

**CLIENT/OWNER**  
RICHMOND PROPERTY GROUP  
333 N. ALABAMA STREET  
INDIANAPOLIS, IN 46204

**CIVIL ENGINEER**  
EMANUEL ENGINEERING, INC.  
118 PORTSMOUTH AVENUE, SUITE A202  
STRATHAM, NH 03885

**LAND SURVEYOR**  
DOUCET SURVEY, INC.  
102 KENT PLACE  
NEWMARKET, NH 03857

**SOIL SCIENTIST**  
GZA GEOENVIRONMENTAL  
5 COMMERCE PARK NORTH, SUITE 201  
BEDFORD, NH 03110

**ARCHITECT**  
KRITTENBRINK ARCHITECTURE  
119 W. MAIN STREET  
NORMAN, OK 73069

**LIGHTING PLAN**  
KRITTENBRINK ARCHITECTURE  
119 W. MAIN STREET  
NORMAN, OK 73069

**GEOTECHNICAL ENGINEER**  
S.W. COLE ENGINEERING, INC.  
10 CENTRE ROAD  
SOMERSWORTH, NH 03878

**LANDSCAPE ARCHITECT**  
WOODBURN & COMPANY  
103 KENT PLACE  
NEWMARKET, NH 03857

# AMENDED SITE PLAN FOR RICHMOND PROPERTY GROUP

## ALPHA TAU OMEGA FRATERNITY

### DURHAM TAX MAP 2 LOT 12-12

### 18 GARRISON AVENUE

### DURHAM, NH 03824

- WAIVERS GRANTED BY THE TOWN OF DURHAM ZONING BOARD ON MARCH 17, 2020:**
- ZONING ORDINANCE 175.62 - PARKING WITHIN WCOD
  - ZONING ORDINANCE 175.11 - PARKING WITHIN FRONT COURT OF BUILDING



**PROJECT DRAWING SET:**

- |         |   |
|---------|---|
|         | COVER SHEET                                       |
| 1       | EXISTING CONDITIONS PLAN (BY DOUCET SURVEY, INC.) |
| C2      | SITE PLAN   |
| C3      | GRADING & DRAINAGE PLAN                           |
| C4      | PAVING & CURBING PLAN                             |
| D1 - D2 | NOTES   |
| D3 - D6 | DETAILS   |
| CS1     | CONSTRUCTION SEQUENCING PLAN                      |
|         | FLOOR PLANS                                       |
|         | ARCHITECTURAL ELEVATIONS                          |

**PROJECT LOCUS PLAN**

1" = 1,000 '

FINAL APPROVAL BY DURHAM PLANNING BOARD.  
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER

\_\_\_\_\_, DATE \_\_\_\_\_

6	APR 20, 2021	FOR APPROVAL	
5	DEC 28, 2020	FOR APPROVAL	
1	MAR 11, 2020	FOR APPROVAL	
ISS	DATE:	DESCRIPTION OF ISSUE:	CHK:
DRAWN:	JJM	DESIGN:	JJM
CHECKED:	BDS	CHECKED:	BDS



CLIENT:

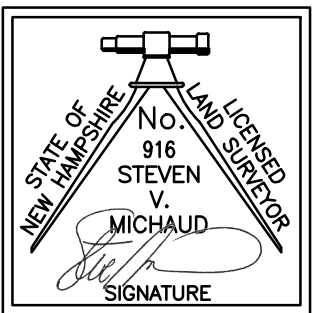
RICHMOND PROPERTY GROUP  
333 N. ALABAMA ST.  
INDIANAPOLIS, IN 46204

TITLE:

**COVER**  
FOR  
RICHMOND PROPERTY GROUP  
ELIZABETH DEMERITT HOUSE  
18 GARRISON AVENUE (SITE)  
DURHAM, NH 03824

PROJECT:	SCALE:	SHEET:
19-083	AS SHOWN	COVER

FILE NAME: Y:\PROJECTS\6117\_CAD\DWG\6117A\_E.dwg PLOTTED: Thursday, March 26, 2020 - 9:26am



PURSUANT TO RSA 676:18, III:

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR BY THOSE UNDER MY DIRECT SUPERVISION AND FALLS UNDER THE URBAN SURVEY CLASSIFICATION OF THE NH CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS. I CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. RANDOM TRAVERSE SURVEY BY TOTAL STATION, WITH A PRECISION GREATER THAN 1:15,000.

3/26/2020 DATE  
L.L.S. #916

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

SEWER STRUCTURES			
SMH A RIM ELEV.=46.3' (A) 8" CIP INV.=42.2' (B) 6" CIP INV.=42.5' (8502) 8" CIP=42.2'	SMH 1224 RIM ELEV.=54.6' (BLDG) 6" PVC INV.=47.8' (1226) 6" PVC INV.=47.8'	SMH 7132 RIM ELEV.=45.3' (7035) 8" PVC INV.=38.5' (1126) 8" PVC INV.=38.5' (1359) 10" UNK. INV.=38.5'	SMH 9216 RIM ELEV.=52.3' (A) 8" UNK. INV.=39.6' (9217) 8" UNK. INV.=39.6'
SMH 1126 RIM ELEV.=44.8' (A) UNK. PVC=39.2' (1224) 6" PVC=39.1' (7132) 8" PVC=39.1'	SMH 1359 RIM ELEV.=44.6' (7132) 10" PVC INV.=36.4' (9217) 18" PVC INV.=35.6' (8502) 18" PVC INV.=35.6'	SMH 8502 RIM ELEV.=42.9' (SMH A) CC ELEV.=36.1' (1359) CC ELEV.=35.1' (1501) CC ELEV.=35.1'	SMH 9217 RIM ELEV.=52.5' (A) 8" CLAY INV.=45.7' (B) 8" UNK. INV.=37.3' (9216) 8" UNK. INV.=37.2' (1359) 18" UNK. CC ELEV.=36.6'

#### NOTES:

- REFERENCE: ELIZABETH DEMERITT HOUSE  
TAX MAP 2 LOT 12-12  
GARRISON AVENUE  
DURHAM, NH
- TOTAL PARCEL AREA: 73,000± SQ. FT. OR 1.70± AC.
- OWNER OF RECORD: RICHMOND PROPERTY GROUP LTD  
333 NORTH ALABAMA STREET  
INDIANAPOLIS, IN 46204  
S.C.R.D. BK. 4626 PG. 697
- ZONE: CB (CENTRAL BUSINESS)  
DIMENSIONAL REQUIREMENTS:  
REFER TO TOWN OF DURHAM ZONING ORDINANCE "DEVELOPMENT STANDARD"  
SECTION FOR DIMENSIONAL REQUIREMENTS.
- FIELD SURVEY PERFORMED BY L.P.S. & E.D.P. DURING AUGUST 2019 USING A TRIMBLE S7 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR AND A TRIMBLE DINI DIGITAL AUTO LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.
- HORIZONTAL DATUM BASED ON NH STATE PLANE COORDINATES (NAD83/96) USING AN OPUS CORRECTED GPS SOLUTION.
- VERTICAL DATUM IS BASED ON APPROXIMATE NAVD88.
- JURISDICTIONAL WETLANDS DELINEATED BY GZA GEOENVIRONMENTAL, INC. DURING AUGUST 2019 IN ACCORDANCE TO THE:  
• U.S. ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JANUARY, 1987).  
• INTERIM REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION (OCTOBER 2009).  
• NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: NORTHEAST (REGION 1). U.S. FISH AND WILDLIFE SERVICE (MAY 1989).  
• CODE OF ADMINISTRATIVE RULES. WETLANDS BOARD, STATE OF NEW HAMPSHIRE (CURRENT).
- FLOOD HAZARD ZONES: "X" & "AE", PER FIRM MAP #33017C0318E, DATED 9/15/15.
- PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT 2' INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA, AND DOUCET SURVEY, WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.
- UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVED PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE.
- THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING: THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MANHOLE CONFIGURATION, ETC.

#### REFERENCE PLANS:

- "PLAN OF LAND, LAND OF THE UNIVERSITY OF NEW HAMPSHIRE FOR GAMMA THETA CORPORATION, GARRISON AVENUE, (NO TAX MAP/LOT NUMBER ASSIGNED) DURHAM, NEW HAMPSHIRE" DATED JULY 11, 2014 BY DOUCET SURVEY, INC. S.C.R.D. PLAN 108-020.
- "EXISTING CONDITIONS PLAN OF 17 & 21 MADBURY ROAD FOR AG ARCHITECTS, PC" DATED MAY 11, 2006 BY DOUCET SURVEY, INC.
- "TOWN OF DURHAM SEWER EASEMENTS, PETTEE BROOK INTERCEPTOR" DATED NOVEMBER 1964 BY G.L. DAVIS & ASSOCIATES S.C.R.D. POCKET 4 FOLDER 4 PLAN 26.
- "RE-SUBDIVISION OF LAND IN DURHAM, NH PREPARED FOR THETA GAMMA OF DELTA ZETA HOUSE CORP." DATED AUGUST 4, 1980 BY JOHN W. DURGIN ASSOCIATES, INC. S.C.R.D. DRAWER 21, PLAN 86.
- "PLAN OF LAND FOR ERNEST CUTTER" DATED OCTOBER 1977 BY JOHN W. DURGIN ASSOCIATES, INC.
- "UNIVERSITY OF NEW HAMPSHIRE GARRISON AVENUE AREA" DATED SEPTEMBER 16, 1957 BY G.L. DAVIS & ASSOCIATES.

#### LEGEND

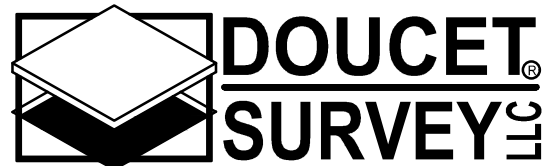
---	LOT LINE
- - - -	APPROXIMATE ABUTTERS LOT LINE
- - - -	EXISTING EASEMENT LINE
- - - -	APPROXIMATE CENTERLINE OF BROOK
- - - -	EDGE OF BROOK
- - - -	RETAINING WALL
○	STONE WALL
—	OVERHEAD WIRE
—	SEWER LINE
—	DRAIN LINE
—	GAS LINE
—	MAJOR CONTOUR LINE
—	MINOR CONTOUR LINE
—	TREE LINE
- - - -	EDGE OF DELINEATED WETLAND (2019)
- - - -	EDGE OF DELINEATED WETLAND (2006/2008)
- - - -	WETLAND AREA
■	CONCRETE
■	LANDSCAPED AREA
■	FEMA ZONE "X" 0.2% ANNUAL CHANCE FLOOD HAZARD
○	UTILITY POLE
○	UTILITY POLE & GUY WIRE
○	UTILITY POLE W/LIGHT SIGN
○	IRON PIPE/ROD FOUND
○	FIRE HYDRANT
○	WATER GATE VALVE
○	CATCH BASIN
○	MANHOLE
○	SEWER MANHOLE
○	WOODED POST
○	BOLLARD
○	CONIFEROUS TREE
○	DECIDUOUS TREE
○	TYP.
○	S.S.F.
○	CONC.
○	GRAN.
○	HDWL
○	FF
○	FINISHED FLOOR ELEVATION
○	THRESHOLD ELEVATION
○	EDGE OF PAVEMENT
○	VERTICAL GRANITE CURB
○	SLOPED GRANITE CURB
○	ELECTRIC METER
○	ELECTRIC SWITCH
○	BITUMINOUS CURB
○	SINGLE WHITE LINE
○	SINGLE YELLOW LINE
○	DOUBLE YELLOW LINE
○	DOWN SPOUT
○	CENTERLINE CHANNEL
■	BUILDING

20 0 20 40  
SCALE: 1 INCH = 20 FT.

#### EXISTING CONDITIONS PLAN FOR EMANUEL ENGINEERING OF THE ELIZABETH DEMERITT HOUSE TAX MAP 2 LOT 12-12 18 GARRISON AVENUE DURHAM, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY

DRAWN BY: M.T.L.	DATE: AUGUST 2019
CHECKED BY: S.V.M.	DRAWING NO. 6117A
JOB NO. 6117	SHEET 1 OF 1



Serving Your Professional Surveying & Mapping Needs  
102 Kent Place, Newmarket, NH 03857 (603) 659-6560  
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http://www.doucetsurvey.com

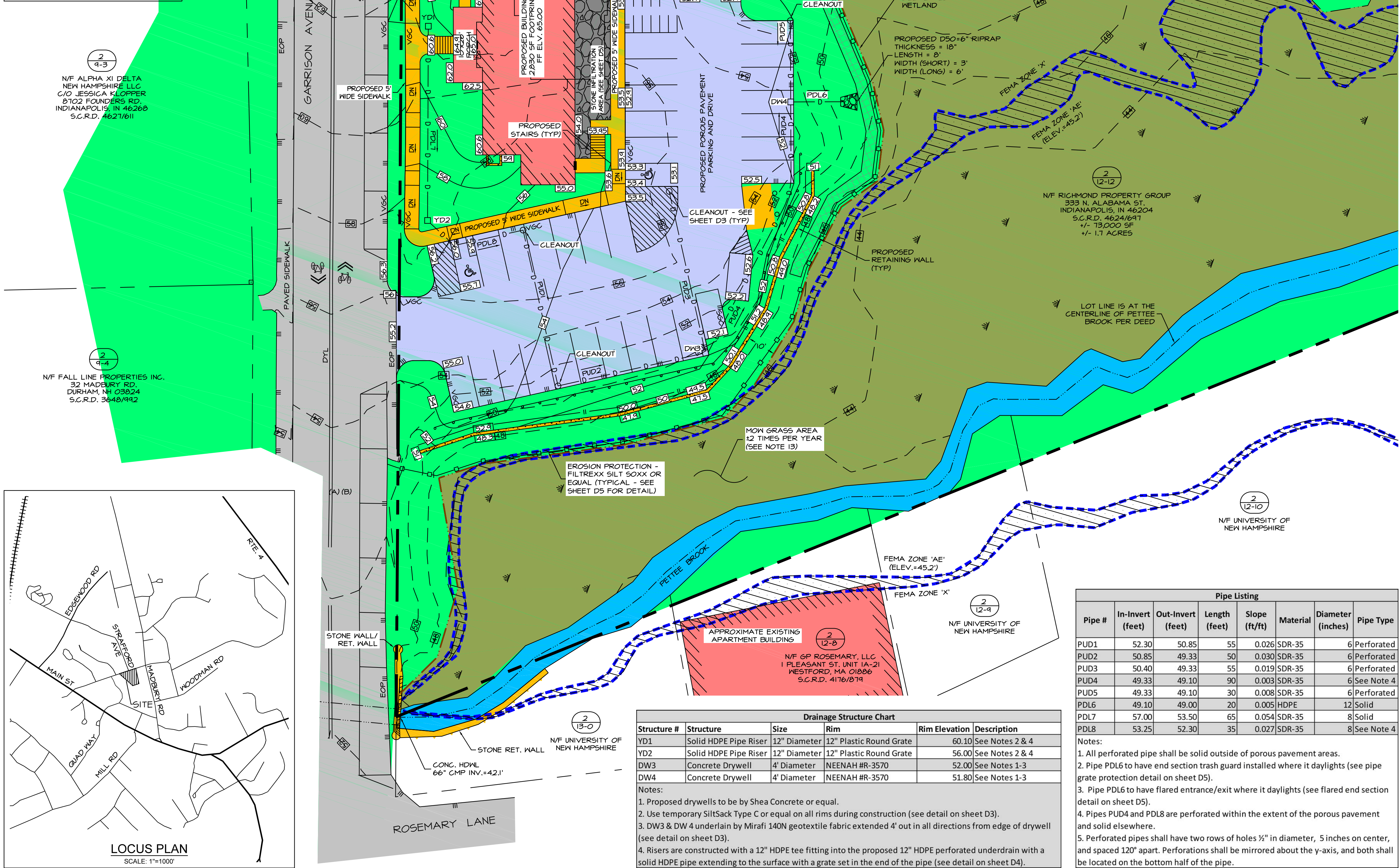






**LEGEND**

- BOUND FOUND
- IRON PIPE FOUND
- (TYP) TYPICAL
- PROPOSED POROUS PAVEMENT
- PROPOSED TRAD. PAVEMENT
- VERTICAL GRANITE CURB
- SLOPED GRANITE CURB
- BITUMINOUS CURB
- PROPERTY LINE
- EDGE OF PAVEMENT (EOP)
- EOP WITH CURB
- OVERHEAD UTILITIES
- WATER LINE
- SEWER LINE
- GAS LINE
- CHAINLINK FENCE
- GUARDRAIL
- EDGE OF WETLANDS
- UTILITY POLE
- LIGHT POLE
- WETLANDS
- SEWER MANHOLE
- CATCH BASIN
- SEWER CLEANOUT
- WATER VALVE
- TREE
- FEMA FLOODZONE X

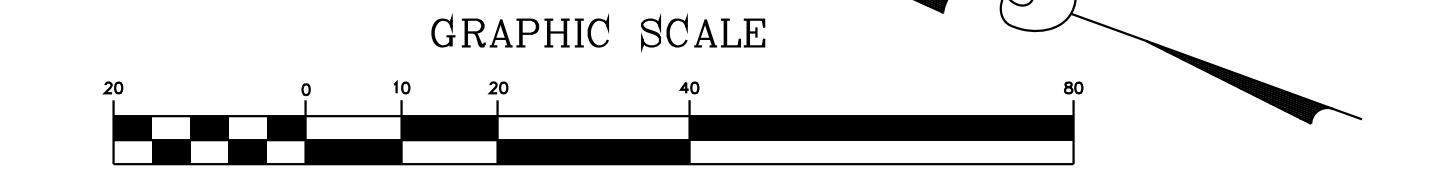


**REFERENCE PLANS:**

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- "PLAN OF LAND FOR ERNEST CUTTER" DATED OCTOBER 1977 BY JOHN W. DURGIN ASSOCIATES, INC.
- "UNIVERSITY OF NEW HAMPSHIRE GARRISON AVENUE AREA" DATED SEPTEMBER 16, 1957 BY G.L. DAVIS & ASSOCIATES.

**NOTES:**

- OWNER OF RECORD: TAX MAP 2, LOT 12-12 RICHMOND PROPERTY GROUP 333 N. ALABAMA ST. INDIANAPOLIS, IN 46204 SCRD BK 4626 PG 647
- THE INTENT OF THIS PLAN IS TO SHOW THE DRAINAGE STRUCTURES AND PROPOSED GRADING ASSOCIATED WITH THE SITE IMPROVEMENTS.
- PARCEL IS ZONED CENTRAL BUSINESS (CB) PER THE 2006 DURHAM ZONING DISTRICT MAP.
- A PORTION OF THE PARCEL IS IN A FLOOD HAZARD ZONE; REFERENCE FLOOD INSURANCE RATE MAP 3301TC0318E, DATED SEPTEMBER 30, 2015.
- SURVEY FIELDWORK CONDUCTED BY DOUCET SURVEY, LLC IN AUGUST, 2019.
- SOILS AND WETLANDS WERE DELINEATED BY GZA GEOENVIRONMENTAL, INC. DURING AUGUST, 2019.
- PROPERTY TO BE SERVICED BY TOWN WATER AND SEWER.
- ALL CONSTRUCTION SHOULD COMPLY WITH FEDERAL, STATE, AND LOCAL STANDARDS AND REGULATIONS.
- THIS PLAN WAS PREPARED WITH ON-SITE FIELD SURVEY AND EXISTING PLANS. THE CONTRACTOR SHOULD NOTIFY EMANUEL ENGINEERING, INC. DURING CONSTRUCTION IF ANY DISCREPANCY TO THE PLAN IS FOUND ON SITE.
- BEFORE ANY EXCAVATION, DIG SAFE AND ALL UTILITY COMPANIES SHOULD BE CONTACTED 12 HOURS BEFORE COMMENCING BY THE CONTRACTOR. CALL DIG SAFE @ 811 OR 1-888-DIG-SAFE.
- ALL UTILITIES SHALL BE LOCATED UNDERGROUND EXCEPT AS NOTED ON PLAN APPROVED BY THE PLANNING BOARD.
- HOUSE ROOF GUTTERS OR DRIP EDGES DRAIN INTO POROUS PAVEMENT. ALL DOWNSPOUT LEADERS TO HAVE A LEADER ADAPTER/GAP INSTALLED TO ALLOW FOR OVERFLOW AT THE SURFACE.
- THE WETLAND MEADOW SHOULD BE MOVED APPROXIMATELY 2 TIMES PER YEAR TO PREVENT INVASIVE SPECIES FROM INHABITING WETLANDS.
- CONNECT DOWNSPOUTS, WINDOW WELLS, AND INTERIOR FOUNDATION DRAINS TO EXTERIOR FOUNDATION DRAINS (MINIMUM 6" DIAMETER PERFORATED PIPE). EXTERIOR FOUNDATION DRAINS SHOULD OUTLET INTO THE STONE LAYER OF THE POROUS PAVEMENT STORAGE AND/OR THE STONE INFILTRATION AREA.



Pipe Listing						
Pipe #	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	Material	Pipe Type
PUD1	52.30	50.85	55	0.026	SDR-35	6 Perforated
PUD2	50.85	49.33	50	0.030	SDR-35	6 Perforated
PUD3	50.40	49.33	55	0.019	SDR-35	6 Perforated
PUD4	49.33	49.10	90	0.003	SDR-35	6 See Note 4
PUD5	49.33	49.10	30	0.008	SDR-35	6 Perforated
PDL6	49.10	49.00	20	0.005	HDPE	12 Solid
PDL7	57.00	53.50	65	0.054	SDR-35	8 Solid
PDL8	53.25	52.30	35	0.027	SDR-35	8 See Note 4

- Notes:
- All perforated pipe shall be solid outside of porous pavement areas.
  - Pipe PDL6 to have end section trash guard installed where it daylight (see pipe grate protection detail on sheet D5).
  - Pipe PDL6 to have flared entrance/exit where it daylight (see flared end section detail on sheet D5).
  - Pipes PUD4 and PDL8 are perforated within the extent of the porous pavement and solid elsewhere.
  - Perforated pipes shall have two rows of holes 1/2" in diameter, 5 inches on center, and spaced 120" apart. Perforations shall be mirrored about the y-axis, and both shall be located on the bottom half of the pipe.

Drainage Structure Chart					
Structure #	Structure	Size	Rim	Rim Elevation	Description
YD1	Solid HDPE Pipe Riser	12" Diameter	12" Plastic Round Grate	60.10	See Notes 2 & 4
YD2	Solid HDPE Pipe Riser	12" Diameter	12" Plastic Round Grate	56.00	See Notes 2 & 4
DW3	Concrete Drywell	4' Diameter	NEENAH #R-3570	52.00	See Notes 1-3
DW4	Concrete Drywell	4' Diameter	NEENAH #R-3570	51.80	See Notes 1-3

Notes:

- Proposed drywells to be by Shea Concrete or equal.
- Use temporary SiltSack Type C or equal on all rims during construction (see detail on sheet D3).
- DW3 & DW 4 underlain by Mirafai 140N geotextile fabric extended 4' out in all directions from edge of drywell (see detail on sheet D3).
- Risers are constructed with a 12" HDPE tee fitting into the proposed 12" HDPE perforated underdrain with a solid HDPE pipe extending to the surface with a grate set in the end of the pipe (see detail on sheet D4).

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CLIENT:

**EMANUEL ENGINEERING**  
civil & structural consultants, land planners  
118 PORTSMOUTH AVENUE, A202  
STRATHAM, NH 03885  
P: 603-772-4400 F: 603-772-4487  
WWW.EMANUELENGINEERING.COM

RICHMOND PROPERTY GROUP  
333 N. ALABAMA ST.  
INDIANAPOLIS, IN 46204

TITLE:

**GRADING & DRAINAGE PLAN**  
FOR  
RICHMOND PROPERTY GROUP  
ELIZABETH DEMERITT HOUSE  
18 GARRISON AVENUE (SITE)  
DURHAM, NH 03824

PROJECT:	SCALE:	SHEET:
19-083	1"=20'	C3



**LEGEND**

- BOUND FOUND
- IRON PIPE FOUND
- (TYP) TYPICAL
- PPP PROPOSED POROUS PAVEMENT
- PTP PROPOSED TRAD. PAVEMENT
- VGC VERTICAL GRANITE CURB
- SGC SLOPED GRANITE CURB
- BC BITUMINOUS CURB
- PROPERTY LINE
- EDGE OF PAVEMENT (EOP)
- EOP WITH CURB
- UG UNDERGROUND UTILITIES
- OHE OVERHEAD UTILITIES
- W WATER LINE
- S SEWER LINE
- G GAS LINE
- IRON FENCE
- GUARD RAIL
- EDGE OF WETLANDS
- UTILITY POLE
- LIGHT POLE
- WETLANDS
- BOLLARD
- ELECTRICAL METER
- SEWER MANHOLE
- CATCH BASIN
- SEWER CLEANOUT
- WATER VALVE
- TREE
- PARKING SPACES IN ROW
- COMPACT PARKING SPOT
- LANDSCAPING
- FEMA FLOOD ZONE X

EDGE OF PAVEMENT OR END OF PARKING ROW

4" WHITE PAINT

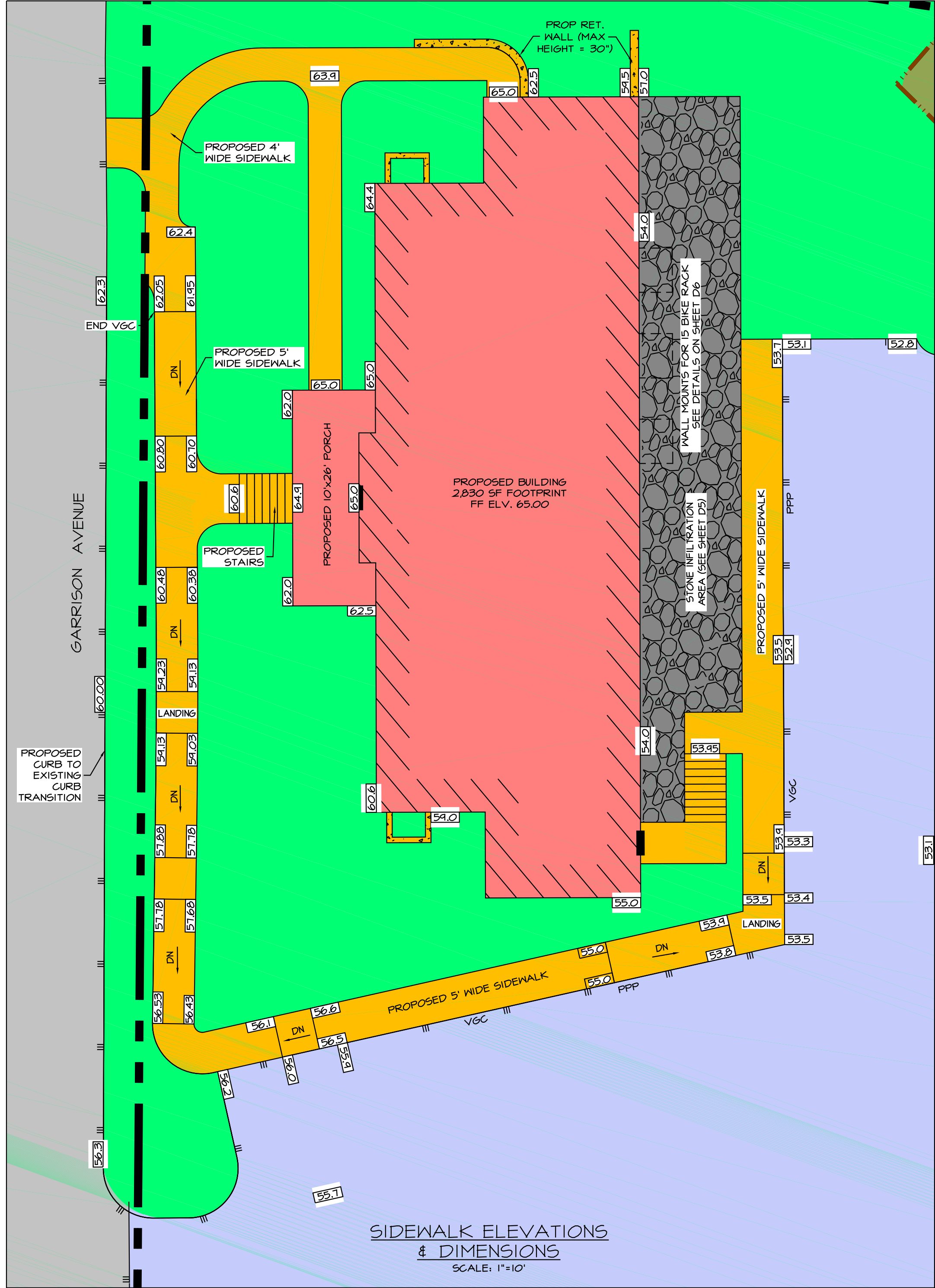
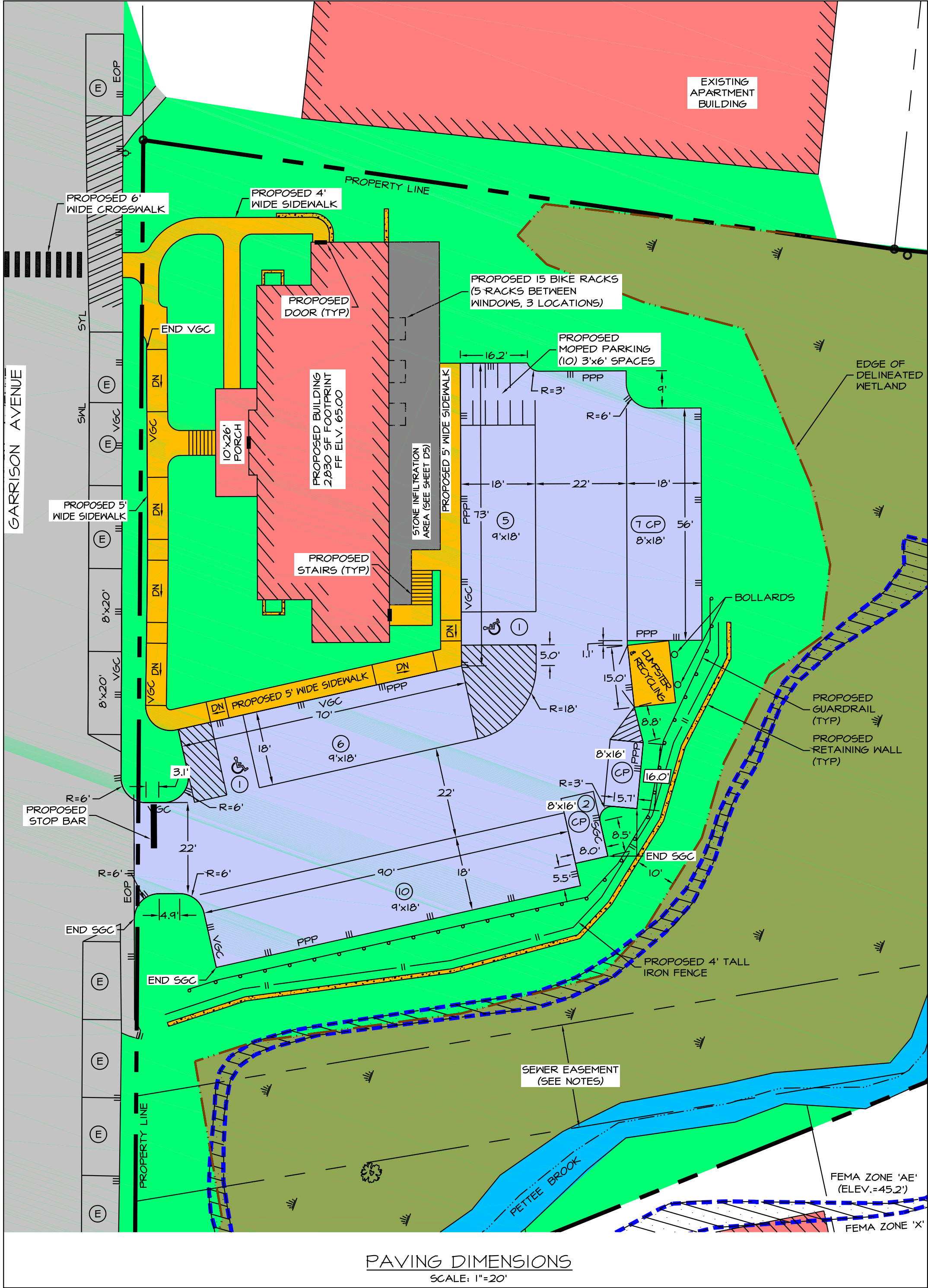
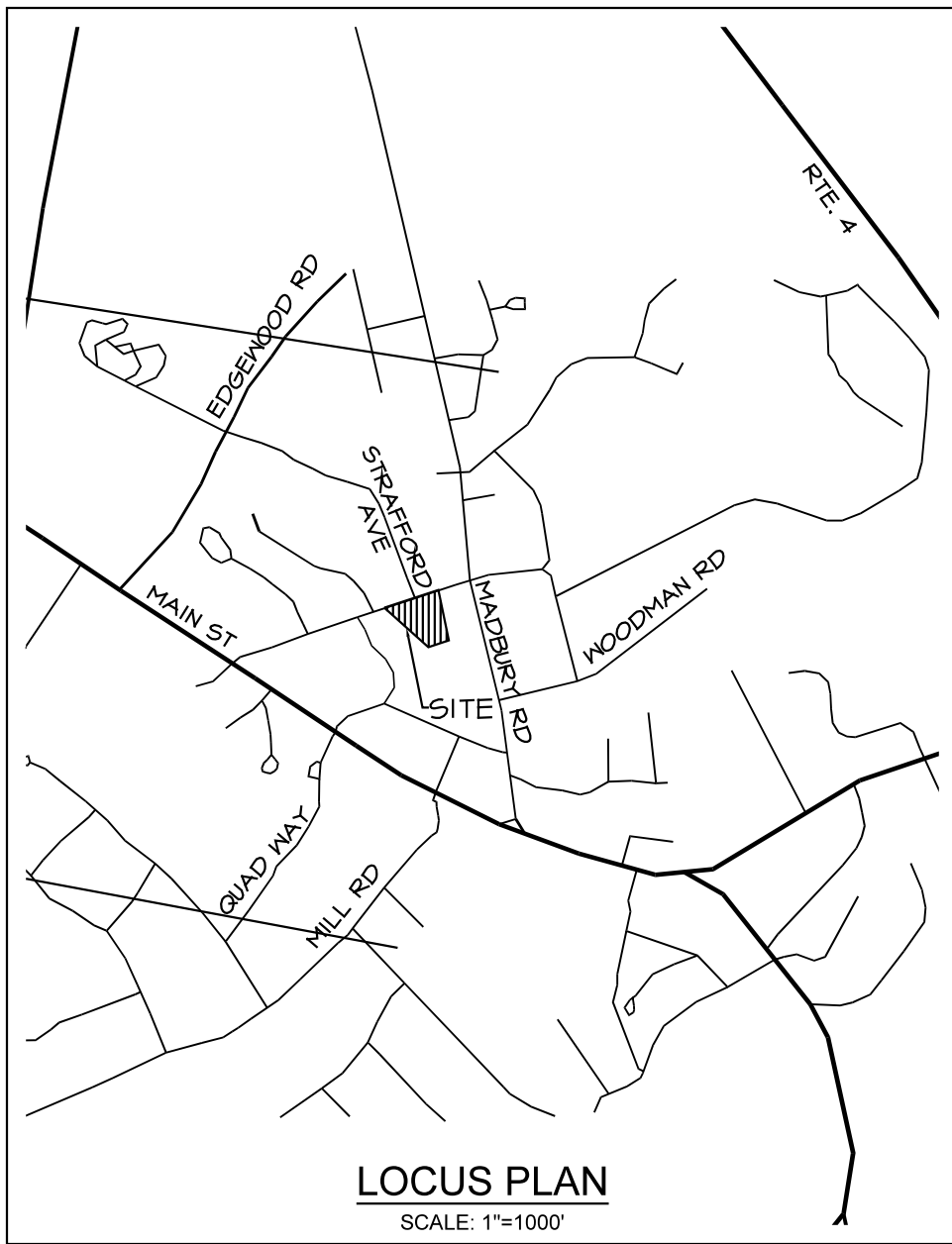
STANDARD PARKING SPACE

10" WHITE PAINT STOP BAR

**PAINTING NOTES:**

- ALL PAINTING TO BE REFLECTIVE.
- SEE SHEET D4 FOR DETAILS ON PARKING STALLS FOR THE PHYSICALLY CHALLENGED.
- SEE PLAN FOR STANDARD AND COMPACT PARKING STALL DIMENSIONS.

**PAINT STRIPING DETAILS**  
NOT TO SCALE



**NOTES:**

- OWNER OF RECORD:  
TAX MAP 2, LOT 12-12  
RICHMOND PROPERTY GROUP  
333 N. ALABAMA ST.  
INDIANAPOLIS, IN 46204  
SGRD BK 4626 PG 647
- THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION, SIZE, PAVING, AND RADII OF THE DRIVEWAY, PARKING LOT, CURBING, AND SIDEWALKS WITHIN THE SITE.
- PARCEL IS ZONED CENTRAL BUSINESS (CB) PER THE 2006 DURHAM ZONING DISTRICT MAP.
- A PORTION OF THE PARCEL IS IN A FLOOD HAZARD ZONE; REFERENCE FLOOD INSURANCE RATE MAP 33017C0318E, DATED SEPTEMBER 30, 2015.
- SURVEY FIELDWORK CONDUCTED BY DOUCET SURVEY, LLC IN AUGUST, 2019.
- SOILS AND WETLANDS WERE DELINEATED BY GZA GEOTECHNICAL, INC. DURING AUGUST, 2019.
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**REFERENCE PLANS:**

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- "UNIVERSITY OF NEW HAMPSHIRE GARRISON AVENUE AREA" DATED SEPTEMBER 16, 1951 BY G.L. DAVIS & ASSOCIATES.

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7	APR 21, 2021	FOR APPROVAL	
1	MAR 24, 2020	FOR APPROVAL	

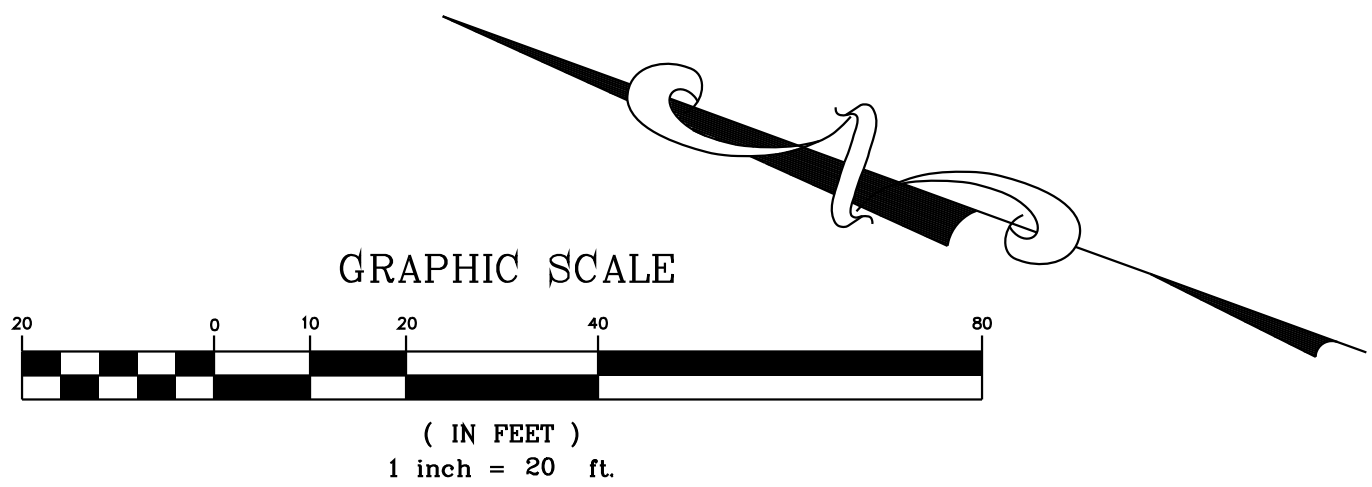
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333 N. ALABAMA ST.  
INDIANAPOLIS, IN 46204

TITLE:  
**PAVING & CURBING PLAN**  
FOR  
**RICHMOND PROPERTY GROUP**  
ELIZABETH DEMERRITT HOUSE  
18 GARRISON AVENUE (SITE)  
DURHAM, NH 03824

PROJECT:	SCALE:	SHEET:
19-083	AS SHOWN	C4





EROSION AND SEDIMENTATION CONTROL CONSTRUCTION PHASING AND SEQUENCING:

1. SEE "EROSION AND SEDIMENTATION CONTROL GENERAL NOTES" WHICH ARE TO BE AN INTEGRAL PART OF THIS PROCESS.
2. INSTALL SILT FENCINGS AND/OR HAY BALE BARRIERS AS PER DETAILS AND AT SEDIMENT MIGRATION.
3. CONSTRUCT TREATMENT SHALES , LEVEL SPREADERS AND DETENTION STRUCTURES AS DEPICTED ON DRAWINGS.
4. INSTALL TEMPORARY GRAVEL CONSTRUCTION ENTRANCES( AS PER DETAIL, AND AT LOCATIONS SHOWN ON THE DRAWINGS. MAINTAIN (TOP DRESS) REGULARLY TO PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC STREETS.
5. STRIP AND STOCKPILE TOPSOIL. STABILIZE PILES OF SOIL CONSTRUCTION MATERIAL.
6. ROUGH GRADE SITE. INSTALL CULVERTS AND ROAD DITCHES.
7. FINISH GRADE AND COMPACT SITE.
8. RE-SPREAD AND ADD TOPSOIL TO ALL ROADSIDE SLOPES. TOTAL TOPSOIL THICKNESS TO BE A MINIMUM OF FOUR TO SIX INCHES.
9. STABILIZE ALL AREAS OF BARE SOIL WITH MULCH AND SEEDING.
10. RE-SEED PER EROSION AND SEDIMENTATION CONTROL GENERAL NOTES.
11. SILT FENCING AND HAY BALES TO REMAIN AND BE MAINTAINED FOR TWENTY FOUR MONTHS AFTER CONSTRUCTION TO INSURE ESTABLISHMENT OF ADEQUATE SOIL STABILIZATION AND VEGETATIVE COVER. ALL SILT FENCINGS, HAY BALES AND TRAPPED SILT ARE THEN TO BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.
12. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS.
13. PONDS AND SHALES SHALL BE INSTALLED EARLY ON IN THE CONSTRUCTION SEQUENCE - BEFORE ROUGH GRADING THE SITE.
14. ALL DITCHES AND SHALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
15. ALL ROADWAYS AND PARKING LOTS SHALL BE STABILIZED WITHIN 12 HOURS OF ACHIEVING FINISHED GRADE.
16. ALL CUT AND FILL SLOPES SHALL BE SEEDBED/LOADED WITHIN 12 HOURS OF ACHIEVING FINISH GRADE.
17. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.

WINTER CONSTRUCTION NOTES  
(OCTOBER 15 TO MAY 1):

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 SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING. ELSEWHERE, 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 EVENT.
2. ALL DITCHES OR SHALES 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.
3. AFTER OCTOBER 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.
4. TIMELY MAINTENANCE IS IMPORTANT TO KEEP THE VEGETATION IN THE SHALE IN GOOD CONDITION. MOVING SHOULD BE DONE FREQUENTLY ENOUGH TO KEEP THE VEGETATION IN VIGOROUS CONDITION AND TO CONTROL ENCRAGEMENT OF WEEDS AND WOODY VEGETATION, HOWEVER, IT SHOULD NOT BE MOVED TOO CLOSELY SO AS TO REDUCE THE FILTERING EFFECT. FERTILIZE ON AN "AS NEEDED" BASIS TO KEEP THE GRASS HEALTHY. OVER FERTILIZATION CAN RESULT IN THE SHALE BECOMING A SOURCE OF POLLUTION.
5. THE SHALE SHOULD BE INSPECTED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE THE CONDITION OF THE SHALE. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND RE-VEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.

GRASS SHALE MAINTENANCE:

1. TIMELY MAINTENANCE IS IMPORTANT TO KEEP THE VEGETATION IN THE SHALE IN GOOD CONDITION. MOVING SHOULD BE DONE FREQUENTLY ENOUGH TO KEEP THE VEGETATION IN VIGOROUS CONDITION AND TO CONTROL ENCRAGEMENT OF WEEDS AND WOODY VEGETATION, HOWEVER, IT SHOULD NOT BE MOVED TOO CLOSELY SO AS TO REDUCE THE FILTERING EFFECT. FERTILIZE ON AN "AS NEEDED" BASIS TO KEEP THE GRASS HEALTHY. OVER FERTILIZATION CAN RESULT IN THE SHALE BECOMING A SOURCE OF POLLUTION.
2. THE SHALE SHOULD BE INSPECTED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE THE CONDITION OF THE SHALE. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND RE-VEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.

EROSION AND SEDIMENTATION CONTROL GENERAL NOTES:

1. CONDUCT ALL CONSTRUCTION IN A MANNER AND SEQUENCE THAT CAUSES THE LEAST PRACTICAL DISTURBANCE OF THE PHYSICAL ENVIRONMENT, BUT IN NO CASE SHALL EXCEED 3 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
2. ALL EROSION AND SEDIMENTATION CONTROL MEASURES IN THE PLAN SHALL MEET THE DESIGN BASED ON NEW HAMPSHIRE STORMWATER MANUAL, VOLUMES 1-3. DATED DECEMBER 2008, PREPARED BY NIDES.
3. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
  - BASED COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
  - A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED.
  - A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED.
  - EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
5. SEE WINTER CONSTRUCTION NOTES IF SCHEDULE AND DATES ARE APPLICABLE.
6. ALL DITCHES, SHALES AND PONDS MUST BE STABILIZED PRIOR TO DIRECTING FLOW TO THEM.
7. ALL GROUND AREAS OPENED UP FOR CONSTRUCTION WILL BE STABILIZED IN THE SHORTEST PRACTICAL TIME. ALL SOILS FINISH GRADED MUST BE STABILIZED WITHIN SEVENTY TWO HOURS OF DISTURBANCE.
8. EMPLOY TEMPORARY EROSION AND SEDIMENTATION CONTROL DEVICES AS DETAILED ON THIS PLAN AS NECESSARY UNTIL ADEQUATE STABILIZATION HAS BEEN ASSURED.
9. TEMPORARY & LONG TERM SEEDING: USE SEED MIXTURES, FERTILIZER, LIME AND MULCHING AS RECOMMENDED (SEE SEEDING AND STABILIZATION NOTES).
10. STRAW OR HAY BALE BARRIERS AND SILTATION FENCING TO BE SECURELY EMBEDDED AND STAKED AS DETAILED. WHEREVER POSSIBLE A VEGETATED STRIP OF AT LEAST TWENTY FIVE FEET IS TO BE KEPT BETWEEN SILT FENCE AND ANY EDGE OF WET AREA.
11. SEEDDED AREAS WILL BE FERTILIZED AND RE-SEEDDED AS NECESSARY TO ENSURE VEGETATIVE ESTABLISHMENT.
12. SEDIMENT BASINS(, IF REQUIRED, TO BE CHECKED AFTER EACH SIGNIFICANT RAINFALL AND CLEANED AS NEEDED TO RETAIN DESIGN CAPACITY.
13. STRAW BALE AND/OR SILT FENCE BARRIERS WILL BE CHECKED REGULARLY AND AFTER EACH SIGNIFICANT RAINFALL. NECESSARY REPAIRS WILL BE MADE TO CORRECT UNDERMINING OR DETERIORATION OF THE BARRIER. AS WELL AS CLEANING, REMOVAL AND PROPER DISPOSAL OF TRAPPED SEDIMENT.
14. TREATMENT SHALES WILL BE CHECKED WEEKLY AND REPAIRED WHEN NECESSARY UNTIL ADEQUATE VEGETATIVE COVER HAS BEEN ESTABLISHED.
15. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:55 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
16. TEMPORARY WATER DIVERSION (SHALES, BASINS, ETC.) MUST BE USED AS NECESSARY UNTIL AREAS ARE STABILIZED.

1. FOR TEMPORARY & LONG TERM SEEDINGS (BY SEPTEMBER 15 OF THE SAME YEAR OF DISTURBANCE) USE AGWAY'S SOIL CONSERVATION GRASS SEED OR EQUAL.
2. COMPONENTS: ANNUAL RYE GRASS, PERENNIAL RYE GRASS, WHITE CLOVER, 2 FESCUES, SEED AT A RATE OF 100 POUNDS PER ACRE.
3. FERTILIZER & LIME: NITROGEN (N) 50 LBS/ACRE, PHOSPHATE (P2O5) 100 LBS/ACRE, POTASH (K2O) 100 LBS/ACRE, LIME 2000 LBS/ACRE.
4. MULCH: HAY OR STRAW 1.5-2 TONS/ACRE.
5. GRADING AND SHAPING: SLOPES GREATER THAN 2:1; 3:1 SLOPES OR FLATTER ARE PREFERRED. WHERE MOVING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
6. SEED BED PREPARATION - SURFACE AND TOP SOIL SEEDING WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS. - STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA, WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND MIX FERTILIZER AND LIME INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.

STABILIZATION CONSTRUCTION ENTRANCE SPECIFICATIONS:

1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH STONE (MINIMUM), RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 75 FEET (OR 50 FEET WITH A 3 TO 6 INCH MOUNTABLE BERM).
3. THE THICKNESS OF THE STONE FOR THE STABILIZATION ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICHEVER IS GREATER.
5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARDS 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. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING OF ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED PROMPTLY.
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.

FILTREXX LAND IMPROVEMENT SYSTEMS INSPECTION & MAINTENANCE:

1. CONSULT FILTREXX SHIPP CUT SHEETS FOR ALL FILTREXX PRODUCTS PRIOR TO INSTALLATION AND FOR MAINTENANCE GUIDELINES. [HTTP://WWW.FILTREXX.COM/DESIGN/CUT\\_SHEETS.HTM](http://www.filtrex.com/design/cut_sheets.htm)
2. ROUTINE INSPECTION SHOULD BE CONDUCTED WITHIN 24 HRS OF A RAINFALL EVENT OR AS DESIGNATED BY THE REGULATING AUTHORITY. UNITS SHOULD BE REGULARLY INSPECTED TO MAKE SURE THEY MAINTAIN THEIR SHAPE AND ARE PRODUCING ADEQUATE HYDRAULIC FLOW-THROUGH, DITCH/CHANNEL EROSION CONTROL, AND SEDIMENT REMOVAL.
3. IF PONDING BECOMES EXCESSIVE, ADDITIONAL CHECK DAMS, LEVEL SPREADERS, OR SEDIMENT CONTROL UNITS FOR SEDIMENT REMOVAL MAY BE REQUIRED.
4. SEDIMENT ACCUMULATION SHOULD BE REMOVED ONCE IT REACHES THE HEIGHT OF THE CHECK DAM OR UNIT. ALTERNATIVELY, ANOTHER UNIT MAY BE INSTALLED SLIGHTLY UPSLOPE, ON TOP OF THE EXISTING ONE. THIS PROCESS IS NOT CONSIDERED A SOIL DISTURBING ACTIVITY.
5. STORM DEBRIS ACCUMULATION BEHIND CHECK DAMS, LEVEL SPREADER, SEDIMENT CONTROL UNIT, ETC. SHOULD NEVER BE HIGHER THAN THE SIDES OF THE CHECK DAM/UNIT. STORM RUNOFF FROM FLOW SHALL MAINTAIN THE FUNCTIONAL CONDITION AT ALL TIMES AND IT SHALL BE ROUTINELY INSPECTED.
6. IF A UNIT HAS BEEN DAMAGED, IT SHALL BE REPAIRED, OR REPLACED IF BEYOND REPAIR.
7. THE CONTRACTOR SHALL REMOVE SEDIMENT AT THE BASE OF THE UPSLOPE SIDE OF UNITS WHEN ACCUMULATION HAS REACHED 1/2 OF THE EFFECTIVE HEIGHT OF THE SOXX, OR AS DIRECTED BY THE ENGINEER.
8. AS AN ALTERNATIVE, ANOTHER SOXX UNIT MAY BE INSTALLED ADJACENT AND PARALLEL TO THE UPSLOPE SIDE OF THE ORIGINAL TO INCREASE SEDIMENT STORAGE CAPACITY. SOXX SEDIMENT BACKUP IN CENTER OF THE DITCH/CHANNEL SHALL REMAIN LOWER THAN THE SIDES.
9. IF SOXX UNIT BECOMES CLOGGED WITH DEBRIS AND SEDIMENT, IMMEDIATE REMOVAL OF DEBRIS AND SEDIMENT SHOULD BE CONDUCTED TO ASSURE PROPER DRAINAGE AND WATER FLOW THROUGH THE DITCH OR CHANNEL. STORM RUNOFF OVERFLOW OF THE SOXX UNIT IS ACCEPTABLE.
10. SOXX UNITS SHALL BE MAINTAINED UNTIL DISTURBED AREA AROUND THE DEVICE HAS BEEN PERMANENTLY STABILIZED AND CONSTRUCTION ACTIVITY HAS CEASED.
11. THE FILTERMEDIATM MAY BE DISPersed ON SITE ONCE DISTURBED AREA HAS PERMANENTLY STABILIZED, CONSTRUCTION ACTIVITY CEASED, OR DETERMINED BY THE ENGINEER.
12. PERMANENT VEGETATED FILTER STRIPS WILL BE LEFT INTACT.

SECTION I- GENERAL (POROUS ASPHALT PAVEMENTS)

- 1.01 SUBMITTALS
  - A. THE CONTRACTOR SHALL SUBMIT TO THE SUPERVISORY ENGINEER THE PROPOSED SOURCE AND QUALIFICATIONS OF THE PROPOSED SOURCE(S) OF THE HOT MIX ASPHALT AT LEAST 14 DAYS IN ADVANCE OF ANTICIPATED PAVING DATE.
  - B. THE CONTRACTOR SHALL SUBMIT TO THE SUPERVISORY ENGINEER THE PROPOSED INSTALLER QUALIFICATIONS AT LEAST 14 DAYS IN ADVANCE OF ANTICIPATED PAVING DATE.
  - C. THE CONTRACTOR SHALL SUBMIT TO THE SUPERVISORY ENGINEER THE CONTRACTOR'S PROPOSED CONSTRUCTION PHASING PLAN AT LEAST 14 DAYS IN ADVANCE OF MOBILIZING TO THE SITE FOR CONSTRUCTION. UPDATES TO THE CONSTRUCTION PHASING PLAN SHALL BE PROVIDED TO THE SUPERVISORY ENGINEER AT LEAST 48 HOURS IN ADVANCE OF THE PROPOSED. THE CONSTRUCTION PHASING PLAN SHALL CONTAIN THE ELEMENTS AS DETAILED WITHIN THIS SECTION AND DRAWINGS.
  - D. THE CONTRACTOR SHALL SUBMIT TO THE SUPERVISORY ENGINEER THE PROPOSED THIRD PARTY QUALITY CONTROL FIRM TO CONDUCT THIRD PARTY QUALITY CONTROL OF THE ASPHALT HOT MIX PLANT PRODUCTION AT LEAST 14 DAYS IN ADVANCE OF ANTICIPATED PAVING DATE.
  - E. THE CONTRACTOR SHALL SUBMIT TO THE SUPERVISORY ENGINEER THE QUALITY CONTROL RESULTS AND JOB MIX FORMULA FOR THE POROUS ASPHALT MATERIAL AT LEAST 14 DAYS IN ADVANCE OF THE ANTICIPATED PAVING DATE.
- 1.02 QUALIFICATIONS
  - A. THE POROUS ASPHALT SHALL BE SUPPLIED FROM A HOT MIX MATERIAL PROVIDER THAT HAS THE FOLLOWING MINIMUM QUALIFICATIONS:
    1. SHALL HAVE SUCCESSFULLY PRODUCED A MINIMUM OF THREE (3) POROUS ASPHALT PAVING JOBS IN THE PAST FIVE (5) YEARS.
    2. CAPABLE OF PRODUCING POROUS ASPHALT WITH A PG16-28 BINDER, UNDER NO CIRCUMSTANCES IS A PGAB 64-28 ACCEPTABLE IN REPLACE OF PG 16-28.
    3. CAPABLE OF CONDUCTING THE MATERIALS TESTING FOR QUALITY CONTROL AS DOCUMENTED IN SECTION IV PART 4, TABLE 3, TABLE 4, TABLE 5.
    4. CAPABLE OF PROVIDING MATERIAL CERTIFICATES SIGNED BY THE PLANTS' AUTHORIZED REPRESENTATIVE, AND
    5. CAPABLE OF PROVIDING THE MOST RECENT ANNUAL PLANT SCALE TESTING DOCUMENTATION.
  - B. THE POROUS ASPHALT INSTALLER SHALL HAVE THE FOLLOWING MINIMUM QUALIFICATIONS:
    1. SHALL HAVE SUCCESSFULLY COMPLETED A MINIMUM OF THREE (3) POROUS ASPHALT PAVING JOBS IN THE PAST FIVE (5) YEARS.
    2. PROVIDE A SITE SUPERINTENDENT THAT WILL BE ON-SITE DURING THE PROJECT THAT HAS SUCCESSFULLY COMPLETED A MINIMUM OF THREE (3) POROUS ASPHALT PAVING JOBS IN THE PAST FIVE (5) YEARS.

- 1.03 TRANSPORTATION AND SHIPPING
  - A. POROUS ASPHALT MATERIALS SHALL BE TRANSPORTED TO THE SITE SUCH THAT THE TEMPERATURE OF THE ASPHALT AT THE TIME OF DISCHARGE FROM THE HAUL VEHICLE SHALL BE AS PER SECTION IV - 3.05 E TEMPERATURE REQUIREMENTS, UNLESS OTHERWISE SPECIFIED BY THE HOT MIX PLANT AND APPROVED BY THE SUPERVISORY ENGINEER.
- 1.04 ENVIRONMENTAL CONDITIONS
  - A. THE ASPHALT PAVING CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING AS NECESSARY AND SEDIMENT CONTROLS THAT ARE DAMAGED FROM PAVING ACTIVITIES.
  - B. WASTE GENERATED DURING ASPHALT PAVING SHALL BE PROMPTLY DISPOSED OF IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND LOCAL, STATE, AND FEDERAL REGULATIONS.
  - C. ASPHALT HAUL TRUCKS SHALL EXIT THE SITE THROUGH THE DESIGNATED STABILIZED CONSTRUCTION ENTRANCE TO PREVENT TRACK OUT.
- 1.05 SCHEDULE FOR CONSTRUCTION DATES
  - A. AFTER MAY 15 OR THE DATE OF ASPHALT PLANT OPENING UNTIL DECEMBER 1 OR THE DATE OF ASPHALT PLANT CLOSURE OR PER APPROVAL OF SUPERVISING ENGINEER.
- 1.06 REQUIREMENTS FOR CONSTRUCTION PHASING
  - A. CONSTRUCTION PHASING, SEQUENCING AND ENGINEERING OVERSIGHT IS REQUIRED TO ENSURE THE SUCCESSFUL PRODUCTION, INSTALLATION, AND LONG-TERM PERFORMANCE OF POROUS PAVEMENT SYSTEMS. PROPER COORDINATION OF THESE PROCEDURES WITH THE CONTRACTOR AND INSPECTION OF THE PAVEMENT SUBGRADE DURING CONSTRUCTION IS CRITICAL TO PROVIDE ACCESS AND PREVENT DAMAGE TO POROUS PAVEMENT SYSTEM COMPONENTS. TEMPORARY CONSTRUCTION METHODS AND PHASING CONSIDERATIONS ACCOUNT FOR THE NECESSARY USE OF LARGE CONSTRUCTION EQUIPMENT OVER THE POROUS PAVEMENT LAYERS WHILE MAINTAINING ITS STRUCTURAL INTEGRITY AND INFILTRATIVE CAPACITY. THE CONTRACTOR'S CONSTRUCTION PHASING SEQUENCE PLAN SHALL INCLUDE PROTECTIVE AND PROTECTIVE ACTIONS DETAILED BELOW FOR EXPECTED IMPACTS FROM CONSTRUCTION ACTIVITIES.
  - B. THE FOLLOWING CONSTRUCTION PHASING IS REQUIRED. ANY CONSTRUCTION MUST BE PLANNED SUCH THAT NO CONSTRUCTION TRAFFIC IS PERMITTED ON A COMPLETED POROUS ASPHALT WEARING COURSE SURFACE AREA. CONSTRUCTION TRAFFIC IS PERMITTED ON THE TEMPORARY CONSTRUCTION ROAD, SUBGRADE AND ON THE SUBBASE DURING PREPARATION. THE USE OF A TEMPORARY POROUS ASPHALT CONSTRUCTION ROAD SHOULD ENABLE CONSTRUCTION TRAFFIC TO PROCEED WITH PHASED COMPLETION AND CLOSURE OF AREAS. INFILTRATION BEDS WILL NEED TO BE PROTECTED FROM CONSTRUCTION AND SEDIMENTATION RUN-ON. IT IS RECOMMENDED THAT AREAS ARE COMPLETED INCREMENTALLY UNTIL PAVING IS COMPLETED. THE PHASING PLAN WILL BE ADAPTED BASED ON THE FEEDBACK WITH THE CLIENT, THE SUPERVISORY ENGINEER, AND THE CONTRACTOR.

- C. THE CONTRACTOR SHALL INCLUDE THE ELEMENTS OF THIS PHASING IN THE CONTRACTOR'S CONSTRUCTION PHASING PLAN.
  1. CONTRACTOR SUBMITTALS AND APPROVALS
  2. HOST A PRE-CONSTRUCTION MEETING AT THE SITE
  3. EROSION AND SEDIMENTATION CONTROL BMPs ESTABLISHED INCLUDING SEDIMENTATION POND AT DOWNHILL END OF SITE. POROUS PAVEMENT RESERVOIRS MAY BE USED FOR TEMPORARY SEDIMENTATION PONDS. ACCUMULATED FINES SHALL BE REMOVED PRIOR TO PLACEMENT OF AGGREGATE AND APPROVED BY THE SUPERVISING ENGINEER.
  4. ROUGH GRADE SITE (CUT/FILL)
  5. FINE GRADE SUBGRADE
  6. PERFORM TOPOGRAPHICAL SURVEY OF SUBGRADE
  7. SUPERVISORY ENGINEER TO INSPECT SUBGRADE AND PERFORM INFILTRATION TESTS TO VERIFY SUITABILITY OF SUBGRADE FOR COMPACTION DURING CONSTRUCTION OR WHERE EROSION HAS CAUSED ACCUMULATION OF FINE MATERIALS. REMORK MATERIALS THAT DO NOT MEET INFILTRATION REQUIREMENTS PER THE DRAWINGS AND SPECIFICATIONS. THESE MATERIALS SHALL BE REMOVED AND/OR SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES, AND RETESTED FOR COMPACTION AND INFILTRATION AS PER SPECIFICATIONS.
  8. INSTALL GEOTEXTILE VERTICAL BARRIERS PLACED ALONG PERIMETER OF POROUS PAVEMENT PARKING AREA PER THE DRAWINGS.
  9. INSTALL CAPILLARY BARRIER AND GEOTEXTILE INTERNAL GRADE CONTROLS
  10. PLACE UTILITIES OVER THE GRADED CAPILLARY BARRIER LAYER
  11. PLACE AND COMPACT FILTER COURSE PER THIS SECTION
  12. SUPERVISORY ENGINEER TO INSPECT FILTER COURSE AND PERFORM INFILTRATION TESTS TO VERIFY SUITABILITY OF COMPACTION AND INFILTRATION PER THIS SECTION.
  13. PLACE AND GRADE CHOKER COARSE INFILTRATION COURSE
  14. PLACE AND COMPACT POROUS ASPHALT BINDER COURSE.

- 1.07 PLACEMENT OF TEMPORARY ROAD OF POROUS ASPHALT BINDER COURSE
  - A. INSTALL AT THICKNESS INDICATED ON DRAWINGS (IN PLACE) LAYER OF BINDER COURSE PER THIS SECTION.
  - B. INSTALL FRAME, GRATES, AND LANDSCAPING. SPECIAL CARE IS TO BE TAKEN TO PROTECT FRESH BINDER COURSE.
  - C. ALL TRUCKS (INCLUDING CONCRETE TRUCKS) WILL BE STOPPED PRIOR TO ENTERING THE SITE AND INSTRUCTED AS TO SPECIAL CONCERNS FOR PAVEMENT DURABILITY.
  - D. A WASHOUT AREA FOR ALL CONCRETE TRUCKS SHALL BE DESIGNATED OUTSIDE OF POROUS PAVEMENT AREA ON THE CONTRACTOR'S EROSION AND SEDIMENT CONTROL PLAN.
  - E. POROUS PAVEMENT SURFACE SHALL BE PROTECTED ON HOT DAYS DURING THE PAVEMENT CURE PERIOD (2-3 DAYS). SURFACE TEMPERATURES CAN QUICKLY REACH OVER 145°F IN DIRECT SUN.
  - F. A TEMPERATURE GUN SHALL BE AVAILABLE ON-SITE TO ASSESS PAVEMENT SURFACE TEMPERATURES. PAVEMENT TEMPERATURES GREATER THAN 100°F SHOULD BE OBSERVED CAREFULLY FOR PAVEMENT DURABILITY. AS NEEDED, COOLING OF PAVEMENT SURFACE BY APPLICATION OF WATER FROM A WATER TRUCK SHOULD OCCUR WHEN HEAVY VEHICULAR TRAFFIC IS EXPECTED SUCH AS CONCRETE TRUCKS FOR DRY WELL FRAME AND GRATE INSTALLATION. IN THE EVENT THIS IS INEFFECTIVE FOR COOLING AND PAVEMENT DEFORMATION IS STILL OBSERVED, THE USE OF 3/4" PLYWOOD UNDER LARGE VEHICLE WHEELS MAY BE REQUIRED.
  - G. TRUCKS AND OTHER CONSTRUCTION TRAFFIC WILL NOT BE ALLOWED TO ACCESS THE SITE WHILE THE PAVEMENT IS EXCESSIVELY HOT (80°F OR HIGHER). IF UNACCEPTABLE DAMAGE IS OBSERVED, COSMETIC DAMAGE TO BINDER COURSE IS ACCEPTABLE NOT INCLUDING LOSS OF INFILTRATION CAPACITY.
  - H. NO STOCKPILING OF MATERIALS (E.G. SOIL, STONE, LIME, OR OTHER INFILTRATION MATERIALS) WILL BE ALLOWED ON POROUS PAVEMENTS.
  - I. MATERIALS EXCAVATED FOR FINISH WORKS SHALL BE PLACED OUTSIDE OF POROUS PAVEMENT AREAS.
  - J. VACUUMING THROUGHOUT CONSTRUCTION MAY BE NECESSARY FOR SURROUNDING PAVED AREAS TO PREVENT RUN-ON OR TRACKING ONTO POROUS PAVEMENTS. FREQUENCY SHALL BE ADJUSTED AS NEEDED.
  - K. REPEAT PHASE I AND 2 INCREMENTALLY UNTIL FULL PAVING IS COMPLETED.

SECTION II-PAVEMENT SUBGRADE (POROUS ASPHALT PAVEMENTS)

- PART I EXECUTION
  - 1.01 EXAMINATION
    - A. EXAMINE SPACES TO BE FILLED BEFOREHAND AND REMOVE ALL UNSUITABLE MATERIALS AND DEBRIS INCLUDING SHEETING, FORMS, TRASH, STUMPS, PLANT LIFE, ETC.
    - B. INSPECT BACKFILL AND FILL MATERIALS BEFOREHAND AND REMOVE ALL UNSUITABLE MATERIALS INCLUDING VEGETATION, ORGANIC MATTER, OR OTHER FOREIGN DEBRIS. STONES LARGER THAN 12 INCHES IN ANY DIMENSION SHALL ALSO BE REMOVED OR BROKEN INTO SMALLER PIECES.
    - C. NO BACKFILL OR FILL MATERIAL SHALL BE PLACED ON FROZEN GROUND NOR SHALL THE MATERIAL ITSELF BE FROZEN OR CONTAIN FROZEN SOIL FRAGMENTS.
    - D. SPACES TO BE FILLED SHALL BE FREE FROM STANDING WATER SO THAT PLACEMENT AND COMPACTION OF THE FILL MATERIALS CAN BE ACCOMPLISHED IN DRY CONDITIONS.
    - E. ALL UNDERGROUND UTILITIES, INCLUDING CULVERTS, SHALL BE COMPLETED, BACKFILLED AND COMPACTED PRIOR TO COMPLETION OF SUBGRADE.
    - F. VERIFY THAT TRAFFIC CONTROLS AND EROSION AND SEDIMENT CONTROLS ARE IN PLACE.

- 1.02 PREPARATION
  - A. TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE INSTALLED PRIOR TO CONSTRUCTION OF SUBGRADE.
  - B. TAKE ANY OTHER NECESSARY STEPS TO PREVENT SEEDING FROM GROWING AND CONTAIN INFILTRATION BEDS DURING CONSTRUCTION. WHEN THE SITE IS FULLY STABILIZED, TEMPORARY SEDIMENT CONTROL DEVICES SHALL BE REMOVED FROM THE SITE.
  - C. TEMPORARY DRAINS AND DITCHES SHALL BE CONSTRUCTED AS NECESSARY TO REMOVE WATER FROM THE SUBGRADE AREA.
    1. TEMPORARY (AGGREGATE BASE COURSE), IN EXISTING CATCH BASINS MAY BE MADE IN A MANNER ACCEPTABLE TO THE ENGINEER. SUCH OPENINGS TO BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.
  - 2. CONTRACTOR TO PREVENT THE ENTRANCE OF DEBRIS, STONES AND SILT FROM ENTERING DRAINAGE SYSTEMS, INCLUDING THE USE OF BALES OF HAY, SCREENS AND OTHER DESILTING METHODS.
  - D. BACKFILLED AREAS SHALL BE RETESTED AT THE DISCRETION OF THE ENGINEER.
  - E. MINIMIZE TRAFFIC AND COMPACTION UPON SUBGRADE.
  - F. IN MOST INSTANCES TRAVEL UPON SUBGRADE IS UNAVOIDABLE, AND A CAREFUL ASSESSMENT OF DEGREE OF SUBGRADE COMPACTION IS NEEDED. TILLING AND REMOVAL OF COMPACTED SUBGRADE MAY BE NEEDED.
  - G. SUBGRADE COMPACTION DURING EXCAVATION OR WHERE EROSION HAS CAUSED ACCUMULATION OF FINE MATERIALS, THIS MATERIAL SHALL BE REMOVED AND/OR SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES. PRIOR TO PLACEMENT OF THE AGGREGATE RESERVOIR (AGGREGATE BASE COURSE), THE INFILTRATION RATE OF THE SUBGRADE SHALL BE DETERMINED BY ASTM D3985 OR APPROVED ALTERNATE AT THE DISCRETION OF THE ENGINEER. THE INFILTRATION RATE OF THE SUBGRADE SHALL BE DETERMINED BY AASHTO T 191 (SAND-CONE METHOD), AASHTO T 204 (DRIVE CYLINDER METHOD), OR AASHTO T 238 (NUCLEAR METHODS), OR OTHER APPROVED METHODS AT THE DISCRETION OF THE ENGINEER.
  - K. UNSUITABLE MATERIALS SHALL BE REMOVED AND REWORKED TO THE SATISFACTION OF THE ON-SITE ENGINEER.
  - L. UPON COMPLETION OF SUBGRADE WORK, THE ENGINEER SHALL BE NOTIFIED AND SHALL INSPECT AT HIS/HER DISCRETION BEFORE PROCEEDING WITH THE POROUS MEDIA BED INSTALLATION.

- 1.03 FIELD QUALITY CONTROL
  - A. FOR COMPACTION REQUIREMENTS SEE TABLE 2.
  - B. TOLERANCE: THE FINAL SUBGRADE SURFACE SHALL NOT VARY MORE THAN 1/2" INCH FROM THE DESIGN GRADE ELEVATION AT ANY LOCATION, PARALLEL TO THE FINAL ROAD SURFACE AS DEFINED BY THE TOTAL ROADWAY THICKNESS.
  - C. PROOF ROLLED - PRIOR TO THE PLACEMENT OF THE NEXT PAVEMENT COURSE, THE SUBGRADE SURFACE SHALL BE PROOF ROLLED TO LOCATE AREAS OF INADEQUATE COMPACTION OR DEFLECTIONS OR SOFT OR RUTTING AREAS REQUIRING UNDERCUTTING, WITH 8" TO 10-INCH RHEUMATIC TIRE COMPACTOR.
    1. AREAS OF INADEQUATE COMPACTION TO BE RECOMPACTED.
    2. IF ADDITIONAL ROLLING DOES NOT CORRECT AN AREA OF INADEQUATE COMPACTION, THEN THIS AREA AND SOFT OR RUTTED AREAS SHALL BE REMOVED AND REPLACED WITH SELECT ON-SITE MATERIAL AND RECOMPACTED.
    3. WHERE NO SUITABLE ON-SITE MATERIAL IS AVAILABLE, GRANULAR MATERIALS SHALL BE INSTALLED AND COMPACTED; AREAS INACCESSIBLE TO EQUIPMENT SHALL BE COMPACTED BY MECHANICAL METHODS.

SECTION III: AGGREGATE BASE COURSE (POROUS ASPHALT PAVEMENTS)

- PART I EXECUTION
  - 1.01 EXAMINATION
    - A. VERIFY THAT PAVEMENT SUBGRADE HAS BEEN ACCEPTED FOR PLACEMENT OF AGGREGATE BASE COURSE.
      1. GRADIENTS, CROWNS AND ELEVATIONS ARE CORRECT.
      2. SUBGRADE IS DRY.
      3. PRIOR TO PLACEMENT OF THE AGGREGATE, THE INFILTRATION RATE OF THE SUBGRADE SHALL BE DETERMINED BY ASTM D3985 OR APPROVED ALTERNATE AT THE DISCRETION OF THE ENGINEER. THE INFILTRATION RATE SHALL BE NO LESS 5-30 FT/DAY OR 50% OF THE HYDRAULIC CONDUCTIVITY (D2434) AT 95% STANDARD PROCTOR COMPACTION.
    - B. VERIFY THAT TRAFFIC CONTROLS ARE IN PLACE.
- 1.02 EDGE LINER INSTALLATION
  - A. EDGE GEOTEXTILE OR PVC LINER SHALL BE PLACED IMMEDIATELY AFTER APPROVAL OF SUBGRADE PREPARATION.
  - B. ACTION: THE LINER IS TO BE PLACED ALONG THE ENTIRE PERIMETER OF THE VERTICAL WALLS OF BOTH SIDES OF THE EXCAVATION AND LOCATED BEHIND THE CURB, SIDEWALK, OR TRAVELWAY. THE LINER SHALL BE PLACED AT LOCATIONS AS SHOWN WITHIN THE CONTRACT DRAWINGS.
  - C. THE LINER IS TO BE PLACED BEHIND THE CURB AND SHALL BE STAKED VERTICALLY AT 12'-10" ABOVE THE SUBGRADE, PRIOR TO PLACEMENT BEHIND CURB TO FUNCTION AS EROSION CONTROL. MEASURE TO PREVENT FINES FROM WASHING INTO RESERVOIR BASE.
  - E. PENETRATIONS TO THE PVC LINER SHALL BE REPAIRED WITH AT LEAST 5 STEEL PIPE CLAMP SEALED BY HEAT-SHRINK OR SIMILAR METHOD TO ACHIEVE LOW PRESSURE WATER TIGHT SEAL OR APPROVED EQUAL TO PREVENT THE MIGRATION OF SEDIMENT ACROSS THE PENETRATION.

- F. INTERNAL GRADE PVC LINER GRADE CONTROL TO BE PLACED EVERY 12' OF GRADE LOSS AT EQUAL ELEVATION ALONG THE CONTOUR. THE INTERNAL GRADE CONTROL ARE TO CONTAIN THE FLOW ON SLOPE WITHIN THE PAVEMENT RESERVOIR AND MUST BE KEPT INTO EDGE PVC LINER AND CONTAIN THE RESERVOIR BED AND SUBGRADE.
- B. THE INTERNAL GRADE CONTROL PVC LINER IS TO BE PLACED ALONG AN EQUAL ELEVATION CONTOUR AS PER THE DIMENSIONS AND LOCATIONS AS SHOWN WITHIN THE CONTRACT DRAWINGS.
- C. PENETRATIONS FROM UTILITIES TO THE PVC LINER ARE TO BE MINIMIZED AND LOCATED BENEATH THE PVC LINER IF POSSIBLE.
- D. UTILITY PIPING WITHIN THE ROADBED SHALL BE MATERTIGHT AND SEALED WITH FOAM, CAULKING, OR OTHER SUITABLE METHOD.
- E. ALL UTILITY TRENCHES THAT INTERSECT OR TRAVEL BELOW THE PAVEMENT SUBBASE SHALL HAVE CONSIDERATIONS TO PREVENT SOIL PIPING AND INFILTRATION AND INFLOW. THIS MAY INCLUDE SEEPAGE COLLAR, COVER WITH LINER, OR OTHER METHOD APPROVED BY ENGINEER.
- F. IN AREAS WHERE THE LINER IS NOT CONTINUOUS, A 12-INCH OVERLAP IS REQUIRED.

- 1.03 FILTER COURSE PREPARATION
  - A. RESERVOIR COURSE AND CAPILLARY BARRIER AGGREGATE SHALL BE PLACED IMMEDIATELY AFTER APPROVAL OF SUBGRADE PREPARATION AND INSTALLATION OF EDGE GEOTEXTILE. ANY ACCUMULATION OF DEBRIS OR SEDIMENT WHICH HAS TAKEN PLACE AFTER APPROVAL OF SUBGRADE SHALL BE REMOVED PRIOR TO INSTALLATION OF GEOTEXTILE AT NO EXTRA COST TO THE OWNER.
  - B. SEE TABLE 1 FOR SPECIFICATIONS FOR FILTER COURSE AND RESERVOIR COURSE / CAPILLARY BARRIER.
  - C. SEE TABLE 2 FOR COMPACTION AND INFILTRATION REQUIREMENTS OF SUBBASE.
  - D. INSTALL FILTER COURSE AGGREGATE IN 12-INCH MAXIMUM LIFTS TO 45 TO 98% STANDARD PROCTOR COMPACTION (ASTM D648 / AASHTO T99). INSTALL AGGREGATE TO GRADES INDICATED ON THE DRAWINGS.
  - E. THE INFILTRATION RATE OF THE FILTER COURSE SHALL BE DETERMINED BY ASTM D3985 OR APPROVED ALTERNATE AT THE DISCRETION OF THE SUPERVISING ENGINEER. THE INFILTRATION RATE SHALL BE NO LESS 5-30 FT/DAY OR 50% OF THE HYDRAULIC CONDUCTIVITY (D2434) AT 95% STANDARD PROCTOR COMPACTION.
  - F. THE DENSITY OF SUBGRADE COURSES SHALL BE DETERMINED BY AASHTO T 191 (SAND-CONE METHOD), AASHTO T 204 (DRIVE CYLINDER METHOD), OR AASHTO T 238 (NUCLEAR METHODS), OR OTHER APPROVED METHODS AT THE DISCRETION OF THE SUPERVISING ENGINEER.
  - G. VIBRATORY COMPACTION SHALL BE PERFORMED USING TWO-AXLE TANDEM ROLLERS WITH A GROSS MASS (HEIGHT) OF NOT LESS THAN 5 METRIC TONS (5.5 TONS) AND NOT MORE THAN 10 METRIC TONS (12 TONS) AND SHALL BE CAPABLE OF PROVIDING A MINIMUM COMPACTION EFFORT OF 44 KNM (250 POUNDS PER INCH OF WIDTH OF THE DRIVE ROLL. ALL ROLLS SHALL BE AT LEAST 1 M (42 INCHES) IN DIAMETER.
  - H. COMPACTION OF SUBGRADE COURSE MATERIAL SHALL BE DONE WITH A METHOD AND ADEQUATE WATER TO MEET THE REQUIREMENTS. ROLLING AND SHAPING SHALL CONTINUE UNTIL THE REQUIRED DENSITY IS ATTAINED. WATER SHALL BE UNIFORMLY APPLIED OVER THE SUBBASE COURSE MATERIALS DURING COMPACTION IN THE AMOUNT NECESSARY FOR PROPER CONSOLIDATION.

- 1.04 POROUS AGGREGATE SUBBASE INSTALLATION
  - A. RESERVOIR BED AGGREGATE SHALL BE PLACED IMMEDIATELY AFTER APPROVAL OF SUBGRADE PREPARATION AND INSTALLATION OF EDGE PVC LINER. ANY ACCUMULATION OF DEBRIS OR SEDIMENT WHICH HAS TAKEN PLACE AFTER APPROVAL OF SUBGRADE SHALL BE REMOVED PRIOR TO INSTALLATION OF PVC LINER AT NO EXTRA COST TO THE OWNER.
  - B. SEE TABLE 2 FOR COMPACTION AND INFILTRATION REQUIREMENTS.
  - C. INSTALL RESERVOIR BED AGGREGATE IN 12-INCH MAXIMUM LIFTS TO 45 TO 98% STANDARD PROCTOR COMPACTION (ASTM D648 / AASHTO T99). INSTALL AGGREGATE TO GRADES INDICATED ON THE DRAWINGS.
  - D. VIBRATORY COMPACTION SHALL BE PERFORMED USING TWO-AXLE TANDEM ROLLERS WITH A GROSS MASS (HEIGHT) OF NOT LESS THAN 5 METRIC TONS (5.5 TONS) AND NOT MORE THAN 10 METRIC TONS (12 TONS) AND SHALL BE CAPABLE OF PROVIDING A MINIMUM COMPACTION EFFORT OF 44 KNM (250 POUNDS PER INCH OF WIDTH OF THE DRIVE ROLL. ALL ROLLS SHALL BE AT LEAST 1 M (42 INCHES) IN DIAMETER.
  - E. COMPACTION OF SUBGRADE COURSE MATERIAL SHALL BE DONE WITH A METHOD AND ADEQUATE WATER TO MEET THE REQUIREMENTS. ROLLING AND SHAPING SHALL CONTINUE UNTIL THE REQUIRED DENSITY IS ATTAINED. WATER SHALL BE UNIFORMLY APPLIED OVER THE SUBBASE COURSE MATERIALS DURING COMPACTION IN THE AMOUNT NECESSARY FOR PROPER CONSOLIDATION.
  - F. ADD SMALL QUANTITIES OF FINE AGGREGATE TO COARSE AGGREGATE AS APPROPRIATE TO ACHIEVE COMPACTION.
  - G. EXCESS WATER IS APPARENT, REMOVE AGGREGATE AND AERATE TO REDUCE MOISTURE CONTENT.
  - H. USE MECHANICAL VIBRATING TAMPING IN AREAS INACCESSIBLE TO COMPACTION EQUIPMENT.
  - I. THE ENGINEER SHALL BE NOTIFIED AND SHALL INSPECT THE LINER AND SUBBASE INFILTRATION CAPACITY AT HIS/HER DISCRETION BEFORE PROCEEDING WITH THE PLACEMENT OF SELECT ROAD BASE MATERIAL.
  - J. INSPECTION OF INFILTRATION CAPACITY WILL VERIFY SUITABILITY OF SUBBASE FROM COMPACTION DURING CONSTRUCTION OR WHERE EROSION HAS CAUSED ACCUMULATION OF FINE MATERIALS. IF NEEDED, COMPACTED/ACCUMULATED MATERIALS SHALL BE REMOVED AND/OR SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES AND RETESTED FOR COMPACTION AND INFILTRATION AS PER SPECIFICATIONS.
  - K. INSTALL INFILTRATION TRENCH PER CONSTRUCTION DETAIL. INFILTRATION TRENCH MAY BE ELIMINATED IN THE EVENT OF SHALLOW UTILITIES THAT WILL INTERSECT THE EXCAVATION.

- 1.05 PROTECTION
  - A. IN THE EVENT THE SUBBASE IS USED FOR MAINTENANCE OF TRAFFIC OR IS DISTURBED OR LOOSENED BY ANY CAUSE THEN PRIOR TO PLACING OF THE NEXT PAVING COURSE, THE SUBBASE SHALL BE REGRADED AND RECOMPACTED TO ITS FINISHED GRADE AND SPECIFIED DENSITY.

SEAL			
			
<i>Bruce D. Scamman</i> 3/25/20			
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SECTION IV- POROUS ASPHALT PAVING (POROUS ASPHALT PAVEMENTS)

DR. ROBERT ROSEEN OF WATERSTONE ENGINEERING, INC. (OR EQUAL) SHALL REVIEW ALL RESULTS OF PREPARATION, INSTALLATION, AND TESTING FOR THE POROUS PAVEMENT SECTIONS. PHONE: (603) 666-2480

PART 1  
1.01 SCHEDULING

- A. SCHEDULE THE PAVING OPERATIONS SUCH THAT ALL PAVING NECESSARY TO PROVIDE SAFE AND ADEQUATE MAINTENANCE AND PROTECTION OF TRAFFIC OR FOR PROTECTION OF PREVIOUSLY LAID COURSES IS COMPLETED WITHIN THE WEATHER AND SEASONAL LIMITATIONS.
1. SUCH SCHEDULING SHALL INCLUDE EXPEDITING CONSTRUCTION OPERATIONS TO PERMIT PAVING BEFORE THE SEASONAL LIMITATIONS OR BY LIMITING THE LENGTH OF WORK TO THAT WHICH CAN BE COMPLETED BEFORE THE SEASONAL SHUTDOWN.
2. THE COST OF SCHEDULING AND SEQUENCING OF WORK TO CONFORM TO THE SEASONAL LIMITATIONS SHALL BE REFLECTED IN THE BID PRICES FOR THE RELATED CONTRACT ITEMS.

PART 2 PRODUCTS

- 2.01 ASPHALT CONCRETE
- A. BINDER COURSE - THE PAVEMENT BINDER COURSE SHALL BE CONSTRUCTED OF THE FOLLOWING TYPE AND TO THE WIDTHS AND DEPTHS AS SHOWN ON THE DRAWINGS.
1. THIS BINDER COURSE SHALL BE IN ACCORDANCE WITH NHDOT SPECIFICATION FOR BITUMINOUS CONCRETE.
- B. PAVEMENT WEARING COURSE (SURFACE COURSE) - PAVEMENT WEARING COURSE SHALL BE CONSTRUCTED TO THE WIDTHS AND DEPTHS AND TO THE WIDTH AND DEPTH AS SHOWN ON THE DRAWINGS.
1. THIS WEARING COURSE SHALL BE IN ACCORDANCE WITH NHDOT SPECIFICATION FOR BITUMINOUS CONCRETE.
- C. PAINTED TRAFFIC MARKINGS - CONTRACTOR SHALL REPLACE ALL MARKINGS IN ACCORDANCE WITH LOCAL, COUNTY, OR STATE SPECIFICATIONS (DEPENDING ON JURISDICTION).

2.02 POROUS ASPHALT

- A. THIS IS A PERFORMANCE SPECIFICATION. ALTERNATIVES CAN BE SUBMITTED IF THE MIX DESIGN MEETS THE MINIMUM GC PERFORMANCE CRITERIA FOR GRADATION, ASPHALT CONCRETE (AC) CONTENT, PERCENT (%) VOID SPACE, & DRAIN DOWN, RETAINED TENSILE STRENGTH (TSR), AND CANTABRO WEAR TEST AND ACCEPTED IN WRITING BY THE ENGINEER.
- B. POLYMER MODIFIED PERFORMANCE GRADED ASPHALT BINDER AND MIX DESIGN
1. POROUS ASPHALT WEARING COURSE, GRADATION, AC CONTENT, & VOID SPACE, & DRAIN DOWN, TSR, CANTABRO AS INDICATED IN TABLE 3. THE ASPHALT BINDER SHALL BE A TERMINAL BLENDED PG16-28 MODIFIED WITH A STYRENE BUTADIENE STYRENE.
2. POROUS ASPHALT BINDER COURSE, GRADATION, AC CONTENT, & VOID SPACE, & DRAIN DOWN, TSR, CANTABRO AS INDICATED IN TABLE 3. THE ASPHALT BINDER SHALL BE A TERMINAL BLENDED PG16-28 MODIFIED WITH A STYRENE BUTADIENE STYRENE.
3. POROUS ASPHALT MIX DESIGN. THE CONTRACTOR SHALL, SIZE, UNIFORMLY GRADE, AND COMBINE THE AGGREGATE FRACTIONS IN PROPORTIONS THAT PROVIDE A MIXTURE MEETING THE REQUIREMENTS SPECIFIED.

PART 3 EXECUTION

- 3.01 PREPARATION - RESET MANHOLE FRAMES PRIOR TO LAYING NEARBY (TOP) COURSE, MAKE FINAL ADJUSTMENTS OF MANHOLE BOXES, CATCH BASIN FRAMES, VALVE BOXES AND ANY OTHER UTILITY STRUCTURES LOCATED IN THE PAVEMENT IN RELATION TO FINISHED GRADE.
1. MANHOLE FRAMES, VALVE BOXES, ETC. TO SET 1/2 INCH BELOW FINISHED GRADE AND PARALLEL TO FINISHED CROWN.
2. CATCH BASIN FRAMES TO SET 1 INCH BELOW FINISHED GRADE AND PARALLEL TO FINISHED CROWN.
- a. BEVEL SLOPE OF WEARING COURSE (FOR 6-INCH WIDTH) AROUND CATCH BASIN FRAME.

3.02 POROUS ASPHALT BINDER COURSE INSTALLATION

- A. TEST STRIP (OPTIONAL)
1. AN OPTIONAL TEST STRIP SHALL BE CONDUCTED TO DETERMINE OPTIMAL COMPACTION PROCEDURES FOR THE BINDER COURSE AT A THICKNESS AS INDICATED IN THE DRAWINGS. THE TEST STRIP WILL BE CONSTRUCTED IN A PORTION OF THE SITE TO ESTABLISH AND ENSURE THE PROPER MIX DESIGN, PRODUCTION AND PLACEMENT.
2. THE TEST STRIP SHALL BE OVERSEEN BY THE ENGINEER.
3. TWO MIX SAMPLES SHALL BE COLLECTED AT THE ASPHALT PLANT BY A 3RD PARTY QC TECHNICIAN DURING BINDER COURSE PRODUCTION FROM EACH TEST STRIP FOR ASPHALT CONTENT, AND GRADATION.
4. FIELD TESTING OF INFILTRATION CAPACITY SHALL BE PERFORMED ON THE TEST STRIP FOR INFILTRATION BY THE ENGINEER.
5. TWO CORES SHALL BE COLLECTED FROM EACH TEST STRIP AND EVALUATED FOR COMPACTION, DENSITY, AND POROSITY.
6. THESE CRITERIA ONCE ESTABLISHED WILL BE APPLIED TO ALL POROUS ASPHALT INSTALLATIONS.
- B. CONDITIONING OF EXISTING SURFACE
1. THE CONTRACTOR SHALL THOROUGHLY CLEAN THE SURFACE UPON WHICH THE BINDER COURSE IS TO BE PLACED OF ALL OBJECTIONABLE MATERIAL.
- C. PREPARATION OF AGGREGATES
1. THE CONTRACTOR SHALL DRY AND HEAT THE AGGREGATES FOR THE BINDER COURSE TO THE REQUIRED TEMPERATURE.
- D. MIXING
1. THE CONTRACTOR SHALL COMBINE THE DRIED AGGREGATE IN THE MIXER IN THE AMOUNT OF EACH FRACTION OF AGGREGATE REQUIRED TO MEET THE SPECIFICATIONS. ONCE MIXED THE BINDER COURSE SHALL BE PLACED AS SOON AS POSSIBLE.

- E. SPREADING AND FINISHING
1. ON AREAS WHERE IRREGULARITIES OR UNAVOIDABLE OBSTACLES MAKE THE USE OF MECHANICAL SPREADING AND FINISHING IMPRACTICABLE, THE CONTRACTOR SHALL SPREAD AND RAKE THE BINDER COURSE WITH HAND TOOLS TO PROVIDE THE REQUIRED COMPACTED THICKNESS.
2. SOLVENT BASED AGENTS DEVELOPED TO STRIP ASPHALT FROM SURFACES WILL NOT BE ALLOWED AS A RELEASE AGENT.
3. JOINTS SHALL BE FULLY COATED WITH ROAD 16-28 JUST PRIOR TO THE PLACEMENT OF THE BINDER COURSE. AREAS THAT BECOME CONTAMINATED OR STRIPPED OF ASPHALT COATING WILL BE RETREATED WITH ASPHALT PRIOR TO ADJOINING THE ADJOINING COURSE.

- F. COMPACTION
1. THE ACTUAL METHODS AND EQUIPMENT USED TO COMPACT THE BINDER COURSE WILL BE DETERMINED DURING THE PLACEMENT AND COMPACTION OF THE TEST STRIP AND AS TABLE 2.

2. IMMEDIATELY AFTER THE ASPHALT TREATED PERMEABLE BASE HAS BEEN SPREAD, STRICKED OFF, AND ANY SURFACE IRREGULARITIES ADJUSTED, THE CONTRACTOR SHALL THOROUGHLY AND UNIFORMLY COMPACT THE BINDER COURSE BY ROLLING.

3. THE BINDER COURSE SHALL BE COMPACTED BY A MAXIMUM OF THREE COMPLETE PASSES OF A STEEL ROLLER HAVING A MINIMUM HEIGHT OF 12 TONS OPERATED IN STATIC MODE, OR 10 TONS IF EQUIPPED WITH OSCILLATORY COMPACTION AND OPERATED IN LOW FREQUENCY, LOW AMPLITUDE MODE, PROVIDED THE ROLLING IS DIRECTED BY THE ENGINEER. PNEUMATIC ROLLERS WILL NOT BE USED TO COMPACT THE BINDER COURSE.

4. THE CONTRACTOR SHALL ROLL THE SURFACE UNIFORMLY IN THE DIRECTION OF PROPER COMPACTION AND WHEN THE ROLLING DOES NOT CAUSE UNDESIRABLE DISPLACEMENT, CRACKING, OR SHOEVING, THE CONTRACTOR SHALL CONTINUE ADVANCEMENT OF THE BINDER COURSE TO THE ROLLERS OR VIBRATING COMPACTORS WITHOUT THE USE OF FUEL OIL OR OTHER PETROLEUM, OR SOLVENT BASED RELEASE AGENTS. SOLVENTS DESIGNED TO STRIP ASPHALT BINDERS FROM AGGREGATES WILL NOT BE PERMITTED AS RELEASE AGENTS ON EQUIPMENT, TOOLS OR BINDER COURSE SURFACES.

5. THE CONTRACT TEST STRIP SHALL IMMEDIATELY CORRECT ANY DISPLACEMENT OCCURRING AS A RESULT OF THE REVERSING OF THE DIRECTION OF A ROLLER OR FROM OTHER CAUSES TO THE SATISFACTION OF THE ENGINEER.
6. ANY OPERATION THAT RESULTS IN BREAKDOWN OF THE AGGREGATE SHALL BE SURFACES DISCONTINUED.

- G. TRAFFIC
1. AFTER A 24 HOUR CURING PERIOD OF THE BINDER COURSE, LIMITED TRAFFIC MAY BE ROUTED OVER THE BINDER COURSE SURFACE, UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER. CONSTRUCTION EQUIPMENT, AND TRAFFIC SHALL BE PROHIBITED FROM TRAVELING OVER THE BINDER COURSE SURFACE UNTIL THE ENTIRE PAVEMENT STRUCTURE IS IN PLACE.
2. DAMAGE TO THE BINDER COURSE LAYER CAUSED BY CONSTRUCTION EQUIPMENT OR TRAFFIC SHALL BE REMEDIED BY COMPLETE REMOVAL REPLACEMENT OF THE DAMAGED AREA TO THE LIMITS DETERMINED BY THE ENGINEER. THERE WILL BE NO ADDITIONAL PAYMENT FOR REPAIRS, OR ASSOCIATED WORK.

3.03 PLACEMENT OF POROUS ASPHALT BINDER COURSE

- A. INSTALL THE BINDER COURSE COURSE AT A THICKNESS AS INDICATED IN DRAWINGS.
- B. INSTALL FRAME, GRATES, AND LANDSCAPING. SPECIAL CARE IS TO BE TAKEN TO PROTECT FRESH BINDER COURSE.
- C. ALL TRUCKS (INCLUDING CONCRETE TRUCKS) WILL BE STOPPED PRIOR TO ENTERING THE SITE AND INSTRUCTED AS TO SPECIAL CONCERNS FOR PAVEMENT DURABILITY.
- D. A WASHOUT AREA FOR ALL CONCRETE TRUCKS SHALL BE DESIGNATED OUTSIDE OF POROUS PAVEMENT AREA ON THE CONTRACTOR'S EROSION AND SEDIMENT CONTROL PLAN OR ON DETAIL SHEET.
- E. POROUS PAVEMENT SURFACE SHALL BE PROTECTED ON HOT DAYS DURING THE PAVEMENT CURE PERIOD (2-3 DAYS). SURFACE TEMPERATURES CAN QUICKLY REACH OVER 140°F IN DIRECT SUN.
- F. A TEMPERATURE GUN SHALL BE AVAILABLE ONSITE TO ASSESS PAVEMENT SURFACE TEMPERATURES. PAVEMENT TEMPERATURES GREATER THAN 100°F SHOULD BE OBSERVED CAREFULLY FOR PAVEMENT DURABILITY. AS NEEDED, COOLING OF PAVEMENT SURFACE BY APPLICATION OF WATER FROM A WATER TRUCK SHOULD OCCUR WHEN HEAVY VEHICULAR TRAFFIC IS EXPECTED SUCH AS CONCRETE TRUCKS FOR DRY WELL FRAME AND GRATE INSTALLATION. IN THE EVENT THIS IS INEFFECTIVE FOR COOLING AND PAVEMENT DEFORMATION IS STILL OBSERVED, THE USE OF 3/4" PLYWOOD UNDER LARGE VEHICLE WHEELS MAY BE REQUIRED.
- G. TRUCKS AND OTHER CONSTRUCTION TRAFFIC WILL NOT BE ALLOWED TO ACCESS THE SITE WHILE THE PAVEMENT IS EXCESSIVELY HOT 130°F.
- H. NO STOCKPILING OF MATERIALS (E.G. SOIL, STONE, LANDSCAPING MATERIALS) WILL BE ALLOWED ON POROUS PAVEMENTS.
- I. MATERIALS EXCAVATED FOR FINISH WORKS SHALL BE PLACED OUTSIDE OF POROUS PAVEMENT AREAS.
- J. VACUUMING THROUGHOUT CONSTRUCTION MAY BE NECESSARY FOR SURROUNDING PAVED AREAS TO PREVENT RUN-ON OR TRACKING OF PAVEMENT AGGREGATES. FREQUENCY SHALL BE ADJUSTED AS NEEDED.

- 3.04 INSPECTION, CORRECTIVE ACTION, REMOVAL AND REPLACEMENT OF BINDER COURSE
- A. PRIOR TO INSTALLATION OF THE POROUS ASPHALT WEARING COURSE, THE BINDER COURSE WILL BE INSPECTED FOR DAMAGE AND DEFECTS. THE CONTRACTOR SHALL PROTECT ALL EXPOSED SURFACES THAT ARE NOT TO BE TREATED FROM DAMAGE DURING ALL PHASES OF THE PAVEMENT OPERATION.
- B. THE CONTRACTOR SHALL PROTECT ALL MATERIAL PLACED UNTIL THE MATERIAL HAS BEEN THOROUGHLY COMPACTED AND HAS BEEN PERMITTED TO COOL TO BELOW 30 °C (85 °F). THE ENGINEER RESERVES THE RIGHT TO REQUIRE THAT ALL WORK ADJACENT TO THE PAVEMENT, SUCH AS GUARDRAIL, CLEANUP, AND TURF ESTABLISHMENT, IS COMPLETED PRIOR TO PLACING THE WEARING COURSE WHEN THIS WORK COULD CAUSE DAMAGE TO THE PAVEMENT.
- C. IF THE MIX IS TOO HOT WHEN THIS WORK COULD CAUSE DAMAGE TO THE PAVEMENT, THE MIX SHALL BE COOLED TO 30 °C (85 °F) BEFORE PLACEMENT.
- D. IF THE MIX IS TOO HOT WHEN THIS WORK COULD CAUSE DAMAGE TO THE PAVEMENT, THE MIX SHALL BE COOLED TO 30 °C (85 °F) BEFORE PLACEMENT.
- E. IF THE MIX IS TOO HOT WHEN THIS WORK COULD CAUSE DAMAGE TO THE PAVEMENT, THE MIX SHALL BE COOLED TO 30 °C (85 °F) BEFORE PLACEMENT.

3.05 POROUS ASPHALT WEARING COURSE INSTALLATION

- A. GENERAL
1. VERIFY BINDER COURSE CONDITION AND PREPARATION FOLLOWING CONSTRUCTION OF BINDER COURSE. THE CONTRACTOR SHALL WEARING COURSE AS DESCRIBED IN SECTION 3.01.
2. THE ENGINEER SHALL BE NOTIFIED AND INSPECT THE BINDER COURSE AT THEIR DISCRETION PRIOR TO PAVING THE POROUS ASPHALT WEARING COURSE.
3. TEMPORARY CONSTRUCTION FENCING WILL BE USED TO PROTECT THE WEARING COURSE AREAS TO CONSTRUCTION TRAFFIC AFTER PAVING DURING PROJECT COMPLETION.

B. TEST STRIP

1. A TEST STRIP SHALL BE CONDUCTED TO DETERMINE OPTIMAL COMPACTION PROCEDURES OF THE POROUS ASPHALT AT A THICKNESS AS INDICATED IN THE DRAWINGS. THE TEST STRIP WILL BE CONSTRUCTED IN A PORTION OF THE SITE TO ESTABLISH AND ENSURE THE PROPER MIX DESIGN, PRODUCTION AND PLACEMENT.
2. THE TEST STRIP SHALL BE OVERSEEN BY THE ENGINEER.
3. TWO MIX SAMPLES SHALL BE COLLECTED AT THE ASPHALT PLANT BY A 3RD PARTY QC TECHNICIAN DURING PRODUCTION FROM EACH TEST STRIP FOR ASPHALT CONTENT, GRADATION, AND CANTABRO WEAR.
4. FIELD TESTING OF INFILTRATION CAPACITY SHALL BE PERFORMED ON THE TEST STRIP FOR INFILTRATION BY THE ENGINEER.
5. TWO CORES SHALL BE COLLECTED FROM EACH TEST STRIP AND EVALUATED FOR COMPACTION, DENSITY, AND POROSITY.
6. THESE CRITERIA ONCE ESTABLISHED WILL BE APPLIED TO ALL POROUS ASPHALT INSTALLATIONS.

- C. ROLLERS
1. ROLLERS OR OSCILLATING VIBRATORY ROLLERS, RANGING FROM 6-12 TONS, SHALL BE USED FOR COMPACTION, AND 1-2 TONS ROLLER FOR FINISHING. THE NUMBER, MASS (WEIGHT), AND SPEED OF THE ROLLER SHALL BE SUFFICIENT TO OBTAIN THE REQUIRED COMPACTION WHILE THE MIXTURE IS IN A WORKABLE CONDITION. GENERALLY, ONE BREAKDOWN ROLLER WILL BE NEEDED FOR EACH PAVEMENT USED IN THE SPREADING OPERATION.
2. ADDITIONAL ROLLING MAY BE EXCESSIVE, CAUSING A BREAK IN THE BOND OF ASPHALT BETWEEN ADJOINING PARTICLES, PARTICULARLY AFTER THE MIX HAS COOLED.
3. TO PREVENT ADHESION OF THE MIXTURE TO THE ROLLER, ROLLS SHALL BE KEPT MOIST WITH WATER OR WATER MIXED WITH VERY SMALL QUANTITIES OF DETERGENT OR OTHER APPROVED MATERIAL. EXCESS WATER WILL NOT BE TOLERATED.
4. OTHER COMBINATIONS OF ROLLERS AND/OR METHODS OF COMPACTING MAY BE USED IF APPROVED IN WRITING BY THE ENGINEER. PROVIDED THE COMPACTION REQUIREMENTS ARE MET, THE SPEED OF THE ROLLER SHALL BE SLOW AND UNIFORM TO AVOID DISPLACEMENT OF THE MIXTURE, AND THE ROLLER SHOULD BE OPERATED AS PRACTICAL. ROLLING SHALL CONTINUE UNTIL ALL ROLLER MARKS AND RIDGES HAVE BEEN ELIMINATED.
5. ROLLERS WILL NOT BE STOPPED OR PARKED ON THE FRESHLY PLACED MAT. THE SPEED OF THE ROLLER SHALL BE SLOW AND UNIFORM TO AVOID DISPLACEMENT OF THE MIXTURE, AND THE ROLLER SHOULD BE OPERATED AS PRACTICAL. ROLLING SHALL CONTINUE UNTIL ALL ROLLER MARKS AND RIDGES HAVE BEEN ELIMINATED.
6. ROLLERS WILL NOT BE STOPPED OR PARKED ON THE FRESHLY PLACED MAT.

- D. CONDITIONING OF EXISTING SURFACE
1. CONTACT SURFACES SUCH AS CURBS, GUTTERS, AND MANHOLES SHALL BE PAINTED WITH A THIN UNIFORM COAT OF TYPE RS-1 EMULSIFIED ASPHALT IMMEDIATELY BEFORE THE ASPHALT MIXTURE IS PLACED AGAINST THEM.

E. TEMPERATURE REQUIREMENTS

1. THE TEMPERATURE OF THE ASPHALT MIXTURE, AT THE TIME OF DISCHARGE FROM THE HAUL VEHICLE AND AT THE PAVED SURFACE, SHALL BE BETWEEN 135-163°C (275 TO 325°F), WITHIN 6 °C (10 °F) OF THE COMPACTION TEMPERATURE FOR THE APPROVED MIX DESIGN.
2. THE TEMPERATURE OF THE ASPHALT MIXTURE, AT THE TIME OF DISCHARGE FROM THE HAUL VEHICLE AND AT THE PAVED SURFACE, SHALL BE BETWEEN 135-163°C (275 TO 325°F), WITHIN 6 °C (10 °F) OF THE COMPACTION TEMPERATURE FOR THE APPROVED MIX DESIGN.
3. BREAKDOWN ROLLING SHALL OCCUR WHEN THE MIX TEMPERATURE IS BETWEEN 135-163°C (275 TO 325°F).
4. INTERMEDIATE ROLLING SHALL OCCUR WHEN THE MIX TEMPERATURE IS BETWEEN 93-135°C (200 TO 275°F).
5. FINISH ROLLING SHALL OCCUR WHEN THE MIX TEMPERATURE IS BETWEEN 66-93°C (150 TO 200°F).

F. SPREADING AND FINISHING

1. THE POROUS ASPHALT WEARING COURSE SHALL BE PLACED IN ONE APPLICATION TO A THICKNESS AS INDICATED ON THE DRAWINGS.
2. THE CONTRACTOR SHALL PROTECT ALL EXPOSED SURFACES THAT ARE NOT TO BE TREATED FROM DAMAGE DURING ALL PHASES OF THE PAVEMENT OPERATION.
3. THE CONTRACTOR SHALL PROTECT ALL MATERIAL PLACED UNTIL THE MATERIAL HAS BEEN THOROUGHLY COMPACTED AND HAS BEEN PERMITTED TO COOL TO BELOW 30 °C (85 °F). THE ENGINEER RESERVES THE RIGHT TO REQUIRE THAT ALL WORK ADJACENT TO THE PAVEMENT, SUCH AS GUARDRAIL, CLEANUP, AND TURF ESTABLISHMENT, IS COMPLETED PRIOR TO PLACING THE WEARING COURSE WHEN THIS WORK COULD CAUSE DAMAGE TO THE PAVEMENT.
4. IF THE MIX IS TOO HOT WHEN THIS WORK COULD CAUSE DAMAGE TO THE PAVEMENT, THE MIX SHALL BE COOLED TO 30 °C (85 °F) BEFORE PLACEMENT.
5. IF THE MIX IS TOO HOT WHEN THIS WORK COULD CAUSE DAMAGE TO THE PAVEMENT, THE MIX SHALL BE COOLED TO 30 °C (85 °F) BEFORE PLACEMENT.

G. COOLING OF PAVEMENT SURFACE BY APPLICATION OF WATER FROM A WATER TRUCK SHOULD OCCUR WHEN HEAVY VEHICULAR TRAFFIC IS EXPECTED, SUCH AS CONCRETE TRUCKS FOR DRY WELL FRAME AND GRATE INSTALLATION. IN THE EVENT THIS IS INEFFECTIVE FOR COOLING AND PAVEMENT DEFORMATION IS STILL OBSERVED, 3/4" PLYWOOD SHALL BE PLACED ON TOP OF THE PAVEMENT SURFACE.

6. AFTER A 24 HOUR CURING PERIOD OF THE POROUS ASPHALT WEARING COURSE, LIMITED TRAFFIC MAY BE ROUTED OVER THE FINISHED SURFACE.
7. TRAVEL OF CONSTRUCTION EQUIPMENT, AND TRAFFIC IS ALLOWED OVER THE BINDER COURSE ROAD.
8. TRACKING OF DEBRIS SHALL BE MINIMIZED TO A FEASIBLE EXTENT DURING CONSTRUCTION THROUGH THE USE OF STONE ENTRANCES, AND ROUTINE PAVEMENT VACUUMING.

9. UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER, CONSTRUCTION EQUIPMENT, AND TRAFFIC SHALL BE PROHIBITED FROM TRAVELING OVER THE COMPLETED POROUS ASPHALT SURFACE UNTIL THE ENTIRE PAVEMENT STRUCTURE IS IN PLACE.
10. DAMAGE TO THE BINDER COURSE LAYER CAUSED BY CONSTRUCTION EQUIPMENT OR TRAFFIC SHALL BE REMEDIED BY COMPLETE REMOVAL AND REPLACEMENT OF THE DAMAGED AREA TO THE LIMITS DETERMINED BY THE ENGINEER.

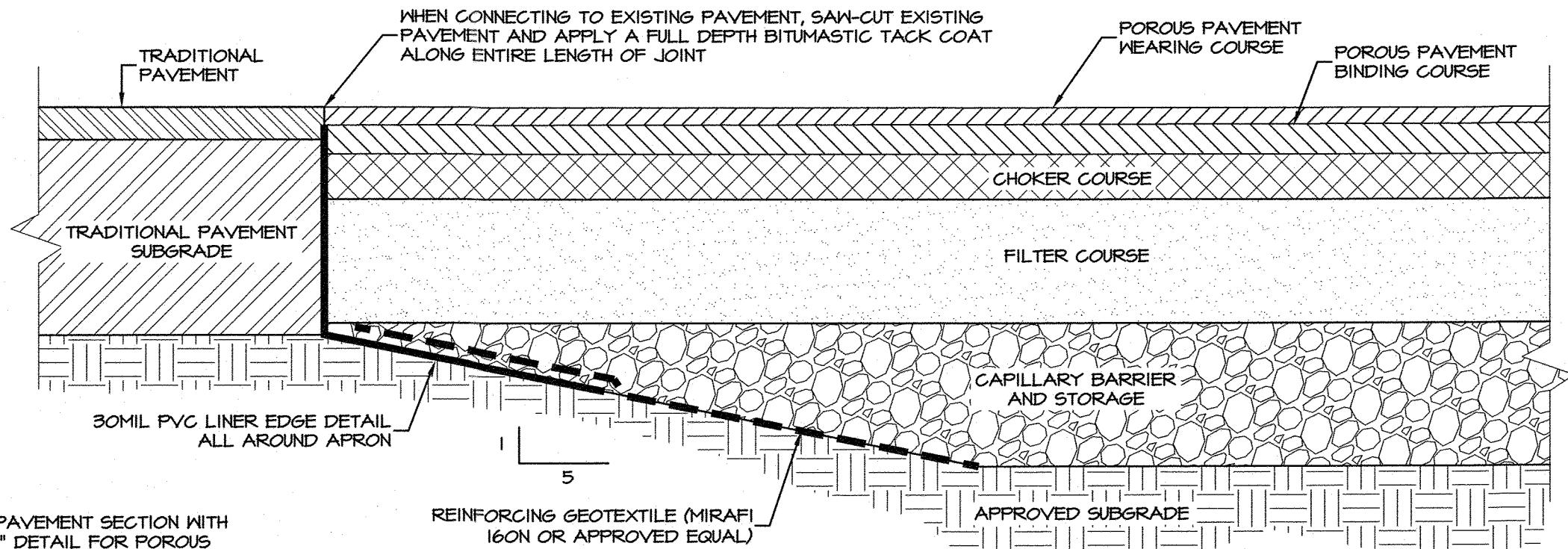
J. OTHER

1. OTHER COMBINATIONS OF ROLLERS AND/OR METHODS OF COMPACTING MAY BE USED IF APPROVED IN WRITING BY THE ENGINEER. PROVIDED THE COMPACTION REQUIREMENTS ARE MET.
2. A WASHOUT AREA FOR ALL CONCRETE TRUCKS SHALL BE DESIGNATED OUTSIDE OF POROUS PAVEMENT AREA ON THE CONTRACTOR'S EROSION AND SEDIMENT CONTROL PLAN OR ON DETAIL SHEET.
3. NO STOCKPILING OF MATERIALS (SOIL, STONE, LANDSCAPING MATERIALS, ETC.) WILL BE ALLOWED ON POROUS PAVEMENTS.
4. MATERIALS EXCAVATED FOR CURB INSTALLATION AND LANDSCAPING STOCKPILES SHALL BE PLACED OUTSIDE OF POROUS PAVEMENT AREAS.
5. THE ENGINEER DETERMINES THAT UNSATISFACTORY COMPACTION OR SURFACE DISTORTION IS BEING OBTAINED OR DAMAGE TO HIGHWAY COMPONENTS HAS BEEN OBTAINED, THE CONTRACTOR SHALL BE REQUIRED TO RECONSTRUCT THE PAVEMENT TO THE REQUIRED COMPACTION AND SURFACE REQUIREMENTS.

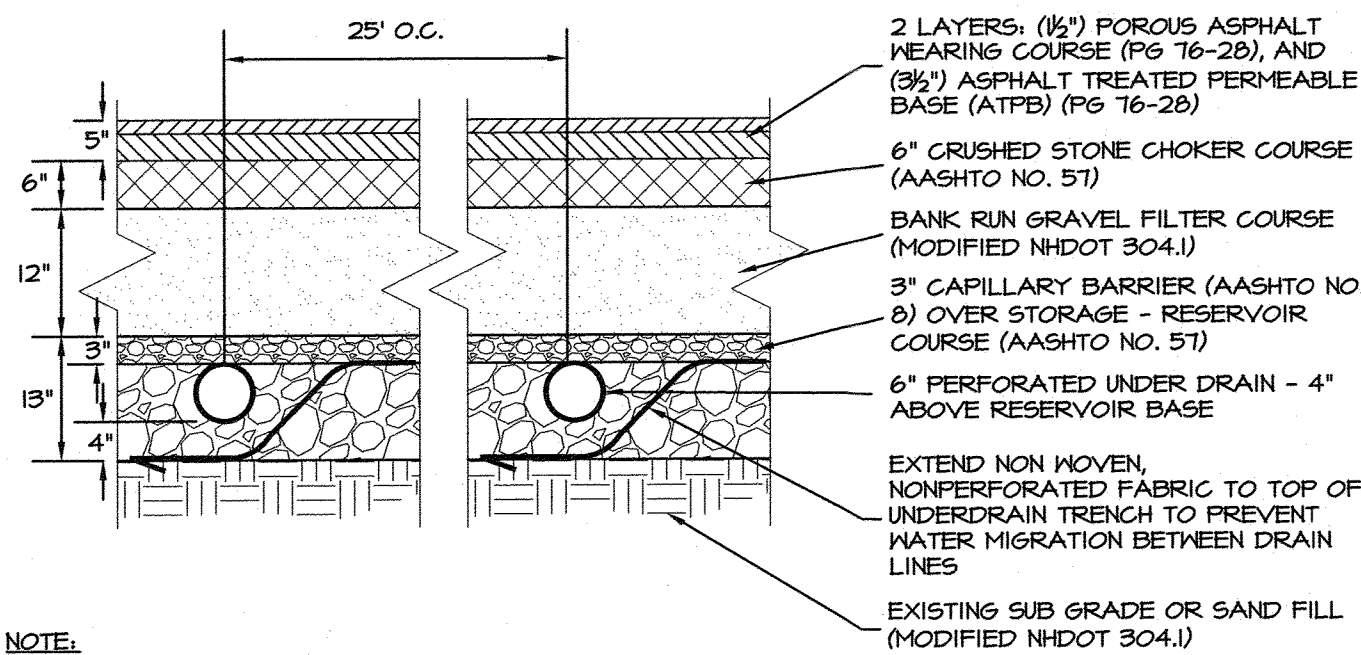
3.06 DRIVEWAYS AND PARKING AREAS

- A. PAVING MATERIALS, TYPE OF PAVING, DEPTH OF VARIOUS COURSES, ETC., SHALL BE AS SHOWN ON THE DRAWINGS.
1. THE DRIVEWAYS AND PARKING AREAS SHALL BE CUT BACK 12 INCHES FROM OUTSIDE DISTURBED OR DAMAGED AREAS AS DESCRIBED ABOVE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE DRIVEWAYS AND PARKING AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE DRIVEWAYS AND PARKING AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE DRIVEWAYS AND PARKING AREAS.
3. THE WORK SHALL INCLUDE PROPER COMPACTION OF ANY NECESSARY SUBBASE, BASE COURSE, AND BINDER COURSE.
4. BITUMINOUS SURFACES SHALL BE RESTORED WITH ASPHALT CONCRETE MATCHING EXISTING, BUT IN NO CASE SHALL BE LESS THAN 2 INCHES OF BINDER AND 1 INCH OF TOP COURSE AS SPECIFIED IN THE APPLICABLE ARTICLES OF THIS SECTION.
5. NON-BITUMINOUS SURFACES - WHERE SHOWN ON THE DRAWINGS, CONSTRUCT NEW DRIVEWAYS AND PARKING AREAS OR RESTORE EXISTING DRIVEWAYS AND PARKING AREAS AS FOLLOWS:
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1. GRAVEL SURFACES SHALL BE RESTORED USING SCREENED GRAVEL, MATCHING EXISTING, BUT IN NO CASE SHALL BE LESS THAN 6 INCHES THICK. THE GRAVEL SHALL BE PLACED IN 4 INCH LIFT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE DRIVEWAYS AND PARKING AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE DRIVEWAYS AND PARKING AREAS.
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- 3.

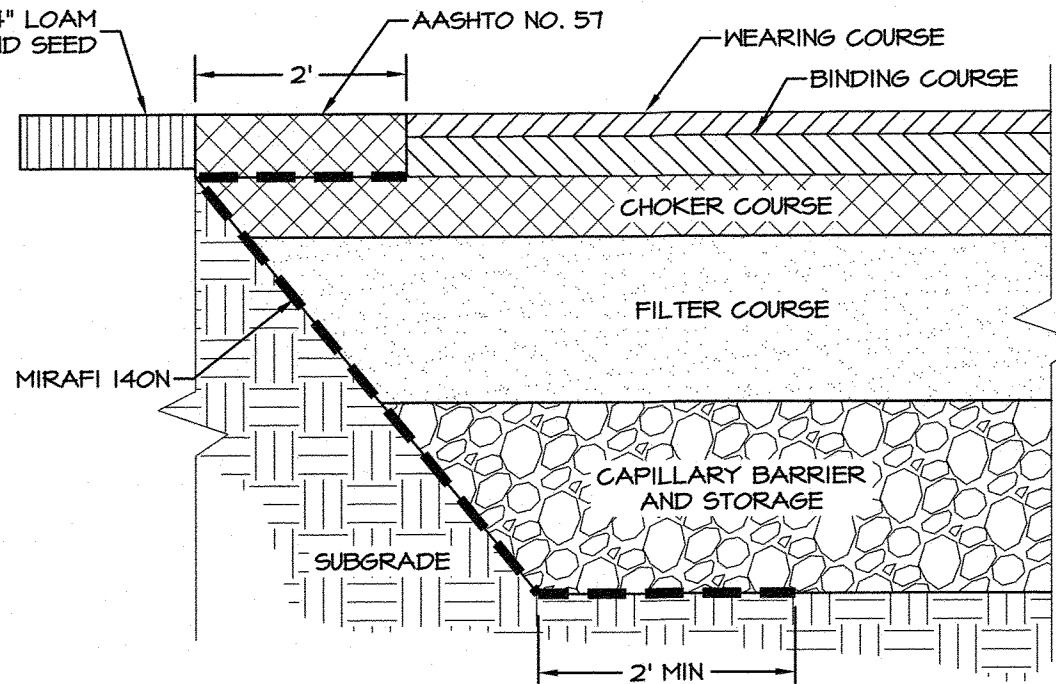




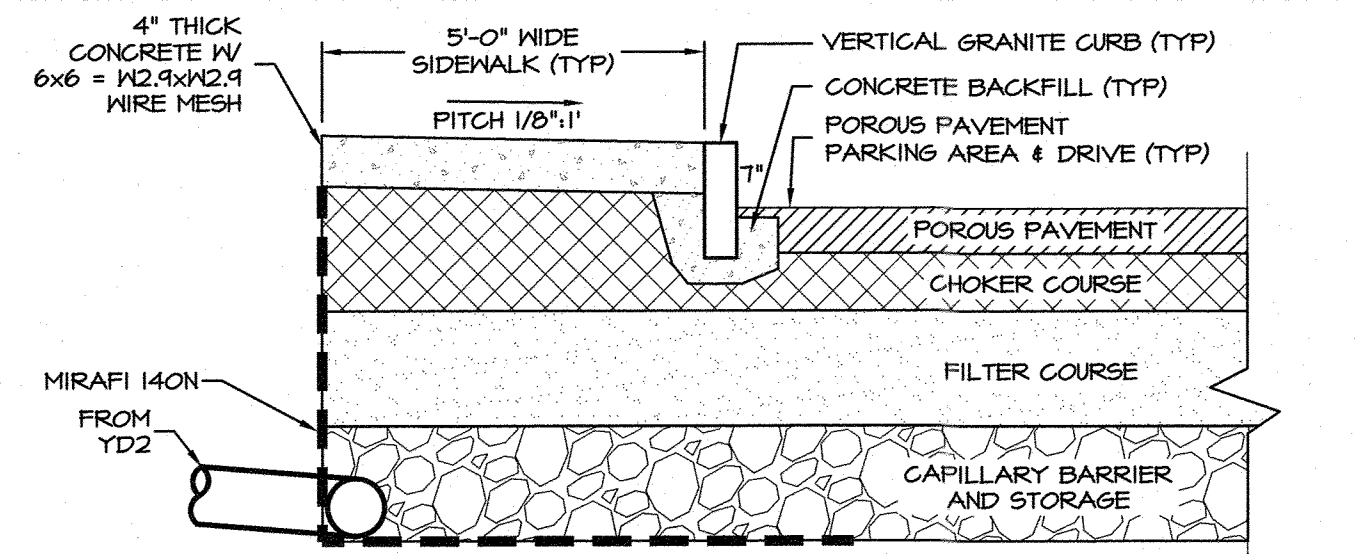
**POROUS PAVEMENT TRANSITION TO TRADITIONAL PAVEMENT OR CONCRETE DETAIL**  
N.T.S.



**POROUS PAVEMENT SECTION WITH UNDER DRAINS**  
N.T.S.

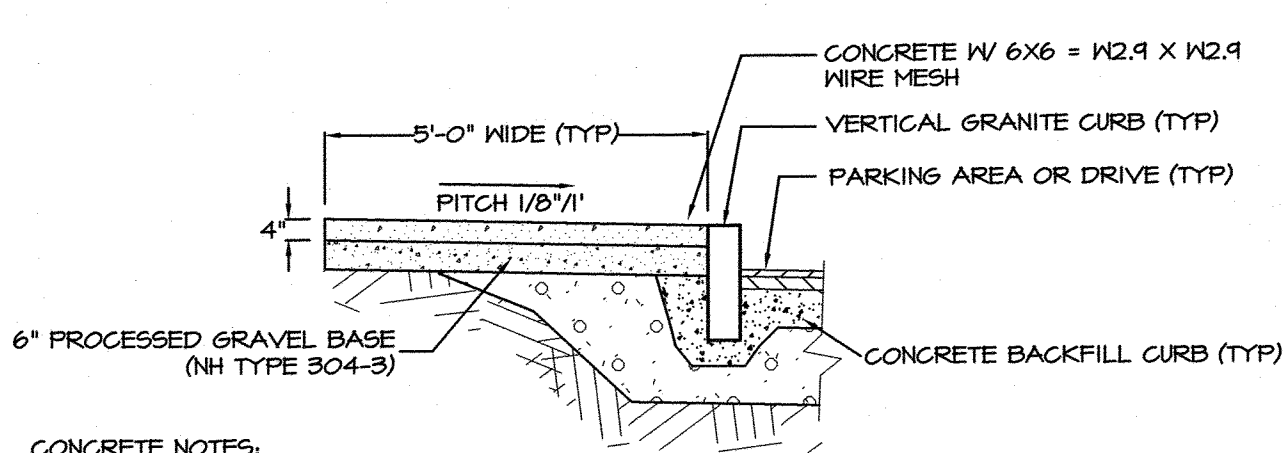


**POROUS PAVEMENT EDGE DETAIL**  
N.T.S.



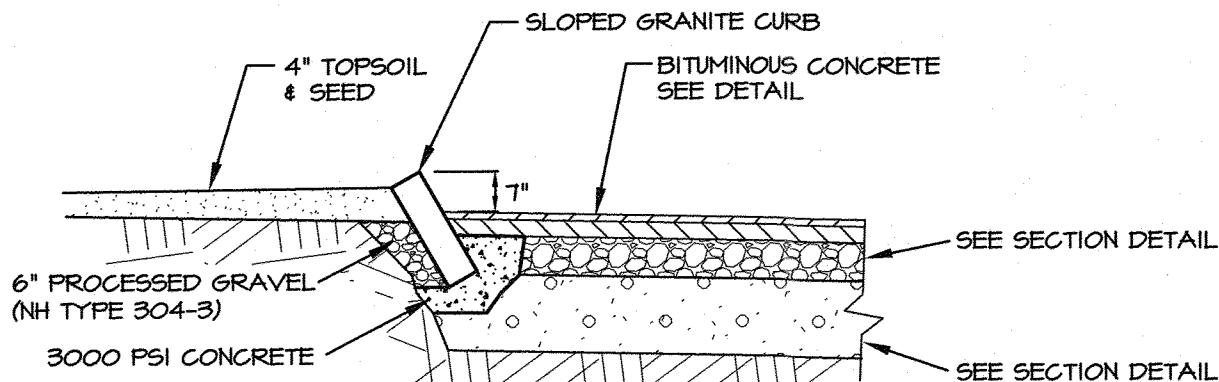
- CONCRETE NOTES:**
1. CONCRETE WORK SHALL CONFORM TO THE FOLLOWING NOTES AND SPECIFICATIONS.
    - \* "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" - ACI 301-05.
    - \* "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" - ACI 318-05.
  2. COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 4000 PSI AFTER 28 DAYS WITH 5 - 7% AIR ENTRAINMENT, W.R. GRACE "ECLIPSE PLUS" SHRINKAGE ADMIXTURE, AND W.R. GRACE "DCI-5" CORROSION INHIBITOR, AND A MIDRANGE WATER REDUCER.
  3. FINISH CONCRETE W/ BROOM FINISH, TOOLED CONTROL JOINTS @ 5'-0" MAX SPACINGS, AND TOOLED JOINT ALONG ALL EDGES OF SIDEWALK.
  4. SLAB SHALL BE WATER CURED FOR A MINIMUM OF 5 DAYS USING WET BURLAP.

**TYPICAL CONCRETE SIDEWALK DETAIL**  
N.T.S.

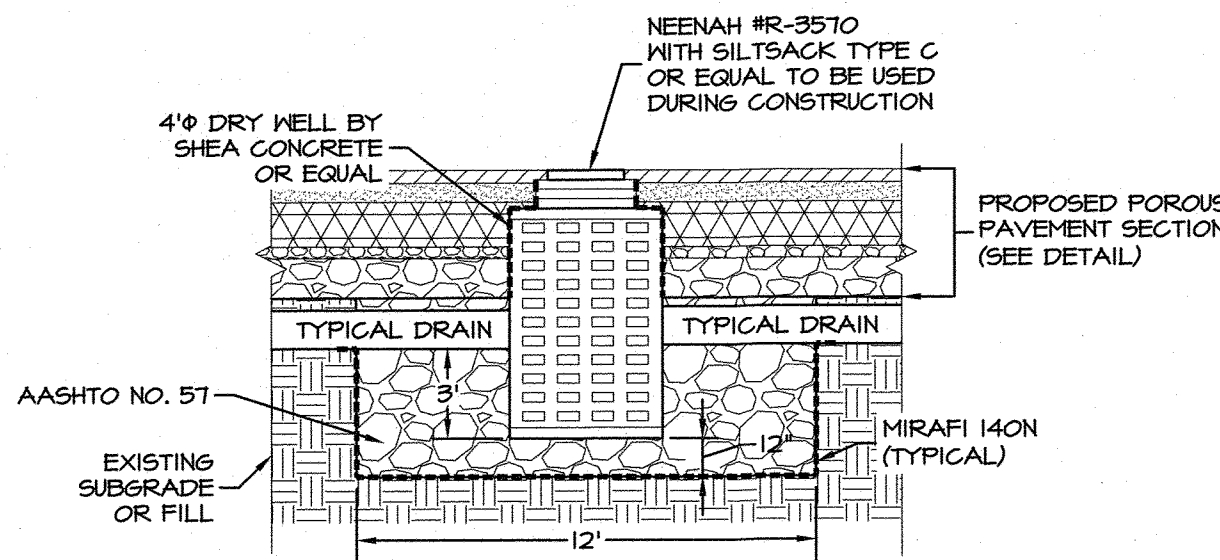


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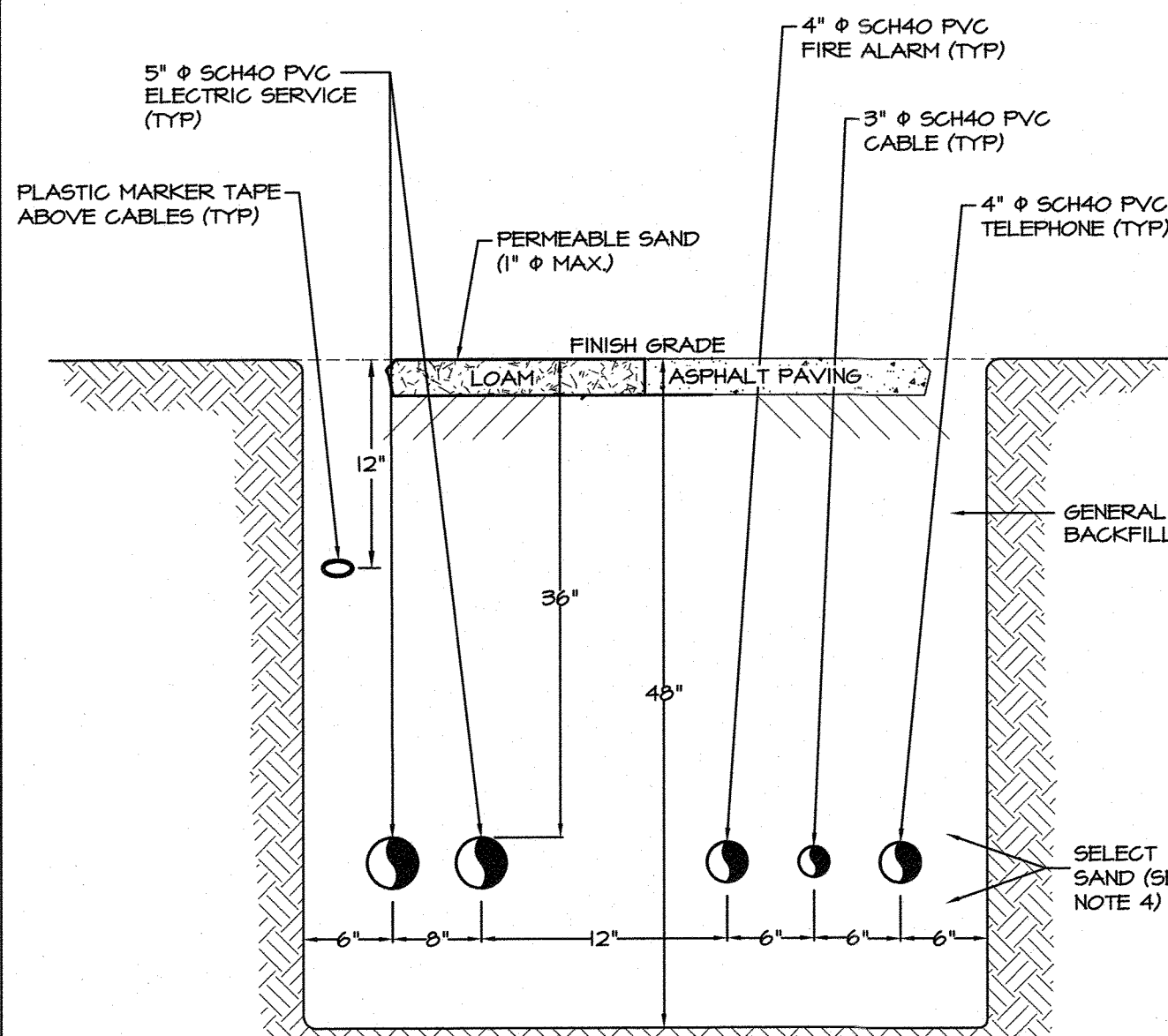
**TYPICAL CONCRETE SIDEWALK DETAIL**  
N.T.S.



**SLOPED CURB DETAIL**  
N.T.S.

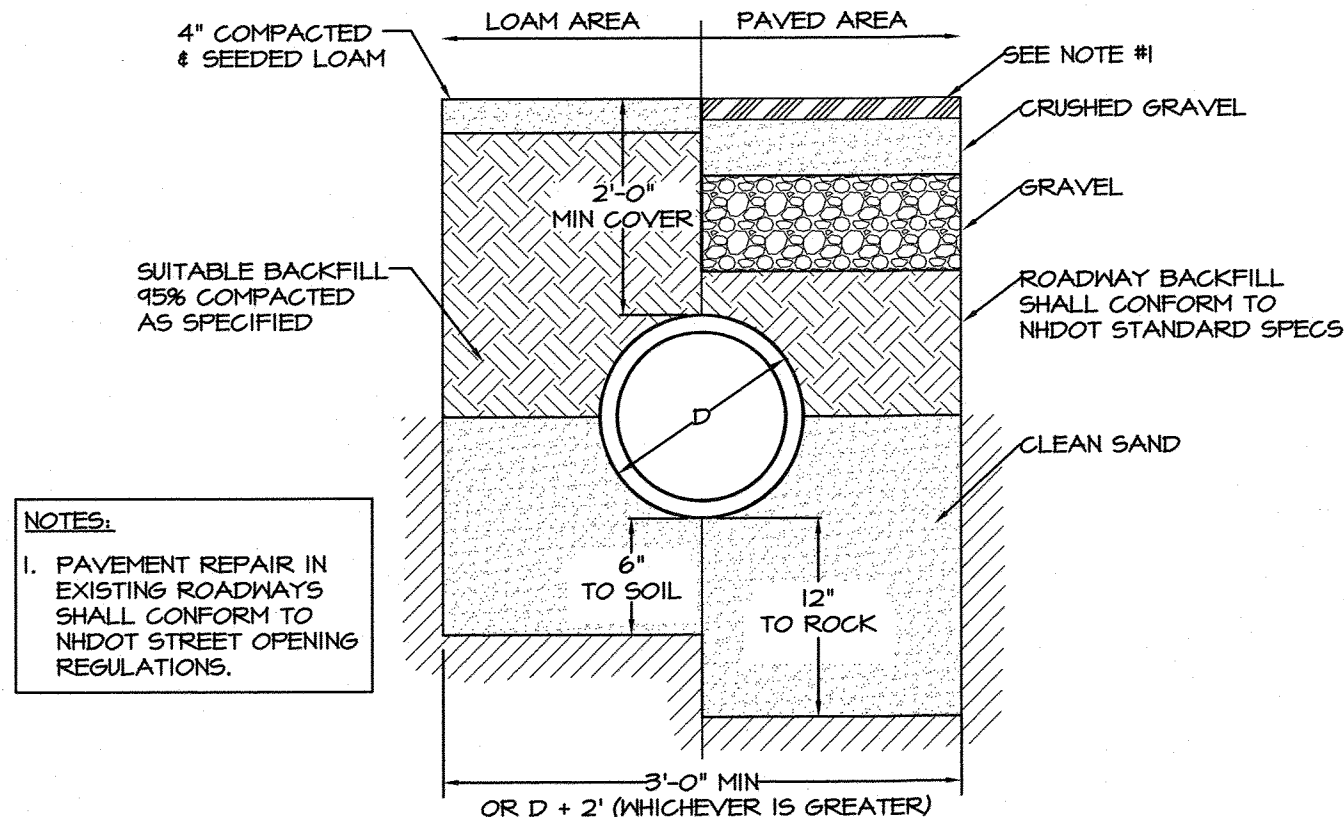


**TYPICAL DRYWELL SECTION**  
N.T.S.

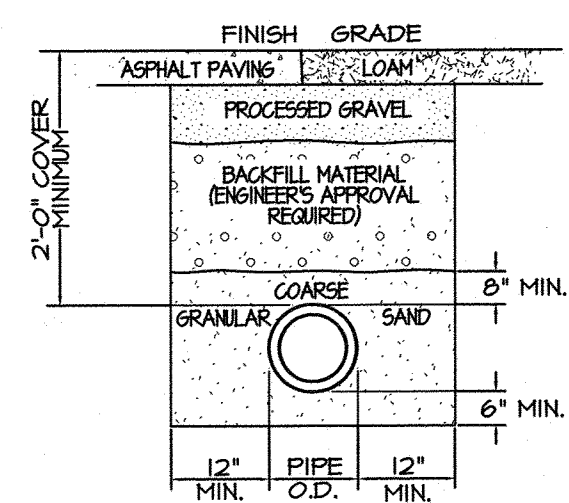


- NOTES:**
- \*\*VERIFY NUMBER OF CONDUIT RUNS AND TYPES OF CONDUITS REQUIRED WITH ELECTRICAL AND MECHANICAL DESIGNERS BEFORE INSTALLATION\*\***
1. ALL UTILITIES SHALL BE REVIEWED AND APPROVED BY APPROPRIATE UTILITY COMPANY.
  2. SERVICE BOX CONNECTIONS SHALL BE "FLUSH MOUNT" TO GREATEST EXTENT POSSIBLE AND LOCATED AT PROPERTY LINE CORNERS.
  3. PIPE SIZES ARE MINIMUM SIZES TO BE INSTALLED.
  4. BACKFILL: SHALL BE SELECTED SAND, 100% SHALL PASS THROUGH 1/4" SCREEN, UP TO 1% MAY BE ROUNDED PEBBLES UP TO 3/8" IN SIZE.
  5. TRENCH WIDTH IS TO BE 12" MINIMUM, DEPENDING ON NUMBER OF UTILITIES IN TRENCH, UNLESS CABLE IS FLOVED IN.
  6. UTILITIES ARE TO BE LOCATED IN ROAD SHOULDERS AND ROW'S AS DETERMINED BY PLANS. ALL WORK TO BE COORDINATED WITH UTILITY COMPANIES.
  7. THERE MAY BE MORE OR LESS SERVICES TO BE INSTALLED IN TRENCH VERIFY WITH UTILITIES PLAN.
  8. VERIFY & REFER TO PROJECT ELECTRICAL DRAWINGS AND DETAILS FOR SPECIFICS.

**TYPICAL UTILITY TRENCH DETAIL**  
N.T.S.

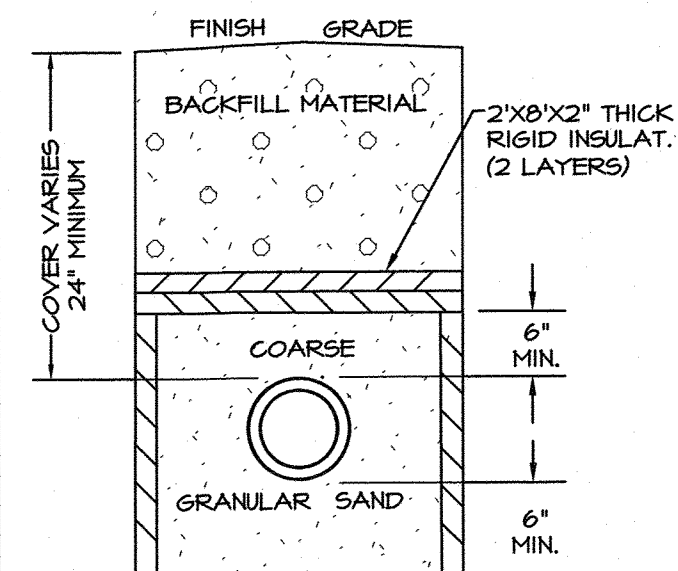


**DRIVEWAY & PARKING LOT TYPICAL PIPE-RUN SECTION**  
N.T.S.



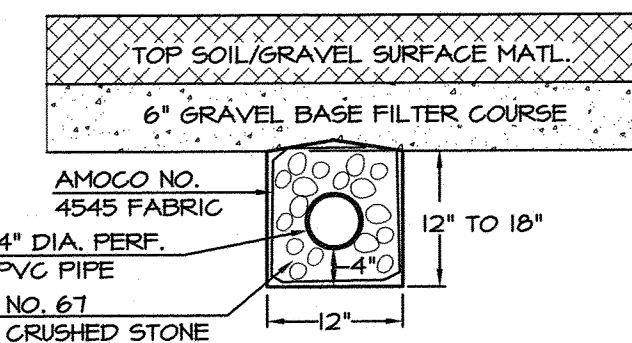
- NOTES:**
1. ALL CONSTRUCTION AND CONNECTIONS TO BE IN ACCORDANCE WITH LOCAL STANDARDS.
  2. SEE MECHANICAL DRAWINGS FOR PIPE SIZES, SCHEDULES, AND PITCH REQUIREMENTS.

**SEWER LINE INSTALLATION**  
N.T.S.



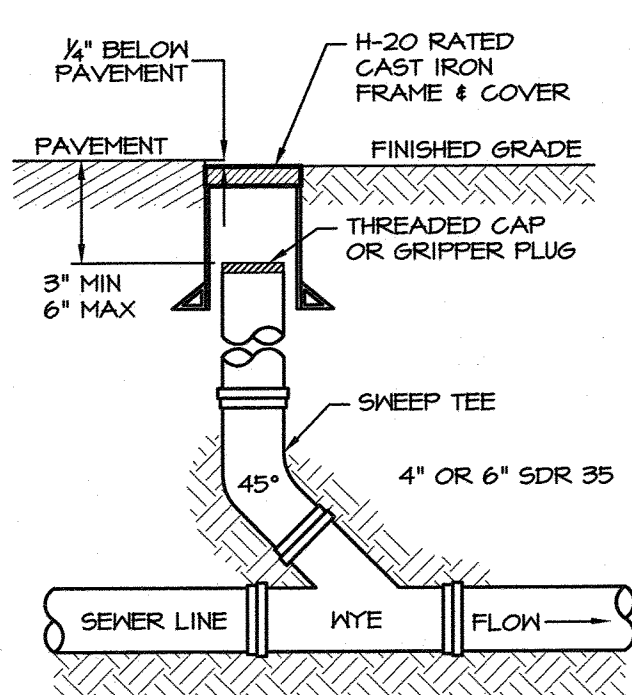
- NOTES:**
1. INSULATE SEWER OR FORCE MAIN WHERE PIPE WILL BE LESS THAN 6' BELOW PLOWED AREAS OR LESS THAN 4' BELOW AREAS RUNNING CROSS COUNTRY.
  2. GAPS BETWEEN SECTIONS OF INSULATION TO BE COVERED WITH 2"x2"x2" PIECE OF INSULATION CENTERED OVER GAP.

**PIPE INSTALLATION DETAIL**  
N.T.S.

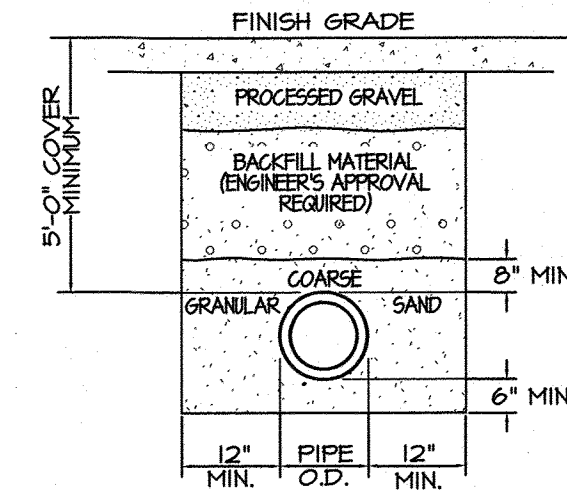


- NOTE:**
1. SUB DRAINS SHALL DRAIN TO DRAINAGE STRUCTURE OR TO DAYLIGHT.

**SUBSOIL DRAIN DETAIL**  
N.T.S.

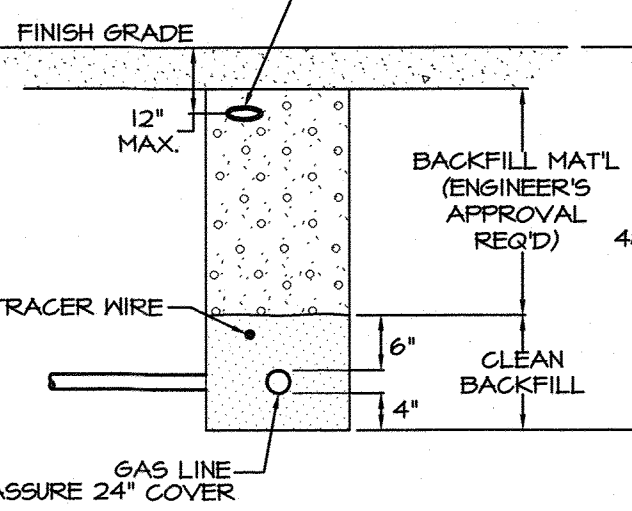


**SERVICE CLEANOUT DETAIL**  
N.T.S.

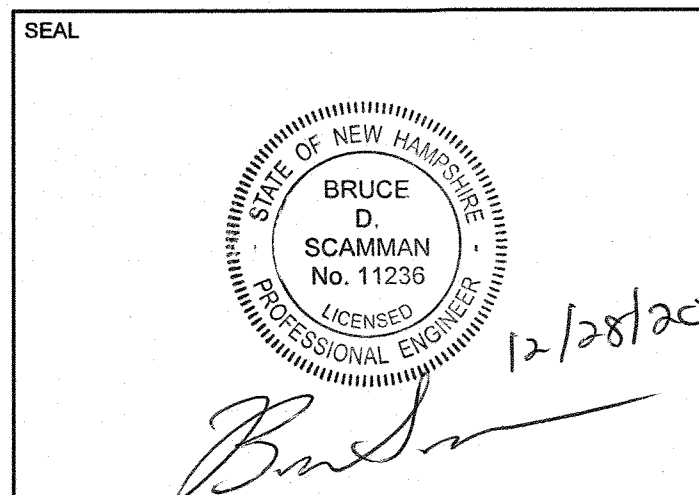
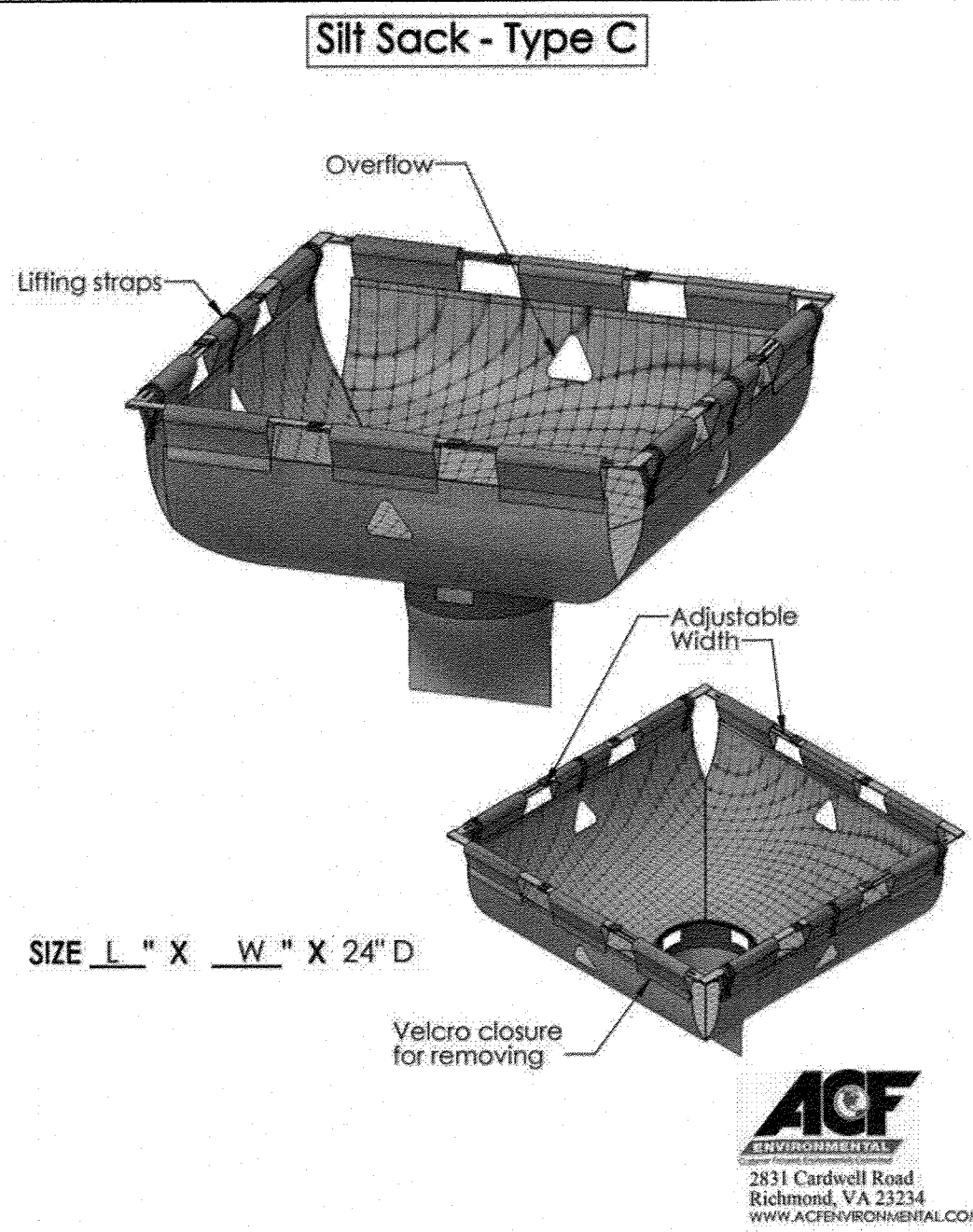


- NOTE:**
1. SEE SITE PLAN FOR PIPE SIZES AND SERVICES.

**WATERLINE INSTALLATION**  
N.T.S.



**GAS LINE INSTALLATION**  
N.T.S.



3	DEC 28, 2020	FOR APPROVAL	
2	MAR 24, 2020	FOR APPROVAL	
1	MAR 11, 2020	PRELIMINARY	
ISS.	DATE:	DESCRIPTION OF ISSUE:	CHK.
DRAWN:	MCV	DESIGN:	MCV
CHECKED:	BDS	CHECKED:	BDS



CLIENT:  
**RICHMOND PROPERTY GROUP**  
333 N. ALABAMA ST.  
INDIANAPOLIS, IN 46204

TITLE:  
**DETAILS**  
**FOR**  
**RICHMOND PROPERTY GROUP**  
ELIZABETH DEMERITT HOUSE  
18 GARRISON AVENUE (SITE)  
DURHAM, NH 03824

PROJECT:	SCALE:	SHEET:
19-083	AS SHOWN	D3









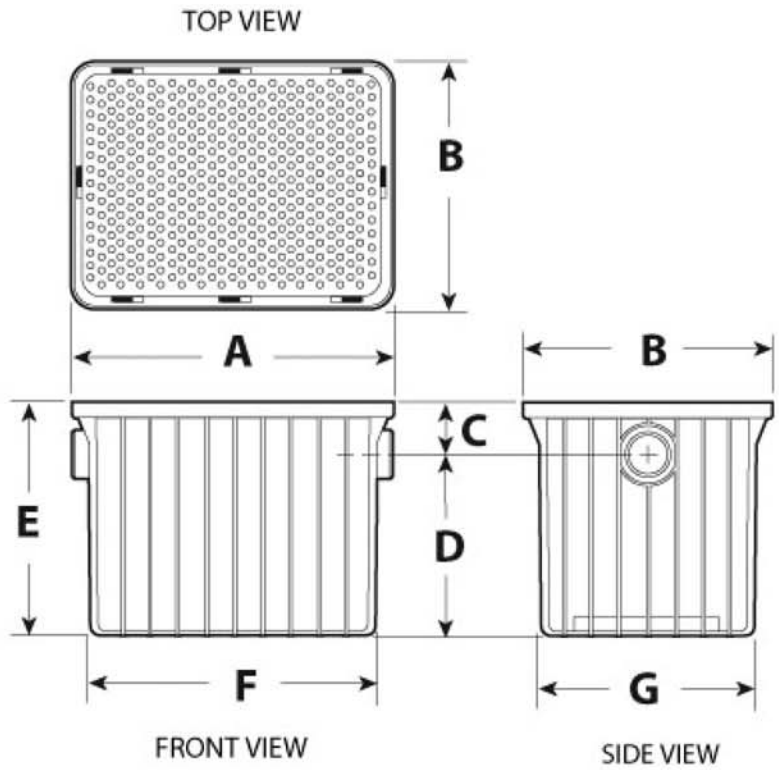




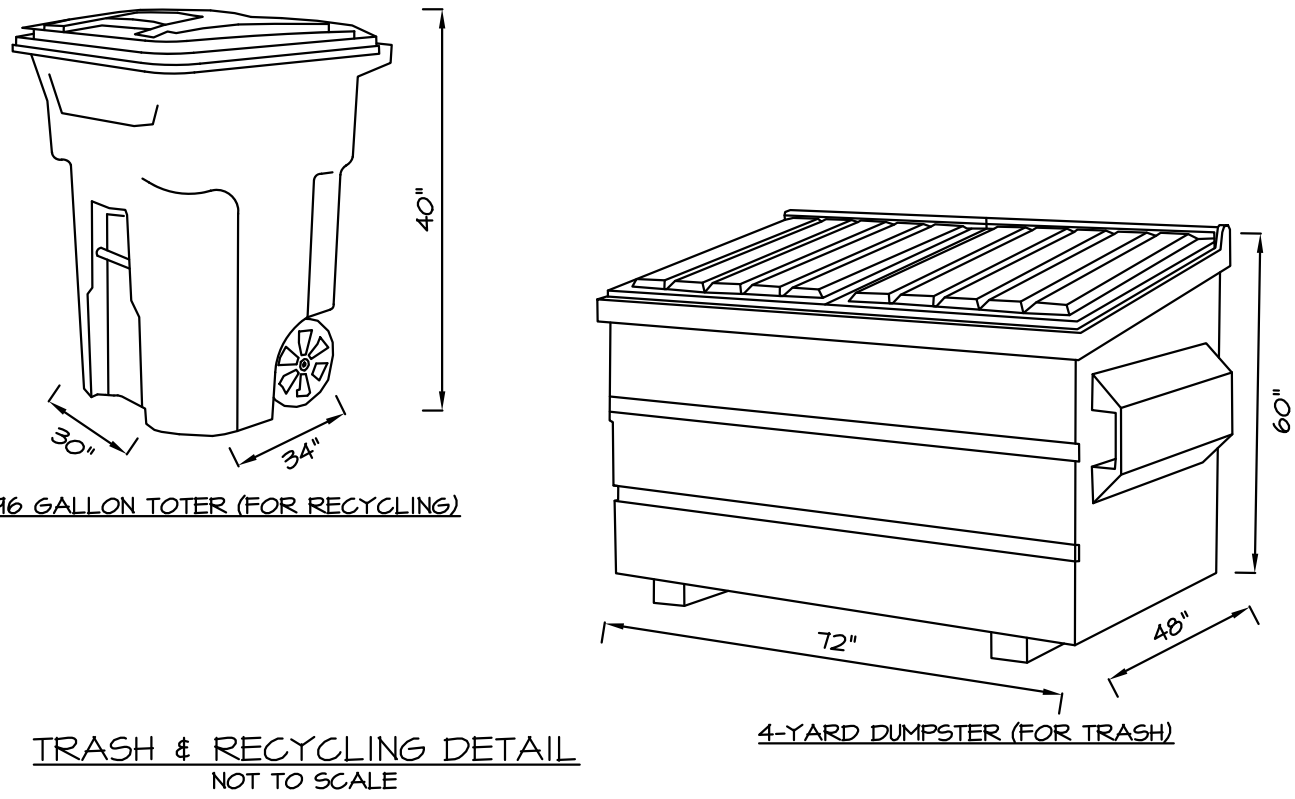
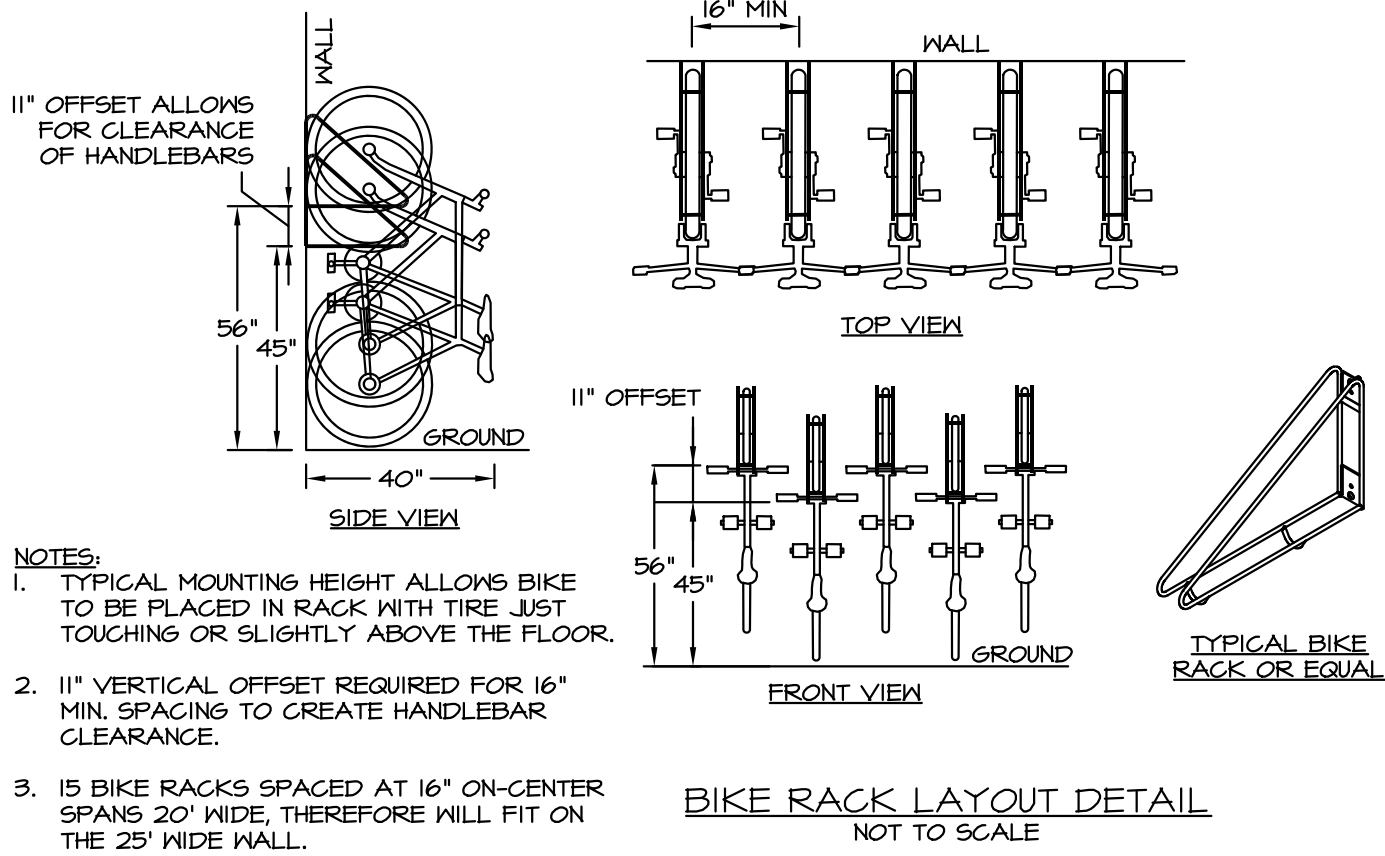
Part Description:  
3" PVC Gray Endura 50 GPM 100lbs Grease  
Interceptor, Flow Control Device Spigot X Spigot  
X Spigot

Part Number:  
3950A03S

Approvals and Listings maintained by:  
Canplas Industries Ltd  
Canada: 1-800-461-5300 USA: 1-888-461-5307



Part #	Part UPC	Colour	Size (inches)	Ctn Qty	Ctn Bar Code	Ctn. Wt (Kgs)	Ctn. Wt (lbs)	Skid Cubic (m)	Skid Cubic (ft)	Ctns/Skid
3950A03S	662671390684	GREY	3X3	1	10662671390681	29.85	65.67	1.63	57.50	4
Dimensions (inches)										
A	B	C	D	E	F	INTERIOR GREASE TRAP DETAIL				
31	23.5	5.205	18.295	23.5	28.75	NOT TO SCALE				



2	APR 20, 2021	FOR APPROVAL	
1	DEC 28, 2020	FOR APPROVAL	
ISS	DATE:	DESCRIPTION OF ISSUE:	CHK:
DRAWN:	JJM	DESIGN:	JJM
CHECKED:	BDS	CHECKED:	BDS



CLIENT:

RICHMOND PROPERTY GROUP  
333 N. ALABAMA ST.  
INDIANAPOLIS, IN 46204

SEAL	TITLE:  DETAILS FOR RICHMOND PROPERTY GROUP ELIZABETH DEMERITT HOUSE 18 GARRISON AVENUE (SITE) DURHAM, NH 03824		
	PROJECT: 19-083	SCALE: AS SHOWN	SHEET: D6



**LEGEND**

- BOUND FOUND
- IRON PIPE FOUND
- (TYP)
- PROPOSED POROUS PAVEMENT
- PROPOSED TRAD. PAVEMENT
- VERTICAL GRANITE CURB
- SLOPED GRANITE CURB
- BITUMINOUS CURB
- PROPERTY LINE
- EDGE OF PAVEMENT (EOP)
- EOP WITH CURB
- UNDERGROUND UTILITIES
- OVERHEAD UTILITIES
- WATER LINE
- SEWER LINE
- GAS LINE
- IRON FENCE
- GUARD RAIL
- EDGE OF WETLANDS
- UTILITY POLE
- LIGHT POLE
- WETLANDS
- BOLLARD
- ELECTRICAL METER
- SEWER MANHOLE
- CATCH BASIN
- SEWER CLEANOUT
- WATER VALVE
- TREE
- PARKING SPACES IN ROW
- COMPACT PARKING SPOT
- LANDSCAPING
- FEMA FLOOD ZONE X

**NOTES:**

- ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
- FILTER MEDIA FILL TO MEET APPLICATION REQUIREMENTS.
- COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.
- ADDITIONAL INFO AVAILABLE AT [HTTP://WWW.FILTREXX.COM](http://WWW.FILTREXX.COM)

**SECTION NTS**

2' TALL EARTH FILTER BERM W/ 1:1 SLOPES

2" X 2" X 36" WOODEN STAKES PLACED 10' O.C. - MINIMUM 12" EMBEDMENT INTO SOIL

FILTREXX® SOXX® (8" TYPICAL)

AREA TO BE PROTECTED

WORK AREA

**PLAN NTS**

AREA TO BE PROTECTED

2" X 2" X 36" WOODEN STAKES PLACED 10' O.C.

2' TALL EARTH FILTER BERM

FILTREXX® SOXX® (8" TYPICAL)

WATER FLOW

WORK AREA

**FILTREXX® SEDIMENT CONTROL & 2' TALL EARTH FILTER BERM SECTION**

**LOCUS PLAN**

SCALE: 1"=100'

LOCUS PLAN showing site location relative to surrounding streets: EDENWOOD RD, STAFFORD AVE, MAIN ST, QUAD RD, MILL RD, WOODMAN RD, and SITE.

**CONSTRUCTION SEQUENCING**

SCALE: 1"=20'

Map showing construction sequencing for the Elizabeth Demeritt House site. Key features include: 6' HIGH CHAIN LINK CONSTRUCTION FENCE (TYP), REMOVE CURB, SIDEWALK, AND 3' OF PAVEMENT, (2) MAPLE TREES TO BE REMOVED (TYP), PROPOSED BUILDING FOOTPRINT, STOCK PILE AREA, MATERIAL STORAGE AREA, PERIMETER FENCE AND SILT/STOCK (TYP), RHODODENDRON TO BE RELOCATED ON SITE, NEW ENTRANCE, TEMPORARY SLOPE, EXISTING APARTMENT BUILDING, PETTEE BROOK, FEMA ZONE 'AE' (ELEV.=45.2'), FEMA ZONE 'X', and various utility lines and structures.

**CONSTRUCTION SEQUENCE:**

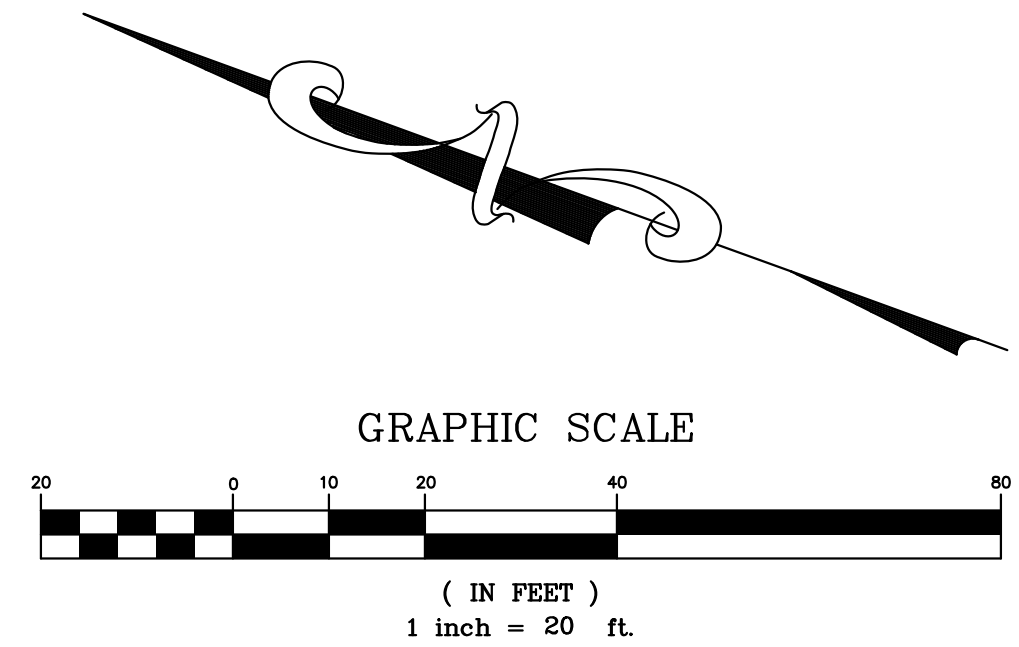
- PRE-CONSTRUCTION WALK THROUGH IS REQUIRED WITH LANDSCAPE ARCHITECT, TOWN OFFICIALS, AND DESIGN ENGINEER. INVASIVE SPECIES TO BE IDENTIFIED AND REMOVED PER BMP STANDARDS.
- INSTALL PROTECTIVE FENCING AROUND EXISTING TREES TO REMAIN, PER LANDSCAPING PLAN.
- REMOVE VEGETATION TO INSTALL FENCING AND SILT/STOCKS AROUND SITE PERIMETER.
- REMOVE REMAINING VEGETATION IN AREAS TO BE DISTURBED AND PER LANDSCAPING PLAN.
- REMOVE EXISTING BUILDING, SHED, AND CONCRETE FOUNDATION & WALL ABUTTING EDGE OF WETLANDS.
- REMOVE PAVEMENT.
- LEVEL SITE TO CREATE LAY-DOWN AREA.
- CONSTRUCT NEW SITE ENTRANCE TO LATER BE NEW POROUS PAVEMENT DRIVEWAY.
- EXCAVATE NEW FOUNDATION FOOTPRINT.
- BUILD NEW STRUCTURE.
- DO NOT CONSTRUCT PARKING AREA UNTIL SITE IS STABILIZED AND EXTERIOR OF NEW STRUCTURE IS COMPLETE (NO SILTING OF BASE MATERIALS OR PAVEMENT.)
- PAVEMENT CONSTRUCTION TO BE REVIEWED/MONITORED BY DR. ROBERT ROSEEN OR EQUAL. CONTACT: 603-686-2488
- CONTRACTOR IS RESPONSIBLE FOR CLEANING POROUS PAVEMENT WHEN CONSTRUCTION IS FINISHED.

**NOTES:**

- OWNER OF RECORD: TAX MAP 2, LOT 12-12 RICHMOND PROPERTY GROUP 333 N. ALABAMA ST. INDIANAPOLIS, IN 46204 SCRD BK 4626 PG 647
- THE INTENT OF THIS PLAN IS TO SHOW CONSTRUCTION SEQUENCING NOTES AND LOCATION OF SAID NOTES WITHIN THE SITE.
- PARCEL IS ZONED CENTRAL BUSINESS (CB) PER THE 2006 DURHAM ZONING DISTRICT MAP.
- A PORTION OF THE PARCEL IS IN A FLOOD HAZARD ZONE, REFERENCE FLOOD INSURANCE RATE MAP 3301TC0318E, DATED SEPTEMBER 30, 2015.
- SURVEY FIELDWORK CONDUCTED BY DOUGET SURVEY, LLC IN AUGUST, 2019.
- SOILS AND WETLANDS WERE DELINEATED BY GZA GEGENVIRONMENTAL, INC. DURING AUGUST, 2019.
- PROPERTY TO BE SERVICED BY TOWN WATER AND SEWER.
- ALL CONSTRUCTION SHOULD COMPLY WITH FEDERAL, STATE, AND LOCAL STANDARDS AND REGULATIONS.
- THIS PLAN WAS PREPARED WITH ON-SITE FIELD SURVEY AND EXISTING PLANS. THE CONTRACTOR SHOULD NOTIFY EMANUEL ENGINEERING, INC. DURING CONSTRUCTION IF ANY DISCREPANCY TO THE PLAN IS FOUND ON SITE.
- BEFORE ANY EXCAVATION, DIG SAFE AND ALL UTILITY COMPANIES SHOULD BE CONTACTED 72 HOURS BEFORE COMMENCING BY THE CONTRACTOR. CALL DIG SAFE @ 811 OR 1-888-DIG-SAFE.
- ALL UTILITIES SHALL BE LOCATED UNDERGROUND EXCEPT AS NOTED ON PLAN APPROVED BY THE PLANNING BOARD.

**REFERENCE PLANS:**

- "PLAN OF LAND, LAND OF THE UNIVERSITY OF NEW HAMPSHIRE FOR GAMMA THETA CORPORATION, GARRISON AVENUE, (NO TAX MAP/LOT NUMBER ASSIGNED) DURHAM, NEW HAMPSHIRE" DATED JULY 11, 2014 BY DOUGET SURVEY, INC. S.C.R.D. PLAN 108-020.
- "EXISTING CONDITIONS PLAN OF 17 & 21 MADBURY ROAD FOR AG ARCHITECTS, PC" DATED MAY 11, 2006 BY DOUGET SURVEY, INC.
- "TOWN OF DURHAM SEWER EASEMENTS, PETTEE BROOK INTERCEPTOR" DATED NOVEMBER 1964 BY G.L. DAVIS & ASSOCIATES S.C.R.D. POCKET 4 FOLDER 4 PLAN 26.
- "RE-SUBDIVISION OF LAND IN DURHAM, NH PREPARED FOR THETA GAMMA OF DELTA ZETA HOUSE CORP." DATED AUGUST 4, 1980 BY JOHN W. DURGIN ASSOCIATES, INC. S.C.R.D. DRAWER 21, PLAN 86.
- "PLAN OF LAND FOR ERNEST CUTTER" DATED OCTOBER 1911 BY JOHN W. DURGIN ASSOCIATES, INC.
- "UNIVERSITY OF NEW HAMPSHIRE GARRISON AVENUE AREA" DATED SEPTEMBER 16, 1951 BY G.L. DAVIS & ASSOCIATES.



5	APR 20, 2021	FOR APPROVAL	
4	DEC 28, 2020	FOR APPROVAL	
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**EMANUEL ENGINEERING**

civil & structural consultants, land planners

118 PORTSMOUTH AVENUE, A202  
STRATHAM, NH 03885  
P: 603-772-4400 F: 603-772-4487  
[WWW.EMANUELENGINEERING.COM](http://WWW.EMANUELENGINEERING.COM)

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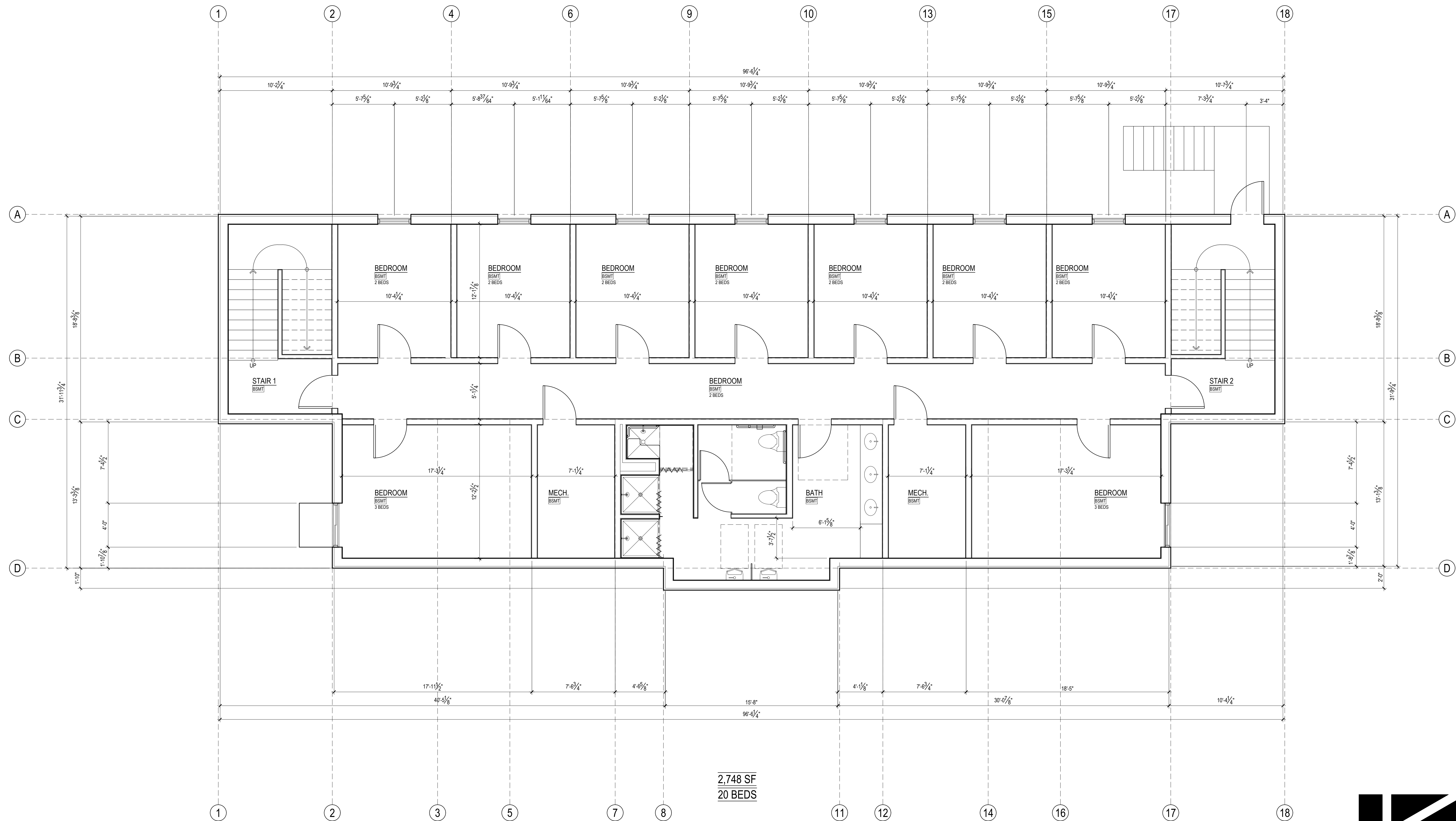
RICHMOND PROPERTY GROUP  
333 N. ALABAMA ST.  
INDIANAPOLIS, IN 46204

TITLE:

**CONSTRUCTION SEQUENCING PLAN**  
FOR  
RICHMOND PROPERTY GROUP  
ELIZABETH DEMERRITT HOUSE  
18 GARRISON AVENUE (SITE)  
DURHAM, NH 03824

PROJECT:	SCALE:	SHEET:
19-083	AS SHOWN	CS1





Basement Plan

Alpha Tau Omega- University of New Hampshire  
Durham, New Hampshire

05.25.21







First Floor

Alpha Tau Omega- University of New Hampshire  
Durham, New Hampshire

05.25.21







Alpha Tau Omega- University of New Hampshire  
Durham, New Hampshire

05.25.21





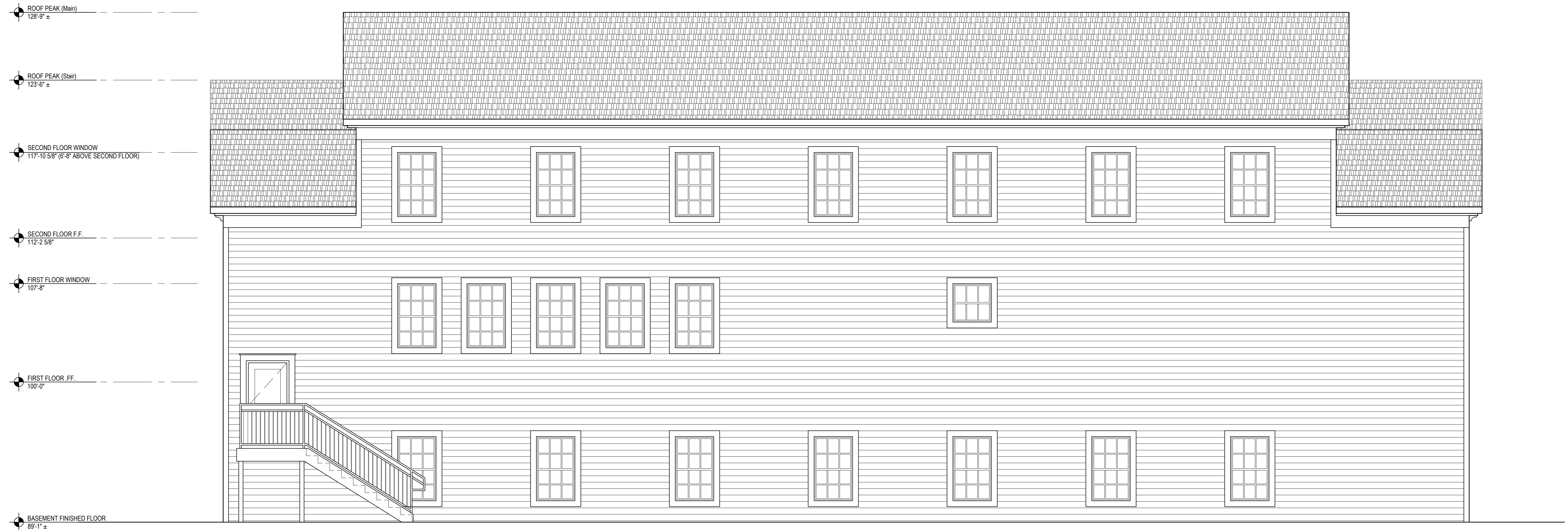


Front Elevation

Alpha Tau Omega- University of New Hampshire  
Durham, New Hampshire

05.25.21





Rear Elevation

Alpha Tau Omega- University of New Hampshire  
Durham, New Hampshire

05.25.21







Left Elevation

Right Elevation

Alpha Tau Omega- University of New Hampshire  
Durham, New Hampshire

05.25.21