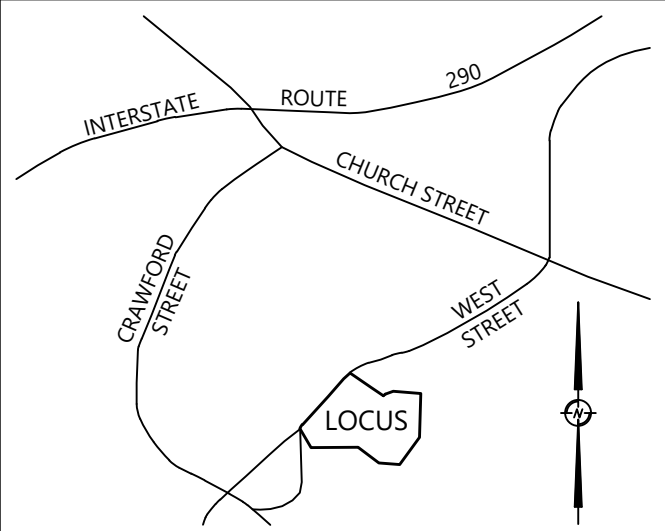
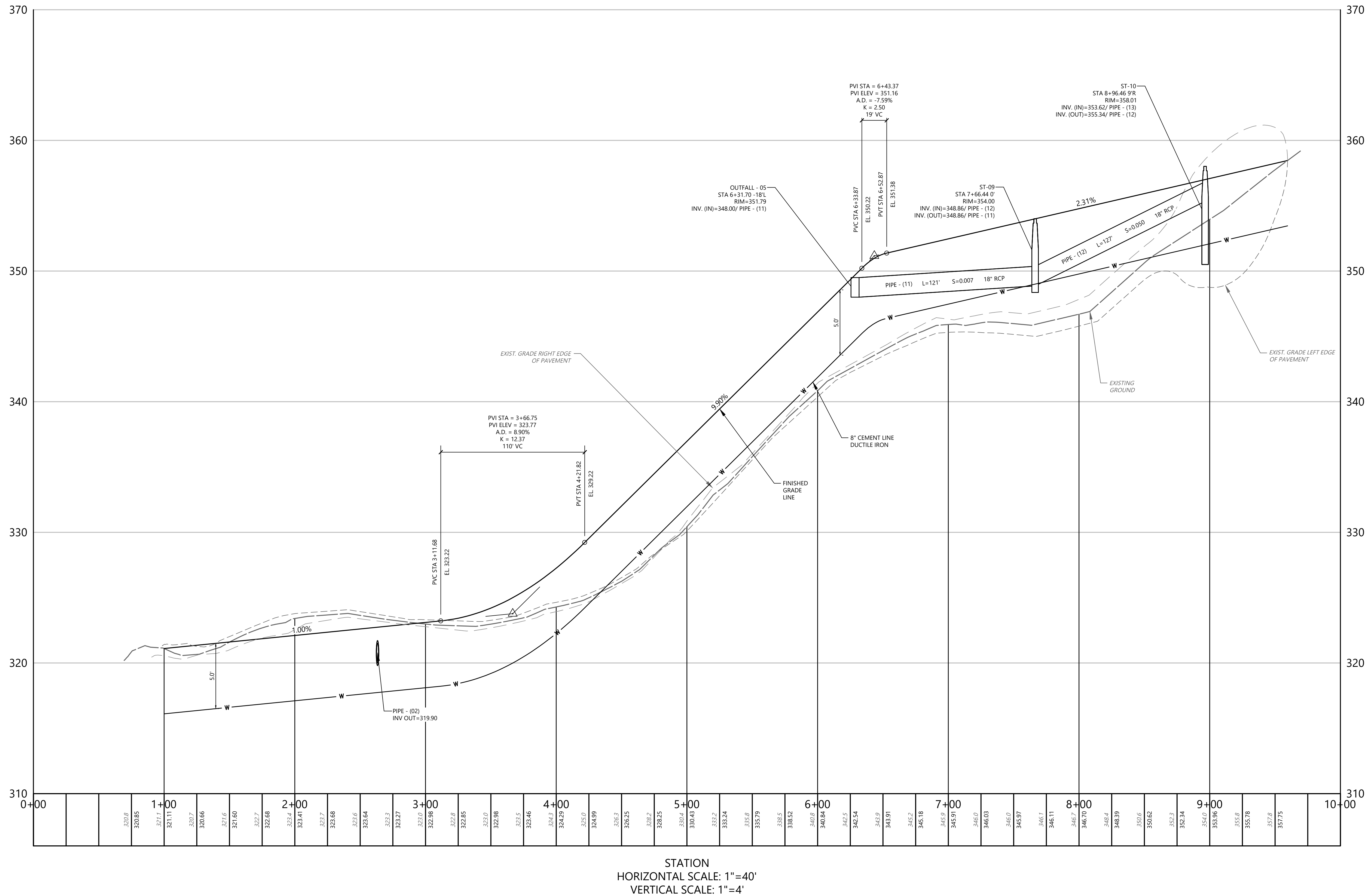


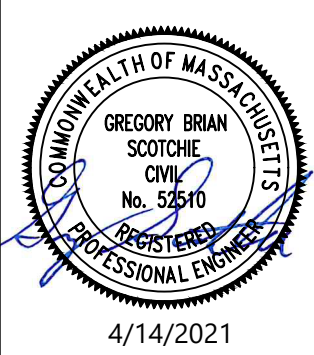
PROFILE: COMMON DRIVEWAY



LOCUS MAP
N.T.S.

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REV.	DATE	DESCRIPTION	INIT.
E	4/14/2021	TOWN COMMENTS	GBS
D	3/16/2021	FOR DATE ONLY	GBS
C	2/24/2021	PLANNING BOARD COMMENTS	GBS
B	12/14/20	FOR DATE ONLY	GBS
A		INITIAL ISSUE	GBS



PREPARED BY:
WDA DESIGN GROUP
31 EAST MAIN STREET WESTBOROUGH, MA
508.366.6552
WDA-DG.COM

OWNER:
Brant L. Viner & Margaret Harling
P.O Box 295
Ellsworth, ME 04605

PREPARED FOR:
Brant L. Viner & Margaret Harling
P.O Box 295
Ellsworth, ME 04605

TITLE:
COMMON DRIVEWAY PROFILE
85 & 98 COMMON DRIVEWAY
85 & 95 West Street
Northborough, MA 01532
(Worcester County)

NOTICE OF INTENT

JOB NO.:	1207.03	DATE:	11/20/20
DWN. BY:	GBS	SHEET:	C4.00
CHK'D. BY:	BPW/JRW		

GENERAL NOTES

- DESCRIPTION: 85 & 95 WEST STREET HAVE 6.6 AND 10.7 ACRES RESPECTIVELY FOR A TOTAL OF 17.3 ACRES. THE PROPOSED DEVELOPMENT, DISTURBING ± 242,552 SF (5.5682 AC.), IS BORDERED ON THE NORTH BY WEST STREET. THE PROJECT DEED AND PLAN BOOK REFERENCES ARE Deed Book 15417 Page 232 Plan Book 438 Plan 122; Plan Book 663 Plan 16, TOWN OF NORTHBOROUGH, Worcester County, MASSACHUSETTS. PROPOSED CONSTRUCTION WILL INCLUDE DEMOLITION OF EXISTING PAVEMENT AND CONSTRUCTION OF 3 SINGLE RESIDENTIAL UNITS WITH ASSOCIATED DRIVES, UTILITIES, AND STORMWATER MANAGEMENT SYSTEM.
- NAME, ADDRESS, AND PHONE NUMBER OF THE PROPERTY OWNER:
Brant L. Viner & Margaret Harling
P.O. Box 295
Ellsworth, ME 04605
CONTACT: Brant L. Viner & Margaret Harling
PHONE: T.B.D.
- NAME AND PHONE NUMBER OF THE 24-HOUR LOCAL CONTACT PERSON RESPONSIBLE FOR EROSION CONTROL EMERGENCIES
NAME: T.B.D.
PHONE: T.B.D.
- ENGINEER/DESIGNER:
WDA DESIGN GROUP
CIVIL ENGINEERS, LANDSCAPE ARCHITECTS, SURVEYORS, PLANNERS
33 EAST MAIN STREET, WESTBOROUGH, MA 01581
(508) 366-6552
WDA-DS.COM
PHONE: (508) 366-6552
CONTACT: BRIAN WATERMAN
- SITE LOCATION:
85 & 95 West Street
Northborough, MA 01532
PROJECT IS LOCATED IN Plan Book 438 Plan 122; Plan Book 663 Plan 16, TOWN OF NORTHBOROUGH, Worcester County, MASSACHUSETTS.
ZONING INFORMATION: RB/RESIDENCE B
SITE AREA: ±763,588 SF
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- THIS SITE IS WITHIN THE LIMITS OF A 1 OR 0.2% ANNUAL CHANCE FLOOD HAZARD AREA AS PER F.I.R.M. FOR Worcester County, MASSACHUSETTS. COMMUNITY PANEL NO. 25027C0633F EFFECTIVE JULY 16, 2014.
- SOIL INFORMATION:

CHATFIELD-HOLLIS-ROCK OUTCROP COMPLEX, 0 TO 15 PERCENT SLOPES (102C)
WINDSOR LOAMY SAND, 3 TO 8 PERCENT SLOPES (255B)
PAXTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES (305B)
PAXTON FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES (305C)
PAXTON FINE SANDY LOAM, 0 TO 8 PERCENT SLOPES, VERY STONY (306C)
PAXTON FINE SANDY LOAM, 15 TO 25 PERCENT SLOPES, EXTREMELY STONY (307D)
WOODBIDGE FINE SANDY LOAM, 0 TO 8 PERCENT SLOPES, EXTREMELY STONY (312B)

CONSTRUCTION PHASING PLAN

PRE-CONSTRUCTION

- PREPARE AND SUBMIT NOTICE OF INTENT WITH US EPA FOR COVERAGE UNDER NPDES CONSTRUCTION GENERAL PERMIT FOR CONSTRUCTION PROJECTS DISTURBING OVER 1 ACRE OF LAND AT LEAST 14 DAYS PRIOR TO LAND DISTURBANCE.
- PREPARE AND PLACE ON-SITE STORMWATER POLLUTION PREVENTION PLAN IN ACCORDANCE WITH NPDES CONSTRUCTION GENERAL PERMIT.
- INSTALL DEP FILE NO. SIGN AND NPDES PERMIT ID SIGN AT PROJECT SITE.

PHASE 1

- INSTALL PROPOSED SILTATION CONTROL MEASURES AS SHOWN ON THESE PLANS. (REFER TO EROSION AND SEDIMENTATION CONTROL DETAILS FOR ADDITIONAL INFORMATION ON SILTATION CONTROL PRACTICES TO BE USED THROUGHOUT THE SITE).
- CONSTRUCT CRUSHED STONE TRACKING PADS PRIOR TO ANY EARTHWORK OR TREE CLEARING BEING PERFORMED.
- NOTIFY CONSERVATION COMMISSION AGENT FOLLOWING INSTALLATION OF SILTATION CONTROL PRIOR TO ANY MAJOR EXCAVATION OR LAND DISTURBANCE TAKING PLACE.
- CLEAR AND GRUB SITE. CONTRACTOR SHALL MAINTAIN FOREST MAT AND/OR SLASH MATERIALS FROM TREE CLEARING FOR TEMPORARY EROSION CONTROLS IN AREAS NOT IMMEDIATELY SCHEDULED FOR CUT/FILL ACTIVITIES TO MINIMIZE POTENTIAL FOR WASHOUT OF DISTURBED SOIL SURFACES.
- CONSTRUCT FILL SLOPES AND STABILIZE DISTURBED SLOPES AS NECESSARY WITH PERMANENT SEEDING.
- CONSTRUCT TEMPORARY SEDIMENT BASIN.

PHASE 2

- ROUGH GRADE PROPOSED PAVE AREAS AND RESIDENTIAL LOT AREAS.
- CONSTRUCT INFILTRATION BASINS AND STABILIZE DISTURBED SLOPES AS NECESSARY WITH PERMANENT SEEDING.
- PREPARE BUILDING PAD AREAS FOR FOUNDATION INSTALLATION.
- CONSTRUCT COMMON DRIVE AND BUILDING FOUNDATIONS.
- INSTALL COMMON DRIVE AND LOT DRAINAGE AND UTILITIES INFRASTRUCTURE.

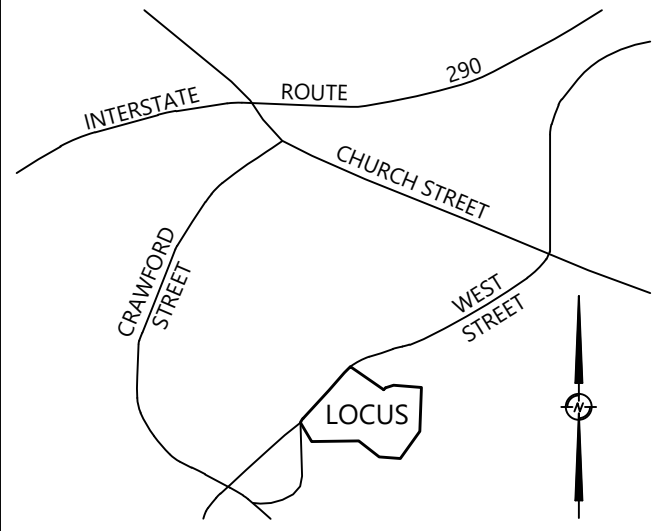
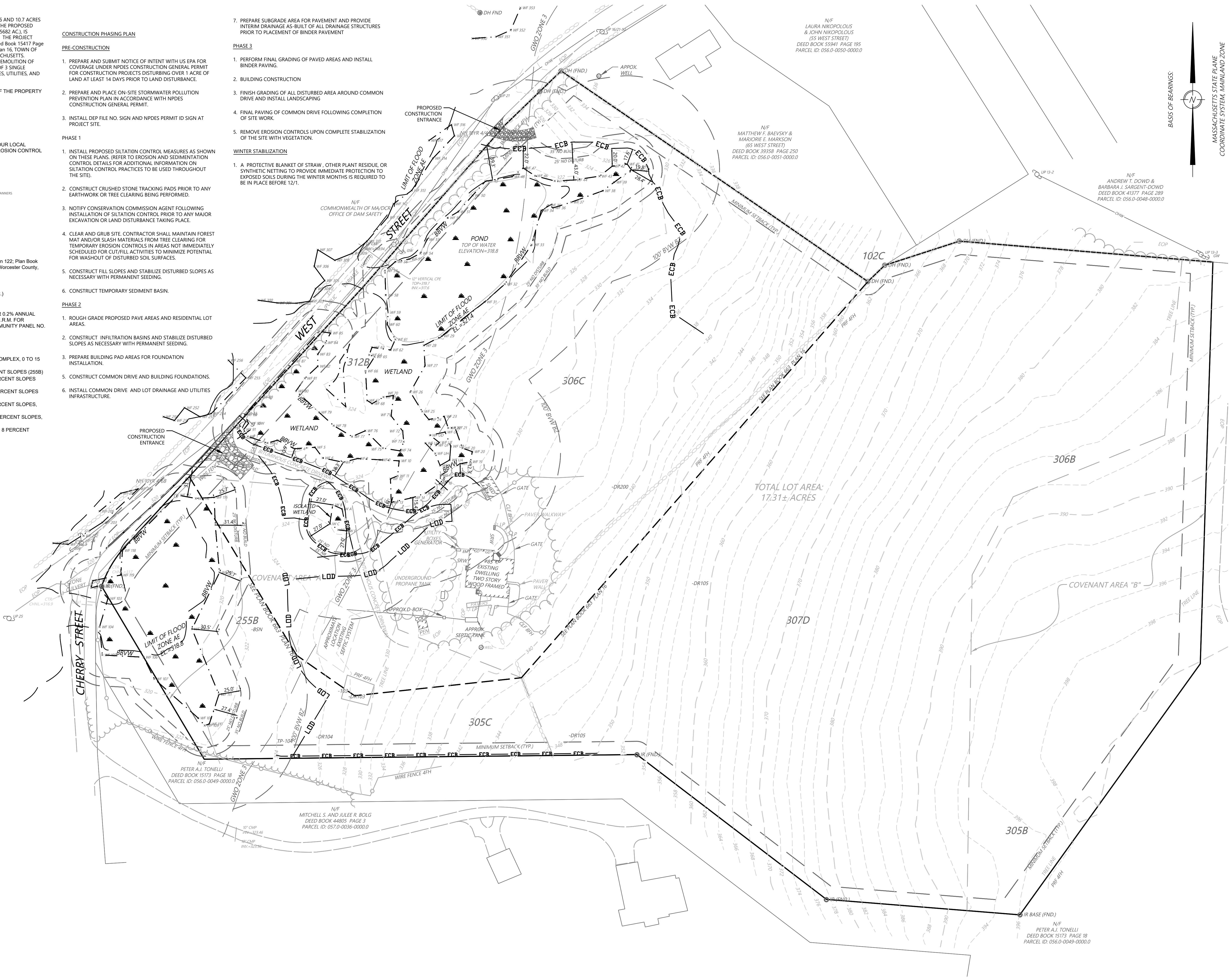
- PREPARE SUBGRADE AREA FOR PAVEMENT AND PROVIDE INTERIM DRAINAGE AS-BUILT OF ALL DRAINAGE STRUCTURES PRIOR TO PLACEMENT OF BINDER PAVEMENT

PHASE 3

- PERFORM FINAL GRADING OF PAVED AREAS AND INSTALL BINDER PAVING.
- BUILDING CONSTRUCTION
- FINISH GRADING OF ALL DISTURBED AREA AROUND COMMON DRIVE AND INSTALL LANDSCAPING
- FINAL PAVING OF COMMON DRIVE FOLLOWING COMPLETION OF SITE WORK.
- REMOVE EROSION CONTROLS UPON COMPLETE STABILIZATION OF THE SITE WITH VEGETATION.

WINTER STABILIZATION

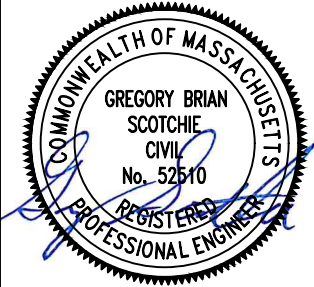
- A. PROTECTIVE BLANKET OF STRAW, OTHER PLANT RESIDUE, OR SYNTHETIC NETTING TO PROVIDE IMMEDIATE PROTECTION TO EXPOSED SOILS DURING THE WINTER MONTHS IS REQUIRED TO BE IN PLACE BEFORE 12/1.



LOCUS MAP
N.T.S.

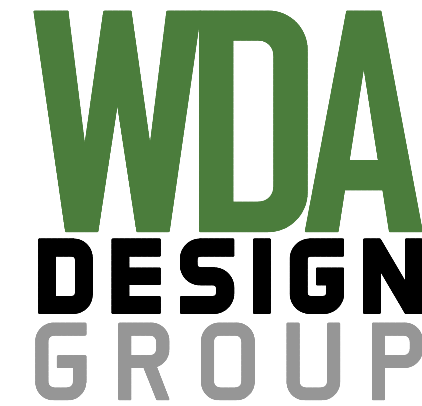
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4/14/2021

PREPARED BY:



31 EAST MAIN STREET, WESTBOROUGH, MA
508.366.6552
WDA-DS.COM

OWNER:

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Harling
P.O. Box 295
Ellsworth, ME 04605

PREPARED FOR:

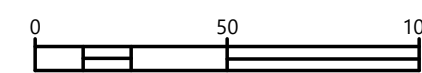
Brant L. Viner & Margaret
Harling
P.O. Box 295
Ellsworth, ME 04605

TITLE:

EROSION CONTROL
PLAN - PHASE 1

85 & 98 COMMON
DRIVEWAY
85 & 95 West Street
Northborough, MA 01532
(Worcester County)

NOTICE OF INTENT



JOB NO.:	1207.03	DATE:	11/20/20
DWN. BY:	GBS	SHEET:	
CHK'D. BY:	BPW/JRW		

C5.00

GENERAL NOTES

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NAME: T.B.D.
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- ENGINEER/DESIGNER:
WDA DESIGN GROUP
CIVIL ENGINEERS, LANDSCAPE ARCHITECTS, SURVEYORS, PLANNERS
31 EAST MAIN STREET, WESTBOROUGH, MA 01581
508.366.6552
WDA-DSG.COM
PHONE: (508) 366-6552
CONTACT: BRIAN WATERMAN
- SITE LOCATION:
85 & 95 West Street
Northborough, MA 01532
PROJECT IS LOCATED IN Plan Book 438 Plan 122; Plan Book 663 Plan 16, TOWN OF NORTHBOROUGH, Worcester County, MASSACHUSETTS.
ZONING INFORMATION: R2/RESIDENCE B
SITE AREA: ±763,588 SF
DISTURBED AREA ± 242,552 SF (5.5682 AC.)
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PAXTON FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES (305C)
PAXTON FINE SANDY LOAM, 0 TO 8 PERCENT SLOPES, VERY STONY (200C)
PAXTON FINE SANDY LOAM, 15 TO 25 PERCENT SLOPES, EXTREMELY STONY (307D)
WOODBIDGE FINE SANDY LOAM, 0 TO 8 PERCENT SLOPES, EXTREMELY STONY (312B)

CONSTRUCTION PHASING PLAN

PRE-CONSTRUCTION

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- PREPARE AND PLACE ON-SITE STORMWATER POLLUTION PREVENTION PLAN IN ACCORDANCE WITH NPDES CONSTRUCTION GENERAL PERMIT.
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- CONSTRUCT FILL SLOPES AND STABILIZE DISTURBED SLOPES AS NECESSARY WITH PERMANENT SEEDING.

PHASE 2

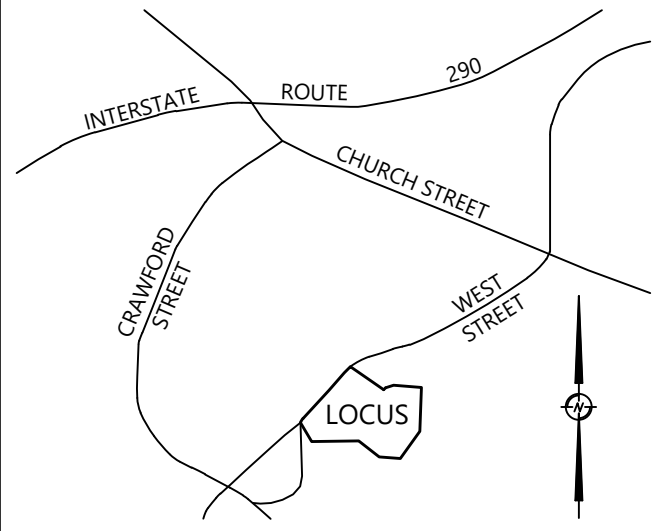
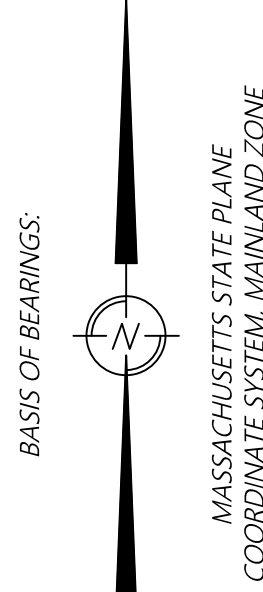
- ROUGH GRADE PROPOSED PAVE AREAS AND RESIDENTIAL LOT AREAS.
- CONSTRUCT INFILTRATION BASINS AND STABILIZE DISTURBED SLOPES AS NECESSARY WITH PERMANENT SEEDING.
- INSTALL EXCAVATED DROP INLET TRAP AS INDICATED.
- PREPARE BUILDING PAD AREAS FOR FOUNDATION INSTALLATION.
- CONSTRUCT COMMON DRIVE AND BUILDING FOUNDATIONS.
- INSTALL COMMON DRIVE AND LOT DRAINAGE AND UTILITIES INFRASTRUCTURE.

PHASE 3

- PERFORM FINAL GRADING OF PAVED AREAS AND INSTALL BINDER PAVING.
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- FINISH GRADING OF ALL DISTURBED AREA AROUND COMMON DRIVE AND INSTALL LANDSCAPING
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WINTER STABILIZATION

- A PROTECTIVE BLANKET OF STRAW, OTHER PLANT RESIDUE, OR SYNTHETIC NETTING TO PROVIDE IMMEDIATE PROTECTION TO EXPOSED SOILS DURING THE WINTER MONTHS IS REQUIRED TO BE IN PLACE BEFORE 12/1.



LOCUS MAP
N.T.S.

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4/14/2021

PREPARED BY:



31 EAST MAIN STREET, WESTBOROUGH, MA
508.366.6552
WDA-DSG.COM

OWNER:

Brant L. Viner & Margaret Harling
P.O. Box 295
Ellsworth, ME 04605

PREPARED FOR:

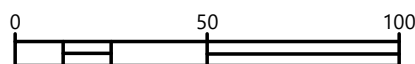
Brant L. Viner & Margaret Harling
P.O. Box 295
Ellsworth, ME 04605

TITLE:

EROSION CONTROL
PLAN - PHASE 2

85 & 98 COMMON
DRIVEWAY
85 & 95 West Street
Northborough, MA 01532
(Worcester County)

NOTICE OF INTENT



JOB NO.:	1207.03	DATE:	11/20/20
DWN. BY:	GBS	SHEET:	C5.01
CHK'D. BY:	BPW/JRW		

GENERAL NOTES

- DESCRIPTION: 85 & 95 WEST STREET HAVE 6.6 AND 10.7 ACRES RESPECTIVELY FOR A TOTAL OF 17.3 ACRES. THE PROPOSED DEVELOPMENT, DISTURBING 4,242,552 SF (5.5682 AC.), IS BORDERED ON THE NORTH BY WEST STREET. THE PROJECT DEED AND PLAN BOOK REFERENCES ARE Deed Book 15417 Page 232 Plan Book 438 Plan 122; Plan Book 663 Plan 16, TOWN OF NORTHBOROUGH, Worcester County, MASSACHUSETTS. PROPOSED CONSTRUCTION WILL INCLUDE DEMOLITION OF EXISTING PAVEMENT AND CONSTRUCTION OF 3 SINGLE RESIDENTIAL UNITS WITH ASSOCIATED DRIVES, UTILITIES, AND STORMWATER MANAGEMENT SYSTEM.
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- ENGINEER/DESIGNER:
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CIVIL ENGINEERS, LANDSCAPE ARCHITECTS, SURVEYORS, PLANNERS
31 EAST MAIN STREET, WESTBOROUGH, MA 01581
508.366.6552
WDA-DG.COM
PHONE: (508) 366-6552
CONTACT: BRIAN WATERMAN
- SITE LOCATION:
85 & 95 West Street
Northborough, MA 01532
PROJECT IS LOCATED IN Plan Book 438 Plan 122; Plan Book 663 Plan 16, TOWN OF NORTHBOROUGH, Worcester County, MASSACHUSETTS.
ZONING INFORMATION: RB/RESIDENCE B
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- SOIL INFORMATION:
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CONSTRUCTION PHASING PLAN

PRE-CONSTRUCTION

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PHASE 1

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- CONSTRUCT FILL SLOPES AND STABILIZE DISTURBED SLOPES AS NECESSARY WITH PERMANENT SEEDING.
- CONSTRUCT TEMPORARY DIVERSION SWALES WITH STRAW BALE CHECK DAMS AS NECESSARY TO DIVERT SEDIMENT LADEN STORM WATER TO SEDIMENT TRAP.

PHASE 2

- ROUGH GRADE PROPOSED PAVE AREAS AND RESIDENTIAL LOT AREAS.
- CONSTRUCT INFILTRATION BASINS AND STABILIZE DISTURBED SLOPES AS NECESSARY WITH PERMANENT SEEDING.
- PREPARE BUILDING PAD AREAS FOR FOUNDATION INSTALLATION.
- CONSTRUCT COMMON DRIVE AND BUILDING FOUNDATIONS.
- INSTALL COMMON DRIVE AND LOT DRAINAGE AND UTILITIES INFRASTRUCTURE.

- PREPARE SUBGRADE AREA FOR PAVEMENT AND PROVIDE INTERIM DRAINAGE AS-BUILT OF ALL DRAINAGE STRUCTURES PRIOR TO PLACEMENT OF BINDER PAVEMENT


PHASE 3

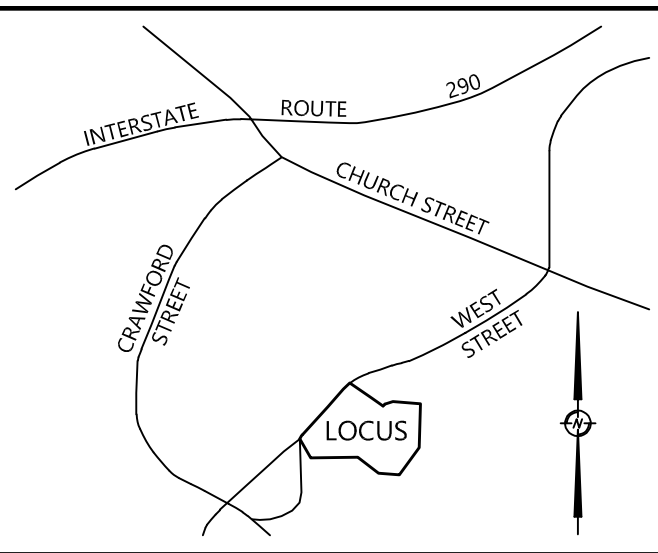
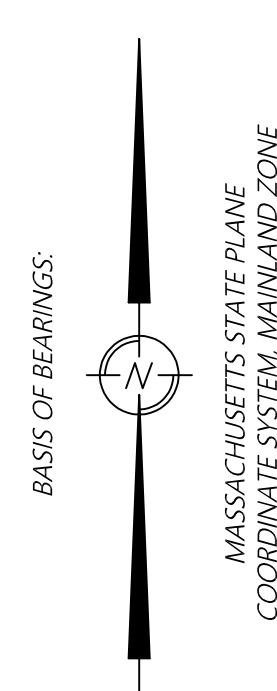
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WINTER STABILIZATION

- A PROTECTIVE BLANKET OF STRAW, OTHER PLANT RESIDUE OR SYNTHETIC NETTING TO PROVIDE IMMEDIATE PROTECTION TO EXPOSED SOILS DURING THE WINTER MONTHS IS REQUIRED TO BE IN PLACE BEFORE 12/1.


EROSION LEGEND

 PERMANENT SEEDING



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4/14/2021

PREPARED BY:

WDA DESIGN GROUP

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WDA-DG.COM

OWNER:

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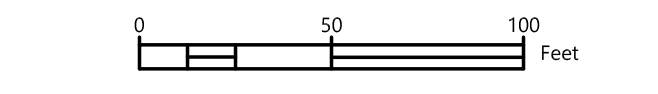
Brant L. Viner & Margaret Harling
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TITLE:

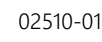
EROSION CONTROL PLAN - PHASE 3

85 & 98 COMMON DRIVEWAY
85 & 95 West Street
Northborough, MA 01532
(Worcester County)

NOTICE OF INTENT



JOB NO.:	1207.03	DATE:	11/20/20
DWN. BY:	GBS	SHEET:	
CHKD. BY:	BPW/JRW		C5.02



02510-06



02510-02

02700-13

02800-25

02510-03

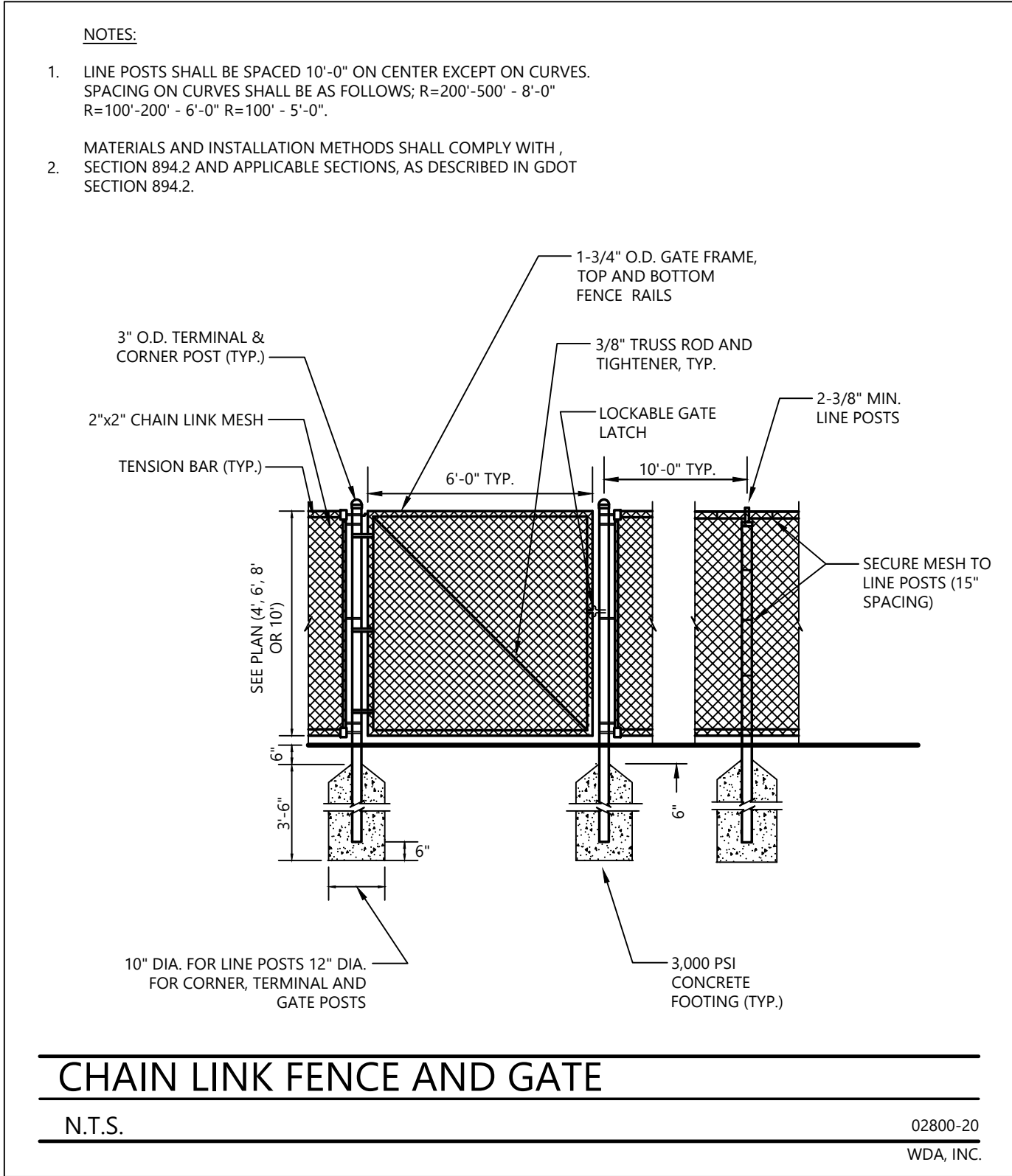
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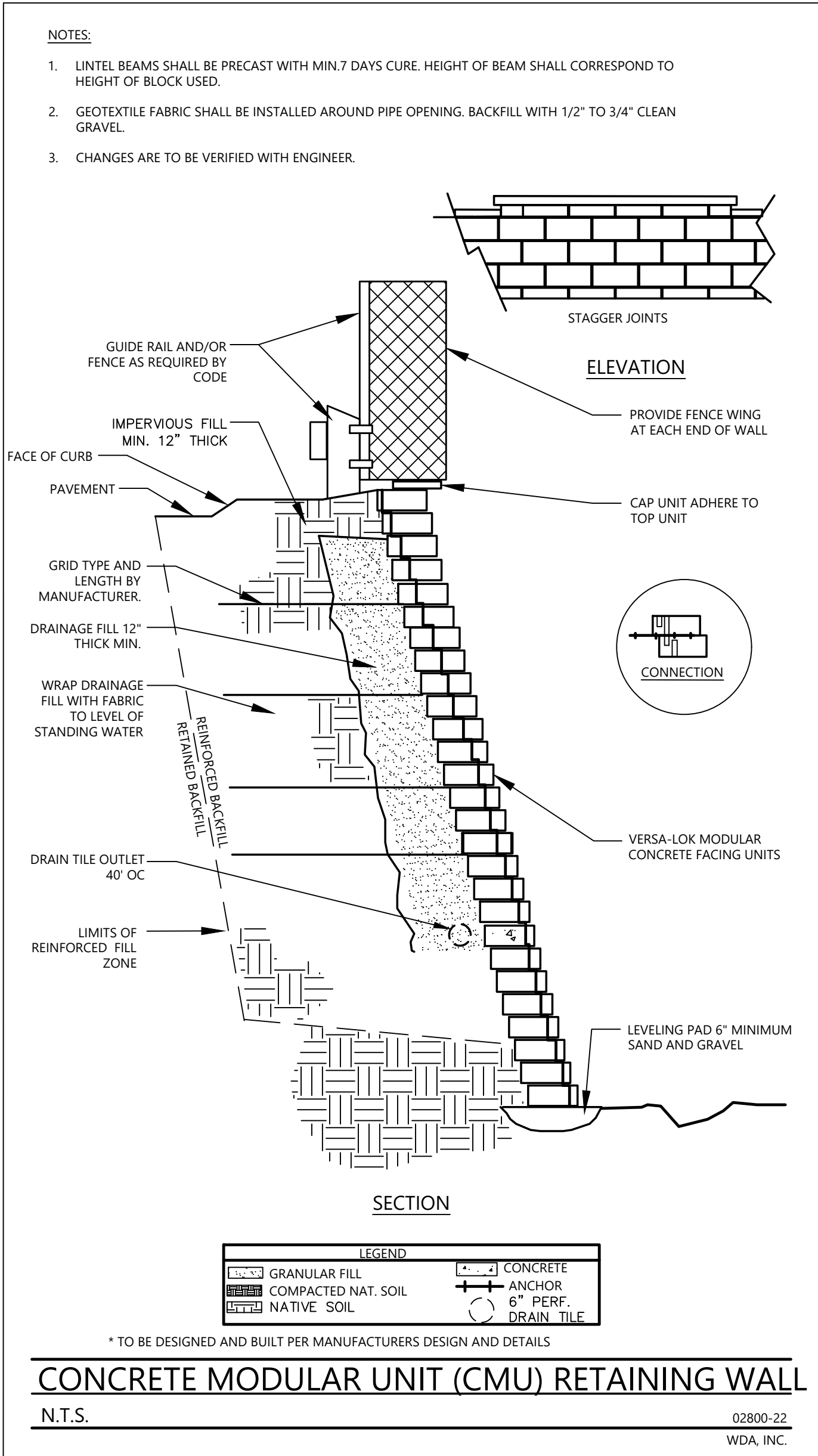
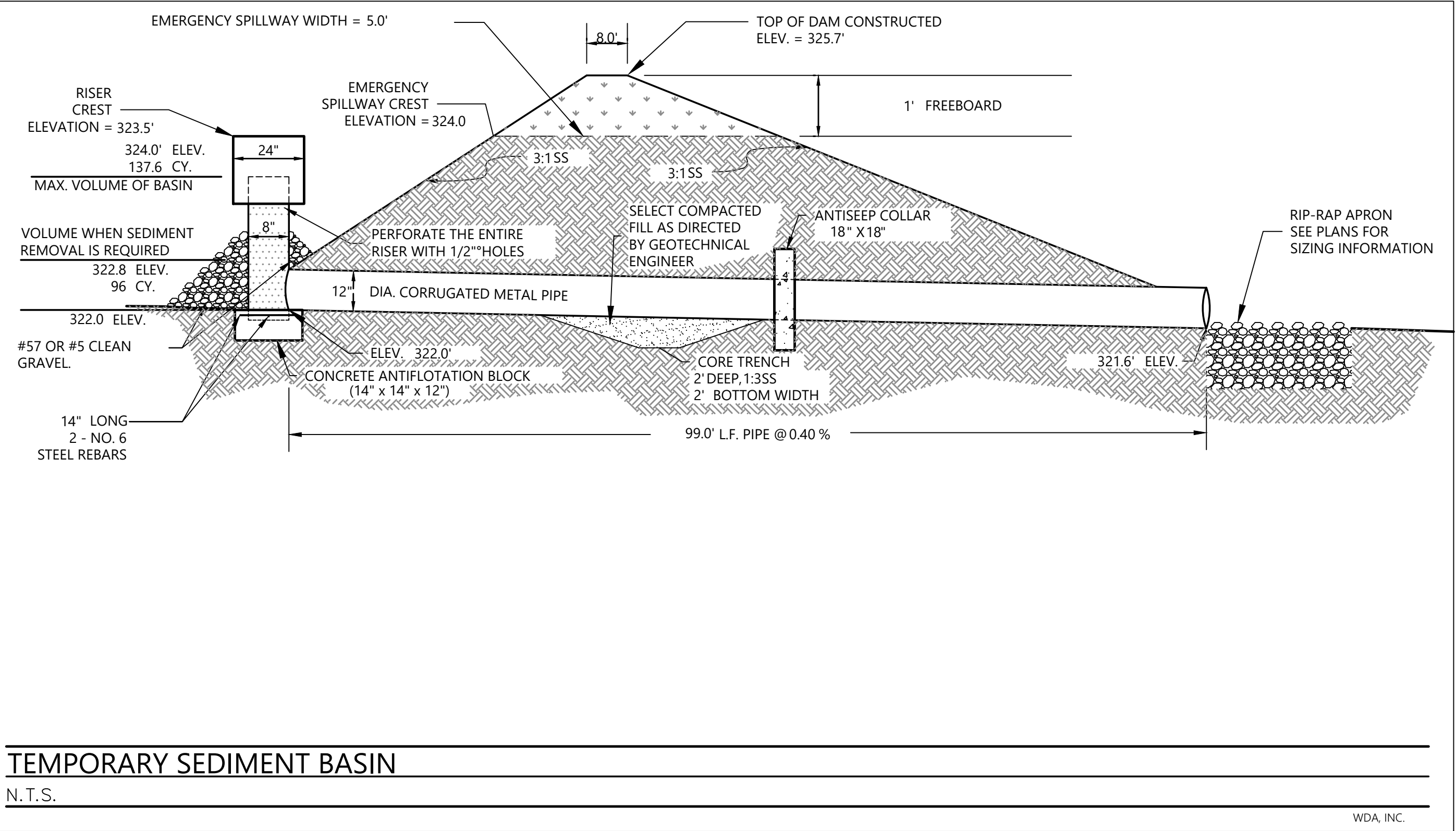
1 25 24-11 - EROSION CONTROL BARRIER - STRAW WATTLE AND SILT FENCE

U.S.

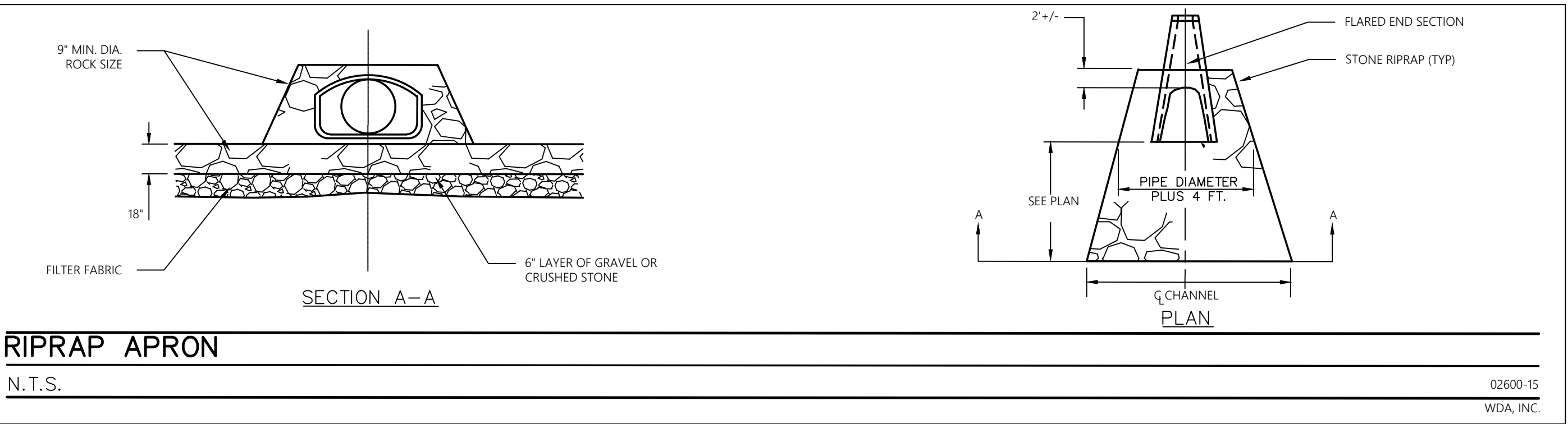
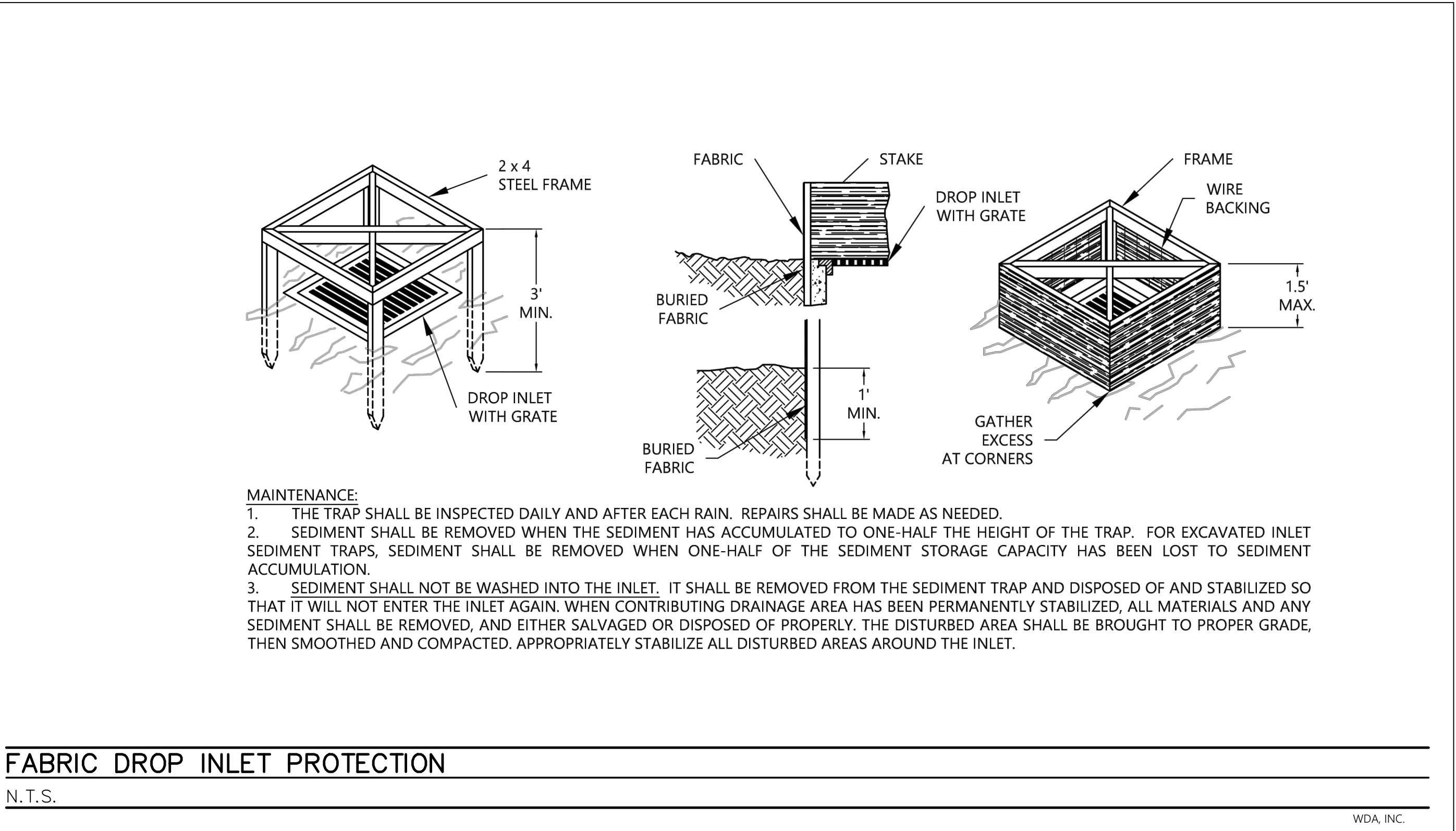
JOB NO.:	1207.03	DATE:	11/20/20
DWN. BY:	GBS	SHEET:	C6.01
CHK'D. BY:	BPW/JRW		



Permanent Seeding Mixtures						
Seed, Pounds per:						
Mix	Site	Seed Mixture	Acre	1,000 sf	Remarks	
1	Dry	Little Bluestem or Broomsedge	10	0.25	* Use Warm Season planting procedure. * Roadsides * Sand and Gravel Stabilization * Clover requires inoculation with nitrogen-fixing bacteria	
		Tumble Lovegrass* Switchgrass	10	0.25		
		Bush Clover*	2	0.10		
		Red Top	1	0.10		
2	Dry	Deertongue	15	0.35	* Use Warm Season planting procedures. * Acid sites/Mine spoil * Clover requires inoculation with nitrogen-fixing bacteria	
		Broomsedge	10	0.25		
		Bush Clover*	2	0.10		
		Red Top	1	0.10		
3	Dry	Big Bluestem	10	0.25	*Rates for this mix are for PLS. * Use Warm Season planting procedures. * Eastern Prairie appearance * Sand and Gravel pits. * Golf Course Wild Areas * Sanitary Landfill Cover seeding * Wildlife Areas *OK to substitute Poverty Dropseed in place of Red Top/Ryegrass. *Rates for this mix are for PLS.	
		Indian Grass	10	0.25		
		Switchgrass	10	0.25		
		Little Bluestem	10	0.25		
		Red Top or	1	0.10		
		Perennial Ryegrass	10	0.25		
4	Dry	Flat Pea	25	0.60	* Use Cool Season planting procedures * Utility Rights-of-Ways (tends to suppress woody growth)	
		Red Top or	2	0.10		
		Perennial Ryegrass	15	0.35		
5	Dry	Little Bluestem	5	0.10	* Use Warm Season planting procedures. * Coastal sites * Rates for Bluestein and Switchgrass are for PLS.	
		Switchgrass	10	0.25		
		Beach Pea*	20	0.45		
		Perennial Ryegrass	10	0.25		
6	Dry - Moist	Red Fescue	10	0.25	* Use Cool Season planting procedure. * Provides quick cover but is non-aggressive; will tend to allow indigenous plant colonization. * General erosion control on variety of sites, including forest roads, skid trails and landings.	
		Canada Bluegrass	10	0.25		
		Perennial Ryegrass	10	0.25		
		Red Top	1	0.10		
7	Moist-Wet	Switchgrass	10	0.25	* Use Warm Season planting procedure. * Coastal plain/flood plain * Rates for Bluestem and Switchgrass are for PLS.	
		Virginia Wild Rye	5	0.10		
		Big Bluestem	15	0.35		
		Red Top	1	0.10		



Permanent Seeding Mixtures						
Seed, Pounds per:						
Mix	Site	Seed Mixture	Acre	1,000 sf	Remarks	
8	Moist Wet	Creeping Bentgrass	5	0.10	* Use Cool Season planting procedures. * Pond Banks * Waterways/ditch banks	
		Fringed Bromegrass	5	0.10		
		Fowl Meadowgrass	5	0.10		
		Bluejoint Reedgrass or Rice Cutgrass	2	0.10		
		Perennial Ryegrass	10	0.25		
9	Moist Wet	Red Fescue	5	0.10	*Salt Tolerant * Fescue and Bentgrass provide low growing appearance, while Switchgrass provides tall cover for wildlife.	
		Creeping Bentgrass	2	0.10		
10	Moist Wet	Switchgrass	8	0.20	* Use Cool Season planting procedure. * Trefoil requires inoculation with nitrogen fixing bacteria.	
		Perennial Ryegrass	10	0.25		
		Red Fescue	5	0.10		
		Creeping Bentgrass	5	0.10		
		Virginia Wild Rye	8	0.20		
11	Moist Wet	Wood Reed Grass*	1	0.10	* Suitable for forest access roads, skid trails and other partial shade situations.	
		Showy Tick Trefoil*	1	0.10		
		Creeping Bentgrass	5	0.10		
		Bluejoint Reed Grass	1	0.10		
		Virginia Wild Rye	3	0.10		
12	Wet	Fowl Meadow Grass	10	0.25	* Use Cool Season planting procedure. * OK to seed in saturated soil conditions, but not in standing water.	
		Showy Tick Trefoil*	1	0.10		
		Red Top	1	0.10		
		Blue Joint Reed Grass	1	0.10		
		Canada Manna Grass	1	0.10		
13	Dry - Inter-Tidal	Rice Cut Grass	1	0.10	* Suitable as stabilization seeding for created wetland. * All species in this mix are native to Massachusetts.	
		Creeping Bent Grass	5	0.10		
		Fowl Meadow Grass	5	0.10		
14	Dry - Inter-Tidal	American Beachgrass	18"	18"	*Vegetative planting with dormant culms, 3-5 culms per planting	
		Smooth Cordgrass	centers	centers		
		Saltmeadow Cordgrass	centers	centers		



LOCUS MAP
N.T.S.

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D	8/16/2021	FOR DATE ONLY	GBS
C	2/24/2021	PLANNING BOARD COMMENTS	GBS
B	12/14/2021	FOR DATE ONLY	GBS
A	4/14/2021	INITIAL ISSUE	
REV.	DATE	DESCRIPTION	INIT.

PREPARED BY:

WDA DESIGN GROUP

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P.O Box 295
Ellsworth, ME 04605

PREPARED FOR:

Brant L. Viner & Margaret Harling
P.O Box 295
Ellsworth, ME 04605

TITLE:

CONSTRUCTION DETAILS
85 & 98 COMMON DRIVEWAY
85 & 95 West Street
Northborough, MA 01532 (Worcester County)

NOTICE OF INTENT

JOB NO.:	1207.03	DATE:	11/20/20
DWN. BY:	GBS	SHEET:	
CHK'D. BY:	BPW/JRW		C6.02

Inlet Sediment Trap Calculations- ST-01.1

1. Drainage Area	=	0.11 ac
2. Required sediment storage	=	67 cy/ac * drainage area
Required sediment storage	=	67 cy/ac * 0.11
Required sediment storage	=	7.37 cy
3. Assume excavation depth (minimum 1.5 feet)	=	2.00 ft
4. Assume slope of sides (shall not be steeper than 2:1)	=	3.00 ft
5. Determine required surface area.		
SA _{min} = Required sediment storage / excavation depth		
SA _{min}	=	7.37 cy / 2.00 ft
SA _{min}	=	99.495 sf
6. Assume shape of excavation and determine dimensions.		
(A rectangular shape with 2:1 length to width ratio is recommended)		
Shape	=	
Dimensions		
length	=	15.00 ft
width	=	7.50 ft
(if applicable) radius	=	ft
Required surface area	=	112.50 sf

Inlet Sediment Trap Calculations- ST-06

- Drainage Area = 1.53 ac
- Required sediment storage = 67 cy/ac * drainage area
Required sediment storage = 67 cy/ac * 1.53
Required sediment storage = 102.51 cy
- Assume excavation depth (minimum 1.5 feet) = 2.00 ft
- Assume **slope** of sides (shall not be steeper than 2:1) = 3.00 ft
- Determine required surface area.

$$SA_{min} = \text{Required sediment storage} / \text{excavation depth}$$

$$SA_{min} = 102.51 \text{ cy} / 2.00 \text{ ft}$$

$$SA_{min} = 1383.885 \text{ sf}$$
- Assume shape of excavation and determine dimensions.
 (A rectangular shape with 2:1 length to width ratio is recommended)
 Shape =
 Dimensions

$$\text{length} = 53.00 \text{ ft}$$

$$\text{width} = 26.50 \text{ ft}$$
 (if applicable) radius = ft
Required surface area = 1404.50 sf

Inlet Sediment Trap Calculations- ST-16.1

1. Drainage Area	=	1.63 ac
2. Required sediment storage	=	67 cy/ac * drainage area
Required sediment storage	=	67 cy/ac * 1.63
Required sediment storage	=	109.21 cy
3. Assume excavation depth (minimum 1.5 feet)	=	2.00 ft
4. Assume slope of sides (shall not be steeper than 2:1)	=	3.00 ft
5. Determine required surface area.		
SA _{min} = Required sediment storage / excavation depth		
SA _{min} =	109.21 cy /	2.00 ft
SA _{min} =	1474.335 sf	
6. Assume shape of excavation and determine dimensions.		
(A rectangular shape with 2:1 length to width ratio is recommended)		
Shape	=	
Dimensions		
length	=	55.00 ft
width	=	27.50 ft
(if applicable) radius	=	ft
Required surface area	=	1512.50 sf

INSTALLATION

THE TRAP SHOULD BE EXCAVATED AROUND THE INLET TO PROVIDE 67 CUBIC FEET OF STORAGE PER ACRE OF DRAINAGE AREA TO THE INLET. THE TRAP SHOULD BE NO LESS THAN 1 FOOT DEEP OR MORE THAN 2 FEET DEEP WHEN MEASURED FROM THE TOP OF THE INLET. SIDE SLOPES SHOULD BE 3:1 OR FLATTER. DIMENSIONS OF THE EXCAVATION SHOULD BE BASED ON THE SITE CONDITIONS. NORMALLY THE TRAPS ARE SQUARE. IF THERE IS CONCENTRATED FLOW BEING DIRECTED INTO THE TRAP, HOWEVER, THEN THE TRAP SHOULD BE RECTANGULAR WITH THE LONG DIMENSION ORIENTED IN THE DIRECTION OF THE FLOW. WHEN NECESSARY, SPOIL MAY BE PLACED TO FORM A DIKE ON THE DOWNSLOPE SIDE OF THE EXCAVATION TO PREVENT BYPASS FLOW.

EXCAVATED DROP INLET TRAP

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Inlet Sediment Trap Calculations- ST-02.1

1. Drainage Area	=	1.12	ac
2. Required sediment storage	=	67 cy/ac * drainage area	
		67 cy/ac * 1.12	
Required sediment storage		75.04	cy
3. Assume excavation depth (minimum 1.5 feet)	=	2.00	ft
4. Assume slope of sides (shall not be steeper than 2:1)	=	3.00	ft
5. Determine required surface area.			
SA _{min} = Required sediment storage / excavation depth			
	SA _{min} =	75.04 cy	/ 2.00 ft
	SA _{min} =	1013.04	sf
6. Assume shape of excavation and determine dimensions.			
(A rectangular shape with 2:1 length to width ratio is recommended)			
Shape	=		
Dimensions			
	length =	45.01	ft
	width =	22.51	ft
(if applicable) radius =		ft	
Required surface area	=	1035.00	sf

Inlet Sediment Trap Calculations- ST-08

1. Drainage Area	=	$\frac{2.11}{ac}$	
2. Required sediment storage	=	$67 \text{ cy/ac} \times \text{drainage area}$	
Required sediment storage	=	$67 \text{ cy/ac} \times 2.11$	
Required sediment storage	=	141.37 cy	
3. Assume excavation depth (minimum 1.5 feet)	=	2.00 ft	
4. Assume slope of sides (shall not be steeper than 2:1)	=	3.00 ft	
5. Determine required surface area.			
$SA_{\min} = \text{Required sediment storage} / \text{excavation depth}$			
	$SA_{\min} =$	$\frac{141.37 \text{ cy}}{2.00 \text{ ft}}$	
		1908.495 sf	
6. Assume shape of excavation and determine dimensions.			
(A rectangular shape with 2:1 length to width ratio is recommended)			
Shape	=		
Dimensions			
	length =	62.00 ft	
	width =	31.00 ft	
	(if applicable) radius =	ft	
Required surface area	=	1922.00 sf	

Inlet Sediment Trap Calculations- ST-17

1. Drainage Area	=	0.77	ac
2. Required sediment storage	=	67	cy/ac * drainage area
		67	cy/ac * 0.77
3. Required sediment storage	=	51.59	cy
4. Assume excavation depth (minimum 1.5 feet)	=	2.00	ft
5. Assume slope of sides (shall not be steeper than 2:1)	=	3.00	ft
6. Determine required surface area.			
SA _{min} = Required sediment storage / excavation depth			
	SA _{min} =	51.59	cy / 2.00
	SA _{min} =	696.465	sf
6. Assume shape of excavation and determine dimensions.			
(A rectangular shape with 2:1 length to width ratio is recommended)			
Shape	=		
Dimensions			
	length =	38.00	ft
	width =	19.00	ft
	(if applicable) radius =		ft
Required surface area	=	722.00	sf

Inlet Sediment Trap Calculations- ST-02.2

- Drainage Area = 0.48 ac
- Required sediment storage = 67 cy/ac * drainage area
Required sediment storage = 67 cy/ac * 0.48
Required sediment storage = 32.16 cy
- Assume excavation depth (minimum 1.5 feet) = 2.00 ft
- Assume **slope of sides** (shall not be steeper than 2:1) = 3.00 ft
- Determine required surface area.
SA_{min} = Required sediment storage / excavation depth
SA_{min} = 32.16 cy / 2.00 ft
SA_{min} = 434.16 sf
- Assume shape of excavation and determine dimensions.
(A rectangular shape with 2:1 length to width ratio is recommended)
Shape =
Dimensions
length = 30.00 ft
width = 15.00 ft
(if applicable) radius = ft
Required surface area = 450.00 sf

Inlet Sediment Trap Calculations- ST-12

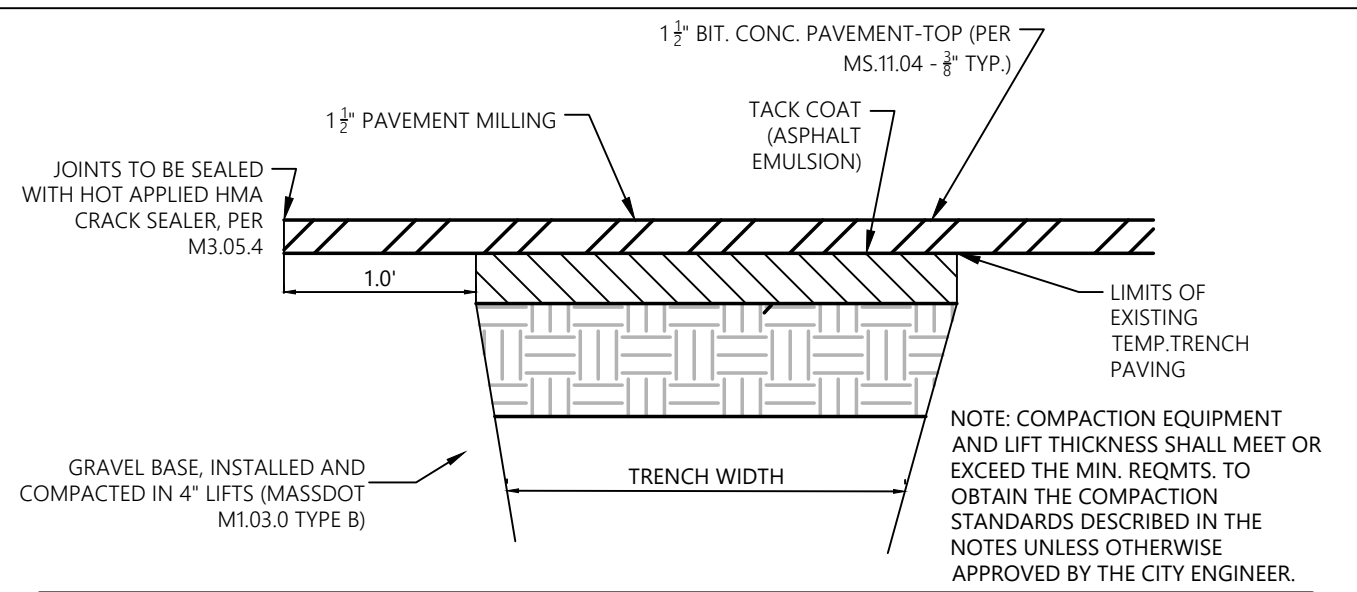
1. Drainage Area = 0.53 ac
2. Required sediment storage = 67 cy/ac * drainage area
= 67 cy/ac * 0.53
Required sediment storage = 35.51 cy
3. Assume excavation depth (minimum 1.5 feet) = 2.00 ft
4. Assume slope of sides (shall not be steeper than 2:1) = 3.00 ft
5. Determine required surface area.
 $SA_{min} = \text{Required sediment storage} / \text{excavation depth}$
 $SA_{min} = 35.51 \text{ cy} / 2.00 \text{ ft}$
 $SA_{min} = 479.385 \text{ sf}$
6. Assume shape of excavation and determine dimensions.
(A rectangular shape with 2:1 length to width ratio is recommended)
Shape =
Dimensions
 $\text{length} = 31.00 \text{ ft}$
 $\text{width} = 15.50 \text{ ft}$
(if applicable) radius = ft
Required surface area = 480.50 sf

Inlet Sediment Trap Calculations- ST-04

1. Drainage Area	=	0.18	ac
2. Required sediment storage	=	67	cy/ac * drainage area
Required sediment storage	=	67	cy/ac * 0.18
Required sediment storage	=	12.06	cy
3. Assume excavation depth (minimum 1.5 feet)	=	2.00	ft
4. Assume slope of sides (shall not be steeper than 2:1)	=	3.00	ft
5. Determine required surface area.			
SA _{min} = Required sediment storage / excavation depth			
SA _{min}	=	12.06	cy / 2.00 ft
SA _{min}	=	162.81	sf
6. Assume shape of excavation and determine dimensions.			
(A rectangular shape with 2:1 length to width ratio is recommended)			
Shape	=		
Dimensions			
length	=	19.00	ft
width	=	9.50	ft
(if applicable) radius	=	ft	
Required surface area	=	180.50	sf

Inlet Sediment Trap Calculations- ST-15

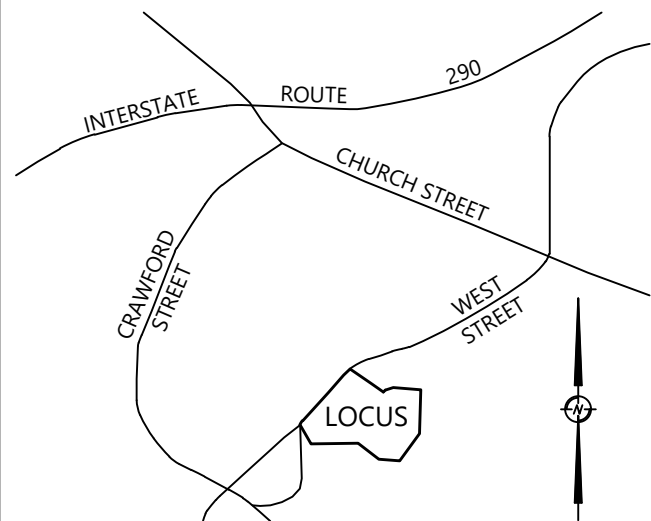
1. Drainage Area	=	<u>0.36</u> ac	
2. Required sediment storage	=	67 cy/ac * drainage area	
Required sediment storage	=	<u>67</u> cy/ac * <u>0.36</u>	
Required sediment storage	=	<u>24.12</u> cy	
3. Assume excavation depth (minimum 1.5 feet)	=	<u>2.00</u> ft	
4. Assume slope of sides (shall not be steeper than 2:1)	=	<u>3.00</u> ft	
5. Determine required surface area.			
SA _{min} = Required sediment storage / excavation depth			
	SA _{min} =	<u>24.12</u> cy / <u>2.00</u> ft	
	SA_{min}	= 325.62 sf	
6. Assume shape of excavation and determine dimensions.			
(A rectangular shape with 2:1 length to width ratio is recommended)			
Shape	=		
Dimensions			
	length =	<u>26.00</u> ft	
	width =	<u>13.00</u> ft	
	(if applicable) radius =	<u>ft</u>	
Required surface area	=	<u>338.00</u> sf	



TYPICAL FINAL TRENCH PAVING

N.T.S

WDA, IN



LOCUS MAP
N.T.S.

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B	12/14/20	FOR DATE ONLY	GBS	
A		INITIAL ISSUE		
REV.	DATE	DESCRIPTION	INITIAL	



PREPARED BY



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Harling
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Ellsworth, ME 04605

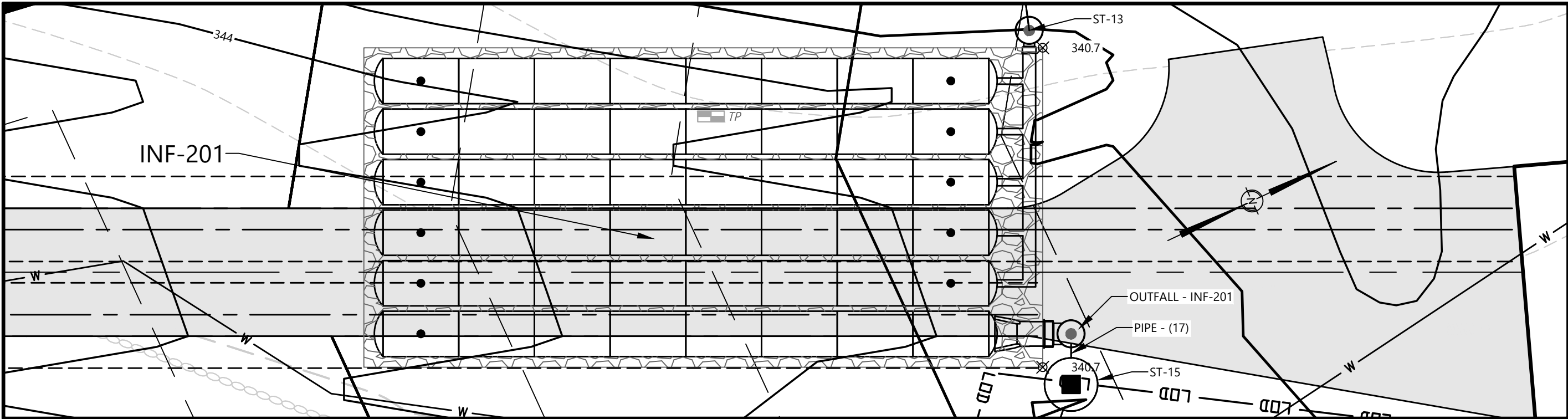
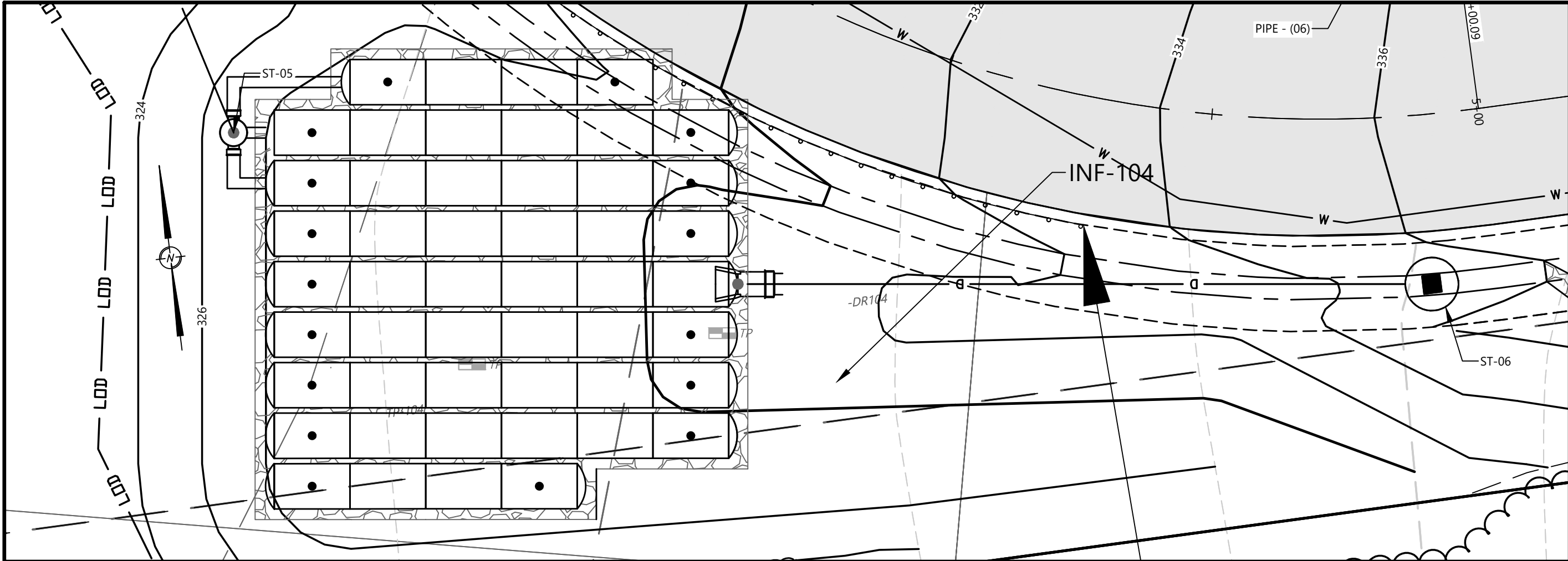
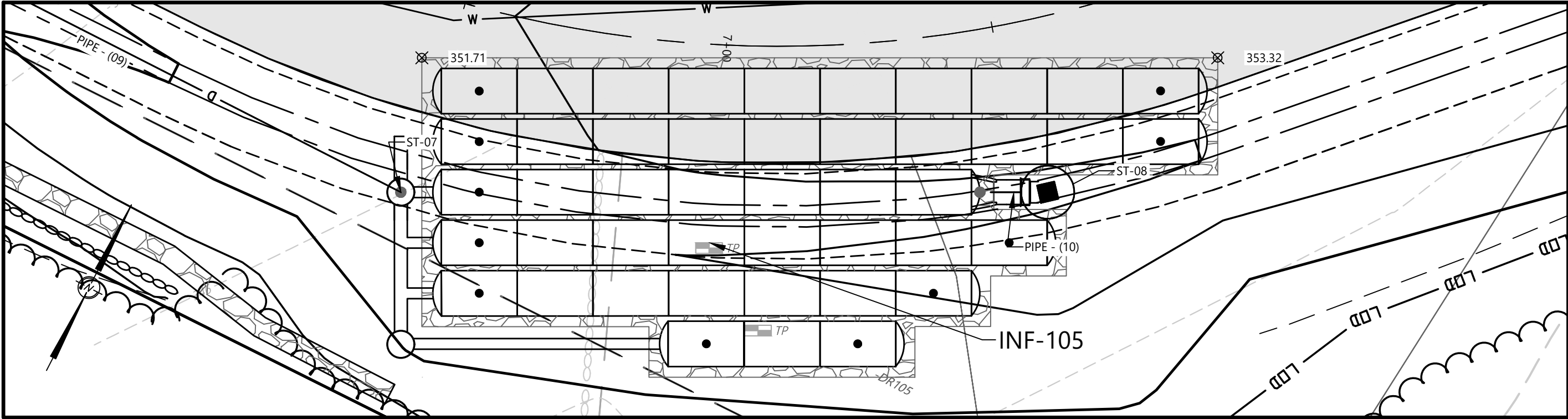
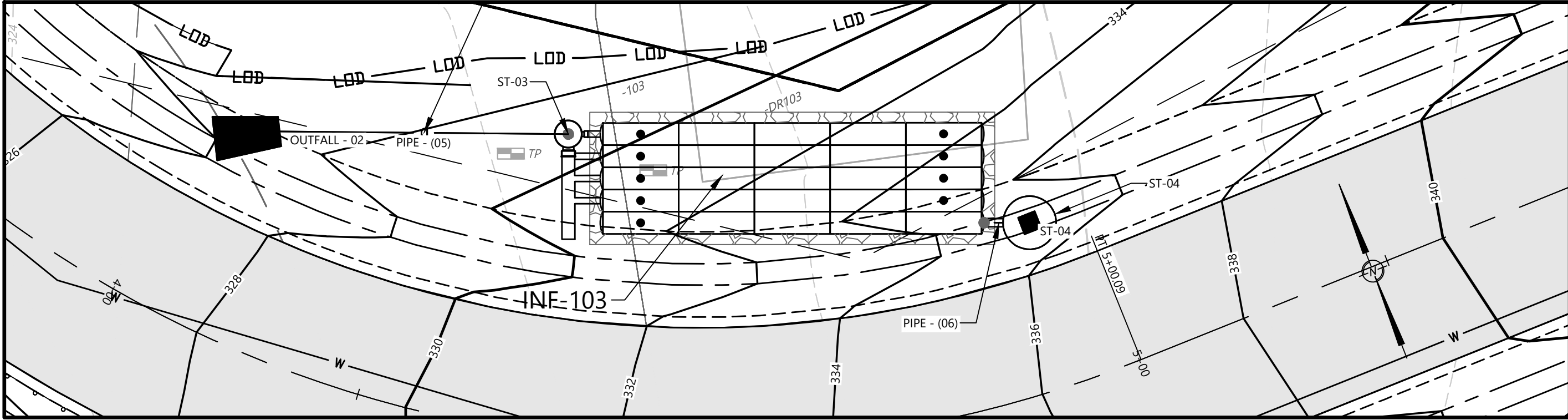
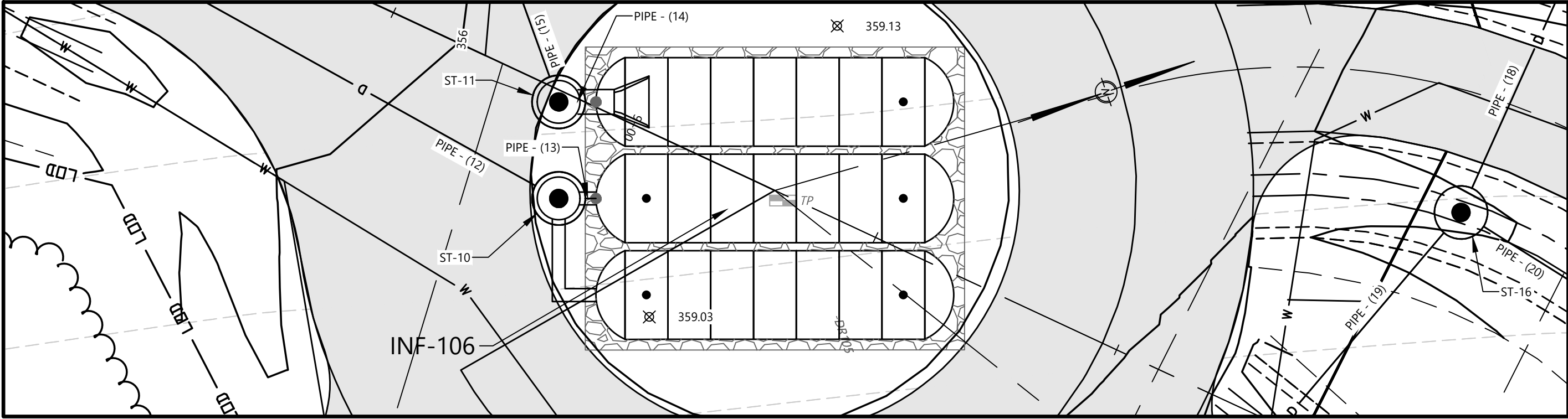
TITLE:

CONSTRUCTION
DETAILS

35 & 98 COMMON
DRIVEWAY
85 & 95 West Street
Northborough, MA 0153
(Worcester County)

NOTICE OF INTENT

JOB NO.: 1207.03	DATE: 11/20/20
DWN. BY: GBS	SHEET: C6.03
CHK'D. BY: BPW/JRW	



6" LOAM AND SEED OR PAVEMENT

18" (MIN) COMPACTED FILL COVER

6" (MIN)

30"

BOTTOM ELEV. 6" (MIN)

1-1/4" CRUSHED STONE (MASSDOT M2.01.3)

COMPACTED SUITABLE SUBGRADE

ACCEPTS 4" SCHEDULE 40 FOR CLEANOUT OR INSPECTION PORT

STORMTECH SC-740 CHAMBER

END CAP

30"

51"

90.7" (85.4" INSTALLED)

NOTES:

- REQUIRES H-20 LOADING.
- "STORMTECH SC-740" BY ADS, OR EQUAL AS APPROVED BY THE ENGINEER.
- INSTALLATION IS TO BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- PROVIDE CLEANOUTS/INSPECTION PORTS ON ALTERNATING ROWS AT 50' INTERVALS.

SYSTEM DESIGNATION	BOTTOM ELEV.	INVERT ELEV. (OUT)	# OF ROWS	WIDTH OF STONE	# OF UNITS/ROW	LENGTH OF STONE	TOTAL # OF UNITS
INF-RF2	332.00	334.04	1	11.00'	2	10.74'	2
INF-RF3	330.00	332.04	1	11.00'	2	10.74'	2
INF-RF4	368.00	370.04	1	11.00'	2	10.74'	2
INF-RF5	374.00	376.04	1	11.00'	2	10.74'	2
INF-RF6	374.00	376.04	1	11.00'	2	10.74'	2

ROOFTOP INFILTRATION SYSTEM (STORMTECH-740)

N. T.S.

02600-12-STORMTECH

WDA, INC.

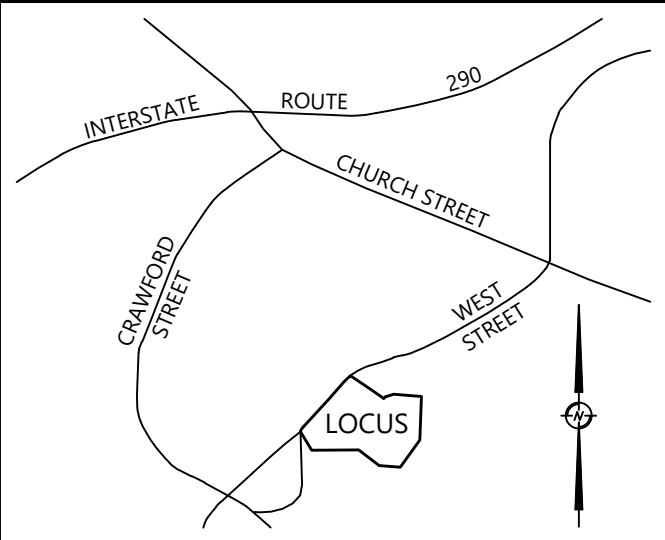
PROPOSED LAYOUT-INF-103							
25	STORMTECH SC-160LP CHAMBERS						
10	STORMTECH SC-160LP END CAPS						
6	STONE ABOVE (in)						
6	STONE BELOW (in)						
40	% STONE VOID						
481	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)						
473	SYSTEM AREA (ft²)						
101	SYSTEM PERIMETER (ft)						
PROPOSED ELEVATIONS-INF-103							
337.50	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)						
328.67	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)						
328.00	TOP OF STONE						
327.50	TOP OF SC-160LP CHAMBER						
326.56	INVERT OUT (6" VERTICAL ORIFACE X 4)						
326.56	INVERT IN						
326.50	BOTTOM OF SC-160LP CHAMBER						
326.00	BOTTOM OF STONE/INVERT						
327.00	EXISTING GROUND AT TEST POINT						
48.00	OBSERVED DEPTH TO GROUNDWATER (INCHES)						
323.00	REDOX ELEVATION						
3.00	PROVIDED SEPERATION TO GROUNDWATER (FEET)						

PROPOSED LAYOUT-INF-104	
50	STORMTECH SC-740 CHAMBERS
6	STORMTECH SC-740 END CAPS
6	STONE ABOVE (in)
6	STONE BELOW (in)
40	% STONE VOID
4,023	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)
1,919	SYSTEM AREA (ft²)
243	SYSTEM PERIMETER (ft)
PROPOSED ELEVATIONS-INF-104	
336.10	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
329.60	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
328.60	TOP OF STONE
328.10	TOP OF SC-740 CHAMBER
326.64	INVERT OUT (12" VERTICAL ORIFCE X 2)
325.73	INVERT IN
325.60	BOTTOM OF SC-740 CHAMBER
325.10	BOTTOM OF STONE/INVERT
325.00	EXISTING GROUND AT TEST POINT
24.00	OBSERVED DEPTH TO GROUNDWATER (INCHES)
323.00	REDOX ELEVATION
2.10	PROVIDED SEPERATION TO GROUNDWATER (FEET)

PROPOSED LAYOUT-INF-106	
21	STORMTECH MC-4500 CHAMBERS
6	STORMTECH MC-4500 END CAPS
12	STONE ABOVE (in)
9	STONE BELOW (in)
40	% STONE VOID
4,227	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)
1,016	SYSTEM AREA (ft²)
128	SYSTEM PERIMETER (ft)
PROPOSED ELEVATIONS-INF-106	
364.00	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
359.00	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
358.00	TOP OF STONE
357.00	TOP OF MC-4500 CHAMBER
355.55	INVERT OUT (6" Vert. Orifice X 2)
352.16	INVERT IN
352.00	BOTTOM OF SC-4500 CHAMBER
351.25	BOTTOM OF STONE/INVERT
355.00	EXISTING GROUND AT TEST POINT
70.00	OBSERVED DEPTH TO GROUNDWATER (INCHES)
349.17	REDOX ELEVATION
2.08	PROVIDED SEPERATION TO GROUNDWATER (FEET)

PROPOSED LAYOUT-INF-105	
45	STORMTECH SC-740 CHAMBERS
6	STORMTECH SC-740 END CAPS
6	STONE ABOVE (in)
6	STONE BELOW (in)
40	% STONE VOID
3,634	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)
1,737	SYSTEM AREA (ft²)
210	SYSTEM PERIMETER (ft)
PROPOSED ELEVATIONS-INF-105	
357.50	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
351.00	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
350.00	TOP OF STONE
349.50	TOP OF SC-740 CHAMBER
348.04	INVERT OUT (6" Vert. Orifice X 5)
347.13	INVERT IN
347.00	BOTTOM OF SC-740 CHAMBER
346.50	BOTTOM OF STONE/INVERT
347.17	EXISTING GROUND AT TEST POINT
37.00	OBSERVED DEPTH TO GROUNDWATER (INCHES)
344.09	REDOX ELEVATION
2.41	PROVIDED SEPERATION TO GROUNDWATER (FEET)

PROPOSED LAYOUT-INF-201	
60	STORMTECH SC-740 CHAMBERS
12	STORMTECH SC-740 END CAPS
6	STONE ABOVE (in)
6	STONE BELOW (in)
40	% STONE VOID
4,796	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)
2,341	SYSTEM AREA (ft²)
216	SYSTEM PERIMETER (ft)
PROPOSED ELEVATIONS-INF-201	
347.20	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
340.70	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
339.70	TOP OF STONE
339.20	TOP OF SC-740 CHAMBER
337.91	INVERT OUT (6") X 3
337.91	INVERT OUT (8") X 2
336.83	INVERT IN
336.70	BOTTOM OF SC-740 CHAMBER
336.20	BOTTOM OF STONE/INVERT
336.20	EXISTING GROUND AT TEST POINT
36.00	OBSERVED DEPTH TO GROUNDWATER (INCHES)
333.20	REDOX ELEVATION
3.00	PROVIDED SEPERATION TO GROUNDWATER (FEET)



LOCUS MAP
N.T.S.

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REV.	DATE	DESCRIPTION	INIT.
E	4/14/2021	TOWN COMMENTS	GBS
D	3/16/2021	FOR DATE ONLY	GBS
C	2/24/2021	PLANNING BOARD COMMENTS	GBS
B	12/14/20	FOR DATE ONLY	GBS
A		INITIAL ISSUE	



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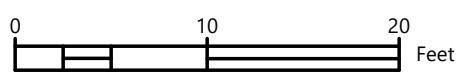
Brant L. Viner & Margaret
Harling
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Ellsworth, ME 04605

TITLE:

CONSTRUCTION
DETAILS

85 & 98 COMMON
DRIVEWAY
85 & 95 West Street
Northborough, MA 01532
(Worcester County)

NOTICE OF INTENT

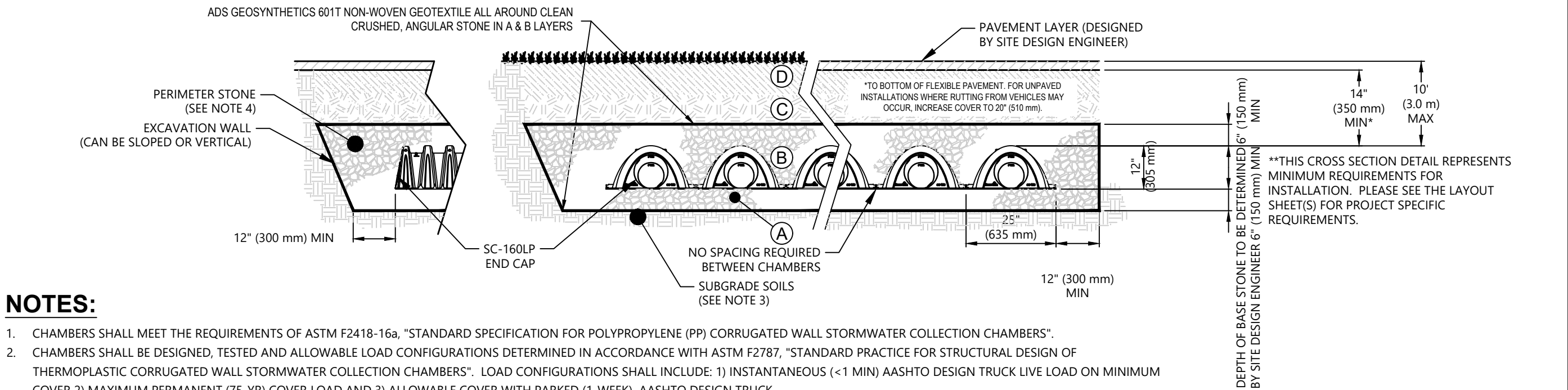


JOB NO.:	1207.03	DATE:	11/20/20
DWN. BY:	GBS	SHEET:	
CHK'D. BY:	BPW/JRW		

C6.04

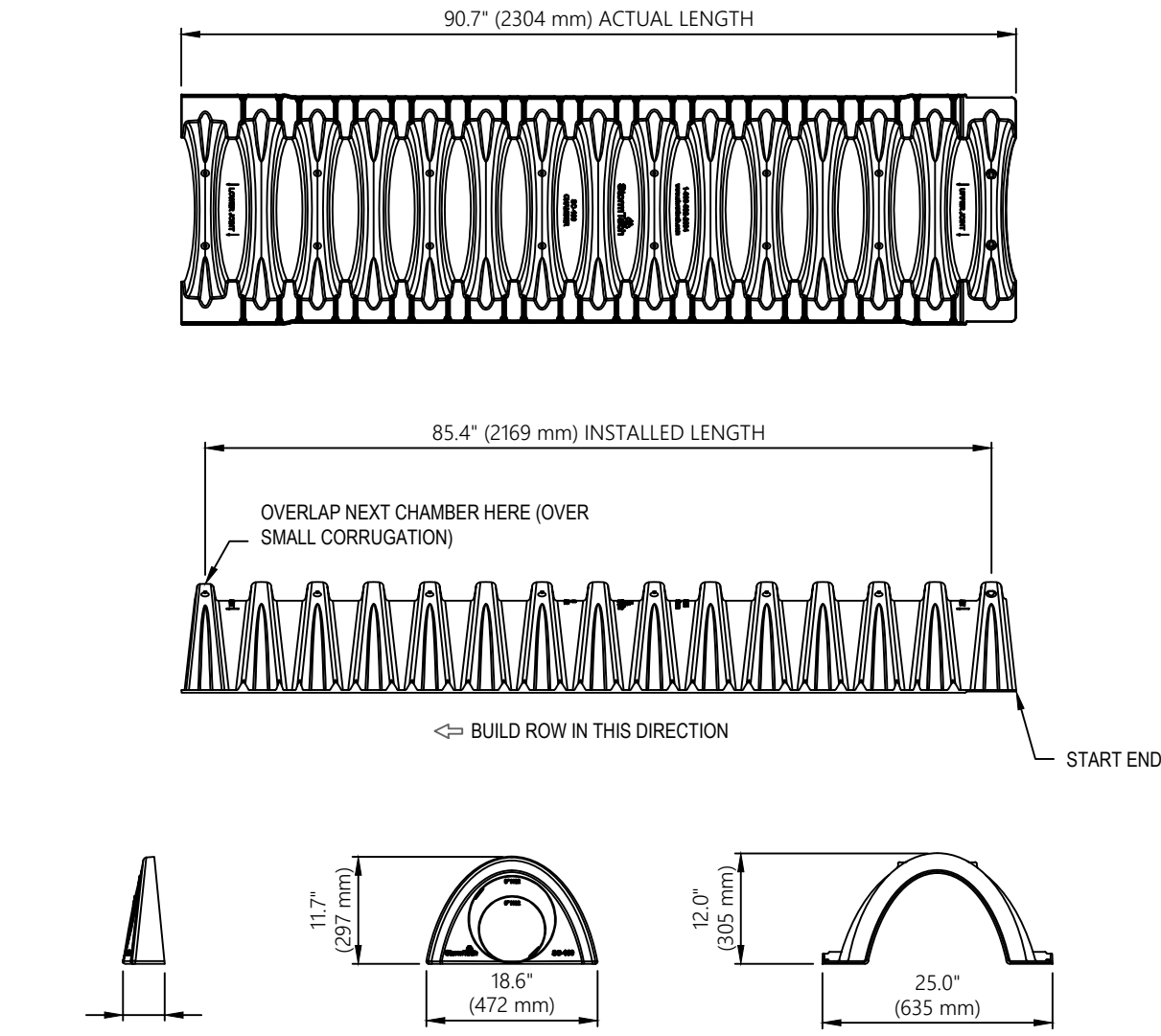
ACCEPTABLE FILL MATERIALS: STORMTECH SC-160LP CHAMBER SYSTEMS			
MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 14" (355 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 ¹ A-1, A-2-4, A-3 OR AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2,3}

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



NOTES:

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- STORMTECH CHAMBERS ARE DESIGNED IN ACCORDANCE WITH SECTION 12.12 OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD BRIDGE DESIGN SPECIFICATIONS. THIS DOCUMENT ESTABLISHES REQUIREMENTS FOR DESIGN OF PROFILE WALL THERMOPLASTIC STRUCTURES FOR BOTH LIVE LOADS AND PERMANENT EARTH LOADS. PROPER USE OF THE AASHTO DESIGN METHOD REQUIRES THAT LOAD MULTIPLIERS FOR IMPACT AND MULTIPLE PRESENCES ARE APPLIED TO THE AASHTO DESIGN TRUCK (HS20) LIVE LOAD. ADDITIONAL FACTORS ARE APPLIED TO THE LOAD AND EARTH LOADS TO PROVIDE THE FULL SAFETY FACTORS FOR BOTH LIVE AND EARTH LOADS. WHEN INSTALLED IN ACCORDANCE WITH THE MINIMUM REQUIREMENTS SPECIFIED IN THE STORMTECH INSTALLATION INSTRUCTIONS, STORMTECH CHAMBERS MEET OR EXCEED THE AASHTO REQUIREMENTS FOR BOTH LIVE LOAD AND EARTH LOAD DESIGN. STORMTECH CHAMBERS ARE ALSO DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS." THIS STANDARD PRACTICE RELATES THE AASHTO DESIGN METHODOLOGY FOR THERMOPLASTIC PIPE AND APPLIES IT TO BURIED STORMWATER CHAMBERS
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 1.5"
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH) 25.0" X 12.0" X 85.4" (635 mm X 305 mm X 2169 mm)
CHAMBER STORAGE 6.85 CUBIC FEET (0.19 m³)
MINIMUM INSTALLED STORAGE* 16.0 CUBIC FEET (0.45 m³)
WEIGHT 24.0 lbs. (10.9 kg)

*ASSUMES 6" (152 mm) ABOVE, 6" (152 mm) BELOW, AND STONE BETWEEN CHAMBERS WITH 40% STONE POROSITY.

PART #	STUB	A
SC160EPP	6" (150 mm)	0.66" (16 mm)
SC160EPP08	8" (200 mm)	0.80" (20 mm)
SC160EPP08	8" (200 mm)	0.96" (24 mm)

ALL STUBS ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

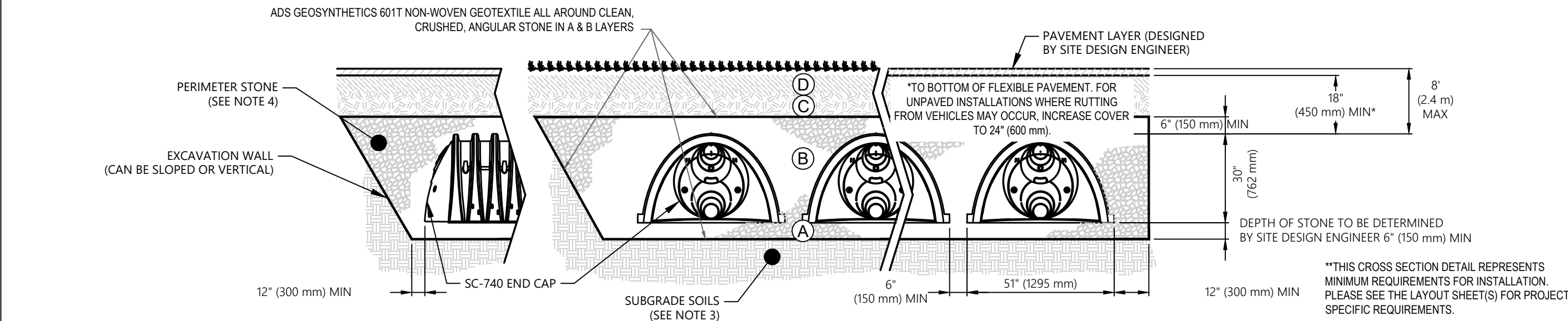
NOTE: ALL DIMENSIONS ARE NOMINAL

STORMTECH CHAMBER SC-160LP

N.T.S.

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS			
MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 ¹ A-1, A-2-4, A-3 OR AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2,3}

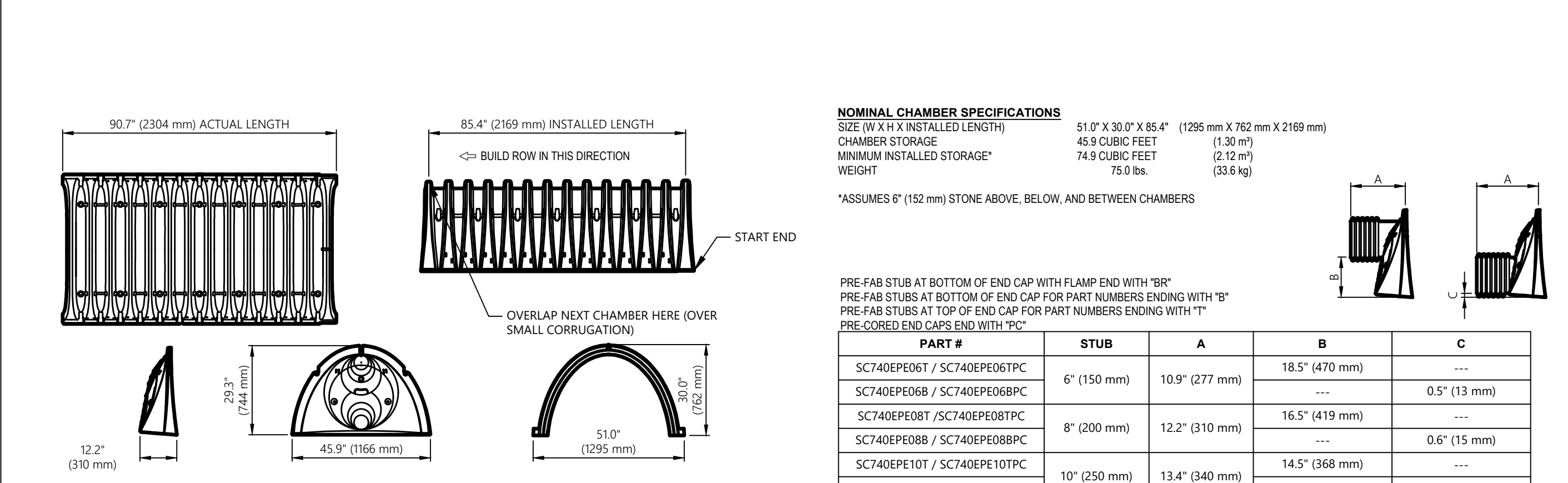
PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN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



NOTES:

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- STORMTECH CHAMBERS ARE DESIGNED IN ACCORDANCE WITH SECTION 12.12 OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD BRIDGE DESIGN SPECIFICATIONS. THIS DOCUMENT ESTABLISHES REQUIREMENTS FOR DESIGN OF PROFILE WALL THERMOPLASTIC STRUCTURES FOR BOTH LIVE LOADS AND PERMANENT EARTH LOADS. PROPER USE OF THE AASHTO DESIGN METHOD REQUIRES THAT LOAD MULTIPLIERS FOR IMPACT AND MULTIPLE PRESENCES ARE APPLIED TO THE AASHTO DESIGN TRUCK (HS20) LIVE LOAD. ADDITIONAL FACTORS ARE APPLIED TO THE LOAD AND EARTH LOADS TO PROVIDE THE FULL SAFETY FACTORS FOR BOTH LIVE AND EARTH LOADS. WHEN INSTALLED IN ACCORDANCE WITH THE MINIMUM REQUIREMENTS SPECIFIED IN THE STORMTECH INSTALLATION INSTRUCTIONS, STORMTECH CHAMBERS MEET OR EXCEED THE AASHTO REQUIREMENTS FOR BOTH LIVE LOAD AND EARTH LOAD DESIGN. STORMTECH CHAMBERS ARE ALSO DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS." THIS STANDARD PRACTICE RELATES THE AASHTO DESIGN METHODOLOGY FOR THERMOPLASTIC PIPE AND APPLIES IT TO BURIED STORMWATER CHAMBERS
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 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

SC-740 CROSS SECTION DETAIL



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH) 51.0" X 30.0" X 85.4" (1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE 45.9 CUBIC FEET (1.30 m³)
MINIMUM INSTALLED STORAGE* 74.9 CUBIC FEET (2.12 m³)
WEIGHT 75.0 lbs. (33.6 kg)

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

PRE-FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "BR"
PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC	6" (150 mm)	10.9" (277 mm)	---	0.5" (13 mm)
SC740EPE08T / SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC	8" (200 mm)	12.2" (310 mm)	---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC	10" (250 mm)	13.4" (340 mm)	---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC	12" (300 mm)	14.7" (373 mm)	---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC	15" (375 mm)	18.4" (467 mm)	---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC	18" (450 mm)	19.7" (500 mm)	---	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)
SC740EPE24BR*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EPE24B/SC740EPE24BR ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

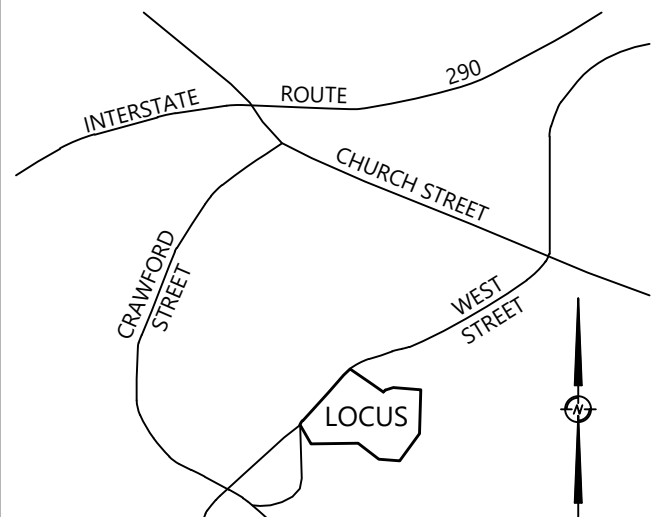
* FOR THE SC740EPE24B/SC740EPE24BR THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

SC-740 TECHNICAL SPECIFICATIONS

STORMTECH CHAMBER SC-740

N.T.S.

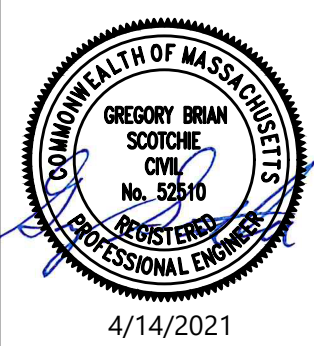


LOCUS MAP

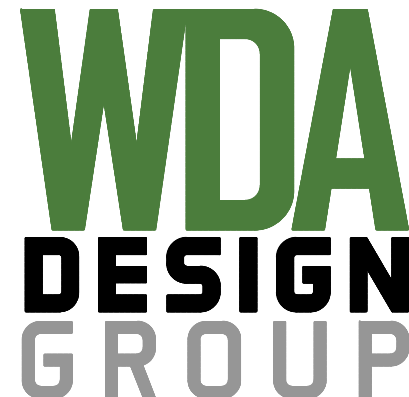
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REV.	DATE	DESCRIPTION	INIT.
E	4/14/20	TOWN COMMENTS	GBS
D	8/16/2021	FOR DATE ONLY	GBS
C	2/24/2021	PLANNING BOARD COMMENTS	GBS
B	12/14/20	CON. COM. COMMENTS	GBS
A		INITIAL ISSUE	GBS



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PREPARED FOR:

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P.O Box 295
Ellsworth, ME 04605

TITLE:

CONSTRUCTION DETAILS

85 & 98 COMMON
DRIVEWAY
85 & 95 West Street
Northborough, MA 01532
(Worcester County)

NOTICE OF INTENT

JOB NO.:	1207.03	DATE:	11/20/20
DWN. BY:	GBS	SHEET:	
CHKD. BY:	BPW/JRW		C6.05



ADS GEOSYNTHETICS 801 NON-WOVEN GEOTEXTILE ALL AROUND CLEAN, CRUSHED, ANGULAR STONE IN A & B LAYERS

PERIMETER STONE (SEE NOTE 4)

EXCAVATION WALL (CAN BE SLOPED OR VERTICAL)

12" (300 mm) MIN

MC-4500 END CAP

SUBGRADE SOILS (SEE NOTE 3)

9' (230 mm) MIN

100' (2540 mm)

12" (300 mm) MIN

60" (1524 mm)

12' (300 mm) MIN

24' (2.1 m) MAX

7'0" (2.1 m) MAX

600 mm MIN*

*TO BOTTOM OF FLEXIBLE PAVEMENT FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm)

PAVEMENT LAYER (DESIGNED BY SITE DESIGN ENGINEER)

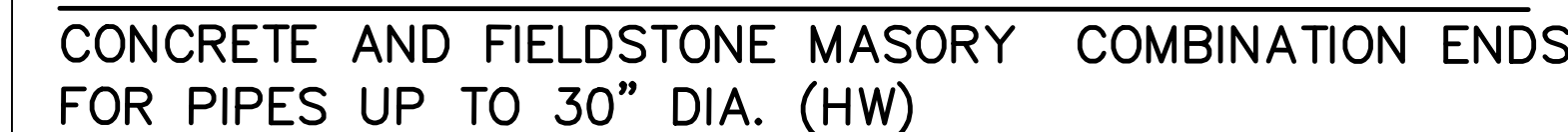
**THIS CROSS SECTION DETAIL REPRESENTS MINIMUM REQUIREMENTS FOR INSTALLATION PLEASE SEE THE LAYOUT SHEET (S) FOR PROJECT SPECIFIC REQUIREMENTS.

DEPTH OF STONE TO BE DETERMINED BY SITE DESIGN ENGINEER 9' (230 mm) MIN

NOTES:

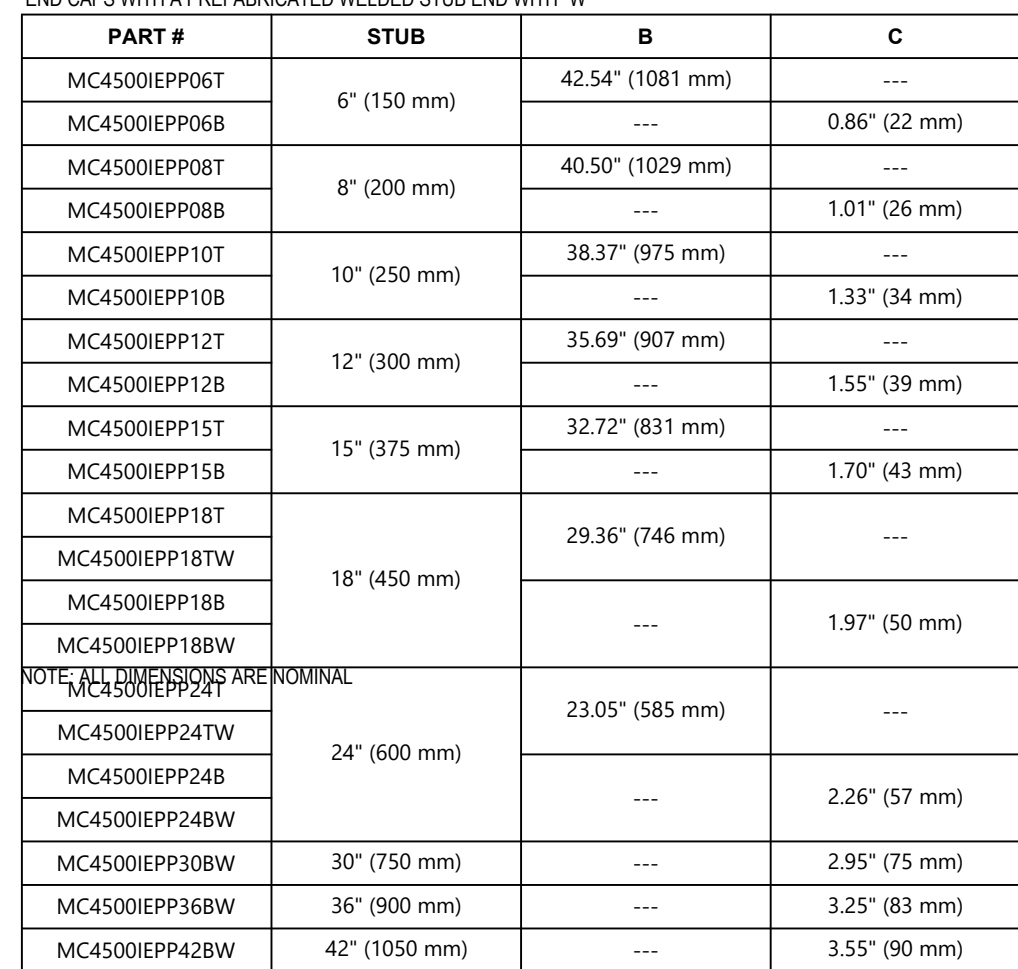
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F169-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" (CHAMBER CLASSIFICATION 80x101)
2. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
3. STORMTECH CHAMBERS ARE DESIGNED IN ACCORDANCE WITH SECTION 12.12 OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD BRIDGE DESIGN SPECIFICATIONS. THIS DOCUMENT ESTABLISHES REQUIREMENTS FOR DESIGN OF PROFILE WALL THERMOPLASTIC STRUCTURES FOR BOTH LIVE LOADS AND PERMANENT EARTH LOADS. PROPER USE OF THE AASHTO DESIGN METHOD REQUIRES THAT LOAD MULTIPLIERS FOR IMPACT AND MULTIPLE PRESENCES ARE APPLIED TO THE AASHTO DESIGN TRUCK (HS20) LIVE LOAD. ADDITIONAL FACTORS ARE APPLIED TO THE LOAD AND EARTH LOADS TO PROVIDE THE FULL SAFETY FACTORS FOR BOTH LIVE AND EARTH LOADS. WHEN INSTALLED IN ACCORDANCE WITH THE MINIMUM REQUIREMENTS SPECIFIED IN THE STORMTECH INSTALLATION INSTRUCTIONS, STORMTECH CHAMBERS MEET OR EXCEED THE AASHTO REQUIREMENTS FOR BOTH LIVE LOAD AND EARTH LOAD DESIGN. STORMTECH CHAMBERS ARE ALSO DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS." THIS STANDARD PRACTICE RELATES THE AASHTO DESIGN METHODOLOGY FOR THERMOPLASTIC PIPE AND APPLIES IT TO BURIED STORMWATER CHAMBERS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, (A) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/IN; AND (b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

N.T.S



MASS. TRAN. SPEC 206.5.0

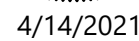
DIAMETER IN INCHES		LENGTHS		
A	B	C	D	E
12"	12"	3'-9"	2'-2"	3'-9"
12"	15"	4'-3"	2'-4"	4'-5"
12"	24"	5'-9"	2'-10"	6'-3"
12"	30"	6'-9"	3'-0"	7'-6"



CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-4500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.



E	4/14/20	TOWN COMMENTS	GBS
D	3/16/2021	FOR DATE ONLY	GBS
C	2/24/2021	PLANNING BOARD COMMENTS	GBS
B	12/14/20	CON. COM. COMMENTS	GBS
A	DATE	INITIAL ISSUE	GBS
REV.	DATE	DESCRIPTION	INIT



WDA
DESIGN
GROUP

OWNER: _____

OWNER:
Brant L. Viner & Margaret
Harling
P.O Box 295
Ellsworth, ME 04605

Brant L. Viner & Margaret
Harling
P.O Box 295
Ellsworth, ME 04605

TITLE: CONSTRUCTION
DETAILS
85 & 98 COMMON
DRIVEWAY
85 & 95 West Street
Northborough, MA 01532
(Worcester County)

NOTICE OF INTENT

JOB NO.:	1207.03	DATE:	11/20/20
DWN. BY:	GBS	SHEET:	C6.06
CHK'D. BY:	BPW/JRW		

NOTES: Intensity = $127.16 / (\text{Inlet time} + 17.80)^{0.82}$; Return period = Yrs. 100 ; c = cir e = ellip b = box

Storm Sewers v2021.00