

# **SITE DEVELOPMENT PLAN SOLAR ENERGY STORAGE SYSTEM (ESS)**

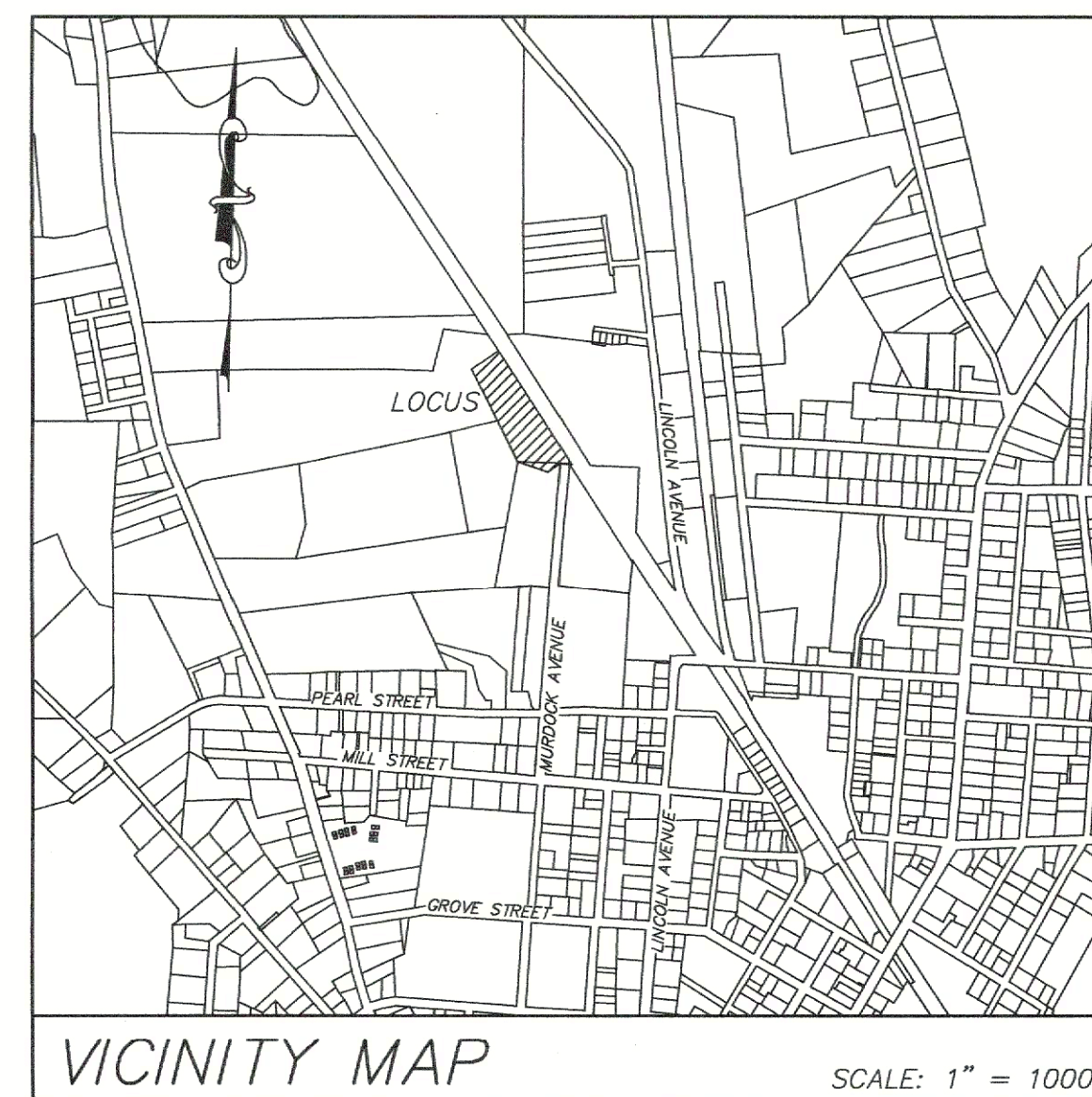
## **256 MURDOCK AVENUE**

**IN**

## **WINCHENDON, MASSACHUSETTS**

### **MARCH 27, 2023**

**REVISIONS THROUGH AUGUST 2, 2023**



**APPLICANT:**

ZP BATTERY DEVCO, LLC  
PETE FORTE  
1 MERCANTILE STREET, SUITE 630  
WORCESTER, MASSACHUSETTS 01608

**OWNER:**

BOSTWICK REALTY TRUST  
256 MURDOCK AVENUE  
WINCHENDON, MASSACHUSETTS 01475

**CIVIL ENGINEER & LAND SURVEYOR:**

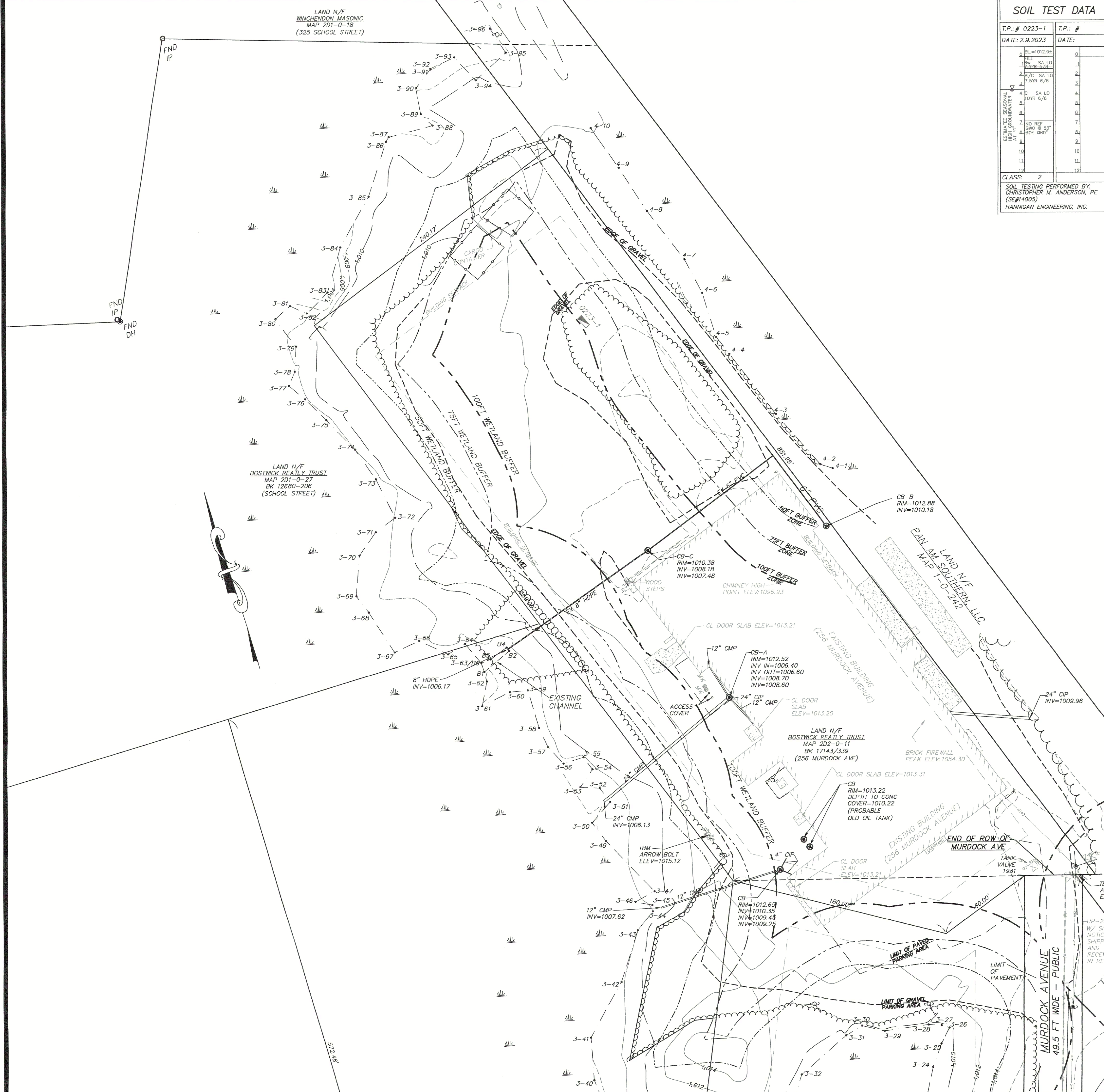
HANNIGAN ENGINEERING, INC.  
8 MONUMENT SQUARE  
LEOMINSTER, MASSACHUSETTS 01453  
TEL: (978) 534-1234

**PLAN INDEX**

SHEET 1	EXISTING CONDITIONS PLAN
SHEET 2	SITE DEVELOPMENT PLAN
SHEET 3	EROSION CONTROL PLAN
SHEET 4	LANDSCAPE AND LAYOUT PLAN
SHEET 5 - 6	CONSTRUCTION DETAILS

PERMITTING SET - NOT FOR CONSTRUCTION





**SOIL TEST DATA**

T.P. #	T.P. #
0223-1	
DATE: 2.9.2023	DATE:
1. 0-1012.88	1.
2. 1012.88 SA LD	2.
3. 2.5% SA LD	3.
4. 2.5% SA LD	4.
5. 2.5% SA LD	5.
6. 2.5% SA LD	6.
7. 2.5% SA LD	7.
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96. 2.5% SA LD	96.
97. 2.5% SA LD	97.
98. 2.5% SA LD	98.
99. 2.5% SA LD	99.
100. 2.5% SA LD	100.

CLASS: 2

SOIL TESTING PERFORMED BY:  
CHRISTOPHER M. ANDERSON, PE  
(SE#14005)  
HANNIGAN ENGINEERING, INC.



**LOCUS MAP** SCALE: 1" = 1000'

**OWNER**  
BOSTWICK REALTY TRUST  
256 MURDOCK AVENUE  
WINCHENDON, MASSACHUSETTS

**APPLICANT**  
ZP BATTERY DEVCO, LLC  
1 MERCANTILE STREET, SUITE 630  
WORCESTER, MASSACHUSETTS 01608

- PROJECT NOTES:**
1. EARTHEN MATERIALS UTILIZED AS FILL WITHIN THE PROJECT AREA SHALL BE CLEAN AND FREE OF DELETERIOUS MATERIALS AND SHALL NOT CONTAIN ANY HAZARDOUS MATERIALS.
  2. PRIOR TO THE START OF CONSTRUCTION AND CLEARING ACTIVITIES, THE APPROVED LIMITS OF CONSTRUCTIONS SHALL BE FIELD STAKED AND REVIEWED BY THIS OFFICE UPON THE COMPLETION OF CONSTRUCTION CATCHBASINS, SUMPS AND STORMWATER BASINS OR BEST MANAGEMENT PRODUCTS (BMPs) SHALL BE CLEANED AND ANNUALLY THEREAFTER.
  3. HAULING OF EARTHEN MATERIALS TO OR FROM THE CONSTRUCTION SITE SHALL BE LIMITED TO THE HOURS OF 9AM TO 4PM MONDAY THROUGH FRIDAY.
  4. IMPERVIOUS COVERAGE FROM THE PROPOSED PROJECT SHALL BE COMPRISED OF CONCRETE AND CRUSHED STONE/GRAVEL FOR ACCESS WAYS.

**PROJECT INFORMATION**

**LAND INFORMATION**

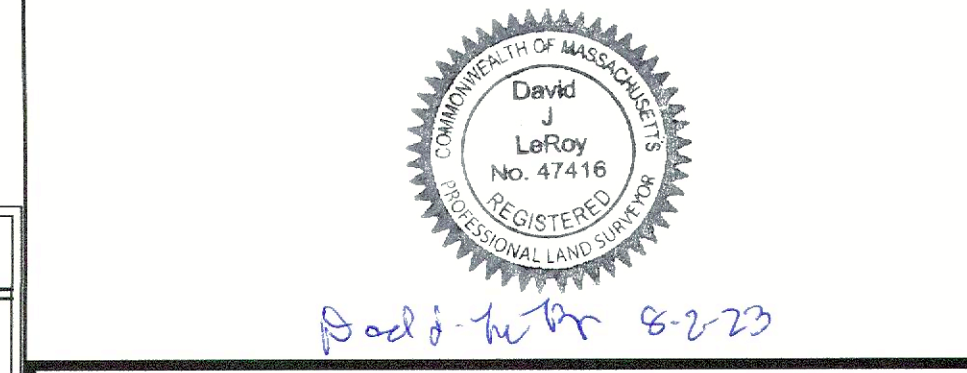
MAP/PARCEL:	202/11
DEED BOOK/PAGE:	17143/339
EXISTING FRONTAGE:	49.5 FT
EXISTING AREA:	3.75 ACRES±

**ZONING INFORMATION**

ZONING DISTRICT:	INDUSTRIAL
DIMENSIONAL REQUIREMENTS:	
MINIMUM AREA:	43,560 SF
MINIMUM FRONTAGE:	150 FEET
MAXIMUM HEIGHT:	50 FT
MAXIMUM COVERAGE:	NA
MINIMUM SETBACKS:	
FRONT YARD:	40 FT
SIDE YARD:	25 FT
REAR YARD:	50 FT

- GENERAL NOTES:**
1. PROPERTY LINE INFORMATION BASED DEEDS AND PLANS OF RECORD. NO CERTIFICATION OF PROPERTY LINES SHOWN ON THIS PLAN IS INTENDED OR IMPLIED BY HANNIGAN ENGINEERING, INC. TOPOGRAPHIC INFORMATION IS THE RESULT OF AN ON-THE-GROUND TOPOGRAPHIC SURVEY BY HANNIGAN ENGINEERING, INC. IN MAY OF 2022.
  2. AREAS SUBJECT TO PROTECTION UNDER THE WETLANDS PROTECTION ACT OR IMPLIED BY HANNIGAN ENGINEERING, INC. TOPOGRAPHIC INFORMATION IS THE RESULT OF AN ON-THE-GROUND TOPOGRAPHIC SURVEY BY HANNIGAN ENGINEERING, INC. IN MAY OF 2022.
  3. LOCATION OF ALL UTILITIES ARE APPROXIMATE AS SHOWN AND BASED UPON VISIBLE STRUCTURES AT THE TIME OF THE FIELD SURVEY. LOCATION OF EXISTING UTILITIES AND SUBSURFACE STRUCTURES, WHETHER OR NOT SHOWN ON THESE PLANS, SHALL BE DETERMINED BY THE CONTRACTOR, MARKED IN THE FIELD, AND REVIEWED BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE AWARE OF THE OBLIGATION TO ALL UTILITY COMPANIES AND AGENCY AS WELL AS DIG-SAFE PRIOR TO EXCAVATION. (SEE NOTE)
  4. NOTIFICATION REQUIREMENTS SHOWN ON THIS PLAN SHALL NOT RELIEVE THE CONTRACTOR OF ANY OTHER REQUIREMENTS WHICH MAY EXIST UNDER LOCAL, STATE, OR FEDERAL JURISDICTION TO WHICH THE CONTRACTOR IS OBLIGATED.
  5. RELOCATION OF AND/OR CONNECTION TO EXISTING UTILITIES SHALL BE PERFORMED IN ACCORDANCE WITH PROVISIONS OF THE APPROPRIATE UTILITY COMPANY AND/OR REGULATORY AGENCY.
  6. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF THE TOWN OF WINCHENDON AND THE MASS DOT SPECIFICATIONS OF HIGHWAYS AND BRIDGES.
  7. ALL SLOPES UNLESS OTHERWISE SPECIFIED, SHALL BE LOAMED AND SEEDED FOR STABILIZATION.
  8. ANY DEVIATIONS IN DESIGN AS SHOWN SHALL REQUIRE A REVIEW AND APPROVAL OF THE DESIGN ENGINEER OR FIRM. CHANGES MADE IN THE FIELD MADE WITHOUT AUTHORIZATION SHALL BE SUBJECT TO REVIEW BY THE ENGINEER AND APPROPRIATE APPROVING AUTHORITY. EXPENSES INCURRED TO BRING THE UNAUTHORIZED CHANGES TO ACCEPTABLE CONFORMANCE SHALL BE BORNE BY THE COMPANY CONTRACTOR MAKING THE UNAUTHORIZED CHANGE.
  9. ANY MATERIALS DISCOVERED ON-SITE WHICH ARE NOT SUITABLE FOR USE IN THE PROJECT AS SHOWN ON THIS PLAN SHALL BE REMOVED AND HAULED OFF-SITE TO AN APPROPRIATELY LICENSED FACILITY.
  10. PLANS TO BE REVIEWED BY APPLICABLE UTILITY AGENCIES FOR COMPLIANCE WITH REGULATIONS. FINAL LOCATION IS SUBJECT TO CHANGE.
  11. APPLICANT SHOULD BE AWARE OF OBLIGATIONS TO COMPLY WITH CHAPTER 131, SECTION 40 OF THE MASSACHUSETTS GENERAL LAWS, OTHERWISE KNOWN AS THE WETLANDS PROTECTION ACT, AND THE ASSOCIATED REGULATIONS (310 CMR 10.00).
  12. STOCKPILING OF MATERIAL SHALL NOT BE PERMITTED WITHIN ANY AREAS SUBJECT TO PROTECTION UNDER THE WETLANDS PROTECTION ACT WITHOUT PRIOR APPROVAL BY THE LOCAL CONSERVATION COMMISSION. STOCKPILES SHALL BE PLACED IN A SUITABLE LOCATION AND SURROUNDED BY A ROW OF STAKED HAY BALES FOR EROSION CONTROL.
  13. AREAS OF FILL TO BE COMPACTED TO A MINIMUM 95% DRY DENSITY IN AREAS WITHIN ROADWAYS AND UTILITY EASEMENTS. OTHER AREAS OF FILL TO BE COMPACTED TO A MINIMUM 90% DRY DENSITY. ALL FILL MATERIALS ARE TO BE CLEAN FILL, FREE OF DELETERIOUS MATERIALS AND DEBRIS.
  14. ALL SIDEWALKS AND RAMPS TO CONFORM TO REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA), AS REQUIRED. SEE ARCHITECTURAL PLANS FOR PERFORMANCE REQUIREMENTS FOR PROPOSED BUILDINGS.
  15. THE AREA PROPOSED FOR DEVELOPMENT IS NOT WITHIN A 100 YEAR FLOOD PLAIN PER F.E.M.A. FIRM PANEL #250348-0016B, DATED: JUNE 15, 1982. COMPLIANCE WITH APPLICABLE REGULATIONS IS REQUIRED.
  16. ALL REINFORCED CONCRETE PIPE TO BE CLASS III UNLESS OTHERWISE NOTED.
  17. PRE-CONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
  18. ALL UTILITIES ARE TO BE INSTALLED BY A LICENSED UTILITY CONTRACTOR LICENSED BY THE TOWN OF WINCHENDON.

NO.	DATE	REVISIONS	BY
2	8/2/2023	PEER REVIEW COMMENT	CMA
1	7/1/2023	PEER REVIEW AND BOARD COMMENT	CMA



**HANNIGAN ENGINEERING, INC.**  
CIVIL ENGINEERS & LAND SURVEYORS

8 MONUMENT SQUARE  
LEOMINSTER, MASSACHUSETTS 01453  
WWW.HANNIGANENGINEERING.COM

(978) 534-1234 (T)  
(978) 534-6060 (F)

**LEGEND**

EXISTING	PROPOSED
542	CONTOURS
PROPERTY LINES	PROPOSED
DRAIN	SEWER
SEWER	WATER
OHW	ELEC/TELE/CABLE
ECT	ELEC/TELE/CABLE
EDGE OF PAVEMENT	EDGE OF PAVEMENT
CURBLINE	CURBLINE
EROSION CONTROL	EROSION CONTROL
STRAW WATTLE AND SILT FENCE	STRAW WATTLE AND SILT FENCE
PRELIMINE	PRELIMINE
WETLAND	WETLAND
WETLAND BUFFER ZONE	WETLAND BUFFER ZONE
HYDRANTS	HYDRANTS
SIGNS	SIGNS
LIGHTPOLE	LIGHTPOLE

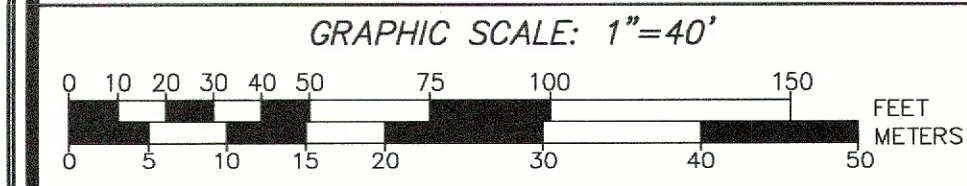
APPROVAL OF THIS PLAN IS GRANTED ON THE CONDITIONS LISTED IN A SEPARATE STATEMENT OF CONDITIONS WHICH PART OF THE APPROVAL OF THIS SITE PLAN.

**WINCHENDON PLANNING BOARD**

DATE:	
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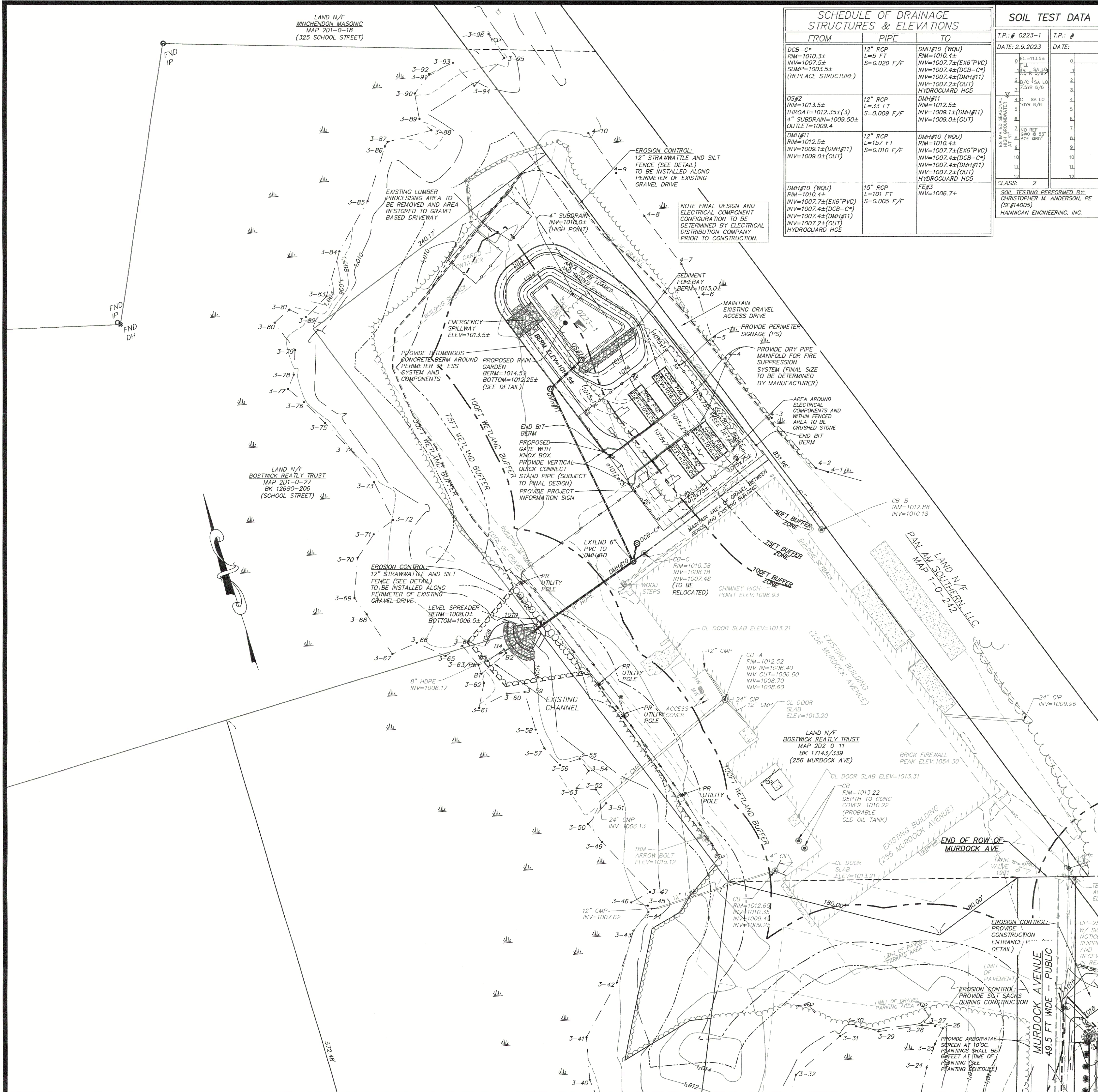
**EXISTING CONDITIONS PLAN**  
IN  
**WINCHENDON, MASSACHUSETTS**

PREPARED FOR:  
ZP BATTERY DEVCO, LLC  
PETE FORTE  
1 MERCANTILE STREET, SUITE 630  
WORCESTER, MASSACHUSETTS 01608  
TEL:



CALC:	CMA	DRWN:	CMA	SCALE:	1"=40'
CHKD:	WDH	APPD:	CMA	DATE:	MAR 27, 2023
SRV:	JEF	FB:	75-130	JOB NO:	3101
TAB:	(1)EXCON A	SHEET	1 OF 6	PLAN NO:	C-18-41





SCHEDULE OF DRAINAGE STRUCTURES & ELEVATIONS		
FROM	PIPE	TO
DCB-C RIM=1010.3± INV=1007.5± SUMP=1003.5± (REPLACE STRUCTURE)	12" RCP L=5 FT S=0.020 F/F	DMH#10 (WOU) RIM=1010.4± INV=1007.7±(EX6" PVC) INV=1007.4±(DCB-C) INV=1007.4±(DMH#11) INV=1009.0±(OUT) HYDROGUARD HG5
OS#2 RIM=1013.5± THROAT=1012.35±(3) 4" SUBRAIN=1009.50± OUTLET=1009.4	12" RCP L=33 FT S=0.009 F/F	DMH#11 RIM=1012.5± INV=1009.1±(DMH#11) INV=1007.2±(OUT) HYDROGUARD HG5
DMH#11 RIM=1012.5± INV=1009.1±(DMH#11) INV=1009.0±(OUT)	12" RCP L=157 FT S=0.010 F/F	DMH#10 (WOU) RIM=1010.4± INV=1007.7±(EX6" PVC) INV=1007.4±(DCB-C) INV=1007.4±(DMH#11) INV=1007.2±(OUT) HYDROGUARD HG5
DMH#10 (WOU) RIM=1010.4± INV=1007.7±(EX6" PVC) INV=1007.4±(DCB-C) INV=1007.4±(DMH#11) INV=1007.2±(OUT) HYDROGUARD HG5	15" RCP L=101 FT S=0.005 F/F	FE#3 INV=1006.7±

SOIL TEST DATA	
T.P. #	T.P. #
0223-1	
DATE: 2.9.2023	DATE:
ESTIMATED SEASONAL RAIN (PROBABILITY)	
CLASS: 2	
SOIL TESTING PERFORMED BY: CHRISTOPHER M. ANDERSON, PE (SE#14005) HANNIGAN ENGINEERING, INC.	



PROJECT INFORMATION	
<b>LAND INFORMATION</b>	
MAP/PARCEL:	202/71
DEED BOOK/PAGE:	17143/339
EXISTING FRONTAGE:	49.5 FT
EXISTING AREA:	3.75 ACRES±
<b>ZONING INFORMATION</b>	
ZONING DISTRICT:	INDUSTRIAL
DIMENSIONAL REQUIREMENTS:	
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MAXIMUM HEIGHT:	50 FT
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2. AREAS SUBJECT TO PROTECTION UNDER THE WETLANDS PROTECTION ACT HAVE BEEN DELINEATED BY LEC ENVIRONMENTAL CONSULTANTS IN FEBRUARY OF 2022. THESE AREAS ARE DEPICTED ON THE PLANS BASED ON FIELD SURVEY LOCATION DURING THE TOPOGRAPHIC SURVEY.	
3. LOCATION OF ALL UTILITIES ARE APPROXIMATE AS SHOWN AND BASED UPON VISIBLE STRUCTURES AT THE TIME OF THE FIELD SURVEY. LOCATION OF EXISTING UTILITIES AND SUBSTRUCTURES, WHETHER OR NOT SHOWN ON THESE PLANS, SHALL BE DETERMINED BY THE CONTRACTOR, MARKED IN THE FIELD, AND REVIEWED BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE AWARE OF THE OBLIGATION TO ALL UTILITY COMPANIES AND AGENCY AS WELL AS DIG-SAFE PRIOR TO EXCAVATION. (SEE NOTE)	
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LOCUS MAP SCALE: 1" = 1000'

**OWNER**  
BOSTWICK REALTY TRUST  
256 MURDOCK AVENUE  
WINCHENDON, MASSACHUSETTS

**APPLICANT**  
ZP BATTERY DEVCO, LLC  
1 MERCANTILE STREET, SUITE 630  
WORCESTER, MASSACHUSETTS 01608

- PROJECT NOTES:**
- EARTHEN MATERIALS UTILIZED AS FILL WITHIN THE PROJECT AREA SHALL BE CLEAN AND FREE OF DELETERIOUS MATERIALS AND SHALL NOT CONTAIN ANY HAZARDOUS MATERIALS
  - PRIOR TO THE START OF CONSTRUCTION AND CLEARING ACTIVITIES, THE APPROVED LIMITS OF CONSTRUCTIONS SHALL BE FIELD STAKED AND REVIEWED BY THIS OFFICE UPON THE COMPLETION OF CONSTRUCTION CATCHBASINS, SUMPS AND STORMWATER BASINS OR BEST MANAGEMENT PRODUCTS (BMPs) SHALL BE CLEANED AND ANNUALLY THEREAFTER.
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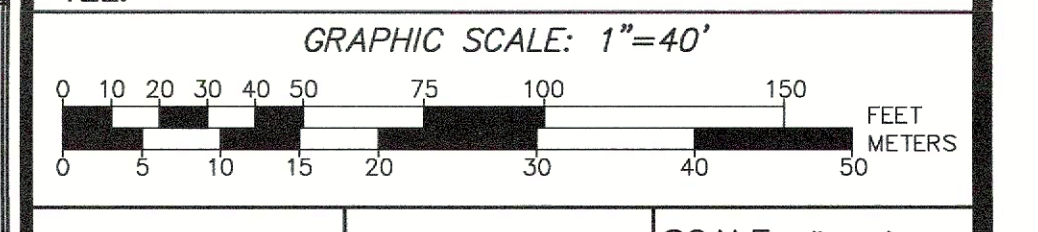
NO.	DATE	REVISIONS	BY
2	8/2/2023	PEER REVIEW COMMENT	CMA
1	7/1/2023	PEER REVIEW AND BOARD COMMENT	CMA



**HANNIGAN ENGINEERING, INC.**  
CIVIL ENGINEERS & LAND SURVEYORS  
8 MONUMENT SQUARE  
LEOMINSTER, MASSACHUSETTS 01453  
(978) 534-1234 (T)  
(978) 534-6060 (F)  
WWW.HANNIGANENGINEERING.COM

**SITE DEVELOPMENT PLAN**  
IN  
**WINCHENDON, MASSACHUSETTS**

PREPARED FOR:  
ZP BATTERY DEVCO, LLC  
PETE FORTE  
1 MERCANTILE STREET, SUITE 630  
WORCESTER, MASSACHUSETTS 01608  
TEL:



CALC: CMA	DRWN: CMA	SCALE: 1"=40'
CHKD: WDH	APPD: CMA	DATE: MAR 27, 2023
SRV: JEF	FB: 75-130	JOB NO: 3101
TAB: (2) SDP-A	SHEET 2 OF 6	PLAN NO: C-18-41

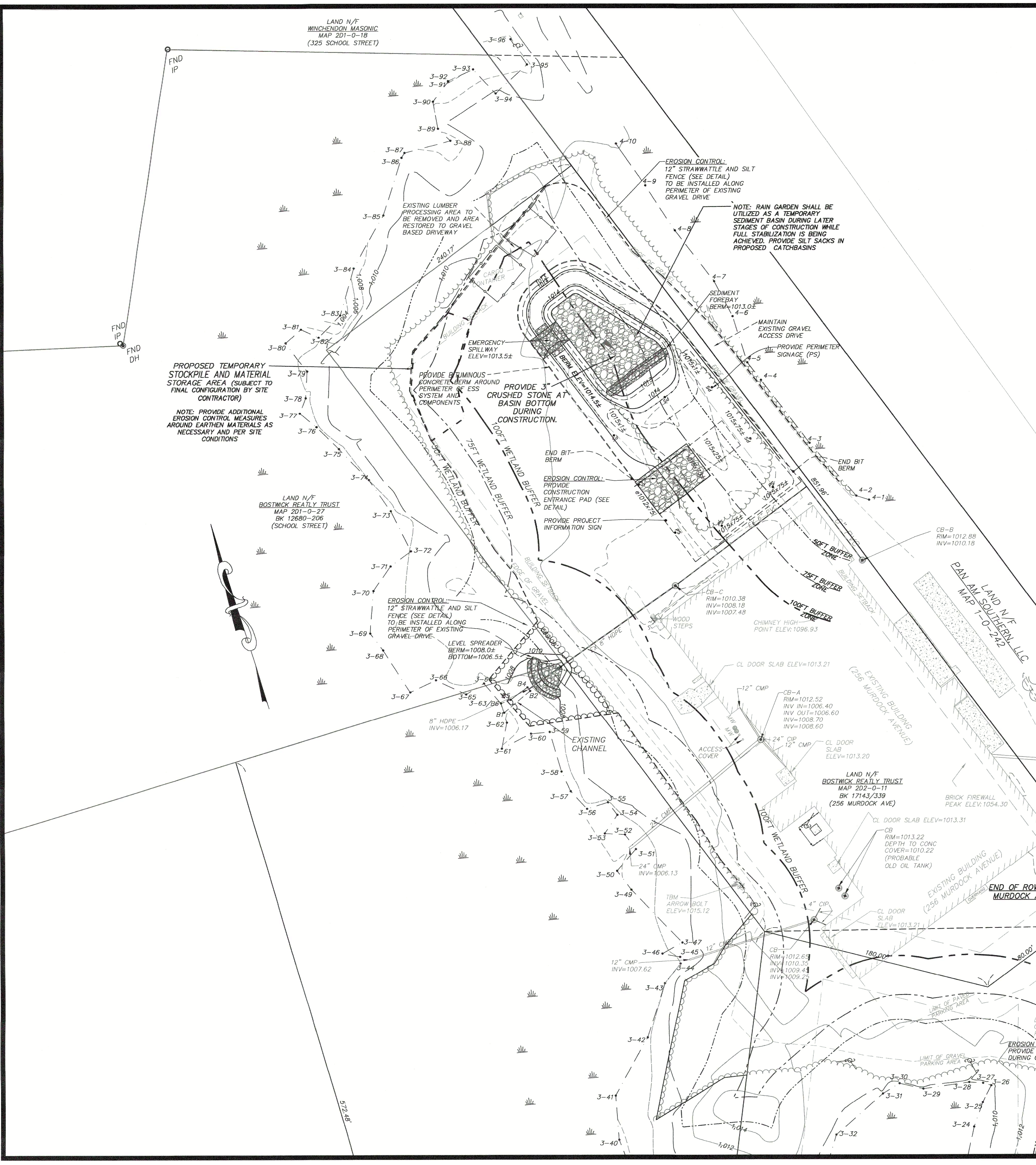
LEGEND	
EXISTING	PROPOSED
542	560
CONTOURS	PROPERTY LINES
DRAIN	SEWER
WATER	
OHW	ELEC/TELE/CABLE
EOT	ELEC/TELE/CABLE
	EDGE OF PAVEMENT
	CURBLINE
	EROSION CONTROL
	STRAW WATTLE AND SILT FENCE
	TREELINE
	WETLAND
	WETLAND BUFFER ZONE
	HYDRANTS
	SIGNS
	LIGHTPOLE

APPROVAL OF THIS PLAN IS GRANTED ON THE CONDITIONS LISTED IN A SEPARATE STATEMENT OF CONDITIONS WHICH PART OF THE APPROVAL OF THIS SITE PLAN.

**WINCHENDON PLANNING BOARD**

DATE: \_\_\_\_\_





**SOIL TEST DATA**

T.P. # 0223-1	T.P. #
DATE: 2.9.2023	DATE:
ESTIMATED SEASONAL AT 4\"/>	
CLASS: 2	

SOIL TESTING PERFORMED BY:  
CHRISTOPHER M. ANDERSON, PE  
(#5714005)  
HANNIGAN ENGINEERING, INC.



**LOCUS MAP** SCALE: 1" = 1000'

**OWNER**  
BOSTWICK REALTY TRUST  
256 MURDOCK AVENUE  
WINCHENDON, MASSACHUSETTS

**APPLICANT**  
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- PROJECT NOTES:**
1. EARTHEN MATERIALS UTILIZED AS FILL WITHIN THE PROJECT AREA SHALL BE CLEAN AND FREE OF DELETERIOUS MATERIALS AND SHALL NOT CONTAIN ANY HAZARDOUS MATERIALS.
  2. PRIOR TO THE START OF CONSTRUCTION AND CLEARING ACTIVITIES, THE APPROVED LIMITS OF CONSTRUCTIONS SHALL BE FIELD STAKED AND REVIEWED BY THIS OFFICE UPON THE COMPLETION OF CONSTRUCTION CATCHBASINS, SUMPS AND STORMWATER BASINS OR BEST MANAGEMENT PRODUCTS (BMPs) SHALL BE CLEANED AND ANNUALLY THEREAFTER.
  3. HAULING OF EARTHEN MATERIALS TO OR FROM THE CONSTRUCTION SITE SHALL BE LIMITED TO THE HOURS OF 9AM TO 4PM MONDAY THROUGH FRIDAY.
  4. IMPERVIOUS COVERAGE FROM THE PROPOSED PROJECT SHALL BE COMPRISED OF CONCRETE AND CRUSHED STONE/GRAVEL FOR ACCESS WAYS.

**PROJECT INFORMATION**

**LAND INFORMATION**

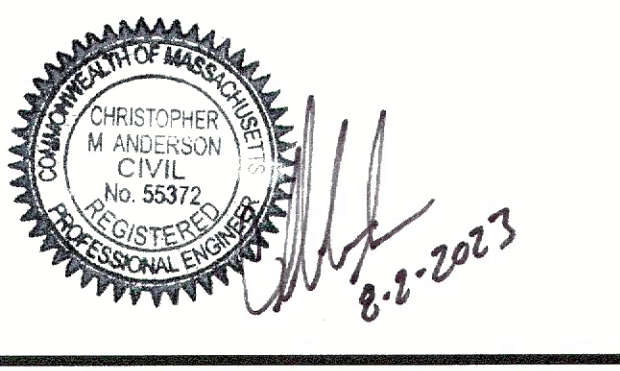
MAP/PARCEL:	202/11
DEED BOOK/PAGE:	17143/339
EXISTING FRONTAGE:	49.5 FT
EXISTING AREA:	3.79 ACRES±

**ZONING INFORMATION**

ZONING DISTRICT:	INDUSTRIAL
DIMENSIONAL REQUIREMENTS:	
MINIMUM AREA:	43,560 SF
MINIMUM FRONTAGE:	150 FEET
MAXIMUM HEIGHT:	50 FT
MAXIMUM COVERAGE:	NA
MINIMUM SETBACKS:	
FRONT YARD:	40 FT
SIDE YARD:	25 FT
REAR YARD:	50 FT

- GENERAL NOTES:**
1. PROPERTY LINE INFORMATION BASED DEEDS AND PLANS OF RECORD. NO CERTIFICATION OF PROPERTY LINES SHOWN ON THIS PLAN IS INTENDED OR IMPLIED BY HANNIGAN ENGINEERING, INC. TOPOGRAPHIC INFORMATION IS THE RESULT OF AN ON-THE-GROUND TOPOGRAPHIC SURVEY BY HANNIGAN ENGINEERING, INC. IN MAY OF 2022.
  2. AREAS SUBJECT TO PROTECTION UNDER THE WETLANDS PROTECTION ACT HAVE BEEN DELINEATED BY LEC ENVIRONMENTAL CONSULTANTS IN FEBRUARY OF 2022. THESE AREAS ARE DEPICTED ON THE PLANS BASED ON FIELD SURVEY LOCATION DURING THE TOPOGRAPHIC SURVEY.
  3. LOCATION OF ALL UTILITIES ARE APPROXIMATE AS SHOWN AND BASED UPON VISIBLE STRUCTURES AT THE TIME OF THE FIELD SURVEY. LOCATION OF EXISTING UTILITIES AND SUBSURFACE STRUCTURES, WHETHER OR NOT SHOWN ON THESE PLANS, SHALL BE DETERMINED BY THE CONTRACTOR MARKED IN THE FIELD, AND REVIEWED BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE AWARE OF THE OBLIGATION TO ALL UTILITY COMPANIES AND AGENCY AS WELL AS "DIG-SAFE" PRIOR TO EXCAVATION. (SEE NOTE)
  4. NOTIFICATION REQUIREMENTS SHOWN ON THIS PLAN SHALL NOT RELIEVE THE CONTRACTOR OF ANY OTHER REQUIREMENTS WHICH MAY EXIST UNDER LOCAL, STATE, OR FEDERAL JURISDICTION TO WHICH THE CONTRACTOR IS OBLIGATED.
  5. RELOCATION OF AND/OR CONNECTION TO EXISTING UTILITIES SHALL BE PERFORMED IN ACCORDANCE WITH PROVISIONS OF THE APPROPRIATE UTILITY COMPANY AND/OR REGULATORY AGENCY.
  6. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF THE TOWN OF WINCHENDON AND THE MASS DOT SPECIFICATIONS OF HIGHWAYS AND BRIDGES.
  7. ALL SLOPES UNLESS OTHERWISE SPECIFIED, SHALL BE LOAMED AND SEEDED FOR STABILIZATION.
  8. ANY DEVIATIONS IN DESIGN AS SHOWN SHALL REQUIRE A REVIEW AND APPROVAL OF THE DESIGN ENGINEER OR FIRM. CHANGES MADE IN THE FIELD MADE WITHOUT AUTHORIZATION SHALL BE SUBJECT TO REVIEW BY THE ENGINEER AND APPROPRIATE APPROVING AUTHORITY. EXPENSES INCURRED TO BRING THE UNAUTHORIZED CHANGES TO ACCEPTABLE CONFORMANCE SHALL BE BORNE BY THE COMPANY OR CONTRACTOR MAKING THE UNAUTHORIZED CHANGE.
  9. ANY MATERIALS COVERED ON-SITE WHICH ARE NOT SUITABLE FOR USE IN THE PROJECT AS SHOWN ON THIS PLAN SHALL BE REMOVED AND HAULED OFF-SITE TO AN APPROPRIATELY LICENSED FACILITY.
  10. PLANS TO BE REVIEWED BY APPLICABLE UTILITY AGENCIES FOR COMPLIANCE WITH REGULATIONS. FINAL LOCATION IS SUBJECT TO CHANGE.
  11. APPLICANT SHOULD BE AWARE OF OBLIGATIONS TO COMPLY WITH CHAPTER 131, SECTION 40 OF THE MASSACHUSETTS GENERAL LAWS, OTHERWISE KNOWN AS THE WETLANDS PROTECTION ACT, AND THE ASSOCIATED REGULATIONS (310 CMR 10.000).
  12. STOCKPILING OF MATERIAL SHALL NOT BE PERMITTED WITHIN ANY AREAS SUBJECT TO PROTECTION UNDER THE WETLANDS PROTECTION ACT WITHOUT PRIOR APPROVAL BY THE LOCAL CONSERVATION COMMISSION. STOCKPILES SHALL BE PLACED IN A SUITABLE LOCATION AND SURROUNDED BY A ROW OF STAKED HAY BALES FOR EROSION CONTROL.
  13. AREAS OF FILL TO BE COMPACTED TO A MINIMUM 95% DRY DENSITY IN AREAS WITHIN ROADWAYS AND UTILITY EASEMENTS. OTHER AREAS OF FILL TO BE COMPACTED TO A MINIMUM 90% DRY DENSITY. ALL FILL MATERIALS ARE TO BE CLEAN FILL, FREE OF DELETERIOUS MATERIALS AND DEBRIS.
  14. ALL SIDEWALKS AND RAMPS TO CONFORM TO REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA), AS REQUIRED. SEE ARCHITECTURAL PLANS FOR PERFORMANCE REQUIREMENTS FOR PROPOSED BUILDINGS.
  15. THE AREA PROPOSED FOR DEVELOPMENT IS NOT WITHIN A 100 YEAR FLOOD PLAIN PER F.E.M.A. FIRM PANEL #250348-0016B, DATED: JUNE 15, 1982. COMPLIANCE WITH APPLICABLE REGULATIONS IS REQUIRED.
  16. ALL REINFORCED CONCRETE PIPE TO BE CLASS III UNLESS OTHERWISE NOTED.
  17. PRE-CONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
  18. ALL UTILITIES ARE TO BE INSTALLED BY A LICENSED UTILITY CONTRACTOR LICENSED BY THE TOWN OF WINCHENDON.

NO.	DATE	REVISIONS	BY
2	8/2/2023	PEER REVIEW COMMENT	CMA
1	7/1/2023	PEER REVIEW AND BOARD COMMENT	CMA



**LEGEND**

EXISTING	PROPOSED
542	582
PROPERTY LINES	CONTOURS
DRAIN	SEWER
WATER	
OHW	ELEC/TELE/CABLE
ECT	ELEC/TELE/CABLE
	EDGE OF PAVEMENT
	CURBLINE
EROSION CONTROL STRAW WATTLE AND SILT FENCE	
TREELINE	
WETLAND BUFFER ZONE	
HYDRANTS	
SIGNS	
LIGHTPOLE	

APPROVAL OF THIS PLAN IS GRANTED ON THE CONDITIONS LISTED IN A SEPARATE STATEMENT OF CONDITIONS WHICH PART OF THE APPROVAL OF THIS SITE PLAN.

**WINCHENDON PLANNING BOARD**

DATE: \_\_\_\_\_

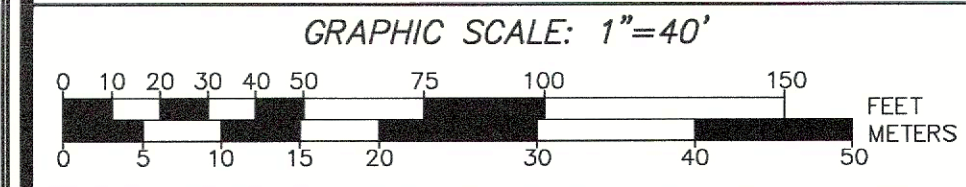
**HANNIGAN ENGINEERING, INC.**  
CIVIL ENGINEERS & LAND SURVEYORS

8 MONUMENT SQUARE (978) 534-1234 (T)  
LEOMINSTER, MASSACHUSETTS 01453 (978) 534-6060 (F)

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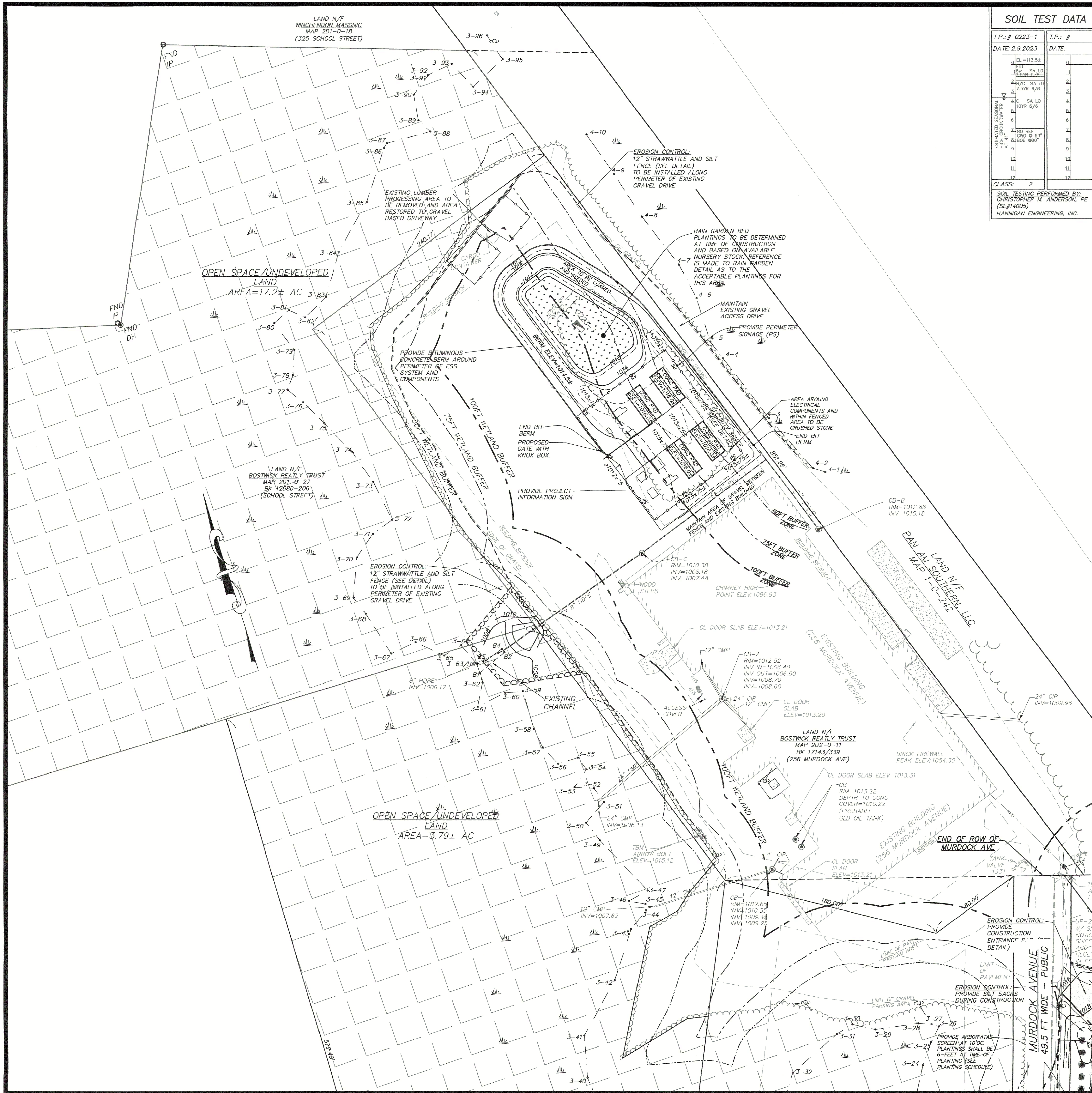
**EROSION CONTROL PLAN**  
IN  
**WINCHENDON, MASSACHUSETTS**

PREPARED FOR:  
ZP BATTERY DEVCO, LLC  
PETE FORTE  
1 MERCANTILE STREET, SUITE 630  
WORCESTER, MASSACHUSETTS 01608  
TEL: \_\_\_\_\_



CALC: CMA	DRWN: CMA	SCALE: 1"=40'
CHKD: WDH	APPD: CMA	DATE: MAR 27, 2023
SRV: JEF	FB: 75-130	JOB NO: 3101
TAB: (3) EROS-A	SHEET 3 OF 6	PLAN NO: C-18-41





**SOIL TEST DATA**

T.P. # 0223-1	T.P. #
DATE: 2.9.2023	DATE:
ESTIMATED SEASONAL HIGH GROUNDWATER	
0 EL=113.58	0
1 1/2" SA LO	1
2 3/4" SA LO	2
7.5"R 6/6	3
10"R 6/6	4
12"R 6/6	5
14"R 6/6	6
16"R 6/6	7
18"R 6/6	8
20"R 6/6	9
22"R 6/6	10
24"R 6/6	11
26"R 6/6	12
CLASS: 2	

SOIL TESTING PERFORMED BY:  
CHRISTOPHER M. ANDERSON, PE  
(SEP#14005)  
HANNIGAN ENGINEERING, INC.



**LOCUS MAP** SCALE: 1" = 1000'

**OWNER**  
BOSTWICK REALTY TRUST  
256 MURDOCK AVENUE  
WINCHENDON, MASSACHUSETTS

**APPLICANT**  
ZP BATTERY DEVCO, LLC  
1 MERCANTILE STREET, SUITE 630  
WORCESTER, MASSACHUSETTS 01608

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**PROJECT INFORMATION**

**LAND INFORMATION**

MAP PARCEL: 202/11  
DEED BOOK/PAGE: 17143/339  
EXISTING FRONTAGE: 49.5 FT  
EXISTING AREA: 3.75 ACRES±

**ZONING INFORMATION**

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2	8/2/2023	PEER REVIEW COMMENT	CMA
1	7/1/2023	PEER REVIEW AND BOARD COMMENT	CMA
NO.	DATE	REVISIONS	BY



**HANNIGAN ENGINEERING, INC.**  
CIVIL ENGINEERS & LAND SURVEYORS

8 MONUMENT SQUARE (978) 534-1234 (T)  
LEOMINSTER, MASSACHUSETTS 01453 (978) 534-6060 (F)

WWW.HANNIGANENGINEERING.COM

**LEGEND**

EXISTING	PROPOSED
S42	CONTOURS 560
○	DRAIN PROPERTY LINES
○	DRAIN SEWER WATER
—	DHW
—	ELEC/TELE/CABLE
—	ELEC/TELE/CABLE
—	EDGE OF PAVEMENT
—	CURBLINE
—	EROSION CONTROL STRAW WATTLE AND SILT FENCE
—	TREELINE
—	WETLAND
—	WETLAND BUFFER ZONE
—	HYDRANTS
—	SIGNS
—	LIGHTPOLE

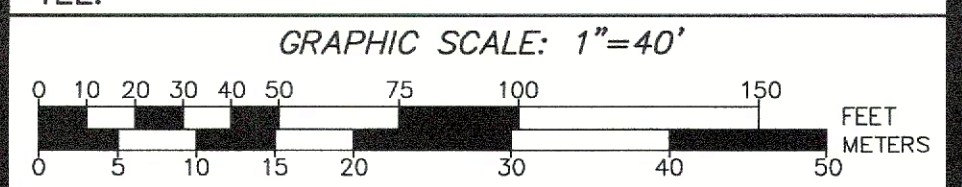
APPROVAL OF THIS PLAN IS GRANTED ON THE CONDITIONS LISTED IN A SEPARATE STATEMENT OF CONDITIONS WHICH PART OF THE APPROVAL OF THIS SITE PLAN.

**WINCHENDON PLANNING BOARD**

DATE: \_\_\_\_\_

**LANDSCAPE & LAYOUT PLAN**  
IN  
WINCHENDON, MASSACHUSETTS

PREPARED FOR:  
ZP BATTERY DEVCO, LLC  
PETE FORTE  
1 MERCANTILE STREET, SUITE 630  
WORCESTER, MASSACHUSETTS 01608  
TEL: \_\_\_\_\_



CALC: CMA	DRWN: CMA	SCALE: 1" = 40'
CHKD: WDH	APPD: CMA	DATE: MAR 27, 2023
SRV: JEF	FB: 75-130	JOB NO: 3101
TAB: (4) LL-A	SHEET 4 OF 6	PLAN NO: C-18-41



**EROSION & SEDIMENTATION CONTROL PLAN**

**GENERAL:**

1. THE PURPOSE OF THIS PLAN IS TO PRESENT A PREVENTIVE METHOD OF CONSTRUCTION TO MINIMIZE THE IMPACT OF THE CONSTRUCTION ACTIVITIES UPON WETLAND AND OTHER SENSITIVE AREAS. THE DATA CONTAINED ON THIS PLAN IS INTENDED TO SUPPLEMENT THE DEVELOPER OR CONTRACTOR'S EXPERTISE AND IS NOT MEANT TO CIRCUMVENT LOGICAL DECISIONS REQUIRED BY A VARIETY OF FIELD CONDITIONS INCLUDING WEATHER AND THE TYPE OF EQUIPMENT AVAILABLE TO THE CONTRACTOR.

2. THE CONTRACTOR IS TO BE AWARE OF THE REQUIREMENTS AND OBLIGATIONS TO COMPLY WITH CHAPTER 131, SECTION 40 OF THE MASSACHUSETTS GENERAL LAWS, OTHERWISE KNOWN AS THE WETLANDS PROTECTION ACT, AND ITS ASSOCIATED REGULATIONS (310 CMR 10.00). CERTAIN PERMITS IN THE FORM OF AN ORDER OF CONDITIONS OR OTHER FORMAT, MAY BE REQUIRED FOR THE CONSTRUCTION AS DEPICTED ON THIS PLAN. THESE PERMITS SHALL BE REVIEWED AND ADHERED TO BY THE CONTRACTOR THROUGHOUT THE CONSTRUCTION PROCESS. THE CONTRACTOR SHALL ALSO MAINTAIN COPIES OF ALL PERMITS ON SITE AT ALL TIMES.

3. IF CHANGES IN THE PROJECT ARE REQUIRED DUE TO FIELD CONDITIONS THE DEVELOPER/CONTRACTOR SHALL PROMPTLY NOTIFY THE ENGINEER FOR REVIEW OF THESE CONDITIONS. UPON REVIEW PRIOR TO THE IMPLEMENTATION OF ANY CHANGE, THE CONTRACTOR AND THE ENGINEER SHALL MEET WITH THE APPROPRIATE LOCAL AND/OR STATE OFFICIAL, OR ITS AGENT, TO DETERMINE IF THE CHANGE REQUIRES MODIFICATION TO EXISTING APPROVED PERMITS.

4. ALTERATION AND/OR DESTRUCTION OF WETLAND AREAS WITHOUT PRIOR CONSENT OF THE CONSERVATION COMMISSION THROUGH SILTATION PLUMES, ILLUOT DISCHARGES, OR INADVERTENT ALTERATION SHALL BE CONSIDERED AS ACTIVITIES NOT PERMITTED BY THE ORDER AND SHALL BE REPORTED TO THE CONSERVATION COMMISSION ALONG WITH THE PROPOSED MITIGATION MEASURES.

5. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE EROSION AND SEDIMENT CONTROL BARRIER SHALL BE INSTALLED AS SHOWN ON THE PLANS. THE CONTRACTOR SHALL MAINTAIN THE EROSION CONTROL BARRIER UNTIL ALL WORK IS COMPLETE AND ALL AREAS HAVE BEEN STABILIZED. THE REMOVAL OF SEDIMENT CONTROL DEVICES SHALL BE ONLY UPON THE APPROVAL OF THE CONSERVATION COMMISSION.

6. EROSION AND SEDIMENTATION CONTROL DEVICES, SUCH AS CHECK DAMS, SEDIMENT BASINS, ETC. ARE TO BE INSTALLED AS SHOWN ON THE SITE DEVELOPMENT PLANS WITH ASSOCIATED DETAILS, AS APPROPRIATE.

7. CONSTRUCTION OPERATIONS SHALL NOT CAUSE NOTICEABLE SEDIMENTATION PLUMES TO OCCUR ON OR SURROUNDING THE PROJECT. SHOULD SEDIMENT EXTEND BEYOND CONSTRUCTION BARRIERS, THE CONTRACTOR SHALL STOP WORK AND INSTALL ADDITIONAL MITIGATION MEASURES TO PREVENT FURTHER SEDIMENTATION.

8. NO MATERIAL SUBJECT TO EROSION SHALL BE STOCKPILED OVERNIGHT WITHIN 100 FEET OF ANY WETLAND AREAS WITHOUT PROPER EROSION AND SEDIMENTATION DEVICES IN PLACE.

9. EQUIPMENT SHALL NOT BE PARKED WITHIN WETLAND OR BUFFER AREAS EXCEPT DURING ACTUAL OPERATIONS REQUIRING SAID EQUIPMENT. SHALL BE PERIODICALLY REMOVED AND DISPOSED OF BY THE CONTRACTOR AS REQUIRED BY THE CONSERVATION COMMISSION OR AS DIRECTED BY THE ENGINEER.

**EROSION CONTROL METHODS:**

1. IT IS OF GREAT IMPORTANCE THAT CONCENTRATION OF RUNOFF BE AVOIDED IN ORDER TO PREVENT THE TRANSPORT OF SEDIMENT.

2. THE PRIMARY EROSION CONTROL METHOD TO BE UTILIZED IS TO LIMIT THE AREA OF DISTURBANCE DURING CONSTRUCTION ACTIVITIES. THIS IS ACCOMPLISHED BY PROMPT STABILIZATION OF DISTURBED AREAS UPON COMPLETION OF SEQUENCES OF CONSTRUCTION.

3. EROSION AND SEDIMENT CONTROL DEVICES SUCH AS HAY BALES, SILT FENCES, DIVERSION BERMS, ETC. SHALL BE UTILIZED FOR THE PROTECTION OF THE AREAS BEYOND THE LIMIT OF CONSTRUCTION.

**DEMARICATION OF SENSITIVE AREAS:**

1. IT IS RECOMMEND THAT BARRIERS BE PLACED ON THE SITE TO CONTROL THE LIMITS OF THE DISTURBANCE. AS AN EXAMPLE, HAY BALE BARRIERS PROVIDE SUCH DEMARICATION AND OTHER METHODS SUCH AS LOG BARRIERS, ROPE WITH FLAGGING, ETC. MAY BE UTILIZED.

2. CARE SHOULD BE TAKEN IN THE OPERATION OF EQUIPMENT, SUCH THAT ONLY THE MINIMUM AREA NEEDED TO BE ALTERED IS DISTURBED.

**ACCESS:**

1. ACCESS TO THE SITE SHALL BE MADE IN THE AREA OF A PERMANENT DRIVEWAY OR ROADWAY UNLESS DOING SO WOULD RESULT IN A TRAFFIC HAZARD.

2. AN AREA OF CRUSHED STONE SHALL BE PLACED AT THE DRIVEWAY ENTRANCE TO INSURE THAT MUD IS NOT TRACKED ONTO THE EXISTING ROAD (SEE CONSTRUCTION ENTRANCE DETAIL). IF MUD IS INADVERTENTLY TRACKED ONTO THE ROAD, IT SHOULD BE PROMPTLY REMOVED.

3. LABORERS VEHICLES SHALL BE PARKED IN A DESIGNATED AREA AS TO MINIMIZE DISTURBED SURFACES AND TO INSURE THAT RUTS ARE NOT CREATED AND WHICH COULD CARRY WATER TO A WETLAND OR OTHER SENSITIVE AREA.

4. SUITABLE MEASURES SHALL BE TAKEN TO INSURE THAT LARGE DELIVERY TRUCKS SERVING THE SITE DO NOT DAMAGE TO AREAS OF EXISTING VEGETATION OR CAUSE DISTURBANCE TO STABILIZED AREAS.

**ORDERLY CONSTRUCTION PROCEDURES:**

1. THE CONTRACTOR SHALL PERFORM SITE CONSTRUCTION IN A MANNER WHICH WILL INSURE THE STABILIZATION OF AREAS IN PROXIMITY OF OR TRIBUTARY TO WETLAND AREAS AS SOON AS POSSIBLE.

2. EROSION CONTROL DEVICES SUCH AS HAY BALE BARRIERS, SILT FENCES AND MULCH SHALL BE BROUGHT TO THE SITE AND STOCKPILED PRIOR TO INITIATING CONSTRUCTION.

3. THE CONTRACTOR SHALL PROVIDE AREAS FOR THE TEMPORARY STORAGE OF CONSTRUCTION DEBRIS. CONSTRUCTION DEBRIS SHALL NOT BE ALLOWED TO ACCUMULATE FOR AN EXTENDED PERIOD OF TIME.

**CLEARING:**

1. LAND CLEARING SHALL BE PERFORMED IN PHASES CONSISTENT WITH ACTUAL CONSTRUCTION REQUIREMENTS. FINAL LAND CLEARING SHALL BE LIMITED TO RETURN TO GRADE SLOPES.

2. TREES SHALL BE CUT AND STUMPS GROUND IN PLACE TO EXISTING GRADE TO MAINTAIN SOIL STABILIZATION.

3. BRUSH AND BRANCHES SHOULD BE CHIPPED AND UTILIZED FOR WOOD MULCH IF PRACTICAL.

4. VEHICLES UTILIZED IN THE CLEARING OPERATION SHOULD NOT TRAVERSE WETLANDS OR FLOWING BROOKS OR STREAMS WITHOUT PRIOR APPROVAL FROM THE LOCAL CONSERVATION COMMISSION OR AGENT.

**GRUBBING AND STRIPPING:**

1. TOP SOIL SHALL BE RETAINED FOR LANDSCAPING PURPOSES.

2. GRUBBING AND STRIPPING OF SLOPES LEADING TO WETLAND AREAS SHOULD NOT BE UNDERTAKEN DURING PERIODS OF INTENSE RAINFALL.

3. TOP SOIL STOCKPILE LOCATIONS ARE DEPICTED ON THE SITE DEVELOPMENT PLAN, THE EROSION CONTROL PLAN, AND/OR THE CONSTRUCTION PHASING PLAN AND SHALL BE ADHERED TO.

4. WHEN WORKING IN THE VICINITY OF WETLANDS, TOP SOIL SATURATED WITH WATER SHALL BE REMOVED, AND CONTAINED PRIOR TO BEING USED.

5. AREAS LEADING TO WETLANDS SHALL HAVE HAY BALE BARRIERS INSTALLED ACROSS THEM IN ARCS POINTING DOWN THE HILL AT INTERVALS SUFFICIENT TO MITIGATE RUNOFF CARRYING SEDIMENT.

6. DURING PERIODS OF INTENSE RAINFALL, OR IF THE PROJECT IS TO BE LEFT FOR A PERIOD OF TIME, CONSIDERATION SHOULD BE GIVEN TO SUPPLEMENT HAY BALE BARRIERS WITH EITHER CRUSHED STONE OR ARMORED BARRIERS. CONSIDERATION MAY ALSO BE GIVEN TO DIVERTING RUNOFF INTO TEMPORARY SEDIMENTATION CONTROL AREAS.

7. WHENEVER PRACTICAL, NATURAL VEGETATION SHALL BE RETAINED, PROTECTED AND SUPPLEMENTED.

**ROUGH GRADING:**

1. THE ROUGH GRADING OF THE ROADWAY SHALL FOLLOW THE FILL AND EXCAVATION SEQUENCES, RESULTING IN SLOPES BEING MAINTAINED AWAY FROM WETLANDS AND SENSITIVE AREAS AS MUCH AS PRACTICAL.

2. DURING THIS PROCESS THE EROSION POTENTIAL IS HIGH. SUFFICIENT EROSION CONTROL BARRIERS SHOULD BE KEPT IN PROXIMITY TO THE WORK AREA TO ALLOW QUICK ACTION SHOULD EROSION BECOME AN ISSUE AND TO INSURE THAT NO SEDIMENT REACHES WETLANDS OR OTHER SENSITIVE AREAS.

3. IN AREAS OF CUT AND/OR FILL WHERE SLOPES COULD DIVERT WATER TOWARD WETLAND AREAS, DIVERSION TRENCHES AND/OR SWALES SHOULD BE CONSIDERED AND IMPLEMENTED TO DIVERT WATER AWAY FROM THESE AREAS.

4. STEEP SLOPES IN EXCAVATION OR FILL SHOULD BE AVOIDED.

5. DISTURBED AREAS SHALL BE STABILIZED BY LOAMING AND SEEDING OR RIPRAPPED IMMEDIATELY AFTER THE FINISH GRADE HAS BEEN MET. IF FINAL GRADING DOES NOT OCCUR DURING THE GROWING SEASON, THESE AREAS SHALL BE MULCHED BY HAY SECURED BY WEIGHTED SNOW FENCE, CHICKEN WIRE MESH OR JUTE NETTING WITH APPROPRIATE SECURING DEVICES.

6. A GROUND COVER SUFFICIENT TO RETAIN SOILS IN A STABILIZED CONDITION MUST BE PROVIDED WITHIN 14 WORKING DAYS, SEASON PERMITTING, ON ANY PORTION OF THE TRACT UPON WHICH FURTHER ACTIVE CONSTRUCTION IS NOT BEING UNDERTAKEN.

**DRAINAGE:**

1. IF DRAINAGE PIPES OR SWALES ARE TO BE INSTALLED, THEY SHALL BE CONSTRUCTED FROM DOWNSTREAM UP AND CONSTRUCTION SHALL INCLUDE THE PLACEMENT OF OUTFALL RIPRAP AND OTHER MITIGATIVE MEASURES SHOWN ON THE PLAN.

2. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, HAY BALES OR OTHER SUITABLE METHODS TO ENTRAP SEDIMENT SHALL BE PLACED DOWNSTREAM.

3. THE TOE OF EMBANKMENTS SHALL BE STABILIZED IMMEDIATELY, MULCHED AND TACKED DOWN BY SUITABLE MEANS.

4. IF THE PROPOSED ROADWAY IS NOT PAVED IMMEDIATELY AFTER THE INSTALLATION OF DRAINAGE STRUCTURES, HAY BALES SHALL BE PLACED TO PROTECT THE INTEGRITY OF THE STRUCTURES.

**LANDSCAPING:**

1. LANDSCAPING OF AREAS SHOULD OCCUR AS SOON AS POSSIBLE.

2. IF THE SEASON OR ADVERSE WEATHER CONDITIONS DO NOT PERMIT THE ESTABLISHMENT OF VEGETATION, TEMPORARY HAY MULCH, OR OTHER MEANS OF STABILIZATION SHALL BE PERFORMED.

3. USE OF HERBICIDES MAY BE SUBJECT TO OTHER REGULATIONS.

4. CARE SHOULD BE TAKEN WITH FERTILIZERS SUCH THAT THEY ARE NOT CARRIED TO A WETLAND OR SENSITIVE AREA.

5. TRUNKS OF TREES SHOULD NOT BE COVERED WITH MORE THAN TWO (2) INCHES OF SOIL.

6. STUMPS SHALL BE GROUND DOWN INTO A WOOD MULCH AND UTILIZED OR REMOVED FROM THE SITE.

**CREATION OF DETENTION BASIN:**

1. THE DETENTION BASIN HAS BEEN PLACED AS A SEPARATE ITEM TO EMPHASIZE THE IMPORTANCE OF EROSION CONTROL DURING ITS CONSTRUCTION.

2. THE PRIMARY EROSION CONTROL METHOD FOR BASIN CONSTRUCTION, AS WELL AS FOR THE SITE IS THE RAPID STABILIZATION OF ALL SURFACES. SECONDARY IN IMPORTANCE IS THE CONCENTRATION OF RUNOFF BE AVOIDED IN ORDER TO PREVENT THE TRANSPORT OF SEDIMENT.

3. DURING CONSTRUCTION, THE FILL AND EXCAVATION SEQUENCES SHOWN ON THIS PLAN SHOULD BE UTILIZED. THESE SEQUENCES REQUIRE THAT SLOPED AREAS LEFT FOR ANY PERIOD OF TIME NOT SLOPED TOWARDS THE WETLAND OR SENSITIVE AREA, BUT RATHER BACK INTO THE FILL MATERIAL.

4. THE BASIN BERM IS TO BE CONSTRUCTED BY EQUIPMENT WORKING ON STABLE MATERIAL ONLY. HAY BALES SHALL BE PLACED AT THE TOE OF SLOPE UNTIL SURFACES ARE STABILIZED.

5. NO EXCAVATION WITHIN THE BASIN SHALL COMMENCE UNTIL THE BERM IS IN PLACE.

6. CARE SHOULD BE TAKEN TO INSURE THAT ORGANIC MATERIAL REMOVED FROM THE BASIN AREA IS RESERVED FOR FINISH GRADING AND THE STABILIZATION OF DISTURBED AREAS.

7. IF DOWELLING IS NECESSARY, PUMPING TO A SETTLING BASIN SHALL BE PERMITTED IF SETTLING BASIN IS CONSTRUCTED, MAINTAINED AND OPERATED EFFECTIVELY.

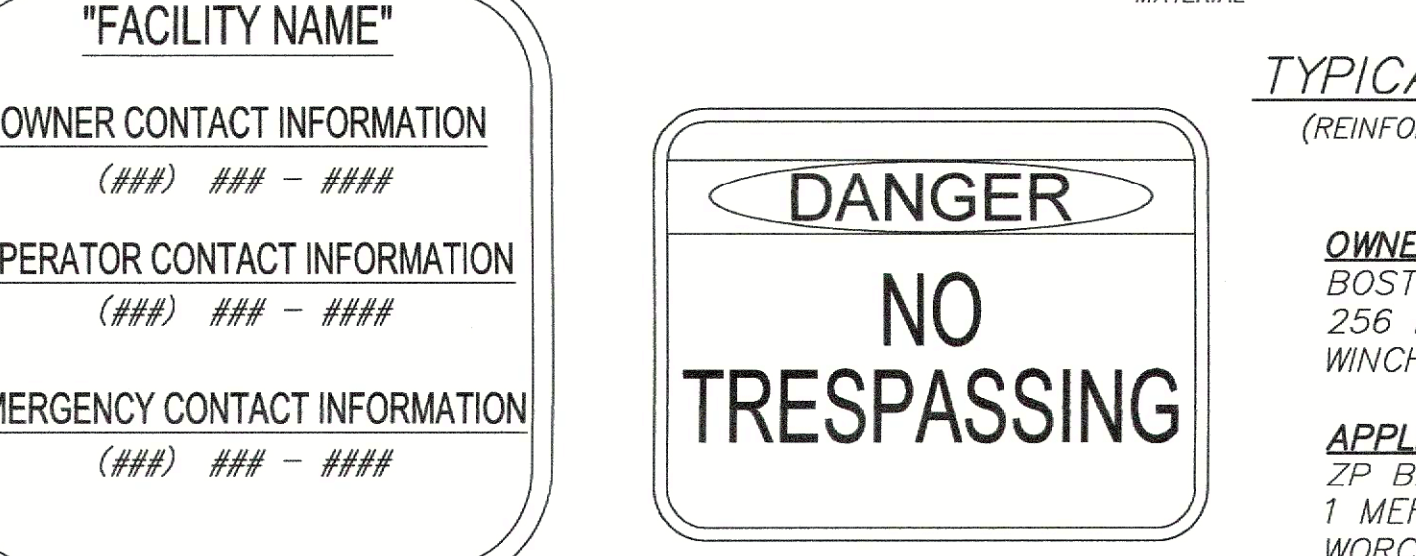
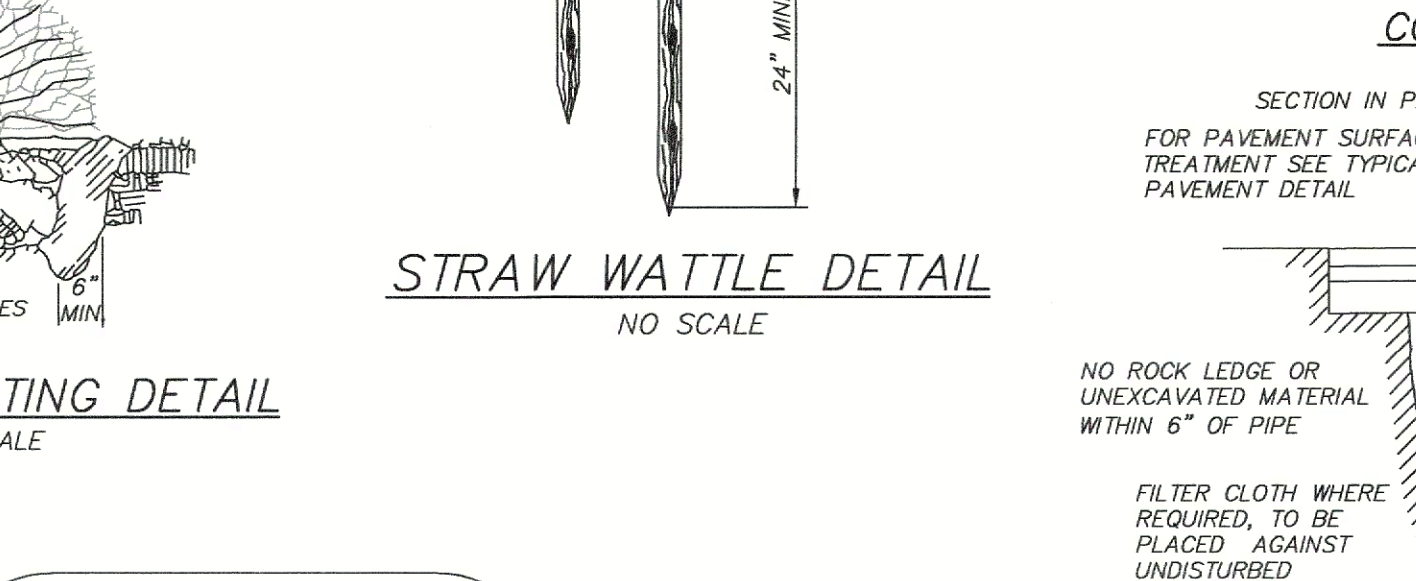
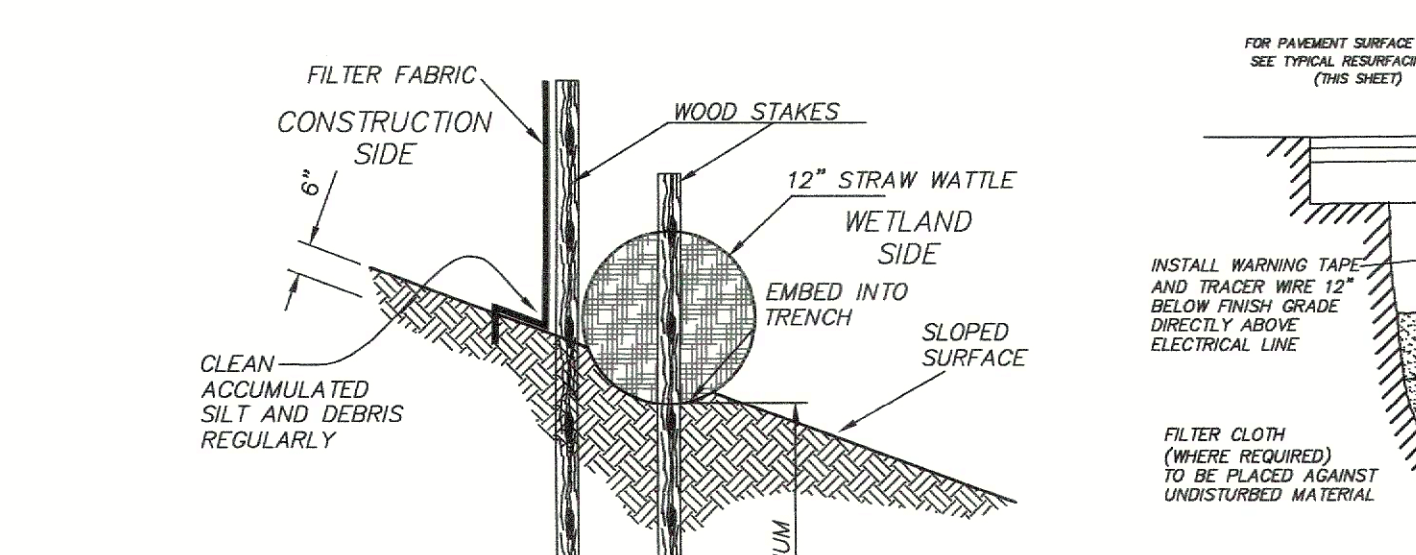
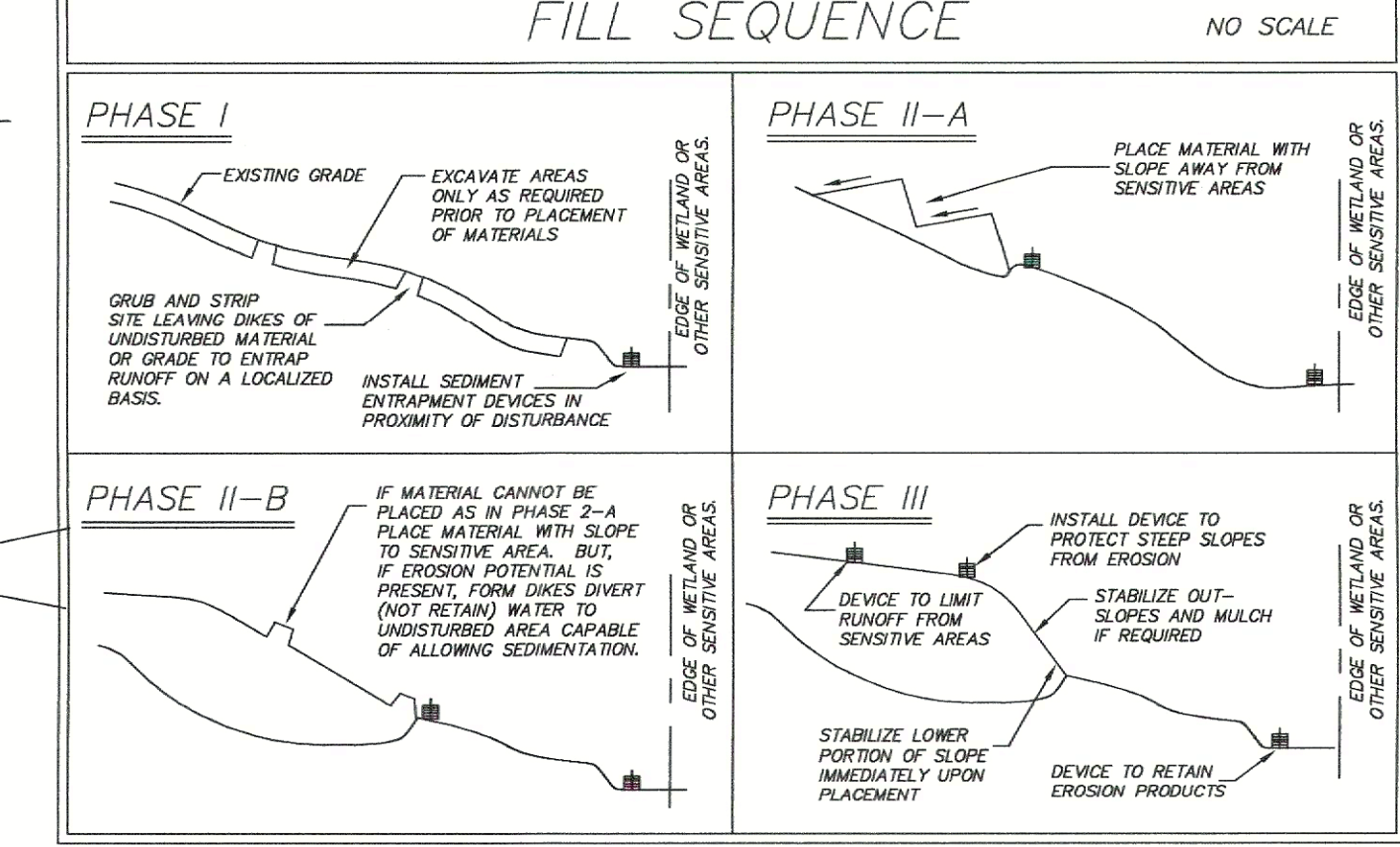
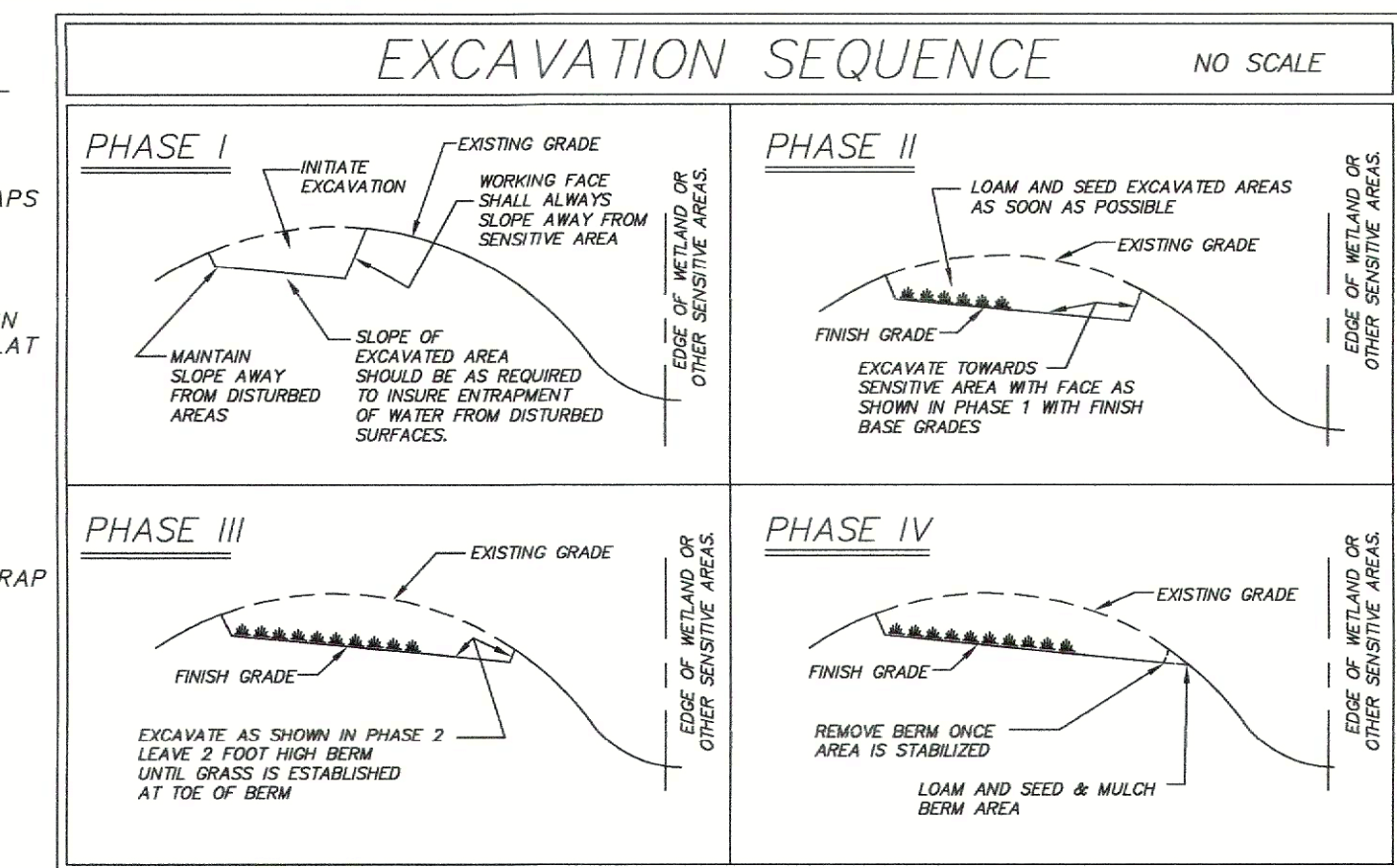
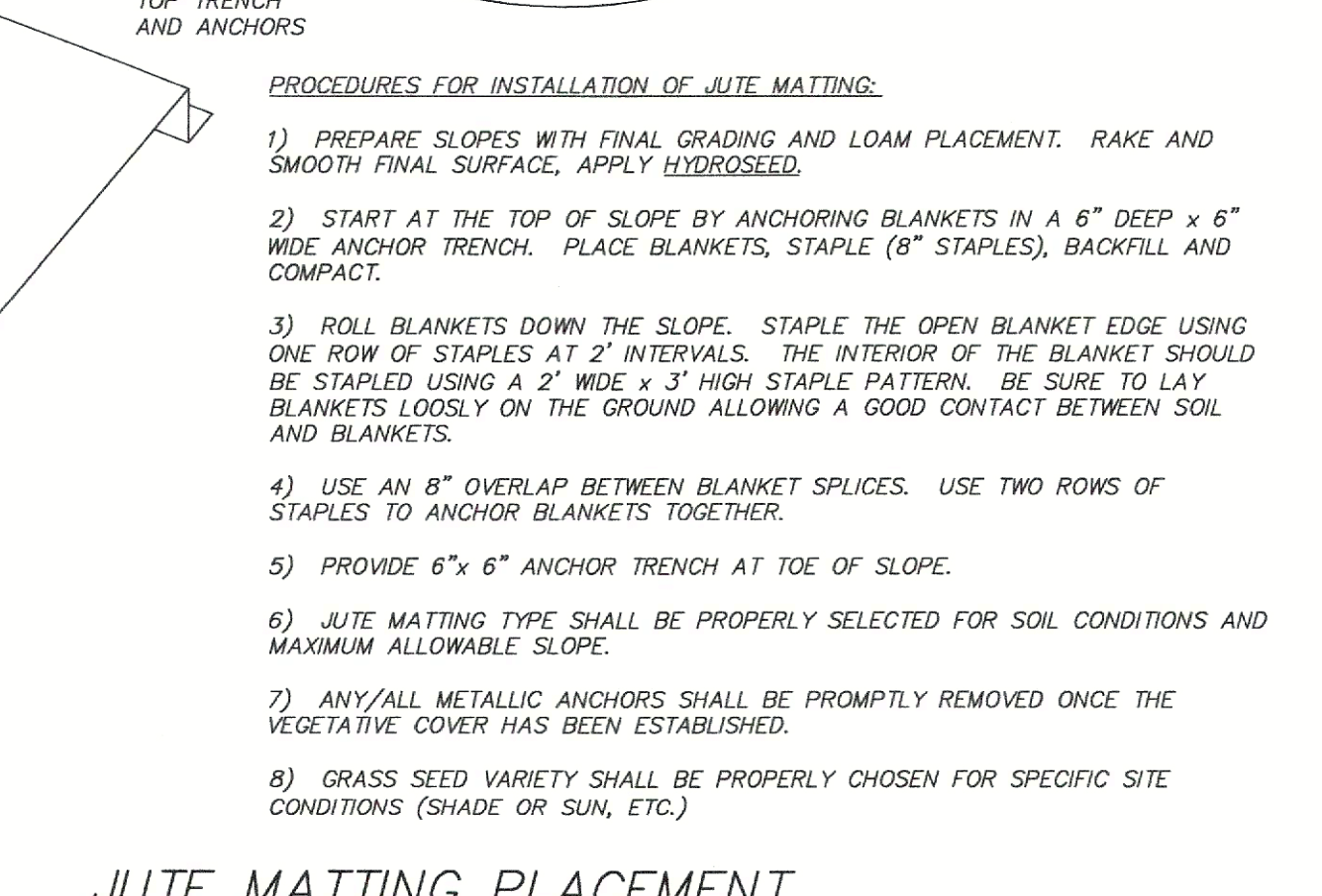
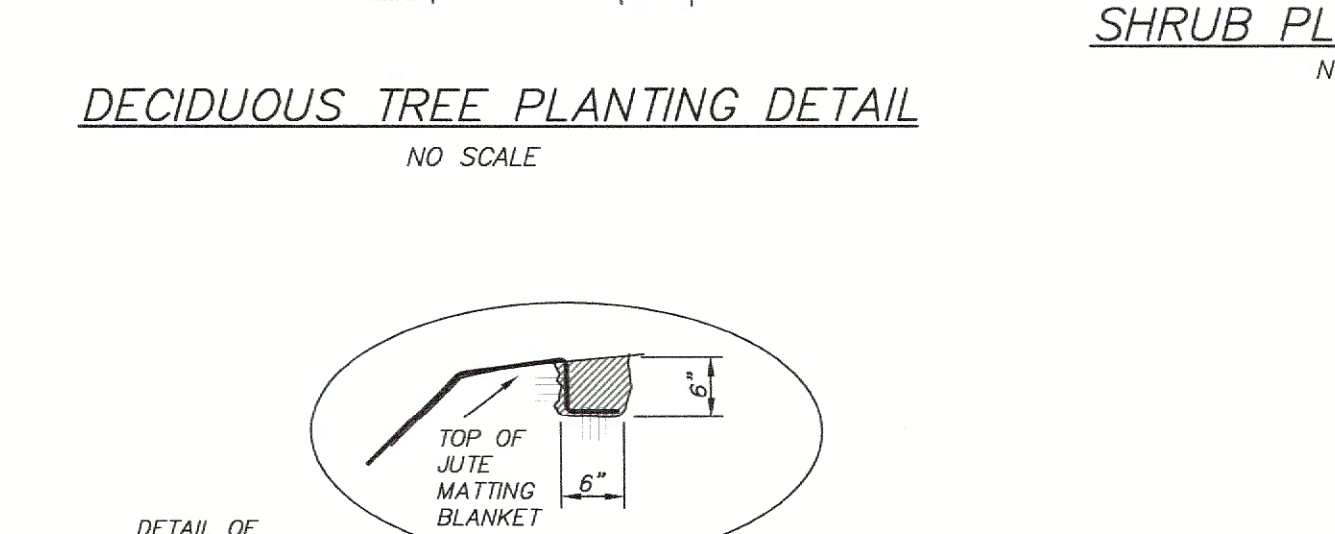
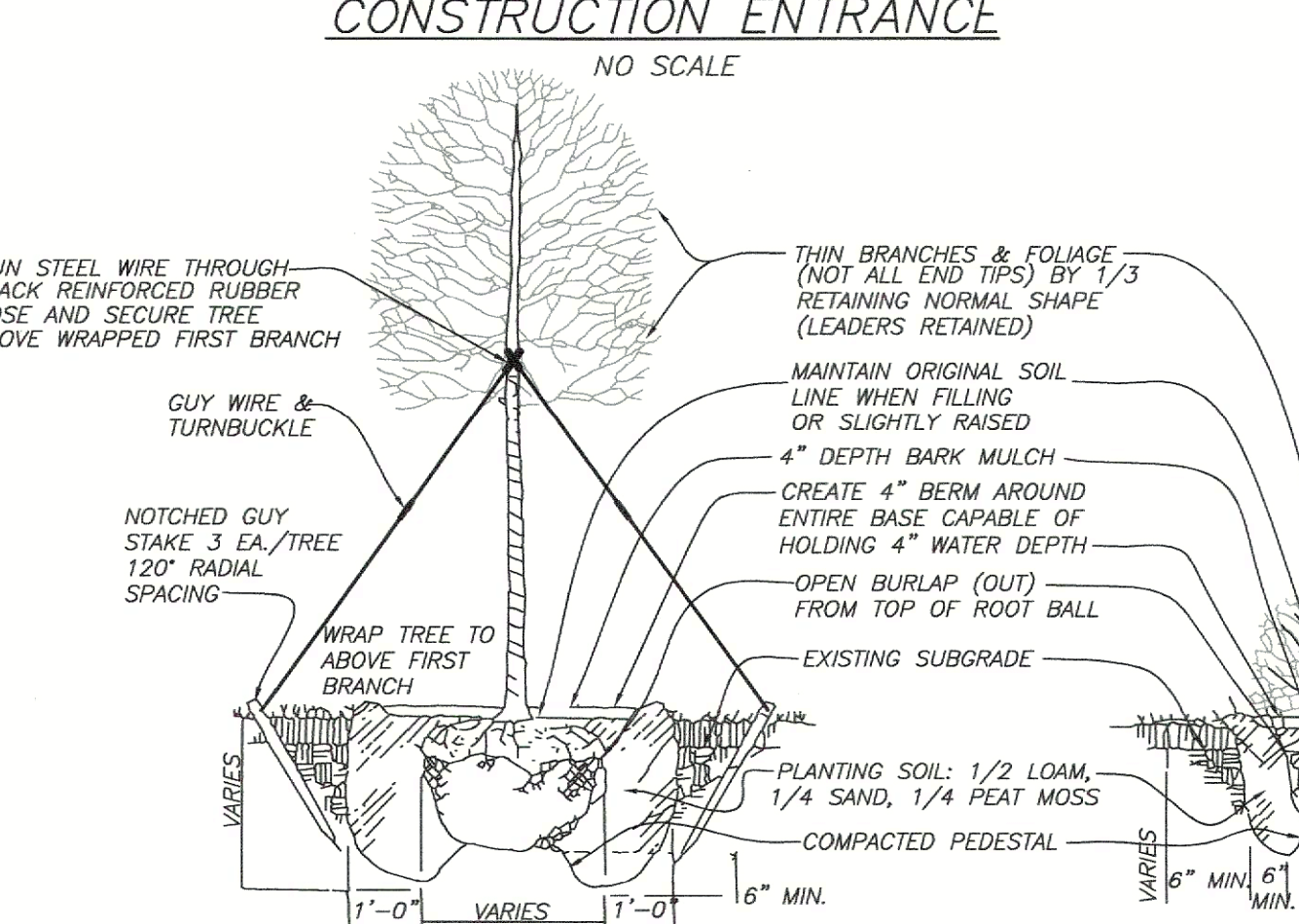
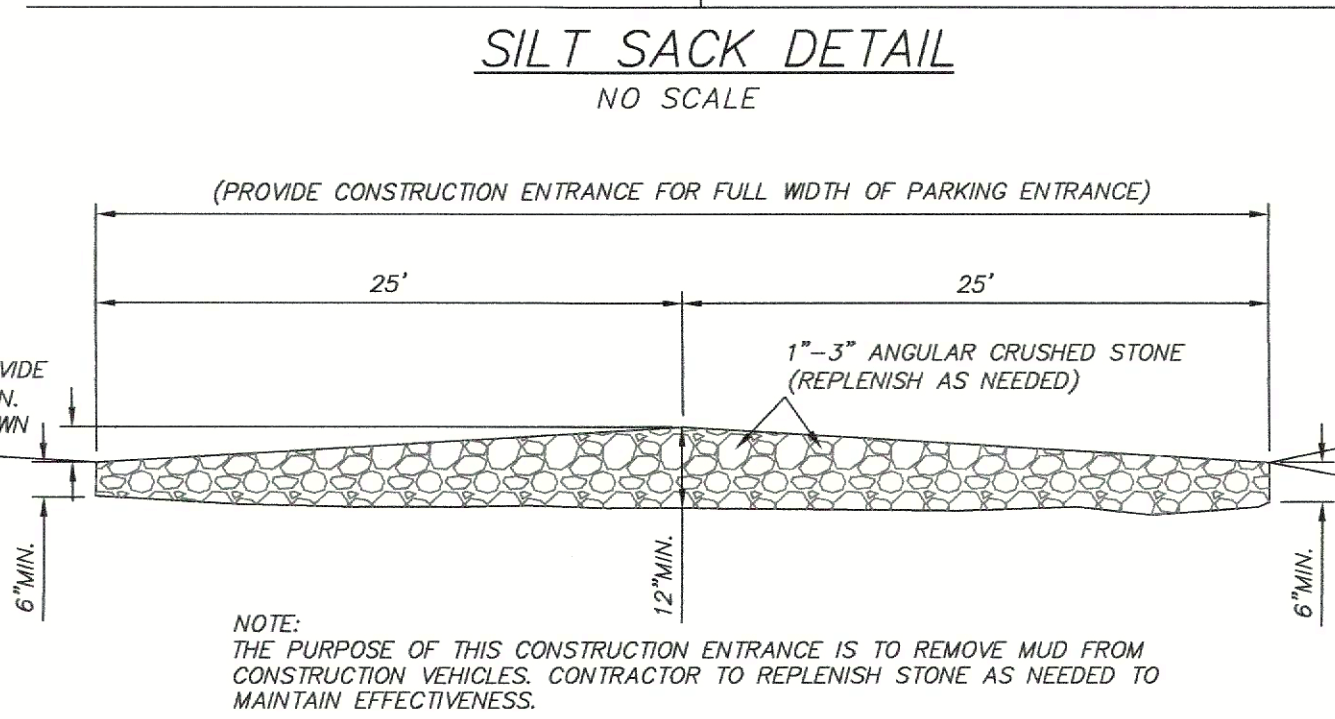
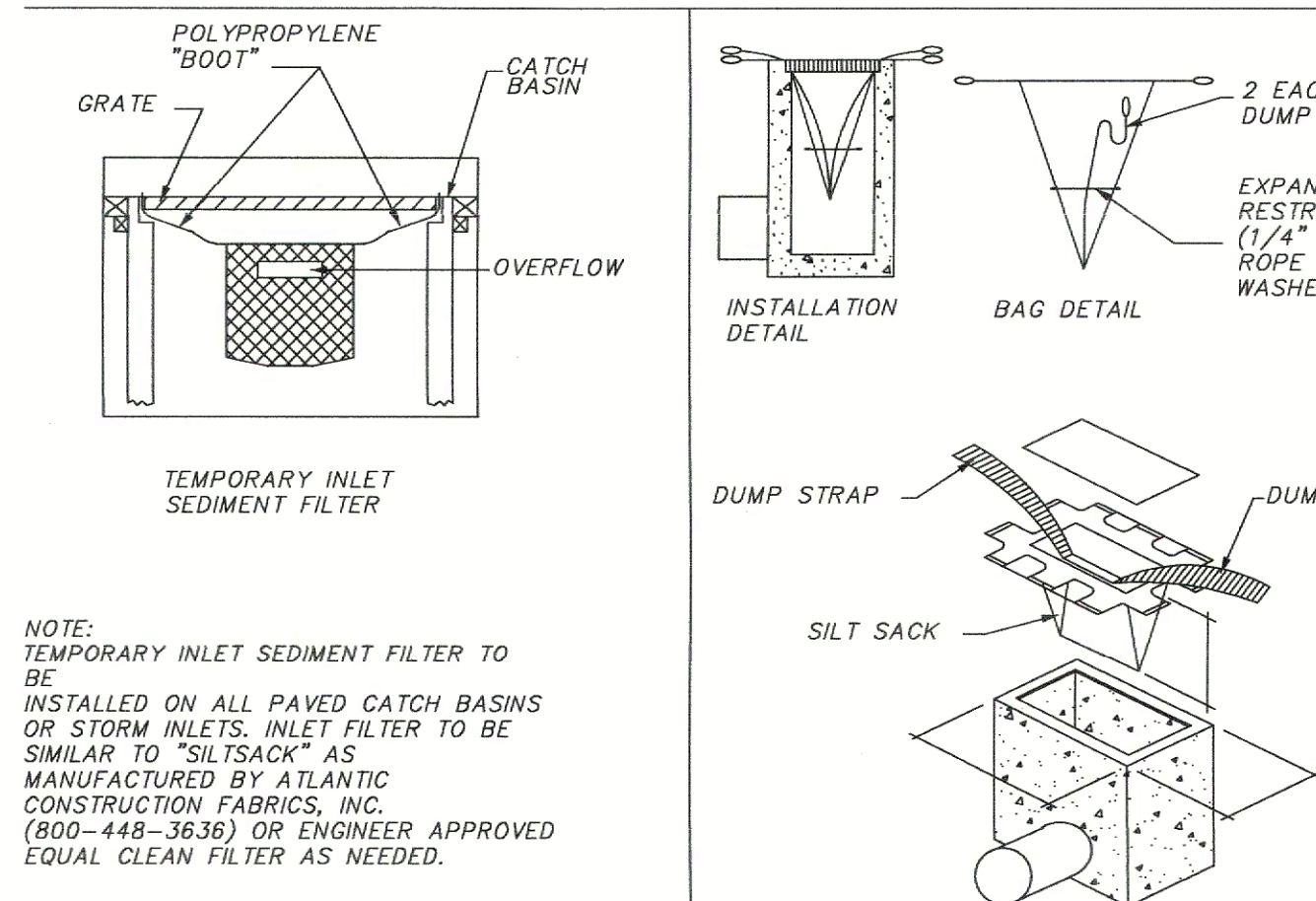
8. AT NO TIME SHALL RUNOFF CARRYING SEDIMENT BE ALLOWED TO FLOW TO THE WETLANDS OR SENSITIVE AREAS.

9. THE WORK AREA SHALL REMAIN FREE OF LITTER AND DEBRIS AT ALL TIMES AND MONITORED ON A DAILY BASIS TO ENSURE COMPLIANCE.

10. ALL MATERIALS STOCKPILED SHALL BE LOCATED, MULCHED OR OTHERWISE TREATED TO INSURE THAT MATERIALS CONTAINED, THEREIN, AREA NOT CARRIED INTO THE WETLANDS.

11. ANY MATERIALS BLOWN OR CARRIED BY WATER AWAY FROM THE CONSTRUCTION SITE OR INTO THE WETLAND AREAS SHALL BE PROMPTLY REMOVED AS REQUIRED BY THE LOCAL CONSERVATION COMMISSION.

12. A GEOTECHNICAL FILTER FABRIC SHALL BE PLACED OVER THE BASIN SUBDRAIN DURING CONSTRUCTION TO PREVENT SEDIMENT FROM ENTERING AND CLOGGING THE DRAIN. THE FABRIC SHALL BE REMOVED FOR BASIN PREPARATION FOR FINAL STABILIZATION.



**STORMWATER OPERATION AND MAINTENANCE PLAN**

THE FOLLOWING SHALL BE CONSIDERED THE OPERATION & MAINTENANCE PLAN (OMP) FOR THE STORMWATER COLLECTION FACILITY FOR THIS DEVELOPMENT. THIS OMP HAS BEEN PREPARED IN ACCORDANCE WITH THE STORMWATER MANAGEMENT POLICY AS ISSUED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

**I. SYSTEM OWNERSHIP:**  
THE SYSTEM SHALL INCLUDE THE DRAINAGE INFRASTRUCTURE AND ALL OF ITS COMPONENTS AS SHOWN ON THE SITE DEVELOPMENT PLANS, INCLUDING THE DETENTION FACILITIES AND OUTFALL AREAS OF THE DRAINAGE SYSTEM. THE STRUCTURES OF THE SYSTEM SHALL INCLUDE THE DRAINAGE SWALES AND THE OUTFALL & CONTROL STRUCTURES. THE SYSTEM SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CONSTRUCTION DETAILS AND THE APPROVED PLANS.

UPON THE COMPLETION OF CONSTRUCTION THE DRAINAGE SYSTEM DESCRIBED ABOVE AND AS DEPICTED ON THE SITE PLANS SHALL BECOME PROPERTY OF THE LAND OWNER, WITH SPECIFIC EASEMENT RIGHTS TO THE OPERATOR OF THE SOLAR SYSTEM TO MAINTAIN THE DRAINAGE SYSTEM AS DEPICTED ON THE APPROVED PLANS. SAID EASEMENT RIGHTS SHALL BE SPECIFICALLY DESCRIBED IN LEASE DOCUMENTS FOR THE PROJECT.

**II. RESPONSIBLE PARTIES:**  
THE OPERATOR OF THE SOLAR SYSTEM SHALL BE CONSIDERED THE RESPONSIBLE PARTY FOR THE OPERATION AND MAINTENANCE OF THE STORMWATER MANAGEMENT SYSTEM. THE SYSTEM SHALL INCLUDE THE DRAINAGE INFRASTRUCTURE AND ALL OF ITS COMPONENTS AS SHOWN ON THE APPROVED PLANS. THE SYSTEM SHALL ALSO INCLUDE THE DETENTION FACILITIES AND THE OUTFALL AREAS OF THE DRAINAGE SYSTEM.

**III. INSPECTION & MAINTENANCE SCHEDULE:**  
THE FOLLOWING MAINTENANCE SCHEDULE SHALL BE FOLLOWED IN ORDER TO MAINTAIN THE EFFECTIVENESS OF THE STORMWATER MANAGEMENT SYSTEM.

STRUCTURE TYPE	INSPECTION	MAINTENANCE	TASK
RIP/RAP APRONS	TWICE A YEAR	EVERY 10 YEARS	REMOVE DEBRIS & ADD STONE
SPILLWAY	TWICE A YEAR	TWICE A YEAR	REMOVE DEBRIS AND SEDIMENT

**SEEDING OPERATION AND MAINTENANCE PLAN**

**I. RESPONSIBLE PARTIES:**  
THE OPERATOR OF THE SOLAR SYSTEM SHALL BE CONSIDERED THE RESPONSIBLE PARTY FOR THE OPERATION AND MAINTENANCE OF THE GRASS & VEGETATION. THE VEGETATION SHALL INCLUDE ALL OF ITS AREAS AS SHOWN ON THE APPROVED PLANS. THE SYSTEM SHALL ALSO INCLUDE THE GRASSED AREAS AROUND THE PANELS AND DRAINAGE STRUCTURES.

**II. INSPECTION & MAINTENANCE SCHEDULE:**  
THE FOLLOWING MAINTENANCE SCHEDULE SHALL BE FOLLOWED IN ORDER TO MAINTAIN THE VEGETATED AREAS

ACTIVITY	MAINTENANCE	TASK
GRASS CUTTING	MONTHLY	GRASS HEIGHT TO BE ALLOWED TO GROW TO A HEIGHT OF NO MORE THAN 18 INCHES AND BE CUT TO A HEIGHT OF 4 TO 6 INCHES.

**III. APPROPRIATE SEED MIX AND APPLICATION RATES:**  
THE FOLLOWING SEED SCHEDULE SHALL BE FOLLOWED IN ORDER TO PROPERLY MAINTAIN VEGETATED AREAS

SEED TYPE (NATIVE SEED REQUIRED)	APPLICATION RATE	% OF MIX
WETLAND SEED MIX	7 TO 10 POUNDS PER ACRE	30%
WHITE CLOVER SEED MIX	3 TO 5 POUNDS PER ACRE	10%
KENTUCKY BLUEGRASS	80 TO 100 POUNDS PER ACRE	40%

**IV. HERBICIDES & PESTICIDES:**  
THERE WILL NO HERBICIDES OR PESTICIDES USED ON THIS PROJECT.

NO.	DATE	REVISIONS	BY
2	8/2/2023	PEER REVIEW COMMENT	CMA
1	7/1/2023	PEER REVIEW AND BOARD COMMENT	CMA

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LEOMINSTER, MASSACHUSETTS 01453 (978) 534-6060 (T)  
WWW.HANNIGANENGINEERING.COM

**CONSTRUCTION DETAILS**  
IN  
**WINCHENDON, MASSACHUSETTS**

PREPARED FOR:  
ZP BATTERY DEVCO, LLC  
PETE FORTE  
1 MERCANTILE STREET, SUITE 630  
WORCESTER, MASSACHUSETTS 01608  
TEL:

"FACILITY NAME"  
OWNER CONTACT INFORMATION  
###-###-####  
OPERATOR CONTACT INFORMATION  
###-###-####  
EMERGENCY CONTACT INFORMATION  
###-###-####

**DANGER**  
**NO TRESPASSING**

**PERIMETER SIGNAGE**  
NO SCALE  
12" x 9" - MATERIAL: VINYL  
SIGNS TO BE PLACED ALONG FENCELINE AT 50 FT INTERVALS

**TYPICAL PROJECT SIGN**  
NO SCALE  
24" x 24" - MATERIAL: VINYL  
SIGNS TO BE PLACED AT ENTRANCE OF PROJECT SITE

**GRAVEL ACCESS LANE SECTION**  
NO SCALE

**WINCHENDON PLANNING BOARD**

DATE: \_\_\_\_\_

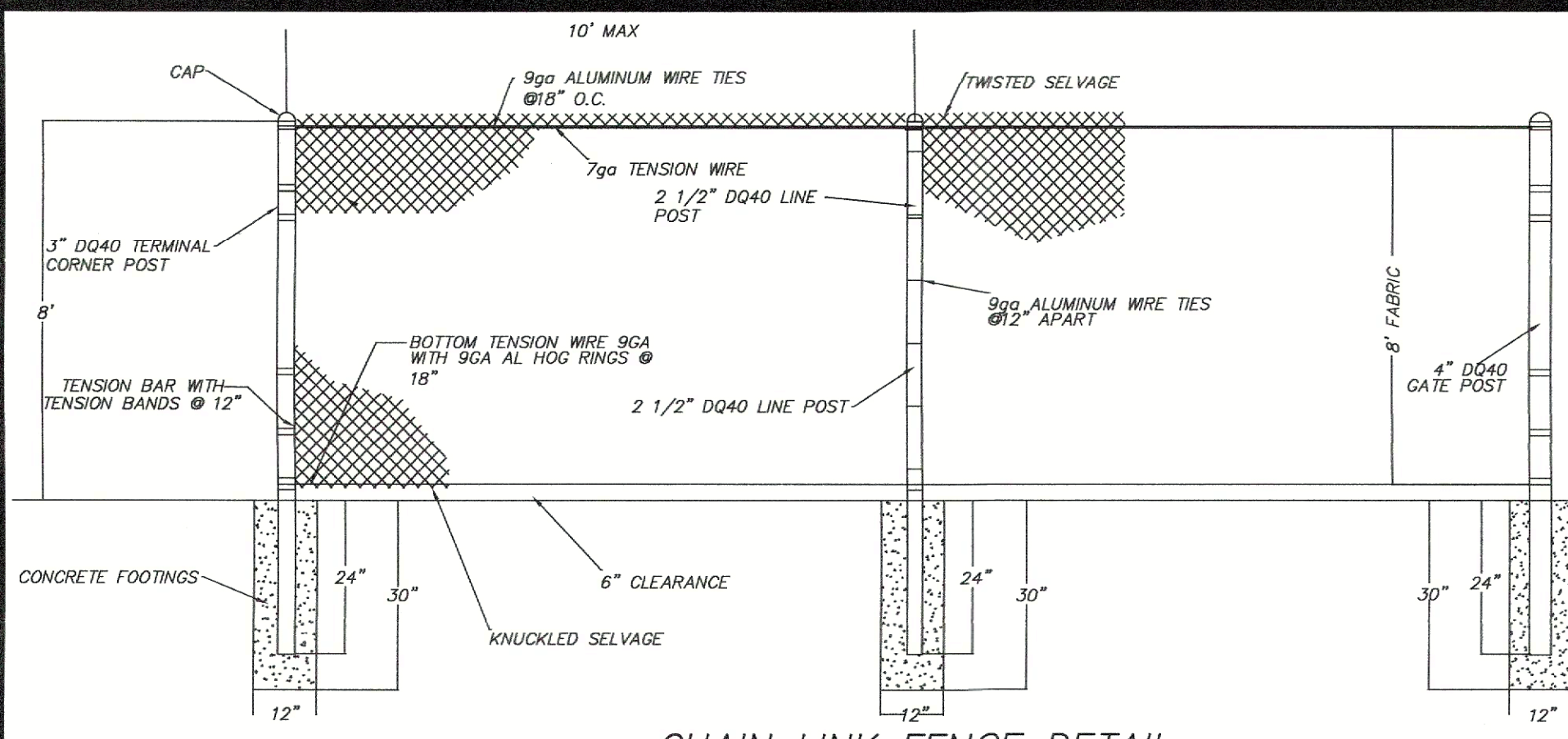
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CMA	CMA	NA

CHKD:	APPD:	DATE:
WDH	CMA	MAR 27, 2023

SRV:	FB:	JOB NO:
JEF	75-130	3101

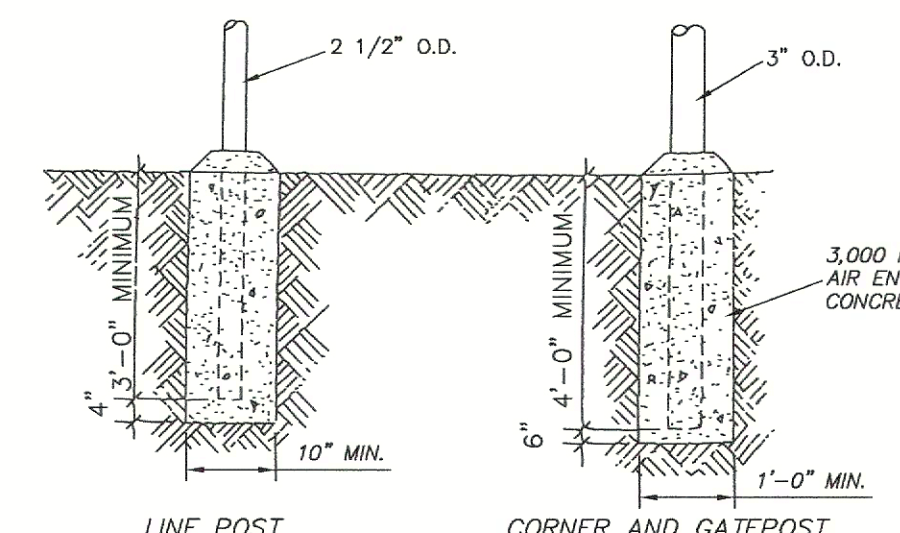
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(5-6)DET	5 OF 6	N0-c-18-41



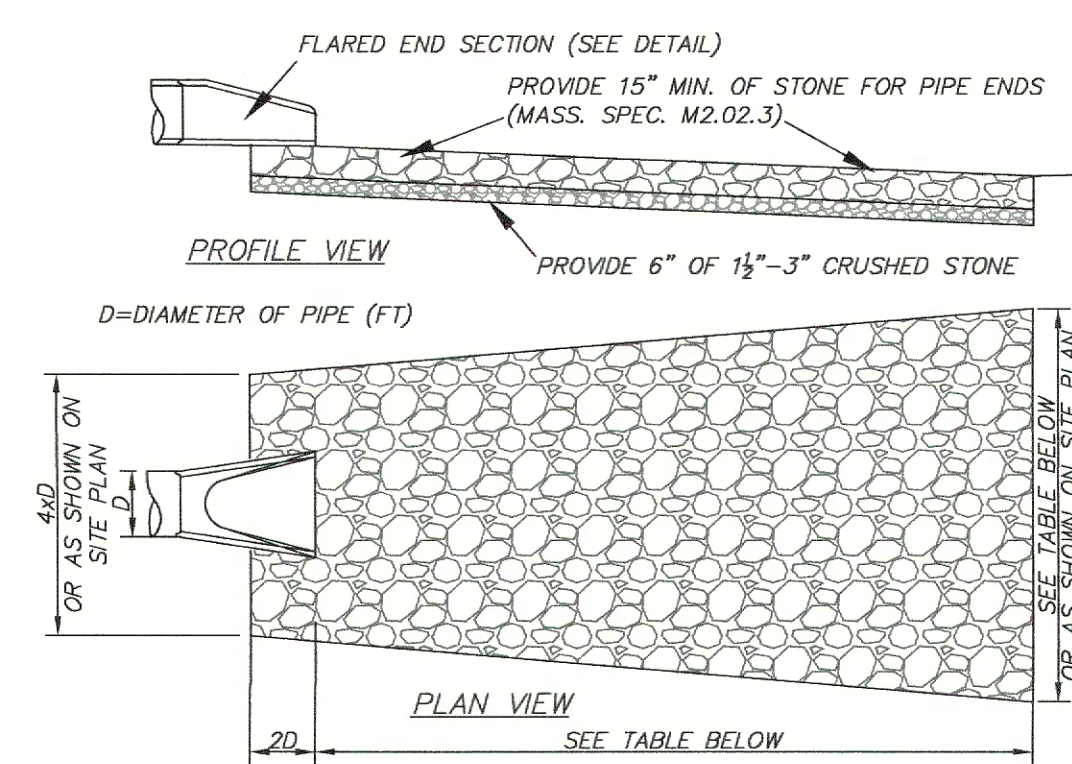


CHAIN LINK FENCE DETAIL

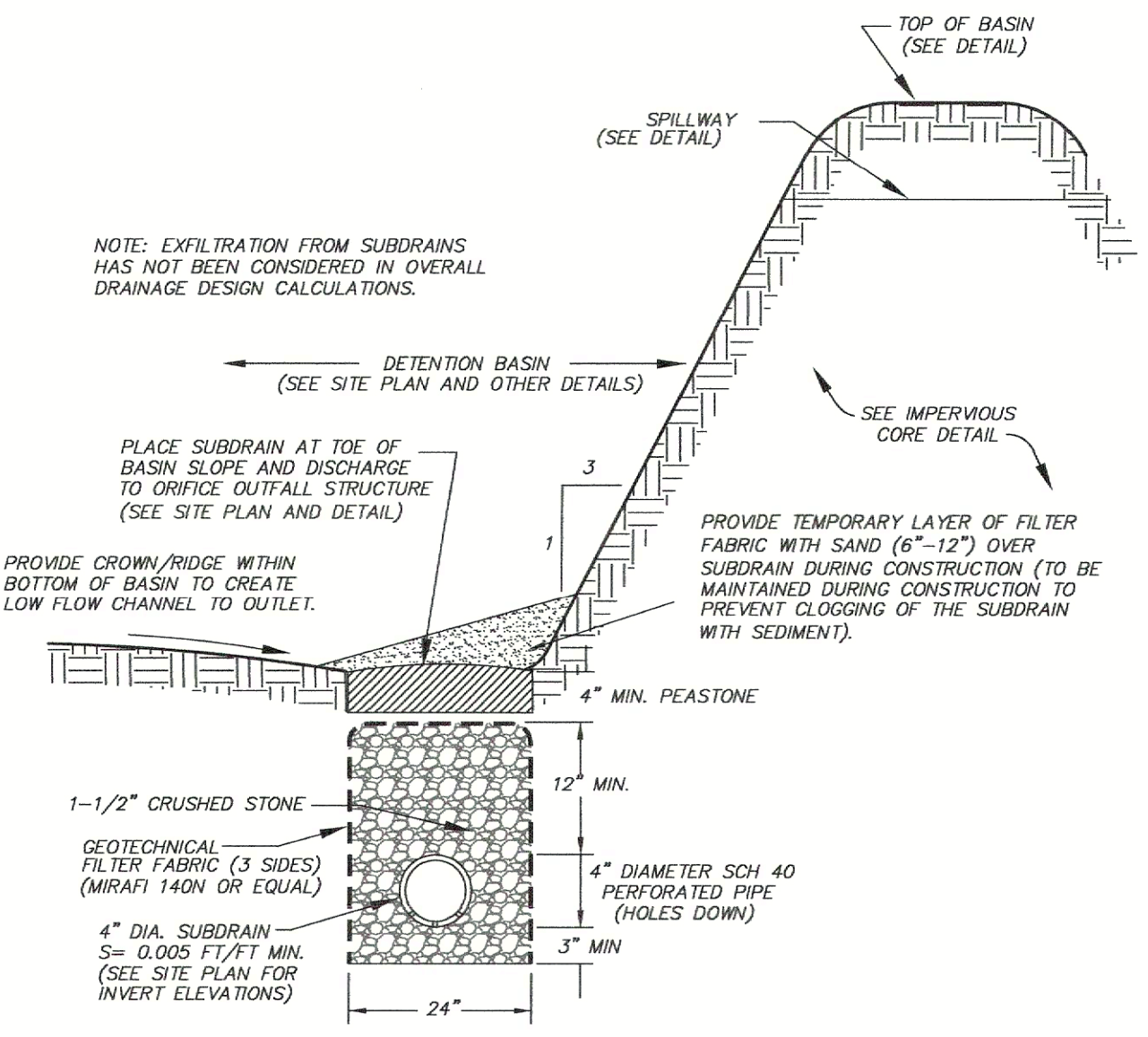
NOTES:  
 COLOR OF ALL MATERIALS ARE GALVANIZED  
 INCLUDES 10'12\"/>



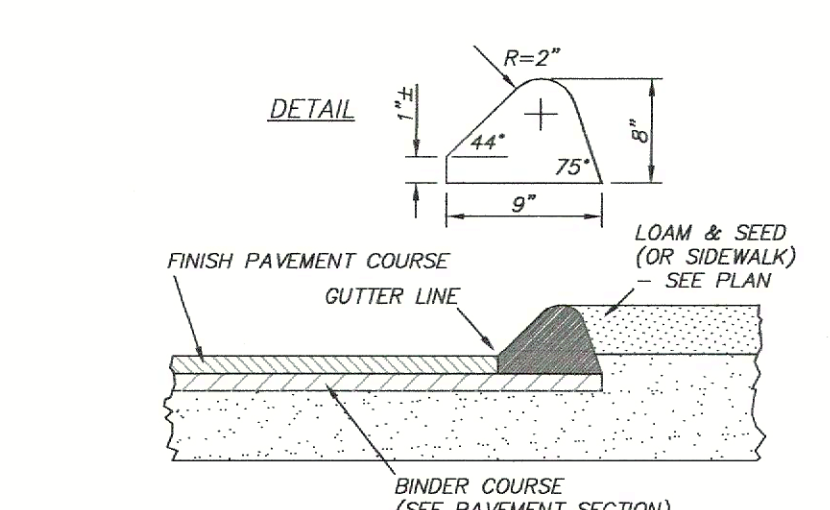
FENCE POST DETAIL  
NO SCALE



RIP RAP APRON DETAIL  
NO SCALE



RAIN GARDEN 4\"/>NO SCALE



BITUMINOUS CONCRETE CURB  
(MHD - TYPE 2)  
NO SCALE

PLANTING LIST AND NOTES

APPROXIMATE SPECIES MIX

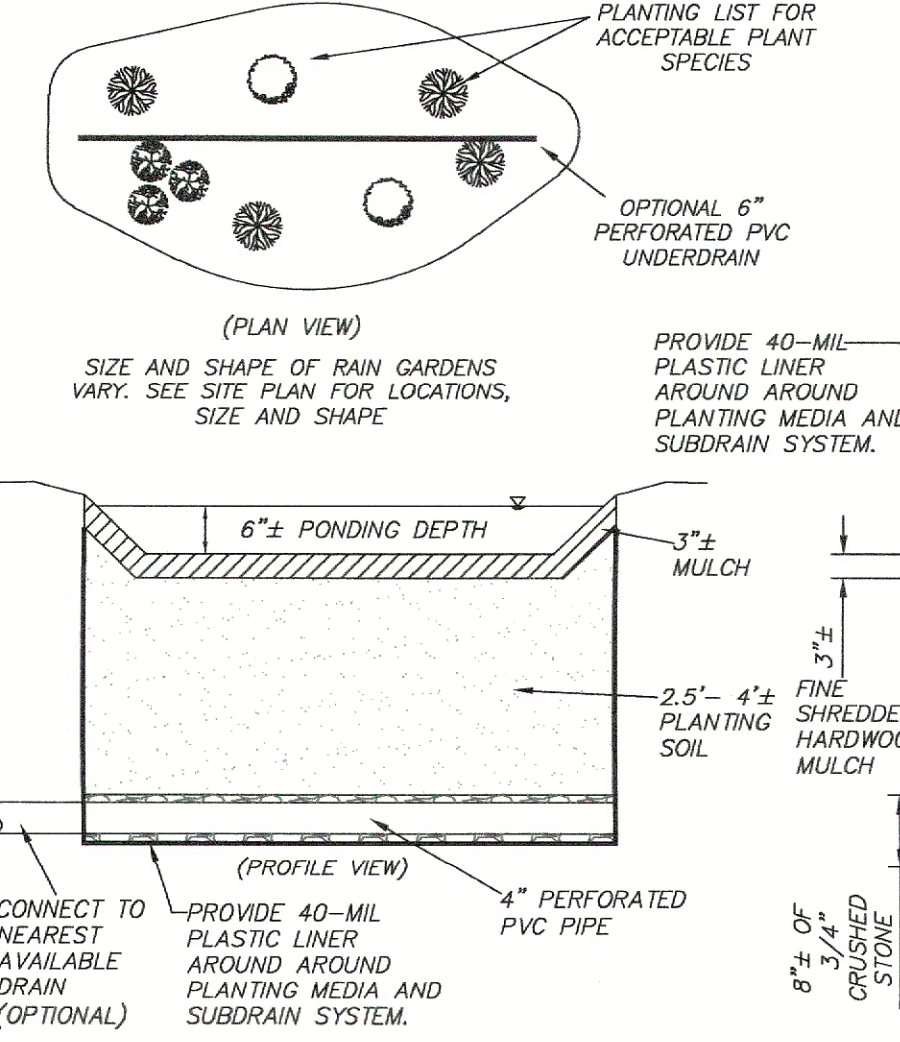
- RED CHOKEBERRY - *Aronia arbutifolia*
- SWEET PEPPERBUSH - *Clethra alnifolia*
- RED OSLER DOGWOOD - *Cornus sericea*
- WITCH HAZEL - *Hamamelis virginiana*
- COMMON ST. JOHN'S WORT - *Hypericum perforatum*
- INKBERRY - *Ilex glabra*
- WINTERBERRY - *Ilex verticillata*
- COMMON JUNIPER - *Juniperus communis*
- CREeping JUNIPER - *Juniperus horizontalis*
- SPICEBUSH - *Lindera benzoin*
- BAYBERRY - *Myrica pensylvanica*
- ARROW-WOOD - *Viburnum dentatum*
- RED MAPLE - *Acer rubrum*
- SWITCH GRASS - *Panicum virgatum*
- SHADBUSH - *Amelanchier*
- RIVER BIRCH - *Betula nigra*
- GRAY BIRCH - *Betula populifolia*
- WHITE ASH - *Fraxinus americana*
- GREEN ASH - *Fraxinus pennsylvanica*
- EASTERN RED CEDAR - *Juniperus virginiana*
- SWEET GUM - *Liquidambar styraciflua*
- BLACK GUM - *Nyssa sylvatica*
- STYCAMORE - *Liquidambar styraciflua*
- EASTERN COTTONWOOD - *Populus deltoides*
- SWAMP WHITE OAK - *Quercus bicolor*
- SCARLET OAK - *Quercus coccinea*
- BUR OAK - *Quercus macrocarpa*

NOTES:

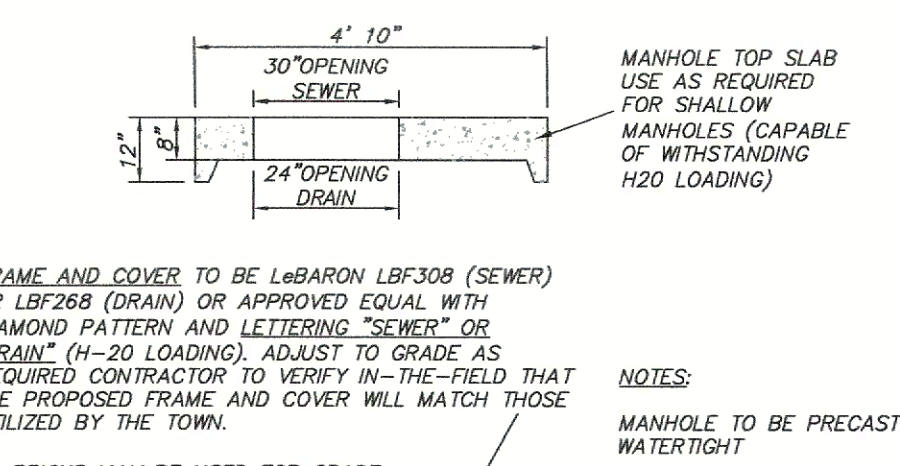
1. THE PLANTING PLAN SHALL INCLUDE A MIX OF PERENNIALS, SHRUBS AND (IF CONDITIONS PERMIT) UNDERSTORY TREES THAT CAN TOLERATE INTERMITTENT PONDING, OCCASIONAL SALINE CONDITIONS DUE TO ROAD SALT, AND EXTENDED DRY PERIODS.
2. INVASIVE OR EXOTIC SPECIES ARE PROHIBITED
3. REFER TO MASSACHUSETTS STORMWATER HANDBOOK (VOLUME 2, CHAPTER 2) FOR ADDITIONAL INFORMATION REGARDING PLANT SPECIES SUITABLE FOR USE IN BIORETENTION.

PLANTING SOIL NOTES

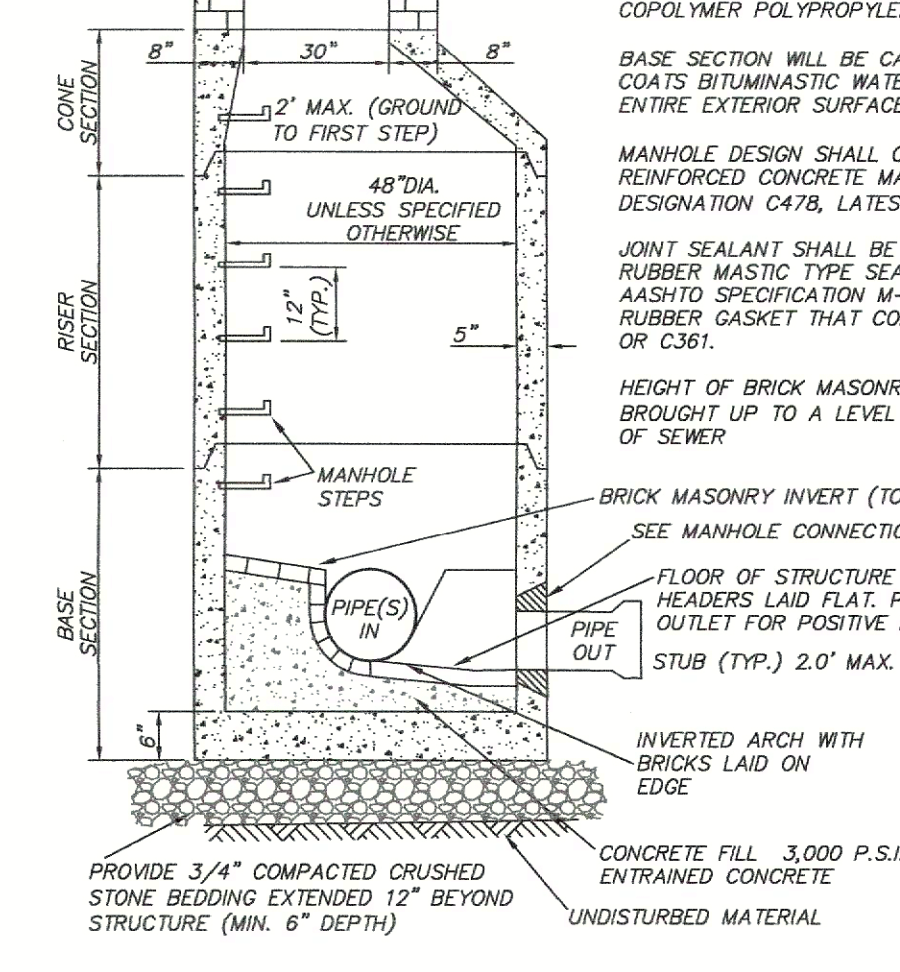
1. THE SOIL MIX SHALL BE A MIXTURE OF SAND COMPOST AND SOIL AS FOLLOWS: 40% SAND, 20-30% TOPSOIL AND 30-40% COMPOST.
2. THE SOIL MIX MUST BE UNIFORM, FREE OF STONES, STUMPS, ROOTS OR SIMILAR OBJECTS LARGER THAN 2". CLAY CONTENT SHALL NOT EXCEED 5%.
3. SOIL PH SHOULD BE BETWEEN 5.5-6.5
4. USE SOILS WITH 1.5% TO 3% ORGANIC CONTENT AND MAXIMUM 500-PPM SOLUBLE SALTS.
5. THE SAND COMPONENT SHALL BE GRAVELLY SAND THAT MEETS ASTM D422.
6. THE TOPSOIL COMPONENT SHALL BE A SANDY LOAM, LOAMY SAND OR LOAM TEXTURE.
7. THE COMPOST COMPONENT MUST BE PROCESSED FROM YARD WASTE IN ACCORDANCE WITH MASS DEP GUIDELINES. THE COMPOST SHALL NOT CONTAIN BIOSOLIDS.



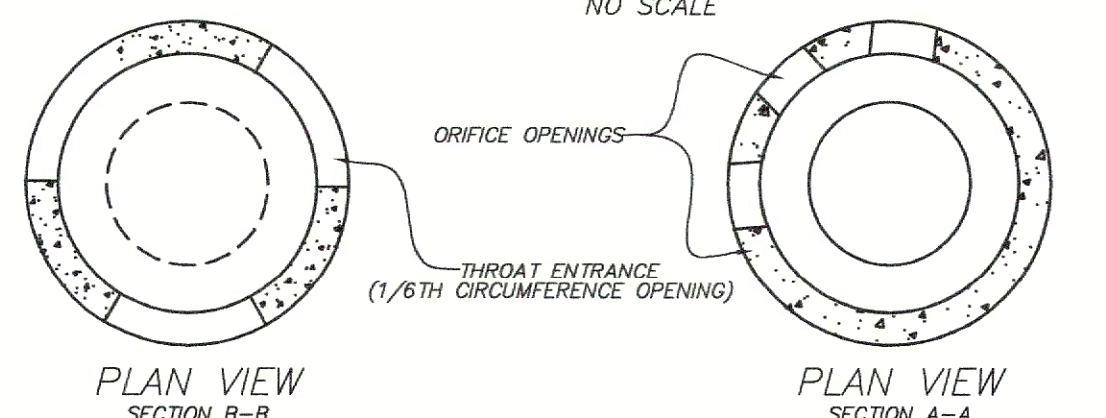
RAIN GARDEN DETAIL  
(NO SCALE)



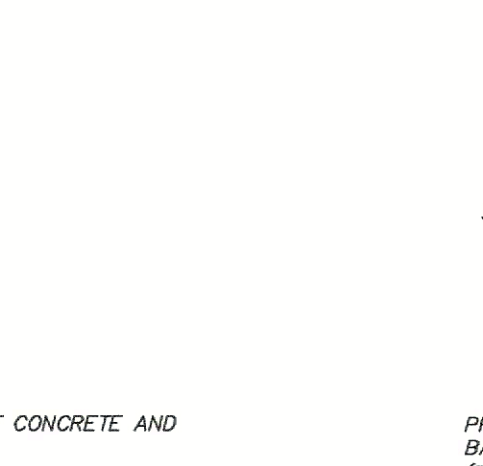
TYPICAL PRECAST MANHOLE  
(SEWER OR DRAIN - USE APPROPRIATE COVER)  
NO SCALE



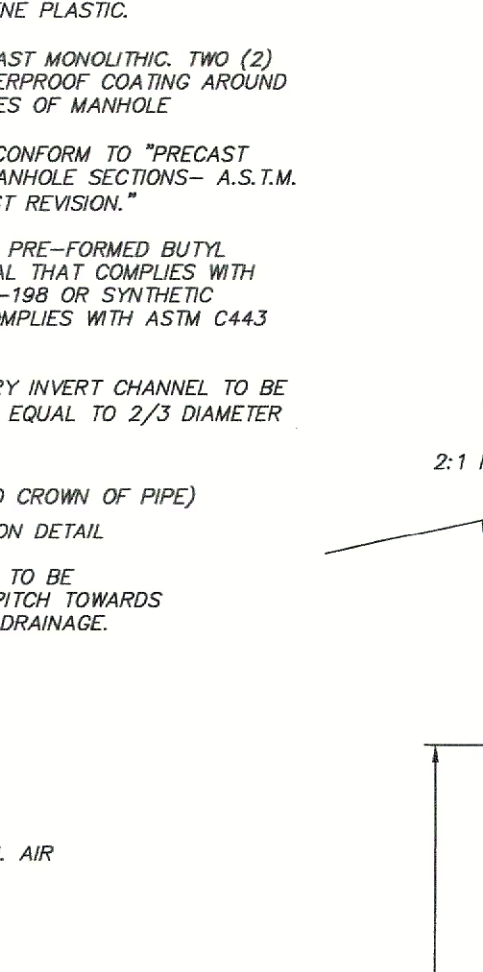
TYPICAL PRECAST CATCH BASIN  
WITH GRANITE CURB INLET  
NO SCALE



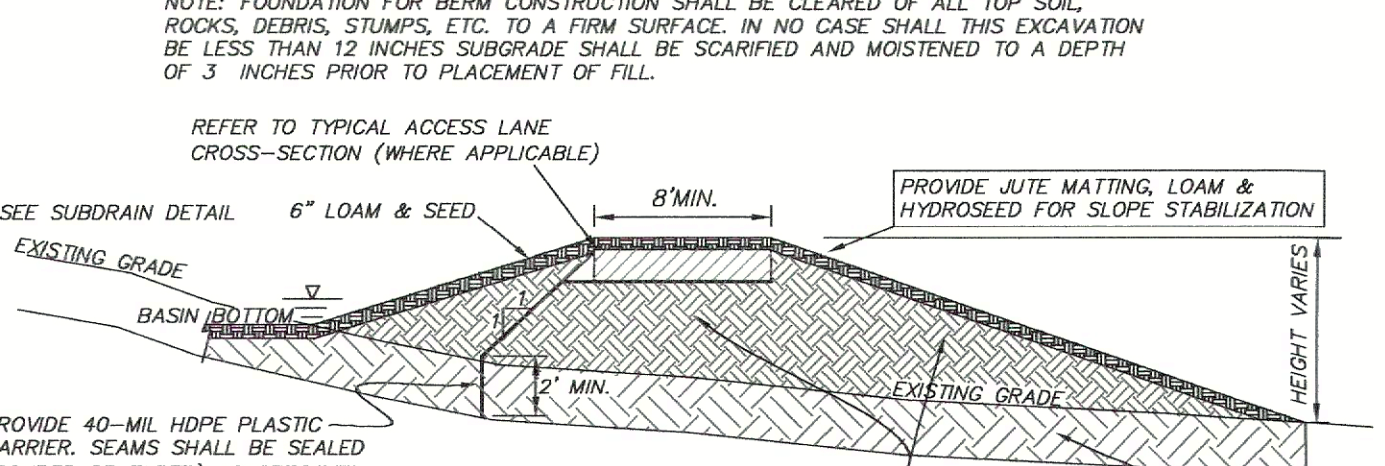
RAIN GARDEN OUTLET STRUCTURE  
WITH 1/6TH CIRCUMFERENCE THROAT OPENINGS  
NO SCALE



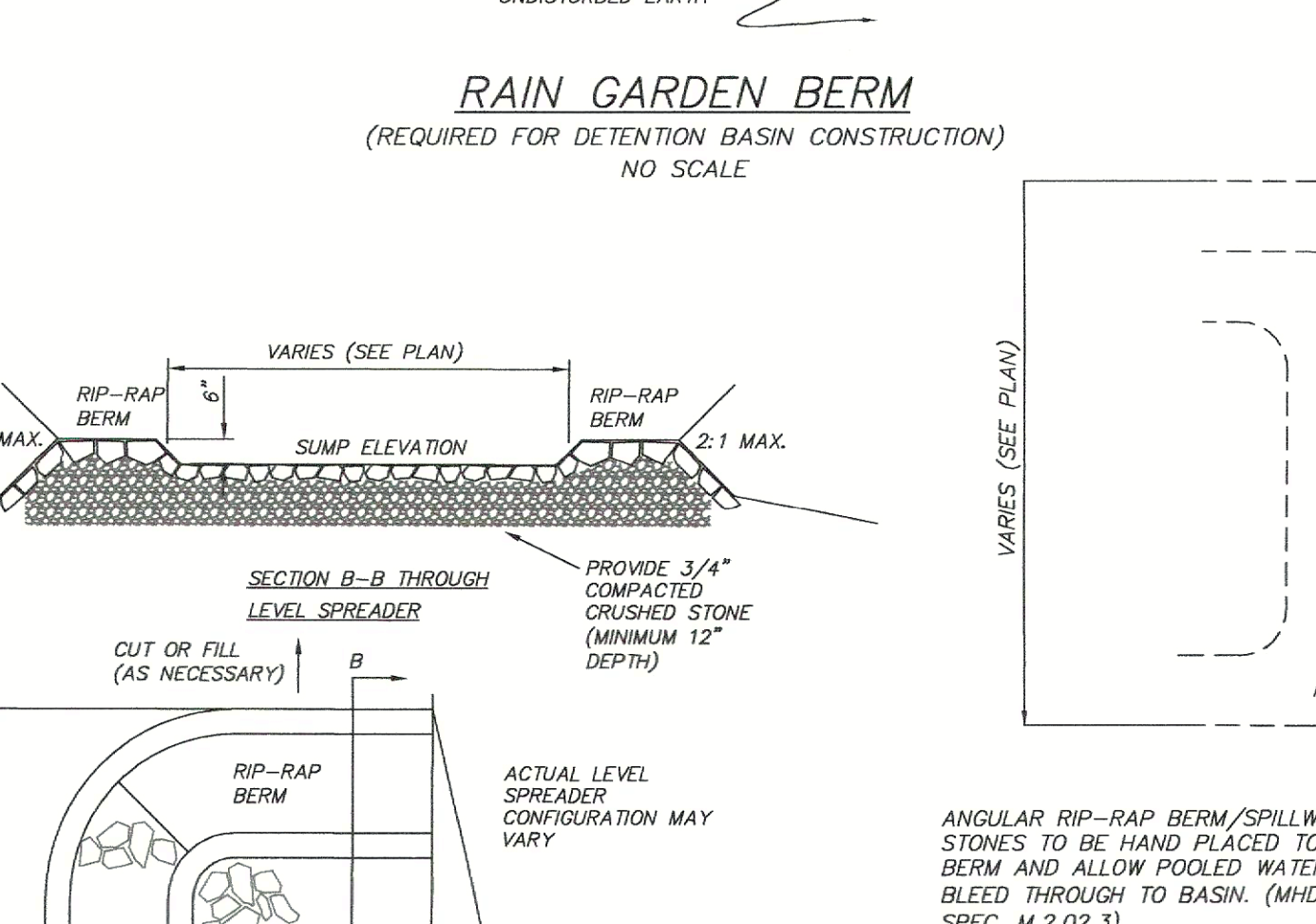
LEVEL SPREADER DETAIL  
NO SCALE  
(SEE PLAN FOR ACTUAL CONFIGURATION)



EMERGENCY SPILLWAY DETAIL  
NO SCALE

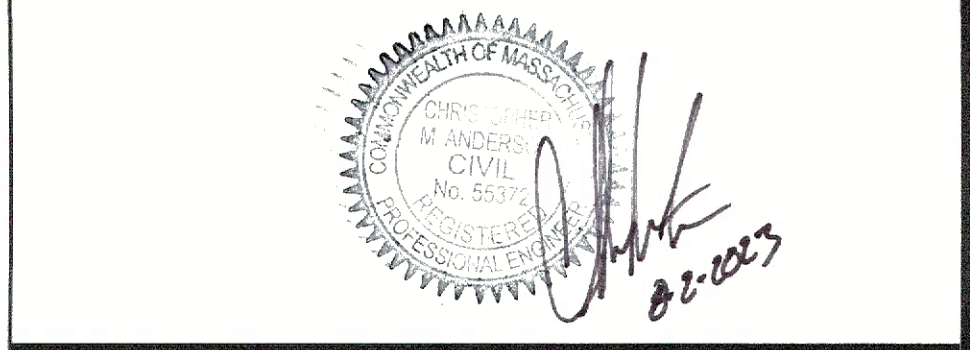


RAIN GARDEN BERM  
(REQUIRED FOR DETENTION BASIN CONSTRUCTION)  
NO SCALE



FOREBAY DETAIL  
(NO SCALE)  
(SEE PLAN FOR ACTUAL CONFIGURATION)

NO.	DATE	REVISIONS	BY
2	8/2/2023	PEER REVIEW COMMENT	CMA
1	7/1/2023	PEER REVIEW AND BOARD COMMENT	CMA



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 IN  
**WINCHENDON, MASSACHUSETTS**

PREPARED FOR:  
 ZP BATTERY DEVCO, LLC  
 PETE FORTE  
 1 MERCANTILE STREET, SUITE 630  
 WORCESTER, MASSACHUSETTS 01608

APPROVAL OF THIS PLAN IS GRANTED ON THE CONDITIONS LISTED IN A SEPARATE STATEMENT OF CONDITIONS WHICH PART OF THE APPROVAL OF THIS SITE PLAN.

CALC:	DRWN:	SCALE:
CMA	CMA	NA
CHKD:	APPD:	DATE:
WDH	CMA	MAR 27, 2023
SRV:	FB:	JOB NO:
JEF	75-130	3101
TAB:	SHEET:	PLAN NO:
(5-6)DET	6 OF 6	NO-C-18-41

WINCHENDON PLANNING BOARD

DATE:
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