

Arbor View Apartments Residential Development Application for Site Plan Amendment

ARBOR VIEW & THE PINES, LLC
145 LANG ROAD
Portsmouth, New Hampshire
Assessor's Parcel 287-01

Owner/Applicant:

ARBOR VIEW &
THE PINES, LLC

145 LANG ROAD
PORTSMOUTH, NH 03801

AUGUST 6, 2019

Issued:

PLANNING BOARD APPROVAL

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

c/o FOREST PROPERTIES
MANAGEMENT, INC.

625 MOUNT AUBURN STREET, SUITE 210
CAMBRIDGE, MA 02138

CONTACT: ANDERSON LIBERT
(617) 630-9560

Landscape Architect:

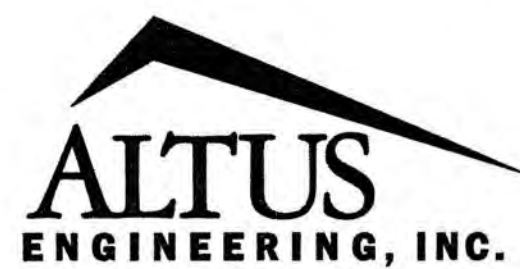


WOODBURN
& COMPANY

Landscape Architecture, LLC

103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

Civil Engineer:



133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

Architect:

McHENRY
ARCHITECTURE

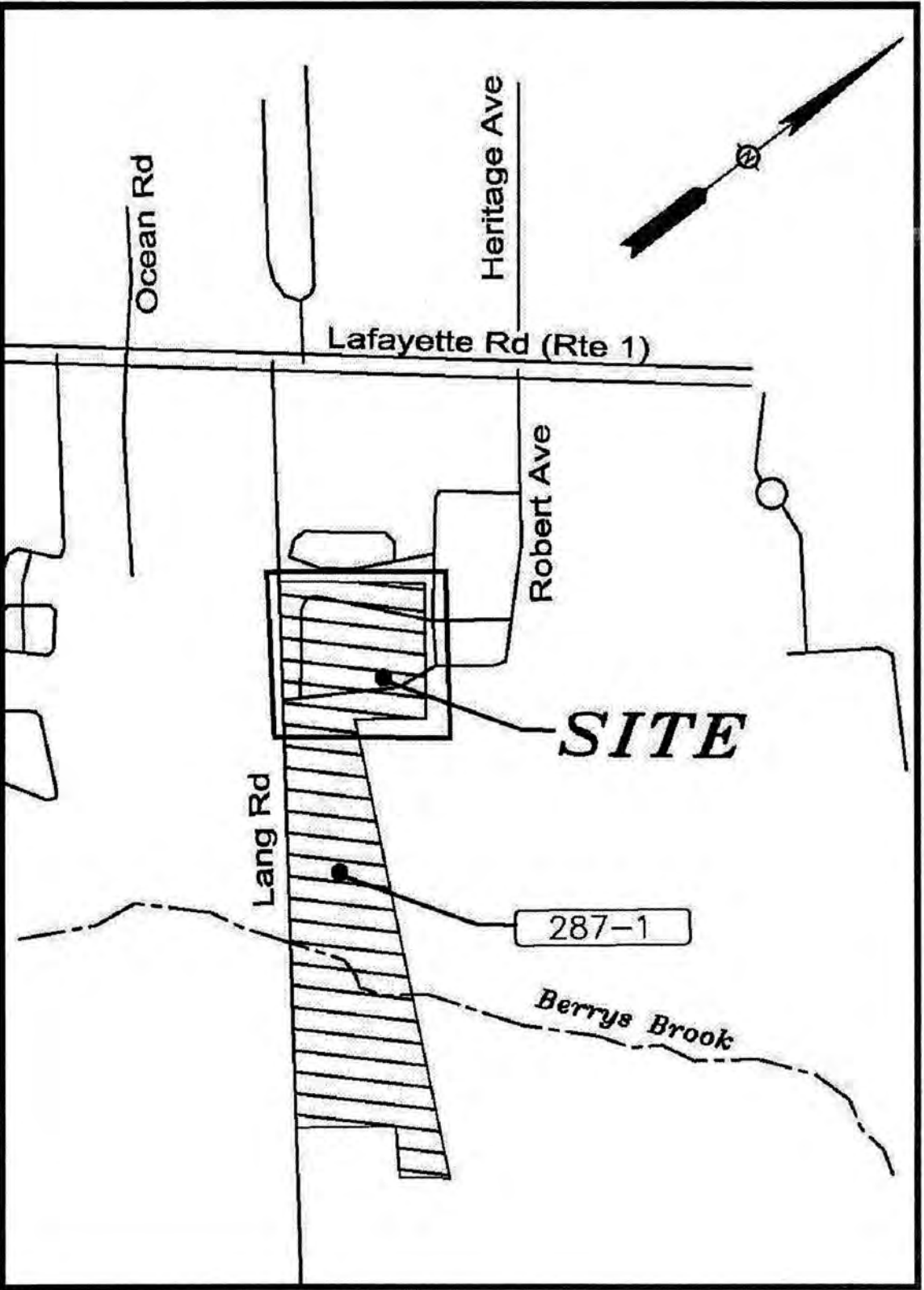
4 Market Street
Portsmouth, New Hampshire
603.430.0274

Surveyor:

James Verra and
Associates, Inc.

LAND SURVEYORS

101 SHATTUCK WAY - SUITE 8
NEWINGTON, N.H. 03801- 7876
603-436-3557



Locus Map

Scale: Not to Scale

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Sheet
No.: *Rev.* *Date*

EC-1 to EC-5	4	05/16/19
GN-1	1	08/06/19
C-1	1	08/06/19
C-2	1	08/06/19
C-3	1	08/06/19
C-4	1	08/06/19
C-5	1	08/06/19
CUP-1	1	08/06/19
CUP-2	1	08/06/19
L-1	0	05/20/19
1 of 1	0	05/13/19
D-1	1	08/06/19
D-2	0	05/20/19
D-3	0	05/20/19
D-4	0	05/20/19
D-5	0	05/20/19
D-6	0	05/20/19
D-7	0	05/20/19
D-8	0	05/20/19
A101 to A103	0	05/07/19
A104 to A106	0	05/07/19
A300	0	05/07/19
A301 to A303	0	05/07/19

Permit Summary

Zoning Variances Granted on Nov. 20, 2018:

- 1) A variance from Section 10.521 to allow a lot area per dwelling unit of 8,321± s.f. where 10,000 s.f. is required
- 2) A variance from Section 10.522 to allow the building lengths of 225' & 170' for a multi-family dwelling where 160' is the maximum allowed.

NOTES:

1. OWNER OF RECORD..... ARBOR VIEW & THE PINES, LLC (65%)
ADDRESS..... C/O FOREST PROPERTIES MANAGEMENT, INC.
625 MOUNT AUBURN ST, SUITE 210
CAMBRIDGE, MA 02138
DEED REFERENCE..... 5934/837
TAX MAP 286 LOTS..... 6 THRU 8, 10, 11, 13, 14, 24
TAX MAP 287 LOTS..... 1, 1-A
2. ZONED..... GA/MH FRONT YARD SETBACK....30'
MINIMUM LOT AREA 5 ACRES SIDE YARD SETBACK.....25'
FRONTAGE..... N/A REAR YARD SETBACK.....25'
3. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.
4. THIS PLAN IS BASED ON A FIELD SURVEY 5/2016 & 2/2019 BY JAMES VERRA AND ASSOC., INC.
5. ELEVATION DATUM: NAVD 1988
PRIMARY BM: CITY CONTROL POINT "ROBE"
COORDINATE SYSTEM: LOCAL PROJECT BASED (NOT NH STATE PLANE COORDINATES)
NOTE: FINAL PROJECT DATA TO BE DELIVERED IN DRAWING FORMAT TO CITY OF PORTSMOUTH REFERENCED TO NH STATE PLANE COORDINATE SYSTEM OF 1983 TO STATISFY CITY REQUIREMENTS.
6. CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE SETTING OR ESTABLISHMENT OF ANY GRADES/ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOC., INC.
7. PARCEL 287-1 & 287-1A ARE SUBJECT TO A UTILITY EASEMENT IN FAVOR OF PUBLIC SERVICE CO. OF NH & NEW ENGLAND TELEPHONE & TELEGRAPH, SEE RCRD BOOK 2528, PAGE 1362.
8. WETLANDS DELINEATION PERFORMED 4/1/2019, 4/2/2019 & 5/13/2019 BY MICHAEL CUOMO, 6 YORK POND RD, YORK, ME 03909, NHCWS# 4. WETLANDS FLAGS SURVEY LOCATED BY JAMES VERRA AND ASSOC., INC.
9. PORTION OF THE SUBJECT PARCEL (AS SHOWN ON SHEET EC-4) LIES IN SPECIAL FLOOD HAZARD AREA ZONE A (NO BASE FLOOD ELEVATIONS DETERMINED) AS SHOWN ON FLOOD INSURANCE RATE MAP 33015CO270E, EFFECTIVE DATE MAY 17, 2005, BY FEMA. THE ZONE LINE SHOWN HEREON WAS TAKEN FROM THE FEMA "DFIRM".

REFERENCE PLANS:

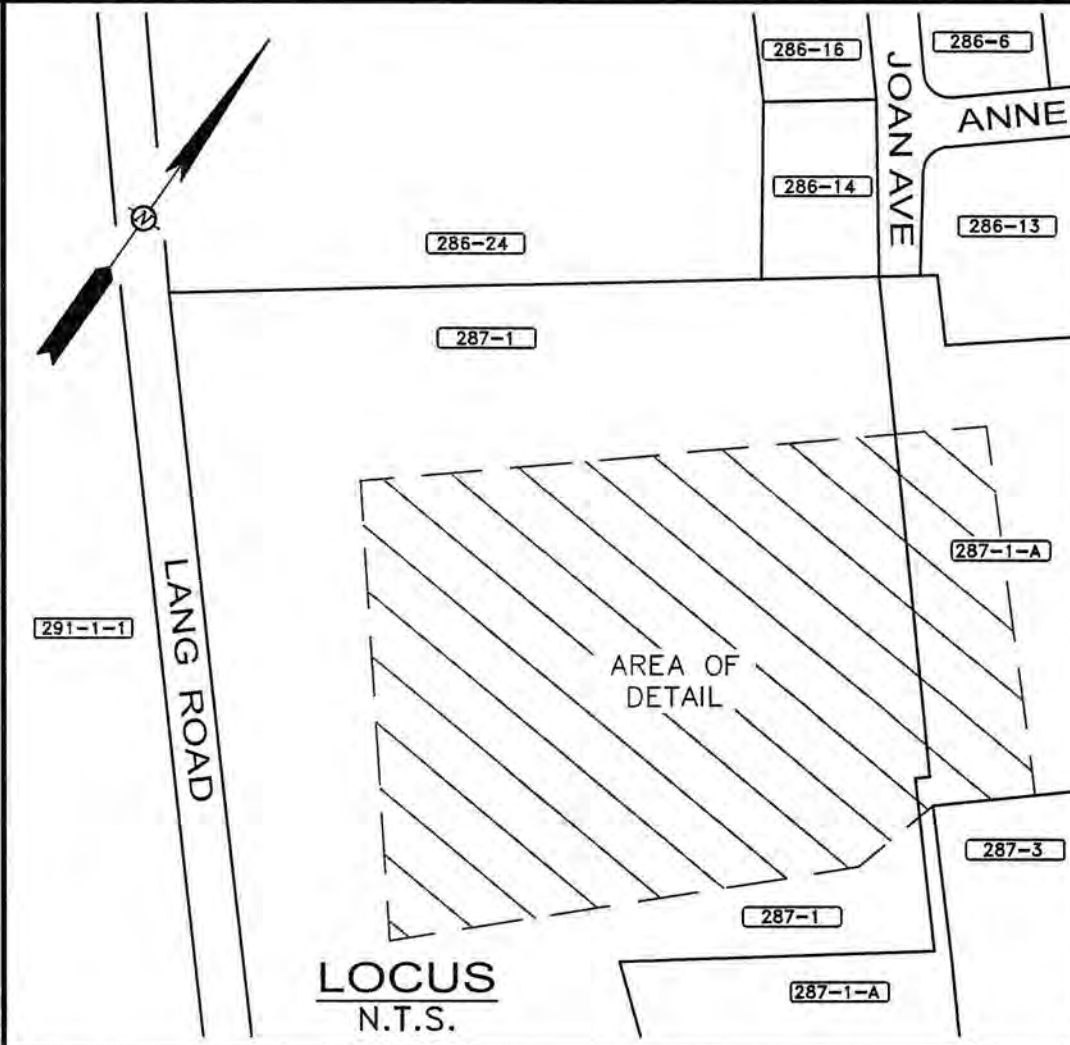
1. ALTA/ACSM LAND TITLE SURVEY, "COLONIAL PINES", PORTSMOUTH, N.H., OWNER: TGM BEECHSTONE, LLC, FOR: FOREST PROPERTIES MANAGEMENT, REVISED TO 7/10/2015, BY JAMES VERRA AND ASSOCIATES, INC., NOT RECORDED.
2. ALTA/ACSM LAND TITLE SURVEY, TAX MAP 287 LOT 1 & 1-A, PROPERTY OF TGM BEECHSTONE LLC, PORTSMOUTH, N.H., DATED 12/4/2014, BY MSC CIVIL ENGINEERS & LAND SURVEYORS, INC., NOT RECORDED.
3. LOT LINE REVISION PLAN, COLONIAL PINES APARTMENTS POOL & AMENITIES PROJECT, 35, 45 & 55 ANNE AVENUE, PORTSMOUTH, N.H., DATED 11/14/2016, RCRD PLAN D-40104.
4. LIMITED EXISTING CONDITIONS PLAN, PROPOSED GROUNDS IMPROVEMENTS, "ARBOR VIEW APARTMENTS", OFF JOAN & ROBERT AVENUES, PORTSMOUTH, N.H., DATED 6/3/2016, BY JAMES VERRA AND ASSOC., INC., NOT RECORDED.
5. REVISED AS BUILT PLAN FOR FORUM DEVELOPMENT, BEECHSTONE-PHASE II, OFF LANG ROAD, PORTSMOUTH, N.H., REVISED TO 2/20/1990, BY RICHARD P. MILLETTE AND ASSOC., NOT RECORDED.

ABUTTERS LIST

MAP-LOT	OWNER OF RECORD	DEED REF.
272-9-7	CEDARS CONDOMINIUM ASSOCIATION WHITE CEDARS BLVD, PORTSMOUTH, NH 03801	DECL: 2566/2219
287-3	CITY OF PORTSMOUTH DPW 680 PEVERLY HILL RD, PORTSMOUTH, NH 03801	2230/277
288-1	CITY OF PORTSMOUTH 1 JUNKINS AVE, PORTSMOUTH, NH 03801	3278/1316
288-1-B	ERIN A. HAYES & JACOB B. WILSON 397 LANG RD, PORTSMOUTH, NH 03801	5953/482
288-7	KARA LAM & COLIN A. MCGEE 387 LANG RD, PORTSMOUTH, NH 03801	3285/2444
288-8	THERESA F. O'CALLAGHAN 379 LANG RD, PORTSMOUTH, NH 03801	5813/304
288-9	MICHAEL G. CORCORAN & SUSAN M. CORCORAN 365 LANG RD, PORTSMOUTH, NH 03801	4505/1454
288-10	LANA M. WOODCOCK & SCOTT B. WOODCOCK 359 LANG RD, PORTSMOUTH, NH 03801	5373/1142
291-1-1	SERVICE CREDIT UNION 3003 LAFAYETTE RD, PORTSMOUTH, NH 03801	N/A

SEWER & DRAIN TABLES

SMH# 5 RIM EL= 46.46 CL INV 8"PVC= 39.52	CB# 5 RIM EL= 44.97 (1) INV IN 12"CMP= 41.57 (2) INV IN 12"CMP= 41.72 (3) INV OUT 18"CMP= 41.42
SMH# 6 RIM EL= 53.09 (1) INV OUT 8"PVC= 47.80	CB# 6 RIM EL= 45.88 (1) INV IN 12"CMP= 40.93 (CLOGGED) (2) INV IN 18"CMP= 40.57 (3) INV IN 8"PVC= 40.60 (4) INV OUT 18"CMP= 40.83
SMH# 7 RIM EL= 50.43 (1) INV IN 8"PVC= 41.15 (2) INV OUT 8"PVC= 40.93	NOTE: INVERTS IN (2) & (3) ARE LOWER THAN INVERT OUT (4) ...
SMH# 8 RIM EL= 49.79 (1) INV IN 8"PVC= 40.40 (2) INV OUT 8"PVC= 40.24	CB# 7 RIM EL= 52.00 (1) INV IN 12"CMP= 48.90 (2) INV IN 12"CMP= 48.72 (3) INV OUT 12"CMP= 48.82
SMH# 9 (PAVED OVER) RIM EL= N/A	CB# 8 RIM EL= 52.10 (1) INV OUT 12"CMP= 49.2±
SMH# 10 RIM EL= 44.18 (1) INV OUT 8"PVC= 38.60	CB# 9 RIM EL= 45.34 (1) INV IN 12"CMP= 42.27 (2) INV OUT 12"CMP= 42.03 NOTE: INVERTS RUSTED OUT ...
SMH# 11 RIM EL= 52.45 (1) INV OUT 8"PVC= 47.93	CB# 10 RIM EL= 42.90 (1) INV IN 8"PVC= 44.68 (2) INV IN 8"PVC= 38.03 (3) INV OUT 6"PVC FM= 44.8±
SEWER PUMP STATION 1 RIM EL= 51.08 (1) INV IN 8"PVC= 44.68 (2) INV IN 8"PVC= 38.03 (3) INV OUT 6"PVC FM= 44.8±	CB# 11 RIM EL= 42.21 (1) INV IN 15"CMP= 39.12 (2) INV IN 12"CMP= 38.89 (3) INV OUT 12"CMP= 38.84
SEWER PUMP STATION 2 RIM EL= 43.87 (1) INV IN 8"PVC= 37.12 (2) INV IN 8"PVC= 37.58 (3) INV OUT 4"PVC FM= 40.0±	



110-5	TAX SHEET - LOT NUMBER
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
EOP	EDGE OF PAVEMENT
SGC	SLOPED FACED GRANITE CURB
RWS	STONE RETAINING WALL
RWW	WOOD RETAINING WALL
—	SIGN
—	UTILITY POLE WITH ARM & LIGHT
—	GUY
—	ELECTRICAL CONDUIT
—	ELECTRICAL BOX
—	ELECTRIC METER
—	CABLE TV RISER
—	TELEPHONE RISER
—	FIRE ALARM RISER
—	GAS SHUT OFF
—	GAS VALVE
—	WATER GATE VALVE
—	WATER SHUT OFF VALVE
—	HYDRANT
—	CATCH BASIN
—	DRAIN MANHOLE
—	SEWER MANHOLE
—	TREE LINE
—	BRUSH LINE
—	CONIFEROUS TREE
—	DECIDUOUS TREE
—	CONIFEROUS SHRUB
—	DECIDUOUS SHRUB
—	WATER LINE
—	SEWER LINE
—	DRAIN LINE
—	GAS LINE
—	FORCE MAIN
—	UNDERGROUND ELECTRIC
—	UNDERGROUND UTILITIES
—	OVERHEAD WIRES
—	OVERHEAD ELECTRIC
—	UNDERGROUND COMMUNICATIONS
—	BOILER WATER LINES
—	CEMENT CONCRETE
—	CRUSHED STONE
—	RETAINING WALL
—	SPOT GRADE

SURVEYOR:

James Verra and Associates, Inc.
LAND SURVEYORS

101 SHATTUCK WAY - SUITE 8
NEWINGTON, N.H. 03801- 7876
603-436-3557
JOB NO: 23678
PLAN NO: 23678-2

ENGINEER:

ALTUS
ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR:

ENGINEERING DESIGN

ISSUE DATE:

MARCH 15, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	ENGINEERING DESIGN	JV	3/15/19
2	ADD MISSING DRAIN LINE	JV	3/25/19
3	ADD WETLANDS, BUILDING, MARKED OUT GAS MAINS, DETAIL @ SNOW PILES & SHEET EC-4	JV	4/5/19
4	ADD SHEET EC-5	JV	5/16/19

DRAWN BY:

JCS

APPROVED BY:

JV

DRAWING FILE:

23678-2.DWG

SCALE:

22" x 34" - 1" = 20'
11" x 17" - 1" = 40'

OWNER/APPLICANT:

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"ARBOR VIEW APARTMENTS" fka "BEECHSTONE APARTMENTS"
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ASSESSOR'S PARCEL 287-1
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RCRD BK. 5934, PG. 837

PROJECT:

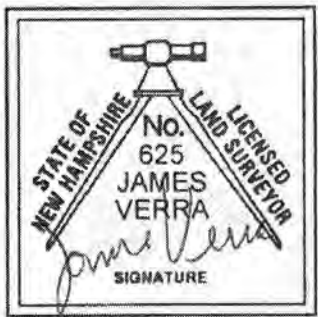
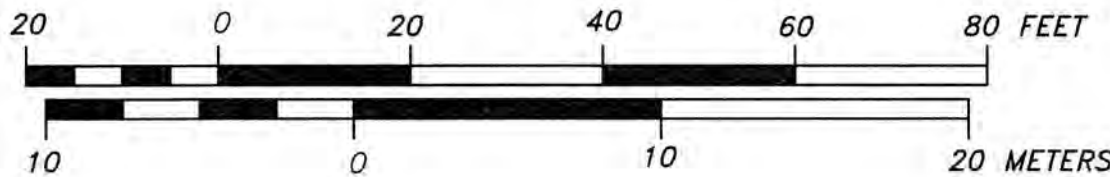
ARBOR VIEW APARTMENTS RESIDENTIAL DEVELOPMENT PROJECT
JOAN AVENUE & LANG ROAD
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 287-1

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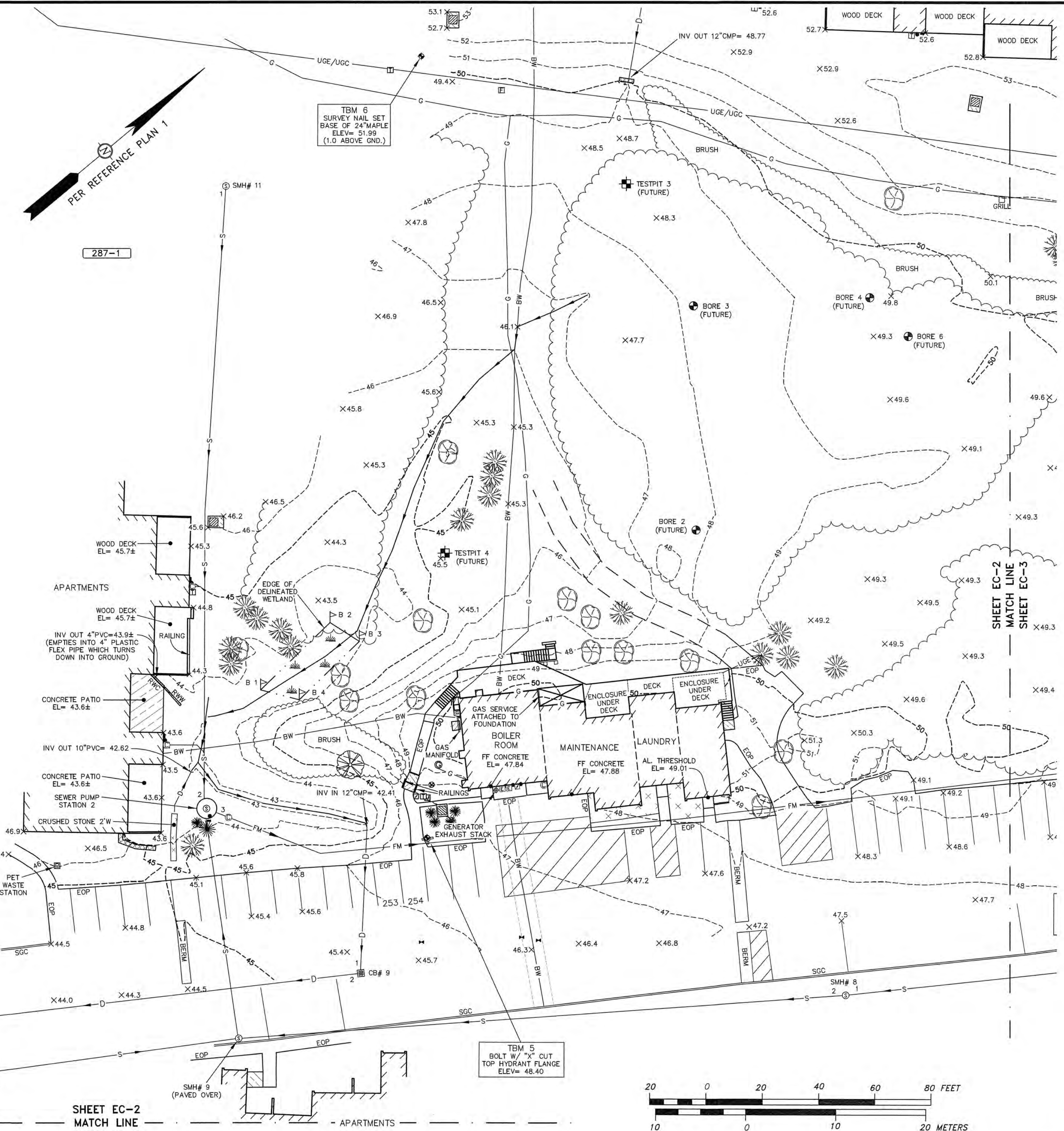
LIMITED EXISTING CONDITIONS PLAN

SHEET NUMBER:

EC-1

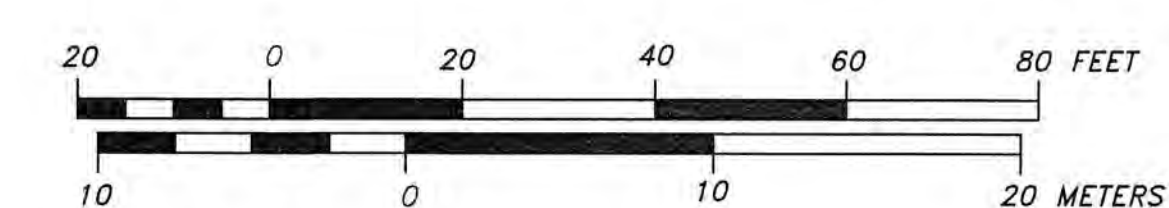


- LEGEND:**
- STONE WALL
 - IRON ROD
 - BOUND as DESCRIBED
 - FENCE
 - 110-5 TAX SHEET - LOT NUMBER
 - RCRD ROCKINGHAM COUNTY REGISTRY OF DEEDS
 - EOP EDGE OF PAVEMENT
 - SGC SLOPED FACED GRANITE CURB
 - RWS STONE RETAINING WALL
 - RWW WOOD RETAINING WALL
 - SIGN
 - UTILITY POLE WITH ARM & LIGHT
 - GUY
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 - DECIDUOUS TREE
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 - DECIDUOUS SHRUB
 - W WATER LINE
 - S SEWER LINE
 - D DRAIN LINE
 - G GAS LINE
 - FM FORCE MAIN
 - UGE UNDERGROUND ELECTRIC
 - UGU UNDERGROUND UTILITIES
 - OHW OVERHEAD WIRES
 - OHE OVERHEAD ELECTRIC
 - UGC UNDERGROUND COMMUNICATIONS
 - BW BOILER WATER LINES
 - CEMENT CONCRETE
 - CRUSHED STONE
 - RETAINING WALL
 - X12.5 SPOT GRADE



LANG ROAD
(A PUBLIC WAY)

SHEET EC-2
MATCH LINE
SHEET EC-4



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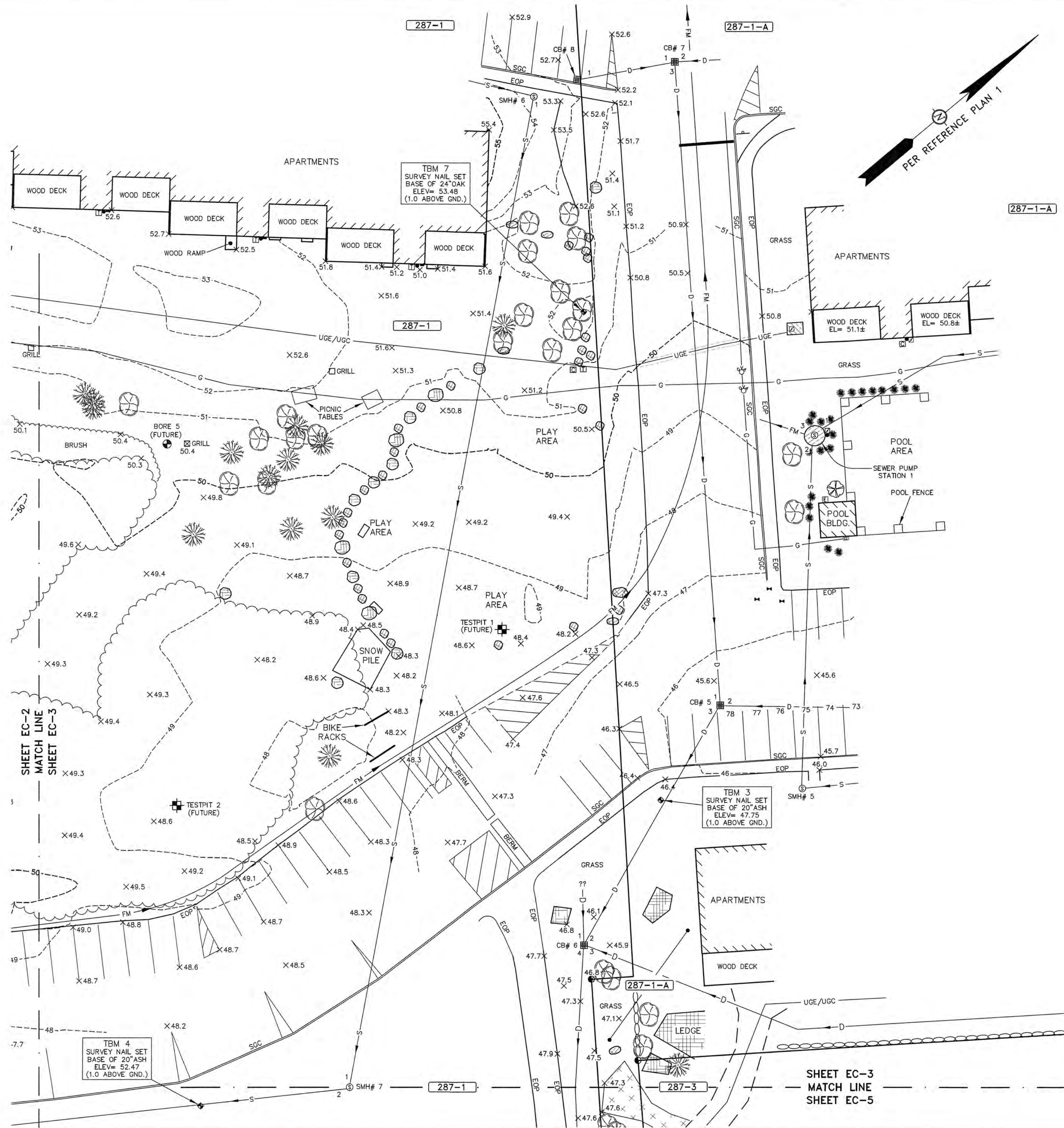
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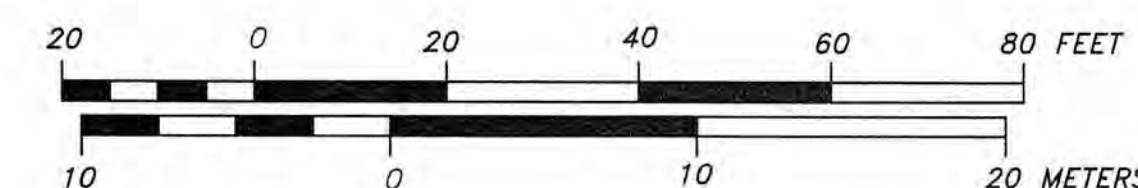
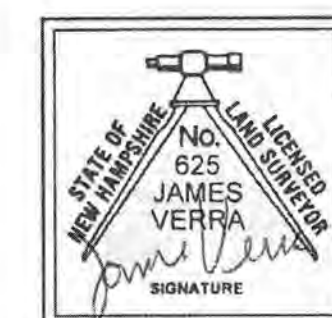
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EC-2

P4787



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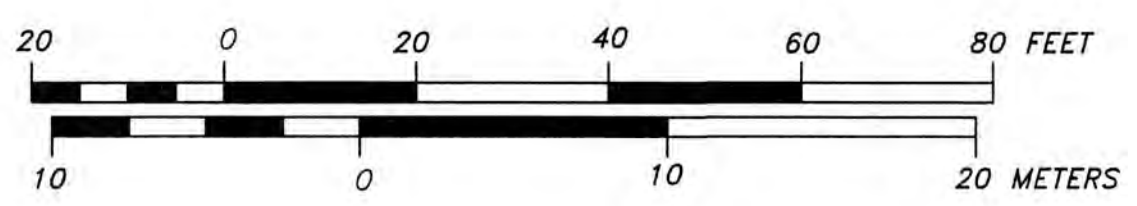
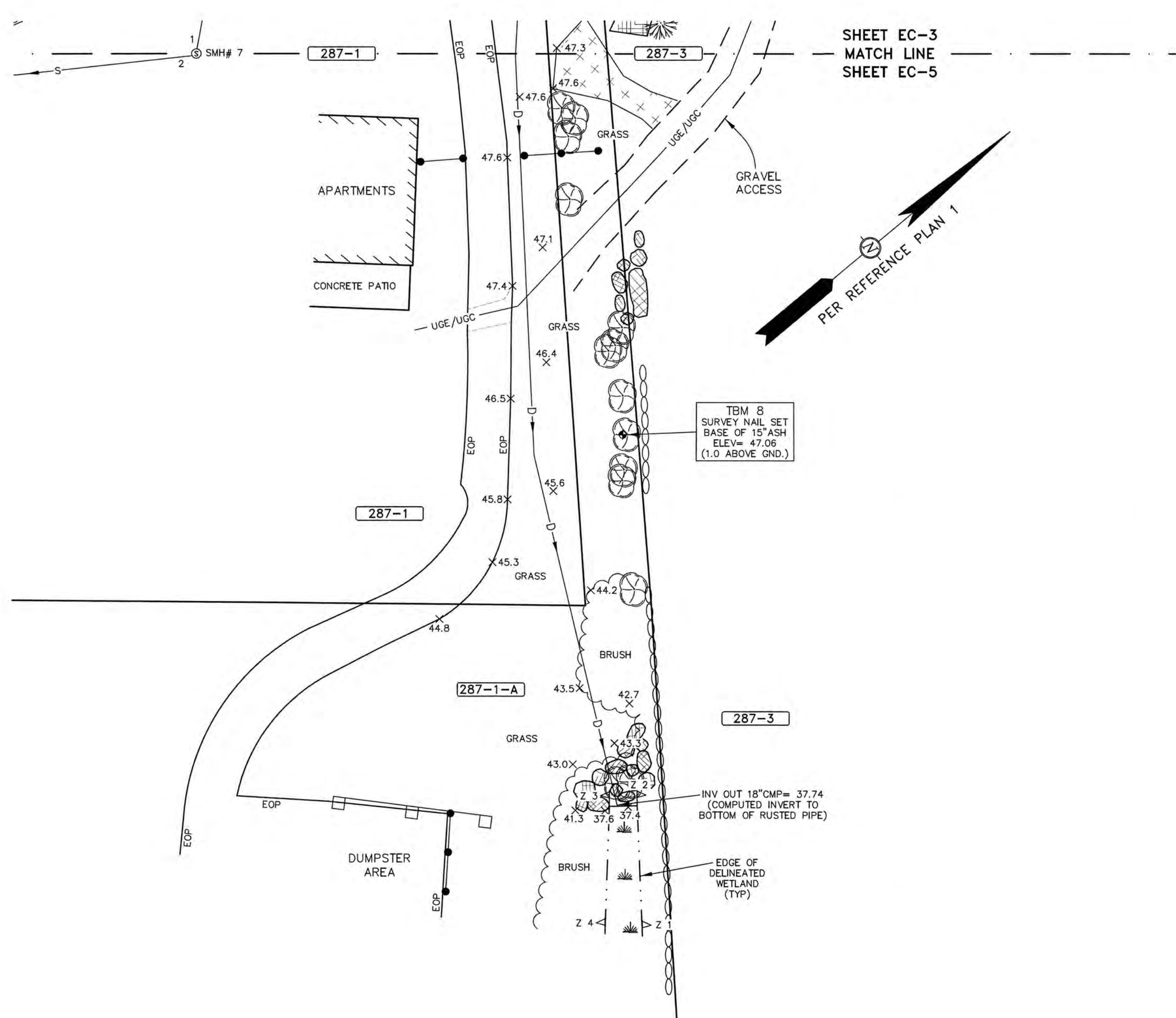
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EC-3

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PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 287-1
c/o FOREST PROPERTIES MANAGEMENT, INC.
625 MOUNT AUBURN ST
SUITE 210
CAMBRIDGE, MA 02138
RCRD BK. 5934, PG. 837

PROJECT:
ARBOR VIEW APARTMENTS RESIDENTIAL DEVELOPMENT PROJECT
JOAN AVENUE & LANG ROAD
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 287-1

TITLE:
LIMITED EXISTING CONDITIONS PLAN

SHEET NUMBER:
EC-5

P4787

DEMOLITION NOTES

1. CONTRACTOR SHALL SAFELY SECURE THE SITE WITH SECURITY FENCING. FENCING SHALL BE LOCKED DURING NON-WORK HOURS.
2. CITY DEMOLITION PERMIT REQUIRED PRIOR TO ANY DEMOLITION ACTIVITIES. CONTRACTOR IS NOTIFIED THAT THIS PERMIT PROCESS MAY REQUIRE A 30-DAY LEAD TIME.
3. CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES SCHEDULED TO REMAIN.
4. THIS DEMOLITION PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR THE DEMOLITION OF EXISTING SITE FEATURES. UNLESS OTHERWISE NOTED TO REMAIN, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL PAVEMENT, CONCRETE, CURBING, SIGNS, POLES, UTILITIES, FENCES, VEGETATION AND OTHER EXISTING FEATURES AS NECESSARY TO FULLY CONSTRUCT THE PROJECT.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY NOTIFICATION OF ALL PARTIES, CORPORATIONS, COMPANIES, INDIVIDUALS AND STATE AND LOCAL AUTHORITIES OWNING AND/OR HAVING JURISDICTION OVER ANY UTILITIES RUNNING TO, THROUGH OR ACROSS AREAS TO BE DISTURBED BY DEMOLITION AND/OR CONSTRUCTION ACTIVITIES WHETHER OR NOT SAID UTILITIES ARE SUBJECT TO DEMOLITION, RELOCATION, MODIFICATION AND/OR CONSTRUCTION.
6. ALL UTILITY DISCONNECTIONS/DEMOLITIONS/RELOCATIONS TO BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES AND THE PORTSMOUTH DEPARTMENT OF PUBLIC WORKS. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELATED EXCAVATION, TRENCHING AND BACKFILLING.
7. ALL STRUCTURES, CURBING, CONCRETE, PAVEMENT AND SUBBASE MATERIALS SHALL BE REMOVED FROM PROPOSED LANDSCAPE AREAS AND REPLACED WITH LOAM MATERIALS SUITABLE FOR LANDSCAPE AND/OR STORMWATER MANAGEMENT PURPOSES AND MEETING THE PROJECT SPECIFICATIONS.
8. WHERE SPECIFIED TO REMAIN, MANHOLE RIMS, CATCH BASIN GRATES, VALVE COVERS, HANDHOLES, MONITORING WELLS, ETC. SHALL BE ADJUSTED TO FINISH GRADE.
9. NO BURNING SHALL BE PERMITTED PER LOCAL REGULATIONS.
10. HAZARDOUS MATERIALS ENCOUNTERED DURING DEMOLITION AND CONSTRUCTION ACTIVITIES SHALL BE ABATED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL REGULATIONS.
11. SEE EROSION CONTROL PLANS FOR EROSION CONTROL REQUIREMENTS TO BE IN PLACE PRIOR TO START OF DEMOLITION ACTIVITIES, INCLUDING, BUT NOT LIMITED TO; SILT FENCING, STABILIZED CONSTRUCTION SITE EXITS, AND STORM DRAIN INLET PROTECTION.
12. ALL DEMOLISHED MATERIALS OR MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS SPECIFIED.
13. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BE LEGALLY DISPOSED IN ACCORDANCE WITH ALL LOCAL, STATE, & FEDERAL REGULATIONS AND CODES.
14. LEDGE REMOVAL MAY BE REQUIRED ON THE PROJECT. THE CONTRACTOR SHALL PROVIDE THE CITY WITH A LEDGE REMOVAL PLAN. IF BLASTING IS TO BE PERFORMED, ALL STATE AND LOCAL REQUIREMENTS SHALL BE COMPLIED WITH. NO BLASTING IS ALLOWED WITHOUT A BLAST SURVEY BEING COMPLETED PRIOR TO.
16. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL DISCONNECTIONS/INSTALLATIONS WITH EVERSOURCE. CONTACT NICK KOSKO @ 603-332-4227, EXT. 5555334
17. CONTRACTOR SHALL COORDINATE ALL NATURAL GAS DISCONNECTIONS/INSTALLATIONS WITH UNTIL CORPORATION. CONTACT DAVID BEAULIEU @ 603-294-5144
18. CONTRACTOR SHALL COORDINATE ALL CABLE DISCONNECTIONS/INSTALLATIONS WITH COMCAST. CONTACT MIKE COLLINS @ 603-679-5695 EXT 1037
19. CONTRACTOR SHALL COORDINATE ALL TELE-COMMUNICATION DISCONNECTIONS AND INSTALLATION WITH FAIRPOINT COMMUNICATIONS. CONTACT JOE CONSIDINE @ 603-427-5525

SITE NOTES

1. ON NOVEMBER 20, 2018 THE PORTSMOUTH BOARD OF ADJUSTMENT GRANTED THE FOLLOWING:
A VARIANCE FROM SECTION 10.521 TO PROVIDE ONE UNIT PER ±8,321 SF WHERE 10,000 SF IS REQUIRED;
A VARIANCE FROM SECTION 10.522 TO ALLOW TWO NEW APARTMENT BUILDINGS OF 170 FEET± AND 225 FEET± IN LENGTH FOR A MULTI-FAMILY DWELLING WHERE 160-FEET IS THE MAXIMUM ALLOWED.
2. TWO BICYCLE RACKS WILL BE PROVIDED, ONE IN FRONT OF EACH BUILDING.
3. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
4. ALL CONDITIONS OF THIS APPROVAL SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
5. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
6. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
7. THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
8. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PRIOR TO CONSTRUCTION. ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER FOR RESOLUTION.
9. AREA OF DISTURBANCE OVER 43,560 SF, COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT REQUIRED (NOI TO BE PREPARED AND SUBMITTED BY CONTRACTOR, SWPPP AND INSPECTIONS TO BE PREPARED AND PERFORMED BY CONTRACTOR). SITEWORK ACTIVITIES UNDER 100,000 SF. NHDES ALTERATION OF TERRAIN PERMIT NOT REQUIRED.
10. SNOW SHALL BE STORED AT THE EDGE OF PAVEMENT, IN UPLAND AREAS SHOWN THEREON. NO SNOW STORAGE SHALL BE PROVIDED IN THE LANDSCAPED ISLAND BETWEEN THE DRIVEWAY ENTRANCE AND EXIT THAT WOULD RESTRICT SITE VEHICULAR AND PEDESTRIAN SIGHT DISTANCE. IF ADEQUATE ON-SITE SNOW STORAGE IS NOT AVAILABLE, THE SNOW SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED.
11. PAVEMENT MARKINGS SHALL BE CONSTRUCTED USING WHITE, YELLOW, OR BLUE TRAFFIC PAINT (WHERE SPECIFIED) MEETING THE REQUIREMENTS OF AASHTO M248, TYPE F OR EQUAL. PAINTED ISLANDS AND LOADING ZONES SHALL BE 4"-WIDE DIAGONAL WHITE LINES 3'-0" O.C. BORDERED BY 4"-WIDE WHITE LINES. PARKING STALLS SHALL BE SEPARATED BY 4"-WIDE WHITE LINES. SEE DETAILS FOR HANDICAP SYMBOLS, SIGNS AND SIGN DETAILS. PAVEMENT MARKINGS SHALL BE INSTALLED AT LEAST 14-DAYS AFTER INSTALLATION OF WEARING COURSE PAVEMENT. CONTRACTOR SHALL APPLY TWO (2) COATS OF ALL PAVEMENT MARKINGS.
12. PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC DEVICES," "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" AND THE AMERICANS WITH DISABILITIES ACT (ADA), LATEST EDITIONS.
13. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS PRIOR TO CONSTRUCTION. ANY AND ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF BOTH THE ARCHITECT AND CIVIL ENGINEER FOR RESOLUTION.
14. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
15. THE SITE PLAN PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
17. SITEWORK CONTRACTOR SHALL PREPARE A LICENSED LAND SURVEYOR (LLS) STAMPED AS-BUILT SITE PLAN & PROVIDE A DIGITAL (CAD FORMAT) COPY FOR THE CITY'S G.I.S. DATA BASE.
18. THE PROPOSED LIGHTING SHALL BE DARK SKY FRIENDLY.

GRADING AND DRAINAGE NOTES

1. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL FIELD VERIFY LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES SCHEDULED TO REMAIN.
2. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION
3. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL READ AND FAMILIARIZE THEMSELVES WITH THE PROJECT GEOTECHNICAL REPORT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING ALL THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT.
4. DEWATERING ACTIVITIES SHALL BE DONE IN ACCORDANCE WITH EPA AND NHDES REGULATIONS AND GUIDELINES.
5. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES AREA SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS DEGREE OF INSULATION AGAINST FREEZING.
6. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
7. ALL STORM DRAIN PIPE SHALL BE ADS N-12 OR EQUAL AND APPROVED BY THE ENGINEER.
8. ALL CATCH BASIN, GATE VALVE COVERS, AND MANHOLE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISHED GRADE. ANY RIM OR VALVE COVER ABOVE SURROUNDING FINISHED GRADE WILL NOT BE ACCEPTED.
9. ALL CATCH BASINS SHALL BE PRECAST, LOCATED IN PAVEMENT AREAS, H-20 LOADING AND BE EQUIPPED WITH 4-FOOT DEEP MIN SEDIMENTATION SUMPS AND GREASE HOODS. (SEE DETAILS)
10. ALL SPOT GRADES ARE AT THE FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
11. UNLESS OTHERWISE SPECIFIED, RETAINING WALL AND BUILDING PERIMETER DRAINS SHALL BE DIRECTED TO THE NEAREST DRAINAGE STRUCTURE. IF DEEMED APPROPRIATE, CONTRACTOR SHALL PROVIDE ADDITIONAL UNDERDRAINS AT THE DIRECTION OF THE ENGINEER.
12. CONTRACTOR SHALL PROTECT ALL RAINGARDENS FROM CONSTRUCTION STORMWATER RUNOFF. TEMPORARY SEDIMENT BASINS SHALL BE CONSTRUCTED DURING CONSTRUCTION. STORMWATER SHALL NOT BE DIRECTED TO THE RAINGARDENS UNTIL THE WATERSHED ARE HAS BEEN STABILIZED.

UTILITY NOTES

1. ALL WATER MAIN INSTALLATIONS AND SERVICE CONNECTIONS SHALL CONFORM TO PORTSMOUTH WATER DEPARTMENT STANDARDS. WATER MAIN SHALL BE WRAPPED WITH A WATER TIGHT POLYETHYLENE WRAPPING. ALL JOINTS SHALL HAVE THREE (3) WEDGES PER JOINT.
2. ALL SEWER INSTALLATIONS AND SERVICE CONNECTIONS SHALL CONFORM TO PORTSMOUTH WATER AND SEWER DEPARTMENT STANDARDS. CONTRACTOR SHALL CONTACT PORTSMOUTH DPW FOR TESTING OF SEWER LINES.
3. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE, LOCAL, AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED. CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH ALL PERMIT CONDITIONS AND REQUIREMENTS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR POSTING OF ALL BONDS AND PAYMENT OF ALL TAP, TIE-IN AND CONNECTION FEES.
5. FIRE ALARM PANEL SHALL BE MONITORED THROUGH A THIRD-PARTY SECURITY COMPANY. CONTRACTOR SHALL COORDINATE ALL PANEL LOCATIONS AND INTERCONNECTIONS WITH FIRE DEPARTMENT.
6. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATION DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE APPLICANT SHALL BE REQUIRED TO PAY FOR THE SITE SURVEY WHETHER OR NOT THE SURVEY INDICATES A REPEATER IS NECESSARY. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY. THE SURVEY SHALL BE COMPLETED AND THE REPEATER, IF DETERMINED IT IS REQUIRED, SHALL BE INSTALLED PRIOR TO THE ISSUANCE OF CERTIFICATE OF OCCUPANCY.
7. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL CONFORM TO FEDERAL OSHA AND CITY REGULATIONS.
8. SITEWORK CONTRACTOR SHALL COORDINATE ALL WORK WITH MECHANICAL DRAWINGS.
9. SEE ARCHITECTURAL/MECHANICAL DRAWINGS FOR EXACT LOCATIONS & ELEVATIONS OF UTILITY CONNECTIONS AT BUILDINGS. COORDINATE ALL WORK WITHIN FIVE (5) FEET OF BUILDINGS WITH BUILDING CONTRACTOR AND ARCHITECTURAL/MECHANICAL DRAWINGS. ALL CONFLICTS AND DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY AND PRIOR TO COMMENCING RELATED WORK.
10. FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES AND THE ARCHITECT.
11. CONTRACTOR SHALL COORDINATE ALL TELECOMMUNICATIONS INSTALLATIONS WITH FAIRPOINT COMMUNICATIONS.
12. CONTRACTOR SHALL COORDINATE ALL CABLE INSTALLATIONS WITH COMCAST.
13. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL INSTALLATIONS WITH EVERSOURCE. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL, 48-HOUR MINIMUM NOTICE REQUIRED.
14. TRANSFORMER SHALL BE PAD MOUNTED. COORDINATE WITH ARCHITECT & EVERSOURCE.
15. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
16. CONTRACTOR SHALL CONTACT CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS AT 603-427-1530 TO COORDINATE INSPECTION OF SEWER WORK.
17. THE TESTING OF THE MUNICIPAL SEWER INFRASTRUCTURE IMPROVEMENTS SHALL BE UNDER THE SUPERVISION OF THE PORTSMOUTH DEPARTMENT OF PUBLIC WORKS (DPW).

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

GENERAL NOTES

1. THE INTENT OF THIS PLAN SET IS TO PROVIDE THE NECESSARY INFORMATION FOR THE REVIEW, PERMITTING AND REDEVELOPMENT OF 145 LANG ROAD. THESE PLANS PROVIDE DETAILED INFORMATION FOR THE SITE LAYOUT, GRADING, UTILITIES, STORMWATER MANAGEMENT, AND LANDSCAPE IMPROVEMENTS. THE PROJECT INTENDS TO IMPLEMENT TWO NEW 3-STORY MULTI-FAMILY BUILDINGS.
2. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE, LOCAL AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED. THE LANDOWNER AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH LOCAL, STATE AND FEDERAL WETLAND PERMITTING REQUIREMENTS INCLUDING PROTECTION OF NATURAL RESOURCES AND THEIR BUFFERS.
3. CONTRACTOR SHALL CALL DIG SAFE AT 1 (800) DIG-SAFE AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO COMMENCING CONSTRUCTION.
4. CONTRACTOR SHALL NOTIFY CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
5. CONTRACTOR SHALL INSTALL AND MAINTAIN A TEMPORARY SECURITY FENCE AROUND THE PERIMETER OF THE WORK AREA THROUGHOUT CONSTRUCTION.
6. CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY SEDIMENT AND EROSION CONTROL ITEMS TO PREVENT SEDIMENT FROM CONSTRUCTION ACTIVITIES FROM LEAVING THE SITE. CONTROLS SHALL BE INSPECTED ON A REGULAR BASIS AND AFTER ALL RAIN EVENTS OF 0.25 INCHES OR GREATER. ANY DEFICIENCIES IN THE CONTROLS SHALL BE ADDRESSED IMMEDIATELY AND BROUGHT TO THE ATTENTION OF THE OWNER. ALL STORMS DRAINS WITHIN OR ADJACENT TO THE WORK AREA, WITH THE POTENTIAL TO RECEIVE RUNOFF FROM EXPOSED CONSTRUCTION AREAS, SHALL RECEIVE STORM DRAIN INLET PROTECTION.
7. CONTRACTOR SHALL PREVENT TRACKING OF DIRT ONTO ANY PUBLIC OR PRIVATE ROADWAYS. IF TRACKING OF DIRT FROM CONSTRUCTION VEHICLES IS PRESENT ON THE OPEN STREETS, CONTRACTOR WILL BE REQUIRED TO SWEEP THE ROADWAY AT NO ADDITIONAL EXPENSE TO THE OWNER.
8. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL THE CONTRIBUTING ARE IS STABILIZED.

ZONING SUMMARY

ZONING DISTRICT GA/MH (MAXIMUM LOT COVERAGE = 50%)

LOT 287-01

	REQUIRED 5.0 Acres (217,800 SF)	EXISTING 35.53 Acres (1,547,700 SF)	PROPOSED 35.53 Acres
LOT AREA			
LOT AREA PER DWELLING (DENSITY) SF	10,000 SF	10,673 SF	8,321±
NUMBER OF UNITS	154 (ALLOWED)	145	186*
MINIMUM YARDS DIMENSIONS			
FRONT	30 FT	71 FT	71 FT
SIDE/REAR	25 FT	25 FT	35 FT
MAXIMUM STRUCTURE DIMENSIONS			
HEIGHT	35 FT	N/A	33.5± FT
COVERAGE	20%	4.1%	5.0%
LENGTH (MULTI-FAMILY DWELLING)	160 FT	285 FT±	225 FT±*
OPEN SPACE	50%	87%±	85%±

PARKING CALCULATIONS

PER ZONING REGULATION 10.1110 FOR MULTI-FAMILY BUILDINGS

1.3 STALLS PER UNIT	=	245 STALLS
VISITOR PARKING 1 STALL PER 5 UNIT	=	38 STALLS
MINIMUM STALLS ALLOWED ALLOWED	=	283 STALLS
MAXIMUM ALLOWABLE STALLS (120% MIN)	=	340 STALLS

PROVIDED = 366 STALLS**

* SEE SITE NOTE 1

** CONDITIONAL USE PERMIT FOR PARKING IS REQUIRED TO EXCEED 120% OF MAXIMUM ALLOWABLE PARKING SPACES.

ENGINEER:

ALTUS
ENGINEERING, INC.

133 COURT STREET
(603) 433-2335

PORTSMOUTH, NH 03801
www.ALTUS-ENG.com



ISSUED FOR:

PLANNING BOARD APPROVAL

ISSUE DATE:

AUGUST 6, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	05/20/19
1	TAC COMMENTS	CDB	08/06/19

DRAWN BY:

RLH

APPROVED BY:

EDW

DRAWING FILE:

4787-DETAILS.DWG

SCALE:

22" x 34" - N.T.S.

11" x 17" - N.T.S.

OWNER OF RECORD:

ARBOR VIEW & THE PINES, LLC
C/O FOREST PROPERTIES MGMT.
625 MOUNT AUBURN STREET
CAMBRIDGE, MA 02138

APPLICANT:

FOREST PROPERTIES MGMT. INC.
625 MOUNT AUBURN STREET
CAMBRIDGE, MA 02138

PROJECT:

ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT

145 LANG ROAD
PORTSMOUTH, NH

TAX MAP 287, LOT 01

TITLE:

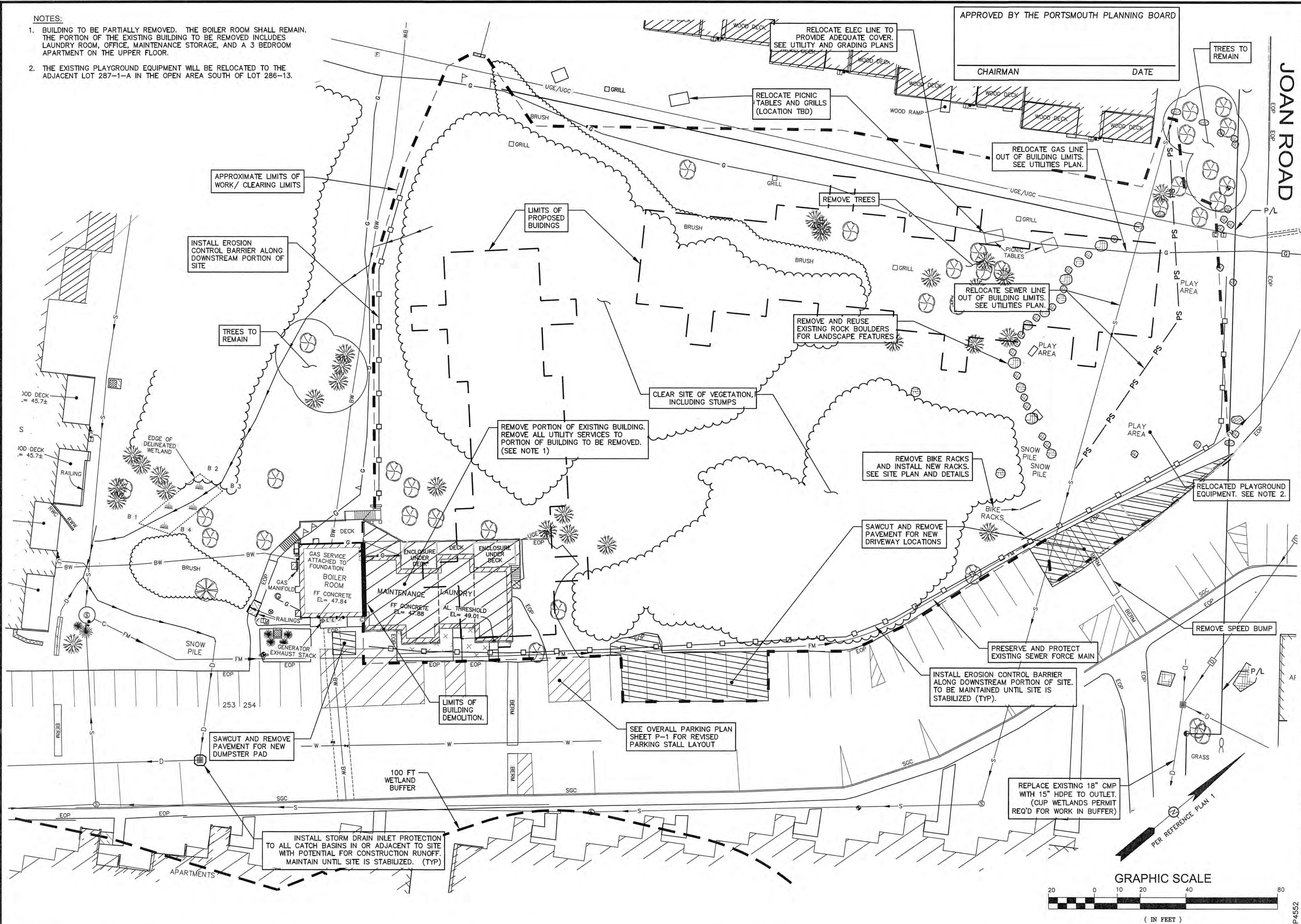
GENERAL NOTES

SHEET NUMBER:

GN-1

NOTES:

1. BUILDING TO BE PARTIALLY REMOVED. THE BOILER ROOM SHALL REMAIN. THE PORTION OF THE EXISTING BUILDING TO BE REMOVED INCLUDES LAUNDRY ROOM, OFFICE, MAINTENANCE STORAGE, AND A 3 BEDROOM APARTMENT ON THE UPPER FLOOR.
2. THE EXISTING PLAYGROUND EQUIPMENT WILL BE RELOCATED TO THE ADJACENT LOT 287-1-A IN THE OPEN AREA SOUTH OF LOT 286-13.



ENGINEER:

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133 COURT STREET PORTSMOUTH, NH 03801
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ISSUED FOR:
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ISSUE DATE:
AUGUST 6, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	CDB	05/20/19
1	TAC COMMENTS	CDB	08/06/19

DRAWN BY: CDB
APPROVED BY: EDW
DRAWING FILE: 4787.2_SITE.DWG

SCALE:
22" x 34" - 1" = 20'
11" x 17" - 1" = 40'

OWNER OF RECORD:
ARBOR VIEW & THE PINES LLC.
C/O FOREST PROPERTIES MGMT
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

APPLICANT:
FOREST PROPERTIES MGMT INC.
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

PROJECT:
**ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT**
145 LANG ROAD
PORTSMOUTH, NH
TAX MAP 287, LOT 01

TITLE:
**DEMOLITION
PLAN**

SHEET NUMBER:
C-2

ZONING SUMMARY:

SEE GENERAL NOTES SHEET GN-1 FOR ZONING TABLE

THE FOLLOWING VARIANCES WERE GRANTED BY THE ZONING BOARD OF ADJUSTMENT IN NOVEMBER 20, 2018:

- SECTION 10.521- TO PROVIDE ONE UNIT PER 8,321 SF WHERE 10,000 IS REQUIRED. DENSITY CALCULATIONS BASED ON PARCEL SIZE OF 35.53 ACRES. NUMBER OF UNITS REQUESTED IS 186.
- SECTION 10.522 - CONSTRUCT A NEW 225 FT AND 170 FOOT LENGTH MULTI-FAMILY BUILDING WHERE 160 FEET IS ALLOWED. FOUR OF THE EXISTING MULTI-FAMILY BUILDINGS ON SITE ARE 285 FEET IN LENGTH.

PARKING CALCULATIONS:

PER ZONING REGULATION 10.1110 FOR MULTI-FAMILY BUILDINGS

186 UNITS X 1.3 STALLS PER UNIT = 242 STALLS
VISITOR PARKING 1 STALL PER 5 UNITS = 38 STALLS
MINIMUM STALLS ALLOWED = 280 STALLS
MAXIMUM ALLOWABLE STALLS (120% MIN) = 336 STALLS

TOTAL STALLS PROVIDED = 366 STALLS*

* CONDITIONAL USE PERMIT FOR PARKING REQUIRED.
SEE CONDITIONAL USE PARKING PLAN, SHEET CUP-1 FOR FULL SITE PARKING LAYOUT

BICYCLE PARKING:

TWO VISITOR BICYCLE RACKS ARE PROVIDED AT EACH BUILDING.
PER SECTION 10.1116, ONE BICYCLE PARKING SPACE PER 5 UNITS.
9 BICYCLE SPACES REQUIRED, 10 SPACES PROVIDED.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

JOAN ROAD

ENGINEER:
ALTUS
ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com



ISSUED FOR:
PLANNING BOARD APPROVAL

ISSUE DATE:
AUGUST 6, 2019

REVISIONS:
NO. DESCRIPTION BY DATE
0 INITIAL SUBMISSION EDW 05/20/19
1 TAC COMMENTS CDB 08/06/19

DRAWN BY: CDB
APPROVED BY: EDW
DRAWING FILE: 4787.2_SITE.DWG

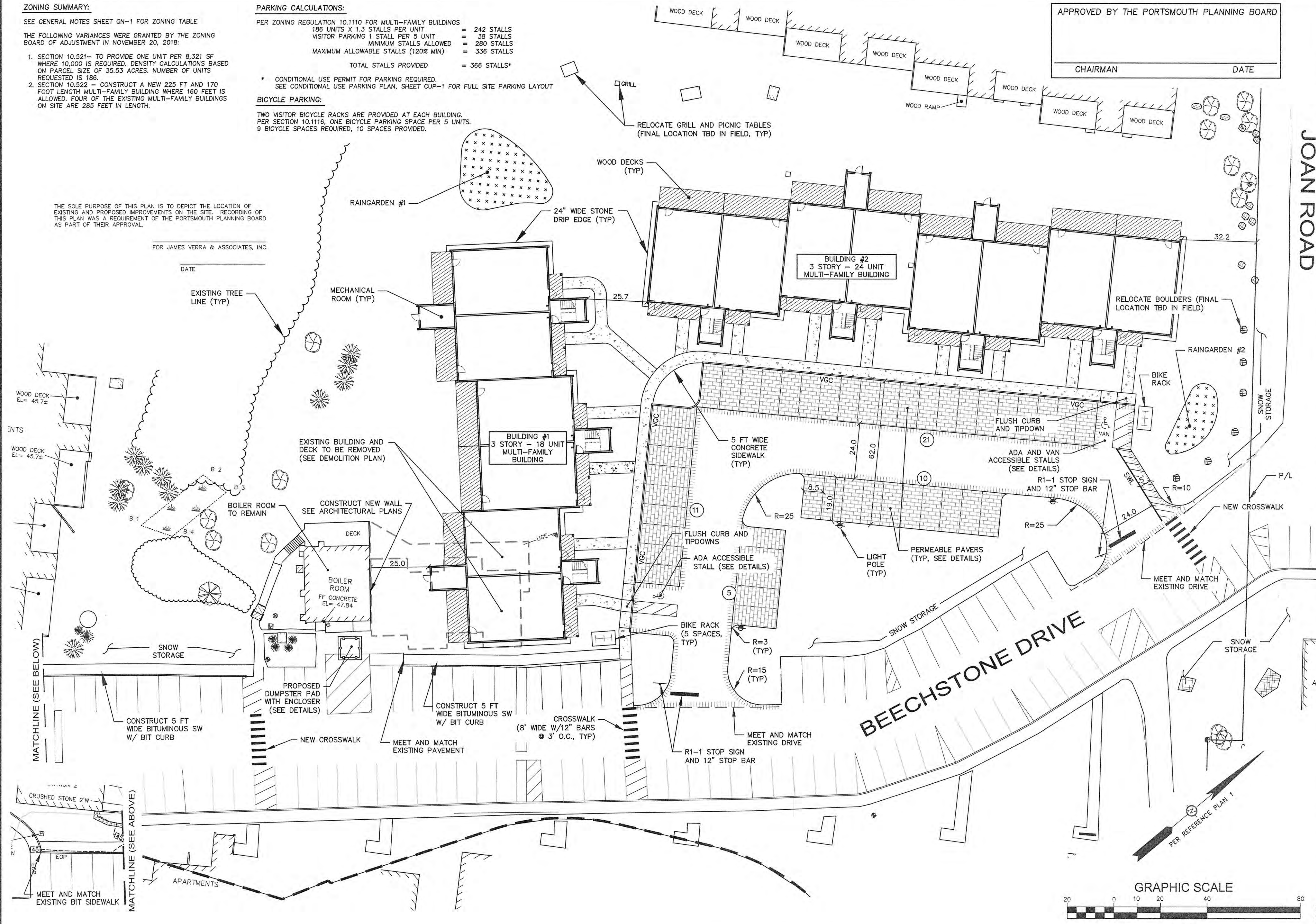
SCALE:
22" x 34" - 1" = 20'
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APPLICANT:
FOREST PROPERTIES MGMT INC.
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

PROJECT:
ARBOR VIEW APARTMENTS RESIDENTIAL DEVELOPMENT
145 LANG ROAD
PORTSMOUTH, NH
TAX MAP 287, LOT 01

TITLE:
SITE PLAN

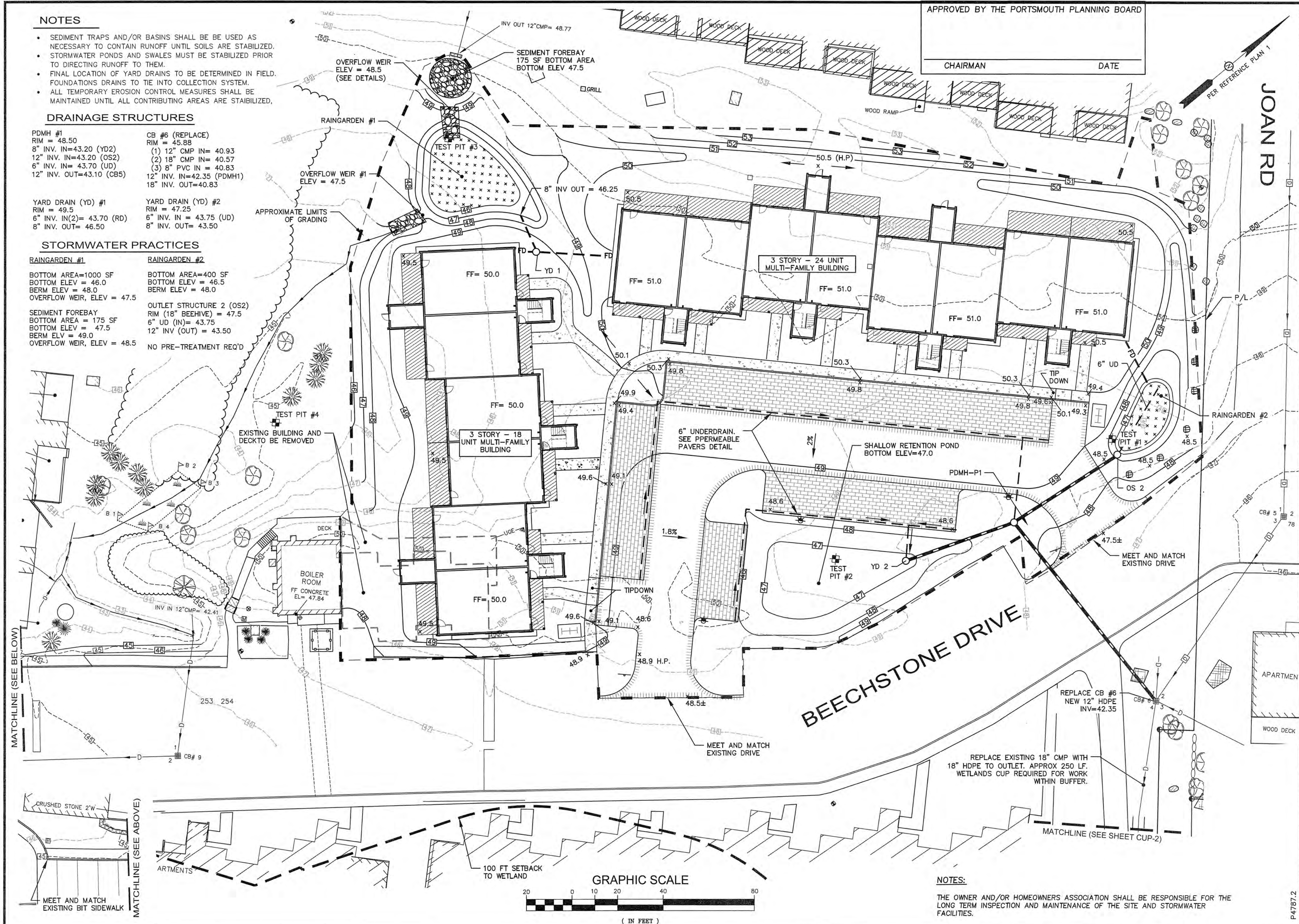
SHEET NUMBER:
C-3



- SEDIMENT TRAPS AND/OR BASINS SHALL BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.
- STORMWATER PONDS AND SWALES MUST BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
- FINAL LOCATION OF YARD DRAINS TO BE DETERMINED IN FIELD. FOUNDATIONS DRAINS TO TIE INTO COLLECTION SYSTEM.
- ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL ALL CONTRIBUTING AREAS ARE STABILIZED,

PDMH #1	CB #6 (REPLACE)
RIM = 48.50	RIM = 45.88
8" INV. IN=43.20 (YD2)	(1) 12" CMP IN= 40.93
12" INV. IN=43.20 (OS2)	(2) 18" CMP IN= 40.57
6" INV. IN= 43.70 (UD)	(3) 8" PVC IN = 40.83
12" INV. OUT=43.10 (CB5)	12" INV. IN=42.35 (PDMH1)
	18" INV. OUT=40.83

RAINGARDEN #1	RAINGARDEN #2
BOTTOM AREA=1000 SF	BOTTOM AREA=400 SF
BOTTOM ELEV = 46.0	BOTTOM ELEV = 46.5
BERM ELEV = 48.0	BERM ELEV = 48.0
OVERFLOW WEIR, ELEV = 47.5	
SEDIMENT FOREBAY	OUTLET STRUCTURE 2 (OS2)
BOTTOM AREA = 175 SF	RIM (18" BEEHIVE) = 47.5
BOTTOM ELEV = 47.5	6" UD (IN) = 43.75
BERM ELV = 49.0	12" INV (OUT) = 43.50
OVERFLOW WEIR, ELEV = 48.5	NO PRE-TREATMENT REQ'D



THE OWNER AND/OR HOMEOWNERS ASSOCIATION SHALL BE RESPONSIBLE FOR THE LONG TERM INSPECTION AND MAINTENANCE OF THE SITE AND STORMWATER FACILITIES.



ALTUS
ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com



ISSUE DATE: AUGUST 6, 2019

REVISIONS			
NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	05/20/19
1	TAC COMMENTS	EDW	08/06/19

DRAWN BY: _____ CDB
APPROVED BY: _____ EDW
DRAWING FILE: _____ 4787.2_SITE.DWG

SCALE:

$$\begin{array}{r} 22'' \times 34'' - 1'' = 20' \\ 11'' \times 17'' - 1'' = 40' \end{array}$$

OWNER OF RECORD:
ARBOR VIEW & THE PINES LLC.
C/O FOREST PROPERTIES MGMT
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

APPLICANT:
FOREST PROPERTIES MGMT INC.
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

PROJECT:

ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT

145 LANG ROAD
PORTSMOUTH, NH

TITLE:

GRADING AND
DRAINAGE PLAN

SHEET NUMBER:

C-4

SEWER STRUCTURES

PROPOSED SEWER MH #1
RIM = 52.1
8" INV. IN = 46.70 (VIF)
8" INV. OUT = 46.20

PROPOSED SEWER MH #2
RIM = 50.2
8" INV. IN = 45.10
8" INV. OUT = 45.00

PROPOSED SEWER MH #3
RIM = 49.2
8" INV. IN = 44.0
8" INV. OUT = 43.45 (VIF)

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

RELOCATE GAS AND
ELECTRIC LINES OUT
OF STORMWATER
TREATMENT AREAS.

VERIFY LOCATION OF
EXISTING GAS LINE
AND RELOCATE AS
REQUIRED.

6" X 10" TEE WITH 6" GATE VALVE FOR FIRE SUPPRESSION
SERVICE. USE TAPPING SLEEVE CONNECTIONS FOR
ALL FIRE SERVICE CONNECTIONS TO WATER MAINS. VERIFY
SIZE OF MAIN PRIOR TO CONSTRUCTION.

6" FIRE SUPPRESSION SERVICE
AND 6" GATE VALVE.

PROPOSED 8" SEWER
(SDR 35) (S = 0.014)

PSMH 1

PW PW

PW PW

PW PW

PW PW

PW PW

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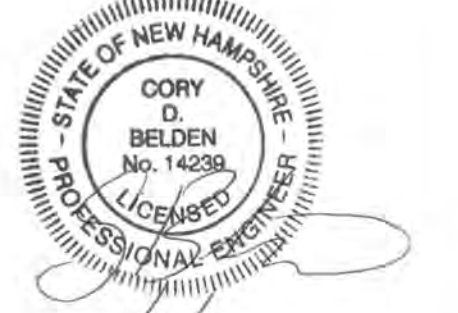
PW PW

PW PW

ENGINEER:

ALTUS
ENGINEERING, INC.

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ISSUED FOR:

PLANNING BOARD APPROVAL

ISSUE DATE:

AUGUST 6, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	05/20/19
1	TAC COMMENTS	CDB	08/06/19

DRAWN BY: CDB

APPROVED BY: EDW

DRAWING FILE: 4787_2_SITE.DWG

SCALE:

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625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

PROJECT:

**ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT**

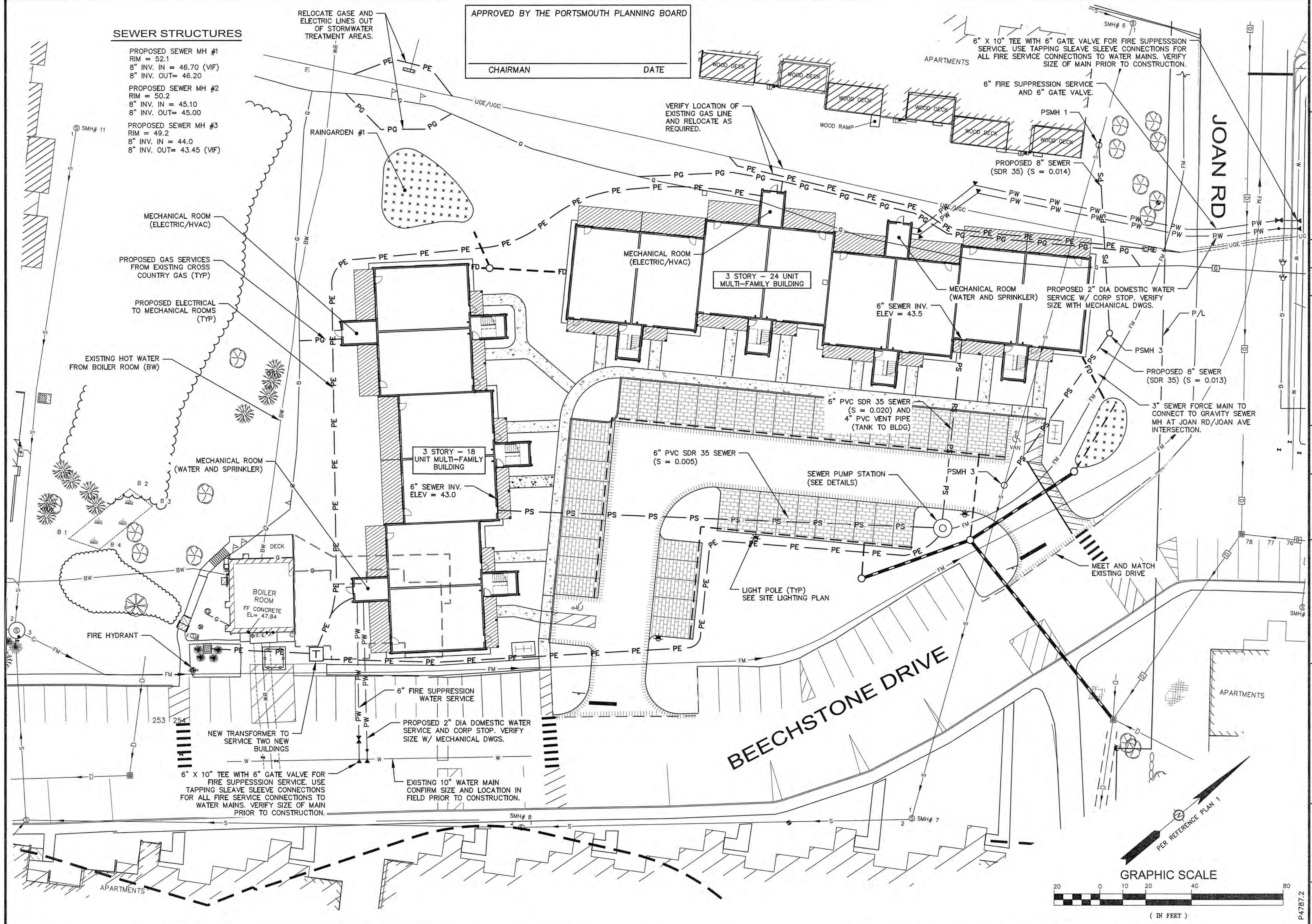
145 LANG ROAD
PORTSMOUTH, NH

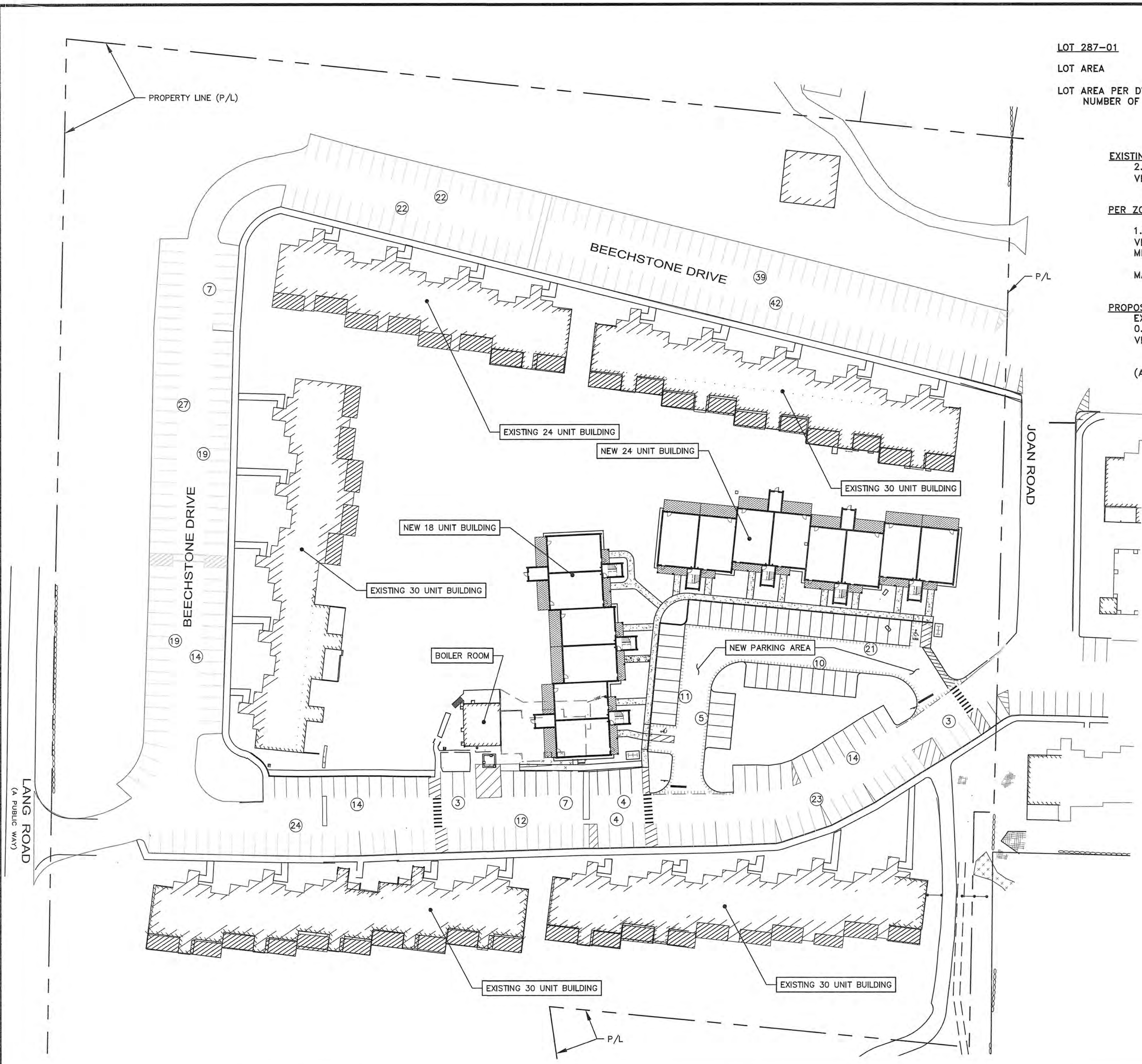
TITLE:

UTILITIES PLAN

SHEET NUMBER:

C-5





PARKING CALCULATIONS

ZONING DISTRICT GA/MH			
LOT 287-01	REQUIRED	EXISTING	PROPOSED
LOT AREA	5.0 Acres	35.53 Acres	35.53 Acres
LOT AREA PER DWELLING (DENSITY)	10,000 SF	10,673 SF	8,321± SF
NUMBER OF UNITS	154 (ALLOWED)	145	186*

EXISTING (145 UNITS)
2.07 STALLS PER UNIT = 300 STALLS
VISITOR PARKING (1 STALL PER 5 UNITS) = 29 STALLS
TOTAL EXISTING STALLS = 329 STALLS

PER ZONING REGULATION 10.1110 FOR MULTI-FAMILY BUILDINGS:
1.3 STALLS PER UNIT = 242 STALLS
VISITOR PARKING (1 STALL PER 5 UNITS) = 38 STALLS
MINIMUM STALLS ALLOWED = 280 STALLS
MAXIMUM ALLOWABLE STALLS (120% MIN) = 336 STALLS

PROPOSED (186 UNITS)
EXISTING RESIDENTIAL PARKING STALLS = 299 STALLS
0.7 STALLS PER 42 NEW UNITS = 29 STALLS
VISITOR PARKING (1 STALL PER 5 UNITS) PROVIDED = 38 STALLS
TOTAL PROVIDED = 366 STALLS

(AVE 1.76 STALLS PER UNIT + 1 VISITOR STALL PER 5 UNITS)

ENGINEER:

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ENGINEERING, INC.

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STATE OF NEW HAMPSHIRE
CORY D. BELDEN
No. 14239
LICENSED PROFESSIONAL ENGINEER
8/6/19

ISSUED FOR:
PLANNING BOARD APPROVAL
ISSUE DATE:
AUGUST 6, 2019

REVISIONS		
NO.	DESCRIPTION	BY DATE
0	INITIAL SUBMISSION	CDB 05/20/19
1	TAC COMMENTS	CDB 08/06/19

DRAWN BY: CDB
APPROVED BY: EDW
DRAWING FILE: 4787.2.DWG

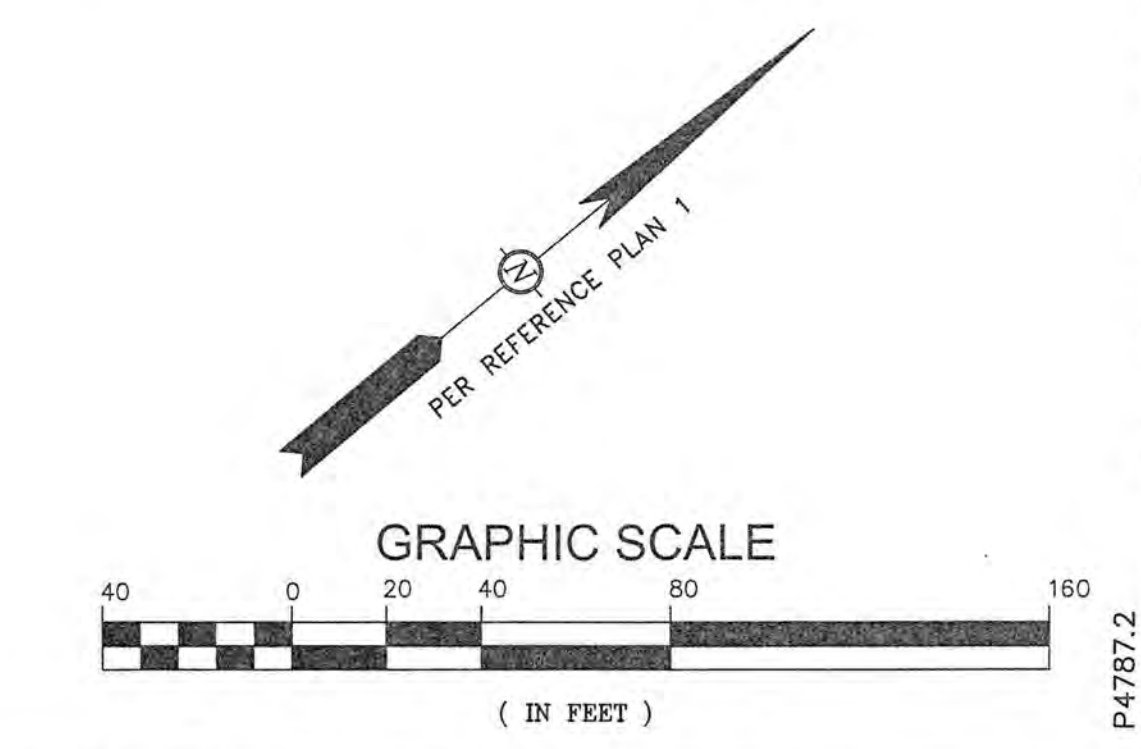
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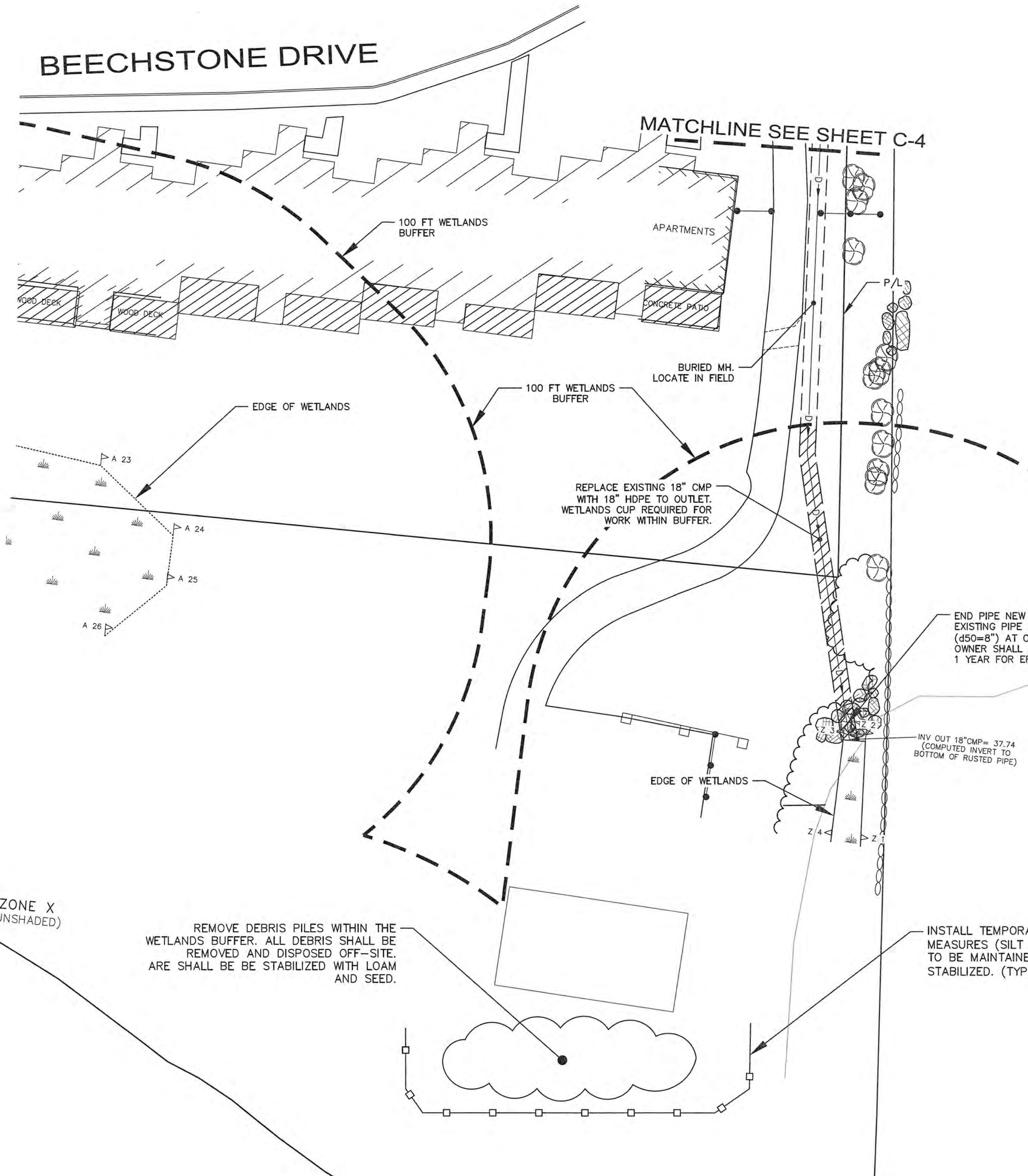
OWNER OF RECORD:
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C/O FOREST PROPERTIES MGMT
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138
APPLICANT:
FOREST PROPERTIES MGMT INC.
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

PROJECT:
**ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT**
145 LANG ROAD
PORTSMOUTH, NH

TITLE:
**CONDITIONAL USE
PARKING PLAN**

SHEET NUMBER:
CUP-1





CHAIRMAN

DATE

SUMMARY

THE PROPOSED PROJECT WILL IMPACT APPROXIMATELY 500 SF OF WETLANDS BUFFER AREA. THIS IMPACT IS WITHIN AN ALREADY DEVELOPED AREA AND IS FOR THE REPLACEMENT OF A CORRODED 18" CORRUGATED METAL PIPE (CMP) THAT WAS INSTALLED IN THE 1980'S. THE 18" CMP WILL BE REPLACED WITH A 18" HDPE PIPE. A DRAINAGE STUDY HAS BEEN PREPARED FOR THE PROPOSED ARBOR VIEW APARTMENTS DEVELOPMENT THAT SHOWS THE POST-DEVELOPMENT FLOWS WILL NOT BE INCREASED AT THIS LOCATION.

WETLANDS IMPACT TABLE

DIRECT IMPACT TO WETLANDS	= 0 SF
IMPACT TO WETLANDS BUFFER	= 500 SF

ENGINEER:

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133 COURT STREET
(603) 433-2335

PORTSMOUTH, NH 03801
www.ALTUS-ENG.com

CORY D. BELDEN
No. 14239
PROFESSIONAL ENGINEER

8/6/19

ISSUED FOR:

PLANNING BOARD APPROVAL

ISSUE DATE:

AUGUST 6, 2019

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	05/20/19
1	TAC COMMENTS	CDB	08/06/19

DRAWN BY:

CDB

APPROVED BY:

EDW

DRAWING FILE:

4787_2_SITE.DWG

SCALE:

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CAMBRIDGE, MA 02138

APPLICANT:

FOREST PROPERTIES MGMT INC.
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

PROJECT:

ARBOR VIEW
APARTMENTS
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DEVELOPMENT

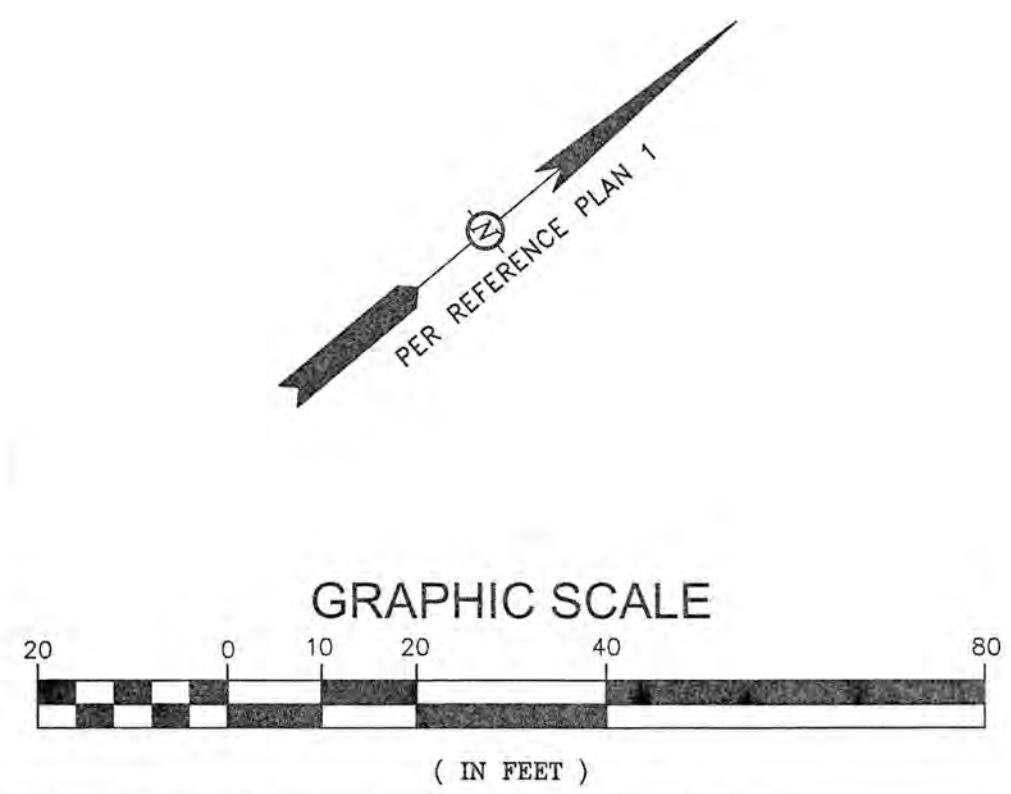
145 LANG ROAD
PORTSMOUTH, NH

TITLE:

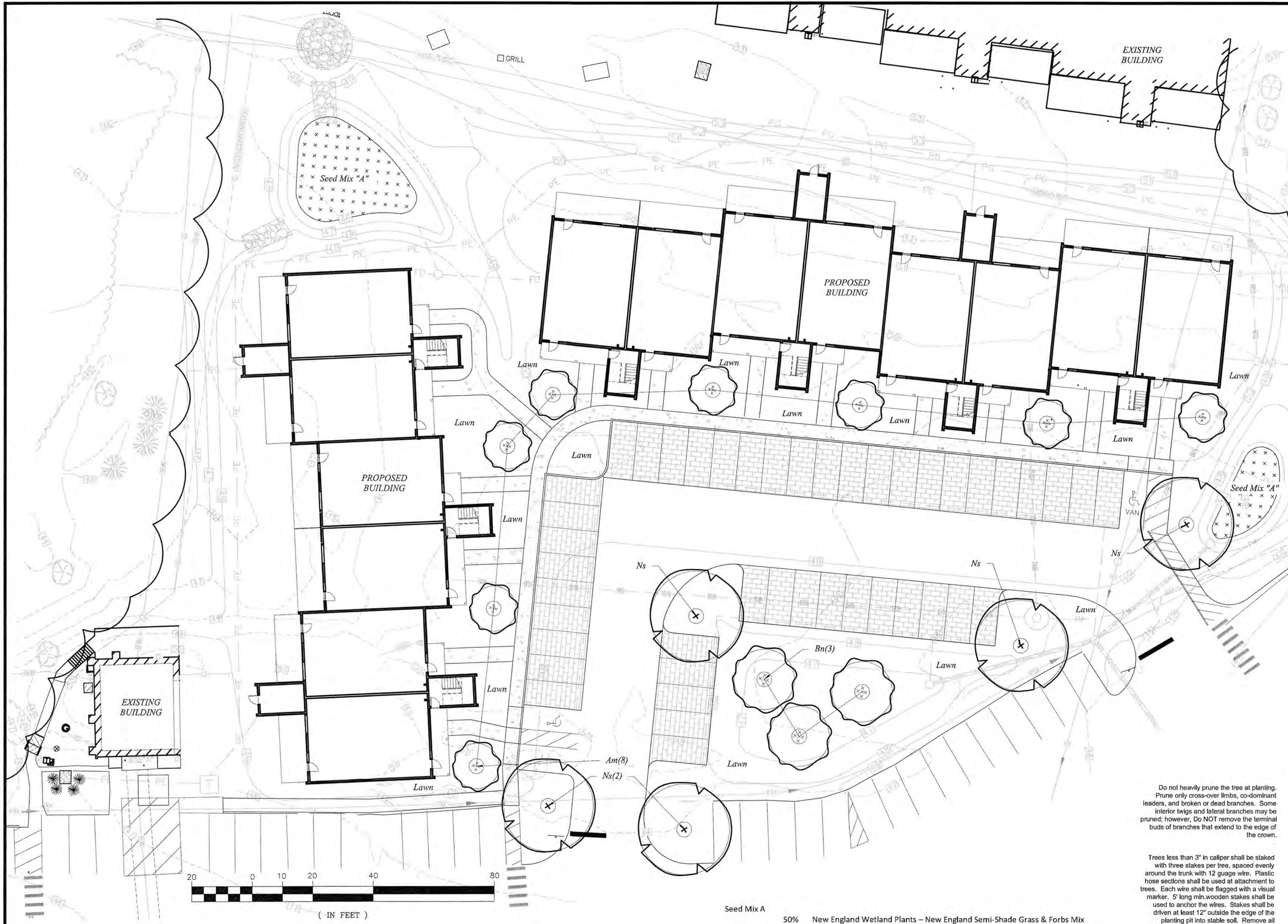
CONDITIONAL USE
WETLANDS PLAN

SHEET NUMBER:

CUP-2



P4787.2



Landscape Notes

- Design is based on drawings by Altus Engineering and may require adjustment due to actual field conditions.
- The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
- Erosion Control shall be in place prior to construction.
- Erosion Control to consist of Hay Bales and Erosion Control Fabric shall be staked in place between the work and Water bodies, Wetlands and/or drainage ways prior to any construction.
- The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
- It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale, at the request of the contractor.
- Trees to Remain within the construction zone shall be protected from damage for the duration of the project by snow fence or other suitable means of protection to be approved by Landscape Architect or Client's Representative. Snow fence shall be located at the drip line at a minimum and shall include any and all surface roots. Do not fill or mulch on the trunk flare. Do not disturb roots. In order to protect the integrity of the roots, branches, trunk and bark of the tree(s) no vehicles or construction equipment shall drive or park in or on the area within the drip line(s) of the tree(s). Do not store any refuse or construction materials or portalets within the tree protection area.
- Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
- The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call DGS&PE at 1-888-344-7233.
- The Contractor shall procure any required permits prior to construction.
- Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micro nutrients, texture, soluble salts, and organic matter. Contractor shall provide Landscape Architect with test results and recommendations along with soil amendment plans as necessary for the proposed plantings to thrive. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
- Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a contractor is aware of a potential issue, and does not bring it to the attention of the landscape architect or owner's representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
- The Contractor shall furnish and plant all plants shown on the drawings and listed thereon. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard of Nursery Stock, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20005.
- A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
- All plants shall be legibly tagged with proper botanical name.
- The Contractor shall guarantee all plants for not less than one year from time of acceptance.
- Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at the place of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
- No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
- All landscaping shall be provided with either of the following:
 - An underground sprinkling system
 - An outside hose attachment within 150 feet
- If an automatic irrigation system is installed, all irrigation valve boxes shall be located within planting bed areas.
- All disturbed areas will be dressed with 6" of topsoil and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
- Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and 3/4" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be black.
- Drip strip shall extend to 6" beyond roof overhang and shall be edged with 3/16" thick metal edger.
- In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
- Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 6' to allow clear and safe passage of vehicles and pedestrians under tree canopy.
- Snow shall be stored a minimum of 8' from shrubs and trunks of trees.
- Landscape Architect is not responsible for the means and methods of the contractor.

Do not heavily prune the tree at planting. Prune only cross-over limbs, co-dominant leaders, and broken or dead branches. Some interior twigs and lateral branches may be pruned; however, Do NOT remove the terminal buds of branches that extend to the edge of the crown.

Trees less than 3" in caliper shall be staked with three stakes per tree, spaced evenly around the trunk with 12 gauge wire. Plastic hose sections shall be used at attachment to trees. Each guy wire shall be flagged with a visual marker. 5' long min. wooden stakes shall be used to anchor the wires. Stakes shall be driven at least 12" outside the edge of the planting pit into stable soil. Remove all staking NO LATER than the end of the first growing season after planting.

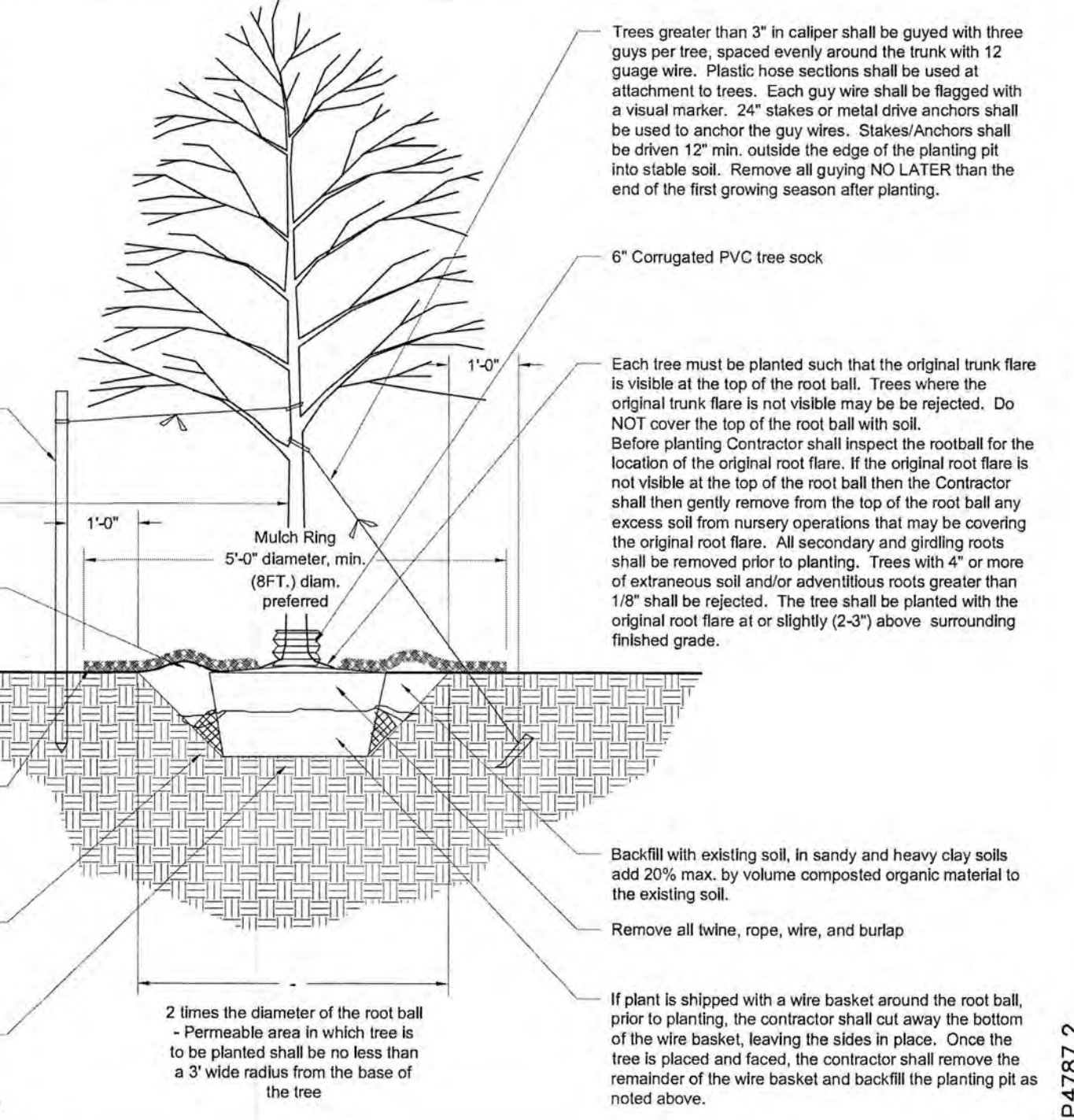
Mark the north side of the tree in the nursery. Rotate the tree to face north at the site whenever possible.

4 in. high earth saucer beyond edge of root ball

2 IN. max. Mulch. Do NOT place mulch in contact with tree trunk. Maintain the mulch weed-free for a minimum of three years after planting.

Tamp soil around root ball base firmly with foot pressure so that root ball does not shift.

Place root ball on unexcavated or tamped soil.



Tree Planting Detail

Plant List

TREES

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Ns	<i>Nyssa Sylvatica</i>	Black Tupelo	5	2.5-3" Cal	B&B
Am	<i>Amelanchier x grandiflora 'Robin Hill'</i>	Robin Hill Serviceberry	8	8-10' Ht	Multi-Stem B&B
Bn	<i>Betula nigra 'Heritage'</i>	Heritage River Birch	3	8-10' Ht	Multi-Stem B&B

Seed Mix A
50% New England Wetland Plants – New England Semi-Grass & Forbs Mix
50% New England Wetland Plants – New England Erosion Control/Restoration Mix for Detention Basins & Moist Sites

ENGINEER:
ALTUS
ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR: TAC
ISSUE DATE: MAY 20, 2019

REVISIONS	NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION		VM	05/20/19

DRAWN BY: VM
APPROVED BY: RW
DRAWING FILE: 4787.2_SITE.DWG

SCALE:
22" x 34" - 1" = 20'
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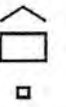
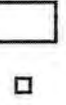
OWNER OF RECORD:
ARBOR VIEW & THE PINES LLC.
C/O FOREST PROPERTIES MGMT
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138
APPLICANT:
FOREST PROPERTIES MGMT INC.
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

PROJECT:
ARBOR VIEW APARTMENTS RESIDENTIAL DEVELOPMENT

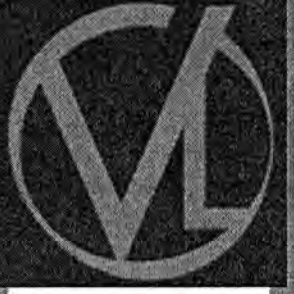
145 LANG ROAD PORTSMOUTH, NH

TITLE:
LANDSCAPE PLAN
SHEET NUMBER:
L-1

P-4787.2

Schedule											
Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
	S3	2	Lithonia Lighting	DSX0 LED P3 40K T3M MVOLT SPA DDBXD with SSS 16 4C DM19AS DDBXD	DSX0 LED Area Fixture; mounted at 16ft	LED	1	DSX0_LED_P3_40K_T3M_MVOLT.ies	8205	0.9	71
	S5	1	Lithonia Lighting	DSX0 LED P3 40K T5M MVOLT SPA DDBXD with SSS 16 4C DM19AS DDBXD	DSX0 LED Area Fixture; mounted at 16ft	LED	1	DSX0_LED_P3_40K_T5M_MVOLT.ies	8770	0.9	71
	W4	7	Lithonia Lighting	WST LED P2 40K VF MVOLT	WST LED Wallpack; mounted at 16ft	LED	1	WST_LED_P2_40K_VF_MVOLT.ies	3469	0.9	25

Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Outside of Parking Lot	+	0.5 fc	5.3 fc	0.0 fc	N/A	N/A
Parking Lot	+	1.3 fc	3.5 fc	0.4 fc	8.8:1	3.3:1



ARBOR VIEW APARTMENTS
Site Lighting Layout

Designer
Heidi G. Connors
Visible Light, Inc.
24 Stickney Terrace
Suite 6
Hampton, NH 03842
Date
5/13/2019
Scale
1"=20'
Drawing No.
Summary

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

Owner: ARBOR VIEW & THE PINES, LLC
C/O FOREST PROPERTIES MANAGEMENT, INC.
625 MT. AUBURN STREET, SUITE 210
CAMBRIDGE, MA 02138

LATITUDE: 043° 01' 31" N
LONGITUDE: 070° 47' 10" W

DESCRIPTION

The project consists of the expansion of a previously disturbed and partially developed area within the "Arbor View" complex consisting of two 3-story residential buildings with 42 residential units total, reconfiguration of parking and access, grading, storm drainage improvements, underground utilities installation, landscaping and associated site improvements.

DISTURBED AREA

The total area to be disturbed on the parcel and for the buildings, driveway, parking area, drainage, and utility construction is approximately 83,000 SF± (1.9 acres±). The combined disturbed area exceeds 43,560 SF (1 acre), thus a SWPPP will be required for compliance with the USEPA-NPDES Construction General Permit.

NPDES CONSTRUCTION GENERAL PERMIT

Contractor shall prepare a Stormwater Pollution Prevention Plan (SWPPP) in accordance with federal storm water permit requirements (see "Developing Your Stormwater Pollution Prevention Plan", EPA 833-R-060-4). The SWPPP must be prepared in a format acceptable to the Owner and provided to the City at least fourteen (14) days prior to initiating construction. Contractor is responsible for all cost associated with preparation and implementation of SWPPP including any temporary erosion control measures (whether indicated or not on these drawings) as required for the contractor's sequence of activities.

The Contractor and Owner shall each file a Notice of Intent (NOI) with the U.S.E.P.A. under the NPDES Construction General Permit. (U.S.E.P.A., 1200 Pennsylvania Avenue NW, Washington, DC 20460) All work shall be in accordance with NPDES General Permit: NHG07000, including NOI requirements, effluent limitations, standards and management for construction. The Contractor shall be responsible for obtaining a USEPA Construction Dewatering Permit, if required.

SEQUENCE OF MAJOR ACTIVITIES

1. Prepare SWPPP and file NPDES Notice of Intent, prior to any construction activities (Required).
2. Hold a pre-construction meeting with City & stake holders.
3. Install temporary erosion control measures, including silt fences and stabilized construction entrance.
4. Protect specified trees (see plans).
5. Terminate existing utilities. Demolish portion of existing building. See Demolition Plan.
6. Clear and Grub vegetated areas per plan; Strip and stockpile loam. Stockpiles shall be temporarily stabilized with hay bales, mulch and surrounded by a hay bale or silt fence barrier until material is removed and final grading is complete. Remove debris.
7. Remove ledge.
8. Construct swales and utility infrastructure. Rough grade lot to prepare for site development. Construct temporary sediment control basins. Stabilize swales prior to directing flow to them.
9. Construct building foundations. Construct bituminous concrete pavement & driveway access.
10. Loam and seed disturbed areas.
11. Construct raingardens & landscaping after site is stabilized.
12. When all construction activity is complete and site is stabilized, remove all hay bales, stone check dams (if applicable), silt fences and temporary structures and sediment that has been trapped by these devices.
13. File a Notice of Termination (N.O.T.) with U.S.E.P.A. (Required)

NAME OF RECEIVING WATER

The majority of the site connects to the stormwater collection system and eventually discharging to Berry's Brook.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 – 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, the silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area, silt fences and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Stabilize all ditches, swales, stormwater ponds, level spreaders and their contributing areas prior to directing flow to them.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time, but in no case shall it exceed 5 acres at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.5 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built-up sediment shall be removed from silt fence or other barriers when it has reached one-third the height of the fence or bale, or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. All roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.
9. All cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade.
10. An area shall be considered stable if one of the following has occurred:
 - a. Base coarse gravels have been installed in areas to be paved;
 - b. A minimum of 85% vegetated growth as been established;
 - c. A minimum of 3 inches of non-erosive material such as stone or riprap has been installed;
- or -
- d. Erosion control blankets have been properly installed.
11. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
 - a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
 - b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CONT)

2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrub plantings.
Jute and Fibrous Matting (Erosion Blanket)	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1-1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100%, dry weight basis. * Particle size by weight is 100% passing a 6" screen and a minimum of 70 % maximum of 85% passing a 0.75" screen. * The organic portion needs to be fibrous and elongated. * Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. * The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. TEMPORARY GRASS COVER

1. Seedbed Preparation – Apply fertilizer at the rate of 600 pounds per acre of 10–10–10. Apply limestone (equivalent to 50 percent calcium plus magnesium oxide) at a rate of three (3) tons per acre.
2. Seeding –
 - a. Utilize annual rye grass at a rate of 40 lbs/acre.
 - b. Where the soil has been compacted by construction operations, loosen soil to a depth of two (2) inches before applying fertilizer, lime and seed.
 - c. Apply seed uniformly by hand, cyclone seeder, or hydroseeder (slurry including seed and fertilizer). Hydroseedings, which include mulch, may be left on soil surface. Seeding rates must be increased 10% when hydroseeding.
3. Maintenance – Temporary seedings shall be periodically inspected. At a minimum, 95% of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (mulch, filter barriers, check dams, etc.).

D. FILTERS

1. Tubular Sediment Barrier
 - a. See detail.
 - b. Install per manufacturer's requirements.
2. Silt Fence (if used)
 - a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM–51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM–52	Extra Strength 50 lb/in (min) Standard Strength 30 lb/in (min)
Flow Rate	VTM–51	0.3 gal/sf/min (min)

* Requirements reduced by 50 percent after six (6) months of installation.

Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizer to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.

- b. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).
- c. A trench shall be excavated approximately six (6) inches wide and eight (8) inches deep along the line of posts and upslope from the barrier.
- d. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.
- e. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
- f. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.
- g. The trench shall be backfilled and the soil compacted over the filter fabric.
- h. Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.

3. Sequence of Installation – Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.

4. Maintenance –
 - a. Silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary stone check dam.

- b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.
- c. Sediment deposits must be removed when deposits reach approximately one-third (1/3) the height of the barrier.

- d. Any sediment deposits remaining in place after the silt fence or other barrier is no longer required shall be removed. The area shall be prepared and seeded.

- e. Additional stone may have to be added to the construction entrance, rock barrier and riprap lined swales, etc., periodically to maintain proper function of the erosion control structure.

E. PERMANENT SEEDING –

1. Bedding – stones larger than 1 1/2", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 5" to prepare a seedbed and mix fertilizer into the soil.
2. Fertilizer – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

Agricultural Limestone @ 100 lbs. per 1,000 s.f.
10–20–20 fertilizer @ 12 lbs. per 1,000 s.f.

3. Seed Mixture (See Landscape Drawings for additional information):

- 3.1. Lawn seed mix shall be a fresh, clean new seed crop. The Contractor shall furnish a dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety.
- 3.2. Seed mixture shall consist of
 - a. 1/3 Kentucky blue,
 - b. 1/3 perennial rye, and
 - c. 1/3 fine fescue.
- 3.1. Turf type tall fescue is unacceptable.

4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;
2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and
3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.

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Long Term Inspection & Maintenance Schedule

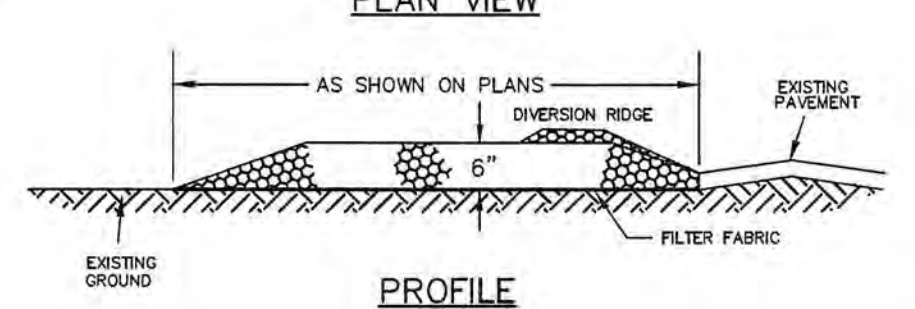
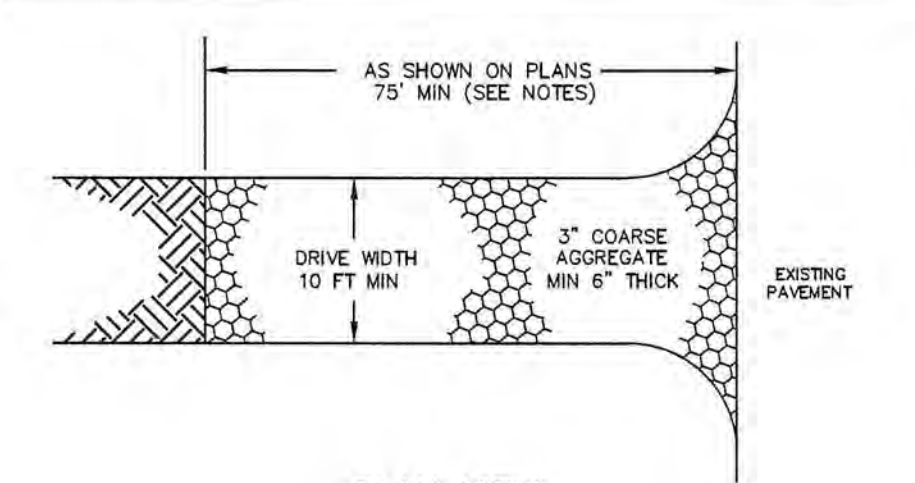
	Spring	Fall or Yearly	After Major Storm	Every 5 Years
Vegetated Areas				
Inspect all slopes and embankments	x		x	
Replant bare areas or areas with sparse growth	x		x	
Armor areas with rill erosion with an appropriate lining or divert the erosive flows to on-site areas able to withstand concentrated flows.	x		x	
Stormwater Channels				
Inspect ditches, swales and other open stormwater channels	x	x	x	
Remove any obstructions and accumulated sediments or debris	x	x		
Control vegetated growth and woody vegetation		x		
Repair any erosion of the ditch lining		x		
Mow vegetated ditches		x		
Remove woody vegetation growing through riprap		x		
Repair any slumping side slopes		x		
Replace riprap where underlying filter fabric or underdrain gravel is exposed or where stones have been dislodged		x		
Culverts				
Remove accumulated sediments and debris at inlet, outlet and within the conduit	x	x	x	
Repair any erosion damage at the culvert's inlet and outlet		x	x	
Remove woody vegetation growing through riprap		x		
Roadways and Parking Surfaces				
Remove accumulated winter sand along roadways	x			
Sweep pavement to remove sediment	x			
Grade road shoulders and remove excess sand either manually or by a front-end loader	x			
Grade gravel roads and gravel shoulders	x			
Clean out sediment contained in water bars or open-top culverts	x			
Ensure that stormwater is not impeded by accumulations of material or false ditches in the roadway shoulder	x			
Runoff Infiltration Facilities				
Remove dead vegetation and any accumulated sediment (normally at the entrance to the garden) to allow for new growth	x			
Weed, add additional hardwood mulch to suppress weeds	x	x		
Mow turf three (3) times a growing season				
Assess area with deep tines, if water ponds on the surface for more than 24 hours during the first year or for a length of 72 hours		x		
Vegetative Swale				
Mow grass swales monthly				
Inspect swale following significant rainfall event	x	x	x	
Control vegetated growth and woody vegetation	x	x		
Repair any erosion of the ditch	x	x		
Remove debris and litter as necessary				

NOTE:

ALL FACILITIES SHOULD BE INSPECTED ON AN ANNUAL BASIS AT A MINIMUM. IN ADDITION, ALL FACILITIES SHOULD BE INSPECTED AFTER A SIGNIFICANT PRECIPITATION EVENT TO ENSURE THE FACILITY IS DRAINING APPROPRIATELY AND TO IDENTIFY ANY DAMAGE THAT OCCURRED AS A RESULT OF THE INCREASED RUNOFF. FOR THE PURPOSE OF THIS STORMWATER MANAGEMENT PROGRAM, A SIGNIFICANT RAINFALL EVENT IS CONSIDERED AN EVENT OF THREE (3) INCHES IN A 24-HOUR PERIOD OR 0.5 INCHES IN A ONE-HOUR PERIOD. IT IS ANTICIPATED THAT A SHORT, INTENSE EVENT IS LIKELY TO HAVE A HIGHER POTENTIAL OF EROSION FOR THIS SITE THAN A LONGER, HIGH VOLUME EVENT.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

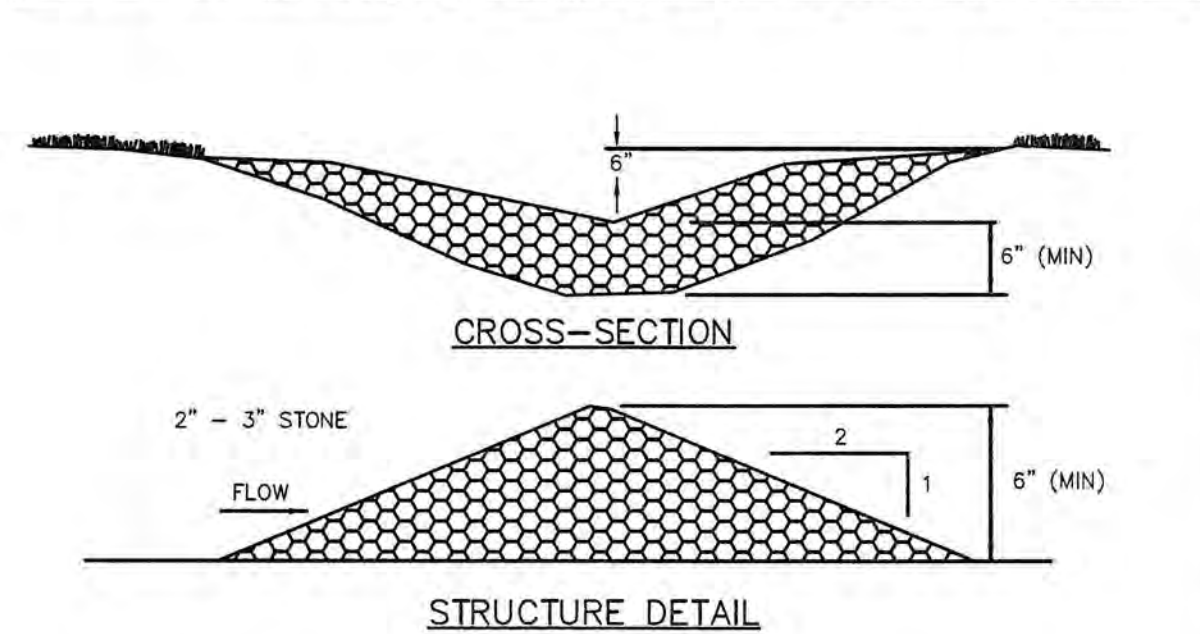
CHAIRMAN	DATE
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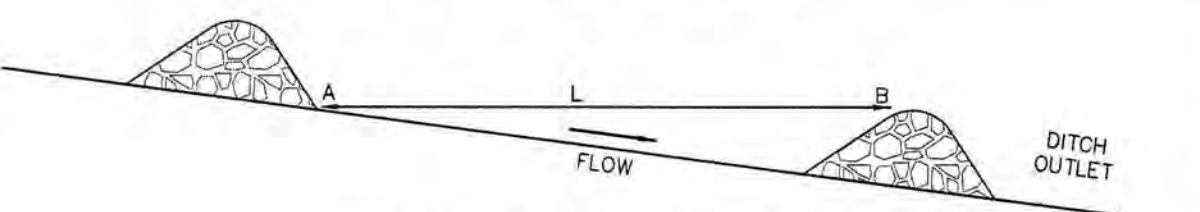
CONSTRUCTION SPECIFICATIONS

1. REFERENCE NEW HAMPSHIRE STORMWATER MANUAL VOLUME 3 (LATEST EDITION), SECTION 4.2
2. "TEMPORARY CONSTRUCTION EXIT" REQUIREMENTS AND BMP DETAIL.
3. STONE SIZE – 3" COARSE AGGREGATE
4. THICKNESS – SIX (6) INCHES (MINIMUM).
5. LENGTH – 75 FOOT MINIMUM, OR 50 FOOT ALLOWED WHEN DIVERSION RIDGE IS PROVIDED.
6. WIDTH – 1/2 OF DRIVEWAY (10 FOOT MINIMUM).
7. FILTER FABRIC – MIRAFI 600X OR APPROVED EQUAL.
8. SURFACE WATER CONTROL – ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
9. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
10. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

STABILIZED CONSTRUCTION EXIT NOT TO SCALE



STRUCTURE DETAIL



SPACING BETWEEN STRUCTURES

1. L = DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION
2. CHECK DAM SHALL BE CONSTRUCTED OF 2" TO 3" STONE WITH COMPLETE COVERAGE OF DITCH OR SWALE TO INSURE THAT THE CENTER OF THE STRUCTURE IS LOWER THAN THE EDGES.

MAINTENANCE

TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED STORMS. ANY NECESSARY REPAIRS SHOULD BE MADE IMMEDIATELY. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE. WHEN THE STRUCTURES ARE REMOVED, THE DISTURBED PORTION SHOULD BE BROUGHT TO THE EXISTING CHANNEL GRADE AND THE AREAS PREPARED, SEEDED, AND MULCHED. WHILE THIS PRACTICE IS NOT INTENDED TO BE USED PRIMARILY FOR SEDIMENT TRAPPING, SOME SEDIMENT WILL ACCUMULATE BEHIND THE STRUCTURES. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT HAS ACCUMULATED TO ONE HALF OF THE ORIGINAL HEIGHT OF THE STRUCTURE.

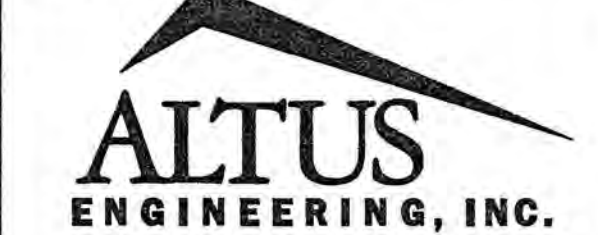
CONSTRUCTION SPECIFICATIONS

1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION AND AIR AND WATER POLLUTION WILL BE MINIMIZED.
3. SEEDING, FERTILIZING, AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPROPRIATE VEGETATIVE BMP.
4. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.

STONE CHECK DAM

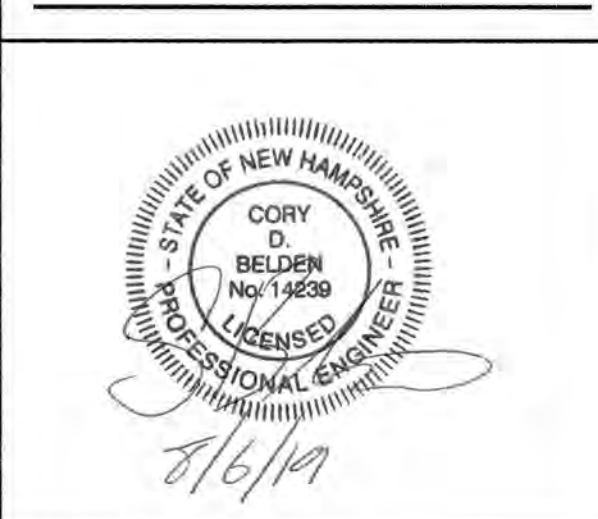
NOT TO SCALE

ENGINEER:



133 COURT STREET
(603) 433-2335

PORTSMOUTH, NH 03801
www.ALTUS-ENG.com



ISSUED FOR:

PLANNING BOARD APPROVAL

ISSUE DATE:

AUGUST 6, 2019

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	05/20/19
1	TAC COMMENTS	CDB	08/06/19

DRAWN BY: _____ RLH

APPROVED BY: _____ EDW

DRAWING FILE: _____ 4787-DETAILS.DWG

SCALE:

22" x 34" – N.T.S.

11" x 17" – N.T.S.

OWNER OF RECORD:

ARBOR VIEW & THE PINES, LLC
C/O FOREST PROPERTIES MGMT.
625 MOUNT AUBURN STREET
CAMBRIDGE, MA 02138

APPLICANT:

FOREST PROPERTIES MGMT. INC.
625 MOUNT AUBURN STREET
CAMBRIDGE, MA 02138

PROJECT:

ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT

145 LANG ROAD
PORTSMOUTH, NH

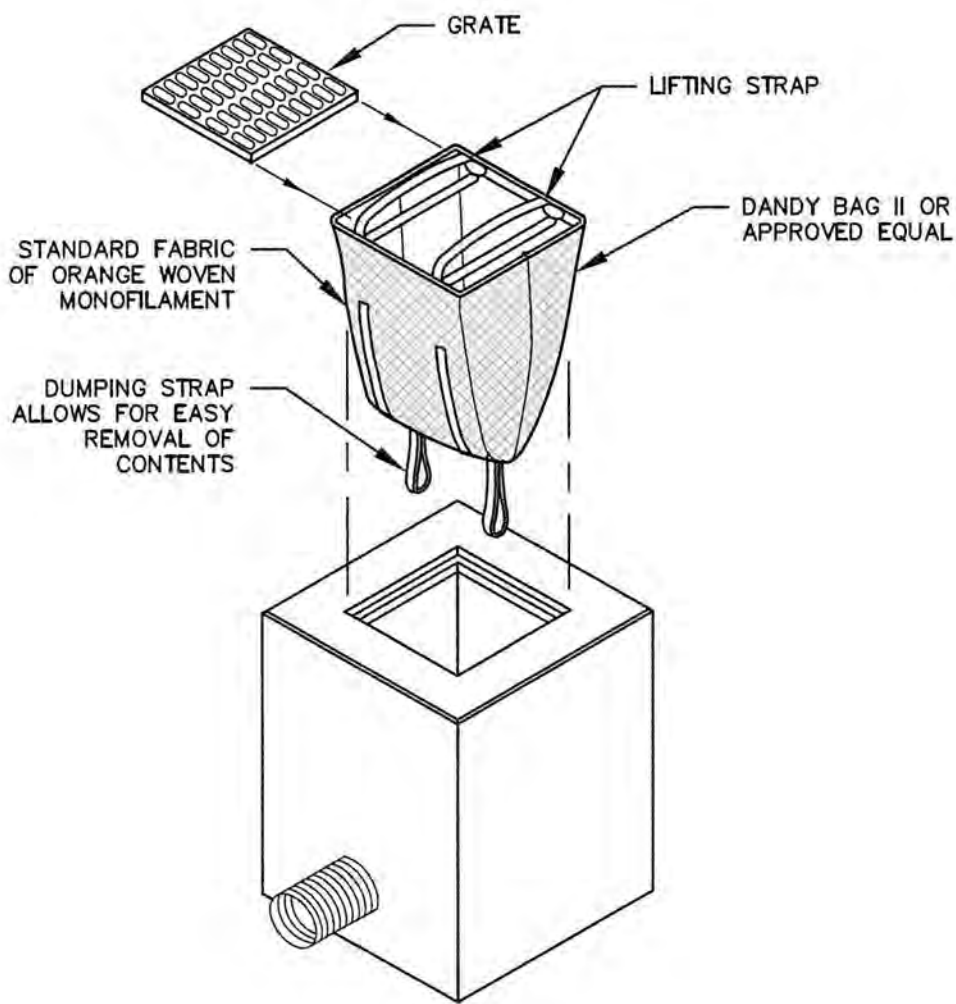
TAX MAP 287, LOT 01

TITLE:

EROSION CONTROL
NOTES & DETAILS

SHEET NUMBER:

D-1



INSTALLATION AND MAINTENANCE:

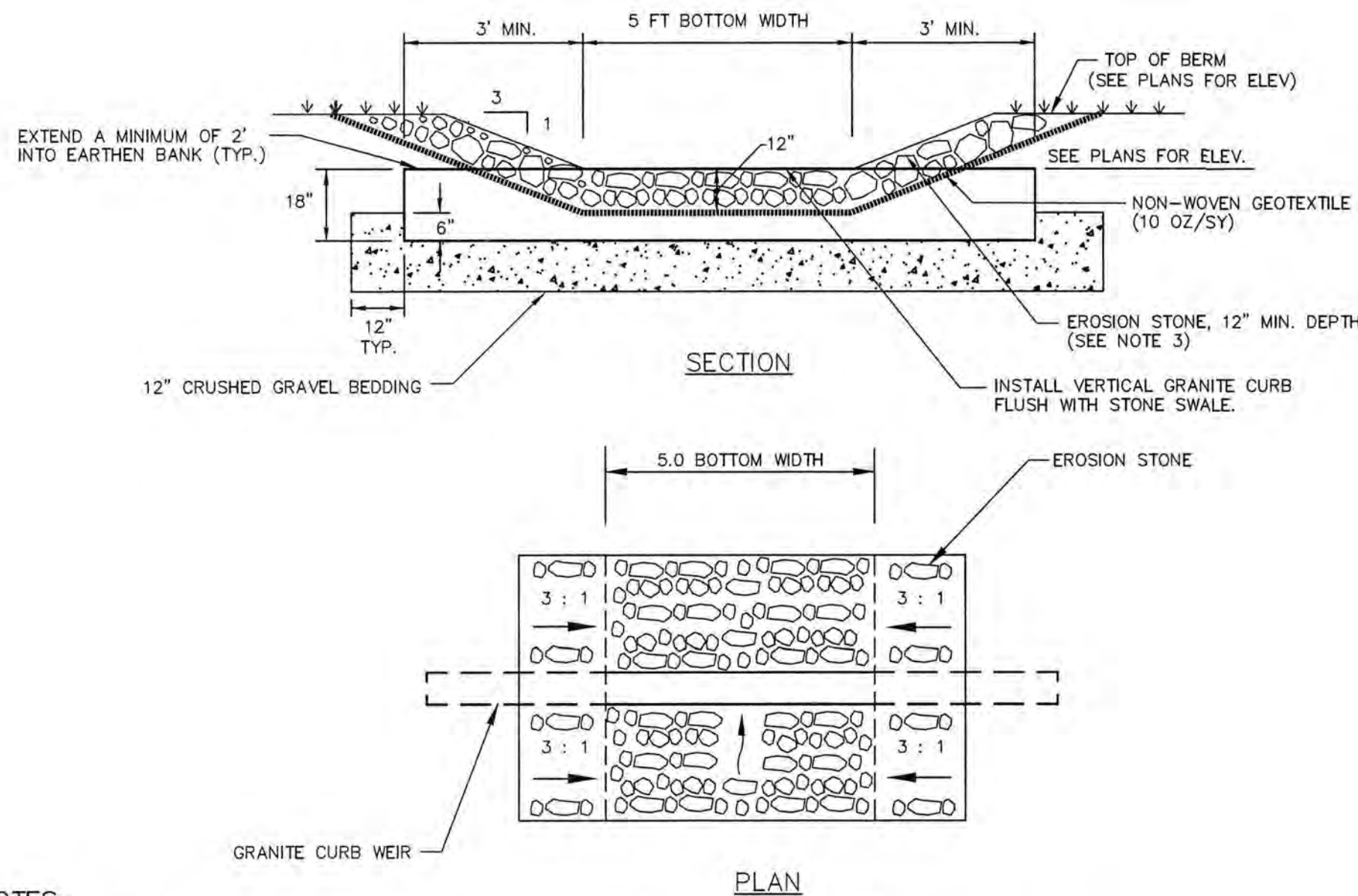
INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS, PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN. INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS, REPLACE ABSORBENT WHEN NEAR SATURATION.

UNACCEPTABLE INLET PROTECTION METHOD:

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

STORM DRAIN INLET PROTECTION NOT TO SCALE

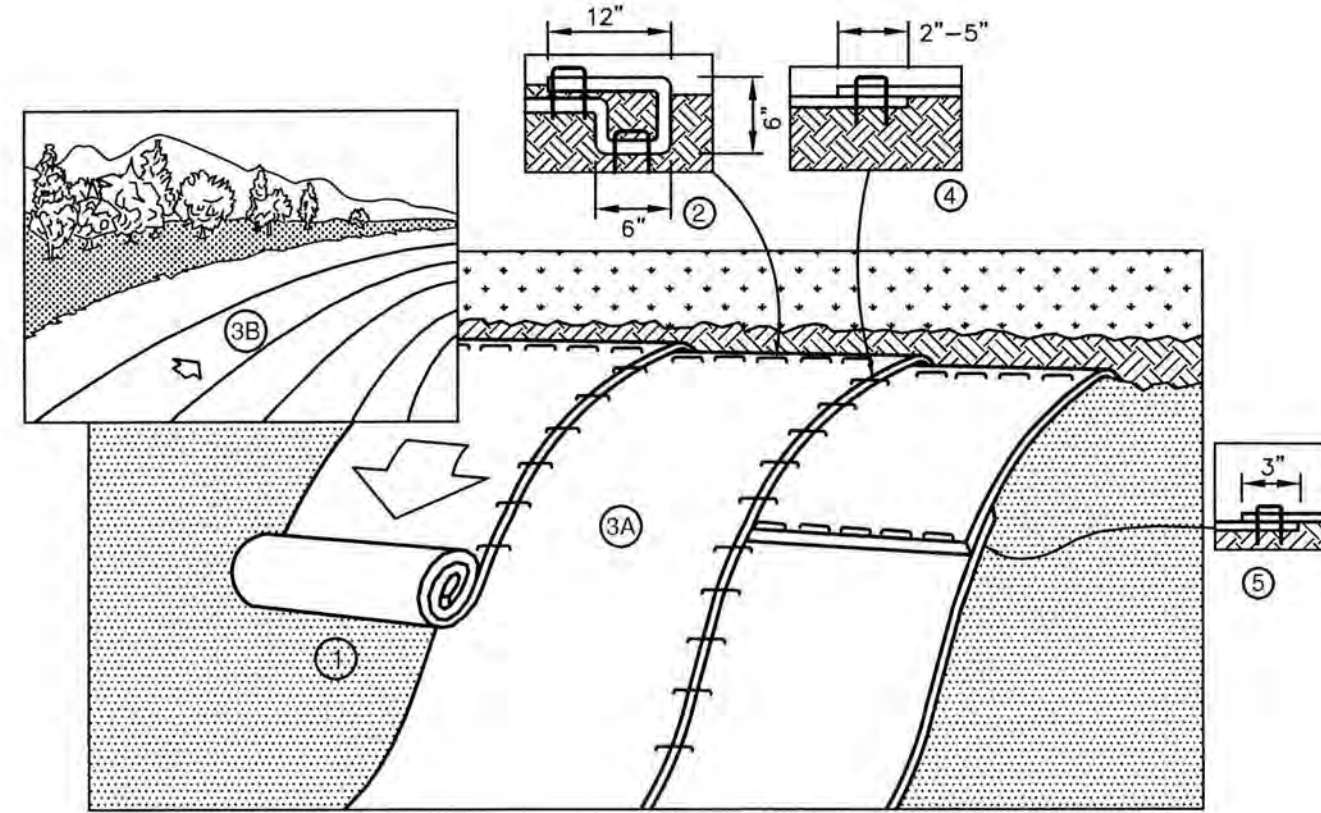


NOTES:

- CONSTRUCT OUTLET CONTROL STRUCTURE TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
- THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
- EROSION STONE SHALL MEET THE FOLLOWING GRADATION:

SIZE	PERCENT PASSING BY WEIGHT
18"	100
12"	90-100
4"	0-15
- GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 18 INCHES.
- THE EROSION STONE MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

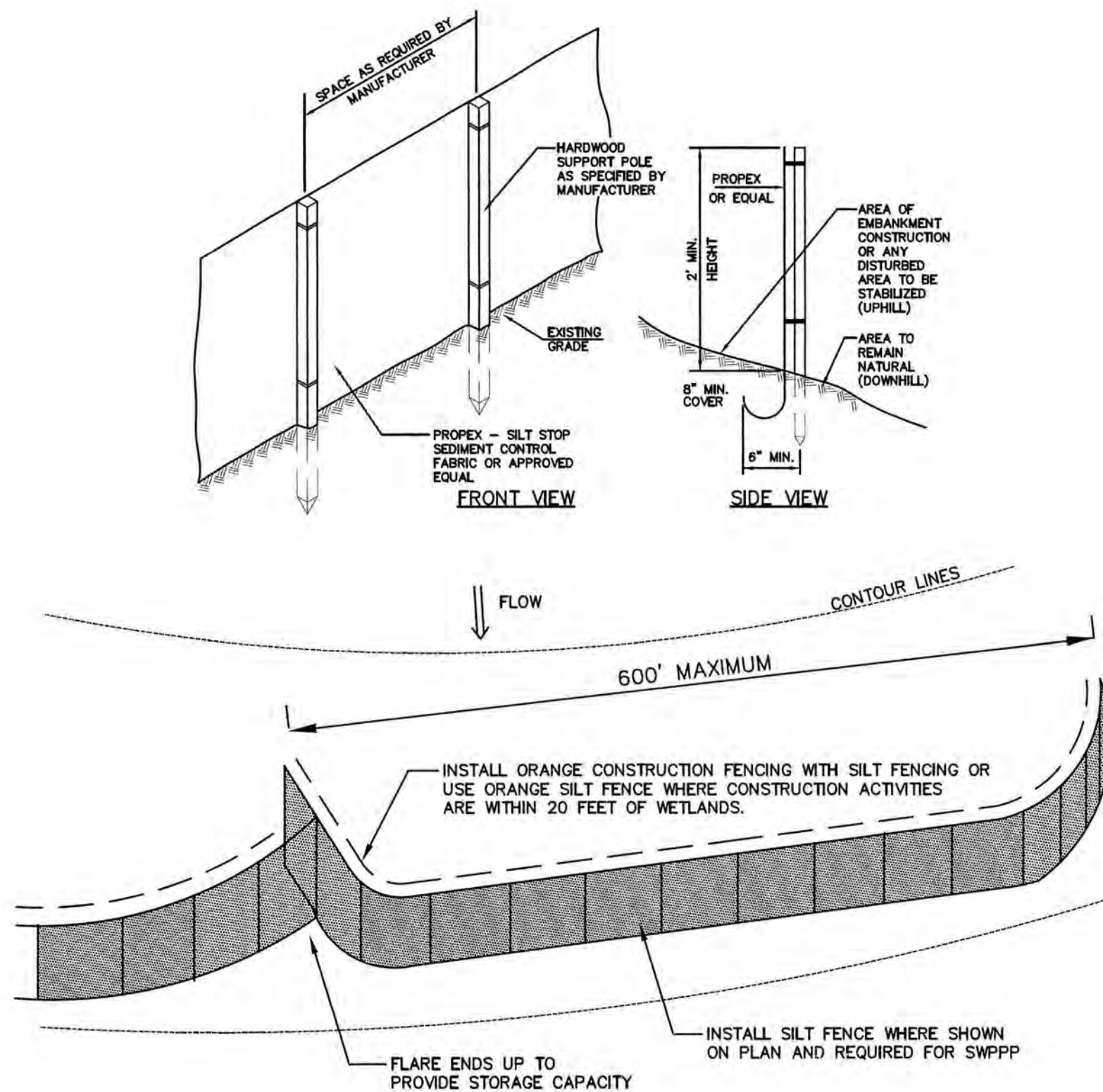
OVERFLOW WEIR /OUTLET STRUCTURE NOT TO SCALE



NOTES:

- PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
- BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
- ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
- THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
- CONSECUTIVE BLANKETS SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH. NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

EROSION CONTROL BLANKET - SLOPE NOT TO SCALE



SILT AND ORANGE CONSTRUCTION FENCE DETAIL NOT TO SCALE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

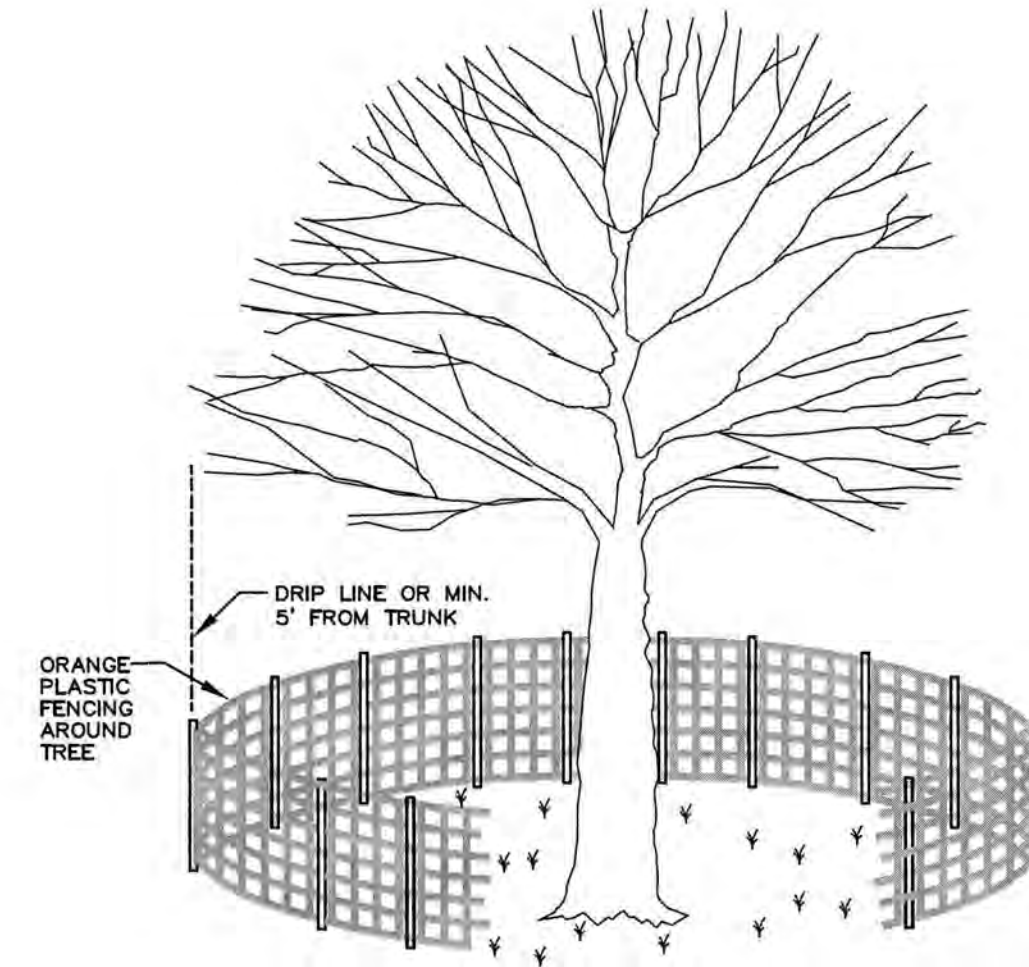
CHAIRMAN

DATE

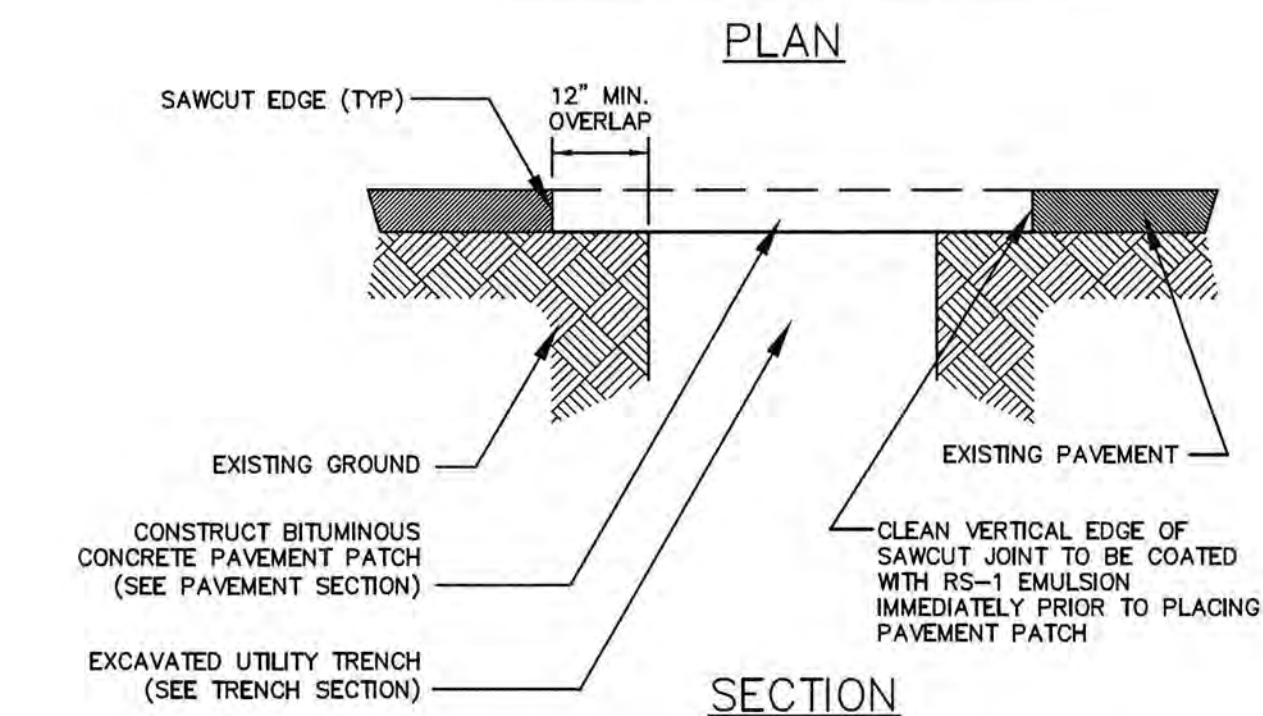
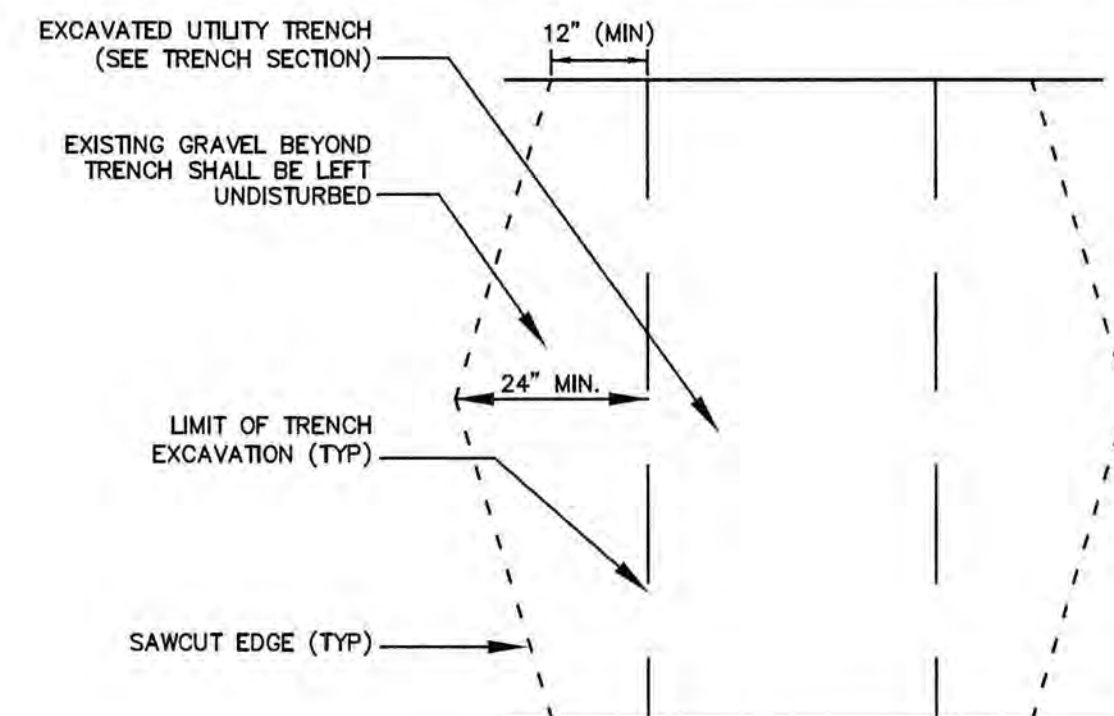
NOTE:
IF SOIL BECOMES COMPACTED OVER THE ROOT ZONE OF ANY TREE, THE GROUND SHOULD BE AERATED BY PUNCHING SMALL HOLES IN IT WITH SUITABLE AERATING EQUIPMENT.

ANY DAMAGE TO THE CROWN, TRUNK OR ROOT SYSTEM OF ANY TREE RETAINED ON SITE SHOULD BE REPAIRED IMMEDIATELY. CONSULT A FORESTER OR TREE SPECIALIST FOR MORE SERIOUS DAMAGE OF TREES.

CONTRACTOR TO USE TREE PROTECTION WHERE SUITABLE AND/OR AS DIRECTED BY THE ENGINEER.



TREE PROTECTION DETAILS NOT TO SCALE



NOTES:

- MACHINE CUT EXISTING PAVEMENT.
- ALL TEMPORARY, DAMAGED OR DEFECTIVE PAVEMENT SHALL BE REMOVED PRIOR TO PLACEMENT OF PERMANENT TRENCH REPAIRS.
- DIAMOND PATCHES, SHALL BE REQUIRED FOR ALL TRENCHES CROSSING ROADWAY. DIAMOND PATCHES SHALL MEET NHDOT REQUIREMENTS.

TYPICAL TRENCH PATCH NOT TO SCALE

ENGINEER:

ALTUS
ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com



ISSUED FOR:

TAC

ISSUE DATE:

MAY 20, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	05/20/19

DRAWN BY: RLH

APPROVED BY: EDW

DRAWING FILE: 4787-DETAILS.DWG

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APARTMENTS
RESIDENTIAL
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145 LANG ROAD
PORTSMOUTH, NH

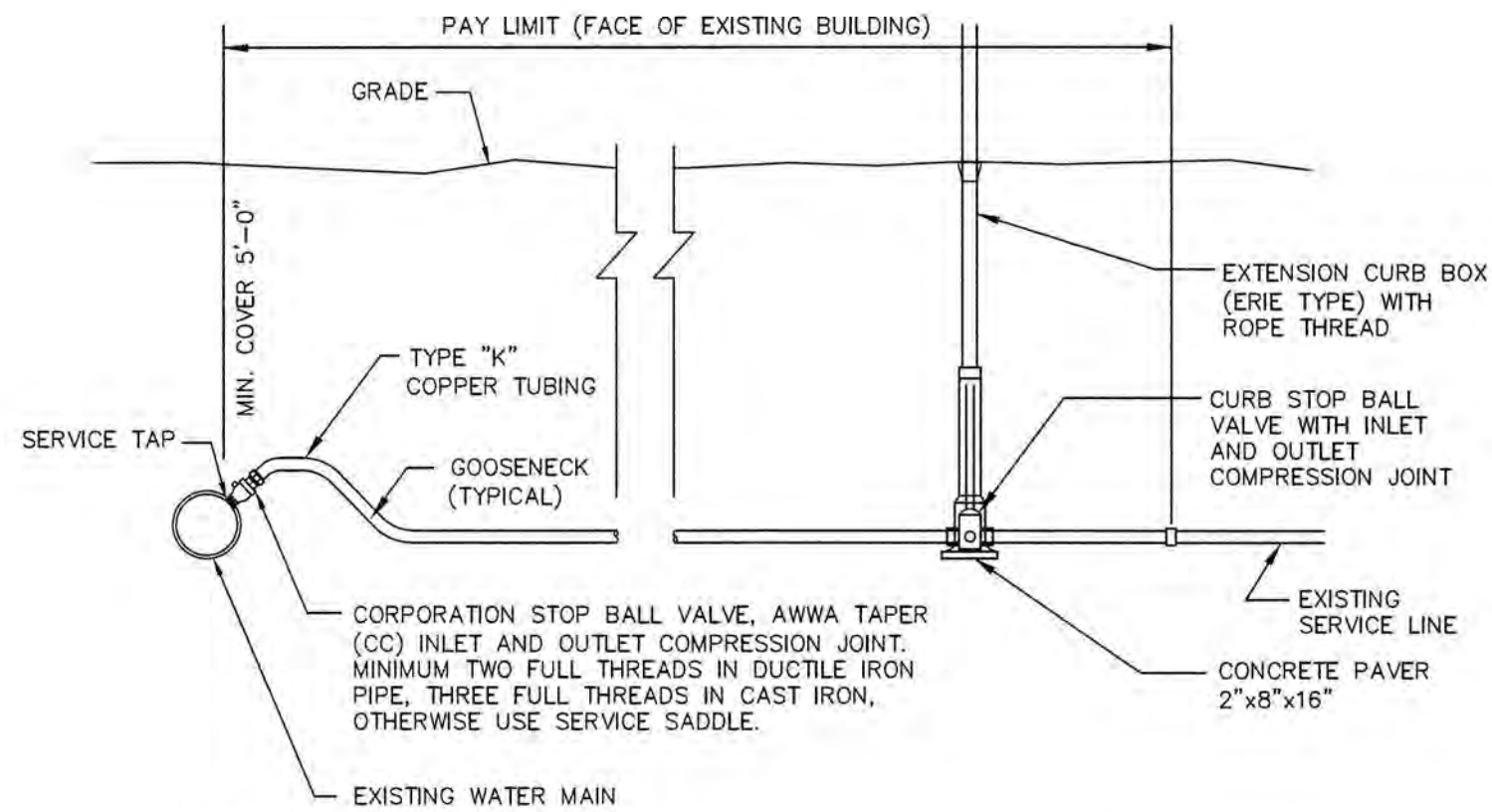
TAX MAP 287, LOT 01

TITLE:

DETAIL SHEET

SHEET NUMBER:

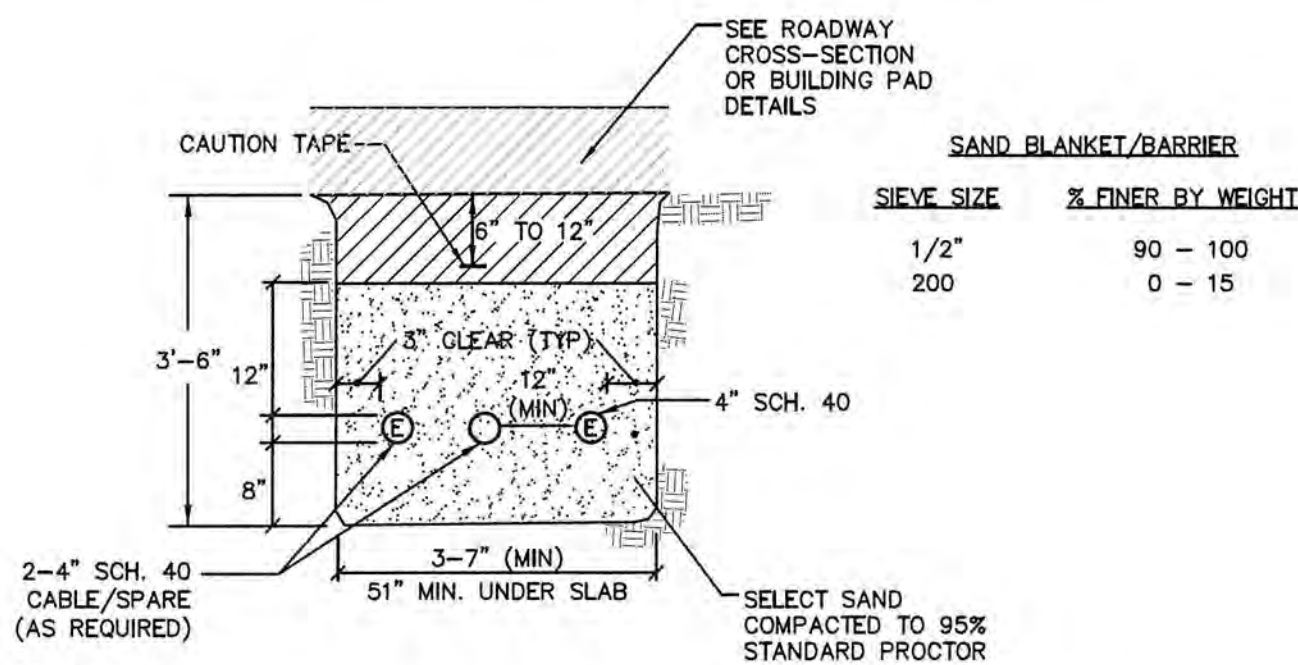
D - 2



NOTES

1. PROVIDE NEW LINE USING CONTINUOUS LENGTHS OF COPPER. NO COUPLING ALLOWED IN ROADWAY WITHOUT APPROVAL OF ENGINEER.
2. TAPS TO BE MADE AT APPROXIMATELY 2:00 & 10:00
3. PROVIDE FOR SERVICE LINE CONTRACTION AND EXPANSION BY INSTALLING "S" IN SERVICE LINE NEAR MAIN.
4. IF SERVICE IS INSTALLED WITH LESS THAN 5' COVER, INSULATE OVER LINE.
5. REMOVE EXISTING CURB STOP.
6. CONNECT CURB STOP TO EXISTING SERVICE LINE AT PROPERTY LINE OR AT LOCATION APPROVED BY THE ENGINEER (NO COUPLING WITHOUT APPROVAL OF ENGINEER) AFTER PRESSURE TESTING AND DISINFECTION.
7. SHUT OFF EXISTING CORPORATION AND REMOVE OR ABANDON EXISTING SERVICE LINE.
8. CURB BOX SHALL BE SET IN THE GRASS/LANDSCAPE AREA BETWEEN CURB AND SIDEWALK UNLESS DIRECTED OTHERWISE.
9. 2" OR LARGER SERVICE CONNECTIONS SHALL USE A STAINLESS STEEL SERVICE SADDLE.

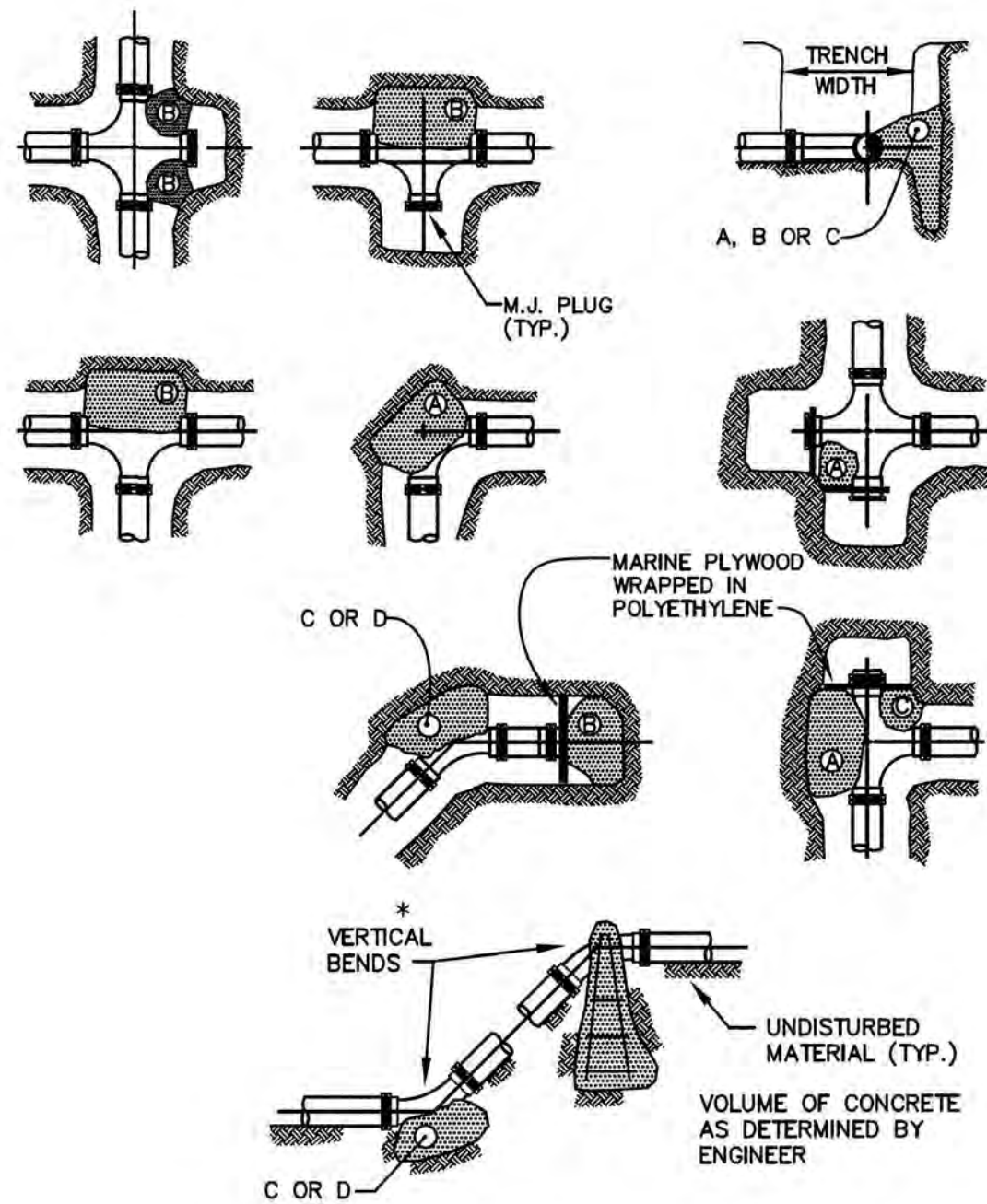
SERVICE CONNECTION DETAIL NOT TO SCALE



NOTES

1. ALL CONDUIT IS TO BE SCHEDULE 40 PVC, ELECTRICAL GRADE, GRAY IN COLOR AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. A 10-FOOT HORIZONTAL SECTION OF RIGID GALVANIZED STEEL CONDUIT WILL BE REQUIRED AT EACH SWEEP, UNLESS IN THE OPINION OF THE SERVICE PROVIDER DESIGNER, THE SWEEP-PVC JOINT IS NOT SUBJECT TO FAILURE DURING PULLING OF THE CABLE. ALL JOINTS ARE TO BE WATERTIGHT.
2. ALL 90 DEGREE SWEEPS WILL BE MADE WITH RIGID GALVANIZED STEEL WITH A MINIMUM RADIUS OF 36 INCHES FOR PRIMARY CABLES AND 24 INCHES FOR SECONDARY CABLES.
3. BACKFILL MAY BE MADE WITH EXCAVATED MATERIAL OR COMPARABLE, UNLESS MATERIAL IS DEEMED UNSUITABLE BY SERVICE PROVIDER. BACKFILL SHALL BE FREE OF FROZEN LUMPS, ROCKS, DEBRIS, AND RUBBISH. ORGANIC MATERIAL SHALL NOT BE USED AS BACKFILL. BACKFILL SHALL BE IN 6-INCH LAYERS AND THOROUGHLY COMPACTED.
4. A SUITABLE PULLING STRING, CAPABLE OF 300 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE SERVICE PROVIDER IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT. A MINIMUM OF TWENTY-FOUR (24") INCHES OF ROPE SLACK SHALL REMAIN AT THE END OF EACH DUCT. PULL ROPE SHALL BE INSTALLED IN ALL CONDUIT FOR FUTURE PULLS. PULL ROPE SHALL BE NYLON ROPE HAVING A MINIMUM TENSILE STRENGTH OF THREE HUNDRED (300#) LBS.
5. SERVICE PROVIDER SHALL BE GIVEN THE OPPORTUNITY TO INSPECT ALL CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD SERVICE PROVIDER BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. TYPICAL CONDUIT SIZES ARE 3-INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4-INCH FOR THREE PHASE SECONDARY, AND 5-INCH FOR THREE PHASE PRIMARY. HOWEVER, SERVICE PROVIDERS MAY REQUIRE DIFFERENT NUMBERS, TYPES AND SIZES OF CONDUIT THAN THOSE SHOWN HERE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL CONDUIT SIZES, TYPES AND NUMBERS WITH EACH SERVICE PROVIDER PRIOR TO ORDERING THEM.
7. ROUTING OF CONDUIT, LOCATION OF MANHOLES, TRANSFORMERS, CABINETS, HANDHOLES, ETC., SHALL BE DETERMINED BY SERVICE PROVIDER DESIGN PERSONNEL. THE CONTRACTOR SHALL COORDINATE WITH ALL SERVICE PROVIDERS PRIOR TO THE INSTALLATION OF ANY CONDUIT.
8. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE. WHERE REQUIRED BY UTILITY PROVIDER, CONDUIT SHALL BE SUPPORTED IN PLACE USING PIPE STANCHIONS PLACED EVERY FIVE (5') FEET ALONG THE CONDUIT RUN.
9. UNDER A BUILDING SLAB THE CONDUIT SHALL BE ENCASED IN 8" OF CONCRETE ON ALL SIDES.
10. ALL CONDUIT TERMINATIONS SHALL BE CAPPED TO PREVENT DEBRIS FROM ENTERING CONDUIT.

ELECTRIC / COMMUNICATION TRENCH NOT TO SCALE

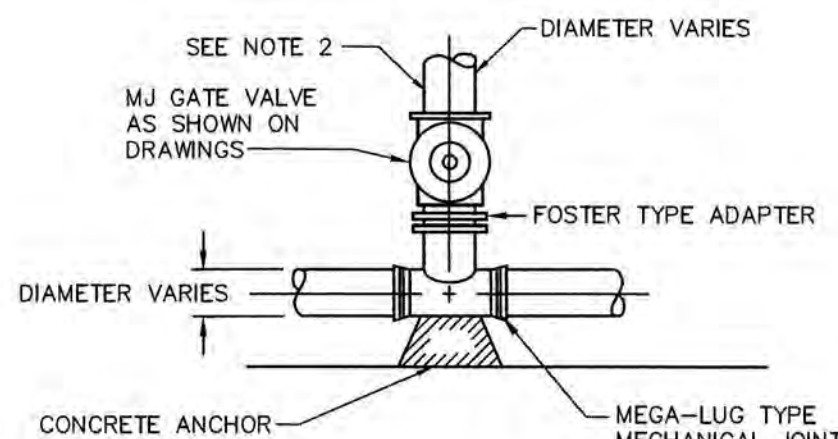


SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL		PIPE SIZE				
REACTION TYPE		4"	6"	8"	10"	12"
A 90°	0.89	2.19	3.82	11.14	17.24	
B 180°	0.65	1.55	2.78	8.38	12.00	
C 45°	0.48	1.19	2.12	6.02	9.32	
D 22-1/2°	0.25	0.60	1.06	3.08	4.74	
E 11-1/4°	0.13	0.30	0.54	1.54	2.38	

NOTES

1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS.
4. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
5. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND FITTINGS PRIOR TO CONCRETE PLACEMENT.

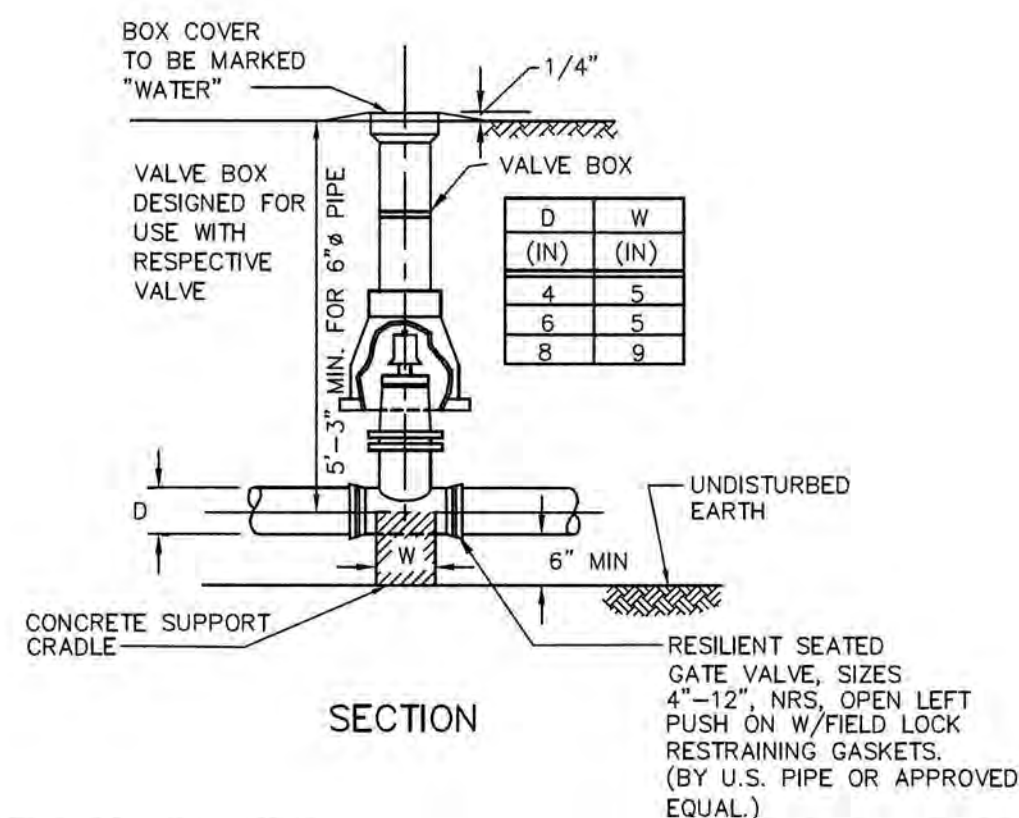
THRUST BLOCKING DETAIL NOT TO SCALE



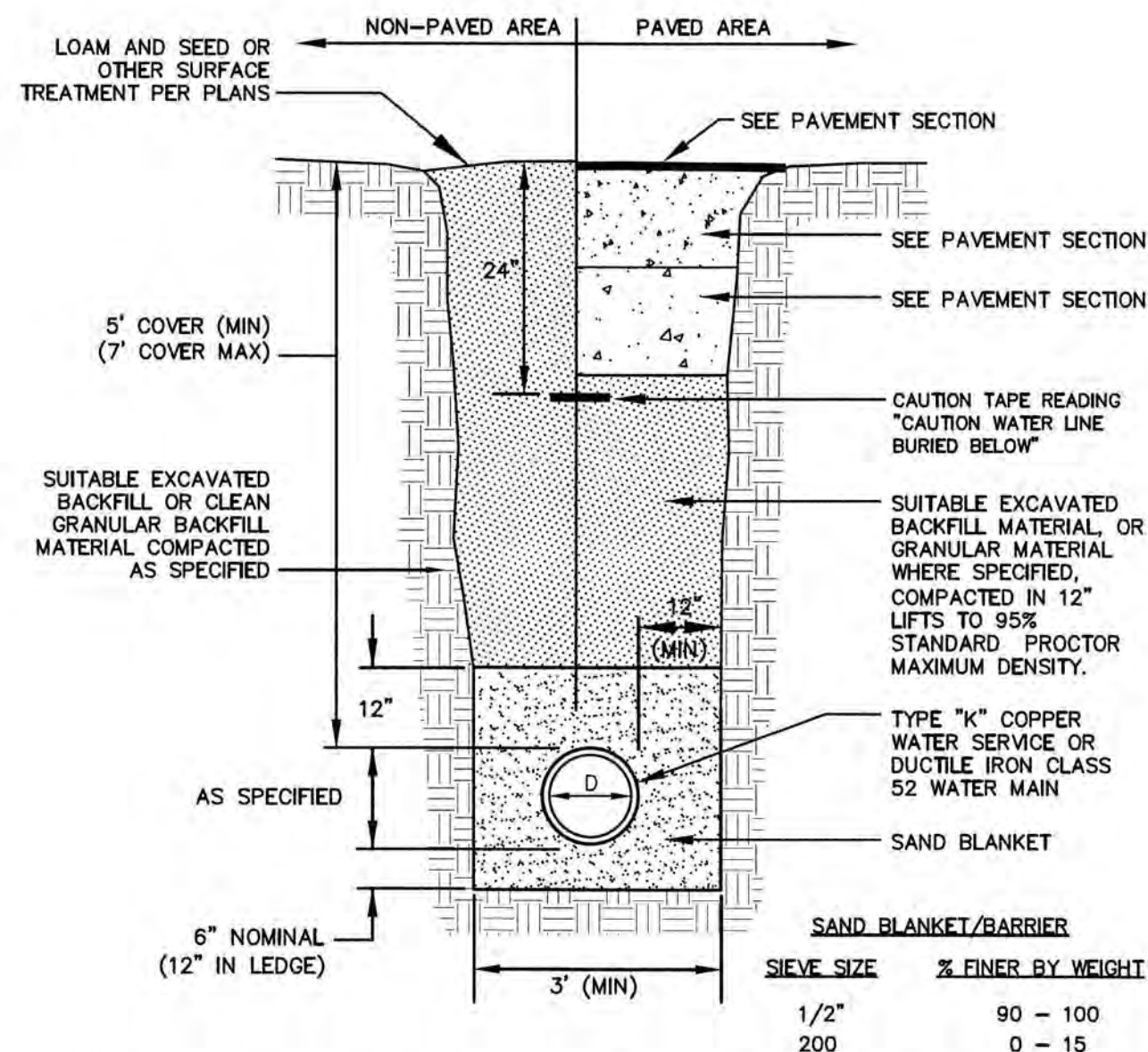
NOTES

1. GATE VALVES SHALL OPEN RIGHT, PER CITY STANDARDS.
2. BRANCH PIPING SHALL BE MECHANICALLY RESTRAINED AS NOTED UNDER THRUST BLOCK DETAIL REQUIREMENTS.

TEE & GATE VALVE ASSEMBLY DETAIL NOT TO SCALE



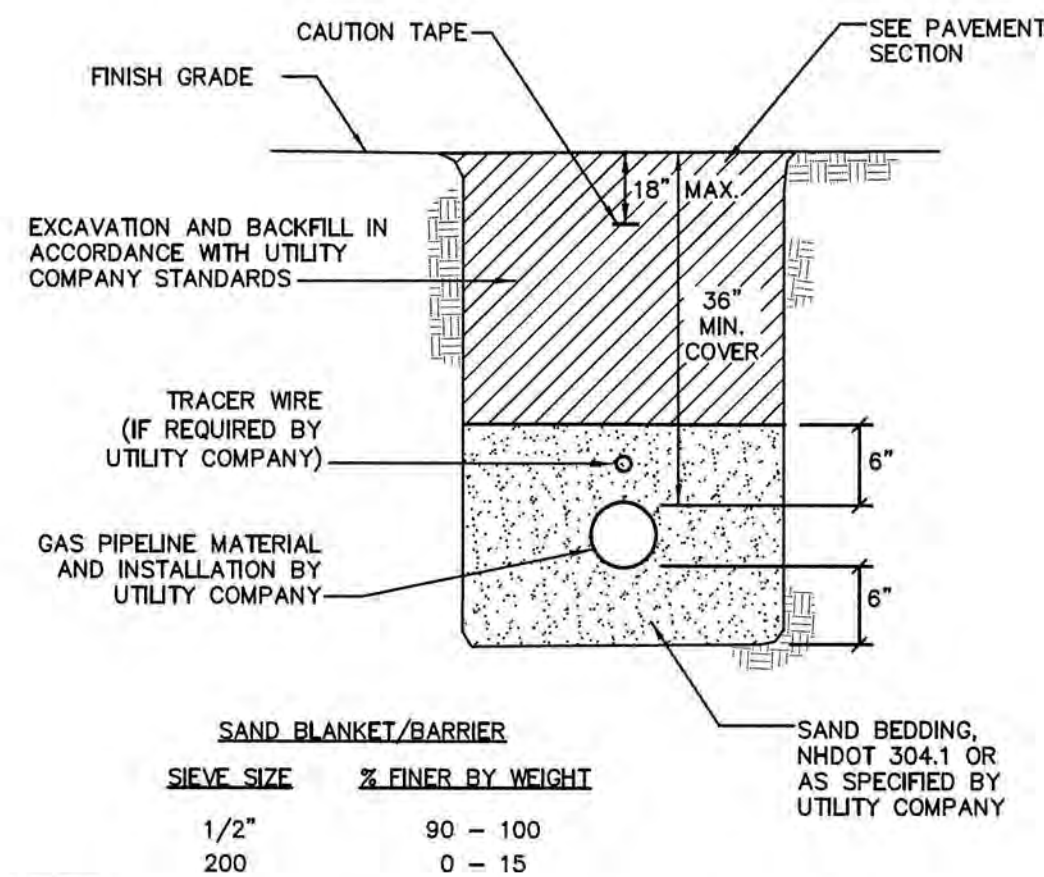
WATER VALVE DETAIL NOT TO SCALE



NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. WATER MAINS SHALL BE POLY WRAPPED.
3. WATER MAINS SHALL HAVE 3 WEDGES PER JOINT.

WATER MAIN TRENCH NOT TO SCALE



NOTES

1. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY AND PROVIDE ALL EXCAVATION, COMPACTION AND BACKFILL FOR PIPE INSTALLATION WITHIN THE PROJECT SITE.
2. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

GAS TRENCH NOT TO SCALE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

ENGINEER:

ALTUS
ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 453-2335 www.ALTUS-ENG.com



ISSUED FOR:

TAC

ISSUE DATE:

MAY 20, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	05/20/19

DRAWN BY: RLH

APPROVED BY: EDW

DRAWING FILE: 4787-DETAILS.DWG

SCALE:

22" x 34" - N.T.S.

11" x 17" - N.T.S.

OWNER OF RECORD:

ARBOR VIEW & THE PINES, LLC
C/O FOREST PROPERTIES MGMT.
625 MOUNT AUBURN STREET
CAMBRIDGE, MA 02138

APPLICANT:

FOREST PROPERTIES MGMT. INC.
625 MOUNT AUBURN STREET
CAMBRIDGE, MA 02138

PROJECT:

ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT

145 LANG ROAD

PORTSMOUTH, NH

TAX MAP 287, LOT 01

TITLE:

DETAIL SHEET

SHEET NUMBER:

D - 3

MANHOLE NOTES:

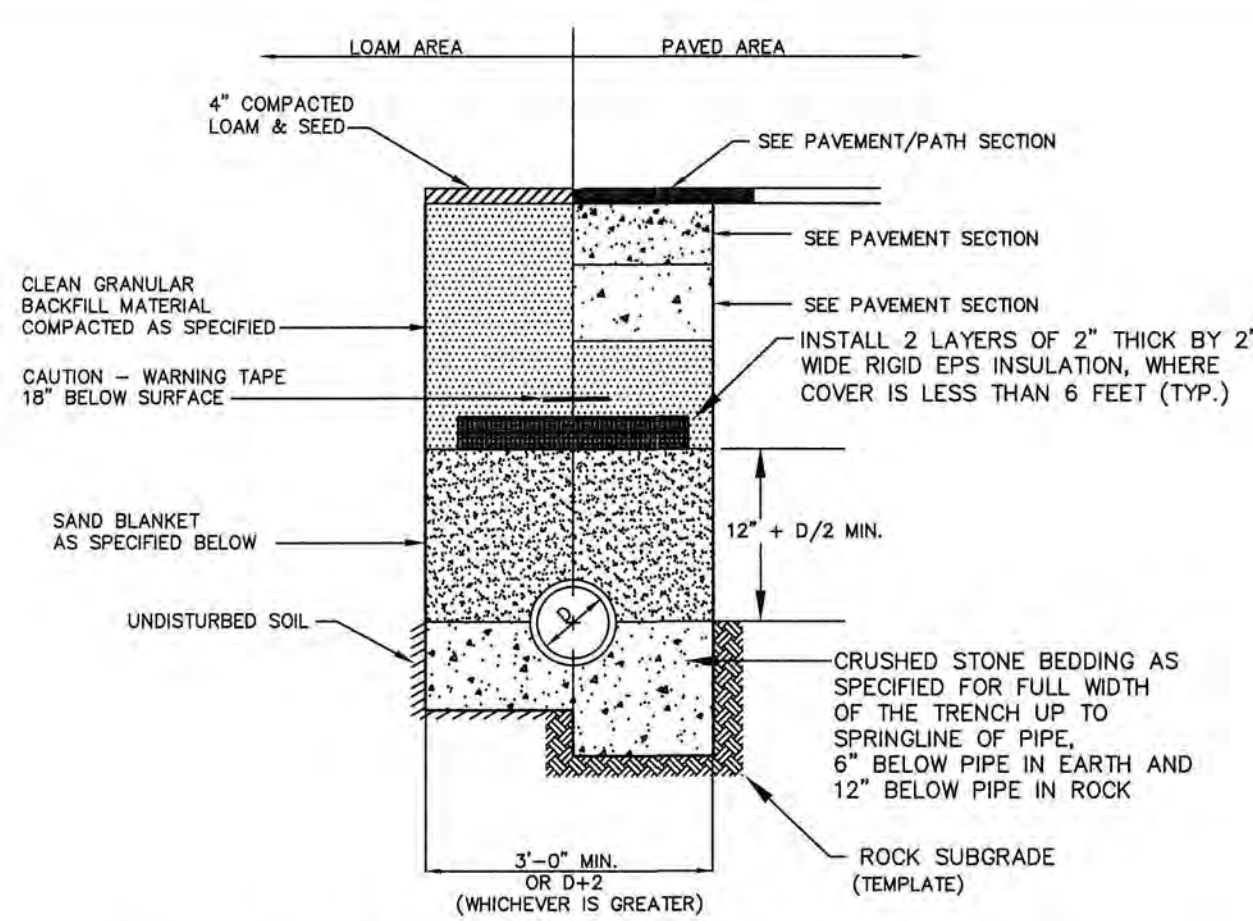
- IT IS THE INTENTION OF THE NHDES THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY BY THE COMMISSION FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES MAY BE AN ASSEMBLY OF PRECAST SECTIONS, WITH OR WITHOUT STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH OR WITHOUT REINFORCEMENT IN ANY APPROVED MANHOLE. THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H-20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE, A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.
- BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED.
- PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478.
- LEAKAGE TEST SHALL BE PERFORMED IN ACCORDANCE WITH THE TOWN'S STANDARD SPECIFICATIONS.
- INVERTS AND SHELVES MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW AT CHANGES IN DIRECTION. THE INVERTS SHALL BE LAID OUT IN CURVES, OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.
- FRAMES AND COVERS MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) LETTER "S" FOR SEWERS OR "D" FOR DRAINS SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
- BEDDING SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33.

100% PASSING 1 INCH SCREEN	0-10% PASSING #4 SIEVE
90-100% PASSING 3/4 INCH SCREEN	0-5% PASSING #6 SIEVE
20-55% PASSING 3/8 INCH SCREEN	

WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1-1/2" TO 1/2" SHALL BE USED.
- CONCRETE FOR DROP SUPPORT SHALL CONFORM TO THE REQUIREMENT FOR CLASS A (3000 LBS.) CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AS FOLLOWS:

CEMENT	6.0 BAGS PER CUBIC YARD
WATER	5.75 GALLONS PER BAG CEMENT
MAXIMUM SIZE OF AGGREGATE 1 INCH	
- FLEXIBLE JOINT A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES:

PVC PIPE - 60"
RCP & CI PIPE - ALL SIZES - 48"
AC & VC PIPE - UP THROUGH 12" DIAMETER - 18"
AC & VC PIPE - LARGER THAN 12" DIAMETER - 36"
- SHALLOW MANHOLE IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H-20 LOADS.



BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

SAND BLANKET		CRUSHED STONE BEDDING *	
SIEVE SIZE	% FINER BY WEIGHT	SIEVE SIZE	% PASSING BY WEIGHT
1/2"	90 - 100	1"	100
200	0 - 15	3/4"	90 - 100
		3/8"	20 - 55
		# 4	0 - 10
		# 8	0 - 5

* EQUIVALENT TO STANDARD STONE SIZE #67 - SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

SEWER TRENCH SECTION

NOT TO SCALE

STANDARD TRENCH NOTES:

- ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN OF THE DRAWING.
- BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33, STONE SIZE NO. 67.

100%	PASSING 1 INCH SCREEN
90 - 100%	PASSING 3/4 INCH SCREEN
20 - 55%	PASSING 3/8 INCH SCREEN
0-10%	PASSING #4 SIEVE
0-5%	PASSING #6 SIEVE

WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1-1/2 INCH TO 1/2 INCH SHALL BE USED.
- SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER, SO GRADED THAT 90 - 100% PASSES 1/2 INCH SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE. BLANKET MAY BE OMITTED FOR CAST-IRON, DUCTILE IRON, AND REINFORCED CONCRETE PIPE PROVIDED HOWEVER, THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE.
- SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS; PIECES OF PAVEMENT; ORGANIC MATTER; TOP SOIL; ALL WET OR SOFT MUCK; PEAT; OR CLAY; ALL EXCAVATED LEDGE MATERIAL; ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION; AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.
- BASE COURSE AND PAVEMENT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES - DIVISIONS 300 AND 400 RESPECTIVELY.
- SHEETING, IF REQUIRED: WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID-DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION 1 FOOT ABOVE THE TOP OF PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE.
- W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.) ALSO, W SHALL BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
- FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
- CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATION REQUIREMENTS FOR CLASS A (3000) CONCRETE AS FOLLOWS:

CEMENT:	6.0 BAGS PER CUBIC YARD
WATER:	5.75 GALLONS PER BAG CEMENT
MAXIMUM SIZE OF AGGREGATE: 1 INCH	

CONCRETE ENCASEMENT IS NOT ALLOWED FOR PVC PIPE.
- CONCRETE FULL ENCASEMENT: IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MINIMUM). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
- NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE TEN FEET (10') SEPARATION BETWEEN WATER AND SEWER. REFER TO CITY'S STANDARD SPECIFICATIONS FOR METHODS OF PROTECTION IN AREAS THAT CANNOT MEET THESE REQUIREMENTS.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

ENGINEER:

ALTUS
ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com



ISSUED FOR:

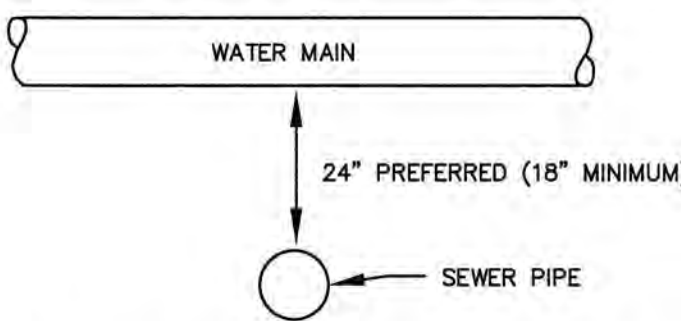
TAC

ISSUE DATE:

MAY 20, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
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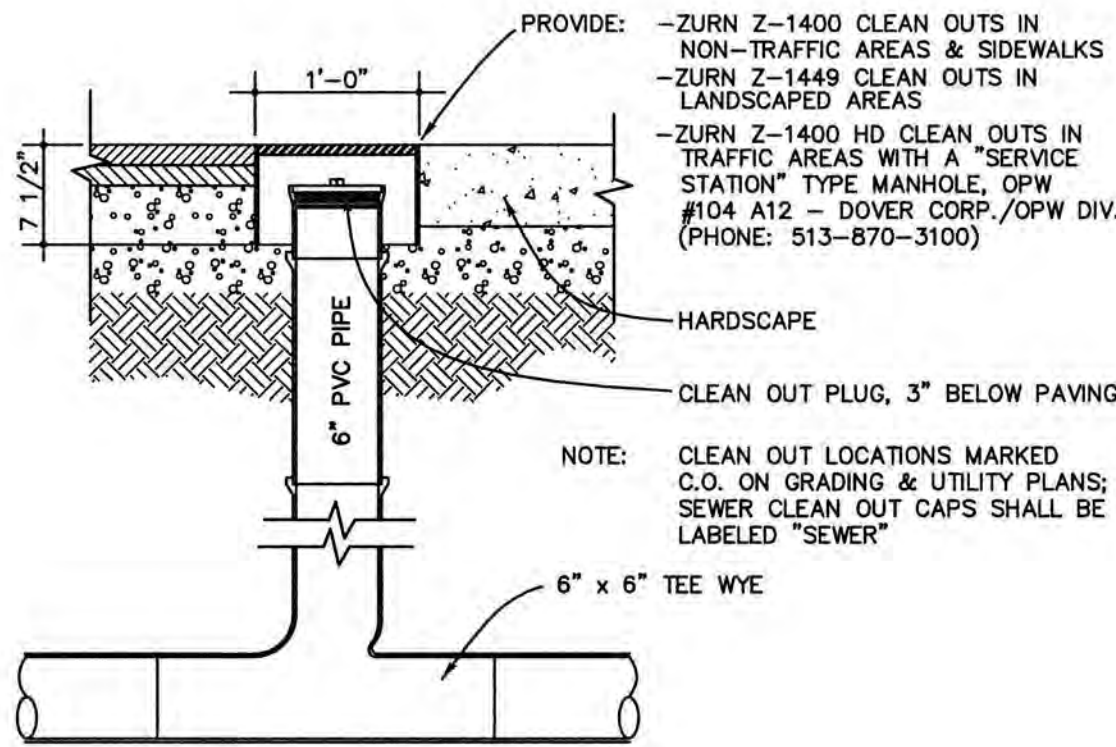
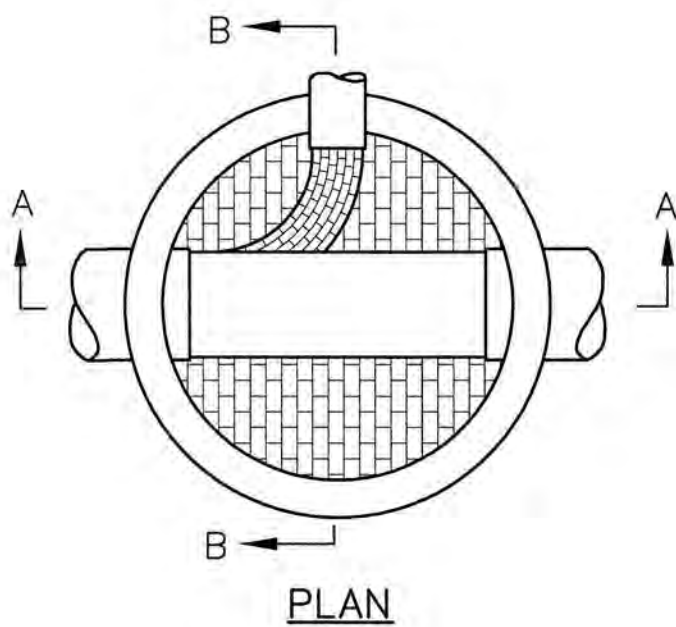


NOTES

- A MINIMUM HORIZONTAL DISTANCE OF 10 FEET SHALL BE MAINTAINED BETWEEN WATER AND SEWER MAINS. A MINIMUM VERTICAL DISTANCE WITH WATER ABOVE SEWER SHALL BE MAINTAINED.
- SEWER PIPE JOINTS SHALL BE LOCATED A MINIMUM OF 6 FEET HORIZONTALLY FROM WATER MAIN.
- IF THE REQUIRED CONFIGURATION CANNOT BE MET, THE SEWER MAIN SHALL BE CONSTRUCTED TO MEET THE NHDES REQUIREMENTS FOR FORCE MAIN CONSTRUCTION.

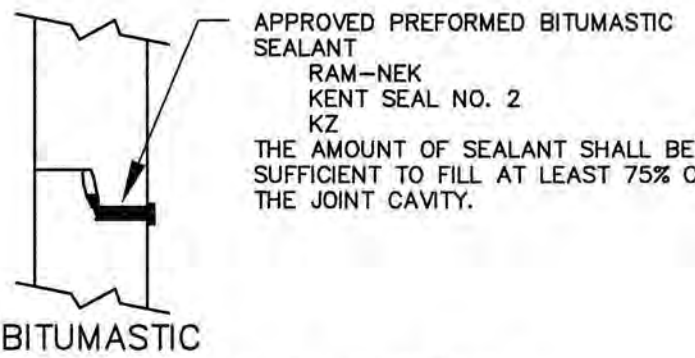
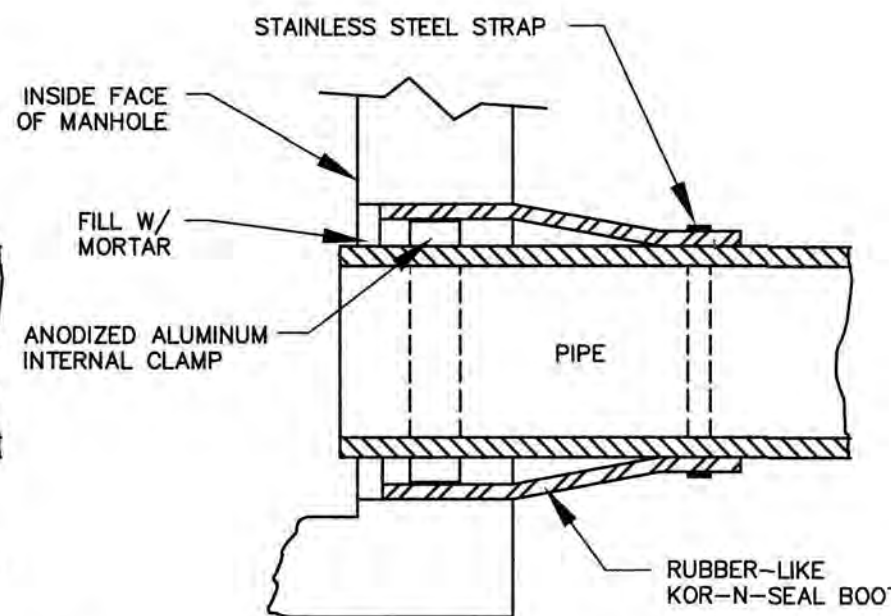
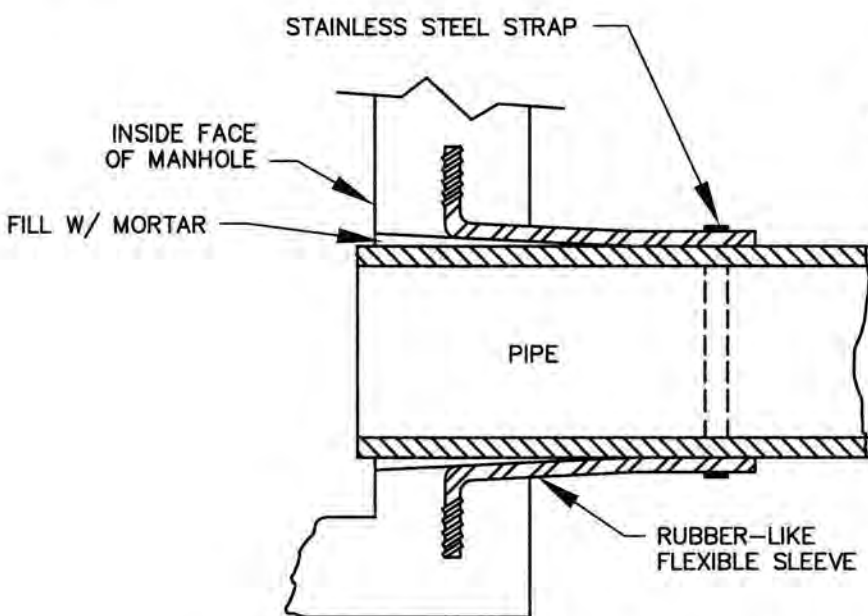
WATER MAIN / SEWER CROSSING

NOT TO SCALE



CLEANOUT DETAIL

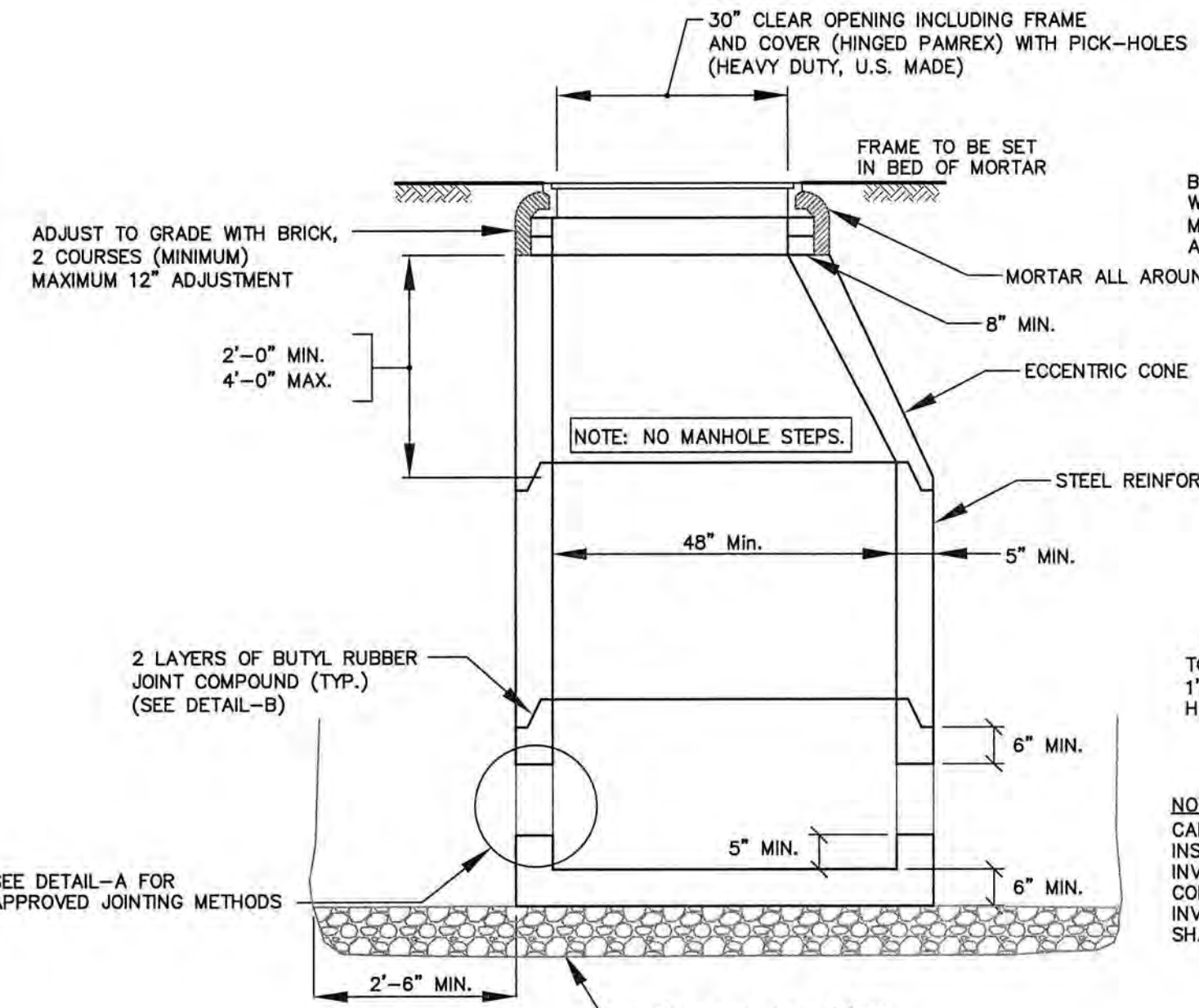
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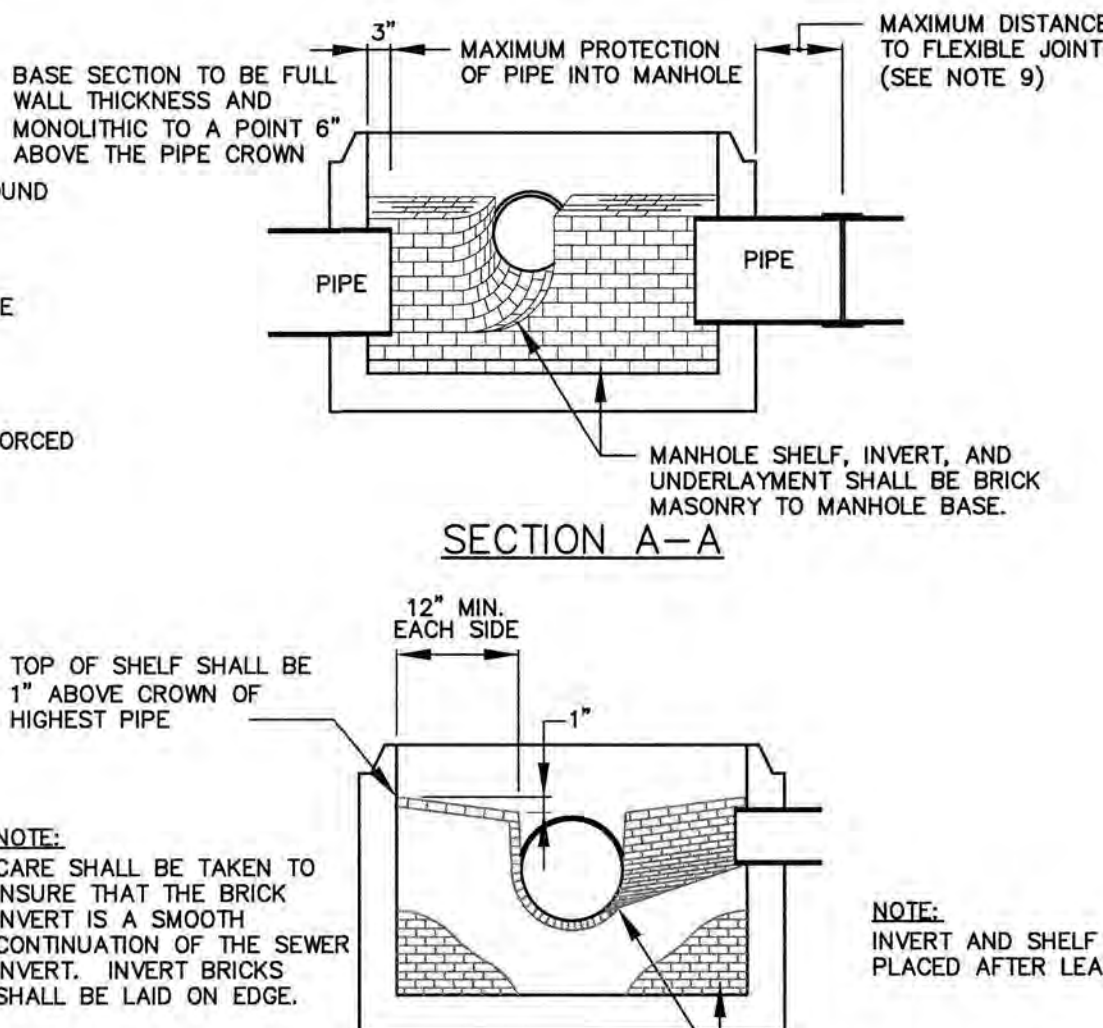
NOTE: ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

DETAIL-B

(APPROVED MANHOLE SECTION JOINTING METHODS)



TYPICAL SECTION



SECTION A-A

SECTION B-B

SEWER MANHOLE DETAILS

NOT TO SCALE

DETAIL-A

NOTE: ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4787-DETAILS.DWG

SCALE:

22" x 34" - N.T.S.
11" x 17" - N.T.S.

OWNER OF RECORD:

ARBOR VIEW & THE PINES, LLC
C/O FOREST PROPERTIES MGMT.
625 MOUNT AUBURN STREET
CAMBRIDGE, MA 02138

APPLICANT:

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PROJECT:

ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT

145 LANG ROAD
PORTSMOUTH, NH

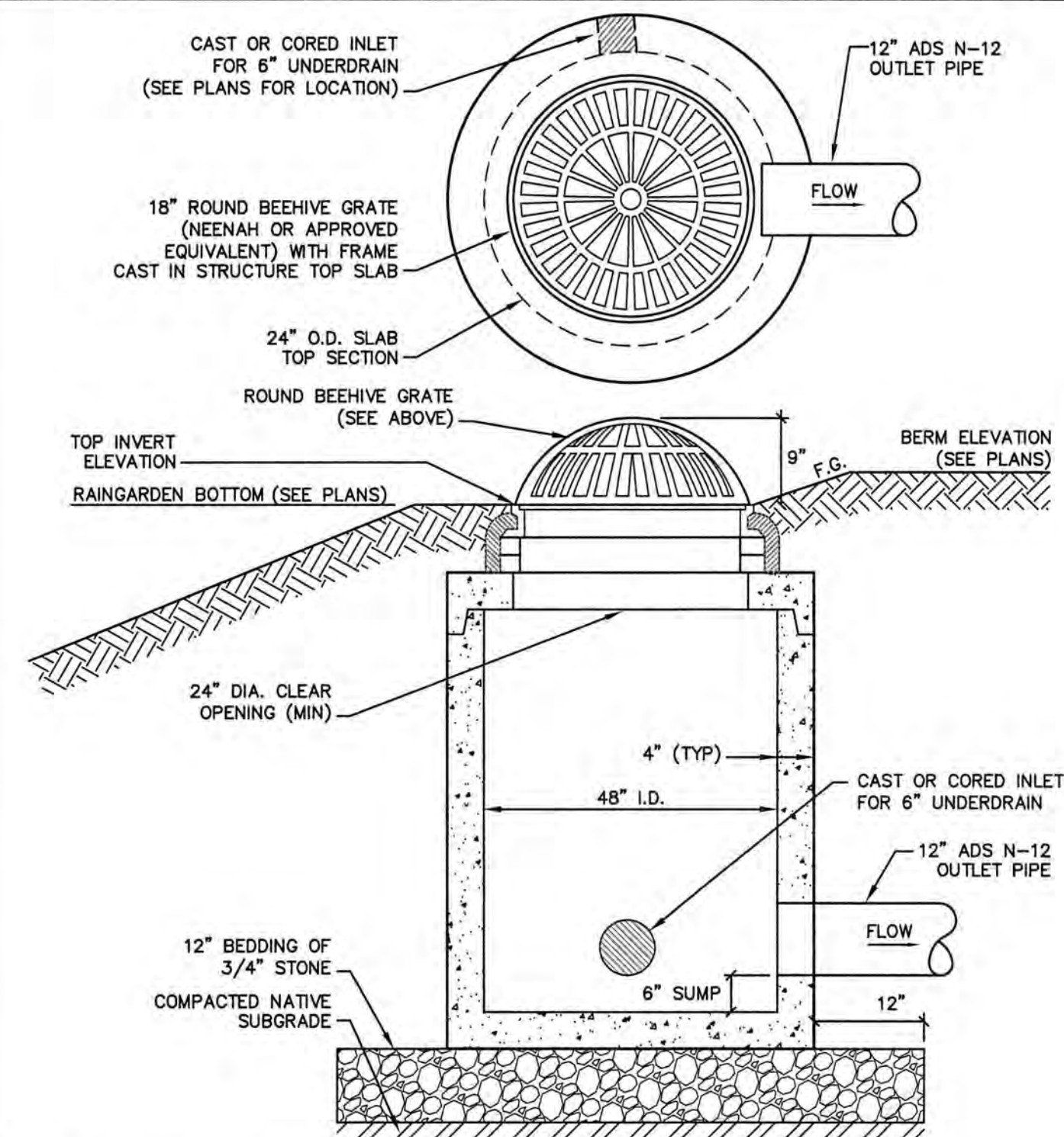
TAX MAP 287, LOT 01

TITLE:

DETAIL SHEET

SHEET NUMBER:

D - 4

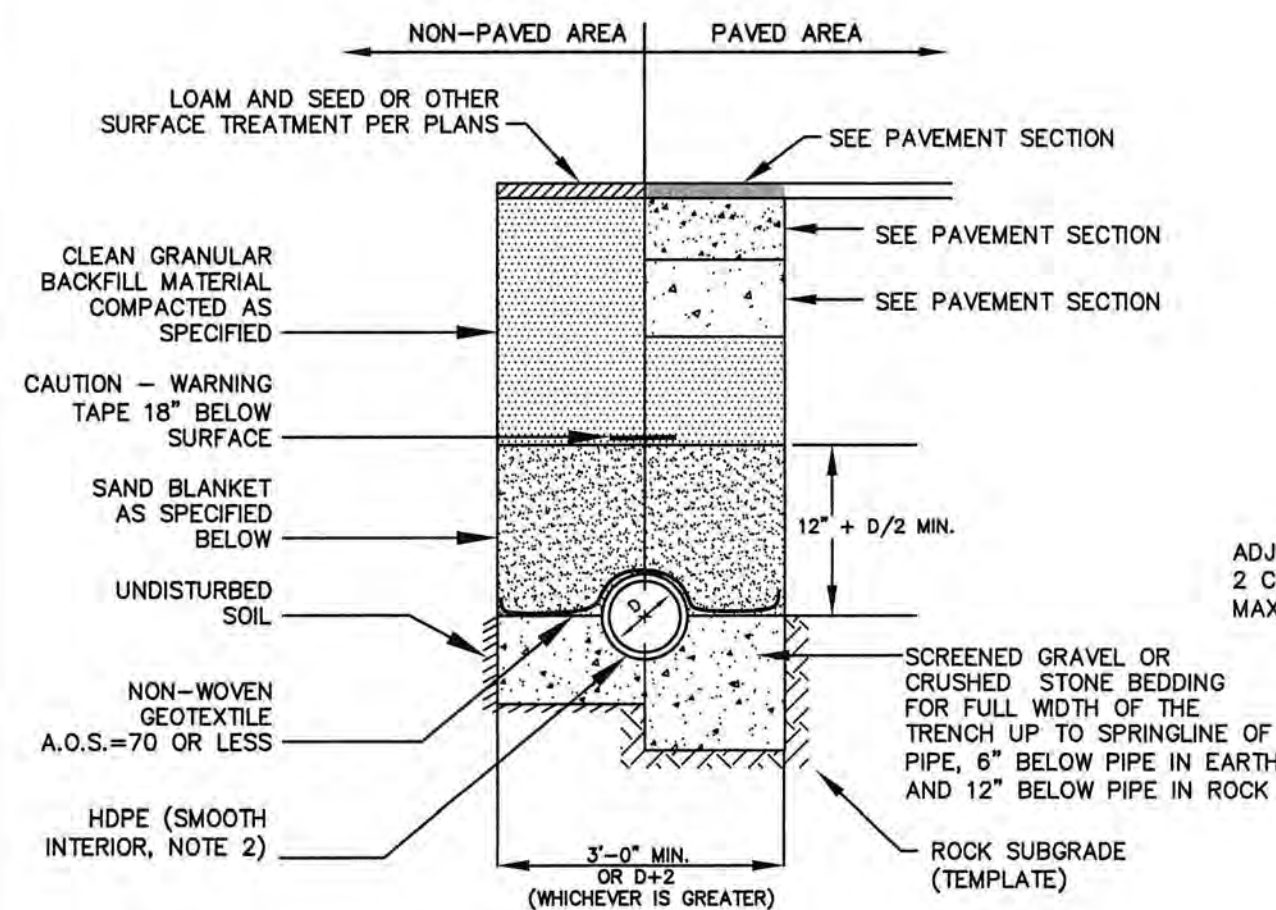


CONSTRUCTION SPECIFICATIONS

1. OUTLET STRUCTURE SHALL BE CONSTRUCTED ONSITE OR PRECAST TO EQUAL DIMENSIONS.
2. ALL JOINTS AND PIPE OPENINGS SHALL BE SEALED WATERTIGHT WITH MORTAR.
3. STRUCTURE IS TO BE BUILT TO WITHSTAND H2O LOADING.
4. SOIL UNDERLYING THE STRUCTURE'S GRAVEL BASE PAD AND THE PAD ITSELF ARE TO BE COMPACTED TO 95% MODIFIED PROCTOR.
5. ALL CONCRETE SHALL BE 4,000 PSI MINIMUM.

OUTLET STRUCTURE DETAIL

NOT TO SCALE



NOTES:

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. ALL PIPE SHALL BE HDPE WITH SMOOTH INTERIOR AND CORRUGATED EXTERIOR, ADS TYPE N-12 OR APPROVED EQUAL.

SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 - 100
200	0 - 15

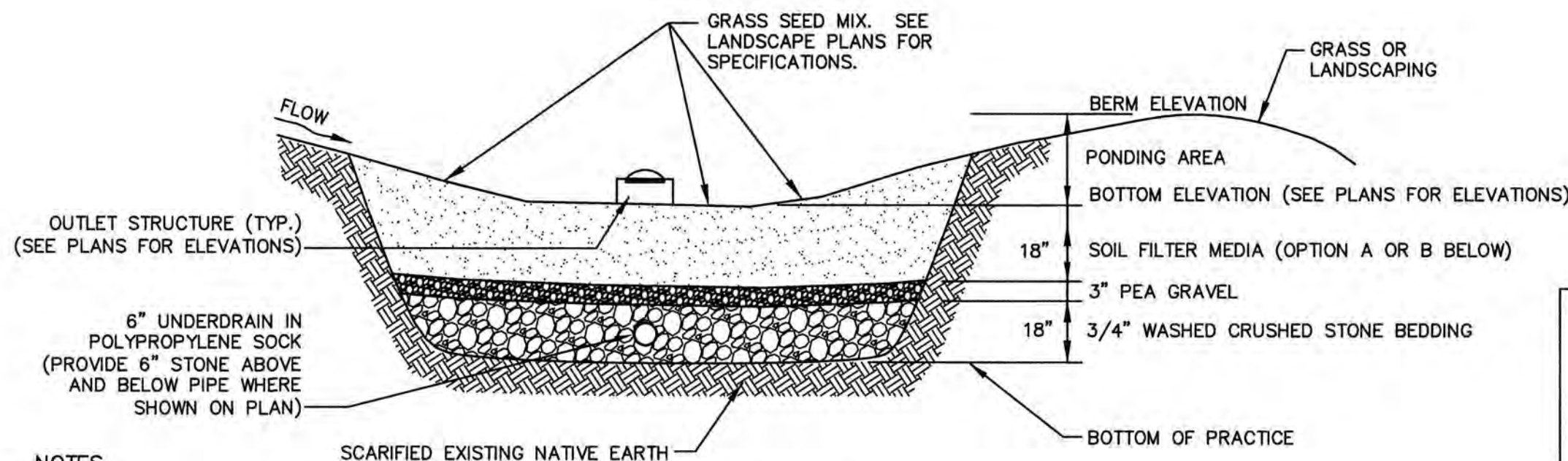
SCREENED GRAVEL OR CRUSHED STONE BEDDING*

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

* EQUIVALENT TO STANDARD STONE SIZE #67 - SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

STORM DRAIN TRENCH

NOT TO SCALE



NOTES

1. WHEN CONTRACTOR EXCAVATES RAIN GARDEN AREA TO SUBGRADE, DESIGN ENGINEER SHALL PERFORM SUBSURFACE EVALUATION PRIOR TO THE PLACEMENT OF ANY SELECT MATERIAL OR OTHER BACKFILL.
2. SOIL FILTER MEDIA SHALL BE EITHER OPTION A OR OPTION B AT CONTRACTOR'S DISCRETION.

MAINTENANCE REQUIREMENTS

- SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EXCEEDING 2.5 INCHES IN A 24-HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS IS WARRANTED BY SUCH INSPECTION.
- PRETREATMENT MEASURES SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND CLEANED OF ACCUMULATED SEDIMENT AS WARRANTED BY INSPECTION, BUT NO LESS THAN ONCE ANNUALLY.
- AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72-HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION OR INFILTRATION FUNCTION (AS APPLICABLE), INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
- VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING, PRUNING, REMOVAL, AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.

DESIGN REFERENCES

- UNH STORMWATER CENTER
- EPA (1999A)
- NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 2, DECEMBER 2008 AS AMENDED.

TYPICAL RAINGARDEN

NOTE: NO MANHOLE STEPS.

ADJUST TO GRADE WITH BRICK, 2 COURSES (MINIMUM) MAXIMUM 12" ADJUSTMENT

2'-0" MIN. 4'-0" MAX.

1 LAYER OF BUTYL RUBBER JOINT COMPOUND (TYP.)

HOLE CAST TO PLAN

KOR-N-SEAL FLEXIBLE BOOT

6" MIN.

5" MIN.

6" BEDDING OF 1/2" TO 3/4" CRUSHED STONE

12" MIN.

6" MIN.

6" MIN.

6" MIN.

6" MIN.

6" MIN.

6" MIN.

6" MIN.

6" MIN.

6" MIN.

6" MIN.

6" MIN.

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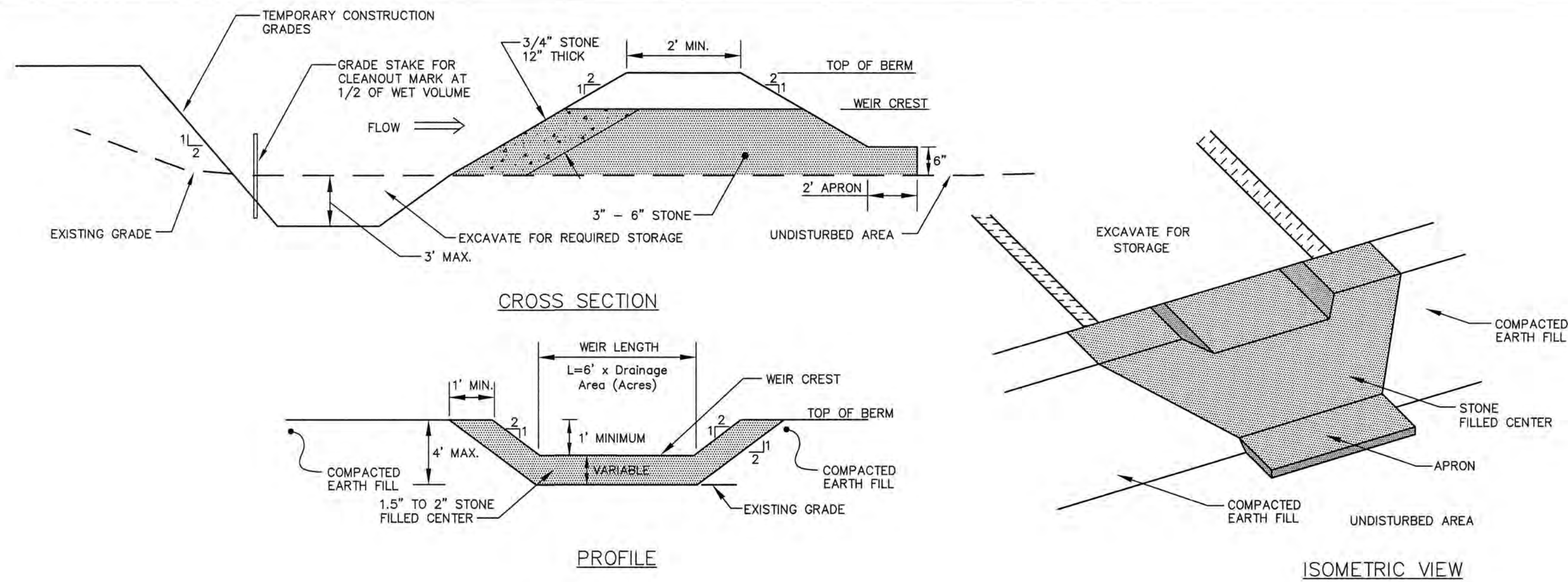
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APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

ENGINEER:

ALTUS
ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com



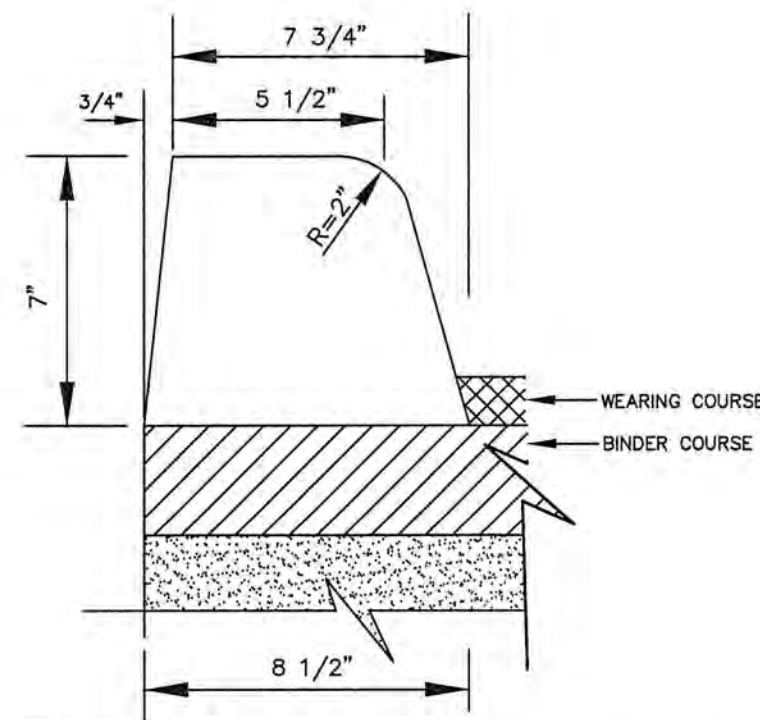
ISSUED FOR: TAC

ISSUE DATE: MAY 20, 2019

REVISIONS:

NO.	DESCRIPTION	BY	DATE
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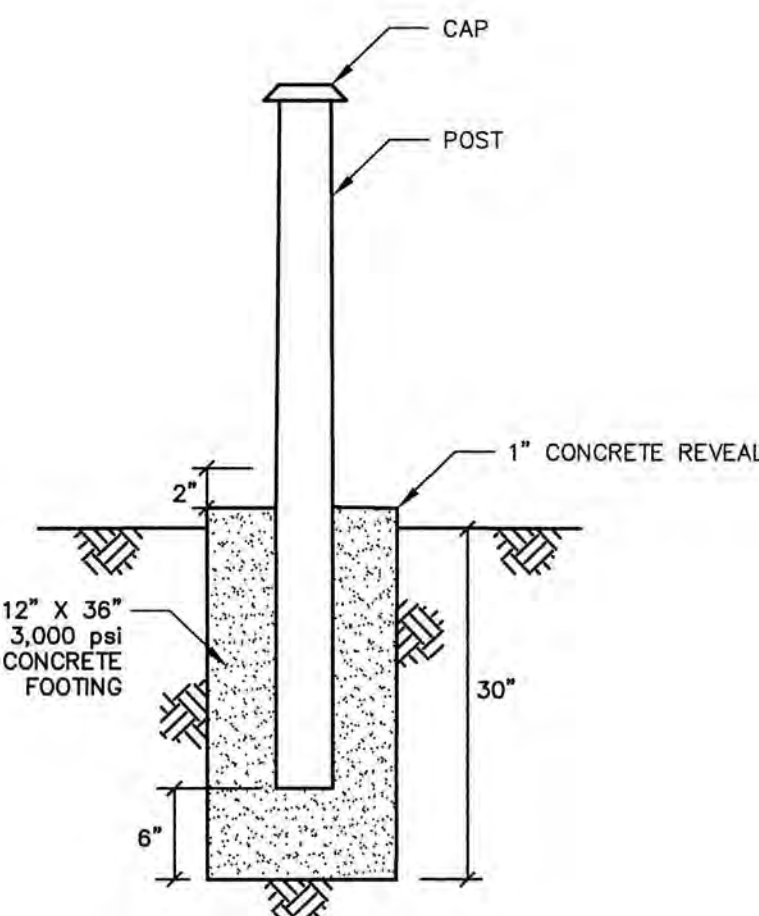
FULL FACE BITUMINOUS CONCRETE CURB DETAIL NOT TO SCALE



MAINTENANCE

- SEDIMENT SHALL BE REMOVED AND THE TRAP SHALL BE RESTORED TO ITS ORIGINAL CAPACITY WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN STORAGE VOLUME. SEDIMENT REMOVED SHALL BE DISPOSED OF SO THAT IT DOES NOT CAUSE A SEDIMENT PROBLEM AT ANOTHER LOCATION.
- THE STRUCTURE SHALL BE CHECKED BI-WEEKLY AND AFTER EVERY MAJOR STORM TO INSURE THAT IT IS WORKING PROPERLY AND IS NOT DAMAGED. DAMAGE TO THE STRUCTURE SHALL BE REPAIRED IMMEDIATELY.
- 3/4" STONE SHALL BE CHECKED DURING INSPECTION AND REPLACED WHEN THE OPENINGS IN THE STONE HAVE BECOME CLOGGED.
- WHEN THE DRAINAGE AREA FLOWING INTO THE BASIN HAS BEEN FULLY STABILIZED, THE SEDIMENT TRAP SHALL BE REMOVED AND THE AREA VEGETATED USING LOAM AND SEED WITH MULCH (OR SOD IF NECESSARY) WITHIN 72 HOURS OF THE REMOVAL OF THE BASIN.

TEMPORARY SEDIMENT TRAP (TST) OUTLET NOT TO SCALE



FENCE POST DETAIL NOT TO SCALE

POST CAP STYLE

NEW ENGLAND - V55NE

POST OPTION

5" X 5" - .140 Wall
Post set in concrete

FENCE HEIGHT

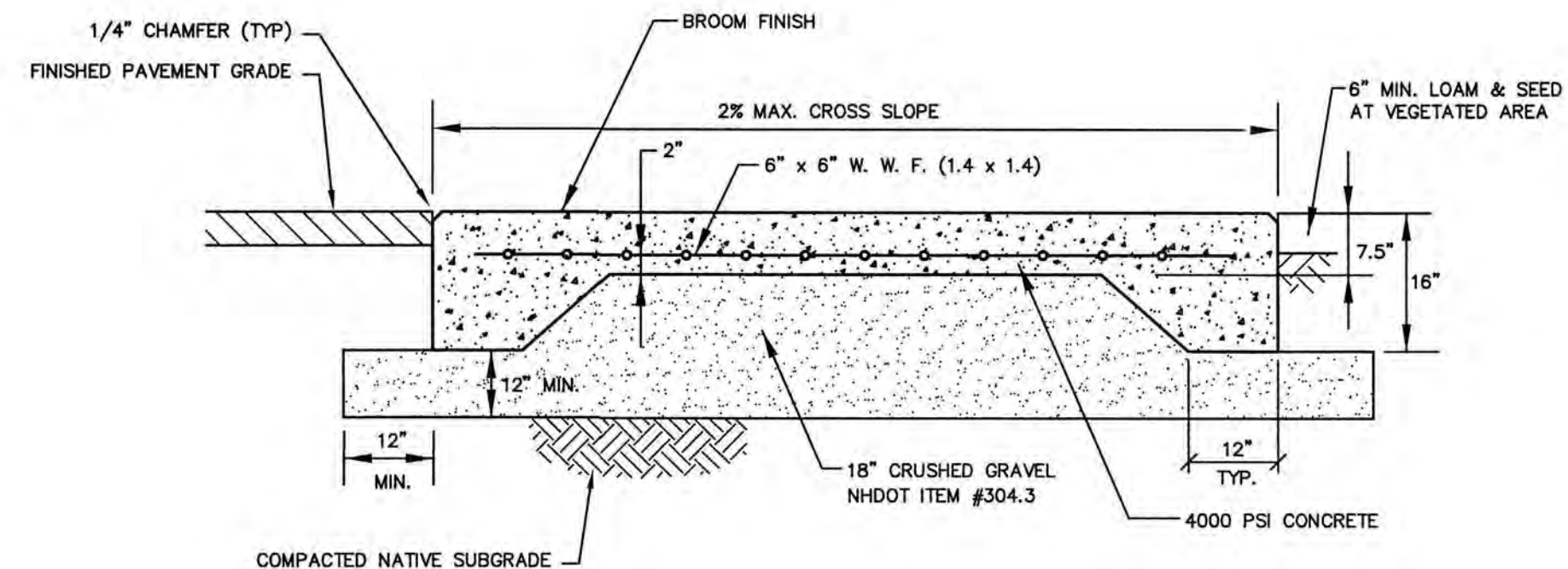
6'-0", see height schedule below

A	B	C	D
H(FT)	INCHES	H(FT)	INCHES
3	60	3	22
4	84	4	34
5	96	5	34
6	108	6	34
8	144	8	46
10	168	10	46
			10
			120

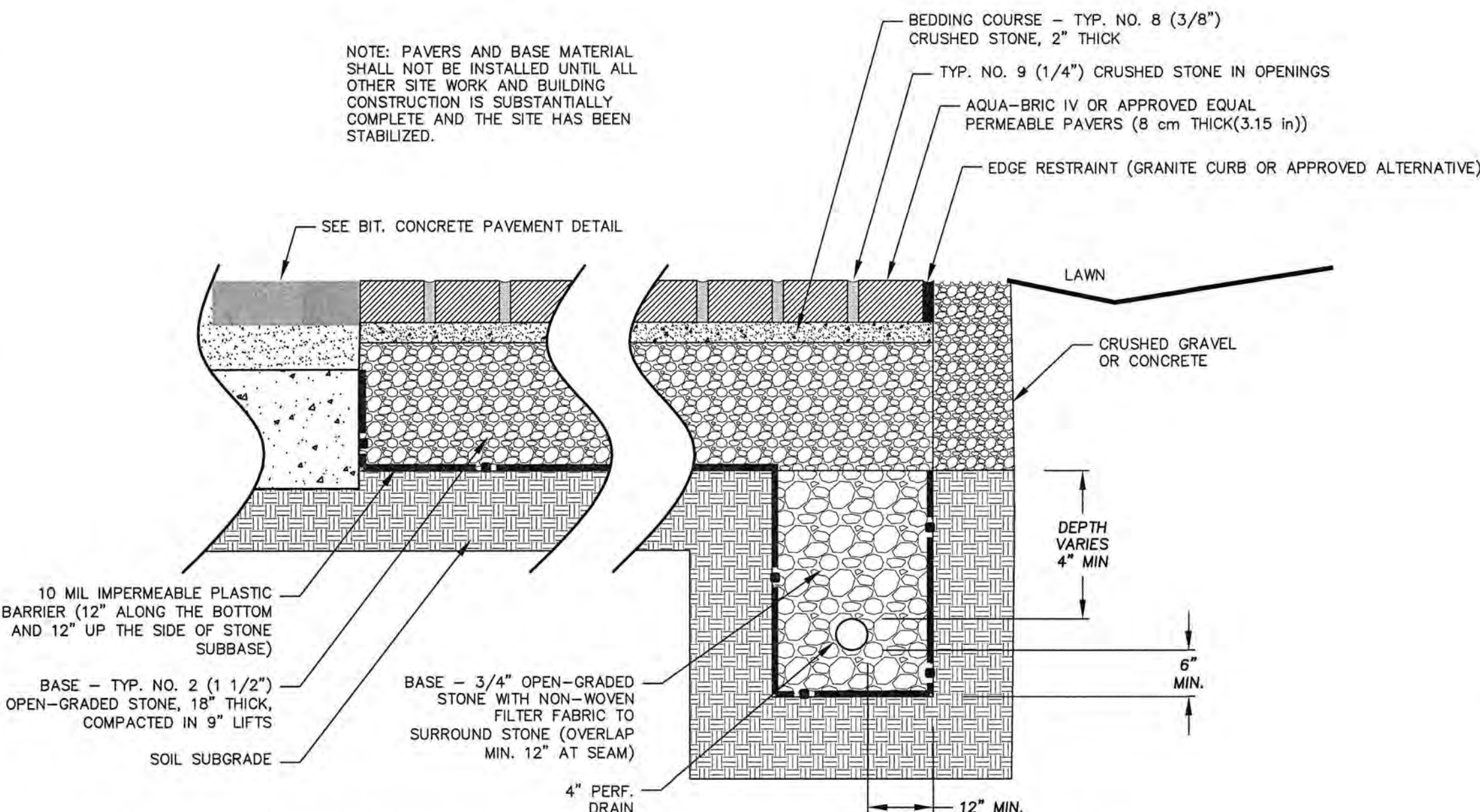
NOTE:

- FENCE SHALL BE ILLUSION VINYL FENCE PRODUCT OR APPROVED EQUAL.
- COLOR SHALL BE DETERMINE BY LANDSCAPE ARCHITECT OR APPLICANT.
- POST SHALL BE SET IN CONCRETE.
- OPENING CLEARANCE DIMENSIONS PER OWNER REQUIREMENT.

DUMPSTER SCREENING DETAIL NOT TO SCALE

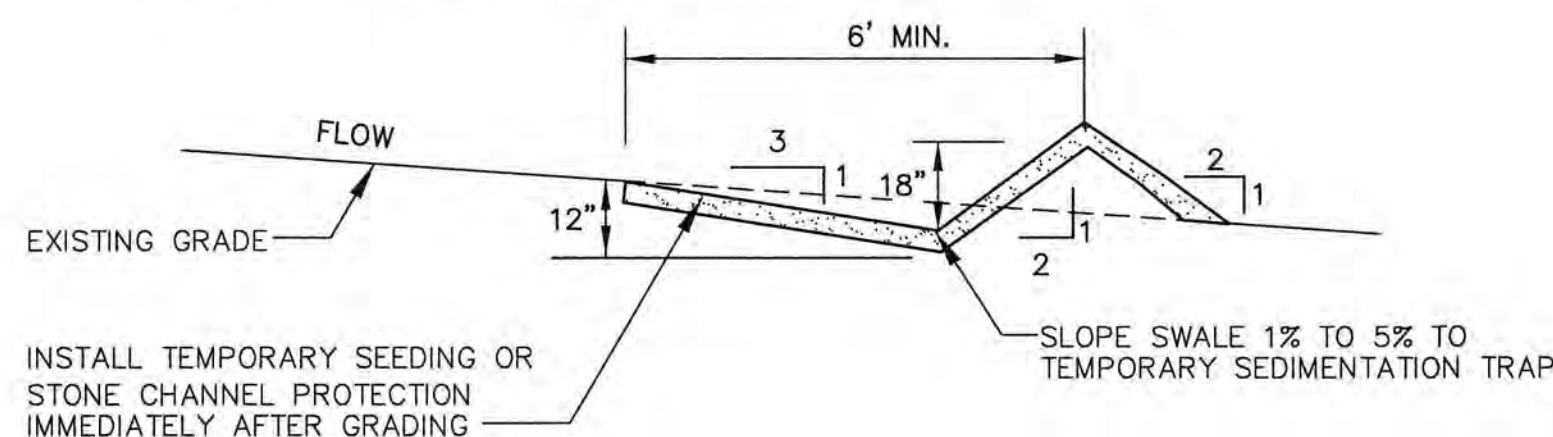


DUMPSTER SLAB DETAILS NOT TO SCALE

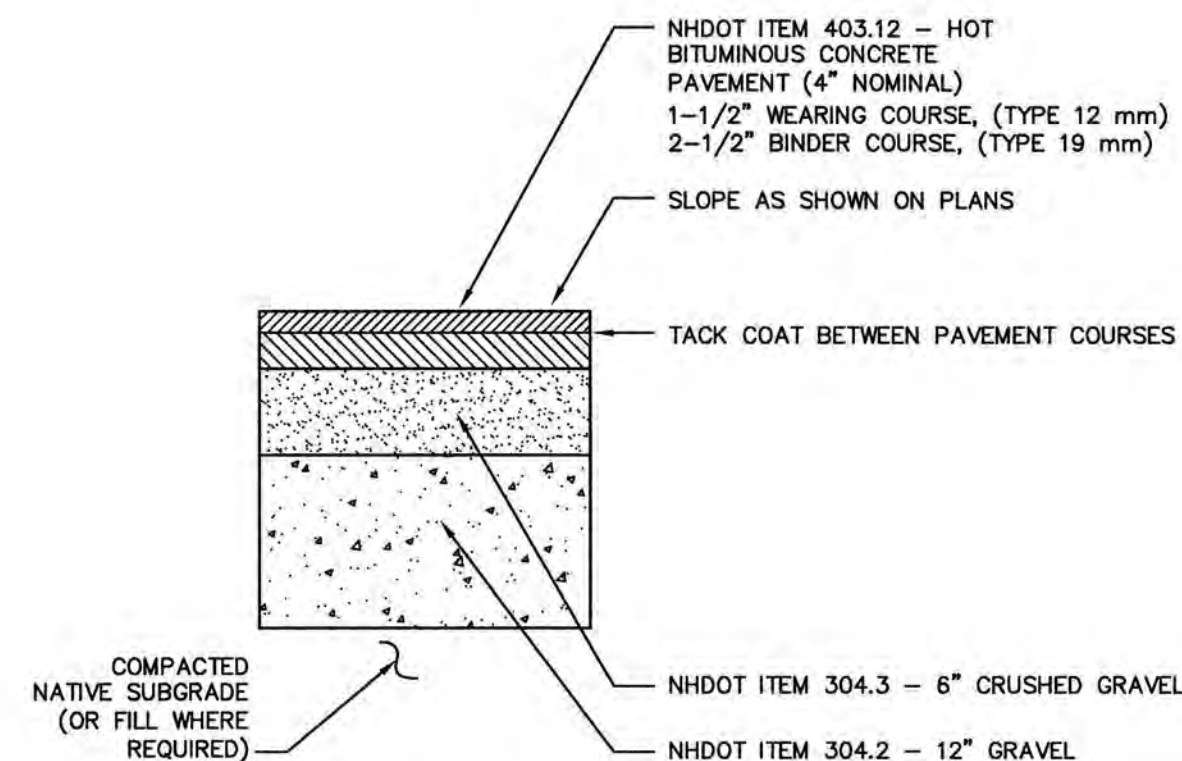


POROUS PAVERS DETAIL NOT TO SCALE

SWALE SHALL BE FREE OF IRREGULARITIES WHICH MAY CAUSE PONDING. COMPACT FILLS AS NECESSARY TO STABILIZE MATERIAL.



TEMPORARY DIVERSION SWALE NOT TO SCALE



PAVEMENT CROSS SECTION NOT TO SCALE

DRAWN BY: RLH

APPROVED BY: EDW

DRAWING FILE: 4787-DETAILS.DWG

SCALE:

22" x 34" - N.T.S.

11" x 17" - N.T.S.

OWNER OF RECORD:

ARBOR VIEW & THE PINES, LLC
C/O FOREST PROPERTIES MGMT.
625 MOUNT AUBURN STREET
CAMBRIDGE, MA 02138

APPLICANT:

FOREST PROPERTIES MGMT. INC.
625 MOUNT AUBURN STREET
CAMBRIDGE, MA 02138

PROJECT:

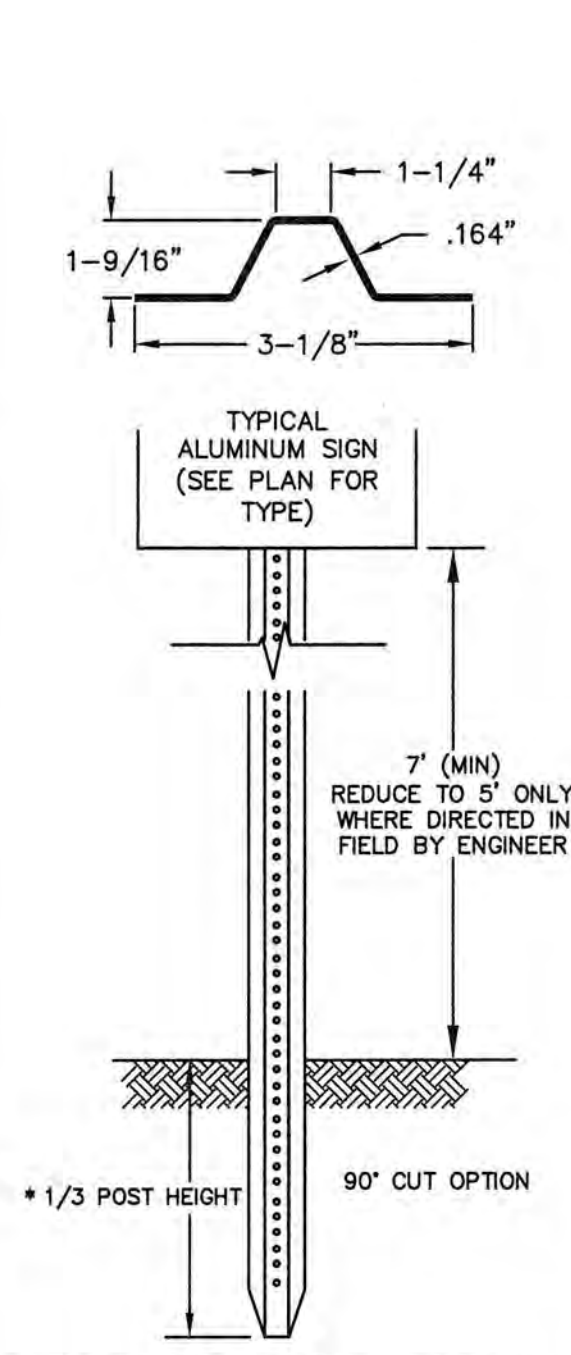
ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT
145 LANG ROAD
PORTSMOUTH, NH
TAX MAP 287, LOT 01

TITLE:

DETAIL SHEET

SHEET NUMBER:

D - 6



NOTES

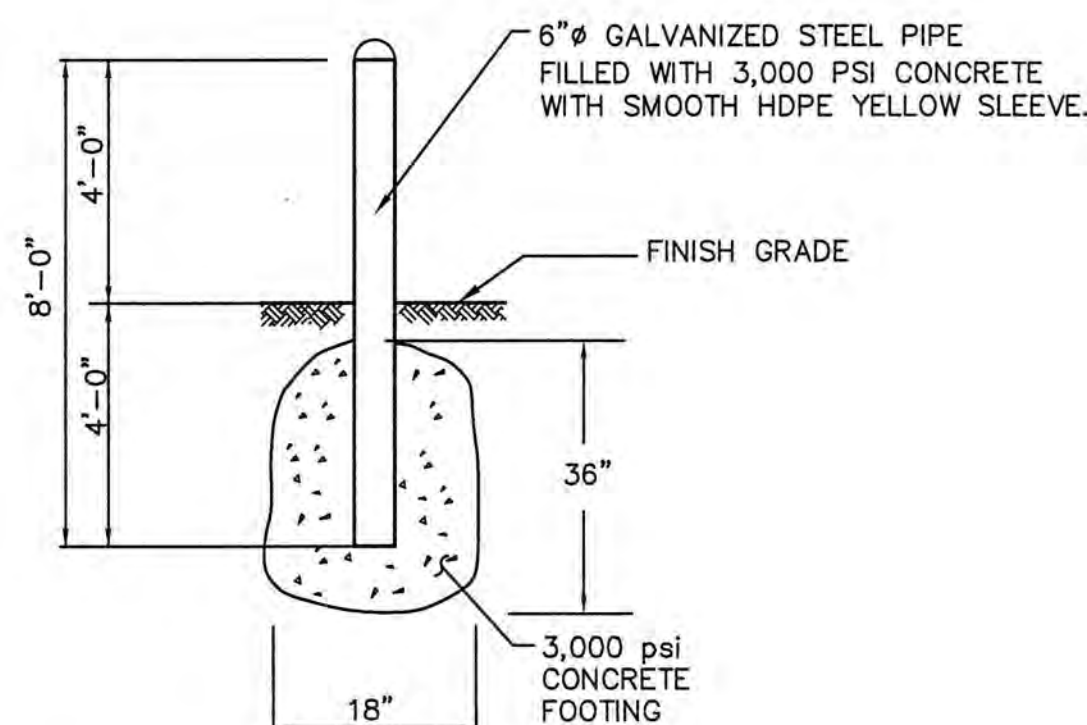
1. ALL SIGNS SHALL MEET THE REQUIREMENTS OF AND BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)

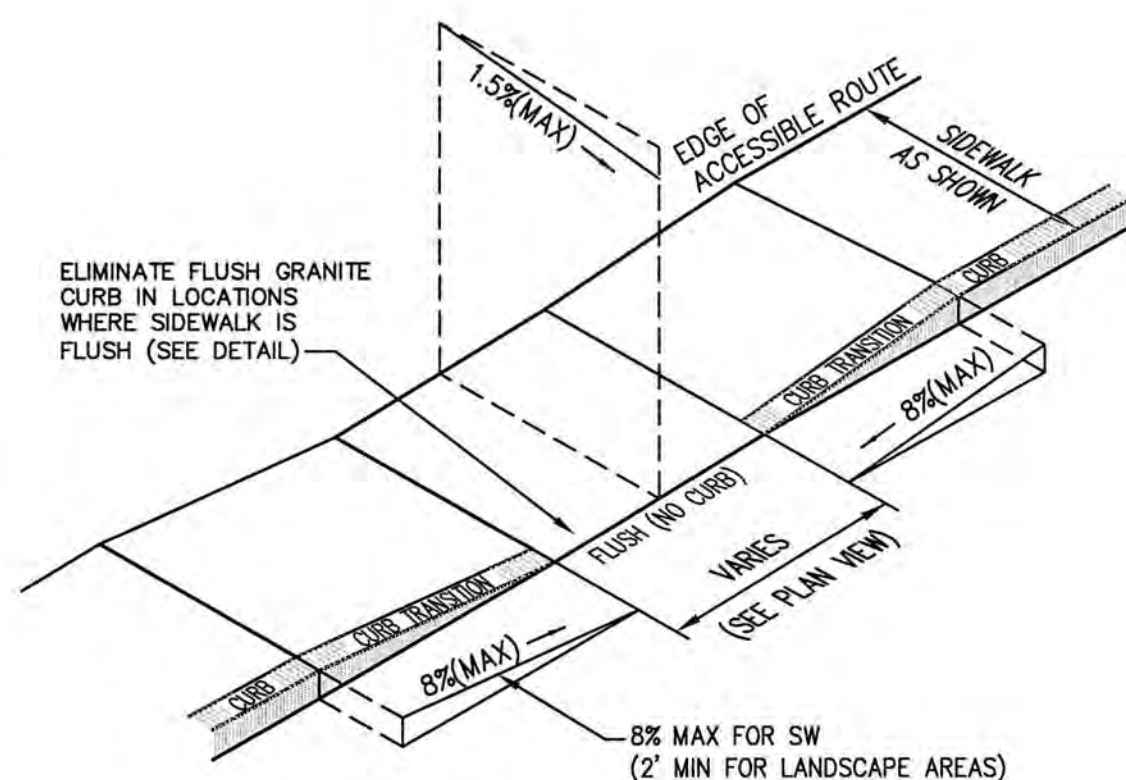
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH

STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 - 1080)

SIGN DETAILS NOT TO SCALE

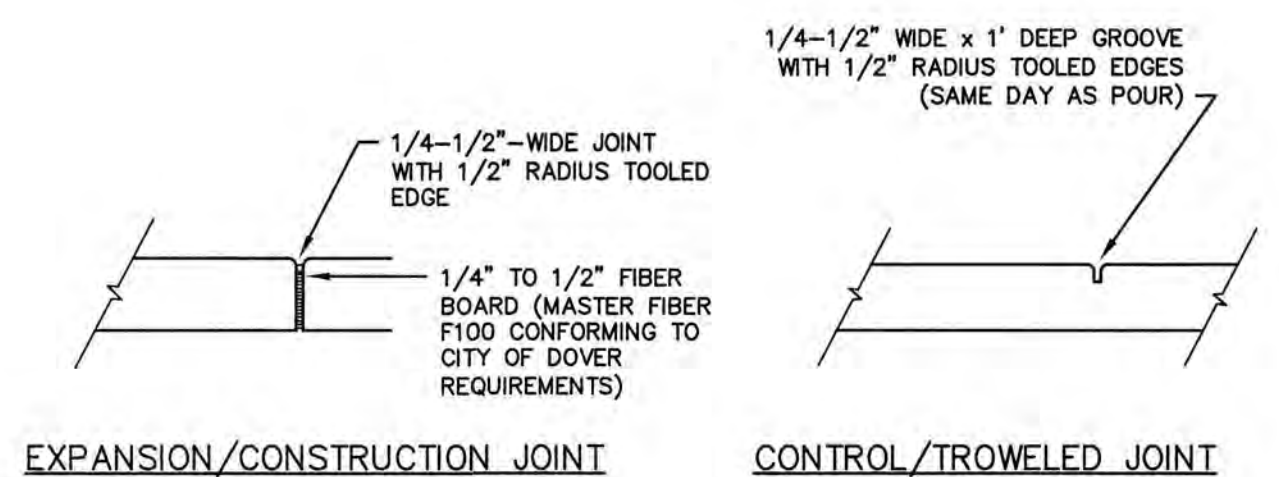


BOLLARD NOT TO SCALE



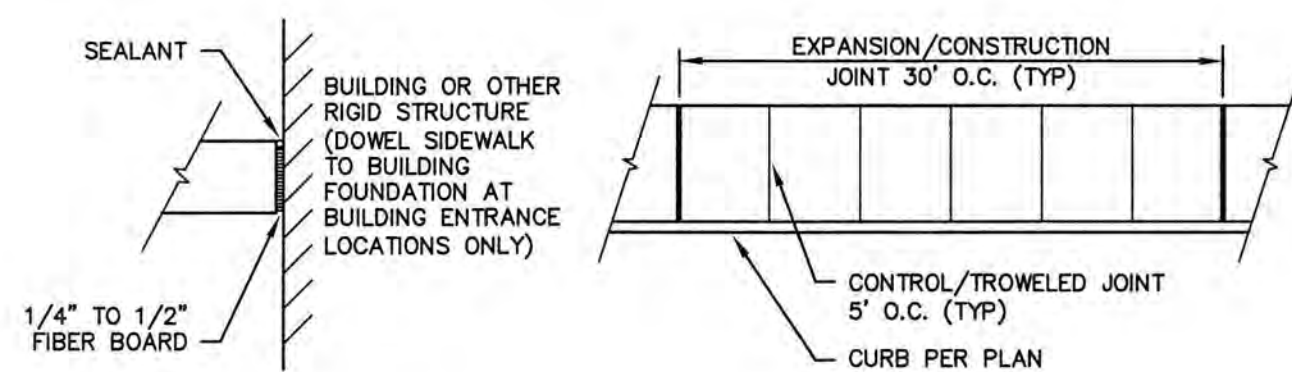
CURB RAMP

NOT TO SCALE

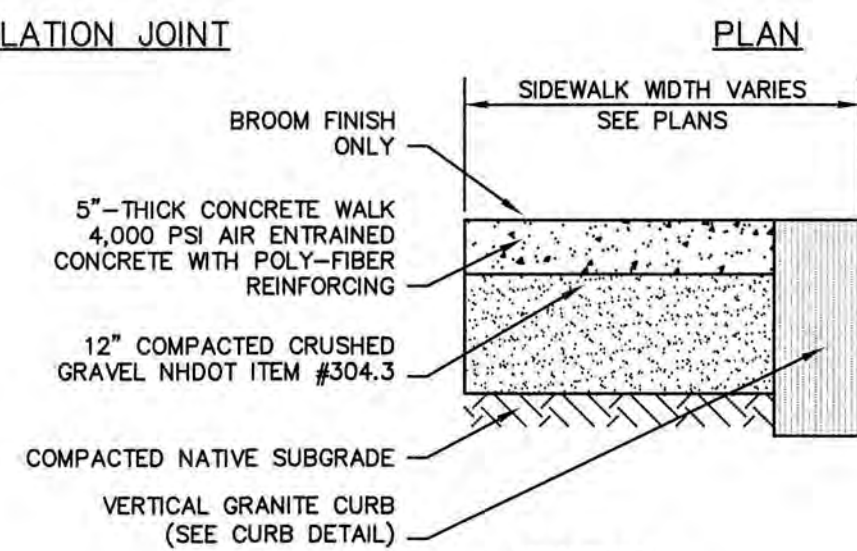


EXPANSION/CONSTRUCTION JOINT

CONTROL/TROWELED JOINT

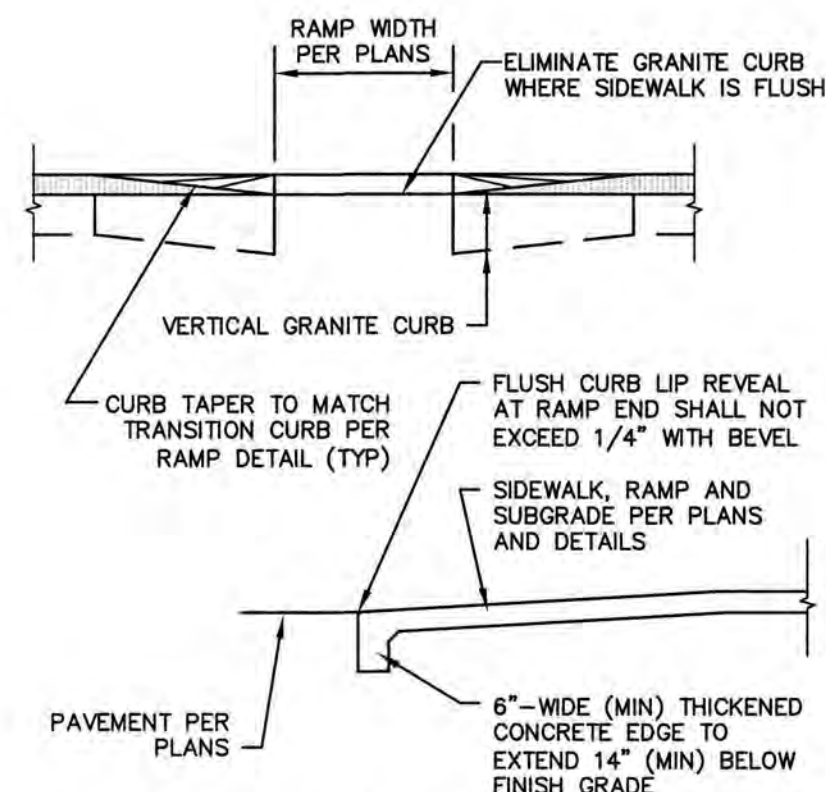


ISOLATION JOINT



CONCRETE SIDEWALK DETAIL

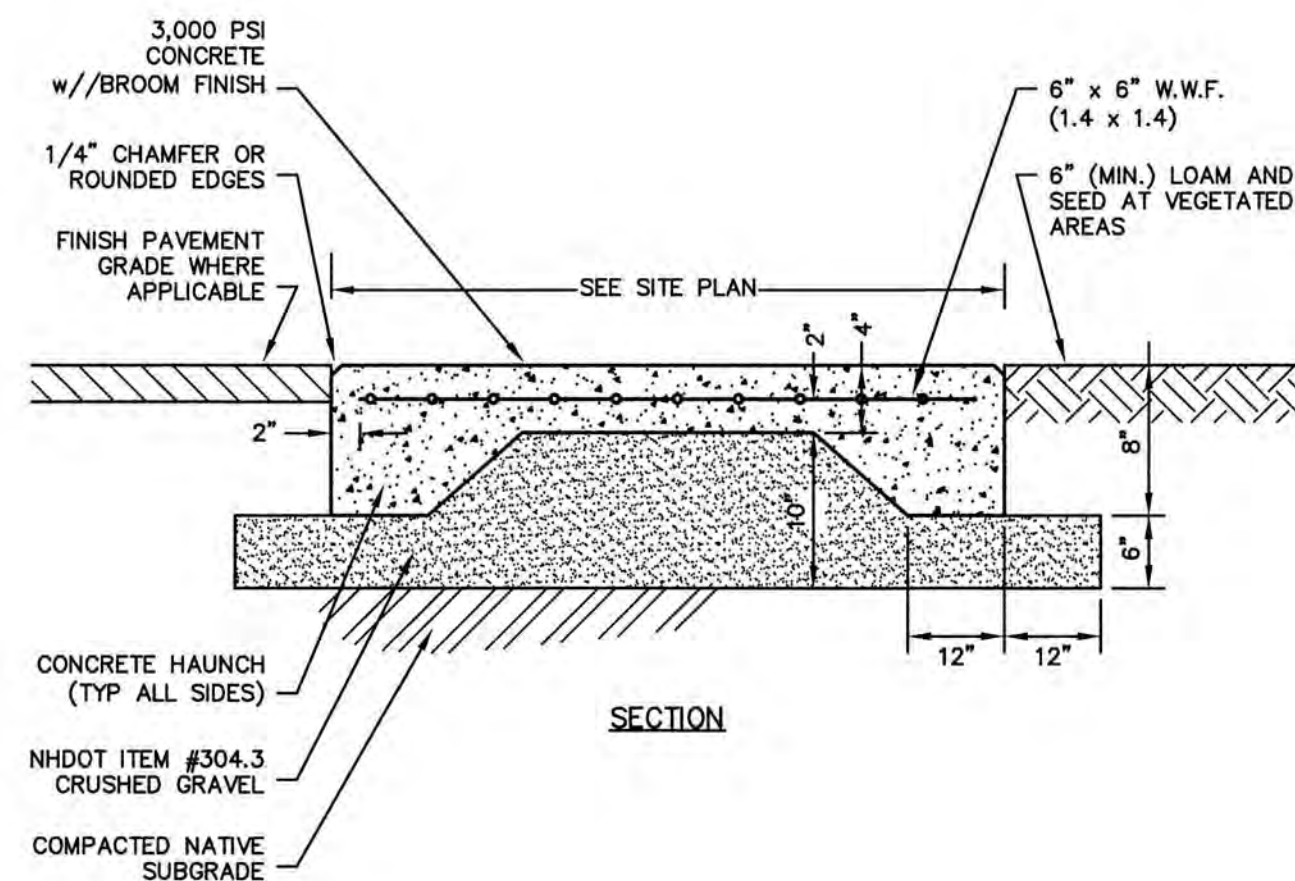
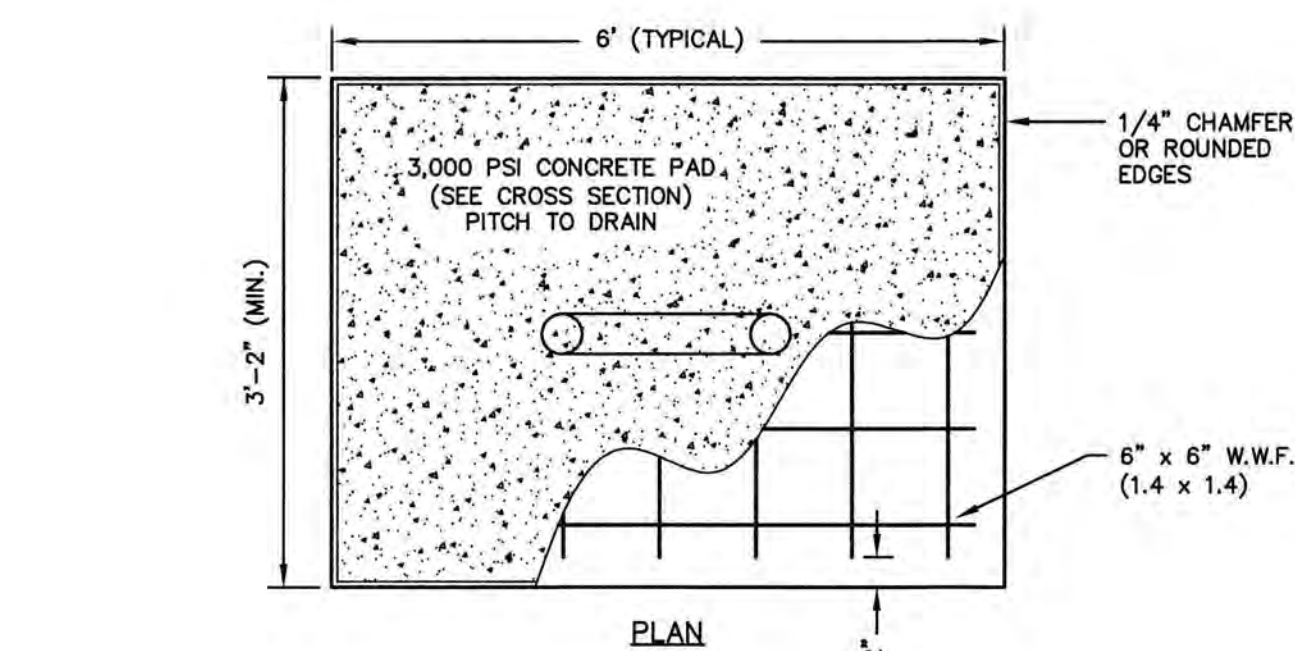
NOT TO SCALE



FLUSH CURB AT RAMP DETAIL NOT TO SCALE

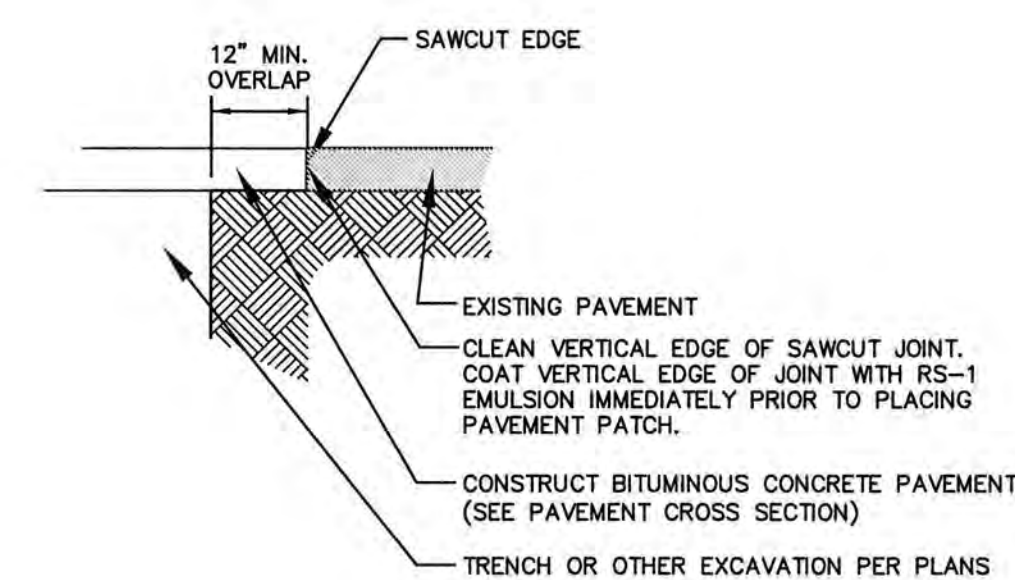
ADDITIONAL NOTES APPLICABLE TO ALL CURB RAMPS:

1. ALL CURB RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH AMERICANS WITH DISABILITIES ACT (ADA) AND ALL APPLICABLE CODES.
2. THE MAXIMUM ALLOWABLE CROSS SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 2%.
3. THE MAXIMUM ALLOWABLE RUNNING SLOPE OF AN ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
4. THE MAXIMUM ALLOWABLE RUNNING SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) CURB RAMP SHALL BE 8.3% FOR A MAXIMUM ELEVATION CHANGE OF 6".
5. CURB TREATMENT VARIES. SEE PLANS FOR CURB TYPE.
6. BASE OF RAMP SHALL BE GRADED TO PREVENT THE PONDING OF WATER.
7. SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.
8. FLUSH CURB SECTIONS SHALL HAVE A MAXIMUM LIP REVEAL OF 1/4" WITH A BEVEL AT THE EDGE OF PAVEMENT.
9. EDGES OF SIDEWALK FOOTINGS ALONG FLUSH CURBS SHALL BE HAUNCHED SO AS TO EXTEND TO A MINIMUM DEPTH OF 1' BELOW FINISH GRADE.
10. NO RAMP SHALL BE LESS THAN 4' IN WIDTH.
11. CURB RAMPS SHALL HAVE A FLAT 2% MAX LANDING AT THE TOP AND BOTTOM OF THE RAMPS WHEN THERE IS A CHANGE IN DIRECTION.



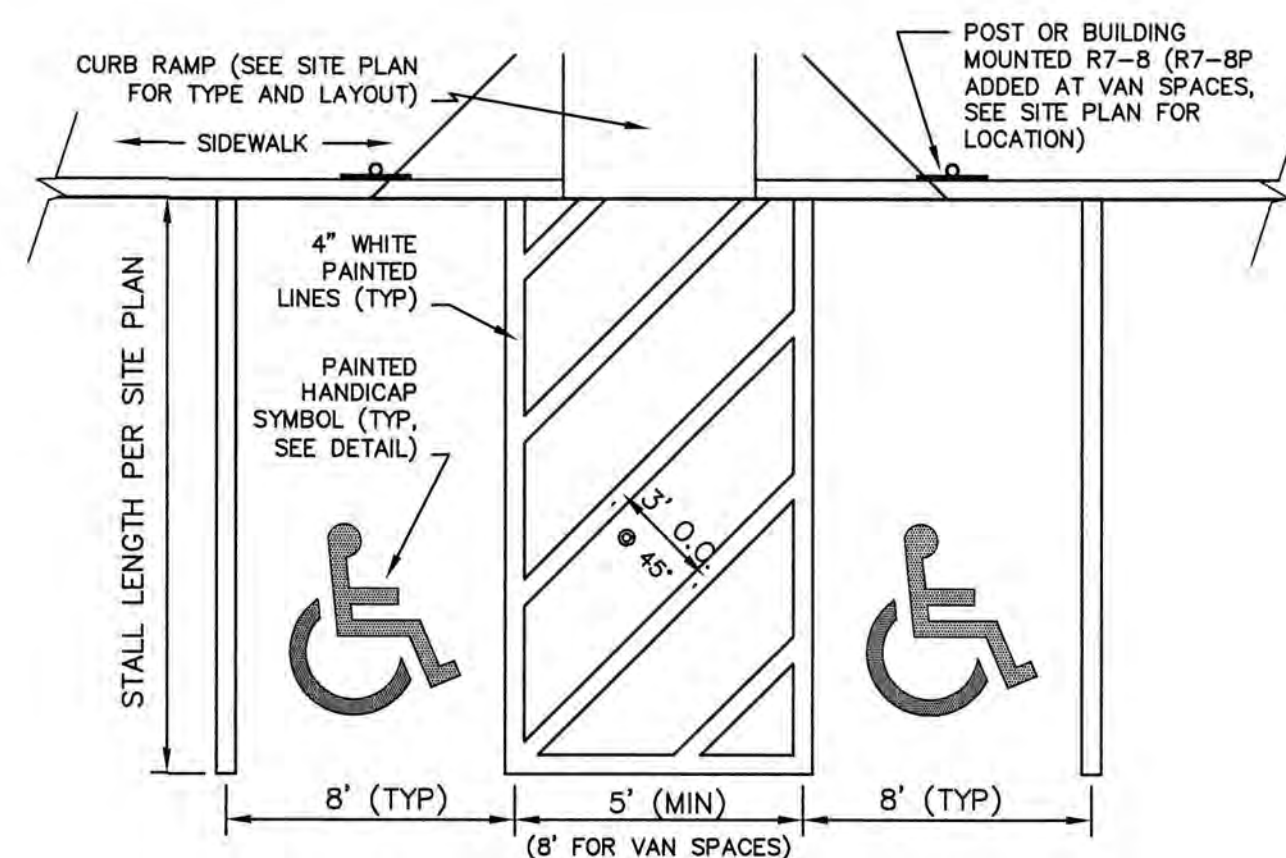
BICYCLE RACK PAD

NOT TO SCALE



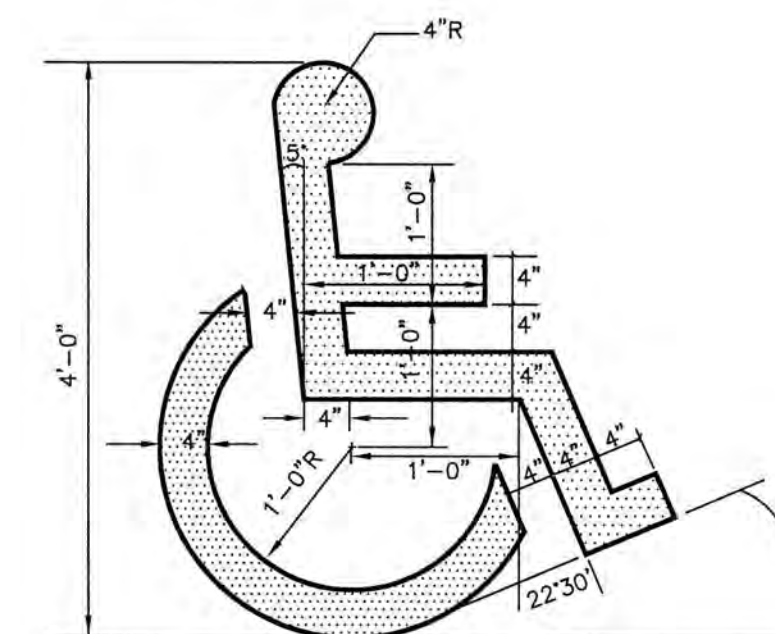
TYPICAL PAVEMENT SAWCUT

NOT TO SCALE



PARKING STALL LAYOUT

NOT TO SCALE



NOTES

1. SYMBOL TO BE PAINTED IN ALL HANDICAPPED ACCESSIBLE SPACES IN WHITE PAINT (BLUE-PAINTED SQUARE BACKGROUND OPTIONAL).

PAINTED ADA SYMBOL

NOT TO SCALE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

ENGINEER:

ALTUS
ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com



ISSUED FOR:

TAC

ISSUE DATE:

MAY 20, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	05/20/19

DRAWN BY: RLH

APPROVED BY: EDW

DRAWING FILE: 4787-DETAILS.DWG

SCALE:

22" x 34" - N.T.S.
11" x 17" - N.T.S.

OWNER OF RECORD:

ARBOR VIEW & THE PINES, LLC
C/O FOREST PROPERTIES MGMT.
625 MOUNT AUBURN STREET
CAMBRIDGE, MA 02138

APPLICANT:

FOREST PROPERTIES MGMT. INC.
625 MOUNT AUBURN STREET
CAMBRIDGE, MA 02138

PROJECT:

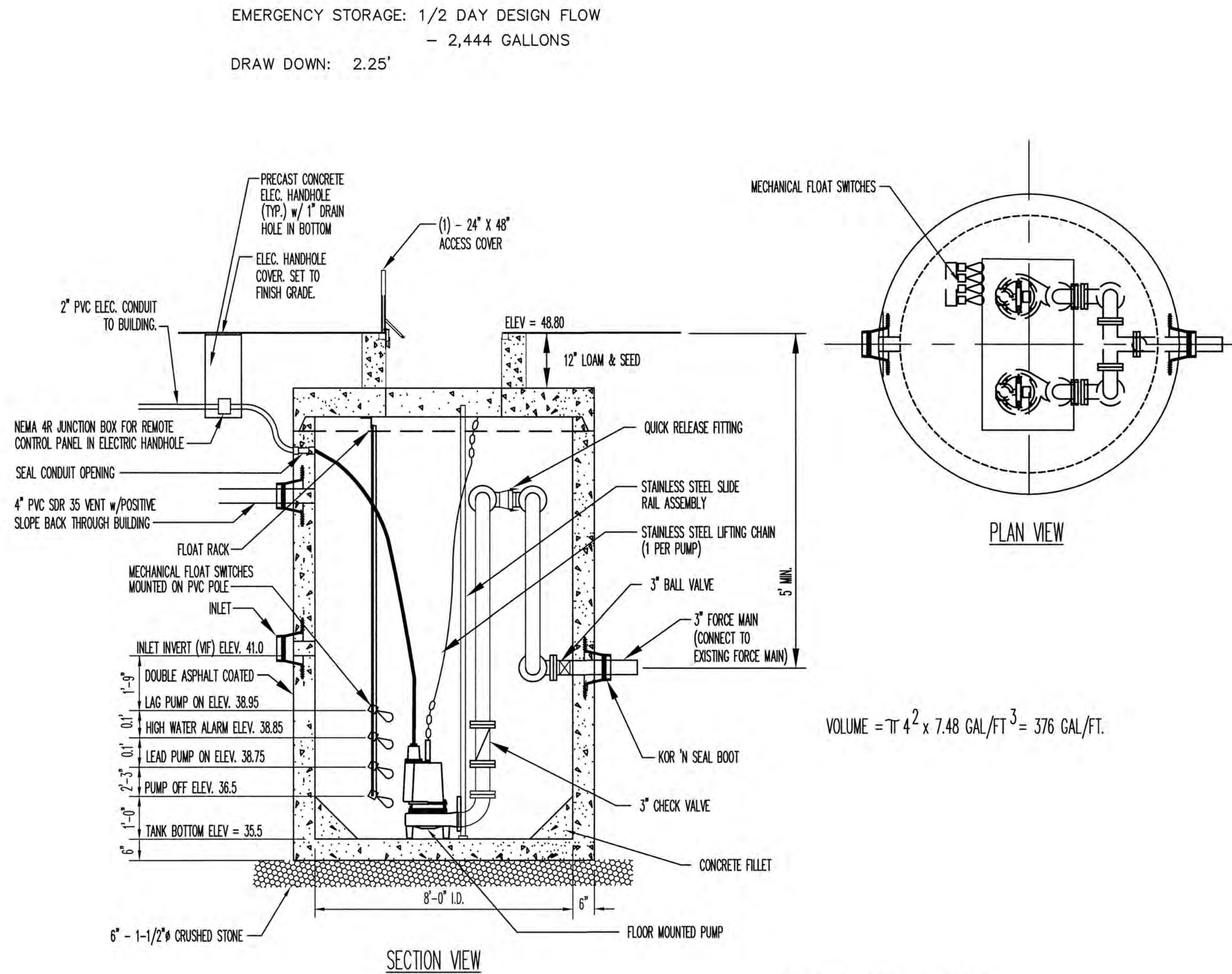
ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT
145 LANG ROAD
PORTSMOUTH, NH
TAX MAP 287, LOT 01

TITLE:

DETAIL SHEET

SHEET NUMBER:

D - 7



SANITARY DESIGN FLOW DATA	
Arbor View Apartments (42 Units) 42 apartment units 28 2-bedroom units & 14 3-bedroom units	
Design flow based on Metcalf and Eddy/AECOM Wastewater Engineering, 5th Edition (2014) Table 3-3 page 190	
Apartment 38 gpd per person typical	
Assume 2.5 occupants per 2-bdrm unit and 3.5 occupants per 3 bdrm unit Average = 2.83 occupants per unit for 42 units	
Design flow:=2.83 people x 38 gpd/person *42 units	4,517 GPD
Peaking factor 6	
Peak flow (NHDES for design flows under 100,000 gpd)	27,100 GPD
Design peak hourly flow (NHDES)	1129.17 GPH
PUMP STATION SIZING	
Expected flow expected to spread over 16 hours	13,550 GPD
Peak flow 3.0 x Design flow	847 GPH
Design peak hourly flow (16 hours)	14.1 GPM
Design Peak (16 hours)	3.1 GPM
Design flow (16 hours)	

PUMP STATION SPECIFICATIONS

- Pump Station: Furnish and install pump station as shown on the plans. Station shall include but not be limited to a concrete pump chamber, pumps, slide rail assemblies, duplex controller, access cover, discharge piping, fittings, valves, junction box, level sensors, electric service and level controls. All wiring shall be in compliance with the City of Portsmouth, New Hampshire codes.
- Pump Chamber: Pump chamber shall be an 8-foot inside diameter precast concrete pump chamber to the depth shown on the Drawings and manufactured by Old Castle Concrete Products or approved equal. Structure shall be designed for an H-20 wheel loading.
- Access Cover: The access covers shall be rigidly constructed to provide a 300 lb. live load/square foot rating with a 24" X 48" clear opening by Syracuse Castings or approved equal. Cover shall be sealed with neoprene seal at openings and have hinges constructed of 316 stainless steel.
- Pumps: Provide pump motors with adequate horsepower to deliver 85 gpm at 26' TDH, taking into account the manufacturer's rated efficiency. Motors shall be 1.0 HP, 240 Volt single phase, 60 Cycle 1750 rpm, 6.00 diameter impeller unless otherwise specified by the manufacturer and approved by the Engineer. Pumps shall be submersible non-clog sewage pumps designed for typical raw sewage applications with 3" discharge as manufactured by Crane Model SE1074L (Barnes series) or approved equal. Provide discharge piping assembly for installation and removal of pump without entering wetwell (Barnes Breakaway Fitting or equal)
- Controller: Duplex control to perform equal alternation of both pumps. Control to consist of two circuit breakers with through-door operating handle, two magnetic starters with ambient compensated quick-trip overloads in each line, discharge piping by manufacturer, duplex unit, running lights, lightning arrestor, moisture sensor alarm, temperature alarm, door-mounted resets, hour meters, and door-mounted hand-off-automatic selector switches for each pump. Enclosure to include continuous hinge, neoprene gasket in cover and continuous seam weld. Model to include transformers for 240 volt control circuit. Initial start up will require system to operate with both pumps.
- The controls located in the building shall be of Nema 3R construction. All conduit and wiring between the station junction boxes and control panel shall be included.
- Slide Rail Assembly: The slide rail assembly, mounting hardware, and lifting chain shall be AISI type 316 stainless steel. Slide rail to be provided with AISI type 316 stainless guide supports. Discharge coupling to be machined cast iron and support the pump four (4) inches above the floor.
- Piping: The discharge pipe shall be two (3") inch in diameter SDR 26 or SCH. 40 PVC pipe. All fittings shall be cemented or threaded. PVC Ball check valves shall be provided with teflon seats. The working pressure of the check valves shall be 150 psi.
- Level Control: Four (4) liquid level control sensors shall be provided to control operation of the pumps and provide a high water alarm. The level control sensors shall be mounted on a PVC pipe. The controls shall be set at elevations shown on the plans and for a dosage rate of 847 gallons.
- Alarm: Alarm shall be interior mounted audio and visual in a location as determined by the Architect. Contractor shall provide a sign for identification. - Remote dial-up alarm as back up.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

ENGINEER:

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RLH

APPROVED BY:

EDW

DRAWING FILE:

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PROJECT:

ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT

145 LANG ROAD
PORTSMOUTH, NH

TAX MAP 287, LOT 01

TITLE:

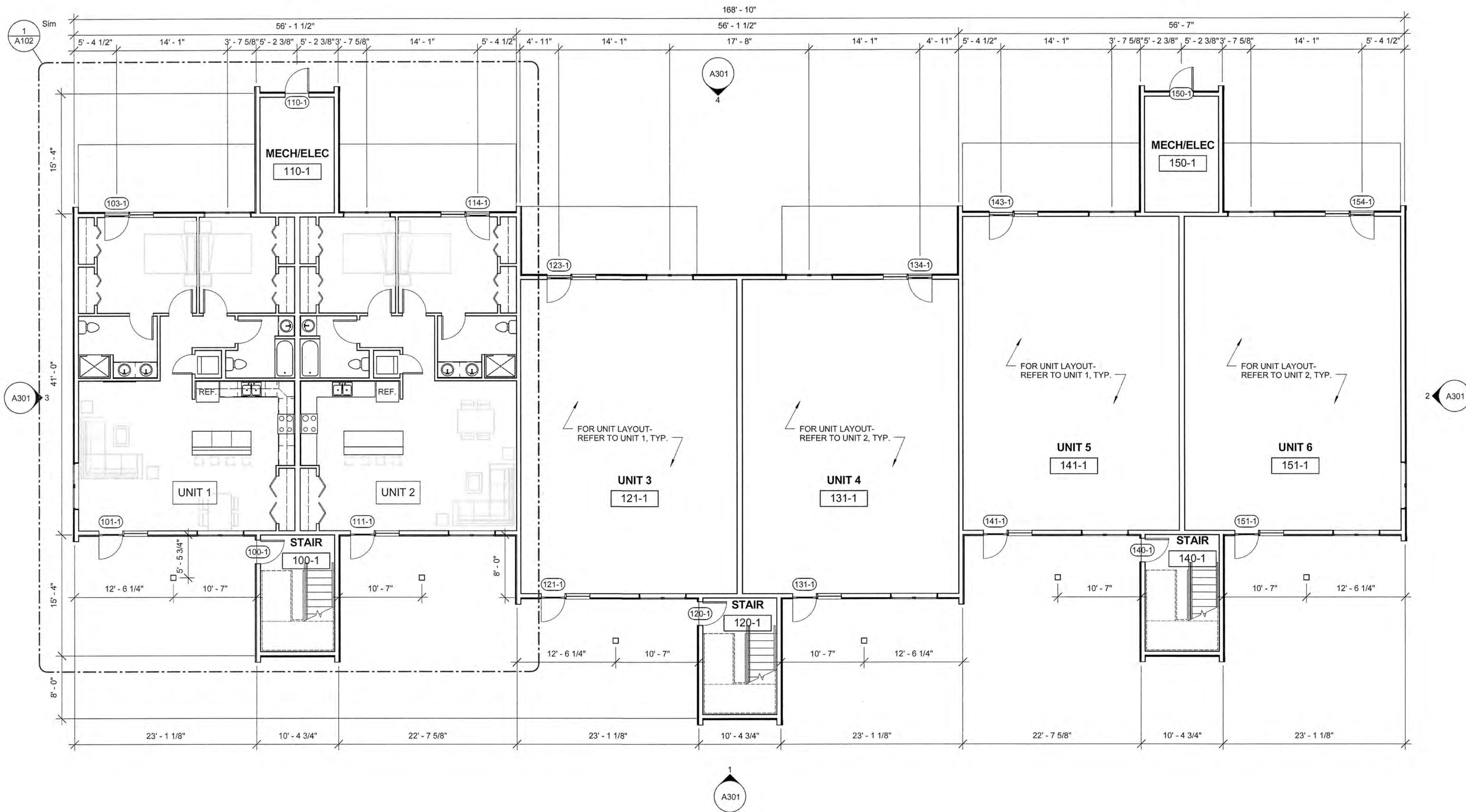
DETAIL SHEET

SHEET NUMBER:

D - 8

DUPLEX SEWER PUMP STATION

NOT TO SCALE



1 BUILDING 1- FIRST FLOOR PLAN
1/8" = 1'-0"

BUILDING AREA CHART		
	GROSS FLOOR AREA	USE PER FLOOR
BUILDING 1		
- FLOOR 1	7840 SF	RESIDENTIAL (R-2), MECH, ELEC
- FLOOR 2	7510 SF	RESIDENTIAL (R-2)
- FLOOR 3/ LOFT	7510 SF/1625 SF	RESIDENTIAL (R-2)
TOTAL BLDG 1	24,485 SF	
BUILDING 2		
- FLOOR 1	10,345 SF	RESIDENTIAL (R-2), MECH, ELEC
- FLOOR 2	10,010 SF	RESIDENTIAL (R-2)
- FLOOR 3/ LOFT	10,010 SF/2165 SF	RESIDENTIAL (R-2)
TOTAL BLDG 2	32,530 SF	

ARBOR VIEW EXPANSION
FOREST PROPERTIES MANAGEMENT
145 LANG ROAD
PORTSMOUTH, NH 03801

McHENRY
ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

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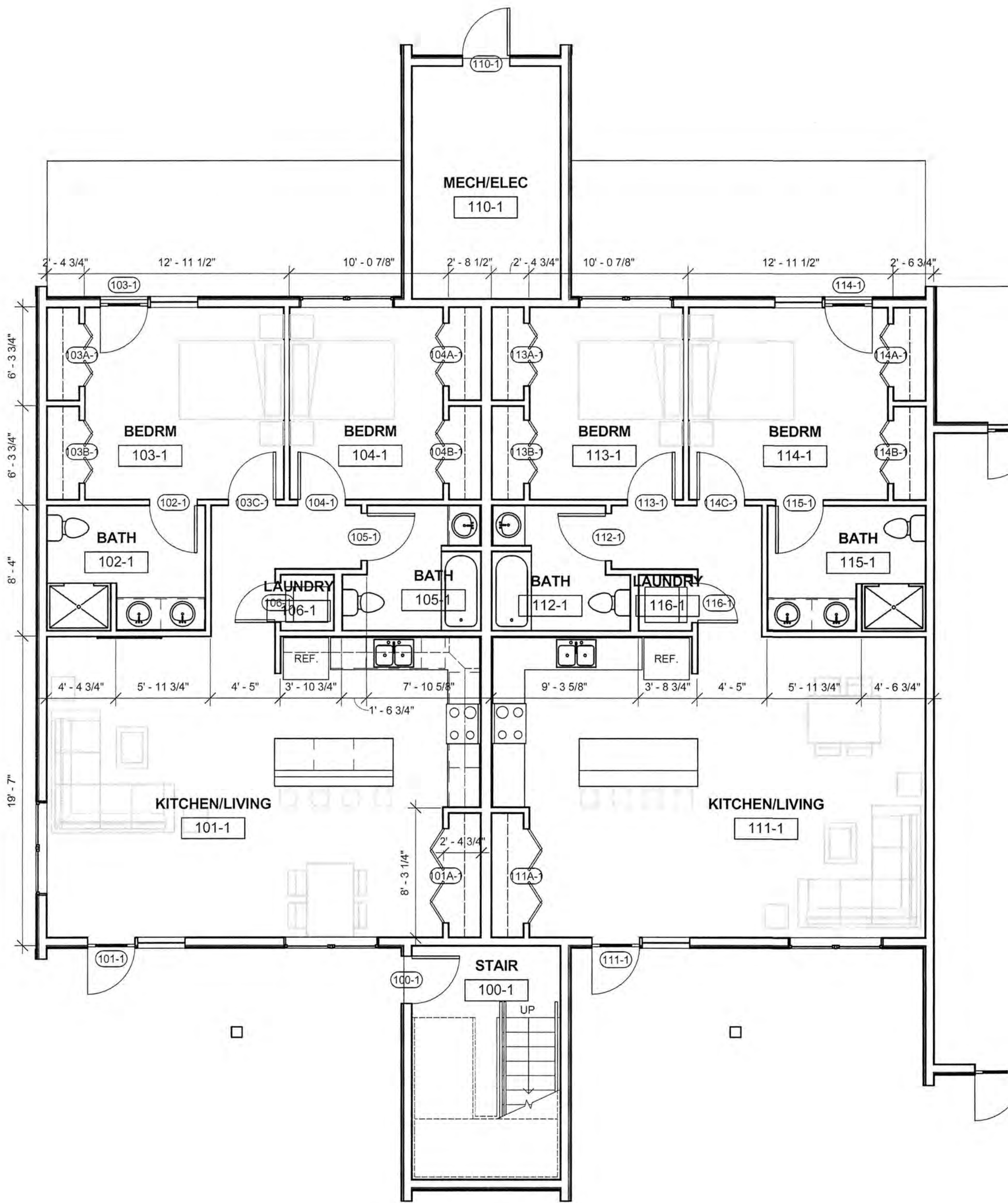
No.	Description	Date

Project Name:
ARBOR VIEW
EXPANSION

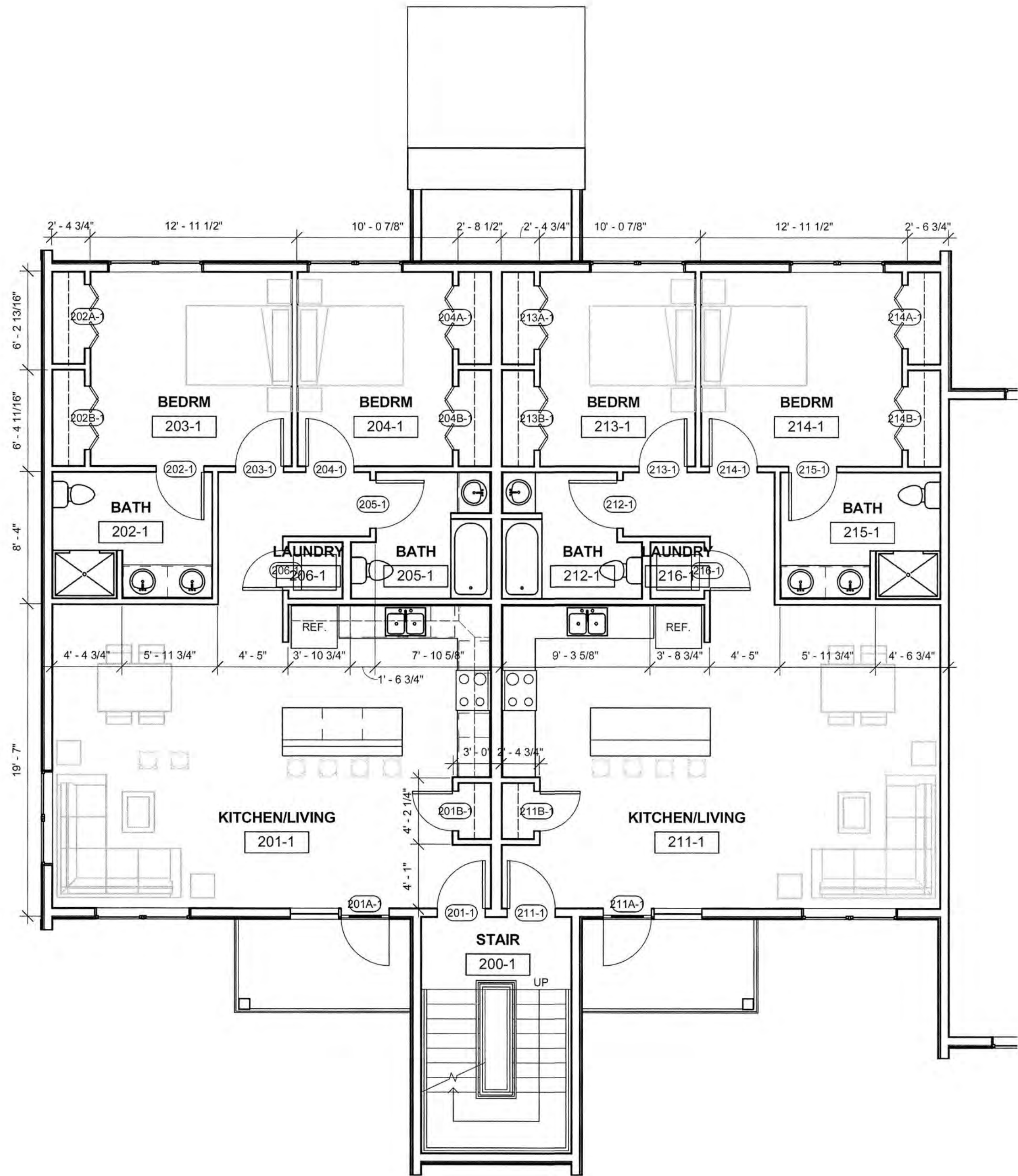
Drawing Name:
BLDG 1 OVERALL PLAN

Project number: 18101
Date: 05/07/2019
Drawn by: MB
Checked by: MG

A101
Scale: As indicated



1 BUILDING 1- FIRST FLOOR PLAN- UNIT LAYOUT
3/16" = 1'-0"



2 BUILDING 1- SECOND FLOOR PLAN- UNIT LAYOUT
3/16" = 1'-0"

ARBOR VIEW EXPANSION
FOREST PROPERTIES MANAGEMENT
145 LANG ROAD
PORTSMOUTH, NH 03801

McHENRY
ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

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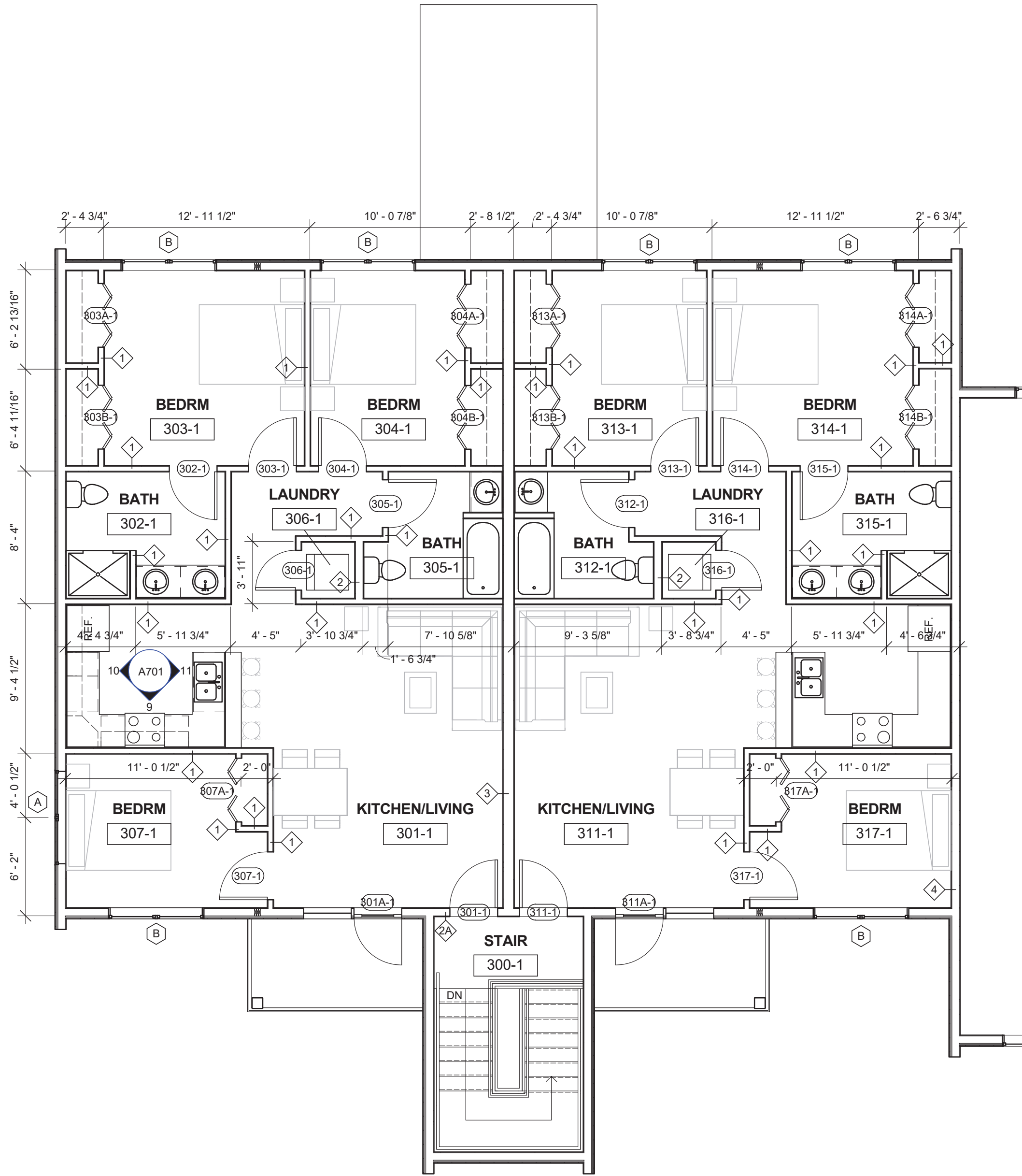
No.	Description	Date

Project Name:
ARBOR VIEW
EXPANSION

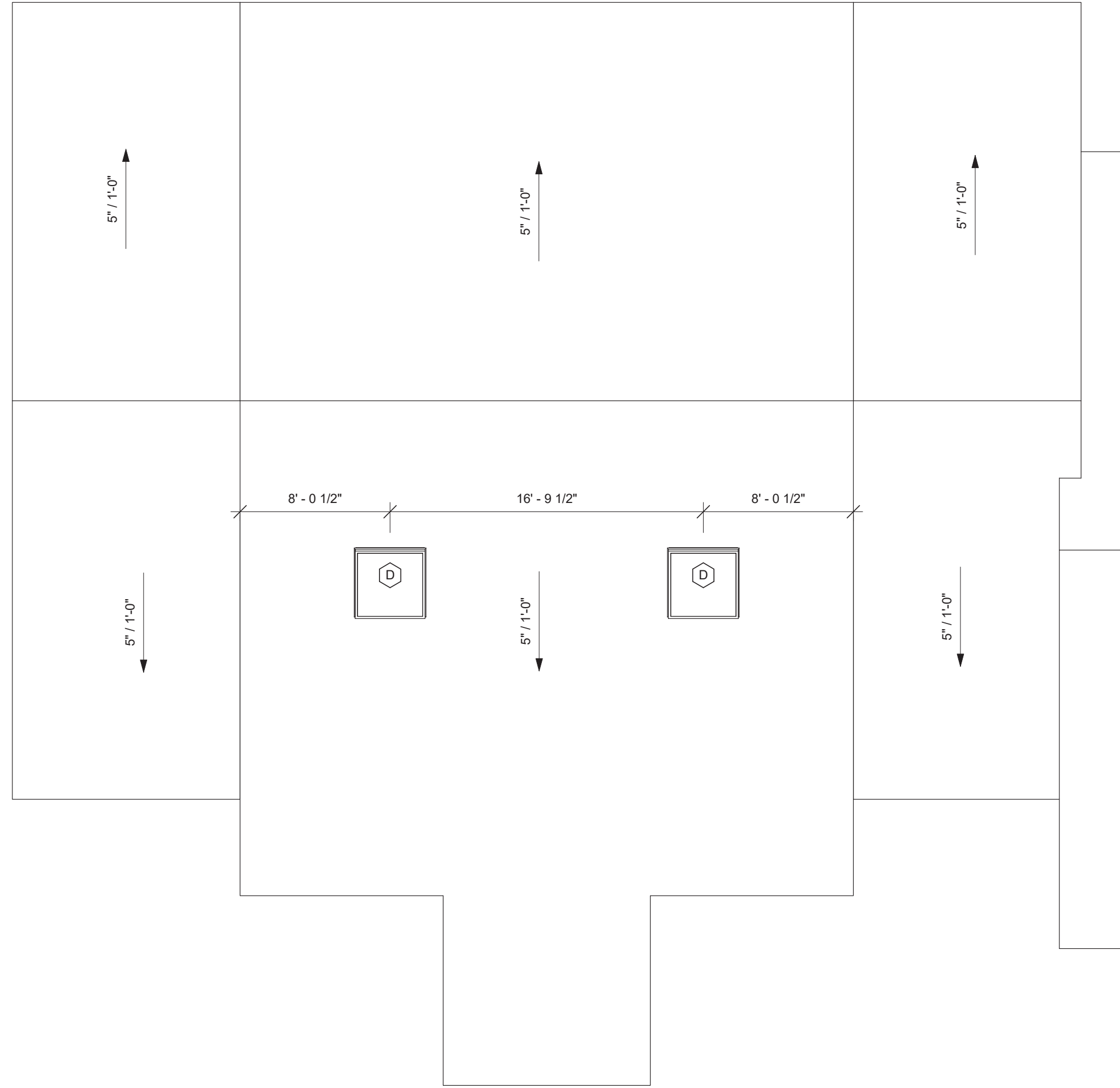
Drawing Name:
BLDG 1 UNIT PLANS

Project number: 18101
Date: 05/07/2019
Drawn by: MB
Checked by: MG

A102
Scale: 3/16" = 1'-0"



1 BUILDING 1- THIRD FLOOR PLAN- UNIT LAYOUT
3/16" = 1'-0"



2 BUILDING 1-PARTIAL ROOF PLAN
3/16" = 1'-0"

ARBOR VIEW EXPANSION
FOREST PROPERTIES MANAGEMENT
145 LANG ROAD
PORTSMOUTH, NH 03801

McHENRY
ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

NOT FOR CONSTRUCTION
PERMIT SET ONLY

No.	Description	Date

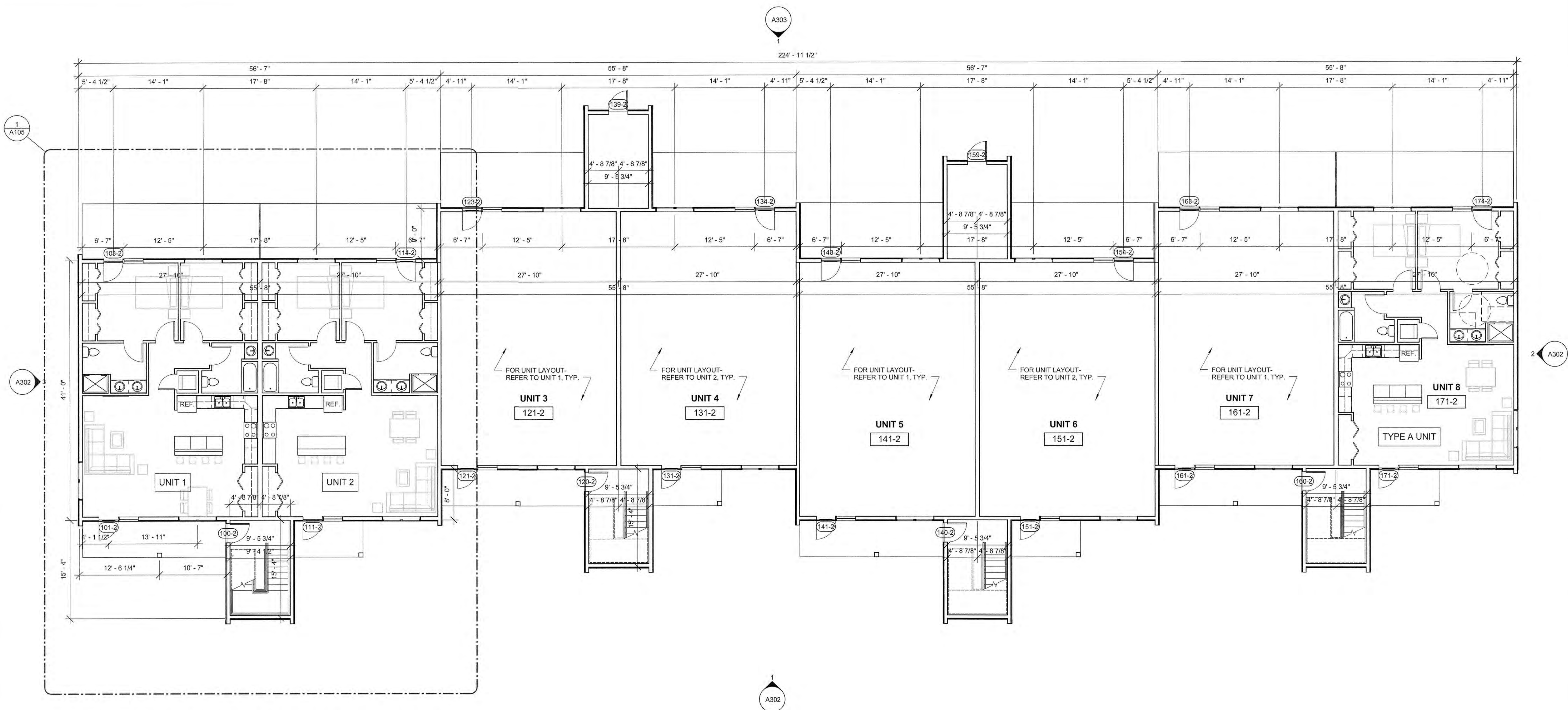
Project Name:
ARBOR VIEW
EXPANSION

Drawing Name:
BLDG 1 UNIT PLANS

Project number: 18101
Date: 08/06/2019
Drawn by: MB
Checked by: MG

A103

Scale: 3/16" = 1'-0"



1 BUILDING 2- FIRST FLOOR PLAN
1/8" = 1'-0"

BUILDING AREA CHART		
	GROSS FLOOR AREA	USE PER FLOOR
BUILDING 1		
- FLOOR 1	7840 SF	RESIDENTIAL (R-2), MECH, ELEC
- FLOOR 2	7510 SF	RESIDENTIAL (R-2)
- FLOOR 3/ LOFT	7510 SF/1625 SF	RESIDENTIAL (R-2)
TOTAL BLDG 1	24,485 SF	
BUILDING 2		
- FLOOR 1	10,345 SF	RESIDENTIAL (R-2), MECH, ELEC
- FLOOR 2	10,010 SF	RESIDENTIAL (R-2)
- FLOOR 3/ LOFT	10,010 SF/2165 SF	RESIDENTIAL (R-2)
TOTAL BLDG 2	32,530 SF	

ARBOR VIEW EXPANSION
FOREST PROPERTIES MANAGEMENT
145 LANG ROAD
PORTSMOUTH, NH 03801

McHENRY
ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

NOT FOR CONSTRUCTION
PERMIT SET ONLY

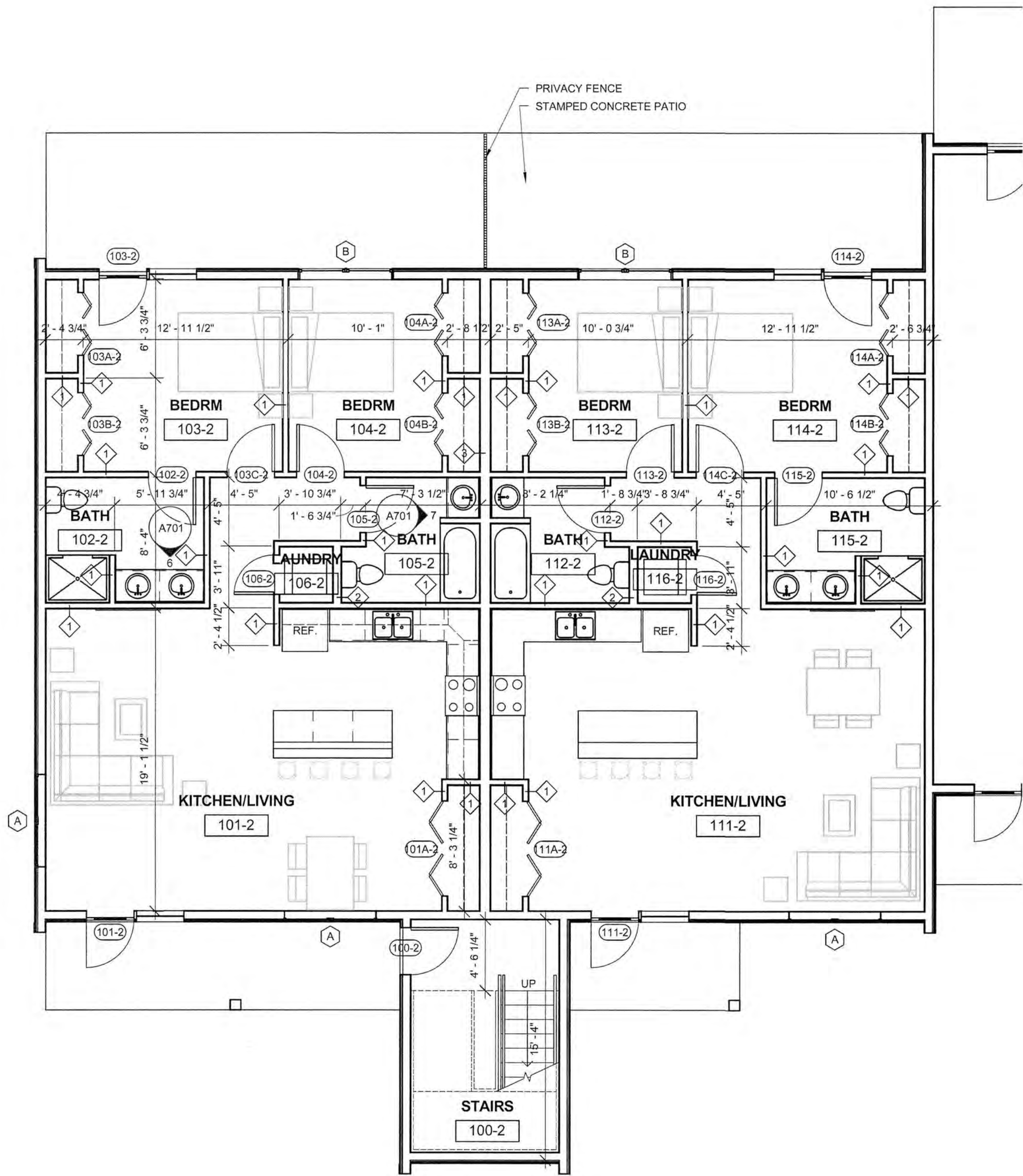
No.	Description	Date

Project Name:
ARBOR VIEW
EXPANSION

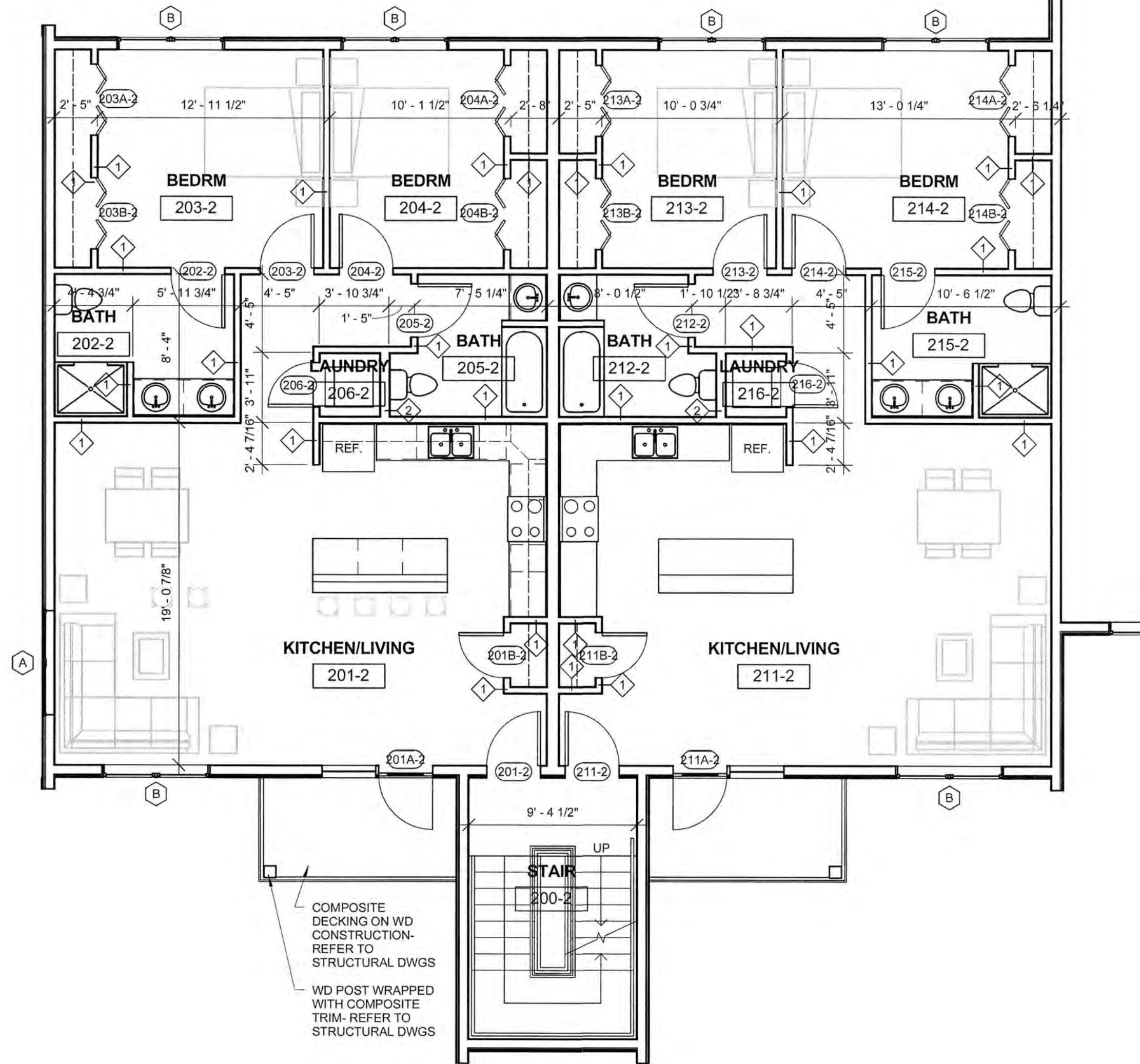
Drawing Name:
BLDG 2 OVERALL PLAN

Project number: 18101
Date: 05/07/2019
Drawn by: MB
Checked by: MG

A104
Scale: As indicated



1 BUILDING 2- FIRST FLOOR PLAN - UNIT LAYOUT
3/16" = 1'-0"



2 BUILDING 2- SECOND FLOOR PLAN- UNIT LAYOUT
3/16" = 1'-0"

ARBOR VIEW EXPANSION
FOREST PROPERTIES MANAGEMENT
145 LANG ROAD
PORTSMOUTH, NH 03801

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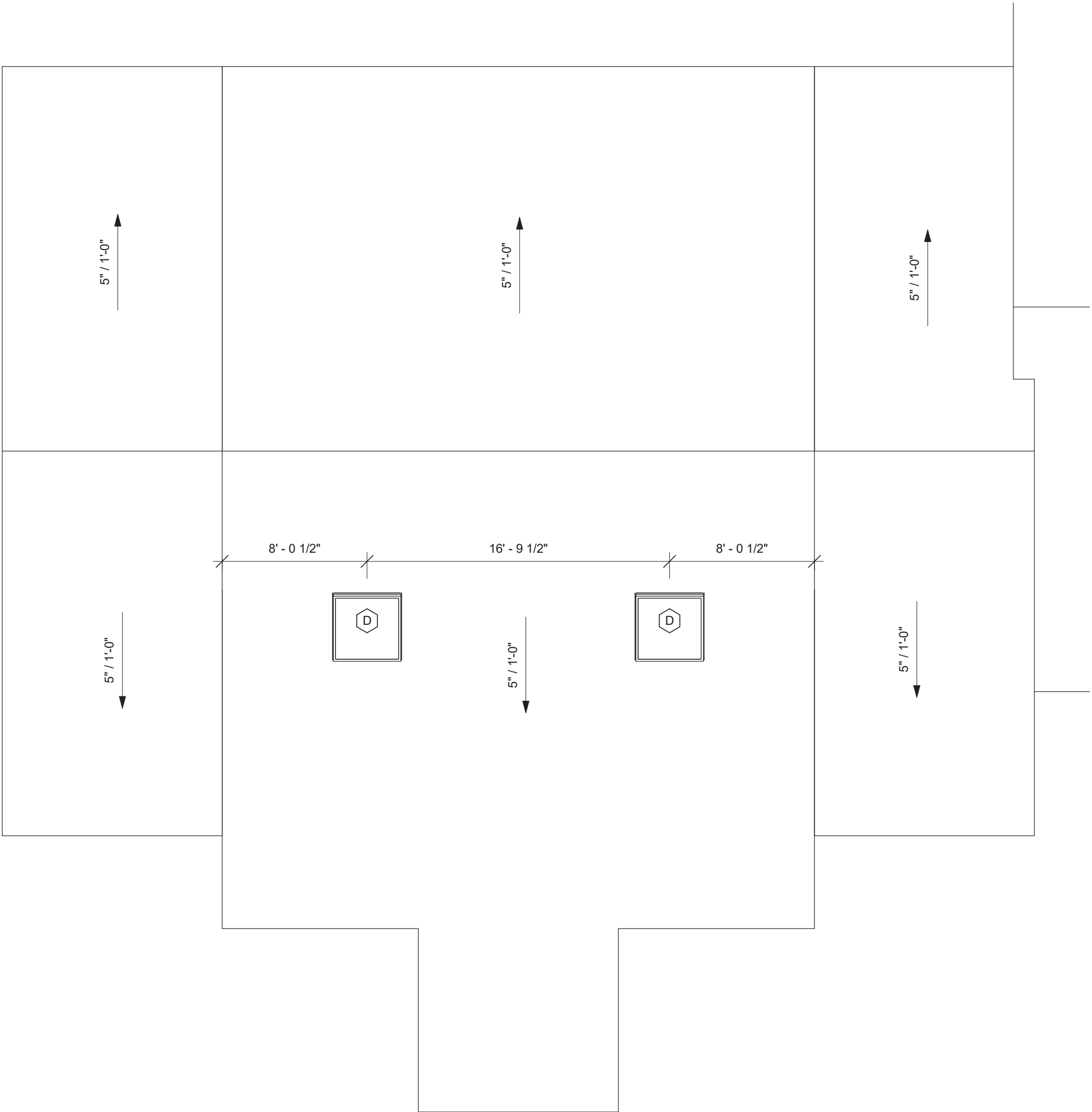
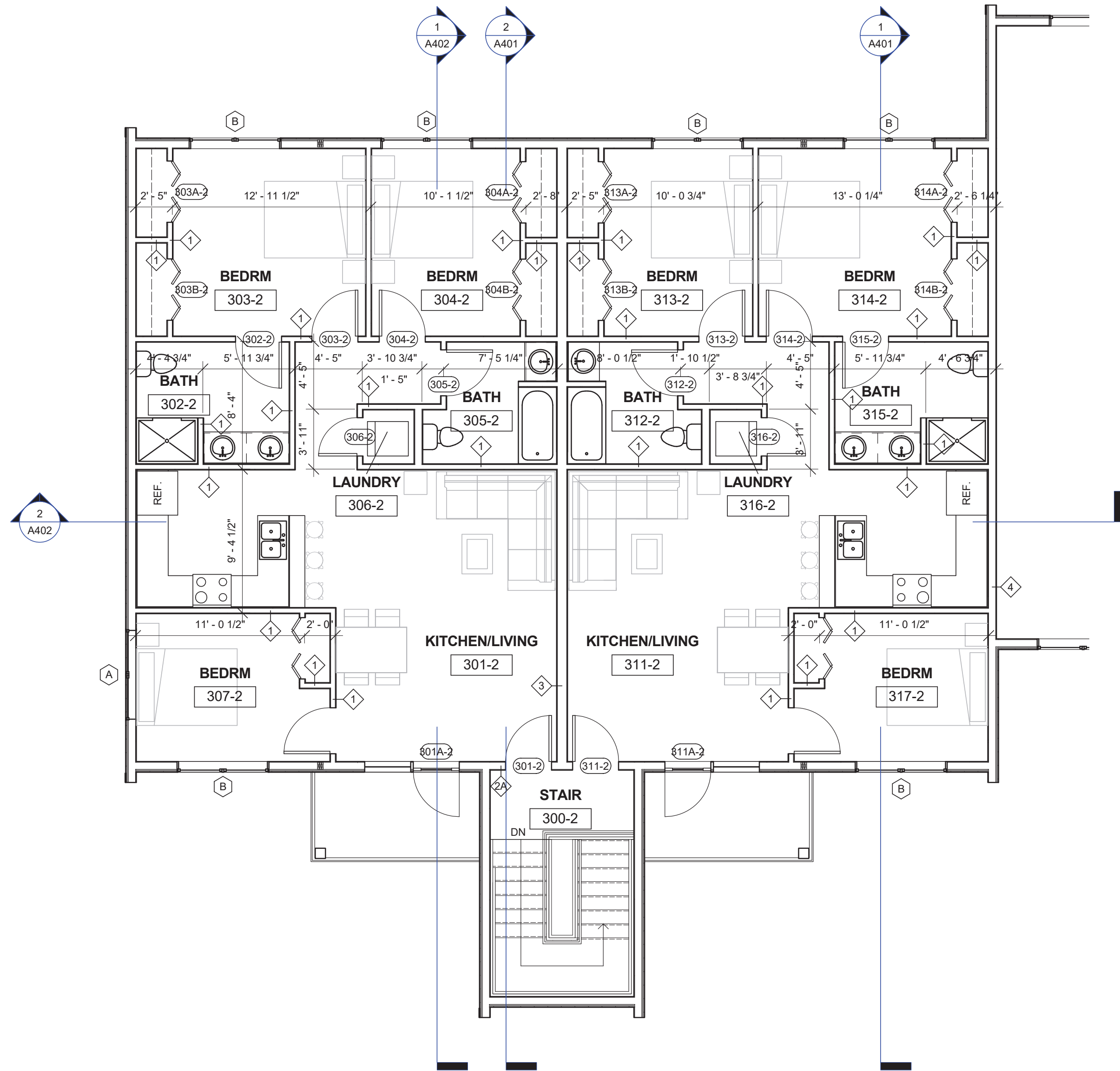
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Project Name:
ARBOR VIEW
EXPANSION

Drawing Name:
BLDG 2 UNIT PLANS

Project number: 18101
Date: 05/07/2019
Drawn by: MB
Checked by: MG

A105
Scale: 3/16" = 1'-0"



1 BUILDING 2- THIRD FLOOR PLAN- UNIT LAYOUT
3/16" = 1'-0"

2 BUILDING 2- PARTIAL ROOF PLAN
3/16" = 1'-0"

ARBOR VIEW EXPANSION
FOREST PROPERTIES MANAGEMENT
145 LANG ROAD
PORTSMOUTH, NH 03801

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Portsmouth, New Hampshire
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No.	Description	Date

Project Name:
ARBOR VIEW
EXPANSION

Drawing Name:
BLDG 2 UNIT PLANS

Project number: 18101
Date: 08/06/2019
Drawn by: MB
Checked by: MG

A106

Scale: 3/16" = 1'-0"



ARBOR VIEW EXPANSION
FOREST PROPERTIES MANAGEMENT
145 LANG ROAD
PORTSMOUTH, NH 03801

McHENRY
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4 Market Street
Portsmouth, New Hampshire
603.430.0274

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PERMIT SET ONLY

No.	Description	Date

Project Name:
ARBOR VIEW
EXPANSION

Drawing Name:
BUILDING RENDERING

Project number: 18101

Date: 05/07/2019

Drawn by: MB

Checked by: MG

A300

Scale:



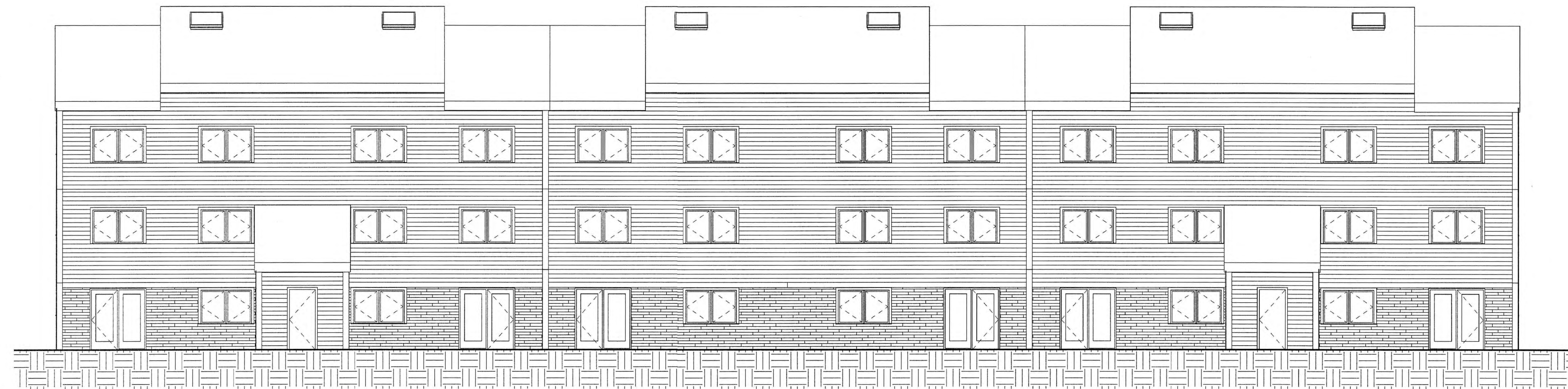
1 BUILDING 1- FRONT ELEVATION
1/8" = 1'-0"



2 BUILDING 1- EAST SIDE ELEVATION
1/8" = 1'-0"



3 BUILDING 1- WEST SIDE ELEVATION
1/8" = 1'-0"



4 BUILDING 1- BACK ELEVATION
1/8" = 1'-0"

ARBOR VIEW EXPANSION
FOREST PROPERTIES MANAGEMENT
145 LANG ROAD
PORTSMOUTH, NH 03801

McHENRY
ARCHITECTURE

4 Market Street
Portsmouth, New Hampshire
603.430.0274

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PERMIT SET ONLY

No.	Description	Date

Project Name:
ARBOR VIEW
EXPANSION

Drawing Name:
EXTERIOR ELEVATIONS-
BLDG 1

Project number: 18101

Date: 05/07/2019

Drawn by: MB

Checked by: MG

A301

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



1 BUILDING 2- FRONT ELEVATION
1/8" = 1'-0"



2 BUILDING 2- EAST ELEVATION
1/8" = 1'-0"



3 BUILDING 2- WEST ELEVATION
1/8" = 1'-0"

EXTERIOR FINISH SCHEDULE			
MATERIAL	MANUFACTURER/MODEL	COLOR	NOTES
ROOFING	IKO CAMBRIDGE OR EQUAL	HARVARD SLATE	CONFIRM COLOR WITH OWNER
SIDING	HARDIPLANK LAP SIDING	STERLING GRAY	CONFIRM COLOR WITH OWNER
TRIM	AZEK OR EQUAL	WHITE, SIZES VARY	CONFIRM COLOR WITH OWNER
WOOD TRIM	STAIN GRADE CEDAR		CONFIRM COLOR WITH OWNER
STONE BASE	STONE YARD.COM	BOSTON BLEND LEDGE	CONFIRM COLOR WITH OWNER
WINDOWS	MARVIN WINDOWS OR EQUAL	DARK BRONZE	CONFIRM COLOR WITH OWNER

EXTERIOR FINISH NOTES

- COLOR SELECTION FOR ALL MATERIALS TO BE PROVIDED TO ARCHITECT AND OWNER FOR FINAL SELECTIONS AND APPROVAL
- PROVIDE GARDEN HOSE HOOK UPS NEAR GREEN SPACES.
- PROVIDE ALL REQUIRED SIGNAGE PER CODE.
- GC TO COORDINATE WINDOW TINTING AND SPANDREL GLASS COLORS TO ENSURE MATCH IN APPEARANCE.

EXTERIOR LIGHTING NOTES

- PROVIDE GOOSENECK LIGHTS AT SIGNAGE. COORDINATE LOCATIONS WITH OWNER AND SIGNAGE. BASIS OF DESIGN: BASELITE SIGN LIGHT, SHADE DSL9, 3/4" ARM EXTENSION E6.
- PROVIDE RECESSED LIGHTING AT SOFFITS, TYP. BASIS OF DESIGN: INDIT LIGHTING L4/LRM4 SERIES.
- PROVIDE VERTICAL LINEAR SCONCES AT ALL EXTERIOR DOORS. PROVIDE ONE TO EACH SIDE AT MAIN ENTRY. BASIS OF DESIGN: CAMMAN LIGHTING OW916, SALONO II.

ARBOR VIEW EXPANSION
FOREST PROPERTIES MANAGEMENT
145 LANG ROAD
PORTSMOUTH, NH 03801

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4 Market Street
Portsmouth, New Hampshire
603.430.0274

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PERMIT SET ONLY

No.	Description	Date

Project Name:
ARBOR VIEW
EXPANSION

Drawing Name:
EXTERIOR ELEVATIONS-
BLDG 2

Project number: 18101
Date: 05/07/2019

Drawn by: MB
Checked by: MG

A302

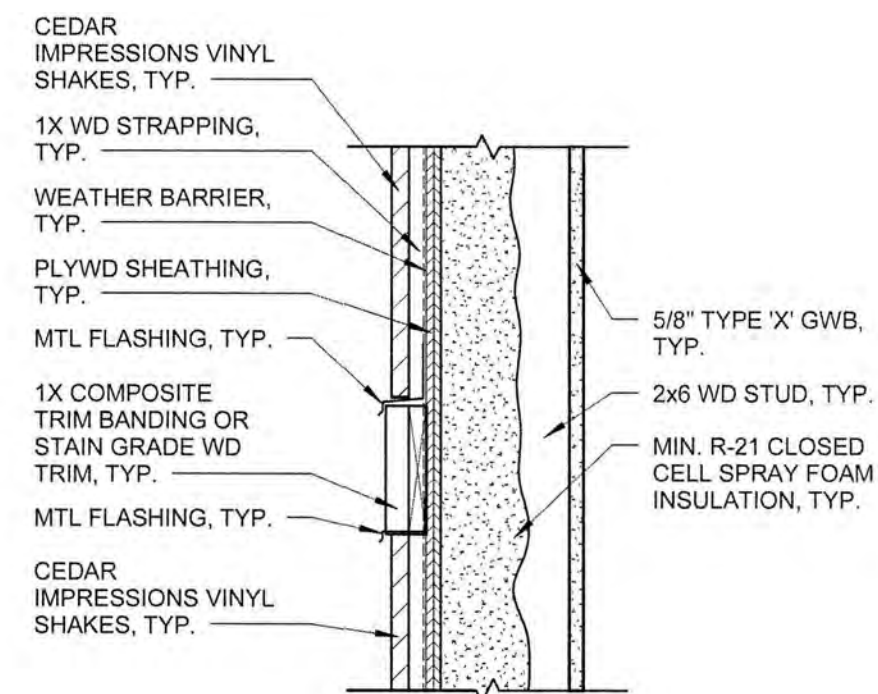
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1 BUILDING 2- BACK ELEVATION
1/8" = 1'-0"



2 BUILDING 2- FRONT ELEVATION - ENLARGED VIEW
1/4" = 1'-0"



3 TYPICAL DETAIL AT HORIZONTAL TRANSITIONS
1 1/2" = 1'-0"

EXTERIOR FINISH SCHEDULE			
MATERIAL	MANUFACTURER/MODEL	COLOR	NOTES
ROOFING	IKO CAMBRIDGE OR EQUAL	HARVARD SLATE	CONFIRM COLOR WITH OWNER
SIDING	HARDPLANK LAP SIDING	STERLING GRAY	CONFIRM COLOR WITH OWNER
TRIM	AZEK OR EQUAL	WHITE, SIZES VARY	CONFIRM COLOR WITH OWNER
WOOD TRIM	STAIN GRADE CEDAR		CONFIRM COLOR WITH OWNER
STONE BASE	STONEYARD.COM	BOSTON BLEND LEDGE	CONFIRM COLOR WITH OWNER
WINDOWS	MARVIN WINDOWS OR EQUAL	DARK BRONZE	CONFIRM COLOR WITH OWNER

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- PROVIDE RECESSED LIGHTING AT SOFFITS, TYP. BASIS OF DESIGN: INDT LIGHTING L4/LRM4 SERIES.
- PROVIDE VERTICAL LINEAR SCONCES AT ALL EXTERIOR DOORS. PROVIDE ONE TO EACH SIDE AT MAIN ENTRY. BASIS OF DESIGN: CAMMAN LIGHTING OW916, SALON II.

ARBOR VIEW EXPANSION
FOREST PROPERTIES MANAGEMENT
145 LANG ROAD
PORTSMOUTH, NH 03801

McHENRY
ARCHITECTURE

4 Market Street
Portsmouth, New Hampshire
603.430.0274

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PERMIT SET ONLY

No.	Description	Date

Project Name:
ARBOR VIEW
EXPANSION

Drawing Name:
EXTERIOR ELEVATIONS-
BLDG 2

Project number: 18101
Date: 05/07/2019
Drawn by: MB
Checked by: MG

A303

Scale: As indicated



City of Portsmouth, New Hampshire

Site Plan Application Checklist

This site plan application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all site plan review requirements. Please refer to the Site Plan review regulations for full details.

Applicant Responsibilities (Section 2.5.2): Applicable fees are due upon application submittal along with required attachments. The application shall be complete as submitted and provide adequate information for evaluation of the proposed site development. Waiver requests must be submitted in writing with appropriate justification.

Name of Owner/Applicant: Forest Properties Management, Inc. Date Submitted: 5/20/19
 Phone Number: 617-630-9560 E-mail: alibert@forestproperties.net
 Site Address: 145 Lang Road Map: 287 Lot: 01
 Zoning District: GA/MH Lot area: 35.53 AC sq. ft.

Application Requirements			
☒	Required Items for Submittal	Item Location (e.g. Page or Plan Sheet/Note #)	Waiver Requested
☒	Fully executed and signed Application form. (2.5.2.3)	In application package	N/A
☒	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF). (2.5.2.8)	In application package	N/A

Site Plan Review Application Required Information			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	Statement that lists and describes "green" building components and systems. (2.5.3.1A)	In application package	
☒	Gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. (2.5.3.1B)	Architectural drawings	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. (2.5.3.1C)	Cover Sheet, Title block	N/A
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. (2.5.3.1D)	Cover sheet	N/A

Site Plan Review Application Required Information			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. (2.5.3.1E)	EC-1 top right Zoning Summary GN-1, middle right	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. (2.5.3.1F)	Cover sheet	N/A
☒	List of reference plans. (2.5.3.1G)	EC-1, left middle	N/A
☒	List of names and contact information of all public or private utilities servicing the site. (2.5.3.1H)	GN-1 left Demolition notes 17 - 19 Utility Notes 17 & 18	N/A

Site Plan Specifications			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director. Submittals shall be a minimum of 11 inches by 17 inches as specified by Planning Dept. staff. (2.5.4.1A)	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. (2.5.4.1B)	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. (2.5.4.1C)	Sheet EC-1, Note 5	N/A
☒	Plans shall be drawn to scale. (2.5.4.1D)	Required on all plan sheets Site details - not to scale	N/A
☒	Plans shall be prepared and stamped by a NH licensed civil engineer. (2.5.4.1D)	Only plans prepared by PE	N/A
☒	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. (2.5.4.1E)	To be provided, Wetlands report provided	N/A
☒	Title (name of development project), north point, scale, legend. (2.5.4.2A)	Cover sheet, All plan sheets	N/A
☒	Date plans first submitted, date and explanation of revisions. (2.5.4.2B)	Cover sheet, title block all other sheets	N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. (2.5.4.2C)	Required on all plan sheets	N/A
☒	Source and date of data displayed on the plan. (2.5.4.2D)	Existing Conditions plans	N/A

Site Plan Specifications			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." (2.5.4.2E)	Sheet GN-1, Site note 3 lower left	N/A
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." (2.13.3)	Sheet GN-1, Site Note 15 Site Note 12 lower left	N/A
☒	Plan sheets showing landscaping and screening shall also include the following additional notes: a. "The property owner and all future property owners shall be responsible for the maintenance, repair and replacement of all required screening and landscape materials." b. "All required plant materials shall be tended and maintained in a healthy growing condition, replaced when necessary, and kept free of refuse and debris. All required fences and walls shall be maintained in good repair." c. "The property owner shall be responsible to remove and replace dead or diseased plant materials immediately with the same type, size and quantity of plant materials as originally installed, unless alternative plantings are requested, justified and approved by the Planning Board or Planning Director." (2.13.4)	To be included on final Landscape Plan	N/A

Site Plan Specifications – Required Exhibits and Data			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
	1. Existing Conditions: (2.5.4.3A)		
☒	a. Surveyed plan of site showing existing natural and built features;	EC-2, EC-3 & EC-4	
☒	b. Zoning boundaries;	Note EC-1, top left	
☒	c. Dimensional Regulations;	Sheet GN-1, Zoning Summary middle right	
☒	d. Wetland delineation, wetland function and value assessment;	EC-4, wetlands report	
☒	e. SFHA, 100-year flood elevation line and BFE data.	Existing Conditions Plans	
	2. Buildings and Structures: (2.5.4.3B)		
☒	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;	Architectural Drawings	
☒	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;	Architectural drawings	
☒	c. Total Floor Area;	Arch dwgs (A101) Bldg 1 = 7840 sf Bldg 2 = 10,345 sf	
☒	d. Number of Usable Floors;	Arch dwgs (A101) 3 - both bldgs	
☒	e. Gross floor area by floor and use.	Arch dwgs (A101) Bldg 1 = 24,485 sf Bldg 2 = 32,530 sf	
	3. Access and Circulation: (2.5.4.3C)		
☒	a. Location/width of access ways within site;	Site Plan, C-3	
☒	b. Location of curbing, right of ways, edge of pavement and sidewalks;	Site Plan, C-3	
☒	c. Location, type, size and design of traffic signing (pavement markings);	Site Plan, C-3	
☒	d. Names/layout of existing abutting streets;	Cover sheet	
☒	e. Driveway curb cuts for abutting prop. and public roads;	NA - no new curb cuts are proposed	
☐	f. If subdivision; Names of all roads, right of way lines and easements noted;	NA	
☐	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Autoturn Exhibit, A-1	
	4. Parking and Loading: (2.5.4.3D)		
☒	a. Location of off street parking/loading areas, landscaped areas/buffers;	Site Plan, C-3 Overall Parking Plan, P-1	
☒	b. Parking Calculations (# required and the # provided).	Overall Parking Plan, top right	
	5. Water Infrastructure: (2.5.4.3E)		
☒	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;	Utilities Plan, C-5	
☐	b. Location of wells and monitoring wells (include protective radii).	NA	
	6. Sewer Infrastructure: (2.5.4.3F)		
☒	a. Size, type and location of sanitary sewage facilities & Engineering data.	Utilities Plan, C-5 & Detail Sheet D-8	
	7. Utilities: (2.5.4.3G)		
☒	a. The size, type and location of all above & below ground utilities;	Utilities Plan, C-5	
☒	b. Size type and location of generator pads, transformers and other fixtures.	Utilities Plan, C-5	

Site Plan Specifications – Required Exhibits and Data

☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☐	8. Solid Waste Facilities: (2.5.4.3H)		
☒	a. The size, type and location of solid waste facilities.	Site Plan, C-3	
	9. Storm water Management: (2.5.4.3I)		
☒	a. The location, elevation and layout of all storm-water drainage.	Utilities Plan, C-5	
	10. Outdoor Lighting: (2.5.4.3J)		
☒	a. Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and; b. photometric plan.	Lighting Plan, , 1 of 1	
☒	11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)	Lighting Plan., 1 of 1 GN-1, Site Note 17	
	12. Landscaping: (2.5.4.3K)		
☒	a. Identify all undisturbed area, existing vegetation and that which is to be retained;	Demolition Plan, C-2	
☒	b. Location of any irrigation system and water source.	NA	
	13. Contours and Elevation: (2.5.4.3L)		
☒	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading Plan, C-4	
	14. Open Space: (2.5.4.3M)		
☒	a. Type, extent and location of all existing/proposed open space.	Overall Site Plan, C-1, Site Plan C-3	
☒	15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)	EC-1 through EC-4	
☒	16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)	Site Plan C-3 GN-1, Site Note 10	
☐	17. Character/Civic District (All following information shall be included): (2.5.4.3Q)	NA	
	a. Applicable Building Height (10.5A21.20 & 10.5A43.30);		
	b. Applicable Special Requirements (10.5A21.30);		
	c. Proposed building form/type (10.5A43);		
	d. Proposed community space (10.5A46).		

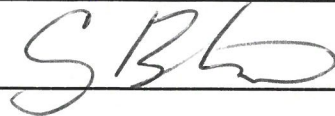
Other Required Information			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☐	Traffic Impact Study or Trip Generation Report, as required. (Four (4) hardcopies of the full study/report and Six (6) summaries to be submitted with the Site Plan Application) (3.2.1-2)	NA	
☒	Indicate where Low Impact Development Design practices have been incorporated. (7.1)	Grading Plan, Sheet C-4	
☒	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. (7.3.1)	NA	
☒	Indicate where measures to minimize impervious surfaces have been implemented. (7.4.3)	Permeable pavers in parking lot	
☒	Calculation of the maximum effective impervious surface as a percentage of the site. (7.4.3.2)	Drainage report	
☒	Stormwater Management and Erosion Control Plan. (Four (4) hardcopies of the full plan/report and Six (6) summaries to be submitted with the Site Plan Application) (7.4.4.1)	In application package	

Final Site Plan Approval Required Information			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	All local approvals, permits, easements and licenses required, including but not limited to: a. Waivers; b. Driveway permits; c. Special exceptions; d. Variances granted; e. Easements; f. Licenses. (2.5.3.2A)	Cover sheet	
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: a. Calculations relating to stormwater runoff; b. Information on composition and quantity of water demand and wastewater generated; c. Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; d. Estimates of traffic generation and counts pre- and post-construction; e. Estimates of noise generation; f. A Stormwater Management and Erosion Control Plan; g. Endangered species and archaeological / historical studies; h. Wetland and water body (coastal and inland) delineations; i. Environmental impact studies. (2.5.3.2B)	a. in drainage study b. D-8, pump station design c. NA d. NA e. NA f. drainage study, grading and drainage plan, C-4 g. NA h. Site Plans i. NA	

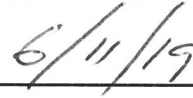
Final Site Plan Approval Required Information

☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. (2.5.3.2D)	To be Provided	
☒	A list of any required state and federal permit applications required for the project and the status of same. (2.5.3.2E)	None required	

Applicant's Signature: _____



Date: _____



ARBOR VIEW APARTMENTS RESIDENTIAL EXPANSION

145 Lang Road
Portsmouth, NH
Assessor's Parcel 287-01

DRAINAGE REPORT

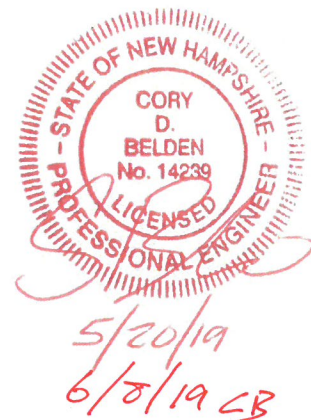
~~May 2019~~
(Revised August 2019)

Prepared For:

Forest Properties Management
625 Mt. Auburn St, Suite 210
Cambridge MA 02138

Prepared By:

ALTUS ENGINEERING, INC.
133 Court Street
Portsmouth, NH 03801
Phone: (603) 433-2335



ARBOR VIEW APARTMENTS
145 Lang Road
Portsmouth, NH
Assessor's Parcel 287-01

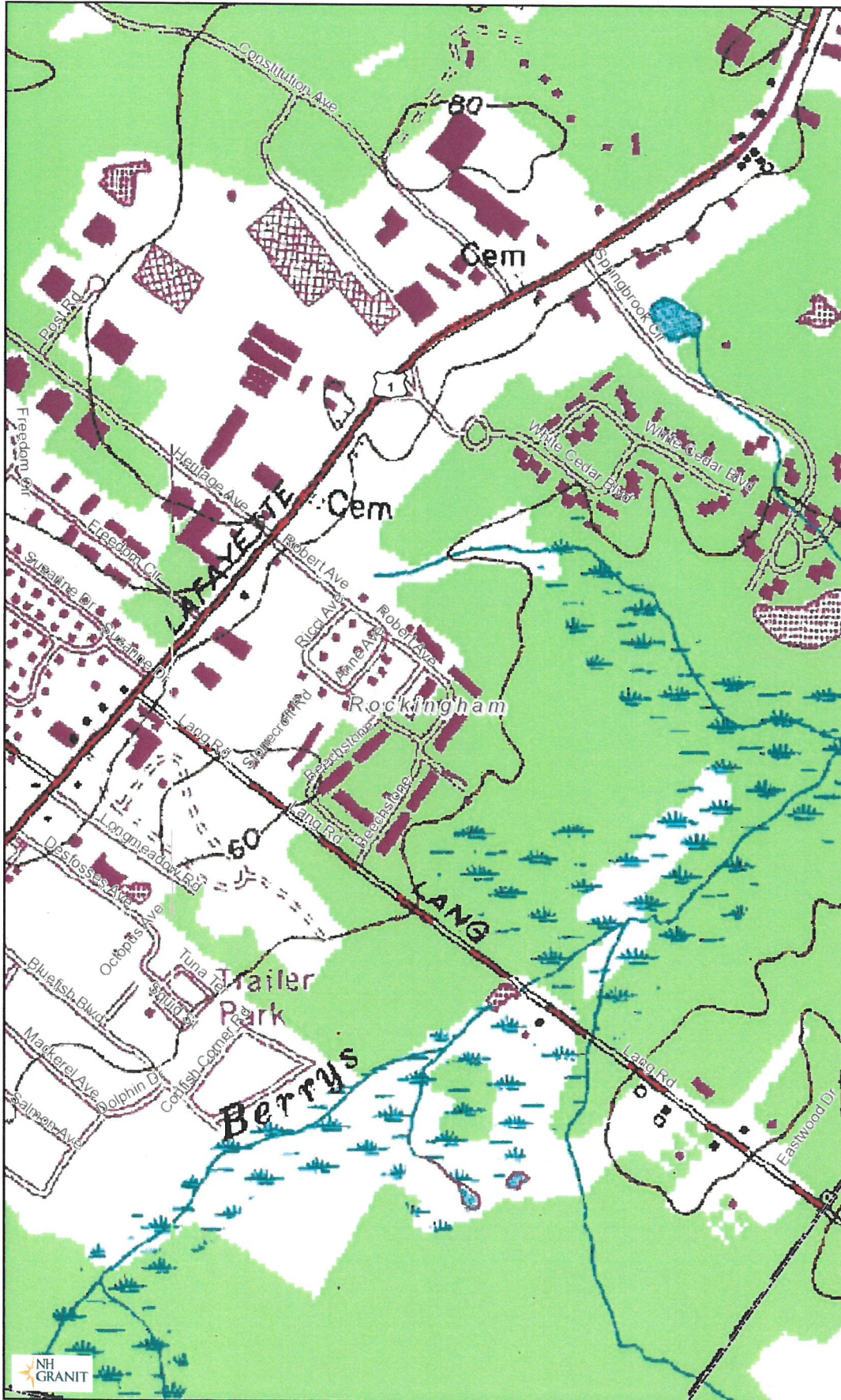
TABLE OF CONTENTS

- 1) USGS Site Location Map
- 2) Project Narrative
- 3) FEMA Map
- 4) Site Photos
- 5) BMP Worksheets
- 6) Drainage Analysis
 - Extreme Precipitation Tables
 - Pre-Development
 - Post Development
- 7) Soil Data
 - Web Soil Survey
 - Test Pit Logs
- 8) Inspection and Maintenance Manual (Separate Attachment)

Appendix: Plans: S-1: Pre-Development Soils Plan (11" x 17")
S-2: Post-Development Soils Plan (11" x 17")
DA-1: Pre-Development Drainage Plan (11" x 17")
DA-2: Post-Development Drainage Plan (11" x 17")

Project Plans (22" x 34") (*project plans under separate attachment*)

Map by NH GRANIT



Legend

- State
- County
- City/Town

Map Scale

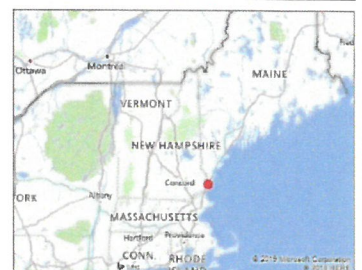
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Map Generated: 5/9/2019



Notes



**“Arbor View Apartments”
Drainage Report
Assessor’s Map 287 Lot 01
Altus Project P4787.2**

PROJECT DESCRIPTION

Site Overview

Forest Properties Management is proposing to re-develop the site located at 145 Lang Road (Assessor’s Map 287, Lot 01) to construct two additional multi-family buildings that will provide 42 more housing units in the City of Portsmouth. The current site is 35.3 acres in size and has five existing multi-family buildings that provide 154 housing units. Zoning relief was granted to allow 186 total units on site at a density of one unit per 8,321 square feet, where 10,000 is required. Relief was also granted for the new buildings to be 225 feet and 170 feet in length where 160 feet is the maximum allowable length. The existing site was constructed in the 1980’s prior to stormwater regulations and does not have treatment on site. The proposed project will treat the new impervious areas on site as well as some of the existing impervious areas that are currently untreated. The development area eventually drains to Berry’s Brook as referenced by the attached USGS map. The site is located within the *Coastal and Great Bay Regional Communities*, so the rainfall precipitation results obtained from the NRCC have been increased by 15% for the hydrologic analysis. The stormwater management system proposed for the site will reduce peak flows and treat site runoff prior to discharging back to the municipal storm drain and surface stormwater systems.

Pre-Development (Existing Conditions)

The pre-development site conditions reflect the existing conditions of the site, which include the existing Arbor View apartment complex and associated site parking. The current site discharges to two primary discharge locations, identified as the Points of Analysis (POA) on the plans; 1) to the southwest of the development area and wetlands adjacent to Lang Road, and 2) the southeast of the development area and the discharge to the same wetlands complex. The Pre-Development analysis models the existing conditions for each point of analysis. The grades and elevations shown on the plans are based on the site survey completed by James Verra and Associates, Inc. in March-May 2019.

The study pre-development area was divided into nine watersheds to reflect the existing site conditions and flow patterns. Watersheds No.1 through 6 discharge to POA #1 as identified above and watersheds No. 7 through 9 discharge to POA #2, as identified above. The points of analysis are the same for the pre and post development models and are used for comparison of flows prior to construction and after the site is development as shown on the plans.

Post-Development (Proposed Site Design)

The Proposed development will construct two three story buildings with 24 units one building and 18 units in the other building. A new 47 stall parking lot will be constructed to accommodate the additional units with walkways and lighting. There will be two raingardens constructed on site to treat and manage the stormwater and porous pavers will be used in the parking stall areas for infiltration.

The proposed stormwater system is depicted on the Grading and Drainage Plan in the project plans and the attached Post-Development Drainage Plan. For the post development analysis, the site was divided into fourteen (14) watershed areas to depict the post-development conditions. The same points of analysis that were used in the Pre-Development model were used for an accurate comparison of the Pre and Post development conditions.

The “Post-Development Drainage Plan” illustrates the proposed stormwater management system. The subcatchments from the Pre-Development conditions have been divided into smaller areas to emulate the proposed grading and stormwater management system proposed for construction. The post-development conditions were analyzed at the same primary discharge point examined in the pre-development modeling.

Site topography, existing features, proposed site improvements, proposed grading, drainage and erosion control measures are shown on the accompanying plans. Recommended erosion control measures are based upon the December 2008 edition of the “*New Hampshire Stormwater Manual Volumes 1 through 3*” prepared by NHDES and Comprehensive Environmental, Inc. as amended.

Effective Impervious Area

The current site has approximately 185,000 square feet of effective impervious area, which is approximately 12% of the 35.53 acre site. The proposed project will treat all new impervious surfaces, as well as approximately 30,000 sf of existing upslope impervious areas, reducing the site effective impervious to approximately 155,000 sf or 10% of the total site.

Drainage Analysis

A complete summary of the drainage model is included in the appendix of this report. The following table compares pre- and post-development peak rates at the two Points of Analysis identified on the plans for the 2, 10, 25, and 50 year storm events:

Stormwater Modeling Summary
Peak Q (cfs) for Type III 24-Hour Storm Events

*Rainfall Intensities reflect 15% Increase per AOT	2-Yr Storm (3.74 inch)	10-Yr Storm (5.67 inch)	25-Yr Storm (7.19 inch)	50-Yr Storm (8.61 inch)
POA #1				
Pre	7.1	16.0	23.2	32.4
Post	5.6	14.7	22.9	30.7
Net Change	-1.5	-1.3	-0.3	-1.7
POA #2				
Pre	4.5	9.0	12.4	16.1
Post	4.5	8.1	11.3	15.3
Net Change	-0.0	-0.9	-1.1	-0.8
TOTAL Change	-1.5	-2.2	-1.4	-2.5

As the above table demonstrates, the proposed peak rates of runoff will not be increased from the existing conditions for any of the analyzed storm events.

CONCLUSION

The proposed Arbor View Apartment development will not have an adverse effect on abutting properties and infrastructure as a result of stormwater runoff. The existing site was developed in the 1980's and has no designed stormwater treatment facilities and minimal detention areas. The redevelopment has been designed to meet the NHDES threshold for the Alteration of Terrain Permit, including the analysis of the site using a 15% increase to the rainfall intensities for seacoast communities. The site was analyzed for the 2, 10, 25, and 50 year storm events. Through the use of porous pavement surfaces and raingardens, the stormwater is managed to not increase flows for any of the storms analyzed.

Post-construction peak rates of runoff from the site will be lower than the existing conditions for all analyzed storm events. The construction of a stormwater drainage system consisting of porous pavement surfaces, raingardens, sediment forebays, and deep sump catch basins will provide the required treatment to stormwater runoff. Appropriate steps will be taken to properly mitigate erosion and sedimentation through the use of temporary and permanent Best Management Practices for sediment and erosion control.

CALCULATION METHODS

The project lies with the *Coastal and Great Bay Regional Communities* as identified in Section 6 – One-Stop AoT Screening Layers Results. As a result, the rainfall precipitation results obtained from the Northeast Regional Climate Center for the project site have been increased by 15% for the hydrologic analysis. The drainage study was completed using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. Reservoir routing was performed with the Dynamic Storage Indication method which automates the calculation of Tailwater conditions. A Type III 24-hour rainfall distribution was utilized in analyzing the data for the 2, 10, 25, and 50 Year - 24-hour storm events using rainfall data provided by Northeast Regional Climate Center – Extreme Precipitation Tables.

Disclaimer

Altus Engineering, Inc. notes that stormwater modeling is limited in its capacity to precisely predict peak rates of runoff and flood elevations. Results should not be considered to represent actual storm events due to the number of variables and assumptions involved in the modeling effort. Surface roughness coefficients (n), entrance loss coefficients (k_e), velocity factors (k_v) and times of concentration (T_c) are based on subjective field observations and engineering judgment using available data. For design purposes, curve numbers (C_n) describe the average conditions. However, curve numbers will vary from storm to storm depending on the antecedent runoff conditions (ARC) including saturation and frozen ground. Also, higher water elevations than predicted by modeling could occur if drainage channels, closed drain systems or culverts are not maintained and/or become blocked by debris before and/or during a storm event as this will impact flow capacity of the structures. Structures should be re-evaluated if future changes occur within relevant drainage areas in order to assess any required design modifications.

National Flood Hazard Layer FIRMette



43°14'43.97"N



USGS The National Map: Orthoimagery, Data refreshed April, 2019.
43°14'43.97"N
70°47'1.93"W

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE)
Zone A, V, A99
- With BFE or Depth
Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with draining areas of less than one square mile (Zone 1)
- Future Conditions 1% Annual Chance Flood Hazard (Zone X)
- Area with Reduced Flood Risk due to Levee. See Notes. (Zone X)
- Area with Flood Risk due to Levee (Zone D)

OTHER AREAS

- Area of Minimal Flood Hazard (Zone X)
- Effective LOMRs
- Area of Undetermined Flood Hazard (Zone X)

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/9/2019 at 4:34:08 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.











INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: **Raingarden #1**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
1.34	ac	A = Area draining to the practice	
0.75	ac	A _I = Impervious area draining to the practice	
0.56	decimal	I = percent impervious area draining to the practice, in decimal form	
0.55	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
0.74	ac-in	WQV = 1" x R _v x A	
2,691	cf	WQV conversion (ac-in x 43,560 sf/ac x 1 ft/12")	
673	cf	25% x WQV (check calc for sediment forebay volume)	
Forebay		Method of pretreatment? (not required for clean or roof runoff)	
	cf	V _{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
2,900	cf	V = volume ¹ (attach a stage-storage table)	← ≥ WQV
1,000	sf	A _{SA} = surface area of the bottom of the pond	
	iph	K _{sat} _{DESIGN} = design infiltration rate ²	
-	hours	T _{DRAIN} = drain time = V / (A _{SA} * I _{DESIGN})	← ≤ 72-hrs
43.50	feet	E _{BTM} = elevation of the bottom of the basin	
41.00	feet	E _{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E _{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
2.50	feet	D _{SHWT} = separation from SHWT	← ≥ * ³
43.5	feet	D _{ROCK} = separation from bedrock	← ≥ * ³
	ft	D _{amend} = Depth of amended soil, if applicable due high infiltration rate	← ≥ 24"
	ft	D _T = depth of trench, if trench proposed	← 4 - 10 ft
	Yes/No	If a trench or underground system is proposed, observation well provided ⁴	
		If a trench is proposed, material in trench	
		If a basin is proposed, basin floor material	
	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
	:1	If a basin is proposed, pond side slopes	← ≥ 3:1
47.86	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
48.22	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
48.50	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench? ⁵	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. K_{sat}_{DESIGN} includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

4787.2 POST_15AoT

Prepared by Altus Engineering, Inc.

Type III 24-hr 2-Year Rainfall=3.74"

Printed 5/20/2019

HydroCAD® 10.00-22 s/n 01222 © 2018 HydroCAD Software Solutions LLC

Stage-Area-Storage for Pond RG1: Raingarden 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
43.25	1,000	0	45.90	1,000	610
43.30	1,000	20	45.95	1,000	630
43.35	1,000	40	46.00	1,000	650
43.40	1,000	60	46.05	1,025	725
43.45	1,000	80	46.10	1,050	800
43.50	1,000	100	46.15	1,075	875
43.55	1,000	120	46.20	1,100	950
43.60	1,000	140	46.25	1,125	1,025
43.65	1,000	160	46.30	1,150	1,100
43.70	1,000	180	46.35	1,175	1,175
43.75	1,000	200	46.40	1,200	1,250
43.80	1,000	220	46.45	1,225	1,325
43.85	1,000	240	46.50	1,250	1,400
43.90	1,000	260	46.55	1,275	1,475
43.95	1,000	280	46.60	1,300	1,550
44.00	1,000	300	46.65	1,325	1,625
44.05	1,000	320	46.70	1,350	1,700
44.10	1,000	340	46.75	1,375	1,775
44.15	1,000	360	46.80	1,400	1,850
44.20	1,000	380	46.85	1,425	1,925
44.25	1,000	400	46.90	1,450	2,000
44.30	1,000	405	46.95	1,475	2,075
44.35	1,000	410	47.00	1,500	2,150
44.40	1,000	415	47.05	1,525	2,225
44.45	1,000	420	47.10	1,550	2,300
44.50	1,000	425	47.15	1,575	2,375
44.55	1,000	430	47.20	1,600	2,450
44.60	1,000	435	47.25	1,625	2,525
44.65	1,000	440	47.30	1,650	2,600
44.70	1,000	445	47.35	1,675	2,675
44.75	1,000	450	47.40	1,700	2,750
44.80	1,000	455	47.45	1,725	2,825
44.85	1,000	460	47.50	1,750	2,900
44.90	1,000	465	47.55	1,775	2,975
44.95	1,000	470	47.60	1,800	3,050
45.00	1,000	475	47.65	1,825	3,125
45.05	1,000	480	47.70	1,850	3,200
45.10	1,000	485	47.75	1,875	3,275
45.15	1,000	490	47.80	1,900	3,350
45.20	1,000	495	47.85	1,925	3,425
45.25	1,000	500	47.90	1,950	3,500
45.30	1,000	505	47.95	1,975	3,575
45.35	1,000	510	48.00	2,000	3,650
45.40	1,000	515			
45.45	1,000	520			
45.50	1,000	525			
45.55	1,000	530			
45.60	1,000	535			
45.65	1,000	540			
45.70	1,000	545			
45.75	1,000	550			
45.80	1,000	570			
45.85	1,000	590			



INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: **Raingarden #2**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

	Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
0.51 ac	A = Area draining to the practice	
0.22 ac	A _I = Impervious area draining to the practice	
0.44 decimal	I = percent impervious area draining to the practice, in decimal form	
0.45 unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
0.23 ac-in	WQV = 1" x R _v x A	
824 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
206 cf	25% x WQV (check calc for sediment forebay volume)	
roof runoff	Method of pretreatment? (not required for clean or roof runoff)	
cf	V _{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
915 cf	V = volume ¹ (attach a stage-storage table)	← ≥ WQV
400 sf	A _{SA} = surface area of the bottom of the pond	
iph	K _{sat} _{DESIGN} = design infiltration rate ²	
- hours	T _{DRAIN} = drain time = V / (A _{SA} * I _{DESIGN})	← ≤ 72-hrs
43.50 feet	E _{BTM} = elevation of the bottom of the basin	
42.00 feet	E _{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
feet	E _{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.50 feet	D _{SHWT} = separation from SHWT	← ≥ * ³
43.5 feet	D _{ROCK} = separation from bedrock	← ≥ * ³
ft	D _{amend} = Depth of amended soil, if applicable due high infiltration rate	← ≥ 24"
ft	D _T = depth of trench, if trench proposed	← 4 - 10 ft
Yes/No	If a trench or underground system is proposed, observation well provided ⁴	
	If a trench is proposed, material in trench	
	If a basin is proposed, basin floor material	
Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
:1	If a basin is proposed, pond side slopes	← ≥ 3:1
47.65 ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
47.79 ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
48.00 ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES	10 peak elevation ≤ Elevation of the top of the trench? ⁵	← yes
YES	If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. K_{sat}_{DESIGN} includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

4787.2 POST_15AoT

Prepared by Altus Engineering, Inc.

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Type III 24-hr 50-Year Rainfall=8.61"

Printed 5/20/2019

Stage-Area-Storage for Pond RG2: Raingarden 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
43.75	400	0	46.40	400	212
43.80	400	7	46.45	400	218
43.85	400	13	46.50	400	225
43.90	400	20	46.55	419	259
43.95	400	26	46.60	439	294
44.00	400	33	46.65	458	328
44.05	400	40	46.70	477	363
44.10	400	46	46.75	497	398
44.15	400	53	46.80	516	432
44.20	400	59	46.85	535	467
44.25	400	66	46.90	555	501
44.30	400	73	46.95	574	536
44.35	400	79	47.00	593	570
44.40	400	86	47.05	613	604
44.45	400	92	47.10	632	639
44.50	400	99	47.15	651	673
44.55	400	106	47.20	671	708
44.60	400	112	47.25	690	743
44.65	400	119	47.30	709	777
44.70	400	125	47.35	729	812
44.75	400	132	47.40	748	846
44.80	400	134	47.45	767	881
44.85	400	136	47.50	787	915
44.90	400	138	47.55	806	949
44.95	400	140	47.60	825	984
45.00	400	142	47.65	845	1,018
45.05	400	144	47.70	864	1,053
45.10	400	146	47.75	883	1,088
45.15	400	148	47.80	903	1,122
45.20	400	150	47.85	922	1,157
45.25	400	152	47.90	941	1,191
45.30	400	154	47.95	961	1,226
45.35	400	156	48.00	980	1,260
45.40	400	158			
45.45	400	160			
45.50	400	162			
45.55	400	164			
45.60	400	166			
45.65	400	168			
45.70	400	170			
45.75	400	172			
45.80	400	174			
45.85	400	176			
45.90	400	178			
45.95	400	180			
46.00	400	182			
46.05	400	184			
46.10	400	186			
46.15	400	188			
46.20	400	190			
46.25	400	192			
46.30	400	199			
46.35	400	205			

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.776 degrees West
Latitude	43.019 degrees North
Elevation	0 feet
Date/Time	Tue, 12 Mar 2019 16:04:12 -0400

Extreme Precipitation Estimates

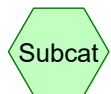
	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.66	0.82	1.04	1yr	0.71	0.98	1.22	1.57	2.05	2.69	2.96	1yr	2.38	2.85	3.26	3.98	4.61	1yr
2yr	0.32	0.50	0.62	0.82	1.03	1.31	2yr	0.89	1.19	1.52	1.95	2.51	3.25	3.61	2yr	2.87	3.47	3.98	4.73	5.39	2yr
5yr	0.38	0.58	0.73	0.98	1.26	1.62	5yr	1.08	1.47	1.90	2.45	3.17	4.12	4.64	5yr	3.64	4.46	5.11	6.01	6.78	5yr
10yr	0.42	0.65	0.83	1.12	1.46	1.90	10yr	1.26	1.74	2.25	2.92	3.79	4.93	5.60	10yr	4.36	5.39	6.18	7.21	8.08	10yr
25yr	0.48	0.77	0.98	1.35	1.79	2.36	25yr	1.55	2.16	2.80	3.67	4.80	6.25	7.20	25yr	5.53	6.92	7.94	9.16	10.18	25yr
50yr	0.54	0.87	1.11	1.56	2.10	2.79	50yr	1.81	2.55	3.33	4.38	5.73	7.49	8.70	50yr	6.63	8.37	9.60	10.99	12.14	50yr
100yr	0.60	0.98	1.26	1.79	2.45	3.30	100yr	2.11	3.01	3.96	5.23	6.86	8.98	10.52	100yr	7.94	10.12	11.61	13.19	14.47	100yr
200yr	0.69	1.12	1.45	2.08	2.87	3.89	200yr	2.47	3.56	4.68	6.22	8.20	10.76	12.73	200yr	9.52	12.24	14.05	15.83	17.26	200yr
500yr	0.81	1.34	1.74	2.53	3.54	4.84	500yr	3.05	4.44	5.86	7.83	10.38	13.68	16.38	500yr	12.11	15.75	18.09	20.16	21.81	500yr

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	1yr	0.62	0.87	0.92	1.33	1.68	2.27	2.58	1yr	2.01	2.48	2.90	3.19	3.96	1yr
2yr	0.32	0.49	0.60	0.81	1.00	1.19	2yr	0.87	1.17	1.37	1.82	2.33	3.10	3.50	2yr	2.74	3.37	3.88	4.61	5.14	2yr
5yr	0.35	0.54	0.68	0.93	1.18	1.41	5yr	1.02	1.38	1.61	2.11	2.73	3.84	4.27	5yr	3.40	4.11	4.80	5.63	6.35	5yr
10yr	0.39	0.60	0.74	1.04	1.34	1.61	10yr	1.16	1.57	1.81	2.38	3.05	4.44	4.97	10yr	3.93	4.78	5.58	6.55	7.34	10yr
25yr	0.44	0.68	0.84	1.20	1.58	1.91	25yr	1.37	1.87	2.11	2.75	3.53	4.82	6.06	25yr	4.26	5.83	6.87	8.01	8.88	25yr
50yr	0.49	0.74	0.93	1.33	1.79	2.18	50yr	1.55	2.13	2.35	3.06	3.92	5.46	7.02	50yr	4.83	6.75	8.03	9.33	10.27	50yr
100yr	0.55	0.83	1.04	1.50	2.05	2.49	100yr	1.77	2.43	2.64	3.39	4.34	6.16	8.14	100yr	5.45	7.83	9.40	10.89	11.88	100yr
200yr	0.61	0.91	1.16	1.67	2.33	2.84	200yr	2.01	2.78	2.95	3.75	4.78	6.93	9.43	200yr	6.13	9.07	11.01	12.72	13.76	200yr
500yr	0.71	1.05	1.35	1.96	2.79	3.40	500yr	2.41	3.32	3.43	4.27	5.44	8.10	11.47	500yr	7.17	11.03	13.58	15.64	16.70	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.73	0.89	1.09	1yr	0.77	1.06	1.27	1.74	2.20	3.01	3.18	1yr	2.67	3.06	3.63	4.41	5.10	1yr
2yr	0.34	0.52	0.64	0.87	1.07	1.27	2yr	0.92	1.25	1.48	1.96	2.51	3.46	3.73	2yr	3.06	3.59	4.12	4.88	5.69	2yr
5yr	0.40	0.62	0.77	1.06	1.34	1.63	5yr	1.16	1.59	1.89	2.53	3.25	4.38	4.99	5yr	3.88	4.80	5.43	6.42	7.20	5yr
10yr	0.47	0.72	0.90	1.25	1.62	1.99	10yr	1.40	1.94	2.29	3.11	3.95	5.39	6.22	10yr	4.77	5.98	6.83	7.88	8.80	10yr
25yr	0.58	0.88	1.10	1.57	2.06	2.59	25yr	1.78	2.53	2.96	4.07	5.15	7.83	8.34	25yr	6.93	8.02	9.13	10.38	11.45	25yr
50yr	0.68	1.03	1.28	1.85	2.48	3.16	50yr	2.14	3.09	3.61	5.00	6.32	9.79	10.42	50yr	8.66	10.02	11.38	12.77	13.99	50yr
100yr	0.80	1.21	1.51	2.18	2.99	3.85	100yr	2.58	3.76	4.38	6.16	7.76	12.24	13.03	100yr	10.83	12.53	14.18	15.72	17.11	100yr
200yr	0.93	1.41	1.78	2.58	3.60	4.70	200yr	3.11	4.60	5.35	7.59	9.53	15.33	16.30	200yr	13.57	15.68	17.68	19.35	20.92	200yr
500yr	1.16	1.73	2.22	3.23	4.59	6.11	500yr	3.96	5.97	6.95	10.04	12.55	20.68	21.93	500yr	18.30	21.09	23.67	25.47	27.30	500yr



Reach



Link

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.230	79	<50% Grass cover, Poor, HSG B (9S)
3.665	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S)
3.529	98	Paved parking, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S)
1.491	98	Roofs, HSG B (1S, 2S, 3S, 5S, 6S, 7S, 8S, 9S)
0.481	98	Unconnected pavement, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S)
3.333	55	Woods, Good, HSG B (1S, 3S, 5S, 7S, 9S)
12.729	76	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
12.729	HSG B	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
12.729		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.230	0.000	0.000	0.000	0.230	<50% Grass cover, Poor	9S
0.000	3.665	0.000	0.000	0.000	3.665	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S
0.000	3.529	0.000	0.000	0.000	3.529	Paved parking	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S
0.000	1.491	0.000	0.000	0.000	1.491	Roofs	1S, 2S, 3S, 5S, 6S, 7S, 8S, 9S
0.000	0.481	0.000	0.000	0.000	0.481	Unconnected pavement	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S
0.000	3.333	0.000	0.000	0.000	3.333	Woods, Good	1S, 3S, 5S, 7S, 9S
0.000	12.729	0.000	0.000	0.000	12.729	TOTAL AREA	

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Type III 24-hr 2-Year Rainfall=3.74"

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Time span=1.00-30.00 hrs, dt=0.05 hrs, 581 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: Lang Rd Runoff Area=124,920 sf 38.02% Impervious Runoff Depth=1.34"
 Flow Length=575' Tc=25.3 min CN=73 Runoff=2.64 cfs 0.321 af

Subcatchment 2S: Beechstone Northwest Runoff Area=28,210 sf 78.29% Impervious Runoff Depth=2.67"
 Tc=6.0 min CN=90 Runoff=1.95 cfs 0.144 af

Subcatchment 3S: Wooded Area Runoff Area=114,365 sf 20.17% Impervious Runoff Depth=0.88"
 Flow Length=555' Tc=17.2 min UI Adjusted CN=65 Runoff=1.66 cfs 0.193 af

Subcatchment 4S: Entrance Drive Runoff Area=7,305 sf 64.96% Impervious Runoff Depth=2.23"
 Tc=6.0 min CN=85 Runoff=0.43 cfs 0.031 af

Subcatchment 5S: Beechstone to CB#10 Runoff Area=19,705 sf 81.40% Impervious Runoff Depth=2.77"
 Tc=6.0 min CN=91 Runoff=1.40 cfs 0.104 af

Subcatchment 6S: Beechstone to CB#9 Runoff Area=39,170 sf 78.04% Impervious Runoff Depth=2.67"
 Tc=6.0 min CN=90 Runoff=2.71 cfs 0.200 af

Subcatchment 7S: Stoencroft Runoff Area=132,300 sf 38.78% Impervious Runoff Depth=1.34"
 Flow Length=705' Tc=37.4 min CN=73 Runoff=2.34 cfs 0.340 af

Subcatchment 8S: Beechstone Northeast Runoff Area=30,575 sf 84.14% Impervious Runoff Depth=2.87"
 Tc=6.0 min CN=92 Runoff=2.23 cfs 0.168 af

Subcatchment 9S: Playground Runoff Area=57,915 sf 32.14% Impervious Runoff Depth=1.47"
 Flow Length=300' Tc=11.5 min CN=75 Runoff=1.86 cfs 0.163 af

Reach 1R: Reach Avg. Flow Depth=0.00' Max Vel=0.00 fps
 n=0.035 L=100.0' S=0.0421 '/' Capacity=465.89 cfs Outflow=0.00 cfs 0.000 af

Reach 2R: Reach Avg. Flow Depth=0.00' Max Vel=0.00 fps
 n=0.016 L=30.0' S=0.0230 '/' Capacity=753.28 cfs Outflow=0.00 cfs 0.000 af

Reach 3R: Reach Avg. Flow Depth=0.00' Max Vel=0.00 fps
 n=0.016 L=192.0' S=0.0127 '/' Capacity=559.93 cfs Outflow=0.00 cfs 0.000 af

Reach R1: Reach Avg. Flow Depth=0.26' Max Vel=2.14 fps Inflow=1.95 cfs 0.144 af
 n=0.030 L=350.0' S=0.0181 '/' Capacity=167.68 cfs Outflow=1.81 cfs 0.144 af

Pond P1: 12" Culvert Peak Elev=44.66' Storage=647 cf Inflow=2.64 cfs 0.321 af
 15.0" Round Culvert n=0.025 L=52.0' S=0.0888 '/' Outflow=2.50 cfs 0.321 af

Pond P2: CB A Peak Elev=51.82' Storage=11 cf Inflow=1.95 cfs 0.144 af
 12.0" Round Culvert n=0.025 L=120.0' S=0.0179 '/' Outflow=1.95 cfs 0.144 af

Pond P3: 12" Culvert Peak Elev=44.72' Storage=1,241 cf Inflow=3.23 cfs 0.337 af
 12.0" Round Culvert n=0.025 L=50.0' S=0.0028 '/' Outflow=2.74 cfs 0.337 af

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Pond P4: CB #11

Peak Elev=44.63' Storage=125 cf Inflow=6.74 cfs 0.994 af
15.0" Round Culvert n=0.025 L=102.0' S=0.0082 '/' Outflow=7.12 cfs 0.994 af

Pond P5: CB #10

Peak Elev=43.33' Storage=78 cf Inflow=5.39 cfs 0.642 af
12.0" Round Culvert n=0.025 L=30.0' S=0.0153 '/' Outflow=5.24 cfs 0.642 af

Pond P6: CB #9

Peak Elev=45.69' Storage=63 cf Inflow=3.99 cfs 0.537 af
Outflow=4.02 cfs 0.537 af

Pond P7: CB #7

Peak Elev=49.88' Storage=13 cf Inflow=2.84 cfs 0.508 af
12.0" Round Culvert n=0.025 L=230.0' S=0.0315 '/' Outflow=2.84 cfs 0.508 af

Pond P8: CB B

Peak Elev=50.59' Storage=19 cf Inflow=2.23 cfs 0.168 af
12.0" Round Culvert n=0.025 L=35.0' S=0.0057 '/' Outflow=2.23 cfs 0.168 af

Pond P9: CB #5

Peak Elev=42.85' Storage=18 cf Inflow=4.48 cfs 0.671 af
18.0" Round Culvert n=0.025 L=95.0' S=0.0080 '/' Outflow=4.49 cfs 0.671 af

Link POA1: POA #1

Inflow=7.12 cfs 0.994 af
Primary=7.12 cfs 0.994 af

Link POA2: POA #2

Inflow=4.49 cfs 0.671 af
Primary=4.49 cfs 0.671 af

Total Runoff Area = 12.729 ac Runoff Volume = 1.665 af Average Runoff Depth = 1.57"
56.78% Pervious = 7.227 ac 43.22% Impervious = 5.501 ac

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Type III 24-hr 2-Year Rainfall=3.74"

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Summary for Subcatchment 1S: Lang Rd

Runoff = 2.64 cfs @ 12.38 hrs, Volume= 0.321 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
40,125	61	>75% Grass cover, Good, HSG B
37,300	55	Woods, Good, HSG B
38,610	98	Paved parking, HSG B
6,100	98	Roofs, HSG B
2,785	98	Unconnected pavement, HSG B
124,920	73	Weighted Average
77,425		61.98% Pervious Area
47,495		38.02% Impervious Area
2,785		5.86% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	75	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.23"
8.3	500	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
25.3	575	Total			

Summary for Subcatchment 2S: Beechstone Northwest

Runoff = 1.95 cfs @ 12.09 hrs, Volume= 0.144 af, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
6,125	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
1,625	98	Unconnected pavement, HSG B
4,810	98	Roofs, HSG B
15,650	98	Paved parking, HSG B
28,210	90	Weighted Average
6,125		21.71% Pervious Area
22,085		78.29% Impervious Area
1,625		7.36% Unconnected

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

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Type III 24-hr 2-Year Rainfall=3.74"

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Summary for Subcatchment 3S: Wooded Area

Runoff = 1.66 cfs @ 12.27 hrs, Volume= 0.193 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Adj	Description
46,000	61		>75% Grass cover, Good, HSG B
45,300	55		Woods, Good, HSG B
16,080	98		Roofs, HSG B
615	98		Paved parking, HSG B
6,370	98		Unconnected pavement, HSG B
114,365	66	65	Weighted Average, UI Adjusted
91,300			79.83% Pervious Area
23,065			20.17% Impervious Area
6,370			27.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	60	0.0080	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
1.3	75	0.0200	0.99		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
4.2	180	0.0200	0.71		Shallow Concentrated Flow, Shallow Woods Woodland Kv= 5.0 fps
2.4	240	0.0120	1.64		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
17.2	555	Total			

Summary for Subcatchment 4S: Entrance Drive

Runoff = 0.43 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
2,560	61	>75% Grass cover, Good, HSG B
4,520	98	Paved parking, HSG B
225	98	Unconnected pavement, HSG B
7,305	85	Weighted Average
2,560		35.04% Pervious Area
4,745		64.96% Impervious Area
225		4.74% Unconnected

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

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Type III 24-hr 2-Year Rainfall=3.74"

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Summary for Subcatchment 5S: Beechstone to CB#10

Runoff = 1.40 cfs @ 12.09 hrs, Volume= 0.104 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
3,000	61	>75% Grass cover, Good, HSG B
665	55	Woods, Good, HSG B
4,270	98	Roofs, HSG B
10,270	98	Paved parking, HSG B
1,500	98	Unconnected pavement, HSG B
19,705	91	Weighted Average
3,665		18.60% Pervious Area
16,040		81.40% Impervious Area
1,500		9.35% Unconnected

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

Summary for Subcatchment 6S: Beechstone to CB#9

Runoff = 2.71 cfs @ 12.09 hrs, Volume= 0.200 af, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
8,600	61	>75% Grass cover, Good, HSG B
8,220	98	Roofs, HSG B
19,800	98	Paved parking, HSG B
2,550	98	Unconnected pavement, HSG B
39,170	90	Weighted Average
8,600		21.96% Pervious Area
30,570		78.04% Impervious Area
2,550		8.34% Unconnected

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

Summary for Subcatchment 7S: Stoencroft

Runoff = 2.34 cfs @ 12.55 hrs, Volume= 0.340 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

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Type III 24-hr 2-Year Rainfall=3.74"

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Area (sf)	CN	Description
33,000	61	>75% Grass cover, Good, HSG B
48,000	55	Woods, Good, HSG B
16,920	98	Roofs, HSG B
32,180	98	Paved parking, HSG B
2,200	98	Unconnected pavement, HSG B
132,300	73	Weighted Average
81,000		61.22% Pervious Area
51,300		38.78% Impervious Area
2,200		4.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	80	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.23"
19.2	575	0.0100	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
37.4	705	Total			

Summary for Subcatchment 8S: Beechstone Northeast

Runoff = 2.23 cfs @ 12.09 hrs, Volume= 0.168 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
4,850	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
6,100	98	Roofs, HSG B
17,650	98	Paved parking, HSG B
1,975	98	Unconnected pavement, HSG B
30,575	92	Weighted Average
4,850		15.86% Pervious Area
25,725		84.14% Impervious Area
1,975		7.68% Unconnected

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

Summary for Subcatchment 9S: Playground

Runoff = 1.86 cfs @ 12.17 hrs, Volume= 0.163 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

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Type III 24-hr 2-Year Rainfall=3.74"

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Area (sf)	CN	Description
15,400	61	>75% Grass cover, Good, HSG B
10,000	79	<50% Grass cover, Poor, HSG B
2,440	98	Roofs, HSG B
13,900	55	Woods, Good, HSG B
14,440	98	Paved parking, HSG B
1,735	98	Unconnected pavement, HSG B
57,915	75	Weighted Average
39,300		67.86% Pervious Area
18,615		32.14% Impervious Area
1,735		9.32% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	90	0.0170	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
1.7	160	0.0250	1.58		Shallow Concentrated Flow, Nearly Bare & Untilled Kv= 10.0 fps
0.2	50	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
11.5	300	Total			

Summary for Reach 1R: Reach

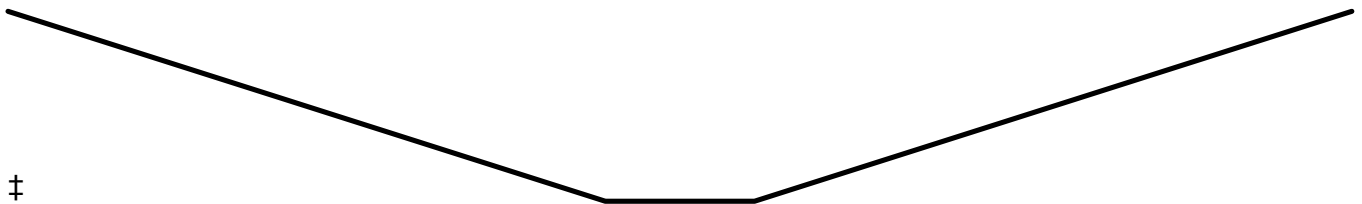
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 465.89 cfs

5.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds

Side Slope Z-value= 10.0 ' ' Top Width= 45.00'

Length= 100.0' Slope= 0.0421 ' '

Inlet Invert= 42.21', Outlet Invert= 38.00'

**Summary for Reach 2R: Reach**

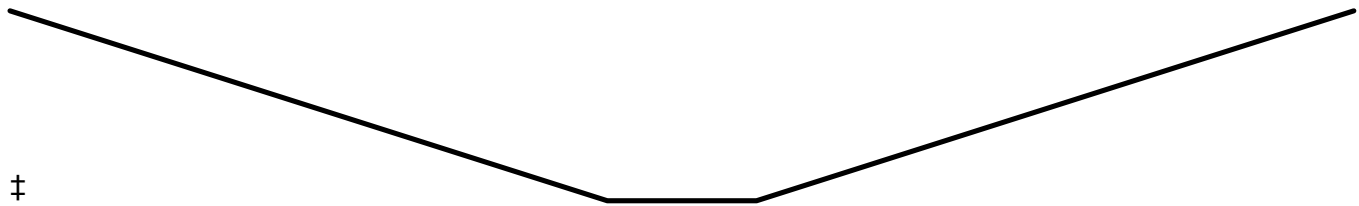
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 753.28 cfs

5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 10.0 ' ' Top Width= 45.00'

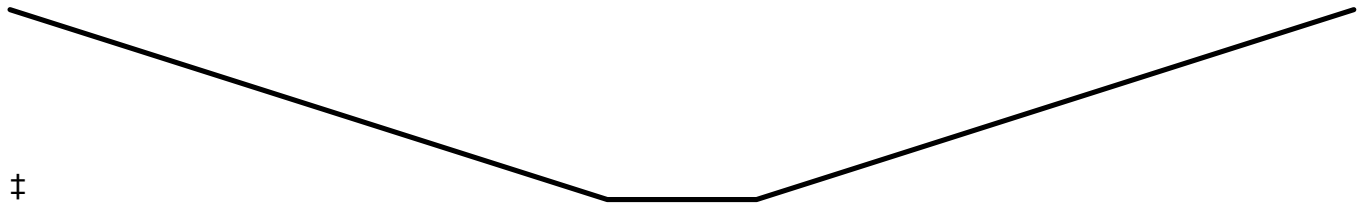
Length= 30.0' Slope= 0.0230 ' '

Inlet Invert= 42.90', Outlet Invert= 42.21'

**Summary for Reach 3R: Reach**

Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 559.93 cfs

5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 10.0 ' ' Top Width= 45.00'
Length= 192.0' Slope= 0.0127 ' '
Inlet Invert= 45.34', Outlet Invert= 42.90'

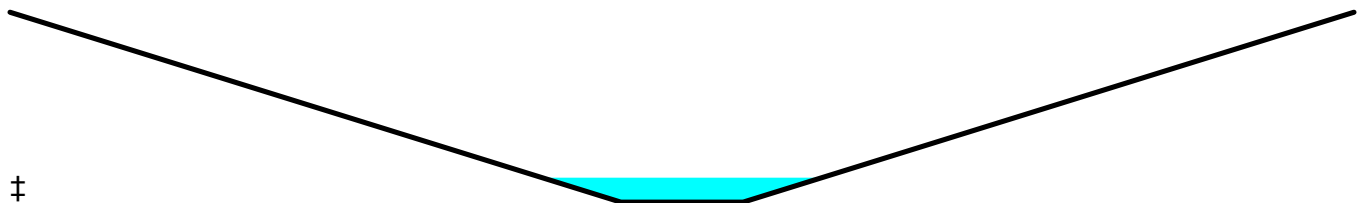
**Summary for Reach R1: Reach**

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 2.67" for 2-Year event
Inflow = 1.95 cfs @ 12.09 hrs, Volume= 0.144 af
Outflow = 1.81 cfs @ 12.17 hrs, Volume= 0.144 af, Atten= 7%, Lag= 4.6 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.14 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.69 fps, Avg. Travel Time= 8.4 min

Peak Storage= 297 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 167.68 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 5.0 ' ' Top Width= 22.00'
Length= 350.0' Slope= 0.0181 ' '
Inlet Invert= 48.76', Outlet Invert= 42.41'



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Type III 24-hr 2-Year Rainfall=3.74"

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Summary for Pond P1: 12" Culvert

Inflow Area = 2.868 ac, 38.02% Impervious, Inflow Depth = 1.34" for 2-Year event
 Inflow = 2.64 cfs @ 12.38 hrs, Volume= 0.321 af
 Outflow = 2.50 cfs @ 12.46 hrs, Volume= 0.321 af, Atten= 5%, Lag= 5.3 min
 Primary = 2.50 cfs @ 12.46 hrs, Volume= 0.321 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 44.66' @ 12.46 hrs Surf.Area= 1,423 sf Storage= 647 cf

Plug-Flow detention time= 5.5 min calculated for 0.321 af (100% of inflow)
 Center-of-Mass det. time= 4.4 min (878.0 - 873.6)

Volume	Invert	Avail.Storage	Storage Description
#1	43.50'	1,228 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.50	10	0	0
44.00	300	78	78
45.00	2,000	1,150	1,228

Device	Routing	Invert	Outlet Devices
#1	Primary	43.74'	15.0" Round Culvert L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 43.74' / 39.12' S= 0.0888 ' S= 0.0888 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=2.49 cfs @ 12.46 hrs HW=44.66' (Free Discharge)
 ↑1=Culvert (Inlet Controls 2.49 cfs @ 2.58 fps)

Summary for Pond P2: CB A

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 2.67" for 2-Year event
 Inflow = 1.95 cfs @ 12.09 hrs, Volume= 0.144 af
 Outflow = 1.95 cfs @ 12.09 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.95 cfs @ 12.09 hrs, Volume= 0.144 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 51.82' @ 12.09 hrs Surf.Area= 13 sf Storage= 11 cf

Plug-Flow detention time= 0.3 min calculated for 0.144 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (801.3 - 801.0)

Volume	Invert	Avail.Storage	Storage Description
#1	50.93'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder
Device	Routing	Invert	Outlet Devices
#1	Primary	50.92'	12.0" Round Culvert L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 50.92' / 48.77' S= 0.0179 ' S= 0.0179 ' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=1.91 cfs @ 12.09 hrs HW=51.81' (Free Discharge)

↑1=Culvert (Barrel Controls 1.91 cfs @ 3.44 fps)

Summary for Pond P3: 12" Culvert

Inflow Area = 3.273 ac, 31.67% Impervious, Inflow Depth = 1.24" for 2-Year event
 Inflow = 3.23 cfs @ 12.20 hrs, Volume= 0.337 af
 Outflow = 2.74 cfs @ 12.34 hrs, Volume= 0.337 af, Atten= 15%, Lag= 7.9 min
 Primary = 2.74 cfs @ 12.34 hrs, Volume= 0.337 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 44.72' @ 12.34 hrs Surf.Area= 2,000 sf Storage= 1,241 cf

Plug-Flow detention time= 5.3 min calculated for 0.337 af (100% of inflow)
 Center-of-Mass det. time= 5.3 min (861.9 - 856.6)

Volume	Invert	Avail.Storage	Storage Description
#1	42.41'	1,241 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.41	10	0	0
43.00	300	91	91
44.00	2,000	1,150	1,241

Device	Routing	Invert	Outlet Devices
#1	Primary	42.41'	12.0" Round Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.41' / 42.27' S= 0.0028 ' / Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=2.65 cfs @ 12.34 hrs HW=44.64' (Free Discharge)

↑1=Culvert (Barrel Controls 2.65 cfs @ 3.38 fps)

Summary for Pond P4: CB #11

Inflow Area = 7.660 ac, 43.16% Impervious, Inflow Depth = 1.56" for 2-Year event
 Inflow = 6.74 cfs @ 12.34 hrs, Volume= 0.994 af
 Outflow = 7.12 cfs @ 12.35 hrs, Volume= 0.994 af, Atten= 0%, Lag= 0.3 min
 Primary = 7.12 cfs @ 12.35 hrs, Volume= 0.994 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 44.63' @ 12.35 hrs Surf.Area= 213 sf Storage= 125 cf

Plug-Flow detention time= 0.2 min calculated for 0.994 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (847.1 - 846.9)

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Volume	Invert	Avail.Storage	Storage Description
#1	38.84'	42 cf	4.00'D x 3.37'H Vertical Cone/Cylinder
#2	42.21'	83 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		125 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.21	10	0	0
43.00	200	83	83

Device	Routing	Invert	Outlet Devices
#1	Primary	38.84'	15.0" Round Culvert L= 102.0' Ke= 0.500 Inlet / Outlet Invert= 38.84' / 38.00' S= 0.0082 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=7.10 cfs @ 12.35 hrs HW=44.60' (Free Discharge)↑**1=Culvert** (Barrel Controls 7.10 cfs @ 5.78 fps)**Summary for Pond P5: CB #10**

Inflow Area = 4.625 ac, 45.55% Impervious, Inflow Depth = 1.67" for 2-Year event
 Inflow = 5.39 cfs @ 12.10 hrs, Volume= 0.642 af
 Outflow = 5.24 cfs @ 12.12 hrs, Volume= 0.642 af, Atten= 3%, Lag= 1.1 min
 Primary = 5.24 cfs @ 12.12 hrs, Volume= 0.642 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 43.33' @ 12.12 hrs Surf.Area= 158 sf Storage= 78 cf

Plug-Flow detention time= 0.2 min calculated for 0.641 af (100% of inflow)

Center-of-Mass det. time= 0.2 min (832.7 - 832.5)

Volume	Invert	Avail.Storage	Storage Description
#1	39.35'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder
#2	42.90'	63 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		108 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.90	10	0	0
43.50	200	63	63

Device	Routing	Invert	Outlet Devices
#1	Primary	39.35'	12.0" Round Culvert L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 39.35' / 38.89' S= 0.0153 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=5.16 cfs @ 12.12 hrs HW=43.22' (Free Discharge)↑**1=Culvert** (Barrel Controls 5.16 cfs @ 6.56 fps)

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Summary for Pond P6: CB #9

Inflow Area = 4.172 ac, 41.66% Impervious, Inflow Depth = 1.55" for 2-Year event
 Inflow = 3.99 cfs @ 12.11 hrs, Volume= 0.537 af
 Outflow = 4.02 cfs @ 12.11 hrs, Volume= 0.537 af, Atten= 0%, Lag= 0.3 min
 Primary = 4.02 cfs @ 12.11 hrs, Volume= 0.537 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 45.69' @ 12.11 hrs Surf.Area= 123 sf Storage= 63 cf

Plug-Flow detention time= 0.2 min calculated for 0.537 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (839.4 - 839.2)

Volume	Invert	Avail.Storage	Storage Description
#1	42.03'	42 cf	4.00'D x 3.31'H Vertical Cone/Cylinder
#2	45.34'	69 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		111 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.34	10	0	0
46.00	200	69	69

Device	Routing	Invert	Outlet Devices
#1	Primary	42.03'	12.0" Round Culvert L= 192.0' Ke= 0.500 Inlet / Outlet Invert= 42.03' / 39.47' S= 0.0133 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Primary	45.34'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=3.94 cfs @ 12.11 hrs HW=45.67' (Free Discharge)

1=Culvert (Barrel Controls 2.95 cfs @ 3.75 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 0.99 cfs @ 1.49 fps)

Summary for Pond P7: CB #7

Inflow Area = 3.739 ac, 47.29% Impervious, Inflow Depth = 1.63" for 2-Year event
 Inflow = 2.84 cfs @ 12.11 hrs, Volume= 0.508 af
 Outflow = 2.84 cfs @ 12.11 hrs, Volume= 0.508 af, Atten= 0%, Lag= 0.1 min
 Primary = 2.84 cfs @ 12.11 hrs, Volume= 0.508 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 49.88' @ 12.11 hrs Surf.Area= 13 sf Storage= 13 cf

Plug-Flow detention time= 0.2 min calculated for 0.508 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (854.5 - 854.4)

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Volume	Invert	Avail.Storage	Storage Description
#1	48.82'	40 cf	4.00'D x 3.18'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	48.82'	12.0" Round Culvert L= 230.0' Ke= 0.500 Inlet / Outlet Invert= 48.82' / 41.57' S= 0.0315 ' /' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=2.81 cfs @ 12.11 hrs HW=49.87' (Free Discharge)↑**1=Culvert** (Inlet Controls 2.81 cfs @ 3.57 fps)**Summary for Pond P8: CB B**

Inflow Area = 0.702 ac, 84.14% Impervious, Inflow Depth = 2.87" for 2-Year event
 Inflow = 2.23 cfs @ 12.09 hrs, Volume= 0.168 af
 Outflow = 2.23 cfs @ 12.09 hrs, Volume= 0.168 af, Atten= 0%, Lag= 0.2 min
 Primary = 2.23 cfs @ 12.09 hrs, Volume= 0.168 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 50.59' @ 12.09 hrs Surf.Area= 13 sf Storage= 19 cf

Plug-Flow detention time= 0.5 min calculated for 0.168 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (792.7 - 792.3)

Volume	Invert	Avail.Storage	Storage Description
#1	49.10'	38 cf	4.00'D x 3.00'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	12.0" Round Culvert L= 35.0' Ke= 0.500 Inlet / Outlet Invert= 49.10' / 48.90' S= 0.0057 ' /' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=2.16 cfs @ 12.09 hrs HW=50.55' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.16 cfs @ 2.75 fps)**Summary for Pond P9: CB #5**

Inflow Area = 5.069 ac, 43.32% Impervious, Inflow Depth = 1.59" for 2-Year event
 Inflow = 4.48 cfs @ 12.13 hrs, Volume= 0.671 af
 Outflow = 4.49 cfs @ 12.14 hrs, Volume= 0.671 af, Atten= 0%, Lag= 0.1 min
 Primary = 4.49 cfs @ 12.14 hrs, Volume= 0.671 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 42.85' @ 12.14 hrs Surf.Area= 13 sf Storage= 18 cf

Plug-Flow detention time= 0.2 min calculated for 0.670 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (854.8 - 854.6)

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Volume	Invert	Avail.Storage	Storage Description
#1	41.42'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	41.42'	18.0" Round Culvert L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 41.42' / 40.66' S= 0.0080 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf

Primary OutFlow Max=4.44 cfs @ 12.14 hrs HW=42.84' (Free Discharge)↑**1=Culvert** (Barrel Controls 4.44 cfs @ 3.30 fps)**Summary for Link POA1: POA #1**

Inflow Area = 7.660 ac, 43.16% Impervious, Inflow Depth = 1.56" for 2-Year event
 Inflow = 7.12 cfs @ 12.35 hrs, Volume= 0.994 af
 Primary = 7.12 cfs @ 12.35 hrs, Volume= 0.994 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Summary for Link POA2: POA #2

Inflow Area = 5.069 ac, 43.32% Impervious, Inflow Depth = 1.59" for 2-Year event
 Inflow = 4.49 cfs @ 12.14 hrs, Volume= 0.671 af
 Primary = 4.49 cfs @ 12.14 hrs, Volume= 0.671 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

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Time span=1.00-30.00 hrs, dt=0.05 hrs, 581 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: Lang Rd Runoff Area=124,920 sf 38.02% Impervious Runoff Depth=2.82"
 Flow Length=575' Tc=25.3 min CN=73 Runoff=5.75 cfs 0.673 af

Subcatchment 2S: Beechstone Northwest Runoff Area=28,210 sf 78.29% Impervious Runoff Depth=4.52"
 Tc=6.0 min CN=90 Runoff=3.21 cfs 0.244 af

Subcatchment 3S: Wooded Area Runoff Area=114,365 sf 20.17% Impervious Runoff Depth=2.11"
 Flow Length=555' Tc=17.2 min UI Adjusted CN=65 Runoff=4.48 cfs 0.463 af

Subcatchment 4S: Entrance Drive Runoff Area=7,305 sf 64.96% Impervious Runoff Depth=3.99"
 Tc=6.0 min CN=85 Runoff=0.76 cfs 0.056 af

Subcatchment 5S: Beechstone to CB#10 Runoff Area=19,705 sf 81.40% Impervious Runoff Depth=4.63"
 Tc=6.0 min CN=91 Runoff=2.28 cfs 0.175 af

Subcatchment 6S: Beechstone to CB#9 Runoff Area=39,170 sf 78.04% Impervious Runoff Depth=4.52"
 Tc=6.0 min CN=90 Runoff=4.46 cfs 0.339 af

Subcatchment 7S: Stoencroft Runoff Area=132,300 sf 38.78% Impervious Runoff Depth=2.82"
 Flow Length=705' Tc=37.4 min CN=73 Runoff=5.08 cfs 0.713 af

Subcatchment 8S: Beechstone Northeast Runoff Area=30,575 sf 84.14% Impervious Runoff Depth=4.75"
 Tc=6.0 min CN=92 Runoff=3.59 cfs 0.278 af

Subcatchment 9S: Playground Runoff Area=57,915 sf 32.14% Impervious Runoff Depth=3.00"
 Flow Length=300' Tc=11.5 min CN=75 Runoff=3.88 cfs 0.333 af

Reach 1R: Reach Avg. Flow Depth=0.00' Max Vel=0.00 fps
 n=0.035 L=100.0' S=0.0421 '/' Capacity=465.89 cfs Outflow=0.00 cfs 0.000 af

Reach 2R: Reach Avg. Flow Depth=0.00' Max Vel=0.00 fps
 n=0.016 L=30.0' S=0.0230 '/' Capacity=753.28 cfs Outflow=0.00 cfs 0.000 af

Reach 3R: Reach Avg. Flow Depth=0.00' Max Vel=0.00 fps
 n=0.016 L=192.0' S=0.0127 '/' Capacity=559.93 cfs Outflow=0.00 cfs 0.000 af

Reach R1: Reach Avg. Flow Depth=0.33' Max Vel=2.46 fps Inflow=3.20 cfs 0.244 af
 n=0.030 L=350.0' S=0.0181 '/' Capacity=167.68 cfs Outflow=2.98 cfs 0.244 af

Pond P1: 12" Culvert Peak Elev=45.96' Storage=1,228 cf Inflow=5.75 cfs 0.673 af
 15.0" Round Culvert n=0.025 L=52.0' S=0.0888 '/' Outflow=5.90 cfs 0.673 af

Pond P2: CB A Peak Elev=53.74' Storage=35 cf Inflow=3.21 cfs 0.244 af
 12.0" Round Culvert n=0.025 L=120.0' S=0.0179 '/' Outflow=3.20 cfs 0.244 af

Pond P3: 12" Culvert Peak Elev=53.74' Storage=1,241 cf Inflow=7.08 cfs 0.707 af
 12.0" Round Culvert n=0.025 L=50.0' S=0.0028 '/' Outflow=7.36 cfs 0.707 af

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Pond P4: CB #11

Peak Elev=66.33' Storage=125 cf Inflow=15.66 cfs 1.949 af
15.0" Round Culvert n=0.025 L=102.0' S=0.0082 '/' Outflow=15.97 cfs 1.949 af

Pond P5: CB #10

Peak Elev=59.68' Storage=108 cf Inflow=12.35 cfs 1.221 af
12.0" Round Culvert n=0.025 L=30.0' S=0.0153 '/' Outflow=12.56 cfs 1.221 af

Pond P6: CB #9

Peak Elev=46.56' Storage=111 cf Inflow=10.70 cfs 1.046 af
Outflow=10.52 cfs 1.046 af

Pond P7: CB #7

Peak Elev=68.20' Storage=40 cf Inflow=5.90 cfs 0.991 af
12.0" Round Culvert n=0.025 L=230.0' S=0.0315 '/' Outflow=6.01 cfs 0.991 af

Pond P8: CB B

Peak Elev=51.70' Storage=33 cf Inflow=3.59 cfs 0.278 af
12.0" Round Culvert n=0.025 L=35.0' S=0.0057 '/' Outflow=3.59 cfs 0.278 af

Pond P9: CB #5

Peak Elev=45.30' Storage=45 cf Inflow=8.95 cfs 1.323 af
18.0" Round Culvert n=0.025 L=95.0' S=0.0080 '/' Outflow=8.95 cfs 1.323 af

Link POA1: POA #1

Inflow=15.97 cfs 1.949 af
Primary=15.97 cfs 1.949 af

Link POA2: POA #2

Inflow=8.95 cfs 1.323 af
Primary=8.95 cfs 1.323 af

Total Runoff Area = 12.729 ac Runoff Volume = 3.273 af Average Runoff Depth = 3.09"
56.78% Pervious = 7.227 ac 43.22% Impervious = 5.501 ac

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Summary for Subcatchment 1S: Lang Rd

Runoff = 5.75 cfs @ 12.36 hrs, Volume= 0.673 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
40,125	61	>75% Grass cover, Good, HSG B
37,300	55	Woods, Good, HSG B
38,610	98	Paved parking, HSG B
6,100	98	Roofs, HSG B
2,785	98	Unconnected pavement, HSG B
124,920	73	Weighted Average
77,425		61.98% Pervious Area
47,495		38.02% Impervious Area
2,785		5.86% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	75	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.23"
8.3	500	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
25.3	575	Total			

Summary for Subcatchment 2S: Beechstone Northwest

Runoff = 3.21 cfs @ 12.09 hrs, Volume= 0.244 af, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
6,125	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
1,625	98	Unconnected pavement, HSG B
4,810	98	Roofs, HSG B
15,650	98	Paved parking, HSG B
28,210	90	Weighted Average
6,125		21.71% Pervious Area
22,085		78.29% Impervious Area
1,625		7.36% Unconnected

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

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Summary for Subcatchment 3S: Wooded Area

Runoff = 4.48 cfs @ 12.25 hrs, Volume= 0.463 af, Depth= 2.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Adj	Description
46,000	61		>75% Grass cover, Good, HSG B
45,300	55		Woods, Good, HSG B
16,080	98		Roofs, HSG B
615	98		Paved parking, HSG B
6,370	98		Unconnected pavement, HSG B
114,365	66	65	Weighted Average, UI Adjusted
91,300			79.83% Pervious Area
23,065			20.17% Impervious Area
6,370			27.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	60	0.0080	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
1.3	75	0.0200	0.99		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
4.2	180	0.0200	0.71		Shallow Concentrated Flow, Shallow Woods Woodland Kv= 5.0 fps
2.4	240	0.0120	1.64		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
17.2	555	Total			

Summary for Subcatchment 4S: Entrance Drive

Runoff = 0.76 cfs @ 12.09 hrs, Volume= 0.056 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
2,560	61	>75% Grass cover, Good, HSG B
4,520	98	Paved parking, HSG B
225	98	Unconnected pavement, HSG B
7,305	85	Weighted Average
2,560		35.04% Pervious Area
4,745		64.96% Impervious Area
225		4.74% Unconnected

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

Summary for Subcatchment 5S: Beechstone to CB#10

Runoff = 2.28 cfs @ 12.09 hrs, Volume= 0.175 af, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
3,000	61	>75% Grass cover, Good, HSG B
665	55	Woods, Good, HSG B
4,270	98	Roofs, HSG B
10,270	98	Paved parking, HSG B
1,500	98	Unconnected pavement, HSG B
19,705	91	Weighted Average
3,665		18.60% Pervious Area
16,040		81.40% Impervious Area
1,500		9.35% Unconnected

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

Summary for Subcatchment 6S: Beechstone to CB#9

Runoff = 4.46 cfs @ 12.09 hrs, Volume= 0.339 af, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
8,600	61	>75% Grass cover, Good, HSG B
8,220	98	Roofs, HSG B
19,800	98	Paved parking, HSG B
2,550	98	Unconnected pavement, HSG B
39,170	90	Weighted Average
8,600		21.96% Pervious Area
30,570		78.04% Impervious Area
2,550		8.34% Unconnected

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

Summary for Subcatchment 7S: Stoencroft

Runoff = 5.08 cfs @ 12.53 hrs, Volume= 0.713 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

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Type III 24-hr 10-Year Rainfall=5.67"

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Area (sf)	CN	Description
33,000	61	>75% Grass cover, Good, HSG B
48,000	55	Woods, Good, HSG B
16,920	98	Roofs, HSG B
32,180	98	Paved parking, HSG B
2,200	98	Unconnected pavement, HSG B
132,300	73	Weighted Average
81,000		61.22% Pervious Area
51,300		38.78% Impervious Area
2,200		4.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	80	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.23"
19.2	575	0.0100	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
37.4	705	Total			

Summary for Subcatchment 8S: Beechstone Northeast

Runoff = 3.59 cfs @ 12.09 hrs, Volume= 0.278 af, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
4,850	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
6,100	98	Roofs, HSG B
17,650	98	Paved parking, HSG B
1,975	98	Unconnected pavement, HSG B
30,575	92	Weighted Average
4,850		15.86% Pervious Area
25,725		84.14% Impervious Area
1,975		7.68% Unconnected

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

Summary for Subcatchment 9S: Playground

Runoff = 3.88 cfs @ 12.16 hrs, Volume= 0.333 af, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

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Type III 24-hr 10-Year Rainfall=5.67"

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Area (sf)	CN	Description
15,400	61	>75% Grass cover, Good, HSG B
10,000	79	<50% Grass cover, Poor, HSG B
2,440	98	Roofs, HSG B
13,900	55	Woods, Good, HSG B
14,440	98	Paved parking, HSG B
1,735	98	Unconnected pavement, HSG B
57,915	75	Weighted Average
39,300		67.86% Pervious Area
18,615		32.14% Impervious Area
1,735		9.32% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	90	0.0170	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
1.7	160	0.0250	1.58		Shallow Concentrated Flow, Nearly Bare & Untilled Kv= 10.0 fps
0.2	50	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
11.5	300	Total			

Summary for Reach 1R: Reach

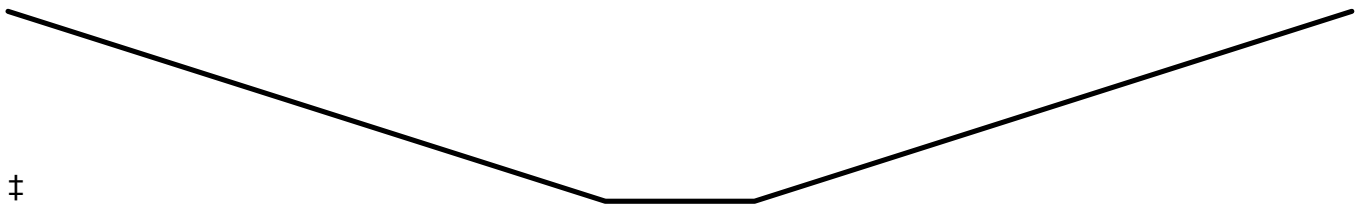
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 465.89 cfs

5.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds

Side Slope Z-value= 10.0 ' ' Top Width= 45.00'

Length= 100.0' Slope= 0.0421 ' '

Inlet Invert= 42.21', Outlet Invert= 38.00'

**Summary for Reach 2R: Reach**

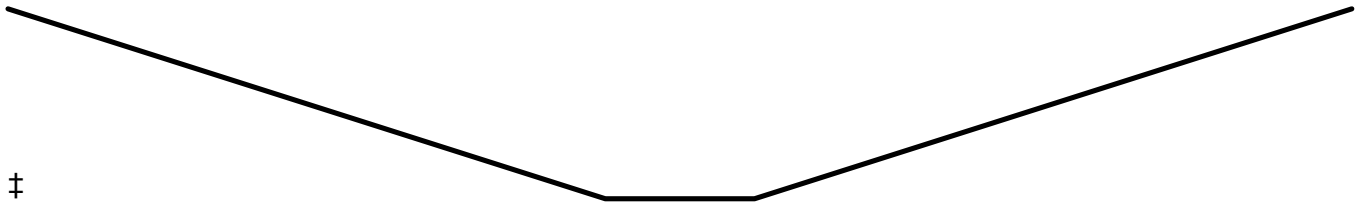
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 753.28 cfs

5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 10.0 ' ' Top Width= 45.00'

Length= 30.0' Slope= 0.0230 ' '

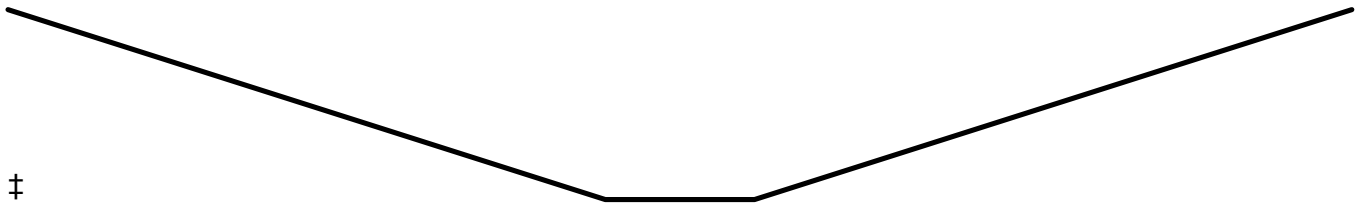
Inlet Invert= 42.90', Outlet Invert= 42.21'



Summary for Reach 3R: Reach

Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 559.93 cfs

5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough
 Side Slope Z-value= 10.0 ' ' Top Width= 45.00'
 Length= 192.0' Slope= 0.0127 ' '
 Inlet Invert= 45.34', Outlet Invert= 42.90'



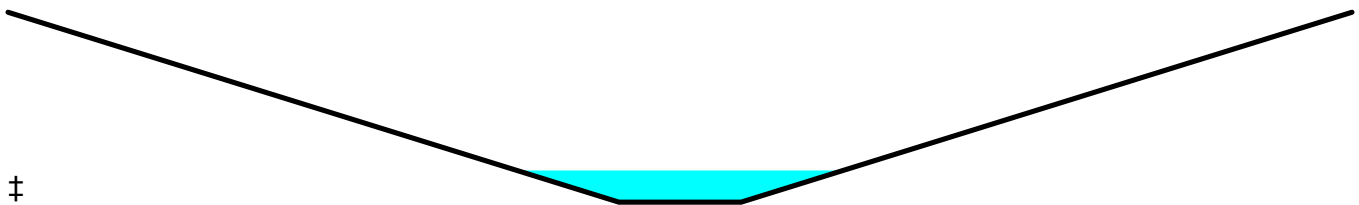
Summary for Reach R1: Reach

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 4.52" for 10-Year event
 Inflow = 3.20 cfs @ 12.10 hrs, Volume= 0.244 af
 Outflow = 2.98 cfs @ 12.16 hrs, Volume= 0.244 af, Atten= 7%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.46 fps, Min. Travel Time= 2.4 min
 Avg. Velocity = 0.79 fps, Avg. Travel Time= 7.4 min

Peak Storage= 428 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.33'
 Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 167.68 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 5.0 ' ' Top Width= 22.00'
 Length= 350.0' Slope= 0.0181 ' '
 Inlet Invert= 48.76', Outlet Invert= 42.41'



Summary for Pond P1: 12" Culvert

Inflow Area = 2.868 ac, 38.02% Impervious, Inflow Depth = 2.82" for 10-Year event
 Inflow = 5.75 cfs @ 12.36 hrs, Volume= 0.673 af
 Outflow = 5.90 cfs @ 12.39 hrs, Volume= 0.673 af, Atten= 0%, Lag= 2.0 min
 Primary = 5.90 cfs @ 12.39 hrs, Volume= 0.673 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 45.96' @ 12.39 hrs Surf.Area= 2,000 sf Storage= 1,228 cf

Plug-Flow detention time= 4.6 min calculated for 0.672 af (100% of inflow)
 Center-of-Mass det. time= 4.2 min (855.9 - 851.7)

Volume	Invert	Avail.Storage	Storage Description
#1	43.50'	1,228 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.50	10	0	0
44.00	300	78	78
45.00	2,000	1,150	1,228

Device	Routing	Invert	Outlet Devices
#1	Primary	43.74'	15.0" Round Culvert L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 43.74' / 39.12' S= 0.0888 ' S= 0.0888 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=5.83 cfs @ 12.39 hrs HW=45.93' (Free Discharge)
 ↑1=Culvert (Inlet Controls 5.83 cfs @ 4.75 fps)

Summary for Pond P2: CB A

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 4.52" for 10-Year event
 Inflow = 3.21 cfs @ 12.09 hrs, Volume= 0.244 af
 Outflow = 3.20 cfs @ 12.10 hrs, Volume= 0.244 af, Atten= 1%, Lag= 0.5 min
 Primary = 3.20 cfs @ 12.10 hrs, Volume= 0.244 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 53.74' @ 12.10 hrs Surf.Area= 13 sf Storage= 35 cf

Plug-Flow detention time= 0.2 min calculated for 0.244 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (786.8 - 786.5)

Volume	Invert	Avail.Storage	Storage Description
#1	50.93'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder
Device	Routing	Invert	Outlet Devices
#1	Primary	50.92'	12.0" Round Culvert L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 50.92' / 48.77' S= 0.0179 ' S= 0.0179 ' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=3.16 cfs @ 12.10 hrs HW=53.66' (Free Discharge)

↑**1=Culvert** (Barrel Controls 3.16 cfs @ 4.03 fps)

Summary for Pond P3: 12" Culvert

Inflow Area = 3.273 ac, 31.67% Impervious, Inflow Depth = 2.59" for 10-Year event
 Inflow = 7.08 cfs @ 12.20 hrs, Volume= 0.707 af
 Outflow = 7.36 cfs @ 12.24 hrs, Volume= 0.707 af, Atten= 0%, Lag= 2.2 min
 Primary = 7.36 cfs @ 12.24 hrs, Volume= 0.707 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 53.74' @ 12.24 hrs Surf.Area= 2,000 sf Storage= 1,241 cf

Plug-Flow detention time= 4.4 min calculated for 0.707 af (100% of inflow)
 Center-of-Mass det. time= 4.4 min (844.1 - 839.7)

Volume	Invert	Avail.Storage	Storage Description
#1	42.41'	1,241 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.41	10	0	0
43.00	300	91	91
44.00	2,000	1,150	1,241

Device	Routing	Invert	Outlet Devices
#1	Primary	42.41'	12.0" Round Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.41' / 42.27' S= 0.0028 ' / Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=7.16 cfs @ 12.24 hrs HW=53.20' (Free Discharge)

↑**1=Culvert** (Barrel Controls 7.16 cfs @ 9.11 fps)

Summary for Pond P4: CB #11

Inflow Area = 7.660 ac, 43.16% Impervious, Inflow Depth = 3.05" for 10-Year event
 Inflow = 15.66 cfs @ 12.15 hrs, Volume= 1.949 af
 Outflow = 15.97 cfs @ 12.15 hrs, Volume= 1.949 af, Atten= 0%, Lag= 0.0 min
 Primary = 15.97 cfs @ 12.15 hrs, Volume= 1.949 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 66.33' @ 12.15 hrs Surf.Area= 213 sf Storage= 125 cf

Plug-Flow detention time= 0.2 min calculated for 1.949 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (831.9 - 831.7)

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Volume	Invert	Avail.Storage	Storage Description
#1	38.84'	42 cf	4.00'D x 3.37'H Vertical Cone/Cylinder
#2	42.21'	83 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		125 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.21	10	0	0
43.00	200	83	83

Device	Routing	Invert	Outlet Devices
#1	Primary	38.84'	15.0" Round Culvert L= 102.0' Ke= 0.500 Inlet / Outlet Invert= 38.84' / 38.00' S= 0.0082 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=15.93 cfs @ 12.15 hrs HW=66.21' (Free Discharge)↑**1=Culvert** (Barrel Controls 15.93 cfs @ 12.98 fps)**Summary for Pond P5: CB #10**

Inflow Area = 4.625 ac, 45.55% Impervious, Inflow Depth = 3.17" for 10-Year event
 Inflow = 12.35 cfs @ 12.14 hrs, Volume= 1.221 af
 Outflow = 12.56 cfs @ 12.14 hrs, Volume= 1.221 af, Atten= 0%, Lag= 0.1 min
 Primary = 12.56 cfs @ 12.14 hrs, Volume= 1.221 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 59.68' @ 12.14 hrs Surf.Area= 213 sf Storage= 108 cf

Plug-Flow detention time= 0.2 min calculated for 1.218 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (819.7 - 819.5)

Volume	Invert	Avail.Storage	Storage Description
#1	39.35'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder
#2	42.90'	63 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		108 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.90	10	0	0
43.50	200	63	63

Device	Routing	Invert	Outlet Devices
#1	Primary	39.35'	12.0" Round Culvert L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 39.35' / 38.89' S= 0.0153 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=12.38 cfs @ 12.14 hrs HW=59.12' (Free Discharge)↑**1=Culvert** (Barrel Controls 12.38 cfs @ 15.76 fps)

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Summary for Pond P6: CB #9

Inflow Area = 4.172 ac, 41.66% Impervious, Inflow Depth = 3.01" for 10-Year event
 Inflow = 10.70 cfs @ 12.15 hrs, Volume= 1.046 af
 Outflow = 10.52 cfs @ 12.15 hrs, Volume= 1.046 af, Atten= 2%, Lag= 0.0 min
 Primary = 10.52 cfs @ 12.15 hrs, Volume= 1.046 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 46.56' @ 12.15 hrs Surf.Area= 213 sf Storage= 111 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.2 min (825.6 - 825.4)

Volume	Invert	Avail.Storage	Storage Description
#1	42.03'	42 cf	4.00'D x 3.31'H Vertical Cone/Cylinder
#2	45.34'	69 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		111 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.34	10	0	0
46.00	200	69	69

Device	Routing	Invert	Outlet Devices
#1	Primary	42.03'	12.0" Round Culvert L= 192.0' Ke= 0.500 Inlet / Outlet Invert= 42.03' / 39.47' S= 0.0133 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Primary	45.34'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=10.51 cfs @ 12.15 hrs HW=46.56' (Free Discharge)

1=Culvert (Barrel Controls 3.19 cfs @ 4.06 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 7.32 cfs @ 2.99 fps)

Summary for Pond P7: CB #7

Inflow Area = 3.739 ac, 47.29% Impervious, Inflow Depth = 3.18" for 10-Year event
 Inflow = 5.90 cfs @ 12.46 hrs, Volume= 0.991 af
 Outflow = 6.01 cfs @ 12.49 hrs, Volume= 0.991 af, Atten= 0%, Lag= 2.0 min
 Primary = 6.01 cfs @ 12.49 hrs, Volume= 0.991 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 68.20' @ 12.49 hrs Surf.Area= 13 sf Storage= 40 cf

Plug-Flow detention time= 0.1 min calculated for 0.989 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (839.6 - 839.5)

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Volume	Invert	Avail.Storage	Storage Description
#1	48.82'	40 cf	4.00'D x 3.18'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	48.82'	12.0" Round Culvert L= 230.0' Ke= 0.500 Inlet / Outlet Invert= 48.82' / 41.57' S= 0.0315 ' / ' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=5.97 cfs @ 12.49 hrs HW=67.86' (Free Discharge)↑**1=Culvert** (Barrel Controls 5.97 cfs @ 7.60 fps)**Summary for Pond P8: CB B**

Inflow Area = 0.702 ac, 84.14% Impervious, Inflow Depth = 4.75" for 10-Year event
 Inflow = 3.59 cfs @ 12.09 hrs, Volume= 0.278 af
 Outflow = 3.59 cfs @ 12.09 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.2 min
 Primary = 3.59 cfs @ 12.09 hrs, Volume= 0.278 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 51.70' @ 12.09 hrs Surf.Area= 13 sf Storage= 33 cf

Plug-Flow detention time= 0.3 min calculated for 0.277 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (779.2 - 778.8)

Volume	Invert	Avail.Storage	Storage Description
#1	49.10'	38 cf	4.00'D x 3.00'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	12.0" Round Culvert L= 35.0' Ke= 0.500 Inlet / Outlet Invert= 49.10' / 48.90' S= 0.0057 ' / ' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=3.51 cfs @ 12.09 hrs HW=51.63' (Free Discharge)↑**1=Culvert** (Barrel Controls 3.51 cfs @ 4.48 fps)**Summary for Pond P9: CB #5**

Inflow Area = 5.069 ac, 43.32% Impervious, Inflow Depth = 3.13" for 10-Year event
 Inflow = 8.95 cfs @ 12.12 hrs, Volume= 1.323 af
 Outflow = 8.95 cfs @ 12.12 hrs, Volume= 1.323 af, Atten= 0%, Lag= 0.1 min
 Primary = 8.95 cfs @ 12.12 hrs, Volume= 1.323 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 45.30' @ 12.12 hrs Surf.Area= 13 sf Storage= 45 cf

Plug-Flow detention time= 0.1 min calculated for 1.321 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (838.4 - 838.2)

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Volume	Invert	Avail.Storage	Storage Description
#1	41.42'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	41.42'	18.0" Round Culvert L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 41.42' / 40.66' S= 0.0080 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf

Primary OutFlow Max=8.70 cfs @ 12.12 hrs HW=45.15' (Free Discharge)↑**1=Culvert** (Barrel Controls 8.70 cfs @ 4.93 fps)**Summary for Link POA1: POA #1**

Inflow Area = 7.660 ac, 43.16% Impervious, Inflow Depth = 3.05" for 10-Year event
 Inflow = 15.97 cfs @ 12.15 hrs, Volume= 1.949 af
 Primary = 15.97 cfs @ 12.15 hrs, Volume= 1.949 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Summary for Link POA2: POA #2

Inflow Area = 5.069 ac, 43.32% Impervious, Inflow Depth = 3.13" for 10-Year event
 Inflow = 8.95 cfs @ 12.12 hrs, Volume= 1.323 af
 Primary = 8.95 cfs @ 12.12 hrs, Volume= 1.323 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

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Time span=1.00-30.00 hrs, dt=0.05 hrs, 581 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Lang Rd Runoff Area=124,920 sf 38.02% Impervious Runoff Depth=4.10"
 Flow Length=575' Tc=25.3 min CN=73 Runoff=8.40 cfs 0.980 af

Subcatchment2S: Beechstone Northwest Runoff Area=28,210 sf 78.29% Impervious Runoff Depth=6.01"
 Tc=6.0 min CN=90 Runoff=4.20 cfs 0.324 af

Subcatchment3S: Wooded Area Runoff Area=114,365 sf 20.17% Impervious Runoff Depth=3.25"
 Flow Length=555' Tc=17.2 min UI Adjusted CN=65 Runoff=7.06 cfs 0.711 af

Subcatchment4S: Entrance Drive Runoff Area=7,305 sf 64.96% Impervious Runoff Depth=5.43"
 Tc=6.0 min CN=85 Runoff=1.01 cfs 0.076 af

Subcatchment5S: Beechstone to CB#10 Runoff Area=19,705 sf 81.40% Impervious Runoff Depth=6.13"
 Tc=6.0 min CN=91 Runoff=2.97 cfs 0.231 af

Subcatchment6S: Beechstone to CB#9 Runoff Area=39,170 sf 78.04% Impervious Runoff Depth=6.01"
 Tc=6.0 min CN=90 Runoff=5.83 cfs 0.450 af

Subcatchment7S: Stoencroft Runoff Area=132,300 sf 38.78% Impervious Runoff Depth=4.10"
 Flow Length=705' Tc=37.4 min CN=73 Runoff=7.43 cfs 1.038 af

Subcatchment8S: Beechstone Northeast Runoff Area=30,575 sf 84.14% Impervious Runoff Depth=6.24"
 Tc=6.0 min CN=92 Runoff=4.65 cfs 0.365 af

Subcatchment9S: Playground Runoff Area=57,915 sf 32.14% Impervious Runoff Depth=4.32"
 Flow Length=300' Tc=11.5 min CN=75 Runoff=5.57 cfs 0.478 af

Reach 1R: Reach Avg. Flow Depth=0.00' Max Vel=0.00 fps
 n=0.035 L=100.0' S=0.0421 '/' Capacity=465.89 cfs Outflow=0.00 cfs 0.000 af

Reach 2R: Reach Avg. Flow Depth=0.00' Max Vel=0.00 fps
 n=0.016 L=30.0' S=0.0230 '/' Capacity=753.28 cfs Outflow=0.00 cfs 0.000 af

Reach 3R: Reach Avg. Flow Depth=0.00' Max Vel=0.00 fps
 n=0.016 L=192.0' S=0.0127 '/' Capacity=559.93 cfs Outflow=0.00 cfs 0.000 af

Reach R1: Reach Avg. Flow Depth=0.38' Max Vel=2.66 fps Inflow=4.45 cfs 0.324 af
 n=0.030 L=350.0' S=0.0181 '/' Capacity=167.68 cfs Outflow=3.93 cfs 0.324 af

Pond P1: 12" Culvert Peak Elev=47.76' Storage=1,228 cf Inflow=8.40 cfs 0.980 af
 15.0" Round Culvert n=0.025 L=52.0' S=0.0888 '/' Outflow=8.59 cfs 0.979 af

Pond P2: CB A Peak Elev=57.46' Storage=50 cf Inflow=4.20 cfs 0.324 af
 12.0" Round Culvert n=0.025 L=120.0' S=0.0179 '/' Outflow=4.45 cfs 0.324 af

Pond P3: 12" Culvert Peak Elev=65.31' Storage=1,241 cf Inflow=10.40 cfs 1.035 af
 12.0" Round Culvert n=0.025 L=50.0' S=0.0028 '/' Outflow=10.66 cfs 1.035 af

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Pond P4: CB #11

Peak Elev=96.48' Storage=125 cf Inflow=23.25 cfs 2.772 af
15.0" Round Culvert n=0.025 L=102.0' S=0.0082 '/' Outflow=23.22 cfs 2.772 af

Pond P5: CB #10

Peak Elev=76.21' Storage=108 cf Inflow=16.82 cfs 1.717 af
12.0" Round Culvert n=0.025 L=30.0' S=0.0153 '/' Outflow=17.05 cfs 1.717 af

Pond P6: CB #9

Peak Elev=46.90' Storage=111 cf Inflow=14.09 cfs 1.486 af
Outflow=14.42 cfs 1.486 af

Pond P7: CB #7

Peak Elev=94.20' Storage=40 cf Inflow=8.49 cfs 1.403 af
12.0" Round Culvert n=0.025 L=230.0' S=0.0315 '/' Outflow=8.53 cfs 1.403 af

Pond P8: CB B

Peak Elev=53.02' Storage=38 cf Inflow=4.65 cfs 0.365 af
12.0" Round Culvert n=0.025 L=35.0' S=0.0057 '/' Outflow=4.72 cfs 0.365 af

Pond P9: CB #5

Peak Elev=48.20' Storage=45 cf Inflow=12.35 cfs 1.881 af
18.0" Round Culvert n=0.025 L=95.0' S=0.0080 '/' Outflow=12.38 cfs 1.881 af

Link POA1: POA #1

Inflow=23.22 cfs 2.772 af
Primary=23.22 cfs 2.772 af

Link POA2: POA #2

Inflow=12.38 cfs 1.881 af
Primary=12.38 cfs 1.881 af

Total Runoff Area = 12.729 ac Runoff Volume = 4.653 af Average Runoff Depth = 4.39"
56.78% Pervious = 7.227 ac 43.22% Impervious = 5.501 ac

Summary for Subcatchment 1S: Lang Rd

Runoff = 8.40 cfs @ 12.35 hrs, Volume= 0.980 af, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
40,125	61	>75% Grass cover, Good, HSG B
37,300	55	Woods, Good, HSG B
38,610	98	Paved parking, HSG B
6,100	98	Roofs, HSG B
2,785	98	Unconnected pavement, HSG B
124,920	73	Weighted Average
77,425		61.98% Pervious Area
47,495		38.02% Impervious Area
2,785		5.86% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	75	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.23"
8.3	500	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
25.3	575	Total			

Summary for Subcatchment 2S: Beechstone Northwest

Runoff = 4.20 cfs @ 12.09 hrs, Volume= 0.324 af, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
6,125	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
1,625	98	Unconnected pavement, HSG B
4,810	98	Roofs, HSG B
15,650	98	Paved parking, HSG B
28,210	90	Weighted Average
6,125		21.71% Pervious Area
22,085		78.29% Impervious Area
1,625		7.36% Unconnected

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

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Type III 24-hr 25-Year Rainfall=7.19"

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Summary for Subcatchment 3S: Wooded Area

Runoff = 7.06 cfs @ 12.25 hrs, Volume= 0.711 af, Depth= 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Adj	Description
46,000	61		>75% Grass cover, Good, HSG B
45,300	55		Woods, Good, HSG B
16,080	98		Roofs, HSG B
615	98		Paved parking, HSG B
6,370	98		Unconnected pavement, HSG B
114,365	66	65	Weighted Average, UI Adjusted
91,300			79.83% Pervious Area
23,065			20.17% Impervious Area
6,370			27.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	60	0.0080	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
1.3	75	0.0200	0.99		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
4.2	180	0.0200	0.71		Shallow Concentrated Flow, Shallow Woods Woodland Kv= 5.0 fps
2.4	240	0.0120	1.64		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
17.2	555	Total			

Summary for Subcatchment 4S: Entrance Drive

Runoff = 1.01 cfs @ 12.09 hrs, Volume= 0.076 af, Depth= 5.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
2,560	61	>75% Grass cover, Good, HSG B
4,520	98	Paved parking, HSG B
225	98	Unconnected pavement, HSG B
7,305	85	Weighted Average
2,560		35.04% Pervious Area
4,745		64.96% Impervious Area
225		4.74% Unconnected

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

Summary for Subcatchment 5S: Beechstone to CB#10

Runoff = 2.97 cfs @ 12.09 hrs, Volume= 0.231 af, Depth= 6.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
3,000	61	>75% Grass cover, Good, HSG B
665	55	Woods, Good, HSG B
4,270	98	Roofs, HSG B
10,270	98	Paved parking, HSG B
1,500	98	Unconnected pavement, HSG B
19,705	91	Weighted Average
3,665		18.60% Pervious Area
16,040		81.40% Impervious Area
1,500		9.35% Unconnected

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

Summary for Subcatchment 6S: Beechstone to CB#9

Runoff = 5.83 cfs @ 12.09 hrs, Volume= 0.450 af, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
8,600	61	>75% Grass cover, Good, HSG B
8,220	98	Roofs, HSG B
19,800	98	Paved parking, HSG B
2,550	98	Unconnected pavement, HSG B
39,170	90	Weighted Average
8,600		21.96% Pervious Area
30,570		78.04% Impervious Area
2,550		8.34% Unconnected

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

Summary for Subcatchment 7S: Stoencroft

Runoff = 7.43 cfs @ 12.52 hrs, Volume= 1.038 af, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

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Type III 24-hr 25-Year Rainfall=7.19"

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Area (sf)	CN	Description
33,000	61	>75% Grass cover, Good, HSG B
48,000	55	Woods, Good, HSG B
16,920	98	Roofs, HSG B
32,180	98	Paved parking, HSG B
2,200	98	Unconnected pavement, HSG B
132,300	73	Weighted Average
81,000		61.22% Pervious Area
51,300		38.78% Impervious Area
2,200		4.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	80	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.23"
19.2	575	0.0100	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
37.4	705	Total			

Summary for Subcatchment 8S: Beechstone Northeast

Runoff = 4.65 cfs @ 12.09 hrs, Volume= 0.365 af, Depth= 6.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
4,850	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
6,100	98	Roofs, HSG B
17,650	98	Paved parking, HSG B
1,975	98	Unconnected pavement, HSG B
30,575	92	Weighted Average
4,850		15.86% Pervious Area
25,725		84.14% Impervious Area
1,975		7.68% Unconnected

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

Summary for Subcatchment 9S: Playground

Runoff = 5.57 cfs @ 12.16 hrs, Volume= 0.478 af, Depth= 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

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Type III 24-hr 25-Year Rainfall=7.19"

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Area (sf)	CN	Description
15,400	61	>75% Grass cover, Good, HSG B
10,000	79	<50% Grass cover, Poor, HSG B
2,440	98	Roofs, HSG B
13,900	55	Woods, Good, HSG B
14,440	98	Paved parking, HSG B
1,735	98	Unconnected pavement, HSG B
57,915	75	Weighted Average
39,300		67.86% Pervious Area
18,615		32.14% Impervious Area
1,735		9.32% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	90	0.0170	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
1.7	160	0.0250	1.58		Shallow Concentrated Flow, Nearly Bare & Untilled Kv= 10.0 fps
0.2	50	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
11.5	300	Total			

Summary for Reach 1R: Reach

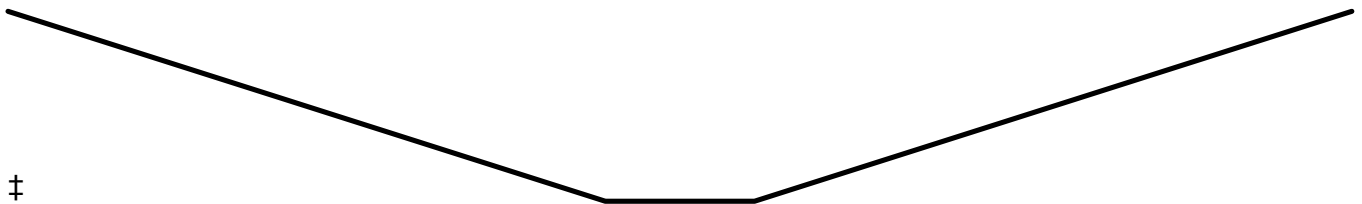
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 465.89 cfs

5.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds

Side Slope Z-value= 10.0 '/' Top Width= 45.00'

Length= 100.0' Slope= 0.0421 '/'

Inlet Invert= 42.21', Outlet Invert= 38.00'

**Summary for Reach 2R: Reach**

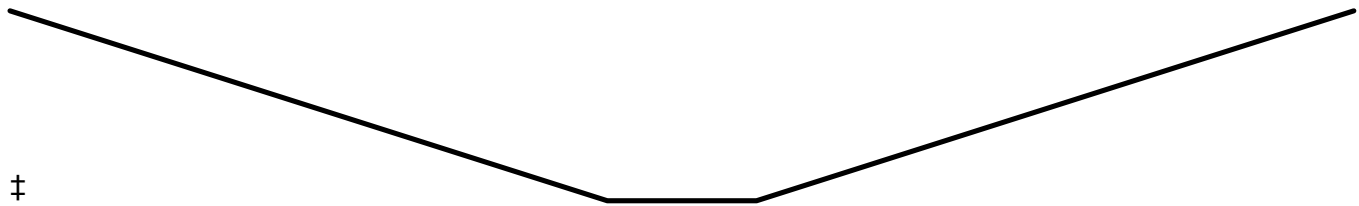
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 753.28 cfs

5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 10.0 '/' Top Width= 45.00'

Length= 30.0' Slope= 0.0230 '/'

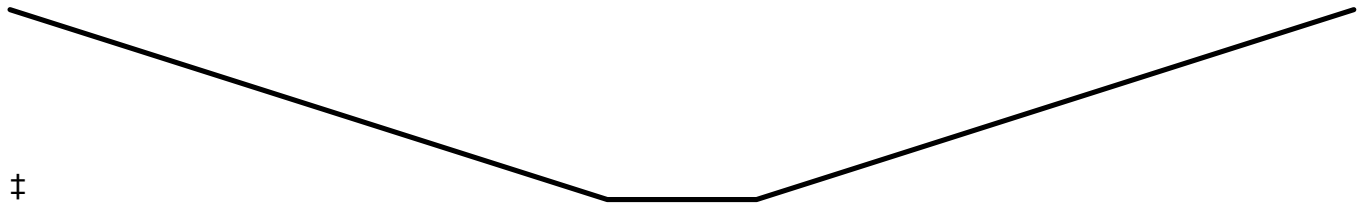
Inlet Invert= 42.90', Outlet Invert= 42.21'



Summary for Reach 3R: Reach

Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 559.93 cfs

5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough
 Side Slope Z-value= 10.0 ' ' Top Width= 45.00'
 Length= 192.0' Slope= 0.0127 ' '
 Inlet Invert= 45.34', Outlet Invert= 42.90'



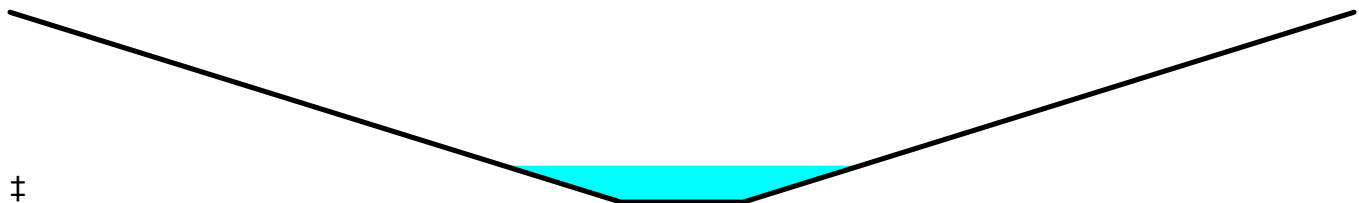
Summary for Reach R1: Reach

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 6.01" for 25-Year event
 Inflow = 4.45 cfs @ 12.10 hrs, Volume= 0.324 af
 Outflow = 3.93 cfs @ 12.16 hrs, Volume= 0.324 af, Atten= 12%, Lag= 3.8 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.66 fps, Min. Travel Time= 2.2 min
 Avg. Velocity = 0.85 fps, Avg. Travel Time= 6.8 min

Peak Storage= 526 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.38'
 Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 167.68 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 5.0 ' ' Top Width= 22.00'
 Length= 350.0' Slope= 0.0181 ' '
 Inlet Invert= 48.76', Outlet Invert= 42.41'



Summary for Pond P1: 12" Culvert

Inflow Area = 2.868 ac, 38.02% Impervious, Inflow Depth = 4.10" for 25-Year event
 Inflow = 8.40 cfs @ 12.35 hrs, Volume= 0.980 af
 Outflow = 8.59 cfs @ 12.40 hrs, Volume= 0.979 af, Atten= 0%, Lag= 2.9 min
 Primary = 8.59 cfs @ 12.40 hrs, Volume= 0.979 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 47.76' @ 12.40 hrs Surf.Area= 2,000 sf Storage= 1,228 cf

Plug-Flow detention time= 4.0 min calculated for 0.978 af (100% of inflow)
 Center-of-Mass det. time= 3.8 min (844.7 - 840.9)

Volume	Invert	Avail.Storage	Storage Description
#1	43.50'	1,228 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.50	10	0	0
44.00	300	78	78
45.00	2,000	1,150	1,228

Device	Routing	Invert	Outlet Devices
#1	Primary	43.74'	15.0" Round Culvert L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 43.74' / 39.12' S= 0.0888 ' S= 0.0888 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=8.59 cfs @ 12.40 hrs HW=47.76' (Free Discharge)
 ↑1=Culvert (Inlet Controls 8.59 cfs @ 7.00 fps)

Summary for Pond P2: CB A

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 6.01" for 25-Year event
 Inflow = 4.20 cfs @ 12.09 hrs, Volume= 0.324 af
 Outflow = 4.45 cfs @ 12.10 hrs, Volume= 0.324 af, Atten= 0%, Lag= 0.5 min
 Primary = 4.45 cfs @ 12.10 hrs, Volume= 0.324 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 57.46' @ 12.10 hrs Surf.Area= 13 sf Storage= 50 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.2 min (779.3 - 779.1)

Volume	Invert	Avail.Storage	Storage Description
#1	50.93'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder
Device	Routing	Invert	Outlet Devices
#1	Primary	50.92'	12.0" Round Culvert L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 50.92' / 48.77' S= 0.0179 ' S= 0.0179 ' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=4.37 cfs @ 12.10 hrs HW=57.21' (Free Discharge)

↑1=Culvert (Barrel Controls 4.37 cfs @ 5.57 fps)

Summary for Pond P3: 12" Culvert

Inflow Area = 3.273 ac, 31.67% Impervious, Inflow Depth = 3.80" for 25-Year event
 Inflow = 10.40 cfs @ 12.20 hrs, Volume= 1.035 af
 Outflow = 10.66 cfs @ 12.20 hrs, Volume= 1.035 af, Atten= 0%, Lag= 0.0 min
 Primary = 10.66 cfs @ 12.20 hrs, Volume= 1.035 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 65.31' @ 12.20 hrs Surf.Area= 2,000 sf Storage= 1,241 cf

Plug-Flow detention time= 4.1 min calculated for 1.034 af (100% of inflow)
 Center-of-Mass det. time= 4.1 min (834.8 - 830.6)

Volume	Invert	Avail.Storage	Storage Description
#1	42.41'	1,241 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.41	10	0	0
43.00	300	91	91
44.00	2,000	1,150	1,241

Device	Routing	Invert	Outlet Devices
#1	Primary	42.41'	12.0" Round Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.41' / 42.27' S= 0.0028 ' / Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=10.63 cfs @ 12.20 hrs HW=65.21' (Free Discharge)

↑1=Culvert (Barrel Controls 10.63 cfs @ 13.54 fps)

Summary for Pond P4: CB #11

Inflow Area = 7.660 ac, 43.16% Impervious, Inflow Depth = 4.34" for 25-Year event
 Inflow = 23.25 cfs @ 12.20 hrs, Volume= 2.772 af
 Outflow = 23.22 cfs @ 12.20 hrs, Volume= 2.772 af, Atten= 0%, Lag= 0.0 min
 Primary = 23.22 cfs @ 12.20 hrs, Volume= 2.772 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 96.48' @ 12.20 hrs Surf.Area= 213 sf Storage= 125 cf

Plug-Flow detention time= 0.1 min calculated for 2.772 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (823.5 - 823.4)

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Type III 24-hr 25-Year Rainfall=7.19"

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Volume	Invert	Avail.Storage	Storage Description
#1	38.84'	42 cf	4.00'D x 3.37'H Vertical Cone/Cylinder
#2	42.21'	83 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		125 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.21	10	0	0
43.00	200	83	83

Device	Routing	Invert	Outlet Devices
#1	Primary	38.84'	15.0" Round Culvert L= 102.0' Ke= 0.500 Inlet / Outlet Invert= 38.84' / 38.00' S= 0.0082 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=23.07 cfs @ 12.20 hrs HW=95.74' (Free Discharge)↑**1=Culvert** (Barrel Controls 23.07 cfs @ 18.80 fps)**Summary for Pond P5: CB #10**

Inflow Area = 4.625 ac, 45.55% Impervious, Inflow Depth = 4.45" for 25-Year event
 Inflow = 16.82 cfs @ 12.13 hrs, Volume= 1.717 af
 Outflow = 17.05 cfs @ 12.12 hrs, Volume= 1.717 af, Atten= 0%, Lag= 0.0 min
 Primary = 17.05 cfs @ 12.12 hrs, Volume= 1.717 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 76.21' @ 12.12 hrs Surf.Area= 213 sf Storage= 108 cf

Plug-Flow detention time= 0.2 min calculated for 1.714 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (812.5 - 812.4)

Volume	Invert	Avail.Storage	Storage Description
#1	39.35'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder
#2	42.90'	63 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		108 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.90	10	0	0
43.50	200	63	63

Device	Routing	Invert	Outlet Devices
#1	Primary	39.35'	12.0" Round Culvert L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 39.35' / 38.89' S= 0.0153 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=16.63 cfs @ 12.12 hrs HW=74.57' (Free Discharge)↑**1=Culvert** (Barrel Controls 16.63 cfs @ 21.17 fps)

Summary for Pond P6: CB #9

Inflow Area = 4.172 ac, 41.66% Impervious, Inflow Depth = 4.27" for 25-Year event
 Inflow = 14.09 cfs @ 12.17 hrs, Volume= 1.486 af
 Outflow = 14.42 cfs @ 12.15 hrs, Volume= 1.486 af, Atten= 0%, Lag= 0.0 min
 Primary = 14.42 cfs @ 12.15 hrs, Volume= 1.486 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 46.90' @ 12.15 hrs Surf.Area= 213 sf Storage= 111 cf

Plug-Flow detention time= 0.2 min calculated for 1.483 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (818.1 - 817.9)

Volume	Invert	Avail.Storage	Storage Description
#1	42.03'	42 cf	4.00'D x 3.31'H Vertical Cone/Cylinder
#2	45.34'	69 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		111 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.34	10	0	0
46.00	200	69	69

Device	Routing	Invert	Outlet Devices
#1	Primary	42.03'	12.0" Round Culvert L= 192.0' Ke= 0.500 Inlet / Outlet Invert= 42.03' / 39.47' S= 0.0133 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Primary	45.34'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=14.37 cfs @ 12.15 hrs HW=46.89' (Free Discharge)

1=Culvert (Barrel Controls 3.27 cfs @ 4.17 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 11.09 cfs @ 3.57 fps)

Summary for Pond P7: CB #7

Inflow Area = 3.739 ac, 47.29% Impervious, Inflow Depth = 4.50" for 25-Year event
 Inflow = 8.49 cfs @ 12.48 hrs, Volume= 1.403 af
 Outflow = 8.53 cfs @ 12.49 hrs, Volume= 1.403 af, Atten= 0%, Lag= 0.3 min
 Primary = 8.53 cfs @ 12.49 hrs, Volume= 1.403 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 94.20' @ 12.49 hrs Surf.Area= 13 sf Storage= 40 cf

Plug-Flow detention time= 0.1 min calculated for 1.400 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (831.5 - 831.4)

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Volume	Invert	Avail.Storage	Storage Description
#1	48.82'	40 cf	4.00'D x 3.18'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	48.82'	12.0" Round Culvert L= 230.0' Ke= 0.500 Inlet / Outlet Invert= 48.82' / 41.57' S= 0.0315 ' / Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=8.48 cfs @ 12.49 hrs HW=93.59' (Free Discharge)↑**1=Culvert** (Barrel Controls 8.48 cfs @ 10.79 fps)**Summary for Pond P8: CB B**

Inflow Area = 0.702 ac, 84.14% Impervious, Inflow Depth = 6.24" for 25-Year event
 Inflow = 4.65 cfs @ 12.09 hrs, Volume= 0.365 af
 Outflow = 4.72 cfs @ 12.09 hrs, Volume= 0.365 af, Atten= 0%, Lag= 0.2 min
 Primary = 4.72 cfs @ 12.09 hrs, Volume= 0.365 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 53.02' @ 12.09 hrs Surf.Area= 13 sf Storage= 38 cf

Plug-Flow detention time= 0.3 min calculated for 0.365 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (772.3 - 772.0)

Volume	Invert	Avail.Storage	Storage Description
#1	49.10'	38 cf	4.00'D x 3.00'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	12.0" Round Culvert L= 35.0' Ke= 0.500 Inlet / Outlet Invert= 49.10' / 48.90' S= 0.0057 ' / Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=4.61 cfs @ 12.09 hrs HW=52.87' (Free Discharge)↑**1=Culvert** (Barrel Controls 4.61 cfs @ 5.86 fps)**Summary for Pond P9: CB #5**

Inflow Area = 5.069 ac, 43.32% Impervious, Inflow Depth = 4.45" for 25-Year event
 Inflow = 12.35 cfs @ 12.14 hrs, Volume= 1.881 af
 Outflow = 12.38 cfs @ 12.14 hrs, Volume= 1.881 af, Atten= 0%, Lag= 0.1 min
 Primary = 12.38 cfs @ 12.14 hrs, Volume= 1.881 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 48.20' @ 12.14 hrs Surf.Area= 13 sf Storage= 45 cf

Plug-Flow detention time= 0.1 min calculated for 1.878 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (829.6 - 829.5)

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Volume	Invert	Avail.Storage	Storage Description
#1	41.42'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	41.42'	18.0" Round Culvert L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 41.42' / 40.66' S= 0.0080 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf

Primary OutFlow Max=12.35 cfs @ 12.14 hrs HW=48.18' (Free Discharge)↑**1=Culvert** (Barrel Controls 12.35 cfs @ 6.99 fps)**Summary for Link POA1: POA #1**

Inflow Area = 7.660 ac, 43.16% Impervious, Inflow Depth = 4.34" for 25-Year event
 Inflow = 23.22 cfs @ 12.20 hrs, Volume= 2.772 af
 Primary = 23.22 cfs @ 12.20 hrs, Volume= 2.772 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Summary for Link POA2: POA #2

Inflow Area = 5.069 ac, 43.32% Impervious, Inflow Depth = 4.45" for 25-Year event
 Inflow = 12.38 cfs @ 12.14 hrs, Volume= 1.881 af
 Primary = 12.38 cfs @ 12.14 hrs, Volume= 1.881 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

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Time span=1.00-30.00 hrs, dt=0.05 hrs, 581 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: Lang Rd

Runoff Area=124,920 sf 38.02% Impervious Runoff Depth=5.35"
 Flow Length=575' Tc=25.3 min CN=73 Runoff=10.95 cfs 1.280 af

Subcatchment 2S: Beechstone Northwest

Runoff Area=28,210 sf 78.29% Impervious Runoff Depth=7.41"
 Tc=6.0 min CN=90 Runoff=5.11 cfs 0.400 af

Subcatchment 3S: Wooded Area

Runoff Area=114,365 sf 20.17% Impervious Runoff Depth=4.39"
 Flow Length=555' Tc=17.2 min UI Adjusted CN=65 Runoff=9.62 cfs 0.961 af

Subcatchment 4S: Entrance Drive

Runoff Area=7,305 sf 64.96% Impervious Runoff Depth=6.80"
 Tc=6.0 min CN=85 Runoff=1.25 cfs 0.095 af

Subcatchment 5S: Beechstone to CB#10

Runoff Area=19,705 sf 81.40% Impervious Runoff Depth=7.53"
 Tc=6.0 min CN=91 Runoff=3.60 cfs 0.284 af

Subcatchment 6S: Beechstone to CB#9

Runoff Area=39,170 sf 78.04% Impervious Runoff Depth=7.41"
 Tc=6.0 min CN=90 Runoff=7.10 cfs 0.555 af

Subcatchment 7S: Stoencroft

Runoff Area=132,300 sf 38.78% Impervious Runoff Depth=5.35"
 Flow Length=705' Tc=37.4 min CN=73 Runoff=9.69 cfs 1.355 af

Subcatchment 8S: Beechstone Northeast

Runoff Area=30,575 sf 84.14% Impervious Runoff Depth=7.65"
 Tc=6.0 min CN=92 Runoff=5.63 cfs 0.447 af

Subcatchment 9S: Playground

Runoff Area=57,915 sf 32.14% Impervious Runoff Depth=5.60"
 Flow Length=300' Tc=11.5 min CN=75 Runoff=7.19 cfs 0.620 af

Reach 1R: Reach

Avg. Flow Depth=0.00' Max Vel=0.00 fps
 n=0.035 L=100.0' S=0.0421 '/' Capacity=465.89 cfs Outflow=0.00 cfs 0.000 af

Reach 2R: Reach

Avg. Flow Depth=0.00' Max Vel=0.00 fps
 n=0.016 L=30.0' S=0.0230 '/' Capacity=753.28 cfs Outflow=0.00 cfs 0.000 af

Reach 3R: Reach

Avg. Flow Depth=0.00' Max Vel=0.00 fps
 n=0.016 L=192.0' S=0.0127 '/' Capacity=559.93 cfs Outflow=0.00 cfs 0.000 af

Reach R1: Reach

Avg. Flow Depth=0.42' Max Vel=2.82 fps Inflow=5.11 cfs 0.400 af
 n=0.030 L=350.0' S=0.0181 '/' Capacity=167.68 cfs Outflow=4.77 cfs 0.400 af

Pond P1: 12" Culvert

Peak Elev=51.80' Storage=1,228 cf Inflow=10.95 cfs 1.280 af
 15.0" Round Culvert n=0.025 L=52.0' S=0.0888 '/' Outflow=12.72 cfs 1.279 af

Pond P2: CB A

Peak Elev=59.90' Storage=50 cf Inflow=5.11 cfs 0.400 af
 12.0" Round Culvert n=0.025 L=120.0' S=0.0179 '/' Outflow=5.11 cfs 0.400 af

Pond P3: 12" Culvert

Peak Elev=79.47' Storage=1,241 cf Inflow=13.58 cfs 1.361 af
 12.0" Round Culvert n=0.025 L=50.0' S=0.0028 '/' Outflow=13.54 cfs 1.361 af

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Pond P4: CB #11

Peak Elev=150.51' Storage=125 cf Inflow=32.12 cfs 3.574 af
15.0" Round Culvert n=0.025 L=102.0' S=0.0082 ' Outflow=32.38 cfs 3.574 af

Pond P5: CB #10

Peak Elev=102.37' Storage=108 cf Inflow=22.27 cfs 2.200 af
12.0" Round Culvert n=0.025 L=30.0' S=0.0153 ' Outflow=22.32 cfs 2.200 af

Pond P6: CB #9

Peak Elev=47.33' Storage=111 cf Inflow=18.98 cfs 1.916 af
Outflow=19.41 cfs 1.916 af

Pond P7: CB #7

Peak Elev=128.15' Storage=40 cf Inflow=10.96 cfs 1.802 af
12.0" Round Culvert n=0.025 L=230.0' S=0.0315 ' Outflow=10.98 cfs 1.802 af

Pond P8: CB B

Peak Elev=54.27' Storage=38 cf Inflow=5.63 cfs 0.447 af
12.0" Round Culvert n=0.025 L=35.0' S=0.0057 ' Outflow=5.60 cfs 0.447 af

Pond P9: CB #5

Peak Elev=52.32' Storage=45 cf Inflow=15.99 cfs 2.422 af
18.0" Round Culvert n=0.025 L=95.0' S=0.0080 ' Outflow=16.06 cfs 2.422 af

Link POA1: POA #1

Inflow=32.38 cfs 3.574 af
Primary=32.38 cfs 3.574 af

Link POA2: POA #2

Inflow=16.06 cfs 2.422 af
Primary=16.06 cfs 2.422 af

Total Runoff Area = 12.729 ac Runoff Volume = 5.997 af Average Runoff Depth = 5.65"
56.78% Pervious = 7.227 ac 43.22% Impervious = 5.501 ac

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Summary for Subcatchment 1S: Lang Rd

Runoff = 10.95 cfs @ 12.35 hrs, Volume= 1.280 af, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
40,125	61	>75% Grass cover, Good, HSG B
37,300	55	Woods, Good, HSG B
38,610	98	Paved parking, HSG B
6,100	98	Roofs, HSG B
2,785	98	Unconnected pavement, HSG B
124,920	73	Weighted Average
77,425		61.98% Pervious Area
47,495		38.02% Impervious Area
2,785		5.86% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	75	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.23"
8.3	500	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
25.3	575	Total			

Summary for Subcatchment 2S: Beechstone Northwest

Runoff = 5.11 cfs @ 12.09 hrs, Volume= 0.400 af, Depth= 7.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
6,125	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
1,625	98	Unconnected pavement, HSG B
4,810	98	Roofs, HSG B
15,650	98	Paved parking, HSG B
28,210	90	Weighted Average
6,125		21.71% Pervious Area
22,085		78.29% Impervious Area
1,625		7.36% Unconnected

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

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Type III 24-hr 50-Year Rainfall=8.61"

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Summary for Subcatchment 3S: Wooded Area

Runoff = 9.62 cfs @ 12.24 hrs, Volume= 0.961 af, Depth= 4.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Adj	Description
46,000	61		>75% Grass cover, Good, HSG B
45,300	55		Woods, Good, HSG B
16,080	98		Roofs, HSG B
615	98		Paved parking, HSG B
6,370	98		Unconnected pavement, HSG B
114,365	66	65	Weighted Average, UI Adjusted
91,300			79.83% Pervious Area
23,065			20.17% Impervious Area
6,370			27.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	60	0.0080	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
1.3	75	0.0200	0.99		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
4.2	180	0.0200	0.71		Shallow Concentrated Flow, Shallow Woods Woodland Kv= 5.0 fps
2.4	240	0.0120	1.64		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
17.2	555	Total			

Summary for Subcatchment 4S: Entrance Drive

Runoff = 1.25 cfs @ 12.09 hrs, Volume= 0.095 af, Depth= 6.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
2,560	61	>75% Grass cover, Good, HSG B
4,520	98	Paved parking, HSG B
225	98	Unconnected pavement, HSG B
7,305	85	Weighted Average
2,560		35.04% Pervious Area
4,745		64.96% Impervious Area
225		4.74% Unconnected

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

Summary for Subcatchment 5S: Beechstone to CB#10

Runoff = 3.60 cfs @ 12.09 hrs, Volume= 0.284 af, Depth= 7.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
3,000	61	>75% Grass cover, Good, HSG B
665	55	Woods, Good, HSG B
4,270	98	Roofs, HSG B
10,270	98	Paved parking, HSG B
1,500	98	Unconnected pavement, HSG B
19,705	91	Weighted Average
3,665		18.60% Pervious Area
16,040		81.40% Impervious Area
1,500		9.35% Unconnected

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

Summary for Subcatchment 6S: Beechstone to CB#9

Runoff = 7.10 cfs @ 12.09 hrs, Volume= 0.555 af, Depth= 7.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
8,600	61	>75% Grass cover, Good, HSG B
8,220	98	Roofs, HSG B
19,800	98	Paved parking, HSG B
2,550	98	Unconnected pavement, HSG B
39,170	90	Weighted Average
8,600		21.96% Pervious Area
30,570		78.04% Impervious Area
2,550		8.34% Unconnected

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

Summary for Subcatchment 7S: Stoencroft

Runoff = 9.69 cfs @ 12.51 hrs, Volume= 1.355 af, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

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Area (sf)	CN	Description
33,000	61	>75% Grass cover, Good, HSG B
48,000	55	Woods, Good, HSG B
16,920	98	Roofs, HSG B
32,180	98	Paved parking, HSG B
2,200	98	Unconnected pavement, HSG B
132,300	73	Weighted Average
81,000		61.22% Pervious Area
51,300		38.78% Impervious Area
2,200		4.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	80	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.23"
19.2	575	0.0100	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
37.4	705	Total			

Summary for Subcatchment 8S: Beechstone Northeast

Runoff = 5.63 cfs @ 12.09 hrs, Volume= 0.447 af, Depth= 7.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
4,850	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
6,100	98	Roofs, HSG B
17,650	98	Paved parking, HSG B
1,975	98	Unconnected pavement, HSG B
30,575	92	Weighted Average
4,850		15.86% Pervious Area
25,725		84.14% Impervious Area
1,975		7.68% Unconnected

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

Summary for Subcatchment 9S: Playground

Runoff = 7.19 cfs @ 12.16 hrs, Volume= 0.620 af, Depth= 5.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

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Type III 24-hr 50-Year Rainfall=8.61"

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Area (sf)	CN	Description
15,400	61	>75% Grass cover, Good, HSG B
10,000	79	<50% Grass cover, Poor, HSG B
2,440	98	Roofs, HSG B
13,900	55	Woods, Good, HSG B
14,440	98	Paved parking, HSG B
1,735	98	Unconnected pavement, HSG B
57,915	75	Weighted Average
39,300		67.86% Pervious Area
18,615		32.14% Impervious Area
1,735		9.32% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	90	0.0170	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
1.7	160	0.0250	1.58		Shallow Concentrated Flow, Nearly Bare & Untilled Kv= 10.0 fps
0.2	50	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
11.5	300	Total			

Summary for Reach 1R: Reach

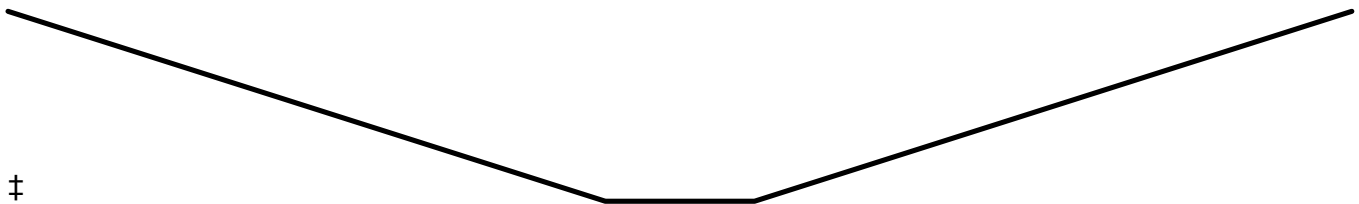
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 465.89 cfs

5.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds

Side Slope Z-value= 10.0 ' ' Top Width= 45.00'

Length= 100.0' Slope= 0.0421 ' '

Inlet Invert= 42.21', Outlet Invert= 38.00'

**Summary for Reach 2R: Reach**

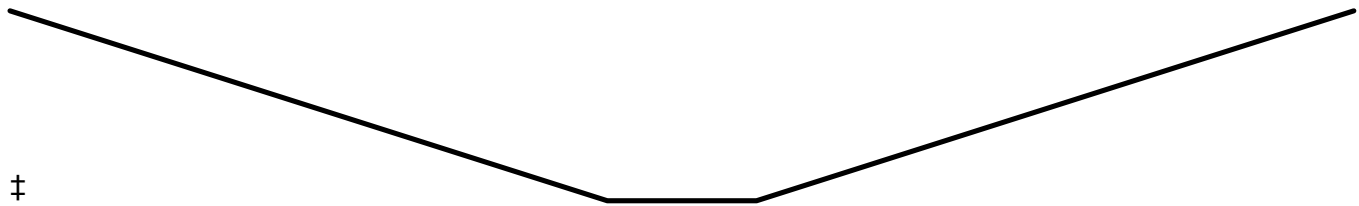
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 753.28 cfs

5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 10.0 ' ' Top Width= 45.00'

Length= 30.0' Slope= 0.0230 ' '

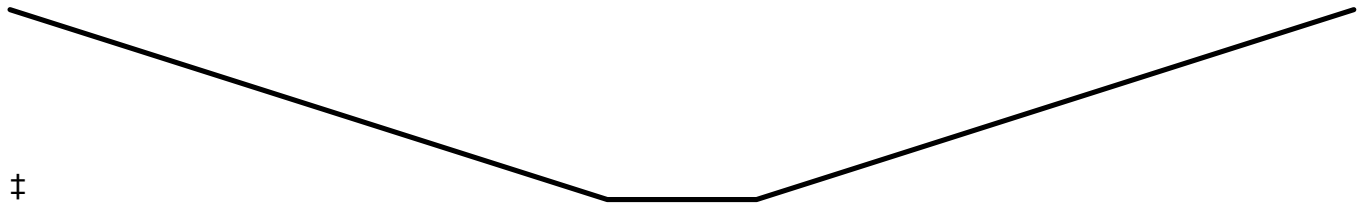
Inlet Invert= 42.90', Outlet Invert= 42.21'



Summary for Reach 3R: Reach

Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 559.93 cfs

5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough
 Side Slope Z-value= 10.0 ' ' Top Width= 45.00'
 Length= 192.0' Slope= 0.0127 ' '
 Inlet Invert= 45.34', Outlet Invert= 42.90'



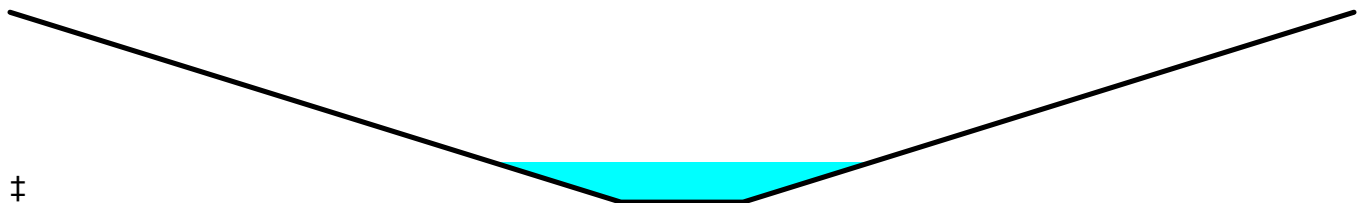
Summary for Reach R1: Reach

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 7.41" for 50-Year event
 Inflow = 5.11 cfs @ 12.09 hrs, Volume= 0.400 af
 Outflow = 4.77 cfs @ 12.15 hrs, Volume= 0.400 af, Atten= 7%, Lag= 3.9 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.82 fps, Min. Travel Time= 2.1 min
 Avg. Velocity = 0.90 fps, Avg. Travel Time= 6.5 min

Peak Storage= 609 cf @ 12.11 hrs
 Average Depth at Peak Storage= 0.42'
 Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 167.68 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 5.0 ' ' Top Width= 22.00'
 Length= 350.0' Slope= 0.0181 ' '
 Inlet Invert= 48.76', Outlet Invert= 42.41'



Summary for Pond P1: 12" Culvert

Inflow Area = 2.868 ac, 38.02% Impervious, Inflow Depth = 5.35" for 50-Year event
 Inflow = 10.95 cfs @ 12.35 hrs, Volume= 1.280 af
 Outflow = 12.72 cfs @ 12.35 hrs, Volume= 1.279 af, Atten= 0%, Lag= 0.1 min
 Primary = 12.72 cfs @ 12.35 hrs, Volume= 1.279 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 51.80' @ 12.35 hrs Surf.Area= 2,000 sf Storage= 1,228 cf

Plug-Flow detention time= 3.9 min calculated for 1.279 af (100% of inflow)
 Center-of-Mass det. time= 3.5 min (836.7 - 833.3)

Volume	Invert	Avail.Storage	Storage Description
#1	43.50'	1,228 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.50	10	0	0
44.00	300	78	78
45.00	2,000	1,150	1,228

Device	Routing	Invert	Outlet Devices
#1	Primary	43.74'	15.0" Round Culvert L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 43.74' / 39.12' S= 0.0888 ' S= 0.0888 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=12.72 cfs @ 12.35 hrs HW=51.79' (Free Discharge)
 ↑1=Culvert (Inlet Controls 12.72 cfs @ 10.36 fps)

Summary for Pond P2: CB A

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 7.41" for 50-Year event
 Inflow = 5.11 cfs @ 12.09 hrs, Volume= 0.400 af
 Outflow = 5.11 cfs @ 12.09 hrs, Volume= 0.400 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.11 cfs @ 12.09 hrs, Volume= 0.400 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 59.90' @ 12.09 hrs Surf.Area= 13 sf Storage= 50 cf

Plug-Flow detention time= 0.2 min calculated for 0.399 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (774.0 - 773.8)

Volume	Invert	Avail.Storage	Storage Description
#1	50.93'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder
Device	Routing	Invert	Outlet Devices
#1	Primary	50.92'	12.0" Round Culvert L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 50.92' / 48.77' S= 0.0179 ' S= 0.0179 ' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=4.98 cfs @ 12.09 hrs HW=59.41' (Free Discharge)

↑**1=Culvert** (Barrel Controls 4.98 cfs @ 6.34 fps)

Summary for Pond P3: 12" Culvert

Inflow Area = 3.273 ac, 31.67% Impervious, Inflow Depth = 4.99" for 50-Year event
 Inflow = 13.58 cfs @ 12.20 hrs, Volume= 1.361 af
 Outflow = 13.54 cfs @ 12.25 hrs, Volume= 1.361 af, Atten= 0%, Lag= 2.9 min
 Primary = 13.54 cfs @ 12.25 hrs, Volume= 1.361 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 79.47' @ 12.23 hrs Surf.Area= 2,000 sf Storage= 1,241 cf

Plug-Flow detention time= 4.0 min calculated for 1.359 af (100% of inflow)
 Center-of-Mass det. time= 4.0 min (828.0 - 824.1)

Volume	Invert	Avail.Storage	Storage Description
#1	42.41'	1,241 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.41	10	0	0
43.00	300	91	91
44.00	2,000	1,150	1,241

Device	Routing	Invert	Outlet Devices
#1	Primary	42.41'	12.0" Round Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.41' / 42.27' S= 0.0028 ' / Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=13.54 cfs @ 12.25 hrs HW=78.83' (Free Discharge)

↑**1=Culvert** (Barrel Controls 13.54 cfs @ 17.24 fps)

Summary for Pond P4: CB #11

Inflow Area = 7.660 ac, 43.16% Impervious, Inflow Depth = 5.60" for 50-Year event
 Inflow = 32.12 cfs @ 12.15 hrs, Volume= 3.574 af
 Outflow = 32.38 cfs @ 12.15 hrs, Volume= 3.574 af, Atten= 0%, Lag= 0.0 min
 Primary = 32.38 cfs @ 12.15 hrs, Volume= 3.574 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 150.51' @ 12.15 hrs Surf.Area= 213 sf Storage= 125 cf

Plug-Flow detention time= 0.1 min calculated for 3.568 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (817.4 - 817.3)

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Type III 24-hr 50-Year Rainfall=8.61"

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Volume	Invert	Avail.Storage	Storage Description
#1	38.84'	42 cf	4.00'D x 3.37'H Vertical Cone/Cylinder
#2	42.21'	83 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		125 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.21	10	0	0
43.00	200	83	83

Device	Routing	Invert	Outlet Devices
#1	Primary	38.84'	15.0" Round Culvert L= 102.0' Ke= 0.500 Inlet / Outlet Invert= 38.84' / 38.00' S= 0.0082 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=32.13 cfs @ 12.15 hrs HW=148.84' (Free Discharge)↑**1=Culvert** (Barrel Controls 32.13 cfs @ 26.18 fps)**Summary for Pond P5: CB #10**

Inflow Area = 4.625 ac, 45.55% Impervious, Inflow Depth = 5.71" for 50-Year event
 Inflow = 22.27 cfs @ 12.14 hrs, Volume= 2.200 af
 Outflow = 22.32 cfs @ 12.14 hrs, Volume= 2.200 af, Atten= 0%, Lag= 0.0 min
 Primary = 22.32 cfs @ 12.14 hrs, Volume= 2.200 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 102.37' @ 12.14 hrs Surf.Area= 213 sf Storage= 108 cf

Plug-Flow detention time= 0.2 min calculated for 2.200 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (807.2 - 807.1)

Volume	Invert	Avail.Storage	Storage Description
#1	39.35'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder
#2	42.90'	63 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		108 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.90	10	0	0
43.50	200	63	63

Device	Routing	Invert	Outlet Devices
#1	Primary	39.35'	12.0" Round Culvert L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 39.35' / 38.89' S= 0.0153 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=22.04 cfs @ 12.14 hrs HW=100.85' (Free Discharge)↑**1=Culvert** (Barrel Controls 22.04 cfs @ 28.07 fps)

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Summary for Pond P6: CB #9

Inflow Area = 4.172 ac, 41.66% Impervious, Inflow Depth = 5.51" for 50-Year event
 Inflow = 18.98 cfs @ 12.15 hrs, Volume= 1.916 af
 Outflow = 19.41 cfs @ 12.15 hrs, Volume= 1.916 af, Atten= 0%, Lag= 0.0 min
 Primary = 19.41 cfs @ 12.15 hrs, Volume= 1.916 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 47.33' @ 12.15 hrs Surf.Area= 213 sf Storage= 111 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.2 min (812.5 - 812.3)

Volume	Invert	Avail.Storage	Storage Description
#1	42.03'	42 cf	4.00'D x 3.31'H Vertical Cone/Cylinder
#2	45.34'	69 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		111 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.34	10	0	0
46.00	200	69	69

Device	Routing	Invert	Outlet Devices
#1	Primary	42.03'	12.0" Round Culvert L= 192.0' Ke= 0.500 Inlet / Outlet Invert= 42.03' / 39.47' S= 0.0133 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Primary	45.34'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=19.35 cfs @ 12.15 hrs HW=47.33' (Free Discharge)

1=Culvert (Barrel Controls 3.38 cfs @ 4.31 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 15.97 cfs @ 4.02 fps)

Summary for Pond P7: CB #7

Inflow Area = 3.739 ac, 47.29% Impervious, Inflow Depth = 5.78" for 50-Year event
 Inflow = 10.96 cfs @ 12.46 hrs, Volume= 1.802 af
 Outflow = 10.98 cfs @ 12.46 hrs, Volume= 1.802 af, Atten= 0%, Lag= 0.0 min
 Primary = 10.98 cfs @ 12.46 hrs, Volume= 1.802 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 128.15' @ 12.46 hrs Surf.Area= 13 sf Storage= 40 cf

Plug-Flow detention time= 0.1 min calculated for 1.799 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (825.5 - 825.4)

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Volume	Invert	Avail.Storage	Storage Description
#1	48.82'	40 cf	4.00'D x 3.18'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	48.82'	12.0" Round Culvert L= 230.0' Ke= 0.500 Inlet / Outlet Invert= 48.82' / 41.57' S= 0.0315 ' / Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=10.96 cfs @ 12.46 hrs HW=127.78' (Free Discharge)↑**1=Culvert** (Barrel Controls 10.96 cfs @ 13.95 fps)**Summary for Pond P8: CB B**

Inflow Area = 0.702 ac, 84.14% Impervious, Inflow Depth = 7.65" for 50-Year event
 Inflow = 5.63 cfs @ 12.09 hrs, Volume= 0.447 af
 Outflow = 5.60 cfs @ 12.09 hrs, Volume= 0.447 af, Atten= 1%, Lag= 0.0 min
 Primary = 5.60 cfs @ 12.09 hrs, Volume= 0.447 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 54.27' @ 12.09 hrs Surf.Area= 13 sf Storage= 38 cf

Plug-Flow detention time= 0.3 min calculated for 0.447 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (767.4 - 767.2)

Volume	Invert	Avail.Storage	Storage Description
#1	49.10'	38 cf	4.00'D x 3.00'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	12.0" Round Culvert L= 35.0' Ke= 0.500 Inlet / Outlet Invert= 49.10' / 48.90' S= 0.0057 ' / Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=5.46 cfs @ 12.09 hrs HW=54.07' (Free Discharge)↑**1=Culvert** (Barrel Controls 5.46 cfs @ 6.95 fps)**Summary for Pond P9: CB #5**

Inflow Area = 5.069 ac, 43.32% Impervious, Inflow Depth = 5.74" for 50-Year event
 Inflow = 15.99 cfs @ 12.15 hrs, Volume= 2.422 af
 Outflow = 16.06 cfs @ 12.15 hrs, Volume= 2.422 af, Atten= 0%, Lag= 0.0 min
 Primary = 16.06 cfs @ 12.15 hrs, Volume= 2.422 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 52.32' @ 12.15 hrs Surf.Area= 13 sf Storage= 45 cf

Plug-Flow detention time= 0.1 min calculated for 2.418 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (823.2 - 823.1)

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Volume	Invert	Avail.Storage	Storage Description
#1	41.42'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	41.42'	18.0" Round Culvert L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 41.42' / 40.66' S= 0.0080 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf

Primary OutFlow Max=16.05 cfs @ 12.15 hrs HW=52.31' (Free Discharge)**1=Culvert** (Barrel Controls 16.05 cfs @ 9.08 fps)**Summary for Link POA1: POA #1**

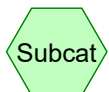
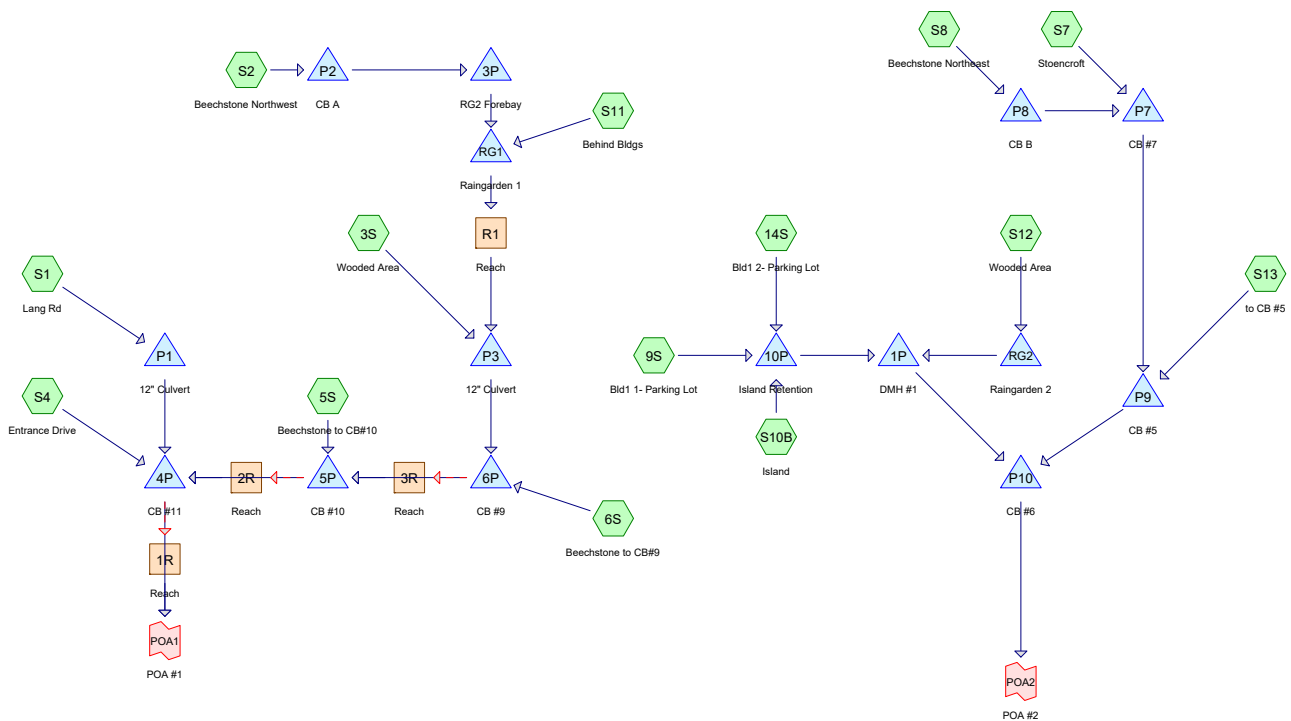
Inflow Area = 7.660 ac, 43.16% Impervious, Inflow Depth = 5.60" for 50-Year event
 Inflow = 32.38 cfs @ 12.15 hrs, Volume= 3.574 af
 Primary = 32.38 cfs @ 12.15 hrs, Volume= 3.574 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Summary for Link POA2: POA #2

Inflow Area = 5.069 ac, 43.32% Impervious, Inflow Depth = 5.74" for 50-Year event
 Inflow = 16.06 cfs @ 12.15 hrs, Volume= 2.422 af
 Primary = 16.06 cfs @ 12.15 hrs, Volume= 2.422 af, Atten= 0%, Lag= 0.0 min

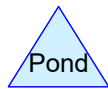
Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs



Subcat



Reach



Pond



Link

Routing Diagram for 4787.2 POST_15AoT_18out
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.059	61	>75% Grass cover, Good, HSG B (3S, 5S, 6S, 9S, 14S, S1, S10B, S11, S12, S13, S2, S4, S7, S8)
3.651	98	Paved parking, HSG B (5S, 6S, 9S, 14S, S1, S10B, S12, S13, S2, S4, S7, S8)
0.163	98	Porous Pavers, HSG B (9S, 14S)
1.856	98	Roofs, HSG B (3S, 5S, 6S, 9S, 14S, S1, S11, S12, S2, S7, S8)
0.649	98	Unconnected pavement, HSG B (3S, 5S, 6S, 9S, 14S, S1, S11, S12, S13, S2, S4, S7, S8)
2.350	55	Woods, Good, HSG B (3S, 5S, S1, S7)
12.729	78	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
12.729	HSG B	3S, 5S, 6S, 9S, 14S, S1, S10B, S11, S12, S13, S2, S4, S7, S8
0.000	HSG C	
0.000	HSG D	
0.000	Other	
12.729		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	4.059	0.000	0.000	0.000	4.059	>75% Grass cover, Good	3S, 5S, 6S, 9S, 14S, S1, S10B, S11, S12, S13, S2, S4, S7, S8
0.000	3.651	0.000	0.000	0.000	3.651	Paved parking	5S, 6S, 9S, 14S, S1, S10B, S12, S13, S2, S4, S7, S8
0.000	0.163	0.000	0.000	0.000	0.163	Porous Pavers	9S, 14S
0.000	1.856	0.000	0.000	0.000	1.856	Roofs	3S, 5S, 6S, 9S, 14S, S1, S11, S12, S2, S7, S8
0.000	0.649	0.000	0.000	0.000	0.649	Unconnected pavement	3S, 5S, 6S, 9S, 14S, S1, S11, S12, S13, S2, S4, S7, S8
0.000	2.350	0.000	0.000	0.000	2.350	Woods, Good	3S, 5S, S1, S7
0.000	12.729	0.000	0.000	0.000	12.729	TOTAL AREA	

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Type III 24-hr 2-Year Rainfall=3.74"

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Time span=1.00-30.00 hrs, dt=0.05 hrs, 581 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment3S: Wooded Area	Runoff Area=70,810 sf 31.15% Impervious Runoff Depth=1.22" Flow Length=460' Tc=13.5 min CN=71 Runoff=1.71 cfs 0.165 af
Subcatchment5S: Beechstone to CB#10	Runoff Area=19,705 sf 81.40% Impervious Runoff Depth=2.77" Tc=6.0 min CN=91 Runoff=1.40 cfs 0.104 af
Subcatchment6S: Beechstone to CB#9	Runoff Area=36,370 sf 78.20% Impervious Runoff Depth=2.67" Tc=6.0 min CN=90 Runoff=2.51 cfs 0.186 af
Subcatchment9S: Bld1 1- Parking Lot	Runoff Area=11,945 sf 80.75% Impervious Runoff Depth>2.21" Tc=790.0 min CN=91 Runoff=0.05 cfs 0.050 af
Subcatchment14S: Bld1 2- Parking Lot	Runoff Area=17,735 sf 79.56% Impervious Runoff Depth>2.12" Tc=790.0 min CN=90 Runoff=0.08 cfs 0.072 af
SubcatchmentS1: Lang Rd	Runoff Area=124,920 sf 38.02% Impervious Runoff Depth=1.34" Flow Length=575' Tc=25.3 min CN=73 Runoff=2.64 cfs 0.321 af
SubcatchmentS10B: Island	Runoff Area=6,520 sf 12.50% Impervious Runoff Depth=0.93" Tc=6.0 min CN=66 Runoff=0.14 cfs 0.012 af
SubcatchmentS11: Behind Bldgs	Runoff Area=25,565 sf 30.18% Impervious Runoff Depth=1.28" Flow Length=160' Tc=10.0 min CN=72 Runoff=0.73 cfs 0.063 af
SubcatchmentS12: Wooded Area	Runoff Area=22,120 sf 44.17% Impervious Runoff Depth=1.61" Flow Length=265' Tc=10.7 min CN=77 Runoff=0.80 cfs 0.068 af
SubcatchmentS13: to CB #5	Runoff Area=20,405 sf 75.25% Impervious Runoff Depth=2.58" Tc=6.0 min CN=89 Runoff=1.37 cfs 0.101 af
SubcatchmentS2: Beechstone Northwest	Runoff Area=28,210 sf 78.29% Impervious Runoff Depth=2.67" Tc=6.0 min CN=90 Runoff=1.95 cfs 0.144 af
SubcatchmentS4: Entrance Drive	Runoff Area=7,305 sf 64.96% Impervious Runoff Depth=2.23" Tc=6.0 min CN=85 Runoff=0.43 cfs 0.031 af
SubcatchmentS7: Stoencroft	Runoff Area=132,300 sf 38.78% Impervious Runoff Depth=1.34" Flow Length=705' Tc=37.4 min CN=73 Runoff=2.34 cfs 0.340 af
SubcatchmentS8: Beechstone Northeast	Runoff Area=30,575 sf 84.14% Impervious Runoff Depth=2.87" Tc=6.0 min CN=92 Runoff=2.23 cfs 0.168 af
Reach 1R: Reach	Avg. Flow Depth=0.00' Max Vel=0.00 fps n=0.035 L=100.0' S=0.0421 '/' Capacity=465.89 cfs Outflow=0.00 cfs 0.000 af
Reach 2R: Reach	Avg. Flow Depth=0.00' Max Vel=0.00 fps n=0.016 L=30.0' S=0.0230 '/' Capacity=753.28 cfs Outflow=0.00 cfs 0.000 af

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Reach 3R: ReachAvg. Flow Depth=0.04' Max Vel=1.25 fps Inflow=0.47 cfs 0.003 af
n=0.016 L=192.0' S=0.0127 '/ Capacity=559.93 cfs Outflow=0.27 cfs 0.003 af**Reach R1: Reach**Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=300.0' S=0.0212 '/ Capacity=181.12 cfs Outflow=0.00 cfs 0.000 af**Pond 1P: DMH #1**Peak Elev=43.41' Storage=25 cf Inflow=0.39 cfs 0.187 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0083 '/ Outflow=0.39 cfs 0.186 af**Pond 3P: RG2 Forebay**Peak Elev=48.80' Storage=405 cf Inflow=1.95 cfs 0.144 af
Outflow=1.95 cfs 0.137 af**Pond 4P: CB #11**Peak Elev=42.34' Storage=45 cf Inflow=5.61 cfs 0.807 af
Outflow=5.63 cfs 0.807 af**Pond 5P: CB #10**Peak Elev=42.25' Storage=36 cf Inflow=4.33 cfs 0.456 af
Outflow=4.34 cfs 0.456 af**Pond 6P: CB #9**Peak Elev=45.60' Storage=54 cf Inflow=3.32 cfs 0.351 af
Primary=2.93 cfs 0.349 af Secondary=0.47 cfs 0.003 af Outflow=3.39 cfs 0.351 af**Pond 10P: Island Retention**Peak Elev=47.31' Storage=734 cf Inflow=0.15 cfs 0.134 af
Outflow=0.14 cfs 0.118 af**Pond P1: 12" Culvert**Peak Elev=44.66' Storage=647 cf Inflow=2.64 cfs 0.321 af
15.0" Round Culvert n=0.025 L=52.0' S=0.0888 '/ Outflow=2.50 cfs 0.321 af**Pond P10: CB #6**Peak Elev=41.75' Storage=13 cf Inflow=4.53 cfs 0.795 af
18.0" Round Culvert n=0.012 L=250.0' S=0.0108 '/ Outflow=4.54 cfs 0.795 af**Pond P2: CB A**Peak Elev=51.82' Storage=11 cf Inflow=1.95 cfs 0.144 af
12.0" Round Culvert n=0.025 L=120.0' S=0.0179 '/ Outflow=1.95 cfs 0.144 af**Pond P3: 12" Culvert**Peak Elev=43.50' Storage=450 cf Inflow=1.71 cfs 0.165 af
12.0" Round Culvert n=0.025 L=50.0' S=0.0028 '/ Outflow=1.40 cfs 0.165 af**Pond P7: CB #7**Peak Elev=49.88' Storage=13 cf Inflow=2.84 cfs 0.508 af
12.0" Round Culvert n=0.025 L=230.0' S=0.0315 '/ Outflow=2.84 cfs 0.508 af**Pond P8: CB B**Peak Elev=50.59' Storage=19 cf Inflow=2.23 cfs 0.168 af
12.0" Round Culvert n=0.025 L=35.0' S=0.0057 '/ Outflow=2.23 cfs 0.168 af**Pond P9: CB #5**Peak Elev=42.79' Storage=17 cf Inflow=4.19 cfs 0.609 af
18.0" Round Culvert n=0.025 L=95.0' S=0.0080 '/ Outflow=4.20 cfs 0.609 af**Pond RG1: Raingarden 1**Peak Elev=47.12' Storage=2,334 cf Inflow=2.61 cfs 0.200 af
Discarded=0.79 cfs 0.200 af Primary=0.00 cfs 0.000 af Outflow=0.79 cfs 0.200 af**Pond RG2: Raingarden 2**Peak Elev=46.92' Storage=512 cf Inflow=0.80 cfs 0.068 af
Outflow=0.39 cfs 0.068 af**Link POA1: POA #1**Inflow=5.63 cfs 0.807 af
Primary=5.63 cfs 0.807 af

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Type III 24-hr 2-Year Rainfall=3.74"

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Link POA2: POA #2

Inflow=4.54 cfs 0.795 af

Primary=4.54 cfs 0.795 af

Total Runoff Area = 12.729 ac Runoff Volume = 1.826 af Average Runoff Depth = 1.72"
50.35% Pervious = 6.409 ac 49.65% Impervious = 6.320 ac

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Type III 24-hr 2-Year Rainfall=3.74"

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Summary for Subcatchment 3S: Wooded Area

Runoff = 1.71 cfs @ 12.20 hrs, Volume= 0.165 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
32,350	61	>75% Grass cover, Good, HSG B
16,400	55	Woods, Good, HSG B
15,300	98	Roofs, HSG B
0	98	Paved parking, HSG B
6,760	98	Unconnected pavement, HSG B
70,810	71	Weighted Average
48,750		68.85% Pervious Area
22,060		31.15% Impervious Area
6,760		30.64% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	100	0.0300	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
3.9	220	0.0350	0.94		Shallow Concentrated Flow, Shallow Woods Woodland Kv= 5.0 fps
1.3	140	0.0150	1.84		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
13.5	460	Total			

Summary for Subcatchment 5S: Beechstone to CB#10

Runoff = 1.40 cfs @ 12.09 hrs, Volume= 0.104 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
3,000	61	>75% Grass cover, Good, HSG B
665	55	Woods, Good, HSG B
4,270	98	Roofs, HSG B
10,270	98	Paved parking, HSG B
1,500	98	Unconnected pavement, HSG B
19,705	91	Weighted Average
3,665		18.60% Pervious Area
16,040		81.40% Impervious Area
1,500		9.35% Unconnected

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

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Type III 24-hr 2-Year Rainfall=3.74"

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Summary for Subcatchment 6S: Beechstone to CB#9

Runoff = 2.51 cfs @ 12.09 hrs, Volume= 0.186 af, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
7,930	61	>75% Grass cover, Good, HSG B
7,175	98	Roofs, HSG B
18,865	98	Paved parking, HSG B
2,400	98	Unconnected pavement, HSG B
36,370	90	Weighted Average
7,930		21.80% Pervious Area
28,440		78.20% Impervious Area
2,400		8.44% Unconnected

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

Summary for Subcatchment 9S: Bld1 1- Parking Lot

Runoff = 0.05 cfs @ 21.96 hrs, Volume= 0.050 af, Depth> 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
2,300	61	>75% Grass cover, Good, HSG B
3,150	98	Roofs, HSG B
0	55	Woods, Good, HSG B
2,490	98	Paved parking, HSG B
* 2,270	98	Porous Pavers, HSG B
1,735	98	Unconnected pavement, HSG B
11,945	91	Weighted Average
2,300		19.25% Pervious Area
9,645		80.75% Impervious Area
1,735		17.99% Unconnected

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

Summary for Subcatchment 14S: Bld1 2- Parking Lot

Runoff = 0.08 cfs @ 21.96 hrs, Volume= 0.072 af, Depth> 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

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Type III 24-hr 2-Year Rainfall=3.74"

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Area (sf)	CN	Description
3,625	61	>75% Grass cover, Good, HSG B
4,640	98	Roofs, HSG B
3,020	98	Paved parking, HSG B
* 4,850	98	Porous Pavers, HSG B
1,600	98	Unconnected pavement, HSG B
17,735	90	Weighted Average
3,625		20.44% Pervious Area
14,110		79.56% Impervious Area
1,600		11.34% Unconnected

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

Summary for Subcatchment S1: Lang Rd

Runoff = 2.64 cfs @ 12.38 hrs, Volume= 0.321 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
40,125	61	>75% Grass cover, Good, HSG B
37,300	55	Woods, Good, HSG B
38,610	98	Paved parking, HSG B
6,100	98	Roofs, HSG B
2,785	98	Unconnected pavement, HSG B
124,920	73	Weighted Average
77,425		61.98% Pervious Area
47,495		38.02% Impervious Area
2,785		5.86% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	75	0.0200	0.07		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.23"
8.3	500	0.0400	1.00		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
25.3	575	Total			

Summary for Subcatchment S10B: Island

Runoff = 0.14 cfs @ 12.11 hrs, Volume= 0.012 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

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Type III 24-hr 2-Year Rainfall=3.74"

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Area (sf)	CN	Description
5,705	61	>75% Grass cover, Good, HSG B
0	79	<50% Grass cover, Poor, HSG B
0	98	Roofs, HSG B
0	55	Woods, Good, HSG B
815	98	Paved parking, HSG B
0	98	Unconnected pavement, HSG B
6,520	66	Weighted Average
5,705		87.50% Pervious Area
815		12.50% Impervious Area

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

Summary for Subcatchment S11: Behind Bldgs

Runoff = 0.73 cfs @ 12.15 hrs, Volume= 0.063 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
17,850	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
5,515	98	Roofs, HSG B
0	98	Paved parking, HSG B
2,200	98	Unconnected pavement, HSG B
25,565	72	Weighted Average
17,850		69.82% Pervious Area
7,715		30.18% Impervious Area
2,200		28.52% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	40	0.0050	0.08		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.23"
1.8	120	0.0250	1.11		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
10.0	160	Total			

Summary for Subcatchment S12: Wooded Area

Runoff = 0.80 cfs @ 12.16 hrs, Volume= 0.068 af, Depth= 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

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Type III 24-hr 2-Year Rainfall=3.74"

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Area (sf)	CN	Description
12,350	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
6,870	98	Roofs, HSG B
450	98	Paved parking, HSG B
2,450	98	Unconnected pavement, HSG B
22,120	77	Weighted Average
12,350		55.83% Pervious Area
9,770		44.17% Impervious Area
2,450		25.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	40	0.0050	0.08		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.5	225	0.0100	1.50		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
10.7	265	Total			

Summary for Subcatchment S13: to CB #5

Runoff = 1.37 cfs @ 12.09 hrs, Volume= 0.101 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
5,050	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
0	55	Woods, Good, HSG B
14,530	98	Paved parking, HSG B
825	98	Unconnected pavement, HSG B
20,405	89	Weighted Average
5,050		24.75% Pervious Area
15,355		75.25% Impervious Area
825		5.37% Unconnected

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

Summary for Subcatchment S2: Beechstone Northwest

Runoff = 1.95 cfs @ 12.09 hrs, Volume= 0.144 af, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

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Area (sf)	CN	Description
6,125	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
1,625	98	Unconnected pavement, HSG B
4,810	98	Roofs, HSG B
15,650	98	Paved parking, HSG B
28,210	90	Weighted Average
6,125		21.71% Pervious Area
22,085		78.29% Impervious Area
1,625		7.36% Unconnected

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

Summary for Subcatchment S4: Entrance Drive

Runoff = 0.43 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
2,560	61	>75% Grass cover, Good, HSG B
4,520	98	Paved parking, HSG B
225	98	Unconnected pavement, HSG B
7,305	85	Weighted Average
2,560		35.04% Pervious Area
4,745		64.96% Impervious Area
225		4.74% Unconnected

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

Summary for Subcatchment S7: Stoencroft

Runoff = 2.34 cfs @ 12.55 hrs, Volume= 0.340 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

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Area (sf)	CN	Description
33,000	61	>75% Grass cover, Good, HSG B
48,000	55	Woods, Good, HSG B
16,920	98	Roofs, HSG B
32,180	98	Paved parking, HSG B
2,200	98	Unconnected pavement, HSG B
132,300	73	Weighted Average
81,000		61.22% Pervious Area
51,300		38.78% Impervious Area
2,200		4.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	80	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.23"
19.2	575	0.0100	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
37.4	705	Total			

Summary for Subcatchment S8: Beechstone Northeast

Runoff = 2.23 cfs @ 12.09 hrs, Volume= 0.168 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.74"

Area (sf)	CN	Description
4,850	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
6,100	98	Roofs, HSG B
17,650	98	Paved parking, HSG B
1,975	98	Unconnected pavement, HSG B
30,575	92	Weighted Average
4,850		15.86% Pervious Area
25,725		84.14% Impervious Area
1,975		7.68% Unconnected

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

Summary for Reach 1R: Reach

Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

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Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

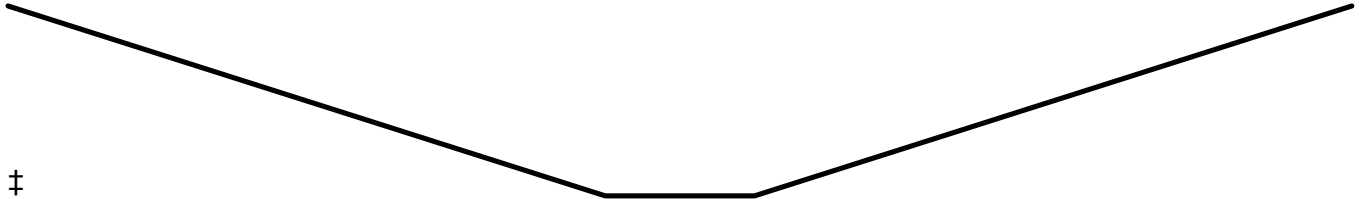
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 465.89 cfs

5.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds

Side Slope Z-value= 10.0 '/' Top Width= 45.00'

Length= 100.0' Slope= 0.0421 '/'

Inlet Invert= 42.21', Outlet Invert= 38.00'

**Summary for Reach 2R: Reach**

Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 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'

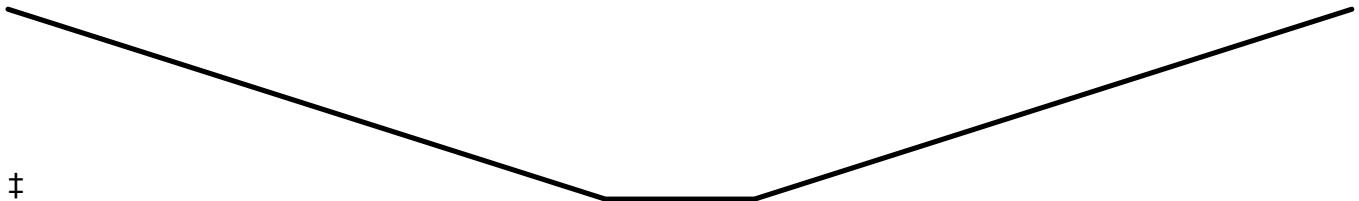
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 753.28 cfs

5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 10.0 '/' Top Width= 45.00'

Length= 30.0' Slope= 0.0230 '/'

Inlet Invert= 42.90', Outlet Invert= 42.21'

**Summary for Reach 3R: Reach**

Inflow = 0.47 cfs @ 12.11 hrs, Volume= 0.003 af

Outflow = 0.27 cfs @ 12.19 hrs, Volume= 0.003 af, Atten= 42%, Lag= 5.3 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.25 fps, Min. Travel Time= 2.6 min

Avg. Velocity= 0.82 fps, Avg. Travel Time= 3.9 min

Peak Storage= 46 cf @ 12.15 hrs

Average Depth at Peak Storage= 0.04'

Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 559.93 cfs

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5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 10.0 '/' Top Width= 45.00'

Length= 192.0' Slope= 0.0127 '/'

Inlet Invert= 45.34', Outlet Invert= 42.90'

**Summary for Reach R1: Reach**

Inflow Area = 1.235 ac, 55.42% Impervious, Inflow Depth = 0.00" for 2-Year event

Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 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 @ 1.00 hrs

Average Depth at Peak Storage= 0.00'

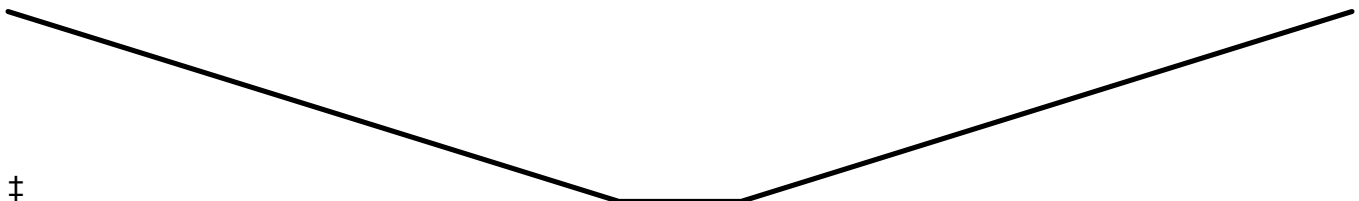
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 181.12 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding

Side Slope Z-value= 5.0 '/' Top Width= 22.00'

Length= 300.0' Slope= 0.0212 '/'

Inlet Invert= 48.76', Outlet Invert= 42.41'

**Summary for Pond 1P: DMH #1**

Inflow Area = 1.339 ac, 58.88% Impervious, Inflow Depth > 1.67" for 2-Year event

Inflow = 0.39 cfs @ 12.43 hrs, Volume= 0.187 af

Outflow = 0.39 cfs @ 12.42 hrs, Volume= 0.186 af, Atten= 0%, Lag= 0.0 min

Primary = 0.39 cfs @ 12.42 hrs, Volume= 0.186 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 43.41' @ 12.42 hrs Surf.Area= 13 sf Storage= 25 cf

Plug-Flow detention time= 3.3 min calculated for 0.186 af (100% of inflow)

Center-of-Mass det. time= 1.7 min (1,196.4 - 1,194.7)

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Volume	Invert	Avail.Storage	Storage Description
#1	41.42'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	43.10'	12.0" Round Culvert L= 90.0' Ke= 0.500 Inlet / Outlet Invert= 43.10' / 42.35' S= 0.0083 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.42 hrs HW=43.41' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.39 cfs @ 2.80 fps)**Summary for Pond 3P: RG2 Forebay**

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 2.67" for 2-Year event
 Inflow = 1.95 cfs @ 12.09 hrs, Volume= 0.144 af
 Outflow = 1.95 cfs @ 12.10 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.5 min
 Primary = 1.95 cfs @ 12.10 hrs, Volume= 0.137 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 48.80' @ 12.10 hrs Surf.Area= 413 sf Storage= 405 cf

Plug-Flow detention time= 43.5 min calculated for 0.137 af (95% of inflow)
 Center-of-Mass det. time= 16.2 min (817.5 - 801.3)

Volume	Invert	Avail.Storage	Storage Description
#1	47.50'	469 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.50	175	0.0	0	0
49.00	450	100.0	469	469

Device	Routing	Invert	Outlet Devices
#1	Primary	48.50'	5.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.95 cfs @ 12.10 hrs HW=48.80' (Free Discharge)↑**1=Broad-Crested Rectangular Weir** (Weir Controls 1.95 cfs @ 1.32 fps)**Summary for Pond 4P: CB #11**

Inflow Area = 7.183 ac, 47.49% Impervious, Inflow Depth = 1.35" for 2-Year event
 Inflow = 5.61 cfs @ 12.14 hrs, Volume= 0.807 af
 Outflow = 5.63 cfs @ 12.10 hrs, Volume= 0.807 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.63 cfs @ 12.10 hrs, Volume= 0.807 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

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Peak Elev= 42.34' @ 12.10 hrs Surf.Area= 37 sf Storage= 45 cf

Plug-Flow detention time= 0.2 min calculated for 0.806 af (100% of inflow)

Center-of-Mass det. time= 0.2 min (846.8 - 846.6)

Volume	Invert	Avail.Storage	Storage Description
#1	38.84'	42 cf	4.00'D x 3.37'H Vertical Cone/Cylinder
#2	42.21'	43 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		86 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.21	10	0	0
43.00	100	43	43

Device	Routing	Invert	Outlet Devices
#1	Primary	38.84'	15.0" Round Culvert L= 102.0' Ke= 0.500 Inlet / Outlet Invert= 38.84' / 38.00' S= 0.0082 1' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf
#2	Primary	42.21'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=5.63 cfs @ 12.10 hrs HW=42.34' (Free Discharge)

1=Culvert (Barrel Controls 5.39 cfs @ 4.40 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 0.24 cfs @ 0.92 fps)

Summary for Pond 5P: CB #10

Inflow Area = 4.147 ac, 53.33% Impervious, Inflow Depth = 1.32" for 2-Year event
 Inflow = 4.33 cfs @ 12.11 hrs, Volume= 0.456 af
 Outflow = 4.34 cfs @ 12.11 hrs, Volume= 0.456 af, Atten= 0%, Lag= 0.2 min
 Primary = 4.34 cfs @ 12.11 hrs, Volume= 0.456 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 42.25' @ 12.11 hrs Surf.Area= 13 sf Storage= 36 cf

Plug-Flow detention time= 0.2 min calculated for 0.455 af (100% of inflow)

Center-of-Mass det. time= 0.2 min (826.4 - 826.2)

Volume	Invert	Avail.Storage	Storage Description
#1	39.35'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder
#2	42.90'	63 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		108 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.90	10	0	0
43.50	200	63	63

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Device	Routing	Invert	Outlet Devices
#1	Primary	39.35'	12.0" Round Culvert L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 39.35' / 38.89' S= 0.0153 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Primary	42.90'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=4.29 cfs @ 12.11 hrs HW=42.20' (Free Discharge)

1=Culvert (Barrel Controls 4.29 cfs @ 5.46 fps)

2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 6P: CB #9

Inflow Area = 3.695 ac, 49.89% Impervious, Inflow Depth = 1.14" for 2-Year event
 Inflow = 3.32 cfs @ 12.10 hrs, Volume= 0.351 af
 Outflow = 3.39 cfs @ 12.11 hrs, Volume= 0.351 af, Atten= 0%, Lag= 0.2 min
 Primary = 2.93 cfs @ 12.12 hrs, Volume= 0.349 af
 Secondary = 0.47 cfs @ 12.11 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 45.60' @ 12.12 hrs Surf.Area= 98 sf Storage= 54 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 0.3 min (834.9 - 834.6)

Volume	Invert	Avail.Storage	Storage Description
#1	42.03'	42 cf	4.00'D x 3.31'H Vertical Cone/Cylinder
#2	45.34'	69 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		111 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.34	10	0	0
46.00	200	69	69

Device	Routing	Invert	Outlet Devices
#1	Primary	42.03'	12.0" Round Culvert L= 192.0' Ke= 0.500 Inlet / Outlet Invert= 42.03' / 39.47' S= 0.0133 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	45.34'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

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Primary OutFlow Max=2.90 cfs @ 12.12 hrs HW=45.50' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.90 cfs @ 3.69 fps)**Secondary OutFlow** Max=0.43 cfs @ 12.11 hrs HW=45.53' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.43 cfs @ 1.11 fps)**Summary for Pond 10P: Island Retention**

Inflow Area = 0.831 ac, 67.87% Impervious, Inflow Depth > 1.94" for 2-Year event
 Inflow = 0.15 cfs @ 12.11 hrs, Volume= 0.134 af
 Outflow = 0.14 cfs @ 22.17 hrs, Volume= 0.118 af, Atten= 6%, Lag= 604.1 min
 Primary = 0.14 cfs @ 22.17 hrs, Volume= 0.118 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 47.31' @ 22.17 hrs Surf.Area= 2,051 sf Storage= 734 cf

Plug-Flow detention time= 121.7 min calculated for 0.118 af (88% of inflow)

Center-of-Mass det. time= 68.6 min (1,387.0 - 1,318.4)

Volume	Invert	Avail.Storage	Storage Description	
#1	47.00'	2,400 cf	Custom Stage Data (Prismatic) Listed below	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	1,500	0.0	0	0
48.00	3,300	100.0	2,400	2,400
Device	Routing	Invert	Outlet Devices	
#1	Primary	43.50'	12.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.50' / 43.20' S= 0.0055 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf	
#2	Device 1	47.25'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	

Primary OutFlow Max=0.14 cfs @ 22.17 hrs HW=47.31' (Free Discharge)↑**1=Culvert** (Passes 0.14 cfs of 6.44 cfs potential flow)↑**2=Orifice/Grate** (Weir Controls 0.14 cfs @ 0.77 fps)**Summary for Pond P1: 12" Culvert**

Inflow Area = 2.868 ac, 38.02% Impervious, Inflow Depth = 1.34" for 2-Year event
 Inflow = 2.64 cfs @ 12.38 hrs, Volume= 0.321 af
 Outflow = 2.50 cfs @ 12.46 hrs, Volume= 0.321 af, Atten= 5%, Lag= 5.3 min
 Primary = 2.50 cfs @ 12.46 hrs, Volume= 0.321 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 44.66' @ 12.46 hrs Surf.Area= 1,423 sf Storage= 647 cf

Plug-Flow detention time= 5.5 min calculated for 0.321 af (100% of inflow)

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Center-of-Mass det. time= 4.4 min (878.0 - 873.6)

Volume	Invert	Avail.Storage	Storage Description
#1	43.50'	1,228 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.50	10	0	0
44.00	300	78	78
45.00	2,000	1,150	1,228

Device	Routing	Invert	Outlet Devices
#1	Primary	43.74'	15.0" Round Culvert L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 43.74' / 39.12' S= 0.0888 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=2.49 cfs @ 12.46 hrs HW=44.66' (Free Discharge)↑**1=Culvert** (Inlet Controls 2.49 cfs @ 2.58 fps)**Summary for Pond P10: CB #6**

Inflow Area = 5.546 ac, 52.45% Impervious, Inflow Depth > 1.72" for 2-Year event
 Inflow = 4.53 cfs @ 12.10 hrs, Volume= 0.795 af
 Outflow = 4.54 cfs @ 12.10 hrs, Volume= 0.795 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.54 cfs @ 12.10 hrs, Volume= 0.795 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 41.75' @ 12.10 hrs Surf.Area= 13 sf Storage= 13 cf

Plug-Flow detention time= 0.1 min calculated for 0.795 af (100% of inflow)

Center-of-Mass det. time= 0.1 min (928.5 - 928.5)

Volume	Invert	Avail.Storage	Storage Description
#1	40.71'	65 cf	4.00'D x 5.15'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	40.71'	18.0" Round Culvert L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 40.71' / 38.00' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.50 cfs @ 12.10 hrs HW=41.74' (Free Discharge)↑**1=Culvert** (Inlet Controls 4.50 cfs @ 3.46 fps)**Summary for Pond P2: CB A**

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 2.67" for 2-Year event
 Inflow = 1.95 cfs @ 12.09 hrs, Volume= 0.144 af
 Outflow = 1.95 cfs @ 12.09 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.95 cfs @ 12.09 hrs, Volume= 0.144 af

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Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 51.82' @ 12.09 hrs Surf.Area= 13 sf Storage= 11 cf

Plug-Flow detention time= 0.3 min calculated for 0.144 af (100% of inflow)

Center-of-Mass det. time= 0.3 min (801.3 - 801.0)

Volume	Invert	Avail.Storage	Storage Description
#1	50.93'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	50.92'	12.0" Round Culvert L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 50.92' / 48.77' S= 0.0179 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=1.91 cfs @ 12.09 hrs HW=51.81' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.91 cfs @ 3.44 fps)**Summary for Pond P3: 12" Culvert**

Inflow Area = 2.860 ac, 41.63% Impervious, Inflow Depth = 0.69" for 2-Year event

Inflow = 1.71 cfs @ 12.20 hrs, Volume= 0.165 af

Outflow = 1.40 cfs @ 12.32 hrs, Volume= 0.165 af, Atten= 18%, Lag= 7.0 min

Primary = 1.40 cfs @ 12.32 hrs, Volume= 0.165 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 43.50' @ 12.32 hrs Surf.Area= 1,144 sf Storage= 450 cf

Plug-Flow detention time= 3.8 min calculated for 0.165 af (100% of inflow)

Center-of-Mass det. time= 3.8 min (872.5 - 868.7)

Volume	Invert	Avail.Storage	Storage Description
#1	42.41'	1,241 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.41	10	0	0
43.00	300	91	91
44.00	2,000	1,150	1,241

Device	Routing	Invert	Outlet Devices
#1	Primary	42.41'	12.0" Round Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.41' / 42.27' S= 0.0028 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=1.39 cfs @ 12.32 hrs HW=43.49' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.39 cfs @ 2.04 fps)

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Summary for Pond P7: CB #7

Inflow Area = 3.739 ac, 47.29% Impervious, Inflow Depth = 1.63" for 2-Year event
 Inflow = 2.84 cfs @ 12.11 hrs, Volume= 0.508 af
 Outflow = 2.84 cfs @ 12.11 hrs, Volume= 0.508 af, Atten= 0%, Lag= 0.1 min
 Primary = 2.84 cfs @ 12.11 hrs, Volume= 0.508 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 49.88' @ 12.11 hrs Surf.Area= 13 sf Storage= 13 cf

Plug-Flow detention time= 0.2 min calculated for 0.508 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (854.5 - 854.4)

Volume	Invert	Avail.Storage	Storage Description
#1	48.82'	40 cf	4.00'D x 3.18'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	48.82'	12.0" Round Culvert L= 230.0' Ke= 0.500 Inlet / Outlet Invert= 48.82' / 41.57' S= 0.0315 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=2.81 cfs @ 12.11 hrs HW=49.87' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 2.81 cfs @ 3.57 fps)

Summary for Pond P8: CB B

Inflow Area = 0.702 ac, 84.14% Impervious, Inflow Depth = 2.87" for 2-Year event
 Inflow = 2.23 cfs @ 12.09 hrs, Volume= 0.168 af
 Outflow = 2.23 cfs @ 12.09 hrs, Volume= 0.168 af, Atten= 0%, Lag= 0.2 min
 Primary = 2.23 cfs @ 12.09 hrs, Volume= 0.168 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 50.59' @ 12.09 hrs Surf.Area= 13 sf Storage= 19 cf

Plug-Flow detention time= 0.5 min calculated for 0.168 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (792.7 - 792.3)

Volume	Invert	Avail.Storage	Storage Description
#1	49.10'	38 cf	4.00'D x 3.00'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	12.0" Round Culvert L= 35.0' Ke= 0.500 Inlet / Outlet Invert= 49.10' / 48.90' S= 0.0057 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=2.16 cfs @ 12.09 hrs HW=50.55' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 2.16 cfs @ 2.75 fps)

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Summary for Pond P9: CB #5

Inflow Area = 4.208 ac, 50.40% Impervious, Inflow Depth = 1.74" for 2-Year event
 Inflow = 4.19 cfs @ 12.10 hrs, Volume= 0.609 af
 Outflow = 4.20 cfs @ 12.10 hrs, Volume= 0.609 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.20 cfs @ 12.10 hrs, Volume= 0.609 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 42.79' @ 12.10 hrs Surf.Area= 13 sf Storage= 17 cf

Plug-Flow detention time= 0.2 min calculated for 0.609 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (846.5 - 846.3)

Volume	Invert	Avail.Storage	Storage Description
#1	41.42'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	41.42'	18.0" Round Culvert L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 41.42' / 40.66' S= 0.0080 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf

Primary OutFlow Max=4.19 cfs @ 12.10 hrs HW=42.79' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 4.19 cfs @ 3.26 fps)

Summary for Pond RG1: Raingarden 1

Inflow Area = 1.235 ac, 55.42% Impervious, Inflow Depth = 1.94" for 2-Year event
 Inflow = 2.61 cfs @ 12.11 hrs, Volume= 0.200 af
 Outflow = 0.79 cfs @ 12.49 hrs, Volume= 0.200 af, Atten= 70%, Lag= 22.8 min
 Discarded = 0.79 cfs @ 12.49 hrs, Volume= 0.200 af
 Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 47.12' @ 12.49 hrs Surf.Area= 1,561 sf Storage= 2,334 cf

Plug-Flow detention time= 28.7 min calculated for 0.199 af (100% of inflow)
 Center-of-Mass det. time= 28.6 min (860.2 - 831.6)

Volume	Invert	Avail.Storage	Storage Description
#1	43.25'	3,650 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.25	1,000	0.0	0	0
44.25	1,000	40.0	400	400
45.75	1,000	10.0	150	550
46.00	1,000	40.0	100	650
48.00	2,000	100.0	3,000	3,650

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Type III 24-hr 2-Year Rainfall=3.74"

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Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	5.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	43.25'	2.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 43.00'

Discarded OutFlow Max=0.79 cfs @ 12.49 hrs HW=47.12' (Free Discharge)↑ **2=Exfiltration** (Controls 0.79 cfs)**Primary OutFlow** Max=0.00 cfs @ 1.00 hrs HW=43.25' (Free Discharge)↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond RG2: Raingarden 2**

Inflow Area = 0.508 ac, 44.17% Impervious, Inflow Depth = 1.61" for 2-Year event
Inflow = 0.80 cfs @ 12.16 hrs, Volume= 0.068 af
Outflow = 0.39 cfs @ 12.43 hrs, Volume= 0.068 af, Atten= 51%, Lag= 16.4 min
Primary = 0.39 cfs @ 12.43 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 46.92' @ 12.43 hrs Surf.Area= 561 sf Storage= 512 cf

Plug-Flow detention time= 12.3 min calculated for 0.068 af (100% of inflow)

Center-of-Mass det. time= 12.3 min (860.6 - 848.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	43.75'	1,260 cf	Custom Stage Data (Prismatic) Listed below	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.75	400	0.0	0	0
44.75	400	33.0	132	132
46.25	400	10.0	60	192
46.50	400	33.0	33	225
48.00	980	100.0	1,035	1,260

Device	Routing	Invert	Outlet Devices
#1	Primary	43.50'	12.0" Round Culvert L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.50' / 43.20' S= 0.0065 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	47.50'	18.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	43.75'	3.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 43.50'

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Primary OutFlow Max=0.39 cfs @ 12.43 hrs HW=46.91' (Free Discharge)

↑ **1=Culvert** (Passes 0.39 cfs of 6.28 cfs potential flow)

↑ **2=Orifice/Grate** (Controls 0.00 cfs)

↑ **3=Exfiltration** (Controls 0.39 cfs)

Summary for Link POA1: POA #1

Inflow Area = 7.183 ac, 47.49% Impervious, Inflow Depth = 1.35" for 2-Year event

Inflow = 5.63 cfs @ 12.10 hrs, Volume= 0.807 af

Primary = 5.63 cfs @ 12.10 hrs, Volume= 0.807 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Summary for Link POA2: POA #2

Inflow Area = 5.546 ac, 52.45% Impervious, Inflow Depth > 1.72" for 2-Year event

Inflow = 4.54 cfs @ 12.10 hrs, Volume= 0.795 af

Primary = 4.54 cfs @ 12.10 hrs, Volume= 0.795 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

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Time span=1.00-30.00 hrs, dt=0.05 hrs, 581 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment3S: Wooded Area	Runoff Area=70,810 sf 31.15% Impervious Runoff Depth=2.64" Flow Length=460' Tc=13.5 min CN=71 Runoff=3.89 cfs 0.357 af
Subcatchment5S: Beechstone to CB#10	Runoff Area=19,705 sf 81.40% Impervious Runoff Depth=4.63" Tc=6.0 min CN=91 Runoff=2.28 cfs 0.175 af
Subcatchment6S: Beechstone to CB#9	Runoff Area=36,370 sf 78.20% Impervious Runoff Depth=4.52" Tc=6.0 min CN=90 Runoff=4.14 cfs 0.315 af
Subcatchment9S: Bld1 1- Parking Lot	Runoff Area=11,945 sf 80.75% Impervious Runoff Depth>3.73" Tc=790.0 min CN=91 Runoff=0.09 cfs 0.085 af
Subcatchment14S: Bld1 2- Parking Lot	Runoff Area=17,735 sf 79.56% Impervious Runoff Depth>3.63" Tc=790.0 min CN=90 Runoff=0.13 cfs 0.123 af
SubcatchmentS1: Lang Rd	Runoff Area=124,920 sf 38.02% Impervious Runoff Depth=2.82" Flow Length=575' Tc=25.3 min CN=73 Runoff=5.75 cfs 0.673 af
SubcatchmentS10B: Island	Runoff Area=6,520 sf 12.50% Impervious Runoff Depth=2.20" Tc=6.0 min CN=66 Runoff=0.37 cfs 0.027 af
SubcatchmentS11: Behind Bldgs	Runoff Area=25,565 sf 30.18% Impervious Runoff Depth=2.73" Flow Length=160' Tc=10.0 min CN=72 Runoff=1.61 cfs 0.133 af
SubcatchmentS12: Wooded Area	Runoff Area=22,120 sf 44.17% Impervious Runoff Depth=3.19" Flow Length=265' Tc=10.7 min CN=77 Runoff=1.61 cfs 0.135 af
SubcatchmentS13: to CB #5	Runoff Area=20,405 sf 75.25% Impervious Runoff Depth=4.42" Tc=6.0 min CN=89 Runoff=2.28 cfs 0.172 af
SubcatchmentS2: Beechstone Northwest	Runoff Area=28,210 sf 78.29% Impervious Runoff Depth=4.52" Tc=6.0 min CN=90 Runoff=3.21 cfs 0.244 af
SubcatchmentS4: Entrance Drive	Runoff Area=7,305 sf 64.96% Impervious Runoff Depth=3.99" Tc=6.0 min CN=85 Runoff=0.76 cfs 0.056 af
SubcatchmentS7: Stoencroft	Runoff Area=132,300 sf 38.78% Impervious Runoff Depth=2.82" Flow Length=705' Tc=37.4 min CN=73 Runoff=5.08 cfs 0.713 af
SubcatchmentS8: Beechstone Northeast	Runoff Area=30,575 sf 84.14% Impervious Runoff Depth=4.75" Tc=6.0 min CN=92 Runoff=3.59 cfs 0.278 af
Reach 1R: Reach	Avg. Flow Depth=0.00' Max Vel=0.00 fps n=0.035 L=100.0' S=0.0421 '/' Capacity=465.89 cfs Outflow=0.00 cfs 0.000 af
Reach 2R: Reach	Avg. Flow Depth=0.00' Max Vel=0.00 fps n=0.016 L=30.0' S=0.0230 '/' Capacity=753.28 cfs Outflow=0.00 cfs 0.000 af

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Reach 3R: ReachAvg. Flow Depth=0.21' Max Vel=3.11 fps Inflow=5.75 cfs 0.113 af
n=0.016 L=192.0' S=0.0127 '/ Capacity=559.93 cfs Outflow=4.25 cfs 0.113 af**Reach R1: Reach**Avg. Flow Depth=0.28' Max Vel=2.44 fps Inflow=2.59 cfs 0.052 af
n=0.030 L=300.0' S=0.0212 '/ Capacity=181.12 cfs Outflow=2.23 cfs 0.052 af**Pond 1P: DMH #1**Peak Elev=43.72' Storage=29 cf Inflow=1.37 cfs 0.354 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0083 '/ Outflow=1.36 cfs 0.354 af**Pond 3P: RG2 Forebay**Peak Elev=48.90' Storage=438 cf Inflow=3.20 cfs 0.244 af
Outflow=3.18 cfs 0.237 af**Pond 4P: CB #11**Peak Elev=43.53' Storage=86 cf Inflow=14.71 cfs 1.627 af
Outflow=14.69 cfs 1.627 af**Pond 5P: CB #10**Peak Elev=43.61' Storage=108 cf Inflow=8.25 cfs 0.899 af
Outflow=8.54 cfs 0.899 af**Pond 6P: CB #9**Peak Elev=46.39' Storage=111 cf Inflow=8.79 cfs 0.724 af
Primary=3.14 cfs 0.611 af Secondary=5.75 cfs 0.113 af Outflow=8.89 cfs 0.724 af**Pond 10P: Island Retention**Peak Elev=47.33' Storage=791 cf Inflow=0.38 cfs 0.236 af
Outflow=0.23 cfs 0.219 af**Pond P1: 12" Culvert**Peak Elev=45.96' Storage=1,228 cf Inflow=5.75 cfs 0.673 af
15.0" Round Culvert n=0.025 L=52.0' S=0.0888 '/ Outflow=5.90 cfs 0.673 af**Pond P10: CB #6**Peak Elev=42.36' Storage=21 cf Inflow=8.10 cfs 1.517 af
18.0" Round Culvert n=0.012 L=250.0' S=0.0108 '/ Outflow=8.08 cfs 1.517 af**Pond P2: CB A**Peak Elev=53.74' Storage=35 cf Inflow=3.21 cfs 0.244 af
12.0" Round Culvert n=0.025 L=120.0' S=0.0179 '/ Outflow=3.20 cfs 0.244 af**Pond P3: 12" Culvert**Peak Elev=52.28' Storage=1,241 cf Inflow=5.52 cfs 0.409 af
12.0" Round Culvert n=0.025 L=50.0' S=0.0028 '/ Outflow=6.82 cfs 0.409 af**Pond P7: CB #7**Peak Elev=68.20' Storage=40 cf Inflow=5.90 cfs 0.991 af
12.0" Round Culvert n=0.025 L=230.0' S=0.0315 '/ Outflow=6.01 cfs 0.991 af**Pond P8: CB B**Peak Elev=51.70' Storage=33 cf Inflow=3.59 cfs 0.278 af
12.0" Round Culvert n=0.025 L=35.0' S=0.0057 '/ Outflow=3.59 cfs 0.278 af**Pond P9: CB #5**Peak Elev=44.49' Storage=39 cf Inflow=7.69 cfs 1.163 af
18.0" Round Culvert n=0.025 L=95.0' S=0.0080 '/ Outflow=7.69 cfs 1.163 af**Pond RG1: Raingarden 1**Peak Elev=47.86' Storage=3,433 cf Inflow=4.70 cfs 0.370 af
Discarded=0.95 cfs 0.318 af Primary=2.59 cfs 0.052 af Outflow=3.54 cfs 0.370 af**Pond RG2: Raingarden 2**Peak Elev=47.65' Storage=1,017 cf Inflow=1.61 cfs 0.135 af
Outflow=1.37 cfs 0.135 af**Link POA1: POA #1**Inflow=14.69 cfs 1.627 af
Primary=14.69 cfs 1.627 af

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Link POA2: POA #2

Inflow=8.08 cfs 1.517 af

Primary=8.08 cfs 1.517 af

Total Runoff Area = 12.729 ac Runoff Volume = 3.487 af Average Runoff Depth = 3.29"
50.35% Pervious = 6.409 ac 49.65% Impervious = 6.320 ac

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Summary for Subcatchment 3S: Wooded Area

Runoff = 3.89 cfs @ 12.19 hrs, Volume= 0.357 af, Depth= 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
32,350	61	>75% Grass cover, Good, HSG B
16,400	55	Woods, Good, HSG B
15,300	98	Roofs, HSG B
0	98	Paved parking, HSG B
6,760	98	Unconnected pavement, HSG B
70,810	71	Weighted Average
48,750		68.85% Pervious Area
22,060		31.15% Impervious Area
6,760		30.64% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	100	0.0300	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
3.9	220	0.0350	0.94		Shallow Concentrated Flow, Shallow Woods Woodland Kv= 5.0 fps
1.3	140	0.0150	1.84		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
13.5	460	Total			

Summary for Subcatchment 5S: Beechstone to CB#10

Runoff = 2.28 cfs @ 12.09 hrs, Volume= 0.175 af, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
3,000	61	>75% Grass cover, Good, HSG B
665	55	Woods, Good, HSG B
4,270	98	Roofs, HSG B
10,270	98	Paved parking, HSG B
1,500	98	Unconnected pavement, HSG B
19,705	91	Weighted Average
3,665		18.60% Pervious Area
16,040		81.40% Impervious Area
1,500		9.35% Unconnected

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

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Type III 24-hr 10-Year Rainfall=5.67"

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Summary for Subcatchment 6S: Beechstone to CB#9

Runoff = 4.14 cfs @ 12.09 hrs, Volume= 0.315 af, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
7,930	61	>75% Grass cover, Good, HSG B
7,175	98	Roofs, HSG B
18,865	98	Paved parking, HSG B
2,400	98	Unconnected pavement, HSG B
36,370	90	Weighted Average
7,930		21.80% Pervious Area
28,440		78.20% Impervious Area
2,400		8.44% Unconnected

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

Summary for Subcatchment 9S: Bld1 1- Parking Lot

Runoff = 0.09 cfs @ 21.95 hrs, Volume= 0.085 af, Depth> 3.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
2,300	61	>75% Grass cover, Good, HSG B
3,150	98	Roofs, HSG B
0	55	Woods, Good, HSG B
2,490	98	Paved parking, HSG B
* 2,270	98	Porous Pavers, HSG B
1,735	98	Unconnected pavement, HSG B
11,945	91	Weighted Average
2,300		19.25% Pervious Area
9,645		80.75% Impervious Area
1,735		17.99% Unconnected

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

Summary for Subcatchment 14S: Bld1 2- Parking Lot

Runoff = 0.13 cfs @ 21.96 hrs, Volume= 0.123 af, Depth> 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

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Type III 24-hr 10-Year Rainfall=5.67"

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Area (sf)	CN	Description
3,625	61	>75% Grass cover, Good, HSG B
4,640	98	Roofs, HSG B
3,020	98	Paved parking, HSG B
* 4,850	98	Porous Pavers, HSG B
1,600	98	Unconnected pavement, HSG B
17,735	90	Weighted Average
3,625		20.44% Pervious Area
14,110		79.56% Impervious Area
1,600		11.34% Unconnected

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

Summary for Subcatchment S1: Lang Rd

Runoff = 5.75 cfs @ 12.36 hrs, Volume= 0.673 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
40,125	61	>75% Grass cover, Good, HSG B
37,300	55	Woods, Good, HSG B
38,610	98	Paved parking, HSG B
6,100	98	Roofs, HSG B
2,785	98	Unconnected pavement, HSG B
124,920	73	Weighted Average
77,425		61.98% Pervious Area
47,495		38.02% Impervious Area
2,785		5.86% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	75	0.0200	0.07		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.23"
8.3	500	0.0400	1.00		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
25.3	575	Total			

Summary for Subcatchment S10B: Island

Runoff = 0.37 cfs @ 12.10 hrs, Volume= 0.027 af, Depth= 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

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Type III 24-hr 10-Year Rainfall=5.67"

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Area (sf)	CN	Description
5,705	61	>75% Grass cover, Good, HSG B
0	79	<50% Grass cover, Poor, HSG B
0	98	Roofs, HSG B
0	55	Woods, Good, HSG B
815	98	Paved parking, HSG B
0	98	Unconnected pavement, HSG B
6,520	66	Weighted Average
5,705		87.50% Pervious Area
815		12.50% Impervious Area

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

Summary for Subcatchment S11: Behind Bldgs

Runoff = 1.61 cfs @ 12.15 hrs, Volume= 0.133 af, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
17,850	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
5,515	98	Roofs, HSG B
0	98	Paved parking, HSG B
2,200	98	Unconnected pavement, HSG B
25,565	72	Weighted Average
17,850		69.82% Pervious Area
7,715		30.18% Impervious Area
2,200		28.52% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	40	0.0050	0.08		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.23"
1.8	120	0.0250	1.11		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
10.0	160	Total			

Summary for Subcatchment S12: Wooded Area

Runoff = 1.61 cfs @ 12.15 hrs, Volume= 0.135 af, Depth= 3.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

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Type III 24-hr 10-Year Rainfall=5.67"

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Area (sf)	CN	Description
12,350	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
6,870	98	Roofs, HSG B
450	98	Paved parking, HSG B
2,450	98	Unconnected pavement, HSG B
22,120	77	Weighted Average
12,350		55.83% Pervious Area
9,770		44.17% Impervious Area
2,450		25.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	40	0.0050	0.08		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.5	225	0.0100	1.50		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
10.7	265	Total			

Summary for Subcatchment S13: to CB #5

Runoff = 2.28 cfs @ 12.09 hrs, Volume= 0.172 af, Depth= 4.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
5,050	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
0	55	Woods, Good, HSG B
14,530	98	Paved parking, HSG B
825	98	Unconnected pavement, HSG B
20,405	89	Weighted Average
5,050		24.75% Pervious Area
15,355		75.25% Impervious Area
825		5.37% Unconnected

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

Summary for Subcatchment S2: Beechstone Northwest

Runoff = 3.21 cfs @ 12.09 hrs, Volume= 0.244 af, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

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Type III 24-hr 10-Year Rainfall=5.67"

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Area (sf)	CN	Description
6,125	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
1,625	98	Unconnected pavement, HSG B
4,810	98	Roofs, HSG B
15,650	98	Paved parking, HSG B
28,210	90	Weighted Average
6,125		21.71% Pervious Area
22,085		78.29% Impervious Area
1,625		7.36% Unconnected

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

Summary for Subcatchment S4: Entrance Drive

Runoff = 0.76 cfs @ 12.09 hrs, Volume= 0.056 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
2,560	61	>75% Grass cover, Good, HSG B
4,520	98	Paved parking, HSG B
225	98	Unconnected pavement, HSG B
7,305	85	Weighted Average
2,560		35.04% Pervious Area
4,745		64.96% Impervious Area
225		4.74% Unconnected

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

Summary for Subcatchment S7: Stoencroft

Runoff = 5.08 cfs @ 12.53 hrs, Volume= 0.713 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

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Type III 24-hr 10-Year Rainfall=5.67"

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Area (sf)	CN	Description
33,000	61	>75% Grass cover, Good, HSG B
48,000	55	Woods, Good, HSG B
16,920	98	Roofs, HSG B
32,180	98	Paved parking, HSG B
2,200	98	Unconnected pavement, HSG B
132,300	73	Weighted Average
81,000		61.22% Pervious Area
51,300		38.78% Impervious Area
2,200		4.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	80	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.23"
19.2	575	0.0100	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
37.4	705	Total			

Summary for Subcatchment S8: Beechstone Northeast

Runoff = 3.59 cfs @ 12.09 hrs, Volume= 0.278 af, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.67"

Area (sf)	CN	Description
4,850	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
6,100	98	Roofs, HSG B
17,650	98	Paved parking, HSG B
1,975	98	Unconnected pavement, HSG B
30,575	92	Weighted Average
4,850		15.86% Pervious Area
25,725		84.14% Impervious Area
1,975		7.68% Unconnected

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

Summary for Reach 1R: Reach

Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

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Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

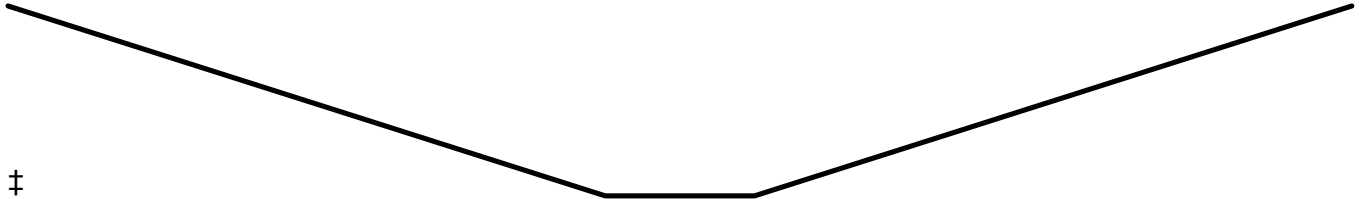
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 465.89 cfs

5.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds

Side Slope Z-value= 10.0 '/' Top Width= 45.00'

Length= 100.0' Slope= 0.0421 '/'

Inlet Invert= 42.21', Outlet Invert= 38.00'

**Summary for Reach 2R: Reach**

Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 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'

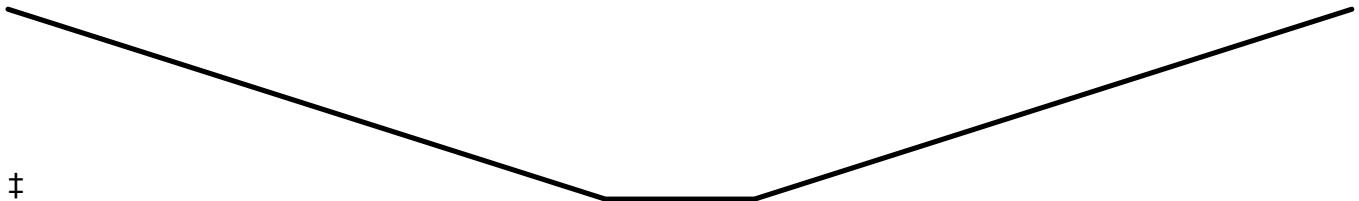
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 753.28 cfs

5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 10.0 '/' Top Width= 45.00'

Length= 30.0' Slope= 0.0230 '/'

Inlet Invert= 42.90', Outlet Invert= 42.21'

**Summary for Reach 3R: Reach**

Inflow = 5.75 cfs @ 12.25 hrs, Volume= 0.113 af

Outflow = 4.25 cfs @ 12.30 hrs, Volume= 0.113 af, Atten= 26%, Lag= 2.7 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 3.11 fps, Min. Travel Time= 1.0 min

Avg. Velocity= 1.61 fps, Avg. Travel Time= 2.0 min

Peak Storage= 293 cf @ 12.27 hrs

Average Depth at Peak Storage= 0.21'

Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 559.93 cfs

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Type III 24-hr 10-Year Rainfall=5.67"

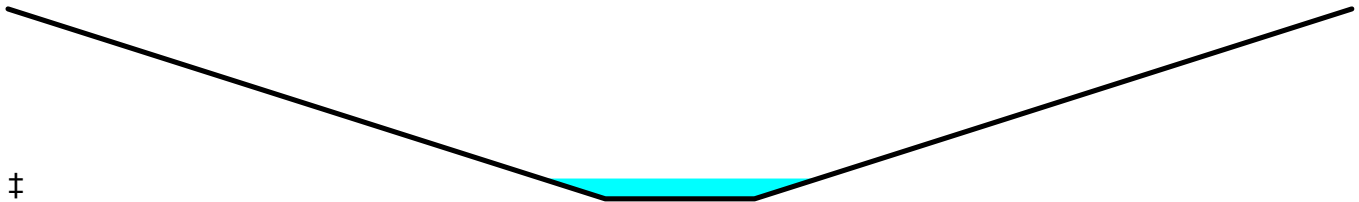
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5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 10.0 '/' Top Width= 45.00'
Length= 192.0' Slope= 0.0127 '/'
Inlet Invert= 45.34', Outlet Invert= 42.90'

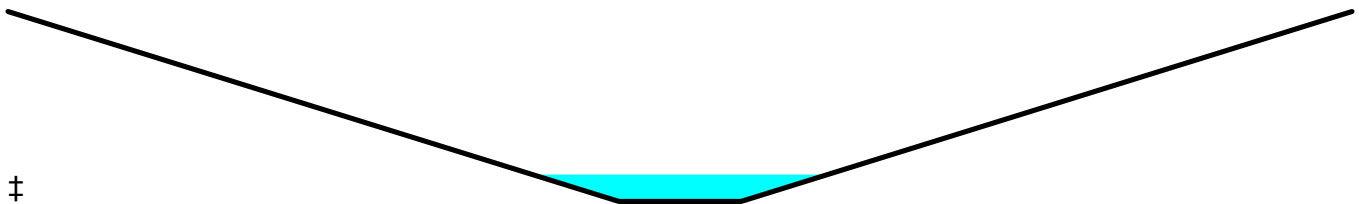
**Summary for Reach R1: Reach**

Inflow Area = 1.235 ac, 55.42% Impervious, Inflow Depth = 0.51" for 10-Year event
Inflow = 2.59 cfs @ 12.22 hrs, Volume= 0.052 af
Outflow = 2.23 cfs @ 12.30 hrs, Volume= 0.052 af, Atten= 14%, Lag= 5.1 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.44 fps, Min. Travel Time= 2.0 min
Avg. Velocity= 0.98 fps, Avg. Travel Time= 5.1 min

Peak Storage= 290 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 181.12 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 5.0 '/' Top Width= 22.00'
Length= 300.0' Slope= 0.0212 '/'
Inlet Invert= 48.76', Outlet Invert= 42.41'

**Summary for Pond 1P: DMH #1**

Inflow Area = 1.339 ac, 58.88% Impervious, Inflow Depth > 3.18" for 10-Year event
Inflow = 1.37 cfs @ 12.26 hrs, Volume= 0.354 af
Outflow = 1.36 cfs @ 12.27 hrs, Volume= 0.354 af, Atten= 1%, Lag= 0.1 min
Primary = 1.36 cfs @ 12.27 hrs, Volume= 0.354 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 43.72' @ 12.27 hrs Surf.Area= 13 sf Storage= 29 cf

Plug-Flow detention time= 1.9 min calculated for 0.354 af (100% of inflow)
Center-of-Mass det. time= 1.0 min (1,150.5 - 1,149.5)

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Volume	Invert	Avail.Storage	Storage Description
#1	41.42'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	43.10'	12.0" Round Culvert L= 90.0' Ke= 0.500 Inlet / Outlet Invert= 43.10' / 42.35' S= 0.0083 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.27 cfs @ 12.27 hrs HW=43.70' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.27 cfs @ 3.73 fps)**Summary for Pond 3P: RG2 Forebay**

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 4.52" for 10-Year event
 Inflow = 3.20 cfs @ 12.10 hrs, Volume= 0.244 af
 Outflow = 3.18 cfs @ 12.10 hrs, Volume= 0.237 af, Atten= 0%, Lag= 0.4 min
 Primary = 3.18 cfs @ 12.10 hrs, Volume= 0.237 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 48.90' @ 12.10 hrs Surf.Area= 432 sf Storage= 438 cf

Plug-Flow detention time= 30.1 min calculated for 0.237 af (97% of inflow)
 Center-of-Mass det. time= 12.6 min (799.4 - 786.8)

Volume	Invert	Avail.Storage	Storage Description
#1	47.50'	469 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.50	175	0.0	0	0
49.00	450	100.0	469	469

Device	Routing	Invert	Outlet Devices
#1	Primary	48.50'	5.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.16 cfs @ 12.10 hrs HW=48.90' (Free Discharge)↑**1=Broad-Crested Rectangular Weir** (Weir Controls 3.16 cfs @ 1.58 fps)**Summary for Pond 4P: CB #11**

Inflow Area = 7.183 ac, 47.49% Impervious, Inflow Depth = 2.72" for 10-Year event
 Inflow = 14.71 cfs @ 12.31 hrs, Volume= 1.627 af
 Outflow = 14.69 cfs @ 12.31 hrs, Volume= 1.627 af, Atten= 0%, Lag= 0.0 min
 Primary = 14.69 cfs @ 12.31 hrs, Volume= 1.627 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

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Peak Elev= 43.53' @ 12.31 hrs Surf.Area= 113 sf Storage= 86 cf

Plug-Flow detention time= 0.1 min calculated for 1.627 af (100% of inflow)

Center-of-Mass det. time= 0.1 min (828.7 - 828.5)

Volume	Invert	Avail.Storage	Storage Description
#1	38.84'	42 cf	4.00'D x 3.37'H Vertical Cone/Cylinder
#2	42.21'	43 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		86 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.21	10	0	0
43.00	100	43	43

Device	Routing	Invert	Outlet Devices
#1	Primary	38.84'	15.0" Round Culvert L= 102.0' Ke= 0.500 Inlet / Outlet Invert= 38.84' / 38.00' S= 0.0082 1' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf
#2	Primary	42.21'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=14.36 cfs @ 12.31 hrs HW=43.50' (Free Discharge)

1=Culvert (Barrel Controls 6.33 cfs @ 5.16 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 8.03 cfs @ 3.11 fps)

Summary for Pond 5P: CB #10

Inflow Area = 4.147 ac, 53.33% Impervious, Inflow Depth = 2.60" for 10-Year event
 Inflow = 8.25 cfs @ 12.29 hrs, Volume= 0.899 af
 Outflow = 8.54 cfs @ 12.30 hrs, Volume= 0.899 af, Atten= 0%, Lag= 0.6 min
 Primary = 8.54 cfs @ 12.30 hrs, Volume= 0.899 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 43.61' @ 12.30 hrs Surf.Area= 213 sf Storage= 108 cf

Plug-Flow detention time= 0.2 min calculated for 0.899 af (100% of inflow)

Center-of-Mass det. time= 0.2 min (809.6 - 809.4)

Volume	Invert	Avail.Storage	Storage Description
#1	39.35'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder
#2	42.90'	63 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		108 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.90	10	0	0
43.50	200	63	63

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Device	Routing	Invert	Outlet Devices
#1	Primary	39.35'	12.0" Round Culvert L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 39.35' / 38.89' S= 0.0153 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Primary	42.90'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=8.46 cfs @ 12.30 hrs HW=43.60' (Free Discharge)

1=Culvert (Barrel Controls 5.44 cfs @ 6.92 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 3.03 cfs @ 2.17 fps)

Summary for Pond 6P: CB #9

Inflow Area = 3.695 ac, 49.89% Impervious, Inflow Depth = 2.35" for 10-Year event
 Inflow = 8.79 cfs @ 12.25 hrs, Volume= 0.724 af
 Outflow = 8.89 cfs @ 12.25 hrs, Volume= 0.724 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.14 cfs @ 12.25 hrs, Volume= 0.611 af
 Secondary = 5.75 cfs @ 12.25 hrs, Volume= 0.113 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 46.39' @ 12.25 hrs Surf.Area= 213 sf Storage= 111 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.2 min (815.5 - 815.2)

Volume	Invert	Avail.Storage	Storage Description
#1	42.03'	42 cf	4.00'D x 3.31'H Vertical Cone/Cylinder
#2	45.34'	69 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		111 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.34	10	0	0
46.00	200	69	69

Device	Routing	Invert	Outlet Devices
#1	Primary	42.03'	12.0" Round Culvert L= 192.0' Ke= 0.500 Inlet / Outlet Invert= 42.03' / 39.47' S= 0.0133 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	45.34'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

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Primary OutFlow Max=3.14 cfs @ 12.25 hrs HW=46.38' (Free Discharge)↑**1=Culvert** (Barrel Controls 3.14 cfs @ 4.00 fps)**Secondary OutFlow** Max=5.67 cfs @ 12.25 hrs HW=46.38' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 5.67 cfs @ 2.72 fps)**Summary for Pond 10P: Island Retention**

Inflow Area = 0.831 ac, 67.87% Impervious, Inflow Depth > 3.40" for 10-Year event
 Inflow = 0.38 cfs @ 12.10 hrs, Volume= 0.236 af
 Outflow = 0.23 cfs @ 22.08 hrs, Volume= 0.219 af, Atten= 39%, Lag= 598.9 min
 Primary = 0.23 cfs @ 22.08 hrs, Volume= 0.219 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 47.33' @ 22.08 hrs Surf.Area= 2,093 sf Storage= 791 cf

Plug-Flow detention time= 79.3 min calculated for 0.219 af (93% of inflow)

Center-of-Mass det. time= 45.4 min (1,337.5 - 1,292.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	47.00'	2,400 cf	Custom Stage Data (Prismatic) Listed below	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	1,500	0.0	0	0
48.00	3,300	100.0	2,400	2,400
Device	Routing	Invert	Outlet Devices	
#1	Primary	43.50'	12.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.50' / 43.20' S= 0.0055 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf	
#2	Device 1	47.25'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	

Primary OutFlow Max=0.23 cfs @ 22.08 hrs HW=47.33' (Free Discharge)↑**1=Culvert** (Passes 0.23 cfs of 6.47 cfs potential flow)↑**2=Orifice/Grate** (Weir Controls 0.23 cfs @ 0.92 fps)**Summary for Pond P1: 12" Culvert**

Inflow Area = 2.868 ac, 38.02% Impervious, Inflow Depth = 2.82" for 10-Year event
 Inflow = 5.75 cfs @ 12.36 hrs, Volume= 0.673 af
 Outflow = 5.90 cfs @ 12.39 hrs, Volume= 0.673 af, Atten= 0%, Lag= 2.0 min
 Primary = 5.90 cfs @ 12.39 hrs, Volume= 0.673 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 45.96' @ 12.39 hrs Surf.Area= 2,000 sf Storage= 1,228 cf

Plug-Flow detention time= 4.6 min calculated for 0.672 af (100% of inflow)

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Center-of-Mass det. time= 4.2 min (855.9 - 851.7)

Volume	Invert	Avail.Storage	Storage Description
#1	43.50'	1,228 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.50	10	0	0
44.00	300	78	78
45.00	2,000	1,150	1,228

Device	Routing	Invert	Outlet Devices
#1	Primary	43.74'	15.0" Round Culvert L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 43.74' / 39.12' S= 0.0888 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=5.83 cfs @ 12.39 hrs HW=45.93' (Free Discharge)↑**1=Culvert** (Inlet Controls 5.83 cfs @ 4.75 fps)**Summary for Pond P10: CB #6**

Inflow Area = 5.546 ac, 52.45% Impervious, Inflow Depth > 3.28" for 10-Year event
 Inflow = 8.10 cfs @ 12.10 hrs, Volume= 1.517 af
 Outflow = 8.08 cfs @ 12.10 hrs, Volume= 1.517 af, Atten= 0%, Lag= 0.1 min
 Primary = 8.08 cfs @ 12.10 hrs, Volume= 1.517 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 42.36' @ 12.10 hrs Surf.Area= 13 sf Storage= 21 cf

Plug-Flow detention time= 0.1 min calculated for 1.514 af (100% of inflow)

Center-of-Mass det. time= 0.1 min (906.7 - 906.6)

Volume	Invert	Avail.Storage	Storage Description
#1	40.71'	65 cf	4.00'D x 5.15'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	40.71'	18.0" Round Culvert L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 40.71' / 38.00' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=8.00 cfs @ 12.10 hrs HW=42.34' (Free Discharge)↑**1=Culvert** (Inlet Controls 8.00 cfs @ 4.52 fps)**Summary for Pond P2: CB A**

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 4.52" for 10-Year event
 Inflow = 3.21 cfs @ 12.09 hrs, Volume= 0.244 af
 Outflow = 3.20 cfs @ 12.10 hrs, Volume= 0.244 af, Atten= 1%, Lag= 0.5 min
 Primary = 3.20 cfs @ 12.10 hrs, Volume= 0.244 af

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Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 53.74' @ 12.10 hrs Surf.Area= 13 sf Storage= 35 cf

Plug-Flow detention time= 0.2 min calculated for 0.244 af (100% of inflow)

Center-of-Mass det. time= 0.3 min (786.8 - 786.5)

Volume	Invert	Avail.Storage	Storage Description
#1	50.93'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	50.92'	12.0" Round Culvert L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 50.92' / 48.77' S= 0.0179 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=3.16 cfs @ 12.10 hrs HW=53.66' (Free Discharge)↑**1=Culvert** (Barrel Controls 3.16 cfs @ 4.03 fps)**Summary for Pond P3: 12" Culvert**

Inflow Area = 2.860 ac, 41.63% Impervious, Inflow Depth = 1.72" for 10-Year event
 Inflow = 5.52 cfs @ 12.27 hrs, Volume= 0.409 af
 Outflow = 6.82 cfs @ 12.25 hrs, Volume= 0.409 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.82 cfs @ 12.25 hrs, Volume= 0.409 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 52.28' @ 12.25 hrs Surf.Area= 2,000 sf Storage= 1,241 cf

Plug-Flow detention time= 4.8 min calculated for 0.409 af (100% of inflow)

Center-of-Mass det. time= 4.8 min (837.3 - 832.6)

Volume	Invert	Avail.Storage	Storage Description
#1	42.41'	1,241 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.41	10	0	0
43.00	300	91	91
44.00	2,000	1,150	1,241

Device	Routing	Invert	Outlet Devices
#1	Primary	42.41'	12.0" Round Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.41' / 42.27' S= 0.0028 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=6.67 cfs @ 12.25 hrs HW=51.90' (Free Discharge)↑**1=Culvert** (Barrel Controls 6.67 cfs @ 8.49 fps)

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Type III 24-hr 10-Year Rainfall=5.67"

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Summary for Pond P7: CB #7

Inflow Area = 3.739 ac, 47.29% Impervious, Inflow Depth = 3.18" for 10-Year event
 Inflow = 5.90 cfs @ 12.46 hrs, Volume= 0.991 af
 Outflow = 6.01 cfs @ 12.49 hrs, Volume= 0.991 af, Atten= 0%, Lag= 2.0 min
 Primary = 6.01 cfs @ 12.49 hrs, Volume= 0.991 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 68.20' @ 12.49 hrs Surf.Area= 13 sf Storage= 40 cf

Plug-Flow detention time= 0.1 min calculated for 0.989 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (839.6 - 839.5)

Volume	Invert	Avail.Storage	Storage Description
#1	48.82'	40 cf	4.00'D x 3.18'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	48.82'	12.0" Round Culvert L= 230.0' Ke= 0.500 Inlet / Outlet Invert= 48.82' / 41.57' S= 0.0315 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=5.97 cfs @ 12.49 hrs HW=67.86' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 5.97 cfs @ 7.60 fps)

Summary for Pond P8: CB B

Inflow Area = 0.702 ac, 84.14% Impervious, Inflow Depth = 4.75" for 10-Year event
 Inflow = 3.59 cfs @ 12.09 hrs, Volume= 0.278 af
 Outflow = 3.59 cfs @ 12.09 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.2 min
 Primary = 3.59 cfs @ 12.09 hrs, Volume= 0.278 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 51.70' @ 12.09 hrs Surf.Area= 13 sf Storage= 33 cf

Plug-Flow detention time= 0.3 min calculated for 0.277 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (779.2 - 778.8)

Volume	Invert	Avail.Storage	Storage Description
#1	49.10'	38 cf	4.00'D x 3.00'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	12.0" Round Culvert L= 35.0' Ke= 0.500 Inlet / Outlet Invert= 49.10' / 48.90' S= 0.0057 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=3.51 cfs @ 12.09 hrs HW=51.63' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 3.51 cfs @ 4.48 fps)

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Summary for Pond P9: CB #5

Inflow Area = 4.208 ac, 50.40% Impervious, Inflow Depth = 3.32" for 10-Year event
 Inflow = 7.69 cfs @ 12.10 hrs, Volume= 1.163 af
 Outflow = 7.69 cfs @ 12.10 hrs, Volume= 1.163 af, Atten= 0%, Lag= 0.1 min
 Primary = 7.69 cfs @ 12.10 hrs, Volume= 1.163 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 44.49' @ 12.10 hrs Surf.Area= 13 sf Storage= 39 cf

Plug-Flow detention time= 0.1 min calculated for 1.161 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (832.4 - 832.3)

Volume	Invert	Avail.Storage	Storage Description
#1	41.42'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	41.42'	18.0" Round Culvert L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 41.42' / 40.66' S= 0.0080 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf

Primary OutFlow Max=7.64 cfs @ 12.10 hrs HW=44.46' (Free Discharge)
 1=Culvert (Barrel Controls 7.64 cfs @ 4.32 fps)

Summary for Pond RG1: Raingarden 1

Inflow Area = 1.235 ac, 55.42% Impervious, Inflow Depth = 3.60" for 10-Year event
 Inflow = 4.70 cfs @ 12.11 hrs, Volume= 0.370 af
 Outflow = 3.54 cfs @ 12.22 hrs, Volume= 0.370 af, Atten= 25%, Lag= 6.2 min
 Discarded = 0.95 cfs @ 12.22 hrs, Volume= 0.318 af
 Primary = 2.59 cfs @ 12.22 hrs, Volume= 0.052 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 47.86' @ 12.22 hrs Surf.Area= 1,928 sf Storage= 3,433 cf

Plug-Flow detention time= 29.5 min calculated for 0.370 af (100% of inflow)
 Center-of-Mass det. time= 29.5 min (843.5 - 814.0)

Volume	Invert	Avail.Storage	Storage Description
#1	43.25'	3,650 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.25	1,000	0.0	0	0
44.25	1,000	40.0	400	400
45.75	1,000	10.0	150	550
46.00	1,000	40.0	100	650
48.00	2,000	100.0	3,000	3,650

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Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	5.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	43.25'	2.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 43.00'

Discarded OutFlow Max=0.95 cfs @ 12.22 hrs HW=47.84' (Free Discharge)↑ **2=Exfiltration** (Controls 0.95 cfs)**Primary OutFlow** Max=2.39 cfs @ 12.22 hrs HW=47.84' (Free Discharge)↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 2.39 cfs @ 1.42 fps)**Summary for Pond RG2: Raingarden 2**

Inflow Area = 0.508 ac, 44.17% Impervious, Inflow Depth = 3.19" for 10-Year event
Inflow = 1.61 cfs @ 12.15 hrs, Volume= 0.135 af
Outflow = 1.37 cfs @ 12.26 hrs, Volume= 0.135 af, Atten= 15%, Lag= 6.6 min
Primary = 1.37 cfs @ 12.26 hrs, Volume= 0.135 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 47.65' @ 12.26 hrs Surf.Area= 844 sf Storage= 1,017 cf

Plug-Flow detention time= 16.0 min calculated for 0.135 af (100% of inflow)

Center-of-Mass det. time= 16.0 min (844.4 - 828.4)

Volume	Invert	Avail.Storage	Storage Description	
#1	43.75'	1,260 cf	Custom Stage Data (Prismatic) Listed below	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.75	400	0.0	0	0
44.75	400	33.0	132	132
46.25	400	10.0	60	192
46.50	400	33.0	33	225
48.00	980	100.0	1,035	1,260

Device	Routing	Invert	Outlet Devices
#1	Primary	43.50'	12.0" Round Culvert L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.50' / 43.20' S= 0.0065 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	47.50'	18.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	43.75'	3.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 43.50'

Primary OutFlow Max=1.28 cfs @ 12.26 hrs HW=47.64' (Free Discharge)

↑ **1=Culvert** (Passes 1.28 cfs of 7.07 cfs potential flow)
↑ **2=Orifice/Grate** (Weir Controls 0.78 cfs @ 1.21 fps)
↑ **3=Exfiltration** (Controls 0.50 cfs)

Summary for Link POA1: POA #1

Inflow Area = 7.183 ac, 47.49% Impervious, Inflow Depth = 2.72" for 10-Year event
Inflow = 14.69 cfs @ 12.31 hrs, Volume= 1.627 af
Primary = 14.69 cfs @ 12.31 hrs, Volume= 1.627 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Summary for Link POA2: POA #2

Inflow Area = 5.546 ac, 52.45% Impervious, Inflow Depth > 3.28" for 10-Year event
Inflow = 8.08 cfs @ 12.10 hrs, Volume= 1.517 af
Primary = 8.08 cfs @ 12.10 hrs, Volume= 1.517 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

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Time span=1.00-30.00 hrs, dt=0.05 hrs, 581 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment3S: Wooded Area	Runoff Area=70,810 sf 31.15% Impervious Runoff Depth=3.88" Flow Length=460' Tc=13.5 min CN=71 Runoff=5.78 cfs 0.526 af
Subcatchment5S: Beechstone to CB#10	Runoff Area=19,705 sf 81.40% Impervious Runoff Depth=6.13" Tc=6.0 min CN=91 Runoff=2.97 cfs 0.231 af
Subcatchment6S: Beechstone to CB#9	Runoff Area=36,370 sf 78.20% Impervious Runoff Depth=6.01" Tc=6.0 min CN=90 Runoff=5.41 cfs 0.418 af
Subcatchment9S: Bld1 1- Parking Lot	Runoff Area=11,945 sf 80.75% Impervious Runoff Depth>4.95" Tc=790.0 min CN=91 Runoff=0.12 cfs 0.113 af
Subcatchment14S: Bld1 2- Parking Lot	Runoff Area=17,735 sf 79.56% Impervious Runoff Depth>4.84" Tc=790.0 min CN=90 Runoff=0.18 cfs 0.164 af
SubcatchmentS1: Lang Rd	Runoff Area=124,920 sf 38.02% Impervious Runoff Depth=4.10" Flow Length=575' Tc=25.3 min CN=73 Runoff=8.40 cfs 0.980 af
SubcatchmentS10B: Island	Runoff Area=6,520 sf 12.50% Impervious Runoff Depth=3.35" Tc=6.0 min CN=66 Runoff=0.57 cfs 0.042 af
SubcatchmentS11: Behind Bldgs	Runoff Area=25,565 sf 30.18% Impervious Runoff Depth=3.99" Flow Length=160' Tc=10.0 min CN=72 Runoff=2.37 cfs 0.195 af
SubcatchmentS12: Wooded Area	Runoff Area=22,120 sf 44.17% Impervious Runoff Depth=4.54" Flow Length=265' Tc=10.7 min CN=77 Runoff=2.28 cfs 0.192 af
SubcatchmentS13: to CB #5	Runoff Area=20,405 sf 75.25% Impervious Runoff Depth=5.89" Tc=6.0 min CN=89 Runoff=3.00 cfs 0.230 af
SubcatchmentS2: Beechstone Northwest	Runoff Area=28,210 sf 78.29% Impervious Runoff Depth=6.01" Tc=6.0 min CN=90 Runoff=4.20 cfs 0.324 af
SubcatchmentS4: Entrance Drive	Runoff Area=7,305 sf 64.96% Impervious Runoff Depth=5.43" Tc=6.0 min CN=85 Runoff=1.01 cfs 0.076 af
SubcatchmentS7: Stoencroft	Runoff Area=132,300 sf 38.78% Impervious Runoff Depth=4.10" Flow Length=705' Tc=37.4 min CN=73 Runoff=7.43 cfs 1.038 af
SubcatchmentS8: Beechstone Northeast	Runoff Area=30,575 sf 84.14% Impervious Runoff Depth=6.24" Tc=6.0 min CN=92 Runoff=4.65 cfs 0.365 af
Reach 1R: Reach	Avg. Flow Depth=0.00' Max Vel=0.00 fps n=0.035 L=100.0' S=0.0421 '/' Capacity=465.89 cfs Outflow=0.00 cfs 0.000 af
Reach 2R: Reach	Avg. Flow Depth=0.00' Max Vel=0.00 fps n=0.016 L=30.0' S=0.0230 '/' Capacity=753.28 cfs Outflow=0.00 cfs 0.000 af

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Reach 3R: Reach	Avg. Flow Depth=0.33' Max Vel=3.89 fps Inflow=12.20 cfs 0.276 af n=0.016 L=192.0' S=0.0127 '/' Capacity=559.93 cfs Outflow=9.96 cfs 0.276 af
Reach R1: Reach	Avg. Flow Depth=0.41' Max Vel=2.96 fps Inflow=5.67 cfs 0.116 af n=0.030 L=300.0' S=0.0212 '/' Capacity=181.12 cfs Outflow=4.80 cfs 0.116 af
Pond 1P: DMH #1	Peak Elev=43.98' Storage=32 cf Inflow=2.29 cfs 0.494 af 12.0" Round Culvert n=0.012 L=90.0' S=0.0083 '/' Outflow=2.34 cfs 0.494 af
Pond 3P: RG2 Forebay	Peak Elev=48.98' Storage=463 cf Inflow=4.45 cfs 0.324 af Outflow=4.34 cfs 0.317 af
Pond 4P: CB #11	Peak Elev=44.21' Storage=86 cf Inflow=22.90 cfs 2.346 af Outflow=22.92 cfs 2.346 af
Pond 5P: CB #10	Peak Elev=44.30' Storage=108 cf Inflow=14.79 cfs 1.291 af Outflow=15.16 cfs 1.291 af
Pond 6P: CB #9	Peak Elev=46.99' Storage=111 cf Inflow=15.64 cfs 1.060 af Primary=3.30 cfs 0.784 af Secondary=12.20 cfs 0.276 af Outflow=15.50 cfs 1.060 af
Pond 10P: Island Retention	Peak Elev=47.35' Storage=830 cf Inflow=0.59 cfs 0.319 af Outflow=0.31 cfs 0.302 af
Pond P1: 12" Culvert	Peak Elev=47.76' Storage=1,228 cf Inflow=8.40 cfs 0.980 af 15.0" Round Culvert n=0.025 L=52.0' S=0.0888 '/' Outflow=8.59 cfs 0.979 af
Pond P10: CB #6	Peak Elev=43.22' Storage=32 cf Inflow=11.30 cfs 2.127 af 18.0" Round Culvert n=0.012 L=250.0' S=0.0108 '/' Outflow=11.30 cfs 2.126 af
Pond P2: CB A	Peak Elev=57.46' Storage=50 cf Inflow=4.20 cfs 0.324 af 12.0" Round Culvert n=0.025 L=120.0' S=0.0179 '/' Outflow=4.45 cfs 0.324 af
Pond P3: 12" Culvert	Peak Elev=73.20' Storage=1,241 cf Inflow=10.51 cfs 0.642 af 12.0" Round Culvert n=0.025 L=50.0' S=0.0028 '/' Outflow=12.47 cfs 0.642 af
Pond P7: CB #7	Peak Elev=94.20' Storage=40 cf Inflow=8.49 cfs 1.403 af 12.0" Round Culvert n=0.025 L=230.0' S=0.0315 '/' Outflow=8.53 cfs 1.403 af
Pond P8: CB B	Peak Elev=53.02' Storage=38 cf Inflow=4.65 cfs 0.365 af 12.0" Round Culvert n=0.025 L=35.0' S=0.0057 '/' Outflow=4.72 cfs 0.365 af
Pond P9: CB #5	Peak Elev=46.41' Storage=45 cf Inflow=10.35 cfs 1.633 af 18.0" Round Culvert n=0.025 L=95.0' S=0.0080 '/' Outflow=10.38 cfs 1.633 af
Pond RG1: Raingarden 1	Peak Elev=48.07' Storage=3,650 cf Inflow=6.57 cfs 0.512 af Discarded=1.00 cfs 0.396 af Primary=5.67 cfs 0.116 af Outflow=6.67 cfs 0.512 af
Pond RG2: Raingarden 2	Peak Elev=47.75' Storage=1,091 cf Inflow=2.28 cfs 0.192 af Outflow=2.41 cfs 0.192 af
Link POA1: POA #1	Inflow=22.92 cfs 2.346 af Primary=22.92 cfs 2.346 af

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Link POA2: POA #2

Inflow=11.30 cfs 2.126 af

Primary=11.30 cfs 2.126 af

Total Runoff Area = 12.729 ac Runoff Volume = 4.894 af Average Runoff Depth = 4.61"
50.35% Pervious = 6.409 ac 49.65% Impervious = 6.320 ac

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Summary for Subcatchment 3S: Wooded Area

Runoff = 5.78 cfs @ 12.19 hrs, Volume= 0.526 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
32,350	61	>75% Grass cover, Good, HSG B
16,400	55	Woods, Good, HSG B
15,300	98	Roofs, HSG B
0	98	Paved parking, HSG B
6,760	98	Unconnected pavement, HSG B
70,810	71	Weighted Average
48,750		68.85% Pervious Area
22,060		31.15% Impervious Area
6,760		30.64% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	100	0.0300	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
3.9	220	0.0350	0.94		Shallow Concentrated Flow, Shallow Woods Woodland Kv= 5.0 fps
1.3	140	0.0150	1.84		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
13.5	460	Total			

Summary for Subcatchment 5S: Beechstone to CB#10

Runoff = 2.97 cfs @ 12.09 hrs, Volume= 0.231 af, Depth= 6.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
3,000	61	>75% Grass cover, Good, HSG B
665	55	Woods, Good, HSG B
4,270	98	Roofs, HSG B
10,270	98	Paved parking, HSG B
1,500	98	Unconnected pavement, HSG B
19,705	91	Weighted Average
3,665		18.60% Pervious Area
16,040		81.40% Impervious Area
1,500		9.35% Unconnected

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

Summary for Subcatchment 6S: Beechstone to CB#9

Runoff = 5.41 cfs @ 12.09 hrs, Volume= 0.418 af, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
7,930	61	>75% Grass cover, Good, HSG B
7,175	98	Roofs, HSG B
18,865	98	Paved parking, HSG B
2,400	98	Unconnected pavement, HSG B
36,370	90	Weighted Average
7,930		21.80% Pervious Area
28,440		78.20% Impervious Area
2,400		8.44% Unconnected

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

Summary for Subcatchment 9S: Bld1 1- Parking Lot

Runoff = 0.12 cfs @ 21.95 hrs, Volume= 0.113 af, Depth> 4.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
2,300	61	>75% Grass cover, Good, HSG B
3,150	98	Roofs, HSG B
0	55	Woods, Good, HSG B
2,490	98	Paved parking, HSG B
* 2,270	98	Porous Pavers, HSG B
1,735	98	Unconnected pavement, HSG B
11,945	91	Weighted Average
2,300		19.25% Pervious Area
9,645		80.75% Impervious Area
1,735		17.99% Unconnected

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

Summary for Subcatchment 14S: Bld1 2- Parking Lot

Runoff = 0.18 cfs @ 21.95 hrs, Volume= 0.164 af, Depth> 4.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
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Area (sf)	CN	Description
3,625	61	>75% Grass cover, Good, HSG B
4,640	98	Roofs, HSG B
3,020	98	Paved parking, HSG B
* 4,850	98	Porous Pavers, HSG B
1,600	98	Unconnected pavement, HSG B
17,735	90	Weighted Average
3,625		20.44% Pervious Area
14,110		79.56% Impervious Area
1,600		11.34% Unconnected

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

Summary for Subcatchment S1: Lang Rd

Runoff = 8.40 cfs @ 12.35 hrs, Volume= 0.980 af, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
40,125	61	>75% Grass cover, Good, HSG B
37,300	55	Woods, Good, HSG B
38,610	98	Paved parking, HSG B
6,100	98	Roofs, HSG B
2,785	98	Unconnected pavement, HSG B
124,920	73	Weighted Average
77,425		61.98% Pervious Area
47,495		38.02% Impervious Area
2,785		5.86% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	75	0.0200	0.07		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.23"
8.3	500	0.0400	1.00		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
25.3	575	Total			

Summary for Subcatchment S10B: Island

Runoff = 0.57 cfs @ 12.10 hrs, Volume= 0.042 af, Depth= 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

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Type III 24-hr 25-Year Rainfall=7.19"

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Area (sf)	CN	Description
5,705	61	>75% Grass cover, Good, HSG B
0	79	<50% Grass cover, Poor, HSG B
0	98	Roofs, HSG B
0	55	Woods, Good, HSG B
815	98	Paved parking, HSG B
0	98	Unconnected pavement, HSG B
6,520	66	Weighted Average
5,705		87.50% Pervious Area
815		12.50% Impervious Area

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

Summary for Subcatchment S11: Behind Bldgs

Runoff = 2.37 cfs @ 12.14 hrs, Volume= 0.195 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
17,850	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
5,515	98	Roofs, HSG B
0	98	Paved parking, HSG B
2,200	98	Unconnected pavement, HSG B
25,565	72	Weighted Average
17,850		69.82% Pervious Area
7,715		30.18% Impervious Area
2,200		28.52% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	40	0.0050	0.08		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.23"
1.8	120	0.0250	1.11		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
10.0	160	Total			

Summary for Subcatchment S12: Wooded Area

Runoff = 2.28 cfs @ 12.15 hrs, Volume= 0.192 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

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Area (sf)	CN	Description
12,350	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
6,870	98	Roofs, HSG B
450	98	Paved parking, HSG B
2,450	98	Unconnected pavement, HSG B
22,120	77	Weighted Average
12,350		55.83% Pervious Area
9,770		44.17% Impervious Area
2,450		25.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	40	0.0050	0.08		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.5	225	0.0100	1.50		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
10.7	265	Total			

Summary for Subcatchment S13: to CB #5

Runoff = 3.00 cfs @ 12.09 hrs, Volume= 0.230 af, Depth= 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
5,050	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
0	55	Woods, Good, HSG B
14,530	98	Paved parking, HSG B
825	98	Unconnected pavement, HSG B
20,405	89	Weighted Average
5,050		24.75% Pervious Area
15,355		75.25% Impervious Area
825		5.37% Unconnected

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

Summary for Subcatchment S2: Beechstone Northwest

Runoff = 4.20 cfs @ 12.09 hrs, Volume= 0.324 af, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

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Type III 24-hr 25-Year Rainfall=7.19"

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Area (sf)	CN	Description
6,125	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
1,625	98	Unconnected pavement, HSG B
4,810	98	Roofs, HSG B
15,650	98	Paved parking, HSG B
28,210	90	Weighted Average
6,125		21.71% Pervious Area
22,085		78.29% Impervious Area
1,625		7.36% Unconnected

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

Summary for Subcatchment S4: Entrance Drive

Runoff = 1.01 cfs @ 12.09 hrs, Volume= 0.076 af, Depth= 5.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
2,560	61	>75% Grass cover, Good, HSG B
4,520	98	Paved parking, HSG B
225	98	Unconnected pavement, HSG B
7,305	85	Weighted Average
2,560		35.04% Pervious Area
4,745		64.96% Impervious Area
225		4.74% Unconnected

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

Summary for Subcatchment S7: Stoencroft

Runoff = 7.43 cfs @ 12.52 hrs, Volume= 1.038 af, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

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Area (sf)	CN	Description
33,000	61	>75% Grass cover, Good, HSG B
48,000	55	Woods, Good, HSG B
16,920	98	Roofs, HSG B
32,180	98	Paved parking, HSG B
2,200	98	Unconnected pavement, HSG B
132,300	73	Weighted Average
81,000		61.22% Pervious Area
51,300		38.78% Impervious Area
2,200		4.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	80	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.23"
19.2	575	0.0100	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
37.4	705	Total			

Summary for Subcatchment S8: Beechstone Northeast

Runoff = 4.65 cfs @ 12.09 hrs, Volume= 0.365 af, Depth= 6.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=7.19"

Area (sf)	CN	Description
4,850	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
6,100	98	Roofs, HSG B
17,650	98	Paved parking, HSG B
1,975	98	Unconnected pavement, HSG B
30,575	92	Weighted Average
4,850		15.86% Pervious Area
25,725		84.14% Impervious Area
1,975		7.68% Unconnected

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

Summary for Reach 1R: Reach

Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

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Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

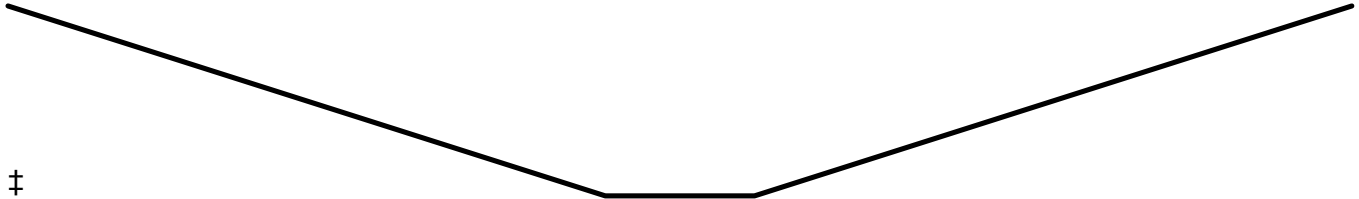
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 465.89 cfs

5.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds

Side Slope Z-value= 10.0 '/' Top Width= 45.00'

Length= 100.0' Slope= 0.0421 '/'

Inlet Invert= 42.21', Outlet Invert= 38.00'

**Summary for Reach 2R: Reach**

Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 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'

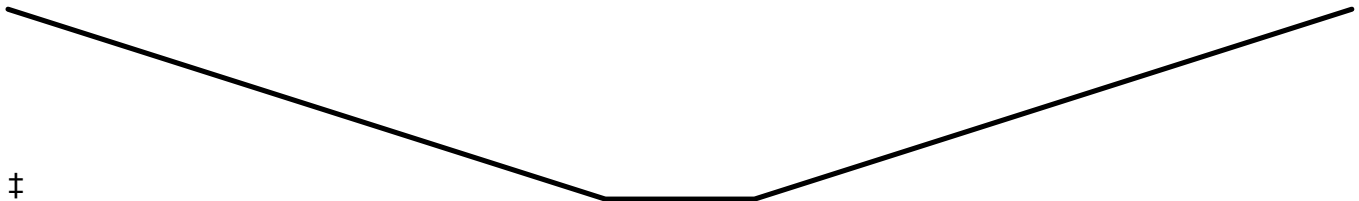
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 753.28 cfs

5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 10.0 '/' Top Width= 45.00'

Length= 30.0' Slope= 0.0230 '/'

Inlet Invert= 42.90', Outlet Invert= 42.21'

**Summary for Reach 3R: Reach**

Inflow = 12.20 cfs @ 12.16 hrs, Volume= 0.276 af

Outflow = 9.96 cfs @ 12.22 hrs, Volume= 0.276 af, Atten= 18%, Lag= 3.6 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 3.89 fps, Min. Travel Time= 0.8 min

Avg. Velocity= 1.93 fps, Avg. Travel Time= 1.7 min

Peak Storage= 517 cf @ 12.17 hrs

Average Depth at Peak Storage= 0.33'

Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 559.93 cfs

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Type III 24-hr 25-Year Rainfall=7.19"

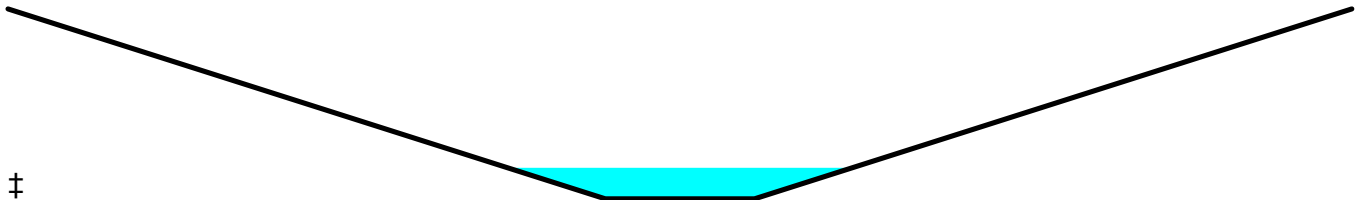
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5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 10.0 '/' Top Width= 45.00'
Length= 192.0' Slope= 0.0127 '/'
Inlet Invert= 45.34', Outlet Invert= 42.90'

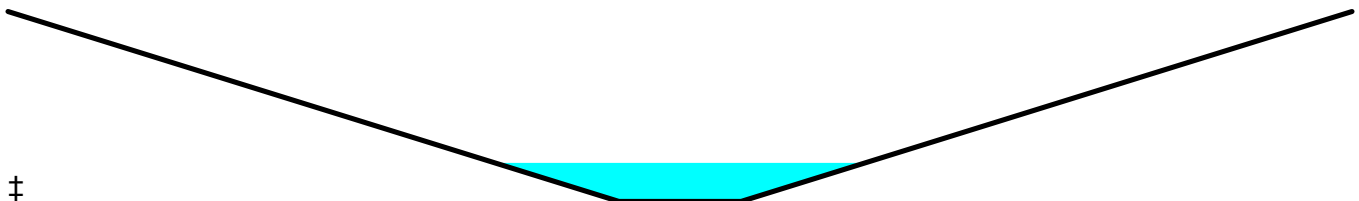
**Summary for Reach R1: Reach**

Inflow Area = 1.235 ac, 55.42% Impervious, Inflow Depth = 1.13" for 25-Year event
Inflow = 5.67 cfs @ 12.15 hrs, Volume= 0.116 af
Outflow = 4.80 cfs @ 12.21 hrs, Volume= 0.116 af, Atten= 15%, Lag= 3.7 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.96 fps, Min. Travel Time= 1.7 min
Avg. Velocity= 1.15 fps, Avg. Travel Time= 4.3 min

Peak Storage= 491 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 181.12 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 5.0 '/' Top Width= 22.00'
Length= 300.0' Slope= 0.0212 '/'
Inlet Invert= 48.76', Outlet Invert= 42.41'

**Summary for Pond 1P: DMH #1**

Inflow Area = 1.339 ac, 58.88% Impervious, Inflow Depth > 4.43" for 25-Year event
Inflow = 2.29 cfs @ 12.18 hrs, Volume= 0.494 af
Outflow = 2.34 cfs @ 12.19 hrs, Volume= 0.494 af, Atten= 0%, Lag= 0.6 min
Primary = 2.34 cfs @ 12.19 hrs, Volume= 0.494 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 43.98' @ 12.19 hrs Surf.Area= 13 sf Storage= 32 cf

Plug-Flow detention time= 1.5 min calculated for 0.493 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (1,127.7 - 1,127.0)

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Volume	Invert	Avail.Storage	Storage Description
#1	41.42'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	43.10'	12.0" Round Culvert L= 90.0' Ke= 0.500 Inlet / Outlet Invert= 43.10' / 42.35' S= 0.0083 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.30 cfs @ 12.19 hrs HW=43.97' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.30 cfs @ 4.23 fps)**Summary for Pond 3P: RG2 Forebay**

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 6.01" for 25-Year event
 Inflow = 4.45 cfs @ 12.10 hrs, Volume= 0.324 af
 Outflow = 4.34 cfs @ 12.10 hrs, Volume= 0.317 af, Atten= 3%, Lag= 0.3 min
 Primary = 4.34 cfs @ 12.10 hrs, Volume= 0.317 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 48.98' @ 12.10 hrs Surf.Area= 447 sf Storage= 463 cf

Plug-Flow detention time= 24.2 min calculated for 0.317 af (98% of inflow)
 Center-of-Mass det. time= 10.9 min (790.2 - 779.3)

Volume	Invert	Avail.Storage	Storage Description
#1	47.50'	469 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.50	175	0.0	0	0
49.00	450	100.0	469	469

Device	Routing	Invert	Outlet Devices
#1	Primary	48.50'	5.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.32 cfs @ 12.10 hrs HW=48.98' (Free Discharge)↑**1=Broad-Crested Rectangular Weir** (Weir Controls 4.32 cfs @ 1.79 fps)**Summary for Pond 4P: CB #11**

Inflow Area = 7.183 ac, 47.49% Impervious, Inflow Depth = 3.92" for 25-Year event
 Inflow = 22.90 cfs @ 12.22 hrs, Volume= 2.346 af
 Outflow = 22.92 cfs @ 12.22 hrs, Volume= 2.346 af, Atten= 0%, Lag= 0.0 min
 Primary = 22.92 cfs @ 12.22 hrs, Volume= 2.346 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

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Peak Elev= 44.21' @ 12.22 hrs Surf.Area= 113 sf Storage= 86 cf

Plug-Flow detention time= 0.1 min calculated for 2.342 af (100% of inflow)

Center-of-Mass det. time= 0.1 min (818.7 - 818.6)

Volume	Invert	Avail.Storage	Storage Description
#1	38.84'	42 cf	4.00'D x 3.37'H Vertical Cone/Cylinder
#2	42.21'	43 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		86 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.21	10	0	0
43.00	100	43	43

Device	Routing	Invert	Outlet Devices
#1	Primary	38.84'	15.0" Round Culvert L= 102.0' Ke= 0.500 Inlet / Outlet Invert= 38.84' / 38.00' S= 0.0082 1' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf
#2	Primary	42.21'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=22.31 cfs @ 12.22 hrs HW=44.16' (Free Discharge)

1=Culvert (Barrel Controls 6.80 cfs @ 5.54 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 15.51 cfs @ 3.99 fps)

Summary for Pond 5P: CB #10

Inflow Area = 4.147 ac, 53.33% Impervious, Inflow Depth = 3.74" for 25-Year event
 Inflow = 14.79 cfs @ 12.20 hrs, Volume= 1.291 af
 Outflow = 15.16 cfs @ 12.20 hrs, Volume= 1.291 af, Atten= 0%, Lag= 0.0 min
 Primary = 15.16 cfs @ 12.20 hrs, Volume= 1.291 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 44.30' @ 12.20 hrs Surf.Area= 213 sf Storage= 108 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 0.2 min (800.2 - 800.1)

Volume	Invert	Avail.Storage	Storage Description
#1	39.35'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder
#2	42.90'	63 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		108 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.90	10	0	0
43.50	200	63	63

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Device	Routing	Invert	Outlet Devices
#1	Primary	39.35'	12.0" Round Culvert L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 39.35' / 38.89' S= 0.0153 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Primary	42.90'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=15.10 cfs @ 12.20 hrs HW=44.30' (Free Discharge)

1=Culvert (Barrel Controls 5.93 cfs @ 7.55 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 9.17 cfs @ 3.28 fps)

Summary for Pond 6P: CB #9

Inflow Area = 3.695 ac, 49.89% Impervious, Inflow Depth = 3.44" for 25-Year event
 Inflow = 15.64 cfs @ 12.16 hrs, Volume= 1.060 af
 Outflow = 15.50 cfs @ 12.16 hrs, Volume= 1.060 af, Atten= 1%, Lag= 0.0 min
 Primary = 3.30 cfs @ 12.16 hrs, Volume= 0.784 af
 Secondary = 12.20 cfs @ 12.16 hrs, Volume= 0.276 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 46.99' @ 12.16 hrs Surf.Area= 213 sf Storage= 111 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.2 min (804.9 - 804.7)

Volume	Invert	Avail.Storage	Storage Description
#1	42.03'	42 cf	4.00'D x 3.31'H Vertical Cone/Cylinder
#2	45.34'	69 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		111 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.34	10	0	0
46.00	200	69	69

Device	Routing	Invert	Outlet Devices
#1	Primary	42.03'	12.0" Round Culvert L= 192.0' Ke= 0.500 Inlet / Outlet Invert= 42.03' / 39.47' S= 0.0133 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	45.34'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

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Primary OutFlow Max=3.28 cfs @ 12.16 hrs HW=46.92' (Free Discharge)↑**1=Culvert** (Barrel Controls 3.28 cfs @ 4.18 fps)**Secondary OutFlow** Max=11.57 cfs @ 12.16 hrs HW=46.93' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 11.57 cfs @ 3.64 fps)**Summary for Pond 10P: Island Retention**

Inflow Area = 0.831 ac, 67.87% Impervious, Inflow Depth > 4.61" for 25-Year event
 Inflow = 0.59 cfs @ 12.10 hrs, Volume= 0.319 af
 Outflow = 0.31 cfs @ 22.05 hrs, Volume= 0.302 af, Atten= 48%, Lag= 597.1 min
 Primary = 0.31 cfs @ 22.05 hrs, Volume= 0.302 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 47.35' @ 22.05 hrs Surf.Area= 2,123 sf Storage= 830 cf

Plug-Flow detention time= 61.8 min calculated for 0.302 af (95% of inflow)

Center-of-Mass det. time= 35.1 min (1,313.4 - 1,278.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	47.00'	2,400 cf	Custom Stage Data (Prismatic) Listed below	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	1,500	0.0	0	0
48.00	3,300	100.0	2,400	2,400
Device	Routing	Invert	Outlet Devices	
#1	Primary	43.50'	12.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.50' / 43.20' S= 0.0055 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf	
#2	Device 1	47.25'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	

Primary OutFlow Max=0.31 cfs @ 22.05 hrs HW=47.35' (Free Discharge)↑**1=Culvert** (Passes 0.31 cfs of 6.49 cfs potential flow)↑**2=Orifice/Grate** (Weir Controls 0.31 cfs @ 1.01 fps)**Summary for Pond P1: 12" Culvert**

Inflow Area = 2.868 ac, 38.02% Impervious, Inflow Depth = 4.10" for 25-Year event
 Inflow = 8.40 cfs @ 12.35 hrs, Volume= 0.980 af
 Outflow = 8.59 cfs @ 12.40 hrs, Volume= 0.979 af, Atten= 0%, Lag= 2.9 min
 Primary = 8.59 cfs @ 12.40 hrs, Volume= 0.979 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 47.76' @ 12.40 hrs Surf.Area= 2,000 sf Storage= 1,228 cf

Plug-Flow detention time= 4.0 min calculated for 0.978 af (100% of inflow)

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Type III 24-hr 25-Year Rainfall=7.19"

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Center-of-Mass det. time= 3.8 min (844.7 - 840.9)

Volume	Invert	Avail.Storage	Storage Description
#1	43.50'	1,228 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.50	10	0	0
44.00	300	78	78
45.00	2,000	1,150	1,228

Device	Routing	Invert	Outlet Devices
#1	Primary	43.74'	15.0" Round Culvert L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 43.74' / 39.12' S= 0.0888 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=8.59 cfs @ 12.40 hrs HW=47.76' (Free Discharge)↑**1=Culvert** (Inlet Controls 8.59 cfs @ 7.00 fps)**Summary for Pond P10: CB #6**

Inflow Area = 5.546 ac, 52.45% Impervious, Inflow Depth > 4.60" for 25-Year event
 Inflow = 11.30 cfs @ 12.15 hrs, Volume= 2.127 af
 Outflow = 11.30 cfs @ 12.15 hrs, Volume= 2.126 af, Atten= 0%, Lag= 0.1 min
 Primary = 11.30 cfs @ 12.15 hrs, Volume= 2.126 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 43.22' @ 12.15 hrs Surf.Area= 13 sf Storage= 32 cf

Plug-Flow detention time= 0.1 min calculated for 2.123 af (100% of inflow)

Center-of-Mass det. time= 0.1 min (895.1 - 895.0)

Volume	Invert	Avail.Storage	Storage Description
#1	40.71'	65 cf	4.00'D x 5.15'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	40.71'	18.0" Round Culvert L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 40.71' / 38.00' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=11.29 cfs @ 12.15 hrs HW=43.22' (Free Discharge)↑**1=Culvert** (Inlet Controls 11.29 cfs @ 6.39 fps)**Summary for Pond P2: CB A**

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 6.01" for 25-Year event
 Inflow = 4.20 cfs @ 12.09 hrs, Volume= 0.324 af
 Outflow = 4.45 cfs @ 12.10 hrs, Volume= 0.324 af, Atten= 0%, Lag= 0.5 min
 Primary = 4.45 cfs @ 12.10 hrs, Volume= 0.324 af

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Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 57.46' @ 12.10 hrs Surf.Area= 13 sf Storage= 50 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 0.2 min (779.3 - 779.1)

Volume	Invert	Avail.Storage	Storage Description
#1	50.93'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	50.92'	12.0" Round Culvert L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 50.92' / 48.77' S= 0.0179 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=4.37 cfs @ 12.10 hrs HW=57.21' (Free Discharge)↑**1=Culvert** (Barrel Controls 4.37 cfs @ 5.57 fps)**Summary for Pond P3: 12" Culvert**

Inflow Area = 2.860 ac, 41.63% Impervious, Inflow Depth = 2.69" for 25-Year event
 Inflow = 10.51 cfs @ 12.21 hrs, Volume= 0.642 af
 Outflow = 12.47 cfs @ 12.24 hrs, Volume= 0.642 af, Atten= 0%, Lag= 2.1 min
 Primary = 12.47 cfs @ 12.24 hrs, Volume= 0.642 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 73.20' @ 12.25 hrs Surf.Area= 2,000 sf Storage= 1,241 cf

Plug-Flow detention time= 4.0 min calculated for 0.642 af (100% of inflow)

Center-of-Mass det. time= 4.0 min (821.4 - 817.4)

Volume	Invert	Avail.Storage	Storage Description
#1	42.41'	1,241 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.41	10	0	0
43.00	300	91	91
44.00	2,000	1,150	1,241

Device	Routing	Invert	Outlet Devices
#1	Primary	42.41'	12.0" Round Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.41' / 42.27' S= 0.0028 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=11.98 cfs @ 12.24 hrs HW=71.11' (Free Discharge)↑**1=Culvert** (Barrel Controls 11.98 cfs @ 15.25 fps)

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Summary for Pond P7: CB #7

Inflow Area = 3.739 ac, 47.29% Impervious, Inflow Depth = 4.50" for 25-Year event
 Inflow = 8.49 cfs @ 12.48 hrs, Volume= 1.403 af
 Outflow = 8.53 cfs @ 12.49 hrs, Volume= 1.403 af, Atten= 0%, Lag= 0.3 min
 Primary = 8.53 cfs @ 12.49 hrs, Volume= 1.403 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 94.20' @ 12.49 hrs Surf.Area= 13 sf Storage= 40 cf

Plug-Flow detention time= 0.1 min calculated for 1.400 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (831.5 - 831.4)

Volume	Invert	Avail.Storage	Storage Description
#1	48.82'	40 cf	4.00'D x 3.18'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	48.82'	12.0" Round Culvert L= 230.0' Ke= 0.500 Inlet / Outlet Invert= 48.82' / 41.57' S= 0.0315 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=8.48 cfs @ 12.49 hrs HW=93.59' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 8.48 cfs @ 10.79 fps)

Summary for Pond P8: CB B

Inflow Area = 0.702 ac, 84.14% Impervious, Inflow Depth = 6.24" for 25-Year event
 Inflow = 4.65 cfs @ 12.09 hrs, Volume= 0.365 af
 Outflow = 4.72 cfs @ 12.09 hrs, Volume= 0.365 af, Atten= 0%, Lag= 0.2 min
 Primary = 4.72 cfs @ 12.09 hrs, Volume= 0.365 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 53.02' @ 12.09 hrs Surf.Area= 13 sf Storage= 38 cf

Plug-Flow detention time= 0.3 min calculated for 0.365 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (772.3 - 772.0)

Volume	Invert	Avail.Storage	Storage Description
#1	49.10'	38 cf	4.00'D x 3.00'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	12.0" Round Culvert L= 35.0' Ke= 0.500 Inlet / Outlet Invert= 49.10' / 48.90' S= 0.0057 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=4.61 cfs @ 12.09 hrs HW=52.87' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 4.61 cfs @ 5.86 fps)

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Summary for Pond P9: CB #5

Inflow Area = 4.208 ac, 50.40% Impervious, Inflow Depth = 4.66" for 25-Year event
 Inflow = 10.35 cfs @ 12.10 hrs, Volume= 1.633 af
 Outflow = 10.38 cfs @ 12.10 hrs, Volume= 1.633 af, Atten= 0%, Lag= 0.0 min
 Primary = 10.38 cfs @ 12.10 hrs, Volume= 1.633 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 46.41' @ 12.10 hrs Surf.Area= 13 sf Storage= 45 cf

Plug-Flow detention time= 0.1 min calculated for 1.630 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (824.7 - 824.5)

Volume	Invert	Avail.Storage	Storage Description
#1	41.42'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	41.42'	18.0" Round Culvert L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 41.42' / 40.66' S= 0.0080 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf

Primary OutFlow Max=10.37 cfs @ 12.10 hrs HW=46.39' (Free Discharge)
 1=Culvert (Barrel Controls 10.37 cfs @ 5.87 fps)

Summary for Pond RG1: Raingarden 1

Inflow Area = 1.235 ac, 55.42% Impervious, Inflow Depth = 4.98" for 25-Year event
 Inflow = 6.57 cfs @ 12.11 hrs, Volume= 0.512 af
 Outflow = 6.67 cfs @ 12.15 hrs, Volume= 0.512 af, Atten= 0%, Lag= 2.6 min
 Discarded = 1.00 cfs @ 12.15 hrs, Volume= 0.396 af
 Primary = 5.67 cfs @ 12.15 hrs, Volume= 0.116 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 48.07' @ 12.15 hrs Surf.Area= 2,000 sf Storage= 3,650 cf

Plug-Flow detention time= 27.5 min calculated for 0.511 af (100% of inflow)
 Center-of-Mass det. time= 27.5 min (832.4 - 804.9)

Volume	Invert	Avail.Storage	Storage Description
#1	43.25'	3,650 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.25	1,000	0.0	0	0
44.25	1,000	40.0	400	400
45.75	1,000	10.0	150	550
46.00	1,000	40.0	100	650
48.00	2,000	100.0	3,000	3,650

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Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	5.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	43.25'	2.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 43.00'

Discarded OutFlow Max=1.00 cfs @ 12.15 hrs HW=48.06' (Free Discharge)↑ **2=Exfiltration** (Controls 1.00 cfs)**Primary OutFlow** Max=5.57 cfs @ 12.15 hrs HW=48.06' (Free Discharge)↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 5.57 cfs @ 1.99 fps)**Summary for Pond RG2: Raingarden 2**

Inflow Area = 0.508 ac, 44.17% Impervious, Inflow Depth = 4.54" for 25-Year event
Inflow = 2.28 cfs @ 12.15 hrs, Volume= 0.192 af
Outflow = 2.41 cfs @ 12.17 hrs, Volume= 0.192 af, Atten= 0%, Lag= 1.4 min
Primary = 2.41 cfs @ 12.17 hrs, Volume= 0.192 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 47.75' @ 12.17 hrs Surf.Area= 885 sf Storage= 1,091 cf

Plug-Flow detention time= 15.0 min calculated for 0.192 af (100% of inflow)

Center-of-Mass det. time= 15.0 min (833.4 - 818.4)

Volume	Invert	Avail.Storage	Storage Description	
#1	43.75'	1,260 cf	Custom Stage Data (Prismatic) Listed below	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.75	400	0.0	0	0
44.75	400	33.0	132	132
46.25	400	10.0	60	192
46.50	400	33.0	33	225
48.00	980	100.0	1,035	1,260

Device	Routing	Invert	Outlet Devices
#1	Primary	43.50'	12.0" Round Culvert L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.50' / 43.20' S= 0.0065 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	47.50'	18.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	43.75'	3.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 43.50'

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Primary OutFlow Max=2.19 cfs @ 12.17 hrs HW=47.73' (Free Discharge)

- 1=Culvert (Passes 2.19 cfs of 7.16 cfs potential flow)
- 2=Orifice/Grate (Weir Controls 1.68 cfs @ 1.56 fps)
- 3=Exfiltration (Controls 0.51 cfs)

Summary for Link POA1: POA #1

Inflow Area = 7.183 ac, 47.49% Impervious, Inflow Depth = 3.92" for 25-Year event
Inflow = 22.92 cfs @ 12.22 hrs, Volume= 2.346 af
Primary = 22.92 cfs @ 12.22 hrs, Volume= 2.346 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Summary for Link POA2: POA #2

Inflow Area = 5.546 ac, 52.45% Impervious, Inflow Depth > 4.60" for 25-Year event
Inflow = 11.30 cfs @ 12.15 hrs, Volume= 2.126 af
Primary = 11.30 cfs @ 12.15 hrs, Volume= 2.126 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

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Time span=1.00-30.00 hrs, dt=0.05 hrs, 581 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment3S: Wooded Area	Runoff Area=70,810 sf 31.15% Impervious Runoff Depth=5.11" Flow Length=460' Tc=13.5 min CN=71 Runoff=7.61 cfs 0.693 af
Subcatchment5S: Beechstone to CB#10	Runoff Area=19,705 sf 81.40% Impervious Runoff Depth=7.53" Tc=6.0 min CN=91 Runoff=3.60 cfs 0.284 af
Subcatchment6S: Beechstone to CB#9	Runoff Area=36,370 sf 78.20% Impervious Runoff Depth=7.41" Tc=6.0 min CN=90 Runoff=6.59 cfs 0.515 af
Subcatchment9S: Bld1 1- Parking Lot	Runoff Area=11,945 sf 80.75% Impervious Runoff Depth>6.09" Tc=790.0 min CN=91 Runoff=0.15 cfs 0.139 af
Subcatchment14S: Bld1 2- Parking Lot	Runoff Area=17,735 sf 79.56% Impervious Runoff Depth>5.99" Tc=790.0 min CN=90 Runoff=0.22 cfs 0.203 af
SubcatchmentS1: Lang Rd	Runoff Area=124,920 sf 38.02% Impervious Runoff Depth=5.35" Flow Length=575' Tc=25.3 min CN=73 Runoff=10.95 cfs 1.280 af
SubcatchmentS10B: Island	Runoff Area=6,520 sf 12.50% Impervious Runoff Depth=4.51" Tc=6.0 min CN=66 Runoff=0.78 cfs 0.056 af
SubcatchmentS11: Behind Bldgs	Runoff Area=25,565 sf 30.18% Impervious Runoff Depth=5.23" Flow Length=160' Tc=10.0 min CN=72 Runoff=3.10 cfs 0.256 af
SubcatchmentS12: Wooded Area	Runoff Area=22,120 sf 44.17% Impervious Runoff Depth=5.84" Flow Length=265' Tc=10.7 min CN=77 Runoff=2.92 cfs 0.247 af
SubcatchmentS13: to CB #5	Runoff Area=20,405 sf 75.25% Impervious Runoff Depth=7.29" Tc=6.0 min CN=89 Runoff=3.66 cfs 0.284 af
SubcatchmentS2: Beechstone Northwest	Runoff Area=28,210 sf 78.29% Impervious Runoff Depth=7.41" Tc=6.0 min CN=90 Runoff=5.11 cfs 0.400 af
SubcatchmentS4: Entrance Drive	Runoff Area=7,305 sf 64.96% Impervious Runoff Depth=6.80" Tc=6.0 min CN=85 Runoff=1.25 cfs 0.095 af
SubcatchmentS7: Stoencroft	Runoff Area=132,300 sf 38.78% Impervious Runoff Depth=5.35" Flow Length=705' Tc=37.4 min CN=73 Runoff=9.69 cfs 1.355 af
SubcatchmentS8: Beechstone Northeast	Runoff Area=30,575 sf 84.14% Impervious Runoff Depth=7.65" Tc=6.0 min CN=92 Runoff=5.63 cfs 0.447 af
Reach 1R: Reach	Avg. Flow Depth=0.00' Max Vel=0.00 fps n=0.035 L=100.0' S=0.0421 '/ Capacity=465.89 cfs Outflow=0.00 cfs 0.000 af
Reach 2R: Reach	Avg. Flow Depth=0.00' Max Vel=0.00 fps n=0.016 L=30.0' S=0.0230 '/ Capacity=753.28 cfs Outflow=0.00 cfs 0.000 af

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Reach 3R: ReachAvg. Flow Depth=0.39' Max Vel=4.37 fps Inflow=15.35 cfs 0.446 af
n=0.016 L=192.0' S=0.0127 '/' Capacity=559.93 cfs Outflow=14.97 cfs 0.446 af**Reach R1: Reach**Avg. Flow Depth=0.47' Max Vel=3.24 fps Inflow=8.14 cfs 0.182 af
n=0.030 L=300.0' S=0.0212 '/' Capacity=181.12 cfs Outflow=6.61 cfs 0.182 af**Pond 1P: DMH #1**Peak Elev=44.36' Storage=37 cf Inflow=3.28 cfs 0.628 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0083 '/' Outflow=3.30 cfs 0.628 af**Pond 3P: RG2 Forebay**Peak Elev=49.04' Storage=469 cf Inflow=5.11 cfs 0.400 af
Outflow=5.30 cfs 0.393 af**Pond 4P: CB #11**Peak Elev=44.67' Storage=86 cf Inflow=30.67 cfs 3.048 af
Outflow=30.69 cfs 3.048 af**Pond 5P: CB #10**Peak Elev=44.78' Storage=108 cf Inflow=20.93 cfs 1.674 af
Outflow=21.00 cfs 1.674 af**Pond 6P: CB #9**Peak Elev=47.27' Storage=111 cf Inflow=18.88 cfs 1.390 af
Primary=3.37 cfs 0.944 af Secondary=15.35 cfs 0.446 af Outflow=18.71 cfs 1.390 af**Pond 10P: Island Retention**Peak Elev=47.37' Storage=896 cf Inflow=0.79 cfs 0.399 af
Outflow=0.44 cfs 0.381 af**Pond P1: 12" Culvert**Peak Elev=51.80' Storage=1,228 cf Inflow=10.95 cfs 1.280 af
15.0" Round Culvert n=0.025 L=52.0' S=0.0888 '/' Outflow=12.72 cfs 1.279 af**Pond P10: CB #6**Peak Elev=45.81' Storage=64 cf Inflow=15.57 cfs 2.715 af
18.0" Round Culvert n=0.012 L=250.0' S=0.0108 '/' Outflow=15.34 cfs 2.715 af**Pond P2: CB A**Peak Elev=59.90' Storage=50 cf Inflow=5.11 cfs 0.400 af
12.0" Round Culvert n=0.025 L=120.0' S=0.0179 '/' Outflow=5.11 cfs 0.400 af**Pond P3: 12" Culvert**Peak Elev=85.63' Storage=1,241 cf Inflow=14.17 cfs 0.875 af
12.0" Round Culvert n=0.025 L=50.0' S=0.0028 '/' Outflow=14.80 cfs 0.875 af**Pond P7: CB #7**Peak Elev=128.15' Storage=40 cf Inflow=10.96 cfs 1.802 af
12.0" Round Culvert n=0.025 L=230.0' S=0.0315 '/' Outflow=10.98 cfs 1.802 af**Pond P8: CB B**Peak Elev=54.27' Storage=38 cf Inflow=5.63 cfs 0.447 af
12.0" Round Culvert n=0.025 L=35.0' S=0.0057 '/' Outflow=5.60 cfs 0.447 af**Pond P9: CB #5**Peak Elev=48.49' Storage=45 cf Inflow=12.74 cfs 2.087 af
18.0" Round Culvert n=0.025 L=95.0' S=0.0080 '/' Outflow=12.67 cfs 2.087 af**Pond RG1: Raingarden 1**Peak Elev=48.22' Storage=3,650 cf Inflow=8.18 cfs 0.649 af
Discarded=1.03 cfs 0.467 af Primary=8.14 cfs 0.182 af Outflow=9.17 cfs 0.649 af**Pond RG2: Raingarden 2**Peak Elev=47.79' Storage=1,112 cf Inflow=2.92 cfs 0.247 af
Outflow=2.88 cfs 0.247 af**Link POA1: POA #1**Inflow=30.69 cfs 3.048 af
Primary=30.69 cfs 3.048 af

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Link POA2: POA #2

Inflow=15.34 cfs 2.715 af

Primary=15.34 cfs 2.715 af

Total Runoff Area = 12.729 ac Runoff Volume = 6.255 af Average Runoff Depth = 5.90"
50.35% Pervious = 6.409 ac 49.65% Impervious = 6.320 ac

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Summary for Subcatchment 3S: Wooded Area

Runoff = 7.61 cfs @ 12.19 hrs, Volume= 0.693 af, Depth= 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
32,350	61	>75% Grass cover, Good, HSG B
16,400	55	Woods, Good, HSG B
15,300	98	Roofs, HSG B
0	98	Paved parking, HSG B
6,760	98	Unconnected pavement, HSG B
70,810	71	Weighted Average
48,750		68.85% Pervious Area
22,060		31.15% Impervious Area
6,760		30.64% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	100	0.0300	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
3.9	220	0.0350	0.94		Shallow Concentrated Flow, Shallow Woods Woodland Kv= 5.0 fps
1.3	140	0.0150	1.84		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
13.5	460	Total			

Summary for Subcatchment 5S: Beechstone to CB#10

Runoff = 3.60 cfs @ 12.09 hrs, Volume= 0.284 af, Depth= 7.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
3,000	61	>75% Grass cover, Good, HSG B
665	55	Woods, Good, HSG B
4,270	98	Roofs, HSG B
10,270	98	Paved parking, HSG B
1,500	98	Unconnected pavement, HSG B
19,705	91	Weighted Average
3,665		18.60% Pervious Area
16,040		81.40% Impervious Area
1,500		9.35% Unconnected

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

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Type III 24-hr 50-Year Rainfall=8.61"

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Summary for Subcatchment 6S: Beechstone to CB#9

Runoff = 6.59 cfs @ 12.09 hrs, Volume= 0.515 af, Depth= 7.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
7,930	61	>75% Grass cover, Good, HSG B
7,175	98	Roofs, HSG B
18,865	98	Paved parking, HSG B
2,400	98	Unconnected pavement, HSG B
36,370	90	Weighted Average
7,930		21.80% Pervious Area
28,440		78.20% Impervious Area
2,400		8.44% Unconnected

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

Summary for Subcatchment 9S: Bld1 1- Parking Lot

Runoff = 0.15 cfs @ 21.95 hrs, Volume= 0.139 af, Depth> 6.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
2,300	61	>75% Grass cover, Good, HSG B
3,150	98	Roofs, HSG B
0	55	Woods, Good, HSG B
2,490	98	Paved parking, HSG B
* 2,270	98	Porous Pavers, HSG B
1,735	98	Unconnected pavement, HSG B
11,945	91	Weighted Average
2,300		19.25% Pervious Area
9,645		80.75% Impervious Area
1,735		17.99% Unconnected

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

Summary for Subcatchment 14S: Bld1 2- Parking Lot

Runoff = 0.22 cfs @ 21.95 hrs, Volume= 0.203 af, Depth> 5.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

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Type III 24-hr 50-Year Rainfall=8.61"

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Area (sf)	CN	Description
3,625	61	>75% Grass cover, Good, HSG B
4,640	98	Roofs, HSG B
3,020	98	Paved parking, HSG B
* 4,850	98	Porous Pavers, HSG B
1,600	98	Unconnected pavement, HSG B
17,735	90	Weighted Average
3,625		20.44% Pervious Area
14,110		79.56% Impervious Area
1,600		11.34% Unconnected

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

Summary for Subcatchment S1: Lang Rd

Runoff = 10.95 cfs @ 12.35 hrs, Volume= 1.280 af, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
40,125	61	>75% Grass cover, Good, HSG B
37,300	55	Woods, Good, HSG B
38,610	98	Paved parking, HSG B
6,100	98	Roofs, HSG B
2,785	98	Unconnected pavement, HSG B
124,920	73	Weighted Average
77,425		61.98% Pervious Area
47,495		38.02% Impervious Area
2,785		5.86% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	75	0.0200	0.07		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.23"
8.3	500	0.0400	1.00		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
25.3	575	Total			

Summary for Subcatchment S10B: Island

Runoff = 0.78 cfs @ 12.09 hrs, Volume= 0.056 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

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Type III 24-hr 50-Year Rainfall=8.61"

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Area (sf)	CN	Description
5,705	61	>75% Grass cover, Good, HSG B
0	79	<50% Grass cover, Poor, HSG B
0	98	Roofs, HSG B
0	55	Woods, Good, HSG B
815	98	Paved parking, HSG B
0	98	Unconnected pavement, HSG B
6,520	66	Weighted Average
5,705		87.50% Pervious Area
815		12.50% Impervious Area

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

Summary for Subcatchment S11: Behind Bldgs

Runoff = 3.10 cfs @ 12.14 hrs, Volume= 0.256 af, Depth= 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
17,850	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
5,515	98	Roofs, HSG B
0	98	Paved parking, HSG B
2,200	98	Unconnected pavement, HSG B
25,565	72	Weighted Average
17,850		69.82% Pervious Area
7,715		30.18% Impervious Area
2,200		28.52% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	40	0.0050	0.08		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.23"
1.8	120	0.0250	1.11		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
10.0	160	Total			

Summary for Subcatchment S12: Wooded Area

Runoff = 2.92 cfs @ 12.15 hrs, Volume= 0.247 af, Depth= 5.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

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Type III 24-hr 50-Year Rainfall=8.61"

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Area (sf)	CN	Description
12,350	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
6,870	98	Roofs, HSG B
450	98	Paved parking, HSG B
2,450	98	Unconnected pavement, HSG B
22,120	77	Weighted Average
12,350		55.83% Pervious Area
9,770		44.17% Impervious Area
2,450		25.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	40	0.0050	0.08		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.5	225	0.0100	1.50		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
10.7	265	Total			

Summary for Subcatchment S13: to CB #5

Runoff = 3.66 cfs @ 12.09 hrs, Volume= 0.284 af, Depth= 7.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
5,050	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
0	55	Woods, Good, HSG B
14,530	98	Paved parking, HSG B
825	98	Unconnected pavement, HSG B
20,405	89	Weighted Average
5,050		24.75% Pervious Area
15,355		75.25% Impervious Area
825		5.37% Unconnected

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

Summary for Subcatchment S2: Beechstone Northwest

Runoff = 5.11 cfs @ 12.09 hrs, Volume= 0.400 af, Depth= 7.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

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Type III 24-hr 50-Year Rainfall=8.61"

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Area (sf)	CN	Description
6,125	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
1,625	98	Unconnected pavement, HSG B
4,810	98	Roofs, HSG B
15,650	98	Paved parking, HSG B
28,210	90	Weighted Average
6,125		21.71% Pervious Area
22,085		78.29% Impervious Area
1,625		7.36% Unconnected

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

Summary for Subcatchment S4: Entrance Drive

Runoff = 1.25 cfs @ 12.09 hrs, Volume= 0.095 af, Depth= 6.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
2,560	61	>75% Grass cover, Good, HSG B
4,520	98	Paved parking, HSG B
225	98	Unconnected pavement, HSG B
7,305	85	Weighted Average
2,560		35.04% Pervious Area
4,745		64.96% Impervious Area
225		4.74% Unconnected

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

Summary for Subcatchment S7: Stoencroft

Runoff = 9.69 cfs @ 12.51 hrs, Volume= 1.355 af, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

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Type III 24-hr 50-Year Rainfall=8.61"

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Area (sf)	CN	Description
33,000	61	>75% Grass cover, Good, HSG B
48,000	55	Woods, Good, HSG B
16,920	98	Roofs, HSG B
32,180	98	Paved parking, HSG B
2,200	98	Unconnected pavement, HSG B
132,300	73	Weighted Average
81,000		61.22% Pervious Area
51,300		38.78% Impervious Area
2,200		4.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	80	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.23"
19.2	575	0.0100	0.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
37.4	705	Total			

Summary for Subcatchment S8: Beechstone Northeast

Runoff = 5.63 cfs @ 12.09 hrs, Volume= 0.447 af, Depth= 7.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.61"

Area (sf)	CN	Description
4,850	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
6,100	98	Roofs, HSG B
17,650	98	Paved parking, HSG B
1,975	98	Unconnected pavement, HSG B
30,575	92	Weighted Average
4,850		15.86% Pervious Area
25,725		84.14% Impervious Area
1,975		7.68% Unconnected

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

Summary for Reach 1R: Reach

Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

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Type III 24-hr 50-Year Rainfall=8.61"

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Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

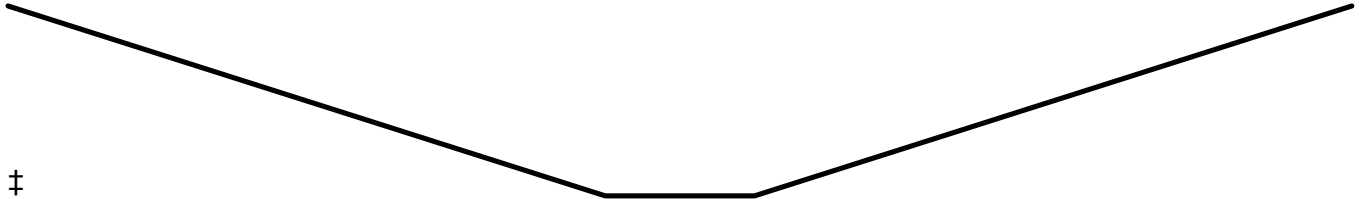
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 465.89 cfs

5.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds

Side Slope Z-value= 10.0 '/' Top Width= 45.00'

Length= 100.0' Slope= 0.0421 '/'

Inlet Invert= 42.21', Outlet Invert= 38.00'

**Summary for Reach 2R: Reach**

Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 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'

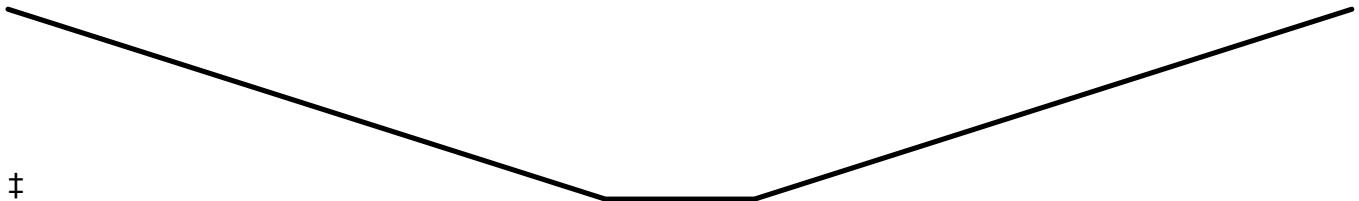
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 753.28 cfs

5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 10.0 '/' Top Width= 45.00'

Length= 30.0' Slope= 0.0230 '/'

Inlet Invert= 42.90', Outlet Invert= 42.21'

**Summary for Reach 3R: Reach**

Inflow = 15.35 cfs @ 12.18 hrs, Volume= 0.446 af

Outflow = 14.97 cfs @ 12.18 hrs, Volume= 0.446 af, Atten= 2%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 4.37 fps, Min. Travel Time= 0.7 min

Avg. Velocity= 2.15 fps, Avg. Travel Time= 1.5 min

Peak Storage= 669 cf @ 12.17 hrs

Average Depth at Peak Storage= 0.39'

Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 559.93 cfs

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Type III 24-hr 50-Year Rainfall=8.61"

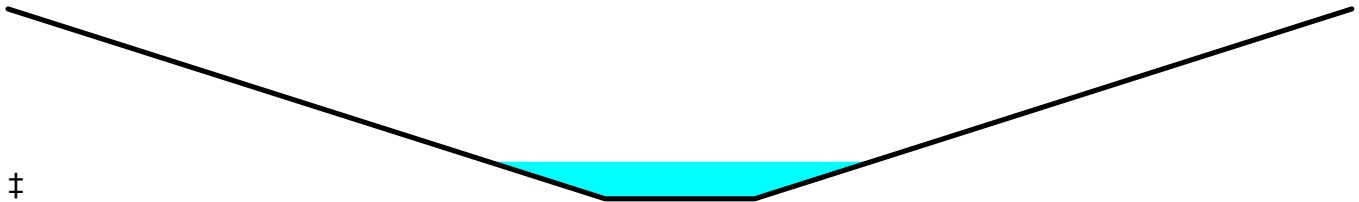
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5.00' x 2.00' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 10.0 '/' Top Width= 45.00'
Length= 192.0' Slope= 0.0127 '/'
Inlet Invert= 45.34', Outlet Invert= 42.90'

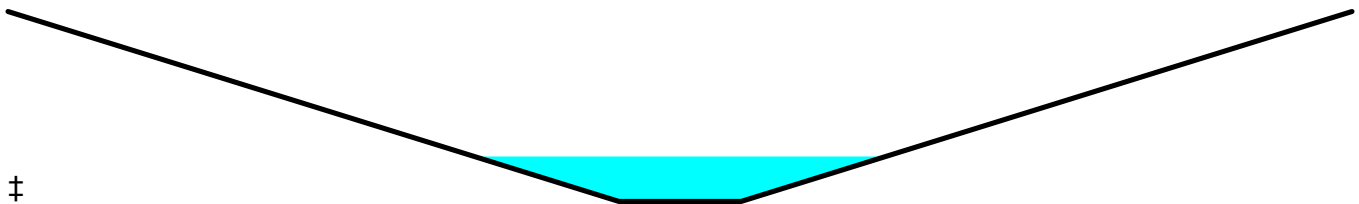
**Summary for Reach R1: Reach**

Inflow Area = 1.235 ac, 55.42% Impervious, Inflow Depth = 1.77" for 50-Year event
Inflow = 8.14 cfs @ 12.10 hrs, Volume= 0.182 af
Outflow = 6.61 cfs @ 12.17 hrs, Volume= 0.182 af, Atten= 19%, Lag= 3.8 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.24 fps, Min. Travel Time= 1.5 min
Avg. Velocity= 1.27 fps, Avg. Travel Time= 3.9 min

Peak Storage= 619 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 181.12 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 5.0 '/' Top Width= 22.00'
Length= 300.0' Slope= 0.0212 '/'
Inlet Invert= 48.76', Outlet Invert= 42.41'

**Summary for Pond 1P: DMH #1**

Inflow Area = 1.339 ac, 58.88% Impervious, Inflow Depth > 5.63" for 50-Year event
Inflow = 3.28 cfs @ 12.17 hrs, Volume= 0.628 af
Outflow = 3.30 cfs @ 12.17 hrs, Volume= 0.628 af, Atten= 0%, Lag= 0.0 min
Primary = 3.30 cfs @ 12.17 hrs, Volume= 0.628 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 44.36' @ 12.17 hrs Surf.Area= 13 sf Storage= 37 cf

Plug-Flow detention time= 1.2 min calculated for 0.627 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (1,112.9 - 1,112.3)

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Type III 24-hr 50-Year Rainfall=8.61"

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Volume	Invert	Avail.Storage	Storage Description
#1	41.42'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	43.10'	12.0" Round Culvert L= 90.0' Ke= 0.500 Inlet / Outlet Invert= 43.10' / 42.35' S= 0.0083 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=3.22 cfs @ 12.17 hrs HW=44.33' (Free Discharge)↑**1=Culvert** (Inlet Controls 3.22 cfs @ 4.10 fps)**Summary for Pond 3P: RG2 Forebay**

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 7.41" for 50-Year event
 Inflow = 5.11 cfs @ 12.09 hrs, Volume= 0.400 af
 Outflow = 5.30 cfs @ 12.09 hrs, Volume= 0.393 af, Atten= 0%, Lag= 0.4 min
 Primary = 5.30 cfs @ 12.09 hrs, Volume= 0.393 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 49.04' @ 12.09 hrs Surf.Area= 450 sf Storage= 469 cf

Plug-Flow detention time= 20.7 min calculated for 0.392 af (98% of inflow)
 Center-of-Mass det. time= 9.7 min (783.7 - 774.0)

Volume	Invert	Avail.Storage	Storage Description
#1	47.50'	469 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.50	175	0.0	0	0
49.00	450	100.0	469	469

Device	Routing	Invert	Outlet Devices
#1	Primary	48.50'	5.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=5.18 cfs @ 12.09 hrs HW=49.04' (Free Discharge)↑**1=Broad-Crested Rectangular Weir** (Weir Controls 5.18 cfs @ 1.93 fps)**Summary for Pond 4P: CB #11**

Inflow Area = 7.183 ac, 47.49% Impervious, Inflow Depth = 5.09" for 50-Year event
 Inflow = 30.67 cfs @ 12.15 hrs, Volume= 3.048 af
 Outflow = 30.69 cfs @ 12.15 hrs, Volume= 3.048 af, Atten= 0%, Lag= 0.0 min
 Primary = 30.69 cfs @ 12.15 hrs, Volume= 3.048 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

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Peak Elev= 44.67' @ 12.15 hrs Surf.Area= 113 sf Storage= 86 cf

Plug-Flow detention time= 0.1 min calculated for 3.043 af (100% of inflow)

Center-of-Mass det. time= 0.1 min (811.8 - 811.7)

Volume	Invert	Avail.Storage	Storage Description
#1	38.84'	42 cf	4.00'D x 3.37'H Vertical Cone/Cylinder
#2	42.21'	43 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		86 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.21	10	0	0
43.00	100	43	43

Device	Routing	Invert	Outlet Devices
#1	Primary	38.84'	15.0" Round Culvert L= 102.0' Ke= 0.500 Inlet / Outlet Invert= 38.84' / 38.00' S= 0.0082 1' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf
#2	Primary	42.21'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=30.68 cfs @ 12.15 hrs HW=44.67' (Free Discharge)

1=Culvert (Barrel Controls 7.14 cfs @ 5.82 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 23.54 cfs @ 4.79 fps)

Summary for Pond 5P: CB #10

Inflow Area = 4.147 ac, 53.33% Impervious, Inflow Depth = 4.84" for 50-Year event
 Inflow = 20.93 cfs @ 12.17 hrs, Volume= 1.674 af
 Outflow = 21.00 cfs @ 12.16 hrs, Volume= 1.674 af, Atten= 0%, Lag= 0.0 min
 Primary = 21.00 cfs @ 12.16 hrs, Volume= 1.674 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 44.78' @ 12.16 hrs Surf.Area= 213 sf Storage= 108 cf

Plug-Flow detention time= 0.1 min calculated for 1.674 af (100% of inflow)

Center-of-Mass det. time= 0.1 min (793.9 - 793.7)

Volume	Invert	Avail.Storage	Storage Description
#1	39.35'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder
#2	42.90'	63 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		108 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.90	10	0	0
43.50	200	63	63

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Device	Routing	Invert	Outlet Devices
#1	Primary	39.35'	12.0" Round Culvert L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 39.35' / 38.89' S= 0.0153 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Primary	42.90'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=20.63 cfs @ 12.16 hrs HW=44.75' (Free Discharge)

1=Culvert (Barrel Controls 6.22 cfs @ 7.92 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 14.41 cfs @ 3.90 fps)

Summary for Pond 6P: CB #9

Inflow Area = 3.695 ac, 49.89% Impervious, Inflow Depth = 4.51" for 50-Year event
 Inflow = 18.88 cfs @ 12.18 hrs, Volume= 1.390 af
 Outflow = 18.71 cfs @ 12.18 hrs, Volume= 1.390 af, Atten= 1%, Lag= 0.0 min
 Primary = 3.37 cfs @ 12.18 hrs, Volume= 0.944 af
 Secondary = 15.35 cfs @ 12.18 hrs, Volume= 0.446 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 47.27' @ 12.18 hrs Surf.Area= 213 sf Storage= 111 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.2 min (797.9 - 797.8)

Volume	Invert	Avail.Storage	Storage Description
#1	42.03'	42 cf	4.00'D x 3.31'H Vertical Cone/Cylinder
#2	45.34'	69 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		111 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.34	10	0	0
46.00	200	69	69

Device	Routing	Invert	Outlet Devices
#1	Primary	42.03'	12.0" Round Culvert L= 192.0' Ke= 0.500 Inlet / Outlet Invert= 42.03' / 39.47' S= 0.0133 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	45.34'	2.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

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Primary OutFlow Max=3.36 cfs @ 12.18 hrs HW=47.22' (Free Discharge)↑**1=Culvert** (Barrel Controls 3.36 cfs @ 4.28 fps)**Secondary OutFlow** Max=14.84 cfs @ 12.18 hrs HW=47.22' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 14.84 cfs @ 3.94 fps)**Summary for Pond 10P: Island Retention**

Inflow Area = 0.831 ac, 67.87% Impervious, Inflow Depth > 5.76" for 50-Year event
 Inflow = 0.79 cfs @ 12.09 hrs, Volume= 0.399 af
 Outflow = 0.44 cfs @ 12.24 hrs, Volume= 0.381 af, Atten= 44%, Lag= 8.7 min
 Primary = 0.44 cfs @ 12.24 hrs, Volume= 0.381 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 47.37' @ 12.24 hrs Surf.Area= 2,172 sf Storage= 896 cf

Plug-Flow detention time= 51.8 min calculated for 0.381 af (95% of inflow)
 Center-of-Mass det. time= 29.5 min (1,298.0 - 1,268.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	47.00'	2,400 cf	Custom Stage Data (Prismatic) Listed below	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	1,500	0.0	0	0
48.00	3,300	100.0	2,400	2,400

Device	Routing	Invert	Outlet Devices
#1	Primary	43.50'	12.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.50' / 43.20' S= 0.0055 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	47.25'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.44 cfs @ 12.24 hrs HW=47.37' (Free Discharge)↑**1=Culvert** (Passes 0.44 cfs of 6.51 cfs potential flow)↑**2=Orifice/Grate** (Weir Controls 0.44 cfs @ 1.15 fps)**Summary for Pond P1: 12" Culvert**

Inflow Area = 2.868 ac, 38.02% Impervious, Inflow Depth = 5.35" for 50-Year event
 Inflow = 10.95 cfs @ 12.35 hrs, Volume= 1.280 af
 Outflow = 12.72 cfs @ 12.35 hrs, Volume= 1.279 af, Atten= 0%, Lag= 0.1 min
 Primary = 12.72 cfs @ 12.35 hrs, Volume= 1.279 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 51.80' @ 12.35 hrs Surf.Area= 2,000 sf Storage= 1,228 cf

Plug-Flow detention time= 3.9 min calculated for 1.279 af (100% of inflow)

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Center-of-Mass det. time= 3.5 min (836.7 - 833.3)

Volume	Invert	Avail.Storage	Storage Description
#1	43.50'	1,228 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.50	10	0	0
44.00	300	78	78
45.00	2,000	1,150	1,228

Device	Routing	Invert	Outlet Devices
#1	Primary	43.74'	15.0" Round Culvert L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 43.74' / 39.12' S= 0.0888 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=12.72 cfs @ 12.35 hrs HW=51.79' (Free Discharge)↑**1=Culvert** (Inlet Controls 12.72 cfs @ 10.36 fps)**Summary for Pond P10: CB #6**

Inflow Area = 5.546 ac, 52.45% Impervious, Inflow Depth > 5.87" for 50-Year event
 Inflow = 15.57 cfs @ 12.12 hrs, Volume= 2.715 af
 Outflow = 15.34 cfs @ 12.13 hrs, Volume= 2.715 af, Atten= 1%, Lag= 0.4 min
 Primary = 15.34 cfs @ 12.13 hrs, Volume= 2.715 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 45.81' @ 12.13 hrs Surf.Area= 13 sf Storage= 64 cf

Plug-Flow detention time= 0.1 min calculated for 2.710 af (100% of inflow)

Center-of-Mass det. time= 0.1 min (887.0 - 886.9)

Volume	Invert	Avail.Storage	Storage Description
#1	40.71'	65 cf	4.00'D x 5.15'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	40.71'	18.0" Round Culvert L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 40.71' / 38.00' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=15.16 cfs @ 12.13 hrs HW=45.67' (Free Discharge)↑**1=Culvert** (Barrel Controls 15.16 cfs @ 8.58 fps)**Summary for Pond P2: CB A**

Inflow Area = 0.648 ac, 78.29% Impervious, Inflow Depth = 7.41" for 50-Year event
 Inflow = 5.11 cfs @ 12.09 hrs, Volume= 0.400 af
 Outflow = 5.11 cfs @ 12.09 hrs, Volume= 0.400 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.11 cfs @ 12.09 hrs, Volume= 0.400 af

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Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 59.90' @ 12.09 hrs Surf.Area= 13 sf Storage= 50 cf

Plug-Flow detention time= 0.2 min calculated for 0.399 af (100% of inflow)

Center-of-Mass det. time= 0.2 min (774.0 - 773.8)

Volume	Invert	Avail.Storage	Storage Description
#1	50.93'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	50.92'	12.0" Round Culvert L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 50.92' / 48.77' S= 0.0179 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=4.98 cfs @ 12.09 hrs HW=59.41' (Free Discharge)↑**1=Culvert** (Barrel Controls 4.98 cfs @ 6.34 fps)**Summary for Pond P3: 12" Culvert**

Inflow Area = 2.860 ac, 41.63% Impervious, Inflow Depth = 3.67" for 50-Year event
 Inflow = 14.17 cfs @ 12.17 hrs, Volume= 0.875 af
 Outflow = 14.80 cfs @ 12.19 hrs, Volume= 0.875 af, Atten= 0%, Lag= 1.2 min
 Primary = 14.80 cfs @ 12.19 hrs, Volume= 0.875 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 85.63' @ 12.19 hrs Surf.Area= 2,000 sf Storage= 1,241 cf

Plug-Flow detention time= 3.6 min calculated for 0.875 af (100% of inflow)

Center-of-Mass det. time= 3.6 min (811.9 - 808.3)

Volume	Invert	Avail.Storage	Storage Description
#1	42.41'	1,241 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.41	10	0	0
43.00	300	91	91
44.00	2,000	1,150	1,241

Device	Routing	Invert	Outlet Devices
#1	Primary	42.41'	12.0" Round Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 42.41' / 42.27' S= 0.0028 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=14.45 cfs @ 12.19 hrs HW=83.78' (Free Discharge)↑**1=Culvert** (Barrel Controls 14.45 cfs @ 18.40 fps)

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Summary for Pond P7: CB #7

Inflow Area = 3.739 ac, 47.29% Impervious, Inflow Depth = 5.78" for 50-Year event
 Inflow = 10.96 cfs @ 12.46 hrs, Volume= 1.802 af
 Outflow = 10.98 cfs @ 12.46 hrs, Volume= 1.802 af, Atten= 0%, Lag= 0.0 min
 Primary = 10.98 cfs @ 12.46 hrs, Volume= 1.802 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 128.15' @ 12.46 hrs Surf.Area= 13 sf Storage= 40 cf

Plug-Flow detention time= 0.1 min calculated for 1.799 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (825.5 - 825.4)

Volume	Invert	Avail.Storage	Storage Description
#1	48.82'	40 cf	4.00'D x 3.18'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	48.82'	12.0" Round Culvert L= 230.0' Ke= 0.500 Inlet / Outlet Invert= 48.82' / 41.57' S= 0.0315 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=10.96 cfs @ 12.46 hrs HW=127.78' (Free Discharge)
 ↗ **1=Culvert** (Barrel Controls 10.96 cfs @ 13.95 fps)

Summary for Pond P8: CB B

Inflow Area = 0.702 ac, 84.14% Impervious, Inflow Depth = 7.65" for 50-Year event
 Inflow = 5.63 cfs @ 12.09 hrs, Volume= 0.447 af
 Outflow = 5.60 cfs @ 12.09 hrs, Volume= 0.447 af, Atten= 1%, Lag= 0.0 min
 Primary = 5.60 cfs @ 12.09 hrs, Volume= 0.447 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 54.27' @ 12.09 hrs Surf.Area= 13 sf Storage= 38 cf

Plug-Flow detention time= 0.3 min calculated for 0.447 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (767.4 - 767.2)

Volume	Invert	Avail.Storage	Storage Description
#1	49.10'	38 cf	4.00'D x 3.00'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	12.0" Round Culvert L= 35.0' Ke= 0.500 Inlet / Outlet Invert= 49.10' / 48.90' S= 0.0057 '/' Cc= 0.900 n= 0.025, Flow Area= 0.79 sf

Primary OutFlow Max=5.46 cfs @ 12.09 hrs HW=54.07' (Free Discharge)
 ↗ **1=Culvert** (Barrel Controls 5.46 cfs @ 6.95 fps)

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Summary for Pond P9: CB #5

Inflow Area = 4.208 ac, 50.40% Impervious, Inflow Depth = 5.95" for 50-Year event
 Inflow = 12.74 cfs @ 12.10 hrs, Volume= 2.087 af
 Outflow = 12.67 cfs @ 12.10 hrs, Volume= 2.087 af, Atten= 1%, Lag= 0.0 min
 Primary = 12.67 cfs @ 12.10 hrs, Volume= 2.087 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 48.49' @ 12.10 hrs Surf.Area= 13 sf Storage= 45 cf

Plug-Flow detention time= 0.1 min calculated for 2.083 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (819.0 - 818.8)

Volume	Invert	Avail.Storage	Storage Description
#1	41.42'	45 cf	4.00'D x 3.55'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	41.42'	18.0" Round Culvert L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 41.42' / 40.66' S= 0.0080 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf

Primary OutFlow Max=12.65 cfs @ 12.10 hrs HW=48.46' (Free Discharge)

↑**1=Culvert** (Barrel Controls 12.65 cfs @ 7.16 fps)

Summary for Pond RG1: Raingarden 1

Inflow Area = 1.235 ac, 55.42% Impervious, Inflow Depth = 6.30" for 50-Year event
 Inflow = 8.18 cfs @ 12.10 hrs, Volume= 0.649 af
 Outflow = 9.17 cfs @ 12.10 hrs, Volume= 0.649 af, Atten= 0%, Lag= 0.1 min
 Discarded = 1.03 cfs @ 12.11 hrs, Volume= 0.467 af
 Primary = 8.14 cfs @ 12.10 hrs, Volume= 0.182 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 48.22' @ 12.10 hrs Surf.Area= 2,000 sf Storage= 3,650 cf

Plug-Flow detention time= 26.2 min calculated for 0.649 af (100% of inflow)
 Center-of-Mass det. time= 26.2 min (824.7 - 798.5)

Volume	Invert	Avail.Storage	Storage Description
#1	43.25'	3,650 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.25	1,000	0.0	0	0
44.25	1,000	40.0	400	400
45.75	1,000	10.0	150	550
46.00	1,000	40.0	100	650
48.00	2,000	100.0	3,000	3,650

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Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	5.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	43.25'	2.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 43.00'

Discarded OutFlow Max=1.02 cfs @ 12.11 hrs HW=48.20' (Free Discharge)↑ **2=Exfiltration** (Controls 1.02 cfs)**Primary OutFlow** Max=7.83 cfs @ 12.10 hrs HW=48.20' (Free Discharge)↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 7.83 cfs @ 2.25 fps)**Summary for Pond RG2: Raingarden 2**

Inflow Area = 0.508 ac, 44.17% Impervious, Inflow Depth = 5.84" for 50-Year event
Inflow = 2.92 cfs @ 12.15 hrs, Volume= 0.247 af
Outflow = 2.88 cfs @ 12.17 hrs, Volume= 0.247 af, Atten= 1%, Lag= 0.9 min
Primary = 2.88 cfs @ 12.17 hrs, Volume= 0.247 af

Routing by Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 47.79' @ 12.17 hrs Surf.Area= 897 sf Storage= 1,112 cf

Plug-Flow detention time= 14.4 min calculated for 0.247 af (100% of inflow)

Center-of-Mass det. time= 14.4 min (825.6 - 811.2)

Volume	Invert	Avail.Storage	Storage Description	
#1	43.75'	1,260 cf	Custom Stage Data (Prismatic) Listed below	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.75	400	0.0	0	0
44.75	400	33.0	132	132
46.25	400	10.0	60	192
46.50	400	33.0	33	225
48.00	980	100.0	1,035	1,260

Device	Routing	Invert	Outlet Devices
#1	Primary	43.50'	12.0" Round Culvert L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.50' / 43.20' S= 0.0065 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	47.50'	18.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	43.75'	3.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 43.50'

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Primary OutFlow Max=2.82 cfs @ 12.17 hrs HW=47.78' (Free Discharge)

- 1=Culvert (Passes 2.82 cfs of 7.22 cfs potential flow)
- 2=Orifice/Grate (Weir Controls 2.31 cfs @ 1.74 fps)
- 3=Exfiltration (Controls 0.52 cfs)

Summary for Link POA1: POA #1

Inflow Area = 7.183 ac, 47.49% Impervious, Inflow Depth = 5.09" for 50-Year event
Inflow = 30.69 cfs @ 12.15 hrs, Volume= 3.048 af
Primary = 30.69 cfs @ 12.15 hrs, Volume= 3.048 af, Atten= 0%, Lag= 0.0 min

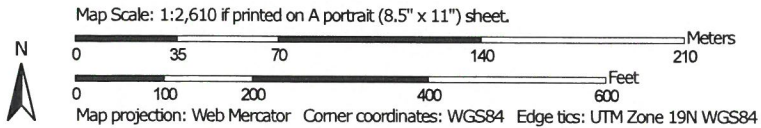
Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Summary for Link POA2: POA #2

Inflow Area = 5.546 ac, 52.45% Impervious, Inflow Depth > 5.87" for 50-Year event
Inflow = 15.34 cfs @ 12.13 hrs, Volume= 2.715 af
Primary = 15.34 cfs @ 12.13 hrs, Volume= 2.715 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Soil Map—Rockingham County, New Hampshire (Beechstone Expansion)



MAP LEGEND

Area of Interest (AOI)		Area of Interest (AOI)		Spoil Area	
Soils		Soil Map Unit Polygons		Stony Spot	
	Soil Map Unit Lines		Wet Spot		Other
	Soil Map Unit Points		Special Line Features		Special Line Features
Special Point Features		Water Features		Streams and Canals	
	Blowout	Transportation		Rails	
	Borrow Pit		Interstate Highways		US Routes
	Clay Spot		Major Roads		Local Roads
	Closed Depression		Aerial Photography		
	Gravel Pit		Background		
	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				

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 20, Sep 7, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Jun 14, 2017

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
32A	Boxford silt loam, 0 to 3 percent slopes	0.4	2.4%
460B	Pennichuck channery very fine sandy loam, 3 to 8 percent slopes	0.9	5.3%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	3.6	22.2%
799	Urban land-Canton complex, 3 to 15 percent slopes	11.4	70.2%
Totals for Area of Interest		16.2	100.0%



TEST PIT LOGS

PROJECT NO.: 19-0299
LOGGED BY: Tyler Demers
CONTRACTOR:
JNL, Inc.
EQUIPMENT:
Kubota kx040-4

CLIENT: Forest of Portsmouth, LLC.
PROJECT: Proposed Multi-Unit Buildings
LOCATION: 145 Lang Rd, Portsmouth, NH

TEST PIT TP-1

DATE: 4/4/2019 LOCATION: See Exploration Location Plan SURFACE ELEVATION (FT): 49' ± COMPLETION DEPTH (FT): 7.0
WATER LEVEL DEPTHS (FT): 7 ft Free water at 7 feet. SHGWT at 6 feet REMARKS:

Depth (feet)	Graphic Log	Stratum Description	H ₂ O Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		9" Topsoil with roots					
		0.8 Light brown fine to medium SAND some silt (Fill)					
		2.0 Buried Topsoil with roots					
		2.2 Brown Silty Gravelly SAND with roots (Glacial Till)					
		3.0 Brown Silty Gravelly SAND (Glacial Till)					
5							

Bottom of Exploration at 7.0 feet

TEST PIT TP-2

DATE: 4/4/2019 LOCATION: See Exploration Location Plan SURFACE ELEVATION (FT): 48' ± COMPLETION DEPTH (FT): 9.5
WATER LEVEL DEPTHS (FT): No free water observed. SHGWT at 8 feet REMARKS:

Depth (feet)	Graphic Log	Stratum Description	H ₂ O Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		0.3 4" Forest Duff with roots					
		Brown Silty Gravelly SAND with roots (Glacial Till)					
		3.0 Brown Silty Gravelly SAND occasional cobbles (Glacial Till)					
5							

Bottom of Exploration at 9.5 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

KEY TO NOTES AND SYMBOLS:

Water Level
▽ At time of Digging
▼ At Completion of Digging
▽ After Digging

q_p = Pocket Penetrometer Strength, kips/sq.ft.

NOTES

- SEDIMENT TRAPS AND/OR BASINS MUST BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.
- STORMWATER PONDS AND SWALES MUST BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
- FINAL LOCATION OF YARD DRAINS TO BE DETERMINED IN FIELD. FOUNDATIONS DRAINS TO TIE INTO COLLECTION SYSTEM.

DRAINAGE STRUCTURES

PCB #1
RIM = 47.90
12" INV. IN=43.45
12" INV. OUT=43.35

STORMWATER PRACTICES

RAINGARDEN #1
BOTTOM AREA=800 SF
BOTTOM ELEV = 46.0
BERM ELEV = 48.0

OUTLET STRUCTURE 1 (OS1)
OVERFLOW WIER, ELEV = 47.5

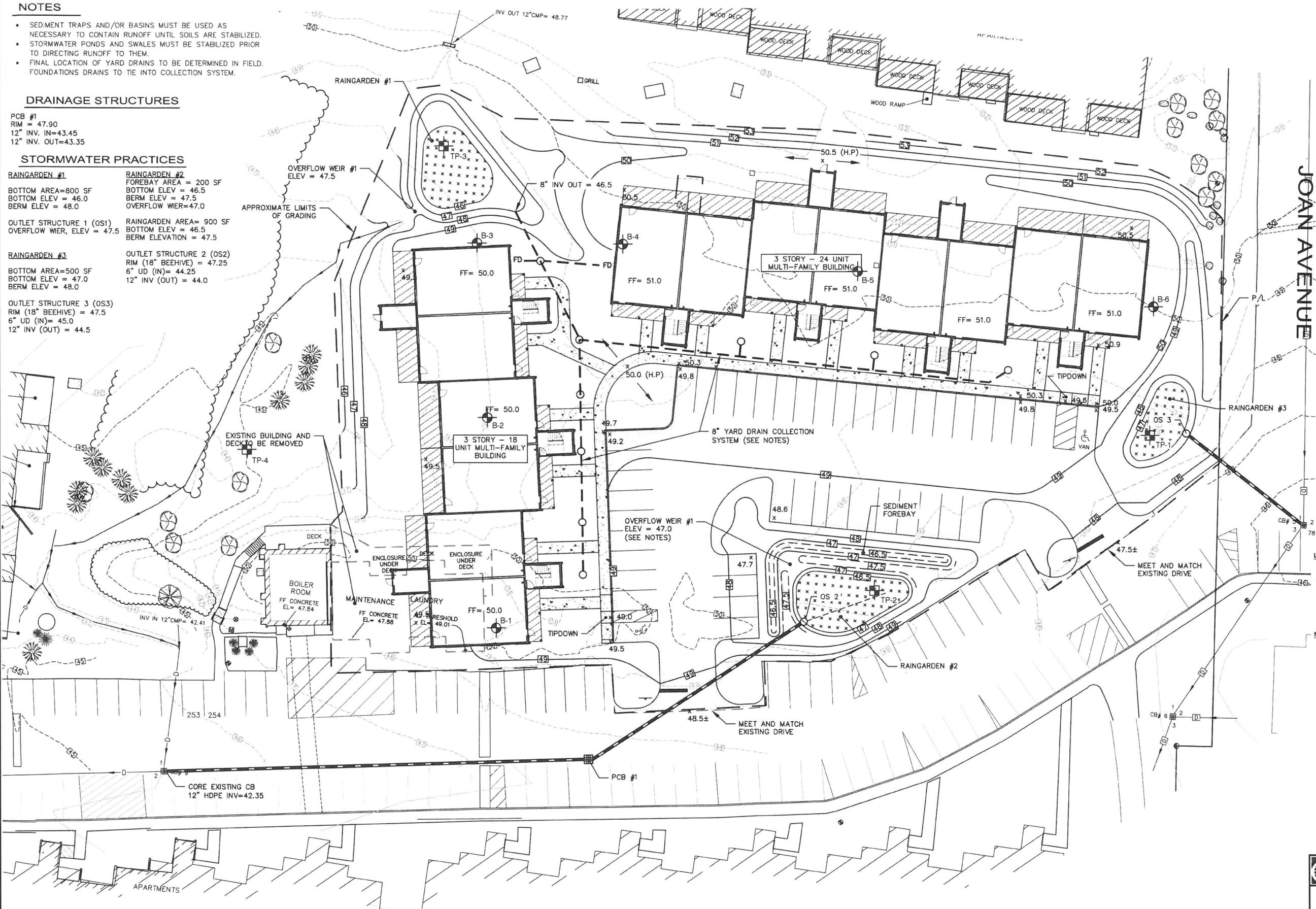
RAINGARDEN #3
BOTTOM AREA=500 SF
BOTTOM ELEV = 47.0
BERM ELEV = 48.0

OUTLET STRUCTURE 3 (OS3)
RIM (18" BEEHIVE) = 47.5
6" UD (IN)= 45.0
12" INV (OUT) = 44.5

RAINGARDEN #2
FOREBAY AREA = 200 SF
BOTTOM ELEV = 46.5
BERM ELEV = 47.5
OVERFLOW WIER=47.0

RAINGARDEN AREA= 900 SF
BOTTOM ELEV = 46.5
BERM ELEVATION = 47.5

OUTLET STRUCTURE 2 (OS2)
RIM (18" BEEHIVE) = 47.25
6" UD (IN)= 44.25
12" INV (OUT) = 44.0



LEGEND:

- APPROXIMATE BORING LOCATION
- APPROXIMATE TEST PIT LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=20' SCALE PLAN OF THE SITE ENTITLED "GRADING AND DRAINAGE PLAN" PREPARED BY ALTUS ENGINEERING, INC., DATED APRIL 2, 2019.
2. THE BORINGS WERE LOCATED IN THE FIELD BY TAPED MEASUREMENTS FROM EXISTING SITE FEATURES.
3. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
4. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.

S.W. COLE
ENGINEERING, INC.

FOREST OF PORTSMOUTH, LLC
EXPLORATION LOCATION PLAN
PROPOSED MULTI-UNIT BUILDINGS
145 LANG ROAD
PORTSMOUTH, NEW HAMPSHIRE

Job No.: 19-0289 Scale: 1" = 20'
Date: 04/24/2019 Sheet: 1



LEGEND

- PROPERTY LINE
- WETLAND/SOILS BOUNDARY
- 60 EXISTING CONTOUR
- EXISTING PAVEMENT/CURB
- EXISTING TREELINE
- WATERSHED BOUNDARY
- Tc PATH
- SURFACE FLOW DIRECTION
- 1 1 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

SOILS LEGEND

HYDROLOGIC GROUP

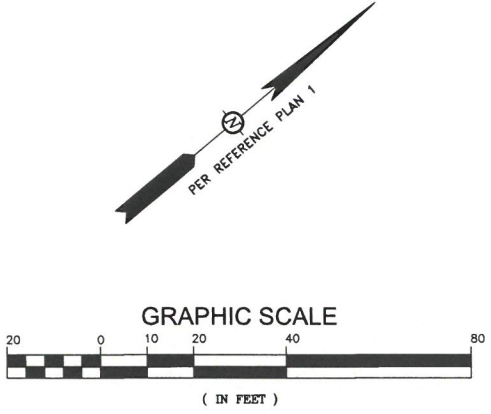
- SOILS - HSG A
- SOILS - HSG B
- SOILS - HSG C
- SOILS - HSG D
- IMPERVIOUS (BLDG/ROADS)
- OPEN WATER

SOILS CLASSIFICATION

SYMBOL	DESCRIPTION	HSG
460	PENNICHUCK - VERY FINE SANDY LOAM	B
538	SQUAMSCOTT - FINE SANDY LOAM	C
799	URBAN LAND - CANTON COMPLEX	B

SLOPE PHASES

SYMBOL	PHASE
A	0-3%
B	3-8%
C	8-15%
D	15-25%
E	25-50%
F	50%+



ENGINEER:

ALTUS
ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR: **DRAINAGE STUDY**

ISSUE DATE: **MAY 20, 2019**

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	CDB	05/20/19

DRAWN BY: CDB

APPROVED BY: EDW

DRAWING FILE: 4787.DWG

SCALE:

22" x 34" - 1" = 20'

11" x 17" - 1" = 40'

OWNER OF RECORD:

ARBOR VIEW & THE PINES LLC.
C/O FOREST PROPERTIES MGMT
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

APPLICANT:

FOREST PROPERTIES MGMT INC.
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

PROJECT:

ARBOR VIEW APARTMENTS RESIDENTIAL EXPANSION

145 LANG ROAD
PORTSMOUTH, NH

TITLE:

PRE-DEVELOPMENT SOILS PLAN

SHEET NUMBER:

S-1



LEGEND

- PROPERTY LINE
- WETLAND/SOILS BOUNDARY
- 60 EXISTING CONTOUR
- EXISTING PAVEMENT/CURB
- EXISTING TREELINE
- WATERSHED BOUNDARY
- Tc PATH
- SURFACE FLOW DIRECTION
- 1 1 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

SOILS LEGEND

HYDROLOGIC GROUP

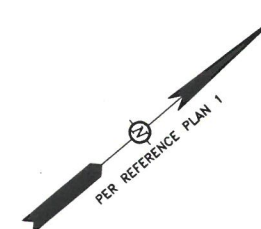
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- SOILS - HSG B
- SOILS - HSG C
- SOILS - HSG D
- IMPERVIOUS (BLDG/ROADS)
- OPEN WATER

SOILS CLASSIFICATION

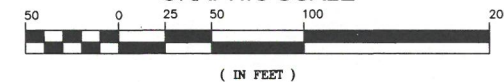
SYMBOL	DESCRIPTION	HSG
460	PENNICHUCK - VERY FINE SANDY LOAM	B
538	SQUAMSCOTT - FINE SANDY LOAM	C
799	URBAN LAND - CANTON COMPLEX	B

SLOPE PHASES

SYMBOL	PHASE
A	0-3%
B	3-8%
C	8-15%
D	15-25%
E	25-50%
F	50%+



GRAPHIC SCALE



ENGINEER:
ALTUS
ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR: **DRAINAGE STUDY**

ISSUE DATE: **MAY 20, 2019**

REVISIONS		
NO.	DESCRIPTION	BY DATE
0	INITIAL SUBMISSION	CDB 05/20/14

DRAWN BY: **CDB**
APPROVED BY: **EDW**
DRAWING FILE: **4787.DWG**

SCALE:
22" x 34" - 1" = 50'
11" x 17" - 1" = 100'

OWNER OF RECORD:
ARBOR VIEW & THE PINES LLC.
C/O FOREST PROPERTIES MGMT
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138
APPLICANT:
FOREST PROPERTIES MGMT INC.
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

PROJECT:
ARBOR VIEW APARTMENTS RESIDENTIAL EXPANSION

145 LANG ROAD PORTSMOUTH, NH

TITLE:
POST-DEVELOPMENT SOILS PLAN

SHEET NUMBER:
S-2



LEGEND

- PROPERTY LINE
- WETLAND/SOILS BOUNDARY
- 60 EXISTING CONTOUR
- EXISTING PAVEMENT/CURB
- EXISTING TREELINE
- WATERSHED BOUNDARY
- Tc PATH
- SURFACE FLOW DIRECTION
- 1 1 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

SOILS LEGEND

HYDROLOGIC GROUP

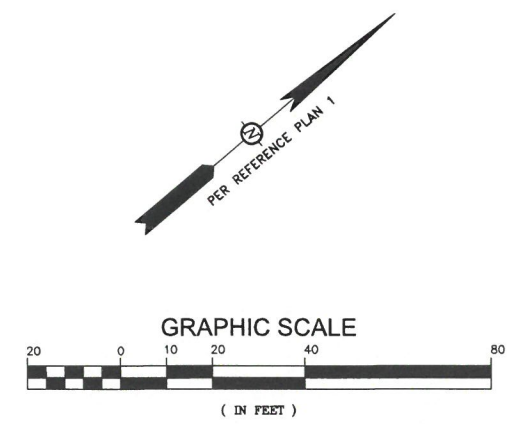
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- SOILS - HSG B
- SOILS - HSG C
- SOILS - HSG D
- IMPERVIOUS (BLDGs/ROADS)
- OPEN WATER

SOILS CLASSIFICATION

SYMBOL	DESCRIPTION	HSG
460	PENNICHUCK - VERY FINE SANDY LOAM	B
538	SQUAMSCOTT - FINE SANDY LOAM	C
799	URBAN LAND - CANTON COMPLEX	B

SLOPE PHASES

SYMBOL	PHASE
A	0-3%
B	3-8%
C	8-15%
D	15-25%
E	25-50%
F	50%+



ENGINEER:

ALTUS
ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR: **DRAINAGE STUDY**

ISSUE DATE: **MAY 20, 2019**

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	CDB	05/20/19

DRAWN BY: CDB

APPROVED BY: EDW

DRAWING FILE: 4787.DWG

SCALE:
22" x 34" - 1" = 20'
11" x 17" - 1" = 40'

OWNER OF RECORD:
ARBOR VIEW & THE PINES LLC.
C/O FOREST PROPERTIES MGMT
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

APPLICANT:
FOREST PROPERTIES MGMT INC.
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

PROJECT:
ARBOR VIEW APARTMENTS RESIDENTIAL EXPANSION

145 LANG ROAD
PORTSMOUTH, NH

TITLE:
PRE-DEVELOPMENT DRAINAGE PLAN

SHEET NUMBER:
DA-1



- LEGEND**
- PROPERTY LINE
 - WETLAND/SOILS BOUNDARY
 - 60 EXISTING CONTOUR
 - EXISTING PAVEMENT/CURB
 - EXISTING TREELINE
 - WATERSHED BOUNDARY
 - Tc PATH
 - SURFACE FLOW DIRECTION
 - 1 1 1 SUBCATCHMENT/POND/REACH
 - POA POINT OF ANALYSIS

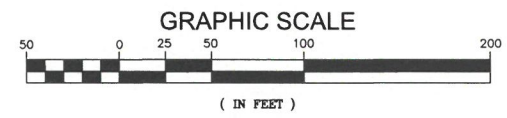
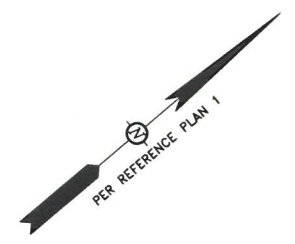
- SOILS LEGEND**
- HYDROLOGIC GROUP**
- SOILS - HSG A
 - SOILS - HSG B
 - SOILS - HSG C
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SOILS CLASSIFICATION

SYMBOL	DESCRIPTION	HSG
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SLOPE PHASES

SYMBOL	PHASE
A	0-3%
B	3-8%
C	8-15%
D	15-25%
E	25-50%
F	50%+



ENGINEER:

 133 COURT STREET PORTSMOUTH, NH 03801
 (603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR:
DRAINAGE REPORT

ISSUE DATE:
 JULY 8, 2014

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	07/08/14

DRAWN BY: CDB
APPROVED BY: EDW
DRAWING FILE: 4552.DWG

SCALE:
 22" x 34" - 1" = 50'
 11" x 17" - 1" = 100'

OWNER OF RECORD:
 ARBOR VIEW & THE PINES LLC.
 C/O FOREST PROPERTIES MGMT
 625 MT AUBURN ST, STE 210
 CAMBRIDGE, MA 02138

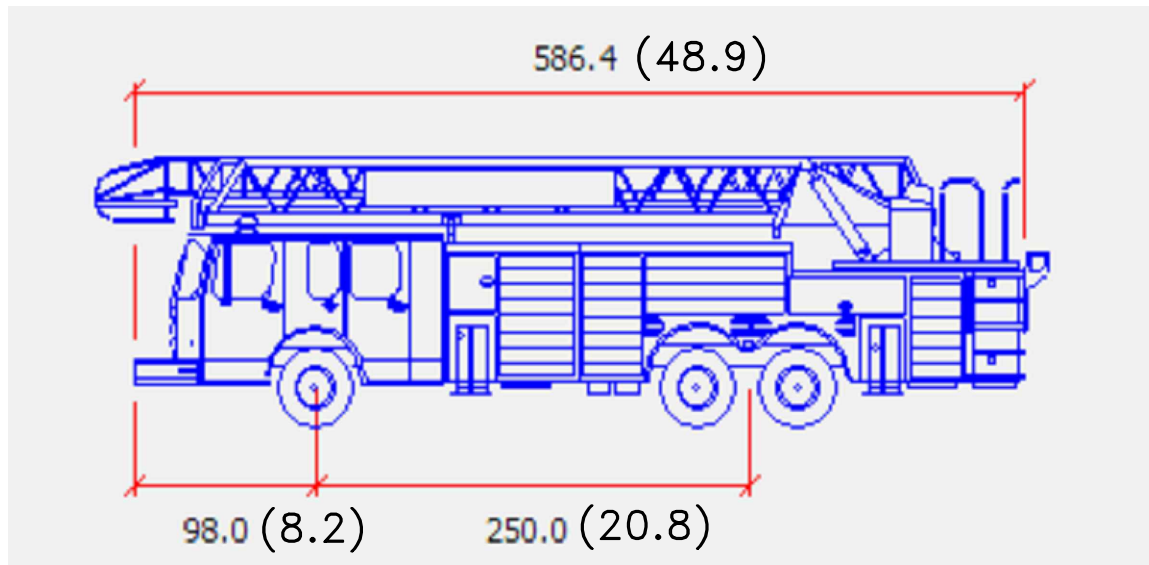
APPLICANT:
 FOREST PROPERTIES MGMT INC.
 625 MT AUBURN ST, STE 210
 CAMBRIDGE, MA 02138

PROJECT:
 ARBOR VIEW APARTMENTS RESIDENTIAL EXPANSION
 145 LANG ROAD
 PORTSMOUTH, NH

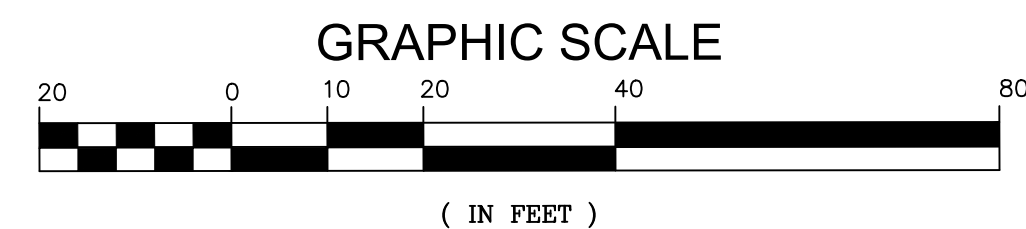
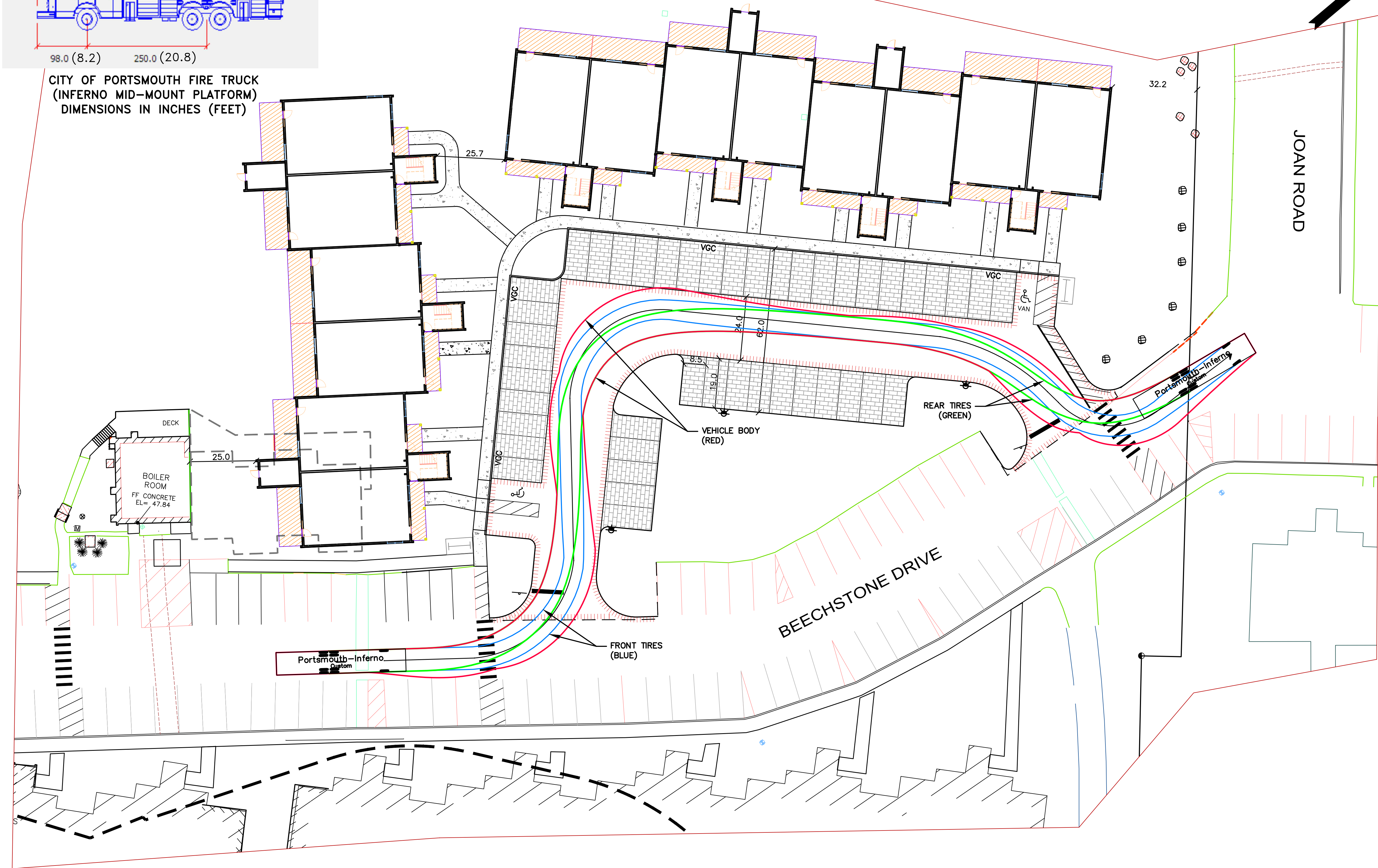
TITLE:
 POST-DEVELOPMENT DRAINAGE PLAN

SHEET NUMBER:
 DA-2

P4552



CITY OF PORTSMOUTH FIRE TRUCK
(INFERNO MID-MOUNT PLATFORM)
DIMENSIONS IN INCHES (FEET)



ENGINEER:

ALTUS
ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR: TAC

ISSUE DATE: MAY 20, 2019

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	05/20/19

DRAWN BY: CDB

APPROVED BY: EDW

DRAWING FILE: 4787.2_SITE.DWG

SCALE:

22" x 34" - 1" = 20'

11" x 17" - 1" = 40'

OWNER OF RECORD:

ARBOR VIEW & THE PINES LLC.
C/O FOREST PROPERTIES MGMT
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

APPLICANT:

FOREST PROPERTIES MGMT INC.
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

PROJECT:

ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT

145 LANG ROAD
PORTSMOUTH, NH

TITLE:

AUTOTURN

SHEET NUMBER:

A-1

“Green” Statement
Assessor’s Map 287 Lot 01
145 Lang Road
“Arbor View Apartments”
Altus Project P4787.2

Pursuant to Section 2.4.3.1(a) of the Site Plan Review Regulations, Altus Engineering, Inc. (Altus) respectfully submits the following list of the project’s “green” components for the site plan amendment and expansion of the property located at 145 Lang Road:

- The existing Arbor View Apartment complex was constructed in the 1980’s prior to stormwater treatment or detention design considerations. Runoff from the pavement and building surfaces currently discharge to a closed drainage system that discharges to the wetlands to the south. The stormwater management design for this site will enhance the runoff quality and reduce the peak rates of runoff to improve down gradient conditions.
- The proposed stormwater management system is designed to use elements of low impact design (LID) to treat and detain stormwater. The drainage system is designed to mimic the predevelopment runoff conditions at the wetlands and property lines.
- The proposed parking areas will be constructed using porous materials.
- Two raingardens will be constructed to treat and detain stormwater flows from the proposed development as well as additional flows from the existing development. Approximately 30,000 sf (3/4 acre) of existing impervious surfaces will be treated through the construction of the proposed raingardens.
- No wetlands will be impacted as a result of the development. Temporary wetland buffer impacts will occur for the replacement of a corroded corrugated metal drainage pipe.
- The proposed site lighting will have LED fixtures. They will be mounted at a maximum height of 16-feet. The lights will be dark sky friendly and will exceed the minimum City requirements.
- The existing mature vegetated buffer on three sides of the property will be maintained. The proposed landscape plan for the development area will plant additional trees to provide shade areas.
- The proposed development will have a two interior bicycle racks.
- The two new buildings will be code compliant buildings with components that will meet or exceed all applicable energy codes.
 - The proposed interior lighting will have LED fixtures to reduce electrical usage.
 - Wall and roof insulation is proposed to be spray foam to maximize R-value and air tightness in the building envelope.
 - Centralized high efficiency boilers will provide domestic hot water and heating.
 - Proposed low-flow plumbing fixtures to reduce overall water usage.

IMPERVIOUS AREA CALCULATIONS TABLE

Arbor View Apartments
145 Lang Road, Portsmouth, NH

	Pre Development	Post Development	Increase
Description	s.f.	s.f.	s.f.
Driveways and Parking Areas	107,270	110,320	3,050
Porous Pavement(Pavers)	0	7,100	7,100*
Buildings (Roofs)	63,090	79,190	16,100
Other (Sidewalks, Decks, Etc)	20,965	28,270	7,305
TOTALS	191,325	217,780	26,455
			13.83%

Prepared by Altus Engineering
12-Jun-19
P4787.2



D-Series Size 0 LED Area Luminaire



Catalog Number
Notes
Type

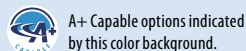
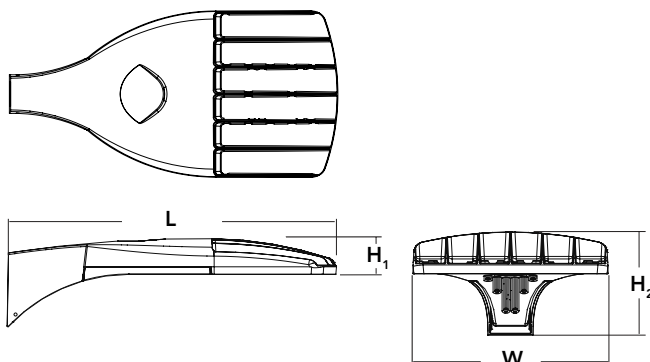
Hit the Tab key or mouse over the page to see all interactive elements.

Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment. The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 400W metal halide with typical energy savings of 70% and expected service life of over 100,000 hours.

Specifications

EPA:	0.95 ft ² (.09 m ²)
Length:	26" (66.0 cm)
Width:	13" (33.0 cm)
Height ₁ :	3" (7.62 cm)
Height ₂ :	7" (17.8 cm)
Weight (max):	16 lbs (7.25 kg)



Ordering Information

EXAMPLE: DSX0 LED P6 40K T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX0 LED					
Series	LEDs	Color temperature	Distribution	Voltage	Mounting
DSX0 LED	Forward optics P1 P4 P7 P2 P5 P3 P6 Rotated optics P10' P12' P11' P13'	30K 3000 K 40K 4000 K 50K 5000 K	T1S Type I short T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium T5VS Type V very short T5S Type V short T5M Type V medium T5W Type V wide BLC Backlight control ² LCCO Left corner cutoff ² RCCO Right corner cutoff ²	MVOLT ^{3,4} 120 ⁴ 208 ⁴ 240 ⁴ 277 ⁴ 347 ^{4,5} 480 ^{4,5}	Shipped included SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMBA Square pole universal mounting adaptor ⁶ RPUMBA Round pole universal mounting adaptor ⁶ Shipped separately KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish) ⁷

Control options		Other options		Finish <i>(required)</i>		
Shipped installed		PIR	High/low, motion/ambient sensor, 8–15' mounting height, ambient sensor enabled at 5fc ^{13,14}	Shipped installed	DDBXD Dark bronze	
NLTAIR2	nLight AIR generation 2 enabled ^{8,9}	PIRH	High/low, motion/ambient sensor, 15–30' mounting height, ambient sensor enabled at 5fc ^{13,14}	HS	House-side shield ¹⁶	DBLXD Black
PIRHN	Network, high/low motion/ambient sensor ¹⁰	PIR1FC3V	High/low, motion/ambient sensor, 8–15' mounting height, ambient sensor enabled at 1fc ^{13,14}	SF	Single fuse (120, 277, 347V) ⁴	DNAXD Natural aluminum
PER	NEMA twist-lock receptacle only (control ordered separate) ¹¹	PIRH1FC3V	High/low, motion/ambient sensor, 15–30' mounting height, ambient sensor enabled at 1fc ^{13,14}	DF	Double fuse (208, 240, 480V) ⁴	DWHXD White
PER5	Five-pin receptacle only (control ordered separate) ^{11,12}	FAO	Field adjustable output ¹⁵	L90	Left rotated optics ¹	DDBTXD Textured dark bronze
PER7	Seven-pin receptacle only (leads exit fixture) (control ordered separate) ^{11,12}			R90	Right rotated optics ¹	DBLBXD Textured black
DMG	0–10V dimming extend out back of housing for external control (control ordered separate)			DDL	Diffused drop lens ¹⁶	DNATXD Textured natural aluminum
				Shipped separately		DWHGXD Textured white
				BS	Bird spikes ¹⁷	
				EGS	External glare shield ¹⁷	



Ordering Information

Accessories

Ordered and shipped separately.

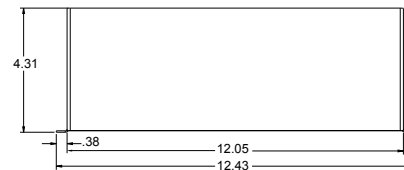
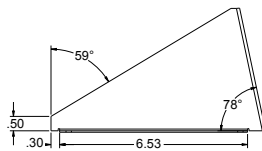
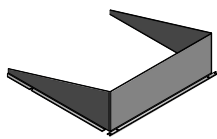
DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) ¹⁸
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) ¹⁸
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) ¹⁸
DSHORT SBK U	Shorting cap ¹⁸
DSX0HS 20C U	House-side shield for P1,P2,P3 and P4 ¹⁶
DSX0HS 30C U	House-side shield for P10,P11,P12 and P13 ¹⁶
DSX0HS 40C U	House-side shield for P5,P6 AND P7 ¹⁶
DSX0DDL U	Diffused drop lens (polycarbonate) ¹⁶
PUMBA DDBXD U*	Square and round pole universal mounting bracket adaptor (specify finish) ¹⁹
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish) ¹⁹

For more control options, visit [DTL](#) and [ROAM](#) online.
Link to [nLight Air 2](#)

NOTES

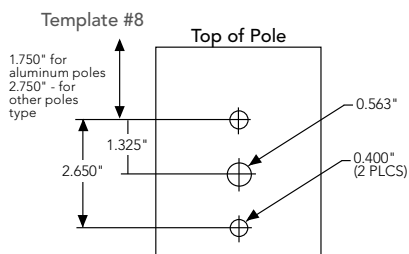
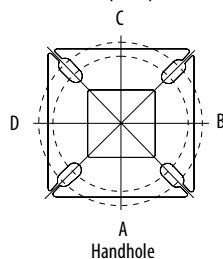
- 1 P10, P11, P12 and P13 and rotated options (L90 or R90) only available together.
- 2 Not available with HS or DDL.
- 3 MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
- 4 Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
- 5 Not available in P4, P7 or P13. Not available with BL30, BL50 or PNMT options.
- 6 Universal mounting brackets intended for retrofit on existing pre-drilled poles only. 1.5 G vibration load rating per ANSI C136.31.
- 7 Must order fixture with SPA mounting. Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8" mast arm (not included).
- 8 Must be ordered with PIRHN.
- 9 Sensor cover available only in dark bronze, black, white and natural aluminum colors.
- 10 Must be ordered with NLTAIR2. For more information on nLight Air 2 visit [this link](#).
- 11 Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Shorting Cap included.
- 12 If ROAM® node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Shorting Cap included.
- 13 Reference Motion Sensor table on page 3.
- 14 Reference PER Table on page 3 to see functionality.
- 15 Not available with other dimming controls options.
- 16 Not available with BLC, LCCO and RCCO distribution. Must be ordered with fixture for factory pre-drilling.
- 17 Must be ordered with fixture for factory pre-drilling.
- 18 Requires luminaire to be specified with PER, PER5 or PER7 option. See PER Table on page 3.
- 19 For retrofit use only.

EGS – External Glare Shield



Drilling

HANDHOLE ORIENTATION (from top of pole)



Tenon Mounting Slipfitter

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	AST20-290	AST20-320	AST20-390	AST20-490
2-7/8"	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

Mounting Option	Drilling Template	Single	2 @ 180	2 @ 90	3 @ 90	3 @ 120	4 @ 90
Head Location		Side B	Side B & D	Side B & C	Side B, C & D	Round Pole Only	Side A, B, C & D
Drill Nomenclature	#8	DM19AS	DM28AS	DM29AS	DM39AS	DM32AS	DM49AS

		Minimum Acceptable Outside Pole Dimension					
SPA	#8	2-7/8"	2-7/8"	3.5"	3.5"		3.5"
RPA	#8	2-7/8"	2-7/8"	3.5"	3.5"	3"	3.5"
SPUMBA	#5	2-7/8"	3"	4"	4"		4"
RPUMBA	#5	2-7/8"	3.5"	5"	5"	3.5"	5"

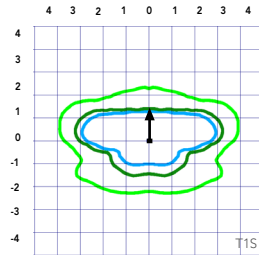
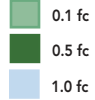


Photometric Diagrams

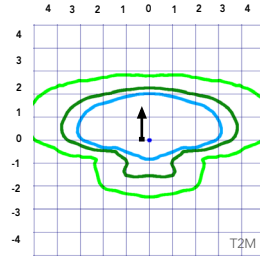
To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's [D-Series Area Size 0 homepage](#).

Isofootcandle plots for the DSX0 LED 40C 1000 40K. Distances are in units of mounting height (20').

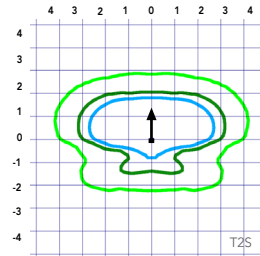
LEGEND



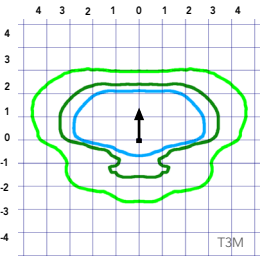
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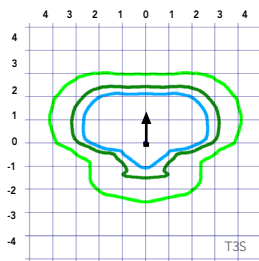
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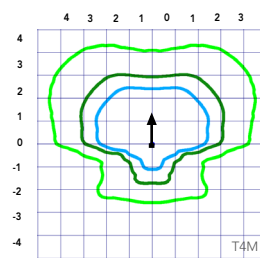
Test No. LTL23457P25 tested in accordance with IESNA LM-79-08.



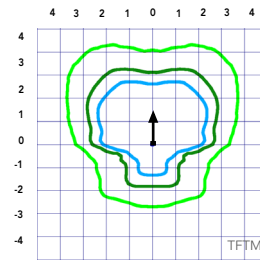
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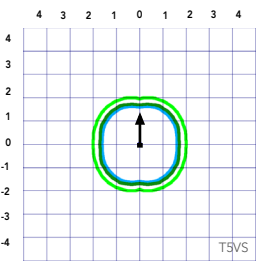
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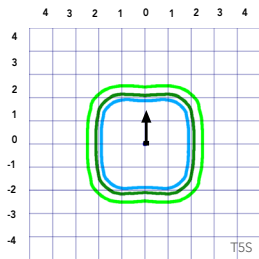
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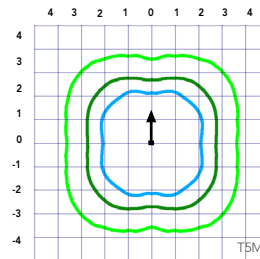
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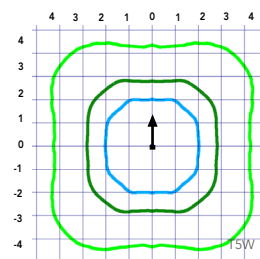
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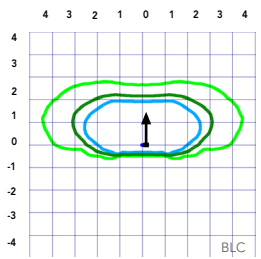
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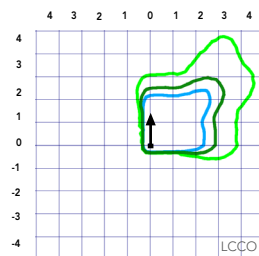
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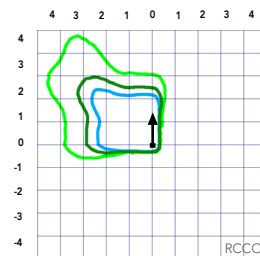
Test No. LTL23451P25 tested in accordance with IESNA LM-79-08.



Test No.



Test No.



Test No.

Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.04
5°C	41°F	1.04
10°C	50°F	1.03
15°C	59°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
35°C	95°F	0.98
40°C	104°F	0.97

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	Lumen Maintenance Factor
25,000	0.96
50,000	0.92
100,000	0.85

Motion Sensor Default Settings						
Option	Dimmed State	High Level (when triggered)	Photocell Operation	Dwell Time	Ramp-up Time	Ramp-down Time
PIR or PIRH	3V (37%) Output	10V (100%) Output	Enabled @ 5FC	5 min	3 sec	5 min
*PIR1FC3V or PIRH1FC3V	3V (37%) Output	10V (100%) Output	Enabled @ 1FC	5 min	3 sec	5 min

*for use with separate Dusk to Dawn or timer.

Controls Options

Nomenclature	Description	Functionality	Primary control device	Notes
FAO	Field adjustable output device installed inside the luminaire; wired to the driver dimming leads.	Allows the luminaire to be manually dimmed, effectively trimming the light output.	FAO device	Cannot be used with other controls options that need the 0-10V leads
DS	Drivers wired independently for 50/50 luminaire operation	The luminaire is wired to two separate circuits, allowing for 50/50 operation.	Independently wired drivers	Requires two separately switched circuits. Consider nLight AIR as a more cost effective alternative.
PERS or PER7	Twist-lock photocell receptacle	Compatible with standard twist-lock photocells for dusk to dawn operation, or advanced control nodes that provide 0-10V dimming signals.	Twist-lock photocells such as DLL Elite or advanced control nodes such as ROAM.	Pins 4 & 5 to dimming leads on driver, Pins 6 & 7 are capped inside luminaire
PIR or PIRH	Motion sensors with integral photocell. PIR for 8-15' mounting; PIRH for 15-30' mounting	Luminaires dim when no occupancy is detected.	Acuity Controls SBOR	Also available with PIRH1FC3V when the sensor photocell is used for dusk-to-dawn operation.
NLTAIR2 PIRHN	nLight AIR enabled luminaire for motion sensing, photocell and wireless communication.	Motion and ambient light sensing with group response. Scheduled dimming with motion sensor over-ride when wirelessly connected to the nLight Eclipse.	nLight Air rSDGR	nLight AIR sensors can be programmed and commissioned from the ground using the CIAIRity Pro app.

Electrical Load

					Current (A)					
	Performance Package	LED Count	Drive Current	Wattage	120	208	240	277	347	480
Forward Optics (Non-Rotated)	P1	20	530	38	0.32	0.18	0.15	0.15	0.10	0.08
	P2	20	700	49	0.41	0.23	0.20	0.19	0.14	0.11
	P3	20	1050	71	0.60	0.37	0.32	0.27	0.21	0.15
	P4	20	1400	92	0.77	0.45	0.39	0.35	0.28	0.20
	P5	40	700	89	0.74	0.43	0.38	0.34	0.26	0.20
	P6	40	1050	134	1.13	0.65	0.55	0.48	0.39	0.29
	P7	40	1300	166	1.38	0.80	0.69	0.60	0.50	0.37
Rotated Optics (Requires L90 or R90)	P10	30	530	53	0.45	0.26	0.23	0.21	0.16	0.12
	P11	30	700	72	0.60	0.35	0.30	0.27	0.20	0.16
	P12	30	1050	104	0.88	0.50	0.44	0.39	0.31	0.23
	P13	30	1300	128	1.08	0.62	0.54	0.48	0.37	0.27

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics																			
Power Package	LED Count	Drive Current	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P1	20	530	38W	T1S	4,369	1	0	1	115	4,706	1	0	1	124	4,766	1	0	1	125
				T2S	4,364	1	0	1	115	4,701	1	0	1	124	4,761	1	0	1	125
				T2M	4,387	1	0	1	115	4,726	1	0	1	124	4,785	1	0	1	126
				T3S	4,248	1	0	1	112	4,577	1	0	1	120	4,634	1	0	1	122
				T3M	4,376	1	0	1	115	4,714	1	0	1	124	4,774	1	0	1	126
				T4M	4,281	1	0	1	113	4,612	1	0	2	121	4,670	1	0	2	123
				TFTM	4,373	1	0	1	115	4,711	1	0	2	124	4,771	1	0	2	126
				TSVS	4,548	2	0	0	120	4,900	2	0	0	129	4,962	2	0	0	131
				TSS	4,552	2	0	0	120	4,904	2	0	0	129	4,966	2	0	0	131
				TSM	4,541	3	0	1	120	4,891	3	0	1	129	4,953	3	0	1	130
				TSW	4,576	3	0	2	120	4,929	3	0	2	130	4,992	3	0	2	131
				BLC	3,586	1	0	1	94	3,863	1	0	1	102	3,912	1	0	1	103
				LCCO	2,668	1	0	1	70	2,874	1	0	2	76	2,911	1	0	2	77
				RCCO	2,668	1	0	1	70	2,874	1	0	2	76	2,911	1	0	2	77
P2	20	700	49W	T1S	5,570	1	0	1	114	6,001	1	0	1	122	6,077	2	0	2	124
				T2S	5,564	1	0	2	114	5,994	1	0	2	122	6,070	2	0	2	124
				T2M	5,593	1	0	1	114	6,025	1	0	1	123	6,102	1	0	1	125
				T3S	5,417	1	0	2	111	5,835	1	0	2	119	5,909	2	0	2	121
				T3M	5,580	1	0	2	114	6,011	1	0	2	123	6,087	1	0	2	124
				T4M	5,458	1	0	2	111	5,880	1	0	2	120	5,955	1	0	2	122
				TFTM	5,576	1	0	2	114	6,007	1	0	2	123	6,083	1	0	2	124
				TSVS	5,799	2	0	0	118	6,247	2	0	0	127	6,327	2	0	0	129
				TSS	5,804	2	0	0	118	6,252	2	0	0	128	6,332	2	0	1	129
				TSM	5,789	3	0	1	118	6,237	3	0	1	127	6,316	3	0	1	129
				TSW	5,834	3	0	2	119	6,285	3	0	2	128	6,364	3	0	2	130
				BLC	4,572	1	0	1	93	4,925	1	0	1	101	4,987	1	0	1	102
				LCCO	3,402	1	0	2	69	3,665	1	0	2	75	3,711	1	0	2	76
				RCCO	3,402	1	0	2	69	3,665	1	0	2	75	3,711	1	0	2	76
P3	20	1050	71W	T1S	7,833	2	0	2	110	8,438	2	0	2	119	8,545	2	0	2	120
				T2S	7,825	2	0	2	110	8,429	2	0	2	119	8,536	2	0	2	120
				T2M	7,865	2	0	2	111	8,473	2	0	2	119	8,580	2	0	2	121
				T3S	7,617	2	0	2	107	8,205	2	0	2	116	8,309	2	0	2	117
				T3M	7,846	2	0	2	111	8,452	2	0	2	119	8,559	2	0	2	121
				T4M	7,675	2	0	2	108	8,269	2	0	2	116	8,373	2	0	2	118
				TFTM	7,841	2	0	2	110	8,447	2	0	2	119	8,554	2	0	2	120
				TSVS	8,155	3	0	0	115	8,785	3	0	0	124	8,896	3	0	0	125
				TSS	8,162	3	0	1	115	8,792	3	0	1	124	8,904	3	0	1	125
				TSM	8,141	3	0	2	115	8,770	3	0	2	124	8,881	3	0	2	125
				TSW	8,204	3	0	2	116	8,838	4	0	2	124	8,950	4	0	2	126
				BLC	6,429	1	0	2	91	6,926	1	0	2	98	7,013	1	0	2	99
				LCCO	4,784	1	0	2	67	5,153	1	0	2	73	5,218	1	0	2	73
				RCCO	4,784	1	0	2	67	5,153	1	0	2	73	5,218	1	0	2	73
P4	20	1400	92W	T1S	9,791	2	0	2	106	10,547	2	0	2	115	10,681	2	0	2	116
				T2S	9,780	2	0	2	106	10,536	2	0	2	115	10,669	2	0	2	116
				T2M	9,831	2	0	2	107	10,590	2	0	2	115	10,724	2	0	2	117
				T3S	9,521	2	0	2	103	10,256	2	0	2	111	10,386	2	0	2	113
				T3M	9,807	2	0	2	107	10,565	2	0	2	115	10,698	2	0	2	116
				T4M	9,594	2	0	2	104	10,335	2	0	3	112	10,466	2	0	3	114
				TFTM	9,801	2	0	2	107	10,558	2	0	2	115	10,692	2	0	2	116
				TSVS	10,193	3	0	1	111	10,981	3	0	1	119	11,120	3	0	1	121
				TSS	10,201	3	0	1	111	10,990	3	0	1	119	11,129	3	0	1	121
				TSM	10,176	4	0	2	111	10,962	4	0	2	119	11,101	4	0	2	121
				TSW	10,254	4	0	3	111	11,047	4	0	3	120	11,186	4	0	3	122
				BLC	8,036	1	0	2	87	8,656	1	0	2	94	8,766	1	0	2	95
				LCCO	5,979	1	0	2	65	6,441	1	0	2	70	6,523	1	0	3	71
					5,979	1	0	2	65	6,441	1	0	2	70	6,523	1	0	3	71

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics

Power Package	LED Count	Drive Current	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P5	40	700	89W	T1S	10,831	2	0	2	122	11,668	2	0	2	131	11,816	2	0	2	133
				T2S	10,820	2	0	2	122	11,656	2	0	2	131	11,803	2	0	2	133
				T2M	10,876	2	0	2	122	11,716	2	0	2	132	11,864	2	0	2	133
				T3S	10,532	2	0	2	118	11,346	2	0	2	127	11,490	2	0	2	129
				T3M	10,849	2	0	2	122	11,687	2	0	2	131	11,835	2	0	2	133
				T4M	10,613	2	0	3	119	11,434	2	0	3	128	11,578	2	0	3	130
				TFTM	10,842	2	0	2	122	11,680	2	0	2	131	11,828	2	0	2	133
				TSVS	11,276	3	0	1	127	12,148	3	0	1	136	12,302	3	0	1	138
				TSS	11,286	3	0	1	127	12,158	3	0	1	137	12,312	3	0	1	138
				TSM	11,257	4	0	2	126	12,127	4	0	2	136	12,280	4	0	2	138
				TSW	11,344	4	0	3	127	12,221	4	0	3	137	12,375	4	0	3	139
				BLC	8,890	1	0	2	100	9,576	1	0	2	108	9,698	1	0	2	109
				LCCO	6,615	1	0	3	74	7,126	1	0	3	80	7,216	1	0	3	81
				RCCO	6,615	1	0	3	74	7,126	1	0	3	80	7,216	1	0	3	81
P6	40	1050	134W	T1S	14,805	3	0	3	110	15,949	3	0	3	119	16,151	3	0	3	121
				T2S	14,789	3	0	3	110	15,932	3	0	3	119	16,134	3	0	3	120
				T2M	14,865	3	0	3	111	16,014	3	0	3	120	16,217	3	0	3	121
				T3S	14,396	3	0	3	107	15,509	3	0	3	116	15,705	3	0	3	117
				T3M	14,829	2	0	3	111	15,975	3	0	3	119	16,177	3	0	3	121
				T4M	14,507	2	0	3	108	15,628	3	0	3	117	15,826	3	0	3	118
				TFTM	14,820	2	0	3	111	15,965	3	0	3	119	16,167	3	0	3	121
				TSVS	15,413	4	0	1	115	16,604	4	0	1	124	16,815	4	0	1	125
				TSS	15,426	3	0	1	115	16,618	4	0	1	124	16,828	4	0	1	126
				TSM	15,387	4	0	2	115	16,576	4	0	2	124	16,786	4	0	2	125
				TSW	15,506	4	0	3	116	16,704	4	0	3	125	16,915	4	0	3	126
				BLC	12,151	1	0	2	91	13,090	1	0	2	98	13,255	1	0	2	99
				LCCO	9,041	1	0	3	67	9,740	1	0	3	73	9,863	1	0	3	74
				RCCO	9,041	1	0	3	67	9,740	1	0	3	73	9,863	1	0	3	74
P7	40	1300	166W	T1S	17,023	3	0	3	103	18,338	3	0	3	110	18,570	3	0	3	112
				T2S	17,005	3	0	3	102	18,319	3	0	3	110	18,551	3	0	3	112
				T2M	17,092	3	0	3	103	18,413	3	0	3	111	18,646	3	0	3	112
				T3S	16,553	3	0	3	100	17,832	3	0	3	107	18,058	3	0	3	109
				T3M	17,051	3	0	3	103	18,369	3	0	3	111	18,601	3	0	3	112
				T4M	16,681	3	0	3	100	17,969	3	0	3	108	18,197	3	0	3	110
				TFTM	17,040	3	0	3	103	18,357	3	0	4	111	18,590	3	0	4	112
				TSVS	17,723	4	0	1	107	19,092	4	0	1	115	19,334	4	0	1	116
				TSS	17,737	4	0	2	107	19,108	4	0	2	115	19,349	4	0	2	117
				TSM	17,692	4	0	2	107	19,059	4	0	2	115	19,301	4	0	2	116
				TSW	17,829	5	0	3	107	19,207	5	0	3	116	19,450	5	0	3	117
				BLC	13,971	2	0	2	84	15,051	2	0	2	91	15,241	2	0	2	92
				LCCO	10,396	1	0	3	63	11,199	1	0	3	67	11,341	1	0	3	68
					10,396	1	0	3	63	11,199	1	0	3	67	11,341	1	0	3	68

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Rotated Optics																			
Power Package	LED Count	Drive Current	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P10	30	530	53W	T1S	6,727	2	0	2	127	7,247	3	0	3	137	7,339	3	0	3	138
				T2S	6,689	3	0	3	126	7,205	3	0	3	136	7,297	3	0	3	138
				T2M	6,809	3	0	3	128	7,336	3	0	3	138	7,428	3	0	3	140
				T3S	6,585	3	0	3	124	7,094	3	0	3	134	7,183	3	0	3	136
				T3M	6,805	3	0	3	128	7,331	3	0	3	138	7,424	3	0	3	140
				T4M	6,677	3	0	3	126	7,193	3	0	3	136	7,284	3	0	3	137
				TFTM	6,850	3	0	3	129	7,379	3	0	3	139	7,472	3	0	3	141
				TSVS	6,898	3	0	0	130	7,431	3	0	0	140	7,525	3	0	0	142
				T5S	6,840	2	0	1	129	7,368	2	0	1	139	7,461	2	0	1	141
				T5M	6,838	3	0	1	129	7,366	3	0	2	139	7,460	3	0	2	141
				TSW	6,777	3	0	2	128	7,300	3	0	2	138	7,393	3	0	2	139
				BLC	5,626	2	0	2	106	6,060	2	0	2	114	6,137	2	0	2	116
				LCCO	4,018	1	0	2	76	4,328	1	0	2	82	4,383	1	0	2	83
				RCCO	4,013	3	0	3	76	4,323	3	0	3	82	4,377	3	0	3	83
P11	30	700	72W	T1S	8,594	3	0	3	119	9,258	3	0	3	129	9,376	3	0	3	130
				T2S	8,545	3	0	3	119	9,205	3	0	3	128	9,322	3	0	3	129
				T2M	8,699	3	0	3	121	9,371	3	0	3	130	9,490	3	0	3	132
				T3S	8,412	3	0	3	117	9,062	3	0	3	126	9,177	3	0	3	127
				T3M	8,694	3	0	3	121	9,366	3	0	3	130	9,484	3	0	3	132
				T4M	8,530	3	0	3	118	9,189	3	0	3	128	9,305	3	0	3	129
				TFTM	8,750	3	0	3	122	9,427	3	0	3	131	9,546	3	0	3	133
				TSVS	8,812	3	0	0	122	9,493	3	0	0	132	9,613	3	0	0	134
				T5S	8,738	3	0	1	121	9,413	3	0	1	131	9,532	3	0	1	132
				T5M	8,736	3	0	2	121	9,411	3	0	2	131	9,530	3	0	2	132
				TSW	8,657	4	0	2	120	9,326	4	0	2	130	9,444	4	0	2	131
				BLC	7,187	3	0	3	100	7,742	3	0	3	108	7,840	3	0	3	109
				LCCO	5,133	1	0	2	71	5,529	1	0	2	77	5,599	1	0	2	78
				RCCO	5,126	3	0	3	71	5,522	3	0	3	77	5,592	3	0	3	78
P12	30	1050	104W	T1S	12,149	3	0	3	117	13,088	3	0	3	126	13,253	3	0	3	127
				T2S	12,079	4	0	4	116	13,012	4	0	4	125	13,177	4	0	4	127
				T2M	12,297	3	0	3	118	13,247	3	0	3	127	13,415	3	0	3	129
				T3S	11,891	4	0	4	114	12,810	4	0	4	123	12,972	4	0	4	125
				T3M	12,290	3	0	3	118	13,239	4	0	4	127	13,407	4	0	4	129
				T4M	12,058	4	0	4	116	12,990	4	0	4	125	13,154	4	0	4	126
				TFTM	12,369	4	0	4	119	13,325	4	0	4	128	13,494	4	0	4	130
				TSVS	12,456	3	0	1	120	13,419	3	0	1	129	13,589	4	0	1	131
				T5S	12,351	3	0	1	119	13,306	3	0	1	128	13,474	3	0	1	130
				T5M	12,349	4	0	2	119	13,303	4	0	2	128	13,471	4	0	2	130
				TSW	12,238	4	0	3	118	13,183	4	0	3	127	13,350	4	0	3	128
				BLC	10,159	3	0	3	98	10,944	3	0	3	105	11,083	3	0	3	107
				LCCO	7,256	1	0	3	70	7,816	1	0	3	75	7,915	1	0	3	76
				RCCO	7,246	3	0	3	70	7,806	4	0	4	75	7,905	4	0	4	76
P13	30	1300	128W	T1S	14,438	3	0	3	113	15,554	3	0	3	122	15,751	3	0	3	123
				T2S	14,355	4	0	4	112	15,465	4	0	4	121	15,660	4	0	4	122
				T2M	14,614	3	0	3	114	15,744	4	0	4	123	15,943	4	0	4	125
				T3S	14,132	4	0	4	110	15,224	4	0	4	119	15,417	4	0	4	120
				T3M	14,606	4	0	4	114	15,735	4	0	4	123	15,934	4	0	4	124
				T4M	14,330	4	0	4	112	15,438	4	0	4	121	15,633	4	0	4	122
				TFTM	14,701	4	0	4	115	15,836	4	0	4	124	16,037	4	0	4	125
				TSVS	14,804	4	0	1	116	15,948	4	0	1	125	16,150	4	0	1	126
				T5S	14,679	3	0	1	115	15,814	3	0	1	124	16,014	3	0	1	125
				T5M	14,676	4	0	2	115	15,810	4	0	2	124	16,010	4	0	2	125
				TSW	14,544	4	0	3	114	15,668	4	0	3	122	15,866	4	0	3	124
				BLC	7,919	3	0	3	62	8,531	3	0	3	67	8,639	3	0	3	67
				LCCO	5,145	1	0	2	40	5,543	1	0	2	43	5,613	1	0	2	44
					5,139	3	0	3	40	5,536	3	0	3	43	5,606	3	0	3	44

A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and system-level interoperability.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is A+ Certified when ordered with DTL® controls marked by a [shaded background](#). DTL DLL equipped luminaires meet the A+ specification for luminaire to photocontrol interoperability¹
- This luminaire is part of an A+ Certified solution for ROAM® or XPoint™ Wireless control networks, providing out-of-the-box control compatibility with simple commissioning, when ordered with drivers and control options marked by a [shaded background](#)¹

To learn more about A+, visit www.acuitybrands.com/aplus.

1. See ordering tree for details.

2. A+ Certified Solutions for ROAM require the order of one ROAM node per luminaire.

Sold Separately: [Link to Roam](#); [Link to DTL DLL](#)

FEATURES & SPECIFICATIONS

INTENDED USE

The sleek design of the D-Series Size 0 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and pedestrian areas.

CONSTRUCTION

Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (0.95 ft²) for optimized pole wind loading.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

OPTICS

Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in 3000 K, 4000 K or 5000 K (70 CRI) configurations. The D-Series Size 0 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL

Light engine(s) configurations consist of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L85/100,000 hours at 25°C). Class 1 electronic drivers are designed to have a power factor >90%, THD <20%, and an expected life of 100,000 hours with <1% failure rate. Easily serviceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

STANDARD CONTROLS

The DSX0 LED area luminaire has a number of control options. Dusk to dawn controls can be utilized via optional NEMA twist-lock photocell receptacles. Integrated motion sensors with on-board photocells feature field-adjustable programming and are suitable for mounting heights up to 30 feet.

nLIGHT AIR CONTROLS

The DSX0 LED area luminaire is also available with nLight® AIR for the ultimate in wireless control. This powerful controls platform provides out-of-the-box basic motion sensing and photocontrol functionality and is suitable for mounting heights up to 40 feet. Once commissioned using a smartphone and the easy-to-use CLAIRITY app, nLight AIR equipped luminaires can be grouped, resulting in motion sensor and photocell group response without the need for additional equipment. Scheduled dimming with motion sensor over-ride can be achieved when used with the nLight Eclipse. Additional information about nLight Air can be found [here](#).

INSTALLATION

Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 0 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 0 utilizes the AERIS™ series pole drilling pattern (template #8). Optional terminal block and NEMA photocell receptacle are also available.

LISTINGS

UL Listed for wet locations. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color temperature only.

WARRANTY

5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/resources/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.





WST LED

Architectural Wall Sconce



Catalog
Number

Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

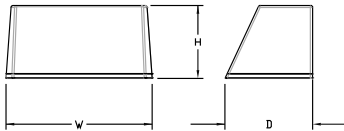
Luminaire

Height: 8-1/2"
(21.59 cm)

Width: 17"
(43.18 cm)

Depth: 10-3/16"
(25.9 cm)

Weight: 20 lbs
(9.1 kg)

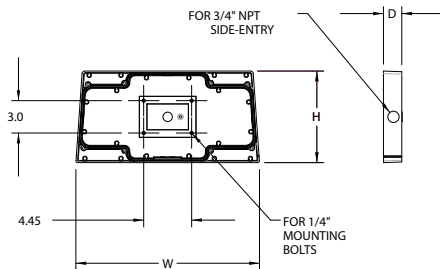


Optional Back Box (PBBW)

Height: 8.49"
(21.56 cm)

Width: 17.01"
(43.21 cm)

Depth: 1.70"
(4.32 cm)

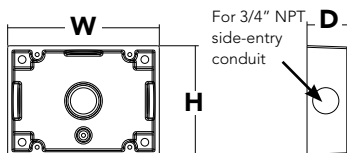


Optional Back Box (BBW)

Height: 4"
(10.2 cm)

Width: 5-1/2"
(14.0 cm)

Depth: 1-1/2"
(3.8 cm)



A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and system-level interoperability.

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- This luminaire is A+ Certified when ordered with DTL® controls marked by a shaded background. DTL DLL equipped luminaires meet the A+ specification for luminaire to photocontrol interoperability¹
- This luminaire is part of an A+ Certified solution for ROAM® or XPoint™ Wireless control networks, providing out-of-the-box control compatibility with simple commissioning, when ordered with drivers and control options marked by a shaded background¹

To learn more about A+, visit www.acuitybrands.com/aplus.

See ordering tree for details.

A+ Certified Solutions for ROAM require the order of one ROAM node per luminaire. Sold Separately: [Link to Roam](#); [Link to DTL DLL](#)



Ordering Information

EXAMPLE: WST LED P1 40K VF MVOLT DDBTXD

WST LED						
Series	Performance Package	Color temperature	Distribution	Voltage		Mounting
WST LED	P1 1,500 Lumen package	27K 2700 K	VF Visual comfort forward throw	MVOLT ¹	277 ²	Shipped included (blank) Surface mounting bracket Shipped separately BBW Surface-mounted back box ³ PBBW Premium surface-mounted back box ^{3,4}
	P2 3,000 Lumen package	30K 3000 K	VW Visual comfort wide	120 ²	347 ²	
	P3 6,000 Lumen package	40K 4000 K		208 ²	480 ²	
		50K 5000 K		240 ²		

Options				Finish (required)	
NLTAIR2 PIR	nLIGHT AIR Wireless enabled motion/ambient sensor for 8'-15' mounting heights ^{5,6}	E7WC	Emergency battery backup, Non CEC compliant (cold, 7W) ^{10,11}	DDBXD	Dark bronze
NLTAIR2 PIRH	nLIGHT AIR Wireless enabled motion/ambient sensor for 15'-30' mounting heights ^{5,6}	E7WHR	Remote emergency battery backup, Non CEC compliant (remote 7W) ^{10,12}	DBLXD	Black
PE	Photoelectric cell, button type ⁷	E20WH	Emergency battery pack 18W constant power, CEC compliant ¹⁰	DNAXD	Natural aluminum
PER	NEMA twist-lock receptacle only (controls ordered separate) ⁸	E20WC	Emergency battery pack -20°C 18W constant power, CEC compliant ^{10,11}	DWHXD	White
PER5	Five-wire receptacle only (controls ordered separate) ⁸	E23WHR	Remote emergency battery backup, Non CEC compliant (remote 20W) ^{10,11,13}	DSSXD	Sandstone
PER7	Seven-wire receptacle only (controls ordered separate) ⁸	LCE	Left side conduit entry ¹⁴	DBBXTD	Textured dark bronze
PIR	Motion/Ambient Light Sensor, 8'-15' mounting height ^{7,8}	RCE	Right side conduit entry ¹⁴	DBLXTD	Textured black
PIR1FC3V	Motion/ambient sensor, 8'-15' mounting height, ambient sensor enabled at 1fc ^{5,6}	Shipped separately		DNATXD	Textured natural aluminum
PIRH	180° motion/ambient light sensor, 15'-30' mounting height ^{5,6}	RBPW	Retrofit back plate ³	DWHGXD	Textured white
PIRH1FC3V	Motion/ambient sensor, 15'-30' mounting height, ambient sensor enabled at 1fc ^{5,6}	VG	Vandal guard ¹⁵	DSSTXD	Textured sandstone
SF	Single fuse (120, 277, 347V) ²	WG	Wire guard ¹⁵		
DF	Double fuse (208, 240, 480V) ²				
DS	Dual switching ⁹				
E7WH	Emergency battery backup, Non CEC compliant (7W) ¹⁰				

Accessories

Ordered and shipped separately.

WSTVCPBBW DDBXD U	Premium Surface - mounted back box
WSBBW DDBTX U	Surface - mounted back box
RBPW DDBXD U	Retrofit back plate

NOTES

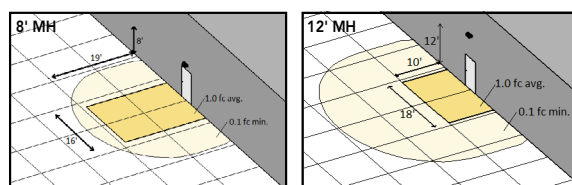
- MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
- Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
- Also available as a separate accessory; see accessories information.
- Top conduit entry standard.
- Not available with VG or WG. See PER Table.
- Reference Motion Sensor table.
- Need to specify 120, 208, 240 or 277 voltage.

- Photocell ordered and shipped as a separate line item from Acuity Brands Controls. Shorting Cap included.
- Not available with Emergency options, PE or PER options.
- Not available with 347/480V.
- Battery pack rated for -20° to 40°C.
- Comes with PBBW.
- Warranty period is 3-years.
- Not available with BBW.
- Must order with fixture; not an accessory.

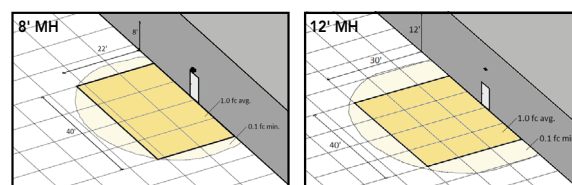
Emergency Battery Operation

The emergency battery backup is integral to the luminaire — no external housing required! This design provides reliable emergency operation while maintaining the aesthetics of the product. All emergency backup configurations include an independent secondary driver with an integral relay to immediately detect AC power loss, meeting interpretations of [NFPA 70/NEC 2008 - 700.16](#). The emergency battery will power the luminaire for a minimum duration of 90 minutes (maximum duration of three hours) from the time supply power is lost, per [International Building Code Section 1006](#) and [NFPA 101 Life Safety Code Section 7.9](#), provided luminaires are mounted at an appropriate height and illuminate an open space with no major obstructions. The examples below show illuminance of 1 fc average and 0.1 fc minimum of the P1 power package and VF distribution product in emergency mode.

10' x 10' Gridlines
8' and 12' Mounting Height



WST LED P1 27K VF MVOLT E7WH



WST LED P2 40K VF MVOLT E20WH

Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.03
10°C	50°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
40°C	104°F	0.98

Projected LED Lumen Maintenance

Values calculated according to IESNA TM-21-11 methodology and valid up to 40°C.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	>0.95	>0.92	>0.87

Electrical Load

Performance package	System Watts	Current (A)					
		120	208	240	277	347	480
P1	11	0.1	0.06	0.05	0.04	---	---
	14	---	---	---	---	0.04	0.03
P1 DS	14	0.12	0.07	0.06	0.06	---	---
P2	25	0.21	0.13	0.11	0.1	---	---
	30	---	---	---	---	0.09	0.06
P2 DS	25	0.21	0.13	0.11	0.1	---	---
P3	50	0.42	0.24	0.21	0.19	---	---
	56	---	---	---	---	0.16	0.12
P3 DS	52	0.43	0.26	0.23	0.21	---	---

Motion Sensor Default Settings

Option	Dimmed State	High Level (when triggered)	Photocell Operation	Ramp-up Time	Dwell Time	Ramp-down Time
*PIR or PIRH	3V (37%) Output	10V (100%) Output	Enabled @ 5FC	3 sec	5 min	5 min
PIR1FC3V or PIRH1FC3V	3V (37%) Output	10V (100%) Output	Enabled @ 1FC	3 sec	5 min	5 min

*for use with centralize Dusk to Dawn

PER Table

Control	PER (3 wire)	PER5 (5 wire)		PER7 (7 wire)		
			Wire 4/Wire5		Wire 4/Wire5	Wire 6/Wire7
Photocontrol Only (On/Off)	✓	⚠	Wired to dimming leads on driver	⚠	Wired to dimming leads on driver	Wires Capped inside fixture
ROAM	✗	✓	Wired to dimming leads on driver	⚠	Wired to dimming leads on driver	Wires Capped inside fixture
ROAM with Motion	✗	⚠	Wired to dimming leads on driver	⚠	Wired to dimming leads on driver	Wires Capped inside fixture
Futureproof*	✗	⚠	Wired to dimming leads on driver	✓	Wired to dimming leads on driver	Wires Capped inside fixture
Futureproof* with Motion	✗	⚠	Wired to dimming leads on driver	✓	Wired to dimming leads on driver	Wires Capped inside fixture

✓ Recommended

✗ Will not work

⚠ Alternate

*Futureproof means: Ability to change controls in the future.

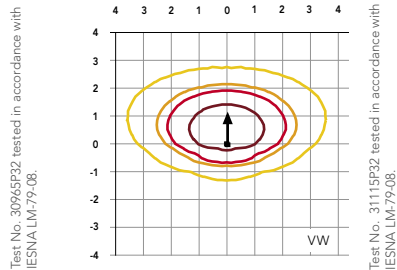
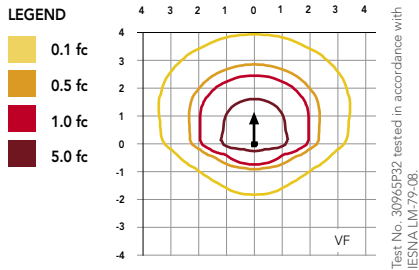
Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts.

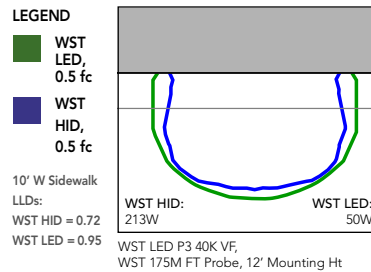
Performance Package	System Watts (MVOLT ¹)	Dist. Type	27K (2700K, 70 CRI)					30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)				
			Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P1	12W	VF	1,494	0	0	0	125	1,529	0	0	0	127	1,639	0	0	0	137	1,639	0	0	0	137
		VW	1,513	0	0	0	126	1,548	0	0	0	129	1,659	0	0	0	138	1,660	0	0	0	138
P2	25W	VF	3,163	1	0	1	127	3,237	1	0	1	129	3,469	1	0	1	139	3,468	1	0	1	139
		VW	3,201	1	0	0	128	3,276	1	0	0	131	3,512	1	0	0	140	3,512	1	0	0	140
P3	50W	VF	6,025	1	0	1	121	6,165	1	0	1	123	6,609	1	0	1	132	6,607	1	0	1	132
		VW	6,098	1	0	1	122	6,240	1	0	1	125	6,689	1	0	1	134	6,691	1	0	1	134



Isofootcandle plots for the WST LED P3 40K VF and VW. Distances are in units of mounting height (10').



Distribution overlay comparison to 175W metal halide.



FEATURES & SPECIFICATIONS

INTENDED USE

The classic architectural shape of the WST LED was designed for applications such as hospitals, schools, malls, restaurants, and commercial buildings. The long life LEDs and driver make this luminaire nearly maintenance-free.

CONSTRUCTION

The single-piece die-cast aluminum housing integrates secondary heat sinks to optimize thermal transfer from the internal light engine heat sinks and promote long life. The driver is mounted in direct contact with the casting for a low operating temperature and long life. The die-cast door frame is fully gasketed with a one-piece solid silicone gasket to keep out moisture and dust, providing an IP65 rating for the luminaire.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum, sandstone and white. Available in textured and non-textured finishes.

OPTICS

Well crafted reflector optics allow the light engine to be recessed within the luminaire, providing visual comfort, superior distribution, uniformity, and spacing in wall-mount applications. The WST LED has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL

Light engine(s) consist of 98 high-efficacy LEDs mounted to a metal core circuit board and integral aluminum heat sinks to maximize heat dissipation and promote long life (100,000 hrs at 40°C, L87). Class 2 electronic driver has a power factor >90%, THD <20%. Easily-serviceable surge protection device meets a minimum Category B (per ANSI/IEEE C62.41.2).

INSTALLATION

A universal mounting plate with integral mounting support arms allows the fixture to hinge down for easy access while making wiring connections.

LISTINGS

CSA certified to U.S. and Canadian standards. Luminaire is IP65 rated. PIR and back box options are rated for wet location. Rated for -30°C to 40°C ambient.

DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY

5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/resources/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.



**Civil
Site Planning
Environmental
Engineering**

133 Court Street
Portsmouth, NH
03801-4413

**ARBOR VIEW APARTMENTS
EXPANSION
SITE PLAN AMENDMENT
145 Lang Road
Portsmouth, NH
Bond Estimate - Site Work**

DATE: 20-May-19
PROJECT: 4787

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL COST
DEMOLITION - BLDG AND FOUNDATION				
NIC				
SITework DEMOLITION				
CLEARING AND GRUBBING	1.7	AC	\$2,500.00	\$4,250.00
SITE FEATURES (ALLOWANCE)	1	LS	\$3,000.00	\$3,000.00
UTILITIES (ALLOWANCE)	1	LS	\$10,000.00	\$10,000.00
PAVEMENT RECLAMATION/CONCRETE REMOVAL	300	SY	\$1.50	\$450.00
WATER SUPPLY				
2" DOMESTIC WATER SERVICE	400	LF	\$55.00	\$22,000
2" SHUT OFF	2	EA	\$500.00	\$1,000
6" DI CL 52 FIRE SERVICE	400	LF	\$75.00	\$30,000
6" GATE VALVE	2	EA	\$800.00	\$1,600
8 X 10 LIVE TAP	2	EA	\$3,000.00	\$6,000
TESTING AND CHLORINATION	1	LS	\$3,500.00	\$3,500
SEWER SERVICE				
SANITARY PUMP STATION	1	LS	\$35,000.00	\$35,000
6" SDR 35	277	LF	\$40.00	\$11,080
8" SDR 35	150	LF	\$50.00	\$7,500
SEWER MANHOLES	3	EA	\$2,500.00	\$7,500
3" SANITARY FORCE MAIN	625	LF	\$45.00	\$28,125
GAS SERVICE				
TRENCHING AND BACKFILL	325	LF	\$15.00	\$4,875
ELECTRIC/PHONE/CABLE SERVICES				
SCH 40 CONDUIT (x4 PER TRENCH)	475	LF	\$30.00	\$14,250
TRANSFORMER PADS	1	EA	\$2,000.00	\$2,000
CURBING				
VERTICAL GRANITE CURBING	320	LF	\$30.00	\$9,600
BITUMINOUS CURB	125	LF	\$8.00	\$1,000
STORM DRAINAGE SYSTEM				
CATCH BASIN/RAIN GARDEN OUTLET STRUCTURES	2	EA	\$2,000.00	\$4,000
YARD DRAINS	7	EA	\$1,800.00	\$12,600
DRAIN MANHOLE	1	EA	\$2,000.00	\$2,000
6" UNDERDRAIN/ YARD DRAIN CULVERTS	840	LF	\$15.00	\$12,600
8" ROOF GUTTER COLLECTION DRAIN PIPE	0	LF	\$22.00	\$0
12" DRAIN PIPE	150	LF	\$32.00	\$4,800
15" DRAIN PIPE	250	LF	\$36.00	\$9,000
RAIN GARDEN	1,400	SY	\$32.00	\$44,800
OVER FLOW WEIR	2	EA	\$800.00	\$1,600
SEDIMENT FOREBAY/RIPRAP	1	EA	\$1,000.00	\$1,000

SEDIMENT AND EROSION CONTROL					
TEMPORARY EROSION CONTROL/SWPPP	1	LS	\$15,000.00		\$15,000
AGGREGATE BASE COURSES (FOR PAVEMENT)					
12" GRAVEL (NHDOT 304.2)	570	CY	\$18.00		\$10,260
6" CRUSHED GRAVEL (NHDOT 304.3)	285	CY	\$22.00		\$6,270
CUTS	5,000	CY	\$8.00		\$40,000
FILLS	1,000	CY	\$8.00		\$8,000
HOT BITUMINOUS PAVEMENT					
2.5" BASE COURSE	220	TONS	\$90.00		\$19,800
1.5" WEARING COURSE	130	TONS	\$90.00		\$11,700
PERMEABLE PAVERS					
PERMEABLE PAVERS (INCLUDING SUBBASE)	700	SY	\$40.00		\$28,000
MISC.					
BIKE RACKS	4	EA	\$350.00		\$1,400
STONE DRIP EDGE	1	LS	\$1,000.00		\$1,000
SIDEWALKS					
2" BITUMINOUS SIDEWALKS INCLUDING SUBGRADE MATERIALS	70	SY	\$22.50		\$1,575
STRIPING AND SIGNAGE					
STRIPING	1	LS	\$800.00		\$800
TRAFFIC SIGNAGE	1	LS	\$300.00		\$300
LANDSCAPING					
LANDSCAPING (ALLOWANCE)	1	LS	\$15,000.00		\$15,000
LOAM AND SEED - TURF ESTABLISHMENT	1.0	AC	\$8,000.00		\$8,000
LIGHTING					
POLES, POLE BASES AND FIXTURES	3	EA	\$5,000.00		\$15,000
CONCRETE FLATWORK					
DUMPSTER PAD	1	EA	\$2,000.00		\$2,000
CONCRETE WALKS	350	SY	\$30.00		\$10,500
BOLLARDS					
6" CONCRETE-FILLED STEEL BOLLARD	2	EA	\$150.00		\$300
DUMPSTER ENCLOSURE					
ENCLOSURE FENCING AND GATE	1	EA	\$2,500.00		\$2,500

SUBTOTAL

\$492,535

TOTAL: \$492,535

EXCLUSIONS:

ITEMS EXCLUDED FROM THIS ESTIMATE INCLUDE, BUT ARE NOT LIMITED TO, THOSE ITEMS SPECIFIED ABOVE AS BEING NOT INCLUDED IN THIS ESTIMATE AND THE FOLLOWING:

INSPECTION FEES, MONUMENTATION, HVAC PADS, TEMPORARY FENCING AND BARRICADES, TRAFFIC CONTROL, MATERIALS AND COMPACTION TESTING, BUILDING FOUNDATION, BUILDING FOUNDATION EXCAVATION, BUILDING MOUNTED EXTERIOR LIGHTING, BUILDINGS

TEMPORARY STABILIZATION, STAGING, MOBILIZATION, TEMPORARY CONSTRUCTION FACILITIES, CONSTRUCTION MANAGEMENT, SWPPP REQUIREMENTS, UNFORESEEN CONDITIONS, PRICE ESCALATION, ETC.

THIS ESTIMATE IS FOR BONDING PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION, CONSTRUCTION BIDDING, CONTRACTING OR SUBCONTRACTING.



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133 Court Street
Portsmouth, NH
03801-4413

PARKING DEMAND ANALYSIS

(For Conditional Use Permit Application)

June 24, 2019

**Assessor's Map 287, Lot 01
145 Lang Road, Portsmouth, NH
Altus Project #P4787**

Forest Properties Management, owners of the Arbor View Apartment Complex at 145 Lang Road, in Portsmouth, NH (Tax Map 287, Lot 01) is proposing to construct two new apartment buildings on the site. The current site has five existing apartment buildings, and a maintenance building with an additional apartment for a total of 145 existing units.

Two variances to allow the construction of the two new apartment buildings were granted on November 20, 2018. A variance from Section 10.521 to allow a lot area per dwelling unit of $\pm 8,321$ s.f. where 10,000 s.f. is required and a variance from Section 10.522 to allow building lengths of 225 feet and 170 feet for a multi-family dwelling where 160 feet is the maximum allowed.

The existing apartment complex was constructed in the 1980's prior to the City's current parking requirements. There are currently 329 existing parking stalls on the site that service the 145 units. Using the current 1 stall per 5 unit requirement for visitor parking, there are currently 29 visitor stalls and 300 residents parking stalls, an average of 2.07 stalls per unit. There is not a recorded plan of the approved site plan from the 1980's, but there is a 2007 survey plan on record with the City. This plan shows some of the existing stalls as winter snow storage areas and they are not included in the parking totals. For this Parking Demand Analysis all existing striped parking stalls are included in the total number of stalls on-site.

The current Zoning regulations (Section 10.1110) allow for 1.3 parking stalls per unit for multi-family buildings and 1 visitor stall per 5 units. The minimum required number of stalls for the new 186-unit lot would be 280 stalls based on current zoning regulations, with an allowable 20% increase for a maximum of 336 parking spaces.

Based on these calculations, the proposed 42 unit buildings (41 new units) would only be allowed to construct 7 new parking spaces on site, as there are currently 329 existing spaces. This project is proposing to construct a total of 38 new parking spaces (29 resident spaces and 9 visitor spaces). This is 0.7 new stalls per unit for the new 41 units. The following Parking Table illustrates the existing and proposed parking numbers for the site.

Table 1. Parking Table

Existing Conditions

Number of Units	145
Parking Spaces	
2.07 spaces per unit	300 spaces
Visitor Spaces (1 per 5 units)	29 spaces
Total Parking Spaces on Site	329 spaces

Proposed Conditions (allowed per current zoning regulations)

Number of Units	186
Parking Spaces	
1.3 spaces per unit	242 spaces
Visitor Spaces (1 per 5 units)	38 spaces
Min Parking Spaces Required	280 spaces
Max Parking Spaces Allowed (+20%)	336 spaces

Proposed Conditions (Proposed per CUP)

Proposed New Buildings	186
Parking Spaces	
1.77 resident stalls per unit	329 spaces
Visitor Spaces (1 per 5 units)	38 spaces
Total Proposed Parking Spaces	367 spaces
(Average of 1.77 spaces per unit plus 1 visitor stall per 5 units)	

Under current zoning regulations for on-site parking, when an existing site is expanded the entire site has to be meet the current parking zoning regulations. As noted, above this this would only allow construction of 7 new on-site parking stalls for the new 41 units on site. As shown in the attached photos taken on Monday June 17, 2019, at approximately 6:50 pm, the parking lot is currently being utilized close to capacity.

Per Section 10.1112.142 of the Zoning Ordinance, *“An application for a conditional use permit under this section shall identify permanent evidence-based measures to reduce parking demand, including but not limited to provision of rideshare/microtransit services or bikeshare station(s) servicing the property, proximity to public transit, car/van-pool incentives, alternative transit subsidies, provisions for teleworking, and shared parking on a separate lot subject to the requirements of 10.1112.62.”*

- There is a bus transit stop on Lafayette Road, which approximately a 0.4 mile walk from the development site.
- The proposed development will install bike racks for bicycle usage.
- There are not any restrictions on the property that restrict teleworking.

All of the existing 145 units on site are two bedroom units, as well as the proposed new units. Many of the units are rented by couples and small families that have two adults in the household and require two vehicles. This is the primary demographic that is attracted to these moderately priced rental units located far from the City center. The tenants are currently allowed two vehicles for each unit and it would be a hardship to the owner if they had to limit the number of vehicles per unit. This area of town is also one of the few areas that provides reasonable rental rates, partially because it is located far from the downtown and many of the job opportunities and services. We understand the 1.3 parking stalls per unit in the downtown environment with job opportunities, shopping, and services within walking distance, but this location does not provide those opportunities.

We feel that the current proposal to add 38 additional parking spaces for the proposed 41 new units on site and reduce the average parking stall per unit from 2.07 down to 1.77 is a reasonable request. The current stalls are being used close to capacity and taking parking away from the existing tenants would be a hardship on the development.

ALTUS ENGINEERING, INC.

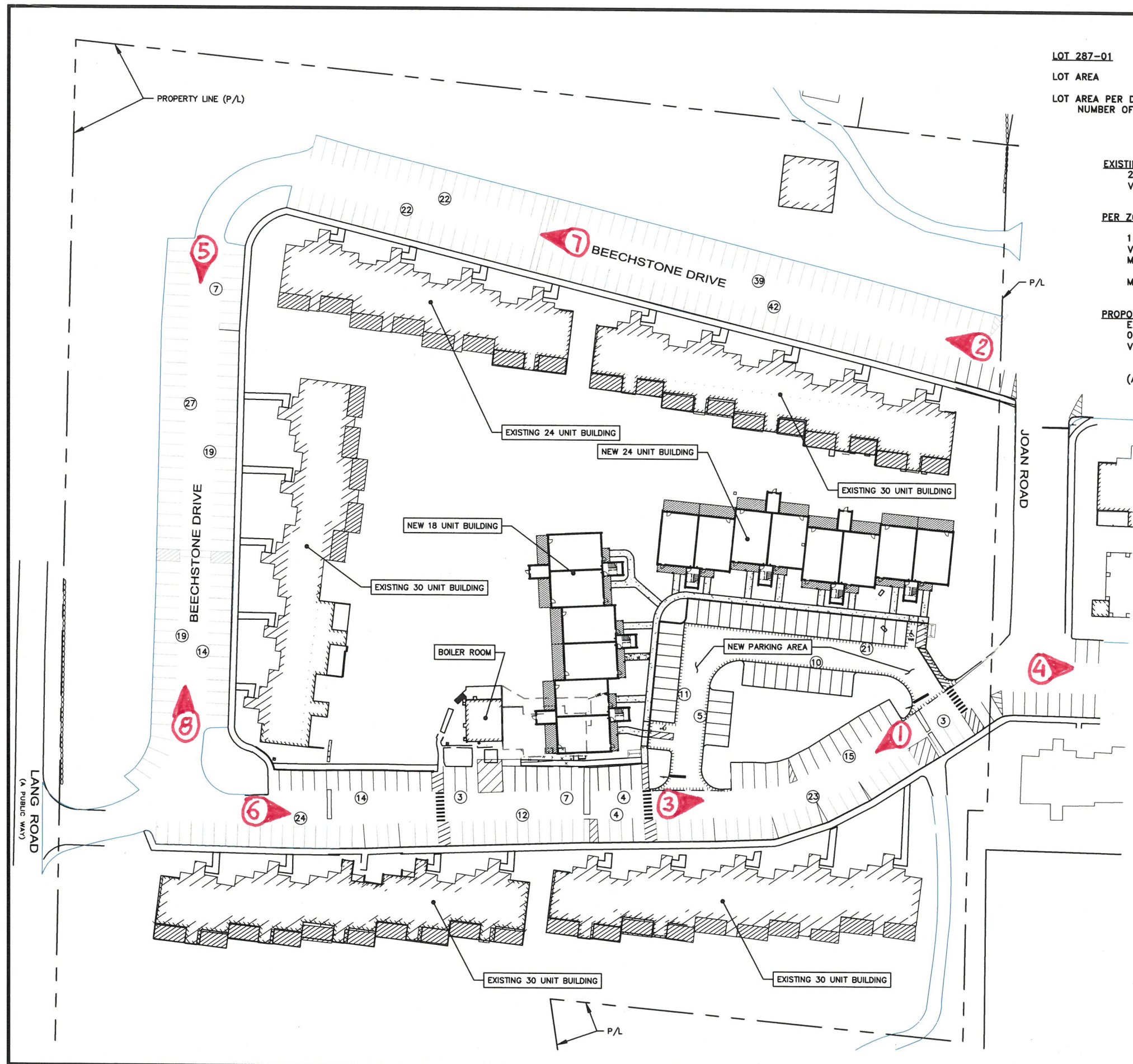


Cory Belden, PE

Attachments: Conditional Use Parking plan, by Altus Engineering dated May 20, 2019
Site Pictures (taken June 17, 2019 - 6:50 pm)

Ecopy: Anderson Libert, Forest Properties

wde/4787-Parking Demand2.doc



PARKING CALCULATIONS

ZONING DISTRICT GA/MH			
LOT 287-01	REQUIRED	EXISTING	PROPOSED
LOT AREA	5.0 Acres	35.53 Acres	35.53 Acres
LOT AREA PER DWELLING (DENSITY)	10,000 SF	10,673 SF	8,321± SF
NUMBER OF UNITS	154 (ALLOWED)	145	186*

EXISTING (145 UNITS)
2.07 STALLS PER UNIT = 300 STALLS
VISITOR PARKING (1 STALL PER 5 UNITS) = 29 STALLS
TOTAL EXISTING STALLS = 329 STALLS

PER ZONING REGULATION 10.1110 FOR MULTI-FAMILY BUILDINGS:
1.3 STALLS PER UNIT = 242 STALLS
VISITOR PARKING (1 STALL PER 5 UNITS) = 38 STALLS
MINIMUM STALLS ALLOWED = 280 STALLS
MAXIMUM ALLOWABLE STALLS (120% MIN) = 336 STALLS

PROPOSED (186 UNITS)
EXISTING RESIDENTIAL PARKING STALLS = 300 STALLS
0.7 STALLS PER 42 NEW UNITS = 29 STALLS
VISITOR PARKING (1 STALL PER 5 UNITS) = 38 STALLS
PROVIDED = 367 STALLS

(AVE 1.77 STALLS PER UNIT + 1 VISITOR STALL PER 5 UNITS)

(X) Photo/Direction

ENGINEER:
ALTUS
ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR: TAC

ISSUE DATE: MAY 20, 2019

REVISIONS		
NO.	DESCRIPTION	BY DATE
0	INITIAL SUBMISSION	CDB 05/20/19

DRAWN BY: CDB
APPROVED BY: EDW
DRAWING FILE: 4787.2.DWG

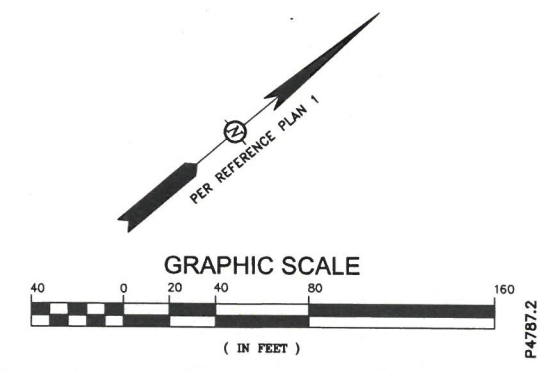
SCALE:
22" x 34" - 1" = 40'
11" x 17" - 1" = 80'

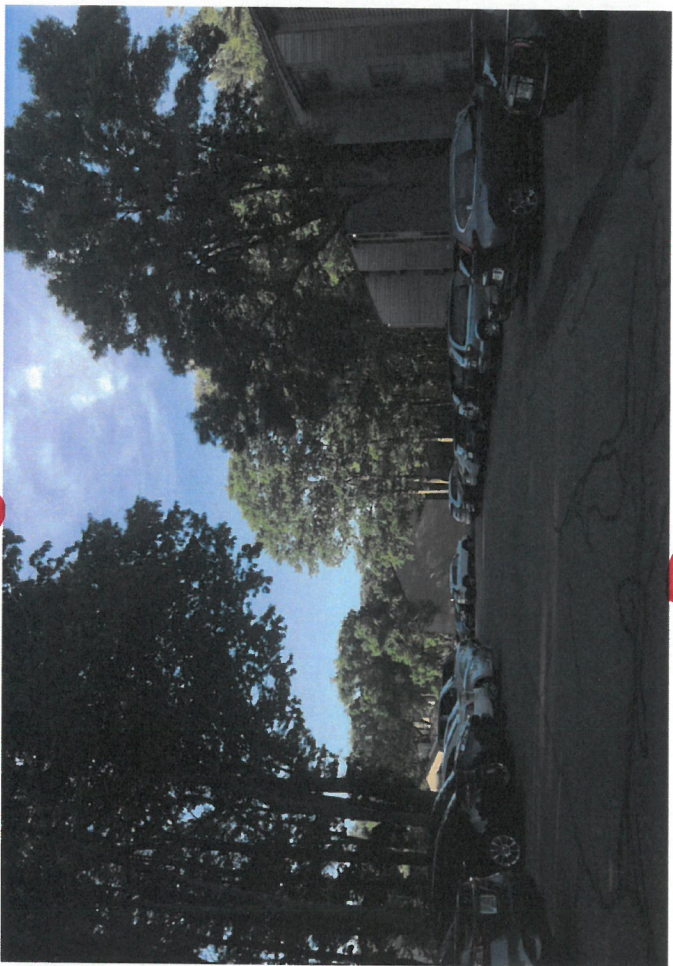
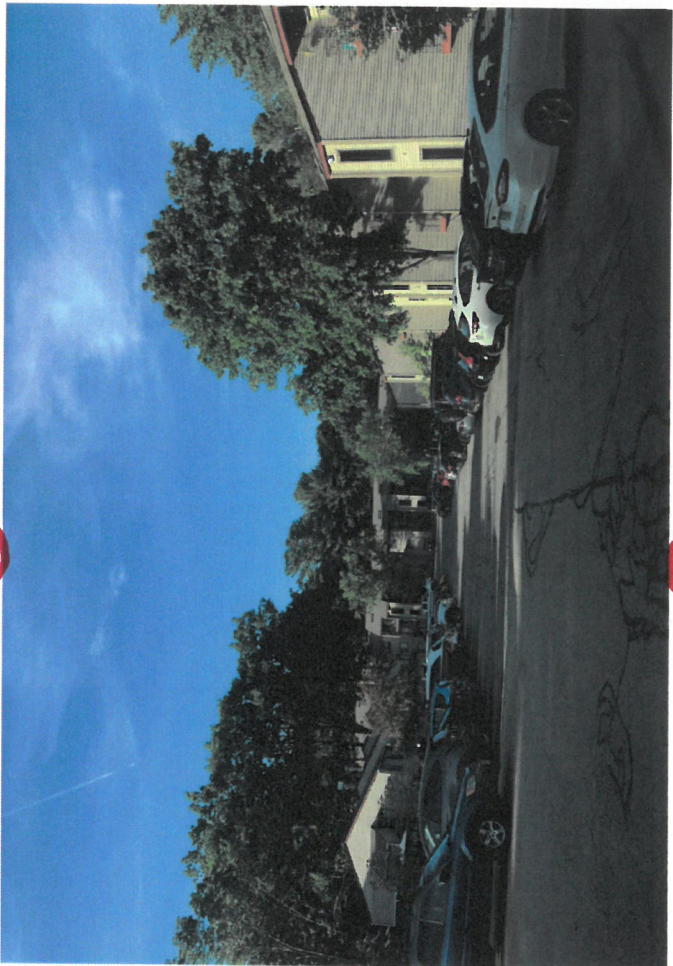
OWNER OF RECORD:
ARBOR VIEW & THE PINES LLC.
C/O FOREST PROPERTIES MGMT
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138
APPLICANT:
FOREST PROPERTIES MGMT INC.
625 MT AUBURN ST, STE 210
CAMBRIDGE, MA 02138

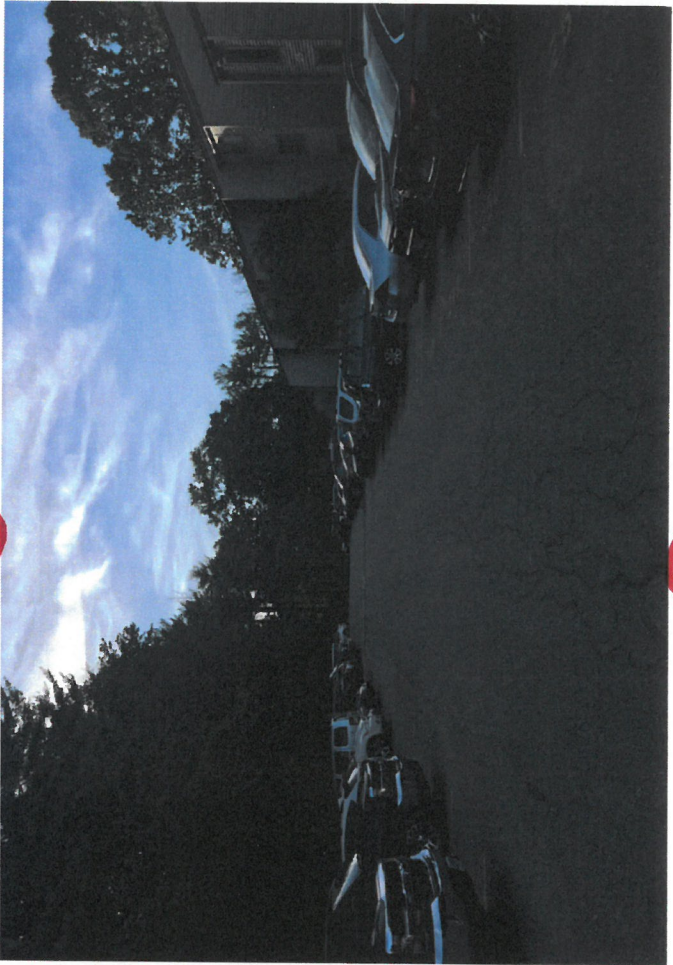
PROJECT:
**ARBOR VIEW
APARTMENTS
RESIDENTIAL
DEVELOPMENT**
145 LANG ROAD
PORTSMOUTH, NH

TITLE:
**CONDITIONAL USE
PARKING PLAN**

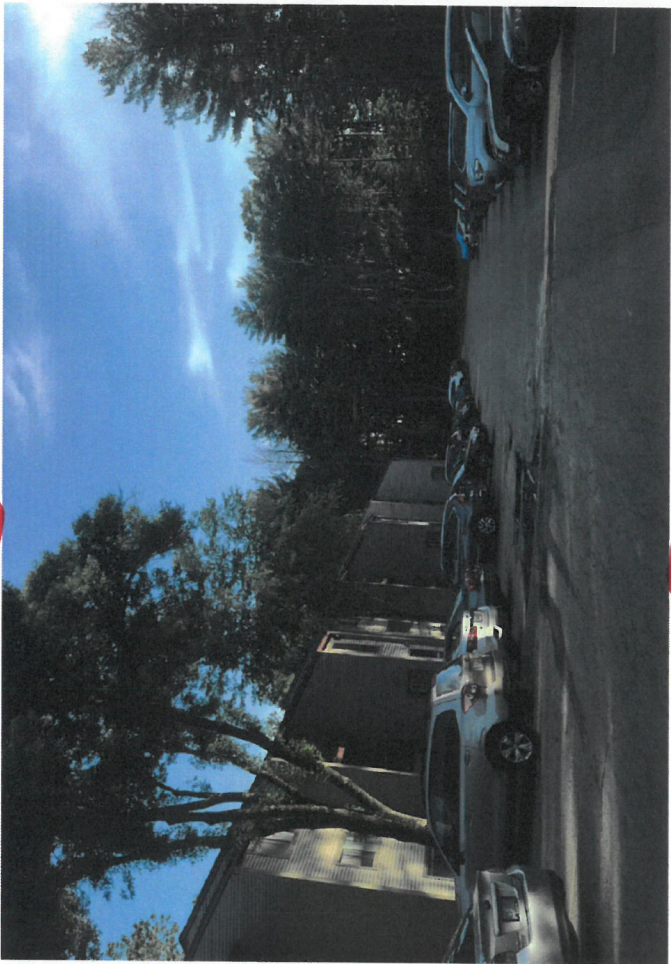
SHEET NUMBER:
CUP-1



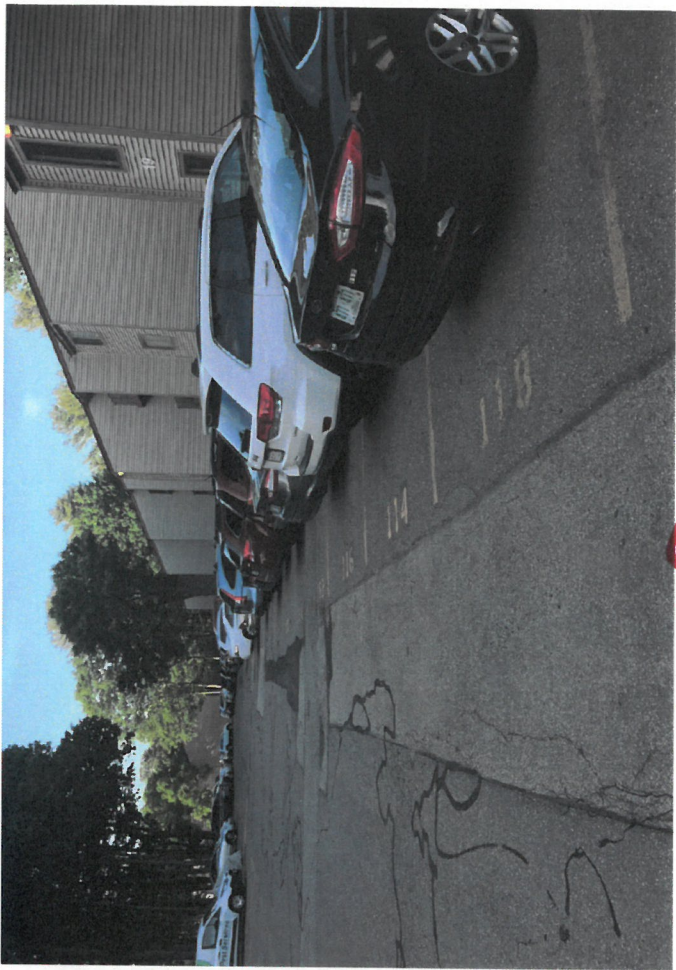




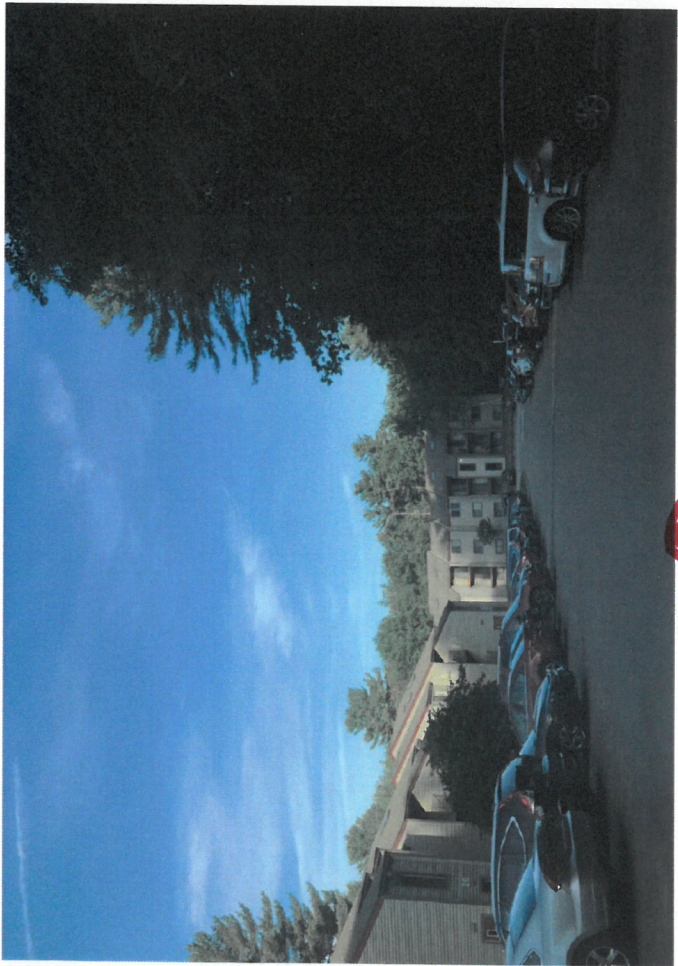
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7



6



5

Sewer Pump Station Design Information

ARBOR VIEW APARTMENTS RESIDENTIAL EXPANSION

**145 Lang Road
Portsmouth, NH
Assessor's Parcel 287-01**

May 2019

Prepared By:

ALTUS ENGINEERING, INC.
133 Court Street
Portsmouth, NH 03801
Phone: (603) 433-2335

Arbor View Apartments (42 Units)
42 apartment units
28 2-bedroom units & 14 3-bedroom units

Design flow based on Metcalf and Eddy/AECOM Wastewater Engineering, 5th Edition (2014)
Table 3-3 page 190

Apartment 38 gpd per person typical

Assume 2.5 occupants per 2-bdr unit and 3.5 occupants per 3 bdrm unit
Average = 2.83 occupants per unit for 42 units

Design flow: $= 2.83 \text{ people} \times 38 \text{ gpd/person} \times 42 \text{ units}$ **4,517 GPD**

peaking factor 6

peak flow (NHDES for design flows under 100,000 gpd) **27,100 GPD**

Design peak hourly flow (NHDES) **1129.17 GPH**

PUMP STATION SIZING

Expected flow expected to spread over 16 hours

Peak flow $3.0 \times \text{Design flow}$ **13,550 GPD**

Design peak hourly flow (16 hours) **847 GPH**

Design Peak (16 hours) **14.1 GPM**

Design flow (16 hours) **3.1 GPM**

New 3-inch diameter force main
minimum flow velocity 2.0 FPS

8-foot diameter pump station 376 gallons/vertical ft

invert in at SMH	53	
force main length	600 ft	
minor losses	30 ft	equivalent

design 1 dose per hour - peak design flow	752 gallons	+/- no in-coming flow
---	-------------	-----------------------

invert in	42	
emergency storage	6.5 ft	
emergency storage	2444 gallons	

lag pump on	39.25
high water alarm	39.00
lead pump on	38.75
pump off	36.50
bottom of chamber	35.50
Draw down	2.25

Static head	16.50
-------------	-------

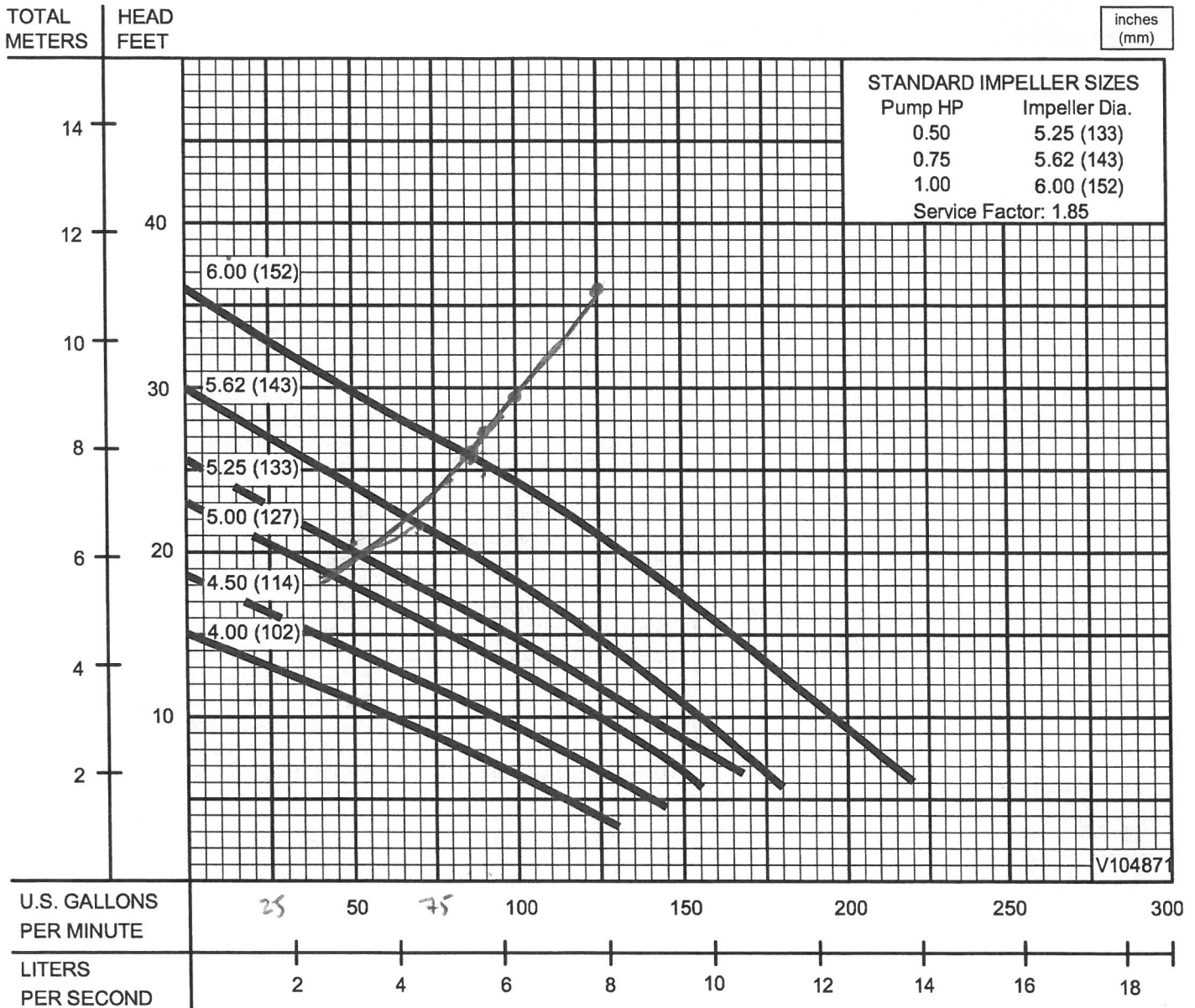
ARBOR VIEW APARTMENTS

HEAD LOSS COMPUTATIONS

9-May-19

3" PVC FORCE MAIN

FLOW GPM	VELOCITY FPS	HEAD LOSS Hf - FT/100FT	PIPE LENGTH FT	FRICTION LOSS FT	STATIC HEAD FT	TDH FT
40	1.74	0.40	600	2.4	16.5	18.9
50	2.17	0.66	600	4.0	16.5	20.5
70	2.82	0.85	600	5.1	16.5	21.6
80	3.47	1.30	600	7.8	16.5	24.3
90	3.91	1.80	600	10.8	16.5	27.3
100	4.34	2.18	600	13.1	16.5	29.6
125	5.05	3.31	600	19.9	16.5	36.4
150	6.51	4.63	600	27.8	16.5	44.3
175	7.55	6.16	600	37.0	16.5	53.5
200	8.68	7.68	600	46.1	16.5	62.6



Testing is performed with water, specific gravity 1.0 @ 68° F @ (20°C), other fluids may vary performance

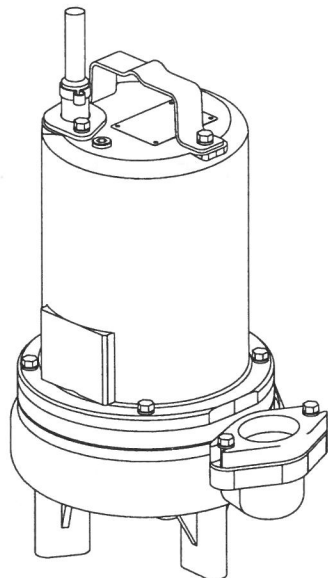
Series SE-HT

2" Spherical Solids Handling
High Temperature - Manual & Automatic

BARNES®

www.cranepumps.com

1½", 2" & 3" Discharge



Series: SE (SE51HT & SE52HT)
.5 HP, 1750RPM, 60Hz



Sample Specifications: Section 1 Page 6.

DESCRIPTION:

SUBMERSIBLE NON-CLOG SEWAGE PUMP
DESIGNED FOR **HIGH TEMPERATURE** RAW
SEWAGE APPLICATIONS

DISCHARGE	2" NPT, Female, Vertical, Bolt-on Flange
LIQUID TEMPERATURE	200°F (98°C) Continuous
VOLUTE	Cast Iron ASTM A-48, Class 30
MOTOR HOUSING	Cast Iron ASTM A-48, Class 30
SEAL PLATE	Cast Iron ASTM A-48, Class 30
IMPELLER: <i>Design</i>	2 Vane, open, with pump out vanes on back side. Dynamically balanced, ISO G6.3
<i>Material</i>	Cast Iron ASTM A-48, Class 30
SHAFT	416 Stainless Steel
SQUARE RINGS	Buna-N
HARDWARE	300 Series Stainless Steel
PAINT	Air Dry Enamel
SEAL: <i>Design</i>	Single Mechanical
<i>Material</i>	Carbon/Ceramic/Buna-N
	Hardware -300 Series Stainless
CORD ENTRY	15 ft. (5m) Cord with plug on 120 & 240 Volt, Quick connect custom molded for sealing and strain relief
SPEED	1750 RPM (Nominal)
UPPER BEARING	Single Row, Ball, Oil lubricated
<i>Load</i>	Radial
LOWER BEARING	Single Row, Ball, Oil lubricated
<i>Load</i>	Radial & Thrust
MOTOR: <i>Design</i>	NEMA L -Single Phase Torque Curve Oil Filled, Squirrel Cage Induction
<i>Insulation</i>	Class F
SINGLE PHASE	Includes Overload Protection in Motor
LEVEL CONTROL	"A" - Wide Angle, PVC, Mechanical, 15 ft (5m) cord with Piggy-Back Plug, N/O "AU"- Wide Angle, Polypropylene, Mechanical, N/O Integral to pump. ON and OFF Points are adjustable
OPTIONAL EQUIPMENT	Seal Material, Impeller Trims, Additional cord, *Inlet Strainer

(* 3/4" Spherical solids handling with optional inlet strainer.)

SECTION 1B
PAGE 16
DATE 6/04

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PUMPS & SYSTEMS

USA: (937) 778-8947 • Canada: (905) 457-6223 • International: (937) 615-3598

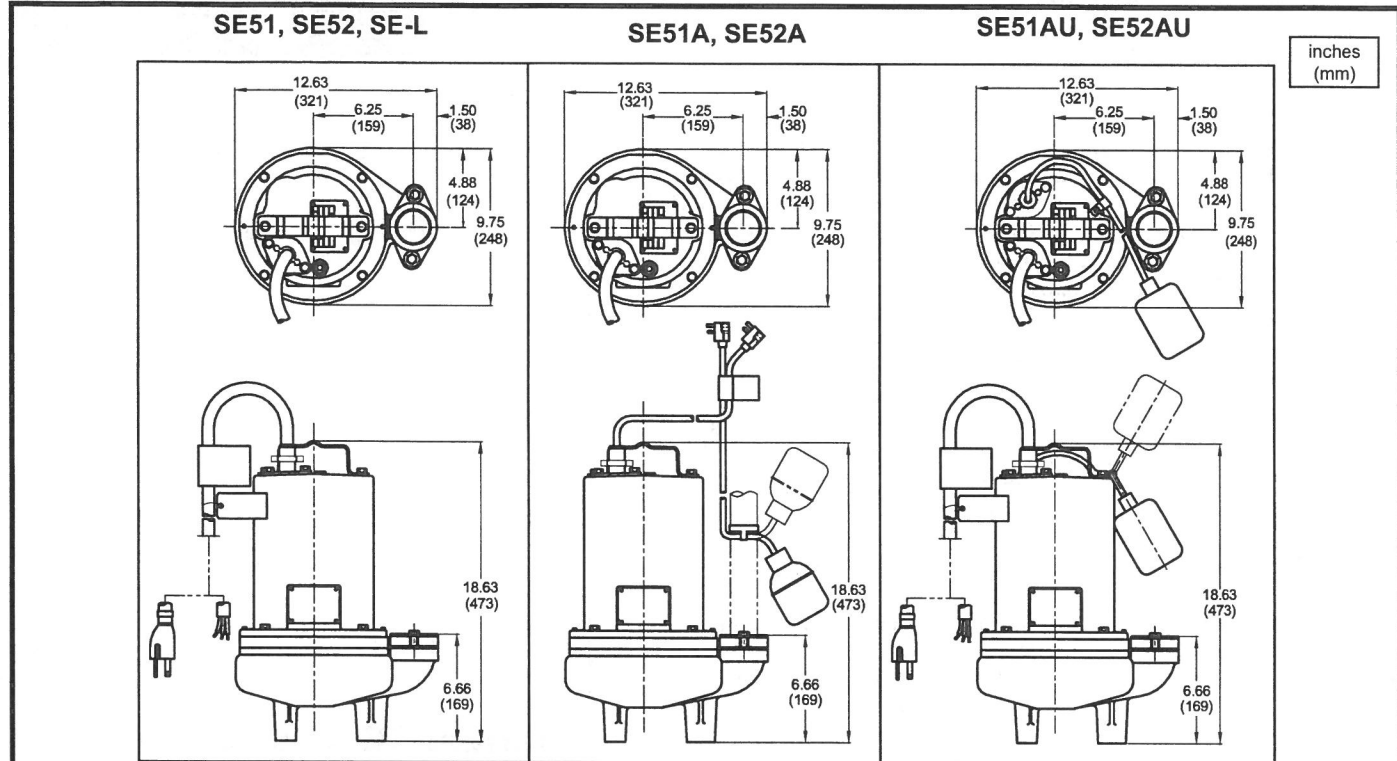
Series SE-L

2" Spherical Solids Handling
Manual & Automatic

BARNES®

www.cranepumps.com

1½", 2" & 3" Discharge



MODEL NO	PART NO	HP	VOLT/PH	Hz	RPM (Nom)	NEMA START CODE	FULL LOAD AMPS	LOCKED ROTOR AMPS	CORD SIZE	CORD TYPE	CORD O.D inch (mm)
SE51	104871	0.5	120/1	60	1750	F	11.6	21.3	14/3	SJTOW	0.375 (9.5)
SE51A	104872	0.5	120/1	60	1750	F	11.6	21.3	14/3	SJTOW	0.375 (9.5)
SE51AU	104873	0.5	120/1	60	1750	F	11.6	21.3	14/3	SJTOW	0.375 (9.5)
SE52	104874	0.5	240/1	60	1750	J	5.9	14.9	14/3	SOW	0.530 (13.5)
SE52AU	104875	0.5	240/1	60	1750	J	5.9	14.9	14/3	SOW	0.530 (13.5)
SE594L	104881	0.5	200-240/3	60	1750	H/L	3.2/3.0	9.8/11.0	14/4	SOW	0.570 (14.5)
SE544L	104882	0.5	480/3	60	1750	K	1.5	5.3	14/4	SOW	0.570 (14.5)
SE554L	104883	0.5	600/3	60	1750	H	1.0	3.4	14/4	SOW	0.570 (14.5)
SE774L	104884	0.75	200-240/1	60	1750	G/K	7.4/7.0	21.5/25.8	14/3	SOW	0.530 (13.5)
SE794L	104885	0.75	200-240/3	60	1750	H/K	4.8/4.5	13.7/15.4	14/4	SOW	0.570 (14.5)
SE744L	104886	0.75	480/3	60	1750	K	2.2	7.7	14/4	SOW	0.570 (14.5)
SE754L	104887	0.75	600/3	60	1750	L	1.5	7.2	14/4	SOW	0.570 (14.5)
SE1074L	104888	1.0	200-240/1	60	1750	D/G	8.8/8.3	21.5/25.8	14/3	SOW	0.530 (13.5)
SE1094L	104889	1.0	200-240/3	60	1750	E/H	5.1/4.9	13.7/15.4	14/4	SOW	0.570 (14.5)
SE1044L	104890	1.0	480/3	60	1750	H	2.4	7.7	14/4	SOW	0.570 (14.5)
SE1054L	104891	1.0	600/3	60	1750	J	1.9	7.2	14/4	SOW	0.570 (14.5)

Mechanical Switch on SE51A, cord 16/2, SJOW, 0.320 (8.1mm) O.D., Piggy-Back Plug
Mechanical Switch on SE-AU, cord 14/2, SJOW, 0.345 (8.8mm) O.D.

IMPORTANT !

- 1.) PUMP MAY BE OPERATED "DRY" FOR EXTENDED PERIODS WITHOUT DAMAGE TO MOTOR AND/OR SEALS.
- 2.) THIS PUMP IS APPROPRIATE FOR THOSE APPLICATIONS SPECIFIED AS CLASS I DIVISION II HAZARDOUS LOCATIONS.
- 3.) THIS PUMP IS NOT APPROPRIATE FOR THOSE APPLICATIONS SPECIFIED AS CLASS I DIVISION I HAZARDOUS LOCATIONS.
- 4.) INSTALLATIONS SUCH AS DECORATIVE FOUNTAINS OR WATER FEATURES PROVIDED FOR VISUAL ENJOYMENT MUST BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE ANSI/NFPA 70 AND/OR THE AUTHORITY HAVING JURISDICTION. THIS PUMP IS NOT INTENDED FOR USE IN SWIMMING POOLS, RECREATIONAL WATER PARKS, OR INSTALLATIONS IN WHICH HUMAN CONTACT WITH PUMPED MEDIA IS A COMMON OCCURRENCE.

SECTION 1B
PAGE 14
DATE 6/04

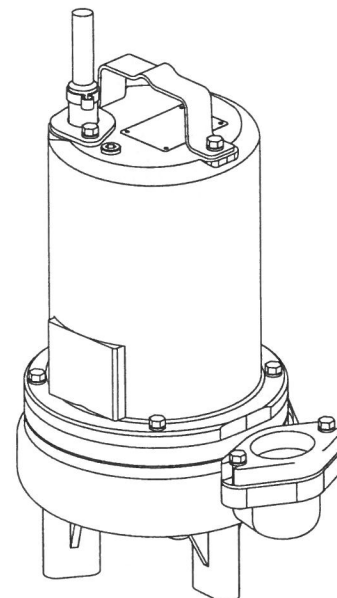
CRANE®

A Crane Co. Company

PUMPS & SYSTEMS

USA: (937) 778-8947 • Canada: (905) 457-6223 • International: (937) 615-3598

DISCHARGE	2" NPT, Female, Vertical, Bolt-on Flange
LIQUID TEMPERATURE	104°F (40°C) Continuous
VOLUTE	Cast Iron ASTM A-48, Class 30
MOTOR HOUSING	Cast Iron ASTM A-48, Class 30
SEAL PLATE	Cast Iron ASTM A-48, Class 30
IMPELLER: Design	2 Vane, open, with pump out vanes on back side. Dynamically balanced, ISO G6.3
<i>Material</i>	Cast Iron ASTM A-48, Class 30
SHAFT	416 Stainless Steel
SQUARE RINGS	Buna-N
HARDWARE	300 Series Stainless Steel
PAINT	Air Dry Enamel
SEAL: Design	Single Mechanical
<i>Material</i>	Carbon/Ceramic/Buna-N
	Hardware -300 Series Stainless
CORD ENTRY	15 ft. (5m) Cord with plug on 120 volt & .5HP, 240 volt, 1 phase. Quick connect custom molded for sealing and strain relief
SPEED	1750 RPM (Nominal)
UPPER BEARING	Single Row, Ball, Oil lubricated
<i>Load</i>	Radial
LOWER BEARING	Single Row, Ball, Oil lubricated
<i>Load</i>	Radial & Thrust
MOTOR: Design	NEMA L -Single Phase, NEMA B -Three phase Torque Curve, Oil Filled, Squirrel Cage Induction
<i>Insulation</i>	Class B
SINGLE PHASE	Permanent Split Capacitor (PSC) Includes Overload Protection in Motor
THREE PHASE	200-240/480 is Tri-Voltage motor 600V. Requires overload Protection to be included in control panel
LEVEL CONTROL	"A" - Wide Angle, PVC, Mechanical, 15 ft (5m) cord with Piggy-Back Plug, N/O "AU"- Wide Angle, Polypropylene, Mechanical, N/O Integral to pump. ON and OFF Points are adjustable
OPTIONAL EQUIPMENT	Seal Material, Impeller Trims, Additional cord, Normally Closed Temperature Sensors with cord for 3 phase pumps (Requires relay in control panel),



Series: SE (SE51 & SE52)
.5, .75, 1.0HP, 1750RPM,
60Hz



Sample Specifications: Section 1 Page 5.

DESCRIPTION:

SUBMERSIBLE NON-CLOG SEWAGE PUMP
DESIGNED FOR TYPICAL RAW SEWAGE
APPLICATIONS

Michael Cuomo, Soil Scientist
6 York Pond Road, York, Maine 03909
207 363 4532
mcuomosoil@gmail.com

3 June 2019

Cory D. Belden, PE
Altus Engineering, Inc.
133 Court St.
Portsmouth, NH 03801

Dear Mr. Belden;

This letter is in reference to the proposed replacement of the storm drain along the eastern property line at Arbor View Apartments in Portsmouth, NH. As part of the Conditional Use Permit application Altus Engineering is preparing, the City requires a functional evaluation of wetland buffer impacts using *The Highway Methodology Workbook Supplement – Wetland Functions and Values: A Descriptive Approach*, NAEEP-360-1-30a, US Army Corps of Engineers, New England Division, September 1999, as amended. In this report, the document is referred to as the "Highway Method".

PROJECT

The existing corrugated metal storm drain pipe is rotted and will be replaced with an HDPE pipe at the same location, alignment, and grade as the existing one. The new pipe will end a couple feet short of where the existing pipe ends. The channel bottom will remain undisturbed, except what is required to install the new pipe in the same location. The installation trench has to be a minimum of 3 ft wide, but for impact

assessment purposes it is assumed a 5 foot wide impact area for the 100 linear feet of the buffer (500 sf of impact). This impact is entirely within the wetland buffer.

SCOPE

The existing and proposed storm drain discharges into a rip rap lined swale which becomes a man-made ditch that discharges east into Prime Wetland #2. The Highway Method is intended to evaluate the entire wetland and buffer. This focus is too broad, as the wetland is greater than 200 acres in size, extends onto multiple properties, and is part of the Berry's Brook watershed extending into Rye. The evaluation of wetland functions for this report focused on the wetland within 200 feet of the storm drain outfall, except where the predictor questions in the Highway Method specifically referenced the entire wetland.

WETLAND CLASSIFICATION, VEGETATION, and SOILS

Using the *Classification of Wetlands and Deepwater Habitats of the United States*, developed by Cowardin and others, this wetland is labeled a 'PF01'. This indicates the core of the wetland is a forested freshwater swamp dominated by deciduous trees.

Dominant trees in this forested wetland are red maple (*Acer rubrum*), white pine (*Pinus strobus*), and apple (*Malus sp.*). Dominant shrubs are smooth winterberry holly (*Ilex verticillata*), common buckthorn (*Rhamnus frangula*), and high-bush blueberry (*Vaccinium corymbosum*). Dominant forbs are spotted touch-me-not (*Impatiens capensis*), sensitive fern (*Onoclea sensibilis*), and poison ivy (*Toxicodendron radicans*).

The soils in the wetland are poorly drained medium textured

glacial till over a restrictive layer of firm silt loam in the substrate. This is the Squamscott soil series. The soil is typically saturated to the surface for less than 9 months of the average year.

HIGHWAY METHOD

The wetland and buffer were evaluated using the Highway Method on 3 June 2019 by Michael Cuomo, NH Wetland Scientist #4. The field results are presented on the worksheets attached at the rear of this report.

The Highway Method was developed to rapidly evaluate and compare a series of wetlands, primarily for the purpose of selecting the highway corridor with the least wetland impact from among alternative routes. For the purpose of this work, it provides an evaluation framework for drawing attention to the most important functions the wetland serves. For more detail, the numerical rationales can be read from the field worksheet and referenced to the predictor questions in the published document (<http://www.nae.usace.army.mil/Portals/74/docs/regulatory/Forms/HighwaySupplement6Apr2015.pdf>). The Highway Method does not produce a numerical score. It provides guidance and a framework for the professional judgment of the evaluator, who selects which functions occur and determines the Principal Function(s).

SUMMARY OF RESULTS

The Principal Functions served by the wetland are Floodflow Alteration and Sediment/Toxicant Retention.

Floodflow Alteration is defined in the Highway Method as "...the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following

precipitation events and the gradual release of flood waters. It adds to the stability of the wetland ecological system or it's buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas." The wetland performs this function well because of it's location relative to developed areas and infrastructure, and the wetland's soil type, topography, and dense vegetation. All of these physical characteristics act to slow the release of water from the wetland to downstream surface waters during periods of excessive rainfall or rapid snow melt.

Sediment/Toxicant Retention is defined in the Highway Method as a function which "...reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens ..." This wetland trap sediments and pollutants well because of the soil type, dense vegetation, topography, and it's landscape position.

The wetland also performs the following functions: Nutrient Removal, Production Export, Wildlife Habitat, and Uniqueness/Heritage (as part of Berry's Brook watershed).

The wetland does not perform the following functions to any measurable degree: Fish and Shellfish Habitat, Groundwater Recharge/Discharge, Shoreline Stabilization, Recreation, and Educational Scientific Value. Endangered Species Habitat was not investigated for this report

There are limitations to the health and productivity of the wetland system resulting from the historic development in parts of the wetland and surrounding watershed. Untreated storm runoff enters the wetland from existing development. There has been

filling of the wetland by previous development. As is now typical, invasive plants are numerous and widespread in both the wetland and the watershed.

No direct wetland impact is proposed. The proposed 500 square feet of buffer impact is necessary and unavoidable to correct a failed storm drain.

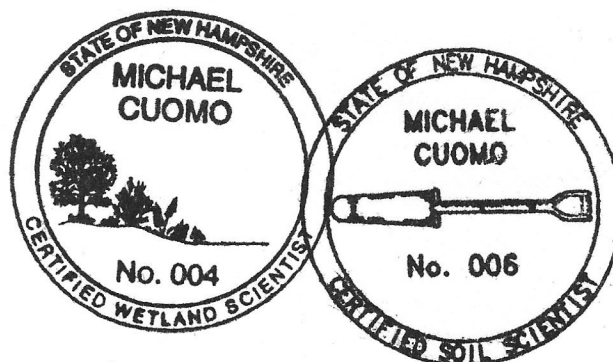
Sincerely,

Michael Cuomo

Michael Cuomo

NH Certified Wetland Scientist #4

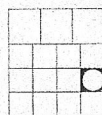
NH Certified Soil Scientist #6



Graphical Representation of Wetland Functions and Values

ARBORVIEW APARTMENTS
PORTSMOUTH, NH

Wetland I.D.	Total Acres	Impacted Acres
		
		
		



Indicates Principal Function or Value

Symbols Key

	Groundwater Recharge/ Discharge		Sediment/Shoreline Stabilization
	Floodflow Alteration (Storage & Desynchronization)		Wildlife Habitat
	Fish and Shellfish Habitat		Recreation(Consumptive & Non-Consumptive)
	Sediment/Toxicant Retention		Educational/Scientific Value
	Nutrient Removal/ Retention/Transformation		Uniqueness/Heritage
	Production Export (Nutrient)		Visual Quality/Aesthetics
		ES	Endangered Species

This graphical summary of wetland characteristics was developed as a tool to help construct an annotated map of functions and values for project analysis. Based on the findings reported on a data collection form, an icon box is prepared for each wetland investigated during Phase II of the Highway Methodology. The Endangered Species value may be added when present.

WETLAND FUNCTION-VALUE ASSESSMENT

WETLAND I.D. _____

PROJECT NAME: ARROWVIEW APTS

PROJECT LOCATION: LONG RD. PORTSMOUTH

PREPARED BY: UK

DATE: 3 JUN 19

TOTAL APPROXIMATE AREA OF WETLAND: ±200 IS WETLAND PART OF A WILDLIFE CORRIDOR? Y

OR A "HABITAT ISLAND"? N

ADJACENT LAND USE? HIGH DENS. RES/CONSERV. MAN MADE? N DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT 4100 FT.

DOMINANT WETLAND SYSTEMS PRESENT: PFO

CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? N

IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? N

IF NOT, WHERE DOES THE WETLAND LIE IN THE DRAINAGE BASIN? UPGR

OF TRIBUTARIES INTO THE WETLAND? UNKNOWN AQUATIC DIVERSITY/ABUNDANCE MOD. VEGETATIVE DIVERSITY/ABUNDANCE MOD.

WILDLIFE DIVERSITY/ABUNDANCE MOD. ANTICIPATED IMPACTS BUFFERS ONLY WETLAND AREA IMPACTED: NONE

TREES	SHRUBS	HERBS	SOIL WILDLIFE	COMMENTS
<u>ACER RUBRUM</u> <u>PINUS STROBILIS</u> <u>UNALUS SP. (APPE)</u>	<u>TIEX</u> <u>VERGILICILATA</u> <u>RHAMNUS FRANKLINI</u> <u>VACCINIUM</u> <u>CORYMBOSUM</u>	<u>IMPATIENS</u> <u>CARPENUS</u> <u>ONOCLEA</u> <u>SENSIBILIS</u> <u>TOXICODENDRON</u> <u>RADICANS</u>	<u>WETLAND SOIL</u> <u>NEAR PROPOSED</u> <u>WILDLIFE AREA,</u> <u>DEEPER ORGANIC</u> <u>SOILS ± 200 FT</u> <u>AWAY</u>	<u>INVADES WIDESPREAD</u> <u>AT EDGE OF EXISTING</u> <u>DEVELOPMENT</u> <u>EXISTING DITCH AT</u> <u>CUNELI/BEDEN OUTFALL</u> <u>EXTENDS ± 200 FT INTO</u> <u>WETLANDS</u>

Wetland Function-Value Evaluation Form

Wetland I.D. _____ Longitude _____
 Latitude _____
 Prepared by: _____ Date _____
 Wetland Impact: _____ Area _____
 Evaluation based on: _____
 Office _____ Field _____
 Corps manual wetland delineation completed? Y _____ N _____

Total area of wetland 200 Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No
 Adjacent land use HEAVY RESIDENTIAL DEVELOPMENT Distance to nearest roadway or other development 400 FT
 Dominant wetland systems present PFD1 Contiguous undeveloped buffer zone present No
 Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? UPPER
 How many tributaries contribute to the wetland? Unknown Wildlife & vegetation diversity/abundance (see attached list)

Function/Value	Occurrence Y N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	☒	6, 7	<u>LONGER</u>	
Floodflow Alteration	☒	2, 4, 5, 6, 9, 13	Significant <u>Significant</u>	
Fish and Shellfish Habitat	☒	1	<u>Not applicable</u>	
Sediment/Toxicant Retention	☒	12, 3, 4, 5, 7, 8, 14, 16	Significant <u>Important due to landscape position</u>	
Nutrient Removal	☒	3, 4, 6, 7, 8, 10	<u>Significant</u>	
Production Export	☒	12, 4, 7	<u>MODERATE</u>	
Sediment/Shoreline Stabilization	☒		<u>Not applicable</u>	
Wildlife Habitat	☒	6, 8, 11, 13, 19	<u>Significant for foraging</u>	
Recreation	☒		<u>LIMITED ACCESS - PRIVATE PROPERTY</u>	
Educational Scientific Value	☒	5, 14	<u>" " " "</u>	
Uniqueness/Heritage	☒	5, 27	<u>Boggy's Brook Watershed</u>	
Visual Quality/Aesthetics	☒		<u>VERY LOW</u>	
ES Endangered Species Habitat	☒	<u>Unknown</u>	<u>Unknown</u>	
Other	☒			

* Refer to back up list of numbered considerations.

Notes: