1. Conservation Commission Agenda

    Documents:

        3-12-2026 CONSERVATION AGENDA.PDF

2. Symphony Drive/Tanglewood Estates II

    Documents:

        25-0108B 20260226.PDF
        25-0108 CORRESPONDENCE - CONCOM PEER REVIEW RESPONSE 20260226.PDF
        25-0108 NOI CORRESPONDENCE V2 20260226.PDF
        25-0108 STORMWATER V2 20260226.PDF

3. 670 King Street

    Documents:

        REVISED SCAN 2026-1-7 (15,30,40).PDF

4. Lewis Street

    Documents:

        25125 CONSERVATION SITE PLAN REV030226.PDF
        LPI RESPONSE 03.02.26 - BETA PEER REVIEW 1B, SIGNED.PDF
        TR 900 SERIES - UPLAND.PDF
        TR 900 SERIES - WETLAND.PDF
        25125 EXISTING CONDITIONS REV030226.PDF
        LEWIS ST NOI REVIEW 2026-02-23.PDF

5. 47 Partridge Street

    Documents:

        DONOVAN_ESTATES_STORMWATER_FACILITIES_PLAN_REV2-EMAIL.PDF
        DONOVAN_ESTATES_SUBDIVISIONS_PLAN_REV2-EMAIL.PDF
        DONOVAN_ESTATES_STORMWATER_REPORT_REV2-EMAIL.PDF
        DONOVAN_ESTATES_WATERSHED_PLANS_REV2-EMAIL.PDF

6. Minor Buffer Zone Activity

    Documents:

        POOL FENCING PLACEMENT-5 OAK TREE LANE.PDF

Tel: (508) 520-4929 Fax: (508) 520 4906

# Town of Franklin

## Conservation Commission

# AGENDA
# March 12, 2026
# 7:00 PM

This Conservation Commission Meeting is available to be attended in person and via the ZOOM platform. In an effort to ensure citizen engagement and comply with open meeting law regulations, citizens will be able to dial into the meeting using the provided phone number (Cell phone or Landline Required) OR citizens can participate by copying the link (Phone, Computer, or Tablet required). Please click/**copy and paste the link** https://us02web.zoom.us/j/84046963959 or call on your phone at 929-205-6099, meeting number is 840 4696 3959. Attendees are muted until they use the 'raise hand' function to indicate that they wish to speak. If you are having trouble accessing through the link, please call on your phone and use *6 to toggle between mute/unmute and *9 to raise your hand. If you wish to attend in person, the meeting is held in the Council Chambers, second floor of the Municipal Building.

**The Franklin Conservation Department has been made aware of fraudulent emails impersonating Town departments and requesting payment via wire transfer. The Conservation Department will never request payment by wire transfer. All applicant fees must be paid by check and mailed or delivered to the Franklin Municipal Building. If you receive a suspicious email or are unsure if a request is legitimate, please contact the Department at 508-520-4929 to verify any outstanding fees related to your application**

**0.0 SCHEDULING**

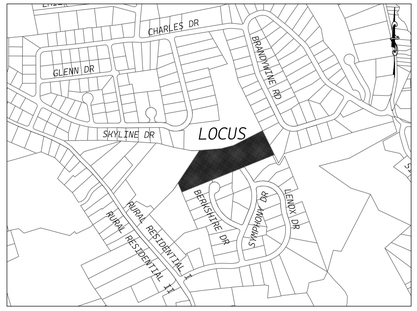
**1. PUBLIC HEARINGS:**

- **1.1.** 7:01 PM NOI – Nicholas Drive/Prospect Street Culvert Repair
- **1.2.** 7:02 PM NOI – Symphony Drive/Tanglewood Estates II
- **1.3.** 7:03 PM NOI – 670 King Street
- **1.4.** 7:04 PM NOI – Lewis Street
- **1.5.** 7:05 PM NOI – 47 Partridge Street

**2. GENERAL BUSINESS**

- **2.1 Friendly 40B Lip**
- **2.2 Minor Buffer Zone Activities**
  - **2.2.1** 5 Oak Tree Lane
- **2.3 Request for Determination of Applicability**
- **2.4 Permit Modifications/Extensions**
- **2.5 Certificates of Compliance**
- **2.6 Violations/Enforcement**
  - **2.6.1** 8 Bogastow Brook Lane
- **2.7 Minutes**
  - **2.7.1** February 26, 2026
- **2.8 Discussions**

**Chair & Commission Comments**




LOCUS 1"=800'

# PRIVATE DEFINITIVE PLAN OF LAND IN

# FRANKLIN, MA

## TANGLEWOOD ESTATES II

## SYMPHONY DRIVE EXTENSION

DECEMBER 4, 2025 — SCALE: AS NOTED


BAY COLONY GROUP, INC.
PROFESSIONAL CIVIL ENGINEERS & LAND SURVEYORS
FOUR SCHOOL STREET, P.O. BOX 9136
FOXBOROUGH, MA 02035
(508) 543-3939


OWNER/APPLICANT: CYPRESS REAL ESTATE DEVELOPMENT LLC
3 ROTHCHILD DRIVE
FOXBOROUGH, MA 02035

ZONING:
RURAL RESIDENTIAL I

ASSESSORS REF:
218-020-000

| DATE | DESCRIPTION |
|---|---|
| | |
| | |
| | |
| 2/10/2026 | ADD ADDITIONAL SHEETS AND VARIANCE. UPDATE LOCUS |

ZONING DIMENSIONAL REQUIREMENTS:

ZONING DISTRICT: RURAL RESIDENTIAL I
MINIMUM AREA = 40,000sf
FRONTAGE - 200'
DEPTH - 200'
LOT WIDTH - 135'
FRONT YARD - 40'
SIDE YARD - 40'
REAR YARD - 40'
IMPERVIOUS COVER (STRUCTURES) - 20%
IMPERVIOUS COVER (STRUCTURE + PAVING) - 25%

SUBDIVISION DATA

- NEW HOMES - 2
- LENGTH OF COMMON DRIVE - 159FT.
- TOTAL AREA- 7.0± acres

WAIVERS REQUESTED

1. SECTION 300-8.C STREET PLAN AND PROFILE PLAN SET
   EXCLUDES PLAN AND PROFILE, AS THERE ARE NO PUBLIC UTILITIES PROPOSED
2. SECTION 300-10 STREETS (C)(1):
   TO REDUCE PAVEMENT WIDTH TO 20 FEET, WHERE 26 FEET IS REQUIRED.
3. SECTION 300-10 (E)(1) DEAD END STREETS:
   TO ALLOW FOR A TEE TURN-AROUND WHERE A 45 FOOT CUL-DE-SAC IS REQUIRED.
4. SECTION 300-10- (E) DEAD END STREETS (4):
   TO EXTEND THE ROADWAY 159'± BEYOND THE EXISTING SYMPHONY DRIVE WHICH HAS AN EXISTING LENGTH OF 1129'± WHERE 600 FEET MAXIMUM IS REQUIRED.
5. SECTION 300-10 STREETS (H) CURBING(1):
   TO ALLOW NO CURBING WHERE SLANT GRANITE CURB IS REQUIRED.
6. SECTION 300-11 STORMWATER MANAGEMENT (B) CONSTRUCTION (2):
   TO ALLOW ADS PIPE WHERE REINFORCED CONCRETE PIPE IS REQUIRED.
7. SECTION 300-12 UTILITIES (B) SANITARY SEWERS (1) DESIGN (C):
   TO ALLOW A SEWER ENTRANCE ABOVE BASEMENT FLOOR GRADE
8. SECTION 300-12 UTILITIES (C) OTHER UTILITIES (2) STREET LIGHTING :
   TO ALLOW NO STREET LIGHTENING WHERE STREET LIGHTENING IS REQUIRED.
9. SECTION 300-13 OTHER IMPROVEMENTS (A) SIDEWALKS(1):
   TO INSTALL NO SIDEWALKS WHERE TWO SIDEWALKS ARE REQUIRED.
10. SECTION 300-13 OTHER IMPROVEMENTS (E) SHADE TREES:
    TO ALLOW NO SHADE TREES TO BE PLANTED ALONG THE RIGHT-OF-WAY.

REGULATORY APPROVALS

- SUBJECT TO A CERTIFICATE OF VOTE ISSUED BY THE FRANKLIN PLANNING BOARD ON XXXXX, XX, 2026 AND FILED WITH THE TOWN CLERK ON XXXXX, XX, 2026 - SEE SHEET XX.
- SUBJECT TO AN ORDER OF CONDITIONS (CE 159-XXXX) ISSUED BY THE FRANKLIN CONSERVATION COMMISSION ON XXXX, XX, 2026

LIST OF PLAN SHEETS

| SHEET NO. | DESCRIPTION | LAST REVISED |
|---|---|---|
| SHEET 1 | LEGEND | 12-04-2025 |
| SHEET 2 | EXISTING CONDITIONS | 2-10-2026 |
| SHEET 2.1 | EXISTING CONDITIONS | 2-10-2026 |
| SHEET 3 | PROPERTY LINE PLAN | 2-10-2026 |
| SHEET 4 | TOPOGRAPHIC & UTILITY PLAN | 2-10-2026 |
| SHEET 5 | CONSTRUCTION DETAILS | 2-10-2026 |
| SHEET 6 | CONSTRUCTION DETAILS | 2-10-2026 |
| SHEET 7 | SWPPP | 2-10-2026 |

THE LAST REVISED DATE FOR PLANS IN THIS SET IS: **2-10-2026**

PROJECT:

*Symphony Drive Extension*

*Franklin Massachusetts*

OWNER/APPLICANT:

*CYPRESS REAL ESTATE DEVELOPMENT LLC*
*3 ROTHCHILD DRIVE*
*FOXBOROUGH, MA 02035*


Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors
FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939


DATE APPROVED: _____
DATE ENDORSED: _____
FRANKLIN PLANNING BOARD

I HEREBY CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE PLANNING BOARD APPROVAL AND THAT NO APPEAL HAS BEEN FILED IN THIS OFFICE.

_____ DATE

_____ FRANKLIN TOWN CLERK

STAMP

COMMONWEALTH OF MASSACHUSETTS — WILLIAM R. BUCKLEY, JR. — CIVIL — No. 35813 — REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS — RICHARD J. LESLIE — No. 38384 — REGISTERED PROFESSIONAL LAND SURVEYOR

DRAWING TITLE

Cover Sheet

SCALE: 1" = 40'

| DEC. 4, 2025 | SHEET NUMBER |
|---|---|
| 25-0108B | CV |

# GENERAL NOTES

- *ON SITE TOPOGRAPHICAL INFORMATION OBTAINED FROM AN ON-THE-GROUND SURVEY CONDUCTED BAY COLONY GROUP, INC. FROM MARCH, 2025 TO APRIL, 2025 AND NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) LIDAR. VERTICAL DATUM IS NAVD 88 AND HORIZONTAL DATUM IS NAD 83. OFF SITE DATA FROM TOWN OF FRANKLIN GIS.*
- *UNDERGROUND UTILITIES ARE SHOWN HEREON AS COMPILED FROM RECORD PLANS AND VISIBLE UTILITY STRUCTURES. BAY COLONY GROUP DOES NOTE WARRANT THE ACTUAL DEPTH AND LOCATIONS OF ANY UTILITIES SHOWN HEREON. CONTACT DIGSAFE AT 1-800-322-4844 AND THE TOWN DPW WHERE APPROPRIATE AT LEAST 72 HOURS, SATURDAYS, SUNDAYS AND HOLIDAYS EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. A COPY OF THE DIGSAFE PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER PRIOR TO EXCAVATION.*
- *WHERE AN EXISTING UNDERGROUND UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER IMMEDIATELY.*
- *TEST PITS TO LOCATE EXISTING UTILITIES MAY BE ORDERED BY THE ENGINEER.*
- *THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE RESPECTIVE COMPANIES.*
- *AREAS OUTSIDE THE LIMITS OF THE PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITIONS AT THE CONTRACTOR'S EXPENSE.*
- *STONE WALLS, FENCES, MAIL BOXES, SIGNS, CURBS, LIGHT POLES ETC. ALONG SYMPHONY DRIVE SHALL BE REMOVED AND REPLACED AS NECESSARY TO PERFORM THE WORK.*
- *ALL PAVEMENT DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS OR THE REQUIREMENTS OF THE TOWN OF FRANKLIN DPW.*
- *CONTRACTOR SHALL NOT STORE ANY EQUIPMENT, MATERIALS, SUPPLIES ON DRAINAGE STRUCTURES OR WITHIN 100 FEET OF WETLANDS.*
- *OPENINGS FOR PIPE IN PRECAST STRUCTURES SHALL BE CAST IN THE REQUIRED LOCATIONS DURING MANHOLE MANUFACTURE. FIELD CUT OPENINGS WILL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER.*
- *IN PAVED AND GRAVELED AREAS THE TOP OF THE STRUCTURE COVERS SHALL BE SET FLUSH WITH THE PAVED SURFACE. IN CROSS-COUNTRY AREAS THE TOP OF THE COVER SHALL EXTEND 6 INCHES ABOVE FINISHED GRADE, OR AS SHOWN ON THE DRAWINGS, OR AS DIRECTED BY THE ENGINEER.*
- *THE TERM "PROPOSED" (PROP or PR-) SHALL BE UNDERSTOOD TO MEAN WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED ON THE PLAN AS R&R (REMOVE AND RESET).*
- *THE LOCATIONS OF THE HOMES AND DRIVEWAYS ARE ESTIMATES ONLY AND WILL BE ADJUSTED BASED ON THE ACTUAL HOME TO BE BUILT. THIS WILL ALSO AFFECT LIMITS OF CLEARING FOR THE HOMES.*
- *THIS PLAN IS SUBJECT TO A CERTIFICATION OF VOTE BY THE FRANKLIN PLANNING BOARD DATED XXXXXXXXX SAID CERTIFICATION SHALL BE CONSIDERED PART OF THIS PLAN.*
- *THIS PLAN IS SUBJECT TO AN ORDER OF CONDITIONS ISSUED BY THE FRANKLIN CONSERVATION COMMISSION DATED XXXXXXXX, DEP FILE No. XXXXXXXX. SAID ORDER SHALL BE CONSIDERED APART OF THIS PLAN.*

# PAVEMENT MARKINGS

| | |
|---|---|
| SWL | SWL – SOLID WHITE LINE – 6" STATE HIGHWAY, 4" LOCAL STREETS |
| SYL | SYL – SOLID YELLOW LINE – 6" STATE HIGHWAY, 4" LOCAL STREETS |
| DWL | DWL – DOTTED WHITE LINE – 6" (2' STRIPE w/4' GAP) STATE HIGHWAY<br>DOTTED WHITE LINE – 4" (2' STRIPE w/4' GAP) LOCAL STREETS |
| WLDL | WHITE LANE DELINEATION LINE – 6" (3' STRIPE w/9' GAP) STATE HIGHWAY<br>WHITE LANE DELINEATION LINE – 4" (3' STRIPE w/9' GAP) LOCAL STREETS |
| DDYL | DOUBLE DOTTED YELLOW LINE – 6" (2' STRIPE w/4' GAP) STATE HIGHWAY<br>DOUBLE DOTTED YELLOW LINE – 4" (2' STRIPE w/4' GAP) LOCAL STREETS |
| BWLL | BROKEN WHITE LANE LINE – 6" (10' STRIPE w/30' GAP) STATE HIGHWAY<br>BROKEN WHITE LANE LINE – 4" (10' STRIPE w/30' GAP) LOCAL STREETS |
| SWLL | SOLID WHITE LANE LINE – 6" STATE HIGHWAY, 4" LOCAL STREETS |
| SWEL | SOLID WHITE EDGE LINE – 6" STATE HIGHWAY, 4" LOCAL STREETS |
| SWGL | SOLID WHITE GORE LINE – 12" |
| SYEL | SOLID YELLOW EDGE LINE – 6" STATE HIGHWAY, 4" LOCAL STREETS |
| SYGL | SOLID YELLOW GORE LINE – 12" |
| DYL | DOUBLE YELLOW LINE – 2-6" LINES STATE HIGHWAY<br>DOUBLE YELLOW LINE – 2-4" LINES LOCAL STREETS |
| | PAVEMENT ARROW AND LEGEND |

# SYMBOLS & LEGEND

## EXISTING

| | |
|---|---|
| n.t.s. | NOT TO SCALE |
| T.B.M. | TEMPORARY BENCH MARK |
| ⊡ | BOUND (TYPE NOTED) |
| | STAKE & STONE |
| DH ◉ | DRILL HOLE |
| IP ○ | IRON PIPE/PIN |
| ⊡MHB | MASS HIGHWAY BOUND |
| . s/n | STAKE & NAIL |
| (fd) | FOUND |
| (set) | SET IN PLACE |
| | UTILITY POLE |
| UPLP | UTILITY POLE/LIGHT POLE |
| UP | UTILITY POLE |
| Ⓦ | WELL |
| n/f | NOW OR FORMERLY |
| | TREE (SIZE NOTED) |
| (rec) | RECORD |
| Ⓓ | DRAIN MANHOLE |
| Ⓣ | TELEPHONE MANHOLE |
| Ⓔ | ELECTRIC MANHOLE |
| Ⓢ | SEWER MANHOLE |
| □ | CATCH BASIN |
| WG ⋈ | WATER GATE |
| WS ⋈ | WATER SERVICE |
| GG ⋈ | GAS GATE |
| | EXISTING HYDRANT |
| SGC | SLOPED GRANITE CURBING |
| VGC | VERTICAL GRANITE CURBING |
| PVC | POLYVINYL CHLORIDE PIPE |
| CMP | CORRUGATED METAL PIPE |
| VCP | VITREOUS CLAY PIPE |
| CLF | CHAIN LINK FENCE |
| OHW | OVERHEAD WIRE |
| SIGN | SIGN (SIZE & TYPE NOTED) |
| TP | TEST PIT |
| D | DRAIN PIPE (SIZE & TYPE NOTED) |
| S | SEWER PIPE (SIZE & TYPE NOTED) |
| E | ELECTRIC DUCT (SIZE & TYPE NOTED) |
| G | GAS MAIN (SIZE & TYPE NOTED) |
| W | WATER MAIN (SIZE & TYPE NOTED) |
| T | TELEPHONE DUCT |
| | STONE WALL |
| | EDGE OF TREELINE |
| | GUARD-RAIL (TYPE NOTED) |
| | RAILROAD TRACKS |
| | RETAINING WALL (SIZE & TYPE NOTED) |
| -x-x-x-x-x-x- | BARBED WIRE FENCE |
| | STOCKADE FENCE |
| | CHAIN-LINK FENCE |

## PROPOSED

| | |
|---|---|
| n.t.s. | NOT TO SCALE |
| T.B.M. | TEMPORARY BENCH MARK |
| ⊡ | BOUND (TYPE NOTED) |
| | STAKE & STONE |
| DH ◉ | DRILL HOLE |
| IP ○ | IRON PIPE/PIN |
| ⊡MHB | MASS HIGHWAY BOUND |
| . s/n | STAKE & NAIL |
| (fd) | FOUND |
| (set) | SET IN PLACE |
| | UTILITY POLE |
| UPLP | UTILITY POLE/LIGHT POLE |
| UP | UTILITY POLE |
| Ⓦ | WELL |
| n/f | NOW OR FORMERLY |
| | TREE (SIZE NOTED) |
| (rec) | RECORD |
| Ⓓ | DRAIN MANHOLE |
| Ⓣ | TELEPHONE MANHOLE |
| Ⓔ | ELECTRIC MANHOLE |
| Ⓢ | SEWER MANHOLE |
| □ | CATCH BASIN |
| WG ⋈ | WATER GATE |
| WS ⋈ | WATER SERVICE |
| GG ⋈ | GAS GATE |
| | PROPOSED HYDRANT |
| SGC | SLOPED GRANITE CURBING |
| VGC | VERTICAL GRANITE CURBING |
| PVC | POLYVINYL CHLORIDE PIPE |
| CMP | CORRUGATED METAL PIPE |
| VCP | VITREOUS CLAY PIPE |
| CLF | CHAIN LINK FENCE |
| OHW | OVERHEAD WIRE |
| HMA | HOT MIX ASPHALT |
| WCR | WHEELCHAIR RAMP |
| SIGN | SIGN (SIZE & TYPE NOTED) |
| D | DRAIN PIPE (SIZE & TYPE NOTED) |
| S | SEWER PIPE (SIZE & TYPE NOTED) |
| E | UNDERGROUND ELECTRIC |
| G | GAS MAIN (SIZE & TYPE NOTED) |
| W | WATER MAIN (SIZE & TYPE NOTED) |
| T | TELEPHONE DUCT |
| | STONE WALL |
| | EDGE OF TREELINE |
| | GUARD-RAIL (TYPE NOTED) |
| | RETAINING WALL (SIZE & TYPE NOTED) |
| -x-x-x-x-x-x- | BARBED WIRE FENCE |
| | STOCKADE FENCE |
| | CHAIN-LINK FENCE |

PROJECT:

*Symphony Drive Extension*

*Franklin Massachusetts*

OWNER/APPLICANT:

*CYPRESS REAL ESTATE DEVELOPMENT LLC 3 ROTHCHILD DRIVE FOXBOROUGH, MA 02035*


Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors

FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939


DATE APPROVED: _____

DATE ENDORSED: _____

FRANKLIN PLANNING BOARD

*I HEREBY CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE PLANNING BOARD APPROVAL AND THAT NO APPEAL HAS BEEN FILED IN THIS OFFICE.*

_____ _____

*DATE* *FRANKLIN TOWN CLERK*

STAMP

COMMONWEALTH OF MASSACHUSETTS
WILLIAM R. BUCKLEY, JR.
CIVIL
No. 35813
REGISTERED PROFESSIONAL ENGINEER

DRAWING TITLE

Legend

SCALE: 1" = 40'

| DEC. 4, 2025 | SHEET NUMBER |
|---|---|
| 25-0108B | 1 |

TOWN OF FRANKLIN
PARCEL ID: 218-049

N64° 12' 31"E 240.59'

N74° 34' 59"E 149.31'

N85° 00' 27"E 247.13'

JAMES & PAULINE McLAUGHLIN
231 DANIELS STREET
PARCEL ID: 219-086

N28° 08' 38"E 438.57'

N21° 18' 13"W 108.46'

TOWN OF FRANKLIN
PARCEL ID: 218-010

THOMAS BETRO & AMY MOUSSEAU
20 BERKSHIRE DRIVE
PARCEL ID: 218-012

AKRAM & REHAM ALSHAWABKEY
21 BERKSHIRE DRIVE
PARCEL ID: 218-014

S68° 45' 40"W 118.02'

CARYE & ANDREW RODMAN
24 SYMPHONY DRIVE
PARCEL ID: 218-019

BERKSHIRE DRIVE
(Public - 56' wide)

SYMPHONY DRIVE
(Public - 56' wide)

N34° 16' 42"W

S34° 18' 42"E 125.91'

R=406.00'
L=72.11'
Δ=10°10'35"

R=350.00'
L=353.19'
Δ=57°49'06"

BENCHMARK: BM SQUARE CHISEL CONCRETE BASE LP
EL=302.95'

SMH
RIM=301.83
INV=295.13

SMH
RIM=303.00
INV=292.89

EXISTING 20' WIDE TEMPORARY CONSTRUCTION EASEMENT

EXISTING TEMPORARY TURNAROUND EASEMENT

EXISTING 20' WIDE TEMPORARY CONSTRUCTION EASEMENT

EXISTING TEMPORARY TURNAROUND EASEMENT

50' BUFFER ZONE

100' BUFFER ZONE

25' NO DISTURB LINE

6' PATH

BIT DRIVE

EXIST BIT DRIVEWAY

LAWN AREA

MULCH AREA

WOODED AREA

SHED

SIDEWALK

PAVERS

RET. WALL

FIRE PIT

PLAY AREA

2 STORY WOOD #15

2 STORY WOOD #17

2 STORY WOOD #19

2 STORY WOOD #20

2 STORY WOOD #21

2 STORY WOOD #22

2 STORY WOOD #23

2 STORY WOOD #24

2 STORY WOOD #25

2 STORY WOOD #28

2 STORY WOOD #45

2 STORY WOOD #49

TP#1 TP#2 TP#3 TP#4 TP#5 TP#6 TP#7 TP#8

PVP-1 PVP-2 PVP-3 PVP-4 PVP-5 PVP-6 PVP-7 PVP-8

B-1 B-2 B-3 B-4 B-5 B-6 B-7 B-8 B-10 B-11 B-12 B-13 B-14 B-100 B-101 B-103 B-104 B-105 B-106

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

| | |
|---|---|
| | 1 |
| | |
| 2/10/2026 | ADD ABUTTING STRUCTURES, TREE LINE & BENCHMARK |
| DATE | DESCRIPTION |

PROJECT:

*Symphony Drive Extension*

*Franklin Massachusetts*

OWNER/APPLICANT:

*CYPRESS REAL ESTATE DEVELOPMENT LLC*
*3 ROTHCHILD DRIVE*
*FOXBOROUGH, MA 02035*


Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors

FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939


DATE APPROVED: _____

DATE ENDORSED: _____

FRANKLIN PLANNING BOARD

I HEREBY CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE PLANNING BOARD APPROVAL AND THAT NO APPEAL HAS BEEN FILED IN THIS OFFICE.

_____ _____

DATE FRANKLIN TOWN CLERK

STAMP

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. LESLIE
No. 38384
REGISTERED PROFESSIONAL LAND SURVEYOR

DRAWING TITLE

# Existing Conditions Plan

SCALE: 1" = 40'

| DEC. 4, 2025 | SHEET NUMBER |
|---|---|
| 25-0108B | 2 |

PROJECT:

*Symphony Drive Extension*

*Franklin Massachusetts*

OWNER/APPLICANT:

*CYPRESS REAL ESTATE DEVELOPMENT LLC*
*3 ROTHCHILD DRIVE*
*FOXBOROUGH, MA 02035*


Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors

FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939


DATE APPROVED: _____

DATE ENDORSED: _____
FRANKLIN PLANNING BOARD

I HEREBY CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE PLANNING BOARD APPROVAL AND THAT NO APPEAL HAS BEEN FILED IN THIS OFFICE.

_____ _____
DATE FRANKLIN TOWN CLERK

STAMP

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. LESIEUR
No. 38384
REGISTERED PROFESSIONAL LAND SURVEYOR

DRAWING TITLE

# Existing Conditions Plan

SCALE: 1" = 40'

| DATE | DESCRIPTION |
|---|---|
| | |
| | |
| 2/10/2026 | ADD ABUTTING STRUCTURES, TREE LINE & BENCHMARK |

DEC. 4, 2025 | SHEET NUMBER
25-0108B | **2.1**

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

## ZONING:

| | |
|---|---|
| ZONING DISTRICT: | RURAL RESIDENTIAL I (RR-1) |
| AREA: | 40,000 sq. ft. |
| CONTINUOUS FRONTAGE: | 200' |
| LOT DEPTH: | 200' |
| SETBACKS: | |
| FRONT | 40' |
| SIDE | 40' |
| REAR | 40' |

NAD83

N: 2870470.8063
E: 687046.7083

N: 2870260.9016
E: 686339.6761

N: 2869798.2826
E: 686134.1613

JOSE JESTUS
125 BRANDYWINE ROAD
PACEL ID: 218-087

RONAN & CHERYL HANLY
129 BRANDYWINE ROAD
PACEL ID: 218-086

JOSEPH & MELISSA AMANTE
133 BRANDYWINE ROAD
PARCEL ID: 218-085

TOWN OF FRANKLIN
PARCEL ID: 218-049

JAMES & PAULINE McLAUGHLIN
231 DANIELS STREET
PARCEL ID: 219-086

TOWN OF FRANKLIN
PARCEL ID: 218-010

AKRAM & REHAM ALSHAWABKEY
21 BERKSHIRE DRIVE
PARCEL ID: 218-014

THOMAS BETRO & AMY MOUSSEAU
20 BERKSHIRE DRIVE
PARCEL ID: 218-012

CARYE & ANDREW RODMAN
24 SYMPHONY DRIVE
PARCEL ID: 218-019

JAMES LEROY & SHRESHTHA RAMANLAL
25 SYMPHONY DRIVE
PARCEL ID: 218-021

TOWN OF FRANKLIN
PARCEL ID: 218-025

STEVEN & GAIL RITUCCI
71 LENOX DRIVE
PARCEL ID: 218-022

PARCEL A
13,000± sq. ft.

PARCEL B
5,936± sq. ft.

LOT 1
180,923± sq. ft.
4.2± acres

LOT 2
105,055± sq. ft.
2.4± acres

SYMPHONY DRIVE
(Public - 56' wide)

BERKSHIRE DRIVE
(Public - 56' wide)

LENOX DRIVE
(Public - 56' wide)

CB (TO BE SET) (TYP)

CB TO BE SET IN PLACE OF I.ROD

I.ROD(fd) w/cap

CB(fd) w/dh

CB(fd)

EXISTING 20' WIDE TEMPORARY CONSTRUCTION EASEMENT

EXISTING TEMPORARY TURNAROUND EASEMENT

2 STORY WOOD #219

2 STORY WOOD #21

2 STORY WOOD #24

2 STORY WOOD #26

2 STORY WOOD #27

SHED

6' PATH

N85° 00' 27"E 247.13'
N74° 34' 59"E 149.31'
N64° 12' 31"E 240.59'
N66° 17' 49"E 89.51'
109.52'
20.01'
S25° 50' 15"E 267.22'
N25° 50' 15"W 296.38'
20.06'
I.ROD(fd) w/cap
343.74'
S34° 16' 42"E 238.63'
N34° 16' 42"W 225.68'
57.48'
S34° 16' 42"E 112.91'
N34° 16' 42"W 125.88'
R=406.00'
L=72.11'
Δ=10°10'35"
R=350.00'
L=353.19'
Δ=57°49'06"
S68° 45' 40"W 1118.02'
696.74'
N27° 16' 33"W 108.46'
N34° 08' 10"E 436.67'
DEPTH=670'
DEPTH=350'
180.0'
S34° 16' 42"E 56.56'
28.00'
28.00'
56.00'
N55° 43' 18"E

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

( REGISTRY )

I HEREBY CERTIFY TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, INFORMATION AND BELIEF THAT THE PROPERTY LINES SHOWN ON THIS PLAN ARE THE LINES DIVIDING EXISTING OWNERSHIPS AND THE LINES OF THE STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED, AND THAT NO NEW LINES FOR DIVISION OF EXISTING OWNERSHIP OR FOR NEW WAYS ARE SHOWN.

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

I CERTIFY THAT THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.

DATE

PROFESSIONAL LAND SURVEYOR

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. LESLIE
No. 38384
REGISTERED PROFESSIONAL LAND SURVEYOR

PROJECT:

*Symphony Drive Extension*

*Franklin Massachusetts*

OWNER/APPLICANT:

*CYPRESS REAL ESTATE DEVELOPMENT LLC*
*3 ROTHCHILD DRIVE*
*FOXBOROUGH, MA 02035*


Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors

FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939


| DATE | DESCRIPTION |
|---|---|
| | |
| | |
| 2/10/2026 | ADD TIES, BOUNDS & PARCEL B |

DEED REF:

BK.4525, PG.319

PLAN REF:

PB.334, PLAN No.400-1986
PB.417, PLAN No.706-1993
PB.474, PLAN No.296-2000
PB.529, PLAN No.99-2004
PB.593, PLAN No.46-2009
PB.637, PLAN No.82-2015
PB.699, PLAN No.22-2021
PB.711, PLAN No.3-2022
PB.734, PG.61
BK.4215, PG.518, No.1130-1964
BK.4892, PG.466, No.1057-1972

ASSESSOR'S REF:

MAP 218, PARCEL 20

ZONING REF:

RURAL RESIDENTIAL I

DATE APPROVED: _____

DATE ENDORSED: _____

FRANKLIN PLANNING BOARD

I HEREBY CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE PLANNING BOARD APPROVAL AND THAT NO APPEAL HAS BEEN FILED IN THIS OFFICE.

DATE FRANKLIN TOWN CLERK

DRAWING TITLE

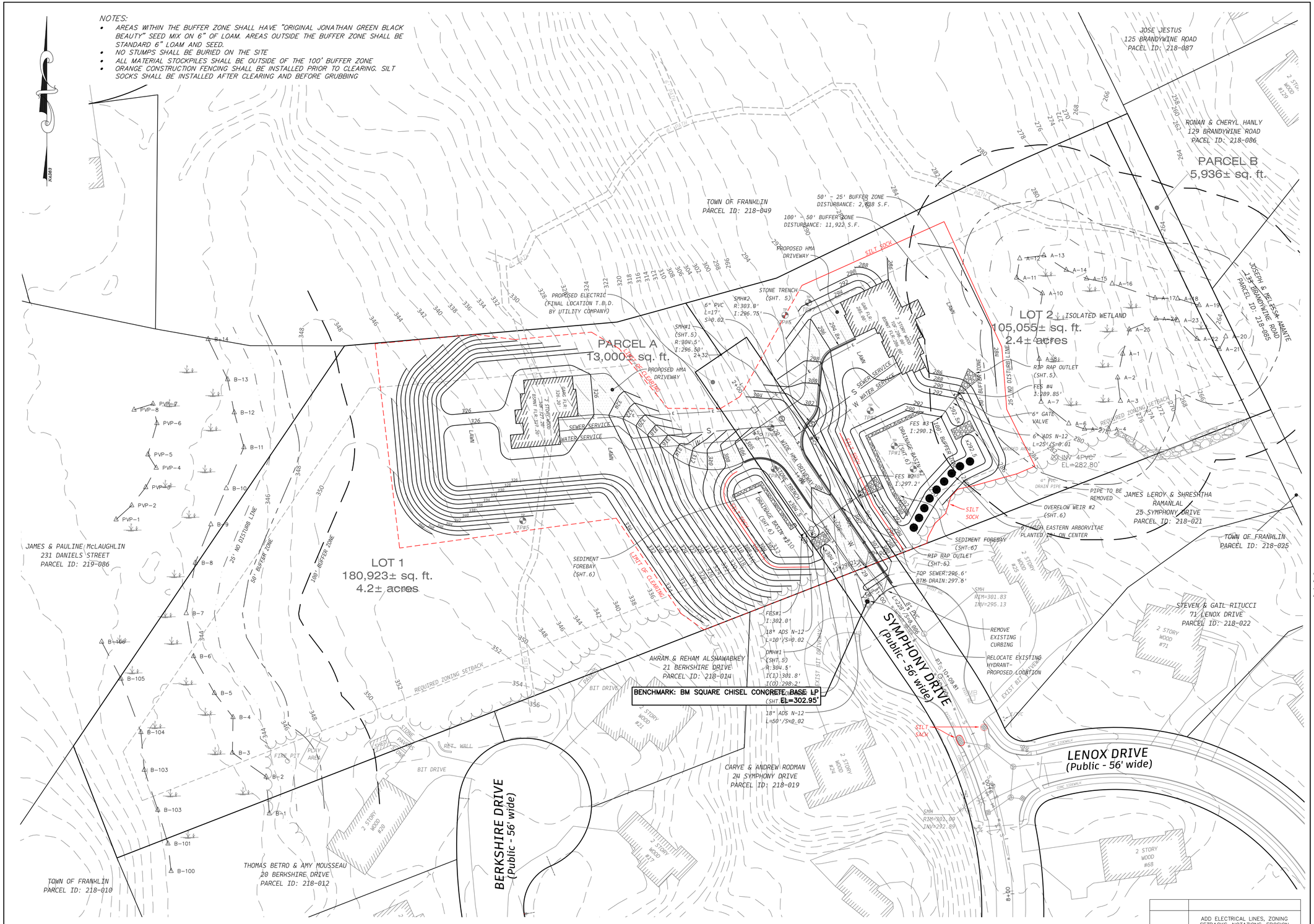
# Property Line Plan

SCALE: 1" = 40'

| DEC. 4, 2025 | SHEET NUMBER |
|---|---|
| 25-0108B | 3 |

NOTES:

- AREAS WITHIN THE BUFFER ZONE SHALL HAVE "ORIGINAL JONATHAN GREEN BLACK BEAUTY" SEED MIX ON 6" OF LOAM. AREAS OUTSIDE THE BUFFER ZONE SHALL BE STANDARD 6" LOAM AND SEED.
- NO STUMPS SHALL BE BURIED ON THE SITE
- ALL MATERIAL STOCKPILES SHALL BE OUTSIDE OF THE 100' BUFFER ZONE
- ORANGE CONSTRUCTION FENCING SHALL BE INSTALLED PRIOR TO CLEARING. SILT SOCKS SHALL BE INSTALLED AFTER CLEARING AND BEFORE GRUBBING




40 0 20 40 80 160

( IN FEET )
1 inch = 40 ft.

| DATE | DESCRIPTION |
|---|---|
| 2/10/2026 | ADD ELECTRICAL LINES, ZONING SETBACKS, NOTATIONS, EROSION CONTROLS, VEGETATION, BUFFER ZONE DISTURBANCE, PIPE REMOVED & ARBORVITAES. REVISE BASIN AND SMH LOCATION |

PROJECT:

*Symphony Drive Extension*

*Franklin Massachusetts*

OWNER/APPLICANT:

*CYPRESS REAL ESTATE DEVELOPMENT LLC*
*3 ROTHCHILD DRIVE*
*FOXBOROUGH, MA 02035*


Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors

FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939


DATE APPROVED: _____

DATE ENDORSED: _____

FRANKLIN PLANNING BOARD

I HEREBY CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE PLANNING BOARD APPROVAL AND THAT NO APPEAL HAS BEEN FILED IN THIS OFFICE.

_____ _____

DATE FRANKLIN TOWN CLERK

STAMP

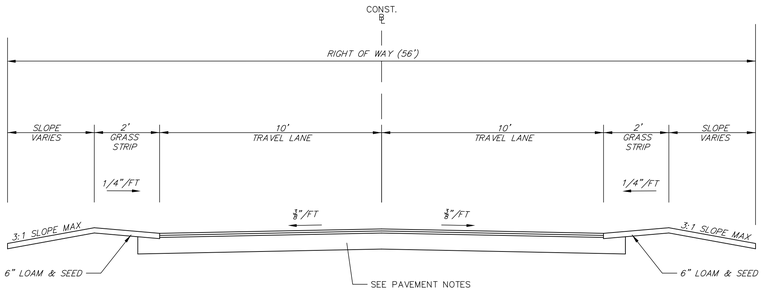
COMMONWEALTH OF MASSACHUSETTS
WILLIAM R. BUCKLEY, JR.
CIVIL
No. 35813
REGISTERED PROFESSIONAL ENGINEER

DRAWING TITLE

Topographic Plan

SCALE: 1" = 40'

| DEC. 4, 2025 | SHEET NUMBER |
|---|---|
| 25-0108B | 4 |



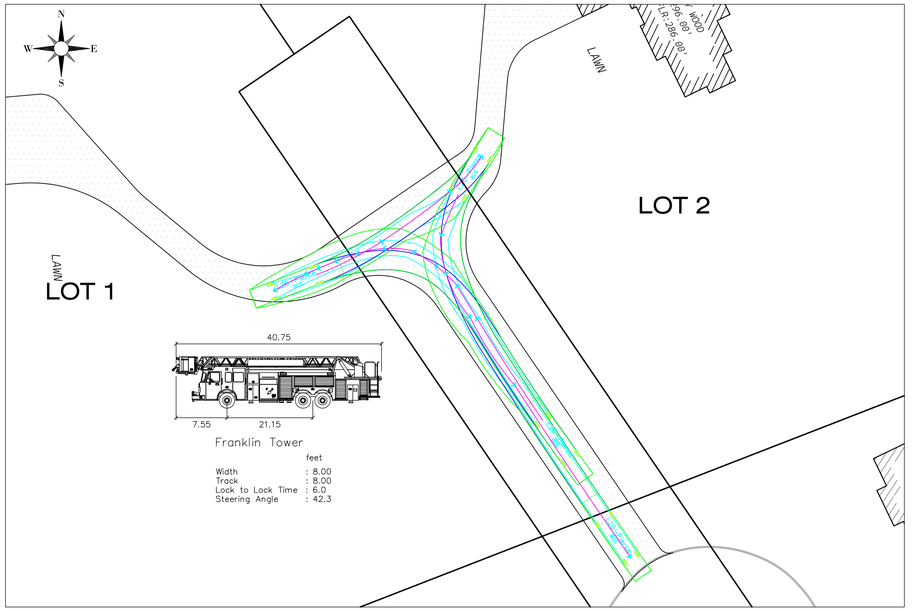

## PAVEMENT NOTES

HOT MIX ASPHALT ROADWAY PAVEMENT

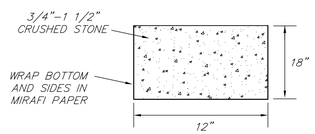
SURFACE: 1-1/2" TYPE I-1 HOT MIX ASPHALT TOP COURSE PLACED IN ONE COURSE

BASE: 2-1/2" HOT MIX ASPHALT BINDER COURSE MATERIAL PLACED IN ONE COURSE

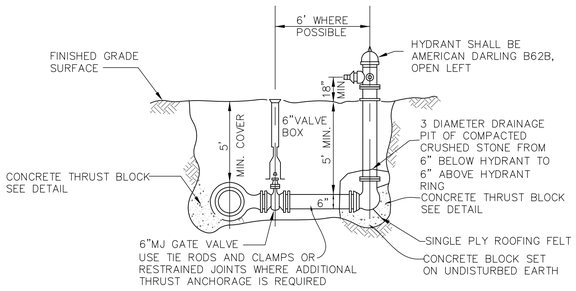
SUBBASE: 12" GRAVEL (MASSDOT SPEC M1.03.0 TYPE B) SPREAD IN 2 LAYERS OF EQUAL THICKNESS




### TYPICAL CROSS SECTION
N.T.S.

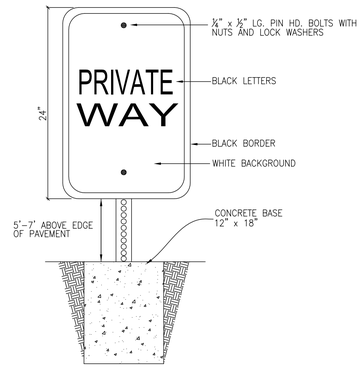



### CRUSHED STONE SWALE
N.T.S.




### HYDRANT ASSEMBLY
N.T.S.

### FIRE TRUCK TURNING PLAN
1"=30'




### ROADWAY CROSS SECTION
N.T.S.



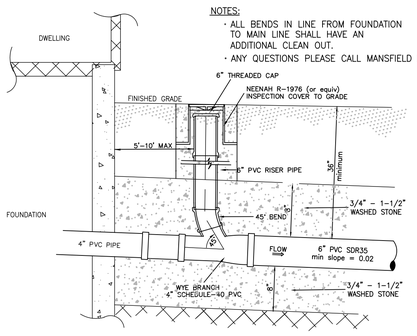

NOTE

TYPE K COPPER TUBING SHALL MEET ASTM B-88, BE SEAMLES, HAVE A MINIMUM DIAMETER OF 1 INCH, AND SHALL BE MANUFACTURED IN NORTH AMERICA

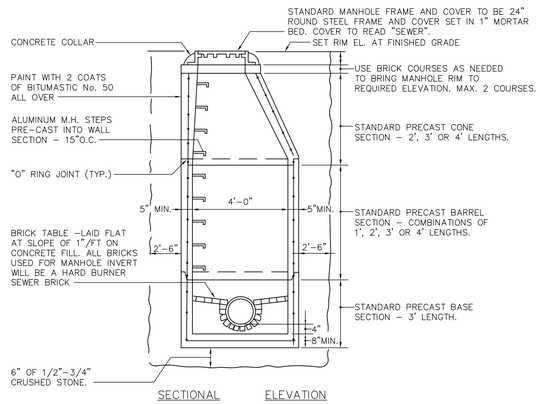
### WATER SERVICE ASSEMBLY
N.T.S.



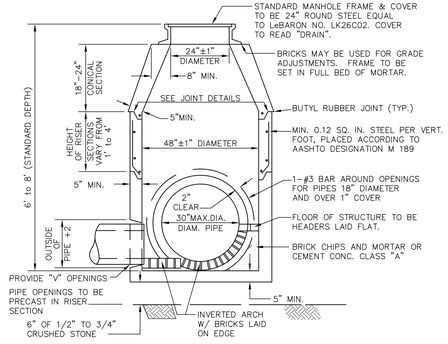

### DRAINAGE TRENCH
N.T.S.



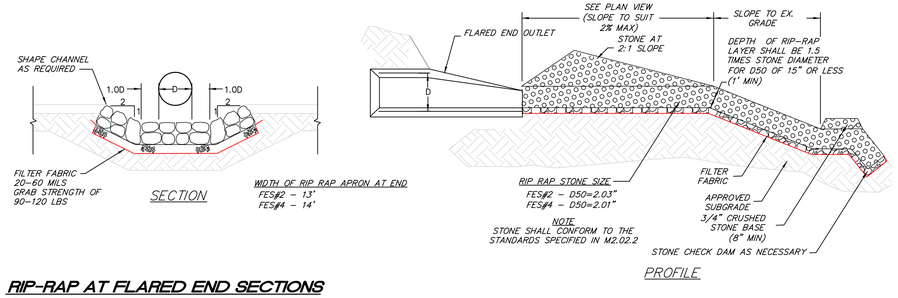

### SEWER SERVICE CONNECTION
N.T.S.




### PRECAST CONCRETE SEWER MANHOLE
N.T.S.




### PRECAST CONCRETE DRAIN MANHOLE
N.T.S.




### RIP-RAP AT FLARED END SECTIONS
N.T.S.

PROJECT:

*Symphony Drive Extension*

*Franklin Massachusetts*

OWNER/APPLICANT:

*CYPRESS REAL ESTATE DEVELOPMENT LLC 3 ROTHCHILD DRIVE FOXBOROUGH, MA 02035*

Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors

FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939

| | |
|---|---|
| | |
| | |
| 2/10/2026 | ADD RIP-RAP DETAIL |
| DATE | DESCRIPTION |

DATE APPROVED: _____

DATE ENDORSED: _____

FRANKLIN PLANNING BOARD

I HEREBY CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE PLANNING BOARD APPROVAL AND THAT NO APPEAL HAS BEEN FILED IN THIS OFFICE.

_____ _____

DATE FRANKLIN TOWN CLERK

STAMP

COMMONWEALTH OF MASSACHUSETTS
WILLIAM R. BUCKLEY, JR.
CIVIL
No. 35813
REGISTERED PROFESSIONAL ENGINEER

DRAWING TITLE

Detail Plan

SCALE: AS NOTED

| DEC. 4, 2025 | SHEET NUMBER |
|---|---|
| 25-0108B | 5 |

| DATE | DESCRIPTION |
|---|---|
| | |
| | |
| 2/10/2026 | REVISE BASINS. ADD TEST PIT DATA |

**TEST PIT #1**

DATE: 6/3/2025 | GND ELEV: 290.2' | TOP WELL EL:

| Depth (Elevation) | Soil Description |
|---|---|
| | A SL; 10YR3/2 |
| 5" (289.8') | B SL; 5YR4/6 |
| 36" (287.2') | C LS; 7.5YR5/4 GRAVELLY, COBBLY, COARSE |
| 120" (280.2') | WATER WEEPING @ 32" (287.5') WATER STANDING @ 80" (283.5') NO MOTTLING |

| | |
|---|---|
| BASIS OF GNDWTR ADJUSTMENT: | DIRECT READING |
| SCS SOIL TYPE: | MONTAUK FINE SANDY LOAM |
| SOIL EVALUATOR: | WILLIAM BUCKLEY, JR. |
| WITNESS: | STEVE DONATELLI |

**TEST PIT #2**

DATE: 6/3/2025 | GND ELEV: 290.4' | TOP WELL EL:

| Depth (Elevation) | Soil Description |
|---|---|
| | A SL; 10YR3/2 |
| 5" (290.0') | B SL; 5YR4/6 |
| 42" (286.9') | C LS; 7.5YR5/4 GRAVELLY, COBBLY, COARSE |
| 120" (280.4') | WATER WEEPING @ 36" (287.4') WATER STANDING @ 80" (283.7') NO MOTTLING |

| | |
|---|---|
| BASIS OF GNDWTR ADJUSTMENT: | DIRECT READING |
| SCS SOIL TYPE: | MONTAUK FINE SANDY LOAM |
| SOIL EVALUATOR: | WILLIAM BUCKLEY, JR. |
| WITNESS: | STEVE DONATELLI |

**TEST PIT #3**

DATE: 6/3/2025 | GND ELEV: 306.5' | TOP WELL EL:

| Depth (Elevation) | Soil Description |
|---|---|
| | A SL; 10YR3/2 |
| 6" (306.0') | B SL; 10YR5/6 |
| 35" (303.6') | B2 SL; 5YR4/6 |
| 66" (301.0') | REFUSAL @ 66" (301.0') NO WATER/MOTTLING |

| | |
|---|---|
| BASIS OF GNDWTR ADJUSTMENT: | DIRECT READING |
| SCS SOIL TYPE: | MONTAUK FINE SANDY LOAM |
| SOIL EVALUATOR: | WILLIAM BUCKLEY, JR. |
| WITNESS: | STEVE DONATELLI |

**TEST PIT #4**

DATE: 6/3/2025 | GND ELEV: 303.8' | TOP WELL EL:

| Depth (Elevation) | Soil Description |
|---|---|
| | A SL; 10YR3/2 |
| 6" (303.3') | B SL; 10YR5/6 |
| 36" (300.8') | B2 SL; 5YR4/6 |
| 60" (298.8') | REFUSAL @ 60" (298.8') NO WATER/MOTTLING |

| | |
|---|---|
| BASIS OF GNDWTR ADJUSTMENT: | DIRECT READING |
| SCS SOIL TYPE: | MONTAUK FINE SANDY LOAM |
| SOIL EVALUATOR: | WILLIAM BUCKLEY, JR. |
| WITNESS: | STEVE DONATELLI |

**TEST PIT #5**

DATE: 6/3/2025 | GND ELEV: 343.0' | TOP WELL EL:

| Depth (Elevation) | Soil Description |
|---|---|
| | A SL; 10YR3/2 |
| 6" (342.5') | B SL; 10YR5/6 |
| 36" (340.0') | B2 SL; 5YR4/6 |
| 62" (337.8') | REFUSAL @ 62" (337.8') NO WATER/ MOTTLING |

| | |
|---|---|
| BASIS OF GNDWTR ADJUSTMENT: | DIRECT READING |
| SCS SOIL TYPE: | MONTAUK FINE SANDY LOAM |
| SOIL EVALUATOR: | CAMERON GRAY |
| WITNESS: | STEVE DONATELLI |

**TEST PIT #6**

DATE: 6/3/2025 | GND ELEV: 293.0' | TOP WELL EL:

| Depth (Elevation) | Soil Description |
|---|---|
| | A SL; 10YR3/2 |
| 6" (292.5') | B1 SL; 5YR4/6 |
| 24" (291.0') | B2 SL; 5YR3/4 |
| 60" (288.0') | C LS; 7.5YR5/4 GRAVELLY, COBBLY, COARSE |
| 120" (283.0') | WATER WEEPING @ 29" (290.5') WATER STANDING @ 80" (286.3') NO MOTTLING |

| | |
|---|---|
| BASIS OF GNDWTR ADJUSTMENT: | DIRECT READING |
| SCS SOIL TYPE: | MONTAUK FINE SANDY LOAM |
| SOIL EVALUATOR: | WILLIAM BUCKLEY, JR. |
| WITNESS: | STEVE DONATELLI |

**TEST PIT #7**

DATE: 6/3/2025 | GND ELEV: 290.9' | TOP WELL EL:

| Depth (Elevation) | Soil Description |
|---|---|
| | A SL; 10YR3/2 |
| 6" (290.4') | B SL; 5YR4/6 |
| 30" (288.4') | C LS; 7.5YR5/4 |
| 120" (280.9') | WATER WEEPING @ 29" (288.4') NO MOTTLING |

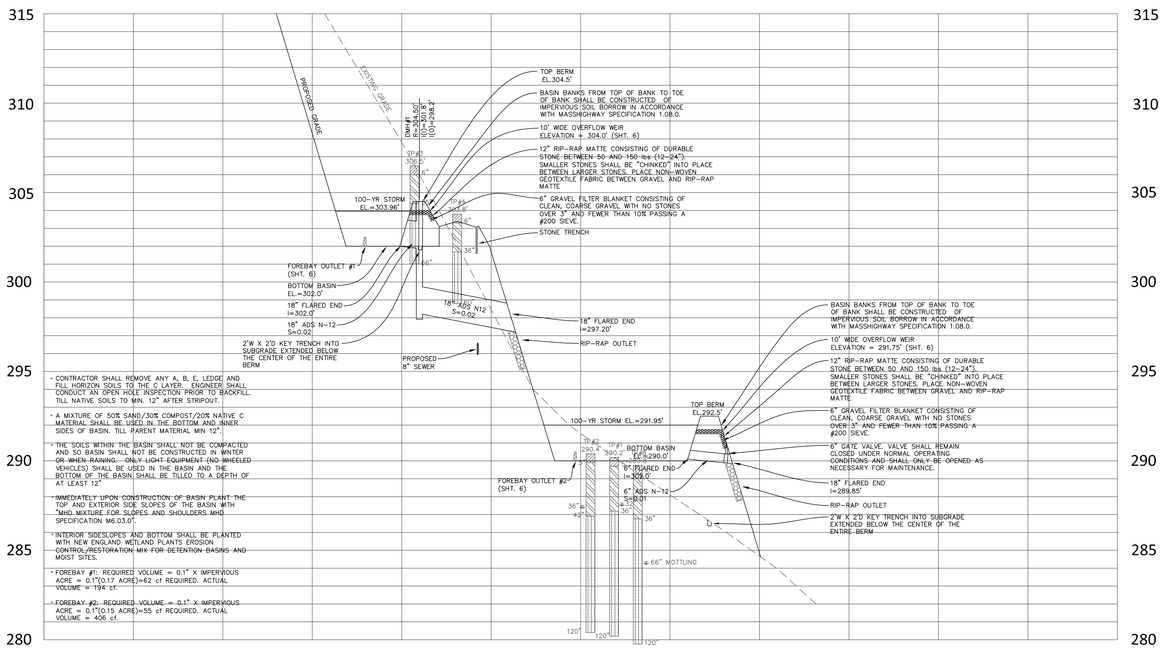
| | |
|---|---|
| BASIS OF GNDWTR ADJUSTMENT: | DIRECT READING |
| SCS SOIL TYPE: | MONTAUK FINE SANDY LOAM |
| SOIL EVALUATOR: | WILLIAM BUCKLEY, JR. |
| WITNESS: | STEVE DONATELLI |

**TEST PIT #8**

DATE: 2/17/2026 | GND ELEV: 289.8' | TOP WELL EL:

| Depth (Elevation) | Soil Description |
|---|---|
| | A SL; 10YR3/2 |
| 5" (289.3') | B SL; 5YR4/6 |
| 36" (286.8') | C LS; 7.5YR5/4 GRAVELLY, COBBLY, COARSE |
| 120" (279.8') | MOTTLING @ 66" (284.3') WATER WEEPING @ 96" (281.8') WATER STANDING @ 120" (279.8) |

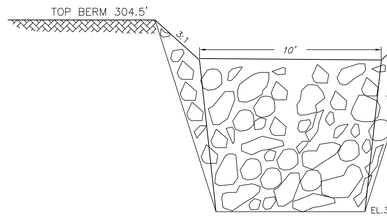
| | |
|---|---|
| BASIS OF GNDWTR ADJUSTMENT: | DIRECT READING |
| SCS SOIL TYPE: | MONTAUK FINE SANDY LOAM |
| SOIL EVALUATOR: | CAMERON GRAY |



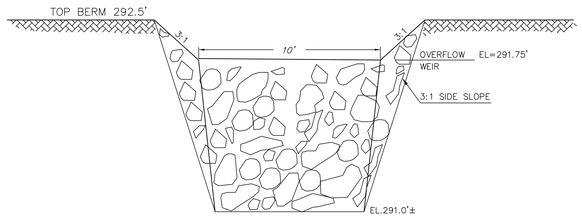

- CONTRACTOR SHALL REMOVE ANY A, B, E, LEDGE AND FILL HORIZON SOILS TO THE C LAYER. ENGINEER SHALL CONDUCT AN OPEN HOLE INSPECTION PRIOR TO BACKFILL TILL NATIVE SOILS TO MIN. 12" AFTER STRIPOUT.
- A MIXTURE OF 50% SAND/30% COMPOST/20% NATIVE C MATERIAL SHALL BE USED IN THE BOTTOM AND INNER SIDES OF BASIN. TILL PARENT MATERIAL MIN 12".
- THE SOILS WITHIN THE BASIN SHALL NOT BE COMPACTED AND SO BASIN SHALL NOT BE CONSTRUCTED IN WINTER OR WHEN RAINING. ONLY LIGHT EQUIPMENT (NO WHEELED VEHICLES) SHALL BE USED IN THE BASIN AND THE BOTTOM OF THE BASIN SHALL BE TILLED TO A DEPTH OF AT LEAST 12"
- IMMEDIATELY UPON CONSTRUCTION OF BASIN PLANT THE TOP AND EXTERIOR SIDE SLOPES OF THE BASIN WITH "MHD MIXTURE FOR SLOPES AND SHOULDERS MHD SPECIFICATION M6.03.01".
- INTERIOR SIDESLOPES AND BOTTOM SHALL BE PLANTED WITH NEW ENGLAND WETLAND PLANTS EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES.
- FOREBAY #1: REQUIRED VOLUME = 0.1" X IMPERVIOUS ACRE = 0.1"(0.17 ACRE)=62 cf REQUIRED. ACTUAL VOLUME = 194 cf.
- FOREBAY #2: REQUIRED VOLUME = 0.1" X IMPERVIOUS ACRE = 0.1"(0.15 ACRE)=55 cf REQUIRED. ACTUAL VOLUME = 406 cf.

## Basin #1 & #2

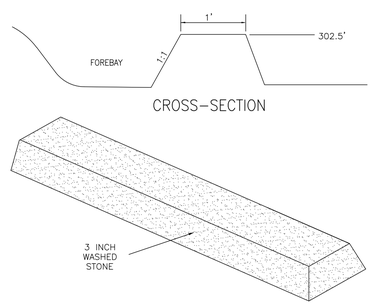
Horizontal Scale: 1" =40'
Vertical Scale: 1" = 4'



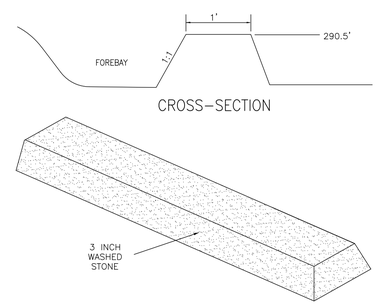

**END VIEW OF OVERFLOW WEIR BASIN #1**
N.T.S.




**END VIEW OF OVERFLOW WEIR BASIN #2**
N.T.S.




**FOREBAY OUTLET BASIN #1**
N.T.S.




**FOREBAY OUTLET BASIN #2**
N.T.S.

PROJECT:

*Symphony Drive Extension*

*Franklin Massachusetts*

OWNER/APPLICANT:

*CYPRESS REAL ESTATE DEVELOPMENT LLC 3 ROTHCHILD DRIVE FOXBOROUGH, MA 02035*


Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors

FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939


DATE APPROVED: _____

DATE ENDORSED: _____

FRANKLIN PLANNING BOARD

I HEREBY CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE PLANNING BOARD APPROVAL AND THAT NO APPEAL HAS BEEN FILED IN THIS OFFICE.

_____ _____

DATE FRANKLIN TOWN CLERK

STAMP

COMMONWEALTH OF MASSACHUSETTS
WILLIAM R. BUCKLEY, JR.
CIVIL
No. 35813
REGISTERED PROFESSIONAL ENGINEER

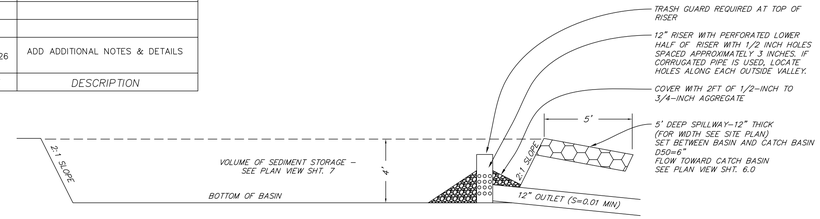
DRAWING TITLE

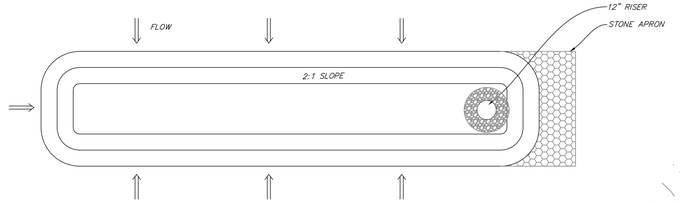
Detail Plan

SCALE: AS NOTED

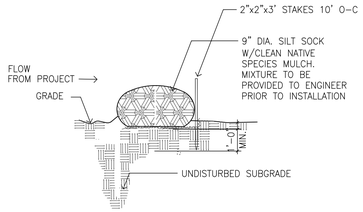
| DEC. 4, 2025 | SHEET NUMBER |
|---|---|
| 25-0108B | 6 |

| DATE | DESCRIPTION |
|---|---|
| | |
| | |
| | |
| 2/10/2026 | ADD ADDITIONAL NOTES & DETAILS |

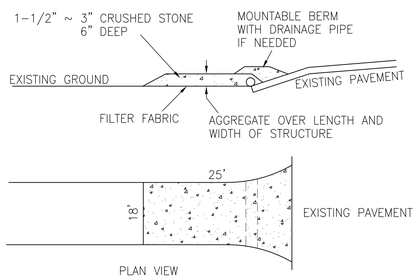


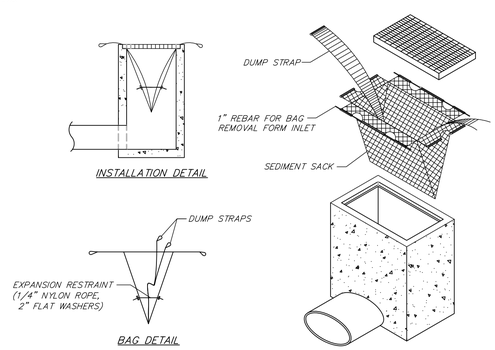

## TEMPORARY SEDIMENT BASIN DETAIL
N.T.S.



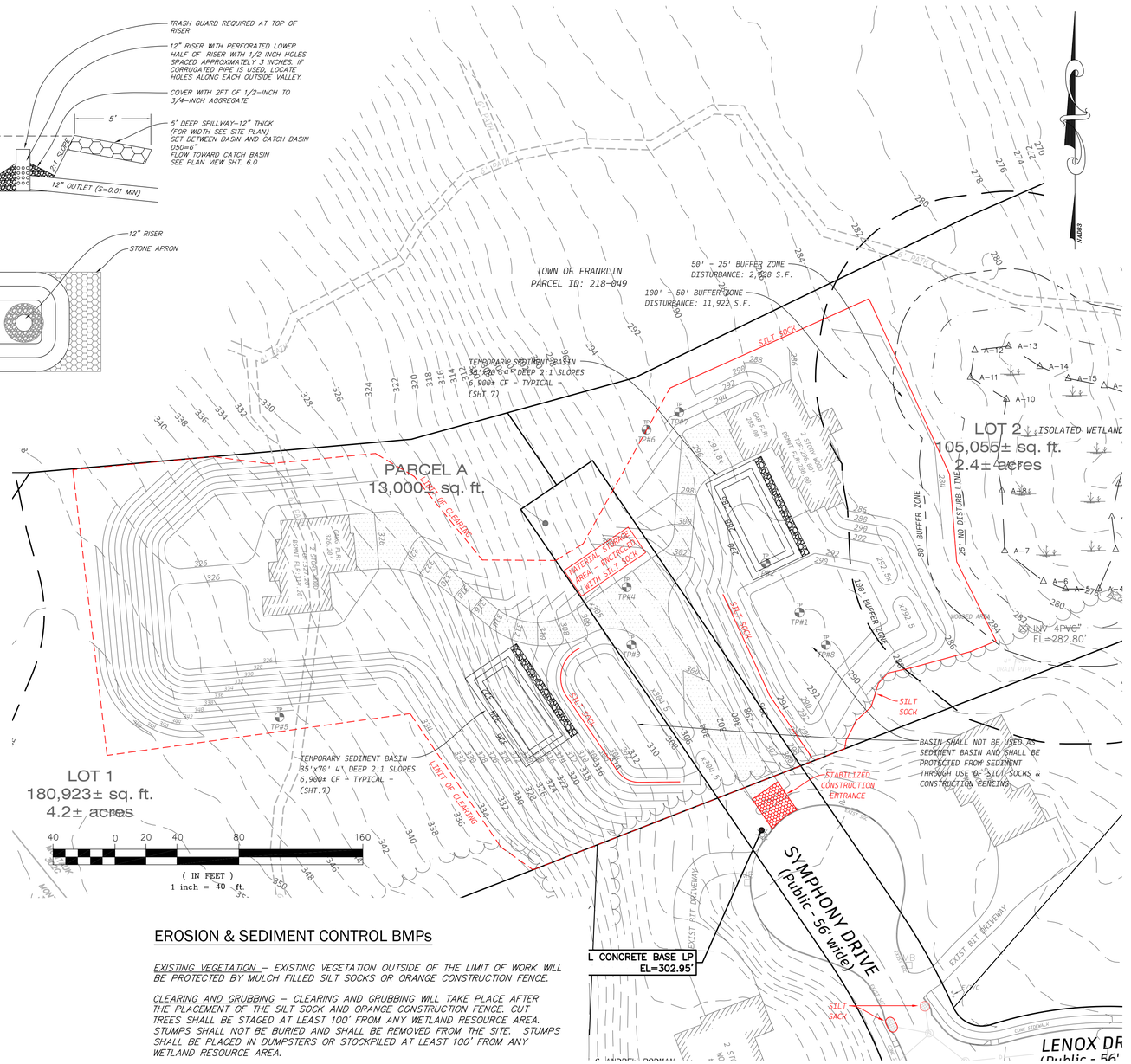

## SILT SOCK EROSION CONTROL
N.T.S.




## STABILIZED CONSTRUCTION ENTRANCE
N.T.S.




## SILT SACK
N.T.S.




## LEGEND

SILT SOCK
LIMIT OF CLEARING
SILT SACK

ALONG THE LIMIT OF WORK LINES WHERE SILT SOCKS ARE NOT SPECIFIED THE CONTRACTOR SHALL MARK THE LIMIT OF WORK WITH ORANGE CONSTRUCTION FENCING.

## PROJECT PHASING

PHASE 1:
EST. START DATE: _ _ _ _ _ _ _ _
EST. FINISH DATE: _ _ _ _ _ _ _ _

INSTALL EROSION CONTROLS AND LIMITS OF WORK, CLEAR TREES TO LIMIT OF WORK, GRUBBING AND REMOVAL OF STUMPS FROM SITE. INSTALLATION OF TEMPORARY SEDIMENT BASINS.

PHASE 2:
EST. START DATE: _ _ _ _ _ _ _ _
EST. FINISH DATE: _ _ _ _ _ _ _ _

STOCKPILE OF MATERIAL AND BRING SITE TO SUBGRADE. CONSTRUCTION OF STORMWATER BASINS. INSTALLATION OF DRAINAGE AND UTILITIES WITHIN ROADWAY LAYOUT.

PHASE 3:
EST. START DATE: _ _ _ _ _ _ _ _
EST. FINISH DATE: _ _ _ _ _ _ _ _

INSTALLATION OF BASE COURSE OF ROADWAY. START CONSTRUCTION OF INDIVIDUAL HOMES.

PHASE 4:
EST. START DATE: _ _ _ _ _ _ _ _
EST. FINISH DATE: _ _ _ _ _ _ _ _

COMPLETE CONSTRUCTION OF HOMES. INSTALL FINISH COURSE OF PAVEMENT. COMPLETE LANDSCAPING AND REMOVE EROSION CONTROLS ONCE SITE IS FULLY STABILIZED.

## PROCEDURAL NOTES

1. PRIOR TO ANY ALTERATION OF THE SITE, AN ON-SITE MEETING BETWEEN THE OWNER'S REPRESENTATIVE, THE CONSTRUCTION SUPERVISOR, AND THE TOWN'S AGENT SHALL OCCUR. THE OWNER AND AGENT MAY INVITE OTHER INDIVIDUALS NEEDED. SIMILAR MEETINGS WILL OCCUR ONCE EROSION CONTROL MEASURES ARE IN PLACE AND THEREAFTER ON A REGULAR BASIS UNLESS OTHERWISE AGREED TO BY ALL PARTIES.
2. THE INSPECTION OF EROSION CONTROL DEVICES ADJACENT TO THE BUFFER ZONES WILL BE DONE BY THE APPLICANT'S ENGINEER, AND ONCE DETERMINED TO BE ACCURATE, THE ENGINEER WILL SEND A LETTER TO THE TOWN'S AGENT ATTESTING TO THE ACCURACY AND DESCRIBING ANY DEVIATIONS.
3. THE PROJECT CONSTRUCTION SUPERVISOR WILL INSPECT THE SITE EROSION CONTROLS IAW THE SWPPP PLAN AND O&M PLAN. THE OWNER SHALL SUBMIT ANY CHANGES TO SEQUENCE OR TIMING OF CONSTRUCTION OR INSPECTIONS TO THE TOWN'S AGENT PRIOR TO IMPLEMENTATION.
4. INSTALL A LIMIT OF WORK (LOW) FENCE TO ENCLOSE THE WORK SITE.
5. STORM WATER MUST BE MANAGED IN THE WORK AREA AND NOT DISCHARGED OUTSIDE OF SAME.
6. ALL BARE SOIL WITHIN THE SITE POTENTIALLY DRAINING TO THE PROPOSED INFILTRATION BASIN OR OFF THE SITE SHALL BE FENCED OR STABILIZED WITHIN 48 HOURS AND NO SEDIMENT IS TO LEAVE THE LIMIT OF WORK.

## EROSION & SEDIMENT CONTROL BMPs

EXISTING VEGETATION – EXISTING VEGETATION OUTSIDE OF THE LIMIT OF WORK WILL BE PROTECTED BY MULCH FILLED SILT SOCKS OR ORANGE CONSTRUCTION FENCE.

CLEARING AND GRUBBING – CLEARING AND GRUBBING WILL TAKE PLACE AFTER THE PLACEMENT OF THE SILT SOCK AND ORANGE CONSTRUCTION FENCE. CUT TREES SHALL BE STAGED AT LEAST 100' FROM ANY WETLAND RESOURCE AREA. STUMPS SHALL NOT BE BURIED AND SHALL BE REMOVED FROM THE SITE. STUMPS SHALL BE PLACED IN DUMPSTERS OR STOCKPILED AT LEAST 100' FROM ANY WETLAND RESOURCE AREA.

SOIL STABILIZATION – IMMEDIATELY UPON COMPLETION OF ROUGH GRADING THE SLOPES ON THE WEST SIDE OF THE SITE SHALL BE PLANTED WITH "MHD MIXTURE FOR SLOPES AND SHOULDERS – MHD SPECIFICATION M6.03.0" AND COVERED WITH EROSION CONTROL MATTING (ECS-2B BY NEW ENGLAND WETLAND PLANTS OR EQUIV) INSTALLED IAW MANUFACTURER'S RECOMMENDATION. THE PURPOSE IS TO CONTROL EROSION AND SEDIMENTATION. STABILIZE AND CONSTRUCT THE INFILTRATION BASIN IAW THE DETAILS ON SHEET 6. HYDROSEEDING CONSISTING OF WOOD FIBERS, FERTILIZER AND STABILIZING EMULSION SHALL TAKE PLACE IN SLOPED AREAS OF EXPOSED SOILS WHERE CONSTRUCTION WILL CEASE FOR MORE THAN 14 DAYS.

TEMPORARY SEDIMENT BASINS – GRADING, AND DIVERSION SWALES IF NECESSARY, SHALL BE USED THROUGHOUT THE SITE IN ORDER TO DIRECT RUNOFF TO THE TEMPORARY SEDIMENT BASINS IN ORDER TO CAPTURE RUNOFF AS CLOSE TO THE SOURCE AS PRACTICAL TO PREVENT IT FROM MIGRATING OUTSIDE OF THE LIMIT OF WORK. CONSTRUCT BASIN BY EXCAVATING BASIN BEFORE ANY GRADING WORK BEGINS. THE BASIN AREA MUST BE CLEARED, GRUBBED, AND STRIPPED OF ANY VEGETATION. IF NECESSARY, FILL MATERIAL MUST BE CLEAN, LOW PERMEABILITY, MINERAL FREE SOIL FREE OF 3" OR LARGER ROCKS AND OTHER NON-SOIL MATERIAL. SCARIFY BOTTOM OF BASIN TO A DEPTH OF 12" SEED BASIN SIDEWALLS IMMEDIATELY AFTER CONSTRUCTION. INSPECT THE BASIN WEEKLY AND AFTER EACH RAINFALL. ALL DAMAGES CAUSED BY SOIL EROSION OR CONSTRUCTION EQUIPMENT WILL BE REPAIRED BEFORE END OF DAY. REMOVE SEDIMENT WHEN SEDIMENT STORAGE ZONE IS HALF FULL. SCARIFY BOTTOM OF BASIN AFTER EACH SEDIMENT REMOVAL

SILT SOCKS – SHALL BE USED ON THE PROJECT AT THE LIMIT OF WORK WHERE IT IS ADJACENT TO THE WETLAND BUFFER ZONES AND WITHIN THE WORK PERIMETER IN ORDER TO PROTECT THE INFILTRATION BASIN FROM SEDIMENTATION. THEY SHALL BE 9" DIAMETER AND MULCH FILLED IN ACCORDANCE WITH THE FRANKLIN CONSERVATION COMMISSION'S SPECIFICATIONS FOR MULCH FILTER TUBES. HAY BALES AND STRAW WATTLES ARE NOT ACCEPTABLE. INSPECT AFTER EACH RAINFALL AND ANY GAPS, OVERTOPPING, CLOGGING, EROSION, SEDIMENT TO HALF THE HEIGHT, OR OTHERWISE BECOME INEFFECTIVE SHALL BE IMMEDIATELY REMEDIED. AFTER SITE IS STABILIZED THE THE EXTERIOR TUBING MATERIAL SHALL BE CUT AND REMOVED OFF SITE AND THE FILTER MATERIAL SHALL BE RAKED INTO NO GREATER THAN 3" DEPTH.

SILT SACKS – SHALL BE PLACED IN ALL CATCH BASINS ON THE PROJECT AND ON COMMERCE BOULEVARD AND SHALL REMAIN UNTIL THE SITE HAS BEEN FULLY STABILIZED. THE SACKS SHALL BE CHECKED AND CLEANED AFTER EVERY STORM AND IF MORE THAN ½ FULL.

MATERIAL PILES – ALL MATERIAL PILES SHALL BE PLACED MORE THAN 100' FROM ANY WETLAND RESOURCE AREAS. THEY SHALL BE ENCIRCLED WITH A SILT SOCK AND CONSTRUCTION FENCE IAW DETAIL ON SHEET 6.1.

STABILIZED CONSTRUCTION ENTRANCES – SHALL BE PLACED AT THE START OF CONSTRUCTION AT THE ACCESS POINTS OFF SYMPHONY DRIVE WHERE THE FINAL ROADWAY IS PROPOSED TO BE LOCATED. IT IS TO BE USED FOR ACCESS AND EGRESS. THEY SHALL BE INSPECTED WEEKLY AND THE AGGREGATE SHALL BE REPLENISHED OR REPLACED AS NECESSARY TO ENSURE NO SEDIMENT IS ON SYMPHONY DRIVE. IF SEDIMENT IS DEPOSITED ON THE STREET THE CONTRACTOR SHALL HAVE IT SWEPT UP BY THE END OF THE WORK DAY.

PROJECT:

*Symphony Drive Extension*

*Franklin Massachusetts*

OWNER/APPLICANT:

*CYPRESS REAL ESTATE DEVELOPMENT LLC 3 ROTHCHILD DRIVE FOXBOROUGH, MA 02035*


Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors

FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939


DATE APPROVED: _____

DATE ENDORSED: _____

FRANKLIN PLANNING BOARD

*I HEREBY CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE PLANNING BOARD APPROVAL AND THAT NO APPEAL HAS BEEN FILED IN THIS OFFICE.*

DATE _____ FRANKLIN TOWN CLERK

STAMP

COMMONWEALTH OF MASSACHUSETTS
WILLIAM R. BUCKLEY, JR.
CIVIL
No. 35813
REGISTERED PROFESSIONAL ENGINEER

DRAWING TITLE

SWPPP

SCALE: 1" = 40'

| DEC. 4, 2025 | SHEET NUMBER |
|---|---|
| 25-0108B | 7 |

Bay Colony Group, Inc.
Professional Civil Engineers & Land Surveyors

4 School Street, PO Box 9136
Foxborough, Massachusetts 02035
Telephone (508) 543-3939 • Fax (508) 543-8866
E-mail: mailbox@baycolonygroup.com

February 19, 2026

Mr. Mark C. LePage, Chairman
Franklin Conservation Commission
355 E Central Street
Franklin, MA 02038

**RE: "Tanglewood Estates II" Symphony Drive Extension Definitive Plan**

Dear Mr. Lepage,

On behalf of my client, Cypress Real Estate Development, LLC, I am submitting herewith a revised definitive plan and notice of intent. The modifications to the plan and report are as a result of the comments received by the Town's professional consultant BETA through a memo dated February 13, 2026. For ease of review, we have included the comment and our response.

BETA:

PLAN AND GENERAL COMMENTS

A1. The Project was filed under the Bylaw only; therefore, no DEP file number has been issued.

**BCG Response: Correct**

A2. The following elements are missing from the provided plan set:

a. Existing and proposed vegetation should be included on the plans as referenced in Bylaw Regulations Section 7.18.1.5 and 7.18.1.6, including individual trees/shrubs with a diameter greater than 1" proposed for removal. It is BETA's understanding that the Commission generally increases the size threshold for tree location based on the Project and therefore defers to the Commission on this matter. However, the proposed tree line, areas of proposed lawn, and any other proposed vegetation should be depicted on the plans.

**BCG Response: The existing tree line is shown on Sheets 2 & 2.1 of the Definitive Plan. All trees within the limit of work are to be removed. The proposed project disturbs approximately 20% of the 25'-100' buffer zone on the site. Given the limited scope of disturbance and the nature of the**

**project, individual trees greater than 1-inch diameter have not been separately identified.**

**The proposed vegetation is depicted on Sheet 4 of the Definitive Plan and consists primarily of grassed yard areas and stabilization planting associated with the stormwater basin. No additional landscaping is proposed.**

b. The proposed location of erosion and sedimentation controls are only shown on Sheet 7 of the submitted plan set. Erosion controls should be depicted on Sheet 4 of the plans with all other proposed Site elements to ensure constructability and protection of Resource Areas.

**BCG Response: Erosion controls have been shown on Sheet 4 of the Definitive Plan.**

c. A Construction Sequence with all proposed activities within Jurisdictional Areas should be provided on the plans per Bylaw Regulations Section 7.18.1.14.

**BCG Response: A construction sequence has been added to Sheet 7 of the Definitive Plan.**

d. A survey benchmark should be provided on the plans.

**BCG Response: A benchmark has been added to Sheet 2 & 2.1 of the Definitive Plan.**

A3. Impacts to both the 25-50-foot and 50-100-foot Buffer Zone should be noted on the plans.

**BCG Response: The impacts to the buffer zone are noted on Sheet 4 of the Definitive Plan.**

WETLAND RESOURCE AREAS AND REGULATORY REVIEW

CONSTRUCTION & MTIGATION COMMENTS

W1. Provide specifications of the seed mixture(s) proposed for stabilization of disturbed areas within Buffer Zone, including any areas that are proposed to be lawn. All areas of proposed lawn should be demarcated on the Project plans. BETA recommends that native species with wildlife habitat value be proposed within Buffer Zone where lawn is not required as mitigation for Buffer Zone clearing.

**BCG Response: All disturbed areas within the limit of work not occupied by the proposed homes or drainage infrastructure are proposed to be maintained as yard/lawn. Seed mixtures, both within and outside of the buffer zone are specified in the notes on Sheet 4. The proposed lawn areas have also been labeled on Sheet 4.**

W2. The Applicant should consider providing a planting plan to mitigate for additional development within Buffer Zone. Specifically, areas within Buffer Zone closest to the IVW boundary should be prioritized for the planting of native vegetation and the application of native seed mix.

**BCG Response: A native seed mix is proposed for areas within the buffer zone as specified on Sheet 4 of the Definitive Plan. At this time no additional planting plan is proposed, as the extent of buffer zone disturbance has been minimized to the greatest extent practicable and stabilization with native seed mix is considered appropriate for the limited encroachment.**

W3. The Commission could include a Special Condition in the order of Conditions requiring the submission and approval of a dewatering plan prior to discharge in the event that groundwater is encountered.

**BCG Response: Acknowledged.**

W4. On Sheet 7 of the plans, line work associated with erosion and sedimentation controls and the limit of clearing are shown; however, the limits of work is not shown in the vicinity of the Buffer Zone impacts. The Applicant should confirm if the limits of erosion controls are the same as the limits of work in this area and depict this on the plans.

**BCG Response: Notes added to Sheet 7 specify that existing vegetation outside the limit of work will be protected by mulched filled silt socks or orange construction fence.**

W5. The Project proposes to clear vegetation and grade within approximately 2,638 square feet of the 25-50-foot Buffer Zone; however, no Site elements are proposed for construction in this area. The Applicant should provide further details addressing what is proposed within this area and determine if these impacts are necessary.

**BCG Response: No structures or impervious area are proposed within the 25-50-foot buffer zone in accordance with the local regulations. The approximately 2,638 square feet of disturbance in this area is limited to vegetation clearing and grading to establish lawn associated with the proposed home.**

**The proposed dwelling is designed as a walk-out structure, and the site grading has been carefully tailored to tie into existing grades to the greatest extent practicable. Minimal fill is required within the Buffer Zone to accommodate the walk-out configuration and to establish a usable backyard area. The layout and grading plan were developed to minimize disturbance within the Buffer Zone while addressing existing topography, roadway and driveway access constraints, and drainage requirements.**

W6. Inlet protection within the catch basins along Symphony Drive should be depicted on the Erosion Control Plan.

**BCG Response: Silt sacks have been added to catch basins on Symphony Drive as shown on Sheet 7 of the Definitive Plan.**

BYLAW REGULATORY COMMENTS

W7. A Construction Sequence should also be provided on the Plans per Bylaw Regulation Section 7.15.1.

**BCG Response: A construction sequence is shown on Sheet 7 of the Definitive Plan.**

W8. The Applicant should provide an Erosion & Sedimentation Control Plan which includes contact information of the person(s) responsible for inspecting and maintaining erosion controls,

the requirement to inspect erosion controls weekly or following significant rain events, and all other requirements listed in Section 7.12.1 of the Bylaw Regulations.

**BCG Response: An erosion and sediment control plan has been included on Sheet 7 of the Definitive Plan and Appendix C of the Stormwater Management Report. Prior to the start of construction, the contact information for the person(s) responsible for inspecting and maintaining of erosion control will be provided to the Commission. The inspections will be conduct in accordance with the SWPPP prepared for the project.**

W9. A Mitigation Plan with information outlined in Bylaw Regulation Section 7.11 should be provided.

**BCG Response: The project narrative in the Notice of Intent has been revised to include a Mitigation Plan in accordance with Section 7.11.**

W10. A Vernal Pool Statement should be provided per Bylaw Regulations Section 7.7.

**BCG Response: The presence of vernal pools was noted in the Wetland Delineation Report prepared by the Pare Corporation in Appendix B of the Notice of Intent.**

W11. According to Section 7.9.1 of the Bylaw, the Project Narrative should include the following missing content:

a. All activities required to construct the Project;

   **BCG Response: A construction sequence has been provided in the narrative of the Notice of intent as well as on Sheet 7 of the Definitive Plan.**

b. How the Project will affect the Functions and Characteristics outlined in Section 7 of the Regulations;

   **BCG Response: In accordance will Section 7.10.1of the Bylaw the project will have the following effects:**

   - **Private Water Supplies – The nearest public well is located approximately 0.6 miles away off of Populatic Street**
   - **Private water supplies – The nearest private domestic well is located approximately 0.4 miles away at 80 Populatic Street.**
   - **Groundwater - Due to the existing site topography, and in compliance with the local Subdivision of Land Regulations and standard engineering practice, the project has been designed to the maximum extent reasonably practicable to minimize the depth and extent of the proposed cut into the hillside. The design is consistent with grading design previously approved and constructed along Symphony Drive and Berkshire Drive. The proposed drainage system is designed to control site hydrology. No groundwater was encountered in the western portion of the site within the area of the proposed cut during site investigations. Any groundwater encountered is due to an impermeable layer and will be handled during the home and potential wall construction in accordance with 780 CMR Section 1807.0**

**(Massachusetts Building Code). We do not anticipate any off-site impacts.**

- **Flood Control – No work within the floodplain is proposed aspart of this project**
- **Erosion and Sedimentation – An erosion control plan (Sheet 7) has been developed in accordance with the state and local regulations. An operation and maintenance plan has been included in Appendix B of the Stormwater Management report.**
- **Storm Damage Prevention – The stormwater management has been designed in accordance with all state and local regulations. The stormwater analysis confirms that the proposed design will decrease the rate and volume of runoff flowing to the wetland.**

  **Trees are proposed to be cleared around the proposed homes in order to minimize the risk for future damage due to fallen trees.**
- **Water Quality – The stormwater management consist of a multiphase system designed to treat and control stormwater runoff. The system meets the water quality standard outlined in the state and local regulations.**
- **Water pollution control - The stormwater management consist of a multiphase system designed to treat and control stormwater runoff. The system meets the state and local standards for TSS removal.**
- **Fisheries – The site is not located adjacent to any ponds or perennial stream. The resource area is also an isolated wetland with no hydraulic connections to a pond or river.**
- **Shellfish – Not applicable.**
- **Wildlife Habitat – The site is not located within an estimated habitat of rare wildlife or priority habitat of rare species.**
- **Rare species habitat - The site is not located within an estimated habitat of rare wildlife or priority habitat of rare species. No rare plant species were observed on-site by this office or the wetland consultant.**
- **Agriculture – There is no agriculture proposed as part of this project.**
- **Aquaculture – There is no aquaculture proposed as part of this project.**
- **Recreation - A 20’ wide parcel (Parcel B) has been created east of Lot 2 to connect the Tanglewood Estates open space to the Town of Franklin land north of the site (Sheet 3).**

c. The entity performing the work; and

**BCG Response: We represent the land owner, once a contractor has been determined their information will be shared with the Town.**

d. When the proposed activities will be completed.

**BCG Response: We anticipate the project will be completed in the Spring 2027. This date is subject to change based on weather, availability of material and personnel.**

I believe this addresses the issues raised. Please feel free to contact me should you have any questions or concerns that you would like addressed prior to the public hearing.

Very truly yours,
**BAY COLONY GROUP, INC.**



Cameron Gray
Project Engineer



William R. Buckley, Jr., P.E.
Project Manager

Bay Colony Group, Inc.
Professional Civil Engineers & Land Surveyors

4 School Street, PO Box 9136
Foxborough, Massachusetts 02035
Telephone (508) 543-3939 • Fax (508) 543-8866
E-mail: mailbox@baycolonygroup.com

# NOTICE OF INTENT
# WETLANDS PROTECTION ACT
# MASS G.L.C. 131, SECTION 40

## Tanglewood Estates II
## Symphony Drive Extension
## Franklin, MA

PREPARED FOR: Cypress Real Estates Development, LLC
3 Rothchild Drive
Foxborough, MA 02035

PREPARED BY: Bay Colony Group, Inc.
4 School Street
Foxborough, MA 02035

**December, 2025**
**Rev. February, 2026**

Bay Colony Group, Inc.
Professional Civil Engineers & Land Surveyors

4 School Street, PO Box 9136
Foxborough, Massachusetts 02035
Telephone (508) 543-3939 • Fax (508) 543-8866
E-mail: mailbox@baycolonygroup.com

December 16, 2025

Mr. Mark LePage, Chair
Franklin Conservation Commission
355 East Central Street
Franklin, MA 02038

**RE: "Tanglewood Estates II" Symphony Drive Extension**
**Franklin, MA**

Dear Mr. LePage,

On behalf of our client, Cypress Real Estate Development, LLC, we are submitting herewith a revised Notice of Intent pursuant to Article 181 of the Town of Franklin Wetlands Protection Regulations for the construction of a single-family home as part of a two-lot subdivision, including the associated driveway, grading, lawn, and utilities, portions of which are located within the local buffer zone to an isolated vegetated wetland (IVW). Under the Wetlands Protection Act (310 CMR 10.00), an IVW does not have a buffer zone, therefore, no application will be filed with the Massachusetts Department of Environmental Protection.

The modification is as a result of the comments received by the Town's professional consultant, BETA, through a memo dated February 13, 2026. This document is not a stand-alone document and is meant to update and supplement the December 2025 Submittal.

The site is located at the end of Symphony Drive on a 7.0± acre parcel of land identified as Assessors' Parcel 218-020-000 **(Appendix A)**. The property is currently undeveloped and consists primarily of wooded area. The site is situated on a hillside that generally slopes from west to east, with an approximate 90-foot change in elevation across the property. Two IVWs are located on the site, one in the western corner and one on the eastern portion of the property. There are no certified or potential vernal pools located on the property. There is a potential vernal pool located off the property to the west. The wetlands and potential vernal pool were flagged by Pare Corporation on March 13, 2025 and subsequently located by this firm during an on-the-ground survey conducted on March 21, 2025. A copy of the Pare Corporation Wetland Delineation Report is included in **Appendix B**.

The proposed project will involve the construction of a single-family home along with the associated driveway, grading, utilities, and yard area. A portion of the home, drainage basin, and yard will lie within the local buffer zone to an IVW. The home will be located approximately 51 feet from the wetland at its closest point, the drainage basin approximately

81 feet from the wetland at its closest point, and proposed clearing approximately 31 feet from the wetland at its closest point. Approximately 164 square feet of buffer zone will be altered for the home, approximately 958 square feet for the drainage basin and approximately 13,438 square feet for the yard area. In total, approximately 14,560 square feet of buffer zone will be altered, with approximately 2,638 square feet of that alteration occurring within the 50-foot buffer zone. No structures or impervious surfaces are proposed within the 25–50-foot buffer zone. The disturbance in this area is limited to clearing and grading to establish lawn associated with the proposed home. No work is proposed within the 25-foot No Disturbance Zone.

The home will be serviced by municipal water and sewer. The project is not subject to the Massachusetts Stormwater Standards, as the subdivision consists of fewer than four lots, however, the project will meet all applicable standards in accordance with the Town of Franklin Stormwater Management Bylaws. The proposed stormwater management system will include stone trenches, sediment forebays, and above-ground drainage basins. A detention basin is proposed on Lot 1, and an infiltration basin is proposed on Lot 2. The system has been designed to manage all storm events up to and including the 100-year storm without increasing the rate or volume of off-site runoff. The system will comply with the DEP Stormwater Standards and the Franklin Stormwater Management Bylaw. A copy of the Stormwater Impact Report is included in Appendix C.

Due to the location of the existing roadway and the site's topography, disturbance within the buffer zone is unavoidable in order to construct a roadway that complies with applicable local regulations. The grading of Lot 2 has been carefully designed to tie into existing elevations while minimizing earthwork within the buffer zone. A walkout design is proposed to reduce the extent of fill placed within the buffer zone while maintaining compliance with local requirements. Because disturbance within the buffer zone is unavoidable, a native seed mix suitable for buffer zone restoration is proposed for the yard areas located within the buffer zone. The incorporation of native plantings, together with maintaining a minimum 30-foot undisturbed buffer to the IVW, will provide adequate resource area protection in accordance with local and state regulatory standards.

We have not finalized the construction sequence for this project but, conceptually the roadway will be constructed first and then the homes will be started once base course of pavement has been installed. Once the contractor is chosen, we will coordinate with the contractor on the construction schedule. At that point we will contact the Agent and other Town Officials, to coordinate that aspect of the project. The general sequence of activities would be as follows:

- Cut trees, but no grubbing
- Install erosion control
- Stump and grub
- Bring site to subgrade
- Install drainage and utilities
- Pave base course
- Construct homes

- Landscaping
- Pave top course

The locations, sizes and grading of the homes is approximate only. Stockpiling will be limited to the area outside the 100' buffer zone. If dewatering is necessary, then areas outside of the buffer zone will be constructed to allow water to infiltrate back into the ground or sheet flow back to the wetlands after passing through stone filters.

Erosion control measures for the project will consist of silt socks and sacks which will be installed prior to the start of construction and maintained until construction is complete and stable ground cover has been reestablished.

Thank you for your consideration. Please feel free to contact me should you have any questions or concerns you would like us to address prior to the public hearing.

Very truly yours,

**BAY COLONY GROUP, INC.**



Cameron Gray
Project Engineer



William R. Buckley, Jr., P.E.
Project Manager

**List of Documents**

Previous Page – Letter to Conservation Commission

(*Previously Submitted) WPA Form 3 – Notice of Intent
Local Filing Fee Calculation Worksheet
Copies of Checks

(*Previously Submitted) Resource Area Impact Summary Form

(*Previously Submitted) Application Process Signature Form

(*Previously Submitted) Property Access Signature Form

(*Previously Submitted) Form of Notification to Abutters

(*Previously Submitted) List of Abutters

(*Previously Submitted) Affidavit of Service

(*Previously Submitted) Appendix A
USGS Quadrangle Map Extract
FEMA Flood Insurance Rate Map
Extract from MassMapper

(*Previously Submitted) Appendix B
Pare Corporation Wetland Delineation Report dated November 26, 2025

Appendix C
Stormwater Management Report Tanglewood Estates II Symphony Drive Extension Franklin, MA December 2025 Rev. February 2026

Attachments
Private Definitive Plan of Land in Franklin, MA Tanglewood Estates II Symphony Drive Extension by Bay Colony Group, Inc dated December 4, 2024 Rev. February 10, 2026

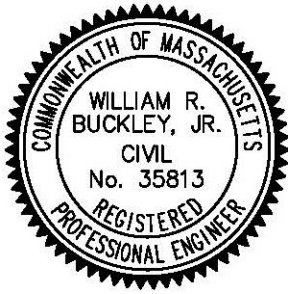
**APPENDIX C**

*Stormwater Management Report

Bay Colony Group, Inc.
Professional Civil Engineers & Land Surveyors

4 School Street, PO Box 9136
Foxborough, Massachusetts 02035
Telephone (508) 543-3939 • Fax (508) 543-8866
E-mail: mailbox@baycolonygroup.com

# Storm Water Management Report
# Tanglewood Estates II
# Symphony Drive Extension
# Franklin, MA




**December, 2025**
**Rev. February, 2026**

Prepared for:

Cypress Real Estate Development, LLC
3 Rothchild Drive
Foxborough, MA 02035

**Table of Contents:**

**Contents ..... Page**

**Modification.....1**
**1.0 Introduction.....1**
**2.0 Existing Conditions.....1**
**3.0 Flood Condition Analysis and Flood Control.....2**
**4.0 Storm Water Management.....3**

**Figure 1- Locus Plan.....Previously Submitted**
**Figure 2- Existing Drainage Subareas and Soils.....Appendix A**
**Figure 3- Proposed Drainage Subareas and Soils.....Appendix A**

**Appendix A: Pre- and Post-development Analysis and Storm Water Pond Designs..... A-1**
**Appendix B: Storm Water Worksheets .....B-1**
**Appendix C: Operation and Maintenance Plan..... C-1**
**Appendix D: Soil Data ..... D-1**

## Modification

The modification is as a result of comments received by the Town's professional consultant, BETA, through a memo dated January 26, 2026 and comments received from the Town Engineer, Micheal Maglio, in a letter dated December 30, 2025. The major change involved the hydrology computations by basing the computations off NOAA Atlas 14 instead of Technical Paper 40 required by the DEP Stormwater Standards. This resulted in a redesign of the detention basin by increasing its size. This document is not a stand-alone document and is meant to update and supplement the December 2025 submittal.

## 1.0 Introduction

The project involves the construction of a common driveway and two single-family homes on a 7.0 +/- acre parcel of land located beyond the end of the Symphony Drive cul-de-sac. The property is bordered by residential properties to the east, south and west and Town-owned land to the north. The property is located within the Rural Residential I Zoning District. **Figure 1** provides an extract from the USGS Franklin Quadrangle and shows the site locus.

Bay Colony Group, Inc. conducted a stormwater management study to ensure that the proposed project meets the stormwater standards outlined in the Town of Franklin Stormwater Management Bylaws and standard engineering practice. The project is not subject to the Massachusetts Stormwater Management Standards because the subdivision contains fewer than four lots, however, it will meet all applicable standards in accordance with the local Stormwater Management Bylaws. The scope of this study includes:

- Determining existing flood conditions and stormwater quality calculations and analysis;
- Developing proposed flood conditions and stormwater quality calculations and analysis;
- Designing a stormwater management system.

## 2.0 Existing Conditions

The site is located at the end of Symphony Drive and is listed as Assessor's Parcel No.218-020-00. The property is located on a hillside that generally slopes from west to east. The high point of the site is at approximately elevation 354 feet in the western portion of the property and slopes significantly to the east to approximately elevation 264 feet at the eastern property line. The property consists of an undeveloped wooded area. The site contains two Isolated Vegetated Wetlands (IVW) located in the eastern and western portions of the property.

The NRCS has mapped the soils on the site as Montauk fine sandy loam (**Appendix D)**. Montauk soils are classified as Hydrologic Soil Group C. The wooded area on the site consists of a mixture of primary and secondary growth, including deciduous and coniferous trees. BCG conducted soil evaluations throughout the site to determine the general soil conditions, depth to groundwater and depth to refusal. The native soil identified at the proposed infiltration basin on Lot 2 is Loamy Sand. The RAWLS table provided in the DEP Stormwater Management Standards, Volume 3, Chapter 1 identifies an infiltration rate of 2.41 inches per hour for Loamy

Sand. Copies of the basin soil logs are included in **Appendix D** and the locations of the test pits are shown on the existing conditions plan **Sheet 2 & 2.1.**

### 3.0 Flood Condition Analyses and Flood Control

The stormwater management system will consist of roof drainage, driveway drainage (runoff collection, pretreatment, and conveyance) and flood control and treatment. This report focuses on the stormwater basin design and the Town of Franklin performance standards. The proposed system will comply with all applicable requirements and will improve existing conditions. The proposed design will achieve runoff control through a multi-phase system that includes a detention basin (Drainage Basin #1) located in the western portion of the property and an infiltration basin (Drainage Basin #2) located in the eastern portion of the property. The basins will capture, treat and control runoff from the roof and driveway areas. All runoff from the pavement will be pretreated by stone trenches and sediment forebays before discharging to the basins. The basins have been designed to accommodate the 100-year storm event with six inches of freeboard. The system ensures that the post-development rate of runoff is less than the pre-development condition.

The current land uses consist of woodland and grass areas. The proposed land uses include single-family homes, driveways, lawns and remaining woods. The land uses for existing and proposed conditions are summarized in **Tables 1a** and **1b**. One study line was selected to develop the existing and proposed condition models. For the existing conditions, the watershed is modeled as a single subarea. Subarea EA comprises the majority of the site and flows toward the eastern IVW. See the plan in **Appendix A – Existing Subareas**

**Table 1a – Summary of Existing Land Uses**

| Subarea | Total Area (acre) | Land use | Area (acre) |
|---|---|---|---|
| EA | 4.120 | Woods, Good, HSG C | 3.750 |
| | | >75% Grass cover, Good, HSG C | 0.370 |
| Total: | 4.120 | Total: | 4.120 |

For proposed conditions, the watershed is divided into three separate subareas. Subarea PA represents the western portion of the site and drains to Drainage Basin #1. Subarea PB is located in the central portion of the site and drains to Drainage Basin #2. Subarea PC is located in the northern and eastern portion of the site and sheet flows to the IVW located in the eastern portion of the site. The proposed watershed area is larger than the existing watershed area due to changes in topography that direct more runoff toward the drainage system. See the plan in **Appendix A – Developed Subareas**

**Table 1b – Summary of Proposed Land Uses**

| Subarea | Total Area (acre) | Land use | Area (acre) |
|---|---|---|---|
| PA | 2.220 | Roofs, HSG C | 0.060 |
| | | Paved parking, HSG C | 0.100 |
| | | >75% Grass cover, Good, HSG C | 1.340 |
| | | Woods, Good, HSG C | 0.720 |
| PB | 0.690 | Roofs, HSG C | 0.040 |
| | | Paved parking, HSG C | 0.120 |
| | | >75% Grass cover, Good, HSG C | 0.530 |
| PC | 1.380 | Roofs, HSG C | 0.040 |
| | | >75% Grass cover, Good, HSG C | 0.760 |
| | | Woods, Good, HSG C | 0.580 |
| Total: | 4.290 | Total: | 4.290 |

The runoff conditions derived from the land uses in **Tables 1a** and **1b** are summarized in **Table 2**. Detailed calculations are provided in **Appendix A**.

**Table 2: Summary of Peak Runoff (cfs) at the Study Lines**

| Condition | | 2-year (cfs) | 2-year (af) | 10-year (cfs) | 10-year (af) | 100-year (cfs) | 100-year (af) |
|---|---|---|---|---|---|---|---|
| **Existing Conditions** | Isolated Wetland | 3.0 | 0.318 | 7.8 | 0.761 | 16.8 | 1.599 |
| **Proposed Conditions** | Isolated Wetland | 1.5 | 0.125 | 3.7 | 0.415 | 14.8 | 1.190 |

The detailed storm routing calculations are attached in **Appendix A**.

## 4.0 Stormwater Management

The site is not located within a groundwater protection district (Zone II). There are no private drinking water wells in proximity to the project site. There are no critical areas down-gradient of the project site based on 314 CMR 4.00 (Massachusetts Surface Water Quality Standards). There are no certified vernal pools in the vicinity of the site.

***DEP STORMWATER MANAGEMENT STANDARDS***

***Standard #1: NO UNTREATED DISCHARGE OR EROSION TO WETLANDS***

No untreated stormwater from the proposed project area will be discharged to a resource area. Runoff from all pavement will be discharged to stone trenches, then to sediment forebays and finally to the above-ground detention and infiltration basins. This treatment train will achieve a TSS removal rate of approximately 90%. The outfall has been designed to accept the 25-year storm flow from the basin without causing erosion in the wetlands or soils **Appendix B**.

***Standard #2: PEAK RATE ATTENUATION***

Stormwater controls have been designed for the 2-, 10-, and 100-year storms in accordance with local regulations. Peak discharge rates are evaluated at a design point, typically the lowest point of discharge along the downgradient property line (Massachusetts Stormwater Handbook, Vol. 1, Ch. 1, P.5). The design ensures that the post-development peak runoff rates do not exceed pre-development rates at any design point. Proponents must also evaluate the impact of peak discharges from the 100-year storm event. If this evaluation shows that increased off-site flooding will result from peak discharge from the storm then BMPs must also attenuate that discharge (Massachusetts Stormwater Handbook, Vol. 1, Ch. 1, P.5). In this case, the post-development peak rates for the 100-year event are less than the pre-development condition everywhere **Table 2.**

***Standard #3: STORMWATER RECHARGE***

1) The project area is located on soils mapped as Hydrologic Soil Group C based on the NRCS soil survey. The target recharge depth for C soils is 0.25 inches. Due to the site consisting of C and D soils, the Required Recharge Volume (RRV) must be infiltrated to the maximum extent practicable. The RAWLS rate for Loamy Sand is 2.41 inches per hour and this rate will be used for the recharge calculations **Appendix B**.

2) The infiltration BMP that will be used will be the above ground infiltration basin **Appendix B**.

3) Using the RAWLS rates for the basin, the analysis shows that the drawdown time for the Required Recharge Volume is 0.3 hours, which meets the required 72 hours dewatering standard **Appendix B**.

4) A capture area adjustment is not necessary since 100% of the impervious area will be directed to the above-ground stormwater basin, which meets the 65% standard

5) A mounding analysis is not required for Drainage Basin #1 because it is operating as a non-infiltrating BMP for the inflow and outflow analysis. A mounding analysis is necessary under Drainage Basin #2 per the DEP Stormwater standards since the vertical separation from the bottom of the basins and the estimated high ground water elevation is less than 4'. In accordance with the "Static" methodology, the RAWLS rate is used as the hydraulic conductivity and the mounding analysis assumes that the Required Recharge Volume is applied during a 2-hour period during the storm. The specific yield at the basins is based on the USDA Textural Analysis and USGS Water Supply Paper 1662-D **Appendix D**. The model used is the AQTESOLV V.4.50.002 program that uses the ground water mounding solution by Hantush (1967). The analysis found that the top of the mound is below the bottom of the basin. Therefore, the mound does not breach the bottom of the pond and will not impact the ability of the basin to drain within 72 hours as was previously discussed. **Appendix B**

***Standard # 4: WATER QUALITY***

1) The required water quality volume is based on 0.36 acres of impervious area and a 1.0-inch water quality depth, which yields a volume of 1,307cubic feet or 0.0300 ac-ft. The Drainage Basin #2 can accommodate a volume of 9,714 cubic feet or 0.223 ac-ft prior to discharge **Appendix B**.

2) The BMPs used for the proposed project to improve water quality include: stone trenches, sediment forebays and stormwater basins. The estimated overall TSS removal is 90% **Appendix B.**

3) Since Drainage Basin #2 is being used to fulfill the requirements of Standards 3 and 4, it must handle the greater of the volumes. The basin provides a storage volume of 0.223 ac-ft below discharge. The required recharge volume is 0.0075 ac-ft and the water quality volume is 0.0300 ac-ft **Appendix B**

***Standard # 5: LAND USES WITH HIGHER POTENTIAL POLLUTION LOADS***

The site will consist of a typical residential property, which is not considered to have a high potential pollutant load. The site will be compatible with the surrounding environment, which is a residential area.

***Standard #6: CRITICAL AREAS***

According to 314 CMR 14.400 and MASS MAPPER the project site does not contain any critical resource areas

***Standard #7: REDEVELOPMENT***

Th proposed activity is not a redevelopment project

***Standard #8: CONSTRUCTION PERIOD CONTROLS***

Silt sock barriers will be installed at the downgradient limit of work before any excavation starts. A stone pad shall be spread at the entrance from the existing shared entrance to the project site to prevent mud from escaping the site during construction.

A Draft Stormwater Pollution Prevention Plan has been developed in accordance with the EPA General Permit for Construction Activities. A final SWPPP will be prepared once the construction schedule is finalized and the contractors are chosen. A copy of the Draft SWPPP is included in **Sheet 7.**

***Standard #9: OPERATION AND MAINTENANCE PLAN***

Pre- and Post-Development Operation and Maintenance Plans have been developed for the project **Appendix C**.

***Standard # 10: ILLICIT DISCHARGES TO DRAINAGE SYSTEM***

I certify to the best of my professional knowledge, information and belief that there are no illicit discharges to the stormwater management system, including wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease. The proposed systems as shown on the referenced plans do not allow entry of any illicit discharges into the system and there are no connections between the stormwater and wastewater management systems.

To be signed prior to construction _____

Owner Date

# APPENDIX A – Pre- and Post-DEVELOPMENT ANALYSIS AND STORM WATER POND DESIGNS

NOAA Atlas 14, Volume 10, Version 3
Location name: Franklin, Massachusetts, USA*
Latitude: 42.1237°, Longitude: -71.387°
Elevation: 294 ft**
* source: ESRI Maps
** source: USGS

## POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

# PF tabular

**PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]**

| Duration | Average recurrence interval (years) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 5 | 10 | 25 | 50 | 100 | 200 | 500 | 1000 |
| 5-min | 0.324 (0.250-0.417) | 0.393 (0.303-0.506) | 0.506 (0.389-0.653) | 0.600 (0.459-0.781) | 0.730 (0.541-0.991) | 0.827 (0.602-1.15) | 0.929 (0.657-1.34) | 1.04 (0.701-1.54) | 1.20 (0.780-1.84) | 1.34 (0.846-2.09) |
| 10-min | 0.459 (0.355-0.590) | 0.557 (0.430-0.717) | 0.717 (0.552-0.926) | 0.851 (0.651-1.10) | 1.03 (0.767-1.40) | 1.17 (0.852-1.63) | 1.32 (0.931-1.90) | 1.48 (0.992-2.18) | 1.71 (1.10-2.61) | 1.89 (1.20-2.96) |
| 15-min | 0.540 (0.417-0.694) | 0.656 (0.506-0.843) | 0.845 (0.650-1.09) | 1.00 (0.765-1.30) | 1.22 (0.902-1.65) | 1.38 (1.00-1.91) | 1.55 (1.10-2.23) | 1.74 (1.17-2.56) | 2.01 (1.30-3.07) | 2.23 (1.41-3.48) |
| 30-min | 0.740 (0.571-0.951) | 0.899 (0.693-1.16) | 1.16 (0.891-1.50) | 1.37 (1.05-1.78) | 1.67 (1.24-2.27) | 1.89 (1.38-2.63) | 2.13 (1.50-3.06) | 2.39 (1.60-3.52) | 2.76 (1.79-4.22) | 3.06 (1.94-4.78) |
| 60-min | 0.940 (0.726-1.21) | 1.14 (0.881-1.47) | 1.47 (1.13-1.90) | 1.75 (1.34-2.27) | 2.12 (1.58-2.89) | 2.41 (1.75-3.34) | 2.71 (1.91-3.90) | 3.04 (2.04-4.48) | 3.51 (2.27-5.37) | 3.89 (2.46-6.08) |
| 2-hr | 1.20 (0.936-1.54) | 1.48 (1.14-1.88) | 1.92 (1.48-2.46) | 2.28 (1.76-2.95) | 2.79 (2.09-3.78) | 3.17 (2.32-4.40) | 3.57 (2.56-5.17) | 4.05 (2.73-5.95) | 4.79 (3.11-7.28) | 5.41 (3.43-8.39) |
| 3-hr | 1.39 (1.09-1.77) | 1.71 (1.33-2.18) | 2.23 (1.73-2.85) | 2.66 (2.05-3.42) | 3.25 (2.44-4.40) | 3.69 (2.72-5.11) | 4.16 (3.00-6.03) | 4.75 (3.20-6.94) | 5.64 (3.67-8.55) | 6.42 (4.08-9.92) |
| 6-hr | 1.80 (1.41-2.27) | 2.20 (1.72-2.78) | 2.86 (2.23-3.63) | 3.41 (2.64-4.35) | 4.16 (3.14-5.59) | 4.71 (3.50-6.50) | 5.32 (3.86-7.67) | 6.08 (4.11-8.82) | 7.25 (4.72-10.9) | 8.26 (5.27-12.7) |
| 12-hr | 2.29 (1.80-2.87) | 2.79 (2.20-3.50) | 3.61 (2.83-4.55) | 4.29 (3.35-5.43) | 5.22 (3.96-6.97) | 5.92 (4.41-8.08) | 6.67 (4.85-9.52) | 7.59 (5.16-10.9) | 9.02 (5.90-13.5) | 10.2 (6.55-15.6) |
| 24-hr | 2.74 (2.18-3.42) | 3.37 (2.67-4.20) | 4.40 (3.48-5.51) | 5.25 (4.13-6.61) | 6.43 (4.91-8.52) | 7.30 (5.47-9.92) | 8.24 (6.03-11.7) | 9.42 (6.43-13.5) | 11.2 (7.38-16.7) | 12.8 (8.23-19.4) |
| 2-day | 3.10 (2.48-3.84) | 3.88 (3.10-4.81) | 5.16 (4.10-6.41) | 6.22 (4.91-7.78) | 7.68 (5.90-10.1) | 8.74 (6.61-11.9) | 9.93 (7.34-14.1) | 11.4 (7.83-16.3) | 13.9 (9.12-20.4) | 16.0 (10.3-24.0) |
| 3-day | 3.39 (2.71-4.17) | 4.23 (3.38-5.22) | 5.60 (4.47-6.94) | 6.74 (5.35-8.40) | 8.32 (6.41-10.9) | 9.46 (7.17-12.8) | 10.7 (7.96-15.2) | 12.4 (8.49-17.5) | 15.0 (9.89-22.0) | 17.3 (11.2-25.9) |
| 4-day | 3.65 (2.94-4.49) | 4.53 (3.63-5.57) | 5.95 (4.76-7.34) | 7.13 (5.67-8.86) | 8.76 (6.77-11.5) | 9.95 (7.55-13.4) | 11.3 (8.37-15.9) | 13.0 (8.91-18.3) | 15.6 (10.3-22.9) | 18.0 (11.6-26.9) |
| 7-day | 4.40 (3.56-5.38) | 5.32 (4.29-6.51) | 6.83 (5.48-8.38) | 8.08 (6.45-9.96) | 9.79 (7.59-12.7) | 11.1 (8.40-14.7) | 12.4 (9.22-17.3) | 14.2 (9.78-19.9) | 16.9 (11.2-24.5) | 19.2 (12.4-28.4) |
| 10-day | 5.11 (4.14-6.22) | 6.06 (4.90-7.39) | 7.61 (6.14-9.31) | 8.90 (7.13-10.9) | 10.7 (8.28-13.8) | 12.0 (9.12-15.8) | 13.4 (9.92-18.5) | 15.1 (10.5-21.1) | 17.7 (11.8-25.7) | 20.0 (13.0-29.5) |
| 20-day | 7.21 (5.88-8.72) | 8.23 (6.70-9.96) | 9.89 (8.02-12.0) | 11.3 (9.08-13.8) | 13.2 (10.2-16.8) | 14.6 (11.1-19.0) | 16.1 (11.8-21.7) | 17.8 (12.4-24.6) | 20.1 (13.4-28.8) | 22.0 (14.3-32.3) |
| 30-day | 8.95 (7.32-10.8) | 10.0 (8.18-12.1) | 11.8 (9.57-14.2) | 13.2 (10.7-16.0) | 15.2 (11.8-19.2) | 16.7 (12.7-21.5) | 18.2 (13.4-24.3) | 19.8 (13.9-27.3) | 22.0 (14.7-31.4) | 23.7 (15.4-34.5) |
| 45-day | 11.1 (9.14-13.3) | 12.2 (10.0-14.7) | 14.1 (11.5-16.9) | 15.6 (12.6-18.9) | 17.7 (13.8-22.1) | 19.3 (14.7-24.6) | 20.9 (15.3-27.5) | 22.4 (15.7-30.7) | 24.3 (16.3-34.5) | 25.7 (16.8-37.3) |
| 60-day | 13.0 (10.7-15.5) | 14.1 (11.6-16.9) | 16.0 (13.1-19.2) | 17.6 (14.3-21.2) | 19.7 (15.4-24.6) | 21.4 (16.3-27.2) | 23.1 (16.8-30.1) | 24.5 (17.2-33.4) | 26.2 (17.7-37.1) | 27.4 (17.9-39.7) |

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

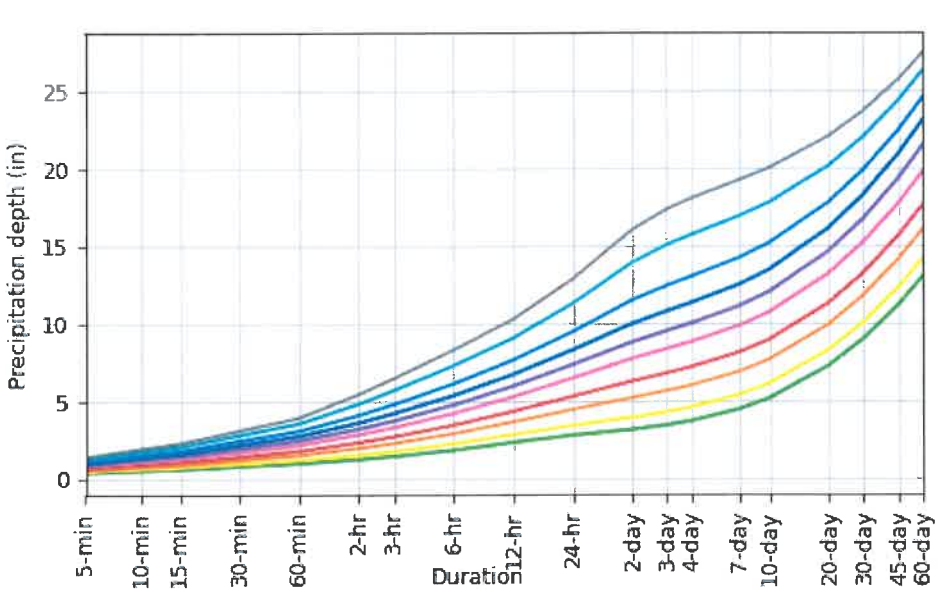
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

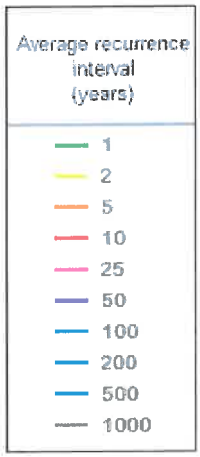
Please refer to NOAA Atlas 14 document for more information.

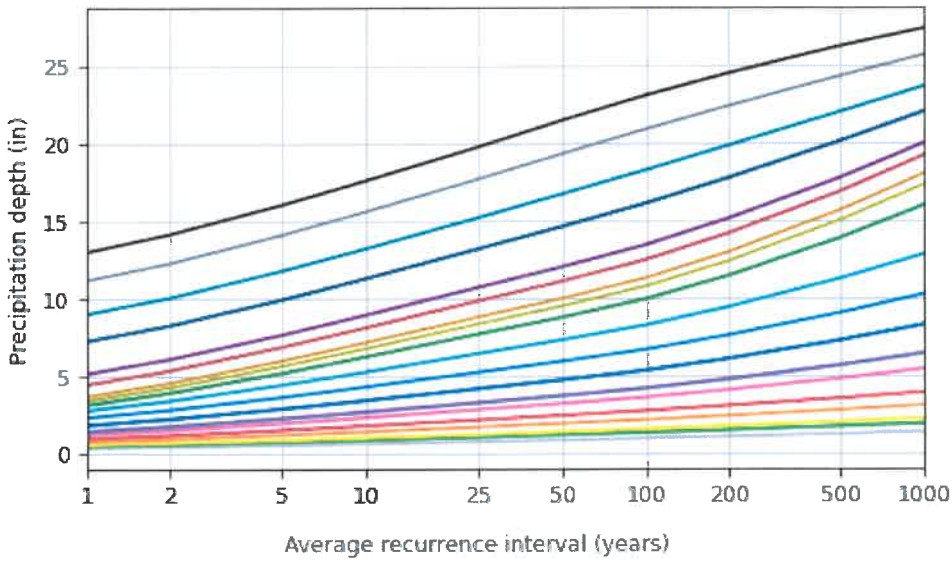
Back to Top

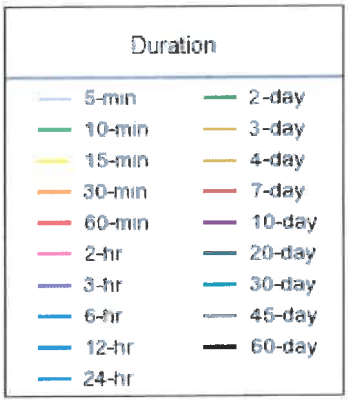
# PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 42.1237°, Longitude: -71.3870°



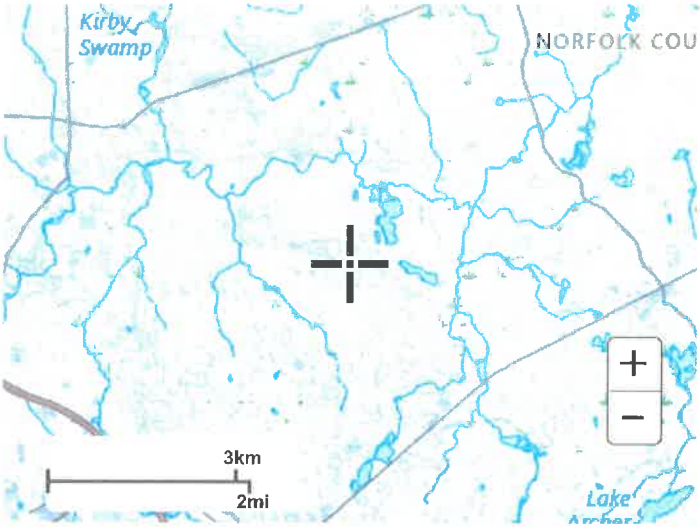

NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Wed Dec 31 12:54:46 2025

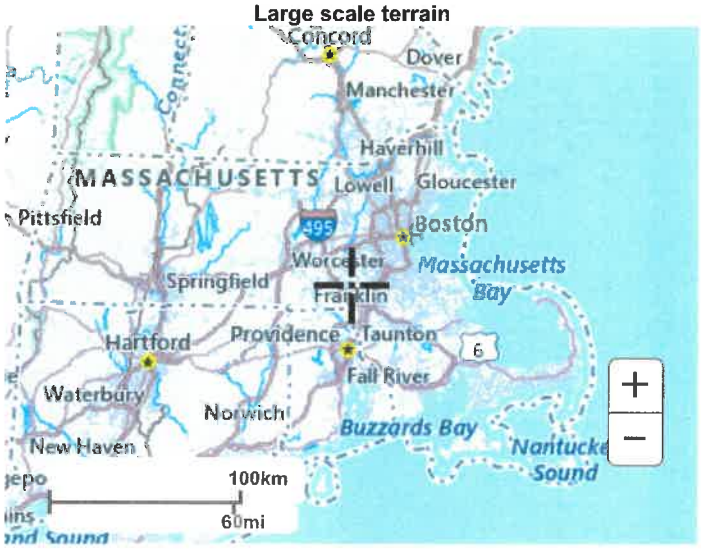
Back to Top

## Maps & aerials

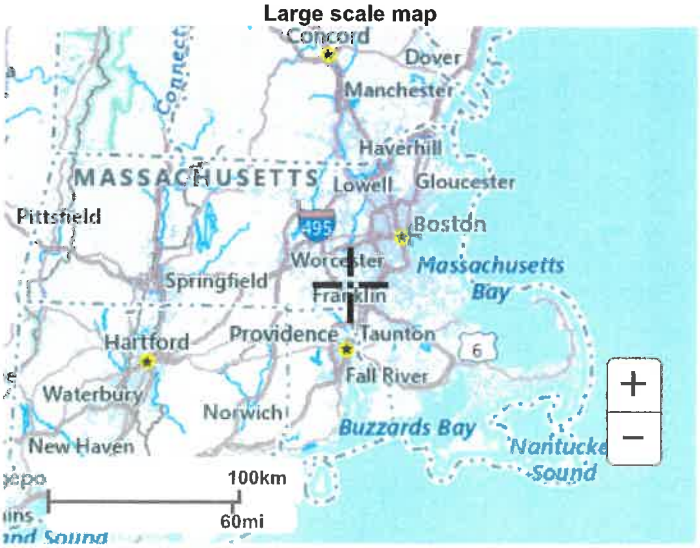
**Small scale terrain**




Large scale terrain




Large scale map



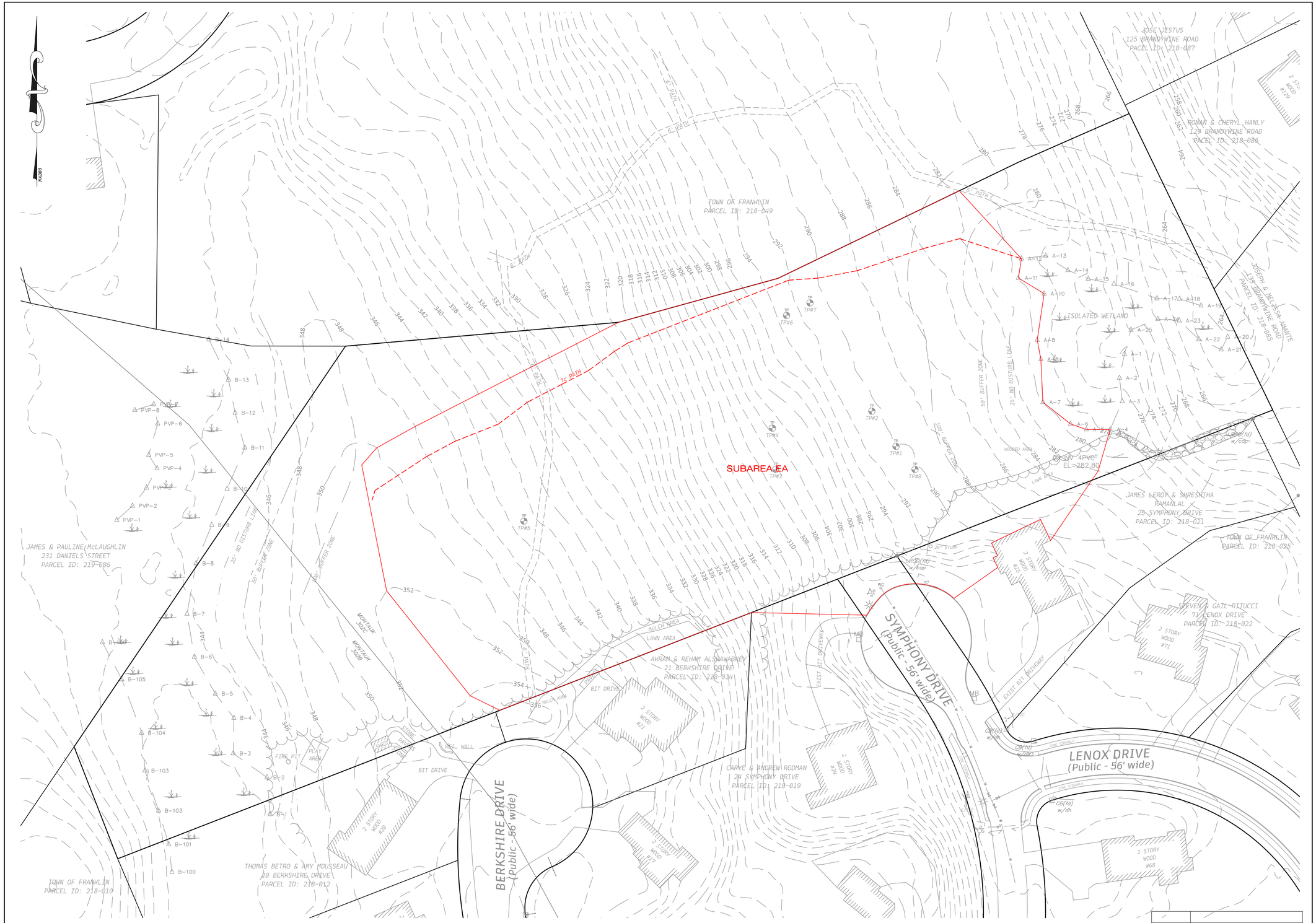

Large scale aerial




Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer




| | |
|---|---|
| | |
| 2/10/2026 | ADD SOIL OUTLINES |
| DATE | DESCRIPTION |

PROJECT:

*Symphony Drive Extension*

*Franklin Massachusetts*

OWNER/APPLICANT:

*CYPRESS REAL ESTATE DEVELOPMENT LLC*
*3 ROTHCHILD DRIVE*
*FOXBOROUGH, MA 02035*


Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors

FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939

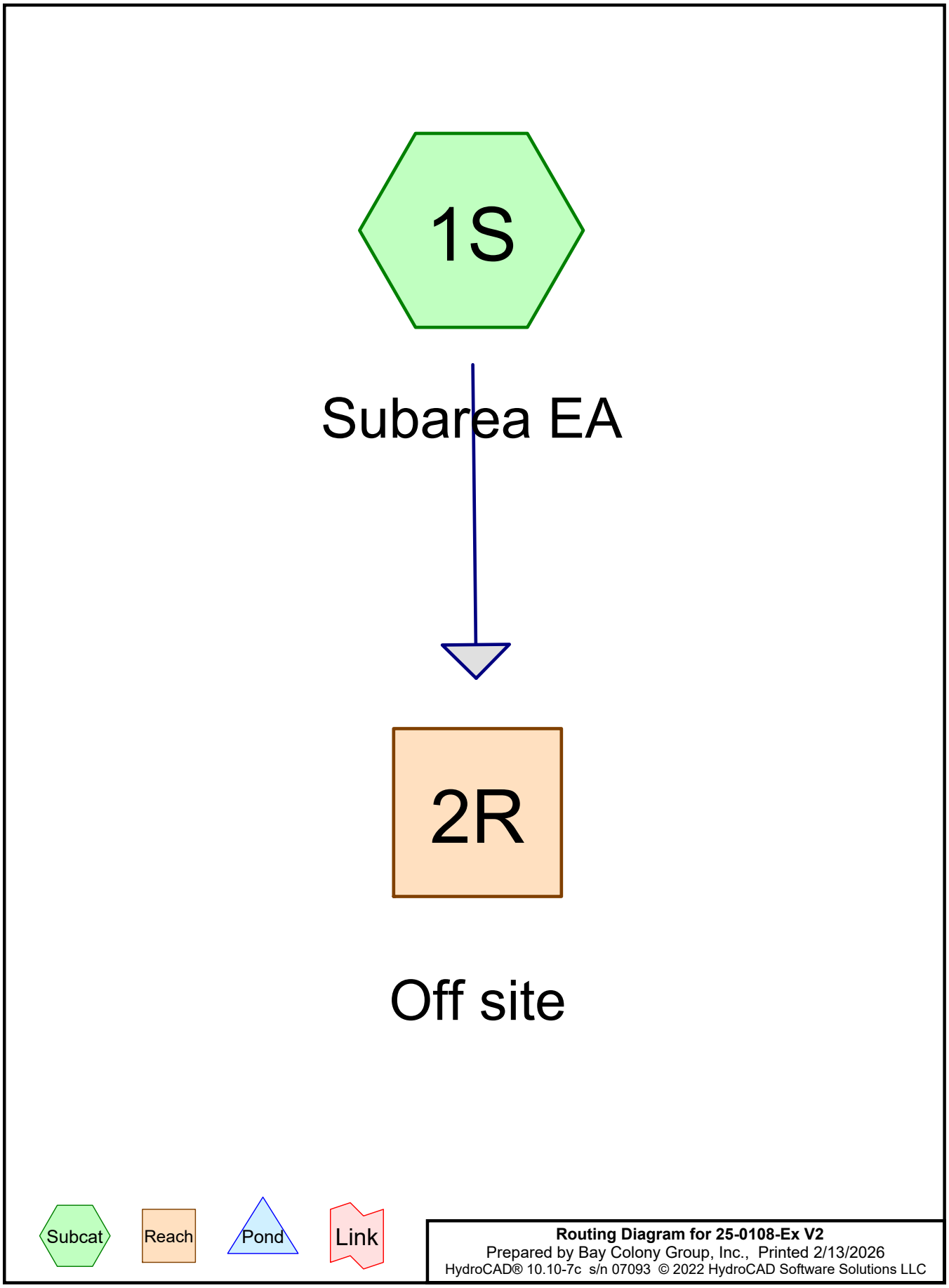

STAMP

DRAWING TITLE

Existing Subarea

SCALE: 1" = 40'

| DEC. 4, 2025 | SHEET NUMBER |
|---|---|
| *25-0108B* | **EX** |




**Routing Diagram for 25-0108-Ex V2**
Prepared by Bay Colony Group, Inc., Printed 2/13/2026
HydroCAD® 10.10-7c s/n 07093 © 2022 HydroCAD Software Solutions LLC

## Rainfall Events Listing (selected events)

| 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 | 3.37 | 2 |
| 2 | 10-Year | Type III 24-hr | | Default | 24.00 | 1 | 5.25 | 2 |
| 3 | 100-Year | Type III 24-hr | | Default | 24.00 | 1 | 8.24 | 2 |

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 0.370 | 74 | >75% Grass cover, Good, HSG C (1S) |
| 3.750 | 70 | Woods, Good, HSG C (1S) |
| **4.120** | **70** | **TOTAL AREA** |

## Soil Listing (all nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 0.000 | HSG A | |
| 0.000 | HSG B | |
| 4.120 | HSG C | 1S |
| 0.000 | HSG D | |
| 0.000 | Other | |
| **4.120** | | **TOTAL AREA** |

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

**Subcatchment 1S: Subarea EA** Runoff Area=4.120 ac 0.00% Impervious Runoff Depth>0.92"
Flow Length=648' Tc=15.6 min CN=70 Runoff=3.0 cfs 0.318 af

**Reach 2R: Off site** Inflow=3.0 cfs 0.318 af
Outflow=3.0 cfs 0.318 af

**Total Runoff Area = 4.120 ac Runoff Volume = 0.318 af Average Runoff Depth = 0.92"**
**100.00% Pervious = 4.120 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment 1S: Subarea EA

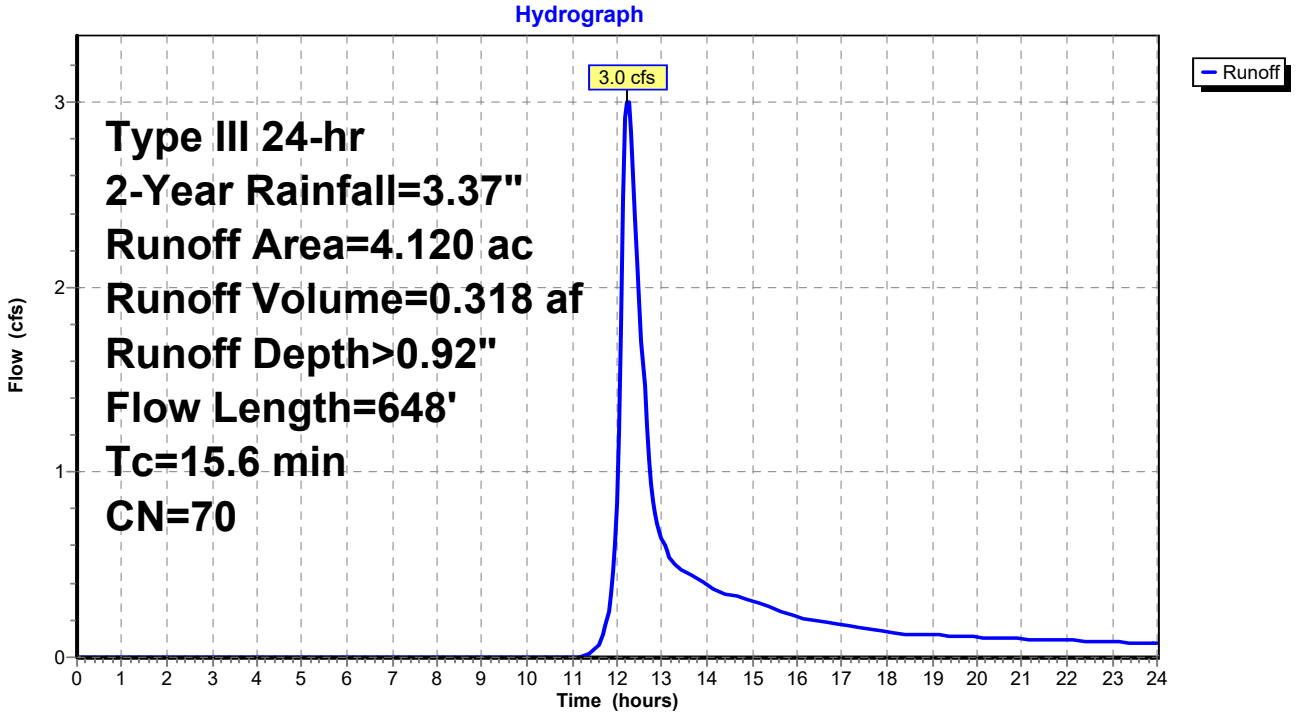
Runoff = 3.0 cfs @ 12.24 hrs, Volume= 0.318 af, Depth> 0.92"
Routed to Reach 2R : Off site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

| Area (ac) | CN | Description |
|---|---|---|
| 3.750 | 70 | Woods, Good, HSG C |
| 0.370 | 74 | >75% Grass cover, Good, HSG C |
| 4.120 | 70 | Weighted Average |
| 4.120 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.2 | 50 | 0.0420 | 0.09 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20" |
| 1.3 | 118 | 0.0920 | 1.52 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 1.7 | 223 | 0.1880 | 2.17 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 3.4 | 257 | 0.0650 | 1.27 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 15.6 | 648 | Total | | | |

### Subcatchment 1S: Subarea EA



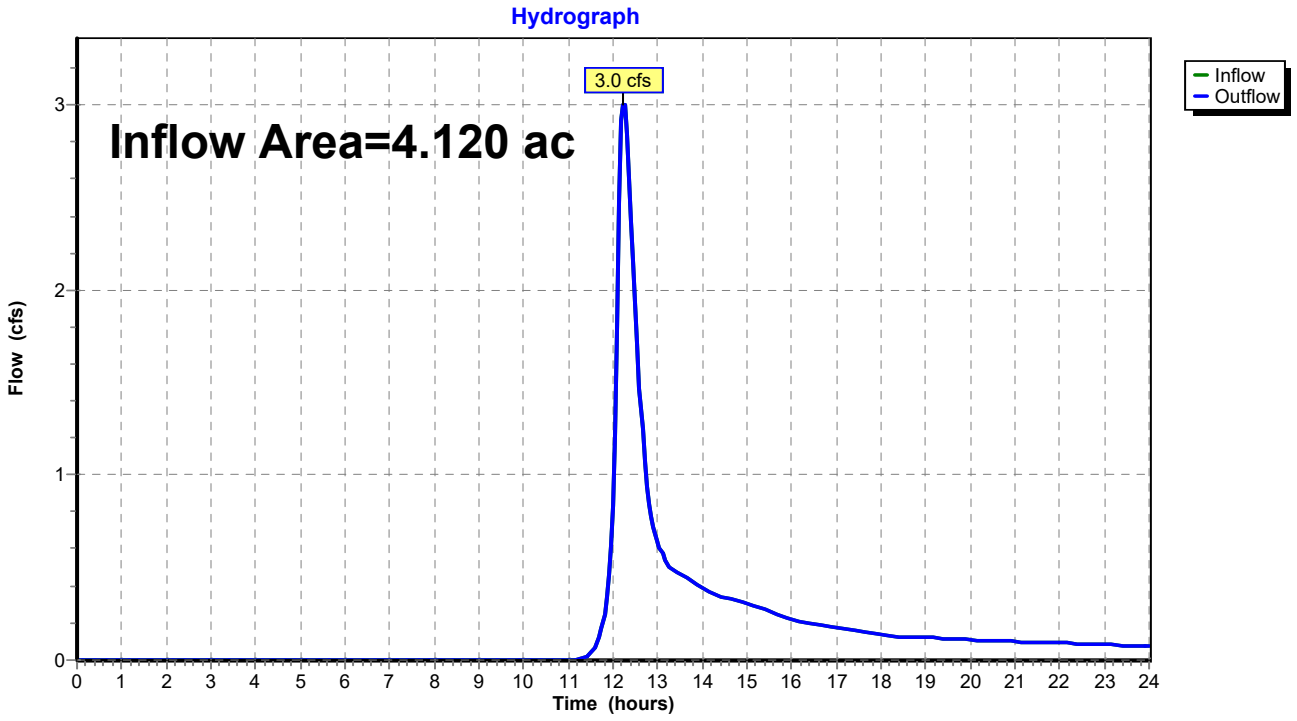
## Summary for Reach 2R: Off site

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.120 ac, 0.00% Impervious, Inflow Depth > 0.92" for 2-Year event
Inflow = 3.0 cfs @ 12.24 hrs, Volume= 0.318 af
Outflow = 3.0 cfs @ 12.24 hrs, Volume= 0.318 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Reach 2R: Off site



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

**Subcatchment 1S: Subarea EA** Runoff Area=4.120 ac 0.00% Impervious Runoff Depth>2.22"
Flow Length=648' Tc=15.6 min CN=70 Runoff=7.8 cfs 0.761 af

**Reach 2R: Off site** Inflow=7.8 cfs 0.761 af
Outflow=7.8 cfs 0.761 af

**Total Runoff Area = 4.120 ac Runoff Volume = 0.761 af Average Runoff Depth = 2.22"**
**100.00% Pervious = 4.120 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment 1S: Subarea EA

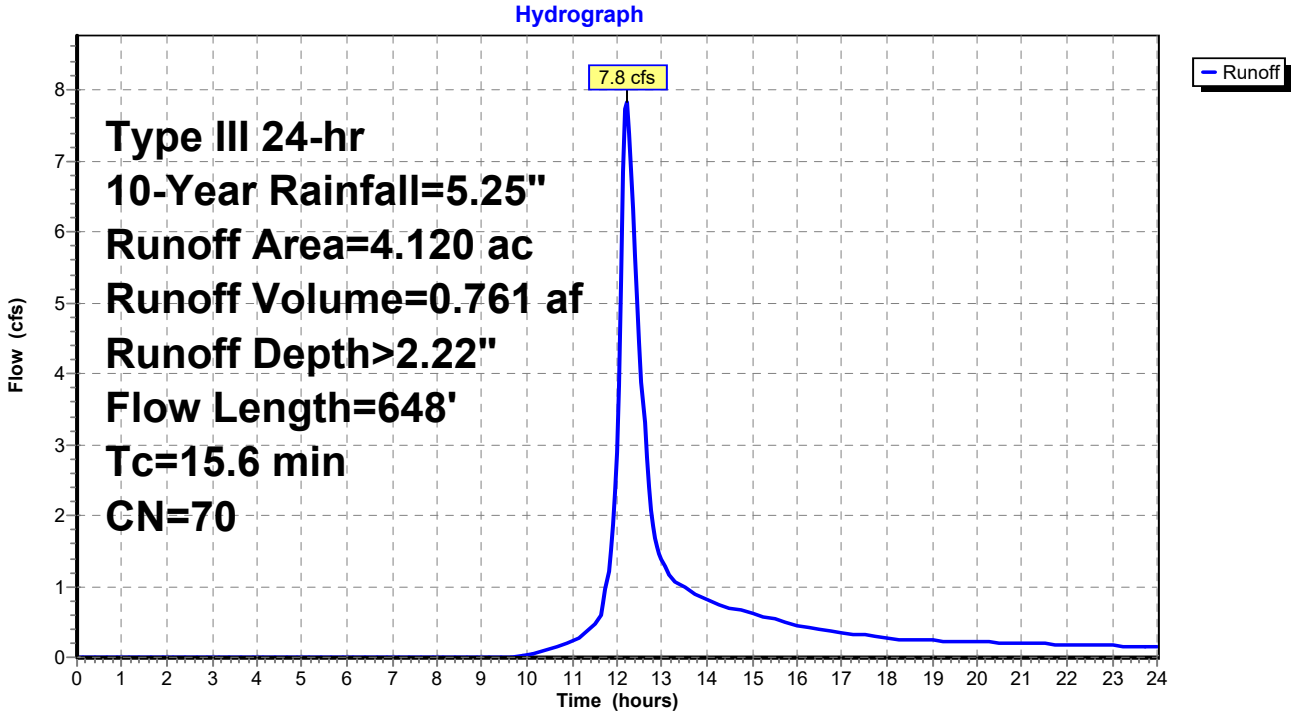
Runoff = 7.8 cfs @ 12.22 hrs, Volume= 0.761 af, Depth> 2.22"
Routed to Reach 2R : Off site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.25"

| Area (ac) | CN | Description |
|---|---|---|
| 3.750 | 70 | Woods, Good, HSG C |
| 0.370 | 74 | >75% Grass cover, Good, HSG C |
| 4.120 | 70 | Weighted Average |
| 4.120 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.2 | 50 | 0.0420 | 0.09 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20" |
| 1.3 | 118 | 0.0920 | 1.52 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 1.7 | 223 | 0.1880 | 2.17 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 3.4 | 257 | 0.0650 | 1.27 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 15.6 | 648 | Total | | | |

## Subcatchment 1S: Subarea EA



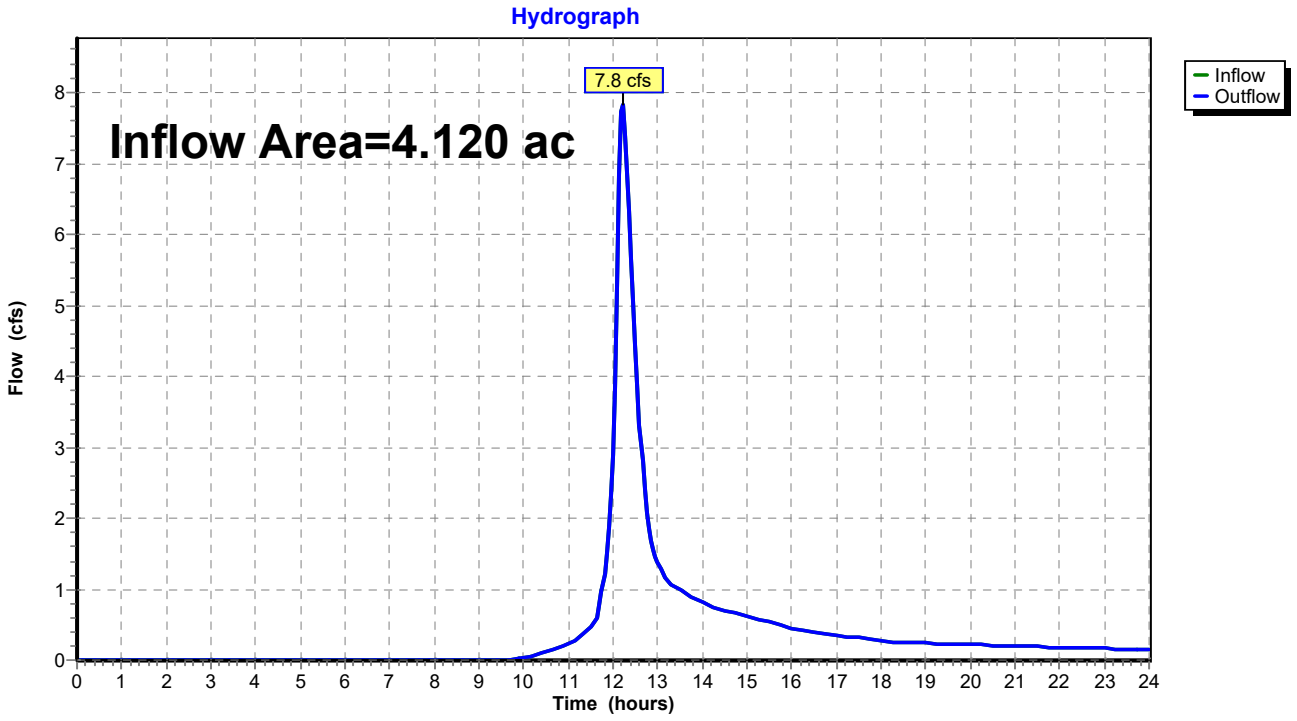
## Summary for Reach 2R: Off site

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.120 ac, 0.00% Impervious, Inflow Depth > 2.22" for 10-Year event
Inflow = 7.8 cfs @ 12.22 hrs, Volume= 0.761 af
Outflow = 7.8 cfs @ 12.22 hrs, Volume= 0.761 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Reach 2R: Off site



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

**Subcatchment 1S: Subarea EA** Runoff Area=4.120 ac 0.00% Impervious Runoff Depth>4.66"
Flow Length=648' Tc=15.6 min CN=70 Runoff=16.8 cfs 1.599 af

**Reach 2R: Off site** Inflow=16.8 cfs 1.599 af
Outflow=16.8 cfs 1.599 af

**Total Runoff Area = 4.120 ac Runoff Volume = 1.599 af Average Runoff Depth = 4.66"**
**100.00% Pervious = 4.120 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment 1S: Subarea EA

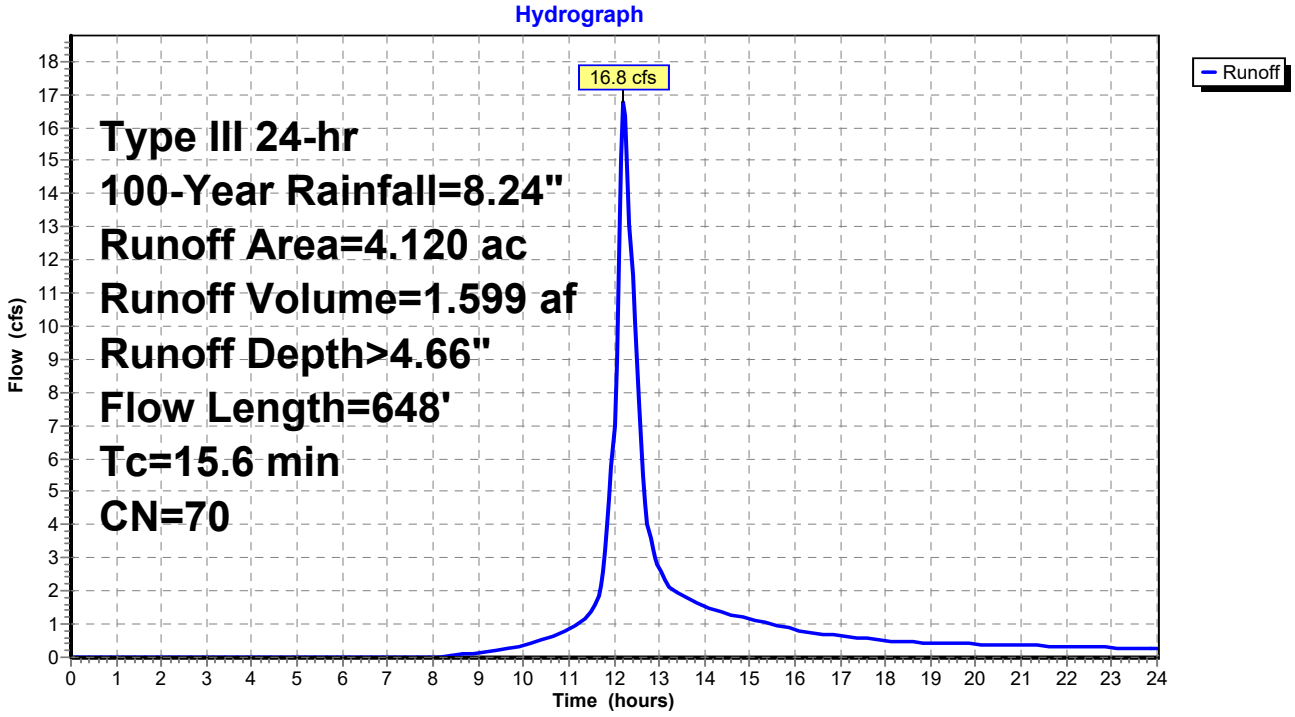
Runoff = 16.8 cfs @ 12.22 hrs, Volume= 1.599 af, Depth> 4.66"
Routed to Reach 2R : Off site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.24"

| Area (ac) | CN | Description |
|---|---|---|
| 3.750 | 70 | Woods, Good, HSG C |
| 0.370 | 74 | >75% Grass cover, Good, HSG C |
| 4.120 | 70 | Weighted Average |
| 4.120 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.2 | 50 | 0.0420 | 0.09 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20" |
| 1.3 | 118 | 0.0920 | 1.52 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 1.7 | 223 | 0.1880 | 2.17 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 3.4 | 257 | 0.0650 | 1.27 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 15.6 | 648 | Total | | | |

## Subcatchment 1S: Subarea EA



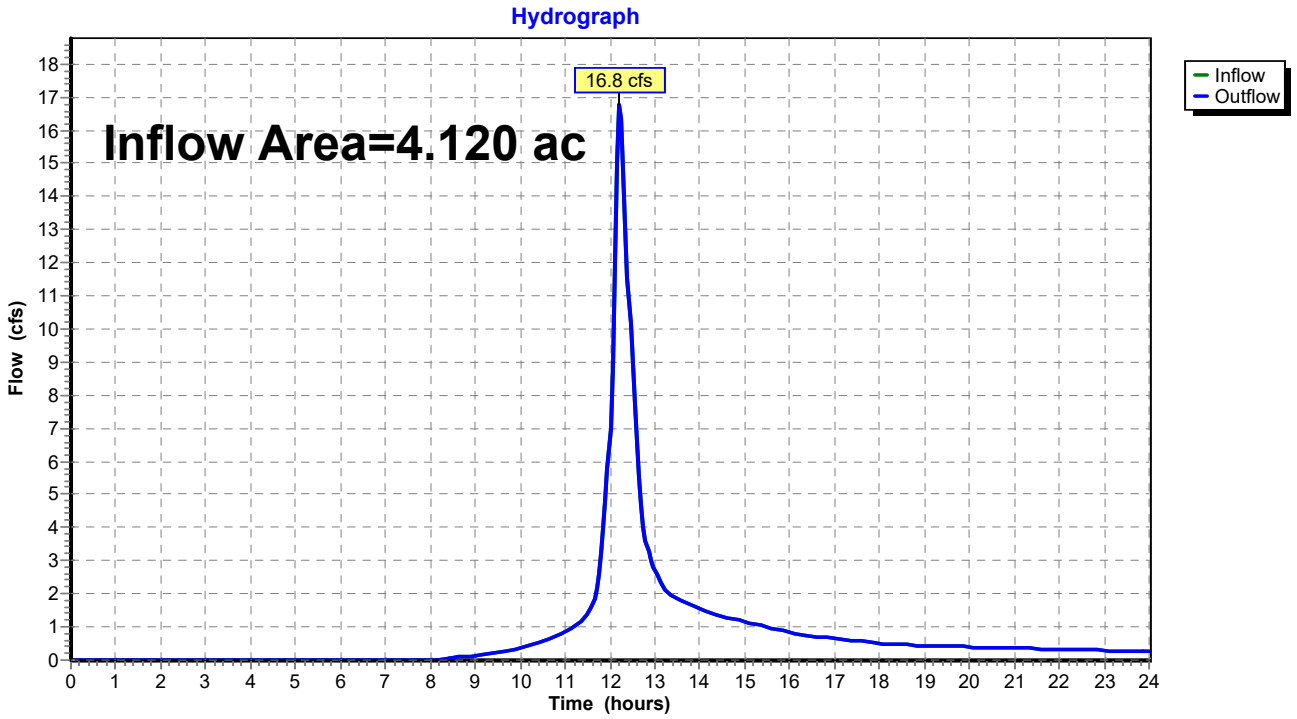
## Summary for Reach 2R: Off site

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.120 ac, 0.00% Impervious, Inflow Depth > 4.66" for 100-Year event
Inflow = 16.8 cfs @ 12.22 hrs, Volume= 1.599 af
Outflow = 16.8 cfs @ 12.22 hrs, Volume= 1.599 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Reach 2R: Off site



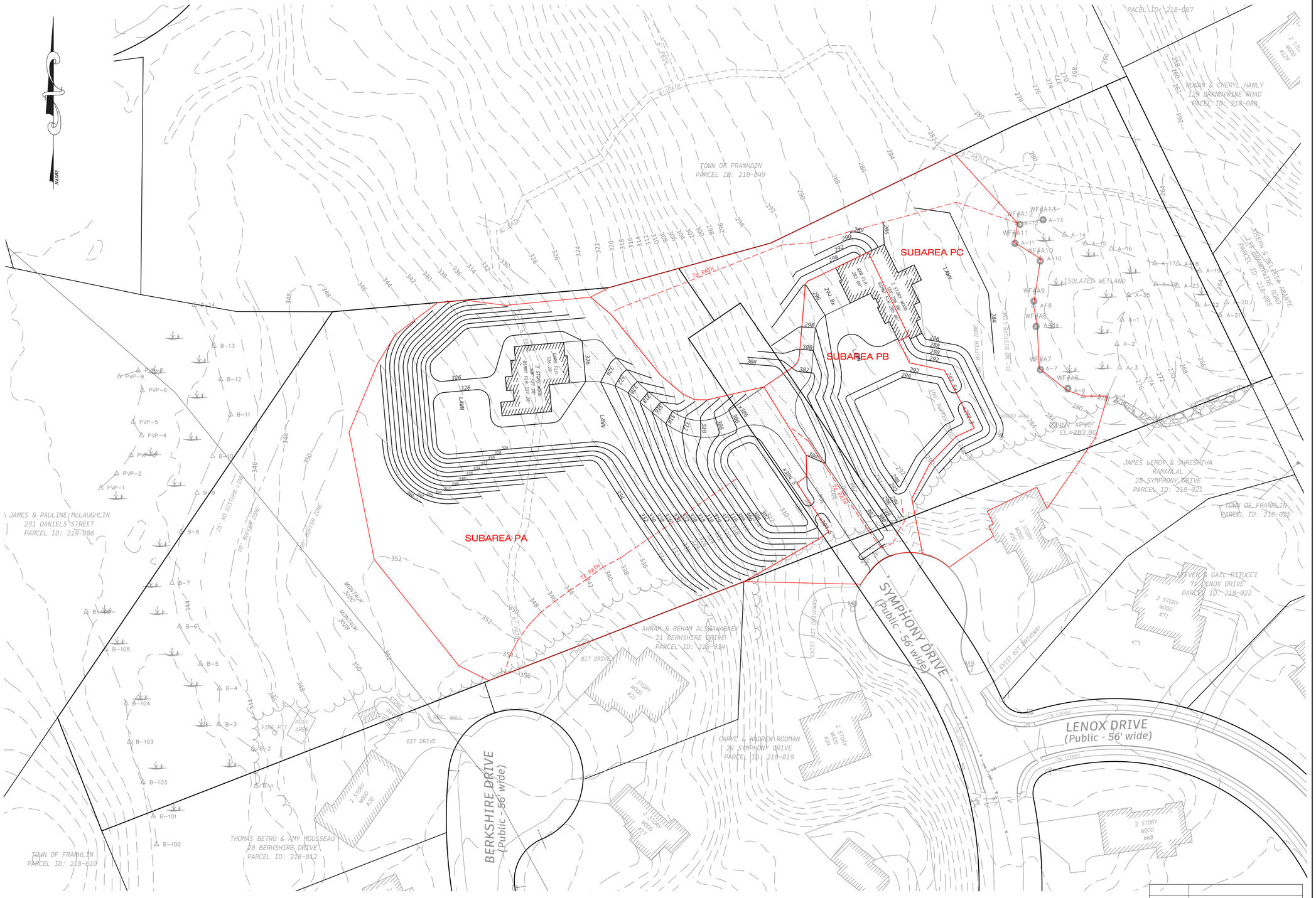
## TABLE OF CONTENTS

**Project Reports**
1 Routing Diagram
2 Rainfall Events Listing (selected events)
3 Area Listing (all nodes)
4 Soil Listing (all nodes)

**2-Year Event**
5 Node Listing
6 Subcat 1S: Subarea EA
7 Reach 2R: Off site

**10-Year Event**
8 Node Listing
9 Subcat 1S: Subarea EA
10 Reach 2R: Off site

**100-Year Event**
11 Node Listing
12 Subcat 1S: Subarea EA
13 Reach 2R: Off site




| | |
|---|---|
| | |
| | |
| 2/10/2026 | ADD SOIL OUTLINES |
| *DATE* | *DESCRIPTION* |

PROJECT:

*Symphony Drive Extension*

*Franklin Massachusetts*

OWNER/APPLICANT:

*CYPRESS REAL ESTATE DEVELOPMENT LLC*
*3 ROTHCHILD DRIVE*
*FOXBOROUGH, MA 02035*


Bay Colony Group, Inc.
Professional Civil Engineers & Professional Land Surveyors

FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939

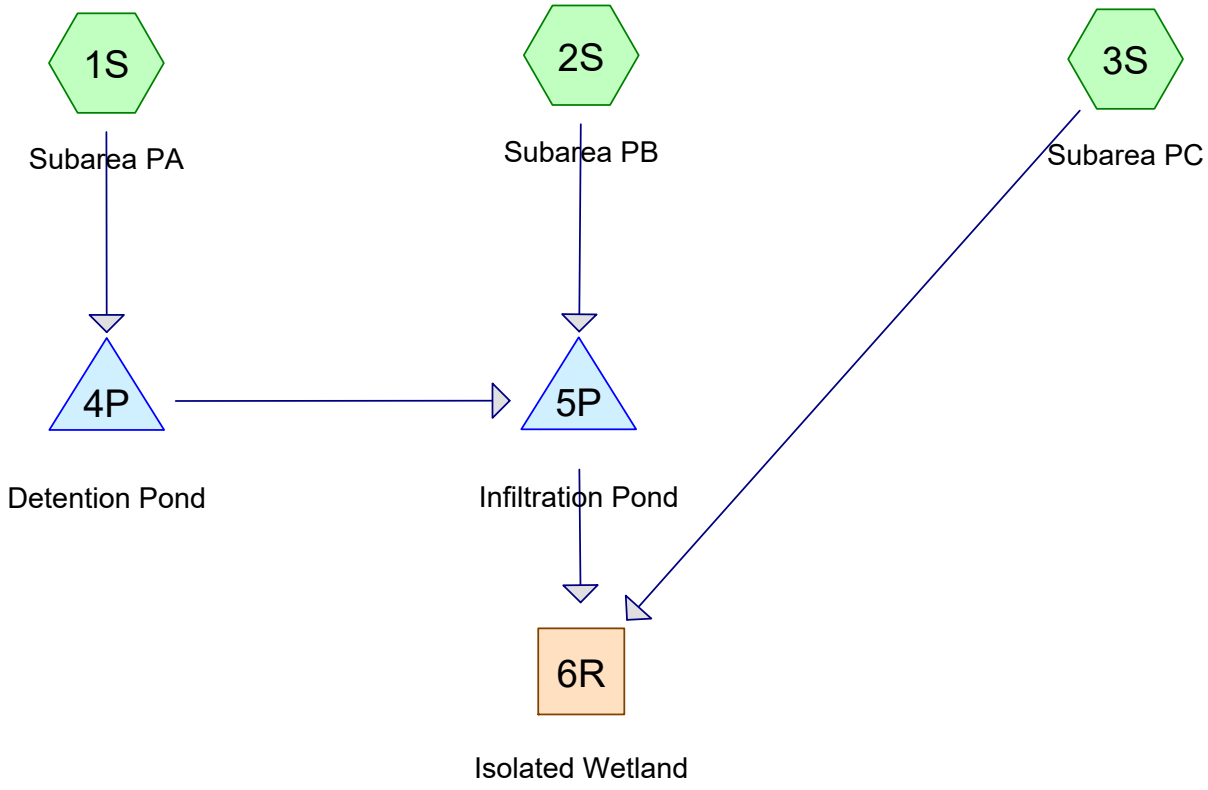

STAMP

DRAWING TITLE

Proposed Subarea

SCALE: 1" = 40'

| DEC. 4, 2025 | SHEET NUMBER |
|---|---|
| *25-0108B* | **PR** |




Subcat Reach Pond Link

**Routing Diagram for 25-0108-Pr V2**
Prepared by Bay Colony Group, Inc., Printed 2/13/2026
HydroCAD® 10.10-7c s/n 07093 © 2022 HydroCAD Software Solutions LLC

## Rainfall Events Listing (selected events)

| 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 | 3.37 | 2 |
| 2 | 10-Year | Type III 24-hr | | Default | 24.00 | 1 | 5.25 | 2 |
| 3 | 100-Year | Type III 24-hr | | Default | 24.00 | 1 | 8.24 | 2 |

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 2.630 | 74 | >75% Grass cover, Good, HSG C (1S, 2S, 3S) |
| 0.220 | 98 | Paved parking, HSG C (1S, 2S) |
| 0.140 | 98 | Roofs, HSG C (1S, 2S, 3S) |
| 1.300 | 70 | Woods, Good, HSG C (1S, 3S) |
| **4.290** | **75** | **TOTAL AREA** |

## Soil Listing (all nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 0.000 | HSG A | |
| 0.000 | HSG B | |
| 4.290 | HSG C | 1S, 2S, 3S |
| 0.000 | HSG D | |
| 0.000 | Other | |
| **4.290** | | **TOTAL AREA** |

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

**Subcatchment 1S: Subarea PA** Runoff Area=2.220 ac 7.21% Impervious Runoff Depth>1.15"
Flow Length=276' Tc=7.5 min CN=74 Runoff=2.7 cfs 0.213 af

**Subcatchment 2S: Subarea PB** Runoff Area=0.690 ac 23.19% Impervious Runoff Depth>1.53"
Flow Length=187' Tc=6.0 min CN=80 Runoff=1.2 cfs 0.088 af

**Subcatchment 3S: Subarea PC** Runoff Area=1.380 ac 2.90% Impervious Runoff Depth>1.09"
Flow Length=379' Tc=8.0 min CN=73 Runoff=1.5 cfs 0.125 af

**Reach 6R: Isolated Wetland** Inflow=1.5 cfs 0.125 af
Outflow=1.5 cfs 0.125 af

**Pond 4P: Detention Pond** Peak Elev=302.65' Storage=0.041 af Inflow=2.7 cfs 0.213 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0200 '/' Outflow=1.5 cfs 0.207 af

**Pond 5P: Infiltration Pond** Peak Elev=290.90' Storage=0.107 af Inflow=2.2 cfs 0.295 af
Discarded=0.4 cfs 0.294 af Primary=0.0 cfs 0.000 af Outflow=0.4 cfs 0.294 af

**Total Runoff Area = 4.290 ac Runoff Volume = 0.426 af Average Runoff Depth = 1.19"**
**91.61% Pervious = 3.930 ac 8.39% Impervious = 0.360 ac**

## Summary for Subcatchment 1S: Subarea PA

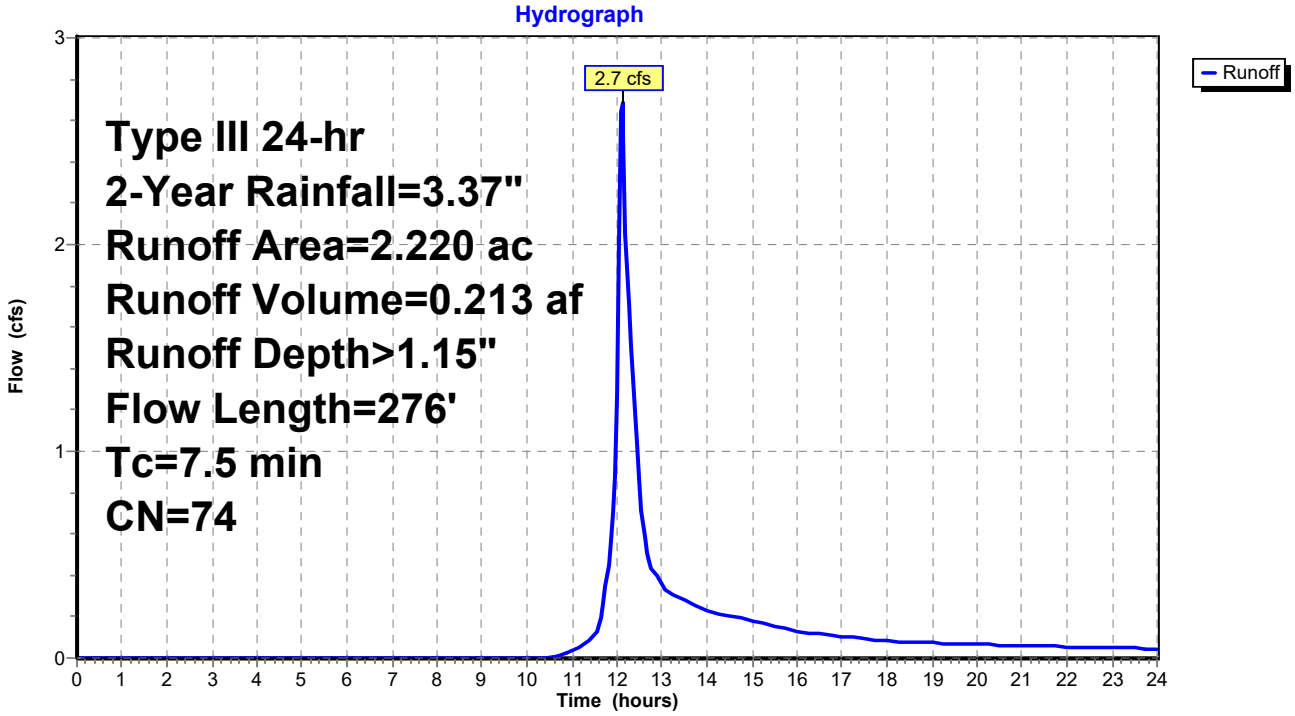
Runoff = 2.7 cfs @ 12.12 hrs, Volume= 0.213 af, Depth> 1.15"
Routed to Pond 4P : Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

| Area (ac) | CN | Description |
|---|---|---|
| 0.060 | 98 | Roofs, HSG C |
| 0.100 | 98 | Paved parking, HSG C |
| 1.340 | 74 | >75% Grass cover, Good, HSG C |
| 0.720 | 70 | Woods, Good, HSG C |
| 2.220 | 74 | Weighted Average |
| 2.060 | | 92.79% Pervious Area |
| 0.160 | | 7.21% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.0 | 50 | 0.1220 | 0.14 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20" |
| 1.0 | 107 | 0.1210 | 1.74 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.5 | 119 | 0.2770 | 3.68 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 7.5 | 276 | Total | | | |

## Subcatchment 1S: Subarea PA



## Summary for Subcatchment 2S: Subarea PB

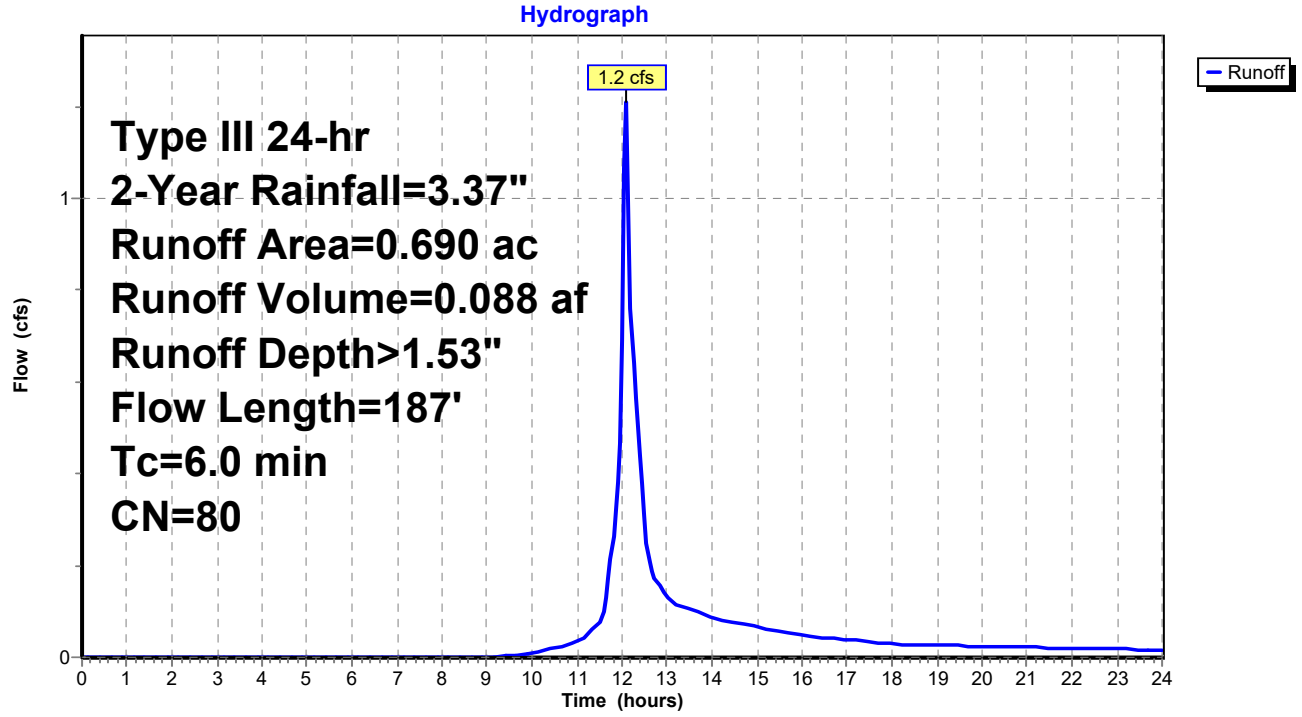
Runoff = 1.2 cfs @ 12.10 hrs, Volume= 0.088 af, Depth> 1.53"
Routed to Pond 5P : Infiltration Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

| Area (ac) | CN | Description |
|---|---|---|
| 0.040 | 98 | Roofs, HSG C |
| 0.120 | 98 | Paved parking, HSG C |
| 0.530 | 74 | >75% Grass cover, Good, HSG C |
| 0.690 | 80 | Weighted Average |
| 0.530 | | 76.81% Pervious Area |
| 0.160 | | 23.19% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 0.7 | 50 | 0.0200 | 1.20 | | **Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20" |
| 0.5 | 85 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.3 | 52 | 0.1940 | 3.08 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 1.5 | 187 | Total, Increased to minimum Tc = 6.0 min | | | |

## Subcatchment 2S: Subarea PB



## Summary for Subcatchment 3S: Subarea PC

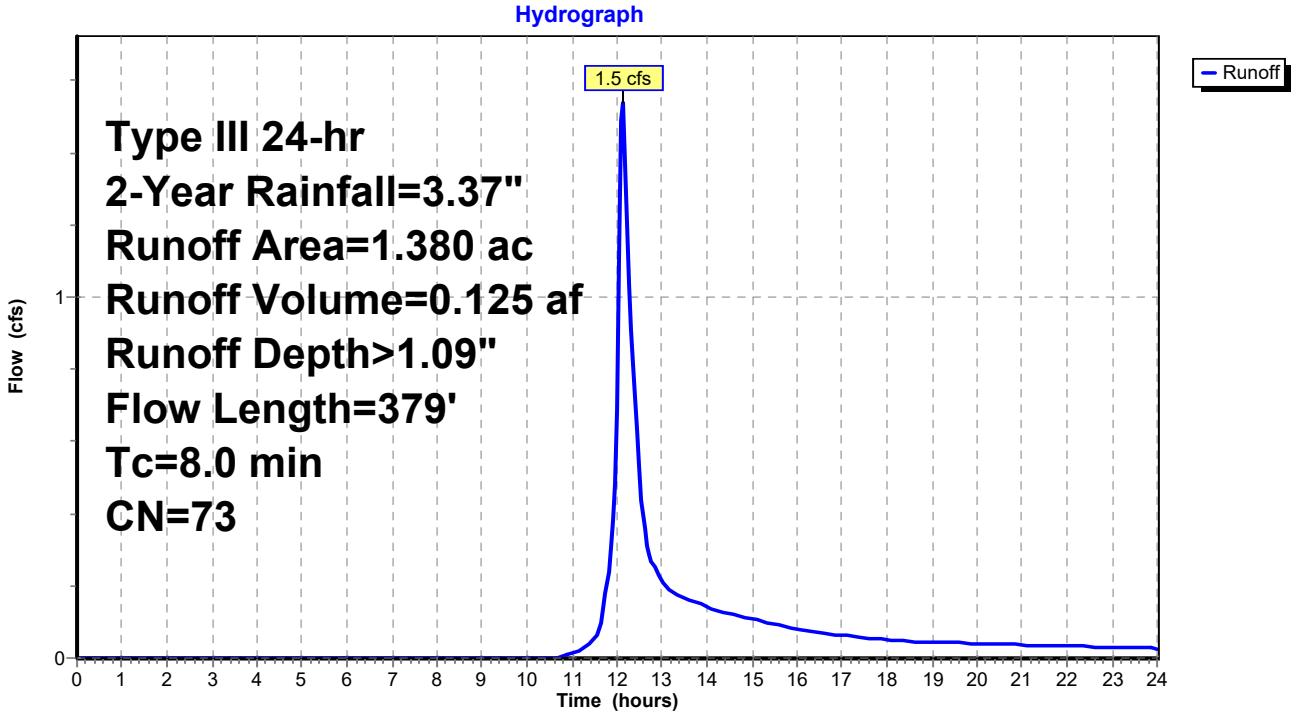
Runoff = 1.5 cfs @ 12.12 hrs, Volume= 0.125 af, Depth> 1.09"
Routed to Reach 6R : Isolated Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

| Area (ac) | CN | Description |
|---|---|---|
| 0.040 | 98 | Roofs, HSG C |
| 0.760 | 74 | >75% Grass cover, Good, HSG C |
| 0.580 | 70 | Woods, Good, HSG C |
| 1.380 | 73 | Weighted Average |
| 1.340 | | 97.10% Pervious Area |
| 0.040 | | 2.90% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 50 | 0.2220 | 0.18 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20" |
| 0.9 | 110 | 0.1800 | 2.12 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 1.5 | 148 | 0.0540 | 1.63 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.9 | 71 | 0.0630 | 1.25 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 8.0 | 379 | Total | | | |

## Subcatchment 3S: Subarea PC



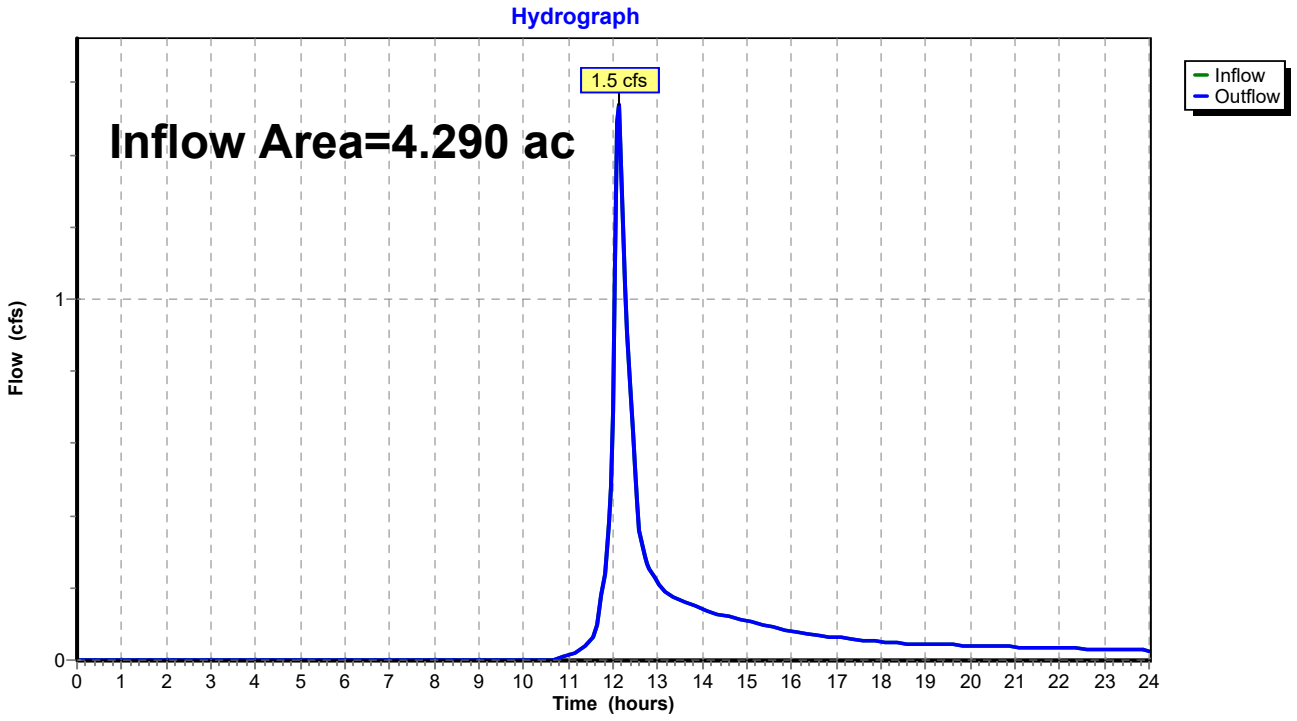
## Summary for Reach 6R: Isolated Wetland

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.290 ac, 8.39% Impervious, Inflow Depth > 0.35" for 2-Year event
Inflow = 1.5 cfs @ 12.12 hrs, Volume= 0.125 af
Outflow = 1.5 cfs @ 12.12 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Reach 6R: Isolated Wetland



## Summary for Pond 4P: Detention Pond

Inflow Area = 2.220 ac, 7.21% Impervious, Inflow Depth > 1.15" for 2-Year event
Inflow = 2.7 cfs @ 12.12 hrs, Volume= 0.213 af
Outflow = 1.5 cfs @ 12.30 hrs, Volume= 0.207 af, Atten= 43%, Lag= 10.9 min
Primary = 1.5 cfs @ 12.30 hrs, Volume= 0.207 af
Routed to Pond 5P : Infiltration Pond

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 302.65' @ 12.30 hrs Surf.Area= 0.068 ac Storage= 0.041 af

Plug-Flow detention time= 38.9 min calculated for 0.207 af (97% of inflow)
Center-of-Mass det. time= 23.7 min ( 883.1 - 859.4 )

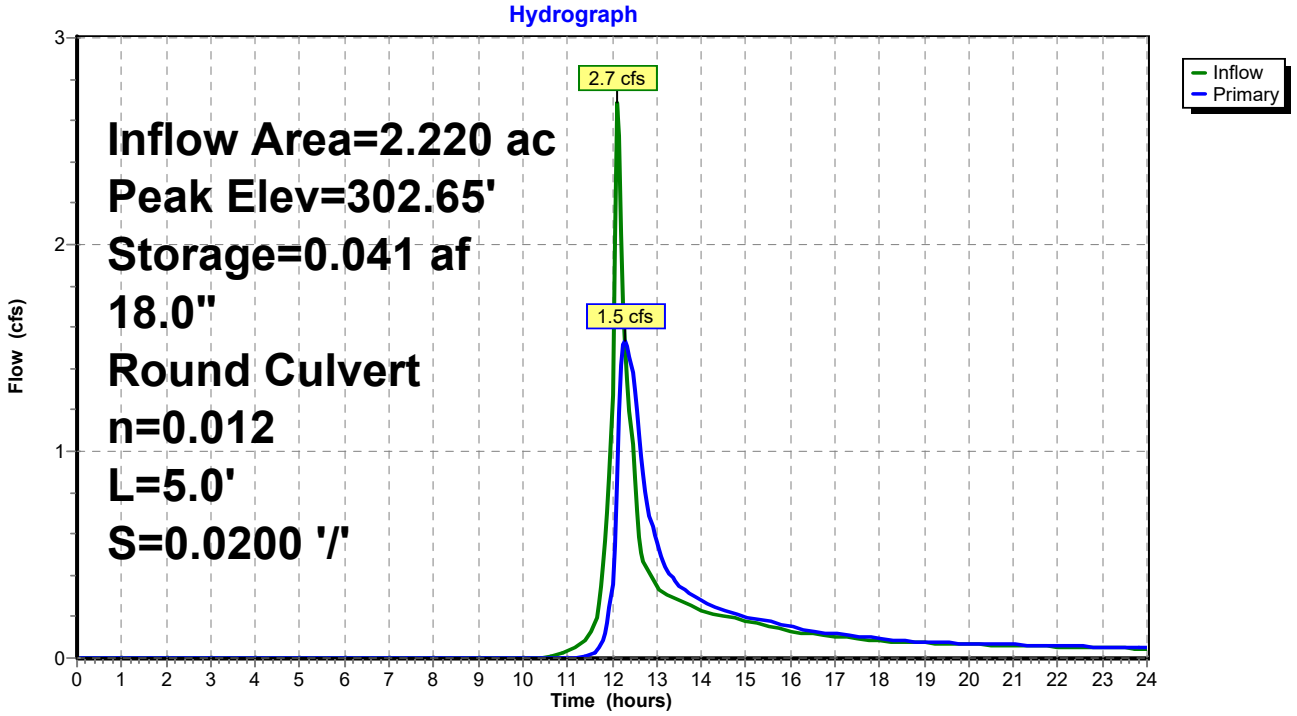
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 302.00' | 0.199 af | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (acres) | Perim. (feet) | Inc.Store (acre-feet) | Cum.Store (acre-feet) | Wet.Area (acres) |
|---|---|---|---|---|---|
| 302.00 | 0.058 | 224.0 | 0.000 | 0.000 | 0.058 |
| 304.00 | 0.092 | 265.0 | 0.149 | 0.149 | 0.096 |
| 304.50 | 0.111 | 284.0 | 0.051 | 0.199 | 0.116 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 302.00' | **18.0" Round Culvert**<br>L= 5.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 302.00' / 301.90' S= 0.0200 '/' Cc= 0.900<br>n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf |

**Primary OutFlow** Max=1.5 cfs @ 12.30 hrs HW=302.65' (Free Discharge)
**1=Culvert** (Barrel Controls 1.5 cfs @ 3.05 fps)

## Pond 4P: Detention Pond



## Stage-Area-Storage for Pond 4P: Detention Pond

| Elevation (feet) | Surface (acres) | Storage (acre-feet) |
|---|---|---|
| 302.00 | 0.058 | 0.000 |
| 302.05 | 0.059 | 0.003 |
| 302.10 | 0.060 | 0.006 |
| 302.15 | 0.060 | 0.009 |
| 302.20 | 0.061 | 0.012 |
| 302.25 | 0.062 | 0.015 |
| 302.30 | 0.063 | 0.018 |
| 302.35 | 0.063 | 0.021 |
| 302.40 | 0.064 | 0.024 |
| 302.45 | 0.065 | 0.028 |
| 302.50 | 0.066 | 0.031 |
| 302.55 | 0.067 | 0.034 |
| 302.60 | 0.067 | 0.038 |
| 302.65 | 0.068 | 0.041 |
| 302.70 | 0.069 | 0.044 |
| 302.75 | 0.070 | 0.048 |
| 302.80 | 0.071 | 0.051 |
| 302.85 | 0.071 | 0.055 |
| 302.90 | 0.072 | 0.059 |
| 302.95 | 0.073 | 0.062 |
| 303.00 | 0.074 | 0.066 |
| 303.05 | 0.075 | 0.070 |
| 303.10 | 0.076 | 0.073 |
| 303.15 | 0.077 | 0.077 |
| 303.20 | 0.077 | 0.081 |
| 303.25 | 0.078 | 0.085 |
| 303.30 | 0.079 | 0.089 |
| 303.35 | 0.080 | 0.093 |
| 303.40 | 0.081 | 0.097 |
| 303.45 | 0.082 | 0.101 |
| 303.50 | 0.083 | 0.105 |
| 303.55 | 0.084 | 0.109 |
| 303.60 | 0.085 | 0.113 |
| 303.65 | 0.085 | 0.118 |
| 303.70 | 0.086 | 0.122 |
| 303.75 | 0.087 | 0.126 |
| 303.80 | 0.088 | 0.131 |
| 303.85 | 0.089 | 0.135 |
| 303.90 | 0.090 | 0.140 |
| 303.95 | 0.091 | 0.144 |
| 304.00 | 0.092 | 0.149 |
| 304.05 | 0.094 | 0.153 |
| 304.10 | 0.096 | 0.158 |
| 304.15 | 0.098 | 0.163 |
| 304.20 | 0.099 | 0.168 |
| 304.25 | 0.101 | 0.173 |
| 304.30 | 0.103 | 0.178 |
| 304.35 | 0.105 | 0.183 |
| 304.40 | 0.107 | 0.188 |
| 304.45 | 0.109 | 0.194 |
| 304.50 | **0.111** | **0.199** |

## Summary for Pond 5P: Infiltration Pond

Inflow Area = 2.910 ac, 11.00% Impervious, Inflow Depth > 1.22" for 2-Year event
Inflow = 2.2 cfs @ 12.17 hrs, Volume= 0.295 af
Outflow = 0.4 cfs @ 13.71 hrs, Volume= 0.294 af, Atten= 81%, Lag= 92.1 min
Discarded = 0.4 cfs @ 13.71 hrs, Volume= 0.294 af
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 6R : Isolated Wetland

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 290.90' @ 13.71 hrs Surf.Area= 0.128 ac Storage= 0.107 af

Plug-Flow detention time= 119.2 min calculated for 0.294 af (100% of inflow)
Center-of-Mass det. time= 117.7 min ( 987.7 - 870.1 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 290.00' | 0.339 af | **Custom Stage Data (Irregular)** Listed below (Recalc) |

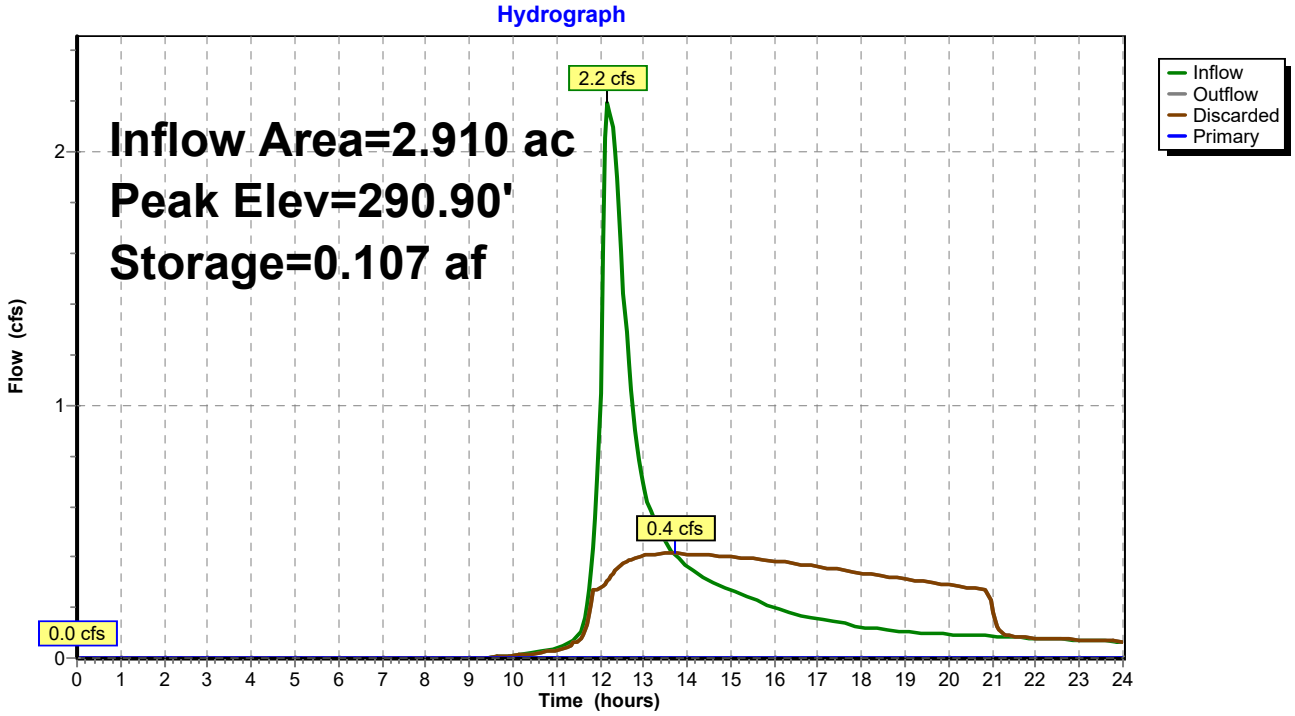
| Elevation (feet) | Surf.Area (acres) | Perim. (feet) | Inc.Store (acre-feet) | Cum.Store (acre-feet) | Wet.Area (acres) |
|---|---|---|---|---|---|
| 290.00 | 0.109 | 220.0 | 0.000 | 0.000 | 0.109 |
| 292.00 | 0.152 | 331.0 | 0.260 | 0.260 | 0.221 |
| 292.50 | 0.164 | 340.0 | 0.079 | 0.339 | 0.233 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 290.00' | **2.410 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 287.50' |
| #2 | Primary | 291.50' | **10.0' long x 0.50' rise Sharp-Crested Rectangular Weir**<br>2 End Contraction(s) |

**Discarded OutFlow** Max=0.4 cfs @ 13.71 hrs HW=290.90' (Free Discharge)
↑—**1=Exfiltration** ( Controls 0.4 cfs)

**Primary OutFlow** Max=0.0 cfs @ 0.00 hrs HW=290.00' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** ( Controls 0.0 cfs)

## Pond 5P: Infiltration Pond



## Stage-Area-Storage for Pond 5P: Infiltration Pond

| Elevation (feet) | Surface (acres) | Storage (acre-feet) |
|---|---|---|
| 290.00 | 0.109 | 0.000 |
| 290.05 | 0.110 | 0.005 |
| 290.10 | 0.111 | 0.011 |
| 290.15 | 0.112 | 0.017 |
| 290.20 | 0.113 | 0.022 |
| 290.25 | 0.114 | 0.028 |
| 290.30 | 0.115 | 0.034 |
| 290.35 | 0.116 | 0.039 |
| 290.40 | 0.117 | 0.045 |
| 290.45 | 0.118 | 0.051 |
| 290.50 | 0.119 | 0.057 |
| 290.55 | 0.120 | 0.063 |
| 290.60 | 0.121 | 0.069 |
| 290.65 | 0.122 | 0.075 |
| 290.70 | 0.123 | 0.081 |
| 290.75 | 0.124 | 0.087 |
| 290.80 | 0.125 | 0.094 |
| 290.85 | 0.126 | 0.100 |
| 290.90 | 0.127 | 0.106 |
| 290.95 | 0.129 | 0.113 |
| 291.00 | 0.130 | 0.119 |
| 291.05 | 0.131 | 0.126 |
| 291.10 | 0.132 | 0.132 |
| 291.15 | 0.133 | 0.139 |
| 291.20 | 0.134 | 0.146 |
| 291.25 | 0.135 | 0.152 |
| 291.30 | 0.136 | 0.159 |
| 291.35 | 0.137 | 0.166 |
| 291.40 | 0.138 | 0.173 |
| 291.45 | 0.139 | 0.180 |
| 291.50 | 0.141 | 0.187 |
| 291.55 | 0.142 | 0.194 |
| 291.60 | 0.143 | 0.201 |
| 291.65 | 0.144 | 0.208 |
| 291.70 | 0.145 | 0.215 |
| 291.75 | 0.146 | 0.223 |
| 291.80 | 0.147 | 0.230 |
| 291.85 | 0.149 | 0.237 |
| 291.90 | 0.150 | 0.245 |
| 291.95 | 0.151 | 0.252 |
| 292.00 | 0.152 | 0.260 |
| 292.05 | 0.153 | 0.267 |
| 292.10 | 0.154 | 0.275 |
| 292.15 | 0.156 | 0.283 |
| 292.20 | 0.157 | 0.291 |
| 292.25 | 0.158 | 0.299 |
| 292.30 | 0.159 | 0.306 |
| 292.35 | 0.160 | 0.314 |
| 292.40 | 0.162 | 0.323 |
| 292.45 | 0.163 | 0.331 |
| 292.50 | **0.164** | **0.339** |

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

**Subcatchment 1S: Subarea PA** Runoff Area=2.220 ac 7.21% Impervious Runoff Depth>2.56"
Flow Length=276' Tc=7.5 min CN=74 Runoff=6.2 cfs 0.474 af

**Subcatchment 2S: Subarea PB** Runoff Area=0.690 ac 23.19% Impervious Runoff Depth>3.11"
Flow Length=187' Tc=6.0 min CN=80 Runoff=2.5 cfs 0.179 af

**Subcatchment 3S: Subarea PC** Runoff Area=1.380 ac 2.90% Impervious Runoff Depth>2.47"
Flow Length=379' Tc=8.0 min CN=73 Runoff=3.7 cfs 0.285 af

**Reach 6R: Isolated Wetland** Inflow=3.7 cfs 0.415 af
Outflow=3.7 cfs 0.415 af

**Pond 4P: Detention Pond** Peak Elev=303.18' Storage=0.080 af Inflow=6.2 cfs 0.474 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0200 '/' Outflow=4.1 cfs 0.466 af

**Pond 5P: Infiltration Pond** Peak Elev=291.68' Storage=0.212 af Inflow=5.7 cfs 0.645 af
Discarded=0.6 cfs 0.481 af Primary=2.4 cfs 0.130 af Outflow=2.9 cfs 0.611 af

**Total Runoff Area = 4.290 ac Runoff Volume = 0.937 af Average Runoff Depth = 2.62"**
**91.61% Pervious = 3.930 ac 8.39% Impervious = 0.360 ac**

## Summary for Subcatchment 1S: Subarea PA

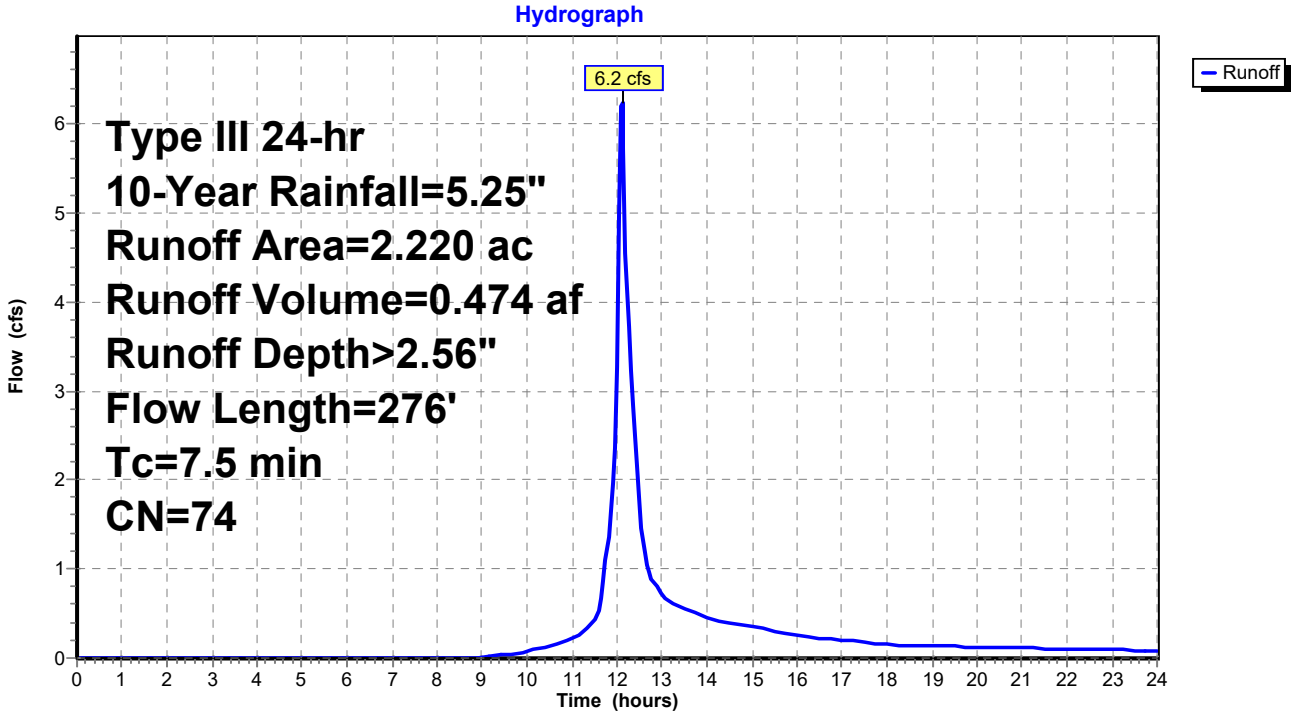
Runoff = 6.2 cfs @ 12.11 hrs, Volume= 0.474 af, Depth> 2.56"
Routed to Pond 4P : Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.25"

| Area (ac) | CN | Description |
|---|---|---|
| 0.060 | 98 | Roofs, HSG C |
| 0.100 | 98 | Paved parking, HSG C |
| 1.340 | 74 | >75% Grass cover, Good, HSG C |
| 0.720 | 70 | Woods, Good, HSG C |
| 2.220 | 74 | Weighted Average |
| 2.060 | | 92.79% Pervious Area |
| 0.160 | | 7.21% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.0 | 50 | 0.1220 | 0.14 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20" |
| 1.0 | 107 | 0.1210 | 1.74 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.5 | 119 | 0.2770 | 3.68 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 7.5 | 276 | Total | | | |

## Subcatchment 1S: Subarea PA



## Summary for Subcatchment 2S: Subarea PB

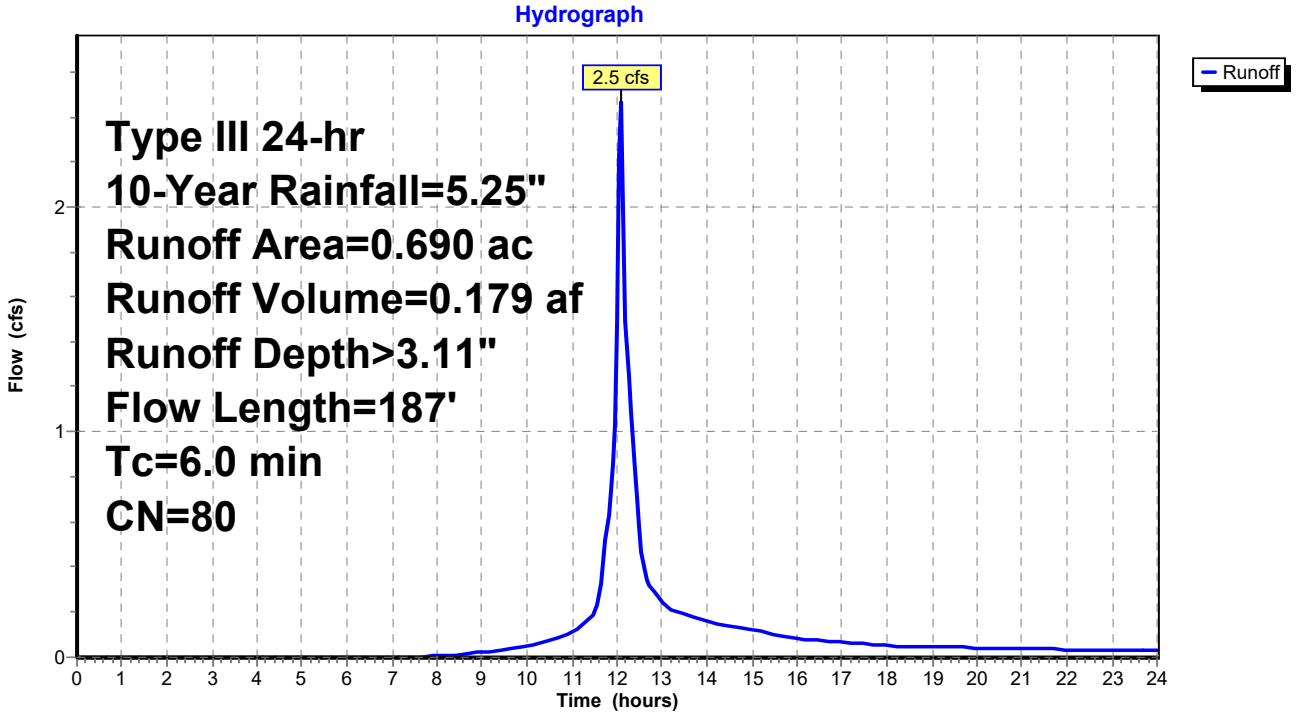
Runoff = 2.5 cfs @ 12.09 hrs, Volume= 0.179 af, Depth> 3.11"
Routed to Pond 5P : Infiltration Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.25"

| Area (ac) | CN | Description |
|---|---|---|
| 0.040 | 98 | Roofs, HSG C |
| 0.120 | 98 | Paved parking, HSG C |
| 0.530 | 74 | >75% Grass cover, Good, HSG C |
| 0.690 | 80 | Weighted Average |
| 0.530 | | 76.81% Pervious Area |
| 0.160 | | 23.19% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 0.7 | 50 | 0.0200 | 1.20 | | **Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20" |
| 0.5 | 85 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.3 | 52 | 0.1940 | 3.08 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 1.5 | 187 | Total, Increased to minimum Tc = 6.0 min | | | |

## Subcatchment 2S: Subarea PB



## Summary for Subcatchment 3S: Subarea PC

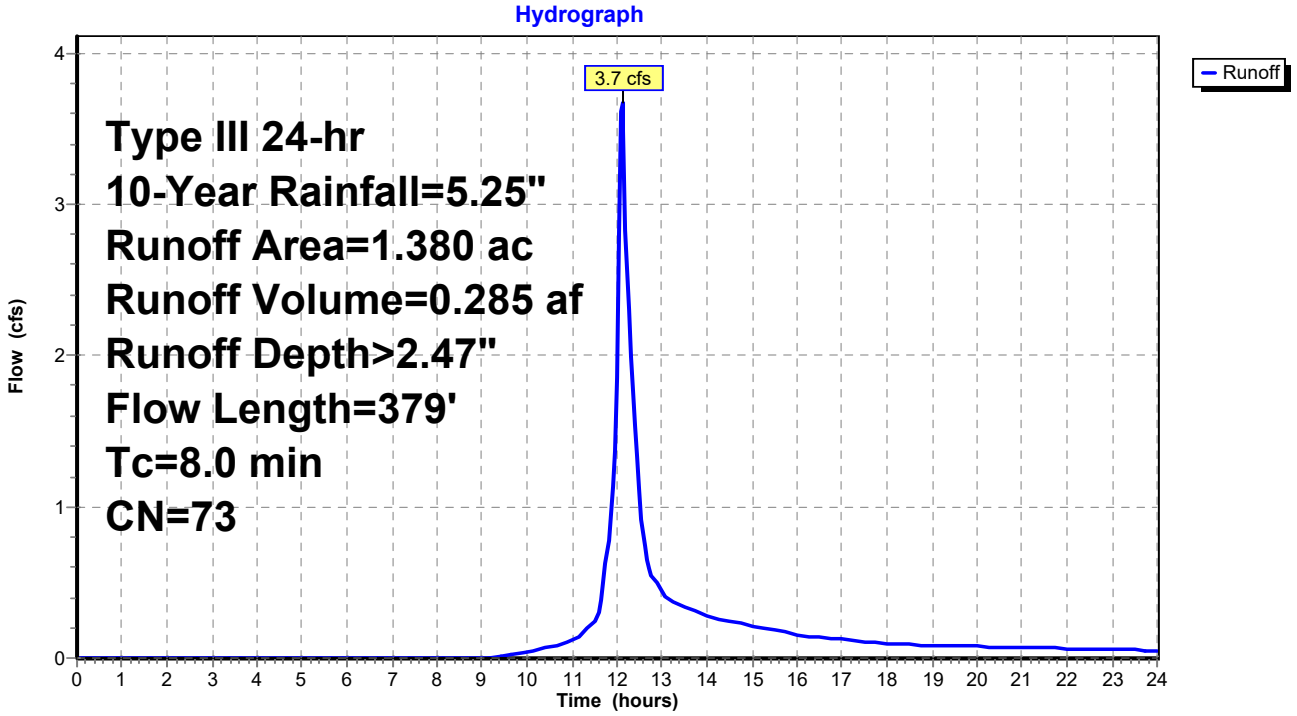
Runoff = 3.7 cfs @ 12.12 hrs, Volume= 0.285 af, Depth> 2.47"
Routed to Reach 6R : Isolated Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.25"

| Area (ac) | CN | Description |
|---|---|---|
| 0.040 | 98 | Roofs, HSG C |
| 0.760 | 74 | >75% Grass cover, Good, HSG C |
| 0.580 | 70 | Woods, Good, HSG C |
| 1.380 | 73 | Weighted Average |
| 1.340 | | 97.10% Pervious Area |
| 0.040 | | 2.90% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 50 | 0.2220 | 0.18 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20" |
| 0.9 | 110 | 0.1800 | 2.12 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 1.5 | 148 | 0.0540 | 1.63 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.9 | 71 | 0.0630 | 1.25 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 8.0 | 379 | Total | | | |

## Subcatchment 3S: Subarea PC



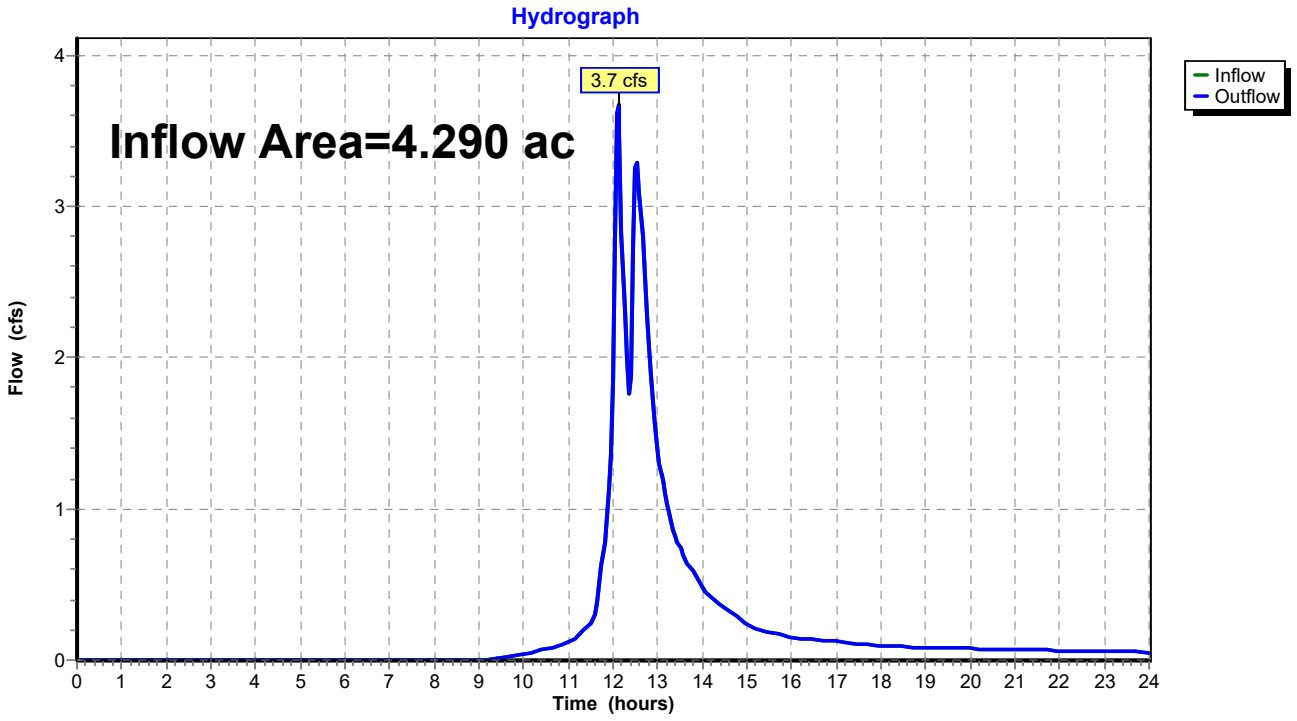
## Summary for Reach 6R: Isolated Wetland

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.290 ac, 8.39% Impervious, Inflow Depth > 1.16" for 10-Year event
Inflow = 3.7 cfs @ 12.12 hrs, Volume= 0.415 af
Outflow = 3.7 cfs @ 12.12 hrs, Volume= 0.415 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Reach 6R: Isolated Wetland



## Summary for Pond 4P: Detention Pond

Inflow Area = 2.220 ac, 7.21% Impervious, Inflow Depth > 2.56" for 10-Year event
Inflow = 6.2 cfs @ 12.11 hrs, Volume= 0.474 af
Outflow = 4.1 cfs @ 12.23 hrs, Volume= 0.466 af, Atten= 34%, Lag= 7.0 min
Primary = 4.1 cfs @ 12.23 hrs, Volume= 0.466 af
Routed to Pond 5P : Infiltration Pond

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 303.18' @ 12.23 hrs Surf.Area= 0.077 ac Storage= 0.080 af

Plug-Flow detention time= 28.2 min calculated for 0.465 af (98% of inflow)
Center-of-Mass det. time= 18.5 min ( 854.2 - 835.7 )

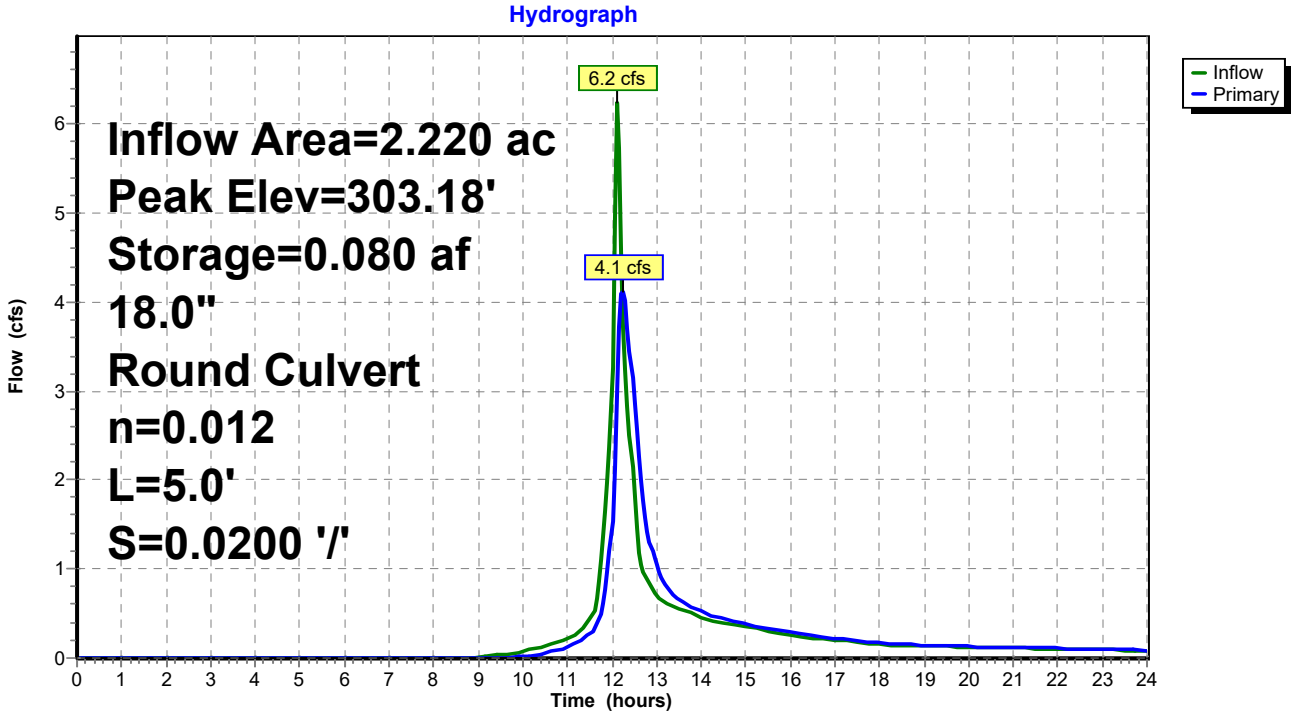
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 302.00' | 0.199 af | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (acres) | Perim. (feet) | Inc.Store (acre-feet) | Cum.Store (acre-feet) | Wet.Area (acres) |
|---|---|---|---|---|---|
| 302.00 | 0.058 | 224.0 | 0.000 | 0.000 | 0.058 |
| 304.00 | 0.092 | 265.0 | 0.149 | 0.149 | 0.096 |
| 304.50 | 0.111 | 284.0 | 0.051 | 0.199 | 0.116 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 302.00' | **18.0" Round Culvert**<br>L= 5.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 302.00' / 301.90' S= 0.0200 '/' Cc= 0.900<br>n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf |

**Primary OutFlow** Max=4.1 cfs @ 12.23 hrs HW=303.18' (Free Discharge)
**1=Culvert** (Barrel Controls 4.1 cfs @ 3.79 fps)

## Pond 4P: Detention Pond



## Stage-Area-Storage for Pond 4P: Detention Pond

| Elevation (feet) | Surface (acres) | Storage (acre-feet) |
|---|---|---|
| 302.00 | 0.058 | 0.000 |
| 302.05 | 0.059 | 0.003 |
| 302.10 | 0.060 | 0.006 |
| 302.15 | 0.060 | 0.009 |
| 302.20 | 0.061 | 0.012 |
| 302.25 | 0.062 | 0.015 |
| 302.30 | 0.063 | 0.018 |
| 302.35 | 0.063 | 0.021 |
| 302.40 | 0.064 | 0.024 |
| 302.45 | 0.065 | 0.028 |
| 302.50 | 0.066 | 0.031 |
| 302.55 | 0.067 | 0.034 |
| 302.60 | 0.067 | 0.038 |
| 302.65 | 0.068 | 0.041 |
| 302.70 | 0.069 | 0.044 |
| 302.75 | 0.070 | 0.048 |
| 302.80 | 0.071 | 0.051 |
| 302.85 | 0.071 | 0.055 |
| 302.90 | 0.072 | 0.059 |
| 302.95 | 0.073 | 0.062 |
| 303.00 | 0.074 | 0.066 |
| 303.05 | 0.075 | 0.070 |
| 303.10 | 0.076 | 0.073 |
| 303.15 | 0.077 | 0.077 |
| 303.20 | 0.077 | 0.081 |
| 303.25 | 0.078 | 0.085 |
| 303.30 | 0.079 | 0.089 |
| 303.35 | 0.080 | 0.093 |
| 303.40 | 0.081 | 0.097 |
| 303.45 | 0.082 | 0.101 |
| 303.50 | 0.083 | 0.105 |
| 303.55 | 0.084 | 0.109 |
| 303.60 | 0.085 | 0.113 |
| 303.65 | 0.085 | 0.118 |
| 303.70 | 0.086 | 0.122 |
| 303.75 | 0.087 | 0.126 |
| 303.80 | 0.088 | 0.131 |
| 303.85 | 0.089 | 0.135 |
| 303.90 | 0.090 | 0.140 |
| 303.95 | 0.091 | 0.144 |
| 304.00 | 0.092 | 0.149 |
| 304.05 | 0.094 | 0.153 |
| 304.10 | 0.096 | 0.158 |
| 304.15 | 0.098 | 0.163 |
| 304.20 | 0.099 | 0.168 |
| 304.25 | 0.101 | 0.173 |
| 304.30 | 0.103 | 0.178 |
| 304.35 | 0.105 | 0.183 |
| 304.40 | 0.107 | 0.188 |
| 304.45 | 0.109 | 0.194 |
| 304.50 | **0.111** | **0.199** |

## Summary for Pond 5P: Infiltration Pond

Inflow Area = 2.910 ac, 11.00% Impervious, Inflow Depth > 2.66" for 10-Year event
Inflow = 5.7 cfs @ 12.16 hrs, Volume= 0.645 af
Outflow = 2.9 cfs @ 12.57 hrs, Volume= 0.611 af, Atten= 49%, Lag= 24.5 min
Discarded = 0.6 cfs @ 12.57 hrs, Volume= 0.481 af
Primary = 2.4 cfs @ 12.57 hrs, Volume= 0.130 af
Routed to Reach 6R : Isolated Wetland

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 291.68' @ 12.57 hrs Surf.Area= 0.145 ac Storage= 0.212 af

Plug-Flow detention time= 153.1 min calculated for 0.610 af (95% of inflow)
Center-of-Mass det. time= 125.3 min ( 969.7 - 844.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 290.00' | 0.339 af | **Custom Stage Data (Irregular)** Listed below (Recalc) |

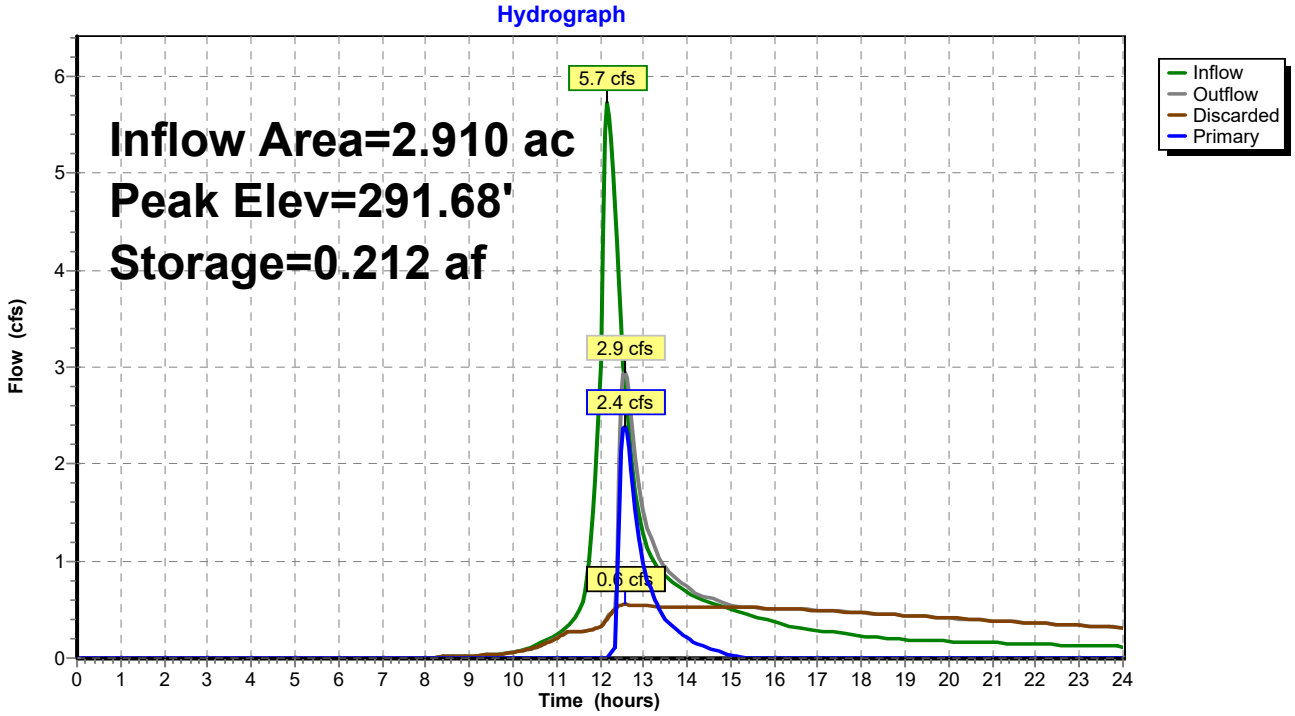
| Elevation (feet) | Surf.Area (acres) | Perim. (feet) | Inc.Store (acre-feet) | Cum.Store (acre-feet) | Wet.Area (acres) |
|---|---|---|---|---|---|
| 290.00 | 0.109 | 220.0 | 0.000 | 0.000 | 0.109 |
| 292.00 | 0.152 | 331.0 | 0.260 | 0.260 | 0.221 |
| 292.50 | 0.164 | 340.0 | 0.079 | 0.339 | 0.233 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 290.00' | **2.410 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 287.50' |
| #2 | Primary | 291.50' | **10.0' long x 0.50' rise Sharp-Crested Rectangular Weir**<br>2 End Contraction(s) |

**Discarded OutFlow** Max=0.6 cfs @ 12.57 hrs HW=291.67' (Free Discharge)
**1=Exfiltration** ( Controls 0.6 cfs)

**Primary OutFlow** Max=2.4 cfs @ 12.57 hrs HW=291.67' (Free Discharge)
**2=Sharp-Crested Rectangular Weir** (Weir Controls 2.4 cfs @ 1.36 fps)

## Pond 5P: Infiltration Pond



## Stage-Area-Storage for Pond 5P: Infiltration Pond

| Elevation (feet) | Surface (acres) | Storage (acre-feet) |
|---|---|---|
| 290.00 | 0.109 | 0.000 |
| 290.05 | 0.110 | 0.005 |
| 290.10 | 0.111 | 0.011 |
| 290.15 | 0.112 | 0.017 |
| 290.20 | 0.113 | 0.022 |
| 290.25 | 0.114 | 0.028 |
| 290.30 | 0.115 | 0.034 |
| 290.35 | 0.116 | 0.039 |
| 290.40 | 0.117 | 0.045 |
| 290.45 | 0.118 | 0.051 |
| 290.50 | 0.119 | 0.057 |
| 290.55 | 0.120 | 0.063 |
| 290.60 | 0.121 | 0.069 |
| 290.65 | 0.122 | 0.075 |
| 290.70 | 0.123 | 0.081 |
| 290.75 | 0.124 | 0.087 |
| 290.80 | 0.125 | 0.094 |
| 290.85 | 0.126 | 0.100 |
| 290.90 | 0.127 | 0.106 |
| 290.95 | 0.129 | 0.113 |
| 291.00 | 0.130 | 0.119 |
| 291.05 | 0.131 | 0.126 |
| 291.10 | 0.132 | 0.132 |
| 291.15 | 0.133 | 0.139 |
| 291.20 | 0.134 | 0.146 |
| 291.25 | 0.135 | 0.152 |
| 291.30 | 0.136 | 0.159 |
| 291.35 | 0.137 | 0.166 |
| 291.40 | 0.138 | 0.173 |
| 291.45 | 0.139 | 0.180 |
| 291.50 | 0.141 | 0.187 |
| 291.55 | 0.142 | 0.194 |
| 291.60 | 0.143 | 0.201 |
| 291.65 | 0.144 | 0.208 |
| 291.70 | 0.145 | 0.215 |
| 291.75 | 0.146 | 0.223 |
| 291.80 | 0.147 | 0.230 |
| 291.85 | 0.149 | 0.237 |
| 291.90 | 0.150 | 0.245 |
| 291.95 | 0.151 | 0.252 |
| 292.00 | 0.152 | 0.260 |
| 292.05 | 0.153 | 0.267 |
| 292.10 | 0.154 | 0.275 |
| 292.15 | 0.156 | 0.283 |
| 292.20 | 0.157 | 0.291 |
| 292.25 | 0.158 | 0.299 |
| 292.30 | 0.159 | 0.306 |
| 292.35 | 0.160 | 0.314 |
| 292.40 | 0.162 | 0.323 |
| 292.45 | 0.163 | 0.331 |
| 292.50 | **0.164** | **0.339** |

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

**Subcatchment 1S: Subarea PA** Runoff Area=2.220 ac 7.21% Impervious Runoff Depth>5.14"
Flow Length=276' Tc=7.5 min CN=74 Runoff=12.5 cfs 0.950 af

**Subcatchment 2S: Subarea PB** Runoff Area=0.690 ac 23.19% Impervious Runoff Depth>5.85"
Flow Length=187' Tc=6.0 min CN=80 Runoff=4.5 cfs 0.336 af

**Subcatchment 3S: Subarea PC** Runoff Area=1.380 ac 2.90% Impervious Runoff Depth>5.02"
Flow Length=379' Tc=8.0 min CN=73 Runoff=7.5 cfs 0.577 af

**Reach 6R: Isolated Wetland** Inflow=14.8 cfs 1.190 af
Outflow=14.8 cfs 1.190 af

**Pond 4P: Detention Pond** Peak Elev=303.96' Storage=0.145 af Inflow=12.5 cfs 0.950 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0200 '/' Outflow=8.2 cfs 0.939 af

**Pond 5P: Infiltration Pond** Peak Elev=291.95' Storage=0.252 af Inflow=11.4 cfs 1.276 af
Discarded=0.6 cfs 0.571 af Primary=9.7 cfs 0.613 af Outflow=10.3 cfs 1.184 af

**Total Runoff Area = 4.290 ac Runoff Volume = 1.863 af Average Runoff Depth = 5.21"**
**91.61% Pervious = 3.930 ac 8.39% Impervious = 0.360 ac**

## Summary for Subcatchment 1S: Subarea PA

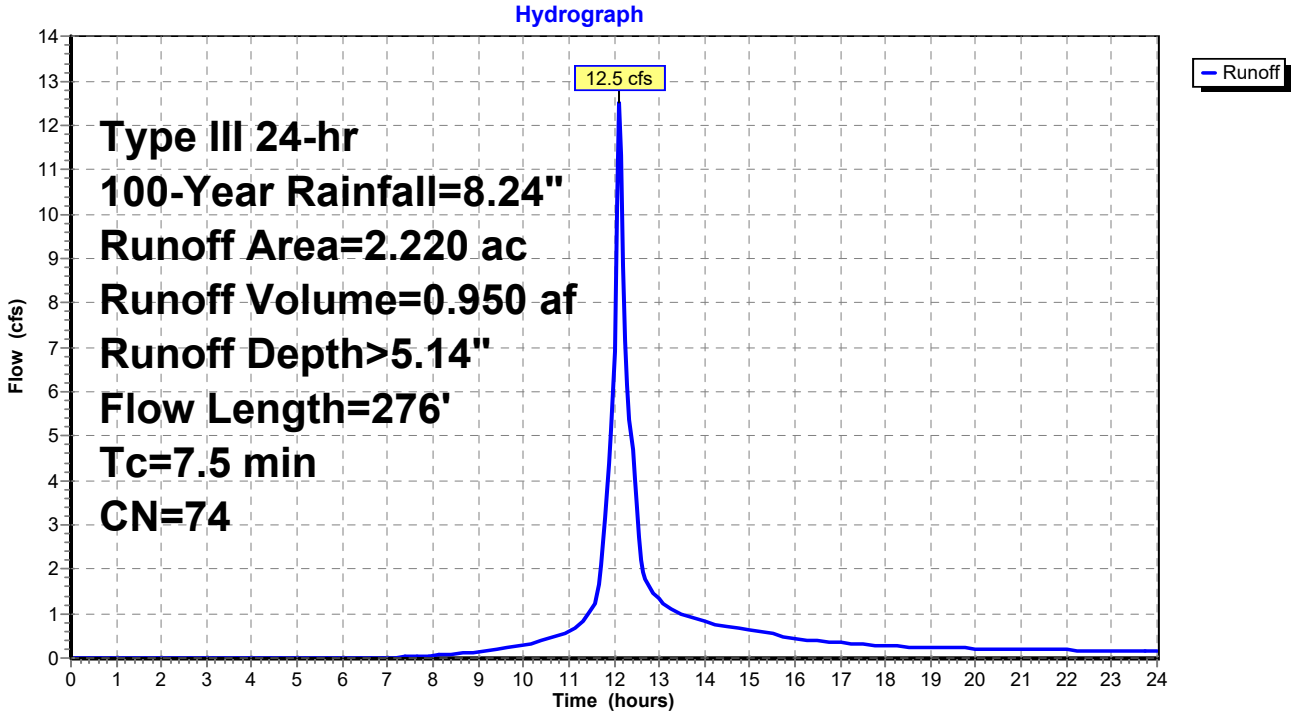
Runoff = 12.5 cfs @ 12.11 hrs, Volume= 0.950 af, Depth> 5.14"
Routed to Pond 4P : Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.24"

| Area (ac) | CN | Description |
|---|---|---|
| 0.060 | 98 | Roofs, HSG C |
| 0.100 | 98 | Paved parking, HSG C |
| 1.340 | 74 | >75% Grass cover, Good, HSG C |
| 0.720 | 70 | Woods, Good, HSG C |
| 2.220 | 74 | Weighted Average |
| 2.060 | | 92.79% Pervious Area |
| 0.160 | | 7.21% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.0 | 50 | 0.1220 | 0.14 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20" |
| 1.0 | 107 | 0.1210 | 1.74 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.5 | 119 | 0.2770 | 3.68 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 7.5 | 276 | Total | | | |

## Subcatchment 1S: Subarea PA



## Summary for Subcatchment 2S: Subarea PB

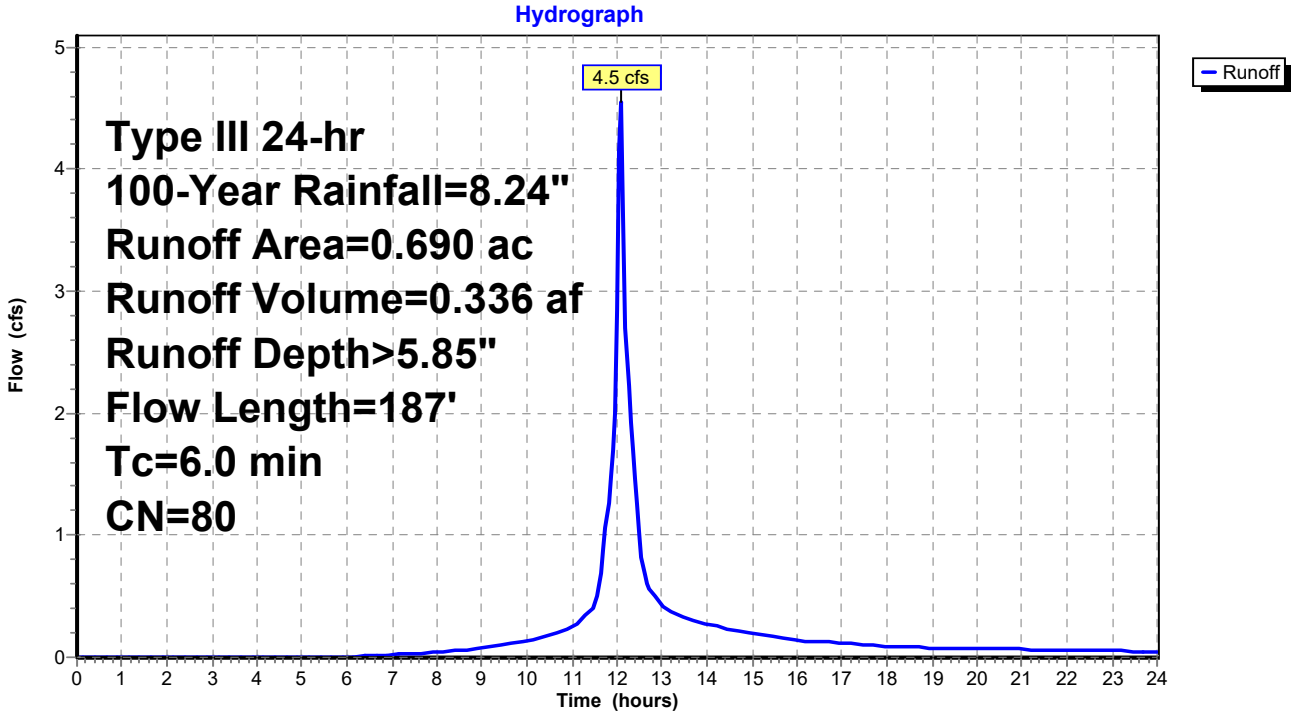
Runoff = 4.5 cfs @ 12.09 hrs, Volume= 0.336 af, Depth> 5.85"
Routed to Pond 5P : Infiltration Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.24"

| Area (ac) | CN | Description |
|---|---|---|
| 0.040 | 98 | Roofs, HSG C |
| 0.120 | 98 | Paved parking, HSG C |
| 0.530 | 74 | >75% Grass cover, Good, HSG C |
| 0.690 | 80 | Weighted Average |
| 0.530 | | 76.81% Pervious Area |
| 0.160 | | 23.19% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 0.7 | 50 | 0.0200 | 1.20 | | **Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20" |
| 0.5 | 85 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.3 | 52 | 0.1940 | 3.08 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 1.5 | 187 | Total, Increased to minimum Tc = 6.0 min | | | |

### Subcatchment 2S: Subarea PB



## Summary for Subcatchment 3S: Subarea PC

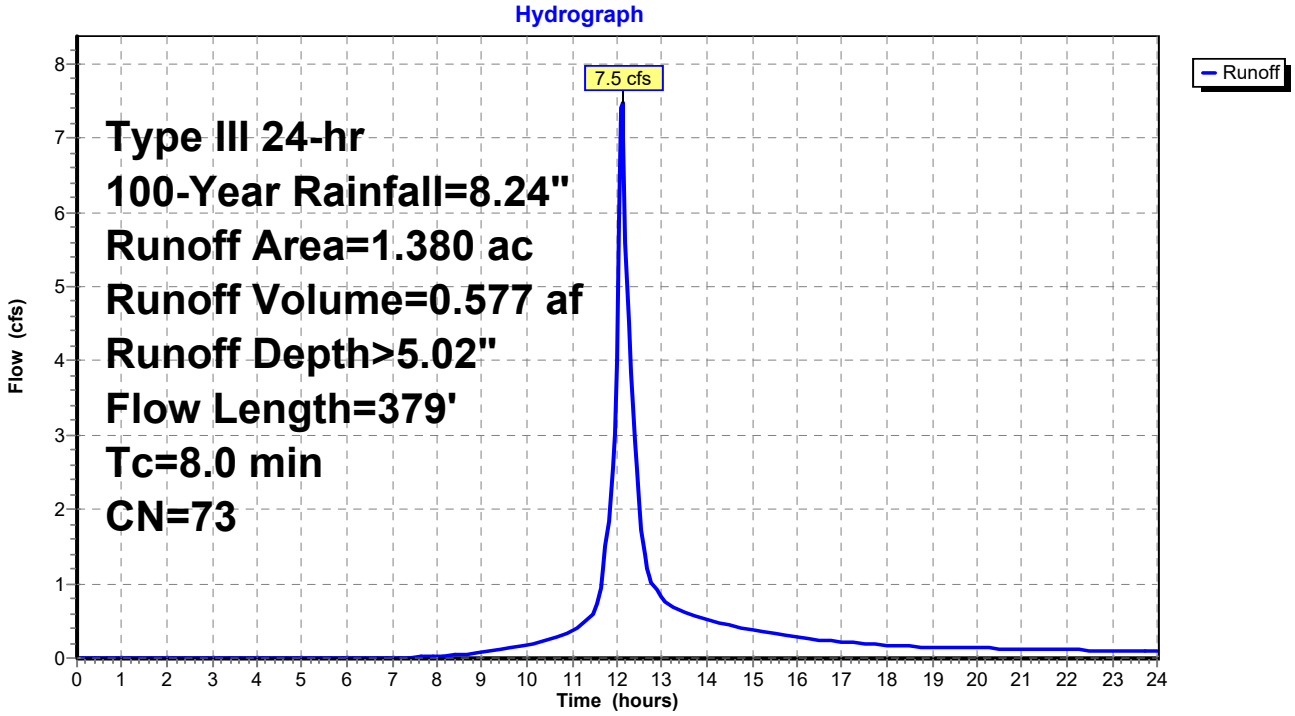
Runoff = 7.5 cfs @ 12.11 hrs, Volume= 0.577 af, Depth> 5.02"
Routed to Reach 6R : Isolated Wetland

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.24"

| Area (ac) | CN | Description |
|---|---|---|
| 0.040 | 98 | Roofs, HSG C |
| 0.760 | 74 | >75% Grass cover, Good, HSG C |
| 0.580 | 70 | Woods, Good, HSG C |
| 1.380 | 73 | Weighted Average |
| 1.340 | | 97.10% Pervious Area |
| 0.040 | | 2.90% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 50 | 0.2220 | 0.18 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20" |
| 0.9 | 110 | 0.1800 | 2.12 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 1.5 | 148 | 0.0540 | 1.63 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.9 | 71 | 0.0630 | 1.25 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 8.0 | 379 | Total | | | |

## Subcatchment 3S: Subarea PC



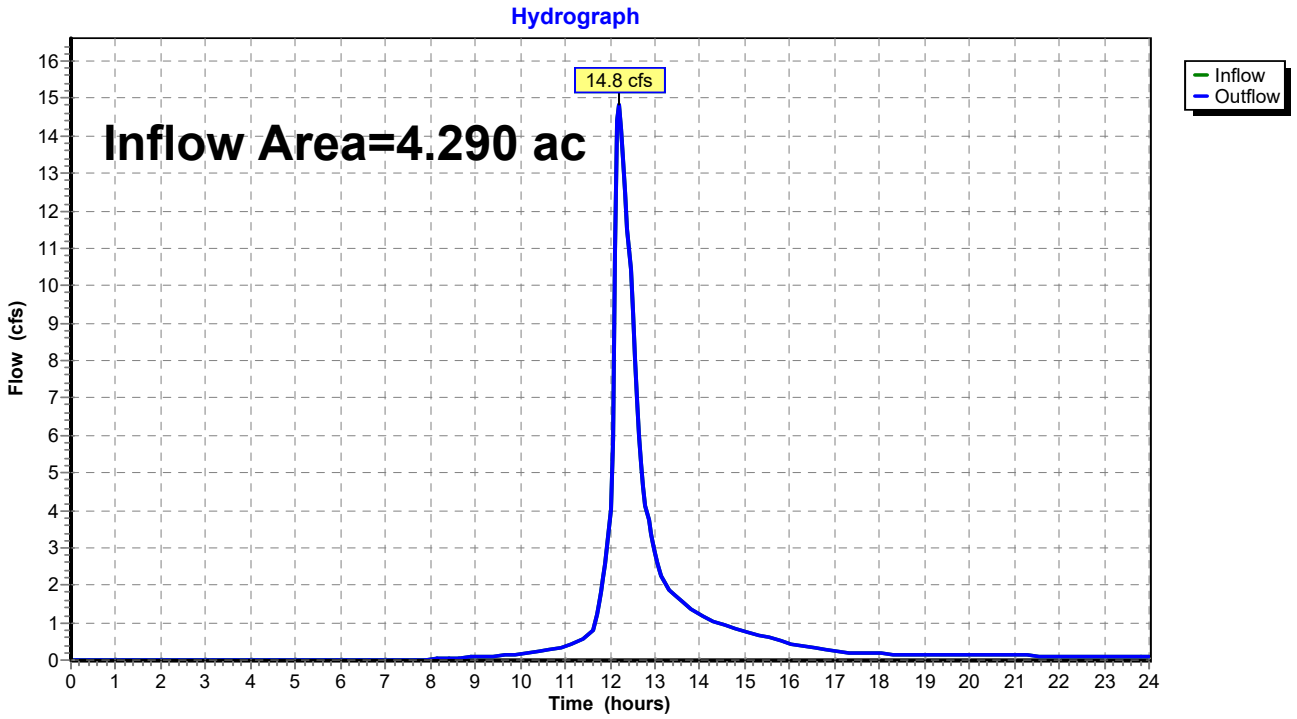
## Summary for Reach 6R: Isolated Wetland

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.290 ac, 8.39% Impervious, Inflow Depth > 3.33" for 100-Year event
Inflow = 14.8 cfs @ 12.20 hrs, Volume= 1.190 af
Outflow = 14.8 cfs @ 12.20 hrs, Volume= 1.190 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Reach 6R: Isolated Wetland



## Summary for Pond 4P: Detention Pond

Inflow Area = 2.220 ac, 7.21% Impervious, Inflow Depth > 5.14" for 100-Year event
Inflow = 12.5 cfs @ 12.11 hrs, Volume= 0.950 af
Outflow = 8.2 cfs @ 12.22 hrs, Volume= 0.939 af, Atten= 35%, Lag= 6.9 min
Primary = 8.2 cfs @ 12.22 hrs, Volume= 0.939 af
Routed to Pond 5P : Infiltration Pond

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 303.96' @ 12.22 hrs Surf.Area= 0.091 ac Storage= 0.145 af

Plug-Flow detention time= 22.4 min calculated for 0.937 af (99% of inflow)
Center-of-Mass det. time= 15.7 min ( 831.5 - 815.8 )

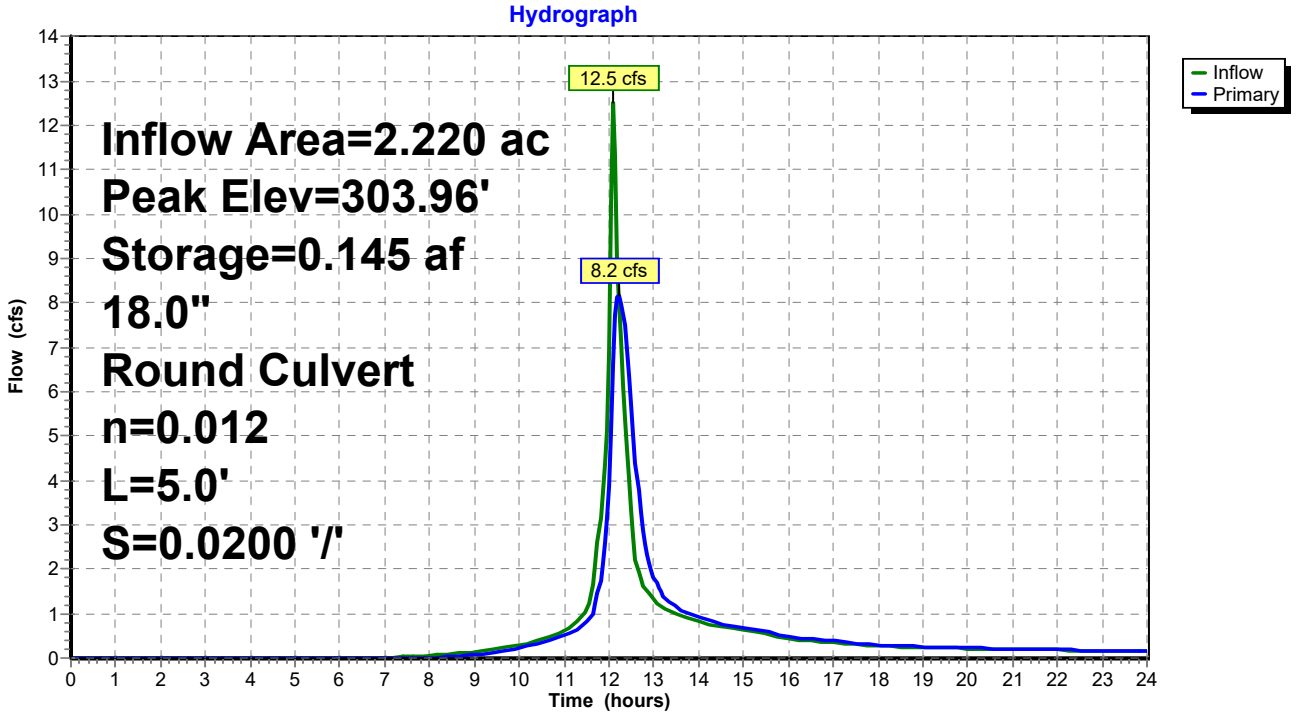
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 302.00' | 0.199 af | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (acres) | Perim. (feet) | Inc.Store (acre-feet) | Cum.Store (acre-feet) | Wet.Area (acres) |
|---|---|---|---|---|---|
| 302.00 | 0.058 | 224.0 | 0.000 | 0.000 | 0.058 |
| 304.00 | 0.092 | 265.0 | 0.149 | 0.149 | 0.096 |
| 304.50 | 0.111 | 284.0 | 0.051 | 0.199 | 0.116 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 302.00' | **18.0" Round Culvert**<br>L= 5.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 302.00' / 301.90' S= 0.0200 '/' Cc= 0.900<br>n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf |

**Primary OutFlow** Max=8.1 cfs @ 12.22 hrs HW=303.95' (Free Discharge)
**1=Culvert** (Barrel Controls 8.1 cfs @ 4.62 fps)

## Pond 4P: Detention Pond



## Stage-Area-Storage for Pond 4P: Detention Pond

| Elevation (feet) | Surface (acres) | Storage (acre-feet) |
|---|---|---|
| 302.00 | 0.058 | 0.000 |
| 302.05 | 0.059 | 0.003 |
| 302.10 | 0.060 | 0.006 |
| 302.15 | 0.060 | 0.009 |
| 302.20 | 0.061 | 0.012 |
| 302.25 | 0.062 | 0.015 |
| 302.30 | 0.063 | 0.018 |
| 302.35 | 0.063 | 0.021 |
| 302.40 | 0.064 | 0.024 |
| 302.45 | 0.065 | 0.028 |
| 302.50 | 0.066 | 0.031 |
| 302.55 | 0.067 | 0.034 |
| 302.60 | 0.067 | 0.038 |
| 302.65 | 0.068 | 0.041 |
| 302.70 | 0.069 | 0.044 |
| 302.75 | 0.070 | 0.048 |
| 302.80 | 0.071 | 0.051 |
| 302.85 | 0.071 | 0.055 |
| 302.90 | 0.072 | 0.059 |
| 302.95 | 0.073 | 0.062 |
| 303.00 | 0.074 | 0.066 |
| 303.05 | 0.075 | 0.070 |
| 303.10 | 0.076 | 0.073 |
| 303.15 | 0.077 | 0.077 |
| 303.20 | 0.077 | 0.081 |
| 303.25 | 0.078 | 0.085 |
| 303.30 | 0.079 | 0.089 |
| 303.35 | 0.080 | 0.093 |
| 303.40 | 0.081 | 0.097 |
| 303.45 | 0.082 | 0.101 |
| 303.50 | 0.083 | 0.105 |
| 303.55 | 0.084 | 0.109 |
| 303.60 | 0.085 | 0.113 |
| 303.65 | 0.085 | 0.118 |
| 303.70 | 0.086 | 0.122 |
| 303.75 | 0.087 | 0.126 |
| 303.80 | 0.088 | 0.131 |
| 303.85 | 0.089 | 0.135 |
| 303.90 | 0.090 | 0.140 |
| 303.95 | 0.091 | 0.144 |
| 304.00 | 0.092 | 0.149 |
| 304.05 | 0.094 | 0.153 |
| 304.10 | 0.096 | 0.158 |
| 304.15 | 0.098 | 0.163 |
| 304.20 | 0.099 | 0.168 |
| 304.25 | 0.101 | 0.173 |
| 304.30 | 0.103 | 0.178 |
| 304.35 | 0.105 | 0.183 |
| 304.40 | 0.107 | 0.188 |
| 304.45 | 0.109 | 0.194 |
| 304.50 | **0.111** | **0.199** |

## Summary for Pond 5P: Infiltration Pond

Inflow Area = 2.910 ac, 11.00% Impervious, Inflow Depth > 5.26" for 100-Year event
Inflow = 11.4 cfs @ 12.14 hrs, Volume= 1.276 af
Outflow = 10.3 cfs @ 12.26 hrs, Volume= 1.184 af, Atten= 9%, Lag= 7.5 min
Discarded = 0.6 cfs @ 12.26 hrs, Volume= 0.571 af
Primary = 9.7 cfs @ 12.26 hrs, Volume= 0.613 af
Routed to Reach 6R : Isolated Wetland

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 291.95' @ 12.26 hrs Surf.Area= 0.151 ac Storage= 0.252 af

Plug-Flow detention time= 95.4 min calculated for 1.184 af (93% of inflow)
Center-of-Mass det. time= 58.8 min ( 882.3 - 823.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 290.00' | 0.339 af | **Custom Stage Data (Irregular)** Listed below (Recalc) |

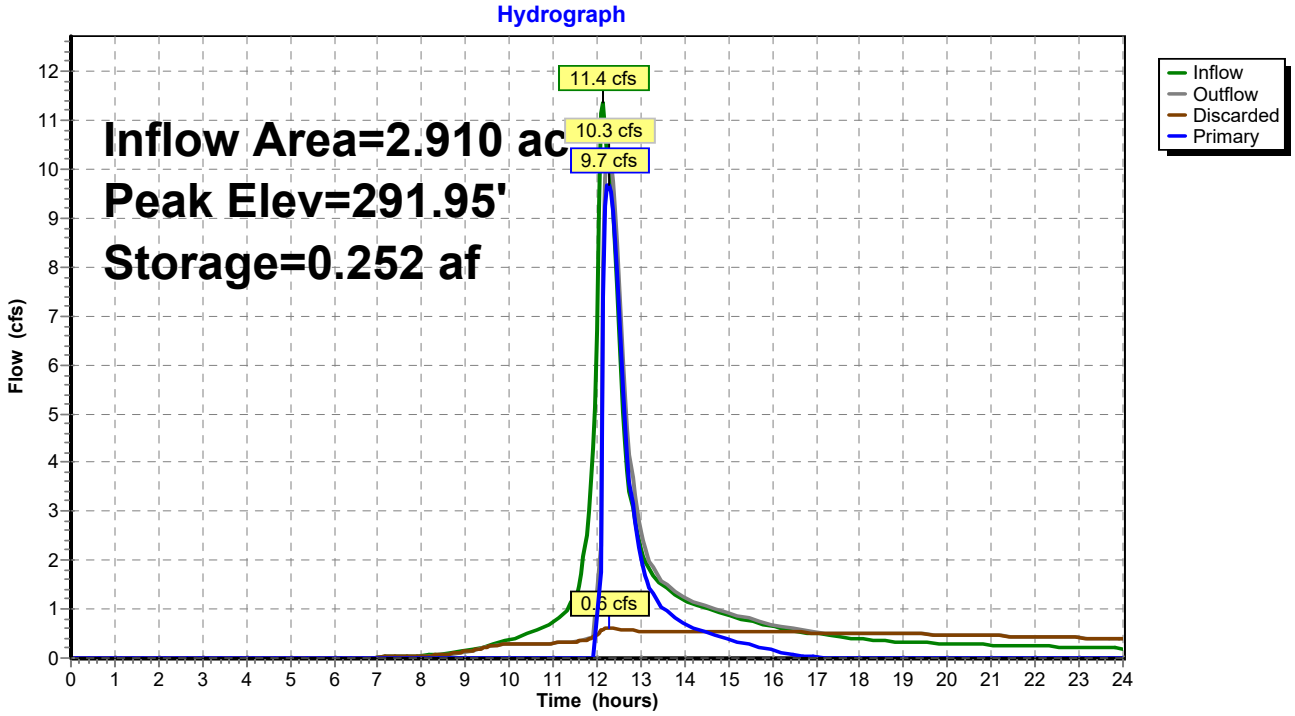
| Elevation (feet) | Surf.Area (acres) | Perim. (feet) | Inc.Store (acre-feet) | Cum.Store (acre-feet) | Wet.Area (acres) |
|---|---|---|---|---|---|
| 290.00 | 0.109 | 220.0 | 0.000 | 0.000 | 0.109 |
| 292.00 | 0.152 | 331.0 | 0.260 | 0.260 | 0.221 |
| 292.50 | 0.164 | 340.0 | 0.079 | 0.339 | 0.233 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 290.00' | **2.410 in/hr Exfiltration over Surface area**<br>Conductivity to Groundwater Elevation = 287.50' |
| #2 | Primary | 291.50' | **10.0' long x 0.50' rise Sharp-Crested Rectangular Weir**<br>2 End Contraction(s) |

**Discarded OutFlow** Max=0.6 cfs @ 12.26 hrs HW=291.95' (Free Discharge)
↑—**1=Exfiltration** ( Controls 0.6 cfs)

**Primary OutFlow** Max=9.6 cfs @ 12.26 hrs HW=291.95' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 9.6 cfs @ 2.18 fps)

## Pond 5P: Infiltration Pond



## Stage-Area-Storage for Pond 5P: Infiltration Pond

| Elevation (feet) | Surface (acres) | Storage (acre-feet) |
|---|---|---|
| 290.00 | 0.109 | 0.000 |
| 290.05 | 0.110 | 0.005 |
| 290.10 | 0.111 | 0.011 |
| 290.15 | 0.112 | 0.017 |
| 290.20 | 0.113 | 0.022 |
| 290.25 | 0.114 | 0.028 |
| 290.30 | 0.115 | 0.034 |
| 290.35 | 0.116 | 0.039 |
| 290.40 | 0.117 | 0.045 |
| 290.45 | 0.118 | 0.051 |
| 290.50 | 0.119 | 0.057 |
| 290.55 | 0.120 | 0.063 |
| 290.60 | 0.121 | 0.069 |
| 290.65 | 0.122 | 0.075 |
| 290.70 | 0.123 | 0.081 |
| 290.75 | 0.124 | 0.087 |
| 290.80 | 0.125 | 0.094 |
| 290.85 | 0.126 | 0.100 |
| 290.90 | 0.127 | 0.106 |
| 290.95 | 0.129 | 0.113 |
| 291.00 | 0.130 | 0.119 |
| 291.05 | 0.131 | 0.126 |
| 291.10 | 0.132 | 0.132 |
| 291.15 | 0.133 | 0.139 |
| 291.20 | 0.134 | 0.146 |
| 291.25 | 0.135 | 0.152 |
| 291.30 | 0.136 | 0.159 |
| 291.35 | 0.137 | 0.166 |
| 291.40 | 0.138 | 0.173 |
| 291.45 | 0.139 | 0.180 |
| 291.50 | 0.141 | 0.187 |
| 291.55 | 0.142 | 0.194 |
| 291.60 | 0.143 | 0.201 |
| 291.65 | 0.144 | 0.208 |
| 291.70 | 0.145 | 0.215 |
| 291.75 | 0.146 | 0.223 |
| 291.80 | 0.147 | 0.230 |
| 291.85 | 0.149 | 0.237 |
| 291.90 | 0.150 | 0.245 |
| 291.95 | 0.151 | 0.252 |
| 292.00 | 0.152 | 0.260 |
| 292.05 | 0.153 | 0.267 |
| 292.10 | 0.154 | 0.275 |
| 292.15 | 0.156 | 0.283 |
| 292.20 | 0.157 | 0.291 |
| 292.25 | 0.158 | 0.299 |
| 292.30 | 0.159 | 0.306 |
| 292.35 | 0.160 | 0.314 |
| 292.40 | 0.162 | 0.323 |
| 292.45 | 0.163 | 0.331 |
| 292.50 | **0.164** | **0.339** |

## TABLE OF CONTENTS

**Project Reports**
1 Routing Diagram
2 Rainfall Events Listing (selected events)
3 Area Listing (all nodes)
4 Soil Listing (all nodes)

**2-Year Event**
5 Node Listing
6 Subcat 1S: Subarea PA
8 Subcat 2S: Subarea PB
9 Subcat 3S: Subarea PC
11 Reach 6R: Isolated Wetland
12 Pond 4P: Detention Pond
15 Pond 5P: Infiltration Pond

**10-Year Event**
18 Node Listing
19 Subcat 1S: Subarea PA
21 Subcat 2S: Subarea PB
22 Subcat 3S: Subarea PC
24 Reach 6R: Isolated Wetland
25 Pond 4P: Detention Pond
28 Pond 5P: Infiltration Pond

**100-Year Event**
31 Node Listing
32 Subcat 1S: Subarea PA
34 Subcat 2S: Subarea PB
35 Subcat 3S: Subarea PC
37 Reach 6R: Isolated Wetland
38 Pond 4P: Detention Pond
41 Pond 5P: Infiltration Pond

## APPENDIX B – STORM WATER WORKSHEETS

Required Recharge Volume and Drawdown Worksheet (*Previously Submitted)
TSS Removal Worksheet (*Previously Submitted)
Checklist for Stormwater Report (*Previously Submitted)
Ground Water Mounding Summary Worksheet (*Previously Submitted)
Rip-Rap Calculations

**PIPE OUTLET PROTECTION APRON DESIGN**
**And**
**$d_{50}$ RIPRAP SIZING**

| | | | | | |
|---|---|---|---|---|---|
| | | | | **Outlet Name -** | FES#2 |
| PROJECT NAME : | Symphony drive Extension | | | | |
| PROJECT # : | 25-0108 | | | | |
| BY : | CG | | CHECKED BY : | WBJr | |
| DATE : | 2/10/2026 | STORM: | 25-yr | DATE : | |

| **DOWMSTREAM CHANNEL (OR SPREADER) HYDRAULICS** | | | |
|---|---|---|---|
| Culvert Diameter (Do) = | 18 | Inches | |
| Peak Discharge Required = | 5.90 | cfs | |
| Channel Bottom Width = | 4.5 | Feet | **(3 x Do) all cases** |
| Hydraulic Gradient = | 0.00100 | Feet/Feet | (Est from Apron Outlet Depth to Pipe Outlet Depth) |
| Left Side Slope = | 3.0 | :1(h:v) | |
| Right Side Slope = | 3.0 | :1(h:v) | |
| Depth of Flow* = | 0.840 | Feet | |
| Manning's "n" = | 0.0335 | Please refer to Figure 7-52 of HANDBOOK | |
| Area = | 5.90 | Square Feet | |
| Wetted Perimeter = | 9.81 | Feet | |
| Hydraulic Radius = | 0.60 | Feet | |
| Top Width = | 9.54 | Feet | |
| Velocity = | 1.00 | Feet/Second | |
| Peak Discharge Calculated = | 5.90 | cfs | Q calc should approx = Q required |
| **Q**calc - **Q**required = | 0.00 | **Calculation OK** | |

**La AND W CALCULATIONS:**

| | | |
|---|---|---|
| Culvert Diameter (Do) = | 18.0 | Inches |
| Tail Water Depth (TW)* = | 0.84 | Feet |
| Length of Apron (La) = | 20 | Feet |
| Width of Apron @ D.S End - (W) = | 13 | Feet |
| Width of D.S. Apron if Channel - (W) = | 9.5 | Feet |

Assumes Channel Bottom at the Culvert Equals the Invert Outlet Elevation of the Pipe. If this is not the case, the calculations involving the Tailwater will have to be calculated by hand.

***If outletting to Flat Area use TW depth = 0.2 x Do**

**ROCK RIPRAP SIZE**

$d_{50}$ = 0.17 Feet or 2.03 Inches

$d_{50} = (0.02 \times Q^{4/3})/(Tw \times Do)$

**ROCK RIPRAP GRADATION (TABLE 7-24 OF NHDES HANDBOOK)**

| % of Weight Smaller Than The Given Size | Size of Stone in Inches | | |
|---|---|---|---|
| 100 | ---------- | to | 4.1 |
| 85 | 2.6 | to | 3.7 |
| 50 | 2.0 | to | 3.0 |
| 15 | 0.6 | to | 1.0 |

Minimum Rock Riprap Blanket Thickness = 6.1 Inches
Minimum Six inch Sand/Gravel Bedding or Geotextile Fabric Required Under All Rock Riprap

**FORMULAS USED (Reference NHDES HANDBOOK, Pages 7-114, 7-115)**

| | |
|---|---|
| Manning's Uniform Channel Flow - | Q = (A x 1.486 x R^(2/3) x S^(1/2))/"n" |
| Length of Apron (La) TW< Do/2 - | La = (1.8 x Q/Do^1.5) + 7 x Do |
| Length of Apron (La) TW>= Do/2 - | La = 3.0 x Q/Do^1.5 + 7 x Do |
| Width of Apron @ D.S End TW < Do/2 - | W = 3 x Do + La |
| Width of Apron @ D.S End TW >= Do/2 - | W = 3 x Do + 0.4 x La |
| Width of D.S. Apron if in Channel - | Ch. BW +Sum of Side Slopes x Flow Depth |
| Width of Apron @ Culvert - | Wc = 3 x Do |

Bay Colony Group, Inc.
4 School Street
Foxborough, MA 02035

**PIPE OUTLET PROTECTION APRON DESIGN**
**And**
**$d_{50}$ RIPRAP SIZING**

| | | | | | |
|---|---|---|---|---|---|
| | | | | **Outlet Name -** | FES#4 |
| PROJECT NAME : | Symphony drive Extension | | | | |
| PROJECT # : | 25-0108 | | | | |
| BY : | CG | | | CHECKED BY : | WBJr |
| DATE : | 2/10/2026 | STORM: | 25-yr | DATE : | |

| **DOWMSTREAM CHANNEL (OR SPREADER) HYDRAULICS** | | | |
|---|---|---|---|
| Culvert Diameter (Do) = | 6 | Inches | |
| Peak Discharge Required = | 8.00 | cfs | |
| Channel Bottom Width = | 1.5 | Feet | **(3 x Do) all cases** |
| Hydraulic Gradient = | 0.00100 | Feet/Feet | (Est from Apron Outlet Depth to Pipe Outlet Depth) |
| Left Side Slope = | 3.0 | :1(h:v) | |
| Right Side Slope = | 3.0 | :1(h:v) | |
| Depth of Flow* = | 1.272 | Feet | |
| Manning's "n" = | 0.0315 | Please refer to Figure 7-52 of HANDBOOK | |
| Area = | 6.76 | Square Feet | |
| Wetted Perimeter = | 9.54 | Feet | |
| Hydraulic Radius = | 0.71 | Feet | |
| Top Width = | 9.13 | Feet | |
| Velocity = | 1.18 | Feet/Second | |
| Peak Discharge Calculated = | 8.01 | cfs | Q calc should approx = Q required |
| **Q**calc - **Q**required = | 0.01 | **Calculation OK** | |

**La AND W CALCULATIONS:**

| | | |
|---|---|---|
| Culvert Diameter (Do) = | 18.0 | Inches |
| Tail Water Depth (TW)* = | 1.27 | Feet |
| Length of Apron (La) = | 24 | Feet |
| Width of Apron @ D.S End - (W) = | 14 | Feet |
| Width of D.S. Apron if Channel - (W) = | 9.1 | Feet |

Assumes Channel Bottom at the Culvert Equals the Invert Outlet Elevation of the Pipe. If this is not the case, the calculations involving the Tailwater will have to be calculated by hand.

***If outletting to Flat Area use TW depth = 0.2 x Do**

**ROCK RIPRAP SIZE**

$d_{50}$ = 0.17 Feet or 2.01 Inches

$d_{50} = (0.02 \times Q^{4/3})/(Tw \times Do)$

**ROCK RIPRAP GRADATION (TABLE 7-24 OF NHDES HANDBOOK)**

| % of Weight Smaller Than The Given Size | Size of Stone in Inches | | |
|---|---|---|---|
| 100 | ---------- | to | 4.0 |
| 85 | 2.6 | to | 3.6 |
| 50 | 2.0 | to | 3.0 |
| 15 | 0.6 | to | 1.0 |

Minimum Rock Riprap Blanket Thickness = 6.0 Inches
Minimum Six inch Sand/Gravel Bedding or Geotextile Fabric Required Under All Rock Riprap

**FORMULAS USED (Reference NHDES HANDBOOK, Pages 7-114, 7-115)**

| | |
|---|---|
| Manning's Uniform Channel Flow - | Q = (A x 1.486 x R^(2/3) x S^(1/2))/"n" |
| Length of Apron (La) TW< Do/2 - | La = (1.8 x Q/Do^1.5) + 7 x Do |
| Length of Apron (La) TW>= Do/2 - | La = 3.0 x Q/Do^1.5 + 7 x Do |
| Width of Apron @ D.S End TW < Do/2 - | W = 3 x Do + La |
| Width of Apron @ D.S End TW >= Do/2 - | W = 3 x Do + 0.4 x La |
| Width of D.S. Apron if in Channel - | Ch. BW +Sum of Side Slopes x Flow Depth |
| Width of Apron @ Culvert - | Wc = 3 x Do |

Bay Colony Group, Inc.
4 School Street
Foxborough, MA 02035

# APPENDIX C - OPERATION AND MAINTENANCE PLAN FOR STORM WATER BMPS

Construction Period O & M Plan
Post-Construction O & M Plan

**Appendix C: LONG TERM OPERATION AND MAINTENANCE PLAN FOR STORMWATER BMPs**
**Symphony Drive Extension Franklin, MA**

| | During Construction | Post-construction |
|---|---|---|
| *BMP Owner:* | **Owner** | **HOA** |
| *Party of Plan Responsibility:* | **Owner** | **HOA** |

**References:**

- Private Definitive Plan of Land of land in Franklin, MA Tanglewood Estates II Symphony Drive Extensions dated December 4, 2025 Rev. February 10, 2026
- Storm Water Report "Symphony Drive Extension" Franklin, MA dated December, 2025 Rev. February, 2026

**Operation and Maintenance**

Infiltration Basin: Once the infiltration systems are in use, inspect it after every major storm (3.2 inches in 24 hours) for the first few months to ensure it is functioning properly and if necessary, take corrective action. Note how long water remains standing in the basin after a storm; standing water within the basin 48 to 72 hours after a storm indicates that there is an issue. If the ponding is due to clogging, immediately address the reasons for the clogging (such as upland sediment erosion). If necessary, aerate the bottom or replace the top 6" with the same mixture used to create the basin. Thereafter, inspect the infiltration basin at least twice per year to ensure that it is dry. During the inspection mowing the basin is appropriate.

Sediment Forebays: Shall be inspected on the same schedule as the infiltration basins. Remove trash and silt from the basin and remove from the site.

**Estimated Operations and Maintenance Budget**

The following is an estimate of the O&M Budget, post construction.
Inspections (3 times per year): $200

**CONSTRUCTION PERIOD MAINTENANCE PLAN**
**FOR STORMWATER BMPs**
**Symphony Drive Extension Franklin, MA**

**References:**

- Private Definitive Plan of Land of land in Franklin, MA Tanglewood Estates II Symphony Drive Extensions dated December 4, 2025 Rev. February 10, 2026
- Storm Water Report "Symphony Drive Extension" Franklin, MA dated December, 2025 Rev. February, 2026

**Operation and Maintenance**

Item 1: During construction, **weekly** inspection of the crushed stone construction entrance pad and erosion control silt socks shall be conducted by a qualified staff member of the responsible party or an independent sediment and erosion control expert hired by the responsible party. Any displaced barriers shall be restored or repaired immediately.

Item 2: During construction every effort will be made to ensure that silt does not enter the infiltration basins. Additional silt socks shall be used as necessary. If silt does enter the basin, then clean out the bottom of the basin. Do not install the bottom material in the basin until the entire site has been stabilized.

Item 3: During construction, the stone pad at the entrance to the project shall be inspected **weekly** and replenished if siltation is impeding the cleaning of truck tires. Any materials tracked into the roadway shall be swept up within a day.

Item 4: The location of sediment basins shall not be in areas of proposed storm water basins. The basins shall be inspected weekly to ensure that the banks are stable and that the only clean runoff is exiting the structure.

## APPENDIX D – SOIL DATA

Soil Evaluation Forms
NRCS Soil Resource Report (*Previously Submitted)

No. 25-0108 Date: June 3, 2025

## Commonwealth of Massachusetts

## Franklin , Massachusetts

# *Soil Suitability Assessment for On-Site Sewage Disposal*

Performed By: William Buckley, Jr. Date: June 3, 2025

Witnessed By: Steve Donatelli

| Location Address or Lot #: | Owner's Name, Address, and , Telephone #: |
|---|---|
| Symphony Drive Extension<br>Franklin, MA 02038<br>New Construction: ☑ Repair ☐ | Cypress Real Estate Development, LLC<br>3 Rothchild Drive<br>Foxborough, MA 02035 781.223.1188 |

**Office Review**

Published Soil Survey Available: No ☐ Yes ☑

Year Published 1989 Publication Scale 1:25,000 Soil Map Unit Montauk FSL

Drainage Class C Soil Limitations Bedrock

Surficial Geology Report Available: No ☐ Yes ☑

Year Published 1992 Publication Scale 1:250,000

Geologic Material (Map Unit) Thin Till

Landform Side slope

Flood Insurance Rate Map:

Above 500 year flood boundary No ☐ Yes ☑

Within 500 year flood boundary No ☑ Yes ☐

Within 100 year flood boundary No ☑ Yes ☐

Wetland Area:

National Wetland Inventory Map (map unit) _____

Wetlands Conservancy Program Map (map unit) _____

Current Water Resource Conditions (USGS): Month June, 2025

Range: Above Normal ☑ Normal ☐ Below Normal ☐

Other References Reviewed: _____

Location Address or Lot No. Symphony Drive Extension

# *On-site Review*

Deep Hole Number: 1 Date: 6/3/2025 Time: 0800 Weather: 60°/Sunny

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 10% Surface Stones Some

Vegetation Mixed Woods

Landform Side slope

Position on landscape (sketch on back) See site plan

Distances from:

| | | | |
|---|---|---|---|
| Open Water Body | >150' | Drainageway | >100' |
| Possible Wet Area | >100' | Property Line | 25'+/- |
| Drinking Water Well | >100' | Other | |

**DEEP OBSERVATION HOLE LOG***

| Depth from Surface (inches) | Soil Horizon | Soil Texture (USDA) | Soil Color (Munsell) | Soil Mottling | Other (Structure, Stones, Boulders, Consistency, % Gravel) |
|---|---|---|---|---|---|
| 0" - 5" | A | SL | 10YR3/2 | | |
| 5" - 36" | B | SL | 5YR4/6 | | |
| 36" - 120" | C | LS | 7.5YR5/4 | | Gravelly, Cobbly, Coarse |

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Coarse-loamy over sandy lodgment till Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: 80" Weeping from Pit Face: 32"

Estimated Seasonal High Groundwater: 32"

Location Address or Lot No. Symphony Drive Extension

# *On-site Review*

Deep Hole Number: 2 Date: 6/3/2025 Time: 0830 Weather: 60°/Sunny

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 10% Surface Stones Some

Vegetation Mixed Woods

Landform Side slope

Position on landscape (sketch on back) See site plan

Distances from:

| | | | |
|---|---|---|---|
| Open Water Body | >150' | Drainageway | >100' |
| Possible Wet Area | >100' | Property Line | 25'+/- |
| Drinking Water Well | >100' | Other | |

**DEEP OBSERVATION HOLE LOG***

| Depth from Surface (inches) | Soil Horizon | Soil Texture (USDA) | Soil Color (Munsell) | Soil Mottling | Other (Structure, Stones, Boulders, Consistency, % Gravel) |
|---|---|---|---|---|---|
| 0" - 5" | A | SL | 10YR3/2 | | |
| 5" - 42" | B | SL | 5YR4/6 | | |
| 42" - 120" | C | LS | 7.5YR5/4 | | Gravelly, Cobbly, Coarse |

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Coarse-loamy over sandy lodgment till Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: 80" Weeping from Pit Face: 36"

Estimated Seasonal High Groundwater: 36"

Location Address or Lot No. Symphony Drive Extension

# *On-site Review*

Deep Hole Number: 3 Date: 6/3/2025 Time: 0900 Weather: 60°/Sunny

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 15% Surface Stones Some

Vegetation Mixed Woods

Landform Side slope

Position on landscape (sketch on back) See site plan

Distances from:

| | | | |
|---|---|---|---|
| Open Water Body | >150' | Drainageway | >100' |
| Possible Wet Area | >100' | Property Line | 25'+/- |
| Drinking Water Well | >100' | Other | |

**DEEP OBSERVATION HOLE LOG***

| Depth from Surface (inches) | Soil Horizon | Soil Texture (USDA) | Soil Color (Munsell) | Soil Mottling | Other (Structure, Stones, Boulders, Consistency, % Gravel) |
|---|---|---|---|---|---|
| 0" - 6" | A | SL | 10YR3/2 | | |
| 6" - 35" | B | SL | 10YR5/6 | | |
| 35" - 66" | B2 | SL | 5YR4/6 | | |

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Coarse-loamy over sandy lodgment till Depth to Bedrock: 66"

Depth to Groundwater Standing Water in Hole: _____ Weeping from Pit Face: _____

Estimated Seasonal High Groundwater: _____

Location Address or Lot No. Symphony Drive Extension

# *On-site Review*

Deep Hole Number: 4 Date: 6/3/2025 Time: 0930 Weather: 60°/Sunny

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 15% Surface Stones Some

Vegetation Mixed Woods

Landform Side slope

Position on landscape (sketch on back) See site plan

Distances from:

| | | | |
|---|---|---|---|
| Open Water Body | >150' | Drainageway | >100' |
| Possible Wet Area | >100' | Property Line | 25'+/- |
| Drinking Water Well | >100' | Other | |

**DEEP OBSERVATION HOLE LOG***

| Depth from Surface (inches) | Soil Horizon | Soil Texture (USDA) | Soil Color (Munsell) | Soil Mottling | Other (Structure, Stones, Boulders, Consistency, % Gravel) |
|---|---|---|---|---|---|
| 0" - 6" | A | SL | 10YR3/2 | | |
| 6" - 36" | B | SL | 10YR5/6 | | |
| 36" - 60" | B2 | SL | 5YR4/6 | | |

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Coarse-loamy over sandy lodgment till Depth to Bedrock: 60"

Depth to Groundwater Standing Water in Hole: _____ Weeping from Pit Face: _____

Estimated Seasonal High Groundwater: _____

Location Address or Lot No. Symphony Drive Extension

# *On-site Review*

Deep Hole Number: 5 Date: 6/3/2025 Time: 1000 Weather: 60°/Sunny

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 10% Surface Stones Some

Vegetation Mixed Woods

Landform Side slope

Position on landscape (sketch on back) See site plan

Distances from:

| | | | |
|---|---|---|---|
| Open Water Body | >150' | Drainageway | >100' |
| Possible Wet Area | >100' | Property Line | 25'+/- |
| Drinking Water Well | >100' | Other | |

**DEEP OBSERVATION HOLE LOG***

| Depth from Surface (inches) | Soil Horizon | Soil Texture (USDA) | Soil Color (Munsell) | Soil Mottling | Other (Structure, Stones, Boulders, Consistency, % Gravel) |
|---|---|---|---|---|---|
| 0" - 6" | A | SL | 10YR3/2 | | |
| 6" - 36" | B | SL | 10YR5/6 | | |
| 36" - 62" | B2 | SL | 5YR4/6 | | |

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Coarse-loamy over sandy lodgment till Depth to Bedrock: 62"

Depth to Groundwater Standing Water in Hole: _____ Weeping from Pit Face: _____

Estimated Seasonal High Groundwater: _____

Location Address or Lot No. Symphony Drive Extension

# *On-site Review*

Deep Hole Number: 6 Date: 6/3/2025 Time: 1030 Weather: 60°/Sunny

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 10% Surface Stones Some

Vegetation Mixed Woods

Landform Side slope

Position on landscape (sketch on back) See site plan

Distances from:

| | | | |
|---|---|---|---|
| Open Water Body | >150' | Drainageway | >100' |
| Possible Wet Area | >100' | Property Line | 25'+/- |
| Drinking Water Well | >100' | Other | |

**DEEP OBSERVATION HOLE LOG***

| Depth from Surface (inches) | Soil Horizon | Soil Texture (USDA) | Soil Color (Munsell) | Soil Mottling | Other (Structure, Stones, Boulders, Consistency, % Gravel) |
|---|---|---|---|---|---|
| 0" - 6" | A | SL | 10YR3/2 | | |
| 6" - 24" | B | SL | 5YR4/6 | | |
| 24" - 60" | B2 | SL | 5YR3/4 | | |
| 60" - 120" | C | LS | 7.5YR5/4 | | Gravelly, Cobbly, Coarse |

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Coarse-loamy over sandy lodgment till Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: 80" Weeping from Pit Face: 29"

Estimated Seasonal High Groundwater: 29"

Location Address or Lot No. Symphony Drive Extension

# ***On-site Review***

Deep Hole Number: 7 Date: 6/3/2025 Time: 1100 Weather: 60°/Sunny

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 10% Surface Stones Some

Vegetation Mixed Woods

Landform Side slope

Position on landscape (sketch on back) See site plan

Distances from:

| | | | |
|---|---|---|---|
| Open Water Body | >150' | Drainageway | >100' |
| Possible Wet Area | >100' | Property Line | 25'+/- |
| Drinking Water Well | >100' | Other | |

**DEEP OBSERVATION HOLE LOG***

| Depth from Surface (inches) | Soil Horizon | Soil Texture (USDA) | Soil Color (Munsell) | Soil Mottling | Other (Structure, Stones, Boulders, Consistency, % Gravel) |
|---|---|---|---|---|---|
| 0" - 6" | A | SL | 10YR3/2 | | |
| 6" - 30" | B | SL | 5YR4/6 | | |
| 30" - 120" | C | LS | 7.5YR5/4 | | Gravelly, Cobbly, Coarse |

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Coarse-loamy over sandy lodgment till Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: Weeping from Pit Face: 29"

Estimated Seasonal High Groundwater: 29"

No. 25-0108 Date: February 17, 2025

## Commonwealth of Massachusetts

## Franklin , Massachusetts

# *Soil Suitability Assessment for On-Site Sewage Disposal*

Performed By: Cameron Gray Date: February 17, 2025

Witnessed By: _____

| Location Address or Lot #: | Owner's Name, Address, and , Telephone #: |
|---|---|
| Symphony Drive Extension<br>Franklin, MA 02038<br>New Construction: ☑ Repair ☐ | Cypress Real Estate Development, LLC<br>3 Rothchild Drive<br>Foxborough, MA 02035 781.223.1188 |

**Office Review**

Published Soil Survey Available: No ☐ Yes ☑

Year Published 1989 Publication Scale 1:25,000 Soil Map Unit Montauk FSL

Drainage Class C Soil Limitations Bedrock

Surficial Geology Report Available: No ☐ Yes ☑

Year Published 1992 Publication Scale 1:250,000

Geologic Material (Map Unit) Thin till

Landform Side slope

Flood Insurance Rate Map:

Above 500 year flood boundary No ☐ Yes ☑

Within 500 year flood boundary No ☑ Yes ☐

Within 100 year flood boundary No ☑ Yes ☐

Wetland Area:

National Wetland Inventory Map (map unit) _____

Wetlands Conservancy Program Map (map unit) _____

Current Water Resource Conditions (USGS): Month February, 2026

Range: Above Normal ☐ Normal ☐ Below Normal ☑

Other References Reviewed: _____

Location Address or Lot No. Symphony Drive Extension

# *On-site Review*

Deep Hole Number: 8 Date: 2/17/2026 Time: 0930 Weather: 27°/Cloudy

Location (identify on site plan) See site plan

Land Use Vacant Slope (%) 10% Surface Stones Some

Vegetation Mixed Woods

Landform Side slope

Position on landscape (sketch on back) See site plan

Distances from:

| | | | |
|---|---|---|---|
| Open Water Body | >150' | Drainageway | >100' |
| Possible Wet Area | >100' | Property Line | 25'+/- |
| Drinking Water Well | >100' | Other | |

**DEEP OBSERVATION HOLE LOG***

| Depth from Surface (inches) | Soil Horizon | Soil Texture (USDA) | Soil Color (Munsell) | Soil Mottling | Other (Structure, Stones, Boulders, Consistency, % Gravel) |
|---|---|---|---|---|---|
| 0" - 5" | A | SL | 10YR3/2 | 66" | |
| 5" - 36" | B | SL | 5YR4/6 | | |
| 36" - 120" | C | LS | 7.5YR5/4 | | Gravelly, Cobbly, Coarse |

*MINIMUM OF TWO HOLES REQUIRED AT EVERY DISPOSAL AREA

Parent Material (geologic) Coarse-loamy over sandy lodgment till Depth to Bedrock:

Depth to Groundwater Standing Water in Hole: 120" Weeping from Pit Face: 96"

Estimated Seasonal High Groundwater: 66"

An official website of the United States government Here's how you know

USGS science for a changing world

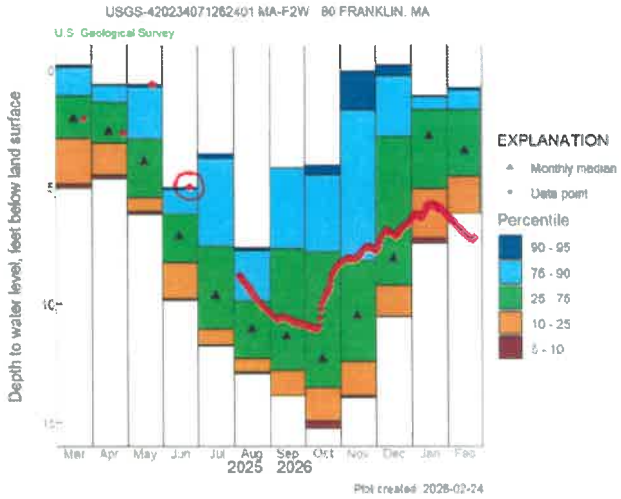
New England Water Science Center

**Site Information**

**Site: USGS-420234071262401 MA-F2W 80 FRANKLIN, MA**
**Location: Norfolk County, Massachusetts**
**Hydrologic Unit: 010900010601**
**Aquifer: Bedrock**
**Site Type: GW, continuous, Climate Response Network: NA**
**Land surface datum: 304.38 feet above NAVD88**
**Depth of well: 800 feet**
**Period of record: 2013-11-25 to 2026-02-23**
**Lowest approved groundwater level: 15.25 feet on 2014-10-31**
**Highest approved groundwater level: 0.21 feet on 2014-03-31**

View Data on Monitoring Location Page

**Groundwater Levels**



OWNER:
MARY DAVIS & MICHAEL DAVIS

DEED REFERENCE:
DEED BOOK 18693 PAGE 574

TOTAL LOT AREA = 752,037± S.F.

TAX ASSESSORS PARCEL ID:
313-65

ZONING DISTRICT:
GENERAL RESIDENTIAL V

TOWN OF FRANKLIN
DIMENSIONAL REGULATIONS

LOT AREA: 10,000 SF
LOT FRONTAGE: 100'
FRONT YARD SETBACK: 20'
SIDE YARD SETBACK: 10'
REAR YARD SETBACK: 20'

OWNER TO VERIFY THE ZONING REGULATIONS WITH THE TOWN OF FRANKLIN BUILDING DEPARTMENT.

NOTES:

ALL OFFSETS & DIMENSIONS ARE TO THE SIDING UNLESS OTHERWISE NOTED.

ELEVATIONS ARE BASED NAVD 88 DATUM.

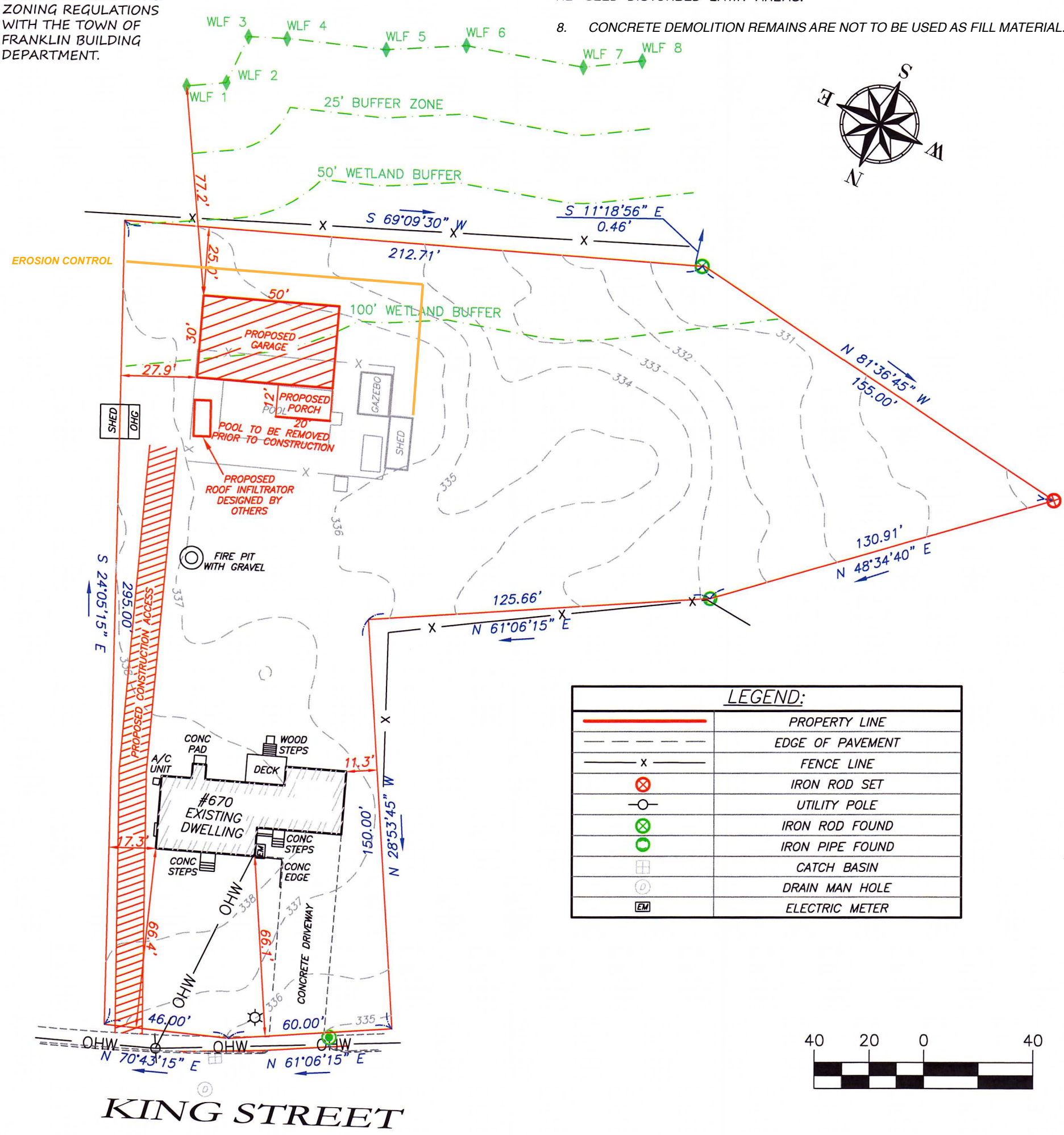
AC=AIR CONDITIONING
BH=BULKHEAD
EM=ELECTRIC METER
GM=GAS METER
OHW=OVERHEAD WIRES
S=SEWER
W=WATER
WL=WOOD LANDING

CONSTRUCTION SEQUENCE & SCHEDULE

1. RECORD THE ORDER OF CONDITIONS AT THE REGISTRY OF DEEDS AND PROVIDE PROOF OF THE RECORDING TO THE COMMISSION PRIOR TO THE START OF CLEAN-UP ACTIVITIES.
2. PROMINENTLY DISPLAY THE DEP FILE NUMBER AT THE SITE.
3. INSTALL THE EROSION CONTROLS.
4. THE EROSION CONTROLS WILL BE INSPECTED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE INSPECTOR WILL SUPPLY THE CONSERVATION DEPARTMENT WITH A LETTER STATING THAT THE EROSION CONTROLS ARE INSTALLED ACCORDING TO THE PLAN AND THAT THE EROSION CONTROLS WILL BE MAINTAINED UNTIL A CERTIFICATE OF COMPLIANCE IS ISSUED.
5. REMOVE THE EXISTING POOL AND FILL THE REMAINING HOLE.
6. PREP THE GARAGE LOCATION FOR POURING THE CONCRETE SLAB.
7. CONSTRUCT GARAGE AND PORCH.

RE-SEED DISTURBED LAWN AREAS.

8. CONCRETE DEMOLITION REMAINS ARE NOT TO BE USED AS FILL MATERIAL.




| LEGEND: | |
|---|---|
| | PROPERTY LINE |
| | EDGE OF PAVEMENT |
| x | FENCE LINE |
| | IRON ROD SET |
| | UTILITY POLE |
| | IRON ROD FOUND |
| | IRON PIPE FOUND |
| | CATCH BASIN |
| D | DRAIN MAN HOLE |
| EM | ELECTRIC METER |

40 20 0 40

KING STREET

COMMONWEALTH OF MASSACHUSETTS
DENNIS B. O'BRIEN
No. 40046
PROFESSIONAL LAND SURVEYOR

Dennis O'Brien P.L.S.

D. O'BRIEN
LAND SURVEYING
EST 1996
480 WEST CENTRAL ST.
FRANKLIN, MA 02038 508-541-0048

# PLAN SHOWING PROPOSED GARAGE
## #670 KING STREET
## FRANKLIN, MA NORFOLK COUNTY

| SCALE: | DATE: | REVISED: | DRAWN BY: | CHECKED BY: |
|---|---|---|---|---|
| 1:40' | 11/4/25 | 1/7/26 | J.E.S. | D.O. |

## GENERAL NOTES

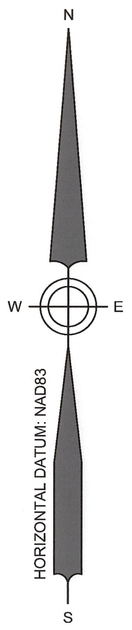
1. TOPOGRAPHY DETERMINED BY AN ON-THE-GROUND SURVEY BY LAND PLANNING, INC. ALL ELEVATIONS REFER TO NAVD 1988 DATUM.
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLY WITH THE CURRENT STATE AND MUNICIPAL CONSTRUCTION CODES, STANDARDS AND REQUIREMENTS.
3. THE SITE IS NOT LOCATED WITHIN THE LIMITS OF THE 100 YEAR FLOOD ZONE AS SHOWN ON THE FIRM MAP #25021C0309F DATED 7/8/2025.
4. WETLAND RESOURCE BOUNDARIES WERE FLAGGED AND LOCATED BY LAND PLANNING, INC DURING JULY 2025
5. PLACE 4" OF LOAM AND SEED ALL DISTURBED AREAS OF THE PROJECT NOT OTHERWISE IMPROVED.
6. ANY ALTERATIONS MUST BE REPORTED TO THE DESIGN ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
7. CONSERVATION COMMISSION APPROVAL IS REQUIRED.
8. ALL TRENCHES FOR UTILITIES TO BE BACKFILLED AND COMPACTED WITH GRANULAR MATERIALS FREE OF ROCKS LARGER THAN 2".
9. ALL UNDERGROUND UTILITY LOCATIONS SHOWN ARE BASED ON FIELD EVIDENCE AND RECORDS PROVIDED TO LAND PLANNING, INC.. THESE LOCATIONS SHOULD BE CONSIDERED APPROXIMATE. OTHER UTILITIES MAY EXIST WHICH ARE NOT EVIDENT OR FOR WHICH RECORD INFORMATION WAS NOT FOUND. THE CONTRACTOR MUST CONTACT ALL UTILITY COMPANIES AND "DIG SAFE" (888-DIG-SAFE) BEFORE EXCAVATION BEGINS. WE ASSUME NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN.
10. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THIS PROJECT WORK AND PROJECT SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS, RELATIVE TO THE SPECIFICATIONS OR APPLICABLE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE DESIGN ENGINEER OF RECORD IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE DESIGN ENGINEER SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN FULL CONFORMANCE WITH LOCAL REGULATIONS AND CODES.
11. CONTRACTOR IS RESPONSIBLE FOR ALL EXCAVATION TO BE PERFORMED IN ACCORDANCE WITH CURRENT O.S.H.A. STANDARDS, AS WELL AS ADDITIONAL PROVISIONS TO ASSURE STABILITY OF CONTIGUOUS STRUCTURES, AS FIELD CONDITIONS DICTATE.

## EROSION & SEDIMENT CONTROL NOTES

1. THE CONTRACTOR AND ALL SUB-CONTRACTORS ARE TO BE MADE AWARE THAT THIS PROJECT IS SUBJECT TO AN ORDER OF CONDITIONS FROM THE CONSERVATION COMMISSION AND ITS REGULATIONS ARE APPLICABLE TO THIS PROJECT. A COPY OF THIS ORDER IS TO BE READILY AVAILABLE ON SITE AT ALL TIMES.
2. SEDIMENT BARRIERS ARE TO BE INSTALLED WHERE SHOWN ON THIS PLAN. THE CONTRACTOR AND THE OWNER ARE RESPONSIBLE FOR THE PROPER MAINTENANCE OF THE SEDIMENT BARRIERS AND TO IDENTIFY AND CORRECT ALL SOURCES OF EROSION. EXTRA SEDIMENT BARRIER MATERIALS ARE TO BE STORED ON SITE IN ORDER TO QUICKLY REPAIR EROSION PRONE AREAS. PERIODIC MAINTENANCE OF THE EROSION CONTROL STRUCTURES IS REQUIRED IN ORDER TO INSURE THE PROPER PROTECTION OF THE RESOURCE AREAS.
3. STOCKPILED MATERIAL THAT IS SUBJECT TO EROSION SHALL BE PROTECTED AT ITS BASE ON THE DOWN-SLOPE SIDE WITH A SILT FENCE.
4. TEMPORARY STABILIZATION OF DISTURBED AREAS IS REQUIRED TO LIMIT EROSION TOWARD ABUTTING PROPERTIES AND PUBLIC WAYS. ALL GRADED SLOPES ARE TO BE STABILIZED ON A DAILY BASIS WITH SPECIAL CARE TAKEN TO AVOID ROUTING RAINFALL THROUGH GULLIES TOWARD THE RESOURCE AREAS. AREAS OF EROSION ARE TO BE REPAIRED ON A DAILY BASIS.
5. THE CONTRACTOR IS TO USE PROPER JUDGMENT RELATIVE TO CONSTRUCTION PRACTICES DURING ADVERSE WEATHER CONDITIONS OR PERIODS OF HIGH GROUNDWATER. NO WORK IS TO BE PERFORMED NEAR THE WETLAND AREAS DURING PERIODS OF HEAVY RAINFALL. INSPECTION IS REQUIRED AFTER MORE THAN 1/2" OF RAINFALL IN 24 HOURS.
6. ALL GRADED AREAS ARE TO BE LOAMED AND SEEDED AS SOON AS POSSIBLE IN ORDER TO INSURE THE RAPID STABILIZATION OF THE EROSION PRONE AREAS. A GRASS SEED MIXTURE OF 20% RED TOP, 60% CHEWINGS FESCUE AND 20% KENTUCKY BLUEGRASS IS RECOMMENDED. "HYDROSEED" WITH HIGH FIBER CONTENT.
7. THE SEDIMENT BARRIERS SHALL REMAIN IN PLACE UNTIL ALL UPGRADIENT AREAS HAVE BEEN STABILIZED.
8. DURING PERIODS OF HEAVY RAINFALL, IT WILL BE EXPECTED TO EXPERIENCE EROSION OF THE UNSTABILIZED SLOPES. IMMEDIATE ATTENTION TO THE MAINTENANCE OF THESE ERODED AREAS WILL FURTHER INSURE THE SUCCESSFUL STABILIZATION OF THE EXPOSED SLOPES WHILE LIMITING THE IMPACTS TO NEARBY RESOURCE AREAS.
9. PERIODIC INSPECTIONS OF THE ENTIRE CONSTRUCTION SITE ARE TO BE PERFORMED BY A COMPETENT REPRESENTATIVE WHO WILL INSURE THE ADHERENCE TO THE REGULATIONS AS SET FORTH IN 310 CMR 10.00. NO UNAUTHORIZED INDIVIDUALS ARE TO ENTER THE CONSTRUCTION AREA WITHOUT THE EXPRESSED CONSENT OF THE OWNER.
10. THE APPLICANT IS TO NOTIFY THE CONSERVATION COMMISSION ONCE THE JURISDICTIONAL WORK HAS BEEN COMPLETED AND THE ENTIRE SITE HAS BEEN PROPERLY STABILIZED. UPON APPROVAL OF THE WORK SUBJECT TO THE ORDER OF CONDITIONS, THE APPLICANT IS TO RECEIVE A CERTIFICATE OF COMPLIANCE.

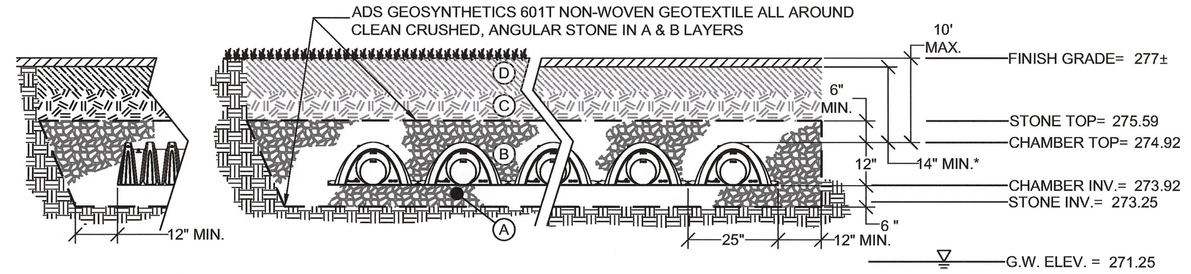
## UTILITY CONSTRUCTION NOTES

1. ALL WORK SHALL CONFORM TO TOWN OF FRANKLIN REQUIREMENTS AND MASSACHUSETTS HIGHWAY DEPARTMENT CONSTRUCTION STANDARDS AS APPLICABLE.
2. ALL BACKFILL SHALL BE PLACED AND COMPACTED IN 6" LIFTS OR 12" LIFTS WHEN MACHANICAL MEANS ARE UTILIZED.
3. MEASURES SHALL BE TAKEN TO PREVENT THE MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL.
4. FOUNDATION- WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE DESIGN ENGINEERAND REPLACEMENT WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEEER. AS AN ALTERNATIVE AND AT THE DESCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABALIZED USING GEOTEXTILE MATERIAL.
5. BEDDING- PIPE BEDDING FOR WATER UTILITIES SHALL BE SAND. PIPE BEDDING FOR SANITARY SEWER AND STORMWATER UTILITIES SHALL BE 3/4" DIAMETER CRUSHED STONE.
6. BACKFILL- SUITABLE MATERIAL SHALL BE CLASS I, II, OR III IN THE PIPE ZONE NOT LESS THAN 6"ABOVE THE CROWN OF THE PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATIONS TO THE DESIGN ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN THE LATEST EDITION OF ASTM D2321.
7. WHERE FEASIBLE, SEWERS SHALL BE SEPARATED A MINIMUM OF 10 FEET, HORIZONTALLY, FROM ANY EXISTING WATER MAIN OR IT SHALL BE ENCASED IN CONCRETE.
8. WHERE A 10 FOOT LATERAL SEPARATION BETWEEN SEWER AND WATER CAN NOT BE MAINTAINED, THE WATER MAIN SHALL BE LOCATED WITHIN A SEPARATE TRENCH AND THE CROWN OF THE SEWER SHALL BE PLACED A MINIMUM OF 18" BELOW THE INVERT OF THE WATER MAIN.
9. WHERE SEWERS CROSS WATER MAINS, THE CROWN OF THE SEWER SHALL BE LAID 18" BELOW THE INVERT OF THE WATER MAIN. WHERE THIS REQUIREMENT CAN NOT BE MEET, THE WATER LINE SHALL BE CONSTRUCTED OF MECHANICAL-JOINT PIPE FOR A DISTANCE OF 10 FEET OF EITHER SIDE OF THE CROSSING. ONE FULL LENGTH OF WATER MAIN SHALL BE CENTERED OVER THE SEWER SO THAT BOTH JOINTS WILL BE AS FAR AS POSSIBLE FROM THE SEWER. BOTH THE WATER AND SEWER LINES SHALL BE ENCASED IN CONCRETE FOR 10 FEET EITHER SIDE OF THE CROSSING WHERE THE REQUIRED VERTICAL SEPARATION CAN NOT BE PROVIDED.
10. ALL SEWER PIPING AND/OR STRUCTURES LOCATED WITHIN 100 FEET OF ANY WETLAND, SURFACE WATER-BODY, OR DETENTION POND, SHALL BE BUILT USING WATERTIGHT CONSTRUCTION METHODS AND MATERIALS.
11. THE CONTRACTOR MUST CONTACT ALL UTILITY COMPANIES AND "DIG SAFE" BEFORE EXCAVATION BEGINS. WE ASSUME NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURACIES SHOWN.
12. WHERE ANY UTILITY INSTALLATION DETAIL CONFLICTS WITH THE TOWN OF FRANKLIN DEPARTMENT OF PUBLIC WORKS STANDARDS FOR UTILITY MATERIALS AND INSTALLATION, THE TOWN STANDARDS SHALL GOVERN.
13. ALL SEWER PIPING AND/OR STRUCTURES LOCATED WITHIN 100 FEET OF ANY WETLAND, SURFACE WATER-BODY, OR DETENTION POND, SHALL BE BUILT USING WATERTIGHT CONSTRUCTION METHODS AND MATERIALS.
14. THE SANITARY SEWER NETWORK CONNECTION SHALL PASS OVER THE EXISTING 18" RCP STORM DRAIN CULVERT. THE PROPOSED CONNECTION TRENCH SHALL BE HAND DUG WITHIN 5' OF THE EXISTING DRAIN CULVERT.




*TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 20".

**THIS CROSS SECTION DETAIL REPRESENTS MINIMUM REQUIREMENTS FOR INSTALLATION. PLEASE SEE THE LAYOUT SHEET(S) FOR PROJECT SPECIFIC REQUIREMENTS.




**ADS STORMTECH FIELD DETAIL SC-160LP**
NOT TO SCALE

SOIL TEST LOG: January 13, 2026
TP1-0106

| Depth | Horizon | Texture | Color |
|---|---|---|---|
| 0-5 | O | Sandy loam | 10YR 2/1 |
| 5-11 | A | Sandy loam | 10YR 3/2 |
| 11-24 | Bw | Sandy loam | 10YR 5/6 |
| 24-78 | C | Sand | 2.5Y 5/3 |

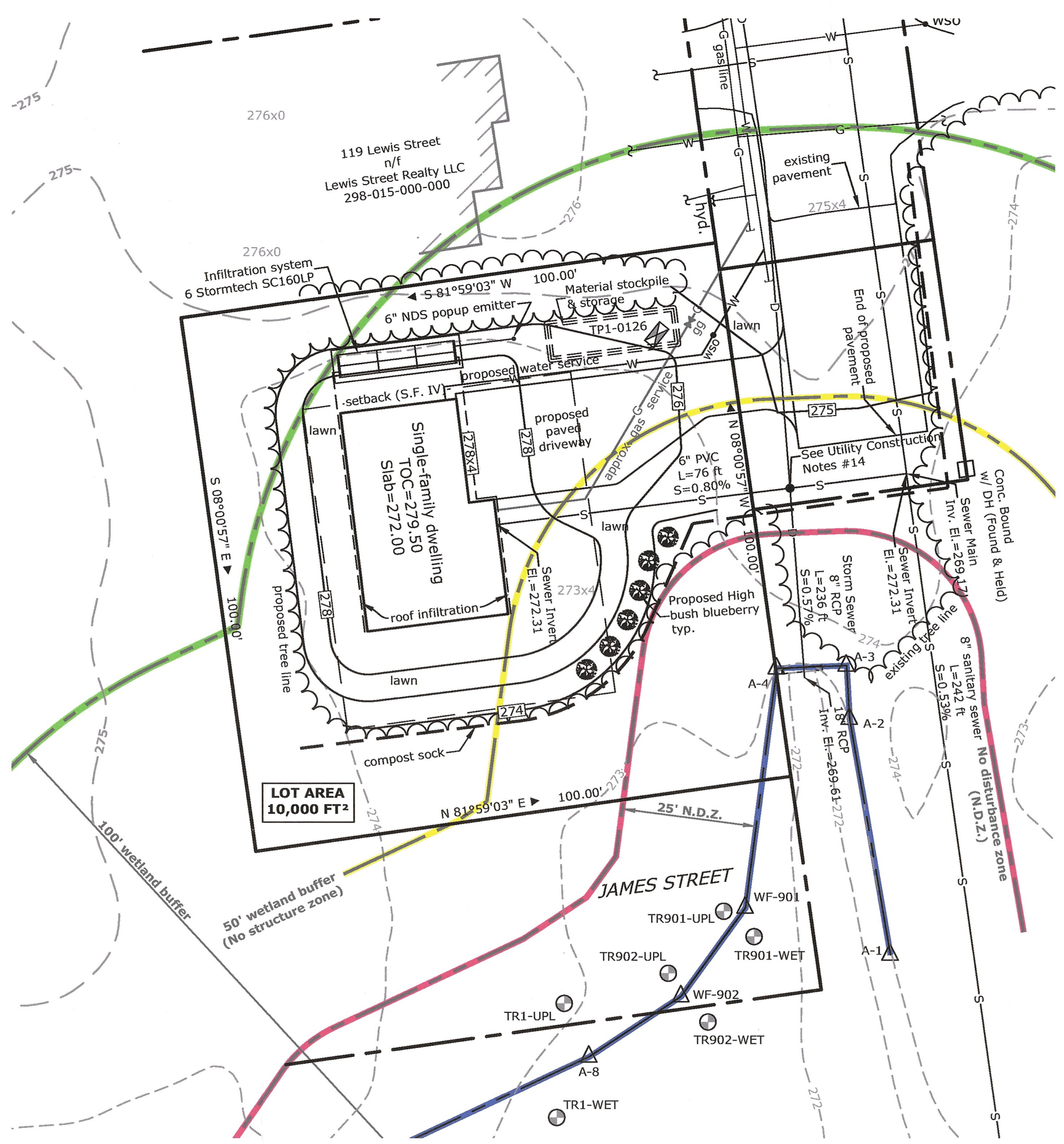
Notes: Weeping: @ 27" Standing: N/A

BUFFER ZONE IMPACT REPORT

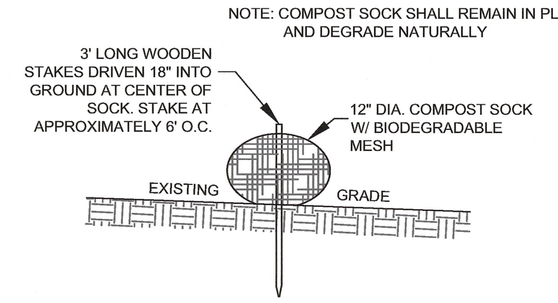
| Buffer Zone (ft) | Total Existing Area (ft²) | Impact-Disturbed Area (ft²) |
|---|---|---|
| 0-25 | 1,064 | 0 |
| 25-50 | 2,008 | 1,458 |
| 50-100 | 5,977 | 4,198 |
| Total: | 9,049 | 5,656 |

BENCHMARK SCHEDULE

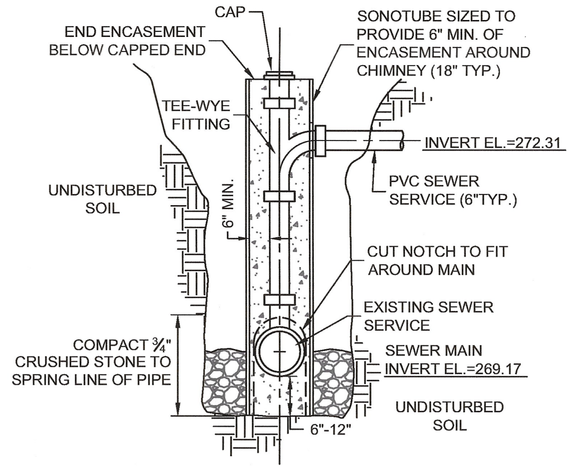
| No. | Description | Elevation |
|---|---|---|
| BM#1 | Nail in UP#16 | 276.07 |



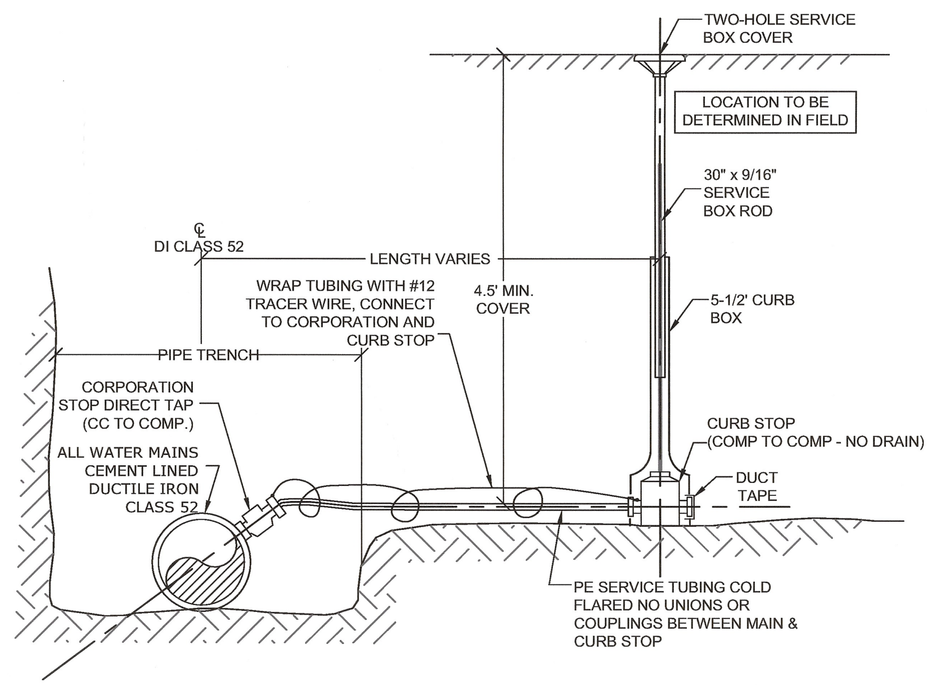

SITE PLAN
1" = 20'




**COMPOST SOCK DETAIL**
NOT TO SCALE




**SONOTUBE CAST-IN-PLACE CHIMNEY**
NOT TO SCALE




**TYPICAL SERVICE CONNECTION**
NOT TO SCALE




**LOCUS MAP**
Scale 1" = 250'
from Mass Mapper data layers
to be considered approximate

**ESC Contact Information**
Lewis Street Realty LLC
P.O. Box 411
Franklin, MA 02038
508-918-9766

**Construction Sequence & Schedule**

The following construction sequence and schedule, assuming all required permits are obtained by March 2026 is as follows:

March 2026

*Pre-construction activities*

1. Install perimeter erosion and sediment control measures
2. Schedule & conduct an on-site pre-construction meeting with the Conservation Commission or its Agent
3. Install construction entrance

*Construction activities*

4. Clear site
5. Strip topsoil and rough grade site
6. Provide temporary sanitary facilities
7. Provide temporary power
8. Establish equipment storage and material stockpile

*April 2026- September 2026*

9. Excavate, form, and pour foundation
10. Backfill foundation
11. Frame structure
12. Constructing subsurface drainage system
13. Construct all utility connections (as applicable)
14. Prepare Site access and driveway base course
15. Final grade site
16. Install access and driveway top course of pavement
17. Stabilize and seed site
18. Monitor site until final stabilization is reached
19. Prepare As-built Plans
20. Remove perimeter erosion and sediment control measures
21. Close permits

Note: The following sequence of construction is a general description of construction activities. The Site Supervisor shall use proper judgement when determining the final sequence of construction activities.

MassDEP File No.
159-1324

811 DigSafe MA ME NH RI VT

# CONSERVATION SITE DESIGN PLAN

Located at
Lewis Street
Franklin, MA

Owned By
Lewis Street Realty LLC

Applicant
Lewis Street Realty LLC
P.O. Box 411
Franklin, MA 02038

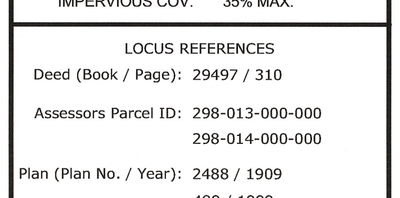
Revised: March 2, 2026

GRAPHIC SCALE
20 0 10 20 40
( IN FEET )
1 INCH = 20 FT.

**ZONING DISTRICT**
SINGLE FAMILY IV

| | |
|---|---|
| AREA: | 15,000 FT² |
| FRONTAGE: | 100 FT |
| FRONT YARD: | 30 FT |
| SIDE YARD: | 20 FT |
| REAR YARD: | 20 FT |
| IMPERVIOUS COV. | 35% MAX. |

LOCUS REFERENCES
Deed (Book / Page): 29497 / 310
Assessors Parcel ID: 298-013-000-000
298-014-000-000
Plan (Plan No. / Year): 2488 / 1909
489 / 1999
460 / 2000
Lewis Street Acceptance Plan 2015




Date: 2-2-26
Norman G. Hill, PE #31887

REVISIONS

| Date | Description |
|---|---|
| 2/24/26 | per Peer Review letter 2/13/2026 |
| 3/2/26 | revise wetland delineation |
| | |
| | |

| | | |
|---|---|---|
| Field By: | SB/JB | 12/2025 |
| Designed By: | SB | 1/2026 |
| Drawn By: | SB | 1/2026 |
| Checked By: | NGH | 1/2026 |


**Land Planning, Inc.**
Civil Engineers • Land Surveyors
Environmental Consultants

**Bellingham**
167 Hartord Ave.
Bellingham, MA 02019
508-966-4130

**North Grafton**
214 Worcester St.
N. Grafton, MA 01536
508-839-9526

**Hanson**
1115 Main Street
Hanson, MA 02341
781-294-4144

www.landplanninginc.com


Date: Jan. 6, 2026
Job No.: G25125
Sheet No.: 1 of 1

Land Planning Inc.

**Date: March 2, 2026**

ATTN: Mark C. LePage, Chair
Town of Franklin Conservation Commission
355 East Central Street
Franklin, MA 02038

RE: **Lewis Street**
**MassDEP File No. 159-1324**
**Notice of Intent Peer Review Response**

Mr. LePage,

The following comments and updated design plans are submitted in response to the revised BETA peer-review letter dated February 23, 2026, issued after the resource-area delineation field inspection. All original comments and LPI responses remain unchanged.

## PLAN AND GENERAL COMMENTS

A1. The Massachusetts Department of Environmental Protection (MassDEP) issued a DEP file number (File No. 159-1324) with the following technical comments:

MassDEP recommends that the applicant demonstrate that adequate separation exists to allow the installation of the proposed sewer line and existing stormwater culvert which conveys flows developed parts of Lewis St to downgradient wetlands and provide details on how this stormwater conveyance will be maintained during project construction.

*LPI RESPONSE A1.*
*See response to peer review comment W2.*

A2. The following elements are missing from the provided plan set:

a. Existing and proposed vegetation should be included on the plans as referenced in Bylaw Regulations Section 7.18.1.5 and 7.18.1.6, including individual trees/shrubs with a diameter greater than 1" proposed for removal. It is BETA's understanding that the Commission generally increases the size threshold for tree location based on the Project and therefore defers to the Commission on this matter. However, the existing tree line, areas of proposed lawn, and any other proposed vegetation should be depicted on the plans.

*LPI RESPONSE A2.a*
*An existing condition has been submitted to document the existing tree line location. The proposed tree clearing has been indicated on the design plans.*

b. A Construction Sequence with all proposed activities within Jurisdictional Areas should be provided on the plans per Bylaw Regulations Section 7.18.1.14.

*LPI RESPONSE A2.b*
*A Construction Sequence and Schedule has been provided in the Project Narrative and Statement Document. The Construction Sequence and Schedule, Section 8, has been added to the Design Plan.*

c. A PLS stamp should be provided on the plans to verify the existing conditions survey.

*LPI RESPONSE A2.c*
*An existing condition has been submitted in support of the Notice of Intent stamped by a Professional Land Surveyor.*

A3. Impacts to both the 25-50-foot and 50-100-foot Buffer Zone should be noted on the plans.

*LPI RESPONSE A3.*
*The buffer zone impacts were included on the initial submission Design Plans. See "BUFFER ZONE IMPACT REPORT" table on the revised Design Plans.*

## RESOURCE AREA AND BOUNDARY COMMENTS

As noted earlier in this letter, BETA will be conducting a Site visit once ground conditions improve and will subsequently provide any resulting comments.

*LPI RESPONSE*
*To discuss during meeting on 2-26-2026.*

***BETA Commenrt (February 23rd, 2026)***
*BETA conducted a Site visit on February 20, 2026, to assess existing conditions and to review Resource Area delineations, focusing on the definitions and methodologies referenced under the Act and the Bylaw. Review of Resource Area delineation included all flagged areas on the Site, with a focus on areas closest to where work is proposed. This assessment was performed outside of the growing season with approximately 5 inches of snow cover present at the Site. Accordingly, the scope of the review was limited, as herbaceous vegetation could not be reviewed during this Site visit.*

*BETA offers the following comment regarding Resource Area boundaries:*

W1. Hydric soils consisting of a dark/organic surface layer underlain by depleted soils with redoximorphic concentrations were observed within the area between flags A-5 and A-8 and approximately 5-10 feet upgradient of the area between flags A-1 and A-5. Vegetation in these areas consists of sweet pepperbush (Clethra alnifolia), highbush blueberry (Vaccinium corymbosum), and red maple (Acer rubrum).The Applicant should revise the BVW boundary and associated Buffer Zones accordingly. In addition, the field data sheets for the relevant upland/wetland plots should be revised, as no soils information is included on the forms submitted with the NOI application.

*LPI RESPONSE W1.*
*An assessment of the wetland flags was conducted on February 27th , 2026. The delineation was amended to include the area as previously described. Revised wetland flags (900-series) were hung between wetland flag A-4 and A-8. Additional field data sheets were submitted for the amended delineation. The flag locations and transect areas were field located and amended on the revised site plans dated March 2, 2026.*

W2. Flag A-3 was not observed in the field; however, the location of the flag as depicted on the plans

*LPI RESPONSE W2.*
*A limited amount of vegetation exists in the vicinity of wetland flag A-3 and was hung on low lying vegetation at the corner of the existing headwall. The flag may be buried underneath the existing snowpack.*

### CONSTRUCTION & MITIGATION COMMENTS

W3. Provide specifications of the seed mixture(s) proposed for stabilization of disturbed areas within Buffer Zone, including any areas that are proposed to be lawn. All areas of proposed lawn should be demarcated on the Project plans.

Per the Erosion & Sediment Controls Notes on the plans, Note 6 provides a suggestion for proposed seed that consists of non-native grasses for stabilization. BETA recommends that native species with wildlife habitat value be proposed within Buffer Zone where lawn is not required as mitigation for Buffer Zone clearing.

*LPI RESPONSE W3.*
*The seed mixture recommended is a convention turf grass lawn. The areas to be seeded as "lawn" have been indicated on the revised Design Plans.*

W4. The Applicant should provide a cross section to demonstrate that the proposed sewer can be constructed over or under the existing drain without conflict.

*LPI RESPONSE W4.*
*The proposed sanitary sewer connection will pass over the existing storm drain as noted on the plan. The proposed connection cannot pass under the storm culvert and gravity connect to the existing sanitary sewer network. Field measurements and calculation have determined that there is 2-inches of clearance between the top of storm sewer pipe and the invert of the proposed sewer connection. The applicant will continue to coordinate sanitary and storm sewer construction activities with the Town of Franklin DPW.*

*A note has been added that the proposed sanitary sewer connection trench shall be hand dug within 5 feet of the storm sewer pipe to prevent damage during construction.*

W5. Material storage and laydown areas should be depicted on the Project plans and located outside of jurisdictional areas to the extent feasible.

*LPI RESPONSE W5.*
*The revised Design Plans indicate a temporary stockpile and material storage area.*

W6. Groundwater may be encountered when excavating for the new foundation and utilities. The Commission could include a Special Condition in the order of Conditions requiring the submission and approval of a dewatering plan prior to discharge in the even that groundwater is encountered.

*LPI RESPONSE W6.*
*If groundwater is encountered during construction, a dewatering plan must be submitted to the Conservation Commission and/or its agent for review and approval before any dewatering activities begin. A Special Condition for this review comment is requested.*

W7. The Applicant should consider providing a planting plan to mitigate for additional development within Buffer Zone. Specifically, areas within Buffer Zone closest to BVW should be prioritized for the planting of native vegetation and the application of native seed mix.

*LPI RESPONSE W7.*
*The addition of six (6) High bush blueberry plantings have been added and noted on the revised Design Plans.*

W8. The Applicant should quantify impacts to the 0-25-foot No Disturb Zone, as the proposed tree line depicts vegetation clearing within this Buffer Zone up to the BVW boundary at one location. Additionally, erosion and sedimentation controls should be depicted at the limits of work in this area. If the Commission permits this vegetation clearing, BETA suggests that the Commission include a Special Condition requiring the Applicant to provide signage at the proposed limits of work to prevent future encroachments further into jurisdictional areas.

*LPI RESPONSE W8.*
*The project does not propose land disturbing activities within the 0-25 foot No Disturb Zone. The tree line within the No Disturb area is existing. See provided existing conditions plan and Google Street View image; Attachment #1.*

**WPA PERFORMANCE STANDARDS COMMENTS**

The Project does not propose any work within Resource Areas Subject to Protection under the Act; therefore, the Project is not required to comply with Performance Standards under the Act.

*LPI RESPONSE*
*No Comment.*

**BYLAW REGULATORY COMMENTS**

W9. A Variance Request should be submitted for vegetation clearing within the 0-25-foot Buffer Zone and construction of impervious surfaces within the 25-50-foot Buffer Zone in accordance with the procedure per Bylaw Regulation Section 5.

*LPI RESPONSE W9.*
*The tree line within the 0-25 foot No Disturb Zone is existing. The project does not propose land disturbing activities within the 0-25 foot No Disturb Zone. See provided existing conditions plan and Google Street View image; Attachment #1.*

W10. A Construction Sequence should also be provided on the Plans per Bylaw Regulation Section 7.15.1.

*LPI RESPONSE W10.*
*The Construction Sequence & Schedule that is within the Project Narrative has been added to the plan.*

W11. The Applicant should provide an Erosion & Sedimentation Control Plan which includes the name and phone number of the person(s) responsible for inspecting and maintaining erosion controls as required in Section 7.12.1 of the Bylaw Regulations. The erosion & sedimentation control plan should be included on the plan.

*LPI RESPONSE W11.*
*The Property Owner/ Applicants contact information has been added to the design plan. Erosion and Sediment Controls include compost sock and are indicated on the Design Plan.*

W12. According to Section 7.9.1 of the Bylaw, the Project Narrative should include the following missing content:

a. The entity performing the work; and

*LPI RESPONSE W12.a*
*The entity performing the work will be the Property Owner/ Applicant (i.e. Lewis Street Realty LLC). The Project Narrative Section 1.0 Project Description states that "Lewis Streat Realty LLC proposes to develop the residential lot" and includes the activities that will be performed to accomplish the proposal in subsequent paragraphs..*

b. When the proposed activities will be completed.

*LPI RESPONSE W12.b*
*The Project Narrative Section 8.0 Construction Sequence & Schedule documents the approximate timeline of the project and necessary activities. The approximate completion time is documented between April and September 2026.*

W13. Section 4.4.1 of the Bylaw states that "mitigation offsets may be required by the Commission when the applicant proposed that more than 30% of the 50-100-foot Buffer Zone Resource Area is proposed to be impervious surface." The Applicant should provide the Commission with calculations of proposed impervious area within the 50-100-foot Buffer Zone as it compares to existing conditions to allow the Commission to determine if additional mitigation measures are warranted.

*LPI RESPONSE W13.*
*The existing lot area is 10,000 $ft^2$ with more than 50% of the lot being between the 50–100-foot Buffer Zone (6,053 $ft^2$). The impervious surface to this area has been minimized to the maximum extent practicable. The project proposes 1,766 $ft^2$ (29.2%) of impervious surface area between the 50 - 100 foot Buffer Zone.*

Sincerely,

Norman G. Hill, P.E. 3-2-26

Norman Hill, PE Date
Land Planning, Inc

## BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: Lewis Street City/Town: Franklin Sampling Date: 2-27-26

Applicant/Owner: J J Marinella Sampling Point or Zone: 901 and 902

Investigator(s): Norman G. Hill. P.E. Latitude / Longitude: N42.0755/ W71.3856

Soil Map Unit Name: Scarboro NWI or DEP Classification: PF01E

Are climatic/hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? (If yes, explain in Remarks)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If yes, explain in Remarks)

**SUMMARY OF FINDINGS – Attach site map and photograph log showing sampling locations, transects, etc.**

| | | | |
|---|---|---|---|
| Wetland vegetation criterion met? | Yes [ ] No [✓] | **Is the Sampled Area within a Wetland?** | **Yes** [ ] **No** [✓] |
| Hydric Soils criterion met? | Yes [ ] No [✓] | | |
| Wetlands hydrology present? | Yes [ ] No [✓] | | |

Remarks, Photo Details, Flagging, etc.:

some larger trees

**HYDROLOGY**

| **Field Observations:** | | | |
|---|---|---|---|
| Surface Water Present? | Yes [ ] | No [✓] | Depth (inches) |
| Water Table Present? | Yes [ ] | No [✓] | Depth (inches) 12.00 |
| Saturation Present (including capillary fringe)? | Yes [ ] | No [✓] | Depth (inches) 12.00 |

**Wetland Hydrology Indicators**

| Reliable Indicators of Wetlands Hydrology | Indicators that can be Reliable with Proper Interpretation | Indicators of the Influence of Water |
|---|---|---|
| [ ] Water-stained leaves | [ ] Hydrological records | [ ] Direct observation of inundation |
| [ ] Evidence of aquatic fauna | [ ] Free water in a soil test hole | [ ] Drainage patterns |
| [ ] Iron deposits | [ ] Saturated soil | [ ] Drift lines |
| [ ] Algal mats or crusts | [ ] Water marks | [ ] Scoured areas |
| [ ] Oxidized rhizospheres/pore linings | [ ] Moss trim lines | [ ] Sediment deposits |
| [ ] Thin muck surfaces | [ ] Presence of reduced iron | [ ] Surface soil cracks |
| [ ] Plants with air-filled tissue (aerenchyma) | [ ] Woody plants with adventitious roots | [ ] Sparsely vegetated concave surface |
| [ ] Plants with polymorphic leaves | [ ] Trees with shallow root systems | [ ] Microtopographic relief |
| [ ] Plants with floating leaves | [ ] Woody plants with enlarged lenticels | [ ] Geographic position (depression, toe of slope, fringing lowland |
| [ ] Hydrogen sulfide odor | | |

Remarks (describe recorded data from stream gauge, monitoring well, aerial photos, previous inspections, if available):

This form is only for BVW delineations. Other wetland resource areas may be present and should be delineated according to the applicable regulatory provisions.

Form Revised July 2023

**VEGETATION** – Use both common and scientific names of plants.

Tree Stratum  Plot size 30' x30'

| Common name | Scientific name | Indicator Status | Absolute % Cover | Dominant? (yes/no) | Wetland Indictor? (yes/no) |
|---|---|---|---|---|---|
| 1. red maple | acer rubru, | FACW | 5.0 | No | Yes |
| 2. oak | querus alba | FACU | 30.0 | Yes | No |
| 3. pine | pinus r. | FAC | 10.0 | No | No |
| 4. | | | | | |
| 5. | | | | | |
| 6. | | | | | |
| 7. | | | | | |
| 8. | | | | | |
| 9. | | | | | |

45.0 = Total Cover

Shrub/Sapling Stratum  Plot size 30' x 30'

| Common name | Scientific name | Indicator Status | Absolute % Cover | Dominant? (yes/no) | Wetland Indictor? (yes/no) |
|---|---|---|---|---|---|
| 1. pine saplings | pinus r. | FACU | 10.0 | No | No |
| 2. red maple saplings | acer r. | FACW | 30.0 | Yes | Yes |
| 3. oak saplings | querus alba | FACU | 10.0 | No | No |
| 4. | | | | | |
| 5. | | | | | |
| 6. | | | | | |
| 7. | | | | | |
| 8. | | | | | |
| 9. | | | | | |

50.0 = Total Cover

Herb Stratum  Plot size 30' x 30'

| Common name | Scientific name | Indicator Status | Absolute % Cover | Dominant? (yes/no) | Wetland Indictor? (yes/no) |
|---|---|---|---|---|---|
| 1. Princess pine | dendrolycopdrum | FACU | 10.0 | No | No |
| 2. multi flora rosa | rosa multiflora | FACU | 15.0 | Yes | Yes |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| 6. | | | | | |
| 7. | | | | | |
| 8. | | | | | |
| 9. | | | | | |
| 10. | | | | | |
| 11. | | | | | |
| 12. | | | | | |

25.0 = Total Cover

**VEGETATION** – continued.

| Woody Vine Stratum | Plot size | | | | |
|---|---|---|---|---|---|
| Common name | Scientific name | Indicator Status | Absolute % Cover | Dominant? (yes/no) | Wetland Indictor? (yes/no) |
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |
| | | 0.0 = Total Cover | | | |

| Rapid Test: | Do all dominant species have an indicator status of OBL or FACW? | | Yes ☐ No ☑ |
|---|---|---|---|
| Dominance Test: | Number of dominant species | Number of dominant species that are wetland indicator plants | Do wetland indicator plants make up ≥ 50% of dominant plant species? Yes ☐ No ☑ |
| | | | |

| Prevalence Index: | | Total % Cover (all strata) | Multiply by: | Result |
|---|---|---|---|---|
| | OBL species | 0 | X 1 | = 0.00 |
| | FACW species | 2 | X 2 | = 4.00 |
| | FAC species | 1 | X 3 | = 3.00 |
| | FACU species | 5 | X 4 | = 20.00 |
| | UPL species | 0 | X 5 | = 0.00 |
| | Column Totals | (A) 8 | | (B) 27 |
| | Prevalence Index | B/A = 3.38 | | Is the Prevalence Index ≤ 3.0? Yes ☐ No ☑ |

**Wetland vegetation criterion met?** **Yes** ☐ **No** ☑

**Definitions of Vegetation Strata**

Tree - Woody plants 3 in. (7.62 cm) or more in diameter at breast height (DBH), regardless of height

Shrub / Sapling - Woody plants less than 3 in. (7.62 cm) DBH and greater than or equal to 3.3 ft. (1 m) tall

Herb - All herbaceous (non-woody plants, regardless of size, and woody plants less than 3.3 ft. (1 m) tall

Woody vines - All woody vines greater than 3.3 ft. (1 m) in height

| Cover Ranges | |
|---|---|
| Range | Midpoint |
| 1-5 % | 3.0 % |
| 6-15 % | 10.5 % |
| 15-25 % | 20.5 % |
| 26-50 % | 38.0 % |
| 51-75 % | 63.0 % |
| 76-95 % | 85.5 % |
| 96-100 % | 98.0 % |

**SOIL**

**Profile Description:** (Describe to the depth needed to document the indicator or confirm the absence of indicators)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| | Color (moist) | % | Color (moist) | % | Type[1] | Location[2] | | |
| 0 to 2 | | | | | | | | organics |
| 2 to 12 | 10YR4/4 | | | | | | sandy loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

| **Hydric Soil Indicators** (Check all that apply) | | **Indicators for Problematic Hydric Soils** |
|---|---|---|
| ☐ Histosol (A1) | ☐ Polyvalue Below Surface (S8) | ☐ 2 cm Muck (A10) |
| ☐ Histic Epipedon (A2) | ☐ Thin Dark Surface (S9) | ☐ 5 cm Mucky Peat or Peat (S3) |
| ☐ Black Histic (A3) | ☐ Loamy Gleyed Matrix (F2) | ☐ Iron-Manganese Masses (F12) |
| ☐ Hydrogen Sulfide (A4) | ☐ Depleted Matrix (F3) | ☐ Mesic Spodic (A17) |
| ☐ Stratified Layers (A5) | ☐ Redox Dark Surface (F6) | ☐ Red Parent Material (F21) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Dark Surface (F7) | ☐ Very Shallow Dark Surface (F22) |
| ☐ Thick Dark Surface (A12) | ☐ **Redox Depressions (F8)** | |
| ☐ Sandy Mucky Mineral (S1) | | |
| ☐ Sandy Gleyed Matrix (S4) | | |
| ☐ Sandy Redox (S5) | | ☐ Other (Include Explanation in Remarks) |
| ☐ Stripped Matrix (S6) | | |
| ☐ Dark Surface (S7) | | |

**Restrictive Layer (if observed)** Type: _____ Depth (inches): _____

Remarks: no mottles

**Hydric Soils criterion met?** **Yes** ☐ **No** ☑

## BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: Lewis Street City/Town: Franklin Sampling Date: 2-27-26

Applicant/Owner: J J Marinella Sampling Point or Zone: 901 and 902

Investigator(s): NOrman G. Hill. P.E. Latitude / Longitude: N42.0755/ W71.3856

Soil Map Unit Name: scarboro NWI or DEP Classification: PF01E

Are climatic/hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? (If yes, explain in Remarks)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If yes, explain in Remarks)

**SUMMARY OF FINDINGS – Attach site map and photograph log showing sampling locations, transects, etc.**

| | | |
|---|---|---|
| Wetland vegetation criterion met? | Yes [✓] No [ ] | **Is the Sampled Area within a Wetland?** Yes [✓] No [ ] |
| Hydric Soils criterion met? | Yes [✓] No [ ] | |
| Wetlands hydrology present? | Yes [✓] No [ ] | |

Remarks, Photo Details, Flagging, etc.:

All larger trees in the wetland area have died.

**HYDROLOGY**

| **Field Observations:** | | | |
|---|---|---|---|
| Surface Water Present? | Yes [ ] | No [ ] | Depth (inches) |
| Water Table Present? | Yes [✓] | No [ ] | Depth (inches) 8.00 |
| Saturation Present (including capillary fringe)? | Yes [✓] | No [ ] | Depth (inches) 6.00 |

**Wetland Hydrology Indicators**

| Reliable Indicators of Wetlands Hydrology | Indicators that can be Reliable with Proper Interpretation | Indicators of the Influence of Water |
|---|---|---|
| [✓] Water-stained leaves | [ ] Hydrological records | [✓] Direct observation of inundation |
| [ ] Evidence of aquatic fauna | [ ] Free water in a soil test hole | [ ] Drainage patterns |
| [ ] Iron deposits | [✓] Saturated soil | [ ] Drift lines |
| [ ] Algal mats or crusts | [ ] Water marks | [ ] Scoured areas |
| [ ] Oxidized rhizospheres/pore linings | [ ] Moss trim lines | [ ] Sediment deposits |
| [ ] Thin muck surfaces | [✓] Presence of reduced iron | [ ] Surface soil cracks |
| [ ] Plants with air-filled tissue (aerenchyma) | [ ] Woody plants with adventitious roots | [ ] Sparsely vegetated concave surface |
| [ ] Plants with polymorphic leaves | [✓] Trees with shallow root systems | [ ] Microtopographic relief |
| [ ] Plants with floating leaves | [ ] Woody plants with enlarged lenticels | [ ] Geographic position (depression, toe of slope, fringing lowland |
| [ ] Hydrogen sulfide odor | | |

Remarks (describe recorded data from stream gauge, monitoring well, aerial photos, previous inspections, if available):

This form is only for BVW delineations. Other wetland resource areas may be present and should be delineated according to the applicable regulatory provisions.

Form Revised July 2023

**VEGETATION** – Use both common and scientific names of plants.

Tree Stratum Plot size 30' x30'

| Common name | Scientific name | Indicator Status | Absolute % Cover | Dominant? (yes/no) | Wetland Indictor? (yes/no) |
|---|---|---|---|---|---|
| 1. red maple | acer rubru, | FACW | 90.0 | Yes | Yes |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| 6. | | | | | |
| 7. | | | | | |
| 8. | | | | | |
| 9. | | | | | |

90.0 = Total Cover

Shrub/Sapling Stratum Plot size 30' x 30'

| Common name | Scientific name | Indicator Status | Absolute % Cover | Dominant? (yes/no) | Wetland Indictor? (yes/no) |
|---|---|---|---|---|---|
| 1. pine saplings | pinus r. | FACU | 10.0 | No | No |
| 2. red maple saplings | acer r. | FACW | 30.0 | Yes | Yes |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| 6. | | | | | |
| 7. | | | | | |
| 8. | | | | | |
| 9. | | | | | |

40.0 = Total Cover

Herb Stratum Plot size 30' x 30'

| Common name | Scientific name | Indicator Status | Absolute % Cover | Dominant? (yes/no) | Wetland Indictor? (yes/no) |
|---|---|---|---|---|---|
| 1. moss | bryophyta | FACW | 5.0 | No | Yes |
| 2. water hemlock | cicuta bulbifern | OBL | 15.0 | Yes | Yes |
| 3. sensitive fern | onoclea sensibilois | FACW | 10.0 | Yes | Yes |
| 4. | | | | | |
| 5. | | | | | |
| 6. | | | | | |
| 7. | | | | | |
| 8. | | | | | |
| 9. | | | | | |
| 10. | | | | | |
| 11. | | | | | |
| 12. | | | | | |

30.0 = Total Cover

**VEGETATION** – continued.

| Woody Vine Stratum | Plot size | | | | |
|---|---|---|---|---|---|
| Common name | Scientific name | Indicator Status | Absolute % Cover | Dominant? (yes/no) | Wetland Indictor? (yes/no) |
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |
| | | 0.0 = Total Cover | | | |

| Rapid Test: | Do all dominant species have an indicator status of OBL or FACW? | | Yes ☑ No ☐ |
|---|---|---|---|
| Dominance Test: | Number of dominant species | Number of dominant species that are wetland indicator plants | Do wetland indicator plants make up ≥ 50% of dominant plant species? Yes ☑ No ☐ |
| | | | |

| Prevalence Index: | | Total % Cover (all strata) | Multiply by: | Result |
|---|---|---|---|---|
| | OBL species | 1 | X 1 | = 1.00 |
| | FACW species | 4 | X 2 | = 8.00 |
| | FAC species | 0 | X 3 | = 0.00 |
| | FACU species | 1 | X 4 | = 4.00 |
| | UPL species | 0 | X 5 | = 0.00 |
| | Column Totals | (A) 6 | | (B) 13 |
| | Prevalence Index | B/A = 2.17 | | Is the Prevalence Index ≤ 3.0? Yes ☑ No ☐ |

**Wetland vegetation criterion met?** **Yes** ☑ **No** ☐

**Definitions of Vegetation Strata**

Tree - Woody plants 3 in. (7.62 cm) or more in diameter at breast height (DBH), regardless of height

Shrub / Sapling - Woody plants less than 3 in. (7.62 cm) DBH and greater than or equal to 3.3 ft. (1 m) tall

Herb - All herbaceous (non-woody plants, regardless of size, and woody plants less than 3.3 ft. (1 m) tall

Woody vines - All woody vines greater than 3.3 ft. (1 m) in height

| Cover Ranges | |
|---|---|
| Range | Midpoint |
| 1-5 % | 3.0 % |
| 6-15 % | 10.5 % |
| 15-25 % | 20.5 % |
| 26-50 % | 38.0 % |
| 51-75 % | 63.0 % |
| 76-95 % | 85.5 % |
| 96-100 % | 98.0 % |

**SOIL**

**Profile Description:** (Describe to the depth needed to document the indicator or confirm the absence of indicators)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| | Color (moist) | % | Color (moist) | % | Type[1] | Location[2] | | |
| 0 to 4 | | | | | | | | organics |
| 4 to 8 | 7.5YR.2.5/1 | | | | | | sandy loam | |
| 8 to 12 | 7.5YR7/2 | | 10yr 6/1 | 10.00 | | | sandy loam | MOTTLES |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

| **Hydric Soil Indicators** (Check all that apply) | | **Indicators for Problematic Hydric Soils** |
|---|---|---|
| ☐ Histosol (A1) | ☐ Polyvalue Below Surface (S8) | ☐ 2 cm Muck (A10) |
| ☐ Histic Epipedon (A2) | ☐ Thin Dark Surface (S9) | ☐ 5 cm Mucky Peat or Peat (S3) |
| ☐ Black Histic (A3) | ☐ Loamy Gleyed Matrix (F2) | ☐ Iron-Manganese Masses (F12) |
| ☐ Hydrogen Sulfide (A4) | ☑ Depleted Matrix (F3) | ☐ Mesic Spodic (A17) |
| ☐ Stratified Layers (A5) | ☐ Redox Dark Surface (F6) | ☐ Red Parent Material (F21) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Dark Surface (F7) | ☐ Very Shallow Dark Surface (F22) |
| ☐ Thick Dark Surface (A12) | ☐ **Redox Depressions (F8)** | |
| ☐ Sandy Mucky Mineral (S1) | | |
| ☐ Sandy Gleyed Matrix (S4) | | |
| ☐ Sandy Redox (S5) | | ☐ Other (Include Explanation in Remarks) |
| ☐ Stripped Matrix (S6) | | |
| ☐ Dark Surface (S7) | | |

**Restrictive Layer (if observed)** Type: _____ Depth (inches): _____

Remarks: MOTTLES AT 8 INCHES

**Hydric Soils criterion met?** **Yes** ☑ **No** ☐

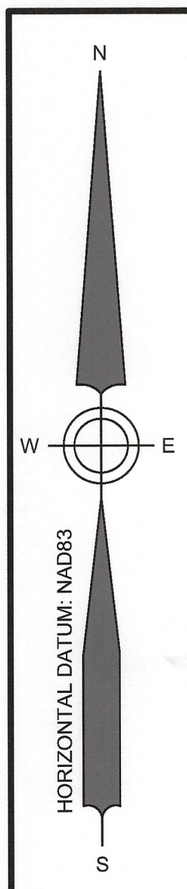
# EXISTING CONDITIONS PLAN

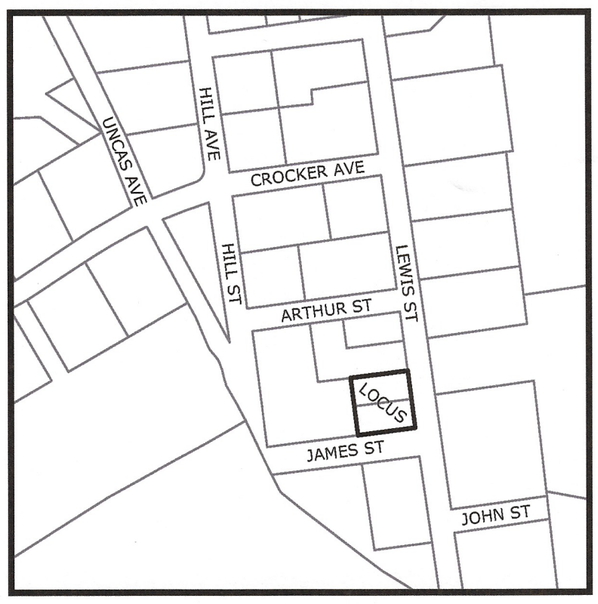
Located at
Lewis Street
Franklin, MA

Owned By
Lewis Street Realty LLC

Applicant
Lewis Street Realty LLC
P.O. Box 411
Franklin, MA 02038

Revised: March 2, 2026




**LOCUS MAP**
Scale 1" = 250'
from Mass Mapper data layers
to be considered approximate

GRAPHIC SCALE
20 0 10 20 40
( IN FEET )
1 INCH = 20 FT.

**ZONING DISTRICT**

SINGLE FAMILY IV

| | |
|---|---|
| AREA: | 15,000 FT² |
| FRONTAGE: | 100 FT |
| FRONT YARD: | 30 FT |
| SIDE YARD: | 20 FT |
| REAR YARD: | 20 FT |
| IMPERVIOUS COV. | 35% MAX. |

LOCUS REFERENCES

Deed (Book / Page): 29497 / 310

Assessors Parcel ID: 298-013-000-000
298-014-000-000

Plan (Plan No. / Year): 2488 / 1909
489 / 1999
460 / 2000
Lewis Street Acceptance Plan 2015

SOIL TEST LOG: January 13, 2026

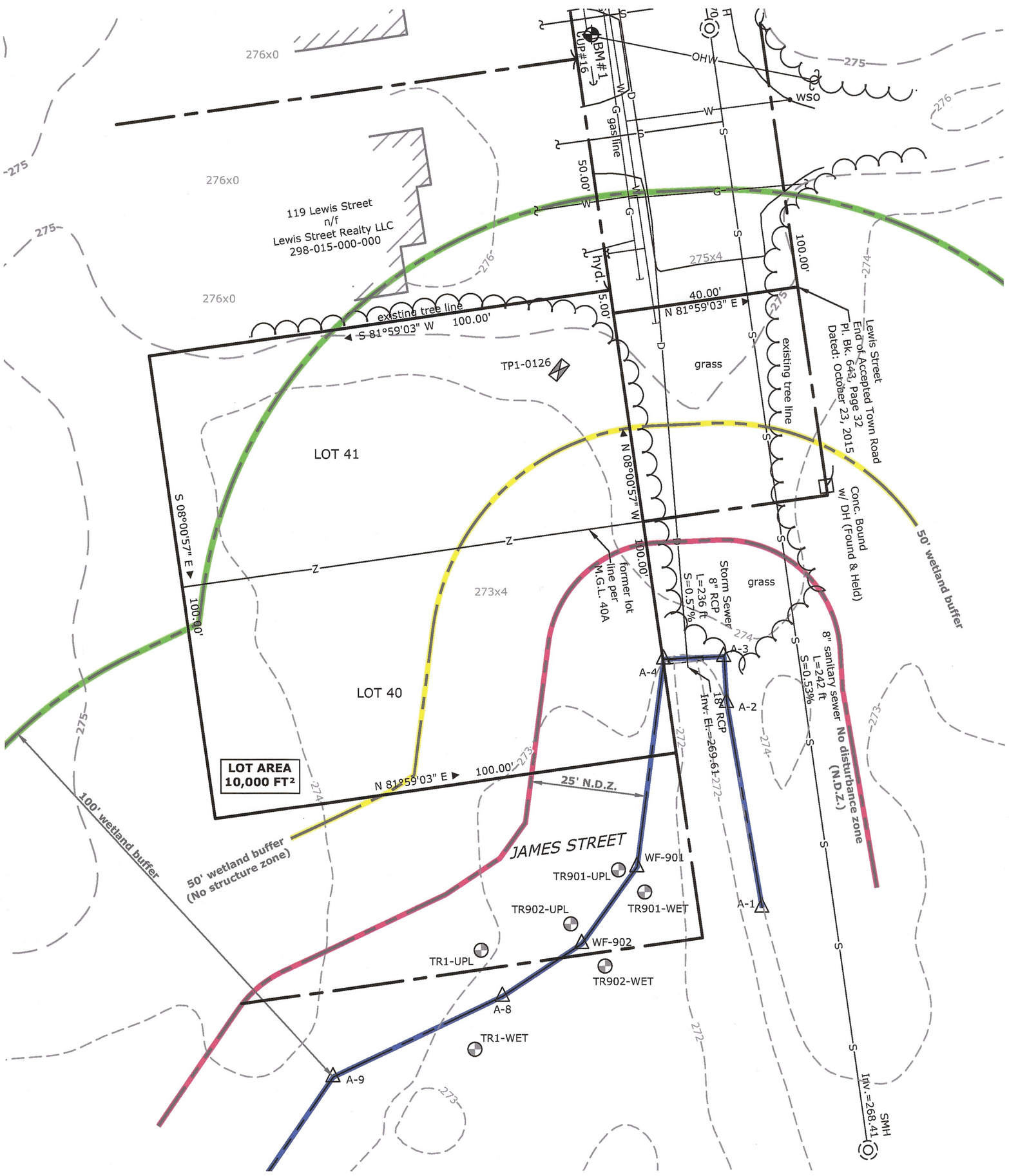
TP1-0106

| Depth | Horizon | Texture | Color |
|---|---|---|---|
| 0-5 | O | Sandy loam | 10YR 2/1 |
| 5-11 | A | Sandy loam | 10YR 3/2 |
| 11-24 | Bw | Sandy loam | 10YR 5/6 |
| 24-78 | C | Sand | 2.5Y 5/3 |

Notes: Weeping: @ 27" Standing: N/A

BUFFER ZONE IMPACT REPORT

| Buffer Zone (ft) | Total Existing Area (ft²) |
|---|---|
| 0-25 | 1,064 |
| 25-50 | 2,008 |
| 50-100 | 5,977 |
| Total: | 9,049 |




EXISTING CONDITIONS PLAN
1" = 20'

BENCHMARK SCHEDULE

| No. | Description | Elevation |
|---|---|---|
| BM#1 | Nail in UP#16 | 276.07 |

COMMONWEALTH OF MASSACHUSETTS
NORMAN G HILL No. 41786 PROFESSIONAL LAND SURVEYOR

Norman G. Hill, PLS #41786 Date: 3-2-26

REVISIONS

| Date | Description |
|---|---|
| 3/2/26 | revise wetland delineation |
| | |
| | |
| | |
| | |

| | | |
|---|---|---|
| Field By: | SB/JB | 12/2025 |
| Designed By: | SB | 2/2026 |
| Drawn By: | SB | 2/2026 |
| Checked By: | NGH | 2/2026 |


**Land Planning, Inc.**
Civil Engineers • Land Surveyors
Environmental Consultants

**Bellingham**
167 Hartord Ave.
Bellingham, MA 02019
508-966-4130

**North Grafton**
214 Worcester St.
N. Grafton, MA 01536
508-839-9526

**Hanson**
1115 Main Street
Hanson, MA 02341
781-294-4144

www.landplanninginc.com


Date: Feb. 24, 2026
Job No. G25125
Sheet No. 1 of 1

February 13, 2026
*Revised February 23, 2026*

Breeka Li Goodlander, PWS, CERPIT
Conservation Director
Town of Franklin Conservation Commission
355 East Central Street
Franklin, MA 02038

**Re: Lewis Street**
**MassDEP File No. 159-1324**
**Notice of Intent Peer Review**

Dear Ms. Goodlander:

BETA Group, Inc. (BETA) has reviewed documents and plans for the proposed construction of a single-family dwelling (the Project) off of ***Lewis Street*** in Franklin, Massachusetts (the "Site"). This revised letter is provided to present BETA's current findings, comments, and recommendations.

## BASIS OF REVIEW

The following documents were received by BETA and will form the basis of the review:

- Notice of Intent entitled ***Notice of Intent***; prepared by Land Planning, Inc., dated January 8, 2026.
    - Attachments include:
        - Figures (Plan Book 52 Plan No. 2488 Map, FEMA Map, USGS map, NHESP map, and Franklin GIS Map);
        - Local Forms;
        - WPA Form 3;
        - Filing Fees;
        - Field Data Sheets;
        - Abutters Information.
- Plans (1 Sheet) entitled ***Conservation Site Design Plan,*** dated January 6, 2026, prepared by Land Planning, Inc.; stamped and signed by Norman G Hill MA PE No. 31887.

Review by BETA included the above items along with the following, as applicable:

- Site Visit on February 20, 2026
- ***Massachusetts Wetlands Protection Act 310 CMR 10.00*** effective October 24, 2014
- ***Wetlands Protection Chapter 181 From the Code of the Town of Franklin,*** dated August 20, 1997
- ***Conservation Commission Bylaws Chapter 271 From the Code of the Town of Franklin,*** dated July 11, 2019
- ***Town of Franklin Conservation Commission Regulations,*** dated October 3, 2019
- ***Town of Franklin Best Development Practices Guidebook***, dated September 2016

## SITE AND PROJECT DESCRIPTION

The 0.23-acre Site consists of two (2) parcels located off of Lewis Street in Franklin, Massachusetts, further identified by the Franklin Assessor's Office as Assessor's Parcel 298-013-000 and 298-014-000. The Site is

bounded to the north by a residential property and to the south, east, and west by undeveloped forested areas. Existing conditions at the Site consist of undeveloped/wooded upland and wetland complexes. The Site is generally flat with slight topographic relief to the south.

According to the Applicant, Resource Areas Subject to Protection and Jurisdiction under the Massachusetts Wetlands Protection Act (M.G.L. ch.131 s.40) and its implementing regulations at 310 CMR 10.00 (collectively "the Act"), as well as the Town of Franklin Wetlands Protection Bylaw (Chapter 181) and its associated regulations (collectively "the Bylaw") present at or adjacent to the Site include Bordering Vegetated Wetland (BVW), the 25-foot No Disturbance Zone, the 50-foot No Build Zone, and the 100-foot Buffer Zone.

The Site is not located within Zone I or Interim Wellhead Protection Areas, nor is it located within Surface Water Protection Areas (Zone A, B, or C) or Outstanding Resource Waters (ORWs). The Site is located within a Zone II Wellhead Protection Area. There are no Areas of Critical Environmental Concern (ACECs) present, and the most recent Natural Heritage and Endangered Species Program (NHESP) mapping does not depict Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife at the Site. There are no NHESP-mapped Certified Vernal Pools or Potential Vernal Pools (PVPs) mapped within 100 feet of the Site. According to the FEMA Flood Insurance Rate Map (FIRM) community panel number 25021C0309F, dated July 8, 2025, the Site is not located within a FEMA Flood Zone.

Natural Resource Conservation Service (NRCS) soil maps of the Site indicate the presence of Scarboro and Birdsall soils with a Hydrological Soil Group (HSG) rating of C/D and Walpole sandy loam with the HSG rating of B/D.

The Applicant seeks approval for the construction of a single-family dwelling and other associated Site features within the 100-foot Buffer Zone to BVW. Proposed work includes the following activities (collectively referred to as the "Project"):

- Installation of erosion and sedimentation controls;
- Installation of a temporary construction entrance;
- Clearing and grubbing of portions of the Site;
- Grading of portions of the Site;
- Construction of the proposed house and infiltration system;
- Paving of the roadway and driveway; and
- Stabilization of the Site.

The Project proposes 1,559 square feet of impacts to the 25-50-foot No Build Zone and 4,261 square feet of impacts to the 50-100-foot Buffer Zone. Work proposed within Buffer Zones includes installation of erosion and sedimentation controls; clearing of vegetation; grading; and construction of the single-family home, driveway, roadway, and the infiltration system.

## ADMINISTRATIVE AND PLAN COMMENTS

The plan set (as identified above) is missing information and requires additional information for clarity.

**Table 1. NOI Plan**

| NOI Plan Requirements | Yes | No |
|---|---|---|
| Scale of 40'=1" or larger | ✓ | |
| North Arrow (with reference) | ✓ | |

| | | |
|---|---|---|
| Topographic contours (2' intervals) | ✓ | |
| Existing Conditions Topography (with source and date of survey) | ✓ | |
| Proposed Topography | ✓ | |
| Existing and Proposed Vegetation | | ✓ (Comment A2.a) |
| Existing Structures and Improvements | ✓ | |
| Resource Areas and Buffer Zones labeled | ✓ | |
| Location of Erosion Controls | ✓ | |
| Details of Proposed Structures | ✓ | |
| Construction Sequence and Schedule | | ✓ (Comment A2.b) |
| Registered PLS Stamp (Existing Condition Plans Only) | | ✓ (Comment A2.c) |
| Assessors' Reference | ✓ | |
| Abutting Property Assessors' Reference | ✓ | |
| Survey Benchmark | ✓ | |
| Accurate Plan Scale | ✓ | |

### PLAN AND GENERAL COMMENTS

A1. The Massachusetts Department of Environmental Protection (MassDEP) issued a DEP file number (File No. 159-1324) with the following technical comments:

> MassDEP recommends that the applicant demonstrate that adequate separation exists to allow the installation of the proposed sewer line and existing stormwater culvert which conveys flows developed parts of Lewis St to downgradient wetlands and provide details on how this stormwater conveance will be maintained during project construction.

A2. The following elements are missing from the provided plan set:

a. Existing and proposed vegetation should be included on the plans as referenced in Bylaw Regulations Section 7.18.1.5 and 7.18.1.6, including individual trees/shrubs with a diameter greater than 1" proposed for removal. It is BETA's understanding that the Commission generally increases the size threshold for tree location based on the Project and therefore defers to the Commission on this matter. However, the existing tree line, areas of proposed lawn, and any other proposed vegetation should be depicted on the plans.

b. A Construction Sequence with all proposed activities within Jurisdictional Areas should be provided on the plans per Bylaw Regulations Section 7.18.1.14.

c. A PLS stamp should be provided on the plans to verify the existing conditions survey.

A3. Impacts to both the 25-50-foot and 50-100-foot Buffer Zone should be noted on the plans.

## WETLAND RESOURCE AREAS AND REGULATORY REVIEW

BETA has completed a regulatory review of the Site and the submitted documents and plans, focusing on compliance with jurisdictional regulations set forth in the Act and Bylaw. The Project is proposed within Buffer Zone only and is accordingly not subject to the Resource Area Performance Standards set forth by the Act.

The NOI application generally requires the submission of additional materials to meet all submission requirements of the Bylaw. In addition, the Applicant should clarify proposed conditions as they relate to plantings, seed mixtures, and the sewer line crossing over the existing drainage line. In addition, the Applicant is required to provide calculations of proposed impervious area within the 50-100-foot Buffer Zone.

At this time, the Applicant is required to provide the Conservation Commission with additional information to describe the work and the effect of the work on the interests identified in the Act and the Bylaw.

## RESOURCE AREA AND BOUNDARY COMMENTS

BETA conducted a Site visit on February 20, 2026, to assess existing conditions and to review Resource Area delineations, focusing on the definitions and methodologies referenced under the Act and the Bylaw. Review of Resource Area delineation included all flagged areas on the Site, with a focus on areas closest to where work is proposed. This assessment was performed outside of the growing season with approximately 5 inches of snow cover present at the Site. Accordingly, the scope of the review was limited, as herbaceous vegetation could not be reviewed during this Site visit.

BETA offers the following comment regarding Resource Area boundaries:

W1. Hydric soils consisting of a dark/organic surface layer underlain by depleted soils with redoximorphic concentrations were observed within the area between flags A-5 and A-8 and approximately 5-10 feet upgradient of the area between flags A-1 and A-5. Vegetation in these areas consists of sweet pepperbush (*Clethra alnifolia*), highbush blueberry (*Vaccinium corymbosum*), and red maple (*Acer rubrum*).

The Applicant should revise the BVW boundary and associated Buffer Zones accordingly. In addition, the field data sheets for the relevant upland/wetland plots should be revised, as no soils information is included on the forms submitted with the NOI application.

W2. Flag A-3 was not observed in the field; however, the location of the flag as depicted on the plans appears to be accurate.

## CONSTRUCTION & MITIGATION COMMENTS

W3. Provide specifications of the seed mixture(s) proposed for stabilization of disturbed areas within Buffer Zone, including any areas that are proposed to be lawn. All areas of proposed lawn should be demarcated on the Project plans.

Per the Erosion & Sediment Controls Notes on the plans, Note 6 provides a suggestion for proposed seed that consists of non-native grasses for stabilization. BETA recommends that native species with wildlife habitat value be proposed within Buffer Zone where lawn is not required as mitigation for Buffer Zone clearing.

W4. The Applicant should provide a cross section to demonstrate that the proposed sewer can be constructed over or under the existing drain without conflict.

W5. Material storage and laydown areas should be depicted on the Project plans and located outside of jurisdictional areas to the extent feasible.

W6. Groundwater may be encountered when excavating for the new foundation and utilities. The Commission could include a Special Condition in the order of Conditions requiring the submission and approval of a dewatering plan prior to discharge in the even that groundwater is encountered.

W7. The Applicant should consider providing a planting plan to mitigate for additional development within Buffer Zone. Specifically, areas within Buffer Zone closest to BVW should be prioritized for the planting of native vegetation and the application of native seed mix.

### WPA Performance Standards Comments

The Project does not propose any work within Resource Areas Subject to Protection under the Act; therefore, the Project is not required to comply with Performance Standards under the Act.

### Bylaw Regulatory Comments

W8. A Variance Request should be submitted for construction of impervious surfaces within the 25-50-foot Buffer Zone in accordance with the procedure per Bylaw Regulation Section 5.

W9. A Construction Sequence should also be provided on the Plans per Bylaw Regulation Section 7.15.1.

W10. The Applicant should provide an Erosion & Sedimentation Control Plan which includes the name and phone number of the person(s) responsible for inspecting and maintaining erosion controls as required in Section 7.12.1 of the Bylaw Regulations. The erosion & sedimentation control plan should be included on the plan.

W11. According to Section 7.9.1 of the Bylaw, the Project Narrative should include the following missing content:

a. The entity performing the work; and

b. When the proposed activities will be completed.

W12. Section 4.4.1 of the Bylaw states that "mitigation offsets may be required by the Commission when the applicant proposed that more than 30% of the 50-100-foot Buffer Zone Resource Area is proposed to be impervious surface." The Applicant should provide the Commission with calculations of proposed impervious area within the 50-100-foot Buffer Zone as it compares to existing conditions to allow the Commission to determine if additional mitigation measures are warranted.

## Stormwater Management

The proposed Project is not subject to the MassDEP Stormwater Management Standards as a single-family home construction project.

## Review Summary

Based on our review of the NOI submittal, the Site, and Project plans, the Applicant is required to provide the Conservation Commission with additional information to describe the work and the effect of the work on the interests identified in the Act and the Bylaw.

If we can be of any further assistance regarding this matter, please contact us at our office.

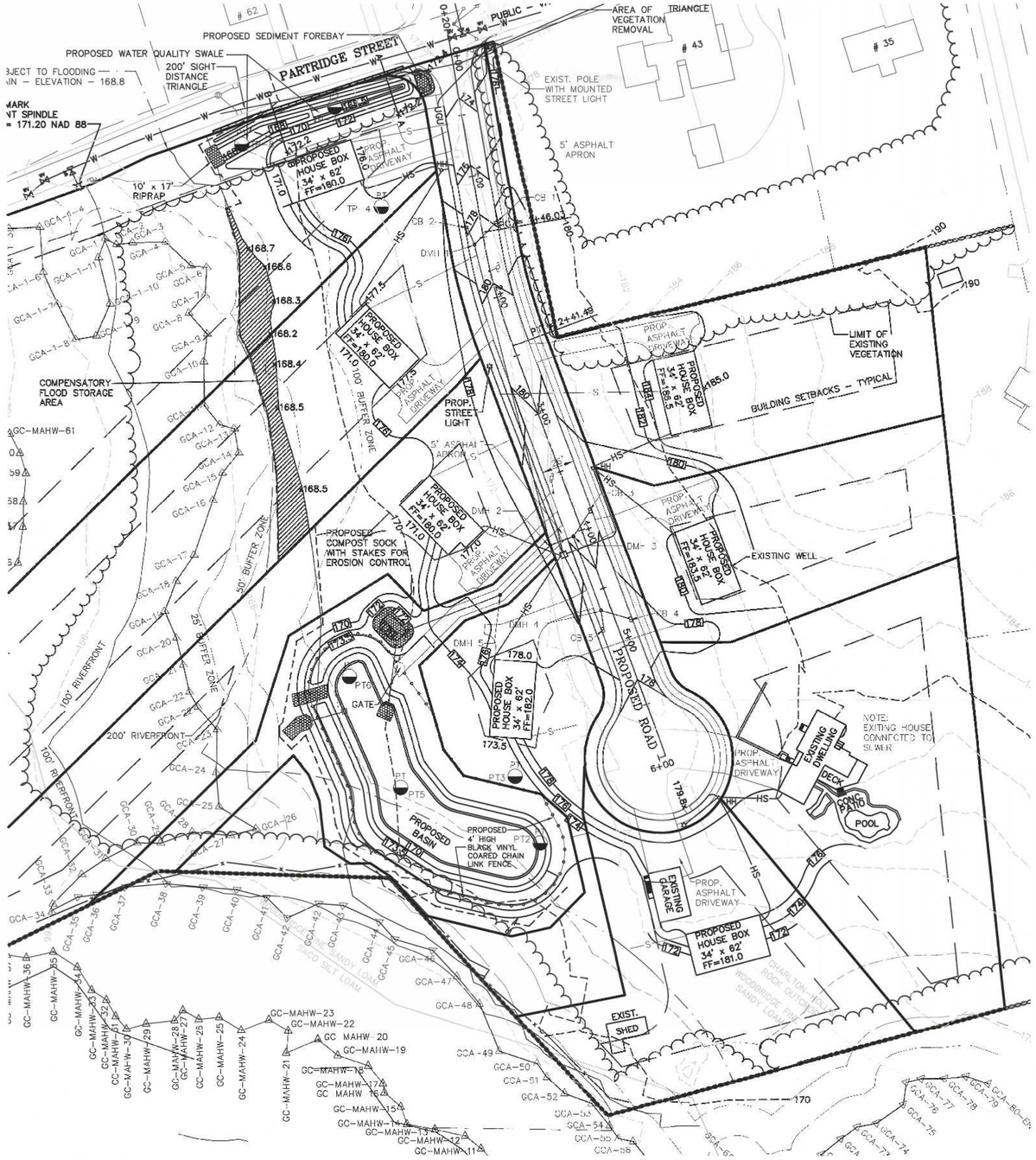
Very truly yours,

BETA Group, Inc.

Anna Haznar
Scientist

Jonathan Niro, PWS
Project Manager

cc: Amy Love, Town Planner
Matt Crowley, P.E., BETA


PROPOSED SEDIMENT FOREBAY
PROPOSED WATER QUALITY SWALE
200' SIGHT DISTANCE TRIANGLE
PARTRIDGE STREET
AREA OF VEGETATION REMOVAL TRIANGLE
EXIST. POLE WITH MOUNTED STREET LIGHT
5' ASPHALT APRON
10' x 17' RIPRAP
PROPOSED HOUSE BOX 34' x 62' FF=180.0
PROP. ASPHALT DRIVEWAY
PROPOSED HOUSE BOX 34' x 62' FF=183.5
PROPOSED HOUSE BOX 34' x 62' FF=182.0
PROPOSED HOUSE BOX 34' x 62' FF=181.0
PROP. STREET LIGHT
LIMIT OF EXISTING VEGETATION
BUILDING SETBACKS - TYPICAL
COMPENSATORY FLOOD STORAGE AREA
100' BUFFER ZONE
50' BUFFER ZONE
25' BUFFER ZONE
PROPOSED COMPOST SOCK WITH STAKES FOR EROSION CONTROL
EXISTING WELL
PROPOSED ROAD 1
NOTE: EXITING HOUSE CONNECTED TO SEWER
EXISTING DWELLING
DECK
CONC. PATIO
POOL
EXISTING GARAGE
PROPOSED BASIN
PROPOSED 4' HIGH BLACK VINYL COARED CHAIN LINK FENCE
EXIST. SHED
GATE
200' RIVERFRONT
100' RIVERFRONT
CB 1
CB 2
CB 3
CB 4
CB 5
DMH 1
DMH 2
DMH 3
DMH 4
DMH 5
CS 1
CS 2
CS 3
CS 4
CS 5
TP 1
TP 2
TP 3
TP 4
TP 5
TP 6
PROPOSED HOUSE BOX 34' x 62' FF=181.0
PROPOSED HOUSE BOX 34' x 62' FF=182.0
PROPOSED HOUSE BOX 34' x 62' FF=183.5
PROPOSED HOUSE BOX 34' x 62' FF=180.0
PROP. ASPHALT DRIVEWAY
EXISTING DWELLING
EXISTING GARAGE
# 62
# 43
# 35
# 39
# 47
# 51
# 55
# 59
# 63
# 67
# 71
# 75
# 79
# 83
# 87
# 91
# 95
# 99
# 103
# 107
# 111
# 115
# 119
# 123
#

## ABUTTERS WITHIN 300'

220–020
TOWN OF FRANKLIN
355 EAST CENTRAL ST.
FRANKLIN, MA. 02038

220–017
HENRY & MICHELLE BRATCHER
85 PARTRIDGE ST.
FRANKLIN, MA. 02038

220–016
ROBERT & MARLENE OLIVER
81 PARTRIDGE ST.
FRANKLIN, MA. 02038

220–007
EDWARD & MARION SYNGAY
22 ELM ST.
FRANKLIN, MA. 02038

220–011
JOHN DONAVAN JR.
47 PARTRIDGE ST.
FRANKLIN, MA. 02038

220–012
19 PARTRIDGE LLC.
19 PARTRIDGE ST.
FRANKLIN, MA. 02038

214–005
STANLEY & DONNA SYNGAY
24 ELM ST
FRANKLIN, MA. 02038

214–006
MICHAEL & AMY JOHNSON
15 PARTRIDGE ST.
FRANKLIN, MA. 02038

214–007
JOSHUA SHERWOOD
35 PARTRIDGE ST.
FRANKLIN, MA. 02038

214–008
WILLIAM & ALLISON WHITE
43 PARTRIDGE ST.
FRANKLIN, MA. 02038

214–027
CHAD & KRISTEN HESS
46 PARTRIDGE ST.
FRANKLIN, MA. 02038

214–028
FATHIMA SALAHUDEEN
42 PARTRIDGE ST.
FRANKLIN, MA. 02038

214–029
CAROL–ANNE L. PISO REVOCABLE TRUST
40 PARTRIDGE ST.
FRANKLIN, MA. 02038

214–030
JENNIFER & LOUIS BARBA
32 PARTRIDGE ST.
FRANKLIN, MA. 02038

214–010
PATRICK & JULIA WILLIAMS
60 PARTRIDGE ST.
FRANKLIN, MA. 02038

214–009
ROBERT & NANCY HENNESSEY
62 PARTRIDGE ST.
FRANKLIN, MA. 02038

220–056
TOWN OF FRANKLIN
355 EAST CENTRAL ST.
FRANKLIN, MA. 02038

220–055
BENJAMIN & MONA KLIBANOFF
137 MASTRO DR.
FRANKLIN, MA. 02038

220–054
CRAIG & ELLEN MOODIE
82 PARTRIDGE ST.
FRANKLIN , MA. 02038

214–011
JOSEPH & ELAINA COOK
4 HARBORWOOD DR.
FRANKLIN, MA. 02038

214–012
KENNEY REVOCABLE TRUST
6 HARBORWOOD DR.
FRANKLIN, MA. 02038

214–013
JOSEPH & NANCY SCARINGELLO
8 HARBORWOOD DR.
FRANKLIN, MA. 02038

214–014
MARK & NOREEN REARDON
10 HARBORWOOD DR.
FRANKLIN, MA. 02038

220–010
JOHN DONOVAN & ANTHONY CLARIZIO
RIDENOUR WAY
FRANKLIN, MA. 02038

214–025
ROMSEY FAMILY IRREVOCABLE TRUST
6 HARBORWOOD DR.
FRANKLIN, MA. 02038

214–026
HARBOR REALTY TRUST
3 HARBORWOOD DR.
FRANKLIN, MA. 02038

# DONOVAN ESTATES

## DEFINITIVE SUBDIVISION PLAN OF LAND
## FRANKLIN, MASSACHUSETTS
## SEPTEMBER 3, 2025

FOR REGISTRY USE ONLY

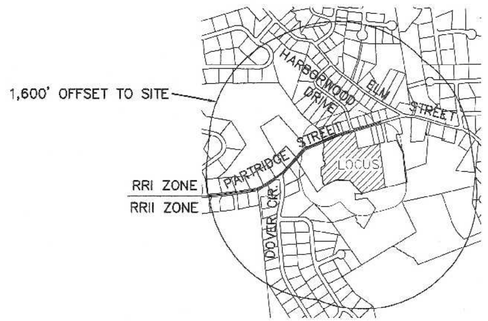
I NANCY DANELLO, CLERK OF THE TOWN OF FRANKLIN, RECEIVED AND RECORDED FROM THE PLANNING BOARD COVENANT APPROVAL OF THIS PLAN ON

_____

AND NO APPEAL WAS RECIEVED DURING THE 20 DAYS NEXT AFTER RECEIPT AND RECORDING OF SAME.

_____

TOWN CLERK – FRANKLIN DATE




PLAN 1085–1984

## VICINITY MAP

SCALE: 1" = 800'

WAIVER REQUESTS:
1. SECTION 330–13.A.(1) A WAIVER IS REQEUSTED TO CONSTRUCT A SIDEWALK ON ONE SIDE OF THE ROADWAY.
2. SECTION 330–11.B.(1) A WAIVER IS REQEUSTED TO ALLOW LESS THAN 42" OF COVER OVER THE DRAIN PIPES. DRAIN PIPES TO BE CLASS V RCP.
3. SECTION 330–11.A.(4) A WAIVER IS REQEUSTED TO ALLOW THE WATER QUALITY SWALE ON LOT 8 TO BE LOCATED WITHIN AN EASEMENT.

REFERENCES:
ASSESSORS PARCELS 220–013,
220–014 AND 220–015
DEED BOOK 39210 PAGE 372
PLAN 1085 OF 1984
PLAN 1469 OF 1987
PLAN 800 OF 1987
PLAN 1557 OF 1985
PLAN 427 OF 1994
PLAN 430 OF 1995
ANORAD RECORDED IN BOOK 42515 PAGE 133

DRAWING INDEX

SHEET 1 – COVER SHEET
SHEET 2 – EXISTING CONDITIONS PLAN
SHEET 3 – LOT LAYOUT PLAN
SHEET 4 – GRADING AND UTILITY PLAN
SHEET 5 – ROADWAY PLAN AND PROFILE
SHEET 6 – EROSION CONTROL PLAN
SHEET 7 – DEMOLITION PLAN
SHEET 8 – PLANTING PLAN
SHEET 9 – CONSTRUCTION DETAILS – 1
SHEET 10 – CONSTRUCTION DETAILS – 2
SHEET 11 – CONSTRUCTION DETAILS – 3
DEVELOPMENT PLANS 1 – 2

OWNER:
DONOVAN FAMILY REALTY TRUST
47 PARTRIDGE ST.
FRANKLIN, MA

APPLICANT:
DONOVAN FAMILY REALTY TRUST
C/O ATTORNEY RICHARD CORNETTA
47 PARTRIDGE ST.
FRANKLIN, MA

I DECLARE THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

DONOVAN ESTATES
COVER SHEET
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 800'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

DATE

GRAPHIC SCALE
800 0 400 800 1600 3200
( IN FEET )
1 inch = 800 ft.

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

COMMONWEALTH OF MASSACHUSETTS
CARLOS A. QUINTAL
CIVIL
No. 30812
REGISTERED PROFESSIONAL ENGINEER

CARLOS A. QUINTAL P.E. #30812

| DATE | | INT. |
|---|---|---|
| 2/18 | FIELD BY: | BL |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | COMP |
| 9/25 | CHECKED BY: | CAQ |

UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508–384–6560 FAX 508–384–6566

| | |
|---|---|
| DATE | SEPT. 3, 2025 |
| SCALE | 1" = 800' |
| PROJECT | UC1340 |
| SHEET | 1 of 11 |

ZONE: RURAL RESIDENTIAL II
AREA: 30,000 SQ. FT.
FRONTAGE: 150'
DEPTH 200'
LOT WIDTH: 135'
SETBACKS:
F – 40'
S – 35'
R – 35'
LOT COVERAGE STRUCTURES 20%
LOT COVERAGE STRUCTURES AND PAVING 25%

THE PROPERTY IS NOT LOCATED WITHIN A WATER RESOURCE DISTRICT. THE PROPERTY IS LOCATED WITHIN FLOOD ZONE A ZONE B AND ZONE X AS SHOWN ON MAPS 25021C0143F AND 25021C0306F DATED JULY 8 2025.

I NANCY DANELLO, CLERK OF THE TOWN OF FRANKLIN, RECEIVED AND RECORDED FROM THE PLANNING BOARD COVENANT APPROVAL OF THIS PLAN ON

_____

AND NO APPEAL WAS RECIEVED DURING THE 20 DAYS NEXT AFTER RECEIPT AND RECORDING OF SAME.

_____

TOWN CLERK – FRANKLIN DATE

FOR REGISTRY USE ONLY

## LEGEND

- DHCB DRILL HOLE CONCRETE BOUND (TO BE SET)
- 297 EXISTING COUNTOUR
- 297 PROPOSED COUNTOUR
- 48M EXIST. TREE – DIAMETER – SPECIES
- UP4 UTILITY POLE
- OHW OVERHEAD WIRES
- GAS GATE
- WATER CURB STOP
- WATER GATE
- FIRE HYDRANT
- DRAIN MANHOLE
- CATCH BASIN
- SEWER MANHOLE

SITE SOILS:
THE SITE SOILS ARE LISTED AS WOODBRIDGE FINE SANDY LOAM, CHARLTON–HOLLIS–ROCK OUTCROP AND SACO SILT LOAM. REFERENCE SOILS MAP FOR NORFOLK AND SUFFOLK COUNTIES.

TEST PIT DATA:

PT–2 ELEV. = 170.48
0 – 12" A FINE SANDY LOAM ELEV. = 169.48
12" – 30" B FINE SANDY LOAM ELEV. = 167.98
30" – 102" C GRAVELLY SANDY LOAM ELEV. = 161.98
WATER STANDING AT 60" ELEV. = 165.48
MOTTLING @ 52" 7.5Y 6/4 ELEV. = 166.15
PERMEABILITY RATE – 0.77 IN / HR

PT–3 ELEV. = 171.59
0 – 6" A FINE SANDY LOAM ELEV. = 171.09
6" – 24" B FINE SANDY LOAM ELEV. = 169.59
24" – 108" C GRAVELLY SANDY LOAM ELEV. = 162.59
WATER AT 60" ELEV. = 166.59
MOTTLING @ 52" ELEV. = 167.26
PERMEABILITY RATE – 2.98 IN / HR

PT–5 ELEV. = 170.02
0 – 12" A SANDY LOAM ELEV. = 169.02
12" – 18" B SANDY LOAM ELEV. = 168.52
30" – 60" C FINE SANDY LOAM ELEV. = 165.02
PERMEABILITY RATE – 1.34 IN / HR

PT–6 ELEV. = 169.11
0 – 12" A SANDY LOAM ELEV. = 168.11
12" – 18" B SANDY LOAM ELEV. = 167.51
18" – 60" C FINE SANDY LOAM ELEV. = 164.11
PERMEABILITY RATE – 2.02 IN / HR

TP–7 ELEV. = 171.31
0 – 12" A SANDY LOAM ELEV. = 170.31
12" – 18" B SANDY LOAM ELEV. = 169.81
18" – 60" C FINE SANDY LOAM ELEV. = 166.31
NO WATER OBSERVED @ ELEV. = 166.31
MOTTLING @ 24" ELEV. = 169.31

TP–8 ELEV. = 169.23
0 – 12" A FINE SANDY LOAM ELEV. = 168.23
12" – 18" B FINE SANDY LOAM ELEV. = 167.73
18" – 60" C GRAVELLY SANDY LOAM ELEV. = 164.23
NO WATER OBSERVED @ 60" ELEV. = 164.23
MOTTLING @ 20" ELEV. = 167.56

EXISTING CONDITIONS SURVEY WAS CONDUCTED BETWEEN FEBRUARY 7, 2018 AND APRIL 25, 2024.

I DECLARE THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

REFERENCES:
ASSESSORS PARCELS 220–013, 220–014 AND 220–015
DEED BOOK 39210 PAGE 372
PLAN 1085 OF 1984
PLAN 1469 OF 1987
PLAN 800 OF 1987
PLAN 1557 OF 1985
PLAN 427 OF 1994
PLAN 430 OF 1995
ANORAD RECORDED IN BOOK 42515 PAGE 133

# DONOVAN ESTATES
EXISTING CONDITIONS PLAN
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 50'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

DATE

GRAPHIC SCALE
50 0 25 50 100 200
( IN FEET )
1 inch = 50 ft.

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

ANDREW C. MURPHY P.L.S. #35042
2/17/26

| DATE | | INT. |
|---|---|---|
| 2/18 | FIELD BY: | BL |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | COMP |
| 9/25 | CHECKED BY: | CAQ |

UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508–384–6560 FAX 508–384–6566

SEPT 3, 2025
1" = 50'
UC1340

ZONE: RURAL RESIDENTIAL II
AREA: 30,000 SQ. FT.
FRONTAGE: 150'
DEPTH 200'
LOT WIDTH: 135'
SETBACKS:
F – 40'
S – 35'
R – 35'
LOT COVERAGE STRUCTURES 20%
LOT COVERAGE STRUCTURES AND PAVING 25%

THE PROPERTY IS NOT LOCATED WITHIN A WATER RESOURCE DISTRICT. THE PROPERTY IS LOCATED WITHIN FLOOD ZONE A ZONE B AND ZONE X AS SHOWN ON MAPS 25021C0143F AND 25021C0306F DATED JULY 8 2025.

FOR REGISTRY USE ONLY

I NANCY DANELLO, CLERK OF THE TOWN OF FRANKLIN, RECEIVED AND RECORDED FROM THE PLANNING BOARD COVENANT APPROVAL OF THIS PLAN ON

_____

AND NO APPEAL WAS RECIEVED DURING THE 20 DAYS NEXT AFTER RECEIPT AND RECORDING OF SAME.

_____

TOWN CLERK – FRANKLIN DATE

## LEGEND

- DHCB DRILL HOLE CONCRETE BOUND (TO BE SET)
- 287 EXISTING COUNTOUR
- 297 PROPOSED COUNTOUR
- 48M EXIST. TREE – DIAMETER – SPECIES
- UP4 UTILITY POLE
- OHW OVERHEAD WIRES
- GAS GATE
- WATER CURB STOP
- WATER GATE
- FIRE HYDRANT
- DRAIN MANHOLE
- CATCH BASIN
- SEWER MANHOLE

PARTRIDGE STREET
DH PUBLIC – VARIABLE WIDTH (FND)
N 410362.47 E 624936.65
N 410402.36 E 624871.12
DRAINAGE EASEMENT
N73°26'16"E 69.44'
7.20'
N71°53'38"E 85.28'
62.24'
56.24'
29.04'
N71°55'06"E 84.94'
3.59' "EASEMENT"
R=30.00' L=51.62' T=34.87' D=98°35'37"
N70°36'41"E 140.59' FRONTAGE=364.01'
N64°17'55"E 58.86'
N70°14'15"E 105.33'
104.33'
303.79'
N70°36'41"E
S19°45'45"E 30.74'
S12°00'11"E 244.16'
S09°30'45"E 149.50'
1+00
N09°30'45"W 107.86'
52.69'
55.17'
EXISTING SEWER EASEMENT
PROPOSED 6" x 6" 3' CONCRETE BOUND (TYP)
PC
46.03
S12°00'11"E 244.16'
R=472.00' L= 90.11' T=45.19' D=10°56'19"
PT
DH (FND)
41.49
2+00
MAP 214 PARCEL 008
43 PARTRIDGE STREET
N/F WHITE
MAP 214 PARCEL 007
35 PARTRIDGE STREET
N/F SHERWOOD
RIDENOUR WAY
PRIVATE – 40' WIDE
DH (FND) N75°38'51"E 53.69'
N76°19'42"E 253.66'
136.90'
LOT 8
82,624± SQ. FT.
CENTERLINE RADIUS = 500'
FRONTAGE=150.00'
R=528.00' L=100.80' T=50.55' D=10°56'19"
LOT 7
82,214± SQ. FT.
N41°26'41"E 30.00'
FRONTAGE=150.13'
LOT 1
42,529 SQ. FT.
HOUSE NUMBER
BUILDING SETBACKS – TYPICAL
FRONTAGE=354.59'
114.38'
N73°03'01"W 50.00'
N76°19'42"E 241.09'
115.00'
# 19
MAP 220 PARCEL 012
19 PARTRIDGE STREET
N/F 19 PARTRIDGE STREET, LLC
CENTERLINE SHEPARD'S BROOK
GC-MAHW-72
GC-MAHW-71
GC-MAHW-70
GC-MAHW-69
GC-MAHW-68
GC-MAHW-67
GC-MAHW-66
GC-MAHW-65
GC-MAHW-64
GC-MAHW-63
GC-MAHW-62
GC-MAHW-61
GC-MAHW-60
GC-MAHW-59
GC-MAHW-58
GC-MAHW-57
GC-MAHW-56
GC-MAHW-55
GC-MAHW-54
GC-MAHW-53
GC-MAHW-52
GC-MAHW-51
GC-MAHW-50
GC-MAHW-49
GC-MAHW-48
GC-MAHW-47
GC-MAHW-46
GC-MAHW-45
GC-MAHW-44
GC-MAHW-43
GC-MAHW-42
GC-MAHW-41
GC-MAHW-40
GC-MAHW-39
GCA-1-4
GCA-1-5
GCA-1-6
GCA-1-7
GCA-1-8
GCA-1-9
GCA-1-10
GCA-1-11
345'±
277'±
S45°32'55"W 504'±
S74°56'43"W 40'±
S45°32'55"W 593'±
100' RIVERFRONT
N17°45'44"E 86.80'
N56°16'11"E 94.38'
N69°05'14"E 60.16'
EXISTING LOT LINES AS SHOWN ON PLANS OF RECORD
LOT 6
54,098± SQ. FT.
N20°27'04"W 279.06'
N45°32'55"E 59.72'
N45°32'55"E 52.93'
S45°32'55"W 107.32'
S45°32'55"W 52.21'
S69°05'14"W 37.56'
FRONTAGE=175.9
LOT 5
35,387± SQ. FT.
R=30.00' L=28.64' T=15.52' D=54°42'20"
R=60.90' L=40.22' T=40.22' D=38°24'13"
S20°27'04"E 289.24'
4+00 LENGTH = 800.00 5+00
PROPOSED ROAD "MINOR STREET" WIDTH = 56'
FRONTAGE=150.01'
150.00'
N89°53'34"E
24.57.56'
24.26'
R=30.00' L=23.39' T=12.33' D=44°40'29"
FRONTAGE=150.00'
S89°25'07"W 196.25'
S05°57'36"E 617.86'
365.96'
6+00
EXISTING WELL
LOT 2
34,041 SQ. FT.
EXISTING DWELLING
DECK
CONC. PATIO
POOL
R=60.00' L=292.57' D=279°22'49"
R=60.00' L=102.35' T=68.70' D=97°44'13"
MAP 220 PARCEL 011
PARTRIDGE STREET
N/F DONOVAN, JOHN, JR.
PARCEL "D"
21,192 SQ.FT.
NOT TO BE CONSIDERED A SEPARATE BUILDING LOT
LOT P
45,062± SQ. FT.
S45°32'55"E 190.85'
S45°32'55"E 133.87'
N38°35'06"W 19.92'
N22°27'47"W 22.52'
37.59'
N06°34'15"W 24.98'
LOT 5
N58°58'53"W 173.32'
14.15'
63.62'
100'±
163.79'
S63°40'36"W
187.47'
N88°18'07"W
S88°37'14"W 15.95'
19.60'
N56°45'41"W 42.65'
N42°15'40"W 133.99'
N42°30'07"W 127.07'
N 109588.01 E 624940.83
S64°37'28"E 70.54'
S38°30'32"E 26.22'
S38°29'35"E 64.37'
S76°34'00"E 28.18'
S48°48'49"E 62.45'
S12°59'19"E 158.89'
S17°59'19"E
N76°29'40"W 71.31'
32.22'
39.73'
S44°45'38"W
S77°27'33"W
LOT 3
60,307 SQ. FT.
R=60.00' L=150.00' T=180.57' D=143°14'22"
EXISTING GARAGE
N39°46'37"W 245.84'
DH (FND) N78°53'34"E 17.63'
90.40'
LOT 5
LOT 4
42,999 SQ. FT.
EXIST. SHED
75.00'
333.50'
258.50'
S74°49'58"W
N 109588.01 E 624940.83
MAP 220 PARCEL 020
DOVER CIRCLE
N/F TOWN OF FRANKLIN
MAP 220 PARCEL 007
22 ELM STREET
N/F SYNGAY
GC-MAHW-38
GC-MAHW-37
GC-MAHW-36
GC-MAHW-35
GC-MAHW-34
GC-MAHW-33
GC-MAHW-32
GC-MAHW-31
GC-MAHW-30
GC-MAHW-29
GC-MAHW-28
GC-MAHW-27
GC-MAHW-26
GC-MAHW-25
GC-MAHW-24
GC-MAHW-23
GC-MAHW-22
GC-MAHW-21
GC-MAHW-20
GC-MAHW-19
GC-MAHW-18
GC-MAHW-17
GC-MAHW-16
GC-MAHW-15
GC-MAHW-14

I DECLARE THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

ANDREW C. MURPHY P.L.S. #35042
2/17/26

REFERENCES:
ASSESSORS PARCELS 220–013, 220–014 AND 220–015
DEED BOOK 39210 PAGE 372
PLAN 1085 OF 1984
PLAN 1469 OF 1987
PLAN 800 OF 1987
PLAN 1557 OF 1985
PLAN 427 OF 1994
PLAN 430 OF 1995
ANORAD RECORDED IN BOOK 42515 PAGE 133

# DONOVAN ESTATES
LOT LAYOUT PLAN
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 50'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

_____
DATE

GRAPHIC SCALE
50 0 25 50 100 200
( IN FEET )
1 inch = 50 ft.

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

| DATE | | INT. |
|---|---|---|
| 2/18 | FIELD BY: | BL |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | COMP |
| 9/25 | CHECKED BY: | CAQ |

UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508–384–6560 FAX 508–384–6566

SEPT. 3, 2025
1" = 50'
UC1340

POSTED SPEED LIMIT 30 MPH ON PARTRIDGE STREET IN THE WEST BOUND DIRECTION
STOPPING SIGHT FROM THE PROPOSED ROADWAY INTERSECTION WITH PARTRIDGE STREET WILL EXCEED 200 FEET (WITH VEGETATION REMOVAL)

STREET LIGHT NOTES:
1. EXISTING STREET LIGHT AND POLE AT THE INTERSECTION OF THE PROPOSED ROAD AND PARTRIDGE STREET TO BE RELOCATED AS NECESSARY BY THE APPROPRIATE UTILITY COMPANIES.
2. PROPOSED STREET LIGHT TO BE A MPR LED BY LITHONIA LIGHTING.

NOTE:
SWALE SECTIONS A–A AND B–B CAN BE FOUND ON SHEET 11.

HARBORWOOD DRIVE
VARIABLE WIDTH

PARTRIDGE STREET
PUBLIC – VARIABLE WIDTH

ROADWAY INTERSECTION ANGLE – 97°02'59"

PROPOSED GUARDRAIL

PROPOSED WATER QUALITY SWALE

PROPOSED SEDIMENT FOREBAY

200' SIGHT DISTANCE TRIANGLE

BORDERING LAND SUBJECT TO FLOODING
100 YEAR FLOOD PLAIN – ELEVATION – 168.8

EXIST. 12" DI WATER MAIN

BENCHMARK
HYDRANT SPINDLE
ELEV. = 171.20 NAD 88

10' x 17' RIPRAP

PROPOSED HOUSE BOX 34' x 62' FF=180.0

LOT 8

LOT 7

LOT 6

LOT 5

LOT F

LOT 1

LOT 2

LOT 3

LOT 4

COMPENSATORY FLOOD STORAGE AREA

CENTERLINE SHEPARD'S BROOK

PLAN 1065–1984

100' RIVERFRONT

200' RIVERFRONT

50' BUFFER ZONE

25' BUFFER ZONE

PROPOSED COMPOST SOCK WITH STAKES FOR EROSION CONTROL

77' – 24" RCP S=0.008

FES INV = 171.18

HW INV = 169.94

28' – 18" RCP S=0.02

FES INV = 170.6

53' – 24" RCP S=0.008

HW INV = 170.2

10' FROM TOE OF SLOPE FOR DETENTION POND BERM EMBANKMENT

RIP RAP (TYP)

PROPOSED RETAINING WALL

PROPOSED BASIN

PROPOSED 4' HIGH BLACK VINYL COARED CHAIN LINK FENCE

PROPOSED TOE OF SLOPE FOR DETENTION POND

PROPOSED ROAD

6+00

PROP. ASPHALT DRIVEWAY

PROP. STREET LIGHT

5' ASPHALT APRON

RELOCATED POLE W/MOUNTED STREET LIGHT.

EXIST. POLE WITH MOUNTED STREET LIGHT

EXISTING SEWER EASEMENT

PROPOSED 6" x 6" 3' CONCRETE BOUND (TYP)

21' – 12" RCP S=0.01

11' – 12" RCP S=0.019

24' – 15" RCP S=0.006

2+41.49

16' – 24" RCP S=0.01

21' – 12" RCP S=0.01

60' – 18" RCP S=0.01

21' – 15" RCP S=0.01

12' – 12" RCP S=0.01

AREA OF VEGETATION REMOVAL

LIMIT OF EXISTING VEGETATION

BUILDING SETBACKS – TYPICAL

EXISTING WELL

NO EXITING HOUSE CONNECTED TO SEWER

EXISTING DWELLING

DECK

SCREENED PATIO

POOL

EXISTING GARAGE

EXIST. SHED

V-SMH-1

V-SMH-2

CB 1

CB 2

CB 3

CB 4

CB 5

DMH 1

DMH 2

DMH 3

DMH 4

DMH 5

# 43

# 35

# 19

MAP 214 PARCEL 008
43 PARTRIDGE STREET
N/F WHITE

MAP 214 PARCEL 007
35 PARTRIDGE STREET
N/F SHERWOOD

N 410,196.92
E 625,285.91

RIDENOUR WAY
PRIVATE – 40' WIDE

MAP 220 PARCEL 012
19 PARTRIDGE STREET
N/F 19 PARTRIDGE STREET, LLC

MAP 220 PARCEL 011
PARTRIDGE STREET
N/F DONOVAN, JOHN, JR.

MAP 220 PARCEL 020
DOVER CIRCLE
N/F TOWN OF FRANKLIN

MAP 220 PARCEL 007
22 ELM STREET
N/F SYNGAY

N 409,582.32
E 625,349.35

NOTE:
ALL CURBING TO BE VERTICAL GRANITE.

WOODBRIDGE FINE SANDY LOAM
CHARLTON–HOLLIS–ROCK OUTCROP
SAGO SILT LOAM

## WETLAND RESOURCE AREA DISTURBANCES:

0 – 25' BUFFER ZONE = 0 – SQ. FT.

25' – 50' BUFFER ZONE = 5,961 SQ. FT.

50' – 100' BUFFER ZONE = 30,339 SQ. FT.

INNER RIPARIAN ZONE = 0 SQ. FT.

OUTTER RIPARIAN ZONE = 9,575 SQ. FT

THERE ARE NOT ANY POTENTIAL OR CERTIFED VERNAL POOLS LOCATED ON THE SITE OR WITHIN 100 FEET OF THE SITE.

BLSF FILL AREA – 2,848 SQ. FT.
BLSF COMPENSATORY AREA – 4,811 SQ. FT.
BLSF FILL VOLUME 570 CUBIC FEET BETWEEN ELEVATION 168.4 – 168.8
BLSF COMPENSATORY VOLUME 962 CUBIC FEET BETWEEN ELEVATION 168.2 – 168.8

WETLAND DELINEATION BY GODDARD CONSULTING.

EXISTING SEWER:

X–SMH–1
RIM = 171.07
INV = 158.4 (CALCULATED FROM RECORD ELEVATIONS)

X–SMH–2
RIM173.2
18" INV IN = 157.42
18" INV OUT = 157.35

X–SMH–3
RIM172.6
18" INV IN = 156.51
8" INV IN (WEST) = 156.86
8" INV IN (EAST) = 157.22
21" INV OUT = 156.49

FOR REGISTRY USE ONLY

I NANCY DANELLO, CLERK OF THE TOWN OF FRANKLIN, RECEIVED AND RECORDED FROM THE PLANNING BOARD COVENANT APPROVAL OF THIS PLAN ON

AND NO APPEAL WAS RECIEVED DURING THE 20 DAYS NEXT AFTER RECEIPT AND RECORDING OF SAME.

TOWN CLERK – FRANKLIN DATE

PROJECT UTILITY NOTES:
1. WATER SERVICES HAVE BEEN SHOWN FOR EACH LOT. WATER SERVICE CONNECTIONS TO BE FINALIZED ONCE A WATER MAP AMENDMENT IS OBTAINED.
2. SEWER SERVICES HAVE BEEN SHOWN FOR EACH LOT. SEWER SERVICE CONNECTIONS TO BE FINALIZED ONCE APPROVED BY THE DPW, A SEWER MAP AMENDMENT IS OBTAINED AND OR PERMITS ARE GRANTED FROM THE CHARLES RIVER POLLUTION CONTROL DISTRICT.
3. THE PROPOSED POLE RELOCATION LOCATION HAS BEEN SHOWN.
4. THE PROPOSED UNDERGROUND CONNECTION TO THE RELOCATED POLE, THE TRANSFORMER LOCATION AND HAND HOLE LOCATIONS HAVE BEEN SHOWN AND ARE SUBJECT TO APPROVAL FROM THE APPROPRIATE UTILITY COMPANIES.

PROPOSED GUARDRAIL NOTES:
1. PROPOSED GUARDRAIL LOCATION AND INSTALLATION TO BE APPROVED BY THE TOWN OF FRANKLIN DPW.

## LEGEND

- DHCB DRILL HOLE CONCRETE BOUND (TO BE SET)
- 297 EXISTING COUNTOUR
- 297 PROPOSED COUNTOUR
- 48M EXIST. TREE – DIAMETER – SPECIES
- UP4–1 UTILITY POLE
- OHW OVERHEAD WIRES
- GAS GATE
- WATER CURB STOP
- WATER GATE
- FIRE HYDRANT
- DRAIN MANHOLE
- CATCH BASIN
- SEWER MANHOLE
- S SEWER SERVICE
- W WATER SERVICE
- HS HOUSE UTILITY SERVICE
- HH HAND HOLE
- T TRANSFORMER

REFERENCES:
ASSESSORS PARCELS 220–013, 220–014 AND 220–015
DEED BOOK 39210 PAGE 372
PLAN 1085 OF 1984
PLAN 1469 OF 1987
PLAN 800 OF 1987
PLAN 1557 OF 1985
PLAN 427 OF 1994
PLAN 430 OF 1995
ANORAD RECORDED IN BOOK 42515 PAGE 133

I DECLARE THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

# DONOVAN ESTATES
GRADING AND UTILITY PLAN
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 50'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

DATE

GRAPHIC SCALE
50 0 25 50 100 200
( IN FEET )
1 inch = 50 ft.

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

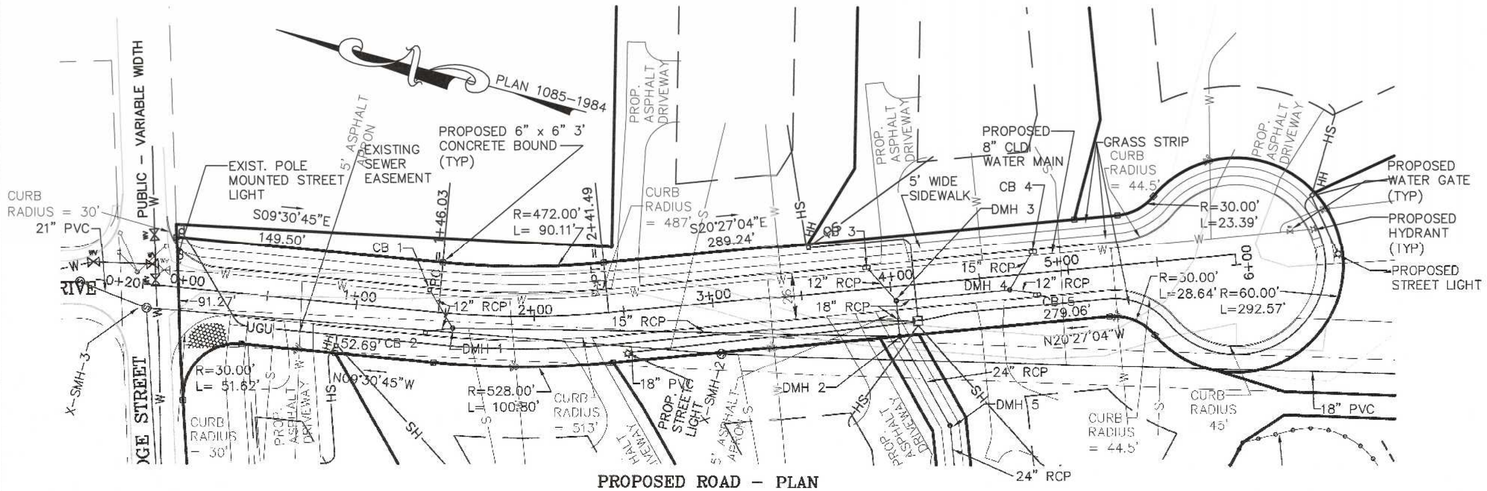
COMMONWEALTH OF MASSACHUSETTS
CARLOS A. QUINTAL
CIVIL
No. 30812
REGISTERED PROFESSIONAL ENGINEER

CARLOS A. QUINTAL P.E. #30812

| DATE | | INT. |
|---|---|---|
| 2/18 | FIELD BY: | BL |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | COMP |
| 9/25 | CHECKED BY: | CAQ |

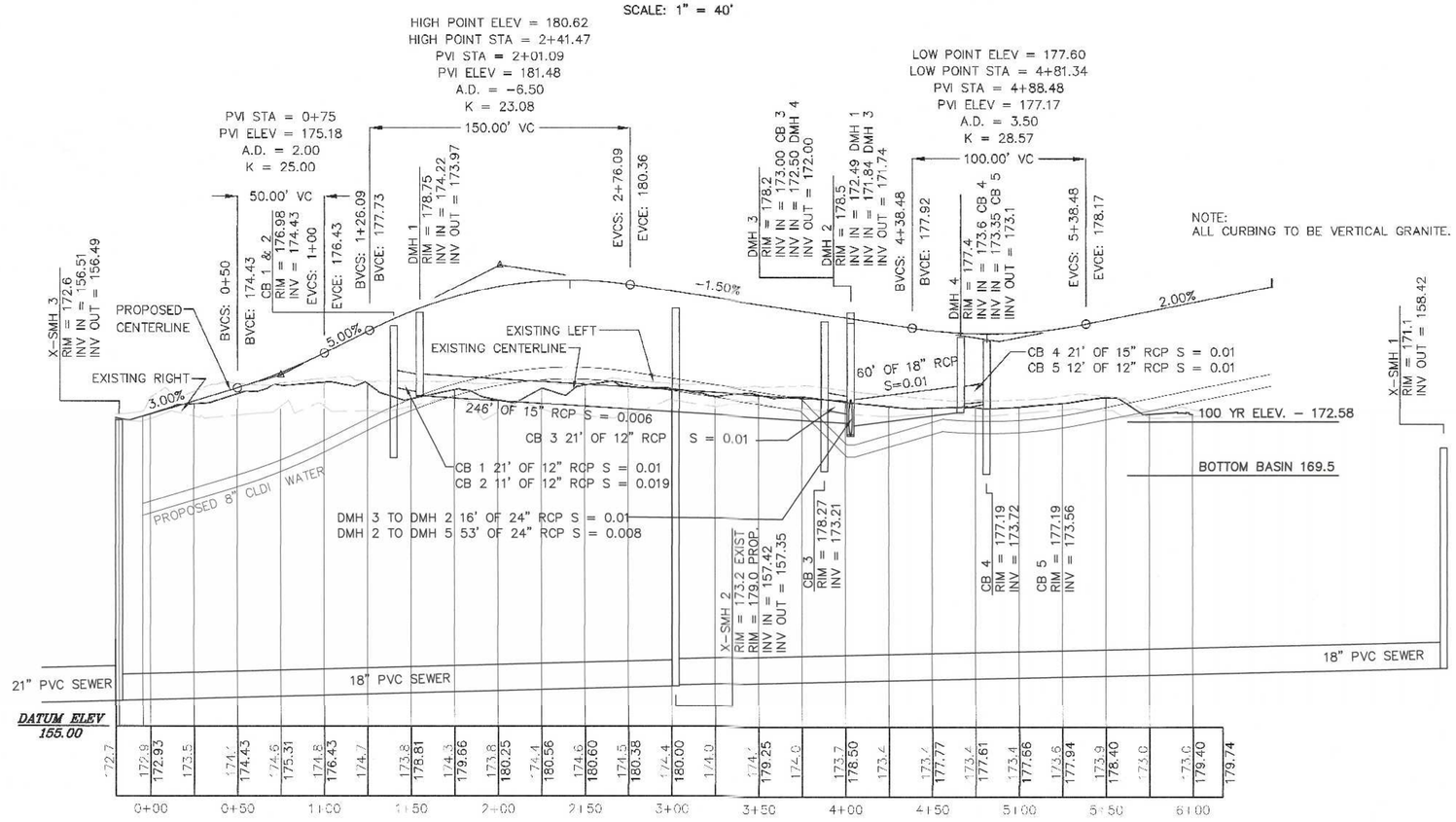

UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508–384–6560 FAX 508–384–6566


SEPT. 3, 2025
1" = 50'
UC1340




PROPOSED ROAD – PLAN

SCALE: 1" = 40'




PROPOSED ROAD – PROFILE

SCALE:
H – 1" = 40'
V – 1" = 4'

## DRAINAGE STRUCTURE SCHEDULE

CB 1 & 2
RIM = 177.98
INV = 174.43

CB 3 – DOUBLE GRATE
RIM = 178.27
INV = 173.21

CB 4 – DOUBLE GRATE
RIM = 177.19
INV = 173.72

CB 5 – DOUBLE GRATE
RIM = 177.19
INV = 173.56

DMH 1
RIM = 178.75
INV IN = 174.22
INV OUT = 173.97

DMH 2
RIM = 178.8
INV IN = 172.49 DMH 1
INV IN = 171.84 DMH 3
INV OUT = 171.74

DMH 3
RIM = 178.2
INV IN = 173.00 CB 3
INV IN = 172.50 DMH 4
INV OUT = 172.00

DMH 4
RIM = 177.4
INV IN = 173.60 CB 4
INV IN = 173.35 CB 5
IINV OUT = 173.10

DMH 5
RIM = 176.5
INV IN = 171.32
IINV OUT = 171.22

FOR REGISTRY USE ONLY

I NANCY DANELLO, CLERK OF THE TOWN OF FRANKLIN, RECEIVED AND RECORDED FROM THE PLANNING BOARD COVENANT APPROVAL OF THIS PLAN ON

_____

AND NO APPEAL WAS RECIEVED DURING THE 20 DAYS NEXT AFTER RECEIPT AND RECORDING OF SAME.

_____

TOWN CLERK – FRANKLIN DATE

EXISTING SEWER:

X-SMH-1
RIM = 171.07
INV = 158.4 (CALCULATED FROM RECORD ELEVATIONS)

X-SMH-2
RIM173.2
18" INV IN = 157.42
18" INV OUT = 157.35

X-SMH-3
RIM172.6
18" INV IN = 156.51
8" INV IN (WEST) = 156.86
8" INV IN (EAST) = 157.22
21" INV OUT = 156.49

## LEGEND

- ⊡DHCB DRILL HOLE CONCRETE BOUND (TO BE SET)
- 297 EXISTING COUNTOUR
- 297 PROPOSED COUNTOUR
- 48M EXIST. TREE – DIAMETER – SPECIES
- UP4-1 UTILITY POLE
- OHW OVERHEAD WIRES
- GAS GATE
- WATER CURB STOP
- WATER GATE
- FIRE HYDRANT
- DRAIN MANHOLE
- CATCH BASIN
- SEWER MANHOLE
- S SEWER SERVICE
- W WATER SERVICE
- HS HOUSE UTILITY SERVICE
- HH HAND HOLE
- T TRANSFORMER

SEWER NOTES:
1. SEWER INFORMATION TAKEN FROM PLANS OR RECORD AND FIELD LOCATIONS. CONTRACTOR TO VERIFY INFORMATION AND REPORT ANY DISCREPANCIES TO UNITED CONSULTANTS INC.
2. X-SMH 2 RIM ELEVATION TO BE BE RAISED WITH A RISER INSTALLED TO THE DIAMETER OF THE EXISTING MANHOLE. DEVELOPER TO OBTAIN PERMISSION FROM CHARLES RIVER POLLUTION CONTROL DISTRICT PRO TO COMMENCING WITH THE PROJECT.
3. HOUSE LOT SEWER CONNECTIONS SHALL COMPLY WITH FRANKLIN SUBDIVISION REGULATIONS SECTION 300-12.(B).(1)(a). SEWER CONNECTIONS SHALL BE INCLUDED WITH INDIVIDUAL HOUSE LOT SITE PLANS.

REFERENCES:
ASSESSORS PARCELS 220-013, 220-014 AND 220-015
DEED BOOK 39210 PAGE 372
PLAN 1085 OF 1984
PLAN 1469 OF 1987
PLAN 800 OF 1987
PLAN 1557 OF 1985
PLAN 427 OF 1994
PLAN 430 OF 1995
ANORAD RECORDED IN BOOK 42515 PAGE 133

I DECLARE THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

DONOVAN ESTATES
ROADWAY PLAN AND PROFILE
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 40'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

DATE

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

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

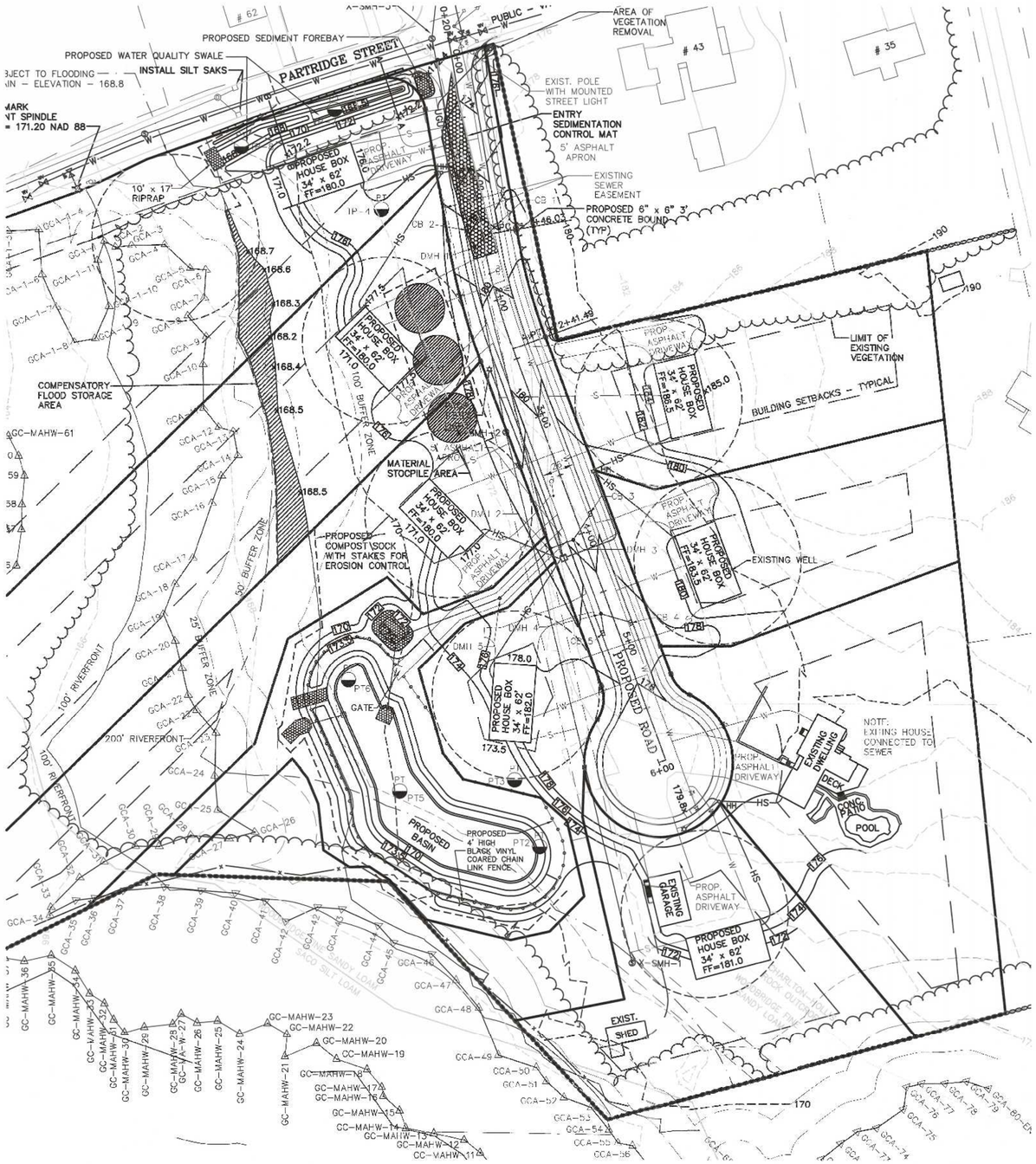
COMMONWEALTH OF MASSACHUSETTS
CARLOS A. QUINTAL
CIVIL
No. 30812
REGISTERED PROFESSIONAL ENGINEER

CARLOS A. QUINTAL P.E. #30812

| DATE | | INT. |
|---|---|---|
| 2/18 | FIELD BY: | BL |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | COMP |
| 9/25 | CHECKED BY: | CAQ |

UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508-384-6560 FAX 508-384-6566

SEPT. 3, 2025
1" = 40'
UC1340
5 of 11




# OPERATION AND MAINTENANCE PLAN

CONSTRUCTION PHASE

1. THE OWNERS REPRESENTATIVE, TO BE DETERMINED, SHALL BE THE RESPONSIBLE PARTY FOR THE STORMWATER MAINTENANCE PLAN AND THE SITES EROSION CONTROL.
2. THE SITE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES WEEKLY AND AFTER ALL RAIN EVENTS.
3. SEDIMENT SHALL BE REMOVED FROM COMPOST SOCK WHEN A MAXIMUM DEPTH OF 6" IS OBSERVED OR AS NEEDED.
4. CONSTRUCTION ENTRY MAT SHALL BE INSPECTED WEEKLY AND AFTER ALL RAIN EVENTS. SEE DETAIL FOR MAINTENANCE REQUIREMENTS.
5. DAMAGED OR DETERIORATED COMPOST SOCK SHALL BE REPLACED IMMEDIATELY.
6. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETED AND ALL DISTURBED AREAS ARE STABILIZED.
7. SILT SAKS SHALL BE INSTALLED AT ALL PROPOSED CATCH BASINS (CB 1 – CB 5) AND EXISTING CATCH BASINS IN PATRIDGE STREET AND SHALL BE INSPECTED WEEKLY AND AFTER ALL RAIN EVENTS.
8. CLEANING OF SILT SAKS SHALL BE COMPLETED AS NECESSARY.

INSPECTION AND MAINTENANCE SCHEDULE:

1. INSPECTIONS SHALL BE CONDUCTED BY THE APPLICANTS ENGINEER, CONTRACTOR AND / OR REPRESENTATIVES OF THE TOWN AS NECESSARY. AT A MINIMUM INSPECTIONS SHALL BE CONDUCTED ON A MONTHLY BASIS.
2. MONTHLY INSPECTIONS SHALL INCLUDE THE DRIVEWAY(S) AND ROADWAY SURFACES TO DETERMINE IF ACCUMULATED SEDIMENTS ARE TO BE REMOVED.
3. INSPECTION OF THE PROPOSED CATCH BASINS TO DETERMINE THE DEPTH OF SEDIMENT AND REQUIRED CLEANING.
4. INSPECTION OF THE INFILTRATION POND, SEDIMENT FOREBAY AND WATER QUALITY SWALES TO DETERMINE IF CLEANING IS NECESSARY.
5. THE HEADWALL OUTLET RIPRAP SHALL BE INSPECTED WEEKLY AND ANY SEDIMENT OBSERVED SHALL BE IMMEDIATELY REMOVED.

OPERATION AND MAINTENANCE SCHEDULE

CONSTRUCTION PHASE:

1. THE EROSION CONTROL BARRIERS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER ALL STORM EVENTS.
2. THE PROPOSED PARKING AREA ONCE PAVED WILL REQUIRE DAILY INSPECTIONS TO BE CONDUCTED TO DETERMINE THE NECESSITY TO REMOVE ANY ACCUMULATED SEDIMENT. THE REMOVAL OF THE ACCUMULATED SEDIMENT SHALL BE COMPLETED ON THE DAY THE DETERMINATION IS MADE.
3. SILT SAKS SHALL BE INSTALLED AT ALL CATCH BASINS. SILT SAKS, ONCE INSTALLED SHALL BE INSPECTED ON A WEEKLY BASIS AND CLEANED AS NECESSARY.
4. THE INFILTRATION AREA SHALL BE INSPECTED AFTER EACH STORM EVENT AND CLEANED WHEN 2" OF SEDIMENT HAS ACCUMULATED AT THE INLET. ANY TRASH OR CONSTRUCTION DEBRIS SHALL BE IMMEDIATELY REMOVED.
5. ALL SLOPE AREAS TO BE SEEDED WITH NEW ENGLAND CONSERVATION AND WILDLIFE MIX SHALL BE LOAMED AND SEED WITHIN 1 WEEK OF COMPLETING OF EXCAVATION IN THE AREA. SLOPES TO BE COVERED WITH ECS-1 SINGLE NET STRAW ROLLED EROSION CONTROL BLANKET.
6. ALL OTHER AREA OF SITE GRADING SHALL BE TEMPORARILY LOAMED AND SEEDED WITH A NEW ENGLAND EROSION CONTROL / RESTORATION MIX WITHIN ONE WEEK OF AREAS BEING BROUGHT TO SUB-GRADE.
7. ALL MATERIAL STOCKPILES THAT ARE NOT BEING ACTIVELY USED FOR A PERIOD OF 2 WEEKS SHALL BE COVERED WITH A TARP(S) OR VEGETATED WITH NEW ENGLAND EROSION CONTROL / RESTORATION MIX.

ADDITIONAL EROSION CONTROLS MAY BE REQUIRED DEPENDING ON ACTUAL FIELD CONDITIONS DURING CONSTRUCTION.

LONG TERM:

1. THE ROADWAY SHALL BE SWEPT FOUR TIMES PER YEAR WITH (WITH A MECHANICAL OR VACUUM SWEEPER) ONE BEING AFTER THE LAST WINTER SANDING.
2. INSPECT AND CLEAN PRETREATMENT BMP'S EVERY SIX MONTHS AND AFTER EVERY MAJOR STORM EVENT (2 YEAR RETURN FREQUENCY). CHECK THE INLET AND OUTLET PIPES TO DETERMINE IT THEY ARE CLOGGED. REMOVE ACCUMULATED SEDIMENT, TRASH, DEBRIS, LEAVES, LAWN CLIPPINGS FROM MOWING. INSPECT THE INFILTRATION AREA AFTER THE FIRST SEVERAL RAINFALL EVENTS, AFTER ALL MAJOR STORMS, AND ON REGULARLY SCHEDULED DATES EVERY SIX MONTHS. INSPECT THE INFILTRATION AREA 24 HOURS TO SEVERAL DAYS AFTER A RAIN EVENT, TO LOOK FOR PONDED WATER AT THE SURFACE OF THE TRENCH. IF WATER IS PRESENT IT MAY BE THAT THE INFILTRATION AREA IS CLOCGGED. IF SO THEN REHABILITATION OF THE BOTTOM OF THE TRENCH SHALL BE COMPLETED INCLUDING REMOVING ALL ACCUMULATED SEDIMENT, SCARIFYING AND TILLING THE BOTTOM AREA, REMOVE AND REPLACE STONE MEDIA AND FILTER FABRIC.
3. INSPECT THE LANDSCAPE AREAS FOR BARE SPOTS AND EROSION. REPAIR ERODED AREAS WITH LOAM AND SEED TO PROVIDE ADEQUATE COVERAGE. INSPECT LANDSCAPE AREAS FOR EROSION AND WEEDS. FIX EROSION AND APPLY ADDITIONAL MULCH OR LANDSCAPE STONE AS NECESSARY.

## EROSION CONTROL NOTES:

1. COMPOST SOCK SHALL BE INSTALLED PRIOR TO TREE CLEARING OR SITE WORK COMMENCING.
2. COMPOST SOCK TO REMAIN IN CONTACT WITH THE EARTH. REPAIR OR RESET AS NECESSARY.
3. REFER TO CONSTRUCTION SEQUENCE FOR SLOPE GREATER THAN 3' HORIZONTAL TO 1' VERTICAL.
4. CATCH BASINS, WATER QUALITY UNITS, UNDERGROUND INFILTRATION AREA AND PARKING AREA TO BE CLEANED ONCE CONSTRUCTION IS COMPLETED.
5. ALL SEDIMENT COLLECTED DURING THE CONSTRUCTION PHASE OR POST CONSTRUCTION PHASE SHALL BE DISPOSED OF TO AN APPROVED LOCATION.
6. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED THE EROSION CONTROL MEASURES SHALL BE REMOVED.
7. DAMAGED OR DETERIORATED EROSION CONTROL MEASURES SHALL BE REPAIRED OR REPLACED IMMEDIATELY AFTER THEY HAVE BEEN IDENTIFIED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INSPECTIONS.
9. DUST CONTROL WILL BE BY SPRAYING WATER AS NECESSARY. THE USE OF OILS, PETROLEUM PRODUCTS OR TOXIC LIQUIDS FOR DUST CONTROL IS PROHIBITED.

## CONSTRUCTION SEQUENCE AND SCHEDULE:

1. INSTALL EROSION CONTROL AND SIGN.
2. COMPLETE THE CLEARING, STUMP REMOVAL AND REMOVE LOAM AND SUBSOIL.
3. INSTALL THE DRAINAGE SYSTEM
4. INSTALL THE WATER MAIN.
5. BRING THE ROADWAY TO SUBGRADE
6. PAVE THE ROADWAY WITH A BINDER COURSE.
7. CONSTRUCT THE HOUSES.
8. LOAM AND SEED EACH LOT UPON COMPLETION OF THE SITE WORK.
9. CONSTRUCT THE SIDEWALKS.
10. INSTALL CURBING.
10. PAVE THE ROADWAY WITH A TOP COURSE.
11. LANDSCAPING SHALL BE PLANTED AND ALL DISTURBED AREAS SHALL BE LOAMED AND SEEDED OR COVERED WITH MULCH OR STONE.
12. INSTALL SITE SIGNS.

THE GENERAL CONTRACTOR (TO BE DETERMINED) WILL BE RESPONSIBLE FOR INSPECTION AND MAINTENANCE AND SHALL KEEP A LOG OF THE INSPECTIONS AND MAINTENANCE AND THE REPORT SHALL BE SUBMITTED TO THE CONSERVATION COMMISSION OFFICE ON A WEEKLY BASIS DETAILING THE STATE OF THE EROSION CONTROL AND ANY STEPS TAKEN TO ADDRESS ANY ISSUES WITH FAILURE OF THE BARRIERS.

I DECLARE THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

FOR REGISTRY USE ONLY

I NANCY DANELLO, CLERK OF THE TOWN OF FRANKLIN, RECEIVED AND RECORDED FROM THE PLANNING BOARD COVENANT APPROVAL OF THIS PLAN ON

_____

AND NO APPEAL WAS RECIEVED DURING THE 20 DAYS NEXT AFTER RECEIPT AND RECORDING OF SAME.

_____

TOWN CLERK – FRANKLIN DATE

DONOVAN ESTATES
EROSION CONTROL PLAN
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 50'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

_____
DATE

GRAPHIC SCALE
50 0 25 50 100 200
( IN FEET )
1 inch = 50 ft.

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

CARLOS A. QUINTAL CIVIL No. 30812 REGISTERED PROFESSIONAL ENGINEER
CARLOS A. QUINTAL P.E. #30812

| DATE | | INT. |
|---|---|---|
| 2/18 | FIELD BY: | BL |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | COMP |
| 9/25 | CHECKED BY: | CAQ |

UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508-384-6560 FAX 508-384-6566

SEPT. 3, 2025
1" = 50'
UC1340
6 of 11

FOR REGISTRY USE ONLY

BENCHMARK
HYDRANT SPINDLE
ELEV. = 174.50 NAD 88

WOOD DRIVE

# 60

# 62

TO BE RELOCATED

DH PUBLIC – VARIABLE WIDTH

PARTRIDGE STREET

N71°53'38"E 85.28'

N73°26'55"E 69.44'

7.20'

BORDERING LAND SUBJECT TO FLOODING
100 YEAR FLOOD PLAIN – ELEVATION – 168.8

BENCHMARK
HYDRANT SPINDLE
ELEV. = 171.20 NAD 88

N70°36'41"E 140.59'

N64°17'55"E 56.86'

N70°47'10"E 105.34'

EXIST. POLE WITH MOUNTED STREET LIGHT

MAP 214 PARCEL 008
43 PARTRIDGE STREET
N/F WHITE

# 43

# 35

EXISTING SEWER EASEMENT

MAP 214 PARCEL 007
35 PARTRIDGE STREET
N/F SHERWOOD

RIDENOUR WAY
PRIVATE – 40' WIDE

DH (FND)

N75°38'51"E 53.69'

N76°19'42"E 253.66'

S12°01'11"E 244.79'

EXISTING POLE AND OVERHEAD UTILITY LINES TO BE REMOVED

LIMIT OF EXISTING VEGETATION

# 19

MAP 220 PARCEL 012
19 PARTRIDGE STREET
N/F 19 PARTRIDGE STREET, LLC

S05°55'36"E 617.86'

GC-MAHW-72 through GC-MAHW-39

CENTERLINE SHEPARD'S BROOK

EXISTING FENCE

100' BUFFER ZONE

EXISTING LOT LINES AS SHOWN ON PLANS OF RECORD

EXISTING POLE AND OVERHEAD UTILITY LINES TO BE REMOVED

EXISTING FENCE TO BE REMOVED

EXISTING DRIVEWAY TO BE REMOVED

EXISTING WELL TO BE ABANDONED

50' BUFFER ZONE

25' BUFFER ZONE

100' RIVERFRONT

200' RIVERFRONT

WOODBRIDGE FINE SANDY LOAM

CHARLTON-HOLLIS-ROCK OUTCROP

EXISTING DWELLING

DECK

CONC. PATIO

POOL

MAP 220 PARCEL 011
PARTRIDGE STREET
N/F DONOVAN, JOHN, JR.

EXISTING GARAGE

EXISTING GARAGE TO BE REMOVED

EXISTING SHED TO BE REMOVED

EXIST. SHED

163.79'
S53°40'36"W

187.47'
N88°18'07"W

N42°15'40"W 133.98'

N42°59'07"W 127.07'

S74°49'58"W 333.50'

MAP 220 PARCEL 020
DOVER CIRCLE
N/F TOWN OF FRANKLIN

MAP 220 PARCEL 007
22 ELM STREET
N/F SYNGAY

PLAN 1085–1984

I DECLARE THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

DONOVAN ESTATES
DEMOLITION PLAN
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 50'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

DATE

GRAPHIC SCALE
50 0 25 50 100 200
( IN FEET )
1 inch = 50 ft.

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

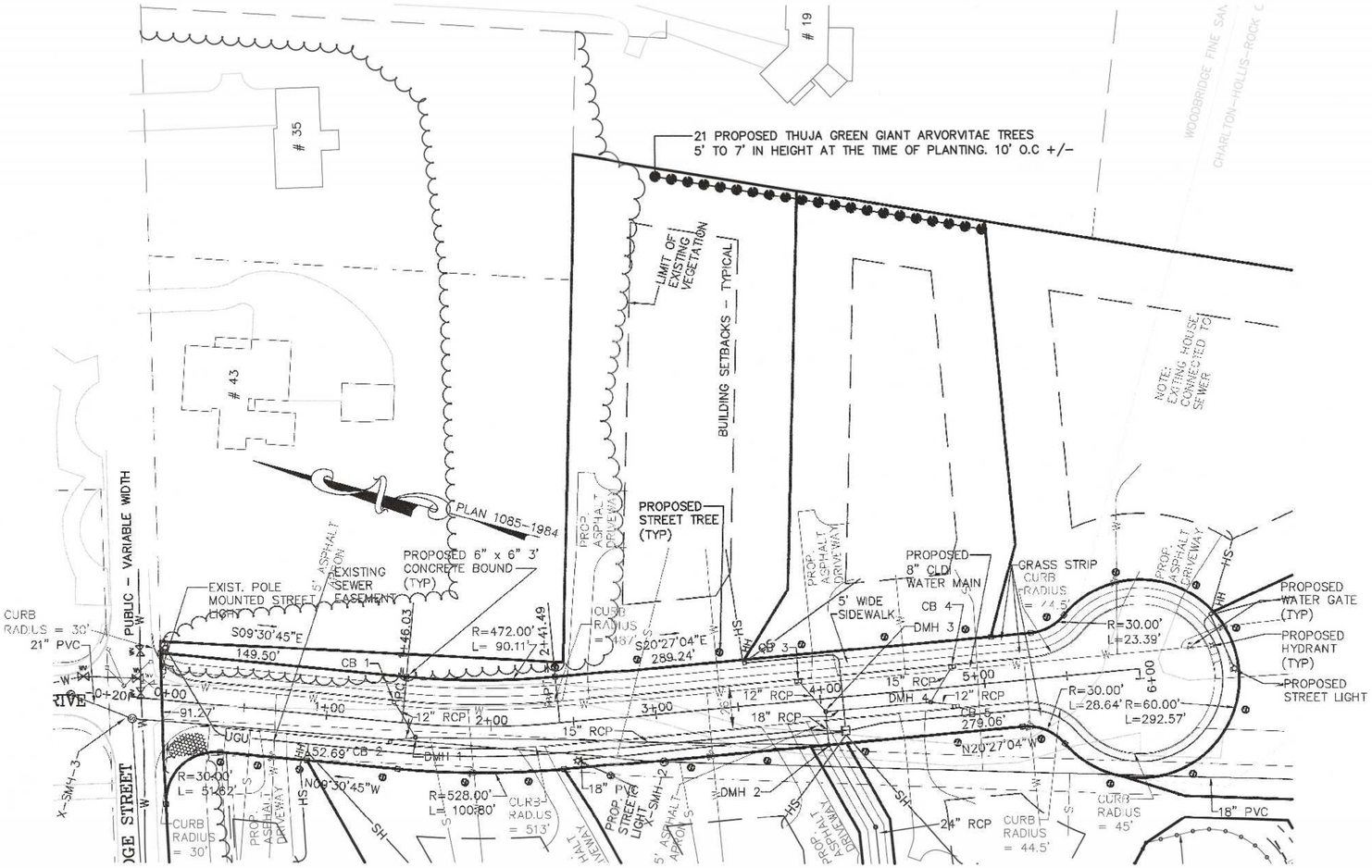
CARLOS A. QUINTAL P.E. #30812

| DATE | | INT. |
|---|---|---|
| 2/18 | FIELD BY: | BL |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | COMP |
| 9/25 | CHECKED BY: | CAQ |

UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508-384-6560 FAX 508-384-6568

SEPT. 3, 2025
1" = 50'
UC1340
7 of 11

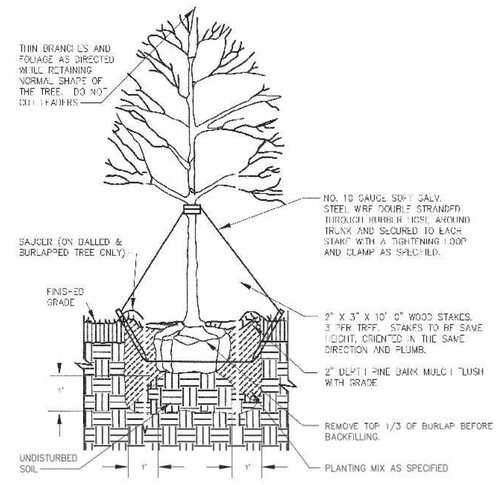
FOR REGISTRY USE ONLY




PROPOSED PLANTING - PLAN
SCALE: 1" = 40'

SHADE TREES TO BE PLANTED AT AN AVERAGE SPACING OF 50 FEET AND OF A HARDWOOD SPECIES APPROVED BY THE PLANNING BOARD.
THREE TREES ARE TO BE PLANTED PER LOT.
SHADE TREES TO BE 2 1/2" CALIPER AT 1' ABOVE FINISH GRADE.
SHADE TREES SHALL BE VARIED AROUND THE FOLLOWING SPECIES:
- SUGAR MAPLE (ACER SACCHARUM)
- WHITE OAK ( QUERCUS ALBA)
- LITTLE LEAF LINDEN ( TILIA CORDATA)

THE SUBDIVIDER SHALL BE RESPONSIBLE FOR ALL APPROVED TREES FOR A MINIMUM PERIOD OF ONE YEAR.




DECIDUOUS TREE PLANTING
NTS

NEW ENGLAND EROSION CONTROL / RESTORATION FOR DETENTION BASINS AND MOIST SITES

- RIVERBANK WILD RYE - ELYMUS RIPARIUS
- LITTLE BLUESTEAM - SCHIZACHYPARIUM SCOPARIUM
- RED FESCUE - FESTUCA RUBRA
- BIG BLUESTEM - ANDROPOGON GERARDII
- SWITCH GRASS - PANICUM VIRGATUM
- NEW YORK IRONWEED - VERNOBIA MOVEBORACENSIS
- UPLAND BENTGRASS - AGROSTIS PERENNANS
- BEGGAR TRICKS - BIDENS FRONDOSA
- SPOTTED JOE PYE WEED - EUPATORIUM MACULATUM (EUTROCHIUM MACULATUM)
- BONESET - EUPATORIUM PERFOLIATUM
- NEW ENGALND ASTER - ASTER NOVAE-ANGLIAE (SYMPHPTRICHUM NOVAE-ANGLIA)
- WOOD GRASS - SCIRPUS CYPERINUS
- SOFT RUSH - JUNCUS EFFUSUS

I DECLARE THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

DONOVAN ESTATES
PLANTING PLAN
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 50'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

DATE

GRAPHIC SCALE
50 0 25 50 100 200
( IN FEET )
1 inch = 50 ft.

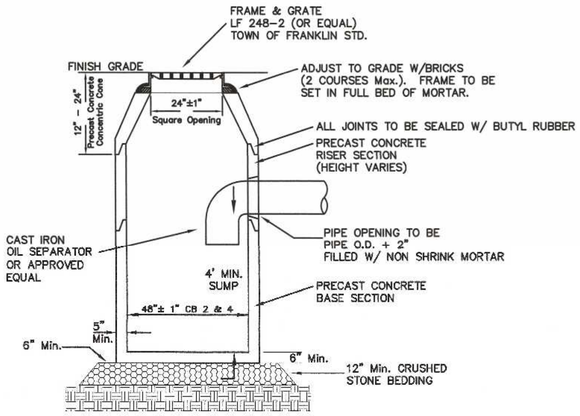
| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

COMMONWEALTH OF MASSACHUSETTS
CARLOS A. QUINTAL
CIVIL
No. 30812
REGISTERED PROFESSIONAL ENGINEER
CARLOS A. QUINTAL P.E. #30812

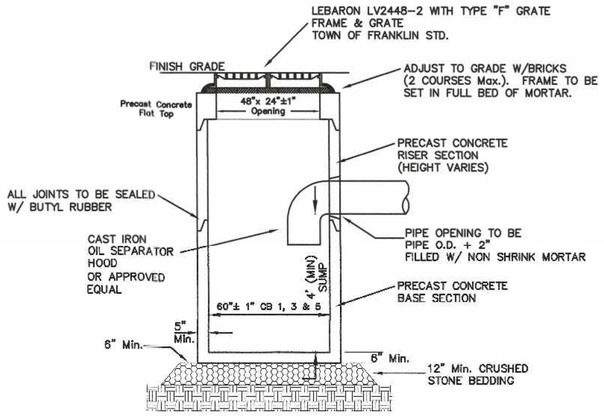
| DATE | | INT. |
|---|---|---|
| 2/18 | FIELD BY: | BL |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | COMP |
| 9/25 | CHECKED BY: | CAQ |

UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508-384-6560 FAX 508-384-6566

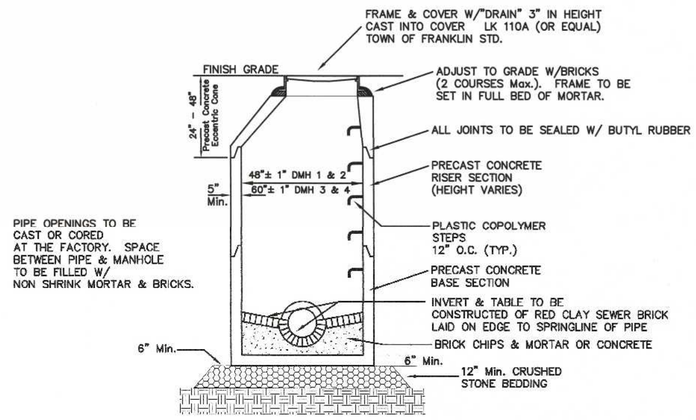
SEPT. 3, 2025
1" = 50'
UC1340
8 of 11




PRECAST CATCH BASIN
W/ DEEP SUMP




DOUBLE GRATE
PRECAST CATCH BASIN
W/ DEEP SUMP




PRECAST DRAIN MANHOLE

FOR REGISTRY USE ONLY

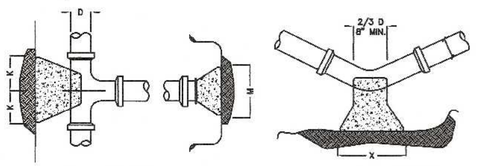
I NANCY DANELLO, CLERK OF THE TOWN OF FRANKLIN, RECEIVED AND RECORDED FROM THE PLANNING BOARD COVENANT APPROVAL OF THIS PLAN ON

_____

AND NO APPEAL WAS RECIEVED DURING THE 20 DAYS NEXT AFTER RECEIPT AND RECORDING OF SAME.

_____

TOWN CLERK – FRANKLIN DATE



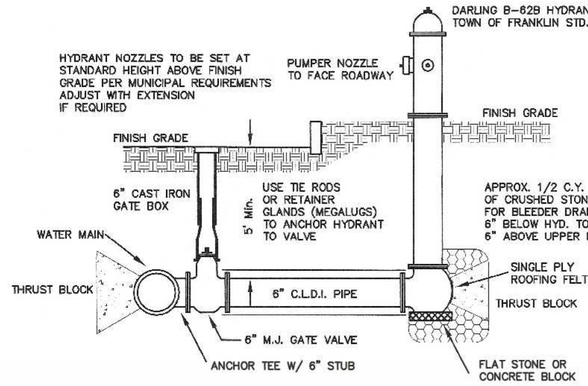

TEES AND PLUGS

| SIZE OF BRANCH | J | K | L | M | N | O |
|---|---|---|---|---|---|---|
| 4" TO 8" | 10" | 10" | 1'-0" | 2'-0" | 1'-8" | 10" |
| 10" TO 16" | 1'-0" | 1'-6" | 1'-8" | 3'-10" | 2'-10" | 1'-6" |
| 24" | 1'-4" | 2'-0" | 2'-8" | 5'-0" | 3'-6" | 1'-8" |

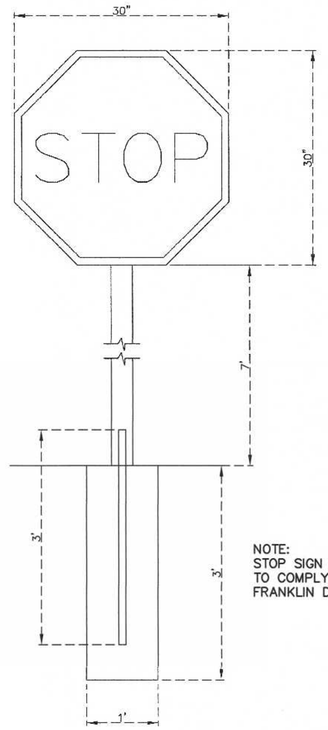
BENDS

| | 90 & 45 BENDS | | | 22 1/2 & 11 1/4 | | |
|---|---|---|---|---|---|---|
| D | 4" TO 8" | 10" TO 16" | 24" | 4"TO 8" | 10" TO 16" | 24" |
| X | 1'-8" | 3'-4" | 3'-8" | 1'-4" | 2'-0" | 3'-6" |
| Y | 1'-2" | 1'-8" | 2'-4" | 1'-0" | 1'-2" | 2'-4" |

THRUST BLOCK DETAILS

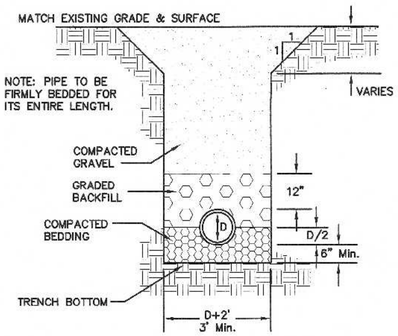



HYDRANT CONNECTION



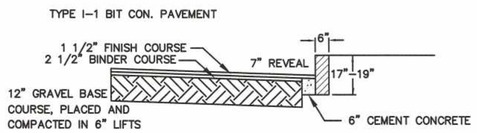

STOP SIGN DETAIL
N.T.S

NOTE:
STOP SIGN AND STREET SIGN
TO COMPLY WITH THE TOWN OF
FRANKLIN DPW STANDARDS.

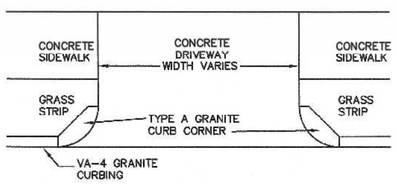



| TYPE OF PIPE | RCP DRAIN | CLDI WATER | PVC SEWER |
|---|---|---|---|
| BEDDING MATERIAL | PROC. GRAVEL | SAND | 3/4" STONE |
| BACKFILL MATERIAL | ORD. FILL | SAND | 3/4" STONE |

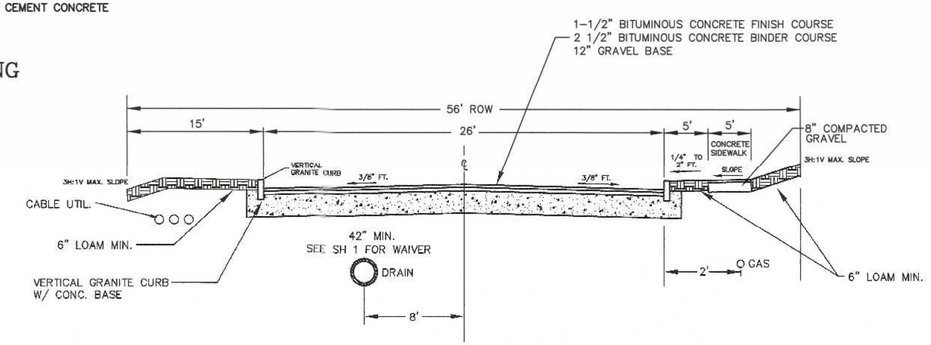
UTILITY TRENCH DETAIL




PAVEMENT AND VA-4
VERTICAL GRANITE CURBING




DRIVEWAY APRON




ROADWAY CROSS SECTION

I DECLARE THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

DONOVAN ESTATES
CONSTRUCTION DETAILS – 1
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 40'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

_____
DATE

GRAPHIC SCALE

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

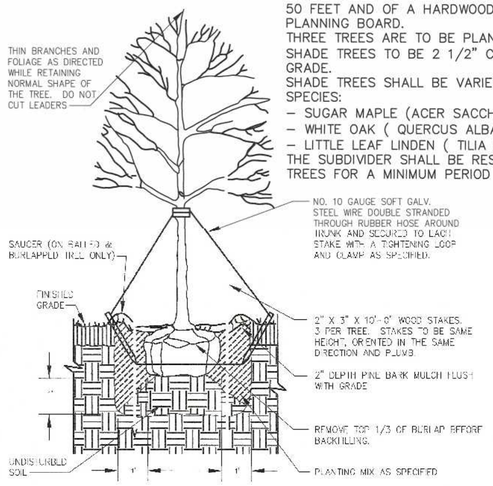
| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

CARLOS A. QUINTAL P.E. #30812

| DATE | | INT. |
|---|---|---|
| 6/14 | FIELD BY: | KK |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | RRG |
| 9/25 | CHECKED BY: | CAQ |

UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508-384-6560 FAX 508-384-6566

| | |
|---|---|
| DATE | SEPT. 3, 2025 |
| SCALE | 1" = 40' |
| PROJECT | UC1340 |
| SHEET | 9 of 11 |

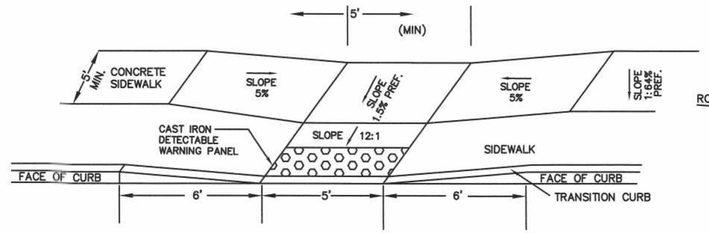



DECIDUOUS TREE PLANTING

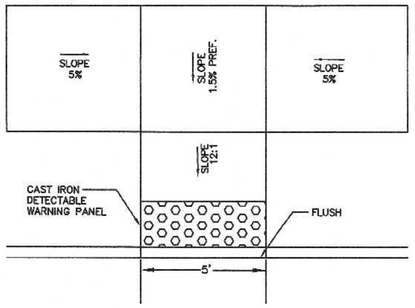
NTS

SHADE TREES TO BE PLANTED AT AN AVERAGE SPACING OF 50 FEET AND OF A HARDWOOD SPECIES APPROVED BY THE PLANNING BOARD.
THREE TREES ARE TO BE PLANTED PER LOT.
SHADE TREES TO BE 2 1/2" CALIPER AT 1' ABOVE FINISH GRADE.
SHADE TREES SHALL BE VARIED AROUND THE FOLLOWING SPECIES:
- SUGAR MAPLE (ACER SACCHARUM)
- WHITE OAK ( QUERCUS ALBA)
- LITTLE LEAF LINDEN ( TILIA CORDATA)

THE SUBDIVIDER SHALL BE RESPONSIBLE FOR ALL APPROVED TREES FOR A MINIMUM PERIOD OF ONE YEAR.

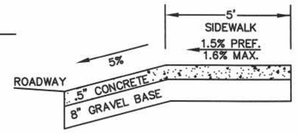



1. CROSS SLOPE ON ANY RAMP, LANDING OR ACCESSIBLE ROUTE SHALL NOT EXCEED 3/16" PER FOOT.
2. CAST IRON DETECTABLE SURFACES TO BE INSTALLED AT SIDEWALK RAMP ONLY.

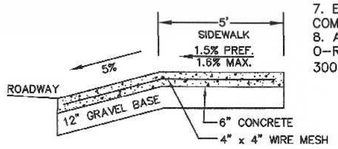



1. CONCRETE TO BE 4,000 PSI.
2. CONCRETE SHALL BE PLANT MIXED, PLACED, FLOATED, TROWELED AND BROOM FINISHED.
3. CURING AND SEALING COMPOUND SHALL BE APPLIED.

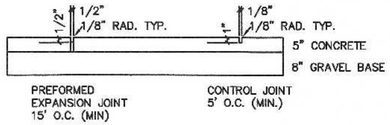
TYP. SIDEWALK RAMP




SIDEWALK RAMP SECTION




DRIVEWAY APRON SECTION




SIDEWALK JOINT DETAIL

GENERAL NOTES:
1. IF NECESSARY, ALL BLASTING OPERATIONS SHALL BE PERFORMED IN COMPLIANCE WITH ALL TOWN, STATE AND FEDERAL REGULATIONS.
2. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE TOWN OF FRANKLIN SUBDIVISION RULES AND REGULATIONS AND MASS DOT STANDARDS.
3. LOTS TO BE SERVICED BY TOWN WATER AND SEWER.
4. ALL DRAIN PIPE SHALL BE CLASS V REINFORCED CONCRETE PIPE WHERE THERE IS GREATER THAN 3.5' OF COVER. SEE PROFILES FOR PIPE CLASS.
5. MINIMUM DRAIN PIPE DIAMETER IS 12".
6. IT IS THE CONTRACTORS RESPONSIBILITY TO MAINTAIN EROSION CONTROL DEVICES DURING CONSTRUCTION.
7. EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO COMMENCING WITH CONSTRUCTION.
8. ALL PIPE GASKETS SHALL BE PRE-MOLDED NEOPRENE O-RING TYPE IN ACCORDANCE WITH SUBDIVISION REGULATION 300-11B(2)(a).

FOR REGISTRY USE ONLY

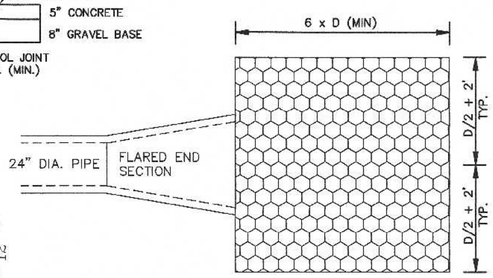
I NANCY DANELLO, CLERK OF THE TOWN OF FRANKLIN, RECEIVED AND RECORDED FROM THE PLANNING BOARD COVENANT APPROVAL OF THIS PLAN ON

_____

AND NO APPEAL WAS RECIEVED DURING THE 20 DAYS NEXT AFTER RECEIPT AND RECORDING OF SAME.

_____

TOWN CLERK – FRANKLIN DATE

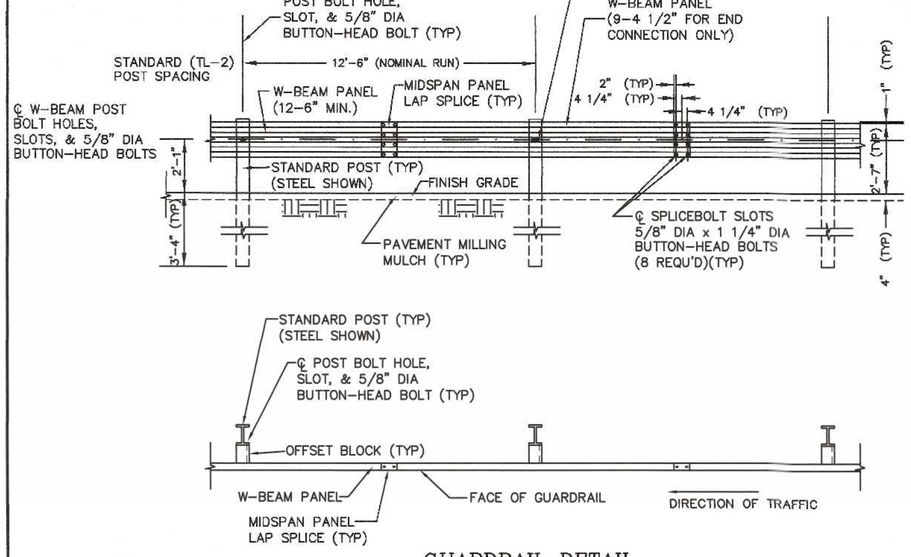



TYP.

RIP RAP AT FES PIPE OUTLET

N.T.S.

CONSTRUCTION NOTES:
1. RIP RAP TO BE MAXIMUM OF 18" AVERAGE OF 12" AND MINIMUM OF 10".
2. RIP RAP TO BE PLACED OVER A FILTER FABRIC.
3. RIP RAP THICKNESS = 1.5 x D max
1.5 x 18 = 27" DEPTH

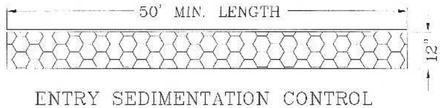



GUARDRAIL DETAIL

N.T.S.

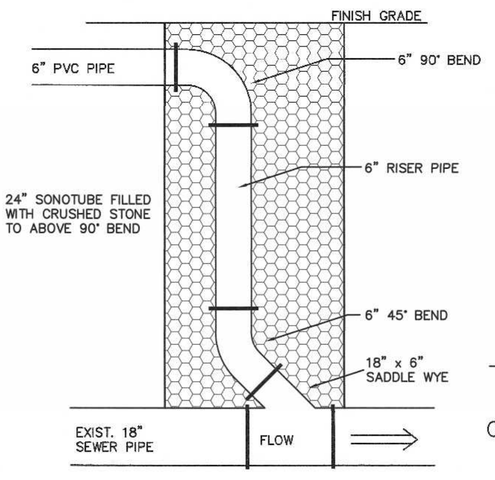
NOTES:
1. A 9-4 1/2" PANEL IS REQUIRED WHEN TRANSITIONS TO TL-3 W-BEAM GUARDRAIL TO MAINTAIN PROPER POST SPACING.
2. EACH END OF THE GUARDRAIL SHALL HAVE MAX-TENSION GUARDRAIL TERMINAL SECTIONS. (OR APPROVED EQUAL)
3. GUARDRAILS TO CONFORM TO MASSDOT STANDARDS FOR GUARDRAILS SEE CONSTRUCTION STANDARDS SECTION 400.
4. GUARDRAILS SHALL BE APPROVED BY THE TOWN OF FRANKLIN DPW.
5. GUARDRAIL INSTALLATION SHALL BE AS DIRECTED BY THE TOWN OF FRANKLIN DPW.

NOTES:
1. PAD SHALL BE A MINIMUM OF 20 FEET IN WIDTH. EXISTING ASPHALT DRIVE TO REMAIN IN PLACE UNTIL FINAL PAVEMENT IS TO BE INSTALLED.
2. PAD SHALL CONSIST OF 4" STONE 8" MIN. DEPTH AND THEN TOP DRESSED WITH 4" OF 1" - 2" WASHED STONE.




ENTRY SEDIMENTATION CONTROL MAT SECTION

N.T.S.

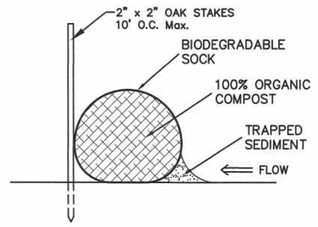



SECTION VIEW

SEWER CHIMNEY DETAIL

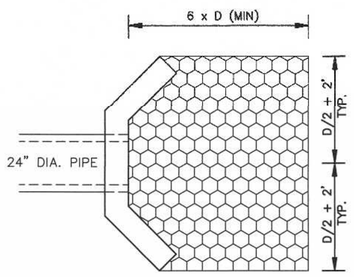
N.T.S.

PROPOSED RIP RAP DIMENSIONS:
- INTO SEDIMENT FOREBAY AT WET SWALE = 13' x 20'
- INTO SEDIMENT FOREBAY AT POND = 24' x 32'
- HEADWALL INTO POND - 24" DIA RCP PIPE = 12' x 12'
- HEADWALL OUTLET OF POND - 18" DIA RCP PIPE = 10.5' x 24'




COMPOST SOCK DETAIL

NOTE: COMPOST SOCK TO BE A MINIMUM OF 12" IN DIAMETER.




RIP RAP AT HEADWALL OUTLET

N.T.S.

I DECLARE THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

DONOVAN ESTATES
CONSTRUCTION DETAILS - 2
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 40'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

_____
DATE

GRAPHIC SCALE

( IN FEET )
1 inch = 40 ft.

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

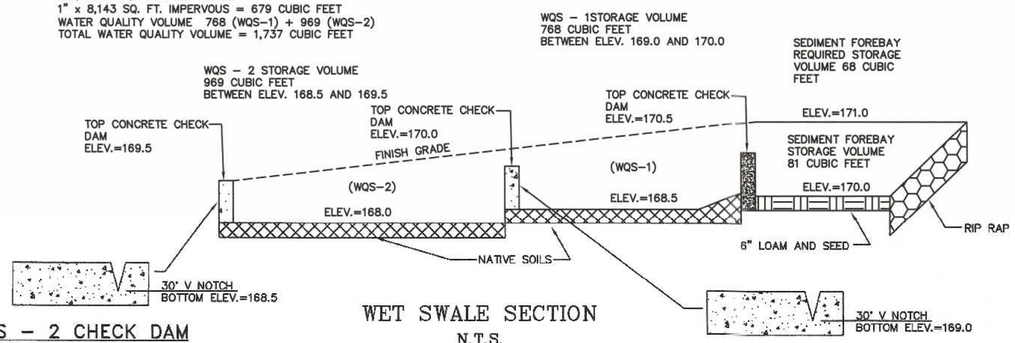
CARLOS A. QUINTAL P.E. #30812

| DATE | | INT. |
|---|---|---|
| | FIELD BY: | KK |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | RRG |
| 9/25 | CHECKED BY: | CAQ |

UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508-384-6560 FAX 508-384-6566

DATE: SEPT. 3, 2025
SCALE: 1" = 40'
PROJECT: UC1340
SHEET: 10 of 11

REQUIRED WQV FOR WET SWALE –
1" x 8,143 SQ. FT. IMPERVOUS = 679 CUBIC FEET
WATER QUALITY VOLUME 768 (WQS–1) + 969 (WQS–2)
TOTAL WATER QUALITY VOLUME = 1,737 CUBIC FEET




WQS – 2 CHECK DAM
NOT TO SCALE

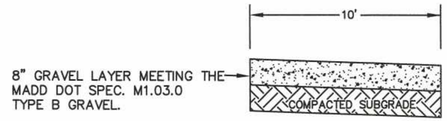
WET SWALE SECTION
N.T.S.

WQS – 1 CHECK DAM
NOT TO SCALE

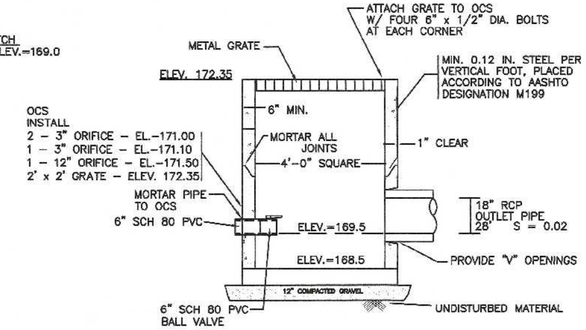
CONSTRUCTION NOTES:
1. RIP RAP TO BE MAXIMUM OF 12" AVERAGE OF 18" AND MINIMUM OF 4".
2. RIP RAP TO BE PLACED OVER A FILTER FABRIC.
3. RIP RAP MINIMUM DEPTH SHALL BE 12"
4. SEDIMENT FOREBAY TO HAVE A RIP RAP INLET.
5. SIDE SLOPES TO HAVE A MINIMUM OF 6" OF LOAM.
6. REFER TO ENVIRONMENTAL CONSULTANTS REPORT FOR PLANTING DETAILS.

NOTE:
ONCE THE SITE IS STABILIZED, REMOVE ALL ACCUMULATED SEDIMENT FROM THE BOTTOM OF THE BASIN AS WELL AS ALL A AND B HORIZON SOILS AND AN ADDITIONAL 18" OF SOIL AND REPLACE WITH 12" OF CLEAN COARSE SAND AND GRAVEL FREE OF ORGANICS AND FINES. THEN ADD 6" OF ROOT ZONE MIX TO FINISH GRADE AND SEED WITH A WATER TOLERANT GRASS.

CONSTRUCTION NOTES:
1. RIP RAP TO BE MAXIMUM OF 16" AVERAGE OF 12" AND MINIMUM OF 10".
2. RIP RAP TO BE PLACED OVER A FILTER FABRIC.
3. RIP RAP MINIMUM DEPTH SHALL BE 12"
4. SEDIMENT FOREBAY TO HAVE A 10' x 10' RIP RAP INLET.
5. BOTTOM OF SEDIMENT FOREBAY AND INFILTRATION BASIN SHALL HAVE ALL A AND B HORIZON SOIL REMOVED, FILLED WITH CLEAN SAND AND GRAVEL AND SHALL THEN HAVE A 6" MINIMUM LAYER OF ROOT ZONE MIX APPLIED.
6. SIDE SLOPES TO HAVE A MINIMUM OF 6" OF LOAM.
7. SEDIMENT FOREBAY AND INFILTRATION BASIN SHALL BE SEEDED WITH WATER TOLERANT SEED MIX.
8. THE AREA UNDER EMBANKMENTS SHALL BE STRIPPED OF ALL TOPSOIL, TREES, ROOTS, VEGETATION AND DELETERIOUS MATERIALS.
9. COMPACTED LOW PERMEABILITY SOIL (SILTY GRAVELY SAND) WHICH SHALL BE FREE OF STONES GREATER THAN 6", ORGANIC MATTER, CONSTRUCTION DEBRIS, SNOW AND FROZEN SOIL.
10. EMBANKMENTS SOIL TO BE PLACED IN 8" LIFTS AND SHALL BE COMPACTED.

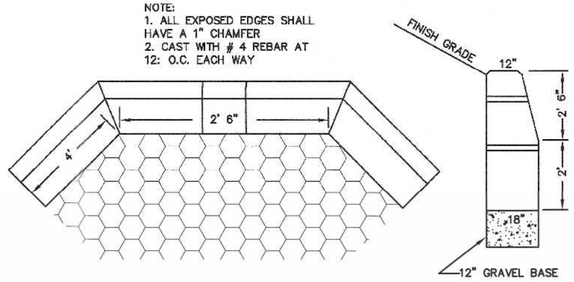



10' WIDE
GRAVEL ACCESS DRIVE

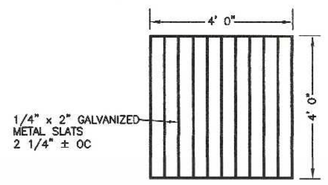



OCS
NOT TO SCALE

NOTE:
1. ALL EXPOSED EDGES SHALL HAVE A 1" CHAMFER
2. CAST WITH # 4 REBAR AT 12: O.C. EACH WAY

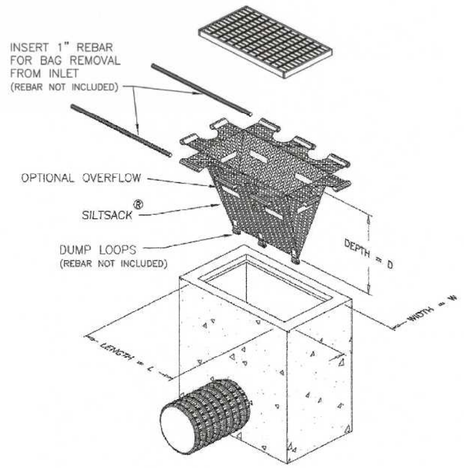



TYPE "B" PRECAST HEADWALL




OCS GRATE DETAIL
NOT TO SCALE

## Typical Siltsack® Construction - Type B




FOR REGISTRY USE ONLY

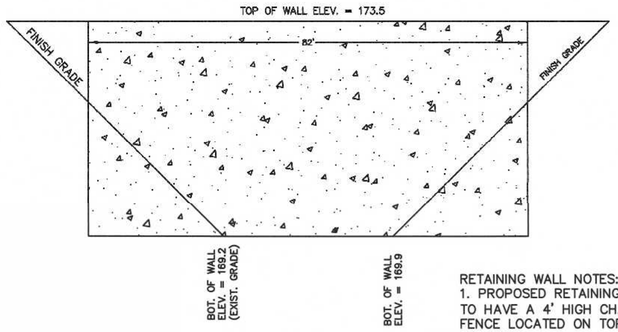
I NANCY DANELLO, CLERK OF THE TOWN OF FRANKLIN, RECEIVED AND RECORDED FROM THE PLANNING BOARD COVENANT APPROVAL OF THIS PLAN ON

_____

AND NO APPEAL WAS RECIEVED DURING THE 20 DAYS NEXT AFTER RECEIPT AND RECORDING OF SAME.

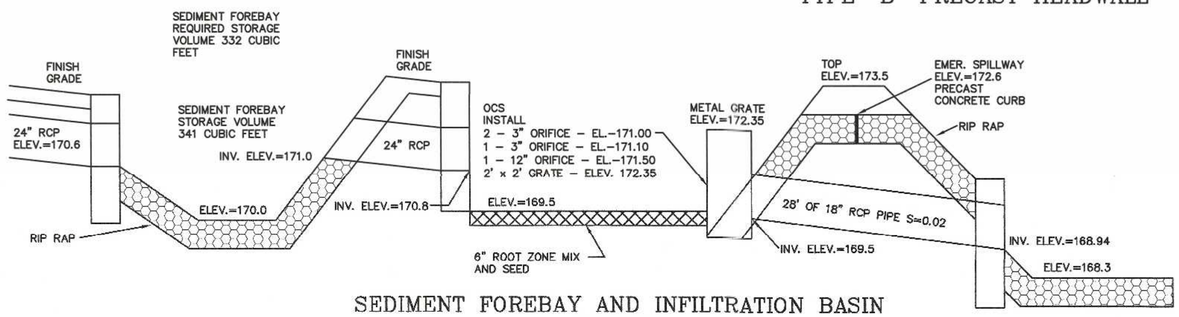
_____

TOWN CLERK – FRANKLIN DATE

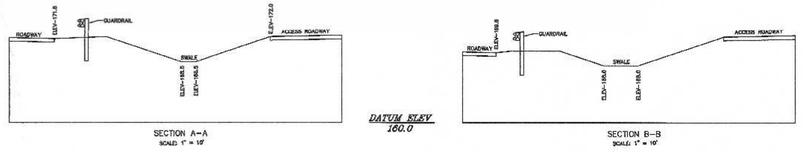



RETAINING WALL
NOT TO SCALE

RETAINING WALL NOTES:
1. PROPOSED RETAINING WALL TO HAVE A 4' HIGH CHAIN LINK FENCE LOCATED ON TOP OF THE WALL.
2. THE RETAINING WALL SHALL BE DESIGNED BY A STRUCTURAL ENGINEER.




SEDIMENT FOREBAY AND INFILTRATION BASIN
SECTION
N.T.S.




I DECLARE THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

DONOVAN ESTATES
CONSTRUCTION DETAILS – 3
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 40'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

DATE

_____ _____
_____ _____
_____ _____

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

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

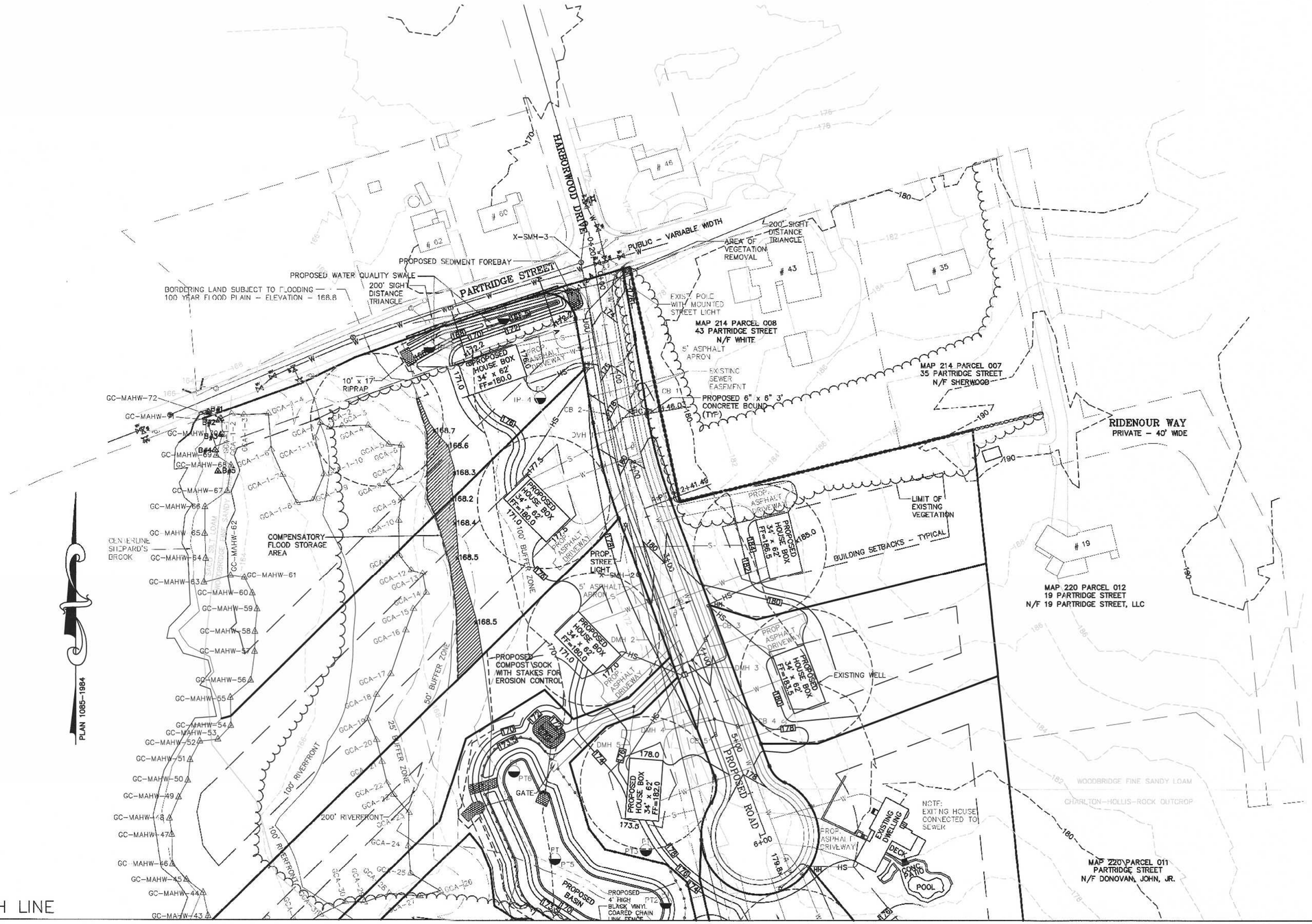
CARLOS A. QUINTAL P.E. #30812

| DATE | | INT. |
|---|---|---|
| | FIELD BY: | KK |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | RRG |
| 9/25 | CHECKED BY: | CAQ |


UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508-384-6560 FAX 508-384-6566


DATE: SEPT. 3, 2025
SCALE: 1" = 40'
PROJECT: UC1340
SHEET: 11 of 11

FOR REGISTRY USE ONLY




DONOVAN ESTATES
DEVELOPMENT PLAN – 1
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 50'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

DATE

GRAPHIC SCALE
50 0 25 50 100 200
( IN FEET )
1 inch = 50 ft.

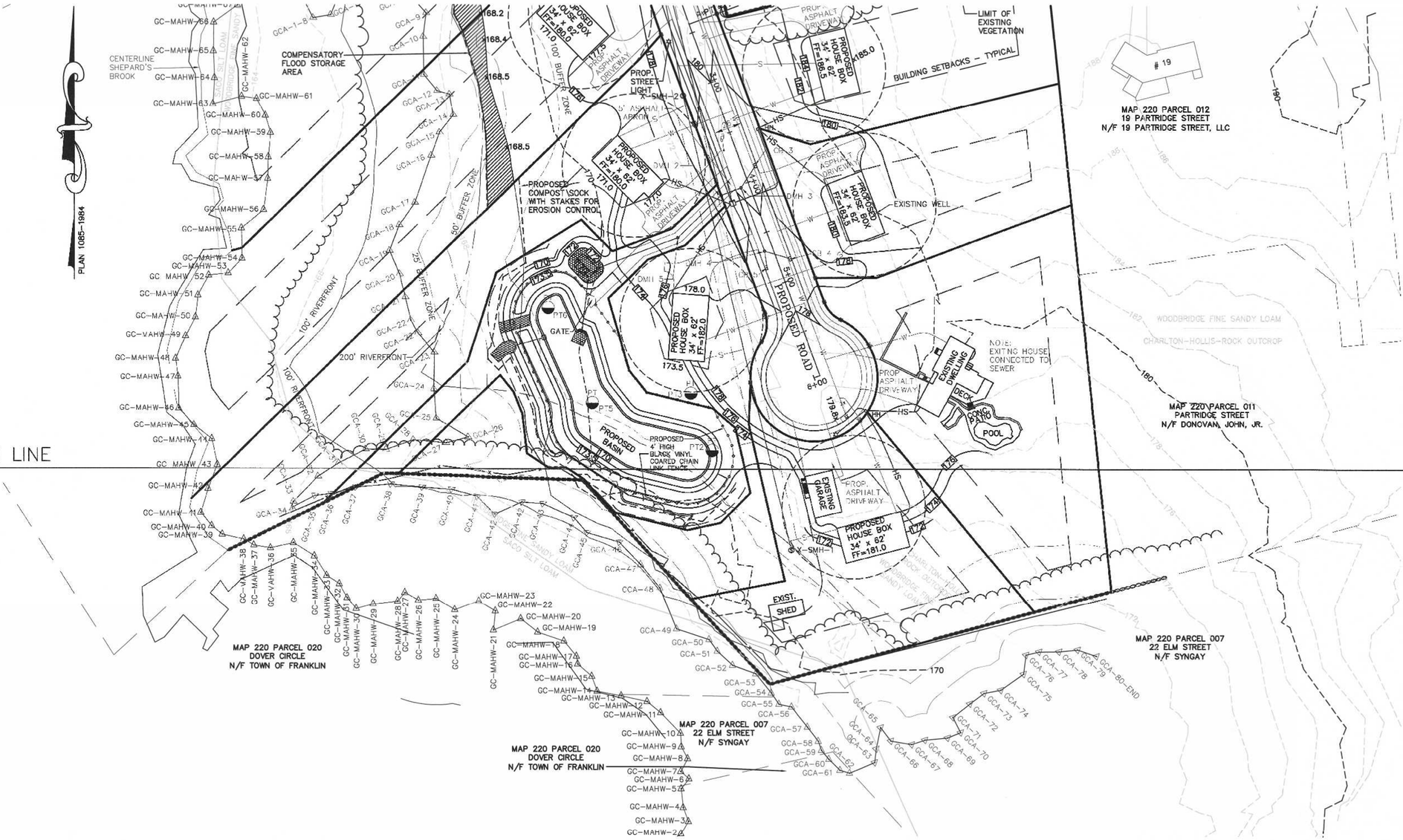
| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

| DATE | | INT. |
|---|---|---|
| 2/18 | FIELD BY: | BL |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | COMP |
| 9/25 | CHECKED BY: | CAQ |


UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508–384–6560 FAX 508–384–6566


SEPT 3, 2025
1" = 50'
UC1340
1 of 2

FOR REGISTRY USE ONLY




DONOVAN ESTATES
DEVELOPMENT PLAN - 1
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 50'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

DATE

GRAPHIC SCALE
50 0 25 50 100 200
( IN FEET )
1 inch = 50 ft.

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

| DATE | | INT. |
|---|---|---|
| 2/18 | FIELD BY: | BL |
| BK# | FIELD BOOK | PG# |
| 9/25 | CALCS BY: | RRG |
| 9/25 | DESIGNED BY: | RRG |
| 9/25 | DRAWN BY: | COMP |
| 9/25 | CHECKED BY: | CAQ |


UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508-384-6560 FAX 508-384-6566


SEPT 3, 2025
1" = 50'
UC1340
2 of 2

# DRAINAGE ANALYSIS

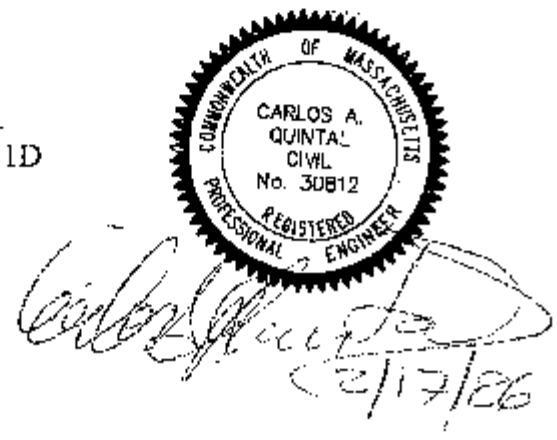
FOR
Definitive Subdivision
**Donovan Estates**

LOCATED IN
FRANKLIN, MASSACHUSETTS

PREPARED FOR
Donovan Family Realty Trust
47 Partridge Street
Franklin, MA 02038

PREPARED BY
UNITED CONSULTANTS, INC.
850 FRANKLIN STREET, SUITE 11D
WRENTHAM, MA. 02093

DATE: September 3, 2025
Revised: January 16, 2026
Revised: February 13, 2026



# Table of Contents


| | | |
|---|---|---|
| Appendix A | - | Narrative Description |
| Appendix B | - | Pre-development vs Post-development Rate and Volume of Runoff |
| Appendix C | - | Pre-development Drainage Analysis |
| Appendix D | - | Post-development Drainage Analysis |
| Appendix E | - | TSS Removal Worksheet |
| Appendix F | - | Permeability Calculations Soil Logs, SCS Soil Map and Information and Soil Logs |
| Appendix G | - | Checklist for Designers |
| Appendix H | - | Checklist for Storm-Water Report and Stormwater Facilities Plan |
| Appendix I | - | Operation and Maintenance Plan - Sample Maintenance Log |
| Appendix J | - | Draft Illicit Discharge Statement |
| Appendix K | - | Rip Rap Sizing |
| Appendix L | - | Watershed Plans |

# APPENDIX A

## I. DESCRIPTION

This report is offered in support of the stormwater management system designed for the "Definitive Subdivision – Donovan Estates" in Franklin, Massachusetts. The site currently consists of three lots with a total area of approximately 12 acres. One existing house is located on the site with out buildings and a pool. There are existing houses and vacant land abutting the site. The site has a wetland system which includes bordering vegetated wetlands, a river and a flood plain.
The project included the construction of a roadway with a water main underground utilities and a stormwater system.
The primary goals of the stormwater system are to collect and treat the stormwater runoff generated from the proposed roadway, driveways, and houses. The stormwater will be directed to an infiltration pond. Infiltration Pond 1 is open infiltration area located on Lot P.
Both the pre-development and post-development conditions flowing to the bordering vegetated wetlands are summarized in Appendix B.

## II. Purpose

The purpose of this report is to examine the hydrological and hydraulic aspects of the proposed "Definitive Subdivision – Donovan Estates". This report was developed for review by the Town of Franklin Planning Board and Conservation Commission to obtain the necessary permits to allow the project to proceed.

This report considers the overall hydrological impact of proposed additional development upon the local watersheds with specific emphasis directed toward the adjacent and immediate downstream areas. The hydrology and criteria are consistent with the Town of Franklin Planning Board, Franklin Conservation Commission and Mass DEP Storm Water Management Policies.

## III. Pre-Development Conditions

The site currently consists of three lots with a total area of approximately 12 acres. One existing house is located on the site with out buildings and a pool. There are existing houses and vacant land abutting the site. The site has a wetland system which includes bordering vegetated wetlands, a river and a flood plain. The project included the construction of a roadway with a water main underground utilities and a stormwater system.
The upland soils for the site were taken from the soil survey of Norfolk and Suffolk counties. The soils are mapped as -Charlton Hollis Rock-Outcrop Complex (HSG-C) and Woodbridge Fine Sandy Loam (HSG-B) Note: Refer to the subdivision plan for the location and soil types. Soil testing was conducted on the site to determine soil types and permeability rates. See the soil logs and permeability test results located in Appendix F. Permeability test was completed on site and the results can be found in Appendix F.
Utilizing a Hydrocad computer model the pre-development and post development conditions were calculated. This included an analysis of the watershed utilizing a Hydrologic soil group B or C. A comparison of the pre-development vs. post development rate and volume of runoff can be found in Appendix B.

IV. Post Development Conditions

The project included the construction of a roadway with a water main underground utilities and a stormwater system.
The roadway stormwater runoff will be captured in deep sump hooded catch basin and then directed to a sediment forebay and then to an open infiltration pond. The proposed infiltration system will promote groundwater re-charge as required by the Town of Franklin Stormwater Regulations. Municipal utility connections are also proposed for the project. The proposal is to service the houses with town water and sewer. The project includes the construction of a proposed roadway.
TSS removal will be accomplished by a treatment train with deep sump hooded catch basin, sediment forebay and an infiltration pond. Additionally, the entrance portion of the roadway will have a sediment forebay and two water quality swales. Utilizing the same computer model as the existing conditions we have modeled the changes in surfaces and ground cover and have calculated the post development conditions.
All calculations for the above have been included in this report. Pre-development calculations are in Appendix C. Post-development calculations are located in Appendix D.

V. Conclusion

Stormwater from the proposed roadway will be captured by the catch basins type water quality units and a sediment forebay for TSS removal which will then be directed to the underground infiltration pond. Additionally, the entrance portion of the roadway will have a sediment forebay and two water quality swales.
The comparison in Appendix B summarizes the rate and volumes of runoff at the bordering vegetated wetland boundary in both the pre-development and post-development conditions.

VI. Stormwater Management Standards

Refer to Checklist for Stormwater Report in Appendix H

**Town of Franklin Stormwater Management Bylaw – Chapter 153 – Bylaw Amendment 21-867**

Impervious Coverage Entire Site site =

1" x 61,111 sq. ft. impervious = 5,093 cubic feet (Required)

Storage in Pond 1 below the outlet invert (171.0) = 14,338 cubic feet (Provided) See Stage-Area-Storage for Pond 1 this Appendix.

**LID Measures**

- Existing Vegetation Removal within the buffer zone has been reduced to the extent practicable and mitigation plantings have been proposed.

**Standard 1: No New Untreated Discharges**
No new untreated discharges are proposed.
A stormwater system has been provided or is proposed which will provide the required TSS removal which includes the installation of deep sump hooded catch basins, sediment forebay and an infiltration basin as well as a sediment forebay and water quality swales.

**Standard 2: Peak Rate Attenuation**
The drainage system has been designed to match or reduce the rate of storm-water runoff from the site when comparing the pre-development conditions to the post development conditions. See Appendix B of this report for a summary of the design storms.

**Standard 3: Recharge**

- Soil testing has been completed. See Appendix F of this report for permeability test results and soil testing information. Additionally, soil testing results can be found on the plan sheets.

- Drawdown within 72 hours
  Pond 1 - Storage Volume below outlet = 14,338 cubic feet
  Time = (14,338) / (0.39"/hr x 1'/12" x 8,348 sf. = 52.85 hours < 72 hours
  See Stage-Area-Storage table for Pond 1this Appendix.

**Standard 4: Water Quality**

- The owner will be responsible for compliance with standard four requirements.
- Refer to the Operation and Maintenance Plan and the Storm-water Facilities Plan for the Inspection and Maintenance Schedule and the Operation and Maintenance Schedule.
- See Appendix E for the Manufactures TSS removal rate. The site is not located within a zone II. The Infiltration Pond has been designed with an infiltration rate of 0.39 inches per hour. This led to a Water Quality volume of 1/2" WQV.

The proposed project will include a stormwater system which includes the installation of deep sump hooded catch basins, sediment forebay and an infiltration basin as well as a sediment forebay and water quality swales.

Water Quality Volumes for Pond 1 Note: Due to Town of Franklin Stormwater Management Bylaw a WQV of 1" is being used.

Storage in Pond 1 below the outlet invert (171.0) = 14,338 cubic feet (Provided)

**Standard 5: Land uses with higher potential pollutant loads**
None proposed.

**Standard 6: Critical Areas**
N/A

**Standard 7: Re-developments and Other Projects**
N/A

**Standard 8: Construction Period Pollution Prevention and Erosion Sedimentation Control**

- Refer to Site Plans for the Inspection and Maintenance Schedule and the Operation and Maintenance Schedule.
- The project will be covered by an NPDES Construction General Permit.

**Standard 9: Operation and Maintenance Plan**

- Refer to Site Plans for the Inspection and Maintenance Schedule and the Operation and Maintenance Schedule.

- The owner will be responsible for the storm-water management system, implementation of the operation and maintenance, the maintenance costs, and completion of the maintenance logs.

**Standard 10: Prohibition of Illicit Discharges**

- Owner to be responsible for compliance with avoiding illicit discharges.
- The site will be connected to the town sewer system.

## Stage-Area-Storage for Pond 1P: POND 1

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 169.50 | 8,348 | 0 |
| 169.51 | 8,364 | 84 |
| 169.52 | 8,380 | 167 |
| 169.53 | 8,396 | 251 |
| 169.54 | 8,411 | 335 |
| 169.55 | 8,427 | 419 |
| 169.56 | 8,443 | 504 |
| 169.57 | 8,459 | 588 |
| 169.58 | 8,475 | 673 |
| 169.59 | 8,491 | 758 |
| 169.60 | 8,506 | 843 |
| 169.61 | 8,522 | 928 |
| 169.62 | 8,538 | 1,013 |
| 169.63 | 8,554 | 1,099 |
| 169.64 | 8,570 | 1,184 |
| 169.65 | 8,586 | 1,270 |
| 169.66 | 8,601 | 1,356 |
| 169.67 | 8,617 | 1,442 |
| 169.68 | 8,633 | 1,528 |
| 169.69 | 8,649 | 1,615 |
| 169.70 | 8,665 | 1,701 |
| 169.71 | 8,681 | 1,788 |
| 169.72 | 8,696 | 1,875 |
| 169.73 | 8,712 | 1,962 |
| 169.74 | 8,728 | 2,049 |
| 169.75 | 8,744 | 2,137 |
| 169.76 | 8,760 | 2,224 |
| 169.77 | 8,776 | 2,312 |
| 169.78 | 8,792 | 2,400 |
| 169.79 | 8,807 | 2,488 |
| 169.80 | 8,823 | 2,576 |
| 169.81 | 8,839 | 2,664 |
| 169.82 | 8,855 | 2,752 |
| 169.83 | 8,871 | 2,841 |
| 169.84 | 8,887 | 2,930 |
| 169.85 | 8,902 | 3,019 |
| 169.86 | 8,918 | 3,108 |
| 169.87 | 8,934 | 3,197 |
| 169.88 | 8,950 | 3,287 |
| 169.89 | 8,966 | 3,376 |
| 169.90 | 8,982 | 3,466 |
| 169.91 | 8,997 | 3,556 |
| 169.92 | 9,013 | 3,646 |
| 169.93 | 9,029 | 3,736 |
| 169.94 | 9,045 | 3,826 |
| 169.95 | 9,061 | 3,917 |
| 169.96 | 9,077 | 4,008 |
| 169.97 | 9,092 | 4,099 |
| 169.98 | 9,108 | 4,190 |
| 169.99 | 9,124 | 4,281 |
| 170.00 | 9,140 | 4,372 |
| 170.01 | 9,157 | 4,463 |
| 170.02 | 9,173 | 4,555 |
| 170.03 | 9,190 | 4,647 |
| 170.04 | 9,206 | 4,739 |
| 170.05 | 9,223 | 4,831 |
| 170.06 | 9,239 | 4,923 |
| 170.07 | 9,256 | 5,016 |
| 170.08 | 9,272 | 5,108 |
| 170.09 | 9,289 | 5,201 |
| 170.10 | 9,305 | 5,294 |
| 170.11 | 9,322 | 5,387 |
| 170.12 | 9,338 | 5,481 |
| 170.13 | 9,355 | 5,574 |
| 170.14 | 9,371 | 5,668 |
| 170.15 | 9,388 | 5,762 |
| 170.16 | 9,404 | 5,856 |
| 170.17 | 9,421 | 5,950 |
| 170.18 | 9,437 | 6,044 |
| 170.19 | 9,454 | 6,138 |
| 170.20 | 9,470 | 6,233 |
| 170.21 | 9,487 | 6,328 |
| 170.22 | 9,503 | 6,423 |
| 170.23 | 9,520 | 6,518 |
| 170.24 | 9,536 | 6,613 |
| 170.25 | 9,553 | 6,709 |
| 170.26 | 9,569 | 6,804 |
| 170.27 | 9,586 | 6,900 |
| 170.28 | 9,602 | 6,996 |
| 170.29 | 9,619 | 7,092 |
| 170.30 | 9,635 | 7,188 |
| 170.31 | 9,652 | 7,285 |
| 170.32 | 9,668 | 7,381 |
| 170.33 | 9,685 | 7,478 |
| 170.34 | 9,701 | 7,575 |
| 170.35 | 9,718 | 7,672 |
| 170.36 | 9,734 | 7,769 |
| 170.37 | 9,751 | 7,867 |
| 170.38 | 9,767 | 7,964 |
| 170.39 | 9,784 | 8,062 |
| 170.40 | 9,800 | 8,160 |
| 170.41 | 9,817 | 8,258 |
| 170.42 | 9,833 | 8,356 |
| 170.43 | 9,850 | 8,455 |
| 170.44 | 9,866 | 8,553 |
| 170.45 | 9,883 | 8,652 |
| 170.46 | 9,899 | 8,751 |
| 170.47 | 9,916 | 8,850 |
| 170.48 | 9,932 | 8,949 |
| 170.49 | 9,949 | 9,049 |
| 170.50 | 9,966 | 9,148 |
| 170.51 | 9,982 | 9,248 |
| 170.52 | 9,999 | 9,348 |
| 170.53 | 10,015 | 9,448 |

## Stage-Area-Storage for Pond 1P: POND 1 (continued)

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 170.54 | 10,032 | 9,548 |
| 170.55 | 10,048 | 9,649 |
| 170.56 | 10,065 | 9,749 |
| 170.57 | 10,081 | 9,850 |
| 170.58 | 10,098 | 9,951 |
| 170.59 | 10,114 | 10,052 |
| 170.60 | 10,131 | 10,153 |
| 170.61 | 10,147 | 10,255 |
| 170.62 | 10,164 | 10,356 |
| 170.63 | 10,180 | 10,458 |
| 170.64 | 10,197 | 10,560 |
| 170.65 | 10,213 | 10,662 |
| 170.66 | 10,230 | 10,764 |
| 170.67 | 10,246 | 10,866 |
| 170.68 | 10,263 | 10,969 |
| 170.69 | 10,279 | 11,072 |
| 170.70 | 10,296 | 11,174 |
| 170.71 | 10,312 | 11,278 |
| 170.72 | 10,329 | 11,381 |
| 170.73 | 10,345 | 11,484 |
| 170.74 | 10,362 | 11,588 |
| 170.75 | 10,378 | 11,691 |
| 170.76 | 10,395 | 11,795 |
| 170.77 | 10,411 | 11,899 |
| 170.78 | 10,428 | 12,003 |
| 170.79 | 10,444 | 12,108 |
| 170.80 | 10,461 | 12,212 |
| 170.81 | 10,477 | 12,317 |
| 170.82 | 10,494 | 12,422 |
| 170.83 | 10,510 | 12,527 |
| 170.84 | 10,527 | 12,632 |
| 170.85 | 10,543 | 12,737 |
| 170.86 | 10,560 | 12,843 |
| 170.87 | 10,576 | 12,949 |
| 170.88 | 10,593 | 13,054 |
| 170.89 | 10,609 | 13,160 |
| 170.90 | 10,626 | 13,267 |
| 170.91 | 10,642 | 13,373 |
| 170.92 | 10,659 | 13,480 |
| 170.93 | 10,675 | 13,586 |
| 170.94 | 10,692 | 13,693 |
| 170.95 | 10,708 | 13,800 |
| 170.96 | 10,725 | 13,907 |
| 170.97 | 10,741 | 14,015 |
| 170.98 | 10,758 | 14,122 |
| 170.99 | 10,774 | 14,230 |
| 171.00 | 10,791 | 14,338 |
| 171.01 | 10,808 | 14,445 |
| 171.02 | 10,824 | 14,554 |
| 171.03 | 10,841 | 14,662 |
| 171.04 | 10,857 | 14,770 |
| 171.05 | 10,874 | 14,879 |
| 171.06 | 10,890 | 14,988 |
| 171.07 | 10,907 | 15,097 |
| 171.08 | 10,923 | 15,206 |
| 171.09 | 10,940 | 15,315 |
| 171.10 | 10,956 | 15,425 |
| 171.11 | 10,973 | 15,534 |
| 171.12 | 10,989 | 15,644 |
| 171.13 | 11,006 | 15,754 |
| 171.14 | 11,022 | 15,864 |
| 171.15 | 11,039 | 15,975 |
| 171.16 | 11,055 | 16,085 |
| 171.17 | 11,072 | 16,196 |
| 171.18 | 11,088 | 16,307 |
| 171.19 | 11,105 | 16,418 |
| 171.20 | 11,121 | 16,529 |
| 171.21 | 11,138 | 16,640 |
| 171.22 | 11,154 | 16,751 |
| 171.23 | 11,171 | 16,863 |
| 171.24 | 11,187 | 16,975 |
| 171.25 | 11,204 | 17,087 |
| 171.26 | 11,220 | 17,199 |
| 171.27 | 11,237 | 17,311 |
| 171.28 | 11,253 | 17,424 |
| 171.29 | 11,270 | 17,536 |
| 171.30 | 11,286 | 17,649 |
| 171.31 | 11,303 | 17,762 |
| 171.32 | 11,319 | 17,875 |
| 171.33 | 11,336 | 17,988 |
| 171.34 | 11,352 | 18,102 |
| 171.35 | 11,369 | 18,215 |
| 171.36 | 11,385 | 18,329 |
| 171.37 | 11,402 | 18,443 |
| 171.38 | 11,418 | 18,557 |
| 171.39 | 11,435 | 18,672 |
| 171.40 | 11,451 | 18,786 |
| 171.41 | 11,468 | 18,901 |
| 171.42 | 11,484 | 19,015 |
| 171.43 | 11,501 | 19,130 |
| 171.44 | 11,517 | 19,245 |
| 171.45 | 11,534 | 19,361 |
| 171.46 | 11,550 | 19,476 |
| 171.47 | 11,567 | 19,592 |
| 171.48 | 11,583 | 19,707 |
| 171.49 | 11,600 | 19,823 |
| 171.50 | 11,617 | 19,939 |
| 171.51 | 11,633 | 20,056 |
| 171.52 | 11,650 | 20,172 |
| 171.53 | 11,666 | 20,289 |
| 171.54 | 11,683 | 20,405 |
| 171.55 | 11,699 | 20,522 |
| 171.56 | 11,716 | 20,639 |
| 171.57 | 11,732 | 20,757 |

## Stage-Area-Storage for Pond 1P: POND 1 (continued)

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 171.58 | 11,749 | 20,874 |
| 171.59 | 11,765 | 20,992 |
| 171.60 | 11,782 | 21,109 |
| 171.61 | 11,798 | 21,227 |
| 171.62 | 11,815 | 21,345 |
| 171.63 | 11,831 | 21,463 |
| 171.64 | 11,848 | 21,582 |
| 171.65 | 11,864 | 21,700 |
| 171.66 | 11,881 | 21,819 |
| 171.67 | 11,897 | 21,938 |
| 171.68 | 11,914 | 22,057 |
| 171.69 | 11,930 | 22,176 |
| 171.70 | 11,947 | 22,296 |
| 171.71 | 11,963 | 22,415 |
| 171.72 | 11,980 | 22,535 |
| 171.73 | 11,996 | 22,655 |
| 171.74 | 12,013 | 22,775 |
| 171.75 | 12,029 | 22,895 |
| 171.76 | 12,046 | 23,015 |
| 171.77 | 12,062 | 23,136 |
| 171.78 | 12,079 | 23,257 |
| 171.79 | 12,095 | 23,378 |
| 171.80 | 12,112 | 23,499 |
| 171.81 | 12,128 | 23,620 |
| 171.82 | 12,145 | 23,741 |
| 171.83 | 12,161 | 23,863 |
| 171.84 | 12,178 | 23,984 |
| 171.85 | 12,194 | 24,106 |
| 171.86 | 12,211 | 24,228 |
| 171.87 | 12,227 | 24,350 |
| 171.88 | 12,244 | 24,473 |
| 171.89 | 12,260 | 24,595 |
| 171.90 | 12,277 | 24,718 |
| 171.91 | 12,293 | 24,841 |
| 171.92 | 12,310 | 24,964 |
| 171.93 | 12,326 | 25,087 |
| 171.94 | 12,343 | 25,210 |
| 171.95 | 12,359 | 25,334 |
| 171.96 | 12,376 | 25,458 |
| 171.97 | 12,392 | 25,581 |
| 171.98 | 12,409 | 25,705 |
| 171.99 | 12,425 | 25,830 |
| 172.00 | 12,442 | 25,954 |
| 172.01 | 12,459 | 26,079 |
| 172.02 | 12,477 | 26,203 |
| 172.03 | 12,494 | 26,328 |
| 172.04 | 12,512 | 26,453 |
| 172.05 | 12,529 | 26,578 |
| 172.06 | 12,547 | 26,704 |
| 172.07 | 12,564 | 26,829 |
| 172.08 | 12,582 | 26,955 |
| 172.09 | 12,599 | 27,081 |
| 172.10 | 12,617 | 27,207 |
| 172.11 | 12,634 | 27,333 |
| 172.12 | 12,652 | 27,460 |
| 172.13 | 12,669 | 27,586 |
| 172.14 | 12,687 | 27,713 |
| 172.15 | 12,704 | 27,840 |
| 172.16 | 12,722 | 27,967 |
| 172.17 | 12,739 | 28,094 |
| 172.18 | 12,757 | 28,222 |
| 172.19 | 12,774 | 28,350 |
| 172.20 | 12,791 | 28,477 |
| 172.21 | 12,809 | 28,605 |
| 172.22 | 12,826 | 28,734 |
| 172.23 | 12,844 | 28,862 |
| 172.24 | 12,861 | 28,990 |
| 172.25 | 12,879 | 29,119 |
| 172.26 | 12,896 | 29,248 |
| 172.27 | 12,914 | 29,377 |
| 172.28 | 12,931 | 29,506 |
| 172.29 | 12,949 | 29,636 |
| 172.30 | 12,966 | 29,765 |
| 172.31 | 12,984 | 29,895 |
| 172.32 | 13,001 | 30,025 |
| 172.33 | 13,019 | 30,155 |
| 172.34 | 13,036 | 30,285 |
| 172.35 | 13,054 | 30,416 |
| 172.36 | 13,071 | 30,546 |
| 172.37 | 13,089 | 30,677 |
| 172.38 | 13,106 | 30,808 |
| 172.39 | 13,123 | 30,939 |
| 172.40 | 13,141 | 31,071 |
| 172.41 | 13,158 | 31,202 |
| 172.42 | 13,176 | 31,334 |
| 172.43 | 13,193 | 31,466 |
| 172.44 | 13,211 | 31,598 |
| 172.45 | 13,228 | 31,730 |
| 172.46 | 13,246 | 31,862 |
| 172.47 | 13,263 | 31,995 |
| 172.48 | 13,281 | 32,127 |
| 172.49 | 13,298 | 32,260 |
| 172.50 | 13,316 | 32,393 |
| 172.51 | 13,333 | 32,527 |
| 172.52 | 13,351 | 32,660 |
| 172.53 | 13,368 | 32,794 |
| 172.54 | 13,386 | 32,927 |
| 172.55 | 13,403 | 33,061 |
| 172.56 | 13,421 | 33,196 |
| 172.57 | 13,438 | 33,330 |
| 172.58 | 13,455 | 33,464 |
| 172.59 | 13,473 | 33,599 |
| 172.60 | 13,490 | 33,734 |
| 172.61 | 13,508 | 33,869 |

## Stage-Area-Storage for Pond 1P: POND 1 (continued)

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 172.62 | 13,525 | 34,004 |
| 172.63 | 13,543 | 34,139 |
| 172.64 | 13,560 | 34,275 |
| 172.65 | 13,578 | 34,410 |
| 172.66 | 13,595 | 34,546 |
| 172.67 | 13,613 | 34,682 |
| 172.68 | 13,630 | 34,819 |
| 172.69 | 13,648 | 34,955 |
| 172.70 | 13,665 | 35,091 |
| 172.71 | 13,683 | 35,228 |
| 172.72 | 13,700 | 35,365 |
| 172.73 | 13,718 | 35,502 |
| 172.74 | 13,735 | 35,639 |
| 172.75 | 13,753 | 35,777 |
| 172.76 | 13,770 | 35,915 |
| 172.77 | 13,787 | 36,052 |
| 172.78 | 13,805 | 36,190 |
| 172.79 | 13,822 | 36,328 |
| 172.80 | 13,840 | 36,467 |
| 172.81 | 13,857 | 36,605 |
| 172.82 | 13,875 | 36,744 |
| 172.83 | 13,892 | 36,883 |
| 172.84 | 13,910 | 37,022 |
| 172.85 | 13,927 | 37,161 |
| 172.86 | 13,945 | 37,300 |
| 172.87 | 13,962 | 37,440 |
| 172.88 | 13,980 | 37,580 |
| 172.89 | 13,997 | 37,719 |
| 172.90 | 14,015 | 37,859 |
| 172.91 | 14,032 | 38,000 |
| 172.92 | 14,050 | 38,140 |
| 172.93 | 14,067 | 38,281 |
| 172.94 | 14,084 | 38,421 |
| 172.95 | 14,102 | 38,562 |
| 172.96 | 14,119 | 38,703 |
| 172.97 | 14,137 | 38,845 |
| 172.98 | 14,154 | 38,986 |
| 172.99 | 14,172 | 39,128 |
| 173.00 | 14,189 | 39,270 |
| 173.01 | 14,207 | 39,412 |
| 173.02 | 14,224 | 39,554 |
| 173.03 | 14,242 | 39,696 |
| 173.04 | 14,259 | 39,839 |
| 173.05 | 14,277 | 39,981 |
| 173.06 | 14,294 | 40,124 |
| 173.07 | 14,312 | 40,267 |
| 173.08 | 14,329 | 40,410 |
| 173.09 | 14,347 | 40,554 |
| 173.10 | 14,364 | 40,697 |
| 173.11 | 14,382 | 40,841 |
| 173.12 | 14,399 | 40,985 |
| 173.13 | 14,416 | 41,129 |
| 173.14 | 14,434 | 41,273 |
| 173.15 | 14,451 | 41,418 |
| 173.16 | 14,469 | 41,562 |
| 173.17 | 14,486 | 41,707 |
| 173.18 | 14,504 | 41,852 |
| 173.19 | 14,521 | 41,997 |
| 173.20 | 14,539 | 42,142 |
| 173.21 | 14,556 | 42,288 |
| 173.22 | 14,574 | 42,434 |
| 173.23 | 14,591 | 42,579 |
| 173.24 | 14,609 | 42,725 |
| 173.25 | 14,626 | 42,872 |
| 173.26 | 14,644 | 43,018 |
| 173.27 | 14,661 | 43,164 |
| 173.28 | 14,679 | 43,311 |
| 173.29 | 14,696 | 43,458 |
| 173.30 | 14,714 | 43,605 |
| 173.31 | 14,731 | 43,752 |
| 173.32 | 14,748 | 43,900 |
| 173.33 | 14,766 | 44,047 |
| 173.34 | 14,783 | 44,195 |
| 173.35 | 14,801 | 44,343 |
| 173.36 | 14,818 | 44,491 |
| 173.37 | 14,836 | 44,639 |
| 173.38 | 14,853 | 44,788 |
| 173.39 | 14,871 | 44,936 |
| 173.40 | 14,888 | 45,085 |
| 173.41 | 14,906 | 45,234 |
| 173.42 | 14,923 | 45,383 |
| 173.43 | 14,941 | 45,533 |
| 173.44 | 14,958 | 45,682 |
| 173.45 | 14,976 | 45,832 |
| 173.46 | 14,993 | 45,982 |
| 173.47 | 15,011 | 46,132 |
| 173.48 | 15,028 | 46,282 |
| 173.49 | 15,046 | 46,432 |
| 173.50 | **15,063** | **46,583** |

# APPENDIX B

## Pre-Development vs. Post Development Rate and Volume of Runoff

This analysis was prepared to show the summary of the pre-development and post development rate and volume of runoff as required by the Town of Franklin Storm-water Requirements.

The pre-development watershed area 1S has a discharge to the on-site wetland. Post-development Link 1L was provided to combine the outlet from Pond 1 and the wet swale with the undeveloped area which discharge to the on-site wetland. A comparison of the rate and volume for pre-development area 1S and post-development Link 1L (To Wetlands) is provided below:

| 2-year storm event (CFS) | | | 2 year storm event (A.F.) | | |
|---|---|---|---|---|---|
| Pre | | Post | Pre | | Post |
| 1S | vs | 1L | 1S | vs | 1L |
| 5.23 | | 4.15 | 0.729 | | 0.568 |

| 10 year storm event (CFS) | | | 10 year storm event (A.F.) | | |
|---|---|---|---|---|---|
| Pre | | Post | Pre | | Post |
| 1S | vs | 1L | 1S | vs | 1L |
| 17.14 | | 12.98 | 1.995 | | 1.851 |

| 100 year storm event (CFS) | | | 100 year storm event (A.F.) | | |
|---|---|---|---|---|---|
| Pre | | Post | Pre | | Post |
| 1S | vs | 1L | 1S | vs | 1L |
| 41.08 | | 33.52 | 4.544 | | 4.521 |

The rate of runoff and volume of runoff for the 2 year, 10 year and 100 year storm events have been matched or reduced.

# APPENDIX C




1S

Subcat Reach Pond Link

**Drainage Diagram for UC1340-PRE**
Prepared by United Consultants, Inc.
HydroCAD® 8.00 s/n 001535 © 2006 HydroCAD Software Solutions LLC

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcats) |
|---|---|---|
| 1.766 | 55 | Woods, Good, HSG B (1S) |
| 8.386 | 61 | >75% Grass cover, Good, HSG B (1S) |
| 0.494 | 70 | Woods, Good, HSG C (1S) |
| 2.412 | 74 | >75% Grass cover, Good, HSG C (1S) |
| 0.609 | 98 | Paved parking & roofs (1S) |
| 13.667 | | |

# 2 YR PRE-DEVELOPMENT

## Subcatchment 1S: 1S

Runoff = 5.23 cfs @ 12.38 hrs, Volume= 0.729 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2YR-NOAA Rainfall=3.37"

| Area (sf) | CN | Description |
|---|---|---|
| 26,517 | 98 | Paved parking & roofs |
| 365,308 | 61 | >75% Grass cover, Good, HSG B |
| 105,060 | 74 | >75% Grass cover, Good, HSG C |
| 76,931 | 55 | Woods, Good, HSG B |
| 21,529 | 70 | Woods, Good, HSG C |
| 595,345 | 64 | Weighted Average |
| 568,828 | | Pervious Area |
| 26,517 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.3 | 42 | 0.0110 | 0.05 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.37" |
| 2.4 | 127 | 0.0310 | 0.88 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 1.6 | 172 | 0.0650 | 1.78 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.1 | 13 | 0.0220 | 3.01 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 4.8 | 301 | 0.0220 | 1.04 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 22.2 | 655 | Total | | | |

# 10 YR PRE-DEVELOPMENT

## Subcatchment 1S: 1S

Runoff = 17.14 cfs @ 12.33 hrs, Volume= 1.995 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 10YR-NOAA Rainfall=5.26"

| Area (sf) | CN | Description |
|---|---|---|
| 26,517 | 98 | Paved parking & roofs |
| 365,308 | 61 | >75% Grass cover, Good, HSG B |
| 105,060 | 74 | >75% Grass cover, Good, HSG C |
| 76,931 | 55 | Woods, Good, HSG B |
| 21,529 | 70 | Woods, Good, HSG C |
| 595,345 | 64 | Weighted Average |
| 568,828 | | Pervious Area |
| 26,517 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.3 | 42 | 0.0110 | 0.05 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.37" |
| 2.4 | 127 | 0.0310 | 0.88 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 1.6 | 172 | 0.0650 | 1.78 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.1 | 13 | 0.0220 | 3.01 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 4.8 | 301 | 0.0220 | 1.04 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 22.2 | 655 | Total | | | |

# 100 YR PRE-DEVELOPMENT

## Subcatchment 1S: 1S

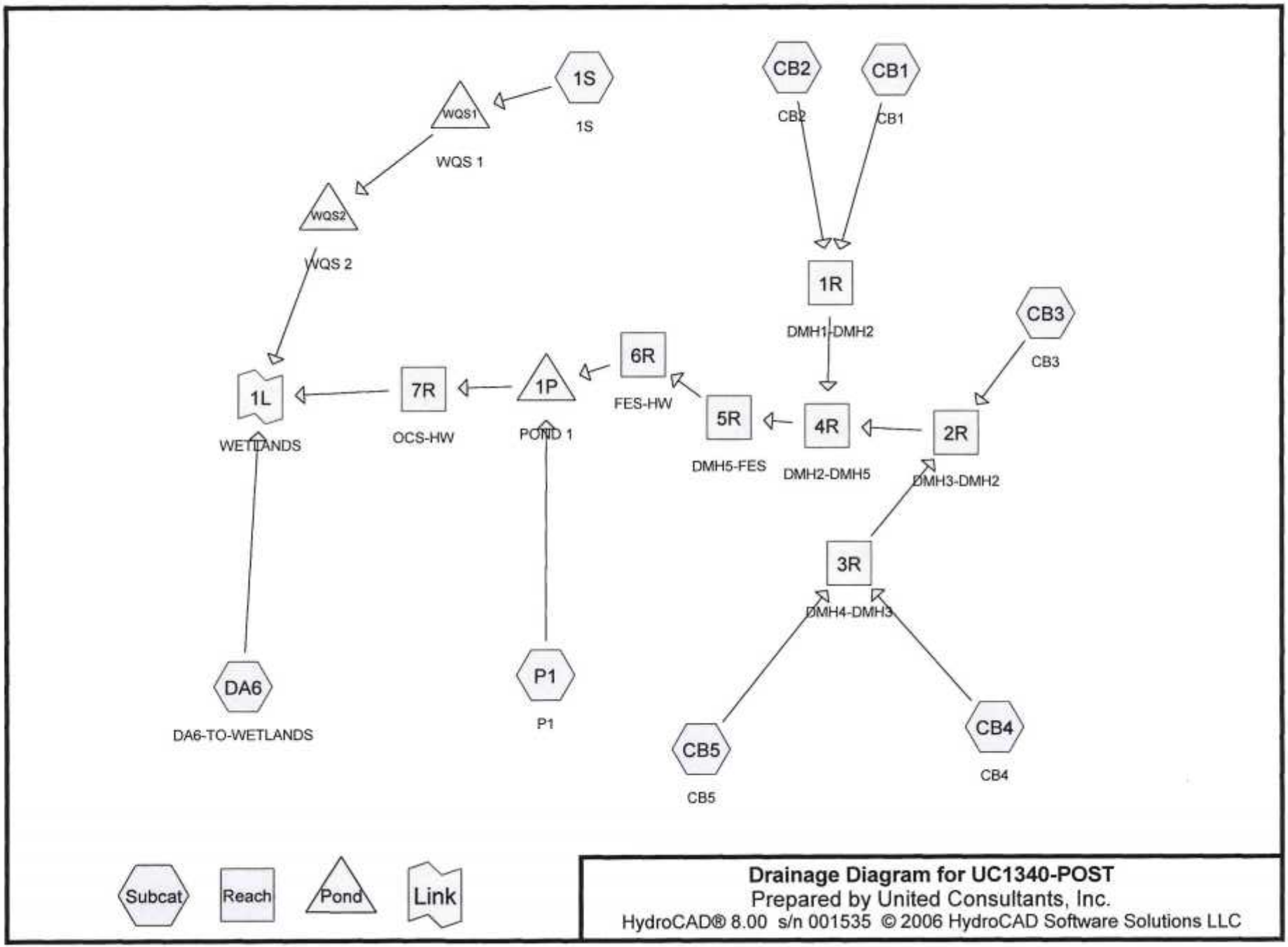
Runoff = 41.08 cfs @ 12.31 hrs, Volume= 4.544 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 100YR-NOAA Rainfall=8.26"

| Area (sf) | CN | Description |
|---|---|---|
| 26,517 | 98 | Paved parking & roofs |
| 365,308 | 61 | >75% Grass cover, Good, HSG B |
| 105,060 | 74 | >75% Grass cover, Good, HSG C |
| 76,931 | 55 | Woods, Good, HSG B |
| 21,529 | 70 | Woods, Good, HSG C |
| 595,345 | 64 | Weighted Average |
| 568,828 | | Pervious Area |
| 26,517 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.3 | 42 | 0.0110 | 0.05 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.37" |
| 2.4 | 127 | 0.0310 | 0.88 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 1.6 | 172 | 0.0650 | 1.78 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.1 | 13 | 0.0220 | 3.01 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 4.8 | 301 | 0.0220 | 1.04 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 22.2 | 655 | Total | | | |

# APPENDIX D


1S
1S
WQS1
WQS 1
WQS2
WQS 2
CB2
CB2
CB1
CB1
1R
DMH1-DMH2
CB3
CB3
6R
FES-HW
1P
POND 1
7R
OCS-HW
1L
WETLANDS
5R
DMH5-FES
4R
DMH2-DMH5
2R
DMH3-DMH2
3R
DMH4-DMH3
DA6
DA6-TO-WETLANDS
P1
P1
CB5
CB5
CB4
CB4
Subcat
Reach
Pond
Link
Drainage Diagram for UC1340-POST
Prepared by United Consultants, Inc.
HydroCAD® 8.00 s/n 001535 © 2006 HydroCAD Software Solutions LLC

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcats) |
|---|---|---|
| 1.140 | 55 | Woods, Good, HSG B (CB1,CB3,DA6) |
| 7.943 | 61 | >75% Grass cover, Good, HSG B (1S,CB1,CB2,CB3,CB4,CB5,DA6,P1) |
| 0.494 | 70 | Woods, Good, HSG C (DA6) |
| 2.386 | 74 | >75% Grass cover, Good, HSG C (CB5,DA6,P1) |
| 0.305 | 98 | POND (P1) |
| 1.403 | 98 | Paved parking & roofs (1S,CB1,CB2,CB3,CB4,CB5,DA6,P1) |
| 13.671 | | |

# 2 YR POST-DEVELOPMENT

## Subcatchment 1S: 1S

Runoff = 0.70 cfs @ 12.10 hrs, Volume= 0.054 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2YR-NOAA Rainfall=3.37"

| Area (sf) | CN | Description |
|---|---|---|
| 8,143 | 98 | Paved parking & roofs |
| 20,718 | 61 | >75% Grass cover, Good, HSG B |
| 28,861 | 71 | Weighted Average |
| 20,718 | | Pervious Area |
| 8,143 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.8 | 50 | 0.0280 | 0.17 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 0.2 | 15 | 0.0280 | 1.17 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.3 | 28 | 0.0910 | 1.51 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.2 | 16 | 0.1250 | 1.77 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.0 | 5 | 0.1250 | 2.47 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.0 | 5 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 5 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.4 | 89 | 0.0300 | 3.52 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 32 | 0.0460 | 4.35 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 6.1 | 245 | Total | | | |

## Subcatchment CB1: CB1

Runoff = 0.13 cfs @ 12.39 hrs, Volume= 0.022 af, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2YR-NOAA Rainfall=3.37"

| Area (sf) | CN | Description |
|---|---|---|
| 1,788 | 98 | Paved parking & roofs |
| 3,957 | 61 | >75% Grass cover, Good, HSG B |
| 20,562 | 55 | Woods, Good, HSG B |
| 26,307 | 59 | Weighted Average |
| 24,519 | | Pervious Area |
| 1,788 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 12.0 | 50 | 0.0200 | 0.07 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.37" |
| 2.5 | 109 | 0.0210 | 0.72 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 2.8 | 160 | 0.0375 | 0.97 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.8 | 62 | 0.0678 | 1.30 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.1 | 12 | 0.1667 | 2.04 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.1 | 7 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.0 | 5 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 5 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.5 | 86 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 21 | 0.0100 | 4.91 | 3.86 | **Circular Channel (pipe),** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished |
| 19.0 | 517 | Total | | | |

## Subcatchment CB2: CB2

Runoff = 0.22 cfs @ 12.13 hrs, Volume= 0.018 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2YR-NOAA Rainfall=3.37"

| Area (sf) | CN | Description |
|---|---|---|
| 2,838 | 98 | Paved parking & roofs |
| 5,427 | 61 | >75% Grass cover, Good, HSG B |
| 8,265 | 74 | Weighted Average |
| 5,427 | | Pervious Area |
| 2,838 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.2 | 50 | 0.0100 | 0.12 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 1.3 | 53 | 0.0100 | 0.70 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.1 | 10 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.0 | 11 | 0.0190 | 6.77 | 5.32 | **Circular Channel (pipe),** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished |
| 8.6 | 124 | Total | | | |

## Subcatchment CB3: CB3

Runoff = 0.50 cfs @ 12.22 hrs, Volume= 0.056 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2YR-NOAA Rainfall=3.37"

| Area (sf) | CN | Description |
|---|---|---|
| 6,010 | 98 | Paved parking & roofs |
| 28,667 | 61 | >75% Grass cover, Good, HSG B |
| 5,036 | 55 | Woods, Good, HSG B |
| 39,713 | 66 | Weighted Average |
| 33,703 | | Pervious Area |
| 6,010 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.3 | 50 | 0.0380 | 0.09 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.37" |
| 1.2 | 77 | 0.0227 | 1.05 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 1.1 | 92 | 0.0435 | 1.46 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 1.1 | 66 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.1 | 27 | 0.1850 | 3.01 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.3 | 25 | 0.0400 | 1.40 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.4 | 22 | 0.0220 | 1.04 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.0 | 5 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 5 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 24 | 0.0100 | 2.03 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 21 | 0.0100 | 4.91 | 3.86 | **Circular Channel (pipe),** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished |
| 13.9 | 414 | Total | | | |

## Subcatchment CB4: CB4

Runoff = 1.27 cfs @ 12.10 hrs, Volume= 0.096 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2YR-NOAA Rainfall=3.37"

| Area (sf) | CN | Description |
|---|---|---|
| 14,187 | 98 | Paved parking & roofs |
| 34,440 | 61 | >75% Grass cover, Good, HSG B |
| 48,627 | 72 | Weighted Average |
| 34,440 | | Pervious Area |
| 14,187 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 50 | 0.0440 | 0.21 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 0.5 | 64 | 0.0781 | 1.96 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.6 | 63 | 0.0645 | 1.78 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.5 | 46 | 0.0500 | 1.57 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.0 | 5 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 5 | 0.0100 | 0.70 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 25 | 0.0100 | 2.03 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 21 | 0.0100 | 5.70 | 7.00 | **Circular Channel (pipe),** Diam= 15.0" Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished |
| 6.0 | 279 | Total | | | |

## Subcatchment CB5: CB5

Runoff = 0.80 cfs @ 12.09 hrs, Volume= 0.057 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2YR-NOAA Rainfall=3.37"

| Area (sf) | CN | Description |
|---|---|---|
| 9,299 | 98 | Paved parking & roofs |
| 6,735 | 61 | >75% Grass cover, Good, HSG B |
| 1,715 | 74 | >75% Grass cover, Good, HSG C |
| 17,749 | 82 | Weighted Average |
| 8,450 | | Pervious Area |
| 9,299 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 0.9 | 5 | 0.0200 | 0.10 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 0.1 | 5 | 0.0200 | 0.78 | | **Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.37" |
| 0.9 | 5 | 0.0200 | 0.10 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 1.2 | 201 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 2.9 | | | | | **Direct Entry, MIN TC** |
| 0.0 | 12 | 0.0100 | 4.91 | 3.86 | **Circular Channel (pipe),** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished |
| 6.0 | 228 | Total | | | |

## Subcatchment DA6: DA6-TO-WETLANDS

Runoff = 4.15 cfs @ 12.33 hrs, Volume= 0.525 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2YR-NOAA Rainfall=3.37"

| Area (sf) | CN | Description |
|---|---|---|
| 13,120 | 98 | Paved parking & roofs |
| 215,109 | 61 | >75% Grass cover, Good, HSG B |
| 102,048 | 74 | >75% Grass cover, Good, HSG C |
| 24,053 | 55 | Woods, Good, HSG B |
| 21,529 | 70 | Woods, Good, HSG C |
| 375,859 | 66 | Weighted Average |
| 362,739 | | Pervious Area |
| 13,120 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.3 | 13 | 0.0340 | 0.07 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.37" |
| 3.5 | 37 | 0.0340 | 0.18 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 1.8 | 101 | 0.0180 | 0.94 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.8 | 61 | 0.0330 | 1.27 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 4.3 | 357 | 0.0400 | 1.40 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 5.6 | 225 | 0.0090 | 0.66 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 17 | 0.0400 | 1.40 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.5 | 32 | 0.0400 | 1.00 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 20.0 | 843 | Total | | | |

## Subcatchment P1: P1

Runoff = 1.58 cfs @ 12.09 hrs, Volume= 0.116 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2YR-NOAA Rainfall=3.37"

| Area (sf) | CN | Description |
|---|---|---|
| 5,726 | 98 | Paved parking & roofs |
| 30,929 | 61 | >75% Grass cover, Good, HSG B |
| 155 | 74 | >75% Grass cover, Good, HSG C |
| 13,301 | 98 | POND |
| 50,111 | 75 | Weighted Average |
| 31,084 | | Pervious Area |
| 19,027 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 50 | 0.0300 | 0.18 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 0.2 | 16 | 0.0300 | 1.21 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.4 | 40 | 0.0500 | 1.57 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.7 | 58 | 0.0340 | 1.29 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 6.0 | 164 | Total | | | |

## Reach 1R: DMH1-DMH2

Inflow Area = 0.794 ac, Inflow Depth = 0.61" for 2YR-NOAA event
Inflow = 0.26 cfs @ 12.16 hrs, Volume= 0.040 af
Outflow = 0.26 cfs @ 12.23 hrs, Volume= 0.040 af, Atten= 1%, Lag= 3.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.28 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 3.8 min

Peak Storage= 28 cf @ 12.20 hrs, Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.25', Capacity at Bank-Full= 5.43 cfs

15.0" Diameter Pipe, n= 0.012 Concrete pipe, finished
Length= 246.0' Slope= 0.0060 '/'
Inlet Invert= 173.97', Outlet Invert= 172.49'



## Reach 2R: DMH3-DMH2

Inflow Area = 2.435 ac, Inflow Depth = 1.03" for 2YR-NOAA event
Inflow = 2.38 cfs @ 12.11 hrs, Volume= 0.209 af
Outflow = 2.38 cfs @ 12.11 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.95 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.86 fps, Avg. Travel Time= 0.1 min

Peak Storage= 8 cf @ 12.11 hrs, Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 24.51 cfs

24.0" Diameter Pipe, n= 0.012 Concrete pipe, finished
Length= 16.0' Slope= 0.0100 '/'
Inlet Invert= 172.00', Outlet Invert= 171.84'



## Reach 3R: DMH4-DMH3

Inflow Area = 1.524 ac, Inflow Depth = 1.21" for 2YR-NOAA event
Inflow = 2.07 cfs @ 12.09 hrs, Volume= 0.153 af
Outflow = 2.06 cfs @ 12.10 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.89 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 0.6 min

Peak Storage= 25 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 11.38 cfs

18.0" Diameter Pipe, n= 0.012 Concrete pipe, finished
Length= 60.0' Slope= 0.0100 '/'
Inlet Invert= 173.10', Outlet Invert= 172.50'



## Reach 4R: DMH2-DMH5

Inflow Area = 3.229 ac, Inflow Depth = 0.93" for 2YR-NOAA event
Inflow = 2.55 cfs @ 12.12 hrs, Volume= 0.249 af
Outflow = 2.55 cfs @ 12.12 hrs, Volume= 0.249 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.65 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 0.5 min

Peak Storage= 29 cf @ 12.12 hrs, Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 21.82 cfs

24.0" Diameter Pipe, n= 0.012
Length= 53.0' Slope= 0.0079 '/'
Inlet Invert= 171.74', Outlet Invert= 171.32'



## Reach 5R: DMH5-FES

Inflow Area = 3.229 ac, Inflow Depth = 0.93" for 2YR-NOAA event
Inflow = 2.55 cfs @ 12.12 hrs, Volume= 0.249 af
Outflow = 2.54 cfs @ 12.13 hrs, Volume= 0.249 af, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.67 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.78 fps, Avg. Travel Time= 0.7 min

Peak Storage= 42 cf @ 12.13 hrs, Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 21.99 cfs

24.0" Diameter Pipe, n= 0.012
Length= 77.0' Slope= 0.0081 '/'
Inlet Invert= 171.22', Outlet Invert= 170.60'



## Reach 6R: FES-HW

Inflow Area = 3.229 ac, Inflow Depth = 0.93" for 2YR-NOAA event
Inflow = 2.54 cfs @ 12.13 hrs, Volume= 0.249 af
Outflow = 2.54 cfs @ 12.14 hrs, Volume= 0.249 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.65 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 0.5 min

Peak Storage= 27 cf @ 12.13 hrs, Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 21.86 cfs

24.0" Diameter Pipe, n= 0.012
Length= 49.0' Slope= 0.0080 '/'
Inlet Invert= 171.19', Outlet Invert= 170.80'



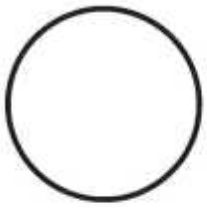
## Reach 7R: OCS-HW

Inflow Area = 4.380 ac, Inflow Depth = 0.00" for 2YR-NOAA event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 16.09 cfs

18.0" Diameter Pipe, n= 0.012 Concrete pipe, finished
Length= 28.0' Slope= 0.0200 '/'
Inlet Invert= 169.50', Outlet Invert= 168.94'



## Pond 1P: POND 1

Inflow Area = 4.380 ac, Inflow Depth = 1.00" for 2YR-NOAA event
Inflow = 4.01 cfs @ 12.12 hrs, Volume= 0.365 af
Outflow = 0.09 cfs @ 22.54 hrs, Volume= 0.365 af, Atten= 98%, Lag= 625.2 min
Discarded = 0.09 cfs @ 22.54 hrs, Volume= 0.365 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 170.75' @ 22.54 hrs Surf.Area= 10,382 sf Storage= 11,717 cf

Plug-Flow detention time= 1,297.6 min calculated for 0.365 af (100% of inflow)
Center-of-Mass det. time= 1,297.7 min ( 2,165.3 - 867.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 169.50' | 46,583 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 169.50 | 8,348 | 0 | 0 |
| 170.00 | 9,140 | 4,372 | 4,372 |
| 172.00 | 12,442 | 21,582 | 25,954 |
| 173.50 | 15,063 | 20,629 | 46,583 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 169.50' | **18.0" x 28.0' long Culvert** RCP, square edge headwall, Ke= 0.500<br>Outlet Invert= 168.94' S= 0.0200 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished |
| #2 | Device 1 | 171.00' | **3.0" Vert. Orifice/Grate X 2.00** C= 0.600 |
| #3 | Device 1 | 171.10' | **3.0" Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 171.50' | **12.0" Vert. Orifice/Grate** C= 0.600 |
| #5 | Device 1 | 172.35' | **4.00' x 4.00' Horiz. Orifice/Grate** Limited to weir flow C= 0.600 |
| #6 | Discarded | 0.00' | **0.390 in/hr Exfiltration over Surface area** |

**Discarded OutFlow** Max=0.09 cfs @ 22.54 hrs HW=170.75' (Free Discharge)
└**6=Exfiltration** (Exfiltration Controls 0.09 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=169.50' (Free Discharge)
└**1=Culvert** ( Controls 0.00 cfs)
  ├**2=Orifice/Grate** ( Controls 0.00 cfs)
  ├**3=Orifice/Grate** ( Controls 0.00 cfs)
  ├**4=Orifice/Grate** ( Controls 0.00 cfs)
  └**5=Orifice/Grate** ( Controls 0.00 cfs)

## Pond WQS1: WQS 1

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 0.663 ac, | Inflow Depth = | 0.98" | for | 2YR-NOAA event |
| Inflow = | 0.70 cfs @ | 12.10 hrs, | Volume= | 0.054 af | |
| Outflow = | 0.27 cfs @ | 12.43 hrs, | Volume= | 0.050 af, | Atten= 62%, Lag= 19.9 min |
| Primary = | 0.27 cfs @ | 12.43 hrs, | Volume= | 0.050 af | |

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 169.68' @ 12.43 hrs Surf.Area= 856 sf Storage= 669 cf

Plug-Flow detention time= 142.4 min calculated for 0.049 af (91% of inflow)
Center-of-Mass det. time= 99.6 min ( 968.3 - 868.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 168.50' | 2,110 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 168.50 | 276 | 0 | 0 |
| 170.00 | 1,013 | 967 | 967 |
| 171.00 | 1,273 | 1,143 | 2,110 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 170.00' | **13.5' long x 0.5' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00<br>Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #2 | Primary | 169.00' | **30.0 deg Sharp-Crested Vee/Trap Weir** C= 2.61 |

**Primary OutFlow** Max=0.27 cfs @ 12.43 hrs HW=169.68' (Free Discharge)
├**1=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)
└**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.27 cfs @ 2.15 fps)

## Pond WQS2: WQS 2

Inflow Area = 0.663 ac, Inflow Depth > 0.90" for 2YR-NOAA event
Inflow = 0.27 cfs @ 12.43 hrs, Volume= 0.050 af
Outflow = 0.09 cfs @ 13.60 hrs, Volume= 0.042 af, Atten= 67%, Lag= 70.4 min
Primary = 0.09 cfs @ 13.60 hrs, Volume= 0.042 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 168.94' @ 13.60 hrs Surf.Area= 938 sf Storage= 662 cf

Plug-Flow detention time= 271.2 min calculated for 0.042 af (85% of inflow)
Center-of-Mass det. time= 174.4 min ( 1,142.7 - 968.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 168.00' | 1,936 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 168.00 | 473 | 0 | 0 |
| 169.50 | 1,216 | 1,267 | 1,267 |
| 170.00 | 1,461 | 669 | 1,936 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 169.50' | **16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** |
| | | | Head (feet) 0.20 0.40 0.60 0.80 1.00 |
| | | | Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #2 | Primary | 168.50' | **30.0 deg Sharp-Crested Vee/Trap Weir** C= 2.61 |

**Primary OutFlow** Max=0.09 cfs @ 13.60 hrs HW=168.94' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)
└—**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.09 cfs @ 1.73 fps)

## Link 1L: WETLANDS

Inflow Area = 13.671 ac, Inflow Depth = 0.50" for 2YR-NOAA event
Inflow = 4.15 cfs @ 12.33 hrs, Volume= 0.568 af
Primary = 4.15 cfs @ 12.33 hrs, Volume= 0.568 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

# 10 YR POST-DEVELOPMENT

## Subcatchment 1S: 1S

Runoff = 1.77 cfs @ 12.09 hrs, Volume= 0.128 af, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 10YR-NOAA Rainfall=5.26"

| Area (sf) | CN | Description |
|---|---|---|
| 8,143 | 98 | Paved parking & roofs |
| 20,718 | 61 | >75% Grass cover, Good, HSG B |
| 28,861 | 71 | Weighted Average |
| 20,718 | | Pervious Area |
| 8,143 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.8 | 50 | 0.0280 | 0.17 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 0.2 | 15 | 0.0280 | 1.17 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.3 | 28 | 0.0910 | 1.51 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.2 | 16 | 0.1250 | 1.77 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.0 | 5 | 0.1250 | 2.47 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.0 | 5 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 5 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.4 | 89 | 0.0300 | 3.52 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 32 | 0.0460 | 4.35 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 6.1 | 245 | Total | | | |

## Subcatchment CB1: CB1

Runoff = 0.60 cfs @ 12.30 hrs, Volume= 0.070 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 10YR-NOAA Rainfall=5.26"

| Area (sf) | CN | Description |
|---|---|---|
| 1,788 | 98 | Paved parking & roofs |
| 3,957 | 61 | >75% Grass cover, Good, HSG B |
| 20,562 | 55 | Woods, Good, HSG B |
| 26,307 | 59 | Weighted Average |
| 24,519 | | Pervious Area |
| 1,788 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 12.0 | 50 | 0.0200 | 0.07 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.37" |
| 2.5 | 109 | 0.0210 | 0.72 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 2.8 | 160 | 0.0375 | 0.97 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.8 | 62 | 0.0678 | 1.30 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.1 | 12 | 0.1667 | 2.04 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.1 | 7 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.0 | 5 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 5 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.5 | 86 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 21 | 0.0100 | 4.91 | 3.86 | **Circular Channel (pipe),** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished |
| 19.0 | 517 | Total | | | |

## Subcatchment CB2: CB2

Runoff = 0.52 cfs @ 12.12 hrs, Volume= 0.041 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 10YR-NOAA Rainfall=5.26"

| Area (sf) | CN | Description |
|---|---|---|
| 2,838 | 98 | Paved parking & roofs |
| 5,427 | 61 | >75% Grass cover, Good, HSG B |
| 8,265 | 74 | Weighted Average |
| 5,427 | | Pervious Area |
| 2,838 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.2 | 50 | 0.0100 | 0.12 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 1.3 | 53 | 0.0100 | 0.70 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.1 | 10 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.0 | 11 | 0.0190 | 6.77 | 5.32 | **Circular Channel (pipe),** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished |
| 8.6 | 124 | Total | | | |

## Subcatchment CB3: CB3

Runoff = 1.52 cfs @ 12.20 hrs, Volume= 0.145 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 10YR-NOAA Rainfall=5.26"

| Area (sf) | CN | Description |
|---|---|---|
| 6,010 | 98 | Paved parking & roofs |
| 28,667 | 61 | >75% Grass cover, Good, HSG B |
| 5,036 | 55 | Woods, Good, HSG B |
| 39,713 | 66 | Weighted Average |
| 33,703 | | Pervious Area |
| 6,010 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.3 | 50 | 0.0380 | 0.09 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.37" |
| 1.2 | 77 | 0.0227 | 1.05 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 1.1 | 92 | 0.0435 | 1.46 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 1.1 | 66 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.1 | 27 | 0.1850 | 3.01 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.3 | 25 | 0.0400 | 1.40 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.4 | 22 | 0.0220 | 1.04 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.0 | 5 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 5 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 24 | 0.0100 | 2.03 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 21 | 0.0100 | 4.91 | 3.86 | **Circular Channel (pipe),** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished |
| 13.9 | 414 | Total | | | |

## Subcatchment CB4: CB4

Runoff = 3.12 cfs @ 12.09 hrs, Volume= 0.223 af, Depth= 2.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 10YR-NOAA Rainfall=5.26"

| Area (sf) | CN | Description |
|---|---|---|
| 14,187 | 98 | Paved parking & roofs |
| 34,440 | 61 | >75% Grass cover, Good, HSG B |
| 48,627 | 72 | Weighted Average |
| 34,440 | | Pervious Area |
| 14,187 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 50 | 0.0440 | 0.21 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 0.5 | 64 | 0.0781 | 1.96 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.6 | 63 | 0.0645 | 1.78 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.5 | 46 | 0.0500 | 1.57 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.0 | 5 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 5 | 0.0100 | 0.70 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 25 | 0.0100 | 2.03 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 21 | 0.0100 | 5.70 | 7.00 | **Circular Channel (pipe),** Diam= 15.0" Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished |
| 6.0 | 279 | Total | | | |

## Subcatchment CB5: CB5

Runoff = 1.58 cfs @ 12.09 hrs, Volume= 0.112 af, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 10YR-NOAA Rainfall=5.26"

| Area (sf) | CN | Description |
|---|---|---|
| 9,299 | 98 | Paved parking & roofs |
| 6,735 | 61 | >75% Grass cover, Good, HSG B |
| 1,715 | 74 | >75% Grass cover, Good, HSG C |
| 17,749 | 82 | Weighted Average |
| 8,450 | | Pervious Area |
| 9,299 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 0.9 | 5 | 0.0200 | 0.10 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 0.1 | 5 | 0.0200 | 0.78 | | **Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.37" |
| 0.9 | 5 | 0.0200 | 0.10 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 1.2 | 201 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 2.9 | | | | | **Direct Entry, MIN TC** |
| 0.0 | 12 | 0.0100 | 4.91 | 3.86 | **Circular Channel (pipe),** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished |
| 6.0 | 228 | Total | | | |

## Subcatchment DA6: DA6-TO-WETLANDS

Runoff = 12.51 cfs @ 12.29 hrs, Volume= 1.371 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 10YR-NOAA Rainfall=5.26"

| Area (sf) | CN | Description |
|---|---|---|
| 13,120 | 98 | Paved parking & roofs |
| 215,109 | 61 | >75% Grass cover, Good, HSG B |
| 102,048 | 74 | >75% Grass cover, Good, HSG C |
| 24,053 | 55 | Woods, Good, HSG B |
| 21,529 | 70 | Woods, Good, HSG C |
| 375,859 | 66 | Weighted Average |
| 362,739 | | Pervious Area |
| 13,120 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.3 | 13 | 0.0340 | 0.07 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.37" |
| 3.5 | 37 | 0.0340 | 0.18 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 1.8 | 101 | 0.0180 | 0.94 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.8 | 61 | 0.0330 | 1.27 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 4.3 | 357 | 0.0400 | 1.40 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 5.6 | 225 | 0.0090 | 0.66 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 17 | 0.0400 | 1.40 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.5 | 32 | 0.0400 | 1.00 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 20.0 | 843 | Total | | | |

## Subcatchment P1: P1

Runoff = 3.59 cfs @ 12.09 hrs, Volume= 0.255 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 10YR-NOAA Rainfall=5.26"

| Area (sf) | CN | Description |
|---|---|---|
| 5,726 | 98 | Paved parking & roofs |
| 30,929 | 61 | >75% Grass cover, Good, HSG B |
| 155 | 74 | >75% Grass cover, Good, HSG C |
| 13,301 | 98 | POND |
| 50,111 | 75 | Weighted Average |
| 31,084 | | Pervious Area |
| 19,027 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 50 | 0.0300 | 0.18 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 0.2 | 16 | 0.0300 | 1.21 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.4 | 40 | 0.0500 | 1.57 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.7 | 58 | 0.0340 | 1.29 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 6.0 | 164 | Total | | | |

## Reach 1R: DMH1-DMH2

Inflow Area = 0.794 ac, Inflow Depth = 1.67" for 10YR-NOAA event
Inflow = 0.93 cfs @ 12.20 hrs, Volume= 0.110 af
Outflow = 0.93 cfs @ 12.24 hrs, Volume= 0.110 af, Atten= 0%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.30 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 3.1 min

Peak Storage= 69 cf @ 12.22 hrs, Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 1.25', Capacity at Bank-Full= 5.43 cfs

15.0" Diameter Pipe, n= 0.012 Concrete pipe, finished
Length= 246.0' Slope= 0.0060 '/'
Inlet Invert= 173.97', Outlet Invert= 172.49'



## Reach 2R: DMH3-DMH2

Inflow Area = 2.435 ac, Inflow Depth = 2.37" for 10YR-NOAA event
Inflow = 5.78 cfs @ 12.10 hrs, Volume= 0.481 af
Outflow = 5.77 cfs @ 12.11 hrs, Volume= 0.481 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.38 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.22 fps, Avg. Travel Time= 0.1 min

Peak Storage= 14 cf @ 12.11 hrs, Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 24.51 cfs

24.0" Diameter Pipe, n= 0.012 Concrete pipe, finished
Length= 16.0' Slope= 0.0100 '/'
Inlet Invert= 172.00', Outlet Invert= 171.84'



## Reach 3R: DMH4-DMH3

Inflow Area = 1.524 ac, Inflow Depth = 2.64" for 10YR-NOAA event
Inflow = 4.70 cfs @ 12.09 hrs, Volume= 0.336 af
Outflow = 4.69 cfs @ 12.09 hrs, Volume= 0.336 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.13 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.10 fps, Avg. Travel Time= 0.5 min

Peak Storage= 46 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 11.38 cfs

18.0" Diameter Pipe, n= 0.012 Concrete pipe, finished
Length= 60.0' Slope= 0.0100 '/'
Inlet Invert= 173.10', Outlet Invert= 172.50'



## Reach 4R: DMH2-DMH5

Inflow Area = 3.229 ac, Inflow Depth = 2.20" for 10YR-NOAA event
Inflow = 6.45 cfs @ 12.11 hrs, Volume= 0.591 af
Outflow = 6.44 cfs @ 12.12 hrs, Volume= 0.591 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.04 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.13 fps, Avg. Travel Time= 0.4 min

Peak Storage= 56 cf @ 12.12 hrs, Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 21.82 cfs

24.0" Diameter Pipe, n= 0.012
Length= 53.0' Slope= 0.0079 '/'
Inlet Invert= 171.74', Outlet Invert= 171.32'



## Reach 5R: DMH5-FES

Inflow Area = 3.229 ac, Inflow Depth = 2.20" for 10YR-NOAA event
Inflow = 6.44 cfs @ 12.12 hrs, Volume= 0.591 af
Outflow = 6.43 cfs @ 12.12 hrs, Volume= 0.591 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.08 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.14 fps, Avg. Travel Time= 0.6 min

Peak Storage= 82 cf @ 12.12 hrs, Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 21.99 cfs

24.0" Diameter Pipe, n= 0.012
Length= 77.0' Slope= 0.0081 '/'
Inlet Invert= 171.22', Outlet Invert= 170.60'



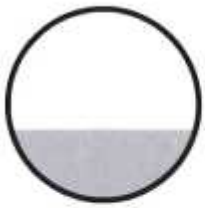
## Reach 6R: FES-HW

Inflow Area = 3.229 ac, Inflow Depth = 2.20" for 10YR-NOAA event
Inflow = 6.43 cfs @ 12.12 hrs, Volume= 0.591 af
Outflow = 6.42 cfs @ 12.13 hrs, Volume= 0.591 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.05 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.13 fps, Avg. Travel Time= 0.4 min

Peak Storage= 52 cf @ 12.13 hrs, Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 21.86 cfs

24.0" Diameter Pipe, n= 0.012
Length= 49.0' Slope= 0.0080 '/'
Inlet Invert= 171.19', Outlet Invert= 170.80'



## Reach 7R: OCS-HW

Inflow Area = 4.380 ac, Inflow Depth = 1.00" for 10YR-NOAA event
Inflow = 0.56 cfs @ 14.88 hrs, Volume= 0.364 af
Outflow = 0.56 cfs @ 14.89 hrs, Volume= 0.364 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.27 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.14 fps, Avg. Travel Time= 0.1 min

Peak Storage= 4 cf @ 14.88 hrs, Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 16.09 cfs

18.0" Diameter Pipe, n= 0.012 Concrete pipe, finished
Length= 28.0' Slope= 0.0200 '/'
Inlet Invert= 169.50', Outlet Invert= 168.94'



## Pond 1P: POND 1

Inflow Area = 4.380 ac, Inflow Depth = 2.32" for 10YR-NOAA event
Inflow = 9.80 cfs @ 12.11 hrs, Volume= 0.846 af
Outflow = 0.67 cfs @ 14.88 hrs, Volume= 0.846 af, Atten= 93%, Lag= 166.3 min
Discarded = 0.11 cfs @ 14.88 hrs, Volume= 0.482 af
Primary = 0.56 cfs @ 14.88 hrs, Volume= 0.364 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 171.63' @ 14.88 hrs Surf.Area= 11,834 sf Storage= 21,487 cf

Plug-Flow detention time= 996.5 min calculated for 0.846 af (100% of inflow)
Center-of-Mass det. time= 996.5 min ( 1,840.0 - 843.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 169.50' | 46,583 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 169.50 | 8,348 | 0 | 0 |
| 170.00 | 9,140 | 4,372 | 4,372 |
| 172.00 | 12,442 | 21,582 | 25,954 |
| 173.50 | 15,063 | 20,629 | 46,583 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 169.50' | **18.0" x 28.0' long Culvert** RCP, square edge headwall, Ke= 0.500<br>Outlet Invert= 168.94' S= 0.0200 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished |
| #2 | Device 1 | 171.00' | **3.0" Vert. Orifice/Grate X 2.00** C= 0.600 |
| #3 | Device 1 | 171.10' | **3.0" Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 171.50' | **12.0" Vert. Orifice/Grate** C= 0.600 |
| #5 | Device 1 | 172.35' | **4.00' x 4.00' Horiz. Orifice/Grate** Limited to weir flow C= 0.600 |
| #6 | Discarded | 0.00' | **0.390 in/hr Exfiltration over Surface area** |

**Discarded OutFlow** Max=0.11 cfs @ 14.88 hrs HW=171.63' (Free Discharge)
└**6=Exfiltration** (Exfiltration Controls 0.11 cfs)

**Primary OutFlow** Max=0.56 cfs @ 14.88 hrs HW=171.63' (Free Discharge)
└**1=Culvert** (Passes 0.56 cfs of 10.00 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.34 cfs @ 3.43 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.15 cfs @ 3.07 fps)
  ├**4=Orifice/Grate** (Orifice Controls 0.08 cfs @ 1.24 fps)
  └**5=Orifice/Grate** ( Controls 0.00 cfs)

## Pond WQS1: WQS 1

Inflow Area = 0.663 ac, Inflow Depth = 2.31" for 10YR-NOAA event
Inflow = 1.77 cfs @ 12.09 hrs, Volume= 0.128 af
Outflow = 1.63 cfs @ 12.13 hrs, Volume= 0.123 af, Atten= 8%, Lag= 2.1 min
Primary = 1.63 cfs @ 12.13 hrs, Volume= 0.123 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 170.08' @ 12.13 hrs Surf.Area= 1,033 sf Storage= 1,045 cf

Plug-Flow detention time= 74.6 min calculated for 0.123 af (96% of inflow)
Center-of-Mass det. time= 54.1 min ( 896.6 - 842.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 168.50' | 2,110 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 168.50 | 276 | 0 | 0 |
| 170.00 | 1,013 | 967 | 967 |
| 171.00 | 1,273 | 1,143 | 2,110 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 170.00' | **13.5' long x 0.5' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00<br>Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #2 | Primary | 169.00' | **30.0 deg Sharp-Crested Vee/Trap Weir** C= 2.61 |

**Primary OutFlow** Max=1.63 cfs @ 12.13 hrs HW=170.08' (Free Discharge)
├**1=Broad-Crested Rectangular Weir** (Weir Controls 0.79 cfs @ 0.77 fps)
└**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.84 cfs @ 2.71 fps)

## Pond WQS2: WQS 2

Inflow Area = 0.663 ac, Inflow Depth = 2.23" for 10YR-NOAA event
Inflow = 1.63 cfs @ 12.13 hrs, Volume= 0.123 af
Outflow = 0.62 cfs @ 12.50 hrs, Volume= 0.116 af, Atten= 62%, Lag= 22.6 min
Primary = 0.62 cfs @ 12.50 hrs, Volume= 0.116 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 169.46' @ 12.50 hrs Surf.Area= 1,194 sf Storage= 1,213 cf

Plug-Flow detention time= 123.8 min calculated for 0.116 af (94% of inflow)
Center-of-Mass det. time= 80.7 min ( 977.4 - 896.6 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 168.00' | 1,936 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 168.00 | 473 | 0 | 0 |
| 169.50 | 1,216 | 1,267 | 1,267 |
| 170.00 | 1,461 | 669 | 1,936 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 169.50' | **16.0' long x 0.5' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00<br>Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #2 | Primary | 168.50' | **30.0 deg Sharp-Crested Vee/Trap Weir** C= 2.61 |

**Primary OutFlow** Max=0.62 cfs @ 12.50 hrs HW=169.46' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)
└—**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.62 cfs @ 2.55 fps)

## Link 1L: WETLANDS

Inflow Area = 13.671 ac, Inflow Depth = 1.63" for 10YR-NOAA event
Inflow = 12.98 cfs @ 12.29 hrs, Volume= 1.851 af
Primary = 12.98 cfs @ 12.29 hrs, Volume= 1.851 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

# 100 YR POST-DEVELOPMENT

## Subcatchment 1S: 1S

Runoff = 3.72 cfs @ 12.09 hrs, Volume= 0.265 af, Depth= 4.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 100YR-NOAA Rainfall=8.26"

| Area (sf) | CN | Description |
|---|---|---|
| 8,143 | 98 | Paved parking & roofs |
| 20,718 | 61 | >75% Grass cover, Good, HSG B |
| 28,861 | 71 | Weighted Average |
| 20,718 | | Pervious Area |
| 8,143 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.8 | 50 | 0.0280 | 0.17 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 0.2 | 15 | 0.0280 | 1.17 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.3 | 28 | 0.0910 | 1.51 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.2 | 16 | 0.1250 | 1.77 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.0 | 5 | 0.1250 | 2.47 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.0 | 5 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 5 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.4 | 89 | 0.0300 | 3.52 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 32 | 0.0460 | 4.35 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 6.1 | 245 | Total | | | |

## Subcatchment CB1: CB1

Runoff = 1.63 cfs @ 12.27 hrs, Volume= 0.172 af, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 100YR-NOAA Rainfall=8.26"

| Area (sf) | CN | Description |
|---|---|---|
| 1,788 | 98 | Paved parking & roofs |
| 3,957 | 61 | >75% Grass cover, Good, HSG B |
| 20,562 | 55 | Woods, Good, HSG B |
| 26,307 | 59 | Weighted Average |
| 24,519 | | Pervious Area |
| 1,788 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 12.0 | 50 | 0.0200 | 0.07 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.37" |
| 2.5 | 109 | 0.0210 | 0.72 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 2.8 | 160 | 0.0375 | 0.97 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.8 | 62 | 0.0678 | 1.30 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.1 | 12 | 0.1667 | 2.04 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 0.1 | 7 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.0 | 5 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 5 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.5 | 86 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 21 | 0.0100 | 4.91 | 3.86 | **Circular Channel (pipe),** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished |
| 19.0 | 517 | Total | | | |

## Subcatchment CB2: CB2

Runoff = 1.05 cfs @ 12.12 hrs, Volume= 0.082 af, Depth= 5.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 100YR-NOAA Rainfall=8.26"

| Area (sf) | CN | Description |
|---|---|---|
| 2,838 | 98 | Paved parking & roofs |
| 5,427 | 61 | >75% Grass cover, Good, HSG B |
| 8,265 | 74 | Weighted Average |
| 5,427 | | Pervious Area |
| 2,838 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.2 | 50 | 0.0100 | 0.12 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 1.3 | 53 | 0.0100 | 0.70 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.1 | 10 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.0 | 11 | 0.0190 | 6.77 | 5.32 | **Circular Channel (pipe),** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished |
| 8.6 | 124 | Total | | | |

## Subcatchment CB3: CB3

Runoff = 3.51 cfs @ 12.19 hrs, Volume= 0.321 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 100YR-NOAA Rainfall=8.26"

| Area (sf) | CN | Description |
|---|---|---|
| 6,010 | 98 | Paved parking & roofs |
| 28,667 | 61 | >75% Grass cover, Good, HSG B |
| 5,036 | 55 | Woods, Good, HSG B |
| 39,713 | 66 | Weighted Average |
| 33,703 | | Pervious Area |
| 6,010 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.3 | 50 | 0.0380 | 0.09 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.37" |
| 1.2 | 77 | 0.0227 | 1.05 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 1.1 | 92 | 0.0435 | 1.46 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 1.1 | 66 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.1 | 27 | 0.1850 | 3.01 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.3 | 25 | 0.0400 | 1.40 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.4 | 22 | 0.0220 | 1.04 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.0 | 5 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 5 | 0.0200 | 0.99 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 24 | 0.0100 | 2.03 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 21 | 0.0100 | 4.91 | 3.86 | **Circular Channel (pipe),** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished |
| 13.9 | 414 | Total | | | |

## Subcatchment CB4: CB4

Runoff = 6.44 cfs @ 12.09 hrs, Volume= 0.458 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 100YR-NOAA Rainfall=8.26"

| Area (sf) | CN | Description |
|---|---|---|
| 14,187 | 98 | Paved parking & roofs |
| 34,440 | 61 | >75% Grass cover, Good, HSG B |
| 48,627 | 72 | Weighted Average |
| 34,440 | | Pervious Area |
| 14,187 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 50 | 0.0440 | 0.21 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 0.5 | 64 | 0.0781 | 1.96 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.6 | 63 | 0.0645 | 1.78 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.5 | 46 | 0.0500 | 1.57 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.0 | 5 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 5 | 0.0100 | 0.70 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 25 | 0.0100 | 2.03 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 0.1 | 21 | 0.0100 | 5.70 | 7.00 | **Circular Channel (pipe),** Diam= 15.0" Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished |
| 6.0 | 279 | Total | | | |

## Subcatchment CB5: CB5

Runoff = 2.85 cfs @ 12.09 hrs, Volume= 0.207 af, Depth= 6.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 100YR-NOAA Rainfall=8.26"

| Area (sf) | CN | Description |
|---|---|---|
| 9,299 | 98 | Paved parking & roofs |
| 6,735 | 61 | >75% Grass cover, Good, HSG B |
| 1,715 | 74 | >75% Grass cover, Good, HSG C |
| 17,749 | 82 | Weighted Average |
| 8,450 | | Pervious Area |
| 9,299 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 0.9 | 5 | 0.0200 | 0.10 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 0.1 | 5 | 0.0200 | 0.78 | | **Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.37" |
| 0.9 | 5 | 0.0200 | 0.10 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 1.2 | 201 | 0.0200 | 2.87 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 2.9 | | | | | **Direct Entry, MIN TC** |
| 0.0 | 12 | 0.0100 | 4.91 | 3.86 | **Circular Channel (pipe),** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished |
| 6.0 | 228 | Total | | | |

## Subcatchment DA6: DA6-TO-WETLANDS

Runoff = 28.72 cfs @ 12.28 hrs, Volume= 3.036 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 100YR-NOAA Rainfall=8.26"

| Area (sf) | CN | Description |
|---|---|---|
| 13,120 | 98 | Paved parking & roofs |
| 215,109 | 61 | >75% Grass cover, Good, HSG B |
| 102,048 | 74 | >75% Grass cover, Good, HSG C |
| 24,053 | 55 | Woods, Good, HSG B |
| 21,529 | 70 | Woods, Good, HSG C |
| 375,859 | 66 | Weighted Average |
| 362,739 | | Pervious Area |
| 13,120 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.3 | 13 | 0.0340 | 0.07 | | **Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.37" |
| 3.5 | 37 | 0.0340 | 0.18 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 1.8 | 101 | 0.0180 | 0.94 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.8 | 61 | 0.0330 | 1.27 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 4.3 | 357 | 0.0400 | 1.40 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 5.6 | 225 | 0.0090 | 0.66 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 17 | 0.0400 | 1.40 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.5 | 32 | 0.0400 | 1.00 | | **Shallow Concentrated Flow,** Woodland Kv= 5.0 fps |
| 20.0 | 843 | Total | | | |

## Subcatchment P1: P1

Runoff = 7.08 cfs @ 12.09 hrs, Volume= 0.506 af, Depth= 5.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 100YR-NOAA Rainfall=8.26"

| Area (sf) | CN | Description |
|---|---|---|
| 5,726 | 98 | Paved parking & roofs |
| 30,929 | 61 | >75% Grass cover, Good, HSG B |
| 155 | 74 | >75% Grass cover, Good, HSG C |
| 13,301 | 98 | POND |
| 50,111 | 75 | Weighted Average |
| 31,084 | | Pervious Area |
| 19,027 | | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 50 | 0.0300 | 0.18 | | **Sheet Flow,** Grass: Short n= 0.150 P2= 3.37" |
| 0.2 | 16 | 0.0300 | 1.21 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.4 | 40 | 0.0500 | 1.57 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 0.7 | 58 | 0.0340 | 1.29 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 6.0 | 164 | Total | | | |

## Reach 1R: DMH1-DMH2

Inflow Area = 0.794 ac, Inflow Depth = 3.83" for 100YR-NOAA event
Inflow = 2.30 cfs @ 12.22 hrs, Volume= 0.253 af
Outflow = 2.30 cfs @ 12.24 hrs, Volume= 0.253 af, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.24 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 2.6 min

Peak Storage= 133 cf @ 12.22 hrs, Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 1.25', Capacity at Bank-Full= 5.43 cfs

15.0" Diameter Pipe, n= 0.012 Concrete pipe, finished
Length= 246.0' Slope= 0.0060 '/'
Inlet Invert= 173.97', Outlet Invert= 172.49'



## Reach 2R: DMH3-DMH2

Inflow Area = 2.435 ac, Inflow Depth = 4.86" for 100YR-NOAA event
Inflow = 11.88 cfs @ 12.10 hrs, Volume= 0.986 af
Outflow = 11.88 cfs @ 12.10 hrs, Volume= 0.986 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.74 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.61 fps, Avg. Travel Time= 0.1 min

Peak Storage= 25 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 24.51 cfs

24.0" Diameter Pipe, n= 0.012 Concrete pipe, finished
Length= 16.0' Slope= 0.0100 '/'
Inlet Invert= 172.00', Outlet Invert= 171.84'



## Reach 3R: DMH4-DMH3

Inflow Area = 1.524 ac, Inflow Depth = 5.24" for 100YR-NOAA event
Inflow = 9.28 cfs @ 12.09 hrs, Volume= 0.665 af
Outflow = 9.27 cfs @ 12.09 hrs, Volume= 0.665 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.18 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.45 fps, Avg. Travel Time= 0.4 min

Peak Storage= 78 cf @ 12.09 hrs, Average Depth at Peak Storage= 1.03'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 11.38 cfs

18.0" Diameter Pipe, n= 0.012 Concrete pipe, finished
Length= 60.0' Slope= 0.0100 '/'
Inlet Invert= 173.10', Outlet Invert= 172.50'



## Reach 4R: DMH2-DMH5

Inflow Area = 3.229 ac, Inflow Depth = 4.61" for 100YR-NOAA event
Inflow = 13.63 cfs @ 12.11 hrs, Volume= 1.240 af
Outflow = 13.62 cfs @ 12.11 hrs, Volume= 1.240 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.33 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.51 fps, Avg. Travel Time= 0.4 min

Peak Storage= 99 cf @ 12.11 hrs, Average Depth at Peak Storage= 1.15'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 21.82 cfs

24.0" Diameter Pipe, n= 0.012
Length= 53.0' Slope= 0.0079 '/'
Inlet Invert= 171.74', Outlet Invert= 171.32'



## Reach 5R: DMH5-FES

Inflow Area = 3.229 ac, Inflow Depth = 4.61" for 100YR-NOAA event
Inflow = 13.62 cfs @ 12.11 hrs, Volume= 1.240 af
Outflow = 13.61 cfs @ 12.12 hrs, Volume= 1.240 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.37 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.52 fps, Avg. Travel Time= 0.5 min

Peak Storage= 142 cf @ 12.12 hrs, Average Depth at Peak Storage= 1.14'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 21.99 cfs

24.0" Diameter Pipe, n= 0.012
Length= 77.0' Slope= 0.0081 '/'
Inlet Invert= 171.22', Outlet Invert= 170.60'



## Reach 6R: FES-HW

Inflow Area = 3.229 ac, Inflow Depth = 4.61" for 100YR-NOAA event
Inflow = 13.61 cfs @ 12.12 hrs, Volume= 1.240 af
Outflow = 13.60 cfs @ 12.12 hrs, Volume= 1.240 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.34 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.51 fps, Avg. Travel Time= 0.3 min

Peak Storage= 91 cf @ 12.12 hrs, Average Depth at Peak Storage= 1.14'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 21.86 cfs

24.0" Diameter Pipe, n= 0.012
Length= 49.0' Slope= 0.0080 '/'
Inlet Invert= 171.19', Outlet Invert= 170.80'



## Reach 7R: OCS-HW

Inflow Area = 4.380 ac, Inflow Depth = 3.37" for 100YR-NOAA event
Inflow = 7.68 cfs @ 12.48 hrs, Volume= 1.232 af
Outflow = 7.68 cfs @ 12.48 hrs, Volume= 1.232 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.00 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.98 fps, Avg. Travel Time= 0.1 min

Peak Storage= 24 cf @ 12.48 hrs, Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 16.09 cfs

18.0" Diameter Pipe, n= 0.012 Concrete pipe, finished
Length= 28.0' Slope= 0.0200 '/'
Inlet Invert= 169.50', Outlet Invert= 168.94'



## Pond 1P: POND 1

Inflow Area = 4.380 ac, Inflow Depth = 4.78" for 100YR-NOAA event
Inflow = 20.30 cfs @ 12.11 hrs, Volume= 1.745 af
Outflow = 7.80 cfs @ 12.48 hrs, Volume= 1.745 af, Atten= 62%, Lag= 22.2 min
Discarded = 0.12 cfs @ 12.48 hrs, Volume= 0.514 af
Primary = 7.68 cfs @ 12.48 hrs, Volume= 1.232 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 172.53' @ 12.48 hrs Surf.Area= 13,372 sf Storage= 32,825 cf

Plug-Flow detention time= 553.2 min calculated for 1.745 af (100% of inflow)
Center-of-Mass det. time= 553.4 min ( 1,377.0 - 823.6 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 169.50' | 46,583 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 169.50 | 8,348 | 0 | 0 |
| 170.00 | 9,140 | 4,372 | 4,372 |
| 172.00 | 12,442 | 21,582 | 25,954 |
| 173.50 | 15,063 | 20,629 | 46,583 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 169.50' | **18.0" x 28.0' long Culvert** RCP, square edge headwall, Ke= 0.500<br>Outlet Invert= 168.94' S= 0.0200 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished |
| #2 | Device 1 | 171.00' | **3.0" Vert. Orifice/Grate X 2.00** C= 0.600 |
| #3 | Device 1 | 171.10' | **3.0" Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 171.50' | **12.0" Vert. Orifice/Grate** C= 0.600 |
| #5 | Device 1 | 172.35' | **4.00' x 4.00' Horiz. Orifice/Grate** Limited to weir flow C= 0.600 |
| #6 | Discarded | 0.00' | **0.390 in/hr Exfiltration over Surface area** |

**Discarded OutFlow** Max=0.12 cfs @ 12.48 hrs HW=172.53' (Free Discharge)
└**6=Exfiltration** (Exfiltration Controls 0.12 cfs)

**Primary OutFlow** Max=7.66 cfs @ 12.48 hrs HW=172.53' (Free Discharge)
└**1=Culvert** (Passes 7.66 cfs of 12.85 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.56 cfs @ 5.71 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.27 cfs @ 5.51 fps)
  ├**4=Orifice/Grate** (Orifice Controls 2.76 cfs @ 3.51 fps)
  └**5=Orifice/Grate** (Weir Controls 4.07 cfs @ 1.40 fps)

## Pond WQS1: WQS 1

Inflow Area = 0.663 ac, Inflow Depth = 4.81" for 100YR-NOAA event
Inflow = 3.72 cfs @ 12.09 hrs, Volume= 0.265 af
Outflow = 3.68 cfs @ 12.10 hrs, Volume= 0.261 af, Atten= 1%, Lag= 0.7 min
Primary = 3.68 cfs @ 12.10 hrs, Volume= 0.261 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 170.17' @ 12.10 hrs Surf.Area= 1,057 sf Storage= 1,142 cf

Plug-Flow detention time= 45.5 min calculated for 0.261 af (98% of inflow)
Center-of-Mass det. time= 34.9 min ( 856.3 - 821.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 168.50' | 2,110 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 168.50 | 276 | 0 | 0 |
| 170.00 | 1,013 | 967 | 967 |
| 171.00 | 1,273 | 1,143 | 2,110 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 170.00' | **13.5' long x 0.5' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00<br>Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #2 | Primary | 169.00' | **30.0 deg Sharp-Crested Vee/Trap Weir** C= 2.61 |

**Primary OutFlow** Max=3.67 cfs @ 12.10 hrs HW=170.17' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 2.64 cfs @ 1.15 fps)
└**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.03 cfs @ 2.82 fps)

## Pond WQS2: WQS 2

Inflow Area = 0.663 ac, Inflow Depth = 4.72" for 100YR-NOAA event
Inflow = 3.68 cfs @ 12.10 hrs, Volume= 0.261 af
Outflow = 3.64 cfs @ 12.11 hrs, Volume= 0.253 af, Atten= 1%, Lag= 0.8 min
Primary = 3.64 cfs @ 12.11 hrs, Volume= 0.253 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 169.65' @ 12.11 hrs Surf.Area= 1,290 sf Storage= 1,456 cf

Plug-Flow detention time= 68.2 min calculated for 0.253 af (97% of inflow)
Center-of-Mass det. time= 46.3 min ( 902.6 - 856.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 168.00' | 1,936 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 168.00 | 473 | 0 | 0 |
| 169.50 | 1,216 | 1,267 | 1,267 |
| 170.00 | 1,461 | 669 | 1,936 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 169.50' | **16.0' long x 0.5' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00<br>Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #2 | Primary | 168.50' | **30.0 deg Sharp-Crested Vee/Trap Weir** C= 2.61 |

**Primary OutFlow** Max=3.63 cfs @ 12.11 hrs HW=169.65' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 2.63 cfs @ 1.09 fps)
└—**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.99 cfs @ 2.80 fps)

## Link 1L: WETLANDS

Inflow Area = 13.671 ac, Inflow Depth = 3.97" for 100YR-NOAA event
Inflow = 33.52 cfs @ 12.35 hrs, Volume= 4.521 af
Primary = 33.52 cfs @ 12.35 hrs, Volume= 4.521 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

# APPENDIX E

# De Minimus Storm-water Discharge Calculation

Impervious Areas
To Deep Sump Hooded Catch Basins, Sediment Forebay and Pond 1 – 34,122 sq. ft.
To Sediment Forebay and Water Quality Swales – 8,143 sq. ft.

TSS Removal
To Ponds 1 - 85%
To Sediment Forebay and Water Quality Swales 78%

Pond 1 – 34,122 x .85 = 29,004
To Sediment Forebay and Water Quality Swales – 8,143 x .78 = 6,352

29,004 + 6,352 = 35,356

34,122 + 8,143 = 42,265

35,356
42,268 = 83.6% which is greater than 80%

Pre-treatment - To Road 1

V

INSTRUCTIONS:

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

*Version 1, Automated: Mar. 4, 2008*

Location: Donovan Estates

## TSS Removal Calculation Worksheet

| B<br>BMP[1] | C<br>TSS Removal Rate[1] | D<br>Starting TSS Load* | E<br>Amount Removed (C*D) | F<br>Remaining Load (D-E) |
|---|---|---|---|---|
| Sediment Forebay | 0.25 | 1.00 | 0.25 | 0.75 |
| | 0.00 | 0.75 | 0.00 | 0.75 |
| | 0.00 | 0.75 | 0.00 | 0.75 |
| | 0.00 | 0.75 | 0.00 | 0.75 |
| | 0.00 | 0.75 | 0.00 | 0.75 |

**Total TSS Removal =** 25%

**Separate Form Needs to be Completed for Each Outlet or BMP Train**

Project: UC1340
Prepared By: RRG
Date: Jan-26

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

*Version 1, Automated: Mar. 4, 2008*

Location: Donovan Estates

## TSS Removal Calculation Worksheet

| B<br>BMP[1] | C<br>TSS Removal Rate[1] | D<br>Starting TSS Load* | E<br>Amount Removed (C*D) | F<br>Remaining Load (D-E) |
|---|---|---|---|---|
| **Deep Sump and Hooded Catch Basin** | **0.25** | **1.00** | **0.25** | **0.75** |
| **Infiltration Basin** | **0.80** | **0.75** | **0.60** | **0.15** |
| | **0.00** | **0.15** | **0.00** | **0.15** |
| | **0.00** | **0.15** | **0.00** | **0.15** |
| | **0.00** | **0.15** | **0.00** | **0.15** |

**Total TSS Removal =** **85%**

**Separate Form Needs to be Completed for Each Outlet or BMP Train**

Project: UC1340
Prepared By: RRG
Date: Sep-25

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

*Version 1, Automated: Mar. 4, 2008*

Location: Donovan Estates

## TSS Removal Calculation Worksheet

| B<br>BMP[1] | C<br>TSS Removal Rate[1] | D<br>Starting TSS Load* | E<br>Amount Removed (C*D) | F<br>Remaining Load (D-E) |
|---|---|---|---|---|
| **Sediment Forebay** | **0.25** | **1.00** | **0.25** | **0.75** |
| **Water Quality Swale - Wet** | **0.70** | **0.75** | **0.53** | **0.23** |
| | **0.00** | **0.23** | **0.00** | **0.23** |
| | **0.00** | **0.23** | **0.00** | **0.23** |
| | **0.00** | **0.23** | **0.00** | **0.23** |

**Total TSS Removal =** **78%**

**Separate Form Needs to be Completed for Each Outlet or BMP Train**

Project: UC1340
Prepared By: RRG
Date: Sep-25

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

# APPENDIX F

# Guelph Permeameter Calculations

Input

Result

Support: sli@soilmoisture.com

## Head #1

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): 1
Enter water Head Height ("H" in cm): 5
Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.

Steady State Rate of Water Level Change ("R" in cm/min): 0.4000

$\alpha^* =$ 0.12 $cm^{-1}$

$C =$ 0.80318
$Q =$ 0.28178

$K_{fs} =$ 6.11E-04 cm/sec
3.67E-02 cm/min
6.12E-06 m/sec
1.21E-03 inch/min
2.02E-04 inch/sec

$\Phi_m =$ 4.27E-03 $cm^2/sec$

## Head #2

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): 1
Enter water Head Height ("H" in cm): 10
Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.

Steady State Rate of Water Level Change ("R" in cm/min): 0.8000

$\alpha^* =$ 0.12 $cm^{-1}$

$C =$ 1.36754
$Q =$ 0.63417

$K_{fs} =$ 6.79E-04 cm/sec
4.07E-02 cm/min
6.79E-06 m/sec
1.33E-03 inch/min
2.26E-04 inch/sec

$\Phi_m =$ 4.82E-03 $cm^2/sec$

## Average

$K_{fs} =$ 6.48E-04 cm/sec
3.87E-02 cm/min
6.48E-06 m/s
1.28E-02 inch/min
2.15E-04 inch/sec

$\Phi_m =$ 4.55E-03 $cm^2/sec$




## Two Head Method

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): 1

Enter the first water Head Height ("H1" in cm): 5
Enter the second water Head Height ("H2" in cm): 10

Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.

$\alpha^* =$ 0.12 $cm^{-1}$

Steady State Rate of Water Level Change ("R1" in cm/min): 0.4000

Steady State Rate of Water Level Change ("R2" in cm/min): 0.8000

1.95

$Q_1 =$ 0.61728

$Q_2 =$ 0.80279

$C_1 =$ 0.80313

$C_2 =$ 1.36754

$G_1 =$ 0.00490

$G_2 =$ 0.00397

$G_3 =$ 0.65569

$G_4 =$ 0.00455

$K_{fs} =$ 4.48E-04 cm/sec
2.67E-02 cm/min
4.45E-07 m/sec
1.65E-03 cm/sec
1.75E-05 inch/sec

$\Phi_m =$ 1.71E-04 $cm^2/sec$

Calculation formulas related to shape factor (C). Where $H_1$ is the first water head height (cm), $H_2$ is the second water head height (cm), $a$ is borehole radius (cm), and $\alpha^*$ is macroscopic capillary length factor which is divided according to the soil texture-structure category. For combined method, only $C_1$ needs to be calculated. Table for two head method, $C_1$ and $C_2$ are calculated (Zang et al., 1998).

| Soil Texture-Structure Category | $\alpha^*$(cm$^{-1}$) | Shape Factor |
|---|---|---|
| Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc. | 0.01 | $C_1 = \left(\frac{H_1/a}{2.182 + 0.818(H_1/a)}\right)^{0.632}$<br>$C_2 = \left(\frac{H_2/a}{2.182 + 0.818(H_2/a)}\right)^{0.632}$ |
| Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands. | 0.01 | $C_1 = \left(\frac{H_1/a}{1.992 + 0.091(H_1/a)}\right)^{0.882}$<br>$C_2 = \left(\frac{H_2/a}{1.992 + 0.091(H_2/a)}\right)^{0.882}$ |
| Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils. | 0.12 | $C_1 = \left(\frac{H_1/a}{2.074 + 0.093(H_1/a)}\right)^{0.724}$<br>$C_2 = \left(\frac{H_2/a}{2.074 + 0.093(H_2/a)}\right)^{0.724}$ |
| Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc. | 0.36 | $C_1 = \left(\frac{H_1/a}{2.074 + 0.093(H_1/a)}\right)^{0.724}$<br>$C_2 = \left(\frac{H_2/a}{2.074 + 0.093(H_2/a)}\right)^{0.724}$ |

Calculation formulas related to one-head and two-head methods. Where $R$ is steady-state rate of fall of water in reservoir (cm/s), $K_{fs}$ is field saturated hydraulic conductivity (cm/s), $\Phi_m$ is field matric flux potential (cm$^2$/s), $\alpha^*$ is macroscopic capillary length parameter (from Table 2), $a$ is Borehole radius (cm), $H_1$ is the first head of water established in borehole (cm), $H_2$ is the second head of water established in borehole (cm) and $G_1$ Shape factor (from Table 2).

| | | |
|---|---|---|
| One Head, Combined Reservoir | $Q_1 = \bar{R}_1 \times 35.22$ | $K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \alpha a^2 C_1 + 2\pi\left(\frac{H_1}{a}\right)}$<br>$\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \alpha a^2 C_1)\alpha^2 + 2\pi H_1}$ |
| One Head, Inner Reservoir | $Q_1 = \bar{R}_1 \times 2.16$ | |
| Two Head, Combined Reservoir | $Q_1 = \bar{R}_1 \times 35.22$<br>$Q_2 = \bar{R}_2 \times 35.22$ | $G_3 = \frac{H_1 G_4}{\pi(2H_1H_2(H_2 - H_1) + \alpha^2(H_2C_2 - H_1C_1))}$<br>$\bar{G}_1 = \frac{H_1 G_3}{\pi(2H_1H_2(H_2 - H_1) + \alpha^2(H_2C_1 - H_1C_2))}$<br>$K_{fs} = G_3 Q_2 - G_4 Q_1$<br>$\bar{G}_2 = \frac{(2H_1^2 + \alpha^2 C_1)G_4}{2\pi(2H_1H_2(H_2 - H_1) + \alpha^2(H_2C_2 - H_1C_1))}$ |
| Two Head, Inner Reservoir | $Q_1 = \bar{R}_1 \times 2.16$<br>$Q_2 = \bar{R}_2 \times 2.16$ | $G_5 = \frac{(2H_2^2 + \alpha^2 C_2)G_6}{2\pi(2H_1H_2(H_2 - H_1) + \alpha^2(H_2C_2 - H_1C_1))}$<br>$\Phi_m = G_3 Q_1 - G_4 Q_2$ |

PT # 2

## Guelph Permeameter Data Sheet

Investigator: CARLOS DIGITAL Date: 6/23/25

Location: 47 [illegible] ST Test Id: PT. # 2

Depth of hole: 30" Radius: 3 CM FRONT (standard calcs assume 3 cm radius)

Reservoirs used during test (check one): Combined: ✓ Inner only: _____

Reservoir constant used: 35,22

**Water level in well = 5 cm**

| Time *t* (min) | D*t* (min) | Water level in reservoir *h* (cm) | D*h* (cm) | Rate of change D*h*/ D*t* |
|---|---|---|---|---|
| 0 | | 18 | | |
| 3:40 | 3,67 | 20 | 2 | 0,55 |
| 13:37 | 9,88 | 25 | 5 | 0,51 |
| 25:00 | 11,38 | 30 | 5 | 0,44 |
| 36:09 | 11,15 | 35 | 5 | 0,45 |
| 47:09 | 11,0 | 40 | 5 | 0,46 |
| 59:26 | 12,28 | 46 | 6 | 0,49 |
| 1:08:10 | 8,57 | 50 | 4 | 0,47 |
| 10:09 | 10 02 | 55 | 5 | 0,50 |
| 14:51 | | 60 | 5 | |
| 29:36 | 14,65 | 65 | 5 | 0,34 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Steady rate for 3 consecutive readings ($R_1$): 0,48

**Water level in well = 10 cm**

| Time *t* (min) | D*t* (min) | Water level in reservoir *h* (cm) | D*h* (cm) | Rate of change D*h*/ D*t* |
|---|---|---|---|---|
| 0 | | 15 | | |
| 9;22 | 9,37 | 20 | 5 | 0,53 |
| 15;02 | 5,40 | 25 | 5 | 0,93 |
| 20;41 | 5,65 | 30 | 5 | 0,89 |
| 26;22 | 5,85 | 35 | 5 | 0,86 |
| 32;03 | 5,68 | 40 | 5 | 0,88 |
| 37;34 | 5 52 | 45 | 5 | 0,91 |
| 42;55 | 5,35 | 50 | 5 | 0,94 |
| 48;32 | 5,62 | 55 | 5 | 0,89 |
| 53;54 | 5,37 | 60 | 5 | 0,93 |
| 59;11 | 5,28 | 65 | 5 | 0,94 |
| 1 04;40 | 5,48 | 70 | 5 | 0,91 |
| 1 12;27 | 7,78 | 75 | 5 | 0,64 * |
| | | | | |
| | | | | |
| | | | | |

Steady rate for 3 consecutive readings ($R_2$): 0,91

Comments:

$K_{sat}$ = 0.0129 in/min = 0.77 in/hr

GP FIELD DATA SHEET

SECTION 1: SITE INFORMATION

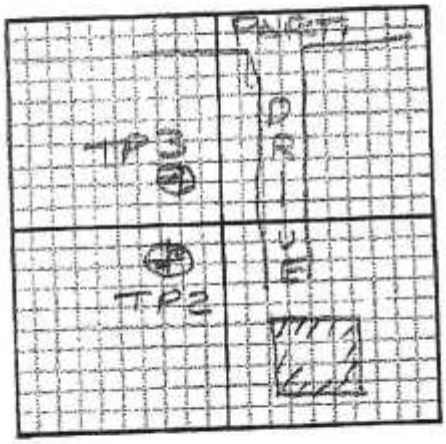
Date 6/23/25 Investigator CARLOS QUINTAL

Site Location 47 PARTRIDGE ST, FRANKLIN

Dominant Soil Type(s) CHARLTON HOLLIS FINE SANDY LOAM

Site Map:

TP#2




Soil Profile Description (horizon depth, texture, structure, color, etc.):

| Depth | | Description |
|---|---|---|
| | A | FSL |
| 12" | B | FSL |
| 30" | C | Gravelly SL |
| 102" | | |

Presence of special soil conditions (mottling, water table depth, hardpan, induration, compacted layers, etc.):

Water @ 60"

Mottles @ 52" (7.5 Y 6/4)

Comments and Notes (topography, slope, vegetation, etc.):



SOILMOISTURE EQUIPMENT CORP.
P.O. Box 30025, Santa Barbara, CA 93130 USA
Phone: 805-964-3525 - Fax: (805) 683-2189 - Email: sales@soilmoisture.com
Website: http://www.soilmoisture.com

SOILMOISTURE®

# Guelph Permeameter Calculations

Input

Result

Support: all@soilmoisture.com

## Head #1

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): 1

Enter water Head Height ("H" in cm): 5

Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.

Steady State Rate of Water Level Change ("R" in cm/min): 0.1000

$\alpha^* =$ 0.12 $(cm^{-1})$

$C =$ 0.80316

$G =$ 1.26631

$K_{fs} =$ 2.37E-03 cm/sec
1.39E-01 cm/min
2.37E-06 m/sec
9.37E-03 inch/min
8.85E-04 inch/sec

$\Phi_m =$ 1.96E-02 $(cm^2/sec)$

## Head #2

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): 1

Enter water Head Height ("H" in cm): 10

Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.

Steady State Rate of Water Level Change ("R" in cm/min): 0.1000

$\alpha^* =$ 0.12 $(cm^{-1})$

$C =$ 1.38764

$G =$ 1.77881

$K_{fs} =$ 1.93E-03 cm/sec
1.16E-01 cm/min
1.93E-06 m/sec
7.59E-02 inch/min
7.19E-04 inch/sec

$\Phi_m =$ 1.61E-02 $(cm^2/sec)$

## Average

$K_{fs} =$ 2.15E-03 cm/sec
1.28E-01 cm/min
2.15E-06 m/s
8.48E-02 inch/min
8.02E-04 inch/sec

$\Phi_m =$ 1.79E-02 $(cm^2/sec)$



## Two Head Method

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): 1

Enter the first water Head Height ("H1" in cm): 5

Enter the second water Head Height ("H2" in cm): 10

Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.

$\alpha^* =$ 0.12 $(cm^{-1})$

Steady State Rate of Water Level Change ("R1" in cm/min): 0.1000

Steady State Rate of Water Level Change ("R2" in cm/min): 0.0500

1.85

$Q_1 =$ 0.07778

$Q_2 =$ 0.10888

$C_1 =$ 0.80315

$C_2 =$ 1.26734

$G_1 =$ 0.06496

$G_2 =$ 0.08307

$G_3 =$ 0.03569

$G_4 =$ 0.02415

$K_{fs} =$ 4.79E-05 cm/sec
2.88E-03 cm/min
4.79E-07 m/sec
1.13E-03 inch/min
1.02E-05 inch/sec

$\Phi_m =$ 1.79E-02 $(cm^2/sec)$

PT #3

Calculation formulas utilized to obtain factors ($C_1$). Where $H_1$ is the first water head height (cm), $H_2$ is the second water head height (cm), $a$ = borehole radius (cm) and $\alpha^*$ is a macroscopic capillary length parameter (from Table 1), a value is calculated using the soil texture-structure category. For the second method, only $C_1$ needs to be calculated while for the two-head method, $C_1$ and $C_2$ are calculated. (Zhang et al. 1998).

| Soil Texture-Structure Category | $\alpha^*$ ($cm^{-1}$) | Shape Factor |
|---|---|---|
| Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc. | 0.01 | $C_1 = \left(\frac{H_1/a}{2.102 + 0.168(H_1/a)}\right)^{0.670}$<br>$C_2 = \left(\frac{H_2/a}{2.102 + 0.168(H_2/a)}\right)^{0.670}$ |
| Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands. | 0.04 | $C_1 = \left(\frac{H_1/a}{1.992 + 0.091(H_1/a)}\right)^{0.920}$<br>$C_2 = \left(\frac{H_2/a}{1.992 + 0.091(H_2/a)}\right)^{0.920}$ |
| Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils. | 0.12 | $C_1 = \left(\frac{H_1/a}{2.074 + 0.093(H_1/a)}\right)^{0.874}$<br>$C_2 = \left(\frac{H_2/a}{2.074 + 0.093(H_2/a)}\right)^{0.874}$ |
| Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc. | 0.36 | $C_1 = \left(\frac{H_1/a}{2.074 + 0.093(H_1/a)}\right)^{0.874}$<br>$C_2 = \left(\frac{H_2/a}{2.074 + 0.093(H_2/a)}\right)^{0.874}$ |

Calculation formulas utilized to obtain soil hydraulic conductivity ($K_{fs}$) and matric flux potential ($\Phi_m$). Where $R$ is steady-state rate of fall of water in reservoir (cm/s), $K_{fs}$ is field saturated hydraulic conductivity (cm/s), $\Phi_m$ is field matric flux potential ($cm^2/s$), $\alpha^*$ is a macroscopic capillary length parameter (from Table 1), $a$ is borehole radius (cm), $H_1$ is the first head of water maintained in borehole (cm), $H_2$ is the second head of water established in borehole (cm) and $C_1$ is Shape factor (from Table 2).

| | | |
|---|---|---|
| One Head, Combined Reservoir | $Q_1 = R_1 \times 35.22$ | $K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{\alpha^*}\right)}$<br>$\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)\alpha^* + 2\pi H_1}$ |
| One Head, Inner Reservoir | $Q_1 = R_1 \times 2.16$ | |
| Two Head, Combined Reservoir | $Q_1 = R_1 \times 35.22$<br>$Q_2 = R_2 \times 35.22$ | $G_1 = \frac{H_1 C_1}{2\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$<br>$G_2 = \frac{H_2 C_2}{\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$<br>$G_3 = G_1Q_2 - G_2Q_1$<br>$G_4 = \frac{(2H_1^2 + a^2C_1)G_1}{2\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$<br>$K_{fs} = G_3G_4$<br>$\Phi_m = G_2Q_1 - G_4Q_1$ |
| Two Head, Inner Reservoir | $Q_1 = R_1 \times 2.16$<br>$Q_2 = R_2 \times 2.16$ | |

## Guelph Permeameter Data Sheet

Investigator: CARLOS QUINTAL Date: 6/23/25

Location: 47 PARTRIDGE ST Test Id: PT #3

Depth of hole: 33" Radius: 3 CM (standard calcs assume 3 cm radius)

Reservoirs used during test (check one): Combined: ✓ Inner only: _____

Reservoir constant used: 35,22

**Water level in well = 5 cm**

| Time $t$ (min) | $Dt$ (min) | Water level in reservoir $h$ (cm) | $Dh$ (cm) | Rate of change $Dh/Dt$ |
|---|---|---|---|---|
| 0 | | 18 | | |
| 1:16 | 1.27 | 20 | 2 | 1,58 |
| 3:02 | 1.93 | 25 | 5 | 2,59 |
| 5:19 | 2.28 | 30 | 5 | 2,19 |
| 7:35 | 2.27 | 35 | 5 | 2,21 |
| 9:51 | 2.27 | 40 | 5 | 2,21 |
| 12:17 | 2,43 | 45 | 5 | 2,06 |
| 14:32 | 2.33 | 50 | 5 | 2,14 |
| 17:40 | 2.43 | 55 | 5 | 2,06 |
| 4:12 | 2.53 | 60 | 5 | 1,97 |
| 6:25 | 2.22 | 65 | 5 | 2.26 |
| 8:55 | 2.50 | 70 | 5 | 2,00 |
| 11:20 | 2,42 | 75 | 5 | 2,07 |
| | | | | |
| | | | | |
| | | | | |

Steady rate for 3 consecutive readings ($R_1$): 2,16

**Water level in well = 10 cm**

| Time $t$ (min) | $Dt$ (min) | Water level in reservoir $h$ (cm) | $Dh$ (cm) | Rate of change $Dh/Dt$ |
|---|---|---|---|---|
| 0 | | 18 | | |
| 0:24 | 0.40 | 20 | 2 | 5,00 |
| 2:01 | 1.62 | 25 | 5 | 3,09 |
| 3:38 | 1.62 | 30 | 5 | 3,09 |
| 5:17 | 1.65 | 35 | 5 | 3,03 |
| 6:59 | 1.70 | 40 | 5 | 2,94 |
| 8:45 | 1.77 | 45 | 5 | 2,83 |
| 10:23 | 1.63 | 50 | 5 | 3,06 |
| 11:55 | 1.37 | 55 | 5 | 3,66 |
| 13:35 | 1.67 | 60 | 5 | 3,00 |
| 15:19 | 1.73 | 65 | 5 | 2,89 |
| 16:58 | 1.65 | 70 | 5 | 3,03 |
| 18:49 | 1.85 | 75 | 5 | 2,70 |
| | | | | |
| | | | | |
| | | | | |

Steady rate for 3 consecutive readings ($R_2$): 3,03

Comments:

$K_{SAT}$ = 0,0496 in/min = 2.98 in/hr

GP FIELD DATA SHEET

SECTION 1: SITE INFORMATION

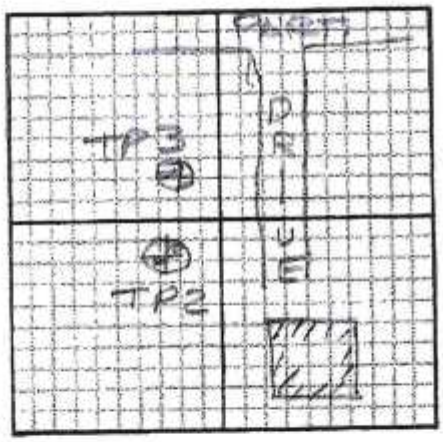
Date 6/23/25 Investigator CARLOS QUINTAL

Site Location 47 PARRIDGE ST, FRANKLIN

Dominant Soil Type(s) CHARLTON HOLLIS ROCK OUTCROP

Site Map:

TP#3




Soil Profile Description (horizon depth, texture, structure, color, etc.):

| Depth | | Description |
|---|---|---|
| 6" | A | FSL |
| 24" | B | FSL |
| 108" | | GRAVELLY SL |

Presence of special soil conditions (mottling, water table depth, hardpan, induration, compacted layers, etc.):

Mottles @ 52"

Water @ 60"

Comments and Notes (topography, slope, vegetation, etc.):



SOILMOISTURE EQUIPMENT CORP.
P.O. Box 30025, Santa Barbara, CA 93130 USA
Phone: 805-964-3525 - Fax: (805) 683-2189 - Email: sales@soilmoisture.com
Website: http://www.soilmoisture.com

SOILMOISTURE

# Guelph Permeameter Calculations

Input

Result

Support: ok@soilmoisture.com

## Head #1

Reservoir Type(enter "1" for Combined and "2" for Inner reservoir): 1

Enter water Head Height ("H" in cm): 5

Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below number): 2

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable to agricultural soils.
4. Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc

Steady State Rate of Water Level Change ("R" in cm/min): 1.5010

$\phi' =$ 0.12 $cm^{-1}$

$C =$ 0.80316

$Q =$ 0.7831

$K_{fs} =$ 1.39E-03 cm/sec
8.33E-02 cm/min
1.39E-06 m/sec
3.28E-02 inch/min
4.60E-04 inch/sec

$\Phi_m =$ 1.16E-02 $cm^2/sec$

## Head #2

Reservoir Type (enter "1" for Combined and "2" for inner reservoir): 1

Enter water Head Height ("H" in cm): 10

Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 2

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable to agricultural soils.
4. Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc

Steady State Rate of Water Level Change ("R" in cm/min): 2.2900

$\phi' =$ 0.12 $cm^{-1}$

$C =$ 1.28754

$Q =$ 1.14423

$K_{fs} =$ 1.40E-03 cm/sec
8.74E-02 cm/min
1.46E-06 m/sec
3.44E-02 inch/min
4.73E-04 inch/sec

$\Phi_m =$ 1.21E-02 $cm^2/sec$

## Average

$K_{fs} =$ 1.40E-03 cm/sec
8.53E-02 cm/min
1.42E-06 m/s
3.36E-02 inch/min
4.66E-04 inch/sec

$\Phi_m =$ 1.19E-02 $cm^2/sec$




## Two Head Method

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): 1

Enter the first water Head Height ("H1" in cm): 5

Enter the second water Head Height ("H2" in cm): 10

Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 2

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc

$\phi' =$ 0.12 $cm^{-1}$

Steady State Rate of Water Level Change ("R1" in cm/min): 1.5010

Steady State Rate of Water Level Change ("R2" in cm/min): 2.2900

1.95

$Q_1 =$ 0.0468

$Q_2 =$ 0.68244

$C_1 =$ 0.80316

$C_1 =$ 1.28754

$G_1 =$ 0.00496

$G_2 =$ 0.00397

$G_3 =$ 0.03589

$G_4 =$ 0.02415

$K_{fs} =$ 9.66E-08 cm/sec
5.73E-03 cm/min
9.55E-07 m/sec
2.26E-03 inch/min
3.19E-05 inch/sec

$\Phi_m =$ 8.18E-04 $cm^2/sec$

Calculation formula related to shape factor (C). Where $H_1$ is the first water head height (cm), $H_2$ is the second water head height (cm), $a$ is borehole radius (cm) and $\phi'$ is macroscopic capillary length factor which is detailed according to the soil texture-structure category. For one head method, only C can to be calculated while for two head method, $C_1$ and $C_2$ are calculated (Zhang et al., 1998).

| Soil Texture-Structure Category | $\phi'$(cm$^{-1}$) | Shape Factor |
|---|---|---|
| Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc. | 0.01 | $C_1 = \left(\frac{H_1/a}{2.102 + 0.11\left(H_1/a\right)}\right)^{0.632}$ <br> $C_2 = \left(\frac{H_2/a}{2.102 + 0.11\left(H_2/a\right)}\right)^{0.632}$ |
| Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands. | 0.04 | $C_1 = \left(\frac{H_1/a}{1.992 + 0.091\left(H_1/a\right)}\right)^{0.895}$ <br> $C_2 = \left(\frac{H_2/a}{1.992 + 0.091\left(H_2/a\right)}\right)^{0.895}$ |
| Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils. | 0.12 | $C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.757}$ <br> $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.757}$ |
| Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc. | 0.24 | $C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.757}$ <br> $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.757}$ |

Calculation formulas related to one-head and two-head methods. Where P is steady-state rate of fall of water in reservoir (cm/s), $K_{fs}$ is Soil saturated hydraulic conductivity (cm/s), $\Phi_m$ is Soil matric flux potential ($cm^2/s$), $\phi'$ is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), $H_1$ is the first head of water established in borehole (cm) , $H_2$ is the second head of water established in borehole (cm) and C is shape factor (from Table 3).

| | | |
|---|---|---|
| One Head, Combined Reservoir | $Q_1 = \bar{R}_1 \times 35.22$ | $K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{\phi'}\right)}$ <br> $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)\phi' + 2\pi H_1}$ |
| One Head, Inner Reservoir | $Q_1 = \bar{R}_1 \times 2.16$ | |
| Two Head, Combined Reservoir | $Q_1 = \bar{R}_1 \times 35.22$ <br> $Q_2 = \bar{R}_2 \times 35.22$ | $G_1 = \frac{H_2 C_1}{a(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ <br> $G_2 = \frac{H_1 C_2}{a(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ <br> $K_{fs} = G_2Q_2 - G_1Q_1$ <br> $G_3 = \frac{(2H_1^2 + a^2C_1)C_1}{2a(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ <br> $G_4 = \frac{(2H_2^2 + a^2C_2)C_2}{2a(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ <br> $\Phi_m = G_2Q_2 - G_1Q_1$ |
| Two Head, Inner Reservoir | $Q_1 = \bar{R}_1 \times 2.16$ <br> $Q_2 = \bar{R}_2 \times 2.16$ | |

P7 - 6

## Guelph Permeameter Data Sheet

Investigator: ADRIAN QUINTAL Date: 12/18/25

Location: 47 PINERIDGE ST, PA Test Id: PT-6

Depth of hole: 29" Radius: 3 CM (standard calcs assume 3 cm radius)

Reservoirs used during test (check one): Combined: ✓ Inner only: _____

Reservoir constant used: 35,22

PT-6

| Water level in well = 5 cm | | | | |
|---|---|---|---|---|
| Time $t$ (min) | D$t$ (min) | Water level in reservoir $h$ (cm) | D$h$ (cm) | Rate of change D$h$/ D$t$ |
| 0 | | 17 | | |
| 2:17 | 2,28 | 20 | 3 | 1,31 |
| 6:07 | 3,83 | 25 | 5 | 1,30 |
| 10:05 | 3,97 | 30 | 5 | 1,26 |
| 14:01 | 3,93 | 35 | 5 | 1,27 |
| 17:55 | 3,93 | 40 | 5 | 1,27 |
| 21:50 | 3,92 | 45 | 5 | 1,28 |
| 25:30 | 3,67 | 50 | 5 | 1,36 |
| 29:20 | 3,83 | 55 | 5 | 1,30 |
| 33:10 | 3,67 | 60 | 5 | 1,36 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Steady rate for 3 consecutive readings ($R_1$): | | | | 1,30 |

| Water level in well = 10 cm | | | | |
|---|---|---|---|---|
| Time $t$ (min) | D$t$ (min) | Water level in reservoir $h$ (cm) | D$h$ (cm) | Rate of change D$h$/ D$t$ |
| 0 | | 15 | | |
| 2:14 | 2,23 | 20 | 5 | 2,24 |
| 4:34 | 2,33 | 25 | 5 | 2,14 |
| 6:38 | 2,07 | 30 | 5 | 2,42 |
| 8:42 | 2,07 | 35 | 5 | 2,42 |
| 10:50 | 2,13 | 40 | 5 | 2,34 |
| 12:58 | 2,13 | 45 | 5 | 2,34 |
| 15:05 | 2,12 | 50 | 5 | 2,36 |
| 17:30 | 2,27 | 55 | 5 | 2,20 |
| 19:50 | 2,33 | 60 | 5 | 2,14 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Steady rate for 3 consecutive readings ($R_2$): | | | | 2,29 |

Comments:

$K_{SAT} = 0,0336 \text{ in/min} = 2,02 \text{ in/hr}$

# Guelph Permeameter Calculations

Input

Result

Support: sk@soilmoisture.com

## Head #1

Reservoir Type(enter "1" for Combined and "2" for Inner reservoir): 1
Enter water Head Height ("H" in cm): 5
Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 3

1. Compacted, Structure-less, clayey or silty materials such as landfill cap and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.8400

$\phi_m$ = 0.12 $cm^2$

C = 0.80315
Q = 0.49306

$K_{fs}$ = 9.97E-04 cm/sec
5.98E-02 cm/min
8.97E-06 m/sec
2.12E-02 inch/min
3.53E-04 inch/sec

$\Phi_m$ = 7.47E-03 $(cm^2/sec)$

## Head #2

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): 1
Enter water Head Height ("H" in cm): 10
Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc

Steady State Rate of Water Level Change ("R" in cm/min): 1.6700

$\phi_m$ = 0.12 $cm^2$

C = 1.38784
Q = 0.82189

$K_{fs}$ = 9.99E-04 cm/sec
5.99E-02 cm/min
8.99E-06 m/sec
2.36E-02 inch/min
3.93E-04 inch/sec

$\Phi_m$ = 8.32E-03 $(cm^2/sec)$

## Average

$K_{fs}$ = 9.98E-04 cm/sec
5.99E-02 cm/min
8.98E-06 m/s
2.24E-02 inch/min
3.73E-04 inch/sec

$\Phi_m$ = 7.90E-03 $(cm^2/sec)$




## Two Head Method

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): 1

Enter the first water Head Height ("H1" in cm): 5
Enter the second water Head Height ("H2" in cm): 10

Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc

$\phi_m$ = 0.12 $cm^2$

Steady State Rate of Water Level Change ("R1" in cm/min): 0.8400

Steady State Rate of Water Level Change ("R2" in cm/min): 1.6700

1.98

$Q_1$ = 0.03324

$Q_2$ = 0.05552

$C_1$ = 0.80315

$C_2$ = 1.38754

$G_1$ = 0.00488

$G_2$ = 0.00397

$G_3$ = 0.03589

$G_4$ = 0.02415

$K_{fs}$ = 7.47E-06 cm/sec
4.48E-03 cm/min
7.47E-07 m/sec
1.76E-03 inch/min
2.94E-05 inch/sec

$\phi_m$ = 3.19E-04 $(cm^2/sec)$

Calculation formula related to shape factor (C). Where $H_1$ is the first water head height (cm), $H_2$ is the second water head height (cm), a is borehole radius (cm), and $\alpha^*$ is macroscopic capillary length factor which is needed according to the soil texture-structure category. For one head method, only Cowan can be calculated while for two head method, $C_1$ and $C_2$ are calculated (Zhang et al., 1998).

| Soil Texture-Structure Category | $\alpha^*$(cm$^{-1}$) | Shape Factor |
|---|---|---|
| Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc. | 0.01 | $C_1 = \left(\frac{H_1/a}{2.102 + 0.11\pi\left(H_1/a\right)}\right)^{0.5}$<br>$C_2 = \left(\frac{H_2/a}{2.102 + 0.11\pi\left(H_2/a\right)}\right)^{0.5}$ |
| Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands. | 0.04 | $C_1 = \left(\frac{H_1/a}{1.992 + 0.09\pi\left(H_1/a\right)}\right)^{0.5}$<br>$C_2 = \left(\frac{H_2/a}{1.992 + 0.09\pi\left(H_2/a\right)}\right)^{0.5}$ |
| Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils. | 0.12 | $C_1 = \left(\frac{H_1/a}{2.074 + 0.093\pi\left(H_1/a\right)}\right)^{0.5}$<br>$C_2 = \left(\frac{H_2/a}{2.074 + 0.093\pi\left(H_2/a\right)}\right)^{0.5}$ |
| Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc. | 0.36 | $C_1 = \left(\frac{H_1/a}{2.074 + 0.093\pi\left(H_1/a\right)}\right)^{0.5}$<br>$C_2 = \left(\frac{H_2/a}{2.074 + 0.093\pi\left(H_2/a\right)}\right)^{0.5}$ |

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/h), $K_{fs}$ is Soil saturated hydraulic conductivity (cm/h), $\Phi_m$ is Soil matric flux potential (cm$^2$/h), $\alpha^*$ is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), $H_1$ is the first head of water established in borehole (cm) , $H_2$ is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

| | | |
|---|---|---|
| One Head, Combined Reservoir | $Q_1 = \bar{R}_1 \times 35.22$ | $K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{C_1}\right)}$<br>$\Phi_m = \frac{C_1 \times Q_1}{\left(2\pi H_1^2 + \pi a^2 C_1\right)\alpha^* + 2\pi H_1}$ |
| One Head, Inner Reservoir | $Q_1 = \bar{R}_1 \times 3.14$ | |
| Two Head, Combined Reservoir | $Q_1 = \bar{R}_1 \times 35.22$<br>$Q_2 = \bar{R}_2 \times 35.22$ | $G_1 = \frac{H_2 Q_1}{\pi\left(2H_1 H_2(H_2 - H_1) + a^2(H_2 C_2 - H_2 C_1)\right)}$<br>$G_2 = \frac{H_1 C_2}{\pi\left(2H_1 H_2(H_2 - H_1) + a^2(H_1 C_2 - H_2 C_1)\right)}$<br>$K_{fs} = G_1 Q_2 - G_2 Q_1$<br>$G_3 = \frac{(2H_2^2 + a^2 C_2)C_1}{2\pi\left(2H_1 H_2(H_2 - H_1) + a^2(H_1 C_2 - H_2 C_1)\right)}$<br>$G_4 = \frac{(2H_1^2 + a^2 C_1)C_2}{2\pi\left(2H_1 H_2(H_2 - H_1) + a^2(H_1 C_2 - H_2 C_1)\right)}$<br>$\phi_m = G_3 Q_2 - G_4 Q_1$ |
| Two Head, Inner Reservoir | $Q_1 = \bar{R}_1 \times 3.14$<br>$Q_2 = \bar{R}_2 \times 3.14$ | |

PT-5

## Guelph Permeameter Data Sheet

Investigator: CARLOS QUINTAL Date: 12/18/25

Location: 47 CARTRIDGE ST FR Test Id: PT 5

Depth of hole: 30" Radius: 3 CM (standard calcs assume 3 cm radius)

Reservoirs used during test (check one): Combined: ✓ Inner only: _____

Reservoir constant used: 35,22

PT 5

| Water level in well = 5 cm | | | | |
|---|---|---|---|---|
| Time $t$ (min) | D$t$ (min) | Water level in reservoir $h$ (cm) | D$h$ (cm) | Rate of change D$h$/ D$t$ |
| 0 | | 17 | | |
| 3:25 | 3.42 | 20 | 3 | 0,88 |
| 9:53 | 6,47 | 25 | 5 | 0,77 |
| 16:15 | 6,37 | 30 | 5 | 0,78 |
| 22:10 | 5,92 | 35 | 5 | 0,85 |
| 28:18 | 6,13 | 40 | 5 | 0,82 |
| 34:31 | 6,22 | 45 | 5 | 0,80 |
| 40:20 | 5,82 | 50 | 5 | 0,86 |
| 46:17 | 5,95 | 55 | 5 | 0,84 |
| 51:58 | 5,68 | 60 | 5 | 0,88 |
| 58:00 | 6 03 | 65 | 5 | 0,83 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Steady rate for 3 consecutive readings ($R_1$): | | | | 0,84 |

| Water level in well = 10 cm | | | | |
|---|---|---|---|---|
| Time $t$ (min) | D$t$ (min) | Water level in reservoir $h$ (cm) | D$h$ (cm) | Rate of change D$h$/ D$t$ |
| 0 | | 14 | | |
| 4:14 | 4.23 | 21 | 7 | 1,65 |
| 6:52 | 2,63 | 25 | 4 | 1,52 |
| 10:06 | 3,23 | 30 | 5 | 1,55 |
| 13:12 | 3,10 | 35 | 5 | 1,61 |
| 16:26 | 3,23 | 40 | 5 | 1,55 |
| 19:39 | 3,22 | 45 | 5 | 1,55 |
| 22:55 | 3,27 | 50 | 5 | 1,53 |
| 26:07 | 3,20 | 55 | 5 | 1,56 |
| 29:13 | 3,10 | 60 | 5 | 1,61 |
| 32:18 | 3,08 | 65 | 5 | 1,62 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Steady rate for 3 consecutive readings ($R_2$): | | | | 1,57 |

Comments:

$K_{SAT}$ = 0,0224 in/min = 1,34 in/hr

GP FIELD DATA SHEET

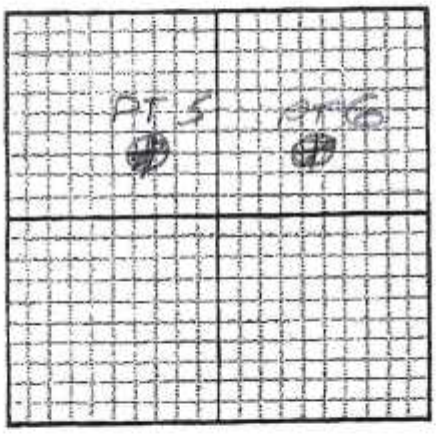
SECTION 1: SITE INFORMATION

Date 12/18/25 Investigator CARLOS A RUIZ VITAL

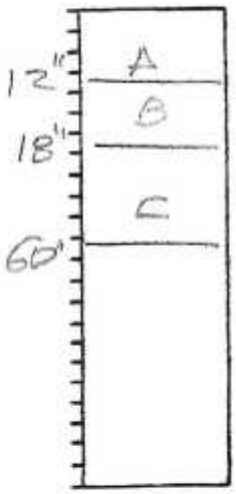
Site Location 47 ARTRIDGE ST - FRANKLIN

Dominant Soil Type(s) WOODBRIDGE FINE SANDY LOAM

Site Map:




Soil Profile Description (horizon depth, texture, structure, color, etc.):




Presence of special soil conditions (mottling, water table depth, hardpan, induration, compacted layers, etc.):

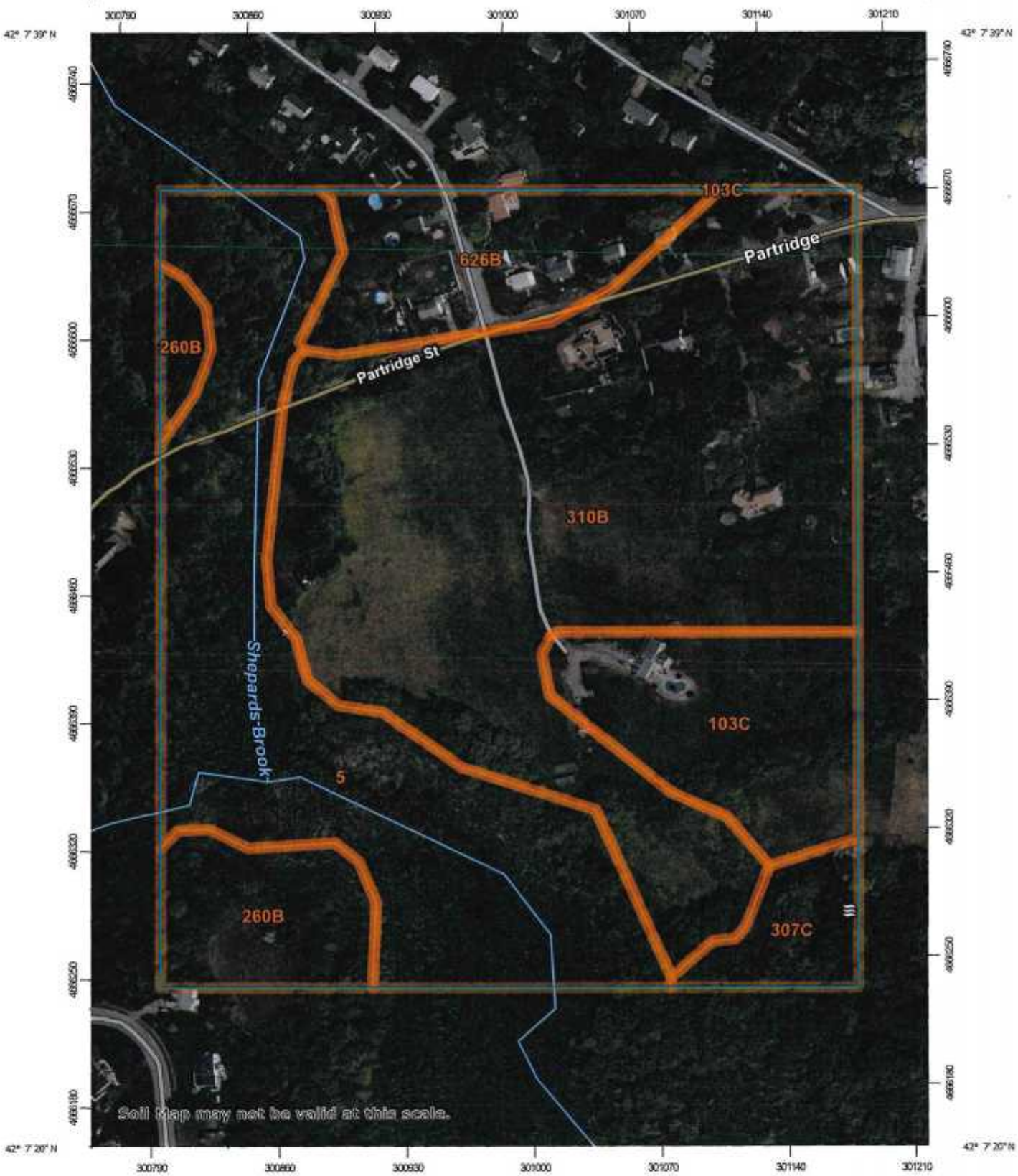
Comments and Notes (topography, slope, vegetation, etc.):



SOILMOISTURE EQUIPMENT CORP.
P.O. Box 30025, Santa Barbara, CA 93130 USA
Phone: 805-964-3525 - Fax: (805) 683-2189 - Email: sales@soilmoisture.com
Website: http://www.soilmoisture.com

SOILMOISTURE

Soil Map—Norfolk and Suffolk Counties, Massachusetts
(47 Partridge Street Franklin)




Map Scale: 1:2,970 if printed on A portrait (8.5" x 11") sheet.

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

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

## MAP LEGEND

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

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

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

**Water Features**
- Streams and Canals

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

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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

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

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

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

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

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

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 20, Aug 27, 2024

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 5 | Saco silt loam, frequently ponded, 0 to 1 percent slopes, frequently flooded | 11.1 | 26.8% |
| 103C | Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes | 3.9 | 9.4% |
| 260B | Sudbury fine sandy loam, 2 to 8 percent slopes | 2.7 | 6.5% |
| 307C | Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony | 1.3 | 3.1% |
| 310B | Woodbridge fine sandy loam, 3 to 8 percent slopes | 19.0 | 45.9% |
| 626B | Merrimac-Urban land complex, 0 to 8 percent slopes | 3.4 | 8.3% |
| **Totals for Area of Interest** | | **41.5** | **100.0%** |

# Norfolk and Suffolk Counties, Massachusetts

## 310B—Woodbridge fine sandy loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 2t2ql
*Elevation:* 0 to 1,470 feet
*Mean annual precipitation:* 36 to 71 inches
*Mean annual air temperature:* 39 to 55 degrees F
*Frost-free period:* 140 to 240 days
*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Woodbridge, fine sandy loam, and similar soils:* 82 percent
*Minor components:* 18 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Woodbridge, Fine Sandy Loam

#### Setting

*Landform:* Ground moraines, drumlins, hills
*Landform position (two-dimensional):* Summit, backslope, footslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

#### Typical profile

*Ap - 0 to 7 inches:* fine sandy loam
*Bw1 - 7 to 18 inches:* fine sandy loam
*Bw2 - 18 to 30 inches:* fine sandy loam
*Cd - 30 to 65 inches:* gravelly fine sandy loam

#### Properties and qualities

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* 20 to 39 inches to densic material
*Drainage class:* Moderately well drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)
*Depth to water table:* About 18 to 30 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 3.6 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2w
*Hydrologic Soil Group:* C/D

*Ecological site:* F144AY037MA - Moist Dense Till Uplands
*Hydric soil rating:* No

**Minor Components**

**Paxton**

*Percent of map unit:* 10 percent
*Landform:* Drumlins, ground moraines, hills
*Landform position (two-dimensional):* Summit, shoulder, backslope
*Landform position (three-dimensional):* Nose slope, side slope, crest
*Down-slope shape:* Convex, linear
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Ridgebury**

*Percent of map unit:* 8 percent
*Landform:* Depressions, ground moraines, hills, drainageways
*Landform position (two-dimensional):* Toeslope, backslope, footslope
*Landform position (three-dimensional):* Base slope, head slope, dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

## Data Source Information

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 20, Aug 27, 2024

# Norfolk and Suffolk Counties, Massachusetts

## 103C—Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes

### Map Unit Setting

*National map unit symbol:* 2wzp1
*Elevation:* 0 to 1,390 feet
*Mean annual precipitation:* 36 to 71 inches
*Mean annual air temperature:* 39 to 55 degrees F
*Frost-free period:* 140 to 240 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Charlton, extremely stony, and similar soils:* 50 percent
*Hollis, extremely stony, and similar soils:* 20 percent
*Rock outcrop:* 10 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Charlton, Extremely Stony

#### Setting

*Landform:* Ridges, hills
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex, linear
*Across-slope shape:* Convex
*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

#### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material
*A - 2 to 4 inches:* fine sandy loam
*Bw - 4 to 27 inches:* gravelly fine sandy loam
*C - 27 to 65 inches:* gravelly fine sandy loam

#### Properties and qualities

*Slope:* 8 to 15 percent
*Surface area covered with cobbles, stones or boulders:* 9.0 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 14.17 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 8.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7s
*Hydrologic Soil Group:* B
*Ecological site:* F144AY034CT - Well Drained Till Uplands
*Hydric soil rating:* No

**Description of Hollis, Extremely Stony**

**Setting**

*Landform:* Ridges, hills
*Landform position (two-dimensional):* Summit, shoulder, backslope
*Landform position (three-dimensional):* Nose slope, side slope, crest
*Down-slope shape:* Convex
*Across-slope shape:* Linear, convex
*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

**Typical profile**

*Oi - 0 to 2 inches:* slightly decomposed plant material
*A - 2 to 7 inches:* gravelly fine sandy loam
*Bw - 7 to 16 inches:* gravelly fine sandy loam
*2R - 16 to 26 inches:* bedrock

**Properties and qualities**

*Slope:* 8 to 15 percent
*Surface area covered with cobbles, stones or boulders:* 9.0 percent
*Depth to restrictive feature:* 8 to 23 inches to lithic bedrock
*Drainage class:* Somewhat excessively drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water supply, 0 to 60 inches:* Very low (about 2.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7s
*Hydrologic Soil Group:* D
*Ecological site:* F144AY033MA - Shallow Dry Till Uplands
*Hydric soil rating:* No

**Description of Rock Outcrop**

**Setting**

*Landform:* Ridges, hills
*Parent material:* Igneous and metamorphic rock

**Typical profile**

*R - 0 to 79 inches:* bedrock

**Properties and qualities**

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* 0 inches to lithic bedrock
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Available water supply, 0 to 60 inches:* Very low (about 0.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 8
*Hydrologic Soil Group:* D
*Hydric soil rating:* No

## Minor Components

**Woodbridge, extremely stony**

*Percent of map unit:* 8 percent
*Landform:* Ground moraines, hills, drumlins
*Landform position (two-dimensional):* Backslope, footslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Canton, extremely stony**

*Percent of map unit:* 5 percent
*Landform:* Moraines, hills, ridges
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex, linear
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Chatfield, extremely stony**

*Percent of map unit:* 5 percent
*Landform:* Ridges, hills
*Landform position (two-dimensional):* Summit, shoulder, backslope
*Landform position (three-dimensional):* Nose slope, side slope, crest
*Down-slope shape:* Convex
*Across-slope shape:* Linear, convex
*Hydric soil rating:* No

**Ridgebury, extremely stony**

*Percent of map unit:* 2 percent
*Landform:* Hills, drainageways, drumlins, depressions, ground moraines
*Landform position (two-dimensional):* Footslope, toeslope
*Landform position (three-dimensional):* Head slope, base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave

*Hydric soil rating:* Yes

## Data Source Information

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 20, Aug 27, 2024

# APPENDIX G

# CHECKLIST FOR DESIGNERS

**GOALS and NEEDS Addressed:**

1. Create a visually appealing community
2. Stabilize and increase property values
3. Encourage low impact development
4. Preserve the Town's historic and cultural heritage
5. Protect Franklin's natural environment, including habitat, water resources, and ecosystem services

**FRANKLIN POLICY:**
Subdivision plans and site plans for all forms of development shall adhere to the principles of environmental and aesthetic compatibility and energy-efficient design.

| **BEST DEVELOPMENT PRACTICES**<br>The site plan should be designed to address the following to the maximum extent practicable | Incorporated into Project? |
|---|---|
| **Unique natural features have been preserved** *(the development program should either avoid altering or showcase significant natural features)* | N/A |
| **Native vegetation planted in disturbed areas as needed to enhance or restore habitat** | ✓ |
| **Historic and cultural resources have been preserved** (*the development program should either avoid altering or showcase significant historic and cultural features)* | N/A |
| **Clearing, grading, and building placement consider view sheds** | ✓ |
| **Cut and fill have been minimized** | ✓ |
| **Buildings blend into the natural topography** | ✓ |
| **Buildings are oriented to the sun and wind for maximum energy efficiency**<br>*Vegetated protection from northwest (winter) winds is provided*<br>*Deciduous species planted or retained close to the East, South and West building edges* | ✓ |
| **Conforms to §185-31 of the Town of Franklin Zoning Code and/or Chapter 300 of the Town of Franklin Subdivision Regulations** | ✓<br>With waiver requests |

### GOALS and NEEDS addressed:

1. Protect local and regional wetlands and water bodies;
2. Maximize groundwater recharge to retain a viable local groundwater supply; and
3. Minimize pollutants in stormwater runoff.

**FRANKLIN POLICY:** In addition to MassDEP's Stormwater Management Standards, all new development projects in Franklin must meet the following performance measures. All redevelopment projects shall meet the standards and if they fail to meet the standards, shall retrofit or expand existing stormwater management systems to improve existing conditions.

1. Post-development peak discharge rates and volumes from the site shall not exceed pre-development peak discharge rates and volumes from the site.
2. All drainage facilities proposed shall utilize best management practices as outlined in the Massachusetts Stormwater Management Standards.
3. All sites will have an Operation and Maintenance plan to insure future compliance.

Additionally, new development projects must:

1. Retain the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area on the site AND/OR
2. Remove 90% of the average annual load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site AND 60% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site.

And redevelopment projects must:

1. Retain the volume of runoff equivalent to, or greater than, 0.80 inch multiplied by the total post-construction impervious surface area on the site AND/OR
2. Remove 80% of the average annual post-construction load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site AND 50% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site.

| **BEST DEVELOPMENT PRACTICES**<br>The site plan should be designed to address the following to the maximum extent practicable | Incorporated into Project? |
|---|---|
| **Vegetated swales** *(recommended to convey runoff from roadways & parking lots)* | ✓ |
| **Vegetated filter strips** *(recommended to filter and infiltrate runoff from roadways, parking lots, and driveways; use along roadsides and parking lots)* | |
| **Constructed wetlands**<br>*(preferred method for stormwater retention & pollutant removal)* | |
| **Bioretention cells** *(rain gardens) (recommended on residential lots and parking lot islands)* | |
| **Pervious paving surfaces**<br>*(recommended in overflow parking and low-traffic areas)* | |
| **Sediment Forebays** *(use in combination with other BDP)* | ✓ |
| **Roof gardens** *(encouraged on flat or gently sloped commercial and industrial rooftops)* | |
| **Retention/Detention basins**<br>*(may be used in series with other practices to provide pre-treatment)* | ✓ |
| **Recharge Systems** *(suitable for all areas of development)* | ✓ |
| **Drain pipe/catch basin systems** *(as required to collect runoff when other systems are not practical)* | ✓ |
| **If utilizing drain pipe and/or catch basin systems, have you documented that other systems are infeasible?** | ✓ prel. many subdivision |

## Erosion & Sedimentation Control

*Checklist for Designers*

**GOALS and NEEDS addressed:**

1. Minimize clearing and regrading
2. Prevent erosion and sedimentation

FRANKLIN POLICIES:

a) Any proposed project on a previously undeveloped site shall accommodate the development program in a way that minimizes clearing and re-grading, especially in areas of steep slopes, erosion-prone soils, or sensitive vegetation. For redevelopment projects, the site plan shall concentrate development in previously-disturbed areas to the extent possible.

b) As a condition of approval, every proposed project shall submit and adhere to an erosion control plan that addresses soil stabilization, sediment retention, perimeter protection, construction scheduling, and traffic area stabilization and dust control.

c) If the proposed project is in an area under conservation jurisdiction, the project will require permitting deemed appropriate by the Conservation Commission.

| BEST DEVELOPMENT PRACTICES<br>The site plan should be designed to address the following to the maximum extent practicable. | Incorporated into Project? |
|---|---|
| Clearing and re-grading have been minimized | ✓ |
| Plan identifies sensitive areas to be protected and areas that are suitable for development | ✓ |
| Conservation Permits have been obtained<br>*(when applicable)* | Applying For |
| The erosion and sedimentation control plan addresses:<br>• Soil stabilization<br>  ○ *(cover or stabilize erodible surfaces not in immediate use)*<br>• Sediment retention<br>  ○ *(runoff interceptors and sediment traps/ponds)*<br>• Perimeter protection<br>  ○ *(vegetated buffers, compost socks or straw wattles at limit of work)*<br>• Construction scheduling<br>  ○ *(minimize disturbed area at any given time)*<br>• Traffic area stabilization<br>  ○ *(crushed rock or similar at construction vehicle entrance and parking areas)*<br>• Dust control<br>  ○ *(plan for stabilizing dry, dust-prone surfaces when necessary)*<br>• Vegetation<br>  ○ *(preserve existing vegetation and/or identify areas to be revegetated including proposed planting species, quantity and planting specifications)* | ✓ |

**GOALS and NEEDS addressed:**

1. Stabilize water use at a sustainable level;
2. Create landscapes that minimize habitat destruction and maximize habitat value;
3. Encourage the development of landscapes that provide environmental quality and visual relief through the planting of native or naturalized species

FRANKLIN POLICIES:

a) Site plans and landscape plans for all proposed projects shall take appropriate steps, as outlined in the Guidebook, to minimize water use for irrigation and to allow for natural recharge of groundwater. Landscape plans shall follow the guidelines in the Guidebook for selecting species that are most appropriate to the site conditions.

b) Native and habitat-creating species shall be used in all landscape plans to the maximum extent possible while still meeting the site's landscaping needs. Invasive species may not be planted in Franklin under any condition. Refer to the Massachusetts Prohibited Plant list for more information.

c) Actively promote the Town of Franklin's Water Conservation Measures.

| **BEST DEVELOPMENT PRACTICES** The site plan must address all of the following principles. | Incorporated into Project? |
|---|---|
| **Retain and Recharge water on site** *(install bio-retention cells, vegetated filter strips and minimize lawn areas where feasible)* | ✓ |
| **Preserve natural vegetation to the maximum extent practicable** | ✓ |
| **Irrigation system is water efficient** *(if an in-ground irrigation system is proposed, it is a water efficient system with timers and automatic sensors to prevent overwatering)* | |
| **Preserve soil permeability** *(minimize disturbing existing landscapes. Prepare new planting beds in accordance to the Planting Bed Guidelines on p. 13, and install 1-2" of shredded pine bark mulch on new planting areas)* | ✓ |
| **Minimize the use of turf grass** *(when applicable, reduce the size of the lawn area; instead, plant a bio-retention cell, use alternative, drought tolerant groundcover)* | ✓ |
| **Specify variety of native and naturalized species** *(species from the plant list have been incorporated into the landscape design, and no invasive species are used. Refer to the Plant Species Section and the Massachusetts Prohibited Plant List)* | ✓ |
| **Species are appropriate to the soil, site, and microclimate conditions** *(select appropriate species from the plant list in this guidebook)* | ✓ |

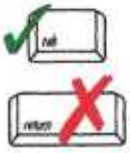
# APPENDIX H

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands Program

# Checklist for Stormwater Report

## A. Introduction

**Important:** When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

---

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands Program

# Checklist for Stormwater Report

## B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

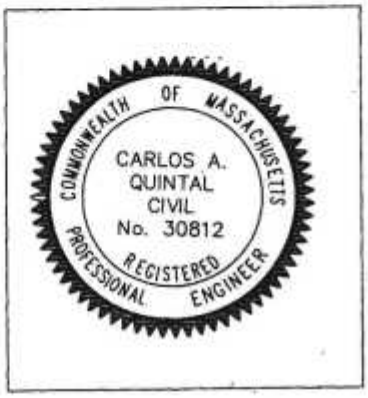
*Note:* Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

## Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature




1/20/26

Signature and Date

## Checklist

**Project Type:** Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

# Checklist for Stormwater Report

## Checklist (continued)

**LID Measures:** Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☒ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

**Standard 1: No New Untreated Discharges**

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

# Checklist for Stormwater Report

## Checklist (continued)

### Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

### Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

# Checklist for Stormwater Report

## Checklist (continued)

**Standard 3: Recharge** (continued)

☒ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

**Standard 4: Water Quality**

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

# Checklist for Stormwater Report

## Checklist (continued)

**Standard 4: Water Quality** (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

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

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

**Standard 6: Critical Areas**

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

# Checklist for Stormwater Report

## Checklist (continued)

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

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☒ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

**Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control**

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

# Checklist for Stormwater Report

## Checklist (continued)

**Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control** (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

**Standard 9: Operation and Maintenance Plan**

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

**Standard 10: Prohibition of Illicit Discharges**

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☒ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

# APPENDIX I

# Operation and Maintenance Plan

FOR
Definitive Subdivision
**Donovan Estates**

LOCATED IN
FRANKLIN, MASSACHUSETTS

PREPARED FOR
Donovan Family Realty Trust
47 Partridge Street
Franklin, MA 02038

PREPARED BY
UNITED CONSULTANTS, INC.
850 FRANKLIN STREET, SUITE 11D
WRENTHAM, MA. 02093

DATE: September 3, 2025
Revised: January 16, 2026

## Operation and Maintenance Plan

### Good House Keeping Measures

1. The roadway and driveway will receive the minimum amount of sand and salt. Snow will be stored at the roadway edges in windrows consistent with Town of Franklin Snow plowing of roadways.
2. The site landscaping will consist of turf lawn, mulch with trees, shrubs, and existing wooded areas. Minimal amounts of fertilizers, herbicides and pesticides will be applied.
3. The site will be stabilized with landscaped areas with mulch and native seed mixes. This will improve the existing site coverage.

### Long Term Pollution Prevention Plan

The owner shall employ good housekeeping measures, which include removing trash and debris from the site, keeping trash in receptacles and complying with the long-term operation and maintenance plan.
The owner does not plan to store materials or waste products on the site.
The owner will have routine inspections and maintenance completed for the Storm-water BMP's. See the Operation and Maintenance Plan Stormwater Facilities Plan for details and schedule.
Typical hazardous materials for single family residences are anticipated. All hazardous materials shall be stored within the houses.
The owner's shall apply the minimum amounts of fertilizers, herbicides and pesticides.
The houses will be serviced by Town water and sewer.
Town trash receptacles are expected to provide refuse storage and will be emptied and disposed of offsite.
The owner will designate an emergency contact person prior to commencing construction.
Snow will be stored at the roadway edges in windrows consistent with Town of Franklin Snow plowing of roadways.
The owner will apply the minimum amount of sand and salt necessary. The roadway will be swept by the Town of Franklin DPW based on their street sweeping program.
Sand piles will not be stored on site.

### Operation and Maintenance Plan Reference

An operation and maintenance schedule for the construction period and the post-development period has been provided on the Operation and Maintenance Plan Stormwater Facilities Plan.
Refer to the O&M plan (Sheet 5) for the location of the proposed grading and drainage easement.

During the construction period and after completion the future Owner shall be responsible for the operation and maintenance of the site and the drainage system.
Upon completion of the construction work the Town of Franklin shall be responsible for the maintenance of the drainage facilities.
The yearly estimated operation and maintenance budget is $2,500.

### During Construction:

The owner will provide documentation which will be submitted to the Franklin DPW confirming when maintenance has been satisfactorily completed.

The maintenance in the maintenance agreement may be amended to achieve the purpose of the bylaws by mutual agreement of the Director of the DPW and the responsible parties.

The owner of the stormwater management system will notify the Director of changes in ownership or assignment of financial responsibility.

The owner will provide future property owners with a copy of the O&M plan and the Stormwater Facilities plan and inform them of the responsibilities of the stormwater system inspections and maintenance.

The owner shall contract with a company which provides emergency response, spill containment and remediation.
The owner will have a spill prevention kit on site for any spills containing oil or gas.
The owners shall employ a landscape professional who is qualified in fertilizer and pesticide applications.
Landscape professionals shall have spill containment for all fertilizers and pesticides.

The owner will provide documentation which will be submitted to the Franklin DPW confirming when maintenance has been satisfactorily completed.

The owner of the stormwater management system will notify the Director of changes in ownership or assignment of financial responsibility.

During Construction the Future Owner will be the party responsible.

_____

Name Title

Note: This document shall be signed and submitted with SWPPP and the Town of Franklin Stormwater Permit.

# Yearly Inspection and Maintenance Log

## Page 1

**Lot 2 Forge Parkway**
**Franklin, Massachusetts**

Road Sweeping and Curb Inspection – Per Town of Franklin Street Sweeping and Inspection Plan

Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____

Roadway sweeping should be completed by a mechanical or vacuum sweeper.

Notes:

Deep Sump Hooded Catch Basins - Per Town of Franklin Catch Basin Cleaning and Inspection Plan

Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____

Cleaning Performed

Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____

Notes:

Sediment Forebay– Per Town of Franklin Drainage Facility Inspection Plan

Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____

Cleaning Performed:

Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____

Infiltration Pond – Per Town of Franklin Drainage Facility Inspection Plan

Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____

Cleaning Performed:

Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____

Sediment Forebay and Water Quality Swales – Per Town of Franklin Drainage Facility Inspection Plan

Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____

Cleaning Performed:

Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____

## Notes:

Landscape Area Inspection – 4 times per year

Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____

Work Performed Repairs completed:

Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____
Date: _____ Performed By: _____

Inspect the area with grass for bare spots and erosion. Repair eroded areas with loam and seed to provide adequate coverage. Inspect landscaped areas for erosion and weeds. Fix erosion and apply additional mulch or landscape stone as necessary.

Inspect and clean pretreatment BMP's every six months and after every major storm event (2 year return frequency). Check the inlet and outlet pipes to determine if they are clogged. Remove accumulated sediment, trash, debris, leaves, lawn clippings from mowing.

Inspect the infiltration area after the first several rainfall events, after all major storms, and on regularly scheduled dates every six months.

Inspect the infiltration area 24 hours to several days after a rain event, to look for ponded water at the surface of the trench. If water is present in may be that the infiltration area is clogged. If so then rehabilitation of the bottom of the trench shall be completed including removing all accumulated sediment, scarifying and till the bottom area, remove and replace the stone media.

# APPENDIX J

# In Compliance with DEP Storm-water Management Standard 10

Definitive Subdivision "**Donovan Estates**"

No Illicit discharges to the storm-water management system, including wastewater discharges and discharges of storm-water contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease are proposed and shall not be allowed.

The site map located in Appendix J shall be part of this Illicit Discharge Compliance Statement.

During Construction the future owner will be the responsible party.

_____

Name Title

Note: Once ownership of an approved Subdivisions is secured this document shall be signed and submitted with SWPPP and the Town of Franklin Stormwater Permit.

# APPENDIX K

## Rip Rap Sizing Calculations

Into Sediment Forebay at Wet Swale

# Rip Rap Calculator

I want to find the... ...

- (●) average rock diameter ($D_{50}$)
- ( ) rip rap volume
- ( ) both $D_{50}$ and rip rap volume

### ^ Rip rap specifications

Water velocity (V) i ...

4.35 ft/s

Isbash constant (C) ...

- (●) Highly turbulent (0.86)
- ( ) Low turbulence (1.2)

Gravitational acceleration (g) ...

32.17 ft/s²

Specific gravity (S) i ...

2.75

Average rock diameter ($D_{50}$) ...

2.727 in

# Rip Rap Sizing Calculations

Into Sediment Forebay at Pond 1

## Rip Rap Calculator

I want to find the... ...

- (●) average rock diameter ($D_{50}$)
- ( ) rip rap volume
- ( ) both $D_{50}$ and rip rap volume

**Rip rap specifications**

Water velocity (V) i ...

5.56 ft/s

Isbash constant (C) ...

- (●) Highly turbulent (0.86)
- ( ) Low turbulence (1.2)

Gravitational acceleration (g) ...

32.17 ft/s²

Specific gravity (S) i ...

2.75

Average rock diameter ($D_{50}$) ...

4.455 in

Share result

Reload calculator

Clear all changes

Did we solve your problem today? Yes No

## Rip Rap Sizing Calculations

Into Pond 1

# Rip Rap Calculator

I want to find the... ...

- (●) average rock diameter ($D_{50}$)
- ( ) rip rap volume
- ( ) both $D_{50}$ and rip rap volume

### ^ Rip rap specifications

Water velocity (V) i ...

5.59 ft/s

Isbash constant (C) ...

- (●) Highly turbulent (0.86)
- ( ) Low turbulence (1.2)

Gravitational acceleration (g) ...

32.17 ft/s²

Specific gravity (S) i ...

2.75

Average rock diameter ($D_{50}$) ...

4.503 in

# Rip Rap Sizing Calculations

Out of Pond 1

## Rip Rap Calculator

I want to find the... ...

- (●) average rock diameter ($D_{50}$)
- ( ) rip rap volume
- ( ) both $D_{50}$ and rip rap volume

**Rip rap specifications**

Water velocity (V) i ...

8.63 ft/s

Isbash constant (C) ...

- (●) Highly turbulent (0.86)
- ( ) Low turbulence (1.2)

Gravitational acceleration (g) ...

32.17 ft/s²

Specific gravity (S) i ...

2.75

Average rock diameter ($D_{50}$) ...

10.732 in

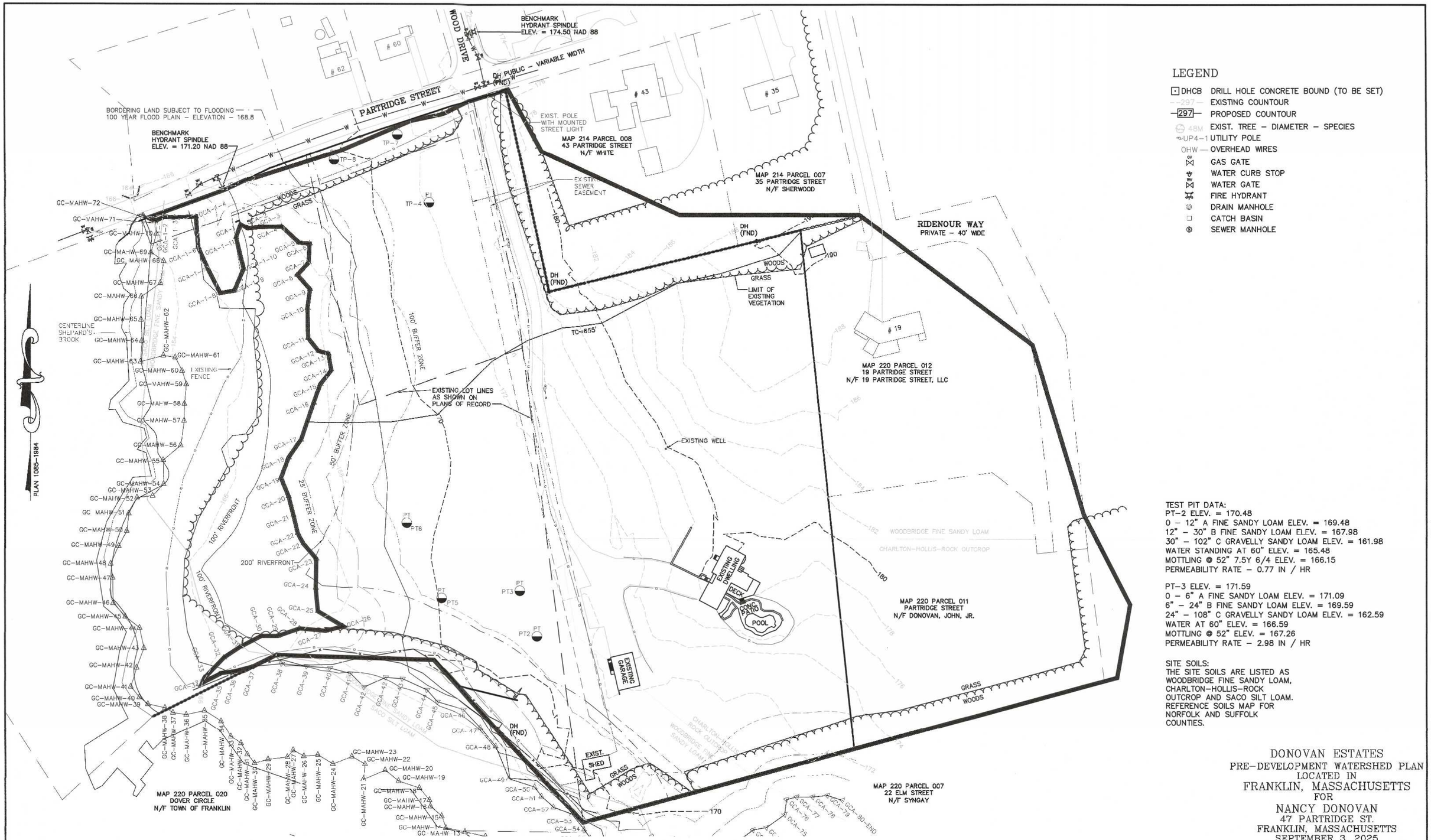
Share result

Reload calculator

Clear all changes

*Did we solve your problem today?* Yes No

# APPENDIX L




## LEGEND

- DHCB DRILL HOLE CONCRETE BOUND (TO BE SET)
- 297 EXISTING COUNTOUR
- 297 PROPOSED COUNTOUR
- 48M EXIST. TREE – DIAMETER – SPECIES
- UP4–1 UTILITY POLE
- OHW OVERHEAD WIRES
- GAS GATE
- WATER CURB STOP
- WATER GATE
- FIRE HYDRANT
- DRAIN MANHOLE
- CATCH BASIN
- SEWER MANHOLE

TEST PIT DATA:
PT–2 ELEV. = 170.48
0 – 12" A FINE SANDY LOAM ELEV. = 169.48
12" – 30" B FINE SANDY LOAM ELEV. = 167.98
30" – 102" C GRAVELLY SANDY LOAM ELEV. = 161.98
WATER STANDING AT 60" ELEV. = 165.48
MOTTLING @ 52" 7.5Y 6/4 ELEV. = 166.15
PERMEABILITY RATE – 0.77 IN / HR

PT–3 ELEV. = 171.59
0 – 6" A FINE SANDY LOAM ELEV. = 171.09
6" – 24" B FINE SANDY LOAM ELEV. = 169.59
24" – 108" C GRAVELLY SANDY LOAM ELEV. = 162.59
WATER AT 60" ELEV. = 166.59
MOTTLING @ 52" ELEV. = 167.26
PERMEABILITY RATE – 2.98 IN / HR

SITE SOILS:
THE SITE SOILS ARE LISTED AS WOODBRIDGE FINE SANDY LOAM, CHARLTON–HOLLIS–ROCK OUTCROP AND SACO SILT LOAM. REFERENCE SOILS MAP FOR NORFOLK AND SUFFOLK COUNTIES.

# DONOVAN ESTATES
PRE–DEVELOPMENT WATERSHED PLAN
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 50'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

DATE

GRAPHIC SCALE
50 0 25 50 100 200
( IN FEET )
1 inch = 50 ft.

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

| DATE | | INT. |
|---|---|---|
| 2/18 | FIELD BY: | BL |
| BK# | FIELD BOOK | PG# |
| 8/25 | CALCS BY: | RRG |
| 8/25 | DESIGNED BY: | RRG |
| 8/25 | DRAWN BY: | COMP |
| 8/25 | CHECKED BY: | CAQ |

UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508–384–6560 FAX 508–384–6566

SEPT. 3, 2025
1" = 50'
UC1340
1 of 1




## LEGEND

- ⊡DHCB DRILL HOLE CONCRETE BOUND (TO BE SET)
- 297 EXISTING COUNTOUR
- 297 PROPOSED COUNTOUR
- 48M EXIST. TREE – DIAMETER – SPECIES
- UP4–1 UTILITY POLE
- OHW OVERHEAD WIRES
- GAS GATE
- WATER CURB STOP
- WATER GATE
- FIRE HYDRANT
- DRAIN MANHOLE
- CATCH BASIN
- SEWER MANHOLE

SITE SOILS:
THE SITE SOILS ARE LISTED AS WOODBRIDGE FINE SANDY LOAM, CHARLTON–HOLLIS–ROCK OUTCROP AND SACO SILT LOAM. REFERENCE SOILS MAP FOR NORFOLK AND SUFFOLK COUNTIES.

# DONOVAN ESTATES

POST–DEVELOPMENT WATERSHED PLAN
LOCATED IN
FRANKLIN, MASSACHUSETTS
FOR
NANCY DONOVAN
47 PARTRIDGE ST.
FRANKLIN, MASSACHUSETTS
SEPTEMBER 3, 2025
SCALE: 1" = 50'

APPROVAL UNDER SUBDIVISION CONTROL LAW
REQUIRED
FRANKLIN PLANNING BOARD

DATE

GRAPHIC SCALE
50 0 25 50 100 200
( IN FEET )
1 inch = 50 ft.

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2 | 2/13/26 | TOWN AND BETA REVIEW COMMENTS | RRG |
| 1 | 1/16/26 | BETA REVIEW COMMENTS | RRG |

| DATE | | INT. |
|---|---|---|
| 2/18 | FIELD BY: | BL |
| BK# | FIELD BOOK | PG# |
| 8/25 | CALCS BY: | RRG |
| 8/25 | DESIGNED BY: | RRG |
| 8/25 | DRAWN BY: | COMP |
| 8/25 | CHECKED BY: | CAQ |

UNITED CONSULTANTS INC.
850 FRANKLIN STREET SUITE 11D
WRENTHAM, MASSACHUSETTS 02093
508–384–6560 FAX 508–384–6566

SEPT. 3, 2025
1" = 50'
UC1340
1 of 1

# TOWN OF FRANKLIN
# CONSERVATION COMMISSION

# MINOR BUFFER ZONE ACTIVITY APPLICATION AS PER FRANKLIN BY-LAW CHAPTER 181

**In order to be considered complete, all information, requirements and conditions must be completed and the $50.00 filing fee submitted with the application.**

**Applicant: (Please Print the following information)**

Jaclyn Leslie

Applicant's Name

5 Oak Tree Lan

Mailing Address

| Franklin | MA | 02038 |
|---|---|---|
| City/Town | State | Zip Code |

| 813-431-0511 | jaclyn.leslie@gmail.com |
|---|---|

Telephone Number and e-mail address of primary contact for this application.

**Property & Plan Information:**

Jaclyn and John-Thomas Leslie

Land Owner's Name (If Different from Applicant)

5 Oak Tree Lane

Project Location (Street Address)

| 226 | 007 |
|---|---|

Assessor's Map & Parcel Number

| Pool Fence Placement – 5 Oak Tree Lane | 3/5/2026 |
|---|---|

Plan Name and date

All plans and information submitted for an MBZA must contain information to adequately depict the following: (NOTE: 2 hard copies of all material must be submitted to the Town Hall and an electronic copy of the entire application to the Conservation Agent's email.)

1. Plans:

   1.1. Existing conditions of the property showing all existing structures;

   1.2. Area of proposed work including total area of disturbance and whether the disturbances are permanent or temporary;

   1.3. Location of all wetlands and buffer zones, including the 25', 50' and 100' buffers;

   1.4. Location, type and size of any vegetation being removed and any vegetation to be planted as a mitigation measure;

   1.5. Existing slopes and direction of drainage; and

   1.6. Location of any required erosion control.

2. Narrative:

   2.1. Detailed description of the activity to take place; and

   2.2. Detailed description of how and when the work will be performed.

3. Other:

   3.1. A photograph of the area where the activity is to take place.

   3.2. A filing fee of $50.00.

**Authorization:**

**I hereby request that the Franklin Conservation Commission review this Application for a Minor Buffer Zone Activity. I (we) affirm that the project will comply with all criteria as stated in Section 14 of the Franklin Wetlands Protection Regulations as well as all information submitted. I (we) also grant authority to the Franklin Conservation Commission members and agent to go onto my (our) property solely for purposes directly related to the inspection and approval of this application**

Jaclyn Leslie 3/5/2026

Property owner's Signature Date

## 2. PERFORMANCE STANDARDS

2.1. These are the requirements for a Minor Buffer Zone Activity (MBZA)

2.1.1. The Conservation Commission (The Commission) shall presume that activity proposed to occur:

- Exclusively within a previously disturbed or clearly delineated buffer zone; and
- The alteration is less than 1,000 Square Feet or 5% of the buffer zone on the lot, whichever is less; and
- At a minimum, a 25 foot wide area is preserved between the activity and the resource area boundary; and
- The buffer zone does not contain estimated wildlife habitat which is indicated on the most recent Estimated Habitat Map of State listed Rare Wetlands Wildlife; and
- Erosion and sedimentation controls, if required, are provided at the limit of work to protect the resource areas, and
- Shall constitute activities within the buffer zone that would be eligible for a Negative Determination of Applicability with conditions.

2.2. The Commission may determine that this presumption should not apply based on unusual circumstances such as steep slopes, the potential for negative impacts over time or because the proposed project would require oversight through continuing conditions. The Commission may waive any or all of the above requirements if they find that there is an emergency situation. In order for the site to be declared an emergency, a vote of the Commission shall be required.

2.3. In order for a property owner to apply for an MBZA they must meet all of the above requirements and provide a plan of the activity, a detailed project narrative and photographs of the project area. The distance between the proposed project and the wetlands must be noted on the plan and may require delineation if requested by the Commission or Agent. Additional items detailed on the MBZA form or requested by the Commission, or its Agent, may be required. The applicant is required to prove by a preponderance of the evidence that their proposed MBZA will not result in a negative impact to the wetlands.

2.4. The minor nature of these projects will not require the Commission to hold an advertised public hearing on the matter. The Agent shall review the application and may perform a site visit to confirm information provided in the plan, project narrative and photographs. The Agent may request additional information if s/he deems necessary. Upon review of the MBZA application, the commission may issue an approval, with or without conditions, a denial, or require the applicant to provide further information. If the commission issues a denial, the applicant shall be required to file a Notice of Intent if they wish to pursue the activity.

2.5. The work must conform to the plans submitted in the Minor Buffer Zone Activity application and all applicable conditions or modifications imposed by the Commission in the approval. If the applicant fails to perform the work according to the approved plan or in conformance with the applicable conditions of the approval, the permit will be revoked. Failure to conform to the plans and specifications shall constitute grounds for requiring a Notice of Intent and/or an Enforcement Action, including fines, by the Commission.

2.6. Upon completion of the project the applicant shall notify the Agent. The Agent shall inspect the work for and inform the Commission of the results.

2.7 Minor activities within Riverfront Zone, the 100' buffer zone, but not within the 25' "no touch" zone, and not within 25' of a perennial stream, may be authorized by the Conservation Agent under the following conditions:

2.7.1. The proposed activity will not run counter to the interests of the Wetlands Protection Act;

2.7.2. The proposed activity shall collectively not encompass more than 150 $ft^2$ of land area;

2.7.3. The proposed activity shall be only those activities permitted under 310 CMR 10.02 (2) (b) as well as the removal of vegetative debris and trees;

2.7.4. These activities shall be outlined on a MBZA application providing all required information and accompanied by the required filing fee;

2.7.5. All decisions of the Conservation Agent may be appealed to the Conservation Commission following the procedures outlined in section 8 of these regulations;

2.7.6. The agent shall prepare and submit a report, at least monthly, to the Commission on all permits approved under this section.

# Section 2 – Project Narrative

**Project Name:**
Pool Fence Placement - 5 Oak Tree Lane

**Property Address:**
5 Oak Tree Lane
Franklin, MA 02038

---

# 2.1 Description of the Activity

This filing is to include the installation of a residential fence associated with the previously approved pool project at **5 Oak Tree Lane, Franklin, MA**.

The swimming pool project was previously approved by the **Franklin Conservation Commission under Order of Conditions CE 159-1297 issued October 3, 2024**.

See **Attachment A – Order of Conditions (Pool Approval – 2024)**.

The approved pool project referenced fencing for safety purposes; however, the specific fence installation work was not included in the original filing scope. This submission is therefore being made as a **Minor Buffer Zone Activity (MBZA)** to formally include the fence installation.

The proposed work consists only of installing a perimeter fence around the backyard to restrict access to the pool area from outside the property.

No additional construction, grading, excavation, or modification to the previously approved pool project is proposed.

Fence posts will be installed using small post holes only. Disturbance will be limited to the footprint of the fence posts.

The proposed work will **not alter existing drainage, slopes, vegetation patterns, or wetlands resource areas**.

Photographs of the project area are included within the submitted plan materials.

---

# 2.2 Fence Materials and Installation

Two fence materials will be installed as shown on the submitted fence plan.

See **Attachment B – Proposed Fence Layout Plan**.

### Chain Link Fence

- Height: 5 feet
- Fabric: 9-gauge mesh
- Terminal Post: 2-3/8"
- Line Post: 1-7/8"
- Top Rail: 1-3/8"
- Post depth: approximately 2.5 feet
- Includes top rail and tension wire

### Vinyl Fence

- Height: 6 feet
- Post: 5" x 5"
- Rail: 1-3/4" x 7"
- Picket: 6" tongue-and-groove
- Post depth: approximately 3 feet

The layout and alignment of the fence are shown in **Attachment B**.

---

# 2.3 Construction Method and Schedule

Fence installation will be completed by a licensed contractor using standard residential fence installation practices.

Installation will include the following steps:

1. Marking the fence line according to the submitted plan.
2. Digging small post holes at designated locations.
3. Installing and securing fence posts.
4. Installing fence rails, mesh, and vinyl fence panels.
5. Restoring disturbed soil around fence posts.

The work involves **minimal ground disturbance** and **no heavy site work**.

Work is anticipated to occur **between May and June 2026**, pending Conservation Commission approval and weather conditions.

---

# 2.4 Minor Buffer Zone Activity (MBZA) Compliance

The proposed fence installation meets the criteria for a **Minor Buffer Zone Activity** for the following reasons:

• The work occurs within an **existing residential yard that has already been disturbed during the previously approved pool project**.

• The proposed disturbance is limited to **fence post installation only**, resulting in minimal ground disturbance well below the **1,000 square foot MBZA threshold**.

• The work **maintains the required 25-foot buffer to the wetland resource area**, as shown on the submitted plans.

• The project **does not involve significant vegetation removal** and does not impact estimated wildlife habitat.

• Disturbance is limited to small post holes and **soil will be stabilized immediately following installation**.

• The project **will not alter drainage patterns or create sedimentation impacts to wetlands**.

Due to the limited nature of the activity and its location within an already disturbed residential yard, the proposed work **will not result in any negative impact to wetlands or resource areas**.

---

# 2.5 Project Clarification

This filing is being submitted **only to formally include the fence installation associated with the previously approved pool project** and does not modify or expand the scope of the approved pool construction.

---

# Attachments

**Attachment A**
Order of Conditions – Pool Project Approval

**Attachment B**
Fence Installation Plan and Site Photographs

Attachment A
Order of Conditions – Pool Project Approval

Tel: (508) 520-4929 Fax: (508) 520 4906

# Town of Franklin

## Conservation Commission

October 3, 2024

Jaclyn Leslie
5 Oak Tree Lane
Franklin, MA 02038

RE: Order of Conditions, 5 Oak Tree Lane (CE 159-1297)

Dear Ms. Leslie,

Please find enclosed the Order of Conditions for the Project at 5 Oak Tree Lane recently permitted through the Franklin Conservation Commission. Please note the Special Conditions attached. The Order of Conditions must be recorded in the Registry of Deeds and evidence of this recording must be given to the Conservation Department. In addition, the erosion control barriers must be installed, inspected and certified by your representative prior to the Conservation Agent signing off on any building permits.

If you have any questions, please feel free to contact me at 508-520-4929 or via email at bgoodlander@franklinma.gov.

Sincerely,

Breeka Lí Goodlander, PWS, CERPIT
Conservation Director

SWS PCP EDUCATION EXPERIENCE PWS ETHICS BREEKA LI GOODLANDER 3575 PWS PROFESSIONAL WETLAND SCIENTIST

Massachusetts Department of Environmental Protection

# eDEP Transaction Copy

Here is the file you requested for your records.

To retain a copy of this file you must save and/or print.

| | |
|---|---|
| Username: | **FRANKLINCONCOM** |
| Transaction ID: | **1804153** |
| Document: | **WPA Form 5 - OOC** |
| Size of File: | **149.98K** |
| Status of Transaction: | **In Process** |
| Date and Time Created: | **10/3/2024:2:12:55 PM** |

**Note**: This file only includes forms that were part of your transaction as of the date and time indicated above. If you need a more current copy of your transaction, return to eDEP and select to "Download a Copy" from the Current Submittals page.

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
**WPA Form 5 - Order of Conditions**
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:159-1297
eDEP Transaction #:1804153
City/Town:FRANKLIN

## A. General Information

1. Conservation Commission: FRANKLIN
2. Issuance: a. ☑ OOC b. ☐ Amended OOC
3. Applicant Details
   a. First Name: JACLYN b. Last Name: LESLIE
   c. Organization:
   d. Mailing Address: 5 OAK TREE LANE
   e. City/Town: FRANKLIN f. State: MA g. Zip Code: 02038
4. Property Owner
   a. First Name: b. Last Name:
   c. Organization:
   d. Mailing Address:
   e. City/Town: f. State: g. Zip Code:
5. Project Location

| | | | |
|---|---|---|---|
| a.Street Address | 5 OAK TREE LANE | | |
| b.City/Town | FRANKLIN | c. Zip Code | 02038 |
| d. Assessors Map/Plat# | 226 | e. Parcel/Lot# | 007 |
| f. Latitude | 42.11609N | g. Longitude | 71.42011W |

6. Property recorded at the Registry of Deed for:

| a. County | b. Certificate | c. Book | d. Page |
|---|---|---|---|

7.Dates

a. Date NOI Filed : 7/20/2024 b. Date Public Hearing Closed: 10/3/2024 c. Date Of Issuance: 10/7/2024

8.Final Approved Plans and Other Documents

| a. Plan Title: | b. Plan Prepared by: | c. Plan Signed/Stamped by: | d. Revised Final Date: | e. Scale: |
|---|---|---|---|---|
| 5 OAK TREE LANE PLAN | KARON SKINNER | | 9/23/2024 | 1"=50' |

## B. Findings

1.Findings pursuant to the Massachusetts Wetlands Protection Act
Following the review of the the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act.

Check all that apply:

| | | |
|---|---|---|
| a. ☐ Public Water Supply | b. ☐ Land Containing Shellfish | c. ☑ Prevention of Pollution |
| d. ☑ Private Water Supply | e. ☐ Fisheries | f. ☑ Protection of Wildlife Habitat |
| g. ☑ Ground Water Supply | h. ☑ Storm Damage Prevention | i. ☑ Flood Control |

2. Commission hereby finds the project, as proposed, is:

**Approved** subject to:

a. ☑ The following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

**Denied** because:

b. ☐ The proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ The information submitted by the applicant is not sufficient to describe the site, the work or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the interests of the Act , and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☑ Buffer Zone Impacts:Shortest distance between limit of project disturbance and the wetland resource area specified in 310CMR10.02(1)(a). 65 a. linear feet

**Inland Resource Area Impacts:**(For Approvals Only):

| Resource Area | Proposed Alteration | Permitted Alteration | Proposed Replacement | Permitted Replacement |
|---|---|---|---|---|
| 4. ☐ Bank | a. linear feet | b. linear feet | c. linear feet | d. linear feet |
| 5. ☐ Bordering Vegetated Wetland | a. square feet | b. square feet | c. square feet | d. square feet |
| 6. ☐ Land under Waterbodies and Waterways | a. square feet | b. square feet | c. square feet | d. square feet |
| | e. c/y dredged | f. c/y dredged | | |
| 7. ☐ Bordering Land Subject to Flooding | a. square feet | b. square feet | c. square feet | d. square feet |
| Cubic Feet Flood Storage | e. cubic feet | f. cubic feet | g. cubic feet | h. cubic feet |
| 8. ☐ Isolated Land Subject to Flooding | a. square feet | b. square feet | | |
| Cubic Feet Flood Storage | c. cubic feet | d. cubic feet | e. cubic feet | f. cubic feet |
| 9. ☐ Riverfront Area | a. total sq. feet | b. total sq. feet | | |

| | | | | |
|---|---|---|---|---|
| Sq ft within 100 ft | c. square feet | d. square feet | e. square feet | f. square feet |
| Sq ft between 100-200 ft | g. square feet | h. square feet | i. square feet | j. square feet |

**Coastal Resource Area Impacts:**

| Resource Area | Proposed Alteration | Permitted Alteration | Proposed Replacement | Permitted Replacement |
|---|---|---|---|---|
| 10.☐ Designated Port Areas | Indicate size under Land Under the Ocean, below | | | |
| 11.☐ Land Under the Ocean | a. square feet | b. square feet | | |
| | c. c/y dredged | d. c/y dredged | | |
| 12.☐ Barrier Beaches | Indicate size under Coastal Beaches and/or Coastal Dunes below | | | |
| 13.☐ Coastal Beaches | a. square feet | b. square feet | c. c/y nourishment | d. c/y nourishment |
| 14.☐ Coastal Dunes | a. square feet | b. square feet | c. c/y nourishment | d. c/y nourishment |
| 15.☐ Coastal Banks | a. linear feet | b. linear feet | | |
| 16.☐ Rocky Intertidal Shores | a. square feet | b. square feet | | |
| 17.☐ Salt Marshes | a. square feet | b. square feet | c. square feet | d. square feet |
| 18.☐ Land Under Salt Ponds | a. square feet | b. square feet | | |
| | c. c/y dredged | d. c/y dredged | | |
| 19.☐ Land Containing Shellfish | a. square feet | b. square feet | c. square feet | d. square feet |
| 20.☐ Fish Runs | Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above | | | |
| | c. c/y dredged | d. c/y dredged | | |
| 21.☐ Land Subject to Coastal Storm Flowage | a. square feet | b. square feet | | |

22.

☐ Restoration/Enhancement (For Approvals Only)

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage

that has been entered in Section B.5.c & d or B.17.c & d above, please entered the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

23.

☐ Streams Crossing(s)

If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

a. number of new stream crossings

b. number of replacement stream crossings

## C. General Conditions Under Massachusetts Wetlands Protection Act

**The following conditions are only applicable to Approved projects**

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. the work is a maintenance dredging project as provided for in the Act; or
   b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not exceed the issuance date of the original Final Order of Conditions.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work..
10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

" Massachusetts Department of Environmental Protection"
[or 'MassDEP"]

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before Mass DEP.
12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
13. The work shall conform to the plans and special conditions referenced in this order.
14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.
17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. The work associated with this Order(the "Project") is (1) ☐ is not (2) ☑ subject to the Massachusetts Stormwater Standards. If the work is subject to Stormwater Standards, then the project is subject to the following conditions;

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Construction General Permit as required by Stormwater Standard 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that: *i.* all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures; *ii.*. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized; *iii.* any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10; *iv.* all post-construction stormwater BMPs are installed in

accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition; *v.* any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 19(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 19(f) through 19(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 19(f) through 19(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

g) The responsible party shall:
   1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
   2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
   3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

**Special Conditions:**

**D. Findings Under Municipal Wetlands Bylaw or Ordinance**

1.Is a municipal wetlands bylaw or ordinance applicable? ☑ Yes ☐ No

2.The Conservation Commission hereby(check one that applies):

a. ☐ DENIES the proposed work which cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw specifically:

1. Municipal Ordinance or Bylaw _____ 2. Citation _____

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order or Conditions is issued. Which are necessary to comply with a municipal ordinance or bylaw:

b. ☑ APPROVES the proposed work, subject to the following additional conditions.

1. Municipal Ordinance or Bylaw FRANKLIN WETLANDS PROTECTION BYLAW 2. Citation CHAPTER 181

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows:
SEE ATTACHED

## E. Signatures

This Order is valid for three years from the date of issuance, unless otherwise specified pursuant to General Condition #4. If this is an Amended Order of Conditions, the Amended Order expires on the same date as the original Order of Conditions.

10/7/2024
1. Date of Original Order

Please indicate the number of members who will sign this form. This Order must be signed by a majority of the Conservation Commission.

4
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on

Date 10/08/24

## F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

## G. Recording Information

This Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

FRANKLIN

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
**WPA Form 5 - Order of Conditions**
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:159-1297
eDEP Transaction #:1804153
City/Town:FRANKLIN

Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

FRANKLIN
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

5 OAK TREE LANE
Project Location

159-1297
MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for:

Property Owner

and has been noted in the chain of title of the affected property in:

Book | Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

Rev. 4/1/2010

**PROJECT** **5 Oak Tree Lane** **CE-#159-1297**

**ATTACHMENT**
**SPECIAL CONDITIONS**

**Table 1. List of Special Conditions**

All Conditions

| Add | No. | Special Conditions |
|---|---|---|
| | 19 | Mitigation Planting Plan |
| X | 20 | Erosion Control Barriers |
| X | 21 | Extra Siltation Barriers |
| X | 22 | As-Built Plan |
| | 23 | Written Conformance Reports |
| X | 24 | Work Performed According to Plan |
| X | 25 | Referencing Order of Conditions |
| X | 26 | Provision of Plans and Order of Conditions |
| X | 27 | Approved Changes |
| X | 28 | Notification Prior to Work |
| X | 29 | Right to Impose Additional Conditions |
| X | 30 | Errata as Changes |
| X | 31 | Compliance Contact Information |
| X | 32 | Weekly Monitor Reports |
| X | 33 | Use of Clean Fill |
| X | 34 | No Straw Bales |
| X | 35 | Stockpile Maintenance |
| X | 36 | Cleaning Vehicles |
| X | 37 | Remedy Upon Problem Identification |
| X | 38 | Barriers as Limit to Work |
| X | 39 | Limit of Work Marked |
| X | 40 | No Construction Materials |
| X | 41 | Inspections and Disposal of Sediment |
| | 42 | No Rock Salt |
| | 43 | No Fertilizers |
| X | 44 | Removal of Barriers |
| | 45 | Dewatering Plan |

| | | |
|---|---|---|
| X | 46 | Stockpile Location |
| X | 47 | Removal of Sediment |
| | 48 | No Refueling |
| | 49 | Emergency Repairs |
| | 50 | Leaks and Spills |
| X | 51 | Building Permit Sign Off |

19. **Mitigation Planting Plan**: If the project involves detention basins, drainage swales or other significant drainage structures, prior to the first pre-construction meeting, the Applicant shall submit a mitigation planting plan to the Conservation Department for review and approval. The mitigation planting plan shall use low shrub and tree species from the Franklin Best Development Practices Guide Book - specific for wildlife habitat - to be planted near the detention basin and altered swale.

20. **Erosion Control Barriers:** Erosion control barriers must be installed, inspected and approved by a professional engineer or licensed wetlands scientist. Before any work commences (including any land and/or vegetation cutting, removal, or disturbance) said professional shall submit to the Conservation Commission a written statement confirming the erosion control barriers are installed according to the approved plan. The statement shall be signed and stamped by said professional. All erosion control barriers must be biodegradable. This biodegradable requirement supersedes any details shown on the plan.

21. **Extra Siltation Barriers**: An extra 10% of the required biodegradable siltation barriers must be stored on site in the event of an emergency or storm.

22. **As-Built Plan**: If the Order of Conditions was based on a plan submitted and stamped by a licensed professional, then simultaneous with any written request for a Certificate of Compliance inspection, the Applicant will provide an as-built drawing plan stamped with the same license as the original plan. Any deviation from the approved plan must be demarcated and duly explained.

23. **Written Conformance Reports**: The Commission must receive a written report with respect to a project's conformance to Orders of Conditions every April and October from a professional consultant (e.g. engineer or wetland scientist) until a Certificate of Compliance is issued.

24. **Work Performed According to Plan**: Except where modified by the Commission, all work must be performed in accordance with the plans and the Order of Conditions. Any violation of these Orders of Conditions may result in the Applicant being subject to an Enforcement Order.

25. **Referencing Order of Conditions**: This Order shall be referenced in all construction contracts, subcontracts, and specifications dealing with the proposed work and shall supersede any conflicting contract requirements. The Applicant shall ensure that all Contractors, Subcontractors, and other personnel performing the permitted work are fully aware of the permit's terms and conditions. Thereafter, the Contractor will be held jointly and independently liable for any violation of the Order of Conditions, resulting from failure to comply with its conditions.

26. **Provision of Plans and Order of Conditions**: A copy of the plans and associated Order of Conditions must be provided to the contractor responsible for the project's construction and completion, *prior* to the commencement of work. The contractor must have a copy of this Order of Conditions on site at all times while activities regulated by this Order of Conditions are being performed.

27. **Approved Changes**: Any changes, alterations, or revisions in the submitted plans or Notice of Intent must be approved by the Commission prior to their implementation. Failure to comply with this condition may subject the Applicant to an Enforcement Order. If the Commission finds, by a majority vote, said changes to be significant and/or to deviate from the revised plans, Notice of Intent, or the Order of Conditions, then the Commission may require that the Applicant file a Request to Amend the Order of Conditions or a new Notice of Intent. All changes to the plan shall be in accordance with DEP Policy 85-4.

28. **Notification Prior to Work**: The Applicant must notify the Franklin Conservation Commission in writing one week before any activity, including vegetation removal, commences on the project site. Failure to comply with pertinent conditions may result in a directive to cease all activity. In the event that work ceases on the site for a period of time greater than five business days **and** inspections required by this Order are stopped, this condition shall again apply prior to recommencing work on the site. Compliance with this condition does not relieve the Applicant from complying with all other conditions. All conditions requiring additional information prior to commencing construction shall be met prior to submitting said notice.

29. **Right to Impose Additional Conditions**: If siltation, erosion, or other adverse impacts to any resource areas occur, the Commission reserves the right to impose additional conditions as necessary to protect the interests of the Wetlands Protection Act and the Franklin Wetlands Protection Act Bylaw.

30. **Errata as Changes**: Any errors found on the plans or in the information submitted by the Applicant shall be considered as changes, and the procedures and policies related to plan changes outlined above, shall be followed.

31. **Compliance Contact Information**: Prior to any work being performed on the site, the Applicant shall inform the Franklin Conservation Commission in writing of the names, addresses, and business and home phone numbers of both the project supervisor who will be responsible for ensuring on site compliance with the Order of Conditions, as well as his/her alternate. The Applicant shall notify the Commission in writing of any changes in this information as soon as practically possible.

32. **Weekly Monitor Reports**: At least every other week, beginning the first week of construction, in which construction activity occurs on site and for as long thereafter as the ground remains destabilized, the applicant, the applicant's representative, or the contractor must submit a written report to the Conservation Commission. The report must include weekly erosion control inspection logs, details of any remediation activities taken, and descriptions of any deviations from approved plans.

33. **Use of Clean Fill**: Any fill used in connection with this project shall be clean, meaning it contains no trash, refuse, rubbish or debris, including but not limited to lumber, bricks, plaster,

wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles or parts of any of the foregoing.

34. **No Straw Bales**: In order to help prevent the spread of invasive plant species, the use of straw hay bales as a means of erosion control is prohibited.

35. **Stockpile Maintenance**: Any soil areas, including stockpiles, which will remain exposed for longer than thirty calendar days shall be mulched or covered with a short-lived annual herbaceous cover crop.

36. **Cleaning Vehicles**: In order to help prevent the spread of invasive plant species during construction, all vehicles entering or leaving the site will be thoroughly cleaned of accumulated soil or plant material.

37. **Remedy Upon Problem Identification**: If any unforeseen problems occur during construction that affect any of the statutory interests identified in MGL c. 131 §40 and 310 CMR 10.00, and/or the Town of Franklin Wetlands Bylaw, the Applicant shall immediately notify the Conservation Commission, and a meeting shall be held shortly thereafter between the Conservation Commission, the Applicant, the Applicant's licensed professionals, the Contractor, and any other concerned parties, to determine corrective measures to be taken. The Applicant shall then implement the agreed upon corrective measures. In the event of a dispute between the meeting participants, the Commission's judgment shall prevail.

38. **Barriers as Limit of Work**: The sedimentation barriers will also serve as the limit of work, and no work, disturbance, or alteration shall occur on the resource area side of the barrier except as depicted on the approved plans.

39. **Limit of Work Marked**: The limit of work area shall be clearly marked in the field with said indicators being spaced at intervals no greater than 50 feet.

40. **No Construction Materials**: No construction materials, debris, leaves, or other materials shall be deposited outside the limits of work.

41. **Inspections and Disposal of Sediment**: To assure the continued effective removal of sediments, the Contractor shall inspect the barriers weekly and after each rainfall event to determine its condition. At the time of these inspections, accumulated sediments will be removed from the barriers and damaged barriers will be repaired or replaced as necessary. In no event shall silt be allowed to accumulate to a height greater than one-half the height of the barriers. Any removed sediment will be moved to and disposed of at a suitable location.

42. **No Rock Salt**: No rock salt (sodium chloride) can be used on paved surfaces within one hundred feet of wetland resource areas. Other de-icing chemicals may be used with the prior written approval of the Conservation Commission, and only after a formal review of the proposed substance. Signs, submitted to and approved by the Conservation Commission, shall be posted at the site stating this is a no-salt zone. The Conservation Commission shall not grant a perpetual use of any salt alternative chemical for the site. This condition will be noted on the Certificate of Compliance and will continue in perpetuity.

43. **No Fertilizers**: Pesticides, herbicides, and fungicides will not be used within the 100-foot buffer zone resource area. Fertilizers may be used if it is a slow release fertilizer and has been approved in advance by the Conservation Commission. This Condition will be noted on the Certificate of Compliance and will continue in perpetuity.

44. **Removal of Barriers**: No sedimentation barrier may be removed without the prior approval of the Commission or its staff.

45. **Dewatering Plan**: Prior to any excavation dewatering activity, the applicant must submit a dewatering plan to the Conservation Commission for approval. The dewatering plan must clearly indicate the location of the dewatering discharge and the measures used to prevent discharge of silt or sediment into the stormwater system or a wetland resource area. The dewatering plan must also include a contingency plan for emergency dewatering requirements. The contingency plan will provide for the pumped water to be contained in a settling basin prior to discharge. No dewatering will take place without the prior written approval of the Conservation Commission. No direct discharge to wetland resource areas will be allowed. Subsequent to dewatering, accumulated sediments will be removed to a secure location.

46. **Stockpile Location**: No debris, fill, or excavated material shall be stockpiled within 25 linear feet of the limit of work, unless approved beforehand by the commission. At no time shall any debris or other material be buried or disposed of within wetland resource areas or the 100-foot buffer zone resource areas, other than fill that is allowed by this Order of Conditions and as shown on the above-referenced plan.

47. **Removal of Sediment**: Any debris, sediment, or other material that falls into or otherwise enters the wetland resource area during the construction period must be immediately removed by hand.

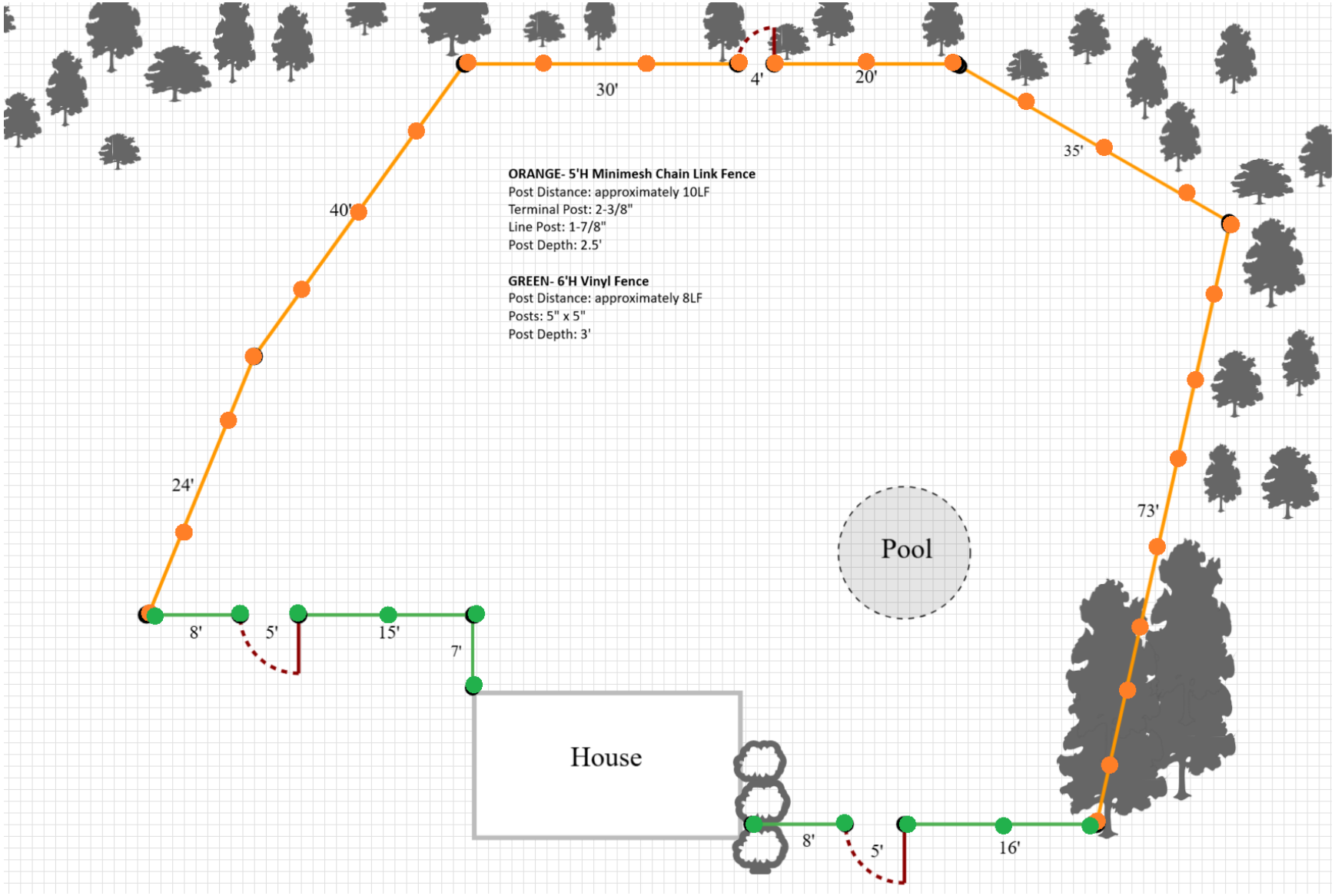
48. **No Refueling**: No refueling of equipment or trucks shall occur within 100 linear feet of any wetland resource area.

49. **Emergency Repairs**: There shall be no more than a total of 50 gallons of fuel (other than what is in vehicles) or maintenance chemicals stored on any jurisdictional site at any one time. No routine servicing of vehicles used for this project will be permitted on the site. The Conservation Commission will be notified prior to initiating any emergency repairs to vehicles that must take place on the site.

50. **Leaks and Spills**: Any leaks or spills of hazardous material must be cleaned up immediately and disposed of at an appropriate off-site location in accordance with all federal, state, and local requirements and regulations. The Contractor must notify the Conservation Commission within 24 hours of any spillage or leakage of hazardous material, and must maintain an appropriate amount of absorbent on site.

51. **Building Permit Sign Off**: No land alteration, except for installation of erosion control, may begin and no building permit will be signed by the Conservation Office until such time as stipulations 9 and 20 are complied with and evidence of said compliance is received by the Conservation Office.

Attachment B
Fence Installation Plan and Site Photographs




15
17.87'

## Town of Franklin Conservation Commission

# APPLICATION PROCESS SIGNATURE FORM

There are three different applications that can be submitted to undertake work in a jurisdictional area: a Notice of Intent (NOI), a Request for Determination (RDA) and a Minor Buffer Zone Activity (MBZA). All three applications have different criteria for submission and approval and the NOI and RDA are governed by both the state law and the local bylaw. The MBZA is issued under the local bylaw only.

When a potential applicant requests advice from the Conservation Agent on which application to file, the opinion of the Agent is based on the information given by the potential applicant and any other information available to the Agent, e.g. the town's GIS system. The Agent has no legal right to go onto private property at any time until after an application is filed or permission of the property owner is given.

It is important that all applicants understand that after an application is filed, additional information may come to light e.g. via a field inspection or a review of the application, that may impact the scope of the submitted application and the approval process. **Therefore, it is the ultimate responsibility of the applicant to decide which application to file.**

In light of the above, please sign below indicating an understanding of this policy and submit it with the application.

Jaclyn Loslie _____ 3/5/2026 _____

Signature of Property Owner Date