PROPOSED INDUSTRIAL WAREHOUSE DEVELOPMENT

SHEET INDEX: SITE CIVIL

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C-2.0	GENERAL NOTES & LEGEND
C-3.0 - 3.4	EXISTING CONDITIONS PLAN
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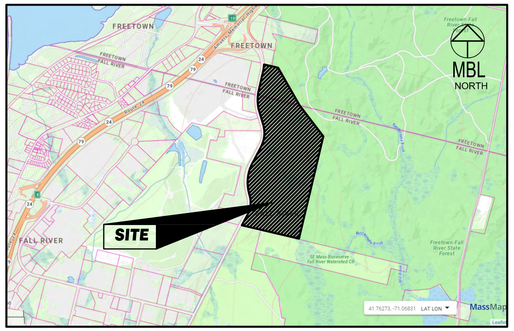
SITE PLANS

0 INNOVATION WAY
FALL RIVER - ASSESSORS MAP W-19
LOTS 185, 189, 191, 192, & 193
FREETOWN - PARCEL ID 236-006.01
MASSACHUSETTS

JULY 25, 2022
REVISED THROUGH NOVEMBER 20, 2023



LOCUS MAP
1"=2000'

PARCEL SUMMARY TABLE			
FALL RIVER			
PARCEL ID	PROPERTY OWNER	PROPERTY LOCATION	ZONING DISTRICT/OVERLAY
W-19-185	VMD INDUSTRIAL FR LLC. 614 NORTH DUPONT HIGHWAY, SUITE 210, DOVER DE, 19901	0 INNOVATION WAY	INDUSTRIAL DISTRICT RESEARCH AND DEVELOPMENT OVERLAY (RDOD)
W-19-189	VMD INDUSTRIAL FR LLC. 614 NORTH DUPONT HIGHWAY, SUITE 210, DOVER DE, 19901	0 INNOVATION WAY	INDUSTRIAL DISTRICT RESEARCH AND DEVELOPMENT OVERLAY (RDOD)
W-19-192	VMD INDUSTRIAL FR LLC. 614 NORTH DUPONT HIGHWAY, SUITE 210, DOVER DE, 19901	0 INNOVATION WAY	INDUSTRIAL DISTRICT RESEARCH AND DEVELOPMENT OVERLAY (RDOD)
W-19-193	VMD INDUSTRIAL FR LLC. 614 NORTH DUPONT HIGHWAY, SUITE 210, DOVER DE, 19901	0 INNOVATION WAY	INDUSTRIAL DISTRICT RESEARCH AND DEVELOPMENT OVERLAY (RDOD)
W-19-191	VMD INDUSTRIAL FR LLC. 614 NORTH DUPONT HIGHWAY, SUITE 210, DOVER DE, 19901	0 INNOVATION WAY	INDUSTRIAL DISTRICT RESEARCH AND DEVELOPMENT OVERLAY (RDOD)
W-19-190	HUTCHENS HOLDING III LLC. 481 CURRANT ROAD FALL RIVER, MA 02720	615 INNOVATION WAY	INDUSTRIAL DISTRICT RESEARCH AND DEVELOPMENT OVERLAY (RDOD)
FREETOWN			
236-006.01	VMD INDUSTRIAL FR LLC. 614 NORTH DUPONT HIGHWAY, SUITE 210, DOVER DE, 19901	0 INNOVATION WAY	GENERAL USE SCIENCE & TECHNOLOGY OVERLAY DISTRICT
232-016	FREETOWN STATE FOREST OF COMMONWEALTH OF MASSACHUSETTS 108 SLAB BRIDGE RD ASSONET, MA 02702	0 COPICUT RD	OPEN SPACE & RECREATION
236-004	MASSDOT OF COMMONWEALTH OF MASSACHUSETTS 10 PARK PLAZA BOSTON, MA 02116	0 INNOVATION WAY	OPEN SPACE & RECREATION
236-005	MASSDOT OF COMMONWEALTH OF MASSACHUSETTS 1000 COUNTY ST TAUNTON, MA 02780	0 ROUTE 24	OPEN SPACE & RECREATION
236-006	LIT FALL RIVER LLC 1717 MCKINNEY AVE, SUITE 1900 DALLAS, TX 75202	1180 INNOVATION WAY	GENERAL USE SCIENCE & TECHNOLOGY OVERLAY DISTRICT
236-006.02	DEVCON INNOVATION WAY LLC 1140 RESERVOIR AVE CRANSTON, RI 02920	30-36 INNOVATION WAY	GENERAL USE SCIENCE & TECHNOLOGY OVERLAY DISTRICT

PROJECT CONTACTS:

CIVIL ENGINEER/LAND SURVEYOR

MBL LAND DEVELOPMENT & PERMITTING, CORP.
5 BRISTOL DRIVE, SUITE 3A
SOUTH EASTON, MA 02375
P.508.297.2746
BRIAN M. DUNN PRIMARY CONTACT
brian@mbllanddevelopment.com
website:www.MBLLandDevelopment.com

COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED
PROFESSIONAL ENGINEER

TOWN OF FREETOWN APPROVALS:

PLANNING BOARD SITE PLAN APPROVAL: OCTOBER 27, 2023 (AMENDED FEBRUARY 15, 2023)

PLANNING BOARD ANR APPROVAL: NOVEMBER 15, 2023

APPROVED WAIVERS:

RULES AND REGULATIONS OF THE PLANNING BOARD AS SITE PLAN REVIEW AUTHORITY

SECTION II.B.3- TO ALLOW PLANS TO BE SUBMITTED AT 1"=50' SCALE
SECTION II.B.3- TO ALLOW PLANS TO BE SUBMITTED REFERENCING N.A.V.D. 1988 DATUM
SECTION II.B.3.l- TO WAIVE THE REQUIREMENT OF PROFILES
SECTION II.B.3.n- TO WAIVE THE REQUIREMENT TO PROVIDE ESTIMATED WATER AND SEWER USAGE CALCULATIONS, AND PROFILES OF THE PROPOSED DRAINAGE AND SEWER SYSTEM.
SECTION II.B.3.o.ii- TO WAIVE THE REQUIREMENT THAT STANDARDS FOR DRAINAGE DESIGN SHALL BE THE SAME AS THOSE REQUIRED FOR ANY SUBDIVISION.
SECTION II.B.4- TO WAIVE THE REQUIREMENT FOR A IMPACT STATEMENT.
SECTION II.C.3- TO WAIVE THE REQUIREMENT THAT STATES ALL SITE PLANS SHOULD CONFORM TO THE DRAINAGE AND RUNOFF CONTROLS REQUIREMENTS SPECIFIED IN THE TOWN OF FREETOWN'S RULES AND REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

RULES AND REGULATIONS OF THE PLANNING BOARD AS SPECIAL PERMIT GRANTING AUTHORITY

SECTION II.B.4.e.7.- TO REDUCE THE REQUIREMENT FOR PARKING REGULATIONS FOR WAREHOUSE ESTABLISHMENTS.
SECTION II.B.5.h.7- TO WAIVE THE REQUIREMENT FOR A 15 FT LANDSCAPED BUFFER ZONE SHALL BE PROVIDED ALONG THE FRONT LOT LINE AND NOT LESS THAN THE FOLLOWING ALONG A SIDE OR REAR LOT LINE. (INDUSTRIAL USE 40 FT).

TOWN OF FREETOWN GENERAL AND ZONING BY-LAWS

ARTICLE 11.23 H. PARKING – TO WAIVE THE REQUIREMENT FOR PARKING AREAS TO BE LOCATED TO THE REAR OR SIDE OF BUILDINGS.

CONSERVATION COMMISSION APPROVAL:

ORDER OF CONDITIONS ISSUED AUGUST 9, 2022

OWNER AND APPLICANT:

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER, MASSACHUSETTS

MASSDOT ACCESS PERMIT APPROVAL: ISSUED ON NOVEMBER 29, 2022

MASSACHUSETTS FISH & WILDLIFE APPROVAL: ISSUED ON SEPTEMBER 21, 2022

CITY OF FALL RIVER APPROVALS:

CITY OF FALL RIVER REDEVELOPMENT AUTHORITY/SITE PLAN REVIEW COMMITTTE: APPROVED DECEMBER 20, 2022

PLANNING BOARD ANR APPROVAL: NOVEMBER 9, 2022

APPROVED WAIVERS

DECLARATION OF COVENANTS FOR THE SOUTHCOAST LIFE SCIENCE AND TECHNOLOGY PARK AND AMENDMENTS (LATEST RECORDING BOOK 1044 PAGE 57)

FRONTAGE, SETBACK, AND YARD REQUIREMENTS
TO WAIVE THE REQUIREMENT TO ALLOW OFFICES, PARKING AREAS, AND OUTDOOR STORAGE OR WORK AREAS WITHIN 25FT TO ANY STREET LINE AND 20 FEET FROM ANY SIDE OR REAR LOT LINE.

PARKING
TO ALLOW PARKING OUTSIDE OF THE SIDE AND REAR AREAS OF THE BUILDINGS.

CONSERVATION COMMISSION APPROVALS:

ORDER OF RESOURCE AREA DELINEATION: ISSUED ON MAY 3, 2022

ORDER OF CONDITIONS: ISSUED ON SEPTEMBER 16, 2022

PLANS PREPARED BY:

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MASSACHUSETTS 02375
P.508.297.2746
EMAIL:info@MBLLanddevelopment.com
WEBSITE: www.MBLLandDevelopment.com

811 DigSafe MA ME NH RI VT

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-1.0

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MS VIEW:
LMAN:
CTB:

LEGEND

EXIST	PROP	
		PROPERTY LINE/RIGHT-OF-WAY
		BUILDING SETBACK
WF-7	WF-7	BORDERING VEGETATED WETLAND
		25' WETLAND BUFFER ZONE
		CONSERVATION RESTRICTION BOUNDARY
		100' WETLAND BUFFER ZONE
		TOWN BOUNDARY
EOP	EOP	EDGE OF PAVEMENT
PCC	PCC	PRECAST CONC. CURB
VGC	VGC	VERT. GRAN. CURB
		SAW CUT
STOP	STOP	STOP LINE
		TREE LINE
2	20	CONTOUR
RD	RD	ROOF DRAIN
D	D	DRAIN LINE
S	S	SEWER LINE
OHW	OHW	OVERHEAD WIRE
W	W	WATER LINE
G	G	GAS LINE
UGE	UGE	UNDERGROUND ELECTRIC
		BUILDING
		SIGN
	10	PARKING COUNT
		ACCESSIBLE PARKING
	21.25 TC 21.25 BC	TOP & BOTTOM ELEVATION
x21.25	x21.25	SPOT ELEVATION
		TEST PIT LOCATION
		IRON PIPE
		DRILL HOLE
		MONUMENT
CB	CB	CATCH BASIN
		DOUBLE CATCH BASIN
DMH	DMH	DRAIN MANHOLE
SMH	SMH	SEWER MANHOLE
CO	CO	CLEAN OUT
WG	WG	WATER GATE
	HYD	FIRE HYDRANT
	PIV	POST INDICATOR VALVE
	GG	GAS GATE
T	T	TELEPHONE MANHOLE
		LIGHT POLE
		STRAW WATTLE
		SILT FENCE
		EASEMENT LINE

ABBREVIATIONS

2ND	SECONDARY BUILDING ACCESS
APPROX	APPROXIMATE
BFE	BASEMENT FLOOR ELEVATION
BIT.	BITUMINOUS PAVEMENT
BM	BENCHMARK
B.W.	BOTTOM OF WALL
CB	CATCH BASIN
CC	CONCRETE CURB
CCB	CAPE COD BERM
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
CONC.	CONCRETE
CPP	CORRUGATED POLYETHYLENE PIPE
CS	CARBON STEEL
DCB	DOUBLE GRATE CATCH BASIN
ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
EXIST	EXISTING
FFE	FINISHED FLOOR ELEVATION
FSB	FIELD STONE BOUND
GG	GAS GATE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HTS	HUB AND TACK SET
HYD	HYDRANT
INV	INVERT ELEVATION
MAN	MAN DOOR ENTRANCE
MAX	MAXIMUM
MCC	MONOLITHIC CONCRETE CURB
MHB	MASS HIGHWAY BOUND
MIN	MINIMUM
MNS	MAGNAIL SET
NTS	NOT TO SCALE
PCC	PRE CAST CONCRETE CURB
PROP	PROPOSED
PVC	POLYVINYL CHLORIDE PIPE
RD	ROOF DRAIN
SHLO	STATE HIGHWAY LAYOUT
SMH	SEWER MANHOLE
T.W.	TOP OF WALL
TYP	TYPICAL
UGE	UNDERGROUND ELECTRIC
UP	UTILITY POLE
VGC	VERTICAL GRANITE CURB
WCR	WHEELCHAIR RAMP

GENERAL NOTES

EXISTING CONDITIONS INFORMATION

1.) THE SITE IS COMPRISED OF LOTS 1-5 AS SHOWN ON THE APPROVAL NOT REQUIRED PLANS PREPARED BY MBL LAND DEVELOPMENT & PERMITTING, CORP. DATED NOVEMBER 2, 2022, APPROVED BY THE CITY OF FALL RIVER PLANNING BOARD ON NOVEMBER 9, 2022 AND THE TOWN OF FREETOWN PLANNING BOARD ON NOVEMBER 15, 2022. THE PLANS ARE RECORDED IN THE BRISTOL COUNTY FALL RIVER REGISTRY OF DEEDS PLAN BOOK 169 PAGES 32-33.

2.) THE LOTS LIE WITHIN A "ZONE X", AN AREA OF MINIMAL FLOOD HAZARD, AS SHOWN ON FEMA F.I.R.M. MAP 25005C0263G HAVING AN EFFECTIVE DATE OF JULY 16, 2014 AND FEMA F.I.R.M MAP 25005C0264F HAVING AN EFFECTIVE DATE OF JULY 7, 2009.

3.) BENCHMARK INFORMATION: ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

BM-1: MAGNAIL SET IN PAVEMENT ALONG THE NORTH SIDE OF INNOVATION WAY, AS SHOWN SHEET C-3.1. ELEV.=193.75

BM-2: IRON ROAD AND CAP FOUND IN GRASS AREA ALONG THE NORTH SIDE OF INNOVATION WAY, AS SHOWN SHEET C-3.2. ELEV.=223.61

BM-3: MASSACHUSETTS HIGHWAY BOUND LOCATED ALONG THE SOUTH SIDE OF INNOVATION WAY ALONG THE PROJECT LOCUS AS SHOWN ON SHEET C-3.3. ELEV.=222.16

4.) THE WETLAND RESOURCE AREAS SHOWN HEREON WERE DELINEATED BY GODDARD CONSULTING, LLC. AN ORDER OF RESOURCE AREA DELINEATION WAS ISSUED BY THE FALL RIVER CONSERVATION COMMISSION ON MAY 3, 2022 (MASSDEP FILE NUMBER SE-024-0801). AN ORDER OF RESOURCE AREA DELINEATION WAS ISSUED BY THE FREETOWN CONSERVATION COMMISSION ON MAY 25, 2022 (MASSDEP FILE NUMBER SE-026-0679).

5.) THE ORIGINAL SITE IS SUBJECT TO 51.8 ACRES TAKING FOR THE PURPOSE OF A CONSERVATION RESTRICTION AND CONSERVATION EASEMENTS BY THE COMMONWEALTH OF MASSACHUSETTS THROUGH THE DEPT. OF CONSERVATION AND RECREATION (DCR) AND DEPT. OF FISH AND GAME (DFG). REFERENCED IN DEED BOOK 7121 PAGE 95. NOW KNOWN AS LOT 5 AS SHOWN ON APPROVAL NOT REQUIRED PLAN RECORDED IN THE BRISTOL COUNTY REGISTRY OF DEEDS PLAN BOOK 169 PAGE 33.

6.) THIS SITE LIES WITHIN A NHESP PRIORITY HABITAT OF RARE SPECIES (PH 478) AS WELL AS AN ESTIMATED HABITAT OF RARE SPECIES (EH 415).

7.) THE TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON FIELD LOCATION POINTS AND ON THE GROUND SURVEY PERFORMED BY THIS FIRM FROM AUGUST 2, 2021 TO OCTOBER 5, 2022.

8.) THIS SURVEY IS BASED ON RECORD PLANS & DEEDS AND A FIELD SURVEY PERFORMED BY THIS FIRM FROM AUGUST 2, 2021 TO JULY 25, 2023.

9.) UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE ONLY AND BASED ON BOTH RECORD AVAILABLE AT THE TIME OF SURVEY AND FIELD LOCATION OF STRUCTURES. ALL UTILITIES SHOULD BE VERIFIED IN THE FIELD BY THE APPROPRIATE UTILITY COMPANY PRIOR TO ANY CONSTRUCTION.

10.) EXISTING SEWER INVERT AND OUTLET INFORMATION SHOWN HEREON WAS OBTAINED FROM A PLAN ENTITLED "EXECUTIVE PARK DRIVE/SOUTH COAST BIOPARK" PREPARED BY VANASSE HANGEN BRUSTLIN, INC. AND DATED FEBRUARY 1, 2010.

11.) THE SITE IS SUBJECT TO MASSDEP ORDER OF CONDITIONS ISSUED BY BOTH THE CITY OF FALL RIVER CONSERVATION COMMISSION ON SEPTEMBER 16, 2022 (MASSDEP FILE NUMBER SE-024-0804), AND THE TOWN OF FREETOWN CONSERVATION COMMISSION ON AUGUST 9, 2022 (MASSDEP FILE NUMBER SE-026-0688).

12.) THE SITE IS SUBJECT TO THE TOWN OF FREETOWN PLANNING BOARD SITE PLAN REVIEW DECISION APPROVED ON OCTOBER 27, 2022.

13.) THE SITE IS SUBJECT TO THE CITY OF FALL RIVER SITE PLAN REVIEW COMMITTEE CONDITIONS OF APPROVAL, APPROVED ON DECEMBER 20, 2022.

14.) THIS DOCUMENT IS AN INSTRUMENT OF SERVICE OF MBL LAND DEVELOPMENT & PERMITTING, CORP. ISSUED TO OUR CLIENT FOR PURPOSES RELATED DIRECTLY AND SOLELY TO MBL LAND DEVELOPMENT & PERMITTING, CORP.'S SCOPE OF SERVICES UNDER CONTRACT TO OUR CLIENT FOR THIS PROJECT. ANY USE OR REUSE OF THIS DOCUMENT FOR ANY REASON BY ANY PARTY FOR PURPOSES UNRELATED DIRECTLY AND SOLELY TO SAID CONTRACT SHALL BE AT THE USER'S SOLE AND EXCLUSIVE RISK AND LIABILITY, INCLUDING LIABILITY FOR VIOLATION OF COPYRIGHT LAWS, UNLESS WRITTEN CONSENT IS PROVIDED BY MBL LAND DEVELOPMENT & PERMITTING, CORP.

1. MATERIALS

A. CURBING:
ALL CURBING WITHIN THE SITE SHALL BE PRE CAST CONCRETE CURB, UNLESS OTHERWISE NOTED. ALL CURBING WITHIN THE TOWN RIGHT-OF-WAY SHALL MATCH EXISTING CURB MATERIAL. VERTICAL GRANITE CURB. ALL CURBING WITHIN THE SHLO SHOULD BE VERTICAL GRANITE CURB TYPE-VA4.

B. PARKING AREAS AND ACCESS DRIVE:
BITUMINOUS PAVEMENT SHALL MEET THE REQUIREMENTS OF SECTION 400 OF THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION, REVISIONS AND ALL CURRENT ADDENDA.

WITHIN STATE HIGHWAY LAYOUT & TOWN OF FREETOWN:
SURFACE COURSE: 1.5 INCHES SUPERPAVE SURFACE COURSE-12.5 (SSC-12.5)
BINDER COURSE: 2.5 INCHES SUPERPAVE SURFACE COURSE-12.5 (SSC-12.5)
BASE COURSE: 8.0 INCHES COMPACTED GRAVEL: 8" GRAVEL BORROW TYPE B

STANDARD:
SURFACE COURSE: 1.5 INCHES BITUMINOUS CONCRETE
BINDER COURSE: 2.0 INCHES BITUMINOUS BINDER
BASE COURSE: 12.0 INCHES COMPACTED GRAVEL: 12" OF GRADED GRAVEL

HEAVY DUTY:
SURFACE COURSE: 1.5 INCHES BITUMINOUS CONCRETE
BINDER COURSE: 2.5 INCHES BITUMINOUS BINDER
BASE COURSE: 18.0 INCHES COMPACTED GRAVEL: 6" OF GRADED GRAVEL AND 12" OF 3/4" GRAVEL

C. LANDSCAPE AREAS: ALL SURFACED AREAS OR DISTURBED AREAS NOT SPECIFIED ON THE LANDSCAPE PLAN SHALL RECEIVE FOUR (4) INCHES OF TOPSOIL, SEED, MULCH, AND BE WATERED UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.

2. PARKING STALLS SHALL BE AS FOLLOWS:

STANDARD PARKING: 9' x 18' MINIMUM
ACCESSIBLE PARKING: 9' x 18' MINIMUM

3. SNOW STORAGE:

SNOW SHALL BE PLOWED TO THE AREAS INDICATED ON THE PLANS. NO SNOW IS TO BE STORED WITHIN THE 100-FOOT BUFFER ZONE.

4. UTILITIES:

A. LOCATION AND ELEVATIONS OF EXISTING UTILITIES:
THE LOCATION AND ELEVATIONS OF ALL EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON THE INFORMATION AS REFERENCED IN THE EXISTING CONDITIONS INFORMATION PROVIDED ABOVE, AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

B. STORM DRAINAGE:
UNLESS OTHERWISE NOTED, STORM DRAIN PIPING SHALL BE HDPE, HIGH DENSITY POLYETHYLENE PIPE, SMOOTH LINED (n=0.013) WITH LOCK TIGHT JOINTS. THE SIZES OF ALL PIPES ARE NOTED ON THE GRADING & DRAINAGE PLAN.

CATCH BASINS SHALL BE PRECAST CONCRETE, AS SPECIFIED ON THE DETAIL SHEET. ALL SINGLE GRATE CATCH BASINS SHALL BE FOUR (4) FEET IN DIAMETER, HAVE A FOUR (4) FOOT MINIMUM SUMP, AND HAVE HOODS/SNOUTS INSTALLED AT THEIR OUTLETS.

DOUBLE GRATE CATCH BASINS SHALL BE PRECAST CONCRETE, AS SPECIFIED ON THE DETAIL SHEET. ALL DOUBLE GRATE CATCH BASINS SHALL BE FIVE (5) FEET IN DIAMETER, HAVE A FOUR (4) FOOT MINIMUM SUMP, AND HAVE HOODS/SNOUTS INSTALLED AT THEIR OUTLETS.

C. WATER/SEWER
PIPE INSTALLATION AND MATERIALS SHALL COMPLY WITH THE STATE PLUMBING CODE WHERE APPLICABLE. CONTRACTOR SHALL COORDINATE WITH LOCAL PLUMBING INSPECTOR PRIOR TO THE PURCHASE OF MATERIALS AND CONSTRUCTION

GENERAL CONSTRUCTION REQUIREMENTS (CONT.)

1.) THE CONTRACTOR SHALL VERIFY THE PROPOSED LAYOUT WITH ITS RELATIONSHIP TO THE EXISTING SITE SURVEY. THE CONTRACTOR SHALL ALSO VERIFY ALL DIMENSIONS, SITE CONDITIONS, AND MATERIAL SPECIFICATIONS AND SHALL NOTIFY THE OWNER AND ENGINEER OF ANY ERRORS, OMISSIONS OR DISCREPANCIES BEFORE COMMENCING OR PROCEEDING WITH WORK.

2.) THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, INSPECTIONS, BONDS, ETC. AND OTHER APPROVAL RELATED ITEMS WITH THE CITY OF FALL RIVER AND MASSACHUSETTS HIGHWAY DEPARTMENT. NO CONSTRUCTION SHALL COMMENCE UNTIL SUCH PERMITS HAVE BEEN SECURED.

3.) METHODS AND MATERIALS USED IN THE CONSTRUCTION OF IMPROVEMENTS FOR THIS PROJECT SHALL CONFORM TO THE CURRENT CONSTRUCTION STANDARDS AND SPECIFICATIONS OF THE MASSACHUSETTS HIGHWAY DEPARTMENT AND THE CITY OF FALL RIVER.

4.) DEVIATIONS OR CHANGES FROM THESE PLANS WILL NOT BE ALLOWED UNLESS APPROVED BY THE ENGINEER/OWNER.

5.) CONTRACTOR TO CONFIRM AND VERIFY THE VALIDITY, LOCATION, MATERIAL, AND AVAILABILITY TO USE EXISTING UTILITIES ON OR NEAR THE PROJECT SITE PROPERTY. CONTRACTOR TO LOCATE EXISTING UTILITIES AND CONFIRM SAID UTILITIES WITH ALL APPLICABLE MUNICIPALITIES AND UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION. ONCE UTILITIES HAVE BEEN CONFIRMED IN THE FIELD BY CONTRACTOR AND VERIFIED BY APPLICABLE MUNICIPALITY AND UTILITY COMPANY AND CONNECTION HAS BEEN APPROVED BY ENTITY, ONLY THEN SHALL CONTRACTOR CONSTRUCT AND UTILIZE THESE UTILITIES. CONTRACTOR TO IMMEDIATELY INFORM ENGINEER OF RECORD OF ANY DEVIATIONS TO PLANS.

6.) THE CONTRACTOR SHALL MAKE EXPLORATORY EXCAVATIONS AND LOCATE ANY EXISTING UTILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF NECESSARY. THE EXISTENCE AND/OR LOCATION OF UTILITIES SHOWN ON THESE PLANS MAY BE ONLY APPROXIMATELY CORRECT AND THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN HEREON AND ANY OTHER EXISTING UTILITIES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING, AT HIS EXPENSE, ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.

7.) THE CONTRACTOR SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATION OR BLASTING AT LEAST TWO WORKING DAYS, BUT NOT MORE THAN TEN WORKING DAYS, PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION. ALL WATER, GAS, SEWER AND OTHER UTILITIES SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.

8.) RELOCATION OF ANY UTILITIES SHALL BE AT THE OWNERS EXPENSE AND COMPLETED WITH THE UTILITY WORK. THE OWNER SHALL BE NOTIFIED AS TO THE RELOCATION'S REQUIRED PRIOR TO THE START OF CONSTRUCTION.

9.) IF THE PROJECT DISTURBS MORE THAN ONE ACRE OF LAND AND FALLS WITHIN THE NPDES CONSTRUCTION GENERAL PERMIT(CGP)AND EPA JURISDICTION. PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR IS TO FILE A CGP NOTICE OF INTENT WITH THE EPA AND PREPARE A STORMWATER POLLUTION PREVENTION PLAN IN ACCORDANCE WITH THE NPDES REGULATIONS. CONTRACTOR SHALL CONFIRM WITH THE OWNER AND MBL THAT THE NOTICE OF INTENT HAS BEEN FILED WITH THE EPA.

10.) CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR AND SHALL FURNISH EXCAVATION, INSTALLATION AND BACKFILL OF ELECTRICAL FURNISHED SITE WORK RELATED ITEMS SUCH AS PULL BOXES, CONDUITS, DUCT BANKS, LIGHT POLE BASES, AND CONCRETE PADS. SITE CONTRACTOR SHALL FURNISH CONCRETE ENCASEMENT OF DUCT BANKS IF REQUIRED BY THE UTILITY COMPANY AND AS INDICATED ON THE DRAWINGS. THE CONTRACTOR SHALL EXCAVATE AND BACKFILL TRENCHES FOR GAS IN ACCORDANCE WITH GAS COMPANY'S REQUIREMENTS.

11.) THESE PLANS AND CORRESPONDING AUTO CAD FILES AND DOCUMENTS ARE INSTRUMENTS OF PROFESSIONAL SERVICE, AND SHALL NOT BE USED, IN WHOLE OR IN PART, FOR ANY PURPOSE OTHER THAN FOR WHICH IT WAS CREATED WITHOUT THE EXPRESSED WRITTEN CONSENT OF MBL. ANY UNAUTHORIZED USE, REUSE, MODIFICATION OR ALTERATION AND DISTRIBUTION OF ANY KIND, INCLUDING AUTOMATED CONVERSION OF THIS DOCUMENT SHALL BE AT THE USERS SOLE RISK WITHOUT LIABILITY OR LEGAL EXPOSURE TO MBL.

12.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING, WITH MATCHING MATERIALS, ANY PAVEMENT, WALKS, CURBS, ETC. THAT MUST BE CUT OR THAT ARE DAMAGED DURING CONSTRUCTION.

13.) AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES.

14.) CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL AND ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM "THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER." THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING A PROTECTIVE BARRIER AROUND THE SITE PRIOR TO AND DURING CONSTRUCTION.

15.) WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.

16.) THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS WITH THE APPROPRIATE UTILITY COMPANIES FOR POLE RELOCATION, AND FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE, CABLE, FIRE ALARM, WATER, SANITARY SEWER, STORM DRAIN, AND ANY OTHER UTILITIES, BOTH PUBLIC AND PRIVATE, AS REQUIRED.

17.) THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES, PUBLIC AND PRIVATE, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN, (SEE CHAPTER 370, ACTS OF 1963, MASSACHUSETTS) PRIOR COMMENCING ANY WORK.

18.) MBL LAND DEVELOPMENT & PERMITTING, CORP. ASSUMES NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN.

19.) UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY PERMITS, PAY ALL FEES AND POST ALL BONDS ASSOCIATED WITH SAME, AND COORDINATE WITH THE ENGINEER AS REQUIRED.

20.) THE CONTRACTOR SHALL REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ALL BUILDING DIMENSIONS AND CONSTRUCTION. BUILDING DIMENSIONS ARE SHOWN FOR COORDINATION WITH OTHER SITE WORK ONLY AND SHOULD NOT BE USED TO STAKE OUT BUILDINGS. SITE CONTRACTOR SHALL STAKE OUT THE EXTERIOR BUILDING CORNERS FROM THE LATEST ARCHITECTURAL PLANS. THE CONTRACTOR SHALL NOTIFY MBL LAND DEVELOPMENT & PERMITTING, CORP. OF ANY DISCREPANCIES BETWEEN SITE PLAN DIMENSIONS AND ARCHITECTURAL BUILDING PLANS BEFORE PROCEEDING WITH ANY PORTION OF SITE WORK WHICH MAY BE EFFECTED SO THAT PROPER ADJUSTMENTS TO THE SITE LAYOUT CAN BE MADE IF NECESSARY.

21.) PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL SUBMIT A SCHEDULE OF OPERATIONS TO THE OWNER AND ITS REPRESENTATIVE. THE CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE OWNER, ITS ENGINEER OR REPRESENTATIVE.

22.) CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR JOB SITE SAFETY AND ALL CONSTRUCTION MEANS AND METHODS. MBL LAND DEVELOPMENT & PERMITTING, CORP. DOES NOT ASSUME ANY RESPONSIBILITY IN JOB SITE SAFETY FOR CONSTRUCTION METHODS USED. ALL FEDERAL, STATE, AND LOCAL OSHA REQUIREMENTS AND REGULATIONS SHALL BE FOLLOWED BY ALL PERSONNEL ON THE JOB SITE AT ALL TIMES.

23.) THE CONTRACTOR SHALL REMOVE ALL STUMPS, RUBBISH, UNSUITABLE MATERIAL AND DEBRIS FROM THE SITE PROJECT SITE. STORAGE OF THESE ITEMS WILL NOT BE PERMITTED ON THE PROJECT SITE. THE CONTRACTOR SHALL LEAVE THE SITE IN A SAFE, CLEAN, AND LEVEL CONDITION AT THE COMPLETION OF THE SITE CLEARANCE WORK.

24.) AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS, WITHOUT PRIOR APPROVAL BY THE OWNER OR ITS REPRESENTATIVE, SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.

25.) THE CONTRACTOR SHALL PROTECT ALL UNDERGROUND DRAINAGE, SEWER, AND UTILITY FACILITIES FROM EXCESSIVE VEHICULAR LOADS DURING CONSTRUCTION. ANY FACILITIES DAMAGED BY CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

26.) JOINTS BETWEEN NEW BITUMINOUS CONCRETE ROADWAY PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH BITUMEN AND BACKSANDED.

GENERAL CONSTRUCTION REQUIREMENTS (CONT.)

27.) ALL PROPOSED WALKWAYS TO ACCESSIBLE AREAS WILL BE HANDICAPPED ACCESSIBLE. ALL PROPOSED SLOPES ON WALKWAYS TO BE LESS THAN 5% AND ALL CROSS SLOPES TO BE EQUAL TO OR LESS THAN 1.5% ALL WORK WILL BE IN ACCORDANCE WITH THE MOST CURRENT REQUIREMENTS OF THE U.S. ACCESS BOARD, AMERICANS WITH DISABILITIES ACT & COMMONWEALTH OF MASSACHUSETTS ARCHITECTURAL ACCESS BOARD.

28.) FINAL LAYOUT AND STAKING OF ALL PROPOSED FEATURES AND GRADING SHALL BE REVIEWED IN THE FIELD AND APPROVED BY THE OWNERS REPRESENTATIVE PRIOR TO ANY SITE PREPARATION OR CONSTRUCTION. THE CONTRACTOR SHALL NOT ADJUST OR MODIFY THE LAYOUT AND STAKING OF ANY PROPOSED FEATURES WITHOUT FINAL APPROVAL FROM THE OWNERS REPRESENTATIVE AND ANY GOVERNMENTAL AGENCY WHICH MAY HAVE JURISDICTION OVER CONTEMPLATED CHANGE.

29.) ALL ELECTRICAL, TELEPHONE, DATA/COM AND FIRE DEPARTMENT CONDUITS ARE TO BE INSTALLED BY THE ELECTRICAL CONTRACTOR. TRENCHING, BACKFILLING, CONCRETE WORK AND STREET REPAIR SHALL BE PERFORMED BY THE GENERAL CONTRACTOR.

30.) RIM ELEVATIONS OF DRAINAGE AND SANITARY SEWER MANHOLES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH AND CONSISTENT WITH GRADING PLANS. ADJUST ALL OTHER RIM ELEVATIONS OF MANHOLES, GAS GATES, WATER GATES AND OTHER UTILITIES TO FINISHED GRADE WITHIN THE LIMITS OF THE SITE WORK.

31.) ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE REPLACED IN KIND. LAWN AREAS SHALL HAVE A MODIFIED LOAM BORROW PLACED AND SEEDED. THE MODIFIED LOAM BORROW SHALL HAVE A MINIMUM DEPTH OF 4" AND SHALL BE PLACED FLUSH WITH THE TOP OF ADJACENT CURB, EDGING, BERM, OR OTHER SURFACE.

32.) THE CONTRACTOR SHALL WATER, MOW, FERTILIZE OR OTHERWISE MAINTAIN LAWN AREAS UNTIL SATISFACTORY GRASS STANDS ARE ACHIEVED TO THE OWNER OR ITS REPRESENTATIVE SATISFACTION.

33.) THE CONTRACTOR SHALL RESET ALL MONUMENTATION DISTURBED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.

34.) THE CONTRACTOR SHALL PROVIDE A SURVEY BY A PLS TO ENSURE THAT THE MONUMENTATION IS RESET TO ITS ORIGINAL LOCATION. MONUMENTS INCLUDE, BUT ARE NOT LIMITED TO, TOWN BOUNDS, MASS HIGHWAY BOUNDS, PROPERTY LINE MONUMENTS, IRON RODS, STAKES, CONCRETE BOUNDS, GRANITE BOUNDS AND STONE WALLS WITH DRILL HOLES.

35.) THE CONTRACTOR SHALL NOTIFY MBL LAND DEVELOPMENT & PERMITTING, CORP. AFTER INSTALLATION OF ANY UTILITIES AND/OR SUBSURFACE STRUCTURES SO THAT AS-BUILT INFORMATION MAY BE OBTAINED PRIOR TO BACKFILLING.

36.) THE CONTRACTOR SHALL NOTIFY TOWN OF FREETOWN DEPARTMENTS AT LEAST 7 DAYS IN ADVANCE OF COMMENCE WORK IN THE FIELD.

STORM WATER MAINTENANCE PROGRAM

1.) ALL EROSION AND SEDIMENTATION CONTROL DEVICES TO BE USED FOR THIS PROJECT SHALL BE INSTALLED AND MAINTAINED AS SPECIFIED ON THESE PLANS AND IN VOLUME TWO OF THE STATE OF MASSACHUSETTS STORM WATER MANAGEMENT MANUAL.

2.) PROPER EROSION AND SEDIMENT CONTROL PRACTICES MUST BE IMPLEMENTED DURING ALL PHASES OF CONSTRUCTION AND UNTIL THE SITE IS SATISFACTORILY STABILIZED. ALL CONTROL PRACTICES SHOULD BE IN ACCORDANCE WITH VOLUME TWO OF THE STATE OF MASSACHUSETTS STORM WATER MANAGEMENT MANUAL.

3.) THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE AND/OR REPLACEMENT OF ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENTATION CONTROL DEVICES TO ENSURE PROPER OPERATION THROUGHOUT THE LIFE OF THE PROJECT. THE CONTRACTOR SHALL CONDUCT THE FOLLOWING MAINTENANCE AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE OF PERMANENT MEASURES UNTIL CONSTRUCTION OF THE PROJECT IS COMPLETED OR UNTIL IT IS ACCEPTED BY THE OWNER. THE OWNER IS RESPONSIBLE THEREAFTER.

4.) TEMPORARY VEGETATIVE COVER SHALL BE APPLIED TO ANY DISTURBED AREAS (INCLUDING SOIL STOCKPILE AREAS) THAT HAVE NOT YET REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS TEMPORARILY CEASED, UNLESS THE ACTIVITY IS TO RESUME WITHIN TWENTY-ONE (21) DAYS.

5.) PERMANENT VEGETATIVE COVER SHALL BE APPLIED TO ALL DISTURBED AREAS THAT HAVE REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS PERMANENTLY CEASED. THE RECOMMENDED PERMANENT SEEDING DATES ARE APRIL 1 TO JUNE 15 AND AUGUST 15 TO OCTOBER 1.

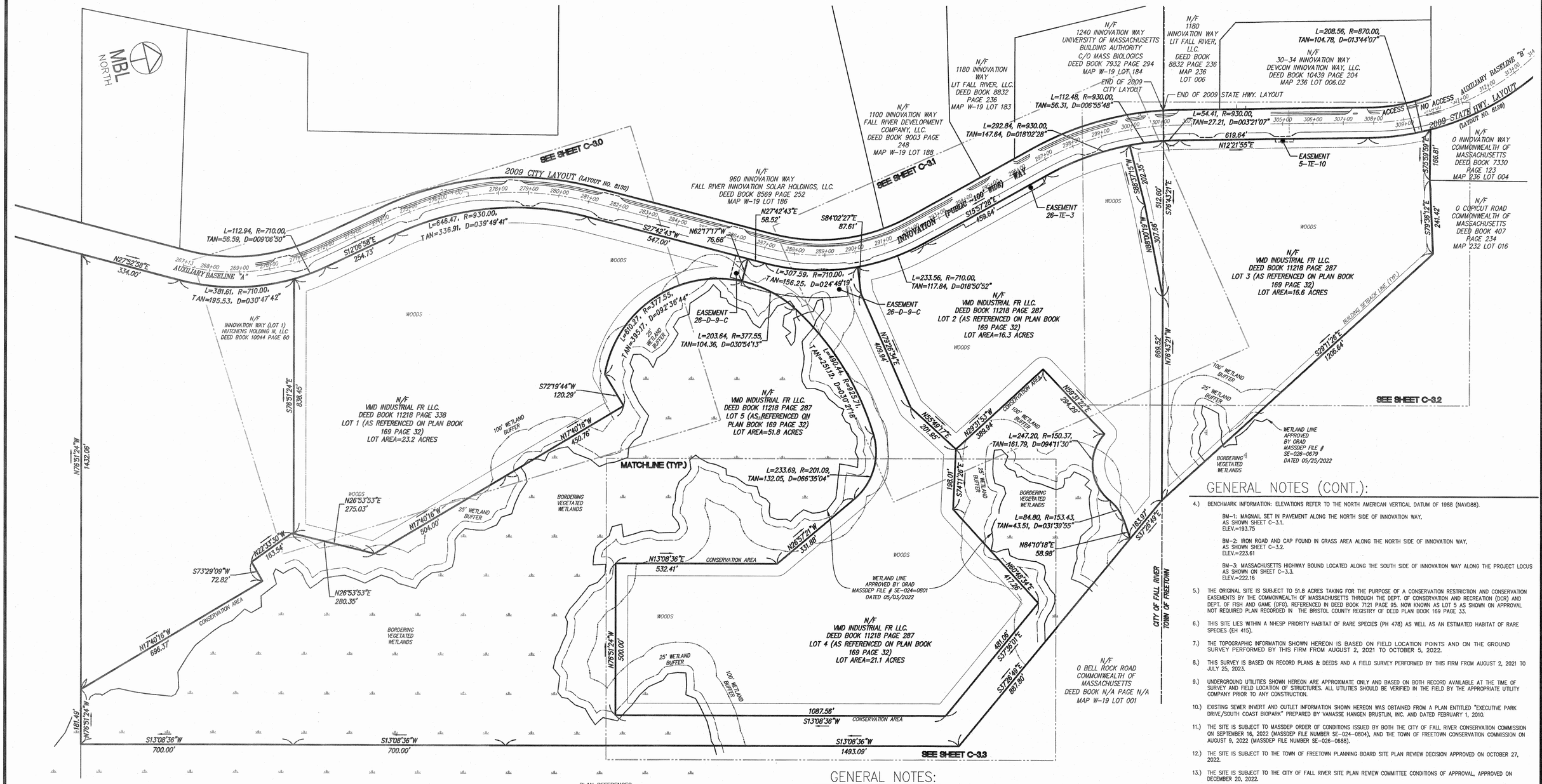
6.) IF SEEDING CANNOT BE COMPLETED IMMEDIATELY OR WITHIN THE RECOMMENDED SEEDING DATES, USE THE TEMPORARY MULCHING MEASURE TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.

7.) AREAS WHICH HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDED SHOULD BE MULCHED IMMEDIATELY FOLLOWING SEEDING IN ADDITION TO AREAS WHICH CANNOT BE SEEDED WITHIN THE RECOMMENDED SEEDING DATES AND ANY SOIL STOCKPILE AREAS. TEMPORARY MULCHING SHOULD BE PERFORMED AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS TEMPORARILY CEASED UNLESS THE ACTIVITY IS TO RESUME WITHIN TWENTY-ONE (21) DAYS.

8.) ALL MULCHES MUST BE INSPECTED PERIODICALLY, IN PARTICULAR AFTER RAINSTORMS, TO CHECK FOR RILL EROSION. WHERE EROSION IS OBSERVED, ADDITIONAL MULCH MUST BE APPLIED. IF NETTING IS USED, THE NET SHOULD BE INSPECTED AFTER RAINSTORMS FOR DISLOCATION OR FAILURE. IF WASHOUTS OR BREAKAGE OCCUR, THE NET MUST BE REINSTALLED AS NECESSARY AFTER REPAIRING DAMAGE TO SLOPE. INSPECTIONS SHOULD TAKE PLACE UNTIL GRASSES ARE FIRMLY ESTABLISHED. GRASS IS CONSIDERED TO BE FIRMLY ESTABLISHED AT A MINIMUM HEIGHT OF THREE (3) INCHES.

9.) IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTROL DUST AND TAKE ALL NECESSARY MEASURES TO ENSURE ALL ROADS ARE MAINTAINED IN A DUST FREE CONDITION AT ALL TIMES THROUGHOUT THE LIFE OF THE CONTRACT. REPETITIVE TREATMENTS SHOULD BE APPLIED AS NECESSARY.

10.) ALL PROPOSED CONSTRUCTION ENTRANCES SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO THE SURROUNDING ROADWAYS. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO THE SURROUNDING ROADWAYS MUST B



PLAN REFERENCES:

BRISTOL COUNTY REGISTRY OF DEEDS

PLAN BOOK 117 PAGE 81
PLAN BOOK 117 PAGE 84
PLAN BOOK 147 PAGE 35
PLAN BOOK 150 PAGE 36
PLAN BOOK 150 PAGE 78
PLAN BOOK 154 PAGE 66
PLAN BOOK 157 PAGE 79
PLAN BOOK 164 PAGE 68
PLAN BOOK 169 PAGE 32-33

DEED REFERENCES (BRISTOL COUNTY NORTH REGISTRY OF DEEDS):

BOOK 7124 PAGE 95
BOOK 10044 PAGE 60
BOOK 11218 PAGE 287

GENERAL NOTES:

1.) THE SITE IS COMPRISED OF LOTS 1-5 AS SHOWN ON THE APPROVAL NOT REQUIRED PLANS PREPARED BY MBL LAND DEVELOPMENT & PERMITTING, CORP. DATED NOVEMBER 2, 2022, APPROVED BY THE CITY OF FALL RIVER PLANNING BOARD ON NOVEMBER 9, 2022 AND THE TOWN OF FREETOWN PLANNING BOARD ON NOVEMBER 15, 2022. THE PLANS ARE RECORDED IN THE BRISTOL COUNTY FALL RIVER REGISTRY OF DEEDS PLAN BOOK 169 PAGES 32-33.

2.) THE LOTS LIE WITHIN A "ZONE X", AN AREA OF MINIMAL FLOOD HAZARD, AS SHOWN ON FEMA F.I.R.M. MAP 25005C0263G HAVING AN EFFECTIVE DATE OF JULY 16, 2014 AND FEMA F.I.R.M MAP 25005C0264F HAVING AN EFFECTIVE DATE OF JULY 7, 2009.

3.) THE WETLAND RESOURCE AREAS SHOWN HEREON WERE DELINEATED BY GODDARD CONSULTING, LLC. AN ORDER OF RESOURCE AREA DELINEATION WAS ISSUED BY THE FALL RIVER CONSERVATION COMMISSION ON MAY 3, 2022 (MASSDEP FILE NUMBER SE-024-0801). AN ORDER OF RESOURCE AREA DELINEATION WAS ISSUED BY THE FREETOWN CONSERVATION COMMISSION ON MAY 25, 2022 (MASSDEP FILE NUMBER SE-026-0679).

GENERAL NOTES (CONT.):

4.) BENCHMARK INFORMATION: ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

BM-1: MAGNAIL SET IN PAVEMENT ALONG THE NORTH SIDE OF INNOVATION WAY, AS SHOWN SHEET C-3.1. ELEV.=193.75

BM-2: IRON ROAD AND CAP FOUND IN GRASS AREA ALONG THE NORTH SIDE OF INNOVATION WAY, AS SHOWN SHEET C-3.2. ELEV.=223.61

BM-3: MASSACHUSETTS HIGHWAY BOUND LOCATED ALONG THE SOUTH SIDE OF INNOVATION WAY ALONG THE PROJECT LOCUS AS SHOWN ON SHEET C-3.3. ELEV.=222.16

5.) THE ORIGINAL SITE IS SUBJECT TO 51.8 ACRES TAKING FOR THE PURPOSE OF A CONSERVATION RESTRICTION AND CONSERVATION EASEMENTS BY THE COMMONWEALTH OF MASSACHUSETTS THROUGH THE DEPT. OF CONSERVATION AND RECREATION (DCR) AND DEPT. OF FISH AND GAME (DFG). REFERENCED IN DEED BOOK 7121 PAGE 95. NOW KNOWN AS LOT 5 AS SHOWN ON APPROVAL NOT REQUIRED PLAN RECORDED IN THE BRISTOL COUNTY REGISTRY OF DEED PLAN BOOK 169 PAGE 33.

6.) THIS SITE LIES WITHIN A NHESP PRIORITY HABITAT OF RARE SPECIES (PH 478) AS WELL AS AN ESTIMATED HABITAT OF RARE SPECIES (EH 415).

7.) THE TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON FIELD LOCATION POINTS AND ON THE GROUND SURVEY PERFORMED BY THIS FIRM FROM AUGUST 2, 2021 TO OCTOBER 5, 2022.

8.) THIS SURVEY IS BASED ON RECORD PLANS & DEEDS AND A FIELD SURVEY PERFORMED BY THIS FIRM FROM AUGUST 2, 2021 TO JULY 25, 2023.

9.) UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE ONLY AND BASED ON BOTH RECORD AVAILABLE AT THE TIME OF SURVEY AND FIELD LOCATION OF STRUCTURES. ALL UTILITIES SHOULD BE VERIFIED IN THE FIELD BY THE APPROPRIATE UTILITY COMPANY PRIOR TO ANY CONSTRUCTION.

10.) EXISTING SEWER INVERT AND OUTLET INFORMATION SHOWN HEREON WAS OBTAINED FROM A PLAN ENTITLED "EXECUTIVE PARK DRIVE/SOUTH COAST BIOPARK" PREPARED BY VANASSE HANGEN BRUSTLIN, INC. AND DATED FEBRUARY 1, 2010.

11.) THE SITE IS SUBJECT TO MASSDEP ORDER OF CONDITIONS ISSUED BY BOTH THE CITY OF FALL RIVER CONSERVATION COMMISSION ON SEPTEMBER 16, 2022 (MASSDEP FILE NUMBER SE-024-0804), AND THE TOWN OF FREETOWN CONSERVATION COMMISSION ON AUGUST 9, 2022 (MASSDEP FILE NUMBER SE-026-0688).

12.) THE SITE IS SUBJECT TO THE TOWN OF FREETOWN PLANNING BOARD SITE PLAN REVIEW DECISION APPROVED ON OCTOBER 27, 2022.

13.) THE SITE IS SUBJECT TO THE CITY OF FALL RIVER SITE PLAN REVIEW COMMITTEE CONDITIONS OF APPROVAL, APPROVED ON DECEMBER 20, 2022.

14.) THIS DOCUMENT IS AN INSTRUMENT OF SERVICE OF MBL LAND DEVELOPMENT & PERMITTING, CORP. ISSUED TO OUR CLIENT FOR PURPOSES RELATED DIRECTLY AND SOLELY TO MBL LAND DEVELOPMENT & PERMITTING, CORP.'S SCOPE OF SERVICES UNDER CONTRACT TO OUR CLIENT FOR THIS PROJECT. ANY USE OR REUSE OF THIS DOCUMENT FOR ANY REASON BY ANY PARTY FOR PURPOSES UNRELATED DIRECTLY AND SOLELY TO SAID CONTRACT SHALL BE AT THE USER'S SOLE AND EXCLUSIVE RISK AND LIABILITY, INCLUDING LIABILITY FOR VIOLATION OF COPYRIGHT LAWS, UNLESS WRITTEN CONSENT IS PROVIDED BY MBL LAND DEVELOPMENT & PERMITTING, CORP.

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6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL
NOV 21 2023
COMMONWEALTH OF MASSACHUSETTS
MICHAEL ROBERT KEEGAN No. 33859
PROFESSIONAL LAND SURVEYOR
Michael Robert Keegan

SEAL

PREPARED FOR
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733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.: 1"=150'
VERT.:
DATUM:
HORZ.: NAD83
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GRAPHIC SCALE

MBL
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PROPOSED WAREHOUSE DEVELOPMENT
EXISTING CONDITIONS INDEX SHEET
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

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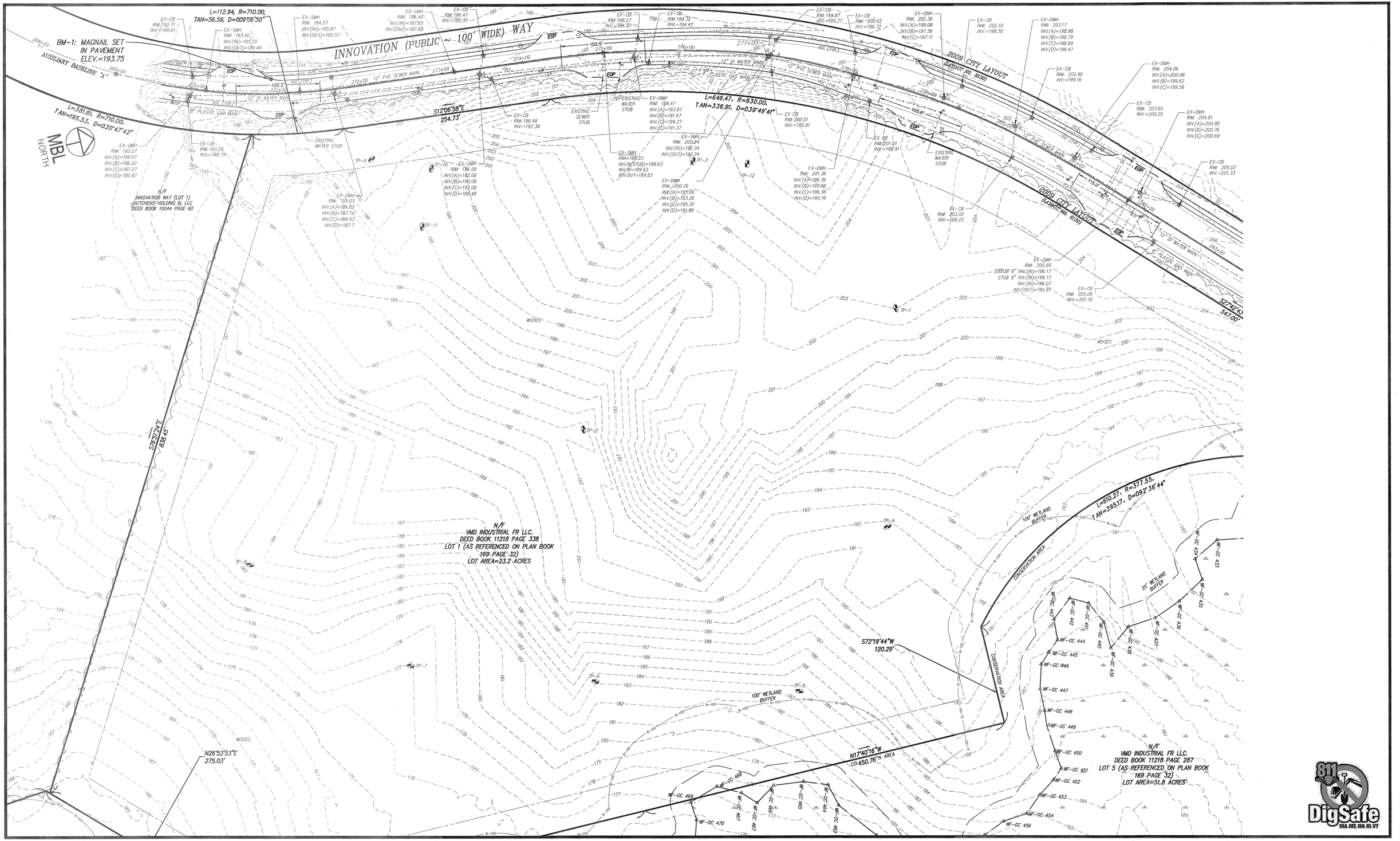

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PROJ. No.: 2021-036
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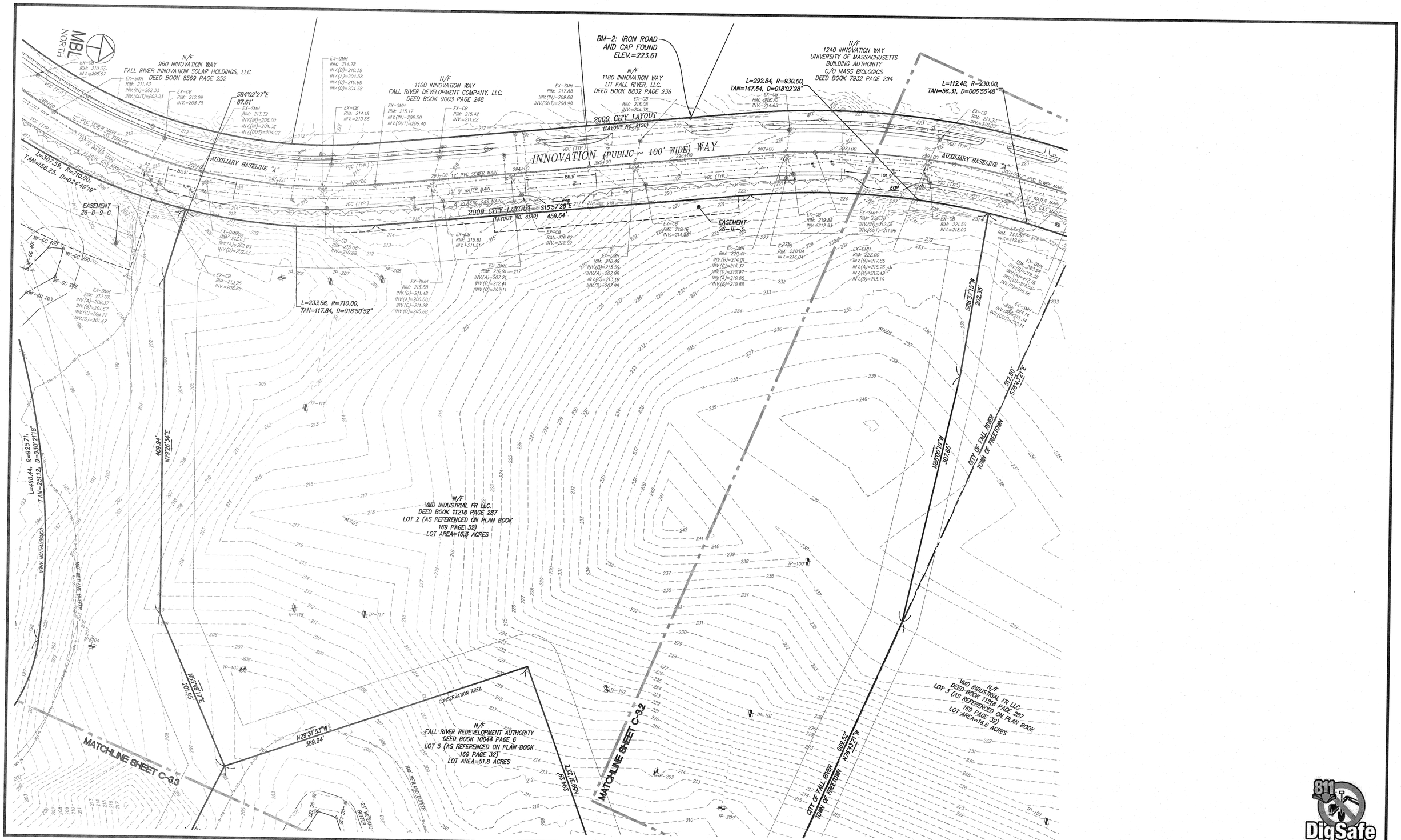

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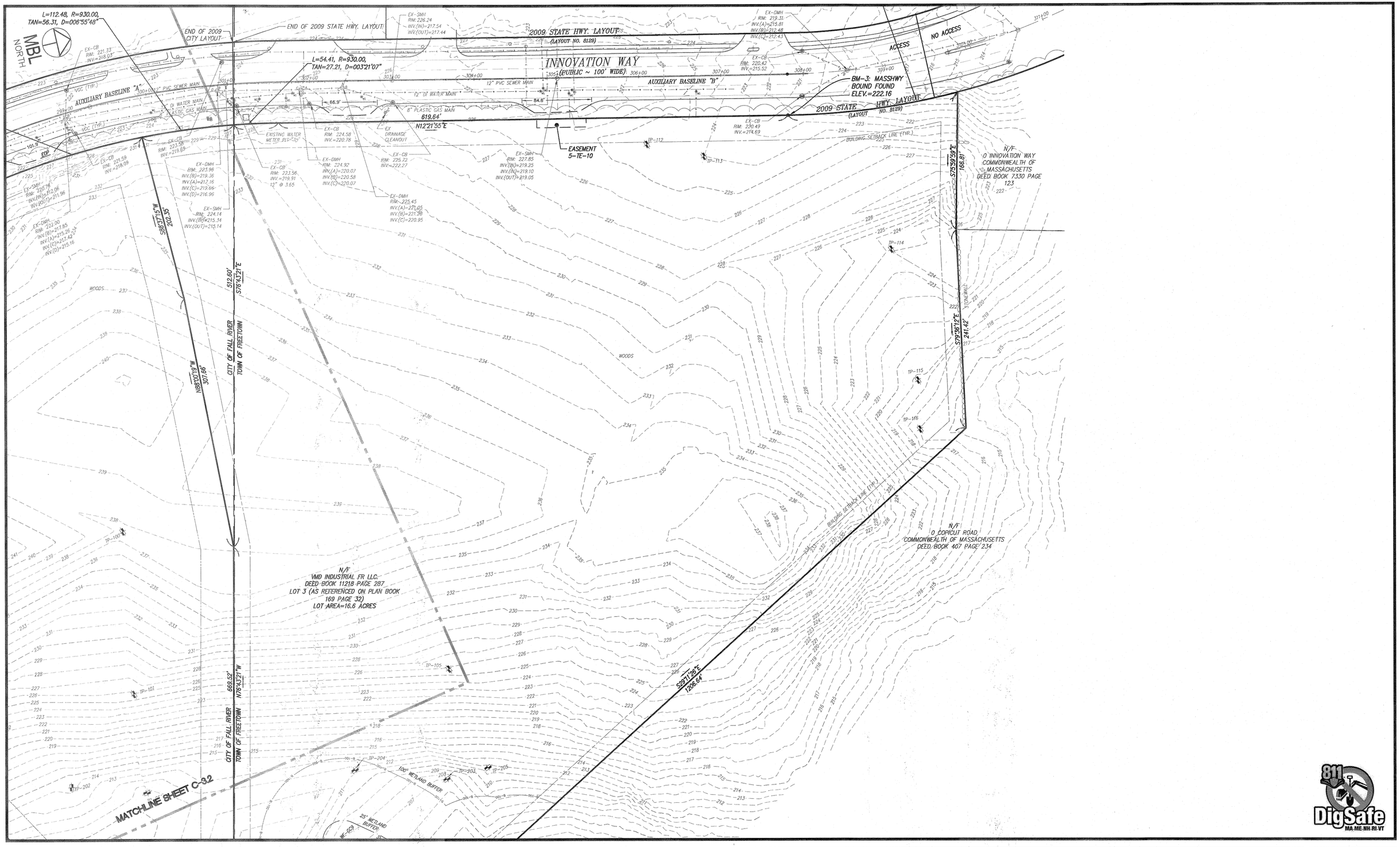

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COMMONWEALTH OF MASSACHUSETTS
MICHAEL ROBERT KEEGAN
No. 33626
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0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-3.3

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UCS: MS VIEW: LMAN: CTB:

MBL NORTH

MATCHLINE SHEET C-3.2

BORDERING VEGETATED WETLANDS

L=233.69, R=201.09'
TAN=132.05, D=066°35'04"

25' WETLAND BUFFER

100' WETLAND BUFFER

N/F
FALL RIVER REDEVELOPMENT AUTHORITY
DEED BOOK 10044 PAGE 6
LOT 5 (AS REFERENCED ON PLAN BOOK 169 PAGE 32)
LOT AREA=51.8 ACRES

N13°08'36"E
532.41'

N26°57'21"W
331.88'

CONSERVATION AREA

WETLAND LINE
APPROVED BY GRAD
MASSDEP FILE # SE-024-0801
DATED 05/03/2022

WOODS

S74°11'28"E
198.01'

N84°10'18"E
58.98'

N80°48'34"E
417.26'

N76°51'24"W
500.00'

S37°35'01"E
481.06'

S37°26'43"E
887.80'

N13°08'36"E
1087.56'

S13°08'36"W
1493.09'

N/F
VMD INDUSTRIAL FR LLC
DEED BOOK 11218 PAGE 287
LOT 4 (AS REFERENCED ON PLAN BOOK 169 PAGE 32)
LOT AREA=21.1 ACRES

N/F
FALL RIVER REDEVELOPMENT AUTHORITY
DEED BOOK 10044 PAGE 6
LOT 5 (AS REFERENCED ON PLAN BOOK 169 PAGE 32)
LOT AREA=51.8 ACRES

N/F
0 BELL ROCK ROAD
COMMONWEALTH OF MASSACHUSETTS
DEED BOOK N/A PAGE N/A

TP-109 TP-121 TP-108 TP-120 TP-107 TP-119 TP-106 TP-110

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No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
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3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL
COMMONWEALTH OF MASSACHUSETTS
MICHAEL ROBERT KEEGAN
No. 33639
REGISTERED LAND SURVEYOR
NOV 21 2023

SEAL

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.: 1"=50'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
50 25 0 50
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

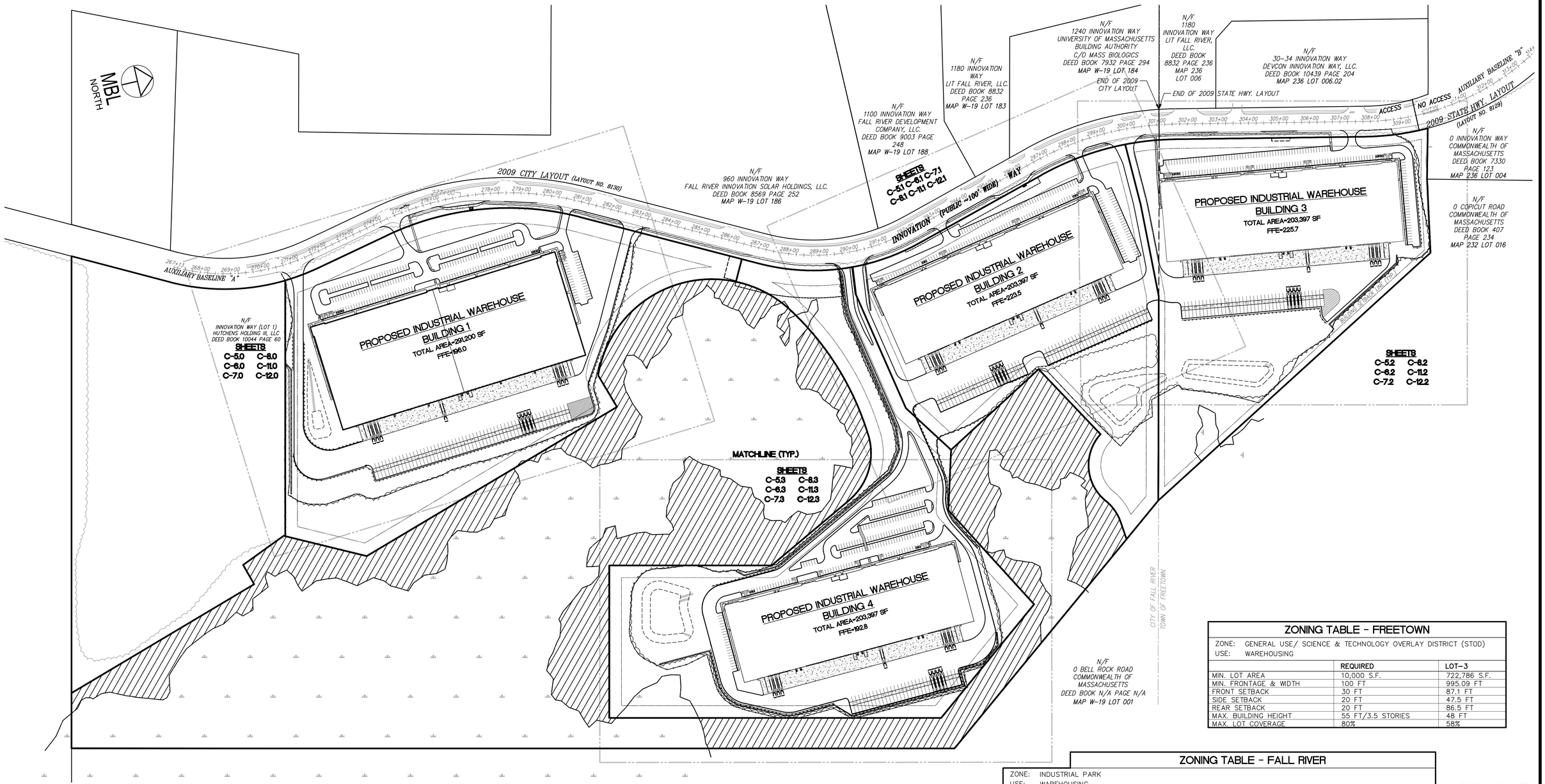
PROPOSED WAREHOUSE DEVELOPMENT

EXISTING CONDITIONS PLAN

0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-3.4



ZONING TABLE - FREETOWN

ZONE: GENERAL USE/ SCIENCE & TECHNOLOGY OVERLAY DISTRICT (STOD)
USE: WAREHOUSING

	REQUIRED	LOT-3
MIN. LOT AREA	10,000 S.F.	722,786 S.F.
MIN. FRONTAGE & WIDTH	100 FT	995.09 FT
FRONT SETBACK	30 FT	87.1 FT
SIDE SETBACK	20 FT	47.5 FT
REAR SETBACK	20 FT	86.5 FT
MAX. BUILDING HEIGHT	55 FT/3.5 STORIES	48 FT
MAX. LOT COVERAGE	80%	58%

ZONING TABLE - FALL RIVER

ZONE: INDUSTRIAL PARK
USE: WAREHOUSING

	REQUIRED	LOT-1	LOT-2	LOT-4
MIN. LOT AREA	10,000 S.F.	1,010,653 S.F.	709,429 S.F.	919,380 S.F.
MIN. FRONTAGE & WIDTH	100 FT	1,561.1 FT	986.0 FT	366.1 FT
FRONT SETBACK	50 FT	129.9 FT	83.5 FT	962.7 FT
SIDE SETBACK	40 FT	52.52 FT	57.0 FT	62.9 FT
REAR SETBACK	40 FT	198.7 FT	190.0 FT	115.1 FT
MAX. BUILDING HEIGHT	80 FT/6 STORIES	48 FT	48 FT	48 FT
MAX. LOT COVERAGE	70%	61%	63%	59%

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2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL
TRACY L. DUARTE CIVIL NO. 48660 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

SEAL

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.: 1"=150'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
150 75 0 150
GRAPHIC SCALE

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PROPOSED WAREHOUSE DEVELOPMENT

PROPOSED INDEX SHEET
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

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C-4.0

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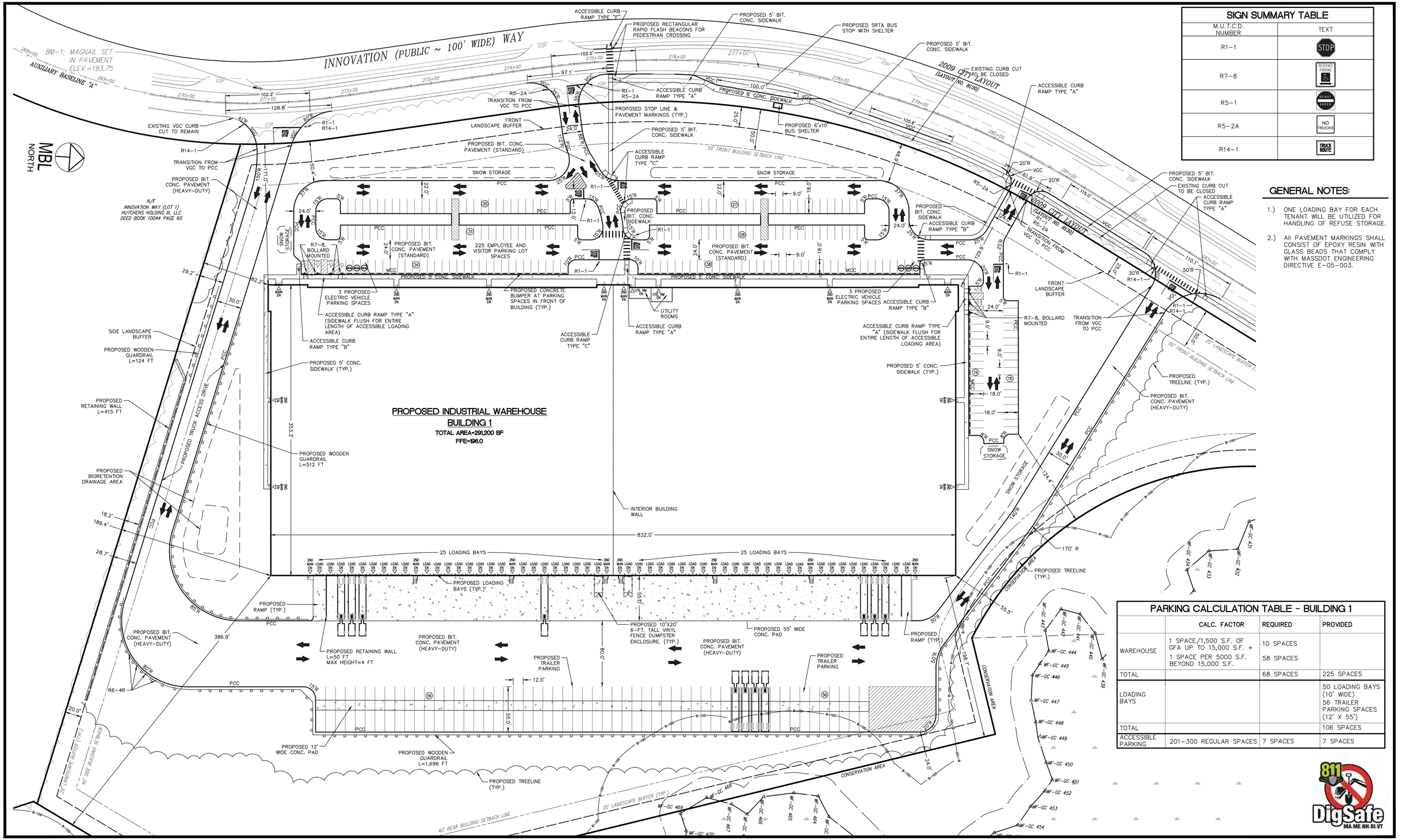

SIGN SUMMARY TABLE

M.U.T.C.D. NUMBER	TEXT
R1-1	STOP
R7-8	RESERVED PARKING
R5-1	DO NOT ENTER
R5-2A	NO TRUCKS
R14-1	TRUCK ROUTE

GENERAL NOTES:

1.) ONE LOADING BAY FOR EACH TENANT WILL BE UTILIZED FOR HANDLING OF REFUSE STORAGE.

2.) All PAVEMENT MARKINGS SHALL CONSIST OF EPOXY RESIN WITH GLASS BEADS THAT COMPLY WITH MASSDOT ENGINEERING DIRECTIVE E-05-003.

PARKING CALCULATION TABLE - BUILDING 1

	CALC. FACTOR	REQUIRED	PROVIDED
WAREHOUSE	1 SPACE/1,500 S.F. OF GFA UP TO 15,000 S.F. + 1 SPACE PER 5000 S.F. BEYOND 15,000 S.F.	10 SPACES 58 SPACES	
TOTAL		68 SPACES	225 SPACES
LOADING BAYS			50 LOADING BAYS (10' WIDE) 56 TRAILER PARKING SPACES (12' X 55')
TOTAL			106 SPACES
ACCESSIBLE PARKING	201-300 REGULAR SPACES	7 SPACES	7 SPACES

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1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

SEAL

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.: 1"=50'
VERT.:
DATUM:
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50 25 0 50
GRAPHIC SCALE

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PROPOSED WAREHOUSE DEVELOPMENT

LAYOUT & MATERIALS PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

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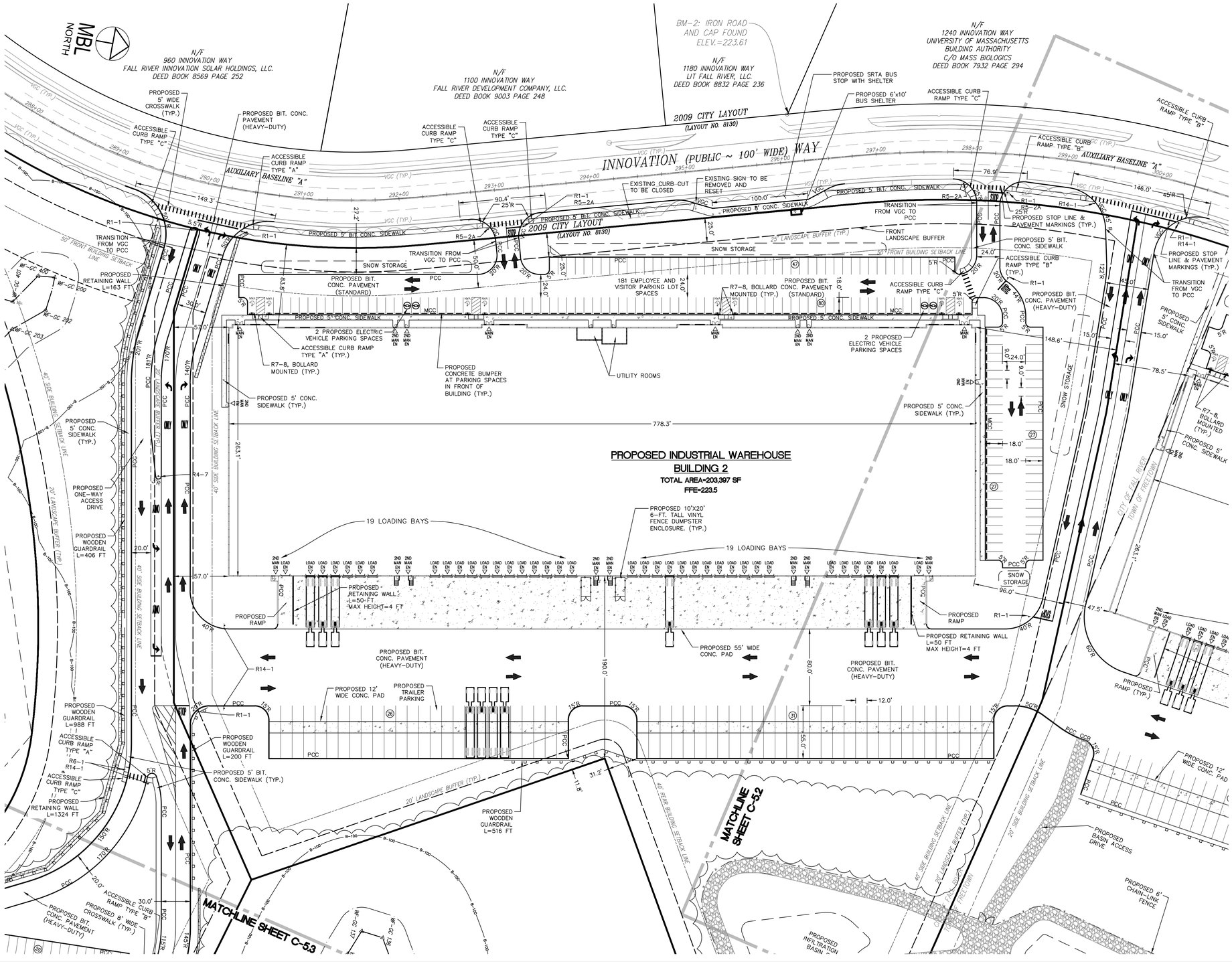

GENERAL NOTES:

1.) ONE LOADING BAY FOR EACH TENANT WILL BE UTILIZED FOR HANDLING OF REFUSE STORAGE.

2.) All PAVEMENT MARKINGS SHALL CONSIST OF EPOXY RESIN WITH GLASS BEADS THAT COMPLY WITH MASSDOT ENGINEERING DIRECTIVE E-05-003.

PARKING CALCULATION TABLE - BUILDING 2

	CALC. FACTOR	REQUIRED	PROVIDED
WAREHOUSE	1 SPACE/1,500 S.F. OF GFA UP TO 15,000 S.F. + 1 SPACE PER 5000 S.F. BEYOND 15,000 S.F.	10 SPACES 38 SPACES	
TOTAL		48 SPACES	181 SPACES
LOADING BAYS			38 LOADING BAYS (10' WIDE) 57 TRAILER PARKING SPACES (12' X 55')
TOTAL			106 SPACES
ACCESSIBLE PARKING	101-200 REGULAR SPACES	6 SPACES	6 SPACES

SIGN SUMMARY TABLE

M.U.T.C.D. NUMBER	TEXT
R1-1	STOP
R7-8	RESERVED PARKING
R5-1	DO NOT ENTER
R5-2A	NO TRUCKS
R14-1	TRUCK ROUTE

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1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

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PROPOSED WAREHOUSE DEVELOPMENT

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C-5.1

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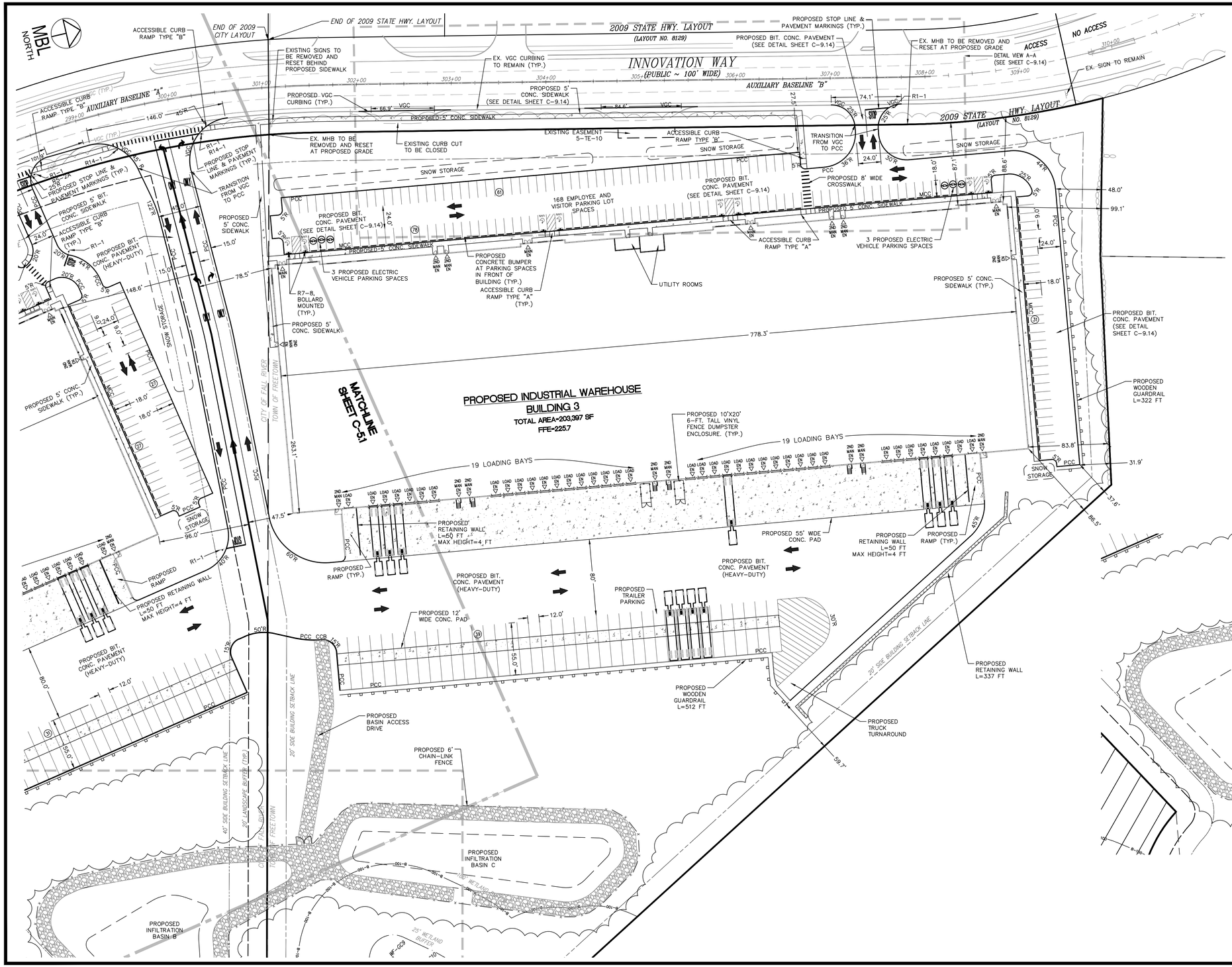


GENERAL NOTES:

1.) ONE LOADING BAY FOR EACH TENANT WILL BE UTILIZED FOR HANDLING OF REFUSE STORAGE.

2.) All PAVEMENT MARKINGS SHALL CONSIST OF EPOXY RESIN WITH GLASS BEADS THAT COMPLY WITH MASSDOT ENGINEERING DIRECTIVE E-05-003.

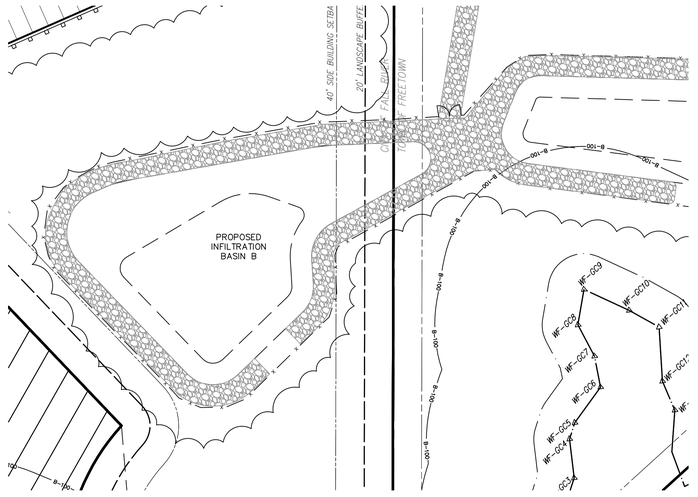
PARKING CALCULATION TABLE - BUILDING 3

	CALC. FACTOR	REQUIRED	PROVIDED
WAREHOUSE	1 SPACE/1,000 S.F. OF GFA	203 SPACES	
TOTAL		203 SPACES	170 SPACES*
LOADING BAYS			38 LOADING BAYS (10' WIDE) 39 TRAILER PARKING SPACES (12' X 55')
TOTAL			81 SPACES
ACCESSIBLE PARKING	101-200 REGULAR SPACES	6 SPACES	8 SPACES

* = WAIVER GRANTED

SIGN SUMMARY TABLE

M.U.T.C.D. NUMBER	TEXT
R1-1	STOP
R7-8	RESERVED PARKING
R5-1	DO NOT ENTER
R5-2A	NO TRUCKS
R14-1	TRUCK ROUTE



DETAIL BASIN B
1"=50'

811 DigSafe MA.ME.NH.RI.VT

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2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 49660
REGISTERED PROFESSIONAL ENGINEER

SEAL

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.: 1"=50'
VERT.:
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50 25 0 50
GRAPHIC SCALE

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PROPOSED WAREHOUSE DEVELOPMENT
LAYOUT & MATERIALS PLAN
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C-5.2

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MS VIEW:
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MBL NORTH

MATCHLINE SHEET C-5.1

PROPOSED INDUSTRIAL WAREHOUSE
BUILDING 4
TOTAL AREA=203,397 SF
FFE=192.8

PARKING CALCULATION TABLE - BUILDING 4			
	CALC. FACTOR	REQUIRED	PROVIDED
WAREHOUSE	1 SPACE/1,500 S.F. OF GFA UP TO 15,000 S.F. + 1 SPACE PER 5000 S.F. BEYOND 15,000 S.F.	10 SPACES 38 SPACES	
TOTAL		48 SPACES	207 SPACES
LOADING BAYS			38 LOADING BAYS (10' WIDE) 31 TRAILER PARKING SPACES (12' X 55')
TOTAL			73 SPACES
ACCESSIBLE PARKING	101-200 REGULAR SPACES	6 SPACES	8 SPACES

GENERAL NOTES:

1.) ONE LOADING BAY FOR EACH TENANT WILL BE UTILIZED FOR HANDLING OF REFUSE STORAGE.

2.) All PAVEMENT MARKINGS SHALL CONSIST OF EPOXY RESIN WITH GLASS BEADS THAT COMPLY WITH MASSDOT ENGINEERING DIRECTIVE E-05-003.

SIGN SUMMARY TABLE	
M.U.T.C.D. NUMBER	TEXT
R1-1	STOP
R7-8	RESERVED PARKING
R5-1	DO NOT ENTER
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N/F
0 BELL ROCK ROAD
COMMONWEALTH OF MASSACHUSETTS
DEED BOOK N/A PAGE N/A

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2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW		
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW		
No.	DATE	DESCRIPTION	BY		
REVISIONS					

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

SEAL

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50 25 0 50
GRAPHIC SCALE

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C-5.3

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GENERAL NOTES:

1.) ALL 3:1 SLOPES ARE TO BE STABILIZED WITH AN EROSION CONTROL BLANKET AND ALL 2:1 SLOPES ARE TO BE STABILIZED WITH RIPRAP.

2.) CONTRACTOR TO REMOVE A AND B LAYER SOILS PRIOR TO INSTALLATION OF SUBSURFACE CHAMBERS AND INFILTRATION BASINS.

3.) CONTRACTOR TO REFER TO GEOTECHNICAL REPORT BY GEOENGINEERS USA FOR REMOVAL OF LEDGE WHEN NECESSARY.

4.) PRIOR TO THE CONSTRUCTION OF RETAINING WALLS GREATER THEN 4–FEET IN HEIGHT. DETAILED DESIGN BY A PROFESSIONAL ENGINEER OF WALL IS REQUIRED TO BE SUBMITTED TO CITY OF FALL RIVER BUILDING AND ENGINEERING DEPARTMENTS FOR APPROVAL.

MBL NORTH

INNOVATION (PUBLIC ~ 100' WIDE) WAY

AUXILIARY BASELINE "A"

BM–1: MAGNAIL SET IN PAVEMENT ELEV.=193.75

2009 CITY LAYOUT (LAYOUT NO. 8130)

N/F INNOVATION WAY (LOT 1) HUTCHENS HOLDING III, LLC DEED BOOK 10044 PAGE 60

PROPOSED INDUSTRIAL WAREHOUSE
BUILDING 1
TOTAL AREA=291,200 SF
FFE=196.0

(415) PROPOSED STORMTRAP SYSTEM A
STORMTRAP ST2 4 FT TALL PRECAST CHAMBERS:
TOP OF CHAMBER=189.33
BOTTOM OF CHAMBERS=184.83
MIN FINAL GRADE=190.50

FES W/STONE PROTECTION (TYP.) EL.=187.08

PROPOSED RETAINING WALL L=414 FT MAX HEIGHT=18 FT (SEE NOTE 4)

PROPOSED TEMPORARY PONDING AREA

PRETX CURB INLET PRETREATMENT UNIT RIM=191.04 OUTLET=189.37 BOTTOM=187.37

PROPOSED FOCAL POINT BIORETENTION SYSTEM A TOP OF MULCH=186.50 BOTTOM MEDIA EL.=184.25

PROPOSED R–TANK HD 2 DETENTION SYSTEM (1,088) R–TANKS TOP OF TANK=184.25 BOTTOM OF TANK=181.43

(2) 6" HDPE PIPES INV. OUT=181.43

(2) 12" HDPE PIPES INV. OUT=183.17

PROPOSED OUTLET CONTROL STRUCTURE (SEE DETAIL) RIM=188.70 INV. OUT=185.00

(2) 6" HDPE PIPES L=205 FT, SE=0.026 FT/FT FES=176.10

(2) 12" HDPE PIPES L=207 FT, S=0.035 FT/FT FES=175.93

PROPOSED RETAINING WALL L=414 FT MAX HEIGHT=18 FT (SEE NOTE 4)

3:1 SLOPE W/SLOPE STABILIZATION BLANKET (TYP.)

3:1 RIPRAP SLOPE

12" HDPE PIPE L=177 FT, S=0.051 FT/FT FES=175.97

PROPOSED IMPERVIOUS BARRIER AROUND AND BIORETENTION DOWN TO EL.=181.18

PROPOSED RETAINING WALL L=50 FT MAX HEIGHT=4 FT

PROPOSED (RD–1) 15" HDPE ROOF DRAIN. (REFER TO ARCHITECTURAL PLANS FOR LOCATIONS IN BUILDING) S=0.005 FT/FT MIN.

PROPOSED (RD–2) 15" HDPE ROOF DRAIN. (REFER TO ARCHITECTURAL PLANS FOR LOCATIONS IN BUILDING) S=0.005 FT/FT MIN.

PROPOSED 30" DIA. MAINTENANCE MANHOLE (TYP.)

PROPOSED (RD–3) 18" HDPE ROOF DRAIN. (REFER TO ARCHITECTURAL PLANS FOR LOCATIONS IN BUILDING) S=0.005 FT/FT MIN.

PROPOSED (RD–4) 15" HDPE ROOF DRAIN. (REFER TO ARCHITECTURAL PLANS FOR LOCATIONS IN BUILDING) S=0.005 FT/FT MIN.

(3) 15" HDPE PIPES INV. OUT=186.80 L=70 FT, S=0.083 FT/FT FES=180.99

INV.=186.80

T.O.C.=195.8 B.O.C.=195.3

3:1 SLOPE W/SLOPE STABILIZATION BLANKET (TYP.)

DRAINAGE STRUCTURE TABLE - BUILDING 1

STRUCTURE #	RIM	INVERT IN	INVERT OUT
CB-1	195.53		192.02
DMH-1	195.12	191.85	191.85
DCB-2	194.36	-	191.36
CB-3	195.32	-	191.82
DMH-2	194.40	191.36 (DMH-1) 191.31 (DCB-2) 191.34 (CB-3)	191.31
DCB-4	194.36	-	190.36
CB-5	195.32	-	191.32
DMH-3	194.40	190.31 (DMH-2) 190.28 (DCB-4) 190.48 (CB-5)	190.28
CB-6	195.32	-	190.82
DCB-7	194.36	-	189.86
DMH-4	194.4	189.23 (DMH-3) 189.54 (CB-6) 189.70 (DCB-7)	189.23
DCB-8	194.36		188.36
CB-9	195.32	-	189.32
DMH-5	194.4	188.23 (DMH-4) 188.31 (CB-9) 188.25 (DCB-8)	188.23
DMH-6	195.2	187.7 (DMH-5)	187.70
CB-10	192.05		188.05
WQU-1 (CS-5)	192.5	187.69 (CB-10) 187.31 (DMH-6)	187.31
FES-1	-	-	187.08
DCB-11	194.36		191.86
DMH-7	195.10	191.49 (DCB-11)	191.49
CB-12	201.00	-	197.00
DMH-8	200.90	196.93 (CB-12)	196.43
DMH-9	196.9	191.05 (DMH-7) 191.15 (DMH-8)	191.05
CB-13	193.60	-	189.90
DMH-10	193.6	189.77 (DMH-9) 189.83 (CB-13)	189.77
DCB-14	191.00	-	188.50
DMH-11	191.21	188.39 (DMH-10) 188.31 (DCB-14)	188.31
DCB-15	190.50		188.00
DCB-16	190.50	-	188.00
DMH-12	190.85	187.46 (DCB-14) 187.46 (DCB-15)	187.46
WQU-2 (CS-5)	191.10	187.41 (DMH-11) 185.64 (DMH-12)	185.64
DCB-17	190.50	-	187.50
DCB-18	190.50		187.50
WQU-3 (CDS2015-4)	191.00	186.95 (DCB-16) 186.94 (DCB-17)	186.94
DCB-19	190.50	-	187.50
DCB-20	190.50	-	187.50
WQU-4 (CDS-2015-4)	191.00	186.94 (DCB-18) 187.04 (DCB-17)	186.94
WQU-5 (STC 450i)	191.30	-	187.80

DRAINAGE PIPE TABLE - BUILDING 1

PIPE #	UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	PIPE SIZE & MATERIAL	LENGTH (FT)	SLOPE (%)
P-1	CB-1	DMH-1	12" RCP	34	0.5%
P-2	DMH-1	DMH-2	12" RCP	99	0.5%
P-3	DCB-2	DMH-2	12" RCP	5	1.0%
P-4	CB-3	DMH-2	12" RCP	32	1.5%
P-5	DMH-2	DMH-3	15" RCP	201	0.5%
P-6	DCB-4	DMH-3	12" HDPE	8	1.0%
P-7	CB-5	DMH-3	12" HDPE	56	1.5%
P-8	DMH-3	DMH-4	18" RCP	211	0.5%
P-9	CB-6	DMH-4	12" HDPE	32	4.0%
P-10	DCB-7	DMH-4	12" HDPE	8	2.0%
P-11	DMH-4	DMH-5	21" HDPE	200	0.5%
P-12	DCB-8	DMH-5	12" HDPE	11	1.0%
P-13	CB-9	DMH-5	12" HDPE	29	3.5%
P-14	DMH-5	DMH-6	24" HDPE	106	0.5%
P-15	DMH-6	WQU-1 (CS-5)	24" HDPE	78	0.5%
P-16	CB-10	WQU-1 (CS-5)	12" HDPE	12	1.0%
P-17	WQU-1 (CS-5)	FES-1	24" HDPE	46	0.5%
P-18	DCB-11	DMH-7	12" RCP	74	0.5%
P-19	DMH-7	DMH-9	15" HDPE	88	0.5%
P-20	CB-12	DMH-8	12" RCP	7	1.0%
P-21	DMH-8	DMH-9	12" HDPE	151	3.5%
P-22	DMH-9	DMH-10	12" HDPE	128	1.0%
P-23	DMH-10	DMH-11	12" RCP	7	1.0%
P-24	DMH-10	DMH-11	15" HDPE	92	1.5%
P-25	DCB-14	DMH-11	12" RCP	38	0.5%
P-26	DMH-11	WQU-2 (CS-5)	18" HDPE	112	0.8%
P-27	DCB-15	DMH-12	12" RCP	54	1.0%
P-28	DCB-16	DMH-12	12" RCP	54	1.0%
P-29	DMH-12	WQU-2 (CS-5)	18" HDPE	76	7.0%
P-30	WQU-2 (CS-5)	CHAMBERS	18" HDPE	77	1.0%
P-31	DCB-17	WQU-3 (CDS2015-4)	12" HDPE	55	1.0%
P-32	DCB-18	WQU-3 (CDS2015-4)	12" HDPE	56	1.0%
P-33	WQU-3 (CDS2015-4)	CHAMBERS	15" HDPE	7	1.0%
P-34	DCB-19	WQU-4 (CDS-2015-4)	12" HDPE	56	1.0%
P-35	DCB-20	WQU-4 (CDS-2015-4)	12" HDPE	46	1.0%
P-36	WQU-4 (CDS-2015-4)	CHAMBERS	15" HDPE	7	1.0%
P-37	WQU-5 (STC 450i)	CHAMBERS	12" RCP	28	1.0%

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No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 46660
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.: 1"=50'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
50 25 0 50
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT
GRADING & DRAINAGE PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-6.0

UCS: C:\Users\JustinWilliams\OneDrive - MBL Land Development & Permitting, Corp (New)\OneDrive - MBL Land Development & Permitting, Corp\MBL Sharepoint\MBL\2021\2021-036\CIVIL\Plot\2021-036-Innovation Way-Site Planset- Master-GAD-UTIL.dwg, 11/22/2023 12:33:28 PM
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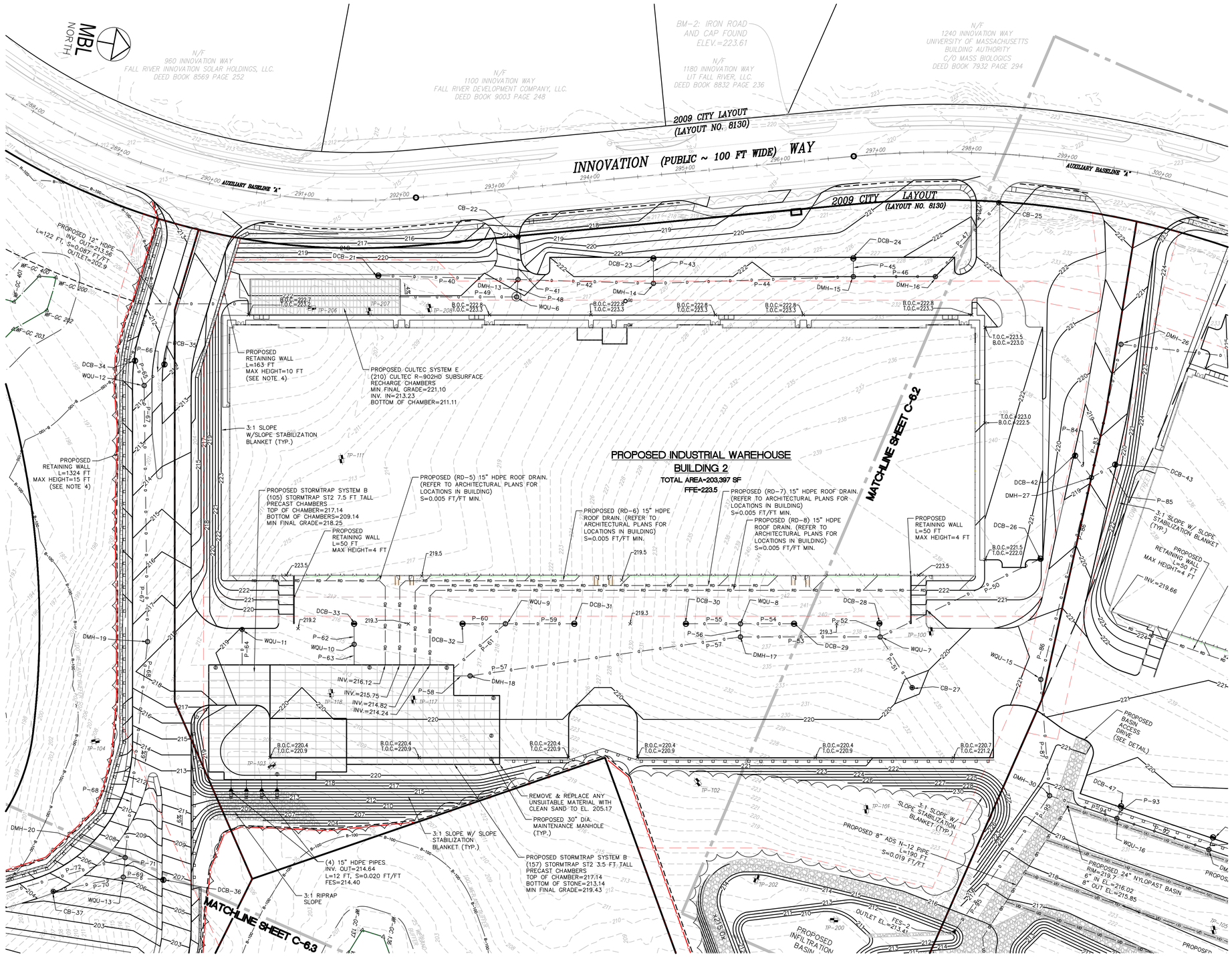

GENERAL NOTES:

1.) ALL 3:1 SLOPES ARE TO BE STABILIZED WITH AN EROSION CONTROL BLANKET AND ALL 2:1 SLOPES ARE TO BE STABILIZED WITH RIPRAP.

2.) CONTRACTOR TO REMOVE A AND B LAYER SOILS PRIOR TO INSTALLATION OF SUBSURFACE CHAMBERS AND INFILTRATION BASINS.

3.) CONTRACTOR TO REFER TO GEOTECHNICAL REPORT BY GEOENGINEERS USA FOR REMOVAL OF LEDGE WHEN NECESSARY.

4.) PRIOR TO THE CONSTRUCTION OF RETAINING WALLS GREATER THEN 4-FEET IN HEIGHT. DETAILED DESIGN BY A PROFESSIONAL ENGINEER OF WALL IS REQUIRED TO BE SUBMITTED TO CITY OF FALL RIVER BUILDING AND ENGINEERING DEPARTMENTS FOR APPROVAL.

DRAINAGE STRUCTURE TABLE - BUILDING 2

STRUCTURE #	RIM	INVERT IN	INVERT OUT
CB-25	221.23	-	218.23
DMH-16	222.00	217.45	217.45
DCB-24	221.50		217.00
DMH-15	222.00	216.79 (DMH-16) 216.85 (DCB-24)	216.79
DCB-23	221.50		216.00
DMH-14	222.1	215.15 (DMH-15) 215.34 (DCB-23)	215.15
DCB-21	221.10	-	217.10
CB-22	218.00		214.50
DMH-13	221.5	214.26 (DCB-21) 214.09 (CB-22)	214.05
WQU-6 (CDS2015-4)	222.2	214.05 (DMH-14) 213.93 (DMH-13)	213.93
CHAMBERS E	-	213.32	-
DCB-26	220.50	-	218.00
DCB-27	219.80	-	216.80
DCB-28	219.00	-	216.50
WQU-7 (CDS2015-5)	219.15	216.54 (DCB-26) 216.51 (DCB-27) 216.4 (DCB-28)	216.40
DCB-29	219.00	-	216.25
DCB-30	219.00	-	216.25
WQU-8 (CDS2015-4)	219.20	215.83 (DCB-29) 215.83 (DCB-30)	215.83
DMH-17	219.25	215.73 (WQU-8) 215.69 (WQU-7)	215.69
DMH-18	219.55	214.28 (DMH-17)	214.28
CHAMBERS B	-	-	214.16
DCB-31	219.00	-	216.25
DCB-32	219.00	-	216.25
WQU-9 (CDS2015-5)	219.15	215.71 (DCB-31) 215.76 (DCB-32)	215.71
CHAMBERS B	-	-	215.01
DCB-33	219.00	-	216.00
WQU-10 (CDS1515)	219.20	215.83 (DCB-33)	215.83
CHAMBERS B	-	-	215.13
WQU-11 (STC 450i)	219.00	-	216.00
CHAMBERS B	-	-	215.13
DCB-34	211.70	-	207.70
DCB-35	211.20	-	207.20
WQU-12 (CDS1515)	211.9	207.05 (DCB-35) 206.97 (DCB-36)	206.97
DMH-19	217.7	203.8 (WQU-12)	203.80
DCB-36	206.50	-	201.50
DCB-37	204.50	-	201.50
WQU-13 (STC450i)	206.1	200.93 (DCB-37) 200.78 (CB-38)	200.78
DMH-20	207.5	201.13 (DMH-19) 200.61 (WQU-13)	200.61

SEE DRAINAGE STRUCTURE TABLE ON SHEET C-6.3 FOR CONTINUATION TO DMH-20

DRAINAGE PIPE TABLE - BUILDING 2

PIPE #	UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	PIPE SIZE & MATERIAL	LENGTH (FT)	SLOPE (%)
P-40	DCB-21	DMH-13	12" HDPE	142	2.0%
P-41	CB-22	DMH-13	12" RCP	41	1.00%
P-42	DMH-14	DMH-13	15" HDPE	138	0.8%
P-43	DCB-23	DMH-14	12" HDPE	22	3.0%
P-44	DMH-15	DMH-14	12" HDPE	205	0.8%
P-45	DCB-24	DMH-15	12" HDPE	15	1.0%
P-46	DMH-16	DMH-15	12" HDPE	82	0.8%
P-47	CB-25	DMH-16	12" RCP	98	0.5%
P-48	DMH-13	WQU-6	15" HDPE	15	0.8%
P-49	WQU-6	CHAMBERS E	15" HDPE	121	0.5%
P-50	DCB-26	WQU-7	12" RCP	182	0.8%
P-51	DCB-27	WQU-7	12" RCP	59	0.5%
P-52	DCB-28	WQU-7	12" RCP	10	1.0%
P-53	WQU-7	DMH-17	18" RCP	142	0.5%
P-54	DCB-29	WQU-8	12" RCP	52	0.8%
P-55	DCB-30	WQU-8	12" RCP	53	0.8%
P-56	WQU-8	DMH-17	15" RCP	10	1.0%
P-57	DMH-17	DMH-18	21" RCP	282	0.5%
P-58	DMH-18	CHAMBERS B	21" HDPE	15	0.8%
P-59	DCB-31	WQU-9	12" RCP	68	0.8%
P-60	DCB-32	WQU-9	12" RCP	41	1.2%
P-61	WQU-9	DMH-18	15" RCP	70	1.0%
P-62	DCB-33	WQU-10	12" RCP	17	1.0%
P-63	WQU-10	CHAMBERS B	12" RCP	20	3.5%
P-64	WQU-11	CHAMBERS B	12" HDPE	35	2.5%
P-65	DCB-34	WQU-12	12" HDPE	26	2.5%
P-66	DCB-35	WQU-12	12" HDPE	23	1.0%
P-67	WQU-12	DMH-19	15" HDPE	264	1.2%
P-68	DMH-19	DMH-20	15" HDPE	223	1.2%
P-69	DCB-36	WQU-13	12" HDPE	38	1.5%
P-70	CB-37	WQU-13	12" RCP	72	1.0%
P-71	WQU-13	DMH-20	15" HDPE	17	1.0%
P-72	DMH-20	DMH-21	15" HDPE	332	2.2%

SEE DRAINAGE PIPE TABLE ON SHEET C-6.3 FOR CONTINUATION TO P-73

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6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
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REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED
PROFESSIONAL ENGINEER

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.: 1"=50'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
50 25 0 50
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT
GRADING & DRAINAGE PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-6.1

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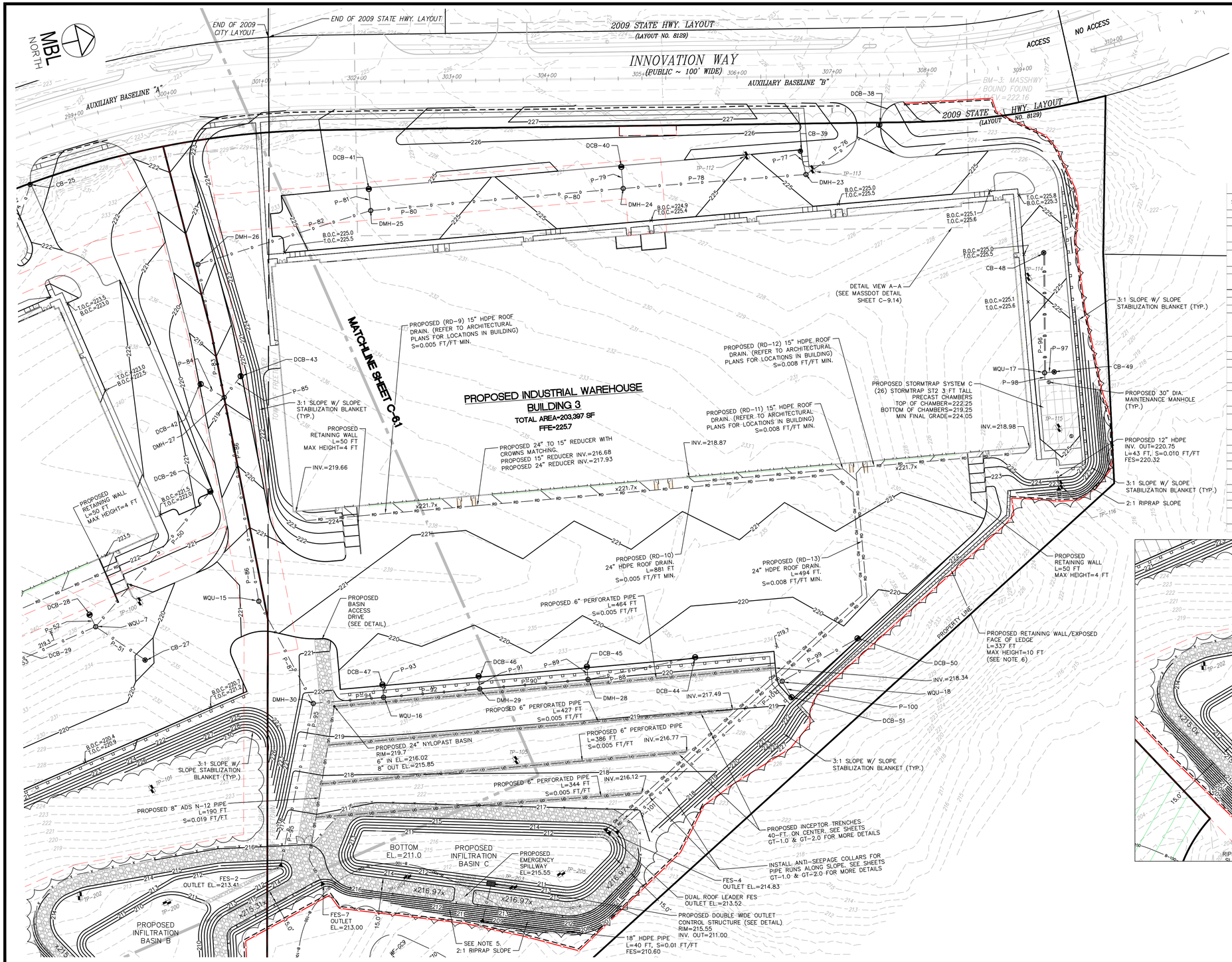


GENERAL NOTES:

1.) ALL 3:1 SLOPES ARE TO BE STABILIZED WITH AN EROSION CONTROL BLANKET AND ALL 2:1 SLOPES ARE TO BE STABILIZED WITH RIPRAP.

2.) CONTRACTOR TO REMOVE A AND B LAYER SOILS PRIOR TO INSTALLATION OF SUBSURFACE CHAMBERS AND INFILTRATION BASINS.

3.) CONTRACTOR TO REFER TO GEOTECHNICAL REPORT BY GEOENGINEERS USA FOR REMOVAL OF LEDGE WHEN NECESSARY.

4.) SEE SHEETS GT-1.0 AND GT-2.0 FOR SLOPE UNDERDRAIN ALONG THE UPHILL SLOPE OF BASIN C DESIGNED BY OTHERS.

5.) CLAY CORE IN EMBANKMENT DOWNSLOPE REQUIRED WHERE FILL MATERIAL WILL BE PLACED. APPROXIMATE LIMITS SHOWN. SEE SHEETS GT-1.0 AND GT-2.0 FOR DETAILS.

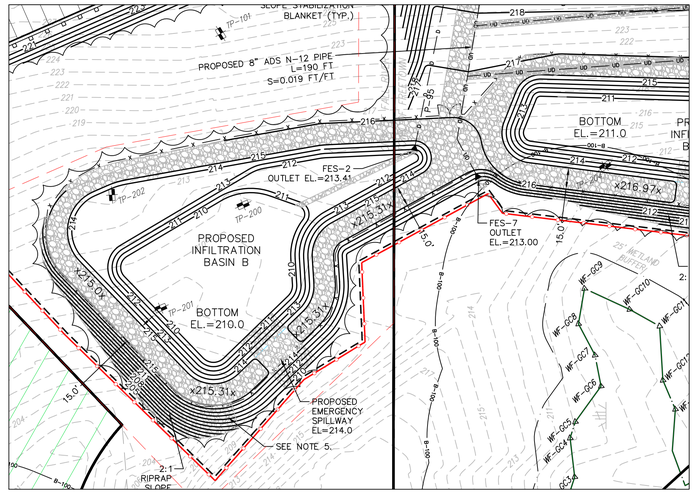
6.) PRIOR TO THE CONSTRUCTION OF RETAINING WALLS GREATER THEN 4-FEET IN HEIGHT. DETAILED DESIGN BY A PROFESSIONAL ENGINEER OF WALL IS REQUIRED TO BE SUBMITTED TO CITY OF FALL RIVER BUILDING AND ENGINEERING DEPARTMENTS FOR APPROVAL.

DRAINAGE STRUCTURE TABLE - BUILDING 3

STRUCTURE #	RIM	INVERT IN	INVERT OUT
DCB-38	223.63	-	220.88
CB-39	224.50	-	220.50
DMH-23	224.80	220.17 (DCB-38) 220.24 (CB-39)	220.17
DCB-40	224.40		219.90
DMH-24	224.60	219.22 (DMH-23) 219.52 (DCB-40)	219.22
DCB-41	224.40	-	218.40
DMH-25	224.60	218.02 (DCB-41) 217.91 (DMH-24)	217.91
DMH-26	220.20	216.98 (DMH-29)	216.98
DCB-42	218.70	-	216.20
DCB-43	218.70		216.20
DMH-27	218.9	215.96 (DCB-43) 215.96 (DCB-44) 216.28 (DMH-26)	215.96
WQU-15 (CS-4)	225.00	214.89 (DMH-27)	214.89
DCB-44	219.60	-	216.80
DCB-45	219.60	-	216.30
DMH-28	220	215.91 (DCB-44) 216.21 (DCB-45)	215.91
DCB-46	219.60	-	215.80
DMH-29	220	215.71 (DCB-46) 215.36 (DMH-28)	215.36
DCB-47	219.60	-	215.30
WQU-16 (CS-4)	219.9	215.21 (DCB-47) 214.87 (DMH-29)	214.87
DMH-30	219.7	214.29 (WQU-15) 214.3 (WQU-16)	214.29
FES-2	-	-	213.41
CB-48	224.60	-	222.40
CB-49	224.00	-	221.50
WQU-17 (STC 450i)	224.10	221.79 (CB-48) 221.44 (CB-49)	221.34
CHAMBERS C		-	221.24
DCB-50	219.80	-	217.00
DCB-51	219.00	-	216.20
WQU-18 (CDS2015-4)	219.10	216.13 (CB-48) 216.05 (CB-49)	216.05
FES-4	-	-	214.83

DRAINAGE PIPE TABLE - BUILDING 3

PIPE #	UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	PIPE SIZE & MATERIAL	LENGTH (FT)	SLOPE (%)
P-76	DCB-38	DMH-23	12" RCP	89	0.8%
P-77	CB-39	DMH-23	12" RCP	22	1.2%
P-78	DMH-23	DMH-24	12" HDPE	189	0.5%
P-79	DCB-40	DMH-24	12" HDPE	19	2.0%
P-80	DMH-24	DMH-25	15" HDPE	263	0.5%
P-81	DCB-41	DMH-25	12" HDPE	19	2.0%
P-82	DMH-25	DMH-26	18" HDPE	186	0.5%
P-83	DMH-26	DMH-27	18" HDPE	139	0.5%
P-84	DCB-42	DMH-27	12" RCP	24	1.0%
P-85	DCB-43	DMH-27	12" RCP	24	1.0%
P-86	DMH-27	WQU-15	21" RCP	214	0.5%
P-87	WQU-15	DMH-30	21" HDPE	120	0.5%
P-88	DCB-44	DMH-28	12" RCP	111	0.8%
P-89	DCB-45	DMH-28	12" HDPE	9	1.0%
P-90	DMH-28	DMH-29	18" HDPE	111	0.5%
P-91	DCB-46	DMH-29	12" HDPE	9	1.0%
P-92	DMH-29	WQU-16	18" HDPE	98	0.5%
P-93	DCB-47	WQU-16	12" HDPE	9	1.0%
P-94	WQU-16	DMH-30	18" HDPE	71	0.8%
P-95	DMH-30	FES-2	24" HDPE	176	0.5%
P-96	CB-48	WQU-17	DOUBLE 6" ADS N-12	123	0.5%
P-97	CB-49	WQU-17	12" RCP	6	1.0%
P-98	WQU-17	CHAMBERS	12" RCP	5	2.0%
P-99	DCB-50	WQU-18	12" RCP	87	1.0%
P-100	DCB-51	WQU-18	12" RCP	15	1.0%
P-101	WQU-18	FES-4	18" HDPE	245	0.5%



DETAIL BASIN B
1"=50'

6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW	
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1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW	
No.	DATE	DESCRIPTION	BY	

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

SEAL

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

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PROPOSED WAREHOUSE DEVELOPMENT

GRADING & DRAINAGE PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-6.2

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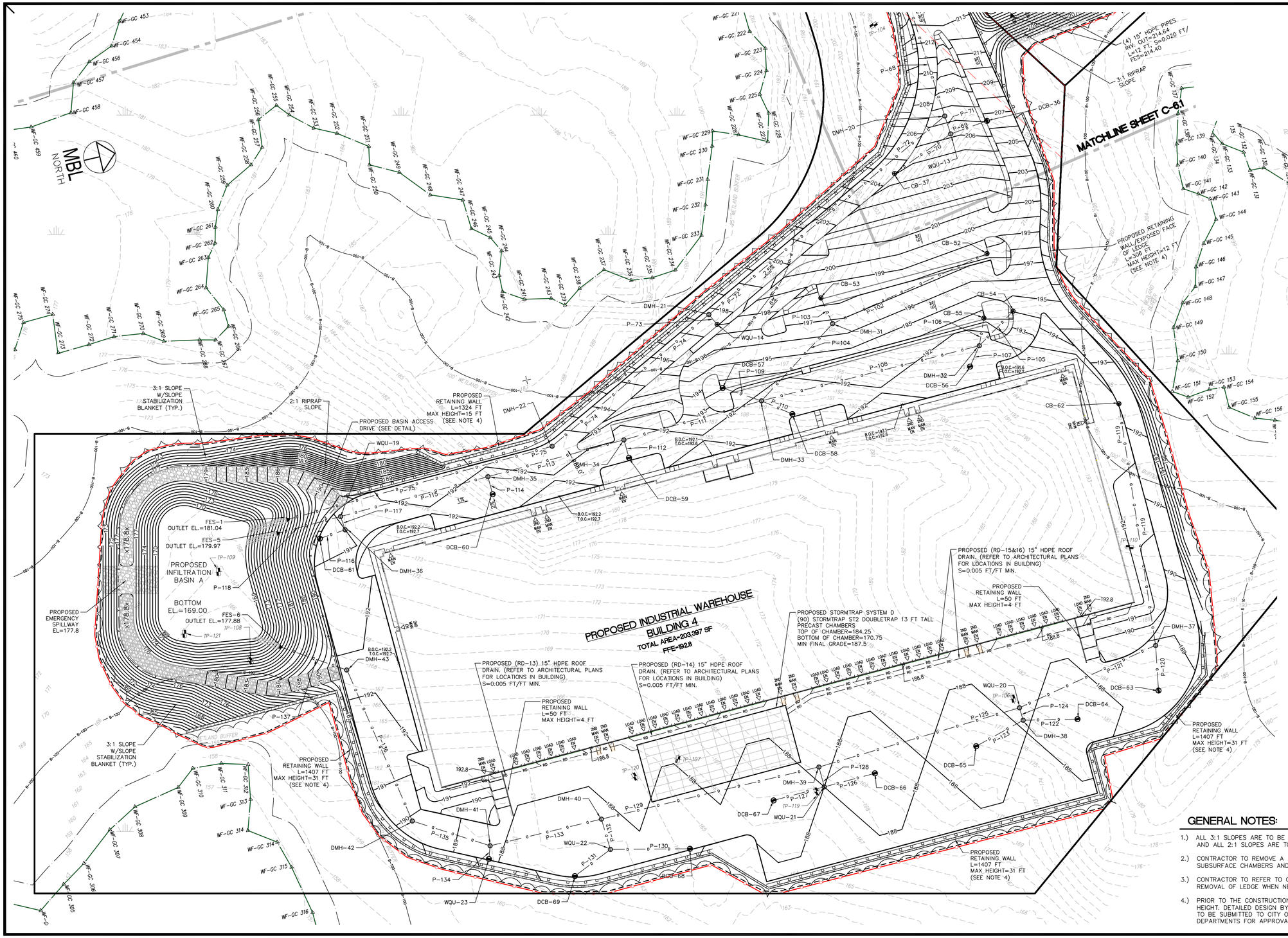

DRAINAGE STRUCTURE TABLE - BUILDING 4			
STRUCTURE #	RIM	INVERT IN	INVERT OUT
CONTINUED FROM BUILDING 2 SEE SHEET C-6.1			
WQU-14 (STC 450i)	197.50	-	193.50
DMH-21	197.80	193.31 (DMH-20) 193.35 (WQU-14)	193.31
DMH-22	192.85	188.49 (DMH-21)	188.49
FES-1	-	-	181.04
CB-52	198.02	-	193.02
CB-53	198.02	-	192.02
DMH-31	196.74	190.31 (CB-52) 190.94 (CB-53)	190.31
CB-54	194.00	-	189.00
CB-55	194.00	-	188.80
DCB-56	191.00	-	187.00
DMH-32	193.20	187.78 (CB-54) 187.99 (CB-55) 186.79 (DCB-56)	187.78
DCB-57	193.50	-	187.50
DCB-58	191.00	-	186.00
DMH-33	193.20	185.85 (DMH-32) 186.98 (DMH-31) 186.7 (DCB-57) 185.68 (DCB-58)	185.68
DCB-59	191.30	-	184.30
DMH-34	191.60	184.16 (DMH-33) 184.14 (DCB-59)	184.14
DCB-60	191.30	-	184.30
DMH-35	191.80	182.64 (DMH-34) 183.82 (DCB-60)	182.64
DCB-61	190.70	-	183.70
DMH-36	191.10	182.45 (DCB-61)	182.45
WQU-19 (CS-5)	191.10	181.02 (DMH-35) 181.97 (DMH-36)	181.02
FES-5	-	-	180.32
CB-62	192.50	-	189.50
DCB-63	188.40	-	185.40
DMH-37	188.90	185.54 (CB-62) 185.18 (DCB-63)	185.54
DCB-64	187.00	-	184.00
DCB-65	187.00	-	184.00
DMH-38	188.10	183.73 (DCB-64) 183.73 (DCB-65)	183.73
WQU-20 (CS-4)	188.2	183.95 (DMH-38) 183.64 (DMH-37)	183.64
DCB-66	187.00	-	183.00
DCB-67	187.00	-	183.00
WQU-21 (CDS2015-4)	188.00	182.47 (DCB-66) 182.47 (DCB-67)	182.47
DMH-39	188.20	182.19 (WQU-21) 181.85 (WQU-20)	181.85
DCB-68	187.10	-	182.10
DCB-69	187.10	-	182.10
WQU-22 (CDS2015-4)	187.40	181.66 (DCB-69) 181.28 (DCB-68)	181.28
DMH-40	187.70	180.65 (DMH-39) 180.82 (WQU-22)	180.65
WQU-23 (CDS2015-4)	188.10	-	182.10
DMH-41	188.20	180.04 (DMH-40) 181.85 (WQU-23)	180.04
DMH-42	189.90	179.36 (DMH-41)	179.36
DMH-43	192.15	178.49 (DMH-42)	178.49
FES-6	-	-	177.88

DRAINAGE PIPE TABLE - BUILDING 4					
PIPE #	UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	PIPE SIZE & MATERIAL	LENGTH (FT)	SLOPE (%)
CONTINUED FROM BUILDING 2 SEE SHEET C-6.1					
P-72	DMH-20	DMH-21	15" HDPE	332	2.2%
P-73	WQU-14	DMH-21	12" HDPE	10	1.50%
P-74	DMH-21	DMH-22	18" HDPE	219	2.2%
P-75	DMH-22	FES-1	18" HDPE	298	2.5%
P-102	CB-52	DMH-31	12" HDPE	181	1.5%
P-103	CB-53	DMH-31	12" HDPE	27	4.0%
P-104	DMH-31	DMH-33	12" HDPE	111	3.0%
P-105	CB-54	DMH-32	12" HDPE	49	2.5%
P-106	CB-55	DMH-32	12" HDPE	27	2.5%
P-107	DCB-56	DMH-32	12" HDPE	21	0.8%
P-108	DMH-32	DMH-33	15" HDPE	241	1.0%
P-109	DCB-57	DMH-33	12" HDPE	40	2.0%
P-110	DCB-58	DMH-33	12" HDPE	32	1.0%
P-111	DMH-33	DMH-34	18" HDPE	152	1.0%
P-112	DCB-59	DMH-34	12" HDPE	16	1.0%
P-113	DMH-34	DMH-35	18" HDPE	150	1.0%
P-114	DCB-60	DMH-35	12" HDPE	16	3.0%
P-115	DMH-35	WQU-19	18" HDPE	162	1.0%
P-116	DCB-61	DMH-36	12" HDPE	25	5.0%
P-117	DMH-36	WQU-19	12" HDPE	12	4.0%
P-118	WQU-19	FES-5	21" HDPE	70	1.0%
P-119	CB-62	DMH-37	12" RCP	264	1.5%
P-120	DCB-63	DMH-37	12" RCP	45	0.5%
P-121	DMH-37	WQU-20	15" RCP	159	1.0%
P-122	DCB-64	DMH-38	12" RCP	55	0.5%
P-123	DCB-65	DMH-38	12" RCP	54	0.5%
P-124	DMH-38	WQU-20	15" RCP	11	0.8%
P-125	WQU-20	DMH-39	21" HDPE	224	0.8%
P-126	DCB-66	WQU-21	12" HDPE	53	1.0%
P-127	DCB-67	WQU-21	12" HDPE	53	1.0%
P-128	WQU-21	DMH-39	15" HDPE	19	1.5%
P-129	DMH-39	DMH-40	24" HDPE	240	0.5%
P-130	DCB-68	WQU-23	12" HDPE	82	1.0%
P-131	DCB-69	WQU-22	12" HDPE	44	1.0%
P-132	WQU-22	DMH-40	15" HDPE	31	1.5%
P-133	DMH-40	DMH-41	30" HDPE	121	0.5%
P-134	WQU-23	DMH-41	12" HDPE	10	2.5%
P-135	DMH-41	DMH-42	30" HDPE	85	0.8%
P-136	DMH-42	DMH-43	30" HDPE	175	0.5%
P-137	DMH-43	FES-6	30" HDPE	76	0.8%

GENERAL NOTES:

1.) ALL 3:1 SLOPES ARE TO BE STABILIZED WITH AN EROSION CONTROL BLANKET AND ALL 2:1 SLOPES ARE TO BE STABILIZED WITH RIPRAP.

2.) CONTRACTOR TO REMOVE A AND B LAYER SOILS PRIOR TO INSTALLATION OF SUBSURFACE CHAMBERS AND INFILTRATION BASINS.

3.) CONTRACTOR TO REFER TO GEOTECHNICAL REPORT BY GEOENGINEERS USA FOR REMOVAL OF LEDGE WHEN NECESSARY.

4.) PRIOR TO THE CONSTRUCTION OF RETAINING WALLS GREATER THEN 4-FEET IN HEIGHT, DETAILED DESIGN BY A PROFESSIONAL ENGINEER OF WALL IS REQUIRED TO BE SUBMITTED TO CITY OF FALL RIVER BUILDING AND ENGINEERING DEPARTMENTS FOR APPROVAL.

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REVISIONS

PROJ. MANAGER:	MBL
CHIEF DESIGNER:	MBL
REVIEWED BY:	DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED
PROFESSIONAL ENGINEER

PREPARED FOR

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

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PROPOSED WAREHOUSE DEVELOPMENT

GRADING & DRAINAGE PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01

FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-6.3

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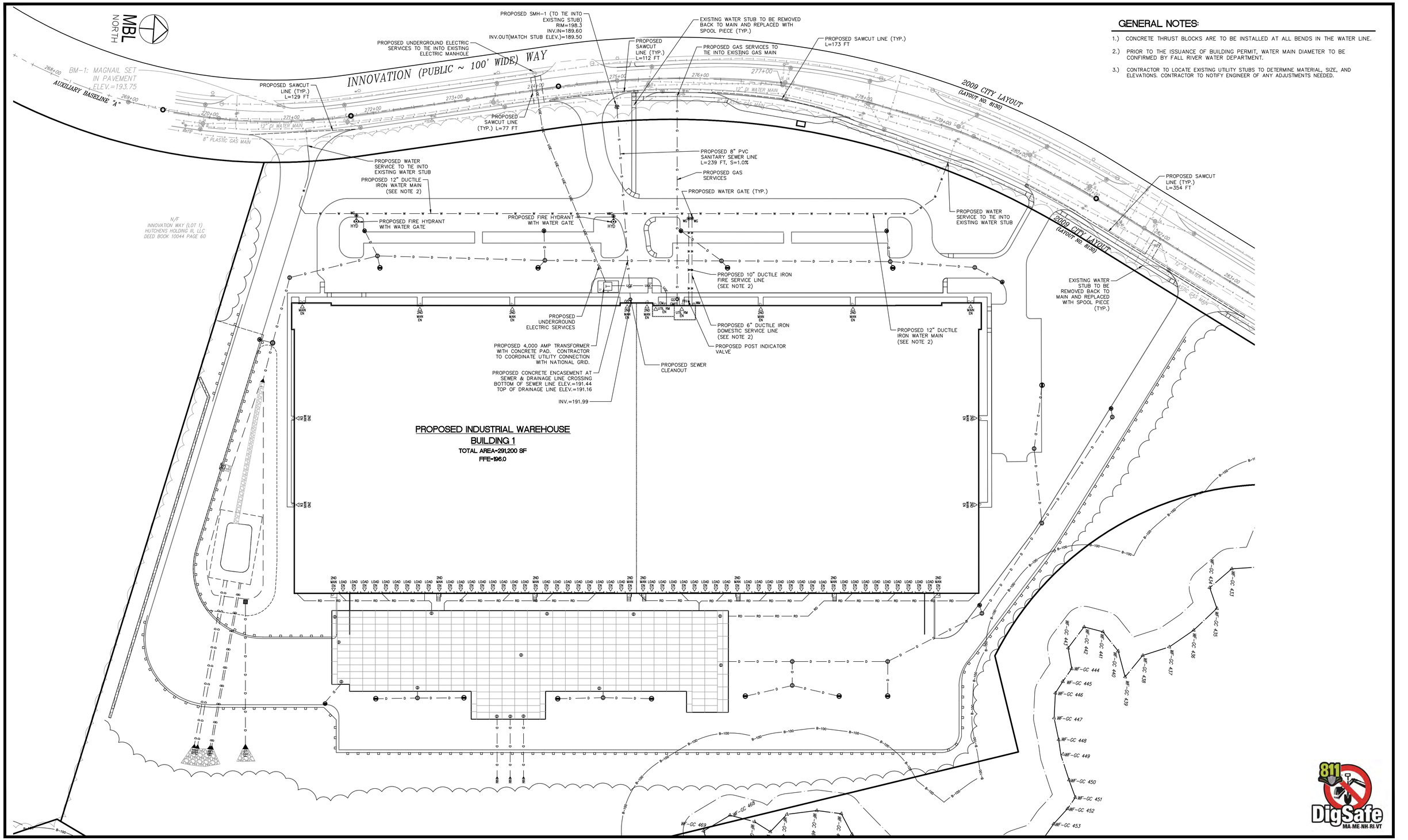

GENERAL NOTES:

1.) CONCRETE THRUST BLOCKS ARE TO BE INSTALLED AT ALL BENDS IN THE WATER LINE.

2.) PRIOR TO THE ISSUANCE OF BUILDING PERMIT, WATER MAIN DIAMETER TO BE CONFIRMED BY FALL RIVER WATER DEPARTMENT.

3.) CONTRACTOR TO LOCATE EXISTING UTILITY STUBS TO DETERMINE MATERIAL, SIZE, AND ELEVATIONS. CONTRACTOR TO NOTIFY ENGINEER OF ANY ADJUSTMENTS NEEDED.

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REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

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PROPOSED WAREHOUSE DEVELOPMENT

UTILITY PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
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NORTH

N/F
960 INNOVATION WAY
FALL RIVER INNOVATION SOLAR HOLDINGS, LLC.
DEED BOOK 8569 PAGE 252

N/F
1100 INNOVATION WAY
FALL RIVER DEVELOPMENT COMPANY, LLC.
DEED BOOK 9003 PAGE 248

BM-2: IRON ROAD AND CAP FOUND ELEV.=223.61

N/F
1180 INNOVATION WAY
LIT FALL RIVER, LLC.
DEED BOOK 8832 PAGE 236

N/F
1240 INNOVATION WAY
UNIVERSITY OF MASSACHUSETTS BUILDING AUTHORITY
C/O MASS BIOLOGICS
DEED BOOK 7932 PAGE 294

INNOVATION (PUBLIC ~ 100 FT WIDE) WAY

2009 CITY LAYOUT (LAYOUT NO. 8130)

AUXILIARY BASELINE "A"

PROPOSED SAWCUT LINE (TYP.) L=250 FT

PROPOSED SEWER TIE INTO EXISTING SMH INV.IN=207.40

PROPOSED 8" PVC SANITARY SEWER LINE L=106 FT, S=2.0%

PROPOSED SAWCUT LINE (TYP.) L=117 FT

PROPOSED SAWCUT LINE (TYP.) L=206 FT

PROPOSED GAS SERVICES TO TIE INTO EXISTING GAS MAIN

PROPOSED SAWCUT LINE (TYP.) L=286 FT

PROPOSED SAWCUT LINE (TYP.) L=273 FT

PROPOSED WATER SERVICE TO TIE INTO EXISTING WATER MAIN

PROPOSED WATER SERVICE TO TIE INTO EXISTING WATER STUB

PROPOSED SMH-8 RIM=212.2 INV. IN=208.2 INV. OUT=206.7(STUB)

PROPOSED 4,000 AMP TRANSFORMER WITH CONCRETE PAD. CONTRACTOR TO COORDINATE UTILITY CONNECTION WITH NATIONAL GRID.

PROPOSED 12" DUCTILE IRON WATER MAIN (SEE NOTE 2)

WATER GATE (TYP.)

PROPOSED FIRE HYDRANT WITH WATER GATE

PROPOSED 8" PVC SANITARY SEWER LINE L=21 FT, S=2.0%

INV.=213.5

PROPOSED SMH-2 RIM=222.7 INV. IN=209.62(SMH-3) INV. IN=209.62(INTERIOR DROP) INV. IN=213.08(BLDG.) INV.OUT=209.52

PROPOSED 8" PVC SANITARY SEWER LINE L=346 FT, S=1.0%

PROPOSED 12" DUCTILE IRON WATER MAIN (SEE NOTE 2)

PROPOSED 10" DUCTILE IRON FIRE SERVICE LINE (SEE NOTE 2)

PROPOSED GAS SERVICES

PROPOSED 6" DUCTILE IRON DOMESTIC SERVICE LINE (SEE NOTE 2)

INV.=213.5

PROPOSED POST INDICATOR VALVE

PROPOSED SMH3 RIM=222.7 INV. IN=213.08 INV.OUT=213.08

PROPOSED 8" PVC SANITARY SEWER LINE L=21 FT, S=2.0%

PROPOSED FIRE HYDRANT WITH WATER GATE

PROPOSED 2" SDR-11 HDPE SEWER FORCE MAIN. L=975 FT.

PROPOSED GAS SERVICES

PROPOSED 12" DUCTILE IRON WATER MAIN (SEE NOTE 2)

PROPOSED 12" DUCTILE IRON WATER MAIN (SEE NOTE 2)

PROPOSED 20 FT WIDE UTILITY EASEMENT (TYP.) (SEE SHEET C-13.1)

PROPOSED SEWER FORCE MAIN CLEANOUT MANHOLE

PROPOSED FIRE HYDRANT WITH WATER GATE

PROPOSED 6" DUCTILE IRON WATER MAIN (SEE NOTE 2)

PROPOSED FIRE HYDRANT WITH WATER GATE

PROPOSED 12" DUCTILE IRON WATER MAIN (SEE NOTE 2)

PROPOSED 12" DUCTILE IRON WATER MAIN (SEE NOTE 2)

PROPOSED 20 FT WIDE UTILITY EASEMENT (TYP.) (SEE SHEET C-13.1)

PROPOSED 6" DUCTILE IRON WATER MAIN (SEE NOTE 2)

PROPOSED FIRE HYDRANT WITH WATER GATE

PROPOSED 12" DUCTILE IRON WATER MAIN (SEE NOTE 2)

MATCHLINE SHEET C-72

MATCHLINE SHEET C-73

CITY OF FALL RIVER
TOWN OF FREETOWN

PROPOSED INDUSTRIAL WAREHOUSE BUILDING 2

TOTAL AREA=203,397 SF

FFE=223.5

GENERAL NOTES:

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TRACY L. DUARTE
CIVIL
NO. 45660
REGISTERED PROFESSIONAL ENGINEER

SEAL

PREPARED FOR

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733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

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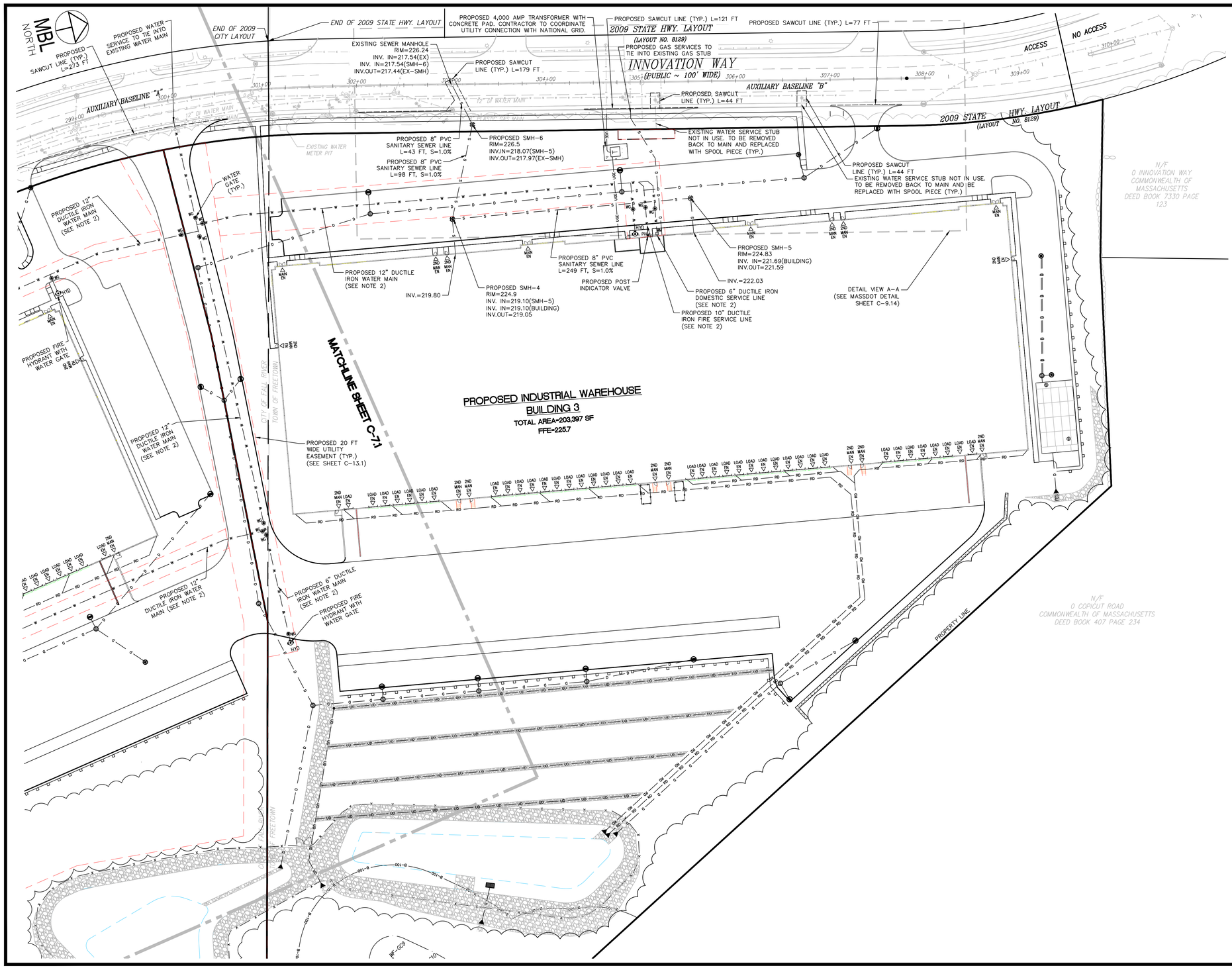

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REVIEWED BY: DATE

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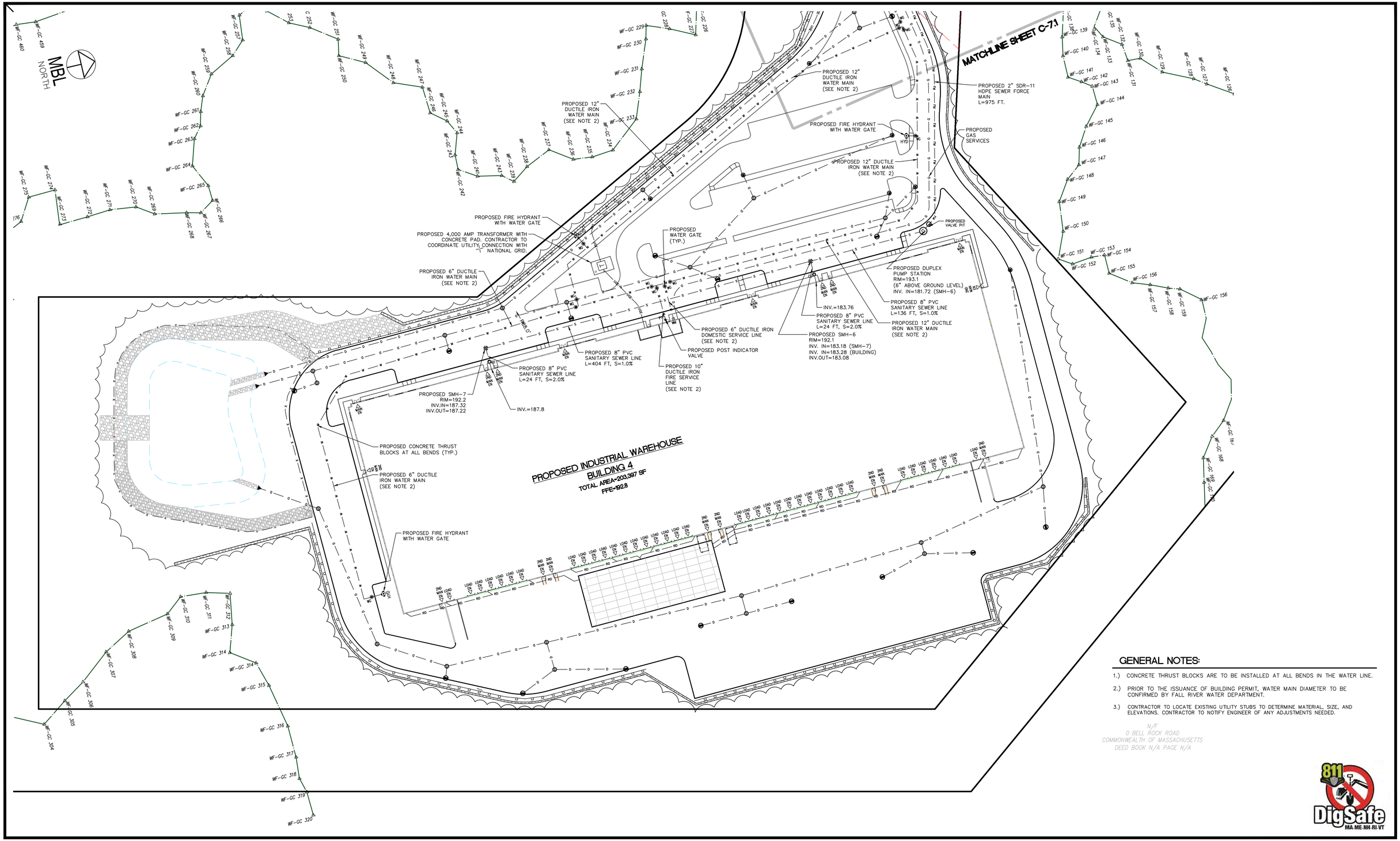

GENERAL NOTES:

1.) CONCRETE THRUST BLOCKS ARE TO BE INSTALLED AT ALL BENDS IN THE WATER LINE.

2.) PRIOR TO THE ISSUANCE OF BUILDING PERMIT, WATER MAIN DIAMETER TO BE CONFIRMED BY FALL RIVER WATER DEPARTMENT.

3.) CONTRACTOR TO LOCATE EXISTING UTILITY STUBS TO DETERMINE MATERIAL, SIZE, AND ELEVATIONS. CONTRACTOR TO NOTIFY ENGINEER OF ANY ADJUSTMENTS NEEDED.

N/F
0 BELL ROCK ROAD
COMMONWEALTH OF MASSACHUSETTS
DEED BOOK N/A PAGE N/A

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6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
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3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER:	MBL
CHIEF DESIGNER:	MBL
REVIEWED BY:	DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 49660
REGISTERED
PROFESSIONAL ENGINEER

PREPARED FOR

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

SCALE:	
HORZ.:	1"=50'
VERT.:	
DATUM:	
HORZ.:	NAD83
VERT.:	NAVD88

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GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

UTILITY PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01

FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-7.3

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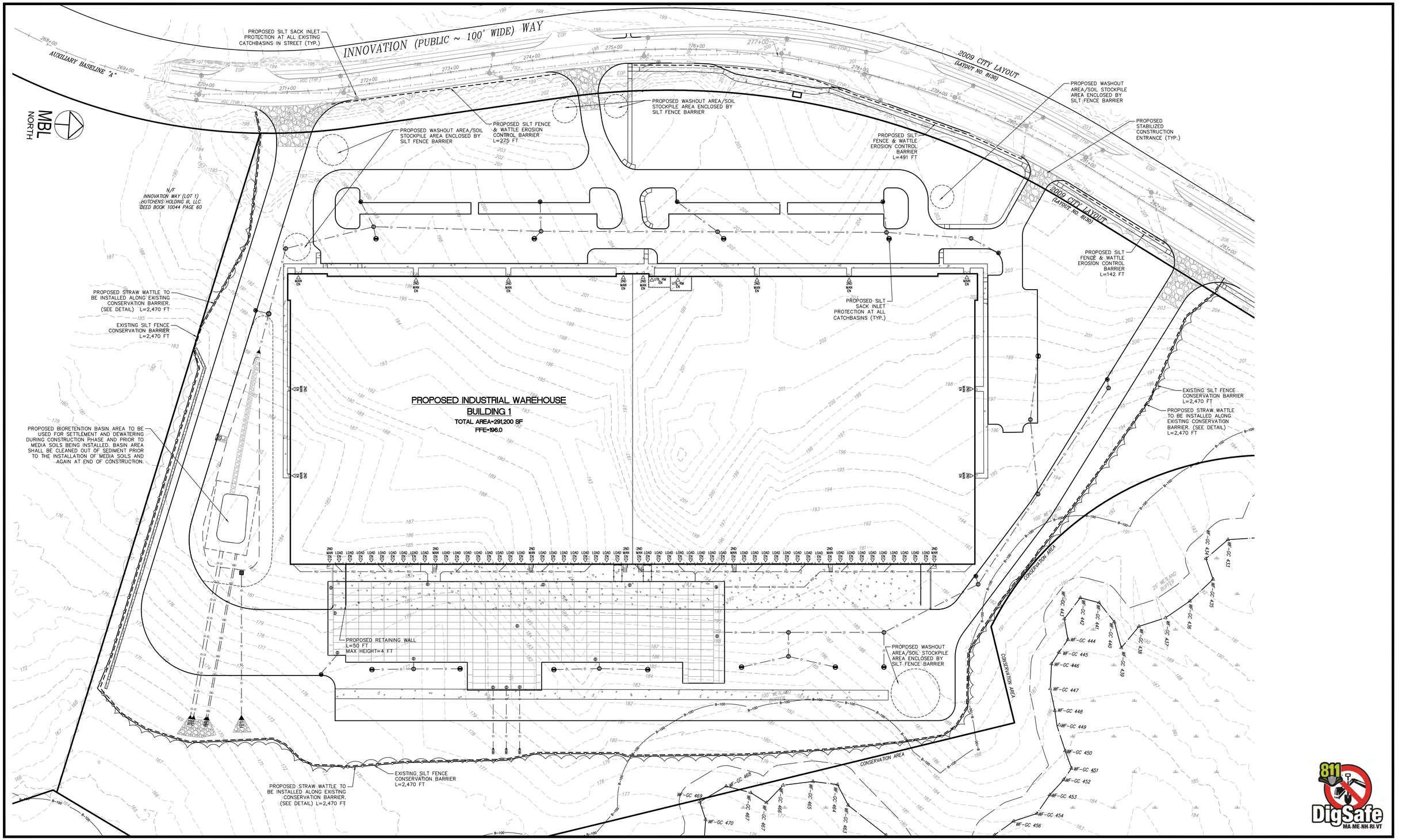

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EROSION CONTROL & DEMOLITION PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01

FALL RIVER/FREETOWN MASSACHUSETTS

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NORTH

N/F
960 INNOVATION WAY
FALL RIVER INNOVATION SOLAR HOLDINGS, LLC.
DEED BOOK 8569 PAGE 252

N/F
1100 INNOVATION WAY
FALL RIVER DEVELOPMENT COMPANY, LLC.
DEED BOOK 9003 PAGE 248

N/F
1180 INNOVATION WAY
LIT FALL RIVER, LLC.
DEED BOOK 8832 PAGE 236

N/F
1240 INNOVATION WAY
UNIVERSITY OF MASSACHUSETTS
BUILDING AUTHORITY
C/O MASS BIOLOGICS
DEED BOOK 7932 PAGE 294

2009 CITY LAYOUT
(LAYOUT NO. 8130)

INNOVATION (PUBLIC ~ 100' WIDE) WAY

AUXILIARY BASELINE "A"

PROPOSED SILT SACK INLET PROTECTION AT ALL EXISTING CATCHBASINS IN STREET (TYP.)

PROPOSED STABILIZED CONSTRUCTION ENTRANCE (TYP.)

PROPOSED SILT FENCE & WATTLE EROSION CONTROL BARRIER L=220 FT

PROPOSED SILT FENCE & WATTLE EROSION CONTROL BARRIER L=576 FT

PROPOSED SILT SACK INLET PROTECTION AT ALL CATCHBASINS (TYP.)

PROPOSED WASHOUT AREA/SOIL STOCKPILE AREA ENCLOSED BY SILT FENCE BARRIER

PROPOSED STRAW WATTLE TO BE INSTALLED ALONG EXISTING CONSERVATION BARRIER. (SEE DETAIL) L=4,544 FT

EXISTING SILT FENCE CONSERVATION BARRIER L=4,544 FT

PROPOSED INDUSTRIAL WAREHOUSE
BUILDING 2
TOTAL AREA=203,397 SF
FFE=223.5

MATCHLINE SHEET C-8.2

MATCHLINE SHEET C-8.3

PROPOSED WASHOUT AREA/SOIL STOCKPILE AREA ENCLOSED BY SILT FENCE BARRIER

CONSERVATION AREA

EXISTING SILT FENCE CONSERVATION BARRIER L=4,543 FT

PROPOSED STRAW WATTLE TO BE INSTALLED ALONG EXISTING CONSERVATION BARRIER. (SEE DETAIL) L=4,544 FT

100' WETLAND BUFFER

CITY OF FALL RIVER
TOWN OF FREETOWN

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TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR
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733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

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PROPOSED WAREHOUSE DEVELOPMENT

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0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
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C-8.1

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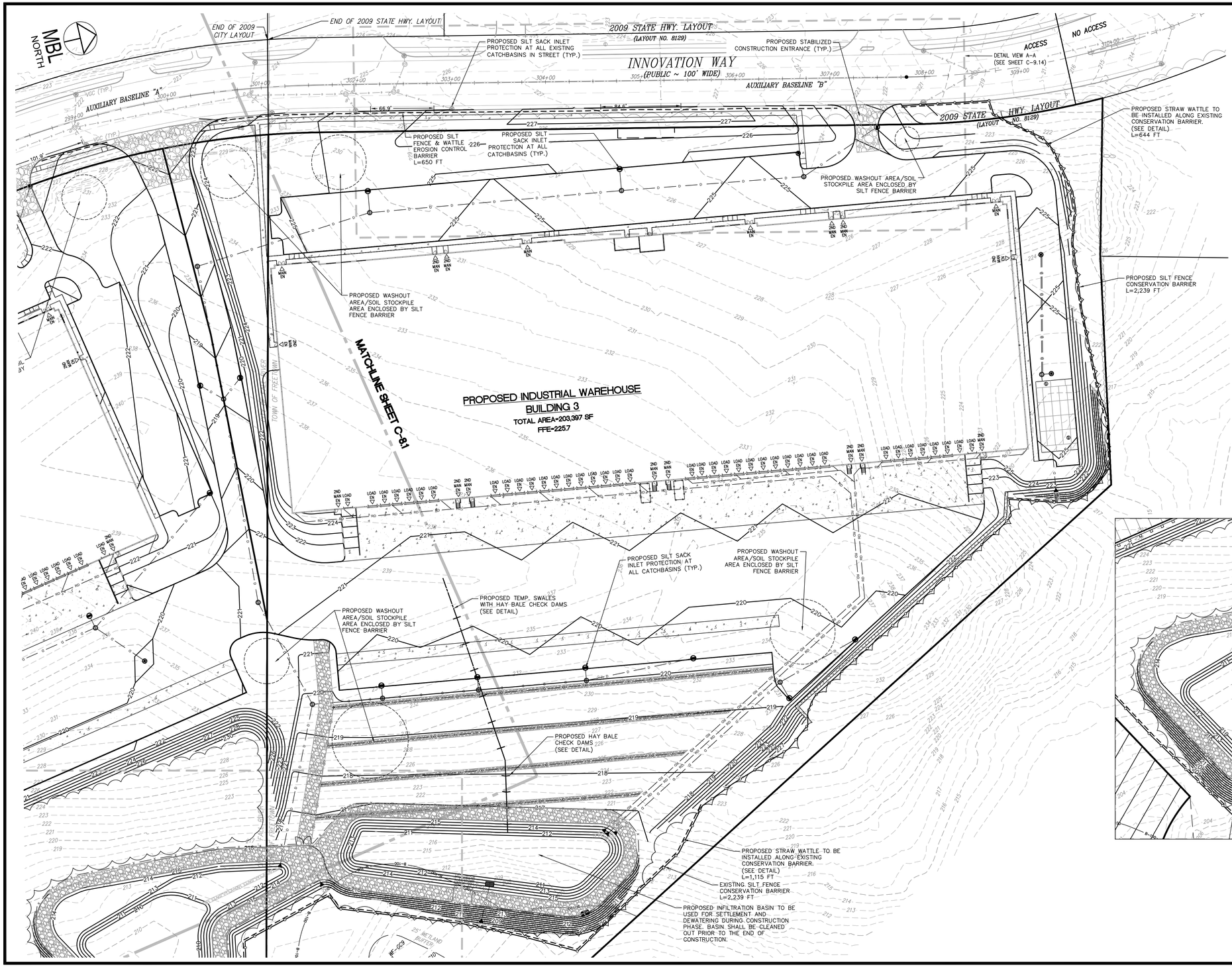

DETAIL VIEW B-B
1"=50'

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C-8.2

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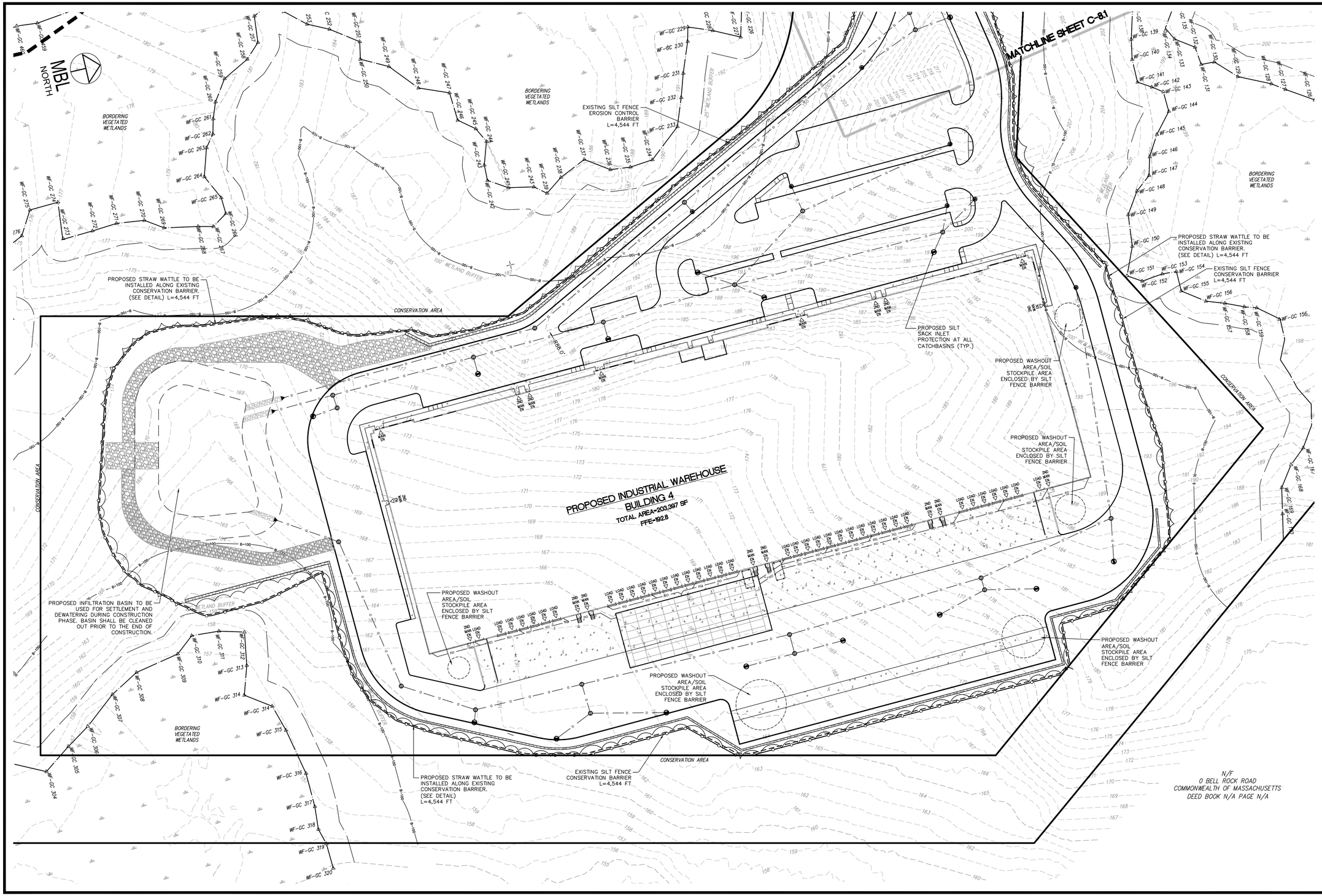

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NORTH ANDOVER MASSACHUSETTS

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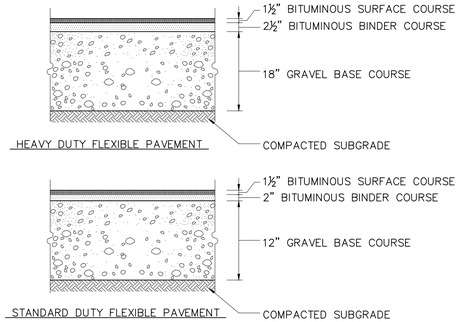


NOTES:

1. PAVEMENT SECTIONS SHOWN FOLLOW GEOTECHNICAL ENGINEER REPORT RECOMMENDATIONS DEVELOPED BY GEOENGINEERS USA DATED SEPTEMBER 9, 2022
2. SEE DETAIL ON SHEET C-9.13 FOR PAVEMENT SECTION WITHIN STATE HIGHWAY LAYOUT.

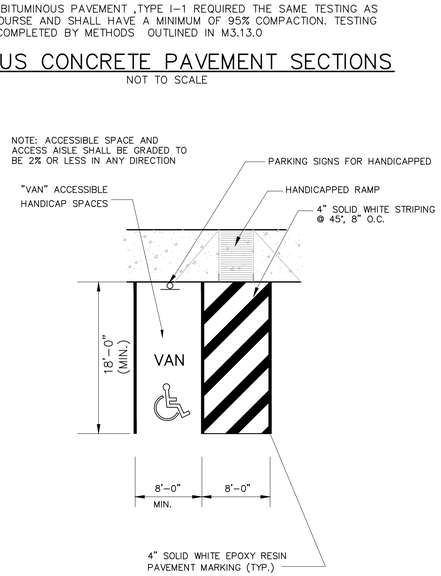
COMPOSITION AND COMPACTION ACCEPTANCE TESTS

1. OBTAIN SAMPLES FROM PLANT TO INDICATE CONFORMANCE WITH M3.13.0
2. PAVEMENT DENSITY AS OUTLINED IN M3.06.0
3. ALL SAMPLES TO BE TAKEN IN ACCORDANCE WITH AASHTO R97
4. MATERIALS SHALL MEET OR ACCEED THE REQUIREMENTS SPECIFIED IN SECTION M3. DIVISION III, MATERIALS AND THE FOLLOWING SUBSECTIONS

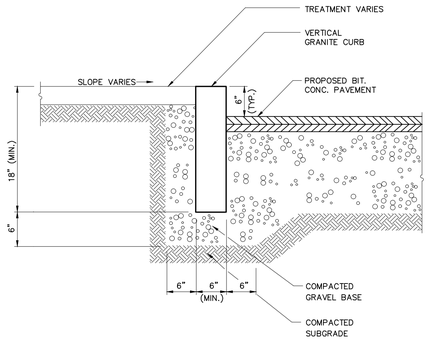
MINERAL AGGREGATE :M3.06.2	BITUMINOUS MATERIALS :M3.01.0
MINERAL FILLER :M3.10.5	COMPOSITION OF BASE COURSE :M2.01.7

5. THE BITUMINOUS CONCRETE BASE COURSE SHALL BE CONSTRUCTED IN ACCORDANCE WITH RELEVANT SECTIONS/PROVISIONS OF SECTION 460 FOR CLASS I BITUMINOUS CONCRETE PAVEMENT, TYPE I-1
6. CLASS I BITUMINOUS PAVEMENT ,TYPE I-1 REQUIRED THE SAME TESTING AS BASE COURSE AND SHALL HAVE A MINIMUM OF 95% COMPACTION. TESTING TO BE COMPLETED BY METHODS OUTLINED IN M3.13.0

BITUMINOUS CONCRETE PAVEMENT SECTIONS
NOT TO SCALE



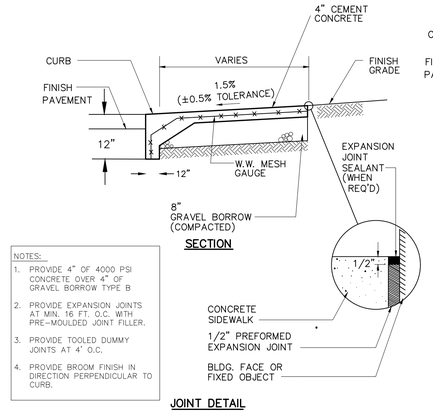
HANDICAP PARKING STALL LAYOUT
NOT TO SCALE



NOTES:

1. PROPOSED VERTICAL GRANITE CURB WITHIN STATE HIGHWAY LAYOUT TO BE TYPE VA4 AND CONFORM TO SPECIFICATION M9.04.1
2. REFER TO THE DETAIL ON SHEET C-9.13 FOR INSTALLATION OF CURB WITHIN THE STATE HIGHWAY LAYOUT.

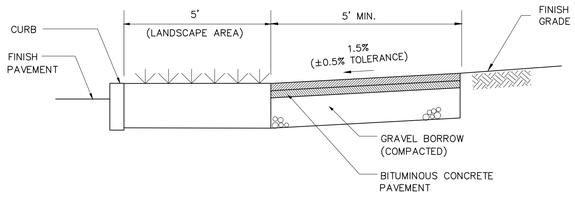
VERTICAL GRANITE CURB (VGC)
NOT TO SCALE



NOTES:

1. PROVIDE 4" OF 4000 PSI CONCRETE OVER 4" OF GRAVEL BORROW TYPE B
2. PROVIDE EXPANSION JOINTS AT MIN. 16 FT. O.C. WITH PRE-MOULDED JOINT FILLER.
3. PROVIDE TOOLED DUMMY JOINTS AT 4' O.C.
4. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.

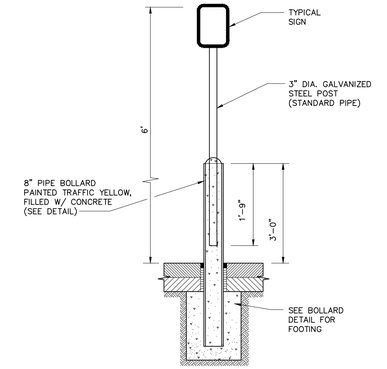
MONOLITHIC CONCRETE SIDEWALK AND CURB
NOT TO SCALE



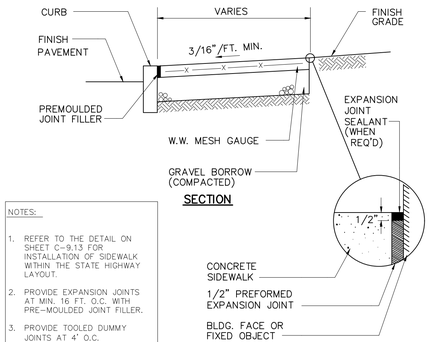
NOTES:

PROVIDE 1¼" BITUMINOUS SURFACE COURSE OVER 1¾" BITUMINOUS BINDER COURSE OVER 4" OF COMPACTED GRAVEL TYPE B

BITUMINOUS CONCRETE SIDEWALK
NOT TO SCALE



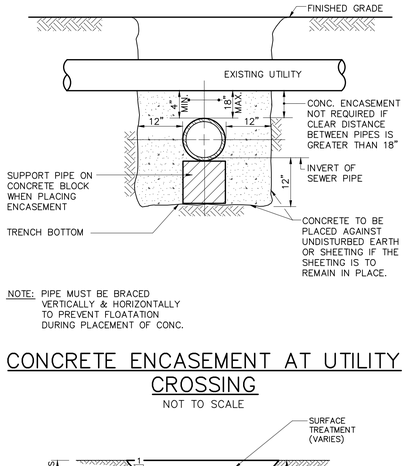
HANDICAP PARKING SIGN BASE (IN PAVED AREA)
NOT TO SCALE



NOTES:

1. REFER TO THE DETAIL ON SHEET C-9.13 FOR INSTALLATION OF SIDEWALK WITHIN THE STATE HIGHWAY LAYOUT.
2. PROVIDE EXPANSION JOINTS AT MIN. 16 FT. O.C. WITH PRE-MOULDED JOINT FILLER.
3. PROVIDE TOOLED DUMMY JOINTS AT 4' O.C.
4. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.

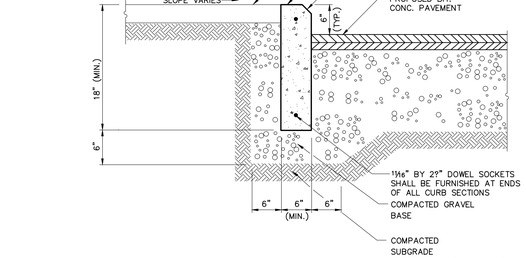
CONCRETE SIDEWALK (TYP.)
NOT TO SCALE



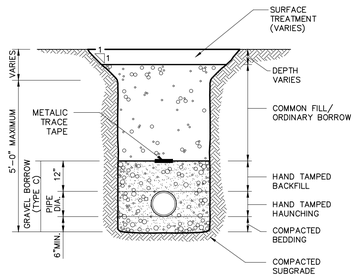
NOTE: PIPE MUST BE BRACED VERTICALLY & HORIZONTALLY TO PREVENT FLOATATION DURING PLACEMENT OF CONC.

CONCRETE ENCASEMENT AT UTILITY CROSSING
NOT TO SCALE

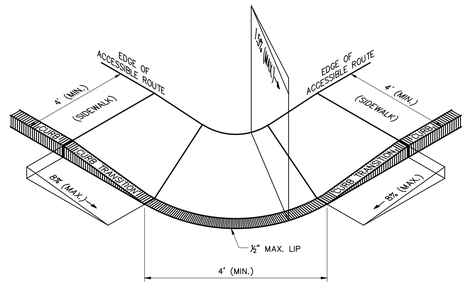
SEWER CLEANOUT
NOT TO SCALE



PRECAST CONCRETE CURBING (PCC)
NOT TO SCALE



UTILITY TRENCH
NOT TO SCALE



NOTES:

1. THE MAXIMUM ALLOWABLE ROUTE (SIDEWALK) AND CURB RAMP CROSS SLOPES SHALL BE 1.5%
2. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%
3. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE CURB RAMPS SHALL BE 8%
4. A MINIMUM OF 4 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.)
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. BASE OF RAMP SHALL BE GRADED TO PREVENT PONDING.
7. SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.

ACCESSIBLE CURB RAMP – TYPE 'C'
NOT TO SCALE

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LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT
DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.0

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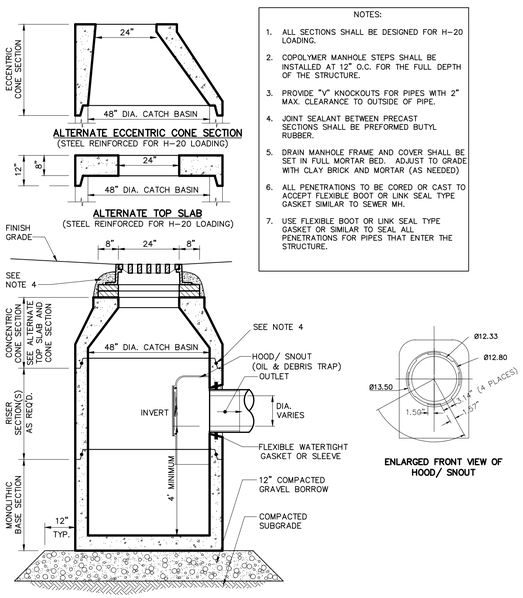
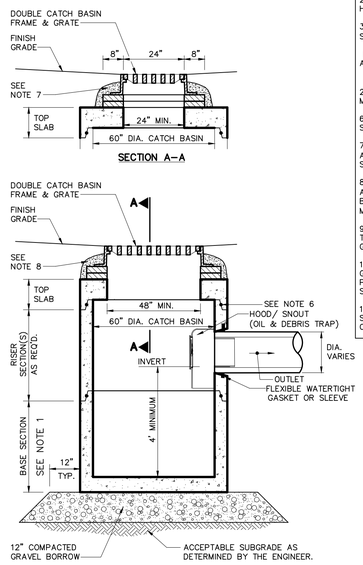
CTB:
LMAN:
MS VIEW:



NOTES:

1. ALL SECTIONS SHALL BE DESIGNED FOR H-20 LOADING.
2. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
3. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. DRAIN MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (AS NEEDED)
6. ALL PENETRATIONS TO BE CORED OR CAST TO ACCEPT FLEXIBLE BOOT OR LINK SEAL TYPE GASKET SIMILAR TO SEWER MH.
7. USE FLEXIBLE BOOT OR LINK SEAL TYPE GASKET OR SIMILAR TO SEAL ALL PENETRATIONS FOR PIPES THAT ENTER THE STRUCTURE.

CATCH BASIN (CB)
NOT TO SCALE



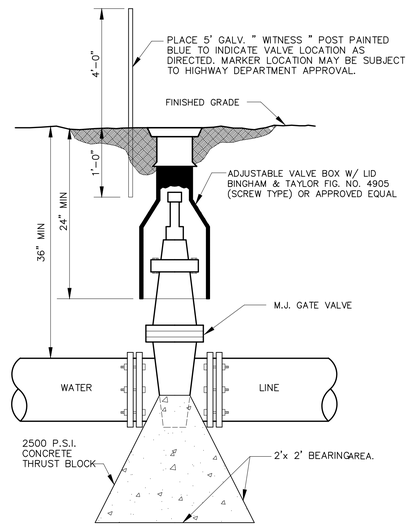
NOTES:

1. BASE SECTION SHALL BE MONOLITHIC WITH A 60" INSIDE DIAMETER.
2. ALL SECTIONS SHALL BE DESIGNED FOR H-20 LOADING.
3. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI, TYPE ‖ CEMENT.

FRAMES AND GRATES SHALL BE HEAVY DUTY AND DESIGNED FOR HS-20 LOADING.

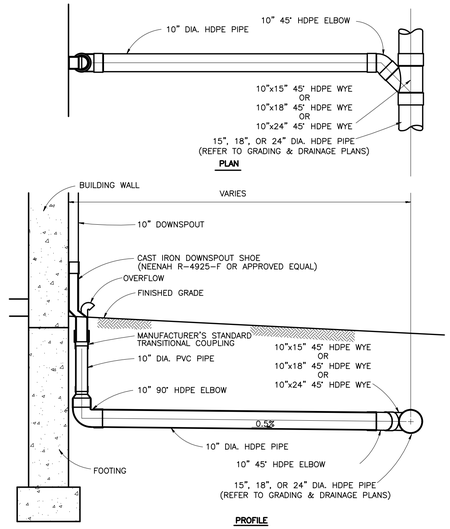
5. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
6. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
7. STANDARD DOUBLE CATCH BASIN FRAME AND GRATE(S) SHALL MEET MUNICIPAL AND/OR STATE SPECIFICATIONS WHEN APPLICABLE.
8. STANDARD DOUBLE CATCH BASIN FRAME AND GRATE(S) SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (AS NEEDED)
9. ALL PENETRATIONS TO BE CORED OR CAST TO ACCEPT FLEXIBLE BOOT OR LINK SEAL TYPE GASKET SIMILAR TO SEWER MH.
10. USE FLEXIBLE BOOT OR LINK SEAL TYPE GASKET SIMILAR TO SEWER MH TO SEAL ALL PENETRATIONS FOR PIPES THAT ENTER THE STRUCTURE.
11. PENETRATION IN THE TOP OF THE CASTING SHALL BE THE WIDTH OF THE INSIDE OF THE CASTING.

DOUBLE GRATE CATCH BASIN (DCB)
NOT TO SCALE

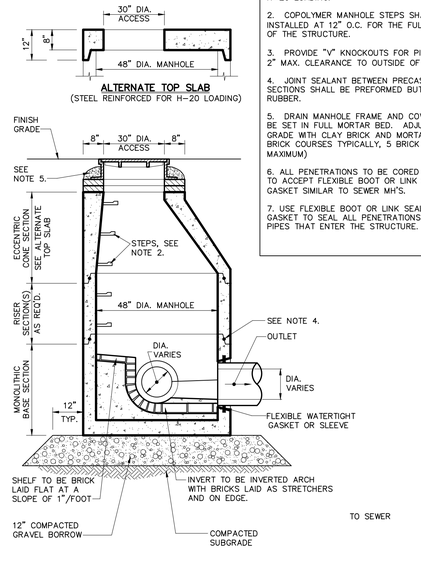


NOTE : IN REMOTE AREAS, VALVE BOXES SHALL EXTEND SIX (6) INCHES ABOVE GRADE.

GATE VALVE
NOT TO SCALE



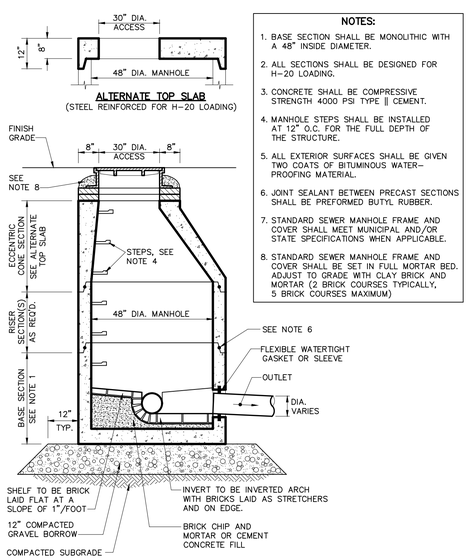
ROOF DRAIN DETAIL
NOT TO SCALE



NOTES:

1. ALL SECTIONS SHALL BE DESIGNED FOR H-20 LOADING.
2. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
3. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. DRAIN MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)
6. ALL PENETRATIONS TO BE CORED OR CAST TO ACCEPT FLEXIBLE BOOT OR LINK SEAL TYPE GASKET SIMILAR TO SEWER MH'S.
7. USE FLEXIBLE BOOT OR LINK SEAL TYPE GASKET TO SEAL ALL PENETRATIONS FOR PIPES THAT ENTER THE STRUCTURE.

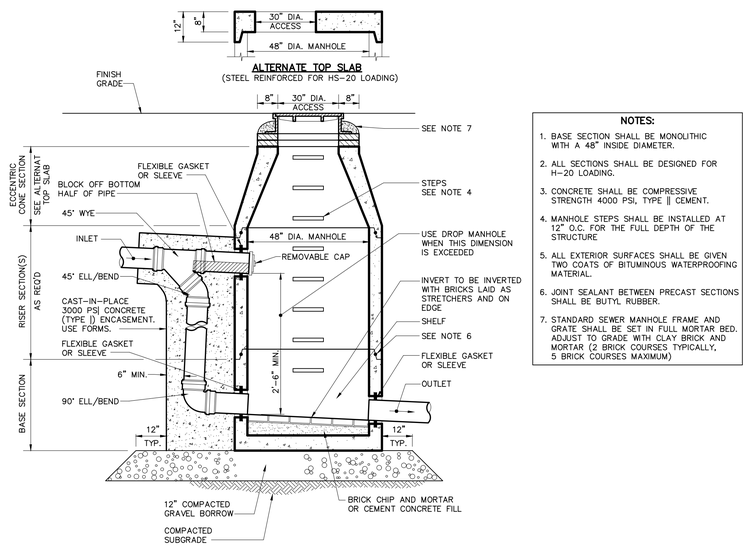
DRAIN MANHOLE (DMH)
NOT TO SCALE



NOTES:

1. BASE SECTION SHALL BE MONOLITHIC WITH A 48" INSIDE DIAMETER.
2. ALL SECTIONS SHALL BE DESIGNED FOR H-20 LOADING.
3. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI TYPE ‖ CEMENT.
4. MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
5. ALL EXTERIOR SURFACES SHALL BE GIVEN TWO COATS OF BITUMINOUS WATER-PROOFING MATERIAL.
6. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
7. STANDARD SEWER MANHOLE FRAME AND COVER SHALL MEET MUNICIPAL AND/OR STATE SPECIFICATIONS WHEN APPLICABLE.
8. STANDARD SEWER MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)

SEWER MANHOLE
NOT TO SCALE



NOTES:

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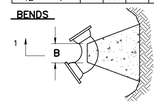
6. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
7. STANDARD SEWER MANHOLE FRAME AND GRATE SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)

EXTERNAL DROP SEWER MANHOLE
NOT TO SCALE

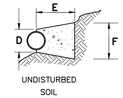
TABLE OF DIMENSIONS

BENDS	B	C	D	E	F	BENDS	B	C	D	E	F
6" 111/4°	8"	15"	12"	24"	12"	6" 45°	8"	30"	12"	24"	14"
6" 221/2°	"	19"	"	"	13"	6" 90°	"	30"	"	"	27"
8" 111/4°	"	20"	"	"	12"	8" 45°	"	30"	"	"	24"
8" 221/2°	"	22"	"	"	17"	8" 90°	"	38"	"	"	36"
12" 111/4°	"	30"	"	"	15"	12" 45°	"	40"	"	"	40"
12" 221/2°	"	35"	"	"	25"	12" 90°	"	60"	"	"	52"

BENDS



PLAN

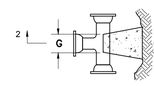


SECTION 1-1

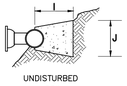
TABLE OF DIMENSIONS

TEES	G	H	I	J	TEES	G	H	I	J
6"x 6"x 6"	12"	24"	24"	18"	12"x 12"x 6"	12"	24"	24"	18"
8"x 8"x 6"	"	"	"	"	12"x 12"x 8"	"	"	"	24"
8"x 8"x 8"	"	"	"	24"	12"x 12"x 12"	"	36"	"	36"

TEES



PLAN



SECTION 2-2

NOTES:
1. PROVIDE BLOCKS FOR TAPPING SLEEVES, DEAD ENDS, GATE VALVES, AND VERTICAL BENDS (SAME SIZE AS REQUIRED FOR TEES). PROVIDE ANCHOR RODS AT VERTICAL BENDS AND GATE VALVES.
2. CONCRETE SHALL NOT BE PLACED AGAINST PIPE BEYOND FITTING.

CONCRETE THRUST BLOCK
N.T.S.

811 DigSafe MA.ME.NH.RI.VT

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

SEAL

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT
DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.1

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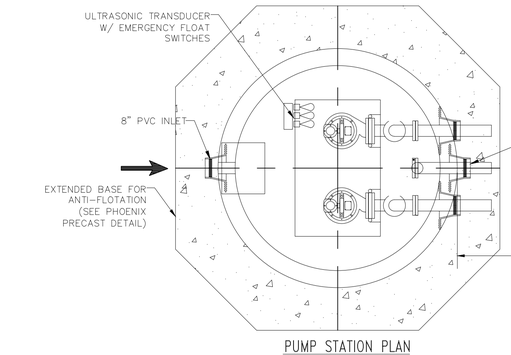
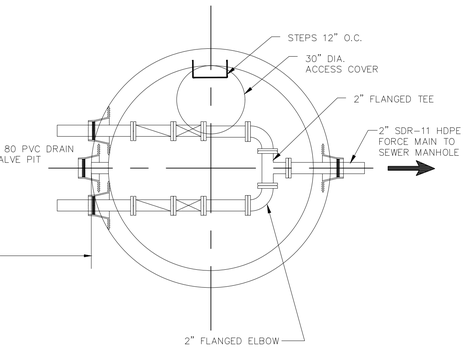
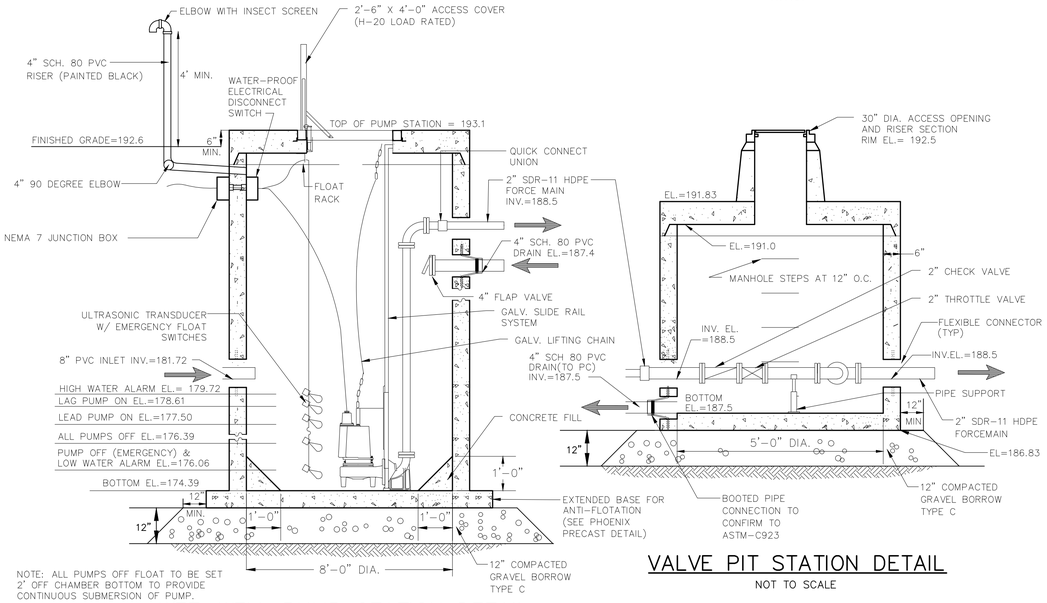
CTB:



PUMP STATION PLAN
N.T.S.



VALVE CHAMBER PLAN
N.T.S.



NOTE: ALL PUMPS OFF FLOAT TO BE SET 2' OFF CHAMBER BOTTOM TO PROVIDE CONTINUOUS SUBMERSION OF PUMP.

VALVE PIT STATION DETAIL
NOT TO SCALE

WET-WELL PUMP STATION DETAIL
NOT TO SCALE

Pump Calculations

STATIC DISCHARGE HEAD = 208.20-174.39= 33.81 FT

FRICTION LOSSES AND FITTING LOSSES FOR 2" PVC DISCHARGE LINE ABOUT 975 FT IN EQUIVALENT LENGTH AT 30 GPM

RATE IS DETERMINED AS:
$hf=4.73x\ (975x30^{1.85}) / (140^{1.85} x\ 2"^{4.87})= 9.12$ FT

IN WHICH "C" IS THE HAZEN-WILLIAMS COEFFICIENT (140 FOR AVE. LIFE OF HDPE PIPE). THE HDPE PIPE SHALL BE PRESSURE RATED FOR FORCE MAIN APPLICATION. ALL JOINTS SHALL BE PERMANENTLY BONDED AND SEALED.

TOTAL DYNAMIC HEAD = 9.12+33.81 = 42.93 FT

A PUMP CAPABLE OF DELIVERING 30 GPM AT A TDH OF 42.93 FT

10,000 GPD / 24 DOSES PER DAY = 416.67 GALLONS PER DOSE

VOLUME = 416.67 GAL PER DOSE / 7.48 GAL PER CF = 55.70 CF PER DOSE

USE 8 FT INTERIOR DIA. WET-WELL

VERTICAL FEET PER DOSE= H = 4 x VOLUME / 8 FT^2 x 3.14 =

(4 x 55.70) / 113.04= 1.11 FT PER DOSE

HIGH WATER ALARM EL.= MIN. 2 FT. BELOW INLET= 179.72

LAG PUMP EL.= 179.72-1.11= 178.61

LEAD PUMP EL.= 178.61-1.11= 177.50

ALL PUMPS OFF EL.= 177.50-1.11= 176.39

PUMP OFF (EMERGENCY)/LOW WATER ALARM EL.= 176.39-.33=176.06

BOTTOM OF TANK EL.=174.39

VELOCITY IN FORCE MAIN=V= 0.408x(Q/d^2)= 0.408x(30/ 2^2)=3.06 FT/S

GENERAL NOTES:

1.) SEWER PUMP STATION IS SIZED FOR 10,000 GPD FLOW RATE. CONTRACTOR TO VERIFY USE OF BUILDING WITH TENANT FOR PROPER SIZING PRIOR TO BUILDING PERMIT AND PUMP STATION DETAIL TO BE UPDATED, IF REQUIRED, BY ENGINEER OF RECORD.

2.) REMOVAL OF LEDGE IN AREA OF SEWER PUMP STATION SHOULD BE EXTENDED A MINIMUM OF 1-FOOT BELOW THE OUTSIDE BOTTOM OF STRUCTURES AND REPLACED WITH 12" COMPACTED BORROW TYPE "C".

3.) DURING INSTALLATION OF WET-WELL PUMP STATION CONTRACTOR MAY USE WATER INSIDE OF PUMP STATION TO DECREASE BUOYANCY PRIOR TO FINAL BACK FILL OF SOILS. UPON COMPLETION OF INSTALLED WET-WELL PUMP WATER LEVEL WITHIN STRUCTURE TO BE SET TO ALL PUMPS OFF ELEVATION.

Pump and Control Panel Specifications

PROVIDE A DUPLEX LIBERTY PUMP CONTROL PANEL, 115/230 VOLTS, NEMA 4 ENCLOSURE, ELAPSED TIME METERS (2) AND CYCLE COUNTER (2), OR APPROVED EQUAL. MOUNT CONTROL PANEL INSIDE BUILDING OR ON EXTERIOR OF BUILDING AND EQUIP WITH AUDIO/VISUAL HIGH WATER ALARM HORN AND LIGHT. ALONG WITH EMERGENCY AUTO DIALER TO PROP. MANAGER AND PUMP CO.

PROVIDE A DUPLEX SUBMERSIBLE GRINDER SEWAGE PUMPING SYSTEM: (2) LIBERTY PUMPS, LSG200-SERIES, 2.0HP, 2" DISCHARGE, 240 VOLT THREE-PHASE MOTOR WITH A RATED CAPACITY OF 30 GPM AT A TOTAL DYNAMIC HEAD OF 42.93 FEET, OR APPROVED EQUAL.

THE ALARM AND PUMP SHALL BE ON SEPARATE DEDICATED ELECTRICAL CIRCUITS.

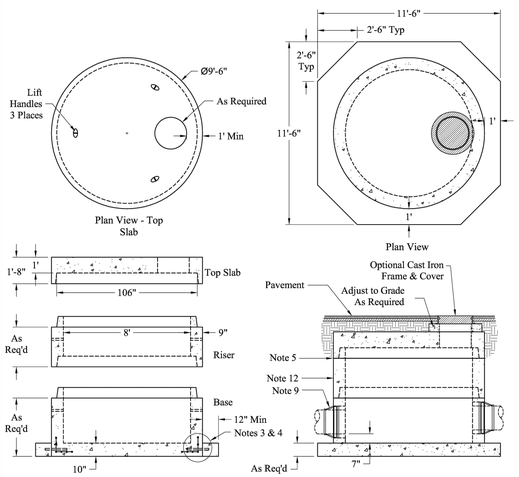
ELECTRICAL PERMITS ARE REQUIRED.

ALL WORK SHALL MEET THE STATE ELECTRCIAL CODE.

1-800-639-2199 **Fax (603) 224-2927**

Std Structures\8Ft Dia\Sanitary Manhole Extended Base

Phoenix Precast Products



General Notes
1. Concrete: fc = 4,000 psi @ 28 Days Minimum, Type III Cement
2. HS-20 Design Loading Conforms to Latest Specifications ASTM C478, AASHTO M199 Precast Reinforced Concrete Manhole Sections
3. Drill & Dowel Base Before Extension is Poured
4. Steel Reinforcement Conforms to Latest ASTM Specification: ASTM A-615, Grade 60 Black Deformed Bars ASTM A-185 Welded Wire Fabric 0.24 Sq. In./Lineal Ft. And 0.12 Sq. In.(Both Ways) Base Bottom
5. Butyl Rubber Joint Sealant Provided Conforms to ASTM C-990 And Federal Spec SS-S-210A
6. 377 Gallons/VF
7. Holes & Elevations TBD
8. Sections Available in Increments of 6"
9. Booted Pipe Connections (If Used) Conform to ASTM C-923. Maximum Booted Connection Pipe Size is 48" RCP
10. Maximum Pipe OD is 79" (60" RCP)
11. Plastic Manhole Steps (If Required) are Steel Reinforced Conforming to ASTM C-478
12. Asphaltic Exterior Coating Available

Est Weights:
Top Slab: 11,650 Lbs
Wt/VF: 3,040 Lbs
Floor: 6,200 Lbs

Phoenix Precast Products	8' Diameter Sanitary Manhole Extended Base

30Jan14_Rev2 cws **77 Regional Drive** **Concord, NH 03301**

Phoenix Precast Products

WET-WELL PUMP STATION DETAIL (TYPICAL)
NOT TO SCALE

Wet-Well Pump Station Buoyancy Calculations

USE A PHOENIX PRECAST PRODUCTS 8-FOOT DIAMETER SANITARY MANHOLE WITH EXTENDED BASE. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES TO PRODUCT FOR APPROVAL PRIOR TO ORDERING. GROUNDWATER ELEVATION USED FOR BUOYANCY CALCULATIONS IS ASSUMED TO BE 8" BELOW FINISH GRADE AT ELEVATION 191.83.

BOUYANT FORCE = DEPTH BELOW GW x TANK AREA x 62.4LB/CF
= 18.27 FT x 119.75 SF x 62.4LB/CF = 136,521 LBS

WEIGHT OF FLOOR + WEIGHT/VERTICAL FOOT + COVER = 69,651 LBS
= (1)(6,200 LBS) + (17.04)(3,040 LBS/VF) + (1)(11,650 LBS) + (1)(3,940 LBS)

WEIGHT OF SOIL OVER EXTENDED BASE = DEPTH OF SOIL ABOVE x EXTENDED BASE AREA x 100 LBS/CF
= 18.21 FT x 48.87 SF x 100 LBS/CF = 88,992 LBS

WEIGHT OF SOIL + WEIGHT OF STRUCTURE = 88,992 + 69,651 = 158,643 LBS > BUOYANT FORCE : OK

Valve Pit Buoyancy Calculations

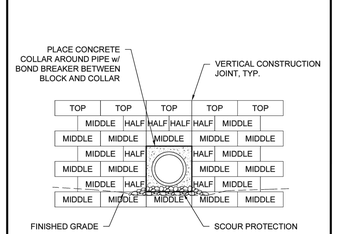
USE A PHOENIX PRECAST PRODUCTS 5-FOOT DIAMETER SANITARY MANHOLE, CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES TO PRODUCT FOR APPROVAL PRIOR TO ORDERING. GROUNDWATER ELEVATION USED FOR BUOYANCY CALCULATIONS IS ASSUMED TO BE 8" BELOW FINISH GRADE AT ELEVATION 191.83.

BOUYANT FORCE = DEPTH BELOW GW x TANK AREA x 62.4LB/CF
= 5.00 FT x 28.26 SF x 62.4LB/CF = 8,817 LBS

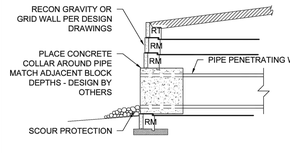
WEIGHT OF BASE & COVER = 9,139 LBS

WEIGHT OF SOIL = DEPTH OF SOIL ABOVE TANK x TANK AREA x 100 LBS/CF
= 0.67 FT x 28.26 SF x 100 LBS/CF = 1,893 LBS

WEIGHT OF SOIL + WEIGHT OF BASE & COVER = 11,032 LBS > BUOYANT FORCE : OK



PARTIAL WALL PROFILE



WALL SECTION

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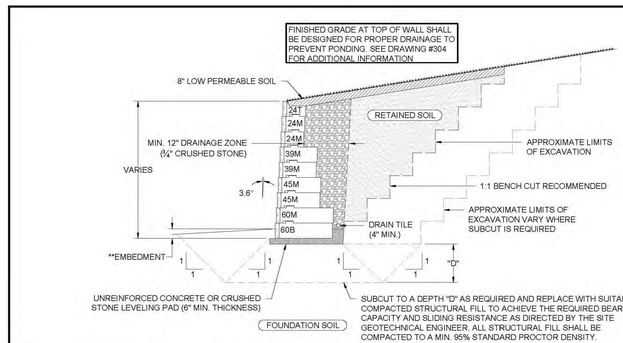
RECON Wall Systems

R-SERIES PIPE PENETRATING WALL FACE	
RECON WALL SYSTEMS, INC. 11521 EAGLE STREET, SUITE #3 COON RAPIDS, MN 55448 952-922-0027 www.reconwalls.com	DRAWING #808



**EMBEDMENT SHOULD BE THE GREATER OF 6" OR H/20 FOR WALLS WITH LEVEL GRADE AT THE TOE. REFER TO RECON'S EMBEDMENT RECOMMENDATION DOCUMENT FOR ADDITIONAL INFORMATION FOR WALLS WITH A TOE SLOPE CONDITION.

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Disclaimer: This drawing has been prepared by ReCon Wall Systems, Inc. and to the best of its knowledge, accurately represents the product use in the application that it is illustrated. This drawing is intended for conceptual purposes only. Anyone making use of this drawing does so at their own risk and assumes all liability for such use. Final design for construction purposes must be completed by a Registered Professional Engineer who is familiar with the product and who has taken into account specific site conditions.

ReCon Retaining Walls

DRAWING #103

TYPICAL GRAVITY WALL CROSS SECTION	
RECON WALL SYSTEMS, INC. 7600 W. 27th STREET, #229 ST. LOUIS PARK, MN 55426 952-922-0027 www.reconwalls.com	

811 DigSafe MA.ME.NH.RI.VT

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 49660
REGISTERED PROFESSIONAL ENGINEER

SEAL

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT
DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.2

C:\Users\JustinWilliams\OneDrive - MBL Land Development & Permitting, Corp (New)\OneDrive - MBL Land Development & Permitting, Corp\MBL Shareporint\MBL\2021\2021-036\CIVIL\Plot\2021-036-Innovation Way-Site Planset- Master-LM-ERO-DTL-REV1.dwg, 11/22/2023 11:38:48 AM
UCS: | MS VIEW: | LMAN: | CTB:

STORMCEPTOR DESIGN NOTES

THE STANDARD STORM3 CONFIGURATION WITH ROAD, SOLID FRAME AND COVER, AND INLET PIPE 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

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (cfs)			
PEAK FLOW RATE (cfs)			
RETURN PERIOD OF PEAK FLOW (yrs)			
RIM ELEVATION			
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
NOTES/SPECIAL REQUIREMENTS:			

PLAN VIEW
TOP SLAB NOT SHOWN

SECTION A-A

FRAME AND COVER
(BAR GRATE)
NOT TO SCALE

FRAME AND GRATE
(BAR GRATE)
NOT TO SCALE

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. STORMCEPTOR MANUFACTURE, STORMCEPTOR DESIGN IS IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STORMCEPTOR STRUCTURE SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO OF 1'-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. STORMCEPTOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. ALTERNATIVE 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 STORMCEPTOR STRUCTURE(S).
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO INSTALL, JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
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.

CONTECH ENGINEERED SOLUTIONS LLC
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800 Cornell Park Drive, Suite 300, Blue Ash, OH 45242
800.338.1122 513.645.7000 513.645.7993 FAX

STC450i
STORMCEPTOR
STANDARD DETAIL

STORMCEPTOR 450i WATER QUALITY UNITS (#5, #11, #13, #14, #17)

NOT TO SCALE

CASCADE SEPARATOR DESIGN NOTES

CS-5 RATED TREATMENT CAPACITY IS 5.50 CFS, OR PER LOCAL REGULATIONS.

THE STANDARD CS5 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

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (cfs)			
PEAK FLOW RATE (cfs)			
RETURN PERIOD OF PEAK FLOW (yrs)			
RIM ELEVATION			
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
NOTES/SPECIAL REQUIREMENTS:			

PLAN VIEW B-B
NOT TO SCALE

ELEVATION A-A
NOT TO SCALE

FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE

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' (0-610), AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL 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. ALTERNATIVE 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 STRUCTURE(S).
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). WATER PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE PENETRATIONS TO BE GROUTED SMOOTH.
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.

CASCADE separator™

CS-5
CASCADE SEPARATOR
STANDARD DETAIL

CASCADE CS-5 WATER QUALITY UNITS (#1, #2, #19)

NOT TO SCALE

PRETX-CURB ELEVATION GUIDE

POINT	DESCRIPTION	HEIGHT IN REFERENCE TO PT. A
A.	EDGE OF PAVEMENT	0 INCHES
B.	OUTSIDE TOP SLAB	8 INCHES
C.	TOP OF BIORETENTION	12 INCHES
D.	SUMP INVERT	36 INCHES
E.	OUTSIDE BOTTOM	42 INCHES

FLUSH MOUNT FRAME & COVER

4" BYPASS OPENING

STAINLESS STEEL HOODED SCREEN

TO BIORETENTION/BIOSWALE/INFILTRATION

12" DROP FROM EDGE OF PAVEMENT TO SHORETEN/VON

HDPE SCREEN

SOLID KNEE WALL

12" OF BACKFILL OF NO. 57 STONE AROUND BOSS & OUTLET

1.5" PAVEMENT

2" TIP DOWN

PRECAST STRUCTURE

BAFFLE

1 D1 PRETX CURB DETAIL
NOT TO SCALE

PRECAST STRUCTURE

BAFFLE

4" OUTLET PIPE (OPTIONAL)

CURB OPENING

STAINLESS STEEL HOODED SCREEN

(INLET PIPE (OPTIONAL))

KNEE WALL

2 D1 PRETREATMENT CATCH BASIN
PLAN VIEW
NOT TO SCALE

4"H x 40" OPENING

DETAIL "A"
STAINLESS STEEL SCREEN

DETAIL "B"
HDPE SCREEN

12" OF BACKFILL OF NO. 57 STONE AROUND BOSS & OUTLET

SS EXPANDED STEEL SCREEN 0.5" X 3.5 DA

DETAIL "A"

1/2" HOLES SPACED 1½" ON CENTER 12"H x 48"W

DETAIL "B"

3 D1 PRETX CURB OUTLET SIDE
NOT TO SCALE

OUTLET SIDE INSTALLED W/ SCREENS

40"

20"

OPENING AREA = 184 SQ IN

PRETX-CURB OUTLET SIDE

4 D1 PRETX CURB SIDE DETAIL
NOT TO SCALE

PRETX-CURB INLET SIDE

EDGE OF PAVEMENT

PONDING DEPTH 4" MIN. BELOW BOTTOM OF OPENING

4" MIN.

TIP DOWN AT BELOW GUTTER LINE

SECTION B-B

CURB

TIP DOWN

FLUSH WITH TOP OF CURB

5 D1 TIP DOWN CURB INLET DETAIL
NOT TO SCALE

TIP DOWN CURB INLET

PRECAST STRUCTURE

CURB

FLUSH WITH TOP OF CURB

PLAN VIEW

TOP SLAB

ACCESS MANOLE

GRASSED ROAD SHOULDER

BAFFLE

STAINLESS STEEL HOODED SCREEN

OUTLET / TRANSITION TO BIOSWALE

VEGETATED BIOSWALE

6 D1 ELEVATION GUIDE
NOT TO SCALE

7 D1 PRETX CURB OUTLET TO BIORETENTION CONFIGURATION
NOT TO SCALE

D-1 PRETX™ CURB INLET PRETREATMENT DETAIL

TO FIND A VALUE ADDED RESELLER IN YOUR AREA VISIT WWW.ADSPIPE.COM OR CONTACT ADS PRODUCTS ON CONTACT CONVERGENT WATER TECHNOLOGIES AT 1.800.711.5428

CONVERGENT WATER TECHNOLOGIES

CDS1515-3-C DESIGN NOTES

CDS1515-3-C RATED TREATMENT CAPACITY IS 1.5 CFS, OR PER LOCAL REGULATIONS.

THE STANDARD CDS1515-3-C CONFIGURATION IS SHOWN.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (1/4(6) OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST	WIDTH		HEIGHT
NOTES/SPECIAL REQUIREMENTS:			

* PER ENGINEER OF RECORD

PLAN VIEW B-B
N.T.S.

ELEVATION A-A
N.T.S.

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

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. CDS STORMWATER 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. CDS 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. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. ALTERNATIVE 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 CDS 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). WATER PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE PENETRATIONS TO BE GROUTED SMOOTH.
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.

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CDS1515-3-C
ONLINE CDS
STANDARD DETAIL

CDS 1515 WATER QUALITY UNITS (#10, #12)

NOT TO SCALE

CDS2015-4-C DESIGN NOTES

CDS2015-4-C RATED TREATMENT CAPACITY IS 1.4 CFS, OR PER LOCAL REGULATIONS.

THE STANDARD CDS2015-4-C 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

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (1/4(6) OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST	WIDTH		HEIGHT
NOTES/SPECIAL REQUIREMENTS:			

* PER ENGINEER OF RECORD

PLAN VIEW B-B
N.T.S.

ELEVATION A-A
N.T.S.

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

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. CDS STORMWATER 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. CDS 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 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. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. ALTERNATIVE 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 CDS 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). WATER PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE PENETRATIONS TO BE GROUTED SMOOTH.
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.

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CDS2015-4-C
ONLINE CDS
STANDARD DETAIL

CDS 2015-4 WATER QUALITY UNITS (#3, #4, #6, #8, #18, #21, #22)

NOT TO SCALE

CASCADE SEPARATOR DESIGN NOTES

THE STANDARD CS-4 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

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (cfs)			
PEAK FLOW RATE (cfs)			
RETURN PERIOD OF PEAK FLOW (yrs)			
RIM ELEVATION			
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
NOTES/SPECIAL REQUIREMENTS:			

PLAN VIEW B-B
NOT TO SCALE

ELEVATION A-A
NOT TO SCALE

FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE

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 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. ALTERNATIVE 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 STRUCTURE(S).
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). WATER PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE PENETRATIONS TO BE GROUTED SMOOTH.
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.

CASCADE separator™

CS-4
CASCADE SEPARATOR
STANDARD DETAIL

CS-4 WATER QUALITY UNIT (#15, #16, #20)

NOT TO SCALE

CDS2015-5-C DESIGN NOTES

THE STANDARD CDS2015-5-C 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
- SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
- SEDIMENT HIDER FOR HDPE INLET / OUTLET CONFORMING UNITS

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (1/4(6) OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST	WIDTH		HEIGHT
NOTES/SPECIAL REQUIREMENTS:			

* PER ENGINEER OF RECORD

PLAN VIEW B-B
N.T.S.

ELEVATION A-A
N.T.S.

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH (*) ARE REFERENCE DIMENSIONS ONLY. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.conteches.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO: HS20 AND CASTINGS SHALL MEET H20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT OR BELOW THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

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 CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. WATER PIPE INVERTS WITH ELEVATIONS SHOWN.
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.

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CDS2015-5-C
INLINE CDS
STANDARD DETAIL

CDS 2015-5 WATER QUALITY UNITS (#7, #9, #23)

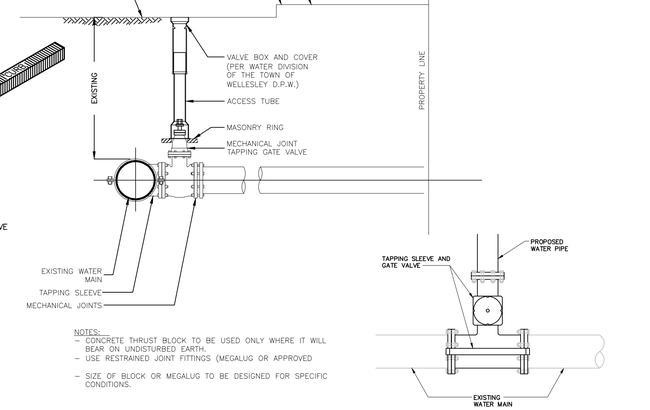
NOT TO SCALE

NOTES:

1. THE MAXIMUM ALLOWABLE ROUTE (SIDEWALK) AND CURB RAMP CROSS SLOPES SHALL BE 1.5%
2. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE CURB RAMPS SHALL BE 8%.
4. A MINIMUM OF 4 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.)
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. BASE OF RAMP SHALL BE GRADED TO PREVENT PONDING.
7. SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.

ACCESSIBLE CURB RAMP – TYPE 'F'

NOT TO SCALE



NOTES:
- CONCRETE THRUST BLOCK TO BE USED ONLY WHERE IT WILL BEAR ON UNDISTURBED EARTH.
- USE RESTRAINED JOINT FITTINGS (MEGALUG OR APPROVED
- SIZE OF BLOCK OR MEGALUG TO BE DESIGNED FOR SPECIFIC CONDITIONS.

TYPICAL WATER PIPE CONNECTION WITH TAPPING SLEEVE AND GATE VALVE

NOT TO SCALE

811 DigSafe MA·ME·NH·RI·VT

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01

FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.3

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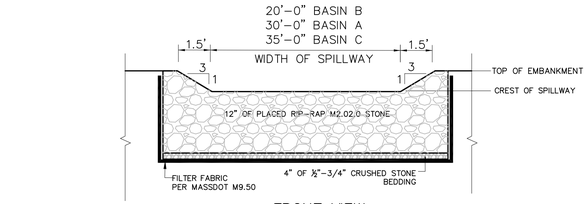
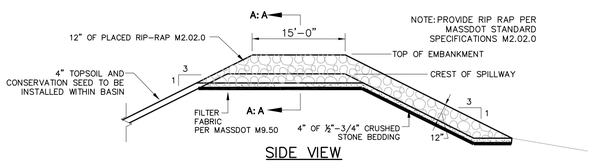
LMAN:
CTB:



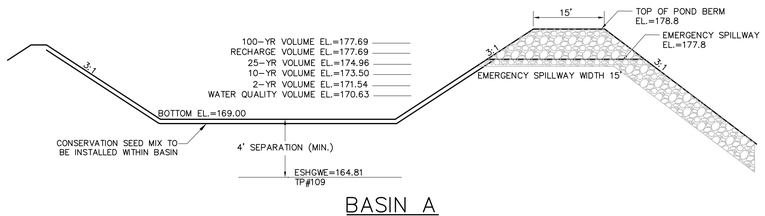
FRONT VIEW
SECTION A-A



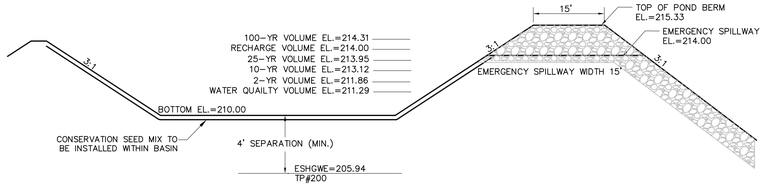
SIDE VIEW

INFILTRATION BASIN EMERGENCY SPILLWAY

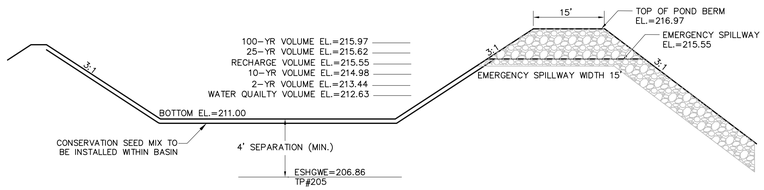
NOT TO SCALE



BASIN A



BASIN B



BASIN C

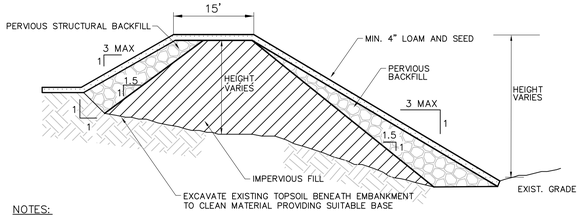
BASIN CONSTRUCTION NOTES:
AS PART OF BASIN CONSTRUCTION, THE CONTRACTOR SHALL REMOVE A & B SOIL HORIZONS AND ANY OTHER UNSUITABLE SOIL THAT MAYBE ENCOUNTERED. THIS REMOVED MATERIAL SHALL BE REPLACED BY A MAINLY SANDY SOIL MIX (80% SAND/ 20% LOAM) OR OTHER MIX THAT WILL NOT OVERLY COMPACT DURING CONSTRUCTION BUT WILL MAINTAIN THE INFILTRATION CAPACITY OF THE BASIN.

THE CONTRACTOR IS CAUTIONED THAT THE BASIN IS DESIGNED TO INFILTRATE/RECHARGE STORMWATER PRIMARILY THROUGH THE BOTTOM AND SIDES OF THE BASIN. CONSTRUCTION TECHNIQUES THAT WOULD POTENTIALLY DIMINISH THE INFILTRATION CAPACITY OF THE UNDERLYING SOILS ARE TO BE AVOIDED. COMPACTION AND SILTATION OF THE BASIN DURING CONSTRUCTION IS PROHIBITED.

1. DO NOT UTILIZE ANY PORTION OF THE BASIN FLOOR AS A HAUL ROAD FOR MATERIAL AND HEAVY EQUIPMENT.
2. DO NOT COMPACT SOILS IN THE BASIN FLOOR.
3. DO NOT PLACE GRAVEL OR OTHER MATERIALS TO STABILIZE THE BASIN FLOOR FOR CONSTRUCTION VEHICULAR TRAVEL ACCESS.
4. STRICT COMPLIANCE WITH THE EROSION CONTROL PLAN AND THE STORMWATER OPERATIONS AND MAINTENANCE PLAN IS NECESSARY.
5. BASIN CONSTRUCTION SHALL OCCUR AT THE EARLY STAGES OF THE PROJECT CONSTRUCTION SO THAT THEY ARE FULLY VEGETATED AND STABILIZED PRIOR TO RECEIVING STORMWATER.

INFILTRATION BASIN CROSS SECTION

NOT TO SCALE



NOTES:

1. IMPERVIOUS MATERIAL FOR USE IN FILL AREAS AND WHERE SHOWN ON THE PLANS SHALL BE COMPOSED OF INORGANIC GRAVELLY SILTY SOIL (GLACIAL TILL) WITH GRAVEL AND COBBLES UP TO 2 INCHES MAXIMUM SIZE. THE SOIL SHALL BE FREE OF RUBBISH, ICE, VEGETATIVE MATTER, LOAM, OR OTHER DEBRIS.
2. PERVIOUS MATERIAL FOR USE IN FILL AREAS AND WHERE SHOWN ON THE PLANS HALL BE COMPOSED OF INORGANIC GRAVELLY SANDY SOIL WITH GRAVEL AND COBBLES UP TO 3.5 INCHES MAXIMUM SIZE. THE SOIL SHALL BE FREE OF RUBBISH, ICE, VEGETATIVE MATTER, LOAM, OR OTHER DEBRIS.
3. IMPERVIOUS FILL MATERIAL SHALL HAVE THE FOLLOWING GRADATION AS DEFINED BY A STANDARD SIEVE TEST (ASTM D422) AND PER MASSDOT STANDARDS (WHICH SHALL BE SUBMITTED TO THE PLANNING DEPT. AND DESIGN ENGINEER FOR APPROVAL)

MIN. PERCENT PASSING (BY WT).	SEIVE TEST
100	3.5"
50-100	3/4"
25-75	No. 4
0-10	No. 200

4. PERVIOUS BACKFILL MATERIAL SHALL CONSIST OF GRAVEL, CRUSHED GRAVEL, CRUSHED ROCK, NATURAL SANDS, MANUFACTURED SANDS OR COMBINATION THEREOF, AND SHALL MEET THE FOLLOWING REQUIREMENTS

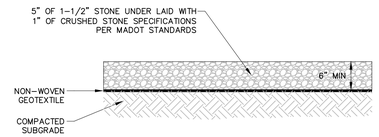
MIN. PERCENT PASSING (BY WT).	SEIVE TEST
100	2"
50-100	No. 4
50-35	No. 30
10-4	No. 100
0-4	No. 200

EMBANKMENT MATERIAL SHALL HAVE A MINIMUM 95% COMPACTED MATERIAL.

**FOR INFILTRATION BASINS B & C EMBANKMENT DETAIL PLEASE SEE SHEETS GT-1.0 AND GT-2.0 FOR MORE DETAILS

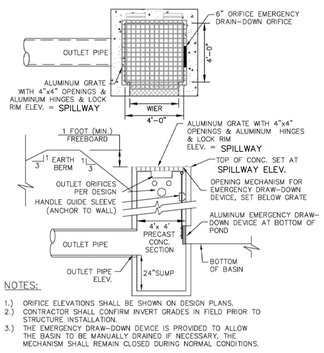
INFILTRATION BASIN EMBANKMENT- BASIN A

NOT TO SCALE



BASIN ACCESS DRIVE DETAIL

NOT TO SCALE

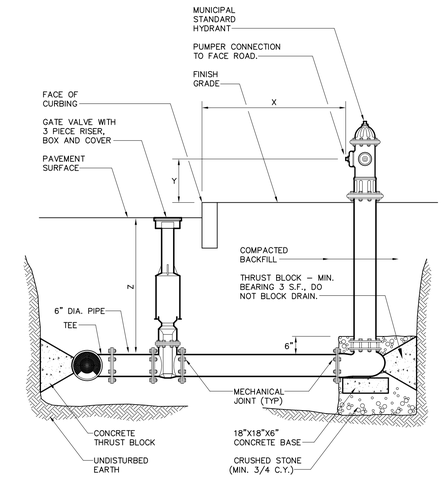


NOTES:

1.) ORIFICE ELEVATIONS SHALL BE SHOWN ON DESIGN PLANS.
2.) CONTRACTOR SHALL CONFIRM INVERT GRADES IN FIELD PRIOR TO STRUCTURE INSTALLATION.
3.) THE EMERGENCY DRAW-DOWN DEVICE IS PROVIDED TO ALLOW THE BASIN TO BE MANUALLY DRAINED IF NECESSARY. THE MECHANISM SHALL REMAIN CLOSED DURING NORMAL CONDITIONS.

OUTLET CONTROL STRUCTURE DETAIL

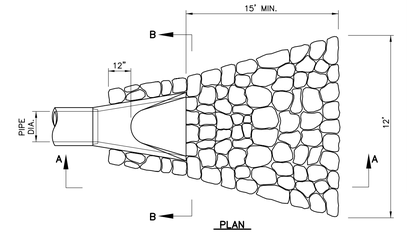
NOT TO SCALE



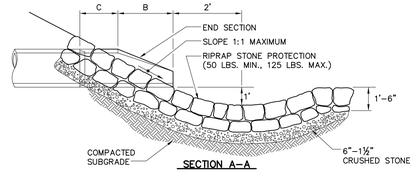
NOTE:
CONCRETE THRUST BLOCKS TO BE USED ONLY WHERE THEY CAN BEAR ON UNDISTURBED EARTH. USE CLAMPS AND TIE RODS OR OTHER ACCEPTABLE MEHTOD OF JOINT RESTRAINT WHERE SOIL CONDITIONS PROHIBIT THE USE OF THRUST BLOCKS.

TYPICAL FIRE HYDRANT CONNECTION DETAIL

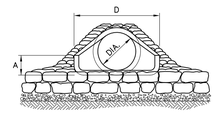
NOT TO SCALE



PLAN



SECTION A-A



SECTION B-B

DIMENSIONAL TABLE						
PIPE DIA.	A	B	C	D	E	R
12"	4"	2'-0"	4'-0"	2'-0"	2"	9"
15"	6"	2'-3"	3'-10"	2'-6"	2 1/2"	11"
18"	9"	2'-3"	3'-10"	3'-0"	2 1/2"	12"
24"	9 1/2"	3'-7 1/2"	2'-6"	4'-0"	3"	14"
30"	12"	4'-6"	1'-7"	5'-0"	3 1/2"	15"
36"	15"	5'-3"	2'-10"	6'-0"	4"	20"
42"	21"	5'-3"	2'-11"	6'-6"	4 1/2"	22"
48"	24"	6'-0	2'-2"	7'-0"	5"	22"
54"	27"	5'-5"	2'-11"	7'-6"	5 1/2"	24'
60"	30"	5'-0"	3'-3"	8'-0"	6"	24"

NOTES

1. THE FLARED END SECTION PIPE JOINT SHALL BE SIMILAR TO THE MAIN RUN OF PIPE JOINTS.
2. FLARED END SECTIONS SHALL CONFORM AS SHOWN IN THE TABLE OR AS APPROVED BY THE ENGINEER.

FLARED END SECTION W/STONE PROTECTION

NOT TO SCALE

811 DigSafe MA ME NH RI VT

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 45660
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01

FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.4

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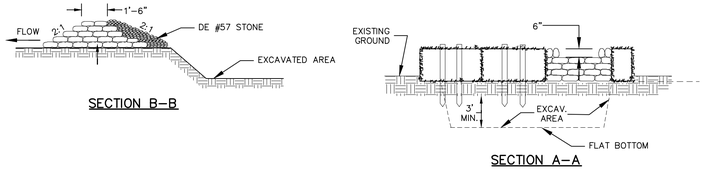
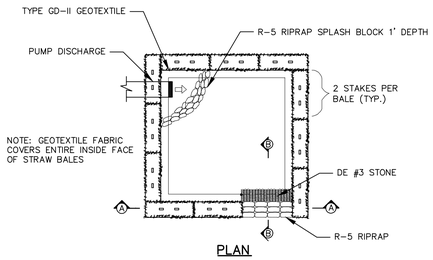
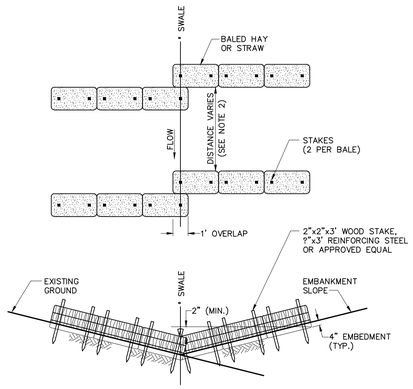




DEWATERING STRAW BALE BASIN

NOT TO SCALE

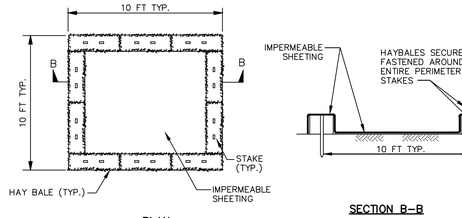


NOTES:

1. THIS CHECKDAM SHALL BE INSTALLED IN A DRAINAGE SWALE WITH BED WIDTHS OF 2 FT. OR LESS.
2. THE DISTANCE BETWEEN HAY BALE CHECKDAMS SHALL BE DETERMINED BY THE SLOPE OF THE SWALE. CHECKDAMS SHALL BE SET AT EVERY 2 FT. DROP IN SWALE ELEVATION.
3. BALES SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.

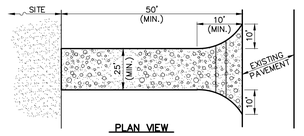
TEMPORARY SWALE WITH HAY BALE CHECK DAMS

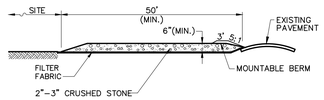
NOT TO SCALE



CONCRETE WASHOUT STRUCTURE

NOT TO SCALE



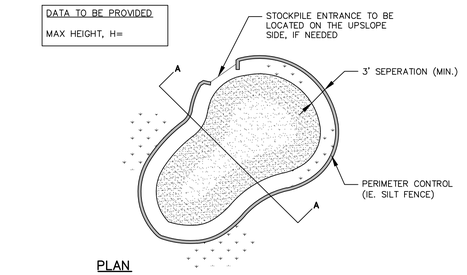


NOTES:

1. ENTRANCE WIDTH SHALL BE A TWENTY–FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY. BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.

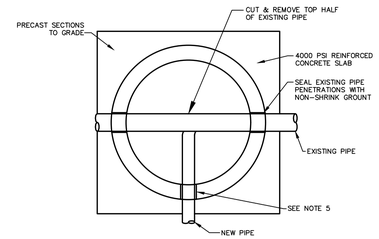
STABILIZED CONSTRUCTION ENTRANCE

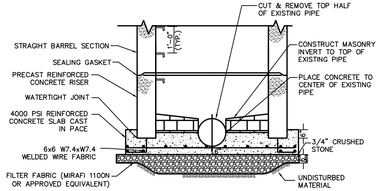
NOT TO SCALE



SOIL STOCKPILE

NOT TO SCALE



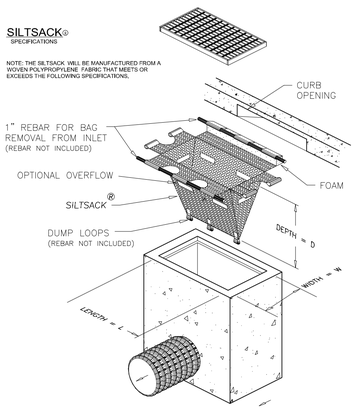


NOTES:

1. FOR MANHOLES IN LOCATIONS REQUIRING CONTROLLED DENSITY FILL, PAYMENT LIMITS SHALL BE A MAXIMUM OF 2.25 CY PER VERICAL FOOT OF MANHOLE.
2. SEE SPECIFICATION SECTION 02607 FOR MANHOLE COMPONENT REQUIREMENTS.
3. SEE SPECIFICATION SECTION 03300 FOR CONCRETE REQUIREMENTS.
4. THE EXISTING PIPE THAT THE DOGHOUSE IS TO BE INSTALLED OVER SHALL BE SEALED WITH NON–SHRINK GROUT.
5. USE FLEXIBLE BOOT OR LINK SEAL GASKET TO SEAL ALL PENETRATIONS FOR PIPES THAT ENTER THE STRUCTURE THROUGH THE BARREL OF THE MH.

DRAIN MANHOLE (DOGHOUSE)

N.T.S.



REGULAR FLOW SILTSACK ®
(FOR AREAS OF LOW TO MODERATE PRECIPITATION AND RUN-OFF)

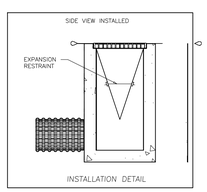
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	600 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80 %
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	0.55 SEC -1

HI-FLOW SILTSACK ®
(FOR AREAS OF MODERATE TO HEAVY PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	135 LBS
MULLEN BURST	ASTM D-3786	420 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90 %
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC -1

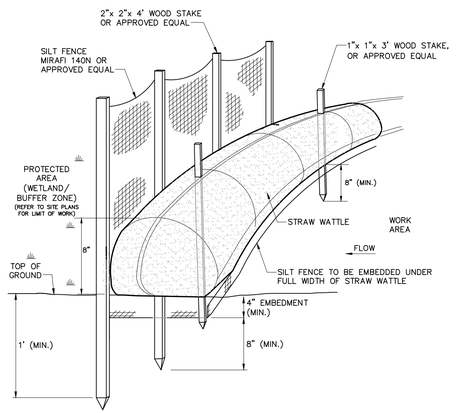
OIL-ABSORBANT SILTSACK ®
(FOR AREAS WHERE THERE IS A CONCERN FOR OIL RUN-OFF OR SPILLS)

DEPENDING ON YOUR PARTICULAR APPLICATION, THE SILTSACK CAN BE MADE FROM EITHER ONE OF THE ABOVE FABRICS WITH AN OIL-ABSORBANT PILLOW INSERT OR, MADE COMPLETELY FROM AN OIL-ABSORBANT SILTSACK® WITH A WOVEN PILLOW INSERT.



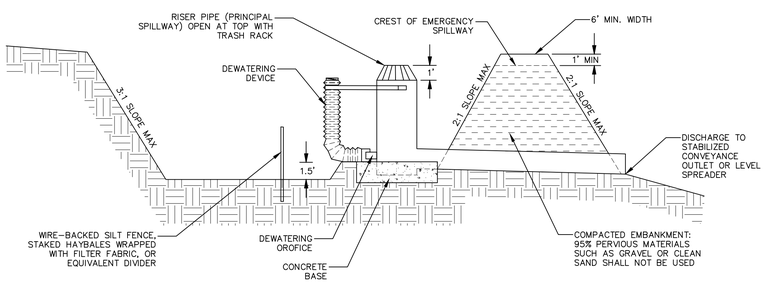
INLET PROTECTION SILT SACK

NOT TO SCALE



SILT FENCE W/ WATTLE DETAIL

NOT TO SCALE



TEMPORARY SEDIMENT BASIN

NOT TO SCALE

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER:	MBL
CHIEF DESIGNER:	MBL
REVIEWED BY:	DATE

SEAL

COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01

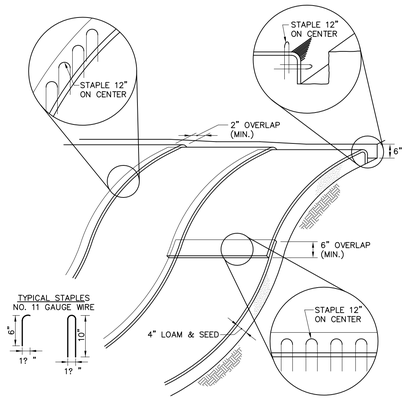
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.5

811 DigSafe MA.ME.NH.RI.VT

C:\Users\JustinWilliams\OneDrive - MBL Land Development & Permitting, Corp (New)\OneDrive - MBL Land Development & Permitting, Corp\MBL Sharepoint\MBL\2021\2021-036\CIVIL\Plot\2021-036-Innovation Way-Site Planset- Master-LM-ERO-DTL-REV1.dwg, 11/22/2023 11:41:26 AM
UCS:
MS VIEW:
LMAN:
CTB:

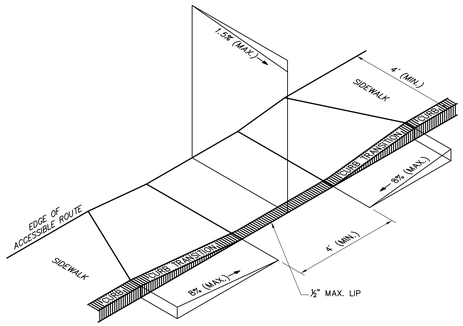


NOTES:

1. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH BACKFILL AND COMPACT TRENCH AFTER STAPLING.
2. ROLL THE BLANKET DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW.
3. THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
4. WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE BLANKET END OVER END WITH 6 INCH (MIN.) OVERLAP AND ANCHOR DOWN SLOPE BLANKET IN A 6 INCH DEEP TRENCH.

BLANKET SLOPE STABILIZATION DETAIL

NOT TO SCALE

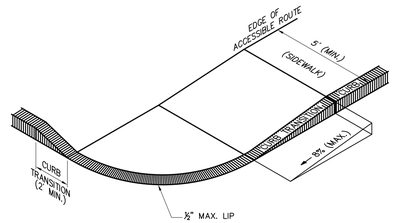


NOTES:

1. THE MAXIMUM ALLOWABLE ROUTE (SIDEWALK) AND CURB RAMP CROSS SLOPES SHALL BE 1.5%.
2. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE CURB RAMPS SHALL BE 8%.
4. A MINIMUM OF 4 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.)
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. BASE OF RAMP SHALL BE GRADED TO PREVENT PONDING.
7. SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.

ACCESSIBLE CURB RAMP – TYPE 'A'

NOT TO SCALE



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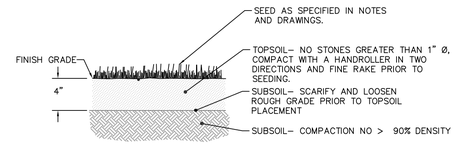
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. BASE OF RAMP SHALL BE GRADED TO PREVENT PONDING.
7. SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.

ACCESSIBLE CURB RAMP – TYPE 'B'

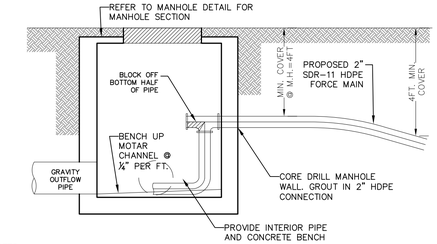
NOT TO SCALE



NOTES:
1. SEE LANDSCAPE GRADING SPECIFICATIONS FOR TOPSOIL REQUIREMENTS.
2. CONFIRM SUBGRADES ARE CORRECT AND POSITIVE DRAINAGE IS MAINTAINED PRIOR TO PLACEMENT OF TOPSOIL.
3. NOTIFY ENGINEER/LANDSCAPE ARCHITECT FOR REVIEW OF SUBGRADE PRIOR TO PLACEMENT OF THE TOPSOIL.

LOAM AND SEED DETAIL

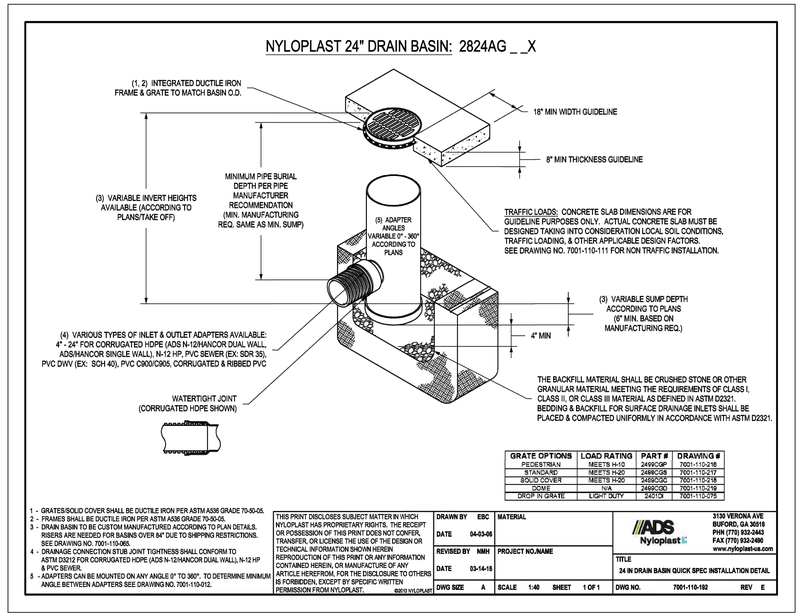
NOT TO SCALE



NOTES
1. ALL CONSTRUCTION AT FORCE MAIN CONNECTION TO SEWER MANHOLE SHALL BE SEALED WATERTIGHT.
2. SUBMIT SHOP DRAWING TO ENGINEER FOR APPROVAL.

SEWER MANHOLE FORCE MAIN INLET DETAIL

NOT TO SCALE



GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
PEDESTRIAN	MEETS H-10	2499CGP	7001-110-216
STANDARD	MEETS H-20	2499CGS	7001-110-217
SOLID COVER	MEETS H-20	2499CGSC	7001-110-218
DOME	N/A	2499CGD	7001-110-219
DROP IN GRATE	LIGHT DUTY	2451CR	7001-110-075

1 - GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-60-05.
2 - FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-60-05.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP & PVC SEWER.
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.

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DRAWN BY	EBC	MATERIAL	
DATE	04-03-06		
REVISED BY	NMH	PROJECT NO./NAME	
DATE	03-14-16		
DWG SIZE	A	SCALE 1:40	SHEET 1 OF 1

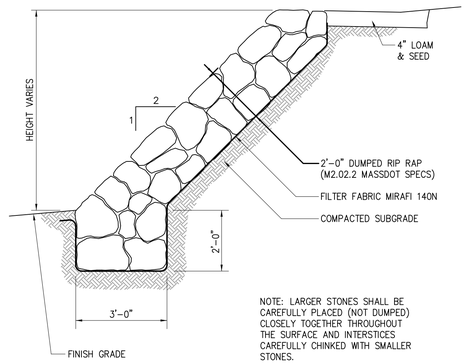
ADS Nyloplast — 3130 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2490 www.nyloplast-us.com

TITLE: 24 IN DRAIN BASIN QUICK SPEC INSTALLATION DETAIL

DWG NO. 7001-110-102 REV E

24" NYLOPLAST TYPICAL DETAIL

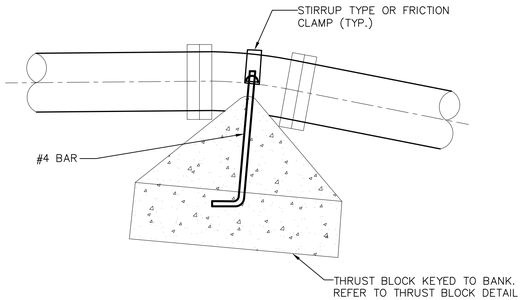
NOT TO SCALE



NOTE: LARGER STONES SHALL BE CAREFULLY PLACED (NOT DUMPED) CLOSELY TOGETHER THROUGHOUT THE SURFACE AND INTERSTICES CAREFULLY CHINKED WITH SMALLER STONES.

RIP–RAP SLOPE STABILIZATION DETAIL

NOT TO SCALE



VERTICAL FORCE MAIN THRUST BLOCK DETAIL

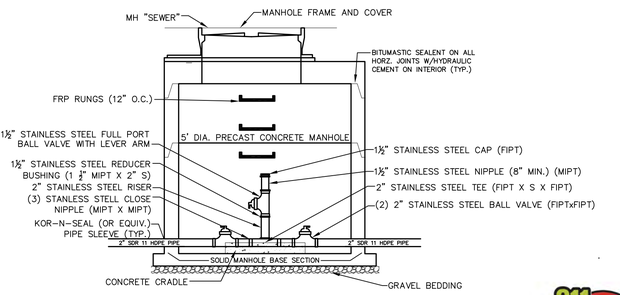
NOT TO SCALE

ABBREVIATIONS

MIPT	MALE IRON PIPE THREADED
FIPT	FEMALE IRON PIPE THREADED
S	SOLVENT WELD JOINT
G	GASKET JOINT

NOTES:

1. ALL CONCRETE SHALL BE 4000 PSI @ 28 DAYS.
2. CONCRETE THRUST BLOCKS SHALL BEAR AGAINST MANHOLE WALL OR UNDISTURBED EARTH AS APPLICABLE.
3. ALL FORCE MAIN BENDS, TEES, MAIN TAPS, AND END CAPS SHALL REQUIRE A CONCRETE THRUST BLOCK.
4. ALL PIPING AND FITTINGS INSIDE MANHOLES SHALL BE HDPE SDR–11 OR STAINLESS STEEL AS SHOWN. PIPING BEYOND 2 FT. OF MANHOLE WALL IN EITHER DIRECTION SHALL BE HDPE SDR–11.
5. BALL VALVES ON PRESSURE MAIN SHALL BE SAME SIZE AS PRESSURE SEWER MAIN AND SHALL HAVE OPERATING LEVERS.



IN LINE FLUSHING CONNECTION

SEWER FORCE MAIN CLEANOUT MANHOLE DETAIL

NOT TO SCALE

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL — COMMONWEALTH OF MASSACHUSETTS — TRACY L. DUARTE — CIVIL — NO. 48660 — REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
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GRAPHIC SCALE

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SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01

FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.6

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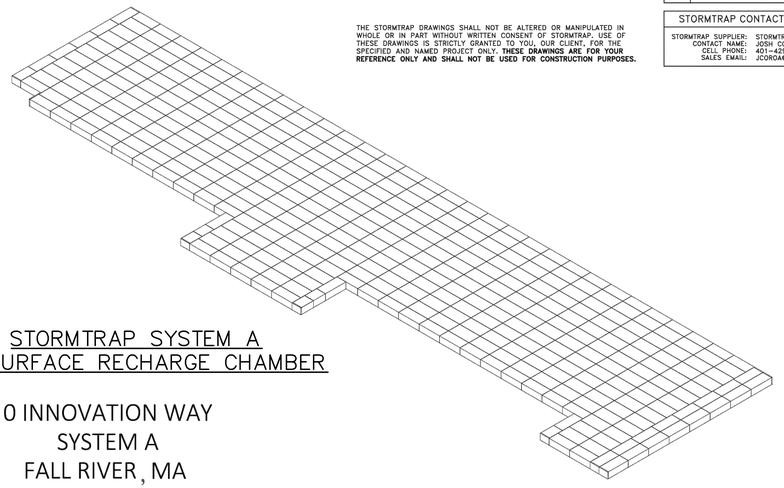
UCS: MS VIEW: LMAN: CTB:

StormTrap®
MODULAR CONCRETE STORMWATER MANAGEMENT



STORMTRAP SYSTEM A
SUBSURFACE RECHARGE CHAMBER

0 INNOVATION WAY
SYSTEM A
FALL RIVER, MA

THE STORMTRAP DRAWINGS SHALL NOT BE ALTERED OR MANIPULATED IN WHOLE OR IN PART WITHOUT WRITTEN CONSENT OF STORMTRAP. USE OF THESE DRAWINGS IS STRICTLY GRANTED TO YOU, OUR CLIENT, FOR THE SPECIFIED AND NAMED PROJECT ONLY. **THESE DRAWINGS ARE FOR YOUR REFERENCE ONLY AND SHALL NOT BE USED FOR CONSTRUCTION PURPOSES.**

SHEET INDEX

PAGE	DESCRIPTION
0.0	COVER SHEET
1.0	SINGLETRAP DESIGN CRITERIA
2.0	SINGLETRAP SYSTEM LAYOUT
3.0	SINGLETRAP INSTALLATION SPECIFICATIONS
3.1	SINGLETRAP INSTALLATION SPECIFICATIONS
4.0	SINGLETRAP BACKFILL SPECIFICATIONS
5.0	RECOMMENDED PIPE/ACCESS OPENING SPECIFICATIONS
6.0	SPLASH PAD & GEOWEB DETAILS
7.0	SINGLETRAP MODULE TYPES

STORMTRAP CONTACT INFORMATION

STORMTRAP SUPPLIER: STORMTRAP
CONTACT NAME: JOSH COROA
CELL PHONE: 401-428-3491
SALES EMAIL: JCOROA@STORMTRAP.COM

StormTrap®
PATENTS LISTED AT: [HTTPS://STORMTRAP.COM/PATENT]
1287 WINDHAM PARKWAY
ROMEOVILLE, IL 60446
P:815-941-4549 / F:331-318-5347

ENGINEER INFORMATION:

MBL LAND DEVELPOMENT & PERMITTING
5 BRISTOL DR, SUITE 3A
EASTON, MA 02375
508-297-2746

PROJECT INFORMATION:

0 INNOVATION WAY
SYSTEM A
FALL RIVER, MA

CURRENT ISSUE DATE: 8/10/2022

ISSUED FOR: PRELIMINARY

REV.	DATE:	ISSUED FOR:	DWN BY:
2	8/10/2022	PRELIMINARY	DG
1	8/3/2022	PRELIMINARY	DG

SCALE: NTS

SHEET TITLE: COVER SHEET

SHEET NUMBER: 0.0

STRUCTURAL DESIGN LOADING CRITERIA

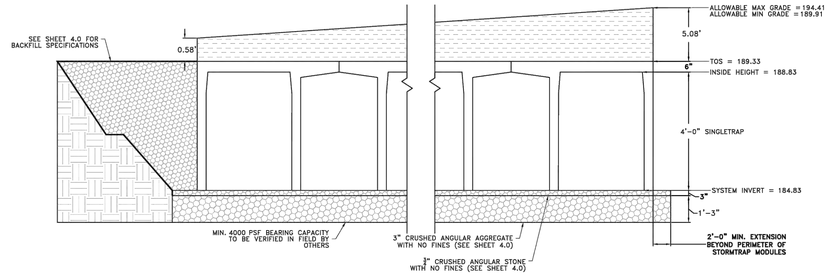
LIVE LOADING: **AASHTO HS-20 HIGHWAY LOADING**
GROUND WATER TABLE: BELOW INVERT OF SYSTEM
SOIL BEARING PRESSURE: 4000PSF
SOIL DENSITY: 120 PCF
EQUIVALENT UNSATURATED LATERAL ACTIVE EARTH PRESSURE: 35 PSF / FT.
EQUIVALENT SATURATED LATERAL ACTIVE EARTH PRESSURE: 80 PSF/FT. (IF WATER TABLE PRESENT)
APPLICABLE CODES: ASTM C857, ACI-318
BACKFILL TYPE: SEE SHEET 4.0 FOR BACKFILL OPTIONS

STORMTRAP SYSTEM INFORMATION

WATER STORAGE PROV: 183,519.66 CUBIC FEET
UNIT HEADROOM: 4'-0" SINGLETRAP

SITE SPECIFIC DESIGN CRITERIA

1. STORMTRAP UNITS SHALL BE MANUFACTURED AND INSTALLED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER OF RECORD. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ROOF OPENINGS AND INLET/ OUTLET PIPE TYPES, SIZES, INVERT ELEVATIONS AND SIZE OF OPENINGS.
2. COVER RANGE: MIN. 0.58' MAX. 5.08' CONSULT STORMTRAP FOR ADDITIONAL COVER OPTIONS.
3. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER AND SOIL BEARING CAPACITY ARE REQUIRED TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO STORMTRAP INSTALLATION.
4. FOR STRUCTURAL CALCULATIONS THE GROUND WATER TABLE IS ASSUMED TO BE BELOW INVERT OF SYSTEM IF WATER TABLE IS DIFFERENT THAN ASSUMED, CONTACT STORMTRAP.



4'-0" SINGLETRAP

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ROMEOVILLE, IL 60446
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ENGINEER INFORMATION:

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EASTON, MA 02375
508-297-2746

PROJECT INFORMATION:

0 INNOVATION WAY
SYSTEM A
FALL RIVER, MA

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2	8/10/2022	PRELIMINARY	DG
1	8/3/2022	PRELIMINARY	DG

SCALE: NTS

SHEET TITLE: SINGLETRAP DESIGN CRITERIA

SHEET NUMBER: 1.0

BILL OF MATERIALS

QTY.	UNIT TYPE	DESCRIPTION	WEIGHT
--	I	4'-0" SINGLETRAP	0
325	II	4'-0" SINGLETRAP	16802
--	III	4'-0" SINGLETRAP	0
82	IV	4'-0" SINGLETRAP	15104
--	VII	4'-0" SINGLETRAP	0
8	SPIV	4'-0" SINGLETRAP	VARIES
1	T2 PANEL	6" THICK PANEL	2841
9	T4 PANEL	6" THICK PANEL	2236
--	T7 PANEL	6" THICK PANEL	0
74	JOINTWRAP	150' PER ROLL	
0	JOINTTAPE	14.5' PER ROLL	
TOTAL PIECES = 415			
TOTAL PANELS = 10			
HEAVIEST PICK WEIGHT = 16,802			

LOADING DISCLAIMER:

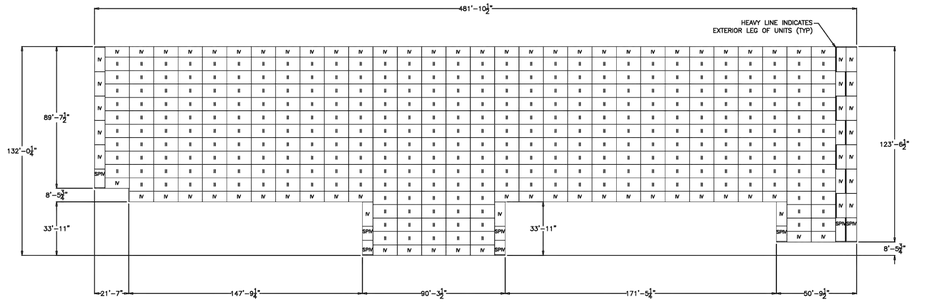
STORMTRAP IS NOT DESIGNED TO ACCEPT ANY ADDITIONAL LOADINGS FROM NEARBY STRUCTURES NEXT TO OR OVER THE TOP OF STORMTRAP. IF ADDITIONAL LOADING CONSIDERATIONS ARE REQUIRED FOR STRUCTURAL DESIGN OF STORMTRAP, PLEASE CONTACT STORMTRAP IMMEDIATELY.

TREE LOADING DISCLAIMER:

THE STORMTRAP SYSTEM HAS NOT BEEN DESIGNED TO SUPPORT THE ADDITIONAL WEIGHT OF ANY TREES. FURTHERMORE, THE ROOTS OF THE TREES MUST BE CONTAINED TO PREVENT FUTURE DAMAGE TO THE STORMTRAP SYSTEM. STORMTRAP ACCEPTS NO LIABILITY FOR DAMAGES CAUSED BY TREES OR OTHER VEGETATION PLACE AROUND OR ON TOP OF THE SYSTEM.

DESIGN CRITERIA
ALLOWABLE MAX GRADE = 194.41
ALLOWABLE MIN GRADE = 189.91
INSIDE HEIGHT ELEVATION = 188.83
SYSTEM INVERT = 184.83

NOTES:
1. DIMENSIONING OF STORMTRAP SYSTEM SHOWN BELOW ALLOW FOR A 3/4" GAP BETWEEN EACH MODULE.
2. ALL DIMENSIONS TO BE VERIFIED IN THE FIELD BY OTHERS.
3. SEE SHEET 3.0 FOR INSTALLATION SPECIFICATIONS.
4. SEE SHEETS 6.0 & 6.1 FOR SPLASH PAD DETAILS AND LAYOUT.
5. SP – INDICATES A MODULE WITH MODIFICATIONS.
6. P – INDICATES A MODULE WITH A PANEL ATTACHMENT.
7. CONTRACTORS RESPONSIBILITY TO ENSURE CONSISTENCY/ACCURACY TO FINAL ENGINEER OF RECORD PLAN SET.



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ENGINEER INFORMATION:

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EASTON, MA 02375
508-297-2746

PROJECT INFORMATION:

0 INNOVATION WAY
SYSTEM A
FALL RIVER, MA

CURRENT ISSUE DATE: 8/10/2022

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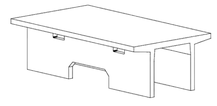
REV.	DATE:	ISSUED FOR:	DWN BY:
2	8/10/2022	PRELIMINARY	DG
1	8/3/2022	PRELIMINARY	DG

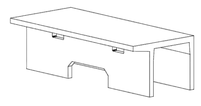
SCALE: NTS

SHEET TITLE: SINGLETRAP LAYOUT DETAILS

SHEET NUMBER: 2.0



TYPE II



TYPE IV

TYPE II END PANEL

TYPE IV END PANEL

NOTES:
1. OPENING LOCATIONS AND SHAPES MAY VARY.
2. SP – INDICATES A MODULE WITH MODIFICATIONS.
3. P – INDICATES A MODULE WITH A PANEL ATTACHMENT.
4. POCKET WINDOW OPENINGS ARE OPTIONAL.

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1	8/3/2022	PRELIMINARY	DG

SCALE: NTS

SHEET TITLE: SINGLETRAP MODULE TYPES

SHEET NUMBER: 7.0

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No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 49660
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

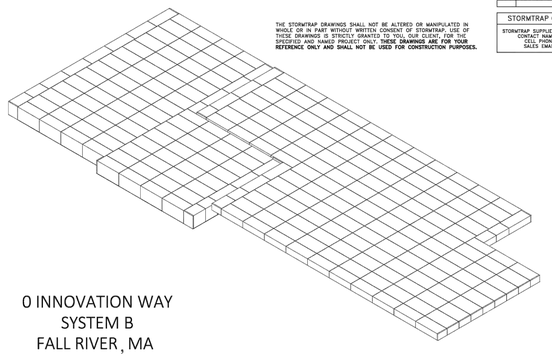
DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.7

UCS: C:\Users\JustinWilliams\OneDrive - MBL Land Development & Permitting, Corp (New)\OneDrive - MBL Land Development & Permitting, Corp\MBL Sharepoint\MBL\2021\2021-036\CIV\LIPlot\2021-036-Innovation Way-Site Planset- Master-LM-ERO-DTL-REV1.dwg, 11/22/2023 11:51:09 AM
CTB:
LMAN:
MS VIEW:

StormTrap
MODULAR CONCRETE STORMWATER MANAGEMENT



0 INNOVATION WAY
SYSTEM B
FALL RIVER, MA

THE STORMTRAP DRAWINGS SHALL NOT BE ALTERED OR MANIPULATED IN WHOLE OR IN PART WITHOUT WRITTEN CONSENT OF STORMTRAP. USE OF THESE DRAWINGS IS STRICTLY GRANTED TO YOU, OUR CLIENT, FOR THE SPECIFIED AND NAMED PROJECT ONLY. **THESE DRAWINGS ARE FOR YOUR REFERENCE ONLY AND SHALL NOT BE USED FOR CONSTRUCTION PURPOSES.**

SHEET INDEX

PAGE	DESCRIPTION
0.0	COVER SHEET
1.0	SINGLETRAP DESIGN CRITERIA
1.1	SINGLETRAP DESIGN CRITERIA
1.2	SINGLETRAP OVERDIG DETAILS
2.0	SINGLETRAP SYSTEM LAYOUT
3.0	SINGLETRAP INSTALLATION SPECIFICATIONS
3.1	SINGLETRAP INSTALLATION SPECIFICATIONS
4.0	SINGLETRAP BACKFILL SPECIFICATIONS
5.0	RECOMMENDED INSP/ACCESS OPENING SPECIFICATIONS
6.0	SPLASH PAD & GEOWEB DETAILS
7.0	SINGLETRAP MODULE TYPES

STORMTRAP CONTACT INFORMATION

STORMTRAP SUPPLIER: STORMTRAP
CONTACT NAME: JOSH CORDA
CELL PHONE: 401-499-3481
SALES EMAIL: JCORDA@STORMTRAP.COM

StormTrap
MODELS USED AS [MFR]/[STORMWATER][ENGINEER]
1287 WINDHAM THRONBY
ROMEDALE, IL 60446
P.815-941-4548 / F.331-318-5347

ENGINEER INFORMATION:
MBL LAND DEVELOPMENT & PERMITTING
5 BRISTOL DR, SUITE 3A
EASTON, MA 02375
508-297-2746

PROJECT INFORMATION:
0 INNOVATION WAY
SYSTEM B
FALL RIVER, MA

CURRENT ISSUE DATE:
11/18/2022

ISSUED FOR:
PRELIMINARY

REV.	DATE:	ISSUED FOR:	OWN BY:
3	11/18/22	PRELIMINARY	KS
2	10/24/22	PRELIMINARY	DG
1	8/8/2022	PRELIMINARY	DG

SCALE: NTS

SHEET TITLE: COVER SHEET

SHEET NUMBER: 0.0

STRUCTURAL DESIGN LOADING CRITERIA

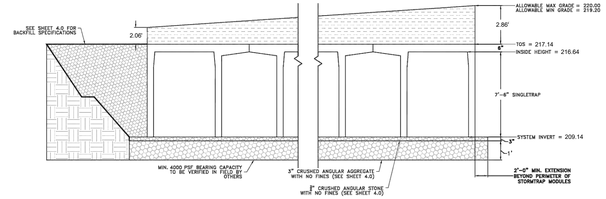
LIVE LOADING: **AASHTO HS-20 HIGHWAY LOADING**
GROUND WATER TABLE: BELOW INVERT OF SYSTEM
SOIL BEARING PRESSURE: 4000PSF
SOIL DENSITY: 120 PCF
EQUIVALENT UNSATURATED
LATERAL ACTIVE EARTH PRESSURE: 35 PSF / FT.
EQUIVALENT SATURATED
LATERAL ACTIVE EARTH PRESSURE: 80 PSF/FT. (IF WATER TABLE PRESENT)
APPLICABLE CODES: ASTM C857
ACI-318
BACKFILL TYPE: SEE SHEET 4.0 FOR BACKFILL OPTIONS

STORMTRAP SYSTEM INFORMATION

WATER STORAGE PROV: 83,575.39 CUBIC FEET
UNIT HEADROOM: 3'-6" SINGLETRAP

SITE SPECIFIC DESIGN CRITERIA

1. STORMTRAP UNITS SHALL BE MANUFACTURED AND INSTALLED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER OF RECORD. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ROOF OPENINGS AND INLET/ OUTLET PIPE TYPES, SIZES, INVERT ELEVATIONS AND SIZE OF OPENINGS.
2. COVER RANGE: MIN. 3.14' MAX. 3.94' CONSULT STORMTRAP FOR ADDITIONAL COVER OPTIONS.
3. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER AND SOIL BEARING CAPACITY ARE REQUIRED TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO STORMTRAP INSTALLATION.
4. FOR STRUCTURAL CALCULATIONS THE GROUND WATER TABLE IS ASSUMED TO BE BELOW INVERT OF SYSTEM IF WATER TABLE IS DIFFERENT THAN ASSUMED, CONTACT STORMTRAP.



7'-6" SINGLETRAP

STRUCTURAL DESIGN LOADING CRITERIA

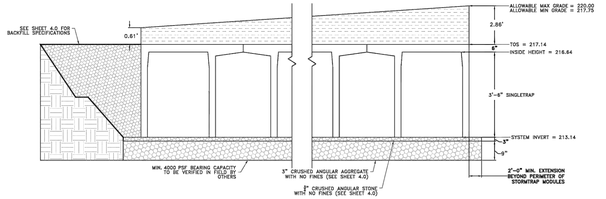
LIVE LOADING: **AASHTO HS-20 HIGHWAY LOADING**
GROUND WATER TABLE: BELOW INVERT OF SYSTEM
SOIL BEARING PRESSURE: 4000PSF
SOIL DENSITY: 120 PCF
EQUIVALENT UNSATURATED
LATERAL ACTIVE EARTH PRESSURE: 35 PSF / FT.
EQUIVALENT SATURATED
LATERAL ACTIVE EARTH PRESSURE: 80 PSF/FT. (IF WATER TABLE PRESENT)
APPLICABLE CODES: ASTM C857
ACI-318
BACKFILL TYPE: SEE SHEET 4.0 FOR BACKFILL OPTIONS

STORMTRAP SYSTEM INFORMATION

WATER STORAGE PROV: 59,884.76 CUBIC FEET
UNIT HEADROOM: 3'-6" SINGLETRAP

SITE SPECIFIC DESIGN CRITERIA

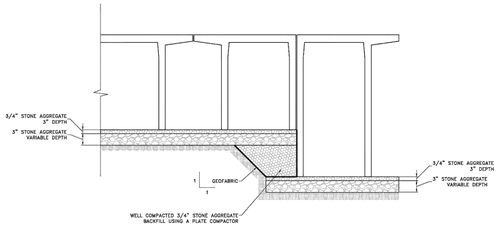
1. STORMTRAP UNITS SHALL BE MANUFACTURED AND INSTALLED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER OF RECORD. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ROOF OPENINGS AND INLET/ OUTLET PIPE TYPES, SIZES, INVERT ELEVATIONS AND SIZE OF OPENINGS.
2. COVER RANGE: MIN. 0.61' MAX. 2.86' CONSULT STORMTRAP FOR ADDITIONAL COVER OPTIONS.
3. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER AND SOIL BEARING CAPACITY ARE REQUIRED TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO STORMTRAP INSTALLATION.
4. FOR STRUCTURAL CALCULATIONS THE GROUND WATER TABLE IS ASSUMED TO BE BELOW INVERT OF SYSTEM IF WATER TABLE IS DIFFERENT THAN ASSUMED, CONTACT STORMTRAP.



3'-6" SINGLETRAP

STORMTRAP SYSTEM B
SUBSURFACE RECHARGE CHAMBER

NOT TO SCALE



SINGLETRAP EXTERIOR STONE – SINGLETRAP OVERDIG

SHEET TITLE: SINGLETRAP OVERDIG DETAILS

SHEET NUMBER: 1.2

BILL OF MATERIALS

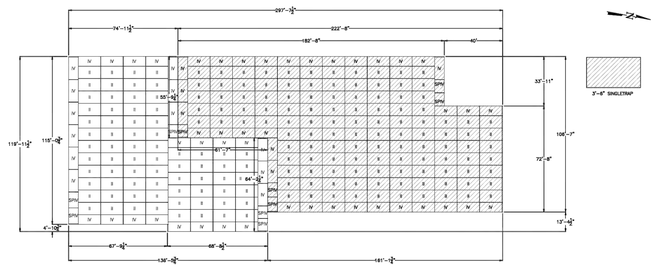
QTY.	UNIT TYPE	DESCRIPTION	WEIGHT
72	II	7'-6" SINGLETRAP	22754
28	IV	7'-6" SINGLETRAP	22287
5	SPIV	7'-6" SINGLETRAP	VARIES
118	II	3'-6" SINGLETRAP	13648
34	IV	3'-6" SINGLETRAP	11810
5	SPIV	3'-6" SINGLETRAP	VARIES
5	1x PANEL	7'x8" THICK PANEL	2727
1	1? PANEL	7'x8" THICK PANEL	2717
5	1x PANEL	3'x8" THICK PANEL	1243
7	1? PANEL	3'x8" THICK PANEL	1578
48	JOINT WRAP 150' PER ROLL		
0	JOINT TAPE 14.5' PER ROLL		
	TOTAL 7'-6" PIECES = 105		
	TOTAL 3'-6" PIECES = 157		
	TOTAL 7'-6" PANELS = 6		
	TOTAL 3'-6" PANELS = 12		
	HEAVIEST PICK WEIGHT = 22,754		

LOADING DISCLAIMER:

STORMTRAP IS NOT DESIGNED TO ACCEPT ANY ADDITIONAL LOADINGS FROM NEARBY STRUCTURES NEXT TO OR OVER THE TOP OF STORMTRAP. IF ADDITIONAL LOADING CONSIDERATIONS ARE REQUIRED FOR STRUCTURAL DESIGN OF STORMTRAP, PLEASE CONTACT STORMTRAP IMMEDIATELY.

TREE LOADING DISCLAIMER:

THE STORMTRAP SYSTEM HAS NOT BEEN DESIGNED TO SUPPORT THE ADDITIONAL WEIGHT OF ANY TREES. FURTHERMORE, THE ROOTS OF THE TREES MUST BE CONTAINED TO PREVENT FUTURE DAMAGE TO THE STORMTRAP SYSTEM. STORMTRAP ACCEPTS NO LIABILITY FOR DAMAGES CAUSED BY TREES OR OTHER VEGETATION PLACE AROUND OR ON TOP OF THE SYSTEM.



DESIGN CRITERIA 7'-6"
ALLOWABLE MAX GRADE = 220.00
ALLOWABLE MIN GRADE = 219.35
INSIDE HEIGHT ELEVATION = 213.58
7'-6" SYSTEM INVERT = 208.06

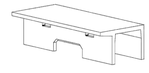
DESIGN CRITERIA 3'-6"
ALLOWABLE MAX GRADE = 220.00
ALLOWABLE MIN GRADE = 217.75
INSIDE HEIGHT ELEVATION = 213.64
3'-6" SYSTEM INVERT = 213.14

NOTES:
1. DIMENSIONING OF STORMTRAP SYSTEM SHOWN BELOW ALLOW FOR A 3/4" GAP BETWEEN EACH MODULE.
2. ALL DIMENSIONS TO BE VERIFIED IN THE FIELD BY OTHERS.
3. SEE SHEET 3.0 FOR INSTALLATION SPECIFICATIONS.
4. SEE SHEETS 8.0 & 6.1 FOR SPLASH PAD DETAILS AND LAYOUT.
5. SP – INDICATES A MODULE WITH MODIFICATIONS.
6. P – INDICATES A MODULE WITH A PANEL ATTACHMENT.
7. CONTRACTORS RESPONSIBILITY TO ENSURE CONSISTENCY/ACCURACY TO FINAL ENGINEER OF RECORD PLAN SET.

SHEET TITLE: SINGLETRAP LAYOUT DETAILS

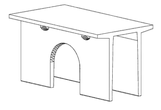
SHEET NUMBER: 2.0

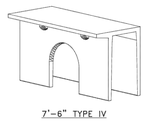
3'-6" TYPE II


3'-6" TYPE IV

3'-6" TYPE II END PANEL

3'-6" TYPE IV END PANEL


7'-6" TYPE II


7'-6" TYPE IV

7'-6" TYPE IV END PANEL

7'-6" TYPE VII END PANEL

NOTES:
1. OPENING LOCATIONS AND SHAPES MAY VARY.
2. SP – INDICATES A MODULE WITH MODIFICATIONS.
3. P – INDICATES A MODULE WITH A PANEL ATTACHMENT.
4. POCKET WINDOW OPENINGS ARE OPTIONAL.

SHEET TITLE: SINGLETRAP MODULE TYPES

SHEET NUMBER: 7.0

811 DigSafe MA.ME.NH.RI.VT

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER:	MBL
CHIEF DESIGNER:	MBL
REVIEWED BY:	DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.8

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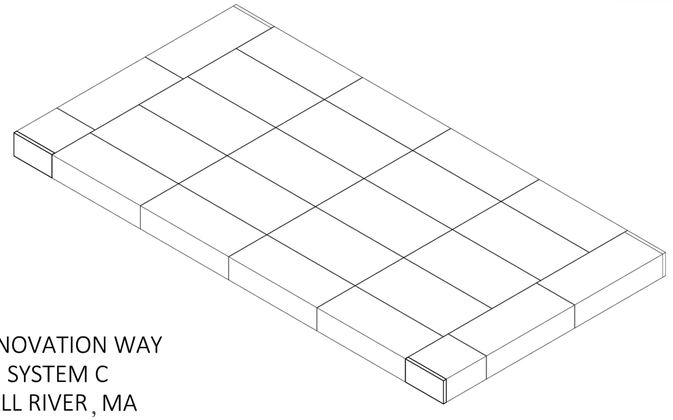
MS VIEW:
LMAN:
CTB:

StormTrap®
MODULAR CONCRETE STORMWATER MANAGEMENT

STORMTRAP SYSTEM C SUBSURFACE RECHARGE CHAMBER

NOT TO SCALE



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0 INNOVATION WAY
SYSTEM C
FALL RIVER, MA

SHEET INDEX

PAGE	DESCRIPTION
0.0	COVER SHEET
1.0	SINGLETRAP DESIGN CRITERIA
2.0	SINGLETRAP SYSTEM LAYOUT
3.0	SINGLETRAP INSTALLATION SPECIFICATIONS
3.1	SINGLETRAP INSTALLATION SPECIFICATIONS
4.0	SINGLETRAP BACKFILL SPECIFICATIONS
5.0	RECOMMENDED PIPE/ACCESS OPENING SPECIFICATIONS
6.0	SPLASH PAD & GEOWEB DETAILS
7.0	SINGLETRAP MODULE TYPES

STORMTRAP CONTACT INFORMATION

STORMTRAP SUPPLIER: STORMTRAP
CONTACT NAME: JOSH COROA
CELL PHONE: 401-423-3491
SALES EMAIL: JCOROA@STORMTRAP.COM

StormTrap®
PATENTS LISTED AT: [HTTPS://STORMTRAP.COM/PATENT]
1287 WINDHAM PARKWAY
ROMEOVILLE, IL 60446
P:815-941-4549 / F:331-318-5347

ENGINEER INFORMATION:

MBL LAND DEVELOPMENT & PERMITTING
5 BRISTOL DR, SUITE 3A
EASTON, MA 02375
508-297-2746

PROJECT INFORMATION:

0 INNOVATION WAY
SYSTEM C
GALL RIVER, MA

CURRENT ISSUE DATE: 11/18/2022

ISSUED FOR: PRELIMINARY

REV.	DATE:	ISSUED FOR:	DWN BY:
1	11/18/2022	PRELIMINARY	KS
1	8/3/2022	PRELIMINARY	DG

SCALE: NTS

SHEET TITLE: COVER SHEET

SHEET NUMBER: 0.0

STRUCTURAL DESIGN LOADING CRITERIA

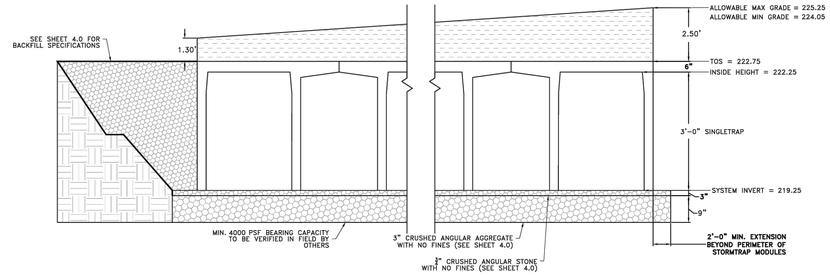
LIVE LOADING: **AASHTO HS-20 HIGHWAY LOADING**
GROUND WATER TABLE: BELOW INVERT OF SYSTEM
SOIL BEARING PRESSURE: 4000PSF
SOIL DENSITY: 120 PCF
EQUIVALENT UNSATURATED LATERAL ACTIVE EARTH PRESSURE: 35 PSF / FT.
EQUIVALENT SATURATED LATERAL ACTIVE EARTH PRESSURE: 80 PSF/FT. (IF WATER TABLE PRESENT)
APPLICABLE CODES: ASTM C857, ACI-318
BACKFILL TYPE: SEE SHEET 4.0 FOR BACKFILL OPTIONS

STORMTRAP SYSTEM INFORMATION

WATER STORAGE PROV: 7681.54 CUBIC FEET
UNIT HEADROOM: 3'-0" SINGLETRAP

SITE SPECIFIC DESIGN CRITERIA

1. STORMTRAP UNITS SHALL BE MANUFACTURED AND INSTALLED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER OF RECORD. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ROOF OPENINGS AND INLET/ OUTLET PIPE TYPES, SIZES, INVERT ELEVATIONS AND SIZE OF OPENINGS.
2. COVER RANGE: MIN. 1.30" MAX. 2.50' CONSULT STORMTRAP FOR ADDITIONAL COVER OPTIONS.
3. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER AND SOIL BEARING CAPACITY ARE REQUIRED TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO STORMTRAP INSTALLATION.
4. FOR STRUCTURAL CALCULATIONS THE GROUND WATER TABLE IS ASSUMED TO BE BELOW INVERT OF SYSTEM IF WATER TABLE IS DIFFERENT THAN ASSUMED, CONTACT STORMTRAP.



3'-0" SINGLETRAP

StormTrap®
PATENTS LISTED AT: [HTTPS://STORMTRAP.COM/PATENT]
1287 WINDHAM PARKWAY
ROMEOVILLE, IL 60446
P:815-941-4549 / F:331-318-5347
ENGINEER INFORMATION:
MBL LAND DEVELOPMENT & PERMITTING
5 BRISTOL DR, SUITE 3A
EASTON, MA 02375
508-297-2746
PROJECT INFORMATION:
0 INNOVATION WAY
SYSTEM C
GALL RIVER, MA
CURRENT ISSUE DATE: 11/18/2022
ISSUED FOR: PRELIMINARY

REV.	DATE:	ISSUED FOR:	DWN BY:
1	11/18/2022	PRELIMINARY	KS
1	8/3/2022	PRELIMINARY	DG

SCALE: NTS

SHEET TITLE: SINGLETRAP DESIGN CRITERIA

SHEET NUMBER: 1.0

BILL OF MATERIALS

QTY.	UNIT TYPE	DESCRIPTION	WEIGHT
0	I	3'-0" SINGLETRAP	0
12	II	3'-0" SINGLETRAP	14886
0	III	3'-0" SINGLETRAP	0
12	IV	3'-0" SINGLETRAP	13188
0	VII	3'-0" SINGLETRAP	0
2	SPIV	3'-0" SINGLETRAP	VARIES
0	T2 PANEL	6" THICK PANEL	0
4	T4 PANEL	6" THICK PANEL	1740
0	T7 PANEL	6" THICK PANEL	0
5	JOINTWRAP	150' PER ROLL	
0	JOINTTAPE	14.5' PER ROLL	
TOTAL PIECES = 26			
TOTAL PANELS = 4			
HEAVIEST PICK WEIGHT = 14,886			

LOADING DISCLAIMER:

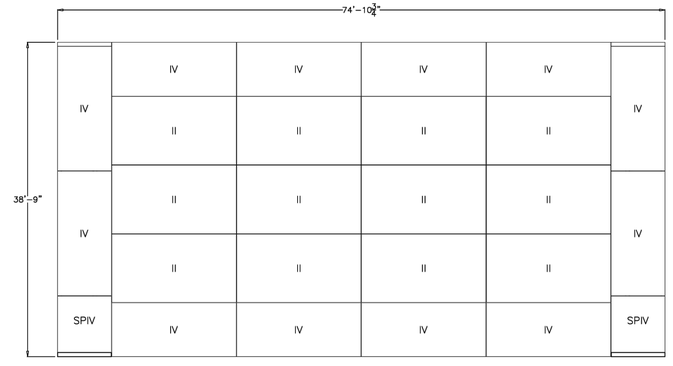
STORMTRAP IS NOT DESIGNED TO ACCEPT ANY ADDITIONAL LOADINGS FROM NEARBY STRUCTURES NEXT TO OR OVER THE TOP OF STORMTRAP. IF ADDITIONAL LOADING CONSIDERATIONS ARE REQUIRED FOR STRUCTURAL DESIGN OF STORMTRAP, PLEASE CONTACT STORMTRAP IMMEDIATELY.

TREE LOADING DISCLAIMER:

THE STORMTRAP SYSTEM HAS NOT BEEN DESIGNED TO SUPPORT THE ADDITIONAL WEIGHT OF ANY TREES. FURTHERMORE, THE ROOTS OF THE TREES MUST BE CONTAINED TO PREVENT FUTURE DAMAGE TO THE STORMTRAP SYSTEM. STORMTRAP ACCEPTS NO LIABILITY FOR DAMAGES CAUSED BY TREES OR OTHER VEGETATION PLACE AROUND OR ON TOP OF THE SYSTEM.

DESIGN CRITERIA
ALLOWABLE MAX GRADE = 225.25
ALLOWABLE MIN GRADE = 224.05
INSIDE HEIGHT ELEVATION= 222.25
SYSTEM INVERT = 219.25

NOTES:
1. DIMENSIONING OF STORMTRAP SYSTEM SHOWN BELOW ALLOW FOR A 3/4" GAP BETWEEN EACH MODULE.
2. ALL DIMENSIONS TO BE VERIFIED IN THE FIELD BY OTHERS.
3. SEE SHEET 3.0 FOR INSTALLATION SPECIFICATIONS.
4. SEE SHEETS 6.0 & 6.1 FOR SPLASH PAD DETAILS AND LAYOUT.
5. SP – INDICATES A MODULE WITH MODIFICATIONS.
6. P – INDICATES A MODULE WITH A PANEL ATTACHMENT.
7. CONTRACTORS RESPONSIBILITY TO ENSURE CONSISTENCY/ACCURACY TO FINAL ENGINEER OF RECORD PLAN SET.



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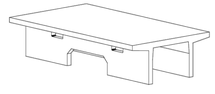
ROMEOVILLE, IL 60446
P:815-941-4549 / F:331-318-5347
ENGINEER INFORMATION:
MBL LAND DEVELOPMENT & PERMITTING
5 BRISTOL DR, SUITE 3A
EASTON, MA 02375
508-297-2746
PROJECT INFORMATION:
0 INNOVATION WAY
SYSTEM C
GALL RIVER, MA
CURRENT ISSUE DATE: 11/18/2022
ISSUED FOR: PRELIMINARY

REV.	DATE:	ISSUED FOR:	DWN BY:
1	11/18/2022	PRELIMINARY	KS
1	8/3/2022	PRELIMINARY	DG

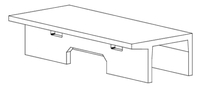
SCALE: NTS

SHEET TITLE: SINGLETRAP LAYOUT DETAILS

SHEET NUMBER: 2.0



TYPE II



TYPE IV

TYPE IV END PANEL

NOTES:
1. OPENING LOCATIONS AND SHAPES MAY VARY.
2. SP – INDICATES A MODULE WITH MODIFICATIONS.
3. P – INDICATES A MODULE WITH A PANEL ATTACHMENT.
4. POCKET WINDOW OPENINGS ARE OPTIONAL.

StormTrap®
PATENTS LISTED AT: [HTTPS://STORMTRAP.COM/PATENT]
1287 WINDHAM PARKWAY
ROMEOVILLE, IL 60446
P:815-941-4549 / F:331-318-5347
ENGINEER INFORMATION:
MBL LAND DEVELOPMENT & PERMITTING
5 BRISTOL DR, SUITE 3A
EASTON, MA 02375
508-297-2746
PROJECT INFORMATION:
0 INNOVATION WAY
SYSTEM C
GALL RIVER, MA
CURRENT ISSUE DATE: 11/18/2022
ISSUED FOR: PRELIMINARY

REV.	DATE:	ISSUED FOR:	DWN BY:
1	11/18/2022	PRELIMINARY	KS
1	8/3/2022	PRELIMINARY	DG

SCALE: NTS

SHEET TITLE: SINGLETRAP MODULE TYPES

SHEET NUMBER: 7.0

811 DigSafe MA.ME.NH.RI.VT

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER:	MBL
CHIEF DESIGNER:	MBL
REVIEWED BY:	DATE

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 49660
REGISTERED PROFESSIONAL ENGINEER

SEAL

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
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P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.9

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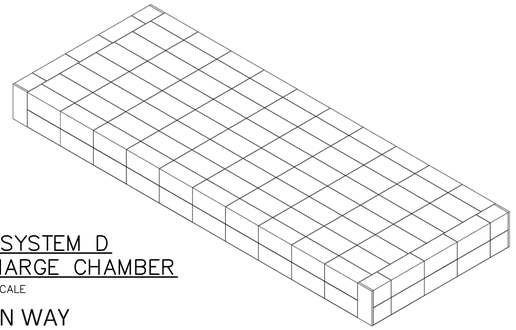
MS VIEW: LMAN: CTB:

StormTrap®
MODULAR CONCRETE
STORMWATER MANAGEMENT

THE STORMTRAP DRAWINGS SHALL NOT BE ALTERED OR MANIPULATED IN WHOLE OR IN PART WITHOUT WRITTEN CONSENT OF STORMTRAP. USE OF THESE DRAWINGS IS STRICTLY GRANTED TO YOU, OUR CLIENT, FOR THE SPECIFIED AND NAMED PROJECT ONLY. **THESE DRAWINGS ARE FOR YOUR REFERENCE ONLY AND SHALL NOT BE USED FOR CONSTRUCTION PURPOSES.**



STORMTRAP SYSTEM D SUBSURFACE RECHARGE CHAMBER

NOT TO SCALE

0 INNOVATION WAY
SYSTEM D
FALL RIVER, MA

SHEET INDEX

PAGE	DESCRIPTION
0.0	COVER SHEET
1.0	DOUBLETRAP DESIGN CRITERIA
2.0	DOUBLETRAP SYSTEM LAYOUT
3.0	DOUBLETRAP INSTALLATION SPECIFICATIONS
3.1	DOUBLETRAP INSTALLATION SPECIFICATIONS
4.0	DOUBLETRAP BACKFILL SPECIFICATIONS
5.0	RECOMMENDED PIPE / ACCESS OPENING SPECIFICATIONS
6.0	DOUBLETRAP MODULE TYPES

STORMTRAP CONTACT INFORMATION

STORMTRAP SUPPLIER: STORMTRAP
CONTACT NAME: JOSH COROA
CELL PHONE: 401-423-3491
SALES EMAIL: JCOROA@STORMTRAP.COM

StormTrap®
PATENTS LISTED AT: HTTP://STORMTRAP.COM/PATENT
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ENGINEER INFORMATION:

MBL LAND DEVELOPMENT & PERMITTING
5 BRISTOL DR, SUITE 3A
EASTON, MA 02375
508-297-2749

PROJECT INFORMATION:

0 INNOVATION WAY
SYSTEM D
FALL RIVER, MA

CURRENT ISSUE DATE: 11/18/2022

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2	11/18/22	PRELIMINARY	EB
1	8/3/2022	PRELIMINARY	DG

SCALE: NTS

SHEET TITLE: COVER SHEET

SHEET NUMBER: 0.0

STRUCTURAL DESIGN LOADING CRITERIA

LIVE LOADING: **AASHTO HS-20 HIGHWAY LOADING**
GROUND WATER TABLE: BELOW INVERT OF SYSTEM
SOIL BEARING PRESSURE: 3000PSF
SOIL DENSITY: 120 PCF
EQUIVALENT UNSATURATED LATERAL ACTIVE EARTH PRESSURE: 35 PSF / FT.
EQUIVALENT SATURATED LATERAL ACTIVE EARTH PRESSURE: 80 PSF/FT. (IF WATER TABLE PRESENT)
APPLICABLE CODES: ASTM C857, ACI-318
BACKFILL TYPE: SEE SHEET 4.0 FOR BACKFILL OPTIONS

STORMTRAP SYSTEM INFORMATION

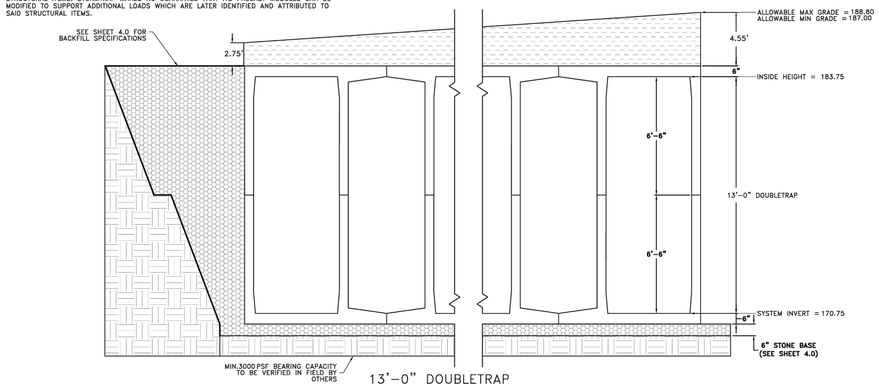
WATER STORAGE PROV: 126,361.67 CUBIC FEET
UNIT HEADROOM: 13'-0" DOUBLETRAP

SITE SPECIFIC DESIGN CRITERIA

1. STORMTRAP UNITS SHALL BE MANUFACTURED AND INSTALLED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER OF RECORD. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ROOF OPENINGS AND INLET/OUTLET PIPE TYPES, SIZES, INVERT ELEVATIONS AND SIZE OF OPENINGS.
2. COVER RANGE: MIN. 2.75' MAX. 4.55' CONSULT STORMTRAP FOR ADDITIONAL COVER OPTIONS.
3. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER AND SOIL BEARING CAPACITY ARE REQUIRED TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO STORMTRAP INSTALLATION.
4. FOR STRUCTURAL CALCULATIONS THE GROUND WATER TABLE IS ASSUMED TO BE BELOW INVERT OF SYSTEM IF WATER TABLE IS DIFFERENT THAN ASSUMED, CONTACT STORMTRAP.
5. **SYSTEM DESIGN MAY ALLOW FOR INCIDENTAL LEAKAGE AND WILL NOT BE SUBJECT TO LEAKAGE TESTING.**

NOTES:
THESE PRELIMINARY DRAWINGS ARE NOT TO BE USED FOR APPROVAL OR CONSTRUCTION PURPOSES. THESE DRAWINGS ARE GENERIC AND DO NOT ACCOUNT FOR SPECIAL CONSIDERATIONS – BE THEY STRUCTURAL OR OTHERWISE – ASSOCIATED WITH ANY NEARBY STRUCTURAL ITEMS OR COMPONENTS.

BUILDING FOOTINGS ARE TO BE SET AT A SUFFICIENT DEPTH AND DISTANCE TO ENSURE THAT THEY EXERT NO LOADS ON THE STORMTRAP SYSTEM. THE DESIGN HERE ASSUMES THAT NO VERTICAL LOADS, SURCHARGE LOADS, OR DIRECT LATERAL LOADS ARE EXERTED ON THE STORMTRAP SYSTEM BY NEARBY BUILDING STRUCTURES, FOUNDATION ELEMENTS, OR RETAINING WALLS. STORMTRAP RESERVES THE RIGHT TO MODIFY THE DESIGN, LAYOUT, AND ORIENTATION OF THE SYSTEM SHOWN HERE TO ADDRESS ANY ISSUES ASSOCIATED WITH NEARBY STRUCTURAL ITEMS. STORMTRAP MAKES NO GUARANTEE THAT ITS PRECAST MODULES CAN BE MODIFIED TO SUPPORT ADDITIONAL LOADS WHICH ARE LATER IDENTIFIED AND ATTRIBUTED TO SAID STRUCTURAL ITEMS.



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ENGINEER INFORMATION:
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SCALE: NTS

SHEET TITLE: DOUBLETRAP DESIGN CRITERIA

SHEET NUMBER: 1.0

BILL OF MATERIALS

QTY.	UNIT TYPE	DESCRIPTION	TOP WEIGHT	BASE WEIGHT
60	I/INF	13'-0" DOUBLETRAP	16690	18700
–	II	13'-0" DOUBLETRAP	0	0
26	III	13'-0" DOUBLETRAP	20234	20243
0	IV	13'-0" DOUBLETRAP	0	0
–	VII	13'-0" DOUBLETRAP	0	0
4	SPIV	13'-0" DOUBLETRAP	VARIES	VARIES
–	T2 PANEL	8" THICK PANEL	0	
4	T4 PANEL	8" THICK PANEL	9938	
–	T7 PANEL	8" THICK PANEL	0	
18	JOINT WRAP	150' PER ROLL		
48	JOINT TAPE	14.5' PER ROLL		
TOTAL PIECES = 180				
TOTAL PANELS = 4				
HEAVIEST PICK WEIGHT = 20,243				

LOADING DISCLAIMER:

STORMTRAP IS NOT DESIGNED TO ACCEPT ANY ADDITIONAL LOADINGS FROM NEARBY STRUCTURES NEXT TO OR OVER THE TOP OF STORMTRAP. IF ADDITIONAL LOADING CONSIDERATIONS ARE REQUIRED FOR STRUCTURAL DESIGN OF STORMTRAP, PLEASE CONTACT STORMTRAP IMMEDIATELY.

TREE LOADING DISCLAIMER:

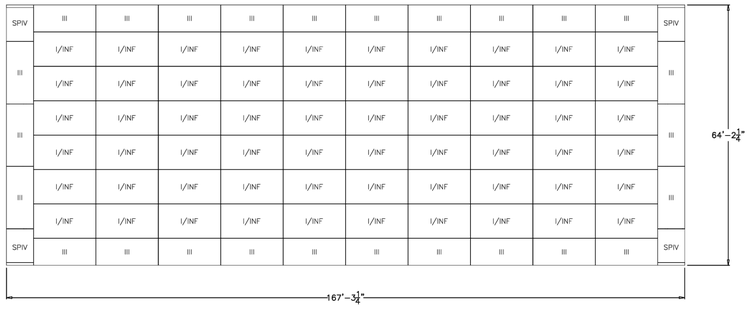
THE STORMTRAP SYSTEM HAS NOT BEEN DESIGNED TO SUPPORT THE ADDITIONAL WEIGHT OF ANY TREES. FURTHERMORE, THE ROOTS OF THE TREES MUST BE CONTAINED TO PREVENT FUTURE DAMAGE TO THE STORMTRAP SYSTEM. STORMTRAP ACCEPTS NO LIABILITY FOR DAMAGES CAUSED BY TREES OR OTHER VEGETATION PLACE AROUND OR ON TOP OF THE SYSTEM.

BUILDING PROXIMITY LOADING DISCLAIMER:

THESE DRAWINGS ARE NOT TO BE USED FOR BIDDING OR CONSTRUCTION PURPOSES. THIS DESIGN ASSUMES THAT NO VERTICAL LOADS, SURCHARGE LOADS, OR DIRECT LATERAL LOADS ARE EXERTED ON THE STORMTRAP SYSTEM BY BUILDING SUPERSTRUCTURES OR FOUNDATION ELEMENTS LOCATED IN PROXIMITY TO THE STORMTRAP SYSTEM. THESE DRAWINGS ARE GENERIC AND DO NOT ACCOUNT FOR SPECIAL CONSIDERATIONS – BE THEY STRUCTURAL OR OTHERWISE – ASSOCIATED WITH ANY BUILDING STRUCTURE OR COMPONENTS. FURTHERMORE, AT THE TIME THESE DRAWINGS WERE PRODUCED, STORMTRAP DID NOT HAVE ACCESS TO STRUCTURAL OR FOUNDATION PLANS FOR THE PROPOSED BUILDING(S) LOCATED ON-SITE. STORMTRAP REQUESTS THE OPPORTUNITY TO REVIEW SAID PLANS AND RELEVANT DRAWINGS WHEN THEY ARE MADE AVAILABLE. STORMTRAP RESERVES THE RIGHT TO MODIFY THE DESIGN SHOWN HERE TO ADDRESS ANY ISSUES ASSOCIATED WITH THE SYSTEM'S PROXIMITY TO ANY BUILDING STRUCTURE OR FOUNDATION ELEMENTS.

DESIGN CRITERIA
ALLOWABLE MAX GRADE = 188.80
ALLOWABLE MIN GRADE = 187.00
INSIDE HEIGHT ELEVATION = 183.75
SYSTEM INVERT = 170.75

NOTES:
1. DIMENSIONING OF STORMTRAP SYSTEM SHOWN BELOW ALLOW FOR A 3/4" GAP BETWEEN EACH MODULE.
2. ALL DIMENSIONS TO BE VERIFIED IN THE FIELD BY OTHERS.
3. SEE SHEET 3.0 FOR INSTALLATION SPECIFICATIONS.
4. SP – INDICATES A MODULE WITH MODIFICATIONS.
5. P – INDICATES A MODULE WITH A PANEL ATTACHMENT.
6. CONTRACTORS RESPONSIBILITY TO ENSURE CONSISTENCY/ACCURACY TO FINAL ENGINEER OF RECORD PLAN SET.



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ENGINEER INFORMATION:
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5 BRISTOL DR, SUITE 3A
EASTON, MA 02375
508-297-2749
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CURRENT ISSUE DATE: 11/18/2022
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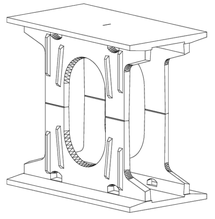
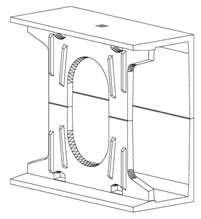
SCALE: NTS

SHEET TITLE: DOUBLETRAP SYSTEM LAYOUT

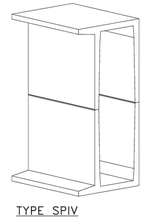
SHEET NUMBER: 2.0



TYPE I/INF



TYPE III



TYPE SPIV

TYPE IV END PANEL

NOTES:
1. OPENING LOCATIONS AND SHAPES MAY VARY.
2. SP – INDICATES A MODULE WITH MODIFICATIONS.
3. P – INDICATES A MODULE WITH A PANEL ATTACHMENT.
4. POCKET WINDOW OPENINGS ARE OPTIONAL.

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1	8/3/2022	PRELIMINARY	DG

SCALE: NTS

SHEET TITLE: DOUBLETRAP MODULE TYPES

SHEET NUMBER: 6.0

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No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
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4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

SEAL

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
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GRAPHIC SCALE

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WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.10

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MS VIEW:
LMAN:
CTB:

CULTEC RECHARGER 902HD® SPECIFICATIONS

GENERAL

CULTEC RECHARGER® 902HD CHAMBERS ARE DESIGNED FOR UNDERGROUND STORMWATER MANAGEMENT. THE CHAMBERS MAY BE USED FOR RETENTION, RECHARGING, DETENTION OR CONTROLLING THE FLOW OF ON-SITE STORMWATER RUNOFF.

CHAMBER PARAMETERS

1. THE CHAMBERS SHALL BE MANUFACTURED IN THE U.S.A. OR CANADA BY CULTEC, INC. OF BROOKFIELD, CT. (CULTEC.COM, 203-775-4416).
2. THE CHAMBERS SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". THE LOAD CONFIGURATION SHALL INCLUDE:
   A. INSTANTANEOUS AASHTO DESIGN TRUCK LIVE LOAD AT MINIMUM COVER
   B. MAXIMUM PERMANENT (50-YEAR) COVER LOAD
   C. 1-WEEK PARKED AASHTO DESIGN TRUCK LOAD
3. THE CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F3430-20 "STANDARD SPECIFICATION FOR CELLULAR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12, WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. THE STRUCTURAL DESIGN OF THE CHAMBERS SHALL INCLUDE THE FOLLOWING:
   A. THE CREEP MODULUS IS SMALL BE 50-YEAR AS SPECIFIED IN ASTM F3430
   B. THE MINIMUM SAFETY FACTOR FOR LIVE LOADS SHALL BE 1.75
   C. THE MINIMUM SAFETY FACTOR FOR DEAD LOADS SHALL BE 1.95
5. THE CHAMBER SHALL BE STRUCTURAL FOAM INJECTION MOLDED OF BLUE VIRGIN HIGH MOLECULAR WEIGHT IMPACT-MODIFIED POLYPROPYLENE.
6. THE CHAMBER SHALL BE ARCHED IN SHAPE.
7. THE CHAMBER SHALL BE OPEN-BOTTOMED.
8. THE CHAMBER SHALL BE JOINED USING AN INTERLOCKING OVERLAPPING RIBS METHOD. CONNECTIONS MUST BE FULLY SHOULDERED OVERLAPPING RIBS, HAVING NO SEPARATE COUPLINGS.
9. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC RECHARGER®902HD SHALL BE 48 INCHES (1219 MM) TALL, 78 INCHES (1981 MM) WIDE AND 4.25 FEET (1.30 M) LONG. THE INSTALLED LENGTH OF A JOINED RECHARGER 902HD SHALL BE 3.67 FEET (1.12 M).
10. MULTIPLE CHAMBERS MAY BE CONNECTED TO FORM DIFFERENT LENGTH ROWS. EACH ROW SHALL BEGIN AND END WITH A SEPARATELY FORMED CULTEC RECHARGER® 902HD END CAP. MAXIMUM INLET OPENING ON THE END CAP IS 30 INCHES (750 MM) HDPE OR 36 INCHES (900 MM) PVC.
11. THE CHAMBER SHALL HAVE TWO SIDE PORTALS TO ACCEPT CULTEC HVLV™ FC-48 FEED CONNECTORS TO CREATE AN INTERNAL MANIFOLD. MAXIMUM ALLOWABLE PIPE SIZE IN THE SIDE PORTAL IS 10 INCHES (250 MM) HDPE AND 12 INCHES (300 MM) PVC.
12. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV™ FC-48 FEED CONNECTOR SHALL BE 12 INCHES (305 MM) TALL, 16 INCHES (406 MM) WIDE AND 49 INCHES (1245 MM) LONG.
13. THE NOMINAL STORAGE VOLUME OF THE RECHARGER 902HD CHAMBER SHALL BE 17.31 FT^3/ FT (1.61 M^3 / M) - WITHOUT STONE. THE NOMINAL STORAGE VOLUME OF A JOINED RECHARGER 902HD SHALL BE 63.47 FT^3 / UNIT (1.80 M^3 / UNIT) - WITHOUT STONE.
14. THE NOMINAL STORAGE VOLUME OF THE HVLV™ FC-48 FEED CONNECTOR SHALL BE 0.913 FT^3 / FT (0.085 M^3 / M) - WITHOUT STONE.
15. THE RECHARGER 902HD CHAMBER SHALL HAVE 5 CORRUGATIONS.
16. THE CHAMBER SHALL BE CAPABLE OF ACCEPTING A 6 INCH (150 MM) INSPECTION PORT OPENING AT THE TOP CENTER OF EACH CHAMBER, CENTERED ON THE CORRUGATION CREST.
17. THE CHAMBER SHALL BE MANUFACTURED IN A FACILITY EMPLOYING CULTEC'S QUALITY CONTROL AND ASSURANCE PROCEDURES.
18. MAXIMUM ALLOWABLE COVER OVER THE TOP OF THE CHAMBER SHALL BE 8.3 FEET (2.53 M).

END CAP PARAMETERS

1. THE CULTEC RECHARGER® 902HD END CAP (REFERRED TO AS 'END CAP') SHALL BE MANUFACTURED IN THE U.S.A. BY CULTEC, INC. OF BROOKFIELD, CT (CULTEC.COM, 203-775-4416).
2. THE END CAP SHALL BE TWIN-SHEET THERMOFORMED OF VIRGIN HIGH MOLECULAR WEIGHT POLYETHYLENE.
3. THE END CAP SHALL BE JOINED AT THE BEGINNING AND END OF EACH ROW OF CHAMBERS USING AN INTERLOCKING OVERLAPPING RIB METHOD. CONNECTIONS MUST BE FULLY SHOULDERED OVERLAPPING RIBS, HAVING NO SEPARATE COUPLINGS.
4. THE NOMINAL DIMENSIONS OF THE END CAP SHALL BE 48.5 INCHES (1231 MM) TALL, 78 INCHES (1982 MM) WIDE AND 9.7 INCHES (246 MM) LONG. WHEN JOINED WITH A RECHARGER 902HD CHAMBER, THE INSTALLED LENGTH OF THE END CAP SHALL BE 6.2 INCHES (157 MM).
5. THE NOMINAL STORAGE VOLUME OF THE END CAP SHALL BE 5.34 FT^3/ FT (0.50 M^3 / M) - WITHOUT STONE. THE NOMINAL STORAGE VOLUME OF AN INTERLOCKED END CAP SHALL BE 2.76 FT^3 / UNIT (0.08 M^3 / UNIT) - WITHOUT STONE.
6. MAXIMUM INLET OPENING ON THE END CAP IS 30 INCHES (750 MM) HDPE OR 36 INCHES (900 MM) PVC.
7. THE END CAP SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12.

CULTEC HVLV FC-48 FEED CONNECTOR PRODUCT SPECIFICATIONS

GENERAL

CULTEC HVLV FC-48 FEED CONNECTORS ARE DESIGNED TO CREATE AN INTERNAL MANIFOLD FOR CULTEC RECHARGER MODEL 902HD STORMWATER CHAMBERS.

FEED CONNECTOR PARAMETERS

1. THE FEED CONNECTOR SHALL BE MANUFACTURED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE FEED CONNECTOR SHALL BE VACUUM THERMOFORMED OF BLACK HIGH MOLECULAR WEIGHT HIGH DENSITY POLYETHYLENE (HMWHDPE).
3. THE FEED CONNECTOR SHALL BE ARCHED IN SHAPE.
4. THE FEED CONNECTOR SHALL BE OPEN-BOTTOMED.
5. THE NOMINAL DIMENSIONS OF THE CULTEC HVLV FC-48 FEED CONNECTOR SHALL BE 12 INCHES (305 mm) TALL, 16 INCHES (406 mm) WIDE AND 49 INCHES (1245 mm) LONG.
6. THE NOMINAL STORAGE VOLUME OF THE HVLV FC-48 FEED CONNECTOR SHALL BE 0.913 FT^3 / FT (0.085 m^3 / m) - WITHOUT STONE.
7. THE HVLV FC-48 FEED CONNECTOR SHALL HAVE 4 CORRUGATIONS.
8. THE HVLV FC-48 FEED CONNECTOR MUST BE FORMED AS A WHOLE UNIT HAVING TWO OPEN END WALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS. THE UNIT SHALL FIT INTO THE SIDE PORTALS OF THE CULTEC RECHARGER STORMWATER CHAMBER AND ACT AS CROSS FEED CONNECTIONS CREATING AN INTERNAL MANIFOLD.
9. THE FEED CONNECTOR SHALL BE DESIGNED TO WITHSTAND AASHTO HS-25 DEFINED LOADS WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS.
10. THE FEED CONNECTOR SHALL BE MANUFACTURED IN AN ISO 9001:2008 CERTIFIED FACILITY.

CULTEC NO. 410™ NON-WOVEN GEOTEXTILE

CULTEC NO. 410™ NON-WOVEN GEOTEXTILE MAY BE USED WITH CULTEC CONTACTOR® AND RECHARGER® STORMWATER INSTALLATIONS TO PROVIDE A BARRIER THAT PREVENTS SOIL INTRUSION INTO THE STONE.

GEOTEXTILE PARAMETERS

1. THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
3. THE GEOTEXTILE SHALL HAVE A TYPICAL WEIGHT OF 4.5 OZ/SY (142 G/M).
4. THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH VALUE OF 120 LBS (533 N) PER ASTM D4632 TESTING METHOD.
5. THE GEOTEXTILE SHALL HAVE AN ELONGATION @ BREAK VALUE OF 50% PER ASTM D4632 TESTING METHOD.
6. THE GEOTEXTILE SHALL HAVE A MULLEN BURST VALUE OF 225 PSI (1551 KPA) PER ASTM D3786 TESTING METHOD.
7. THE GEOTEXTILE SHALL HAVE A PUNCTURE STRENGTH VALUE OF 65 LBS (289 N) PER ASTM D4833 TESTING METHOD.
8. THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE VALUE OF 340 LBS (1513 N) PER ASTM D6241 TESTING METHOD.
9. THE GEOTEXTILE SHALL HAVE A TRAPEZOID TEAR VALUE OF 50 LBS (222 N) PER ASTM D4533 TESTING METHOD.
10. THE GEOTEXTILE SHALL HAVE A AOS VALUE OF 70 U.S. SIEVE (0.212 MM) PER ASTM D4751 TESTING METHOD.
11. THE GEOTEXTILE SHALL HAVE A PERMITTIVITY VALUE OF 1.7 SEC-1 PER ASTM D4491 TESTING METHOD.
12. THE GEOTEXTILE SHALL HAVE A WATER FLOW RATE VALUE OF 135 GAL/MIN/SF (5500 L/MIN/SM) PER ASTM D4491 TESTING METHOD.
13. THE GEOTEXTILE SHALL HAVE A UV STABILITY @ 500 HOURS VALUE OF 70% PER ASTM D4355 TESTING METHOD.

CULTEC NO. 4800™ WOVEN GEOTEXTILE

CULTEC NO. 4800 WOVEN GEOTEXTILE IS DESIGNED AS A UNDERLAYMENT TO PREVENT SCOURING CAUSED BY WATER MOVEMENT WITHIN THE CULTEC CHAMBERS AND FEED CONNECTORS UTILIZING THE CULTEC MANIFOLD FEATURE. IT MAY ALSO BE USED AS A COMPONENT OF THE CULTEC SEPARATOR ROW TO ACT AS A BARRIER TO PREVENT SOIL/CONTAMINANT INTRUSION INTO THE STONE WHILE ALLOWING FOR MAINTENANCE.

GEOTEXTILE PARAMETERS

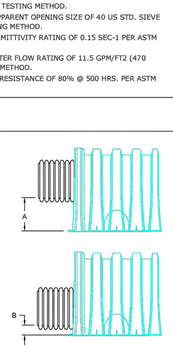
1. THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
3. THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH OF 550 X 550 LBS (2,448 X 2,448 N) PER ASTM D4632 TESTING METHOD.
4. THE GEOTEXTILE SHALL HAVE A ELONGATION @ BREAK RESISTANCE OF 20 X 20% PER ASTM D4632 TESTING METHOD.
5. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE OF 5,070 X 5,070 LBS/FT (74 X 74 KN/M) PER ASTM D4595 TESTING METHOD.
6. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE @ 2% STRAIN OF 960 X 1,096 LBS/FT (14 X 16 KN/M) PER ASTM D4595 TESTING METHOD.
7. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE @ 5% STRAIN OF 2,740 X 2, 740 LBS/FT (40 X 40 KN/M) PER ASTM D4595 TESTING METHOD.
8. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE @ 10% STRAIN OF 4,800 X 4,800 LBS/FT (70 X 70 KN/M) PER ASTM D4595 TESTING METHOD.
9. THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE RESISTANCE OF 1,700 LBS (7,560 N) PER ASTM D6241 TESTING METHOD.
10. THE GEOTEXTILE SHALL HAVE A TRAPEZOIDAL TEAR RESISTANCE OF 180 X 180 LBS (801 X 801 N) PER ASTM D4533 TESTING METHOD.
11. THE GEOTEXTILE SHALL HAVE AN APPARENT OPENING SIZE OF 40 US STD. SIEVE (0.425 MM) PER ASTM D4751 TESTING METHOD.
12. THE GEOTEXTILE SHALL HAVE A PERMITTIVITY RATING OF 0.15 SEC-1 PER ASTM D4491 TESTING METHOD.
13. THE GEOTEXTILE SHALL HAVE A WATER FLOW RATING OF 11.5 GPM/FT2 (470 LPM/M2) PER ASTM D4491 TESTING METHOD.
14. THE GEOTEXTILE SHALL HAVE A UV RESISTANCE OF 80% @ 500 HRS. PER ASTM D4355 TESTING METHOD.

902HD 1.0

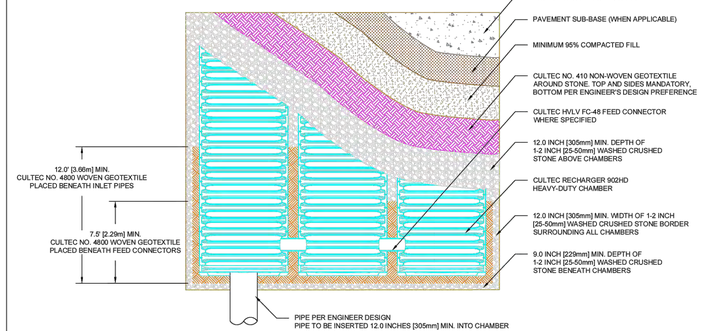
GENERAL NOTES

PIPE	A	B
6" [150 mm]	N/A	N/A
8" [200 mm]	N/A	N/A
10" [250 mm]	N/A	N/A
12" [300 mm]	29.50" [749 mm]	2.25" [57 mm]
15" [375 mm]	26.50" [673 mm]	2.25" [57 mm]
18" [450 mm]	23.50" [597 mm]	2.50" [64 mm]
24" [600 mm]	16.50" [420 mm]	3.00" [76 mm]

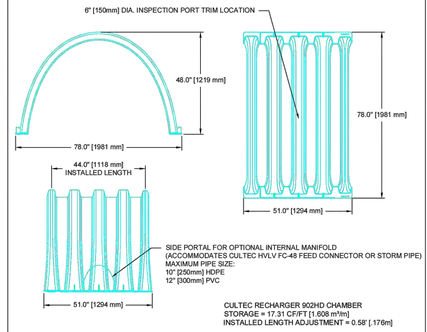
*THE TYPICAL INVERT TABLE ABOVE IS BASED ON THE INSIDE DIAMETER OF STANDARD CORRUGATED PLASTIC PIPE. THE HEAVY DUTY END CAP HAS PRE-MARKED TRIM LINES FOR PIPE DIAMETERS 12" (300mm), 15" (375mm), 18" (450mm) AND 24" (600mm). PIPES OF ANY SIZE AND MATERIAL UP TO 24" MAY BE PLACED AT CUSTOM LOCATIONS AND CUSTOM INVERTS. THE CROWN OF THE PIPE MUST REMAIN A MINIMUM OF 4" (100mm) FROM THE EDGE OF THE HEAVY DUTY END CAP.



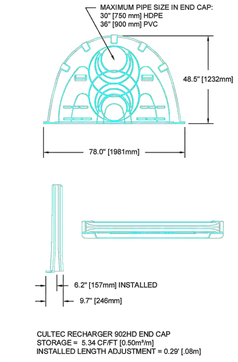
902HD 7.0 **CULTEC RECHARGER 902HD TYPICAL PIPE INVERTS**



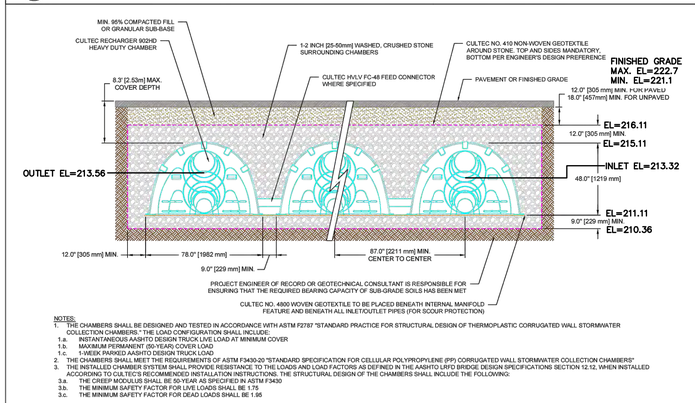
902HD 2.0 **CULTEC RECHARGER 902HD HEAVY DUTY PLAN VIEW**



902HD 3.0 **CULTEC RECHARGER 902HD HEAVY DUTY THREE VIEW**

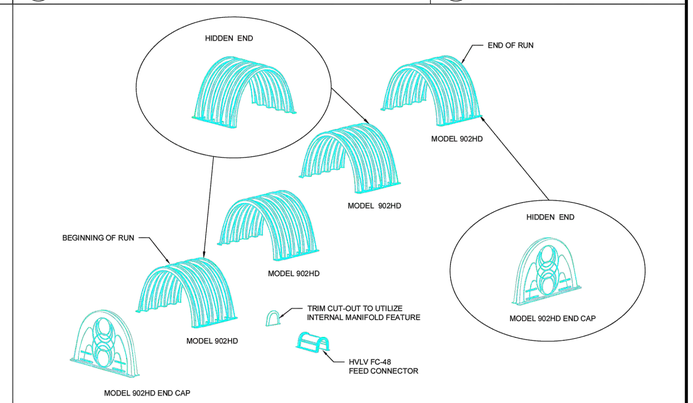


902HD 4.0 **CULTEC RECHARGER 902HD HEAVY DUTY END CAP THREE VIEW**

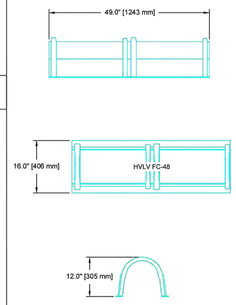


NOTES:
1. THE CHAMBERS SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS." THE LOAD CONFIGURATION SHALL INCLUDE:
   1.a. INSTANTANEOUS AASHTO DESIGN TRUCK LIVE LOAD AT MINIMUM COVER
   1.b. MAXIMUM PERMANENT (50-YEAR) COVER LOAD
   1.c. 1-WEEK PARKED AASHTO DESIGN TRUCK LOAD
2. THE CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F3430-20 "STANDARD SPECIFICATION FOR CELLULAR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
3. THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12, WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. THE STRUCTURAL DESIGN OF THE CHAMBERS SHALL INCLUDE THE FOLLOWING:
   3.a. THE CREEP MODULUS SHALL BE 50-YEAR AS SPECIFIED IN ASTM F3430
   3.b. THE MINIMUM SAFETY FACTOR FOR LIVE LOADS SHALL BE 1.75
   3.c. THE MINIMUM SAFETY FACTOR FOR DEAD LOADS SHALL BE 1.95

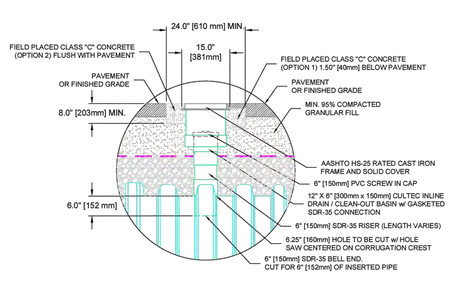
902HD 5.0 **CULTEC RECHARGER 902HD HEAVY DUTY CROSS SECTION**



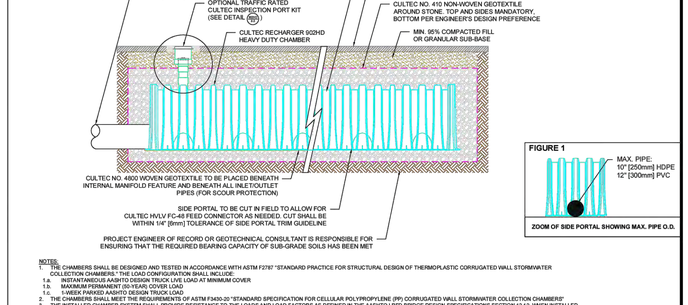
902HD 6.0 **CULTEC RECHARGER 902HD HEAVY DUTY TYPICAL INTERLOCK**



902HD 8.0 **CULTEC HVLV FC-48 FEED CONNECTOR THREE VIEW**



902HD 9.0 **CULTEC INSPECTION PORT - ZOOM DETAIL**



NOTES:
1. THE CHAMBERS SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS." THE LOAD CONFIGURATION SHALL INCLUDE:
   1.a. INSTANTANEOUS AASHTO DESIGN TRUCK LIVE LOAD AT MINIMUM COVER
   1.b. MAXIMUM PERMANENT (50-YEAR) COVER LOAD
   1.c. 1-WEEK PARKED AASHTO DESIGN TRUCK LOAD
2. THE CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F3430-20 "STANDARD SPECIFICATION FOR CELLULAR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
3. THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12, WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. THE STRUCTURAL DESIGN OF THE CHAMBERS SHALL INCLUDE THE FOLLOWING:
   3.a. THE CREEP MODULUS SHALL BE 50-YEAR AS SPECIFIED IN ASTM F3430
   3.b. THE MINIMUM SAFETY FACTOR FOR LIVE LOADS SHALL BE 1.75
   3.c. THE MINIMUM SAFETY FACTOR FOR DEAD LOADS SHALL BE 1.95

902HD 10.0 **CULTEC INTERNAL MANIFOLD - OPTIONAL INSPECTION PORT DETAIL**

CULTEC, Inc.
Subsurface Stormwater Management Systems
P.O. Box 280
878 Federal Road
Brookfield, CT 06804
www.cultec.com
PH: (203) 775-4416
PH: (800) 4-CULTEC
FX: (203) 775-1462
tech@cultec.com

THIS DRAWING WAS PREPARED TO SUPPORT THE PROJECT ENGINEER OF RECORD FOR THE PROPOSED SYSTEM. IT IS THE ULTIMATE RESPONSIBILITY OF THE PROJECT ENGINEER OF RECORD TO ENSURE THAT THE CULTEC SYSTEM'S DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. IT IS THE PROJECT ENGINEER OF RECORD'S RESPONSIBILITY TO ENSURE THAT THE CULTEC PRODUCTS ARE DESIGNED IN ACCORDANCE WITH CULTEC'S MINIMUM REQUIREMENTS. CULTEC DOES NOT APPROVE PLANS, SIZING, OR SYSTEM DESIGNS.

RECHARGER 902HD
DETAIL SHEET
TRAFFIC APPLICATION
CULTEC SYSTEM E

CULTEC STORMWATER CHAMBER

PROJECT NO:	-	DATE:	03/2020
DESIGNED BY:	TECH	CHECKED BY:	TECH
SCALE:	N.T.S.	SHEET NO:	1 OF 2

811 DigSafe MA.ME.NH.RI.VT

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED
PROFESSIONAL ENGINEER

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

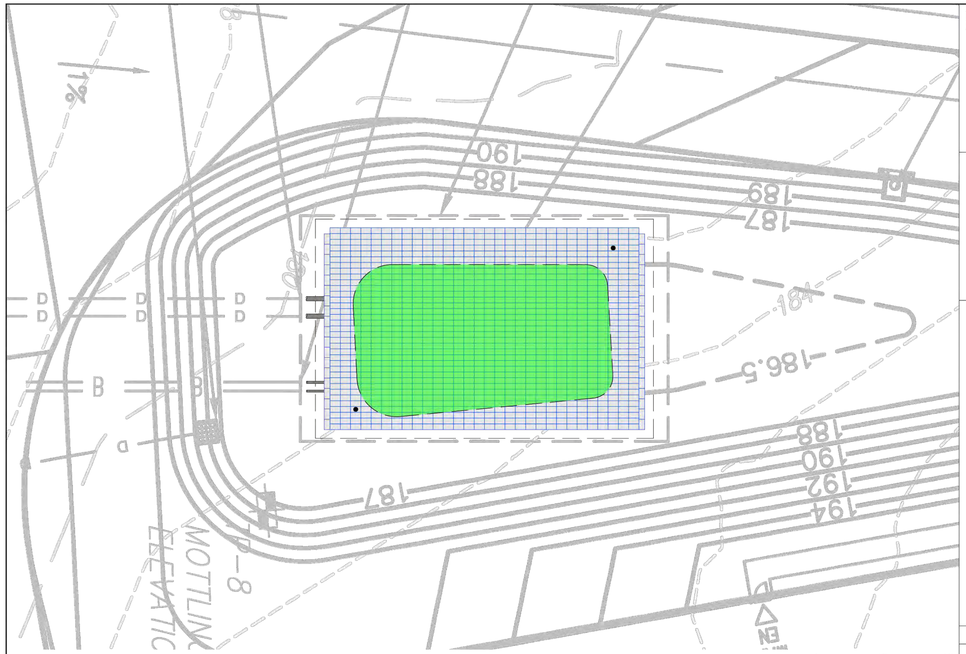
MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT
DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.11

C:\Users\JustinWilliams\OneDrive - MBL Land Development & Permitting, Corp (New)\OneDrive - MBL Land Development & Permitting, Corp\MBL Sharepoint\MBL\2021\2021-036\CIV\LP\lot\2021-036-Innovation Way-Site Planset- Master-LM-ERO-DTL-REV1.dwg, 11/22/2023 11:57:40 AM



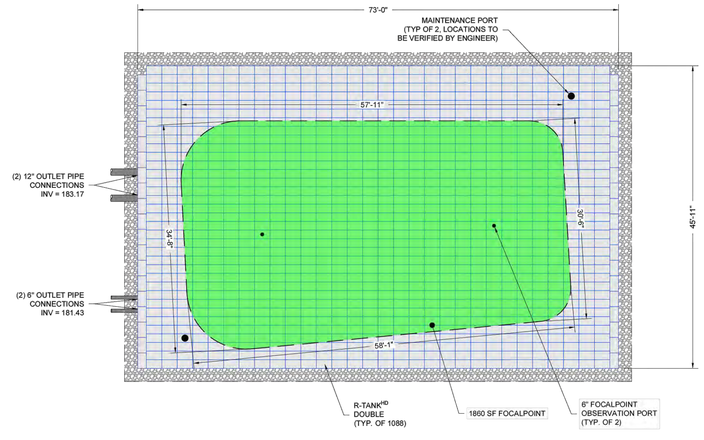
FOCALPOINT SYSTEM OVERLAY
SCALE: 1" = 15'

FocalPoint BIOFILTRATION SYSTEMS
ENGINEER OF RECORD TO REVIEW, APPROVE AND VERIFY FINAL SITE SPECIFIC DESIGN

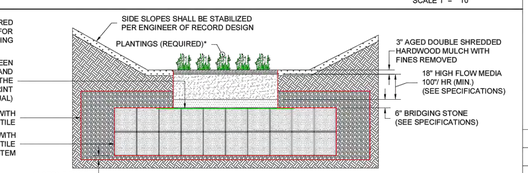
FERGUSON WATERWORKS
FOR ADDITIONAL INFORMATION PLEASE CONTACT:
FERGUSON WATERWORKS
1-800-440-3456, www.fergusonww.com

FOCALPOINT SYSTEM OVERLAY
WAREHOUSE DEVELOPMENT
FALL RIVER, MA
SITE DESIGNATION: FP-1

DRAWN BY: EDQ
DATE: 05/09/2022
SHEET NO.
1 of 7



LAYOUT SCALE	1" = 10'
FOCALPOINT FILTER SURFACE AREA	1860 SF
TOP OF MULCH ELEVATION	186.50
TOP OF MEDIA ELEVATION	186.25
DEPTH OF MEDIA	18"
TOP OF BRIDGING STONE ELEVATION	184.75
TOP OF R-TANK UNDERDRAIN ELEV.	184.25
R-TANK UNDERDRAIN INVERT	181.43
INVERT OF STONE BASE (3")	181.18
R-TANK^HD MODULE TYPE	DOUBLE
# OF DOUBLE R-TANKS	1088
TOTAL R-TANK SYSTEM STORAGE	11,458 CF
R-TANK STORAGE VOLUME	8,976 CF
STONE STORAGE VOLUME (40% VOID RATIO)	2,482 CF



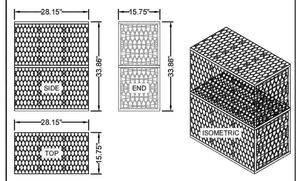
TYPICAL FOCALPOINT WITH EXPANDED R-TANK DETAIL
(ACTUAL MODULE HEIGHT VARIES)

FocalPoint BIOFILTRATION SYSTEMS
ENGINEER OF RECORD TO REVIEW, APPROVE AND VERIFY FINAL SITE SPECIFIC DESIGN

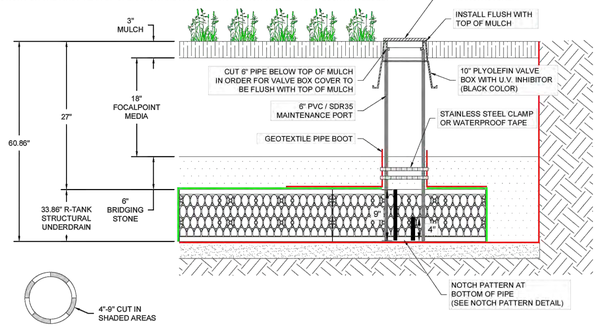
FERGUSON WATERWORKS
FOR ADDITIONAL INFORMATION PLEASE CONTACT:
FERGUSON WATERWORKS
1-800-440-3456, www.fergusonww.com

FOCALPOINT SYSTEM LAYOUT
WAREHOUSE DEVELOPMENT
FALL RIVER, MA
SITE DESIGNATION: FP-1

DRAWN BY: EDQ
DATE: 05/09/2022
SHEET NO.
2 of 7



NOTE:
PORT USED FOR INSPECTION PURPOSES AND FOR SYSTEM MAINTENANCE AS REQUIRED. WATER SHALL BE PUMPED INTO THE SYSTEM AND RESUSPEND ACCUMULATED SEDIMENT. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION FOR THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER. FLUSH AS NEEDED.

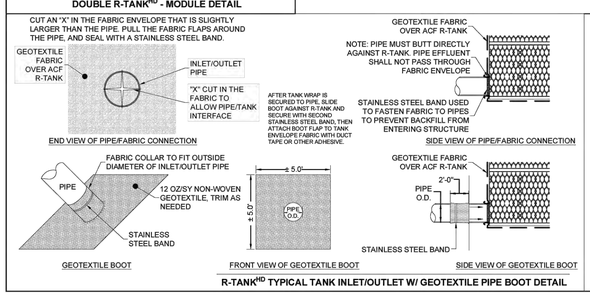


FOCALPOINT OBSERVATION & MAINTENANCE PORT DETAIL

MODULE DATA

GEOMETRY:	LOAD RATING:
LENGTH = 28.15 IN. (715 MM)	33.4 PSI. (MODULE ONLY)
WIDTH = 15.75 IN. (400 MM)	HS20, (WITH ACF COVER SYSTEM)
HEIGHT = 33.86 IN. (860 MM)	**MATERIAL:**
TANK VOLUME = 8.69 CF	100% RECYCLED POLYPROPYLENE
STORAGE VOLUME = 8.25 CF	**SMALL PLATES PER**
VOID INTERNAL VOLUME: 95%	**SEGMENT/TOTAL:**
VOID SURFACE AREA: 90%	5/10

DOUBLE R-TANK^HD - MODULE DETAIL



R-TANK^HD TYPICAL TANK INLET/OUTLET W/ GEOTEXTILE PIPE BOOT DETAIL

R-TANK^HD QUANTITIES	
R-TANK^HD MODULE TYPE	DOUBLE
# OF DOUBLE R-TANKS	1,088
TOTAL SYSTEM STORAGE	11,458 CF
R-TANK STORAGE VOLUME	8,976 CF
STONE STORAGE VOLUME (40% VOID RATIO)	2,482 CF
STONE BED FOOTPRINT	3,845 SF
STONE QUANTITY	230 CY
SR-18 MICROGRID (UNDER FOCALPOINT)	2,337 SF (260 SY)
8 OZ. NON-WOVEN GEOTEXTILE TANK WRAP	8,477 SF (942 SY)
8 OZ. NON-WOVEN GEOTEXTILE EXCAVATION WRAP	5,611 SF (623 SY)
6" FOCALPOINT OBSERVATION PORT	2
12" MAINTENANCE PORTS	2
6" PIPE BOOTS	2
12" PIPE BOOTS	2
NOTE: STONE QUANTITY INCLUDES 6" OF COVER AND 3" OF BASE.	
NOTE: GEOTEXTILE / LINER QUANTITIES INCLUDE A 15% WASTE FACTOR.	

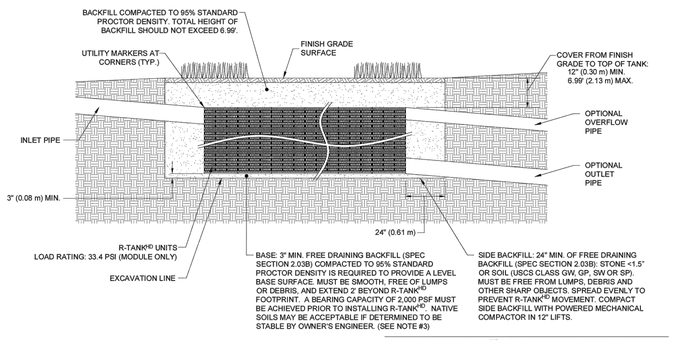
FocalPoint BIOFILTRATION SYSTEMS
ENGINEER OF RECORD TO REVIEW, APPROVE AND VERIFY FINAL SITE SPECIFIC DESIGN

FERGUSON WATERWORKS
FOR ADDITIONAL INFORMATION PLEASE CONTACT:
FERGUSON WATERWORKS
1-800-440-3456, www.fergusonww.com

FOCALPOINT SYSTEM DETAILS
WAREHOUSE DEVELOPMENT
FALL RIVER, MA
SITE DESIGNATION: FP-1

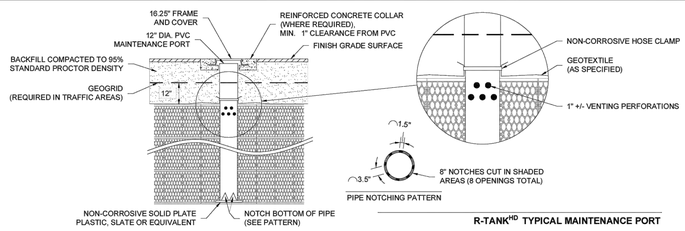
DRAWN BY: EDQ
DATE: 05/09/2022
SHEET NO.
3 of 7

NOTES:
1. FOR COMPLETE MODULE DATA, SEE APPROPRIATE R-TANK^HD SHEET (MINI MODULE, SINGLE MODULE, DOUBLE MODULE, TRIPLE MODULE, QUAD MODULE, OR PENTA MODULE).
2. PRE-TREATMENT STRUCTURES NOT SHOWN.
3. FOR INFILTRATION APPLICATIONS, GEOTEXTILE ENVELOPING R-TANK SHALL BE ACF M200 (PER SPEC SECTION 2.02A) AND BASE SHALL BE 4" MIN. UNCOMPACTED FREE DRAINING BACKFILL (SPEC SECTION 2.03A) TO PROVIDE A LEVEL BASE. SURFACE MUST BE SMOOTH, FREE OF LUMPS OR DEBRIS, AND EXTEND 2' BEYOND R-TANK^HD FOOTPRINT.



R-TANK^HD GREEN SPACE - SECTION VIEW

NOTES
1. THIS PORT IS USED TO PUMP WATER INTO THE SYSTEM AND RE-SUSPEND ACCUMULATED SEDIMENT SO THAT IT MAY BE PUMPED OUT.
2. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION DURING THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER. FLUSH AS NEEDED.
3. ONLY R-TANK^HD AND R-TANK^HD MAY BE USED IN TRAFFIC APPLICATIONS.
4. SEE TRAFFIC LOADING DETAIL FOR MINIMUM & MAXIMUM COVER REQUIREMENTS.



R-TANK^HD TYPICAL MAINTENANCE PORT

FocalPoint BIOFILTRATION SYSTEMS
ENGINEER OF RECORD TO REVIEW, APPROVE AND VERIFY FINAL SITE SPECIFIC DESIGN

FERGUSON WATERWORKS
FOR ADDITIONAL INFORMATION PLEASE CONTACT:
FERGUSON WATERWORKS
1-800-440-3456, www.fergusonww.com

FOCALPOINT SYSTEM DETAILS
WAREHOUSE DEVELOPMENT
FALL RIVER, MA
SITE DESIGNATION: FP-1

DRAWN BY: EDQ
DATE: 05/09/2022
SHEET NO.
4 of 7

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

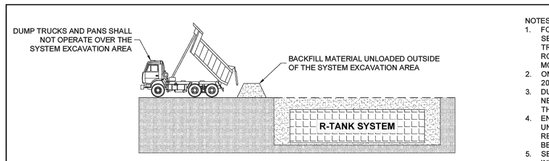
PROPOSED WAREHOUSE DEVELOPMENT
DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.12

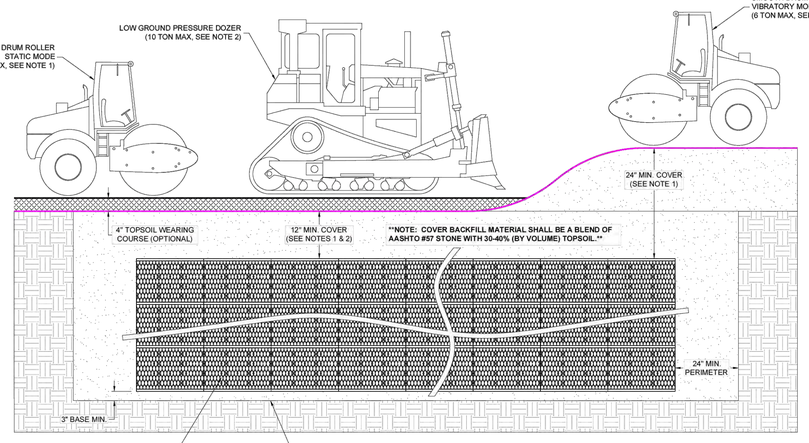
811 DigSafe MA.ME.NH.RI.VT

UCS: MS VIEW: LMAN: CTB:



DUMP TRUCK DETAIL (SEE NOTE 3)

NOTES:
1. FOLLOWING PLACEMENT OF SIDE BACKFILL, A UNIFORM 12" LIFT OF THE FREELY DRAINING MATERIAL (SPEC SECTION 2.03 B) SHALL BE PLACED OVER THE R-TANK AND LIGHTLY COMPACTED USING A WALK-BEHIND TRENCH ROLLER. ALTERNATELY, A ROLLER (MAXIMUM GROSS VEHICLE WEIGHT OF 6 TONS) MAY BE USED. ROLLER MUST REMAIN IN STATIC MODE UNTIL A MINIMUM OF 24" OF COVER HAS BEEN PLACED OVER THE MODULES. SHEEP FOOT ROLLERS SHOULD NOT BE USED. **SPEC SECTION 3.05 A**
2. ONLY LOW PRESSURE TIRE OR TRACK VEHICLES (LESS THAN 7 PSI AND OPERATING WEIGHT OF LESS THAN 20,000 LBS) SHALL BE OPERATED OVER THE R-TANK SYSTEM DURING CONSTRUCTION. **SPEC SECTION 3.05 B**
3. DUMP TRUCKS AND PANS SHALL NOT BE OPERATED WITHIN THE R-TANK SYSTEM AT ANY TIME. WHERE NECESSARY, THE HEAVY EQUIPMENT SHOULD UNLOAD IN AN AREA ADJACENT TO THE R-TANK SYSTEM AND THE MATERIAL SHOULD BE MOVED OVER THE SYSTEM WITH TRACKED EQUIPMENT. **SPEC SECTION 3.05 B**
4. ENSURE THAT ALL UNRELATED CONSTRUCTION TRAFFIC IS KEPT AWAY FROM THE LIMITS OF EXCAVATION UNTIL THE PROJECT IS COMPLETE AND FINAL SURFACE MATERIALS ARE IN PLACE. NO NON-INSTALLATION RELATED LOADING SHOULD BE ALLOWED OVER THE R-TANK SYSTEM UNTIL THE FINAL DESIGN SECTION HAS BEEN CONSTRUCTED (INCLUDING PAVEMENT). **SPEC SECTION 3.05 C**
5. SEE R-TANK INSTALLATION GUIDE OR CONTACT YOUR LOCAL FERGUSON REPRESENTATIVE FOR ADDITIONAL INFORMATION.



CONSTRUCTION EQUIPMENT COVER DETAIL - GREEN SPACE
(FOR AREAS OUTSIDE OF FOCALPOINT FOOTPRINT)

FocalPoint BIOFILTRATION SYSTEMS
ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN

FERGUSON WATERWORKS
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R-TANK CONSTRUCTION EQUIPMENT COVER DETAIL
WAREHOUSE DEVELOPMENT
FALL RIVER, MA
SITE DESIGNATION: FP-1

DRAWN BY: EDQ
DATE: 05/09/2022
SHEET NO.: 5 of 7

FOCALPOINT SPECIFICATION

I. SUMMARY

THE FOLLOWING GENERAL SPECIFICATIONS DESCRIBE THE COMPONENTS AND INSTALLATION REQUIREMENTS FOR A VOLUME BASED HIGH PERFORMANCE MODULAR BIOFILTRATION SYSTEM(S) WHICH ARE DESIGNED TO UTILIZE PHYSICAL, CHEMICAL AND BIOLOGICAL MECHANISMS OF A SOIL, PLANT AND MICROBIOME COMPLEX TO REMOVE POLLUTANTS TYPICALLY FOUND IN URBAN STORM WATER RUNOFF. THE MODULAR TREATMENT SYSTEM IN WHICH THE BIOLOGICALLY ACTIVE BIOFILTRATION MEDIA IS USED SHALL BE A COMPLETE, INTEGRATED SYSTEM DESIGNED TO BE PLACED IN SEALED POST OR UNDER FOOT INCREMENTS PER THE APPROVED DRAWINGS TO TREAT CONTAINED ITO RUNOFF FROM IMPERVIOUS SURFACES.

THE HIGH PERFORMANCE MODULAR BIOFILTRATION SYSTEM (HPMBS) IS COMPRISED OF THE FOLLOWING COMPONENTS:

A. PLANT COMPONENT
1. MANUFACTURER SHALL PROVIDE A REGIONALIZED LIST OF ACCEPTABLE PLANTS.
2. PLANTS, AS SPECIFIED IN THE APPROVED DRAWINGS/MANUFACTURERS PLANT LIST, SHALL BE INSTALLED AT THE TIME THE HPMBS IS COMMISSIONED FOR USE.
3. PLANTS AND PLANTING ARE TYPICALLY INCLUDED IN LANDSCAPE CONTRACT.

B. BIOFILTER COMPONENT
1. THIS COMPONENT EMPLOYS A HIGH PERFORMANCE GROSS-SECTION IN WHICH EACH ELEMENT IS HIGHLY DEPENDENT ON THE OTHERS TO MEET THE PERFORMANCE REQUIREMENTS OF THE COMPLETE SYSTEM. IT IS IMPORTANT THAT THIS ENTIRE CROSS-SECTION BE PROVIDED AS A COMPLETE SYSTEM AND INSTALLED AS SUCH.
2. AS INDICATED IN THE APPROVED DRAWINGS, THE ELEMENTS OF THE BIOFILTER INCLUDE:

A. A WILLO-PROTECTING LAYER (IF SPECIFIED).
B. AN ENGINEERED HIGH-INFILTRATION RATE BIOFILTRATION PLANTING MEDIA BED WHICH UTILIZES PHYSICAL, CHEMICAL AND BIOLOGICAL MECHANISMS OF THE SOIL, PLANT, AND MICROBIOME COMPLEX TO REMOVE POLLUTANTS FOUND IN STORM WATER RUNOFF.
C. A SEPARATION LAYER WHICH UTILIZES THE CONCEPT OF "BRIDGING" TO SEPARATE THE BIOFILTRATION MEDIA FROM THE UNDERDRAIN WITHOUT THE USE OF GEOTEXTILE FABRICS.
D. A WIDE APERTURE MESH LAYER UTILIZED TO PREVENT BRIDGING STONE FROM ENTERING THE UNDERDRAINSTONE ELEMENT.
E. AN UNDERDRAIN SYSTEM (BY OTHERS).
F. AN OVERFLOW WEIR (BY OTHERS) THAT IS PART OF THE HPMBS AND IS DESIGNED TO DIRECTLY INFILTRATE OR EXFILTRATE WATER THROUGH THE SURFACE. THE OVERFLOW UNDERDRAIN MUST PROVIDE A MINIMUM OF 50% VOID SPACE.

C. ENERGY DISSIPATION COMPONENT
1. AN ENERGY DISSIPATION IS TYPICALLY ACCOMPLISHED BY LOCATING THE BIOFILTRATION COMPONENT DOWNSTREAM OF A BASILE CURB CUT/CROSS APRON, SEDIMENT FOREBAY, DEEP OR SHALLOW SUMP WATER QUALITY MANHOLE, ETC. THESE BMPS SHOULD TARGET FINISH AND DESIRE AND NEEDS IN TO COARSE SEDIMENT.

E. OBSERVATION AND MAINTENANCE COMPONENT
1. AN OBSERVATION AND MAINTENANCE PORT SHALL BE INSTALLED PER THE APPROVED DRAWINGS TO PROVIDE FOR EASY INSPECTION OF THE UNDERDRAIN/STONE ELEMENT, AND CLEANOUT ACCESS IF NEEDED.

F. EXTREME EVENT OVERFLOW (BY OTHERS)
1. AN EXTREME EVENT OVERFLOW SHOULD BE LOCATED EXTERNAL TO, BUT NEAR THE BIOFILTRATION ELEMENT TO PROVIDE BYPASS WHEN NEEDED. THIS MAY INCLUDE CURB OPENING, FLOW BYPASS STRUCTURE, SIDEWALK OVERFLOW GRATE STRUCTURE, OR EQUIVALENT THAT SERVES THE PURPOSE. IF A SIDEWALK OVERFLOW STRUCTURE IS UTILIZED IT SHOULD INCLUDE A REMOVABLE FILTER INSERT TO PROVIDE A MINIMUM OF 50% TSS REMOVAL AND CONTROL OF GROSS POLLUTANTS, TRASH AND FLOATABLES.

II. QUALITY ASSURANCE AND PERFORMANCE SPECIFICATIONS

THE QUALITY AND COMPOSITION OF ALL SYSTEM COMPONENTS AND ALL OTHER APPURTENANCES AND THEIR ASSEMBLY PROCESS SHALL BE SUBJECT TO INSPECTION UPON DELIVERY OF THE SYSTEM TO THE WORK SITE.

INSTALLATION IS TO BE PERFORMED ONLY BY SKILLED WORK PEOPLE WITH SATISFACTORY RECORD OF PERFORMANCE ON EARTHWORKS, PIPE, CHAMBER, OR PONDS/AQUIFILL CONSTRUCTION PROJECTS OF COMPARABLE SIZE AND QUALITY.

A. PLANTS
1. PLANTS MUST BE COMPATIBLE WITH THE HPMBS MEDIA AND THE ASSOCIATED HIGHLY VARIABLE HYDROLOGIC REGIME. PLANTS ARE TYPICALLY INSTALLED WITH HERCUS ROOTS SYSTEMS SUCH AS NATIVE GRASSES AND SHRUBS.
2. MANUFACTURER SHALL PROVIDE A REGIONALIZED LIST OF ACCEPTABLE PLANTS.
3. ALL PLANT MATERIAL SHALL COMPLY WITH THE TYPE AND SIZE REQUIRED BY THE APPROVED DRAWINGS AND SHALL BE ALIVE AND FREE OF OBVIOUS SIGNS OF DISEASE.

B. MULCH
1. MULCH, TYPICALLY DOUBLE SHREDDED HARDWOOD (NON-FLOATABLE), SHALL COMPLY WITH THE TYPE AND SIZE REQUIRED BY THE APPROVED DRAWINGS AND SHALL BE APPLIED AT A MINIMUM DEPTH OF 3 INCHES. ROCK MULCH IS AN ALTERNATIVE TO WOOD-BASED MULCH AND TYPICALLY CONSISTS OF CLEAN, ROUNDED RIVER ROCK (1" DIAM SIZE).

C. BIOFILTRATION MEDIA
1. BIOLOGICALLY ACTIVE BIOFILTRATION MEDIA SHALL BE VISUALLY INSPECTED TO ENSURE APPROPRIATE VOLUME, TEXTURE AND CONSISTENCY WITH THE APPROVED DRAWINGS, AND MUST BEAR A BATCH NUMBER MARKING FROM THE MANUFACTURER WHICH CERTIFIES PERFORMANCE WITH ASTM D698. THE MEDIA MUST MEET THE REQUIRED INFILTRATION RATE (SEE BELOW). A THIRD-PARTY LABORATORY TEST MUST BE PROVIDED TO CERTIFY THE MEDIA RATE.
2. AT NO ADDITIONAL COST AND WITHIN THE FIRST YEAR FOLLOWING INSTILLATION, AUTHORIZED VALUE-ADDED RESELLER SHALL PROVIDE ONE SITE MAINTENANCE TRAINING AT THE REQUEST OF OWNER OR OWNER'S REPRESENTATIVE.
3. POLLUTANT REMOVAL PERFORMANCE, COMPOSITION AND CHARACTERISTICS OF THE BIOFILTRATION MEDIUM MUST MEET OR EXCEED THE FOLLOWING MINIMUM STANDARDS AS DEMONSTRATED BY TESTING ACCEPTABLE TO THE PROJECT ENGINEER:

Nutrient	Inlet/Effluent
TSS	81%
Phosphorus	84%
Nitrogen	40%

Composition and Characteristics	
Sand - Fine	< 5%
Sand - Medium	10% - 15%
Sand - Coarse	25% - 35%
Sand - Very Coarse	40% - 45%
Gravel	10% - 20%
Infiltration Rate	>100 inches per hour
Peat Moss*	5% - 15%

* "Peat Moss Specification

Listed by Organic Material Review Institute
100% natural peat (no composted, sludge, yard or leaf waste)

Test Carbon <85%
Carbon to Nitrogen Ratio 15:1 to 23:1
Lignin Content 49% to 52%

Humic Acid >18%
pH 6.0 to 7.5

Moisture Content 35% to 50%
>= 100% passing 2.0mm sieve
< 80% passing 1.0mm sieve

D. UNDERDRAIN/STORAGE SYSTEM
1. UNDERDRAIN/STORAGE COMPONENTS SHALL BE MANUFACTURED IN AN ISO CERTIFIED FACILITY AND BE MANUFACTURED FROM AT LEAST 90% RECYCLED MATERIALS.
2. UNDERDRAIN/STORAGE COMPONENTS SHALL MEET OR EXCEED THE FOLLOWING CHARACTERISTICS:

Property	Value
Surface Void Area	≥ 95%
Unit Weight	≥ 25 lbs/ft³
Service Temperature	-04° to 160°
Unconfined Crush Strength	33.4# psi
LRO Per Creep Test	
Load Applied – Initial and Sustained	21.33 psi
* Creep Sustained – After 100 Days	0.251in/in/yr
* Creep Sustained – After 100 Days	1.13%
* Projected Creep – 40 years	1.72%

G. SEPARATION MESH
1. SEPARATION MESH SHALL BE COMPOSED OF HIGH-TENSILITY MONOFILAMENT POLYPROPYLENE YARNS THAT ARE WOVEN TOGETHER TO PRODUCE AN OPEN MESH GEOTEXTILE WHICH SHALL BE INERT TO BIOLOGICAL DEGRADATION AND RESISTANT TO NATURALLY ENCOUNTERED CHEMICALS, ALKALIS AND ACIDS. THE MESH SHALL MEET OR EXCEED THE FOLLOWING CHARACTERISTICS:

Properties	Test Method	Units	Min Ave Roll Values (MD x CD)
Tensile Strength	ASTM D4595	kN/m (lb/ft)	21.0 (1440) 20.4 (1278)
Creep Reduced Strength	ASTM D7361	kN/m (lb/ft)	8.9 (671) 8.3 (546)
Long Term Allowable Design Load	GRI GG-4	kN/m (lb/ft)	5.9 (407) 7.2 (495)
UV Resistance (at 500 hours)	-	% strength retained	90.00
Apertures Size (machine direction)	-	mm (in)	2 (0.08)
Apertures Size (cross-machine direction)	-	mm (in)	2 (0.08)
Mass/Unit Area	ASTM D5261	g/m2 (oz/yd2)	297 (8.8)

F. BEDDING STONE
1. BEDDING STONE SHALL BE 3/4" PEA GRAVEL, OR OTHER DIAMETER SIZED TO PREVENT MIGRATION OF FILTER MEDIA, AS SPECIFIED BY MANUFACTURER.
2. STONE MUST BE WASHED AND FREE FROM SEDIMENT, SOIL AND CONTAMINANTS.

III. DELIVERY, STORAGE AND HANDLING

A. PROTECT ALL MATERIALS FROM DAMAGE DURING DELIVERY AND STORE UV SENSITIVE MATERIALS UNDER TARP TO PROTECT FROM SUNLIGHT EXPOSURE. PROTECT ALL SYSTEM COMPONENTS FROM DELIVERY TO INSTALLATION ACCESS ONE WEEK. STORAGE SHALL OCCUR ON SMOOTH SURFACES, FREE FROM DIRT, MUD AND DEBRIS.

B. BIOFILTRATION MEDIA SHALL BE SEGREGATED FROM ANY OTHER ASSIGNATE MATERIALS AND SHALL BE PROTECTED AGAINST CONTAMINATION, INCLUDING CONTAMINATION FROM ANY STORMWATER RUNOFF FROM AREAS OF THE SITE WHICH ARE NOT STABILIZED.

IV. SUBMITTALS

A. PRODUCT DATA
1. SUBMIT MANUFACTURER'S PRODUCT DATA AND APPROVED INSTILLATION MANUAL AS WELL AS MANUFACTURERS OPERATIONS AND MAINTENANCE MANUAL FOR THE SYSTEM. IT WILL BE THE RESPONSIBILITY OF THE SYSTEM OWNER/OPERATOR OR THEIR CONTRACTOR TO MAINTAIN THE SYSTEM IN PERFECTED AND WORKING ORDER IN ACCORDANCE WITH THE MANUAL.

B. CERTIFICATION
1. MANUFACTURER SHALL SUBMIT A LETTER OF CERTIFICATION THAT THE COMPLETE SYSTEM MEETS OR EXCEEDS ALL TECHNICAL AND PACKAGING REQUIREMENTS. BIOFILTRATION MEDIA PACKAGING MUST BEAR A BATCH NUMBER MARKING FROM THE MANUFACTURER WHICH MATCHES A LETTER FROM THE MANUFACTURER CERTIFYING PERFORMANCE TESTING OF THE BATCH TO MEET OR EXCEED THE REQUIRED INFILTRATION RATE.

C. DRAWINGS
1. MANUFACTURER SHALL PROVIDE DIMENSIONAL DRAWINGS INCLUDING DETAILS FOR CONSTRUCTION, MATERIALS, SPECIFICATIONS, AND PIPE CONNECTIONS. THESE DIMENSIONAL DRAWINGS SHALL INDICATE THE HPMBS FILTER BED AREA (SQ. FT.) AND CORRESPOND WITH AN APPROVED SET PLAN OR DRAINAGE/STORMWATER MANAGEMENT REPORT STAMPED BY THE ENGINEER OF RECORD.

D. MANUFACTURER'S WARRANTY
1. MANUFACTURER SHALL PROVIDE A WARRANTY FOR ALL COMPONENTS OF THE HPMBS FOR A PERIOD OF ONE YEAR PROVIDED THE UNIT IS INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE WARRANTY SHALL NOT INCLUDE ACTIVITIES (I.E. DUMPING OF POLLUTANTS, VANDALISM, ETC.) WILL VOID THE WARRANTY.

E. DESIGN CERTIFICATIONS
1. THE HPMBS MUST BE SIZED USING A VOLUME-BASED SIZING CRITERIA AND DEMONSTRATE, USING AN ECO STORMWATER MODELING SOFTWARE/SPREADSHEET CALCULATOR THAT THE REQUIRED WATER QUALITY VOLUME (DEFINED BY THE ENGINEER OF RECORD) PASSES THROUGH THE HPMBS PRIOR TO ACTIVATION OF THE OVERFLOW DEVICE (SETBACK HIGHER THAN TABLE (3.2) INCHES ABOVE THE TOP ELEVATION OF THE HPMBS (TYPICALLY DEFINED AS TOP OF MULCH). DESIGN COMPUTATIONS MUST BE PROVIDED AS PART OF THE SUBMITTAL PROCESS. IF THE HPMBS IS ALONE HAVE THE SYSTEM APPROVED BASED ON AN ALTERNATIVE SIZING CRITERION THE LAYMEN OF THE TAN COMPUTED SIZED WILL CHOSEN.

F. SUBSTITUTIONS
1. ANY PROPOSED EQUAL ALTERNATIVE PRODUCT SUBSTITUTION TO THIS SPECIFICATION MUST BE SUBMITTED FOR REVIEW AND APPROVED PRIOR TO BID OPENING. REVIEW PACKAGE SHOULD INCLUDE THIRD PARTY REVIEWED PERFORMANCE DATA FOR BOTH FLOW RATE AND POLLUTANT REMOVAL, AS WELL AS ALL OTHER SUBMITTAL REQUIREMENTS AND INSTALLATION SPEEDED PROTOCOLS. ALL COMPONENTS MUST MEET OR EXCEED QUALITY ASSURANCE AND PERFORMANCE CRITERIA ABOVE/DESCRIBED.

V. PROJECT CONDITIONS

A. REVIEW MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES AND COORDINATE INSTALLATION WITH OTHER WORK AFFECTED, SUCH AS GRADING, EXCAVATION, UTILITIES, CONSTRUCTION ACCESS AND EROSION CONTROL TO PREVENT ALL NON-INSTALLATION RELATED CONSTRUCTION TRAFFIC OVER THE COMPLETED HPMBS.

B. COLD WEATHER
1. DO NOT USE FROZEN MATERIALS OR MATERIALS MIXED OR COATED WITH ICE OR FROST.
2. DO NOT BUILD ON FROZEN GROUND OR WET, SATURATED OR MUDDY SUBGRADE.
3. CARE MUST BE TAKEN WHEN HANDLING PLASTICS WHEN AIR TEMPERATURE IS AT 40 DEGREES FAHRENHEIT OR BELOW AS PLASTIC BECOMES BRITTLE.

C. PROTECT PARTIALLY COMPLETED INSTALLATION AGAINST DAMAGE FROM OTHER CONSTRUCTION TRAFFIC WHEN WORK IS IN PROGRESS AND FOLLOWING COMPLETION OF BACKFILL BY ESTABLISHING A PERIMETER WITH HIGHLY VISIBLE CONSTRUCTION TAPE, FENCING, OR OTHER MEANS UNTIL CONSTRUCTION IS COMPLETE.

D. SOIL STABILIZATION OF THE SURROUNDING SITE MUST BE COMPLETE BEFORE THE BIOFILTRATION SYSTEM CAN BE BROUGHT ONLINE. SOIL STABILIZATION MEASURES SHALL BE IN PLACE AND ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED. EROSION AND SEDIMENT PREVENTION MEASURES SHALL ARE IMPLEMENTED TO REDUCE THE POSSIBILITY OF SEDIMENTS BEING TRANSPORTED INTO THE BIOFILTRATION SYSTEM PRIOR TO FULL STABILIZATION OF THE SITE. SIGNIFICANT SEDIMENT LOADS CAN DAMAGE THE HPMBS AND LEAD TO FAILURE IF NOT PREVENTED OR REMEDIATED PROMPTLY.

VI. PRODUCTS

A. ACCEPTABLE HPMBS
FOCALPOINT HIGH-PERFORMANCE BIOFILTRATION SYSTEM

B. ACCEPTABLE BIOSWALE OVERFLOW GRATE STRUCTURE (OPTIONAL)
BIOSWALE OVERFLOW GRATE STRUCTURE WITH REMOVABLE STORMSHED

C. ACCEPTABLE MANUFACTURER
MANUFACTURER:
CONVEYANT WATER TECHNOLOGIES, INC.
(800) 711-5428
SARA.COUSINS@WATER.COM

D. AUTHORIZED VALUE ADDED RESELLER
MBL LAND DEVELOPMENT
(508) 440-3636
WWW.FERGUSON.COM

VII. PACKAGING

A. HPMBS IS ASSEMBLED ON SITE.

B. MODULAR UNDERDRAIN/STORAGE UNIT IS SHIPPED FLAT AND MODULES ARE ASSEMBLED PRIOR TO INSTALLATION.

C. BIOFILTRATION MEDIA IS DELIVERED IN ONE TON SUPER SACKS EACH LABELED WITH MANUFACTURER'S BATCH NUMBER AND/OR IN BULK WITH ACCOMPANYING MANUFACTURER'S CERTIFICATION.

D. OTHER COMPONENTS ARE DELIVERED IN BULK OR SUPER SACKS

VIII. EXECUTION

A. EXCAVATION AND BACKFILL
1. BASE OF EXCAVATION SHALL BE SMOOTH, LEVEL AND FREE OF LUMPS OR DEBRIS, AND COMPACTED UNLESS INFILTRATION OF STORM WATER INTO UNDERLYING SOILS IS DESIRED. A THIN LAYER (2") OF COMPACTED BASE MATERIAL IS RECOMMENDED TO ESTABLISH A LEVEL WORKING PLATFORM BUT MAY NOT BE NEEDED IN SANDY SOILS. IF THE BASE OF THE EXCAVATION IS PUMPING OR APPEARS EXCESSIVELY SOFT, A GEOTECHNICAL ENGINEER SHOULD BE CONSULTED FOR ADVICE. RAMMY GRAVELS & STABILIZATION GEOTEXTILE AND/OR OF CONTACT MAT BE MATERIAL THAT DYNAMIC WELL WILL BE SUFFICIENT TO ASSIST THE BEARING CAPACITY OF THE SOIL.
2. IF SEDIMENT ACCUMULATES BEYOND AN ACCEPTABLE LEVEL IN THE UNDERDRAINSTONE SYSTEM, IT WILL BE NECESSARY TO FLUSH THE SEDIMENTS. IF MULTIPLE OBSERVATION/MAINTENANCE PORTS HAVE BEEN INSTALLED, WATER SHOULD BE PUMPED INTO EACH PORT TO MAXIMIZE FLUSHING EFFICIENCY.
3. SEDIMENT-LADEN WATER CAN BE PUMPED OUT AND EITHER CAPTURED FOR DISPOSAL OR FILTERED THROUGH A GEOTRAIL FILTER BAG IF PERMITTED BY THE LOCALITY.

IX. MEASUREMENT AND PAYMENT

GIVEN THE INTEGRATED NATURE OF THE HPMBS, MEASUREMENT AND PAYMENT WILL BE BASED NOT ON THE INDIVIDUAL COMPONENT PRICES, BUT ON THE SIZE OF THE BIOFILTRATION MEDIA BED. THE EXTERNAL DIMENSION AS INDICATED IN THE APPROVED PLANS AND EXECUTED IN THE INSTILLATION WILL BE MEASURED IN SQUARE FEET AND PAYMENT WILL BE MADE PER HPMBS SYSTEM.

MEASUREMENT AND PAYMENT OF BIOSWALE OVERFLOW GRATE STRUCTURE WITH REMOVABLE FILTER INSERT WILL BE BASED ON PER UNIT PRICE.

FocalPoint BIOFILTRATION SYSTEMS
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FOCALPOINT SPECIFICATION
WAREHOUSE DEVELOPMENT
FALL RIVER, MA
SITE DESIGNATION: FP-1

DRAWN BY: EDQ
DATE: 05/09/2022
SHEET NO.: 6 of 7

R-TANK SPECIFICATION

PART 1 - GENERAL
1.01 RELATED DOCUMENTS
A. Drawings, technical specification and general provisions of the Contract as modified herein apply to this section.

1.02 DESCRIPTION OF WORK INCLUDED
A. Provide excavation and base preparation per geotechnical engineer's recommendations and/or as shown on the design drawings, to provide adequate support for project design loads and safety from excavation sidewall collapse. Excavations shall be in accordance with the owner's and OSHA requirements.
B. Provide and install R-Tank[4D], R-Tank[6D], or R-Tank[4D] system (hereafter called R-Tank) and all related products including fill materials, geotextiles, geogrids, inlet and outlet pipe with connections per the manufacturer's installation guidelines provided in this section.
C. Provide and construct the cover of the R-Tank system including; stone backfill, structural fill cover, and pavement section as specified.
D. Protect R-Tank system from construction traffic after installation until completion of all construction activity in the installation area.

1.03 QUALITY CONTROL
A. All materials shall be manufactured in ISO certified facilities.
B. Installation Contractor shall demonstrate the following experience:
1. A minimum of three R-Tank or equivalent projects completed within 2 years; and,
2. A minimum of 25,000 cubic feet of storage volume completed within 2 years.
3. Contractor experience requirement may be waived if the manufacturer's representative provides on-site training and review during construction.
C. Installation Personnel: Performed only by skilled workers with satisfactory record of performance on bulk earthworks, pipe, chamber, or pond/landfill construction projects of comparable size and quality.
D. Contractor must have manufacturer's representative available for site review if requested by Owner.

1.04 SUBMITTALS
A. Submit proposed R-Tank layout drawings. Drawings shall include typical section details as well as the required base elevation of stone and tanks, minimum cover requirements and tank configuration.
B. Submit manufacturer's product data, including compressive strength and unit weight.
C. Submit manufacturer's installation instructions.
D. Submit R-Tank sample for review. Reviewed and accepted samples will be returned to the Contractor.
E. Submit material certificates for geotextile, geogrid, base course and backfill materials.
F. Submit required experience and personnel requirements as specified in Section 1.03.
G. Any proposed equal alternative product substitution to this specification must be submitted for review and approved prior to bid opening. Review package should include third party reviewed performance data that meets or exceeds criteria in Table 2.01 B.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Protect R-Tank and other materials from damage during delivery, and store UV sensitive materials under tarp to protect from sunlight when time from delivery to installation exceeds two weeks. Storage of materials should be on smooth surfaces, free from dirt, mud and debris.
B. Handling is to be performed with equipment appropriate to the materials and site conditions, and may include hand, handcart, forklifts, extension lifts, etc.
C. Cold weather:
1. Care must be taken when handling plastics when air temperature is 40 degrees or below as plastic becomes brittle.
2. Do not use frozen materials or materials mixed or coated with ice or frost.
3. Do not build on frozen ground or wet, saturated or muddy subgrade.

1.06 PREINSTALLATION CONFERENCE.
A. Prior to the start of the installation, a preinstallation conference shall occur with the representatives from the design team, the general contractor, the excavation contractor, the R-Tank installation contractor, and the manufacturer's representative.

1.07 PROJECT CONDITIONS
A. Coordinate installation for the R-Tank system with other on-site activities to eliminate all non-installation related construction traffic over the completed R-Tank system. No loads heavier than the design loads shall be allowed over the system, and in no case shall loads higher than a standard AASHTO HS20 (or HS25, depending on design criteria) load be allowed on the system at any time.
B. Protect adjacent work from damage during R-Tank system installation.
C. All pre-treatment systems to remove debris and heavy sediments must be in place and functional prior to operation of the R-Tank system. Additional pretreatment measures may be needed if unit is operational during construction due to increased sediment loads.
D. Contractor is responsible for any damage to the system during construction.

PART 2 - PRODUCTS
2.01 R-TANK UNITS
A. R-Tank - Injection molded plastic tank plates assembled to form a 95% void modular structure of predesigned height (custom for each project).
B. R-Tank units shall meet the following Physical & Chemical Characteristics:

Description	Description	R-Tank[4D] HD, LD	R-Tank[4D] SD, LD	R-Tank[6D] HD, LD	R-Tank[6D] SD, LD
Void Area	Volume available for water storage	95%	95%	95%	95%
Surface Void Area	Percentage of plenums available for infiltration	50%	50%	45%	45%
Vertical Compressive Strength	ASTM D 2412 / ASTM F 2418	3450 psi	16.4 psi	4218 psi	156.2 psi
Lateral Compressive Strength	ASTM D 2412 / ASTM F 2418	2310 psi	22.4 psi	139 psi	0.8 psi
Flexural Strength	ASTM D 790 / ASTM F 2418 Creep	N/A	20	20	20
HS-20 Minimum Cover	Cover required to support HS-20 loads	N/A	24"	24"	24"
Maximum Cover	Maximum allowable cover depth	Open	>7 feet	>12 feet	5 feet
Unit Weight	Weight of each unit / unit filled with water	3.25 lbs / 41	1.62 lbs/2	3.96 lbs / 4	4.73 lbs / 8
Tab Thickness	Thickness of load bearing members	0.150 inches	0.150 inches	0.150 inches	N/A
Plastic Composition	Safe temperature range for use	-34 – 160° F	-34 – 160° F	-34 – 160° F	-34 – 160° F

C. Supplier: Ferguson Waterworks 2831 Cardwell Road Richmond, VA 23234 (T): 800-448-3636; (F): 804-743-7779 www.ferguson.com

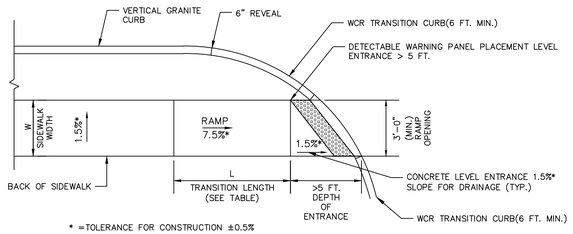
2.02 GEOSYNTHETICS
A. Geotextile: A geotextile envelope is required to prevent backfill material from entering the R-Tank modules.
1. Standard Application: The standard geotextile shall be an 8 oz per square yard nonwoven geotextile (ACF N080 or equivalent).
2. Infiltration Applications: When water must infiltrate/exfiltrate through the geotextile as a function of the system design, a woven monofilament (ACF M200 or equivalent) shall be used.
B. Geogrid. For installations subject to traffic loads and/or when required by project plans, install geogrid (ACF BX12 or equivalent) to reinforce backfill above the R-Tank system. Geogrid is not always required for R-Tank[4D] installations, and is often not required for non-traffic load applications.

2.03 BACKFILL & COVER MATERIALS
A. Bedding Materials: Stone (angular and smaller than 1.5" in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System) shall be used below the R-Tank system (3" minimum). Material must be free from lumps, debris, and any sharp objects that could cut the geotextile. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation. For infiltration applications bedding material shall be free draining.
B. Side and Top Backfill: Material must be free from lumps, debris and any sharp objects that could cut the geotextile. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation.
1. Traffic Applications - Free draining material shall be used adjacent to (24" minimum) and above (for the first 12") the R-Tank system.
a. For HD, and SD modules, backfill materials shall be free-draining stone (angular and smaller than 1.5" in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System).
b. For UD modules with less than 14" of top cover, backfill materials shall be free draining stone (angular and smaller than 1.5" in diameter). The use of soil backfill on the sides and top of the UD module is not permitted unless the modules are installed outside of traffic areas or with cover depths of 14" or more. Top backfill material (from top of module to bottom of pavement base or 12" maximum) must be consistent with side backfill.
2. Non-Traffic / Green Space Applications - For all R-Tank modules installed in green spaces and not subjected to vehicular loads, backfill materials may either follow the guidelines for Traffic Applications above, or the top backfill layer (12" minimum) may consist of AASHTO #57 stone blended with 30-40% (by volume) topsoil to aid in establishing vegetation.
C. Additional Cover Materials: Structural Fill shall consist of granular materials meeting the gradational requirements of SM, SP, SW, GM, GP or GW as classified by the Unified Soil Classification System. Structural fill shall have a maximum of 25 percent passing the No. 200 sieve, shall have a maximum clay content of 12 percent and a maximum Plasticity Index of 4. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation.

2.04 OTHER MATERIALS
A. Utility Marker: Install metallic tape at corners of R-Tank system to mark the area for future utility detection.

PART 3 - EXECUTION
3.01 ASSEMBLY OF R-TANK UNITS
A. Assembly of modules shall be performed in accordance with the R-Tank Installation Manual, Section 2.

3.02 LAYOUT AND EXCAVATION
A. Installer shall stake out, excavate, and prepare the subgrade area to the required plan grades and dimensions, ensuring that the excavation is at least 2 feet greater than R-Tank dimensions in each direction allowing for installation of geotextile filter fabric, R-Tank modules, and free-draining backfill materials.
B. All excavations must be prepared with OSHA approved excavated sides and sufficient working space.
C. Protect partially completed installation against damage from other construction traffic by establishing a perimeter with high visibility construction tape, fencing, barricades, or other means until construction is complete.
D. Base of the excavation shall be uniform, level, and free of lumps or debris and soft or yielding subgrade areas. A minimum 2,000 pounds per square foot bearing capacity is required.
1. Standard Applications: Compact subgrade to a minimum of 95% of Standard Proctor (ASTM D698) density or as required by the Owner's engineer.
2. Infiltration Applications: Subgrade shall be prepared in accordance with the contract documents. Compaction of subgrade should not be performed in infiltration applications.
E. Unsuitable Soils or Conditions: All questions about the base of the excavation shall be directed to the owner's engineer, who will approve the subgrade conditions prior to placement of stone. The owner's engineer shall determine the required bearing capacity of the R-Tank subgrade; however in no case shall a bearing capacity of less than 2,000 pounds per square foot be provided.
1. If unsuitable soils are encountered at the subgrade, or if the subgrade is pumping or appears excessively soft, repair the area in accordance with contract documents and/or as directed by the owner's engineer.
2. If indications of the water table are observed during exc

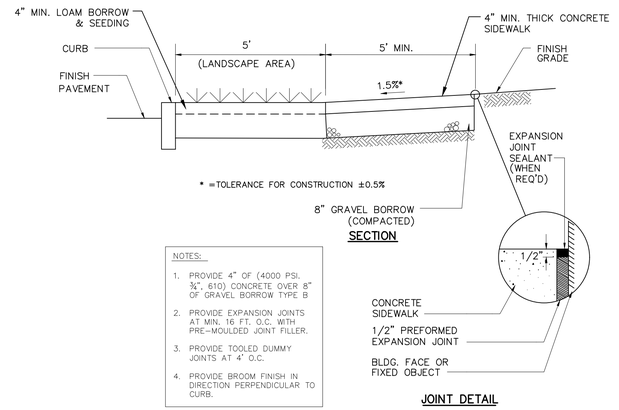


PAVEMENT NOTES:
FOR PEDESTRIAN CURB RAMPS: 4" OF CEMENT CONCRETE (4000 PSI, ¾", 610) OVER 8" OF GRAVEL BORROW TYPE B

NOTES:
1. FOR DETAILS OF TRUNCATED DOMES SEE MASSDOT CONSTRUCTION DETAIL E 107.6.5
2. DETECTABLE WARNING PANEL SHALL BE 2 FEET MEASURED IN THE DIRECTION OF PEDESTRIAN TRAVEL.

DETECTABLE WARNING PANELS ON WHEELCHAIR RAMPS FOR ONE CONTINUOUS DIRECTION OF PEDESTRIAN TRAVEL WHERE LEVEL ENTRANCE EXCEEDS 5' WITH LANDSCAPE STRIP

NOT TO SCALE

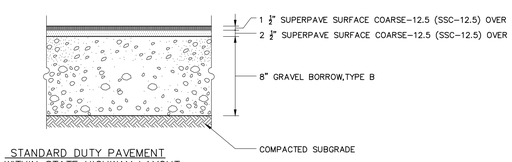


NOTES:
1. PROVIDE 4" OF (4000 PSI, ¾", 610) CONCRETE OVER 8" OF GRAVEL BORROW TYPE B
2. PROVIDE EXPANSION JOINTS AT MIN. 16 FT. O.C. WITH PRE-MOULDED JOINT FILLER.
3. PROVIDE TOOLED DUMMY JOINTS AT 4' O.C.
4. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.

JOINT DETAIL

CONCRETE SIDEWALK WITH LANDSCAPE STRIP

NOT TO SCALE



STANDARD DUTY PAVEMENT WITHIN STATE HIGHWAY LAYOUT

COMPOSITION AND COMPACTION ACCEPTANCE TESTS

1. OBTAIN SAMPLES FROM PLANT TO INDICATE CONFORMANCE WITH M3.13.0
2. PAVEMENT DENSITY AS OUTLINED IN M3.06.0
3. ALL SAMPLES TO BE TAKEN IN ACCORDANCE WITH AASHTO R97
4. MATERIALS SHALL MEET OR ACCEED THE REQUIREMENTS SPECIFIED IN SECTION M3. DIVISION III, MATERIALS AND THE FOLLOWING SUBSECTIONS

MINERAL AGGREGATE : M3.06.2	BITUMINOUS MATERIALS : M3.01.0
MINERAL FILLER : M3.10.5	COMPOSITION OF BASE COURSE : M2.01.7

5. THE BITUMINOUS CONCRETE BASE COURSE SHALL BE CONSTRUCTED IN ACCORDANCE WITH RELEVANT SECTIONS/PROVISIONS OF SECTION 460 FOR CLASS I BITUMINOUS CONCRETE PAVEMENT, TYPE I-1
6. CLASS I BITUMINOUS PAVEMENT ,TYPE I-1 REQUIRED THE SAME TESTING AS BASE COURSE AND SHALL HAVE A MINIMUM OF 95% COMPACTION. TESTING TO BE COMPLETED BY METHODS OUTLINED IN M3.13.0

BITUMINOUS CONCRETE PAVEMENT WITHIN STATE HIGHWAY LAYOUT AND TOWN OF FREETOWN SECTIONS

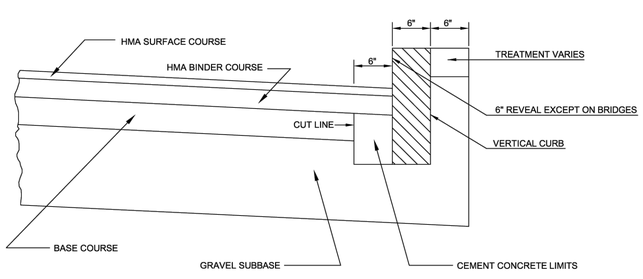
NOT TO SCALE

WCR #	RAMP REFERENCE POINT		WIDTH OF SIDEWALK (W)	WIDTH OF RAMP ENTRANCE 5.0' (MIN)	ROADWAY GUTTER SLOPE	TRANSITION LENGTH	
	STATION	OFFSET				LEFT SIDE	RIGHT SIDE
1	307+19±	36.4 RT	5.0'	5.0'	3.10%	N/A	14.0'

massDOT CONSTRUCTION STANDARDS

METHOD OF SETTING VERTICAL CURB

DRAWING NUMBER E 106.3.0 — DATE OF ISSUE OCTOBER 2017



NOTES:

1. THIS PROCEDURE IS APPLICABLE ONLY IF CURB IS TO BE SET AFTER BASE COURSE IS IN PLACE PRIOR TO BINDER AND TOP PLACEMENT.
2. CUT NEAT LINE 6" FROM CURB LINE AND REMOVE BASE AND GRAVEL. REPLACE WITH CEMENT CONCRETE.
3. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE STANDARD SPECIFICATIONS MAY BE USED; ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT TO BE USED AS A SUBSTITUTE.

massDOT CONSTRUCTION STANDARDS

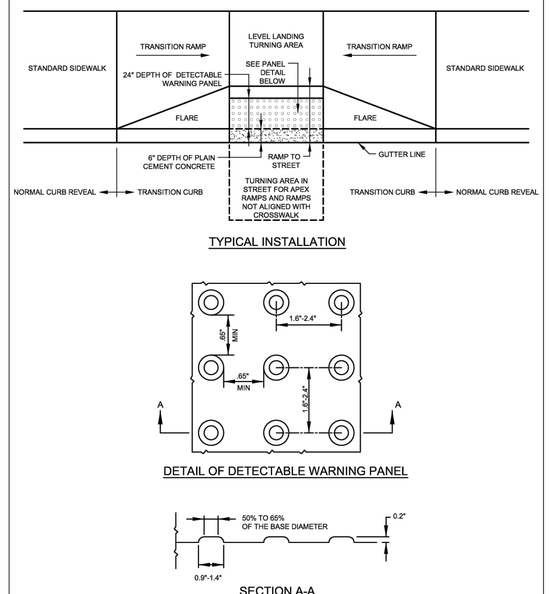
CURB TRANSITION LENGTH FOR WHEELCHAIR RAMPS

DRAWING NUMBER E 107.9.0 — DATE OF ISSUE OCTOBER 2017

ROADWAY PROFILE GRADE %	* HIGH SIDE TRANSITION LENGTH ENGLISH UNITS
=0%	6'-6"
>0% TO 1%	7'-8"
>1% TO 2%	9'-0"
>2% TO 3%	11'-0"
>3% TO 4%	14'-0"
>4% TO 5%	15'-0" Max

NOTE:

* BASED ON A DESIGN SLOPE OF 7.5% AND A REVEAL OF 6".



TYPICAL INSTALLATION

DETAIL OF DETECTABLE WARNING PANEL

SECTION A-A

NOTE:

PANELS MAY BE CONCRETE PRECAST OR CAST IN PLACE OR OTHER SUITABLE MATERIAL PERMANENTLY APPLIED TO THE RAMP. DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT WALKING SURFACES EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT.

massDOT Highway Division — CONSTRUCTION STANDARDS

DETECTABLE WARNING PANEL FOR WHEELCHAIR RAMPS AND STANDARD RAMP TERMINOLOGY

DATE OF ISSUE OCTOBER 2017 — DRAWING NUMBER E 107.6.5

811 DigSafe MA.ME.NH.RI.VT

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL
TRACY L. DUARTE CIVIL NO. 48660 REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS

SEAL

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION, AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT
MASSDOT DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.14

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LMAN:
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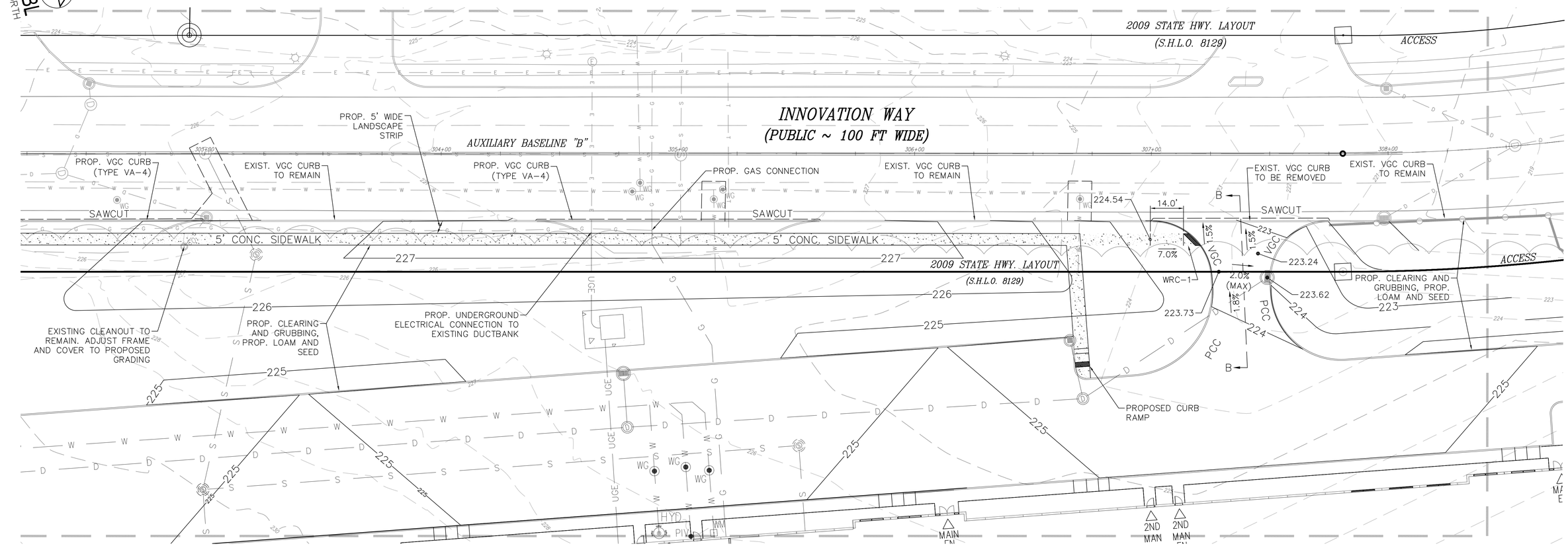
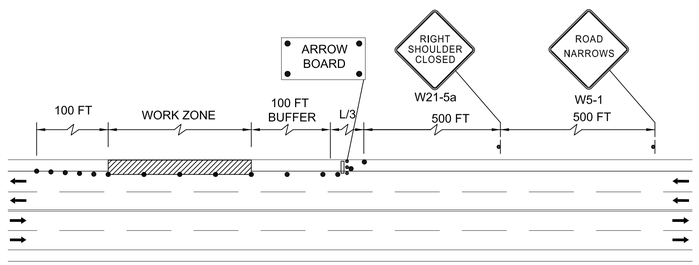
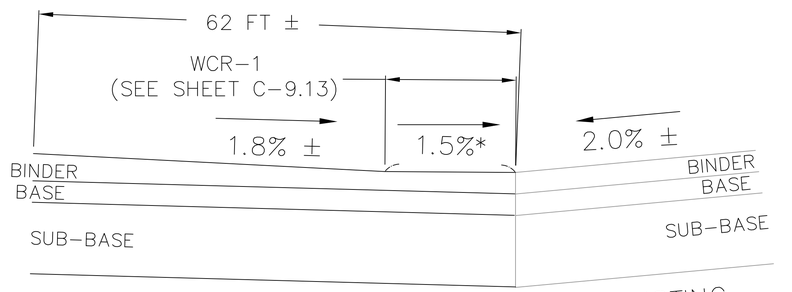


DETAIL VIEW A–A
SCALE: 1"=20'



TYPICAL TRAFFIC MANAGEMENT
N.T.S.



* =CONSTRUCTION TOLERANCE ±0.5%

SECTION B–B
N.T.S.

811 DigSafe MA ME NH RI VT

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
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2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

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COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
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REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR
V.M.D. COMPANIES, LLC
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NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.: 1"=20'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
20 10 0 20
GRAPHIC SCALE

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PROPOSED WAREHOUSE DEVELOPMENT

MASSDOT DETAILS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-9.15

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MS VIEW:
LMAN:
CTB:

OBSERVATION HOLE DATA

TEST PIT 1 GRD. EL. 203.03 GW. EL. 199.20 DATE: 3/21/2022 MOTTLING. EL. 199.20 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
202.53	0"–6"	A	SANDY LOAM	10YR 2/1		ROOTS, ROCKS & BOULDERS
201.54	6"–18"	B	SANDY LOAM	10YR 5/6		ROOTS
199.61	18"–41"	C1	SANDY LOAM	10YR 7/2		UNSORTED FINES
197.03	41"–72"	C2	LOAMY SAND	2.5Y 7/1	@ 46"	TIGHT

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 2 GRD. EL. 192.40 GW. EL. 189.23 DATE: 3/21/2022 MOTTLING. EL. 189.23 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
192.07	0"–4"	A	SANDY LOAM	10YR 2/1		ROOTS, BOULDERS
190.90	4"–18"	B	SANDY LOAM	10YR 5/6		
188.98	18"–41"	C1	SANDY LOAM	10YR 6/3	@ 38"	UNSORTED FINES
186.32	41"–73"	C2	SAND	2.5Y 7/1		TIGHT & ROCKY

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 3 GRD. EL. 204.89 GW. EL. 200.89 DATE: 3/21/2022 MOTTLING. EL. 200.89 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
204.47	0"–5"	A	SANDY LOAM	10YR 2/1		ROOTS, BOULDERS
203.06	5"–22"	B	SANDY LOAM	10YR 5/6		
201.31	22"–43"	C1	LOAMY SAND	10YR 6/3		UNSORTED FINES
200.22	43"–56"	C2	F. SANDY LOAM	2.5Y 6/3	@ 48"	TIGHT, ROCKY
198.06	56"–82"	C3	SAND	2.5Y 7/1		REFUSAL

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 4 GRD. EL. 191.68 GW. EL. 188.26 DATE: 3/21/2022 MOTTLING. EL. 188.26 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
191.26	0"–5"	A	SANDY LOAM	10YR 2/1		ROOTS, BOULDERS
190.35	5"–16"	B	SANDY LOAM	10YR 5/6		
188.85	16"–34"	C1	LOAMY SAND	10YR 7/2		
185.76	34"–71"	C2	F. SANDY LOAM	2.5Y 7/1	@ 41"	TIGHT
						REFUSAL

WATER WEEPING OBSERVED @ 71" WATER STANDING OBSERVED @ N/A

TEST PIT 5 GRD. EL. 183.50 GW. EL. 181.00 DATE: 3/21/2022 MOTTLING. EL. 181.00 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
182.92	0"–7"	A	SANDY LOAM	10YR 2/1		ROOTS, BOULDERS
182.25	7"–15"	B	SANDY LOAM	10YR 5/6		
180.92	15"–31"	C1	LOAMY SAND	10YR 7/3	@ 30"	
178.13	31"–62"	C2	F. SANDY LOAM	2.5Y 7/1		
177.25	62"–75"	C3	SAND	2.5Y 7/2		TIGHT, BOULDERS 10% ROCKS 10%

WATER WEEPING OBSERVED @ 64" WATER STANDING OBSERVED @ 75"

TEST PIT 6 GRD. EL. 183.16 GW. EL. 179.83 DATE: 3/21/2022 MOTTLING. EL. 179.83 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
182.66	0"–6"	A	SANDY LOAM	10YR 2/1		ROOTS, BOULDERS
181.83	6"–16"	B	SANDY LOAM	10YR 5/6		
180.08	16"–37"	C1	LOAMY SAND	10YR 7/3		
179.16	37"–48"	C2	F. SANDY LOAM	2.5Y 7/1	@ 40"	
177.16	48"–72"	C3	SAND	2.5Y 7/2		TIGHT, ROCKS & BOULDERS 10%

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 7 GRD. EL. 176.88 GW. EL. 174.30 DATE: 3/21/2022 MOTTLING. EL. 174.30 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
176.55	0"–4"	A	SANDY LOAM	10YR 2/1		ROOTS, BOULDERS
175.71	4"–14"	B	SANDY LOAM	10YR 5/6		
174.38	14"–30"	C1	LOAMY SAND	10YR 7/3		
172.88	30"–48"	C2	F. SANDY LOAM	2.5Y 7/1	@ 31"	
171.55	48"–64"	C3	SAND	2.5Y 7/2		TIGHT, ROCKS & BOULDERS 10%

WATER WEEPING OBSERVED @ 54" WATER STANDING OBSERVED @ N/A

TEST PIT 8 GRD. EL. 183.55 GW. EL. 180.38 DATE: 3/21/2022 MOTTLING. EL. 180.38 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
183.13	0"–5"	A	SANDY LOAM	10YR 2/1		
182.13	5"–17"	B	SANDY LOAM	10YR 5/6		
180.63	17"–35"	C1	F. LOAMY SAND	10YR 7/3		
179.63	35"–47"	C2	F. SANDY LOAM	2.5Y 7/1	@ 38"	
177.88	47"–68"	C3	SAND	2.5Y 7/2		TIGHT, ROCKS & BOULDERS 10%

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 9 GRD. EL. 201.07 GW. EL. 197.65 DATE: 3/21/2022 MOTTLING. EL. 197.65 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
200.57	0"–6"	A	SANDY LOAM	10YR 2/1		ROOTS, BOULDERS
199.74	6"–16"	B	SANDY LOAM	10YR 4/6		
198.15	16"–35"	C1	LOAMY SAND	10YR 7/4		UNSORTED FINES
194.65	35"–77"	C2	SAND	2.5Y 7/2	@ 41"	TIGHT, ROCKS & BOULDERS 20%
						REFUSAL

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 10 GRD. EL. 198.64 GW. EL. 195.64 DATE: 3/21/2022 MOTTLING. EL. 195.64 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
198.06	0"–7"	A	SANDY LOAM	10YR 2/1		ROOTS, BOULDERS
197.14	7"–18"	B	SANDY LOAM	10YR 4/6		
195.64	18"–36"	C1	LOAMY SAND	10YR 7/4		
192.89	36"–69"	C2	F. SANDY LOAM	2.5Y 8/1	@ 36"	
191.64	69"–84"	C3	SAND	2.5Y 7/3		TIGHT & 20% ROCKS

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 11 GRD. EL. 197.83 GW. EL. 193.58 DATE: 3/21/2022 MOTTLING. EL. 193.58 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
197.16	0"–8"	A	SANDY LOAM	10YR 2/1		ROOTS, BOULDERS
196.33	8"–18"	B	SANDY LOAM	10YR 4/6		
194.75	18"–37"	C1	LOAMY SAND	10YR 7/4		
192.99	37"–58"	C2	F. SANDY LOAM	2.5Y 8/1	@ 51"	
191.99	58"–70"	C3	SAND	2.5Y 7/3		TIGHT & 20% ROCKS

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 12 GRD. EL. 205.40 GW. EL. 202.15 DATE: 3/21/2022 MOTTLING. EL. 202.15 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
204.72	0"–7"	A	SANDY LOAM	10YR 2/1		ROOTS, BOULDERS
203.72	7"–19"	B	SANDY LOAM	10YR 4/6		
201.55	19"–45"	C1	LOAMY SAND	10YR 7/2	@ 39"	UNSORTED FINES
197.73	45"–92"	C2	SAND	2.5Y 7/1		TIGHT, ROCKS & BOULDERS 20%
						REFUSAL

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 100 GRD. EL. 237.80 GW. EL. 233.38 DATE: 3/21/2022 MOTTLING. EL. 233.38 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
237.38	0"–5"	A	SANDY LOAM	10YR 2/1		
235.55	5"– 27"	B	SANDY LOAM	10YR 5/6		
232.13	27"–68"	C1	F. LOAMY SAND	10YR 7/3	@ 53"	
225.63	68"–146"	C2	F. SANDY LOAM	2.5Y 7/1		TIGHT, 20% ROCKS & BOULDERS 10%

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 101 GRD. EL. 225.70 GW. EL. 221.20 DATE: 06/02/2022 MOTTLING. EL. 221.20 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
225.28	0"–5"	A	SANDY LOAM	10YR 3/1		
223.78	5"– 23"	B	SANDY LOAM	10YR 5/8		
220.20	23"–66"	C1	F. SANDY LOAM	10YR 6/3	@ 54"	
216.37	66"–112"	C2	LOAMY SAND	2.5Y 7/1		TIGHT, 20% ROCKS & BOULDERS 10%

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 102 GRD. EL. 221.56 GW. EL. 217.39 DATE: 6/02/2022 MOTTLING. EL. 217.39 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
221.06	0"–6"	A	SANDY LOAM	10YR 3/2		
218.89	6"– 32"	B	SANDY LOAM	10YR 5/8		
213.89	32"–92"	C1	LOAMY SAND	2.5Y 7/1	@ 50"	20% ROCKS & BOULDERS 10%

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 103 GRD. EL. 205.07 GW. EL. 200.40 DATE: 06/02/2022 MOTTLING. EL. 200.40 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
204.65	0"–5"	A	SANDY LOAM	10YR 3/1		
203.49	5"– 19"	B	SANDY LOAM	10YR 5/8		
201.90	19"–38"	C1	F. SANDY LOAM	10YR 6/3		
192.24	38"–154"	C2	LOAMY SAND	2.5Y 7/1	@ 56"	TIGHT, ROCKS & BOULDERS 20%

WATER WEEPING OBSERVED @ 142" EL.=194.74 WATER STANDING OBSERVED @ N/A

TEST PIT 104 GRD. EL. 208.58 GW. EL. N/A DATE: 6/2/2022 MOTTLING. EL. N/A TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
208.08	0"–6"	A	SANDY LOAM	10YR 3/2		
206.66	6"–23"	B	SANDY LOAM	10YR 6/8		
205.25	23"–40"	C1	F SANDY LOAM	10YR 7/4		
201.25	40"–88"	C2	SAND	2.5Y 8/1		TIGHT, ROCKS & BOULDERS 20%
						REFUSAL

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 105 GRD. EL. 225.73 GW. EL. 222.40 DATE: 06/02/2022 MOTTLING. EL. 222.40 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
225.40	0"–4"	A	SANDY LOAM	10YR 3/2		
224.06	4"– 20"	B	SANDY LOAM	10YR 6/7		
222.73	20"–36"	C1	F. LOAMY SAND	10YR 7/3	@ 40"	
214.56	36"–134"	C2	LOAMY SAND	2.5Y 8/1		TIGHT, 20% ROCKS & BOULDERS 10%

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 106 GRD. EL. 179.34 GW. EL. 175.84 DATE: 06/02/2022 MOTTLING. EL. 175.84 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
178.76	0"–7"	A	SANDY LOAM	10YR 3/2		
177.84	7"– 18"	B	SANDY LOAM	10YR 6/7		
175.84	18"–42"	C1	F. LOAMY SAND	10YR 7/3	@ 42"	
167.76	42"–139"	C2	LOAMY SAND	2.5Y 8/1		TIGHT, 20% ROCKS & BOULDERS 10%
						POCKETS OF COARSE SAND

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 107 GRD. EL. 165.52 GW. EL. 163.85 DATE: 06/02/2022 MOTTLING. EL. 163.85 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
165.02	0"–6"	A	SANDY LOAM	10YR 2/1		
163.94	6"– 19"	B	SANDY LOAM	10YR 5/6		
160.44	19"–61"	C1	F. SANDY LOAM	5Y 8/1	@ 20"	
159.52	61"– 72"	C2	LOAMY SAND	2.5Y 8/3		REFUSAL

WATER WEEPING OBSERVED @ 52" EL.=161.19 WATER STANDING OBSERVED @ 72" EL.=159.52

TEST PIT 108 GRD. EL. 164.71 GW. EL. 161.79 DATE: 06/02/2022 MOTTLING. EL. 161.79 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
164.29	0"–5"	A	SANDY LOAM	10YR 2/1		ROOTS & SURFACE COBBLES
162.63	5"– 25"	B	SANDY LOAM	10YR 5/6		
161.38	25"–40"	C1	F. SANDY LOAM	10YR 7/3	@ 35"	
159.13	40"–67"	C2	LOAMY SAND	2.5Y 7/1		TIGHT, ROCKS & BOULDERS 20%
158.21	67"–78"	C3	SAND	2.5Y 6/3		REFUSAL

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 109 GRD. EL. 166.73 GW. EL. 164.81 DATE: 06/02/2022 MOTTLING. EL. 164.81 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
166.23	0"–6"	A	SANDY LOAM	10YR 3/2		ROOTS & SURFACE COBBLES
165.40	6"– 16"	B	SANDY LOAM	10YR 6/7		
161.90	16"–58"	C1	F. LOAMY SAND	10YR 7/3	@ 23"	
160.40	58"– 76"	C2	LOAMY SAND	2.5Y 8/1		TIGHT, 20% ROCKS & BOULDERS 10%
						REFUSAL

WATER WEEPING OBSERVED @ 57" EL.=161.98 WATER STANDING OBSERVED @ 76" EL.=160.40

TEST PIT 110 GRD. EL. 194.41 GW. EL. 190.74 DATE: 06/02/2022 MOTTLING. EL. 190.74 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
194.08	0"–4"	A	SANDY LOAM	10YR 3/2		
192.41	4"– 24"	B	SANDY LOAM	10YR 6/7		
188.24	24"–74"	C	LOAMY SAND	2.5Y 8/1	@ 44"	TIGHT, 20% ROCKS & BOULDERS 10%
						REFUSAL

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 111 GRD. EL. 212.09 GW. EL. 208.01 DATE: 06/02/2022 MOTTLING. EL. 208.01 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
211.67	0"–5"	A	SANDY LOAM	10YR 3/2		
210.59	5"– 18"	B	SANDY LOAM	10YR 6/6		
208.92	18"–38"	C1	F. LOAMY SAND	10YR 7/3		
202.76	38"–112"	C2	LOAMY SAND	2.5Y 8/3	@ 49"	TIGHT, 20% ROCKS & BOULDERS 10%

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

811 DigSafe MA ME NH RI VT

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL COMMONWEALTH OF MASSACHUSETTS TRACY L. DUARTE CIVIL NO. 48660 REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

TEST PIT LOGS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01

FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-10.0

UCS: C:\Users\JustinWilliams\OneDrive - MBL Land Development & Permitting, Corp (New)\OneDrive - MBL Land Development & Permitting, Corp\MBL Sharepoint\MBL\2021\2021-036\CIVIL\Plot\2021-036-Innovation Way-Site Planset- Master-LM-ERO-DTL-REV1.dwg, 11/22/2023 12:01:33 PM
MS VIEW:
LMAN:
CTB:

OBSERVATION HOLE DATA

TEST PIT 112 GRD. EL. 224.04 GW. EL. 220.54 DATE: 06/09/2022 MOTTLING. EL. 220.54 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
223.37	0"–8"	A	SANDY LOAM	10YR 2/2		
222.04	8"– 24"	B	SANDY LOAM	10YR 5/8		
219.54	24"–54"	C1	F. LOAMY SAND	10YR 7/3	@ 42"	
215.29	54"–105"	C2	LOAMY SAND	2.5Y 7/1		TIGHT, 20% ROCKS & BOULDERS 20%

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 113 GRD. EL. 224.07 GW. EL. 220.49 DATE: 06/09/2022 MOTTLING. EL. 220.49 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
223.40	0"–8"	A	SANDY LOAM	10YR 2/2		
222.15	8"– 23"	B	SANDY LOAM	10YR 5/8		
221.07	23"–36"	C1	F. LOAMY SAND	10YR 7/3	@ 43"	
213.99	36"–121"	C2	LOAMY SAND	2.5Y 7/1		TIGHT, 20% ROCKS & BOULDERS 20%

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 114 GRD. EL. 223.92 GW. EL. 220.50 DATE: 06/09/2022 MOTTLING. EL. 220.50 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
223.34	0"–7"	A	SANDY LOAM	10YR 2/2		COBBLES
222.17	7"– 21"	B	SANDY LOAM	10YR 5/8		
220.34	21"–43"	C1	F. LOAMY SAND	10YR 7/3	@ 41"	
216.50	43"–89"	C2	LOAMY SAND	2.5Y 7/1		TIGHT, 20% ROCKS & BOULDERS 20%

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 115 GRD. EL. 218.58 GW. EL. 215.25 DATE: 06/09/2022 MOTTLING. EL. 215.25 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
217.91	0"–8"	A	SANDY LOAM	10YR 2/2		
217.16	8"– 17"	B	SANDY LOAM	10YR 5/8		
215.25	17"–40"	C1	F. LOAMY SAND	10YR 7/3	@ 40"	
210.50	40"–97"	C2	LOAMY SAND	2.5Y 7/1		TIGHT, 20% ROCKS & BOULDERS 20%

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 116 GRD. EL. 215.92 GW. EL. 211.92 DATE: 06/09/2022 MOTTLING. EL. 211.92 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
215.42	0"–6"	A	SANDY LOAM	10YR 3/2		
213.84	6"– 25"	B	SANDY LOAM	10YR 5/6		
207.00	25"–107"	C	F. LOAMY SAND	2.5Y 7/1	@ 48"	UNSORTED FINES

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 117 GRD. EL. 213.06 GW. EL. 209.14 DATE: 06/09/2022 MOTTLING. EL. 209.14 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
212.56	0"–6"	A	SANDY LOAM	10YR 3/2		
211.31	6"– 21"	B	SANDY LOAM	10YR 6/8		
208.89	21"–50"	C1	F. LOAMY SAND	10YR 7/3	@ 47"	
205.56	50"– 90"	C2	LOAMY SAND	2.5Y 7/1		20% ROCKS & POCKET OF SAND

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 118 GRD. EL. 211.69 GW. EL. 208.02 DATE: 06/09/2022 MOTTLING. EL. 208.02 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
211.19	0"–6"	A	SANDY LOAM	10YR 3/2		
210.11	6"– 19"	B	SANDY LOAM	10YR 5/6		
204.77	19"–83"	C1	LOAMY SAND	2.5Y 7/1	@ 44"	UNSORTED FINES

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 119 GRD. EL. 166.88 GW. EL. 164.88 DATE: 06/09/2022 MOTTLING. EL. 164.88 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
166.46	0"–5"	A	SANDY LOAM	10YR 2/1		COBBLES
165.55	5"– 16"	B	SANDY LOAM	10YR 5/6		
164.88	16"–24"	C1	F. SANDY LOAM	5Y 8/1	@ 24"	
160.88	24"– 72"	C2	LOAMY SAND	2.5Y 8/3		REFUSAL

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 120 GRD. EL. 163.84 GW. EL. 162.34 DATE: 06/09/2022 MOTTLING. EL. 162.34 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
163.09	0"–9"	A	SANDY LOAM	10YR 2/1		COBBLES
162.67	9"– 14"	B	SANDY LOAM	10YR 5/6		
160.84	14"–36"	C1	F. LOAMY SAND	2.5Y 8/1	@ 18"	UNSORTED FINES
160.17	36"–44"	C2	LOAMY SAND	2.5Y 8/3		REFUSAL

WATER WEEPING OBSERVED @ 41" EL.=160.42 WATER STANDING OBSERVED @ N/A

TEST PIT 121 GRD. EL. 165.83 GW. EL. 162.91 DATE: 06/09/2022 MOTTLING. EL. 162.91 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
165.41	0"–5"	A	SANDY LOAM	10YR 2/1		COBBLES
164.33	5"– 18"	B	SANDY LOAM	10YR 5/6		
162.33	18"–42"	C1	F. LOAMY SAND	10YR 7/3	@ 35"	
160.58	42"–63"	C2	LOAMY SAND	2.5Y 7/1		POCKETS OF SAND
	63"–77"	C3	SAND	2.5Y 6/3		REFUSAL

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 200 GRD. EL. 210.52 GW. EL. 205.94 DATE: 10/05/2022 MOTTLING. EL. 205.94 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
210.10	0"–5"	A	SANDY LOAM	10YR 3/2		COBBLES
208.10	5"– 29"	B	SANDY LOAM	10YR 6/8		
203.27	29"–87"	C1	F. LOAMY SAND	10YR 7/2	@ 55"	10% GRAVEL
198.19	87"–148"	C2	LOAMY SAND	2.5Y 7/1		15% GRAVEL 20% COBBLES

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 201 GRD. EL. 208.30 GW. EL. 203.97 DATE: 10/05/2022 MOTTLING. EL. 203.97 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
207.72	0"–7"	A	SANDY LOAM	10YR 3/2		COBBLES
206.72	7"– 19"	B	SANDY LOAM	10YR 6/8		
203.05	19"–63"	C1	F. LOAMY SAND	10YR 7/2	@ 52"	10% GRAVEL
195.63	63"–152"	C2	LOAMY SAND	2.5Y 7/1		15% GRAVEL 20% COBBLES

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 202 GRD. EL. 214.22 GW. EL. 209.72 DATE: 10/05/2022 MOTTLING. EL. 209.72 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
213.80	0"–5"	A	SANDY LOAM	10YR 3/2		COBBLES
212.55	5"– 20"	B	SANDY LOAM	10YR 6/8		
209.47	20"–57"	C1	F. LOAMY SAND	10YR 7/2	@ 54"	10% GRAVEL
202.80	57"–137"	C2	LOAMY SAND	2.5Y 7/1		15% GRAVEL 20% COBBLES

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 203 GRD. EL. 206.57 GW. EL. 202.49 DATE: 10/05/2022 MOTTLING. EL. 202.49 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
206.07	0"–6"	A	SANDY LOAM	10YR 3/2		COBBLES
204.74	6"– 22"	B	SANDY LOAM	10YR 6/8		
199.40	22"–86"	C1	F. LOAMY SAND	10YR 7/2	@ 49"	10% GRAVEL
192.24	86"–172"	C2	LOAMY SAND	2.5Y 7/1		15% GRAVEL 20% COBBLES

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 204 GRD. EL. 211.34 GW. EL. 206.84 DATE: 10/05/2022 MOTTLING. EL. 206.84 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
210.84	0"–6"	A	SANDY LOAM	10YR 3/2		COBBLES
209.76	6"– 19"	B	SANDY LOAM	10YR 6/8		
205.42	19"–71"	C1	F. LOAMY SAND	10YR 7/2	@ 54"	10% GRAVEL
199.17	71"–146"	C2	LOAMY SAND	2.5Y 7/1		15% GRAVEL 20% COBBLES

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 205 GRD. EL. 211.53 GW. EL. 206.86 DATE: 10/05/2022 MOTTLING. EL. 206.86 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
210.86	0"–8"	A	SANDY LOAM	10YR 3/2		COBBLES
209.70	8"– 22"	B	SANDY LOAM	10YR 6/8		
205.86	22"–68"	C1	F. LOAMY SAND	10YR 7/2	@ 56"	
199.03	68"–150"	C2	LOAMY SAND	2.5Y 7/1		15% GRAVEL

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 206 GRD. EL. 204.20 GW. EL. 200.53 DATE: 10/05/2022 MOTTLING. EL. 200.53 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
203.62	0"–7"	A	SANDY LOAM	10YR 3/2		COBBLES
201.70	7"– 30"	B	SANDY LOAM	10YR 6/4		
198.45	30"–69"	C1	F. LOAMY SAND	10YR 7/3	@ 44"	
190.95	69"–159"	C2	LOAMY SAND	2.5Y 7/2		10% GRAVEL

WATER WEEPING OBSERVED @ 144" EL.=192.20 WATER STANDING OBSERVED @ 153" EL.=191.45

TEST PIT 207 GRD. EL. 206.78 GW. EL. 203.11 DATE: 10/05/2022 MOTTLING. EL. 203.11 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
206.11	0"–8"	A	SANDY LOAM	10YR 3/2		COBBLES
204.95	8"– 22"	B	SANDY LOAM	10YR 6/4		
202.20	22"–55"	C1	F. LOAMY SAND	10YR 7/3	@ 43"	
195.11	55"–140"	C2	LOAMY SAND	2.5Y 7/2		10% GRAVEL

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

TEST PIT 208 GRD. EL. 209.72 GW. EL. 205.55 DATE: 10/05/2022 MOTTLING. EL. 205.55 TEST BY: JUSTIN WILLIAMS, E.I.T. WITNESSED BY: CERTIFIED BY:

ELEV.	SOIL DEPTH	SOIL HORZ.	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
209.05	0"–8"	A	SANDY LOAM	10YR 3/2		COBBLES
207.72	8"– 24"	B	SANDY LOAM	10YR 6/8		
205.30	24"–53"	C1	F. LOAMY SAND	10YR 7/2	@ 50"	
199.72	53"–120"	C2	LOAMY SAND	2.5Y 7/1		10% GRAVEL REFUSAL

WATER WEEPING OBSERVED @ N/A WATER STANDING OBSERVED @ N/A

811 DigSafe MA ME NH RI VT

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL — COMMONWEALTH OF MASSACHUSETTS — TRACY L. DUARTE — CIVIL — NO. 48660 — REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
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EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

TEST PIT LOGS
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01

FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-10.1

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MS VIEW:
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CTB:

INNOVATION (PUBLIC ~ 100' WIDE) WAY

AUXILIARY BASELINE "A"

2009 CITY LAYOUT (LAYOUT NO. B1/30)

MBL NORTH

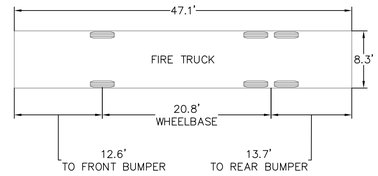
N/F
INNOVATION WAY (LOT 1)
HUTCHENS HOLDING III, LLC
DEED BOOK 10044 PAGE 60

PROPOSED INDUSTRIAL WAREHOUSE
BUILDING 1
TOTAL AREA=291,200 SF
FFE=196.0

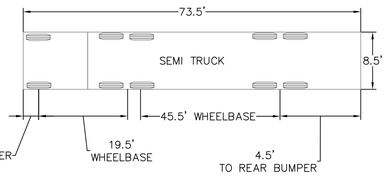
CONSERVATION AREA

LEGEND

VEHICLE BODY
VEHICLE ENVELOPE
WHEEL PATHS
CENTER LINE OF TRAVEL



FIRE TRUCK
N.T.S.



WB-67 SEMI TRUCK
N.T.S.

811 DigSafe MA ME NH RI VT

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6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
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4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

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50 25 0 50
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PROPOSED WAREHOUSE DEVELOPMENT

TRUCK TURNING PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-11.0

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NORTH

N/F
960 INNOVATION WAY
FALL RIVER INNOVATION SOLAR HOLDINGS, LLC.
DEED BOOK 8569 PAGE 252

N/F
1100 INNOVATION WAY
FALL RIVER DEVELOPMENT COMPANY, LLC.
DEED BOOK 9003 PAGE 248

N/F
1180 INNOVATION WAY
LIT FALL RIVER, LLC.
DEED BOOK 8832 PAGE 236

N/F
1240 INNOVATION WAY
UNIVERSITY OF MASSACHUSETTS
BUILDING AUTHORITY
C/O MASS BIOLOGICS
DEED BOOK 7932 PAGE 294

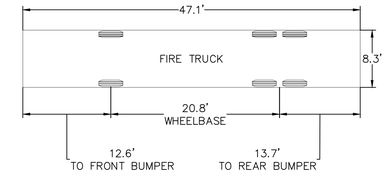
PROPOSED INDUSTRIAL WAREHOUSE
BUILDING 2
TOTAL AREA=203,397 SF
FFE=223.5

MATCHLINE SHEET C-5.3

MATCHLINE SHEET C-5.2

LEGEND

- VEHICLE BODY
- VEHICLE ENVELOPE
- WHEEL PATHS
- CENTER LINE OF TRAVEL



FIRE TRUCK
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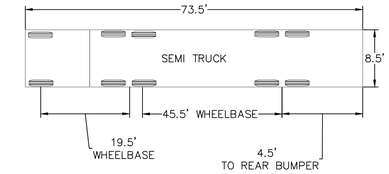

WB-67 SEMI TRUCK
N.T.S.

811 DigSafe MA.ME.NH.RI.VT

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REVISIONS

PROJ. MANAGER:	MBL
CHIEF DESIGNER:	MBL
REVIEWED BY:	DATE

SEAL

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 46660
REGISTERED PROFESSIONAL ENGINEER

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:	
HORZ.:	1"=50'
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HORZ.:	NAD83
VERT.:	NAVD88

50 25 0 50
GRAPHIC SCALE

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PROPOSED WAREHOUSE DEVELOPMENT

TRUCK TURNING PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
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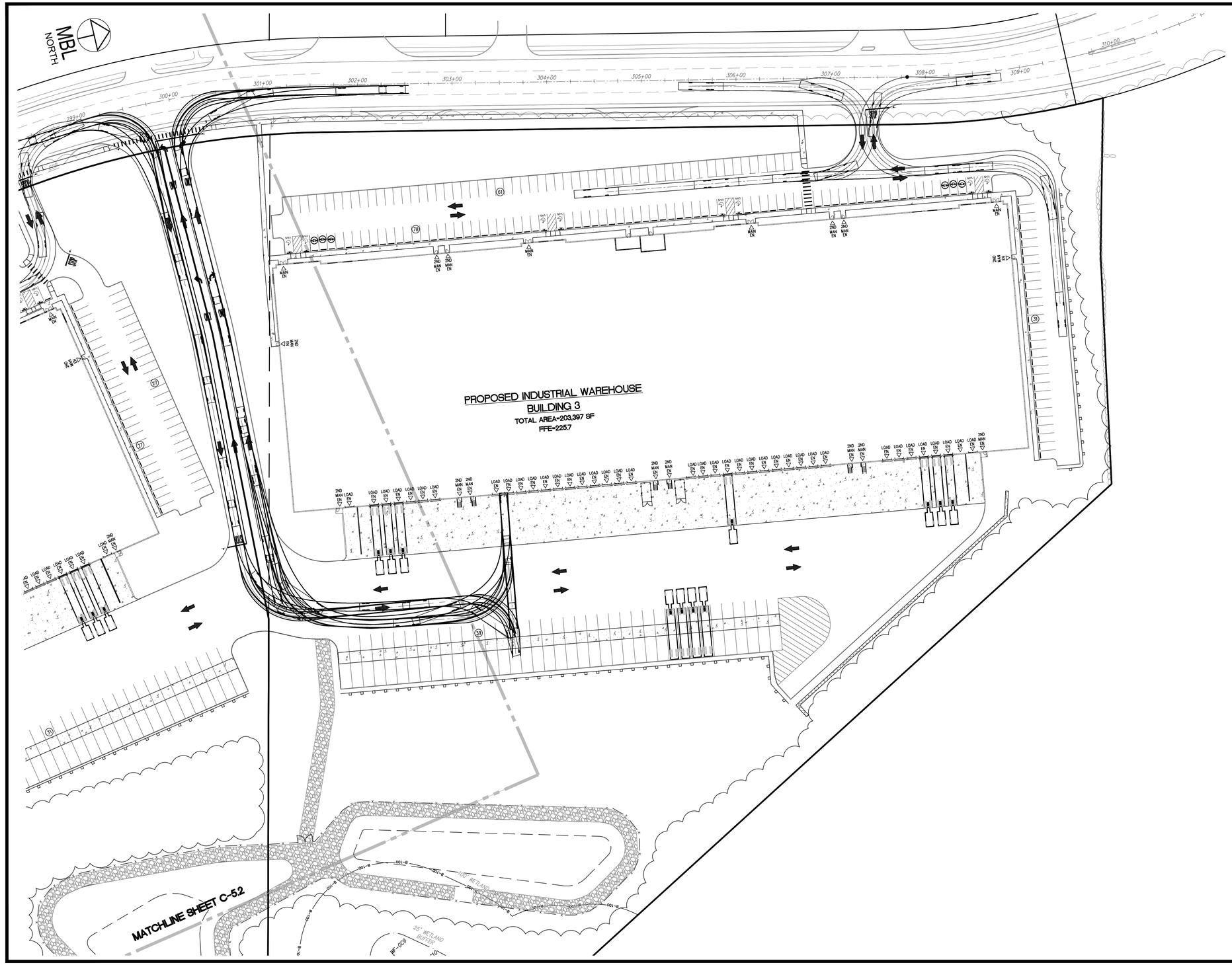

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REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 49660
REGISTERED PROFESSIONAL ENGINEER

SEAL

PREPARED FOR

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.: 1"=50'
VERT.:
DATUM:
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GRAPHIC SCALE

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PROPOSED WAREHOUSE DEVELOPMENT

TRUCK TURNING PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01

FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-11.2

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MBL NORTH

MATCHLINE SHEET C-5.2

BORDERING VEGETATED WETLANDS

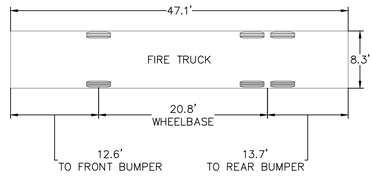
CONSERVATION AREA

PROPOSED INDUSTRIAL WAREHOUSE
BUILDING 4
TOTAL AREA=203,397 SF
FFE=192.8

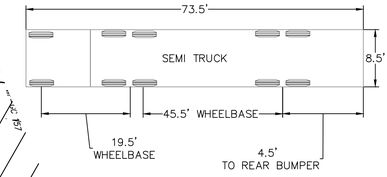
N/F
0 BELL ROCK ROAD
COMMONWEALTH OF MASSACHUSETTS
DEED BOOK N/A PAGE N/A

LEGEND

- VEHICLE BODY
- VEHICLE ENVELOPE
- WHEEL PATHS
- CENTER LINE OF TRAVEL



FIRE TRUCK
N.T.S.



WB-67 SEMI TRUCK
N.T.S.

No.	DATE	DESCRIPTION	BY
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3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER:	MBL
CHIEF DESIGNER:	MBL
REVIEWED BY:	DATE

SEAL
COMMONWEALTH OF MASSACHUSETTS
TRACY L. DUARTE
CIVIL
NO. 48660
REGISTERED PROFESSIONAL ENGINEER

SEAL

PREPARED FOR
V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114
NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.: 1"=50'
VERT.:
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50 25 0 50
GRAPHIC SCALE

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PROPOSED WAREHOUSE DEVELOPMENT

TRUCK TURNING PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

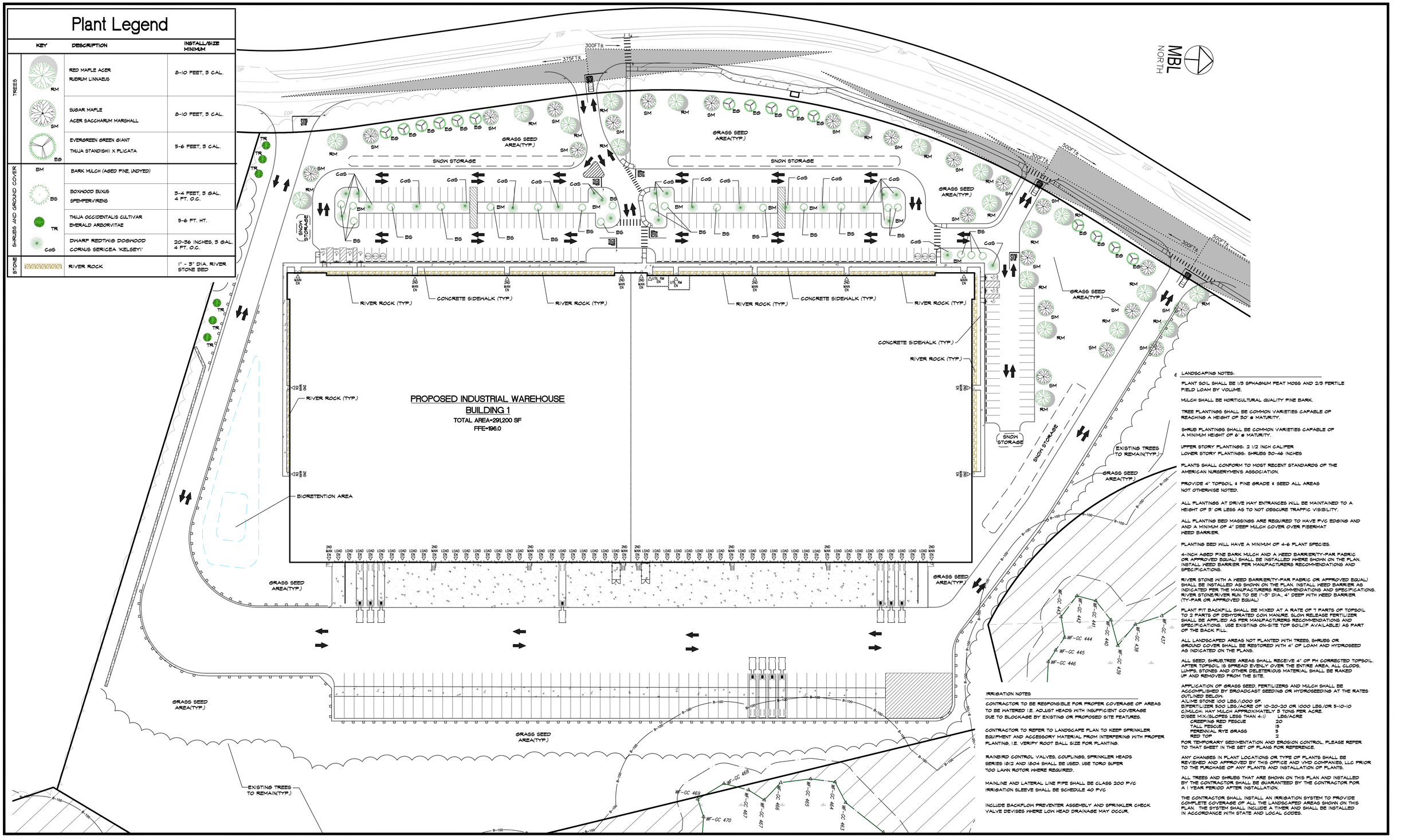
PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-11.3

811 DigSafe MA.ME.NH.RI.VT

Plant Legend

	KEY	DESCRIPTION	INSTALL/SIZE MINIMUM
TREES	RM	RED MAPLE ACER RUBRUM LINNAEUS	8-10 FEET, 3 CAL.
	SM	SUGAR MAPLE ACER SACCHARUM MARSHALL	8-10 FEET, 3 CAL.
	EG	EVERGREEN GREEN GIANT THUJA STANDISHII X PLICATA	5-6 FEET, 3 CAL.
SHRUBS AND GROUND COVER	BM	BARK MULCH (AGED PINE, UNDYED)	
	BS	BOXWOOD BUXUS SEMPERVIRENS	3-4 FEET, 3 GAL. 4 FT. O.C.
	TR	THUJA OCCIDENTALIS CULTIVAR EMERALD ARBORVITAE	5-6 FT. HT.
	CaS	DWARF REDTWIG DOGWOOD CORNUS SERICEA 'KELSEYI'	20-36 INCHES, 3 GAL. 4 FT. O.C.
STONE		RIVER ROCK	1" - 3" DIA. RIVER STONE BED



LANDSCAPING NOTES:

PLANT SOIL SHALL BE 1/3 SPHAGNUM PEAT MOSS AND 2/3 FERTILE FIELD LOAM BY VOLUME.

MULCH SHALL BE HORTICULTURAL QUALITY PINE BARK.

TREE PLANTINGS SHALL BE COMMON VARIETIES CAPABLE OF REACHING A HEIGHT OF 30' @ MATURITY.

SHRUB PLANTINGS SHALL BE COMMON VARIETIES CAPABLE OF A MINIMUM HEIGHT OF 6' @ MATURITY.

UPPER STORY PLANTINGS: 2 1/2 INCH CALIPER
LOWER STORY PLANTINGS: SHRUBS 30-48 INCHES

PLANTS SHALL CONFORM TO MOST RECENT STANDARDS OF THE AMERICAN NURSERYMEN'S ASSOCIATION.

PROVIDE 4" TOPSOIL & FINE GRADE & SEED ALL AREAS NOT OTHERWISE NOTED.

ALL PLANTINGS AT DRIVE WAY ENTRANCES WILL BE MAINTAINED TO A HEIGHT OF 3' OR LESS AS TO NOT OBSCURE TRAFFIC VISIBILITY.

ALL PLANTING BED MASSINGS ARE REQUIRED TO HAVE PVC EDGING AND AND A MINIMUM OF 4" DEEP MULCH COVER OVER FIBERMAT WEED BARRIER.

PLANTING BED WILL HAVE A MINIMUM OF 4-6 PLANT SPECIES.

4-INCH AGED PINE BARK MULCH AND A WEED BARRIER(TY-PAR FABRIC OR APPROVED EQUAL) SHALL BE INSTALLED WHERE SHOWN ON THE PLAN. INSTALL WEED BARRIER PER MANUFACTURERS RECOMMENDATIONS AND SPECIFICATIONS.

RIVER STONE WITH A WEED BARRIER(TY-PAR FABRIC OR APPROVED EQUAL) SHALL BE INSTALLED AS SHOWN ON THE PLAN. INSTALL WEED BARRIER AS INDICATED PER THE MANUFACTURERS RECOMMENDATIONS AND SPECIFICATIONS. RIVER STONE/RIVER RUN TO BE 1"-3" DIA., 4" DEEP WITH WEED BARRIER (TY-PAR OR APPROVED EQUAL)

PLANT PIT BACKFILL SHALL BE MIXED AT A RATE OF 1 PARTS OF TOPSOIL TO 2 PARTS OF DEHYDRATED COW MANURE. SLOW RELEASE FERTILIZER SHALL BE APPLIED AS PER MANUFACTURERS RECOMMENDATIONS AND SPECIFICATIONS. USE EXISTING ON-SITE TOP SOIL(IF AVAILABLE) AS PART OF THE BACK FILL.

ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUND COVER SHALL BE RESTORED WITH 4" OF LOAM AND HYDROSEED AS INDICATED ON THE PLANS.

ALL SEED, SHRUB,TREE AREAS SHALL RECEIVE 4" OF PH CORRECTED TOPSOIL. AFTER TOPSOIL IS SPREAD EVENLY OVER THE ENTIRE AREA, ALL CLODS, LUMPS, STONES AND OTHER DELETERIOUS MATERIAL SHALL BE RAKED UP AND REMOVED FROM THE SITE.

APPLICATION OF GRASS SEED, FERTILIZERS AND MULCH SHALL BE ACCOMPLISHED BY BROADCAST SEEDING OR HYDROSEEDING AT THE RATES OUTLINED BELOW.
A)LIME STONE 100 LBS./1,000 SF.
B)FERTILIZER 500 LBS/ACRE OF 10-20-20 OR 1000 LBS/OR 5-10-10
C)MULCH, HAY MULCH APPROXIMATELY 1 TONS PER ACRE.
D)SEED MIX:(SLOPES LESS THAN 4:1) LBS/ACRE

CREEPING RED FESCUE	20
TALL FESCUE	15
PERENNIAL RYE GRASS	5
RED TOP	2

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INCLUDE BACKFLOW PREVENTER ASSEMBLY AND SPRINKLER CHECK VALVE DEVISES WHERE LOW HEAD DRAINAGE MAY OCCUR.

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL

PREPARED FOR

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.: 1"=50'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
50 25 0 50
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

LANDSCPING PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01

FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-12.0

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LMAN:
CTB:

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NORTH

N/F
960 INNOVATION WAY
FALL RIVER INNOVATION SOLAR HOLDINGS, LLC.
DEED BOOK 8569 PAGE 252

N/F
1100 INNOVATION WAY
FALL RIVER DEVELOPMENT COMPANY, LLC.
DEED BOOK 9003 PAGE 248

N/F
1180 INNOVATION WAY
LIT FALL RIVER, LLC.
DEED BOOK 8832 PAGE 236

N/F
1240 INNOVATION WAY
UNIVERSITY OF MASSACHUSETTS
BUILDING AUTHORITY
C/O MASS BIOLOGICS
DEED BOOK 7932 PAGE 294

PROPOSED INDUSTRIAL WAREHOUSE
BUILDING 2
TOTAL AREA=203,397 SF
FFE=223.5

MATCH-LINE SHEET C-13.2

MATCH-LINE SHEET C-13.3

Plant Legend

	KEY	DESCRIPTION	INSTALL/SIZE MINIMUM
TREES	RM	RED MAPLE ACER RUBRUM LINNAEUS	8-10 FEET, 3 CAL.
	SM	SUGAR MAPLE ACER SACCHARUM MARSHALL	8-10 FEET, 3 CAL.
	EG	EVERGREEN GREEN GIANT THUJA STANDISHII X PLICATA	5-6 FEET, 3 CAL.
SHRUBS AND GROUND COVER	BM	BARK MULCH (AGED PINE, UNDYED)	
	BS	BOXWOOD BUXUS SPEMPERVIRENS	3-4 FEET, 3 GAL, 4 FT. O.C.
	TR	THUJA OCCIDENTALIS CULTIVAR EMERALD ARBORVITAE	5-6 FT. HT.
	CoS	DWARF REDTWIG DOGWOOD CORNUS SERICEA 'KELSEYI'	20-36 INCHES, 3 GAL, 4 FT. O.C.
STONE		RIVER ROCK	1" - 3" DIA. RIVER STONE BED

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PROPOSED WAREHOUSE DEVELOPMENT

LANDSCAPING PLAN
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FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
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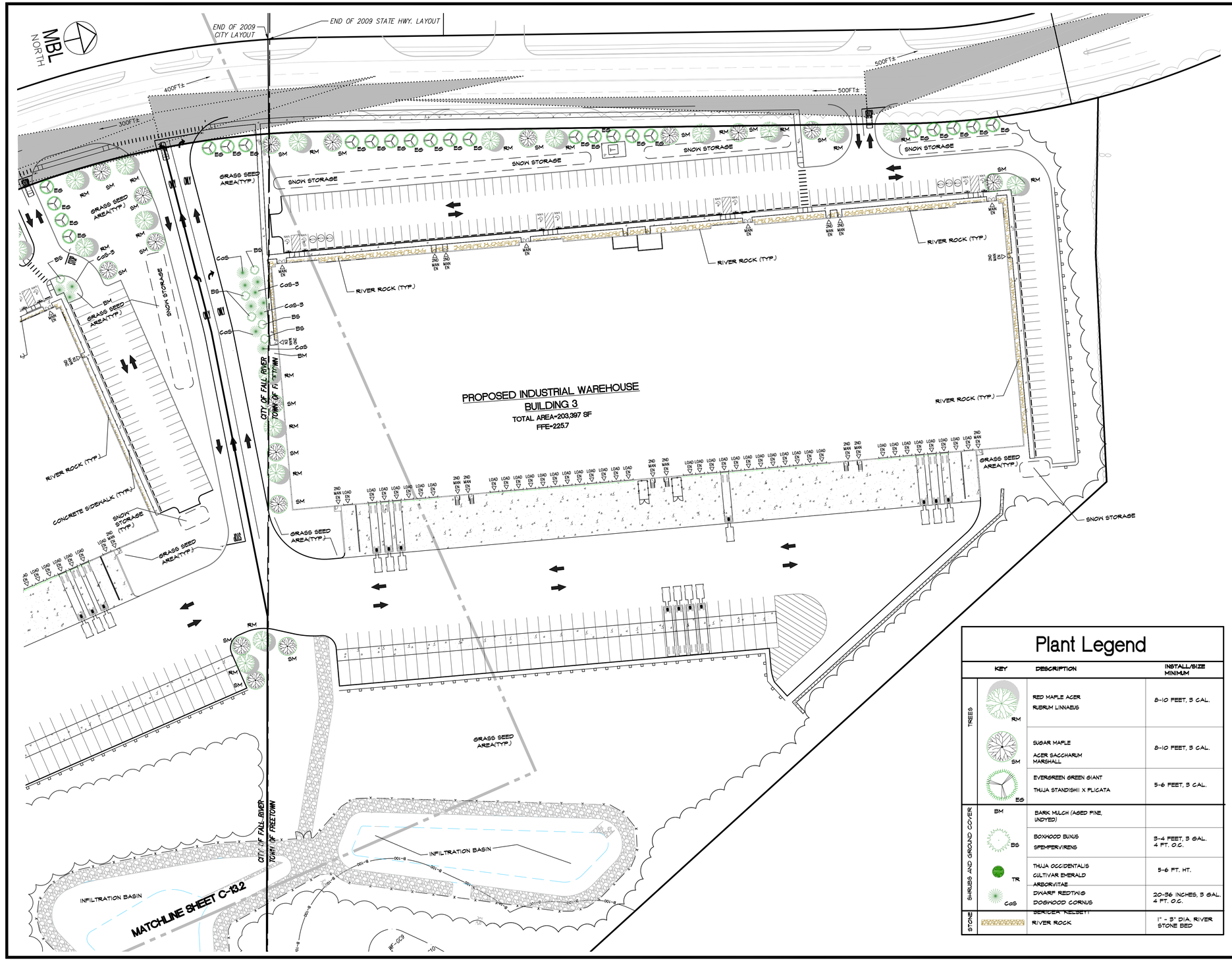
C-12.1



LANDSCAPING NOTES:

PLANT SOIL SHALL BE 1/3 SPHAGNUM PEAT MOSS AND 2/3 FERTILE FIELD LOAM BY VOLUME.

MULCH SHALL BE HORTICULTURAL QUALITY PINE BARK.

TREE PLANTINGS SHALL BE COMMON VARIETIES CAPABLE OF REACHING A HEIGHT OF 30' @ MATURITY.

SHRUB PLANTINGS SHALL BE COMMON VARIETIES CAPABLE OF A MINIMUM HEIGHT OF 6' @ MATURITY.

UPPER STORY PLANTINGS: 2 1/2 INCH CALIPER
LOWER STORY PLANTINGS: SHRUBS 30-46 INCHES

PLANTS SHALL CONFORM TO MOST RECENT STANDARDS OF THE AMERICAN NURSERYMEN'S ASSOCIATION.

PROVIDE 4" TOPSOIL & FINE GRADE & SEED ALL AREAS NOT OTHERWISE NOTED.

ALL PLANTINGS AT DRIVE WAY ENTRANCES WILL BE MAINTAINED TO A HEIGHT OF 3' OR LESS AS TO NOT OBSCURE TRAFFIC VISIBILITY.

ALL PLANTING BED MASSINGS ARE REQUIRED TO HAVE PVC EDGING AND AND A MINIMUM OF 4" DEEP MULCH COVER OVER FIBERMAT WEED BARRIER.

PLANTING BED WILL HAVE A MINIMUM OF 4-6 PLANT SPECIES.

4-INCH AGED PINE BARK MULCH AND A WEED BARRIER(TY-PAR FABRIC OR APPROVED EQUAL) SHALL BE INSTALLED WHERE SHOWN ON THE PLAN. INSTALL WEED BARRIER PER MANUFACTURERS RECOMMENDATIONS AND SPECIFICATIONS.

RIVER STONE WITH A WEED BARRIER(TY-PAR FABRIC OR APPROVED EQUAL) SHALL BE INSTALLED AS SHOWN ON THE PLAN. INSTALL WEED BARRIER AS INDICATED PER THE MANUFACTURERS RECOMMENDATIONS AND SPECIFICATIONS. RIVER STONE/RIVER RUN TO BE 1"-3" DIA., 4" DEEP WITH WEED BARRIER (TY-PAR OR APPROVED EQUAL)

PLANT PIT BACKFILL SHALL BE MIXED AT A RATE OF 1 PARTS OF TOPSOIL TO 2 PARTS OF DEHYDRATED COW MANURE SLOW RELEASE FERTILIZER SHALL BE APPLIED AS PER MANUFACTURERS RECOMMENDATIONS AND SPECIFICATIONS. USE EXISTING ON-SITE TOP SOIL(IF AVAILABLE) AS PART OF THE BACK FILL.

ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUND COVER SHALL BE RESTORED WITH 4" OF LOAM AND HYDROSEED AS INDICATED ON THE PLANS.

ALL SEED, SHRUB,TREE AREAS SHALL RECEIVE 4" FF PH CORRECTED TOPSOIL AFTER TOPSOIL IS SPREAD EVENLY OVER THE ENTIRE AREA, ALL CLODS, LUMPS, STONES AND OTHER DELETERIOUS MATERIAL SHALL BE RAKED UP AND REMOVED FROM THE SITE.

APPLICATION OF GRASS SEED, FERTILIZERS AND MULCH SHALL BE ACCOMPLISHED BY BROADCAST SEEDING OR HYDROSEEDING AT THE RATES OUTLINED BELOW:
A.LIME STONE 100 LBS./1,000 SF.
B)FERTILIZER 500 LBS./ACRE OF 10-20-20 OR 1000 LBS./OR 5-10-10
C)MULCH: HAY MULCH APPROXIMATELY 2 TONS PER ACRE.
D)SEE MIX:(SLOPES LESS THAN 4:1)

	LBS/ACRE
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FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
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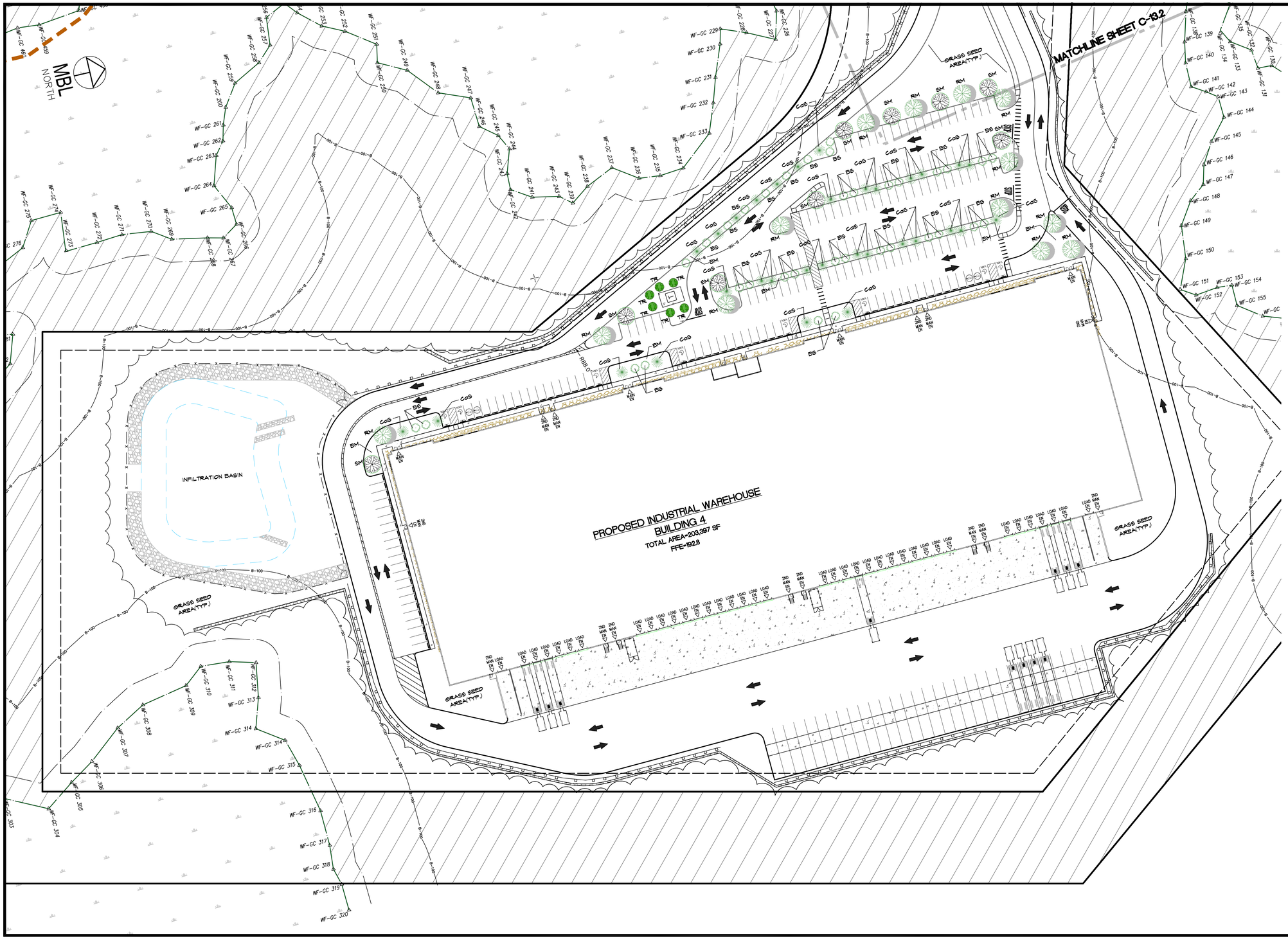

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CHIEF DESIGNER: MBL
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NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
0
GRAPHIC SCALE

MBL
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5 BRISTOL DRIVE, SUITE 3A & 4
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PROPOSED WAREHOUSE DEVELOPMENT

LANSCAPING PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-12.3

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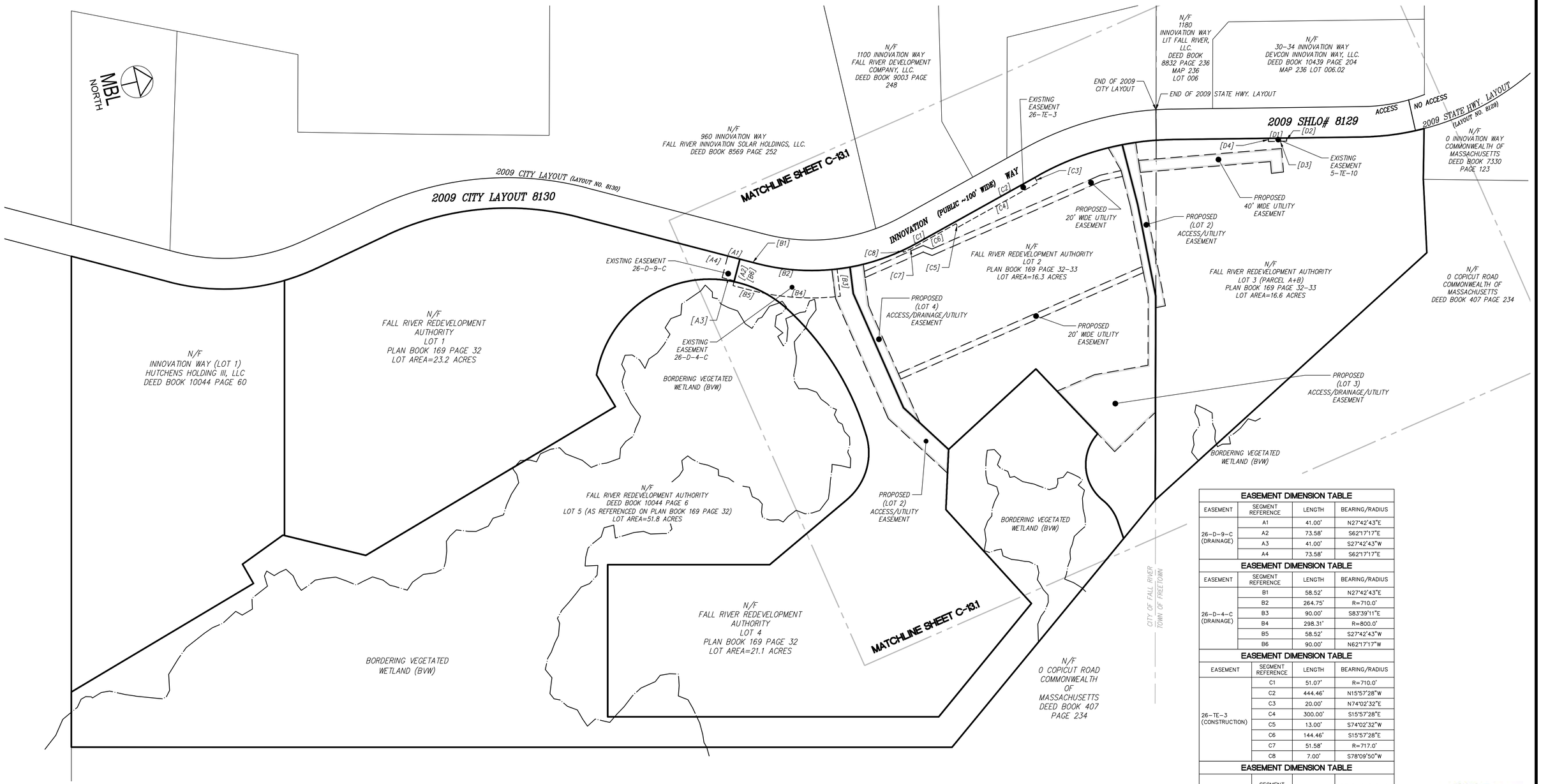

EASEMENT DIMENSION TABLE			
EASEMENT	SEGMENT REFERENCE	LENGTH	BEARING/RADIUS
26-D-9-C (DRAINAGE)	A1	41.00'	N27°42'43"E
	A2	73.58'	S62°17'17"E
	A3	41.00'	S27°42'43"W
	A4	73.58'	S62°17'17"E

EASEMENT DIMENSION TABLE			
EASEMENT	SEGMENT REFERENCE	LENGTH	BEARING/RADIUS
26-D-4-C (DRAINAGE)	B1	58.52'	N27°42'43"E
	B2	264.75'	R=710.0'
	B3	90.00'	S83°39'11"E
	B4	298.31'	R=800.0'
	B5	58.52'	S27°42'43"W
	B6	90.00'	N62°17'17"W

EASEMENT DIMENSION TABLE			
EASEMENT	SEGMENT REFERENCE	LENGTH	BEARING/RADIUS
26-TE-3 (CONSTRUCTION)	C1	51.07'	R=710.0'
	C2	444.46'	N15°57'28"W
	C3	20.00'	N74°02'32"E
	C4	300.00'	S15°57'28"E
	C5	13.00'	S74°02'32"W
	C6	144.46'	S15°57'28"E
	C7	51.58'	R=717.0'
	C8	7.00'	S78°09'50"W

EASEMENT DIMENSION TABLE			
EASEMENT	SEGMENT REFERENCE	LENGTH	BEARING/RADIUS
5-TE-10 (CONSTRUCTION)	D1	60.00'	N12°23'12"E
	D2	10.00'	S77°36'48"E
	D3	60.00'	S12°23'12"W
	D4	10.00'	N77°36'48"W

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NORTH ANDOVER MASSACHUSETTS

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PROPOSED WAREHOUSE DEVELOPMENT

PROPOSED EASEMENT LAYOUT PLAN
0 INNOVATION WAY
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FREETOWN - PARCEL ID 236-006.01

FALL RIVER/FREETOWN MASSACHUSETTS

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NORTH

INNOVATION (PUBLIC ~100' WIDE) WAY

EXISTING EASEMENT 26-TE-3

PROPOSED 20' WIDE UTILITY EASEMENT

PROPOSED 40' WIDE UTILITY EASEMENT

EXISTING EASEMENT 26-D-9-C

EXISTING EASEMENT 26-D-4-C

EXISTING EASEMENT 5-TE-10

BORDERING VEGETATED WETLAND (BVW)

BORDERING VEGETATED WETLANDS (BVW)

PROPOSED (LOT 4) ACCESS/DRAINAGE/UTILITY EASEMENT

PROPOSED (LOT 2) ACCESS/UTILITY EASEMENT

PROPOSED ACCESS/UTILITY EASEMENT (LOT 2)

PROPOSED (LOT 3) ACCESS/DRAINAGE/UTILITY EASEMENT

N62°17'17"W 76.68'

N27°42'43"E 58.52'

L=203.64, R=377.55, TAN=104.36, D=030°54'13"

L=307.59, R=710.00, TAN=156.25, D=024°49'19"

L=233.56, R=710.00, TAN=117.84, D=018°50'52"

S15°57'28"E 459.64'

L=112.48, R=930.00, TAN=56.31, D=006°55'48"

L=292.84, R=930.00, TAN=147.64, D=018°02'28"

L=54.41, R=930.00, TAN=27.21, D=003°21'07"

L=208.56, R=870.00, TAN=104.78, D=013°44'07"

S84°02'27"E 87.61'

L=490.44, R=470.00, TAN=251.12, D=030°21'18"

409.94' N79°26'34"E

N88°37'15"E 202.35'

307.66' S88°00'19"E

619.64' N12°21'55"E

S73°59'39"E 166.81'

N55°49'17"E 201.95'

198.01' S74°11'26"E

N29°31'53"W 389.94'

N69°11'22"E 294.22'

669.52' S76°43'21"E

S29°11'26"E 1206.64'

S79°36'12"E 241.42'

L=233.69, R=201.09, TAN=132.05, D=066°35'04"

L=247.20, R=150.37, TAN=161.79, D=094°11'30"

L=84.80, R=153.43, TAN=43.51, D=031°39'55"

N84°10'18"E 58.98'

N60°48'34"E 417.26'

N/F
960 INNOVATION WAY
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DEED BOOK 8569 PAGE 252

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DEED BOOK 7932 PAGE 294

N/F
1180 INNOVATION WAY
LIT FALL RIVER, LLC.
DEED BOOK 8832 PAGE 236

N/F
30-34 INNOVATION WAY
DEVCON INNOVATION WAY, LLC.
DEED BOOK 10439 PAGE 204
MAP 236 LOT 006.02

N/F
FALL RIVER REDEVELOPMENT AUTHORITY
DEED BOOK 10044 PAGE 6
LOT 5 (AS REFERENCED ON PLAN BOOK 169 PAGE 32)
LOT AREA=51.8 ACRES

N/F
FALL RIVER REDEVELOPMENT AUTHORITY
LOT 2
PLAN BOOK 169 PAGE 32-33
LOT AREA=16.3 ACRES

N/F
FALL RIVER REDEVELOPMENT AUTHORITY
LOT 3 (PARCEL A+B)
PLAN BOOK 169 PAGE 32-33
LOT AREA=16.6 ACRES

N/F
0 INNOVATION WAY
COMMONWEALTH OF MASSACHUSETTS
DEED BOOK 7330 PAGE 123

N/F
0 COPICUT ROAD
COMMONWEALTH OF MASSACHUSETTS
DEED BOOK 407 PAGE 234

LOT 2 EASEMENT DIMENSION TABLE

EASEMENT	SEGMENT REFERENCE	LENGTH	BEARING/RADIUS
PROPOSED ACCESS/UTILITY EASEMENT (LOT 4)	C1	44.88'	R=710.0'
	C2	136.68'	S84°02'27"E
	C3	422.45'	N79°26'34"E
	C4	74.87'	S55°49'17"W
	C5	409.94'	S79°26'34"W
	C6	87.61'	N84°02'27"W

LOT 2 EASEMENT DIMENSION TABLE

EASEMENT	SEGMENT REFERENCE	LENGTH	BEARING/RADIUS
PROPOSED 20' WIDE UTILITY EASEMENT	E1	874.62'	N10°33'26"W
	E2	20.49'	S88°00'19"E
	E3	870.17'	S10°33'26"E
	E4	20.00'	S79°26'34"W

LOT 2 EASEMENT DIMENSION TABLE

EASEMENT	SEGMENT REFERENCE	LENGTH	BEARING/RADIUS
PROPOSED 20' WIDE UTILITY EASEMENT	D1	20.86	N84°02'27"W
	D2	211.23	N10°33'20"W
	D3	31.31'	N34°26'40"E
	D4	603.11'	N48°33'26"W
	D5	70.59'	N00°30'48"E
	D6	20.01'	N88°37'15"E
	D7	69.31'	S00°30'48"W
	D8	609.45'	S48°33'26"E
	D9	31.31'	S34°26'40"W
	D10	208.87	S10°33'20"E

LOT 3 EASEMENT DIMENSION TABLE

EASEMENT	SEGMENT REFERENCE	LENGTH	BEARING/RADIUS
PROPOSED ACCESS/UTILITY EASEMENT (LOT 2)	G1	45.12'	R=930.00'
	G2	200.27'	S85°39'39"E
	G3	345.30'	S88°00'19"E
	G4	32.36'	S01°59'14"W
	G5	37.64'	N76°43'21"W
	G6	307.66'	N88°00'19"W
	G7	202.35'	S88°37'15"W

LOT 3 EASEMENT DIMENSION TABLE

EASEMENT	SEGMENT REFERENCE	LENGTH	BEARING/RADIUS
PROPOSED 40' WIDE UTILITY EASEMENT	H1	471.40'	N8°23'34"E
	H2	77.72'	S81°35'40"E
	H3	40.00'	S6°41'25"W
	H4	38.91'	N81°36'51"W
	H5	428.57'	S8°24'20"W
	H6	40.00'	N85°39'39"W

LOT 2 EASEMENT DIMENSION TABLE

EASEMENT	SEGMENT REFERENCE	LENGTH	BEARING/RADIUS
PROPOSED ACCESS/DRAINAGE /UTILITY EASEMENT (LOT 3)	F1	47.26'	R=930.00
	F2	202.35'	N88°37'15"E
	F3	307.66'	S88°00'19"W
	F4	381.08'	S76°43'21"E
	F5	186.48'	S30°52'51"E
	F6	274.67'	S59°31'22"W
	F7	133.98'	N10°33'05"W
	F8	179.03'	N03°03'03"E
	F9	224.21'	N76°43'21"W
	F10	304.45'	N88°00'19"W
	F11	100.71'	S88°37'15"W
	F12	85.49'	S73°32'53"W

LOT 4 EASEMENT DIMENSION TABLE

EASEMENT	SEGMENT REFERENCE	LENGTH	BEARING/RADIUS
PROPOSED ACCESS/UTILITY EASEMENT (LOT 2)	B1	60.02'	R=710.0'
	B2	87.61'	S84°02'27"E
	B3	409.94'	N79°26'34"E
	B4	201.95'	N55°49'17"E
	B5	78.34'	S74°11'26"E
	B6	264.87'	S55°49'17"W
	B7	431.20'	S79°26'34"W
	B8	95.64'	N84°02'27"W

No.	DATE	DESCRIPTION	BY
6	11/20/2023	REVISIONS PER CITY/TOWN COMMENTS	JAW
5	02/06/2023	REVISIONS PER FREETOWN PEER REVIEW COMMENTS	JAW
4	11/21/2022	REVISION PER COMMENTS	JAW
3	11/10/2022	REVISION PER MASSDOT COMMENTS	JAW
2	10/12/2022	REVISION PER MASSDOT COMMENTS	JAW
1	09/08/2022	REVISION PER COMMENT FROM CITY OF FALL RIVER	JAW

REVISIONS

PROJ. MANAGER: MBL
CHIEF DESIGNER: MBL
REVIEWED BY: DATE

SEAL

SEAL

PREPARED FOR

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

SCALE:
HORZ.: 1"=60'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
60 30 0 60
GRAPHIC SCALE

MBL
LAND DEVELOPMENT & PERMITTING, CORP.
LAND DEVELOPMENT, TRANSPORTATION, AND ENVIRONMENTAL SOLUTIONS
5 BRISTOL DRIVE, SUITE 3A & 4
SOUTH EASTON, MA 02375
P.508.297.2746
EMAIL:info@MBLLandDevelopment.com
WEB: www.MBLLandDevelopment.com

PROPOSED WAREHOUSE DEVELOPMENT

PROPOSED EASEMENT LAYOUT PLAN
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185, 189, 191, 192, 193
FREETOWN - PARCEL ID 236-006.01

FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: JULY 25, 2022

C-13.1

811 DigSafe MA.ME.NH.RI.VT

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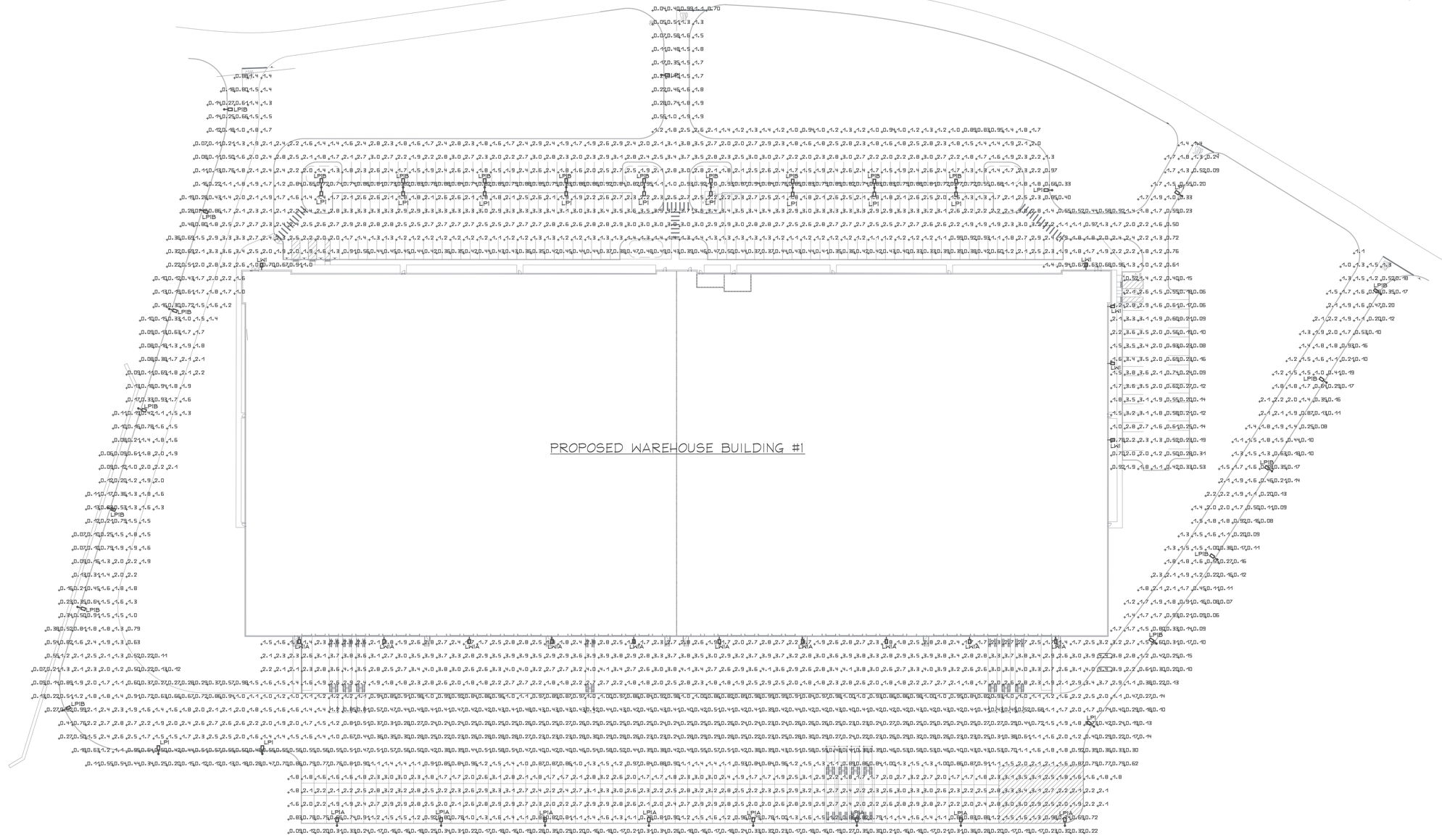

BUILDING #1 PHOTOMETRIC PLAN

SCALE: 1"=40'-0"

INNOVATION WAY – BUILDING #1								
Index	Manufacturer	Article name	Item number	Fitting	Luminous flux	Light loss factor	Connected load	Mounting Height
LP1, LW1	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR-2-320L-1-65-4K7-3-BC	1x X-70-CRI	12762 lm	0.80	145 W	33'
LP1B	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR-2-320L-1-65-4K7-BC	1x X-70-CRI	11924 lm	0.80	154.2 W	33'
LP1A, LW1A	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	LP1C-RAR-2-480L-240-5K7-4-BC	1x X-70-CRI	17672 lm	0.80	226.9 W	33'

#	Name	Parameter	Min	Max	Average	Mean/Min	Max/Min
1	Calculation surface 4	Perpendicular Illuminance	0.010 fc	4.41 fc	1.51 fc	149.5	436.0

NO	DATE	ISSUE
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BUILDING #1 SITE LIGHTING PHOTOMETRIC PLAN

SE2.1

0 4 8 16

4252

J:\SE FILES\SERVER\JOBS\2022\2212\DWGS\SE2.1 BUILDING #1 SITE LIGHTING PHOTOMETRIC PLAN.DWG Plot By: Scott Schlieff Plot Date: June 27, 2022

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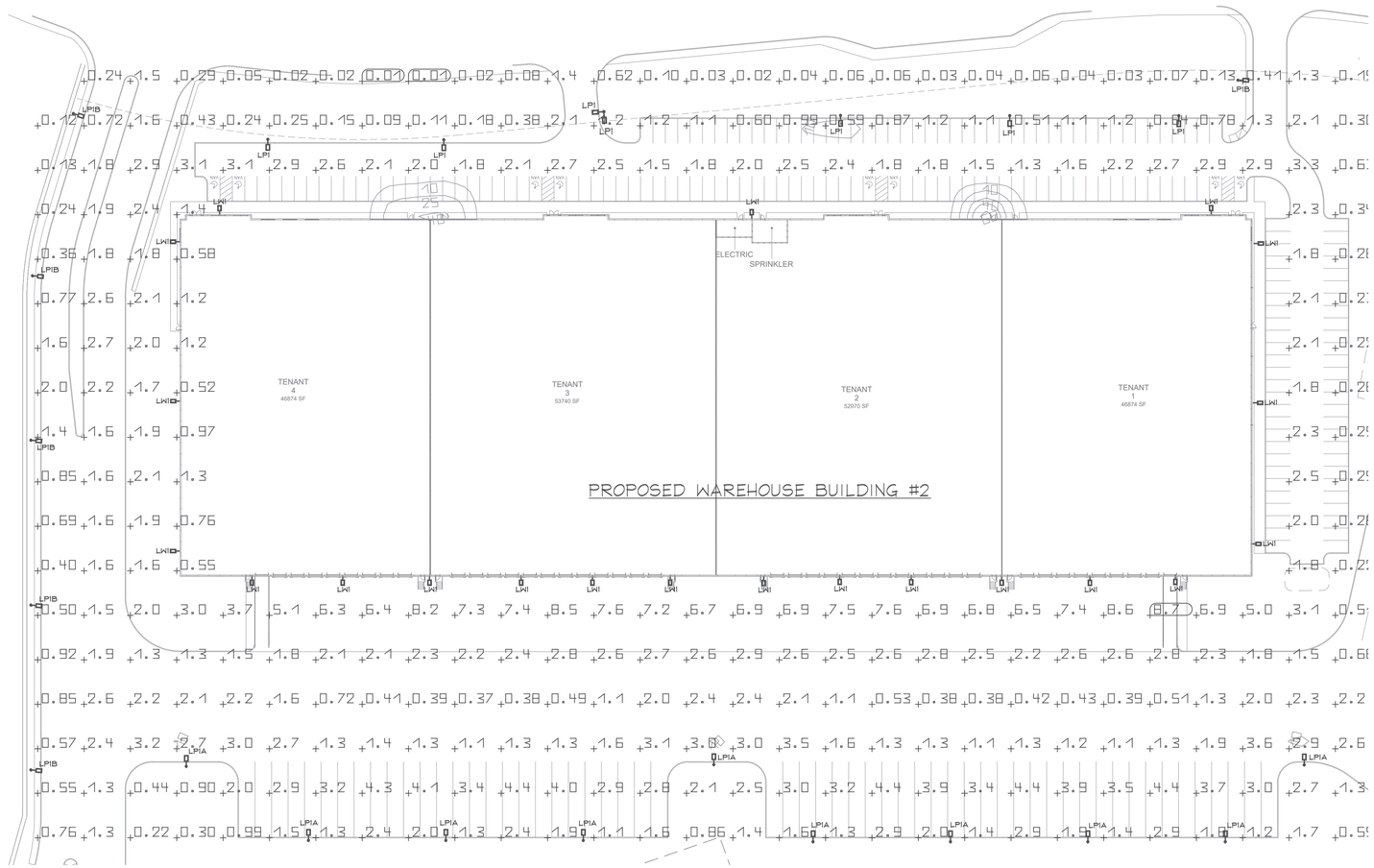

BUILDING #2 PHOTOMETRIC PLAN

SCALE: 1"=40'-0"

INNOVATION WAY – BUILDING #2								
Index	Manufacturer	Article name	Item number	Fitting	Luminous flux	Light loss factor	Connected load	Mounting Height
LW1	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR–2–320L–1 65–4K7–3–BC	1x X–70–CRI	12762 lm	0.80	145 W	33'
LW1A	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR2–480L–24 0–4K7–3–U	1x B–70–CRI	32179 lm	0.80	226.9 W	33'
LP1	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR–2–320L–1 65–4K7–3–BC	1x X–70–CRI	12762 lm	0.80	145 W	33'
LP1A	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR2–480L–24 0–4K7–3–U	1x B–70–CRI	32179 lm	0.80	226.9 W	33'
LP1B	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR–2–320L–1 65–4K7–2–BC	1x X–70–CRI	11924 lm	0.80	154.2 W	33'

#	Name	Parameter	Min	Max	Average	Mean/Min	Max/Min
1	Calculation surface 7	Perpendicular illuminance	0.014 fc	8.68 fc	1.99 fc	143.8	627.4

NO	DATE	ISSUE
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www.waynejgriffinelectric.com

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BUILDING #2 SITE LIGHTING PHOTOMETRIC PLAN

SE2.2

0 4 8 16

4252

J:\SE FILE SERVER\PROJECTS\2022\2252\DWG\SE2.2 BLDG#2 SITE LIGHTING PHOTOMETRIC PLAN.DWG Plot By:Scott Schlaeff Plot Date: June 27, 2022

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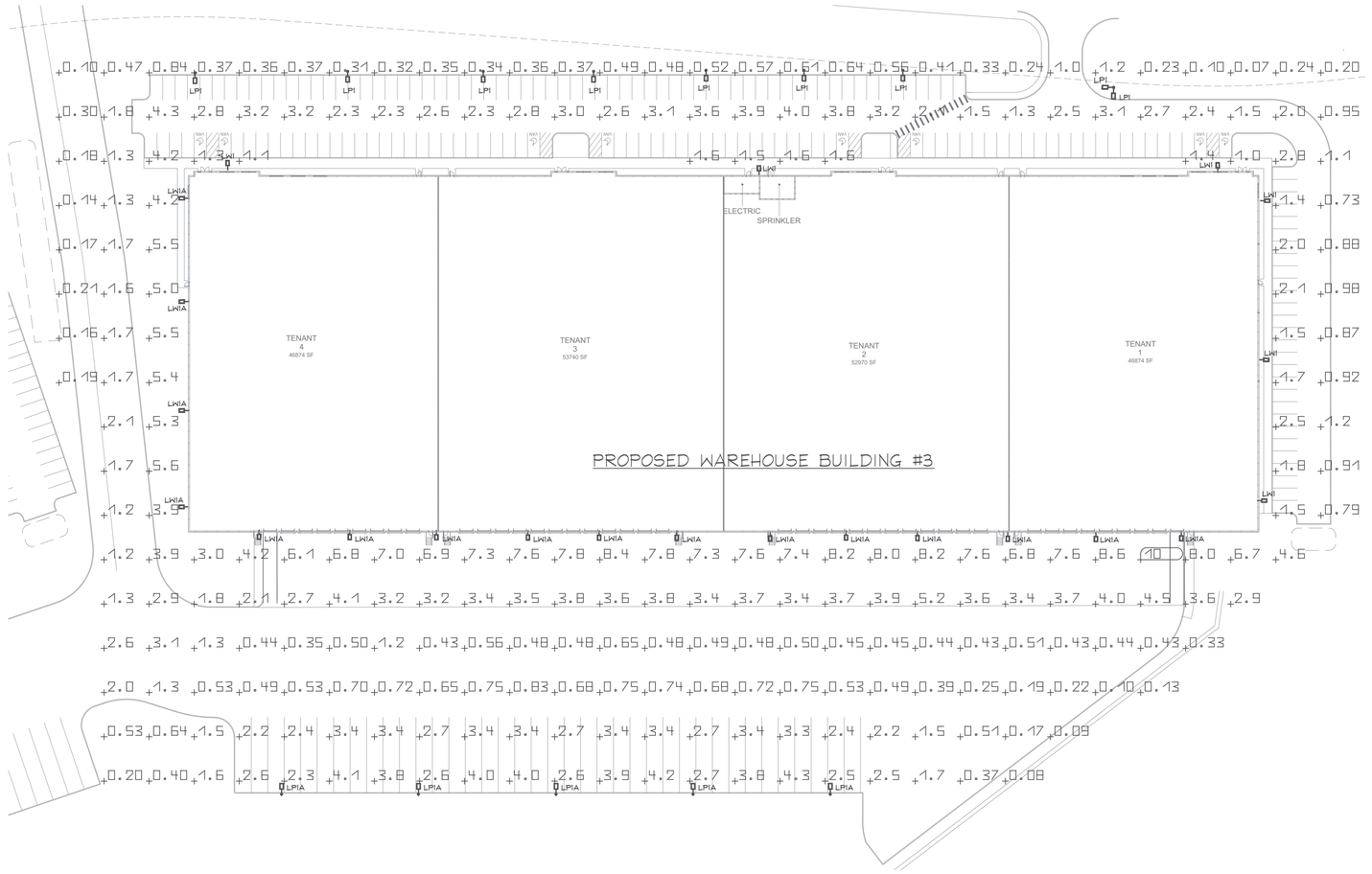

BUILDING #3 PHOTOMETRIC PLAN
SCALE: 1"=40'-0"

INNOVATION WAY – BUILDING #3								
Index	Manufacturer	Article name	Item number	Fitting	Luminous flux	Light loss factor	Connected load	Mounting Height
LW1A	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR2-480L-240-4K7-3-U	1x B-70-CRI	32179 lm	0.80	226.9 W	33'
LW1	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR-2-320L-165-4K7-3-BC	1x X-70-CRI	12762 lm	0.80	145 W	33'
LP1	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR-2-320L-165-4K7-3-BC	1x X-70-CRI	12762 lm	0.80	145 W	33'
LP1A	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR2-480L-240-4K7-3-U	1x B-70-CRI	32179 lm	0.80	226.9 W	33'

#	Name	Parameter	Min	Max	Average	Mean/Min	Max/Min
1	Calculation surface 7	Perpendicular illuminance	0.048 fc	10.2 fc	2.33 fc	48.66	212.4

NO	DATE	ISSUE
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BUILDING #3 SITE LIGHTING PHOTOMETRIC PLAN

SE2.3

0 4 8 16

4252

J:\ESE FILE SERVER\JOBS\2022\2252\DWG\ISSUED\2252-BUILDING #3 SITE LIGHTING PHOTOMETRIC PLAN.DWG Plot Date: June 27, 2022 Plot By: Scott Schlaef

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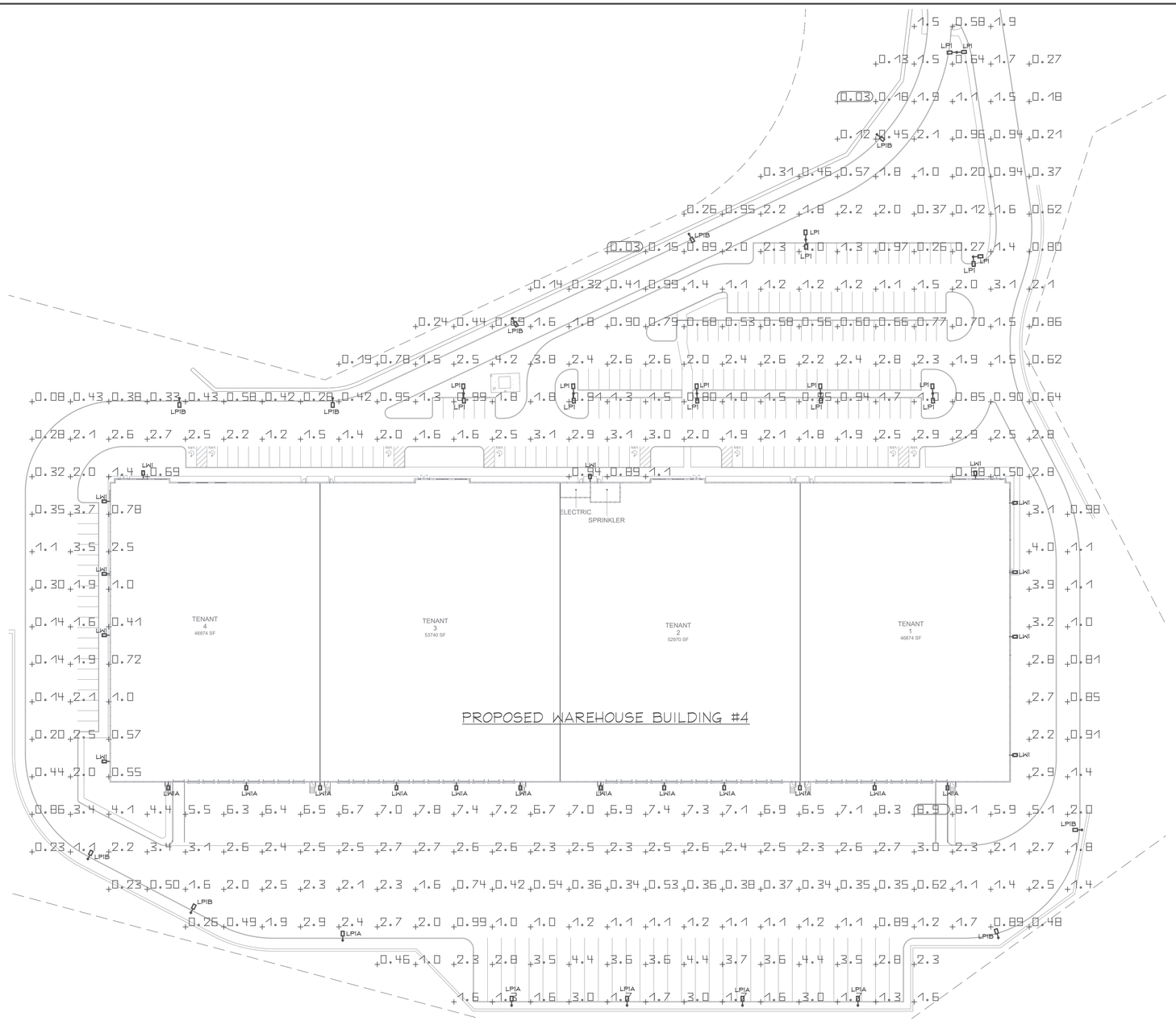

BUILDING #4 PHOTOMETRIC PLAN
SCALE: 1"=40'-0"

INNOVATION WAY – BUILDING #4								
Index	Manufacturer	Article name	Item number	Fitting	Luminous flux	Light loss factor	Connected load	Mounting Height
LW1	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR-2-320L-165-4K7-3-BC	1x X-70-CRI	12762 lm	0.80	145 W	33'
LP1	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR-2-320L-165-4K7-3-BC	1x X-70-CRI	12762 lm	0.80	145 W	33'
LW1A	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR2-480L-240-4K7-3-U	1x B-70-CRI	32179 lm	0.80	226.9 W	33'
LP1A	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR2-480L-240-4K7-3-U	1x B-70-CRI	32179 lm	0.80	226.9 W	33'
LP1B	Hubbell Lighting	RATIO AREA lens gaskets and Back Light Shields	RAR-2-320L-165-4K7-2-BC	1x X-70-CRI	11924 lm	0.80	154.2 W	33'

#	Name	Parameter	Min	Max	Average	Mean/Min	Max/Min
1	Calculation surface	Perpendicular illuminance	0.029 fc	8.92 fc	1.92 fc	66.13	306.9

NO	DATE	ISSUE
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BUILDING #4 SITE LIGHTING PHOTOMETRIC PLAN

SE2.4

0 4 8 16

4252

J:\SE FILE SERVER\PROJECTS\2022\2022052\DWG\SE2.4 BUILDING #4 SITE LIGHTING PHOTOMETRIC PLAN.DWG Plot By: Bruce Kirkhoff
Plot Date: June 27, 2022

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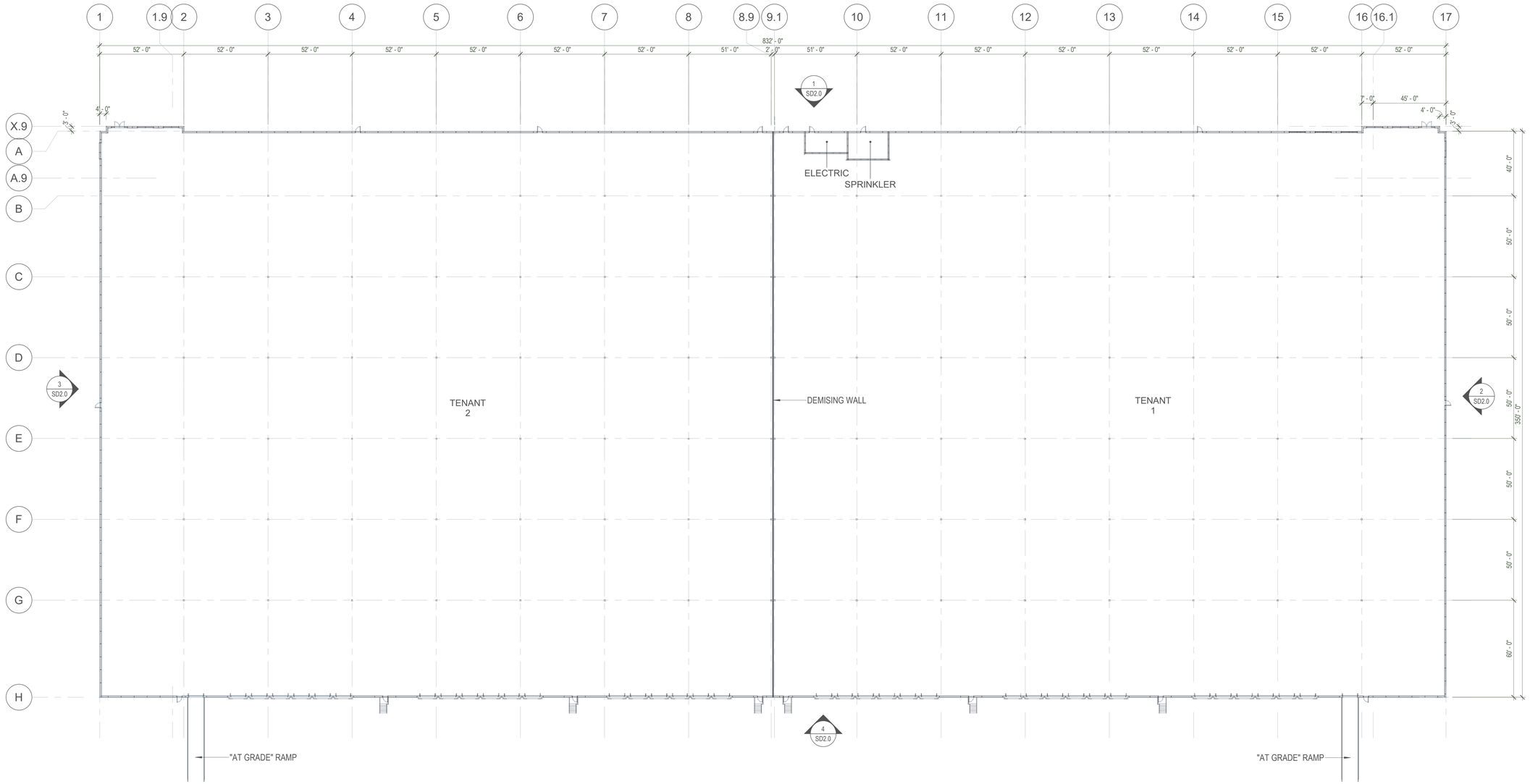
INNOVATION WAY, FALL RIVER, MA ◦ 4252

NO	DATE	ISSUE
01	05-10-22	PROPOSED FLEX BUILDING

SD0.0
SCHEMATIC RENDERING

DACON



1 FIRST FLOOR PLAN
1/32" = 1'-0"

0 32 64 128

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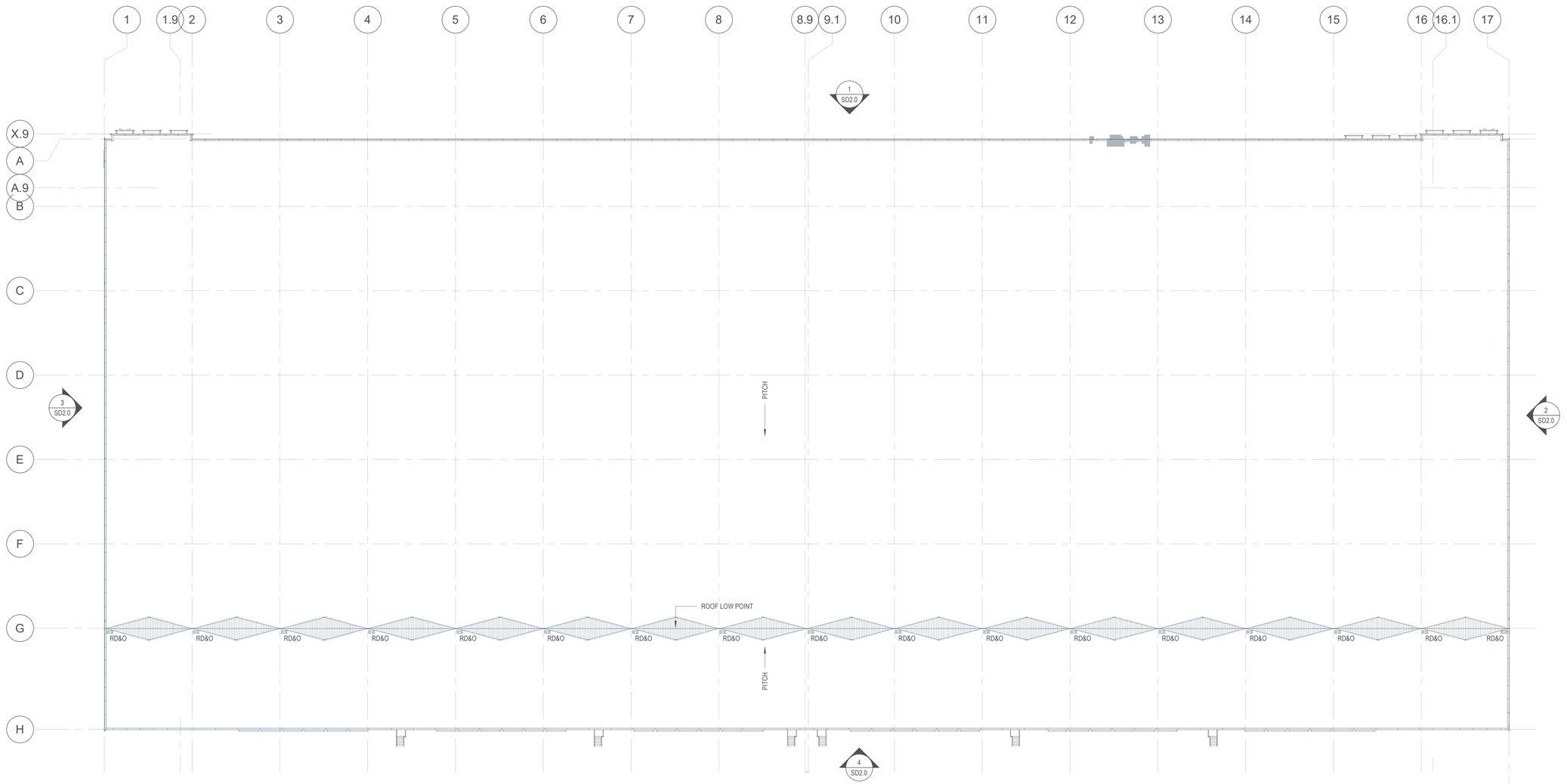
VMD FALL RIVER

INNOVATION WAY, FALL RIVER, MA ◦ 4252

NO	DATE	ISSUE
01	05-10-22	PROPOSED FLEX BUILDING

SD1.1
SCHEMATIC FLOOR PLAN

DACON



1 ROOF PLAN
1/32" = 1'-0"

0 32 64 128

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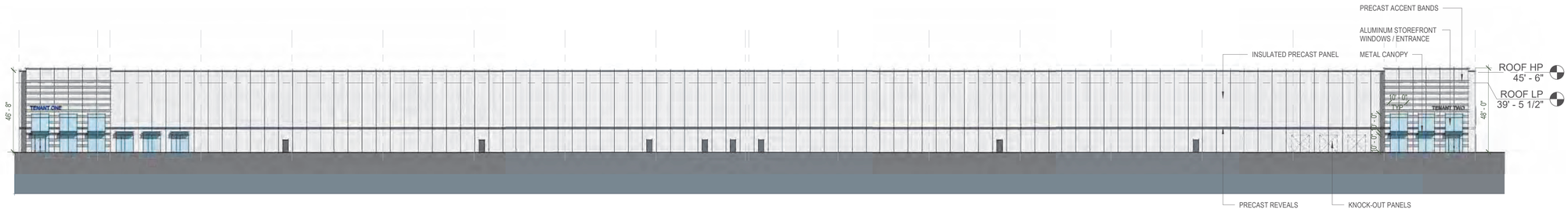
INNOVATION WAY, FALL RIVER, MA ◦ 4252

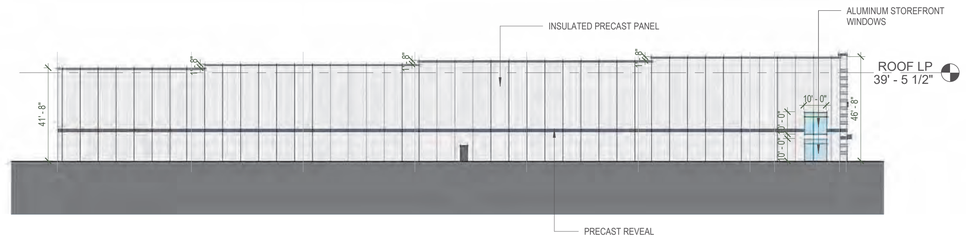
NO	DATE	ISSUE
01	05-10-22	PROPOSED FLEX BUILDING

SD1.2
SCHEMATIC ROOF PLAN

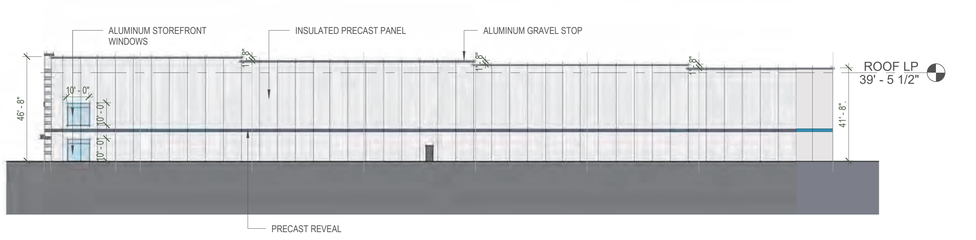
DACON



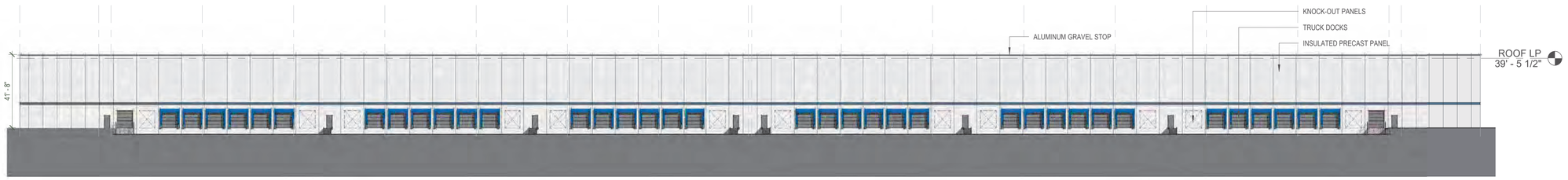
1 FRONT ELEVATION
1/32" = 1'-0"



2 LEFT SIDE ELEVATION
1/32" = 1'-0"



3 RIGHT SIDE ELEVATION
1/32" = 1'-0"



4 REAR ELEVATION
1/32" = 1'-0"

0 32 64 128

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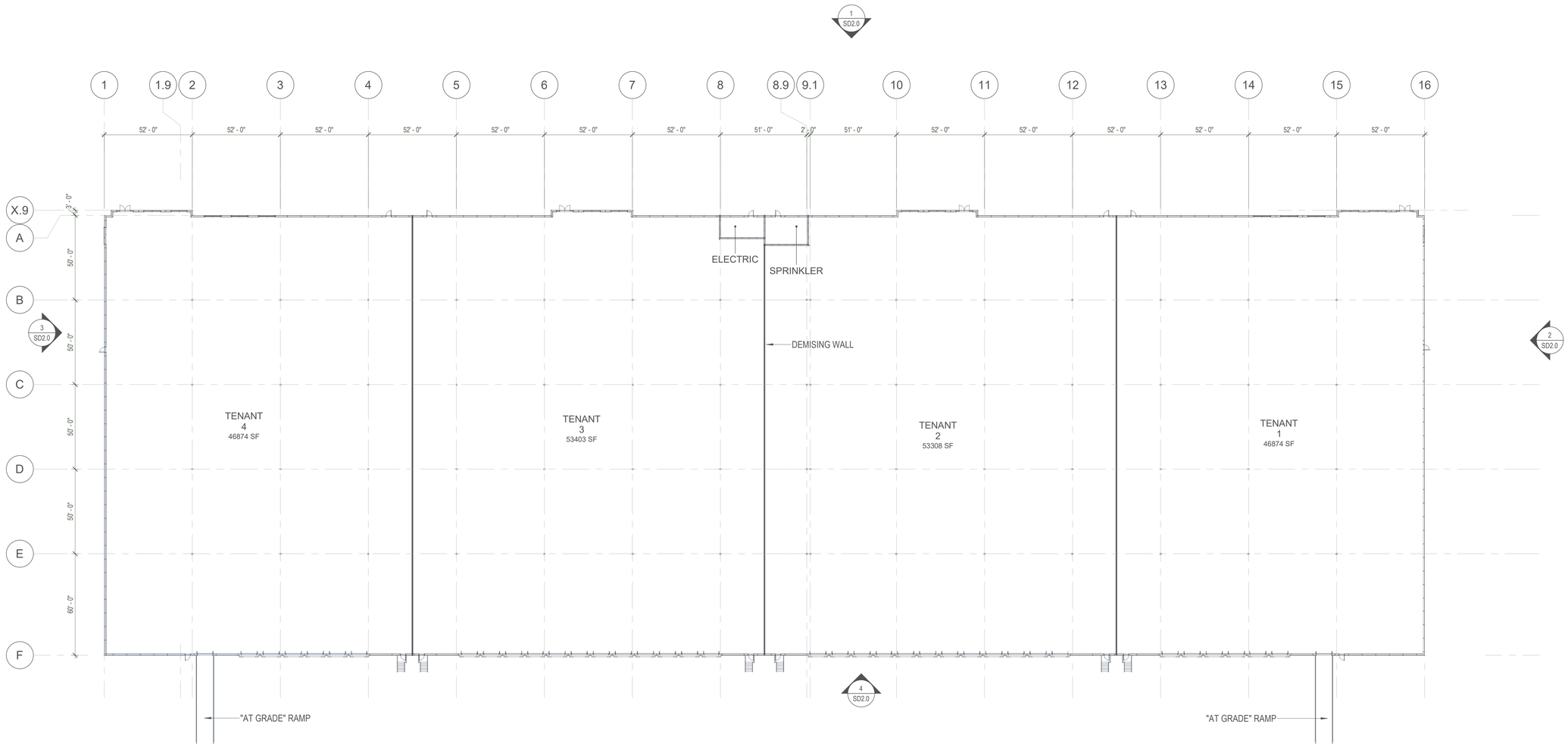
VMD FALL RIVER
INNOVATION WAY, FALL RIVER, MA ◦ 4252

NO	DATE	ISSUE
01	05-10-22	PROPOSED FLEX BUILDING

SD2.0
SCHEMATIC ELEVATIONS

DACON



1 FIRST FLOOR PLAN
1/32" = 1'-0"

0 32 64 128

pda
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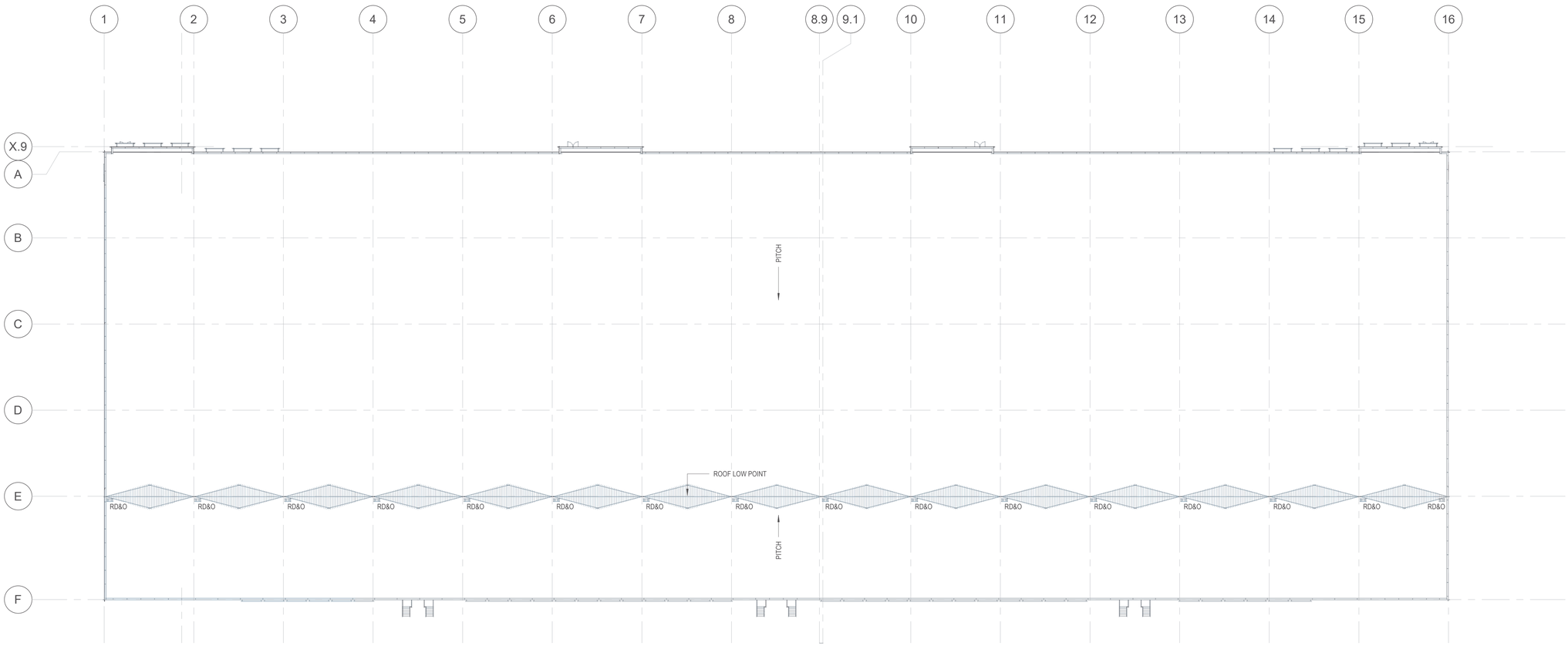
INNOVATION WAY, FALL RIVER, MA ◦ 4252

NO	DATE	ISSUE
01	05-10-22	PROPOSED FLEX BUILDING

SD1.1
SCHEMATIC FLOOR PLAN

DACON



1 ROOF PLAN
1/32" = 1'-0"

0 32 64 128

PLANNERS DESIGNERS ARCHITECTS, INC.
16 HURON DRIVE NATICK, MA 01760
TEL 508 651 3600 FAX 508 655 2229

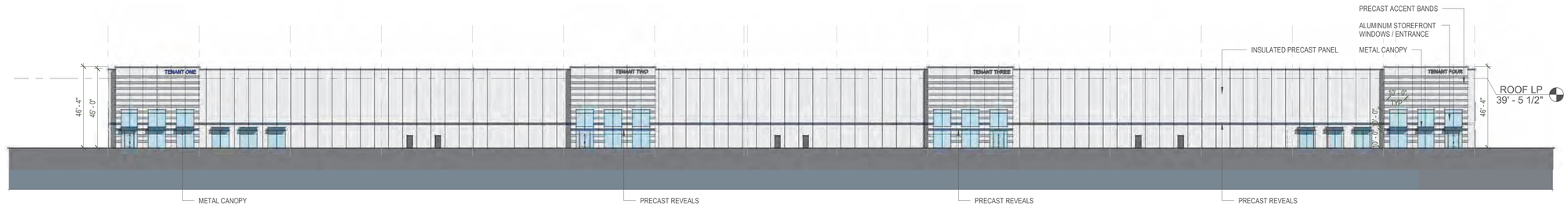
VMD FALL RIVER

INNOVATION WAY, FALL RIVER, MA ◦ 4252

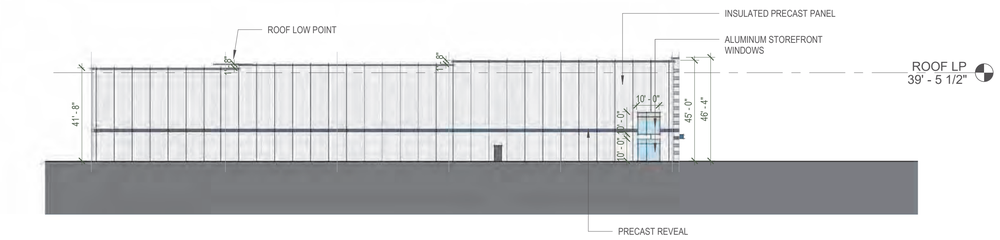
NO	DATE	ISSUE
01	05-10-22	PROPOSED FLEX BUILDING

SD1.2
SCHEMATIC ROOF PLAN

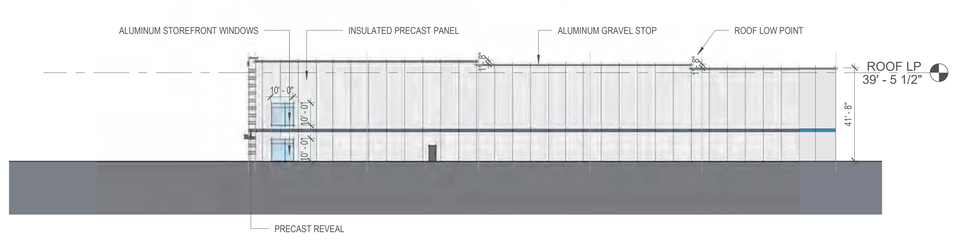
DACON



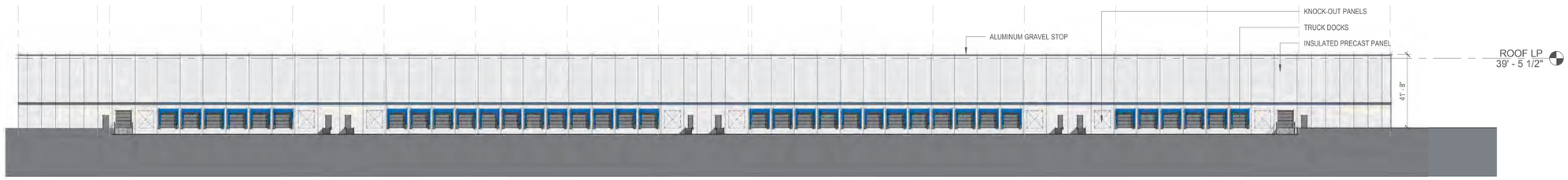
1 FRONT ELEVATION
1/32" = 1'-0"



2 LEFT SIDE ELEVATION
1/32" = 1'-0"



3 RIGHT SIDE ELEVATION
1/32" = 1'-0"



4 REAR ELEVATION
1/32" = 1'-0"

0 32 64 128

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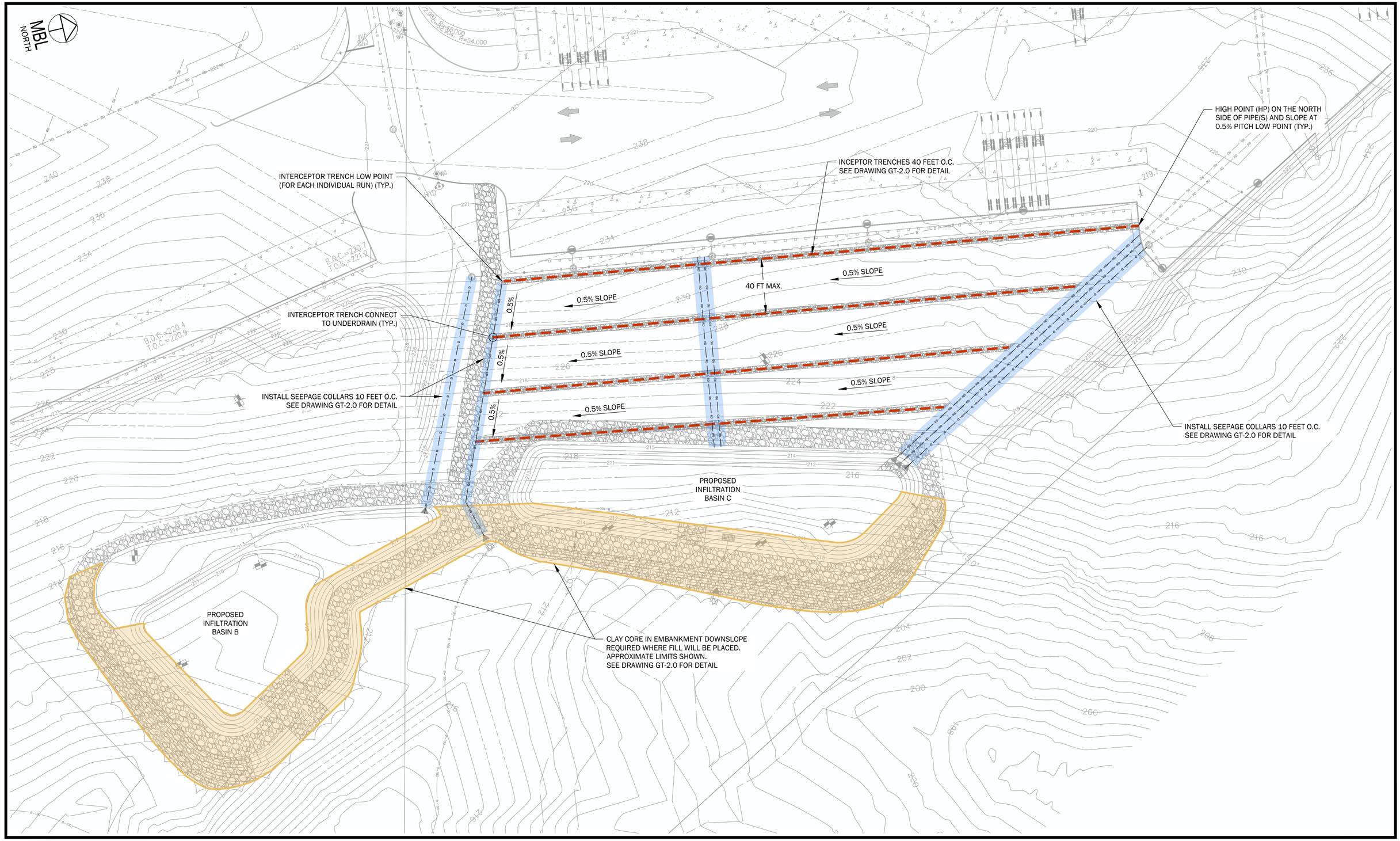
NO	DATE	ISSUE
01	05-10-22	PROPOSED FLEX BUILDING

SD2.0
SCHEMATIC ELEVATIONS

DACON



CTB:
LMAN:
MS VIEW:
UCS:

Plotted: 08/02/2023, 16:36 | cdias

P:\26\26181002\CAD\00\slope stabilization\r01\26181002l00_Sht 1_GT-1.0 [Site Plan].dwg

No.	DATE	DESCRIPTION	BY
		REVISIONS	

PROJ. MANAGER: FA/SSS
CHIEF DESIGNER: CGD
REVIEWED BY: DATE

SEAL

COMMONWEALTH OF MASSACHUSETTS
STANLEY S. SADKOWSKI III
CIVIL
No. 47865
REGISTERED PROFESSIONAL ENGINEER
8/2/2023

PREPARED FOR

V.M.D. COMPANIES, LLC
733 TURNPIKE STREET, ROUTE 114

NORTH ANDOVER MASSACHUSETTS

SCALE:

DATUM:
HORZ.: NAD83
VERT.: NAVD88

30 15 0 30
GRAPHIC SCALE

GeoEngineers USA
EARTH SCIENCE AND GEOTECHNICAL ENGINEERING SERVICES
239 CAUSEWAY STREET
BOSTON, MA 02114
(617) 749-9220
www.geoengineers.com

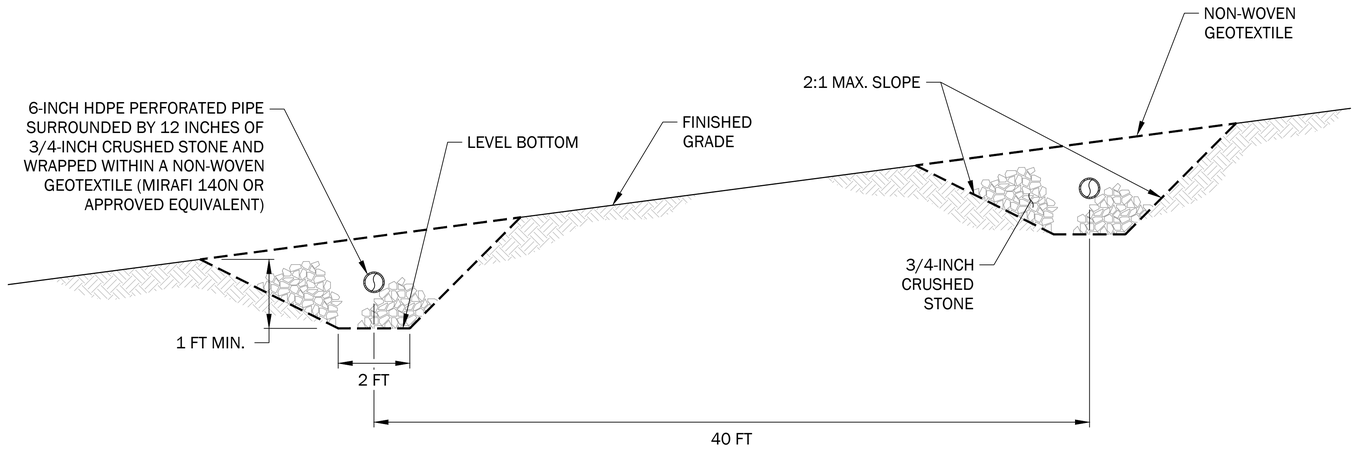
PROPOSED WAREHOUSE DEVELOPMENT

SLOPE AND EMBANKMENT STABILIZATION
0 INNOVATION WAY
FALL RIVER- MAP W-19 LOTS 185 & 189
FREETOWN - PARCEL ID 236-006.01

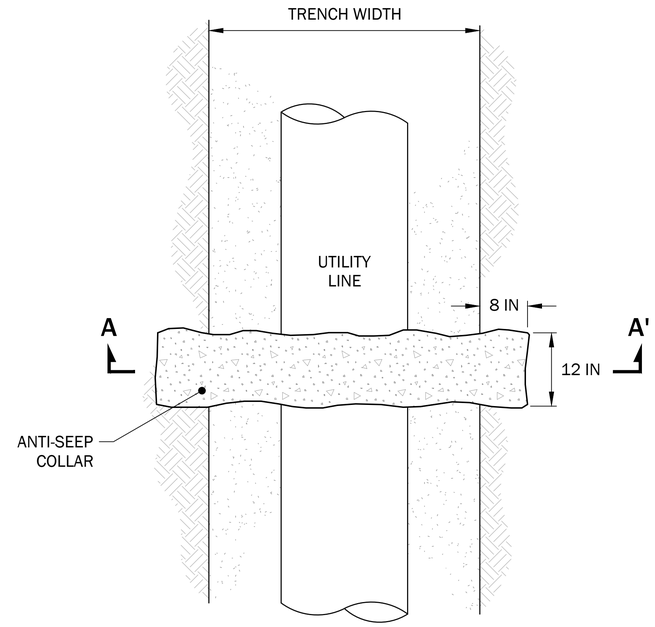
FALL RIVER/FREETOWN MASSACHUSETTS

PROJ. No.: 2021-036
DATE: AUGUST 2, 2023

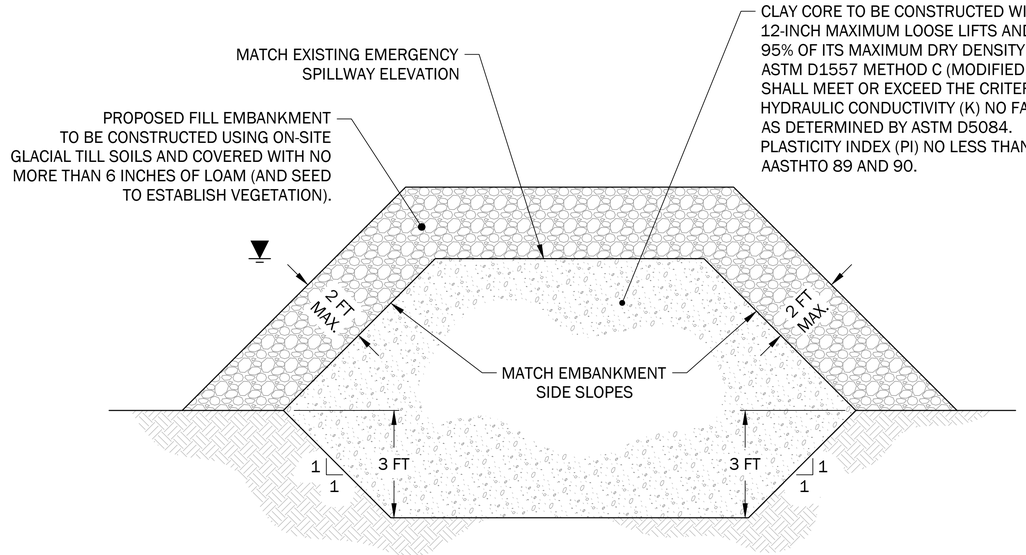
GT-1.0



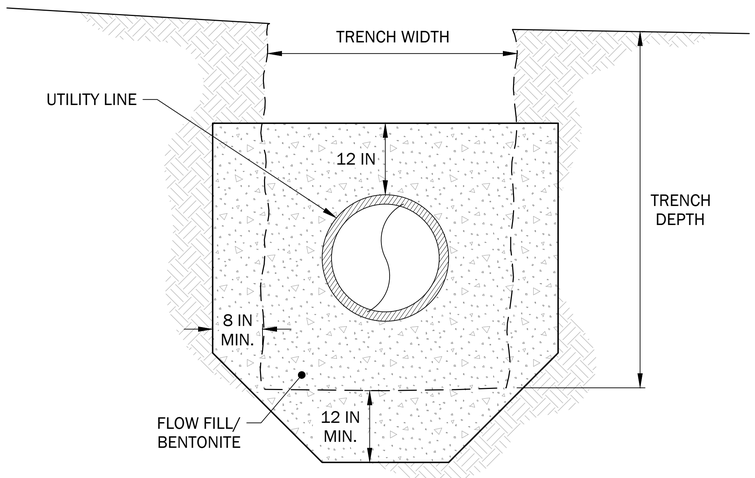
INTERCEPTOR TRENCH DETAIL 1
SCALE: NOT TO SCALE -



PLAN VIEW



CLAY CORE DETAIL 2
SCALE: NOT TO SCALE -



SECTION A-A'

SEEPAGE COLLAR DETAIL 3
SCALE: NOT TO SCALE -

No.	DATE	DESCRIPTION	BY
		REVISIONS	

PROJ. MANAGER: FA/SSS
CHIEF DESIGNER: CGD
REVIEWED BY: DATE

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P:\26\26181002\CAD\00\slope stabilization\v01\26181002000_Sht 2_GT-2.0 [Details].dwg