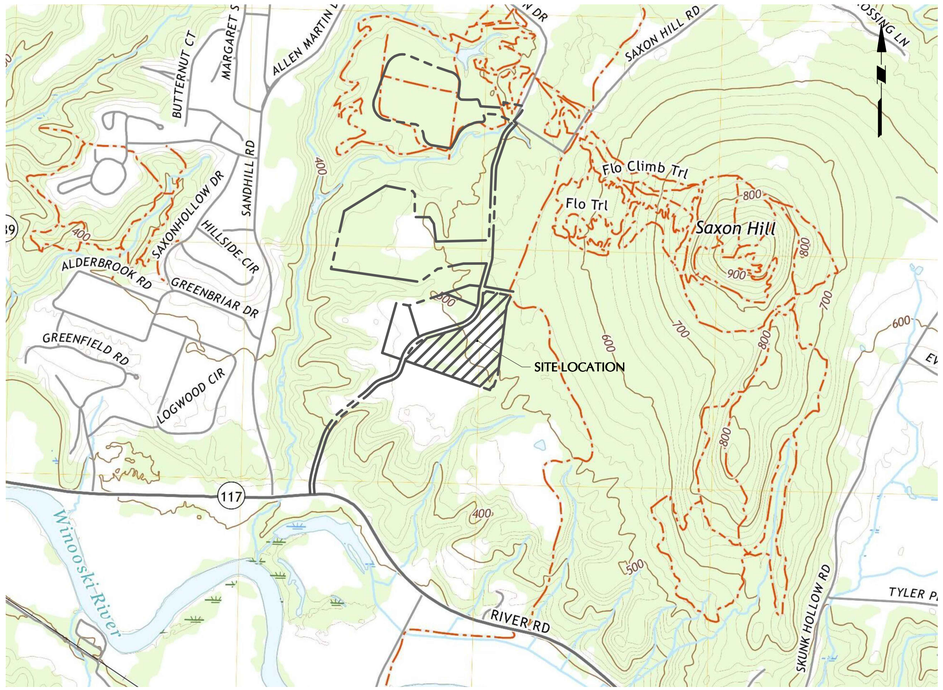
PROJECT MOOSE

KIMO DRIVE LOT #13 SITE PLAN APPLICATION

TOWN OF ESSEX, CHITTENDEN COUNTY, VERMONT

CIVIL DRAWING INDEX			
SHEET NUMBER	DRAWING TITLE	DATE	LAST REVISED
CS001	SITE COVER SHEET	01/30/2025	–
VL101	BOUNDARY AND TOPOGRAPHIC SURVEY	01/23/2025	–
VL102	BOUNDARY AND TOPOGRAPHIC SURVEY	01/23/2025	–
VL103	BOUNDARY AND TOPOGRAPHIC SURVEY	01/23/2025	–
VL104	BOUNDARY AND TOPOGRAPHIC SURVEY	01/23/2025	–
VL105	BOUNDARY AND TOPOGRAPHIC SURVEY	01/23/2025	–
CS002	MASTER LEGEND & NOTES	01/30/2025	–
CS003	MASTER LEGEND & NOTES	01/30/2025	–
CS100	OVERALL SITE PLAN	01/30/2025	–
CS101	SITE PLAN I	01/30/2025	–
CS102	SITE PLAN II	01/30/2025	–
CS103	SITE PLAN III	01/30/2025	–
CS501	SITE DETAILS I	01/30/2025	–
CS502	SITE DETAILS II	01/30/2025	–
CP101	SIGNAGE & STRIPING PLAN I	01/30/2025	–
CP102	SIGNAGE & STRIPING PLAN II	01/30/2025	–
CP103	SIGNAGE & STRIPING PLAN III	01/30/2025	–
CP501	SIGNAGE & STRIPING DETAILS I	01/30/2025	–
CP502	SIGNAGE & STRIPING DETAILS II	01/30/2025	–
CP503	SIGNAGE & STRIPING DETAILS III	01/30/2025	–
CG100	OVERALL GRADING & DRAINAGE PLAN	01/30/2025	–
CG101	GRADING & DRAINAGE PLAN I	01/30/2025	–
CG102	GRADING & DRAINAGE PLAN II	01/30/2025	–
CG103	GRADING & DRAINAGE PLAN III	01/30/2025	–
CG501	GRADING & DRAINAGE DETAILS I	01/30/2025	–
CG502	GRADING & DRAINAGE DETAILS II	01/30/2025	–
CG503	GRADING & DRAINAGE DETAILS III	01/30/2025	–
CG504	GRADING & DRAINAGE DETAILS IV	01/30/2025	–
CU100	OVERALL UTILITY PLAN	01/30/2025	–
CU101	UTILITY PLAN I	01/30/2025	–
CU102	UTILITY PLAN II	01/30/2025	–
CU103	UTILITY PLAN III	01/30/2025	–
CU501	UTILITY DETAILS I	01/30/2025	–
CU502	UTILITY DETAILS II	01/30/2025	–
CU503	UTILITY DETAILS III	01/30/2025	–
CU504	UTILITY DETAILS IV	01/30/2025	–
CU505	UTILITY DETAILS V	01/30/2025	–
CE101	EROSION PREVENTION & SEDIMENT CONTROL PLAN PHASE I	01/30/2025	–
CE201	EROSION PREVENTION & SEDIMENT CONTROL PLAN PHASE II	01/30/2025	–
CE501	EROSION PREVENTION & SEDIMENT CONTROL PLAN DETAILS I	01/30/2025	–
CE502	EROSION PREVENTION & SEDIMENT CONTROL PLAN DETAILS II	01/30/2025	–
LL100	OVERALL SITE LIGHTING PLAN	01/30/2025	–
LL101	SITE LIGHTING PLAN I	01/30/2025	–
LL102	SITE LIGHTING PLAN II	01/30/2025	–
LL103	SITE LIGHTING PLAN III	01/30/2025	–
LL501	SITE LIGHTING DETAILS	01/30/2025	–
LP100	OVERALL PLANTING PLAN	01/30/2025	–
LP101	PLANTING PLAN I	01/30/2025	–
LP102	PLANTING PLAN II	01/30/2025	–
LP103	PLANTING PLAN III	01/30/2025	–
L501	PLANTING DETAILS I	01/30/2025	–

FIRE PROTECTION DRAWINGS (PREPARED BY CESO, INC.)			
SHEET NUMBER	DRAWING TITLE	DATE	LAST REVISED
FP0.01	FIRE PROTECTION SPECIFICATIONS, SCHEDULES & NOTES	09/30/2024	–
FP1.01	OVERALL FIRE PROTECTION CRITERIA PLAN	09/30/2024	–
FP7.01	FIRE SPRINKLER SPECIFICATIONS	09/30/2024	–
FP7.02	FIRE SPRINKLER SPECIFICATIONS	09/30/2024	–



MAP REFERENCE: USGS ESSEX JUNCTION QUADRANGLE (7.5-MINUTE SERIES)

LOCATION MAP

SCALE: 1" = 1000'

INDEX OF ABUTTERS				
PARCEL #	PROPERTY ADDRESS	LANDOWNER	ZONING DISTRICT	PRESENT USE
2072014000	80 THOMPSON DRIVE	TOWN OF ESSEX	RESOURCE PRESERVATION DISTRICT – INDUSTRIAL	INDUSTRIAL
2072012007	72 THOMPSON DRIVE	ALLEN BROOK DEVELOPMENT INC.	RESOURCE PRESERVATION DISTRICT – INDUSTRIAL	INDUSTRIAL
2072012008	63 THOMPSON DRIVE	ALLEN BROOK DEVELOPMENT INC.	RESOURCE PRESERVATION DISTRICT – INDUSTRIAL	INDUSTRIAL
2072011000	55 THOMPSON DRIVE	BLACK BAY VENTURES V LLC	RESOURCE PRESERVATION DISTRICT – INDUSTRIAL	INDUSTRIAL
2072010000	35 THOMPSON DRIVE	BLACK BAY VENTURES XV LLC	RESOURCE PRESERVATION DISTRICT – INDUSTRIAL	INDUSTRIAL
2072012001	84 RED PINE CIR	ALLEN BROOK DEVELOPMENT INC.	RESOURCE PRESERVATION DISTRICT – INDUSTRIAL	INDUSTRIAL
2072012006	65 RED PINE CIR	ALLEN BROOK DEVELOPMENT INC.	RESOURCE PRESERVATION DISTRICT – INDUSTRIAL	INDUSTRIAL
2072007000	32 THOMPSON DRIVE	REINHART FOODSERVICE LLC	RESOURCE PRESERVATION DISTRICT – INDUSTRIAL	INDUSTRIAL
272012003	150 RED PINE CIR	ALLEN BROOK DEVELOPMENT INC.	RESOURCE PRESERVATION DISTRICT – INDUSTRIAL	INDUSTRIAL
2072012005	131 RED PINE CIR	ALLEN BROOK DEVELOPMENT INC.	RESOURCE PRESERVATION DISTRICT – INDUSTRIAL	INDUSTRIAL
2026009000	251 RIVER RD	SH–2 LLC	INDUSTRIAL	INDUSTRIAL

RELEASE DATES	
DATE	ISSUED FOR
01/30/2025	SITE PLAN APPLICATION

OWNER
OMEGA REAL ESTATE ASSOCIATES, INC
C/O: NICOLE SENECAL
31 COMMERCE AVE
SO BURLINGTON, VT 05403
T: (802) 862-0517

APPLICANT
SCANNELL PROPERTIES
C/O: LEO LEIGHTON
294 GROVE LANE,
SUITE 140
WAYZATA, MN 55391
T: (651) 341-5280

LAND SURVEYOR, CIVIL ENGINEER, TRAFFIC ENGINEER & LANDSCAPE ARCHITECT
LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
C/O TIM ONDERKO
555 LONG WHARF DR
NEW HAVEN, CT 06511
T: 203.562.5771

ARCHITECT
CESO, INC.
C/O: JANINE NUNFIO
3300 S MARKET STREET,
SUITE 230
ROGERS, AR 72758
T: (479) 390-0544

ATTORNEY
GRAVEL & SHEA PC
C/O: JEFFERY 0. POLUBINSKI
76 ST. PAUL STREET,
7TH FLOOR
BURLINGTON, VT 05401
T: (802) 658-0220

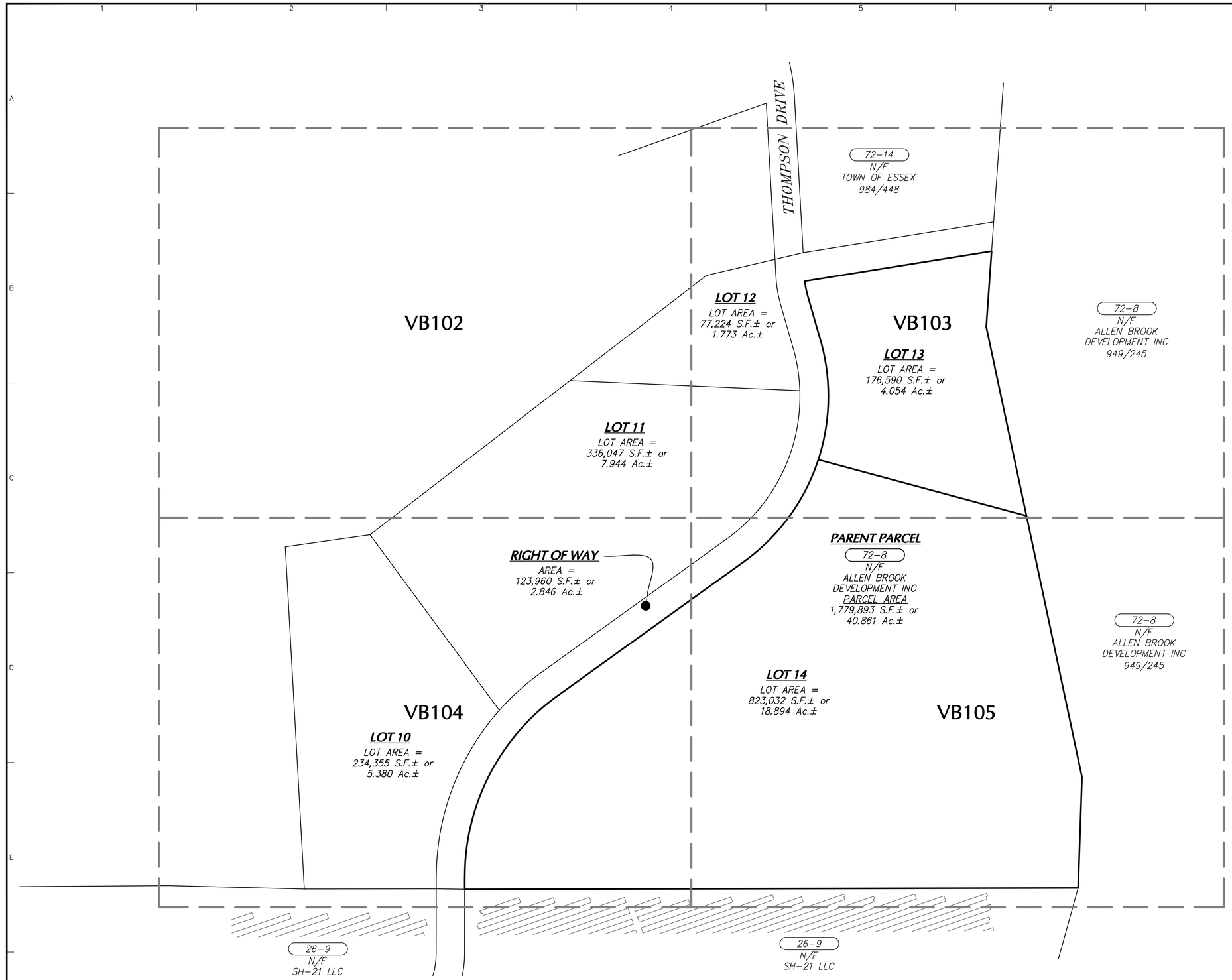
LANGAN

FOR PERMITTING ONLY - NOT FOR CONSTRUCTION

LANGAN

PROJECT No. 140277601

Date: 1/29/2025 Time: 14:24 User: bpalma Style Table: Langan.stb Layout: CS001 Document Code: 140278401-0501-CS001-0101





PROJECT LOCATION MAP
NOT TO SCALE

VT. NAD 83

NOTES

1. PROPERTY LINES AND RIGHT OF WAY SHOWN ARE FROM ACCEPTED SUBDIVISION PLAN ENTITLED "SUBDIVISION PLAT OF PARCEL B LANDS OF ALLEN BROOK DEVELOPMENT, INC." PREPARED BY O'LEARY–BURKE CIVIL ASSOCIATES, PLC, DATED JULY 16, 2024. THE CURRENT TITLE PARCELIZATION, RIGHT OF WAY, AND ASSOCIATED EASEMENTS ARE NOT SHOWN.
2. THE MERIDIAN OF THIS SURVEY IS REFERENCED TO VERMONT STATE PLANE COORDINATE SYSTEM NAD 83 (EPOCH 2001). POSITION WAS DETERMINED BY GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS) AS PROVIDED BY HXGN SMARTNET CONTINUOUSLY OPERATED REFERENCE STATIONS (CORS).
3. ELEVATIONS SHOWN ARE REFERENCED TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 12B) AS DETERMINED BY GNSS
4. PLANIMETRIC AND TOPOGRAPHIC INFORMATION SHOWN HEREON HAS BEEN OBTAINED FROM GROUND AND UAV BASED SURVEYS BY LANGAN ENVIRONMENTAL AND ENGINEERING SERVICES. FIELD WORK COMPLETED DURING THE MONTH OF FEBRUARY 2024.
5. AS PER THE NATIONAL FLOOD INSURANCE PROGRAM FIRM MAP ENTITLED "CHITTENDEN COUNTY, VERMONT PANEL 281 OF 500, MAP NUMBER 50007C0281D, EFFECTIVE DATE JULY 18, 2011" THE PROJECT AREA IS IN ZONE X (UNSHADED).
6. UNLESS SPECIFICALLY NOTED HEREON, STORM AND SANITARY SEWER INFORMATION (INCLUDING PIPE INVERT, PIPE MATERIAL, AND PIPE SIZE) WAS OBSERVED AND MEASURED AT FIELD LOCATED STRUCTURES (MANHOLES/CATCH BASINS, ETC). CONDITIONS CAN VARY FROM THOSE ENCOUNTERED AT THE TIMES WHEN AND LOCATIONS WHERE DATA IS OBTAINED. DESPITE MEETING THE REQUIRED STANDARD OF CARE, THE SURVEYOR CANNOT, AND DOES NOT WARRANT THAT PIPE MATERIAL AND/OR PIPE SIZE THROUGHOUT THE PIPE RUN ARE THE SAME AS THOSE OBSERVED AT EACH STRUCTURE, OR THAT THE PIPE RUN IS STRAIGHT BETWEEN THE LOCATED STRUCTURES.
7. ADDITIONAL UTILITY (WATER, GAS, ELECTRIC ETC.) DATA IS SHOWN FROM FIELD LOCATED SURFACE MARKINGS (BY OTHERS), EXISTING STRUCTURES, AND/OR FROM EXISTING DRAWINGS.
8. UNLESS SPECIFICALLY NOTED HEREON, THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFIGURATION INDICATED HEREON.
9. PRIOR TO ANY DESIGN OR CONSTRUCTION, THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS..
10. THIS SURVEY IS NOT VALID WITHOUT THE EMBOSSED OR INKED SEAL OF THE PROFESSIONAL.
11. WETLANDS DELINEATION CONDUCTED BY LEVI KESZEY, PWS, OF TRUDELL CONSULTING ENGINEERS (TCE), ON OCTOBER 5TH, 2023, AS SHOWN ON WETLAND DELINEATION MAP OF SCANNELL COMMERCIAL ESSEX, VT PROJECT: 22–216 PREPARED BY: LJK 11/7/23 1 INCH = 350 FEET. LINE WORK SHOWN HEREON TAKEN FROM A SHAPE FILE PROVIDED BY TCE ON JANUARY 11, 2024.
13. UPDATED SUB–DIVISION LINES SHOWN HEREON PROVIDED IN A CAD DRAWING BY OLEARY–BURKE ASSOCIATES ENTITLED 2023–104–C3D–PLAT–2–LANGAN.DWG

LEGEND (NOT SHOWN TO SCALE)

- GUY POLE
- GUY WIRE
- POWER POLE
- X 262.3 — SPOT ELEVATION
- WF — WETLAND FLAG
- CHAINLINK FENCE
- TREE LINE
- OVERHEAD WIRE
- EASEMENT LINE
- PROPERTY LINE
- 322 — CONTOUR LINE

METERS: 0 10 25 50 75
FEET: 0 50 100 200 300

PROJECT NO. 140278401

Date	Description	No.
Revisions		

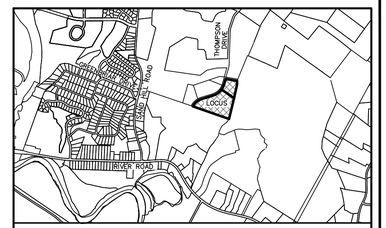
STATE OF VERMONT
IAN C. WISURI
NO. 108945
LICENSED LAND SURVEYOR

IAN C. WISURI, VT LS No. 024.0108945 — 1/23/25 DATE

LANGAN
Langan Engineering and Environmental Services, Inc.
100 Cambridge Street, Suite 1310
Boston, MA 02114
T: 617.824.9100 F: 617.824.9101 www.langan.com

Project	NEW LOTS 13 & 14 75 THOMPSON DRIVE ESSEX 05452 CHITTENDEN COUNTY VERMONT
Prepared for	SCANNELL PROPERTIES 294 GROVE LANE EASE, SUITE 140 WAYZATA, MINNESOTA 55391
Record Owner	ASSESSORS MAP 72 LOT 8 N/F ALLEN BROOK DEVELOPMENT, INC. 925/875
Drawing Title	BOUNDARY AND TOPOGRAPHIC SURVEY
Project No.	140278401
Date	JANUARY 23, 2025
Drawn By	BAL/TGS
Checked By	ICW
Drawing No.	VB101
	Sheet 1 of 5

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PROJECT LOCATION MAP

NOT TO SCALE

VT NAD 83

72-14
N/F
TOWN OF ESSEX
984/448

CLASS II 50' WETLAND BUFFER

WF SERIES "A"

WOODED AREA

APPROXIMATE OFF-SITE WETLANDS (NOT DELINEATED)

LOT 11
LOT AREA =
336,047 S.F.± or
7.944 Ac.±

METERS
0 5 10 25
0 20 40 80 120
FEET

PROJECT NO. 140278401

Date	Description	No.
Revisions		

IAN C. WISURI, VT LS No. 024.0108945 DATE

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Project
NEW LOTS 13 & 14
75 THOMPSON DRIVE
ESSEX 05452
CHITTENDEN COUNTY VERMONT

Prepared for
SCANNELL PROPERTIES
294 GROVE LANE EASE, SUITE 140
WAYZATA, MINNESOTA 55391

Record Owner
ASSESSORS MAP 72 LOT 8
N/F
ALLEN BROOK DEVELOPMENT, INC.
925/875

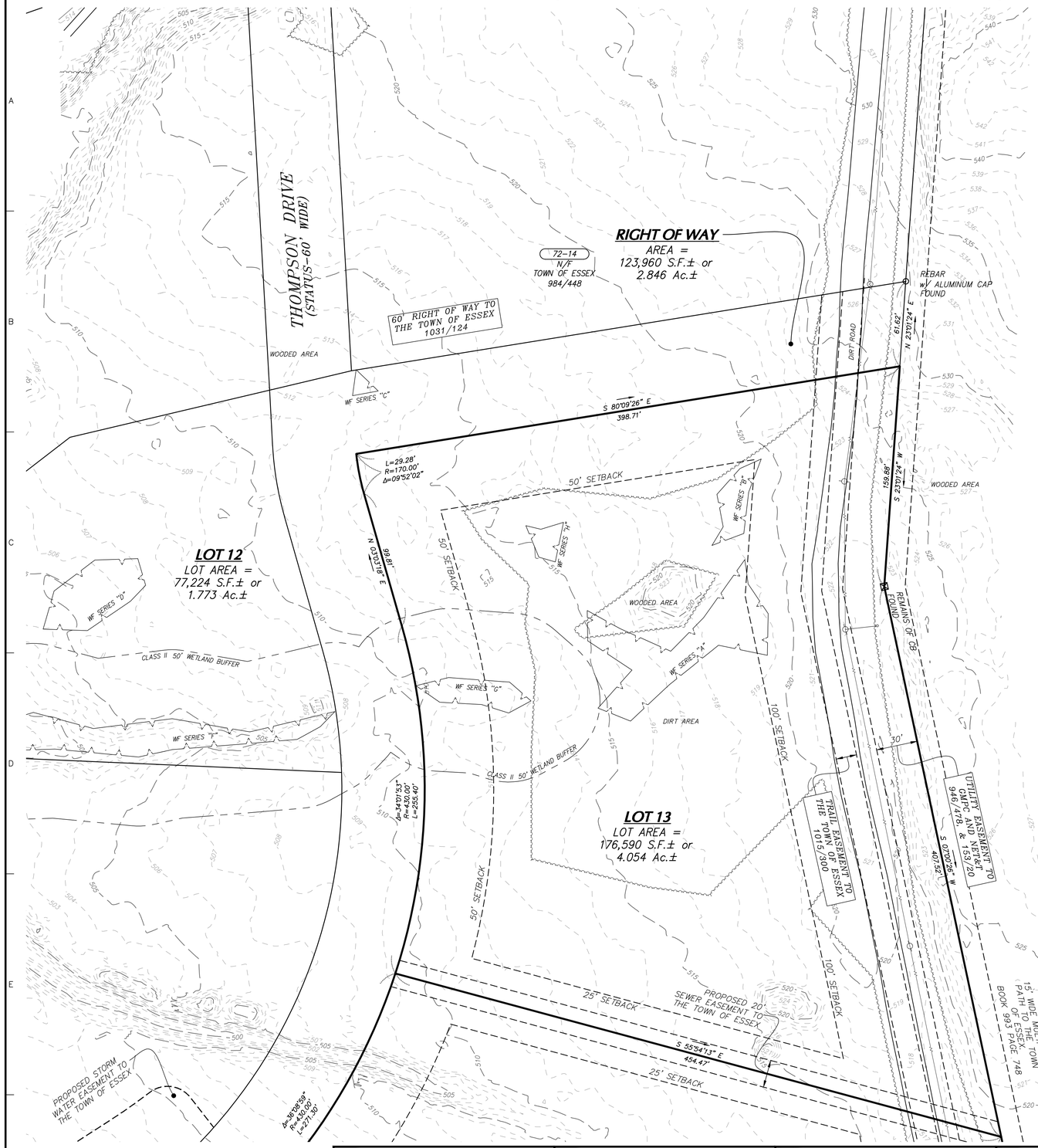
Drawing Title
BOUNDARY AND TOPOGRAPHIC SURVEY

Project No. 140278401
Date JANUARY 23, 2025
Drawn By BAL/TGS
Checked By ICW

Drawing No. VB102

Sheet 2 of 5

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PROJECT LOCATION MAP
NOT TO SCALE

PROJECT NO. 140278401

METERS
0 5 10 25
0 20 40 80 120
FEET

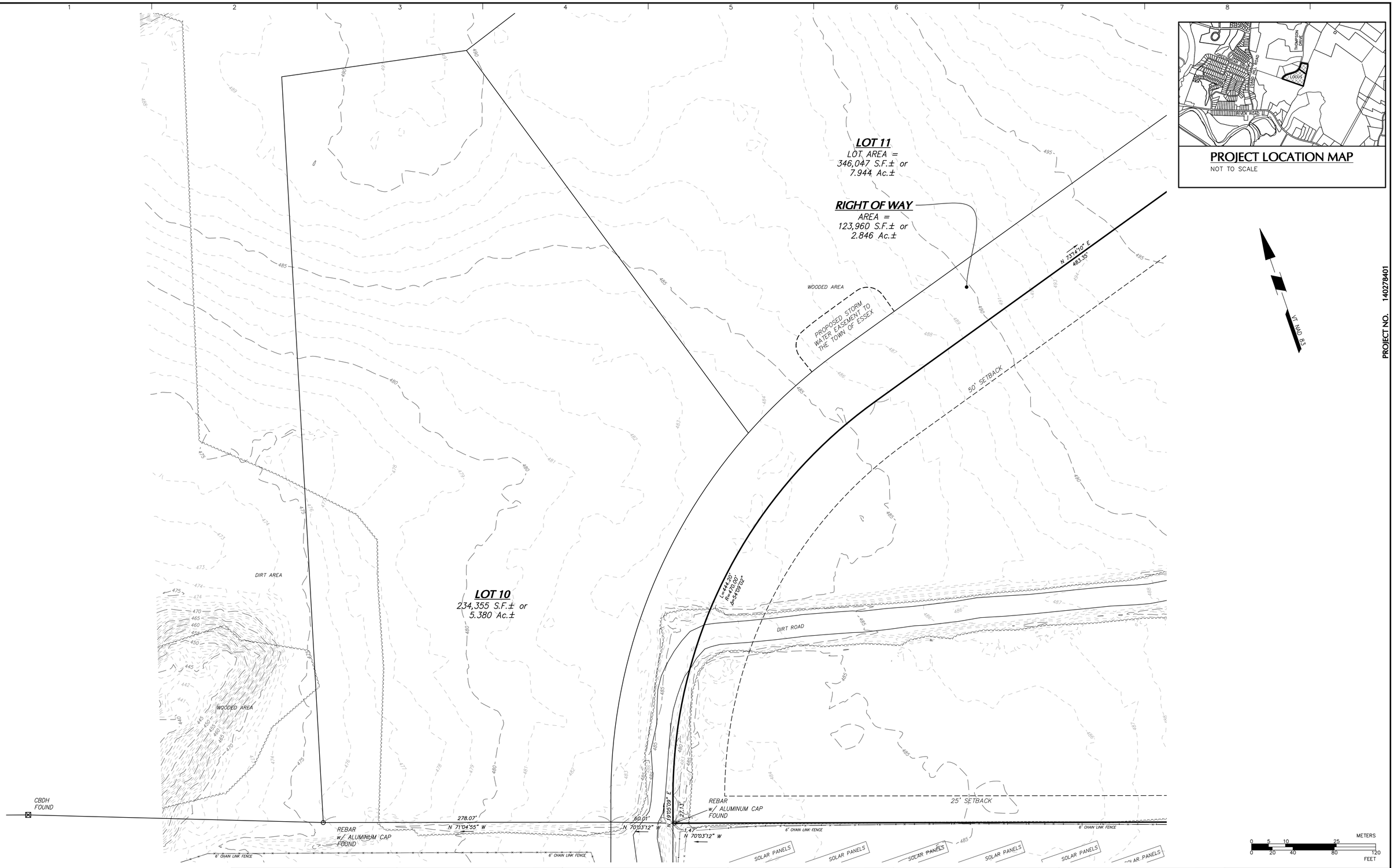
Date	Description	No.
Revisions		

IAN C. WISURI, VT LS No. 024.0108945 DATE

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Environmental Services, Inc.
100 Cambridge Street, Suite 1310
Boston, MA 02114
T: 617.824.9100 F: 617.824.9101 www.langan.com

Project	NEW LOTS 13 & 14 75 THOMPSON DRIVE ESSEX 05452 CHITTENDEN COUNTY VERMONT
Prepared for	SCANNELL PROPERTIES 294 GROVE LANE EASE, SUITE 140 WAYZATA, MINNESOTA 55391
Record Owner	ASSESSORS MAP 72 LOT 8 N/F ALLEN BROOK DEVELOPMENT, INC. 925/875
Drawing Title	BOUNDARY AND TOPOGRAPHIC SURVEY
Project No.	140278401
Date	JANUARY 23, 2025
Drawn By	BAL/TGS
Checked By	ICW
Drawing No.	VB103
	Sheet 3 of 5

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PROJECT LOCATION MAP
NOT TO SCALE

PROJECT NO. 140278401

Date	Description	No.
Revisions		

IAN C. WISURI, VT LS No. 024.0108945 DATE

LANGAN
Langan Engineering and Environmental Services, Inc.
100 Cambridge Street, Suite 1310
Boston, MA 02114
T: 617.824.9100 F: 617.824.9101 www.langan.com

Project	NEW LOTS 13 & 14 75 THOMPSON DRIVE ESSEX 05452 CHITTENDEN COUNTY VERMONT
Prepared for	SCANNELL PROPERTIES 294 GROVE LANE EASE, SUITE 140 WAYZATA, MINNESOTA 55391
Record Owner	ASSESSORS MAP 72 LOT 8 N/F ALLEN BROOK DEVELOPMENT, INC. 925/875
Drawing Title	BOUNDARY AND TOPOGRAPHIC SURVEY
Project No.	140278401
Date	JANUARY 23, 2025
Drawn By	BAL/TGS
Checked By	ICW
Drawing No.	VB104
	Sheet 4 of 5

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PROJECT NO. 140278401

Date	Description	No.
Revisions		

IAN C. WISURI, VT LS No. 024.0108945 DATE

LANGAN
Langan Engineering and Environmental Services, Inc.
100 Cambridge Street, Suite 1310
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Project
NEW LOTS 13 & 14
75 THOMPSON DRIVE
ESSEX 05452
CHITTENDEN COUNTY VERMONT

Prepared for
SCANNELL PROPERTIES
294 GROVE LANE EASE, SUITE 140
WAYZATA, MINNESOTA 55391

Record Owner
ASSESSORS MAP 72 LOT 8
N/F
ALLEN BROOK DEVELOPMENT, INC.
925/875

Drawing Title
BOUNDARY AND TOPOGRAPHIC SURVEY

Project No. 140278401
Date JANUARY 23, 2025
Drawn By BAL/TGS
Checked By ICW

Drawing No. VB105
Sheet 5 of 5

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GENERAL NOTES

1. ALL TOPOGRAPHIC, PROPERTY LINE AND UTILITY INFORMATION TAKEN FROM PLANS TITLED "BOUNDARY AND TOPOGRAPHIC SURVEY" BY LANGAN, CT, DATED 01-23-2025.
2. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING DIGSAFE (WWW.DIGSAFE.COM), PRIOR TO PERFORMING EXCAVATION TEST HOLES, TEST BORINGS, AND WHATEVER ADDITIONAL INVESTIGATION IS NECESSARY TO PROTECT AND MAINTAIN ALL EXISTING UTILITIES TO REMAIN THROUGHOUT THE CONSTRUCTION PERIOD. ANY CONFLICTS BETWEEN EXISTING UTILITIES AND PROPOSED UTILITIES DISCOVERED DURING CONSTRUCTION SHALL BE PROMPTLY REPORTED TO THE PROJECT ENGINEER.
3. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS, DIMENSIONS AND DETAILS OF ALL DOORS, RAMPS, SIDEWALKS AND WALLS ASSOCIATED WITH THE BUILDING.
4. ALL IMPROVEMENTS CONSTRUCTED IN THE TOWN PUBLIC RIGHT-OF-WAY SHALL CONFORM TO TOWN OF ESSEX STANDARD DETAILS. IN THE ABSENCE OF LOCAL DETAILS & REQUIREMENTS AND WORK IN THE STATE RIGHT-OF-WAY SHALL COMPLY WITH THE MOST UP TO DATE VERSION OF THE STATE OF VERMONT DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS.
5. FOR AREAS OUTSIDE THE PROPERTY LINES, REPAIR AND/OR REPLACE ALL DAMAGE DONE TO EXISTING ELEMENTS (SIDEWALKS, PAVING, LANDSCAPING, ETC) AS REQUIRED BY OWNER AND/OR GOVERNING AUTHORITY.
6. ALL SIGNS AND PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE MUTCD AND STATE OF VERMONT AGENCY OF TRANSPORTATION (VTANS).
7. CONTRACTOR SHALL PREVENT DUST, SEDIMENT AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS AND CORRECTIVE ACTION IF SUCH OCCURS. ADJOINING STREETS AND PROPERTIES TO BE KEPT FREE OF DEBRIS RESULTING FROM DEMOLITION AND SHALL BE CLEANED ON A DAILY BASIS OR AS NEEDED.
8. DUST CONTROL TREATMENTS SHALL BE APPLIED AS NECESSARY TO CONTROL AND REDUCE THE AMOUNT OF DUST WHICH MAY CAUSE OFF-SITE DAMAGE, BE A HEALTH HAZARD TO HUMANS, WILDLIFE AND PLANT LIFE, OR POSE A HAZARD TO TRAFFIC SAFETY.
9. ABBREVIATIONS:

ARCH. = ARCHITECTURAL	R.O.W = RIGHT OF WAY
CONC. = CONCRETE	CO = CLEAN OUT
INV = INVERT	DIP = DUCTILE IRON PIPE
EX = EXISTING	PVC = POLYVINYL CHLORIDE PIPE
HDPE = HIGH DENSITY POLYETHYLENE PIPE	OCS = OUTLET CONTROL STRUCTURE
PR. = PROPOSED	RCP = REINFORCED CONCRETE PIPE
R&D = REMOVE & DISPOSE	LF = LINEAR FEET
R&R = REMOVE & REPLACE	RL = ROOF LEADER
TYP. = TYPICAL	TC = TOP OF CURB
SWL = SINGLE WHITE LINE	BC = BOTTOM OF CURB
SYL = SINGLE YELLOW LINE	TW = TOP OF WALL
BW = BOTTOM OF WALL	MH = MANHOLE
HP = HIGHPOINT	LA = LANDSCAPED AREA
GR = TOP OF GRATE	N.T.S. = NOT TO SCALE
INV = INVERT	LF = LINEAR FEET
SAN MH = SANITARY SEWER MANHOLE	CB = CATCH BASIN
FFE = FINISHED FLOOR ELEVATION	YD = YARD DRAIN
	FES = FLAIRED END SECTION

10. THE EXISTING UTILITIES INDICATED HEREON MAY NOT BE LOCATED AS SHOWN. IN ADDITION, OTHER UTILITIES NOT SHOWN HEREON MAY BE PRESENT. ANY DISCREPANCIES DISCOVERED DURING THE COURSE OF CONSTRUCTION SHALL BE PROMPTLY REPORTED TO THE PROJECT ENGINEER.
11. ALL UTILITY WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS AND SPECIFICATIONS/DETAILS OF THE UTILITY COMPANY HAVING AUTHORITY OVER THE PROPOSED WORK. ALL PROPOSED UTILITY WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL ORDINANCES/REQUIREMENTS GOVERNING THE PROPOSED WORK.
12. ANY UTILITY EASEMENTS REQUIRED BY ANY OF THE VARIOUS UTILITY COMPANIES SHALL BE OBTAINED, EXECUTED, AND RECORDED PRIOR TO ANY OF THE AFFECTED UTILITY WORK BEING PERFORMED.
13. ALL PROPOSED UTILITIES WILL BE LOCATED UNDERGROUND.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY SIZING ALL DRAINAGE STRUCTURES AND SUBMITTING SHOP DRAWINGS TO ENGINEER FOR REVIEW.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PAVEMENT REPAIRS REQUIRED AS A RESULT OF ANY UTILITY WORK.
16. BOTTOM AND TOP OF RETAINING WALL ELEVATION SPOT SHOTS REPRESENT THE BASE OF THE WALL AT FINISHED GROUND LEVEL AND THE TOP OF THE FACE OF THE WALL RESPECTIVELY.
17. SPOT SHOTS ALONG CURB LINES REPRESENT THE BASE OF THE CURB UNLESS NOTED OTHERWISE.

CONTRACTOR NOTES

1. THESE PLANS REPRESENT THE OVERALL SITEWORK IMPROVEMENTS REQUIRED FOR PROJECT CONSTRUCTION. THE CONTRACTOR SHALL FURNISH, INSTALL, TEST AND COMPLETE ALL WORK TO THE SATISFACTION OF THE ENGINEER AND OWNER IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION; AS SUCH, THESE PLANS DO NOT COMPLETELY REPRESENT, NOR ARE THEY INTENDED TO REPRESENT, ALL SPECIFIC INSTRUCTIONS REQUIRED FOR SITEWORK CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE TO CONSTRUCT ALL IMPROVEMENTS DEPICTED ON THESE PLANS IN ACCORDANCE WITH ALL APPLICABLE RULES, REGULATIONS AND LAWS IN EFFECT AT THE TIME OF CONSTRUCTION.
2. THE CONTRACTOR SHALL ACCEPT THE SITE AS IS. THE CONTRACTOR SHALL ASSESS CONDITIONS, AND THE KIND, QUALITY AND QUANTITY OF WORK REQUIRED. THE OWNER AND ENGINEER MAKES NO GUARANTEE IN REGARD TO THE ACCURACY OF ANY INFORMATION THAT WAS OBTAINED DURING INVESTIGATIONS. THE CONTRACTOR SHALL: MAKE A THOROUGH SITE INSPECTION IN ORDER TO FIELD CHECK EXISTING SITE CONDITIONS; CORRELATE CONDITIONS WITH THE DRAWINGS; AND, RESOLVE ANY POSSIBLE CONSTRUCTION CONFLICTS WITH THE OWNER AND ENGINEER PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR SHALL PERFORM ADDITIONAL TOPOGRAPHIC SURVEYS HE/SHE DEEMS NECESSARY, PROVIDED THEY ARE COORDINATED WITH THE OWNER. ANY CONDITIONS DETERMINED BY THE CONTRACTOR THAT DIFFER FROM THE INFORMATION SHOWN ON THE DRAWINGS THAT ARE NOT BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER PRIOR TO THE START OF WORK SHALL NOT BE CONSIDERED GROUNDS FOR ADDITIONAL PAYMENT OR CHANGES TO THE CONTRACT DURATION, OR ANY OTHER CLAIMS AGAINST THE OWNER OR OWNER'S ENGINEER.
3. THE CONTRACTOR SHALL, WHEN HE/SHE DEEMS NECESSARY, PROVIDE A WRITTEN REQUESTS FOR INFORMATION (RFI) TO THE OWNER AND/OR OWNER'S DESIGNATED REPRESENTATIVE, AND ENGINEER PRIOR TO THE CONSTRUCTION OF ANY SPECIFIC SITEWORK ITEM. THE (RFI) SHALL BE IN A FORM ACCEPTABLE TO OWNER AND/OR OWNER'S DESIGNATED REPRESENTATIVE, AND ENGINEER AND SHALL ALLOW FOR A MINIMUM OF THREE WORK DAYS FOR A WRITTEN REPLY. RFIS SHALL BE NUMBERED CONSECUTIVELY BY DATE SUBMITTED. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SITEWORK ITEMS CONSTRUCTED DIFFERENTLY THAN INTENDED OR AS DEPICTED ON THE PLANS.
4. INFORMATION RELATED TO ELEVATIONS AND PROPOSED UTILITIES (SUCH AS ROADWAY GRADES, INVERT ELEVATIONS, RIM ELEVATIONS, GRATE ELEVATIONS, BUILDING FINISHED FLOOR ELEVATIONS, ETC.) MAY BE FOUND IN MORE THAN ONE LOCATION IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL SUFFICIENTLY REVIEW ALL PLANS, PROFILES AND ANY OTHER INFORMATION IN THE CONTRACT DOCUMENTS FOR CONSISTENCY PRIOR TO BID. ANY INCONSISTENCIES OR DISCREPANCIES THAT ARE FOUND BY THE CONTRACTOR OR HIS ASSIGNS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER IN WRITING, IN THE FORMAT OF AN RFI PRIOR TO BID.
5. THERE ARE ADDITIONAL NOTES, SPECIFICATIONS AND REQUIREMENTS CONTAINED THROUGHOUT THE PLAN SET AS WELL AS REFERENCES TO SPECIFICATIONS FROM APPLICABLE GOVERNING AUTHORITIES AND INDUSTRY STANDARDS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN, REVIEW AND ADHERE TO ALL THESE DOCUMENTS.
6. CONTRACTOR IS SPECIFICALLY CAUTIONED THAT ALL CONSTRUCTION STAKEOUT FOR THIS PROJECT MUST BE COMPLETED FROM THE SITE SPECIFIC SURVEY CONTROL (HORIZONTAL AND VERTICAL) UPON WHICH THE DESIGN IS BASED. THE CONTRACTOR SHOULD NOT RELY ON OR RE-ESTABLISH SURVEY CONTROL BY GPS OR OTHER METHODS FOR USE IN CONSTRUCTION STAKEOUT OR ANY OTHER PURPOSE FOR THIS PROJECT. ANY DISCREPANCIES BETWEEN THE EXISTING HORIZONTAL OR VERTICAL DATA SHOWN ON THESE DRAWINGS AND THAT ENCOUNTERED IN THE FIELD MUST BE REPORTED TO THE DESIGN TEAM PRIOR TO CONSTRUCTION FOR RESOLUTION.

ACCESSIBILITY NOTES

1. WALKWAYS ALONG ACCESSIBLE ROUTES NOT TO EXCEED 5% RUNNING SLOPE OR 2% CROSS SLOPE.
2. ALL ADA PARKING SPACES AND PASSENGER LOADING ZONES SHALL NOT EXCEED 2% IN ANY DIRECTION.
3. ALL ADA EGRESSES SHALL BE FLUSH WITH ADJOINING MATERIAL UNLESS NOTED OTHERWISE.
4. ALL CURB RAMPS SHALL NOT EXCEED 1:12 RUNNING SLOPE OR 2% CROSS SLOPE.
5. CONTRACTOR SHALL CONFIRM FIELD CONDITIONS ARE CONSISTENT WITH CONSTRUCTION DOCUMENTS AND NOTIFY THE ENGINEER OF ANY COMPLIANCE ISSUES PRIOR TO CONSTRUCTION.

GRADING & DRAINAGE NOTES

1. THE SITE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, UTILITY LOCATIONS, AND INVERTS PRIOR TO CONSTRUCTION. ANY CONDITIONS FOUND TO DIFFER FROM THOSE SHOWN ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
2. LOCATIONS AND ELEVATIONS OF ROOF LEADERS SHOULD BE COORDINATED WITH ARCHITECTURAL DRAWINGS PRIOR TO CONSTRUCTION.
3. ALL EXISTING STORM DRAINAGE PIPING AND STRUCTURES LOCATED WITHIN THE PROJECT SITE SHALL BE MAINTAINED UNLESS OTHERWISE NOTED.
4. ALL REQUIRED STORM LATERALS SERVICING THE PROPOSED BUILDING SHALL BE COORDINATED AND CONSTRUCTED TO WITHIN FIVE FEET OF THE FOUNDATION. ANY NECESSARY EXTENSIONS, RELOCATIONS, OR CORRECTIONS WITHIN FIVE FEET OF THE BUILDING NECESSARY TO COMPLETE CONNECTION OF LATERALS TO THE BUILDING SHALL BE MADE BY THE BUILDING CONTRACTOR.
5. SITE CONTRACTOR TO INSTALL SILT SACK/INLET PROTECTION ON ALL EXISTING AND PROPOSED INLETS BEFORE COMMENCING CONSTRUCTION.
6. BASINS UTILIZED AS SEDIMENT BASINS DURING CONSTRUCTION SHALL BE CLEANED AFTER THE COMPLETION OF CONSTRUCTION TO ENSURE PROPER FUNCTIONALITY.
7. CONTRACTOR TO CLEAN ENTIRE DRAINAGE SYSTEM, WHICH INCLUDES BUT IS NOT LIMITED TO PIPES, STRUCTURES, AND BASINS, OF SEDIMENT PRIOR TO PROJECT COMPLETION.

UTILITY NOTES

GENERAL

1. THE SITE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED UPON AS BEING EXACT OR COMPLETE.
2. THE CONTRACTOR SHALL NOTIFY "DIGSAFE" AT 1-888-DIG-SAFE AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION.
3. THE SITE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, UTILITY LOCATIONS, AND INVERTS PRIOR TO CONSTRUCTION. ANY CONDITIONS FOUND TO DIFFER FROM THOSE SHOWN BY THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE PROJECT ENGINEER.
4. SITE CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS AND SPECIFICATIONS FOR ACTUAL LOCATIONS OF ALL UTILITY ENTRANCES TO INCLUDE SANITARY SEWER LATERALS, DOMESTIC AND FIRE PROTECTION WATER SERVICE, ELECTRICAL, TELEPHONE AND GAS SERVICE, ROOF DRAINS, AND ALL OTHER UTILITIES. SITE CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES IN SUCH A MANNER AS TO AVOID CONFLICTS AND TO ENSURE PROPER DEPTHS ARE ACHIEVED AS WELL AS COORDINATING WITH THE REGULATORY AGENCY AS TO LOCATION OF AND SCHEDULING OF CONNECTIONS TO THEIR FACILITIES.
5. THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UTILITY COMPANIES 72 HOURS PRIOR TO BEGINNING EXCAVATION.
6. THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND ALL PAVEMENT REPAIRS REQUIRED AS A RESULT OF ANY UTILITY WORK.

ELECTRIC, TELEPHONE & GAS

1. SITE CONTRACTOR TO COORDINATE GAS MAIN, ELECTRIC, AND TELEPHONE INSTALLATION WITH APPROPRIATE UTILITY COMPANIES.

EROSION PREVENTION & SEDIMENT CONTROL NOTES

1. CONTRACTOR TO REFER TO THE VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL (2020), VERMONT EROSION PREVENTION AND SEDIMENT CONTROL FIELD GUIDE (2006), AND ANY OTHER RELEVANT PROJECT PERMITS.
2. THE PURPOSE OF THESE PLANS IS TO:
   A. MINIMIZE THE EXTENT OF DISTURBED SOILS LEFT EXPOSED TO EROSION AT ANY GIVEN TIME.
   B. PREVENTING OR MINIMIZING SOIL EROSION OF DISTURBED LAND.
   C. PREVENTING DISCHARGE OF SEDIMENT AND OTHER CONSTRUCTION RELATED POLLUTANTS TO WATERS OF THE STATE, OR NEIGHBORING PROPERTIES.
2. A COPY OF THE PERMIT CARD AND A SET OF PLANS SHALL BE AVAILABLE ON SITE.
3. THE CONTRACTOR SHALL NOTIFY "DIGSAFE" AT 1-888-DIG-SAFE AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION.
4. EXISTING VEGETATION SHALL BE PROTECTED AND MAINTAINED TO THE EXTENT PRACTICABLE. ALL CLEARING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH THE ACCEPTABLE MANAGEMENT PRACTICES.
5. DURING SITE CLEARING OPERATIONS, THE CONTRACTOR SHALL DISPOSE OF ALL STUMPS, EXCESS SOILS, COLLECTED SEDIMENT AND OTHER POLLUTANTS, IN A MANNER THAT WILL NOT RESULT IN SEDIMENTS AND POLLUTANTS ENTERING WATERS OF THE STATE. THE CONTRACTOR SHALL DISPOSE OF THE ABOVE REFERENCED MATERIAL IN THE LOCATION DESIGNATED ON THE EROSION AND SEDIMENT CONTROL PLANS OR AS DIRECTED BY THE PROJECT ENGINEER AND THE TOWN ENGINEER.
6. TO THE EXTENT PRACTICABLE, SURFACE FLOW SHALL BE DIVERTED AWAY FROM EXPOSED SOILS VIA DIVERSION BERMS, TEMPORARY DIVERSION SWALES, CHECK DAMS, ETC. SEE DETAILS.
7. DISTURBED AREAS BORDERING OR DRAINING TO EXISTING ROADS SHALL HAVE AN APPROPRIATE SEDIMENT BARRIER (E.G., SILT FENCE) SPANNING THE EDGE OF THE DISTURBANCE TO PREVENT WASHING OF SEDIMENT ONTO ROADWAYS OR INTO ROAD DITCHES.
8. DUST CONTROL SHALL BE HANDLED VIA WATER APPLICATION TO ROADWAYS AND OTHER AREAS WHERE DUST MAY BE GENERATED,
9. EROSION PREVENTION & SEDIMENT CONTROL (EPSC) PRACTICES SHALL BE IMPLEMENTED IN ALL AREAS WHERE THERE IS HIGH RISK OF EROSION, AND WHERE THERE IS POTENTIAL FOR DISCHARGE OF STORMWATER (EITHER DIRECT OR INDIRECT) TO A WATER BODY OR NEIGHBORING PROPERTY.
10. EPSC MEASURES SHALL BE INSTALLED PRIOR TO ANY EARTH DISTURBING ACTIVITIES WITHIN A GIVEN DRAINAGE AREA WITH THE EXCEPTION OF LAND DISTURBANCE THAT MAY NOT RESULT ACCESSING THE AREA(S) WITH EQUIPMENT IN WHICH EPSC MEASURES ARE TO BE INSTALLED. THIS EXCEPTION INCLUDES LAND DISTURBANCE THAT MAY RESULT FROM ACCESS OF EQUIPMENT THAT IS NEEDED FOR; LOGGING, EXPLORATION, AND/OR SEDIMENT BARRIERS, AND OTHER TEMPORARY MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE WITH THE EXCEPTION OF THOSE ACTIVITES STATED ABOVE. EARTH DISTURBANCE INCLUDES STUMPING AND GRUBBING OF CLEARED AREAS.
11. ALL CLEARING AND LOGGING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH ACCEPTABLE MANAGEMENT PRACTICES FOR MAINTAINING WATER QUALITY ON LOGGING JOBS IN VERMONT (AMPS, 2006).
12. PERMISSION MUST BE GRANTED BY VT DEC PRIOR TO USE OF ANY SUPPORT ACTIVITIES OCCURRING OUTSIDE THE APPROVED PROJECT BOUNDARIES.
13. A QUALIFIED PERSON OR PERSONS SHALL BE DESIGNATED AS THE ON-SITE PLAN COORDINATOR (OSPC).
14. THE OSPC SHALL BE KNOWLEDGEABLE IN PRINCIPLES AND PRACTICES OF EPSC IMPLEMENTATION AND POSSESS SKILLS TO ASSESS CONDITIONS AT THE CONSTRUCTION SITE THAT COULD IMPACT STORMWATER QUALITY AND TO ASSESS EFFECTIVENESS OF EPSC MEASURES SELECTED TO CONTROL QUALITY OF STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITY.
15. THE OSPC SHALL BE RESPONSIBLE FOR ON-SITE IMPLEMENTATION OF THIS EPSC PLAN, INCLUDING TURBIDITY MONITORING AND DISCHARGE REPORTING.
16. THE OSPC SHALL HAVE THE AUTHORITY TO STOP AND/OR MODIFY CONSTRUCTION ACTIVITIES AS NECESSARY TO COMPLY WITH THIS EPSC PLAN, TERMS AND CONDITIONS OF THE PERMIT.
17. THE OSPC SHALL INSPECT AND KEEP WRITTEN RECORD OF THE EROSION AND SEDIMENT CONTROL STRUCTURES AND MEASURES AT A MINIMUM OF ONCE A WEEK AND ALSO WITHIN 24 HOURS OF ANY STORM EVENT THAT DISCHARGES RUNOFF FROM THE SITE.
18. THE OSPC SHALL KEEP A WRITTEN RECORD OF EROSION CONTROL INSPECTIONS AND ANY MONITORING DATA FOR A MINIMUM OF THEE (3) YEARS FOLLOWING COMPLETION OF CONSTRUCTION.
19. THE OSPC OR HIS/HER DESIGNEE SHALL BE ON-SITE ON A DAILY BASIS DURING ACTIVE CONSTRUCTION.
20. THE OSPC'S CONTACT INFORMATION SHALL BE PROVIDED TO VT DEC PRIOR TO START OF CONSTRUCTION.
21. UPON THE COMPLETION OF WORK, THE CONTRACTOR SHALL RESTORE ANY AREAS USED AS ACCESS ROADS, STAGING AREAS, MATERIAL STOCK PILING, AND ALL OTHER AREAS DISTURBED BY CONSTRUCTION ACTIVITIES. ALL FINAL EROSION AND SEDIMENT CONTROLS SHALL BE INSTALLED TO STABILIZE THE SITE, I.E., CHANNEL LININGS, SLOPE DRAINS, STONE CHECK DAMS, AND OUTLET PROTECTION.
22. THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES UPON PROJECT COMPLETION OR FINAL SITE STABILIZATION AS APPROVED BY THE PROJECT ENGINEER AND THE TOWN ENGINEER, WHICHEVER OCCURS LAST.

WINTER GUIDELINES FOR EROSION PREVENTION & SEDIMENT CONTROL (OCTOBER 15 – APRIL 15):

1. FOR AREAS TO BE STABILIZED FOR THE WINTER THROUGH THE ESTABLISHMENT OF VEGATATION, SEEDING, AND MULCHING SHALL BE COMPLETED NO LATER THAN SEPTEMBER 15 TO ENSURE ADEQUATE GROWTH AND COVER BEFORE THE START OF THE WINTER PERIOD.
2. ALL DRAINAGE STRUCTURES MUST BE KEPT OPEN AND FREE OF SNOW AND ICE DAMS.
3. SILT FENCE AND OTHER PRACTICES REQUIRING EARTH DISTURBANCE MUST BE INSTALLED AHEAD OF FROZEN GROUND.
4. TO ENSURE COVER OF DISTURBED SOIL IN ADVANCE OF PRECIPITATION OR MELT EVENT, AREAS OF DISTURBED SOIL MUST BE STABILIZED PRIOR TO ANY RUNOFF PRODUCING EVENT.
5. PRIOR TO STABILIZATION, SNOW OR ICE MUST BE REMOVED TO THE EXTENT PRACTICABLE.

LEGEND

	EXISTING	PROPOSED
PROPERTY LINE		
SETBACK LINE		
WETLAND LIMITS		
ZONE LINE		
BUILDING LINE		
PEDESTRIAN DOOR LOCATION		
LOADING BAY DOOR LOCATION		
MATCHLINE		
CONCRETE CURB LINE		
TRAFFIC SIGN		
STEEL BOLLARD		
PARKING ROW COUNT		58
CONCRETE		
HEAVY DUTY ASPHALT PAVEMENT		
WOODEN SPLIT RAIL FENCE		
GUIDERAIL		
RETAINING WALL		
DIRECTION OF TRAVEL ARROW		
PAVEMENT MARKING		
STORMWATER MANAGEMENT FEATURE		
SNOW STORAGE		
SNOW STORAGE		
STORM PIPE		
STORM CURBED CATCH BASIN		
STORM CURBLESS CATCH BASIN		
STORM TRENCH DRAIN		
STORM YARD DRAIN		
STORM MANHOLE		
CLEANOUT		C.O.
GRAVITY SANITARY LINE		
WATER LINE	W	W
FIRE SERVICE LOOP	UFW UFW UFW	FW
UNDERGROUND TELECOMMUNICATIONS	C	
UNDERGROUND ELECTRIC	E	E
UNDERGROUND GAS	G	G
TRANSFORMER		T
HYDRANT		
SANITARY MANHOLE		
WATER VALVE		
CONTOUR	137	135
SPOT ELEVATION	×192.54	×135.19
INLET PROTECTION		
BUILDING HATCH		
HEAVY DUTY CONCRETE PAVEMENT		
CONCRETE BUILDING CANOPY		
LANDSCAPED AREA	LA	

SIGNAGE GENERAL NOTES

1. REFER TO SIGNAGE AND STRIPING PLAN FOR LOCATIONS FOR SIGNS AND PAVEMENT MARKINGS.
2. ALL SIGNAGE, STRIPING, AND OTHER TRAFFIC CONTROL DEVICES SHALL BE INSTALLED IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
3. ALL SPEED HUMPS AND BUMPS SHALL BE ASPHALT OR CONCRETE. HEAVY DUTY RUBBER SPEED HUMPS AND BUMPS ARE NOT PERMITTED.
4. FINAL SIGN QUANTITIES SHALL BE COORDINATED AND VERIFIED IN FIELD.
5. ADDITIONAL SIGNAGE NOT SHOWN ON GRAPHICS PLAN (E.G. FIRE LANES) OR IN THIS STANDARD, MAY BE REQUIRED PER LOCAL CODE AND/OR AHJ. SUB-CONTRACTOR SHALL COORDINATE WITH OWNER, GENERAL CONTRACTOR & AHJ AND PROVIDE AS REQUIRED.
6. MOUNT SIGNAGE ACCORDING TO LOCAL CODES AND AHJ; REFER TO PROJECT TEAM FOR SITE SPECIFIC DEVIATIONS.
7. TYPICAL SIGN FONT IS SET IN AMAZON EMBER.
8. ALL TEXT AND GRAPHICS SHALL BE WHITE IF THEY ARE TO BE PLACED ON A RED BACKGROUND.
9. VINYL GRAPHICS/TYPOGRAPHY GENERAL NOTE: DI-CUT VINYL GRAPHICS ARE CAST 3M VINYL. DIGITAL PRINTS ARE HIGH RESOLUTION GRAPHICS PRINTED ON PRESSURE SENSITIVE VINYL WITH PERMANENT ADHESIVE. A LUSTER OVER LAMINATE IS APPLIED TO ALL DIGITAL PRINTS. DIGITAL PRINTS ARE CUT TO SHAPE FROM VECTOR FILES.
10. SIGN NAMING CONVENTION: S-X (SITE/TRAFFIC SIGNS); AS-X (AMAZON SIGN, BUILDING OR SITE); PG-X (PAVEMENT GRAPHIC/MARKING); AG-X (AMAZON GRAPHIC); BS-X (INTERIOR BUILDING /ACCESSIBLE SIGNS); MS-X (MONUMENT SIGNS); LS-X (AMAZON LOGO SIGNS); BN-X (BUILDING NUMBER SIGNS); GH-X (GUARDHOUSE GRAPHICS).
11. DIMENSIONS ON ALL SIGNS ARE FOR REFERENCE ONLY, FULL SIZE VECTOR FILES ARE AVAILABLE FROM WWBD. ALL MUTCD, MUTCDC, AHJ AND OTHER STANDARD TRAFFIC SIGNS SHALL MEET THOSE STANDARDS.
12. SIGNAGE APPLICABILITY
    A. GENERAL NOTES/SIGN MOUNTING/PLACEMENT PAGES APPLY TO ALL PROGRAMS AND BUILDING TYPES. INDIVIDUAL SIGN PAGES AND APPENDICES CALL OUT KNOWN SIGNAGE APPLICABILITY FOR BUILDINGS BASED ON WWBD TEMPLATES. IN GENERAL, THESE SIGNS ARE THE MINIMUM REQUIRED FOR EACH LISTED BUILDING, AND MAY VERY BASED ON SITE LOCATION/CONDITIONS; PROJECT TEAM TO VERIFY ALL SIGNAGE REQUIRED, WHICH MAY VARY FROM WHAT IS LISTED HEREIN. PROGRAMS/BUILDINGS NOT LISTED IN APPLICABILITY BANNER OR IN APPENDICES SHALL COORDINATE REQUIRED SIGNS WITH PROJECT TEAM.
    B. SIGNS MARKED APPLICABLE TO "ALL" APPLY TO ALL PROGRAM/BUILDING TYPES. SIGNS MARKED APPLICABLE TO "ALL; EXCEPT..." ARE APPLICABLE TO ALL PROGRAM/BUILDING TYPES EXCEPT ONES LISTED. SIGNS MARKED APPLICABLE TO "XXX, XXX, XXX, ETC." ARE APPLICABLE ONLY TO SPECIFIC PROGRAMS/BUILDINGS LISTED. SIGNS MARKED "SITE SPECIFIC: XXX, XXX, ETC." ARE APPLICABLE IN NOTED PROGRAMS DEPENDING ON LOCATION, SITE LAYOUT, AHJ, BUILDING DESIGN, OR OTHER PROJECT/SITE SPECIFIC FACTORS; APPLICABILITY TBD BY PROJECT TEAM.
13. ERRORS, OMISSIONS, CORRECTIONS AND UPDATES TO THIS DOCUMENT SHALL BE DIRECTED TO THE GBD STANDARDS TEAM: KAPIL UPADHYAYA, UKA-PIL@AMAZON.COM AND MIKE VISOVSKY, VISOVSKY@AMAZON.COM;

Date	Description	No.

Revisions

STATE OF VERMONT · JOHN D. PLANTE · NO. 0093000 · CIVIL · LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

MASTER LEGEND & NOTES

Project No. 140278401	Drawing No. CS002
Date 01/30/2025	
Drawn By BCP	
Checked By DTG	

LANGAN

Project No. 140278401

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WATER SPECIFICATIONS

1.1 GENERAL
THIS ITEM SHALL CONSIST OF THE LABOR, EQUIPMENT, AND MATERIALS REQUIRED FOR THE COMPLETE CONSTRUCTION OF THE WATERMAN AND SERVICES SHALL INCLUDE EXCAVATION, BACKFILLING, PIPE, VALVES, TEES, HYDRANTS, ELBOWS, REDUCERS, AND ALL THE OTHER APPURTENANCES NECESSARY FOR A COMPLETE WATER MAIN SYSTEM AS INDICATED ON THE ACCEPTED DRAWINGS.

CONTRACTOR TO REFER TO THE TOWN OF ESSEX, VERMONT STANDARD SPECIFICATIONS FOR CONSTRUCTION LATEST ADDITION.

1.2 WATER PIPE MATERIALS:
DUCTILE IRON PIPE
PIPE SHALL CONFORM TO CURRENT AWWA/ANSI –C151/A21.51 STANDARDS. PUSHON JOINT PIPE SHALL BE THICKNESS CLASS 52. PUSH–ON JOINT ACCESSORIES SHALL CONFORM TO APPLICABLE REQUIREMENTS OF AWWA/ANSI –C111/A21.11.

PIPE SHALL BE CEMENT MORTAR LINED ON THE INSIDE IN ACCORDANCE WITH AWWA/ANSI –C104/A21.4 STANDARD EXCEPT THAT THE CEMENT LINING THICKNESS SHALL NOT BE LESS THAN 3/16". A PLUS TOLERANCE OF 1/8"WILL BE PERMITTED.PIPE SHALL BE GIVEN AN EXTERIOR BITUMINOUS COATING OF COAL TAR OR ASPHALT BASE IN ACCORDANCE WITH SPECIFICATION ANSI A21.51. ALL DUCTILE IRON PIPE SHALL BE POLYETHYLENE ENCASED IN ACCORDANCE WITH ANSI A21.5.

1.3 FITTINGS:
DUCTILE IRON FITTINGS SHALL BE CEMENT–LINED, HAVE 350 POUNDS WORKING PRESSURE, AND BE IN ACCORDANCE WITH AWWA C–104, C–111, AND C–110 OR C–153 FOR COMPACT FITTINGS. MECHANICAL JOINT NUTS AND BOLTS SHALL BE HIGH STRENGTH, LOW ALLOY STEEL PER ANSI A–21.11. DUCTILE IRON FITTINGS LARGER THAN TWELVE INCHES (12") SHALL HAVE A STANDARD BODY LENGTH EQUAL TO CLASS 250 CAST IRON FITTINGS. CAST IRON CLASS 250 FITTINGS WILL BE ALLOWED IN LIEU OF DUCTILE IRON FITTINGS IN SIZES LARGER THAN TWELVE INCHES (12").

MEGALUG RETAINER GLANDS OR AN APPROVED EQUAL SHALL BE USED ON ALL VERTICAL BEND AND AS SHOWN ON THE PLANS.

1.4 GATE VALVE RESILIENT SEAT
VALVES SHALL BE MANUFACTURED IN NORTH AMERICA TO MEET ALL REQUIREMENTS OF AWWA SPECIFICATIONS C–509. VALVES TWELVE INCHES(12") AND SMALLER SHALL BE BUBBLE–TIGHT, ZERO LEAKAGE AT 250 PSI WORKING PRESSURE. VALVES SHALL HAVE NON–RISING STEMS, OPEN COUNTERCLOCKWISE, AND BE PROVIDED WITH TWO INCH (2") SQUARE OPERATING NUT WITH ARROW CAST IN METAL TO INDICATE DIRECTION OF OPENING.

EACH VALVE SHALL HAVE A MAKER'S NAME, PRESSURE RATING, AND YEAR IN WHICH MANUFACTURED CAST ON THE BODY. PRIOR TO SHIPMENT FROM THE FACTORY, EACH VALVE SHALL BE TESTED BY HYDROSTATIC PRESSURE EQUAL TO TWICE THE SPECIFIED WORKING PRESSURE. BURIED VALVES SHALL BE INSTALLED WITH A VALVE BOX.

1.5 VALVE BOXES:
CAST IRON THREE–PIECE SLIDE–TYPE;FIVE AND ONE–FOURTHS (5 1/4") SHAFT; SIX FOOT (6') TRENCH DEPTH. CAST IRON COVER MARKED "WATER" AND INDICATING DIRECTION OF OPENING.
CAST–IRON COVER SHALL BE MARKED 'WATER'AND SHALL INDICATE DIRECTION OF OPENING

1.6 FIRE HYDRANTS:

FIRE HYDRANTS SHALL BE KENNEDY GUARDIAN K–81D, WITH THE FOLLOWING SPECIFICATIONS:

MAIN VALVE OPENING: 5–¼"OR EQUAL

NOZZLE ARRANGEMENT: TWO 2–½"HOSE NOZZLES WITH NATIONAL STANDARD THREAD.

ONE 5"STORTZ CONNECTION

INLET CONNECTION: 6"MECHANICAL JOINT

OPERATING NUT: STANDARD 1 1/2"PENTAGON

COLOR: ENAMELED HYDRANT RED

DEPTH OF BURY: HYDRANT SHALL BE INSTALLED TO THE MANUFACTURER'S INSTRUCTIONS WITH NOZZLES ABOUT 18"ABOVE FINISH GRADE

DRAIN PLUGS: SHALL BE PLUGGED

HYDRANT ASSEMBLIES SHALL CONSIST OF AN ANCHOR TEE OFF THE MAIN, A 6".MECHANICAL JOINT VALVE CONFORMING TO THESE SPECIFICATIONS AND THE APPROPRIATE. LENGTH OF 6"DUCTILE IRON CEMENT LINED CLASS 52 PIPE, ANCHOR COUPLING, AND HYDRANT. THE USE OF RESTRAINED MECHANICAL JOINT FITTINGS AND RODS OR CONCRETE THRUST BLOCKS ARE BOTH ACCEPTABLE METHODS OF RESTRAINT FOR HYDRANTS

1.7 WATER SERVICE CONNECTION

A. GENERAL REQUIREMENTS

THE CONTRACTOR SHALL INSTALL DUCTILE IRON WATER SERVICES AS INDICATED ON THE CONTRACT DRAWINGS OR AS INDICATED BY THE ENGINEER. EACH SERVICE SHALL INCLUDE A 6 INCH GATE VALVE LOCATED AT THE PROPERTY LINE.

1.8 CONSTRUCTION METHODS

A. ALL PIPE AND FITTINGS SHALL BE INSPECTED AND TESTED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS AND AFOREMENTIONED AWWA SPECIFICATIONS. THE CONTRACTOR SHALLSHALL FURNISH FOR APPROVAL CERTIFICATION FROM THE PIPE MANUFACTURER THAT ALL TESTS HAVE BEEN PERFORMED WITH SATISFACTORY RESULTS. PIPE SHALL NOT BE INSTALLED WITHOUT THE ENGINEER'S OR WATER AUTHORITY'S APPROVAL.

B. INSTALLATION

PIPES, FITTINGS AND ACCESSORIES SHALL BE CAREFULLY HANDLED TO AVOID DAMAGE. PRIOR TO THE ACCEPTANCE OF THE WATER LINE AND WITHIN THE GUARANTEE PERIOD, ANY DEFECTIVE PIPE OR ACCESSORY FOUND TO BE DEFECTIVE SHALL BE REPLACED AT NO EXPENSE TO THE TOWN. ALL PIPES SHOWING VISIBLE CRACKS SHALL BE REJECTED AND REPLACED WITH NEW PIPE. ALL INSTALLATION AND TESTING SHALL BE DONE IN ACCORDANCE WITH AWWA STANDARD C–600 AND ANSI SPECIFICATION A21.11

ALL PIPES AND FITTINGS SHALL BE CLEARED OF ALL FOREIGN MATTER AND DEBRIS PRIOR TO INSTALLATION AND SHALL BE KEPT CLEAN UNTIL THE TIME OF ACCEPTANCE BY THE TOWN. AT ALL TIMES, WHEN THE PIPE LAYING IS NOT ACTUALLY IN PROGRESS, THE OPEN ENDS OF THE PIPE SHALL BE CLOSED BY TEMPORARY WATERTIGHT PLUGS OR BY OTHER APPROVED MEANS. IF WATER IS IN THE TRENCH WHEN WORK IS RESUMED, THE PLUG SHALL NOT BE REMOVED UNTIL ALL DANGER OF WATER ENTERING THE PIPE HAS PASSED. THE PIPE SHALL BE INSTALLED IN TRENCHES AND AT THE LINE AND GRADE SHOWN ON THE CONTRACT DRAWINGS.

ANY DEFLECTION JOINTS SHALL BE WITHIN THE LIMITS SPECIFIED BY THE MANUFACTURER. ALL PIPING AND APPURTENANCES CONNECTED TO THE EQUIPMENT SHALL BE SUPPORTED SO THAT NO STRAIN WILL BE IMPOSED ON THE EQUIPMENT.

CONCRETE THRUST BLOCKS SHALL BE INSTALLED ON ALL PLUGS, TEES AND BENDS DEFLECTING 11 ¼ DEGREES OR MORE. CARE SHALL BE TAKEN TO ENSURE THAT CONCRETE WILL NOT COME IN CONTACT WITH FLANGES, JOINTS OR BOLTS. THE REQUIRED AREA OF THRUST BLOCKS ARE INDICATED ON THE PLANS OR SHALL BE AS APPROVED BY THE ENGINEER.

WHENEVER SEWERS CROSS UNDER WATER MAINS, THE WATER MAIN SHALL BE LAID AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER. THIS VERTICAL SEPARATION SHALL BE MAINTAINED FOR THAT PORTION OF THE WATER MAIN LOCATED WITHIN TEN FEET (10') HORIZONTALLY OF ANY SEWER IT CROSSES.

THERE SHALL BE NO PHYSICAL CONNECTION BETWEEN THE DISTRIBUTION SYSTEM AND ANY PIPES, PUMPS, HYDRANTS, OR TANKS WHICH ARE SUPPLIED OR MAY BE SUPPLIED WITH WATER THAT IS, OR MAY BE, CONTAMINATED. IN INSTANCES WHERE THE USE OF DIFFERENT TYPES OF PIPES REQUIRE JOINING, THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY ADAPTERS.

ALL TRENCHING SAFETY STANDARDS SHALL BE IN CONFORMANCE WITH ALL APPLICABLE STATE AND FEDERAL GUIDELINES.

THE CONTRACTOR SHALL, AT ALL TIMES, KEEP THE TRENCHES ENTIRELY FREE OF WATER UNTIL ALL WORK IS FINISHED AND READY FOR BACKFILLING. AFTER THE VARIOUS PIPELINES HAVE BEEN INSTALLED, THE TRENCHES AND OTHER AREAS TO BE FILLED SHALL BE BACKFILLED TO SUBGRADE WITH, WHERE POSSIBLE, MATERIAL EXCAVATED FROM THE TRENCH. NO BACK FILLING WILL BE ALLOWED UNTIL ANY CONCRETE MASONRY HAS SET SUFFICIENTLY, AS DETERMINED BY THE ENGINEER

ALL MATERIAL FOR BACKFILLING SHALL BE FREE OF ROOTS, STUMPS, AND FROST. MATERIALS. USED FOR BACKFILLING TRENCHES SHALL BE FREE OF STONES WEIGHING OVER 30 POUNDS. NO STONES MEASURING OVER THREE INCHES IN THE LONGEST DIMENSION SHALL BE PLACED WITHIN ONE FOOT (1') OF THE PIPELINE BEING BACKFILLED.

BACKFILL FOR ALL PIPE LINES SHALL BE EITHER NATIVE MATERIAL OR SELECT BACKFILL PLACED IN SIX INCH (6") LIFTS WITH EACH LIFT BEING COMPACTED TO NOT LESS THAN 95 PERCENT OF MAXIMUM DRY DENSITY AS DETERMINED BY THE AASHTO–99, METHOD A, STANDARD PROCTOR. PARTICULAR PRECAUTIONS SHALL BE TAKEN IN PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL IN ORDER NOT TO DAMAGE AND/OR BREAK THE PIPE. THE BACKFILL SHALL BE BROUGHT UP EVENLY ON BOTH SIDES OF THE PIPE FOR ITS FULL LENGTH.

SURPLUS EXCAVATED MATERIALS NOT USED FOR BACKFILL SHALL BE DISPOSED OF IN A MANNER SATISFACTORY TO THE DESIGN/PROJECT ENGINEER. ALL SURPLUS MATERIAL SHALL BE REMOVED PROMPTLY AND DISPOSED OF SO AS NOT TO BE OBJECTIONABLE TO ABUTTERS OR TO THE GENERAL PUBLIC.

C. FIELD TESTING
EXCEPT AS OTHERWISE DIRECTED, ALL PIPELINES SHALL BE TESTED. PIPELINES LAID IN EXCAVATION OR BEDDED IN CONCRETE SHALL BE TESTED PRIOR TO BACKFILLING OR THE PLACING OF CONCRETE AND ANY EXPOSED PIPING SHALL BE TESTED PRIOR TO FIELD PAINTING. THE CONTRACTOR SHALL FURNISH ALL GAUGES, TESTING PLUGS, CAPS, AND ALL OTHER NECESSARY EQUIPMENT AND LABOR TOP PERFORM LEAKAGE AND PRESSURE TEST IN SECTIONS OF APPROVED LENGTH. All TESTING SHALL BE CONDUCTED IN THE PRESENCE OF THE ENGINEER.

PRESSURE TEST:
MINIMUM TEST PRESSURE SHALL BE 200 PSI, AND WILL BE MONITORED AT THE HIGHEST ELEVATION IN THE LENGTHS OF PIPELINE BEING TESTED. THE AWWA STANDARD FOR MAXIMUM ALLOWABLE LEAKAGE IS AS FOLLOWS:

L = SD (SQUARE ROOT OF P) / 148,000

WHERE:
L = LEAKAGE ALLOWED, GPH.
S = SECTION OF PIPE LENGTH, FT.
D = DIAMETER PIPE, INCHES.
P = AVERAGE TEST PRESSURE, PSI.

ANY TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH AWWA C–600 LATEST REVISION. SHOULD ANY SECTION OF THE PIPE FAIL EITHER THE PRESSURE OR LEAKAGE TESTS, THE CONTRACTOR SHALL DO EVERYTHING NECESSARY TO LOCATE AND REPAIR OR REPLACE THE DEFLECTIVE PIPE, FITTINGS, OR JOINTS AT NO EXPENSE TO THE OWNER.

D. FLUSHING AND DISINFECTION

DISINFECTION AND TESTING OF THE PIPELINE SHALL BE DIRECTED BY THE ENGINEER AT THE CONTRACTOR'S EXPENSE AND IN THE PRESENCE OF THE TOWN. AWWA STANDARD C651 (LATEST VERSION) SHALL BE USED AS A BASIS FOR THE DISINFECTION PROCESS OUTLINED AS FOLLOWS:

1. COMPLETE FLUSHING OF THE PIPELINE TO WASH OUT ALL DIRT, DEBRIS, ETC. WHICH MAY HAVE ACCUMULATED IN THE PIPELINE DURING CONSTRUCTION.
2. FOLLOWING FLUSHING, THE CONTRACTOR WILL ADD CHLORINE TO THE ENTIRE PIPELINE VOLUME OF WATER AND LET THE MIXTURE SET FOR AT LEAST 24 HOURS. THE INITIAL CHLORINE CONCENTRATION SHALL BE 25 MG/L OR GREATER.
3. AFTER THE 24–HOUR DURATION, THE WATER IN THE PIPELINE SHALL BE TESTED FOR RESIDUAL FREE CHLORINE AND MUST CONTAIN A MINIMUM OF 50 MG/L CHLORINE. IF LESS THAN 50 MG/L IS FOUND, THEN THE DISINFECTION PROCEDURE SHALL BE REPEATED UNTIL AT LEAST 50 MG/L CHLORINE RESIDUAL IS INDICATED BY TEST.
4. UPON SUCCESSFUL COMPLETION OF STEP 3 ABOVE, THE PIPELINE SHALL BE FLUSHED AGAIN UNTIL THE CHLORINE CONCENTRATION IN THE PIPELINE IS NO HIGHER THAN THAT PREVAILING IN THE SUPPLY SYSTEM.
5. CHLORINATED WATER FLUSHED FROM THE PIPELINE SHALL BE DECHLORINATED PRIOR TO BEING DISCHARGED TO ANY SURFACE WATER.

FROST PROTECTION:

WATERLINES WITH LESS THAN SIX FEET (6') OF COVER OVER THE CROWN MUST BE APPROVED BY THE TOWN PUBLIC WORKS DIRECTOR. PROTECTION AGAINST FREEZING SHALL BE PROVIDED BY INSTALLATION OF TWO INCH (2') THICK STYROFOAM SM INSULATING SHEETS WITH A WIDTH OF 3 FEET OR TWICE THE PIPE DIAMETER, WHICHEVER IS GREATER. IN NO CASE SHALL THERE BE LESS THAN FIVE FEET (5') OF COVER. THE SHEETS SHALL BE PLACED SIX INCHES (6") ABOVE THE CROWN OF THE MAIN AFTER COMPACTION OF THE 6 INCH (6') LIFT IMMEDIATELY ABOVE THE CROWN. CARE SHALL BE EXERCISED BY THE CONTRACTOR DURING BACKFILL AND COMPACTION OVER THE STYROFOAM SHEETS TO PREVENT DAMAGE TO THE SHEETS.

SEWER SPECIFICATIONS

1.1 GENERAL
THIS ITEM SHALL THIS ITEM SHALL CONSIST OF THE EXCAVATION AND BACKFILLING REQUIRED FOR THE COMPLETE CONSTRUCTION OF GRAVITY SANITARY SEWERS, FORCE MAINS, AND ALL APPURTENANT CONSTRUCTION RELATED THERETO, INCLUDING CHIMNEYS, SERVICE CONNECTIONS, THRUST BLOCKS, AND OTHER ITEMS NECESSARY FOR A COMPLETE SANITARY SEWER SYSTEM AS INDICATED ON THE DRAWINGS.

CONTRACTOR TO REFER TO THE TOWN OF ESSEX, VERMONT STANDARD SPECIFICATIONS FOR CONSTRUCTION LATEST ADDITION.

1.2 MATERIALS

A. TYPES OF PIPE

TYPES OF WHICH SHALL BE USED FOR THE VARIOUS PARTS OF WORK ARE AS FOLLOWS: GRAVITY SEWER SHALL BE PVC SOLID WALL PIPE MEETING ASTM SPECIFICATIONS D–3034 OR F679.

B. PVC SEWER PIPE

PVC SEWER PIPE SHALL CONFORM IN ALL RESPECTS TO THE LATEST REVISION OF ASTM SPECIFICATIONS D–3034 OR F679, TYPE PSM, POLYVINYL CHLORIDE (PVC) SEWER PIPE AND FITTINGS, SDR35. WALL THICKNESS OF ALL PVC PIPE SHALL MEET ASTM SPECIFICATIONS FOR SDR35 PIPE. ALL PIPE AND FITTINGS SHALL BE CLEARLY MARKED AS FOLLOWS:

MANUFACTURER'S NAME AND TRADEMARK
NOMINAL PIPE SIZE
MATERIAL DESIGNATION 12454C PVC
LEGEND "TYPE PSM SDR35 PVC SEWER PIPE"
DESIGNATION ASTM D–3034 OR F679

JOINTS SHALL BE PUSH–ON TYPE USING ELASTOMERIC GASKETS AND SHALL CONFORM TO ASTM D–3212. THE GASKETS SHALL BE FACTORY INSTALLED. THE PIPE SHALL BE FURNISHED IN NOMINAL 13 OR 14 FOOT LENGTHS. ALL CONNECTIONS WILL REQUIRE THE USE OF MANUFACTURED FITTINGS. FIELD FABRICATED, SADDLE TYPE CONNECTIONS WILL NOT BE CONSIDERED ACCEPTABLE.

ANY PIPE OR FITTING HAVING A CRACK OR OTHER DEFECT OR WHICH HAS RECEIVED A SEVERE BLOW SHALL BE MARKED REJECTED AND REMOVED AT ONCE FROM THE WORK SITE. ALL FIELD CUTS ARE TO BE MADE WITH SAW AND 90 DEGREE MITRE BOX. THE CUT END SHALL BE BEVELED TO THE SAME AS THE FACTORY BEVEL AND ALL INTERIOR BURRS SHALL BE REMOVED. A HOMING MARK SHALL BE PLACED ON THE PIPE BEFORE ASSEMBLING.

THE PIPE INSTALLED SHALL BE INSTALLED SO THAT THE INITIAL DEFLECTION, MEASURED AS DESCRIBED BELOW, SHALL BE LESS THAN FIVE PERCENT (5%). THE MANHOLE WATER STOP GASKET AND STAINLESS STEEL CLAMP ASSEMBLY MUST BE APPROVED BY THE ENGINEER PRIOR TO THE INSTALLATION OF ANY PIPE. THE CONTRACTOR WILL SUBMIT CERTIFICATION TO THE PROJECT ENGINEER THAT THE MATERIALS OF CONSTRUCTION HAVE BEEN SAMPLED, TESTED, INSPECTED, AND MEET ALL THE REQUIREMENTS INCLUDING WALL THICKNESS IN ACCORDANCE WITH ASTM D3034 OR ASTM F679 FOR ALL PIPE AND FITTINGS TO BE INCLUDED IN THE PROJECT WORK.

PVC PIPE SHALL NOT BE INSTALLED WHEN THE TEMPERATURE DROPS BELOW 32 DEGREES FAHRENHEIT OR GOES ABOVE 100 DEGREES FAHRENHEIT WITHOUT PRIOR APPROVAL. DURING COLD WEATHER, THE FLEXIBILITY AND IMPACT RESISTANCE OF PVC PIPE IS REDUCED. EXTRA CARE IS REQUIRED WHEN HANDLING PVC PIPE DURING COLD WEATHER.

PVC PIPE SHALL NOT BE STORED OUTSIDE AND EXPOSED TO PROLONGED PERIODS OF SUNLIGHT, AS PIPE DISCOLORATION AND REDUCTION IN PIPE IMPACT STRENGTH WILL OCCUR. CANVAS OR OTHER OPAQUE MATERIAL SHALL BE USED TO COVER PVC PIPE STORED ONSITE.

C. MANHOLES

THE CONTRACTOR SHALL CONSTRUCT REINFORCED CONCRETE MANHOLES AND DROP MANHOLES SHALL BE CONSTRUCTED TO THE DIMENSIONS AND AT THE LOCATIONS SHOWN ON THE CONTRACT DRAWINGS. ALL PRECAST REINFORCED CONCRETE MANHOLE SECTIONS SHALL CONFORM TO THE LATEST VERSION OF THE ASTM SPECIFICATIONS C 478.

THE FOOTING MAY BE EITHER CASTIN–PLACE WITH 3000 PSI CONCRETE OR PRECAST AND SHALL CONFORM TO THE DIMENSIONS INDICATED ON THE PLANS. SHELVES AND INVERTS SHALL BE CONSTRUCTED WITH RED–HARDENED BRICK. INVERTS FOR SEWER MANHOLES SHALL BE AS SHOWN ON THE PLANS AND DETAILS. INVERTS SHALL HAVE THE EXACT SHAPE OF THE SEWER TO WHICH THEY ARE CONNECTED, SHALL BE GRADUAL AND EVEN.

ALL CONSTRUCTION OF SEWER MANHOLES MUST BE CARRIED OUT TO ENSURE WATERTIGHT WORK. ANY LEAKS IN MANHOLES SHALL BE CAULKED ON THE EXTERIOR WALL OF THE STRUCTURE AND COMPLETELY REPAIRED TO THE SATISFACTION OF THE ENGINEER OR THE ENTIRE STRUCTURE SHALL BE REMOVED AND REBUILT.

ALL MANHOLES ARE TO BE PROVIDED WITH COPOLYMER POLYPROPYLENE PLASTIC RUNGS WITH STEEL REINFORCEMENT EIGHT INCHES (8") ON CENTER. THE RUNGS WILL HAVE A MINIMUM PULL OUT STRENGTH OF 2500 LBS.

PRECAST RISERS AND BASES FOR MANHOLES SHALL CONFORM TO ASTM SPECIFICATION C361. THE PIPE OPENINGS IN THE PRECAST MANHOLE RISER SHALL HAVE A FLEXIBLE GASKET. JOINTS BETWEEN MANHOLE RISERS SHALL BE RUBBER "O" RING SEALS OR SOFT BUTYL JOINT SEALER (ROPE FORM). MORTAR PURGING WILL NOT BE ALLOWED ON THE INTERIOR SEAMS OF MANHOLE WALLS, BUT MAY BE USED ON THE OUTSIDE OF JOINTS.

TO PROTECT MANHOLES FROM GROUNDWATER INTRUSION, THE MANHOLES WILL BE SEALED ON THE EXTERIOR WITH A TWO–COAT COAL–TAR EPOXY COATING SYSTEM. THE TWO COATING THICKNESS SHALL ACHIEVE A MINIMUM DRY FILM THICKNESS OF 15 MILS.

D. FRAMES AND COVERS

ALL MANHOLES SHALL BE PROVIDED WITH TOUGH GRAY, CAST IRON MANHOLE FRAMES AND COVERS OF THE SIZE AND TYPE AS INDICATED ON THE DETAILED DRAWINGS. THE MINIMUM DIAMETER SHALL BE 30", WITH A MINIMUM WEIGHT OF 400 POUNDS IS THE PREFERRED TYPE. ALL CASTINGS SHALL BE MANUFACTURED IN THE UNITED STATES.

CASTINGS SHALL BE TRUE PATTERN AND FREE FROM FLAWS. BEARING SURFACES OF MANHOLE FRAMES AND COVERS AGAINST EACH OTHER SHALL BE MACHINED TO GIVE CONTINUOUS CONTACT THROUGHOUT THEIR ENTIRE CIRCUMFERENCE.

ALL IRON CASTINGS SHALL BE THOROUGHLY CLEANED AND THEN COATED WITH HOT TAR BEFORE BEING DELIVERED.

MANHOLE COVERS SHALL BE MARKED "SEWER". WATER–PROOF TYPE MANHOLE COVERS SHALL BE PROVIDED WHEN NOTED ON THE PLANS OR AS REQUIRED BY THE PROJECT ENGINEER. ALL MANHOLES SHALL BE NON–VENTING.

E. MASONARY

EACH BRICK SHALL BE WETTED AND COMPLETELY BEDDED IN MORTAR AT ITS BOTTOM, SIDES, AND ENDS IN ONE OPERATION WITH CARE BEING TAKEN TO FILL EVERY JOINT. BRICKWORK SHALL BE WELL–BONDED, AND JOINTS SHALL BE AS CLOSE AS PRACTICABLE. NO BRICK MASONRY SHALL BE LAID IN WATER NOR SHALL ANY WATER BE ALLOWED TO RISE ON OR AROUND ANY BRICK MASONRY UNTIL IT HAS SET AT LEAST 24 HOURS. NO MASONRY SHALL BE LAID IN FREEZING WEATHER.

THE BRICK FOR ORDINARY BRICKWORK SHALL BE LAID IN PORTLAND CEMENT MORTAR REINFORCED WITH FIBER–GLASS FIBERS (BLOCK BOND) COMPOSED OF ONE PART PORTLAND CEMENT AND TWO PARTS OF SAND, MEASURED BY VOLUME, TO WHICH NOT MORE THAN 10 POUNDS OF LIME SHALL BE ADDED FOR EACH BAG OF CEMENT. WATER FOR MORTAR SHALL BE CLEAN AND ONLY AN AMOUNT SUFFICIENT TO PRODUCE A WORKABLE MORTAR SHALL BE USED. MORTAR SHALL BE USED WITHIN ONE HOUR FROM THE TIME THE CEMENT WAS ADDED TO THE MIX. PRE–MIXED, BAGGED MORTAR WILL NOT BE ALLOWED.

THE SAND FOR MORTAR FOR BRICK MASONRY SHALL BE UNIFORMLY GRADED, CLEAN, SHARP, AND CONTAIN NO GRAINS LARGER THAN WILL PASS A ONE–EIGHTH INCH (1/8") MESH SCREEN.

CONSTRUCTION METHODS:

A. EXCAVATION:

EXCAVATIONS SHALL BE MADE TO A POINT AT LEAST SIX INCHES (6") BELOW THE PIPE INVERT TO ACCOMMODATE THE BEDDING MATERIAL. ALL EXCAVATIONS ARE TO BE KEPT DRY WHILE PIPE IS BEING LAID.

B. LAYING SEWER PIPE:

THE BELL END OF THE PIPE SHALL FACE UPGRADE AT ALL TIMES AND BE PLACED IN SUCH A POSITION AS TO MAKE THE INVERT EVEN WHEN THE SUCCEEDING SECTION IS INSERTED. WHERE REQUIRED BY ADVERSE GRADING CONDITIONS, THE CONTRACTOR SHALL FILL ANY GULLY TO MAKE A SUITABLE BEDDING FOR THE SEWER PIPE. THE FILL SHALL BE COMPACTED TO A 95% DRY DENSITY BY THE AASHTO–T–99, METHOD A (STANDARD PROTECTOR) TEST, UPON WHICH SIX INCHES (6") OF BEDDING MATERIAL SHALL BE PLACED.

ANY PIPE WHICH IS NOT LAID TO GRADE AND ALIGNMENT SHALL BE RE–LAID TO THE SATISFACTION OF THE ENGINEER. THE ALLOWABLE HORIZONTAL AND/OR VERTICAL DEFLECTION SHALL AS PER THE MANUFACTURERS SPECIFICATIONS. THE BEDDING MATERIAL SHALL BE PLACED AND COMPACTED ON EACH SIDE OF THE PIPE TO A HEIGHT AS REQUIRED FOR THE TYPE OF PIPE AND FOR THE FULL WIDTH OF THE EXCAVATED TRENCH AND AS SHOWN ON THE ACCEPTED PLANS.

C. BACKFILL

BACKFILL SHALL CONSIST OF APPROVED MATERIAL PLACED IN TWELVE INCH (12") LAYERS WITH EACH LAYER BEING THOROUGHLY COMPACTED TO NOT LESS THAN 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE AASHTO–T–99 STANDARD PROCTOR BY MEANS APPROVED BY THE ENGINEER

NO STONES IN EXCESS OF ONE INCH (1") DIAMETER SHALL BE PLACED WITHIN TWO FEET (2') OF THE OUTSIDE OF THE PIPE. PARTICULAR PRECAUTIONS SHALL BE TAKEN IN PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL IN ORDER NOT TO DAMAGE AND/OR BREAK THE PIPE. THE BACKFILL SHALL BE BROUGHT UP EVENLY ON BOTH SIDES OF THE PIPE FOR ITS FULL LENGTH. WALKING OR WORKING ON THE COMPLETED PIPELINE, EXCEPT AS MAY BE NECESSARY IN TAMPING OR BACKFILLING, SHALL NOT BE PERMITTED UNTIL THE TRENCH HAS BEEN BACKFILLED TO A HEIGHT OF AT LEAST TWO FEET (2') ON THE TOP OF THE PIPES. DURING CONSTRUCTION, ALL OPENINGS TO THE PIPELINES SHALL BE PROTECTED FROM THE ENTERING OF EARTH OR OTHER MATERIALS.

E. FROST PROTECTION FOR SHALLOW SEWERS

SEWERS WITH LESS THAN FIVE AND ONE–HALF FEET (5.5') OF COVER OVER THE CROWN OR WHERE INDICATED ON THE PLANS SHALL BE PROTECTED AGAINST FREEZING BY INSTALLING TWO INCH (2") THICK STYROFOAM SM INSULATING SHEETS WITH A WIDTH OF THREE FEET (3') OR TWCE THE PIPE DIAMETER, WHICHEVER IS GREATER. THE SHEETS SHALL BE PLACED SIX INCHES (6") ABOVE THE CROWN OF THESEWER AFTER COMPACTION OF THE SIX INCH LIFT IMMEDIATELY ABOVE THE CROWN. CARE SHALL BE EXERCISED DURING BACKFILL AND DURING COMPACTION OVER THE STYROFOAM. SM SHEETS SHALL MEET THE COMPRESSIVE STRENGTH REQUIREMENTS OF ASTM D1621–73. THE STYROFOAM SHALL BE AS MANUFACTURED BY DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN OR EQUAL. IN NO CASE SHALL SEWER LINES HAVE LESS THAN 3.5' OF COVER OVER THE TOP OF THE PIPE.

F. LEAKAGE TESTS AND ALLOWANCE FOR GRAVITY SEWERS:

THE LOW PRESSURE AIR TEST SHALL CONFORM TO THE REQUIREMENTS AND PROCEDURES SET FORTH AS FOLLOWS:
1. TEST IS TO BE CONDUCTED BETWEEN TWO (2) CONSECUTIVE MANHOLES, AS DIRECTED BY THE ENGINEER.
2. THE TEST SECTION OF THE SEWER LINE IS PLUGGED AT EACH END. ONE OF THE PLUGS MUST BE TAPPED AND EQUIPPED FOR THE AIR INLET CONNECTION FOR FILLING THE PIPELINE FROM THE AIR COMPRESSOR.
3. ALL SERVICE LATERALS, STUBS, AND FITTINGS INTO THE SEWER TEST SECTION SHOULD BE PROPERLY CAPPED OR PLUGGED AND CAREFULLY BRACED AGAINST THE INTERNAL PRESSURE TO PREVENT AIR LEAKAGE BY SLIPPING AND BLOWOUTS.
4. WHEN A CONSTANT PRESSURE OF 4.0 PSIG IS REACHED, THROTTLE AIR SUPPLY TO MAINTAIN THE INTERNAL PRESSURE ABOVE 3.5 PSIG FOR AT LEAST FIVE (5) MINUTES. THIS TIME PERMITS THE TEMPERATURE OF THE ENTERING AIR TO EQUALIZE WITH THE TEMPERATURE OF THE PIPE WALL. DURING THIS STABILIZATION PERIOD, IT IS ADVISABLE TO CHECK ALL CAPPED AND PLUGGED FITTINGS WITH A SOAP SOLUTION TO DETECT ANY LEAKAGE AT THESE CONNECTIONS.
5. IF LEAKAGE IS DETECTED AT ANY CAP OR PLUG, RELEASE THE PRESSURE IN THE LINE AND TIGHTEN ALL LEAKY CAPS AND PLUGS. THEN START THE TEST OPERATION AGAIN BY SUPPLYING AIR. WHEN IT IS NECESSARY TO BLEED OFF THE AIR TO TIGHTEN OR REPAIR A FAULTY PLUG A NEW FIVE (5) MINUTE INTERVAL MUST BE ALLOWED AFTER THE PIPE LINE HAS BEEN REFILLED.
6. AFTER THE STABILIZATION PERIOD, ADJUST THE AIR PRESSURE TO 3.5 PSIG AND SHUT OFF OR DISCONNECT THE AIR SUPPLY. AT 3.5 PSIG COMMENCE TIMING WITH A STOP WATCH UNTIL THE LINE PRESSURE DROPS TO 2.5 PSIG. THE TIME REQUIRED FOR A PRESSURE LOSS OF 1.0 PSIG IS USED TO DETERMINE THE TEST RESULTS.
7. IF THE TIME, IN MINUTES AND SECONDS, FOR THE AIR PRESSURE TO DROP FROM 3.5 TO 2.5 PSIG IS GREATER THAN THAT SHOWN IN THE TABLE FOR THE DESIGNATED PIPE SIZE, THE SECTION UNDERGOING THE TEST SHALL HAVE PASSED AND SHALL BE PRESUMED TO BE FREE OF LEAKS. THE TEST MAY BE DISCONTINUED AT THAT TIME.
8. IF THE TIME, IN MINUTES AND SECONDS, FOR 1.0 PSIG DROP IS LESS THAN THAT SHOWN IN THE TABLE BELOW FOR THE DESIGNATED PIPE SIZE, THE SECTION OF PIPE SHALL NOT HAVE PASSED THE TEST; THEREFORE, ADEQUATE REPAIRS MUST BE MADE AND THE LINE RETESTED.
9. AN AIR PRESSURE CORRECTION IS REQUIRED WHEN THE PREVAILING GROUND WATER IS ABOVE THE SEWER LINE BEING TESTED. UNDER THIS CONDITION, THE AIR TEST PRESSURE MUST BE INCREASED .433 PSI FOR EACH FOOT THE GROUND WATER LEVEL IS ABOVE THE INVERT OF THE PIPE.
10. IF THE SECTION DOES NOT PASS THE LEAKAGE TESTS, THE CONTRACTOR SHALL DO EVERYTHING NECESSARY TO LOCATE, UNCOVER, AND REPAIR OR REPLACE THE DEFECTIVE PIPE, FITTING, OR JOINT, ALL AT HIS/HER OWN EXPENSE AND WITHOUT EXTENSIONS FOR COMPLETION OF WORK. ADDITIONAL TESTS AND REPAIRS SHALL BE MADE UNTIL THE SECTION PASSES THE SPECIFIED TEST.
11. NO MORE THAN 1,000 FEET OF SEWER SHALL BE CONSTRUCTED INITIALLY WITHOUT TESTING. AFTER THE INITIAL TEST, THE FREQUENCY OF TESTING SHALL BE AS DETERMINED BY THE ENGINEER.

G. CLEANING AND FLUSHING

UPON COMPLETION OF CONSTRUCTION, ALL DIRT AND OTHER FOREIGN MATERIAL SHALL BE REMOVED FROM PIPELINES AND THEIR APPURTENANT CONSTRUCTION. NO MATERIAL SHALL BE LEFT IN THE PIPELINES TO IMPEDE NORMAL FLOW THROUGH THEM.

H. CLEANOUTS FOR SEWERS:

CLEANOUTS SHALL BE INSTALLED WHERE THE DISTANCE FROM THE BUILDING TO THE MAIN SEWER IS GREATER THAN ONE HUNDRED (100) FEET OR WHERE BENDS GREATER THAN OR EQU

ZONING REQUIREMENTS

ZONE: RPD-I 40% – RESOURCE PRESERVATION DISTRICT INDUSTRIAL
PARCEL AREA: ±999,266 SF = ±22.94 AC

	REQUIRED	PROPOSED	SECTION
MINIMUM LOT AREA	40,000 SF	999,266 SF	TABLE 2.14
MINIMUM LOT FRONTAGE	200'	1,609'	TABLE 2.14
MINIMUM SETBACK/FRONT	50'	97.3'	TABLE 2.14
MINIMUM SETBACK/SIDE	25'	301.6'	TABLE 2.14
MINIMUM SETBACK/REAR	25'	143.6'	TABLE 2.14
MAXIMUM LOT COVERAGE	60%	±50.2%	TABLE 2.14
MAXIMUM HEIGHT	45'	31'	TABLE 2.14

NOTES:
1. LOT MAXIMUM COVERAGE = ±(501,782/999,266) * 100 = 50.2%

PARKING REQUIREMENTS

ITEM	REQUIRED	PROPOSED	SECTION
MIN. PARKING SPACE DIMENSIONS REQUIRED	9'X18'	9'X18' (MIN)	SECTION 3.9 (A)
NUMBER OF PARKING[1] SPACES REQUIRED	268 SPACES	482 SPACES	SECTION 3.9 (B)
NUMBER OF ACCESSIBLE PARKING SPACES REQUIRED	9 SPACES	9 SPACES	SECTION 3.9 (H)
NUMBER OF LOADING[2] SPACES REQUIRED	11 SPACES	11 SPACES	SECTION 3.9(J)

NOTES:
1. PER SECTION 3.9(B), PARKING SPACES REQUIRED FOR A DISTRIBUTION FACILITY: 1 SPACE FOR EVERY 400 GROSS SF OF FLOOR SPACE OR 2 SPACES FOR EVERY 3 EMPLOYEES.
   1.1. 1 SPACE/400 SF * 106,993 SF = 268 SPACES
2. PER SECTION 3.9(J), WHOLESALE, MANUFACTURING, WAREHOUSING, AND TRUCKING USES–ONE (1) LOADING SPACE OF AT LEAST 1,000 SF FOR EACH 10,000 SF OF GROSS FLOOR AREA.
   2.1. 1 SPACES/10,000 SF * 106,993 SF = 11 SPACES

PARCEL
72-14
#80 THOMPSON DRIVE
N/F TOWN OF ESSEX

PARCEL
72-14
80 THOMPSON DRIVE
N/F TOWN OF ESSEX

ZONE LINE (TYP)

REBAR w/ ALUMINUM CAP FOUND

50' FRONT YARD SETBACK & LANDSCAPE BUFFER

CS101

LOT 12
± 1.69 ACRES

LOT 13
±22.94 ACRES

LOT 11
± 7.70 ACRES

VAN EGRESS DRIVE

(5) BOX TRUCK PARKING SPACES 12'X37'

CLASS II 50' WETLAND BUFFER (TYP)

WETLAND F BOUNDARY CLASS II

WETLAND D BOUNDARY CLASS III

WETLAND E BOUNDARY CLASS III

(11) LOADING DOCKS 13.5'X60'

SNOW STORAGE AREA (TYP)

50' FRONT YARD SETBACK & LANDSCAPE BUFFER

100' NO-BUILD BUFFER

25' REAR YARD SETBACK

WETLAND C BOUNDARY CLASS III

WETLAND B BOUNDARY CLASS III

WETLAND H BOUNDARY CLASS III

WETLAND A BOUNDARY CLASS III

WETLAND G BOUNDARY CLASS II

100' DIAMETER TRUCK TURN-AROUND

DUMPSTER ENCLOSURE

(5) TRAILER SPACES 13.5'X60'

RETAINING WALL

EXTENTS OF CANOPY

PARCEL
72-8
#75 THOMPSON DRIVE
N/F ALLEN BROOK
DEVELOPMENT, LLC

CS102

CS103

ALL WORK IN RIGHT-OF-WAY PROPOSED BY OTHERS UNDER SEPARATE COVER BY OTHERS

SUBDIVISION LINE SUBMITTED UNDER A SEPARATE COVER BY OTHERS

RIGHT-OF-WAY LINE SUBMITTED UNDER A SEPARATE COVER BY OTHERS

60' KIMO DRIVE

50' FRONT YARD SETBACK & LANDSCAPE BUFFER

LOT 10
± 5.38 ACRES

ZONE: RPD-1 60%
ZONE: RPD-1 40%

PROPOSED DISTRIBUTION FACILITY
± 106,993 SF FOOTPRINT
11 LOADING DOCKS
5 TRAILER PARKING STALLS
5 BOX TRUCK PARKING STALLS
211 ASSOCIATE PARKING STALLS
271 VAN PARKING STALLS

VAN EXTERIOR LAUNCH PADS (11'X35.5')

ASSOCIATE PARKING AREA
211 PARKING SPACES (9'X18')

LAUNCH PAD CANOPY

FLEX CHECK IN

STORMWATER MANAGEMENT FEATURE (TYP)

ACCESS DRIVE (TYP)

PAINTED CROSSWALK (TYP)

VAN PARKING AREA
271 PARKING SPACES (11'X24')

WETLAND I BOUNDARY CLASS III (±2,550 SF)

VAN QUEUING AREA (10'X24')

25' SIDE YARD SETBACK

ZONE: RPD-I 40%
ZONE: I1 - INDUSTRIAL

80 0 40 80
SCALE IN FEET

Date	Description	No.

Revisions

STATE OF VERMONT
JOHN D. FLANNERY
NO. 0093000
CIVIL
LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

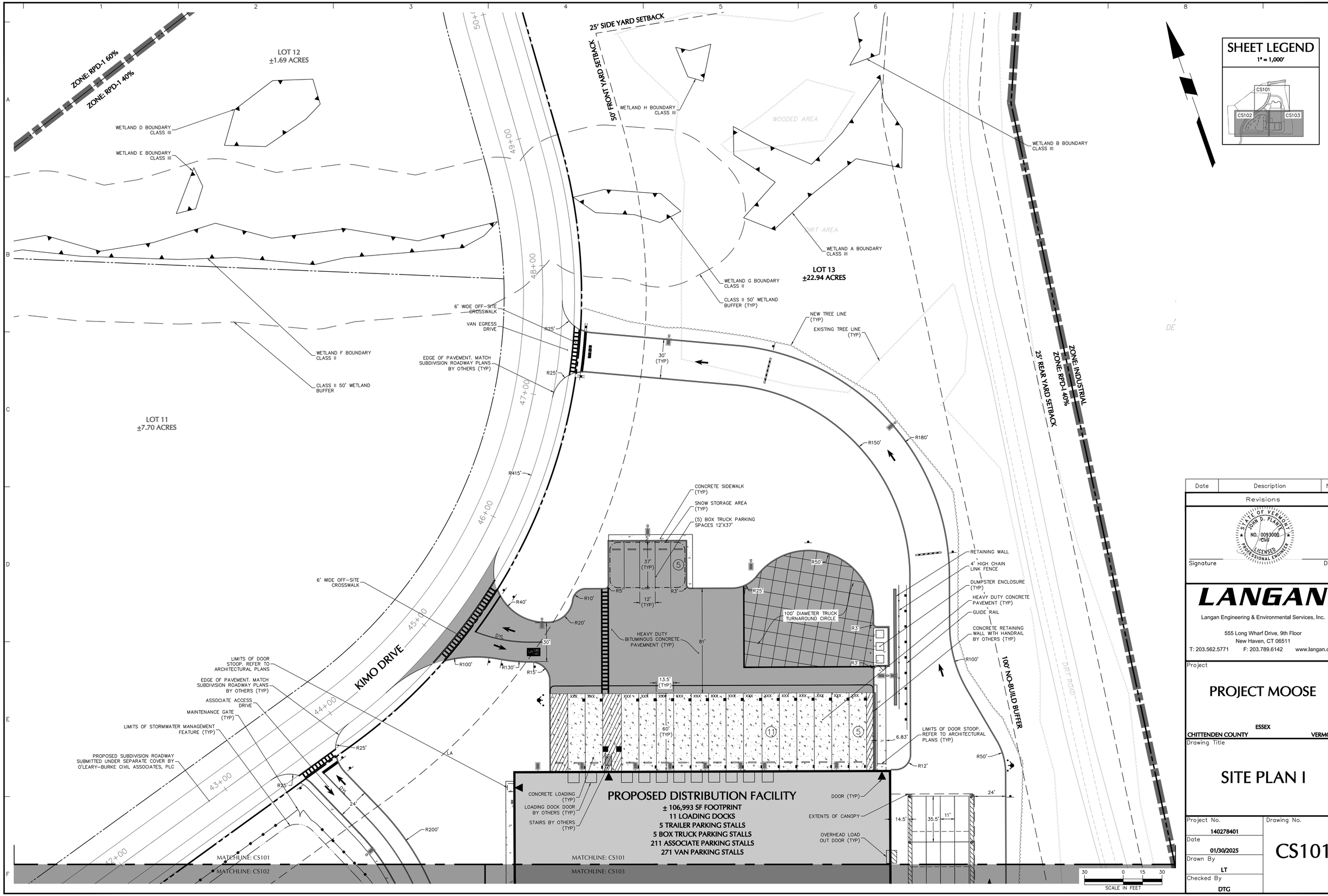
Drawing Title
OVERALL SITE PLAN

Project No.	Drawing No.
140278401	CS100
Date: 01/30/2025	
Drawn By: BCP	
Checked By: TSO	

LANGAN
Project No. 140278401

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Date: 1/29/2025 Time: 10:14 User: bpalma Style Table: Langan.stb Layout: CS100 Document Code: 140278401-0501-CS101-0101



SHEET LEGEND

1" = 1,000'

Date	Description	No.
Revisions		

STATE OF VERMONT
JOHN D. PALMA
NO. 0093000
CIVIL
LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

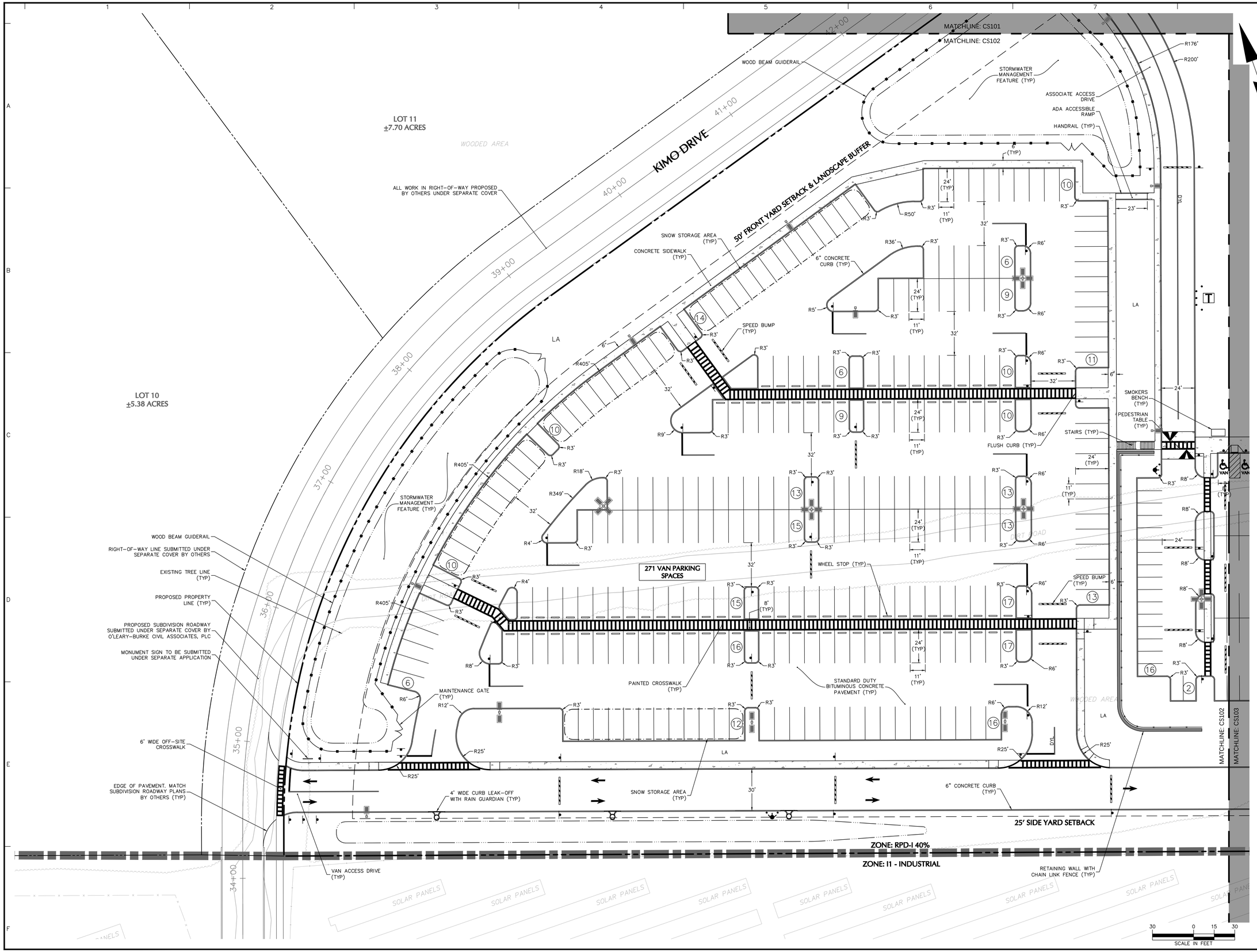
SITE PLAN I

Project No.	Drawing No.
140278401	CS101
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

LANGAN
Project No. 140278401

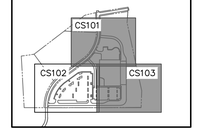
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Date: 1/29/2025 Time: 10:15 User: bpalma Style Table: Langan.stb Layout: CS101 Document Code: 140278401-0501-CS101-0102



SHEET LEGEND

1" = 1,000'



Date	Description	No.
Revisions		

JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER STATE OF VERMONT

Signature Date

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Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

SITE PLAN II

Project No.	Drawing No.
140278401	CS102
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

LANGAN

Project No. 140278401

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MATCHLINE: CS101

MATCHLINE: CS103

PROPOSED DISTRIBUTION FACILITY

± 106,993 SF FOOTPRINT
11 LOADING DOCKS
5 TRAILER PARKING STALLS
5 BOX TRUCK PARKING STALLS
211 ASSOCIATE PARKING STALLS
271 VAN PARKING STALLS

OVERHEAD LOAD OUT DOOR (TYP)

DOOR (TYP)

ADA ACCESSIBLE RAMP (TYP)

ADA SIGN BOLLARD (TYP)

ADA PARKING STALL (TYP)

LAUNCH PAD CANOPY

6" CONCRETE CURB (TYP)

CONCRETE SIDEWALK (TYP)

FLEX CHECK IN

SPEED BUMP (TYP)

LIMITS OF DOOR STOOP. REFER TO ARCHITECTURAL PLANS (TYP)

211 ASSOCIATE PARKING SPACES

STANDARD DUTY BITUMINOUS CONCRETE PAVEMENT (TYP)

WETLAND I BOUNDARY CLASS III

RETAINING WALL WITH CHAIN LINK FENCE (TYP)

TIMBER GUIDE RAIL (TYP)

VAN QUEUING AREA (10'X24')

EXISTING TREE LINE (TYP)

PROPOSED PROPERTY LINE (TYP)

NEW TREE LINE (TYP)

MAINTENANCE GATE (TYP)

WOODEN SPLIT RAIL FENCE

STORMWATER MANAGEMENT FEATURE (TYP)

LOT 13
±22.94 ACRES

100' NO-BUILD BUFFER

25' REAR YARD SETBACK

ZONE: RPD-I 40%

ZONE: RPD-I 60%

ZONE: RPD-I 40%

ZONE: I1 - INDUSTRIAL

WOODED AREA

DIRT AREA

DIRT ROAD

SOLAR PANELS

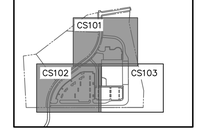
CBDH FOUND

MATCHLINE: CS102

MATCHLINE: CS103

SHEET LEGEND

1" = 1,000'



Date	Description	No.

Revisions

STATE OF VERMONT
JOHN D. PLANTE
NO. 0093000
CIVIL
LICENSED PROFESSIONAL ENGINEER

Signature Date

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555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
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Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

SITE PLAN III

Project No.	Drawing No.
140278401	CS103
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

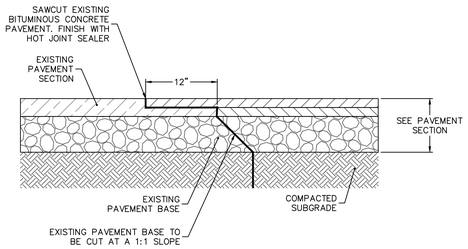
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SCALE IN FEET

Project No. 140278401

LANGAN

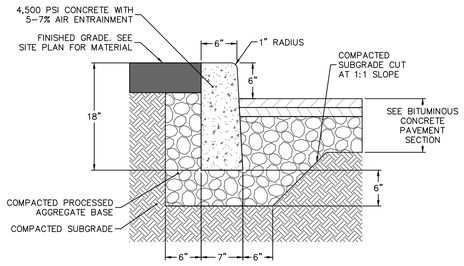
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Date: 1/29/2025 Time: 10:16 User: bpalma Style Table: Langan,stb Layout: CS103 Document Code: 140278401-0501-CS101-0104



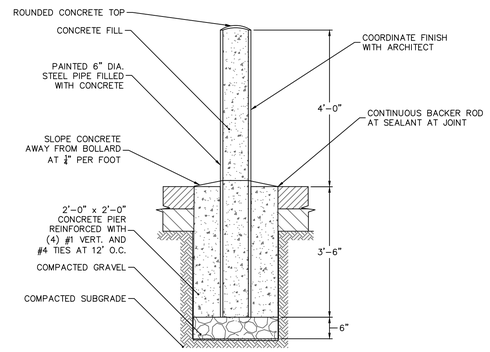
NOTES:
1. CONTRACTOR TO INSTALL TACK COAT ON ALL BUTT EDGES OF EXISTING PAVEMENT

1 ON-SITE CUT PAVEMENT SECTION
N.T.S.

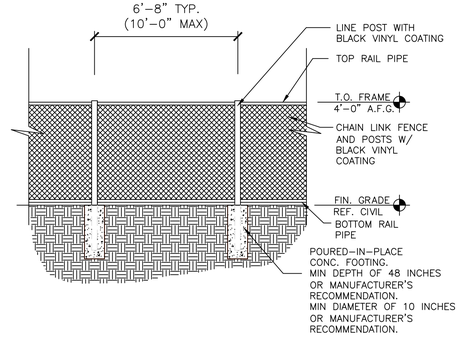


NOTES:
1. TRANSVERSE JOINTS 1/2" WIDE SHALL BE INSTALLED IN THE CAST-IN-PLACE CURB 20'-0" APART AND SHALL BE FILLED WITH PREFORMED BITUMINOUS JOINT FILLER.
2. FOR CAST-IN-PLACE CURB, EXPOSED CONCRETE SURFACE IS TO BE RUBBED TO PROVIDE SMOOTH FINISHED SURFACE.

2 ON-SITE CONCRETE CURB
N.T.S.

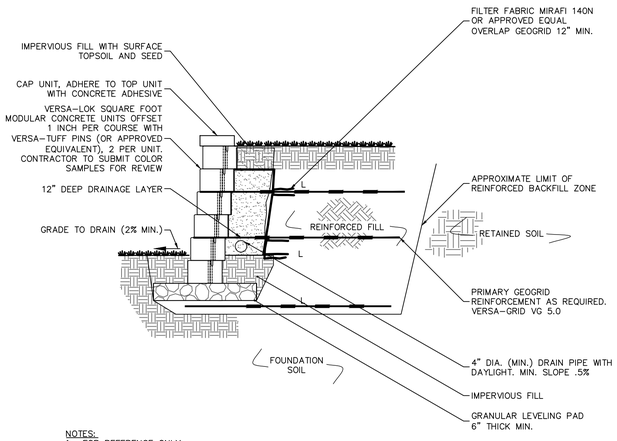


3 BOLLARD
N.T.S.



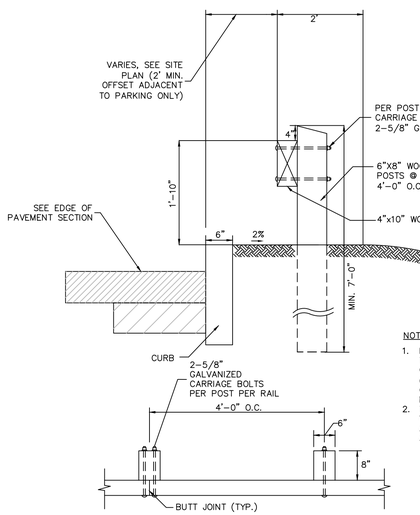
NOTES:
1. FENCE AND POSTS TO BE GALVANIZED AND BLACK VINYL COATED AND FITTED WITH VINYL PRIVACY SLATS
2. 2" MAX FROM BOTTOM RAIL TO FINISH GRADE

4 4 FT CHAIN LINK FENCE
N.T.S.



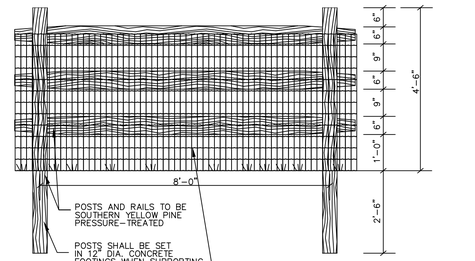
NOTES:
1. FOR REFERENCE ONLY
2. RETAINING WALL TO BE VERSA-LOK OR APPROVED EQUAL AND SUBMITTED AS CONTRACTOR SUBMITTAL FOR REVIEW BY CIVIL ENGINEER. IF DESIGN EXCEEDS 3.5' IN EXPOSED WALL HEIGHT, WALL TO BE DESIGNED, SIGNED, & SEALED BY VT P.E.
3. WALL DESIGNER IS RESPONSIBLE FOR BOTH INTERNAL AND EXTERNAL STABILITY. EXTERNAL STABILITY SHALL INCLUDE A 250 PSI LOAD FOR TRAFFIC WHERE APPLICABLE.

5 MODULAR BLOCK RETAINING WALL (FOR REFERENCE ONLY)
N.T.S.



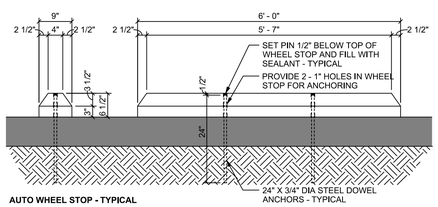
NOTES:
1. RAIL AND POST LUMBER TO BE COMMERCIAL GRADE, NO. 1 DENSE S.B (1,500 PSI) OR BETTER CONFORMING TO AASHTO M168.
2. TIMBER TO BE TREATED WITH PRESERVATIVES IN ACCORDANCE WITH AASHTO M133

6 TIMBER POST & BEAM GUIDERAIL
N.T.S.



NOTE:
PRESSURE TREATED YELLOW PINE RAIL TO BE SUPPLIED BY WEST VIRGINIA SPLIT RAIL (OR APPROVED EQUAL)

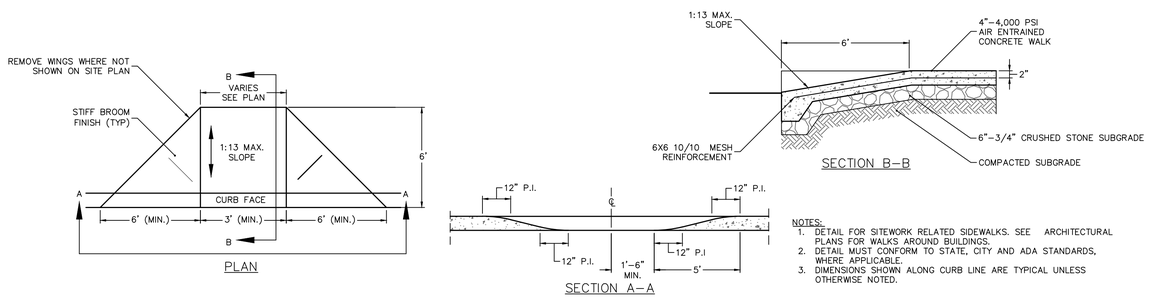
7 SPLIT RAIL FENCE
N.T.S.



AUTO WHEEL STOP - TYPICAL

NOTES:
1. CONCRETE WHEEL STOPS TO BE PAINTED SAFETY YELLOW.
2. WHEEL STOPS ARE NOT REQUIRED AT DOCK DOOR LOCATIONS THAT HAVE DOCK SEAL/CUSHION SYSTEMS.
3. IF PARKING SLIP CURB IS 8-IN OR HIGHER WITH STANDOFF DISTANCE OF 6-FT OR MORE FROM OBJECTS SUCH AS FENCES THEN WHEEL STOPS ARE NOT REQUIRED.

8 AUTO WHEEL STOP
N.T.S.



NOTES:
1. DETAIL FOR SITEWORK RELATED SIDEWALKS. SEE ARCHITECTURAL PLANS FOR WALKS AROUND BUILDINGS.
2. DETAIL MUST CONFORM TO STATE, CITY AND ADA STANDARDS, WHERE APPLICABLE.
3. DIMENSIONS SHOWN ALONG CURB LINE ARE TYPICAL UNLESS OTHERWISE NOTED.

9 DEPRSSED CURB AND RAMP
N.T.S.

Date	Description	No.
Revisions		

STATE OF VERMONT · JOHN D. PLANTE · NO. 0093000 · CIVIL · LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

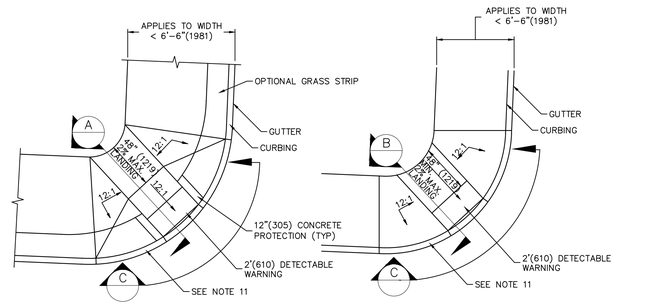
Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title
SITE DETAILS I

Project No.	Drawing No.
140278401	CS501
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

LANGAN
Project No. 140278401

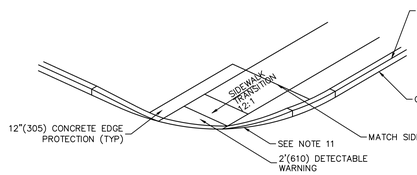
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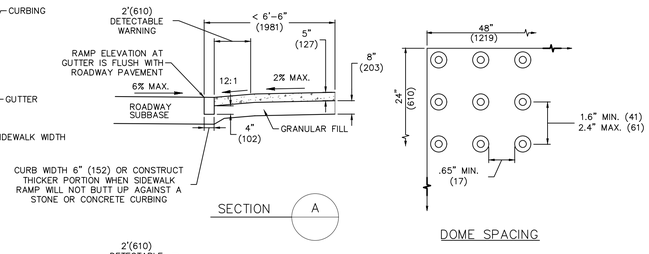
DIAGONAL SIDEWALK RAMP (TYPE 4a)

DIAGONAL/PARALLEL SIDEWALK RAMP (TYPE 4b)

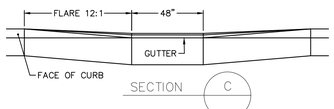
NOTES:
1. MAXIMUM SLOPES OF ADJOINING GUTTERS AND ROAD SURFACES IMMEDIATELY ADJACENT TO THE SIDEWALK RAMP OR ACCESSIBLE ROUTE SHOULD NOT EXCEED 20:1.
2. CARE SHALL BE TAKEN TO ASSURE UNIFORM GRADE ON THE RAMP, FREE OF SAGS AND ABRUPT GRADE CHANGES.
3. ALL RAMPS SHALL BE CONSTRUCTED OF CLASS "C" CONCRETE IN ACCORDANCE WITH CONNECTICUT STANDARD SPECIFICATIONS ARTICLE M.03.01.
4. SIDEWALK RAMPS SHALL HAVE A COARSE BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP.
5. DIAGONAL SIDEWALK RAMPS AT MARKED CROSSINGS SHALL BE WHOLLY CONTAINED WITHIN THE MARKINGS, EXCLUDING ANY FLARED SIDES.
6. REMOVAL OF EXISTING SIDEWALK FOR NEW RAMP INSTALLATIONS SHALL BE TO THE NEAREST EXPANSION / CONTRACTION JOINT OR DUMMY JOINT. 12:1 MAY NOT BE ACHIEVABLE DUE TO SIDEWALK GRADE. IN RECOGNITION OF THIS, A MINIMUM LIMIT OF 15' (4.57m) FOR A PARALLEL RAMP SHALL BE USED. REMOVAL SHALL NOT BE FURTHER THAN 2' (610) FROM THE PROPOSED RAMP UNLESS DIRECTED BY THE ENGINEER. SAW CUT REQUIRED FOR DUMMY JOINTS SHALL BE INCLUDED IN THE COST OF "CONCRETE SIDEWALK".
7. EXPANSION JOINTS IN CONCRETE SHALL MATCH THOSE IN ADJACENT SIDEWALKS BUT IN NO CASE SHALL THE SPACING BETWEEN EXPANSION JOINTS EXCEED 12' (3.66m) UNLESS OTHERWISE NOTED.
8. RAISED MEDIAN ISLANDS IN MARKED CROSSINGS SHALL HAVE SIDEWALK RAMPS AT BOTH SIDES AND A LEVEL AREA AT LEAST 4' (1219) LONG BETWEEN THE RAMPS. IF THIS CAN NOT BE ACHIEVED, THE RAISED ISLAND SHALL BE CUT THROUGH LEVEL WITH THE ROADWAY AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
9. SIDEWALK RAMPS, WHEN CONSTRUCTED IN CONJUNCTION WITH SIDEWALK, SHALL BE PAID FOR UNDER THE ITEM "CONCRETE SIDEWALK", INCLUDING CURBING WITHIN THE LIMITS OF THE NEW SIDEWALK RAMP AND DETECTABLE WARNING STRIPS.WHEN JUST A SIDEWALK RAMP IS CONSTRUCTED, IT SHALL BE PAID FOR UNDER THE ITEM "SIDEWALK RAMP" INCLUDING CURBING WITHIN THE LIMITS OF THE NEW SIDEWALK AND DETECTABLE WARNING STRIP.
10. CURBING WITHIN THE LIMITS OF THE NEW SIDEWALK RAMP SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE REQUIREMENTS OF FORM 816 SECTIONS 8.11 AND 8.13.
11. TRANSITION TO FULL HEIGHT CURB. INSTALL STONE CURBING IF ADJACENT CURBING IS STONE. INSTALL CONCRETE CURBING IF ADJACENT CURBING IS CONCRETE OR BITUMINOUS.
12. INSTALL THE EDGE OF THE DETECTABLE WARNING STRIP 6" (152) FROM THE EDGE OF ROAD.
13. TO PERMIT WHEELCHAIR WHEELS TO ROLL BETWEEN DOMES, ALIGN DOMES ON A SQUARE GRID IN THE DIRECTION OF PEDESTRIAN TRAVEL.
14. THE MAXIMUM HEIGHT OF ANY RAMP WITHOUT HANDRAILS SHALL BE 6".



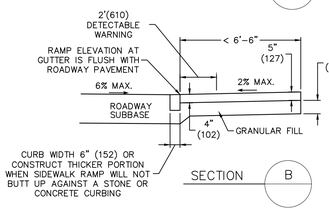
DIAGONAL SIDEWALK RAMP (TYPE 4c)

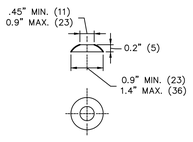


DOME SPACING



ALL METRIC DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS OTHERWISE NOTED

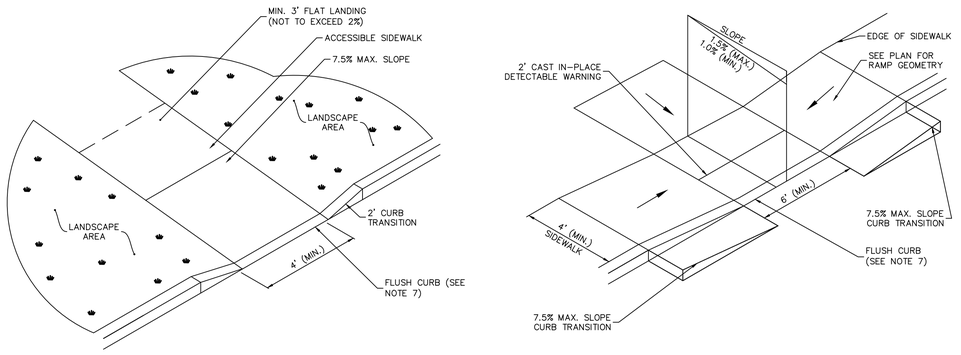




DOME SECTION

1 EXPRESSED CURB RAMP WITH DETECTABLE WARNING STRIPE

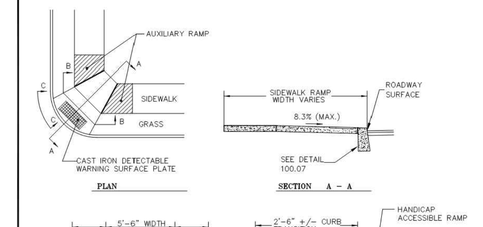
N.T.S.



NOTES:
1. THE SIDEWALK AND CURB RAMP CROSS SLOPES SHALL NOT EXCEED 1.5 (1% MIN.).
2. THE RUNNING SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL NOT EXCEED 5%.
3. THE SLOPE RUNNING OF ACCESSIBLE ROUTE CURB RAMPS SHALL NOT EXCEED 7.5%.
4. A MINIMUM OF 3 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
5. RAMP, CURB AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
6. WHERE ACCESSIBLE ROUTES ARE LESS THAN 5' IN WIDTH (EXCLUDING CURBING) A 5' x 5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FEET.
7. ELIMINATE CURBING (OTHER THAN VERTICAL CURBING, WHICH SHALL BE SET FLUSH) WHERE IT ABUTS ROADWAY.

3 ACCESSIBLE CURB RAMP

N.T.S.

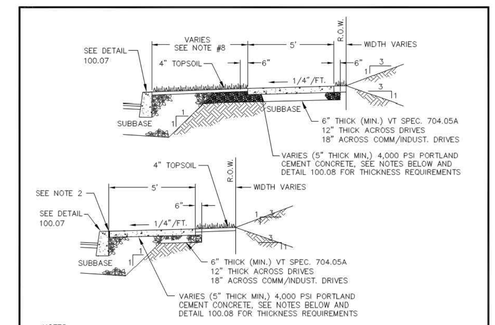


NOTES:
1. SIDEWALK RAMPS SHALL BE INSTALLED AT ALL STREET INTERSECTIONS AND WHEREVER NEW SIDEWALKS AND CURBING INTERSECT.
2. THE MAXIMUM SLOPE ON A HANDICAP ACCESSIBLE RAMP IS 1" PER 12" OR 8.3%.
3. DETECTABLE WARNING SURFACE PLATES SHALL BE INSTALLED AT THE END OF EACH HANDICAP ACCESSIBLE RAMP.
4. APRON SUBBASE SHALL BE 12" THICK MINIMUM.
5. A BROOM FINISH SHALL BE APPLIED TO ALL CONCRETE ADJACENT TO THE DETECTABLE WARNING SURFACES.
6. ALL SIDEWALK RAMPS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT VERSION OF THE MUTCD.

Essex	TOWN OF ESSEX PUBLIC WORKS 81 MAIN STREET ESSEX JCT., VT 05452 P: 802 878-1344 F: 802 878-1356 W: www.essex.org	TOWN OF ESSEX, VERMONT STANDARD SPECIFICATIONS FOR CONSTRUCTION CONCRETE SIDEWALK RAMPS
		Detail No: 100.06 Scale: NOT TO SCALE Date: JAN. 2017 A-6

2 CONCRETE SIDEWALK RAMPS

N.T.S.



NOTES:
1. CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 3,500 PSI AT 28 DAYS AND SHALL BE AIR ENTRAINED WITH AN ADMIXTURE PRODUCING AN AIR CONTENT OF 5% TO 7% BY VOLUME.
2. HALF INCH (1/2") TRANSVERSE EXPANSION JOINTS SHALL BE PLACED AT INTERVALS NOT EXCEEDING TWENTY FEET (20'). SIDEWALKS SHALL BE SCORED TO A DEPTH OF ONE INCH (1") EVERY FIVE (5') FEET. CURB AND SIDEWALK SECTIONS SHALL BE SEPARATED BY A PREMOLDED JOINT FILLER.
3. AFTER THE INITIAL CURING PERIOD IS OVER (APPROXIMATELY 28 DAYS), ALL EXPOSED SURFACES SHALL RECEIVE TWO COATS OF ANTI-SPALLING COMPOUND.
4. SEE WRITTEN SPECIFICATION FOR APPROVED CONSTRUCTION METHODS AND MATERIAL REQUIREMENTS.
5. SIDEWALK BASE SHALL BE VT SPEC. 704.05A OR APPROVED EQUAL
6. SEE DETAIL 100.08 FOR THICKNESS OF SIDEWALK AT DRIVE APRONS
7. WHEN CONNECTING NEW SIDEWALK TO AN EXISTING SIDEWALK, STEEL DOWELS SHALL BE DRILLED INTO THE EXISTING SIDEWALK A MINIMUM OF 6" AND SHALL EXTEND INTO THE NEW SIDEWALK A MINIMUM OF 6".
8. DESIGNS SHOULD MAXIMIZE GREEN SPACE WIDTH TO THE EXTENT PRACTICABLE

Essex	TOWN OF ESSEX PUBLIC WORKS 81 MAIN STREET ESSEX JCT., VT 05452 P: 802 878-1344 F: 802 878-1356 W: www.essex.org	TOWN OF ESSEX, VERMONT STANDARD SPECIFICATIONS FOR CONSTRUCTION CONCRETE SIDEWALK
		Detail No: 100.05 Scale: NOT TO SCALE Date: MAR. 2017 A-5

4 CONCRETE SIDEWALK

N.T.S.

Date	Description	No.
Revisions		

STATE OF VERMONT JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title
SITE DETAILS II

Project No.	Drawing No.
140278401	CS502
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

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LANGAN Project No. 140278401

Sign Face Legend

SYMBOL	SIGN TYPE
S-1	Stop Sign
S-2	Do Not Enter
S-3	Speed Limit, 5 MPH
S-3(mod)	Speed Bump Sign w/ 5 MPH Placard
S-4	Speed Limit, 10 MPH
S-4(mod)	Speed Hump Sign w/ 10 MPH Placard
S-5(L)	Pedestrian Crossing, Left Arrow(S-5(R) OPP.)
S-7(R)	One Way, Left Arrow (S-7(R) OPP.)
S-9(L)	Left Turn Only (S-9(R) OPP.)
S-11(L)	No Left Turn (S-11(R) OPP.)
S-13	No Truck Access
S-14	No Parking
S-15	Accessible Car Parking
S-16	Accessible Van Parking
S-17	No Trespassing
S-18	Stormwater Warning Sign
S-97	Notice: All Trailers Subject to Inspection Sign

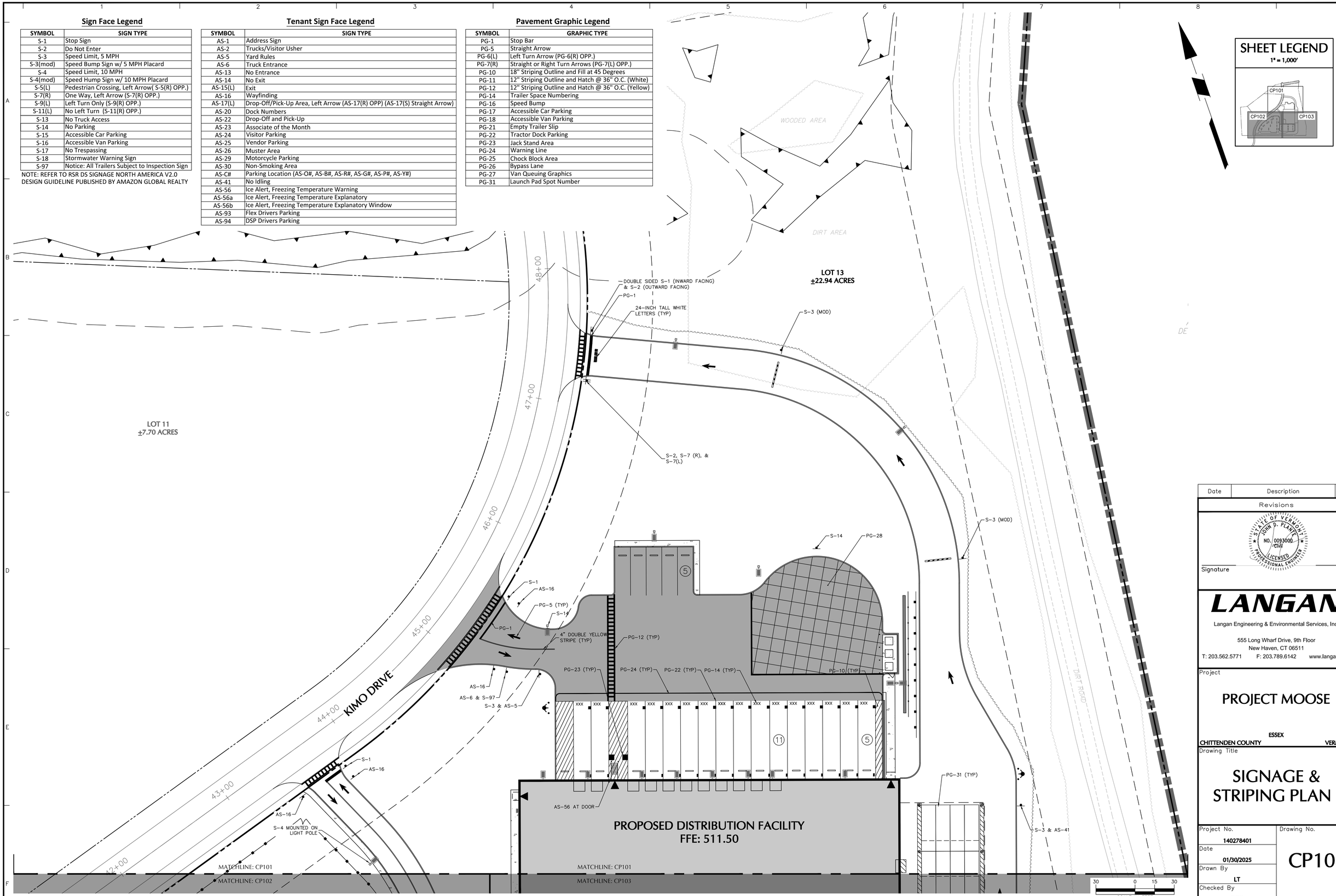
NOTE: REFER TO RSR DS SIGNAGE NORTH AMERICA V2.0 DESIGN GUIDELINE PUBLISHED BY AMAZON GLOBAL REALTY

Tenant Sign Face Legend

SYMBOL	SIGN TYPE
AS-1	Address Sign
AS-2	Trucks/Visitor Usher
AS-5	Yard Rules
AS-6	Truck Entrance
AS-13	No Entrance
AS-14	No Exit
AS-15(L)	Exit
AS-16	Wayfinding
AS-17(L)	Drop-Off/Pick-Up Area, Left Arrow (AS-17(R) OPP) (AS-17(S) Straight Arrow)
AS-20	Dock Numbers
AS-22	Drop-Off and Pick-Up
AS-23	Associate of the Month
AS-24	Visitor Parking
AS-25	Vendor Parking
AS-26	Muster Area
AS-29	Motorcycle Parking
AS-30	Non-Smoking Area
AS-C#	Parking Location (AS-O#, AS-B#, AS-R#, AS-G#, AS-P#, AS-Y#)
AS-41	No Idling
AS-56	Ice Alert, Freezing Temperature Warning
AS-56a	Ice Alert, Freezing Temperature Explanatory
AS-56b	Ice Alert, Freezing Temperature Explanatory Window
AS-93	Flex Drivers Parking
AS-94	DSP Drivers Parking

Pavement Graphic Legend

SYMBOL	GRAPHIC TYPE
PG-1	Stop Bar
PG-5	Straight Arrow
PG-6(L)	Left Turn Arrow (PG-6(R) OPP.)
PG-7(R)	Straight or Right Turn Arrows (PG-7(L) OPP.)
PG-10	18" Striping Outline and Fill at 45 Degrees
PG-11	12" Striping Outline and Hatch @ 36" O.C. (White)
PG-12	12" Striping Outline and Hatch @ 36" O.C. (Yellow)
PG-14	Trailer Space Numbering
PG-16	Speed Bump
PG-17	Accessible Car Parking
PG-18	Accessible Van Parking
PG-21	Empty Trailer Slip
PG-22	Tractor Dock Parking
PG-23	Jack Stand Area
PG-24	Warning Line
PG-25	Chock Block Area
PG-26	Bypass Lane
PG-27	Van Queuing Graphics
PG-31	Launch Pad Spot Number



Date	Description	No.
Revisions		

STATE OF VERMONT JOSEPH D. PLANTE NO. 0083000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

SIGNAGE & STRIPING PLAN I

Project No.	Drawing No.
140278401	CP101
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

LANGAN Project No. 140278401

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Sign Face Legend

SYMBOL	SIGN TYPE
S-1	Stop Sign
S-2	Do Not Enter
S-3	Speed Limit, 5 MPH
S-3(mod)	Speed Bump Sign w/ 5 MPH Placard
S-4	Speed Limit, 10 MPH
S-4(mod)	Speed Hump Sign w/ 10 MPH Placard
S-5(L)	Pedestrian Crossing, Left Arrow(S-5(R) OPP.)
S-7(R)	One Way, Left Arrow (S-7(R) OPP.)
S-9(L)	Left Turn Only (S-9(R) OPP.)
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S-17	No Trespassing
S-18	Stormwater Warning Sign
S-97	Notice: All Trailers Subject to Inspection Sign

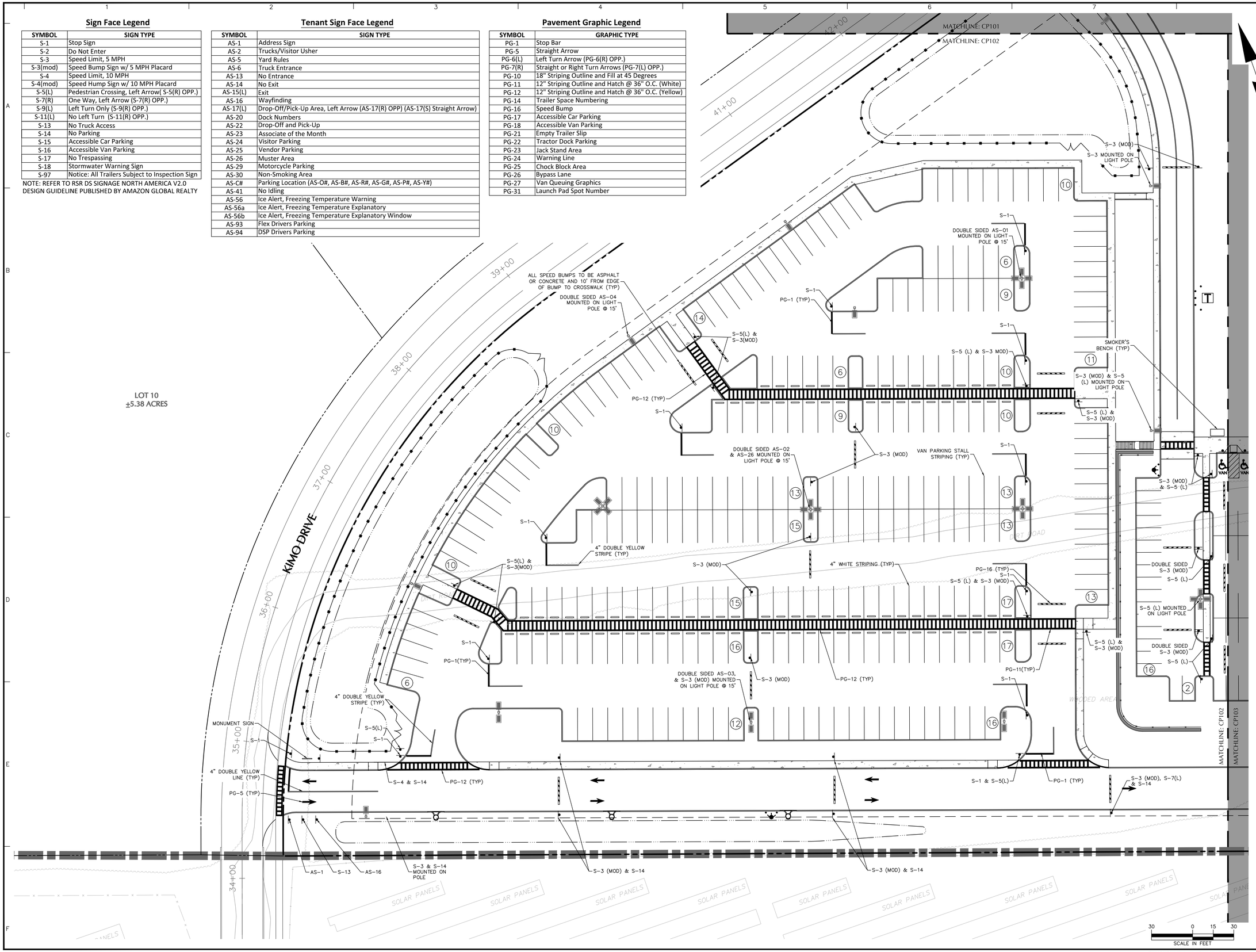
NOTE: REFER TO RSR DS SIGNAGE NORTH AMERICA V2.0 DESIGN GUIDELINE PUBLISHED BY AMAZON GLOBAL REALTY

Tenant Sign Face Legend

SYMBOL	SIGN TYPE
AS-1	Address Sign
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AS-13	No Entrance
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AS-15(L)	Exit
AS-16	Wayfinding
AS-17(L)	Drop-Off/Pick-Up Area, Left Arrow (AS-17(R) OPP) (AS-17(S) Straight Arrow)
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AS-24	Visitor Parking
AS-25	Vendor Parking
AS-26	Muster Area
AS-29	Motorcycle Parking
AS-30	Non-Smoking Area
AS-C#	Parking Location (AS-O#, AS-B#, AS-R#, AS-G#, AS-P#, AS-Y#)
AS-41	No Idling
AS-56	Ice Alert, Freezing Temperature Warning
AS-56a	Ice Alert, Freezing Temperature Explanatory
AS-56b	Ice Alert, Freezing Temperature Explanatory Window
AS-93	Flex Drivers Parking
AS-94	DSP Drivers Parking

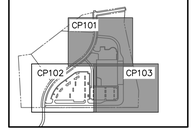
Pavement Graphic Legend

SYMBOL	GRAPHIC TYPE
PG-1	Stop Bar
PG-5	Straight Arrow
PG-6(L)	Left Turn Arrow (PG-6(R) OPP.)
PG-7(R)	Straight or Right Turn Arrows (PG-7(L) OPP.)
PG-10	18" Striping Outline and Fill at 45 Degrees
PG-11	12" Striping Outline and Hatch @ 36" O.C. (White)
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PG-21	Empty Trailer Slip
PG-22	Tractor Dock Parking
PG-23	Jack Stand Area
PG-24	Warning Line
PG-25	Chock Block Area
PG-26	Bypass Lane
PG-27	Van Queuing Graphics
PG-31	Launch Pad Spot Number



SHEET LEGEND

1" = 1,000'



Date	Description	No.

Revisions

STATE OF VERMONT JOHN D. FLANNERY LICENSED PROFESSIONAL ENGINEER NO. 0093000 CIVIL

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

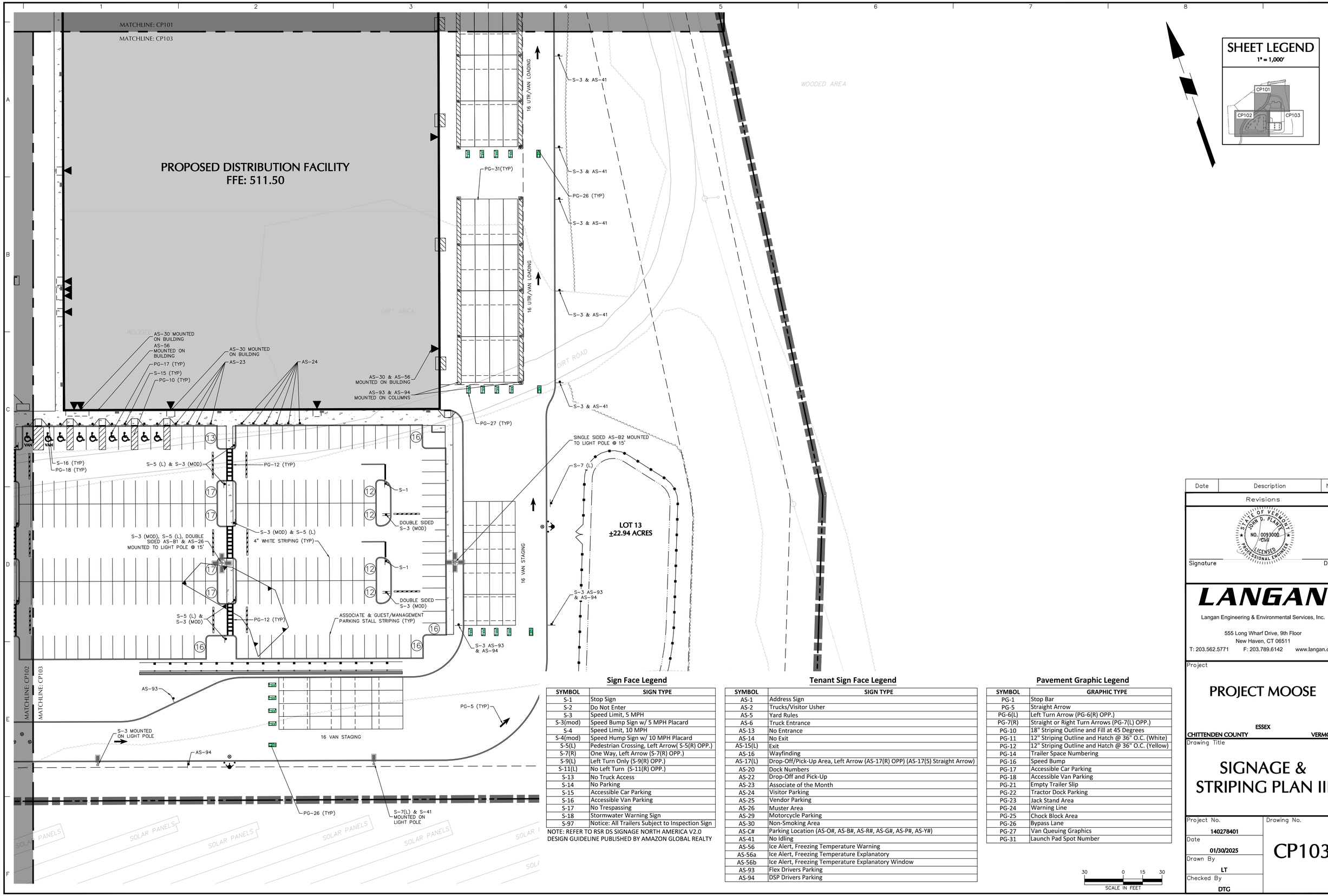
SIGNAGE & STRIPING PLAN II

Project No.	Drawing No.
140278401	CP102
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

LANGAN

Project No. 140278401

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SHEET LEGEND

1" = 1,000'

Sign Face Legend

SYMBOL	SIGN TYPE
S-1	Stop Sign
S-2	Do Not Enter
S-3	Speed Limit, 5 MPH
S-3(mod)	Speed Bump Sign w/ 5 MPH Placard
S-4	Speed Limit, 10 MPH
S-4(mod)	Speed Hump Sign w/ 10 MPH Placard
S-5(L)	Pedestrian Crossing, Left Arrow(S-5(R) OPP.)
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S-11(L)	No Left Turn (S-11(R) OPP.)
S-13	No Truck Access
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S-16	Accessible Van Parking
S-17	No Trespassing
S-18	Stormwater Warning Sign
S-97	Notice: All Trailers Subject to Inspection Sign

NOTE: REFER TO RSR DS SIGNAGE NORTH AMERICA V2.0 DESIGN GUIDELINE PUBLISHED BY AMAZON GLOBAL REALTY

Tenant Sign Face Legend

SYMBOL	SIGN TYPE
AS-1	Address Sign
AS-2	Trucks/Visitor Usher
AS-5	Yard Rules
AS-6	Truck Entrance
AS-13	No Entrance
AS-14	No Exit
AS-15(L)	Exit
AS-16	Wayfinding
AS-17(L)	Drop-Off/Pick-Up Area, Left Arrow (AS-17(R) OPP) (AS-17(S) Straight Arrow)
AS-20	Dock Numbers
AS-22	Drop-Off and Pick-Up
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AS-C#	Parking Location (AS-O#, AS-B#, AS-R#, AS-G#, AS-P#, AS-Y#)
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AS-56a	Ice Alert, Freezing Temperature Explanatory
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AS-93	Flex Drivers Parking
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Pavement Graphic Legend

SYMBOL	GRAPHIC TYPE
PG-1	Stop Bar
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PG-6(L)	Left Turn Arrow (PG-6(R) OPP.)
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PG-23	Jack Stand Area
PG-24	Warning Line
PG-25	Chock Block Area
PG-26	Bypass Lane
PG-27	Van Queuing Graphics
PG-31	Launch Pad Spot Number

30 0 15 30
SCALE IN FEET

Date	Description	No.

Revisions

STATE OF VERMONT JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

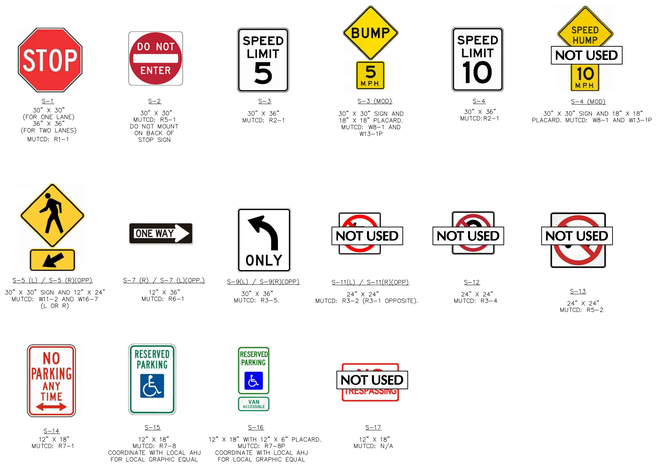
Drawing Title

SIGNAGE & STRIPING PLAN III

Project No.	Drawing No.
140278401	CP103
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

LANGAN
Project No. 140278401

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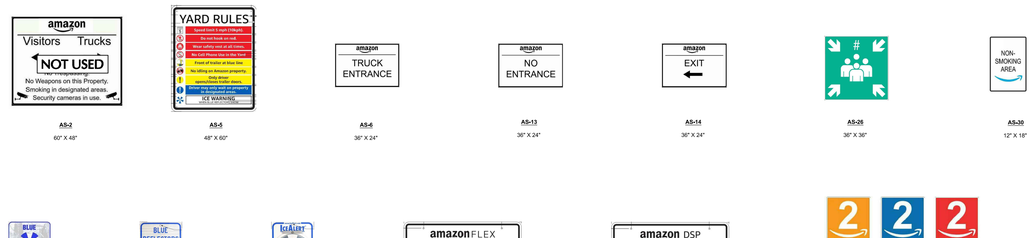


NOTE:

1. ADDITIONAL MUTCD COMPLIANT SIGNAGE MAY BE ADDED ON AN INDIVIDUAL SITE BASIS.

1 TRAFFIC DETAILS

N.T.S.



NOTE:

1. ADDITIONAL AMAZON SIGNAGE MAY BE ADDED ON AN INDIVIDUAL SITE BASIS.

2 AMAZON SIGNS

N.T.S.

SIGNAGE NOTES:

1. REFER TO SIGNAGE AND STRIPING PLAN FOR LOCATIONS OF SIGNS AND PAVEMENT MARKINGS.
2. ALL SIGNAGE, STRIPING, AND OTHER TRAFFIC CONTROL DEVICES SHALL BE INSTALLED IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
3. ALL STRIPING SHALL BE LONG LIFE EPOXY RESIN AND 4" WIDE UNLESS OTHERWISE NOTED. ALL PAVEMENT GRAPHICS SHALL BE HOT-APPLIED THERMOPLASTIC (REFLECTIVE).
4. COLOR SHALL BE WHITE ON ASPHALT AND YELLOW ON CONCRETE, UNLESS OTHERWISE NOTED.
5. ASPHALT SPEED HUMPS AND SPEED BUMPS SHALL BE USED IN COLDER CLIMATES WHERE SNOW REMOVAL EQUIPMENT IS INTENDED TO BE USED. RUBBER SPEED HUMPS AND SPEED BUMPS MAY BE USED IN WARMER CLIMATES OR REGIONS WHERE CONCRETE PAVEMENT IS PREVALENT
6. ALL PROPOSED SIGNAGE AND STRIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE RSR DS SIGNAGE NORTH AMERICA V2.0 DESIGN GUIDELINE PUBLISHED BY AMAZON GLOBAL REALTY.
7. FINAL QUANTITIES SHALL BE COORDINATED AND VERIFIED IN FIELD.
8. ADDITIONAL SIGNAGE NOT SHOWN ON GRAPHICS PLAN (E.G. FIRE LANES) MAY BE REQUIRED PER LOCAL CODE AND/OR AHJ. SUB-CONTRACTOR SHALL COORDINATE WITH LOCAL AHJ AND PROVIDE AS REQUIRED.
9. MOUNT SIGNAGE ACCORDING TO LOCAL CODES.
10. TYPICAL SIGN FONT IS SET IN ARIAL.

Date	Description	No.

Revisions

JOHN D. PLANTE
NO. 0093000
CIVIL
LICENSED PROFESSIONAL ENGINEER
STATE OF VERMONT

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

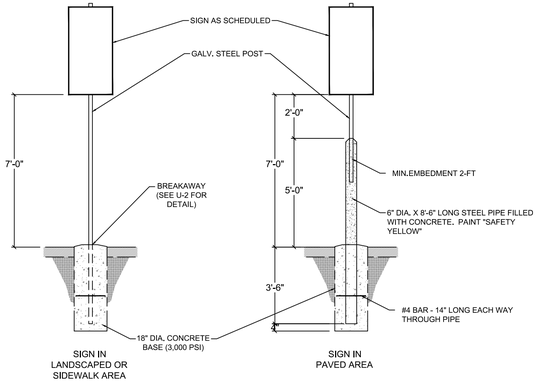
Drawing Title

STRIPING & SIGNAGE DETAILS I

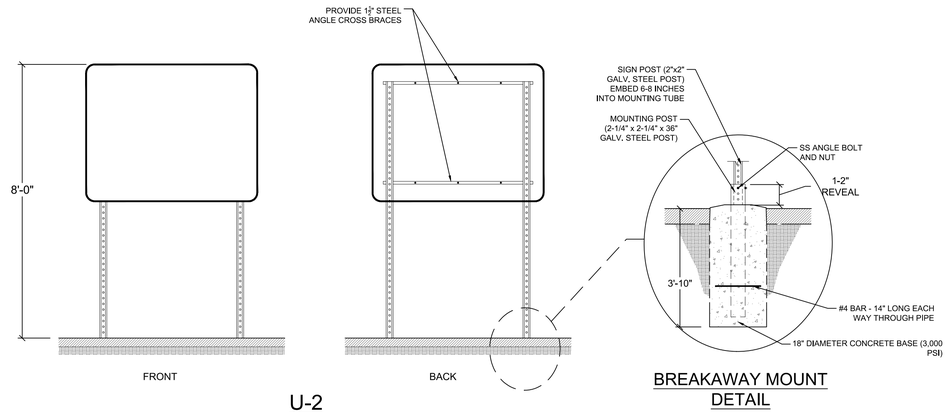
Project No.	Drawing No.
140278401	CP501
Date: 01/30/2025	
Drawn By: BCP	
Checked By: DTG	

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LANGAN Project No. 140278401

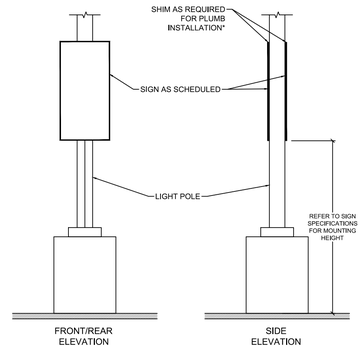


U-1e U-1c



U-2

BREAKAWAY MOUNT DETAIL



LIGHT POLE SIGNS

* ALL POLE MOUNTED SIGNS SHALL BE ATTACHED USING "LOCK BOLTS" TO PREVENT LOOSENING FROM WIND OR OTHER VIBRATION.



TYPICAL MONUMENT SIGN

REFER TO ARCHITECTURAL PLANS FOR MONUMENT SIGN DIMENSIONS AND DETAILS.

VISITORS AND ASSOCIATES ↑
TRUCKS →

FACING PLAN NORTH

VISITORS AND ASSOCIATES →
TRUCKS ↓

FACING PLAN EAST

VISITORS AND ASSOCIATES ↓
TRUCKS ←

FACING PLAN SOUTH

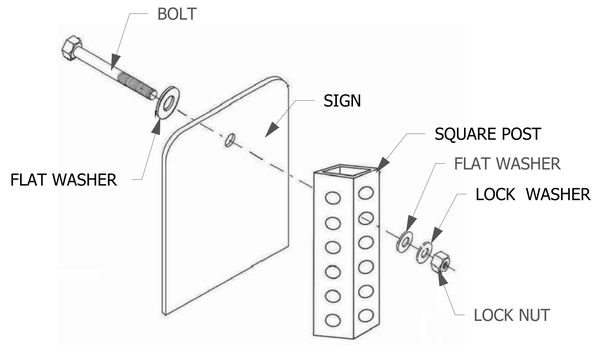
VISITORS AND ASSOCIATES ←
TRUCKS ↑

FACING PLAN WEST

MONUMENT SIGN 1 MONUMENT SIGN 2

NOTES:
1. PLACARD LAYOUT SHALL BE SITE SPECIFIC. ORIENTATION OF ARROWS AND SITE AREAS SHALL BE BASED ON SIGN LOCATION.

PLACARD DETAIL



SIGN ATTACHMENT DETAIL

ALL HARDWARE SHALL BE STAINLESS STEEL

POST AND PANEL SIGNS:

MOUNTING U-1E, U-1C, U-2, LIGHT POLE SIGNS

SPECIFICATIONS:

THE BELOW REPRESENTS THE MINIMUM STANDARDS FOR THIS PROJECT. MATERIALS SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH THE MORE STRICT REQUIREMENTS OF THOSE SET FORTH BELOW AND LOCAL DOT REGULATIONS.

DESCRIPTION:

1. POST AND PANEL SIGNS WITH STANDARD SIZED "MUTCD" AND CUSTOM SIGN FACES.
2. MATERIALS AND CONSTRUCTION
   a. SIGNS TO CONSIST OF ALUMINUM SIGN PANEL ON 2" SQUARE STEEL POST.
   b. PANEL TO CONFORM TO "MUTCD" SPECIFICATIONS. SOLID ALUMINUM PANEL, 0.080" THICK FOR SINGLE POST MOUNTING. SOLID ALUMINUM PANEL, 0.125" THICK FOR DOUBLE POST MOUNTING. COMPOSITE MATERIALS ARE NOT ACCEPTABLE.
   c. POSTS ARE TO BE 2" SQUARE STEEL, 12 GA. 7/16" PERFORATION ON 1" CENTERS. FOUR SIDES TO BE APPROXIMATELY 12' LONG.
   d. SUPPORTS ARE TO BE SUFFICIENT FOR SECURE MOUNTING OF SIGN.
   e. ALL HARDWARE SHALL BE STAINLESS STEEL. IF ADDITIONAL THICKNESS OF MATERIAL OR ADDITIONAL INTERNAL BRACING IS REQUIRED FOR SECURE INSTALLATION OR TO PROVIDE STABILITY, ALTERATIONS SHALL BE REFLECTED IN SHOP DRAWINGS. WIND LOADING AND DURABILITY SHALL BE TAKEN INTO ACCOUNT IN THE ENGINEERING OF THE SIGN.
   f. GRAPHICS AND TYPOGRAPHY SIGN GRAPHICS ARE TO BE HEAVY DUTY '3M' REFLECTIVE VINYL.
   g. CUSTOM GRAPHICS AND TYPOGRAPHY SIGNS ARE AVAILABLE FROM THE OWNER AS ELECTRONIC FILES
   h. COLORS ARE INDICATED ON THE DESIGN INTENT DRAWINGS. ADDITIONAL COLOR AND FINISH SPECIFICATIONS ARE FOUND IN THE GENERAL SPECIFICATIONS.
3. ALL SIGNS INDICATED "DOT" SHALL CONFORM TO THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FROM THE FEDERAL HIGHWAY ADMINISTRATION.

INSTALLATION:

1. LOCATIONS ARE GENERALLY NOTED ON THE ATTACHED LOCATION PLANS. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL INSTALLATION CONDITIONS PRIOR TO FABRICATION.
2. SINGLE POST MOUNTING SHALL BE USED FOR SIGNS WITH A WIDTH OF 30 INCHES OR LESS. MOUNTING U-1e SHALL BE USED FOR SIGNS IN COMPACTED EARTH/GRAVEL OR SIDEWALK. MOUNTING U-1c SHALL BE USED FOR SIGNS IN CONCRETE OR ASPHALT PAVING.
   a. TYPICAL SIGN PANEL INSTALLS BOTTOM OF SIGN AT 7'-0" ABOVE FINISHED GRADE. THE POST EXTENDS TO WITHIN 2" OF THE TOP OF THE SIGN PANEL. INSTALLATION SHALL BE PLUMB, LEVEL, AND STRAIGHT.
   b. MOUNTING U-1e PROVIDES A 36" MOUNTING TUBE (2 1/4" SQUARE STEEL POST EMBEDDED IN CONCRETE WITH 1" TO 2" ABOVE GRADE). THE SIGN POST SHALL BE INSERTED 6-8 INCHES INTO THE MOUNTING TUBE AND ATTACHED WITH A STAINLESS STEEL ANGLE BOLT AND NUT.
3. DOUBLE POST MOUNTING TO BE USED FOR SIGNS WITH A WIDTH OF GREATER THAN 30 INCHES. MOUNTING U-2 PROVIDES TWO POLE SUPPORT SIMILAR TO THE MOUNTING U-1e. ADDITIONALLY, U-2 REQUIRES CROSS BRACING OF STRUCTURAL ANGLE ON THE BACK OF THE SIGN FACE. ALL EXTERIOR SIGNAGE SHALL BE MOUNTED WITH A LOCK WASHER/NUT ASSEMBLY. SEE SIGN ATTACHMENT DETAIL.
   a. TOP OF U-2 MOUNTED SIGN SHALL BE AT 8'-0" ABOVE FINISHED GRADE. INSTALLATION SHALL BE PLUMB, LEVEL, AND STRAIGHT.
   b. MOUNTING U-2 PROVIDES A 36" MOUNTING TUBE (2 1/4" SQUARE STEEL POST EMBEDDED IN CONCRETE WITH 1" TO 2" ABOVE GRADE). THE SIGN POST SHALL BE INSERTED 6-8 INCHES INTO THE MOUNTING TUBE AND ATTACHED WITH A STAINLESS STEEL ANGLE BOLT AND NUT. MOUNTING U-2 IN CONCRETE OR ASPHALT PAVING IS DISCOURAGED.
4. THE INSTALLATION METHODS AND DETAILS FOR EACH LOCATION SHALL BE ILLUSTRATED IN THE SUBMITTED SHOP DRAWINGS. FINAL LOCATION WILL BE APPROVED ON THE SITE BY THE TENANT OR HIS REPRESENTATIVE.
5. SIGN POSTS INSTALLED IN COMPACTED EARTH OR SIDEWALK SHALL BE 18" MIN. FROM FACE OF CURB.

SUBMITTALS:

THE FOLLOWING SHALL BE SUBMITTED FOR APPROVAL PRIOR TO FABRICATION - (3) SETS OF SHOP DRAWINGS AND (3) 6"X6" VINYL SAMPLES OF EACH SIGN FACE COLOR. SEE GENERAL CONSTRUCTION AND INSTALLATION SPECIFICATIONS FOR ADDITIONAL SUBMITTALS.

Date	Description	No.

Revisions

STATE OF VERMONT JOHN D. PLANTE NO. 0083000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

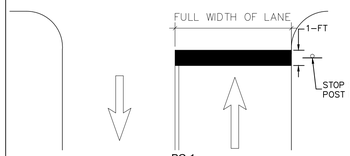
Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title
STRIPING & SIGNAGE DETAILS II

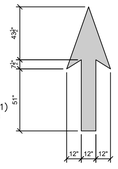
Project No.	Drawing No.
140278401	CP502
Date: 01/30/2025	
Drawn By: BCP	
Checked By: DTG	

LANGAN Project No. 140278401

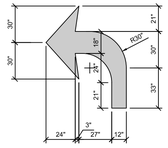
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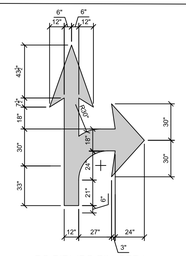
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Width of Lane x 1'-0"



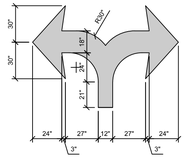
PG-5
Pavement graphics- straight arrow.
Use to direct traffic at one-way drive aisles.
White thermal-applied graphic.



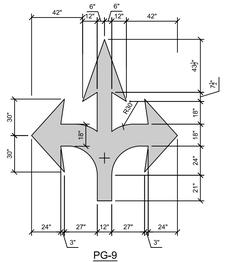
PG-6(L) (PG-6(R) OPP.)
Approx. 8'-0" x 8'-0"
Pavement graphics- left turn arrow.
Use to indicate turning lanes.
White thermal-applied graphic.



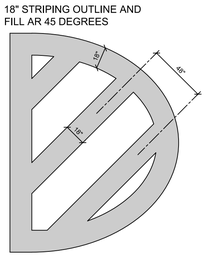
PG-7(R) (PG-7(L) OPP.)
Approx. 8'-0" x 12'-0"
Pavement graphics- straight or right turn arrow.
Use to indicate turning lanes.
White thermal-applied graphic



PG-8
Approx. 10'-0" x 8'-0"
Pavement graphics- left or right turn arrow.
Use to indicate turning lanes.
White thermal-applied graphic.

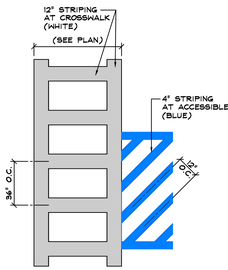


PG-9
Approx. 10'-0" x 12'-0"
Pavement graphics- left, straight, or right turn arrow.
Use to indicate turning lanes.
White thermal-applied graphic.



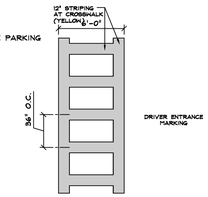
TRAFFIC ISLAND

PG-10
Pavement graphics- traffic island
Use to prohibit vehicle travel and parking.
Stripes; yellow at no traffic, blue at accessible
parking spaces, white at vendor parking (black indicates asphalt).
Include at emergency exits into the parking lot at all parking spaces
that impede direct access to the thoroughfare.

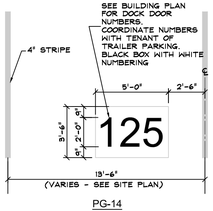


PEDESTRIAN CROSSWALK
ACCESSIBLE PARKING

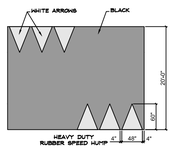
PG-11
12" striping outline and hatch fill at 36" O.C.
Pavement graphics- pedestrian crosswalk.
Use to pedestrian crossing.
White stripes, see plan for width of crosswalk.



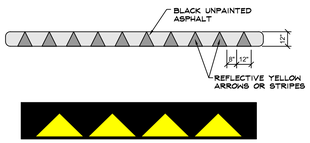
PG-12
12" striping outline and hatch fill at 36" O.C.
Pavement graphics- driver entrance.
Use to direct driver entrance in dock field.
Position in front of dock to correspond with the location of the
truckers lounge and truckers entry points.
Yellow stripes, see plan for width of crosswalk.



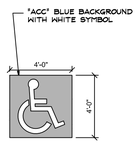
PG-14
5'-0" x 3'-6" (24" tall lettering)
Pavement graphics- trailer space numbering.
Use to label trailer spaces, typical all truck spaces.
Black Box with White Numbering thermal applied graphics .
See plans for dock door numbers, Coordinate numbers with tenant of trailer parking.



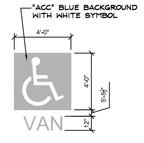
PG-15
20'-0" wide
Pavement graphics- large speed hump.
Use to control speed at outlying drive areas.
White thermal applied white arrows. Asphalt speed humps shall be
used in colder climates where snow removal equipment is intended to
be used. Rubber speed humps may be used in warmer climates or
regions where concrete pavement is prevalent



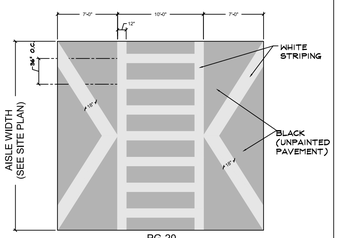
PG-16
12'-0" x 1'-0"
Pavement graphics- small speed bump.
Used to control speed at interior drive aisles. Thermal applied reflective
yellow arrows. Asphalt speed bumps shall be used in colder climates
where snow removal equipment is intended to be used. Rubber speed
bumps may be used in warmer climates or regions where concrete
pavement is prevalent.



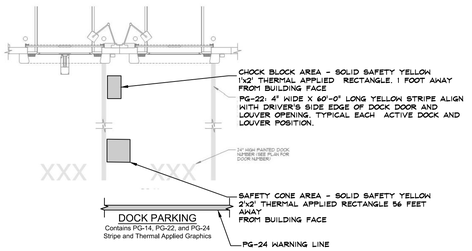
PG-17
4'-0" x 4'-0"
Pavement graphics- standard accessible parking space.
Use at all accessible parking spaces.
Thermal applied graphics, white symbol with blue background.



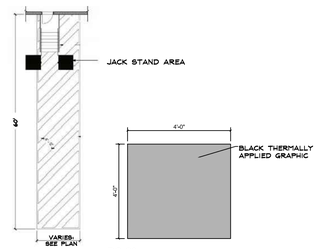
PG-18
4'-0" x 5'-5½"
Pavement graphics- standard accessible parking space.
Use at all van accessible parking spaces.
Thermal applied graphics, white symbol with blue background,
and white text.



PG-20
Pedestrian Table Pavement Graphics



DOCK PARKING
Contains PG-14, PG-22, and PG-24
Stripe and Thermal Applied Graphics



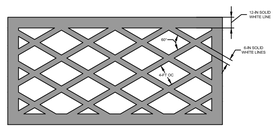
PG-23
Jack Stand Area
Thermal Applied Black Graphics



PG-25
5 MPH Striping
Thermal Applied Black Graphics



PG-24
WARNING LINE
4" Wide Stripe Orange Pantone 021C Line and Graphics



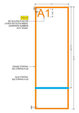
TRAFFIC ISLAND
Pavement graphics - "Do Not Block Box"
Use to prohibit vehicle travel and parking.



PG-26
70" X 36"



PG-27
70" X 36"

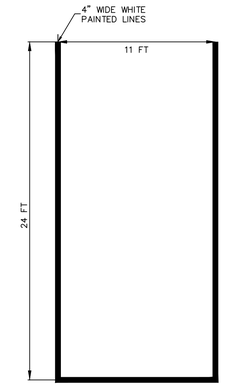


PG-31

PAVEMENT GRAPHICS

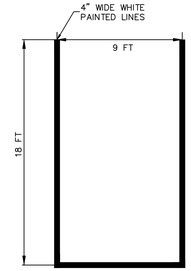
SIGNAGE NOTES:

1. REFER TO SIGNAGE AND STRIPING PLAN FOR LOCATIONS OF SIGNS AND PAVEMENT MARKINGS.
2. ALL SIGNAGE, STRIPING, AND OTHER TRAFFIC CONTROL DEVICES SHALL BE INSTALLED IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
3. ALL STRIPING SHALL BE LONG LIFE EPOXY RESIN AND 4" WIDE UNLESS OTHERWISE NOTED. ALL PAVEMENT GRAPHICS SHALL BE HOT-APPLIED THERMOPLASTIC (REFLECTIVE).
4. COLOR SHALL BE WHITE ON ASPHALT AND YELLOW ON CONCRETE, UNLESS OTHERWISE NOTED.
5. ASPHALT SPEED HUMPS AND SPEED BUMPS SHALL BE USED IN COLDER CLIMATES WHERE SNOW REMOVAL EQUIPMENT IS INTENDED TO BE USED. RUBBER SPEED HUMPS AND SPEED BUMPS MAY BE USED IN WARMER CLIMATES OR REGIONS WHERE CONCRETE PAVEMENT IS PREVALENT
6. ALL PROPOSED SIGNAGE AND STRIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE RSR DS SIGNAGE NORTH AMERICA V2.0 DESIGN GUIDELINE PUBLISHED BY AMAZON GLOBAL REALTY.
7. FINAL QUANTITIES SHALL BE COORDINATED AND VERIFIED IN FIELD.
8. ADDITIONAL SIGNAGE NOT SHOWN ON GRAPHICS PLAN (E.G. FIRE LANES) MAY BE REQUIRED PER LOCAL CODE AND/OR AHJ. SUB-CONTRACTOR SHALL COORDINATE WITH LOCAL AHJ AND PROVIDE AS REQUIRED.
9. MOUNT SIGNAGE ACCORDING TO LOCAL CODES.
10. TYPICAL SIGN FONT IS SET IN ARIAL.



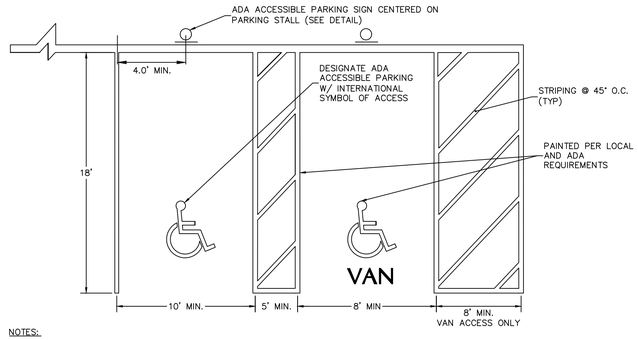
NOTES:
1. SEE SITE PLAN FOR PARKING LAYOUT.
2. TWO COATS OF EPOXY RESIN PAINT SHALL BE USED FOR PARKING STALL STRIPING. ALLOW FOR A MINIMUM CURE TIME OF 24 HOURS BETWEEN APPLICATIONS.

1 VAN PARKING STALL STRIPING
N.T.S.



NOTES:
1. SEE SITE PLAN FOR PARKING LAYOUT.
2. TWO COATS OF EPOXY RESIN PAINT SHALL BE USED FOR PARKING STALL STRIPING. ALLOW FOR A MINIMUM CURE TIME OF 24 HOURS BETWEEN APPLICATIONS.

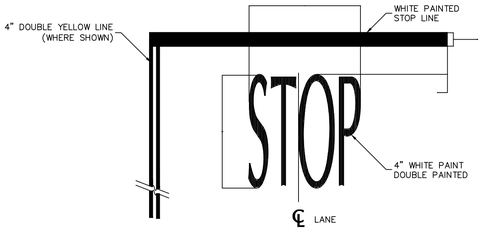
2 ASSOCIATE AND GUEST/MANAGEMENT PARKING STALL STRIPING
N.T.S.



NOTES:

1. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN DISABILITIES ACT (ADA), THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND ALL STATE AND LOCAL REQUIREMENTS.
2. TWO COATS OF EPOXY RESIN PAINT SHALL BE USED FOR PARKING STALL STRIPING. ALLOW FOR A MINIMUM CURE TIME OF 24 HOURS BETWEEN APPLICATIONS.

3 ADA STALL STRIPING
N.T.S.



NOTES:
1. PAVEMENT MARKING TO BE INSTALLED AT EACH STOP BAR LOCATION SHOWN ON THE PLANS, EXCLUDING ROADWAYS.

4 STOP BAR
N.T.S.

Date	Description	No.
Revisions		

STATE OF VERMONT
JOSHUA D. PLANTE
NO. 0083000
CIVIL
LICENSED
PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title
STRIPING & SIGNAGE DETAILS III

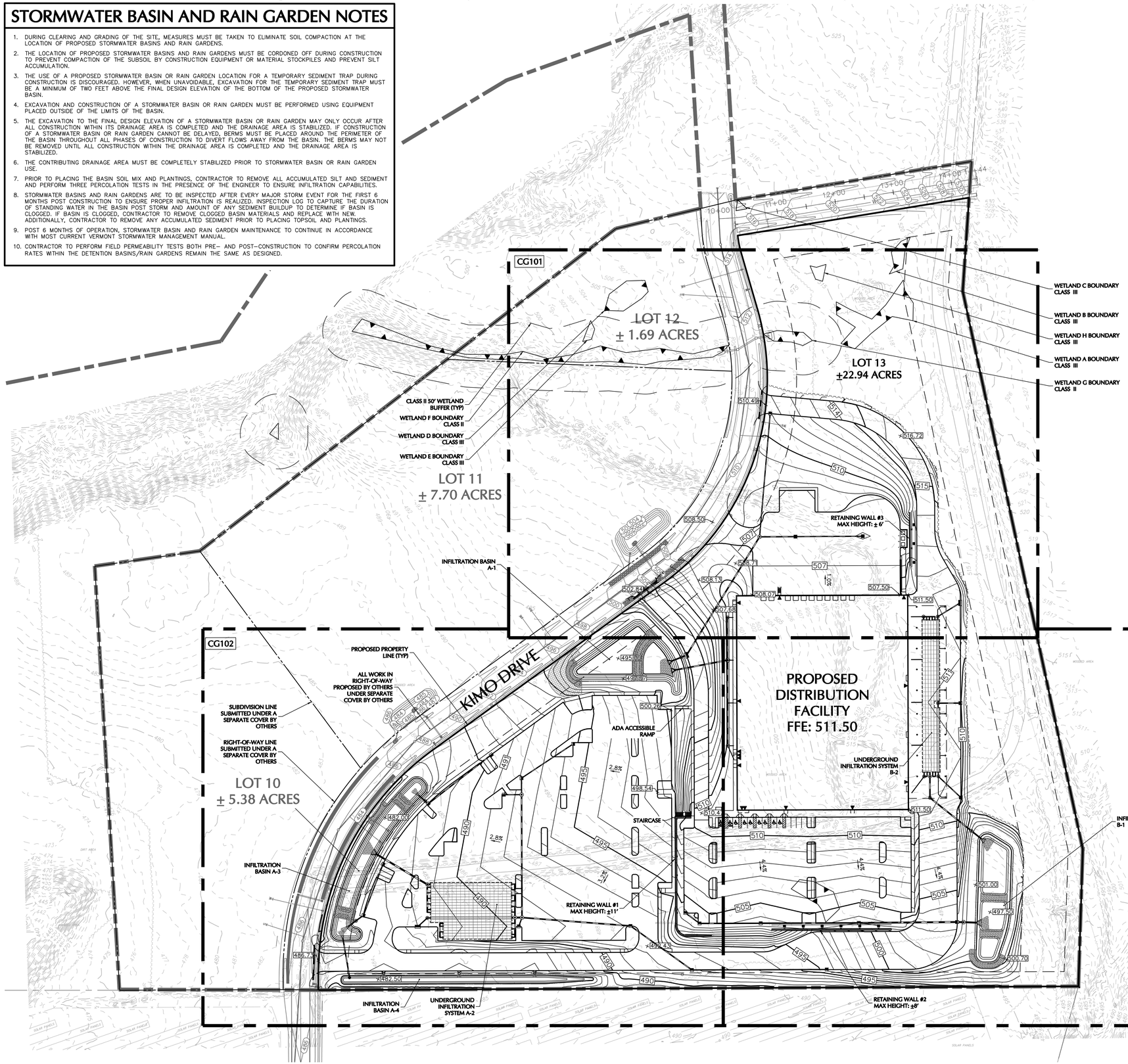
Project No.	Drawing No.
140278401	CP503
Date: 01/30/2025	
Drawn By: BCP	
Checked By: DTG	

LANGAN
Project No. 140278401

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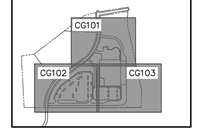
STORMWATER BASIN AND RAIN GARDEN NOTES

1. DURING CLEARING AND GRADING OF THE SITE, MEASURES MUST BE TAKEN TO ELIMINATE SOIL COMPACTION AT THE LOCATION OF PROPOSED STORMWATER BASINS AND RAIN GARDENS.
2. THE LOCATION OF PROPOSED STORMWATER BASINS AND RAIN GARDENS MUST BE CORDONED OFF DURING CONSTRUCTION TO PREVENT COMPACTION OF THE SUBSOIL BY CONSTRUCTION EQUIPMENT OR MATERIAL STOCKPILES AND PREVENT SILT ACCUMULATION.
3. THE USE OF A PROPOSED STORMWATER BASIN OR RAIN GARDEN LOCATION FOR A TEMPORARY SEDIMENT TRAP DURING CONSTRUCTION IS DISCOURAGED. HOWEVER, WHEN UNAVOIDABLE, EXCAVATION FOR THE TEMPORARY SEDIMENT TRAP MUST BE A MINIMUM OF TWO FEET ABOVE THE FINAL DESIGN ELEVATION OF THE BOTTOM OF THE PROPOSED STORMWATER BASIN.
4. EXCAVATION AND CONSTRUCTION OF A STORMWATER BASIN OR RAIN GARDEN MUST BE PERFORMED USING EQUIPMENT PLACED OUTSIDE OF THE LIMITS OF THE BASIN.
5. THE EXCAVATION TO THE FINAL DESIGN ELEVATION OF A STORMWATER BASIN OR RAIN GARDEN MAY ONLY OCCUR AFTER ALL CONSTRUCTION WITHIN ITS DRAINAGE AREA IS COMPLETED AND THE DRAINAGE AREA IS STABILIZED. IF CONSTRUCTION OF A STORMWATER BASIN OR RAIN GARDEN CANNOT BE DELAYED, BERMS MUST BE PLACED AROUND THE PERIMETER OF THE BASIN THROUGHOUT ALL PHASES OF CONSTRUCTION TO DIVERT FLOWS AWAY FROM THE BASIN. THE BERMS MAY NOT BE REMOVED UNTIL ALL CONSTRUCTION WITHIN THE DRAINAGE AREA IS COMPLETED AND THE DRAINAGE AREA IS STABILIZED.
6. THE CONTRIBUTING DRAINAGE AREA MUST BE COMPLETELY STABILIZED PRIOR TO STORMWATER BASIN OR RAIN GARDEN USE.
7. PRIOR TO PLACING THE BASIN SOIL MIX AND PLANTINGS, CONTRACTOR TO REMOVE ALL ACCUMULATED SILT AND SEDIMENT AND PERFORM THREE PERCOLATION TESTS IN THE PRESENCE OF THE ENGINEER TO ENSURE INFILTRATION CAPABILITIES.
8. STORMWATER BASINS AND RAIN GARDENS ARE TO BE INSPECTED AFTER EVERY MAJOR STORM EVENT FOR THE FIRST 6 MONTHS POST CONSTRUCTION TO ENSURE PROPER INFILTRATION IS REALIZED. INSPECTION LOG TO CAPTURE THE DURATION OF STANDING WATER IN THE BASIN POST STORM AND AMOUNT OF ANY SEDIMENT BUILDUP TO DETERMINE IF BASIN IS CLOGGED. IF BASIN IS CLOGGED, CONTRACTOR TO REMOVE CLOGGED BASIN MATERIALS AND REPLACE WITH NEW. ADDITIONALLY, CONTRACTOR TO REMOVE ANY ACCUMULATED SEDIMENT PRIOR TO PLACING TOPSOIL AND PLANTINGS.
9. POST 6 MONTHS OF OPERATION, STORMWATER BASIN AND RAIN GARDEN MAINTENANCE TO CONTINUE IN ACCORDANCE WITH MOST CURRENT VERMONT STORMWATER MANAGEMENT MANUAL.
10. CONTRACTOR TO PERFORM FIELD PERMEABILITY TESTS BOTH PRE– AND POST–CONSTRUCTION TO CONFIRM PERCOLATION RATES WITHIN THE DETENTION BASINS/RAIN GARDENS REMAIN THE SAME AS DESIGNED.



SHEET LEGEND

1" = 1,000'



80 0 40 80
SCALE IN FEET

Date	Description	No.

Revisions

STATE OF VERMONT JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

OVERALL GRADING & DRAINAGE PLAN

Project No.	Drawing No.
140278401	CG100
Date: 01/30/2025	
Drawn By: BCP	
Checked By: DTG	

LANGAN

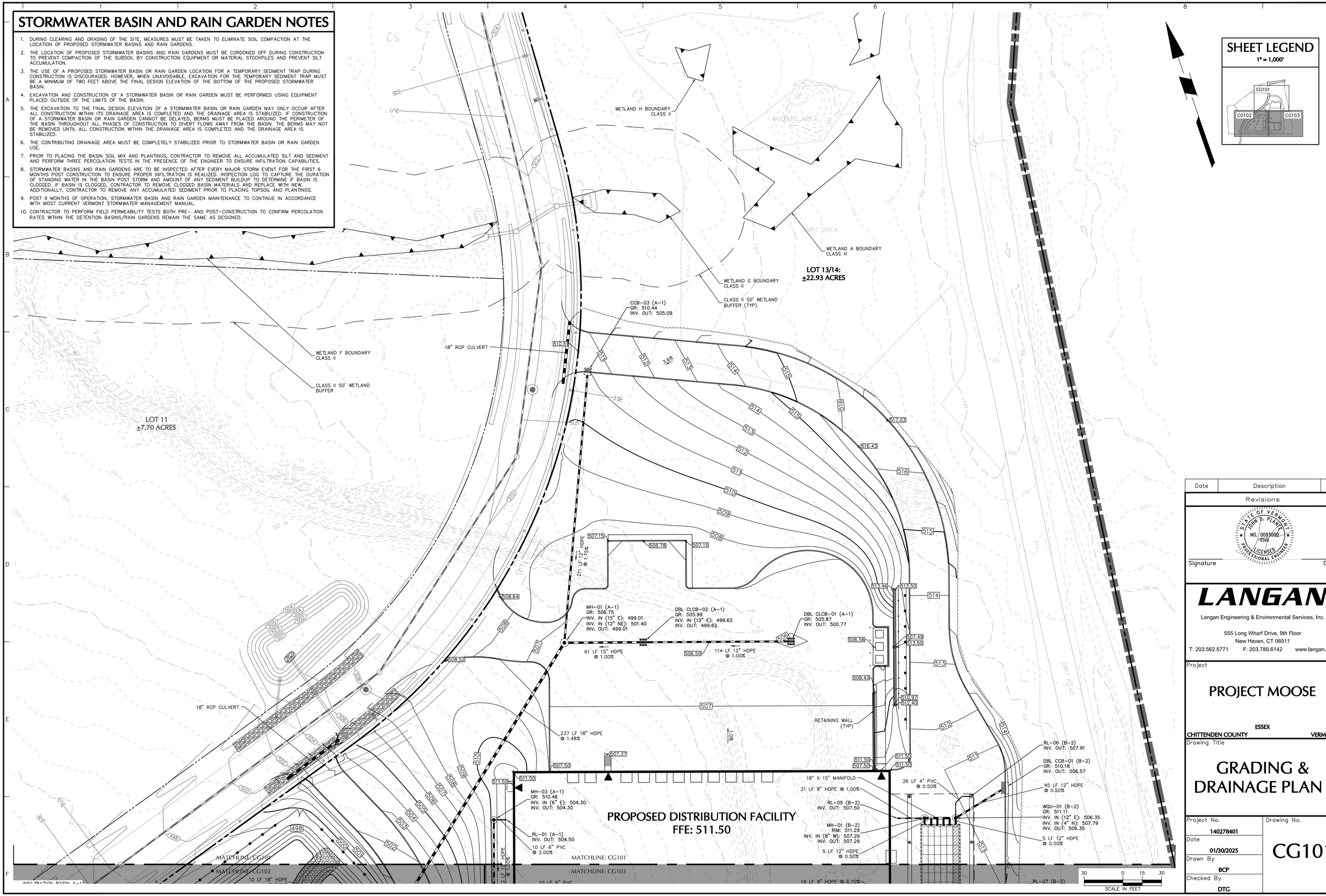
Project No. 140278401

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Date: 1/29/2025 Time: 10:19 User: bpalma Style Table: Langan.stb Layout: CG100 Document Code: 140278401-0501-CG101-0101

STORMWATER BASIN AND RAIN GARDEN NOTES

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6. THE CONTRIBUTING DRAINAGE AREA MUST BE COMPLETELY STABILIZED PRIOR TO STORMWATER BASIN OR RAIN GARDEN USE.
7. PRIOR TO PLACING THE BASIN SOIL MIX AND PLANTINGS, CONTRACTOR TO REMOVE ALL ACCUMULATED SILT AND SEDIMENT AND PERFORM THREE PERCOLATION TESTS IN THE PRESENCE OF THE ENGINEER TO ENSURE INFILTRATION CAPABILITIES.
8. STORMWATER BASINS AND RAIN GARDENS ARE TO BE INSPECTED AFTER EVERY MAJOR STORM EVENT FOR THE FIRST 6 MONTHS POST CONSTRUCTION TO ENSURE PROPER INFILTRATION IS REALIZED. INSPECTION LOG TO CAPTURE THE DURATION OF STANDING WATER IN THE BASIN POST STORM AND AMOUNT OF ANY SEDIMENT BUILDUP TO DETERMINE IF BASIN IS CLOGGED. IF BASIN IS CLOGGED, CONTRACTOR TO REMOVE CLOGGED BASIN MATERIALS AND REPLACE WITH NEW. ADDITIONALLY, CONTRACTOR TO REMOVE ANY ACCUMULATED SEDIMENT PRIOR TO PLACING TOPSOIL AND PLANTINGS.
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SHEET LEGEND

1" = 1,000'

Date	Description	No.
Revisions		

STATE OF VERMONT JOHN D. FLANNERY NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

GRADING & DRAINAGE PLAN I

Project No.	Drawing No.
140278401	CG101
Date: 01/30/2025	
Drawn By: BCP	
Checked By: DTG	

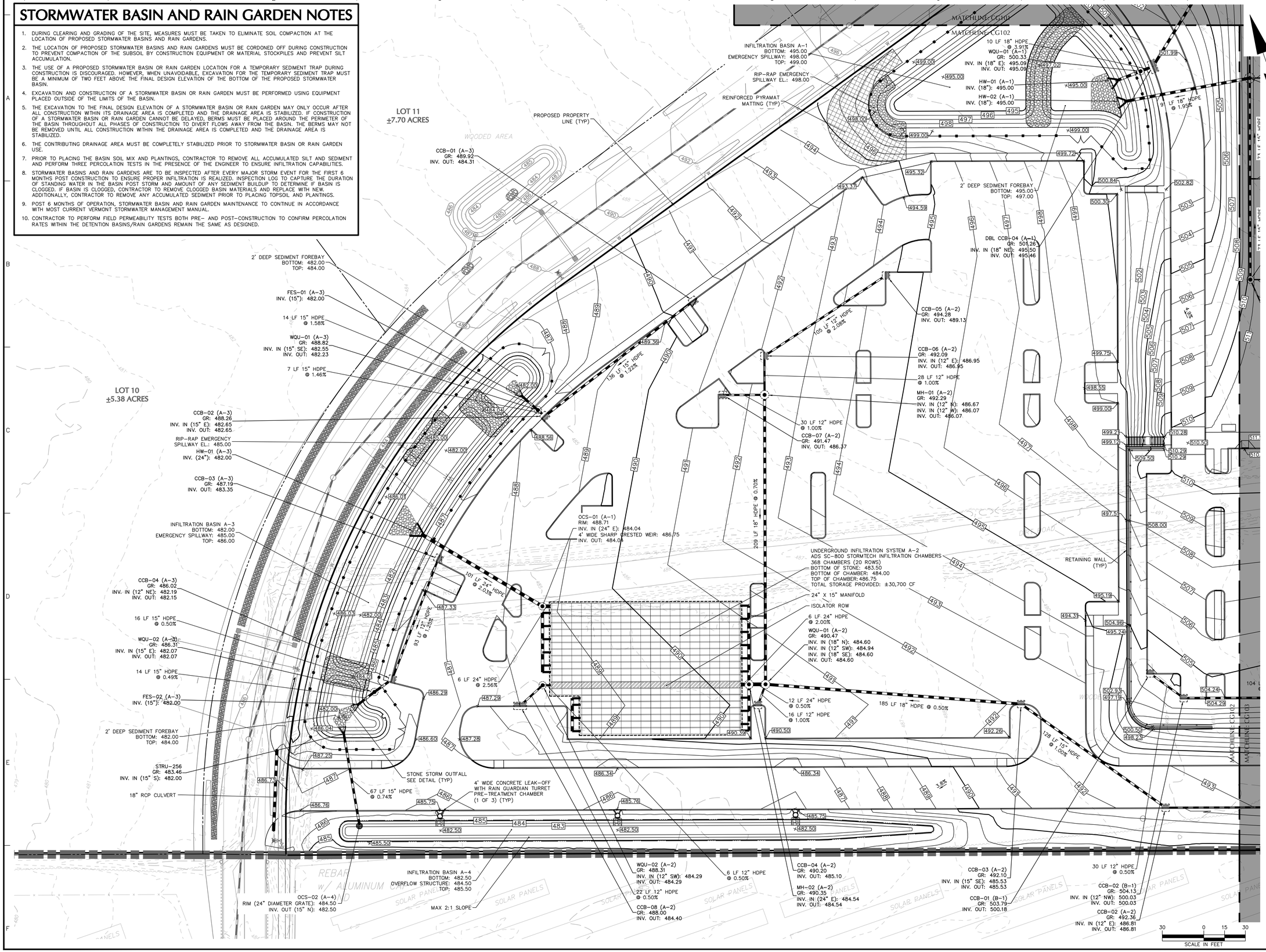
LANGAN Project No. 140278401

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Date: 1/29/2025 Time: 10:20 User: bpalma Style Table: Langan.stb Layout: CG101 Document Code: 140278401-0501-CG101-0102

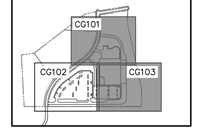
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5. THE EXCAVATION TO THE FINAL DESIGN ELEVATION OF A STORMWATER BASIN OR RAIN GARDEN MAY ONLY OCCUR AFTER ALL CONSTRUCTION WITHIN ITS DRAINAGE AREA IS COMPLETED AND THE DRAINAGE AREA IS STABILIZED. IF CONSTRUCTION OF A STORMWATER BASIN OR RAIN GARDEN CANNOT BE DELAYED, BERMS MUST BE PLACED AROUND THE PERIMETER OF THE BASIN THROUGHOUT ALL PHASES OF CONSTRUCTION TO DIVERT FLOWS AWAY FROM THE BASIN. THE BERMS MAY NOT BE REMOVED UNTIL ALL CONSTRUCTION WITHIN THE DRAINAGE AREA IS COMPLETED AND THE DRAINAGE AREA IS STABILIZED.
6. THE CONTRIBUTING DRAINAGE AREA MUST BE COMPLETELY STABILIZED PRIOR TO STORMWATER BASIN OR RAIN GARDEN USE.
7. PRIOR TO PLACING THE BASIN SOIL MIX AND PLANTINGS, CONTRACTOR TO REMOVE ALL ACCUMULATED SILT AND SEDIMENT AND PERFORM THREE PERCOLATION TESTS IN THE PRESENCE OF THE ENGINEER TO ENSURE INFILTRATION CAPABILITIES.
8. STORMWATER BASINS AND RAIN GARDENS ARE TO BE INSPECTED AFTER EVERY MAJOR STORM EVENT FOR THE FIRST 6 MONTHS POST CONSTRUCTION TO ENSURE PROPER INFILTRATION IS REALIZED. INSPECTION LOG TO CAPTURE THE DURATION OF STANDING WATER IN THE BASIN POST STORM AND AMOUNT OF ANY SEDIMENT BUILDUP TO DETERMINE IF BASIN IS CLOGGED. IF BASIN IS CLOGGED, CONTRACTOR TO REMOVE CLOGGED BASIN MATERIALS AND REPLACE WITH NEW. ADDITIONALLY, CONTRACTOR TO REMOVE ANY ACCUMULATED SEDIMENT PRIOR TO PLACING TOPSOIL AND PLANTINGS.
9. POST 6 MONTHS OF OPERATION, STORMWATER BASIN AND RAIN GARDEN MAINTENANCE TO CONTINUE IN ACCORDANCE WITH MOST CURRENT VERMONT STORMWATER MANAGEMENT MANUAL.
10. CONTRACTOR TO PERFORM FIELD PERMEABILITY TESTS BOTH PRE- AND POST-CONSTRUCTION TO CONFIRM PERCOLATION RATES WITHIN THE DETENTION BASINS/RAIN GARDENS REMAIN THE SAME AS DESIGNED.



SHEET LEGEND

1" = 1,000'



Date	Description	No.
Revisions		

STATE OF VERMONT
STEVEN D. PLANTE
NO. 0093000
CIVIL
LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

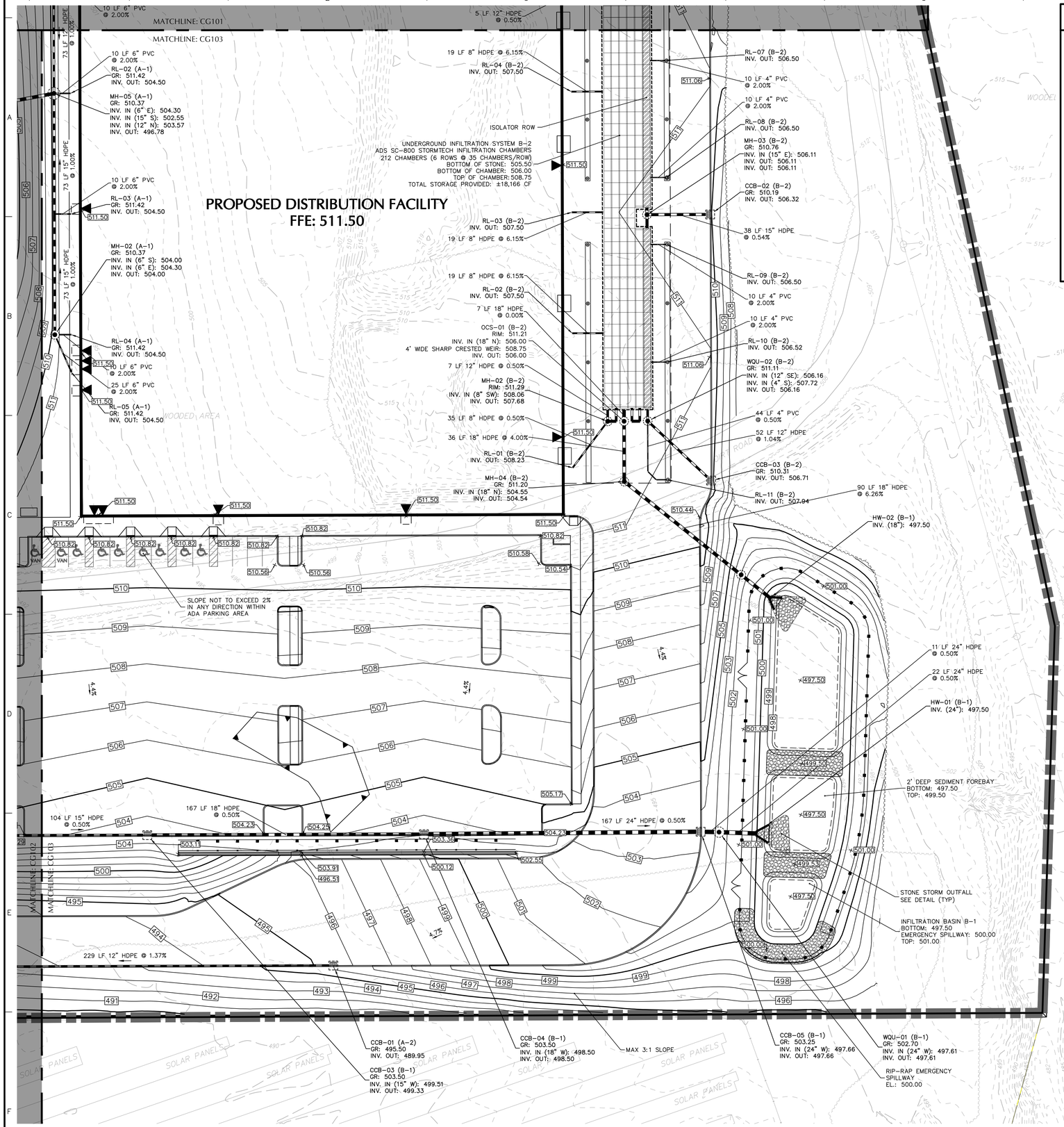
GRADING & DRAINAGE PLAN II

Project No.	Drawing No.
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Date: 01/30/2025	
Drawn By: BCP	
Checked By: DTG	

LANGAN

Project No. 140278401

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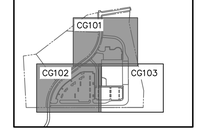


STORMWATER BASIN AND RAIN GARDEN NOTES

1. DURING CLEARING AND GRADING OF THE SITE, MEASURES MUST BE TAKEN TO ELIMINATE SOIL COMPACTION AT THE LOCATION OF PROPOSED STORMWATER BASINS AND RAIN GARDENS.
2. THE LOCATION OF PROPOSED STORMWATER BASINS AND RAIN GARDENS MUST BE CORDONED OFF DURING CONSTRUCTION TO PREVENT COMPACTION OF THE SUBSOIL BY CONSTRUCTION EQUIPMENT OR MATERIAL STOCKPILES AND PREVENT SILT ACCUMULATION.
3. THE USE OF A PROPOSED STORMWATER BASIN OR RAIN GARDEN LOCATION FOR A TEMPORARY SEDIMENT TRAP DURING CONSTRUCTION IS DISCOURAGED. HOWEVER, WHEN UNAVOIDABLE, EXCAVATION FOR THE TEMPORARY SEDIMENT TRAP MUST BE A MINIMUM OF TWO FEET ABOVE THE FINAL DESIGN ELEVATION OF THE BOTTOM OF THE PROPOSED STORMWATER BASIN.
4. EXCAVATION AND CONSTRUCTION OF A STORMWATER BASIN OR RAIN GARDEN MUST BE PERFORMED USING EQUIPMENT PLACED OUTSIDE OF THE LIMITS OF THE BASIN.
5. THE EXCAVATION TO THE FINAL DESIGN ELEVATION OF A STORMWATER BASIN OR RAIN GARDEN MAY ONLY OCCUR AFTER ALL CONSTRUCTION WITHIN ITS DRAINAGE AREA IS COMPLETED AND THE DRAINAGE AREA IS STABILIZED. IF CONSTRUCTION OF A STORMWATER BASIN OR RAIN GARDEN CANNOT BE DELAYED, BERMS MUST BE PLACED AROUND THE PERIMETER OF THE BASIN THROUGHOUT ALL PHASES OF CONSTRUCTION TO DIVERT FLOWS AWAY FROM THE BASIN. THE BERMS MAY NOT BE REMOVED UNTIL ALL CONSTRUCTION WITHIN THE DRAINAGE AREA IS COMPLETED AND THE DRAINAGE AREA IS STABILIZED.
6. THE CONTRIBUTING DRAINAGE AREA MUST BE COMPLETELY STABILIZED PRIOR TO STORMWATER BASIN OR RAIN GARDEN USE.
7. PRIOR TO PLACING THE BASIN SOIL MIX AND PLANTINGS, CONTRACTOR TO REMOVE ALL ACCUMULATED SILT AND SEDIMENT AND PERFORM THREE PERCOLATION TESTS IN THE PRESENCE OF THE ENGINEER TO ENSURE INFILTRATION CAPABILITIES.
8. STORMWATER BASINS AND RAIN GARDENS ARE TO BE INSPECTED AFTER EVERY MAJOR STORM EVENT FOR THE FIRST 6 MONTHS POST CONSTRUCTION TO ENSURE PROPER INFILTRATION IS REALIZED. INSPECTION LOG TO CAPTURE THE DURATION OF STANDING WATER IN THE BASIN POST STORM AND AMOUNT OF ANY SEDIMENT BUILDUP TO DETERMINE IF BASIN IS CLOGGED. IF BASIN IS CLOGGED, CONTRACTOR TO REMOVE CLOGGED BASIN MATERIALS AND REPLACE WITH NEW. ADDITIONALLY, CONTRACTOR TO REMOVE ANY ACCUMULATED SEDIMENT PRIOR TO PLACING TOPSOIL AND PLANTINGS.
9. POST 6 MONTHS OF OPERATION, STORMWATER BASIN AND RAIN GARDEN MAINTENANCE TO CONTINUE IN ACCORDANCE WITH MOST CURRENT VERMONT STORMWATER MANAGEMENT MANUAL.
10. CONTRACTOR TO PERFORM FIELD PERMEABILITY TESTS BOTH PRE- AND POST-CONSTRUCTION TO CONFIRM PERCOLATION RATES WITHIN THE DETENTION BASINS/RAIN GARDENS REMAIN THE SAME AS DESIGNED.

SHEET LEGEND

1" = 1,000'



Date	Description	No.
Revisions		

STATE OF VERMONT
JOHN D. PLANTE
NO. 0093000
CIVIL
LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

GRADING & DRAINAGE PLAN III

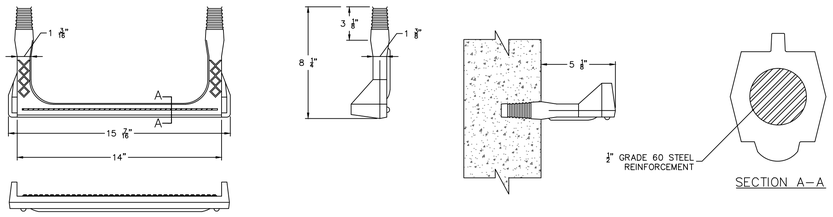
Project No.	Drawing No.
140278401	CG103
Date: 01/30/2025	
Drawn By: BCP	
Checked By: DTG	

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SCALE IN FEET

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Date: 1/29/2025 Time: 10:21 User: bpalma Style Table: Langan.stb Layout: CG103 Document Code: 140278401-0501-CG101-0104

LANGAN Project No. 140278401

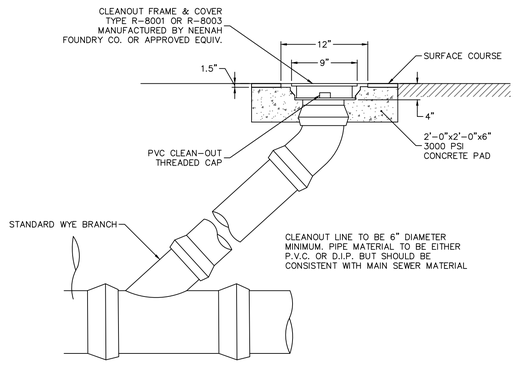


COPOLYMER POLYPROPYLENE PLASTIC

(FOR INSTALLATION IN PRE-CAST CONCRETE)

1 PLASTIC MANHOLE STEP

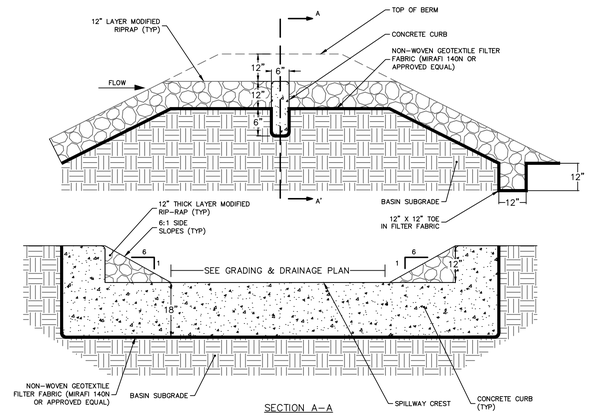
N.T.S.



NOTES:
1. THE CONTRACTOR SHALL PROVIDE ALL APPROPRIATE AND NECESSARY FITTING AND ADAPTORS.

2 CLEANOUT

N.T.S.



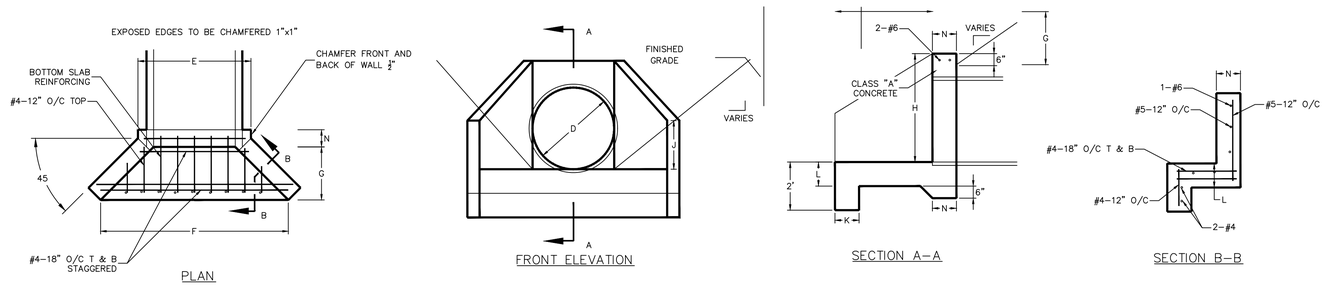
3 RIP-RAP EMERGENCY SPILLWAY

N.T.S

D	E	F	G	H	J	K	L	N	R	Δ VOL. C.Y.
18"	3'-0"	7'-6"	3'-0"	3'-0"	2'-0"	8"	8"	8"	#5-12"o/c	1.70
21"	3'-4"	7'-9"		3'-3"	2'-0"					1.80
24"	3'-8"	8'-0"	3'-0"	3'-6"	2'-0"	8"	8"	8"	#5-12"o/c	1.90
27"	3'-11"	8'-3"		3'-9"	2'-0"					2.00
30"	4'-2"	8'-6"	3'-0"	4'-0"	2'-1"	8"	8"	10"	#5-12"o/c	2.85

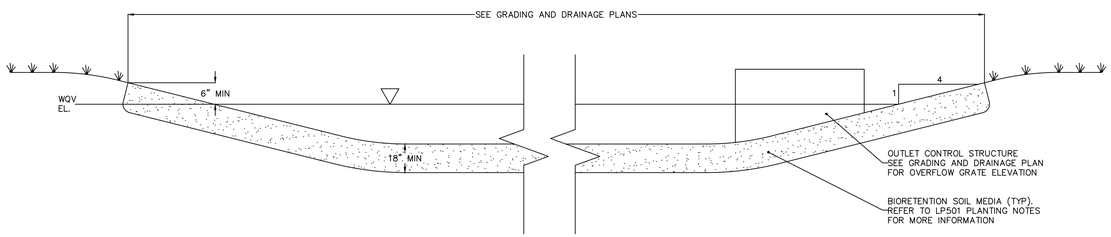
Δ BASED ON 2:1 CHANNEL SIDE SLOPES.

NOTES:
1. HEAD WALLS MAY BE PRECAST OR CAST IN PLACE PER SITE REQUIREMENTS.



4 HEADWALL (30" AND SMALLER)

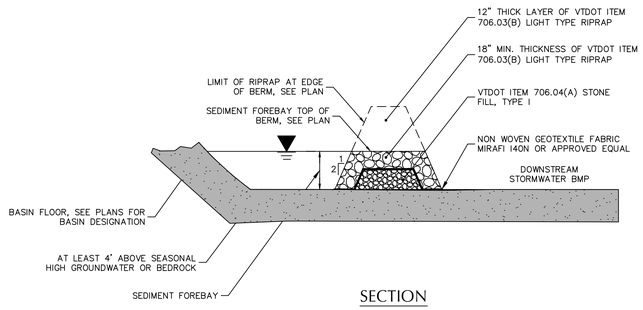
N.T.S.



NOTES:
1. BASIN SOIL MIX SHALL BE PLACED 18" DEEP.
2. COMPACTION OF BASINS AREAS AND REQUIRED BACKFILL SHALL BE MINIMIZED TO THE MAXIMUM EXTENT FEASIBLE BY THE USE OF EXCAVATION HOES, LIGHT EQUIPMENT WITH TURF TYPE TIRES, OR WIDE TRACK EQUIPMENT.
3. IF COMPACTION DOES OCCUR IN BASIN, THE COMPACTED ZONE SHALL BE TILLED TO REFRACTURE AT LEAST 12" OF NATURAL SOIL BEFORE BACKFILLED WITH SOIL MIX.
4. WHEN BACKFILLING BASIN, PLACE SOIL IN LIFTS OF 12-18" AND USE LIGHT EQUIPMENT ONLY WHEN GRADING WITHIN THE BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN.
5. ALLOW SOIL MIXTURE TO SETTLE NATURALLY THROUGH RAIN EVENTS OR PRESOAK AFTER PLACEMENT.
6. REFER TO PLANTING PLANS FOR APPROPRIATE SEED MIX WITHIN INFILTRATION BASIN.
7. CONTRACTOR TO SUBMIT TEST RESULTS FOR BIORETENTION BASIN SOIL MIX PRIOR TO BASIN CONSTRUCTION.

5 TYPICAL INFILTRATION BASIN DETAIL

N.T.S



3 SEDIMENT FOREBAY BERM

N.T.S.

Date	Description	No.

Revisions

STATE OF VERMONT JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

GRADING & DRAINAGE DETAILS I

Project No.	Drawing No.
140278401	CG501
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

LANGAN Project No. 140278401

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ADS
Advanced Drainage Systems, Inc.

ADS SiteAssist®
FOR STORMTECH INSTALLATION INSTRUCTIONS VISIT OUR APP

SC-800 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-800.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/% , THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418, AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-800 SYSTEM

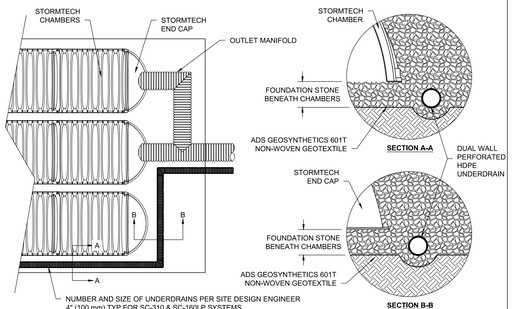
1. STORMTECH SC-800 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-800 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

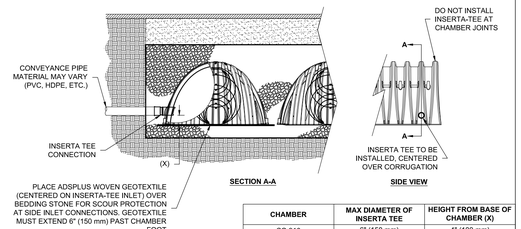
1. STORMTECH SC-800 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-800 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.



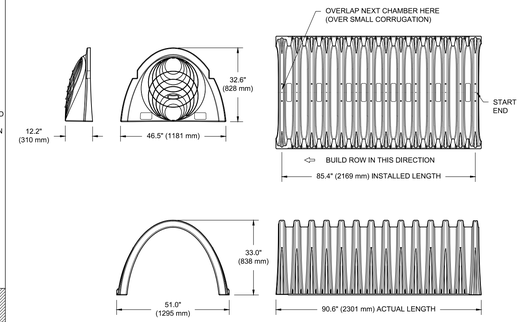
5 UNDERDRAIN DETAIL



CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
SC-800	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
MC-7200	12" (300 mm)	8" (200 mm)
INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON		

NOTES:
- PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.
- CONTACT ADS ENGINEERING SERVICES IF INSERTA TEE INLET MUST BE RAISED AS NOT ALL INVERTS ARE POSSIBLE.

6 INSERTA-TEE SIDE INLET DETAIL



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 33.0" X 85.4"	(1295 mm X 838 mm X 2169 mm)
CHAMBER STORAGE	50.6 CUBIC FEET	(1.43 m³)
MINIMUM INSTALLED STORAGE*	81.0 CUBIC FEET	(2.29 m³)
WEIGHT	81.8 lbs.	(37.1 kg)

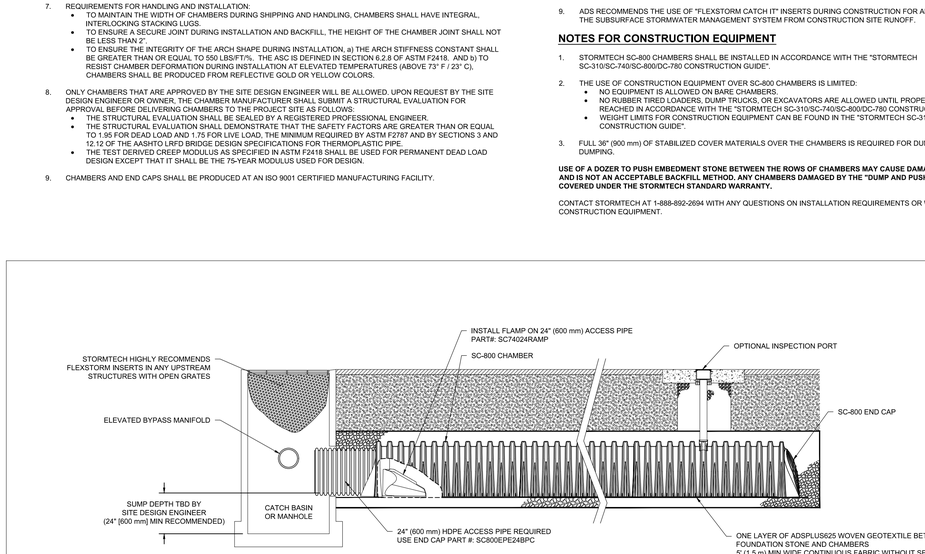
*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

PRE-CORED HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-CORED HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

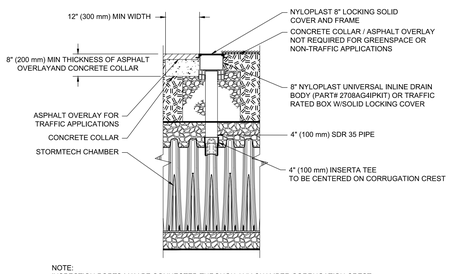
PART #	STUB	B	C
SC800EPE06TPC	6" (150 mm)	21.4" (544 mm)	—
SC800EPE06BPC		—	0.9" (23 mm)
SC800EPE08TPC	8" (200 mm)	19.2" (488 mm)	—
SC800EPE08BPC		—	1.0" (25 mm)
SC800EPE10TPC	10" (250 mm)	17.0" (432 mm)	—
SC800EPE10BPC		—	1.2" (30 mm)
SC800EPE12TPC	12" (300 mm)	14.4" (366 mm)	—
SC800EPE12BPC		—	1.6" (41 mm)
SC800EPE15TPC	15" (375 mm)	11.3" (287 mm)	—
SC800EPE15BPC		—	1.7" (43 mm)
SC800EPE18TPC	18" (450 mm)	8.0" (203 mm)	—
SC800EPE18BPC		—	2.0" (51 mm)
SC800EPE24BPC	24" (600 mm)	—	2.3" (58 mm)
SC800EPE	NONE	SOLID END CAP	

NOTE: ALL DIMENSIONS ARE NOMINAL

2 SC-800 TECHNICAL SPECIFICATIONS



3 SC-800 ISOLATOR ROW PLUS DETAIL



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

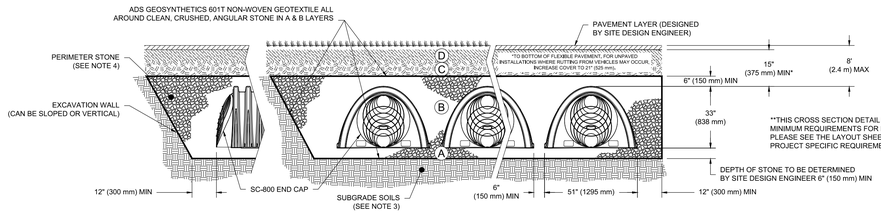
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

4 4" PVC INSPECTION PORT DETAIL (SC SERIES CHAMBER)

ACCEPTABLE FILL MATERIALS: STORMTECH SC-800 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 15" (375 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-800 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/%, AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

1 SC-800 CROSS SECTION DETAIL

Date	Description	No.

Revisions

STATE OF VERMONT JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

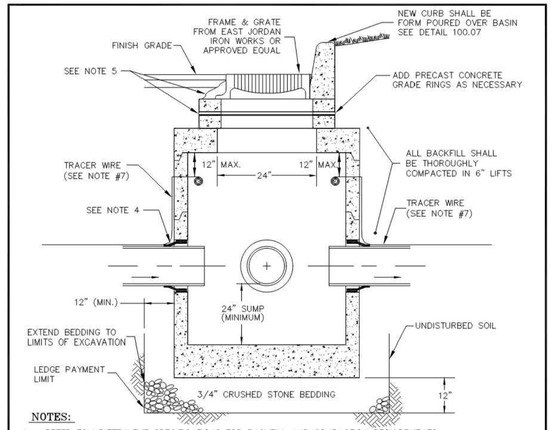
Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title
GRADING & DRAINAGE DETAILS II

Project No.	Drawing No.
140278401	CG502
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

LANGAN Project No. 140278401

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NOTES:

1. REFER TO WRITTEN THE SPECIFICATIONS FOR BACKFILL AND COMPACTION REQUIREMENTS.
2. REFER TO WRITTEN THE SPECIFICATIONS FOR DRAINAGE STRUCTURE AND MATERIAL REQUIREMENTS.
3. RAISE FRAME TO FINISH GRADE ONLY AFTER BASE COURSE OF PAVEMENT IS IN PLACE, RAISE FRAME TO BASE COURSE GRADE IF WEARING COURSE IS TO BE PLACED DURING NEXT CONSTRUCTION SEASON.
4. RUBBER BOOTS SHALL BE USED AROUND ALL STORM CONNECTIONS.
5. HIGH STRENGTH NON-SHRINK GROUT SHALL BE USED TO SET FRAME AND GRADE RINGS.
6. ALL STRUCTURE SHALL BE DESIGNED AND CONSTRUCTED TO WITHSTAND H-20 WHEEL LOADING.
7. INSERT A SECTION OF PVC CONDUIT OR TUBING THROUGH THE SIDEWALL OF THE STRUCTURE AS SHOWN FOR THE TRACER WIRE TO ENTER THE STRUCTURE. ONCE THE TRACER WIRE IS INSTALLED, SEAL THE VOID BETWEEN THE CONDUIT OR TUBING AND THE TRACER WIRE WITH A WATERPROOF SEALANT. INSIDE THE BASINS, A COIL OF WIRE LONG ENOUGH TO REACH THE COVER SHALL BE ATTACHED TO THE INSIDE OF THE STRUCTURE BY MEANS OF PLASTIC "ZIP-TIES" TO A STAINLESS STEEL RING.

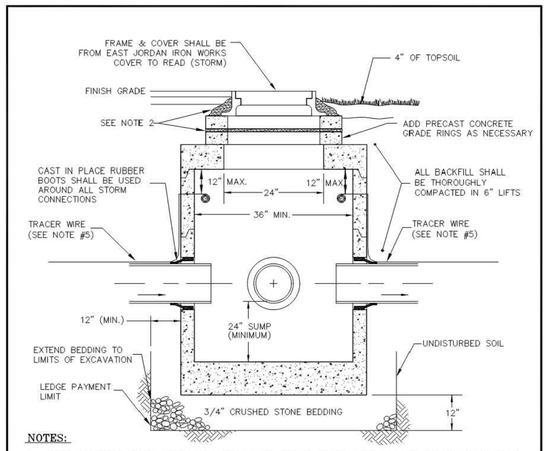
TOWN OF ESSEX PUBLIC WORKS 81 MAIN STREET ESSEX JCT., VT 05452 P: 802 878-1344 F: 802 878-1350 W: www.essex.org

TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

CATCH BASIN

Detail No: 200.02 | Scale: NOT TO SCALE | Date: JAN. 2017 | A-15

1 CATCH BASIN
N.T.S.



NOTES:

1. RAISE FRAME TO FINISH GRADE ONLY AFTER BASE COURSE OF PAVEMENT IS IN PLACE, RAISE FRAME TO BASE COURSE GRADE IF WEARING COURSE IS TO BE PLACED DURING NEXT CONSTRUCTION SEASON.
2. HIGH STRENGTH NON-SHRINK GROUT SHALL BE USED TO SET FRAME AND GRADE RINGS.
3. IN GRASS AREAS, FRAME AND COVER ARE TO BE INSTALLED A MAXIMUM OF 6" ABOVE GRADE.
4. ALL STRUCTURE SHALL BE DESIGNED AND CONSTRUCTED TO WITHSTAND H-20 WHEEL LOADING.
5. INSERT A SECTION OF PVC CONDUIT OR TUBING THROUGH THE SIDEWALL OF THE STRUCTURE AS SHOWN FOR THE TRACER WIRE TO ENTER THE STRUCTURE. ONCE THE TRACER WIRE IS INSTALLED, SEAL THE VOID BETWEEN THE CONDUIT OR TUBING AND THE TRACER WIRE WITH A WATERPROOF SEALANT. INSIDE THE MANHOLE, A COIL OF WIRE LONG ENOUGH TO REACH THE COVER SHALL BE ATTACHED TO THE INSIDE OF THE STRUCTURE BY MEANS OF PLASTIC "ZIP-TIES" TO A STAINLESS STEEL RING.

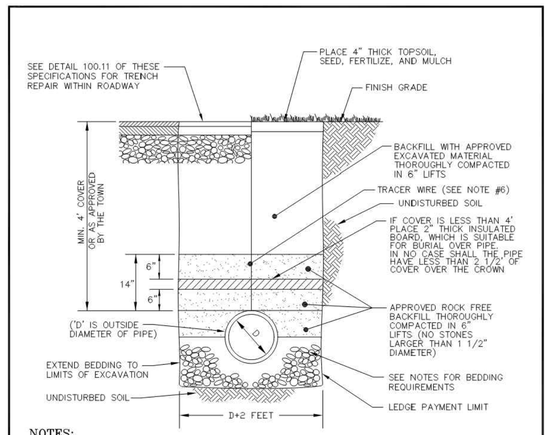
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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

STORM DRAIN MANHOLE

Detail No: 200.03 | Scale: NOT TO SCALE | Date: JAN. 2017 | A-16

2 STORM DRAIN MANHOLE
N.T.S.



NOTES:

1. THE CONTRACTOR SHALL AT ALL TIMES KEEP THE TRENCHES ENTIRELY FREE OF WATER UNTIL ALL WORK IS FINISHED AND READY FOR BACKFILLING.
2. REFER TO THE WRITTEN SPECIFICATIONS FOR BACKFILL AND COMPACTION REQUIREMENTS.
3. REFER TO THE WRITTEN SPECIFICATIONS FOR STORM DRAINAGE PIPE REQUIREMENTS.
4. THE SIDES OF THE TRENCHES 4 FEET OR MORE IN DEPTH TO BE ENTERED BY PERSONNEL SHALL BE SHEETED, SLOPED, OR PROPERLY SUPPORTED, CONFORMING TO VOSHA REQUIREMENTS.
5. PIPE BEDDING SHALL BE CRUSHED STONE, FROM 6" BELOW THE INVERT, TO THE SPRINGLINE OF THE PIPE.
6. INSTALL A CONTINUOUS SHEATHED SOLID CONDUCTOR COPPER TRACER WIRE OVER PIPE. THE WIRE SHALL BEGIN INSIDE ONE CATCH BASIN OR MANHOLE AND RUN TO THE NEXT CATCH BASIN OR MANHOLE. INSIDE THE BASINS AND/OR MANHOLES, A COIL OF WIRE LONG ENOUGH TO REACH THE COVER SHALL BE ATTACHED TO THE INSIDE OF THE STRUCTURE. SEE DETAILS 200.01 – 200.03.

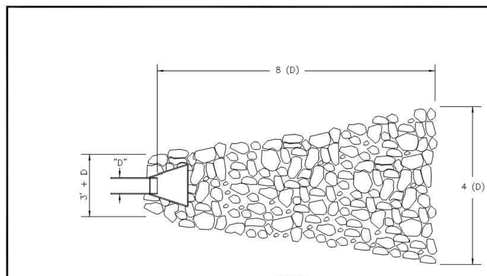
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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

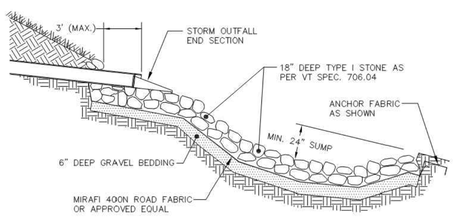
STORM PIPE TRENCH

Detail No: 200.04 | Scale: NOT TO SCALE | Date: JAN. 2017 | A-17

3 STROM PIPE TRENCH
N.T.S.



PLAN



PROFILE

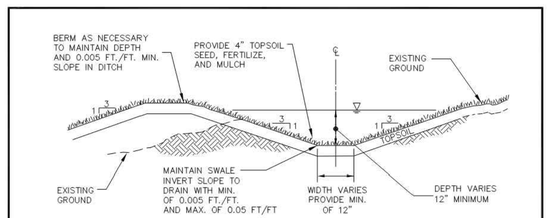
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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

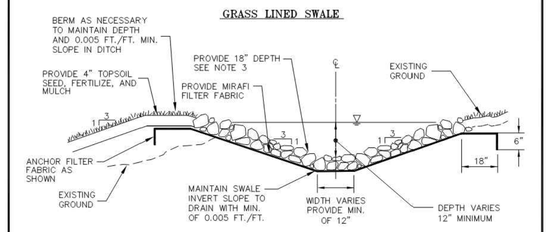
STORM OUTFALL

Detail No: 200.05 | Scale: NOT TO SCALE | Date: JAN. 2017 | A-18

4 STORM OUTFALL
N.T.S.



GRASS LINED SWALE



STONE LINED SWALE

NOTES:

1. THE CONTRACTOR SHALL MAINTAIN THE GRASS LINED SWALE AND RESTORE EROSION PREVENTION MEASURES AFTER EACH STORM EVENT. SEE SECTION 500 OF THESE SPECIFICATIONS FOR FURTHER DIRECTION ON EROSION AND SEDIMENT CONTROL MEASURES.
2. STONE LINED SWALES SHALL BE USED FOR GRADES IN EXCESS OF 0.05 FT/FT (5.0%)
3. DITCHES SHALL BE LINED WITH A COMBINATION OF TYPE 1 STONE & 8" MINUS AS APPROVED BY THE TOWN OF ESSEX PUBLIC WORKS DEPARTMENT.

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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

DRAINAGE SWALES

Detail No: 200.06 | Scale: NOT TO SCALE | Date: JAN. 2017 | A-19

5 DRAINAGE SWALES
N.T.S.

Date	Description	No.

Revisions

STATE OF VERMONT JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

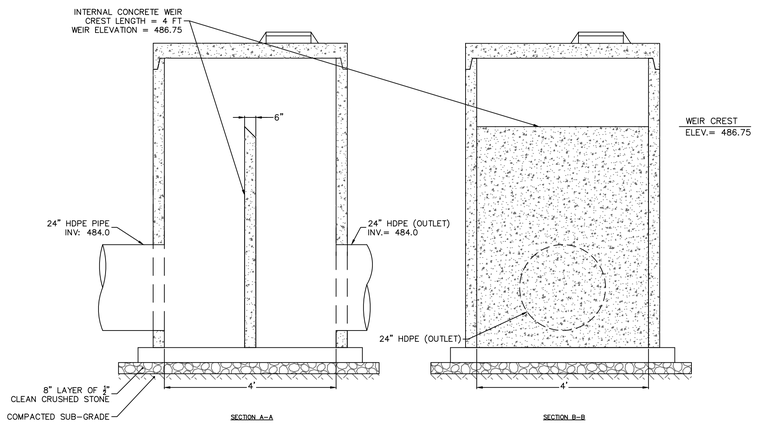
GRADING & DRAINAGE DETAILS III

Project No.	Drawing No.
140278401	CG503
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

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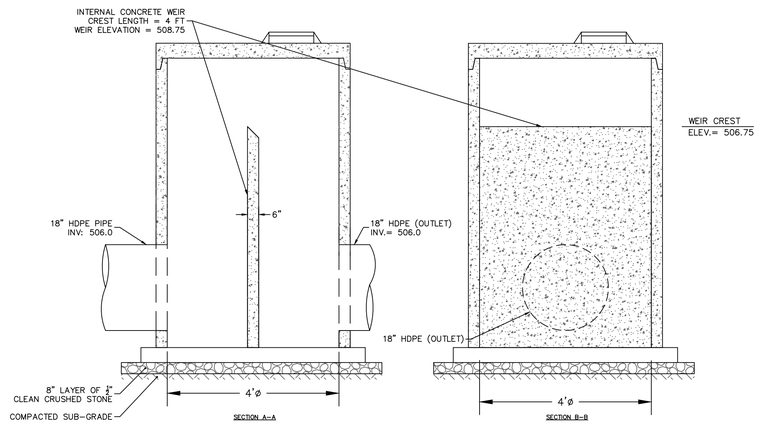
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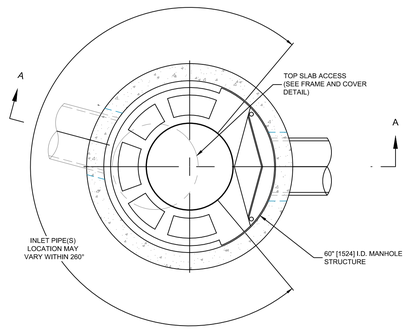
1 OUTLET CONTROL STRUCTURE (OCS-01 (A-2))

N.T.S.

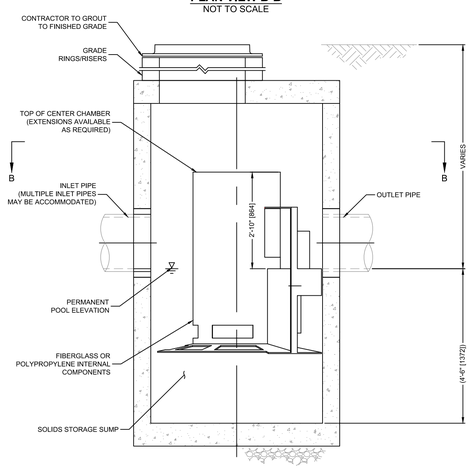


2 OUTLET CONTROL STUCTURE (OCS-01 (B-2))

N.T.S.



PLAN VIEW B-B
NOT TO SCALE



ELEVATION A-A
NOT TO SCALE

CASCADE SEPARATOR DESIGN NOTES

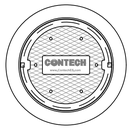
THE STANDARD #### CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. CASCADE SEPARATOR STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' [610], AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. CASCADE SEPARATOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. ALTERNATE UNITS ARE SHOWN IN MILLIMETERS [mm].

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CASCADE SEPARATOR MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

WATERSHED	WQ FLOW (CFS)	PEAK FLOW (CFS)	HDS UNIT RECOMMENDED	PRETREATMENT PROVIDED (CFS)
WQU-01 (A-1)	2.47	12.04	CS-5	2.81
WQU-01 (A-2)	3.24	12.98	CS-6	4.05
WQU-02 (A-3)	0.78	3.63	CS-3	1.02
WQU-01 (A-3)	1.7	7.65	CS-4	1.8
WQU-02 (A-3)	1	3	CS-4*	1.02
WQU-01 (B-1)	2.6	12.89	CS-5	2.81
WQU-01 (B-2)	0.82	4.61	CS-3	1.02



FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE

3 WATER QUALITY UNIT CASCADE SEPARATOR STANDARD DETAIL

N.T.S.

Date	Description	No.

Revisions

STATE OF VERMONT JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

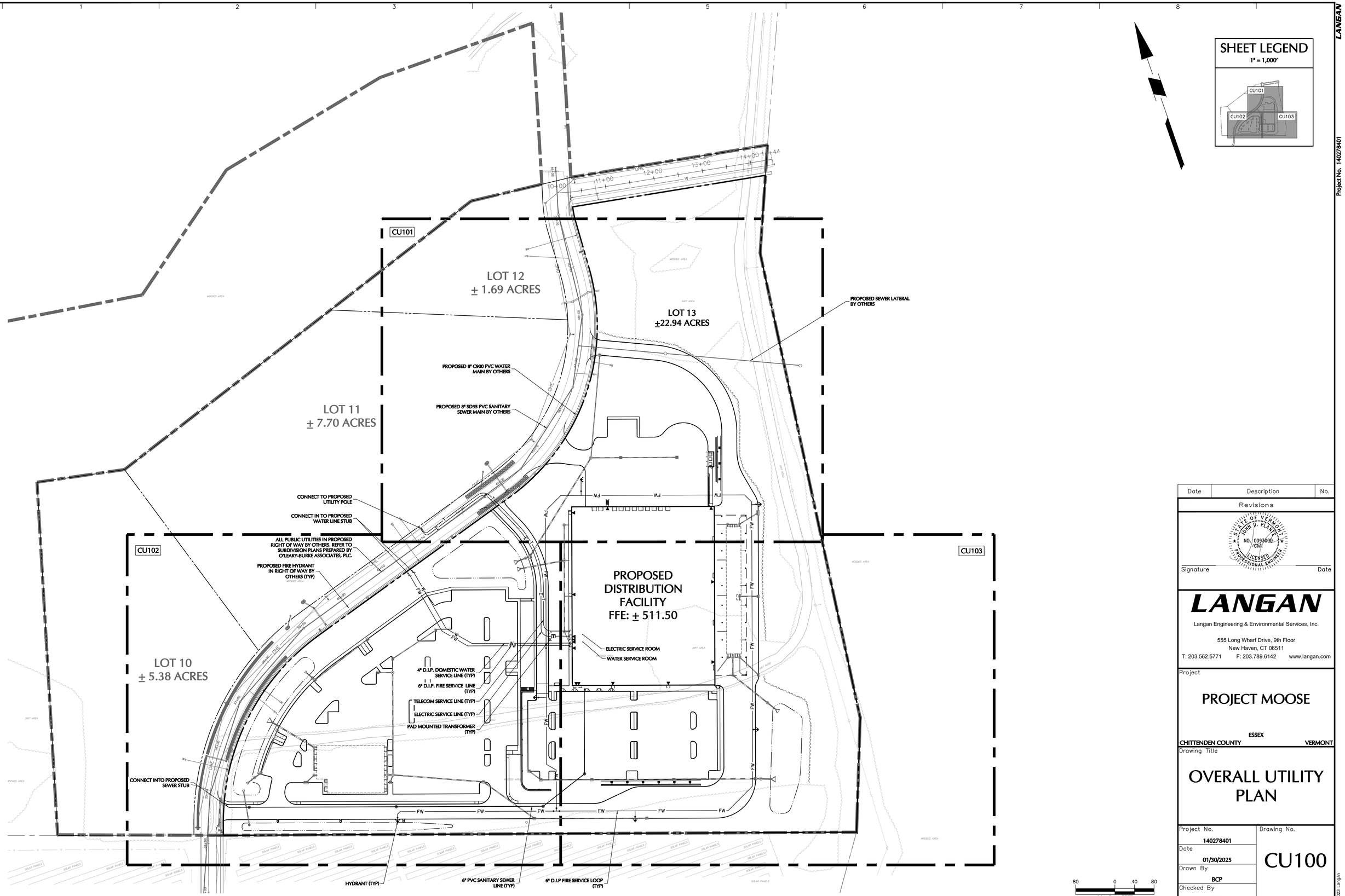
Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title
GRADING & DRAINAGE DETAILS IV

Project No.	Drawing No.
140278401	CG504
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

LANGAN
Project No. 140278401

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SHEET LEGEND

1" = 1,000'

Date	Description	No.
Revisions		

STATE OF VERMONT · JOHN D. PLANTE · NO. 0093000 · CIVIL · LICENSED PROFESSIONAL ENGINEER

Signature Date

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Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

OVERALL UTILITY PLAN

Project No.	Drawing No.
140278401	CU100
Date: 01/30/2025	
Drawn By: BCP	
Checked By: DTG	

80 0 40 80
SCALE IN FEET

Date: 1/29/2025 Time: 11:01 User: bpalma Style Table: Langan.stb Layout: CU100 Document Code: 140278401-0501-CU101-0101

LANGAN

Project No. 140278401

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LOT 12:
±1.69 ACRES

LOT 11
±7.70 ACRES

LOT 13
±22.94 ACRES

WOODED AREA

DIRT AREA

DIRT ROAD

SEWER LATERAL BY OTHERS

PROPOSED 8" C900 WATER MAIN BY OTHERS

PROPOSED 8" SDR35 SANITARY SEWER MAIN BY OTHERS

LIMITS OF STORMWATER MANAGEMENT FEATURE (TYP)

ELECTRIC SERVICE LINE (TYP)

TELECOM SERVICE LINE (TYP)

CONNECT ELECTRIC AND TELECOM SERVICES TO FUTURE UTILITY POLE. COORDINATE WITH UTILITY PROVIDERS.

6" D.I.P. FIRE SERVICE LINE (TYP)

WATER VALVE (TYP)

BOLLARD (TYP)

HYDRANT (TYP)

PROPOSED DISTRIBUTION FACILITY
FFE: 511.50

MATCHLINE: CU101

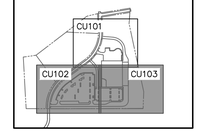
MATCHLINE: CU102

MATCHLINE: CU101

MATCHLINE: CU103

30 0 15 30
SCALE IN FEET

SHEET LEGEND
1" = 1,000'



No.	Description	Date
	Revisions	

STATE OF VERMONT
JOHN D. PLANTE
NO. 0083000
CIVIL
LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

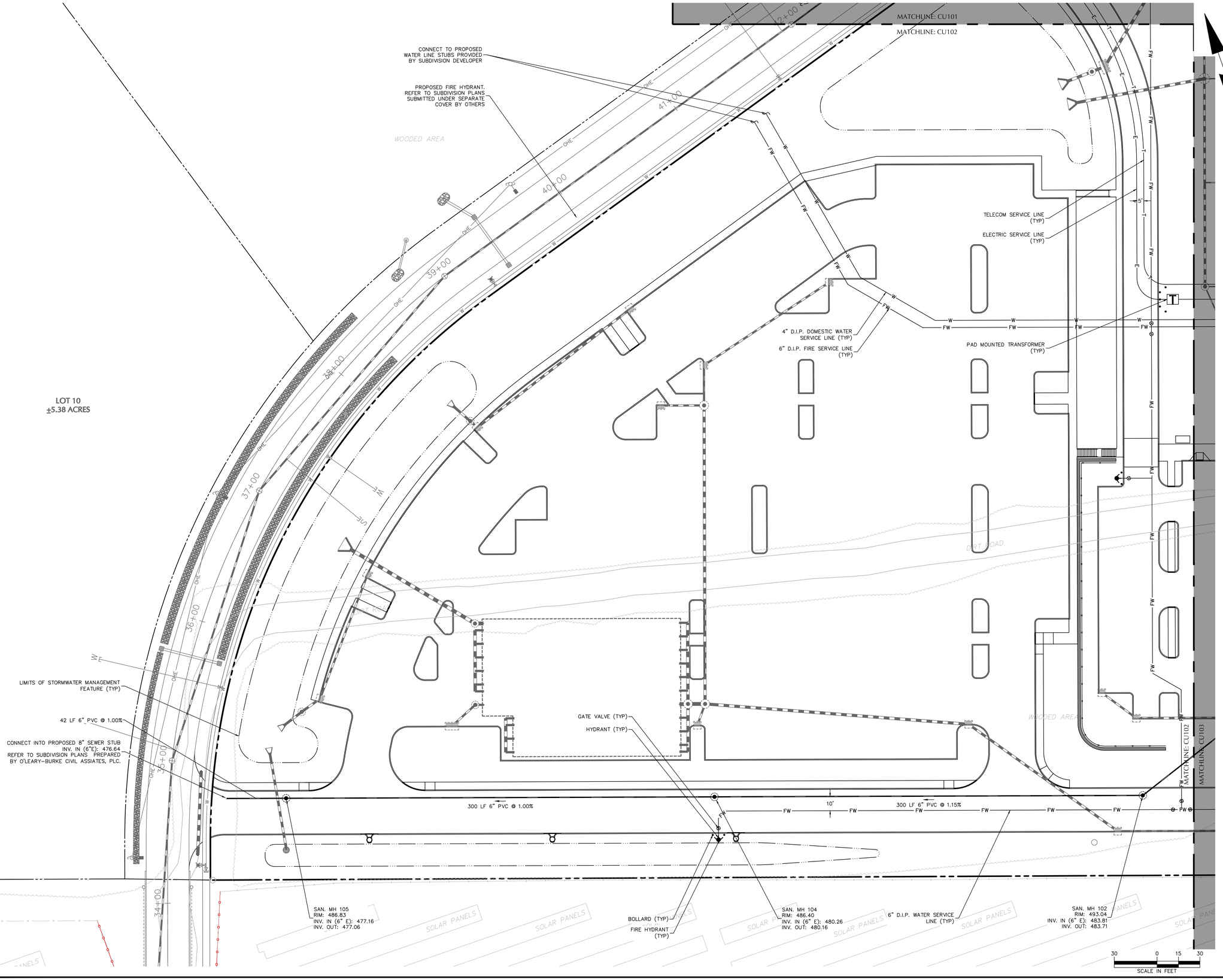
Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title
UTILITY PLAN I

Project No.	Drawing No.
140278401	CU101
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

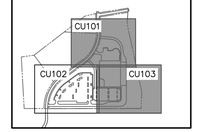
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Project No. 140278401

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SHEET LEGEND

1" = 1,000'



Date	Description	No.

Revisions

STATE OF VERMONT
JOHN D. FLANNERY
NO. 0093000
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Signature Date

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555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
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Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

UTILITY PLAN II

Project No.	Drawing No.
140278401	CU102
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

LANGAN
Project No. 140278401

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MATCHLINE: CU101

MATCHLINE: CU103

PROPOSED DISTRIBUTION FACILITY
FFE: 511.50

PAD MOUNTED TRANSFORMER

SECONDARY ELECTRIC SERVICE LINE TO BUILDING. COORDINATE WITH M.E.P. PLANS

CONNECT 4" WATER SERVICE LINE TO BUILDING. COORDINATE WITH M.E.P. PLANS. WATER TO BE METERED INTERIOR TO BUILDING

CONNECT 6" D.I.P. FIRE SERVICE LINE TO BUILDING. COORDINATE WITH M.E.P. PLANS

6" SDR35
SAN. CONNECTION 1
INV. OUT: 505.00

175 LF 6" PVC @ 5.14%

SAN. MH 101
RIM: 504.17
INV. IN (6" N): 496.00
INV. OUT: 495.90

MATCHLINE: CU102

MATCHLINE: CU103

107 LF 6" PVC @ 11.25%

6" D.I.P. FIRE SERVICE LINE (TYP)

LIMITS OF STORMWATER MANAGEMENT FEATURE (TYP)

45° BEND (TYP)

HYDRANT (TYP)

BOLLARD (TYP)

WATER VALVE (TYP)

LOT 13
±22.94 ACRES

WOODED AREA

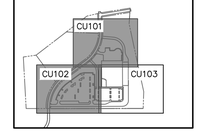
DIRT AREA

DIRT ROAD

SOLAR PANELS

FW

SHEET LEGEND
1" = 1,000'



30 0 15 30
SCALE IN FEET

Date	Description	No.

Revisions

STATE OF VERMONT
JOHN D. PLANTE
NO. 0093000
CIVIL
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PROFESSIONAL ENGINEER

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555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

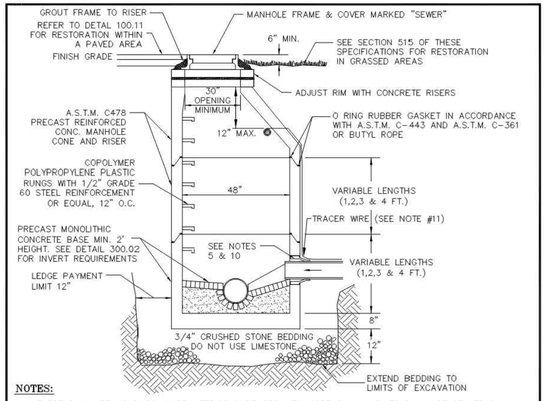
UTILITY PLAN III

Project No.	Drawing No.
140278401	CU103
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

LANGAN

Project No. 140278401

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NOTES:

1. THERE SHALL BE NO PARGING OF INTERIOR SURFACES WITH MORTAR. ALL JOINTS SHALL BE SEALED ON EXTERIOR SURFACES ONLY.
2. REFER TO THE WRITTEN SPECIFICATIONS FOR BACKFILL AND COMPACTION REQUIREMENTS
3. REFER TO THE WRITTEN SPECIFICATIONS FOR SANITARY SEWER STRUCTURE MATERIAL REQUIREMENTS AND TESTING REQUIREMENTS.
4. RAISE FRAME TO FINISH GRADE ONLY AFTER BASE COURSE OF PAVEMENT IS IN PLACE. RAISE FRAME TO BASE COURSE GRADE IF WEARING COURSE IS TO BE PLACED NEXT CONSTRUCTION SEASON.
5. CAST IN PLACE RUBBER BOOTS SHALL BE USED ON ALL SEWER CONNECTIONS. A CORE-N-SEAL STYLE BOOT MAY BE USED UPON TOWN APPROVAL.
6. HIGH STRENGTH NON-SHRINK GROUT SHALL BE USED TO SET FRAME AND GRADE RINGS.
7. IN GRASS AREAS, FRAME AND COVER ARE TO BE INSTALLED A MINIMUM OF 6" ABOVE GRADE.
8. BACKFILL MANHOLES WITH MATERIAL APPROVED BY TOWN.
9. IF THE INVERT IN ELEVATION IS GREATER THAN 2' ABOVE THE INVERT OUT ELEVATION, REFER TO FIGURE A-21 FOR AN INSIDE DROP MANHOLE.
10. FRAME AND COVER SHALL CONFORM TO H-20 LOADING REQUIREMENTS.
11. INSERT A SECTION OF PVC CONDUIT OR TUBING THROUGH THE SIDEWALL OF THE STRUCTURE AS SHOWN FOR THE TRACER WIRE TO ENTER THE STRUCTURE. ONCE THE TRACER WIRE IS INSTALLED, SEAL THE VOID BETWEEN THE CONDUIT OR TUBING AND THE TRACER WIRE WITH A WATERPROOF SEALANT. INSIDE THE MANHOLE, A COIL OF WIRE LONG ENOUGH TO REACH THE COVER SHALL BE ATTACHED TO THE INSIDE OF THE STRUCTURE BY MEANS OF PLASTIC "ZIP-TIES" TO A STAINLESS STEEL RING.

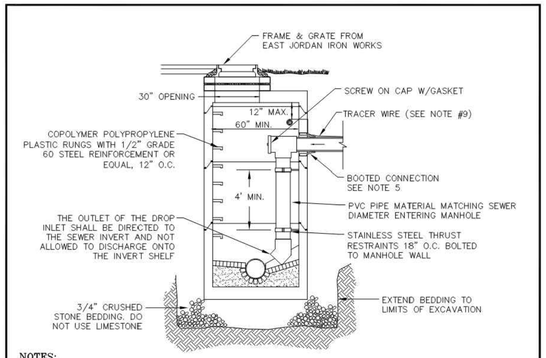
TOWN OF ESSEX PUBLIC WORKS 81 MAIN STREET ESSEX JCT., VT 05452 P: 802 878-1344 F: 802 878-1385 E: www.essex.org

TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

SANITARY SEWER MANHOLE

Detail No: 300.01 | Scale: NOT TO SCALE | Date: MAR. 2017 | A-22

1 SANITARY SEWER MANHOLE
N.T.S.



NOTES:

1. ALL STANDARDS FOUND IN DETAIL 300.01 SHALL BE REFERENCED FOR DIRECTION.
2. REFER TO DETAIL 300.01 FOR PAY LIMITS OF EXCAVATION AND BEDDING REQUIREMENTS
3. REFER TO THE WRITTEN SPECIFICATIONS FOR SANITARY SEWER STRUCTURE MATERIAL REQUIREMENTS AND TESTING REQUIREMENTS.
4. RAISE FRAME TO FINISH GRADE ONLY AFTER BASE COURSE OF PAVEMENT IS IN PLACE. RAISE FRAME TO BASE COURSE GRADE IF WEARING COURSE IS TO BE PLACED NEXT CONSTRUCTION SEASON.
5. CAST IN PLACE RUBBER BOOT SHALL BE USED ON ALL SEWER CONNECTIONS. A CORE-N-SEAL STYLE BOOT MAY BE USED UPON TOWN APPROVAL.
6. HIGH STRENGTH NON-SHRINK GROUT SHALL BE USED TO SET FRAME AND GRADE RINGS
7. IN GRASS AREAS, FRAME AND COVER ARE TO BE INSTALLED A MINIMUM OF 6" ABOVE GRADE
8. FRAME AND GRATE SHALL CONFORM TO H-20 LOADING REQUIREMENTS.
9. INSERT A SECTION OF PVC CONDUIT OR TUBING THROUGH THE SIDEWALL OF THE STRUCTURE AS SHOWN FOR THE TRACER WIRE TO ENTER THE STRUCTURE. ONCE THE TRACER WIRE IS INSTALLED, SEAL THE VOID BETWEEN THE CONDUIT OR TUBING AND THE TRACER WIRE WITH A WATERPROOF SEALANT. INSIDE THE MANHOLES, A COIL OF WIRE LONG ENOUGH TO REACH THE COVER SHALL BE ATTACHED TO THE INSIDE OF THE STRUCTURE BY MEANS OF PLASTIC "ZIP-TIES" TO A STAINLESS STEEL RING.

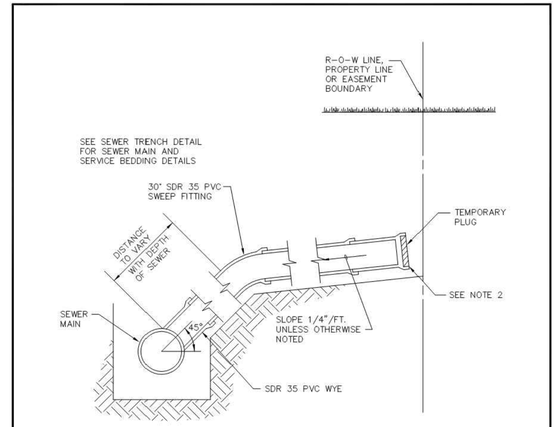
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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

INSIDE DROP MANHOLE

Detail No: 300.03 | Scale: NOT TO SCALE | Date: JAN. 2017 | A-24

2 INSIDE DROP MANHOLE
N.T.S.



NOTES :

1. ALL SANITARY SEWER SERVICE PIPING WITHIN THE TOWN RIGHT OF WAY SHALL BE 6" SDR 35 PVC.
2. ALL CONNECTIONS TO THE NEW SERVICE SHALL BE WITH SDR 35 PVC FITTINGS OR APPROVED EQUAL. FERNCO STYLE FLEXIBLE COUPLINGS SHALL NOT BE USED.
3. ALL WORK SHALL CONFORM TO THESE SPECIFICATIONS AND DETAIL 300.04, SANITARY SEWER TRENCH (GRAVITY).

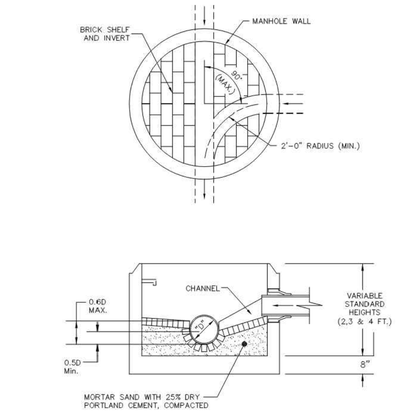
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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

SERVICE CONNECTION

Detail No: 300.06 | Scale: NOT TO SCALE | Date: JAN. 2017 | A-27

3 SERVICE CONNECTION
N.T.S.



NOTES:

1) NO PARGING OF INTERIOR BRICKWORK OR JOINTS WITH MORTAR SHALL BE ALLOWED.
2) ALL INVERT BRICK WORK SHALL BE INSPECTED BY THE TOWN OF ESSEX BEFORE IT IS ACCEPTED.

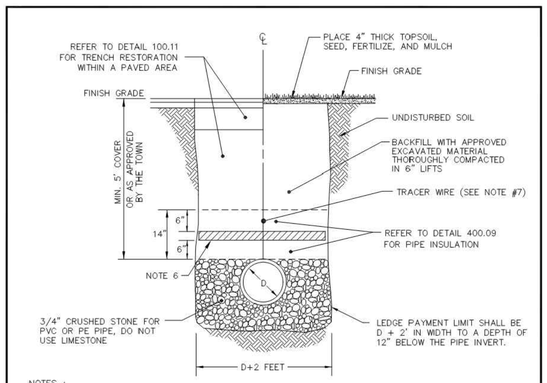
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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

SANITARY SEWER MANHOLE INVERT

Detail No: 300.02 | Scale: NOT TO SCALE | Date: JAN. 2017 | A-23

5 SANITARY SEWER MANHOLE INVERT
N.T.S.



NOTES :

1. THE CONTRACTOR SHALL KEEP THE TRENCH ENTIRELY FREE OF WATER AT ALL TIMES UNTIL THE WORK IS COMPLETE AND READY FOR BACKFILLING.
2. THE SIDES OF THE TRENCHES SHALL BE SHEETED OR SLOPED TO THE ANGLE OF REPOSE IF THE TRENCH IS 4' OR MORE IN DEPTH.
3. BACKFILL TRENCH IN 6" LIFTS AND COMPACT EACH LIFT TO 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698 STANDARD PROCTOR.
4. BACKFILL ABOVE THE CROWN OF THE PIPE SHALL BE COMMON FILL.
5. ALL WORK SHALL CONFORM TO THE WRITTEN SPECIFICATIONS AND PLANS UNLESS OTHERWISE SPECIFIED.
6. IF COVER OVER PIPE IS LESS THAN 5', PLACE 2" THICK INSULATION BOARD OVER PIPE FOR EVERY FOOT OF COVER LESS THAN 5'. IN NO CASE SHALL THERE BE LESS THAN 3.5' OF COVER OVER THE TOP OF PIPE.
7. INSTALL A CONTINUOUS SHEATHED SOLID CONDUCTOR COPPER TRACER WIRE OVER PIPE. THE WIRE SHALL BEGIN INSIDE ONE MANHOLE AND RUN TO THE NEXT MANHOLE. INSIDE THE MANHOLES, A COIL OF WIRE LONG ENOUGH TO REACH THE COVER SHALL BE ATTACHED TO THE INSIDE OF THE STRUCTURE. SEE DETAILS 300.01 AND 300.03

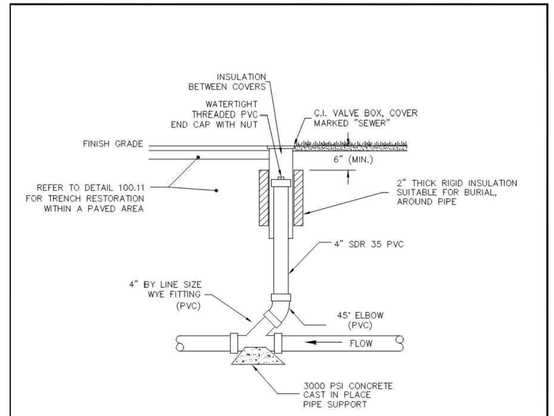
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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

SANITARY SEWER TRENCH (GRAVITY)

Detail No: 300.04 | Scale: NOT TO SCALE | Date: JAN. 2017 | A-25

6 SANITARY SEWER TRENCH (GRAVITY)
N.T.S.



NOTES :

1. CLEANOUTS FOR GRAVITY SEWERS AND FORCE MAINS SHALL BE PROVIDED AT LOCATIONS INDICATED ON THE PLANS OR AS DIRECTED BY THE TOWN OR ENGINEER.
2. CLEANOUT FRAMES AND COVERS SHALL BE CAST IRON.
3. ALL PIPING AND FITTINGS WITHIN THE TOWN RIGHT OF WAY SHALL BE A MINIMUM OF 6".

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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

SANITARY SEWER CLEANOUT

Detail No: 300.07 | Scale: NOT TO SCALE | Date: JAN. 2017 | A-28

7 SANITARY SEWER CLEANOUT
N.T.S.

Date	Description	No.

Revisions

STATE OF VERMONT JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

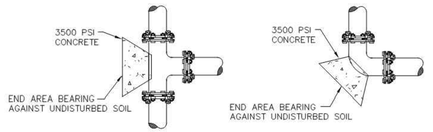
UTILITY DETAILS I

Project No.	Drawing No.
140278401	CU501
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

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Project No. 140278401

NOTE: PLACE 4 mil POLYETHYLENE BETWEEN FITTINGS AND THRUST BLOCK



TEES – CAPS

BENDS: 11°, 25°, 22.5°, 45°, 90°

SOIL TYPE – CLAY/SILT

SIZE / FITTING	6"	8"	12"
11¼ & 22½	3	4	9
45°	4	8	17
90°	9	16	35
TEES OR END CAPS	6	11	25
VALVES	3	3	3

SQ FT BEARING AREA

BASED ON 100 PSI WORKING PRESSURE PLUS 100 PSI SURGE ALLOWANCE AND BEARING CAPACITY OF 1000 LBS/SQ FT

SOIL TYPE – SAND

SIZE / FITTING	6"	8"	12"
11¼ & 22½	2	2	5
45°	2	4	9
90°	4	8	17
TEES OR END CAPS	3	6	12
VALVES	2	2	2

SQ FT BEARING AREA

BASED ON 100 PSI WORKING PRESSURE PLUS 100 PSI SURGE ALLOWANCE AND BEARING CAPACITY OF 2000 LBS/SQ FT

SOIL TYPE – TILL/SHALE

SIZE / FITTING	6"	8"	12"
11¼ & 22½	1	1	2
45°	1	2	4
90°	2	4	9
TEES OR END CAPS	2	3	6
VALVES	2	2	2

SQ FT BEARING AREA

BASED ON 100 PSI WORKING PRESSURE PLUS 100 PSI SURGE ALLOWANCE AND BEARING CAPACITY OF 4000 LBS/SQ FT

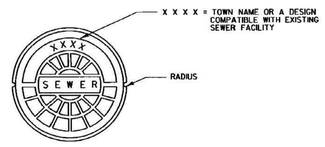
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Ph 802 878-1344
Fx 802 878-1382
@ www.essex.org

TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

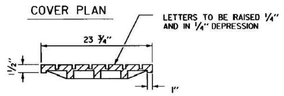
CONCRETE THRUST BLOCK

Detail Nbr: 400.03
Scale: NOT TO SCALE
Date: JAN. 2017
A-33

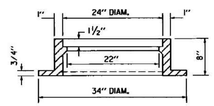
1 CONCRETE THRUST BLOCK
N.T.S.



COVER PLAN



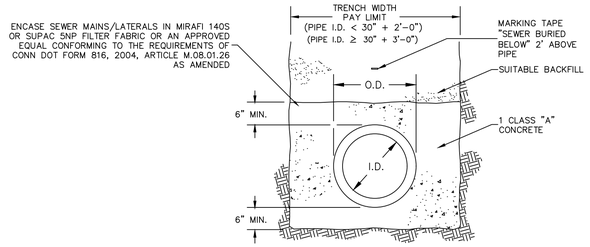
COVER SECTION



FRAME SECTION

MANHOLE FRAME AND COVER DETAIL

2 MANHOLE FRAME AND COVER
N.T.S.

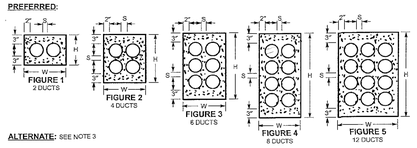


NOTE:
ALL SANITARY PIPES SHALL BE ENCASED IN CONCRETE, WHEN THE VERTICAL DISTANCE BETWEEN PIPE CROSSINGS IS 18" OR LESS AND THE HORIZONTAL SEPARATION DISTANCE BETWEEN PIPES IS LESS THEN 10', ENCASEMENT SHALL BE EXTENDED FOR A DISTANCE OF 10' (20' TOTAL) FROM BOTH SIDES OF THE CENTERLINE OF THE PIPE OR UNTIL THE PIPE SEPARATION IS 10' HORIZONTAL, WHICH EVER IS LONGER.

DETAIL OBTAINED FROM: CITY OF NORWALK DEPARTMENT OF PUBLIC WORKS STANDARD DETAIL DRAWINGS JUNE 2015

3 CONCRETE ENCASEMENT
N.T.S.

PREFERRED:



ALTERNATE: SEE NOTE 3

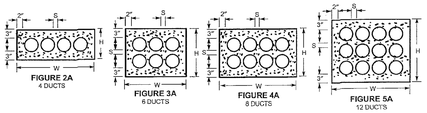
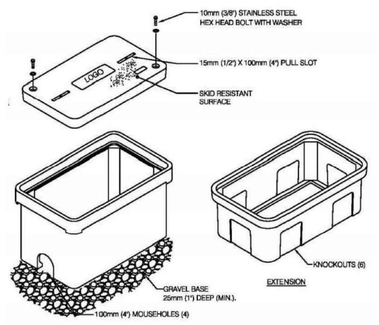


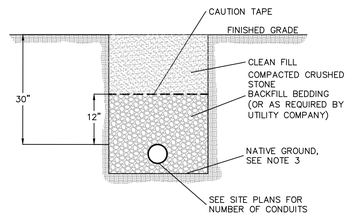
Fig	Dimensions In Inches								
	4" Duct			5" Duct			6" Duct		
	W	H	S	W	H	S	W	H	S
1	14-1/2	10-1/2	1-1/2	16-1/2	11-1/2	1-1/2	19	12-1/2	2
2	14-1/2	18-1/2	1-1/2	16-1/2	18-1/2	1-1/2	19	21	2
2A	26-1/2	10-1/2	1-1/2	30-1/2	11-1/2	1-1/2	36	12-1/2	2
3	14-1/2	22-1/2	1-1/2	16-1/2	25-1/2	1-1/2	19	29-1/2	2
3A	20-1/2	18-1/2	1-1/2	23-1/2	18-1/2	1-1/2	27-1/2	21	2
4	14-1/2	28-1/2	1-1/2	16-1/2	32-1/2	1-1/2	19	38	2
4A	26-1/2	18-1/2	1-1/2	30-1/2	18-1/2	1-1/2	36	21	2
5	20-1/2	28-1/2	1-1/2	23-1/2	32-1/2	1-1/2	27-1/2	38	2
5A	26-1/2	22-1/2	1-1/2	30-1/2	25-1/2	1-1/2	36	29-1/2	2

Notes
1. At manholes conduit banks shall be per Figures 1, 2, 3, 4, or 5.
2. Minimum cover from top of a conduit bank to the pavement or earth surface shall be:
   a. State highways – 36 inches
   b. Railroad tracks – 60 inches
   c. All other areas – 24 inches
3. In the conduit run between manholes if obstructions are encountered or to reduce trench depth, Figures 2A, 3A, 4A, or 5A are permissible.
4. Concrete shall be 2500 psi, 1/2 inch maximum stone, 6–9 inches slump of such consistency that spading will ensure the flow of concrete between and under the individual ducts, but not so wet as to float the ducts. For tier buildup construction a stiffer consistency should be used.

4 ELECTRIC CONDUIT BANK
N.T.S.



5 TELECOM HANDHOLE
N.T.S.



NOTES:

1. TRENCHES IN STABLE SOIL OVER 5 FT DEEP SHALL BE REINFORCED BY APPROVED OSHA METHODS.

2. TRENCHES SHALL BE COMPACTED. IF NATIVE GROUND IS NOT SUITABLE, THE CONTRACTOR SHALL EXCAVATE TO AN ACCEPTABLE DEPTH AND INSTALL MATERIALS AS APPROVED BY ENGINEERS AND UTILITY COMPANY.

6 TELECOM TRENCH DETAIL
N.T.S.

Date	Description	No.

Revisions

STATE OF VERMONT JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

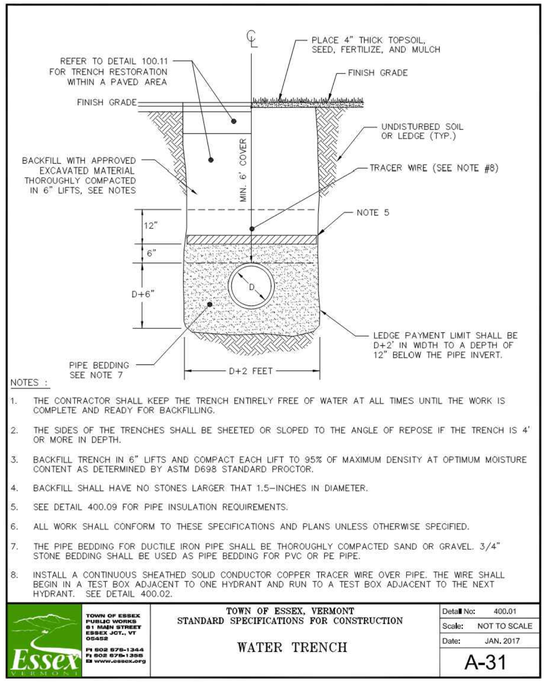
UTILITY DETAILS II

Project No.	Drawing No.
140278401	CU502
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

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LANGAN Project No. 140278401

Date: 1/29/2025 Time: 10:23 User: bpalma Style Table: Langan.stb Layout: CU502 Document Code: 140278401-0501-CU501-0102



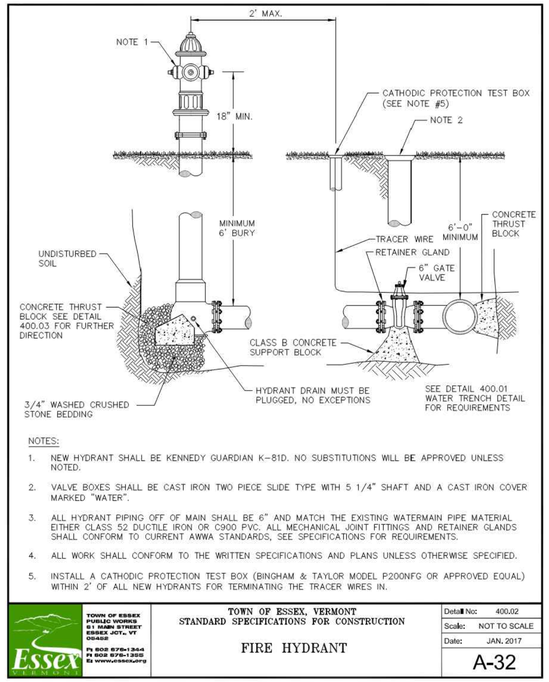
NOTES :

1. THE CONTRACTOR SHALL KEEP THE TRENCH ENTIRELY FREE OF WATER AT ALL TIMES UNTIL THE WORK IS COMPLETE AND READY FOR BACKFILLING.
2. THE SIDES OF THE TRENCHES SHALL BE SHEETED OR SLOPED TO THE ANGLE OF REPOSE IF THE TRENCH IS 4' OR MORE IN DEPTH.
3. BACKFILL TRENCH IN 6" LIFTS AND COMPACT EACH LIFT TO 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698 STANDARD PROCTOR.
4. BACKFILL SHALL HAVE NO STONES LARGER THAT 1.5–INCHES IN DIAMETER.
5. SEE DETAIL 400.09 FOR PIPE INSULATION REQUIREMENTS.
6. ALL WORK SHALL CONFORM TO THESE SPECIFICATIONS AND PLANS UNLESS OTHERWISE SPECIFIED.
7. THE PIPE BEDDING FOR DUCTILE IRON PIPE SHALL BE THOROUGHLY COMPACTED SAND OR GRAVEL. 3/4" STONE BEDDING SHALL BE USED AS PIPE BEDDING FOR PVC OR PE PIPE.
8. INSTALL A CONTINUOUS SHEATHED SOLID CONDUCTOR COPPER TRACER WIRE OVER PIPE. THE WIRE SHALL BEGIN IN A TEST BOX ADJACENT TO ONE HYDRANT AND RUN TO A TEST BOX ADJACENT TO THE NEXT HYDRANT. SEE DETAIL 400.02.

TOWN OF ESSEX PUBLIC WORKS 81 MAIN STREET ESSEX JCT., VT 05452 P: 802 878-1344 F: 802 878-1355 W: www.essex.org	TOWN OF ESSEX, VERMONT STANDARD SPECIFICATIONS FOR CONSTRUCTION WATER TRENCH	Detail No: 400.01 Scale: NOT TO SCALE Date: JAN. 2017 A-31

WATER TRENCH

N.T.S.



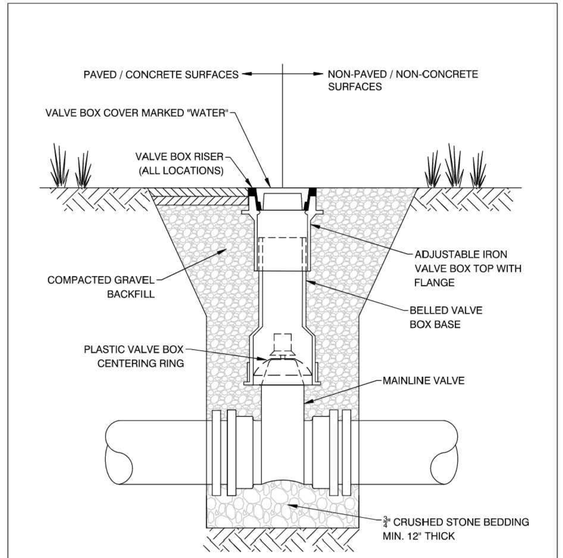
NOTES:

1. NEW HYDRANT SHALL BE KENNEDY GUARDIAN K–81D. NO SUBSTITUTIONS WILL BE APPROVED UNLESS NOTED.
2. VALVE BOXES SHALL BE CAST IRON TWO PIECE SLIDE TYPE WITH 5 1/4" SHAFT AND A CAST IRON COVER MARKED "WATER".
3. ALL HYDRANT PIPING OFF OF MAIN SHALL BE 6" AND MATCH THE EXISTING WATERMAIN PIPE MATERIAL EITHER CLASS 52 DUCTILE IRON OR C900 PVC. ALL MECHANICAL JOINT FITTINGS AND RETAINER GLANDS SHALL CONFORM TO CURRENT AWWA STANDARDS, SEE SPECIFICATIONS FOR REQUIREMENTS.
4. ALL WORK SHALL CONFORM TO THE WRITTEN SPECIFICATIONS AND PLANS UNLESS OTHERWISE SPECIFIED.
5. INSTALL A CATHODIC PROTECTION TEST BOX (BINGHAM & TAYLOR MODEL P200NFG OR APPROVED EQUAL) WITHIN 2' OF ALL NEW HYDRANTS FOR TERMINATING THE TRACER WIRES IN.

TOWN OF ESSEX PUBLIC WORKS 81 MAIN STREET ESSEX JCT., VT 05452 P: 802 878-1344 F: 802 878-1355 W: www.essex.org	TOWN OF ESSEX, VERMONT STANDARD SPECIFICATIONS FOR CONSTRUCTION FIRE HYDRANT	Detail No: 400.02 Scale: NOT TO SCALE Date: JAN. 2017 A-32

FIRE HYDRANT

N.T.S.



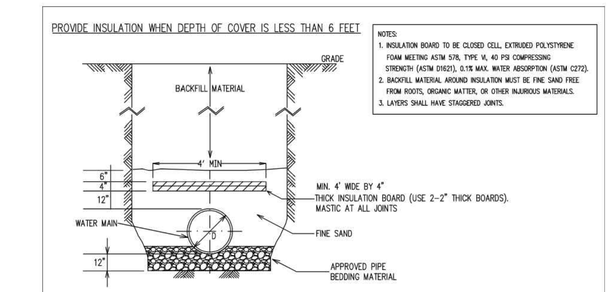
VALVE BOX

NOT TO SCALE

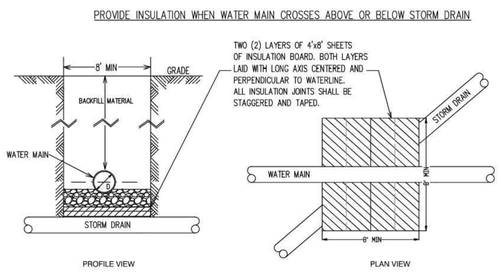
CHAMPLAIN WATER DISTRICT	CHAMPLAIN WATER DISTRICT Specifications Detail VALVE BOX	DATE: January 2024 DRAWING NO.: A-10

VALVE BOX

N.T.S.



NOTES:
1. INSULATION BOARD TO BE CLOSED CELL, EXTRUDED POLYSTYRENE FOAM MEETING ASTM 578, TYPE VI, 40 PSI COMPRESSING STRENGTH (ASTM D1621), 0.1% MAX. WATER ABSORPTION (ASTM C272).
2. BACKFILL MATERIAL AROUND INSULATION MUST BE FINE SAND FREE FROM ROOTS, ORGANIC MATTER, OR OTHER INJURIOUS MATERIALS.
3. LAYERS SHALL HAVE STAGGERED JOINTS.



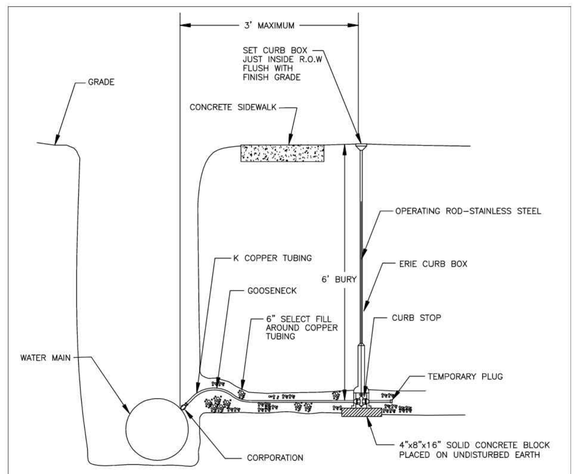
WATER MAIN INSULATION

NOT TO SCALE

CHAMPLAIN WATER DISTRICT	CHAMPLAIN WATER DISTRICT Specifications Detail WATER MAIN TRENCH INSULATION	DATE: February 2023 DRAWING NO.: A-13

WATER MAIN INSULATION

N.T.S.



NOTES: 1) SEE SPECIFICATIONS FOR TAPPING SADDLE, CORPORATION, AND CURBSTOP REQUIREMENTS
2) SEE DETAIL A–3 FOR SYSTEM/SERVICE OWNERSHIP BOUNDARIES
3) TRANSMISSION INSTALLATIONS REQUIRE MAXIMUM DISTANCE OF 3' BETWEEN CORP AND CURB STOP

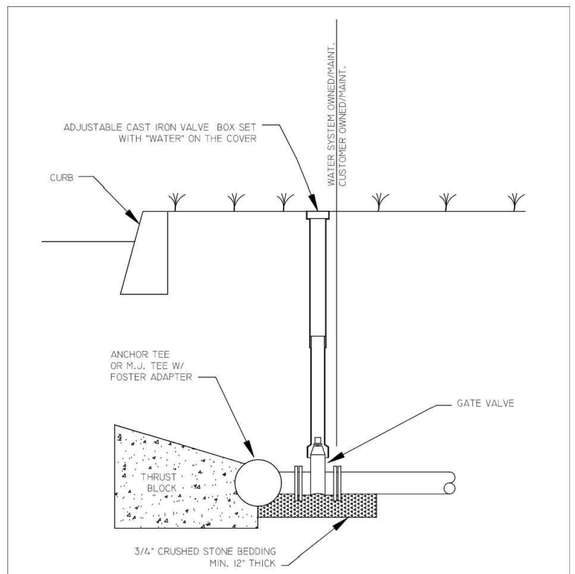
WATER SERVICE CONNECTION

NOT TO SCALE

CHAMPLAIN WATER DISTRICT	CHAMPLAIN WATER DISTRICT Specifications Detail WATER SERVICE CONNECTION	DATE: January 2023 DRAWING NO.: A-2

WATER SERVICE CONNECTION

N.T.S.



NOTE: THERE SHALL BE SEPARATE FIRE AND DOMESTIC SERVICE SHUTOFFS OUTSIDE THE BUILDING

TYPICAL FIRE SERVICE CONNECTION

NOT TO SCALE

CHAMPLAIN WATER DISTRICT	CHAMPLAIN WATER DISTRICT Specifications Detail TYPICAL FIRE SERVICE	DATE: January 2024 DRAWING NO.: A-4

TYPICAL FIRE SERVICE CONNECTION

N.T.S.

Date	Description	No.
Revisions		

STATE OF VERMONT JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

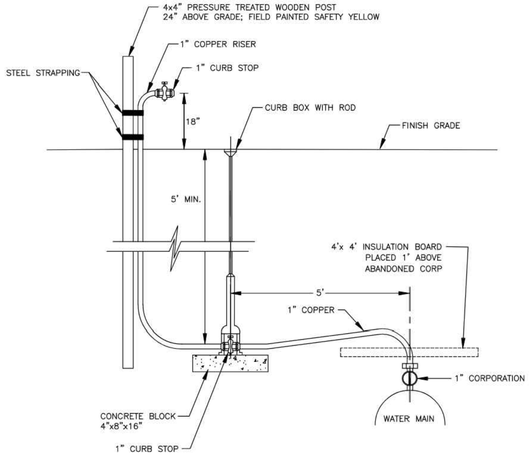
Drawing Title

UTILITY DETAILS III

Project No.	Drawing No.
140278401	CU503
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

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Project No. 140278401



NOTES: 1) AFTER USE TURN OFF CORPORATION AND REMOVE COPPER TO CORPORATION, AND CAP CORPORATION
2) AFTER USE PLACE INSULATION BOARD ABOVE ABANDONED CORPORATION

TEMPORARY CHLORINATION INJECTION INSTALLATION

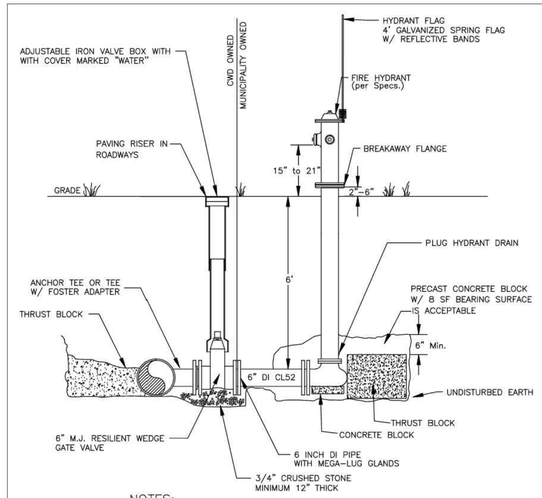
NOT TO SCALE

CHAMPLAIN WATER DISTRICT
Specifications Detail
CHLORINATION INJECTION

DATE: APRIL 2019
DRAWING NO.: A-12

1 TEMPORARY CHLORINATION INJECTION INSTALLATION

N.T.S.



NOTES:

1) ALL FITTINGS ARE TO HAVE WEDGE STYLE RETAINER GLANDS
2) PRIOR TO POURING THRUST BLOCKS ALL FITTINGS ARE TO BE WRAPPED WITH 4mil. POLYETHYLENE.
3) THE ABOVE OWNERSHIP LINE REFERENCES HYDRANTS ON CWD TRANSMISSION MAINS. REFER TO SPECIFICATIONS FOR MORE INFORMATION.

HYDRANT ASSEMBLY

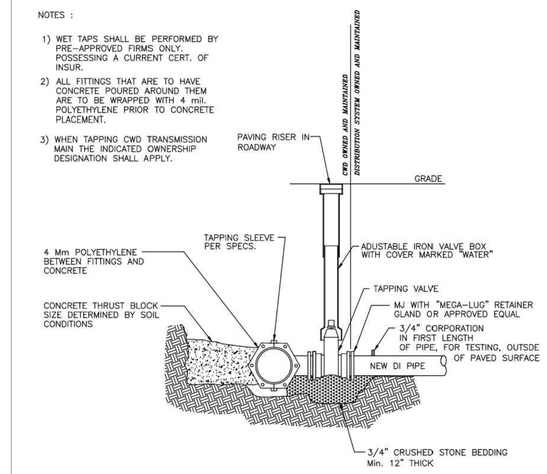
NOT TO SCALE

CHAMPLAIN WATER DISTRICT
Specifications Detail
HYDRANT ASSEMBLY

DATE: JANUARY 2023
DRAWING NO.: A-20

2 HYDRANT ASSEMBLY

N.T.S.



TAPPING SLEEVE AND VALVE

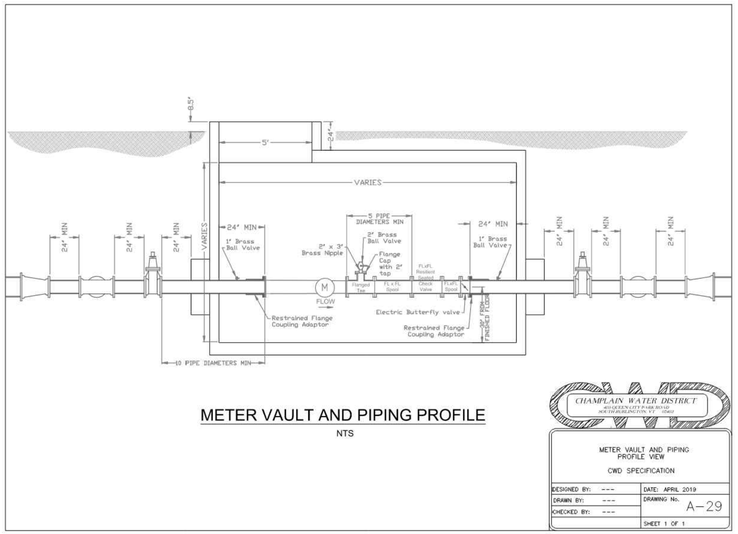
NOT TO SCALE

CHAMPLAIN WATER DISTRICT
Specifications Detail
TAPPING SLEEVE & VALVE

DATE: JUNE 2019
DRAWING NO.: A-6

3 TAPPING SLEEVE AND VALVE

N.T.S.



METER VAULT AND PIPING PROFILE

NTS

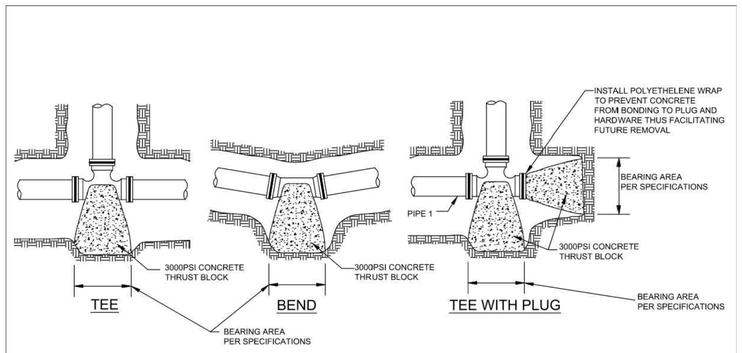
CHAMPLAIN WATER DISTRICT
402 QUEEN CITY PARK ROAD
BURLINGTON, VT 05401

METER VAULT AND PIPING PROFILE VIEW
CWD SPECIFICATION

DESIGNED BY: ---
DRAWN BY: ---
CHECKED BY: ---
DATE: APRIL 2019
DRAWING No. A-29
SHEET 1 OF 1

4 METER VAULT AND PIPING PROFILE VIEW

N.T.S.



NOTES:

1. CONCRETE NOT TO OVERLAP ANY JOINT.
2. CONCRETE TO BE PLACED SO AS NOT TO INTERFERE WITH REMOVING OR INSTALLING ANY OF THE JOINTING HARDWARE.
3. ALL MECHANICAL JOINT FITTINGS TO HAVE RETAINER GLANDS.
4. CONCRETE THRUST BLOCKS SHALL BE POURED TO PROPER DIMENSIONS USING SIDE FORMS.

NOT TO SCALE

CHAMPLAIN WATER DISTRICT
402 QUEEN CITY PARK ROAD
BURLINGTON, VT 05401

TYPICAL CONCRETE THRUST BLOCK
SPECIFICATIONS DETAIL

DESIGNED BY: ---
DRAWN BY: ---
CHECKED BY: ---
DATE: MARCH 2022
DRAWING No. A-31
SHEET 1 OF 1

5 TYPICAL CONCRETE THRUST BLOCK

N.T.S.

Date	Description	No.

Revisions

STATE OF VERMONT · JOHN D. PLANTE · NO. 0093000 CIVIL · LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

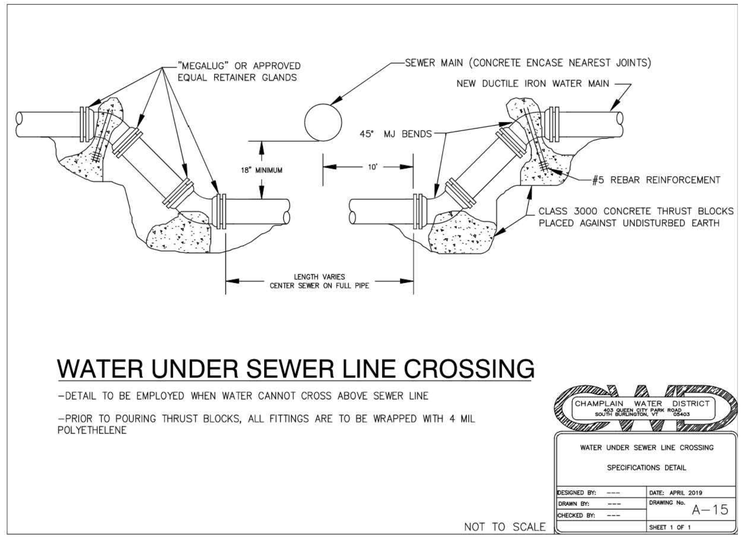
Drawing Title
UTILITY DETAILS IV

Project No. 140278401
Date 01/30/2025
Drawn By LT
Checked By DTG

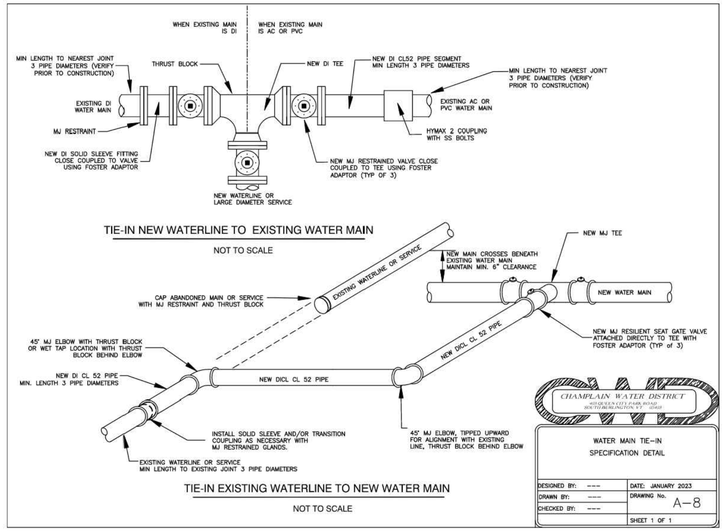
Drawing No. CU504

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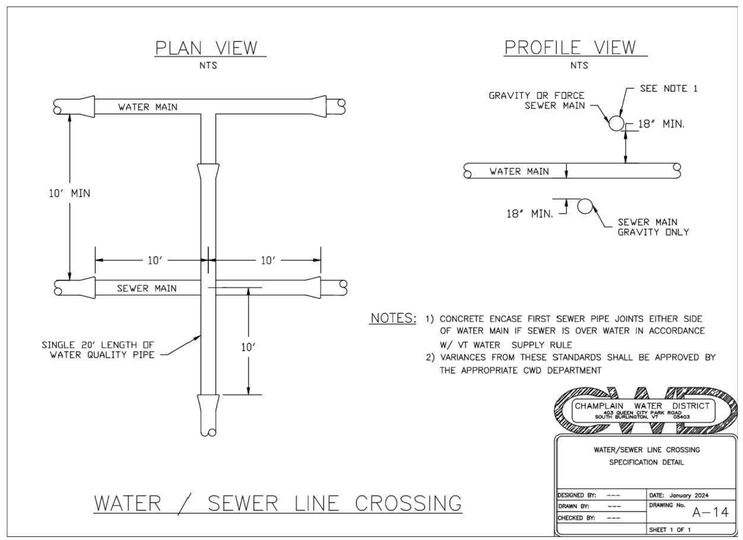
LANGAN Project No. 140278401



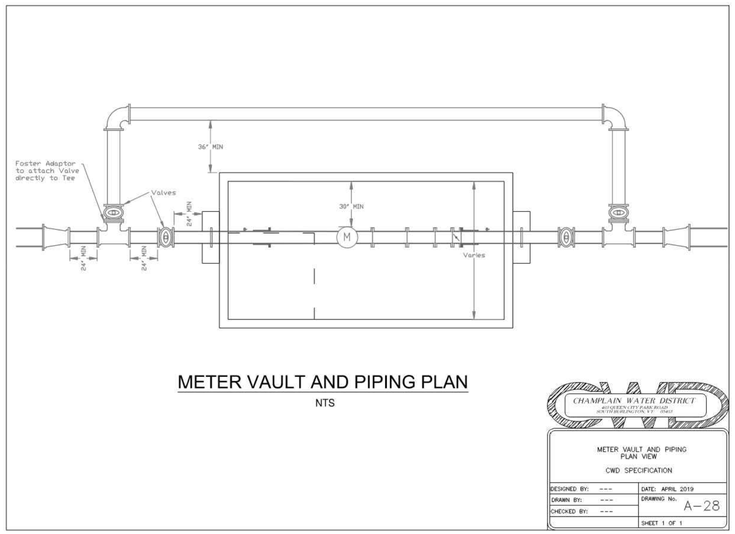
1 WATER UNDER SEWER LINE CORSSING
N.T.S.



2 WATER MAIN TIE-IN
N.T.S.



3 WATER/SEWER LINE CROSSING
N.T.S.



4 METER VAULT AND PIPING PLAN VIEW
N.T.S.

Date	Description	No.

Revisions

JOHN D. PLANTE — STATE OF VERMONT — NO. 0093000 CIVIL — LICENSED PROFESSIONAL ENGINEER

Signature Date

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Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title
UTILITY DETAILS V

Project No.	Drawing No.
140278401	CU505
Date: 01/30/2025	
Drawn By: BCP	
Checked By: DTG	

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Project No. 140278401

TEMPORARY SEDIMENT TRAP SIZING

TRAP #	REQUIRED	PROPOSED
#1	11.03 AC * 3,600 CF/AC = 39,708 CF	0.4 * 24,943 SF * 5 FT = 49,886 CF
#2	2.69 AC * 3,600 CF/AC = 9,684 CF	0.4 * 8,164 SF * 5 FT = 16,328 CF
#3	4.05 AC * 3,600 CF/AC = 14,580 CF	0.4 * 8,344 SF * 5 FT = 16,688 CF

NOTES:

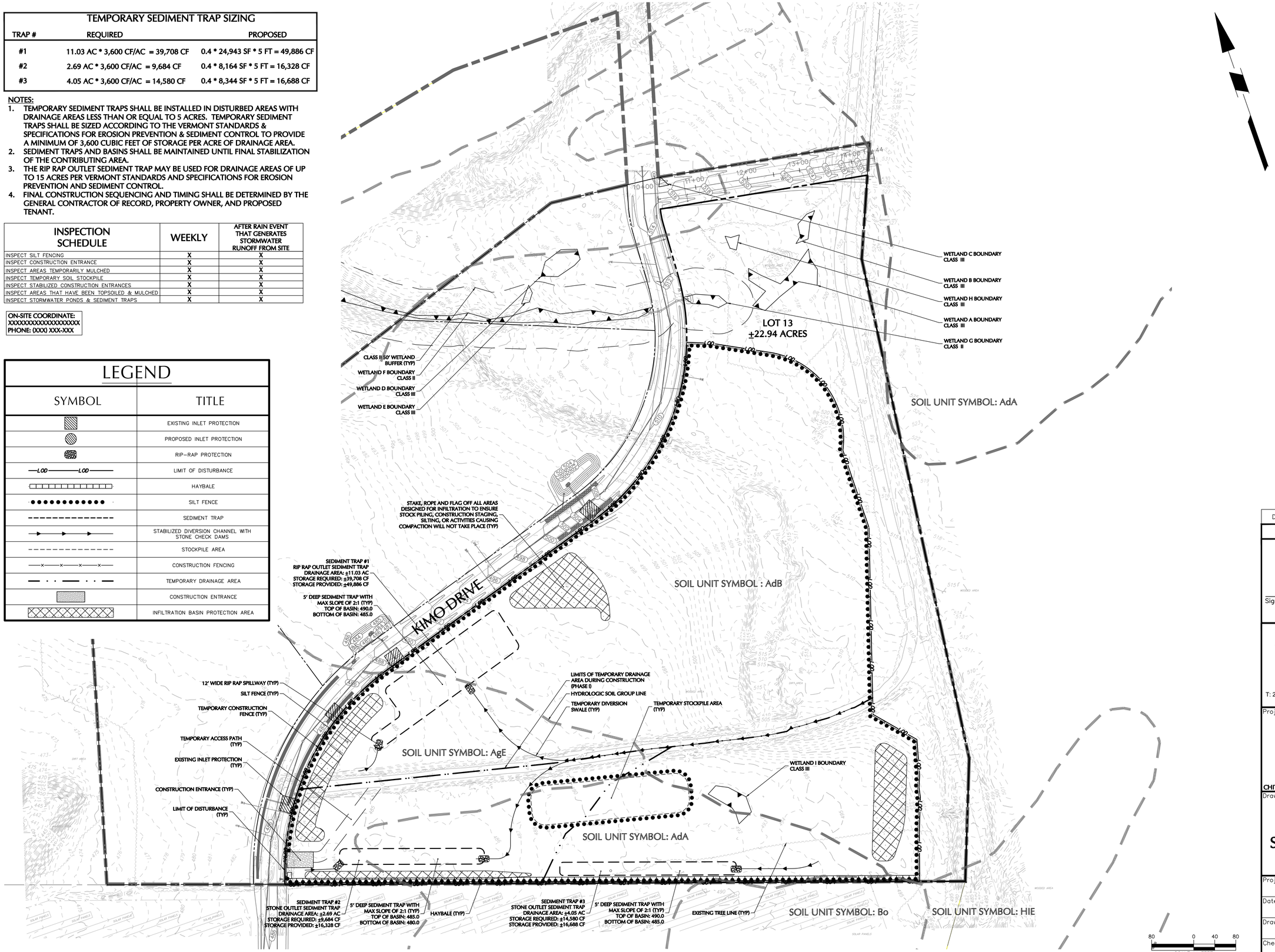
1. TEMPORARY SEDIMENT TRAPS SHALL BE INSTALLED IN DISTURBED AREAS WITH DRAINAGE AREAS LESS THAN OR EQUAL TO 5 ACRES. TEMPORARY SEDIMENT TRAPS SHALL BE SIZED ACCORDING TO THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL TO PROVIDE A MINIMUM OF 3,600 CUBIC FEET OF STORAGE PER ACRE OF DRAINAGE AREA.
2. SEDIMENT TRAPS AND BASINS SHALL BE MAINTAINED UNTIL FINAL STABILIZATION OF THE CONTRIBUTING AREA.
3. THE RIP RAP OUTLET SEDIMENT TRAP MAY BE USED FOR DRAINAGE AREAS OF UP TO 15 ACRES PER VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL.
4. FINAL CONSTRUCTION SEQUENCING AND TIMING SHALL BE DETERMINED BY THE GENERAL CONTRACTOR OF RECORD, PROPERTY OWNER, AND PROPOSED TENANT.

INSPECTION SCHEDULE	WEEKLY	AFTER RAIN EVENT THAT GENERATES STORMWATER RUNOFF FROM SITE
INSPECT SILT FENCING	X	X
INSPECT CONSTRUCTION ENTRANCE	X	X
INSPECT AREAS TEMPORARILY MULCHED	X	X
INSPECT TEMPORARY SOIL STOCKPILE	X	X
INSPECT STABILIZED CONSTRUCTION ENTRANCES	X	X
INSPECT AREAS THAT HAVE BEEN TOPSOILED & MULCHED	X	X
INSPECT STORMWATER PONDS & SEDIMENT TRAPS	X	X

ON-SITE COORDINATE:
XXXXXXXXXXXXXXXXX
PHONE: (XXX) XXX-XXX

LEGEND

SYMBOL	TITLE
	EXISTING INLET PROTECTION
	PROPOSED INLET PROTECTION
	RIP-RAP PROTECTION
LOD LOD	LIMIT OF DISTURBANCE
	HAYBALE
	SILT FENCE
	SEDIMENT TRAP
	STABILIZED DIVERSION CHANNEL WITH STONE CHECK DAMS
	STOCKPILE AREA
x x x x	CONSTRUCTION FENCING
	TEMPORARY DRAINAGE AREA
	CONSTRUCTION ENTRANCE
	INFILTRATION BASIN PROTECTION AREA



Date	Description	No.

Revisions

STATE OF VERMONT JOHN D. PALMER NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

EROSION PREVENTION & SEDIMENT CONTROL PLAN PHASE I

Project No.	Drawing No.
140278401	CE101
Date: 01/30/2025	
Drawn By: BCP	
Checked By: DTG	

LANGAN
Project No. 140278401

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LEGEND

SYMBOL	TITLE
	EXISTING INLET PROTECTION
	PROPOSED INLET PROTECTION
	RIP-RAP PROTECTION
LOD LOD	LIMIT OF DISTURBANCE
	HAYBALE
	SILT FENCE
	SEDIMENT TRAP
	STABILIZED DIVERSION CHANNEL WITH STONE CHECK DAMS
	STOCKPILE AREA
	CONSTRUCTION FENCING
	TEMPORARY DRAINAGE AREA
	CONSTRUCTION ENTRANCE
	INFILTRATION BASIN PROTECTION AREA
	EROSION CONTROL BLANKET

ZONE: RPD-1 60%
ZONE: RPD-1 40%

LOT 12
± 1.69 ACRES

LOT 13
±22.94 ACRES

LOT 11
± 7.70 ACRES

LOT 10
± 5.38 ACRES

WETLAND C BOUNDARY CLASS III
WETLAND B BOUNDARY CLASS III
WETLAND H BOUNDARY CLASS III
WETLAND A BOUNDARY CLASS III
WETLAND G BOUNDARY CLASS II
CLASS II 50' WETLAND BUFFER (TYP)
WETLAND F BOUNDARY CLASS II
WETLAND D BOUNDARY CLASS III
WETLAND E BOUNDARY CLASS III

SOIL UNIT SYMBOL: AdA
SOIL UNIT SYMBOL : AdB
SOIL UNIT SYMBOL: AgE
SOIL UNIT SYMBOL: Bo
SOIL UNIT SYMBOL: HIE

PROPOSED DISTRIBUTION FACILITY
FFE: 511.50

KIMO DRIVE

EXISTING INLET PROTECTION (TYP)
STAKE, ROPE AND FLAG OFF ALL AREAS DESIGNED FOR INFILTRATION TO ENSURE STOCK PILING, CONSTRUCTION STAGING, SILTING, OR ACTIVITIES CAUSING COMPACTION WILL NOT TAKE PLACE (TYP)
LIMIT OF DISTURBANCE (TYP)
PROPOSED INLET PROTECTION (TYP)
HYDROLOGIC SOIL GROUP LINE
INSTALL EROSION CONTROL BLANKET ON ALL SLOPES EQUAL TO OR GREATER THAN 3:1 (TYP)
CONSTRUCTION ENTRANCE (TYP)
TEMPORARY CONSTRUCTION FENCE (TYP)
TEMPORARY STOCKPILE AREA (TYP)
SILT FENCE (TYP)
WETLAND I BOUNDARY CLASS III
EXISTING TREE LINE (TYP)

SCALE IN FEET: 80 0 40 80

Date	Description	No.

Revisions

STATE OF VERMONT
JOHN D. PLANTE
NO. 0093000
CIVIL
LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title
EROSION PREVENTION & SEDIMENT CONTROL PLAN PHASE II

Project No.	Drawing No.
140278401	CE102
Date: 01/30/2025	
Drawn By: BCP	
Checked By: DTG	

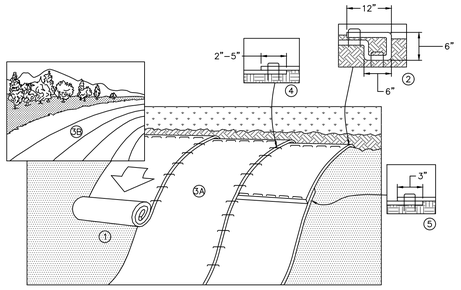
LANGAN
Project No. 140278401

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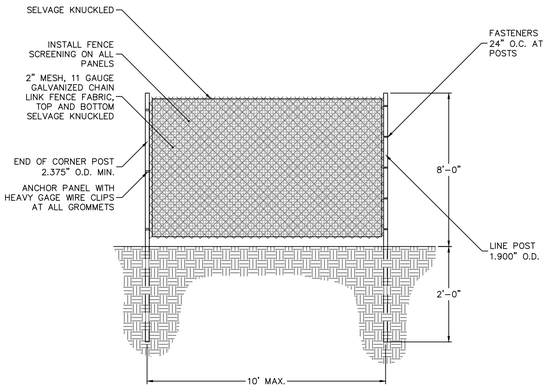
Date: 1/29/2025 Time: 10:24 User: bpalma Style Table: Langan,stb Layout: CE101 Document Code: 140278401-0501-CE101-0102

NOTES:
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" (15cm) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIAMATELY 12" (30cm) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30cm) PORTION OF THE BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH THE APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5cm-12.5cm) OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON TEH PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIAMTE 3" (7.5cm) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30cm) APART ACROSS ENTIRE BLANKET WIDTH.

NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15cm) MAT BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

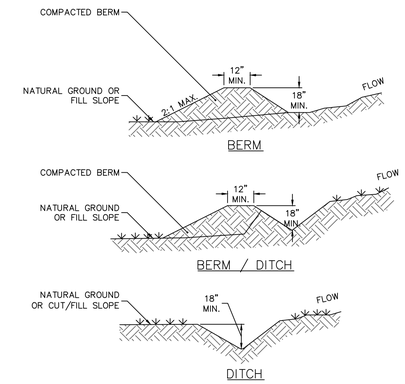


1 EROSION CONTROL BLANKET
N.T.S.



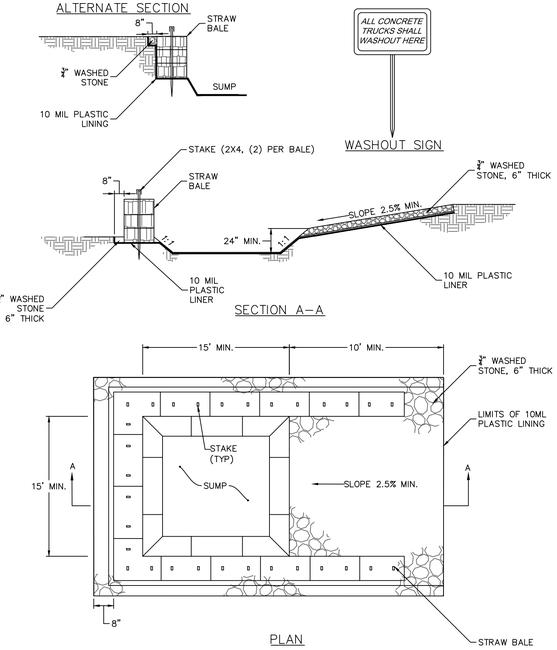
NOTES:
1. PIPE POSTS SHALL BE IMBEDDED INTO THE GROUND. PEDESTAL MOUNTED FENCING WILL ONLY BE ALLOWED AT AREAS APPROVED BY THE PROJECT MANAGER. WHEN ALLOWED, PROVIDE CONCRETE OR GALVANIZED-STEEL BASES FOR SUPPORTING POSTS. PROVIDE BLUE REINFORCED SCRIM SHEETING ON ALL FENCING.

2 TEMPORARY CONSTRUCTION FENCE
N.T.S.

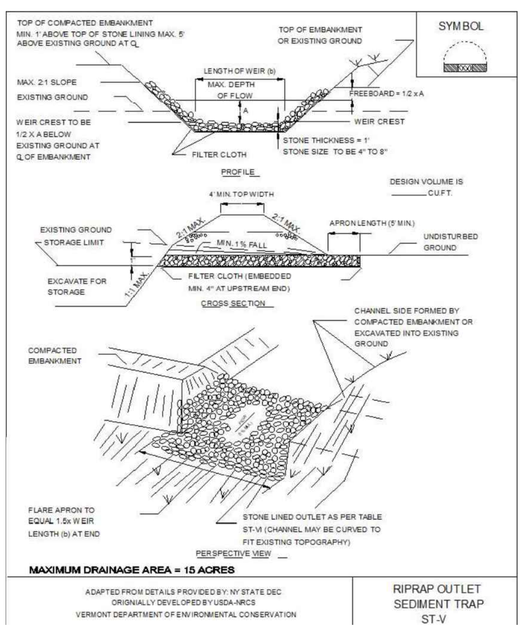


NOTES:
1. POSITIVE GRADE MUST BE PROVIDED TO ASSURE DRAINAGE. 2:1 MAX. SIDE SLOPE. IF SLOPE EXCEEDS 2% OR CHANNEL IS CONSTRUCTED IN FILL, PROVIDE CHANNEL LINER PER DETAIL, EC 5, TRY NOT TO EXCEED 5% (HIGH RUNOFF VELOCITIES RESULT). MAXIMUM DRAINAGE AREA IS 5.00 ACRES WITHOUT SUPPORTING CALCULATIONS FOR PERMANENT CHANNEL. DIVERSIONS AT THE TOPS OF SLOPES MUST EMPTY INTO AN APPROVED SLOPE DRAIN. THE BERM/DITCH IS THE MOST COMMONLY USED DIVERSION.
2. MACHINE COMPACTING OF ALL FILL IS REQUIRED/
3. DIVERSIONS SUFFICIENT TO DIRECT ALL SEDIMENT-LADEN STORMWATER INTO SEDIMENT CONTROL DEVICE MUST BE INSTALLED PRIOR TO CLEARING AND GRUBBING OF AREA (OR IN CONJUNCTION WITH THIS OPERATION IF SEDIMENT CONTROLS AND DIVERSIONS ARE INSTALLED AT EACH CRITICAL POINT AS INDICATED).
4. DIVERSIONS SHOULD BE LOCATED AS SHOWN ON THE PLANS AND TO MINIMIZE DAMAGES BY CONSTRUCTION OPERATIONS.
5. DIVERSIONS SHOULD BE SEEDED AND LINED WITH STRAW MAT IF THEY ARE TO REMAIN IN PLACE OVER 14 DAYS.
6. CHECK DIVERSIONS AFTER EACH RAIN, AND ONCE PER SEVEN CALENDAR DAYS OR MORE FREQUENTLY IF REQUIRED BY REGULATORY AGENCY. REPAIR AS NEEDED TO MAINTAIN FUNCTION.
7. STONE OR RIPRAP TO BE ADDED TO BERM/DITCH AS REQUIRED TO MITIGATE EROSION.

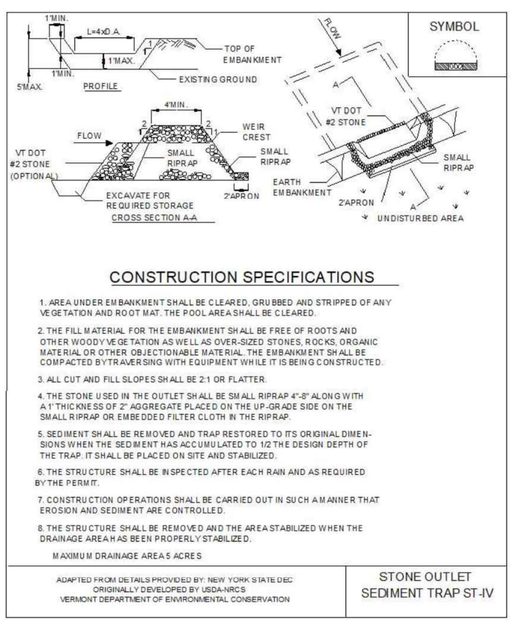
3 TEMPORARY DIVERSION BERM-DITCH
N.T.S.



4 CONCRETE WASHOUT AREA
N.T.S.



5 RIPRAP OUTLET SEDIMENT TRAP
N.T.S.



6 STONE OUTLET SEDIMENT TRAP
N.T.S.

Date	Description	No.
Revisions		

STATE OF VERMONT JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

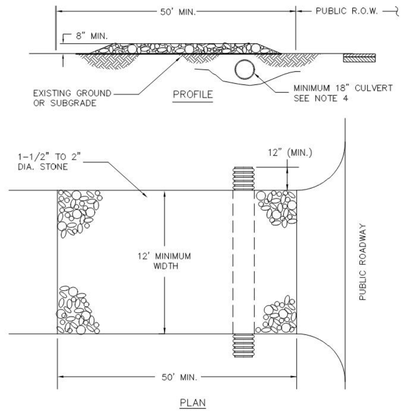
Drawing Title
EROSION PREVENTION & SEDIMENT CONTROL DETAILS I

Project No.	Drawing No.
140278401	CE501
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

LANGAN Project No. 140278401

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Date: 1/29/2025 Time: 10:24 User: bpalma Style Table: Langan,stb Layout: CE501 Document Code: 140278401-0501-CE501-0101



NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT TRACKED, SPILLED, OR WASHED ONTO PUBLIC RIGHTS-OF-WAY SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR.
2. THE USE OF CALCIUM CHLORIDE OR WATER MAY BE NECESSARY TO CONTROL DUST. 3. PROVIDE APPROPRIATE TRANSITION BETWEEN STABILIZED CONSTRUCTION ENTRANCE AND PUBLIC RIGHT-OF-WAY.
3. A TEMPORARY CROSS CULVERT SHALL BE INSTALLED AS REQUIRED, OR AS DIRECTED BY THE TOWN, IF THE ENTRANCE SPANS AN EXISTING SWALE/DITCH. THE TEMPORARY CULVERT SHALL ONLY BE REMOVED WHEN THE PERMANENT CULVERT HAS BEEN INSTALLED.

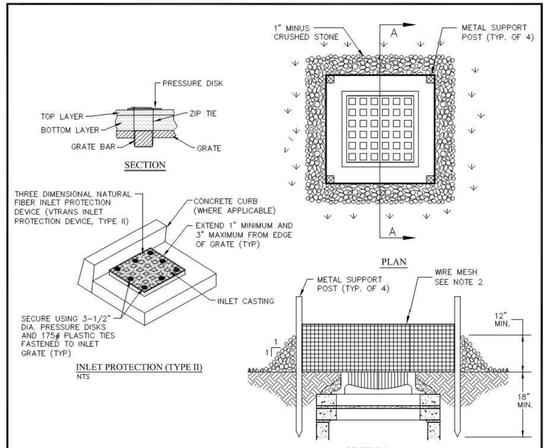
TOWN OF ESSEX PUBLIC WORKS 81 MAIN STREET ESSEX JCT., VT 05452 PH 802 878-1344 FX 802 878-1355 EI www.essex.org

TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

STABILIZED CONSTRUCTION ENTRANCE

Detail No: 500.01
Scale: NOT TO SCALE
Date: JAN. 2017
A-41

1 STABILIZED CONSTRUCTION ENTRANCE
N.T.S.



NOTES:

1. THE CONTRACTOR SHALL MAINTAIN THE ROCK BARRIER INLET PROTECTION THROUGHOUT CONSTRUCTION. THE ROCK BARRIERS SHALL BE MAINTAINED AFTER EACH STORM EVENT. ANY DAMAGE OR EROSION SHALL BE REPAIRED IMMEDIATELY.
2. WIRE MESH WITH 1/2" MAXIMUM OPENINGS. SECURE MESH TIGHTLY TO METAL POSTS BEFORE PLACEMENT OF CRUSHED STONE.
3. CONCRETE CINDER BLOCKS SHALL BE PLACED AROUND THE DRAIN AREA SUCH THAT OPEN AREAS OF BLOCKS ALLOW FLOW TO GRATE. WIRE MESH WITH 1/2" MAXIMUM OPENINGS SHALL BE PLACED AROUND THE CONCRETE BLOCKS TO PREVENT CRUSHED STONE FROM WASHING INTO STRUCTURE.
4. THE CONTRACTOR SHALL MAINTAIN ALL INLET PROTECTION DEVICES THROUGH THE DURATION OF THE PROJECT. THE CONTRACTOR SHALL REMOVE ALL SEDIMENT AND CONSTRUCTION DEBRIS FROM ALL CATCH BASINS WITHIN THE AREAS OF CONSTRUCTION.

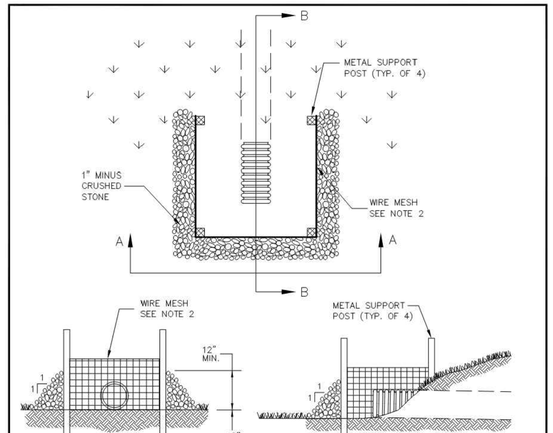
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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

DRAINAGE INLET PROTECTION DETAILS

Detail No: 500.04
Scale: NOT TO SCALE
Date: JAN. 2017
A-44

2 DRAINAGE INLET PROTECTION DETAILS
N.T.S.



NOTES:

1. THE CONTRACTOR SHALL MAINTAIN THE CULVERT INLET PROTECTION THROUGHOUT CONSTRUCTION. THE CULVERT INLETS SHALL BE MAINTAINED AFTER EACH STORM EVENT. ANY DAMAGE OR EROSION SHALL BE REPAIRED IMMEDIATELY.
2. WIRE MESH WITH 1/2" MAXIMUM OPENINGS. SECURE MESH TIGHTLY TO METAL POSTS BEFORE PLACEMENT OF CRUSHED STONE.
3. THE CONTRACTOR SHALL MAINTAIN ALL INLET PROTECTION THROUGH THE DURATION OF THE PROJECT.

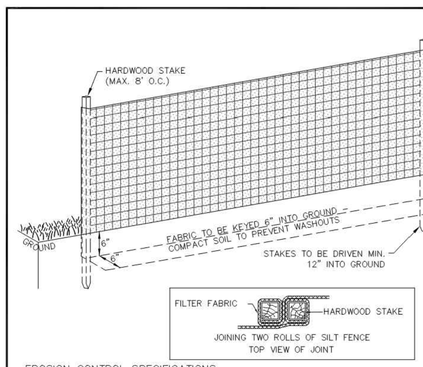
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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

CULVERT INLET PROTECTION

Detail No: 500.05
Scale: NOT TO SCALE
Date: JAN. 2017
A-45

3 CULVERT INLET PROTECTION
N.T.S.



EROSION CONTROL SPECIFICATIONS

1. PRIOR TO THE BEGINNING OF CONSTRUCTION OR EARTHMOVING, THE CONTRACTOR SHALL INSTALL A CONTINUOUS ROW OF SILT FENCE AT THE LIMIT OF DISTURBANCE AS SHOWN ON THE PROJECT PLANS.
2. TO ENSURE PROPER FUNCTION, THE SILT FENCE SHALL BE PROPERLY INSTALLED. THIS INCLUDES DRIVING THE POSTS TO A DEPTH OF 12 INCHES, KEYING THE SILT FENCE FABRIC 6 INCHES INTO THE GROUND, AND COMPACTING THE SOIL OVER THE KEYED-IN PORTION OF THE FABRIC. USE ONLY MANUAL METHODS OF INSTALLATION WITHIN WETLANDS AND BUFFER ZONES.
3. THE SILT FENCE SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION OF THE PROJECT AND UNTIL ESTABLISHMENT OF VEGETATION SUFFICIENT TO PREVENT SOIL EROSION. AFTER WORK IS COMPLETE AND THE DISTURBED SOIL HAS BEEN STABILIZED, THE CONTRACTOR SHALL REMOVE ALL SILT FENCE FROM THE SITE.
4. PROPER SILT FENCE MAINTENANCE SHALL INCLUDE INSPECTIONS AT REGULAR INTERVALS AND AFTER EVERY HEAVY RAINFALL TO ENSURE THAT THERE ARE NO BROKEN POSTS, FABRIC TEARS, WASHOUTS OF THE BOTTOM EDGE OF THE FABRIC, OR EXCESSIVE SEDIMENT ACCUMULATION. ANY DAMAGE OR DEFECTS SHALL BE REPAIRED IMMEDIATELY. SEDIMENT ACCUMULATION OF MORE THAN ONE-QUARTER THE HEIGHT OF THE FABRIC SHALL BE REMOVED AND PLACED IN AN APPROPRIATE AREA OUTSIDE WETLANDS AND BUFFER ZONES.
5. THE CONTRACTOR SHALL INSTALL SILT FENCE AT OTHER LOCATIONS AS NEEDED.

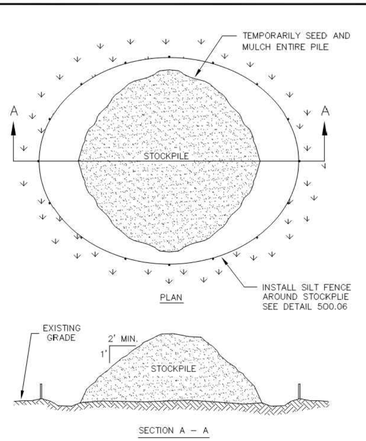
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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

SILT FENCE

Detail No: 500.06
Scale: NOT TO SCALE
Date: JAN. 2017
A-46

4 SILT FENCE
N.T.S.



NOTES:

1. THE CONTRACTOR SHALL MAINTAIN THE SILT FENCE SURROUNDING THE STOCKPILE THROUGHOUT CONSTRUCTION. THE SILT FENCE SHALL BE MAINTAINED AFTER EACH STORM EVENT. ANY DAMAGE OR EROSION SHALL BE REPAIRED IMMEDIATELY.
2. REFERENCE SECTION 300 OF THESE SPECIFICATIONS FOR CONSTRUCTION FOR FURTHER EROSION CONTROL REQUIREMENTS.

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TOWN OF ESSEX, VERMONT
STANDARD SPECIFICATIONS FOR CONSTRUCTION

STOCKPILE EROSION PROTECTION

Detail No: 500.08
Scale: NOT TO SCALE
Date: JAN. 2017
A-48

5 STOCKPILE EROSION PROTECTION
N.T.S.

Date	Description	No.

Revisions

STATE OF VERMONT JOHN D. PLANTE NO. 0093000 CIVIL LICENSED PROFESSIONAL ENGINEER

Signature Date

LANGAN
Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title
EROSION PREVENTION & SEDIMENT CONTROL DETAILS II

Project No.	Drawing No.
140278401	CE502
Date: 01/30/2025	
Drawn By: LT	
Checked By: DTG	

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LANGAN Project No. 140278401

SITE LIGHTING SCHEDULE

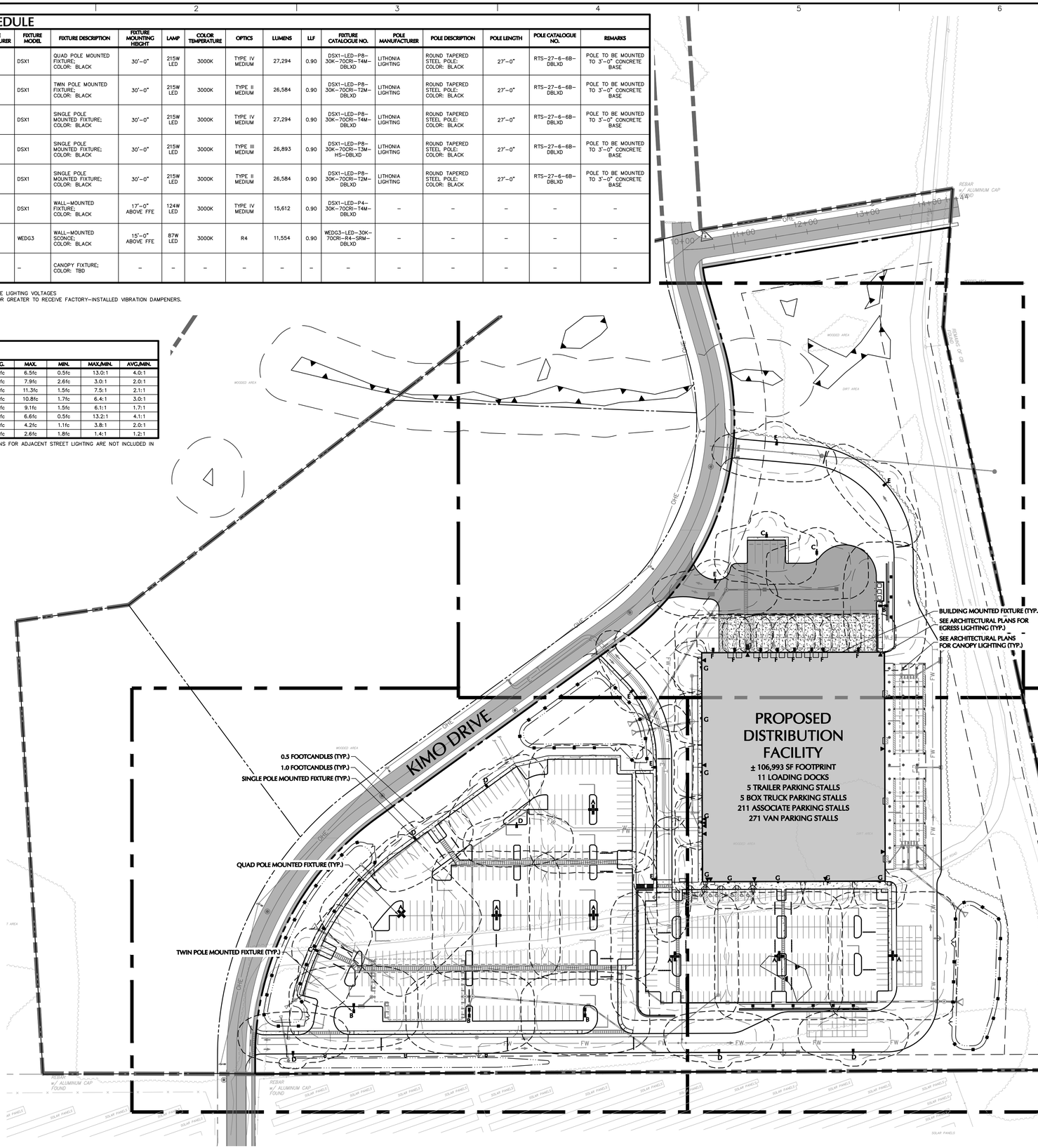
SYMBOL	KEY	QTY.	FIXTURE MANUFACTURER	FIXTURE MODEL	FIXTURE DESCRIPTION	FIXTURE MOUNTING HEIGHT	LAMP	COLOR TEMPERATURE	OPTICS	LUMENS	LLF	FIXTURE CATALOGUE NO.	POLE MANUFACTURER	POLE DESCRIPTION	POLE LENGTH	POLE CATALOGUE NO.	REMARKS
	A	7	LITHONIA LIGHTING	DSX1	QUAD POLE MOUNTED FIXTURE; COLOR: BLACK	30'–0"	215W LED	3000K	TYPE IV MEDIUM	27,294	0.90	DSX1–LED–P8–30K–70CRI–T4M–DBLXD	LITHONIA LIGHTING	ROUND TAPERED STEEL POLE; COLOR: BLACK	27'–0"	RTS–27–6–6B–DBLXD	POLE TO BE MOUNTED TO 3'–0" CONCRETE BASE
	B	4	LITHONIA LIGHTING	DSX1	TWIN POLE MOUNTED FIXTURE; COLOR: BLACK	30'–0"	215W LED	3000K	TYPE II MEDIUM	26,584	0.90	DSX1–LED–P8–30K–70CRI–T2M–DBLXD	LITHONIA LIGHTING	ROUND TAPERED STEEL POLE; COLOR: BLACK	27'–0"	RTS–27–6–6B–DBLXD	POLE TO BE MOUNTED TO 3'–0" CONCRETE BASE
	C	3	LITHONIA LIGHTING	DSX1	SINGLE POLE MOUNTED FIXTURE; COLOR: BLACK	30'–0"	215W LED	3000K	TYPE IV MEDIUM	27,294	0.90	DSX1–LED–P8–30K–70CRI–T4M–DBLXD	LITHONIA LIGHTING	ROUND TAPERED STEEL POLE; COLOR: BLACK	27'–0"	RTS–27–6–6B–DBLXD	POLE TO BE MOUNTED TO 3'–0" CONCRETE BASE
	D	6	LITHONIA LIGHTING	DSX1	SINGLE POLE MOUNTED FIXTURE; COLOR: BLACK	30'–0"	215W LED	3000K	TYPE III MEDIUM	26,893	0.90	DSX1–LED–P8–30K–70CRI–T3M–HS–DBLXD	LITHONIA LIGHTING	ROUND TAPERED STEEL POLE; COLOR: BLACK	27'–0"	RTS–27–6–6B–DBLXD	POLE TO BE MOUNTED TO 3'–0" CONCRETE BASE
	E	6	LITHONIA LIGHTING	DSX1	SINGLE POLE MOUNTED FIXTURE; COLOR: BLACK	30'–0"	215W LED	3000K	TYPE II MEDIUM	26,584	0.90	DSX1–LED–P8–30K–70CRI–T2M–DBLXD	LITHONIA LIGHTING	ROUND TAPERED STEEL POLE; COLOR: BLACK	27'–0"	RTS–27–6–6B–DBLXD	POLE TO BE MOUNTED TO 3'–0" CONCRETE BASE
	F	8	LITHONIA LIGHTING	DSX1	WALL–MOUNTED FIXTURE; COLOR: BLACK	17'–0" ABOVE FFE	124W LED	3000K	TYPE IV MEDIUM	15,612	0.90	DSX1–LED–P4–30K–70CRI–T4M–DBLXD	–	–	–	–	–
	G	9	LITHONIA LIGHTING	WEDG3	WALL–MOUNTED SCONCE; COLOR: BLACK	15'–0" ABOVE FFE	87W LED	3000K	R4	11,554	0.90	WEDG3–LED–30K–70CRI–R4–SRM–DBLXD	–	–	–	–	–
	H	–	–	–	CANOPY FIXTURE; COLOR: TBD	–	–	–	–	–	–	–	–	–	–	–	–

NOTES:
1. REFER TO ELECTRICAL DRAWINGS FOR SITE LIGHTING VOLTAGES.
2. ALL POLES WITH 25' MOUNTING HEIGHT OR GREATER TO RECEIVE FACTORY–INSTALLED VIBRATION DAMPENERS.

STATISTICS

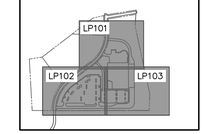
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DRIVE AISLES	2.0fc	6.5fc	0.5fc	13.0:1	4.0:1
LOADING DOCK	5.3fc	7.9fc	2.6fc	3.0:1	2.0:1
PARKING	3.2fc	11.3fc	1.5fc	7.5:1	2.1:1
PEDESTRIAN WALK – BUILDING	5.0fc	10.8fc	1.7fc	6.4:1	3.0:1
PEDESTRIAN WALK – PARKING	2.6fc	9.1fc	1.5fc	6.1:1	1.7:1
QUEUING DRIVE AISLE	2.0fc	6.6fc	0.5fc	13.2:1	4.1:1
TRUCK COURT	2.2fc	4.2fc	1.1fc	3.8:1	2.0:1
TRUCK PARKING	2.2fc	2.6fc	1.8fc	1.4:1	1.2:1

NOTE: LIGHT PHOTOMETRY AND CALCULATIONS FOR ADJACENT STREET LIGHTING ARE NOT INCLUDED IN THE ABOVE STATISTICS.



SHEET LEGEND

1" = 1,000'



Date	Description	No.
Revisions		

VERMONT MICHAEL HUNTON No. 1337139 LANDSCAPE ARCHITECT

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

OVERALL SITE LIGHTING PLAN

Project No.	Drawing No.
140278401	LL100
Date: 01/30/2025	
Drawn By: AC	
Checked By: JA	

LANGAN

Project No. 140278401

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SHEET LEGEND

1" = 1,000'

Date	Description	No.
Revisions		

VERMONT MICHAEL HUNTON 10/13/25 No. 1337.0138 LANDSCAPE ARCHITECT

Signature Date

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Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

SITE LIGHTING PLAN I

Project No.	Drawing No.
140278401	LL101
Date: 01/30/2025	
Drawn By: AC	
Checked By: JA	

LANGAN

Project No. 140278401

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MATCHLINE: LL101

MATCHLINE: LL102

WOODED AREA

0.5 FOOTCANDLES (TYP)

1.0 FOOTCANDLES (TYP)

SINGLE POLE MOUNTED FIXTURE (TYP)

QUAD POLE MOUNTED FIXTURE (TYP)

TWIN POLE MOUNTED FIXTURE (TYP)

MATCHLINE: LL102

MATCHLINE: LL103

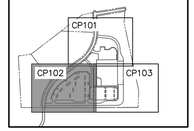
SOLAR PANELS

SCALE IN FEET

0 15 30

SHEET LEGEND

1" = 1,000'



Date	Description	No.

Revisions

VERMONT
MICHAEL HUNTON
No. 1337139
LANDSCAPE ARCHITECT

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

SITE LIGHTING PLAN II

Project No.	Drawing No.
140278401	LL102
Date: 01/30/2025	
Drawn By: AC	
Checked By: JA	

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Project No. 140278401

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Date: 1/29/2025 Time: 10:26 User: bpalma Style Table: Langan.stb Layout: LL102 Document Code: 140278401-0501-LL101-0103

MATCHLINE: LL101

MATCHLINE: LL103

PROPOSED DISTRIBUTION FACILITY

± 106,993 SF FOOTPRINT
11 LOADING DOCKS
5 TRAILER PARKING STALLS
5 BOX TRUCK PARKING STALLS
211 ASSOCIATE PARKING STALLS
271 VAN PARKING STALLS

SEE ARCHITECTURAL PLANS FOR EGRESS LIGHTING (TYP)
SEE ARCHITECTURAL PLANS FOR CANOPY LIGHTING (TYP)
BUILDING MOUNTED FIXTURE (TYP)

QUAD POLE MOUNTED FIXTURE (TYP)

0.5 FOOTCANDLES (TYP)
1.0 FOOTCANDLES (TYP)
SINGLE POLE MOUNTED FIXTURE (TYP)

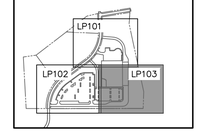
MATCHLINE: LL102

MATCHLINE: LL103

WOODED AREA
DIRT AREA
DIRT ROAD
SOLAR PANELS
72-8
N/F
ALLEN BROOK
DEVELOPMENT INC
949/245
CBDH FOUND

SHEET LEGEND

1" = 1,000'



Date	Description	No.

Revisions

VERMONT MICHAEL HUNTON No. 1337.18 LICENSED LANDSCAPE ARCHITECT

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

SITE LIGHTING PLAN III

Project No.	Drawing No.
140278401	LL103
Date: 01/30/2025	
Drawn By: AC	
Checked By: JA	

30 0 15 30
SCALE IN FEET

LANGAN

Project No. 140278401

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Date: 1/29/2025 Time: 10:27 User: bpalma Style Table: Langan.stb Layout: LL103 Document Code: 140278401-0501-LL101-0104

LIGHTING NOTES:

GENERAL

1. POINT-BY-POINT CALCULATIONS PROVIDED WITHIN HAVE BEEN PREPARED IN ACCORDANCE TO IESNA STANDARDS AND IN CONSIDERATION OF THE VARIABLES WITHIN THESE NOTES AND SITE LIGHTING SCHEDULE. THE VALUES SHOWN ON THE PLANS ARE NOT AN INDICATION OF THE INITIAL LIGHT INTENSITIES OF THE LAMPS. THESE VALUES ARE AN APPROXIMATION OF THE MAINTAINED INTENSITIES DELIVERED TO THE GROUND PLANE USING INDUSTRY STANDARD LIGHT LOSS FACTORS (LLF) WHICH COVER LAMP DEGRADATION AND NATURAL BUILDUP / DIRT DEGRADATION ON THE FIXTURE LENS. THE LIGHTING PLAN IS DESIGNED WITH AN INDUSTRY STANDARD LLF IN ACCORDANCE WITH GUIDANCE AS PROVIDED BY IESNA. MINOR VARIATIONS IN TOPOGRAPHY, PHYSICAL OBSTRUCTIONS, AMBIENT OR ADJACENT LIGHT SOURCES AND/OR OTHER POTENTIAL IMPACTS HAVE NOT BEEN INCLUDED IN THESE CALCULATIONS. THEREFORE, AS-BUILT LIGHT INTENSITIES MAY VARY, IN EITHER DIRECTION, FROM WHAT IS EXPLICITLY PORTRAYED WITHIN THESE DRAWINGS.NO GUARANTEE OF LIGHT LEVELS IS EXPRESSED OR IMPLIED BY THE POINT BY POINT CALCULATIONS SHOWN ON THESE PLANS.
2. LIGHT LEVEL POINT SPACING IS 10 FT. LEFT TO RIGHT AND 10 FT. TOP TO BOTTOM. POINT BY POINT CALCULATIONS ARE BASED ON THE LIGHT LOSS FACTOR AS STATED IN THE LIGHTING SCHEDULE.
3. ALL LIGHTING IS TO BE FULL CUT-OFF.

COMPLIANCE

3. ALL SITE LIGHTING RELATED WORK AND MATERIALS SHALL COMPLY WITH CITY, COUNTY, AND OTHER APPLICABLE GOVERNING AUTHORITY REQUIREMENTS.
4. LIGHTING LAYOUT COMPLIES WITH THE ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IESNA) SAFETY STANDARDS FOR LIGHT LEVELS.

COORDINATION

5. CONTRACTOR TO COORDINATE POWER SOURCE WITH LIGHT FIXTURES TO ENSURE ALL SITE LIGHTING IS OPERATING EFFECTIVELY, EFFICIENTLY AND SAFELY.
6. REFER TO ELECTRIFICATION PLAN FOR PROVIDING ADEQUATE POWER FOR SITE LIGHTING.
7. CONTRACTOR TO COORDINATE LOCATION OF EASEMENTS, UNDERGROUND UTILITIES AND DRAINAGE BEFORE DRILLING POLE BASES.
8. INSTALLATION OF ALL LIGHTING FIXTURES, POLES, FOOTINGS, AND FEEDER CABLE TO BE COORDINATED WITH ALL SITE WORK TRADES TO AVOID CONFLICT WITH FINISHED AND PROPOSED WORK.
9. CONTRACTOR TO COORDINATE INSTALLATION OF UNDERGROUND FEEDER CABLE FOR EXTERIOR LIGHTING WITH EXISTING AND PROPOSED UTILITIES, SITE DRAINAGE SYSTEMS, AND PAVING. CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER'S REPRESENTATIVE SHOULD ANY UTILITIES, NOT SHOWN ON THE PLANS, BE FOUND DURING EXCAVATIONS.

POLES AND FOOTINGS

10. PROVIDE A CONCRETE BASE FOR EACH LIGHT POLE AT THE LOCATIONS INDICATED ON THE CONSTRUCTION DRAWINGS AND/OR IN ACCORDANCE WITH PROJECT PLANS AND SPECIFICATIONS RELATING DIRECTLY TO CAST-IN-PLACE CONCRETE. THE USE OF ALTERNATE LIGHTING FOUNDATIONS, SUCH AS PRECAST, MAY CHANGE THE SIZING AND REINFORCEMENT REQUIREMENTS FROM THOSE SHOWN ON THESE PLANS. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO ORDERING ANY SUBSTITUTED PRODUCTS.
11. CONTRACTOR SHALL EXAMINE AND VERIFY THAT SOIL CONDITIONS ARE SUITABLE TO SUPPORT LOADS EXERTED UPON THE FOUNDATIONS DURING EXCAVATION. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY UNSATISFACTORY CONDITIONS.
12. POLE FOUNDATIONS SHALL NOT BE POURED IF FREE STANDING WATER IS PRESENT IN EXCAVATED AREA.
13. ALL POLES HIGHER THAN 25 FT. SHALL BE EQUIPPED WITH FACTORY INSTALLED VIBRATION DAMPENERS.

WALL MOUNTED FIXTURES

14. CONTRACTOR TO COORDINATE INSTALLATION OF ALL THE WALL MOUNTED FIXTURES AND ELECTRICAL CONNECTIONS TO SITE STRUCTURE(S) WITH BUILDING MEP, ARCHITECT, AND/OR OWNER.
15. INSTALLATION AND ELECTRICAL CONNECTIONS FOR WALL MOUNTED FIXTURES TO BE COORDINATED WITH ARCHITECTURAL, STRUCTURAL, UTILITY AND SITE PLANS AND TO BE IN ACCORDANCE WITH ALL APPLICABLE CODES.

ADJUSTMENT AND INSPECTION

16. CONTRACTOR TO OPERATE EACH LUMINAIRE AFTER INSTALLATION AND CONNECTION. INSPECT FOR IMPROPER CONNECTIONS AND OPERATION.
17. CONTRACTOR TO AIM AND ADJUST ALL LUMINAIRES TO PROVIDE ILLUMINATION LEVELS AND DISTRIBUTION AS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS DIRECTED BY THE LANDSCAPE ARCHITECT AND/OR OWNER.
18. CONTRACTOR TO CONFIRM THAT LIGHT FIXTURES, TILT ANGLE AND AIMING MATCH SPECIFICATIONS ON THE PLANS.

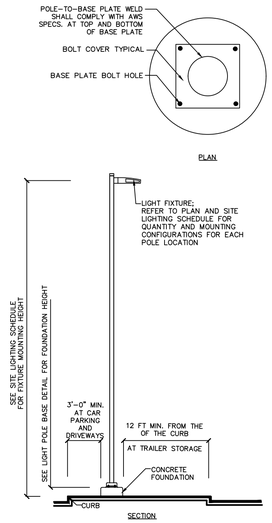
REQUIREMENTS FOR ALTERNATES

19. ALL LIGHTING SUBSTITUTIONS MUST BE MADE WITHIN 14 DAYS PRIOR TO THE BID DATE TO PROVIDE AMPLE TIME FOR REVIEW AND TO ISSUE AN ADDENDUM INCORPORATING THE SUBSTITUTION WITH THE FOLLOWING REQUIREMENTS:
   A. ANY SUBSTITUTION TO LIGHTING FIXTURES, POLES, ETC. MUST BE APPROVED BY THE OWNER, ENGINEER AND TENANTS. ANY COST ASSOCIATED WITH REVIEW AND/OR APPROVAL OF THE SUBSTITUTIONS SHALL BE ENTIRELY BORNE BY THE CONTRACTOR
   B. COMPUTER PREPARED PHOTOMETRIC LAYOUT OF THE PROPOSED LIGHTED AREA WHICH INDICATES, BY ISOFOOTCANDLE, THE SYSTEM'S PERFORMANCE.
   C. A PHOTOMETRIC REPORT FROM A NATIONAL INDEPENDENT TESTING LABORATORY WITH REPORT NUMBER, DATE, FIXTURE CATALOG NUMBER, LUMINAIRE AND LAMP SPECIFICATIONS; IES CALCULATIONS, POINT BY POINT FOOT CANDLE PLAN, STATISTIC ZONES SHOWING AVERAGE, MAXIMUM, MINIMUM AND UNIFORMITY RATIOS, SUMMARY, ISOLUX PLOT, AND CATALOGUE CUTS. CATALOGUE CUTS MUST IDENTIFY OPTICS, LAMP TYPE, DISTRIBUTION TYPE, REFLECTOR, LENS, BALLASTS, WATTAGE, VOLTAGE, FINISH HOUSING DESCRIPTION AND ALL OTHER PERTINENT INFORMATION.
   D. POLE MANUFACTURER AASHTO CALCULATIONS INDICATING THE POLE AND ANCHOR BOLTS BEING SUBMITTED ARE CAPABLE OF SUPPORTING THE POLE AND FIXTURE SYSTEMS BEING UTILIZED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
   E. THE UNDERWRITERS LABORATORY LISTING AND FILE NUMBER FOR THE SPECIFIC FIXTURE(S) TO BE UTILIZED.
   F. A COLOR PHOTOGRAPH THAT CLEARLY SHOWS THE REPLACEMENT FIXTURE POLE MOUNTED, THE FIXTURE'S COLOR, FINISH, AND PHYSICAL CHARACTERISTICS.

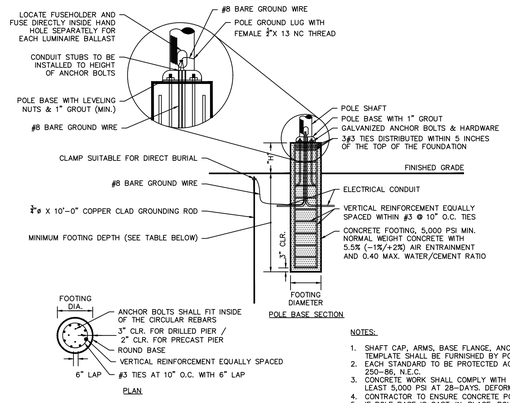
PHOTOMETRIC LIGHTING LEGEND:



NOTE: THE PHOTOMETRIC TEMPLATE REPRESENTS LIGHT THROW FOR EACH INDIVIDUAL FIXTURE AND DOES NOT REPRESENT LIGHT COMING FROM OTHER SOURCES.



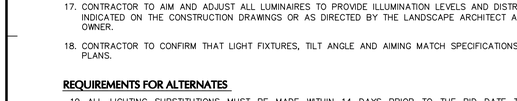
1 LIGHT FIXTURE AND POLE — NTS



MOUNTING HEIGHT	FOOTING DEPTH	FOOTING DIAMETER	VERTICAL REINFORCEMENT	'H'
30'-0"	7'-6"	2'-0"	6 #5 BARS	3'-0" CONCRETE BASE

NOTES:
1. SHAFT CAP, ARMS, BASE FLANGE, ANCHOR BOLTS, LEVELING NUTS, CONNECTION HARDWARE, BOLT COVERS, HANDHOLE COVER, AND BOLT CIRCLE TEMPLATE SHALL BE FURNISHED BY POLE MANUFACTURER.
2. EACH STANDARD TO BE PROTECTED AGAINST LIGHTNING WITH AN INTERCONNECTED GROUND ROD. THIS ROD SHALL BE BONDED PER SECTION NUMBER 250-86, N.E.C.
3. CONCRETE WORK SHALL COMPLY WITH THE REQUIREMENT OF ACI 318. CAST-IN-PLACE SHALL HAVE UNCONFINED COMPRESSIVE STRENGTH OF AT LEAST 5,000 PSI AT 28-DAYS. DEFORMED REINFORCEMENT BARS SHALL CONFORM TO ASTM A615, GRADE 60.
4. CONTRACTOR TO ENSURE CONCRETE POLE BASES ARE POURED / PLACED ABSOLUTELY VERTICAL & LEVEL.
5. IF POLE BASE IS CAST-IN-PLACE, POLE BASE SHALL BE ONE CONTINUOUS POUR. EXPOSED PORTION OF BASE SHALL BE HAND-RUBBED SMOOTH.
6. CONTRACTOR TO COMPACT SUBGRADE AROUND POLE BASE PER EARTHWORK SPECIFICATIONS / GEOTECH REPORT.
7. THE INFORMATION ILLUSTRATED IN THE LIGHT POLE FOUNDATION DETAIL HAS BEEN PROVIDED FOR GENERAL REFERENCE AND PRELIMINARY COST ESTIMATE PURPOSES. LIGHT POLE FOUNDATIONS SHOULD BE DESIGNED AND DETAILED BY A LICENSED STRUCTURAL ENGINEER BASED ON EXISTING SOIL CONDITIONS, LOCAL DESIGN STANDARDS AND MANUFACTURERS RECOMMENDATIONS.
8. CONTRACTOR TO CONFIRM GROUNDING DESIGN WITH MEP.

2 LIGHT POLE BASE — NTS



D-Series Size 1
LED Area Luminaire

d*series

Catalog Number
Notes
Type

Hit the Tab key or mouse over this page to see all interactive elements.

Specifications

EPA:	0.69 ft² (0.06 m²)
Length:	32.71" (831 mm)
Width:	14.26" (362 mm)
Height H1:	7.88" (200 mm)
Height H2:	2.73" (67 mm)
Weight:	34 lbs (15.4 kg)

Introduction

The modern styling of the D-Series features a highly refined aesthetic that blends seamlessly with its environment. The D-Series offers the benefits of the latest in LED technology into a high-performance, high efficacy, long-life luminaire.

The photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. Clients outstanding photometry aids in reducing the number of poles required in area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information EXAMPLE: DSX1 LED P7 40K 70CRI T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX1 LED

Series	LEDs	Color temperature	Color Rendering Index	Distribution	Voltage	Mounting
DSX1 LED	Forward optics: P5 P6 P7 P8 P9 P4 P5 — Rotate optics: P10° P12° P11° P13°	(this section 70CRI only) 30K 3000K 40K 4000K 50K 5000K — (this section 80CRI only, extended lead times apply) 27K 2700K 30K 3000K 35K 3500K 40K 4000K 50K 5000K	70CRI 80CRI 80CRI 80CRI 80CRI	AFR Automotive front row; T1S Type I short; T2M Type II medium; T3M Type III medium; T3LG Type III low glare*; T4M Type IV medium; T4LG Type IV low glare*; TFTM Forward throw medium; T5M Type V medium; T5LG Type V low glare*; T5W Type V wide; BLC3 Type III backlight control*; BLC4 Type IV backlight control*; LCCO Left corner cutoff*; RCCO Right corner cutoff*	MVOLT (120V-277V)*; HVOLT (347V-480V)*; VHVOLT (277V-480V)*; 120*; 208*; 240*; 277*; 347*; 480*	Shipped included: SPA Square pole mounting (#3 drilling); RPA Round pole mounting (#3 drilling); SPA3 Square pole mounting (#3 drilling)*; RPA3 Round pole mounting (#3 drilling)*; SPA4PL Square narrow pole mounting (#3 drilling); WBA Wall bracket*; MA Mast arm adapter (mounts on 2 3/8" OD horizontal tenon)

Control options	Other options	Finish (required)
Shipped included: NLTAIR2 PIRHN nLight AIR gen 2 enabled with bi-level motion / ambient sensor, 8-40' mounting height, ambient sensor enabled at 2fc*,*,*,*; PIR High/low, motion/ambient sensor, 8-40' mounting height, ambient sensor enabled at 2fc*,*,*; PER NEMA® twist-lock receptacle only (controls ordered separately)*; PERS Five-pin receptacle only (controls ordered separately)*,*; PE7 Seven-pin receptacle only (controls ordered separately)*,*; FAO Field adjustable output*,*,*; BL30 Bi-level switched dimming, 30%*,*; BL50 Bi-level switched dimming, 50%*,*; DMG 0-10v dimming wires pulled outside fixture (for use with an external control, ordered separately)*; DS Dual switching*,*,*; — Shipped included: SPD20KV 20kV surge protection; HS Houseside shield (black finish standard)*; L90 Left mounted optics*; R90 Right mounted optics*; CCE Coastal Construction*; HA 50°C ambient operation*; BAA Buy America(n) Act Compliant; SF Single fuse (120, 277, 347V)*; DF Double fuse (208, 240, 480V)*; — Shipped separately: EGSB External Glare Shield (removable, field install required, matches housing finish); BSSB Bird Spikes (field install required)	DDBXD Dark Bronze; DBLXD Black; DNAXD Natural Aluminum; DWHXD White; DDBTXD Textured dark bronze; DBLBXD Textured black; DNATXD Textured natural aluminum; DWHGXD Textured white

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DSX1-LED Rev. 09/05/23 Page 1 of 10

3 POLE & WALL MOUNTED FIXTURES — NTS

LITHONIA LIGHTING.

Catalog Number
Notes
Type

Hit the Tab key or mouse over this page to see all interactive elements.

Anchor Base Poles

RTS

ROUND TAPERED STEEL

BAA BABA

FEATURES & SPECIFICATIONS

INTENDED USE — **These specifications are for BSA standards only.** RTS poles are not to be utilized for Sports/lighting applications requiring use of crossarms to mount luminaires. SPRTS series poles are the correct pole type for Sports/lighting projects and are designed to be configured as a complete assembly with the desired crossarm(s) incorporated within the pole nomenclature description.

CONSTRUCTION —

Pole Shaft: The pole shaft is of 11-gauge (0.120"), 7-gauge (0.179") or, 3-gauge (0.239") with a uniform wall thickness and is made of a weldable-grade (ASTM A-595 Grade X or A572 Grade 55), hot-rolled, commercial-quality carbon steel coiled to a minimum yield of 55,000 psi. Shaft is one-piece construction with a full-length longitudinal high-frequency electric resistance weld and round in cross-section having a uniform linear taper of 0.14 in. per ft.

Pole Top: Options include 4" tenon top, drilled for side mount fixture, tenon with drilling (includes extra handhole) and open top. See drilling pattern guide. Open top poles include a removable steel top cap with set screws.

Handhole: A reinforced handhole with grounding provision is provided at 18" from the base end of the pole assembly on side A. Every handhole includes a cover and cover attachment hardware. 3" x 5" reinforced handhole is provided on pole with 3.9" diameter. Pole shaft with diameters greater than 5.9" are provided with a 4" x 6.5" oval shaped handhole.

Base Cover: A two-piece ABS plastic full base cover is provided with each pole assembly on pole shaft diameters of 8" or less. Shaft sized greater than 8" have a short steel two piece base cover. Additional base cover options are available upon factory request. Bolt cover caps can be substituted on most pole shaft sizes. Options include heavy-duty two-piece cast aluminum full base cover and bolt cover caps. All base covers and bolt cover caps are finished to match pole.

Anchor Base/Bolts: Anchor base is fabricated from hot-rolled carbon steel plate that conforms with ASTM A36. Anchor bolts are manufactured to ASTM F1554 Standards Grade 55, (55 KSI minimum yield strength and tensile strength of 75-95 KSI). Upper portion of anchor bolt is galvanized per ASTM A-153; bolts have an "L"bend at bottom end and are galvanized a minimum of 12" on the threaded end. Each bolt dipped galvanized anchor bolt is furnished with two hex nuts and two flat washers.

HARDWARE — All structural fasteners are high-strength galvanized carbon steel. All non-structural fasteners are galvanized or zinc plated carbon steel, or stainless steel.

FINISH — Extra durable painted finish is coated with TGIC (Triglycidyl Isocyanurate) Polyester powder that meets 5A and 5B classifications of ASTM D3359. Powder-coat finishes include Dark Bronze, White, Black, and Natural Aluminum colors. Architectural Colors and Special Finishes are available by quote and include, but are not limited to Paint over Hot-dipped Galvanized, RAL Colors, Custom Colors and Extended Warranty Finishes.

GOVERNMENT PROCUREMENT —

BAA – Buy America(n) Act: Product qualifies as a domestic end product under the Buy American Act as implemented in the FAR and DFARS. Product also qualifies as manufactured in the United States under DOT Buy America regulations.

BABA – Build America Buy America: Product qualifies as produced in the United States under the definitions of the Build America, Buy America Act.

Please refer to www.acuitybrands.com/buy-american for additional information.

INSTALLATION — Do not erect poles without having fixtures installed. Factory supplied templates must be used when setting anchor bolts. Lithonia Lighting will not accept claim for incorrect anchorage placement due to failure to use Lithonia Lighting factory templates. If poles are stored outside, all protective wrapping must be removed immediately upon delivery to prevent finish damage. Lithonia Lighting is not responsible for the foundation design.

WARRANTY — 1-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at www.acuitybrands.com/support/warranty/terms-and-conditions

NOTE Actual performance may differ as a result of end-user environment and application.
Specifications subject to change without notice.

OUTDOOR — POLE-RTS

4 LIGHT POLE — NTS



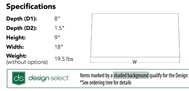
WDGE3 LED
Architectural Wall Sconce

Catalog Number
Notes
Type

Hit the Tab key or mouse over this page to see all interactive elements.

Specifications

Depth (D1):	8"
Depth (D2):	1.5"
Height:	9"
Width:	18"
Weight (without options):	19.5 lbs



design select — Items marked by a shaded background qualify for the Design Select program and ship in 15 days or less. To learn more about Design Select, visit www.acuitybrands.com/designselect. *see ordering tree for details

WDGE LED Family Overview

Luminaire	Optic	Standard (0°C / 32°F)	Cold (-30°C / -22°F)	Sensor	Approximate Lumens (4000K, CRI 80)					
					P1	P2	P3	P4	P5	P6
WDGE1 LED	Visual Comfort	6W		--	750	1,200	2,000	--	--	--
WDGE2 LED	Visual Comfort	10W	18W	Standalone / nLight	--	1,200	2,000	3,000	4,500	6,000
WDGE2 LED	Precision Refractive	10W	18W	Standalone / nLight	750	1,200	2,000	3,200	4,200	--
WDGE3 LED	Precision Refractive	15W	18W	Standalone / nLight	6,000	7,500	8,500	10,000	12,000	--
WDGE4 LED	Precision Refractive			Standalone / nLight	--	12,000	16,000	18,000	20,000	22,000

Ordering Information EXAMPLE: WDGE3 LED P3 40K 70CRI R3 MVOLT SRM DDBXD

Series	Package	Color Temperature	CRI	Distribution	Voltage	Mounting
WDGE3 LED	P1 P2 P3 P4	30K 3000K; 40K 4000K; 50K 5000K	70CRI; 90CRI	R2 Type 2; R3 Type 3; R4 Type 4; RFT Forward Throw	MVOLT 347* 480*	Shipped included: SRM Surface mounting bracket; ICW Indent Canopy Collar, Washer backlit (for damp locations only)* — Shipped separately: AWS 3/8 inch Architectural wall spacer*; PBBW Surface mounted back box (required for right conduit entry). Use with two, 1/2 inch conduits. Use with one, ¾ inch conduit.

Options	Finish
ETLOMV Emergency battery backup, Certified to CA Title 20 MAEDBS (10W, 0°C min)*; ELCMVC Emergency battery backup, Certified to CA Title 20 MAEDBS (10W, -20°C min)*; PE Photocell, Button Type*; DMG 0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately)*; BCE Battery conduit entry for Back box (PBBW). Total of 4 entry points; SPD10KV 10kV Surge pack*; CCE Coastal Construction*.	DDBXD Dark bronze; DBLXD Black; DNAXD Natural aluminum; DWHXD White; DSSTXD Textured sandstone

Standalone Sensors/Controls

PIR	Bi-level (120/277V) motion sensor for 8-15' mounting heights. Intended for use on switched circuits with external dusk to dawn switching.
PIRH	Bi-level (120/277V) motion sensor for 15-30' mounting heights, intended for use on switched circuits with external dusk to dawn switching.
PIR1FC3V	Bi-level (120/277V) motion sensor for 8-15' mounting heights with photocell pre-programmed for dusk to dawn operation.
PIRHTC3V	Bi-level (120/277V) motion sensor for 15-30 mounting heights with photocell pre-programmed for dusk to dawn operation.

Networked Sensors/Controls

NLTAIR2 PIR	Embedded wireless controls by nLight with Passive Infrared (Occ sensor and on/off photocell for 8-15' mounting heights.
NLTAIR2 PIRH	Embedded wireless controls by nLight with Passive Infrared (Occ sensor and on/off photocell for 15'-30' mounting heights.
NLTAIR2 PIR1FC3V	Embedded wireless controls by nLight with ULSCH listed emergency operation, Passive Infrared Occ sensor and on/off photocell for 8-15' mounting heights*
NLTAIR2 PIRH	Embedded wireless controls by nLight with ULSCH listed emergency operation, Passive Infrared Occ sensor and on/off photocell for 15'-30' mounting heights.

See page 4 for out of box functionality

Accessories

Ordered and shipped separately.

WSG WG DDBD	WDGE 3 Mesh Architectural Wall Spacer (specify finish)
WSG3 PBBW DDBXD U	WDGE3 surface-mounted back box (specify finish)

NOTES
1. 347V and 480V not available with ELCMVC and E20WC.
2. Not qualified for DLC. Not available with ELCMVC (emergency battery backup or sensors/controls.
3. For PBBW and AWS with CCE option, require an 8IN.
4. PE not available in 480V and 347V with ELCMVC option.
5. DMG option not available with sensors/controls.
6. Not available with E20WC option.
7. Available with MVOLT only and only rated to 25C ambient.

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WDGE3 LED Rev. 07/08/24

5 WALL MOUNTED SCONCE — NTS

Date	Description	No.

Revisions

Signature — Date

LANGAN

Langan Engineering & Environmental Services, Inc.
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
PROJECT MOOSE
ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title
SITE LIGHTING DETAILS

Project No.	Drawing No.
140278401	LL501
Date: 01/30/2025	
Drawn By: AC	
Checked By: JA	

LANEAN
Project No. 140278401

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PLANT SCHEDULE

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	REMARKS
SHADE TREE(S)						
AS	21	ACER SACCHARUM	SUGAR MAPLE	2 1/2–3" CAL.	B+B	–
GTIK	21	GLEDITSIA TRIACANTHOS INERMIS 'SKYLINE'	SKYLINE THORNLESS HONEYLOCUST	2 1/2–3" CAL.	B+B	–
LST	13	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM	2 1/2–3" CAL.	B+B	–
PLO	14	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	2 1/2–3" CAL.	B+B	–
QP	10	QUERCUS PALUSTRIS	PIN OAK	2 1/2–3" CAL.	B+B	–
UNDERSTORY TREE(S)						
BND	15	BETULA NIGRA 'DURA HEAT'	DURA HEAT RIVER BIRCH	10–12'	B+B	MULTI–STEM
EVERGREEN TREE(S)						
JV	8	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	8–10'	B+B	–
PGL	14	PICEA GLAUCA	WHITE SPRUCE	8–10'	B+B	–
PS	3	PINUS STROBUS	EASTERN WHITE PINE	8–10'	B+B	–
EVERGREEN SHRUB(S)						
IGC	47	ILEX GLABRA COMPACTA	DWARF INKBERRY HOLLY	24–30"	CONTAINER	–
DECIDUOUS SHRUB(S)						
CA	55	CLETHRA ALNIFOLIA	SUMMERSWEET CLETHRA	24–30"	CONTAINER	–
ORNAMENTAL GRASS(ES)						
DCS	90	DESCHAMPSIA CESPITOSA 'SCHOTTLAND'	SCOTTISH TUFTED HAIR GRASS	2 GAL.	CONTAINER	

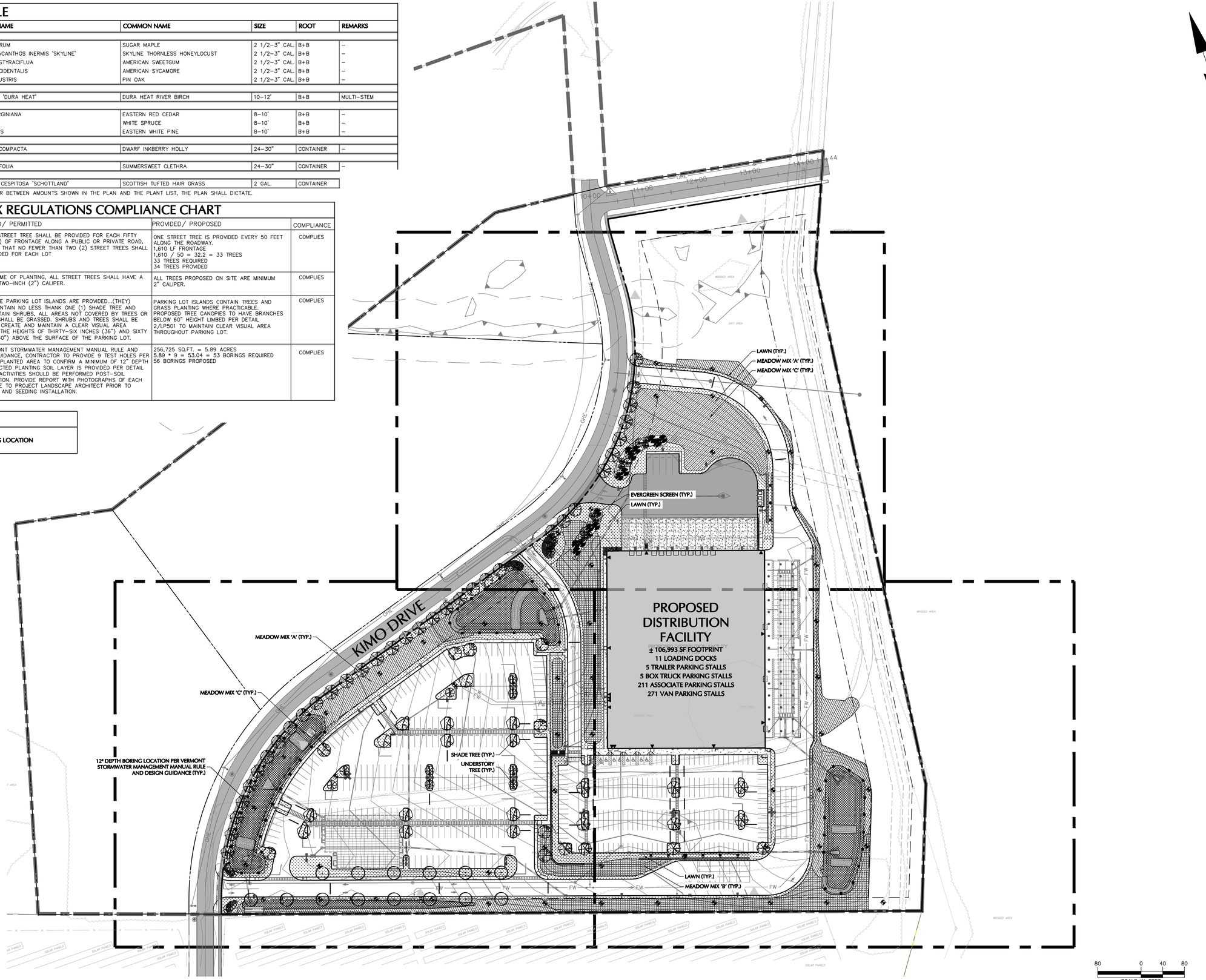
NOTE: IF ANY DISCREPANCIES OCCUR BETWEEN AMOUNTS SHOWN IN THE PLAN AND THE PLANT LIST, THE PLAN SHALL DICTATE.

TOWN OF ESSEX REGULATIONS COMPLIANCE CHART

REGULATION SECTION	REQUIRED/ PERMITTED	PROVIDED/ PROPOSED	COMPLIANCE
5.6(A)	ONE STREET TREE SHALL BE PROVIDED FOR EACH FIFTY FEET (50') OF FRONTAGE ALONG A PUBLIC OR PRIVATE ROAD, PROVIDED THAT NO FEWER THAN TWO (2) STREET TREES SHALL BE PROVIDED FOR EACH LOT	ONE STREET TREE IS PROVIDED EVERY 50 FEET ALONG THE ROADWAY. 1,610 LF FRONTAGE 1,610 / 50 = 32.2 = 33 TREES 33 TREES REQUIRED 34 TREES PROVIDED	COMPLIES
5.6(A)3)	AT TIME OF PLANTING, ALL STREET TREES SHALL HAVE A MINIMUM TWO–INCH (2") CALIPER.	ALL TREES PROPOSED ON SITE ARE MINIMUM 2" CALIPER.	COMPLIES
5.6(B)1)	WHERE PARKING LOT ISLANDS ARE PROVIDED...(THEY) SHALL CONTAIN NO LESS THANK ONE (1) SHADE TREE AND MAY CONTAIN SHRUBS, ALL AREAS NOT COVERED BY TREES OR SHRUBS SHALL BE GRASSED. SHRUBS AND TREES SHALL BE SIZED TO CREATE AND MAINTAIN A CLEAR VISUAL AREA BETWEEN THE HEIGHTS OF THIRTY–SIX INCHES (36") AND SIXTY INCHES (60") ABOVE THE SURFACE OF THE PARKING LOT.	PARKING LOT ISLANDS CONTAIN TREES AND GRASS PLANTING WHERE PRACTICABLE. PROPOSED TREE CANOPIES TO HAVE BRANCHES BELOW 60" HEIGHT LIMBED PER DETAIL 2/LP501 TO MAINTAIN CLEAR VISUAL AREA THROUGHOUT PARKING LOT.	COMPLIES
VERMONT STORMWATER MANUAL	PER VERMONT STORMWATER MANAGEMENT MANUAL RULE AND DESIGN GUIDANCE, CONTRACTOR TO PROVIDE 9 TEST HOLES PER ACRE OF PLANTED AREA TO CONFIRM A MINIMUM OF 12" DEPTH UNCOMPACTED PLANTING SOIL LAYER IS PROVIDED PER DETAIL 1/L2.50. ACTIVITIES SHOULD BE PERFORMED POST–SOIL INSTALLATION. PROVIDE REPORT WITH PHOTOGRAPHS OF EACH TEST HOLE TO PROJECT LANDSCAPE ARCHITECT PRIOR TO PLANTING AND SEEDING INSTALLATION.	256,725 SQ.FT. = 5.89 ACRES 5.89 * 9 = 53.04 = 53 BORINGS REQUIRED 56 BORINGS PROPOSED	COMPLIES

LEGEND

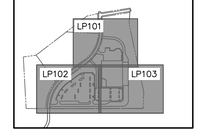
⌖	12" DEPTH BORING LOCATION



80 0 40 80
SCALE IN FEET

SHEET LEGEND

1" = 1,000'



Date	Description	No.
Revisions		

VERMONT MICHAEL HUNTON No. 1317.39 LANDSCAPE ARCHITECT

Signature Date

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

OVERALL PLANTING PLAN

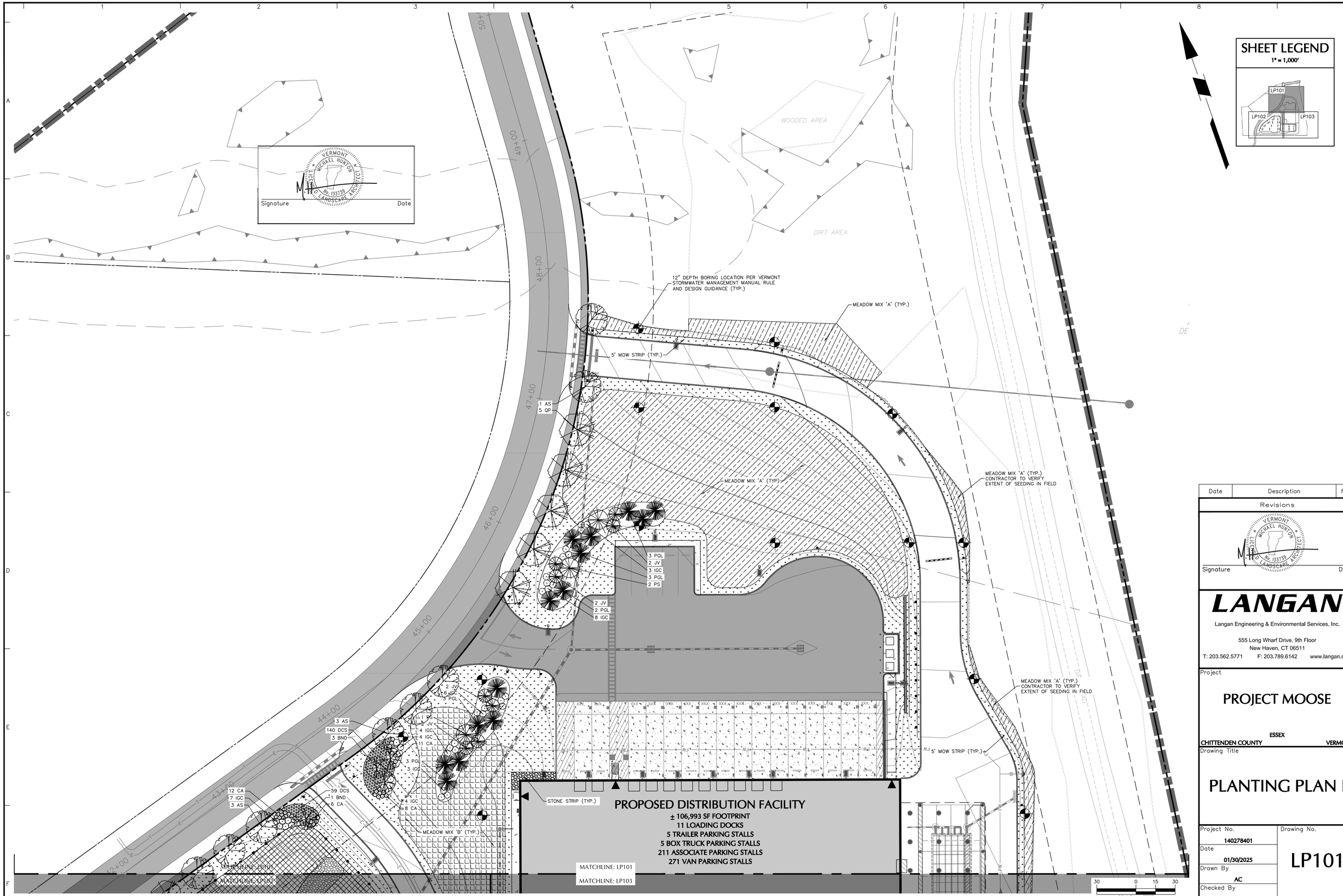
Project No.	Drawing No.
140278401	LP100
Date: 01/30/2025	
Drawn By: AC	
Checked By: JA	

LANGAN

Project No. 140278401

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Date: 1/29/2025 Time: 10:27 User: bpalma Style Table: Langan,stb Layout: LP100 Document Code: 140278401-0501-LP101-0101



SHEET LEGEND

1" = 1,000'

VERMONT MICHAEL HUNTON LICENSED LANDSCAPE ARCHITECT No. 133739

Signature Date

Date	Description	No.
Revisions		

LANGAN

Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

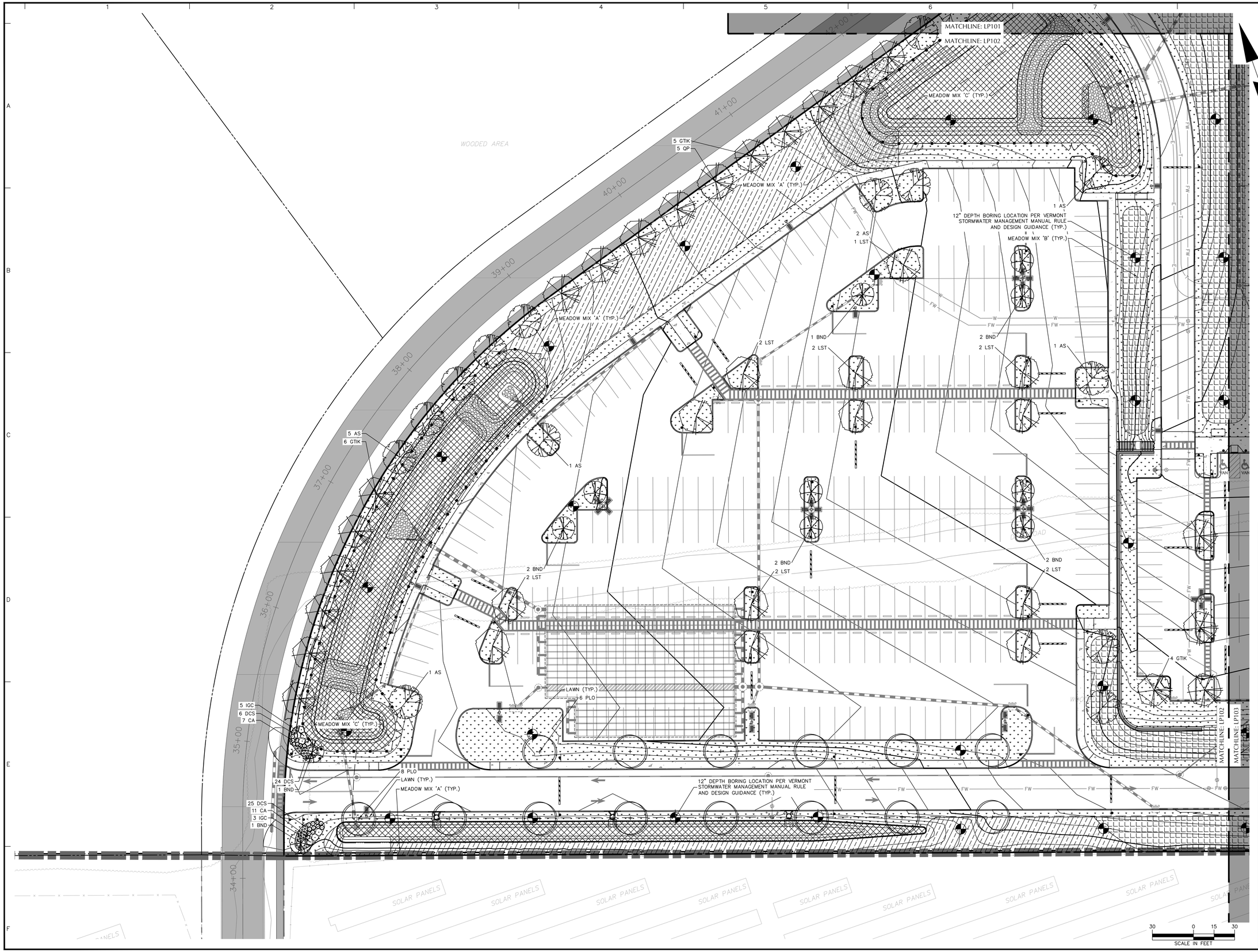
PLANTING PLAN I

Project No.	Drawing No.
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Date: 01/30/2025	
Drawn By: AC	
Checked By: JA	

LANGAN Project No. 140278401

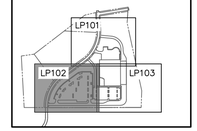
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Date: 1/29/2025 Time: 10:28 User: bpalma Style Table: Langan.stb Layout: LP101 Document Code: 140278401-0501-LP101-0102



SHEET LEGEND

1" = 1,000'



Date	Description	No.
Revisions		

VERMONT MICHAEL HUNT OTT No. 1337139 LANDSCAPE ARCHITECT

Signature Date

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Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

PLANTING PLAN II

Project No.	Drawing No.
140278401	LP102
Date: 01/30/2025	
Drawn By: AC	
Checked By: JA	

LANGAN

Project No. 140278401

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MATCHLINE: LP101

MATCHLINE: LP103

PROPOSED DISTRIBUTION FACILITY

± 106,993 SF FOOTPRINT
11 LOADING DOCKS
5 TRAILER PARKING STALLS
5 BOX TRUCK PARKING STALLS
211 ASSOCIATE PARKING STALLS
271 VAN PARKING STALLS

5' MOW STRIP (TYP.)

12" DEPTH BORING LOCATION PER VERMONT STORMWATER MANAGEMENT MANUAL RULE AND DESIGN GUIDANCE (TYP.)

MEADOW MIX 'A' (TYP.)
CONTRACTOR TO VERIFY EXTENT OF SEEDING IN FIELD

WOODED AREA

DIRT AREA

WOODED AREA

S27°30'27"W
360.58'

72-8
N/F
ALLEN BROOK DEVELOPMENT INC
949/245

MEADOW MIX 'A' (TYP.)

3 GTIK

2 GTIK

1 GTIK

VAN

VAN

LAWN (TYP.)

MEADOW MIX 'B' (TYP.)

MATCHLINE: LP102

MATCHLINE: LP103

LAWN (TYP.)

5' MOW STRIP (TYP.)

MEADOW MIX 'C' (TYP.)

MEADOW MIX 'B' (TYP.)

CBDH FOUND

S20°59'56"W
233.62'

CBDH FOUND

WOODED AREA

SOLAR PANELS

SOLAR PANELS

SOLAR PANELS

SOLAR PANELS

SOLAR PANELS

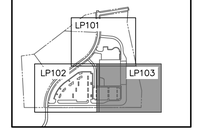
SOLAR PANELS

SOLAR PANELS

FW

SHEET LEGEND

1" = 1,000'



Date	Description	No.
Revisions		

VERMONT MICHAEL HUNTON No. 1337.18 REGISTERED LANDSCAPE ARCHITECT

Signature Date

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Langan Engineering & Environmental Services, Inc.

555 Long Wharf Drive, 9th Floor
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142 www.langan.com

Project

PROJECT MOOSE

ESSEX
CHITTENDEN COUNTY VERMONT

Drawing Title

PLANTING PLAN III

Project No.	Drawing No.
140278401	LP103
Date: 01/30/2025	
Drawn By: AC	
Checked By: JA	

30 0 15 30
SCALE IN FEET

LANGAN

Project No. 140278401

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GENERAL LANDSCAPE PLANTING NOTES

1. NAMES OF PLANTS AS DESCRIBED ON THIS PLAN CONFORM TO THOSE GIVEN IN "STANDARDIZED PLANT NAMES", 1942 EDITION, PREPARED BY THE AMERICAN JOINT COMMITTEE ON HORTICULTURAL NOMENCLATURE. NAMES OF PLANT VARIETIES NOT INCLUDED THEREIN CONFORM TO NAMES GENERALLY ACCEPTED IN NURSERY TRADE.
2. ALL EXPOSED GROUND SURFACES THAT ARE NOT PAVED WITHIN THE CONTRACT LIMIT LINE, AND THAT ARE NOT COVERED BY LANDSCAPE PLANTING OR SEEDING AS SPECIFIED, SHALL BE COVERED BY A NATURAL MULCH THAT WILL PREVENT SOIL EROSION AND THE EMANATION OF DUST.
3. NO PLANT SHALL BE PUT INTO THE GROUND BEFORE ROUGH GRADING HAS BEEN COMPLETED AND APPROVED BY THE PROJECT LANDSCAPE ARCHITECT OR PROJECT ENGINEER.
4. STANDARDS FOR TYPE, SPREAD, HEIGHT, ROOT BALL AND QUALITY OF NEW PLANT MATERIAL SHALL BE IN ACCORDANCE WITH GUIDELINES AS SET FORTH IN THE "AMERICAN STANDARD FOR NURSERY STOCK", PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN. PLANT MATERIAL SHALL HAVE NORMAL HABIT OF GROWTH AND BE HEALTHY, VIGOROUS, AND FREE FROM DISEASES AND INSECT INFESTATION.
5. NEW PLANT MATERIAL SHALL BE NURSERY GROWN UNLESS SPECIFIED OTHERWISE. ALL PLANTS SHALL BE SET PLUMB AND SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS THE PLANT'S ORIGINAL GRADE BEFORE DIGGING. PLANT MATERIAL OF THE SAME SPECIES AND SPECIFIED AS THE SAME SIZE SHOULD BE SIMILAR IN SHAPE, COLOR AND HABIT. THE LANDSCAPE ARCHITECT HAS THE RIGHT TO REJECT PLANT MATERIAL THAT DOES NOT CONFORM TO THE TYPICAL OR SPECIFIED HABIT OF THAT SPECIES.
6. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UNDERGROUND UTILITY AND SEWER LINES PRIOR TO THE START OF EXCAVATION ACTIVITIES. NOTIFY THE PROJECT ENGINEER AND OWNER IMMEDIATELY OF ANY CONFLICTS WITH PROPOSED PLANTING LOCATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE.
7. THE CONTRACTOR SHALL NOT MAKE SUBSTITUTIONS. IF THE SPECIFIED LANDSCAPE MATERIAL IS NOT OBTAINABLE, THE CONTRACTOR SHALL SUBMIT PROOF OF NON-AVAILABILITY TO THE LANDSCAPE ARCHITECT AND OWNER, TOGETHER WITH A WRITTEN PROPOSAL FOR USE OF AN EQUIVALENT MATERIAL.
8. LANDSCAPE CONTRACTOR TO STAKE OUT PLANTING LOCATIONS, FOR REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT AND/OR OWNER BEFORE PLANTING WORK BEGINS. THE LANDSCAPE ARCHITECT AND/OR OWNER SHALL DIRECT THE CONTRACTOR IN THE FINAL PLACEMENT OF ALL PLANT MATERIAL AND LOCATION OF PLANTING BEDS TO ENSURE COMPLIANCE WITH DESIGN INTENT UNLESS OTHERWISE INSTRUCTED.
9. THE LANDSCAPE ARCHITECT MAY REVIEW PLANT MATERIALS AT THE SITE, BEFORE PLANTING, FOR COMPLIANCE WITH REQUIREMENTS FOR GENUS, SPECIES, VARIETY, SIZE, AND QUALITY. THE LANDSCAPE ARCHITECT RETAINS THE RIGHT TO FURTHER REVIEW PLANT MATERIALS FOR SIZE AND CONDITION OF BALLS AND ROOT SYSTEM, INSECTS, INJURIES, AND LATENT DEFECTS, AND TO REJECT UNSATISFACTORY OR DEFECTIVE MATERIAL AT ANY TIME DURING PROGRESS OF WORK. THE CONTRACTOR SHALL REMOVE REJECTED PLANT MATERIALS IMMEDIATELY FROM PROJECT SITE AS DIRECTED BY THE LANDSCAPE ARCHITECT OR OWNER.
10. DELIVERY, STORAGE, AND HANDLING
    A. PACKAGED MATERIALS: PACKAGED MATERIALS SHALL BE DELIVERED IN CONTAINERS SHOWING WEIGHT, ANALYSIS, AND NAME OF MANUFACTURER. MATERIALS SHALL BE PROTECTED FROM DETERIORATION DURING DELIVERY, AND WHILE STORED AT SITE.
    B. TREES AND SHRUBS: THE CONTRACTOR SHALL PROVIDE TREES AND SHRUBS DUG FOR THE GROWING SEASON FOR WHICH THEY WILL BE PLANTED, AND NOT DUG PRIOR TO DELIVERY AND PLANTING UNLESS DIRECTED BY THE LANDSCAPE ARCHITECT. DO NOT BEND OR BIND-TIE TREES OR SHRUBS IN SUCH A MANNER AS TO DAMAGE BARK, BREAK BRANCHES, OR DESTROY NATURAL SHAPE. PROVIDE PROTECTIVE COVERING DURING TRANSIT. DO NOT DROP OR BALL TREES OR SHRUBS. PROVIDE BURLAPPED STOCK DURING DELIVERY OR HANDLING.
    C. ALL PLANTS SHALL BE BALLED AND BURLAPPED OR CONTAINER GROWN AS SPECIFIED. NO CONTAINER GROWN STOCK WILL BE ACCEPTED IF IT IS ROOT BOUND. ALL ROOTBALL WRAPPING AND BINDING MATERIAL MADE OF SYNTHETICS OR PLASTICS SHALL BE REMOVED FROM THE TOP OF THE BALL AT THE TIME OF PLANTING. IF THE PLANT IS SHIPPED WITH A WIRE BASKET AROUND THE ROOT BALL, THE WIRE BASKET SHALL BE CUT AND FOLDED DOWN 8 INCHES INTO THE PLANTING HOLE. WITH CONTAINER GROWN STOCK, THE CONTAINER SHALL BE REMOVED AND THE ROOT BALL SHALL BE CUT THROUGH THE SURFACE IN TWO LOCATIONS.
    D. THE CONTRACTOR SHALL HAVE TREES AND SHRUBS DELIVERED TO SITE AFTER PREPARATIONS FOR PLANTING HAVE BEEN COMPLETED AND PLANT IMMEDIATELY. IF PLANTING IS DELAYED MORE THAN 6 HOURS AFTER DELIVERY, THE CONTRACTOR SHALL SET TREES AND SHRUBS IN SHADE, PROTECT FROM WEATHER AND MECHANICAL DAMAGE AND KEEP ROOTS MOIST BY COVERING WITH MULCH, BURLAP OR OTHER ACCEPTABLE MEANS OF RETAINING MOISTURE.
11. ALL LANDSCAPED AREAS TO BE CLEARED OF ROCKS, STUMPS, TRASH AND OTHER UNSIGHTLY DEBRIS. ALL FINE GRADED AREAS SHOULD BE HAND RAKED SMOOTH ELIMINATING ANY CLUMPS AND AND UNEVEN SURFACES PRIOR TO PLANTING OR MULCHING.
12. ALL PLANT MATERIAL SHALL BE INSTALLED AS PER DETAILS, NOTES AND CONTRACT SPECIFICATIONS. THE LANDSCAPE ARCHITECT MAY REVIEW INSTALLATION AND MAINTENANCE PROCEDURES.
13. NEW PLANT MATERIAL SHALL BE GUARANTEED TO BE ALIVE AND IN VIGOROUS GROWING CONDITION FOR A PERIOD OF ONE YEAR FOLLOWING ACCEPTANCE BY THE OWNER. PLANT MATERIAL FOUND TO BE UNHEALTHY, DYING OR DEAD DURING THIS PERIOD, SHALL BE REMOVED AND REPLACED IN KIND BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
14. THE CONTRACTOR SHALL KEEP AREA CLEAN DURING DELIVERY AND INSTALLATION OF PLANT MATERIALS. REMOVE AND DISPOSE OF OFF-SITE ANY ACCUMULATED DEBRIS OR UNUSED MATERIALS. REPAIR DAMAGE TO ADJACENT AREAS CAUSED BY LANDSCAPE INSTALLATION OPERATIONS.
15. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24-HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL THEN BE WATERED WEEKLY OR AS REQUIRED BY SITE AND WEATHER CONDITIONS TO MAINTAIN VIGOROUS AND HEALTHY PLANT GROWTH.
16. THE BACKFILL MIXTURE AND SOIL MIXES TO BE INSTALLED PER THE SPECIFICATIONS.
17. AFTER PLANT IS PLACED IN TREE PIT LOCATION, ALL TWINE HOLDING ROOT BALL TOGETHER SHOULD BE COMPLETELY REMOVED AND THE BURLAP SHOULD BE PULLED DOWN SO 1/3 OF THE ROOT BALL IS EXPOSED. SYNTHETIC BURLAP SHOULD BE COMPLETELY REMOVED AFTER INSTALLATION.
18. MULCH SHOULD NOT BE PILED UP AROUND THE TRUNK OF ANY PLANT MATERIAL. NO MULCH OR TOPSOIL SHOULD BE TOUCHING THE BASE OF THE TRUNK ABOVE THE ROOT COLLAR.
19. ALL FENCE INSTALLATION SHALL BE COMPLETED PRIOR TO COMMENCEMENT OF ANY LANDSCAPE PLANTING, LAWN AND GRASSES, OR IRRIGATION WORK.
20. FOR ANY DISCREPANCIES BETWEEN THE PLANT SCHEDULE AND PLANTING PLAN THE GRAPHIC QUANTITY SHOWN SHALL GOVERN.
21. PLANT MATERIALS SHALL NOT BE PLANTED UNTIL THE FINISHED GRADING HAS BEEN COMPLETED.
22. ALL PLANT INSTALLATIONS SHALL BE COMPLETED EITHER BETWEEN APRIL 1 – JUNE 15 OR AUGUST 15 – NOVEMBER 1, UNLESS OTHERWISE DIRECTED BY THE PROJECT LANDSCAPE ARCHITECT. SEE LAWN SEEDING DATES IN SEEDING NOTES.

LANDSCAPE MAINTENANCE NOTES

1. MAINTENANCE OPERATIONS BEFORE APPROVAL:
    A. PLANT CARE SHALL BEGIN IMMEDIATELY AFTER EACH PLANT IS SATISFACTORILY INSTALLED AND SHALL CONTINUE THROUGHOUT THE LIFE OF THE CONTRACT UNTIL FINAL ACCEPTANCE OF THE PROJECT.
    B. CARE SHALL INCLUDE, BUT NOT BE LIMITED TO, REPLACING MULCH THAT HAS BEEN DISPLACED BY EROSION OR OTHER MEANS, REPAIRING AND RESHAPING WATER RINGS OR BASINS, AND MAINTAINING STAKES AND GUYS AS ORIGINALLY INSTALLED, WATERING WHEN NEEDED OR DIRECTED, AND PERFORMING ANY OTHER WORK REQUIRED TO KEEP THE PLANTS IN A HEALTHY CONDITION.
    C. CONTRACTOR SHALL REMOVE AND REPLACE ALL DEAD, DEFECTIVE AND/OR REJECTED PLANTS AS REQUIRED BEFORE FINAL ACCEPTANCE.
2. MAINTENANCE DURING CONSTRUCTION:
    A. MAINTENANCE SHALL BEGIN IMMEDIATELY AFTER PLANTING. PLANTS SHALL BE WATERED, MULCHED, WEEDED, PRUNED, SPRAYED, FERTILIZED, CULTIVATED, AND OTHERWISE MAINTAINED AND PROTECTED UNTIL PROVISIONAL ACCEPTANCE. SETTLED PLANTS SHALL BE RESET TO PROPER GRADE AND POSITION, PLANTING SAUCER RESTORED AND DEAD MATERIAL REMOVED. STAKES AND WIRES SHALL BE TIGHTENED AND REPAIRED. DEFECTIVE WORK SHALL BE CORRECTED AS SOON AS POSSIBLE AFTER IT BECOMES APPARENT AND WEATHER AND SEASON PERMIT.
    B. IF A SUBSTANTIAL NUMBER OF PLANTS ARE SICKLY OR DEAD AT THE TIME OF INSPECTION, ACCEPTANCE SHALL NOT BE GRANTED AND THE CONTRACTOR'S RESPONSIBILITY FOR MAINTENANCE OF ALL PLANTS SHALL BE EXTENDED FROM THE TIME REPLACEMENTS ARE MADE OR EXISTING PLANTS ARE DEEMED ACCEPTABLE BY THE LANDSCAPE ARCHITECT.
    C. ALL REPLACEMENTS SHALL BE PLANTS OF THE SAME KIND AND SIZE SPECIFIED ON THE PLANT LIST OR THAT WHICH WAS TO REMAIN OR BE RELOCATED. THEY SHALL BE FURNISHED AND PLANTED AS SPECIFIED. THE COST SHALL BE BORNE BY THE CONTRACTOR. REPLACEMENTS RESULTING FROM REMOVAL, LOSS, OR DAMAGE DUE TO OCCUPANCY OF THE PROJECT IN ANY PART, VANDALISM, PHYSICAL DAMAGE BY ANIMALS, VEHICLES, ETC., AND LOSSES DUE TO CURTAILMENT OF WATER BY LOCAL AUTHORITIES SHALL BE APPROVED AND PAID FOR BY THE OWNER.
    D. PLANTS SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR AFTER INSPECTION AND PROVISIONAL ACCEPTANCE.
    E. AT THE END OF THE ESTABLISHMENT PERIOD, INSPECTION SHALL BE MADE AGAIN. ANY PLANT REQUIRED UNDER THIS CONTRACT THAT IS DEAD OR UNSATISFACTORY TO THE LANDSCAPE ARCHITECT OR OWNER SHALL BE REMOVED FROM THE SITE AND REPLACED DURING THE NORMAL PLANTING SEASON.
3. LAWN MAINTENANCE:
    A. BEGIN MAINTENANCE IMMEDIATELY AFTER EACH PORTION OF LAWN IS PLANTED AND CONTINUE FOR 8 WEEKS AFTER ALL LAWN PLANTING IS COMPLETED.
    B. WATER TO KEEP SURFACE SOIL MOIST, REPAIR WASHED OUT AREAS BY FILLING WITH TOPSOIL, LIMING, FERTILIZING AND RE-SEEDING; MOW TO 2 1/2 – 3 INCHES AFTER GRASS REACHES 3 1/2 INCHES IN HEIGHT, AND MOW FREQUENTLY ENOUGH TO KEEP GRASS FROM EXCEEDING 3 1/2 INCHES. WEED BY LOCAL SPOT APPLICATION OF SELECTIVE HERBICIDE ONLY AFTER GRASS IS WELL-ESTABLISHED.

LAWN SEED MIX

1. LAWN SEED MIX: LESCO GRASS SEED – ALL PRO TRANSITION MIX (3 TURF-TYPE TALL-FESCUE GRASSES)

    NOTES:
    A) SEED RATE:
        1) NEW ESTABLISHMENT: SEED AT A RATE OF 6–8 LBS/1000 SQ FT
        2) RENOVATION: 20–50% EXISTING COVER: 5–7 LBS/1000 SQ FT
           50–75% EXISTING COVER: 4–6 LBS/1000 SQ FT
2. GENERAL SEED NOTES:
    A) FINAL SEED MIXTURES, RATES, AND SPECIES TO BE DETERMINED BASED ON PROJECT LANDSCAPE ARCHITECT REVIEW.
    B) SEEDING SHALL TAKE PLACE IN THE SPRING (APRIL 1 TO JUNE 15) OR THE FALL (SEPTEMBER 1 TO OCTOBER 15).
    C) ELIMINATE UNWANTED VEGETATION PRIOR TO SEEDING USING A GLYPHOSATE-BASED HERBICIDE PER MANUFACTURER'S SPECIFICATIONS.
    D) IT IS RECOMMENDED THAT CONTRACTOR INSTALL SEED MIXTURE USING A NO-TILL TRUAX-TYPE DRILL SEEDER WHERE APPLICABLE.
    E) THERE MUST BE CONTINUOUS SOIL MOISTURE FOR 4–6 WEEKS TO ALLOW FOR PROPER GERMINATION.

LAWN WATERING SCHEDULE

THE FOLLOWING WATERING SCHEDULE COVERS ROUGHLY 8 WEEKS TO ESTABLISH A HEALTHY STAND OF GRASS FROM SEED. THE CONTRACTOR SHALL BE OBLIGATED TO ENSURE A HEALTHY STAND OF GRASS AT THE END OF THE MAINTENANCE/BOND PERIOD. ANY BARE OR DEAD AREAS IN THE LAWN SHALL BE PREPARED, RESEEDED AND REESTABLISHED PRIOR TO THE END OF THE MAINTENANCE/BOND PERIOD AND TO THE SATISFACTION OF THE PROJECT LANDSCAPE ARCHITECT AND THE OWNER.

IMPORTANT ASPECTS TO ATTAINING AND SUSTAINING A HEALTHY STAND OF GRASS ARE THE INSTALLATION OF TOPSOIL, SEED BED PREPARATION, ATTAINING OPTIMAL pH FOR THE INTENDED PLANT SPECIES, FERTILIZING, MULCH COVERING, AND SUFFICIENT WATERING PER THESE NOTES AND/OR PROJECT SPECIFICATIONS.

1. SEEDING SHALL BE DONE DURING THE SEASONS SPECIFIED IN THE LAWN SEED MIX NOTES AND/OR PROJECT SPECIFICATIONS.
2. AFTER THE SEEDBED IS PREPARED, SEED IS INSTALLED, AND MULCH IS APPLIED, WATER LIGHTLY TO KEEP THE TOP 2 INCHES OF SOIL CONSISTENTLY MOIST, NOT SATURATED. AT NO TIME SHOULD WATER BE APPLIED TO THE POINT OF RUNOFF OR THE DISPLACEMENT OF SEED.
3. DEPENDING ON SOIL TEMPERATURES, IT MAY TAKE SEVERAL WEEKS FOR GERMINATION TO OCCUR. DIFFERENT SPECIES WITHIN THE MIX GERMINATE AT DIFFERENT TIMES AND THEREFORE CONTRACTOR SHOULD CONTINUE THE LIGHT WATERING, AS DESCRIBED ABOVE, UNTIL THERE IS AT LEAST 2 INCHES OF GROWTH THROUGHOUT.
4. AT THIS POINT, WATERING FREQUENCY MAY BE REDUCED TO EVERY 3 TO 5 DAYS. WATER SHALL BE APPLIED TO MET A 6 INCH MINIMUM SOIL DEPTH TO PROMOTE HEALTHY DEEP ROOTS.
5. BEGIN MOWING ONCE PER WEEK AFTER THE GRASS HAS REACHED 3 INCHES HEIGHT. MOW TO A HEIGHT OF NO LESS THAN 2–½ INCHES. AFTER 2 TO 3 WEEKS OF MOWING, CONTINUE TO WATER TO A 6 INCH MINIMUM SOIL DEPTH AS NECESSARY PER WEATHER CONDITIONS, AND SOIL MOISTURE SENSORS IF APPLICABLE.

PLANTING SOIL SPECIFICATIONS

1. PLANTING SOIL, ALTERNATELY MAY BE REFERRED TO AS TOPSOIL, SHOULD BE FRIABLE, FERTILE, WELL-DRAINED, FREE OF DEBRIS, TOXINS, TRASH AND STONES OVER 1/2" DIA., IT SHOULD HAVE A HIGH ORGANIC CONTENT SUITABLE TO SUSTAIN HEALTHY PLANT GROWTH AND SHOULD LOOK AESTHETICALLY PLEASING HAVING NO NOXIOUS ODORS.
2. PLANTING SOIL:

    REUSE SURFACE SOILS STOCKPILED ON SITE, VERIFYING COMPLIANCE WITH PLANTING SOIL AND TOPSOIL CRITERIA IN THIS SPECIFICATION THROUGH TESTING. CLEAN SURFACE SOIL OF ALL ROOTS, PLANTS, SOD, AND GRAVEL OVER 1" IN DIAMETER AND DELETERIOUS MATERIALS. IF ON-SITE SOILS ARE TO BE USED FOR PROPOSED PLANTING, THE CONTRACTOR SHALL DEMONSTRATE, THROUGH SOIL TESTING, THAT ON-SITE SOILS MEET THE SAME CRITERIA AS INDICATED IN NOTES PLANS AND SPECIFICATIONS.

    SUPPLEMENT WITH IMPORTED OR MANUFACTURED TOPSOIL FROM OFF SITE SOURCES WHEN TOPSOIL AND PLANTING SOIL QUANTITIES ARE INSUFFICIENT. OBTAIN SOIL DISPLACED FROM NATURALLY WELL-DRAINED UPLAND AREAS. TOPSOIL OCCURS AT LEAST 4" DEEP. DO NOT OBTAIN FROM AGRICULTURAL LAND, BOGS, MARSHES OR CONTAMINATED SITES.

    CONTRACTOR SHALL TEST SOILS AND FURNISH SAMPLES UPON REQUEST. PACKAGED MATERIALS SHALL BE UNOPENED IN BAGS OR CONTAINERS, EACH BEARING A NAME, GUARANTEE, AND TRADING MARK OF THE PRODUCER. MATERIAL COMPOSITION, MANUFACTURER'S CERTIFIED ANALYSIS, AND THE WEIGHT OF THE MATERIALS. SOIL OR AMENDMENT MATERIALS SHALL BE STORED ON SITE TEMPORARILY IN STOCKPILES PRIOR TO PLACEMENT AND SHALL BE PROTECTED FROM INTRUSION OF CONTAMINANTS AND EROSION. AFTER MIXING, SOIL MATERIALS SHALL BE COVERED WITH A TARPAULIN UNTIL TIME OF ACTUAL USE.

    ALL PLANTING SOILS SHALL BE SUBMITTED FOR TESTING TO THE STATE COOPERATIVE EXTENSION SERVICE, OR APPROVED EQUAL, PRIOR TO DELIVERY TO THE SITE. CONTRACTOR SHALL SUBMIT SOIL SAMPLES, FURNISH SOIL TEST RESULTS TO LANDSCAPE ARCHITECT OR OWNER AT A RATE OF ONE SAMPLE PER 500 CUBIC YARDS TO ENSURE CONSISTENCY ACROSS THE TOTAL VOLUME OF PLANTING SOIL REQUIRED. TEST RESULTS SHALL EVALUATE FOR ALL CRITERIA LISTED IN THIS SPECIFICATION. IF TESTING AGENCY DETERMINES THAT THE SOILS ARE DEFICIENT IN ANY MANNER AND MAY BE CORRECTED BY ADDING AMENDMENTS, THE CONTRACTOR SHALL FOLLOW STATED RECOMMENDATIONS FOR SOIL IMPROVEMENT AND FURNISH SUBMITTALS FOR ALL AMENDMENTS PRIOR TO DELIVERY OF SOIL TO THE PROJECT SITE.

    A. THE FOLLOWING TESTING SHOULD BE PERFORMED AND RESULTS GIVEN TO THE LANDSCAPE ARCHITECT FOR APPROVAL BEFORE INSTALLATION:
        a. PARTICLE SIZE ANALYSIS – LOAMY SAND: 60–75% SAND, 25–40% SILT, AND 5–15% CLAY.
        b. FERTILITY ANALYSIS: pH (5.5–6.5), SOLUBLE SALTS (LESS THAN 2 MMHO/CM), NITRATE, PHOSPHATE, POTASSIUM, CALCIUM AND MAGNESIUM
        c. ORGANIC MATTER CONTENT: 2.5–5% IN NATIVE SOILS; UP TO 10% IN AMENDED SOILS
        d. TOXIC SUBSTANCE ANALYSIS
        e. MATERIAL DRAINAGE RATE: 60% PASSING IN 2 MINUTES, 40% RETAINED
        f. NOT MORE THAN 1% OF MATERIAL SHALL BE RETAINED BY A #4 SIEVE
3. SOIL AMENDMENT FOR PLANT MATERIAL:
    IF SOIL ORGANIC CONTENT IS INADEQUATE, SOIL SHALL BE AMENDED WITH COMPOST OR ACCEPTABLE, WEED FREE, ORGANIC MATTER. ORGANIC AMENDMENT SHALL BE WELL COMPOSTED, PH RANGE OF 6–8, MOISTURE CONTENT 35–55% BY WEIGHT 100% PASSING THROUGH 1" SIEVE; SOLUBLE SALT CONTENT LESS THAN 0.5 MM HOS/CM; MEETING ALL APPLICABLE ENVIRONMENTAL CRITERIA FOR CLEAN FILL.

    A. ORGANIC MATTER AS A SOIL AMENDMENT: LEAF MOLD WITH 60–90% ORGANIC CONTENT BY WEIGHT. SHREDDED LEAF LITTER, COMPOSTED FOR A MINIMUM OF 1 YR. SHOULD BE FREE OF DEBRIS, STONES OVER 1/2", WOOD CHIPS OVER 1".

    B. SOIL IN BEDS AND PLANTING ISLANDS OTHER THAN BACKFILL MATERIAL AND TOPSOIL, SHOULD BE FRIABLE, WELL-DRAINED, AND FREE OF DEBRIS, INCLUDING STONES AND TRASH.

    C. AMENDMENTS FOR BACK FILL IN TREE AND SHRUB PITS:
        a. GROUND LIMESTONE (WITH A MIN. OF 88% OF CALCIUM AND MAGNESIUM CARBONATES) USED PENDING RESULTS OF SOIL ANALYSIS.
           – BRING pH LEVELS TO 5.5 MIN. TO 6.5 FOR NON-ERICACEOUS PLANTS
           – BRING pH LEVELS TO 4.5 MIN. TO 5.5 FOR ERICACEOUS PLANTS
        b. TERRA-SORB BY "PLANT HEALTH CARE" 800-421-9051 (SEE MANUFACTURER RECOMMENDATIONS) USED IN PLANTER BACKFILL MIXTURE WITH TREES AND SHRUBS.
        c. MYCOR-ROOT SAVER BY "PLANT HEALTH CARE" 800-421-9051 (SEE MANUFACTURER RECOMMENDATIONS) USED IN BACKFILL MIXTURE WITH TREES.
4. WHERE PLANTING AREAS ARE PROPOSED FOR FORMER PAVED OR GRAVEL AREAS, BEDS SHALL BE EXCAVATED TO A MINIMUM 30" DEPTH AND, AT A MINIMUM, BE BACKFILLED WITH BOTTOM LAYER OF SANDY LOAM (ORGANIC CONTENT LESS THAN 2%) OVER WHICH TOPSOIL AND PLANTING SOILS WILL BE PLACED AT DEPTHS INDICATED IN PLANS, DETAILS AND NOTES.
5. BIORETENTION SOIL MIX
    a. BIORETENTION SOIL MIX IS TO BE USED IN ALL DETENTION BASINS AND RAIN GARDENS.
    b. MIX TO CONSIST OF 60% COARSE SAND, 40% SUBMITTED TOPSOIL/HORTICULTURAL SOIL MIX
    c. TOPSOIL/HORTICULTURAL SOIL MIX: REFER TO SPECIFICATIONS LISTED IN SECTION ABOVE
    d. COARSE SAND

    1) PARTICLE SIZE ANALYSIS

SIEVE	PERCENT PASSING
3/8 INCH (9.5 MM)	100
NO 4 (4.75 MM)	95–100
NO 8 (2.36 MM)	80–100
NO 16 (1.18 MM)	50–85
NO 30 (.60 MM)	25–60
NO 50 (.30 MM)	10–30
NO 100 (.15 MM)	2–10
NO 200 (0.75 MM	2–5

    2) CHEMICAL ANALYSIS
        PH: LOWER THAN 7.0
        TOXIC SUBSTANCE ANALYSIS

    e. FINAL BIORETENTION MIX
    1) PARTICLE SIZE ANALYSIS
        a) SAND – 80–85%
        b) SILT – 10–15%
        c) CLAY – 2–5%

        NOT MORE THAN 1% OF MATERIAL TO BE RETAINED BY A #4 SIEVE

    2) CHEMICAL ANALYSIS
        a) PH – 5.5–6.5
        b) SOLUBLE SALTS: LESS THAN 2 MMHO/CM

    3) CONTRACTOR TO SUBMIT TOXIC SUBSTANCE ANALYSIS AND MATERIAL DRAINAGE RATE IN ADDITION TO INFORMATION LISTED ABOVE. DRAINAGE RATE OF MATERIAL TO EXCEED 1 INCH/HOUR
6. CLEAN SOIL FILL IN LANDSCAPE AREAS:
    LANDSCAPE FILL MATERIAL, BELOW PLANTING SOILS, SHALL HAVE THE PHYSICAL PROPERTIES OF A SANDY LOAM WITH AN ORGANIC CONTENT OF LESS THAN 2% AND A PH BETWEEN 5 – 7.
7. SOIL PLACEMENT:
    A. CONTRACTOR TO PROVIDE SIX INCHES (6") MINIMUM DEPTH PLANTING SOIL LAYER IN LAWN AREAS, TWELVE INCHES (12") MINIMUM DEPTH PLANTING SOIL LAYER IN GROUNDCOVER AND PERENNIAL AREAS, EIGHTEEN INCHES (18") MINIMUM DEPTH PLANTING SOIL LAYER IN SHRUB AREAS, AND THIRTY-SIX INCHES (36") MINIMUM DEPTH PLANTING SOIL LAYER IN TREE PLANTING AREAS.

    B. SCARIFY AND/OR TILL COMPACTED SUBSOILS TO A MINIMUM DEPTH OF 6 INCHES. THOROUGHLY MIX A 6 INCH DEPTH LAYER OF PLANTING SOIL INTO THE SUBSOIL PRIOR TO PLACING PLANTING SOIL AT THE DEPTHS INDICATED ABOVE. PLANTING SOIL SHALL BE PLACED IN 12–18" LIFTS AND WATER THOROUGHLY BEFORE INSTALLING NEXT LIFT. REPEAT UNTIL DEPTHS AND FINISH GRADES HAVE BEEN ACHIEVED. NO SOILS SHALL BE PLACED IN A FROZEN OR MUDDY CONDITION.

    C. PLANTING SOIL PRESENT AT THE SITE, IF ANY, MAY BE USED TO SUPPLEMENT TOTAL AMOUNT REQUIRED. CONTRACTOR TO FURNISH AN ANALYSIS OF ON-SITE PLANTING SOIL UTILIZED IN ALL PLANTING AREAS.
8. SOIL CONDITIONING:
    A. ADJUST pH AND NUTRIENT LEVELS AS REQUIRED TO ENSURE AN ACCEPTABLE GROWING MEDIUM. LOWER pH USING ELEMENTAL SULFUR ONLY. PEAT MOSS OR COPPER SULFATE MAY NOT BE USED. GROUND LIMESTONE AS A SOIL AMENDMENT MATERIAL WILL ONLY BE USED PENDING RESULTS OF SOIL ANALYSIS. PROVIDE WITH MINIMUM 88% CALCIUM AND MAGNESIUM CARBONATES AND SHALL HAVE TOTAL 100% PASSING THE 10 MESH SIEVE, MINIMUM 90% PASSING 20 MESH SIEVE, AND MINIMUM 60% PASSING 100 MESH SIEVE.

    B. ALL DEBRIS EXPOSED FROM EXCAVATION AND CULTIVATION SHALL BE DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

    C. SOIL MODIFICATIONS (PENDING RESULTS OF SOIL ANALYSIS):
        a. THOROUGHLY TILL ORGANIC MATTER (LEAF COMPOST) INTO THE TOP 6 TO 12 IN. OF MOST PLANTING SOILS TO IMPROVE THE SOIL'S ABILITY TO RETAIN WATER AND NUTRIENTS. ALL PRODUCTS SHOULD BE COMPOSTED TO A DARK COLOR AND BE FREE OF PIECES WITH IDENTIFIABLE LEAF OR WOOD STRUCTURE. AVOID MATERIAL WITH A pH HIGHER THAN 7.0. PEAT MOSS MAY NOT BE USED AS ORGANIC MATTER AMENDMENT.

        b. MODIFY HEAVY CLAY OR SILT (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) AND/OR GYPSUM. COARSE SAND MAY BE USED IF ENOUGH IS ADDED TO BRING THE SAND CONTENT TO MORE THAN 60% OF THE TOTAL MIX. IMPROVE DRAINAGE IN HEAVY SOILS BY PLANTING ON RAISED MOUNDS OR BEDS AND INCLUDING SUBSURFACE DRAINAGE LINES.

        c. MODIFY EXTREMELY SANDY SOILS (MORE THAN 85% SAND) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX.

MEADOW SEED NOTES

MEADOW SEED MIX A – ERNST SEED MIX (NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX)

34.9% ANDROPOGON GERARDII, 'NIAGARA'	BIG BLUESTEM, 'NIAGARA'
32.0% PANICUM VIRGATUM, 'CAVE-IN-ROCK'	SWITCHGRASS, 'CAVE-IN-ROCK'
26.0% ELYMUS VIRGINICUS, 'MADISON'	VIRGINIA WILDRYE, 'MADISON'
5.5% RUDBECKIA HIRTA	BLACKEYED SUSAN
2.0% DESMODIUM CANADENSE	SHOWY TICKTREFOIL
0.1% ASCLEPIAS SYRIACA	COMMON MILKWEED
0.1% MONARDA FISTULOSA	WILD BERGAMOT

NOTES:
SEED AT A RATE OF 20 LB/ACRE OF 100% PURE LIVE SEED

MEADOW SEED MIX B – ERNMX-181 (NATIVE STEEP SLOPE MIX WITH ANNUAL RYEGRASS)

22% SORGHASTRUM NUTANS	INDIANGRASS
20% LOLIUM MULTIFLORUM	ANNUAL RYEGRASS
17% SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM
15% ELYMUS CANADENSIS	CANADA WILDRYE
5% ELYMUS VIRGINICUS	VIRGINIA WILDRYE
4% AGROSTIS PERENNANS	AUTUMN BENTGRASS
4% AGROSTIS SCABRA	TICKLEGRASS
4% TRIDENS FLAVUS	PURPLETOP
2% CHAMAECRISTA FASCICULATA	PARTRIDGE PEA
2% ECHINACEA PURPUREA	PURPLE CONEFLOWER
1% COREOPSIS LANCEOLATA	LANCELEAF COREOPSIS
1% LIATRIS SPICATA	MARSH BLAZING STAR
1% MONARDA FISTULOSA	WILD BERGAMOT
1% PENSTEMON DIGITALIS	TALL WHITE BEARDTONGUE
1% RUDBECKIA HIRTA	BLACKEYED SUSAN

NOTES:
SEED AT A RATE OF 60 LBS/ACRE OF 100% PURE LIVE SEED.

MEADOW SEED MIX C – ERNST SEED MIX ERNMX-183 (NATIVE DETENTION AREA MIX)

32% PANICUM CLANDESTINUM, 'TIOGA'	DEERTONGUE, 'TIOGA'
20% CAREX VULPINOIDEA	FOX SEDGE
20% ELYMUS VIRGINICUS	VIRGINIA WILDRYE
20% PANICUM VIRGATUM, 'SHAWNEE'	SWITCHGRASS, 'SHAWNEE'
4% AGROSTIS PERENNANS, ALBANY PINE BUSH	AUTUMN BENTGRASS, ALBANY PINE BUSH
2% JUNCUS TENUIS	POA RUSH
1% JUNCUS EFFUSUS	SOFT RUSH
1% PANICUM RIGIDULUM	REDTOP PANICGRASS

NOTES:
SEED AT A RATE OF 20 LBS/ACRE OF 100% PURE LIVE SEED.

GENERAL SEEDING NOTES:

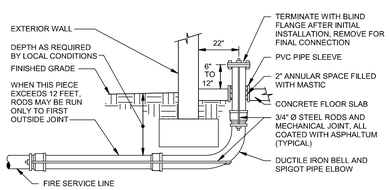
1. FINAL SEED MIXTURES, RATES & SPECIES TO BE DETERMINED BASED ON SUPPLIER RECOMMENDATIONS.
2. SEEDING SHALL TAKE PLACE IN THE SPRING (APRIL 1 TO JUNE 15) OR THE FALL (SEPTEMBER 1 TO OCTOBER 15).
3. ELIMINATE UNWANTED VEGETATION PRIOR TO SEEDING USING A NON-SELECTIVE HERBICIDE PER MANUFACTURER'S SPECIFICATIONS. CONTRACTOR TO ENSURE HERBICIDE IS INDICATED FOR USE AROUND WATER BODIES.
4. IT IS RECOMMENDED THAT CONTRACTOR INSTALL SEED MIXTURE USING A NO-TILL TRUAX-TYPE DRILL SEEDER WHERE APPLICABLE.
5. THERE MUST BE CONTINUOUS SOIL MOISTURE FOR 4–6 WEEKS TO ALLOW PROPER GERMINATION.

WEED CONTROL / MAINTENANCE

1. DURING THE ESTABLISHMENT YEAR, C

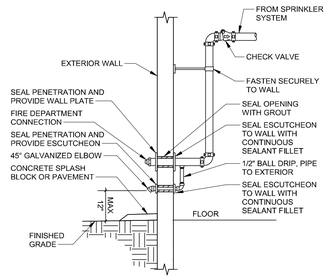
HAZARD CLASSIFICATIONS

OCCUPANCY CLASSIFICATION	DENSITY	MAXIMUM SPRINKLER SPACING (SQ. FT.)	TOTAL HOSE DEMAND (GPM)	DURATION (MINUTES)	DESIGN BASIS
RESTROOMS / OFFICES / BREAKROOM / MOTHERS ROOM	0.10/1500 SQ. FT.	225	100	30	LIGHT HAZARD; 13:11.2.3.1.1 AND TABLE 11.2.3.1.2
ELECTRICAL / MECHANICAL / BUILDING SUPPORT ROOMS	0.15/1500 SQ. FT.	130	250	60	ORDINARY HAZARD GROUP 1; 13:11.2.3.1.1 AND TABLE 11.2.3.1.2
WAREHOUSE	12 25.2K ESFR @25 PSI	100	250	60	CARTONED AND ENCAPSULATED UNEXPANDED GROUP A PLASTICS ON RACKS; 8 FT MAXIMUM STORAGE HEIGHT; 28 FT MAXIMUM CEILING HEIGHT. OWNER ELECTED PROTECTION SCHEME; UL PROJECT 4790050452; FILE NC32504. CARTONED RETAIL PRODUCTS SORTED INTO FLEXIBLE AND RIGID NYLON BAGS ON RACKS. FILLED BAGS ARE LOADED ON VANS FOR DELIVERY.
LOADING CANOPY	0.20/1500 SQ. FT.	130	250	60	ORDINARY HAZARD GROUP 2; 13:11.2.3.1.1 AND TABLE 11.2.3.1.2



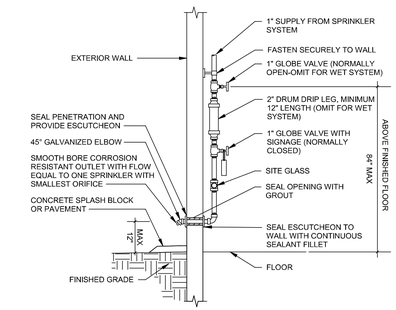
ARRANGEMENT SHOWN IS SCHEMATIC. MODIFY TO SUIT FIELD CONDITIONS AND MEET APPLICABLE CODE REQUIREMENTS. VERIFY FOUNDATION WITH ARCHITECTURAL DRAWINGS. COORDINATE WHO IS TO PROVIDE THE FIRE SERVICE ENTRY WITH THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER PRIOR TO SUBMITTING BID.

1 FIRE SERVICE ENTRY
NOT TO SCALE



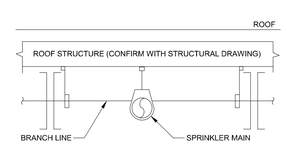
ARRANGEMENT SHOWN IS SCHEMATIC. MODIFY TO SUIT CONDITIONS AND MEET APPLICABLE CODE REQUIREMENTS. EXTERIOR PIPING AND FITTINGS SHALL BE GALVANIZED. REFER TO DRAWINGS FOR APPROVED LOCATIONS.

2 FIRE DEPARTMENT CONNECTION
NOT TO SCALE



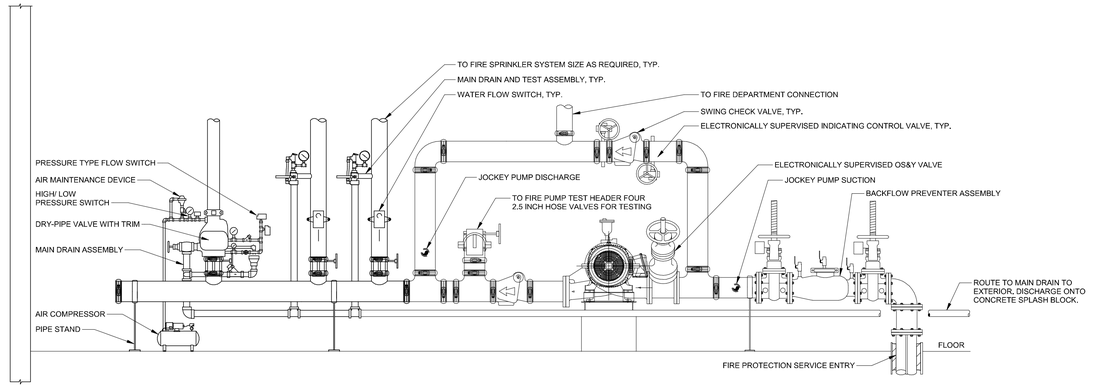
ARRANGEMENT SHOWN IS SCHEMATIC. MODIFY TO SUIT CONDITIONS AND MEET APPLICABLE CODE REQUIREMENTS. OBTAIN ARCHITECT'S APPROVAL FOR FINAL LOCATION. EXTERIOR PIPING AND FITTINGS SHALL BE GALVANIZED.

3 INSPECTORS TEST/AUXILIARY DRAIN
NOT TO SCALE



DETAIL NOTES:
1. INSTALL THE MAIN AND BRANCH LINE PIPING ABOVE THE BOTTOM OF THE TRUSSES TO PROVIDE THE REQUIRED CLEAR HEIGHT.
2. REFER TO STRUCTURAL DRAWINGS FOR DETAILS. COORDINATE SPRINKLER PIPE SIZE AND WEIGHTS WITH THE STRUCTURAL ENGINEER.
3. DO NOT SUPPORT PIPE FROM THE BOTTOM CHORD OF TRUSSES.
4. DO NOT INSTALL PIPE IN THE CLEAR HEIGHT SPACE.

4 CLEAR HEIGHT
NOT TO SCALE



5 FIRE PUMP
NOT TO SCALE

FIRE PROTECTION GENERAL NOTES

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, LAYOUT, AND INSTALLATION OF THE SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS AND ADOPTED CODES AND STANDARDS.

B. CONTRACTOR SHALL PROVIDE SPRINKLER SHOP DRAWINGS FOR ENGINEER, ARCHITECT, OWNER AND OWNER'S INSURANCE COMPANY REVIEW AND APPROVAL. ALL SPRINKLER SHOP DRAWINGS SHALL HAVE AUTHORITY HAVING JURISDICTION AND LOCAL FIRE MARSHAL FINAL APPROVAL. ALL FIRE PROTECTION SHOP DRAWINGS SHALL BEAR THE STAMP AND SIGNATURE OF A REGISTERED FIRE PROTECTION ENGINEER.

C. IN THE EVENT OF A DISCREPANCY BETWEEN CONTRACT DRAWINGS AND SPECIFICATIONS, THE MOST STRINGENT SHALL GOVERN. ALL WORK TO BE IN ACCORDANCE WITH REQUIREMENTS OF GOVERNING STATE AND LOCAL FIRE AND BUILDING CODES, NFPA AND OSHA. INSTALL ALL PIPING TO AVOID ARCHITECTURAL FRAMING, STRUCTURAL MEMBERS, AND OTHER OBSTRUCTIONS. COORDINATE PIPING LOCATIONS WITH ALL APPLICABLE CONTRACT DRAWINGS PRIOR TO PLACING SLEEVES IN FLOORS OR WALLS. INSTALL ALL PIPING TO BEST SUIT FIELD CONDITIONS AND COORDINATE WITH THE INSTALLATION WORK OF OTHER TRADES. THE DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED TO DETERMINE EXACT LOCATIONS OF PIPING.

D. COORDINATE SPRINKLER ZONES WITH FIRE ALARM ZONES. ONE SPRINKLER SYSTEM ZONE SHALL NOT EXCEED TWO FIRE ALARM ZONES. GENERAL CONTRACTOR AND SPRINKLER SUBCONTRACTOR SHALL FULLY COORDINATE THE INSTALLATION OF THE WET/DRY PIPE SPRINKLER SYSTEMS WITH ARCHITECTURAL REFLECTED CEILING PLANS. PROVIDE COORDINATED SHOP DRAWING INDICATING ALL EQUIPMENT/DEVICES.

E. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A NEW TWO HYDRANT FLOW TEST NO MORE THAN 12 MONTHS OLD PRIOR TO PREPARE SPRINKLER SYSTEM HYDRAULIC CALCULATIONS AND SHOP DRAWINGS. CONTRACTOR SHALL PROVIDE SPRINKLER SHOP DRAWINGS FOR ENGINEER, ARCHITECT, OWNER AND OWNER'S INSURANCE COMPANY'S REVIEW AND APPROVAL.

F. FIRE PROTECTION PIPING AND EQUIPMENT SHALL BE RATED FOR EXPECTED MAXIMUM WORKING PRESSURES. WHERE PRESSURES EXCEED 175 PSI, PIPE AND FITTINGS SHALL BE RATED FOR MINIMUM 250 PSI.

G. NEW SPRINKLER MAIN PIPING SHALL BE SCH-10 WITH ROLL GROOVED FITTINGS (OR EQUAL). NEW SPRINKLER BRANCHLINE PIPING SHALL BE SCH-10 WITH ROLL GROOVED FITTINGS (OR EQUAL) FOR SIZES 1-1/4" - 2", AND SCH-40 WITH CLASS 125 CAST IRON FITTINGS FOR SIZES 1" - 1-1/4".

H. ALL SPRINKLER SYSTEM CONTROL VALVES SHALL BE PROVIDED WITH TAMPER SWITCHES. ALL SYSTEMS SHALL BE EQUIPPED WITH A FLOW SWITCH. ALL TAMPERS AND FLOW SWITCHES SHALL BE MONITORED BY AN OFF-SITE PROPRIETARY STATION, U.L. LISTED, AND ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION.

I. PROVIDE ALL MISCELLANEOUS STEEL, SPECIAL SUPPORTS AND ANCHORING FOR COMPLETE INSTALLATION OF SYSTEMS/EQUIPMENT AND FOR SUPPORT OF ALL PIPING, EQUIPMENT, ETC. REQUIRING SUCH. REFER TO STRUCTURAL DRAWINGS. DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ALL CONDITIONS SHALL BE CONTRACTOR COORDINATED AND VERIFIED FOR EXACT LOCATION AND SIZES. THE CONTRACTOR IS RESPONSIBLE TO THOROUGHLY VERIFY ALL CONDITIONS BEFORE SUBMITTING BID INFORMATION.

J. FIRE DEPARTMENT CONNECTIONS SHALL BE INSTALLED IN ACCORDANCE WITH THE AUTHORITY HAVING JURISDICTION (AHJ). NFPA RECOMMENDS THAT THE FDC BE LOCATED NOT LESS THAN 18 INCHES AND NOR MORE THAN 48 INCHES ABOVE FINISHED GRADE.

K. PENETRATIONS OF FIRE RATED ASSEMBLIES SHALL BE FIRE-STOPPED. FIRE STOPPING SHALL BE APPROVED BY THE AUTHORITY HAVING JURISDICTION AT VARIOUS STAGES AND UPON COMPLETION.

L. CONTRACTOR TO COORDINATE WITH STRUCTURAL ENGINEER FOR ALLOWABLE BEAM PENETRATION LOCATIONS, SIZES, AND DETAILS (IF APPLICABLE).

M. ALL MATERIALS AND WORKMANSHIP ARE SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT. ANY PORTION OF THE WORK FOUND TO BE DEFECTIVE SHALL BE REPLACED BY THE CONTRACTOR AS PART OF THIS CONTRACT AT NO ADDITIONAL COST TO THE OWNER.

N. IF A FIRE PUMP IS REQUIRED DUE TO INADEQUATE PRESSURE FROM THE SITE WATER SUPPLY, AN ELECTRIC FIRE PUMP WILL BE UTILIZED.

O. RUN ALL SPRINKLER PIPING ABOVE THE STRUCTURE TO THE GREATEST EXTENT POSSIBLE IN ORDER TO MAINTAIN CLEAR HEIGHT.

P. PROVIDE BOLLARDS IN ORDER TO PROTECT FIRE PROTECTION RISERS IN WAREHOUSE AREAS

Q. THE WAREHOUSE AREAS SHALL BE PROTECTED BY SPRINKLER SYSTEMS WHICH UTILIZE EARLY SUPPRESSION FAST RESPONSE (ESFR) SPRINKLERS. PER NFPA 13, THE WAREHOUSE AREA SPRINKLER SYSTEMS ARE DESIGNED TO MEET A DEMAND OF 1.26 GPM/SQ. FT.

FIRE HYDRANT FLOW TEST

A HYDRANT FLOW TEST SHALL BE PERFORMED IN ACCORDANCE WITH NFPA 291 TO ASSESS ADEQUACY OF EXISTING MUNICIPAL WATER SUPPLY. A 24-HOUR STATIC PRESSURE RECORDING SHALL BE TAKEN. ADEQUACY OF THE PUBLIC WATER SUPPLY SHALL BE DETERMINED BY FIRE PROTECTION ENGINEERING CONSULTANT.

COMPLIANCE

COMPLY WITH NFPA 13, NFPA 20, NFPA 291, NFPA 24, FM GLOBAL 2-0, FM GLOBAL 8-9, OWNER FIRE PROTECTION STANDARD, AND LOCAL CODES.

HYDRAULIC SAFETY FACTOR

SAFETY FACTOR SHALL BE BETWEEN THE AVAILABLE WATER SUPPLY RESIDUAL PRESSURE AND THE DEMAND PRESSURE AT THE DEMAND FLOW. MINIMUM ACCEPTABLE SAFETY FACTOR SHALL BE 10 PSI OR 10% OF STATIC PRESSURE AT THE EFFECTIVE POINT OF FLOW TEST (WHICHEVER IS LARGER). MINIMUM SAFETY MARGIN OF SYSTEMS SUPPLIED BY ONSITE WATER STORAGE TANK AND FIRE PUMP SHALL BE 5 PSI BASED ON EMPTY TANK CONDITIONS.

DEFERRED SUBMISSION

FIRE PROTECTION DRAWINGS AND SPECIFICATIONS ARE PERFORMANCE BASED. FIRE PROTECTION CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL AS A DEFERRED SUBMITTAL TO THE LOCAL AHJ. SHOP DRAWINGS AND HYDRAULIC CALCULATIONS INDICATING THE SPRINKLER SYSTEM LAYOUT INCLUDING FINAL HEAD LOCATIONS SHALL BE PROVIDED. THE PROFESSIONAL SHALL REVIEW THE SHOP DRAWINGS AND HYDRAULIC CALCULATIONS PRIOR TO THE DEFERRED SUBMISSION TO THE AHJ AND PROVIDE NOTATION ON DRAWINGS INDICATING THEY WERE REVIEWED FOR COMPLIANCE BY THE PROFESSIONAL. SUBMIT REVIEWED DRAWINGS AND CALCULATIONS WITH THE REQUIRED APPLICATION FEE TO AHJ PRIOR TO INSTALLATION.

FIRE SPRINKLER SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED.

ABBREVIATIONS V2.02

AFF	ABOVE FINISHED FLOOR	NIC	NOT IN CONTRACT
AFG	ABOVE FINISHED GRADE	OC	ON CENTER
CD	CANDELA	PIV	POST INDICATOR VALVE
DI	DUCTILE IRON	PROVIDE	FURNISH AND INSTALL
ESFR	EARLY SUPPRESSION FAST RESPONSE	PRV	PRESSURE REDUCING VALVE
ETR	EXISTING TO REMAIN	RD	RETURN DUCT
FHC	FIRE HOSE CABINET	REV	REVISION
FP	FIRE PROTECTION	SD	SUPPLY DUCT
GC	CONTRACTOR	SF	SQUARE FEET
GPM	GALLONS PER MINUTE	TYP	TYPICAL
J/B/J-BOX	JUNCTION BOX	UNO	UNLESS NOTES OTHERWISE
MAX	MAXIMUM	V	VOLT(S)
MIN	MINIMUM	W	WATTS
N/A	NOT APPLICABLE	WP	WEATHERPROOF

ANNOTATION

- (1) FIRE SPRINKLER PLAN NOTE CALLOUT
- CONNECTION POINT OF NEW WORK TO EXISTING
- (1 / F1) DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER
- (1 / F1) SECTION CUT DESIGNATION

FIRE SPRINKLERS

- UPRIGHT SPRINKLER
- PENDENT SPRINKLER
- CONCEALED SPRINKLER
- DRY PENDENT SPRINKLER
- DRY SIDEWALL SPRINKLER
- SIDEWALL SPRINKLER

FIRE SPRINKLER PIPING

- FP FIRE PROTECTION (FP)
- SHUTOFF VALVE
- CHECK VALVE
- BACKFLOW PREVENTER
- CAP
- ELBOW UP
- ELBOW DOWN
- TEE UP
- TEE DOWN
- FIRE DEPARTMENT CONNECTION
- FIRE PUMP TEST HEADER
- INSPECTOR'S TEST CONNECTION / AUXILIARY DRAIN
- SPRINKLER RISER
- TOP BEAM CLAMP
- TRAPEZE HANGER

LINETYPE LEGEND

THROUGHOUT THE DRAWINGS DIFFERENT LINETYPES ARE USED IN COMBINATION WITH THE SYMBOLS TO INDICATE THE STATUS OF ITEMS AS EXISTING, TO BE DEMOLISHED, TO BE INCLUDED AS PART OF NEW WORK AND/OR ITEMS WHICH ARE ANTICIPATED TO BE PROVIDED IN THE FUTURE. THE STATUS OF ITEMS USING THESE LINETYPES ARE RELATIVE TO THE VIEW IN WHICH THEY APPEAR. PHASING SHOWN IN DRAWINGS IS NOT INTENDED TO FULLY DESCRIBE ALL NECESSARY CONSTRUCTION PHASING, WHICH IS DETERMINED BY THE CONTRACTOR AS PART OF THEIR RESPONSIBILITIES. ANY SUCH PHASES DESCRIBED IN THE CONSTRUCTION DOCUMENTS ARE GENERAL AND ONLY INTENDED TO INDICATE A BROAD ORDER FOR THE SAKE OF DESCRIBING THE PROJECT. THE FOLLOWING LINETYPES MAY BE USED ON ANY DEVICE, EQUIPMENT, NOTE, LINE, SHAPE, ETC.

EXISTING	NEW
DEMOLISH	FUTURE

CESO
WWW.CESOINC.COM
3601 Rigby Road, Suite 300
Miamisburg, OH 45342
Phone: 937.435.8584 Fax: 888.208.4826

STATE OF VERMONT — ROBERT A. HARVEY — 10/01/2024 — NO. 003830 MECHANICAL — LICENSED PROFESSIONAL ENGINEER

Dialectic ENGINEERING
Dialectic, Inc.
310 W 20th Street, Suite 100
Kansas City, MO 64108
T 816-997-9601
F 816-997-9602
DialecticEng.com

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Project # - 01202415.23

SCANNELL PROPERTIES

PROJECT MOOSE

THOMPSON DRIVE, ESSEX VT, 05452

Revisions / Submissions

ID	Description	Date
	PERMIT SET	09.30.2024

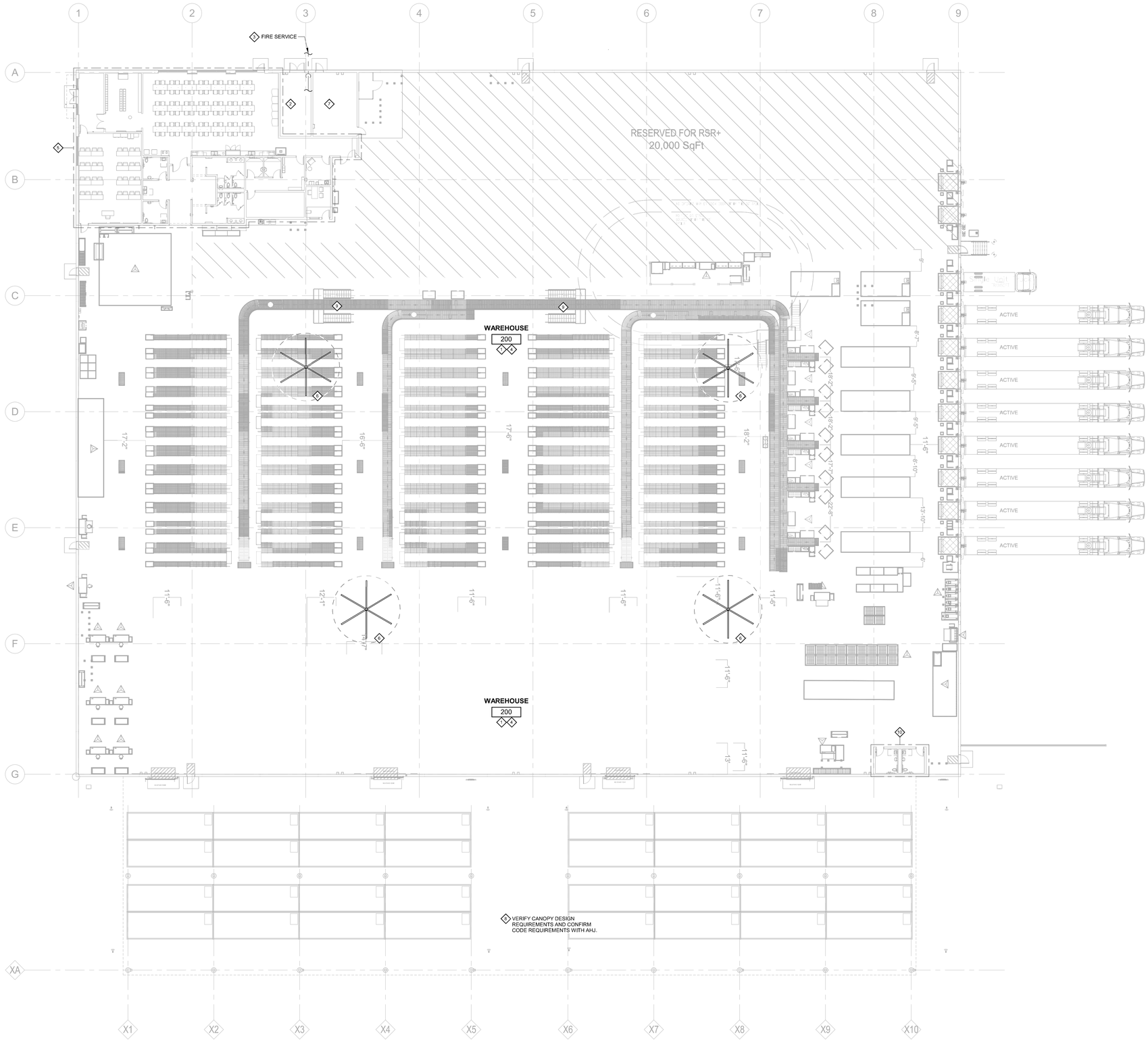
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Project number:	763816-01
Scale:	As indicated
Drawn By:	EJM
Checked By:	JMB
Date:	09.30.2024
Issue:	PERMIT SET

Sheet Title:

FIRE PROTECTION SPECIFICATIONS, SCHEDULES & NOTES

FP0.01



1 OVERALL FIRE PROTECTION CRITERIA PLAN

1/16" = 1'-0"

FIRE PROTECTION NOTES

GENERAL:
1. PROVIDE NEW AUTOMATIC WET PIPE SPRINKLER SYSTEMS THROUGHOUT ENTIRE BUILDING, COVERAGE SHALL BE PER DESIGN CRITERIA.

2. ROUTE FIRE PROTECTION PIPING AS REQUIRED TO AVOID NEW/EXISTING PLUMBING, HVAC, AND ELECTRICAL EQUIPMENT.

3. INSTALL SPRINKLER PIPING TIGHT TO STRUCTURE.

4. COORDINATE TEMPERATURE RATING OF SPRINKLERS NEAR HEAT PRODUCING SOURCES IN ACCORDANCE WITH NFPA 13 FOR ANTICIPATED AMBIENT CEILING TEMPERATURES.

1. WAREHOUSE: PROVIDE HYDRAULICALLY DESIGNED AUTOMATIC WET PIPE SPRINKLER SYSTEM SPRINKLER SYSTEM TO PROTECT WAREHOUSE AREA IN ACCORDANCE WITH LATEST ADOPTED EDITION OF BUILDING CODE AND NFPA13. REFER TO HAZARD CLASSIFICATIONS ON THIS SHEET FOR ADDITIONAL INFORMATION.

2. FIRE PUMP: PROVIDE NEW FIRE PUMP AND ALL ASSOCIATED EQUIPMENT. REFER TO DETAIL ON SHEET FP0.01 AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

3. NEW FIRE PROTECTION SERVICE ENTRANCE. REFER TO CIVIL DRAWINGS FOR CONTINUATION.

4. PROVIDE SPRINKLERS BENEATH OBSTRUCTIONS OVER 2FT WIDE IN AREAS PROTECTED BY ESFR SPRINKLERS IN ACCORDANCE WITH NFPA 13.

5. OFFICE AREA: PROVIDE HYDRAULICALLY DESIGNED AUTOMATIC WET PIPE SPRINKLER SYSTEM TO PROTECT OFFICE AREA IN ACCORDANCE WITH LATEST ADOPTED EDITION OF STATE BUILDING CODE AND NFPA13.

DESIGN CRITERIA:
LIGHT HAZARD
5.6 K-FACTOR CONCEALED PENDENTS.

6. LOCATE SPRINKLERS SO HIGH VOLUME LOW SPEED FAN IS CENTERED APPROXIMATELY BETWEEN FOUR ADJACENT SPRINKLERS. THE VERTICAL CLEARANCE FROM THE HVLS FAN TO SPRINKLER DEFLECTOR SHALL BE A MINIMUM OF 3 FEET.

7. DO NOT ROUTE SPRINKLER PIPING ABOVE ELECTRICAL DISTRIBUTION EQUIPMENT. PROVIDE DRIP PROTECTION SUCH AS SHIELDS AND TRAYS IN ACCORDANCE WITH NFPA 70 REQUIREMENTS FOR THIS AREA.

8. CANOPY: NON COMBUSTIBLE CANOPY. SPRINKLER PROTECTION NOT REQUIRED PER NFPA 13. IF LOCAL JURISDICTION REQUIRES SPRINKLERS UNDER CANOPY PROVIDE A HYDRAULICALLY DESIGNED AUTOMATIC DRY PIPE SPRINKLER SYSTEM.

9. PROVIDE SPRINKLERS BELOW GRATED STAIRS AND STAIR LANDING PER NFPA 13.

10. REMOTE BREAKROOM/RESTROOM: PROVIDE HYDRAULICALLY DESIGNED AUTOMATIC WET PIPE SPRINKLER SYSTEM TO PROTECT REMOTE RESTROOM AREA IN ACCORDANCE WITH LATEST ADOPTED EDITION OF BUILDING CODE AND NFPA13.

DESIGN CRITERIA:
LIGHT HAZARD
5.6 K-FACTOR CONCEALED PENDENTS.
EXTEND OFF WAREHOUSE SYSTEM.

CESO
WWW.CESOINC.COM
3601 Rigby Road, Suite 300
Miamisburg, OH 45342
Phone: 937.435.8584 Fax: 888.208.4826

STATE OF VERMONT
ROBERT A. HARVEY
10/01/2024
NO. 035830
MECHANICAL
LICENSED
PROFESSIONAL ENGINEER

DIALECTIC ENGINEERING
Dialectic, Inc.
310 W 20th Street, Suite 100
Kansas City, MO 64108
T 816-897-9601
F 816-997-9602
DialecticEng.com

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Project # - 01202415.23

SCANNELL PROPERTIES

PROJECT MOOSE

THOMPSON DRIVE, ESSEX VT, 05452

Revisions / Submissions

ID	Description	Date
	PERMIT SET	09.30.2024

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Project number:	763816-01
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Sheet Title:
OVERALL FIRE PROTECTION CRITERIA PLAN

FP1.01

DIVISION 21: AUTOMATIC SPRINKLER SYSTEM

1. GENERAL INSTRUCTIONS

A. GENERAL REQUIREMENTS

REQUIREMENTS UNDER DIVISION 01 AND THE GENERAL AND SUPPLEMENTARY CONDITIONS OF THESE SPECIFICATIONS SHALL APPLY TO THIS SECTION AND DIVISION. WHERE THE REQUIREMENTS OF THIS SECTION AND DIVISION EXCEED THOSE OF DIVISION 01, THIS SECTION AND DIVISION TAKE PRECEDENCE. BECOME THOROUGHLY FAMILIAR WITH ALL ITS CONTENTS AS TO REQUIREMENTS THAT AFFECT THIS DIVISION, SECTION, OR BOTH. WORK REQUIRED UNDER THIS DIVISION INCLUDES ALL MATERIAL, EQUIPMENT, APPLIANCES, TRANSPORTATION, SERVICES, AND LABOR REQUIRED TO COMPLETE THE ENTIRE SYSTEM AS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS, OR REASONABLY INFERRED TO BE NECESSARY TO FACILITATE THE FUNCTION OF EACH SYSTEM AS IMPLIED BY THE DESIGN AND THE EQUIPMENT SPECIFIED.

THE SPECIFICATIONS AND DRAWINGS FOR THE PROJECT ARE COMPLEMENTARY, AND ANY PORTION OF WORK DESCRIBED IN ONE SHALL BE PROVIDED AS IF DESCRIBED IN BOTH. IN THE EVENT OF DISCREPANCIES, NOTIFY THE ENGINEER AND REQUEST CLARIFICATION PRIOR TO PROCEEDING WITH THE WORK INVOLVED.

DRAWINGS ARE GRAPHIC REPRESENTATIONS OF THE WORK UPON WHICH THE CONTRACT IS BASED, THEY SHOW THE MATERIALS AND THEIR RELATIONSHIP TO ONE ANOTHER, INCLUDING SIZES, SHAPES, LOCATIONS, AND CONNECTIONS. THEY CONVEY THE SCOPE OF WORK, INDICATING THE INTENDED GENERAL ARRANGEMENT OF THE SYSTEMS WITHOUT SHOWING ALL OF THE EXACT DETAILS AS TO ELEVATIONS, OFFSETS, CONTROL LINES, AND OTHER INSTALLATION REQUIREMENTS. USE THE DRAWINGS AS A GUIDE WHEN LAYING OUT THE WORK AND TO VERIFY THAT MATERIALS AND EQUIPMENT WILL FIT INTO THE DESIGNATED SPACES, AND WHICH WHEN INSTALLED PER MANUFACTURERS' REQUIREMENTS, WILL ENSURE A COMPLETE, COORDINATED, SATISFACTORY, AND PROPERLY OPERATING SYSTEM.

REFER TO DIVISION 22 FOR ADDITIONAL REQUIREMENTS THAT APPLY TO THIS INSTALLATION THAT ARE NOT WRITTEN HEREIN.

B. DEFINITIONS

DIVISION: REFERENCES CONTAINED IN THIS SPECIFICATION FOLLOW THE NUMBERING SYSTEM DEFINED IN THE CONSTRUCTION SPECIFICATIONS INSTITUTE (CSI) MASTERFORMAT 2004 EDITION SPECIFICATION DIVISIONS 01 THROUGH 13 PROVIDED WITH THIS PROJECT MAY REFERENCE THE CSI MASTERFORMAT 1995 EDITION. THE CORRESPONDING DIVISION REFERENCES BETWEEN THE 2004 EDITION AND 1995 EDITION ARE AS FOLLOWS:

2004 EDITION 1995 EDITION
1. DIVISION 21 – FIRE SUPPRESSION DIVISION 15
2. DIVISION 22 – PLUMBING DIVISION 15
3. DIVISION 23 – HVAC DIVISION 15
4. DIVISION 26 – ELECTRICAL DIVISION 16
5. DIVISION 27 – COMMUNICATIONS DIVISION 16
6. DIVISION 28 – ELECTRONIC SAFETY AND SECURITY DIVISION 16

FURNISH: "TO SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION AND SIMILAR OPERATIONS."

INSTALL: "TO PERFORM ALL OPERATIONS AT THE PROJECT SITE INCLUDING, BUT NOT LIMITED TO, THE ACTUAL UNLOADING, UNPACKING, ASSEMBLING, ERECTING, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, TESTING, COMMISSIONING, STARTING UP AND SIMILAR OPERATIONS, COMPLETE, AND READY FOR THE INTENDED USE."

PROVIDE: "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

FURNISHED BY OWNER (OR OWNER-FURNISHED) OR FURNISHED BY OTHERS: "AN ITEM FURNISHED BY THE OWNER OR UNDER OTHER DIVISIONS OR CONTRACTS, AND INSTALLED UNDER THE REQUIREMENTS OF THIS DIVISION, COMPLETE AND READY FOR THE INTENDED USE, INCLUDING ALL ITEMS AND SERVICES INCIDENTAL TO THE WORK NECESSARY FOR PROPER INSTALLATION AND OPERATION, INCLUDE THE INSTALLATION UNDER THE WARRANTY REQUIRED BY THIS DIVISION."

ENGINEER: WHERE REFERENCED IN THIS DIVISION, "ENGINEER" IS THE ENGINEER OF RECORD AND THE DESIGN PROFESSIONAL FOR THE WORK UNDER THIS DIVISION, AND IS A CONSULTANT TO, AND AN AUTHORIZED REPRESENTATIVE OF THE ARCHITECT, AS DEFINED IN THE GENERAL AND/OR SUPPLEMENTARY CONDITIONS. WHEN USED IN THIS DIVISION, ENGINEER MEANS INCREASED INVOLVEMENT BY AND OBLIGATIONS TO THE ENGINEER, IN ADDITION TO INVOLVEMENT BY AND OBLIGATIONS TO THE ARCHITECT.

AHJ: THE LOCAL CODE AND/OR INSPECTION AGENCY (AUTHORITY) HAVING JURISDICTION OVER THE WORK.

NRTL: NATIONALLY RECOGNIZED TESTING LABORATORY, AS DEFINED AND LISTED BY OSHA IN 29 CFR 1910.7 (E.G., UL, ETL, GSA), AND ACCEPTABLE TO THE AHJ OVER THIS PROJECT. NATIONALLY RECOGNIZED TESTING LABORATORIES AND STANDARDS LISTED ARE USED ONLY TO REPRESENT THE CHARACTERISTICS REQUIRED AND ARE NOT INTENDED TO RESTRICT THE USE OF OTHER NRTLS THAT ARE ACCEPTABLE TO THE AHJ AND STANDARDS THAT MEET THE SPECIFIED CRITERIA.

SUBSTITUTION: CHANGES IN PRODUCTS, MATERIALS, EQUIPMENT, AND METHODS OF CONSTRUCTION FROM THOSE REQUIRED BY THE CONTRACT DOCUMENTS AND PROPOSED BY CONTRACTOR. SUBSTITUTIONS INCLUDE VALUE ENGINEERING PROPOSALS.
1. SUBSTITUTIONS FOR CAUSE: CHANGES PROPOSED BY CONTRACTOR THAT ARE REQUIRED DUE TO CHANGED PROJECT CONDITIONS, SUCH AS UNAVAILABILITY OF PRODUCT, REGULATORY CHANGES, OR UNAVAILABILITY OF REQUIRED WARRANTY TERMS.
2. SUBSTITUTIONS FOR CONVENIENCE: CHANGES PROPOSED BY CONTRACTOR OR OWNER THAT ARE NOT REQUIRED IN ORDER TO MEET OTHER PROJECT REQUIREMENTS BUT MAY OFFER ADVANTAGE TO CONTRACTOR OR OWNER.

THE TERMS "APPROVED EQUAL", "EQUIVALENT", OR "EQUAL" ARE USED SYNONYMOUSLY AND SHALL MEAN "ACCEPTED BY OR ACCEPTABLE TO THE ENGINEER AS EQUIVALENT TO THE ITEM OR MANUFACTURER SPECIFIED". THE TERM "APPROVED" SHALL MEAN LABELED, LISTED, OR BOTH, BY AN NRTL, AND ACCEPTABLE TO THE AHJ OVER THIS PROJECT.

C. PREBID SITE VISIT

PRIOR TO SUBMITTING BID, VISIT THE SITE OF THE PROPOSED WORK AND BECOME FULLY INFORMED AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO COMPLY WITH THIS REQUIREMENT SHALL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.

D. MANUFACTURERS

IN OTHER ARTICLES WHERE LISTS OF MANUFACTURERS ARE INTRODUCED, SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE MANUFACTURERS SPECIFIED.

WHERE A LIST IS PROVIDED, MANUFACTURERS ARE LISTED ALPHABETICALLY AND NOT IN ACCORDANCE WITH ANY RANKING OR PREFERENCE,

WHERE MANUFACTURERS ARE NOT LISTED, PROVIDE PRODUCTS SUBJECT TO COMPLIANCE WITH REQUIREMENTS FROM MANUFACTURERS THAT HAVE BEEN ACTIVELY INVOLVED IN MANUFACTURING THE SPECIFIED PRODUCT FOR NO LESS THAN 5 YEARS.

E. COORDINATION

COORDINATE THE CONNECTION OF THE FIRE SPRINKLER ALARM DEVICES TO THE FIRE ALARM SYSTEM AS REQUIRED.

COORDINATE WORK WITH THAT OF OTHER TRADES SO THAT THE VARIOUS COMPONENTS OF THE SYSTEMS ARE INSTALLED AT THE PROPER TIME, WILL FIT THE AVAILABLE SPACE, AND WILL ALLOW PROPER SERVICE ACCESS TO THOSE ITEMS REQUIRING MAINTENANCE. COMPONENTS INSTALLED WITHOUT REGARD TO THE ABOVE SHALL BE RELOCATED AT NO ADDITIONAL COST TO THE OWNER.

F. SUBSTITUTIONS

MATERIALS, PRODUCTS, EQUIPMENT, AND SYSTEMS DESCRIBED IN THE BIDDING DOCUMENTS ESTABLISH A STANDARD OF REQUIRED FUNCTION, DIMENSION, APPEARANCE AND QUALITY TO BE MET BY THE PROPOSED SUBSTITUTION. THE BASE BID SHALL INCLUDE ONLY THE PRODUCTS FROM MANUFACTURERS SPECIFICALLY NAMED IN THE DRAWINGS AND SPECIFICATIONS. TO REQUEST A SUBSTITUTION, REQUEST THE SUBSTITUTION REQUEST FORM FROM THE ARCHITECT OR ENGINEER. COMPLETE AND SEND THE SUBSTITUTION REQUEST FROM FOR EACH MATERIAL, PRODUCT, EQUIPMENT, OR SYSTEM THAT IS PROPOSED TO BE SUBSTITUTED. THE BURDEN OF PROOF OF THE MERIT OF THE PROPOSED SUBSTITUTION IS UPON THE PROPOSER.

UNLESS STATED OTHERWISE IN WRITING TO THE ENGINEER BY THE CONTRACTOR, CONTRACTOR WARRANTS TO THE ENGINEER, ARCHITECT, AND OWNER THE FOLLOWING:
1. PROPOSED SUBSTITUTION HAS BEEN FULLY INVESTIGATED AND DETERMINED TO MEET OR EXCEED THE SPECIFIED WORK IN ALL RESPECTS UNLESS STATED OTHERWISE IN THE SUBSTITUTION REQUEST.
2. PROPOSED SUBSTITUTION IS CONSISTENT WITH THE CONTRACT DOCUMENTS AND WILL PRODUCE INDICATED RESULTS, INCLUDING FUNCTIONAL CLEARANCES, MAINTENANCE SERVICE, AND SOURCING OF REPLACEMENT PARTS.
3. PROPOSED SUBSTITUTION HAS RECEIVED NECESSARY APPROVALS OF AUTHORITIES HAVING JURISDICTION.
4. SAME WARRANTY WILL BE FURNISHED FOR PROPOSED SUBSTITUTION AS FOR SPECIFIED WORK.
5. IF ACCEPTED SUBSTITUTION FAILS TO PERFORM AS REQUIRED, CONTRACTOR SHALL REPLACE SUBSTITUTE MATERIAL OR SYSTEM WITH THAT ORIGINALLY SPECIFIED AND BEAR COSTS INCURRED THEREBY.
6. COORDINATION, INSTALLATION AND CHANGES IN THE WORK AS NECESSARY FOR ACCEPTED SUBSTITUTION WILL BE COMPLETE IN ALL RESPECTS.

NO SUBSTITUTIONS WILL BE CONSIDERED UNLESS THE SUBSTITUTION REQUEST FORM IS COMPLETED AND ATTACHED WITH THE APPROPRIATE SUBSTITUTION DOCUMENTATION. NO SUBSTITUTION WILL BE CONSIDERED PRIOR TO RECEIPT OF BIDS UNLESS WRITTEN REQUEST FOR APPROVAL TO BID HAS BEEN RECEIVED BY THE ENGINEER AT LEAST TEN (10) CALENDAR DAYS PRIOR TO THE DATE FOR RECEIPT OF BIDS.

IF THE PROPOSED SUBSTITUTION IS APPROVED PRIOR TO RECEIPT OF BIDS, SUCH APPROVAL WILL BE STATED IN AN ADDENDUM. BIDDERS SHALL NOT RELY UPON APPROVALS MADE IN ANY OTHER WAY. VERBAL APPROVAL WILL NOT BE GIVEN. NO SUBSTITUTIONS WILL BE CONSIDERED AFTER THE CONTRACT IS AWARDED UNLESS SPECIFICALLY PROVIDED IN THE CONTRACT DOCUMENTS.

G. SUBMITTALS

ASSEMBLE AND SUBMIT FOR REVIEW SHOP DRAWINGS, MATERIAL LISTS, MANUFACTURER PRODUCT LITERATURE FOR EQUIPMENT TO BE FURNISHED, AND ITEMS REQUIRING COORDINATION BETWEEN CONTRACTORS UNDER THIS CONTRACT. PROVIDE SUBMITTALS IN SUFFICIENT DETAIL SO AS TO DEMONSTRATE COMPLIANCE WITH THESE CONTRACT DOCUMENTS AND THE DESIGN CONCEPT. PRIOR TO TRANSMITTING SUBMITTAL, VERIFY THAT THE EQUIPMENT SUBMITTED IS MUTUALLY COMPATIBLE AND SUITABLE FOR THE INTENDED USE, WILL FIT THE AVAILABLE SPACE, AND MAINTAIN MANUFACTURER RECOMMENDED SERVICE CLEARANCES. IF THE SIZE OF EQUIPMENT FURNISHED MAKES NECESSARY ANY CHANGE IN LOCATION OR CONFIGURATION, SUBMIT A SHOP DRAWING SHOWING THE PROPOSED LAYOUT.

TRANSMIT SUBMITTALS AS EARLY AS REQUIRED TO SUPPORT THE PROJECT SCHEDULE. ALLOW FOR TWO WEEKS ENGINEER REVIEW TIME, PLUS TO/FROM MAILING TIME VIA THE ARCHITECT, PLUS A DUPLICATION OF THIS TIME FOR RESUBMITTAL IF REQUIRED, ONLY RESUBMIT THOSE SECTIONS REQUESTED FOR RESUBMITTAL.

SUBMITTALS SHALL CONTAIN THE PROJECT NAME, APPLICABLE SPECIFICATION SECTION, SUBMITTAL DATE, EQUIPMENT IDENTIFICATION ACRONYM AS USED ON THE DRAWINGS, AND THE CONTRACTOR'S STAMP. THE STAMP SHALL CERTIFY THAT THE SUBMITTAL HAS BEEN CHECKED BY THE CONTRACTOR, COMPLIES WITH THE DRAWINGS AND SPECIFICATIONS, AND IS COORDINATED WITH OTHER TRADES. MANUFACTURER PRODUCT LITERATURE SHALL INCLUDE SHOP DRAWINGS, PRODUCT DATA, PERFORMANCE SHEETS, SAMPLES AND OTHER SUBMITTALS REQUIRED BY THIS DIVISION. HIGHLIGHT, MARK, LIST, OR INDICATE THE MATERIALS, PERFORMANCE CRITERIA, AND ACCESSORIES THAT ARE BEING PROPOSED. GENERAL PRODUCT CATALOG DATA NOT SPECIFICALLY NOTED TO BE PART OF THE SPECIFIED PRODUCT WILL BE REJECTED AND RETURNED WITHOUT REVIEW.

SHOP DRAWINGS SHALL MEET THE REQUIREMENTS OF NFPA 13 FOR WORKING LEVEL DRAWINGS AND SHALL INCLUDE THE FOLLOWING:
1. WORKING PLANS PER NFPA 13, INCLUDING LAYOUT DRAWINGS OF THE COMPLETE OVERHEAD SPRINKLER SYSTEM THAT INDICATES THE RELATIONSHIP OF SPRINKLER PIPING AND SPRINKLERS TO ALL OTHER OVERHEAD ITEMS, INCLUDING DUCTWORK, LIGHT FIXTURES, DIFFUSERS, REGISTERS, GRILLES, DUCTWORK, STRUCTURE, SOFFITS, OBSTRUCTIONS, ETC., LOCATION OF RISERS, PIPING, ETC., SHALL BE AS UNOBTRUSIVE AS POSSIBLE AND SHALL FULFILL ALL FUNCTIONAL REQUIREMENTS. SYSTEM DESIGN CAPABILITIES AND DEMAND SHALL ALSO BE NOTED ON THE DRAWINGS.
2. COMPLETE DETAILS AND SECTIONS AS REQUIRED TO CLEARLY DEFINE AND CLARIFY THE DESIGN, INCLUDING A MATERIALS LIST DESCRIBING ALL PROPOSED MATERIALS BY MANUFACTURER'S NAME AND CATALOG NUMBER.
3. HYDRAULIC CALCULATIONS.
4. PRODUCT DATA FOR ALL FIRE SPRINKLER SYSTEM COMPONENTS. CLEARLY INDICATE COMPONENTS TO BE USED WHERE MULTIPLE COMPONENTS APPEAR ON THE SAME CUT SHEET.

WHERE REQUIRED BY THE AHJ, CONTRACTOR IS RESPONSIBLE FOR OBTAINING A PROFESSIONAL ENGINEER OR NICET STAMP AND SIGNATURE ON THEIR SHOP DRAWING SUBMITTAL. THE ENGINEER IS NOT RESPONSIBLE AND WILL NOT PROVIDE THIS.

SUBMITTALS AND SHOP DRAWINGS SHALL NOT CONTAIN THE FIRM NAME, LOGO, SEAL, OR SIGNATURE OF THE ENGINEER. THEY SHALL NOT BE COPIES OF THE WORK PRODUCT OF THE ENGINEER. IF THE CONTRACTOR DESIRES TO USE ELEMENTS OF SUCH PRODUCT, REFER TO PARAGRAPH "ELECTRONIC DRAWING FILES" FOR PROCEDURES TO BE USED.

SEPARATE SUBMITTALS ACCORDING TO INDIVIDUAL SPECIFICATION SECTIONS. ILLEGIBLE SUBMITTALS SHALL BE REJECTED AND RETURNED WITHOUT REVIEW. SHOP DRAWINGS SHALL BE PRODUCED USING COMPUTER AIDED DESIGN. HAND DRAWN DOCUMENTS WILL NOT BE REVIEWED OR APPROVED. CATALOG DATA SHALL BE PROPERLY BOUND, IDENTIFIED, INDEXED AND TABBED IN A 3-RING BINDER. EACH ITEM OR MODEL NUMBER SHALL BE CLEARLY MARKED AND ACCESSORIES INDICATED. LABEL THE CATALOG DATA WITH THE EQUIPMENT IDENTIFICATION ACRONYM OR NUMBER AS USED ON THE DRAWINGS AND INCLUDE PERFORMANCE CURVES, CAPACITIES, SIZES, WEIGHTS, MATERIALS, FINISHES, WIRING DIAGRAMS, ELECTRICAL REQUIREMENTS AND DEVIATIONS FROM SPECIFIED EQUIPMENT OR MATERIALS. FOR EQUIPMENT WITH MOTOR STARTERS OR VFDS, INCLUDE SHORT CIRCUIT CURRENT RATINGS. MARK OUT AND DELETE IRRELEVANT SHOP DRAWINGS WILL BE RETURNED WITHOUT REVIEW IF THE ABOVE MENTIONED REQUIREMENTS ARE NOT MET.

PROVIDE THE QUANTITY OF SUBMITTALS REQUIRED BY DIVISION 01. IF NOT INDICATED AND HARD-COPY SETS ARE PROVIDED, SUBMIT A MINIMUM OF SIX (6) COPIES. REFER TO DIVISION 01 FOR ACCEPTANCE OF ELECTRONIC SUBMITTALS FOR THIS PROJECT. FOR ELECTRONIC SUBMITTALS, CONTRACTOR SHALL SUBMIT THE DOCUMENTS IN ACCORDANCE WITH THE PROCEDURES SPECIFIED IN DIVISION 01. CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER THAT THE SUBMITTALS HAVE BEEN POSTED. IF ELECTRONIC SUBMITTAL PROCEDURES ARE NOT DEFINED IN DIVISION 01, CONTRACTOR SHALL INCLUDE THE WEBSITE, USER NAME AND PASSWORD INFORMATION NEEDED TO ACCESS THE SUBMITTALS. FOR SUBMITTALS SENT BY E-MAIL, CONTRACTOR SHALL COPY THE DESIGNATED REPRESENTATIVES OF THE ARCHITECT AND ENGINEER. CONTRACTOR SHALL ALLOW THE ENGINEER REVIEW TIME AS SPECIFIED ABOVE IN THE CONSTRUCTION SCHEDULE. CONTRACTOR SHALL SUBMIT ONLY THE DOCUMENTS REQUIRED TO PURCHASE THE MATERIALS AND/OR EQUIPMENT IN THE ELECTRONIC SUBMITTAL.

THE CHECKING AND SUBSEQUENT APPROVAL OF SUCH SHOP DRAWINGS BY THE ENGINEER SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN DIMENSIONS, DETAILS, SIZE OF MEMBERS, QUANTITIES, OMISSIONS OF COMPONENTS OR FITTINGS; COORDINATION OF ELECTRICAL REQUIREMENTS; OR FOR COORDINATING ITEMS WITH ACTUAL BUILDING CONDITIONS. PROCEED WITH THE PROCUREMENT AND INSTALLATION OF EQUIPMENT ONLY AFTER RECEIVING APPROVED SHOP DRAWINGS RELATIVE TO EACH ITEM.

H. ELECTRONIC DRAWINGS

IN PREPARATION OF SHOP DRAWINGS OR RECORD DRAWINGS, CONTRACTOR MAY, AT HIS OPTION, OBTAIN ELECTRONIC DRAWING FILES IN AUTOCAD OR DXF FORMAT ON CD-ROM DISK, DVD DISK, FLASH DRIVE, OR DIRECT DOWNLOAD, AS DESIRED, FROM THE ENGINEER FOR A FEE OF $200 FOR A DRAWING SET UP TO 12 SHEETS AND $15 PER SHEET FOR EACH ADDITIONAL SHEET. CONTACT THE ARCHITECT FOR WRITTEN AUTHORIZATION AND ENGINEER FOR THE NECESSARY RELEASE AGREEMENT FORM AND TO SPECIFY SHIPPING METHOD AND DRAWING FORMAT. IN ADDITION TO PAYMENT, WRITTEN AUTHORIZATION FROM THE ARCHITECT AND RELEASE AGREEMENT FROM THE ENGINEER MUST BE RECEIVED BEFORE ELECTRONIC DRAWING FILES WILL BE SENT.

I. RECORD DRAWINGS (AS-BUILT DRAWINGS)

DURING PROGRESS OF THE WORK IN THIS DIVISION, CONTRACTOR SHALL MAINTAIN AN ACCURATE RECORD OF ALL CHANGES MADE DURING THE INSTALLATION OF THE SYSTEM. UPON COMPLETION OF THE WORK, ACCURATELY TRANSFER ALL RECORD INFORMATION TO THREE IDENTICAL SETS OF THE APPROVED SHOP DRAWINGS. INSERT ONE SET INTO EACH COPY OF THE MANUAL DESCRIBED BELOW.

SEE DIVISION 01 AND GENERAL CONDITIONS FOR ADDITIONAL INFORMATION.

J. OPERATION AND MAINTENANCE INSTRUCTIONS

DURING THE COURSE OF CONSTRUCTION, COLLECT AND COMPILE A COMPLETE BROCHURE OF EQUIPMENT FURNISHED AND INSTALLED ON THIS PROJECT. INCLUDE OPERATIONAL AND MAINTENANCE INSTRUCTIONS, MANUFACTURER'S CATALOG SHEETS, WIRING DIAGRAMS, PARTS LISTS, APPROVED SUBMITTALS AND SHOP DRAWINGS, WARRANTIES, AND DESCRIPTIVE LITERATURE AS FURNISHED BY THE EQUIPMENT MANUFACTURERS. INCLUDE AN INSIDE COVER SHEET THAT LISTS THE PROJECT NAME, DATE, OWNER, ARCHITECT, ENGINEER, GENERAL CONTRACTOR, SUB-CONTRACTOR, AND AN INDEX OF CONTENTS.

SUBMIT THREE COPIES OF LITERATURE BOUND IN APPROVED BINDERS WITH INDEX AND TABS SEPARATING EQUIPMENT TYPES TO THE ARCHITECT, FOR ENGINEER'S REVIEW, AT THE TERMINATION OF THE WORK. PAPER CLIPS, STAPLES, RUBBER BANDS, LOOSE-LEAF BINDING, AND MAILING ENVELOPES ARE NOT CONSIDERED APPROVED BINDERS. FINAL APPROVAL OF SYSTEMS INSTALLED UNDER THIS CONTRACT SHALL BE WITHHELD UNTIL THIS EQUIPMENT BROCHURE IS RECEIVED AND DEEMED COMPLETE BY THE ARCHITECT AND ENGINEER. INSTRUCT WORKMEN TO SAVE REQUIRED LITERATURE SHIPPED WITH THE EQUIPMENT ITSELF FOR INCLUSION IN THIS BROCHURE.

LITERATURE SHALL CONTAIN THE FOLLOWING ITEMS:
1. IDENTIFICATION CLEARLY VISIBLE ON OR THROUGH THE COVER, THE NAME OF THE PROJECT, AND DESCRIPTION "FIRE SPRINKLER SYSTEM MANUAL".
2. NEATLY TYPED INDEX AT FRONT WITH ALL EMERGENCY INFORMATION CLEARLY IDENTIFIED.
3. COMPLETE LIST OF ALL SYSTEM COMPONENTS WITH MANUFACTURER'S NAMES, CATALOG NUMBERS, AND ALL DATA FOR ORDERING PARTS.
4. ONE COPY OF THE RECORD DRAWINGS AS DESCRIBED ABOVE.
5. ALL INFORMATION REQUIRED TO SECURE EMERGENCY REPAIRS OR SERVICE.
6. TEST REPORTS AND CERTIFICATES INCLUDING "CONTRACTOR'S MATERIAL AND TEST CERTIFICATE(S) FOR UNDERGROUND PIPING" AND "CONTRACTOR'S MATERIAL AND TEST CERTIFICATE(S) FOR ABOVE GROUND PIPING" AS DESCRIBED IN NFPA 13.

REFER TO DIVISION 01 FOR ACCEPTANCE OF ELECTRONIC MANUALS FOR THIS PROJECT. FOR ELECTRONIC MANUALS, REFER TO PARAGRAPH "SUBMITTALS" FOR REQUIREMENTS.

K. WARRANTIES

WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, DESIGN, OR MATERIAL FOR A PERIOD OF 12 MONTHS FROM DATE OF SUBSTANTIAL COMPLETION, UNLESS SPECIFIC ITEMS ARE NOTED TO CARRY A LONGER WARRANTY IN THE CONSTRUCTION DOCUMENTS OR MANUFACTURER'S STANDARD WARRANTY EXCEEDS 12 MONTHS. REMEDY ALL DEFECTS, OCCURRING WITHIN THE WARRANTY PERIOD(S), AS STATED IN THE GENERAL CONDITIONS AND DIVISION 01.

WARRANTIES SHALL INCLUDE LABOR AND MATERIAL, INCLUDING TRAVEL EXPENSES. MAKE REPAIRS OR REPLACEMENTS WITHOUT ANY ADDITIONAL COSTS TO THE OWNER, AND TO THE SATISFACTION OF THE OWNER, ARCHITECT, AND ENGINEER.

PERFORM THE REMEDIAL WORK PROMPTLY, UPON WRITTEN NOTICE FROM THE ENGINEER OR OWNER.

AT THE TIME OF SUBSTANTIAL COMPLETION, DELIVER TO THE OWNER ALL WARRANTIES, IN WRITING AND PROPERLY EXECUTED, INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE ONE YEAR PERIOD. EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMMENCEMENT DATE AND TERM.

L. SCOPE

PROVIDE A WET-PIPE, AUTOMATIC FIRE SPRINKLER SYSTEM FOR THE BUILDING AS SHOWN ON THE DRAWINGS. PROVIDE A DRY-PIPE, AUTOMATIC SPRINKLER SYSTEM FOR THE AREA OF WORK SHOWN ON THE DRAWINGS. CONTRACTOR SHALL BE APPROVED AND STATE LICENSED FOR THE DESIGN AND INSTALLATION OF FIRE PROTECTION SYSTEMS. THE WORK DONE UNDER THIS SECTION SHALL BE PERFORMED ONLY BY A CONTRACTOR WHOSE WORKMEN ARE EXPERIENCED AND REGULARLY ENGAGED IN THE INSTALLATION OF FIRE PROTECTION SYSTEMS. CONTRACTOR SHALL BE CAPABLE OF PREPARING HYDRAULIC CALCULATIONS AND SYSTEM LAYOUTS.
PROVIDE ALL FIRE SPRINKLER ALARM DEVICES INCLUDING WATERFLOW ALARM AND VALVE TAMPER SWITCHES PER ALL SYSTEM CONTROL VALVES. PROVIDE A NOTIFICATION APPLIANCE ACCEPTABLE TO THE AHJ ON THE EXTERIOR OF THE BUILDING AT 8'-0" ABOVE FINISHED GRADE, ADJACENT TO THE FIRE DEPARTMENT CONNECTION. COORDINATE ALL WIRING AND CONDUIT FOR A COMPLETE AND FUNCTIONAL INSTALLATION.

SYSTEM SHALL, AT A MINIMUM, BE IN ACCORDANCE WITH THE LATEST EDITION OF NFPA 13, 24, UNDERWRITERS LABORATORIES (UL), AND MUST BE ACCEPTABLE TO THE OWNER'S INSURER, THE AHJ, AND ALL APPLICABLE LOCAL, STATE AND NATIONAL CODES AND STANDARDS. WHERE THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THE REFERENCED CODES, STANDARDS, ETC., THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE.

WORK SHALL INCLUDE, BUT SHALL NOT NECESSARILY BE LIMITED TO THE FOLLOWING:
1. ALL UNDERGROUND PIPING (WHICH PERTAINS TO THE FIRE SPRINKLER SYSTEM) AS INDICATED ON THE DRAWINGS, INCLUDING ALL REQUIRED PIPE, VALVES, ETC., AS WELL AS THE REQUIRED PREPARATORY AND FINISHING WORK SUCH AS TRENCHING, BACKFILLING, AND PAVEMENT REPLACEMENT. PROVIDE THRUST BLOCKS. SUPERVISED POST INDICATING VALVE, AND VALVE PIT AS REQUIRED OR SHOWN ON DRAWINGS.
2. CONNECTION TO CITY MAIN SHALL BE A WET TAP AND SHALL INCLUDE ALL REQUIRED FITTINGS, VALVES, METER VAULTS, BACKFLOW PREVENTERS, BACKFLOW PREVENTER VAULT, ETC. PROVIDE BACKFLOW PREVENTION EQUIPMENT AS REQUIRED BY LOCAL CODES.
3. DESIGN AND INSTALLATION OF A COMPLETE WET-PIPE, AUTOMATIC FIRE SPRINKLER SYSTEM FOR THE AREA OF WORK SHOWN ON THE DRAWINGS OR SPECIFIED HEREIN.
4. PORTIONS OF SYSTEMS SUBJECT TO FREEZING OR TEMPERATURES BELOW 40 DEGREES F SHALL BE PROTECTED AGAINST FREEZING AS REQUIRED BY NFPA 13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRS AND ALL COSTS INCURRED FROM DAMAGE CAUSED BY FREEZING OF THE FIRE PROTECTION SYSTEM.
5. COORDINATE THE CONNECTION OF ALL INSTALLED FIRE SPRINKLER ALARM DEVICES.

M. SYSTEM DESIGN

CONTRACTOR SHALL VERIFY DESIGN CRITERIA AND RATING HAZARDS WITH THE OWNER'S INSURER PRIOR TO DESIGNING THE SYSTEM. WATERFLOW AND PRESSURE TEST DATA SHALL BE ACQUIRED BEFORE SYSTEM IS CALCULATED AND BE DATED NOT MORE THAN 12 MONTHS PRIOR TO THE SUBMITTAL OF SPRINKLER SHOP DRAWINGS. ARRANGEMENTS FOR AND COST OF FLOW TESTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

SUBMIT HYDRAULIC CALCULATIONS AND PLAN. INCLUDING A SUPPLY AND DEMAND GRAPH; ALL HYDRAULIC REFERENCE POINTS AND AREA OF APPLICATION SHALL APPEAR ON THE PLAN. CONTRACTOR SHALL VERIFY WITH AHJ ANY MINIMUM SAFETY FACTOR REQUIREMENTS. DEMAND SHALL NOT BE LESS THAN 10 PERCENT BELOW THE SUPPLY AT THE DEMAND POINT.
REFER TO SPRINKLER DESIGN CRITERIA LEGEND ON SHEET FS001 FOR SPRINKLER DESIGN CRITERIA. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE HYDRAULIC CALCULATIONS, THE FINAL SYSTEM DESIGN, AND THE LAYOUT OF ALL COMPONENTS OF THE SYSTEM AS REQUIRED FOR APPROVAL BY THE OWNER'S INSURER AND THE AHJ.

THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR COORDINATING SYSTEM LAYOUT WITH OTHER CONTRACTORS. CHANGES TO SYSTEM DESIGN DUE TO LACK OF COORDINATION SHALL BE PAID FOR BY THE CONTRACTOR.DESIGNS REQUIRING CUTTING OF STRUCTURAL MEMBERS FOR PASSAGE OF SPRINKLER PIPES OR HANGERS SHALL NOT BE ACCEPTED. WHEN DESIGN APPEARANCE OR SIMILAR ASPECTS REQUIRE CUTTING DUE TO ECONOMY, IT SHALL BE HELD TO AN ABSOLUTE MINIMUM AND DONE ONLY WITH THE ARCHITECT AND STRUCTURAL ENGINEER'S WRITTEN APPROVAL. ANY EXCESSIVE REQUIREMENTS OF THIS TYPE SHALL BE IDENTIFIED DURING THE BID PERIOD.

SPRINKLER SPACING SHALL CONFORM TO NFPA 13. EXTENDED COVERAGE SPRINKLERS SHALL NOT BE USED IN UNFINISHED (SHELL) SPACES.

THE HYDRAULIC AREA OF OPERATION SHALL BE INCREASED BY 30% WITHOUT REVISING THE DENSITY FOR AREAS WITH SLOPED CEILINGS WITH A PITCH EXCEEDING 1 IN 6 (16.7% SLOPE) IN ACCORDANCE WITH NFPA 13.

THE HYDRAULIC AREA OF OPERATION SHALL BE INCREASED BY 30% WITHOUT REVISING THE DENSITY FOR DRY-PIPE SYSTEMS IN ACCORDANCE WITH NFPA 13.

THE HYDRAULIC AREA OF OPERATION MAY NOT BE REDUCED AS ALLOWED BY NFPA 13 FOR AREAS UTILIZING QUICK RESPONSE SPRINKLERS IN UNFINISHED SHELL SPACES. FOR ALL OTHER AREAS, THE HYDRAULIC AREA OF OPERATION SHALL NOT BE REDUCED AS ALLOWED BY NFPA 13 FOR AREAS UTILIZING QUICK RESPONSE SPRINKLERS UNLESS SPECIFICALLY APPROVED BY THE ENGINEER VIA A FORMALLY SUBMITTED RFI.

2. MATERIALS AND INSTALLATION

A. PRODUCTS

ALL FIRE PROTECTION SYSTEM COMPONENTS SHALL BE UNDERWRITER'S LABORATORIES LISTED FOR THEIR INTENDED USE.

B. PIPING AND COMPONENTS

UNDERGROUND PIPING SHALL BE CEMENT LINED DUCTILE IRON OR OTHER APPROVED OR LISTED MATERIAL, INSTALLED IN ACCORDANCE WITH NFPA; FIRE MAIN SHALL INCLUDE ALL REQUI

DIVISION 21: AUTOMATIC SPRINKLER SYSTEM

SECTION 213113: ELECTRIC-DRIVE, CENTRIFUGAL FIRE PUMPS

1. GENERAL REQUIREMENTS

A. SUMMARY

1. THE EXTENT OF THIS FIRE PUMP SYSTEM SHALL BE AS SPECIFIED HEREIN. CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARATION OF DESIGN DRAWINGS, HYDRAULIC CALCULATIONS, FABRICATION AND INSTALLATION FOR COMPLETE FIRE PUMP SYSTEM FOR THE BUILDING.
2. SECTION INCLUDES:
   1. HORIZONTAL SPLIT CASE FIRE PUMPS.
   2. FIRE PUMP ACCESSORIES AND SPECIALTIES.
   3. CONTROLLERS FOR FIRE PUMP DRIVERS.
   4. PRESSURE-MAINTENANCE PUMPS.
   5. CONTROLLERS FOR PRESSURE-MAINTENANCE PUMPS.
   6. REMOTE ALARM PANELS.

B. PERFORMANCE REQUIREMENTS

1. PUMP EQUIPMENT, ACCESSORY, AND SPECIALTY PRESSURE RATING: 175 PSIG MINIMUM UNLESS HIGHER PRESSURE RATING IS INDICATED.

C. SYSTEM DESCRIPTION

1. GENERAL: PROVIDE AN ELECTRIC, HORIZONTAL SPLIT CASE FIRE BOOSTER PUMP, COMPLETE WITH JOCKEY PUMP, FIRE AND JOCKEY PUMP CONTROLLERS AND ALL NECESSARY EQUIPMENT AND ACCESSORIES TO SUPPLY THE SPRINKLER AND/OR STANDPIPE SYSTEM. THE FIRE BOOSTER PUMP, ASSOCIATED EQUIPMENT AND PIPING SHALL BE INSTALLED WHERE INDICATED ON THE DRAWINGS. PROVIDE IN ACCORDANCE WITH THE LATEST ISSUE OF NFPA 20.
2. PUMP CONDITIONS: REMOTE INDICATION OF ALL MONITOR SWITCHES, CIRCUIT BREAKER OPEN, LOW PUMP ROOM TEMPERATURE (BELOW 40° F), POWER FAILURE, PHASE REVERSAL, PUMP RUNNING, AND ALL SIGNALS REQUIRED BY NFPA 20. REFERENCE: DIVISION 26 FOR WIRING.
3. QUALITY ASSURANCE: PUMP MANUFACTURER SHALL HAVE UNIT RESPONSIBILITY FOR PROPER OPERATION OF THE COMPLETE UNIT, AND PROVIDE SERVICES OF A FACTORY TRAINED TECHNICIAN TO SUPERVISE INSTALLATION, AND TO ATTEND FINAL FIELD ACCEPTANCE TESTS.
4. OPERATION: THE FIRE BOOSTER PUMP SHALL BE CONNECTED TO AN AUTOMATIC WATER SUPPLY. TO SUPPLY THE FIRE SPRINKLER, FIRE PUMP SHALL BE AUTOMATIC STARTING FOLLOWING PRESSURE LOSS WITHIN THE SPRINKLER SYSTEM. ALL DRAINS SHALL BE PIPED TO THE EXTERIOR OF THE BUILDING.

D. SUBMITTALS

1. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED, INCLUDE RATED CAPACITIES, OPERATING CHARACTERISTICS, PERFORMANCE CURVES, ELECTRICAL CHARACTERISTICS, AND FURNISHED SPECIALTIES AND ACCESSORIES. HIGHLIGHT, MARK, LIST OR INDICATE THE MATERIALS, PERFORMANCE CRITERIA AND ACCESSORIES THAT ARE BEING PROPOSED.
2. SHOP DRAWINGS: FOR FIRE PUMPS, MOTOR DRIVERS, CONTROLLERS, AND FIRE PUMP ACCESSORIES AND SPECIALTIES, INCLUDE PLANS, ELEVATIONS, SECTIONS, DETAILS, AND ATTACHMENTS TO OTHER WORK.
   1. DETAIL EQUIPMENT ASSEMBLIES AND INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHOD OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH FIELD CONNECTION.
   2. WIRING DIAGRAMS: FOR POWER, SIGNAL, AND CONTROL WIRING.
3. PRODUCT CERTIFICATES: FOR EACH FIRE PUMP, FROM MANUFACTURER.
4. SOURCE QUALITY-CONTROL REPORTS.

E. CLOSEOUT SUBMITTALS

1. OPERATION AND MAINTENANCE DATA: FOR FIRE PUMPS TO INCLUDE IN OPERATION AND MAINTENANCE MANUALS.
2. MANUFACTURER'S WRITTEN INSTRUCTIONS FOR SETTING FIELD-ADJUSTABLE TIMERS, CONTROLS, AND STATUS AND ALARM POINTS
3. MANUFACTURER'S WRITTEN INSTRUCTIONS FOR TESTING, ADJUSTING, AND REPROGRAMMING MICROPROCESSOR-BASED LOGIC CONTROLS.
4. FIELD QUALITY-CONTROL REPORTS TO INCLUDE PUMP ACCEPTANCE TEST DOCUMENTATION.

F. QUALITY ASSURANCE

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS AND FEES ASSOCIATED WITH PREPARATION AND APPROVAL OF DRAWINGS AND THE INSTALLATION AND APPROVAL OF A FIRE BOOSTER PUMP.
2. TESTS AND INSPECTIONS: ARRANGE, TEST, AND PAY FOR ALL TESTS REQUIRED BY CODE AND AUTHORITIES HAVING JURISDICTION.
3. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
4. NFPA COMPLIANCE: COMPLY WITH NFPA 20, "INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION."
5. SOURCE LIMITATIONS: OBTAIN FIRE PUMP CONTROLLERS AND ALL ASSOCIATED EQUIPMENT FROM SINGLE SOURCE OR PRODUCER.

G. DELIVERY, STORAGE, AND HANDLING

1. STORE CONTROLLERS INDOORS IN CLEAN, DRY SPACE WITH UNIFORM TEMPERATURE TO PREVENT CONDENSATION. PROTECT ENCLOSED CONTROLLERS FROM EXPOSURE TO DIRT, FUMES, WATER, CORROSIVE SUBSTANCES, AND PHYSICAL DAMAGE.
2. IF STORED IN AREAS SUBJECT TO WEATHER, PROTECT CONTROLLERS FROM WEATHER, DIRT, DUST, CORROSIVE SUBSTANCES, AND PHYSICAL DAMAGE. REMOVE LOOSE PACKING AND COMBUSTIBLE MATERIALS FROM INSIDE CONTROLLERS.

H. PROJECT CONDITIONS

1. AMBIENT TEMPERATURE RATING: NOT LESS THAN 40 DEG F (5 DEG C) AND NOT EXCEEDING 122 DEG F (50 DEG C) UNLESS OTHERWISE INDICATED.

I. COORDINATION

1. COORDINATE SIZES AND LOCATIONS OF CONCRETE BASES WITH ACTUAL EQUIPMENT PROVIDED.
2. COORDINATE LAYOUT AND INSTALLATION OF CONTROLLERS WITH OTHER CONSTRUCTION INCLUDING CONDUIT, PIPING, FIRE PUMP EQUIPMENT, AND ADJACENT SURFACES. MAINTAIN REQUIRED CLEARANCES FOR WORKSPACE AND EQUIPMENT ACCESS DOORS AND PANELS. ENSURE THAT CONTROLLERS ARE WITHIN SIGHT OF FIRE PUMP DRIVERS.

2. PRODUCTS

A. GENERAL REQUIREMENTS FOR CENTRIFUGAL FIRE PUMPS

1. GENERAL: UL 448, FACTORY-ASSEMBLED AND -TESTED, ELECTRIC-DRIVE, CENTRIFUGAL FIRE PUMPS CAPABLE OF FURNISHING NOT LESS THAN 150 PERCENT OF RATED CAPACITY AT NOT LESS THAN 65 PERCENT OF TOTAL RATED HEAD AND WITH SHUTOFF HEAD LIMITED TO 120 PERCENT OF TOTAL RATED HEAD.
   1. FINISH: MANUFACTURER'S STANDARD RED PAINT APPLIED TO FACTORY-ASSEMBLED AND -TESTED UNIT BEFORE SHIPPING.
   2. NAMEPLATE: COMPLETE WITH CAPACITIES, CHARACTERISTICS, AND OTHER PERTINENT DATA.
2. BASE: FABRICATED AND ATTACHED TO FIRE PUMP AND DRIVER UNIT WITH REINFORCEMENT TO RESIST MOVEMENT OF PUMP DURING SEISMIC EVENTS WHEN BASE IS ANCHORED TO BUILDING SUBSTRATE.

B. SPLIT-CASE FIRE PUMPS

1. AVAILABLE MANUFACTURERS:
   1. A-C PUMP; ITT INDUSTRIES.
   2. ARMSTRONG DARLING, INC.
   3. AURORA PUMP; PENTAIR PUMP GROUP.
   4. FAIRBANKS MORSE; PENTAIR PUMP GROUP.
   5. PATTERSON PUMP COMPANY.
   6. PEERLESS PUMP; GRUNDFOS GROUP.
2. PUMP:
   1. STANDARD: UL 448, FOR SPLIT-CASE PUMPS FOR FIRE SERVICE.
   2. CASING: AXIALLY SPLIT-CASE, CAST IRON WITH ASME B16.1 PIPE-FLANGE CONNECTIONS.
   3. IMPELLER: CAST BRONZE, STATICALLY AND DYNAMICALLY BALANCED, AND KEYED TO SHAFT.
   4. WEAR RINGS: REPLACEABLE BRONZE.
   5. SHAFT AND SLEEVE: STEEL SHAFT WITH BRONZE SLEEVE.
      A. SHAFT BEARINGS: GREASE-LUBRICATED BALL BEARINGS IN CAST-IRON HOUSING.
      B. SEALS: STUFFING BOX WITH MINIMUM OF FOUR RINGS OF GRAPHITE-IMPREGNATED BRAIDED YARN AND BRONZE PACKING GLAND.
   6. MOUNTING: PUMP AND DRIVER SHAFTS ARE HORIZONTAL, WITH PUMP AND DRIVER ON SAME BASE.
3. COUPLING: FLEXIBLE AND CAPABLE OF ABSORBING TORSIONAL VIBRATION AND SHAFT MISALIGNMENT. INCLUDE METAL COUPLING GUARD.
4. DRIVER: OPEN DRIP-PROOF, SQUIRREL-CAGE, INDUCTION MOTOR COMPLYING WITH NFPA 20 AND NFPA 70. INCLUDE WIRING COMPATIBLE WITH CONTROLLER USED.
   1. STANDARD: UL 1004A.
   2. TYPE: ELECTRIC MOTOR; NEMA MG 1, POLYPHASE DESIGN B.
5. CAPACITIES AND CHARACTERISTICS:
   1. RATED CAPACITY: 1000 GPM.
   2. TOTAL RATED HEAD: -- PSI.
   3. INLET FLANGE: CLASS 125.
   4. OUTLET FLANGE: CLASS 125.
   5. MOTOR HORSEPOWER: --- HP.
   6. MOTOR SPEED: ---- RPM.
   7. ELECTRICAL CHARACTERISTICS:
   8. VOLTS: 460.
      A. PHASE: THREE.
      B. HERTZ: 60.
      C. FULL-LOAD AMPERES: VERIFY WITH MANUFACTURE.

C. FIRE PUMP ACCESSORIES AND SPECIALTIES

1. AUTOMATIC AIR-RELEASE VALVES: COMPLY WITH NFPA 20 FOR INSTALLATION IN FIRE PUMP CASING.
2. CIRCULATION RELIEF VALVES: UL 1478, BRASS, SPRING LOADED; FOR INSTALLATION IN PUMP DISCHARGE.
3. RELIEF VALVES:
   1. DESCRIPTION: UL 1478, BRONZE OR CAST-IRON, SPRING LOADED; FOR INSTALLATION IN FIRE SUPPRESSION WATER SUPPLY PIPING.
4. INLET FITTING: ECCENTRIC TAPERED REDUCER AT PUMP SUCTION INLET.
5. OUTLET FITTING: CONCENTRIC TAPERED REDUCER AT PUMP DISCHARGE OUTLET.
6. HOSE VALVE MANIFOLD ASSEMBLY:
   1. STANDARD: COMPLY WITH REQUIREMENTS IN NFPA 20.
   2. HEADER PIPE: ASTM A 53/A 53M, SCHEDULE 40, GALVANIZED STEEL WITH ENDS THREADED ACCORDING TO ASME B1.20.1.
   3. HEADER PIPE FITTINGS: ASME B16.4, GALVANIZED CAST-IRON THREADED FITTINGS.
   4. AUTOMATIC DRAIN VALVE: UL 1726.
   5. MANIFOLD:
      A. TEST CONNECTIONS: COMPLY WITH UL 405 EXCEPT PROVIDE OUTLETS WITHOUT CLAPPERS INSTEAD OF INLETS.
      B. BODY: EXPOSED TYPE, BRASS, WITH NUMBER OF OUTLETS REQUIRED BY NFPA 20.
      C. NIPPLES: ASTM A 53/A 53M, SCHEDULE 40, GALVANIZED STEEL PIPE WITH ENDS THREADED ACCORDING TO ASME B1.20.1.
      D. ADAPTERS AND CAPS WITH CHAIN: BRASS OR BRONZE, WITH OUTLET THREADED ACCORDING TO NFPA 1963.
      E. ESCUTCHEON PLATE: BRASS OR BRONZE; RECTANGULAR.
      F. HOSE VALVES: UL 668, BRONZE, WITH OUTLET THREADED ACCORDING TO NFPA 1963.
      G. EXPOSED PARTS FINISH: FACTORY APPLIED RED PAINT.
      H. ESCUTCHEON PLATE MARKING: EQUIVALENT TO "FIRE PUMP TEST."

D FIRE PUMP CONTROLLERS

1. AVAILABLE MANUFACTURERS:
   1. CUTLER-HAMMER.
   2. FIRETROL, INC.
   3. HUBBELL INDUSTRIAL CONTROLS, INC.
   4. JOSLYN CLARK.
   5. MASTER CONTROL SYSTEMS, INC.
   6. METRON, INC.
   7. TORNATECH, INC.
2. GENERAL REQUIREMENTS FOR FULL-SERVICE CONTROLLERS:
   1. COMPLY WITH NFPA 20 AND UL 218.
   2. LISTED BY AN NRTL FOR ELECTRIC-MOTOR DRIVER FOR FIRE PUMP SERVICE.
   3. COMBINED AUTOMATIC AND MANUAL OPERATION.
   4. FACTORY ASSEMBLED, WIRED, AND TESTED; CONTINUOUS-DUTY RATED.
3. ENCLOSURE:
   1. FIRE PUMP CONTROLLERS, ATS, REMOTE ALARM PANELS, AND LOW-SUCTION-SHUTDOWN PANELS: NEMA 250, TO COMPLY WITH ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATIONS AND NFPA 20.
      A. INDOOR, DRY AND CLEAN LOCATIONS: TYPE 2.
      B. INDOOR LOCATIONS SUBJECT TO DRIPPING NONCORROSIVE LIQUIDS: TYPE 2.
      C. INDOOR LOCATIONS SUBJECT TO DUST, FALLING DIRT, AND DRIPPING NONCORROSIVE LIQUIDS: TYPE 12 (IEC IP12).
   2. ENCLOSURE COLOR: MANUFACTURER'S STANDARD "FIRE PUMP CONTROLLER RED"
   3. NAMEPLATES: COMPLY WITH NFPA 20; COMPLETE WITH CAPACITY, CHARACTERISTICS, APPROVALS, LISTINGS, AND OTHER PERTINENT DATA.
4. METHOD OF STARTING:
   1. PRESSURE SWITCH ACTUATED.
      A. WATER PRESSURE ACTUATED SWITCH AND PRESSURE TRANSDUCER WITH INDEPENDENT HIGH- AND LOW-CALIBRATED ADJUSTMENTS RESPONSIVE TO WATER PRESSURE IN FIRE SUPPRESSION PIPING.
      B. PROGRAMMABLE MINIMUM-RUN-TIME RELAY TO PREVENT SHORT CYCLING.
      C. PROGRAMMABLE TIMER FOR WEEKLY TESTS.
      D. CONTROLLER SENSING PIPES: INCLUDE PIPE AND FITTINGS ACCORDING TO NFPA 20 WITH NONFERROUS-METAL SENSING PIPING, NPS 1/2, WITH GLOBE VALVES FOR TESTING CONTROLLER MECHANISM FROM SYSTEM TO PUMP CONTROLLER AS INDICATED. INCLUDE BRONZE CHECK VALVE WITH 3/32-INCH ORIFICE IN CLAPPER OR GROUND-FACE UNION WITH NONCORROSIVE DIAPHRAGM HAVING 3/32-INCH ORIFICE.
   2. SOLID-STATE CONTROLLER: REDUCED-VOLTAGE TYPE.
   3. EMERGENCY START: MECHANICALLY OPERATED START HANDLE THAT CLOSES AND RETAINS THE MOTOR RUN CONTACTOR INDEPENDENT OF ALL ELECTRIC OR PRESSURE ACTUATORS.
5. METHOD OF STOPPING: MANUAL
6. RATE CONTROLLERS FOR SCHEDULED FIRE PUMP HORSEPOWER AND SHORT-CIRCUIT WITHSTAND RATING AT LEAST EQUAL TO SHORT-CIRCUIT CURRENT AVAILABLE AT CONTROLLER LOCATION. TAKE INTO ACCOUNT CABLE SIZE AND DISTANCE FROM SUBSTATION OR SUPPLY TRANSFORMERS.
7. METHOD OF ISOLATION AND OVERCURRENT PROTECTION: INTERLOCKED ISOLATING SWITCH AND NON-THERMAL MCCB; WITH A COMMON, EXTERNALLY MOUNTED OPERATING HANDLE, AND PROVIDING LOCKED-ROTOR PROTECTION.
8. DOOR-MOUNTED OPERATOR INTERFACE AND CONTROLS:
   1. MONITOR, DISPLAY, AND CONTROL THE DEVICES, ALARMS, FUNCTIONS, AND OPERATIONS LISTED IN NFPA 20 AS REQUIRED FOR DRIVERS AND CONTROLLER TYPES USED.
   2. METHOD OF CONTROL AND INDICATION:
      A. MICROPROCESSOR-BASED LOGIC CONTROLLER, WITH MULTILINE DIGITAL READOUT.
      B. MEMBRANE KEYPAD.
      C. LED ALARM AND STATUS INDICATING LIGHTS.
9. LOCAL ALARM AND STATUS INDICATIONS:
   1. POWER ON.
   2. MOTOR RUNNING CONDITION.
   3. LOSS-OF-LINE POWER.
   4. LINE-POWER PHASE REVERSAL.
   5. LINE-POWER SINGLE-PHASE CONDITION.
10. AUDIBLE ALARM, WITH SILENCE PUSH BUTTON.
11. MANUAL START AND STOP PUSH BUTTONS OR SWITCHES.
12. NAMEPLATE: COMPLETE WITH CAPACITY, CHARACTERISTICS, APPROVALS AND LISTINGS, AND OTHER PERTINENT DATA.

E. PRESSURE MAINTENANCE PUMPS

1. AVAILABLE MANUFACTURERS:
   1. AURORA PUMP; PENTAIR PUMP GROUP.
   2. CRANE PUMPS & SYSTEMS, INC.
   3. FAIRBANKS MORSE; PENTAIR PUMP GROUP.
   4. MTH TOOL CO., INC.
   5. PACO PUMPS, INC.
   6. GRUNDFOS, GRUNDFOS GROUP
2. DESCRIPTION: FACTORY-ASSEMBLED AND -TESTED, VERTICAL, MULTISTAGE, OPEN-LINE-SHAFT TURBINE PUMP AS DEFINED IN HI 2.1-2.2 AND HI 2.3; WITH PUMP MOTOR MOUNTED ABOVE PUMP HEAD. INCLUDE BASE.
3. PUMP CONSTRUCTION:
   1. PUMP HEAD: CAST-IRON, FOR SURFACE DISCHARGE, WITH FLANGE EXCEPT CONNECTIONS MAY BE THREADED IN SIZES IN WHICH FLANGES ARE NOT AVAILABLE.
   2. PUMP HEAD SEAL: STUFFING BOX AND STUFFING.
   3. LINE SHAFT: STAINLESS STEEL OR STEEL, WITH CORROSION-RESISTANT SHAFT SLEEVES.
   4. LINE SHAFT BEARINGS: RUBBER SLEEVE, WATER LUBRICATED.
   5. IMPELLER SHAFT: MONEL METAL OR STAINLESS STEEL.
   6. BOWL SECTION: MULTIPLE CAST-IRON BOWLS WITH CLOSED-TYPE BRONZE OR STAINLESS STEEL IMPELLERS.
4. MOTOR:
   1. SINGLE SPEED WITH PERMANENTLY LUBRICATED BALL BEARINGS.
      A. MOTOR SIZES: MINIMUM SIZE AS INDICATED; IF NOT INDICATED, LARGE ENOUGH SO DRIVEN LOAD WILL NOT REQUIRE MOTOR TO OPERATE IN SERVICE FACTOR RANGE ABOVE 1.0.
5. BASE: CAST-IRON OR STEEL WITH HOLE FOR ELECTRICAL CABLE.
6. NAMEPLATE: PERMANENTLY ATTACHED TO PUMP AND INDICATING CAPACITY AND CHARACTERISTICS.
7. CAPACITIES AND CHARACTERISTICS:
   1. RATED CAPACITY: 10 GPM.
   2. RATED HEAD: --- PSI.
   3. WORKING PRESSURE: 175 PSI.
   4. SUCTION HEAD AVAILABLE AT PUMP: -- PSI.
   5. MOTOR HORSEPOWER: -- HP.
   6. MOTOR SPEED: ---- RPM.
   7. ELECTRICAL CHARACTERISTICS:
      A. VOLTS: 120.
      B. PHASES: SINGLE.
      C. HERTZ: 60.
      D. FULL-LOAD AMPERES: VERIFY WITH MANUFACTURE.

F. CONTROLLERS FOR PRESSURE-MAINTENANCE PUMPS

1. AVAILABLE MANUFACTURERS:
   1. CUTLER-HAMMER.
   2. FIRETROL, INC.
   3. HUBBELL INDUSTRIAL CONTROLS, INC.
   4. JOSLYN CLARK.
   5. MASTER CONTROL SYSTEMS, INC.
   6. METRON, INC.
2. GENERAL REQUIREMENTS FOR PRESSURE-MAINTENANCE-PUMP CONTROLLERS:
   1. TYPE: UL 508 FACTORY ASSEMBLED, WIRED, AND TESTED, ACROSS-THE-LINE; FOR COMBINED AUTOMATIC AND MANUAL OPERATION.
   2. ENCLOSURE: UL 508 AND NEMA 250, TYPE 2 FOR WALL MOUNTING.
   3. FACTORY ASSEMBLED, WIRED, AND TESTED.
   4. FINISH: MANUFACTURER'S STANDARD COLOR PAINT.
3. RATE CONTROLLER FOR SCHEDULED HORSEPOWER AND INCLUDE THE FOLLOWING:
   1. FUSIBLE DISCONNECT SWITCH.
   2. PRESSURE SWITCH.
   3. HAND-OFF-AUTO SELECTOR SWITCH.
   4. PILOT LIGHT.

G. GROUT

1. STANDARD: ASTM C 1107, GRADE B, POST-HARDENING AND VOLUME-ADJUSTING, DRY, HYDRAULIC-CEMENT GROUT.
   1. CHARACTERISTICS: NONSHRINK AND RECOMMENDED FOR INTERIOR AND EXTERIOR APPLICATIONS.
   2. DESIGN MIX: 5000-PSI, 28-DAY COMPRESSIVE STRENGTH.
   3. PACKAGING: PREMIXED AND FACTORY PACKAGED.

G. GROUT

1. STANDARD: ASTM C 1107, GRADE B, POST-HARDENING AND VOLUME-ADJUSTING, DRY, HYDRAULIC-CEMENT GROUT.
   1. CHARACTERISTICS: NONSHRINK AND RECOMMENDED FOR INTERIOR AND EXTERIOR APPLICATIONS.
   2. DESIGN MIX: 5000-PSI, 28-DAY COMPRESSIVE STRENGTH.
   3. PACKAGING: PREMIXED AND FACTORY PACKAGED.

H. SOURCE QUALITY CONTROL

1. TESTING: TEST AND INSPECT FIRE PUMPS ACCORDING TO UL 448 REQUIREMENTS FOR "OPERATION TEST" AND "MANUFACTURING AND PRODUCTION TESTS."
   1. VERIFICATION OF PERFORMANCE: RATE FIRE PUMPS ACCORDING TO UL 448.
2. TESTING: TEST AND INSPECT FIRE PUMP CONTROLLERS ACCORDING TO REQUIREMENTS IN NFPA 20 AND UL 218.
   1. VERIFICATION OF PERFORMANCE: RATE CONTROLLERS ACCORDING TO OPERATION OF FUNCTIONS AND FEATURES SPECIFIED.
3. FIRE PUMPS WILL BE CONSIDERED DEFECTIVE IF THEY DO NOT PASS TESTS AND INSPECTIONS.
4. PREPARE TEST AND INSPECTION REPORTS.

3. EXECUTION

A. EXAMINATION

1. EXAMINE EQUIPMENT BASES AND ANCHORAGE PROVISIONS, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH REQUIREMENTS AND FOR CONDITIONS AFFECTING PERFORMANCE.
2. EXAMINE ROUGHING-IN FOR FIRE SUPPRESSION PIPING SYSTEMS TO VERIFY ACTUAL LOCATIONS AND SIZE OF PIPING CONNECTIONS BEFORE FIRE PUMP INSTALLATION.
3. EXAMINE EQUIPMENT BEFORE INSTALLATION. REJECT EQUIPMENT THAT IS WET OR DAMAGED BY MOISTURE OR MOLD OR PHYSICALLY DAMAGED.
4. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

B. INSTALLATION

1. FIRE PUMP INSTALLATION STANDARD: COMPLY WITH NFPA 20 FOR INSTALLATION OF FIRE PUMPS, RELIEF VALVES, AND RELATED COMPONENTS.
2. PROVIDE DIRECT FEED POWER SUPPLY TO FIRE PUMP CONTROLLER FROM POWER SOURCE WITH NO FUSES OR BREAKERS IN THE CIRCUIT. SEE ELECTRICAL SPECIFICATIONS FOR ELECTRICAL DIAGRAM SUBMITTAL REQUIREMENTS.
3. LOCATE CONTROLLER AS CLOSE TO MOTOR AS PRACTICAL AND WITHIN SIGHT. PROVIDE CONTROLLER WITH SUITABLE PROTECTION AS NECESSARY TO PROTECT AGAINST WATER ESCAPING FROM PUMP OR CONNECTIONS. ELEVATE CONTROLLER MINIMUM OF 12-INCHES ABOVE FINISHED FLOOR.
4. INSTALL PUMPS AND CONTROLLERS TO PROVIDE ACCESS FOR PERIODIC MAINTENANCE INCLUDING REMOVAL OF MOTORS, IMPELLERS, COUPLINGS, AND ACCESSORIES. PROVIDE NO LESS THAN MINIMUM AS RECOMMENDED BY MANUFACTURER.
5. EQUIPMENT MOUNTING:
   1. FABRICATE BASE AND ATTACHMENT TO FIRE PUMPS, PRESSURE-MAINTENANCE PUMPS, AND CONTROLLERS WITH REINFORCEMENT TO RESIST MOVEMENT OF PUMPS AND CONTROLLERS DURING A SEISMIC EVENT WHEN THEIR BASES ARE ANCHORED TO BUILDING STRUCTURE.
6. INSTALL FIRE PUMP SUCTION AND DISCHARGE PIPING EQUAL TO OR LARGER THAN SIZES REQUIRED BY NFPA 20.
7. SUPPORT PIPING AND PUMPS SEPARATELY SO WEIGHT OF PIPING DOES NOT REST ON PUMPS.
8. INSTALL VALVES THAT ARE SAME SIZE AS CONNECTING PIPING, COMPLY WITH REQUIREMENTS FOR FIRE PROTECTION VALVES.
9. INSTALL PRESSURE GAUGES ON FIRE PUMP SUCTION AND DISCHARGE FLANGE PRESSURE-GAUGE TAPPINGS, COMPLY WITH REQUIREMENTS FOR PRESSURE GAUGES.
10. INSTALL PIPING HANGERS AND SUPPORTS. ANCHORS, VALVES, GAUGES, AND EQUIPMENT SUPPORTS ACCORDING TO NFPA 20.
11. ELECTRICAL WIRING: INSTALL ELECTRICAL DEVICES FURNISHED BY EQUIPMENT MANUFACTURERS BUT NOT FACTORY MOUNTED, FURNISH COPIES OF MANUFACTURERS' WIRING DIAGRAM SUBMITTALS TO ELECTRICAL INSTALLER.
12. WIRING METHOD: CONCEAL CONDUCTORS AND CABLES IN ACCESSIBLE CEILINGS, WALLS, AND FLOORS WHERE POSSIBLE.
13. WALL-MOUNTING CONTROLLERS: INSTALL CONTROLLERS ON WALLS WITH DISCONNECT OPERATING HANDLES NOT HIGHER THAN 79-INCHES ABOVE FINISHED FLOOR, AND BOTTOM OF ENCLOSURE NOT LESS THAN 12-INCHES ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED. BOLT UNITS TO WALL OR MOUNT ON LIGHTWEIGHT STRUCTURAL-STEEL CHANNELS BOLTED TO WALL.
14. FLOOR-MOUNTING CONTROLLERS: INSTALL CONTROLLERS ON 4-INCH NOMINAL-THICKNESS CONCRETE BASES. USING FLOOR STANDS HIGH ENOUGH SO THAT THE BOTTOM OF ENCLOSURE CABINET IS NOT LESS THAN 12-INCHES ABOVE FINISHED FLOOR. INSTALL DOWEL RODS TO CONNECT CONCRETE BASE TO CONCRETE FLOOR. UNLESS OTHERWISE INDICATED, INSTALL DOWEL RODS ON 18-INCH (450-MM) CENTERS AROUND THE FULL PERIMETER OF CONCRETE BASE.
    1. FOR SUPPORTED EQUIPMENT, INSTALL EPOXY-COATED ANCHOR BOLTS THAT EXTEND THROUGH CONCRETE BASE, AND ANCHOR INTO STRUCTURAL CONCRETE FLOOR.
    2. PLACE AND SECURE ANCHORAGE DEVICES. USE SETTING DRAWINGS, TEMPLATES, DIAGRAMS, INSTRUCTIONS, AND DIRECTIONS FURNISHED WITH ITEMS TO BE EMBEDDED.
    3. INSTALL ANCHOR BOLTS TO ELEVATIONS REQUIRED FOR PROPER ATTACHMENT TO SUPPORTED EQUIPMENT.
15. TEMPORARY LIFTING PROVISIONS: REMOVE TEMPORARY LIFTING EYES, CHANNELS, AND BRACKETS AND TEMPORARY BLOCKING OF MOVING PARTS FROM ENCLOSURES AND COMPONENTS.
16. COMPLY WITH NEMA ICS 15.

C. ALIGNMENT

1. ALIGN PUMP AND DRIVER SHAFTS AFTER COMPLETE UNIT HAS BEEN LEVELED ON CONCRETE BASE, GROUT HAS SET, AND ANCHOR BOLTS HAVE BEEN TIGHTENED.
2. AFTER ALIGNMENT IS CORRECT, TIGHTEN ANCHOR BOLTS EVENLY. FILL BASEPLATE COMPLETELY WITH GROUT, WITH METAL BLOCKS AND SHIMS OR WEDGES IN PLACE. TIGHTEN ANCHOR BOLTS AFTER GROUT HAS HARDENED. CHECK ALIGNMENT AND MAKE REQUIRED CORRECTIONS.
3. ALIGN PIPING CONNECTIONS.
4. ALIGN PUMP AND DRIVER SHAFTS FOR ANGULAR AND PARALLEL ALIGNMENT ACCORDING TO HI 1.4 AND TO TOLERANCES SPECIFIED BY MANUFACTURER.

D. CONNECTIONS

1. DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES.
2. INSTALL PIPING ADJACENT TO PUMPS AND EQUIPMENT TO ALLOW SERVICE AND MAINTENANCE.
3. CONNECT RELIEF VALVE DISCHARGE TO DRAINAGE PIPING OR POINT OF DISCHARGE.
4. PROVIDE DRAINS FOR BASES AND SEALS, PIPED TO AND DISCHARGING INTO FLOOR DRAINS.
5. CONNECT FIRE PUMPS AND PRESSURE-MAINTENANCE PUMP TO THEIR CONTROLLERS.
6. CONNECT CONTROLLERS TO THEIR DEDICATED PRESSURE-SENSING LINES.
7. PROVIDE FOR FIRE PUMP CONTROLLER CONNECTION TO BUILDING FIRE-ALARM SYSTEM.

E, IDENTIFICATION

1. IDENTIFY SYSTEM COMPONENTS. COMPLY WITH REQUIREMENTS FOR FIRE PUMP MARKING ACCORDING TO NFPA 20.

F. FIELD QUALITY CONTROL

1. TEST EACH FIRE PUMP WITH ITS CONTROLLER AS A UNIT. COMPLY WITH REQUIREMENTS FOR ELECTRIC-MOTOR DRIVER FIRE PUMP CONTROLLERS.
2. PERFORM TESTS AND INSPECTIONS.
   1. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS, AND TO ASSIST IN TESTING.
3. FINAL CHECKS BEFORE STARTUP: PERFORM THE FOLLOWING PREVENTIVE MAINTENANCE OPERATIONS AND CHECKS:
   1. LUBRICATE OIL-LUBRICATION-TYPE BEARINGS.
   2. DISCONNECT COUPLING AND CHECK ELECTRIC MOTOR FOR PROPER ROTATION. ROTATION SHALL MATCH DIRECTION OF ROTATION MARKED ON PUMP CASING.
   3. VERIFY THAT PUMP IS FREE TO ROTATE BY HAND. IF PUMP IS BOUND OR IF IT DRAGS EVEN SLIGHTLY, DO NOT OPERATE UNTIL CAUSE OF TROUBLE IS DETERMINED AND CORRECTED.
   4. INSPECT AND TEST EACH CONTROLLER COMPONENT:
      A. INSPECT WIRING, COMPONENTS, CONNECTIONS, AND EQUIPMENT INSTALLATIONS. TEST AND ADJUST COMPONENTS AND EQUIPMENT.
      B. TEST INSULATION RESISTANCE FOR EACH ELEMENT, COMPONENT, CONNECTING SUPPLY, FEEDER, AND CONTROL CIRCUITS.
      C. TEST CONTINUITY OF EACH CIRCUIT.
4. TESTS AND INSPECTIONS:
   1. AFTER INSTALLING COMPONENTS, ASSEMBLIES, AND EQUIPMENT INCLUDING CONTROLLER, TEST FOR COMPLIANCE WITH REQUIREMENTS.
   2. TEST ACCORDING TO NFPA 20 FOR ACCEPTANCE AND PERFORMANCE TESTING.
   3. LEAK TEST: AFTER INSTALLATION, CHARGE SYSTEM AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST UNTIL NO LEAKS EXIST.
   4. OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATION.
   5. VERIFY AND TEST EACH ELECTRIC-DRIVER CONTROLLER:
      A. VERIFY THAT VOLTAGES AT CONTROLLER LOCATIONS ARE WITHIN PLUS 10 OR MINUS 1 PERCENT OF MOTOR NAMEPLATE RATED VOLTAGES, WITH MOTORS OFF. IF OUTSIDE THIS RANGE FOR ANY MOTOR, NOTIFY ENGINEER BEFORE STARTING THE MOTOR(S).
      B. TEST EACH MOTOR FOR PROPER PHASE ROTATION.
   6. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.
   7. COMPONENTS, ASSEMBLIES, AND EQUIPMENT WILL BE CONSIDERED DEFECTIVE IF THEY DO NOT PASS TESTS AND INSPECTIONS.
   8. PREPARE TEST AND INSPECTION REPORTS.
5. FIELD ACCEPTANCE TESTS:
   1. DO NOT BEGIN FIELD ACCEPTANCE TESTING UNTIL SUCTION PIPING HAS BEEN FLUSHED AND HYDROSTATICALLY TESTED AND THE CERTIFICATE FOR FLUSHING AND TESTING HAS BEEN SUBMITTED TO ENGINEER AND AUTHORITIES HAVING JURISDICTION.
   2. PRIOR TO STARTING, NOTIFY AUTHORITIES HAVING JURISDICTION OF THE TIME AND PLACE OF THE ACCEPTANCE TESTING.
   3. FURNISH FIR