

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

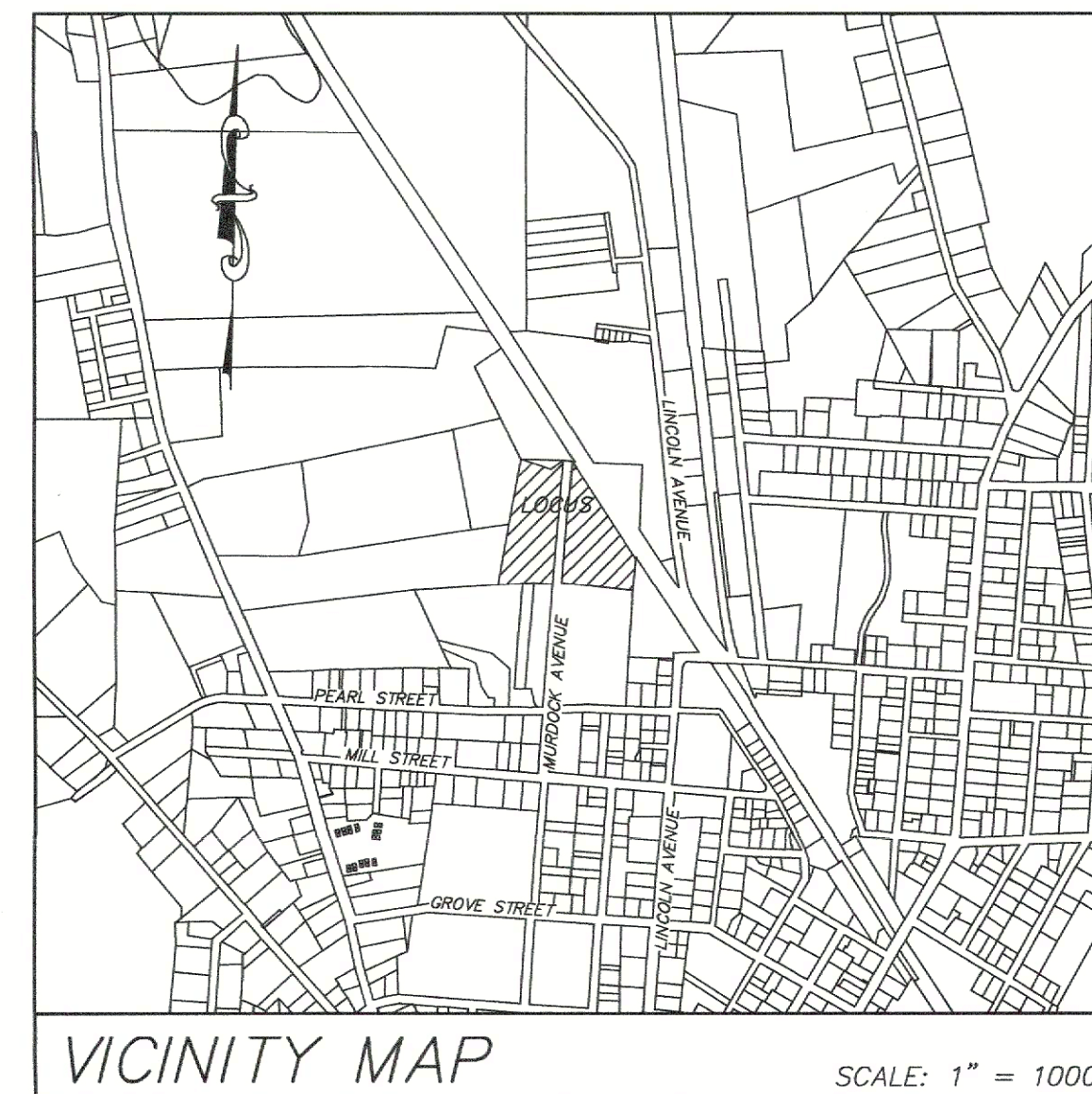
## ***0 MURDOCK AVENUE***

### ***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

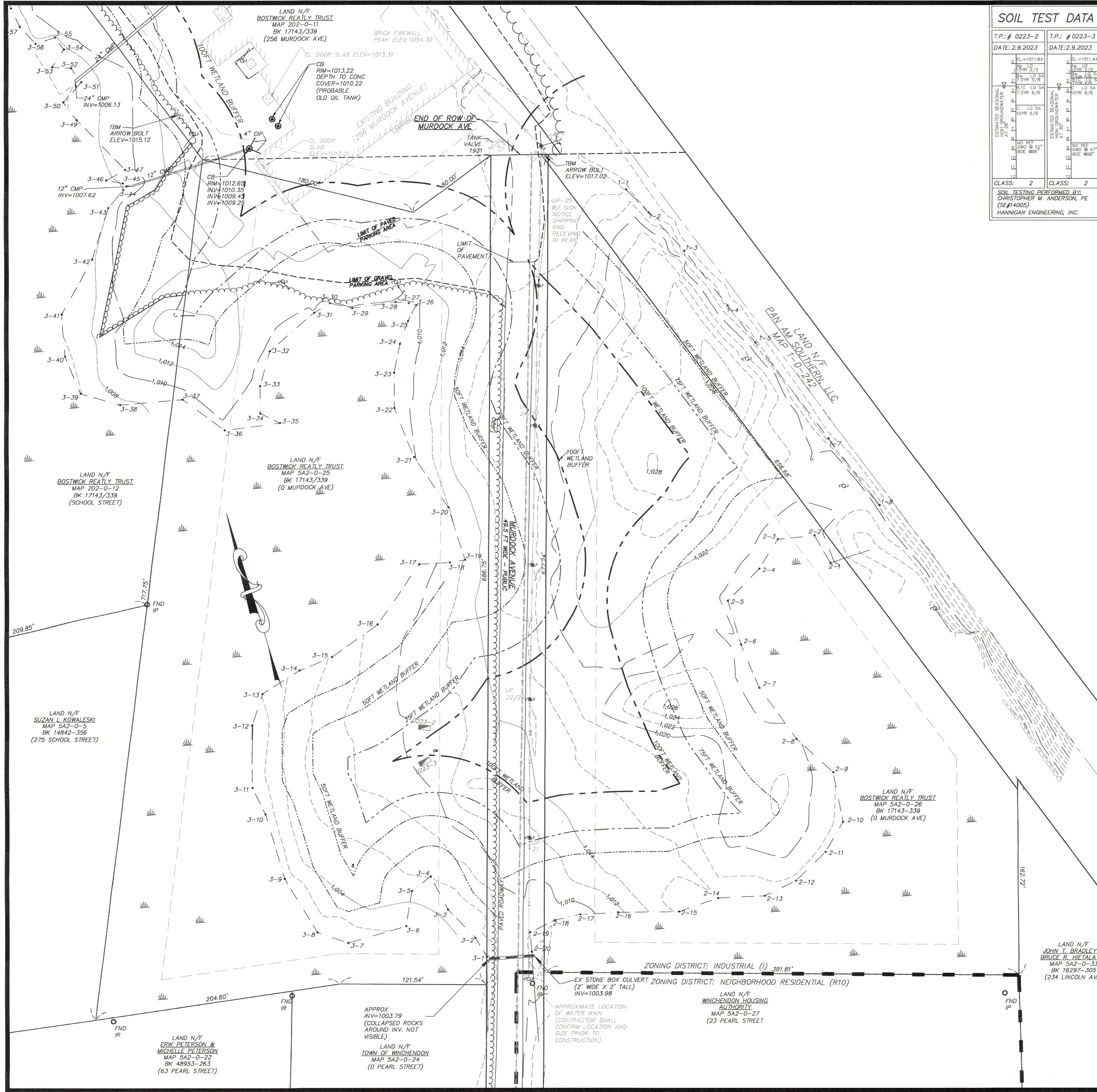
**CIVIL ENGINEER & LAND SURVEYOR:**

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

**PLAN INDEX**

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PERMITTING SET - NOT FOR CONSTRUCTION



SOIL TEST DATA	
T.P.: # 0223-2	T.P.: # 0223-3
DATE: 2.9.2023	DATE: 2.9.2023
ESTIMATED SEASONAL FROST DEPTH AT 20"	ESTIMATED SEASONAL FROST DEPTH AT 20"
NO REF GND @ 5" BSE 000"	NO REF GND @ 4" BSE 000"
CLASS: 2	CLASS: 2
SOIL TESTING PERFORMED BY: CHRISTOPHER M. ANDERSON, PE (SE#14005) HANNIGAN ENGINEERING, INC.	



### PROJECT INFORMATION

LAND INFORMATION	
MAP PARCEL:	5A2/25; 5A2/26
DEED BOOK/PAGE:	17143/339
EXISTING FRONTAGE:	686.75 FT (5A2/25); 677.24 FT (5A2/26)
EXISTING AREA:	4.33 ACRES± (5A2/25); 3.67 ACRES± (5A2/26)
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:**
- 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.
  - 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.
  - 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)
  - 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.
  - RELOCATION OF AND/OR CONNECTION TO EXISTING UTILITIES SHALL BE PERFORMED IN ACCORDANCE WITH PROVISIONS OF THE APPROPRIATE UTILITY COMPANY AND/OR REGULATORY AGENCY.
  - 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.
  - ALL SLOPES UNLESS OTHERWISE SPECIFIED, SHALL BE LOAMED AND SEEDED FOR STABILIZATION.
  - 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 CHANGES.
  - 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.
  - PLANS TO BE REVIEWED BY APPLICABLE UTILITY AGENCIES FOR COMPLIANCE WITH REGULATIONS. FINAL LOCATION IS SUBJECT TO CHANGE.
  - 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).
  - 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 OR STAKED HAY BALES FOR EROSION CONTROL.
  - 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.
  - ALL SIDEWALKS AND RAMPS TO CONFORM TO REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA), AS REQUIRED. SEE ARCHITECTURAL PLANS FOR CONFORMANCE REQUIREMENTS FOR PROPOSED BUILDINGS.
  - THE AREA PROPOSED FOR DEVELOPMENT IS NOT WITHIN A 100 YEAR FLOOD PLAIN PER F.E.M.A. FIRM PANEL #250348-00168, DATED: JUNE 15, 1982. COMPLIANCE WITH APPLICABLE REGULATIONS IS REQUIRED.
  - ALL REINFORCED CONCRETE PIPE TO BE CLASS III UNLESS OTHERWISE NOTED.
  - PRE-CONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
  - ALL UTILITIES ARE TO BE INSTALLED BY A LICENSED UTILITY CONTRACTOR LICENSED BY THE TOWN OF WINCHENDON.

### LOCUS MAP

**OWNER**  
 ZP BATTERY DEVCO, LLC  
 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.
  - HAULING OF EARTHEN MATERIALS TO OR FROM THE CONSTRUCTION SITE SHALL BE LIMITED TO THE HOURS OF 9AM TO 4PM MONDAY THROUGH FRIDAY.
  - IMPERVIOUS COVERAGE FROM THE PROPOSED PROJECT SHALL BE COMPRISED OF CONCRETE AND CRUSHED STONE/GRAVEL FOR ACCESS WAYS.

LEGEND	
EXISTING 540	PROPOSED 560
CONTOURS	CONTOURS
PROPERTY LINES	PROPERTY LINES
DRAIN	DRAIN
SEWER	SEWER
WATER	WATER
OHW	OHW
ELEC/TELE/CABLE	ELEC/TELE/CABLE
ECT	ECT
EDGE OF PAVEMENT	EDGE OF PAVEMENT
CURBLINE	CURBLINE
EROSION CONTROL	EROSION CONTROL
STRAW MATTE AND SILT FENCE	STRAW MATTE AND SILT FENCE
TREELINE	TREELINE
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**

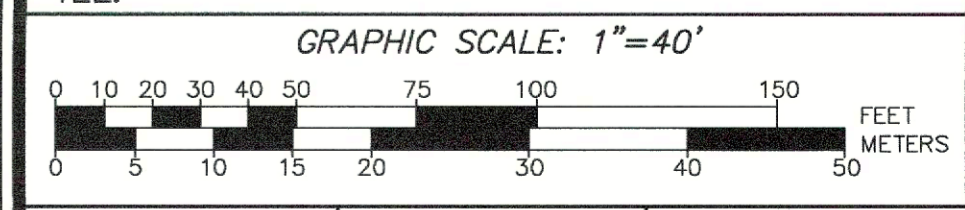
DATE: \_\_\_\_\_

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

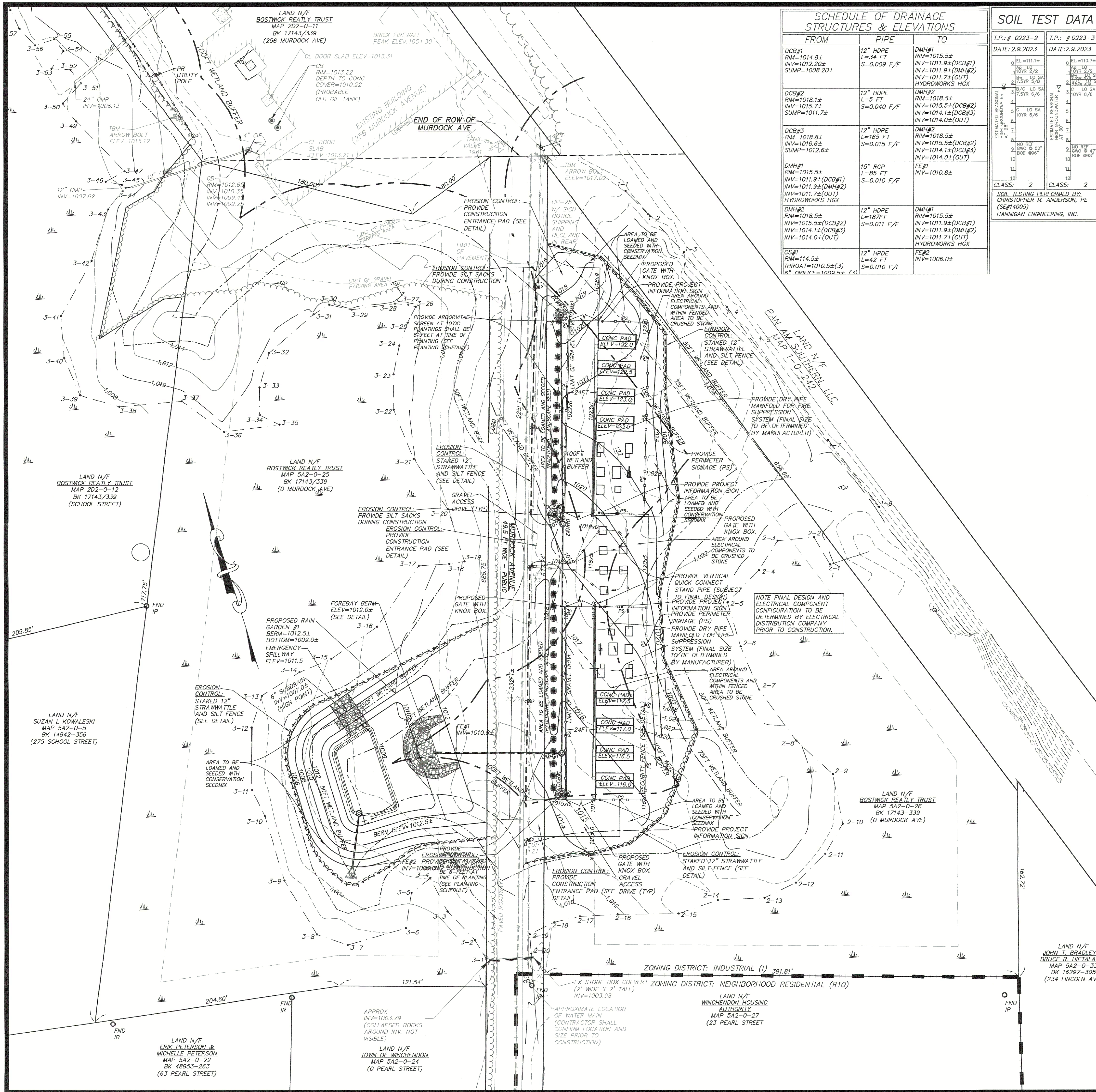
8 MONUMENT SQUARE (978) 534-1234 (T)  
 LEOMINSTER, MASSACHUSETTS 01453 (978) 534-6060 (F)  
 WWW.HANNIGANENGINEERING.COM

### EXISTING CONDITIONS PLAN IN WINCHENDON, MASSACHUSETTS

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



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



SCHEDULE OF DRAINAGE STRUCTURES & ELEVATIONS		
FROM	PIPE	TO
DCB#1 RIM=1014.8± INV=1012.20± SUMP=1008.20±	12" HDPE L=34 FT S=0.009 F/F	DMH#1 RIM=1015.5± INV=1011.9±(DCB#1) INV=1011.9±(DCB#2) INV=1011.7±(OUT) HYDROWORKS HGX
DCB#2 RIM=1018.1± INV=1015.7± SUMP=1011.7±	12" HDPE L=5 FT S=0.040 F/F	DMH#2 RIM=1018.5± INV=1015.5±(DCB#2) INV=1014.1±(DCB#3) INV=1014.0±(OUT)
DCB#3 RIM=1018.8± INV=1016.6± SUMP=1012.6±	12" HDPE L=165 FT S=0.015 F/F	DMH#3 RIM=1018.5± INV=1015.5±(DCB#2) INV=1014.1±(DCB#3) INV=1014.0±(OUT)
DMH#1 RIM=1015.5± INV=1011.9±(DCB#1) INV=1011.9±(DCB#2) INV=1011.7±(OUT) HYDROWORKS HGX	15" RCP L=85 FT S=0.010 F/F	FE#1 INV=1010.8±
DMH#2 RIM=1018.5± INV=1015.5±(DCB#2) INV=1014.1±(DCB#3) INV=1014.0±(OUT) HYDROWORKS HGX	12" HDPE L=187 FT S=0.011 F/F	DMH#1 RIM=1015.5± INV=1011.9±(DCB#1) INV=1011.9±(DCB#2) INV=1011.7±(OUT) HYDROWORKS HGX
OS#1 RIM=114.5± THROAT=1010.5±(3) 6" ORIFICE=1009.5±(3)	12" HDPE L=42 FT S=0.010 F/F	FE#2 INV=1008.0±

SOIL TEST DATA	
T.P.# 0223-2	T.P.# 0223-3
DATE: 2.9.2023	DATE: 2.9.2023
ESTIMATED SEASONAL FROST DEPTH AT 3" AT 3" BELOW SURFACE	ESTIMATED SEASONAL FROST DEPTH AT 3" AT 3" BELOW SURFACE
CLASS: 2	CLASS: 2
SOIL TESTING PERFORMED BY: CHRISTOPHER M. ANDERSON, PE (SE#14005) HANNIGAN ENGINEERING, INC.	



### PROJECT INFORMATION

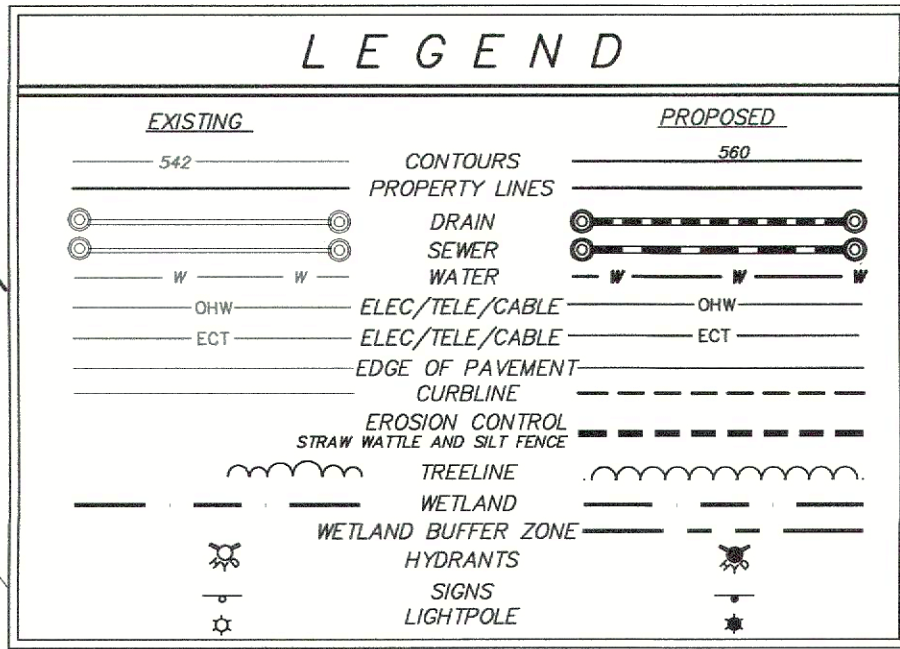
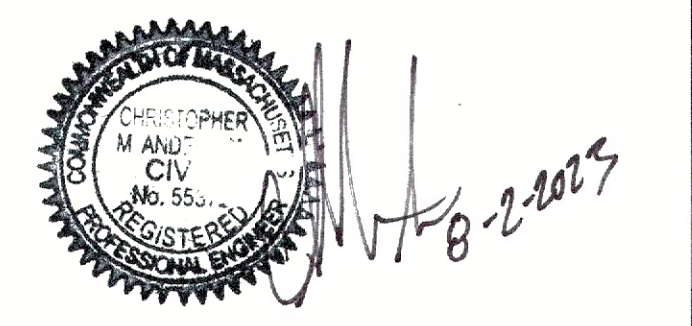
**LAND INFORMATION**  
 MAP (PARCEL): 5A2/25; 5A2/26  
 DEED BOOK/PAGE: 17143/339  
 EXISTING FRONTAGE: 686.75 FT (5A2/25); 677.24 FT (5A2/26)  
 EXISTING AREA: 4.33 ACRES± (5A2/25); 3.67 ACRES± (5A2/26)

**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  
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 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 250348-0068, 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.  
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  - IMPERVIOUS COVERAGE FROM THE PROPOSED PROJECT SHALL BE COMPRISED OF CONCRETE AND CRUSHED STONE/GRAVEL FOR ACCESS WAYS.

NO.	DATE	REVISIONS	BY
2	8/2/2023	PEER REVIEW COMMENT	CMA
1	7/10/2023	PEER REVIEW AND BOARD COMMENT	CMA



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

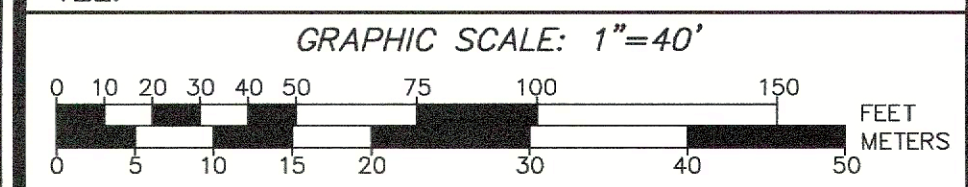
DATE:	
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### HANNIGAN ENGINEERING, INC.

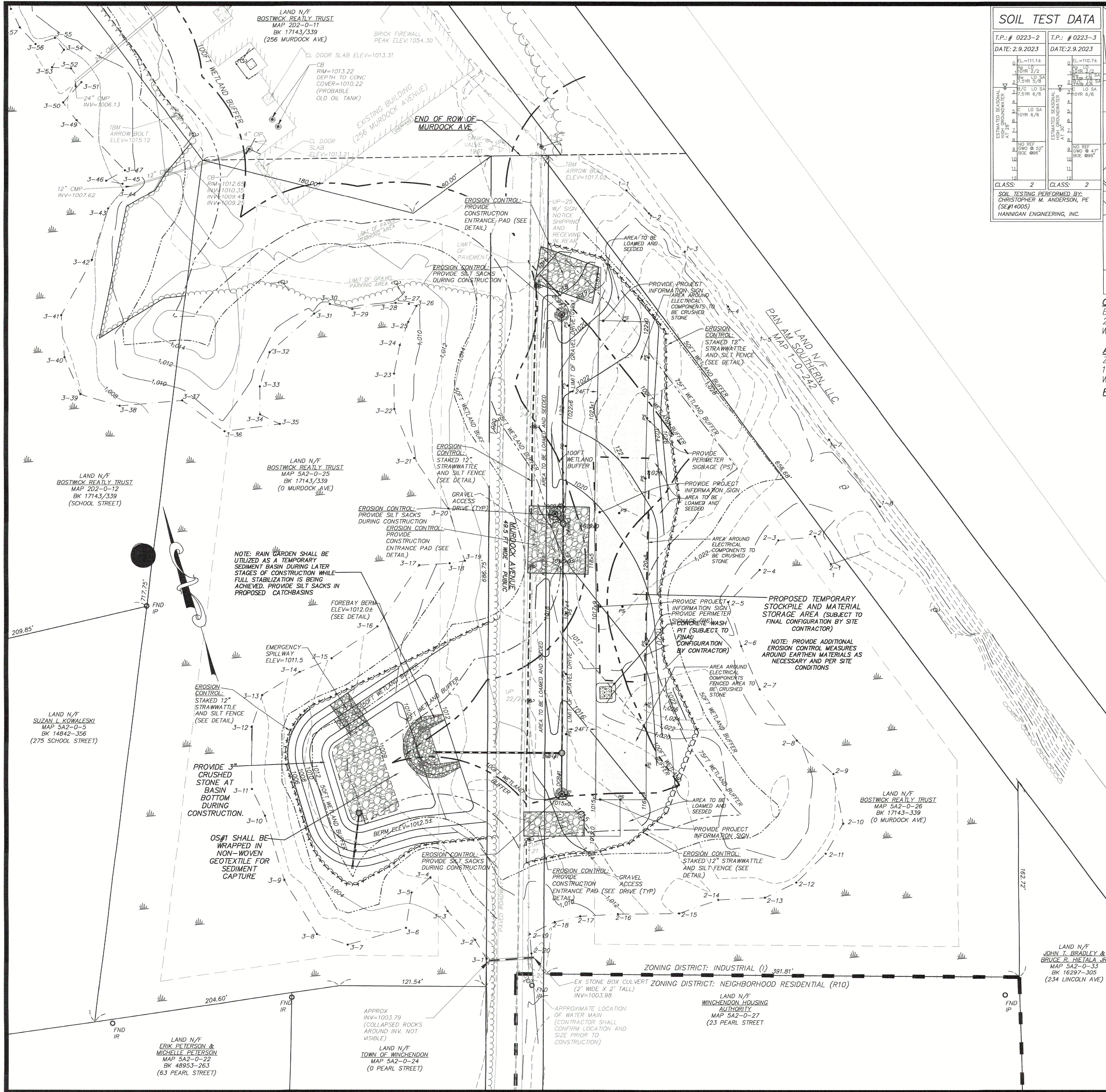
CIVIL ENGINEERS & LAND SURVEYORS  
 8 MONUMENT SQUARE LEOMINSTER, MASSACHUSETTS 01453 (978) 534-1234 (T) (978) 534-6060 (F)  
 WWW.HANNIGANENGINEERING.COM

### SITE DEVELOPMENT PLAN IN WINCHENDON, MASSACHUSETTS

PREPARED FOR:  
 ZP BATTERY DEVCO, LLC  
 PETE FORTÉ  
 1 MERCANTILE STREET, SUIT 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) SDO	SHEET 2 OF 6	PLAN NO: C-18-41



SOIL TEST DATA	
T.P. # 0223-2	T.P. # 0223-3
DATE: 2.9.2023	DATE: 2.9.2023
ESTIMATED SEASONAL PROPHOGRAMMETER AT 2' 3" 10 SA 10W 6/6	ESTIMATED SEASONAL PROPHOGRAMMETER AT 2' 3" 10 SA 10W 6/6
CLASS: 2	CLASS: 2
SOIL TESTING PERFORMED BY: CHRISTOPHER M. ANDERSON, PE (SE#14005) HANNIGAN ENGINEERING, INC.	



PROJECT INFORMATION	
<b>LAND INFORMATION</b>	
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DEED BOOK/PAGE: 686.75 FT (5A2/25); 677.24 FT (5A2/26)	4.33 ACRES± (5A2/25); 3.67 ACRES± (5A2/26)
<b>ZONING INFORMATION</b>	
ZONING DISTRICT: INDUSTRIAL	
<b>DIMENSIONAL REQUIREMENTS:</b>	
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14. ALL SIDEWALKS AND RAMPS TO CONFORM TO REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA), AS REQUIRED. SEE ARCHITECTURAL PLANS FOR CONFORMANCE 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.	

**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.
  - HAULING OF EARTHEN MATERIALS TO OR FROM THE CONSTRUCTION SITE SHALL BE LIMITED TO THE HOURS OF 9AM TO 4PM MONDAY THROUGH FRIDAY.
  - IMPERVIOUS COVERAGE FROM THE PROPOSED PROJECT SHALL BE COMPRISED OF CONCRETE AND CRUSHED STONE/GRAVEL FOR ACCESS WAYS.

NO.	DATE	REVISIONS	BY
2	8/2/2023	PEER REVIEW COMMENT	CMA
1	7/10/2023	PEER REVIEW AND BOARD COMMENT	CMA



LEGEND	
EXISTING: 542	PROPOSED: 560
CONTOURS	PROPERTY LINES
DRAIN	SEWER
WATER	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
TREELINE	TREELINE
WETLAND	WETLAND
WETLAND BUFFER ZONE	WETLAND BUFFER ZONE
HYDRANTS	HYDRANTS
SIGNS	SIGNS
LIGHTPOLE	LIGHTPOLE

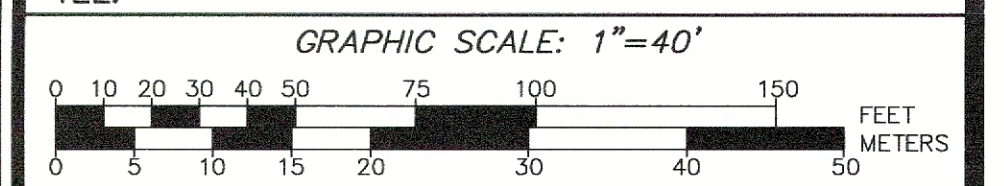
APPROVAL OF THIS PLAN IS GRANTED ON THE CONDITIONS LISTED IN A SEPARATE STATEMENT OF CONDITIONS WHICH PART OF THE APPROVAL OF THIS SITE PLAN.

WINCHENDON PLANNING BOARD		
DATE:		

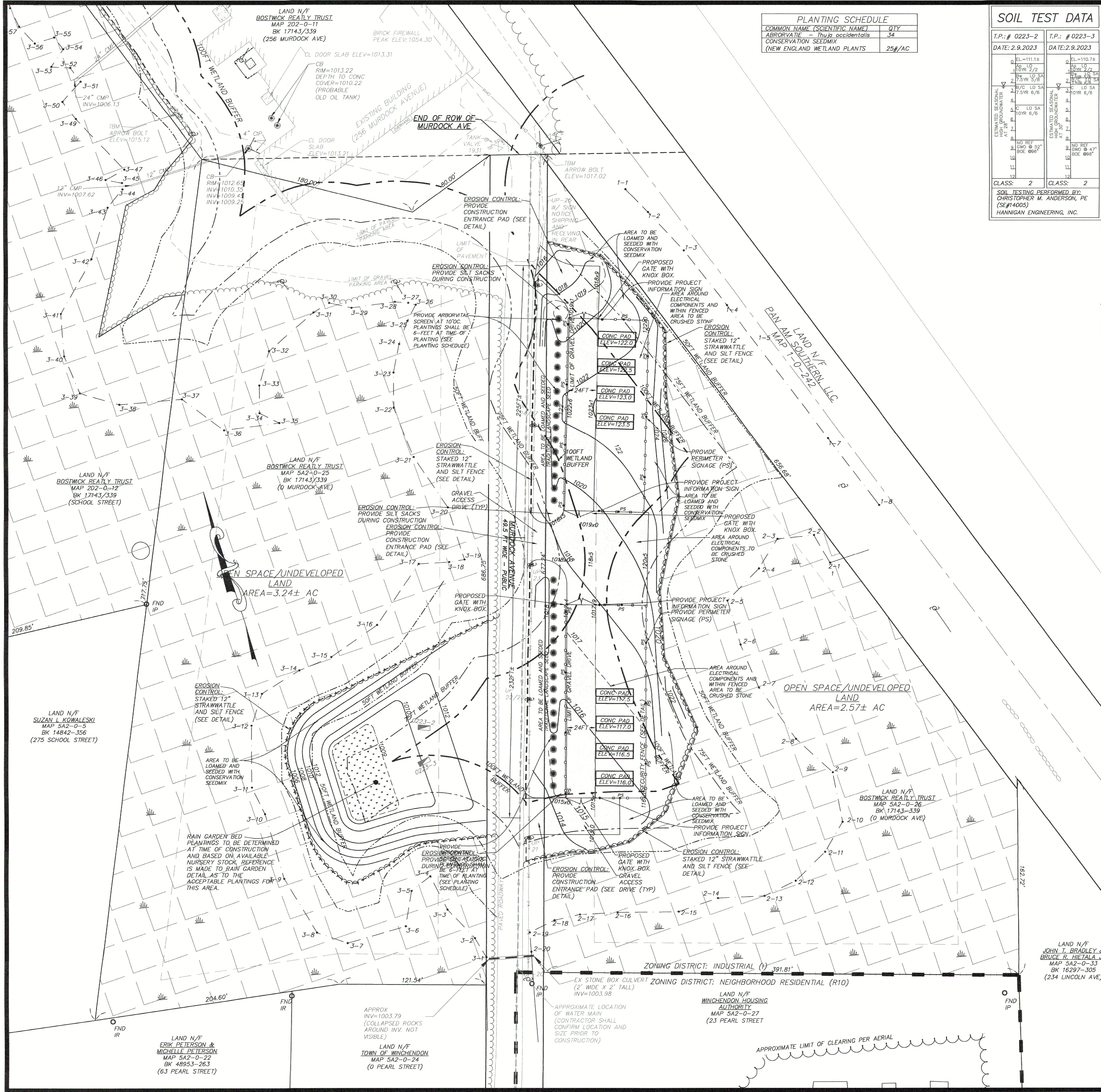
**HANNIGAN ENGINEERING, INC.**  
 CIVIL ENGINEERS & LAND SURVEYORS  
 8 MONUMENT SQUARE (978) 534-1234 (T)  
 LEOMINSTER, MASSACHUSETTS 01453 (978) 534-6060 (F)  
 WWW.HANNIGANENGINEERING.COM

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

PREPARED FOR:  
 ZP BATTERY DEVCO, LLC  
 PETE FORTÉ  
 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) EROSION	SHEET 3 OF 6	PLAN NO: C-18-41



PLANTING SCHEDULE	
COMMON NAME (SCIENTIFIC NAME)	QTY
ABROVATIA - Thuja occidentalis	34
CONSERVATION SEEDMIX (NEW ENGLAND WETLAND PLANTS)	25#/AC

SOIL TEST DATA	
T.P. # 0223-2	T.P. # 0223-3
DATE: 2.9.2023	DATE: 2.9.2023
ESTIMATED SEASONAL HIGH WATER TABLE	ESTIMATED SEASONAL HIGH WATER TABLE
CLASS: 2	CLASS: 2
SOIL TESTING PERFORMED BY: CHRISTOPHER M. ANDERSON, PE (SEP#4005) HANNIGAN ENGINEERING, INC.	

### PROJECT INFORMATION

LAND INFORMATION	
MAP/PARCEL:	5A2/25; 5A2/26
DEED BOOK/PAGE:	17143/339
EXISTING FRONTAGE:	686.75 FT (5A2/25); 677.24 FT (5A2/26)
EXISTING AREA:	4.33 ACRES± (5A2/25); 3.67 ACRES±(5A2/26)

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:**
- 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.
  - AREAS SUBJECT TO PROTECTION UNDER THE WETLANDS PROTECTION ACT HAVE BEEN DELINEATED BY LEG ENVIRONMENTAL CONSULTANTS IN FEBRUARY OF 2022. THESE AREAS ARE RESTRICTED ON THE PLANS BASED ON FIELD SURVEY LOCATION DURING THE TOPOGRAPHIC SURVEY.
  - LOCATION OF ALL UTILITIES ARE APPROXIMATE AS SHOWN AND 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)
  - 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.
  - RELOCATION OF AND/OR CONNECTION TO EXISTING UTILITIES SHALL BE PERFORMED IN ACCORDANCE WITH PROVISIONS OF THE APPROPRIATE UTILITY COMPANY AND/OR REGULATORY AGENCY.
  - 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.
  - ALL SLOPES UNLESS OTHERWISE SPECIFIED, SHALL BE LOAMED AND SEEDED FOR STABILIZATION.
  - 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.
  - 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.
  - PLANS TO BE REVIEWED BY APPLICABLE UTILITY AGENCIES FOR COMPLIANCE WITH REGULATIONS. FINAL LOCATION IS SUBJECT TO CHANGE.
  - 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)
  - 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.
  - 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.
  - ALL SIDEWALKS AND RAMPS TO CONFORM TO REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA), AS REQUIRED. SEE ARCHITECTURAL PLANS FOR CONFORMANCE REQUIREMENTS FOR PROPOSED BUILDINGS.
  - THE AREA PROPOSED FOR DEVELOPMENT IS NOT WITHIN A 100 YEAR FLOOD PLAIN PER F.E.M.A. FIRM 25054S-0168, DATED: JUNE 15, 1982. COMPLIANCE WITH APPLICABLE REGULATIONS IS REQUIRED.
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  - ALL UTILITIES ARE TO BE INSTALLED BY A LICENSED UTILITY CONTRACTOR LICENSED BY THE TOWN OF WINCHENDON.

### 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:**
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  - IMPERVIOUS COVERAGE FROM THE PROPOSED PROJECT SHALL BE COMPOSED OF CONCRETE AND CRUSHED STONE/GRAVEL FOR ACCESS WAYS.

NO.	DATE	REVISIONS	BY
2	8/2/2023	PEER REVIEW COMMENT	CMA
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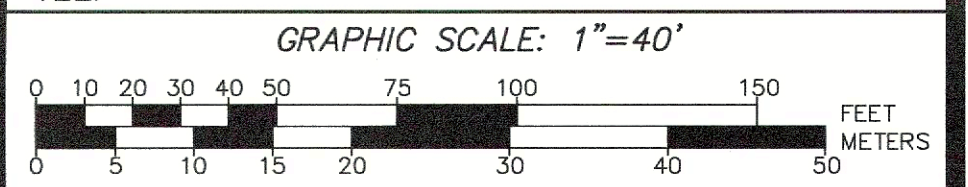
### HANNIGAN ENGINEERING, INC.

CIVIL ENGINEERS & LAND SURVEYORS

8 MONUMENT SQUARE (978) 534-1234 (T)  
LEMINSTER, MASSACHUSETTS 01453 (978) 534-6060 (F)  
WWW.HANNIGANENGINEERING.COM

### LANDSCAPING & 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) LLB	SHEET 4 OF 6	PLAN NO: C-18-41

### LEGEND

EXISTING	PROPOSED
5A2	5B2
CONTOURS	CONTOURS
PROPERTY LINES	PROPERTY LINES
DRAIN	DRAIN
SEWER	SEWER
WATER	WATER
OHW	OHW
ELEC/TELE/CABLE	ELEC/TELE/CABLE
ECT	ECT
EDGE OF PAVEMENT	EDGE OF PAVEMENT
CURBLINE	CURBLINE
EROSION CONTROL	EROSION CONTROL
STRAW WATTLE AND SILT FENCE	STRAW WATTLE AND SILT FENCE
TREELINE	TREELINE
WETLAND	WETLAND
WETLAND BUFFER ZONE	WETLAND BUFFER ZONE
HYDRANTS	HYDRANTS
SIGNS	SIGNS
LIGHT POLE	LIGHT POLE

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: \_\_\_\_\_

LAND N/F JOHN T. BRADLEY & BRUCE R. HETALA JR. MAP 5A2-0-33 BK 16297-305 (234 LINCOLN AVE)

LAND N/F WINCHENDON HOUSING AUTHORITY MAP 5A2-0-27 (23 PEARL STREET)

LAND N/F ERIK PETERSON & MICHELLE PETERSON MAP 5A2-0-22 BK 48953-283 (63 PEARL STREET)

LAND N/F TOWN OF WINCHENDON MAP 5A2-0-24 (0 PEARL STREET)

## EROSION & SEDIMENTATION CONTROL PLAN

### GENERAL:

- THE PURPOSE OF THIS PLAN IS TO PRESENT A PREVENTIVE METHOD OF CONSTRUCTION TO MINIMIZE THE IMPACT OF THE CONSTRUCTION ACTIVITIES UPON WETLANDS AND OTHER SENSITIVE AREAS. THE DATA CONTAINED ON THIS PLAN IS INTENDED TO SUPPLEMENT THE DEVELOPER OR CONTRACTORS' 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.
- 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.
- 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 AND 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.

- ALTERATION AND/OR DESTRUCTION OF WETLAND AREAS WITHOUT PRIOR CONSENT OF THE CONSERVATION COMMISSION IS PROHIBITED. SILTATION PLUMES, ILLIOT 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.
- 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.
- 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.

- CONSTRUCTION OPERATIONS SHALL NOT CAUSE NOTICEABLE SEDIMENTATION PLUMES TO OCCUR ON OR SURROUNDING THE PROJECT. SHOULD SEDIMENTATION PLUMES BE OBSERVED, THE CONTRACTOR SHALL STOP WORK AND INSTALL ADDITIONAL MITIGATION MEASURES TO PREVENT FURTHER SEDIMENTATION.
- NO MATERIAL SUBJECT TO EROSION SHALL BE STOCKPILED OVERNIGHT WITHIN 100 FEET OF ANY WETLAND AREAS WITHOUT PROPER EROSION AND SEDIMENTATION DEVICES IN PLACE.
- EQUIPMENT SHALL NOT BE PARKED WITHIN WETLAND OR BUFFER AREAS EXCEPT DURING ACTUAL OPERATIONS REQUIRING SAID EQUIPMENT.
- ACCUMULATED SEDIMENT ALONG EROSION CONTROL BARRIERS 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:

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

### DEMARCATION OF SENSITIVE AREAS:

- 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 DEMARCATION AND OTHER METHODS SUCH AS LOG BARRIERS, ROPE WITH FLAGGING, ETC. MAY BE UTILIZED.
- CARE SHOULD BE TAKEN IN THE OPERATION OF EQUIPMENT, SUCH THAT ONLY THE MINIMUM AREA NEEDED TO BE ALTERED IS DISTURBED.

### ACCESS:

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

### ORDERLY CONSTRUCTION PROCEDURES:

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

- LAND CLEARING SHALL BE PERFORMED IN PHASES CONSISTENT WITH ACTUAL CONSTRUCTION REQUIREMENTS. FINAL LAND CLEARING SHALL BE LIMITED TO RETURN TO GRADE SLOPES.
- TREES SHALL BE CUT AND STUMPS GROUND IN PLACE TO EXISTING GRADE TO MAINTAIN SOIL STABILIZATION.
- BRUSH AND BRANCHES SHALL BE CHIPPED AND UTILIZED FOR WOOD MULCH IF PRACTICAL.
- 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:

- TOP SOIL SHALL BE RETAINED FOR LANDSCAPING PURPOSES.
- GRUBBING AND STRIPPING OF SLOPES LEADING TO WETLAND AREAS SHOULD NOT BE UNDERTAKEN DURING PERIODS OF INTENSE RAINFALL.
- 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.
- WHEN WORKING IN THE VICINITY OF WETLANDS, TOP SOIL SATURATED WITH WATER SHALL BE REMOVED, AND CONTAINED PRIOR TO BEING USED.
- 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.
- 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 OTHER CRUSHED STONE OR ARMORED BARRIERS. CONSIDERATION MAY ALSO BE GIVEN TO DIVERTING RUNOFF INTO TEMPORARY SEDIMENTATION CONTROL AREAS.
- WHENEVER PRACTICAL, NATURAL VEGETATION SHALL BE RETAINED, PROTECTED AND SUPPLEMENTED.

### ROUGH GRADING:

- 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.
- 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.
- 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.
- STEEP SIDE SLOPES IN EXCAVATION OR FILL SHOULD BE AVOIDED.
- 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.
- 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:

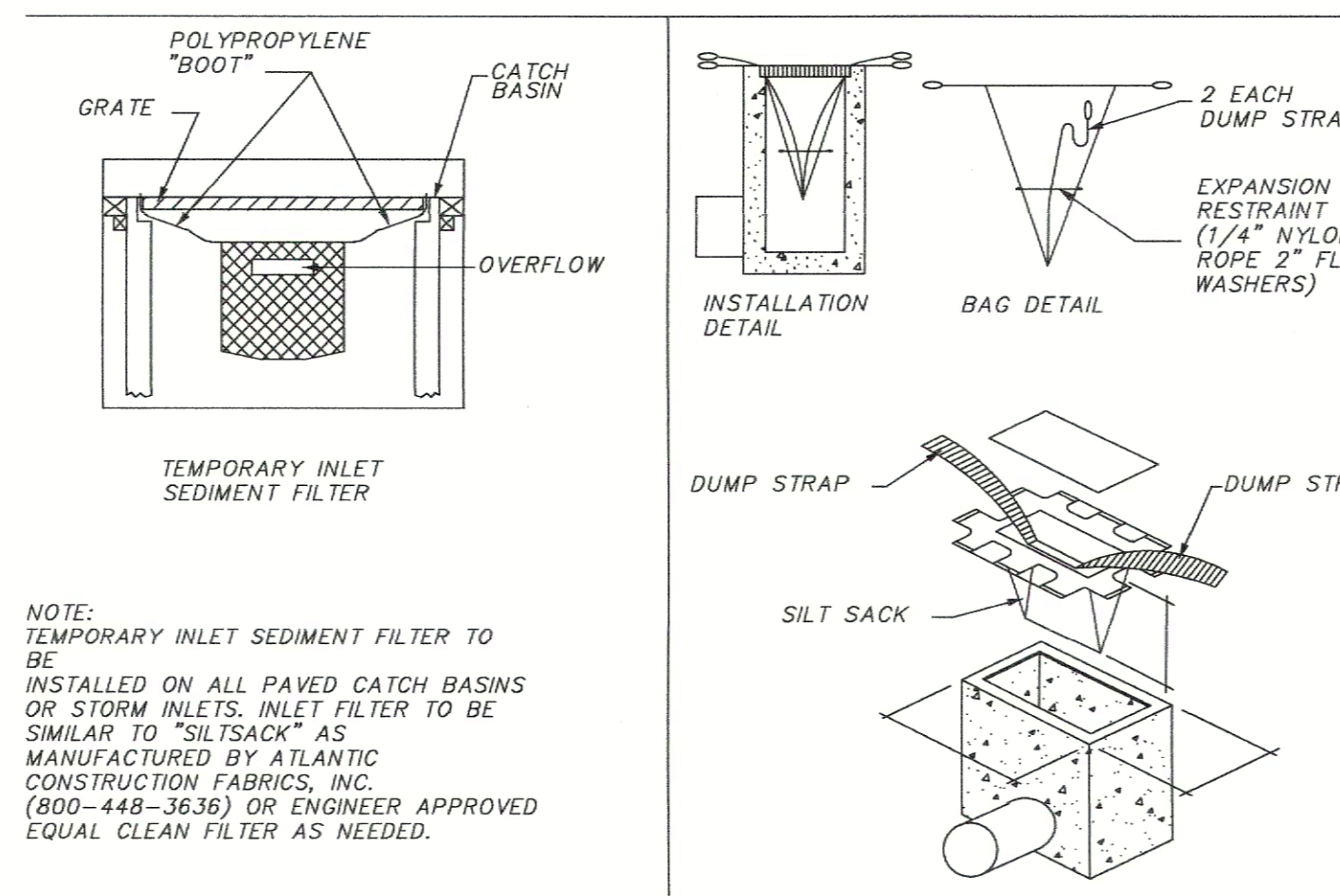
- IF DRAINAGE PIPES OR SWALES ARE TO BE INSTALLED, THEY SHALL BE CONSTRUCTED FROM DOWNSTREAM UP AND CONSTRUCTION SHALL INCLUDE THE PLACEMENT OF OUTFALL RIPRAP AND OTHER MITIGATIVE MEASURES SHOWN ON THE PLANS.
- PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, HAY BALES OR OTHER SUITABLE METHODS TO ENTRAP SEDIMENT SHALL BE PLACED DOWNSTREAM.
- THE TOE OF EMBANKMENTS SHALL BE STABILIZED IMMEDIATELY, MULCHED AND TACKED DOWN BY SUITABLE MEANS.
- 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:

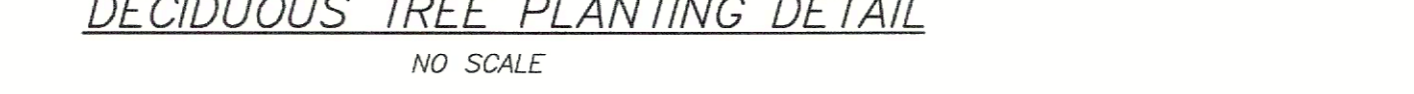
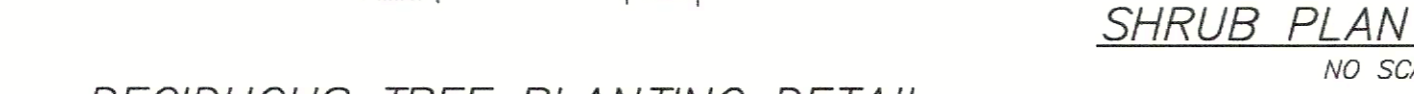
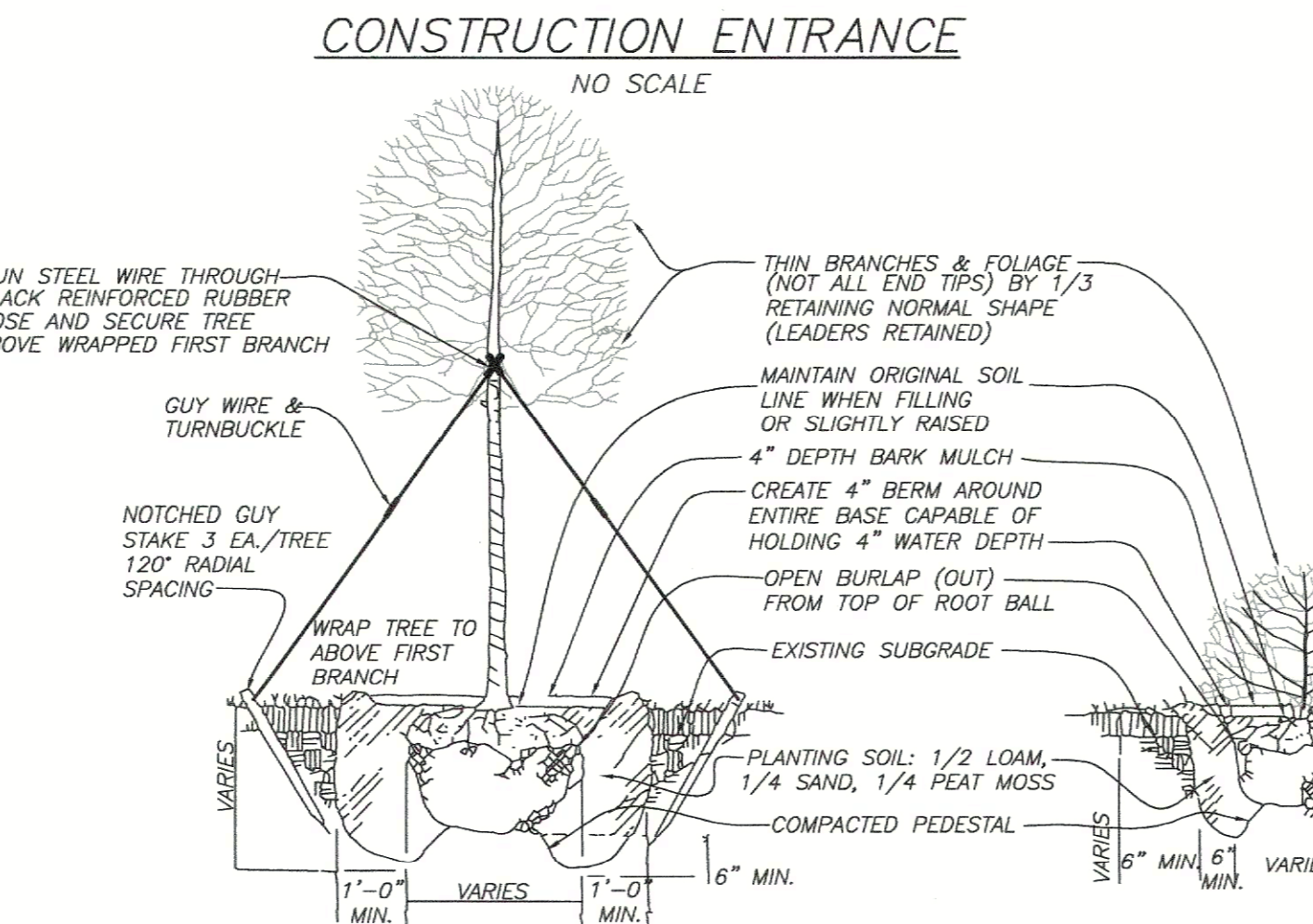
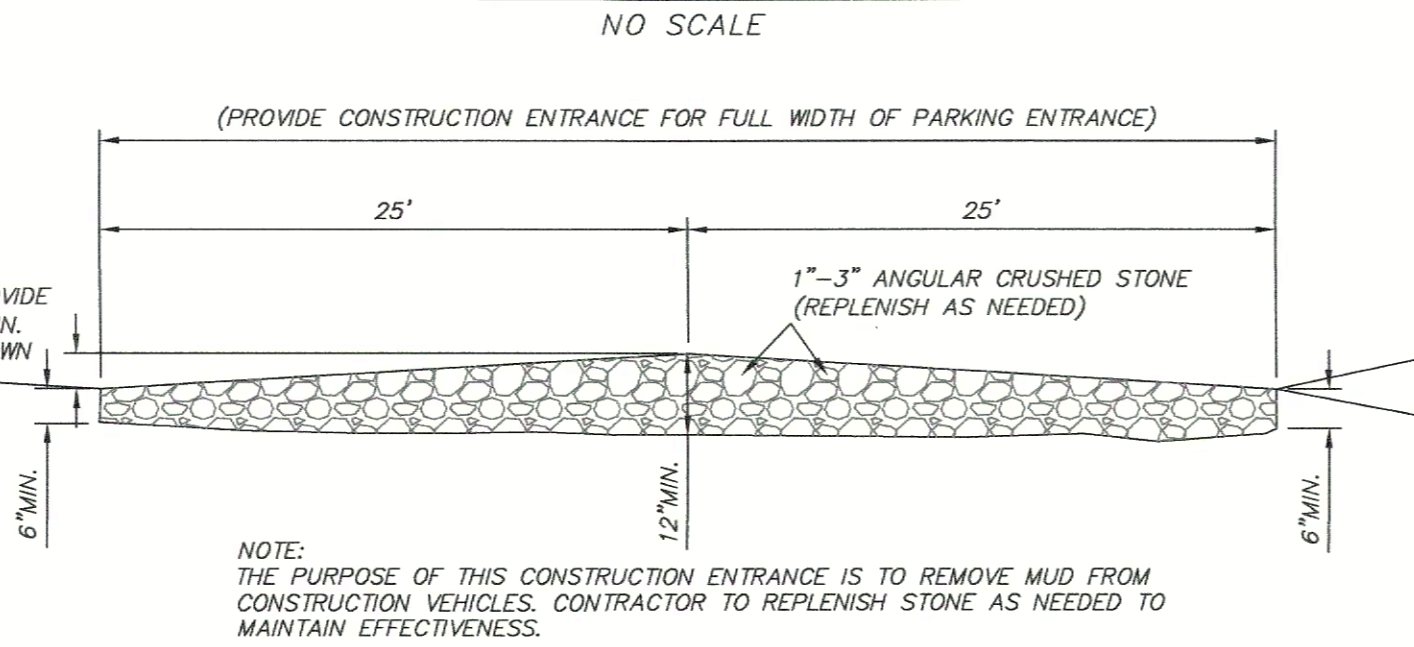
- LANDSCAPING OF AREAS SHOULD OCCUR AS SOON AS POSSIBLE.
- IF THE SEASON OR ADVERSE WEATHER CONDITIONS DO NOT PERMIT THE ESTABLISHMENT OF VEGETATION, TEMPORARY HAY MULCH, OR OTHER MEANS OF STABILIZATION SHALL BE PERFORMED.
- USE OF HERBICIDES MAY BE SUBJECT TO OTHER REGULATIONS.
- CARE SHOULD BE TAKEN WITH FERTILIZERS SUCH THAT THEY ARE NOT CARRIED TO A WETLAND OR SENSITIVE AREA.
- TRUNKS OF TREES SHOULD NOT BE COVERED WITH MORE THAN TWO (2) INCHES OF SOIL.
- STUMPS SHALL BE GROUND DOWN INTO A WOOD MULCH AND UTILIZED OR REMOVED FROM THE SITE.

### CREATION OF DETENTION BASIN:

- THE DETENTION BASIN HAS BEEN PLACED AS A SEPARATE ITEM TO EMPHASIZE THE IMPORTANCE OF EROSION CONTROL DURING ITS CONSTRUCTION.
- 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.
- 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 SLOPE TOWARDS THE WETLAND OR SENSITIVE AREA, BUT RATHER BACK INTO THE FILL MATERIAL.
- 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.
- NO EXCAVATION WITHIN THE BASIN SHALL COMMENCE UNTIL THE BERM IS IN PLACE.
- 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.
- IF DEWATERING IS NECESSARY, PUMPING TO A SETTLING BASIN SHALL BE PERMITTED IF SETTLING BASIN IS CONSTRUCTED, MAINTAINED AND OPERATED EFFECTIVELY.
- AT NO TIME SHALL RUNOFF CARRYING SEDIMENT BE ALLOWED TO FLOW TO THE WETLANDS OR SENSITIVE AREAS.
- THE WORK AREA SHALL REMAIN FREE OF LITTER AND DEBRIS AT ALL TIMES AND MONITORED ON A DAILY BASIS TO ENSURE COMPLIANCE.
- ALL MATERIALS STOCKPILED SHALL BE LOCATED, MULCHED OR OTHERWISE TREATED TO INSURE THAT MATERIALS CONTAINED, THEREIN, AREA NOT CARRIED INTO THE WETLANDS.
- 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.
- A GEOTECHNICAL FILTER FABRIC SHALL BE PLACED OVER THE BASIN SUBDRAIN DURING CONSTRUCTION TO PREVENT SEDIMENT FROM ENTERING AND LOGGING THE DRAIN. THE FABRIC SHALL BE REMOVED FOR BASIN PREPARATION FOR FINAL STABILIZATION.

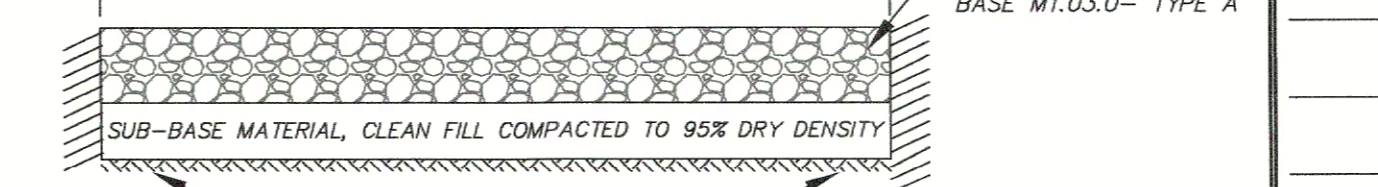
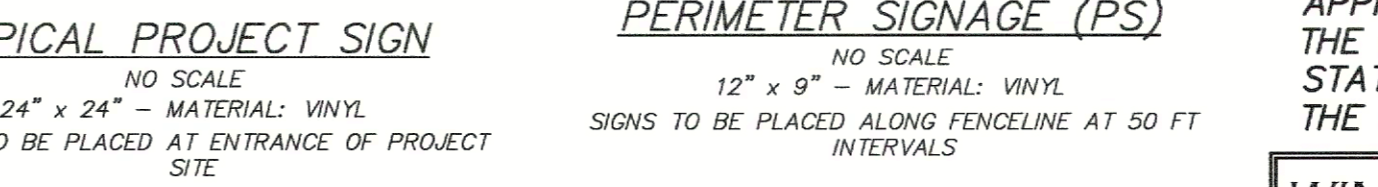
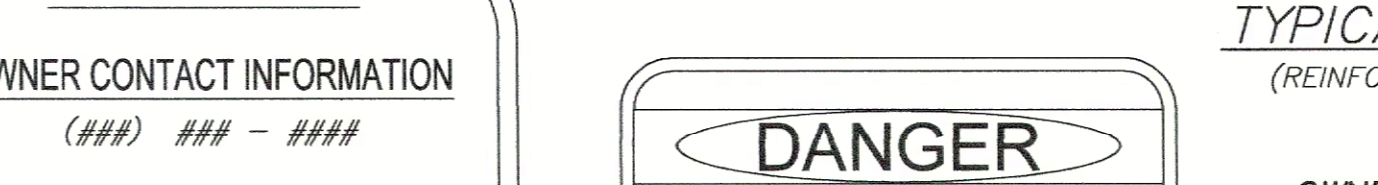
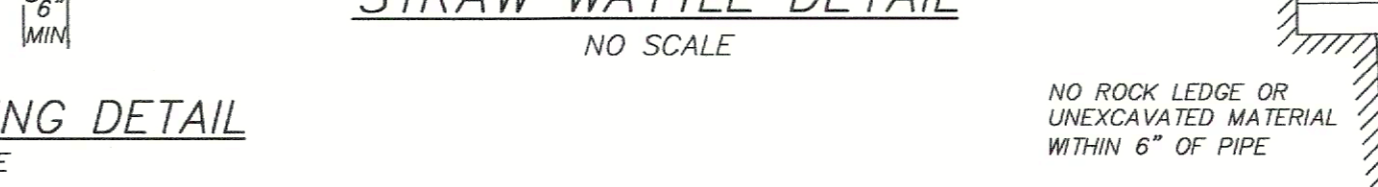
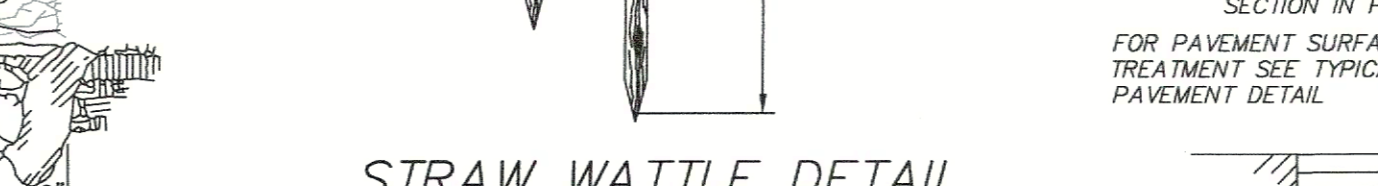
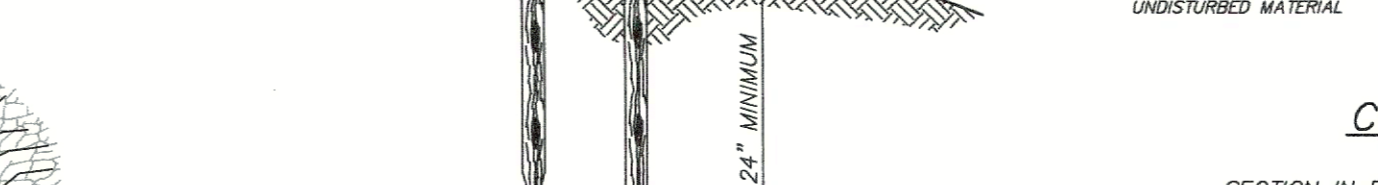
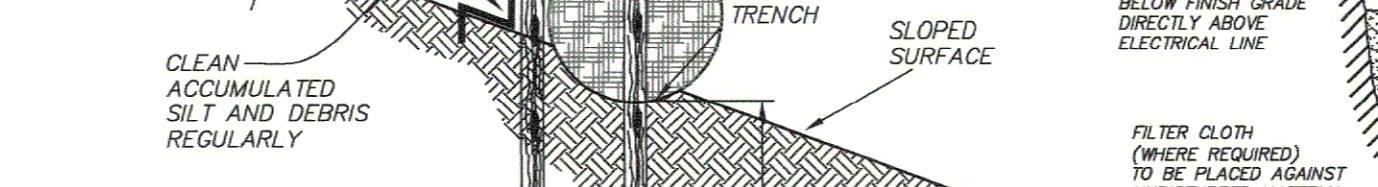
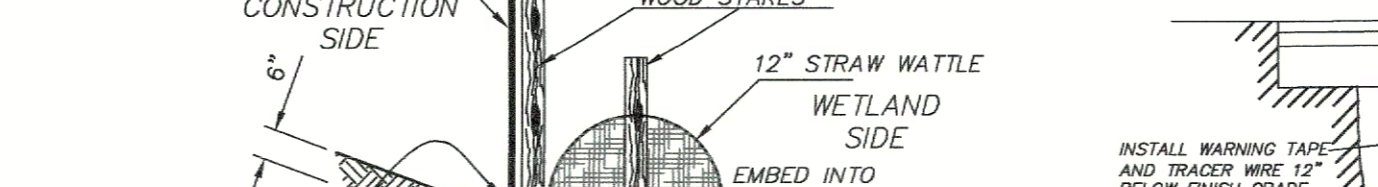
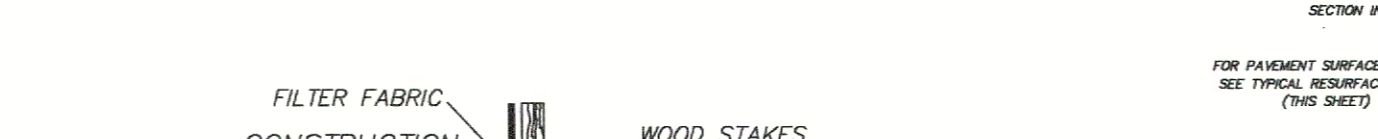
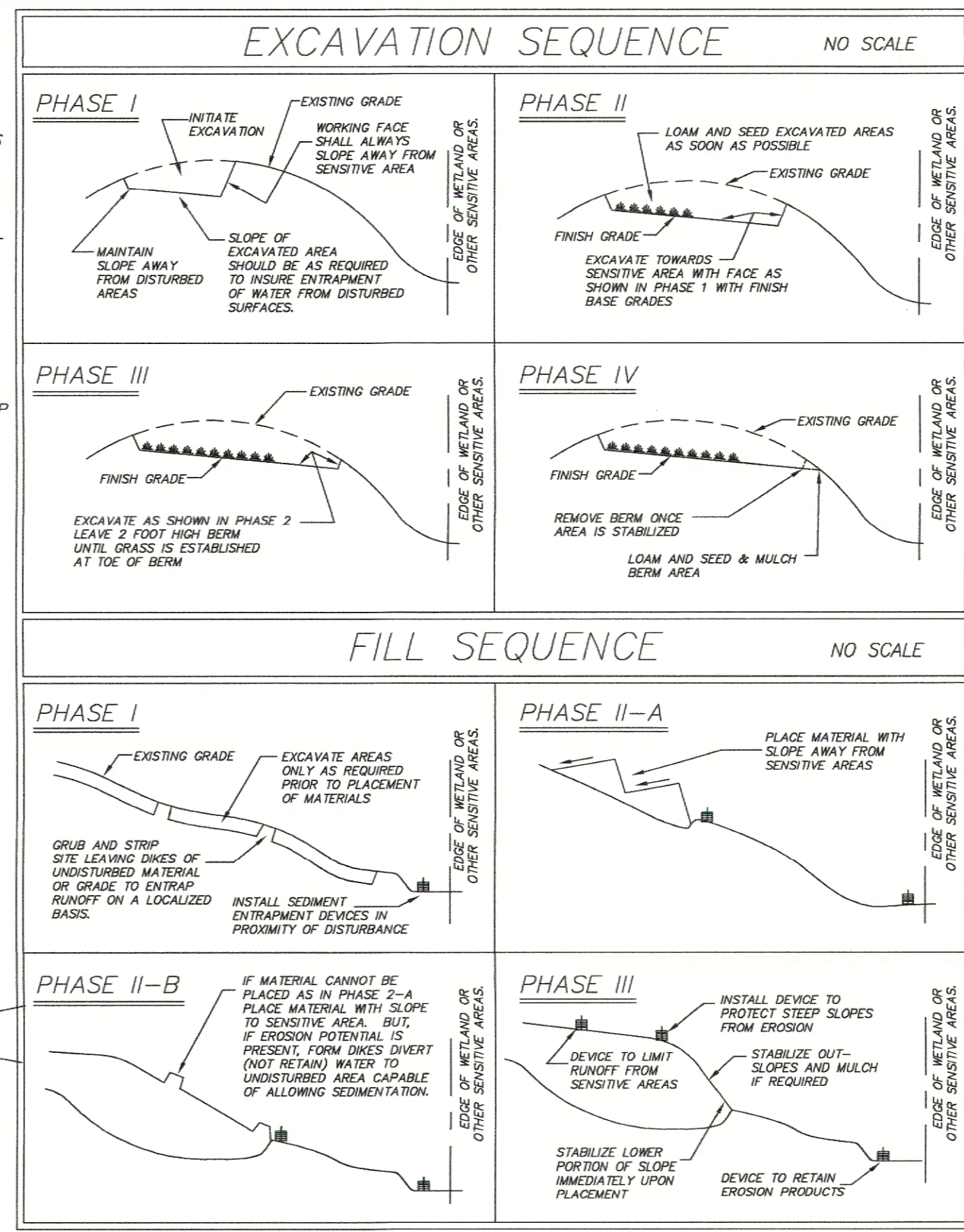
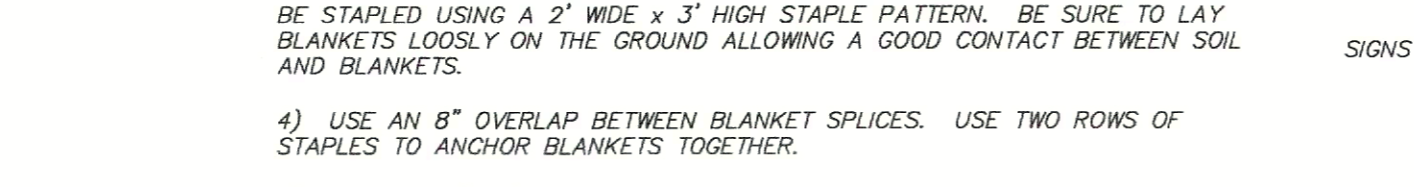
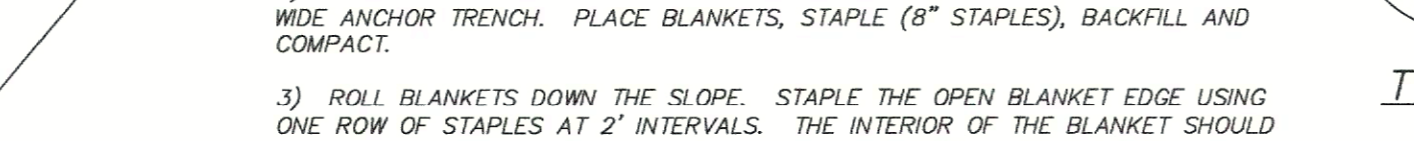
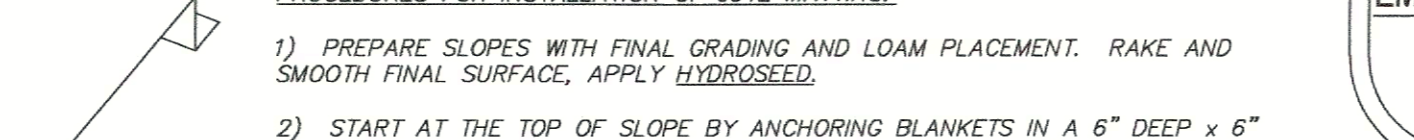
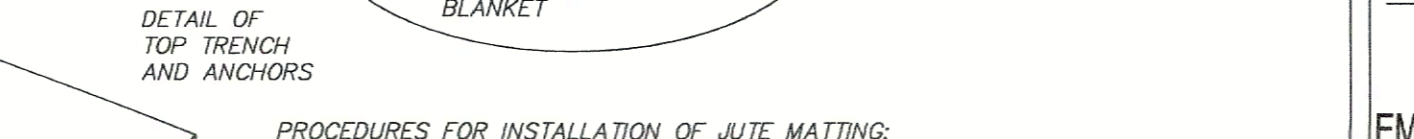
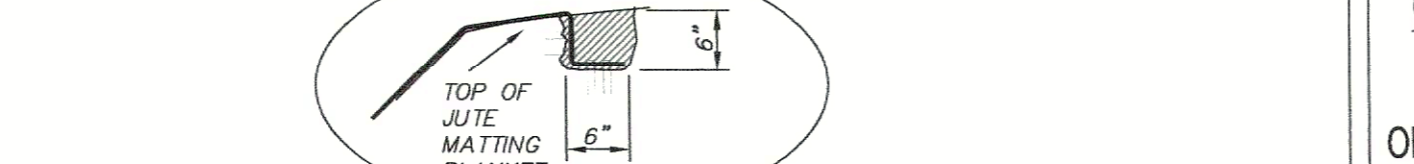


### SILT SACK DETAIL



PROCEDURES FOR INSTALLATION OF JUTE MATTING:

- PREPARE SLOPES WITH FINAL GRADING AND LOAM PLACEMENT. RAKE AND SMOOTH FINAL SURFACE. APPLY HYDROSEED.
- START AT THE TOP OF SLOPE BY ANCHORING BLANKETS IN A 6" DEEP x 6" WIDE ANCHOR TRENCH. PLACE BLANKETS, STAPLE (8" STAPLES), BACKFILL AND COMPACT.
- ROLL BLANKETS DOWN THE SLOPE. STAPLE THE OPEN BLANKET EDGE USING ONE ROW OF STAPLES AT 2' INTERVALS. THE INTERIOR OF THE BLANKET SHOULD BE STAPLED USING A 2" WIDE x 3" HIGH STAPLE PATTERN. BE SURE TO LAY BLANKETS LOOSLY ON THE GROUND ALLOWING A GOOD CONTACT BETWEEN SOIL AND BLANKETS.
- USE AN 8" OVERLAP BETWEEN BLANKET SPICES. USE TWO ROWS OF STAPLES TO ANCHOR BLANKETS TOGETHER.
- PROVIDE 6" x 6" ANCHOR TRENCH AT TOE OF SLOPE.
- JUTE MATTING TYPE SHALL BE PROPERLY SELECTED FOR SOIL CONDITIONS AND MAXIMUM ALLOWABLE SLOPE.
- ANY/ALL METALLIC ANCHORS SHALL BE PROMPTLY REMOVED ONCE THE VEGETATIVE COVER HAS BEEN ESTABLISHED.
- GRASS SEED VARIETY SHALL BE PROPERLY CHOSEN FOR SPECIFIC SITE CONDITIONS (SHADE OR SUN, ETC.)



### 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
PIP/RAP APPROX	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**

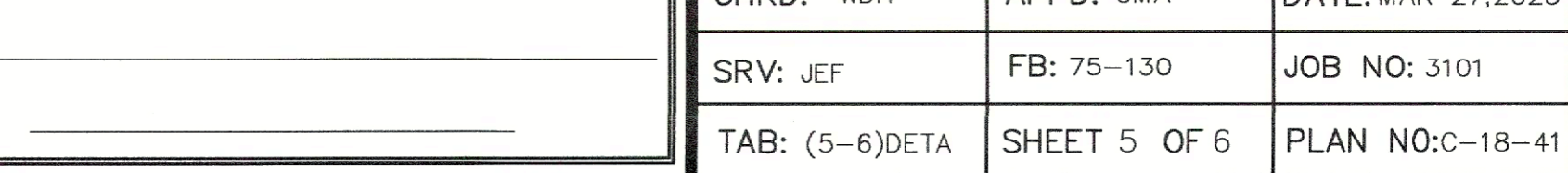
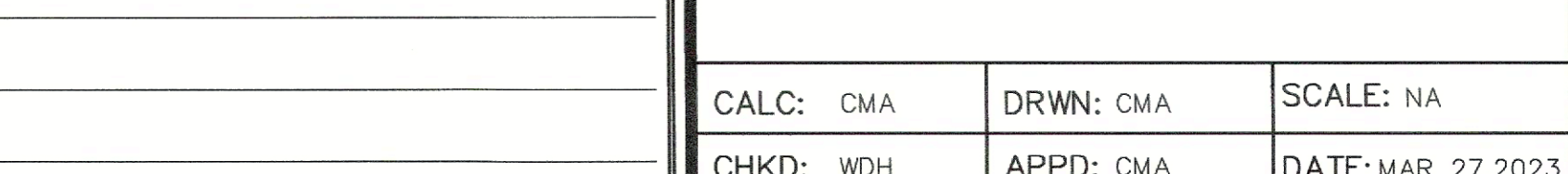
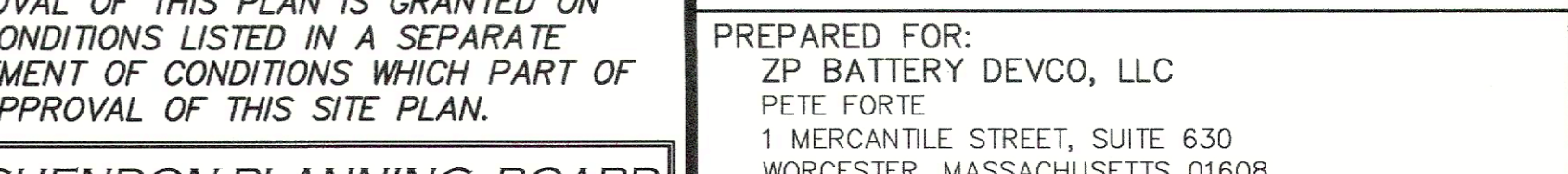
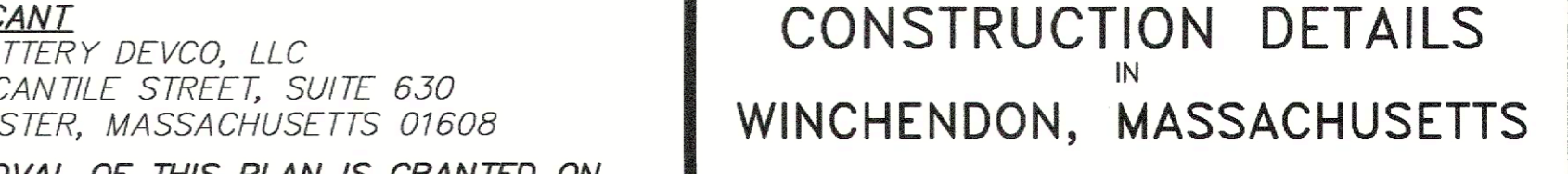
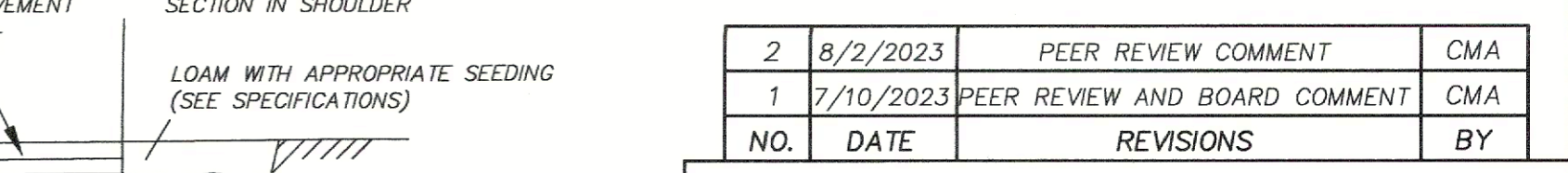
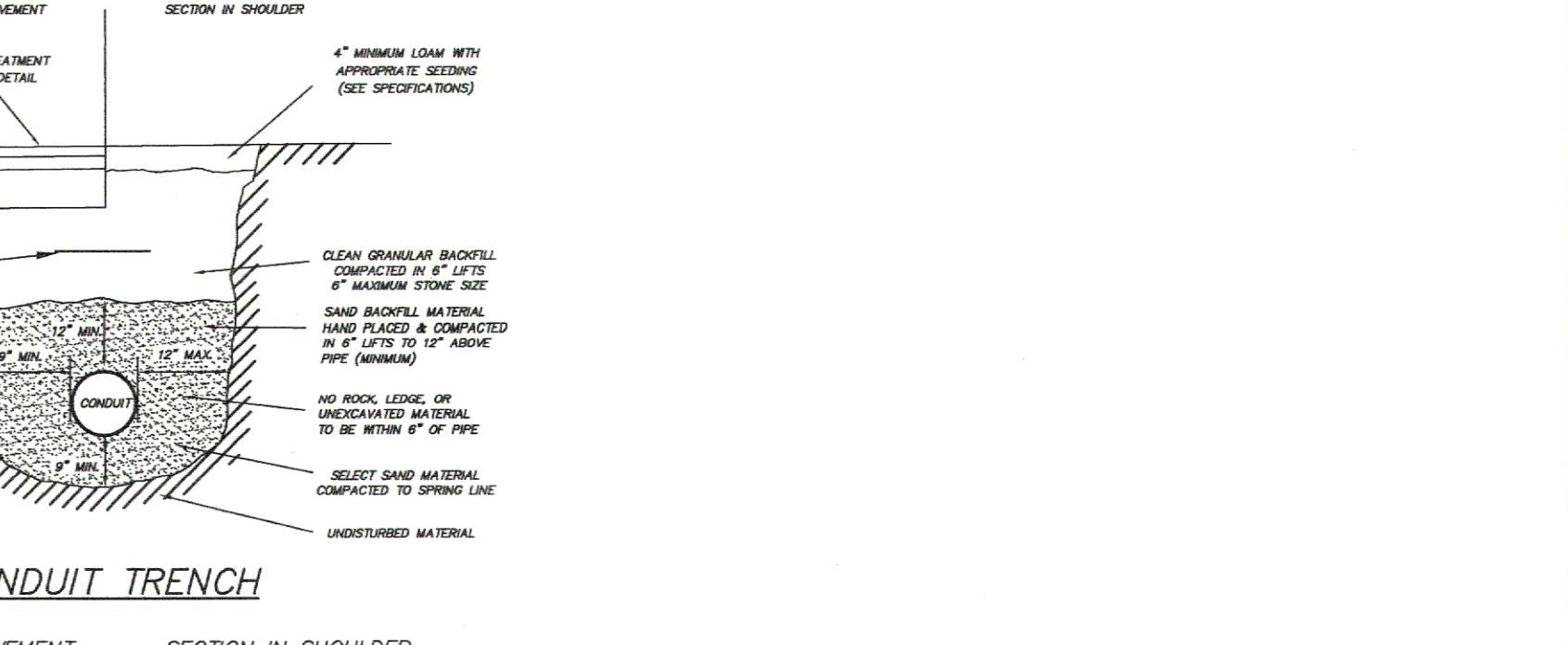
THE FOLLOWING SEED SCHEDULE SHALL BE FOLLOWED IN ORDER TO PROPERLY MAINTAIN VEGETATED AREAS

SEED TYPE (NATIVE SEED REQUIRED)	APPLICATION RATE	% OF MIX
WETLANDER SEED MIX	3 TO 5 POUNDS PER ACRE	50%
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 BE NO HERBICIDES OR PESTICIDES USED ON THIS PROJECT.

NO.	DATE	REVISIONS	BY
2	8/2/2023	PEER REVIEW COMMENT	CMA
1	7/10/2023	PEER REVIEW AND BOARD COMMENT	CMA



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

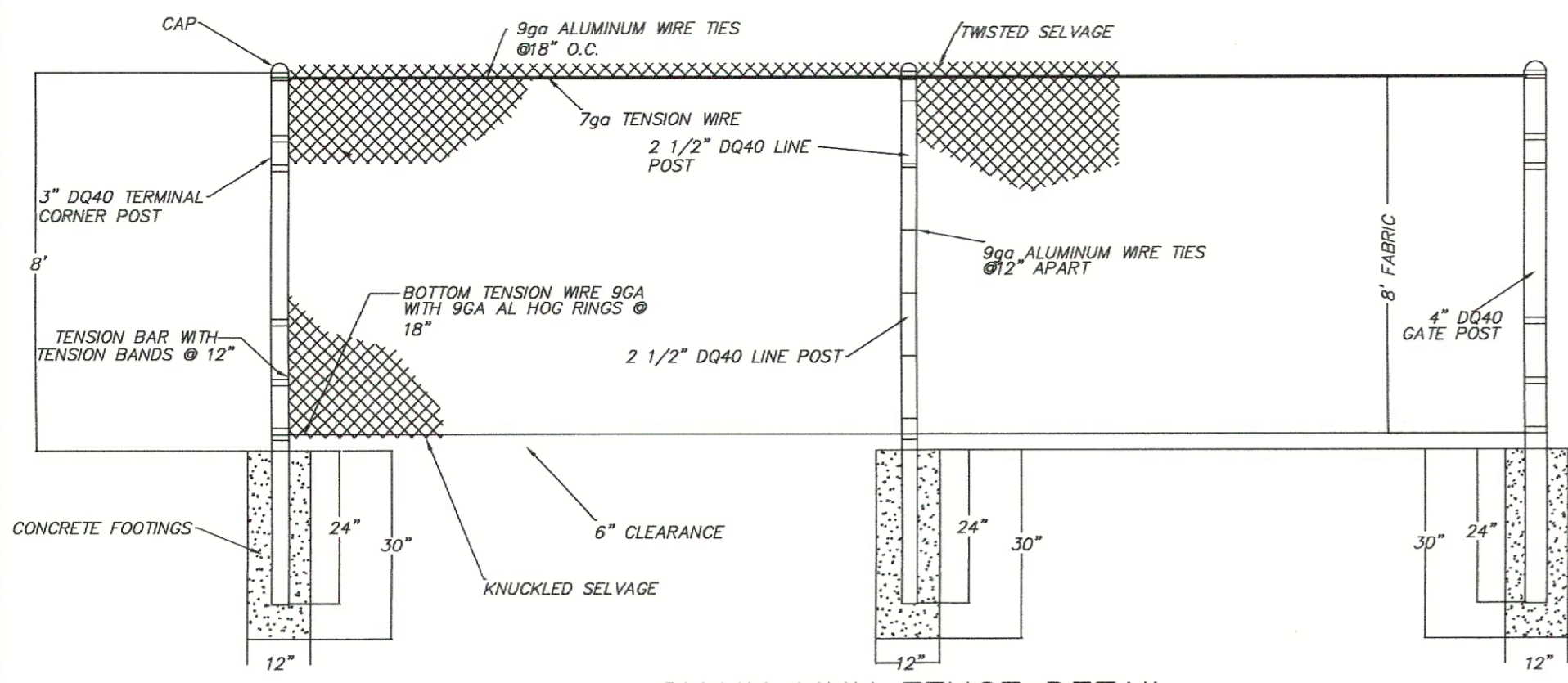
8 MONUMENT SQUARE  
 LEONIMSTER, MASSACHUSETTS 01453 (978) 534-1234 (T)  
 (978) 534-6060 (F)  
 WWW.HANNIGANENGINEERING.COM

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

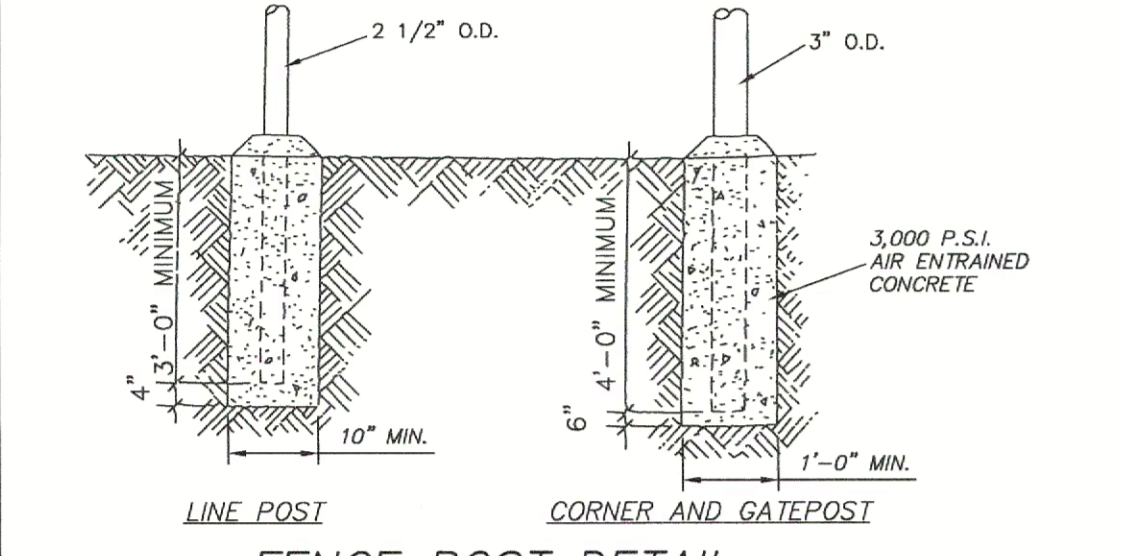
PREPARED FOR:  
 ZP BATTERY DEVCO, LLC  
 PETE FORTE  
 1 MERCANTILE STREET, SUITE 630  
 WORCESTER, MASSACHUSETTS 01608  
 TEL:

CALC:	DRWN:	SCALE:
CMA	CMA	NA

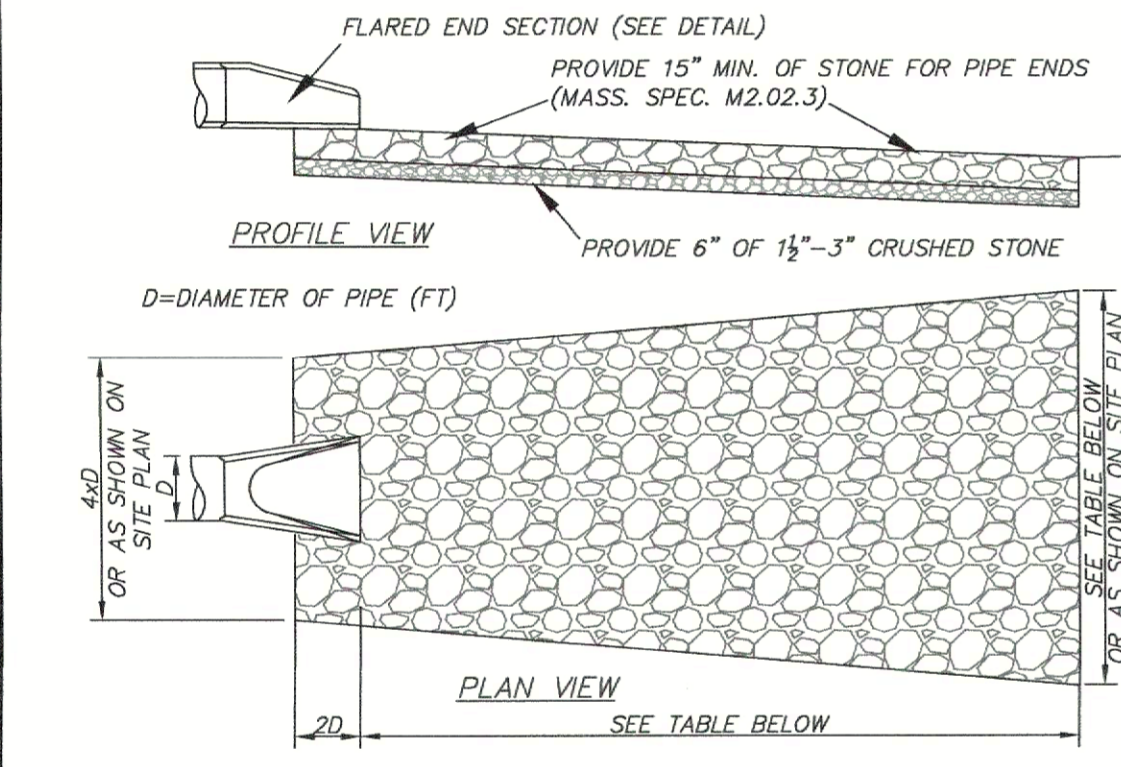
CHKD:	APPD:	DATE:
WDH	CMA	MAR 27, 2023



CHAIN LINK FENCE DETAIL

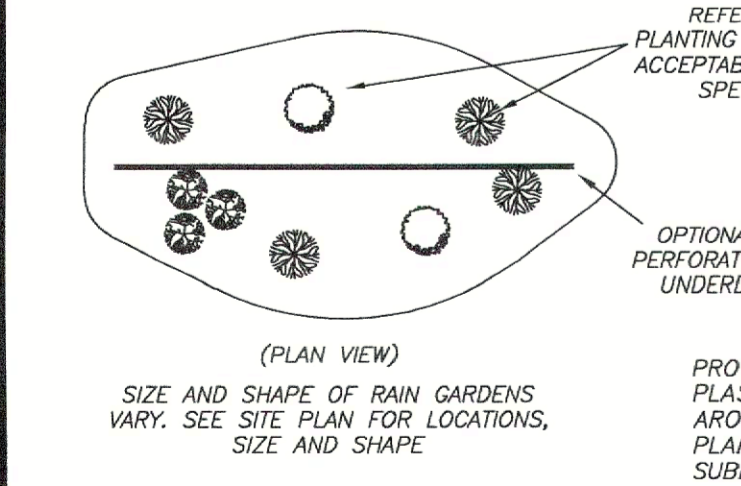


FENCE POST DETAIL



RIP RAP APRON DETAIL

PIPE DIAMETER	LENGTH	TERMINUS WIDTH
15-INCH (FE#1)	10.0 FEET	10.0 FEET



RAIN GARDEN DETAIL

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*
- SPIGEBUSH - *Lindera benzoin*
- BAYBERRY - *Myrica pensylvanica*
- ARROW-WOOD - *Viburnum dentatum*

- RED MAPLE - *Acer rubrum*
- SWITCH GRASS - *Panicum Virgatum*
- SHADBLUSH - *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*
- SYCAMORE - *Platanus Occidentalis*
- EASTERN COTTONWOOD - *Populus Deltoides*
- SWAMP WHITE OAK - *Quercus Bicolor*
- SCARLET OAK - *Quercus coccinea*
- BUR OAK - *Quercus Macrocarpa*

NOTES:

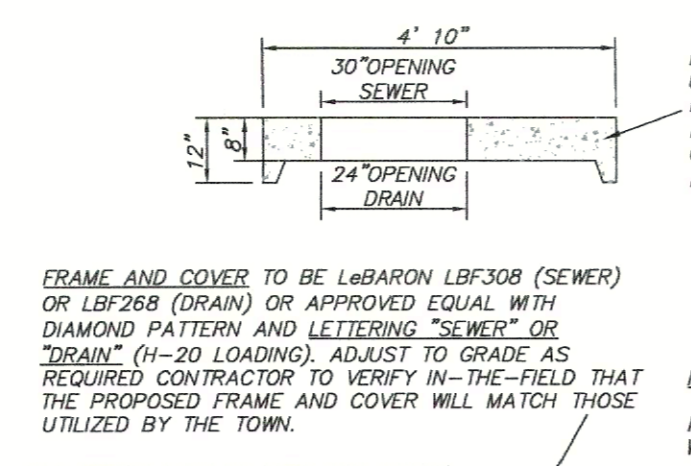
1. THE PLANTING PLAN SHALL INCLUDE A MIX OF PERENNIALS, BIENNIALS, SHRUBS AND (IF CONDITIONS PERMIT) UNDERSTORY TREES THAT CAN TOLERATE INTERMITTENT FLOODING, OCCASIONAL SALINE CONDITIONS DUE TO ROAD SALT, AND EXTENDED DRY PERIODS.
2. INVASIVE OR EXOTIC SPECIES ARE PROHIBITED
3. REFER TO MASSACHUSETTS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

PLANTING SOIL NOTES

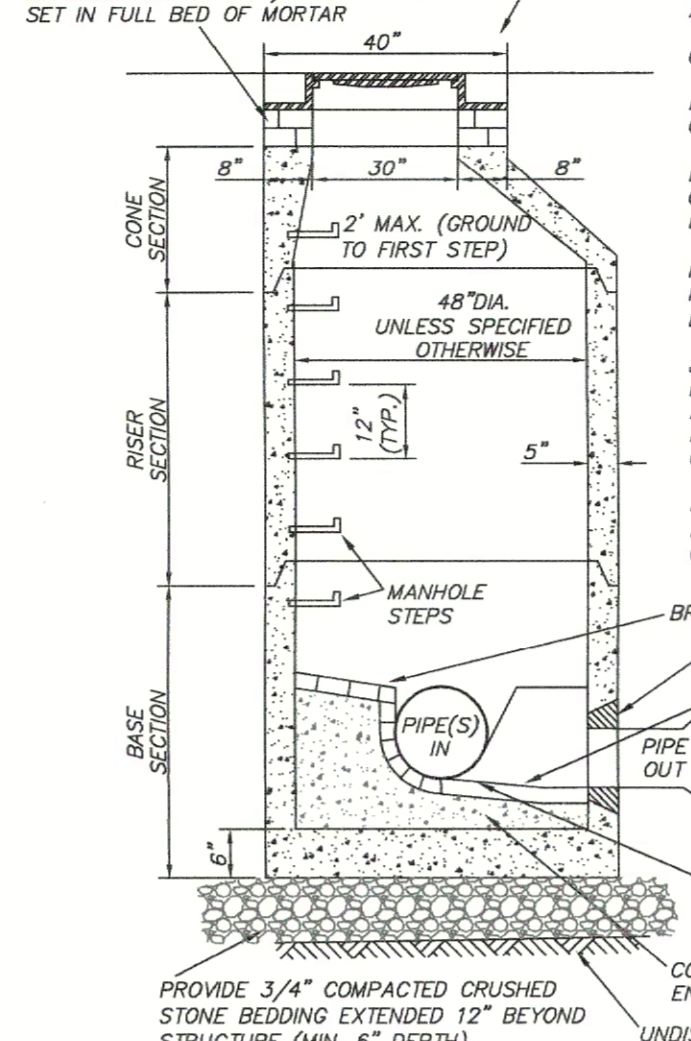
1. THE SOIL MIX SHALL BE A MIXTURE OF SAND COMPOST AND SOIL AS FOLLOWS: 40% SAND, 20-30% TOPSOIL AND 30-40% COMPOST.
2. THE SOIL MIX MUST BE UNIFORM, FREE OF STONES, STUMPS, ROOTS OR SIMILAR OBJECTS LARGER THAN 2". CLAY CONTENT SHALL NOT EXCEED 5%.
3. SOIL PH SHOULD BE BETWEEN 5.5-6.5
4. USE SOILS WITH 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.

NOTES:  
COLOR OF ALL MATERIALS ARE GALVANIZED  
INCLUDES 10'x10' 20' WIDE DOUBLE GATE  
GATE POSTS 4" TERMINAL POSTS 3" LINE POSTS 2.5" TOP TENSION WIRE 7ga HOG RINGS WITH STEEL CORE  
TENSION BANDS @ 12" WIRE 9ga TENSION WIRE TO MATCH FABRIC  
BOTTOM TENSION WIRE WITH 9ga AL HOG RINGS  
DOME CAPS RAIL ENDS 9ga TIE WIRES WITH STEEL CORE  
3" BRACE BANDS

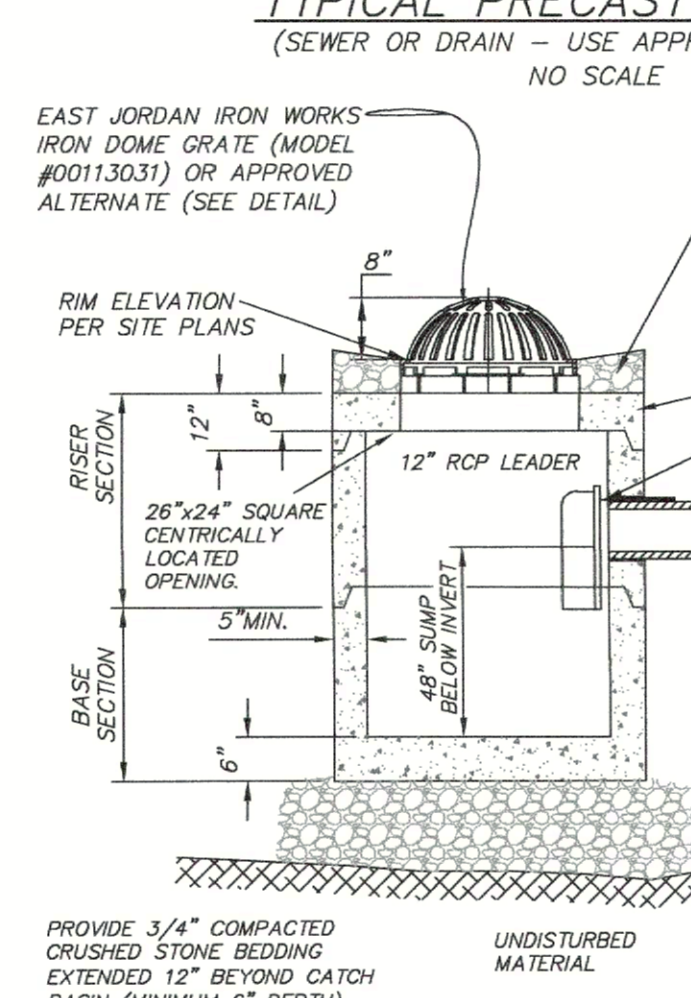
STEEL CORE GALVANIZED WITH 9ga PVC EXTRUDED POLY VINYL CHLORIDE (PVC)  
COATED STEEL CHAIN LINK FABRIC AS PER ASTM F668 CLASS 1



TYPICAL PRECAST MANHOLE



TYPICAL PRECAST CATCH BASIN



RAIN GARDEN OUTLET STRUCTURE

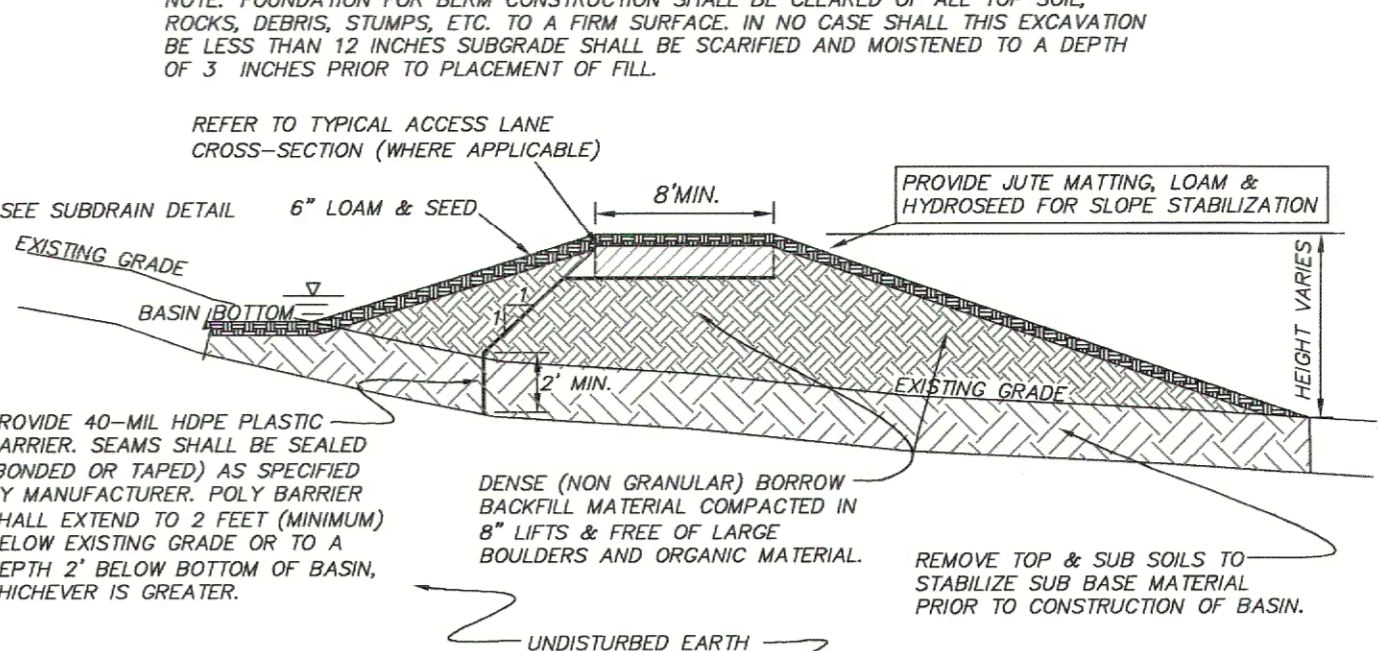
MANHOLE TOP SLAB USE AS REQUIRED FOR SHALLOW MANHOLES (CAPABLE OF WITHSTANDING H2O LOADING)

NOTES:

- MANHOLE TO BE PRECAST CONCRETE AND WATERPROOF
- REINFORCING A.S.T.M. A185 AREA 48" DIA. 0.12 SQIN. VERTICAL FT. AREA 60" DIA. 0.15 SQIN. VERTICAL FT.
- CONCRETE COMPRESSIVE STRENGTH 4,000 P.S.I.
- MANHOLE STEPS SHALL BE STEEL REINFORCED COPOLYMER POLYPROPYLENE PLASTIC
- BASE SECTION WILL BE CAST MONOLITHIC TWO (2) COATS BITUMASTIC WATERPROOF COATING AROUND ENTIRE EXTERIOR SURFACES OF MANHOLE
- MANHOLE DESIGN SHALL CONFORM TO "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS - A.S.T.M. DESIGNATION C478, LATEST REVISION."
- JOINT SEALANT SHALL BE PRE-FORMED BUTYL RUBBER MASTIC TYPE SEAL THAT COMPLIES WITH AASHTO SPECIFICATION M-198 OR SYNTHETIC RUBBER GASKET THAT COMPLIES WITH ASTM C443 OR C361.
- HEIGHT OF BRICK MASONRY INVERT CHANNEL TO BE BROUGHT UP TO A LEVEL EQUAL TO 2/3 DIAMETER OF SEWER
- BRICK MASONRY INVERT (TO CROWN OF PIPE)
- SEE MANHOLE CONNECTION DETAIL
- FLOOR OF STRUCTURE TO BE HEADERS LAID FLAT, PITCH TOWARDS OUTLET FOR POSITIVE DRAINAGE.
- PIPE OUT STUB (TYP.) 2.0' MAX.
- INVERTED ARCH WITH BRICKS LAID ON EDGE
- CONCRETE FILL 3,000 P.S.I. AIR EXTRAINED CONCRETE
- UNDISTURBED MATERIAL

NOTES:

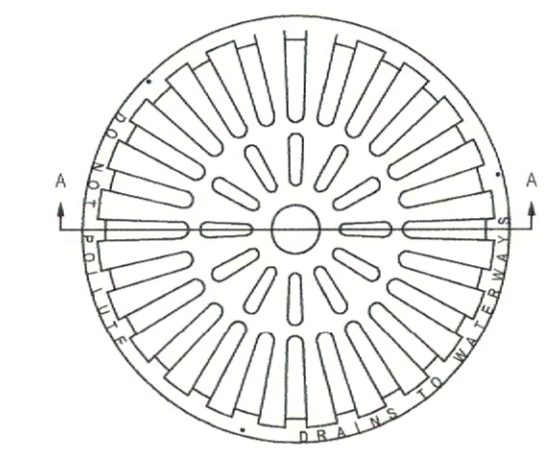
- EAST JORDAN IRON WORKS IRON DOME GRATE (MODEL #00113031) OR APPROVED ALTERNATE (SEE DETAIL)
- ANGULAR STONES (50 LB. - 125 LB.) (MHD SPEC. M2.02.3) PLACED TO FORM A COMPACT, STABLE CHANNEL
- TOP SLAB TO BE STEEL REINFORCED TO MEET OR EXCEED H-20 LOADING
- GENERAL NOTES:  
1. CATCH BASIN TO BE PRECAST REINFORCED CONCRETE  
2. STEEL REINFORCEMENT TO CONFORM TO A.S.T.M. A185 AREA 48" DIA. 0.12 SQIN. VERTICAL FT. AREA 60" DIA. 0.15 SQIN. VERTICAL FT.  
3. CONCRETE TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 P.S.I., MANUFACTURER TO CERTIFY.  
4. BASE SECTION TO BE MONOLITHIC CAST.  
5. JOINT SEALANT SHALL BE PRE-FORMED BUTYL RUBBER MASTIC TYPE SEAL THAT COMPLIES WITH AASHTO SPECIFICATION M-198 OR SYNTHETIC RUBBER GASKET THAT COMPLIES WITH ASTM C443 OR C361.  
6. LEADERS FROM ALL CATCHBASINS SHALL BE 12" RCP UNLESS OTHERWISE NOTED.



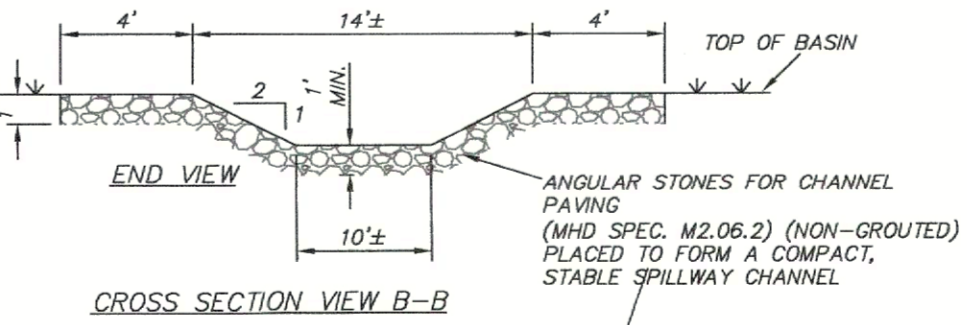
RAIN GARDEN BERM



FOREBAY DETAIL



DOME STYLE GRATE



EMERGENCY SPILLWAY DETAIL

NOTE: FOUNDATION FOR BERM CONSTRUCTION SHALL BE CLEARED OF ALL TOP SOIL, ROCKS, DEBRIS, STUMPS, ETC. TO A FIRM SURFACE. IN NO CASE SHALL THIS EXCAVATION BE LESS THAN 12 INCHES SUBGRADE SHALL BE SCARIFIED AND MOISTENED TO A DEPTH OF 3 INCHES PRIOR TO PLACEMENT OF FILL.

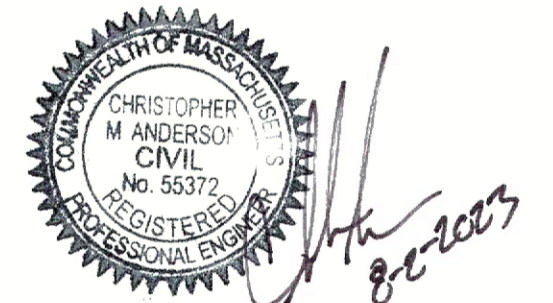
REFER TO TYPICAL ACCESS LANE CROSS-SECTION (WHERE APPLICABLE)

PROVIDE 40-MIL HDPE PLASTIC BARRIER. SEAMS SHALL BE SEALED (BONDED OR TAPED) AS SPECIFIED BY MANUFACTURER. POLY BARRIER SHALL EXTEND TO 2 FEET (MINIMUM) BELOW EXISTING GRADE OR TO A DEPTH 2' BELOW BOTTOM OF BASIN, WHICHEVER IS GREATER.

ANGULAR RIP-RAP BERM/SPILLWAY: STONES TO BE HAND PLACED TO FORM BERM AND ALLOW POOLED WATER TO BLEED THROUGH TO BASIN. (MHD SPEC. M.2.02.3)

SECTION A-A THROUGH FOREBAY

NO.	DATE	REVISIONS	BY
2	8/2/2023	PEER REVIEW COMMENT	CMA
1	7/10/2023	PEER REVIEW AND BOARD COMMENT	CMA



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(978) 534-6060 (F)  
WWW.HANNIGANENGINEERING.COM

CONSTRUCTION DETAILS  
IN  
WINCHENDON, MASSACHUSETTS

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

OWNER  
BOSTWICK REALTY TRUST  
256 MURDOCK AVENUE  
WINCHENDON, MASSACHUSETTS

APPLICANT  
ZP BATTERY DEVCO, LLC  
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.

WINCHENDON PLANNING BOARD

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