

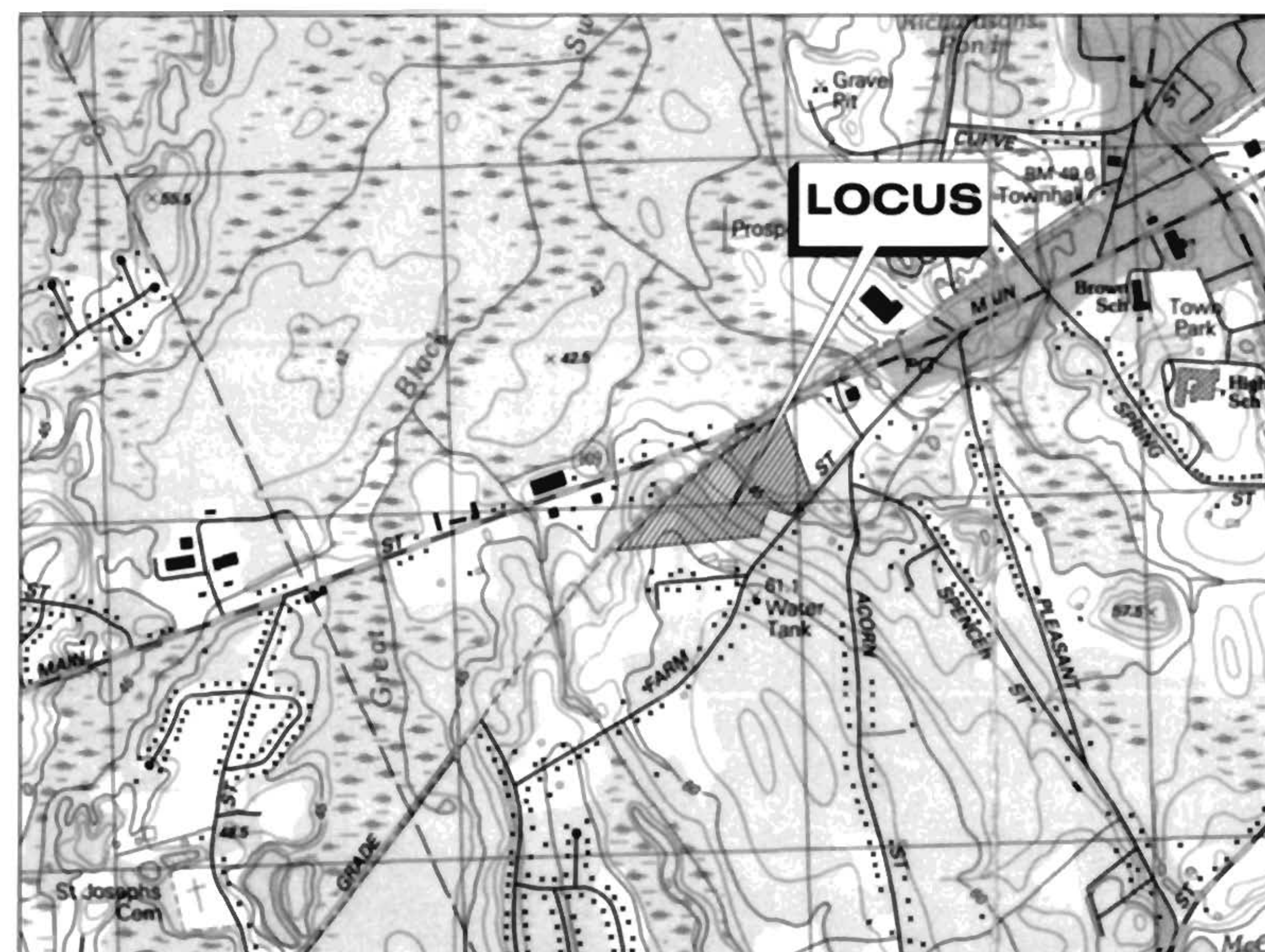
# MILLIS E COMMUNITY SOLAR ARRAY IN MILLIS, MASSACHUSETTS ( Norfolk County )

## APPLICANT

Clean Energy Collective  
146 West Boylston Drive, 3rd Floor  
Worcester, Massachusetts 01606  
617-834-8567

## CIVIL ENGINEER/SURVEYOR AND LANDSCAPE ARCHITECT

Beals and Thomas, Inc.  
Reservoir Corporate Center  
144 Turnpike Road  
Southborough, Massachusetts 01772



**Locus Map**  
Scale: 1" = 1000'



Permit Plan Set - January 6, 2017  
Revision 1 - June 14, 2017  
Revised July 24, 2017  
Revised August 4, 2017

## SHEET INDEX

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	Plan of Land (By Others)
TP-1	Topographic Plan
C1.1	Notes, References and Legend Sheet
C2.1	Index Plan
C3.1	Site Preparation Plan
C4.1	Layout and Materials Plan
C5.1	Grading, Drainage & Utility Plan
C6.1	Site Details #1
C6.2	Site Details #2
C7.1	Plan and Profile

SIGNATURE OF OWNER:

*[Signature]*

SIGNATURE OF APPLICANT:

*[Signature]*

APPROVAL BY THE  
MILLIS PLANNING BOARD

*[Signature]*  
DATE 8/15/17

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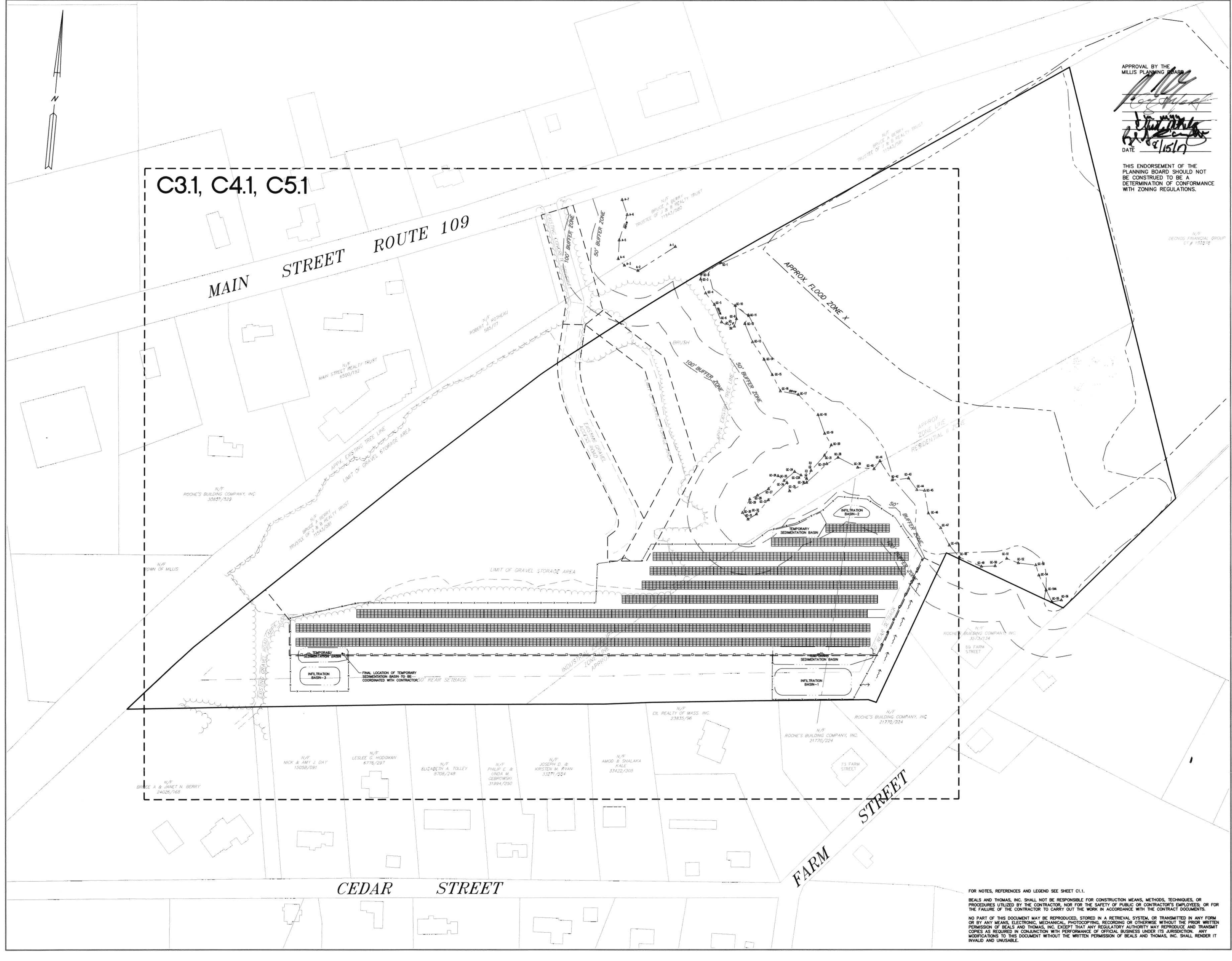


Job No.: 2832.00  
Plan No.: 283200P001E-001  
Sheet 1 of 11









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**Clean Energy COLLECTIVE.**  
146 WEST BOYLSTON DRIVE  
3RD FLOOR  
WORCESTER, MA., 01606  
617-834-8567

RECORD OWNER:  
**BRUCE A. BERRY TRUST,  
J&B REALTY TRUST**  
508-376-5600

ASSESSORS PARCEL 22-27  
DEED BOOK 11543 PAGE 582

PARCEL ADDRESS:  
1280 MAIN STREET  
MILLIS, MA 02054

*[Stamp: DANIEL M. FERRY CIVIL No. 44622]*  
8/14/2017

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4		
3	08/04/2017	REVISED PER TOWN COMMENTS
2	07/24/2017	REVISED PER TOWN COMMENTS
1	06/14/2017	REVISED PER TOWN COMMENT
0	01/06/2017	FIRST ISSUE
ISSUE DATE		DESCRIPTION
DES	DWN	CHK'D APP'D

PROJECT:  
**MILLIS E COMMUNITY  
SOLAR ARRAY**  
MILLIS, MASSACHUSETTS  
(NORFOLK COUNTY)

SCALE: 1" = 60' DATE: JANUARY 6, 2017

METERS  
0 10 20 30 40 50  
FEET  
0 30 60 90 120 150 180

**INDEX PLAN**

FOR NOTES, REFERENCES AND LEGEND SEE SHEET C1.1.

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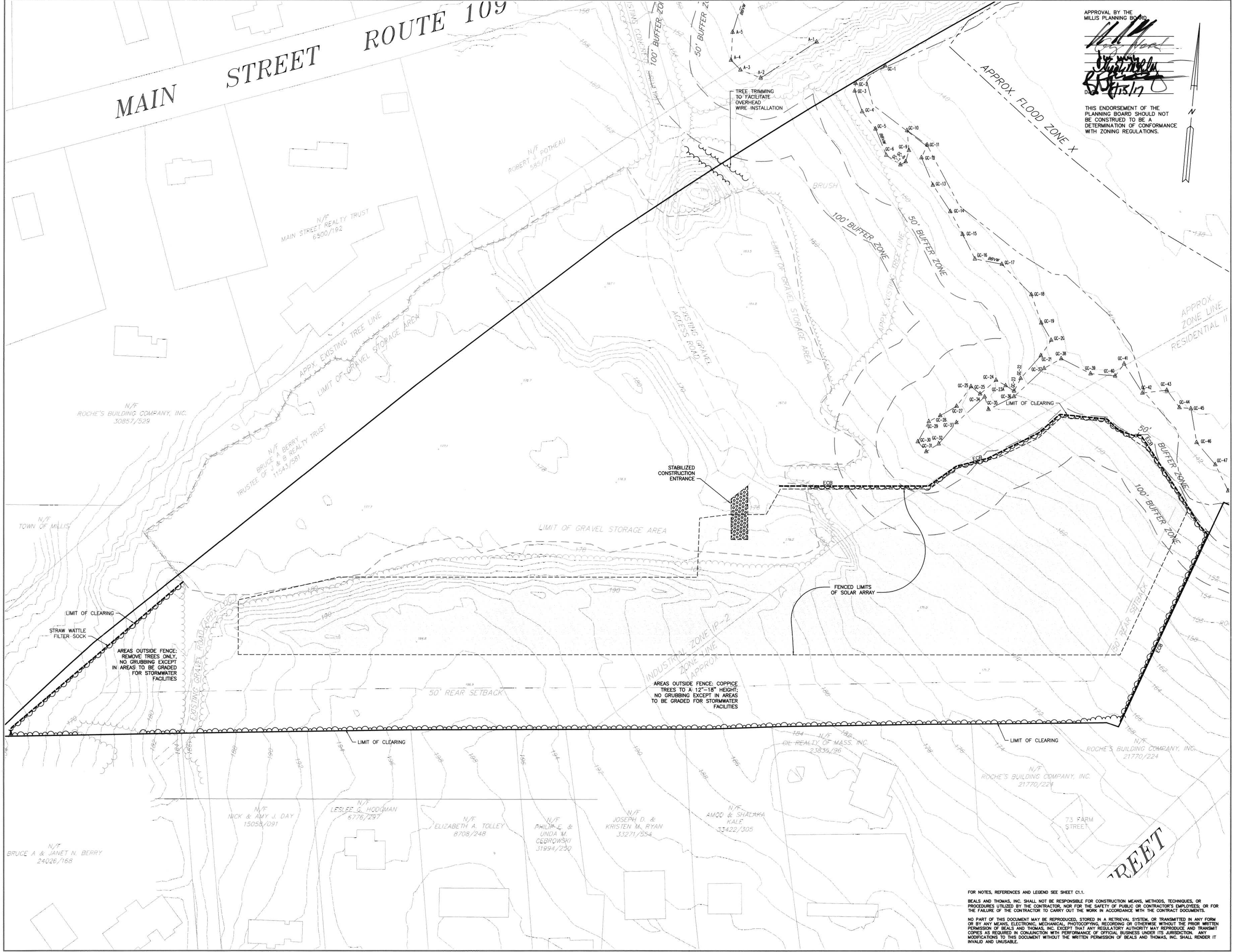
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B+T PLAN NO.  
283200P001E-003

**C2.1**





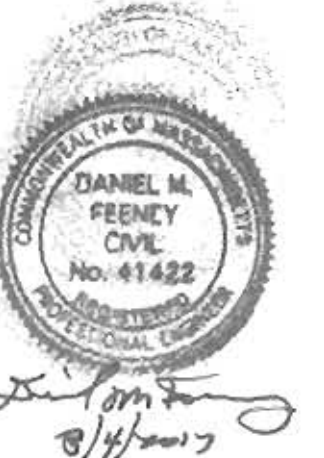
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617-834-8567

RECORD OWNER:  
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Southborough, Massachusetts 01772-2104  
T 508.366.0560 | www.bealsandthomas.com

ISSUE DATE	DESCRIPTION
01/06/2017	FIRST ISSUE
06/14/2017	REVISED PER TOWN'S COMMENT
07/24/2017	REVISED PER TOWN COMMENTS
08/04/2017	REVISED PER TOWN COMMENTS

DES	DWN	CHK'D	APP'D

PROJECT:  
**MILLIS E COMMUNITY  
SOLAR ARRAY**  
MILLIS, MASSACHUSETTS  
(NORFOLK COUNTY)

SCALE: 1" = 40' DATE: JANUARY 6, 2017

METERS  
0 5 10 20 30 40 50 60 70 80 90 100 110 120  
FEET

**SITE PREPARATION  
AND  
EROSION CONTROL**

B+T JOB NO. 2832.00  
B+T PLAN NO. 28320P001E-004  
**C3.1**

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APPROVAL BY THE  
MILLIS PLANNING BOARD

DATE

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MAIN STREET ROUTE 109

ALL PLANTING SHOULD OCCUR AT THE BEGINNING OR  
END OF THE GROWING SEASON. FALL PLANTINGS  
SHOULD BE DONE BEFORE THE FIRST FROST. SHRUBS AND  
TREES, HOWEVER, MAY BE PLANTED UP TO NOVEMBER 15,  
WEATHER PERMITTING. IT SHOULD BE NOTED, HOWEVER,  
THAT SOME PLANT SPECIES ARE ILL-SUITED TO FALL  
PLANTING (INCLUDING RED MAPLE) AND THEREFORE,  
CAREFUL INVESTIGATION REGARDING INDIVIDUAL PLANT  
TOLERANCES SHOULD BE INVESTIGATED DURING DESIGN,  
AND CHECKED ONCE THE CONSTRUCTION SCHEDULE IS  
KNOWN. TREE SURVIVAL SHALL BE NO LESS THAN 75%  
AFTER TWO YEARS.

PREPARED FOR:

**Clean Energy  
COLLECTIVE.**  
146 WEST BOYLSTON DRIVE  
3RD FLOOR  
WORCESTER, MA., 01606  
617-834-8567

RECORD OWNER:

**BRUCE A. BERRY TRUST,  
J&B REALTY TRUST**  
508-376-5600

ASSESSORS PARCEL 22-27  
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PARCEL ADDRESS:

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MILLIS, MA 02054

Approval by  
Millis Planning  
Board  
3/1/2017



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PROJECT:

**MILLIS E COMMUNITY  
SOLAR ARRAY**  
MILLIS, MASSACHUSETTS  
(NORFOLK COUNTY)

SCALE: 1" = 40' DATE: JANUARY 6, 2017



**GRADING, DRAINAGE  
AND UTILITY**

B+T JOB NO. 2832.00

B+T PLAN NO.  
283200P001E-006

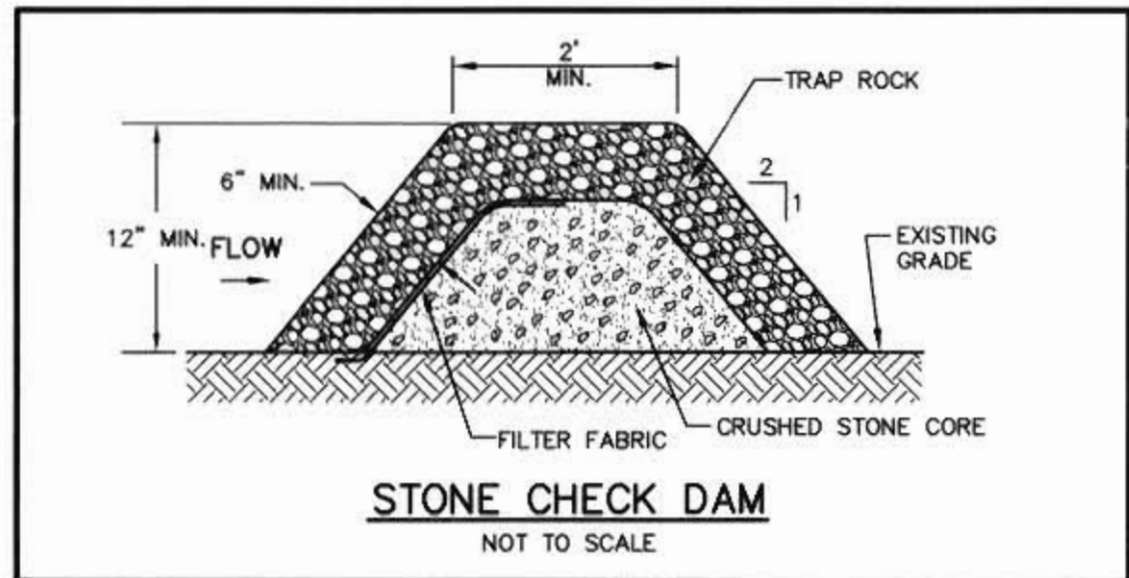
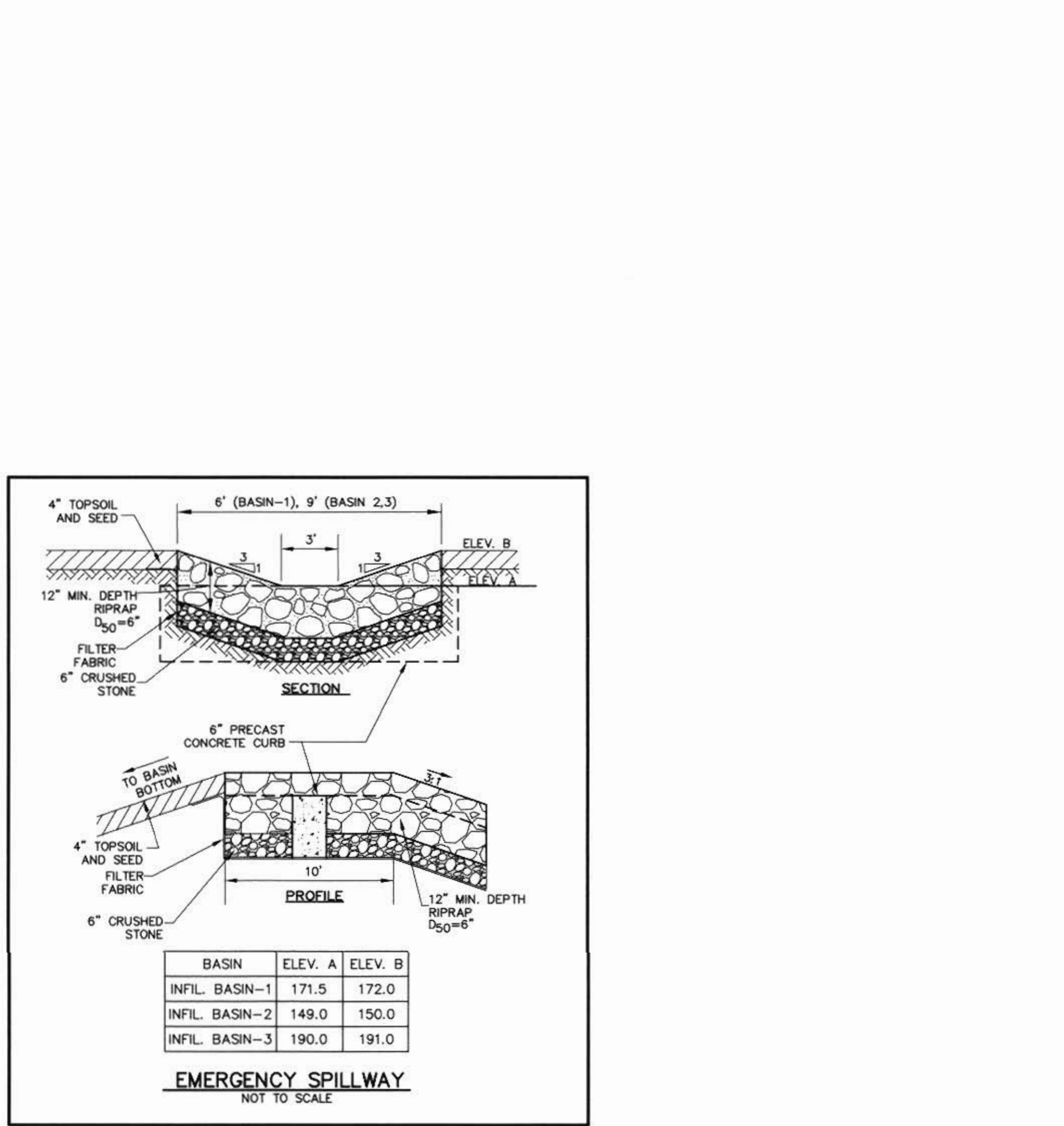
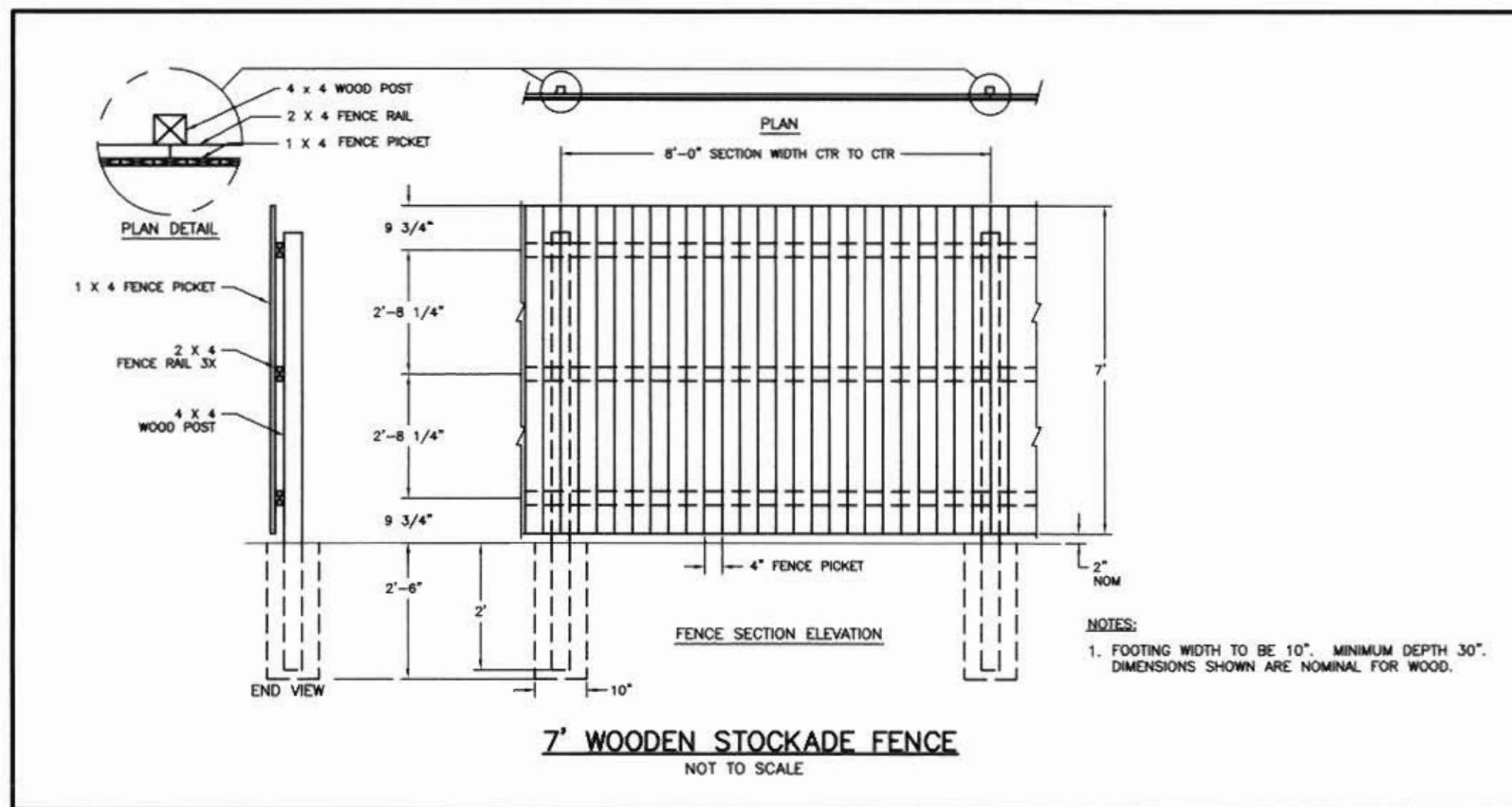
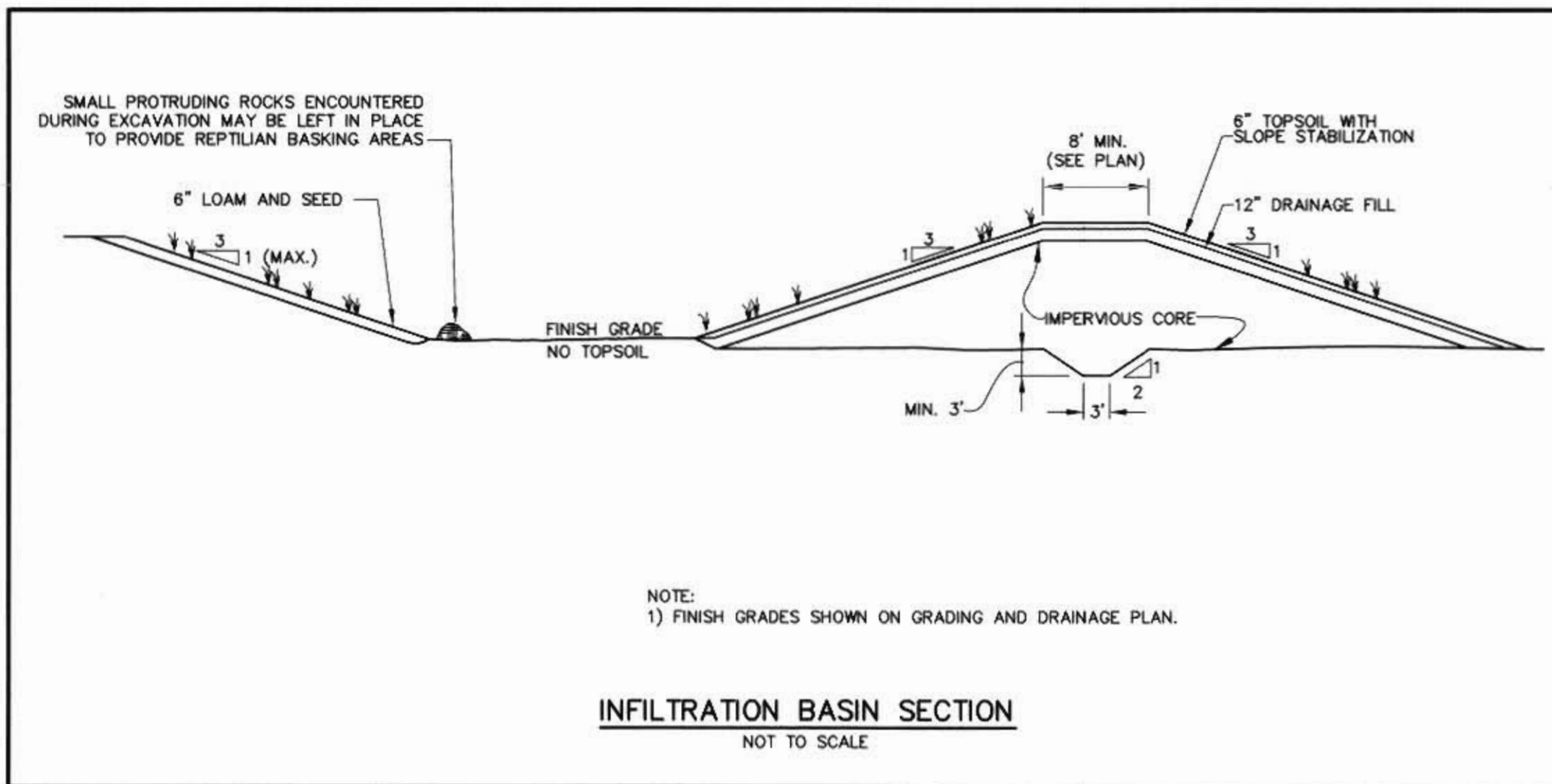
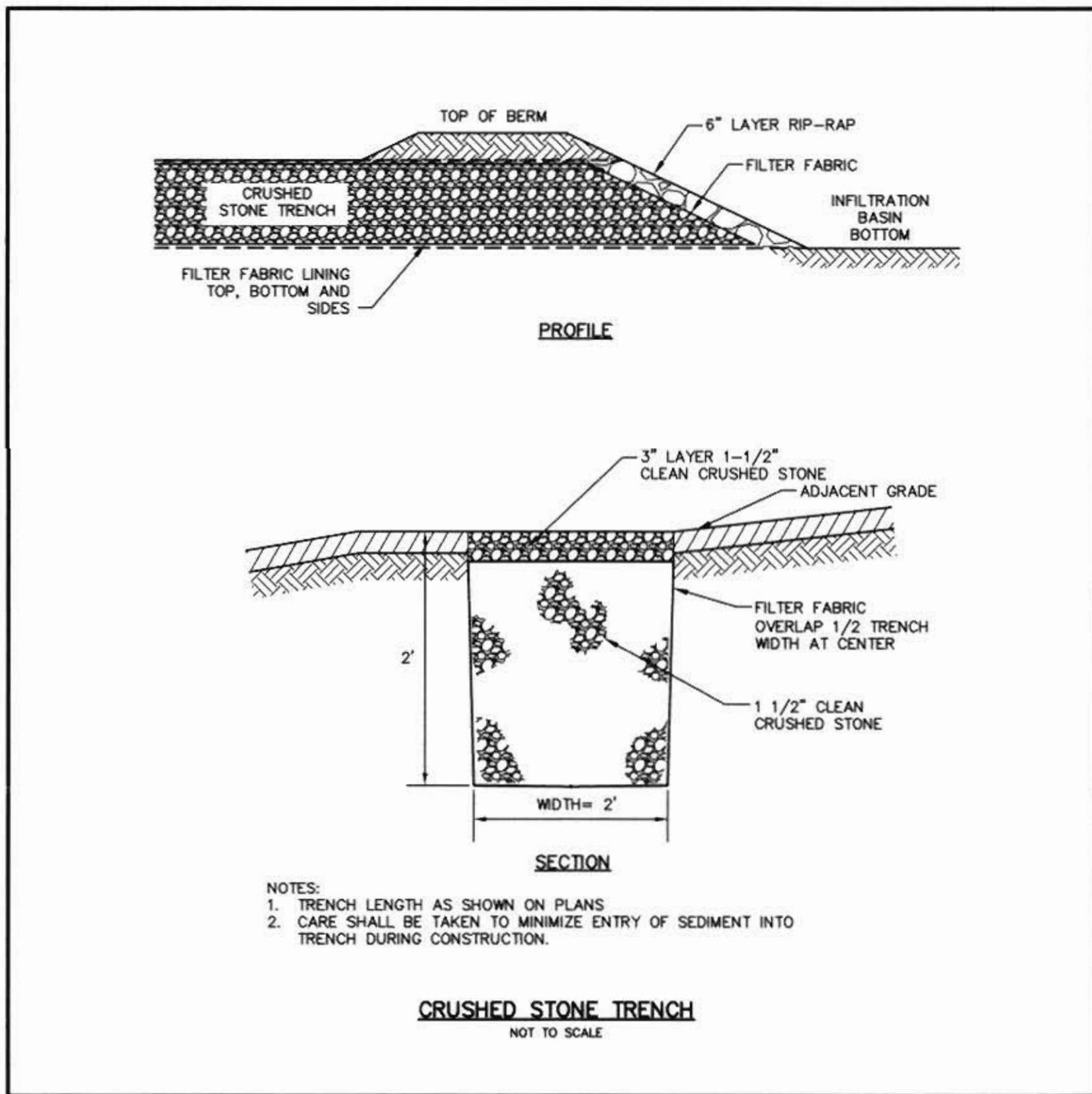
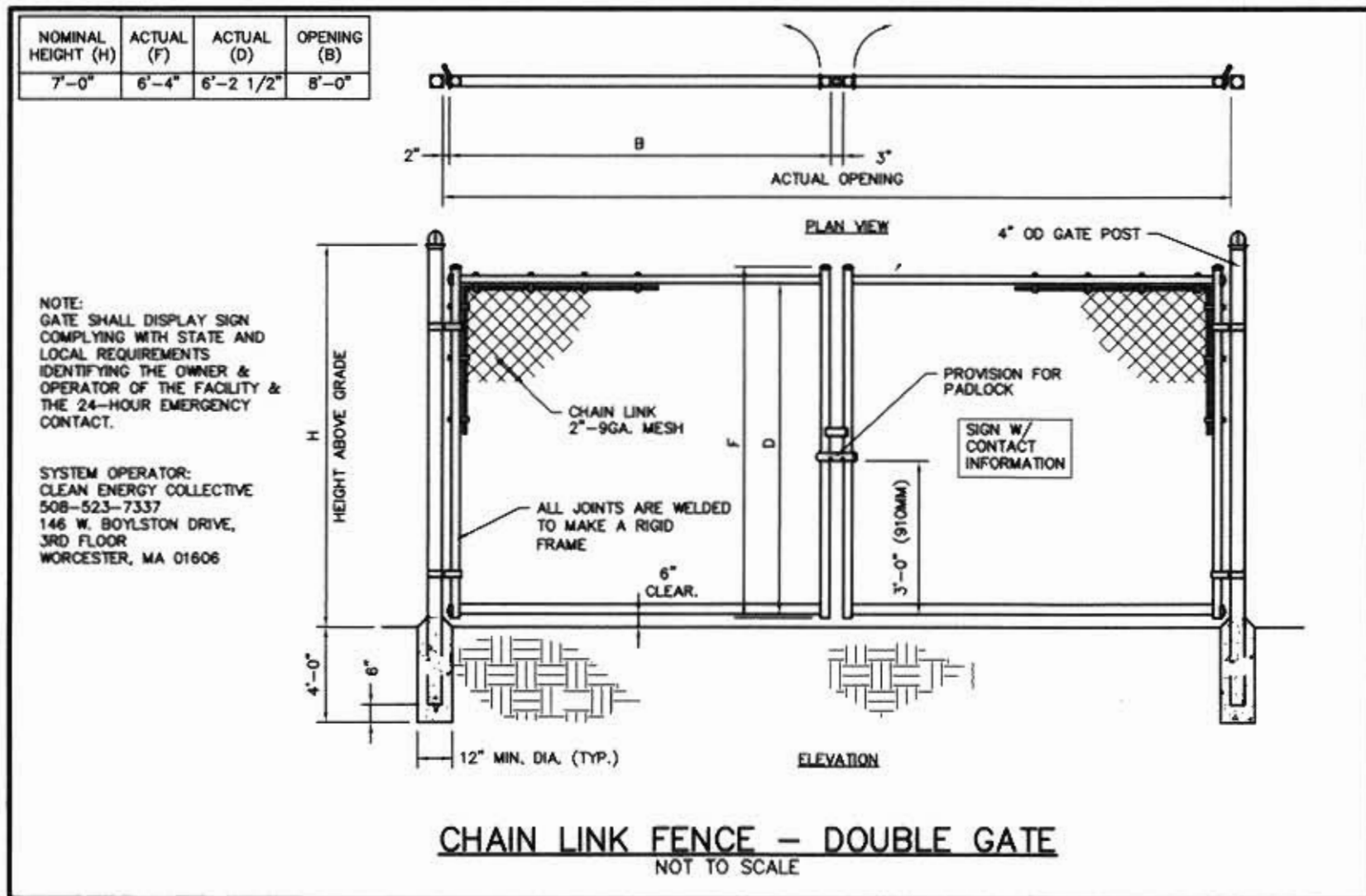
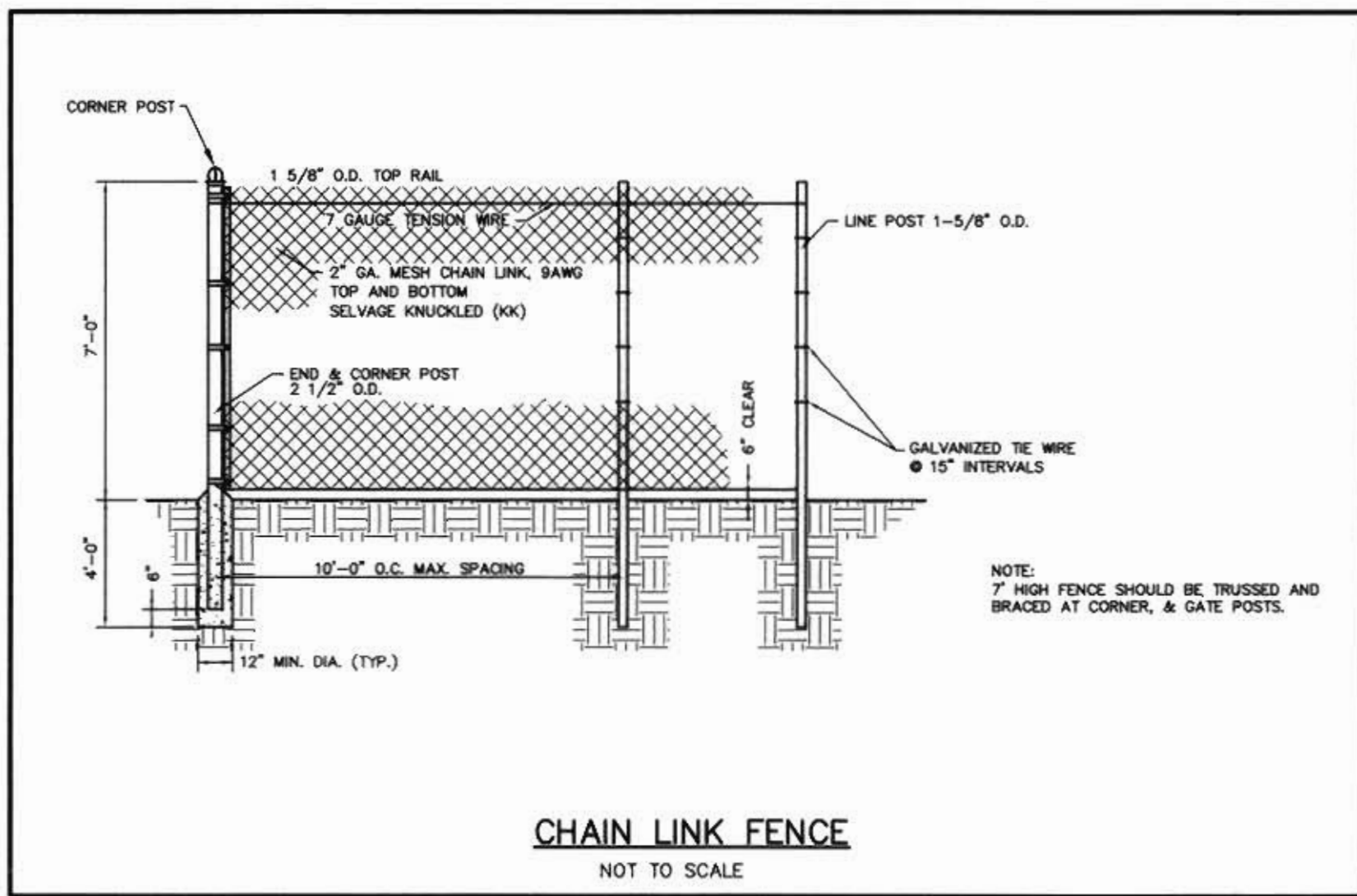
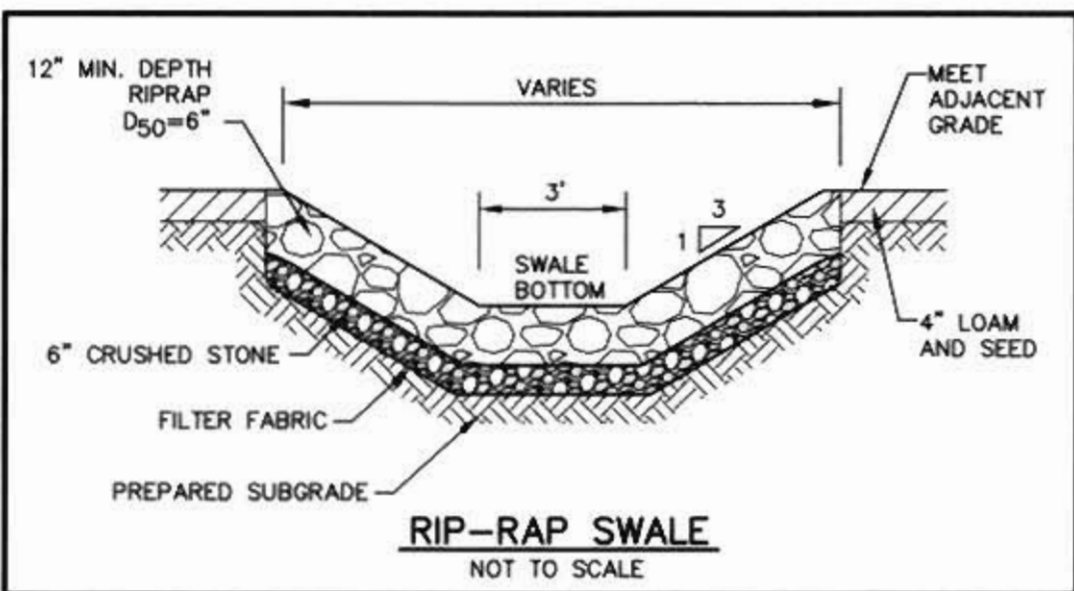
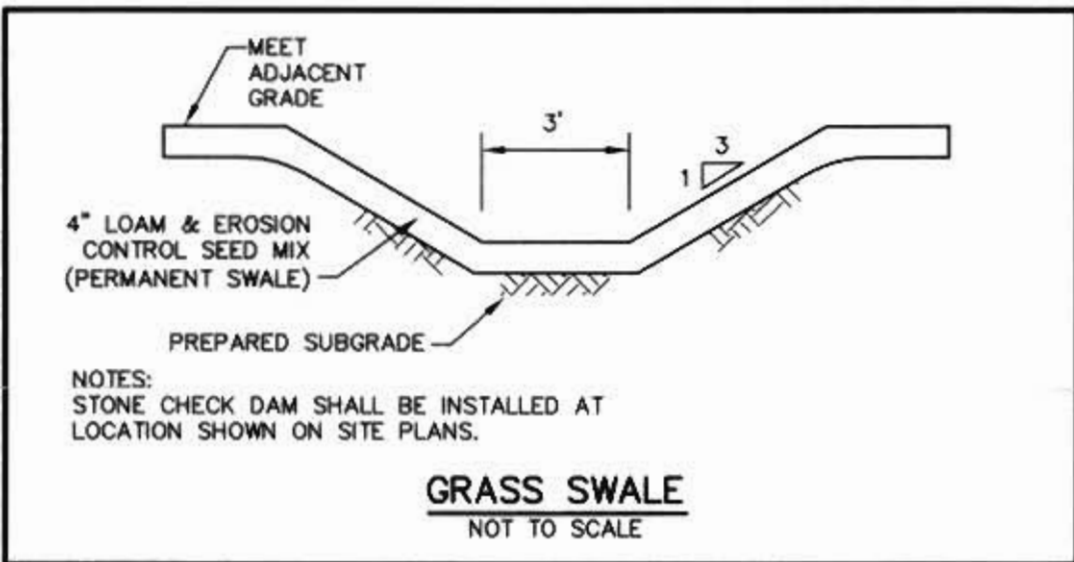
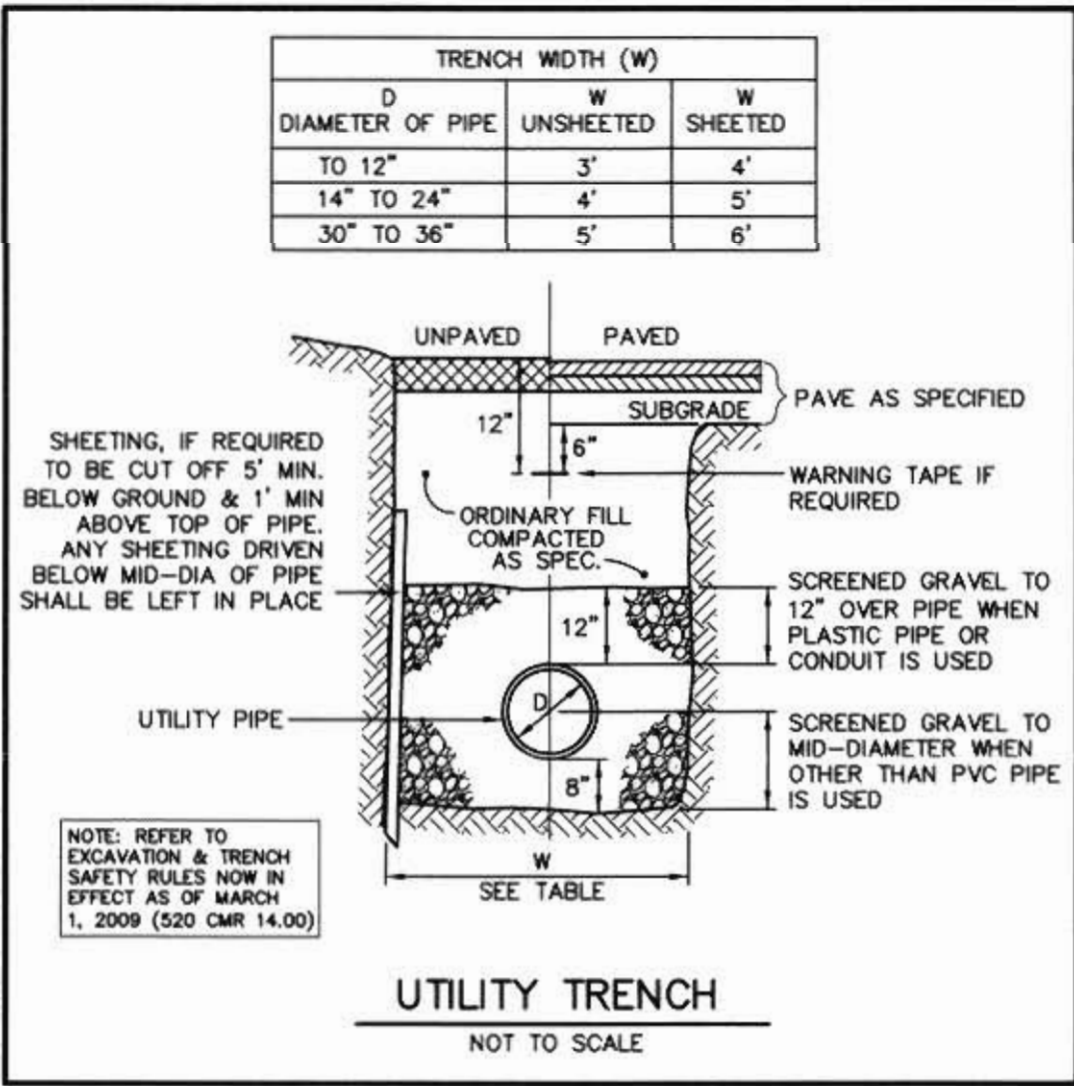
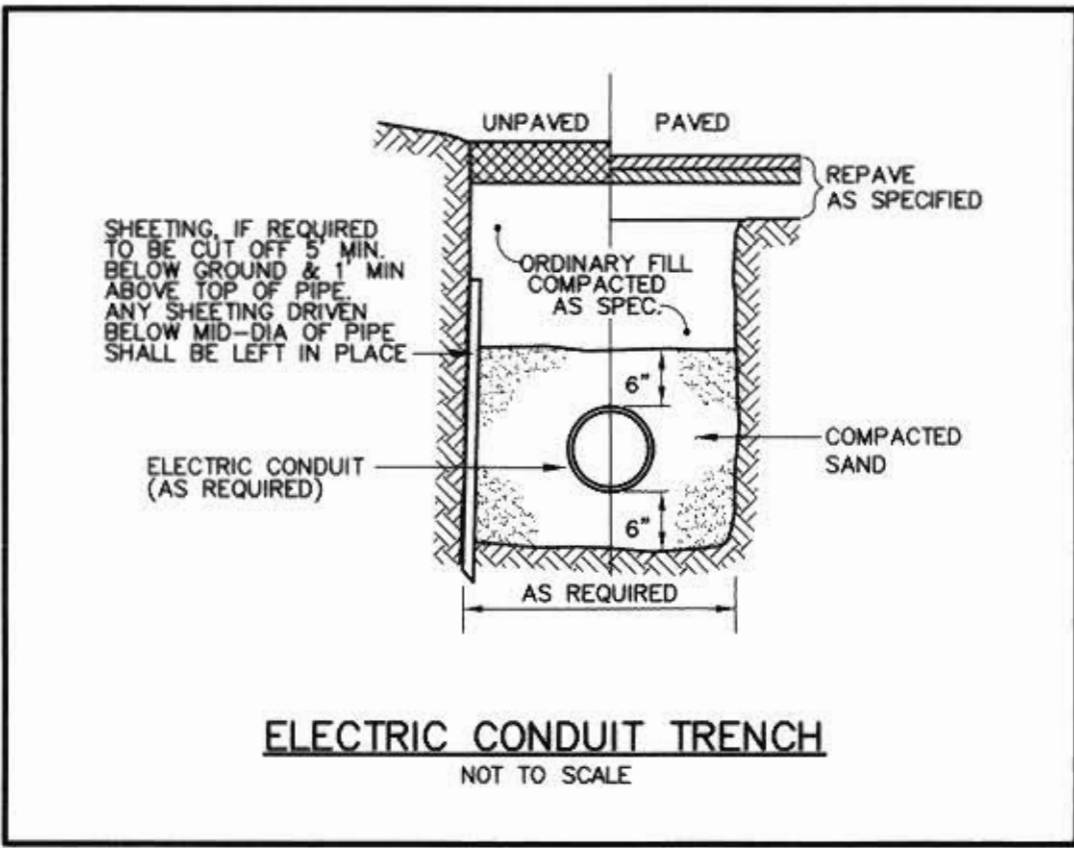
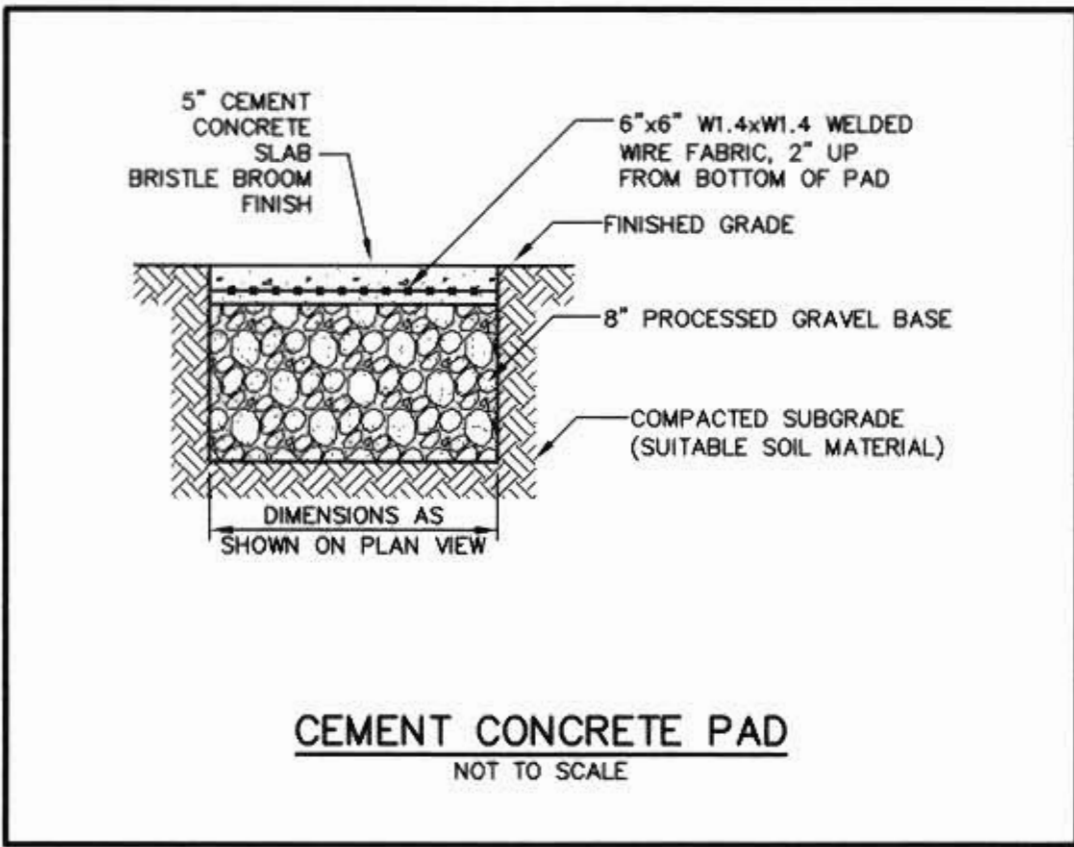
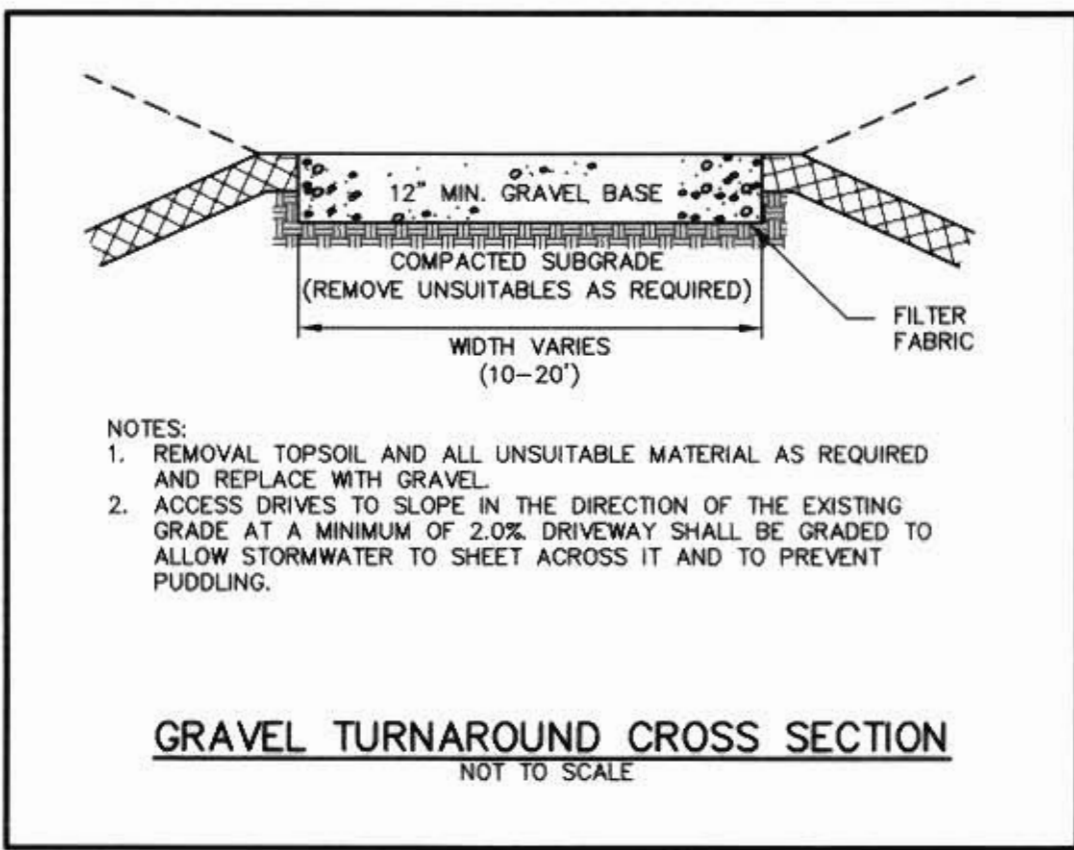
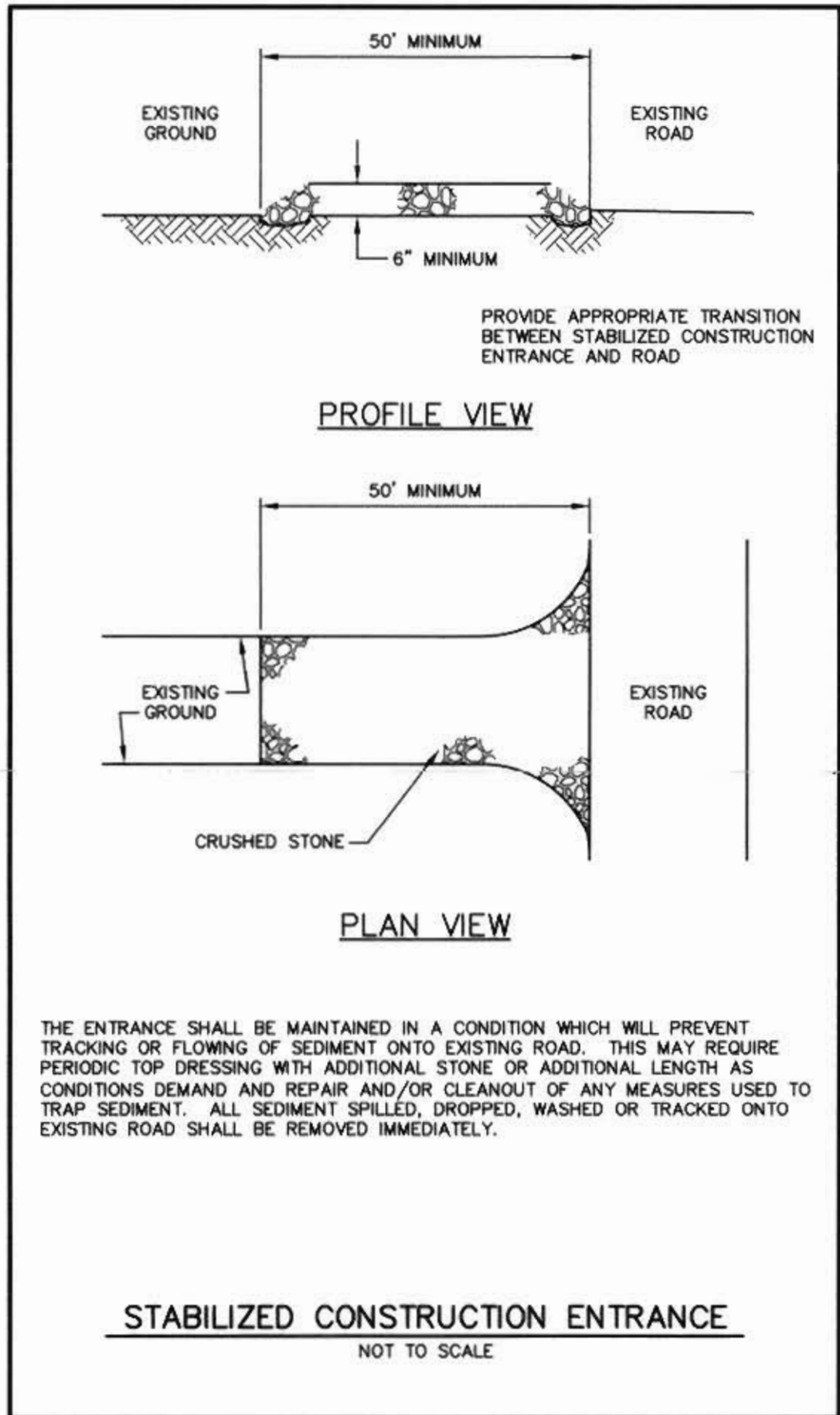
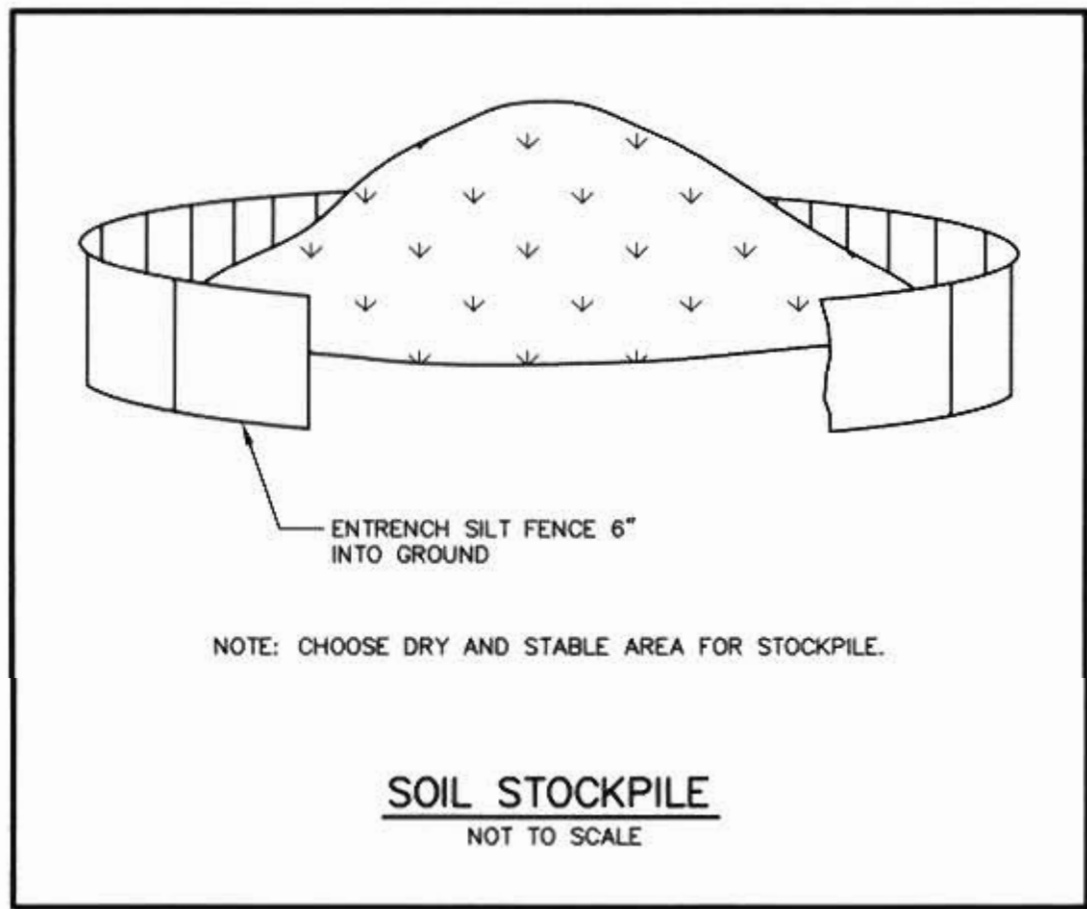
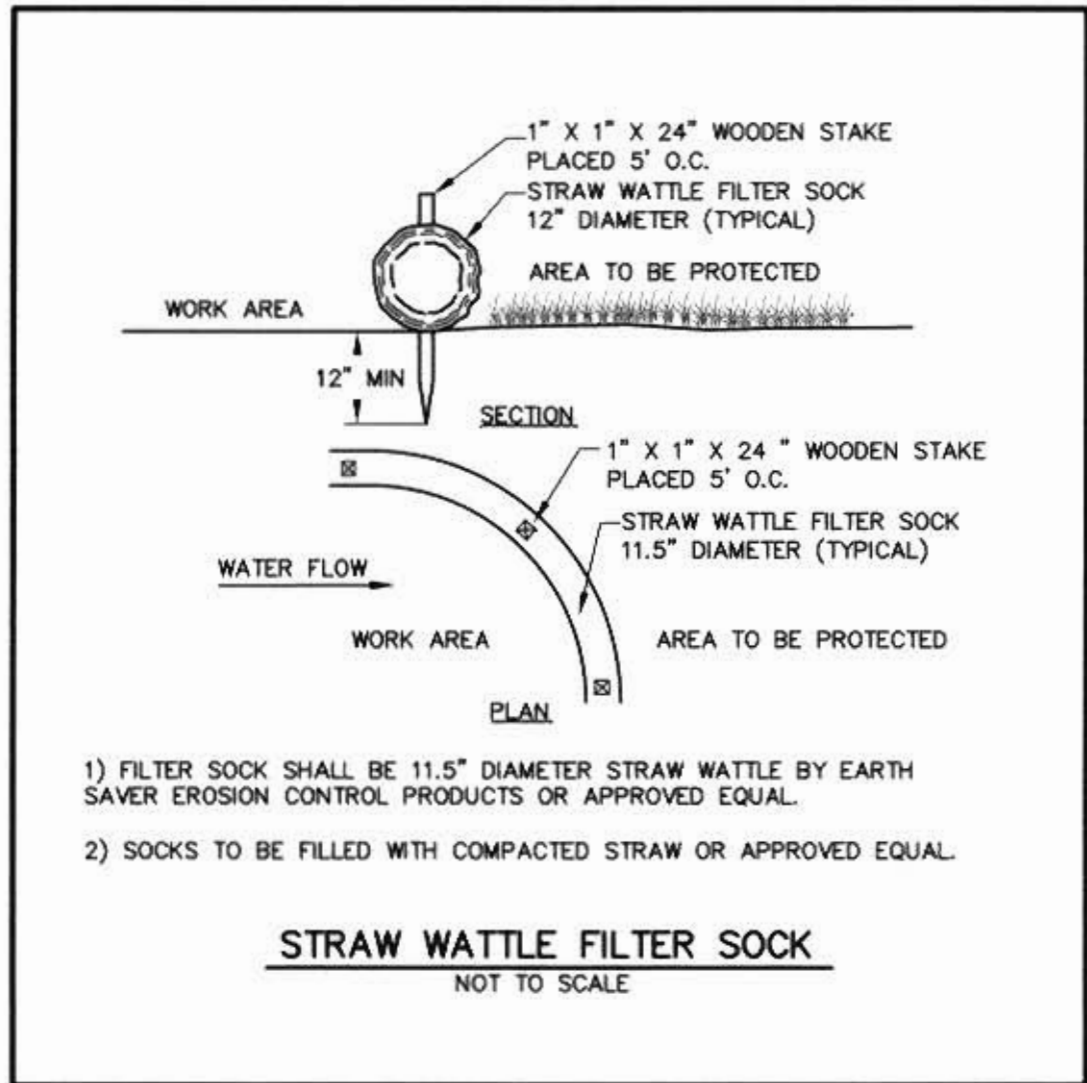
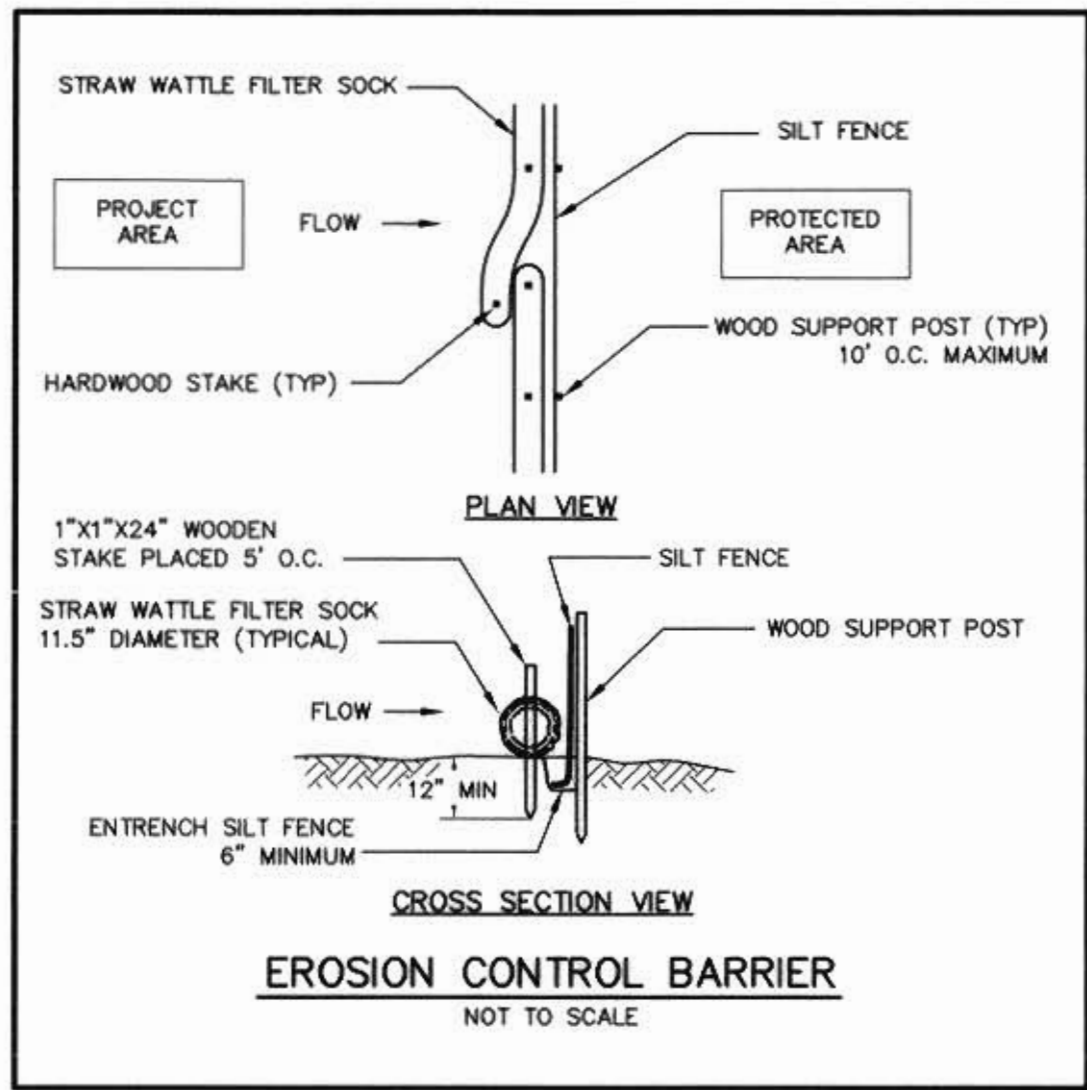
**C5.1**

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**Clean Energy COLLECTIVE**  
146 WEST BOYLSTON DRIVE  
3RD FLOOR  
WORCESTER, MA. 01606  
617-834-8567

RECORD OWNER:

**BRUCE A. BERRY TRUST,  
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508-376-5600

ASSESSORS PARCEL 22-27  
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DES	DWN	CHK'D	APP'D

PROJECT:  
**MILLIS E COMMUNITY  
SOLAR ARRAY**  
MILLIS, MASSACHUSETTS  
(NORFOLK COUNTY)

SCALE: AS NOTED DATE: JANUARY 6, 2017

**SITE DETAILS**

B+T JOB NO. 2832.00  
B+T PLAN NO. 283200P001E-007

**C6.1**



## TerraFarm Data Sheet



### TerraFarm Ground Mount - Landscape

**Application:** Commercial to Utility Scale  
**Grounding:** ETL listed, Electrically bonded system, verified Wiley  
**Panel Orientation:** Landscape  
**Array Configurations:** Up to 7 panels high and up to 12 panels long  
**Tilt Angle:** 5–45 degrees  
**Lower Panel Clearance:** Up to 48 inches, standard  
**Loading Conditions:** Up to 160 mph wind speed, 80 psf snow load, Exposure C  
**Warranty:** 20-year limited warranty  
**Engineering:** Professional Engineer Stamped Drawings Available in 50 States  
**Material:** Custom Engineered to Exceed Applicable ASCE, IBC, and UL Standards.  
**East-West Slope:** 20% maximum  
**North-South Slope:** 60% maximum, limited by installation equipment  
**Max Fuse Rating:** 30 Amp Fuse Rating

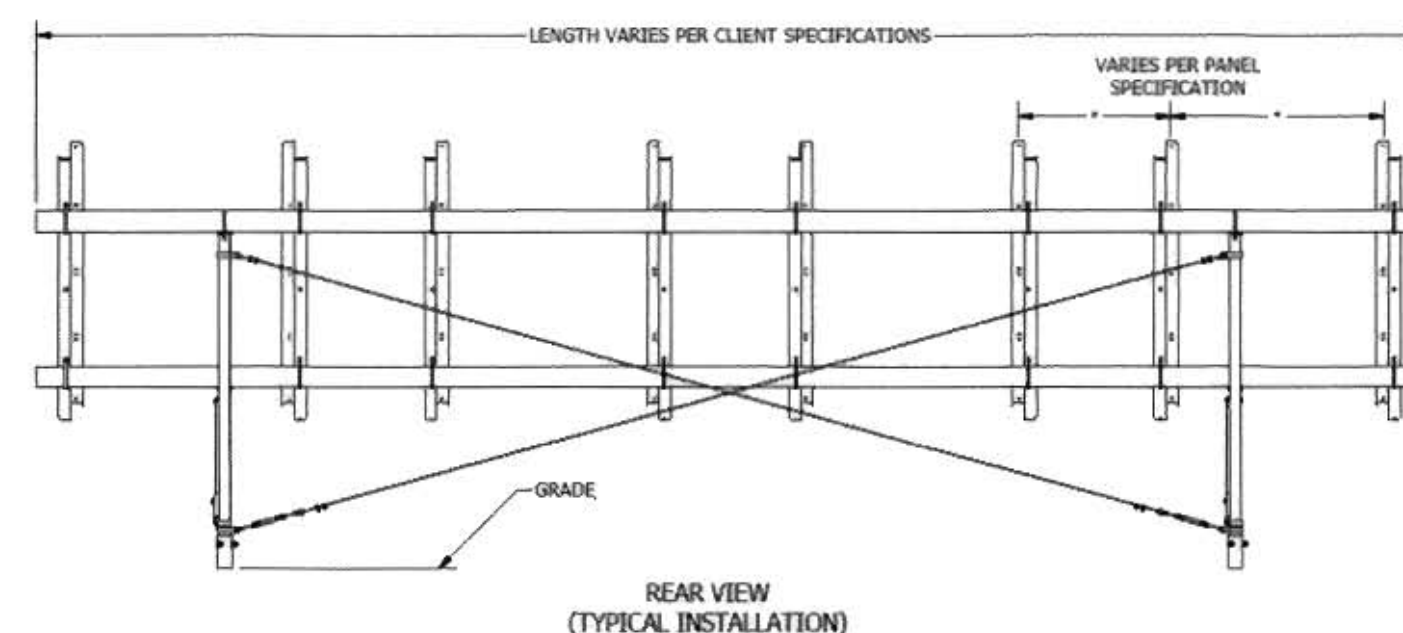
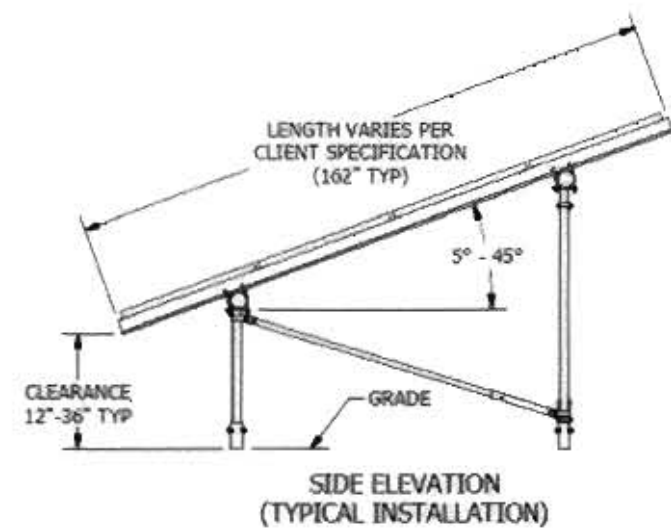


**Max Capacity of PV modules:**  
12 High x 12 Wide (144 Panels): Listed Frameless (Thin Film) PV Module (21" x 26" x 47"–51")  
7 High x 10 Wide (70 Panels): 54 Cell Listed Aluminum Framed PV Module (37"–41" x 56"–60")  
7 High x 9 Wide (63 Panels): 60 Cell Listed Aluminum Framed Module (37"–41" x 63"–67")  
7 High x 8 Wide (56 Panels): 72 Cell Listed Aluminum Framed Module (37"–41" x 75"–79")

PH:239.362.0211 F: 239.362.0586  
Visit us online at [www.terrasmart.com](http://www.terrasmart.com)

## Benefits

Minimal hardware to assemble  
No in-field drilling, cutting, or welding  
Significantly reduces installed labor costs  
Integrated foundation solution  
Turn-key installation service available, Foundation to Panels  
Pre-assembly options available  
Maximum adjustability for following grade



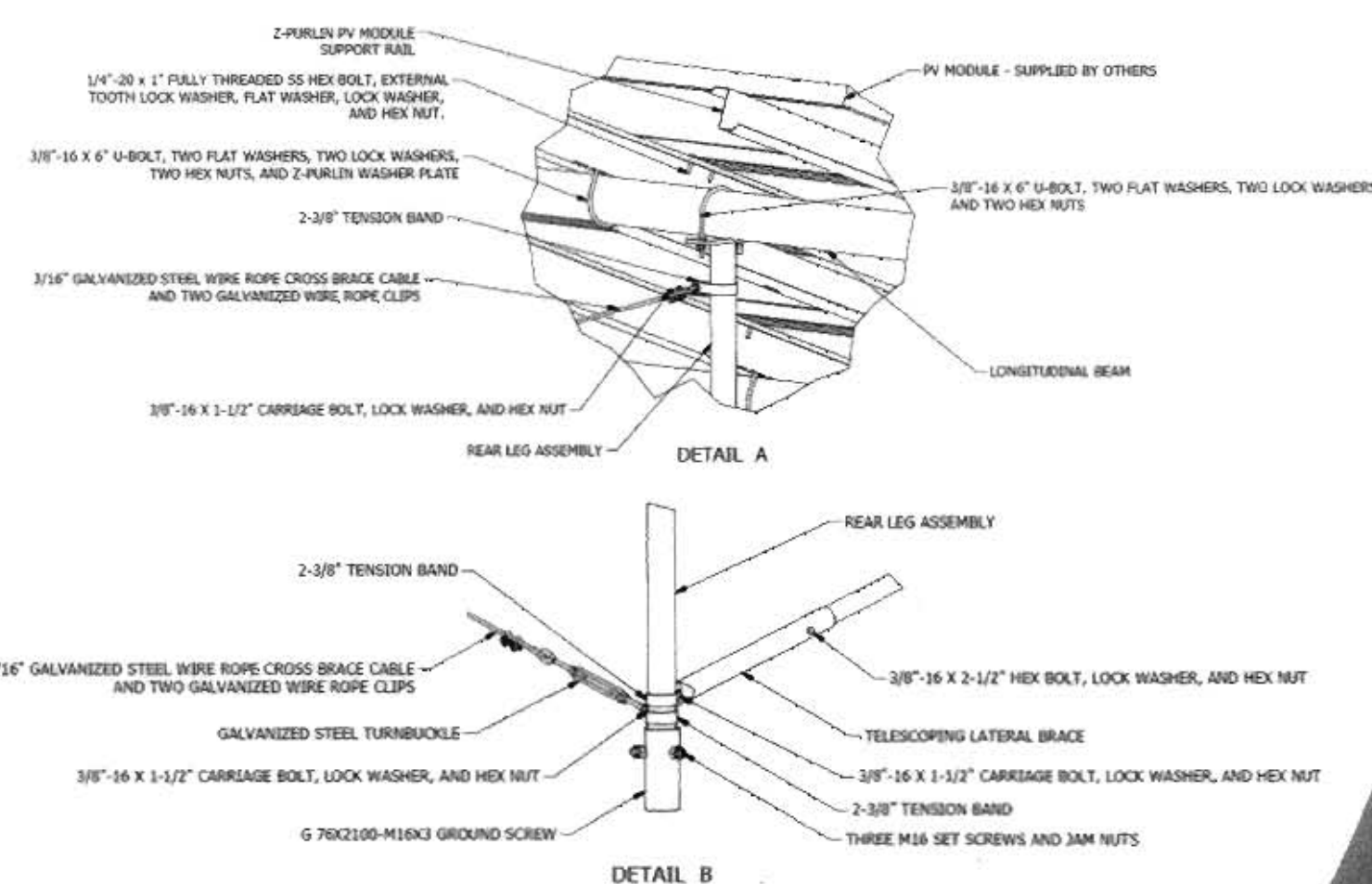
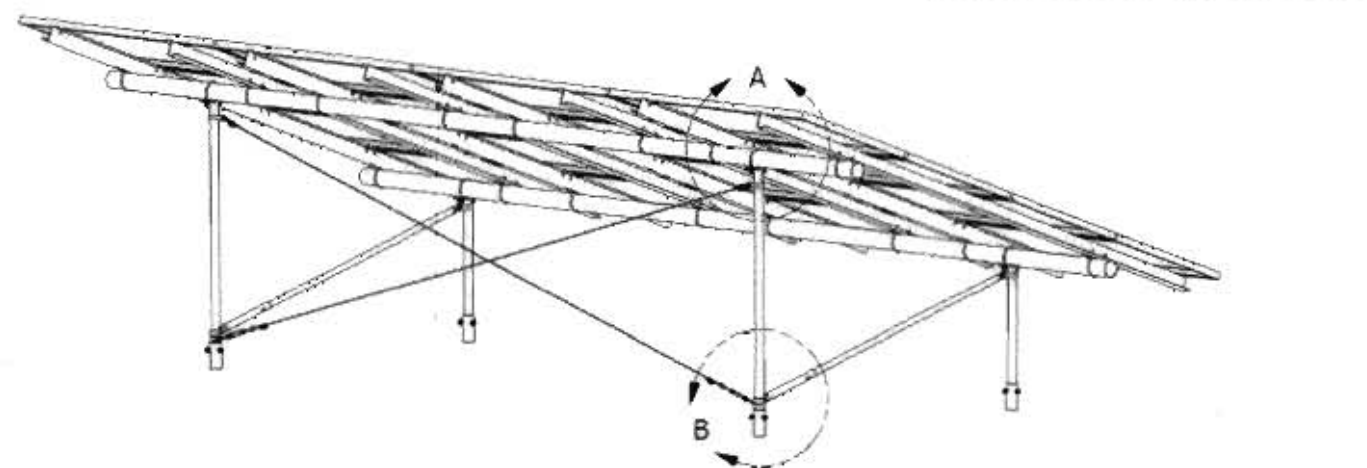
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### RACKING SYSTEM INFORMATION

NOT TO SCALE

#### NOTE:

INFORMATION SHOWN IS A GENERIC DETAIL OF THE RACKING STRUCTURAL SYSTEM PROPOSED. DIMENSIONAL INFORMATION SHOWN SUBJECT TO CHANGE BASED UPON MANUFACTURER'S STRUCTURAL DRAWINGS TO BE PREPARED PRIOR TO CONSTRUCTION OF ARRAY.



PH:239.362.0211 F: 239.362.0586  
Visit us online at [www.terrasmart.com](http://www.terrasmart.com)



**Clean Energy  
COLLECTIVE**

**1280 Main St.  
Millis, MA 02054**

**24-HOUR EMERGENCY NUMBER:  
844-232-7253**

**CleanEnergyCo.com**

### EMERGENCY CONTACT SIGN

NOT TO SCALE

PREPARED FOR:

**Clean Energy  
COLLECTIVE**  
146 WEST BOYLSTON DRIVE  
3RD FLOOR  
WORCESTER, MA., 01606  
617-834-8567

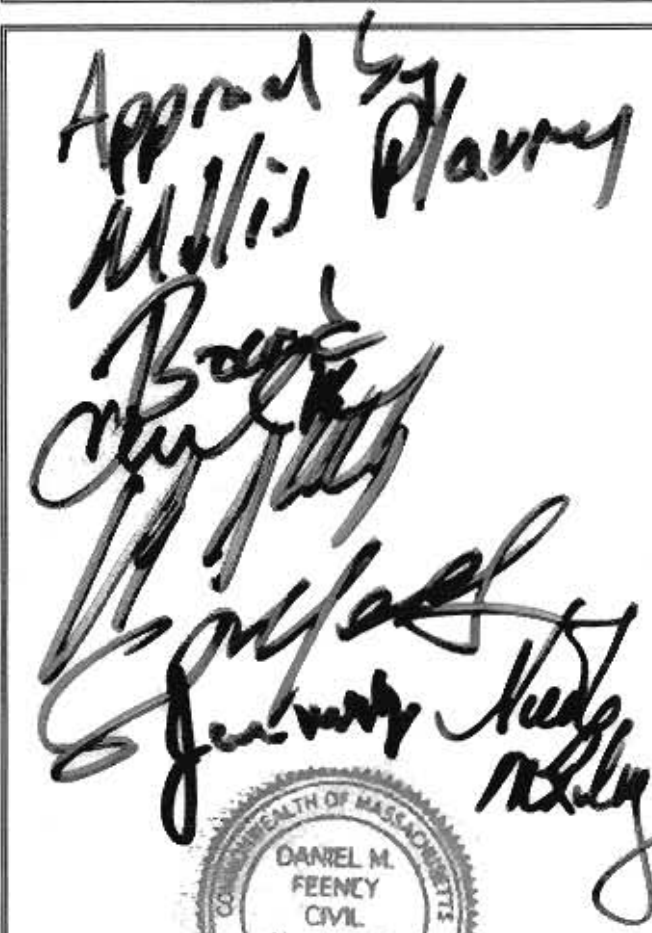
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ASSESSORS PARCEL 22-27  
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**MILLIS E COMMUNITY  
SOLAR ARRAY**  
MILLIS, MASSACHUSETTS  
(NORFOLK COUNTY)

SCALE: AS NOTED DATE: JANUARY 6, 2017

### SITE DETAILS

B+T JOB NO. 2832.00

B+T PLAN NO.  
283200P001E-008

**C6.2**

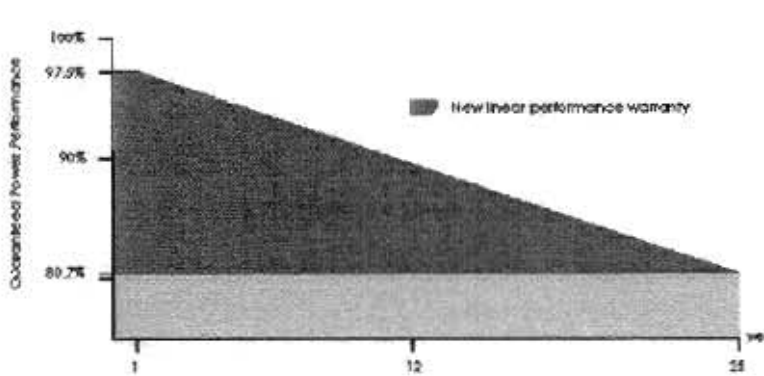


### KEY FEATURES

- Extreme high efficiency module:**  
Through the internal non-reflective technology to improve the power output. Polycrystalline 72-cell module achieves a power output up to 325Wp.
- Anti-PID Guarantee:**  
Through the unique high reliability encapsulating technology to make sure the module passes anti-PID characteristic under high temperature and humidity for a long time. Have passed anti-PID test 60°C/85% RH condition for 1000h.
- Low-light Performance:**  
Advanced glass and surface texturing allow for excellent performance in low-light environments.
- Severe Weather Resilience:**  
Certified to withstand wind load (2400 Pascal) and snow load (5400 Pascal).
- Durability against extreme environmental conditions:**  
High salt mist and ammonia resistance certified by TÜV NORD.
- Temperature Coefficient:**  
Improved temperature coefficient decreases power loss during high temperatures.

### LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty • 25 Year Linear Power Warranty

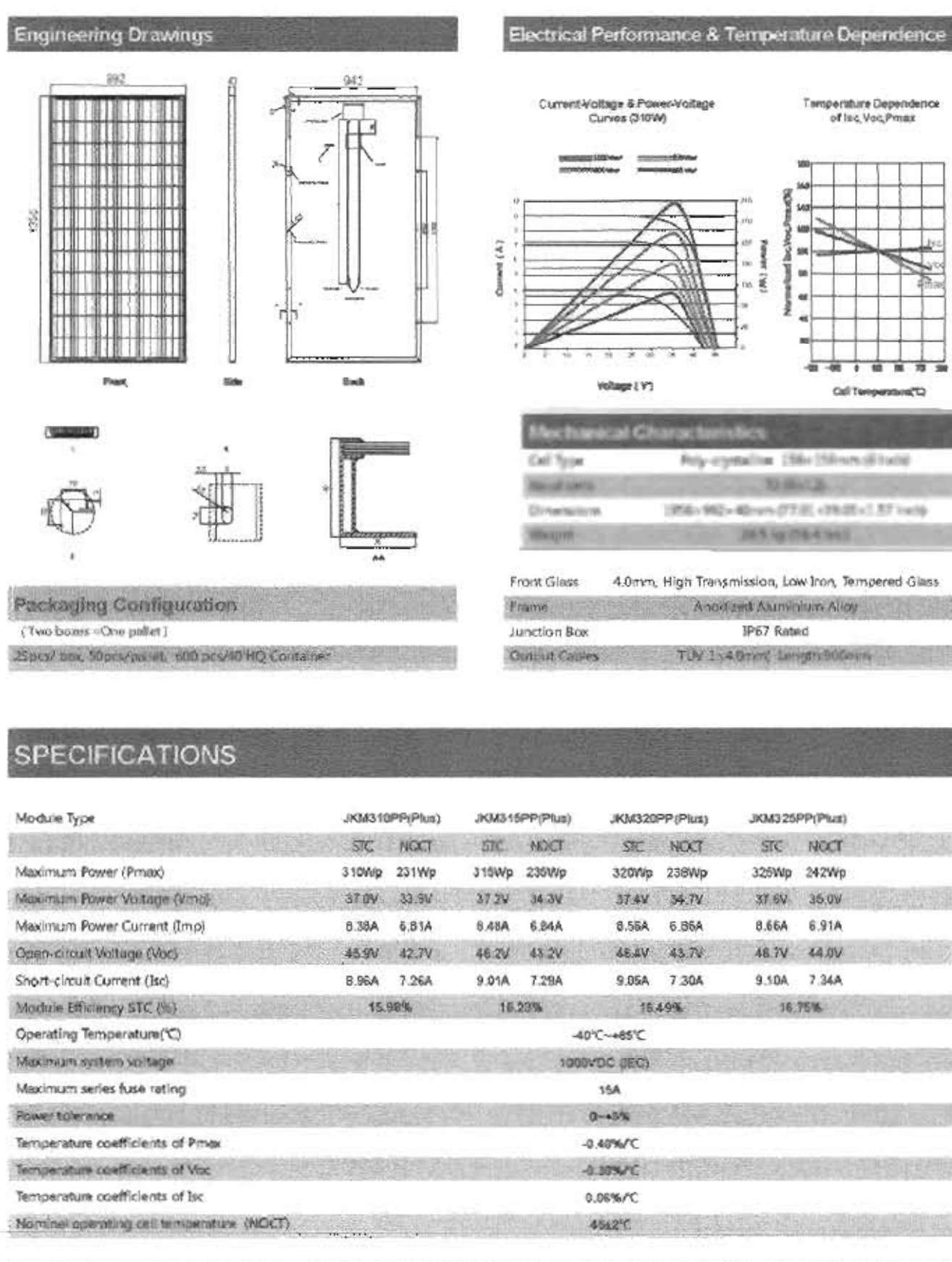


### SOLAR MODULE INFORMATION

NOT TO SCALE

#### NOTE:

SOLAR MODULE SHOWN IS FOR INFORMATIONAL PURPOSES ONLY AND MAY BE SUBJECT TO CHANGE.



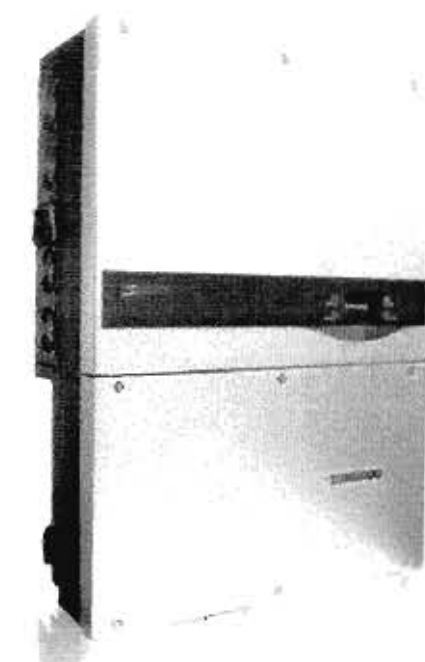
STC: Irradiance 1000W/m<sup>2</sup> Cell Temperature 25°C AM=1.5  
NOCT: Irradiance 800W/m<sup>2</sup> Ambient Temperature 20°C AM=1.5 Wind Speed 1m/s

\* Power measurement tolerance: ± 3%

The company reserves the final right for explanation on any of the information presented hereby. EN-MKT-325PP(Plus)\_rev012015

## SG60KU-M

String Inverter



**Efficient and Flexible**

- High flexibility for complex configurations due to 4 MPPT trackers and a wide input voltage range
- High yields due to efficiency up to 98.5% and CEC efficiency of 98.5%
- Output power up to 60KVA/60KW at power factor of 1
- Can be installed at any angle

**Intelligent Design**

- Integrated combiner box: 16 x Screw terminal pairs with DC wiring fuses (both positive and negative), Type II overvoltage protection (both DC and AC), DC and AC switch, more safety and lower the system cost
- Integrated string detection function and arc fault detection

**Flexible**

- Active power continuously adjustable (0–100%)
- Fulfills a variety of reactive power adjustment requirements with power factor 0.8 leading–0.8 lagging
- Integrated LVRT and CVT function
- Includes RS-485 and Ethernet interface, compatible with all common monitoring systems

**Reliable**

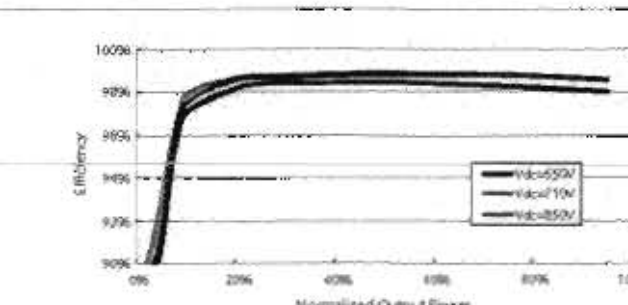
- Product certification: UL IEEE 1574 IEEE 1674-1 CSA C22.2 107.1-01-2001, FCC Part 15 Sub-part B Class B Limits
- Manufacturer certification: ISO 9001, ISO 14001, OHSAS 18000

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SG 60KU-M

DC		Protection	
Maximum PV Input Voltage	1000V	Anti-islanding Protection	Yes
Start-Up Voltage	300V	Low Voltage Ride Through	Yes
Stop Voltage	280V	DC Reverse Connection Protection	Yes
MPPT Voltage Range	300–950V	AC Short Circuit Protection	Yes
MPPT Voltage Range for Nominal Power	300–850V	Leakage Current Protection	Yes
String Fuses	Positive and Negative	AC Switch	Yes
Number of MPPTs	4	Mechanical Data	
Maximum Number of DC Inputs	16	Dimensions (WxHxD)	28.18" x 36.02" x 10.87" 688/913/276mm
Maximum DC short circuit current	250A	Mounting Method	Wall bracket
Maximum Current for Input Connector	15A	Weight	154lbs 70kg
Maximum Cable Size	10AWG, Cu or Al	Communication	
APCI	Yes	RS485	Standard
DC Switch	Yes	Ethernet	Standard
Insulation Detection	Yes	IO Dry Contact	Standard
DC Surge Arrester	Type II DIN Rail Surge Arrester (40kA)	Protocol	Modbus
AC		System Data	
Nominal AC Output Power	60000W	Maximum Efficiency	98.90%
Maximum AC Output Apparent Power	60000VA	CEC Efficiency	98.50%
Maximum AC Output Current	80A	Transformerless	Yes
Nominal AC Voltage	3øW or 4W Ground, 277/480Vac	Ingress Protection Rating	NEMA 4X
AC Voltage Range	432–520Vac	Typ. Losses	<1W
Nominal Grid Frequency	60Hz	Operating Ambient Temperature Range	-15°F to 140°F (-12°F derating) 48°C to 80°C (+45°C derating)
Grid Frequency Range	55–65Hz	Allowable Relative Humidity Range	0–100%
THD	<5% (Nominal Power)	Cooling Method	Smart Fanless Air Cooling
DC Current Injection Power Factor	>0.99 @ Default Value at Nominal Power/45, 0.8 leading–0.8 lagging	Max. Operating Altitude	13120ft (4000m derating)
Maximum Cable Size	250AWG, Cu or Al	Display	Graphic LCD
Type II DIN Rail Surge Arrester	Yes	Communication	RS485 / Ethernet
		DC Connection Type	Screw Terminals
		AC Connection Type	Screw Clamp Terminal
		Certification	CE/UL
		Safety and EMC Standard	UL1741, IEEE 1547, IEEE1547.1, CSA C22.2 107.1-01-2001, FCC Part 15 Sub-part B Class B Limits, UL 1998

### Efficiency Curve



### INVERTER INFORMATION

NOT TO SCALE

#### NOTE:

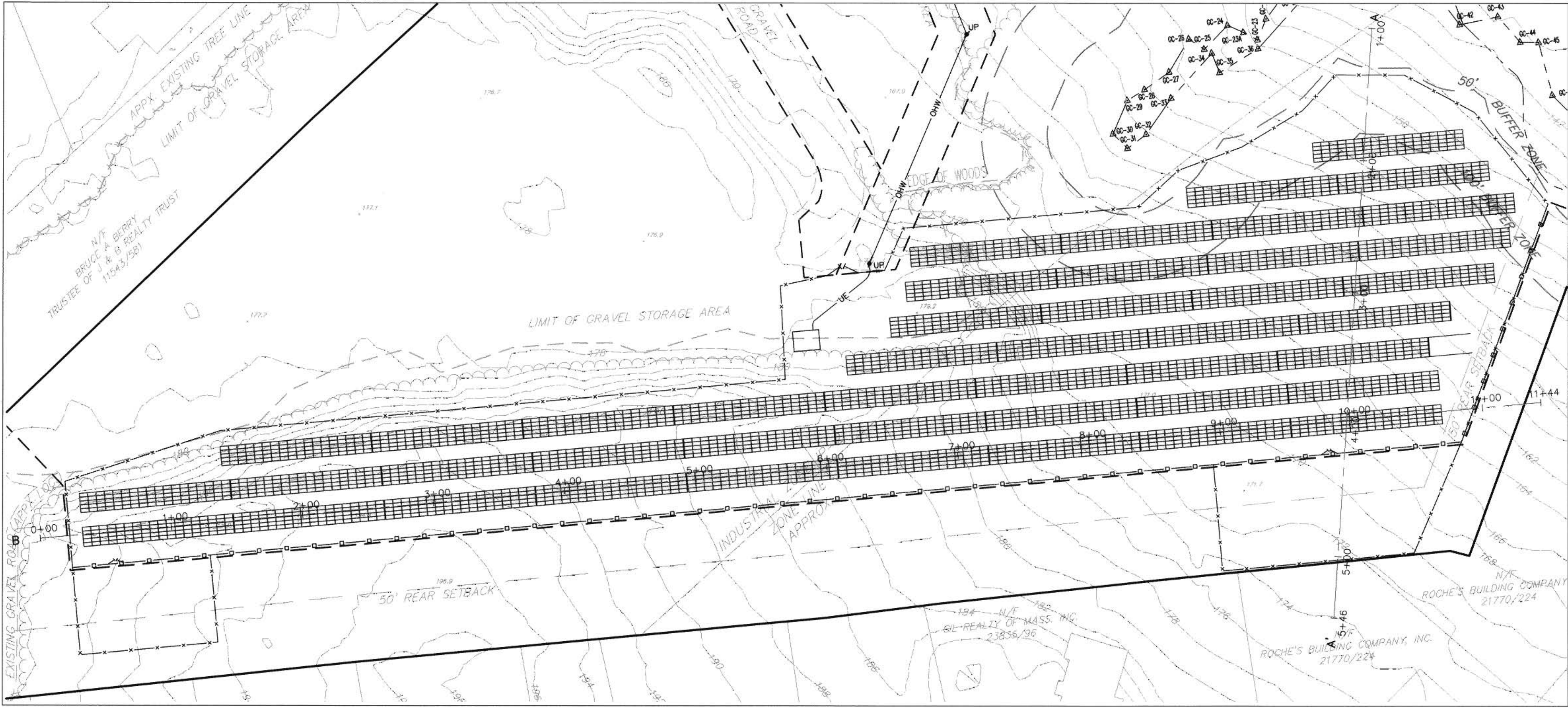
INVERTER MODEL SHOWN IS FOR INFORMATIONAL PURPOSES ONLY AND MAY BE SUBJECT TO CHANGE.

FOR NOTES, REFERENCES AND LEGEND SEE SHEET C1.1.

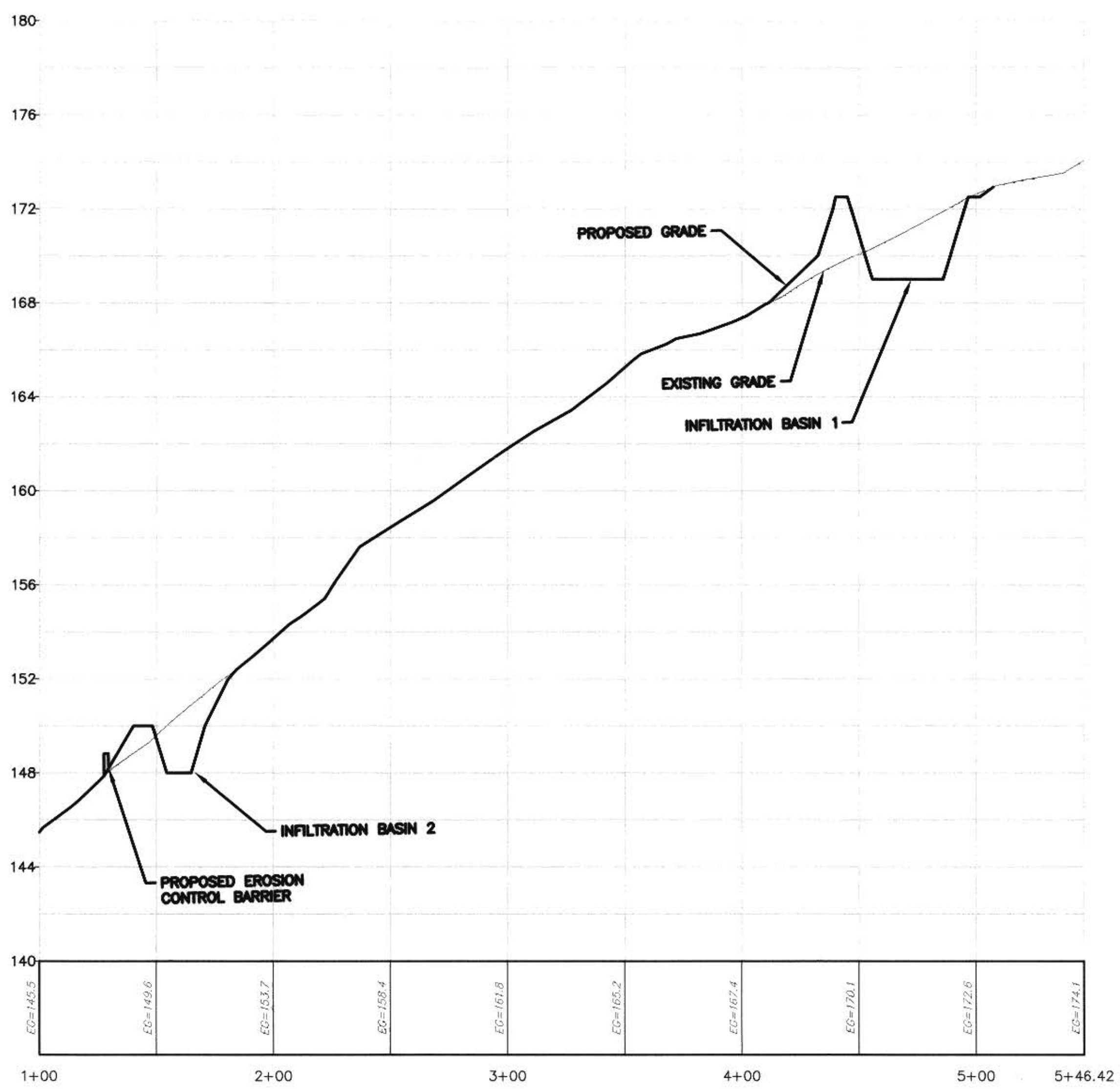
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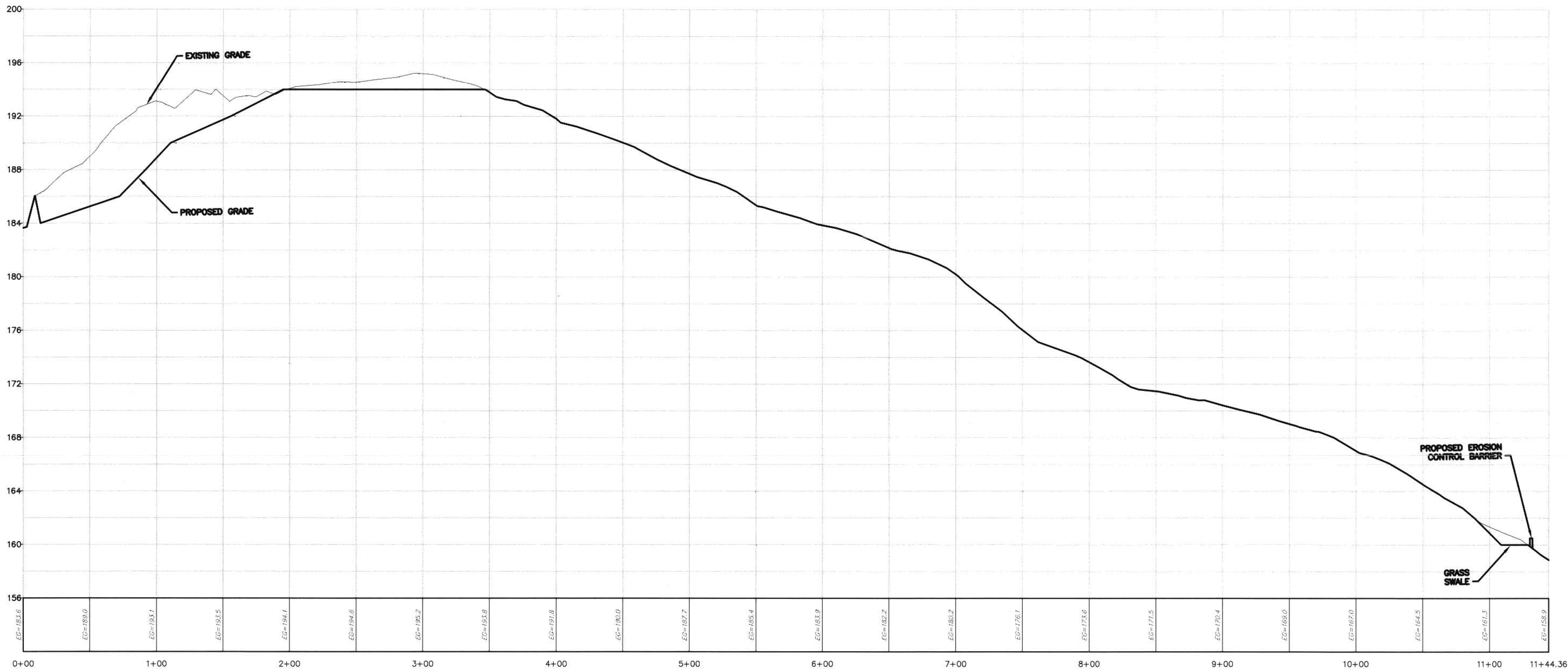




**PLAN VIEW** SCALE: 1" = 50'



**CROSS SECTION A-A** SCALE: 1" = 40' HORIZONTAL  
SCALE: 1" = 4' VERTICAL



**CROSS SECTION B-B** SCALE: 1" = 40' HORIZONTAL  
SCALE: 1" = 4' VERTICAL

APPROVAL BY THE  
MILLIS PLANNING BOARD

*[Signature]*

DATE: 01/06/2017

THIS ENDORSEMENT OF THE  
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PREPARED FOR:

**Clean Energy COLLECTIVE.**

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RECORD OWNER:

**BRUCE A. BERRY TRUST,  
J&B REALTY TRUST**

508-376-5600

ASSESSORS PARCEL 22-27  
DEED BOOK 11543 PAGE 582

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PREPARED BY:

**BEALS + THOMAS**  
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DES	DWN	CHK'D	APP'D

PROJECT:

**MILLIS E COMMUNITY  
SOLAR ARRAY**

MILLIS, MASSACHUSETTS  
(NORFOLK COUNTY)

SCALE: AS NOTED DATE: JANUARY 6, 2017

**PLAN AND PROFILE**

B+T JOB NO. 283200  
B+T PLAN NO. 283200P001E-009

**C7.1**