changes that facilitate creating accessory dwelling units in single-family homes.

Figure 3: Year Housing Constructed



Source: 2020 US Census

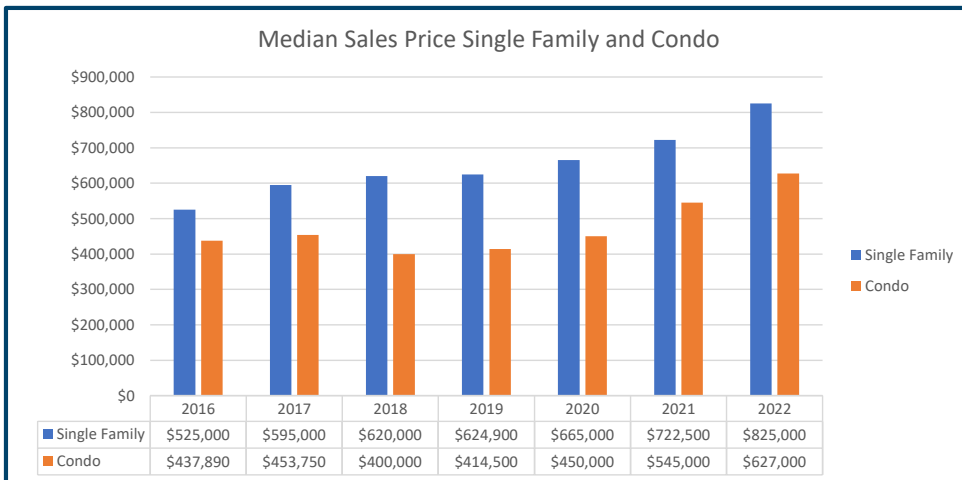
#### 4. Housing Market Conditions:

##### a. Median Selling Prices

Since 2012 Reading has seen a steady rise in sales prices. Figure 4 indicates the median single-family home price in 2016 was \$525,000. Prices have steadily increased year over year since 2016. In 2020 the median single-family sales price was \$665,000, in 2022 through August 31, the median sales price has skyrocketed to \$825,500.

Condominium sales followed a similar pattern with a few years of lower prices followed by a steady increase in prices beginning in 2012.

Figure 4: Median Sales Price of Single-family Homes and Condos 2016-2022

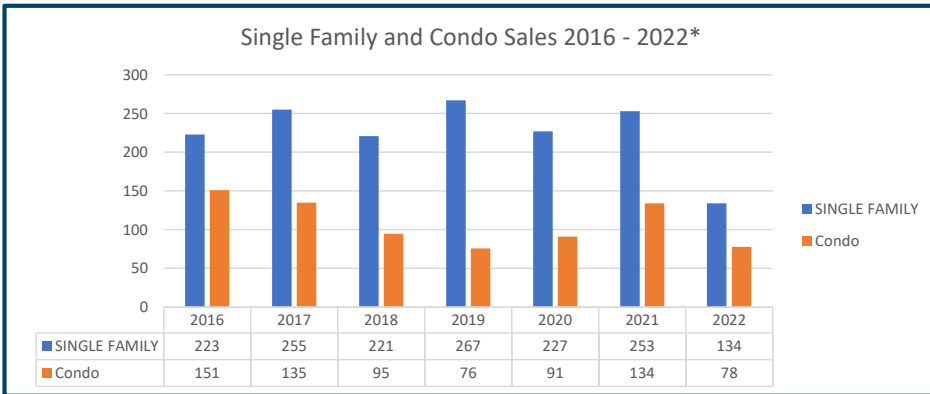


Source: Massachusetts Association of Realtors

**b. Home Sales**

As shown in Figure 5 below, Reading home sale numbers of both single-family homes and condominiums have held steady since 2016. Then, in 2018, the number of sales began to increase at the same time that prices began to increase. The number of condo sales have decreased consistently since 2016.

**Figure 5: Total Number of Single-family Home and Condo Sales 2016-2022\***



Source: Massachusetts Association of Realtors - \* Sales through August 2022

**c. Rental Prices:**

The cost of rental units is an important factor to consider when evaluating the housing market. Back in 2010 the median rent in Reading was \$1,032, the second lowest of all the neighboring communities that abut Reading. By 2020, median rent increased by 32.1% to \$1,363, the second highest increase amongst neighboring communities. One possible reason for the substantial rent increase may be due to the increase in the population group more likely to rent, creating more demand for rental units. High home prices may also force more households to rent. This trend is seen in the neighboring communities as well as all experienced substantial increases in median rent between 2010 and 2020.

**Table 11: Median Rent 2010, 2015, 2020 for Reading and Neighboring Communities**

Median Rent	2010	2015	2020	% Change, 2010 to 2020
Reading	1,032	1,282	1,363	32.1%
North Reading	1,289	1,482	1,696	24.0%
Wilmington	1,567	1,624	2,009	22.0%
Woburn	1,187	1,331	1,763	32.7%
Stoneham	1,161	1,289	1,522	23.7%
Wakefield	1,042	1,203	1,513	31.1%
Lynnfield	623	1,443	1,742	279.1%

Source: 2020 US Census, 2011-2015 and 2014-2018 American Community Survey

## 5. Housing Affordability Analysis:

### 1. Cost Burden

One way to evaluate housing affordability is to examine the ability of households to pay mortgage or rent as a percentage of annual income. Households who pay 30% or more of their annual income on housing costs are considered to be housing cost-burdened. Households who pay 50% or more of their income on housing costs are considered severely burdened. This analysis may help determine how “affordable” it is to live in a particular community.

The US Census Bureau prepares custom tabulations of American Community Survey (ACS) data that demonstrate the extent of housing problems and housing needs. These data tabs are known as the Comprehensive Housing Affordability Strategy or CHAS data. Table 13 below uses CHAS data to show housing cost burden for renters and homeowners. Approximately 22.5% of owner-occupied households, and 50.3% of renter households, in Reading are paying more than 30% or more of their annual household income on housing related costs. Therefore, a total of 2,510 of 9,335 households (26.9%) in Reading may have difficulty paying their housing-related costs and are considered moderately to severely housing cost-burdened.

**Commented [MA8]:**

<sup>5</sup> Costs for homes with a mortgage include all forms of debt including deeds of trust, land contracts, home equity loans, insurance, utilities, real estate taxes, etc. Source: US. Census

<sup>6</sup> Figures derived using a Mortgage Calculator, including a 5% down payment, 30-year fixed mortgage at 4.1% interest rate, and Reading's 2021 tax rate.

**Table 12: Monthly Housing Cost as a Percentage of Annual Household Income**

	Households in Reading	<= 30% of income spent on housing		>30% to <=50% of income spent on housing		>50% of income spent on housing	
		Number	Percent	Number	Percent	Number	Percent
Owners	7,560	5,830	77.1%	1,055	14.0%	675	8.5%
Renters	1,550	760	49.0%	385	24.8%	395	25.5%

Source: 2014-2018 CHAS data

CHAS data also shows how rent burden impacts households at different income levels. Table 13 below shows a greater percentage of low-income households are housing cost-burdened than higher income households. 3,065 of 6,070 (50.5%) households who earn less than 80% AMI are housing cost-burdened. However, in comparison 760 of 6,070 (12.5%) households who earn more than 100% AMI are housing cost-burdened. This indicates a need for more housing in Reading that is affordable to low-income households, so they do not experience such a substantial level of cost burden.

**Table 13: Housing Cost Burden According to Income Level**

Household Income Level	Spending >30% of income on housing costs	Spending >50% of income on housing costs	Total Households
<=30% AMI	670	535	1,260
>30% - <=50% AMI	630	275	905
>50% - <=80% AMI	410	155	900
>80% - <=100% AMI	270	25	655
>100% AMI	760	35	6,070
<b>Total</b>	<b>2,740</b>	<b>1,025</b>	<b>9,374</b>

Source: 2014-2018 CHAS data

## 2. Home Ownership Affordability – Gap Analysis

Another way to measure the affordability of a community is to assess the affordability of home ownership. To do so, the income of the buyer must be evaluated against the sales price of the home. The gap between the sales price and the purchasing ability of a potential home buyer is called the “gap analysis”.

As mentioned the median sales price of a single-family home in Reading in 2022 was \$825,500. A household would have to earn approximately \$199,500 to afford such a home without being cost burdened. This income is above Reading’s median household income of \$133,300 in 2020, and higher than the area median income (Boston-Cambridge) of \$140,200 by over \$59,000. A household looking to purchase a condo would still need to earn approximately \$135,000 to afford \$450,000 – the 2020 median sales price of a condo in Reading.

A household earning the 2020 median income of Reading of \$133,300 can afford a single-family home priced at about \$567,002, resulting in an “affordability gap” of \$258,498. The gap widens for low-income households. A 3-person household earning 80% of AMI or \$100,700 could afford a home costing no more than \$431,812. A 3-person household earning 50% of AMI at \$63,100 could afford a home costing no more than \$257,342. Table 15 shows the affordability gap in Reading for households at different income levels.

**Table 14: Gap Analysis – Single-Family Home**

Income Level	Income	Affordable Purchase Price	Estimated Affordable Monthly Payment	Gap +/- from Median Sales Price	2022 Median Sales Price	Monthly Mortgage Payment for Median Priced Home
Reading Median Income	\$133,300	\$567,002	\$3,018	\$258,498	\$825,500	\$4,242
Low Income (80 AMI%) (3-person HH)	\$100,700	\$431,812	\$2,378	\$393,688		
Very Low Income (50 AMI%) (3-person HH)	\$63,100	\$257,342	\$1,551	\$568,158		

**Affordable Purchase Price Calculation Assumptions**

- Interest Rate – 3.5%**
- Down payment – 3.5% down**
- Taxes - \$5,000**
- Debt - \$500 month**
- Insurance - \$2,000 year**

Income Level	Income	Affordable Purchase Price	Gap +/- from 2022 Median Sales Price
Median Income	\$133,300	\$567,002	\$258,498
Low Income (80%) (3-person HH)	\$100,700	\$431,812	\$393,688
Very Low Income (50%) (3-person HH)	\$63,100	\$257,342	\$568,158

Source for income limits: U.S. Department of Housing and Urban Development  
<http://www.huduser.org/portal/> Median Sales price used from 2022 MAR data - \$825,500

**3. Rent**

Another measure of housing affordability is whether local rent exceeds HUD-determined Fair Market Rents (FMR) which were established as guidelines for Section 8 voucher holders. HUD does not permit voucher holders to rent apartments above the FMR because HUD has determined the FMR to be a fair and reasonable price for the geographic area. Table 16 below identifies the FY22 FMRs for the Boston-Cambridge-Quincy, MA-NH HUD Metro FMR Area. As Table 11 above shows, the median rent paid by Reading households in 2020 as reported by the Census was \$1,363, indicating that households are paying less than the FMR for the Boston-Cambridge-Quincy area (assuming a 1-bedroom). However, the 2020 Census indicates that 44.2% of renters in Reading were paying \$1,500 or more in monthly rent, of that number 16.4% of renters were paying more than \$2,000 in monthly rent.



**Table 16: Fair Market Rents, Boston-Cambridge Quincy, MA-NH HUD Metro Area**

	Efficiency	1-Bedroom	2-Bedroom	3-Bedroom	4-Bedroom
Fair Market Rent 2018	\$1,253	\$1,421	\$1,740	\$2,182	\$2,370
Fair Market Rent 2023	\$2,025	\$2,198	\$2,635	\$3,207	\$3,540
% Change 2018 vs. 2023	61.6%	54.7%	51.4%	47%	49.4%

Source: U.S. Department of Housing and Urban Development, <http://www.huduser.org/portal/>

Since ACS data looks at all current renters, including some who may have been renting for a long time without a rent increase, they do not necessarily paint an accurate picture of the current rental market. An examination of rental listings on Trulia on August 31, 2022, gives a more accurate assessment. Based on these listings in Table 17 below, we can see that there is not much available rental housing – there were only 14 listings on Trulia on August 31<sup>st</sup>, 2022. In addition, the median rents of homes currently listed are slightly higher than the median rent reported by ACS, and also slightly higher than the HUD FMRs for 1, 2, and 3-bedroom units.

**Table 17 Reading Units listed for rent on Trulia.com, 8/31/2022**

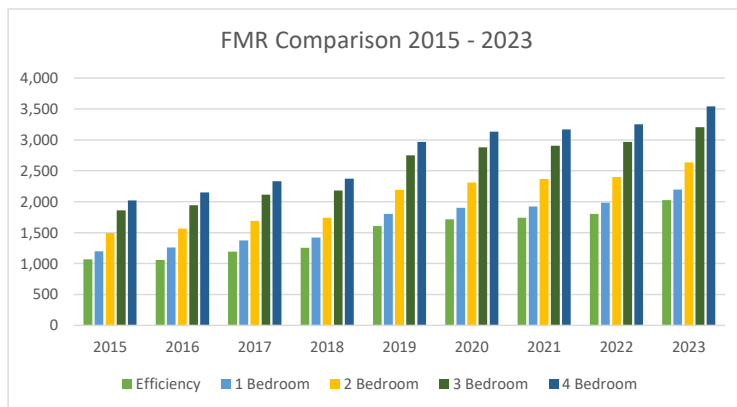
Bedroom size	Median Rent
1-bedroom units (1 listings)	\$2,667
2-bedroom units (7 listings)	\$3,300
3-bedroom units (6 listings)	\$4,000

Source: Trulia.com, August 31, 2022

Reading households would have to earn over \$78,000 to afford the 2022 FMR rent in Reading according to HUD. However, using the current rental listings from Trulia.com, a household would have to earn at least \$105,000 to afford a one-bedroom at the median price. Therefore, a 3-person low-income household earning \$100,700 would not even be able to afford a one-bedroom rental at the median price without cost burden based on the recent listings.

Another measure of housing affordability is whether local rent exceeds HUD-determined Fair Market Rents (FMR) that were established as guidelines for Section 8 voucher holders. HUD does not permit voucher holders to rent apartment units above the FMR because HUD has determined the FMR to be a fair and reasonable price for the geographic area. In Figure 7 below, the upward trend reflects the annual adjustment factor intended to account for rental housing market demands. Given the constraints on the Greater Boston rental housing market, rising FMR's are unsurprising and point to the need for more rental housing at multiple price points. Although HUD determines a certain level of rent in an area to be fair, FMR's do not take into account household income, so even an apartment at the FMR is not necessarily affordable to people at all levels of income.

**Figure 7: Fair Market Rent Comparison 2015-2023**



## 6. M.G.L. Chapter 40B Subsidized Housing Inventory

Under M.G.L. Chapter 40B, affordable housing units are defined as housing that is developed or operated by a public or private entity and reserved by deed restriction for income-eligible households earning at or below 80% of the AMI. In addition, all marketing and placement efforts follow Affirmative Fair Housing Marketing guidelines per the Massachusetts Department of Housing and Community Development (DHCD). Housing that meets these requirements, if approved by DHCD, is added to the subsidized housing inventory (SHI). Chapter 40B allows developers of low- and moderate-income housing to obtain a comprehensive permit to override local zoning and other restrictions if a community has less than 10% of its housing stock included on the SHI.

A municipality's SHI fluctuates with new development of both affordable and market-rate housing. The percentage is determined by dividing the number of affordable units by the total number of year-round housing units according to the most recent decennial Census. As the denominator increases, or if affordable units are lost, more affordable units must be produced to reach, maintain, or exceed the 10% threshold.

Within the past 5 years, Reading has continued to make progress with increasing the number of affordable units within the Town. According to the state's Subsidized Housing Inventory (SHI), approximately 10.5% of year-round housing units in Reading are included on the SHI as of December 2020.

Table 18 on the following page illustrates the status of subsidized housing in Reading from December 2017 to December 2021.

**Table 18: Reading SHI Units**

Time Period	Total SHI Units	Difference in Units from Previous Period	Percent Affordable
December 2017	896	112	12.39%
<del>December 2020</del> <u>May 2022</u>	1,011	115	10.16%

**Commented [MA9]:** We can change this to units added since 2017-18 only.

The XXX increase in units is comprised of:

- Reading Housing Authority Units -13 units (affordability period expired)

**Commented [NL10]:** Add table of new units sent by Julie

Table 19 compares the number of SHI units with neighboring communities that abut Reading.

As identified in the table, Reading has a percentage of affordable housing units that is higher than all but one neighboring community.

**Table 19: Total Subsidized Housing Units for Reading and Neighboring Communities**

Community	Year Around Housing Units 2020	Total Subsidized Housing Units			Percent SHI Units	
		Dec 2017	Dec 2020	Percent Change	Dec 2017	Dec 2020
Reading	9,952	896	1,004	12%	7.74%	10.5%
North Reading	5,875	540	538	-.37%	1.72%	9.2%
Saugus	11,303	732	756	3.28%	6.47%	6.7%
Wilmington	8,320	799	766	-4.13%	8.61%	9.2%
Woburn	17,540	1419	1,706	20.23%	9.72%	9.7%
Stoneham	10,159	495	498	.61%	5.35%	4.9%
Wakefield	11,305	758	703	-7.3%	7.35%	6.2%
Lynnfield	4,773	495	494	-2.0%	1.84%	10.3%

Source: 2020 Census, and Department of Housing and Community Development, Chapter 40B Subsidized Housing Inventory (SHI)

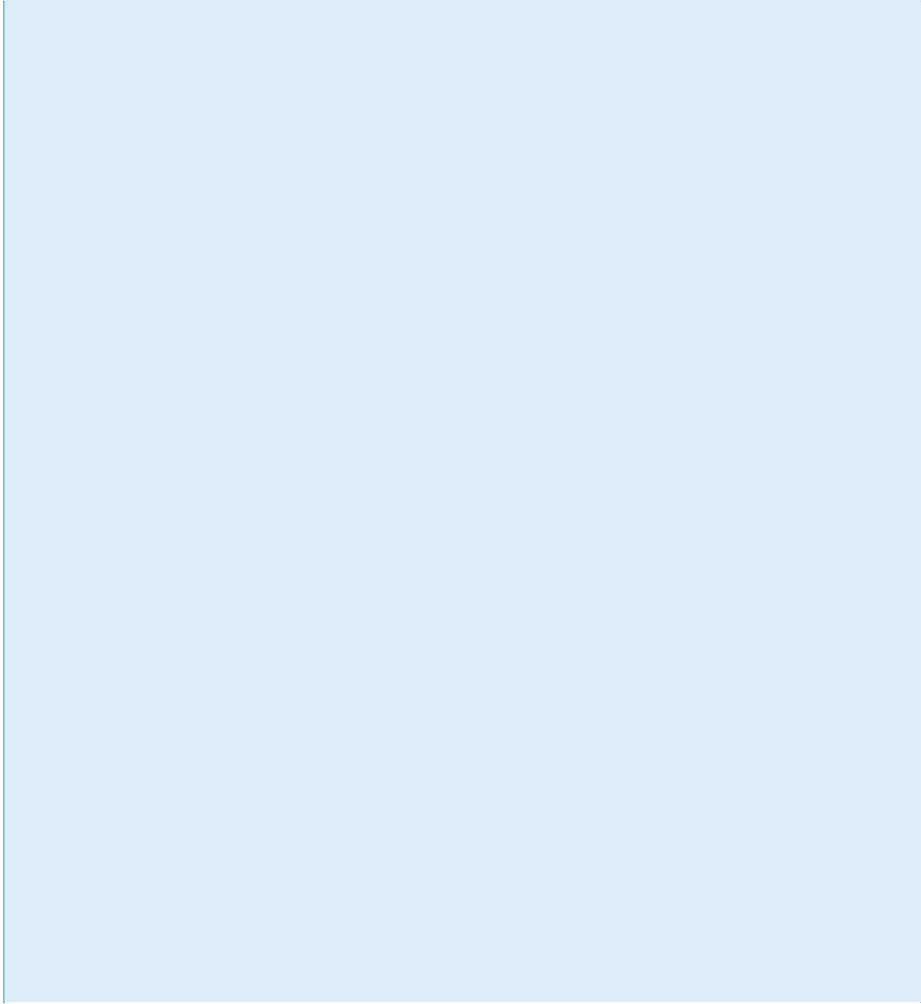
**5. Existing Subsidized Housing Stock**

Table 20 below identifies the existing subsidized housing units currently included on the SHI list (through December 2020). This information is regularly gathered and reported by the Department of Housing and Community Development (DHCD). The properties are listed by property type (not chronological).

**Table 20: Reading Subsidized Housing Inventory Properties**

**Commented [MA11]:** Will use 2022 local SHI inventory.

Development Name	SHI Units	Property Type	Subsidizing Agency	Zoning Permit	Affrd End
RHA: Senior housing	80	Age Restricted Rental	DHCD/PHA	Local	Perp
RHA: Family Scattered Site	12	Family Rental	DHCD/PHA	Local	Perp
RHA: Scattered Site	6	Family Rental	DHCD/PHA	40B	Perp
RHA: Pleasant Street	2	Family Rental	FHLBB	Local	2020
RHA: Wilson Street	2	Family Rental	FHLBB	Local	2021
EMARC Reading	12	Supportive Housing	HUD	Local	2036
Reading Community Residence	3	Supportive Housing	HUD	Local	2037
Hopkins Street Residence	4	Supportive Housing	HUD	Local	2042
DDS / DMH Group Homes	52	Supportive Housing	DDS	Local	NA
Cedar Glen	114	Age Restricted Rental	MassHousing	40B	Perp
Peter Sanborn Place	74	Age Restricted Rental	MassHousing	40B	Perp
Residences at Pearl	86	Assisted Living	MassHousing	Local	2046
Reading Commons (Archstone)	204	Family Rental	FHLBB	40B	Perp
Oaktree	11	Family Rental	DHCD/40R	40R	Perp
Reading Village	68	Family Rental	MassHousing	40B	Perp
Schoolhouse Commons	20	Family Rental	MHP	40B	Perp
20-24 Gould Street	55	Family Rental	DHCD/40R	40R	Perp
Sumner/Cheney	1	Ownership	FHLBB	40B	Perp
George Street	3	Ownership	MassHousing	40B	Perp
Maplewood Village	9	Ownership	DHCD/LIP	40B	2054
Governor's Drive	2	Ownership	DHCD/LIP	40B	2103
Johnson Woods	11	Ownership	DHCD/LIP	Local	Perp
Johnson Woods Phase II	19	Ownership	DHCD/LIP	Local	Perp
Reading Woods	43	Ownership	DHCD/40R	40R	Perp
Postmark Square	10	Ownership	DHCD/40R	40R	Perp
<b>TOTALS</b>	<b>896</b>				
Census 2010 Units	9.35%				



**Commented [NL12]:** Cross reference with Julie's list.

**Key to Subsidizing Agency:**

MHP – Massachusetts Housing Partnership

DHCD/PHA: Department of Housing and Community Development, Public Housing Authority

DHCD/LIP: Department of Housing and Community Development, Local Initiative Program

DHCD/40R: Department of Housing and Community Development, 40R  
DDS: Department of Developmental Services  
FHLBB: Federal Home Loan Bank of Boston  
HUD: Federal Housing and Urban Development Public Housing Authority

## **B. Affordable Housing Efforts**

Reading has pursued a proactive planning-based strategy in an effort to increase the supply of affordable housing and meet the 10% minimum statutory requirement. The Town has made strides towards meeting that goal through adopting zoning changes and utilizing current planning best practices. The Town's 2018 HPP created a roadmap to follow as the Town worked towards meeting its affordable housing goals.

**Safe Harbor** — As reported earlier, in 2020 the Town achieved a 10% stock on the Subsidized Housing Inventory (SHI), the inventory used by the Commonwealth of Massachusetts to monitor the affordable housing statutory requirements. As a result, the Town secured a safe harbor designation. The Town should continue to monitor units that may fall off of the SHI due to permitting timelines and if applicable re-seek Safe Harbor designation as needed.

## 1. Adoption of Smart Growth Districts (40R)

### ***Gateway Smart Growth District (GSGD)***

In December 2007, Reading adopted the Gateway Smart Growth District under MGL Chapter 40R and 760 CMR 59.05(4). The overlay district is located at the southern town line, near Interstate 95/Route 128 and Route 28 (Reading's Main Street). The 424 unit Reading Woods project is currently completed and fully occupied. The GSGD zone includes 200 of the 424 units. Of those 200 units, 43 are affordable and are included on the SHI. This site was formerly a commercial use owned by the Addison Wesley Corporation.



### ***Downtown Smart Growth District (DSGD)***

In November 2009, Reading adopted the Downtown Smart Growth District (DSGD) under MGL Chapter 40R and 760 CMR 59.05(4). This zoning change was also a response to the 2007 Housing Plan which identified downtown as an area for future housing opportunities. At that time, the DSGD overlay district did not encompass the downtown in its entirety and allowed for 203



additional housing units by right. The first project that was permitted and constructed within the DSGD was the Oaktree Development located at the former Atlantic Market site on Haven Street. This project is a mixed-use development with retail uses on the ground floor and 53 residential units above. At 53 units, this project exceeded the maximum density allowed, but was granted a waiver from the CPDC for a density of 73 units per acre. A total of 11 units are affordable and are listed on the SHI.

In September 2017, Postmark Square, an adaptive re-use of the historic Reading Post Office, received 40R Plan Review approval from the Reading Community Planning and Development Commission (CPDC). Postmark Square is a mixed-use project with 50 ownership residential units, 10 of which are affordable units.





***Expanded Downtown Smart Growth District (DSGD)***

In April of 2017, Town Meeting adopted and the AG’s office approved, an expansion of the DSGD to include approximately 21 additional acres, with a potential for 113 new by-right residential units. At this time Town Meeting also adopted, and the AG’s office approved, increasing the affordable housing requirement from 20% to 25% for rental projects within the DSGD. Pursuant to MGL Chapter 40B, the increase to 25% allows the Town to count all of the units in a rental project versus only the actual number of affordable units.

In November 2017, 20-24 Gould Street, a redevelopment of the former EMARC site received 40R Plan Review approval from the Reading Community Planning and Development Commission (CPDC). The mixed-use project includes 55 residential units, 14 of which are deed restricted affordable. As a rental project for which at least 25% of the units are affordable, all 55 units qualified for listing on the SHI.



Another mixed-use 40R redevelopment project was approved for the redevelopment of the former Sunoco station property along Main Street. This 31-unit rental project is currently fully occupied and as a rental project for which at least 25% of the units are affordable, the total number of units in the project will qualified for listing on the SHI.

In 2022 the CPDC approved a mixed-use, 29-rental unit development at the property 6-16 Chute Street. The development will include 8 deed restricted affordable units, though all 29 units will qualify for the SHI.

A number of additional 40R development projects have been approved, though they did not trigger the affordability threshold of 13 units or more. This includes the 3-unit townhouse development along Chapin Avenue; the 7-unit re-development of the Reading Chronicle building at 531 Main Street; and the 6-unit development at 18 Woburn Street.

***Planning Efforts***

**2016-2022 Economic Development Action Plan (EDAP)** - The EDAP recommendations include expanding housing and mixed use in identified Priority Development Area's across the Town. A key recommendation was to expand the DSGD and allow mixed-use development in areas around Town. A future plan update is under consideration. The 2015-2022 EDAP link can be found on the Town's Economic Development webpage at [readingma.gov](http://readingma.gov).

**Metro North Regional Housing Office (MNRHSO)** – In 2015, Reading established the MNRHSO comprised of the towns of Reading, North Reading, Wilmington, and Saugus. The City of Woburn joined the regional group in 2019. The MNRHSO now shares the expenses of a full-time housing consultant agency (Anser Adviosry, 2022) who monitors

existing affordable housing stock across the municipalities and provides expertise related to affordable housing development and needs. Massachusetts has only a handful of RHSO's and Reading is proud to have developed this for the Metro North region.

**Comprehensive Update/Accessory Apartments Update to the Reading Zoning Bylaw (ZBL)** – In 2014, the ZBL was updated to clarify, simplify, and modernize zoning for ease of use by developers. Some development of Accessory Apartments we made “by-right” if performance standards are met and if the unit is located in an existing single-family structure. A special permit is required for accessory apartments in detached structures or involving increases in gross floor area through new construction. Permitting checklists have been developed to further simplify the zoning.

**Mixed-use Bylaw addition to Reading ZBL** – In 2019 the Town proposed and adopted a Mixed-Use Bylaw for its Business-A Zoning District. The Mixed-Use Bylaw allows mixed-use development through a Special Permit granted by the CPDC and requires certain amounts of commercial floor area. Affordable dwellings units are required for projects 10-units and more at 10% of the total units and required for at least 80% AMI.

**40R Zoning Amendments to Reading ZBL** – In 2021-22 Town Meeting requested by Instructional Motion that the CPDC and Town Staff review the existing DSGD 40R Bylaw for improvement. Reading contracted with the Metro Area Planning Council (MAPC) to help lead public engagement around 40R and to learn what was working and what was not. Found desired improvements included requiring open space, additional design criteria, reduced density, setbacks and parking solutions. The CPDC proposed a series of holistic changes to address the needs and developed a ‘tiered schedule for density waiver requests’ – requiring certain improvements and amenities for higher density projects. The Bylaw amendments were approved at April 2022 Town Meeting.

## 2. Challenges and Constraints to the Development of Affordable Housing

### a. Existing Housing Allowances

The Reading Zoning Map illustrates residential uses taken from the Reading Zoning Bylaw effective as of November 2021. The tables below identify which types of residential and business uses are allowed in each zoning district. “YES” indicates uses allowed by right. “SPP” means the use requires a Special Permit from the Community Planning and Development Commission and “SPA” means the use requires a Special permit from the Zoning Board of Appeals. “No” denotes a use that is not allowed.

**Table 21: Uses for Residential Districts**

Principal Uses	RES S-15 S-20 S-40	RES A-40	RES A-80	PRD-G PRD-M	PUD-R
<b>Residential Uses</b>					
Single Family Dwelling	Yes	Yes	No	SPP	SPP
Two Family Dwelling	No (1)	Yes	No	SPP	SPP
Multi-Family Dwelling	No	Yes	Yes	SPP	SPP

Age Restricted Multi-Family Dwelling	No	SPP	SPP	SPP	SPP
Boarding House	No	Yes	No	No	No

**Table 22: Uses for Business and Industrial Districts**

Principal Uses	Bus A	Bus B	Bus C	IND	PUD-B Overlay	PUD-I Overlay
<b>Residential Uses</b>						
Single Family Dwelling	Yes	No	No	No	No	No
Two Family Dwelling	Yes	No	No	No	No	No
Multi-Family Dwelling	Yes	No	Yes (1)	No	No	No
Age Restricted Multi-Family Dwelling	No	No	Yes	No	No	No
Boarding House	No	No	No	No	No	No
<b>Other Uses</b>						
Mixed-Use	SPP	No	SPP	No	No	No

Source: Town of Reading Zoning By-Law, Tables 5.3.1 and 5.3.2, Table of Uses, September, 2017

Although Reading is primarily zoned for single family homes, other zoning districts including A-40, A-80 and Business A allow for other forms of residential development such as apartments or multi-unit homes. Additional zoning overlay districts such as PUD, PRD, and Smart-growth 40R also allowed for multi-family and/or mixed-use development. Table 23 below identifies the base and overlay zoning districts in Reading.

**Table 23: Reading Base Zoning Districts**

Zoning District	Short Name	Area (sq miles)	Acreage	Percent
Single Family 15 District	S-15	3.3	2,120.1	33.2%
Single Family 20 District	S-20	4.1	2,643.2	41.3%
Single Family 40 District	S-40	1.9	1,235.1	19.3%
Apartment 40 District	A-40	0.0	30.8	0.5%
Apartment 80 District	A-80	0.0	12.8	0.2%
Business A	BUS A	0.1	48.4	0.8%
Business B	BUS B	0.1	55.2	0.9%
Business C	BUS C	0.1	38.8	0.6%
Industrial	Ind	0.3	209.1	3.3%
	Totals	10.0	6393.4	100.0%

Source: Town of Reading Zoning By-Law, April 2017

In addition to the base zoning districts, Reading has several overlay districts. Table 24 on the following page is a comprehensive list of all the zoning districts, including overlays within the Town of Reading.

**Table 24: Town of Reading Zoning and Overlay Districts**

Type	Full Name	Short Name
Residence	Single Family 15 District	S-15
Residence	Single Family 20 District	S-20
Residence	Single Family 40 District	S-40
Residence	Apartment 40 District	A-40
Residence	Apartment 80 District	A-80
Business	Business A District	Bus. A
Business	Business B District	Bus. B
Business	Business C District	Bus. C
Industrial	Industrial	Ind.
Overlay	Aquifer Protection District	AQ
Overlay	Municipal Building Reuse	MR
Overlay	Planned Residential Development General	PRD-G
Overlay	Planned Residential Development Municipal	PRD-M
Overlay	Planned Unit Development Business	PUD-B
Overlay	Planned Unit Development Industrial	PUD-I
Overlay	Planned Unit Development Residential	PUD-R
Overlay	Gateway Smart Growth District	GSGD
Overlay	Downtown Smart Growth District	DSGD
Overlay	Planned Unit Development - Residential Corona	PUD-R-C
Overlay	National Flood Insurance Flood Management Dist.	NF
Overlay	Flood Plain District	F

Source: Town of Reading Zoning By-Law, April 2022

**b. Development Capacity and Constraints:**

Residential development is constrained by many factors including availability of land, land use regulations, natural resources such as wetlands and threatened and endangered species, and limitations on infrastructure capacity. In order to evaluate the potential development capacity, the availability of land must be evaluated against potential development constraints.

**Available Land:** The Town of Reading is approximately 10 square miles in size and contains 6,388 acres of land. Using a GIS analysis it was estimated that 1,756 acres (27.5%) of land in Reading is undeveloped or Chapter 61 Land. Of that, 372 acres are potentially developable, and only 139 acres of developable land remain after regulatory constraints<sup>7</sup> are applied. This results in approximately 262 buildable lots based on the minimum lot size of 15,000 square feet required in the S-15 residential zoning district. However, this build-out is for

undeveloped land and does not take into account previously developed land that could be subdivided to yield more homes. Using the same GIS analysis and regulatory constraints, it is estimated that a potential of 513 new homes could be built on currently developed land.

However, the actual number is likely to be significantly less when taking into account infrastructure costs, lot shape, or other geological conditions, as well as particular zoning district (specifically S-20 or S-40).

As identified above, Reading has several overlay districts. Overlay districts are zoning districts which may be placed over the underlying districts. The provisions for the overlay district may be more stringent or flexible based on the purpose of the particular overlay. The following are overlay districts that relate to housing development and the provision of affordable housing in Reading. Some of the overlays allow for other forms of development, increased density in development, and may have requirements for affordable housing.

***Planned Unit Development – Residential***

Denoted as PUD-R this overlay district allows, by a Special Permit from the CPDC, single family, two family, apartments, elderly housing, among other uses. At least ten percent of all residential units in the PUD-R must be affordable. The affordable percentage requirement increases to 15% for property within 300-feet of a municipal boundary. It should also be noted that the Planned Unit Development – Industrial (PUD-I) overlay district also allows residential development when the proposed development is within 200-feet of another residential district.

***Planned Residential Development (PRD)***

A PRD district is an overlay zoning district which may be applied to parcels within the S-15, S-20, S-40 and A-80 residential zoning districts and must be approved through Town Meeting. Upon approval of the overlay, the CPDC may issue a Special Permit for residential development. In Reading, there are two types of PRD districts; General (PRD-G) and Municipal (PRD-M). The PRD-G requires a minimum lot size of 60,000 square feet and encourages affordable unit development. PRD-M development is allowed on current or former municipally-owned land of at least eight acres and requires a certain percentage of affordable units.

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<sup>7</sup> Only residentially-zoned parcels were included in the analysis. Constraints include FEMA 100 year flood zones, 100' buffers around wetlands, streams, and vernal pools, and 200' buffers around perennial streams. Aquifer protection district and slope were not included as constraints. Infrastructure needs were not considered in calculating potential lots.

**Municipal Building Reuse District**

The Municipal Building Reuse District is an overlay district that allows for the redevelopment or reuse of surplus municipal buildings. At least ten percent of the residential units must be affordable.

**Smart Growth Districts (40R)**

Reading has adopted two Smart Growth 40R Districts. The Downtown Smart Growth (DSGD) District is an overlay district that allows for mixed-use or multi-family residential within the downtown area via plan approval by the Community Planning and Development Commission. This overlay district requires a minimum of 20% affordable units (homeownership projects) and a minimum of 25% affordable units if the development is rental or limited to occupancy by elderly residents. As described above the DSGD has seen a number of success in revitalizing the downtown area with both new commercial space and residential growth.

The Gateway Smart Growth District (GSGD) is also an overlay district located at the intersection of Route 28 (Main Street) and Interstate 128/95. This district is fully developed with one 424-unit project (200 of the units are technically within the GSGD) and includes 43 affordable units (10%).

**Natural Resource Limitations:** Wetlands and other natural resources such as endangered species habitats can place constraints on development. As mentioned above, many lots are considered unbuildable due to the presence of some of these resources. Almost one-fourth of the land in Reading is considered wetland or within the jurisdictional buffer zones of resource areas. Another 6% of land is within the 100-year flood zone. Reading is located within the Aberjona, Ipswich and Saugus river watersheds and many of Reading’s wetland areas are located in associated floodplains.

**Rare and Endangered Species:** There are three areas in Reading which contain rare or endangered species. These areas are protected under the Massachusetts Endangered Species Act and the Massachusetts Wetlands Protection Act. Any development within these areas is subject to review by the Massachusetts Natural Heritage and Endangered Species Program (NHESP). The three areas of designation include a large tract of land within the western side of the Town Forest and two separate tracts of land within the Cedar Swamp near the Burbank Ice Arena located on the eastern side of the town.

Commented [MA13]: Nicole to add map.



### c. Infrastructure

Commented [MA14]: Confirming this language with Engineering Dpt.

**Public Water:** The Town of Reading's water distribution system is comprised of 110 miles of distribution main, 2 water booster stations and 2 storage facilities; one 0.75 M gallon elevated tank located at Auburn Street and one 1.0 M gallon standpipe located at Bear Hill. Since 2006 Reading purchases all of its drinking water from the Massachusetts Water Resource Authority (MWRA) which is supplied into the Town's distribution system via a 20" water main located on Border Road. Construction of a second 36" redundant supply pipe line was completed by the MWRA which provides a second supply source to the Town's distribution system at Leech Park on Hopkins Street. The Town also has 5 emergency water connections with 3 of the bordering communities.

Prior to purchasing water from the MWRA, Reading operated a water treatment plant adjacent to the Town Forest which drew water from nine wells within the Town Forest and Revay Swamp, all contained within the Ipswich River Watershed. Following the temporary closure of wells as a precautionary measure to avoid contamination from an overturned petroleum vehicle on Rte. 93 and to aid in relieving stress to the Ipswich River aquifer, the Town decommissioned the treatment plant in 2006 and began purchasing 100% of the Town's drinking water from the MWRA. Reading continues to maintain the wells as a backup water supply until the redundant MWRA water supply source is on-line.

Reading has established a strong water conservation program offering residents rebates for the installation of low flow fixtures and appliances, irrigation sensors and rain barrels. The program has been extremely successful and has lowered water consumption by 10% over a 10-year period. In 2016 the average daily water consumption equaled 1.7 MGD with a maximum daily demand of 2.2MGD.

All water purchased from the MWRA is metered at the supply mains through meters owned by the MWRA and the Town of Reading. Residential and Commercial meter reading is modern and efficient, with an automatic system that uses radio transmitters for optimal accuracy and efficiency. Water rate changes are established by the Board of Selectmen based on recommendations from staff.

Reading's water distribution system is maintained on a GIS mapping and database system. The operation of the water system is overseen by the Department of Public Works, and is on an enterprise basis, through which the full costs of operations are borne by the water users, and not paid for by local property taxes. Water supply is considered adequate for any new development, and it no longer impacts the Ipswich River resource.

**Public Sewer:** The sewer system is owned and operated by the Town and serves approximately 98% of all properties within the Town. While 149 individual properties throughout the Town are not yet connected to available public sewer, the only major unsewered areas are portions of Main Street north of Mill Street, and the westerly portion of Longwood Road. The system consists of 107 miles of sewer main, 12 wastewater pump or lift stations, and approximately 7,800 local service connections.

All sewage from the Town's system discharges into the MWRA's regional collection system through 2 major outfalls; one along Rte. 93 in the west adjacent to Arnold Avenue, and one at the end of Summer Avenue in the south. An isolated collection system servicing Border Road and a small portion of the West Street area discharges into the regional sewerage system via the City of Woburn. The regional sewerage system is operated by the MWRA, with principal treatment at Deer Island facility.

Water usage meters measure outfall flows and discharges. Sewer rate changes are established by the Board of Selectmen based on recommendations from staff. The Town's connection policy requires all new development to tie into the public sewer system and requires conversion to public sewer when residential septic systems fail. In addition, the Town sewer connection policy requires that all new developments perform system Inflow/Infiltration improvements or that equivalent contributions of twice the new flow multiplied by \$4.00 are made to the Town.

Reading's sewer system is maintained on a GIS mapping and database system. The operation of the sewer system is overseen by the Department of Public Works, and is on an enterprise basis, through which the full costs of operations are borne by the sewer users, and not paid for by local property taxes.

**Stormwater System:** Reading is located in the upper reaches of three (3) separate drainage basins; the Ipswich River basin to the north, Saugus River basin to the southeast, and Aberjona River basin to the southwest. All stormwater is collected through a series of approximately 3,400 catch basins, 80 miles of piped system, numerous open water bodies and 450 outfalls. The GIS mapping of the stormwater system was updated in 2016.

The town has evaluated problematic areas of the Aberjona and Saugus River basins and has developed a capital plan for the improvements. The system is operated and maintained by the Department of Public Works and is funded partially through local property taxes and the balance through enterprise funds. Following the authorization of the MS4 permit program by the EPA in 2003, the Town established a stormwater

enterprise in 2006 to fund the additional operation and maintenance of the stormwater system mandated by the MS4 permit. The enterprise funding is apportioned based on the extent of impervious area within the parcel.

Through the policies established under the Town's MS4 permit program, all new developments are required to install and maintain stormwater management systems. Each system must include a long-term operation and maintenance plan which includes annual reporting to the Town.

**Roadway Network:** Reading contains approximately 102 miles of streets and roads, however, the Town only maintains approximately 92.7 miles. The remainder of roadways not maintained by the Town are state-owned or privately-owned roadways. The Town is bordered by Interstate Highway 95 (also known as state Route 128) on the south and southeast, and Interstate Highway 93 on the west.

Reading's roadway system consists of several arterial, collector and local roadways. Arterial streets, carrying large traffic volumes and serving as principal local routes as well as regional routes, include: Main Street (Route 28), and Salem Street and Lowell Street (Route 129). These three main arterials intersect at the Common in the middle of Town, and are lined almost uninterruptedly with commercial and densely developed residential uses.

Minor arterial streets include: Haverhill Street (residential), Walkers Brook Drive (commercial and industrial), Washington Street (residential), Woburn Street (commercial through Downtown and otherwise residential) and West Street (almost entirely residential).

Collector streets, serving traffic from neighborhood streets and feeding into the arterial streets in Town, include: Franklin Street, Grove Street, Forest Street, Charles Street, Washington Street, High Street, Summer Avenue, South Street, Hopkins Street, and Willow Street.

Since 2000, Reading has utilized a computerized pavement management system to assist in developing a roadway capital improvement plan. In 2011 the system was converted to a GIS based management system. The system enables the Town to reliably develop cost effective roadway maintenance plans. Based on roadway inspections, each roadway is given a pavement condition index (PCI) that is used to identify the overall condition of the roadways. PCI values range from 0 to 100 and the 2016 average PCI of all roadways was 77. Every 3-4 years, each roadway is physically inspected to update the database for pavement distresses factors, which are used to determine pavement longevity in the program. Through the use of the computerized program, state Chapter 90 roadway funds and the general operating funds (which is a result of a proposition 2 ½ override), the Town's planned annual expenditure of roadway maintenance will insure an overall

increase in the roadways PCI value for the next 10 to 15 years.

**Commuter Rail:** Reading is served by the Massachusetts Bay Transportation Authority (MBTA) Commuter Rail system. The current MBTA schedule has 19 commuter rail trains each weekday inbound to North Station in downtown Boston. A total of 23 commuter trains travel outbound to Reading each weekday from North Station and of those 13 continue on to the final destination of Haverhill. The Reading train station is located in the heart of downtown at the “Depot”. There is a mix of MBTA/Town parking available at the Depot. The 113 MBTA-owned spaces are available for a rate of \$6.00/weekday, \$2.00/weekend day or \$105 for a monthly pass. There are also several Town-owned parking spaces limited to resident permit only from 6:00AM-9:30AM, for an annual fee of \$150. The town-owned spaces are unregulated after 9:30AM and open to any user.

The most current ridership data available is contained in the MBTA “Blue Book” dated July, 2014. The 2014 Blue Book statistics show a typical weekday station boarding (inbound) at Reading station as of April, 2013 was 799 commuters. The average boarding count for the period 2007 – 2013 for Reading Station (inbound) was 834 with a high of 1010 in 2011 and a low of 444 in 2012. The 2009 ridership in Reading was higher than any other station on the Haverhill/Reading MBTA line. Lawrence had the second highest ridership at 722.

**Bus Service:** The MBTA operates one bus route from Reading to the Malden Center Orange Line subway station through Bus 137. Bus 137 travels from the Reading Depot, continues along Woburn Street and Salem Street where it then travels south through Wakefield and continues south through Melrose on Main Street and terminates at the Malden Center subway station. The entire route from Reading to Malden takes approximately 40-45 minutes.

**Electrical – Reading Municipal Light Department (RMLD):** In 1891, the Massachusetts Legislature passed a law enabling cities and towns to operate their own gas and electric plants. Following several years of study and Special Town Meetings, Reading began producing electricity for 47 streetlights and 1,000 incandescent lamps on September 26, 1895. Special legislation was enacted on April 8, 1908 authorizing the Town of Reading to sell and distribute electricity to Lynnfield, North Reading and Wilmington. As a result, RMLD began delivering power to Lynnfield Center on December 10, 1909; to North Reading in 1910 and to Wilmington in 1912.

There have been decades of advancement and achievement since those early days of electricity, but some things have remained constant. After more than 125 years, RMLD is still committed to reliable service at competitive rates, but maintaining that commitment requires astute planning, innovative ideas and close attention to detail.

The Gaw substation on Causeway Road in Reading was constructed in 1969-1970 allowing RMLD to connect to the grid and purchase power from almost anywhere on the northeast power pool. In June 2000, construction was completed on a distribution substation connected to 115,000-volt transmission lines in North Reading in order to accommodate

growth and enhance the entire system's efficiency and reliability. To ensure reliability, RMLD has an ongoing preventative maintenance program aimed at solving problems before they occur.

Today, RMLD serves more than 70,000 customers in its four-town service area. A professional staff of 75+ employees bring a broad scope of utility experience to RMLD's daily operation, including an up-to-date understanding of the evolving energy market. With its peak demand for electricity at more than 156 megawatts, RMLD purchases electricity from a number of different sources through long-and-short-term contracts. Recent technological advances at RMLD include a fiber optic cable network that links all substations for state-of-the-art system monitoring and control. Computer systems are also state-of-the-art, and now include a sophisticated website. Meter reading is modern and efficient, with an automatic system that uses radio transmitters for optimal accuracy and efficiency.

RMLD supports in-lieu-of-tax payments, community development and energy education programs. This includes energy efficiency programs, energy conservation programs, school safety projects, school-to-work partnerships, outreach to senior groups, community support, and active memberships in local civic groups.

**Infrastructure Capacity for Planned Production:** Reading's overall infrastructure contains adequate capacity and capital facilities for existing build out and anticipated future development. The Town also periodically reviews and assesses its 10-year Capital Plan to ensure that infrastructure will be maintained and sustained for projected growth. The Town expects to continue the policy and practice of requiring mitigation from developers, financial or otherwise, for the impacts of their proposed projects, including infrastructure improvements. Therefore, as needs are identified through staff level and consultant review of individual permitting applications, the Town expects to require - as conditions for approval - adequate improvements and upgrades to systems, resources and capacity to allow for development under this Housing Production Plan, while protecting and enhancing natural, cultural and historical assets consistent with the 2005 Master Plan.

## Section 2: Affordable Housing Goals and Strategies

The housing goals and strategies included in this section are aimed primarily at creating more housing choice and affordable housing in Reading. The goals and their related strategies also support the Town's ability to achieve other interrelated community goals, including goals for economic development as well as protecting quality of life and community character.

### ***Housing Goals and Strategies***

In reviewing the previous Reading Housing Plan of 2018, other Reading related documents, analyzing the current housing situation in Reading, and in discussing housing issues with town citizens and officials, the Town has identified three priority areas to establish overarching goals that are the most appropriate and most realistic for the community. Each of the three priority areas includes a series of strategies to help achieve the vision. The goals and strategies are listed immediately below and discussed in more detail on the following pages.

### **1. Development and Regulatory**

#### **Goals**

- a) Increase, diversify and promote a mix of housing options in Reading for low- to middle-income households.
- b) Create and maintain housing that is available and accessible to aging and disabled populations. Support housing development needs for most vulnerable residents.
- c) Proactively plan for and manage the integration of housing growth to mitigate impacts and enhance the existing residential character of the Town.
- d) Provide equitable access to housing opportunities, public spaces, green spaces and healthy/safe environments.
- e) Maintain Reading's Safe Harbor designation by retaining pace of Affordable Housing development in order to remain above 10% on Subsidized Housing Inventory.

#### **Strategies**

- 1) Adopt/Amend zoning that would comply with MBTA Communities legislation
- 2) Identify Zoning Districts/Geographies in which current regulations can be modified to allow the development of SHI eligible housing units (including previously identified Priority Development Areas)
- 3) Strengthen and expand Inclusionary Zoning to further promote/develop affordable housing opportunities
- 4) Amend Zoning Bylaw to define and expressly permit Congregate Housing. Identify

- sites with the potential to convert to congregate housing use.
- 5) Allow for redevelopment or conversion of pre-existing non-conforming residential uses by-right and/or make the permitting path for such easier
  - 6) Consider zoning amendments to allow Accessory Dwelling Units (ADUs) by-right and/or lessen restrictions on such
  - 7) Require installation of Open Space in a flexible manner on new multi-family developments. Require installation or improvements of sidewalks, bike paths, trails/connections, and/or transit-oriented development for multi-family and mixed-use developments
  - 8) Ensure future Net Zero and energy efficiency requirements are met in new development that provide cost savings to the end user (residents)
  - 9) Preserve existing affordable housing stock to ensure they remain affordable and continue to qualify for SHI
  - 10) Maintain Safe Harbor designation by maintaining, tracking and continuing to add affordable developments to SHI

## 2. Funding and Resources

### Goals

- a) Support vulnerable, low- and middle-income populations through programming and services.
- b) Ensure appropriate maintenance and upkeep of existing affordable housing stock. Continue to look for opportunities to increase affordable units within existing properties.
- c) Maintain and see national/state/local designations that provide grant and financial opportunities to develop/maintain/support affordable housing development and residents.
- d) Ensure equitable access to financial/support services and programming.

### Strategies

- 1)

## 3. Partnerships, Education and Leadership

### Goals

- a) Initiate and strengthen local and regional relationships. Work in cooperation and collaborate with community partners/organizations to promote enhanced understanding of housing needs and support for creation of housing development.
- b) Increase capacity to produce housing through leadership developments, advocacy, staffing, funding, established goals and diverse relationships. Provide education and support to local staff, boards/commissions and public.
- c) Ensure access, support, outreach and inclusion to social and vulnerable populations across the Town and region.

**Commented [MA15]:** We should also include language to partner to raise awareness of programming and services available.

## **Strategies**



### **Housing Strategies**

This section includes descriptions of local regulatory strategies, local initiative strategies and an action plan, all of which are intended to assist the Town of Reading in meeting its affordable housing goals above.

### **Reaching and Maintaining 10%**

The Housing Production Plan guidelines require that the HPP set an annual goal for housing production, pursuant to which there is an increase in the municipality's number of SHI Eligible Housing units by at least 0.50% of its total units during every calendar year included in the HPP, until the overall percentage exceeds the 10% Statutory Minimum.

There should be a direct link between the setting of these goals and the results of the needs assessment. The numerical goal should be based on the total year-round number of housing

units. The total year-round housing units is the total number of units for the community in the latest U.S. Census including any changes due to demolition or new construction.

The Table below projects the Town of Reading SHI. Note that the unit counts for projects on the first three lines are forecast. The denominator of Year-round housing units will be updated by the Census and then reported by DHCD in 2023. These projections are not included in this update, but will be included in the future updates.

	FY18	FY19	FY20	FY21	FY22	FY23
Johnson Woods			7			
Eaton Lakeview 40B				120		
467 Main Street 40R			31			
SHI Units Created	896	0	38	120	0	0
Cumulative SHI Units	896	896	934	1054	1054	1054
Year Round Units (2010 Census)	9584	9584	9952	9952	9952	9952
SHI %	9.35%	9.35%	9.75%	11.00%	11.00%	11.00%
10% Requirement	958.40	958.40	958.40	958.40	958.40	958.40
+/- 10%	-62.4	-62.4	-24.4	95.6	95.6	95.6

### ***Development and Regulatory Strategies***

Regulatory strategies refer to recommendations that entail amendments to local zoning bylaws or other local development regulations to help encourage development of more housing options including affordable housing.

<sup>8</sup> More information about MassHousing’s Housing Production Program: [www.masshousing.com/portal/server.pt/community/planning\\_\\_\\_programs/207/planning\\_for\\_housing\\_production](http://www.masshousing.com/portal/server.pt/community/planning___programs/207/planning_for_housing_production)

### **Strategy 1: Adopt/Amend Zoning to comply with MBTA Communities legislation**

MBTA Communities legislation is the requirement codified as Section 3A of Massachusetts General Law (MGL) Ch. 40A. The law requires designated MBTA Communities to have at least one zoning district of reasonable size in which multi-family housing is permitted as of right and meets other criteria set forth in the statute, including but not limited to: a minimum gross density of 15 units per acre, locations not more than 0.5miles from a MBTA station, no age restrictions and zoning suitable for families with children.

On August 10, 2022 DHCD issued the final guidelines to determine if an MBTA Community is in compliance with the Section 3A language. In total, 175 MBTA Communities are subject to the new requirements. More information and resources are available at the State [webpage](#).

Locally, Reading is designated as a Commuter Rail Community. Based on its designation (and other local factors) the Town must zone to allow the Unit Capacity of 1,493 multi-family units across a Reasonable District Size of 43 acres of area. It also requires that 40% of the Unit Capacity and District Area be located within 0.5miles of the local Reading Train Depot (598 units and 17.3 acres respectively).

There are potentially many paths to compliance with the legislation but new zoning adoption or amendment of existing zoning districts will be needed, that much is certain. Reading will have until December 31, 2024 to comply with the requirements or it may face impacts to funding as described in Section 3A.

The Town should engage its leaders and community as a whole to determine a method of compliance that addresses and meets the local need without dramatically changing the existing character of the community. Technical Assistance should be sought and steps to achieve compliance be planned. Compliance would help address shortfalls identified in this HPP update and identified for the region.

### **Strategy 2: Identify Zoning Districts/Geographies in which current regulations can be modified to allow the development of SHI eligible housing units, including previously identified Priority Development Area's (PDA's).**

As part of the Reading Economic Development Action Plan 2016- 2022 (EDA Plan), the town identified four regionally-significant Priority Development Areas (PDAs). As described in the EDA Plan, redevelopment in these PDAs will help meet projected

**Commented [MA16]:** <https://www.mass.gov/info-details/multi-family-zoning-requirement-for-mbta-communities>

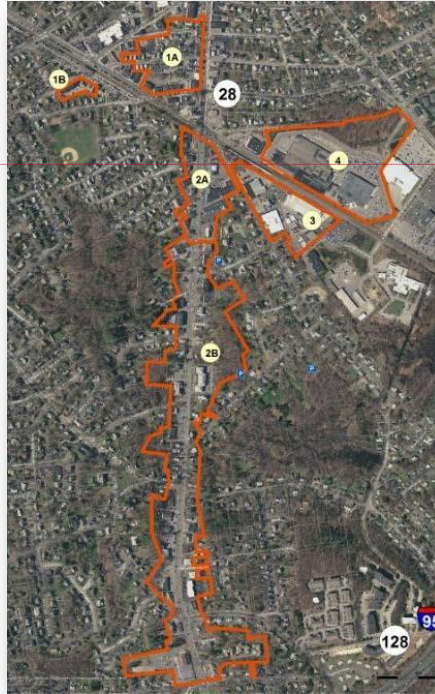
**Redevelopment in the PDAs could generate ~410 new housing units, capturing 43% of town-wide housing demand.**

regional demands for housing and commercial uses and strengthen existing places by improving the mix of development types in areas

where development already exists. The PDAs are sited in areas defined as having major growth potential and near existing transportation resources including public transit, bike, and trail facilities, thus contributing to the creation of more walkable communities.

The four PDAs are described below, as excerpted from the EDA Plan (page 6):

**PDA #1 - Downtown Reading.** PDA #1 is a nine-acre area consisting of 46 parcels – the Town’s 40R Smart Growth Overlay District was expanded to include a portion of this area (PDA #1A) in April 2017. PDA #1A is bounded by Haven Street, Main Street, Washington Street, and High Street and includes mixed use, commercial, and residential development. Since the EDAP was adopted in 2015 the Ace Flats 40R (24 Gould Street), located in PDA #1A, has reached completion. PDA #1B is adjacent to the Commuter Rail and is bounded by Lincoln and Prescott streets and includes commercial and residential development – this property is the location of an approved and completed Comprehensive Permit project – The Metropolitan at Reading Village.



Reading Priority Development Areas  
Source: EDA Plan

**Commented [MA17]:** New number needed with Ace Flats and Reading Village completed. We also had a MF project on South Main St completed.

**PDA #2 – South Main Street.** PDA #2 is a 26-acre area consisting of 82 parcels located south of the downtown on South Main Street. PDA #2A presently contains primarily low- density commercial development and underutilized parcels. PDA #2B consists primarily of low-density residential development. The Town is interested in facilitating more retail and mixed-use development and implement streetscape and road reconfigurations that will enhance safety and the street’s overall connectivity to downtown. In 2019 the Town proposed and adopted a Mixed-Use Bylaw in the Business-A Zoning District, included in PDA #2A and #2B. The Mixed-Use Bylaw allows a mixed-use development through a Special Permit granted by the CPDC and requires both commercial floor area and affordable units for projects 10 units or more. Affordable units are required for 10% of the project units and required for at least 80% AMI.

**PDA #3 – New Crossing Road Redevelopment District and Ash Street Parcels.** PDA #3 consists of the five-acre New Crossing Road Redevelopment District, which consists of four parcels and includes vacant lots, derelict buildings, sites with industrial uses, and adjacent parcels on Ash Street. In 2019 the Town used an awarded Massachusetts Downtown Initiative (MDI) Grant to facilitate conversation around future uses and development in this priority area. Gamble Associates was contracted with and proposed visioning renderings for the area designated as ‘The Eastern Gateway/The Yard’. Numerous public engagements, workshops and discussions were held. Desired vibrant uses and pedestrian improvements/connections were noted – and while mixed-use development can facilitate improvements concerns of losing too much commercial area were noted. Future zoning additions or amendments should look to address the need for vibrant commercial uses without limiting the market for development.

**PDA #4, - 1 General Way.** PDA #4 is one large 20-acre parcel with a mix of single-story commercial uses and ample parking. The Town is interested in facilitating a more vibrant mix of uses and structures of different densities in this area. Conceptual improvements extended and derived from the Eastern Gateway Initiative described above may be extended to this parcel in future discussions.

**Commented [NL18]:** Is this still a target? Has it been developed yet?

**Commented [MA19R18]:** It is a target but no redevelopment or new zoning/visioning has been done here..

### **Consider zoning changes to promote more compact, mixed-use development**

A Mixed-Use Bylaw for PDA #2 (South Main Street) was adopted in 2019. The Bylaw language allows for Mixed-Use development by Special Permit and includes an Inclusionary Zoning requirement for projects 10-units or more. The Bylaw includes commercial space requirements to maintain a level of commercial development on the Town’s main corridor; parking requirements for residential and commercial uses; and, dimensional controls. However, it also allows the ability to apply for a waiver of these dimensional requirements to promote design flexibility and to achieve appropriate densities. The Bylaw has not been utilized since its inception, though important to note that the Covid-19 pandemic and high inflation occurred in the subsequent years after adoption. Future improvements to the bylaw may be considered to further promote development.

### **Consider zoning changes to parking requirements to promote more compact, mixed-use and/or multi-family development**

In accordance with the recommendations of the Reading Economic Development Action Plan 2016-2022, evaluate parking requirements and consider zoning amendments to make parking requirements consistent with best practices.

### Strategy 3: Adopt and/or Strengthen Inclusionary Zoning bylaw

The purpose of inclusionary zoning bylaws (IZ) is to ensure that production of affordable housing units keeps pace with construction of new dwelling units. IZ mandates that developers provide affordable housing units in addition to market-rate housing. Section 9 of the Zoning Act authorizes communities to adopt bylaws that require a developer to provide a certain portion of affordable units (usually 10% to 25%) within an overall development. To help offset the cost of providing these units, the bylaw may offer an incentive, most commonly a density bonus. Other incentives include a waiver of zoning requirements or permit fees, fast-track permitting, local tax abatements, and subsidized infrastructure.<sup>9</sup>

Many variations of inclusionary zoning provisions have been adopted in Massachusetts communities with varying levels of success at producing affordable units. IZ provisions include:

- a unit threshold that triggers the affordable unit requirements
- minimum percentage of affordable units required
- maximum household income targets (e.g., at or below 80 percent of the area median income)
- eligibility for the state’s Subsidized Housing Inventory
- density bonuses, if applicable

For example, density bonuses are sometimes offered to encourage deeper affordability of units (e.g., units affordable to extremely low-income households) or a higher percentage of affordable units.

The Town should consider including language in its IZ to allow for cash payments, off-site units, and/or donated buildable land as an alternative in lieu of construction of affordable units. The monetary payments and donated buildable land could be allocated to the Reading Affordable Housing Trust to create or preserve affordable housing.

It will be important to examine the most current information regarding best practices for Inclusionary Zoning provisions and to customize/improve Reading bylaws to ensure a successful outcome.

### Strategy 4: Amend the Zoning Bylaw to explicitly permit and define Congregate Housing

Congregate housing is a shared living environment designed to integrate the housing and services needs of elders and disabled individuals. The goal of congregate housing is to increase self-sufficiency through the provision of supportive services in a residential setting. Some types of congregate housing are often in converted single-family homes; however, the Reading zoning bylaw restricts dwelling units to “families” of not more than four unrelated individuals, and this restriction may pose an issue in certain situations for congregate housing, which will often house up to 16 people.

Commented [MA20]:<sup>9</sup> Excerpted from the Housing Toolbox for Massachusetts Communities: <https://www.housingtoolbox.org/zoning-and-land-use/adaptive-reuse>

In addition, congregate housing sometimes provides small kitchen facilities in each private unit in addition to the shared common facilities, which may constitute multi-family housing under the current bylaw's use regulations and thus be prohibited in certain residence districts (S-15, S-20, and S-40).

Reading's zoning bylaw does not appear to explicitly define or permit congregate housing (a.k.a. group homes), which can be an important housing choice to accommodate later life stages for an older population and provide supportive housing for individuals with disabilities.

The Reading zoning bylaw provides the below definition for "family," which presents Fair Housing considerations. Policies that require relations by blood/marriage and/or have a limit of unrelated adults in a household may be considered discriminatory if they have an adverse impact on a protected class including people with disabilities. For example, limiting the number of unrelated persons in a dwelling can impact group home uses, foster families, or other alternative household composition.

*Family: One or more persons living together in one dwelling unit as a single housekeeping unit; provided, however, that a group of more than four individuals who are not related by blood, marriage, or legal adoption shall not be deemed to constitute a family.*

*Dwelling, single family: A detached dwelling unit arranged, intended or designed to be occupied by only one family.*

However, it is important to note that despite these limiting definitions and lack of zoning provisions for congregate housing or group homes, the Dover Amendment exempts educational uses from local zoning and programs and services that provide support, training, and skill building for persons with disabilities have been found to be educational in nature. Many congregate living and group home facilities provide such services to residents and would qualify as educational in nature. In addition, federal laws prohibit municipalities from discriminating against persons with disabilities through their land use and zoning policies.<sup>10</sup>

The zoning bylaw should be amended to ensure consistency with these laws and to explicitly permit congregate housing in all residential districts. This strategy would help to support the local initiative Strategy 8 to identify existing houses with potential for conversion to congregate housing.

**Commented [MA21]:** <sup>10</sup> Federal laws referenced here includes Section 504 of the Rehabilitation Act of 1973, the Fair Housing Amendments Act of 1988, and the American with Disabilities Act of 1990.

### **Identify existing houses with potential for conversion to congregate housing.**

Congregate housing, a shared living environment designed to integrate the housing and services needs of elders and disabled individuals, is often created by converting larger single-family homes to house up to 16 residents with private bedrooms and shared common areas including kitchen, living, dining, and outdoor space. Congregate housing will often also have a resident manager with a small (accessory) apartment within the house or in an outbuilding on site. In addition, it is often beneficial for congregate housing to be in a walkable neighborhood that is close to community

services, shops, and public transportation including bus and commuter rail.

The town, perhaps working through the AHTF and in conjunction with community partners, should inventory existing single-family properties to identify potential for conversion to congregate housing. AHTF funds could support acquisition and/or rehabilitation costs of community partners to facilitate such conversions.

**Strategy 5: Review and amend zoning requirements as necessary for pre-existing non-conforming residential uses.**

Reading Zoning Bylaw Section 7 regulates non-conforming lots, uses, buildings and structures, as provided in Section 6 of Chapter 40A of the Massachusetts General Laws. This Bylaw relates heavily to non-conforming single- and two-family uses/structures and how to regulate them, most commonly through a Special Permit granted by the local Zoning Board of Appeals (ZBA). The Bylaw does not clearly articulate how to allow for the improvement or re-development of pre-existing non-conforming multi-family uses in the single-family zoning district and thus a Special Permit process is typically required and, in many cases, a subsequent Site Plan Review process is triggered. It has been noted that the Special Permit process is a deterrent to owners who look to rehabilitate the outdated structures. There are a number of three-, four- or greater unit structures in the single-family districts of Reading. And while many of these dwellings were developed prior to the current zoning they would not be allowed under the current use regulations.

The Town may wish to consider more directly addressing “other non-conforming uses” in Section 7 such as multi-family structures and provide opportunity for redevelopment, by-right improvements on pre-existing multi-family structures, or other.

**Strategy 6: Consider zoning amendments to allow Accessory Dwelling Units (ADU's) by-right and/or lessen restrictions on such.**

Section 5.4.7 of the Reading Zoning Bylaw provides the terms and limitations on the establishment of Accessory Apartments across Reading. Reading adopted the ADU bylaw in 1983 (revised 2017) and has continued to promote the development of such units to offer a means of increasing housing options without adverse impacts on community character. Reading allows for both attached and detached accessory apartments on single-family dwellings. Section 5.4.7.3 includes ‘performance standards’ each ADU is subject to, including maximum square footage, number of occupants allowed, a requirement that the homeowner reside in the principal dwelling or ADU, and more.

While ADU's within (attached) principal dwellings that require no increase in Gross Floor Area are allowed by-right, many other variants require a Special Permit process through the Reading Zoning Board of Appeals. Accessory apartments that require new Gross Floor Area, or those within existing accessory buildings, trigger the Special Permit process. During many of the public hearings for such it has been noted by applicants (generally homeowners and/or their designers) that the process is time consuming and delays contracting the work.

Commented [MA22]: I will try to find out how many we have permitted as well.



Many ADU's are originally proposed to support small family needs and the public has asked to make the process less cumbersome. However, it is important to note that the public hearing/special permit process allows for the notice of such uses and for discussion/education on concerns such as use as short-term rentals, parking needs, design, etc. It also allows for the conditioning of approvals as needed.

The Town may wish to consider reviewing the bylaw for potential improvements for local homeowners.

**Strategy 7: Continue to provide necessary support for 40R, 40B/Comprehensive and Local Permit applications.**

The Town has had multiple development proposals in recent years that can help to create a more diverse housing stock including affordable and mixed-income units. The Town should continue to provide technical and political support for appropriate projects that further the Town's housing and economic development goals. These projects could be developments in

40R Smart Growth Districts, 40B Comprehensive Permit applications, or local permit applications.

**Strategy 8: Preserve existing affordable housing stock to ensure they remain affordable and qualify for SHI.**

**Explore partnership opportunities with the Reading Housing Authority to create and preserve public housing units**

The Reading Housing Authority (RHA) was established in 1963 and has been developing and operating housing for low-income elderly/handicapped persons, families, and people with special needs throughout the Town of Reading. The Authority owns and manages public housing units for both families and seniors.

The RHA owns fourteen (14) or so units of housing that it leases to income eligible tenants. These units are currently unrestricted, despite efforts to work with the RHA to preserve units on the SHI. Some units have expired restrictions, and were recently lapsed from the SHI. In 2017, the Housing Authority hired a new director, which presents an opportunity for the Town to revisit collaborative efforts to restore the affordability of these units by regulating them as Local Action Units under the Local Initiative Program. The Town has identified locations of these fourteen units as follows: Summer/Main (6), Sanborn Schoolhouse (4), 13 Pierce (1), and Gazebo Circle (3).

The Housing Authority owns property on Waverly Road, which could have some potential for development of additional units. In addition to exploring the development potential of the Housing Authority's existing properties, the Town plans to work collaboratively with the Housing Authority to identify other properties for possible expansion of the public housing inventory—possibly through the development or redevelopment of tax-foreclosed, foreclosed, and/or surplus public

- Commented [NL23]:** Is this unit count still the same?
- Commented [NL24R23]:** Have any of the properties listed been able to regain their affordability restrictions?
- Commented [MA25R23]:** Will need to check with Katie

properties, as described above. Town-owned land along Oakland Road has been under consideration for the development of affordable housing; however further public engagement around the site and use is recommended.

**Strategy 9: Maintain Safe Harbor designation by maintaining, tracking and continuing pace of affordable housing development to exceed 10% SHI target.**

The Subsidized Housing Inventory (SHI) is a fluid number that is subject to constant change. This is because units on the SHI may fall off of the list if a unit’s deed restriction expires; if building permits have not been received in the required timeline from project approval; or, if occupancy is not reached one-year after building permit issuance. These items are often out of Town control. Reading does have multiple properties on its SHI that will expire at varying points in the future. Units on the SHI should continue to be tracked, and property owners communicated with, to ensure the units do not relinquish their status on the inventory and request for new units should be submitted as soon as projects become eligible.

**Strategy 10: Preserve/protect/enhance existing parks, open space and conservation land for long-term accessibility and use by residents. Require open space, trails and/or path connection (sidewalk, bike path, trails, transit-oriented improvements) in new residential, multi-family and mixed-use developments.**

The Town recently adopted an updated Open Space and Recreation Plan in 2022, which includes a series of recommendations for the preservation, acquisition and/or development of open space. And while the plan covers open space and recreation in a broader sense across the entire Town, it also includes the recommendation for connecting open space to new development(s). The Town should continue to use the plan, and its recommendations, to ensure long-term protection and accessibility to the public.

During the 40R Bylaw update in 2022 it was strongly expressed that the downtown 40R and nearby 40B developments need more green space, open space, connections and/or shading (as well as other desired improvements). Efforts were made to require open space in future 40R application in a flexible manner to achieve a mix of desired improvements. New open space may be considered public or private; may be green space or urban space (to allow for uses such as outdoor dining); or, may include sidewalk and path connections to heavily utilized areas nearby. It should also be noted that private amenity space such as balconies, courtyards and shared terraces are a desirable ‘open to the air’ use in urban developments and may be considered open space.

Reading also looks to encourage Low Impact Design (LID) and the use of green infrastructure to manage stormwater impacts of housing and urban developments. Green infrastructure, such as green roofs, bioswales and raingardens, as well as strategies to reduce development footprint on the environment, are strongly encouraged but not always

explicitly required.

Regulatory documents can require such open space improvements or LID infrastructure and the Town should review the Zoning Bylaw, Stormwater Bylaw, Stormwater Regulations, and Subdivision Regulations to ensure the desired standards are included. The Town should also continue its efforts to require, expand or promote the installation of bike paths and pedestrian trails where on-site establishment of open space is not available.

**Commented [MA26]:** Though we did update these in 2021-22 for MS4 permitting needs.

**Strategy 11: Ensure future Net Zero and energy efficiency requirements/standards are met in new development that provide cost savings to end users (residents).**

The Town plans to undergo a Net Zero Plan process during 2023 to effectively strategize greenhouse gas reduction across a number of sectors (i.e. transportation, building, waste, etc.). The Net Zero Plan would help align the Town with State initiatives and requirements. The Town should expect recommendations on how to include energy efficiency and renewable infrastructure requirements for new development; as well as ways to ensure development of affordable housing has access to financing sources that will help cover the cost of net zero construction.

The Net Zero Plan should also target strategies to improve existing homes and affordable unit efficiency. The Town should secure funding resources needed to conduct building retrofits to meet the future goals of the plan.

Existing sources related to the initiative, such as MassSave or RMLD programs, should be highlighted in the Net Zero Plan. The Town should consider how to partner, support and market such programs equitably as they continue to grow.

**Funding and Resources Strategies**

Local initiative strategies refer to recommendations that the town can undertake to foster the creation of more housing options, especially affordable housing. These initiatives are not regulatory in nature – they deal with allocation of town resources including staff time, funding, and property.

**Commented [NL27]:** Nicole to update adding CHAPA, Emergency Task Force.

**Strategy 1: Strategize use of Affordable Housing Trust Fund (AHTF) and look to increase revenue sources dedicated to AHTF.**

The town adopted the Reading Affordable Housing Trust (AHTF) through a special act in 2001. In 2001 the Reading Town Meeting passed a warrant article which authorized the Selectmen to petition the Massachusetts General Court to establish an Affordable Housing Trust Fund for creation and preservation of affordable housing. The State legislature approved the special legislation. The Board of Selectmen act as the Trustees of the Trust.<sup>12</sup>

**Commented [MA28]:** This needs to be updated.

The AHTF is required to submit an allocation plan to Town Meeting annually indicating how Trust funds will be utilized in the coming year and accounting for how the prior year's funds were allocated. The AHTF requires a majority vote of the full combined membership of the Board of Selectmen and Housing Authority for all expenditures.

**Commented [MA29]:** <sup>12</sup> Mitchell, Robert P., FAICP, *Affordable Housing Trust Funds: A Report to the Town of Reading, MA, 2013.*

**Secure additional funding for the AHTF**

Adoption of an Inclusionary Zoning bylaw with provisions for cash payments in lieu of units can provide a source of revenue for the AHTF, in addition to other potential sources (see side bar above). The current balance of the AHTF is approximately \$263,000. The AHTF’s past funding sources included the buy-out of an affordable unit at Summer Cheney and the sale of surplus lands. No Town-generated funds have been allocated to the AHTF.

**Collaboration with Community Partners**

The AHTF funds can be leveraged by working in collaboration with community partners including non-profit housing organizations to create and preserve affordable housing. The AHTF funds could support a first-time homebuyer program (see below), locally-initiated developments, or other local initiative strategies.

**Note:** There is a new state funding source—MassHousing’s Planning for Housing Production Program<sup>8</sup>—that could help to support Reading’s efforts to implement the plan’s regulatory strategies. The Program provides municipalities with funding for additional technical capacity to implement recommendations of the housing production plan and deliver new mixed-income housing.

**Strategy 2: Explore Creation of a First-Time Homebuyer Program**

AHTF funds can be used to support the programmatic and administration costs of homeownership assistance programs, which assist low- to moderate-income households to purchase a home. The programs can be designed in a variety of ways including the following three examples:

- 1) Down Payment Assistance: Down payment assistance programs provide financial support to assist with down payment and closing costs. This assistance is provided in the form of deferred payment loans with recapture provisions. However, this type of program does not create units that would count on the state’s Subsidized Housing Inventory because the subsidy provided is modest and would not create a deed-restricted unit—therefore, Reading would benefit from considering alternative models, as described below.
- 2) Purchase/Rehab Model: In this model, the sponsoring entity, such as the AHTF or a non-profit organization, acquires property, rehabilitates it as necessary, and sells it to a qualified buyer for an affordable price with a deed restriction to secure ongoing affordability. It is important to determine an acceptable level of rehabilitation for the subject properties which stays within the program’s budget and does not place unreasonable repair costs on the new homebuyer. These units may be eligible for inclusion on the state’s Subsidized Housing Inventory.
- 3) Subsidy Model: In this model, the sponsoring entity, such as the AHTF or a non-profit organization, qualifies potential buyers, who then locate a market rate home to purchase

**Commented [MA30]:** Partial List of Potential Funding Sources for Affordable Housing Trusts  
Inclusionary Zoning payments, including 40R incentive payments

- Payments in lieu of providing affordable units**
- Voluntary developer payments
- Proceeds from sales of surplus municipal or tax-foreclosed properties
- Private donations
- Revenue from the lease of municipal land for cell towers
- Proceeds from resale of affordable units

**Commented [NL31]:** Has any of this changed?

**Commented [MA32]:** To confirm.

**Commented [NL33]:** Was this completed?

**Commented [MA34R33]:** To my knowledge we have not used such to date but we should include it as a potential strategy under Funding/Resources strategies!

**Commented [MA35R33]:** <https://www.masshousing.com/en/programs-outreach/planning-programs/planning-housing-production#:~:text=MassHousing's%20Planning%20for%20Housing%20Production,deliver%20new%20mixed%20income%20housing>

with the help of a subsidy from the sponsoring entity which buys-down the cost of the mortgage to an affordable price. A permanent deed restriction is then executed for the property to secure ongoing affordability. It is critical to set program parameters, including

maximum subsidy per unit, maximum property acquisition cost, and minimum property condition/rehabilitation needs with quality standards, at the start of the process to ensure the sustainability of the program. These units may also be eligible for inclusion on the state's Subsidized Housing Inventory.

In all of these homeowner assistance models, the sponsoring entity must create a transparent, fair, and affirmative process to market the program and select qualified buyers to ensure compliance with federal Fair Housing laws and the Massachusetts Anti-Discrimination Act.

For the units to count on the state's Subsidized Housing Inventory, the program guidelines and marketing plan must meet with the requirements of the Department of Housing and Community Development (DHCD) under the state's Local Action Unit program. Units must have a permanent deed restriction, be affirmatively and fairly-marketed, and comply with DHCD's resident selection criteria.

**Strategy 3: Seeking sources to create a local aging-in-place program.**

To help low-income seniors afford to stay in their home as they age, it can be helpful to fund small repairs and safety improvements including handicap accessibility improvements. The town could fund such a program. There are many models. It will be important to design a model program that has limited administrative needs, due to limited staff capacity.

As an example, the town of Agawam applied for \$85,000 in federal Community Development Funds to create the Agawam Aging in Place Program (AIP Program).<sup>13</sup> The AIP Program would provide grants up to \$5,000 per qualified senior household to complete non-structural modifications to increase the health and safety of the occupants. To be eligible, owner occupants must be 65 years of age or older, meet HUD income guidelines for low/moderate-income persons, and have home safety needs that fall under the purview of the program.

Funding per unit would vary from a few hundred dollars to the maximum \$5,000 to support improvements to the health and safety of participants' homes allowing seniors to remain living independently in their own homes. Specific improvements will include the installation of grab bars, door levers, slip resistant stair treads, dead-bolts, peep holes, smoke and/or carbon monoxide detectors, the cleaning of furnaces and chimneys or other similar work and activities.

**Commented [NL36]:** Reading to explore. Has any framework been set up around this since the last plan?

**Commented [MA37]:**<sup>13</sup> Although Agawam did not receive the award of federal funds in FY2018, the city is applying again for FY2019.

**Commented [MA38R37]:** Will need an update or look for a more recent example.

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**Strategy 4: Investigate opportunities to provide/increase Veteran's Affairs Supportive Housing vouchers.**

**Strategy 5: Build support for Community Preservation Act (CPA) adoption**

**Strategy 6: Maintain Housing Choice Initiative (HCI) designation for future grant and funding opportunities.**

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**Strategy 7: Consider implementing Commercial Linkage Fees to help support affordable housing needs.**

**Strategy 8: Develop strategy for locally-initiated development of affordable housing.**

**Continue to catalogue, prioritize and target tax-foreclosed, foreclosed, and surplus public properties with development potential**

Tax-foreclosed, foreclosed, and underutilized surplus public properties can have negative impacts on neighborhoods and municipal finance. These properties can be developed or reused as affordable, mixed-income housing and/or mixed-use development and can present opportunities for neighborhood improvement.

The Town has been tracking such properties and should continue to do so to identify properties with development potential for town acquisition and/or a cooperative effort with non-profit partners.

In addition, the Town should adopt a tax title disposition plan or policy that lays out a process for town officials, including the Treasurer, to work collaboratively to foster development/reuse for affordable housing of appropriate properties. Property acquired in tax title foreclosure can be disposed of under Chapter 60 by auction or under Chapter 30B when the tax title custodian transfers the property to another municipal agency (including an Affordable Housing Trust). Such a property disposition through Chapter 30B can specify that the property be developed within a time frame and for a specific purpose, including affordable housing.<sup>11</sup>

**Current Tax Title Inventory:** As of October 2017, the town had three tax title properties with existing single-family houses that could have potential for conversion to affordable units (9 Swan Road, 179 Pearl Street, and Brook Street/Redfield Road).

**Public Property:** There are roughly 332 acres of state land including Camp Curtis Guild (25 River Road) with 291 acres (part of which is under consideration for use as a new DPW garage). The property will require further study to determine if there are environmental constraints or contamination. State land also includes a property at 9 Causeway Road (lot 31-9) with 4.7 acres. In addition, the Town declared an approximately 4.3-acre parcel on Oakland Road (near the High School) as surplus in April 2017. The Board of Selectmen will establish a fully public process to help determine the future disposition of the land; many options for development or use of this parcel are possible.

**Strategy 9: Consider tax incentives for inclusion of deeply (i.e. 50% AMI) affordable units.**

**Strategy 10: Plan for cases of emergency housing needs.**

**Commented [NL39]:** Do the tax title properties become owned by the Town?

**Commented [NL40R39]:** I have a list Julie sent me a while back.

**Commented [MA41]:**<sup>11</sup> Source: CHAPA, *Back on the Roll in Massachusetts: A Report on Strategies to Return Tax Title Properties to Productive Use*, 2000.







## Leadership, Partnership & Education Strategies

### Strategy 1: Foster partnership initiatives with landlords to upgrade existing apartment complexes and convert to affordable apartments.

Reading has a significant stock of rental units in older, mid-size to larger rental complexes of 20+ units. About 40 percent (777) of rental units are in buildings with 20+ units.<sup>14</sup> Of these units, about 38 percent are in older buildings that were constructed prior to 1980.<sup>15</sup> Community workshop participants supported upgrading older apartment complexes and converting more market-rate rental units to affordable units that would count on the SHI. The Town could work to foster and support private deals to upgrade and convert some of these complexes to affordable apartments.

The Town could target local funds (e.g., AHTF) to work with private partners to purchase, upgrade, and convert. The Town could release a Notice of Fund Availability (NOFA) or Request for Proposals (RFP), in accordance with MGL c.30B, to seek proposals from private developers or existing property owners to upgrade the complex and units in return for long-term affordability restrictions.

In addition, the Town/AHTF could work collaboratively with property owners and non-profit organizations to encourage use of the state's new Donation Tax Credit for property donations to non-profit organizations to convert existing buildings to affordable units. As part of the [Act Relative to Job Creation and Workforce Development \(H.4569\)](#), the state created the Donation Tax Credit that provides a credit against Massachusetts income tax liability for property owners who donate existing housing properties or other structures for the conversion of housing to qualified non-profits that commit to long-term affordability. The credit is worth 50 percent of the donated value but may be increased to 65 percent by DHCD. Perhaps in Reading this tax credit could help to encourage conversion of market-rate apartment complexes to affordable units.

### Strategy 2: Seek proposals from private developers or property owners to upgrade developments or units in return for long-term affordability restrictions.

### Strategy 3: Maintain and continue to build Interested Buyers List

### Strategy 4: Work in cooperation with community partners to promote enhanced public understanding of housing needs and creation of affordable housing opportunities

The Town, working with community partners, should expand community outreach and education efforts by initiating a public awareness campaign to build and maintain support for local affordable housing initiatives. Towards that end, the Metro North Regional Housing Services Office could help with this effort by clearly articulating the unmet local housing needs, perhaps through creation of infographics to include in brochures, posters, and online.

**Commented [MA42]:** <sup>14</sup> 2012-2016 ACS, B25032: Tenure by Units in Structure.

**Commented [MA43]:** <sup>15</sup> 2012-2016 ACS, B25127: Tenure by Year Structure.

**Commented [NL44]:** Offering funds for LL's to do upgrades and incentivize them somehow to keep the rent affordable.

In addition, the Town could solicit the assistance of other organizations to help with this effort, such as the Reading Clergy Associations or other groups invested in issues related to affordable housing.

As part of this effort, the Town and Metro North Regional Housing Services Office could consult a variety of publications exploring a variety of concerns and debunking myths related to multifamily housing development and density. For example, the Massachusetts Housing Toolbox may provide ideas to help gain support and address fears of new development, specifically around affordable housing initiatives, including strategies for community engagement and dispelling misperceptions: <https://www.housingtoolbox.org/>

There are multiple organizations working to create or preserve affordable housing and to provide needed services in Reading and the region such as Habitat for Humanity and Mystic Valley Elder Services. The Town has established strong dialogue with these organizations and should continue to have regular dialogue with non-profit entities to promote the creation of affordable housing opportunities, possibly in combination with fostering local initiative projects, as described earlier in this section.

Commented [NL45]: Are there any other local housing developers/providers that we can also partner with?

### **Strategy 5: Continue to support the work of the Metro North Regional Housing Services Office**

The Town of Reading is the host town for the Metro North Regional Housing Services Office (MNRHSO). The MNRHSO includes the towns of Reading, North Reading, Wilmington, Woburn and Saugus. The MNRHSO provides affordable housing support and information to member communities and citizens looking to live in our region. Its primary task is monitoring the more than 3,800 units in the five-member towns with the mission of expanding low- and moderate-income housing options and ensuring that owners of affordable properties are in compliance with their restrictions.

The MNRHSO maintains a website with useful information for current and future residents of the member towns including housing opportunities, refinancing instructions, and current inventory presentations. <https://www.readingma.gov/regional-housing-services-office>

Commented [MA46]: Mnrhso.org

### **Strategy 6: Continue public engagement and education on regional/local housing needs.**

By expanding community outreach and education practices the Town can better help residents understand the regional housing need and how such impacts the local area. Initiating a public awareness campaign to build and maintain support for local affordable housing initiatives, whether locally initiated or private development, is recommended. By clearly articulating the unmet housing needs through infographics, brochures, online information, etc. support can be built. Improved outreach practices to vulnerable residents and geographies should be planned for and prepared. This may include specific working group meetings, language translation services and

Opportunities to partner with local and regional organizations should also be sought to help. For example, the [Citizen's Housing and Planning Association \(CHAPA\) programs the Municipal Engagement Initiative](#)

(MEI) Lite Community Program to build support for affordable housing production across the State.

**Commented [MA47]:** <https://www.chapa.org/about/programs/municipal-engagement-initiative>

**Commented [MA48R47]:** Are there other programs like this Reading can explore?



**Action Plan**

Commented [MA49]: To update.

The Reading Public Services Department, specifically the Planning Division, having spearheaded this planning effort, will be the natural entity to oversee all aspects of its implementation and to provide regular updates on progress to the Board of Selectmen and Community Planning and Development Commission. The matrix below provides more specific assignment of responsible entity, supporting entity, and timeframe to implement the housing strategies.

Housing Strategies	FY2018	FY2019	FY2020	FY2021	FY2022	Responsible Entity	Supporting Entities
Strategy 1: Encourage mixed-use development in the Priority Development Areas by considering adoption of various regulatory tools						CPDC Town Meeting	Planning Division
Strategy 2: Adopt an Inclusionary Zoning bylaw						CPDC Town Meeting	Planning Division
Strategy 3: Amend the Zoning Bylaw to explicitly permit congregate housing						CPDC Town Meeting	Planning Division
Strategy 4: Provide necessary support for 40R, 40B/Comprehensive and Local Permit applications.						Planning Division	Boards, Committees & Commissions
Strategy 5: Seek opportunities for locally-initiated development of affordable housing						BOS RHA	Planning Division
Strategy 6: Strengthen the Affordable Housing Trust Fund with additional sources of revenue and further collaboration						BOS Town Meeting Town Manager	RHA
Strategy 7: Explore creation of a First-Time Homebuyer Program						Planning Division	Local banks
Strategy 8: Identify existing houses with potential for conversion to congregate housing						Planning Division	State
Strategy 9: Seek funding to create a local aging-in-place program						Planning Division Human Elder Services Division	BOS Council on Aging
Strategy 10: Foster partnership initiatives with landlords to upgrade existing apartment complexes and convert to affordable apartments						Planning Division Town Manager	State
Strategy 11: Work in cooperation with community partners to promote enhanced public understanding of housing needs and promote creation of affordable housing						Planning Division	Community Partners
Strategy 12: Continue to support the work of the Metro North Regional Housing Services Office						Planning Division Town Manager	Town Meeting BOS

AHT = Affordable Housing Trust  
 CPDC = Community Planning and Development Commission  
 BOS = Board of Selectmen

**Appendices**

**Housing Profile**



## Reading, MA Housing Profile

### Summary of Housing Needs & Demand

Commented [NL50]: I will update this page later.

#### POPULATION & HOUSEHOLDS (Census)

- As of the 2010 US Census, the population of Reading is 24,747, an increase of 4.4% since 2000.
- In 2010, the largest age group of Reading's population was 35-54 year olds (35% of total population).
- Between 2000-2010, population change by age groups was:
  - 0-9 years old decreased by 4.8%
  - 10-19 years old increased by 6.6%
  - 20-24 years old increased by 26.9%
  - 25-34 years old decreased by 8.9%
  - 35-59 years old increased by 3.8%
  - 60-74 increased by 17.1%
  - 75+ increased by 12.6%
- As of the 2010 Census, 35.9% of Reading's 9,305 households (a household consists of all those occupying one housing unit), have children under 18 years old, and 26.3% have persons age 65+.
- The median age increased from 39.1 years old in 2000 to 41.6 years old in 2010.
- Racial make-up is predominantly white, with 93.5% of the population; 4.2% of the population is Asian; 1.5% of the population is Hispanic or Latino.
- 9% of Reading's total population and 37.2% of Reading's 65+ population reports having one or more disabilities.

#### HOUSEHOLD INCOME & COST OF HOUSING

- In 2015, Reading's median household income was \$107,654; a 39.7% increase from 1999, and significantly more than the Boston-Cambridge-Quincy Metro Area (\$98,500) or the state as a whole (\$68,563). (ACS)
- An estimated 26.3% of Reading households have incomes at or below 80% of AMI. (CHAS)
- 2.8% of Reading's population is below the poverty line (annual income below \$24,600 for a household of 4), much lower than Middlesex County (8.4%) and Massachusetts (11.6%). (ACS)
- The 2016 median price of single family homes in Reading was \$525,000. The 2016 median price of all homes, including condos, was \$479,600. After a dip in prices during the national recession in the mid-2000's, housing prices have been rising steadily since 2012 and are now the highest they have ever been. (Warren Group)
- Of the 7,405 of Reading households who own their homes, 29.4% are cost-burdened (spending over 30% of their income on housing), while 33.1% of Reading's renters cost-burdened. 71% of Reading's low-income households are cost-burdened. (CHAS)
- A recent survey of available rentals on Trulia.com shows a median rent in Reading of \$2,100. The Census reports a median gross rent in Reading of \$1,282.

#### HOUSING SUPPLY (Census & ACS)

- The 2011-2015 ACS reports that of Reading's 9,168 occupied housing units, 78.2% are owner occupied and 21.8% renter occupied.
- The number of owner-occupied units increased by 83 while the number of rental units increased by 534 between 2000 and 2010.
- The Town's housing stock remains primarily single-family at 74.8% of total housing units. 7.5% of units are in two to four family buildings, 7% of units in 5-19 unit buildings, and 10.6% of units in multi-family buildings with 20 or more units.

#### AFFORDABILITY (DHCD Sales Price Calculator, Trulia.com, CHAS)

- 8.78% (841 units) of Reading's total housing stock is counted as affordable on the State's Subsidized Housing Inventory (SHI), which falls short of the State's minimum affordability goal of 10%.
- A low-income 3-person household earning 80% of the Area Median Income (AMI) could roughly afford a home that costs \$262,000 or a monthly rent of \$1,760. There are 780 Reading households (8.4%) who earn 80%-100% AMI and Trulia.com (as of September 2017) shows that there are 2 homes (both small condos) for sale in Reading under \$300,000. There are 3 rental units at this rent.
- Reading's 2016 median sale price of \$525,000 requires an annual income of approximately \$140,918, over \$33,000 higher than Reading's median household income of \$107,654.
- Based on the median sale price, Reading's ownership affordability gap is \$125,000 for median income households, and \$263,000 for low income households. Based on current median rents, Reading rentals are out of reach for low-income households. In addition, there are not very many rentals available.

#### AFFORDABLE HOUSING STOCK (DHCD SHI & CHAS)

- There are 841 units listed on the SHI, 91 ownership and 750 rental units.
- Most (87) of the affordable ownership units were built through the Local Initiative Program (LIP) – 34 units, or through Chapter 40R permits as part of smart growth zoning districts – 53 units.
- Of the 750 rental units on the SHI, 325 are family units, 268 are age-restricted, 71 are supportive housing units for people with disabilities, and 86 are assisted living units.
- Only 109 of the family rental units are affordable to households earning 80% or less of the AMI; the rest are market-rate units.
- Approximately 2,445 households (26.3% of total households) are eligible for affordable housing, but there are only 570 housing units in Reading restricted for households at or below 80% of AMI.

**The Bottom Line:** Reading has grown since 2000, with increases in population, the number of households, and housing units. In particular, the growth of the 65+ population and is projected to continue. Reading's median income has risen significantly, but nearly 1/4 of the population is low-income, and 30% of households are housing cost-burdened. Much of Reading's housing stock is out of reach for lower income households. There is a need for more affordable housing,

# Reading, MA Housing Profile

## Income Limits (2017)

Published annually by Housing and Urban Development (HUD)

FY 2022 Income Limit Area	Median Family Income <a href="#">Click for More Detail</a>	FY 2022 Income Limit Category	Persons in Family							
			1	2	3	4	5	6	7	8
<b>Boston-Cambridge-Quincy, MA-NH HUD Metro FMR Area</b>	\$140,200	Very Low (50%) Income Limits (\$) <a href="#">Click for More Detail</a>	49,100	56,100	63,100	<b>70,100</b>	75,750	81,350	86,950	92,550
		Extremely Low Income Limits (\$)* <a href="#">Click for More Detail</a>	29,450	33,650	37,850	<b>42,050</b>	45,450	48,800	52,150	55,550
		Low (80%) Income Limits (\$) <a href="#">Click for More Detail</a>	78,300	89,500	100,700	<b>111,850</b>	120,800	129,750	138,700	147,650

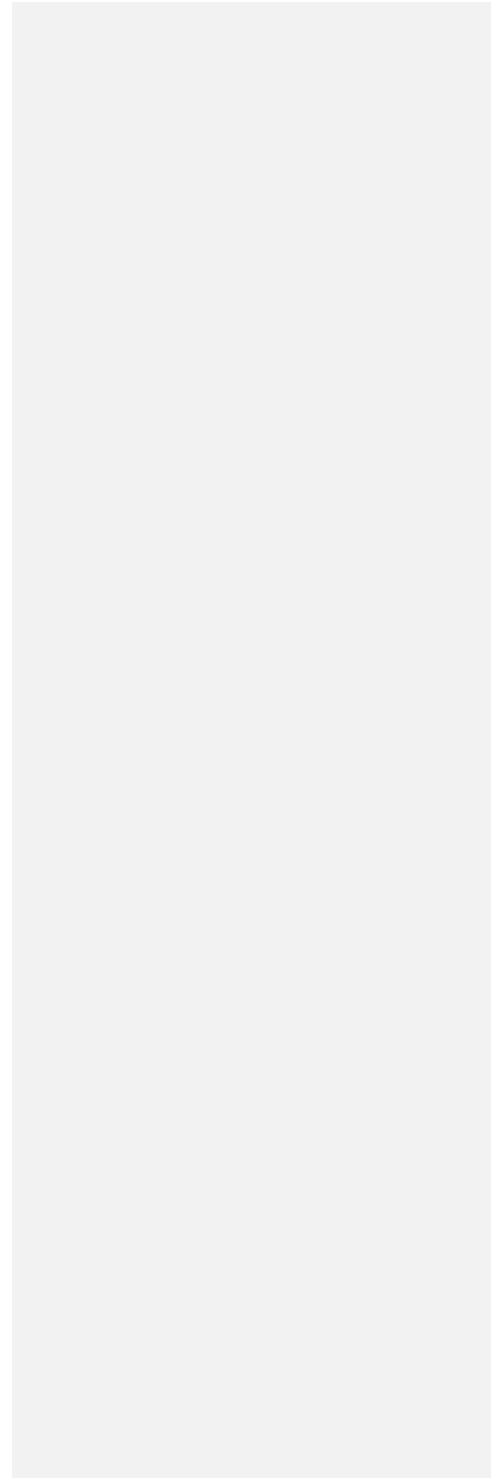
### Sources:

- 2020 Federal Census (Census)
- 2015-2019 American Community Survey (ACS)
- 2015-2019 Comprehensive Housing Affordability Strategy (CHAS) Data
- Massachusetts Association of Realtors
- Metropolitan Area Planning Council (MAPC) Demographic Profiles
- Zillow, Zillow.com
- The Donahue Institute at University of Massachusetts

### Key to Abbreviations:

- AMI: Area Median Income set by the Federal Department of Housing and Urban Development
- DHCD: MA Department of Housing and Community Development

SHI: MA Subsidized Housing Inventory



**Interagency Policy**

## INTERAGENCY AGREEMENT

### Regarding Housing Opportunities for Families with Children

This Interagency Agreement (this "Agreement") is entered into as of the 17th day of January, 2014 by and between the Commonwealth of Massachusetts, acting by and through its Department of Housing and Community Development ("DHCD"), the Massachusetts Housing Partnership Fund Board ("MHP"), the Massachusetts Housing Finance Agency (in its own right and in its capacity as Project Administrator designated by DHCD under the Guidelines for Housing Programs in Which Funding is Provided By Other Than a State Agency, "MassHousing"), the Massachusetts Development Finance Agency ("MassDevelopment") and the Community Economic Development Assistance Corporation ("CEDAC"). DHCD, MHP, MassHousing, MassDevelopment and CEDAC are each referred to herein as a "State Housing Agency" and collectively as the "State Housing Agencies".

### Background

A. DHCD's 2013 Analysis of Impediments to Fair Housing Choice ("AI") includes action steps to improve housing opportunities for families, including families with children, the latter being a protected class pursuant to fair housing laws, including the federal Fair Housing Act, as amended (42 U.S.C. §§ 3601 *et seq.*) and Massachusetts General Laws Chapter 151B. In order to respond to development patterns in the Commonwealth that disparately impact and limit housing options for families with children, such steps include requiring a diversity of bedroom sizes in Affordable Production Developments that are not age-restricted and that are funded, assisted or approved by the State Housing Agencies to ensure that families with children are adequately served.

B. The State Housing Agencies have agreed to conduct their activities in accordance with the action steps set forth in the AI.

C. This Agreement sets forth certain agreements and commitments among the State Housing Agencies with respect to this effort.

### Definitions

1) "Affordable" - For the purposes of this Agreement, the term "Affordable" shall mean that the development will have units that meet the eligibility requirements for inclusion on the Subsidized Housing Inventory ("SHI").

2) "Production Development" - For purposes of this Agreement "Production Development" is defined as new construction or adaptive reuse of a non-residential building and shall include rehabilitation projects if the property has been vacant for two (2) or more years or if the property has been condemned or made uninhabitable by fire or other casualty.

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### Agreements

NOW, THEREFORE, DHCD, MHP, MassHousing, MassDevelopment and CEDAC agree as follows:

#### Bedroom Mix Policy

1) Consistent with the AI, it is the intention of the State Housing Agencies that at least ten percent (10%) of the units in Affordable Production Developments funded, assisted or approved by a State Housing Agency shall have three (3) or more bedrooms except as provided herein. To the extent practicable, the three bedroom or larger units shall be distributed proportionately among affordable and market rate units.

2) The Bedroom Mix Policy shall be applied by the State Housing Agency that imposes the affordability restriction that complies with the requirements of the SHI.

3) The Bedroom Mix Policy shall not apply to Affordable Production Developments for age-restricted housing, assisted living, supportive housing for individuals, single room occupancy or other developments in which the policy is not appropriate for the intended residents. In addition, the Bedroom Mix Policy shall not apply to a Production Development where such units:

- (i) are in a location where there is insufficient market demand for such units , as determined in the reasonable discretion of the applicable State Housing Agency; or
- (ii) will render a development infeasible, as determined in the reasonable discretion of the applicable State Housing Agency.

4) Additionally, a State Housing Agency shall have the discretion to waive this policy (a) for small projects that have less than ten (10) units and (b) in limited instances when, in the applicable State Housing Agency's judgment, specific factors applicable to a project and considered in view of the regional need for family housing, make a waiver reasonable.

5) The Bedroom Mix Policy shall be applicable to all Production Developments provided a Subsidy as defined under 760 CMR 56.02 or otherwise subsidized, financed and/or overseen by a State Housing Agency under the M.G.L. Chapter 40B comprehensive permit rules for which a Chapter 40B Project Eligibility letter is issued on or after March 1, 2014. The policy shall be applicable to all other Affordable Production Developments funded, assisted, or approved by a State Housing Agency on or after May 1, 2014.



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# Town of Reading



Housing Production Plan Public Forum

January 9, 2023

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**WELCOME!**

**Opening Remarks & Acknowledgments**





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# Agenda and Objectives

1. What is a Housing Production Plan
2. Where are we in the process
3. Survey Results
4. SHI additions since 2018 plan
4. Closing Remarks + Next Steps



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# What is a Housing Production Plan

**An HPP is a community's proactive strategy for planning and developing affordable housing. An HPP accomplishes the following for a municipality:**

- 1) Creates a strategy to enable it to meet its affordable housing goals**
  - 2) Produces housing units in accordance with the HPP.**
  - 3) Each community in Massachusetts is required to meet a goal of 10% of all housing units to be dedicated as affordable to those earning 80% AMI or less**
  - 4) Allows community participation in planning for the future**
  - 5) Must be updated every 5 years**
  - 6) Reviewed and approved by DHCD**
-

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**An HPP serves as the community's proactive strategy in determining the type and pace of housing growth.**

- Identifies housing needs in the community and identifies sites for development, the community will be providing guidance and direction for the types of development most responsive to local conditions;
  - The HPP can serve as the housing element of an overall comprehensive plan (“master plan”) and/or capital improvement plan that may be required as a companion to the HPP in order to attract the types of development and housing opportunities the community needs; and
-

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## There are many advantages for a community to create an HPP.

It provides an opportunity to understand current housing conditions and then to determine both the projected housing needs of both the current population and the growth/change in composition of the population

(e.g. more families, more elders).



For example:

Are there enough “starter homes” for those forming new households?

Is there adequate workforce housing?

What are the options in the community for empty nesters?

How are the needs of the elderly being met?

Are there options for residents with physical and mental disabilities?

Are there options for both rental and home ownership?

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# SHI Units Developed Since 2018

	<b>Development</b>	<b>Address</b>	<b>Total # of Units</b>	<b>SHI Affordable Units (80%)</b>	<b>Ownership</b>	<b>Rental</b>
	Reading Village (The Metropolitan)	31-41 Lincoln Street	68	17 (@ 80% AMI)		X
	Schoolhouse Commons	172-180 Woburn Street	20	4 (@ 50% AMI)		X
	Postmark Square (The Postmark)	8 Sanborn Street	10	10 (@ 80% AMI)	X	
	Ace Flats	20-24 Gould Street	55	14 (@80% AMI)		X
	Rise475	467 Main Street	31	8 (@ 80% AMI)		X
<i>construction TBD</i>	<i>Chute Street</i>		29	8 (@ 80% AMI)		X
<i>under construction/permitted</i>	<i>Easton Lakeview</i>		74 Rental	19 (@ 80% AMI)		X
<i>under construction/permitted</i>	<i>Easton Lakeview</i>		12 Owner	3 (@ 80% AMI)	X	
	<i>3 ownership units should be added back to SHI, RNUF has been submitted</i>					
<i>under construction</i>	<i>Johnson Woods Phase II</i>		<i>6 more ownership units to add when Cos issued</i>		X	

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## Comprehensive Housing Needs Assessment

Demographic and housing stock data & projections

Development constraints & limitations

Capacity for growth & Plan to mitigate development constraints

## Affordable Housing Goals

Numerical goal for annual housing production

Assessment of types of housing needed

## Implementation Strategies

Identification of specific sites for future development

Identification of zoning and/or policy changes

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# Public Forums

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October 24, 2022 – Hybrid session at  
Public Library

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November 29, 2022 – Zoom meeting

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January 9, 2023 – CPDC Meeting –  
Hybrid

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January 10, 2023 – Select Board -  
Hybrid

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Forums are recorded and are available on the Town's  
website

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# Needs Assessment Findings/Survey & Feedback Takeaways



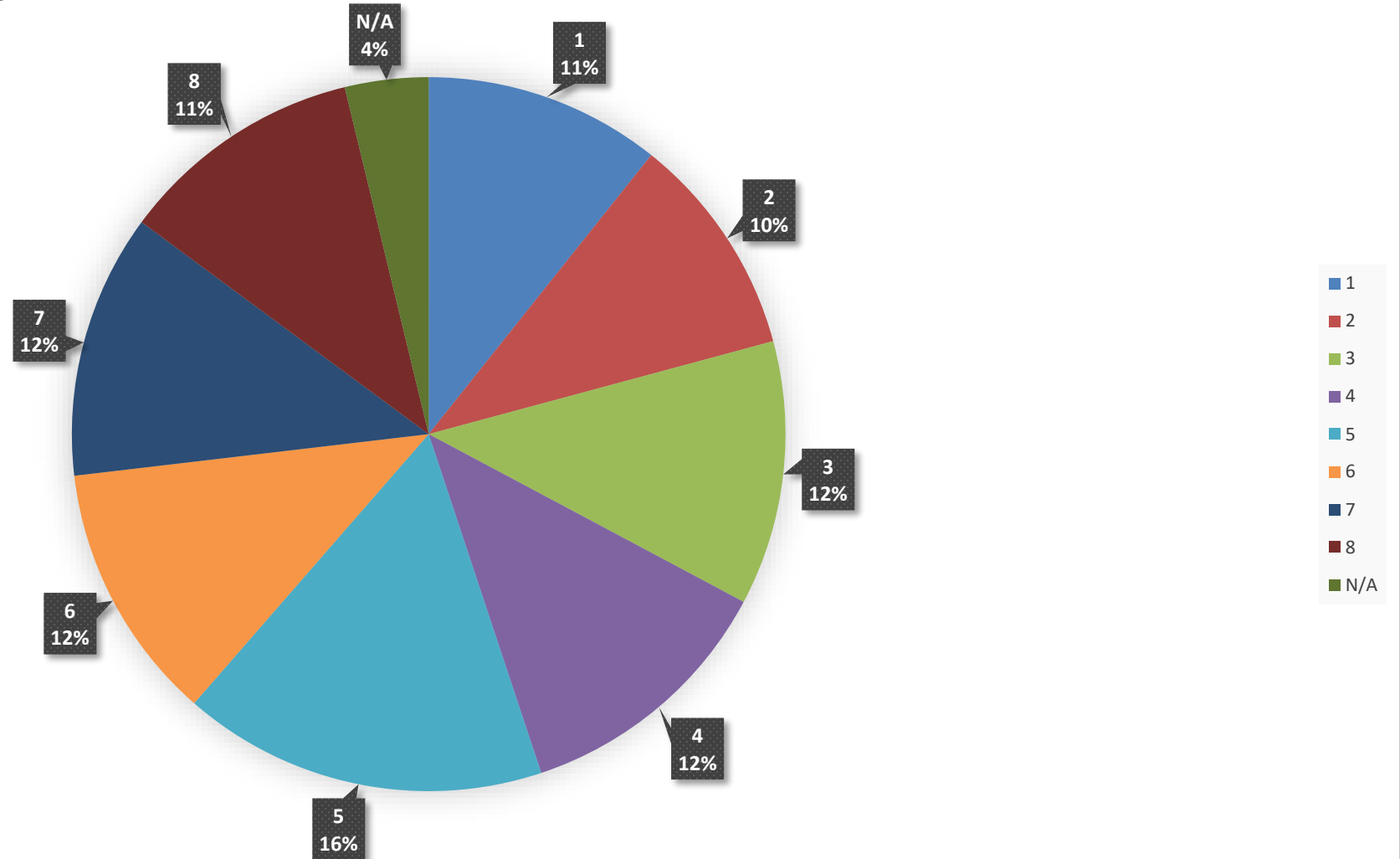
**Final Survey Results as of  
November 18, 2022 5:00 p.m.**

**793 Responses**

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## Responses per Precinct



## Reading By the Numbers



92.74% of respondents identify as Caucasian

52.4% of respondents identify as Female

54.45% of respondent households make over \$150,000 p/yr

95.8% of respondents are Non-Veterans

89.17% of respondents Own their Home

80.34% of Home-Owners live in Single Family Homes

59.61% of Home-Owners currently have a mortgage

65.78% of respondents plan to stay in their current home as they age

The Most common household sizes were – 2 persons at 35.27% and 4 persons at 23.26%

Out of all 793 Respondents the following information highlights some demographic data

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## Reading Statics Overview



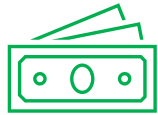
Total Population: 25,510

Total Households: 9,952



Homeowners: 84.6%

Renters: 15.4%



Median Household Income - \$133,300



2 Bedroom FMR: \$2,635

Annual Income Needed to Afford 2 Bedroom  
FMR Rent: \$105,400



Median Single- Family Home Sales Price - \$825,500

Monthly Payment for Median Priced Home - \$4,242

Annual Income Needed to Afford Median Sales Price - \$150,000\*

(\*to avoid being cost burdened)

*Affordable Purchase Price Calculation Assumptions*

*Interest Rate – 3.5%*

*Down payment – 3.5% down*

*Taxes - \$5,000*

*Debt - \$500 month*

*Insurance - \$2,000 year*

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**HUD Fair Market Rents (FMR) for 2023:**

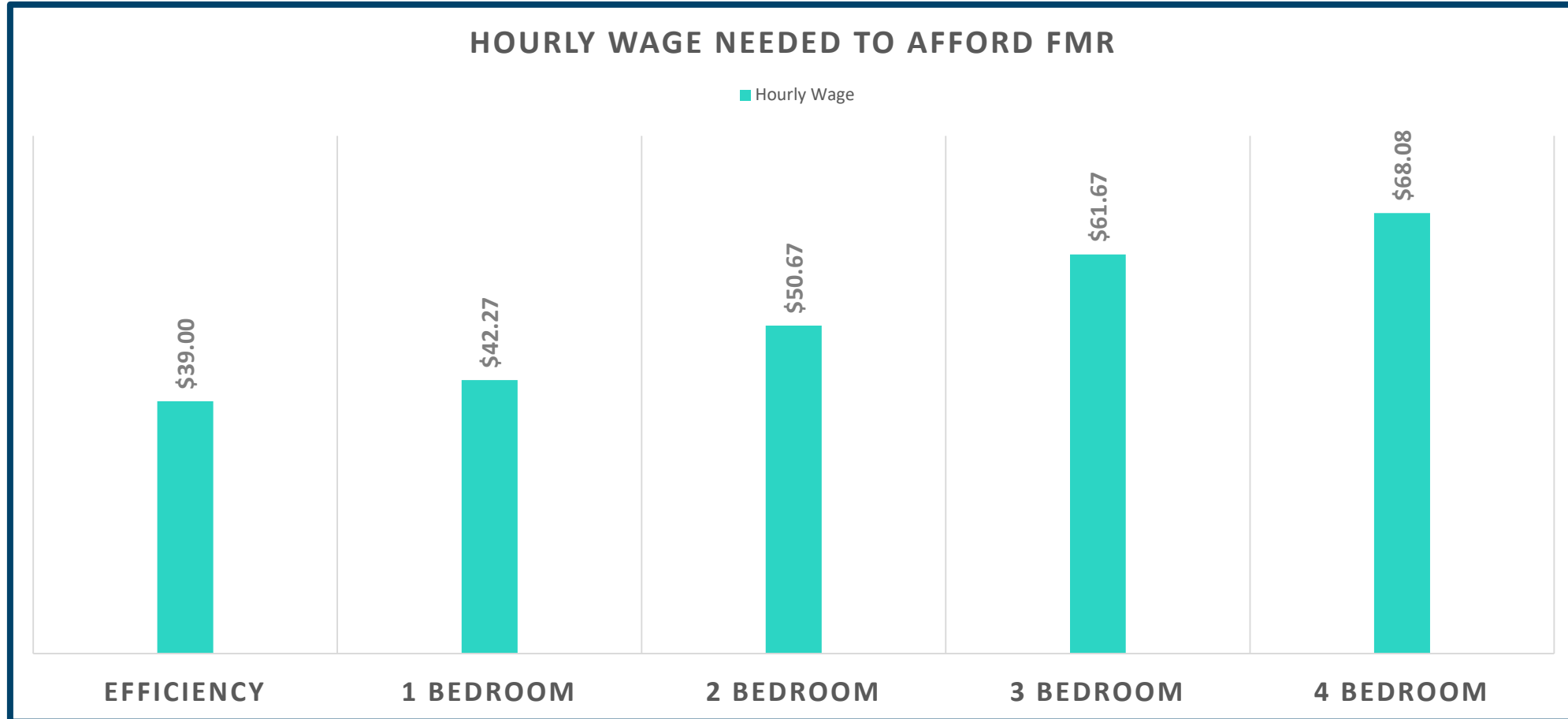
<b>Final FY 2023 FMRs By Unit Bedrooms</b>				
<b><u>Efficiency</u></b>	<b><u>One-Bedroom</u></b>	<b>Two-Bedroom</b>	<b><u>Three-Bedroom</u></b>	<b><u>Four-Bedroom</u></b>
\$2,025	\$2,198	\$2,635	\$3,207	\$3,540

**Actual Rents in Reading** (based on units listed for rent as of 8/31/2022)

<b>Bedroom size</b>	<b>Median Rent</b>
1-bedroom units (1 listings)	\$2,667
2-bedroom units (7 listings)	\$3,300
3-bedroom units (6 listings)	\$4,000

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# Hourly Wages Needed to Afford FMR in Reading



Assumptions: HUD Fair Market Rent for each unit size  
Does not include utilities  
Rent calculated using 30% of income

## Affordable Purchase Prices by Income Level

Income Level	Income	Affordable Purchase Price	Estimated Affordable Monthly Payment	Gap +/- from Median Sales Price	2022 Median Sales Price	Estimated Monthly Mortgage Payment for Median Priced Home
Reading Median Income	\$133,300	\$567,002	\$3,018	\$258,498	\$825,500	\$4,242
Low Income (80 AMI%) <small>(3-person HH)</small>	\$100,700	\$431,812	\$2,378	\$393,688		
Very Low Income (50 AMI%) <small>(3-person HH)</small>	\$63,100	\$257,342	\$1,551	\$568,158		

*Affordable Purchase Price Calculation Assumptions*  
*Interest Rate – 3.5%*  
*Down payment – 3.5% down*  
*Taxes - \$5,000*  
*Debt - \$500 month*  
*Insurance - \$2,000 year*

**In General Respondents Support the Following Methods to Develop Affordable Housing:**

Rehabilitation of Vacant/Foreclosed Property

Development of Town Owned Land

Development of Mixed-Use Buildings

**In General Respondents Support the Following Types of Development:**

Single Family Housing

Two-Family Housing

55+ Communities

Assisted Living/Senior Housing

Accessory Dwelling Units/In-Law Apartments





# Goals & Strategies



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# ***Goals & Strategies***

## **Three Area's of Focus:**

- Regulatory and Development
    - Zoning, Regulations, Development Tools, Geography, etc.
  - Funding and Resources
    - Revenue Sources, Support, Incentives, Opportunities/Use, etc.
  - Leaderships, Partnerships and Education
    - Collaborations, Trainings, Inclusivity, Programming, etc.
-

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# *Regulatory and Development Strategies*

1

Adopt/Amend zoning that would comply with MBTA Communities legislation

2

Identify Zoning Districts/geographies in which current regulations can be modified to allow the development of SHI eligible housing units

3

Strengthen and expand Inclusionary Zoning to further promote/develop affordable housing opportunities

4

Amend Zoning Bylaw to define and permit congregate housing. Identify existing sites with the potential to convert to congregate housing use.

5

Allow for redevelopment or conversion of pre-existing non-conforming residential uses by-right/make permitting path of such easier

6

Consider zoning amendments to allow Accessory Dwelling Units by-right and/or lessen restrictions

---

# *Regulatory and Development Strategies*

## 7. Continue

Continue to provide technical support for 40R, 40B and Local Permit applications

## 8. Preserve

Preserve existing affordable housing stock to ensure they remain affordable and qualify for SHI.

## 9. Maintain

Maintain Safe Harbor designation by maintaining, tracking and continuing affordable developments to achieve 10% SHI target.

## 10. Enhancement

Require through regulations items such as Open Space, connectivity, energy efficiency, transit-oriented development.

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# ***Affordable Housing Funding and Resources Strategies***

Develop/ Enhance	First-Time Homebuyer Program w/ RHA and local institutions
Strategize	Use of Affordable Housing Trust Fund and how to increase revenue sources
Seek	Funding and opportunities to support local aging-in-place program/support
Investigate	Opportunities to provide/increase Veteran's Affairs Supportive Housing Vouchers



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# *Affordable Housing Funding and Resources Strategies*

Build	Build support for Community Preservation Act adoption to strengthen local finances
Maintain	Maintain Housing Choice Initiative status for future grant and funding opportunities
Consider	Consider implementing Commercial Linkage fees to fund affordable housing needs
Develop	Develop strategy to developing additional affordable units off-site
Consider	Consider tax incentives to develop deeply affordable homes
Plan	Plan for cases of emergency housing needs



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# *Leadership, Partnership, & Education Strategies*

01

Foster partnership initiatives with landlords to upgrade existing apartment complexes and convert to affordable apartments

02

Seek proposals from private developers or property owners to upgrade developments or units in return for long-term affordability restrictions.

03

Maintain and continue to build Interested Buyers List

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# ***Leadership, Partnership, & Education Strategies***

## **4. Continue**

**Continue public engagement and education on housing needs**

## **5. Continue**

**Continue to support the work of the Metro North Regional Housing Services Office (MNRHSO)**

## **6. Collaborate**

**Collaborate with community organizations**

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Q&A





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# NEXT STEPS

Contact Us!

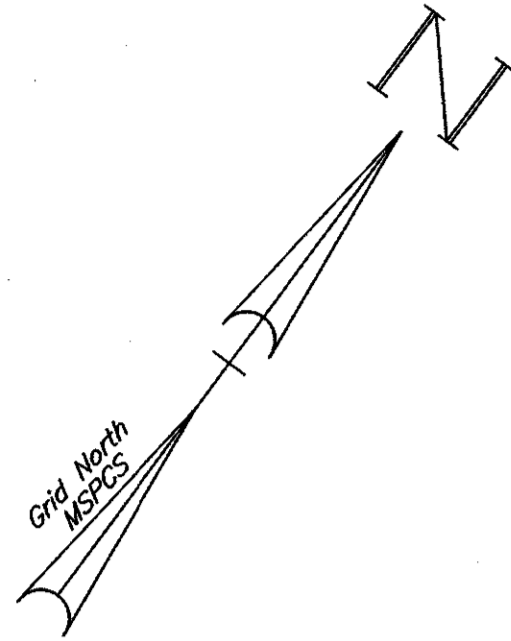
Andrew MacNichol: [amacnichol@ci.reading.ma.us](mailto:amacnichol@ci.reading.ma.us)



# SITE PLAN REVIEW & SPECIAL PERMIT SET

## 25 HAVEN STREET (MIXED-USE DEVELOPMENT)

### Reading, MA



**Vicinity Map**  
Scale: 1"=200'±

READING COMMUNITY PLANNING AND  
DEVELOPMENT COMMISSION

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
DATE: \_\_\_\_\_

**RECORD OWNER:**  
25 HAVEN STREET, LLC  
25 HAVEN STREET, READING, MASSACHUSETTS  
-ASSESSORS MAP 16 LOT 309  
-BOOK 1557 PAGE 74  
-LOT B ON LCC 6084B

**PLAN REFERENCES:**  
- LCC 6084B  
- LCC 19824A  
- PLAN 221 OF 1956

**NOTES:**

1. THIS PLAN IS BASED ON AN ACTUAL ON-THE-GROUND FIELD SURVEY CONDUCTED BY HAYES ENGINEERING, INC. ON MARCH 4, 2022.
2. THE ELEVATIONS DEPICTED HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) BASED UPON MACORS REAL-TIME NETWORK NAD 83 (2011) (EPOCH 2010.00) DATUM USING GEOID 12B FOR ORTHOMETRIC HEIGHTS.
3. THIS PROPERTY DOES NOT LIE WITHIN A FLOOD HAZARD AREA (ZONE A OR V) AS SHOWN ON FLOOD INSURANCE RATE MAP NUMBER 25017C0313E, EFFECTIVE DATE: 06/04/2010

SHEET INDEX	
PLAN TITLE	INDEX
INDEX	C1
EXISTING CONDITION	C2
DEMO/RELOCATION	C3
SITE LAYOUT PLAN	C4
DRAINAGE AND GRADING	C5
UTILITIES	C6
DETAILS	C7
DETAILS	C8

**REQUESTED WAIVERS AND VARIANCES:**

**ZONING BYLAW:**

- SECTION 9.1.1.7 OFF-STREET LOADING REQUIREMENTS
- SECTION 10.5.6.1 RESIDENTIAL DENSITY ALLOWANCES

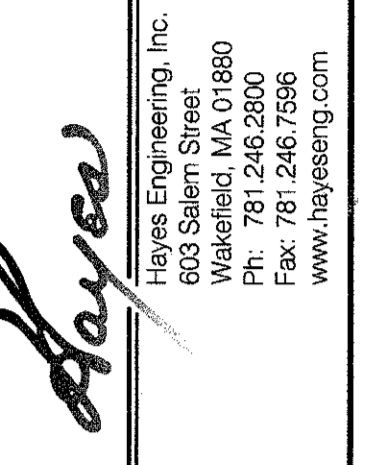
**SITE PLAN REVIEW PROCEDURES:**

- H9: OUTDOOR LIGHTING
- H11: SIGNAGE
- J4: LIMIT OF WORK DELINEATION
- J4: TELEPHONE AND CABLE
- Q: TRAFFIC STUDY

Prepared For:

25 HAVEN STREET, LLC  
25 HAVEN STREET  
READING, MASSACHUSETTS  
REGISTRY BOOK 1557/74  
ASSESSORS MAP 16 LOT 309

Prepared By:



Design By: JG  
Drawn By: JG  
Checked By: PUJ  
Project File: REA-0419  
Comp. No: REA175  
 Issued For Permit  
 Issued For Review  
 Issued For Bid  
 Issued For Construction  
 Not For Construction

No.	Revision	Date
10		
9		
8		
7		
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5		
4		
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1		

Scale: 1"=200'  
0' 100' 200' 400'  
Date: November 22, 2022

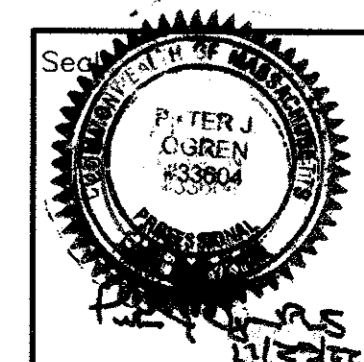
Drawing Title:

**INDEX PLAN  
25 HAVEN STREET  
MIXED-USE DEVELOPMENT  
READING, MASS.**

Drawing No.:

C1

SHEET 1 OF 8

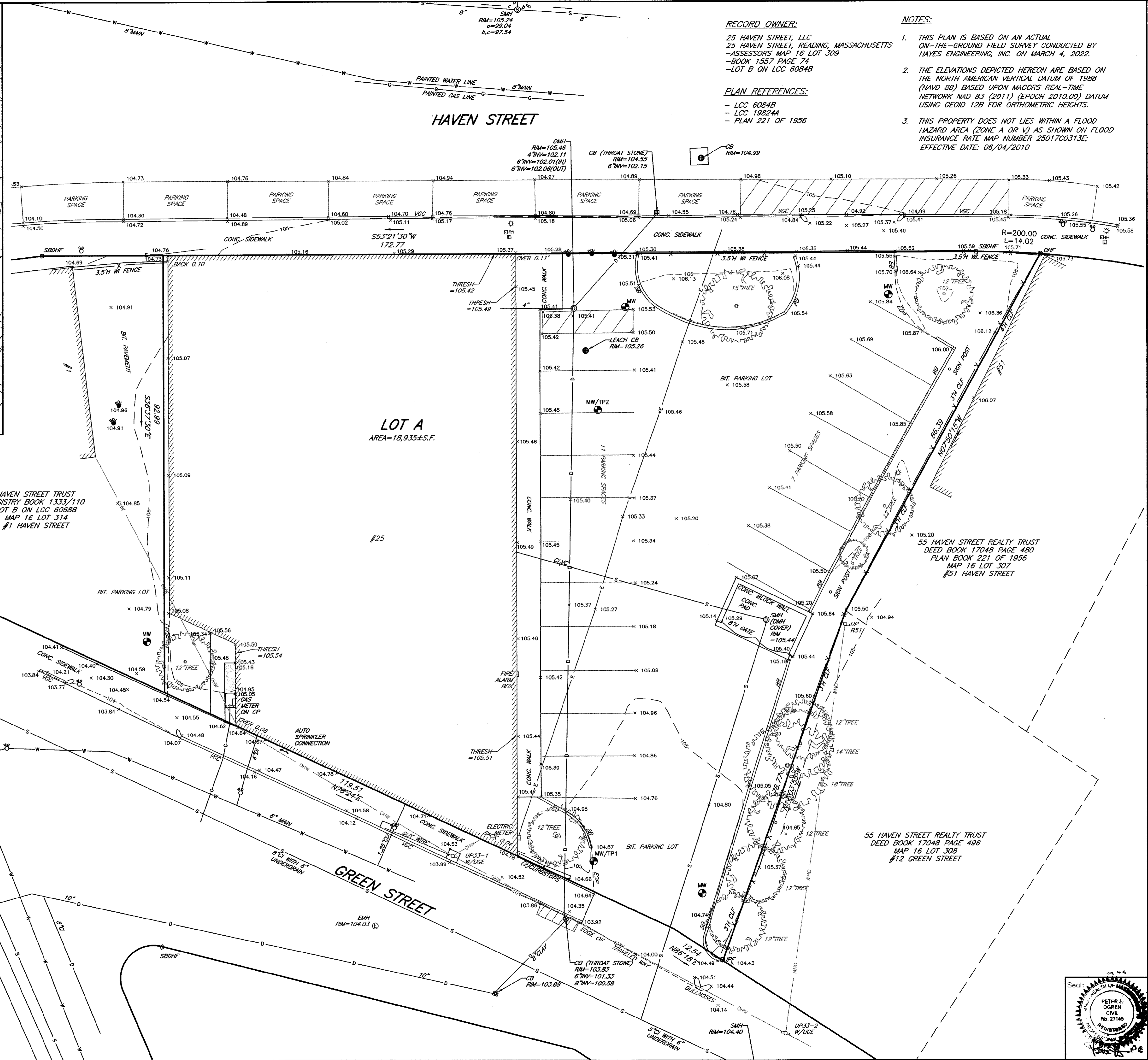
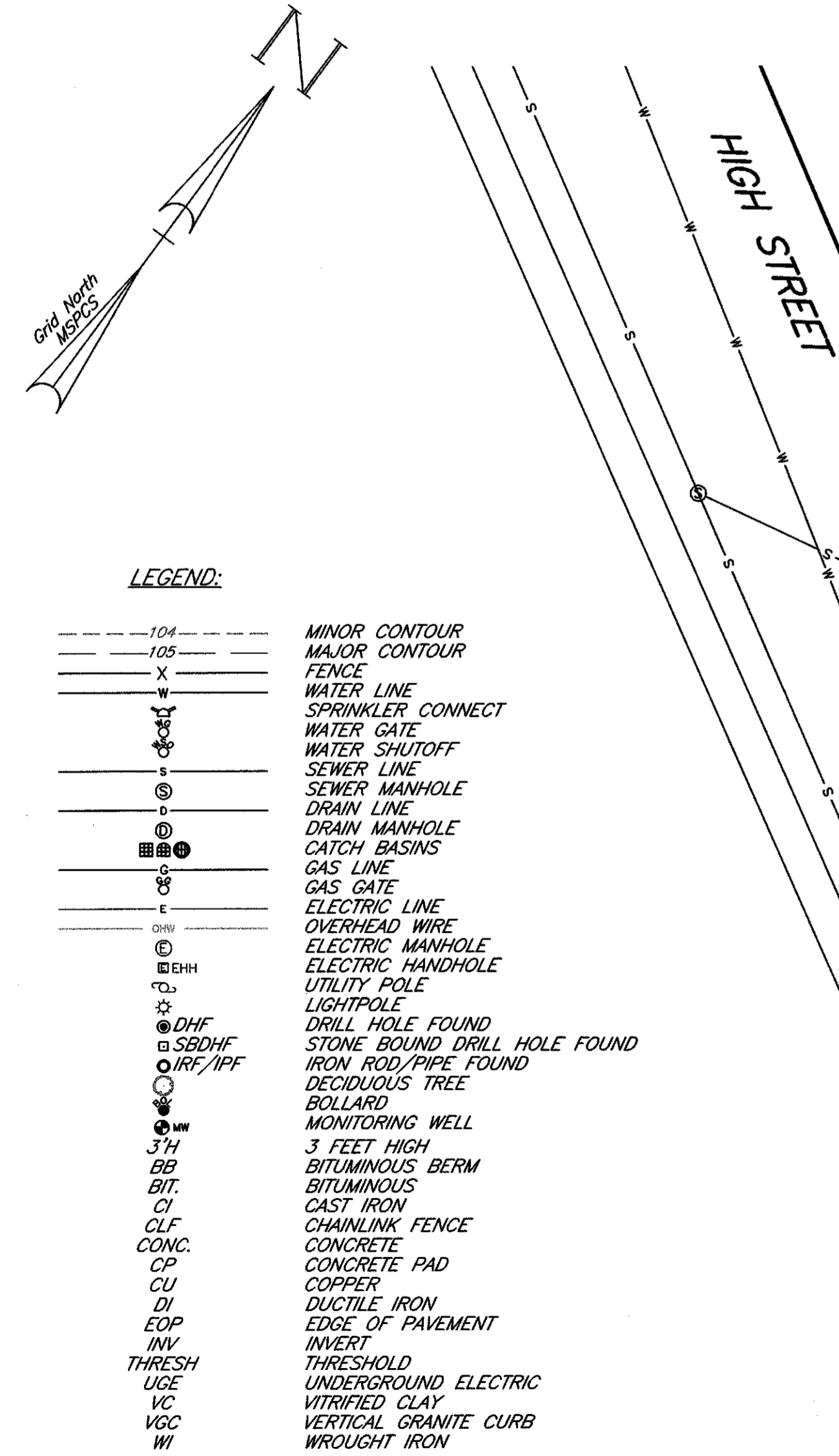


1422



LOCUS MAP:  
(1"=100')

STRUCTURES AND BOUNDARIES COMPILED FROM  
MASSMAPPER GIS INFORMATION



**RECORD OWNER:**  
25 HAVEN STREET, LLC  
25 HAVEN STREET, READING, MASSACHUSETTS  
-ASSESSORS MAP 16 LOT 309  
-BOOK 1557 PAGE 74  
-LOT B ON LCC 6084B

**PLAN REFERENCES:**  
- LCC 6084B  
- LCC 19824A  
- PLAN 221 OF 1956

**NOTES:**

- THIS PLAN IS BASED ON AN ACTUAL ON-THE-GROUND FIELD SURVEY CONDUCTED BY HAYES ENGINEERING, INC. ON MARCH 4, 2022.
- THE ELEVATIONS DEPICTED HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) BASED UPON MACORS REAL-TIME NETWORK NAD 83 (2011) (EPOCH 2010.00) DATUM USING GEOID 12B FOR ORTHOMETRIC HEIGHTS.
- THIS PROPERTY DOES NOT LIES WITHIN A FLOOD HAZARD AREA (ZONE A OR V) AS SHOWN ON FLOOD INSURANCE RATE MAP NUMBER 25017C0313E; EFFECTIVE DATE: 06/04/2010

Prepared For:  
25 HAVEN STREET, LLC  
25 HAVEN STREET, READING, MASSACHUSETTS  
REGISTRY BOOK 1557/74  
ASSESSORS MAP 16 LOT 309

Prepared By:  
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Design By: JC  
Drawn By: PJO  
Checked By: PJO  
Project File: REA-0419  
Comp. No: REA175  
 Issued For Permit  
 Issued For Review  
 Issued For Bid  
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 Not For Construction

No.	Revision	Date
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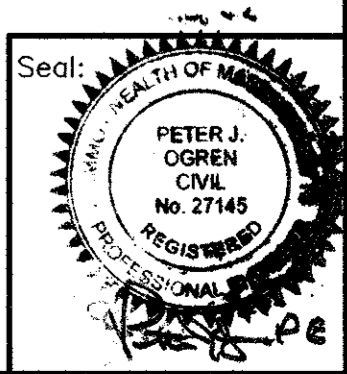
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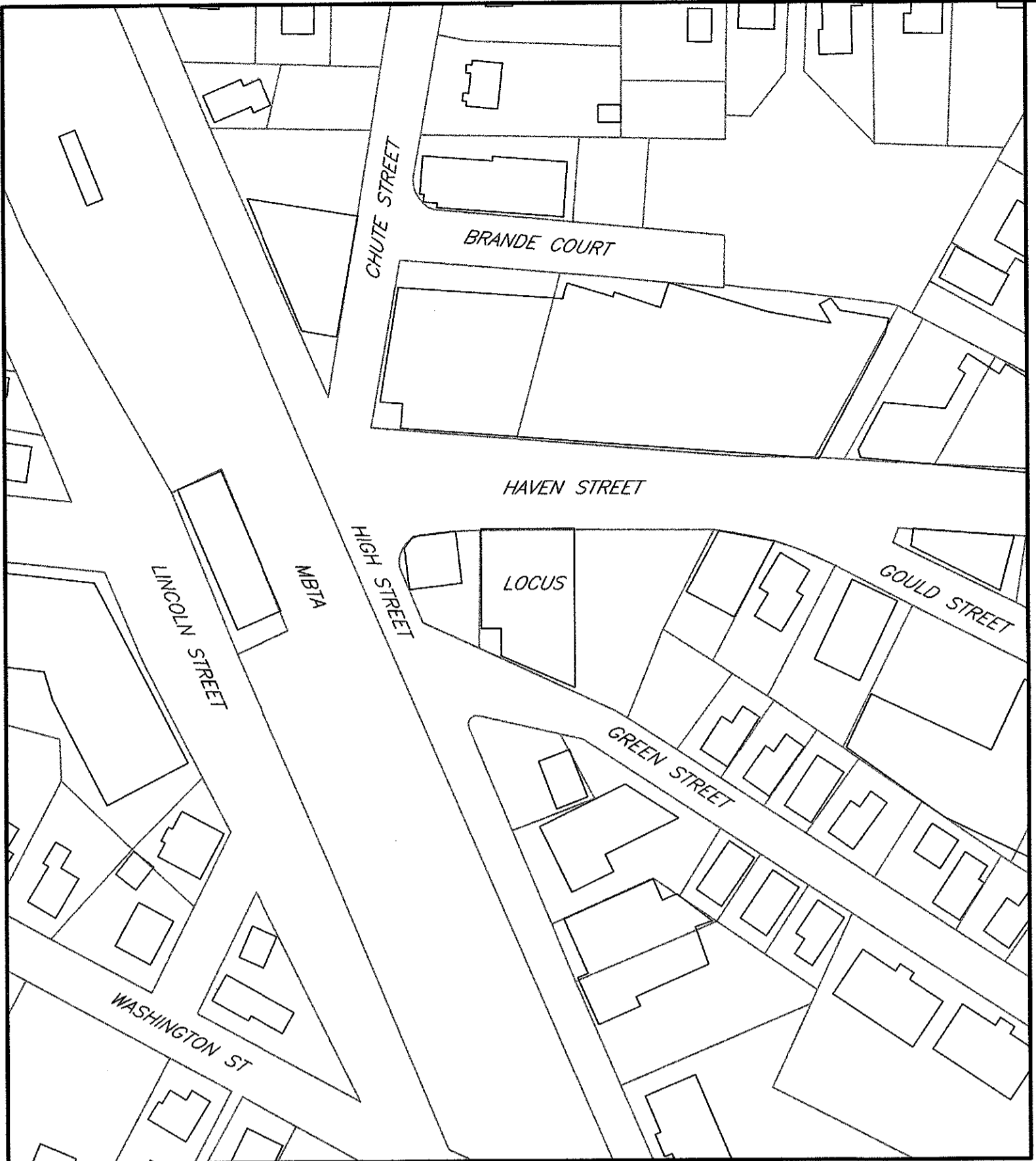
Date: November 22, 2022

Drawing Title:  
**EXISTING CONDITIONS PLAN  
25 HAVEN STREET  
MIXED-USE DEVELOPMENT  
READING, MASS.**

Drawing No.:  
**C2**

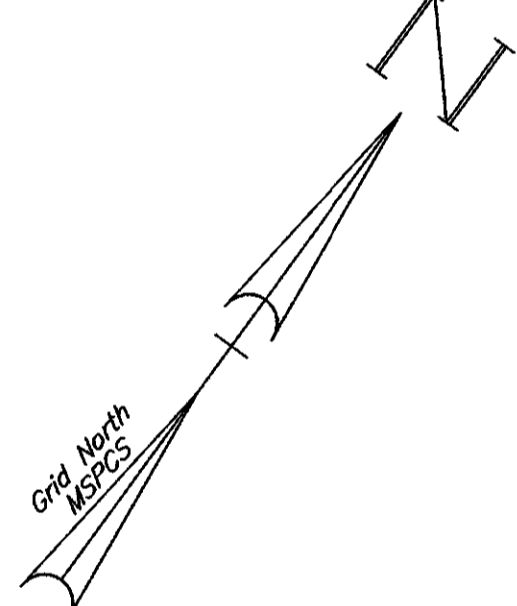
SHEET 2 OF 8





LOCUS MAP:  
(1"=100')

STRUCTURES AND BOUNDARIES COMPILED FROM  
MASSMAPPER GIS INFORMATION



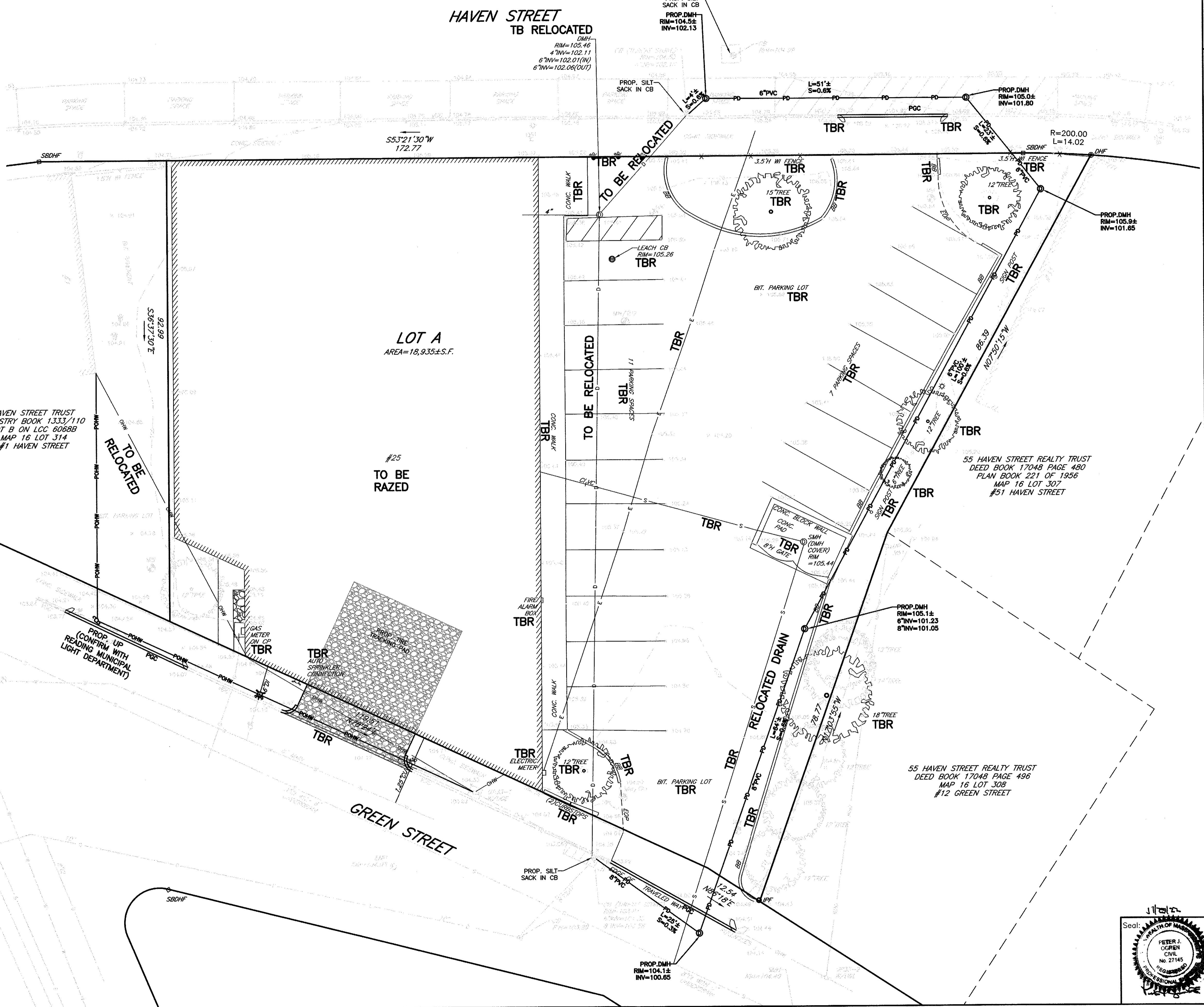
LEGEND:

- MINOR CONTOUR
- MAJOR CONTOUR
- FENCE
- WATER LINE
- SPRINKLER CONNECT
- WATER GATE
- WATER SHUTOFF
- SEWER LINE
- SEWER MANHOLE
- DRAIN LINE
- DRAIN MANHOLE
- CATCH BASINS
- GAS LINE
- GAS GATE
- ELECTRIC LINE
- OVERHEAD WIRE
- ELECTRIC MANHOLE
- ELECTRIC HANDHOLE
- UTILITY POLE
- LIGHTPOLE
- DRILL HOLE FOUND
- STONE BOUND DRILL HOLE FOUND
- IRON ROD/PIPE FOUND
- DECIDUOUS TREE
- BOLLARD
- MONITORING WELL
- 3' H
- BB
- BIT.
- CI
- CLF
- CONC.
- CP
- CU
- DI
- EOP
- INV
- THRESH
- UG
- VG
- VGC
- WI
- PD
- POW
- PGC
- TBR

HAVEN STREET TRUST  
REGISTRY BOOK 1333/110  
LOT B ON LCC 6068B  
MAP 16 LOT 314  
#1 HAVEN STREET

LOT A  
AREA=18,935±S.F.

#25  
TO BE RAZED

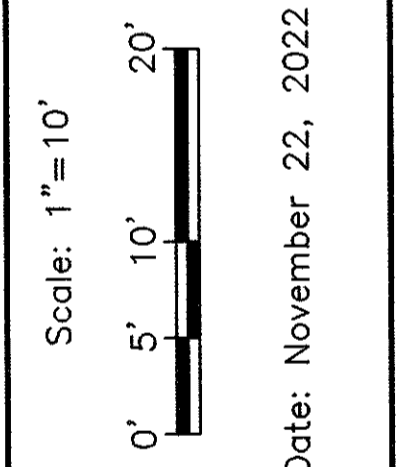


Prepared For:  
25 HAVEN STREET, LLC  
25 HAVEN STREET  
READING, MASSACHUSETTS  
REGISTRY BOOK 1557/74  
ASSESSORS MAP 16 LOT 309

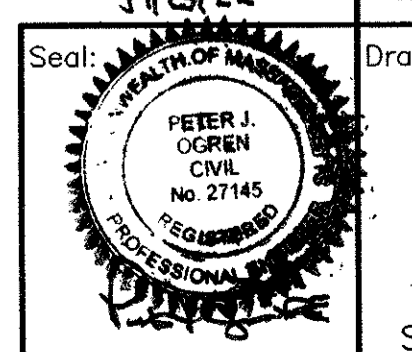
Prepared By:  
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603 Salem Street  
Wareham, MA 01980  
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Design By: JG  
Drawn By: JG  
Checked By: PJO  
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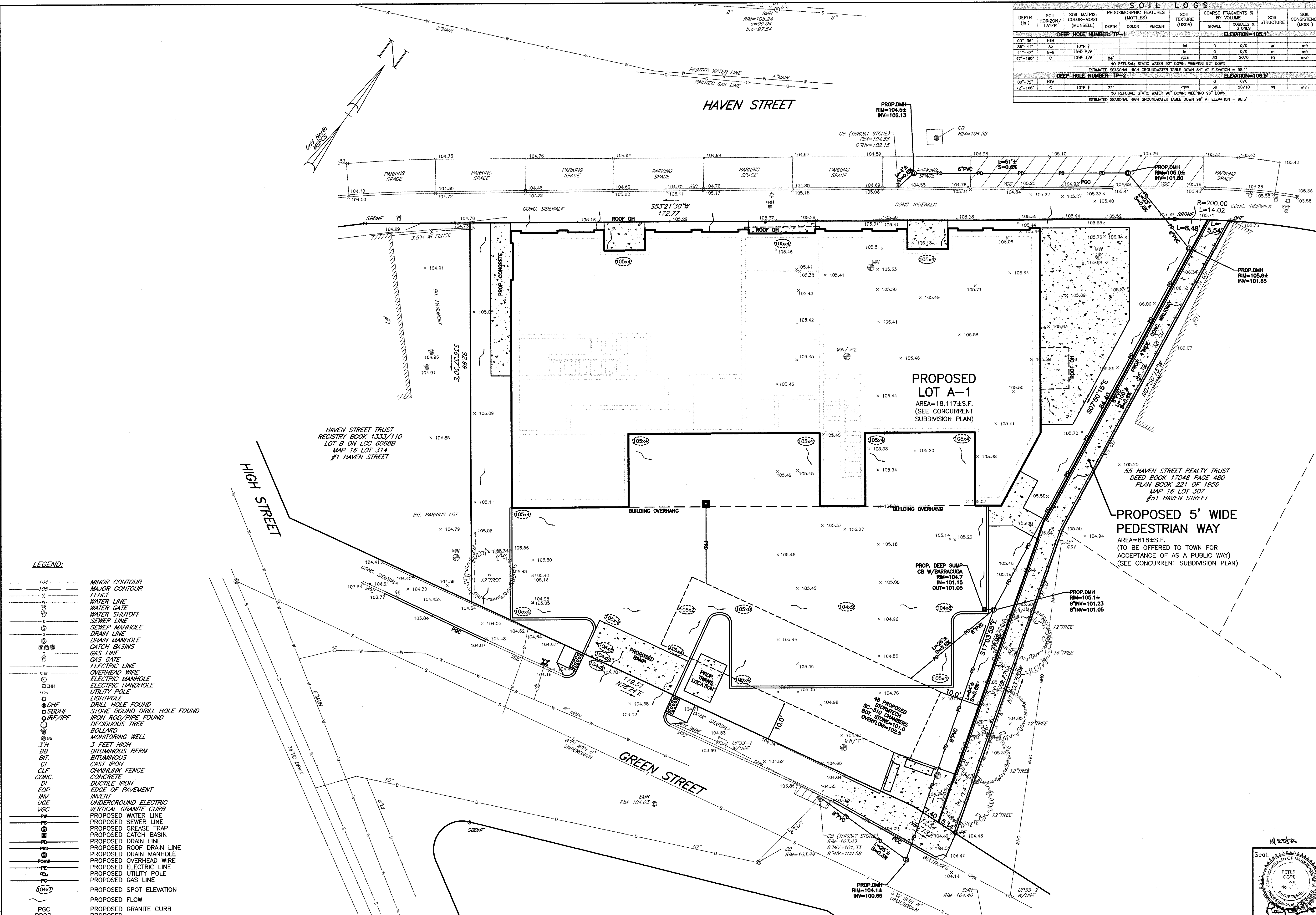


Drawing Title:  
**DEMOLITION & RELOCATION PLAN  
25 HAVEN STREET  
MIXED-USE DEVELOPMENT  
READING, MASS.**



Drawing No.:  
**C3**  
SHEET 3 OF 8





SOIL LOGS									
DEPTH (ft.)	SOIL HORIZON/LAYER	SOIL MATRIX: COLOR-MOIST (MUNSELL)	REDOXIMORPHIC FEATURES (MOTTLES)		SOIL TEXTURE (USDA)	COARSE FRAGMENTS % BY VOLUME (GRAVEL, TORRESILES & STONES)	SOIL STRUCTURE	SOIL CONSISTENCE (MOIST)	
			DEPTH	PERCENT					
DEEP HOLE NUMBER: TP-1 ELEVATION=105.1'									
00"-30"	HM				sl	0	0/0	gr	mfr
30"-41"	Ab				ls	0	0/0	m	mfr
41"-47"	Bwb				vs	30	20/0	sq	mfr
47"-180"	C			64"					
NO REFUSAL: STATIC WATER 92" DOWN; WEIRING 82" DOWN									
ESTIMATED SEASONAL HIGH GROUNDWATER TABLE DOWN 84" AT ELEVATION = 98.1'									
DEEP HOLE NUMBER: TP-2 ELEVATION=106.5'									
00"-72"	HM				vs	30	0/0	sq	mfr
72"-168"	C			72"			20/10	sq	
NO REFUSAL: STATIC WATER 94" DOWN; WEIRING 94" DOWN									
ESTIMATED SEASONAL HIGH GROUNDWATER TABLE DOWN 96" AT ELEVATION = 98.5'									

Prepared For:  
 25 HAVEN STREET, LLC  
 25 HAVEN STREET  
 READING, MASSACHUSETTS  
 REGISTRY BOOK 1557/74  
 ASSESSORS MAP 16 LOT 309

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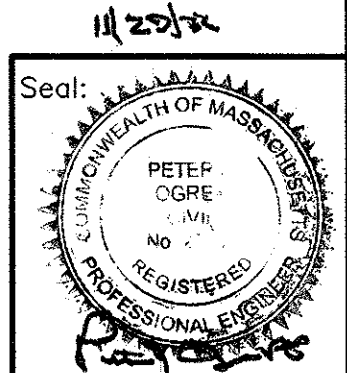
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 Date: November 22, 2022

Drawing Title:  
**GRADING AND DRAINAGE PLAN**  
 25 HAVEN STREET  
 MIXED-USE DEVELOPMENT  
 READING, MASS.


Drawing No.:  
**C5**

SHEET 5 OF 8

- LEGEND:**
- 104 --- MINOR CONTOUR
  - 105 --- MAJOR CONTOUR
  - X FENCE
  - W WATER LINE
  - W WATER GATE
  - W WATER SHUTOFF
  - S SEWER LINE
  - S SEWER MANHOLE
  - D DRAIN LINE
  - D DRAIN MANHOLE
  - C CATCH BASINS
  - G GAS LINE
  - G GAS GATE
  - E ELECTRIC LINE
  - OHV OVERHEAD WIRE
  - EMH ELECTRIC MANHOLE
  - EMH ELECTRIC HANDHOLE
  - U UTILITY POLE
  - L LIGHTPOLE
  - DH FOUND DRILL HOLE FOUND
  - SBDF FOUND STONE BOUND DRILL HOLE FOUND
  - IRP/IFP IRON ROD/PIPE FOUND
  - T TREE
  - B BOLLARD
  - MW MONITORING WELL
  - 3'H 3 FEET HIGH
  - BB BITUMINOUS BERM
  - BIT BITUMINOUS
  - CI CAST IRON CHAINLINK FENCE
  - CONC CONCRETE
  - DI DUCTILE IRON
  - EOP EDGE OF PAVEMENT
  - INV INVERT
  - UGE UNDERGROUND ELECTRIC
  - V VERTICAL GRANITE CURB
  - W PROPOSED WATER LINE
  - PS PROPOSED SEWER LINE
  - PT PROPOSED GREASE TRAP
  - PCB PROPOSED CATCH BASIN
  - PD PROPOSED DRAIN LINE
  - PRD PROPOSED ROOF DRAIN LINE
  - PDM PROPOSED DRAIN MANHOLE
  - PE PROPOSED OVERHEAD WIRE
  - PEL PROPOSED ELECTRIC LINE
  - PU PROPOSED UTILITY POLE
  - PG PROPOSED GAS LINE
  - PEV PROPOSED SPOT ELEVATION
  - PF PROPOSED FLOW
  - PGC PROPOSED GRANITE CURB
  - PROP. PROPOSED

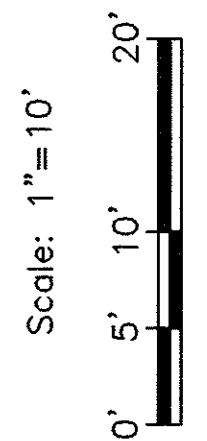


Prepared For:  
 25 HAVEN STREET, LLC  
 25 HAVEN STREET  
 READING, MASSACHUSETTS  
 REGISTRY BOOK 1557/74  
 ASSESSORS MAP 16 LOT 309

Prepared By:  
  
 Hayes Engineering, Inc.  
 603 Salem Street  
 Waltham, MA 01880  
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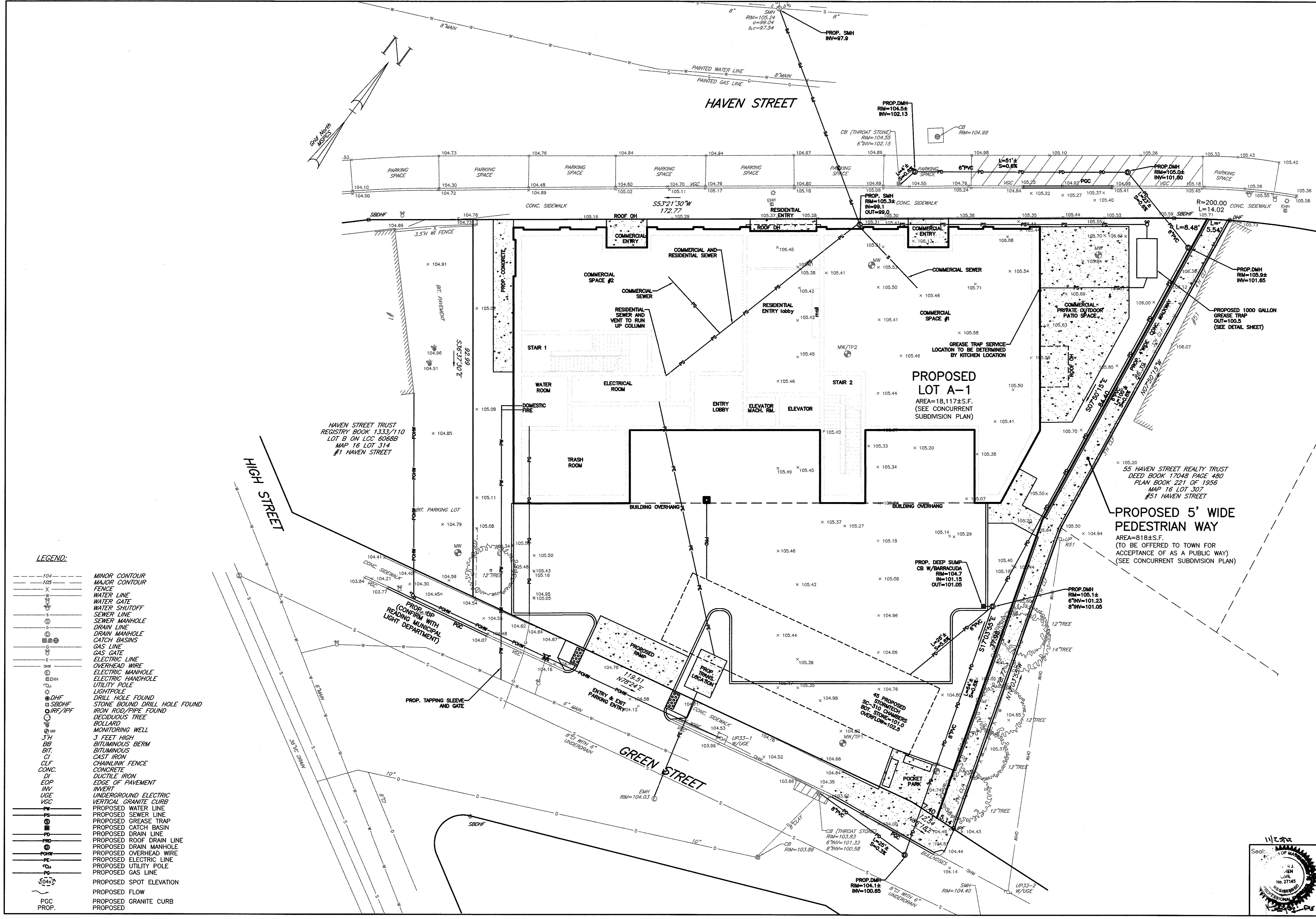
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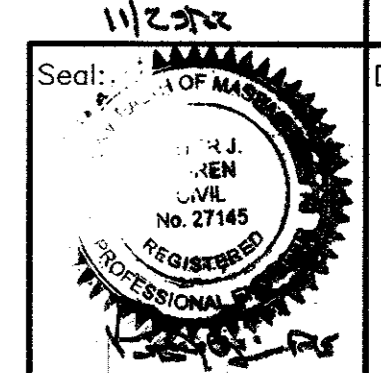
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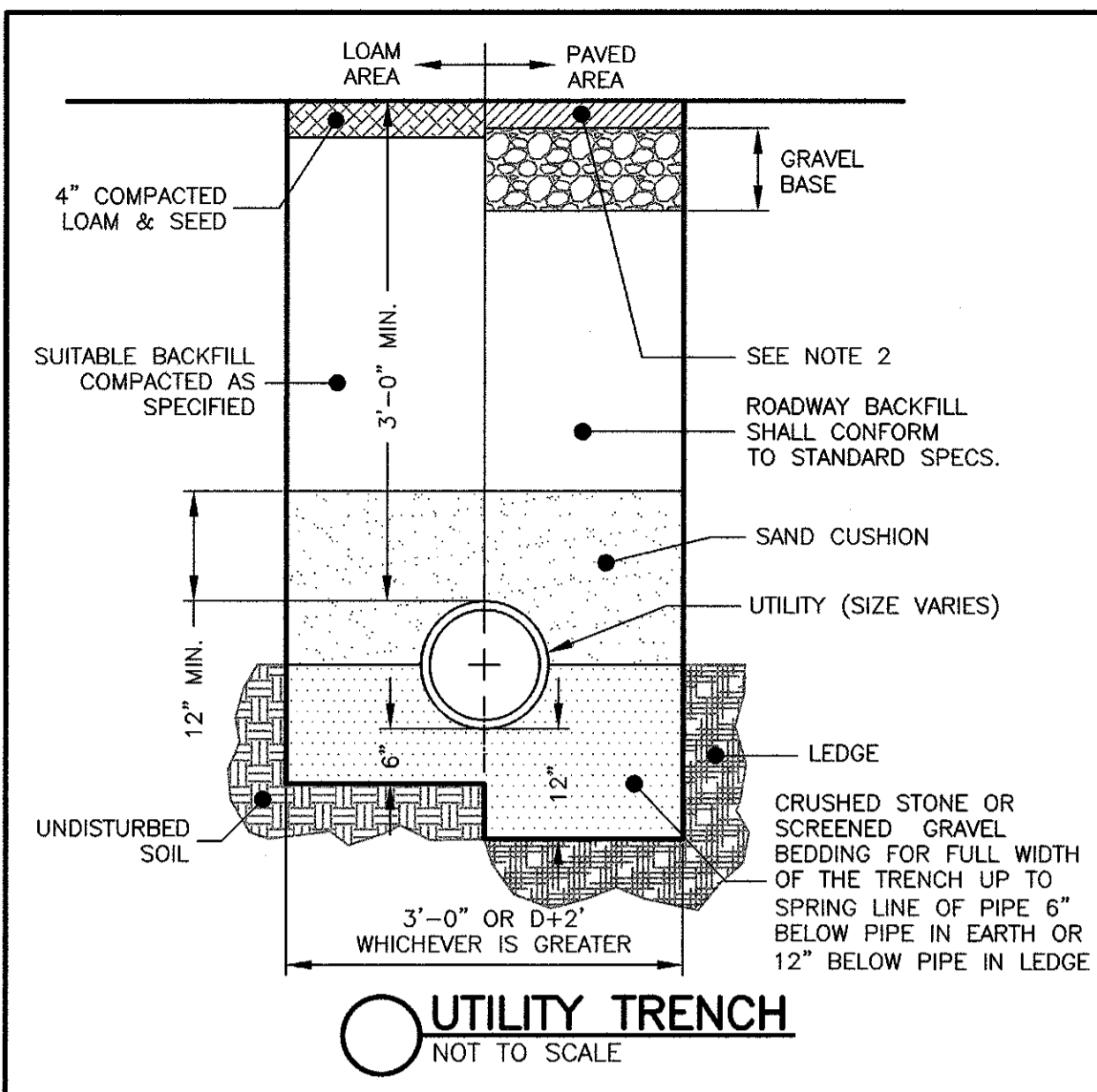
Drawing Title:  
 UTILITY PLAN  
 25 HAVEN STREET  
 MIXED-USE DEVELOPMENT  
 READING, MASS.

Drawing No.:  
 C6  
 SHEET 6 OF 8

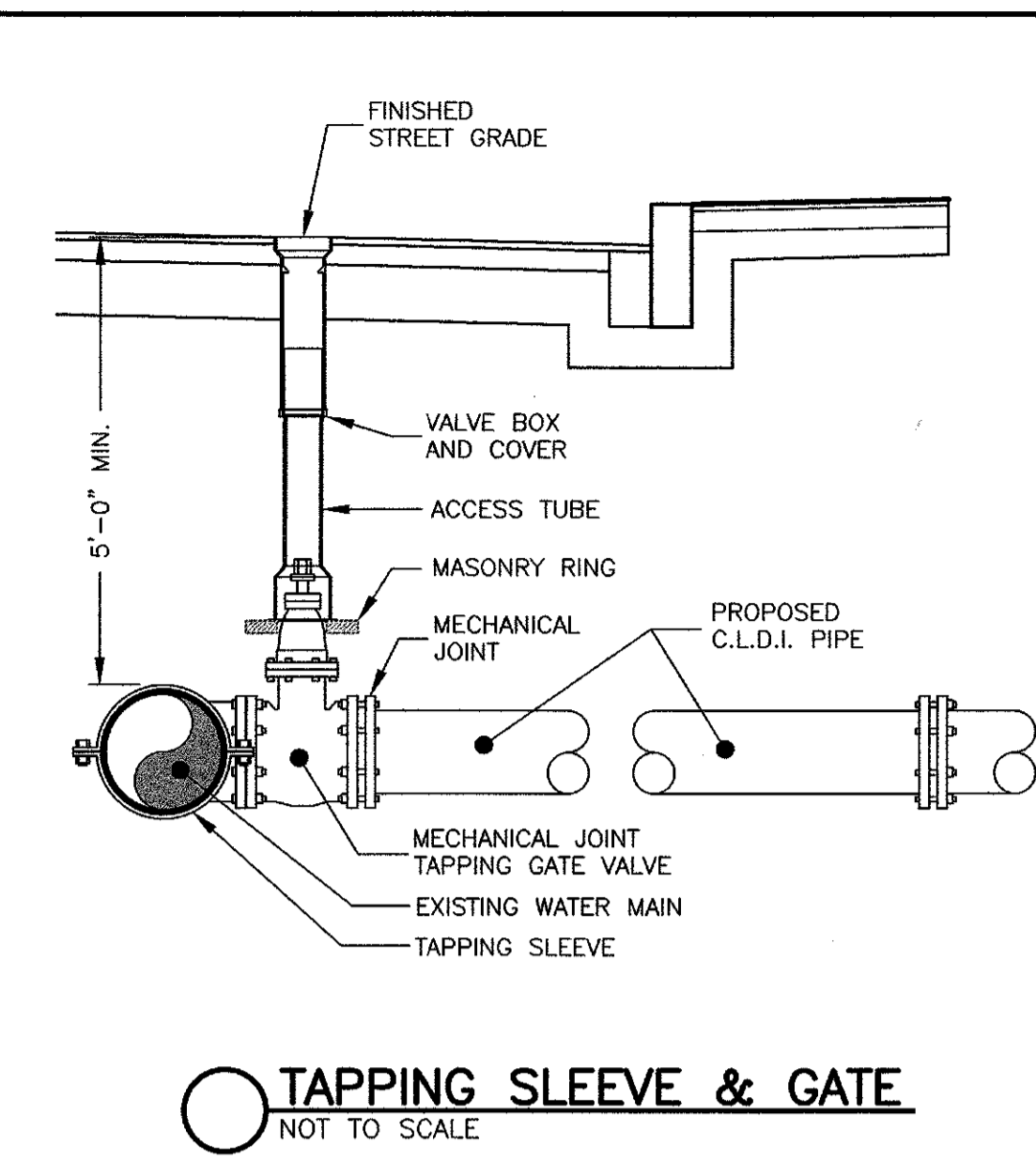


- LEGEND:**
- 104 --- MINOR CONTOUR
  - 105 --- MAJOR CONTOUR
  - FENCE
  - WATER LINE
  - WATER GATE
  - WATER SHUTOFF
  - SEWER LINE
  - SEWER MANHOLE
  - DRAIN LINE
  - DRAIN MANHOLE
  - CATCH BASIN
  - GAS LINE
  - GAS GATE
  - ELECTRIC LINE
  - OVERHEAD WIRE
  - ELECTRIC MANHOLE
  - ELECTRIC HANDHOLE
  - UTILITY POLE
  - LIGHTPOLE
  - DRILL HOLE FOUND
  - STONE BOUND DRILL HOLE FOUND
  - IRON ROD/PIPE FOUND
  - DECIDUOUS TREE
  - BOLLARD
  - MONITORING WELL
  - 3' H 3 FEET HIGH
  - BB BITUMINOUS BERM
  - BIT. BITUMINOUS
  - CI CAST IRON
  - CLF CHAINLINK FENCE
  - CONC. CONCRETE
  - DI DUCTILE IRON
  - EOP EDGE OF PAVEMENT
  - INV INVERT
  - UGE UNDERGROUND ELECTRIC
  - VGC VERTICAL GRANITE CURB
  - PW PROPOSED WATER LINE
  - PS PROPOSED SEWER LINE
  - GTS PROPOSED GREASE TRAP
  - CBS PROPOSED CATCH BASIN
  - PD PROPOSED DRAIN LINE
  - PMD PROPOSED DRAIN MANHOLE
  - POW PROPOSED OVERHEAD WIRE
  - PE PROPOSED ELECTRIC LINE
  - UP PROPOSED UTILITY POLE
  - G PROPOSED GAS LINE
  - 104± PROPOSED SPOT ELEVATION
  - PROPOSED FLOW
  - PGC PROPOSED GRANITE CURB
  - PROP. PROPOSED

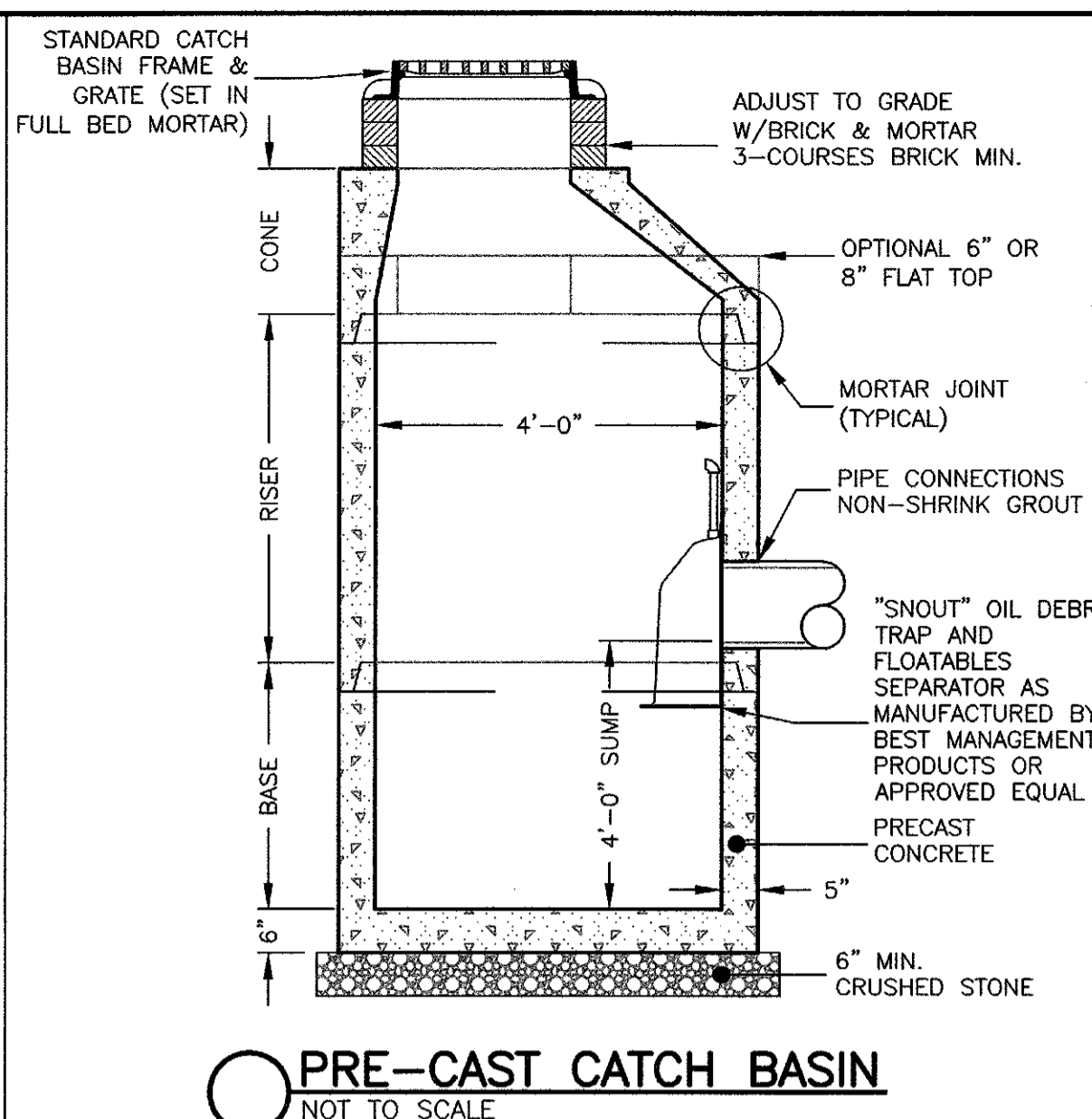




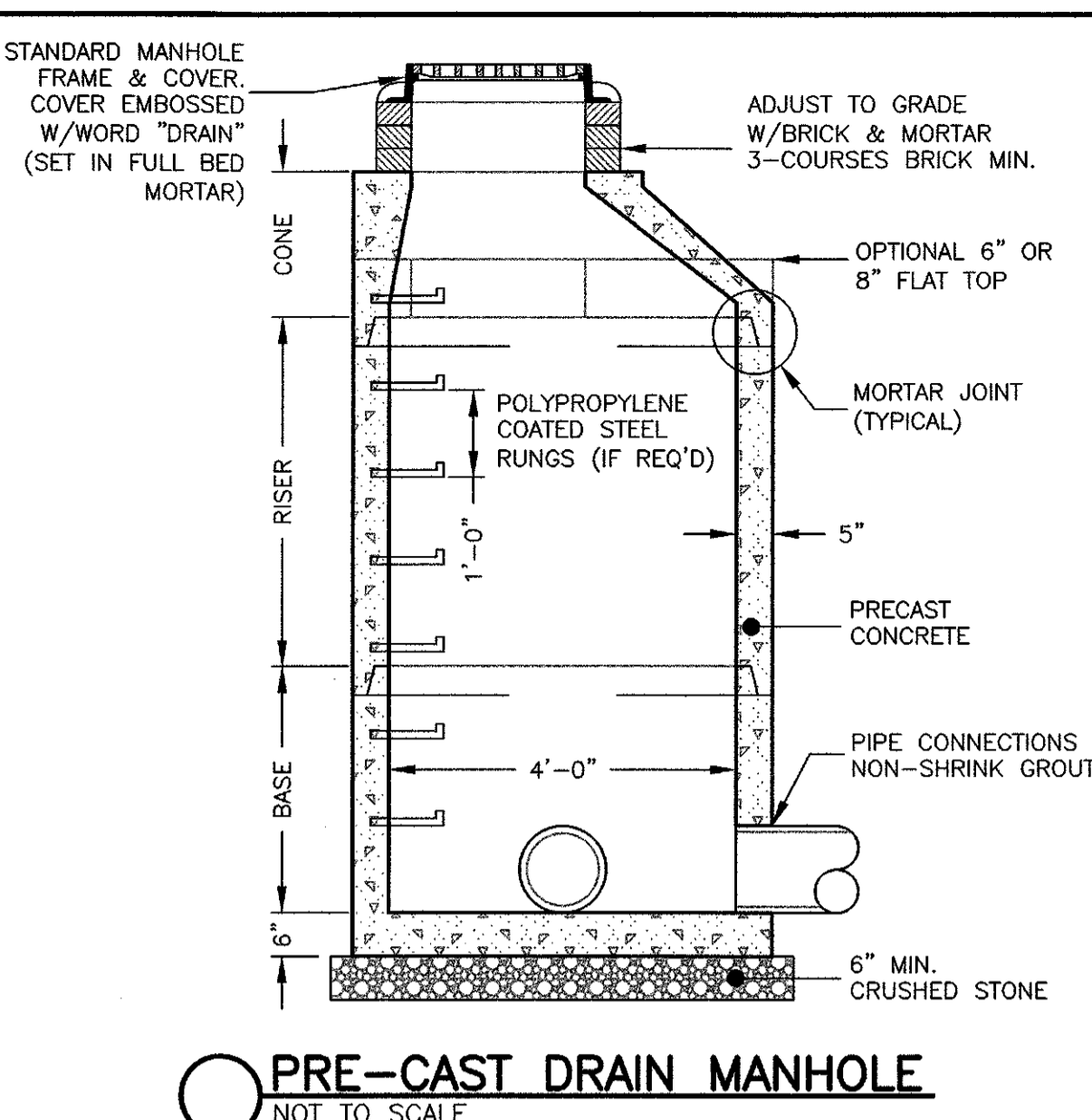
NOTES:  
 1. ALL MATERIAL SHALL CONFORM TO CITY/TOWN OF DEPARTMENT OF PUBLIC WORKS.  
 2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO CITY/TOWN SPECIFICATIONS.  
 3. IN LIEU OF THE 12" GRAVEL COURSE AND 4" OF CRUSHED GRAVEL, 18" OF CRUSHED GRAVEL OR RECLAIMED STABILIZED BASE MAY BE USED AS A BASE FOR THE PAVEMENT REPAIR.  
 4. MATERIAL SHALL BE REPLACED IN KIND WHENEVER POSSIBLE.  
 5. A MINIMUM 2' CUTBACK IS REQUIRED AT THE TOP OF THE TRENCH WALL OVER UNDISTURBED MATERIAL.



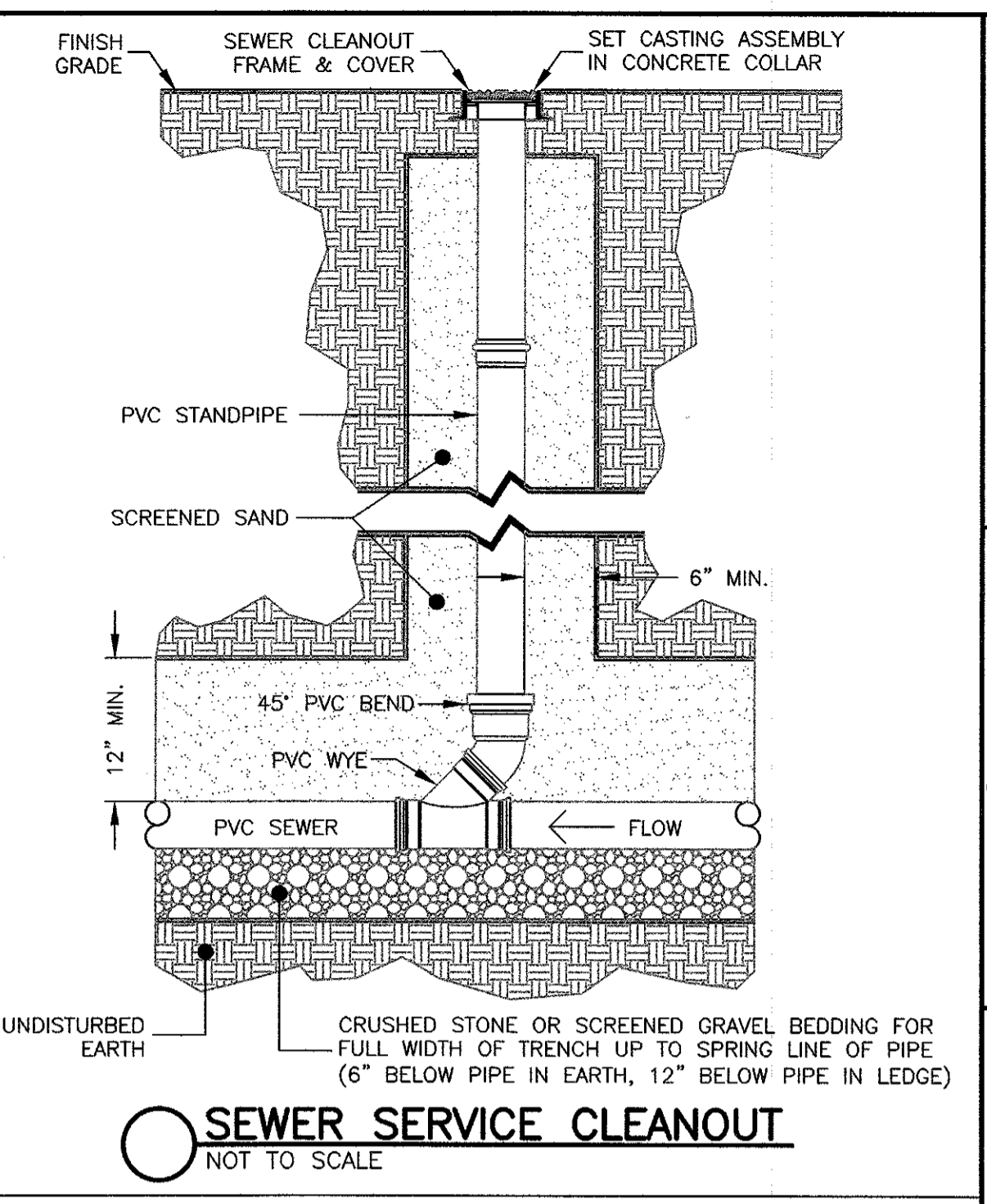
NOTES:  
 1. CONCRETE THRUST BLOCK TO BE USED ONLY WHERE IT WILL BEAR ON UNDISTURBED EARTH.  
 2. USE RESTRAINED JOINT FITTINGS OR TIE RODS WHERE CONCRETE THRUST BLOCK IS UNACCEPTABLE.  
 3. SIZE OF BLOCK OR MEGALUG TO BE DESIGNED FOR SPECIFIC CONDITIONS.



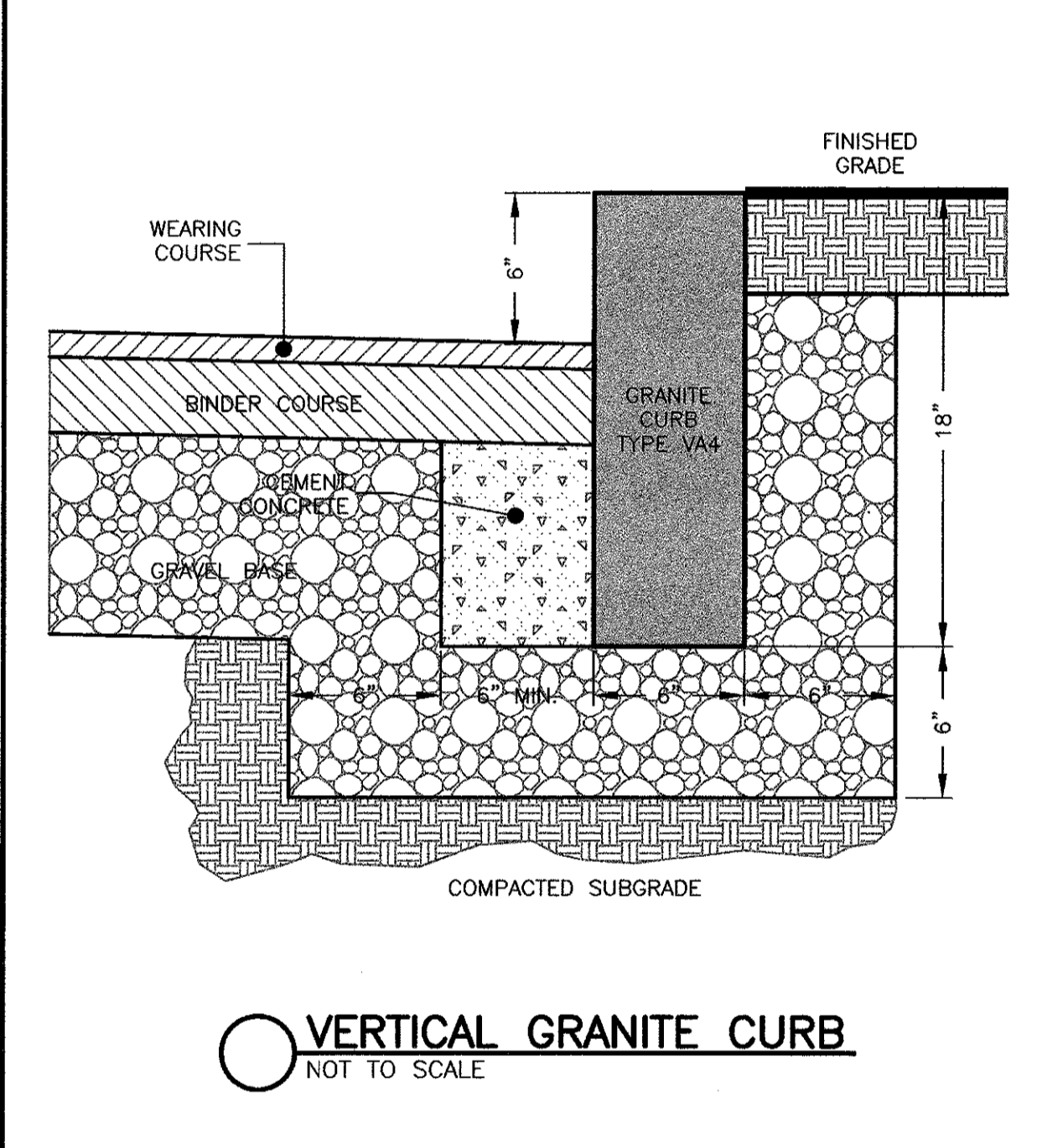
NOTES:  
 1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.  
 2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185 SPEC. 0.12 SQ. IN./LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.  
 3. H-20 DESIGN LOADING PER AASHTO HS-20-44; ASTM C478 SPEC FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."



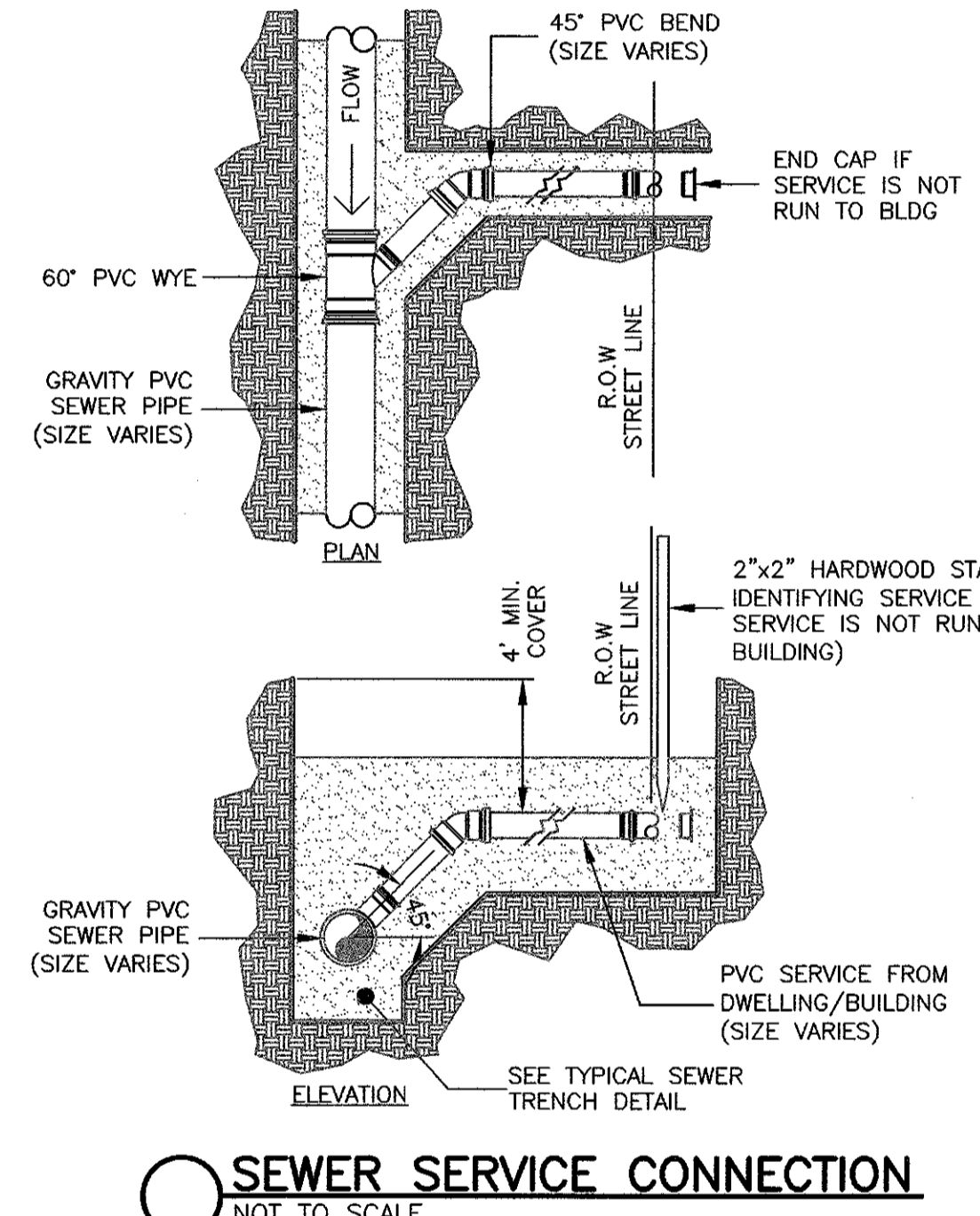
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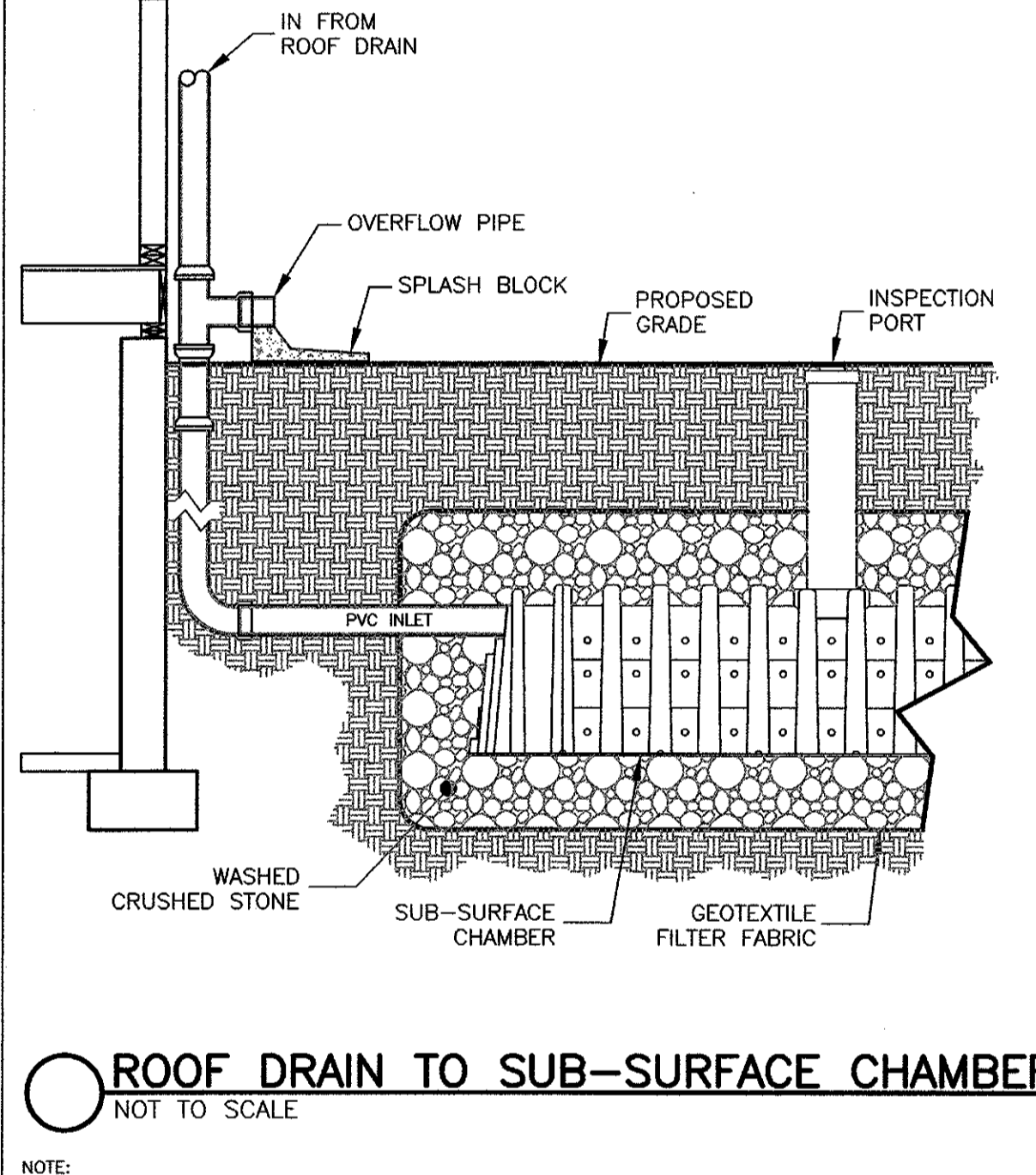
NOTES:  
 1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.  
 2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185 SPEC. 0.12 SQ. IN./LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.  
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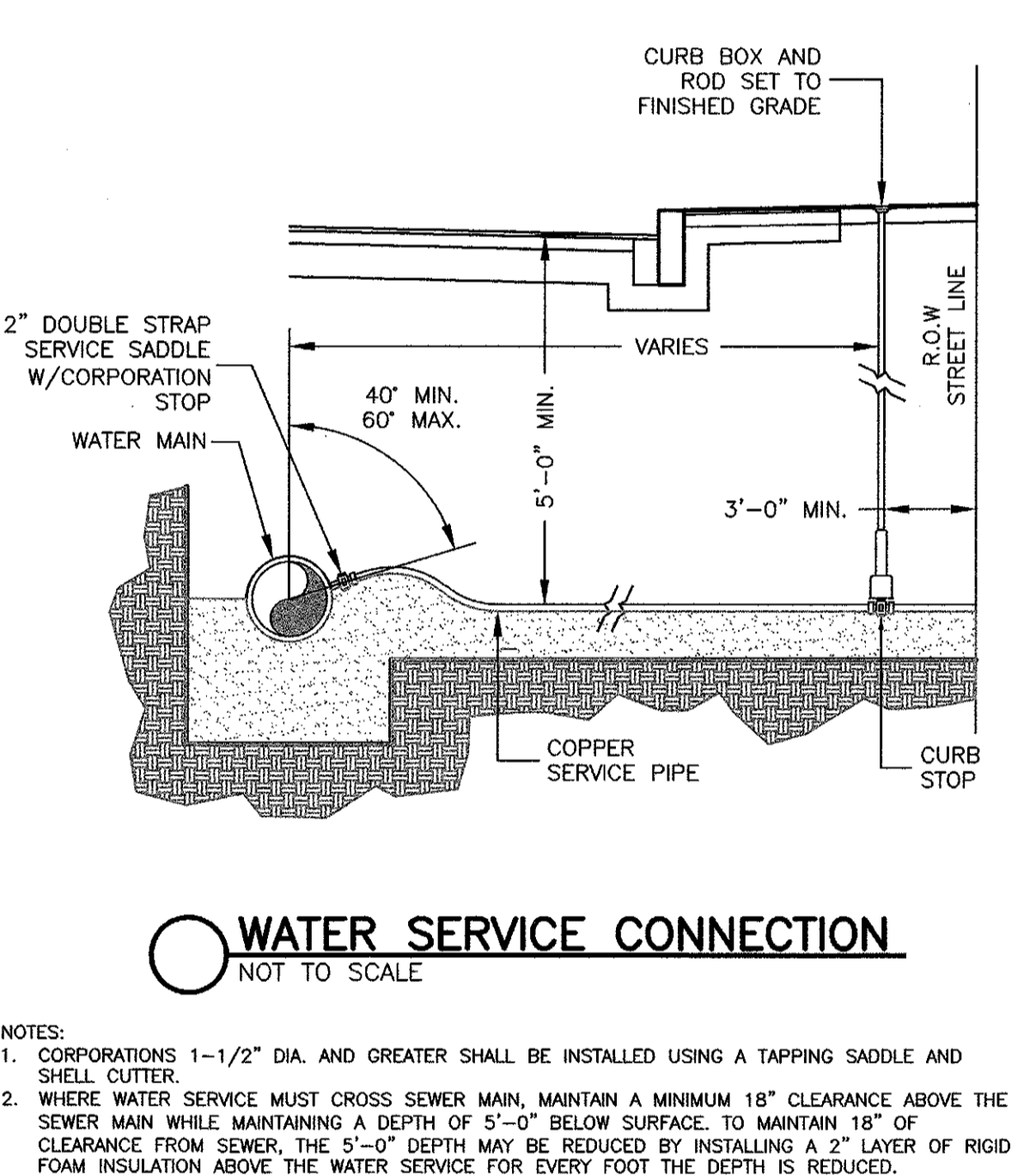
NOTES:  
 1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.  
 2. CONSTRUCTION OF GREASE TRAPS CONFORMS WITH 310 CMR, SECTION 15.00 DEP. TITLE 8 REFS.  
 3. ALL REINFORCEMENT PER ASTM C1222.  
 4. TEES AND BAFFLES SOLD SEPARATELY.  
 5. TONGUE & GROOVE JOINT SEALED WITH BUTYL RESIN.  
 6. DESIGNED FOR AASHTO HS-20 LOADING, 1 TO 5 FT COVER.



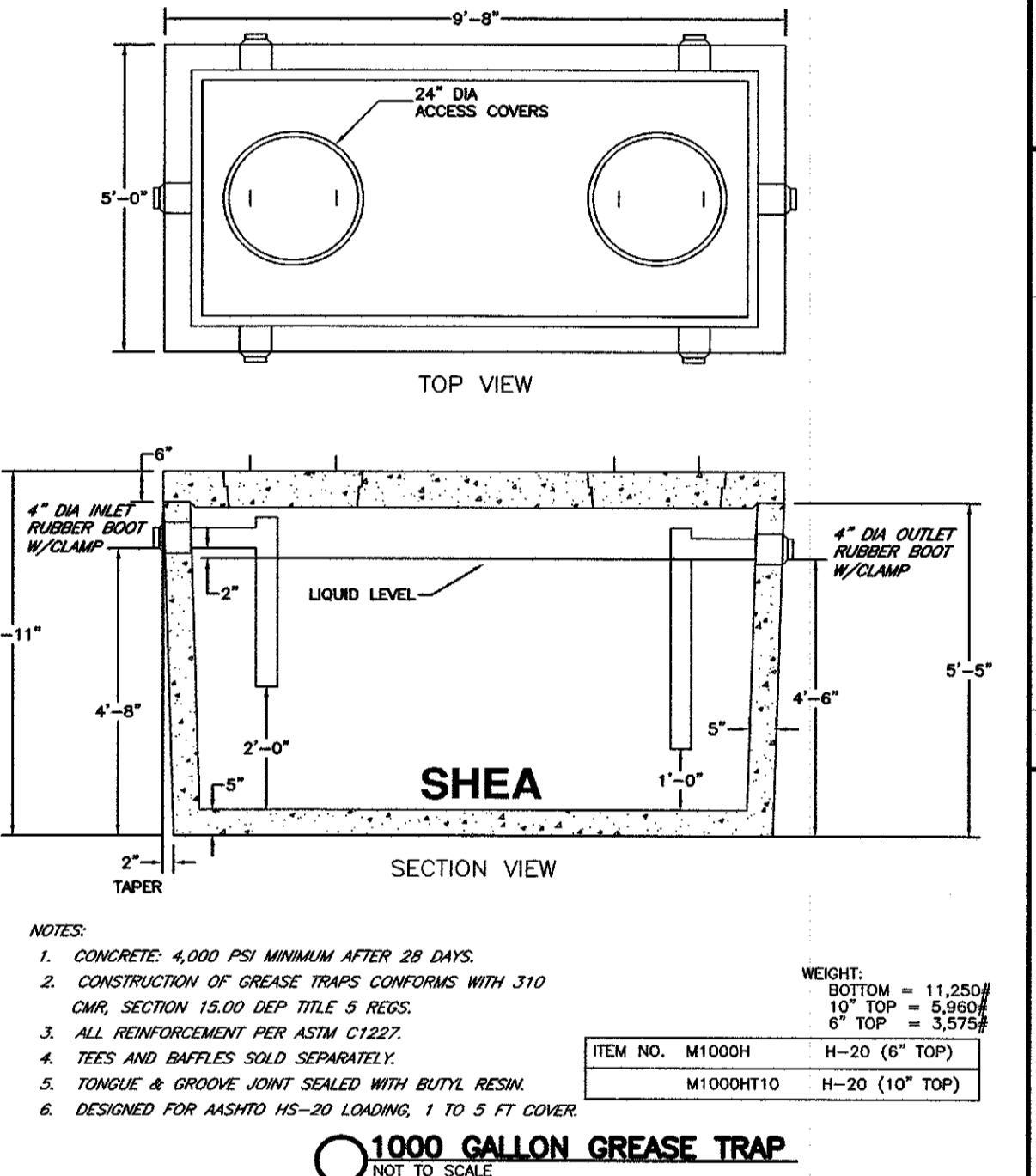
NOTES:  
 1. CHAMBERS SHALL BE INSTALLED A MINIMUM OF 10' FROM STRUCTURE.



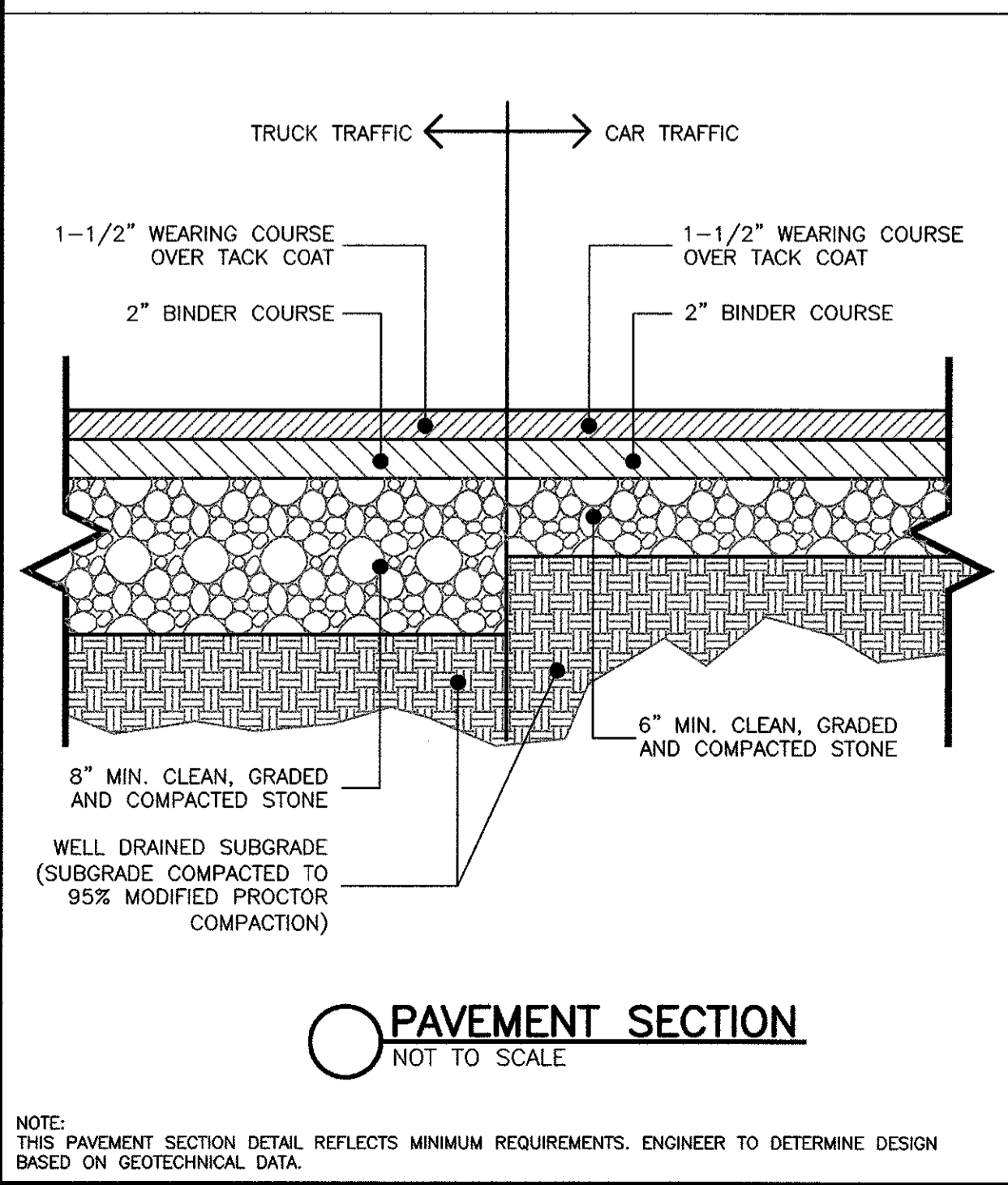
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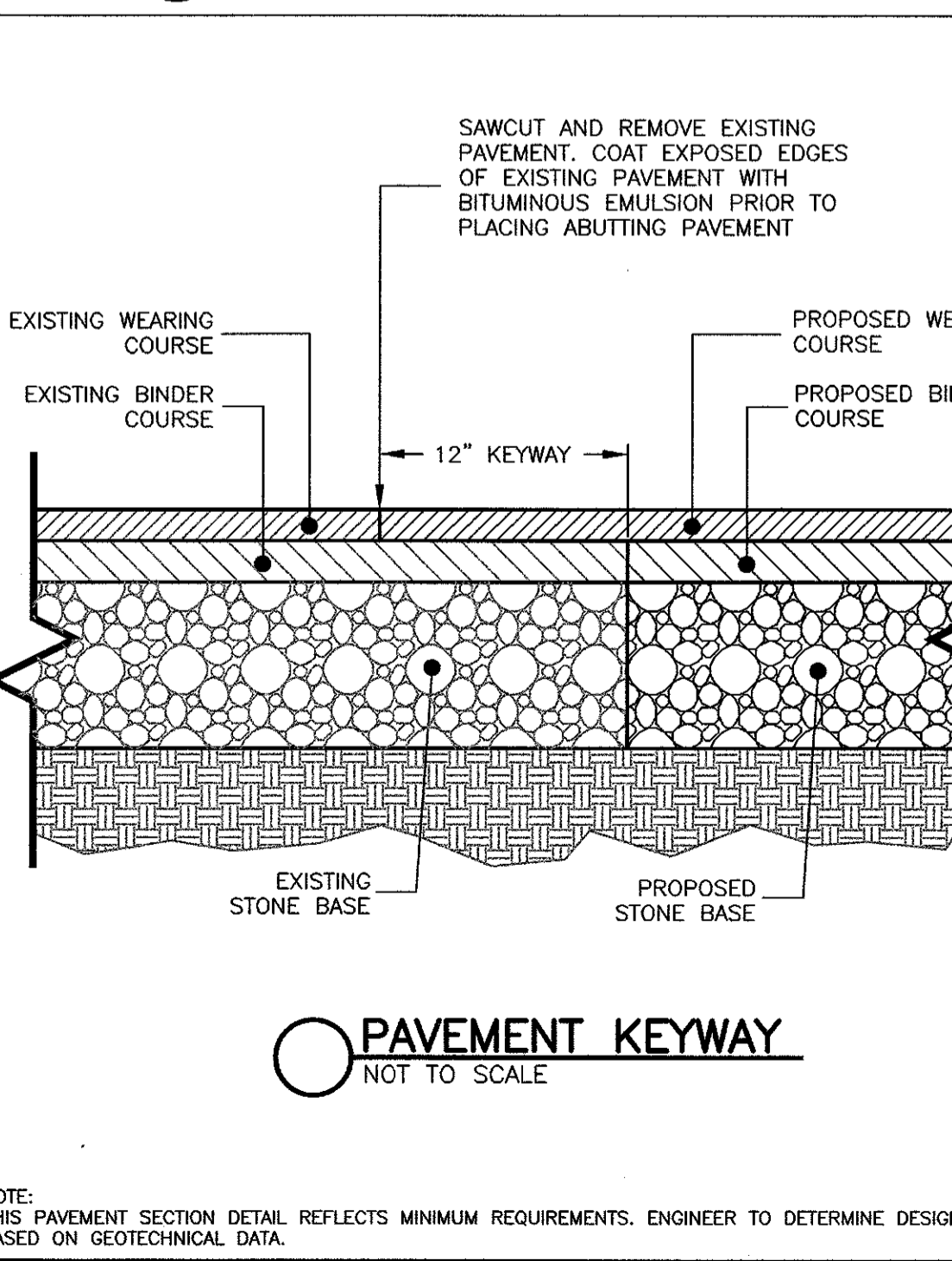
NOTES:  
 1. CORPORATIONS 1-1/2" DIA. AND GREATER SHALL BE INSTALLED USING A TAPPING SADDLE AND SHELL CUTTER.  
 2. WHERE WATER SERVICE MUST CROSS SEWER MAIN, MAINTAIN A MINIMUM 18" CLEARANCE ABOVE THE SEWER MAIN WHILE MAINTAINING A DEPTH OF 5'-0" BELOW SURFACE. TO MAINTAIN 18" OF CLEARANCE FROM SEWER, THE 5'-0" DEPTH MAY BE REDUCED BY INSTALLING A 2" LAYER OF RIGID FOAM INSULATION ABOVE THE WATER SERVICE FOR EVERY FOOT THE DEPTH IS REDUCED.  
 3. ACTUAL SERVICE LOCATIONS WILL BE DETERMINED IN FIELD TO SAVE SPECIMEN TREES.



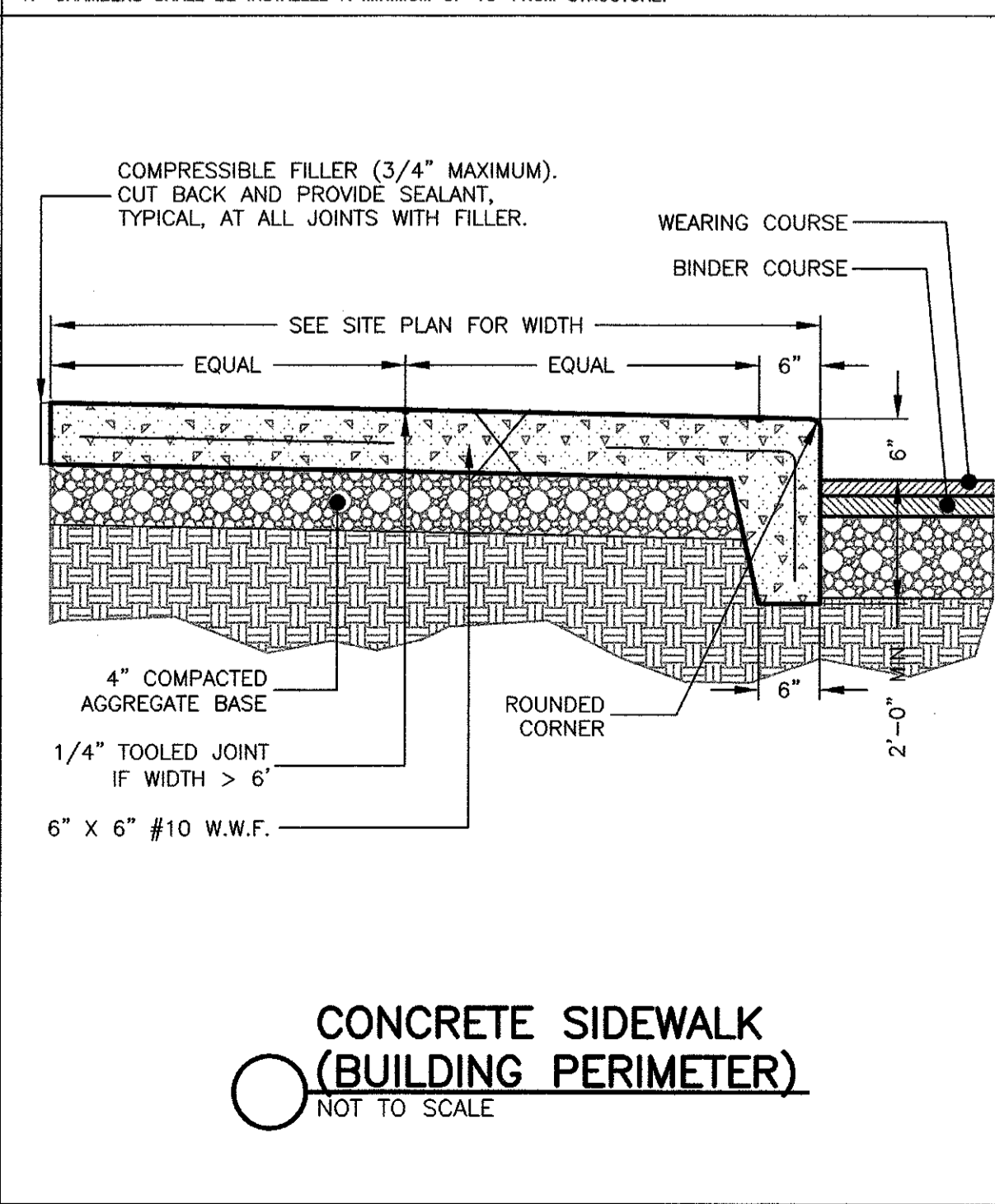
NOTES:  
 1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.  
 2. CONSTRUCTION OF GREASE TRAPS CONFORMS WITH 310 CMR, SECTION 15.00 DEP. TITLE 8 REFS.  
 3. ALL REINFORCEMENT PER ASTM C1222.  
 4. TEES AND BAFFLES SOLD SEPARATELY.  
 5. TONGUE & GROOVE JOINT SEALED WITH BUTYL RESIN.  
 6. DESIGNED FOR AASHTO HS-20 LOADING, 1 TO 5 FT COVER.



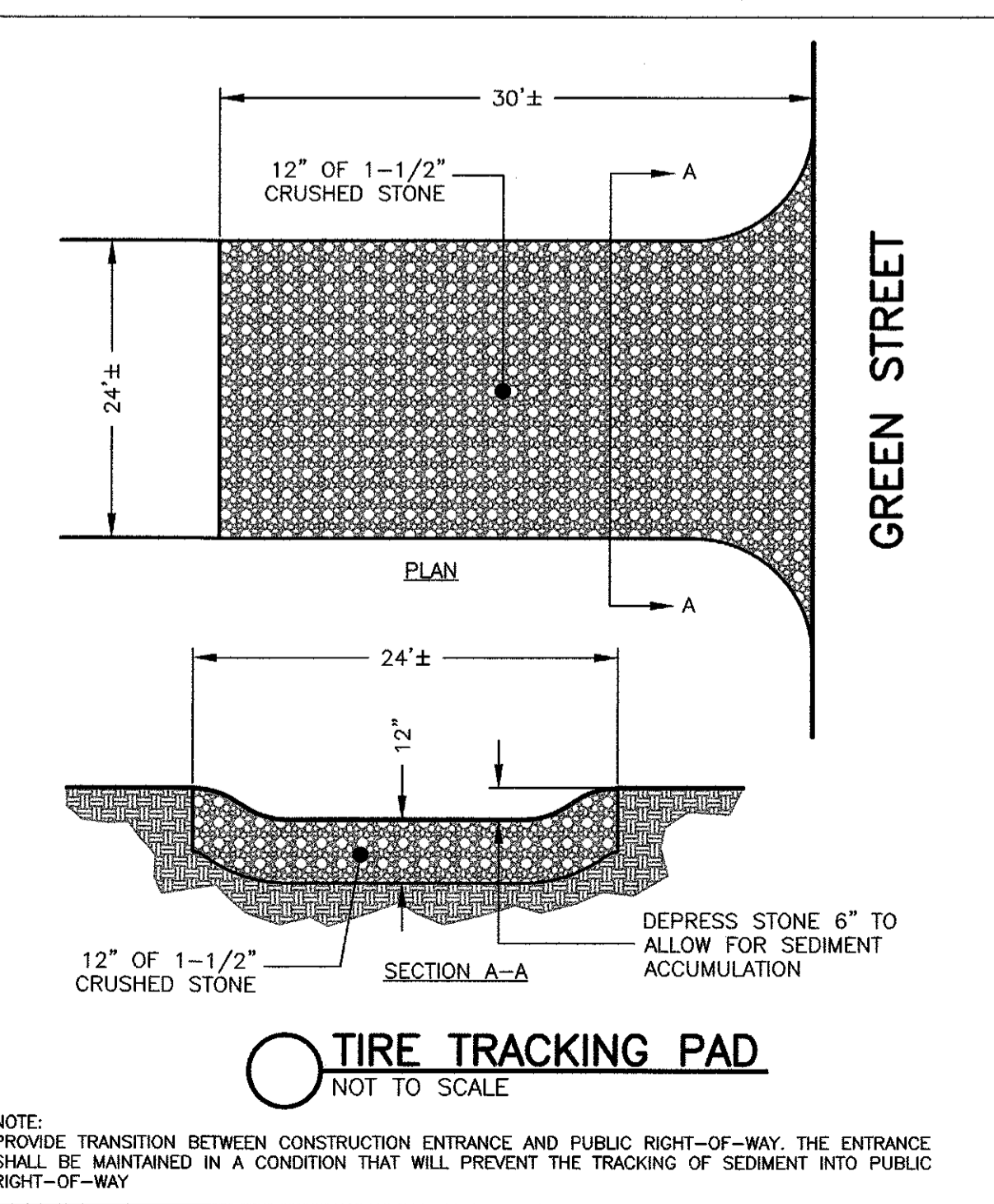
NOTE:  
 THIS PAVEMENT SECTION DETAIL REFLECTS MINIMUM REQUIREMENTS. ENGINEER TO DETERMINE DESIGN BASED ON GEOTECHNICAL DATA.



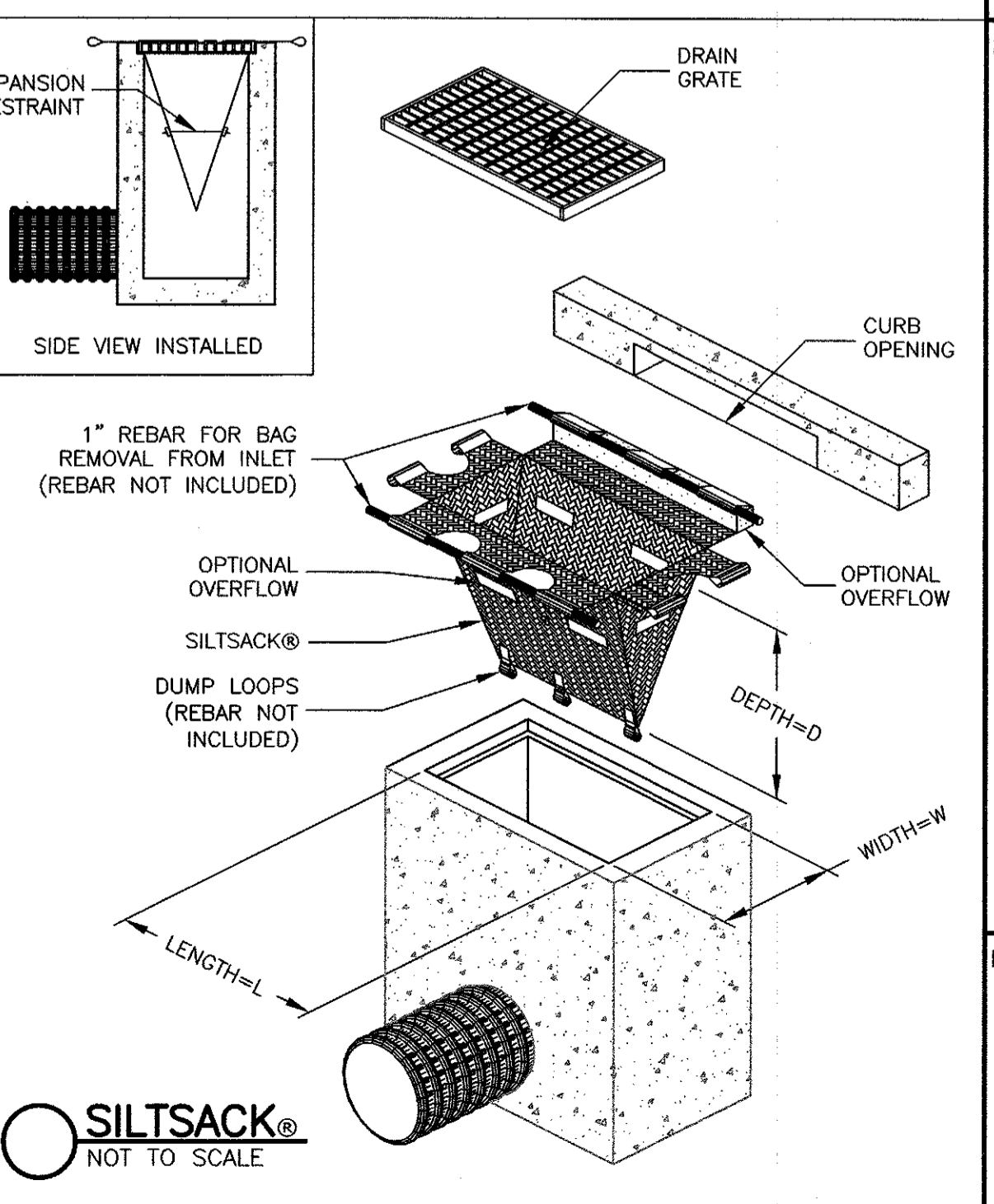
NOTE:  
 THIS PAVEMENT SECTION DETAIL REFLECTS MINIMUM REQUIREMENTS. ENGINEER TO DETERMINE DESIGN BASED ON GEOTECHNICAL DATA.



NOTE:  
 PROVIDE TRANSITION BETWEEN CONSTRUCTION ENTRANCE AND PUBLIC RIGHT-OF-WAY. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT THE TRACKING OF SEDIMENT INTO PUBLIC RIGHT-OF-WAY.



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Prepared For:  
 25 HAVEN STREET, LLC  
 25 HAVEN STREET  
 READING, MASSACHUSETTS  
 REGISTRY BOOK 1557/74  
 ASSESSORS MAP 16 LOT 309

Prepared By:  
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Scale: NOT TO SCALE  
 DATE: NOVEMBER 22, 2022

Drawing Title:  
 25 HAVEN STREET  
 MIXED-USE DEVELOPMENT  
 READING, MASS.

Drawing No.:  
 C7

SHEET 7 OF 8





### SC-310 STORMTECH CHAMBER SPECIFICATIONS

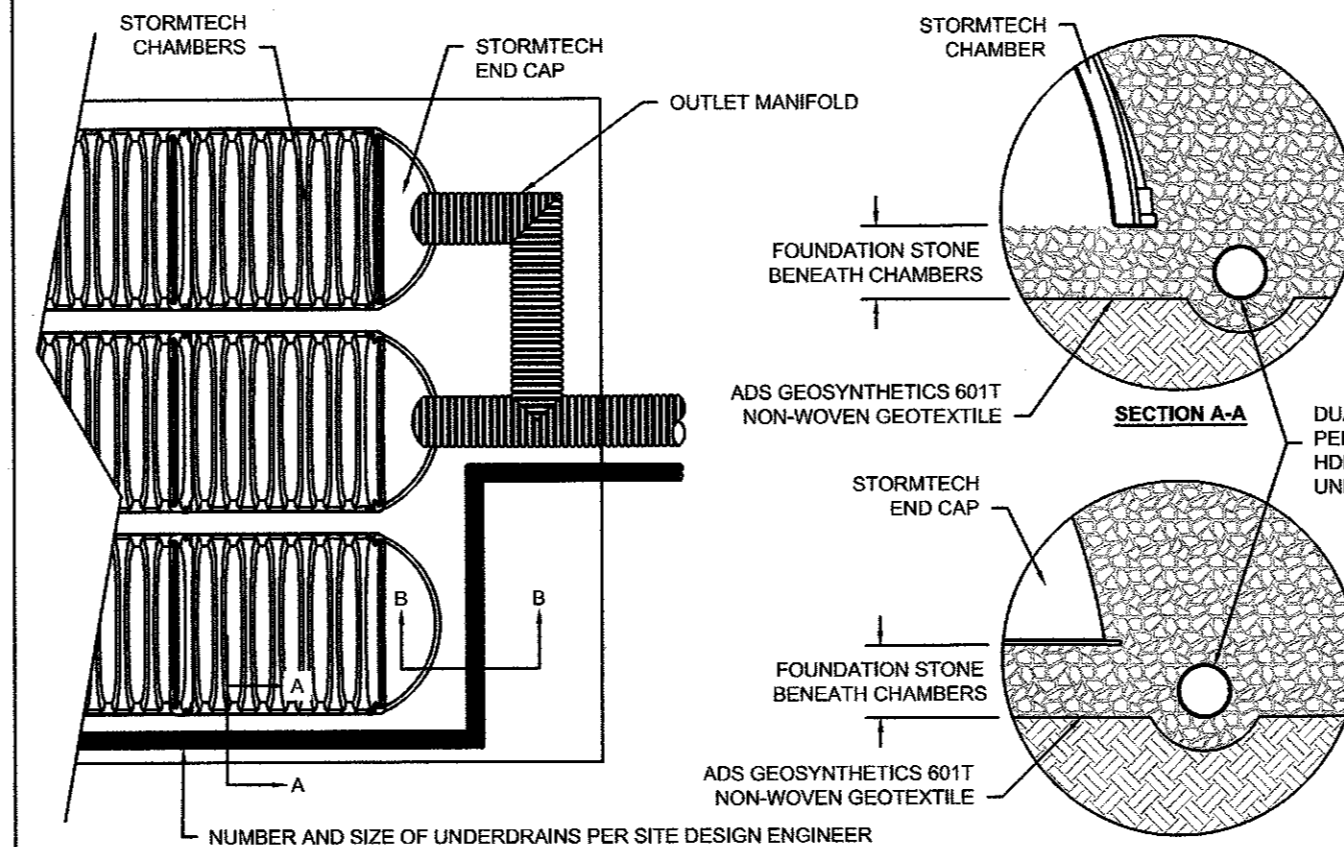
- CHAMBERS SHALL BE STORMTECH SC-310.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE OR POLYETHYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418-16a (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2922 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/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.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
  - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
  - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.36 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
  - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F922 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

### IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310 SYSTEM

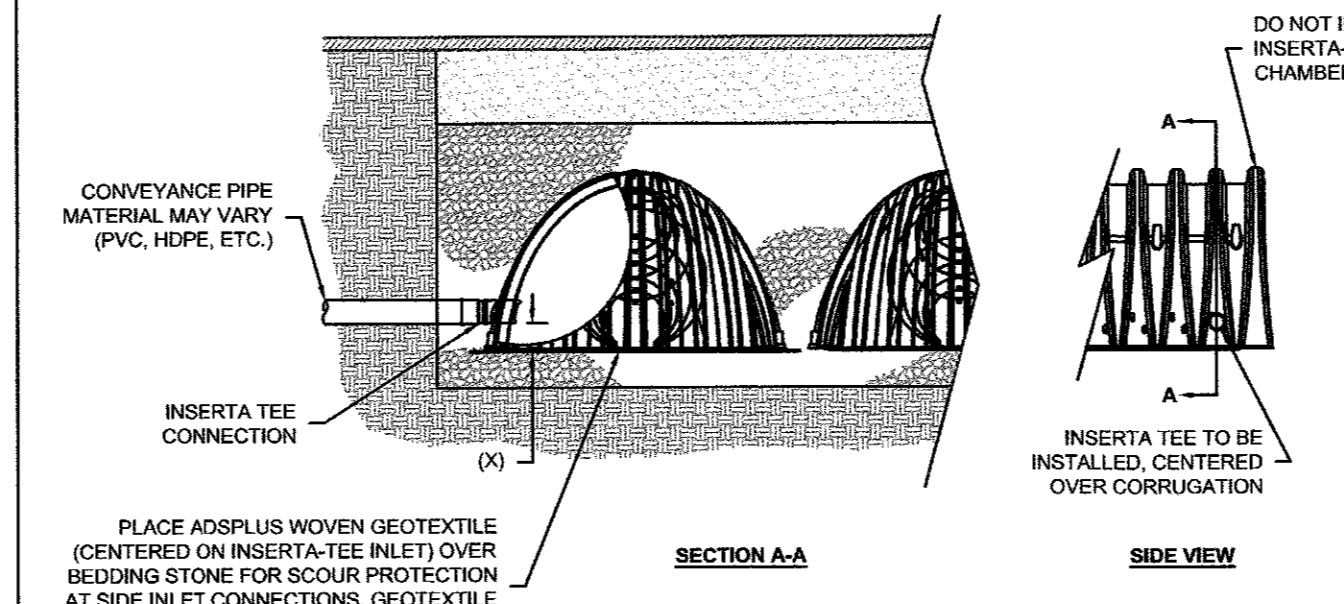
- STORMTECH SC-310 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
  - STONESHOTTER LOCATED OFF THE CHAMBER BED.
  - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
  - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELLED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING CHAMBERS.
- MAINTAIN MINIMUM -6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4" (20-50 mm).
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

### NOTES FOR CONSTRUCTION EQUIPMENT

- STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
  - THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
    - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
    - NO RUBBER Tired LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
    - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
  - FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.
- USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.
- CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.



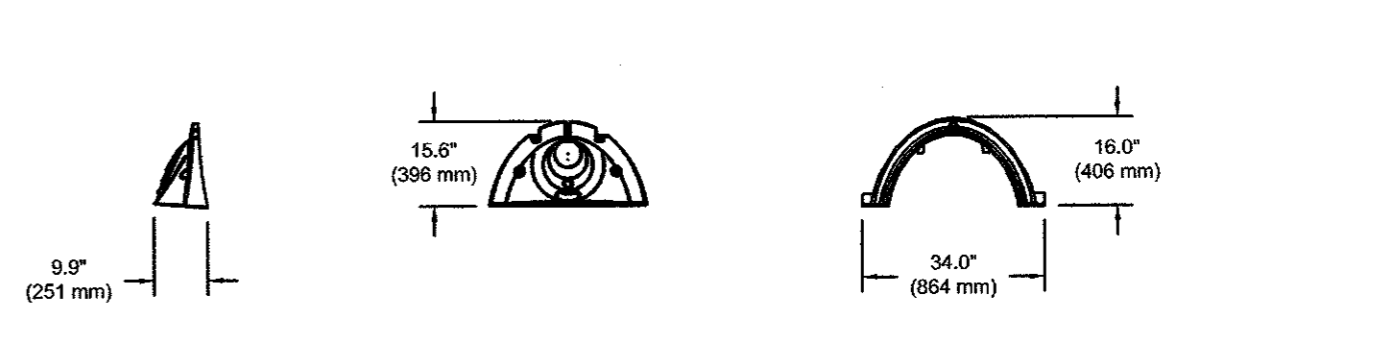
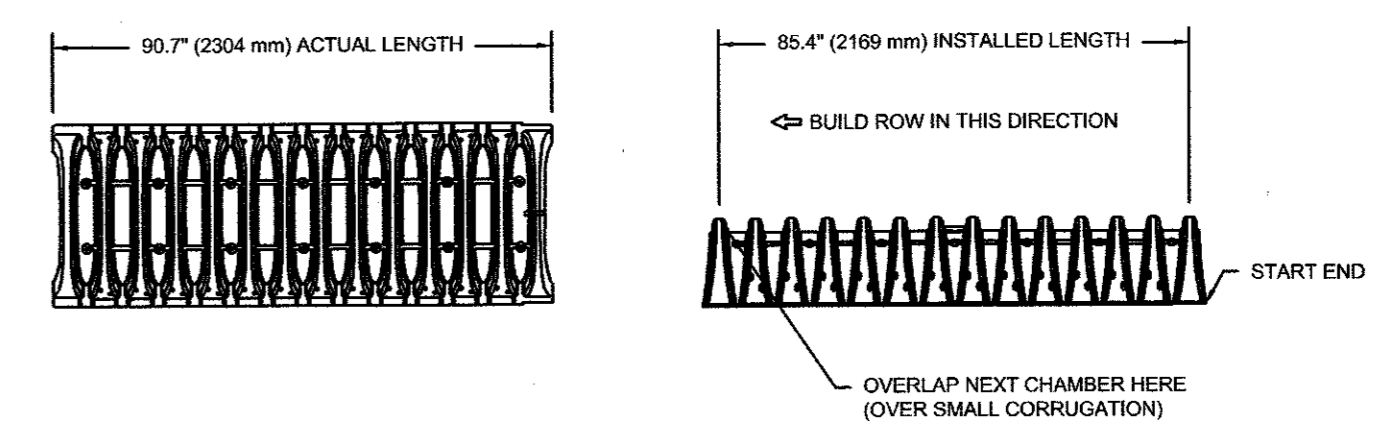
### 5 UNDERDRAIN DETAIL



CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	6" (150 mm)

NOTE: PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.

### 6 INSERTA-TEE SIDE INLET DETAIL



**NOMINAL CHAMBER SPECIFICATIONS**

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

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



PRE-FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "6R"  
PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"  
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"  
PRE-CORDED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC310EPEDT / SC310EPE06TFC	6" (150 mm)	9.6" (244 mm)	5.8" (147 mm)	—
SC310EPE08B / SC310EPE08BFC	8" (200 mm)	11.9" (302 mm)	3.5" (89 mm)	0.5" (13 mm)
SC310EPE08T / SC310EPE08TFC	8" (200 mm)	11.9" (302 mm)	—	0.8" (19 mm)
SC310EPE10B / SC310EPE10BFC	10" (250 mm)	12.7" (323 mm)	1.4" (36 mm)	—
SC310EPE10T / SC310EPE10TFC	10" (250 mm)	12.7" (323 mm)	—	0.7" (18 mm)
SC310EPE12B / SC310EPE12BFC	12" (300 mm)	13.5" (343 mm)	—	0.9" (23 mm)
SC310EPE12T / SC310EPE12TFC	12" (300 mm)	13.5" (343 mm)	—	0.9" (23 mm)

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

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

NOTE: ALL DIMENSIONS ARE NOMINAL

PRE-FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "6R"  
PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"  
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"  
PRE-CORDED END CAPS END WITH "PC"

### 2 SC-310 TECHNICAL SPECIFICATIONS

DATE: \_\_\_\_\_  
PROJECT NO.: \_\_\_\_\_  
NOT TO SCALE

DRAWN: \_\_\_\_\_  
REVIEWED: \_\_\_\_\_  
REV: \_\_\_\_\_

SC-310 STANDARD DETAILS

Prepared For:  
25 HAVEN STREET, LLC  
25 HAVEN STREET  
READING, MASSACHUSETTS 01557/74  
ASSESSORS MAP 16 LOT 309

Prepared By:  
Hayes Engineering, Inc.  
603 Salem Street  
Worcester, MA 01680  
Phone: 781.246.2800  
Fax: 781.246.7596  
www.hayeseng.com

Design By:  
Drawn By:  
Checked By:  
Project File: REA-0419  
Comp. No: REA175

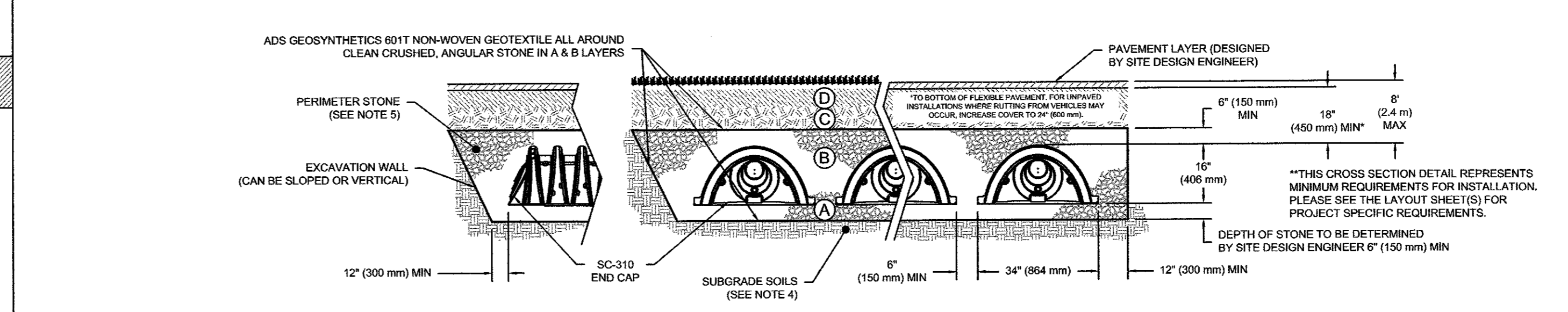
Issued For Permit  
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 Not For Construction

No.	Revision	Date
10		
9		
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### ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	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.	AASHTO M145 <sup>1</sup> A-1, A-2.4, A-3 OR AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 88, 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 CROSS 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.	AASHTO M43 <sup>1</sup> 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.	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2,3</sup>

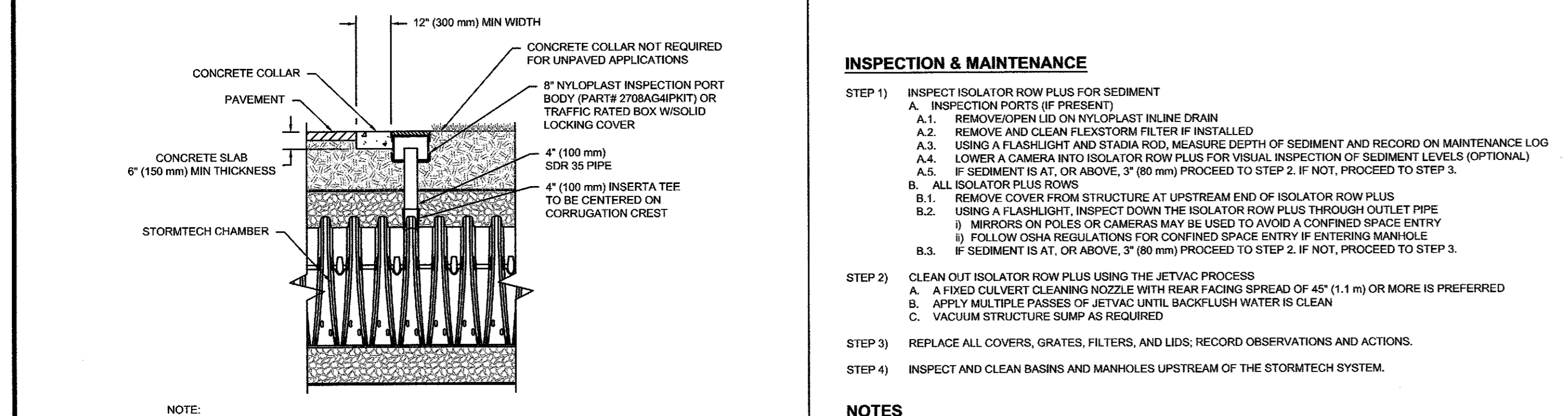
- PLEASE NOTE:
- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
  - STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
  - 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.
  - ONCE LAYER 'C' IS REQUIRED, 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:**
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418-16a (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
  - SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
  - 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.
  - PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
  - REQUIREMENTS FOR HANDLING AND INSTALLATION:
    - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
    - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
    - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2922 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/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.

### 1 SC-310 CROSS SECTION DETAIL

### 3 SC-310 ISOLATOR ROW PLUS DETAIL



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

### INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- INSPECTION PORTS (IF PRESENT)
  - REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
- REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MAIN HOLE
  - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
  - APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
  - VACUUM STRUCTURE SLUMP AS REQUIRED.
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

### NOTES

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

### 4 4" PVC INSPECTION PORT DETAIL (SC SERIES CHAMBER)



4640 TRUEMAN BLVD  
HILLIARD, OH 43026



SHEET

Scale: NOT TO SCALE

DATE: NOVEMBER 22, 2022

Drawing Title:  
DETAIL SHEET  
25 HAVEN STREET  
MIXED-USE DEVELOPMENT  
READING, MASS.

Drawing No.:  
C8  
SHEET 8 OF 8



**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](http://www.readingma.gov)

December 12, 2022

**Downtown Smart Growth District (DSGD) Plan Review**  
**M.G.L. Chapter 40R**  
**DECISION**

Project: 25 Haven Street  
Applicant: 25 Haven Street, LLC

*To the Town Clerk:*

*This is to certify that, at a public hearing of the Community Planning and Development Commission opened on June 13, 2022, continued to November 7, 2022, December 12, 2022 and closed on XXX by a motion duly made and seconded, it was voted:*

“We, the Reading Community Planning and Development Commission, upon request from 25 Haven Street, LLC, under Section 10.5 of the Zoning Bylaws of the Town of Reading, and MGL Chapter 40R, to consider the application for 40R Development Plan Review to construct a 4-story mixed-use building with 12 housing units, and approximately 3,850 square feet of interior commercial space with 16 at-grade parking spaces, at 25 Haven Street (Assessors Map 16, Lot 309) – as shown on the architectural plans prepared by O’Sullivan Architects, Inc. and the site plans prepared by Hayes Engineering, Inc., and listed below – do hereby vote XXX, to \_\_\_\_\_ the 40R Development Plan, inclusive of the listed waivers, subject to the Findings and Conditions below.”

Materials Submitted:

The following materials were submitted into the public record:

- a) Certified List of Abutters, dated 4/19/22;
- b) DSGD Development Application Form, Project Narrative and Requested Waivers, dated 5/2/22;
- c) Legal Notice, published in the Daily Times Chronicle on 5/25/22 and 6/1/22, and posted with the Town Clerk on 5/25/22;
- d) Civil Engineering Plan Set for 25 Haven Street Proposed 40R Development, Reading, MA, prepared by Hayes Engineering, Inc., and prepared for 25 Haven Street, LLC., consisting of:
  - a. Sheet C-1: Index Plan, dated 11/22/22;
  - b. Sheet C-2: Existing Conditions Plan, 11/22/22;
  - c. Sheet C-3: Demolition and Relocation Plan, dated 11/22/22;
  - d. Sheet C-4: Site Layout Plan, dated 11/22/22;
  - e. Sheet C-5: Grading and Drainage Plan, dated 11/22/22;
  - f. Sheet C-6: Utility Plan, dated 11/22/22;

- g. Sheet C-7: Details Sheet, dated 11/22/22;
- h. Sheet C-8: Details Sheet, dated 11/22/22;
- e) Architectural Plan Set for 25 Haven Street Redevelopment, Reading, MA, prepared by O’Sullivan Architects, Inc., and prepared for 25 Haven Street, LLC, consisting of:
  - a. Sheet A0.01: Project Data, originally dated 4/29/22, most recently revised 11/28/22;
  - b. Sheet A0.02: Schematic Landscape Layout Plan, originally dated 4/29/22, most recently revised 11/28/22;
  - c. Sheet A0.03: Shadow Studies, originally dated 4/29/22, most recently revised 11/28/22;
  - d. Sheet A0.04: Layout and Photometric Plan, originally dated 4/29/22, most recently revised 11/28/22;
  - e. Sheet A1.01: Ground Floor Plan, originally dated 4/29/22, most recently revised 11/28/22;
  - f. Sheet A1.02: Second Floor Plan, originally dated 4/29/22, most recently revised 11/28/22;
  - g. Sheet A1.03: Third Floor Plan, originally dated 4/29/22, most recently revised 11/28/22;
  - h. Sheet A1.04: Fourth Floor Plan, originally dated 4/29/22, most recently revised 11/28/22;
  - i. Sheet A1.05: Roof Level Plan, originally dated 4/29/22, most recently revised 11/28/22;
  - j. Sheet A3.01: Elevations Front and Rear, originally dated 4/29/22, most recently revised 11/28/22;
  - k. Sheet A3.02: Elevations Left and Right, originally dated 4/29/22, most recently revised 11/28/22;
  - l. Sheet A3.10: Perspectives, originally dated 4/29/22, most recently revised 11/28/22;
  - m. Sheet A3.11: Perspectives, originally dated 4/29/22, most recently revised 11/28/22;
  - n. Sheet A3.12: Perspectives, originally dated 4/29/22, most recently revised 11/28/22;
- f) Sheet A4.01: Sections, originally dated 4/29/22, most recently revised 11/28/22;
- g) Stormwater Management Report: 25 Haven Street Mixed-Use Development in Reading, MA, dated 11/22/22;
- h) Transportation Impact Assessment, 25 Haven Street Mixed-Use Development, prepared by Vanasse & Associates, Inc., dated October 2020;
- i) Staff Input:
  - a. Email from Reading Fire Department Captain Nelson, dated 11/30/22;
  - b. Memo from Town Engineer, dated XXX;
- j) Abutter Input:
  - a. Email from Ilene Bornstein, dated 5/31/22;
  - b. Email from Jonathan Barnes, dated 11/3/22;
  - c. Email from Jonathan Barnes, dated 11/30/22;
  - d. Email from Samantha Couture, dated 12/2/22;
- k) Draft Decision, dated 12/12/22.

**General Findings:**

- 1) **Zoning:** The site is located within the underlying Business-B Zoning District and the Downtown Smart Growth District (DSGD) / 40R Overlay District. Sites and areas located to the north, south, east and west are also located in the Business-B and DSGD Zoning Districts.

The site is considered a Transitional Area (directly abutting a lot containing single-family dwelling).

→Therefore, Section 10 of the Design Guidelines applies to this redevelopment.

**Commented [MJ1]:** Look for language in DG re: RHC review/approval

"7.2.5 Existing building facades with architectural significance are to be incorporated into new construction wherever feasible. Protected buildings can be changed only with the approval of the Reading Historical Commission."

- 2) **Overview:** The land totals 18,935 square feet in area and maintains ~186.78 linear feet of frontage along Haven Street to the north and ~119.51 linear feet of frontage along Green Street to the south. The site is abutted by: Haven Street to the north; both a single-family dwelling and a one-story commercial building to the east; Green Street to the south, and; a two-story commercial building to the west.

The existing site contains a vacant ~7,953 square-foot, single-story commercial structure and associated parking. It was formerly a Reading Municipal Light Department building, and subsequently owned and occupied by a series of convenience stores, the most recent of which was Rite Aid (which was then bought by Walgreens). The site contains one curb cut along Haven Street and another curb cut along Green Street.

The Applicant proposes to redevelop the site into a Mixed-Use 40R Development including twelve (12) residential dwelling units. The project is proposed as homeownership units, and is under the unit threshold so does not require any deed-restricted affordable units. It will also include a total of ~3,850 square-feet of interior commercial space on the first-floor, with an 875 square-foot commercial patio area, and sixteen (16) associated parking spaces located at-grade. All sixteen (16) parking spaces are located in an at-grade parking lot; seven (7) of the spaces are located under the building roof line and the remaining nine (9) spaces are fully exposed to the elements. The parking lot is accessed by a 26-foot wide two-way driveway on Green Street.

The Applicant is seeking Development Plan approval from the CPDC under Section 10.5 of the Reading Zoning Bylaw and the Downtown Smart Growth District Design Standards & Guidelines, pursuant to M.G.L. Chapter 40R.

- 3) **Historic:** The existing building is listed on the local Reading Historical Inventory and is subject to a demolition delay. On July 28, 2021 the Reading Historical Commission (RHC) voted to impose a demolition delay on the property for up to six (6) months. On January 28, 2022 the demolition delay elapsed and was lifted.
- 4) **Setbacks and Dimensional Requirements:** The proposed building will have a 2' front yard setback from the northern lot line (Haven Street); a 10' side yard setback from the western lot line (adjacent to 1 Haven Street); a minimum 16' side yard setback from the eastern property line (adjacent to 51 Haven Street and 12 Green Street); and a minimum 25' rear yard setback from Green Street.

**Building Height:** For structures with flat roofs, 'height' is defined in Section 2.0 of the Reading Zoning Bylaw as "*The vertical distance from the average grade around the perimeter of a building to the top of a flat roof, including any parapet...*" Height is not defined separately or differently for 40R projects within ZBL Section 10.5, and mixed-use 40R projects are allowed a maximum height of 45' unless a height waiver can be justified.

Design of a flat roof with a metal roof coping is utilized. The elevator penthouse and mechanical units are proposed to be located on the roof and be setback and/or screened from view.

Section 10.4.1 of the Design Guidelines requires the following: “*building height shall be measured from the pre-development site grade.*” The maximum building height, to the parapet, based off of the pre-development site grade, is 44’. While not accounting towards maximum height requirements it should be noted that the elevator penthouse measures X’ in height and the stairwell measures X’ in height bringing maximum building height to X’.

Commented [MJ2]: Does it extend above the roofline?

**Building Step-backs:**

**Lot Coverage:** The lot totals ~18,935 square-feet of area, 8,994 square feet will be covered by the building, resulting in a 47.5% Lot Coverage calculation. Including associated parking, which is exempt under the definition, total impervious area calculates to 13,070 square feet (69%).

- 5) **Interior/Exterior Space:** The proposed project will comprise +/-30,009 net enclosed square feet, as follows: +/-8,637 (1<sup>st</sup> floor); +/-8,416 (2<sup>nd</sup> floor); +/-8,416 (3<sup>rd</sup> floor); +/-4,540 (4<sup>th</sup> floor); and +/-0 (roof). The first-floor/garage level includes seven (7) parking spaces dedicated the residential use, along with a residential lobby, a parking lot lobby, a trash room, a water room, an electrical room, the elevator, an elevator machine room, two stairwells, and the commercial spaces.

Commented [MA3]: Garage storage areas and bike parking accommodations? More utility space needed?

Commercial Space #1 shall include 2,388 gross floor area of interior space as well as an adjacent 875 gross floor area private outdoor patio space. Commercial Space #2 shall include 1,461 gross floor area of interior space. Each commercial space will have a separate and individual entrance off of Haven Street. Commercial Space #1 shall also have exterior access through the eastern public path and Commercial Space #2 shall be provided a secondary access through the rear lobby/parking area.

Two (2) one-bedroom units and ten (10) two-bedroom units are proposed, for a total of twelve (12) units. One-bedroom units average 764.5 net square feet, and two-bedroom units average 1,463 net square feet.

All residential units shall be provided with private balconies or access to private outdoor patios. Sizes of each varies in both width and length but are a minimum of 7’ x 10’. There is also a shared residential terrace on the 4<sup>th</sup> floor that totals 730 net square feet. There are no enclosed areas on the roof and there will be no public access to such.

- 6) **Roof:** Mechanical units located on the roof shall be placed so that they are not viewable from the street level or abutting residential properties. The elevator shaft is approximately X’ tall.
- 7) **Parking:** The project provides 16 parking spaces, which is 1 space more than required and results in a 1.33 spaces/unit ratio. Seven (7) of the parking spaces will be covered by the building while the other nine (9) parking spaces will be fully exposed to the elements. All of the spaces are dimensioned at 9’ x 18’, and one (1) space within the garage will be ADA accessible. The parking lot is accessed via a 26’ two-way drive on Green Street and maintains a 26’ wide two-way drive aisle. All parking spaces shall be designed and future proofed for use of Electric Vehicle Charging Stations.

The curb cut on Haven Street will be closed and two (2) on-street parking spaces will be added. The existing curb cut on Green Street will be relocated to the west and will result in the net loss of XXX parking spaces.

**Commercial Parking:** The site is within 300' of a municipal lot (Brande Court) and is exempt from providing off-street commercial parking. Also, as the proposed commercial spaces are expected to be occupied by retail and/or restaurant uses, zero (0) off-street parking spaces are required per Reading Zoning Bylaw Section 10.5.8:

#### 10.5.8.1 Off-Street Parking

**Off-street parking shall be provided to meet the following minimum requirements:**

**Retail or Restaurant 0 spaces**

**Loading / Deliveries:** Front door and on-street deliveries are not allowed to occur on Haven Street or Green Street. Loading is proposed to occur within the outdoor parking and includes access to the trash room. A 12' x 14' temporary loading zone is shown utilizing the parking aisle in front of the covered parking spaces near the entry lobby and trash room. A drive aisle of 12'-14' shall remain if a truck is utilizing the loading zone. Commercial loading and deliveries will occur during off-peak traffic hours and the size and nature of the commercial space is expected to be served by box trucks and vans, and not trailer trucks. Commercial deliveries shall be provided access to the commercial area from within the garage. The same is expected for both residential move-ins/outs, which shall be managed and scheduled by the property management company.

**Bicycle Parking:** none proposed.

- 8) **Sidewalk Improvements:** The existing sidewalk will be replaced with new concrete sidewalk and vertical granite curbing to match existing. Sidewalk shall be extended down Haven Street along the property's entire frontage. Vertical Granite Curbing shall also be utilized around the outdoor parking area.
- 9) **Traffic Flow and Volume:** A Transportation Impact and Access (TIA) study was completed for the project by Vanasse Associates, Inc.

**The TIA concludes with the following information/recommendations:**

•

- 10) **Drainage and Grading:** The existing site is relatively flat in grade and is nearly 100% impervious area due to the existing building and its associated parking. Redevelopment will incorporate Best Management Practices (BMP's) and Low Impact Design (LID) strategies and result in a net loss of 1,200 square feet of impervious area. LID measures include an infiltration system that mimics the natural runoff rate as the existing conditions.

The site will be graded in a manner to avoid puddling on the premises and to promote positive sheet flow away from the building. All surface runoff from the site will be collected in the closed drainage system so that there is no direct discharge to the surface of any abutting land.

**Commented [MA4]:** Is this the expectation?

**Commented [MA5R4]:** What is height clearance in garage? Can trucks of all sizes be accommodated?

**Commented [MJ6]:** The trash room doors open into a parking space – how will this work if there is a car parked there?

Also, re: the temporary loading space needs to be dimensioned – If delivery access to Commercial Space #1 is proposed via the back door, then I'd think the truck would pull all the way in to the end of the drive aisle. How does it impact/impeged use of residential spaces?

**Commented [MA7]:** This may be difficult when allowing entry and exit.

**Commented [MA8]:** Plans do not indicate any upgrades to sidewalk?

Stormwater runoff will be mitigated through the on-site infiltration system. The system will be designed to capture the 100-year storm event.

Roof and surface runoff will be captured and directed to the underground retention system prior to discharging into the municipal system. Stormwater treatment will be collected by deep-sump basin with an oil water separator. This provides enhanced pollutant removal from the stormwater by separating out Total Suspended Solids (TSS) and floatable oil/grease.

A final stormwater system long-term Operations and Maintenance Plan has been prepared. The Plan details measures to be taken by the property owner to ensure long-term sustainability of the system, which shall be conditioned below. The Plan includes, but is not limited to, schedules for inspections and maintenance, estimated costs of maintenance, safety measures, and responsible entity. A separate construction phase BMP plan has been drafted and shall followed throughout permitting.

- 11) Utilities: All utilities will be removed and re-connected through both Haven Street and Green Street as applicable. The existing sewer line will be cut and capped at the main within the right-of-way and shall be replaced with a PVC pipe. An oil water separator will be provided within the garage level and connected to the sewer line. An existing drain line through the property will be replaced with a new ductile iron drain and be relocated within the right-of-way. The domestic water service and a new fire service will be tapped from the water main within Haven Street. Electric, telephone and fiber optic services will be extended from Green Street. Natural gas will also be extended from the main on Haven Street and will be coordinated with the utility company. A grease trap shall also be provided for the commercial uses and will be located to align with future restaurant/kitchen location(s). All proposed utilities will be underground.
- 12) Lighting: A series of exterior lighting fixtures on the building's façade and within the exterior parking area is proposed. All exterior lighting shall be designed to be Dark Sky compliant and mitigate impacts to abutting residential properties; limited up-lighting is allowed in accordance with Design Guidelines Section 8.4.6.
- 13) Property Management: The property is proposed to be managed by a property management company.
- 14) Transformer: An electric utility plan shall be submitted and approved by RMLD. The transformer shall be located along Green Street and be screened from the street.
- 15) Wetlands / Floodplain: There are no wetland resource areas or buffers on or near the site, and the site is not within a 100-year floodplain.
- 16) Landscaping: Eleven (11) new trees are proposed on site – four (4) of which are to be street trees within the sidewalk along Haven Street. A series of additional shrubs and plantings is proposed along the site's property line. A pocket park will be developed in the southeast corner of the site and include a series of plantings and seating areas.
- 17) Trash Management: Trash and recycle bins shall be located within the garage. Trash is to be managed by a private entity. Language detailing how trash and recycling will be managed on-

Commented [MA9]: Is this true?

site, including but not limited to schedule of pick-up days and times, and logistics for trash truck access to the site shall be described within the property management documents. Trash management for both the residential and retail uses shall be managed separately, as is practicable.

- 18) **Signage:** No building signage is approved herein. Any future signage shall require the submittal of a Sign Permit Application and shall comply with Section 8.0 of the Zoning Bylaw and Section 9.0 of the Downtown Smart Growth District Design Guidelines.

### **Findings pursuant to DSGD Design Standards & Guidelines:**

#### **7. Building Design Standards**

##### **7.1 Massing**

**7.1.1 Front Façade Setback** – Over 60% of the Haven Street façade is setback at 2' and the space between is designed to better activate the pedestrian entries. Additional active uses (i.e. outdoor commercial patio) and landscape is proposed along the front setback.

**7.1.2 Building Step-Back Requirements** – The building maintains a 25'-28'5" step-back at the fourth-floor level along the front façade. The same fourth-floor level also maintains a 12'7" step-back on the western façade. The step-backs are maintained for the entirety of the fourth-floor level.

**7.1.3 Mixed-Use Building Proportions** – The building's commercial space is provided horizontal brick work and large glass paned windows. Residential floors above are provided projecting bays, composite vertical panels, and balconies to differentiate from the retail uses below.

**7.1.4 Special Function Space Differentiation** – Not applicable to the current proposal; however, the Applicant is encouraged to think about community place-making events when approaching commercial tenants.

##### **7.2 Appearance**

**7.2.1 Defined Proportions** – The project uses projecting bays, balconies, a composite paneling system of different colors and a flat rooftop design to define different levels of the façade.

**7.2.2 Horizontal and Vertical Elements** – Horizontal elements such as brick masonry, trim, and large framed windows are combined with vertical projecting bays, at different levels. Materials shall be submitted to CPDC for review.

**7.2.3 Continuous Façade Elements** – Façade elements and materials are used continuously around the façade.

**7.2.4 Rooftop Mechanical Setbacks** – Mechanical units on the rooftop level are setback so as to not be visible from the pedestrian level.

**7.2.5 Incorporation of Existing Significant Building Facades** – The building form adapts in scale and texture to create continuity with abutting properties.

**7.2.6 Franchise Architecture** – Distinctive building design that is trademarked or identified with a particular chain or corporation and is generic in nature, is not allowed in the DSGD – the Applicant shall be aware of this when recruiting tenants.



### 7.3 Entries

**7.3.1 Articulation** – Commercial spaces are provided along Haven Street and are articulated through masonry design, signage, and recessed entries. The residential entry on Haven Street is flush with the rest of the building.

**7.3.2 Retail and Commercial Entry Transparency** – Commercial space is designed to activate Haven Street. Commercial spaces have large glass window panels for visibility.

**7.3.3 Integrated Lighting & Signage** – Exterior lighting has been designed around the entire perimeter of the building. Lighting shall activate entry ways and the commercial patio and illuminate the rear parking area.

**7.3.4 Upper Floor Entries** – The entry to upper floor residential areas shall be made distinct upon entering through the residential lobby on Haven Street.

### 7.4 Fenestration

**7.4.1 Commercial Horizontality & Residential Verticality** – Commercial spaces are designed with over 60% of their façade length being glass window panels. Residential portions of the building have windows designed with a 2/6 muntin grid to balance verticality and horizontality.

**7.4.2 Glazing** – Commercial spaces are designed with over 60% of their façade length being glass window panels. Retail or restaurant uses were stated as intended tenants to provide activation of the areas and limit tint of the windows.

**7.4.3 Overhanging Awnings or Canopies** – Not applicable to application.

### 7.5 Materials

**7.5.1 Exterior Finishes** – A combination of horizontal brick veneer and vertical composite paneling of different colors with aluminum finishing is used on building façades.

**7.5.2 Prohibited Materials** – Not Applicable.

**7.5.3 Changes in Materials** – The first-floor will consist of a brick masonry to transition from the sidewalk to the building structure. Commercial spaces will utilize large windows inserted into the masonry storefronts. Residential spaces and entries above will differentiate themselves by utilizing the composite paneling, aluminum balconies and finishing. Recessed and projecting bays shall utilize different colors of the composite paneling. The fourth-floor will also utilize a different color of composite material than the levels below. Materials shall be submitted to CPDC for review.

**7.5.4 Continuity of Materials** – Façade elements and materials are used continuously around the façade.

**7.5.5 Blank Facades Not Permitted** –

## 8. Site Design Standards

### 8.1 Sidewalks

**8.1.1 Sidewalk Continuity** – The existing curb cut on Haven Street will be removed and replaced with sidewalk. The existing curb cut on Green Street will be relocated to the west and sidewalk shall be provided in its space.

**8.1.2 Pedestrian Amenities** – The project will provide an 875 gross square foot commercial patio along Haven Street and a separate public pocket park along Green Street. A public path will connect Green Street and Haven Street.

**8.1.3 Usable Open Spaces** – The open space will be programmed dependent on commercial uses, but will most likely be used for pedestrian-centric

activities such as dining and seating. A public path and pocket park shall connect Green Street and Haven Street.

**8.1.4 Pedestrian Improvements** – Improvements to adjacent crosswalks, curbing and sidewalks may be requested by the Town Engineer.

## **8.2 Driveways and Parking**

**8.2.1 Sidewalk Continuity** – The existing sidewalk will be removed and replaced. The curb cut on Haven Street will be replaced with sidewalk while the Green Street curb cut will be relocated and replaced with sidewalk.

**8.2.2 Parking Lots** – The parking shall be located at the rear of the building structure and concealed from public view through landscape and screening. The entry and exit of such will be provided off of Green Street.

**8.2.3 Parking Lots Behind Buildings** – The ground level parking shall be screened by landscape. The parking area will be accessed through Green Street.

**8.2.4 Below-grade Parking** – Not Applicable to application.

**8.2.5 Parking Lot Screening** – The ground level parking will be screened through landscape and plantings.

**8.2.6 Shared Parking** – Shared use of parking between residential and commercial tenants will be encouraged. If the parking area is not fully utilized by residents the Applicant shall look to allow commercial employees or patrons parking access/use. Ride sharing services will be encouraged.

**8.2.7 Pedestrian & Vehicular Safety** – Future recommendations of the Traffic Impact Assessment shall be considered and discussed with the Town's Parking Traffic and Transportation Task Force (PTTTF).

## **8.3 Landscaping**

**8.3.1 Street Trees** – Four (4) street trees shall be planted along Haven Street.

**8.3.2 Retail Frontages** – The final location of street trees shall be determined by the Tree Warden and shall not impede visibility of commercial areas or signage.

**8.3.3 Parking Areas** – The parking area will be screened through a series of plantings along the rear and side lot lines.

**8.3.4 Public Open Spaces** – The project will provide an 875 gross square foot commercial patio along Haven Street and a separate public pocket park along Green Street. A public path will connect Green Street and Haven Street.

**8.3.5 Native Species** – Final determination of street tree species shall be determined by the Tree Warden.

**8.3.6 Preservation of Healthy 6" Caliper Trees** – When feasible, healthy existing trees with a minimum 6" caliper and large canopy shall be preserved.

## **8.4 Lighting**

**8.4.1 Articulation of Building Uses & Entries** – The project will incorporate lighting along the street level façade that will identify major commercial and residential entry ways. Any upper level lighting shall be Dark Sky compliant and designed to mitigate impact to residential abutters.

**8.4.2 Coordination w/Town's Street Lighting & Trees** – All proposed lighting will be coordinated with the Town's street lighting and street trees.

**8.4.3 Light Spillover** – Lighting at upper-level terraced areas shall be designed to minimize impact to abutting properties.

**8.4.4 Public Safety** – All lighting for public safety shall be added to the plans.

**8.4.5 Sign Lighting** – No signage proposed or approved herein.

**8.4.6 Dark Sky Standards** – All upper floor lighting shall comply with dark sky standards.

#### **8.5 Utility Areas and Utilities**

**8.5.1 Location** – The trash area will be provided access to/from the rear parking area. The trash area will be situated near garage entry. Mechanical units will be located on the roof and will not be visible from the street. **Utility meter locations?**

**8.5.2 Screening** – All rooftop mechanicals will be setback so they are not viewable from street level.

**8.5.3 Shared Utility Areas** – Not Applicable.

**8.5.4 Aboveground Utilities Not Permitted** – All utilities will be underground.

**8.5.5 Underground Utilities Required** – All utilities will be underground.

#### **8.6 Drainage and Storm Water Management**

**8.6.1 BMP/LID Strategies** – Roof and surface runoff will be captured and directed to the underground retention system prior to discharging into the municipal system. The project will not create new untreated discharge of stormwater runoff.

**8.6.2 System Elements** – Stormwater will be collected through a deep sump basin equipped with a separator to enhance treatment.

**8.6.3 Operations & Maintenance Plan** – A long term O&M Plan has been provided.

**8.6.4 On-site Recharge** – On-site recharge has been provided.

**8.6.5 Pervious Paving** – Not Applicable to application.

**8.6.6 Site Grading** – As existing, the site is proposed to remain relatively flat.

**9. Signage Design Standards** – No building signage has been proposed or approved herein.

#### **10. Additional Considerations for District Edges & Transitional Areas**

**10.3 Applicability** – The site is designated as a Transitional Area as it abuts an existing two-family structure to the east.

##### **10.5 Design Considerations for Transitional Areas**

**10.5.1 Abutting Historic Structures** – Not Applicable to application.

**10.5.2 Density of Project away from Residential Use** – The building structure is setback 16' from the eastern lot line where it abuts an existing commercial structure. Where the lot abuts the existing two-family structure to the east no structures are proposed and parking shall not directly face the structure. The parking lot is screened through a public path and series of landscape plantings.

**10.5.3 Engage Existing Residential Fabric** – Inviting landscape and residential amenities (i.e. pocket park, balconies) are used to engage the residential fabric of Green Street.

**10.5.4 Screen for Residential Privacy** – A series of landscape plantings and public amenities (i.e. path and pocket park) will screen the parking area.

**10.5.5 Shadow Study** – A shadow study has been provided.

**10.5.6 Noise Mitigation** – Mechanical units located on the roof shall be placed so that they are not heard from the street level or abutting residential properties.

**Waivers pursuant to Section 10.5.12 and DSGD Design Standards & Guidelines:**

Upon request of the Applicant, the Commission, in the interests of design flexibility and overall project quality, and upon a finding of consistency of such variation with the overall purpose and objectives of the DSGD and the Reading Master Plan, or if it finds that such waiver will allow the project to achieve the density, affordability, mix of uses and/or physical character allowed. The Commission shall take into consideration the following items when considering a waiver:

1. High performance energy efficient buildings and construction methods.
2. Projects with publicly accessible open space.
3. Projects that include retail and restaurants located on street level.
4. A demonstrated shared parking initiative that makes efficient use of land and existing parking supply.
5. The preservation or rehabilitation of historic properties or other buildings considered significant to the Town.

The Applicant has requested the following waivers from ZBL Section 10.5:

1. **Density:** *to allow a density of 27.9 units/acre where 20 units/acre is permitted by right.* The Applicant stated this will allow the development to be economically viable and notes that the Floor Area Ratio (FAR) of 1.58 is below the maximum of 2.80 allowed.

*The CPDC voted XXX to \_\_\_\_\_ the requested waivers.*

**Conditions:**

**General:**

- 1) **Public Health, Safety and Welfare:** If, at any time, the site becomes a nuisance to public health, safety or welfare (i.e., traffic spillover, excessive noise, unreasonable site illumination beyond the hours of operation, etc.) – as shall be evidenced by substantiated complaints to the Police Department or Public Services Office – the Applicant/Owner shall agree to work with staff to rectify the problem. Should the situation warrant it, an additional Site Plan Review by the CPDC may be required.
- 2) **Utilities:** All utilities, structures, frames and covers shall meet the Town of Reading standards. The electric utility plan is subject to approval by the Reading Municipal Light Department (RMLD).
- 3) **MS4 Permit:** The project shall comply with the most recent MS4 permit.
- 4) **Lighting:** The Applicant shall ensure that any proposed lighting is not occluded by the street trees along the frontage, and does not compete with existing street lighting. The Applicant shall submit specifications for each type of lighting fixture to the Community Development Director for approval.
- 5) **Limitations / Future Uses:** The 40R Development Plan Decision herein does not include approval for any future uses or site renovations that may – on their own merits and design – trigger the requirements of 40R plan review, or site plan review, and/or require a special permit. Pursuant to Section 10.5 of the Zoning Bylaw the following uses are permitted by

**Commented [MA10]:** Anything needed for historic review and input? Look at Chronice/Gould/Postmark

right within the proposed commercial spaces: office, retail, restaurant, institutional and consumer services.

- 6) **Commercial Spaces:** It is strongly recommended that the Applicant prep the commercial space(s) with utility connections, grease traps, etc. in anticipation of future tenants.
- 7) **Engineering Concerns:** In general, throughout the project, the Applicant shall work with the Town Engineer to address any outstanding comments in the memos to the Community Development Director dated XXX.
- 8) **Shared Parking:** The Applicant is encouraged to engage in conversations with nearby property owners regarding shared parking, and to partner with Zip Car and other shared services if possible, and to provide electric vehicle charging stations. If and when progress on shared parking is made, the Applicant shall provide more information about these amenities, and indicate which area(s) of the garage are intended for them and how they will be managed.
- 9) **Storage Areas:** The Applicant is encouraged to consider adding supplemental storage areas for tenants to the building if possible.
- 10) **Community Place-making / Creative Economy:** When approaching potential commercial tenants, the Applicant is encouraged to think about community place-making events, and/or dividing the space into smaller units that are affordable to creative economy tenants.
- 11) **Historic:** If possible, the Applicant shall salvage some bricks/tiles from the existing building and replicate the pattern on an accent wall in the exhibit gallery, and shall consider mimicking the existing art deco design elements in the new building's signage design.

**Commented [MA11]:** Can Applicant confirm such would be included in residential lobby in building not preserved?

**Prior to the Issuance of Building Permits and Prior to the Start of Construction:**

- 1) **The Applicant shall make the following plan changes, and shall submit two (2) full size (24x36) copies of the revised plans to the Community Development Director:**
- 2) **Other Permits:** The Owner/Applicant is responsible for obtaining all other requirements and permits including but not limited to, utility connections, sewer, water, curb cut, street opening and Jackie's Law excavation permits from the Engineering Department (prior to excavation), and Board of Health approvals.
- 3) **Pre-Construction Meeting:** The Owner/Applicant and contractors shall coordinate with the Community Development Director to schedule a pre-construction meeting with Town staff prior to applying for demolition and/or building permits, in order to review these conditions and any and all final construction sequencing, details and plans for this project.
- 4) **Construction Management Plan / Contractor Parking:** The Applicant shall submit a Construction Management Plan which includes provisions for off-site parking.
- 5) **Construction Documents & Fire Safety:** Full construction documents must be submitted and approved by the Fire Department at 80% design. A building permit shall not be issued until the Fire Department has approved the plans.
- 6) **Master Box:** The Applicant shall coordinate with the Fire Department on the requirement for a Master Box tied that is to be tied to the fire alarm system.
- 7) **Materials:** No colors have been approved herein. The Applicant shall return to the Commission with samples of proposed materials and colors to be used on the building prior to installation.

**During Construction:**

- 1) **Construction Hours:** Construction shall be limited to the hours stated in Section 8.9.8 “Construction Hours” of the Reading General Bylaws and said hours shall be posted in a conspicuous place at the entrance prior to any work on the site.
- 2) **Construction Activities:** Construction activities shall be conducted in a workmanlike manner at all times. Blowing dust or debris shall be controlled by the Applicant through stabilization, wetting down, and proper storage and disposal methods, subject to the approval of the Health Agent or designee. The Applicant shall ensure that the abutting local streets are kept clear of dirt and debris, which may accumulate as a result of construction activities for the Project. Documentation shall be provided demonstrating ongoing pest management control, subject to the approval of and administration by the Health Agent.
- 3) **Construction Management Plan / Contractor Parking:** Site operations shall comply with the aforementioned Construction Management Plan at all times. Contractors shall park in the locations designated and provided for within the CMP.
- 4) **Site Inspections:** Town staff or their designee shall have reasonable access to inspect the site to determine compliance with this Decision.
- 5) **Bond:** The Applicant/Owner shall furnish a bond for the final As-Built plans prior to the issuance of the final certificate of occupancy. The bond amount shall be determined by the Town Engineer consistent with the reasonable costs associated with a third party performing the work. The bond shall be returned once the requirements of this condition are met.
- 6) **Scaffolding:** The scaffolding at the property lines shall be completely screened 100% of the time to maintain privacy and prevent materials/debris from falling/blowing or otherwise dropping onto the abutting properties.

**Prior to Vertical Construction:**

- 1) **Covered Parking As-Built:** The Applicant shall provide, to the Building Commissioner and Community Development Director, an as-built of the foundation and covered parking area, that shows an overlay of the location and size of structural columns, fire/building/energy code requirements, and dimensioned parking striping, proving that the parking as approved can work. If the parking cannot work as approved, the Applicant shall return to CPDC for an amendment prior to starting vertical construction.

**Prior to the Issuance of a Certificate of Occupancy:**

- 1) **Architecture:** The building façade on each elevation (north, south, east, and west) shall be substantially as indicated on the approved architectural plans and elevations.
- 2) **Stormwater O&M Plan:** An Operations and Maintenance Plan for the stormwater system shall be provided to the Town Engineer.
- 3) **Property Management Documents:** A copy of the finalized Property Management Documents shall be submitted to the Community Development Director for review and approval, and shall contain the following language:

- a. **Fire Safety:** Language ensuring fire safety by prohibiting gas/propane grills on balconies, etc.
  - b. **Delivery Vehicles & Times:** Language prohibiting commercial deliveries along **Haven Street and Green Street**, and prohibiting commercial deliveries to the commercial space between 10:00 PM and 5:00 AM.
  - c. **Management of Move-ins & Move-outs:** Language regarding management of move-ins and move-outs by the on-site property manager, specifically with regards to the size of moving vehicles allowed and the timing and use of the parking area.
  - d. **Drainage System Maintenance:** Language that requires the property management company to adhere to the requirements of the O&M Plan.
  - e. **Trash Removal:** Language detailing how trash and recycling will be managed on-site, including but not limited to schedule of pick-up days and times, and logistics for trash truck access to the site. Trash management for both the residential and retail uses shall be managed separately, as is practicable.
  - f. **Snow Removal:** Language detailing how snow will be managed and removed from the property, including the roof and uncovered parking area, and that snow storage shall not impact sight lines for vehicular traffic.
  - g. **Site Lighting:** Language that commercial lighting (including signage) shall be programmed to shut off at the close of business each day.
  - h. **Pedestrian Path:** Language outlining responsibility for maintaining the public path through the site, especially during inclement weather, to keep it clear of debris, trash, and snow/ice at all times.
  - i. **Conditions for Ongoing Maintenance after Occupancy:** Language that the property management company shall adhere to the “Conditions for Ongoing Maintenance after Occupancy” as are stated herein below.
- 4) **Rooftop Mechanicals:** All rooftop mechanicals shall be set back from building facades and appropriately screened from view.
  - 5) **Pedestrian Improvements:** Improvements along Haven Street, Green Street, and abutting rights-of-way, as deemed necessary or advantageous to the Town Engineer and Community Development Director, to adjacent crosswalks, curbing and sidewalks, shall be installed at the Applicant’s expense in accordance with Town standards.
  - 6) **Streetscape Design:** The Applicant shall coordinate with the Engineering, Planning, Economic Development, and other staff departments as needed, on the final streetscape design for the Haven Street frontage and Green Street as needed. Design utilizing the Lower Haven streetscape concepts provided by the Town shall be incorporated. The Applicant shall work with Town Staff on the need for potential public easements for a portion of the sidewalk, which shall support the Lower Haven streetscape concepts.
  - 7) **Parking Striping:** All parking spaces shall be striped in accordance with the approved plans. Dimensions shall be measured from centerline to centerline.
  - 8) **I/I Fee:** The Applicant is subject to the required Inflow/Infiltration Fee as the proposed sewer flow usage will be greater than historical usage. The Fee is calculated as twice the flow times \$4.00.

- 9) **Street Trees:** The Applicant shall work with the Tree Warden to locate the street trees along Haven Street to an appropriate location. Both the species and location shall be approved by the Town Tree Warden.
- 10) **Lighting:** All exterior building and site lighting shall comply with the dark sky initiatives (light shall shine down only) with the light source being fully shielded (with cutoff shields) so that little to no light or glare spills onto abutting properties. Spec sheets of proposed lighting fixtures shall be submitted to the Community Development Director for review and approval.
- 11) **Easements:** Necessary easements for the pedestrian pathway(s), streetscape and/or other shall be drafted, approved and recorded. All easements, and agreements, as reviewed by the Community Development Director, Town Engineer and Town Counsel, shall be properly written and recorded.

**Conditions for Ongoing Maintenance after Occupancy:**

- 1) **Parking Utilization Data:** The Applicant shall provide reports to the Community Development Director indicating utilization of the on-site parking and shall work with Town staff to evaluate impacts and make any necessary modifications to the parking space management system described above, including the provision of EV charging infrastructure, Zip Car spaces, etc. if evidenced to be desired by tenants.
- 2) **Signage:** Prior to installation of any building or tenant signage, a Sign Permit Application and/or Master Signage Plan shall be submitted for review and approval.
- 3) **As-Built Plans:** Two full size paper copies and electronic AutoCAD final As-Built plans showing the building footprint, drainage systems and utility connections shall be submitted to the Community Development Director and Town Engineer to ensure compliance with this decision and other applicable Town standards. The bond held for this requirement will be returned to the Applicant once this condition has been fulfilled.
- 4) **Landscaping:** Landscaping on-site shall be maintained in a healthy condition in perpetuity. In the event that landscaping is damaged during snow removal operations, the property owner shall replace such landscaping during the next growing season.
- 5) **Lighting:** All exterior building and site lighting shall comply with the dark sky initiatives (light shall shine down only) with the light source being fully shielded (with cutoff shields) so that little to no light or glare spills onto abutting properties. Any exterior lighting that is required for security purposes may be illuminated by photocells and is not required to be extinguished at the close of business. All site and building lighting for commercial purposes, beyond what is needed for security purposes, shall be programmed to shut off at the close of business each day.
- 6) **Trash Removal:** All trash collection and disposal are the responsibility of the owner / property manager. The Applicant shall ensure daily that exterior areas of the site remain clear of debris, trash and any equipment used in connection with any commercial activities on site.

**Plan Changes after Approval by the Commission:**

Contemplated future changes to the plan approved herein shall be presented to the Community Development Director and the Building Inspector, or other relevant Town staff, for review prior to implementation of proposed changes.



**10.5.13.1 Minor Plan Changes:** After Plan Approval, an Applicant may apply to make minor changes in a Development Project involving minor utility or building orientation adjustments, or minor adjustments to parking or other site details that do not affect the overall build out or building envelope of the site, or provision of open space, number of housing units, or housing need or affordability features. Such minor changes must be submitted to the Commission on redlined prints of the approved plan, reflecting the proposed change, and on application forms provided by the Commission. The Commission may authorize such changes at any regularly scheduled meeting, without the need to hold a public hearing. The Commission shall set forth any decision to approve or deny such minor change by motion and written decision, and provide a copy to the Applicant for filing with the Town Clerk.

**10.5.13.2 Major Plan Changes:** Those changes deemed by the Commission to constitute a major change in a Development Project because of the nature of the change in relation to the prior approved plan, or because such change cannot be appropriately characterized as a minor change as described above, shall be processed by the Commission as a new application for Plan Approval pursuant to Section 10.5.

**Appeal:**

Any person aggrieved by this Decision of the CPDC may appeal to the appropriate court in accordance with the provisions of M.G.L. Ch. 40A Section 17, pursuant to M.G.L. Ch. 40R Section 11, within twenty (20) days after the date of filing of this Decision with the Town Clerk. Notice of any appeal with a copy of the complaint must also be filed with the Town Clerk within such twenty (20) days as provided in M.G.L. Ch. 40A Section 17.

This Decision and the relief, terms, restrictions and conditions contained herein shall run with the land and all subsequent owners shall benefit from and be bound by the relief, terms, restrictions and conditions contained herein.

*Signed as to the accuracy of the vote as reflected in the minutes:*

---

Andrew MacNichol, Community Development Director  
*Cc: Applicant, Town Clerk, DRT Staff, planning file*

Date

# Memo

**To:** Andrew MacNichol, Community Development Director

**From:** Ryan A. Percival, P.E., Town Engineer;

**CC:** Community Planning and Development Commission;

**Date:** December 8, 2022

**Re:** Proposed 25 Haven Street Mixed-Use Development

---

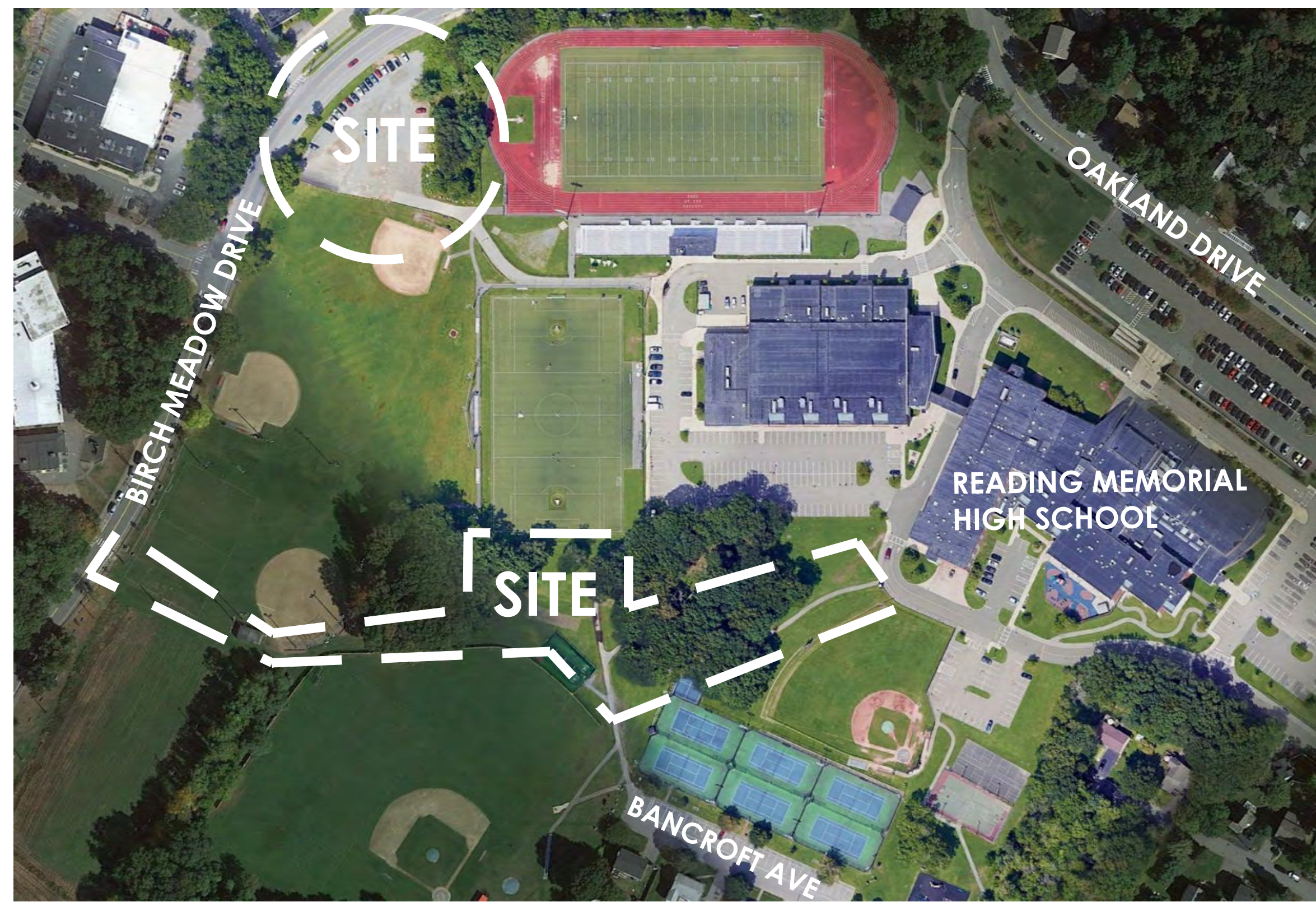
Materials reviewed:

- Civil Engineering Site Plan Review and Special Permit Set entitled; "25 Haven Street Mixed-Use Development", 25 Haven Street Reading, Massachusetts; prepared by Hayes Engineering, Inc.; dated November 22, 2022
- Stormwater Management Report; prepared by Hayes Engineering, Inc.; dated November 22, 2022

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

- The property has a DEP Reportable Release, RTN #3-0013004
- Construction stone entrance shall be a minimum of 50' in length and noted on the plan.
- The stormwater management report utilizes the NOAA Atlas 14 rainfall data.
- Post-development runoff volumes and flows have been reduced for the 2, 10, 25 and 100-year storms.
- The Engineering Division will work with the engineer to coordinate the private drain connections to the Town's system, including location, size, and material. Upgrades may be needed to the Town's drainage system.
- Test pits were performed and indicate an Estimated Seasonal High Groundwater 96" below grade at elevation 98.5
- The stormwater report shall include Phosphorous removal calculations.
- Please clarify the vertical standpipe overflow, it's unclear what this is for and its function.
- Domestic water and fire service should come off Haven Street which is currently being replaced with a 12" CLDI pipe. The current design has the services off an unlined 6" water main.
- Fire flow test shall be performed.
- Sewer flow study shall be performed.
- Label size and type of all utilities
- The plan shall show the dimensions of the driveway opening, a maximum of 24' is allowed per the Select Board Policies.
- All electric utilities shall be underground
- The design consultant shall coordinate with the Engineering Division on the updated utility improvements on Haven Street. The plan shall be updated to reflect the new utility locations.
- ADA Accessible space shall be labeled as Van space
- Trench paving in the Town ROW shall meet Town Standards for this area.
- This site is subject to a Sewer I/I Connection Fee.
- An O&M document should be developed for maintenance and inspections of the above infrastructure as well as the infiltration system.
- 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.



LOCUS MAP



LIST OF DRAWINGS

- TOPOGRAPHIC SURVEY (SHEET 1 OF 2)
- TOPOGRAPHIC SURVEY (SHEET 2 OF 2)
- L0.1 KEY PLAN
- SP1.1 SITE PREPARATION PLAN SHEET I
- SP1.2 SITE PREPARATION PLAN SHEET II
- SP1.3 SITE PREPARATION DETAILS
- L1.1 LAYOUT AND MATERIALS PLAN SHEET I
- L1.2 LAYOUT AND MATERIALS PLAN SHEET II
- L2.1 GRADING AND UTILITY PLAN SHEET I
- L2.2 GRADING AND UTILITY PLAN SHEET II
- L3.1 PLANTING PLAN SHEET I
- L3.2 PLANTING PLAN SHEET II
- L3.3 PLANTING DETAILS AND SCHEDULES
- L5.1 DETAIL SHEET I
- L5.2 DETAIL SHEET II
- L5.3 DETAIL SHEET III

# NOTICE OF INTENT | NOVEMBER 30, 2022

## TOWN OF READING BIRCH MEADOW PARK | PHASE I RENOVATIONS

READING, MA

### OWNER

Town of Reading  
16 Lowell Street  
Reading, MA 01867  
(781) 942-9001

### LANDSCAPE ARCHITECT/CIVIL ENGINEER

Activitas  
70 Milton Street  
Dedham, MA 02026-2915  
(781) 326-2600

### ARCHITECT

OCO Architecture :: Design  
709 Hingham Street  
Hingham, MA 02043  
(617) 699-8395

### ELECTRICAL ENGINEER

NV5 Engineers  
200 Brickstone Square, Suite 201  
Andover, MA 01810-1488  
(978) 475-0298

### WETLAND DELINEATION

Epsilon Associates, Inc.  
3 Mill & Main Place, Suite 250  
Maynard, MA 01754  
(978) 897-7100

### SURVEY

Reed Land Survey, Inc.  
109 Rhode Island Road, Suite 4A  
Lakeville, MA 02347  
(508) 923-1181

TOWN OF READING  
BIRCH MEADOW PARK | PHASE I RENOVATIONS

NOTICE OF INTENT | NOVEMBER 30, 2022

REVISIONS:			PROJECT NO. 22014.00
NO.	DATE	SHEETS REVISED	NOTES
1	12.21.22	SP1.1, L1.1, L2.1, L3.1, L3.2, L3.3 & L5.3	REGULATORY REVIEW COMMENTS



### SITE PREPARATION LEGEND

APPROXIMATE LIMIT OF WORK		PAVEMENT SAWCUT	
WETLAND		STRIP AND DISPOSE OF EXISTING SOD STRIP, SCREEN, AND STOCKPILE TOPSOIL	
35' WETLAND BUFFER		REMOVE AND DISPOSE OF EXISTING PAVEMENT	
100' WETLAND BUFFER		REMOVE AND DISPOSE OF GRAVEL PAVEMENT	
TEMPORARY CONSTRUCTION FENCE		CLEAR AND GRUB EXISTING VEGETATION	
MULCH FILTER SOCK		SILT SACK	
REMOVE AND DISPOSE OF EXISTING CURB			
PROTECT EXISTING TREE OR STRUCTURE TO REMAIN			
REMOVE AND DISPOSE OF EXISTING TREE OR STRUCTURE			

### SITE PREPARATION NOTES

- EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY REED LAND SURVEYING INC., LOCATED AT 109 RHODE ISLAND ROAD, SUITE 4A, LAKEVILLE, MA, AND DATED JULY 28, 2022.
- THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES BETWEEN PLANS, SPECIFICATIONS, AND ACTUAL CONDITIONS TO THE LANDSCAPE ARCHITECT/CIVIL ENGINEER FOR CLARIFICATION AND RESOLUTION PRIOR TO STARTING WORK.
- THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING CONDITIONS TO REMAIN THAT ARE DUE TO CONTRACTOR OPERATIONS.
- ALL ITEMS TO BE REMOVED THAT ARE NOT STOCKPILED FOR LATER REUSE ON THE PROJECT OR FOR DELIVERY TO THE OWNER SHALL BE LEGALLY DISPOSED OF OFF SITE BY THE CONTRACTOR.
- THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE BASED ON THE SURVEY REFERENCED. THE CONTRACTOR SHALL CONTACT DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS EFFORTS OF THE DEMOLITION WITH ALL TRADES.
- THE CONTRACTOR SHALL COORDINATE ALL ADJUSTMENTS OR ABANDONMENT OF UTILITIES WITH THE RESPECTIVE UTILITY COMPANY.
- THE CONTRACTOR SHALL MAINTAIN OR ADJUST TO NEW FINISH GRADE (AS NECESSARY) ALL UTILITY AND SITE STRUCTURES SUCH AS MANHOLES, CATCH BASINS, ETC. FROM MAINTAINED UTILITY AND SITE SYSTEMS UNLESS OTHERWISE NOTED OR DIRECTED BY THE LANDSCAPE ARCHITECT.
- THE CONTRACTOR SHALL INSTALL CONSTRUCTION FENCING PER THE PLANS AND SPECIFICATIONS. CONTRACTOR MUST TAKE APPROPRIATE MEASURES TO MAINTAIN A SECURE SITE THROUGHOUT THE PROJECT.
- CONTRACTOR SHALL REVIEW EROSION CONTROL INSTALLATION METHOD (AS IT RELATES TO CHAIN LINK FENCE REMOVAL) AND SEQUENCING FOR ALL AREAS WITHIN WETLAND BUFFER ZONE PRIOR TO MOBILIZATION. REPRESENTATIVES FROM THE TOWN OF READING CONSERVATION COMMISSION SHALL BE INCLUDED IN PRE-CONSTRUCTION MEETINGS AND MAY BE ON-SITE WITH LANDSCAPE ARCHITECT DURING THE INSTALLATION OF EROSION CONTROL AND SITE PREPARATION.
- CONTRACTOR SHALL CONFIRM BENCHMARKS AND NORTHINGS / EASTINGS IN FIELD PRIOR TO DEMOLITION.
- EXISTING DRAINAGE SYSTEM BASINS SHALL REMAIN OPERATIONAL AS LONG AS POSSIBLE. UPON REMOVAL OF EXISTING BASINS, CONTRACTOR SHALL PROVIDE TEMPORARY INFILTRATION AREAS TO INFILTRATE CONSTRUCTION RUNOFF. CONTRACTOR SHALL FOCUS ON GETTING PROPOSED DRAINAGE SYSTEMS OPERATIONAL AS SOON AS POSSIBLE. CONTRACTOR SHALL ENSURE ALL STORMWATER FLOWING TO NEW BASINS IS TREATED STORMWATER THAT WILL NOT NEGATIVELY AFFECT THE FINAL SYSTEMS.
- ALL MULCH FILTER SOCK SHALL BE FILLED IN THE CONTRACTOR STAGING AREA AND INSTALLED BY HAND ADJACENT TO RESOURCE AREAS.

REMOVE AND DISPOSE OF EXISTING BITUMINOUS CONCRETE PAVEMENT

STRIP AND DISPOSE OF EXISTING SOD STRIP, SCREEN AND STOCKPILE EXISTING TOPSOIL

REMOVE AND STOCKPILE EXISTING GRANITE CURB FOR REUSE

EXISTING TREE PROTECTION, TYPICAL

REMOVE AND DISPOSE OF EXISTING GRAVEL PAVEMENT

PROTECT EXISTING SEWER MANHOLE AND SEWER LINE TO REMAIN

TEMPORARY CONSTRUCTION ENTRANCE

CONTRACTOR TO PROVIDE "SIDEWALK CLOSED" SIGN ATTACHED TO TEMPORARY CONSTRUCTION FENCE, TYPICAL FOR BOTH ENDS OF SIDEWALK REMOVAL

REMOVE AND DISPOSE OF EXISTING WOOD BOLLARDS AND ASSOCIATED FOOTINGS (22)

REMOVE AND DISPOSE OF EXISTING BITUMINOUS CONCRETE PAVEMENT

PROTECT EXISTING WOOD GUARDRAIL TO REMAIN

REMOVE AND DISPOSE OF EXISTING ASPHALT BERM CURB

DO NOT TRAFFIC OR UTILIZE EXISTING GRASS FIELD FOR STAGING/STORAGE

RLS SURVEY CONTROL POINT #7  
MAG NAIL SET  
N:3,021,174.01  
E:761,254.64

100' WETLAND BUFFER ZONE LINE

CB RIM=92.91  
A=87.31  
B=88.74  
OUT=87.51

RIM=92.80  
OUT=89.00

30" RCP  
INV=87.47

TERMINATE TEMPORARY CONSTRUCTION FENCE IN WOODED AREA

CLEAR AND GRUB EXISTING VEGETATION. CONTRACTOR TO REVIEW LIMITS IN THE FIELD WITH LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION

REMOVE AND STOCKPILE EXISTING BOULDERS FOR RE-USE. LANDSCAPE ARCHITECT TO MARK IN FIELD. ASSUME THREE (3) BOULDERS TO BE MOVED

MULCH FILTER SOCK, TYPICAL

CONTRACTOR SHALL ASSUME ALLOWANCE FOR \$1,500 SF OF SELECTIVE INVASIVE PLANT REMOVALS. CONTRACTOR TO REVIEW LIMITS IN THE FIELD WITH LANDSCAPE ARCHITECT AND A REPRESENTATIVE OF THE CONSERVATION COMMISSION

REMOVE AND STOCKPILE EXISTING BOULDERS FOR RE-USE. LANDSCAPE ARCHITECT TO MARK IN FIELD. ASSUME SIX (6) BOULDERS TO BE MOVED

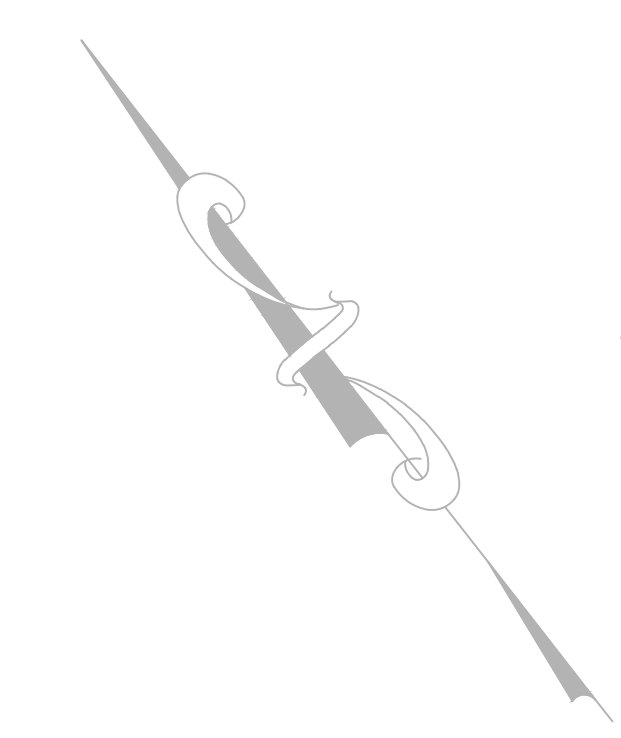
TERMINATE TEMPORARY CONSTRUCTION FENCE IN WOODED AREA

REMOVE AND STOCKPILE TWO (2) EXISTING REMOVABLE BOLLARDS

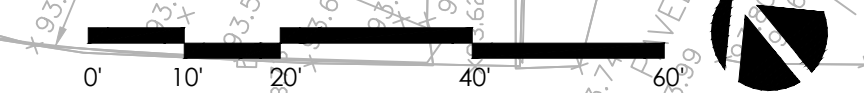
PROVIDE CLEAN PAVEMENT SAWCUT, TYPICAL

SILT SACK TYPICAL

TEMPORARY CONSTRUCTION FENCE, TYPICAL



CONTACT DIGSAFE: UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND/OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS, PHONE DIGSAFE 1-888-344-7233.



#### CONSULTANTS

ARCHITECT -  
OCO ARCHITECTURE :: DESIGN

ELECTRICAL ENGINEER -  
NV5 ENGINEERS

WETLAND DELINEATION -  
EPSILON ASSOCIATES, INC.

SURVEY -  
REED LAND SURVEY, INC.

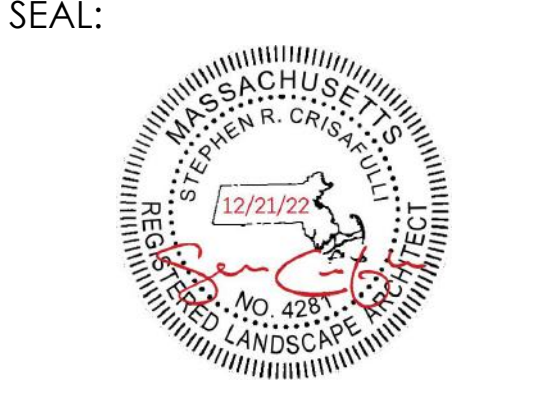
# TOWN OF READING

Reading, MA  
BIRCH MEADOW PARK | PHASE I RENOVATIONS

REGULATORY REVIEW  
November 30, 2022

REVISIONS:	
NO.	DESCRIPTION
1	1/22/22 REGULATORY REVIEW COMMENTS

SCALE: 1"=20'-0"  
PROJECT NO.: 22014.00  
FILE: 22014.00-SP1.1-SP\_PLAN.dwg  
DRAWN: MJGM  
CHECKED: EPM/SRC



SHEET TITLE:  
SITE PREPARATION  
PLAN SHEET 1

SHEET NO:  
**SP1.1**



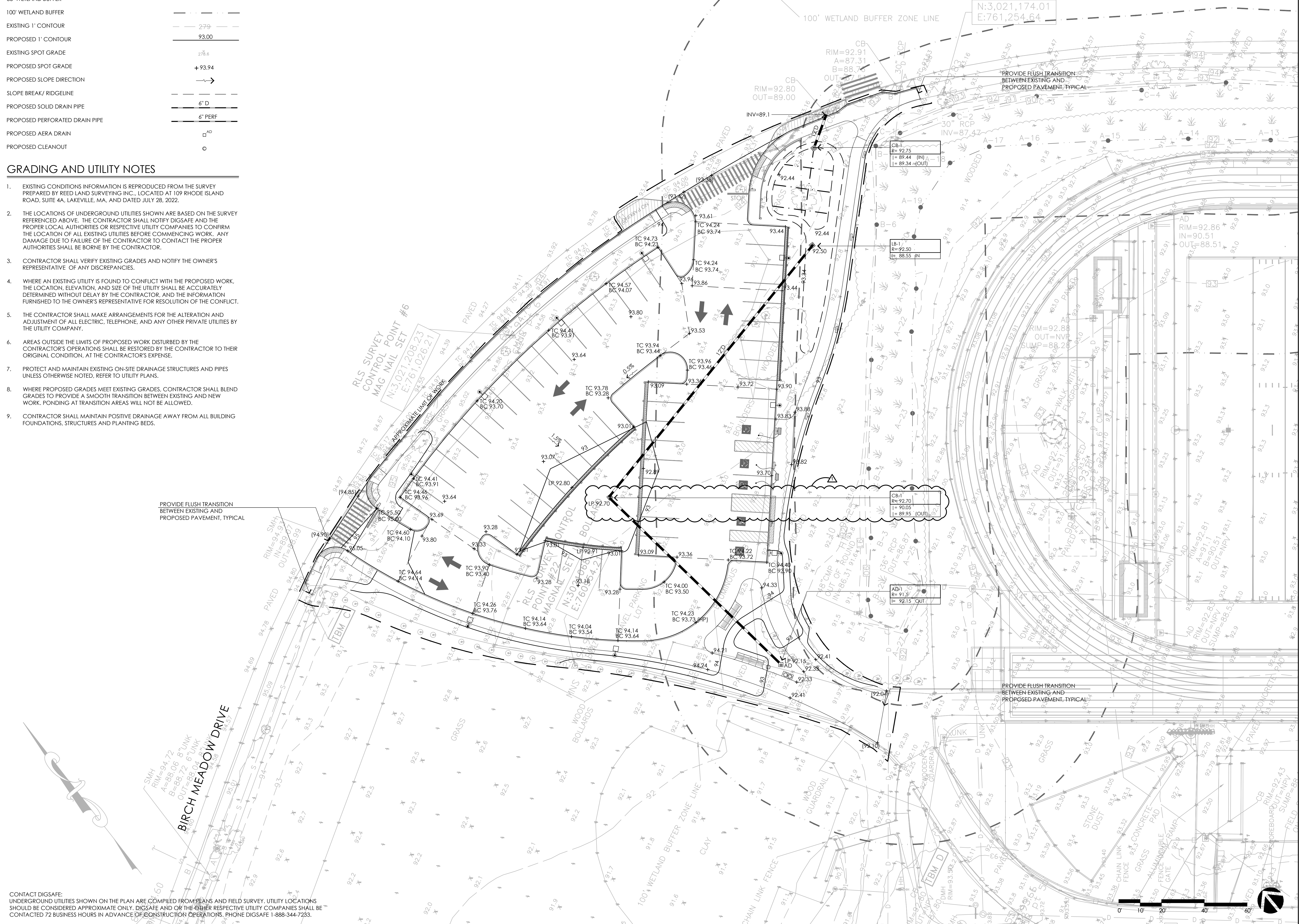
### GRADING AND UTILITY LEGEND

APPROXIMATE LIMIT OF WORK	---
WETLAND	WF-15
35' WETLAND BUFFER	---
100' WETLAND BUFFER	---
EXISTING 1" CONTOUR	27.9
PROPOSED 1" CONTOUR	93.00
EXISTING SPOT GRADE	278.6
PROPOSED SPOT GRADE	+93.94
PROPOSED SLOPE DIRECTION	→
SLOPE BREAK/ RIDGELINE	---
PROPOSED SOLID DRAIN PIPE	6" D
PROPOSED PERFORATED DRAIN PIPE	6" PERF
PROPOSED AERA DRAIN	□ <sup>AD</sup>
PROPOSED CLEANOUT	○

### GRADING AND UTILITY NOTES

- EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY REED LAND SURVEYING INC., LOCATED AT 109 RHODE ISLAND ROAD, SUITE 4A, LAKEVILLE, MA, AND DATED JULY 28, 2022.
- THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON THE SURVEY REFERENCED ABOVE. THE CONTRACTOR SHALL NOTIFY DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
- CONTRACTOR SHALL VERIFY EXISTING GRADES AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES.
- WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER'S REPRESENTATIVE FOR RESOLUTION OF THE CONFLICT.
- THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF ALL ELECTRIC, TELEPHONE, AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANY.
- AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION, AT THE CONTRACTOR'S EXPENSE.
- PROTECT AND MAINTAIN EXISTING ON-SITE DRAINAGE STRUCTURES AND PIPES UNLESS OTHERWISE NOTED, REFER TO UTILITY PLANS.
- WHERE PROPOSED GRADES MEET EXISTING GRADES, CONTRACTOR SHALL BLEND GRADES TO PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING AND NEW WORK. PONDING AT TRANSITION AREAS WILL NOT BE ALLOWED.
- CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL BUILDING FOUNDATIONS, STRUCTURES AND PLANTING BEDS.

RLS SURVEY CONTROL POINT #7  
MAG NAIL SET  
N:3,021,174.01  
E:761,254.64



**ACTIVITAS**  
landscape architecture | civil engineering  
70 Milton Street | Dedham, MA 02026-2915  
(781) 326-2600 | activitas.com

**CONSULTANTS**

ARCHITECT -  
OCO ARCHITECTURE :: DESIGN

ELECTRICAL ENGINEER -  
NV5 ENGINEERS

WETLAND DELINEATION -  
EPSILON ASSOCIATES, INC.

SURVEY -  
REED LAND SURVEY, INC.

**TOWN OF READING**  
Reading, MA  
BIRCH MEADOW PARK | PHASE I RENOVATIONS

REGULATORY REVIEW  
November 30, 2022

REVISIONS:	
NO.	DATE
1	12/21/22
	REGULATORY REVIEW COMMENTS

SCALE: 1"=20'-0"

PROJECT NO.: 22014.00

FILE: 22014.00-L2.1-G\_PLAN.dwg

DRAWN: SRC

CHECKED: MEB

SEAL:

SHEET TITLE:  
GRADING AND UTILITY PLAN SHEET I

SHEET NO.:  
**L2.1**

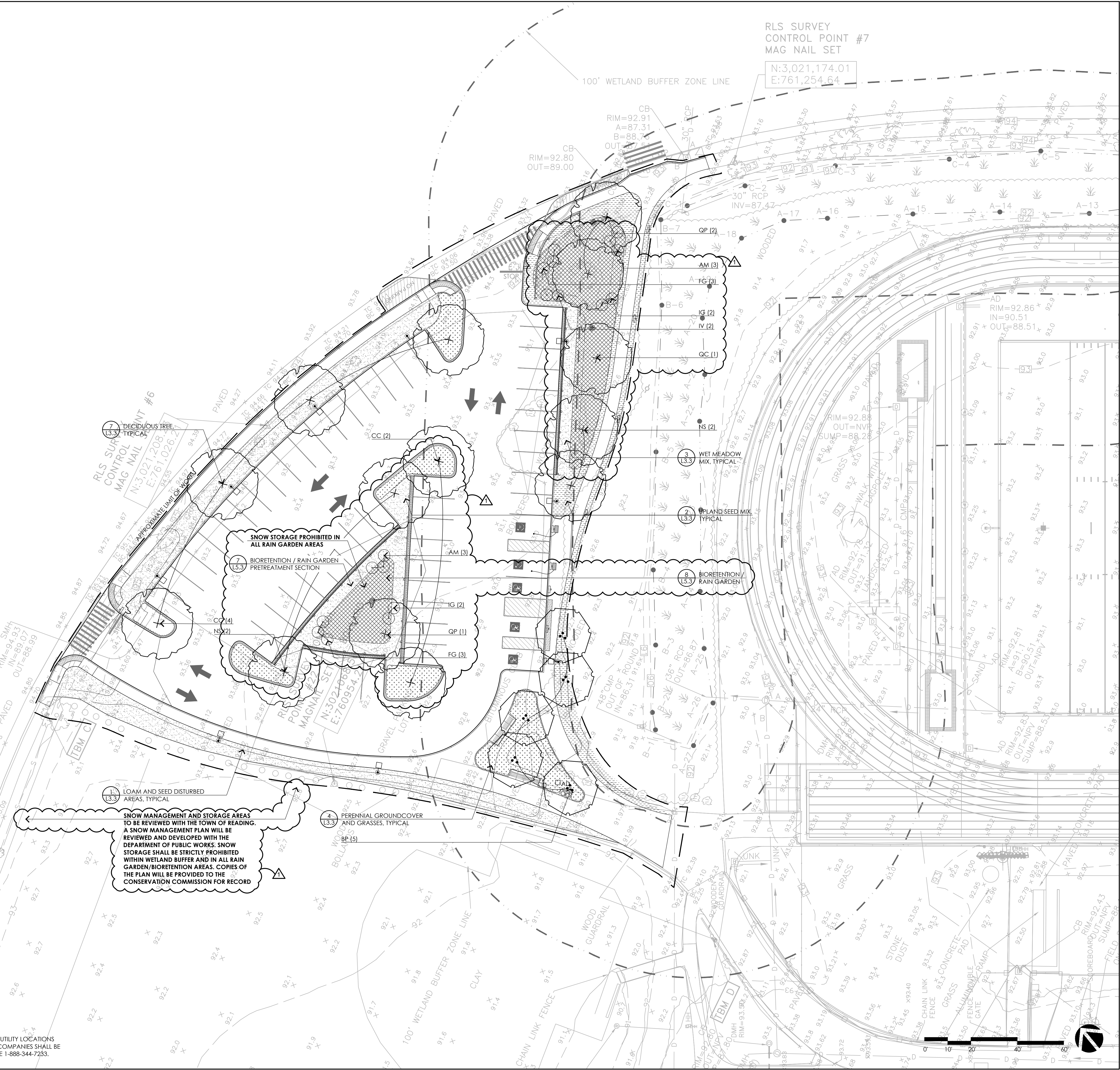
CONTACT DIGSAFE: UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS, PHONE DIGSAFE 1-888-344-7233.

### PLANTING LEGEND

- APPROXIMATE LIMIT OF WORK
- WETLAND
- 30' WETLAND BUFFER
- 100' WETLAND BUFFER
- PROPOSED 1' CONTOUR
- TEMPORARY FENCING AT SEED ESTABLISHMENT AREAS
- PERENNIALS, GROUND COVER, AND GRASSES
- LOAM AND SEED
- CONSERVATION/UPLAND SEED MIX
- WETLAND SEED MIX
- DECIDUOUS TREE
- MULTI-STEM TREE
- SHRUB

### PLANTING NOTES

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY REED LAND SURVEYING INC., LOCATED AT 109 RHODE ISLAND ROAD, SUITE 4A, LAKEVILLE, MA, AND DATED JULY 28, 2022.
2. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON THE SURVEY REFERENCED ABOVE. THE CONTRACTOR SHALL NOTIFY DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
3. CONTRACTOR SHALL BEGIN MAINTENANCE IMMEDIATELY AFTER PLANTING AND WILL CONTINUE UNTIL FINAL WRITTEN ACCEPTANCE OF PLANT MATERIAL.
4. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM PROPOSED BUILDING, STRUCTURES, AND PLANTING BEDS.
5. THE LANDSCAPE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE ALL PLANTINGS SHOWN ON THIS DRAWING.
6. ALL MATERIALS SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.
7. ALL PLANTS SHALL BEED TO FINISH GRADE AS TO ORIGINAL GRADES BEFORE DIGGING.
8. FINAL LAYOUT OF PLANTINGS WILL BE IN THE FIELD PER THE DIRECTION OF THE LANDSCAPE ARCHITECT. PROVIDE A MINIMUM FORTY-EIGHT (48) HOURS NOTICE PRIOR TO BEGINNING FINAL LAYOUT AND PLANTING OPERATIONS.
9. ALL PLANTS TO BE BALLED IN BURLAP OR CONTAINERIZED.
10. ALL PLANTED AREAS TO BE EDGED AND MULCHED WITH AGED PINE BARK; PARTIALLY DECOMPOSED, JET BLACK IN COLOR AND FREE OF WOOD CHIPS THICKER THAN 1/4 INCH.
11. LANDSCAPE ISLAND PLANTING SOIL MIX: UTILIZE EXISTING SITE LOAM FROM STOCKPILES, THOROUGHLY INCORPORATE WITH COMPOST AS NEEDED PER SOILS ANALYSIS. FERTILIZE PER RECOMMENDED RATES IN SOIL ANALYSIS.
12. TREE PIT PLANTING SOIL MIX: REFER TO SPECIFICATIONS FOR CU STRUCTURAL SOIL.
13. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR ONE (1) FULL YEAR FROM DATE OF ACCEPTANCE.
14. ALL PLANT MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT, AT THE NURSERY, AND AT THE SITE.
15. ALL AREAS OF THE SITE WHICH HAVE BEEN DISTURBED AND NOT OTHERWISE DEVELOPED SHALL BE LOAMED AND SEEDED WITH A MINIMUM DEPTH OF 12" DEPTH TOPSOIL UNLESS OTHERWISE NOTED.
16. SLOPES 3:1 AND GREATER SHALL RECEIVE STRAW BLANKET PRIOR TO SEEDING.
17. REFER TO SHEET L3.3 FOR PLANTING AND SEED MIX SCHEDULES.



RLS SURVEY  
CONTROL POINT #7  
MAG NAIL SET  
N:3,021,174.01  
E:761,254.64

**CONSULTANTS**

ARCHITECT -  
OCO ARCHITECTURE :: DESIGN

ELECTRICAL ENGINEER -  
NV5 ENGINEERS

WETLAND DELINEATION -  
EPSILON ASSOCIATES, INC.

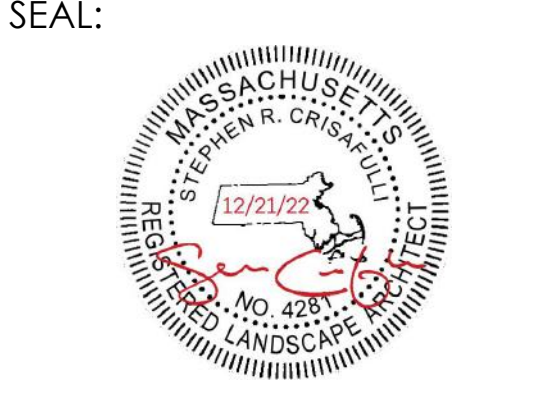
SURVEY -  
REED LAND SURVEY, INC.

**TOWN OF READING**  
Reading, MA  
BIRCH MEADOW PARK | PHASE I RENOVATIONS

REGULATORY REVIEW  
November 30, 2022

REVISIONS:	
NO.	DESCRIPTION
1	12.21.22 REGULATORY REVIEW COMMENTS

SCALE: 1"=20'-0"  
PROJECT NO.: 22014.00  
FILE: 22014.00-L3.1-P\_PLAN.dwg  
DRAWN: MJD  
CHECKED: EPM/SRC



SHEET TITLE:  
PLANTING PLAN  
SHEET I

SHEET NO:  
**L3.1**

CONTACT DIGSAFE: UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS, PHONE DIGSAFE 1-888-344-7233.

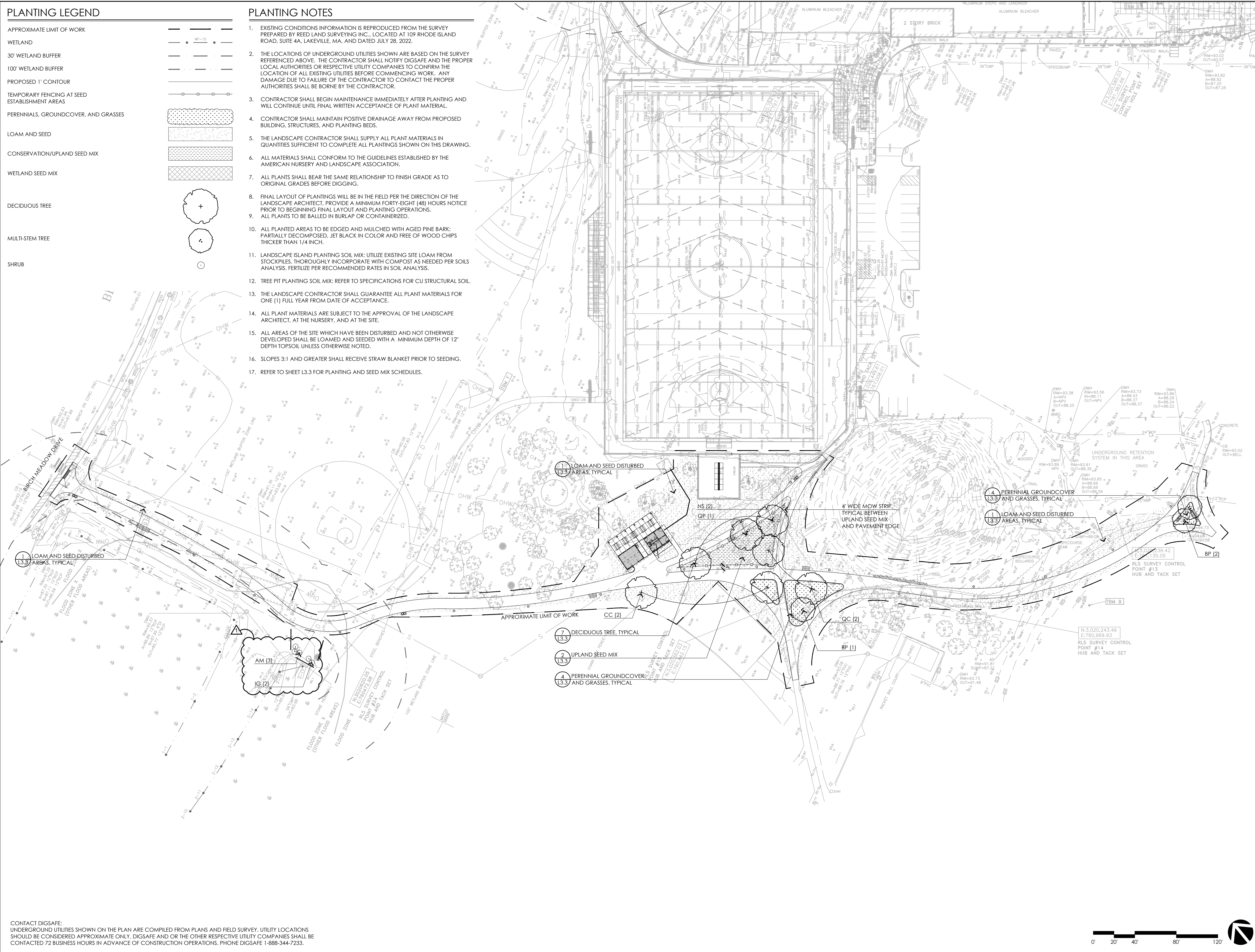


**PLANTING LEGEND**

- APPROXIMATE LIMIT OF WORK
- WETLAND
- 30' WETLAND BUFFER
- 100' WETLAND BUFFER
- PROPOSED 1' CONTOUR
- TEMPORARY FENCING AT SEED ESTABLISHMENT AREAS
- PERENNIALS, GROUNDCOVER, AND GRASSES
- LOAM AND SEED
- CONSERVATION/UPLAND SEED MIX
- WETLAND SEED MIX
- DECIDUOUS TREE
- MULTI-STEM TREE
- SHRUB

**PLANTING NOTES**

1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY REED LAND SURVEYING INC., LOCATED AT 109 RHODE ISLAND ROAD, SUITE 4A, LAKEVILLE, MA, AND DATED JULY 28, 2022.
2. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON THE SURVEY REFERENCED ABOVE. THE CONTRACTOR SHALL NOTIFY DIGSAFE AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
3. CONTRACTOR SHALL BEGIN MAINTENANCE IMMEDIATELY AFTER PLANTING AND WILL CONTINUE UNTIL FINAL WRITTEN ACCEPTANCE OF PLANT MATERIAL.
4. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM PROPOSED BUILDING, STRUCTURES, AND PLANTING BEDS.
5. THE LANDSCAPE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE ALL PLANTINGS SHOWN ON THIS DRAWING.
6. ALL MATERIALS SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.
7. ALL PLANTS SHALL BEAR THE SAME RELATIONSHIP TO FINISH GRADE AS TO ORIGINAL GRADES BEFORE DIGGING.
8. FINAL LAYOUT OF PLANTINGS WILL BE IN THE FIELD PER THE DIRECTION OF THE LANDSCAPE ARCHITECT. PROVIDE A MINIMUM FORTY-EIGHT (48) HOURS NOTICE PRIOR TO BEGINNING FINAL LAYOUT AND PLANTING OPERATIONS.
9. ALL PLANTS TO BE BALLED IN BURLAP OR CONTAINERIZED.
10. ALL PLANTED AREAS TO BE EDGED AND MULCHED WITH AGED PINE BARK; PARTIALLY DECOMPOSED, JET BLACK IN COLOR AND FREE OF WOOD CHIPS THICKER THAN 1/4 INCH.
11. LANDSCAPE ISLAND PLANTING SOIL MIX: UTILIZE EXISTING SITE LOAM FROM STOCKPILES, THOROUGHLY INCORPORATE WITH COMPOST AS NEEDED PER SOILS ANALYSIS. FERTILIZE PER RECOMMENDED RATES IN SOIL ANALYSIS.
12. TREE PIT PLANTING SOIL MIX: REFER TO SPECIFICATIONS FOR CU STRUCTURAL SOIL.
13. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR ONE (1) FULL YEAR FROM DATE OF ACCEPTANCE.
14. ALL PLANT MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT, AT THE NURSERY, AND AT THE SITE.
15. ALL AREAS OF THE SITE WHICH HAVE BEEN DISTURBED AND NOT OTHERWISE DEVELOPED SHALL BE LOAMED AND SEEDED WITH A MINIMUM DEPTH OF 12" DEPTH TOPSOIL UNLESS OTHERWISE NOTED.
16. SLOPES 3:1 AND GREATER SHALL RECEIVE STRAW BLANKET PRIOR TO SEEDING.
17. REFER TO SHEET L3.3 FOR PLANTING AND SEED MIX SCHEDULES.



**CONSULTANTS**

ARCHITECT -  
 OCO ARCHITECTURE :: DESIGN

ELECTRICAL ENGINEER -  
 NV5 ENGINEERS

WETLAND DELINEATION -  
 EPSILON ASSOCIATES, INC.

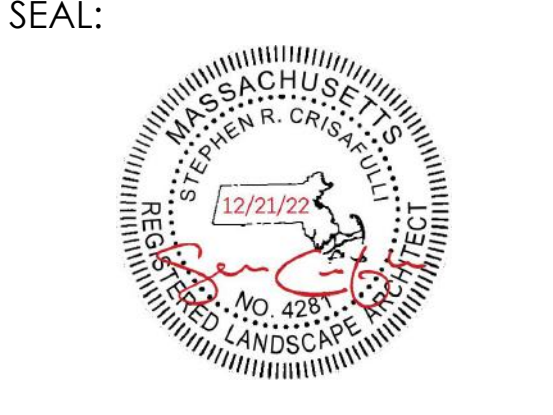
SURVEY -  
 REED LAND SURVEY, INC.

**TOWN OF READING**  
 Reading, MA  
 BIRCH MEADOW PARK | PHASE I RENOVATIONS

REGULATORY REVIEW  
 November 30, 2022

REVISIONS:	
NO.	DESCRIPTION
1	12/21/22 REGULATORY REVIEW COMMENTS

SCALE: 1"=20'-0"  
 PROJECT NO.: 22014.00  
 FILE: 22014.00-L3.2-P\_PLAN.dwg  
 DRAWN: MJD  
 CHECKED: EPM/SRC

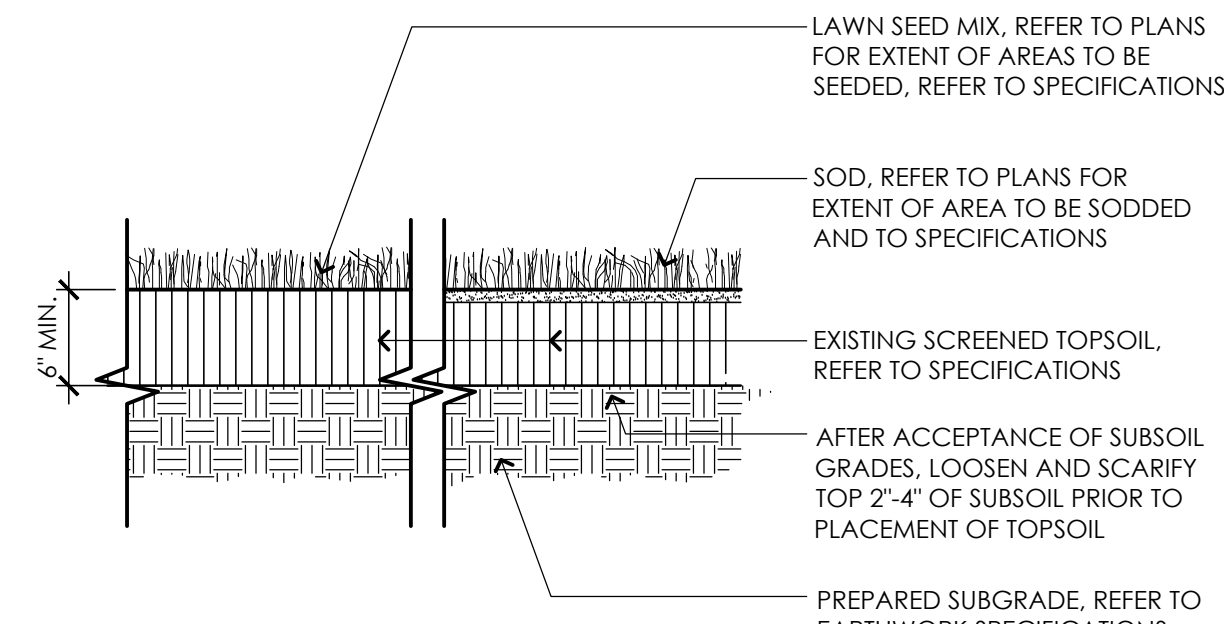


SHEET TITLE:  
 PLANTING PLAN  
 SHEET II

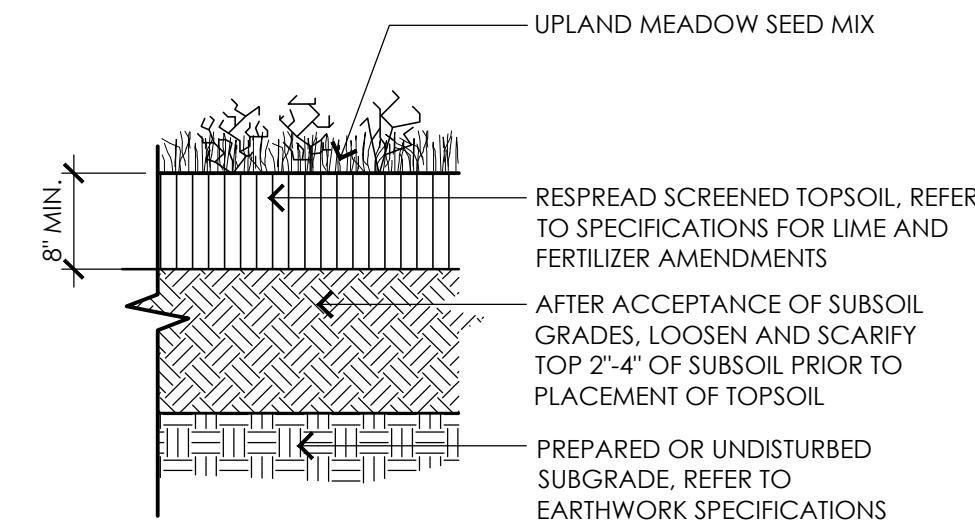
SHEET NO.: **L3.2**

CONTACT DIGSAFE: UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIGSAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIGSAFE 1-888-344-7233.

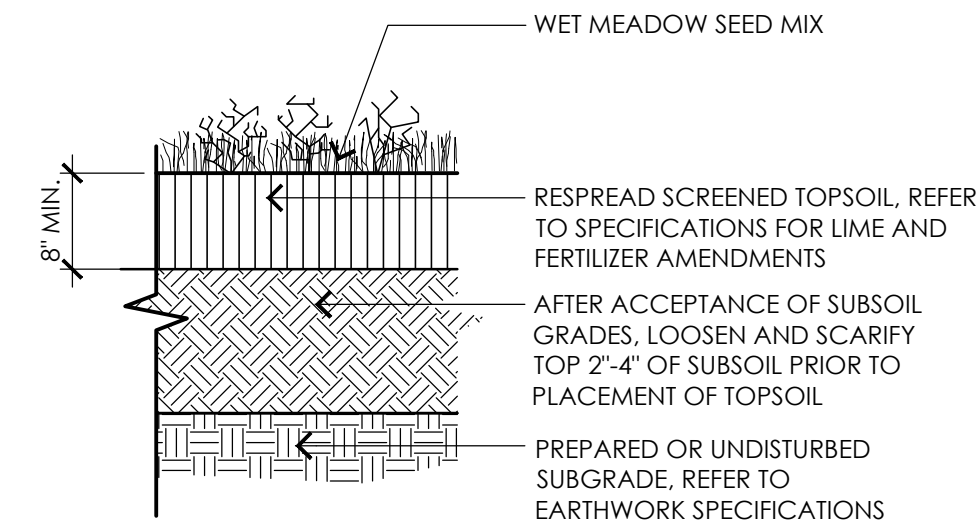
NOTE:  
REFER TO SHEETS L3.1 AND L3.2 FOR LIMITS OF SOD MOW STRIP AREAS.



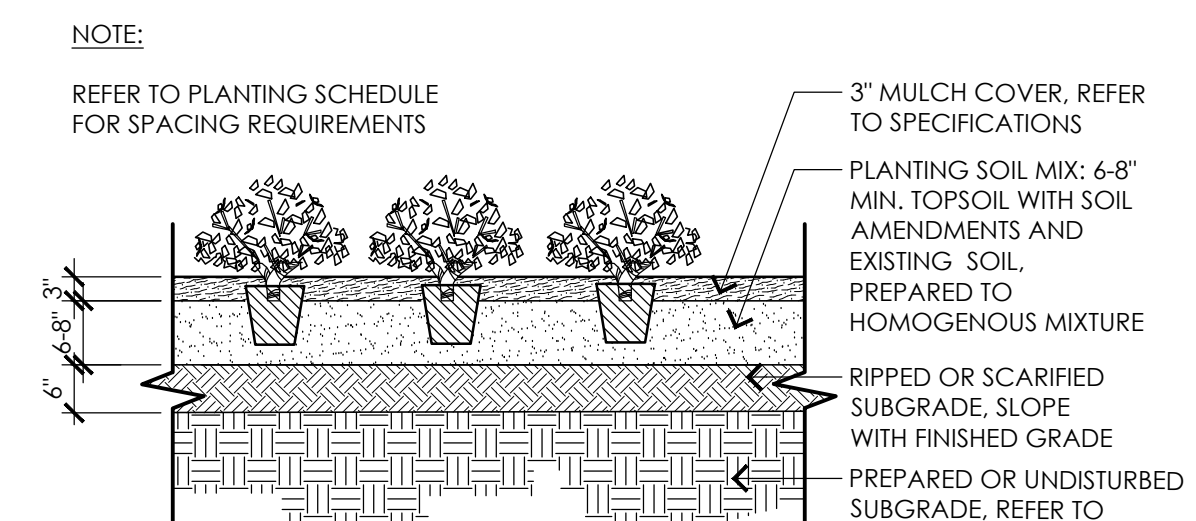
**1** LOAM AND SEED / SOD  
NOT TO SCALE



**2** UPLAND SEED MIX  
NOT TO SCALE

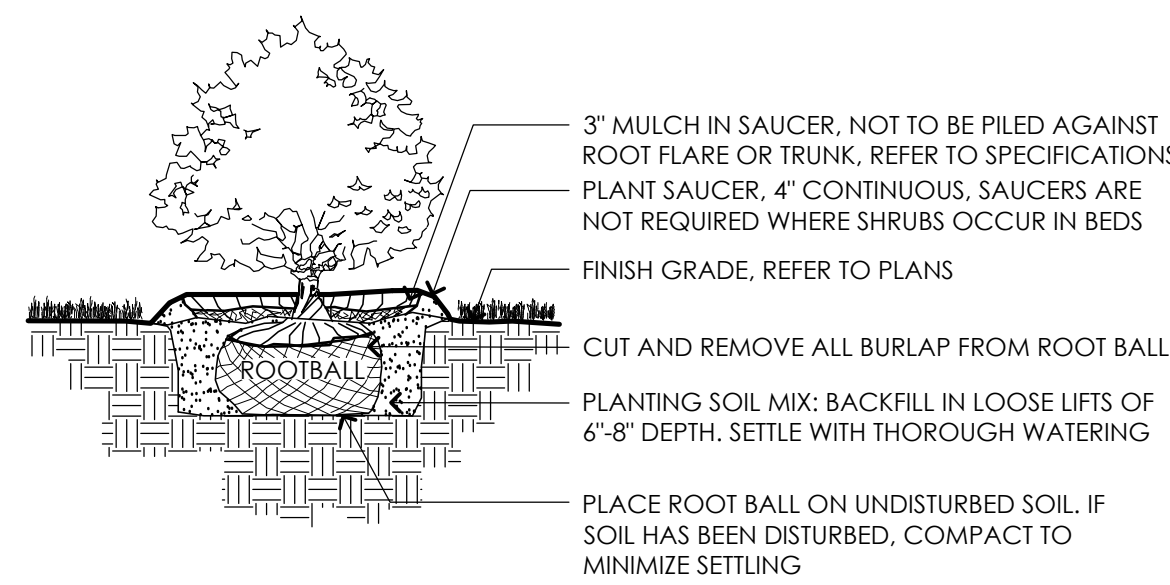


**3** WET MEADOW SEED MIX  
NOT TO SCALE

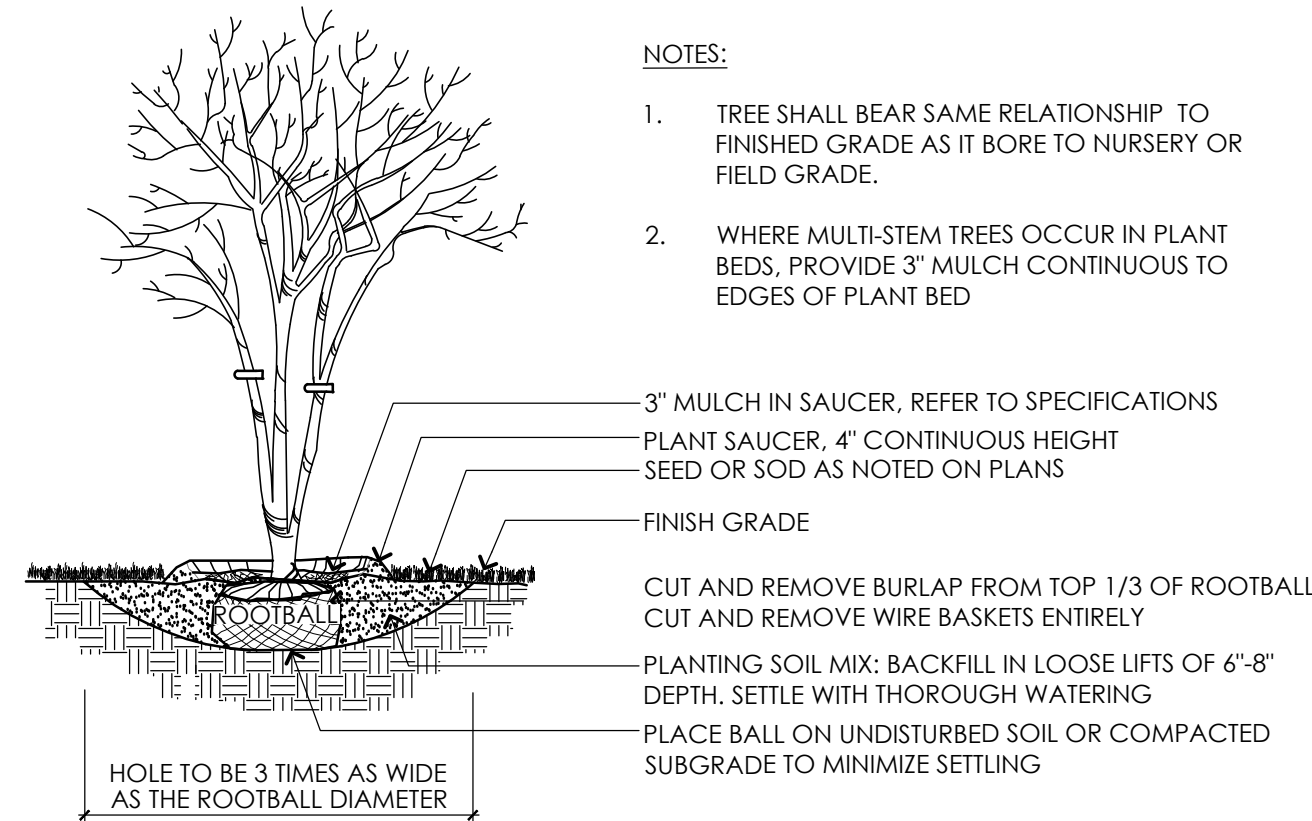


**4** PERENNIALS, GROUNDCOVER, AND GRASSES  
NOT TO SCALE

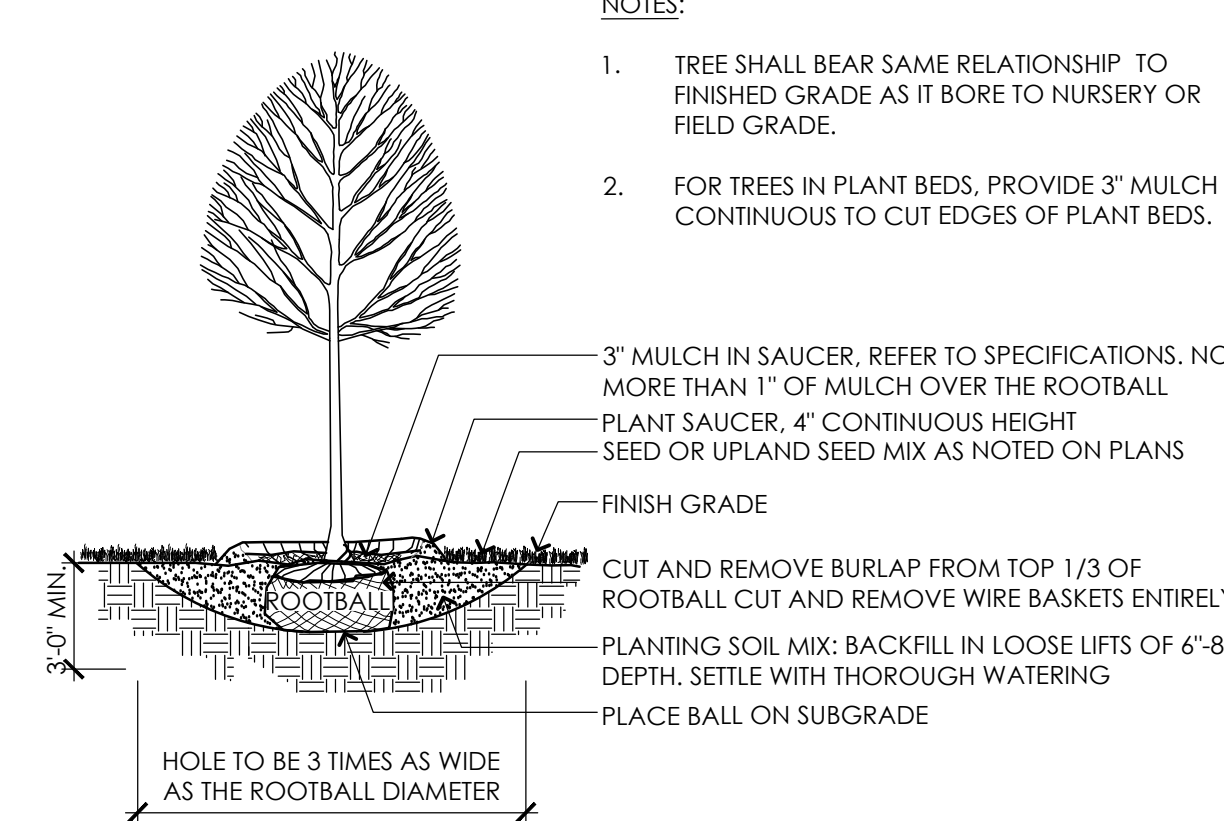
- NOTES:
- SHRUB SHALL BEAR SAME RELATIONSHIP TO FINISHED GRADE AS IT BORE TO NURSERY OR FIELD GRADE.
  - WHERE SHRUBS OCCUR IN GROUPINGS IN PLANT BEDS, PROVIDE 2-FOOT DEEP CONTINUOUS LOAM BED AND 3" MULCH CONTINUOUS TO CUT EDGES OF PLANT BED



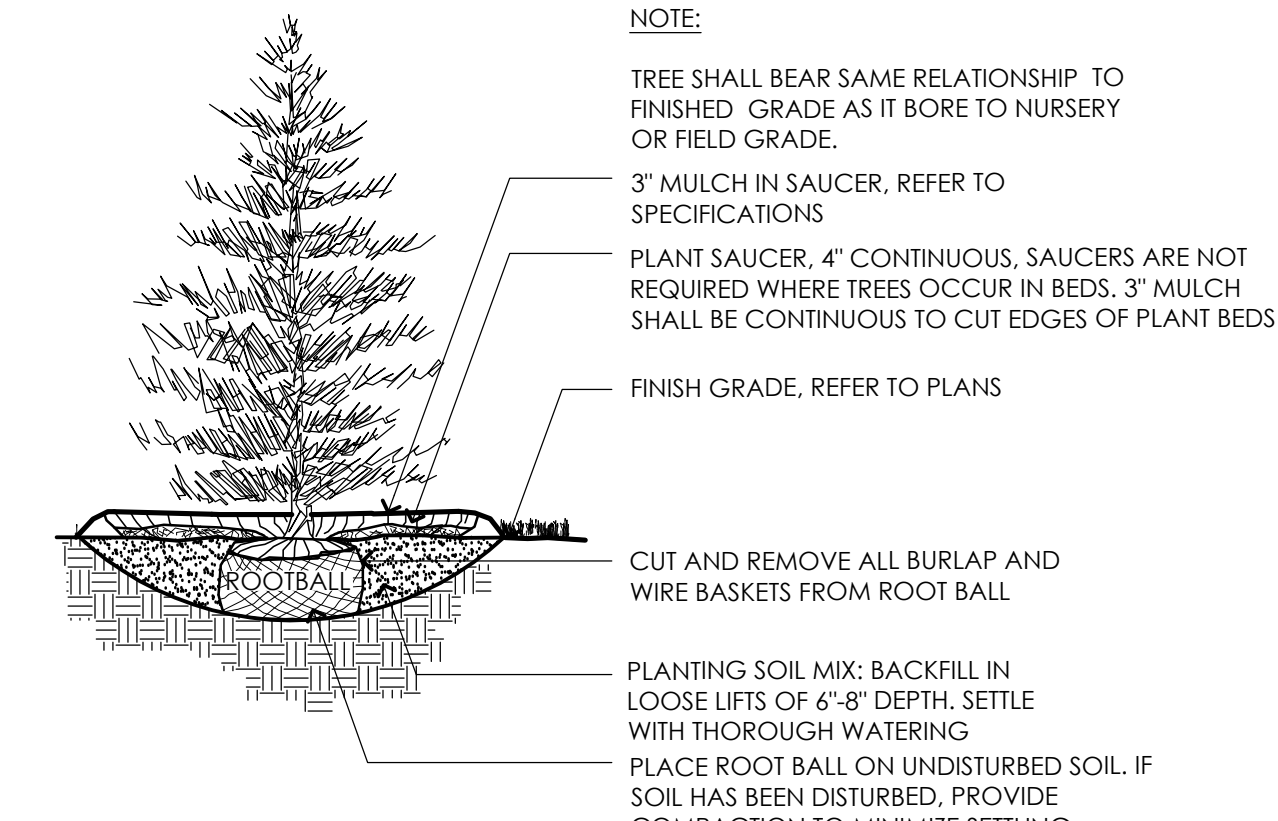
**5** SHRUB  
NOT TO SCALE



**6** MULTI-STEM TREE  
NOT TO SCALE



**7** DECIDUOUS TREE  
NOT TO SCALE



**8** EVERGREEN TREE  
NOT TO SCALE

SUGGESTED TREES AND SHRUBS

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	NOTES	QTY
<b>TREES (MIXTURE OF DRY AND WET)</b>					
BN	BETULA POPULIFOLIA	RIVER BIRCH	10'-12' HT.	MULTI-STEM	8 FACW
CC	CARPINUS CAROLINIANA	AMERICAN HORNBEAM	2-2.5' CAL.	B&B	8 FAC
NS	NYSSA SYLVATICA	BLACK TUPELO	2-2.5' CAL.	B&B	6 FAC
QC	QUERCUS COCCINEA	SCARLET OAK	3-3.5' CAL.	B&B	3 FACW+
QP	QUERCUS PALUSTRIS	PIN OAK	3-3.5' CAL.	B&B	4 FACW
<b>SHRUBS (MIXTURE OF DRY AND WET)</b>					
AM	ARONIA MELANOCARPA	BLACK CHOKEBERRY	3 GAL.	SPACE 36" O.C.	9 FAC
FG	FOTHERGILLA GARDENII	DWARF FOTHERGILLA	3 GAL.	SPACE 24" O.C.	6 FACW
IG	ILEX GLABRA	INKBERRY	3 GAL.	SPACE 36" O.C.	6 FACW+
IV	ILEX VERTICILLATA	WINTERBERRY	3 GAL.	SPACE 36" O.C.	2 FACW+
<b>GRASSES AND GROUNDCOVERS</b>					
CAF	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER'	FEATHER REED GRASS	1 GAL.	SPACE 24" O.C.	
DP	DENNSTAEDIA PUNCTILOBULA	HAY SCENTED FERN	1 GAL.	SPACE 24" O.C.	
MF	MONARDA FISTULOSA	WILD BERGAMOT / BEEBALM	1 GAL.	SPACE 18" O.C.	
PA	PENNISETUM ALOPECUROIDES 'HAEMEL'	DWARF FOUNTAIN GRASS	1 GAL.	SPACE 24" O.C.	
RH	RUDBECKIA HIRTA	BLACK-EYED SUSAN	1 GAL.	SPACE 24" O.C.	

TERMS:

<b>OBL</b>	OBLIGATED WETLAND SPECIES	ALMOST ALWAYS IN WETLANDS
<b>FACW</b>	FACULTATIVE WETLAND SPECIES	USUALLY IN WETLANDS BUT OCCASIONALLY NOT IN WETLANDS
<b>FACU</b>	FACULTATIVE UPLAND SPECIES	EQUALLY LIKELY IN WETLANDS AND NOT IN WETLANDS
<b>UPL</b>	OBLIGATED UPLAND SPECIES	USUALLY NOT IN WETLANDS BUT OCCASIONALLY IN WETLANDS

UPLAND SEED MIX

BOTANICAL NAME	COMMON NAME	
<b>NEW ENGLAND ROADSIDE MATRIX UPLAND SEED MIX</b>		
ELYMUS CANADENSIS	CANADA WILD RYE	FACW+
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	FACU
FESTUCA RUBRA	CREeping RED FESCUE	FACU
ANDROPOGON GERARDII	BIG BLUESTEM	FAC
SORGHASTRUM NUTANS	INDIAN GRASS	UPL
CHAMAECRISTA FASCICULATA	PARTRIDGE PEA	FACU
PANICUM VIRGATUM	SWITCHGRASS	FAC
RHUS TYPHINA	STAGHORN SUMAC	FACW
CORNUS AMOMUM	SILKY DOGWOOD	FACW
CORNUS RACEMOSA	GREY DOGWOOD	FAC
ASCLEPIAS SYRIACA	COMMON MILKWEEED	FACU-
ZIZIA AUREA	GOLDEN ALEXANDERS	FAC
DESMODIUM CANADENSE	SHOWY TICK TREFOIL	FAC
LESPEDeza CAPITATA	BUSH CLOVER	FACU-
HELIOPSIS HELIANTHOIDES	OX EYE SUNFLOWER	UPL
MONARDA FISTULOSA	WILD BERGAMOT	UPL
RUDBECKIA HIRTA	BLACK EYED SUSAN	FACU-
ASTER LAEVIS	SMOOTH BLUE ASTER	UPL
EUTHAMIA GRAMINIFOLIA	GRASS LEAVED GOLDENROD	FAC
SOLIDAGO JUNCEA	EARLY GOLDENROD	

APPLY 18LBS/ACRE: 1250 SF/LB

- NOTES:
- SEED MIXES SHALL BE EQUIVALENT TO THE SEED MIXES SHOWN AS DESIGNED AND SUPPLIED BY NEW ENGLAND WETLAND PLANTS, INC., AMHERST, MA (413) 548-8000.
  - CONTRACTOR SHALL SUBMIT ALL SEED MIXES TO LANDSCAPE ARCHITECT FOR REVIEW PRIOR TO PLACING ORDER.

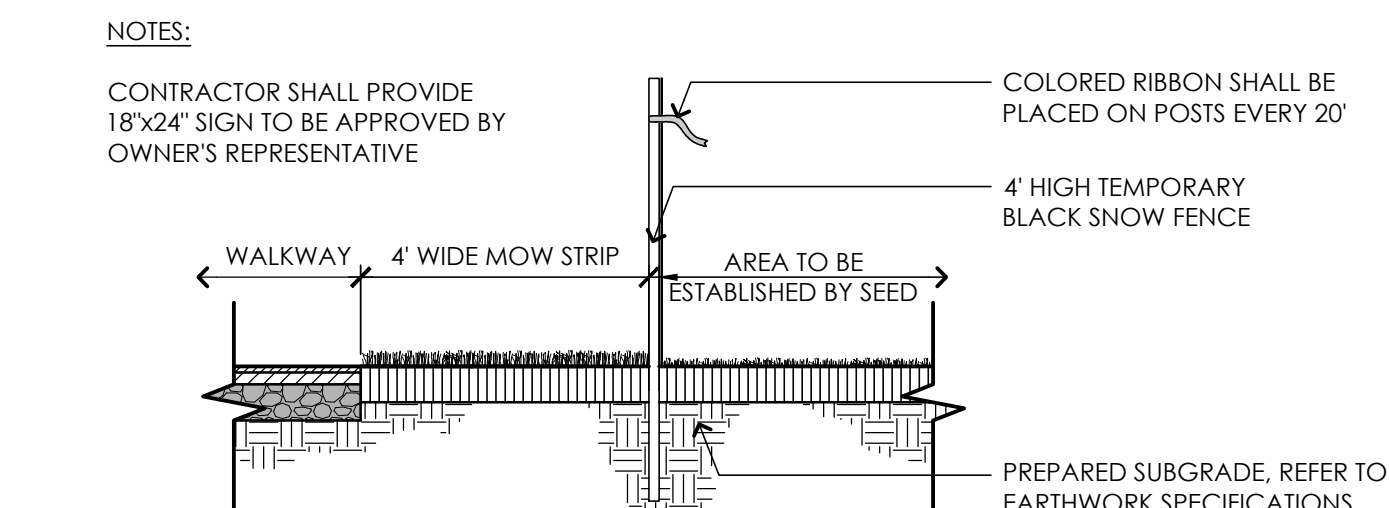
**UPLAND SEED MIX | 50:50 Blend of Upland Seed Mix and Wet Meadow Seed Mix Quantity:**  
Site Development Areas (±5,400 sf) 1 lb/1250 sf (qty. ±5 lbs)

**WETLAND MEADOW SEED MIX | 50:50 Blend of Upland Seed Mix and Wet Meadow Seed Mix Quantity:**  
Site Development Areas (±3,600 sf) 1 lb/1250 sf (qty. ±3 lbs)

WET MEADOW SEED MIX

BOTANICAL NAME	COMMON NAME	
<b>NEW ENGLAND ROADSIDE MATRIX WET MEADOW SEED MIX</b>		
ELYMUS RIPARIUS	RIVERBANK WILD RYE	FACW
FESTUCA RUBRA	CREeping RED FESCUE	FACU
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	FACW-
BIDENS ARISTOSA	TICKSEED SUNFLOWER	FACW
PANICUM DICHOTOMIFLORUM	SMOOTH PANIC GRASS	FACW-
PANICUM VIRGATUM	SWITCHGRASS	FAC
CORNUS AMOMUM	SILKY DOGWOOD	FACW
VERBENA HASTATA	BLUE VERVAIN	FACW
CAREX LURIDA	LURID SEDGE	OBL
CAREX SCOPARIA	BLUNT BROOM SEDGE	FACW
HELIENIUM AUTUMNALE	COMMON SNEEZEWEED	FACW+
VIBURNUM DENTATUM	ARROW WOOD VIBURNUM	FAC
ASCLEPIAS INCARNATA	SWAMP MILKWEEED	OBL
ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	FACW-
EUPATORIUM MACULATUM	SPOTTED JOE PYE WEED	FACW
EUPATORIUM PERFOLIATUM	BONASET	FACW
AGROSTIS SCABRA	ROUGH BENTGRASS/TICKLEGRASS	FAC
SCIRPUS ATROVIRENS	GREEN BULRUSH	OBL
SAMBUCUS CANADENSIS	ELDERBERRY	FACW-

APPLY 18LBS/ACRE: 1250 SF/LB



**9** TEMPORARY FENCING AT SEED ESTABLISHMENT AREAS  
NOT TO SCALE

CONSULTANTS

- ARCHITECT -  
OCO ARCHITECTURE :: DESIGN
- ELECTRICAL ENGINEER -  
NV5 ENGINEERS
- WETLAND DELINEATION -  
EPSILON ASSOCIATES, INC.
- SURVEY -  
REED LAND SURVEY, INC.

TOWN OF READING  
Reading, MA  
BIRCH MEADOW PARK | PHASE I RENOVATIONS

REGULATORY REVIEW  
November 30, 2022

REVISIONS:

NO.	DATE	DESCRIPTION
1	12/21/22	REGULATORY REVIEW COMMENTS

SCALE: AS NOTED

PROJECT NO.: 22014.00

FILE: 22014.00-L3.3-P\_DET\_1.dwg

DRAWN: SRC

CHECKED: EPM/SRC

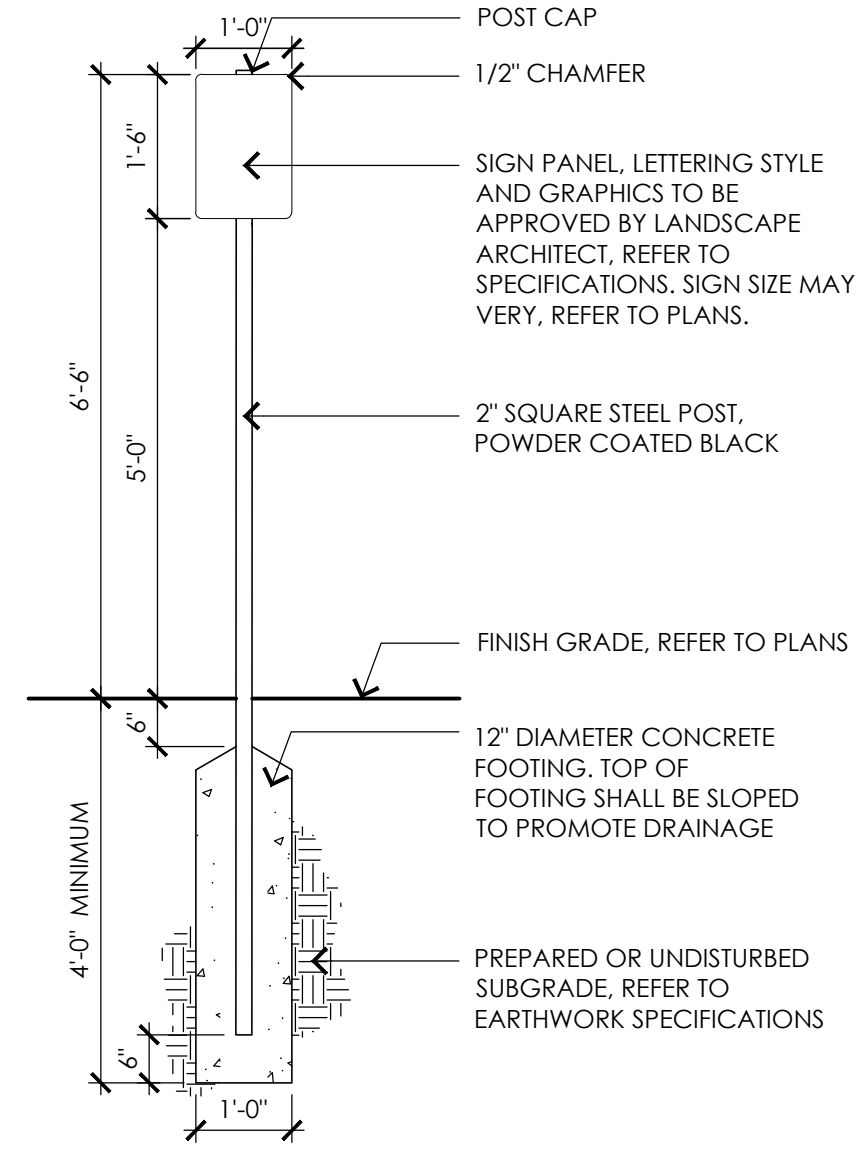
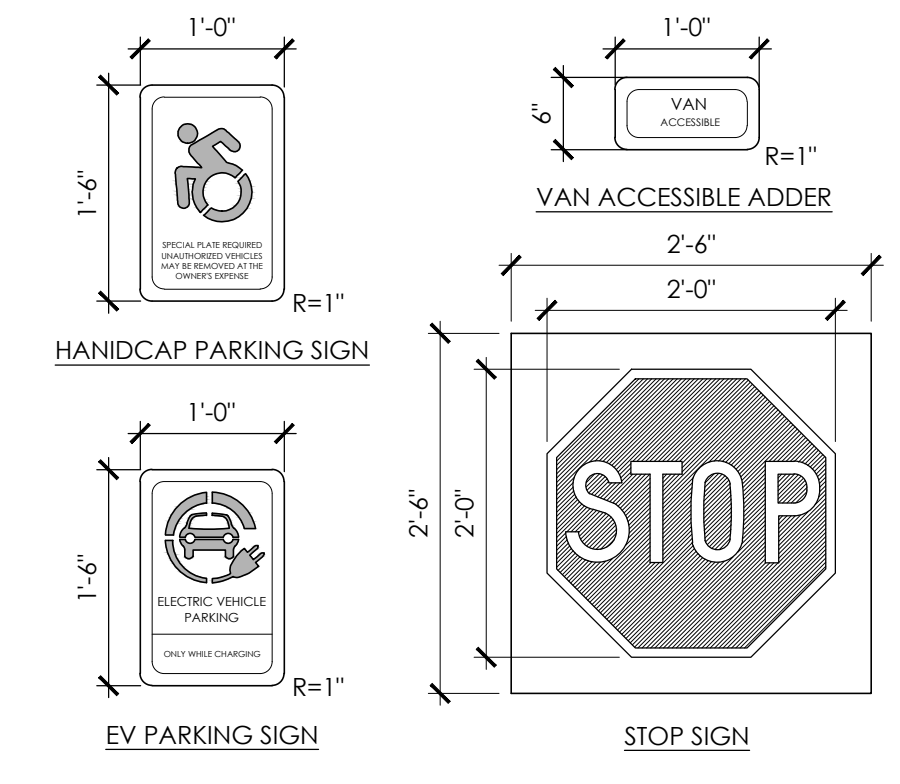


SHEET TITLE:  
PLANTING DETAILS  
AND SCHEDULES

SHEET NO:  
**L3.3**

**NOTES:**

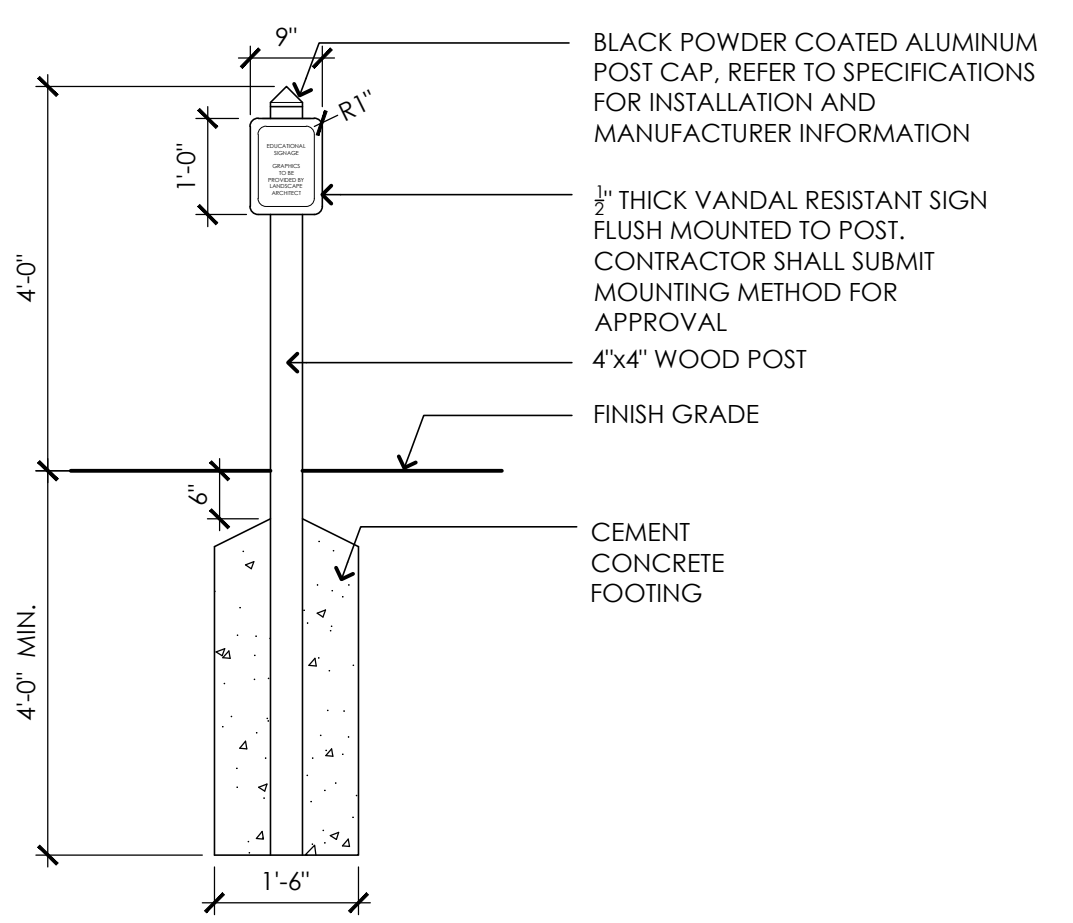
1. ALL TEXT, COLORS, FONTS, AND DIMENSIONS SHALL BE REVIEWED BY LANDSCAPE ARCHITECT AND THE OWNER.
2. GRAPHICS AND LETTERING STYLE SHALL BE SUPPLIED BY THE LANDSCAPE ARCHITECT AND COPY TO BE APPROVED BY LANDSCAPE ARCHITECT.
3. CONTRACTOR SHALL SUBMIT MOUNTING METHOD FOR APPROVAL.
4. ALL SIGN MOUNTING MECHANISMS SHALL BE PAINTED BLACK.



**1 SIGNAGE POST AND PANELS**  
NOT TO SCALE

**NOTES:**

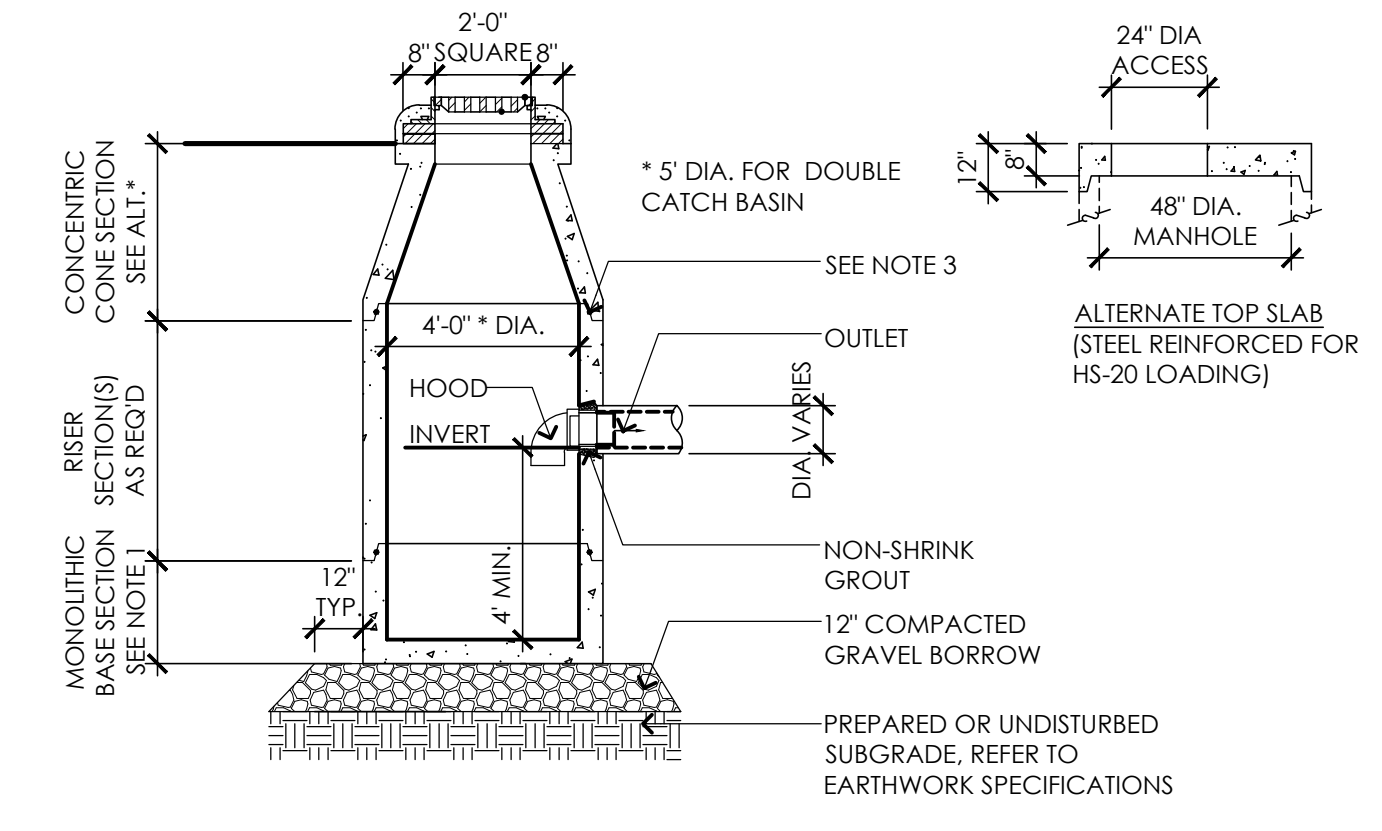
1. GRAPHICS AND LETTERING STYLE SHALL BE SUPPLIED BY THE OWNERS REPRESENTATIVE AND COPY TO BE APPROVED BY OWNERS REPRESENTATIVE
2. ALL WOOD SHALL BE CEDAR, REFER TO SPECIFICATIONS



**2 EDUCATIONAL SIGNAGE**  
NOT TO SCALE

**NOTES:**

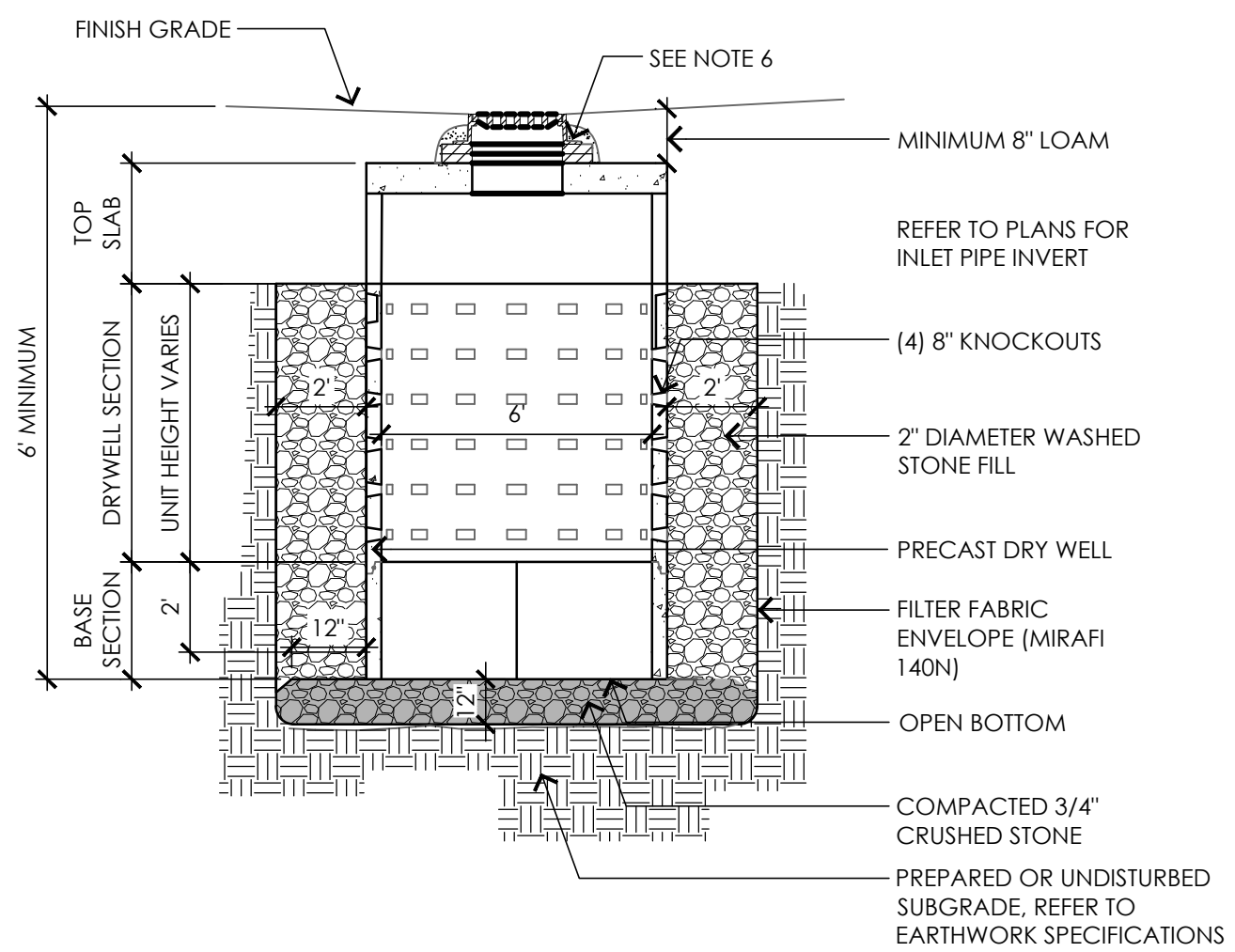
1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.
2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
4. CATCH BASIN FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR. (2 BRICK COURSES MIN., 5 BRICK COURSES MAX.)



**3 CATCH BASIN**  
NOT TO SCALE

**NOTES:**

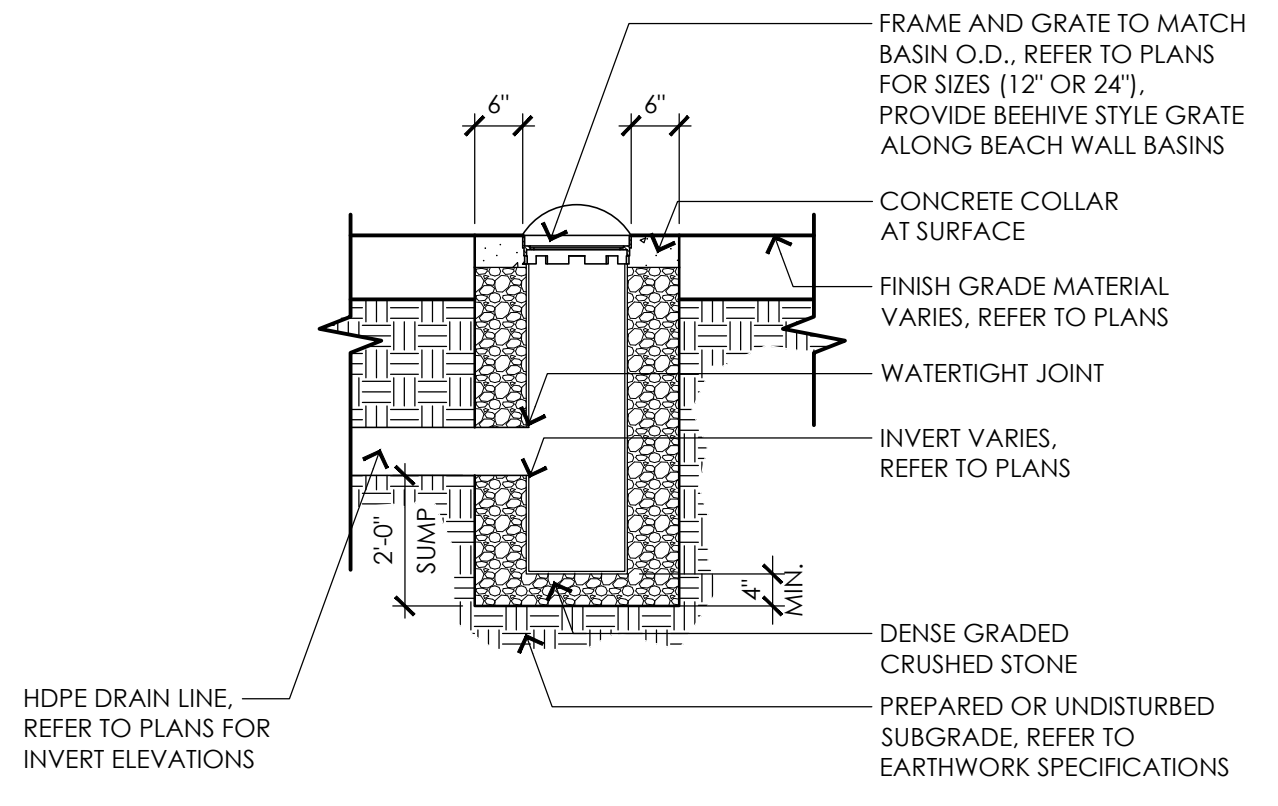
1. BASE SECTION SHALL BE MONOLITHIC WITH 6' INSIDE DIAMETER.
2. ALL PRECAST COMPONENTS SHALL BE DESIGNED FOR HS-20 LOADING.
3. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI, TYPE II CEMENT.
4. FRAMES AND GRATES SHALL BE HEAVY DUTY AND DESIGNED FOR HS-20 LOADING.
5. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
6. STANDARD MANHOLE FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSE MINIMUM, 5 BRICK COURSE MAXIMUM)



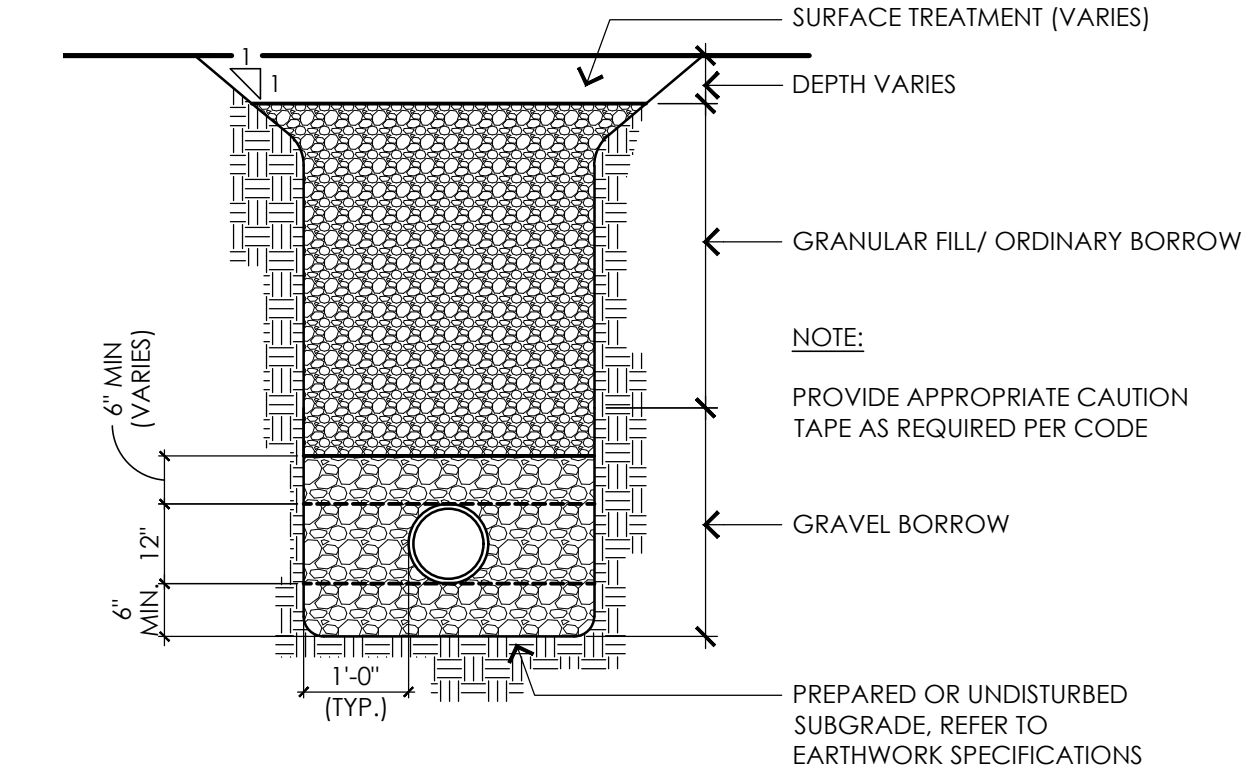
**4 LEACHING BASIN**  
NOT TO SCALE

**NOTES:**

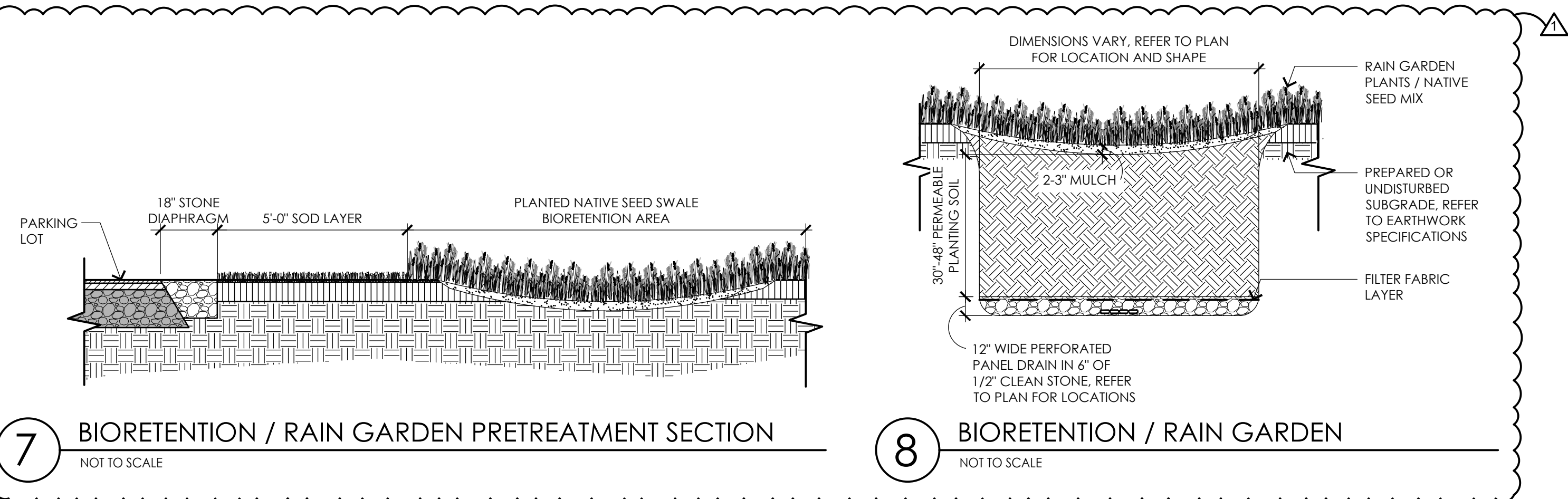
1. GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
3. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE.



**5 AREA DRAIN**  
NOT TO SCALE



**6 UTILITY TRENCH**  
NOT TO SCALE



**CONSULTANTS**  
 ARCHITECT -  
 OCO ARCHITECTURE :: DESIGN  
 ELECTRICAL ENGINEER -  
 NV5 ENGINEERS  
 WETLAND DELINEATION -  
 EPSILON ASSOCIATES, INC.  
 SURVEY -  
 REED LAND SURVEY, INC.

**TOWN OF READING**  
 Reading, MA  
 BIRCH MEADOW PARK | PHASE I RENOVATIONS

REGULATORY REVIEW  
 November 30, 2022

REVISIONS:

NO.	DATE	DESCRIPTION
1	12/21/22	REGULATORY REVIEW COMMENTS

SCALE: AS NOTED  
 PROJECT NO.: 22014.00  
 FILE: 22014.00-L5.3-DET\_3.dwg  
 DRAWN: MJD  
 CHECKED: EPM/SRC

SEAL:  
  
 MEGAN E. BUCZYNSKI  
 CIVIL  
 No. 47392  
 REGISTERED PROFESSIONAL ENGINEER  
 12/21/2022

SHEET TITLE:  
 DETAIL SHEET III

SHEET NO:  
**L5.3**



**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](http://www.readingma.gov)

**January 9, 2022**

## **Minor Site Plan Review**

# **DECISION**

Project/Site: 0 Birch Meadow Drive – Birch Meadow Park

*To the Town Clerk:*

*This is to certify that, at a meeting of the Community Planning and Development Commission, opened on December 12, 2022, continued to and closed on **January 9, 2023**, by a motion duly made and seconded, it was voted:*

“We, the Reading Community Planning and Development Commission, upon request from Activitas, Inc., on behalf of the Town of Reading, for Minor Site Plan Review for the property located at 0 Birch Meadow Drive (Assessors Map 33, Lots 52, 56, 57, and 91) for an increase of over 500 square feet of Gross Floor Area in new floor area, an increase in impervious area and associated parking improvements, as presented in the application materials enumerated below, do hereby vote XXX, to [REDACTED] the project under Minor Site Plan Review in accordance with Section 4.6.3 of the Reading Zoning Bylaw, subject to the Findings and Conditions below.”

### **Materials Submitted:**

The following materials were submitted into the public record:

1. Certified Abutters List, dated 11/23/22;
2. Minor Site Plan Review Courtesy Notice of Public Meeting to Abutters;
3. Minor Site Plan Review Application, received 11/30/22;
4. Project Narrative, prepared by Activitas Inc., dated 11/30/22;
5. Civil Plan Set Birch Meadow Park Phase I, prepared by Activitas Inc., prepared for the Town of Reading, and including:
  - a. Cover Sheet and Locus Map, dated November 30, 2022
  - b. Sheet One: Topographic Survey, prepared by Reed Land Surveying, Inc., dated 7/28/22;
  - c. Sheet Two: Topographic Survey, prepared by Reed Land Surveying, Inc., dated 7/28/22;
  - d. Sheet L0.1: Key Plan Sheet, dated November 2022;
  - e. Sheet SP1.1: Site Preparation Sheet One, dated November 30 2022, and most recently revised 12/21/22;
  - f. Sheet SP1.2: Site Preparation Sheet Two, dated November 2022;
  - g. Sheet SP1.3: Site Preparation Detail Sheet, dated November 2022;
  - h. Sheet L1.1: dated November 30 2022, and most recently revised 12/21/22;

- i. Sheet L1.2: Layout and Materials Plan Sheet Two, dated November 2022;
  - j. Sheet L2.1: Grading and Utility Plan Sheet One, dated November 30 2022, and most recently revised 12/21/22;
  - k. Sheet L2.2: Grading and Utility Plan Sheet Two, dated November 2022;
  - l. Sheet L2.3: Grading and Utility Detail Sheet, dated November 2022;
  - m. Sheet L3.1: Planting Plan Sheet One, dated November 2022;
  - n. Sheet L3.2: Planting Plan Sheet Two, dated November 30 2022, and most recently revised 12/21/22;
  - o. Sheet L3.3: Planting Details and Schedule, dated November 30 2022, and most recently revised 12/21/22;
  - p. Sheet L4.1: Enlargement Sheet, dated November 2022;
  - q. Sheet L5.1: Detail Sheet One, dated November 2022;
  - r. Sheet L5.2: Detail Sheet Two, dated November 2022;
  - s. Sheet L5.3: Detail Sheet Three, dated November 30 2022, and most recently revised 12/21/22;
  - t. Sheet A1.1: Fire Floor Plan, dated November 2022;
  - u. Sheet A1.2: Elevations, dated November 2022;
  - v. Sheet A1.3L Renderings, dated November 2022;
6. Colorized Site Renderings, prepared by Actvitas Inc., received 11/30/22;
  7. Draft Decision, dated 12/12/22;

### **Findings:**

- 1) **Applicability:** The proposed work requires Minor Site Plan Review approval under Zoning Bylaw Section 4.6.2.3(a), “***An increase in gross floor area of 500 square feet or more either by the creation of new floor area or by the expansion of an existing use into adjacent space within an existing structure***” and Section 4.6.2.3(b), “***...an increase in pavement of more than 300 square feet...***”
- 2) **Zoning/Site:** The site is located in the S-15 Residential Zoning District. The abutting/local area also includes the Coolidge Middle School, Reading Memorial High School and the Burbank YMCA.
- 3) **Existing Conditions:** The site maintains a public educational use with associated parking and open space/recreational amenities. The Birch Meadow School is primarily accessed off of Arthur B Lord Drive; though the park amenities and additional parking is accessed through the ‘Imagination Station’ parking lot to the south and off of Birch Meadow Drive. The existing parking lot is currently gravel based and maintains unformalized parking spaces; it also includes a graveled pathway to the fields and parks.
- 4) **Overview:** The proposal is considered as Phase I of improvements to the Birch Meadow Park complex. Phase I includes the improvement and paving of the existing Imagination Station gravel parking lot; a new walkway/path system that will connect the parking lot to the High School; site lighting, landscape and drainage improvements; as well as the construction of a new restroom/storage facility building and a new lacrosse wall. The proposed improvements result in an approximate increase of 14,573 square feet of impervious area.
  - a. **Parking Lot Improvements:** The parking lot will be paved over and formalized into a total of fifty-five (55) striped spaces. Included in the fifty-five spaces is fifty (50) standard 9’x18’ spaces, two (2) ADA accessible parking spaces, one (1) ADA van accessible space, and two (2) Electric Vehicle (EV) charging stalls.  
  
The parking lot will allow two-way vehicle traffic flow by maintaining 24’ wide drive aisles. The existing curb cut along Birch Meadow Drive shall be maintained but

improved with accessible ramps and crosswalks. A second curb cut will be added to the east; those exiting from such curb cut will be limited to ‘Right Turn Only’. Additionally, ‘No Parking’ striping and regulation is proposed between this curb cut and the existing crosswalk directly to the east on Birch Meadow Drive. Both curb cuts measure 24’ wide and both will allow entry and exit.

- b. Walkway/Path System Improvements: The existing gravel path will be expanded, paved and curbed to allow for improved accessibility and drainage. It will be constructed of bituminous concrete. Along the path will be benches, lighting, retaining walls, signage and site amenities to serve as a gateway into the park complex. Paths will range from 4’ to 10’ wide but all will be accessible with flush connections to adjacent areas.
- c. Lighting/Amenity, Landscape and Drainage Improvements: A series of light fixtures will be provided in the parking lot, along the path system and on/within the new facilities. Site amenities, such as benches and seating, will be strategically located around the site. A series of shrubs, trees, upland and wetland plantings will be conducted, with input from the Conservation Commission. All new impervious area will be graded and directed to stormwater collection systems designed with BMP and LID features such as raingardens and bioretention areas. Stormwater will be directed through catch basins to the LID features for pre-treatment before discharge.
- d. New Structures: A new facility building will be constructed, along with a lacrosse wall/practice area, between Turf II and Morton Field.

The facility building will be separated into two restroom facilities and storage for the Town and Recreation needs. The building’s roof will expand to cover a series of picnic tables for gathering. A water fountain will also be provided. The building will measure 47’x16’ and will be constructed of CMU Block walls. The metal roof will be pitched to collect stormwater in a gutter system.

The lacrosse facility will measure 43’x41’ and be constructed of synthetic turf. The precast concrete wall will measure 12’ high and 26’ long for practice use.

- 5) Trash: A series of trash and recycle receptacles will be provided within the parking area, facility building and along the walkway/path system.
- 6) Snow Storage: A snow management and storage plan is to be developed with the Reading Department of Public Works. Snow storage shall be prohibited within the wetland buffers and in all raingarden/bioretention areas.
- 7) Conservation: The proposed improvements will require a Notice of Intent application with the local Conservation Commission. Educational signage, constructed of natural materials, will be strategically located along wetland buffer areas and stormwater features.

## **Conditions:**

### **General:**

- 1. **Limitations / Future Uses**: The Decision herein does not include approval for any future uses or site renovations that may – on their own merits and design – trigger the requirements of future site plan review, and/or require a special permit.
- 2. **Public Health, Safety and Welfare**: If, at any time, the site becomes a nuisance to public health, safety or welfare (i.e., traffic spillover, excessive noise, unreasonable site illumination beyond the hours of operation, etc.) – as shall be evidenced by substantiated complaints to the

Police Department or Public Services Office – the Applicant/Owner shall agree to work with staff to rectify the problem. Should the situation warrant it, an additional Site Plan Review by the CPDC may be required.

3. **Permitting:** The approval herein is for Minor Site Plan Review only. The Applicant shall seek building, electrical, plumbing, and gas permits as required for the work.
4. **Lighting:** Light fixtures shall be installed/adjusted to minimize impacts on traffic.
5. **Conservation:** At all times throughout construction of the project and occupancy of the site, the Applicant and/or future owners shall comply with all provisions of the Order of Conditions issued for the project by the Reading Conservation Commission.

#### **During Construction:**

6. **Construction Hours:** Construction shall be limited to the hours specified in General Bylaw Section 8.9.8.
7. **Construction Activities:** Construction activities shall be conducted in a workmanlike manner at all times. Blowing dust or debris shall be controlled by the Applicant through stabilization, wetting down, and proper storage and disposal methods, subject to the approval of the Health Agent or designee. The Applicant shall ensure that the abutting local streets are kept clear of dirt and debris, which may accumulate as a result of construction activities for the Project. Documentation shall be provided as needed demonstrating ongoing pest management control, subject to the approval of and administration by the Health Agent.
8. **Site Inspections:** Town staff or their designee shall have reasonable access to inspect the site to determine compliance with this Decision.

#### **Prior to the Issuance of Occupancy:**

9. **Architecture:** The building façade on each elevation (north, south, east, and west) shall be substantially as indicated on the approved plans and elevations.
10. **Management Plans:** Copies of the approved snow management plan shall be provided to the DPW Director, Community Development Director and Conservation Administrator for review and approval.
11. **Right of Way/Traffic Improvements:** The Applicant shall continue to work with the Town's Parking Traffic and Transportation Task Force (PTTTF) for review and implementation of additional right-of-way improvements and/or traffic regulations (i.e. turning movement restrictions, etc.).

#### **Conditions for Ongoing Maintenance After Occupancy:**

12. **Landscaping:** Landscaping on-site shall be maintained in a healthy condition in perpetuity. In the event that landscaping is damaged during snow removal operations, the property owner shall replace such landscaping during the next growing season.

#### **Modifications/Revisions - Plan Changes after Approval by the Approving Authority:**

Contemplated future changes to the plan approved herein shall be presented to the Community Development Director and the Zoning Enforcement Officer/Building Inspector, or other relevant Town staff, for review prior to implementation of proposed changes.

**1. Minor Modification:** Changes that do not substantially alter the concept of the approved Plan in terms of the specific location, the proposed land use, the design of building form and approved building details and materials, site grading or egress points. These include but are not limited to small changes in site layout, topography, architectural plans, landscaping plan, traffic circulation, parking, lighting, signage, open space or other criteria set forth in Section 4.6.9.1. Requests for approval under a minor modification for future renovations/alterations to the approved site plan or for future tenant changes shall be reviewed by the Community Development Director to determine if the proposed work qualifies for review through the Minor Site Plan Review process of Section 4.6.3 of the Reading Zoning Bylaw. If the work is eligible for review under Minor Site Plan review, the Community Development Director may review and grant approval of the proposed work by administrative approval of the Minor Modification. At the determination of the Community Development Director, the Applicant may be required to present the proposed project at a public meeting of the CPDC.

**2. Major Modification:** Substantial additions, deletions or deviations from the approved plan, including but not limited to changes in site layout, topography, architectural plan, landscaping plans, traffic circulation, parking, lighting plan, signage, open space or other criteria set forth in Section 4.6.9.1 of the Reading Zoning Bylaw. (Note: Approval of the major modification shall be grounds for reconsideration of the Site Plan application. Denial of proposed major modifications shall not invalidate the Site Plan in conformance with the previously approved Plan).

*Signed as to the accuracy of the vote as reflected in the minutes:*

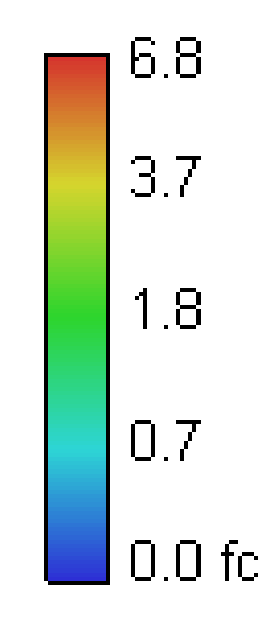
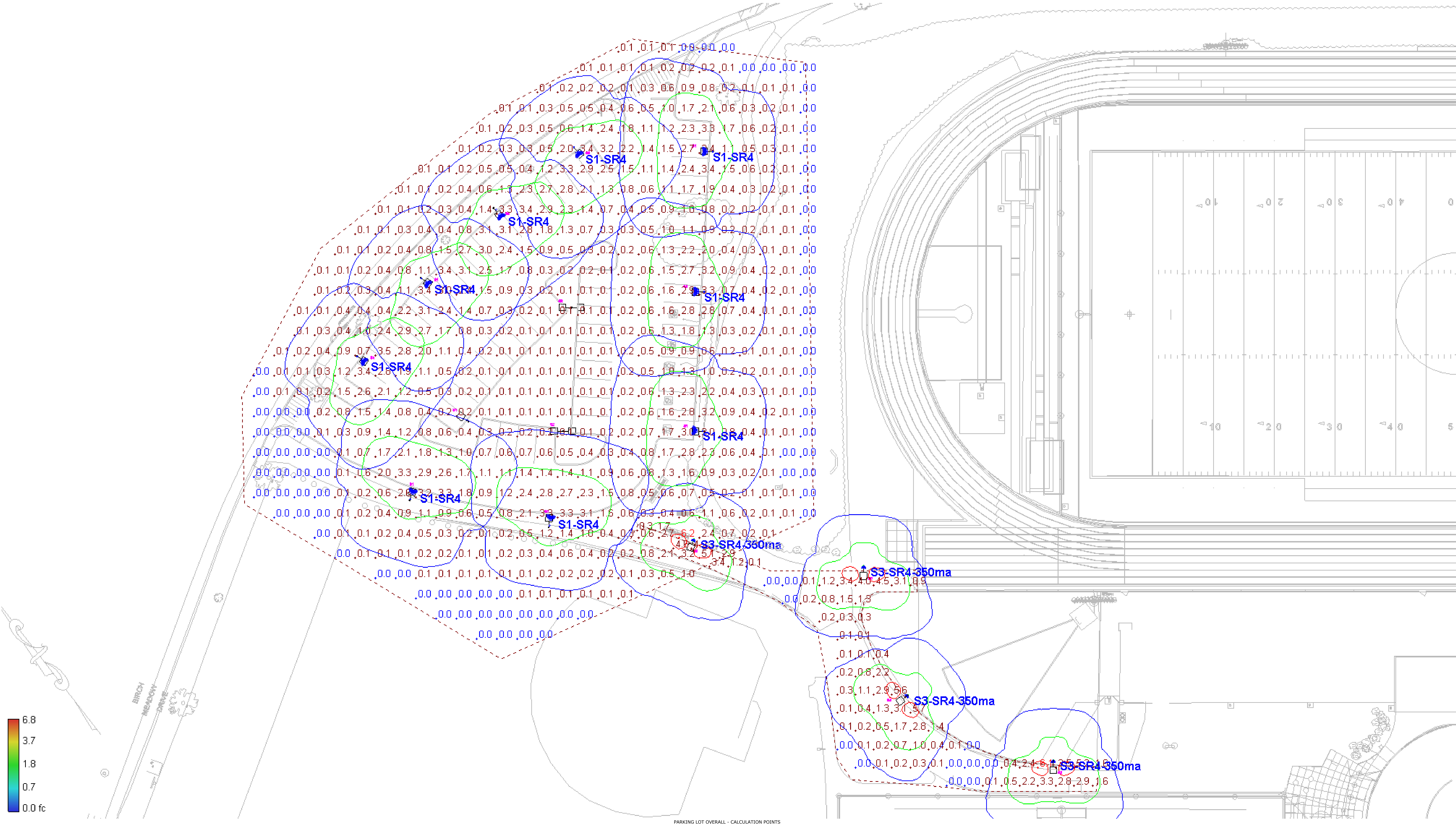
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Andrew MacNichol, Community Development Director

Date

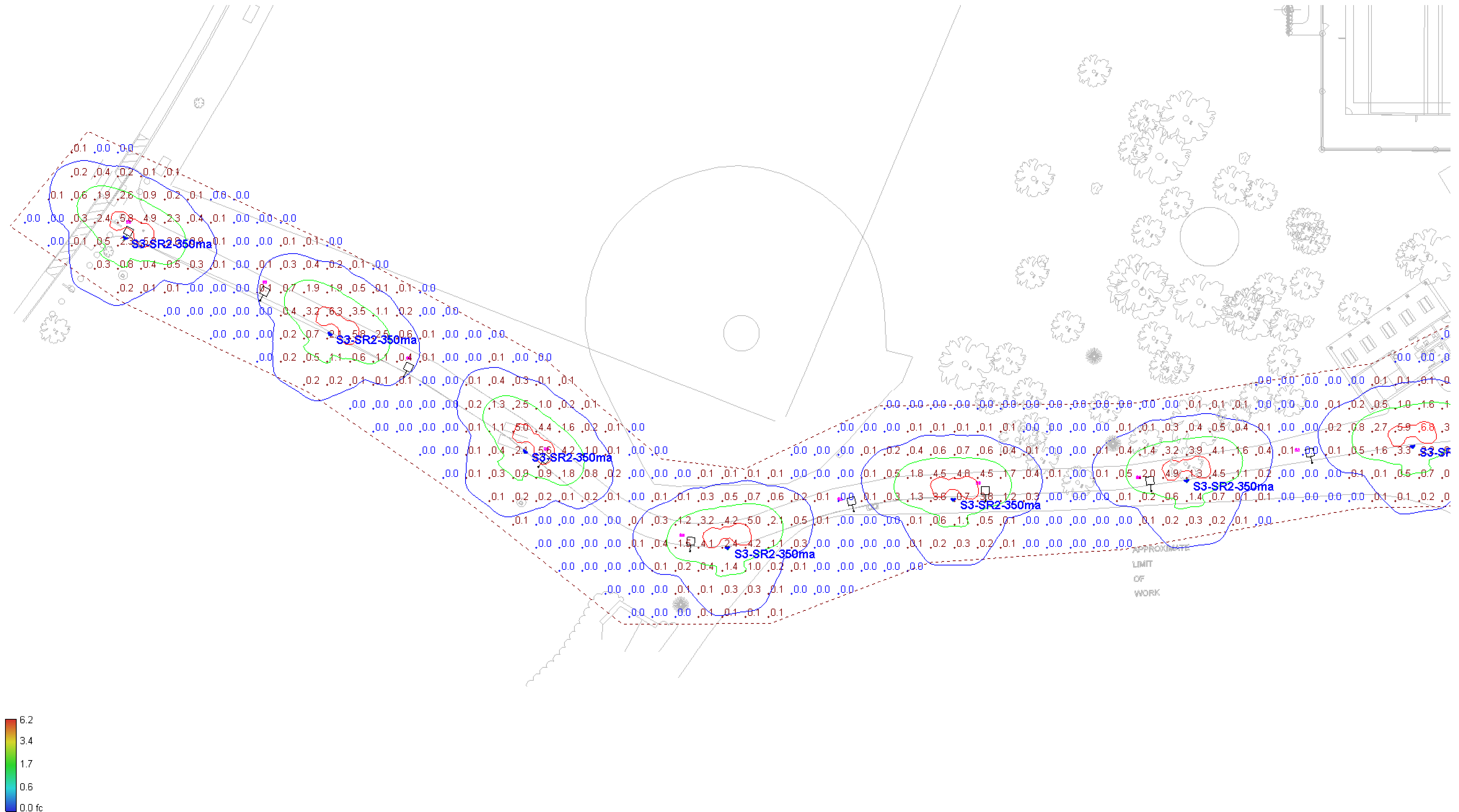
*Cc: Applicant, Town Clerk, CPDC, Development Review Team, Building Inspector, planning file*





Schedule									
Symbol	Label	Quantity	Manufacturer	Catalog Number	Lumens Per Lamp	Light Loss Factor	Description	Wattage	Notes
□	S1-SR4	9	Lithonia Lighting	MR1 LED 42C 350 40K SR4 MVOLT	5074	1	MR1 AREA LIGHT 42 LEDs 350 mA DRIVE CURRENT 40K COLOR TEMP TYPE 4 DISTRIBUTION	49	
□	S2-SR4	0	Lithonia Lighting	MR1 LED 42C 350 40K SR4 MVOLT	5074	1	MR1 AREA LIGHT 42 LEDs 350 mA DRIVE CURRENT 40K COLOR TEMP TYPE 4 DISTRIBUTION	98	
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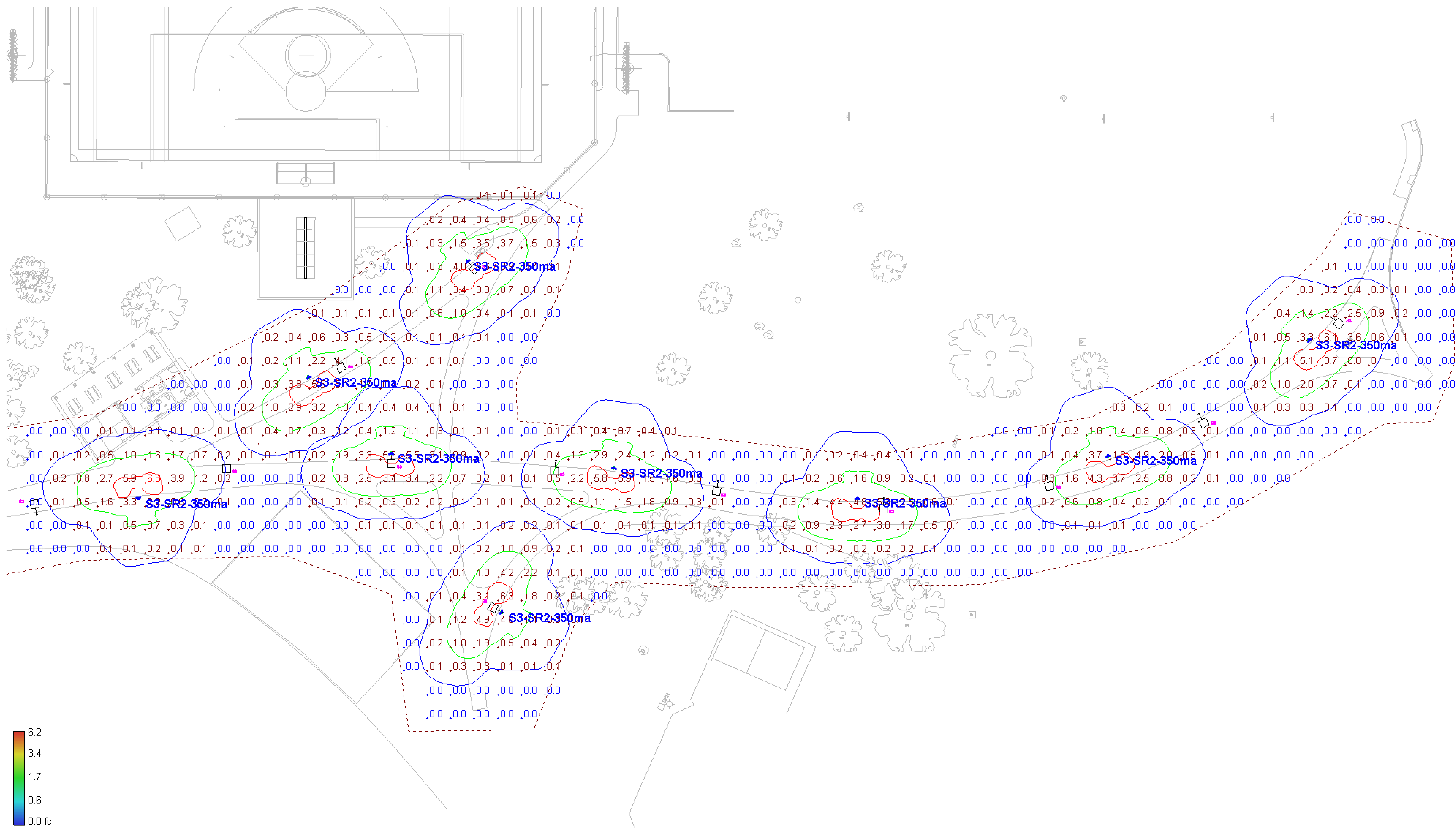
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Parking Lot Overall	+	0.8 fc	6.2 fc	0.0 fc	N/A	N/A
Walkway #1	+	1.3 fc	6.1 fc	0.0 fc	N/A	N/A
Walkway #2	+	1.9 fc	6.8 fc	0.0 fc	N/A	N/A
Calc Zone #5	+	0.6 fc	6.8 fc	0.0 fc	N/A	N/A



WALKWAY OVERALL - PART 1 - CALCULATION POINTS

Schedule									
Symbol	Label	Quantity	Manufacturer	Catalog Number	Lumens Per Lamp	Light Loss Factor	Description	Wattage	Notes
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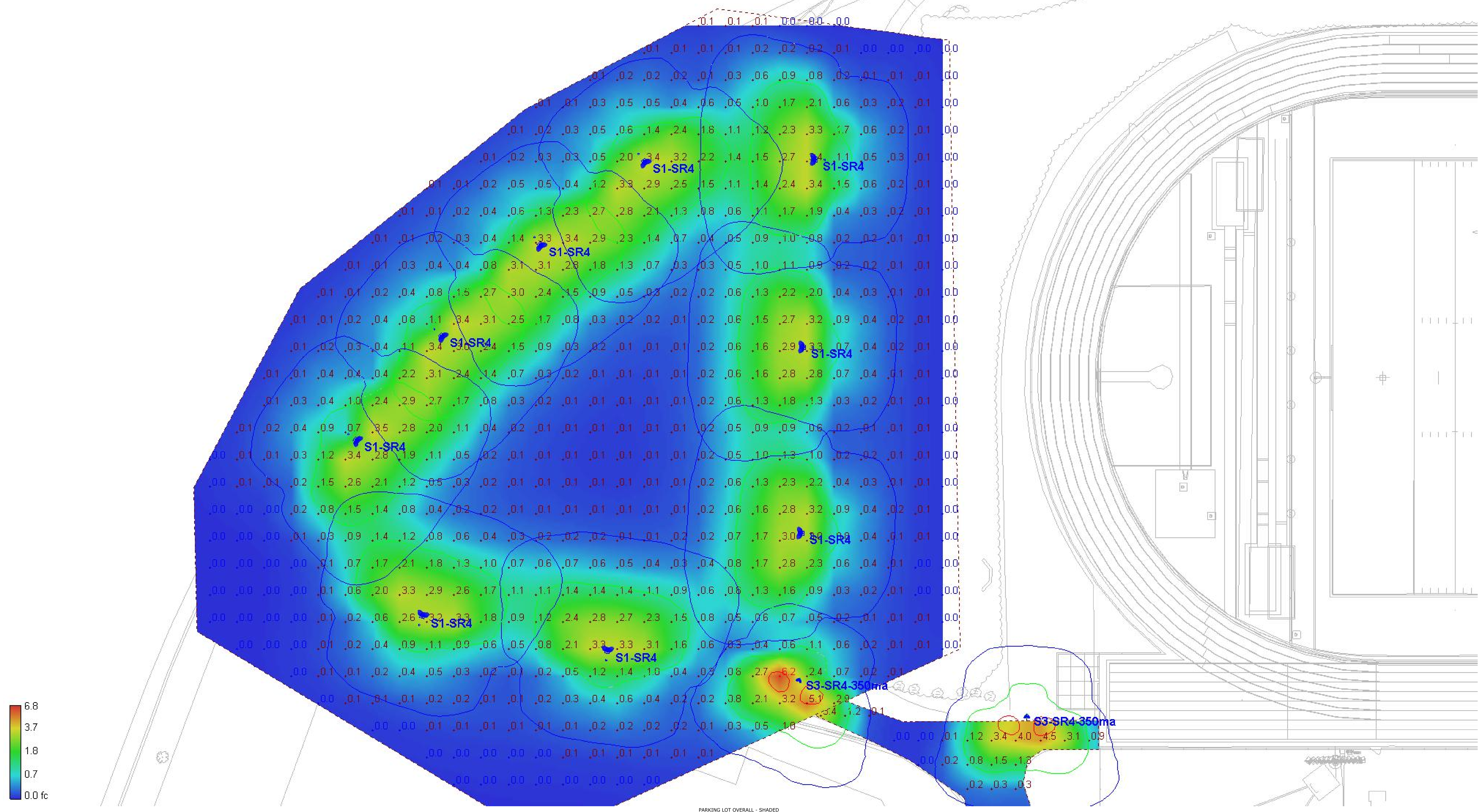
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Walkway #1	+	1.3 fc	6.1 fc	0.0 fc	N/A	N/A
Walkway #2	+	1.9 fc	6.8 fc	0.0 fc	N/A	N/A
Calc Zone #5	+	0.6 fc	6.8 fc	0.0 fc	N/A	N/A



WALKWAY OVERALL - PART 2 - CALCULATION POINTS

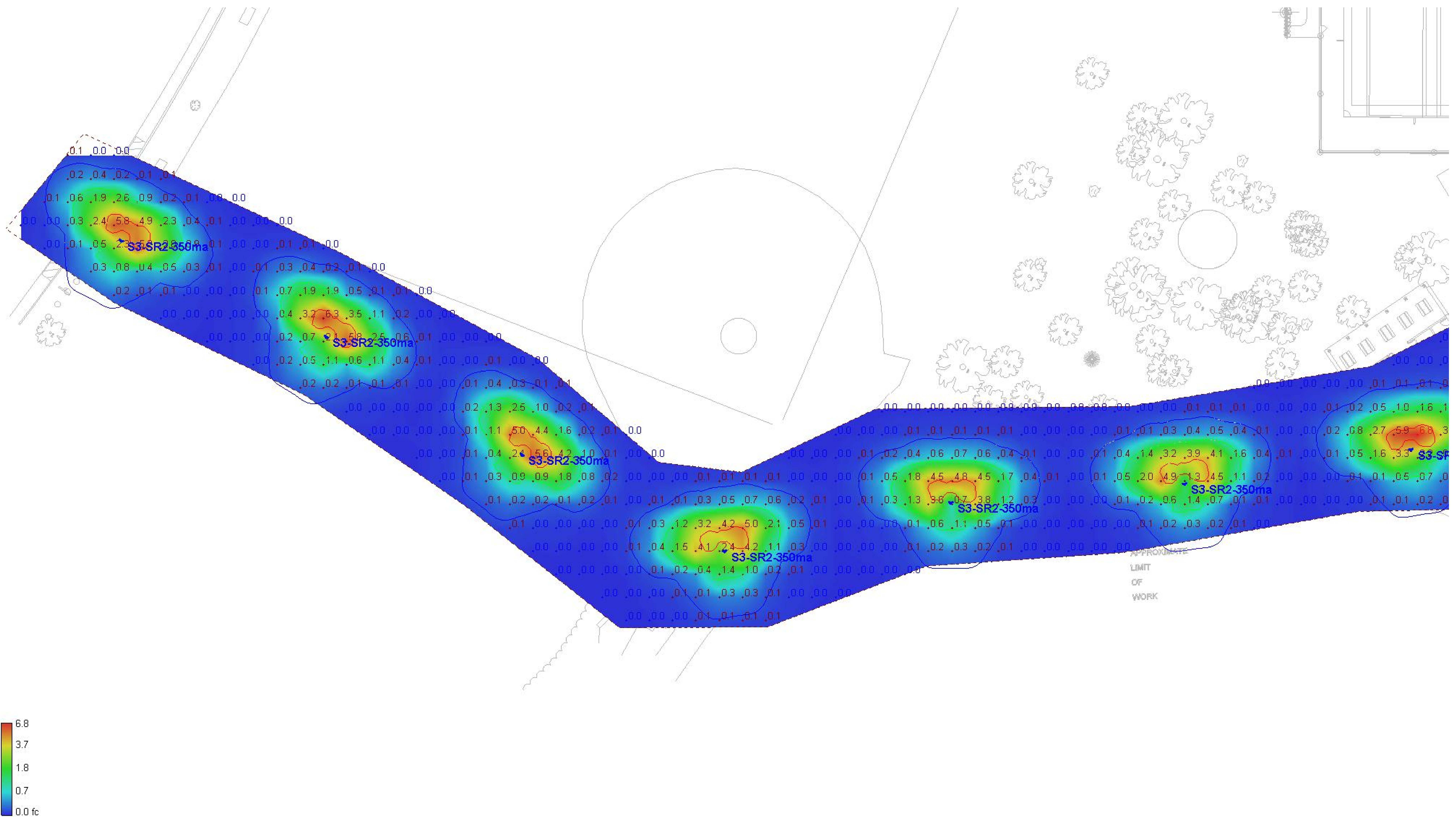
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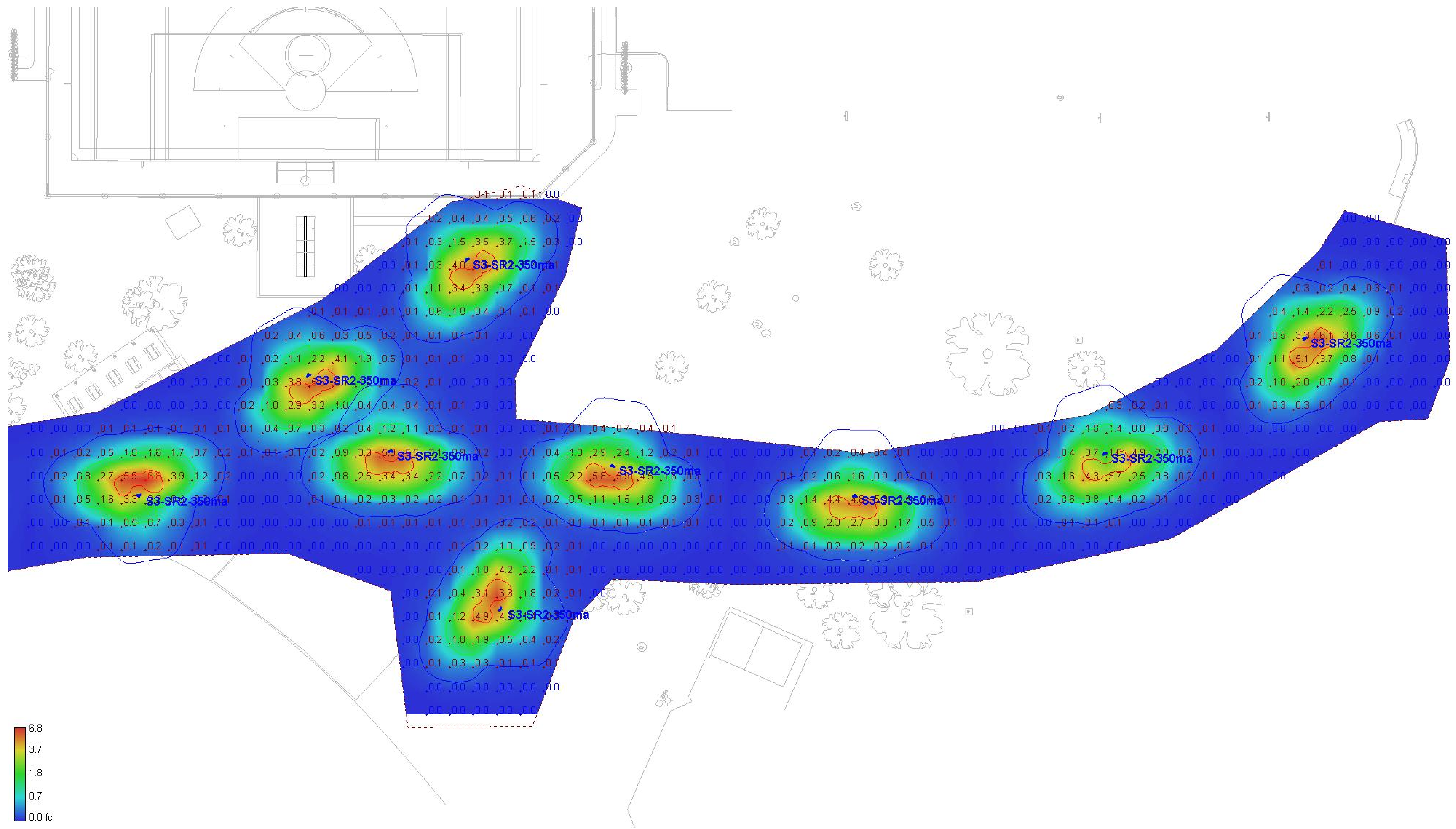
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Calc Zone #5	+	0.6 fc	6.8 fc	0.0 fc	N/A	N/A



WALKWAY OVERALL - PART 1 - SHADED

Schedule									
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Walkway #2	+	1.9 fc	6.8 fc	0.0 fc	N/A	N/A
Calc Zone #5	+	0.6 fc	6.8 fc	0.0 fc	N/A	N/A



WALKWAY OVERALL - PART 2 - SHADED

Schedule									
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Calc Zone #5	+	0.6 fc	6.8 fc	0.0 fc	N/A	N/A



# READING POLICE DEPARTMENT

15 Union Street ▪ Reading, Massachusetts 01867

Emergency Only: 911 ▪ All Other Calls: (781) 944-1212 ▪ Fax: (781) 944-2893

Web: [www.readingma.gov/police-department](http://www.readingma.gov/police-department)

**To:** Reading Community Planning and Development Commission

**From:** TSO Michael Scouten

**Date:** December 19, 2022

**Re:** Birch Meadow Parking Lot

The Reading Police Department has concerns with the proposed traffic management plan for the new Birch Meadow Parking Lot, specifically with traffic flow pattern with the second egress that will be reopened.

This exit/entrance was originally closed due to its close proximity to the crosswalk in front of the Coolidge Middle School. Due to vehicles leaving the lot in this area was causing heavy traffic build up during school drop-off and pick-up. If the second egress is reopened the police department would like to see curbing bump outs on either side of these egresses keeping them clear from vehicles parking too close and also giving the crosswalk some additional clearance.

The police department feels that if these changes are addressed, this would greatly improve the traffic patterns for this project.

Respectfully submitted,

**Michael Scouten**

Traffic and Safety Officer

Reading Police Department

Reading, Ma. 01867

(781) 942-6775

## MEMORANDUM

**Subject:** Response to Reading Conservation Commission Comments

**Project:** **The Town of Reading  
Birch Meadow Park | Phase I Renovations**

**Project No.** 22014.00

**Date:** 4 January 2023

**To:** Chuck Tirone  
Conservation Administrator  
Town of Reading

**By:** Stephen Crisafulli, RLA  
Project Manager

**Delivery:** via email (ctirone@ci.reading.ma.us)

---

Mr. Tirone,

As requested, please find enclosed updated drawings which address comments from both the Community Planning & Development Committee as well as the Conservation Commission. We have also included the following response to the comments received from the Reading Conservation dated 04 January 2023. The original comments are listed in *italics* and the answer has been provided in **bold**.

---

- 1. Identify the stormwater detention pond as a rain garden on the plan and add native shrubs to the planting list;*

**The plans and details have been adjusted with the revised labels. Additional native shrubs have been added at both rain gardens in the parking lot area and by the river near the central walkway. Refer to sheets L3.1, L3.2, L3.3 and L5.3 attached.**

- 2. Add two benches to the previous walking path near the parking lot;*

**Due to budgetary constraints, it is uncertain if some site furnishings (including benches) will be bid as an alternate or purchased later. We have included two areas to designate where these additional benches should go once the furnishings are sorted out. Refer to sheet L1.1 attached.**

- 3. Elevate the drainage area in the center rain garden to retain some of the stormwater so smaller storms will infiltrate into the ground;*

**The drainage area and catch basin rim elevation have been raised to provide a softer slope and allow greater infiltration during smaller storms. Refer to sheet L2.1 attached.**

- 4. Increase the pervious walking path to compensate for the "green area" removed from the parking lot;*



**We have increased the pervious stone dust path towards Birch Meadow drive. The opposite end terminates right on the 35' buffer line before transitioning to bituminous concrete pavement at the accessible parking entrance. We are overcompensating for the "green area" being removed with the vegetated islands, newly planted/seeded areas around the parking lot, and selective invasive removals mitigation. Refer to sheets SP1.1, L3.1, L3.2, and L3.3 attached.**

5. *General Photometric plan the resource area should be at 0;*

**The revised photometric plan shows a reduction in both parking lot and pathway light fixtures with a 0.0 foot candle cutoff at the resource areas. Refer to revised photometric plans attached.**

6. *Move the light next to the Aberjona River to reduce the artificial light in that area;*

**The revised photometric plan shows a reduction in both parking lot and pathway light fixtures which has shifted this light pole farther away from the Aberjona River and maintains a 0.0 foot candle cutoff at the resource area. Refer to revised photometric plans attached.**

7. *Add a guardrail around the rain garden;*

**Additional guardrail has been provided along the entrance side of the northeast rain garden to protect against potential snow dumping. Guardrail is provided around all other sides of both proposed rain gardens except for a portion along the stone dust path which we believe would be unnecessary. Refer to sheet L1.1 attached.**

8. *Show where the snow storage is located;*

**This is a Town DPW item which will be addressed prior to construction completion. We have added notes relating to snow storage and prohibiting snow storage in all rain gardens. Refer to sheet L3.1 attached.**

9. *Move the pathway at the light pole in the center spine;*

**As previously noted, the walkway is constrained in this area by both the 35' wetland buffer and the existing utility poles. The utility poles support the overhead electric feeding the existing field lighting. The cost to relocate these poles and associated electrical components is substantial. These poles are poised to be removed and power relocated underground as part of the next phase of renovations. At that time, adjustments to the walkway will be reviewed and considered.**

---

We trust these responses adequately address the comments, questions and recommendations made by the Reading Conservation Commission. Should you have any questions about this memo or any of its attachments please do not hesitate to contact me at (401) 450-1587 or src@activitas.com.

Thank you,

## ACTIVITAS



**Stephen Crisafulli, RLA**  
Project Manager  
[src@activitas.com](mailto:src@activitas.com)

**Distribution:**  
(via email)

Ryan Percival, PE, Town of Reading  
Joseph Huggins, Town of Reading  
Megan Buczynski, PE, Activitas  
Meghan Donahoe, Activitas

Genevieve Fiorente, Town of Reading  
Andrew MacNichol, Town of Reading  
Mark Novak, RLA, Activitas

**Attachments:**

22014-BirchMeadow\_Park\_Revised\_Sheets\_2023\_01\_04

*Revised sheets included:*

Cover Sheet  
SP1.1 Site Preparation Plan – Sheet I  
L1.1 Layout and Materials Plan – Sheet I  
L2.1 Grading and Utility Plan – Sheet I  
L3.1 Planting Plan – Sheet I  
L3.2 Planting Plan – Sheet II  
L3.3 Planting Details and Schedules  
L5.3 Site Details – Sheet III

22014-Revised\_Photometric\_Layout

## MEMORANDUM

**Subject:** Response to Reading Police Department & Community Planning and Development Committee Comments

**Project:** **The Town of Reading  
Birch Meadow Park | Phase I Renovations**

**Project No.** 22014.00

**Date:** 4 January 2023

**To:** Andrew MacNichol  
Staff Planner, Town of Reading

**By:** Stephen Crisafulli, RLA  
Project Manager

**Delivery:** via email (amacnichol@ci.reading.ma.us)

---

Mr. MacNichol,

As requested, please find enclosed updated drawings which address comments from both the Community Planning & Development Committee as well as the Conservation Commission. We have also included the following response to the comments received from the Reading Police Department dated 19 December 2022. The original comments are listed in *italics* and the answer has been provided in **bold**.

---

- 1. Tree The Reading Police Department has concerns with the proposed traffic management plan for the new Birch Meadow Parking Lot, specifically with traffic flow pattern with the second egress that will be reopened.*

*This exit/entrance was originally closed due to its close proximity to the crosswalk in front of the Coolidge Middle School. Due to vehicles leaving the lot in this area was causing heavy traffic build up during school drop-off and pick-up. If the second egress is reopened the police department would like to see curbing bump outs on either side of these egresses keeping them clear from vehicles parking too close and also giving the crosswalk some additional clearance.*

*The police department feels that if these changes are addressed, this would greatly improve the traffic patterns for this project.*

**We have added no parking zone bump outs on either side of the northeast entrance. We are confident that these striped zones along with the addition of a “right turn only” sign shall provide a protected egress point for both vehicular and pedestrian safety. Please refer to L1.1 Layout and Materials Plan – Sheet I for revisions.**

---

We trust these responses adequately address the comments, questions and recommendations made by the Reading Police Department and Community Planning & Development Committee. Should you have any questions about this memo or any of its attachments please do not hesitate to contact me at (401) 450-1587 or src@activitas.com.

Thank you,

## ACTIVITAS



**Stephen Crisafulli, RLA**  
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**Attachments:**

22014-BirchMeadow\_Park\_Revised\_Sheets\_2023\_01\_04

*Revised sheets included:*

- Cover Sheet
- SP1.1 Site Preparation Plan – Sheet I
- L1.1 Layout and Materials Plan – Sheet I
- L2.1 Grading and Utility Plan – Sheet I
- L3.1 Planting Plan – Sheet I
- L3.2 Planting Plan – Sheet II
- L3.3 Planting Details and Schedules
- L5.3 Site Details – Sheet III

22014-Revised\_Photometric\_Layout