PROPOSED 4-UNIT RESIDENTIAL DEVELOPMENT

FOR

LCSG, LLC

160, 168 &170 Union Street

Portsmouth, New Hampshire

ASSESSOR'S PARCELS
MAP–LOT 135–30 & 135–29

JANUARY 21, 2020	Issued for TAC
FEBRUARY 10, 2020	Issued for Planning Board Submission

Owner/Applicant:

LCSG, LLC
750 BRACKETT ROAD
RYE, NH 03870
PORTSMOUTH, N.H.

Civil Engineer:

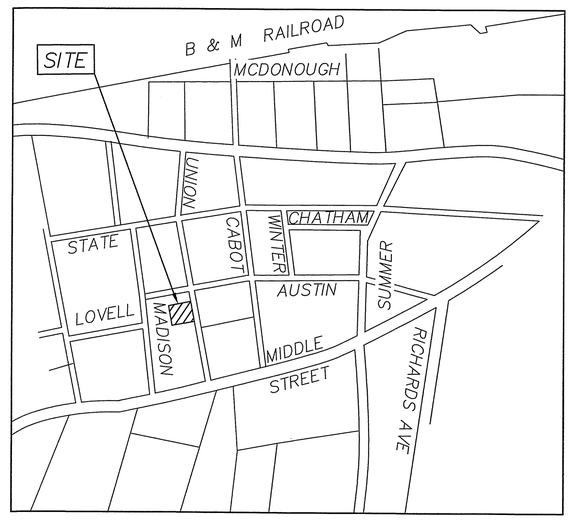
ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433–2335 www.ALTUS–ENG.com

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

Sheet Index

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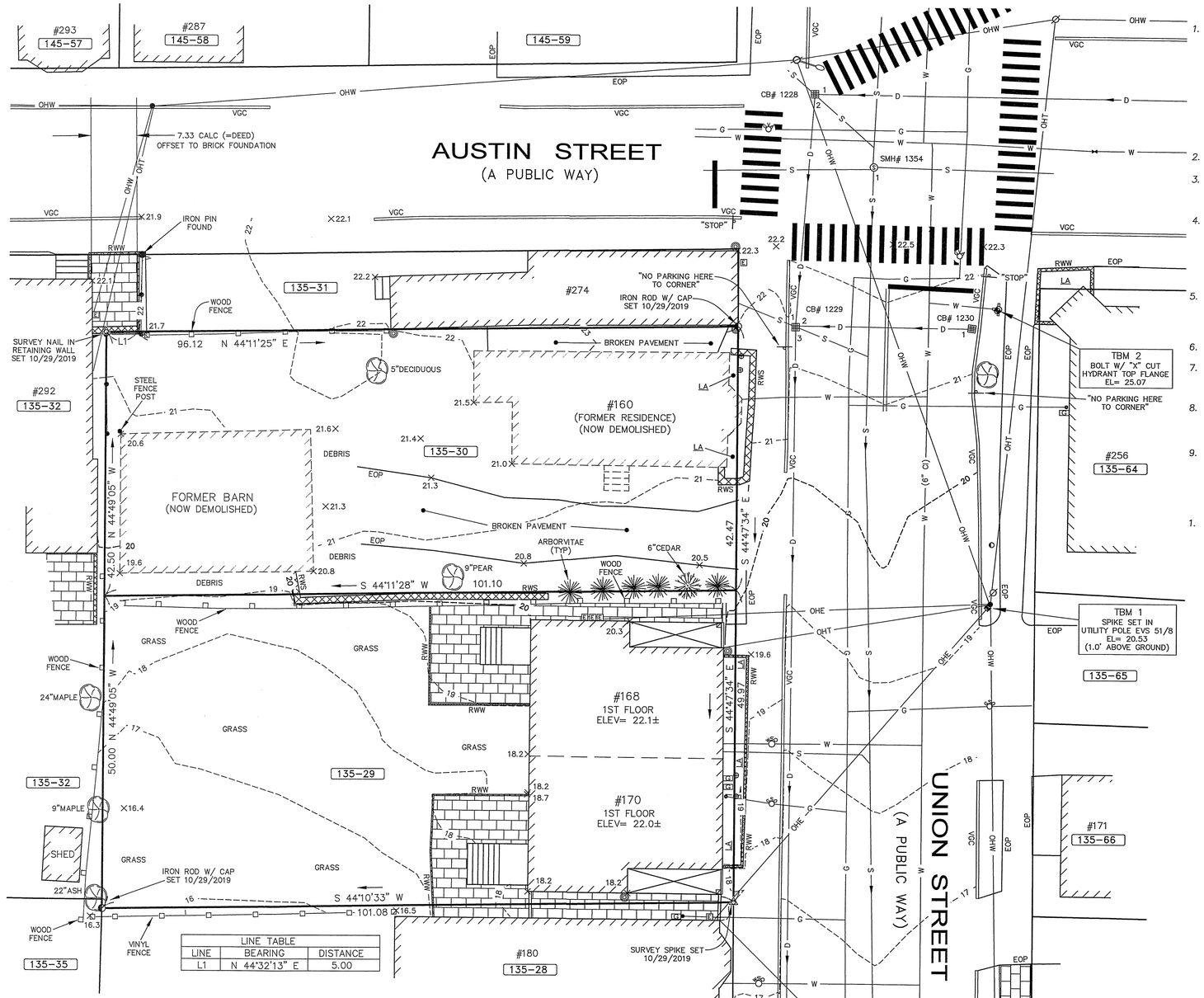
Permit Summary

Zoning Relief – The following Variances were Granted on October 22, 2019:

Section 10.521 to allow a) a lot area per dwelling unit of 2,336 sf where 3,500 sf is required; b) 36% building coverage where 35% is the maximum allowed; c) a 5'–6" left side yard where 10–feet is required; and d) from Section 10.321 to allow a non–conforming building or structure to be extended, reconstructed or enlarged without conforming to the requirements of the Ordinance.

P4823



LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 44°32'13" E	5.00

MAP-LOT	OWNER OF RECORD	DEED REF.
135-28	THELMA J. BRAZIE & CRYSTAL SNOW BRAIZE 180 UNION ST, PORTSMOUTH, NH 03801	5963/1092
135-31	ASHLEY DICKENSON & ELYSE HAMBACHER 220 UNION STREET, PORTSMOUTH, NH 03801	5725/81
135-32	REID H. JOHNSON, 292 AUSTIN ST, PORTSMOUTH, NH 03801	4512/2386
135-35	ROBERT B. HILLMAN II & KATRIE D. HILLMAN 85 MADISON ST, PORTSMOUTH, NH 03801	4941/264
135-64	MATTHEW A. FORREST, 256 AUSTIN ST, PORTSMOUTH, NH 03801	3478/1194
135-65	JOEL JOHNSON, 176 PORTSMOUTH AVE, STRATHAM, NH 03885-2229	5679/1052
135-66	JOEL JOHNSON, 176 PORTSMOUTH AVE, STRATHAM, NH 03885-2229	5679/1054
135-67	NORTHEAST REAL HOLDINGS, LLC 179 UNION ST, PORTSMOUTH, NH 03801	5980/2282

10 0 10 20 30 40 FEET

5 0 5 10 METERS

NOTES:

1. OWNER OF RECORD..... LCSG, LLC
   ADDRESS..... 750 BRACKETT RD, RYE, NH 03870
   DEED REFERENCE..... 5752/1983
   TAX SHEET / LOT..... 135-30
   PARCEL AREA ..... 4,294 S.F.

   OWNER OF RECORD..... LCSG, LLC
   ADDRESS..... 750 BRACKETT RD, RYE, NH 03870
   DEED REFERENCE..... 5613/2372
   TAX SHEET / LOT..... 135-29
   PARCEL AREA ..... 5,052 S.F.
2. THE RELATIVE ERROR OF CLOSURE WAS LESS THAN 1 FOOT IN 15,000 FEET.
3. ZONED:..... GRC
   MINIMUM LOT AREA 3,500 S.F.
   FRONTAGE..... 70'
   FRONT YARD SETBACK.... 5'
   SIDE YARD SETBACK..... 10'
   REAR YARD SETBACK..... 20'
4. 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.
5. ON SITE CONTROL ESTABLISHED USING SURVEY GRADE GPS UNITS.
   HORIZONTAL DATUM: NAD 1983
   VERTICAL DATUM: NAVD 1988
   PRIMARY BM: PORTSMOUTH CONTROL POINT "ROBE"
6. THIS PLAN IS BASED ON A FIELD SURVEY BY JAMES VERRA AND ASSOC., INC.
7. 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.
8. THIS PLAN REPRESENTS THE SITE CONDITIONS THAT EXISTED 10/17/2018 EXCEPTING THE #160 RESIDENCE AND BARN WHICH WERE AFTERWARD DEMOLISHED AND THE LOT CORNERS WHICH WERE SET 10/29/2019.
9. THE SUBJECT PARCELS LIE IN ZONE X (UNSHADED), AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AS SHOWN ON FLOOD INSURANCE RATE MAP 33015C0259E, EFFECTIVE DATE MAY 17, 2005, BY FEMA.

REFERENCE PLANS:

1. CONDOMINIUM SITE PLAN FOR JOSEPH & E. DARYL RAUCH OF 306-308 AUSTIN STREET, PORTSMOUTH, N.H. 03801, DATED 7/10/1987, RCRD PLAN D-16712.

LEGEND:

- CHAIN LINK FENCE
- PRIVACY FENCE
- PRIVACY FENCE
- EVS ..... EVERSOURCE
- 135-29 ..... TAX SHEET – LOT NUMBER
- RCRD ..... ROCKINGHAM COUNTY REGISTRY OF DEEDS
- EOP ..... EDGE OF PAVEMENT
- VGC ..... VERTICAL FACED GRANITE CURB
- RWS ..... STONE RETAINING WALL
- RWW ..... WOOD RETAINING WALL
- BOLLARD
- SIGN
- UTILITY POLE
- UTILITY POLE W/TRANSFORMER
- UTILITY POLE WITH ARM & LIGHT
- GUY
- E ..... ELECTRIC METER
- G ..... GAS METER
- GAS SHUT OFF
- GAS VALVE
- WATER GATE VALVE
- WATER SHUT OFF VALVE
- HYDRANT
- CATCH BASIN
- ROOF DOWNSPOUT
- SEWER MANHOLE
- CONIFEROUS TREE
- DECIDUOUS TREE
- CONIFEROUS SHRUB
- W ..... WATER LINE
- S ..... SEWER LINE
- D ..... DRAIN LINE
- G ..... GAS LINE
- OHW ..... OVERHEAD WIRES
- OHE ..... OVERHEAD ELECTRIC
- OHT ..... OVERHEAD TELEPHONE
- BRICK PAVERS
- RETAINING WALL
- LA ..... LANDSCAPED AREA
- ×12.5 ..... SPOT GRADE

DRAIN & SEWER TABLE

CB# 1225
RIM EL= 15.66
(1) INV IN 15"CMP= 11.95

CB# 1226
RIM EL= 15.63

CB# 1228
RIM EL= 23.36
(1) INV IN 12"HDPE= 19.21
(2) INV OUT 15"CMP= 18.46

CB# 1229
RIM EL= 21.24
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(2) INV IN 12"CMP= 17.66
(3) INV OUT 15"CMP= 15.44

CB# 1230
RIM EL= 21.30
(1) INV OUT 12"CMP= 18.05

SMH# 1354
RIM EL= 23.13
(1) INV OUT 8"VCP= 16.46

SMH# 1355
RIM EL= 14.20
(1) INV IN 8"VCP= 7.48

STATE OF NEW HAMPSHIRE
LICENSED LAND SURVEYOR
No. 625
JAMES VERRA
SIGNATURE

P4823

SURVEYOR:

James Verra and Associates, Inc.
LAND SURVEYORS

101 SHATTUCK WAY – SUITE 8
NEWINGTON, N.H. 03801– 7876
603-436-3557
JOB NO: 23770
PLAN NO: 23770

ENGINEER:

ALTUS ENGINEERING, INC.

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

ISSUED FOR:
ENGINEERING DESIGN

ISSUE DATE:
JANUARY 16, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	ENGINEERING DESIGN	JV	10/17/18
2	UPDATE OWNERS, ADD NOTES 8 & 9	JV	1/16/20

DRAWN BY: JCS
APPROVED BY: JV
DRAWING FILE: 23770.DWG

SCALE:
22" x 34" – 1" = 10'
11" x 17" – 1" = 20'

OWNER/APPLICANT:

LCSG, LLC
160 & 168-170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP-LOT 135-30 & 135-29

C/O LCSG, LLC
750 BRACKETT ROAD
RYE, NH 03870
PORTSMOUTH, N.H.

DEED REFERENCES:
RCRD 5752/1983
& 5613/2372

PROJECT:

PROPOSED SITE DEVELOPMENT PLANS

160 & 168-170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP-LOT 135-30 & 135-29

TITLE:

EXISTING CONDITIONS PLAN

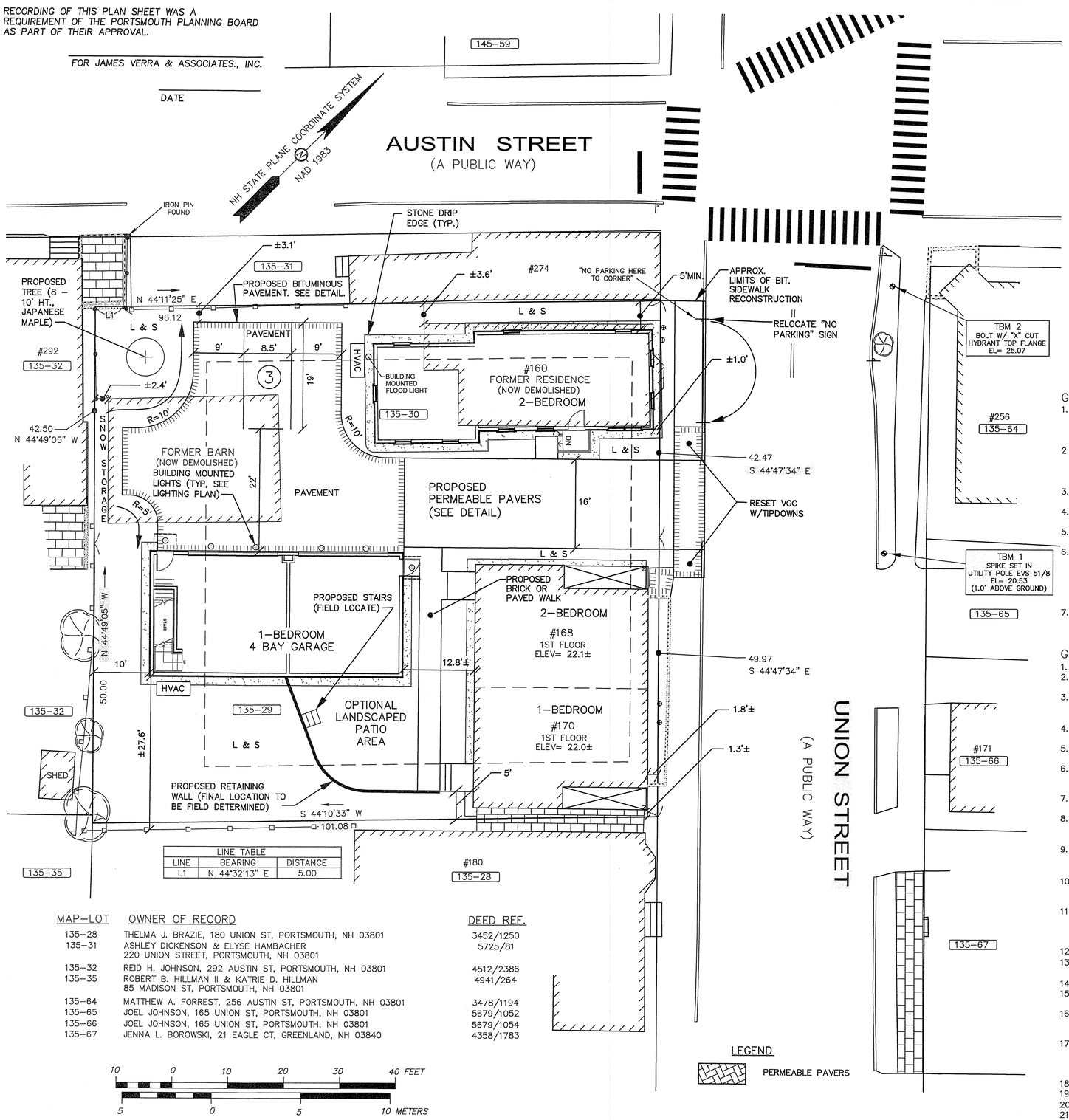
SHEET NUMBER:

1 OF 1

RECORDING OF THIS PLAN SHEET WAS A REQUIREMENT OF THE PORTSMOUTH PLANNING BOARD AS PART OF THEIR APPROVAL.

FOR JAMES VERRA & ASSOCIATES., INC.

DATE



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135-64	MATTHEW A. FORREST, 256 AUSTIN ST, PORTSMOUTH, NH 03801	3478/1194
135-65	JOEL JOHNSON, 165 UNION ST, PORTSMOUTH, NH 03801	5679/1052
135-66	JOEL JOHNSON, 165 UNION ST, PORTSMOUTH, NH 03801	5679/1054
135-67	JENNA L. BOROWSKI, 21 EAGLE CT, GREENLAND, NH 03840	4358/1783

LEGEND

PERMEABLE PAVERS

ZONING SUMMARY

THE PARCEL IS LOCATED IN THE GRC ZONE.

MIN. LOT AREA REQUIRED: 3,500 SF
LOT AREA PROVIDED: 9,346 SF (COMBINED)

MIN. FRONTAGE REQUIRED: 70'
FRONTAGE PROVIDED: 92.4'

BUILDING SETBACKS	REQUIRED	PROVIDED
MIN. FRONT YARD:	5'	0' (EXISTING), ±1.0' PROPOSED
MIN. SIDE YARD:	10'	3.6' (EXISTING), 5' PROPOSED
MIN. REAR YARD:	20'	2.4' (EXISTING), 10' PROPOSED
MAX. BLDG. HEIGHT:	35'	<35'
MAX. BLDG. COVERAGE:	35%	35.2%
MIN. OPEN SPACE:	20%	40%

PARKING CALCULATION:
1.3 SPACES/UNIT x 4 UNITS = 5.2 SPACES REQUIRED, 7 SPACES PROVIDED

MULTI-FAMILY DWELLING UNITS ALLOWED

LOT AREA PER DWELLING UNIT: 3,500 SF REQUIRED
LOT AREA PER DWELLING UNIT PROPOSED : 2,336 SF± *

* ZONING RELIEF GRANTED ON OCTOBER 22, 2019 FROM:
SECTION 10.521 TO ALLOW A LOT AREA PER DWELLING UNIT OF ±2,336 SF WHERE 3,500 SF IS REQUIRE
SECTION 10.521 TO ALLOW 36% BUILDING COVERAGE WHERE 35% IS ALLOWED
SECTION 10.521 TO ALLOW 5'-6" LEFT SIDE YARD WHERE 10-FEET IS REQUIRED
SECTION 10.321 TO ALLOW A NONCONFORMING BUILDING OR STRUCTURE TO BE EXTENDED, RECONSTRUCTED OR ENLARGED WITHOUT CONFORMING TO THE REQUIREMENTS OF THE ORDINANCE

GENERAL NOTES

1. THE INTENT OF THIS PLAN SET IS TO PROVIDE THE NECESSARY INFORMATION FOR THE REVIEW, PERMITTING AND CONSTRUCTION OF A SINGLE FAMLY RESIDENCE AND 4-BAY GARAGE W/AN APARTMENT ABOVE. THESE PLANS PROVIDE DETAILED INFORMATION FOR THE SITE LAYOUT, GRADING, UTILITIES, STORMWATER MANAGEMENT, AND LANDSCAPE IMPROVEMENTS.
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 STORM 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.

GENERAL SITE NOTES

1. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
2. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
3. 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.
4. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
5. THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
6. 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.
7. AREA OF DISTURBANCE UNDER 43,560 SF, COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT NOT REQUIRED.
8. SNOW SHALL BE STORED AT THE EDGE OF PAVEMENT, IN UPLAND AREAS SHOWN THEREON. IF ADEQUATE ON-SITE SNOW STORAGE IS NOT AVAILABLE, THE SNOW SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED.
9. 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 -NONE PROPOSED.
10. 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.
11. 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.
12. THE SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
13. 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.
14. THE PROPOSED LIGHTING WILL BE BUILDING MOUNTED AND SHALL BE DARK SKY FRIENDLY.
15. THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR AND REPLACEMENT OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS.
16. 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.
17. THE PROPERTY OWNER SHALL BE RESPONSIBLE TO REMOVE AND REPLACE DEAD OR DISEASED PLANT MATERIALS IMMEDIATELY WITH THE SAME TYPE, SIZE AND QUANITY OF PLANT MATERIALS AS ORIGINALLY INSTALLED, UNLESS ALTERNATIVE PLANTINGS ARE REQUESTED, JUSTIFIED AND APPROVED BY THE PLANNING BOARD OR PLANNING DIRECTOR.
18. TRASH AND RECYCLING SHALL BE STORED INSIDE BUILDINGS.
19. NO IRRIGATION IS PROPOSED.
20. THE PROPOSED 1 BEDROOM / 4-BAY GARAGE SHALL BE SPRINKLERED.
21. THE GARAGE BUILDING IS 990 SF PER FLOOR. THE NEW SINGLE FAMILY RESIDENCE IS 874 SF PER FLOOR.

P4823

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

STATE OF NEW HAMPSHIRE ERIC D. WEINREB No. 7634 LICENSED PROFESSIONAL ENGINEER

ISSUED FOR: TAC APPROVAL

ISSUE DATE: JANUARY 21, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EDW	12/03/19
1	TAC SUBMISSION	EDW	01/21/20

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4823-CO-11.DWG

SCALE:
22" x 34" - 1" = 10'
11" x 17" - 1" = 20'

OWNER/APPLICANT:
LCSG, LLC
750 BRACKETT ROAD
RYE, NH 03870

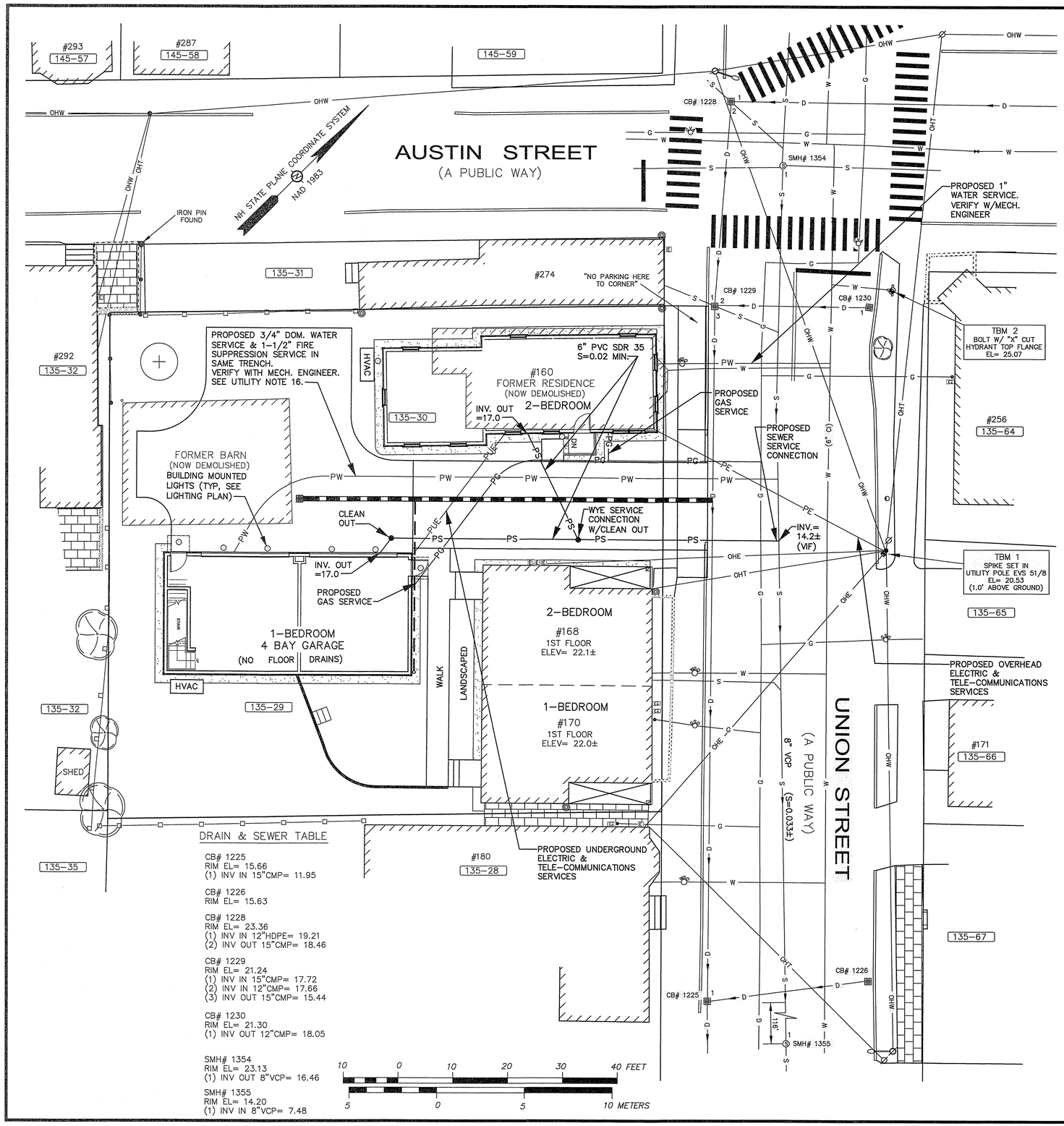
ASSESSOR'S PARCELS
MAP-LOT 135-30 & 135-29

DEED REFERENCES:
RCRD 5752/1983
& 5613/2372

PROJECT:
PROPOSED SITE DEVELOPMENT PLANS
160 & 168-170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP-LOT 135-30 & 135-29

TITLE:
SITE PLAN

SHEET NUMBER:
C-1



DRAIN & SEWER TABLE

CB# 1225
RIM EL= 15.66
(1) INV IN 15"CMP= 11.95

CB# 1226
RIM EL= 15.63

CB# 1228
RIM EL= 23.36
(1) INV IN 12"HDPE= 19.21
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(3) INV OUT 15"CMP= 15.44

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(1) INV OUT 12"CMP= 18.05

SMH# 1354
RIM EL= 23.13
(1) INV OUT 8"VCP= 16.46

SMH# 1355
RIM EL= 14.20
(1) INV IN 8"VCP= 7.48

DEMOLITION/SITE PREPARATION NOTES

1. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON FIELD LOCATION OF VISIBLE UTILITIES AND INFORMATION PROVIDED BY THE UTILITIES AGENCIES. THE LOCATIONS ARE NOT GUARANTEED BY THE ENGINEER, SURVEYOR OR OWNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR ANY DAMAGE DONE TO THE UTILITIES, AND RELOCATE EXISTING UTILITIES (IF REQUIRED) AT NO EXTRA COST TO THE OWNER. UTILITY CONFLICTS SHALL BE RESOLVED WITH THE INVOLVEMENT OF THE ENGINEER AND UTILITY COMPANY.
2. CONTRACTOR SHALL SAFELY SECURE THE SITE WITH SECURITY FENCING. FENCING SHALL BE LOCKED DURING NON-WORK HOURS.
3. CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES SCHEDULED TO REMAIN.
4. THESE DEMOLITION PLAN NOTES ARE 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.
15. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL DISCONNECTIONS/INSTALLATIONS WITH EVERSOURCE. CONTACT NICK KOSKO @ 603-332-4227, EXT. 5555334
16. CONTRACTOR SHALL COORDINATE ALL NATURAL GAS DISCONNECTIONS/INSTALLATIONS WITH UNITIL CORPORATION. CONTACT DAVID BEAULIEU @ 603-294-5144
17. CONTRACTOR SHALL COORDINATE ALL CABLE DISCONNECTIONS/INSTALLATIONS WITH COMCAST. CONTACT MIKE COLLINS @ 603-679-5695 EXT 1037
18. CONTRACTOR SHALL COORDINATE ALL TELE-COMMUNICATION DISCONNECTIONS AND INSTALLATION WITH CONSOLIDATED COMMUNICATIONS. CONTACT JOE CONSIDINE @ 603-427-5525
19. EXISTING DOMESTIC WATER & SANITARY SEWER SERVICES FOR 160 UNION STREET SHALL BE TERMINATED AT THE RESPECTIVE MAINS. WORK SHALL BE WITNESSED & APPROVED BY PORTSMOUTH DPW.

UTILITY NOTES

1. ALL WATER MAIN INSTALLATIONS AND SERVICE CONNECTIONS SHALL CONFORM TO PORTSMOUTH WATER DEPARTMENT STANDARDS. CONTACT JAMES TOW @ (603) 427-1552
2. ALL SEWER INSTALLATIONS AND SERVICE CONNECTIONS SHALL CONFORM TO PORTSMOUTH WATER AND SEWER DEPARTMENT STANDARDS. CONTACT JAMES TOW @ (603) 427-1552
   CONTRACTOR SHALL CONTACT PORTSMOUTH DPW FOR TESTING OF SEWER SERVICE.
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, IF REQUIRED.
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 CONSOLIDATED 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. CONTRACTOR SHALL CONTACT CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS AT 603-427-1530 TO COORDINATE INSPECTION OF SEWER WORK.
15. THERE ARE NO UTILITY SERVICE CHANGES PROPOSED FOR 168 & 170 UNION STREET.
16. ONE (1) BEDROOM APARTMENT SHALL BE SERVICED W/SEPARATE DOMESTIC WATER & FIRE SUPPRESSION SERVICES IN THE SAME TRENCH. SERVICES SHALL BE TERMINATED INSIDE BUILDING CONDITIONED SPACE & SPACE LARGE ENOUGH FOR METERS (24" WIDE X 30" HIGH MIN.)

P4823

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

STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7934
LICENSED
PROFESSIONAL ENGINEER
2/10/20

ISSUED FOR: PB APPROVAL

ISSUE DATE: FEBRUARY 10, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EDW	12/03/19
1	TAC SUBMISSION	EDW	01/21/20
2	PB SUBMISSION	EDW	02/10/20

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4823-CO-2.DWG

SCALE:
22" x 34" – 1" = 10'
11" x 17" – 1" = 20'

OWNER/APPLICANT:
LCSG, LLC
750 BRACKETT ROAD
RYE, NH 03870

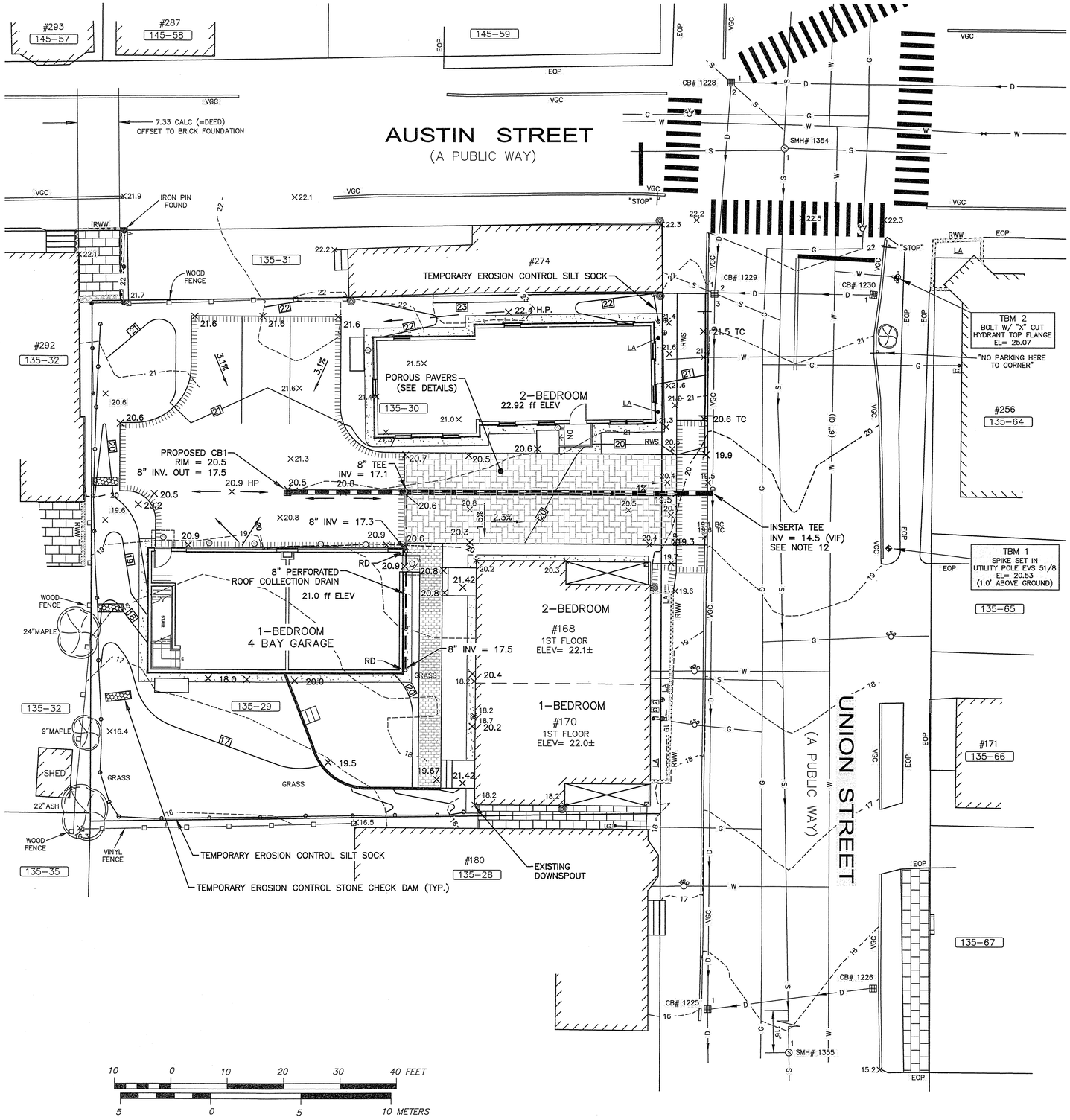
ASSESSOR'S PARCELS
MAP-LOT 135-30 & 135-29

DEED REFERENCES:
RCRD 5752/1983
& 5613/2372

PROJECT:
PROPOSED SITE DEVELOPMENT PLANS
160 & 168-170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP-LOT 135-30 & 135-29

TITLE:
UTILITIES PLAN

SHEET NUMBER:
C - 2



PROPOSED LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT GRADE ELEVATION
- PROPOSED SPOT GRADE ELEVATION
- PROPOSED STONE DRIP EDGE
- PROPOSED EDGE OF PAVEMENT

NH STATE PLANE COORDINATE SYSTEM
NAD 1983

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. DEWATERING ACTIVITIES SHALL BE DONE IN ACCORDANCE WITH EPA AND NHDES REGULATIONS AND GUIDELINES.
4. 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 REPLACED WITH FREE DRAINING STRUCTURAL FILL IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF THE FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WILL ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
5. 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.
6. ALL STORM DRAIN PIPE SHALL BE ADS N-12 OR EQUAL AND APPROVED BY THE ENGINEER.
7. 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.
8. ALL SPOT GRADES ARE AT THE FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
9. 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.
10. CONTRACTOR SHALL PROTECT ALL RAINGARDENS AND OTHER STORM MANAGEMENT DEVICES FROM CONSTRUCTION STORMWATER RUNOFF. TEMPORARY SEDIMENT BASINS SHALL BE CONSTRUCTED DURING CONSTRUCTION. STORMWATER SHALL NOT BE DIRECTED TO THE RAINGARDENS OR STORMWATER MANAGEMENT AREAS UNTIL THE WATERSHED ARE HAS BEEN STABILIZED.
11. EXISTING REAR ENTRANCE LANDINGS & STEPS TO BE MODIFIED AS NECESSARY IN FIELD.
12. THE INSTALLATION OF THE DRAINAGE CONNECTION TO THE PUBLIC STORM DRAIN SHALL BE INSPECTED BY PORTSMOUTH DPW OR THEIR APPOINTED PROXY.
13. STORMWATER INSPECTION AND MAINTENANCE REQUIREMENTS ARE DEPICTED IN THE DRAINAGE ANALYSIS. INSPECTION REPORTS SHALL BE SUBMITTED TO BOTH PORTSMOUTH DPW & PLANNING DEPARTMENT ANNUALLY. SEE MAINTENANCE & INSPECTION REQUIREMENTS IN MAINTENANCE MANUAL.

DRAIN & SEWER TABLE

CB# 1225
RIM EL= 15.66
(1) INV IN 15"CMP= 11.95

CB# 1226
RIM EL= 15.63

CB# 1228
RIM EL= 23.36
(1) INV IN 12"HDPE= 19.21
(2) INV OUT 15"CMP= 18.46

CB# 1229
RIM EL= 21.24
(1) INV IN 15"CMP= 17.72
(2) INV IN 12"CMP= 17.66
(3) INV OUT 15"CMP= 15.44

CB# 1230
RIM EL= 21.30
(1) INV OUT 12"CMP= 18.05

SMH# 1354
RIM EL= 23.13
(1) INV OUT 8"VCP= 16.46

SMH# 1355
RIM EL= 14.20
(1) INV IN 8"VCP= 7.48

P4823

ENGINEER:
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STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7634
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2/10/20

ISSUED FOR: PB APPROVAL

ISSUE DATE: FEBRUARY 10, 2020

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MAP-LOT 135-30 & 135-29

DEED REFERENCES:
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PROJECT:
PROPOSED SITE DEVELOPMENT PLANS
160 & 168-170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP-LOT 135-30 & 135-29

TITLE:
GRADING, DRAINAGE & EROSION CONTROL PLAN

SHEET NUMBER:
C - 3

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

Owner:

LCSG, LLC
750 BRACKETT ROAD
RYE, NEW HAMPSHIRE 03870

LATITUDE: 043° 02' 31" N
LONGITUDE: 070° 47' 15" W

DESCRIPTION

The project consists of the construction of a 2–bedroom residence and a separate 1–bedroom residence over a 4–bay garage with improved parking areas and access, site grading, storm drainage improvements, underground utilities installation, landscaping and associated site improvements. A separate existing structure will be upgraded and converted to contain a 1–bedroom residence & a 2–bedroom residence. A barn and separate residential structure have been demolished to allow for the new structures.

DISTURBED AREA

The total area to be disturbed on the parcel and for the buildings, driveway, parking area, drainage, and utility construction is approximately 8,000 SF± (0.18 acres±). The combined disturbed area does not exceed 43,560 SF (1 acre), thus a SWPPP will not be required for compliance with the USEPA–NPDES Construction General Permit.

NPDES CONSTRUCTION GENERAL PERMIT – NOT REQUIRED

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 three (3) copies provided to the Municipality 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 (Not Required).
2. Hold a pre–construction meeting with City & stake holders.
3. Install temporary erosion control measures, including silt fences and stabilized construction exit/entrance.
4. Protect specified trees (see plans).
5. 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.
6. Construct swales and utility infrastructure. Rough grade lot to prepare for site development. Stabilize swales prior to directing flow to them.
7. Loam and seed disturbed areas.
8. Construct buildings. Construct bituminous concrete pavement & driveway access.
9. Install tree & landscaping.
10. When all construction activity is complete and site is stabilized, remove all hay bales, storm check dams (if applicable), silt fences and temporary structures and sediment that has been trapped by these devices.
11. File a Notice of Termination (N.O.T.) with U.S.E.P.A. (Not Required)

NAME OF RECEIVING WATER

The majority of the site drainage travels overland to the municipal stormwater collection system in Union Street and eventually to the Piscataqua River Basin.

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 0.25 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 of 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 (CON'T)

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/lin in (min) Standard Strength 30 lb/lin 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 $1\frac{1}{2}$", 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.

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;

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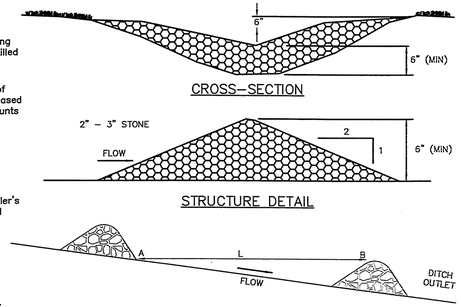
3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.

Long Term Inspection & Maintenance Schedule

	Spring	Fall or Yearly	After Major Storm	Every 2 to 3 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	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 and paths	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				
Aerate 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 liter as necessary				



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

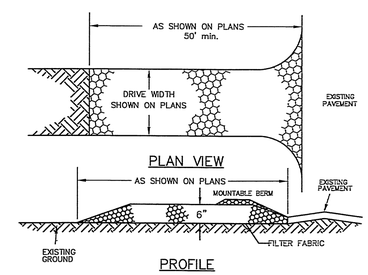
TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED STORMS. ANY NECESSARY REPAIRS SHOULD BE MADE IMMEDIATELY. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE. WHEN THE STRUCTURES ARE REMOVED, 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



STONE GRADATION TABLE

SIEVE SIZE	% PASSING BY WEIGHT
2 inch	100
1 1/2 inch	90–100
1 inch	20–55
3/4 inch	0–15
3/8 inch	0–5

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – NHDOT STANDARD STONE SIZE #4 – SECTION 703 OF NHDOT STANDARD.
2. LENGTH – DETAILED ON PLANS (50 FOOT MINIMUM).
3. THICKNESS – SIX (6) INCHES (MINIMUM).
4. WIDTH – FULL DRIVE WIDTH UNLESS OTHERWISE SPECIFIED.
5. FILTER FABRIC – MIRAFI 600X OR EQUAL APPROVED BY ENGINEER.
6. 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.
7. 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.
8. 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.
9. STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AT ALL ENTRANCES TO PUBLIC RIGHTS–OF–WAY, AT LOCATIONS SHOWN ON THE PLANS, AND/OR WHERE AS DIRECTED BY THE ENGINEER.

STABILIZED CONSTRUCTION EXIT

NOT TO SCALE

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.

P4823

ENGINEER:

ALTUS ENGINEERING, INC.

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

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER

1/17/20

ISSUED FOR: TAC

ISSUE DATE: JANUARY 21, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	01/21/20

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4823DETAILS.DWG

SCALE: NOT TO SCALE

OWNER/APPLICANT:

LCSG, LLC
750 BRACKETT ROAD
RYE, NH 03870

ASSESSOR'S PARCELS
MAP–LOT 135–30 & 135–29

DEED REFERENCES:
RCRD 5752/1983
& 5613/2372

PROJECT:

PROPOSED SITE DEVELOPMENT PLANS

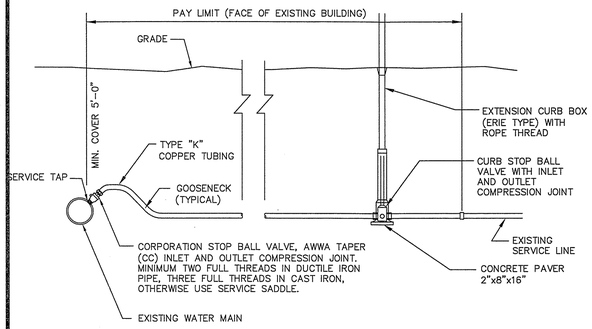
160 & 168–170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP–LOT 135–30 & 135–29

TITLE:

DETAIL SHEET

SHEET NUMBER:

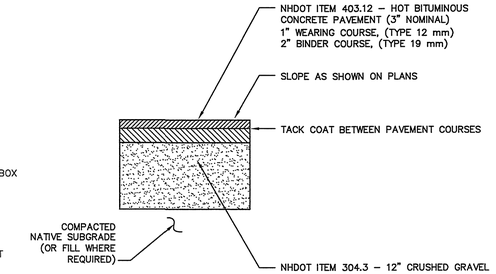
D-1



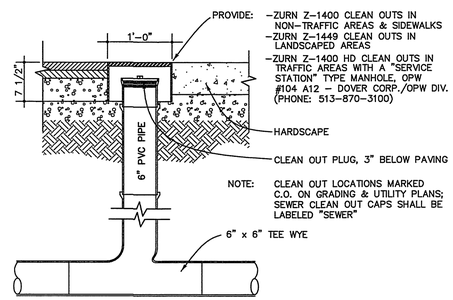
NOTES

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.

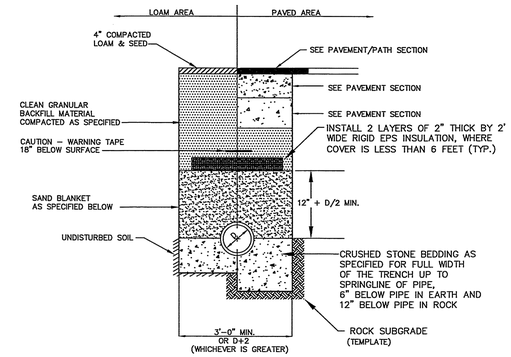
SERVICE CONNECTION DETAIL NOT TO SCALE



PAVEMENT CROSS SECTION NOT TO SCALE



CLEANOUT DETAIL NOT TO SCALE



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

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

CRUSHED STONE BEDDING *

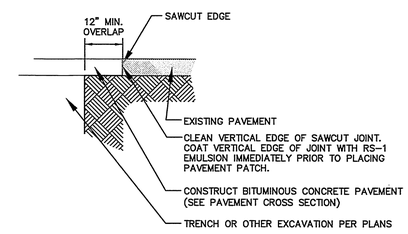
SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

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

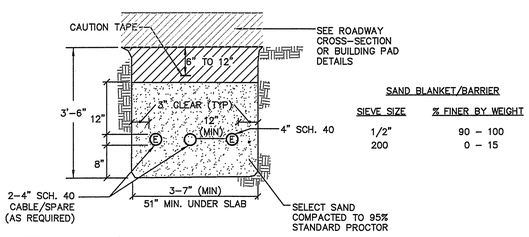
SEWER TRENCH SECTION NOT TO SCALE

STANDARD TRENCH NOTES:

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN OF THE DRAWING.
2. 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 #8 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.
3. 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.
4. 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.
5. 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.
6. 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 THAT 1 FOOT ABOVE THE TOP OF THE PIPE.
7. 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.
8. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
9. 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.
10. 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.
11. 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.



TYPICAL PAVEMENT SAWCUT NOT TO SCALE



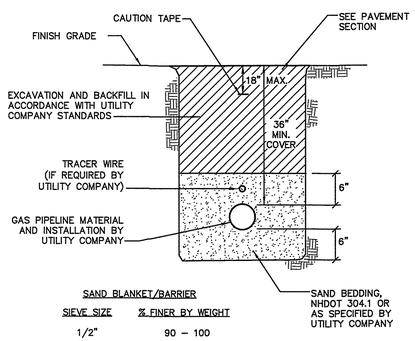
SAND BLANKET/BARRIER

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

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



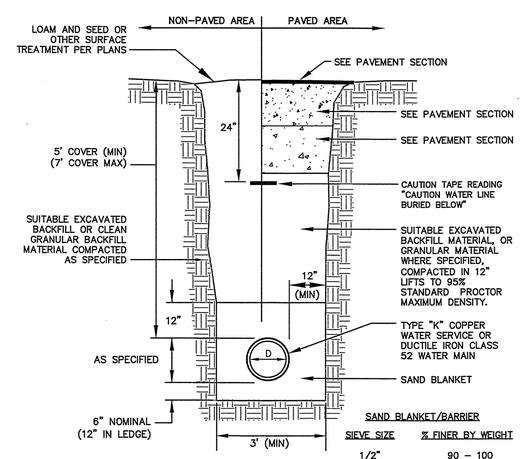
SAND BLANKET/BARRIER

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

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



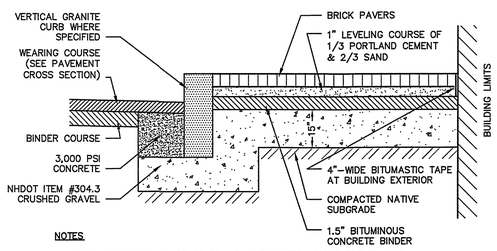
SAND BLANKET/BARRIER

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

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.

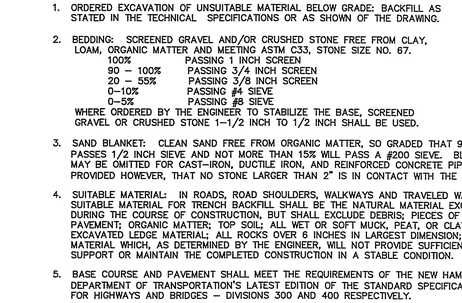
WATER MAIN TRENCH NOT TO SCALE



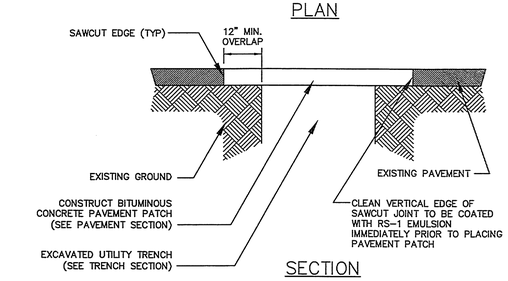
NOTES

1. CONTRACTOR SHALL REUSE WHOLE, UNDAMAGED BRICKS FOR REPAIRS.
2. BRICK PATTERN SHALL MATCH TO EXISTING.
3. NEW BRICKS SHALL MATCH TO EXISTING. SAMPLES SHALL BE PROVIDED TO THE CITY FOR APPROVAL PRIOR TO PURCHASING.

BRICK SIDEWALK DETAIL NOT TO SCALE



PLAN



SECTION

NOTES

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

TYPICAL TRENCH PATCH NOT TO SCALE

P4823

ENGINEER:

ALTUS ENGINEERING, INC.

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

STATE OF NEW HAMPSHIRE ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER 1/17/20

ISSUED FOR: TAC

ISSUE DATE: JANUARY 21, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	01/21/20

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4823DETAILS.DWG

SCALE: NOT TO SCALE

OWNER/APPLICANT:

LCSG, LLC
750 BRACKETT ROAD
RYE, NH 03870

ASSESSOR'S PARCELS
MAP–LOT 135–30 & 135–29

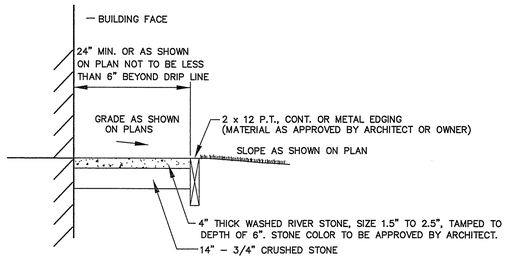
DEED REFERENCES:
RCRD 5752/1983
& 5613/2372

PROJECT:

PROPOSED SITE DEVELOPMENT PLANS
160 & 168–170 UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP–LOT 135–30 & 135–29

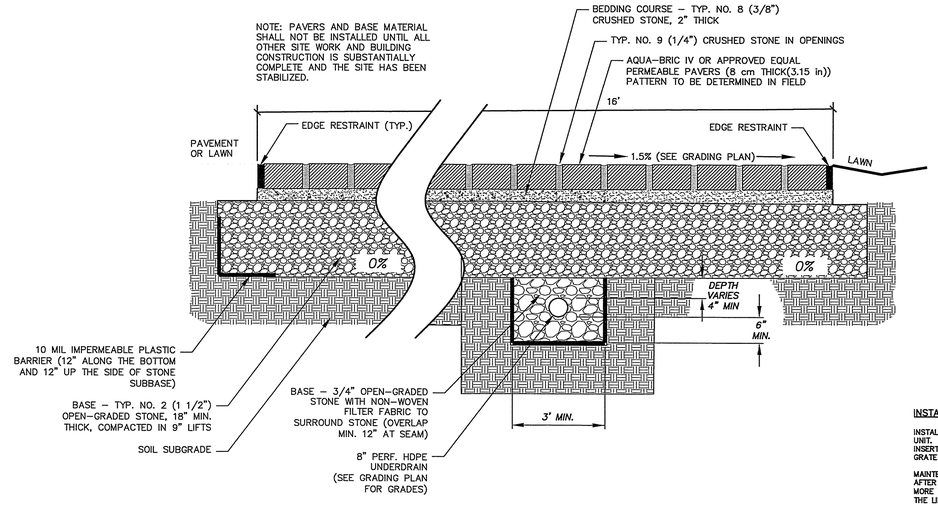
TITLE: DETAIL SHEET

SHEET NUMBER: D-2



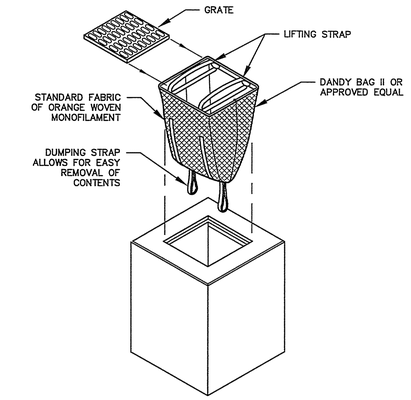
DRIP EDGE DETAIL

NOT TO SCALE



PERMEABLE PAVERS DETAIL

NOT TO SCALE



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.

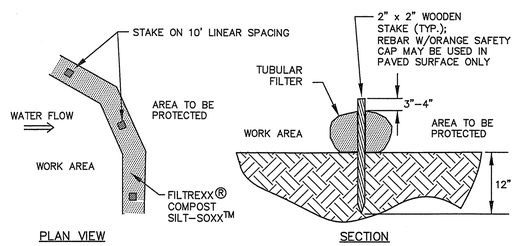
MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE 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

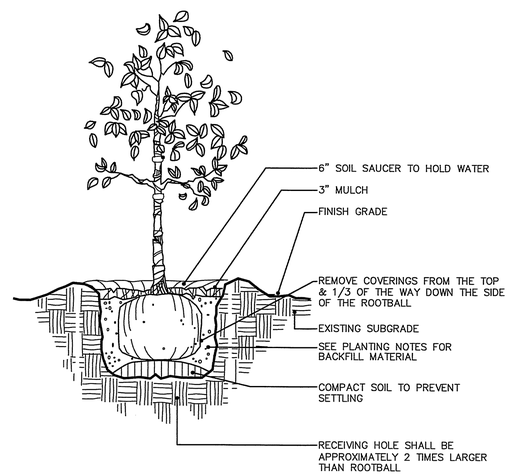
NOT TO SCALE



NOTES:
1. SILTSOXX OR APPROVED EQUAL SHALL BE USED FOR TUBULAR SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET MANUFACTURER'S SPECIFICATIONS.
3. COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY BARRIER SHALL BE DISPOSED OF PROPERLY.

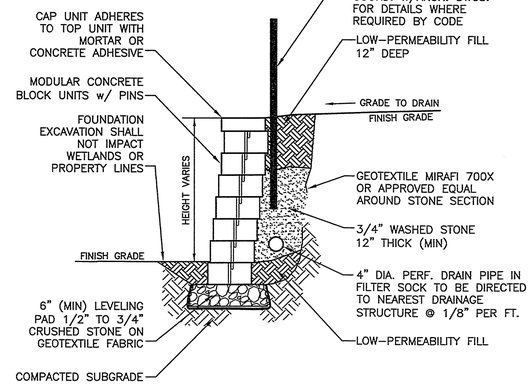
TUBULAR SEDIMENT BARRIER DETAIL

NOT TO SCALE



SMALL TREE PLANTING/STAKING DETAIL

(Trees with 3" cal. & smaller)
Not to Scale

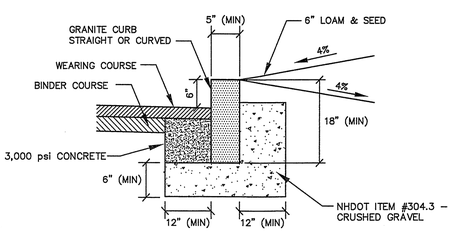


NOTES:

1. TYPICAL MODULAR BLOCK SHALL BE PRECAST CONCRETE MEASURING APPROXIMATELY 16"x12"x6". OTHER BLOCK SIZES MAY BE APPROVED BY THE ENGINEER UPON REQUEST. CAP UNITS SHALL BE PER THE STANDARDS OF THE SELECTED MANUFACTURER.
2. BLOCK MANUFACTURER SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
3. WALL SHALL BE INSTALLED PER THE REQUIREMENTS OF THE MANUFACTURER.
4. WALL HEIGHT SHALL NOT EXCEED 4' WITHOUT DESIGN DRAWINGS STAMPED BY A PROFESSIONAL STRUCTURAL ENGINEER.
5. LOCKING PINS MAY OR MAY NOT BE REQUIRED BASED ON THE WALL MANUFACTURER APPROVED BY THE ENGINEER.
6. WALL SHALL BE EMBEDDED BELOW EXISTING GRADE THE DEPTH OF AT LEAST ONE BLOCK UNLESS OTHERWISE SPECIFIED BY THE WALL MANUFACTURER.
7. WALL BATTER SHALL BE PER THE MANUFACTURER'S SPECIFICATIONS.
8. BLOCK FINISH SHALL BE AT THE DISCRETION OF THE OWNER.
9. MODULAR BLOCK RETAINING WALL SHALL BE DIAMOND PRO WALL SYSTEM BY ANCHOR WALL SYSTEMS (OR APPROVED EQUAL). VERIFY WITH OWNER & ENGINEER.
10. OWNER MAY SUBSTITUTE OTHER MATERIAL FOR WALL WITH PRIOR APPROVAL FROM ENGINEER.

MODULAR BLOCK RETAINING WALL

NOT TO SCALE



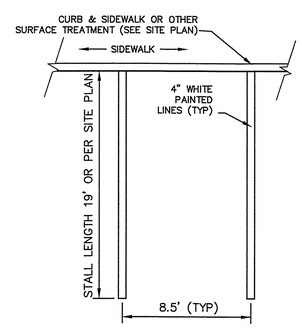
NOTES

1. SEE PLANS FOR CURB LOCATION.
2. SEE PLANS FOR PAVEMENT CROSS SECTION.
3. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
4. MINIMUM LENGTH OF CURB STONES = 4'.
5. MAXIMUM LENGTH OF CURB STONES = 10'.
6. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES – SEE CHART.
7. CURB ENDS TO ROUNDED AND BATTERED FACES TO BE CUT WHEN CALL FOR ON THE PLANS.
8. CURB SHALL BE INSTALLED PRIOR TO PLACEMENT OF TOP PAVEMENT COURSE.
9. JOINTS BETWEEN CURB STONES SHALL BE MORTARED.

RADIUS	MAX. LENGTH
21'	3'
22'–28'	4'
29'–35'	5'
36'–42'	6'
43'–49'	7'
50'–56'	8'
57'–60'	9'
OVER 60'	10'

VERTICAL GRANITE CURB

NOT TO SCALE



PARKING STALL LAYOUT

NOT TO SCALE

P4823

ENGINEER:

ALTUS ENGINEERING, INC.

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

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER

1/17/20

ISSUED FOR: TAC

ISSUE DATE: JANUARY 21, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	01/21/20

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4823DETAILS.DWG

SCALE: NOT TO SCALE

OWNER/APPLICANT:

LCSG, LLC
750 BRACKETT ROAD
RYE, NH 03870

ASSESSOR'S PARCELS
MAP–LOT 135–30 & 135–29

DEED REFERENCES:
RCRD 5752/1983
& 5613/2372

PROJECT:

PROPOSED SITE DEVELOPMENT PLANS

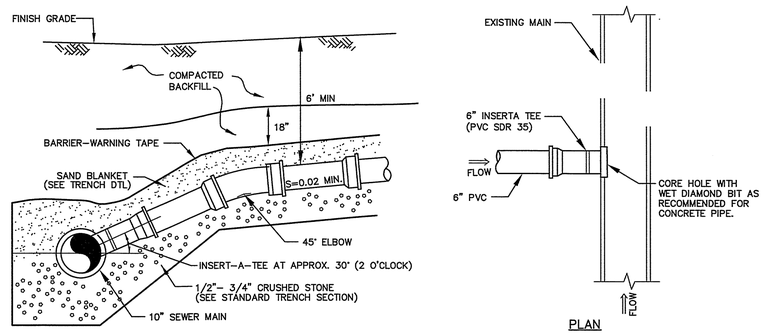
160 & 168–170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP–LOT 135–30 & 135–29

TITLE:

DETAIL SHEET

SHEET NUMBER:

D-3



ELEVATION

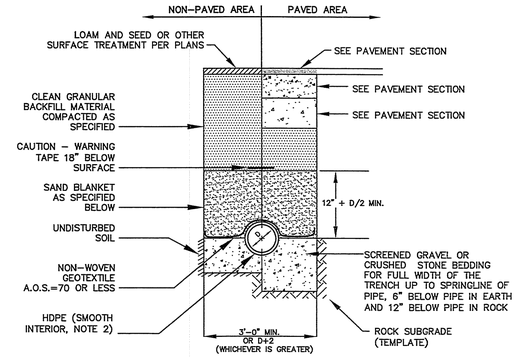
PLAN

NOTES

1. INSERTA TEE SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS.
2. CONTRACTOR TO COORDINATE CONNECTION INSTALLATIONS WITH CITY OF PORTSMOUTH DPW.
3. CONTRACTOR TO COMPLY ALL APPLICABLE OSHA AND EPA REQUIREMENTS FOR CUTTING ASBESTOS CEMENT (AC) PIPE.

DRAINAGE / SEWER CONNECTION 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

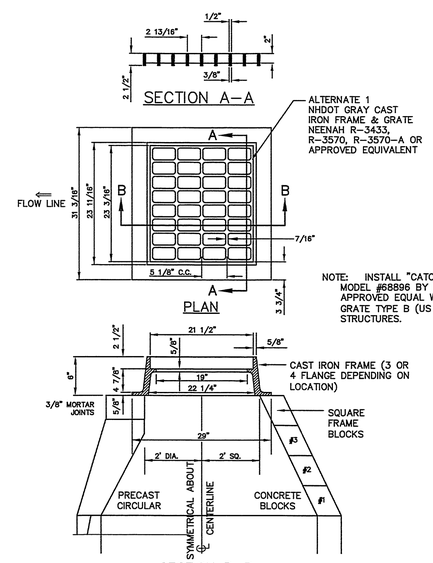
SCREENED GRAVEL OR CRUSHED STONE BEDDING*

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

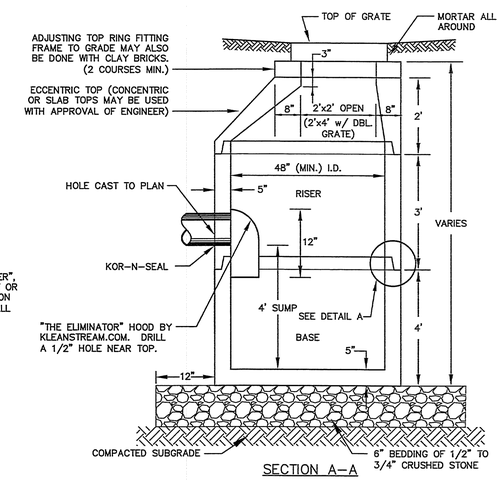
STORM DRAIN TRENCH

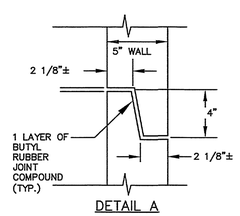
NOT TO SCALE



NOTES

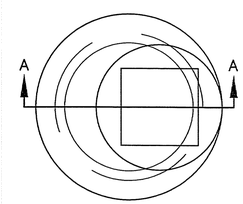
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. USE H20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4' OF FINISH GRADE.
7. FRAME AND GRATE DIMENSIONS ARE TYPICAL BUT MAY VARY BASED ON PRODUCT SELECTED OR EQUIVALENT APRROVED BY THE ENGINEER.





DETAIL A

(TONGUE & GROOVE JOINT)



PLAN–ECCENTRIC CONE

DEEP SUMP CATCH BASIN

NOT TO SCALE

P4823

ENGINEER:

ALTUS ENGINEERING, INC.

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

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 – LICENSED PROFESSIONAL ENGINEER

1/17/20

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ISSUE DATE: JANUARY 21, 2020

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0	INITIAL SUBMISSION	EDW	01/21/20

DRAWN BY: RLH
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OWNER/APPLICANT:

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ASSESSOR'S PARCELS
MAP–LOT 135–30 & 135–29

DEED REFERENCES:
RCRD 5752/1983
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PROJECT:

PROPOSED SITE DEVELOPMENT PLANS

160 & 168–170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP–LOT 135–30 & 135–29

TITLE:

DETAIL SHEET

SHEET NUMBER:

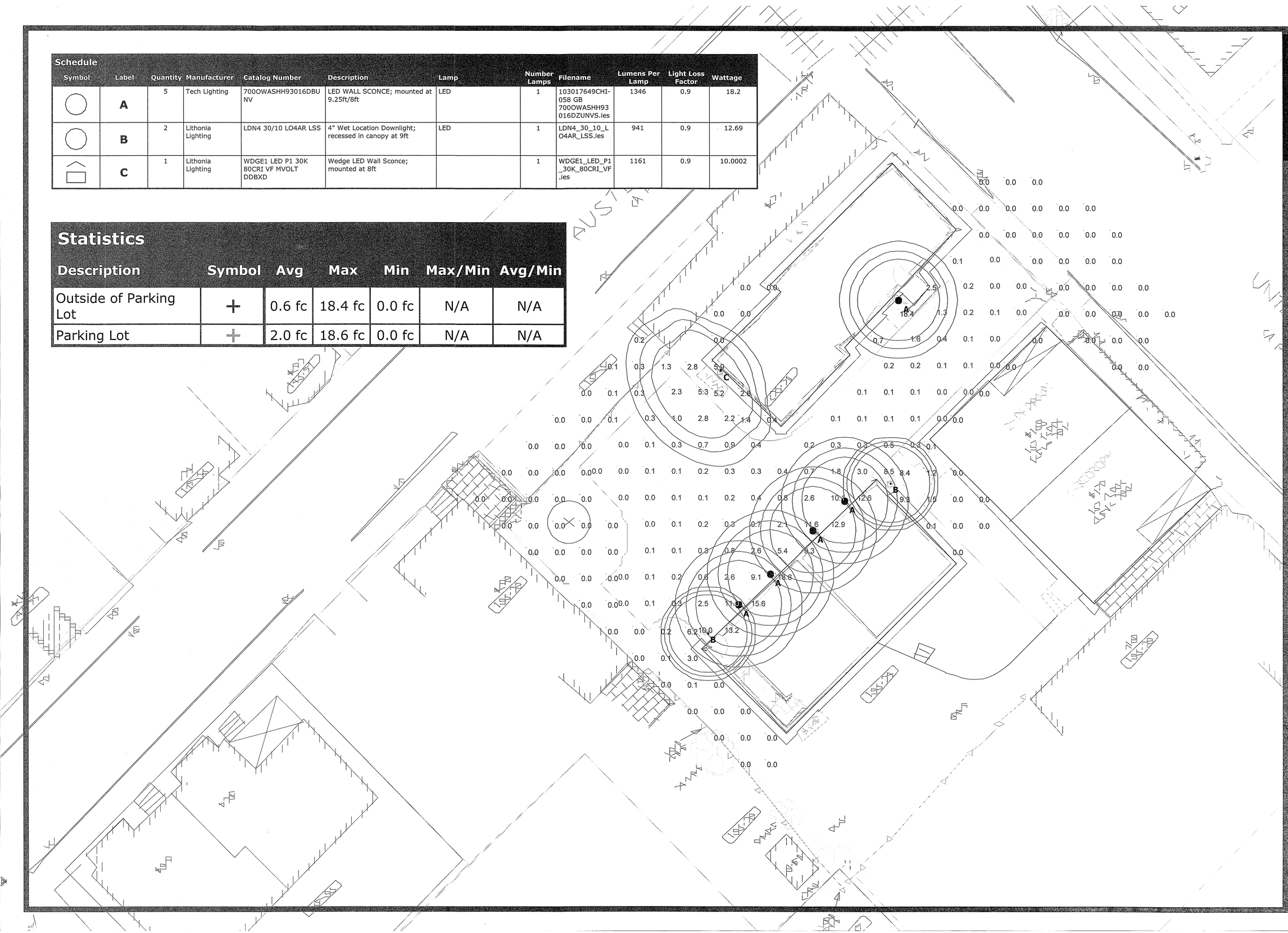
D-4

Schedule

Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
○	A	5	Tech Lighting	700OWASHH93016DBUNV	LED WALL SCONCE; mounted at 9.25ft/8ft	LED	1	103017649CHI-058 GB 700OWASHH93016DZUNVS.ies	1346	0.9	18.2
○	B	2	Lithonia Lighting	LDN4 30/10 LO4AR LSS	4" Wet Location Downlight; recessed in canopy at 9ft	LED	1	LDN4_30_10_LO4AR_LSS.ies	941	0.9	12.69
⌂	C	1	Lithonia Lighting	WDGE1 LED P1 30K 80CRI VF MVOLT DDBXD	Wedge LED Wall Sconce; mounted at 8ft		1	WDGE1_LED_P1_30K_80CRI_VF.ies	1161	0.9	10.0002

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Outside of Parking Lot	+	0.6 fc	18.4 fc	0.0 fc	N/A	N/A
Parking Lot	+	2.0 fc	18.6 fc	0.0 fc	N/A	N/A



VISUAL

160 UNION ST
Portsmouth, NH
Site Lighting Layout

Designer

Heidi G. Connors
Visible Light, Inc.
24 Stickney Terrace
Suite 6
Hampton, NH 03842

Date

1/17/2020

Scale

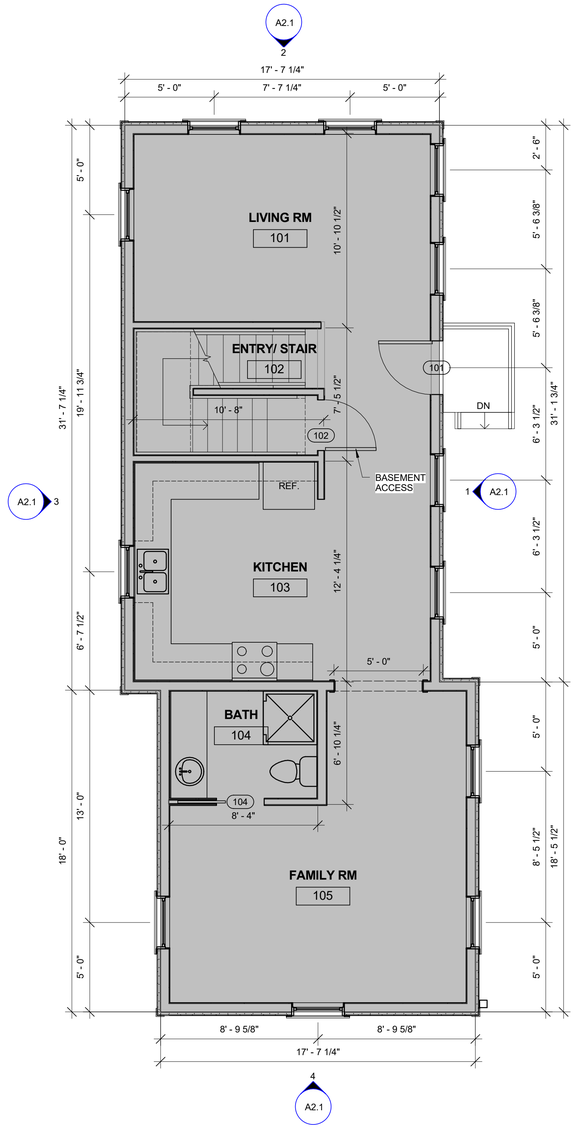
1"=16'

Drawing No.

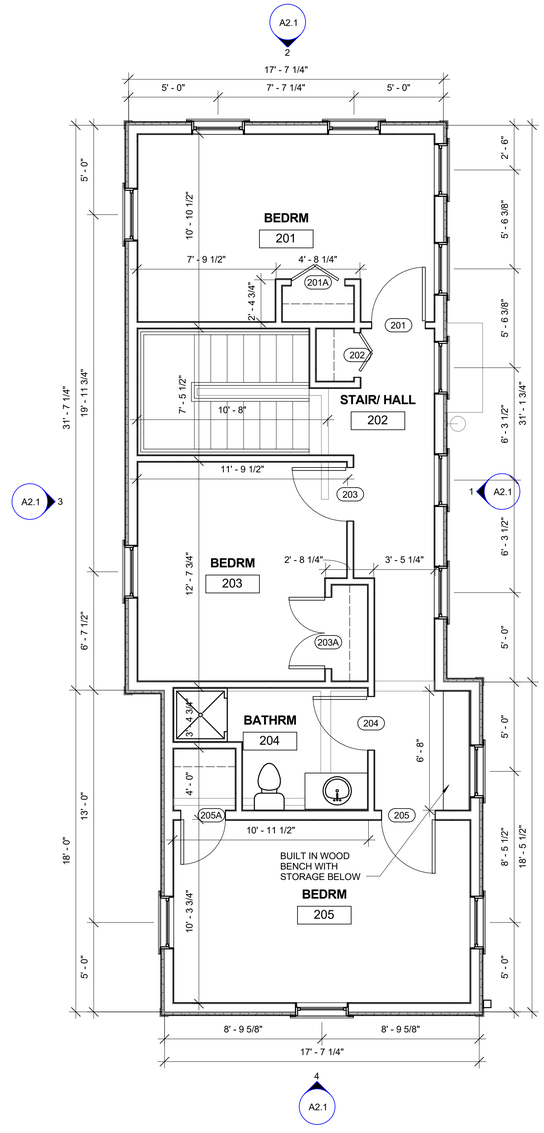
Summary

GENERAL NOTES- SINGLE FAMILY

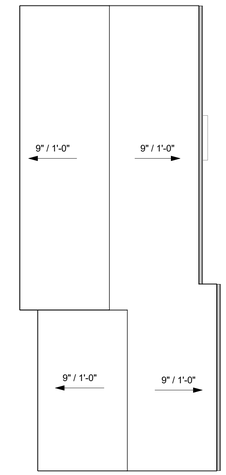
1. FULL BASEMENT TO BE PROVIDED. ACCESS TO BE DETERMINED.



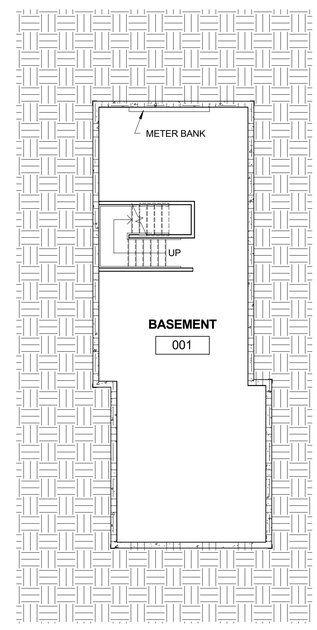
1 Level 1- SINGLE FAMILY
1/4" = 1'-0"



2 Level 2- SINGLE FAMILY
1/4" = 1'-0"



3 ROOF PLAN- SINGLE FAMILY
1/8" = 1'-0"



4 Basement- Single Family
1/8" = 1'-0"

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160-170 Union Street

Matthew and Natasha Goyette
Portsmouth, NH

McHENRY
ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

NOT FOR CONSTRUCTION REVIEW SET ONLY

No.	Description	Date

Project Name:
160-170 Union Street

Drawing Name:
SINGLE FAMILY FLOOR PLANS

Project number:	16093
Date:	02/10/2020
Drawn by:	MB
Checked by:	JJ

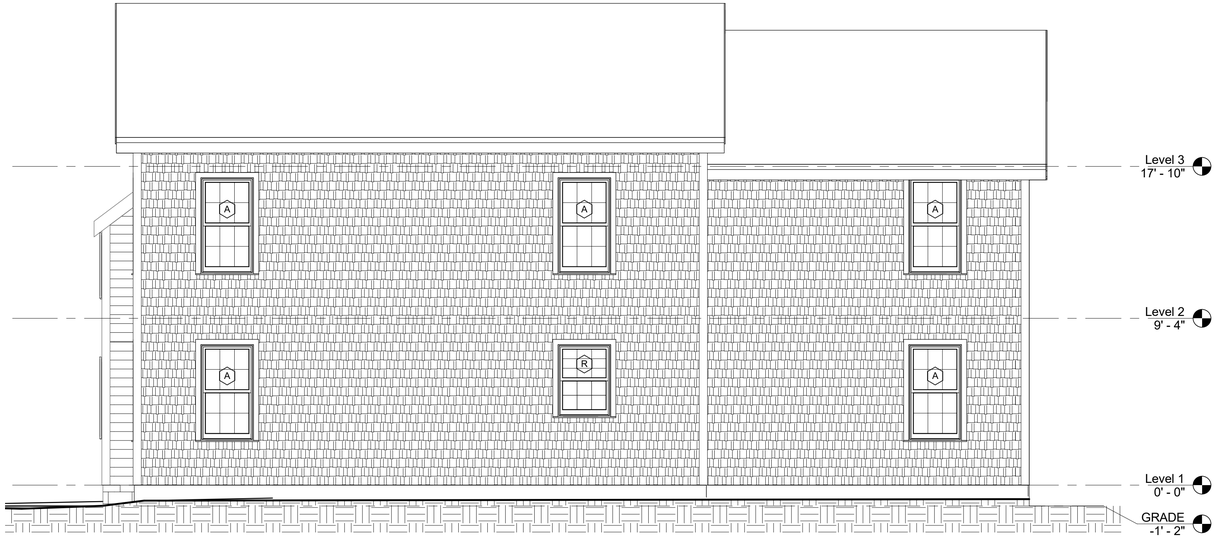
A2

Scale: As indicated

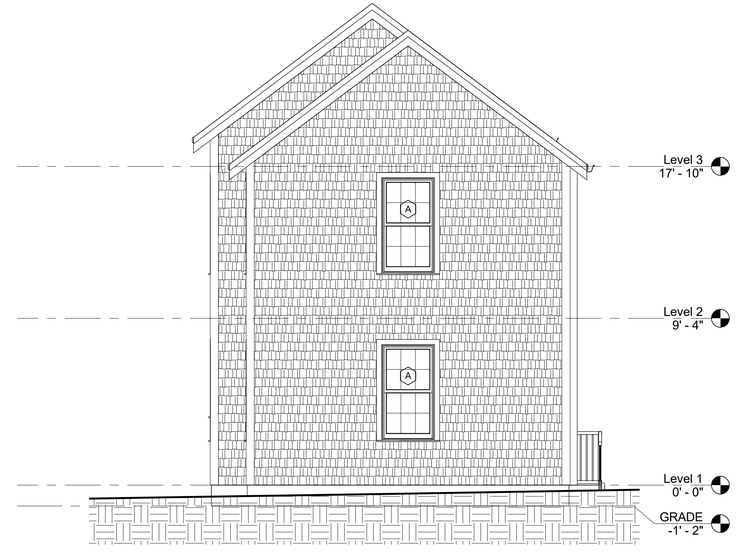
2/10/2020 3:12:18 PM

1 East Elevation- Single Family
1/4" = 1'-0"

2 North Elevation- Single Family
1/4" = 1'-0"



3 West Elevation- Single Family
1/4" = 1'-0"



4 South Elevation- Single Family
1/4" = 1'-0"

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160-170 Union Street
Matthew and Natasha Goyette
Portsmouth, NH

McHENRY ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

NOT FOR CONSTRUCTION REVIEW SET ONLY

No.	Description	Date

Project Name:
160-170 Union Street

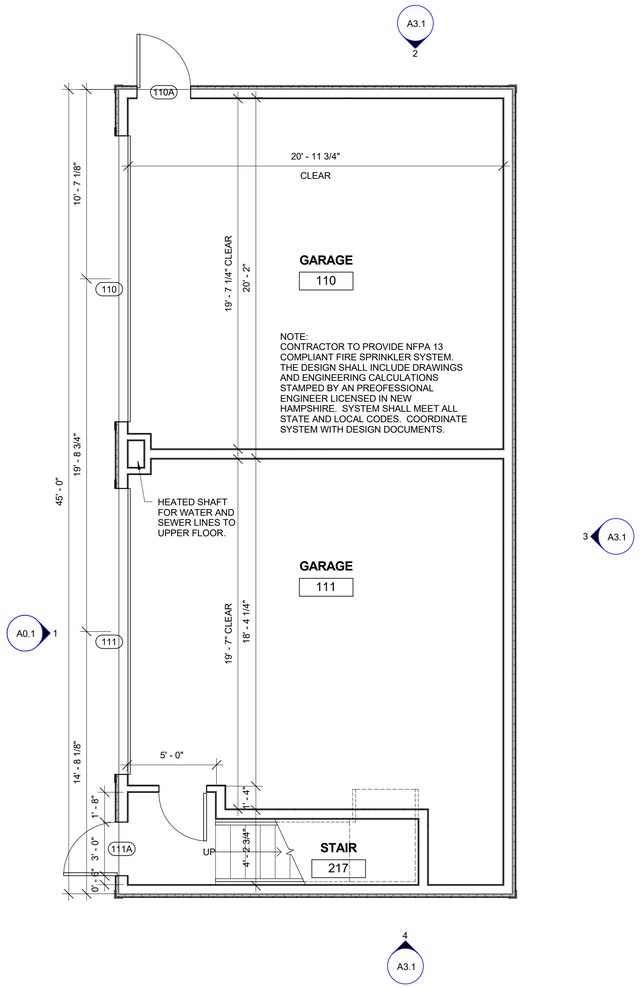
Drawing Name:
EXTERIOR ELEVATIONS- SINGLE FAMILY

Project number:	16093
Date:	02/10/2020
Drawn by:	MB
Checked by:	JJ

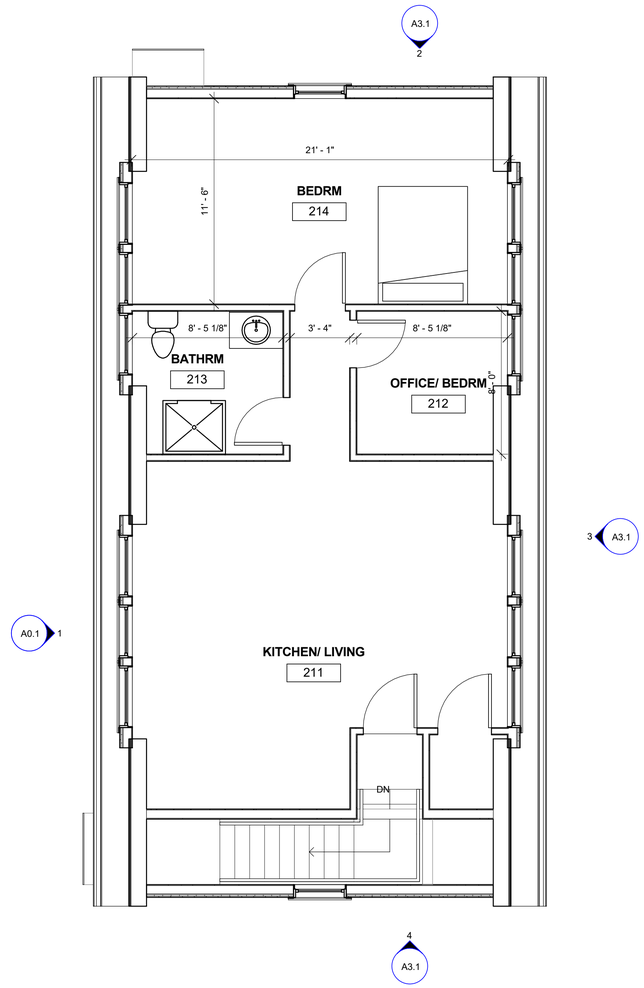
A2.1

Scale: 1/4" = 1'-0"

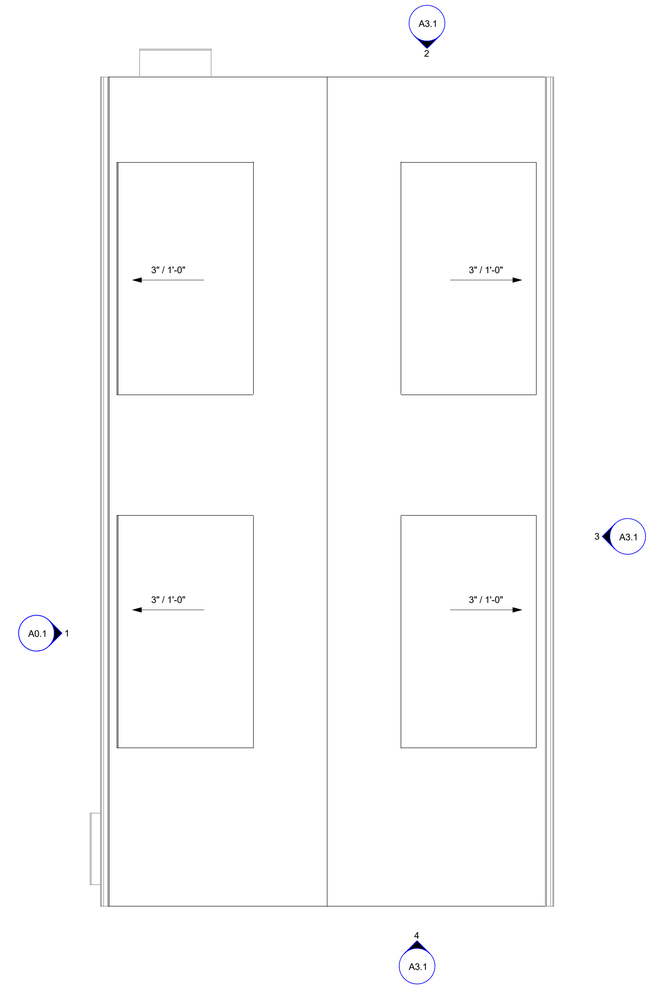
2/10/2020 3:12:22 PM



1 Level 1- APARTMENT
1/4" = 1'-0"



2 Level 2- APARTMENT
1/4" = 1'-0"



3 ROOF PLAN- APARTMENT
1/4" = 1'-0"

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160-170 Union Street
Matthew and Natasha Goyette
Portsmouth, NH

McHENRY
ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

NOT FOR CONSTRUCTION
REVIEW SET ONLY

No.	Description	Date

Project Name:
160-170 Union Street

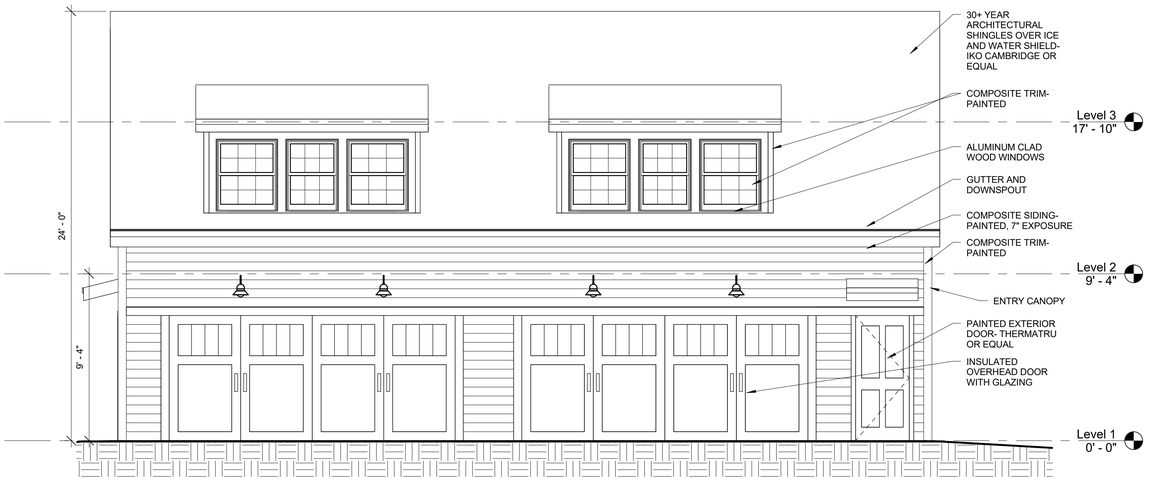
Drawing Name:
APARTMENT FLOOR PLANS

Project number:	16093
Date:	02/10/2020
Drawn by:	MB
Checked by:	JJ

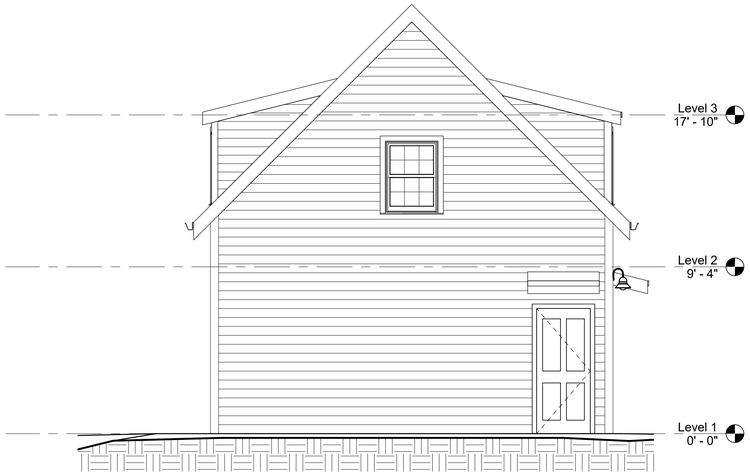
A3

Scale: 1/4" = 1'-0"

2/10/2020 3:12:23 PM

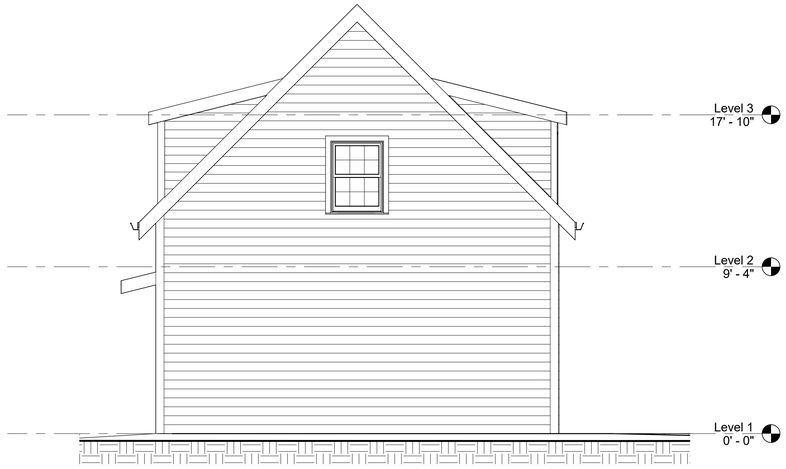


1 West Elevation- Apartment
1/4" = 1'-0"



2 North Elevation- Apartment
1/4" = 1'-0"

3 East Elevation- Apartment
1/4" = 1'-0"



4 South Elevation- Apartment
1/4" = 1'-0"

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160-170 Union Street
Matthew and Natasha Goyette
Portsmouth, NH

McHENRY ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

NOT FOR CONSTRUCTION REVIEW SET ONLY

No.	Description	Date

Project Name:
160-170 Union Street

Drawing Name:
EXTERIOR ELEVATIONS- APARTMENT (OPTION 2)

Project number:	16093
Date:	02/10/2020
Drawn by:	MB
Checked by:	JJ

A3.1

Scale: 1/4" = 1'-0"

2/10/2020 3:12:24 PM

ALTUS
ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

February 10, 2020

Juliet T. H. Walker, AICP, Planning Director
City of Portsmouth Municipal Complex
Planning Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Site Plan Review Application**
Assessor's Map 135, Lots 29 & 30
160 & 168 - 170 Union Street
Altus Project #P4823

Dear Juliet:

On behalf of LCSG, LLC and Natasha & Matthew Goyette, Altus Engineering, Inc. (Altus) respectfully submits revised Site Plans for the redevelopment of 160 & 168-170 Union Street. At the February 4th Technical Advisory Committee meeting, the Committee voted to recommend approval with stipulations.

The stipulations are addressed on the revised plan set as described below:

1. Note 19 has been added to the demolition notes on Sheet C-2 to require the removal of the existing water and sewer services to the main in Union Street.

2. The errant sewer service for 160 Union Street has been removed from the plan.

3. Altus met with Terry Desmarais on February 5th, he confirmed that water meters will be allowed for each building. The water line for the 1-bedroom apartment building runs directly to the unit without entering the single-family residence.

4. Utility Note 16 has been added to Sheet C-2 stating that adequate conditions space shall be provided for the water meter inside the building.

5. A separate fire suppression service for the apartment with the 4-bay garage is now depicted on Sheet C-2. It will be constructed in the same trench as the domestic water service for the building.

6. The stormwater management inspection reporting requirements have been revised to require that the reports are submitted to both the Planning Department and Public Works annually.

7. Utility Note 12 has been added to Sheet C-3 requiring that DPW or their proxy inspect the installation of the drainage connection in Union Street.

Attached please find one copy of the following revised plans and documents for the Planning Board review:

- Site Plans(2 copies);
- Site Plan Review Checklist
- Green Statement;
- Letter of Authorization;
- Wastewater flow projections;
- Site lighting cut sheets;
- Drainage Computations.

Altus looks forward to presenting this project at the February 20th Planning Board meeting. Please call or email me should you have any questions or need any additional information.

Sincerely,

ALTUS ENGINEERING, INC.

Eric D. Weinrieb, PE
President

wde/4823 pb cvr ltr

Enclosure

Ecopy: Matt Goyette
Jeremiah Johnson, McHenry Architecture

ALTUS
ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

LCSG, LLC

160 & 168-170 Union Street
Portsmouth, NH

PRELIMINARY OPINION OF SITEWORK COST

DATE: January 16, 2020
PROJECT: 4823

ITEM DESCRIPTION		QUANTITY	UNIT	UNIT PRICE	TOTAL COST
SITEWORK DEMOLITION					
	DEMOLITION AND MOBILIZATION	1	LS	$2,000.00	$2,000.00
	PAVEMENT SAWCUT	250	LF	$4.50	$1,125.00
SEWER SERVICE					
	6-INCH GRAVITY SDR 35	100	LF	$35.00	$3,500
	CLEAN OUTS AND WYE CONNECTIONS	2	EA	$100.00	$200
WATER SERVICE					
	DOMESTIC WATER SERVICES	60	LF	$32.00	$1,920
	WATER TAPS AND CURB STOPS	1	EA	$500.00	$500
GAS SERVICE					
	GAS SERVICES	75	LF	$26.00	$1,950
ELECTRIC/PHONE/CABLE SERVICES					
	UNDERGROUND ELECTRIC AND TELE-COMMUNICATION CONDUITS	28	LF	$34.00	$952
STORM DRAINAGE SYSTEM					
	EROSION CONTROL RIPRAP AND DRIP EDGE	1	LS	$2,500.00	$2,500
	CATCH BASIN	1	EA	$2,200.00	$2,200
	8 PERFORATED PVC	110	LF	$28.00	$3,080
	INSERTA TEE	1	LS	$750.00	$750
SEDIMENT AND EROSION CONTROL					
	TEMPORARY EROSION CONTROL	1	LS	$800.00	$800
AGGREGATE BASE COURSES					
	12" GRAVEL (NHDOT 304.2)	56	CY	$18.00	$1,008
	6" CRUSHED GRAVEL (NHDOT 304.3)	28	CY	$22.00	$616
	CUTS AND FILLS	150	CY	$12.00	$1,800
HOT BITUMINOUS PAVEMENT					
	4" BASE AND WEARING COURSE	38	TONS	$110.00	$4,180
PERMEABLE PAVERS					
	PERMEABLE PAVERS (INCLUDING SUBBASE MATERIALS)	85	SY	$100.00	$8,500
CONCRETE FLATWORK					
	CONCRETE PADS	1	LS	$400.00	$400
STRIPING AND SIGNAGE					
	STRIPING	1	LS	$250.00	$250
LANDSCAPING					
	LANDSCAPING, LOAM AND SEED - TURF ESTABLISHMENT	1	LS	$1,500.00	$1,500
	RETAINING WALL	12	SY	$40.00	$480
	WALKWAYS	25	SY	$35.00	$875
	REPAIR SIDEWALK	1	LS	$1,000.00	$1,000
LIGHTING					
		NIC			
SUBTOTAL					**$42,086**

TOTAL: $42,086

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:
LEDGE REMOVAL, TAPPING FEES, INSPECTIONS, UTILITY SERVICE FEES

February 4, 2020

City of Portsmouth Planning Board

GREEN BUILDING STATEMENT
Re: Proposed Residential Development at 160-170 Union Street, Portsmouth, NH

The building envelope of the two new buildings proposed at 160-170 Court Street is being designed to meet or exceed the prescriptive method of the current State of NH adopted 2015 International Energy Code requirements.

· Foundation system of new buildings to be cast in place concrete with continuous rigid insulation installed to depths required by the energy code. Continuous insulation will be provided under the concrete slab on grade for 2 feet along the exterior wall. The single-family home will have a full basement with rigid insulation down to the top of the footings.

· Exterior walls of new buildings to have the wall cavity filled with closed cell spray foam insulation and a continuous air barrier. The exterior skin of the building will be composite siding.

· Exterior Windows to have thermally broken aluminum or vinyl framing with insulated, high-performance glazing to provide enhanced thermal performance and solar control. Windows will be low-e, argon filled.

· Roofing system: Architectural asphalt shingle roofing system over cavity filled with closed cell spray foam insulation.

· HVAC systems to consist of high-efficiency heat pumps.

· Plumbing: All fixtures to be low flow.

· Lighting: Exterior lighting to be LED low cutoff fixtures for energy efficiency and to minimize light pollution. All interior lighting to be LED throughout and will use less than 1 watt / sf and perimeter daylight sensors. Occupancy sensors will be utilized as required by code.

· Landscaping: A single local species that is drought tolerant is to be incorporated into the plantings list.

· Permeable Pavers: Installed to reduce the rate and volume of runoff discharged from the site and to allow groundwater recharge.

Sincerely,

Jeremiah Johnson, AIA
Senior Associate
McHenry Architecture

ALTUS
ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

SEWER DESIGN FLOW TABLE

160 & 168-170 Union Street

4 residential units
2, 2-bedroom apartments, 1 1-bedroom apartment & 1 2 bedroom single family residence

Design flow based on Metcalf and Eddy/AECOM Wastewater Engineering, 5th Edition (2014)
Table 3-3 page 190

Apartment 38 gal/capita/day typical
Single Family residence (3 people per unit): 48 gal/capita/day

single family residence was existing - no new flow projected
duplex is existing - no new flow projected

Assume
2 occupants per 1-bedroom unit

Design flow:	=2.0 people x 38 gpd/person * 1 unit	**76 GPD**
peaking factor	6	
peak flow (NHDES for design flows under 100,000 gpd)		**456 GPD**
Design peak hourly flow (NHDES)		**19 GPH**

Tel: (603) 433-2335 E-mail: Altus@altus-eng.com

Letter of Authorization

We, Natasha and Matthew Goyette, owners of LCSG, LLC of 750 Brackett Road Rye, New Hampshire 03801 and Owner of the property located at 160 & 168-170 Union Street in Portsmouth, NH, hereby authorize Altus Engineering, Inc. of Portsmouth, New Hampshire and McHenry Architecture of Portsmouth, New Hampshire to represent LCSG, LLC in all matters concerning engineering and related permitting for the development/redevelopment of the property located at 160 & 168-170 Union Street, Portsmouth, NH. The property is identified on the Portsmouth Assessor's Maps as Tax Map 135, Lots 29 and 30. This authorization shall include any signatures required for Federal, State and Municipal permit applications.

M. Goyette	Matt Goyette	12-2-19
Signature	Print Name	Date
Witness	Print Name	Date
Signature	Print Name	Date
Witness	Print Name	Date

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: LCSG, LLC Date Submitted: January 21, 2020

Phone Number: 603-512-9349 E-mail: mgoyette74@gmail.com

Site Address: 160 & 168-170 Union Street Map: 135 Lot: 29 & 30

Zoning District: GRC Lot area: 9,346 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 plans	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1C)**	Title Block, Cover sheet	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, application package, above	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)**	Existing Conditions survey lower left corner	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1F)**	Cover sheet, plan title block	N/A
☒	List of reference plans. **(2.5.3.1G)**	Existing Conditions Plan, middle right	N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1H)**	Utilities plan, Demolition/ Site preparation notes 15 - 19	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)**	Existing Conditions Plan note 5, top right	N/A
☒	Plans shall be drawn to scale. **(2.5.4.1D)**	Required on all plan sheets	N/A
☒	Plans shall be prepared and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Excluding survey and architectural drawings	N/A
☒	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	NA - no wetlands on lot	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Title block, all sheets. Scale & north arrow all sheets excluding details, architectural's legend existing conditions & Grading	N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	Cover sheet, Title block	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 Plan	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)**	Site Plan,Sheet C-1 Note 2	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)**	Site Plan, Sheet C-1 Note 12 Note 11	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)**	Site Plan, Sheet C-1 Notes 15-17	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)		
X	a. Surveyed plan of site showing existing natural and built features;	Existing Conditions Plan	
X	b. Zoning boundaries;	NA - lot entirely in GRC zone	
X	c. Dimensional Regulations;	Site Plan, top right	
X	d. Wetland delineation, wetland function and value assessment;	NA	
X	e. SFHA, 100-year flood elevation line and BFE data.	Existing Conditions Plan, note 9	
	2. Buildings and Structures: (2.5.4.3B)		
X	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;	Architectural drawings	
X	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;	Architectural drawings	
X	c. Total Floor Area;	Architectural drawings	
X	d. Number of Usable Floors;	Architectural drawings	
X	e. Gross floor area by floor and use.	Site Plan, C-1 Note 21	
	3. Access and Circulation: (2.5.4.3C)		
X	a. Location/width of access ways within site;	Site Plan, C-1	
X	b. Location of curbing, right of ways, edge of pavement and sidewalks;	Site Plan, C-1	
X	c. Location, type, size and design of traffic signing (pavement markings);	Site Plan, C-1	
X	d. Names/layout of existing abutting streets;	Cover Sheet	
X	e. Driveway curb cuts for abutting prop. and public roads;	Site Plan, C-1	
X	f. If subdivision; Names of all roads, right of way lines and easements noted;	NA	
X	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	NA	
	4. Parking and Loading: (2.5.4.3D)		
X	a. Location of off street parking/loading areas, landscaped areas/buffers;	Site Plan, C-1	
X	b. Parking Calculations (# required and the # provided).	Site Plan, C-1, top right	
	5. Water Infrastructure: (2.5.4.3E)		
X	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;	Utilities Plan, C-2	
X	b. Location of wells and monitoring wells (include protective radii).	NA	
	6. Sewer Infrastructure: (2.5.4.3F)		
X	a. Size, type and location of sanitary sewage facilities & Engineering data.	Utilities Plan, C-2	
	7. Utilities: (2.5.4.3G)		
X	a. The size, type and location of all above & below ground utilities;	Utilities Plan, C-2	
X	b. Size type and location of generator pads, transformers and other fixtures.	Utilities Plan, C-2	

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
X	**8. Solid Waste Facilities: (2.5.4.3H)**		
X	a. The size, type and location of solid waste facilities.	Site Plan, Sheet C-1, Note 18	
	9. Storm water Management: (2.5.4.3I)		
X	a. The location, elevation and layout of all storm-water drainage.	Grading Plan, Sheet C-3	
	10. Outdoor Lighting: (2.5.4.3J)		
X	a. Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and; b. photometric plan.	Site Lighting Plan	
X	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Site Plan, Sheet C-1, Note 14	
	12. Landscaping: (2.5.4.3K)		
X	a. Identify all undisturbed area, existing vegetation and that which is to be retained;	Grading Plan, Sheet C-3	
X	**b.** Location of any irrigation system and water source.	Site Plan, Sheet C-1, Note 19	
	13. Contours and Elevation: (2.5.4.3L)		
X	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading Plan, Sheet C-3	
	14. Open Space: (2.5.4.3M)		
X	a. Type, extent and location of all existing/proposed open space.	Site Plan, Sheet C-1	
X	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	NA	
X	**16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)**	Site Plan, Sheet C-1 and note 8.	
X	**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)**	Green Statement, application package	
☒	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 - project not in wellhead protection district	
☒	Indicate where measures to minimize impervious surfaces have been implemented. **(7.4.3)**	See Green Statement, application package	
☒	Calculation of the maximum effective impervious surface as a percentage of the site. **(7.4.3.2)**	Drainage memorandum	
☒	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)**	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)**	Variance relief stated on cover sheet and Site Plan, Sheet C-1, top right	
☒	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. drainage computation in application package b. Projected wastewater flows in application package c. NA d. NA e. NA f. Grading Plan, Sheet C-3 g. NA h. NA 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: Eric D. Weinrich, PE **Date:** 2-21-20

February 4, 2020

City of Portsmouth Planning Board

GREEN BUILDING STATEMENT
Re: Proposed Residential Development at 160-170 Union Street, Portsmouth, NH

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· HVAC systems to consist of high-efficiency heat pumps.

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Sincerely,

Jeremiah Johnson, AIA
Senior Associate
McHenry Architecture

City of Portsmouth, New Hampshire

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Name of Owner/Applicant: LCSG, LLC Date Submitted: January 21, 2020

Phone Number: 603-512-9349 E-mail: mgoyette74@gmail.com

Site Address: 160 & 168-170 Union Street Map: 135 Lot: 29 & 30

Zoning District: GRC Lot area: 9,346 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 plans	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1C)**	Title Block, Cover sheet	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, application package, above	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)**	Existing Conditions survey lower left corner	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1F)**	Cover sheet, plan title block	N/A
☒	List of reference plans. **(2.5.3.1G)**	Existing Conditions Plan, middle right	N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1H)**	Utilities plan, Demolition/ Site preparation notes 15 - 19	N/A

Site Plan Specifications			
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☒	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)**	Existing Conditions Plan note 5, top right	N/A
☒	Plans shall be drawn to scale. **(2.5.4.1D)**	Required on all plan sheets	N/A
☒	Plans shall be prepared and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Excluding survey and architectural drawings	N/A
☒	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	NA - no wetlands on lot	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Title block, all sheets. Scale & north arrow all sheets excluding details, architectural's legend existing conditions & Grading	N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	Cover sheet, Title block	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 Plan	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)**	Site Plan,Sheet C-1 Note 2	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)**	Site Plan, Sheet C-1 Note 12 Note 11	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)**	Site Plan, Sheet C-1 Notes 15-17	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)		
X	a. Surveyed plan of site showing existing natural and built features;	Existing Conditions Plan	
X	b. Zoning boundaries;	NA - lot entirely in GRC zone	
X	c. Dimensional Regulations;	Site Plan, top right	
X	d. Wetland delineation, wetland function and value assessment;	NA	
X	e. SFHA, 100-year flood elevation line and BFE data.	Existing Conditions Plan, note 9	
	2. Buildings and Structures: (2.5.4.3B)		
X	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;	Architectural drawings	
X	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;	Architectural drawings	
X	c. Total Floor Area;	Architectural drawings	
X	d. Number of Usable Floors;	Architectural drawings	
X	e. Gross floor area by floor and use.	Site Plan, C-1 Note 21	
	3. Access and Circulation: (2.5.4.3C)		
X	a. Location/width of access ways within site;	Site Plan, C-1	
X	b. Location of curbing, right of ways, edge of pavement and sidewalks;	Site Plan, C-1	
X	c. Location, type, size and design of traffic signing (pavement markings);	Site Plan, C-1	
X	d. Names/layout of existing abutting streets;	Cover Sheet	
X	e. Driveway curb cuts for abutting prop. and public roads;	Site Plan, C-1	
X	f. If subdivision; Names of all roads, right of way lines and easements noted;	NA	
X	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	NA	
	4. Parking and Loading: (2.5.4.3D)		
X	a. Location of off street parking/loading areas, landscaped areas/buffers;	Site Plan, C-1	
X	b. Parking Calculations (# required and the # provided).	Site Plan, C-1, top right	
	5. Water Infrastructure: (2.5.4.3E)		
X	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;	Utilities Plan, C-2	
X	b. Location of wells and monitoring wells (include protective radii).	NA	
	6. Sewer Infrastructure: (2.5.4.3F)		
X	a. Size, type and location of sanitary sewage facilities & Engineering data.	Utilities Plan, C-2	
	7. Utilities: (2.5.4.3G)		
X	a. The size, type and location of all above & below ground utilities;	Utilities Plan, C-2	
X	b. Size type and location of generator pads, transformers and other fixtures.	Utilities Plan, C-2	

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
X	**8. Solid Waste Facilities: (2.5.4.3H)**		
X	a. The size, type and location of solid waste facilities.	Site Plan, Sheet C-1, Note 18	
	9. Storm water Management: (2.5.4.3I)		
X	a. The location, elevation and layout of all storm-water drainage.	Grading Plan, Sheet C-3	
	10. Outdoor Lighting: (2.5.4.3J)		
X	a. Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and; b. photometric plan.	Site Lighting Plan	
X	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Site Plan, Sheet C-1, Note 14	
	12. Landscaping: (2.5.4.3K)		
X	a. Identify all undisturbed area, existing vegetation and that which is to be retained;	Grading Plan, Sheet C-3	
X	**b.** Location of any irrigation system and water source.	Site Plan, Sheet C-1, Note 19	
	13. Contours and Elevation: (2.5.4.3L)		
X	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading Plan, Sheet C-3	
	14. Open Space: (2.5.4.3M)		
X	a. Type, extent and location of all existing/proposed open space.	Site Plan, Sheet C-1	
X	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	NA	
X	**16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)**	Site Plan, Sheet C-1 and note 8.	
X	**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)**	Green Statement, application package	
☒	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 - project not in wellhead protection district	
☒	Indicate where measures to minimize impervious surfaces have been implemented. **(7.4.3)**	See Green Statement, application package	
☒	Calculation of the maximum effective impervious surface as a percentage of the site. **(7.4.3.2)**	Drainage memorandum	
☒	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)**	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)**	Variance relief stated on cover sheet and Site Plan, Sheet C-1, top right	
☒	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. drainage computation in application package b. Projected wastewater flows in application package c. NA d. NA e. NA f. Grading Plan, Sheet C-3 g. NA h. NA 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: Eric D. Weinrich, PE **Date:** 2-21-20

ALTUS
ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

DRAINAGE MEMO

Assessor's Map 135, Lots 29 & 30
160 & 168-170 Union Street
Altus Project #P4823

LCSG, LLC owns two properties on Union Street in Portsmouth and is proposing to develop the site as a multi-family residential development site. In July of 2018, zoning relief was granted to allow the two lots to be merged with a reduced dwelling density and setback relief. After detailed survey, the zoning relief was amended in October 2019 for dimensional revisions. As noted in the Existing Conditions Plan, prepared by James Verra and Associates, dated January 2020, the existing Lot 135-30 contained two buildings that have since been removed. After the initial zoning approval in 2018, the owner proceeded in removal of the two delipidated buildings on the lot, a single family residence and a barn. The existing lot 135-29 contains a duplex building that will remain.

The proposed development will construct a new single family residence (SFR) in place of the SRF that was removed and a four car detached garage with a one bedroom apartment above the garage. There will be an additional three exterior on-site parking spaces provided for a total of seven on-site parking spaces. The total impervious aera on site will increase by approximately 1,000 s.f. from 44.3% to 55.3% (See Effective Impervious Areas Calculations Table in Attachments). LCSG and Altus Engineering, Inc. (Altus) met with the Technical Advisory Committee (TAC) for a work session at the December 10, 2019 TAC Work Session for conceptual review comments.

The existing site drains to two locations identified as Point of Analysis (POA) #1 and #2 on the attached drainage plans. POA #1 is located to the rear of lot and is identified as the southwest corner of Lot 135-29. POA #2 is the surface runoff that flows to the Union Street drainage system. The majority of the property currently drains to the rear of the property (POA #1. At the TAC meeting, it was noted that the flows to the rear of the property (POA #1) shall not increase for any storms analyzed for the project. The existing drainage patterns are depicted on the attached "Pre-Development Drainage Area Plan".

The proposed stormwater management design will include a 48 ft x 16 ft wide porous paver driveway. The proposed single-family residential building will be constructed with a drip edge around the perimeter of the building. The garage and apartment building will be constructed gutters that convey the roof runoff to the porous pavement section, with a perforated pipe that will allow the runoff to exfiltrate to the porous pavement section. This drainage system will allow for a decrease in the overall runoff from the site. The drainage flows to the rear of the property are decreased for all storm events as the majority of the site is now directed to the Union Street drainage system. The Pre and Post-Development conditions were modeled using the Northeast Regional Climate Center (NRCC) rainfall intensities with a 15% increase for Seacoast communities. The results were then compared to analyze the Pre and Post development conditions. The following table shows the results of the modeling.

Stormwater Modeling Summary Table

Description	2 Year	10 Year	25 Year	50 Year
Rainfall Intensity (inches)	3.68	5.58	7.07	8.46
Results	cfs	cfs	cfs	cfs
POA #1 - Rear of Lot				
PRE-Development	0.28	0.58	0.83	1.07
POST-Development	0.24	0.43	0.58	0.72
Change	(0.04)	(0.15)	(0.25)	(0.35)
POA #2 - Union St. Drainage				
PRE-Development	0.30	0.49	0.64	0.77
POST-Development	0.38	0.59	0.77	0.95
Change	0.08	0.10	0.13	0.18
TOTALS	0.0	-0.1	-0.1	-0.2

The storm water flows from the site are minimal. The results show that Post-development runoff flows are managed so that there is not an increase to POA #1. There is a minor increase to the flows that go to Union Street due to the regrading of the site and additional drainage area, however this increase of 0.13 cfs for the 25 year storm event is minimal and negligible when included in the overall Union Street drainage system. As the above table demonstrates, the proposed project will not negatively impact the adjacent parcels or downstream stormwater conditions.

ATTACHMENTS

1. Aerial Image of Property
2. NRCC Extreme Precipitation Table
3. Effective Impervious Area Calculations Table
4. HydroCAD Modeling Results (2, 10, 25 and 50 Yr Storm Events)
   a. Pre-Development
   b. Post Development
5. Web Soil Survey and Ksat Value
6. Stormwater Inspection and Maintenance Manual
7. Pre- Development Drainage Area Plan
8. Post- Development Drainage Area Plan

STATE OF NEW HAMPSHIRE
CORY D. BELDEN
No. 14239
LICENSED
PROFESSIONAL ENGINEER
1/17/2020

160 & 168-170 Union St
Legend
Austin St
Google Earth
© 2019 Google
90 ft

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	70.771 degrees West
Latitude	43.085 degrees North
Elevation	0 feet
Date/Time	Wed, 28 Aug 2019 16:06:47 -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	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.02	2.65	2.91	**1yr**	2.35	2.80	3.21	3.93	4.53	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.51	1.93	2.48	3.20	3.56	**2yr**	2.83	3.42	3.92	4.67	5.31	**2yr**
5yr	0.37	0.58	0.73	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.42	3.13	4.05	4.56	**5yr**	3.59	4.39	5.02	5.91	6.68	**5yr**
10yr	0.41	0.65	0.82	1.11	1.45	1.88	**10yr**	1.25	1.72	2.22	2.88	3.74	4.85	5.51	**10yr**	4.29	5.30	6.06	7.08	7.95	**10yr**
25yr	0.48	0.76	0.96	1.33	1.77	2.33	**25yr**	1.52	2.13	2.76	3.61	4.72	6.15	7.07	**25yr**	5.44	6.80	7.76	8.98	10.01	**25yr**
50yr	0.53	0.85	1.09	1.53	2.06	2.74	**50yr**	1.78	2.52	3.27	4.30	5.64	7.36	8.55	**50yr**	6.51	8.22	9.37	10.76	11.93	**50yr**
100yr	0.59	0.96	1.24	1.76	2.40	3.24	**100yr**	2.07	2.96	3.88	5.13	6.74	8.82	10.34	**100yr**	7.80	9.94	11.32	12.90	14.22	**100yr**
200yr	0.67	1.09	1.42	2.03	2.80	3.81	**200yr**	2.42	3.50	4.59	6.09	8.04	10.56	12.50	**200yr**	9.35	12.02	13.67	15.46	16.95	**200yr**
500yr	0.79	1.30	1.70	2.46	3.45	4.73	**500yr**	2.98	4.35	5.72	7.66	10.16	13.42	16.08	**500yr**	11.88	15.46	17.55	19.66	21.40	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.88	**1yr**	0.63	0.86	0.92	1.32	1.67	2.22	2.48	**1yr**	1.96	2.38	2.85	3.16	3.86	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.36	1.82	2.34	3.05	3.44	**2yr**	2.70	3.31	3.81	4.53	5.06	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.74	3.77	4.17	**5yr**	3.34	4.01	4.70	5.51	6.21	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.39	3.06	4.35	4.84	**10yr**	3.85	4.65	5.41	6.38	7.16	**10yr**
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.34	1.86	2.10	2.76	3.55	4.67	5.86	**25yr**	4.13	5.63	6.60	7.74	8.63	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.16	**50yr**	1.52	2.12	2.34	3.09	3.94	5.27	6.76	**50yr**	4.66	6.50	7.66	8.97	9.96	**50yr**
100yr	0.53	0.81	1.01	1.46	2.00	2.47	**100yr**	1.73	2.41	2.62	3.43	4.37	5.91	7.80	**100yr**	5.23	7.50	8.89	10.42	11.48	**100yr**
200yr	0.59	0.89	1.12	1.63	2.27	2.81	**200yr**	1.96	2.75	2.93	3.80	4.82	6.61	8.99	**200yr**	5.85	8.64	10.30	12.10	13.27	**200yr**
500yr	0.68	1.01	1.31	1.90	2.70	3.36	**500yr**	2.33	3.29	3.40	4.35	5.49	7.67	10.85	**500yr**	6.79	10.43	12.53	14.79	16.05	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.25	1.74	2.21	2.98	3.15	**1yr**	2.64	3.03	3.57	4.37	5.03	**1yr**
2yr	0.34	0.52	0.64	0.86	1.06	1.27	**2yr**	0.92	1.24	1.48	1.96	2.52	3.42	3.69	**2yr**	3.03	3.55	4.08	4.82	5.62	**2yr**
5yr	0.40	0.62	0.76	1.05	1.33	1.62	**5yr**	1.15	1.58	1.88	2.53	3.25	4.33	4.95	**5yr**	3.83	4.76	5.36	6.35	7.13	**5yr**
10yr	0.47	0.72	0.89	1.24	1.60	1.97	**10yr**	1.38	1.93	2.28	3.10	3.95	5.32	6.19	**10yr**	4.71	5.95	6.80	7.81	8.73	**10yr**
25yr	0.57	0.87	1.08	1.55	2.04	2.56	**25yr**	1.76	2.50	2.95	4.06	5.14	7.79	8.32	**25yr**	6.89	8.00	9.13	10.31	11.38	**25yr**
50yr	0.67	1.02	1.26	1.82	2.45	3.11	**50yr**	2.11	3.04	3.59	4.99	6.30	9.76	10.44	**50yr**	8.64	10.04	11.41	12.69	13.93	**50yr**
100yr	0.78	1.18	1.48	2.14	2.94	3.79	**100yr**	2.54	3.70	4.36	6.14	7.73	12.22	13.08	**100yr**	10.82	12.58	14.28	15.65	17.05	**100yr**
200yr	0.92	1.38	1.75	2.53	3.53	4.62	**200yr**	3.04	4.51	5.32	7.55	9.48	15.34	16.42	**200yr**	13.58	15.79	17.88	19.29	20.88	**200yr**
500yr	1.14	1.69	2.17	3.16	4.49	5.99	**500yr**	3.88	5.85	6.90	9.97	12.47	20.76	22.18	**500yr**	18.37	21.33	24.10	25.44	27.30	**500yr**

Powered by ACIS
Northeast Regional Climate Center

EFFECTIVE IMPERVIOUS AREA CALCUALTIONS TABLE

160, 168-170 Union Street, Portsmouth, NH

Tax Map 135, Lots 29 & 30

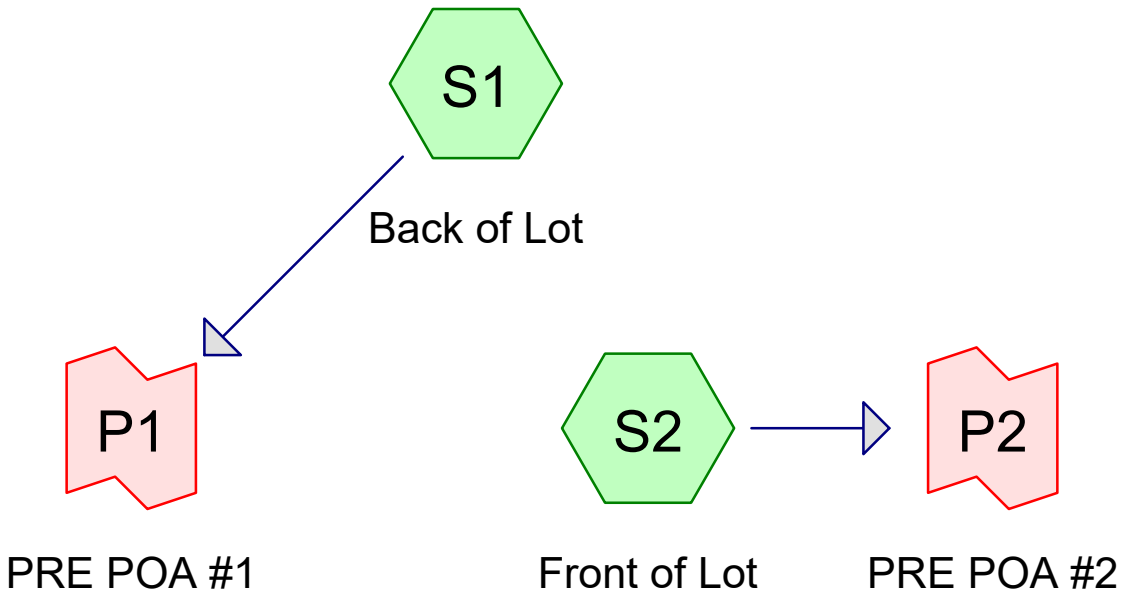
0.215 Acres (9,346 SF)

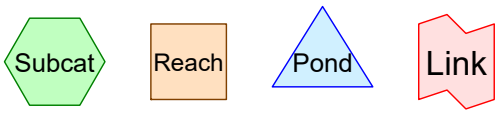
	Pre Development	Post Development	Increase	Percent of Site
Description	s.f.	s.f.	s.f.	%
Driveways and Parking Areas	715	1,540	825	16.48%
Porous Pavers	0	760	760	8.13%
Buildings (Roofs)	2,610	3,135	525	33.54%
Other (Sidewalks, Playground, Etc)	815	490	-325	5.24%
TOTALS IMPERVIOUS	**4,140**	**5,165**	**1,025**	**55.26%**
(Not including Permeable Pavement Areas)				

Prepared by Altus Engineering

17-Jan-20

P4823





Routing Diagram for 4823-PRE
Prepared by Altus Engineering, Inc., Printed 1/14/2020
HydroCAD® 10.00-22 s/n 01222 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.123	61	>75% Grass cover, Good, HSG B (S1, S2)
0.050	98	Paved parking, HSG B (S1, S2)
0.060	98	Roofs, HSG B (S1, S2)
0.032	98	Unconnected pavement, HSG B (S1, S2)
0.265	**81**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.265	HSG B	S1, S2
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.265		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.123	0.000	0.000	0.000	0.123	>75% Grass cover, Good	S1, S2
0.000	0.050	0.000	0.000	0.000	0.050	Paved parking	S1, S2
0.000	0.060	0.000	0.000	0.000	0.060	Roofs	S1, S2
0.000	0.032	0.000	0.000	0.000	0.032	Unconnected pavement	S1, S2
0.000	**0.265**	**0.000**	**0.000**	**0.000**	**0.265**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S1: Back of Lot Runoff Area=7,365 sf 37.14% Impervious Runoff Depth>1.43"
Flow Length=112' Tc=6.1 min CN=75 Runoff=0.28 cfs 0.020 af

Subcatchment S2: Front of Lot Runoff Area=4,165 sf 82.95% Impervious Runoff Depth>2.81"
Tc=6.0 min CN=92 Runoff=0.30 cfs 0.022 af

Link P1: PRE POA #1 Inflow=0.28 cfs 0.020 af
Primary=0.28 cfs 0.020 af

Link P2: PRE POA #2 Inflow=0.30 cfs 0.022 af
Primary=0.30 cfs 0.022 af

Total Runoff Area = 0.265 ac Runoff Volume = 0.042 af Average Runoff Depth = 1.93"
46.31% Pervious = 0.123 ac 53.69% Impervious = 0.142 ac

Summary for Subcatchment S1: Back of Lot

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.020 af, Depth> 1.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.68"

Area (sf)	CN	Description
1,790	98	Roofs, HSG B
365	98	Paved parking, HSG B
580	98	Unconnected pavement, HSG B
4,630	61	>75% Grass cover, Good, HSG B
7,365	75	Weighted Average
4,630		62.86% Pervious Area
2,735		37.14% Impervious Area
580		21.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	25	0.0050	0.07		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.25"
0.1	12	0.0200	2.87		**Shallow Concentrated Flow, grass swale** Paved Kv= 20.3 fps
0.4	75	0.0350	2.81		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	112	Total			

Summary for Subcatchment S2: Front of Lot

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.022 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.68"

Area (sf)	CN	Description
820	98	Roofs, HSG B
1,815	98	Paved parking, HSG B
820	98	Unconnected pavement, HSG B
710	61	>75% Grass cover, Good, HSG B
4,165	92	Weighted Average
710		17.05% Pervious Area
3,455		82.95% Impervious Area
820		23.73% Unconnected

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

Summary for Link P1: PRE POA #1

Inflow Area = 0.169 ac, 37.14% Impervious, Inflow Depth > 1.43" for 2-Year event
Inflow = 0.28 cfs @ 12.09 hrs, Volume= 0.020 af
Primary = 0.28 cfs @ 12.09 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link P2: PRE POA #2

Inflow Area = 0.096 ac, 82.95% Impervious, Inflow Depth > 2.81" for 2-Year event
Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.022 af
Primary = 0.30 cfs @ 12.09 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S1: Back of Lot Runoff Area=7,365 sf 37.14% Impervious Runoff Depth>2.92"
Flow Length=112' Tc=6.1 min CN=75 Runoff=0.58 cfs 0.041 af

Subcatchment S2: Front of Lot Runoff Area=4,165 sf 82.95% Impervious Runoff Depth>4.65"
Tc=6.0 min CN=92 Runoff=0.49 cfs 0.037 af

Link P1: PRE POA #1 Inflow=0.58 cfs 0.041 af
Primary=0.58 cfs 0.041 af

Link P2: PRE POA #2 Inflow=0.49 cfs 0.037 af
Primary=0.49 cfs 0.037 af

Total Runoff Area = 0.265 ac Runoff Volume = 0.078 af Average Runoff Depth = 3.55"
46.31% Pervious = 0.123 ac 53.69% Impervious = 0.142 ac

Summary for Subcatchment S1: Back of Lot

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 0.041 af, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.58"

Area (sf)	CN	Description
1,790	98	Roofs, HSG B
365	98	Paved parking, HSG B
580	98	Unconnected pavement, HSG B
4,630	61	>75% Grass cover, Good, HSG B
7,365	75	Weighted Average
4,630		62.86% Pervious Area
2,735		37.14% Impervious Area
580		21.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	25	0.0050	0.07		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.25"
0.1	12	0.0200	2.87		**Shallow Concentrated Flow, grass swale** Paved Kv= 20.3 fps
0.4	75	0.0350	2.81		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	112	Total			

Summary for Subcatchment S2: Front of Lot

Runoff = 0.49 cfs @ 12.08 hrs, Volume= 0.037 af, Depth> 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.58"

Area (sf)	CN	Description
820	98	Roofs, HSG B
1,815	98	Paved parking, HSG B
820	98	Unconnected pavement, HSG B
710	61	>75% Grass cover, Good, HSG B
4,165	92	Weighted Average
710		17.05% Pervious Area
3,455		82.95% Impervious Area
820		23.73% Unconnected

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

Summary for Link P1: PRE POA #1

Inflow Area = 0.169 ac, 37.14% Impervious, Inflow Depth > 2.92" for 10-Year event
Inflow = 0.58 cfs @ 12.09 hrs, Volume= 0.041 af
Primary = 0.58 cfs @ 12.09 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link P2: PRE POA #2

Inflow Area = 0.096 ac, 82.95% Impervious, Inflow Depth > 4.65" for 10-Year event
Inflow = 0.49 cfs @ 12.08 hrs, Volume= 0.037 af
Primary = 0.49 cfs @ 12.08 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S1: Back of Lot Runoff Area=7,365 sf 37.14% Impervious Runoff Depth>4.21"
Flow Length=112' Tc=6.1 min CN=75 Runoff=0.83 cfs 0.059 af

Subcatchment S2: Front of Lot Runoff Area=4,165 sf 82.95% Impervious Runoff Depth>6.12"
Tc=6.0 min CN=92 Runoff=0.64 cfs 0.049 af

Link P1: PRE POA #1 Inflow=0.83 cfs 0.059 af
Primary=0.83 cfs 0.059 af

Link P2: PRE POA #2 Inflow=0.64 cfs 0.049 af
Primary=0.64 cfs 0.049 af

Total Runoff Area = 0.265 ac Runoff Volume = 0.108 af Average Runoff Depth = 4.90"
46.31% Pervious = 0.123 ac 53.69% Impervious = 0.142 ac

Summary for Subcatchment S1: Back of Lot

Runoff = 0.83 cfs @ 12.09 hrs, Volume= 0.059 af, Depth> 4.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.07"

Area (sf)	CN	Description
1,790	98	Roofs, HSG B
365	98	Paved parking, HSG B
580	98	Unconnected pavement, HSG B
4,630	61	>75% Grass cover, Good, HSG B
7,365	75	Weighted Average
4,630		62.86% Pervious Area
2,735		37.14% Impervious Area
580		21.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	25	0.0050	0.07		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.25"
0.1	12	0.0200	2.87		**Shallow Concentrated Flow, grass swale** Paved Kv= 20.3 fps
0.4	75	0.0350	2.81		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	112	Total			

Summary for Subcatchment S2: Front of Lot

Runoff = 0.64 cfs @ 12.08 hrs, Volume= 0.049 af, Depth> 6.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.07"

Area (sf)	CN	Description
820	98	Roofs, HSG B
1,815	98	Paved parking, HSG B
820	98	Unconnected pavement, HSG B
710	61	>75% Grass cover, Good, HSG B
4,165	92	Weighted Average
710		17.05% Pervious Area
3,455		82.95% Impervious Area
820		23.73% Unconnected

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

Summary for Link P1: PRE POA #1

Inflow Area = 0.169 ac, 37.14% Impervious, Inflow Depth > 4.21" for 25-Year event
Inflow = 0.83 cfs @ 12.09 hrs, Volume= 0.059 af
Primary = 0.83 cfs @ 12.09 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link P2: PRE POA #2

Inflow Area = 0.096 ac, 82.95% Impervious, Inflow Depth > 6.12" for 25-Year event
Inflow = 0.64 cfs @ 12.08 hrs, Volume= 0.049 af
Primary = 0.64 cfs @ 12.08 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S1: Back of Lot Runoff Area=7,365 sf 37.14% Impervious Runoff Depth>5.45"
Flow Length=112' Tc=6.1 min CN=75 Runoff=1.07 cfs 0.077 af

Subcatchment S2: Front of Lot Runoff Area=4,165 sf 82.95% Impervious Runoff Depth>7.49"
Tc=6.0 min CN=92 Runoff=0.77 cfs 0.060 af

Link P1: PRE POA #1 Inflow=1.07 cfs 0.077 af
Primary=1.07 cfs 0.077 af

Link P2: PRE POA #2 Inflow=0.77 cfs 0.060 af
Primary=0.77 cfs 0.060 af

Total Runoff Area = 0.265 ac Runoff Volume = 0.137 af Average Runoff Depth = 6.19"
46.31% Pervious = 0.123 ac 53.69% Impervious = 0.142 ac

Summary for Subcatchment S1: Back of Lot

Runoff = 1.07 cfs @ 12.09 hrs, Volume= 0.077 af, Depth> 5.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=8.46"

Area (sf)	CN	Description
1,790	98	Roofs, HSG B
365	98	Paved parking, HSG B
580	98	Unconnected pavement, HSG B
4,630	61	>75% Grass cover, Good, HSG B
7,365	75	Weighted Average
4,630		62.86% Pervious Area
2,735		37.14% Impervious Area
580		21.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	25	0.0050	0.07		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.25"
0.1	12	0.0200	2.87		**Shallow Concentrated Flow, grass swale** Paved Kv= 20.3 fps
0.4	75	0.0350	2.81		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	112	Total			

Summary for Subcatchment S2: Front of Lot

Runoff = 0.77 cfs @ 12.08 hrs, Volume= 0.060 af, Depth> 7.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=8.46"

Area (sf)	CN	Description
820	98	Roofs, HSG B
1,815	98	Paved parking, HSG B
820	98	Unconnected pavement, HSG B
710	61	>75% Grass cover, Good, HSG B
4,165	92	Weighted Average
710		17.05% Pervious Area
3,455		82.95% Impervious Area
820		23.73% Unconnected

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

Summary for Link P1: PRE POA #1

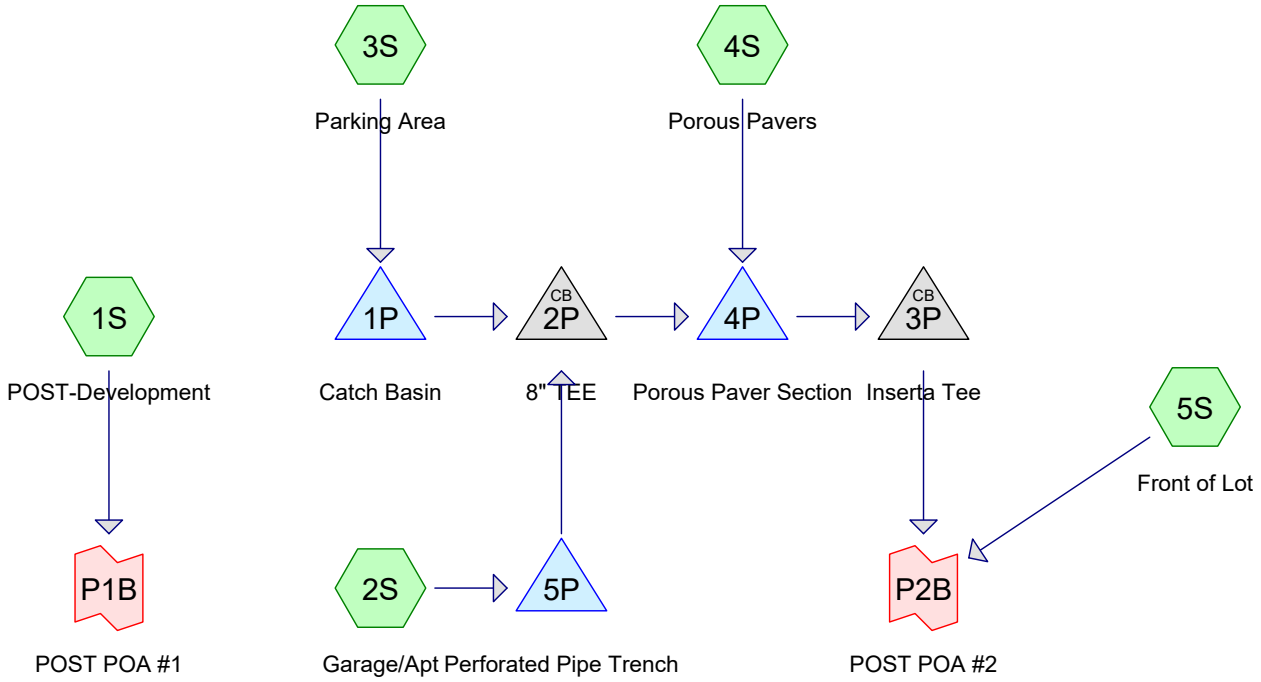
Inflow Area = 0.169 ac, 37.14% Impervious, Inflow Depth > 5.45" for 50-Year event
Inflow = 1.07 cfs @ 12.09 hrs, Volume= 0.077 af
Primary = 1.07 cfs @ 12.09 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min

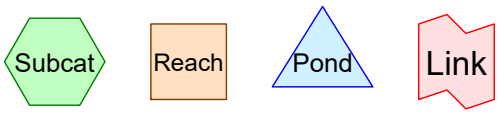
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link P2: PRE POA #2

Inflow Area = 0.096 ac, 82.95% Impervious, Inflow Depth > 7.49" for 50-Year event
Inflow = 0.77 cfs @ 12.08 hrs, Volume= 0.060 af
Primary = 0.77 cfs @ 12.08 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs





Routing Diagram for 4823-POST
Prepared by Altus Engineering, Inc., Printed 1/17/2020
HydroCAD® 10.00-22 s/n 01222 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.016	61	>75% Grass cover, Good, HSG B (4S, 5S)
0.066	74	>75% Grass cover, Good, HSG C (1S, 3S)
0.069	98	Paved parking, HSG B (1S, 3S, 4S, 5S)
0.017	98	Porous Pavers, HSG B (4S)
0.049	98	Roofs, HSG B (1S, 3S, 4S, 5S)
0.023	98	Roofs, HSG C (2S)
0.025	98	Unconnected pavement, HSG B (1S, 3S, 4S, 5S)
0.265	**90**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.176	HSG B	1S, 3S, 4S, 5S
0.089	HSG C	1S, 2S, 3S
0.000	HSG D	
0.000	Other	
0.265		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.016	0.066	0.000	0.000	0.082	>75% Grass cover, Good	1S, 3S, 4S, 5S
0.000	0.069	0.000	0.000	0.000	0.069	Paved parking	1S, 3S, 4S, 5S
0.000	0.017	0.000	0.000	0.000	0.017	Porous Pavers	4S
0.000	0.049	0.023	0.000	0.000	0.072	Roofs	1S, 2S, 3S, 4S, 5S
0.000	0.025	0.000	0.000	0.000	0.025	Unconnected pavement	1S, 3S, 4S, 5S
0.000	**0.176**	**0.089**	**0.000**	**0.000**	**0.265**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: POST-Development Runoff Area=4,235 sf 40.38% Impervious Runoff Depth>2.09"
Tc=6.0 min CN=84 Runoff=0.24 cfs 0.017 af

Subcatchment 2S: Garage/Apt Runoff Area=1,015 sf 100.00% Impervious Runoff Depth>3.44"
Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af

Subcatchment 3S: Parking Area Runoff Area=1,360 sf 75.00% Impervious Runoff Depth>2.81"
Tc=6.0 min CN=92 Runoff=0.10 cfs 0.007 af

Subcatchment 4S: Porous Pavers Runoff Area=1,600 sf 89.06% Impervious Runoff Depth>1.52"
Tc=790.0 min CN=94 Runoff=0.01 cfs 0.005 af

Subcatchment 5S: Front of Lot Runoff Area=3,320 sf 84.49% Impervious Runoff Depth>2.81"
Tc=6.0 min CN=92 Runoff=0.24 cfs 0.018 af

Pond 1P: Catch Basin Peak Elev=17.67' Storage=0.000 af Inflow=0.10 cfs 0.007 af
8.0" Round Culvert n=0.012 L=20.0' S=0.0200 '/' Outflow=0.10 cfs 0.007 af

Pond 2P: 8" TEE Peak Elev=17.39' Inflow=0.18 cfs 0.010 af
8.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=0.18 cfs 0.010 af

Pond 3P: Inserta Tee Peak Elev=14.68' Inflow=0.14 cfs 0.004 af
15.0" Round Culvert n=0.024 L=92.0' S=0.0277 '/' Outflow=0.14 cfs 0.004 af

Pond 4P: Porous Paver Section Peak Elev=17.30' Storage=0.001 af Inflow=0.18 cfs 0.015 af
Discarded=0.05 cfs 0.011 af Primary=0.14 cfs 0.004 af Outflow=0.19 cfs 0.014 af

Pond 5P: Perforated Pipe Trench Peak Elev=17.48' Storage=0.000 af Inflow=0.08 cfs 0.007 af
Discarded=0.00 cfs 0.004 af Primary=0.08 cfs 0.003 af Outflow=0.08 cfs 0.007 af

Link P1B: POST POA #1 Inflow=0.24 cfs 0.017 af
Primary=0.24 cfs 0.017 af

Link P2B: POST POA #2 Inflow=0.38 cfs 0.022 af
Primary=0.38 cfs 0.022 af

Total Runoff Area = 0.265 ac Runoff Volume = 0.053 af Average Runoff Depth = 2.42"
30.83% Pervious = 0.082 ac 69.17% Impervious = 0.183 ac

Summary for Subcatchment 1S: POST-Development

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.017 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.68"

Area (sf)	CN	Description
850	98	Roofs, HSG B
580	98	Paved parking, HSG B
280	98	Unconnected pavement, HSG B
2,525	74	>75% Grass cover, Good, HSG C
4,235	84	Weighted Average
2,525		59.62% Pervious Area
1,710		40.38% Impervious Area
280		16.37% Unconnected

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

Summary for Subcatchment 2S: Garage/Apt

Runoff = 0.08 cfs @ 12.08 hrs, Volume= 0.007 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.68"

Area (sf)	CN	Description
1,015	98	Roofs, HSG C
1,015		100.00% Impervious Area

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

Summary for Subcatchment 3S: Parking Area

Runoff = 0.10 cfs @ 12.09 hrs, Volume= 0.007 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.68"

Area (sf)	CN	Description
785	98	Paved parking, HSG B
15	98	Unconnected pavement, HSG B
220	98	Roofs, HSG B
340	74	>75% Grass cover, Good, HSG C
1,360	92	Weighted Average
340		25.00% Pervious Area
1,020		75.00% Impervious Area
15		1.47% Unconnected

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

Summary for Subcatchment 4S: Porous Pavers

Runoff = 0.01 cfs @ 21.95 hrs, Volume= 0.005 af, Depth> 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.68"

	Area (sf)	CN	Description
	450	98	Roofs, HSG B
	40	98	Unconnected pavement, HSG B
	175	98	Paved parking, HSG B
*	760	98	Porous Pavers, HSG B
	175	61	>75% Grass cover, Good, HSG B
	1,600	94	Weighted Average
	175		10.94% Pervious Area
	1,425		89.06% Impervious Area
	40		2.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
790.0					**Direct Entry, Porous Pavers**

Summary for Subcatchment 5S: Front of Lot

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.018 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.68"

Area (sf)	CN	Description
600	98	Roofs, HSG B
1,465	98	Paved parking, HSG B
740	98	Unconnected pavement, HSG B
515	61	>75% Grass cover, Good, HSG B
3,320	92	Weighted Average
515		15.51% Pervious Area
2,805		84.49% Impervious Area
740		26.38% Unconnected

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

Summary for Pond 1P: Catch Basin

Inflow Area = 0.031 ac, 75.00% Impervious, Inflow Depth > 2.81" for 2-Year event
Inflow = 0.10 cfs @ 12.09 hrs, Volume= 0.007 af
Outflow = 0.10 cfs @ 12.09 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
Primary = 0.10 cfs @ 12.09 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.67' @ 12.09 hrs Surf.Area= 0.000 ac Storage= 0.000 af

Plug-Flow detention time= 0.3 min calculated for 0.007 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (792.4 - 792.2)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	0.000 af	**2.00'D x 3.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	17.50'	**8.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.50' / 17.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.10 cfs @ 12.09 hrs HW=17.67' TW=17.39' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.10 cfs @ 2.11 fps)

Summary for Pond 2P: 8" TEE

Inflow Area = 0.055 ac, 85.68% Impervious, Inflow Depth > 2.23" for 2-Year event
Inflow = 0.18 cfs @ 12.08 hrs, Volume= 0.010 af
Outflow = 0.18 cfs @ 12.08 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
Primary = 0.18 cfs @ 12.08 hrs, Volume= 0.010 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.39' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	17.10'	**8.0" Round Culvert**

L= 5.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 17.10' / 17.05' S= 0.0100 '/' Cc= 0.900
n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.18 cfs @ 12.08 hrs HW=17.39' TW=17.30' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.18 cfs @ 1.79 fps)

Summary for Pond 3P: Inserta Tee

Inflow Area = 0.091 ac, 87.04% Impervious, Inflow Depth = 0.50" for 2-Year event
Inflow = 0.14 cfs @ 12.07 hrs, Volume= 0.004 af
Outflow = 0.14 cfs @ 12.07 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min
Primary = 0.14 cfs @ 12.07 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 14.68' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	14.50'	**15.0" Round Culvert** L= 92.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.50' / 11.95' S= 0.0277 '/' Cc= 0.900 n= 0.024, Flow Area= 1.23 sf

Primary OutFlow Max=0.14 cfs @ 12.07 hrs HW=14.68' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.14 cfs @ 1.95 fps)

Summary for Pond 4P: Porous Paver Section

Inflow Area = 0.091 ac, 87.04% Impervious, Inflow Depth > 1.95" for 2-Year event
Inflow = 0.18 cfs @ 12.08 hrs, Volume= 0.015 af
Outflow = 0.19 cfs @ 12.07 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.05 cfs @ 12.07 hrs, Volume= 0.011 af
Primary = 0.14 cfs @ 12.07 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.30' @ 12.07 hrs Surf.Area= 0.021 ac Storage= 0.001 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 10.8 min (920.1 - 909.3)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	0.001 af	**3.00'W x 48.00'L x 1.20'H Prismatoid** 0.004 af Overall x 33.0% Voids
#2	17.30'	0.009 af	**16.00'W x 48.00'L x 1.50'H Prismatoid** 0.026 af Overall x 33.0% Voids
#3	18.80'	0.000 af	**16.00'W x 48.00'L x 0.17'H Prismatoid** 0.003 af Overall x 10.0% Voids
		0.010 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	17.10'	**8.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.10' / 14.50' S= 0.2600 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	16.00'	**2.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 14.50'

Discarded OutFlow Max=0.05 cfs @ 12.07 hrs HW=17.30' (Free Discharge)
└**2=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.14 cfs @ 12.07 hrs HW=17.30' TW=14.68' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.14 cfs @ 1.53 fps)

Summary for Pond 5P: Perforated Pipe Trench

Inflow Area =	0.023 ac,100.00% Impervious, Inflow Depth > 3.44" for 2-Year event			
Inflow =	0.08 cfs @	12.08 hrs, Volume=	0.007 af	
Outflow =	0.08 cfs @	12.08 hrs, Volume=	0.007 af, Atten= 0%, Lag= 0.0 min	
Discarded =	0.00 cfs @	12.10 hrs, Volume=	0.004 af	
Primary =	0.08 cfs @	12.08 hrs, Volume=	0.003 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.48' @ 12.10 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 20.1 min (773.1 - 753.0)

Volume	Invert	Avail.Storage	Storage Description
#1	16.50'	0.001 af	**2.00'W x 30.00'L x 3.00'H Prismatoid** 0.004 af Overall x 33.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	17.30'	**8.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.30' / 17.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	16.50'	**2.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 14.50'

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=17.48' (Free Discharge)
└**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.08 cfs @ 12.08 hrs HW=17.48' TW=17.39' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.08 cfs @ 1.49 fps)

Summary for Link P1B: POST POA #1

Inflow Area = 0.097 ac, 40.38% Impervious, Inflow Depth > 2.09" for 2-Year event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 0.017 af
Primary = 0.24 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link P2B: POST POA #2

Inflow Area = 0.167 ac, 85.88% Impervious, Inflow Depth > 1.55" for 2-Year event
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 0.022 af
Primary = 0.38 cfs @ 12.09 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: POST-Development Runoff Area=4,235 sf 40.38% Impervious Runoff Depth>3.80"
Tc=6.0 min CN=84 Runoff=0.43 cfs 0.031 af

Subcatchment 2S: Garage/Apt Runoff Area=1,015 sf 100.00% Impervious Runoff Depth>5.34"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 3S: Parking Area Runoff Area=1,360 sf 75.00% Impervious Runoff Depth>4.65"
Tc=6.0 min CN=92 Runoff=0.16 cfs 0.012 af

Subcatchment 4S: Porous Pavers Runoff Area=1,600 sf 89.06% Impervious Runoff Depth>2.52"
Tc=790.0 min CN=94 Runoff=0.01 cfs 0.008 af

Subcatchment 5S: Front of Lot Runoff Area=3,320 sf 84.49% Impervious Runoff Depth>4.65"
Tc=6.0 min CN=92 Runoff=0.39 cfs 0.030 af

Pond 1P: Catch Basin Peak Elev=17.73' Storage=0.000 af Inflow=0.16 cfs 0.012 af
8.0" Round Culvert n=0.012 L=20.0' S=0.0200 '/' Outflow=0.16 cfs 0.012 af

Pond 2P: 8" TEE Peak Elev=17.46' Inflow=0.28 cfs 0.018 af
8.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=0.28 cfs 0.018 af

Pond 3P: Inserta Tee Peak Elev=14.72' Inflow=0.21 cfs 0.009 af
15.0" Round Culvert n=0.024 L=92.0' S=0.0277 '/' Outflow=0.21 cfs 0.009 af

Pond 4P: Porous Paver Section Peak Elev=17.35' Storage=0.002 af Inflow=0.28 cfs 0.025 af
Discarded=0.05 cfs 0.015 af Primary=0.21 cfs 0.009 af Outflow=0.26 cfs 0.024 af

Pond 5P: Perforated Pipe Trench Peak Elev=17.55' Storage=0.000 af Inflow=0.13 cfs 0.010 af
Discarded=0.00 cfs 0.005 af Primary=0.12 cfs 0.005 af Outflow=0.13 cfs 0.010 af

Link P1B: POST POA #1 Inflow=0.43 cfs 0.031 af
Primary=0.43 cfs 0.031 af

Link P2B: POST POA #2 Inflow=0.59 cfs 0.039 af
Primary=0.59 cfs 0.039 af

Total Runoff Area = 0.265 ac Runoff Volume = 0.091 af Average Runoff Depth = 4.10"
30.83% Pervious = 0.082 ac 69.17% Impervious = 0.183 ac

Summary for Subcatchment 1S: POST-Development

Runoff = 0.43 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.58"

Area (sf)	CN	Description
850	98	Roofs, HSG B
580	98	Paved parking, HSG B
280	98	Unconnected pavement, HSG B
2,525	74	>75% Grass cover, Good, HSG C
4,235	84	Weighted Average
2,525		59.62% Pervious Area
1,710		40.38% Impervious Area
280		16.37% Unconnected

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

Summary for Subcatchment 2S: Garage/Apt

Runoff = 0.13 cfs @ 12.08 hrs, Volume= 0.010 af, Depth> 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.58"

Area (sf)	CN	Description
1,015	98	Roofs, HSG C
1,015		100.00% Impervious Area

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

Summary for Subcatchment 3S: Parking Area

Runoff = 0.16 cfs @ 12.08 hrs, Volume= 0.012 af, Depth> 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.58"

Area (sf)	CN	Description
785	98	Paved parking, HSG B
15	98	Unconnected pavement, HSG B
220	98	Roofs, HSG B
340	74	>75% Grass cover, Good, HSG C
1,360	92	Weighted Average
340		25.00% Pervious Area
1,020		75.00% Impervious Area
15		1.47% Unconnected

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

Summary for Subcatchment 4S: Porous Pavers

Runoff = 0.01 cfs @ 21.94 hrs, Volume= 0.008 af, Depth> 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.58"

	Area (sf)	CN	Description
	450	98	Roofs, HSG B
	40	98	Unconnected pavement, HSG B
	175	98	Paved parking, HSG B
*	760	98	Porous Pavers, HSG B
	175	61	>75% Grass cover, Good, HSG B
	1,600	94	Weighted Average
	175		10.94% Pervious Area
	1,425		89.06% Impervious Area
	40		2.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
790.0					**Direct Entry, Porous Pavers**

Summary for Subcatchment 5S: Front of Lot

Runoff = 0.39 cfs @ 12.08 hrs, Volume= 0.030 af, Depth> 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.58"

Area (sf)	CN	Description
600	98	Roofs, HSG B
1,465	98	Paved parking, HSG B
740	98	Unconnected pavement, HSG B
515	61	>75% Grass cover, Good, HSG B
3,320	92	Weighted Average
515		15.51% Pervious Area
2,805		84.49% Impervious Area
740		26.38% Unconnected

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

Summary for Pond 1P: Catch Basin

Inflow Area = 0.031 ac, 75.00% Impervious, Inflow Depth > 4.65" for 10-Year event
Inflow = 0.16 cfs @ 12.08 hrs, Volume= 0.012 af
Outflow = 0.16 cfs @ 12.09 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
Primary = 0.16 cfs @ 12.09 hrs, Volume= 0.012 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.73' @ 12.09 hrs Surf.Area= 0.000 ac Storage= 0.000 af

Plug-Flow detention time= 0.3 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (778.9 - 778.7)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	0.000 af	**2.00'D x 3.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	17.50'	**8.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.50' / 17.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.16 cfs @ 12.09 hrs HW=17.73' TW=17.46' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.16 cfs @ 2.27 fps)

Summary for Pond 2P: 8" TEE

Inflow Area = 0.055 ac, 85.68% Impervious, Inflow Depth > 3.87" for 10-Year event
Inflow = 0.28 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.28 cfs @ 12.09 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.09 hrs, Volume= 0.018 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.46' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	17.10'	**8.0" Round Culvert**

L= 5.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 17.10' / 17.05' S= 0.0100 '/' Cc= 0.900
n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.27 cfs @ 12.09 hrs HW=17.46' TW=17.34' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.27 cfs @ 2.06 fps)

Summary for Pond 3P: Inserta Tee

Inflow Area = 0.091 ac, 87.04% Impervious, Inflow Depth > 1.24" for 10-Year event
Inflow = 0.21 cfs @ 12.12 hrs, Volume= 0.009 af
Outflow = 0.21 cfs @ 12.12 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Primary = 0.21 cfs @ 12.12 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 14.72' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	14.50'	**15.0" Round Culvert** L= 92.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.50' / 11.95' S= 0.0277 '/' Cc= 0.900 n= 0.024, Flow Area= 1.23 sf

Primary OutFlow Max=0.21 cfs @ 12.12 hrs HW=14.72' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.21 cfs @ 2.22 fps)

Summary for Pond 4P: Porous Paver Section

Inflow Area = 0.091 ac, 87.04% Impervious, Inflow Depth > 3.33" for 10-Year event
Inflow = 0.28 cfs @ 12.09 hrs, Volume= 0.025 af
Outflow = 0.26 cfs @ 12.12 hrs, Volume= 0.024 af, Atten= 9%, Lag= 2.2 min
Discarded = 0.05 cfs @ 12.12 hrs, Volume= 0.015 af
Primary = 0.21 cfs @ 12.12 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.35' @ 12.12 hrs Surf.Area= 0.021 ac Storage= 0.002 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 9.8 min (905.0 - 895.3)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	0.001 af	**3.00'W x 48.00'L x 1.20'H Prismatoid** 0.004 af Overall x 33.0% Voids
#2	17.30'	0.009 af	**16.00'W x 48.00'L x 1.50'H Prismatoid** 0.026 af Overall x 33.0% Voids
#3	18.80'	0.000 af	**16.00'W x 48.00'L x 0.17'H Prismatoid** 0.003 af Overall x 10.0% Voids
		0.010 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	17.10'	**8.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.10' / 14.50' S= 0.2600 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	16.00'	**2.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 14.50'

Discarded OutFlow Max=0.05 cfs @ 12.12 hrs HW=17.35' (Free Discharge)
└**2=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.21 cfs @ 12.12 hrs HW=17.35' TW=14.72' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.21 cfs @ 1.71 fps)

Summary for Pond 5P: Perforated Pipe Trench

Inflow Area =	0.023 ac,100.00% Impervious, Inflow Depth > 5.34"	for 10-Year event		
Inflow =	0.13 cfs @	12.08 hrs, Volume=	0.010 af	
Outflow =	0.13 cfs @	12.09 hrs, Volume=	0.010 af, Atten= 1%, Lag= 0.4 min	
Discarded =	0.00 cfs @	12.10 hrs, Volume=	0.005 af	
Primary =	0.12 cfs @	12.09 hrs, Volume=	0.005 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.55' @ 12.10 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 19.2 min (764.9 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	16.50'	0.001 af	**2.00'W x 30.00'L x 3.00'H Prismatoid** 0.004 af Overall x 33.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	17.30'	**8.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.30' / 17.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	16.50'	**2.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 14.50'

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=17.55' (Free Discharge)
└**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.12 cfs @ 12.09 hrs HW=17.54' TW=17.46' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.12 cfs @ 1.52 fps)

Summary for Link P1B: POST POA #1

Inflow Area = 0.097 ac, 40.38% Impervious, Inflow Depth > 3.80" for 10-Year event
Inflow = 0.43 cfs @ 12.09 hrs, Volume= 0.031 af
Primary = 0.43 cfs @ 12.09 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link P2B: POST POA #2

Inflow Area = 0.167 ac, 85.88% Impervious, Inflow Depth > 2.79" for 10-Year event
Inflow = 0.59 cfs @ 12.10 hrs, Volume= 0.039 af
Primary = 0.59 cfs @ 12.10 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: POST-Development Runoff Area=4,235 sf 40.38% Impervious Runoff Depth>5.20"
Tc=6.0 min CN=84 Runoff=0.58 cfs 0.042 af

Subcatchment 2S: Garage/Apt Runoff Area=1,015 sf 100.00% Impervious Runoff Depth>6.83"
Tc=6.0 min CN=98 Runoff=0.16 cfs 0.013 af

Subcatchment 3S: Parking Area Runoff Area=1,360 sf 75.00% Impervious Runoff Depth>6.12"
Tc=6.0 min CN=92 Runoff=0.21 cfs 0.016 af

Subcatchment 4S: Porous Pavers Runoff Area=1,600 sf 89.06% Impervious Runoff Depth>3.32"
Tc=790.0 min CN=94 Runoff=0.02 cfs 0.010 af

Subcatchment 5S: Front of Lot Runoff Area=3,320 sf 84.49% Impervious Runoff Depth>6.12"
Tc=6.0 min CN=92 Runoff=0.51 cfs 0.039 af

Pond 1P: Catch Basin Peak Elev=17.77' Storage=0.000 af Inflow=0.21 cfs 0.016 af
8.0" Round Culvert n=0.012 L=20.0' S=0.0200 '/' Outflow=0.21 cfs 0.016 af

Pond 2P: 8" TEE Peak Elev=17.52' Inflow=0.36 cfs 0.024 af
8.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=0.36 cfs 0.024 af

Pond 3P: Inserta Tee Peak Elev=14.75' Inflow=0.28 cfs 0.017 af
15.0" Round Culvert n=0.024 L=92.0' S=0.0277 '/' Outflow=0.28 cfs 0.017 af

Pond 4P: Porous Paver Section Peak Elev=17.40' Storage=0.002 af Inflow=0.36 cfs 0.034 af
Discarded=0.05 cfs 0.016 af Primary=0.28 cfs 0.017 af Outflow=0.33 cfs 0.033 af

Pond 5P: Perforated Pipe Trench Peak Elev=17.59' Storage=0.000 af Inflow=0.16 cfs 0.013 af
Discarded=0.00 cfs 0.006 af Primary=0.15 cfs 0.008 af Outflow=0.16 cfs 0.013 af

Link P1B: POST POA #1 Inflow=0.58 cfs 0.042 af
Primary=0.58 cfs 0.042 af

Link P2B: POST POA #2 Inflow=0.77 cfs 0.055 af
Primary=0.77 cfs 0.055 af

Total Runoff Area = 0.265 ac Runoff Volume = 0.120 af Average Runoff Depth = 5.46"
30.83% Pervious = 0.082 ac 69.17% Impervious = 0.183 ac

Summary for Subcatchment 1S: POST-Development

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 0.042 af, Depth> 5.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.07"

Area (sf)	CN	Description
850	98	Roofs, HSG B
580	98	Paved parking, HSG B
280	98	Unconnected pavement, HSG B
2,525	74	>75% Grass cover, Good, HSG C
4,235	84	Weighted Average
2,525		59.62% Pervious Area
1,710		40.38% Impervious Area
280		16.37% Unconnected

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

Summary for Subcatchment 2S: Garage/Apt

Runoff = 0.16 cfs @ 12.08 hrs, Volume= 0.013 af, Depth> 6.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.07"

Area (sf)	CN	Description
1,015	98	Roofs, HSG C
1,015		100.00% Impervious Area

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

Summary for Subcatchment 3S: Parking Area

Runoff = 0.21 cfs @ 12.08 hrs, Volume= 0.016 af, Depth> 6.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.07"

Area (sf)	CN	Description
785	98	Paved parking, HSG B
15	98	Unconnected pavement, HSG B
220	98	Roofs, HSG B
340	74	>75% Grass cover, Good, HSG C
1,360	92	Weighted Average
340		25.00% Pervious Area
1,020		75.00% Impervious Area
15		1.47% Unconnected

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

Summary for Subcatchment 4S: Porous Pavers

Runoff = 0.02 cfs @ 21.94 hrs, Volume= 0.010 af, Depth> 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.07"

	Area (sf)	CN	Description
	450	98	Roofs, HSG B
	40	98	Unconnected pavement, HSG B
	175	98	Paved parking, HSG B
*	760	98	Porous Pavers, HSG B
	175	61	>75% Grass cover, Good, HSG B
	1,600	94	Weighted Average
	175		10.94% Pervious Area
	1,425		89.06% Impervious Area
	40		2.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
790.0					**Direct Entry, Porous Pavers**

Summary for Subcatchment 5S: Front of Lot

Runoff = 0.51 cfs @ 12.08 hrs, Volume= 0.039 af, Depth> 6.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.07"

Area (sf)	CN	Description
600	98	Roofs, HSG B
1,465	98	Paved parking, HSG B
740	98	Unconnected pavement, HSG B
515	61	>75% Grass cover, Good, HSG B
3,320	92	Weighted Average
515		15.51% Pervious Area
2,805		84.49% Impervious Area
740		26.38% Unconnected

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

Summary for Pond 1P: Catch Basin

Inflow Area = 0.031 ac, 75.00% Impervious, Inflow Depth > 6.12" for 25-Year event
Inflow = 0.21 cfs @ 12.08 hrs, Volume= 0.016 af
Outflow = 0.21 cfs @ 12.08 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min
Primary = 0.21 cfs @ 12.08 hrs, Volume= 0.016 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.77' @ 12.09 hrs Surf.Area= 0.000 ac Storage= 0.000 af

Plug-Flow detention time= 0.2 min calculated for 0.016 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (772.0 - 771.9)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	0.000 af	**2.00'D x 3.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	17.50'	**8.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.50' / 17.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.20 cfs @ 12.08 hrs HW=17.77' TW=17.51' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.20 cfs @ 2.32 fps)

Summary for Pond 2P: 8" TEE

Inflow Area = 0.055 ac, 85.68% Impervious, Inflow Depth > 5.20" for 25-Year event
Inflow = 0.36 cfs @ 12.09 hrs, Volume= 0.024 af
Outflow = 0.36 cfs @ 12.09 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
Primary = 0.36 cfs @ 12.09 hrs, Volume= 0.024 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.52' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	17.10'	**8.0" Round Culvert**

L= 5.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 17.10' / 17.05' S= 0.0100 '/' Cc= 0.900
n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.35 cfs @ 12.09 hrs HW=17.51' TW=17.38' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.35 cfs @ 2.19 fps)

Summary for Pond 3P: Inserta Tee

Inflow Area = 0.091 ac, 87.04% Impervious, Inflow Depth > 2.17" for 25-Year event
Inflow = 0.28 cfs @ 12.12 hrs, Volume= 0.017 af
Outflow = 0.28 cfs @ 12.12 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.12 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 14.75' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	14.50'	**15.0" Round Culvert** L= 92.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.50' / 11.95' S= 0.0277 '/' Cc= 0.900 n= 0.024, Flow Area= 1.23 sf

Primary OutFlow Max=0.28 cfs @ 12.12 hrs HW=14.75' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.28 cfs @ 2.42 fps)

Summary for Pond 4P: Porous Paver Section

Inflow Area = 0.091 ac, 87.04% Impervious, Inflow Depth > 4.44" for 25-Year event
Inflow = 0.36 cfs @ 12.09 hrs, Volume= 0.034 af
Outflow = 0.33 cfs @ 12.12 hrs, Volume= 0.033 af, Atten= 8%, Lag= 2.2 min
Discarded = 0.05 cfs @ 12.12 hrs, Volume= 0.016 af
Primary = 0.28 cfs @ 12.12 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.40' @ 12.12 hrs Surf.Area= 0.021 ac Storage= 0.002 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 9.8 min (897.9 - 888.1)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	0.001 af	**3.00'W x 48.00'L x 1.20'H Prismatoid** 0.004 af Overall x 33.0% Voids
#2	17.30'	0.009 af	**16.00'W x 48.00'L x 1.50'H Prismatoid** 0.026 af Overall x 33.0% Voids
#3	18.80'	0.000 af	**16.00'W x 48.00'L x 0.17'H Prismatoid** 0.003 af Overall x 10.0% Voids
		0.010 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	17.10'	**8.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.10' / 14.50' S= 0.2600 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	16.00'	**2.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 14.50'

Discarded OutFlow Max=0.05 cfs @ 12.12 hrs HW=17.40' (Free Discharge)
└**2=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.28 cfs @ 12.12 hrs HW=17.40' TW=14.75' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.28 cfs @ 1.86 fps)

Summary for Pond 5P: Perforated Pipe Trench

Inflow Area =	0.023 ac,100.00% Impervious, Inflow Depth > 6.83" for 25-Year event			
Inflow =	0.16 cfs @	12.08 hrs, Volume=	0.013 af	
Outflow =	0.16 cfs @	12.09 hrs, Volume=	0.013 af, Atten= 2%, Lag= 0.4 min	
Discarded =	0.00 cfs @	12.10 hrs, Volume=	0.006 af	
Primary =	0.15 cfs @	12.09 hrs, Volume=	0.008 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.59' @ 12.10 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 18.5 min (760.8 - 742.3)

Volume	Invert	Avail.Storage	Storage Description
#1	16.50'	0.001 af	**2.00'W x 30.00'L x 3.00'H Prismatoid** 0.004 af Overall x 33.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	17.30'	**8.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.30' / 17.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	16.50'	**2.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 14.50'

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=17.59' (Free Discharge)
└**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.15 cfs @ 12.09 hrs HW=17.59' TW=17.52' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.15 cfs @ 1.49 fps)

Summary for Link P1B: POST POA #1

Inflow Area = 0.097 ac, 40.38% Impervious, Inflow Depth > 5.20" for 25-Year event
Inflow = 0.58 cfs @ 12.09 hrs, Volume= 0.042 af
Primary = 0.58 cfs @ 12.09 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link P2B: POST POA #2

Inflow Area = 0.167 ac, 85.88% Impervious, Inflow Depth > 3.97" for 25-Year event
Inflow = 0.77 cfs @ 12.10 hrs, Volume= 0.055 af
Primary = 0.77 cfs @ 12.10 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: POST-Development Runoff Area=4,235 sf 40.38% Impervious Runoff Depth>6.53"
Tc=6.0 min CN=84 Runoff=0.72 cfs 0.053 af

Subcatchment 2S: Garage/Apt Runoff Area=1,015 sf 100.00% Impervious Runoff Depth>8.21"
Tc=6.0 min CN=98 Runoff=0.19 cfs 0.016 af

Subcatchment 3S: Parking Area Runoff Area=1,360 sf 75.00% Impervious Runoff Depth>7.49"
Tc=6.0 min CN=92 Runoff=0.25 cfs 0.019 af

Subcatchment 4S: Porous Pavers Runoff Area=1,600 sf 89.06% Impervious Runoff Depth>4.07"
Tc=790.0 min CN=94 Runoff=0.02 cfs 0.012 af

Subcatchment 5S: Front of Lot Runoff Area=3,320 sf 84.49% Impervious Runoff Depth>7.49"
Tc=6.0 min CN=92 Runoff=0.61 cfs 0.048 af

Pond 1P: Catch Basin Peak Elev=17.81' Storage=0.000 af Inflow=0.25 cfs 0.019 af
8.0" Round Culvert n=0.012 L=20.0' S=0.0200 '/' Outflow=0.25 cfs 0.019 af

Pond 2P: 8" TEE Peak Elev=17.57' Inflow=0.44 cfs 0.029 af
8.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=0.44 cfs 0.029 af

Pond 3P: Inserta Tee Peak Elev=14.78' Inflow=0.35 cfs 0.023 af
15.0" Round Culvert n=0.024 L=92.0' S=0.0277 '/' Outflow=0.35 cfs 0.023 af

Pond 4P: Porous Paver Section Peak Elev=17.44' Storage=0.002 af Inflow=0.44 cfs 0.042 af
Discarded=0.05 cfs 0.017 af Primary=0.35 cfs 0.023 af Outflow=0.40 cfs 0.041 af

Pond 5P: Perforated Pipe Trench Peak Elev=17.64' Storage=0.001 af Inflow=0.19 cfs 0.016 af
Discarded=0.00 cfs 0.006 af Primary=0.19 cfs 0.010 af Outflow=0.19 cfs 0.016 af

Link P1B: POST POA #1 Inflow=0.72 cfs 0.053 af
Primary=0.72 cfs 0.053 af

Link P2B: POST POA #2 Inflow=0.95 cfs 0.071 af
Primary=0.95 cfs 0.071 af

Total Runoff Area = 0.265 ac Runoff Volume = 0.148 af Average Runoff Depth = 6.73"
30.83% Pervious = 0.082 ac 69.17% Impervious = 0.183 ac

Summary for Subcatchment 1S: POST-Development

Runoff = 0.72 cfs @ 12.09 hrs, Volume= 0.053 af, Depth> 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=8.46"

Area (sf)	CN	Description
850	98	Roofs, HSG B
580	98	Paved parking, HSG B
280	98	Unconnected pavement, HSG B
2,525	74	>75% Grass cover, Good, HSG C
4,235	84	Weighted Average
2,525		59.62% Pervious Area
1,710		40.38% Impervious Area
280		16.37% Unconnected

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

Summary for Subcatchment 2S: Garage/Apt

Runoff = 0.19 cfs @ 12.08 hrs, Volume= 0.016 af, Depth> 8.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=8.46"

Area (sf)	CN	Description
1,015	98	Roofs, HSG C
1,015		100.00% Impervious Area

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

Summary for Subcatchment 3S: Parking Area

Runoff = 0.25 cfs @ 12.08 hrs, Volume= 0.019 af, Depth> 7.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=8.46"

Area (sf)	CN	Description
785	98	Paved parking, HSG B
15	98	Unconnected pavement, HSG B
220	98	Roofs, HSG B
340	74	>75% Grass cover, Good, HSG C
1,360	92	Weighted Average
340		25.00% Pervious Area
1,020		75.00% Impervious Area
15		1.47% Unconnected

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

Summary for Subcatchment 4S: Porous Pavers

Runoff = 0.02 cfs @ 21.94 hrs, Volume= 0.012 af, Depth> 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=8.46"

	Area (sf)	CN	Description
	450	98	Roofs, HSG B
	40	98	Unconnected pavement, HSG B
	175	98	Paved parking, HSG B
*	760	98	Porous Pavers, HSG B
	175	61	>75% Grass cover, Good, HSG B
	1,600	94	Weighted Average
	175		10.94% Pervious Area
	1,425		89.06% Impervious Area
	40		2.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
790.0					**Direct Entry, Porous Pavers**

Summary for Subcatchment 5S: Front of Lot

Runoff = 0.61 cfs @ 12.08 hrs, Volume= 0.048 af, Depth> 7.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=8.46"

Area (sf)	CN	Description
600	98	Roofs, HSG B
1,465	98	Paved parking, HSG B
740	98	Unconnected pavement, HSG B
515	61	>75% Grass cover, Good, HSG B
3,320	92	Weighted Average
515		15.51% Pervious Area
2,805		84.49% Impervious Area
740		26.38% Unconnected

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

Summary for Pond 1P: Catch Basin

Inflow Area = 0.031 ac, 75.00% Impervious, Inflow Depth > 7.49" for 50-Year event
Inflow = 0.25 cfs @ 12.08 hrs, Volume= 0.019 af
Outflow = 0.25 cfs @ 12.08 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min
Primary = 0.25 cfs @ 12.08 hrs, Volume= 0.019 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.81' @ 12.09 hrs Surf.Area= 0.000 ac Storage= 0.000 af

Plug-Flow detention time= 0.2 min calculated for 0.019 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (767.2 - 767.0)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	0.000 af	**2.00'D x 3.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	17.50'	**8.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.50' / 17.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.25 cfs @ 12.08 hrs HW=17.80' TW=17.56' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.25 cfs @ 2.34 fps)

Summary for Pond 2P: 8" TEE

Inflow Area = 0.055 ac, 85.68% Impervious, Inflow Depth > 6.47" for 50-Year event
Inflow = 0.44 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.44 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.09 hrs, Volume= 0.029 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.57' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	17.10'	**8.0" Round Culvert**

L= 5.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 17.10' / 17.05' S= 0.0100 '/' Cc= 0.900
n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.42 cfs @ 12.09 hrs HW=17.56' TW=17.42' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.42 cfs @ 2.29 fps)

Summary for Pond 3P: Inserta Tee

Inflow Area = 0.091 ac, 87.04% Impervious, Inflow Depth > 3.09" for 50-Year event
Inflow = 0.35 cfs @ 12.12 hrs, Volume= 0.023 af
Outflow = 0.35 cfs @ 12.12 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min
Primary = 0.35 cfs @ 12.12 hrs, Volume= 0.023 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 14.78' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	14.50'	**15.0" Round Culvert** L= 92.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.50' / 11.95' S= 0.0277 '/' Cc= 0.900 n= 0.024, Flow Area= 1.23 sf

Primary OutFlow Max=0.35 cfs @ 12.12 hrs HW=14.78' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.35 cfs @ 2.59 fps)

Summary for Pond 4P: Porous Paver Section

Inflow Area = 0.091 ac, 87.04% Impervious, Inflow Depth > 5.50" for 50-Year event
Inflow = 0.44 cfs @ 12.09 hrs, Volume= 0.042 af
Outflow = 0.40 cfs @ 12.12 hrs, Volume= 0.041 af, Atten= 8%, Lag= 2.1 min
Discarded = 0.05 cfs @ 12.12 hrs, Volume= 0.017 af
Primary = 0.35 cfs @ 12.12 hrs, Volume= 0.023 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.44' @ 12.12 hrs Surf.Area= 0.021 ac Storage= 0.002 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 9.0 min (892.1 - 883.2)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	0.001 af	**3.00'W x 48.00'L x 1.20'H Prismatoid** 0.004 af Overall x 33.0% Voids
#2	17.30'	0.009 af	**16.00'W x 48.00'L x 1.50'H Prismatoid** 0.026 af Overall x 33.0% Voids
#3	18.80'	0.000 af	**16.00'W x 48.00'L x 0.17'H Prismatoid** 0.003 af Overall x 10.0% Voids
		0.010 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	17.10'	**8.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.10' / 14.50' S= 0.2600 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	16.00'	**2.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 14.50'

Discarded OutFlow Max=0.05 cfs @ 12.12 hrs HW=17.44' (Free Discharge)
└**2=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.35 cfs @ 12.12 hrs HW=17.44' TW=14.78' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.35 cfs @ 1.98 fps)

Summary for Pond 5P: Perforated Pipe Trench

Inflow Area =	0.023 ac,100.00% Impervious, Inflow Depth > 8.21" for 50-Year event			
Inflow =	0.19 cfs @	12.08 hrs, Volume=	0.016 af	
Outflow =	0.19 cfs @	12.09 hrs, Volume=	0.016 af, Atten= 2%, Lag= 0.3 min	
Discarded =	0.00 cfs @	12.10 hrs, Volume=	0.006 af	
Primary =	0.19 cfs @	12.09 hrs, Volume=	0.010 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.64' @ 12.10 hrs Surf.Area= 0.001 ac Storage= 0.001 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 18.0 min (758.0 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	16.50'	0.001 af	**2.00'W x 30.00'L x 3.00'H Prismatoid** 0.004 af Overall x 33.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	17.30'	**8.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.30' / 17.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	16.50'	**2.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 14.50'

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=17.64' (Free Discharge)
└**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.18 cfs @ 12.09 hrs HW=17.64' TW=17.57' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.18 cfs @ 1.47 fps)

Summary for Link P1B: POST POA #1

Inflow Area = 0.097 ac, 40.38% Impervious, Inflow Depth > 6.53" for 50-Year event
Inflow = 0.72 cfs @ 12.09 hrs, Volume= 0.053 af
Primary = 0.72 cfs @ 12.09 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.0 min

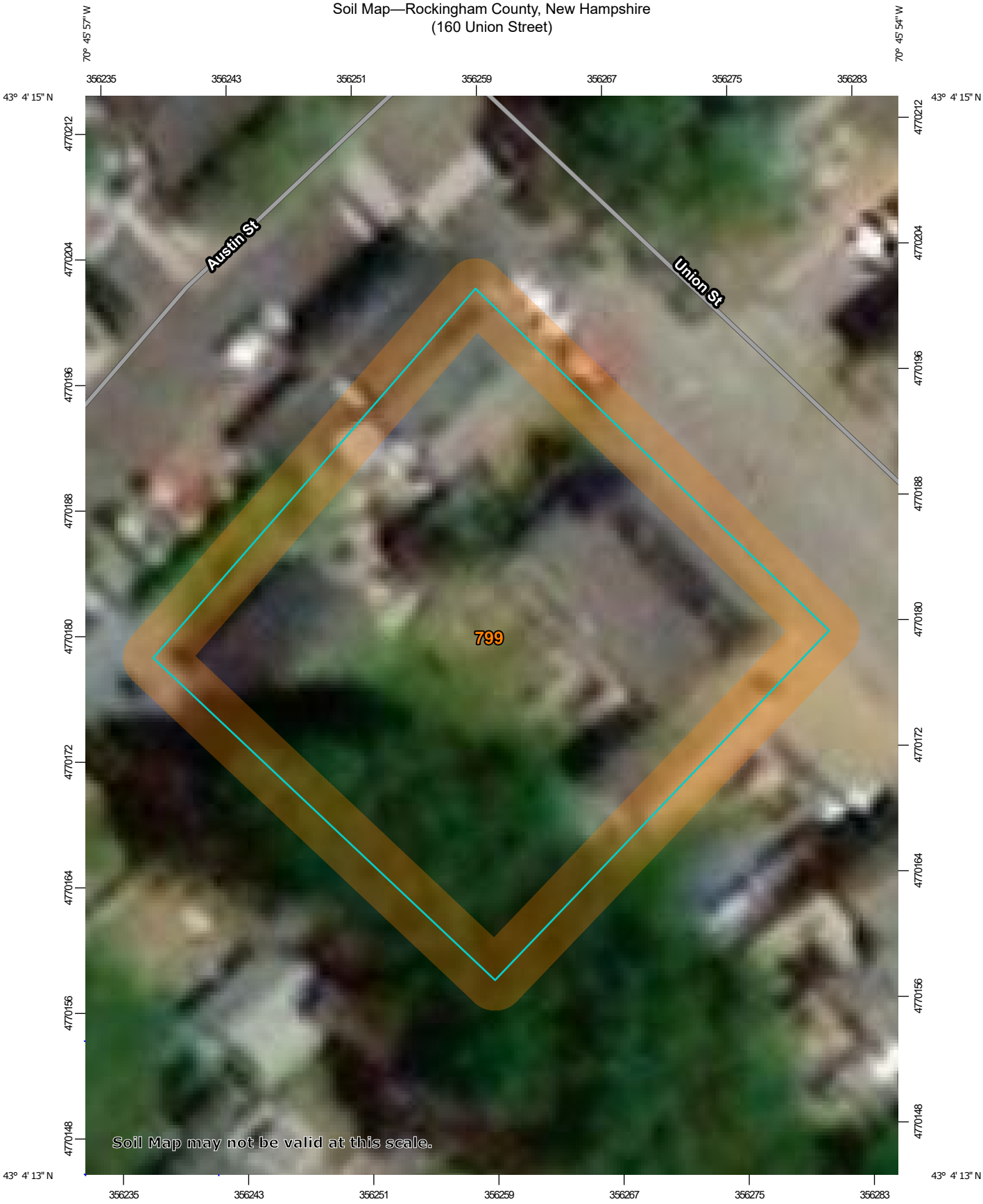
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link P2B: POST POA #2

Inflow Area = 0.167 ac, 85.88% Impervious, Inflow Depth > 5.09" for 50-Year event
Inflow = 0.95 cfs @ 12.10 hrs, Volume= 0.071 af
Primary = 0.95 cfs @ 12.10 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Soil Map—Rockingham County, New Hampshire
(160 Union Street)



Map Scale: 1:335 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 4 9 18 27

Feet: 0 15 30 60 90

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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 21, Sep 16, 2019

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—Sep 9, 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
799	Urban land-Canton complex, 3 to 15 percent slopes	0.2	100.0%
Totals for Area of Interest		**0.2**	**100.0%**

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Abenaki	501	0.6	2.0	6.00	99.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Acton	146	2.0	20.0	2.00	20.0	B	3	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Adams	36	6.0	20.0	20.00	99.0	A	1	Outwash and Stream Terraces	frigid	sandy	yes	
Agawam	24	6.0	20.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Allagash	127	0.6	2.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Au Gres	516					B	5	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Bangor	572	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam
Becket	56	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Belgrade	532	0.6	2.0	0.06	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Bemis	224	0.6	0.2	0.00	0.2	C	5	Firm, platy, loamy till	cryic	loamy	no	
Berkshire	72	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Bernardston	330	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Bice	226	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	no	sandy loam
Biddeford	234	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	frigid	fine	no	organic over clay
Binghamville	534	0.2	2.0	0.06	0.2	D	5	Terraces and glacial lake plains	mesic	silty	no	
Boscawen	220	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Boxford	32	0.1	0.2	0.00	0.2	C	3	Silt and Clay Deposits	mesic	fine	no	silty clay loam
Brayton	240	0.6	2.0	0.06	0.6	C	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Buckland	237	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Bucksport	895					D	6	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Burnham	131	0.2	6.0	0.02	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Buxton	232	0.1	0.6	0.00	0.2	C	3	Silt and Clay Deposits	frigid	fine	no	silty clay
Cabot	589	0.6	2.0	0.06	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Caesar	526	20.0	100.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	coarse sand	no	
Canaan	663	2.0	20.0	2.00	20.0	C	4	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Canterbury	166	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Canton	42	2.0	6.0	6.00	20.0	B	2	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Cardigan	357	0.6	2.0	0.00	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Catden	296					A/D	6	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Champlain	35	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	gravelly sand	no	
Charles	209	0.6	100.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	silty	no	
Charlton	62	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Chatfield	89	0.6	6.0	0.60	6.0	B	4	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Chatfield Var.	289	0.6	6.0	0.60	6.0	B	3	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Chesuncook	126	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Chichester	442	0.6	2.0	2.00	6.0	B		Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Chocorua	395			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Cohas	505	0.6	2.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Colonel	927	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Colton	22	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Colton, gravelly	21	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Croghan	613	20.0	100.0	20.00	100.0	B	3	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Dartmouth	132	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Deerfield	313	6.0	20.0	20.00	100.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	single grain in C
Dixfield	378	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Dixmont	578	0.6	2.0	0.60	2.0	C	3	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Duane	413	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Dutchess	366	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Eldridge	38	6.0	20.0	0.06	0.6	C	3	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Elliottsville	128	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Elmridge	238	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Elmwood	338	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Finch	116					C	3	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)

STORMWATER INSPECTION AND MAINTENANCE MANUAL

160 & 168-170 Union Street
Assessor's Map 135, Lots 29 & 30

OWNER: LCSG, LLC
750 Brackett Road
Rye, NH 03870

Proper inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality. The following responsible parties shall be in charge of managing the stormwater facilities:

NOTE: Inspection and maintenance responsibilities transfer to future property owners.

The owner shall submit an annual inspection log to the Planning Department for the inspection and maintenance of the porous pavers by July 15.

POROUS PAVERS

Function – Porous pavement (Pavers) is designed to capture rainwater runoff containing suspended solids, nutrients and pollutants. Proper maintenance of porous pavement is crucial for ensuring its longevity and functionality to infiltrate runoff.

Maintenance

- Reference attached "Regular Inspection and Maintenance Guidance for Permeable Pavements
- New porous pavement shall be inspected several times in the first month after construction and at least annually thereafter. Inspections shall be conducted after major storms to check for surface ponding that might indicate possible clogging.
- Inspect annually for pavement deterioration or spalling.
- Vacuum sweeping shall be performed once a year or as needed to maintain permeability. Power washing may be required prior to vacuum sweeping to dislodge trapped particles.
- Sand and abrasives shall not be used for winter maintenance, as they will clog the pores; de-icing materials shall be used instead.
- Never reseal or repave with impermeable materials. If the porous pavement is damaged, it can be repaired using conventional, non-porous patching mixes as long as the cumulative area repaired does not exceed 10 percent of the paved area.

DRAINAGE PIPES

Function – Drainage pipes convey stormwater away from buildings, walkways, and parking areas and to surface waters or closed drainage systems.

Maintenance

- Culverts and drainage pipes shall be inspected semi-annually, or more often as needed, for accumulation of debris and structural integrity. Leaves and other debris shall be removed from the inlet and outlet to insure the functionality of drainage structures. Debris shall be disposed of on site where it will not concentrate back at the drainage structures or at a solid waste disposal facility.

- Riprap Areas - Culvert outlets and inlets shall be inspected during annual maintenance and operations for erosion and scour. If scour or creek erosion is identified, the outlet owner shall take appropriate means to prevent further erosion. Increased lengths of riprap may require a NHDES Wetlands Permit modification.

CATCH BASINS

Function – Catch basins collect stormwater, primarily from paved surfaces and roofs. Stormwater from paved areas often contains sediment and contaminants. Catch basin sumps serve to trap sediment, trace metals, nutrients and debris. Hooded catch basins trap hydrocarbons and floating debris.

Maintenance

- Remove leaves and debris from structure grates on an as-needed basis.

- Sumps shall be inspected and cleaned (as needed) on an annual basis to protect water quality and infiltration capacity. Catch basin debris shall be disposed of at a solid waste disposal facility.

DRIP EDGES

Function – Drip edges are to provide erosion control of surface where impervious surfaces meet non-impervious surfaces, such as building or roadway edges.

Maintenance

- Drip edges should be inspected annually for erosion, rutting, and migration of stone. Any areas experiencing erosion shall be properly maintained by replacing or adding additional stone to the area of concern.

APPPENDIX

A. PERMEABLE PAVEMENTS INSPECTION AND MAINTENANCE GUIDANCE
B. STORMWATER SYSTEM OPERATIONS AND MAINTENANCE REPORT
C. SITE GRADING AND DRAINAGE PLAN

Regular Inspection and Maintenance Guidance for Permeable Pavements

Regular inspection and maintenance is critical to the effective operation of permeable pavement. It is the responsibility of the owner to maintain the pavement in accordance with the minimum design standards. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less, frequent maintenance needs, depending on a variety of factors including the occurrence of large storm events, seasonal changes, and traffic conditions.

ACTIVITIES

Visual inspections are an integral part of system maintenance. This includes monitoring pavement to ensure water drainage, debris accumulation, and surface deterioration.

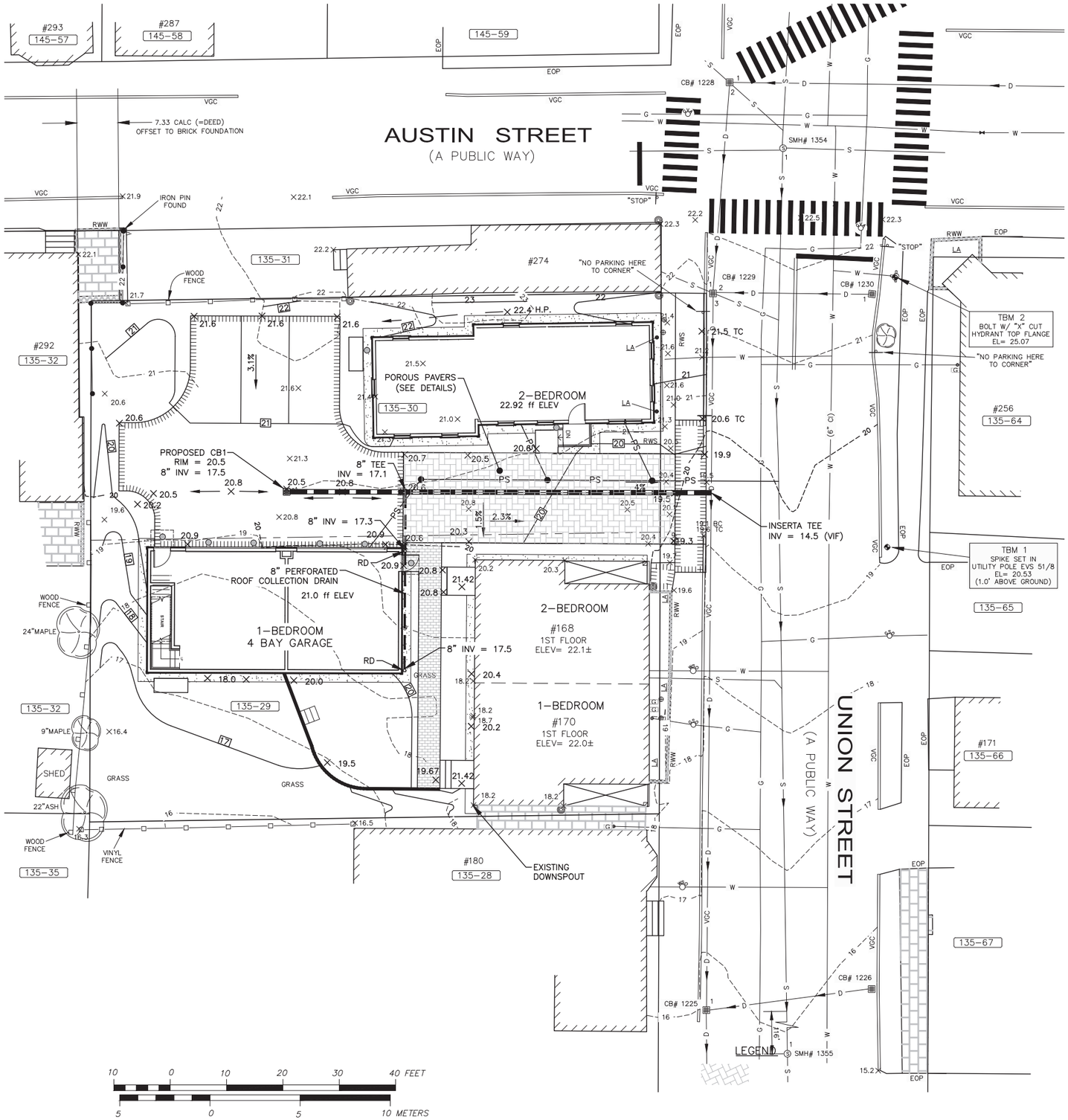
ACTIVITY	FREQUENCY
CLOGGING AND SYSTEM PERFORMANCE	
Adjacent vegetated areas show no signs of erosion and run-on to permeable pavement. **Remedy:** Repair or replace any damaged structural parts.	Whenever vacuuming adjacent permeable pavements
Adjacent non-permeable sections of pavement are clean of debris to prevent debris tracking. **Remedy:** Vacuuming adjacent pavement non-permeable pavement can be effective at minimizing run-on.	
Check for standing water remaining on the surface of the pavement after a precipitation event within 30 minutes. **Remedy:** Use of a power washer or compressed air blower at an angle of 30 degrees or less can be effective, particularly in combination with a vacuum or vacuum sweeper.	1-2 times per year, more frequently for high-use sites or sites with higher potential for run-on
Check for debris accumulation, particularly in the winter. **Remedy:** Loose debris such as leaves or trash can be removed using a power/leaf blower or gutter broom. Fall and spring cleanup should be accompanied by pavement vacuuming.	
Accumulation of sediment and organic debris on the pavement surface. **Remedy:** Regular use of a vacuum sweeper can remove sediment and organic debris. The sweeper may be fitted with water jets.	
PAVEMENT CONDITION	
Check for accumulation of snow or other stockpiles of materials such as sand/salt, mulch, soil, yard waste, etc. Stockpiling of these materials on permeable pavements can lead to premature clogging. **Remedy:** Remove stockpile if possible and check for clogging in storage area.	As Needed
Damage to pavement **Remedy:** Repairs should be repaired as they are identified	

STORM WATER SYSTEM OPERATION AND MAINTENANCE REPORT

General Information	
Project Name	
Owner	
Inspector's Name(s)	
Inspector's Contact Information	
Date of Inspection	**Start Time:** **End Time:**
Type of Inspection: ☐ Annual Report ☐ Post-storm event ☐ Due to a discharge of significant amounts of sediment	
Notes:	

General Site Questions and Discharges of Significant Amounts of Sediment			
Subject		**Status**	**Notes**
A discharge of significant amounts of sediment may be indicated by (but is not limited to) observations of the following. Note whether any are observed during this inspection:			*Notes/ Action taken:*
1	Do the current site conditions reflect the attached site plan?	❑Yes ❑No	
2	Is the site permanently stabilized, temporary erosion and sediment controls are removed, and stormwater discharges from construction activity are eliminated?	❑Yes ❑No	
3	Is there evidence of the discharge of significant amounts of sediment to surface waters, or conveyance systems leading to surface waters?	❑Yes ❑No	

Permit Coverage and Plans				
#	**BMP/Facility**	**Inspected**	**Corrective Action Needed and Notes**	**Date Corrected**
	Porous Pavers	❑Yes ❑No		
	Catch Basin	❑Yes ❑No		
	Drip Edge	❑Yes ❑No		
	Drain Pipes	❑Yes ❑No		
		❑Yes ❑No		
		❑Yes ❑No		



PROPOSED LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT GRADE ELEVATION
- PROPOSED SPOT GRADE ELEVATION
- PROPOSED STONE DRIP EDGE
- PROPOSED EDGE OF PAVEMENT

NH STATE PLANE COORDINATE SYSTEM
NAD 1983

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. DEWATERING ACTIVITIES SHALL BE DONE IN ACCORDANCE WITH EPA AND NHDES REGULATIONS AND GUIDELINES.
4. 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 REPLACED WITH FREE DRAINING STRUCTURAL FILL IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF THE FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WILL ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
5. 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.
6. ALL STORM DRAIN PIPE SHALL BE ADS N-12 OR EQUAL AND APPROVED BY THE ENGINEER.
7. 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.
8. ALL SPOT GRADES ARE AT THE FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
9. 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.
10. CONTRACTOR SHALL PROTECT ALL RAINGARDENS AND OTHER STORM MANAGEMENT DEVICES FROM CONSTRUCTION STORMWATER RUNOFF. TEMPORARY SEDIMENT BASINS SHALL BE CONSTRUCTED DURING CONSTRUCTION. STORMWATER SHALL NOT BE DIRECTED TO THE RAINGARDENS OR STORMWATER MANAGEMENT AREAS UNTIL THE WATERSHED ARE HAS BEEN STABILIZED.
11. EXISTING REAR ENTRANCE LANDINGS & STEPS TO BE MODIFIED AS NECESSARY IN FIELD.

DRAIN & SEWER TABLE

CB# 1225
RIM EL= 15.66
(1) INV IN 15"CMP= 11.95

CB# 1226
RIM EL= 15.63

CB# 1228
RIM EL= 23.36
(1) INV IN 12"HDPE= 19.21
(2) INV OUT 15"CMP= 18.46

CB# 1229
RIM EL= 21.24
(1) INV IN 15"CMP= 17.72
(2) INV IN 12"CMP= 17.66
(3) INV OUT 15"CMP= 15.44

CB# 1230
RIM EL= 21.30
(1) INV OUT 12"CMP= 18.05

SMH# 1354
RIM EL= 23.13
(1) INV OUT 8"VCP= 16.46

SMH# 1355
RIM EL= 14.20
(1) INV IN 8"VCP= 7.48

P4823

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

ISSUED FOR: PB APPROVAL

ISSUE DATE: JANUARY 21, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EDW	12/02/19
1	TAC COMMENTS	EDW	01/21/20

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4823-CO-2.DWG

SCALE:
22" x 34" – 1" = 10'
11" x 17" – 1" = 20'

OWNER/APPLICANT:
LCSG, LLC
160 & 168-170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP-LOT 135-30 & 135-29

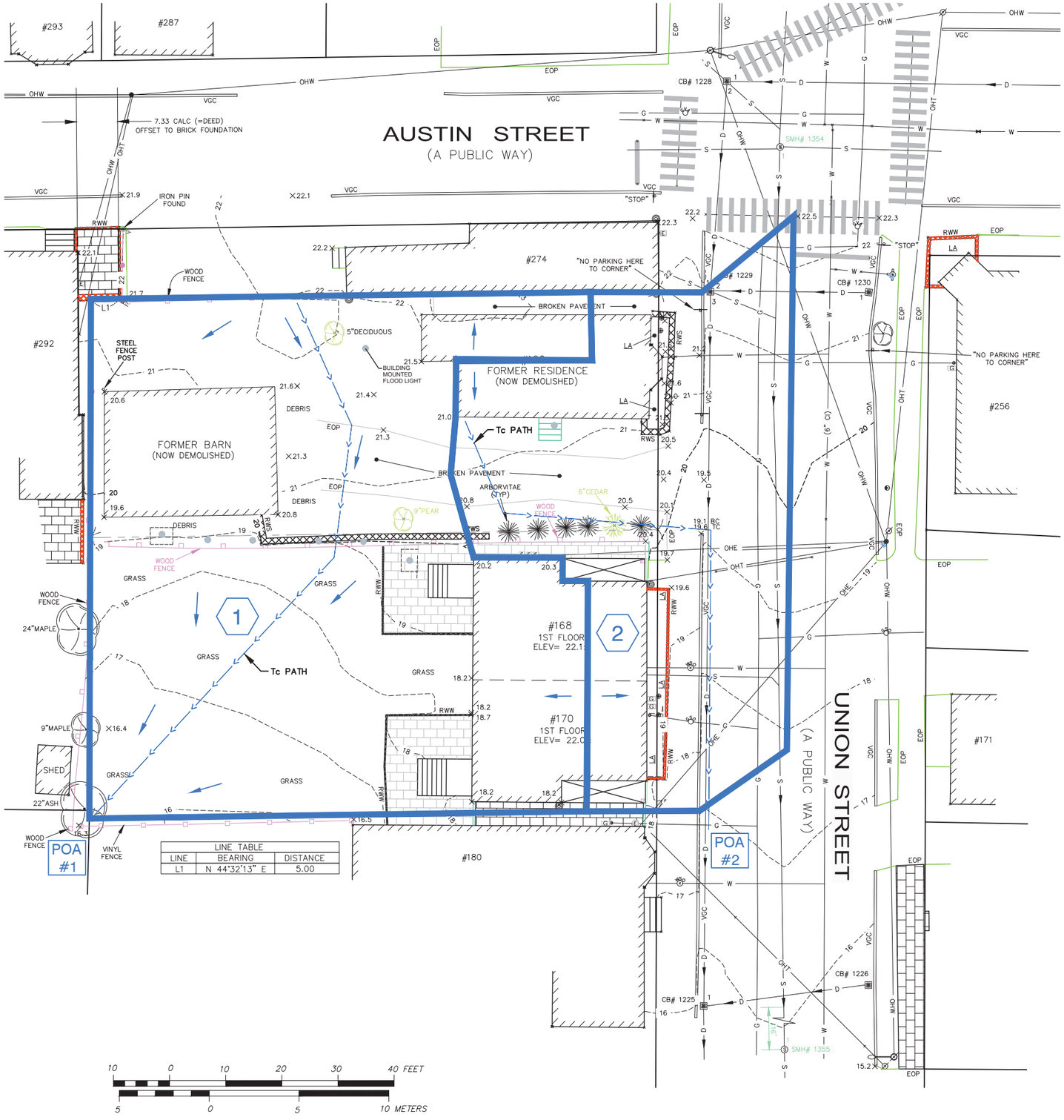
C/O LCSG, LLC
750 BRACKETT ROAD
RYE, NH 03870
PORTSMOUTH, N.H.

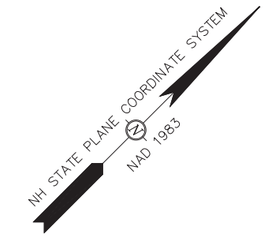
DEED REFERENCES:
RCRD 5752/1983
& 5613/2372

PROJECT:
PROPOSED SITE DEVELOPMENT PLANS
160 & 168-170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP-LOT 135-30 & 135-29

TITLE:
GRADING, DRAINAGE & EROSION CONTROL PLAN

SHEET NUMBER:
C - 3





LEGEND

- PROPERTY LINE
- 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

LEGEND:

- CHAIN LINK FENCE
- PRIVACY FENCE
- PRIVACY FENCE
- EVS EVERSOURCE
- 135–29 TAX SHEET – LOT NUMBER
- RCRD ROCKINGHAM COUNTY REGISTRY OF DEEDS
- EOP EDGE OF PAVEMENT
- VGC VERTICAL FACED GRANITE CURB
- RWS STONE RETAINING WALL
- RWW WOOD RETAINING WALL
- BOLLARD
- SIGN
- UTILITY POLE
- UTILITY POLE W/TRANSFORMER
- UTILITY POLE WITH ARM & LIGHT
- GUY
- E ELECTRIC METER
- G GAS METER
- GAS SHUT OFF
- GAS VALVE
- WATER GATE VALVE
- WATER SHUT OFF VALVE
- HYDRANT
- CATCH BASIN
- ROOF DOWNSPOUT
- SEWER MANHOLE
- CONIFEROUS TREE
- DECIDUOUS TREE
- CONIFEROUS SHRUB
- W WATER LINE
- S SEWER LINE
- D DRAIN LINE
- G GAS LINE
- OHW OVERHEAD WIRES
- OHE OVERHEAD ELECTRIC
- OHT OVERHEAD TELEPHONE
- BRICK PAVERS
- RETAINING WALL
- LA LANDSCAPED AREA
- ×12.5 SPOT GRADE

DRAIN & SEWER TABLE

CB# 1225
RIM EL= 15.66
(1) INV IN 15"CMP= 11.95

CB# 1226
RIM EL= 15.63

CB# 1228
RIM EL= 23.36
(1) INV IN 12"HDPE= 19.21
(2) INV OUT 15"CMP= 18.46

CB# 1229
RIM EL= 21.24
(1) INV IN 15"CMP= 17.72
(2) INV IN 12"CMP= 17.66
(3) INV OUT 15"CMP= 15.44

CB# 1230
RIM EL= 21.30
(1) INV OUT 12"CMP= 18.05

SMH# 1354
RIM EL= 23.13
(1) INV OUT 8"VCP= 16.46

SMH# 1355
RIM EL= 14.20
(1) INV IN 8"VCP= 7.48

P4823

SURVEYOR:

James Verra and Associates, Inc.
LAND SURVEYORS
101 SHATTUCK WAY – SUITE 8
NEWINGTON, N.H. 03801– 7876
603–436–3557
JOB NO: 23770
PLAN NO: 23770

ENGINEER:

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

ISSUED FOR: DRAINAGE REPORT

ISSUE DATE: JANUARY 17, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	DRAINAGE REPORT	CDB	01/17/20

DRAWN BY: JCS
APPROVED BY: JV
DRAWING FILE: 23770.DWG

SCALE:
22" x 34" – 1" = 10'
11" x 17" – 1" = 20'

OWNER/APPLICANT:

LCSG, LLC
160 & 168–170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP–LOT 135–30 & 135–29

C/O LCSG, LLC
750 BRACKETT ROAD
RYE, NH 03870
PORTSMOUTH, N.H.

DEED REFERENCES:
RCRD 5752/1983
& 5613/2372

PROJECT:

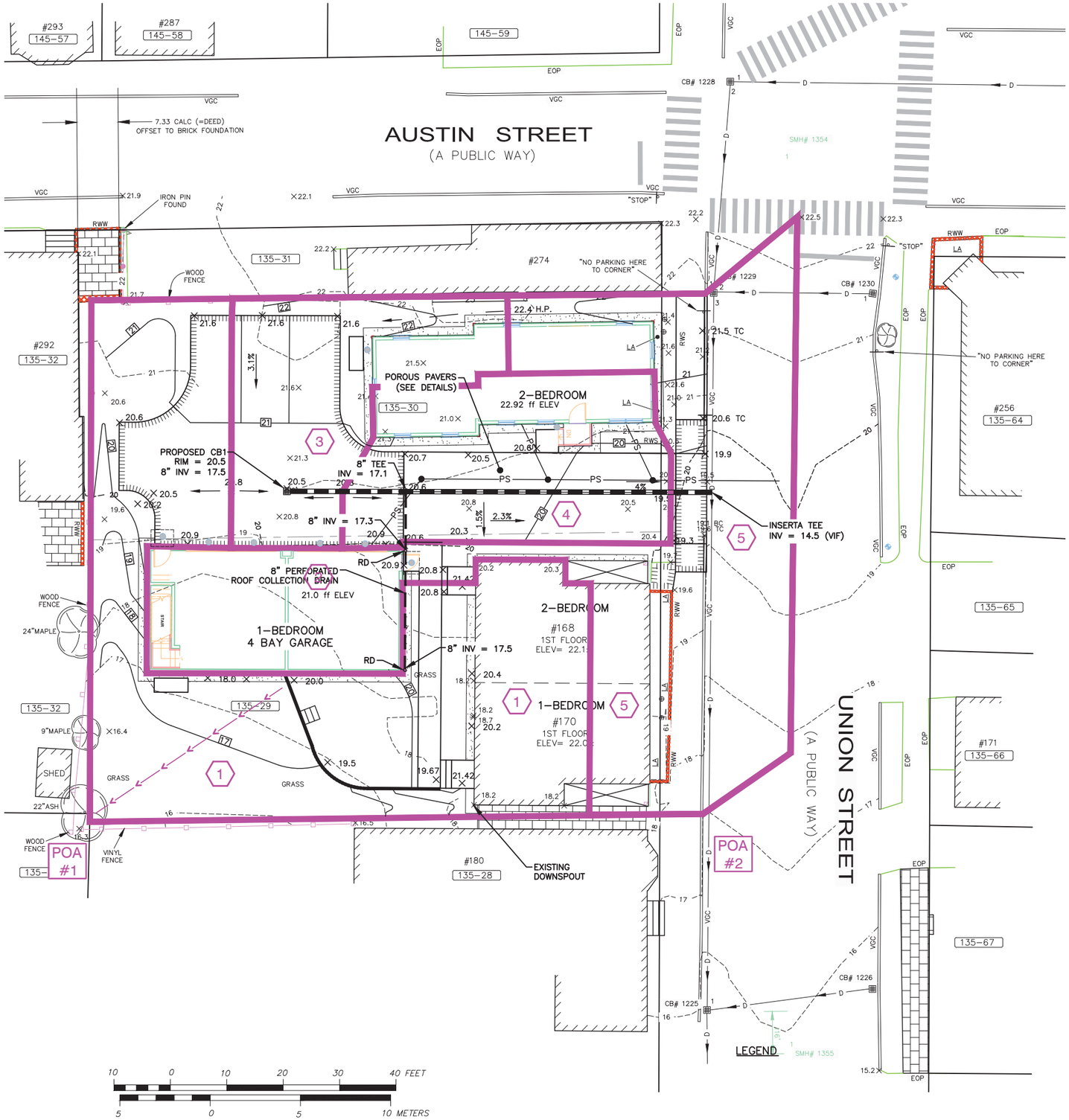
PROPOSED SITE DEVELOPMENT PLANS
160 & 168–170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP–LOT 135–30 & 135–29

TITLE:

PRE DEVELOPMENT DRAINAGE AREA PLAN

SHEET NUMBER:

DA-1



PROPOSED LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- ×21.7 EXISTING SPOT GRADE ELEVATION
- 22.4 × PROPOSED SPOT GRADE ELEVATION
- PROPOSED STONE DRIP EDGE
- PROPOSED EDGE OF PAVEMENT

NH STATE PLANE COORDINATE SYSTEM
NAD 1983

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- EXISTING PAVEMENT/CURB
- EXISTING TREELINE
- WATERSHED BOUNDARY
- Tc PATH
- SURFACE FLOW DIRECTION
- SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

DRAIN & SEWER TABLE

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P4823

ENGINEER:

ALTUS ENGINEERING, INC.

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

ISSUED FOR: PB APPROVAL

ISSUE DATE: JANUARY 21, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EDW	12/02/19
1	TAC COMMENTS	EDW	01/21/20

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4823-CO-2.DWG

SCALE:
22" x 34" – 1" = 10'
11" x 17" – 1" = 20'

OWNER/APPLICANT:

LCSG, LLC
160 & 168-170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP-LOT 135-30 & 135-29

C/O LCSG, LLC
750 BRACKETT ROAD
RYE, NH 03870
PORTSMOUTH, N.H.

DEED REFERENCES:
RCRD 5752/1983
& 5613/2372

PROJECT:

PROPOSED SITE DEVELOPMENT PLANS

160 & 168-170
UNION STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCELS
MAP-LOT 135-30 & 135-29

TITLE:

POST DEVELOPMENT DRAINAGE AREA PLAN

SHEET NUMBER:

DA-2