

LOCUS MAP  
NOT TO SCALE

**PRELIMINARY PLAN**  
**1/2 MILE RADIUS MAP**  
FOR  
**LIBERTY HILL CONDOMINIUMS**

BEING  
A.P. 72, BLOCK 6, LOT 8B  
LOT AREA = 17.71 AC

**OWNER/APPLICANT**  
LIBERTY HILL  
PROFESSIONAL OFFICE  
PARK, LLC  
15 SHEFFIELD HILL ROAD  
EXETER, RI 02822

TOTAL OF 16 BUILDINGS  
32 PROPOSED UNITS  
2 BEDROOMS PER UNIT  
24 UNITS MARKET RATE  
8 UNITS AFFORDABLE HOUSING

PARCEL ZONING: B  
MIN LOT FRONTAGE = 150'  
FRONT SETBACK = 100'  
REAR SETBACK = 75'  
SIDE SETBACK = 30'  
MAX LOT COVERAGE = 25%

**NOTES:**

1. THERE WERE NO CEMETERIES FOUND ON THIS PROPERTY.
2. THE SITE IS PRIMARILY WOODED WITH THE EXCEPTION OF A PATH THAT LEADS TO THE EXISTING OFFICE BUILDING'S PUMPHOUSE.
3. THE PROPOSED UTILITIES ARE TO BE PARTIALLY ABOVE GROUND AND PARTIALLY UNDERGROUND.
4. EACH CONDOMINIUM WILL BE SERVICED BY PRIVATE WELLS AND ONSITE WASTEWATER TREATMENT SYSTEMS.
5. PROPOSED LOTS ARE NOT LOCATED WITHIN ANY OF THE FOLLOWING AREAS:  
-NATURAL HERITAGE DISTRICT

**LEGEND**

- FIRE DEPARTMENT
- EXISTING PROPERTY LINE
- ABUTTER PROPERTY LINE
- ZONING BOUNDARY
- GROUND WATER OVERLAY DISTRICT

**SHEET INDEX:**

1. 1/2 MILE RADIUS MAP
2. EXISTING CONDITIONS MAP
3. PROPOSED CONDITIONS PLAN
4. PROPOSED GRADING PLAN
5. PROPOSED UTILITY/LAYOUT PLAN
6. PROPOSED ROAD PROFILE VIEW
7. PROPOSED ROAD PROFILE VIEW
8. ONSITE WASTEWATER TREATMENT SYSTEM INDEX/DETAIL SHEET
9. ONSITE WASTEWATER TREATMENT SYSTEM CONFIGURATIONS
10. ONSITE WASTEWATER TREATMENT SYSTEM CONFIGURATIONS
11. ONSITE WASTEWATER TREATMENT SYSTEM CONFIGURATIONS
12. ONSITE WASTEWATER TREATMENT SYSTEM CONFIGURATIONS
13. ONSITE WASTEWATER TREATMENT SYSTEM CONFIGURATIONS
14. DRAINAGE DETAILS
15. GENERAL DETAILS



Scale 1" = 300'



1/2 MILE RADIUS MAP

FOR

**LIBERTY HILL CONDOMINIUMS**

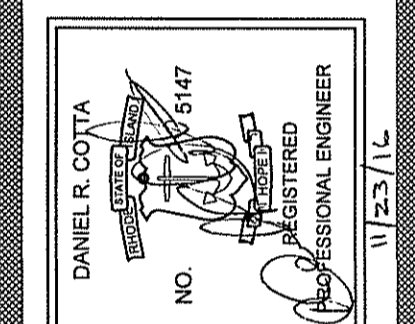
LOCATED AT

**400 SOUTH COUNTY TRAIL**

EXETER, R.I.

DEPARTMENT OF	DATE	REVISION
PLANNING AND ZONING	10/27/2016	
AS SPECIFIED IN		
DATED	10/27/2016	
APPROVED PLANS		

Drawn By: PJP  
Scale: 1" = 300'

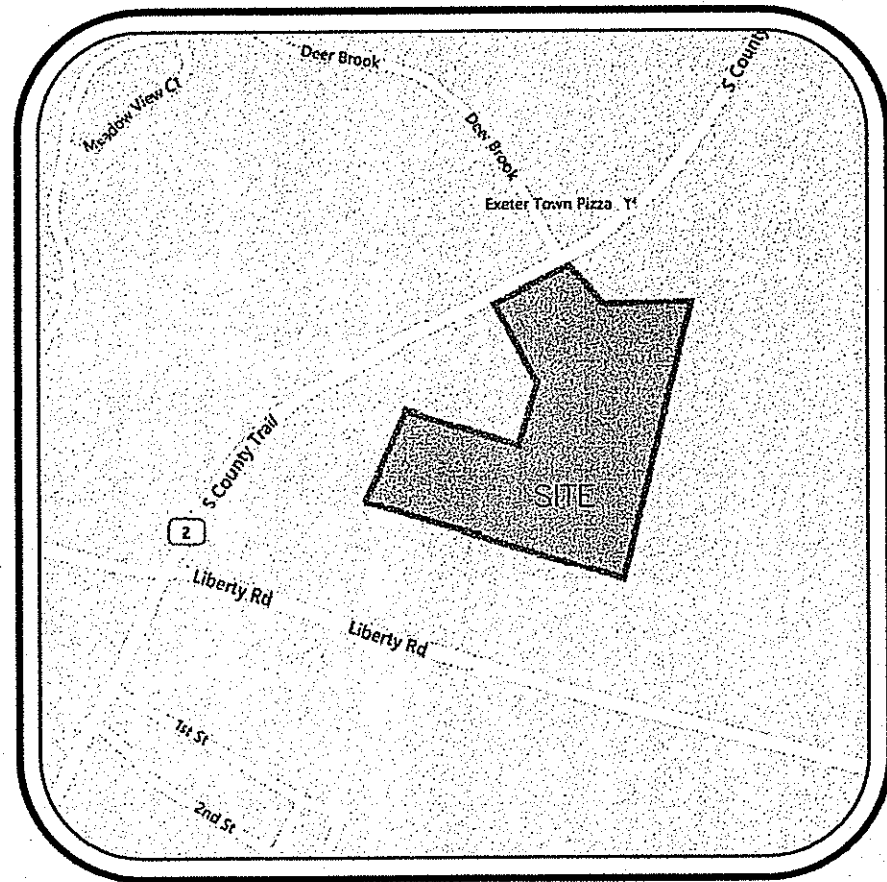


Environmental Management  
Office of Water Resources

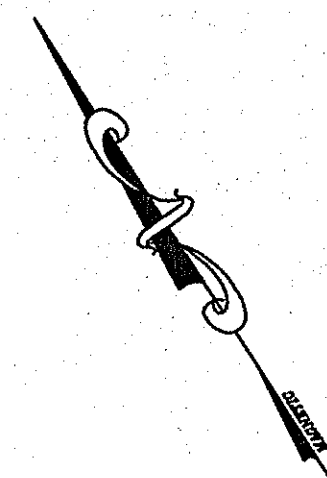
**AMERICAN ENGINEERING, INC.**

DANIEL R. COTTA  
Professional Engineer / Professional Land Surveyor  
400 South County Trail - Suite A 201  
Exeter, Rhode Island 02822  
Phone (401) 294-4090 / Fax (401) 294-3625

Sheet  
**1**  
of 15 sheets  
Drawing No. 98165



LOCUS MAP  
NOT TO SCALE



**BEING A.P. 72, BLOCK 6, LOT 8B  
TOTAL AREA OF LOT = 17.71 AC.**

**PROPERTY OWNER/APPLICANT  
LIBERTY HILL PROFESSIONAL  
OFFICE PARK, LLC  
15 SHEFFIELD HILL ROAD  
EXETER, RI 02822**

**NOTES:**

- EXISTING BUILDINGS SHOWN WERE APPROXIMATELY LOCATED USING AERIAL IMAGERY CAPTURED IN 2011.
- CONTOURS WERE TAKEN FROM A LIDAR SURVEY OF THE ABOVE MENTIONED PROPERTY.

FEMA DETERMINATION  
ZONE "X UNSHADED" - AREA OF MINIMAL FLOODING  
PANEL NO. - 44009C0091 H  
REVISED - OCTOBER 19, 2010

Curve Table					
Curve #	Radius	Length	Delta	CHB	CHD
C1	1539.70'	65.41'	002° 28' 02"	S75° 41' W	65.41'

**REFERENCES:**

- REFERENCE IS HEREBY MADE TO THAT CERTAIN PLAN ENTITLED "SURVEY PLAN FOR JANET I. MACLENNAN LOCATED AT SOUTH COUNTY TRAIL - POLE #69 EXETER, RI AMERICAN ENGINEERING DANIEL R. COTTA REGISTERED PROFESSIONAL ENGINEER SCALE: 1"=100' DATE: 3/13/2001 REVISION 1. DATE: 5/29/01" RECORDED IN THE TOWN OF EXETER AS PLAT MAP #362.
- REFERENCE IS HEREBY MADE TO THAT SURVEY OF LAND ON FILE IN LAND EVIDENCE BOOK 90, PAGE 363 AS RECORDED IN THE TOWN OF EXETER.
- REFERENCE IS HEREBY MADE TO STATE HIGHWAY PLAT 344.
- REFERENCE IS HEREBY MADE TO THAT CERTAIN DEED ON FILE IN LAND EVIDENCE BOOK 93, PAGE 627 AS RECORDED IN THE TOWN OF EXETER.
- REFERENCE IS HEREBY MADE TO THAT CERTAIN PLAN ENTITLED "CONDOMINIUM SURVEY PLAN FOR 400 SOUTH COUNTY TRAIL, INC. SOUTH COUNTY TRAIL - POLE # 69 EXETER, RHODE ISLAND A.P. 72, BLOCK 6, LOT 8A. SHEET 1 OF 3 BY ALPHA ASSOCIATES, LTD SCALE: AS SHOWN DATE : 12/21/2006" RECORDED IN THE TOWN OF EXETER AS PLAT MAP #426-A

**CERTIFICATION:**

THIS SURVEY HAS BEEN CONDUCTED AND THE PLAN HAS BEEN PREPARED PURSUANT TO SECTION 9 OF THE RULES AND REGULATIONS ADOPTED BY THE RHODE ISLAND STATE BOARD OF REGISTRATION FOR PROFESSIONAL LAND SURVEYORS ON NOVEMBER 25, 2015, AS FOLLOWS:

-COMPREHENSIVE BOUNDARY SURVEY

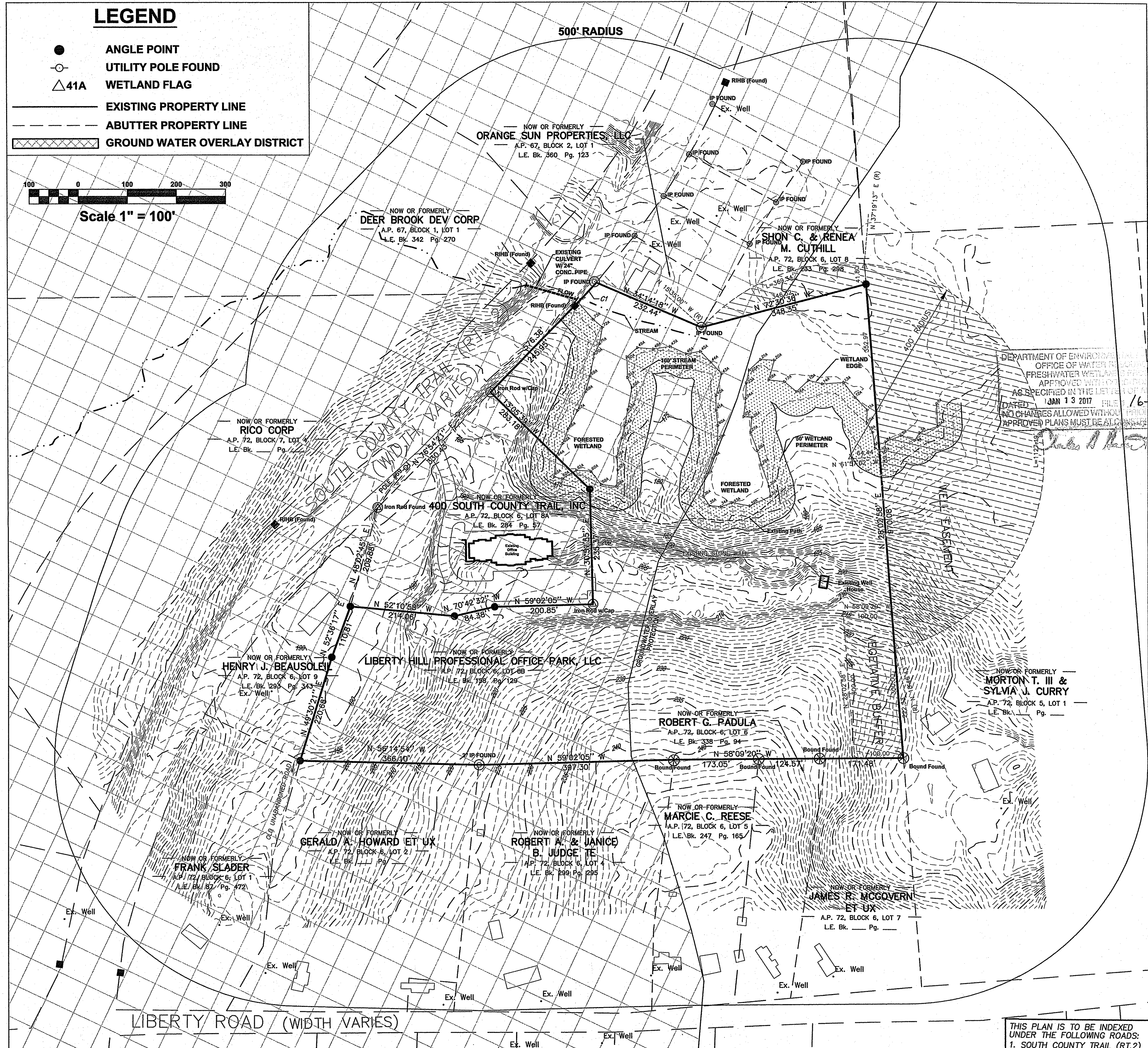
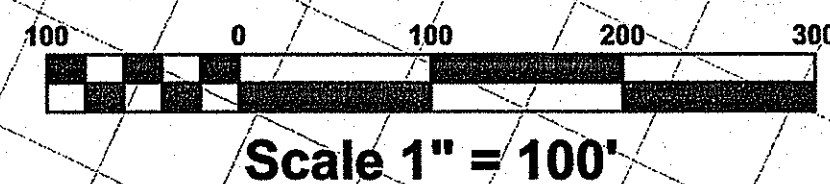
- THE PURPOSE FOR THE CONDUCT OF THE SURVEY AND FOR THE PREPARATION OF THE PLAN IS AS FOLLOWS:

THE PURPOSE OF THIS PLAN IS TO DEPICT THE BOUNDARY OF THE AFOREMENTIONED PROPERTY.

BY:  11/20/16  
DANIEL R. COTTA PLS-1918  
LS.000A453 COA

**LEGEND**

- ANGLE POINT
- UTILITY POLE FOUND
- △ 41A WETLAND FLAG
- EXISTING PROPERTY LINE
- - - ABUTTER PROPERTY LINE
- ▨ GROUND WATER OVERLAY DISTRICT



DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
APPROVED WITH CONDITIONS  
AS SPECIFIED IN THE LETTER DATED  
JAN 13 2017 FILE # 16-030  
NO CHANGES ALLOWED WITHOUT APPROVED PLANS MUST BE AT THE OFFICE OF WATER RESOURCES

EXISTING CONDITIONS MAP  
FOR  
**LIBERTY HILL CONDOMINIUMS**  
LOCATED AT  
400 SOUTH COUNTY TRAIL  
EXETER, R.I.

Checked By: **Drc** Date: 10/21/2016  
Drawn By: **PJF** Scale: 1" = 100'  
REVISIONS

NO.	REVISION	BY	DATE

Environmental Management  
DEC 05 2016  
Office of Water Resources

DANIEL R. COTTA  
REGISTERED PROFESSIONAL LAND SURVEYOR  
No. 1918

**AMERICAN ENGINEERING, INC.**  
Professional Engineer / Professional Land Surveyor  
DANIEL R. COTTA  
400 South County Trail - Suite A 201  
Exeter, Rhode Island 02822  
Phone (401) 294-4090 / Fax (401) 294-3625

Sheet  
**2**  
of 15 sheets  
Drawing No. 98165

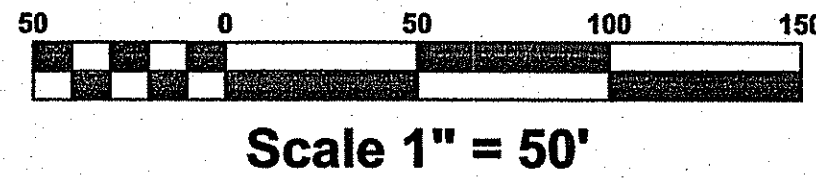
THIS PLAN IS TO BE INDEXED UNDER THE FOLLOWING ROADS:  
1. SOUTH COUNTY TRAIL (RT.2)

BEING A.P. 72, BLOCK 6, LOT 8B  
TOTAL AREA OF LOT = 17.71 AC.

PROPERTY OWNER/APPLICANT  
**LIBERTY HILL PROFESSIONAL  
OFFICE PARK, LLC**  
15 SHEFFIELD HILL ROAD  
EXETER, RI 02822

PARCEL ZONING: B  
MIN LOT FRONTAGE = 150'  
FRONT SETBACK = 100'  
REAR SETBACK = 75'  
SIDE SETBACK = 30'  
MAX LOT COVERAGE = 25%

FEMA DETERMINATION  
ZONE "X UNSHADED" - AREA  
OF MINIMAL FLOODING  
PANEL NO. - 44009C0091 H  
REVISED - OCTOBER 19, 2010



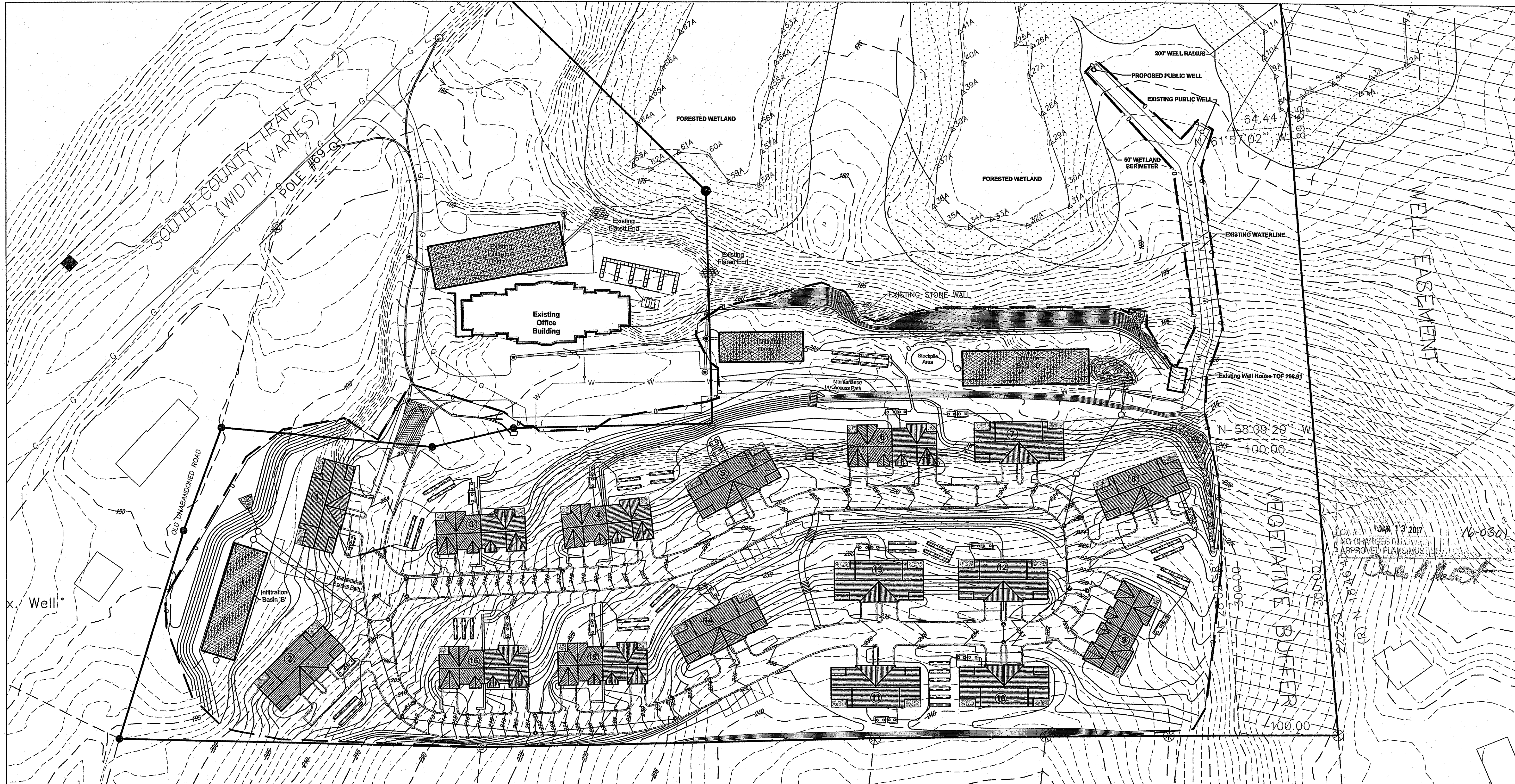
**LEGEND**

- RIHB FOUND
- ANGLE POINT
- ⊕ IRON PIPE FOUND
- ⊗ BOUND FOUND
- ⊙ IRON ROD FOUND
- UTILITY POLE FOUND
- △ 41A WETLAND FLAG
- ⊖ EXISTING CATCH BASIN
- ⊕ PROPOSED CATCH BASIN
- ⊙ EXISTING DRAINAGE MANHOLE
- PROPOSED DRAINAGE MANHOLE
- EXISTING PROPERTY LINE
- - - ABUTTER PROPERTY LINE
- - - LIMIT OF DISTURBANCE
- SILT FENCE
- - - EXISTING WATERLINE
- - - PROPOSED WATERLINE
- - - EXISTING GAS LINE

**TOTAL OF 16 BUILDINGS**  
**32 PROPOSED UNITS**  
**2 BEDROOMS PER UNIT**  
**24 UNITS MARKET RATE**  
**8 UNITS AFFORDABLE HOUSING**

**NOTES:**

1. EXISTING BUILDINGS WERE LOCATED USING FIELD SURVEYING PRACTICES.
2. CONTOURS WERE TAKEN FROM AERIAL TOPOGRAPHY AND SUPPLEMENTED TO REFLECT AS-BUILT CONDITIONS.
3. THERE WERE NO CEMETERIES FOUND ON THIS PROPERTY.
4. THE SITE IS PRIMARILY WOODED WITH THE EXCEPTION OF THE AREA IN THE VICINITY OF BASIN C AND BASIN D AND THE GRAVEL ACCESS ROAD TO THE EXISTING PUBLIC WELL. THESE AREAS WERE DISTURBED AS PART OF THE ORIGINAL CONSTRUCTION FOR THE LIBERTY HILL PROFESSIONAL OFFICE PARK (RIDEM WETLANDS APP#93-0519)
5. THE PROPOSED UTILITIES ARE TO BE PARTIALLY ABOVE GROUND AND PARTIALLY UNDERGROUND.
6. EACH CONDOMINIUM WILL BE SERVICED BY A PUBLIC WELL AND ONSITE WASTEWATER TREATMENT SYSTEMS.
7. PROPOSED LOTS ARE NOT LOCATED WITHIN ANY OF THE FOLLOWING AREAS:  
-NATURAL HERITAGE DISTRICT



**PROPOSED CONDITIONS PLAN**  
FOR  
**LIBERTY HILL CONDOMINIUMS**  
LOCATED AT  
**400 SOUTH COUNTY TRAIL**  
EXETER, R.I.

Drawn By: <b>PJF</b>	Checked By: <b>Drc</b>
Scale: <b>1" = 50'</b>	Date: <b>10/21/2016</b>
REVISIONS	
NO. REVISION	BY DATE

Environmental Management  
 DEC 05 2016  
 Office of Water Resources

**AMERICAN ENGINEERING, INC.**  
 Daniel R. Cotta Professional Engineer / Professional Land Surveyor  
 400 South County Trail - Suite A 201  
 Exeter, Rhode Island 02822  
 Phone (401) 294-4090 / Fax (401) 294-3625

# GRADING PLAN FOR LIBERTY HILL CONDOMINIUMS

Being A.P. 72, Block 6, Lot 8B  
Lot Area = 17.71 Acres

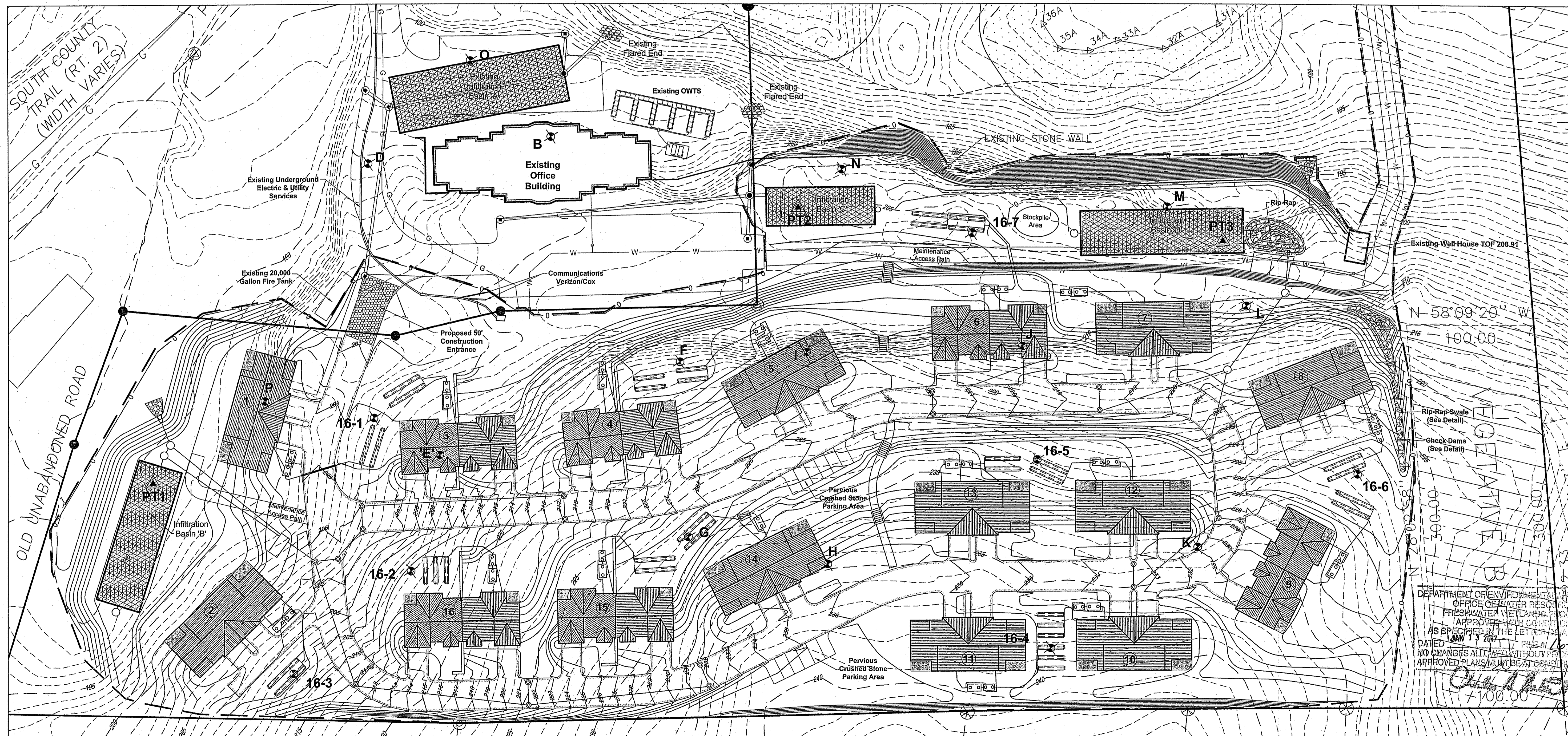
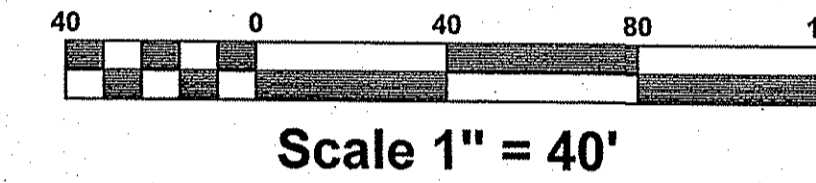
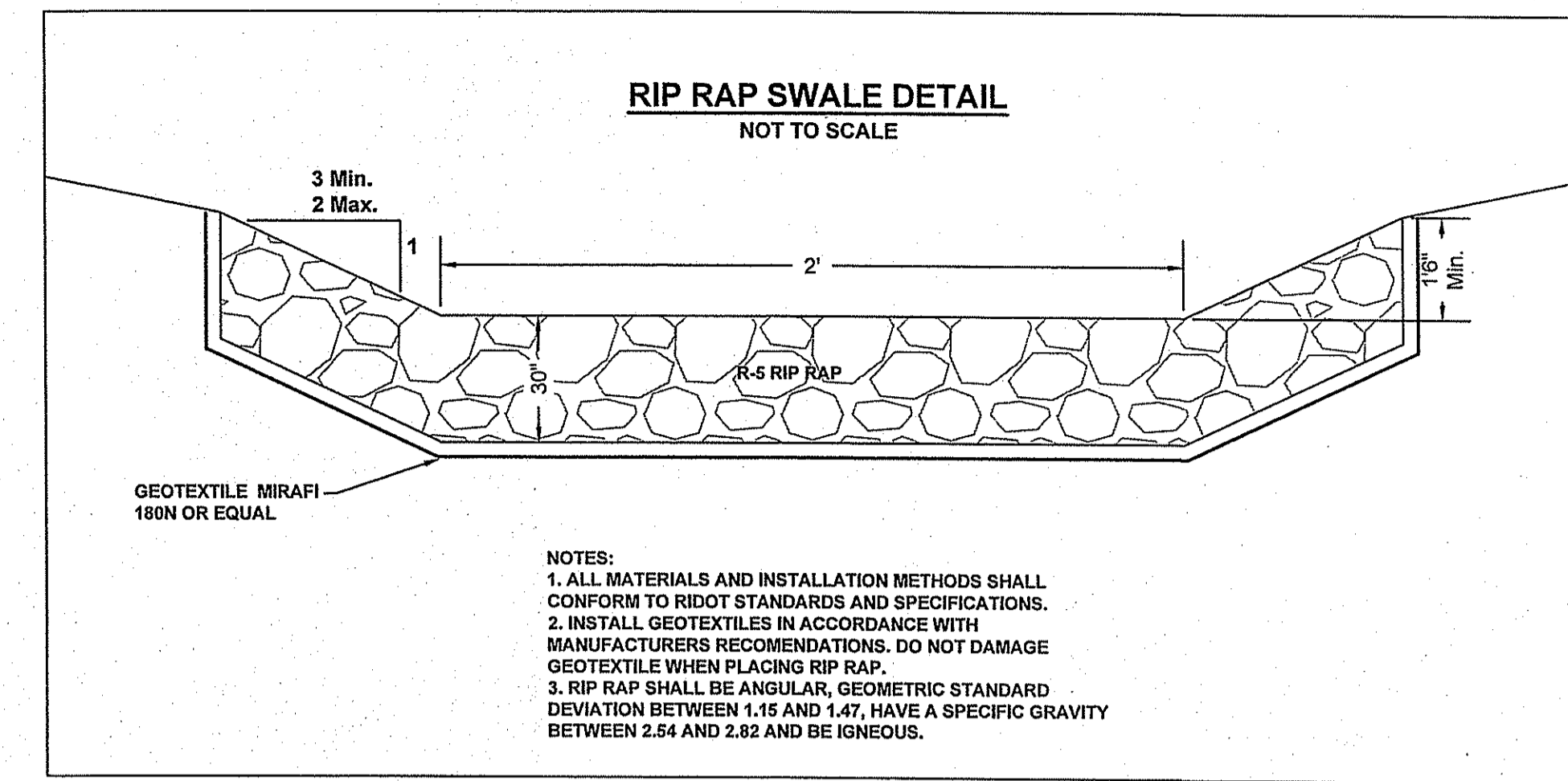
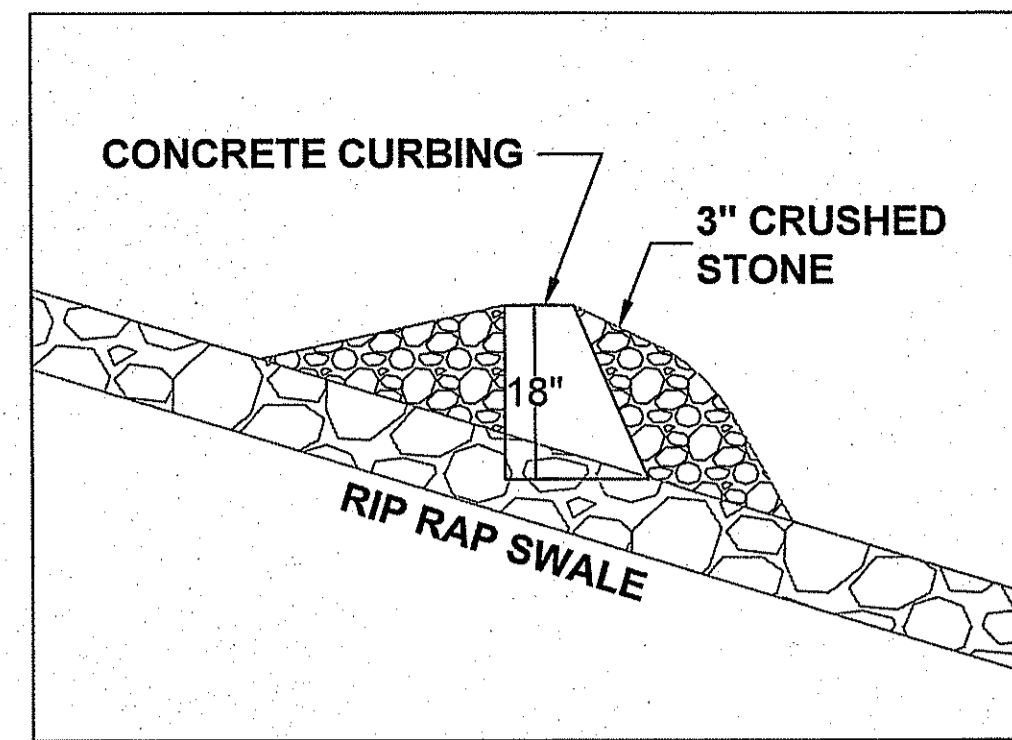
**OWNER/APPLICANT**  
LIBERTY HILL PROFESSIONAL  
OFFICE PARK, LLC  
15 SHEFFIELD HILL ROAD  
EXETER, RI 02822

### SLOPED SURFACE TREATMENT

- For slopes of greater than 2:1 use Rip-Rap (see detail on sheet 15)
- For slopes of 2:1 to greater than 3:1 use North American Green P300 Erosion Control Blanket (see detail on sheet 15)
- For slopes of 3:1 to 4:1 use North American Green S150 Erosion Control Blanket (see detail on sheet 15)

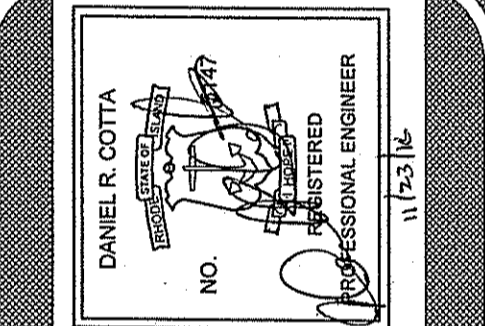
## LEGEND

- RIHB FOUND
- ANGLE POINT
- IRON PIPE FOUND
- ⊙ BOUND FOUND
- ⊖ IRON ROD FOUND
- ▣ EXISTING CATCH BASIN
- ▢ PROPOSED CATCH BASIN
- ⊙ EXISTING DRAINAGE MANHOLE
- PROPOSED DRAINAGE MANHOLE
- UTILITY POLE FOUND
- △ 41A WETLAND FLAG
- ⊕ TEST HOLE
- ▲ PERCOLATION TEST
- EXISTING PROPERTY LINE
- - - ABUTTER PROPERTY LINE
- - - LIMIT OF DISTURBANCE
- SILT FENCE
- W EXISTING WATERLINE
- - - W PROPOSED WATERLINE
- - - G EXISTING GAS LINE



**PROPOSED GRADING PLAN**  
FOR  
**LIBERTY HILL CONDOMINIUMS**  
LOCATED AT  
**400 SOUTH COUNTY TRAIL**  
EXETER, R.I.

Drawn By: <b>PJF</b>	Checked By: <b>DfC</b>
Scale: <b>1" = 40'</b>	Date: <b>10/21/2016</b>
REVISIONS	
NO.	REVISION



Environmental Manager  
REC 05 2016  
Office of Water Resources

**AMERICAN ENGINEERING, INC.**  
Professional Engineer / Professional Land Surveyor  
**DANIEL R. COTTA**  
400 South County Trail - Suite A 201  
Exeter, Rhode Island 02822  
Phone (401) 294-4090 / Fax (401) 294-3625

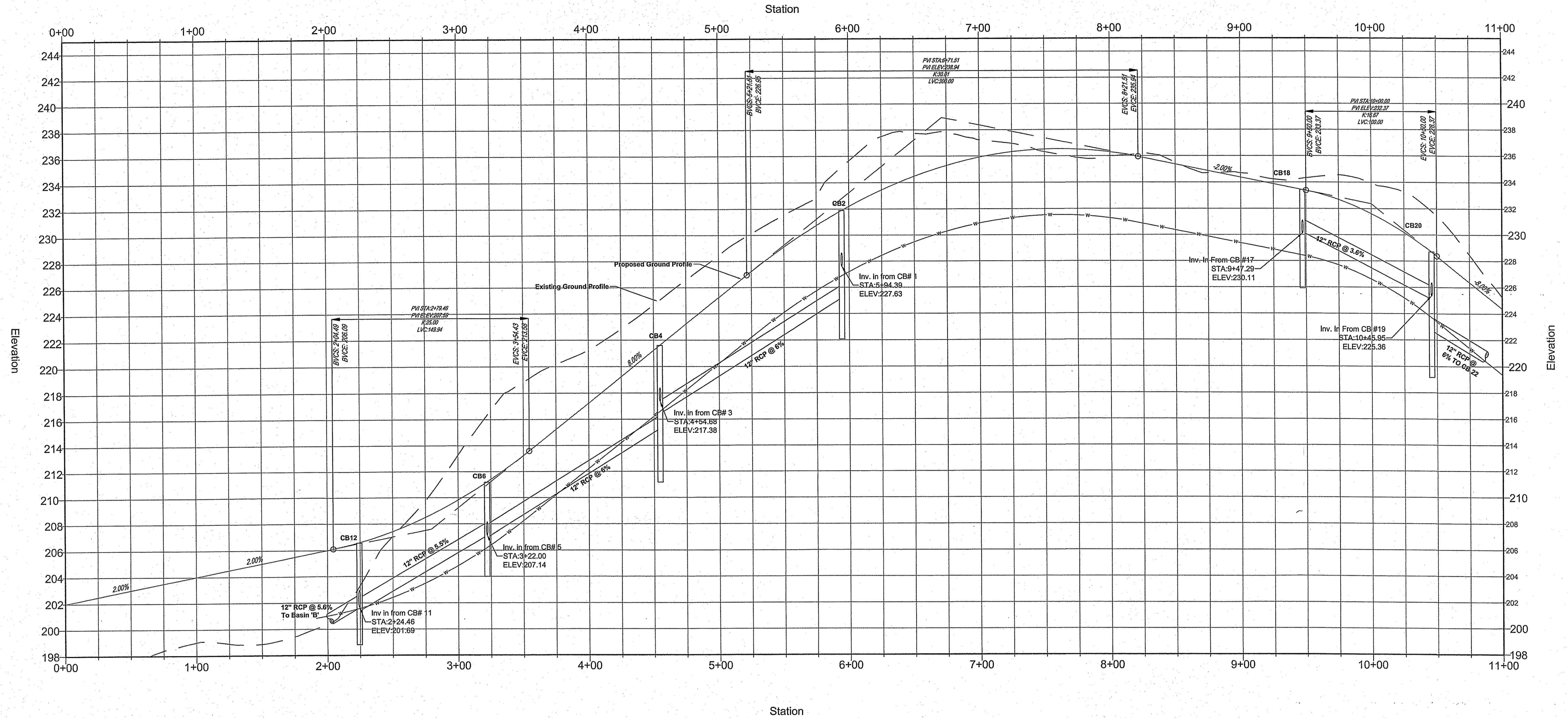
Sheet  
**4**  
of 15 sheets  
Drawing No. 98165

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS  
APPROVED WITH COMMENTS  
AS SPECIFIED IN THE LETTER  
DATED 10/13/2016  
NO CHANGES ALLOWED WITHOUT YOUR PREVIOUS  
APPROVED PLANS/MAJOR REVISIONS  
10/13/2016  
7100.00



HORIZONTAL SCALE 1" = 40'  
VERTICAL SCALE 1" = 4'

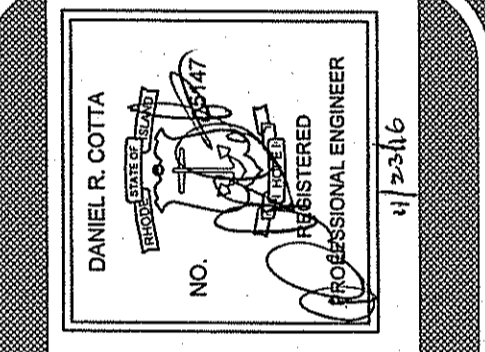
Proposed Road Profile



PROPOSED ROAD PROFILE VIEW  
FOR  
**LIBERTY HILL CONDOMINIUMS**  
LOCATED AT  
**400 SOUTH COUNTY TRAIL**  
EXETER, R.I.

Drawn By: **PJF** Checked By: **Drc**  
Scale: **AS SHOWN** Date: **10/21/2016**

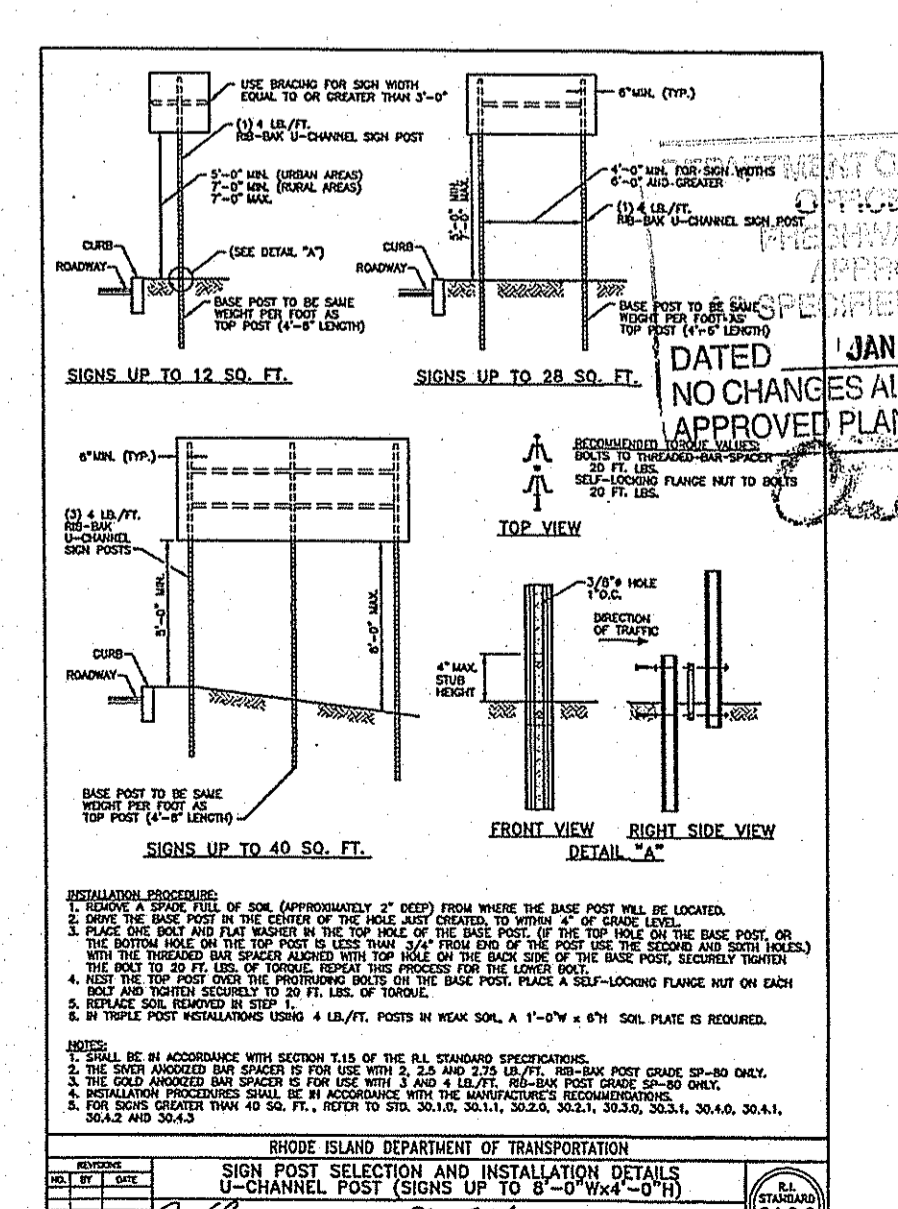
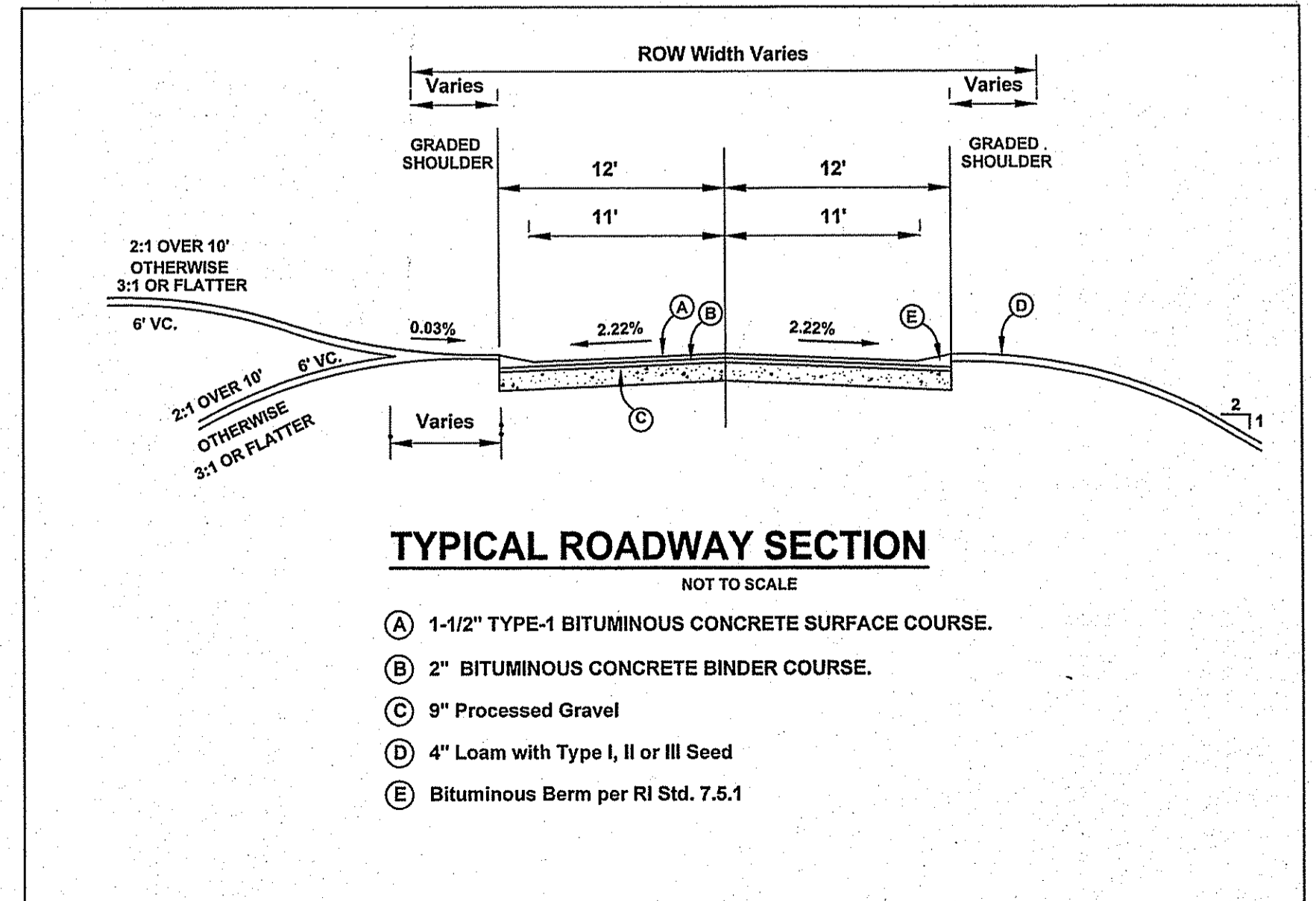
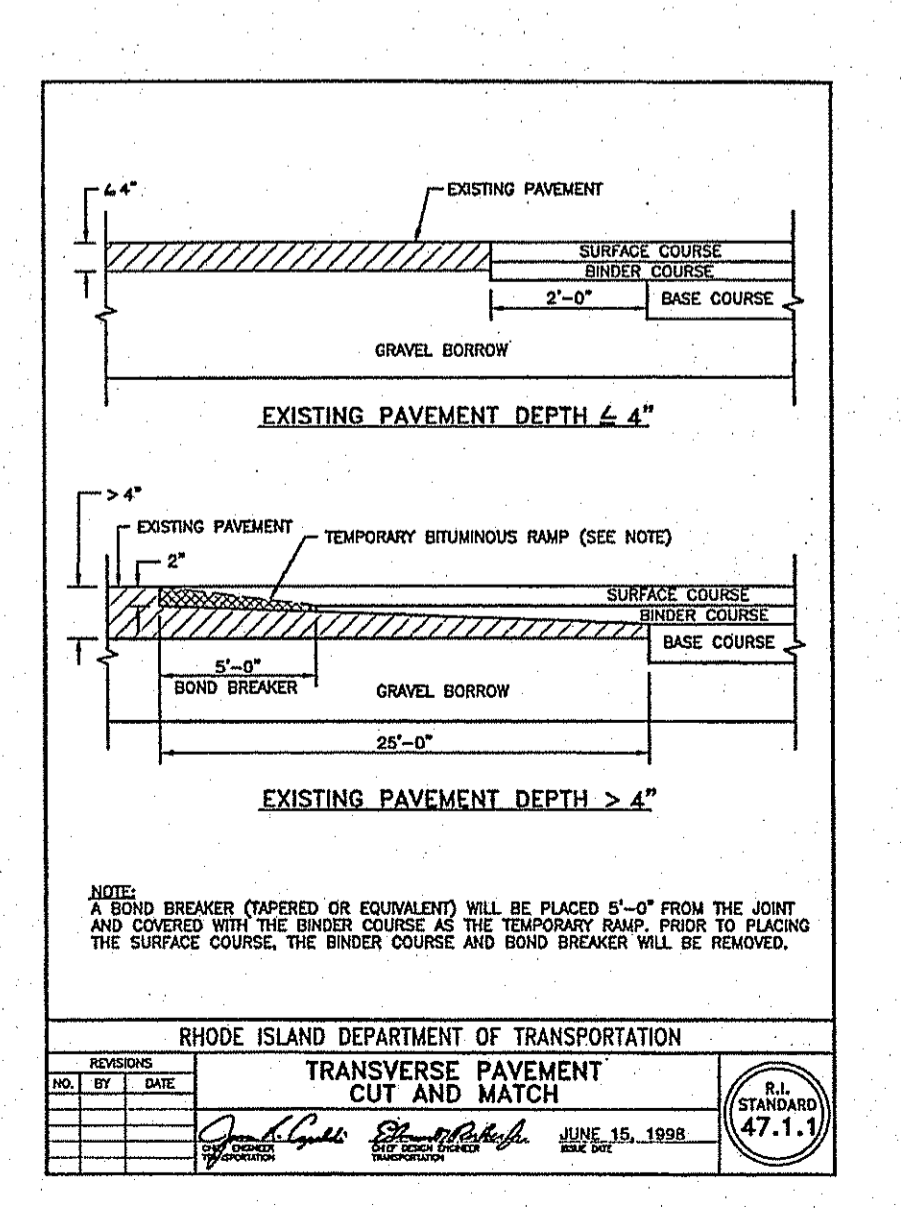
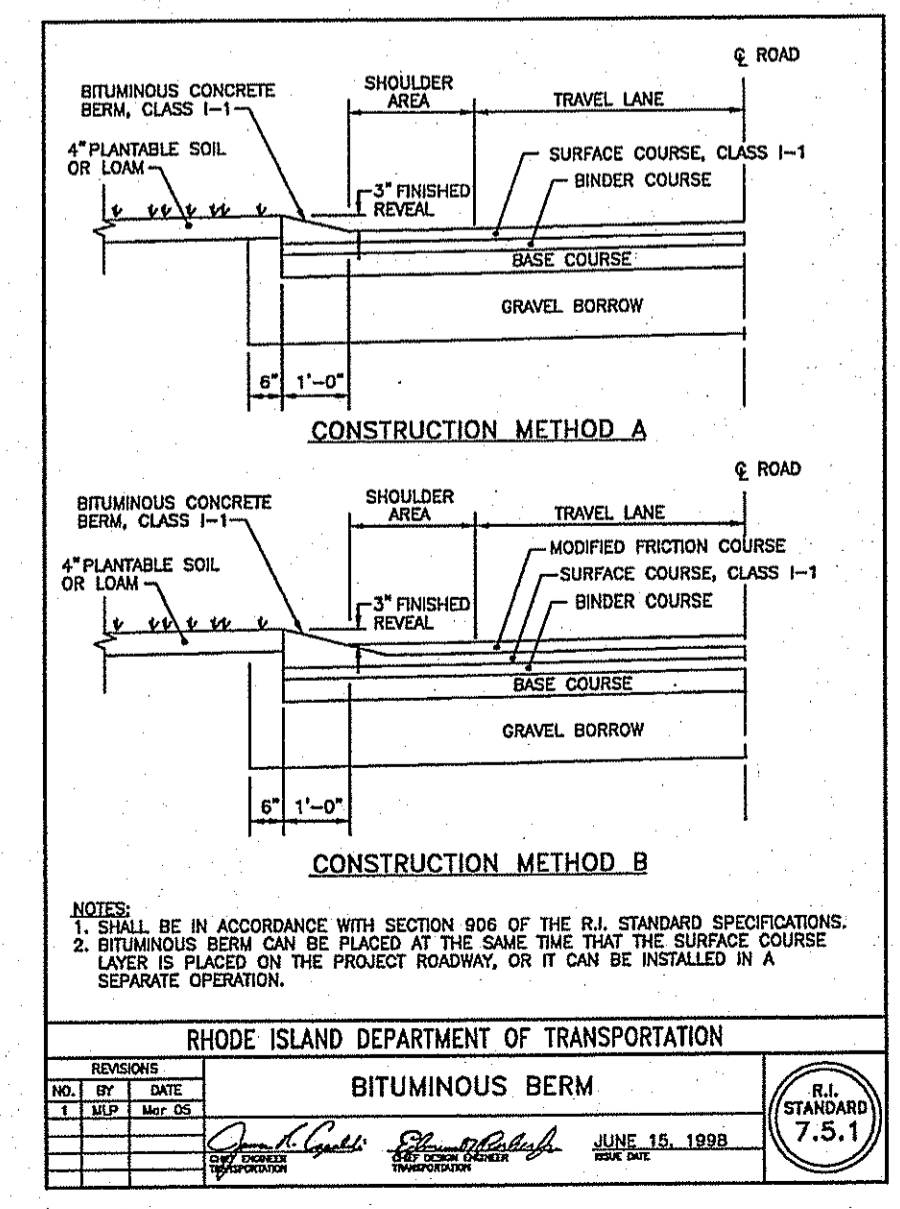
NO.	REVISION	BY	DATE



Environmental Management  
DEC 6 5 2016  
Office of Water Resources

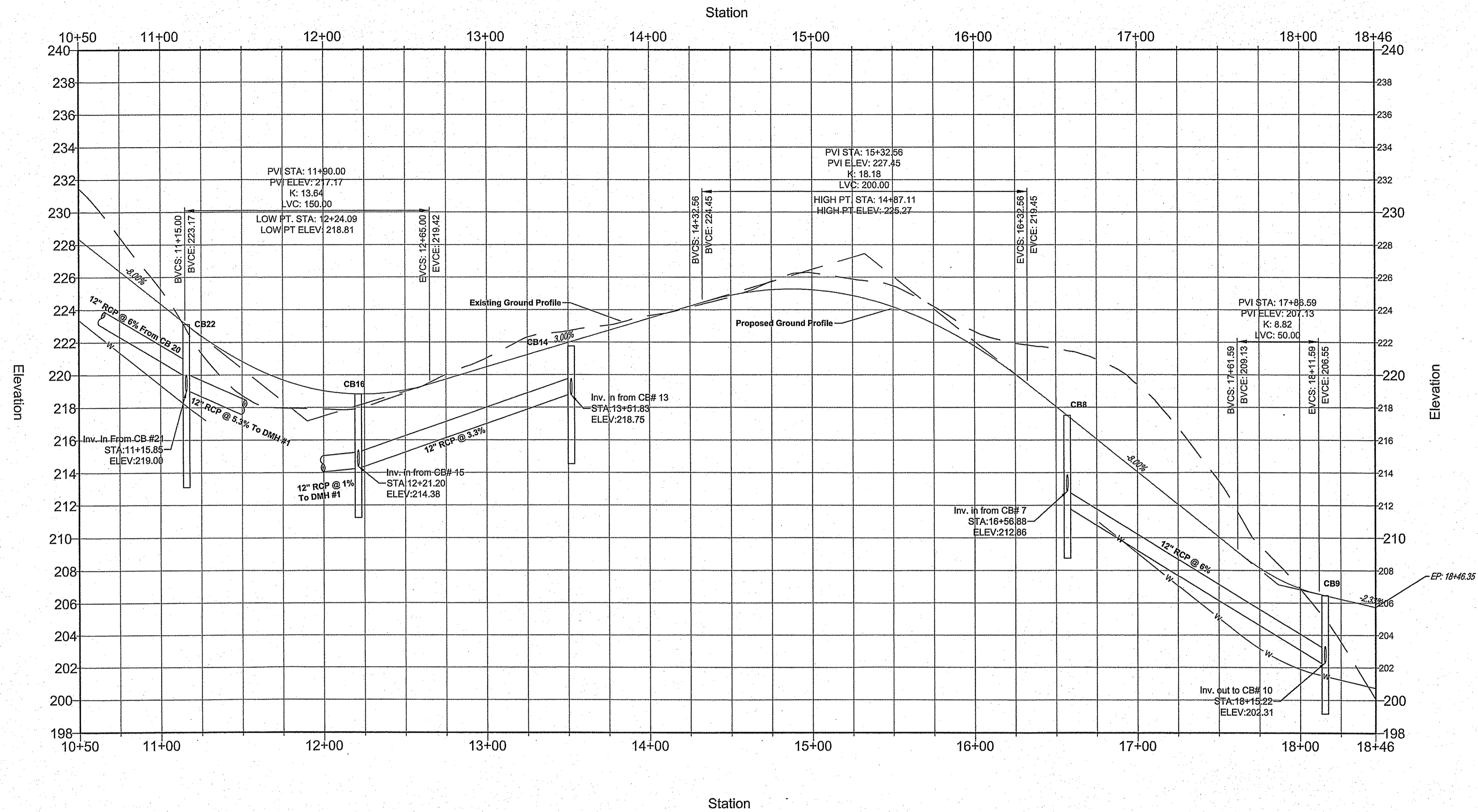
**AMERICAN ENGINEERING, INC.**  
Professional Engineer / Professional Land Surveyor  
**DANIEL R. COTTA**  
400 South County Trail - Suite A 201  
Exeter, Rhode Island 02822  
Phone (401) 294-4090 / Fax (401) 294-3625

Sheet  
**6**  
of 15 sheets  
Drawing No. 98165



HORIZONTAL SCALE 1" = 40'  
VERTICAL SCALE 1" = 4'

Proposed Road Profile



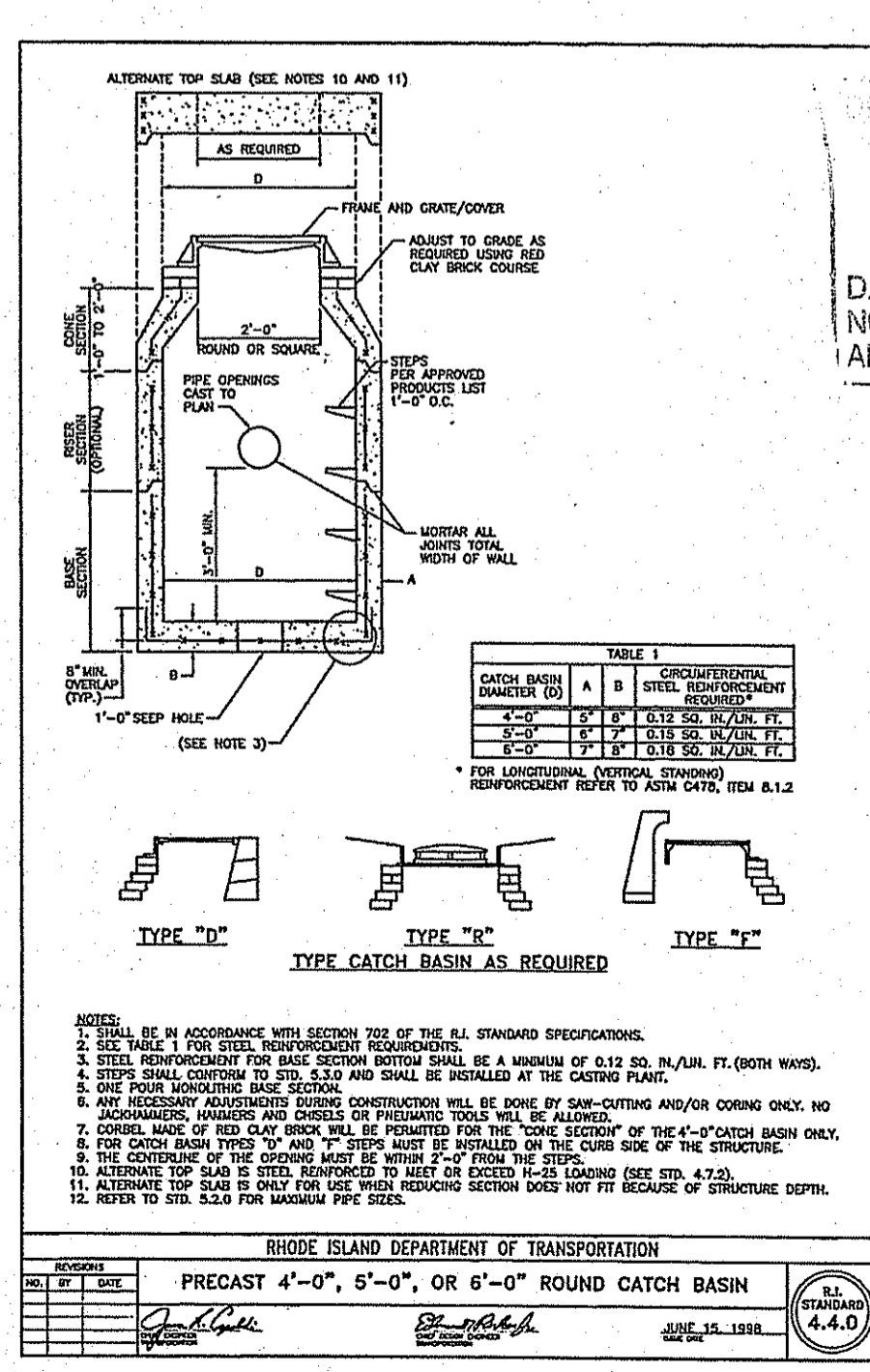
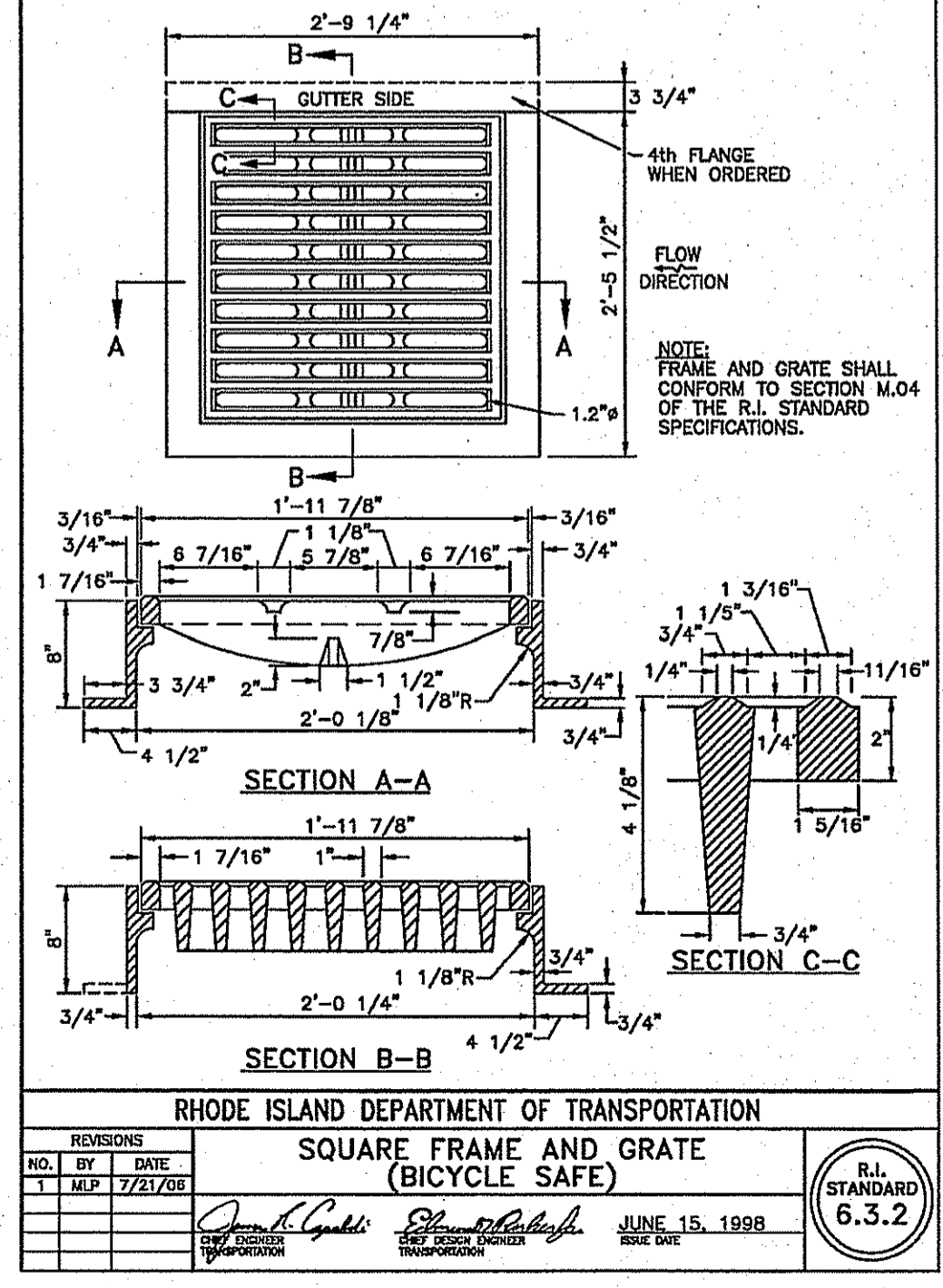
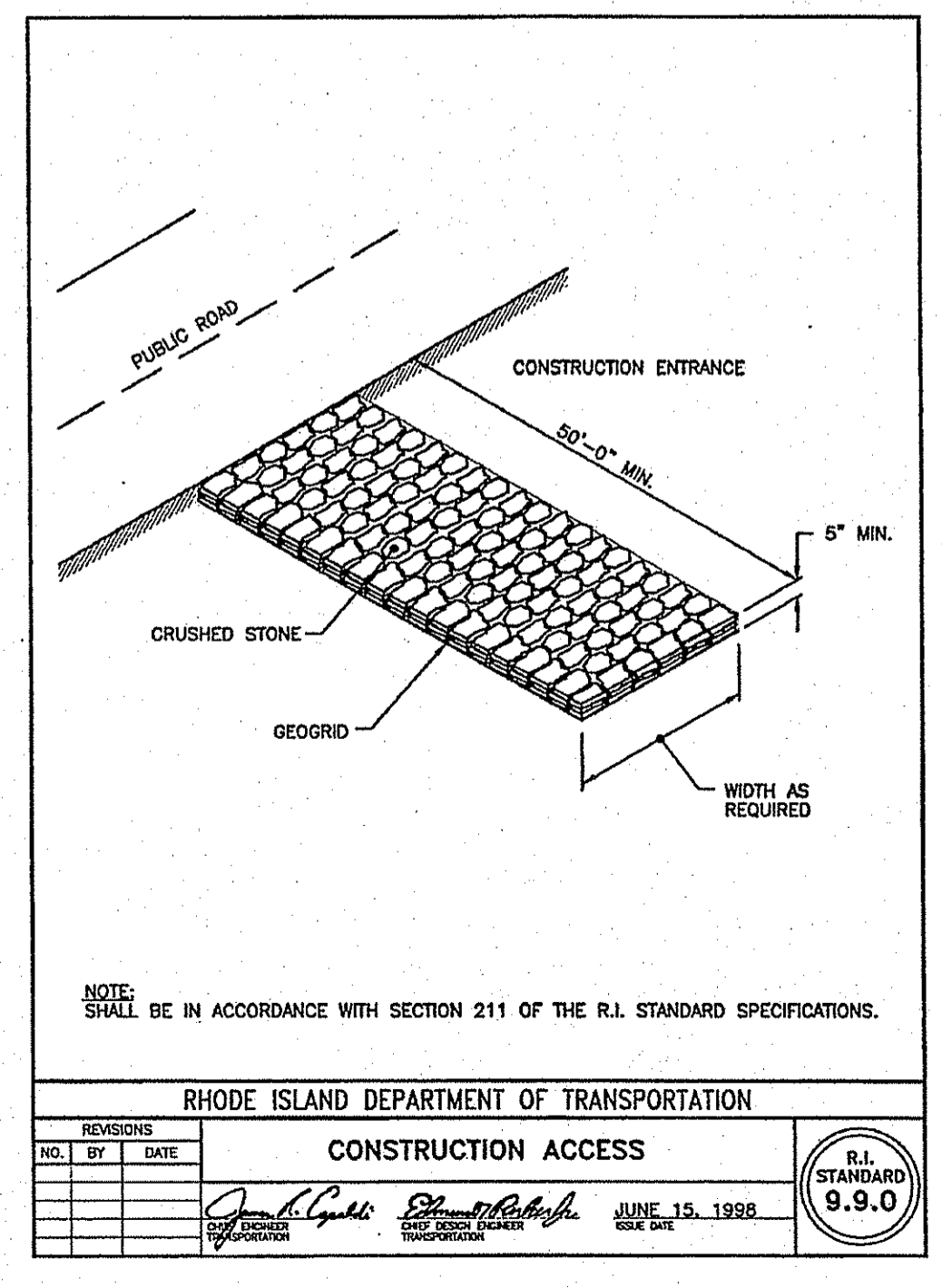
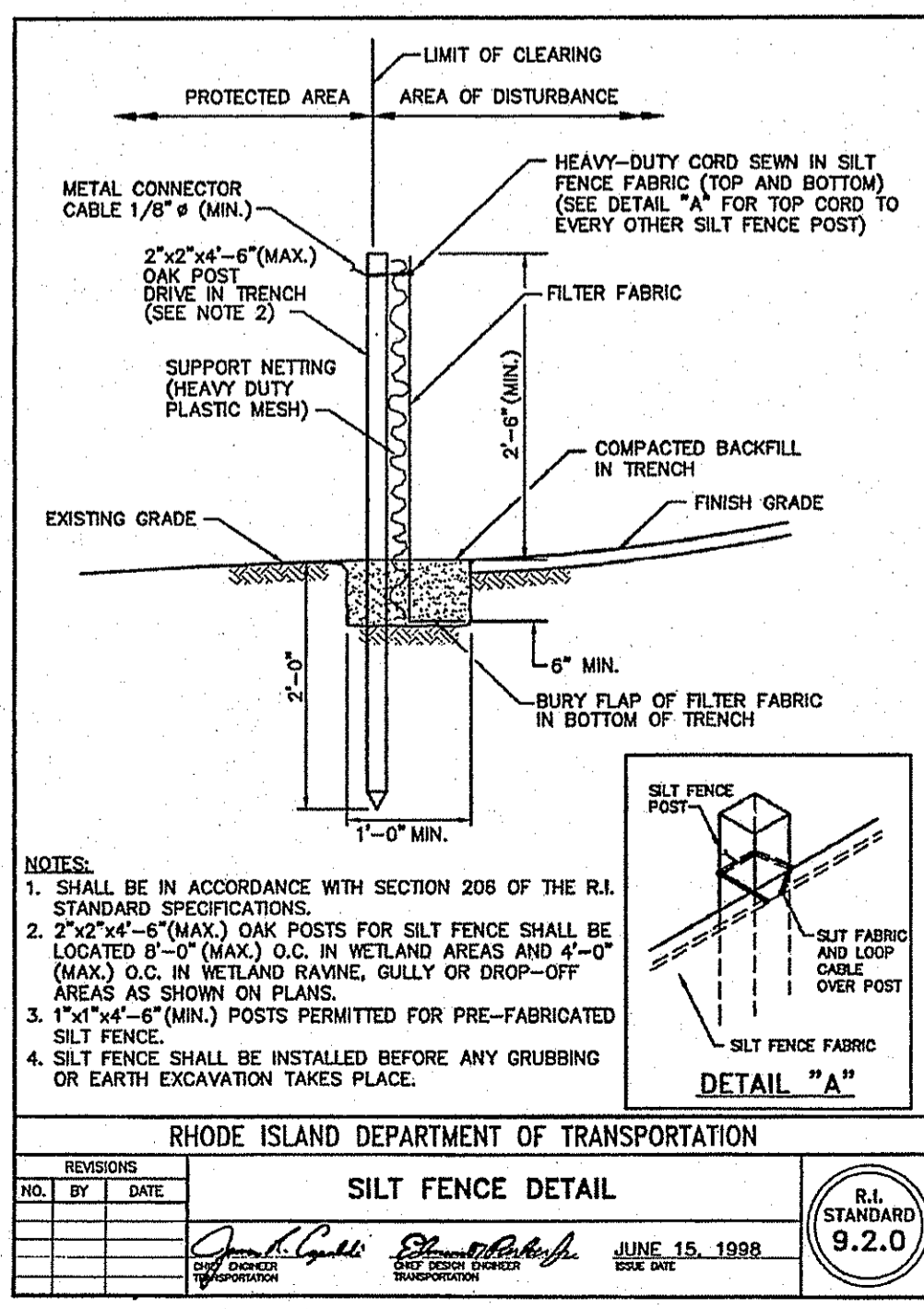
PROPOSED ROAD PROFILE VIEW  
FOR  
**LIBERTY HILL CONDOMINIUMS**  
LOCATED AT  
**400 SOUTH COUNTY TRAIL**  
EXETER, R.I.

Drawn By: **PJF** Checked By: **Drc**  
Scale: **AS SHOWN** Date: **10/21/2016**  
NO. REVISION NO. REVISION DATE

DANIEL R. COTTA  
Professional Engineer  
No. 1142-31c

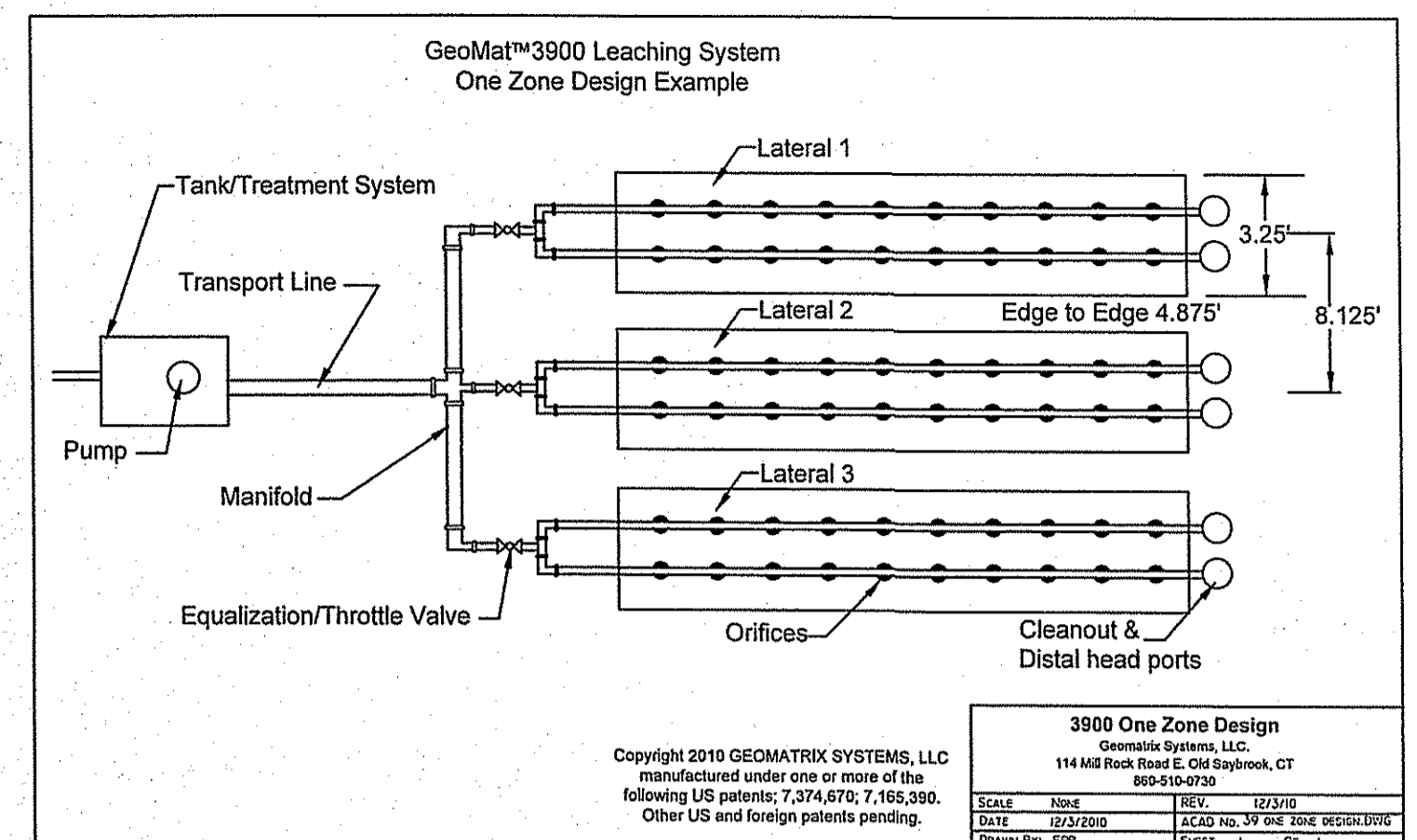
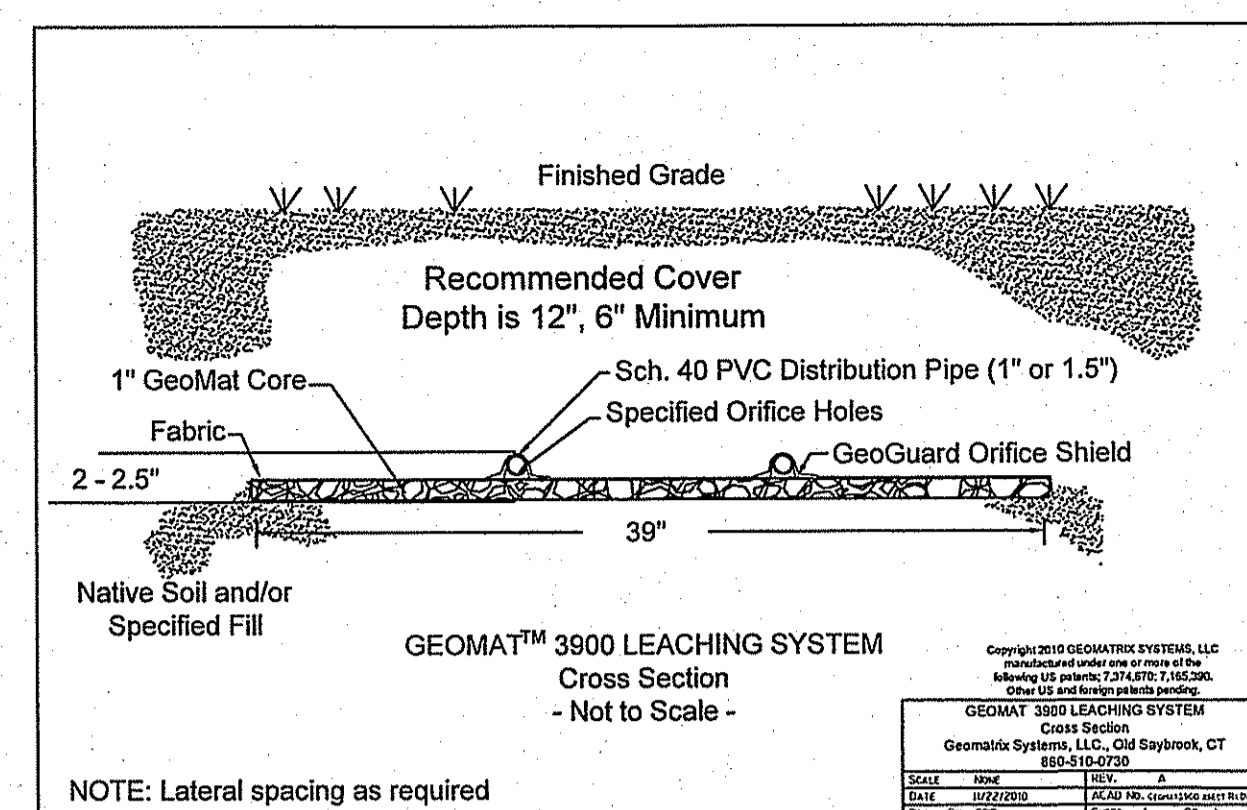
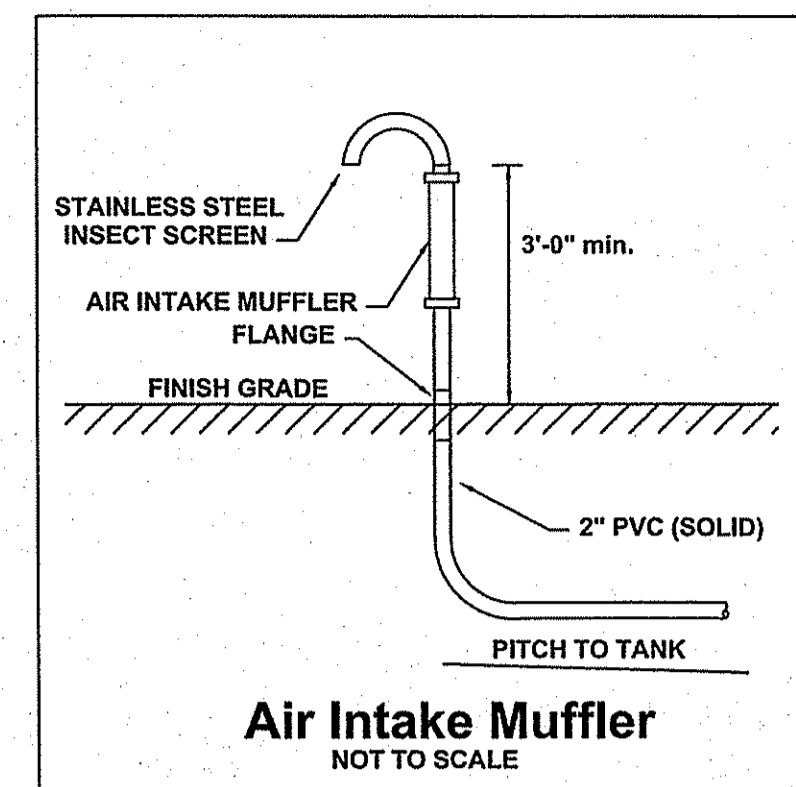
Environmental Management  
DEC 05 2016  
Office of Water Resources

**AMERICAN ENGINEERING, INC.**  
DANIEL R. COTTA Professional Engineer / Professional Land Surveyor  
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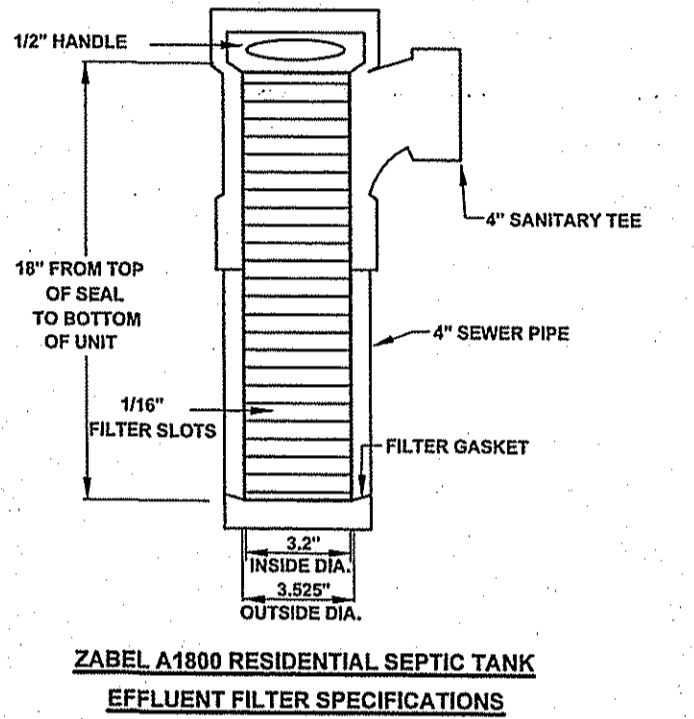
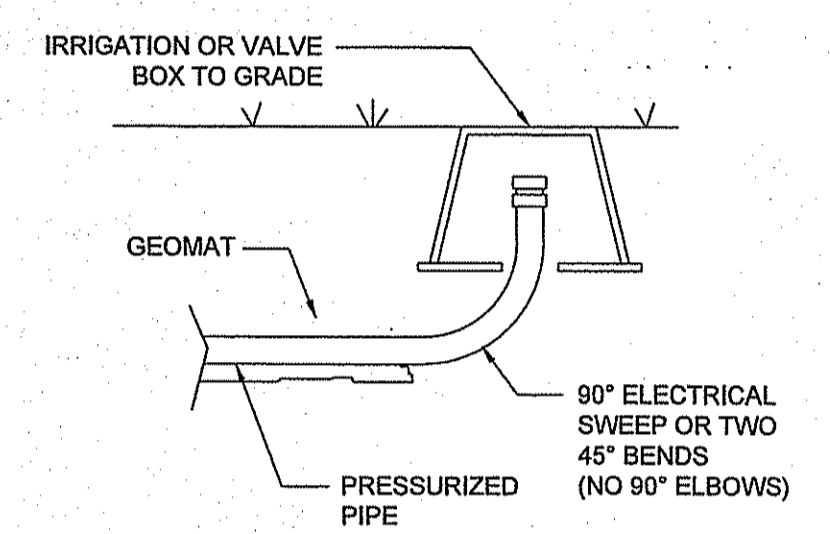
AS SPECIFIED IN SECTION 16-0301  
DATED JAN 13 2017  
NO CHANGES ALLOWED WITHOUT PRIOR APPROVED PLANS MUST BE AT CONSTRUCTION  
*Charles A. West*

TESTHOLE#	GROUND ELEV.	WT DEPTH	DATE
"A"	188.50	8'-0"	4/6/2001
"B"	193.50	8'-6"	
"C"	186.50	2'-0"	
"D"	196.00	2'-6"	4/19/2001
"E"	210.50	5'-0"	
"F"	213.00	6'-8"	
"G"	228.50	8'-8"	
"H"	234.50	9'-4"	
"I"	216.00	12'-0"	
"J"	210.50	10'-0"	
"K"	232.50	10'-0"	
"L"	208.00	9'-4"	
"M"	203.00	8'-6"	5/23/2002
"N"	200.50	9'-0"	
"O"	188.50	4'-6"	
"P"	190.00	3'-0"	
"16-1"	204.50	6'-8"	9/14/2016
"16-2"	213.00	7'-6"	
"16-3"	211.00	7'-0"	
"16-4"	238.50	8'-6"	
"16-5"	226.50	8'-6"	
"16-6"	229.00	8'-6"	
"16-7"	205.00	8'-0"	

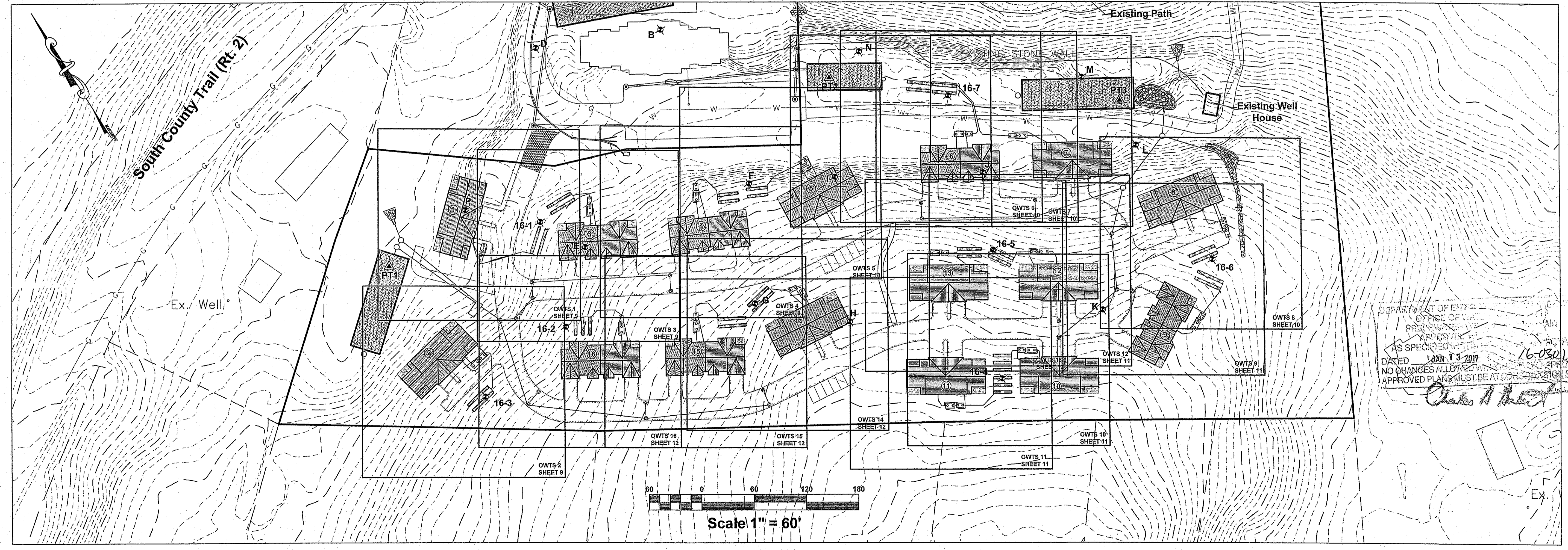


- NOTES:
- THIS SITE DOES NOT FALL WITHIN A CRITICAL RESOURCE AREA AS DEFINED IN SD 38.00.
  - THERE ARE NO EXISTING ONSITE WASTEWATER TREATMENT SYSTEMS WITHIN 100' OF THE LIMIT OF DISTURBANCE, EXCEPT AS SHOWN ON PLAN.
  - THERE ARE NO EXISTING DRAINS WITHIN 100' OF THE LIMIT OF DISTURBANCE, EXCEPT AS SHOWN ON PLAN.
  - THERE ARE NO EXISTING OR PROPOSED PRIVATE WELLS WITHIN 200' OF THE LIMIT OF DISTURBANCE EXCEPT AS SHOWN ON PLAN.
  - THERE ARE NO EXISTING OR PROPOSED PUBLIC WELLS WITHIN 400' OF THE LIMIT OF DISTURBANCE, EXCEPT AS SHOWN ON PLAN.
  - THERE ARE NO WETLANDS IN THE AREA OF PROPOSED OWTS, EXCEPT AS SHOWN ON PLAN.
  - WETLAND EDGE FLAGGED BY EA ENGINEERING, SCIENCE AND TECHNOLOGY ON 10/29/2007
  - WETLAND FLAGS WERE LOCATED WITH A HORIZONTAL ACCURACY OF +/- 1'.
  - BASEMAP AND PHYSICAL DATA TAKEN FROM AN ONSITE FIELD SURVEY, DATED: MARCH 2007, REVISED: AUGUST 2007; WITH A HORIZONTAL ACCURACY OF +/- 1' AND A VERTICAL ACCURACY OF +/- 1'. (ASSUMED DATUM)
  - THE PERIMETER SURVEY WAS PERFORMED TO CONFORM TO THE ACCURACY OF A CLASS I STANDARD.
  - ALL BENCHMARKS ARE TO BE SET WITHIN 150' OF EACH SYSTEM AT TIME OF CONSTRUCTION.
  - THE LOCATION OF ALL PROPOSED UNDERGROUND UTILITIES TO BE SHALL BE DETERMINED BY THE RESPECTIVE UTILITY COMPANY. UNDERGROUND ELECTRIC, CABLE, AND TELEPHONE SERVICES ARE PROPOSED FOR THIS SUBDIVISION.

BUILDING	DAILY FLOW	TESTHOLE	SOIL CATEGORY	LOADING RATE	MIN LEACHING AREA	LEACHING AREA PROVIDED	DESIGN FLOW	MIN. ELEVATION	MAX. GRADE
1	460 GAL	16-1	6	2.3 GAL/SQFT/DAY	200 SF	201.5 SF	205.00	198.33	204.50
2	460 GAL	16-3	6	2.3 GAL/SQFT/DAY	200 SF	201.5 SF	212.00	205.00	207.00
3	460 GAL	16-1	6	2.3 GAL/SQFT/DAY	200 SF	201.5 SF	205.00	198.33	203.50
4	460 GAL	F	4	3.1 GAL/SQFT/DAY	148 SF	148.5 SF	218.00	211.33	216.00
5	460 GAL	F	4	3.1 GAL/SQFT/DAY	148 SF	148.5 SF	218.00	211.33	216.50
6	460 GAL	16-7	5	2.7 GAL/SQFT/DAY	170 SF	175.5 SF	206.00	199.33	205.00
7	460 GAL	16-7	5	2.7 GAL/SQFT/DAY	170 SF	175.5 SF	206.00	199.33	205.00
8	460 GAL	16-6	6	2.3 GAL/SQFT/DAY	200 SF	201.5 SF	229.50	221.50	226.00
9	460 GAL	16-6	6	2.3 GAL/SQFT/DAY	200 SF	201.5 SF	231.00	223.00	226.50
10	460 GAL	16-4	6	2.3 GAL/SQFT/DAY	200 SF	201.5 SF	238.00	229.50	235.00
11	460 GAL	16-4	6	2.3 GAL/SQFT/DAY	200 SF	201.5 SF	240.00	231.50	235.50
12	460 GAL	16-5	5	2.7 GAL/SQFT/DAY	170 SF	175.5 SF	227.75	219.25	227.00
13	460 GAL	16-5	5	2.7 GAL/SQFT/DAY	170 SF	175.5 SF	228.00	220.50	227.50
14	460 GAL	G	6	2.3 GAL/SQFT/DAY	200 SF	201.5 SF	228.00	220.33	223.75
15	460 GAL	G	6	2.3 GAL/SQFT/DAY	200 SF	201.5 SF	229.00	220.33	224.00
16	460 GAL	16-2	6	2.3 GAL/SQFT/DAY	200 SF	201.5 SF	216.50	208.50	210.50



**\*\*NOTICE TO INSTALLER\*\***  
 DESIGNER SUPERVISION REQUIRED.  
 CONTACT DESIGNER 48 HOURS PRIOR TO CONSTRUCTION.



DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
 OFFICE OF WATER RESOURCES  
 AS SPECIFIED BY PERMITS 16-030  
 DATED JAN 13 2017  
 NO CHANGES ALLOWED WITHOUT APPROVED PLANS MUST BE AT THE OFFICE  
*Quinn*

ONSITE WASTEWATER TREATMENT SYSTEM  
 INDEX/DETAIL SHEET  
 FOR  
**LIBERTY HILL CONDOMINIUMS**  
 LOCATED AT  
 400 SOUTH COUNTY TRAIL  
 EXETER, R.I.

Checked By: **DrC**  
 Date: **10/21/2016**  
 Drawn By: **PJF**  
 Scale: **1" = 60'**  
 REVISIONS

DANIEL R. COITTA  
 REGISTERED PROFESSIONAL ENGINEER  
 NO. 11733  
 11/23/16

Environmental Management  
 DEC 05 2016  
 Office of Water Resources

**AMERICAN ENGINEERING, INC.**  
 DANIEL R. COITTA Professional Engineer / Professional Land Surveyor  
 400 South County Trail - Suite A 201  
 Exeter, Rhode Island 02822  
 Phone (401) 294-4090 / Fax (401) 294-3625

Sheet  
**8**  
 of 15 sheets  
 Drawing No. 98165

**System 1 Configuration**

Design Configuration: 4 Bedroom Residential, 460 gpd  
 Design Flow: M400 Panel  
 SeptiTech Controller: NEMA 4X Rated Controller Model

Invert at Dwelling: Elev.= 203.65 A  
 4" PVC Lateral to Septic Tank: 12 feet H

Septic Tank Settings  
 Septic Tank Capacity: 1500 gallon  
 Riser at Inlet End of Septic Tank: Elev.= 204.75 (6" Riser)  
 Invert at Septic Tank In: Elev.= 203.41 B  
 Invert at Septic Tank Out: Elev.= 203.17 C  
 Riser at Outlet End of Septic Tank: Elev.= 205.00 (9" Riser)  
 4" PVC Lateral to Processor Tank: 2 feet I

SeptiTech Tank Settings  
 Processor Tank Series: M400  
 Processor Tank Capacity: 1000 gallon  
 Riser at Inlet End of Processor Tank: Elev.= 205.21 (15" Riser)  
 Invert at Processor Tank In: Elev.= 203.13 D  
 Invert at Processor Tank Out: Elev.= 203.13 E  
 Riser at Outlet End of Processor Tank: Elev.= 205.46 (18" Riser)

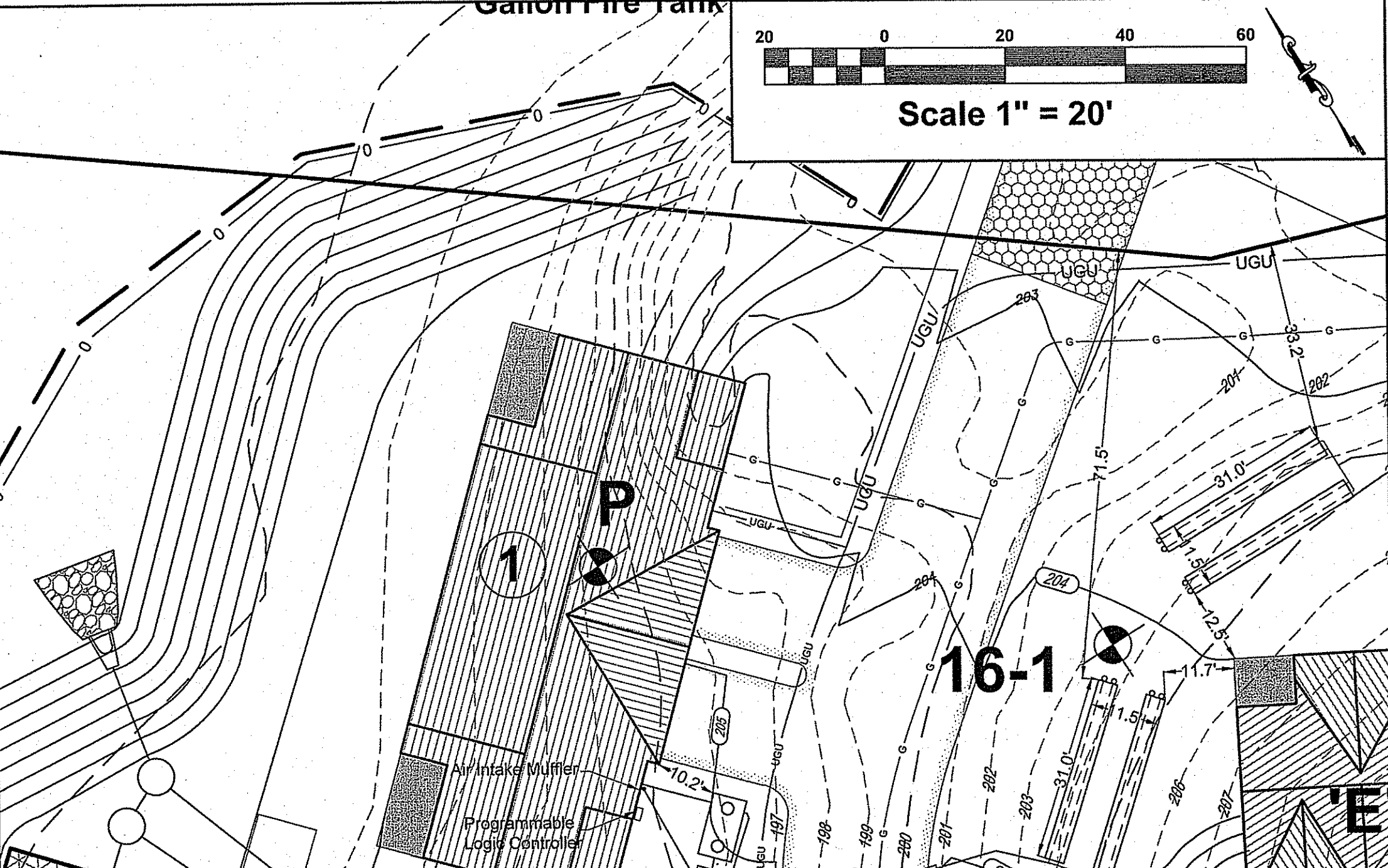
Discharge Pump Settings  
 Pump Model Number: Gould LSP03

Transport Line Size: 1-1/2"  
 PVC Transport Line to Field: 63 feet J  
 Maximum Design Flow: 0.75 gallons/orifice/vent = 48.00 gal  
 Transport Return: 5.73 gallons/vent  
 Design Dosage + Transport: 19.17 + 5.79 = 24.95 gallons/vent

GEOMAT - 3900  
 Mat Length: 31 K  
 Mat Width: 3.25  
 Manifold Length: 9.92  
 Number of Laterals: 4  
 Orifice Spacing: 2.0  
 Number of Orifices: 64  
 Loading Rate: 2.3 gallons/day

Field Invert Table  
 Existing Original Grade: 205.00  
 Finish Grade Min.: 204.50  
 Finish Grade Max.: 205.00

Invert Elevation: 204.00 F  
 Water Table Elevation = 198.33 G



**System 2 Configuration**

Design Configuration: 4 Bedroom Residential, 460 gpd  
 Design Flow: M400 Panel  
 SeptiTech Controller: NEMA 4X Rated Controller Model

Invert at Dwelling: Elev.= 205.65 A  
 4" PVC Lateral to Septic Tank: 12 feet H

Septic Tank Settings  
 Septic Tank Capacity: 1500 gallon  
 Riser at Inlet End of Septic Tank: Elev.= 206.75 (6" Riser)  
 Invert at Septic Tank In: Elev.= 205.42 B  
 Invert at Septic Tank Out: Elev.= 205.17 C  
 Riser at Outlet End of Septic Tank: Elev.= 207.00 (9" Riser)  
 4" PVC Lateral to Processor Tank: 2 feet I

SeptiTech Tank Settings  
 Processor Tank Series: M400  
 Processor Tank Capacity: 1000 gallon  
 Riser at Inlet End of Processor Tank: Elev.= 207.21 (15" Riser)  
 Invert at Processor Tank In: Elev.= 205.13 D  
 Invert at Processor Tank Out: Elev.= 205.13 E  
 Riser at Outlet End of Processor Tank: Elev.= 207.46 (18" Riser)

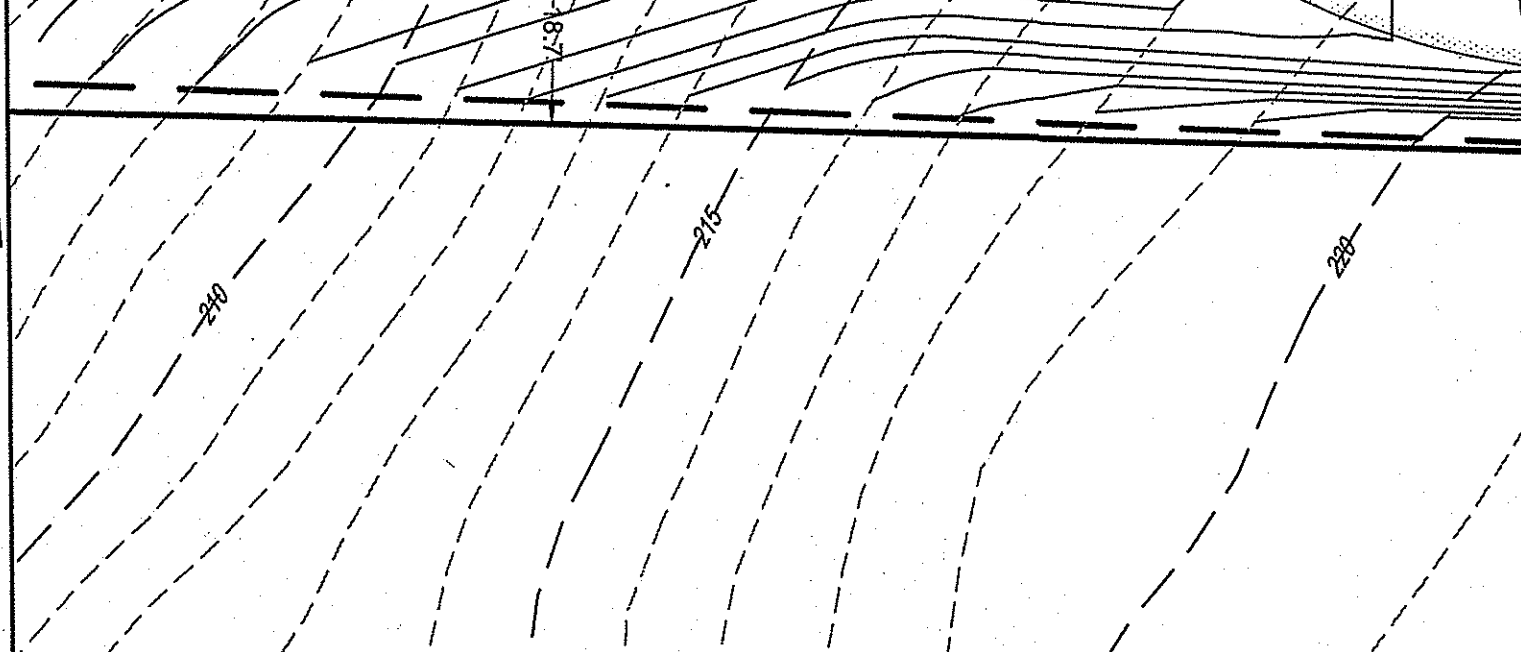
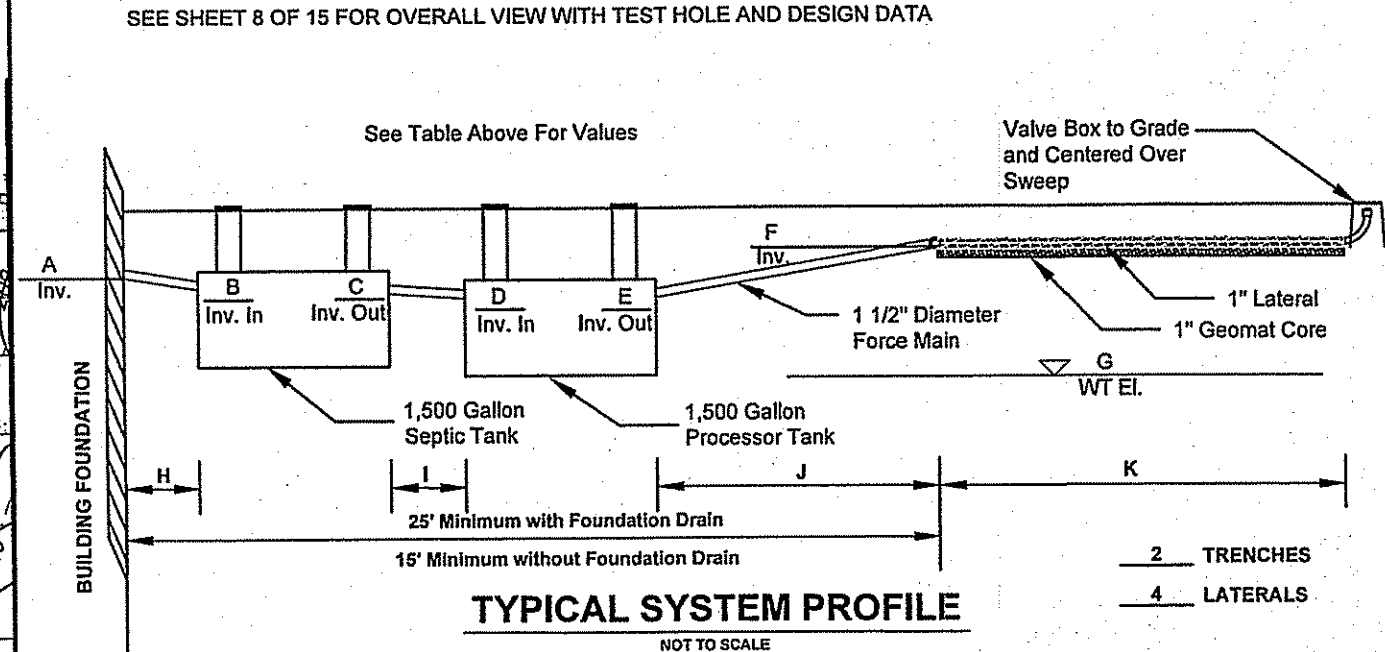
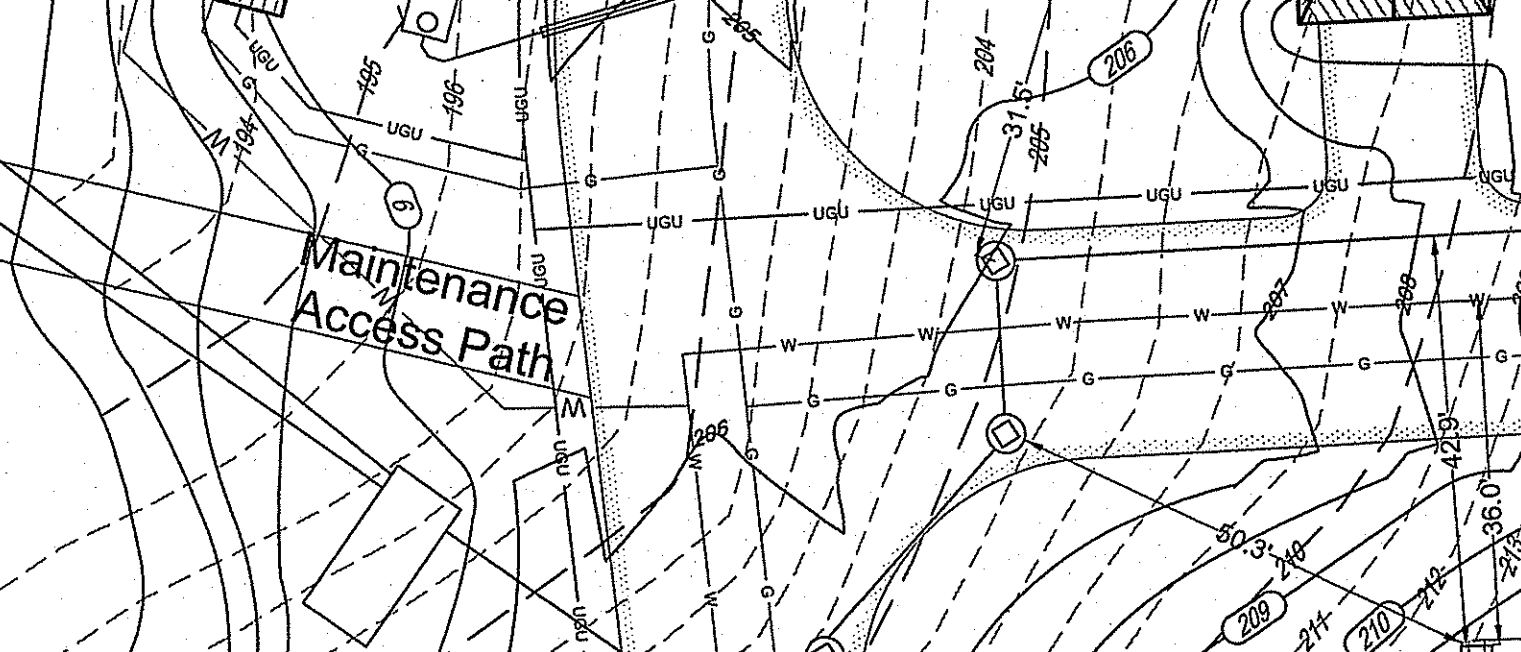
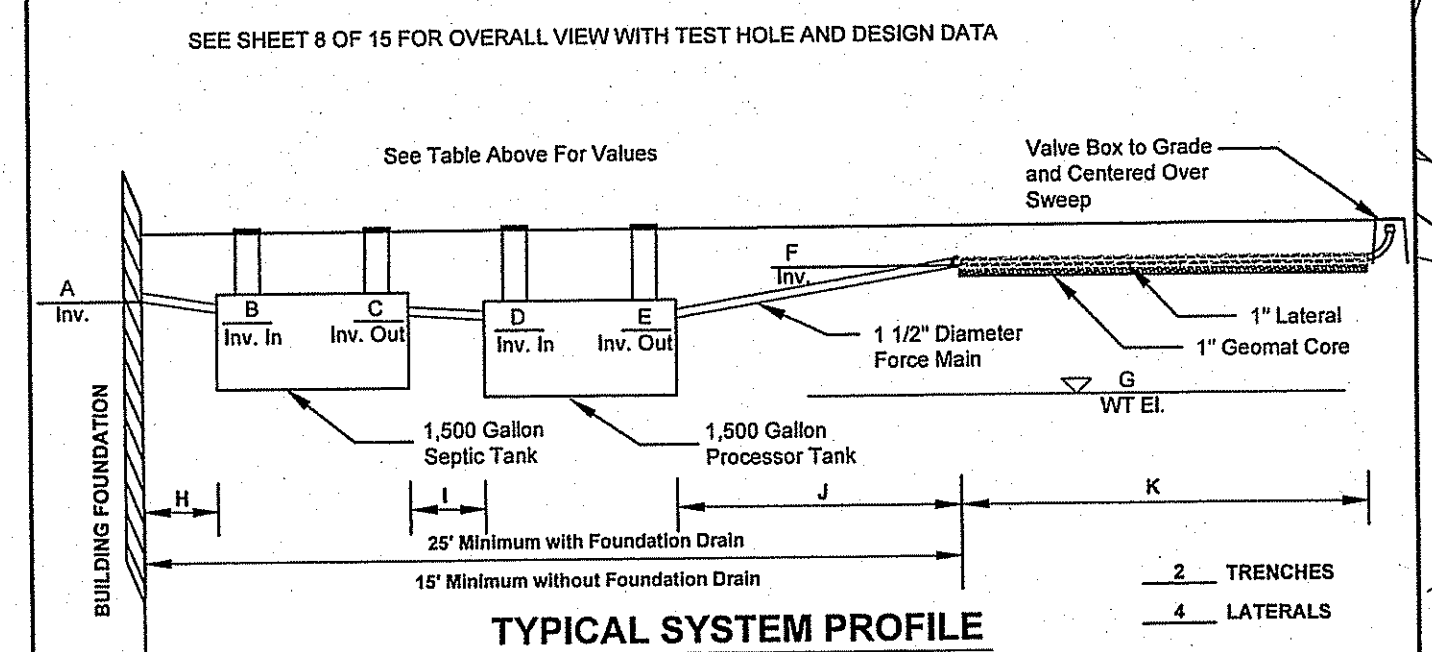
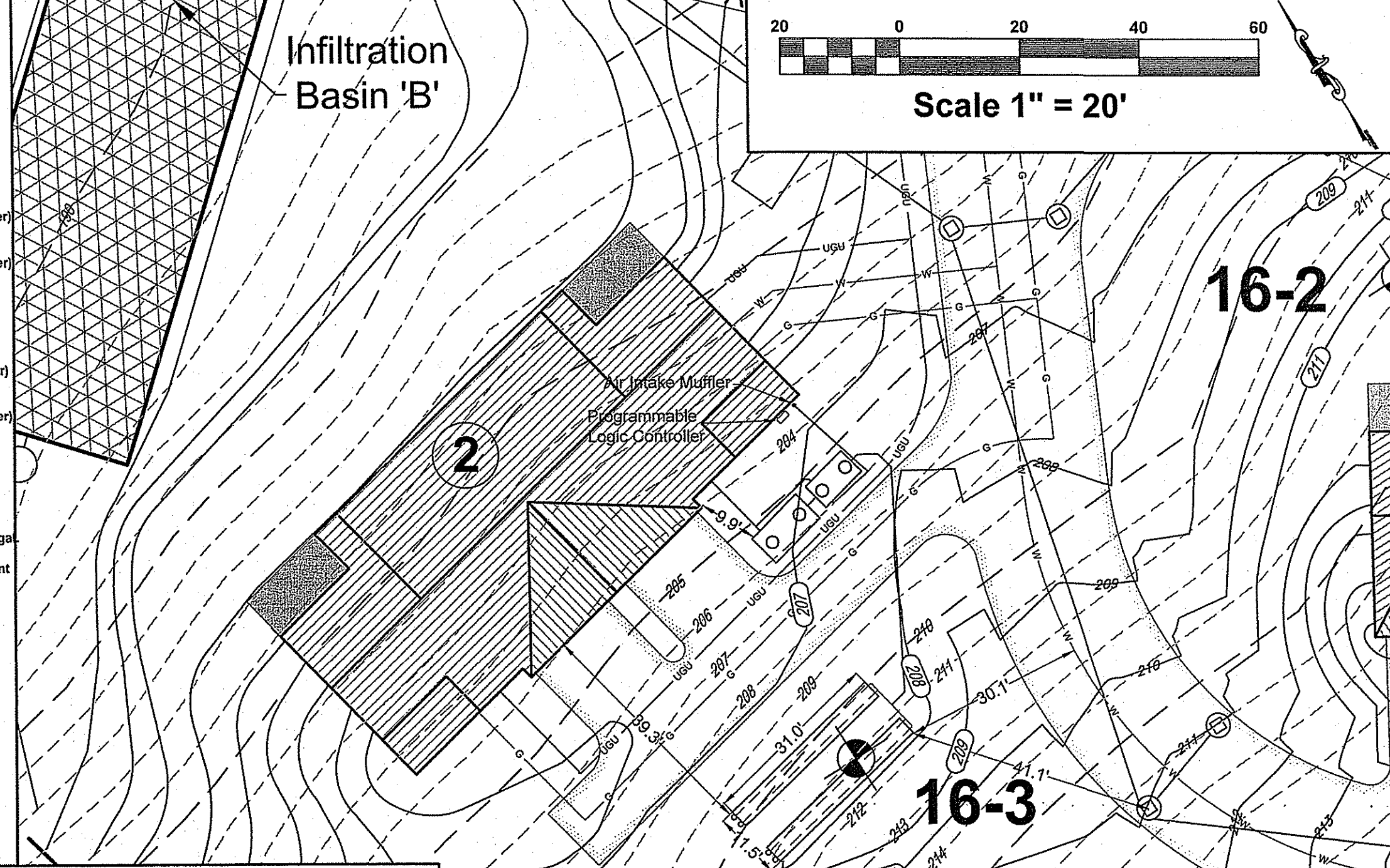
Discharge Pump Settings  
 Pump Model Number: Gould LSP03

Transport Line Size: 1-1/2"  
 PVC Transport Line to Field: 48 feet J  
 Maximum Design Flow: 0.75 gallons/orifice/vent = 48.00 gal  
 Transport Return: 4.41 gallons/vent  
 Design Dosage + Transport: 19.17 + 4.41 = 23.58 gallons/vent

GEOMAT - 3900  
 Mat Length: 31 K  
 Mat Width: 3.25  
 Manifold Length: 9.92  
 Number of Laterals: 4  
 Orifice Spacing: 2.0  
 Number of Orifices: 64  
 Loading Rate: 2.3 gallons/day

Field Invert Table  
 Existing Original Grade: 212.00  
 Finish Grade Min.: 207.50  
 Finish Grade Max.: 208.00

Invert Elevation: 207.00 F  
 Water Table Elevation = 205.00 G



**System 3 Configuration**

Design Configuration: 4 Bedroom Residential, 460 gpd  
 Design Flow: M400 Panel  
 SeptiTech Controller: NEMA 4X Rated Controller Model

Invert at Dwelling: Elev.= 202.32 A  
 4" PVC Lateral to Septic Tank: 12 feet H

Septic Tank Settings  
 Septic Tank Capacity: 1500 gallon  
 Riser at Inlet End of Septic Tank: Elev.= 203.51 (12" Riser)  
 Invert at Septic Tank In: Elev.= 202.68 B  
 Invert at Septic Tank Out: Elev.= 201.83 C  
 Riser at Outlet End of Septic Tank: Elev.= 203.51 (12" Riser)  
 4" PVC Lateral to Processor Tank: 2 feet I

SeptiTech Tank Settings  
 Processor Tank Series: M400  
 Processor Tank Capacity: 1000 gallon  
 Riser at Inlet End of Processor Tank: Elev.= 203.62 (12" Riser)  
 Invert at Processor Tank In: Elev.= 201.79 D  
 Invert at Processor Tank Out: Elev.= 201.79 E  
 Riser at Outlet End of Processor Tank: Elev.= 203.50 (10.5" Riser)

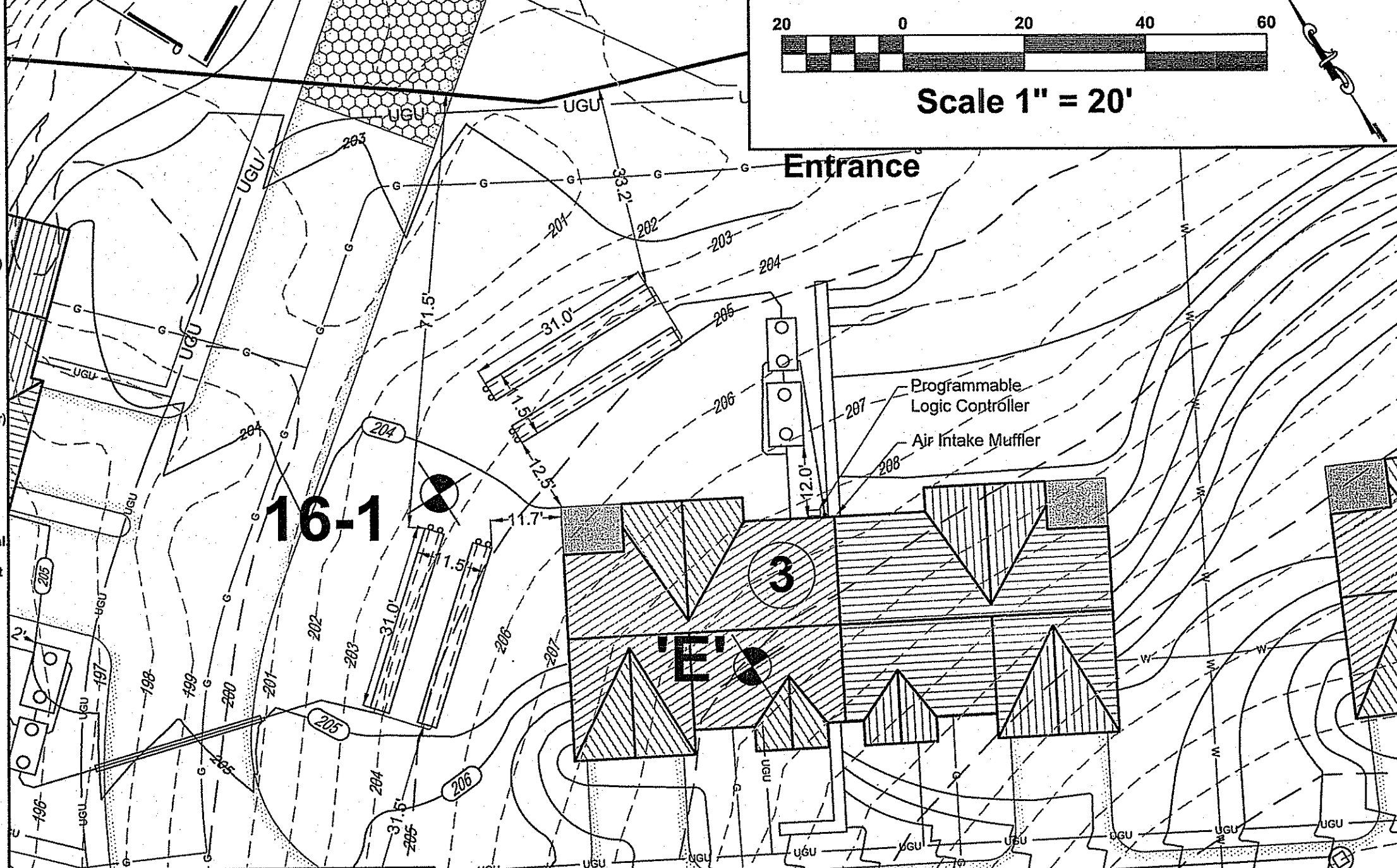
Discharge Pump Settings  
 Pump Model Number: Gould LSP03

Transport Line Size: 1-1/2"  
 PVC Transport Line to Field: 22 feet J  
 Maximum Design Flow: 0.75 gallons/orifice/vent = 48.00 gal  
 Transport Return: 2.02 gallons/vent  
 Design Dosage + Transport: 19.17 + 2.02 = 21.19 gallons/vent

GEOMAT - 3900  
 Mat Length: 31 K  
 Mat Width: 3.25  
 Manifold Length: 9.92  
 Number of Laterals: 4  
 Orifice Spacing: 2.0  
 Number of Orifices: 64  
 Loading Rate: 2.3 gallons/day

Existing Original Grade: 205.00  
 Finish Grade Min.: 203.50  
 Finish Grade Max.: 204.00

Invert Elevation: 203.00 F  
 Water Table Elevation = 198.33 G



**System 4 Configuration**

Design Configuration: 4 Bedroom Residential, 460 gpd  
 Design Flow: M400 Panel  
 SeptiTech Controller: NEMA 4X Rated Controller Model

Invert at Dwelling: Elev.= 211.88 A  
 4" PVC Lateral to Septic Tank: 20 feet H

Septic Tank Settings  
 Septic Tank Capacity: 1500 gallon  
 Riser at Inlet End of Septic Tank: Elev.= 213.54 (15" Riser)  
 Invert at Septic Tank In: Elev.= 211.49 B  
 Invert at Septic Tank Out: Elev.= 211.21 C  
 Riser at Outlet End of Septic Tank: Elev.= 213.29 (12" Riser)  
 4" PVC Lateral to Processor Tank: 2 feet I

SeptiTech Tank Settings  
 Processor Tank Series: M400  
 Processor Tank Capacity: 1000 gallon  
 Riser at Inlet End of Processor Tank: Elev.= 213.25 (15" Riser)  
 Invert at Processor Tank In: Elev.= 211.21 C  
 Invert at Processor Tank Out: Elev.= 211.17 E  
 Riser at Outlet End of Processor Tank: Elev.= 213.00 (12" Riser)

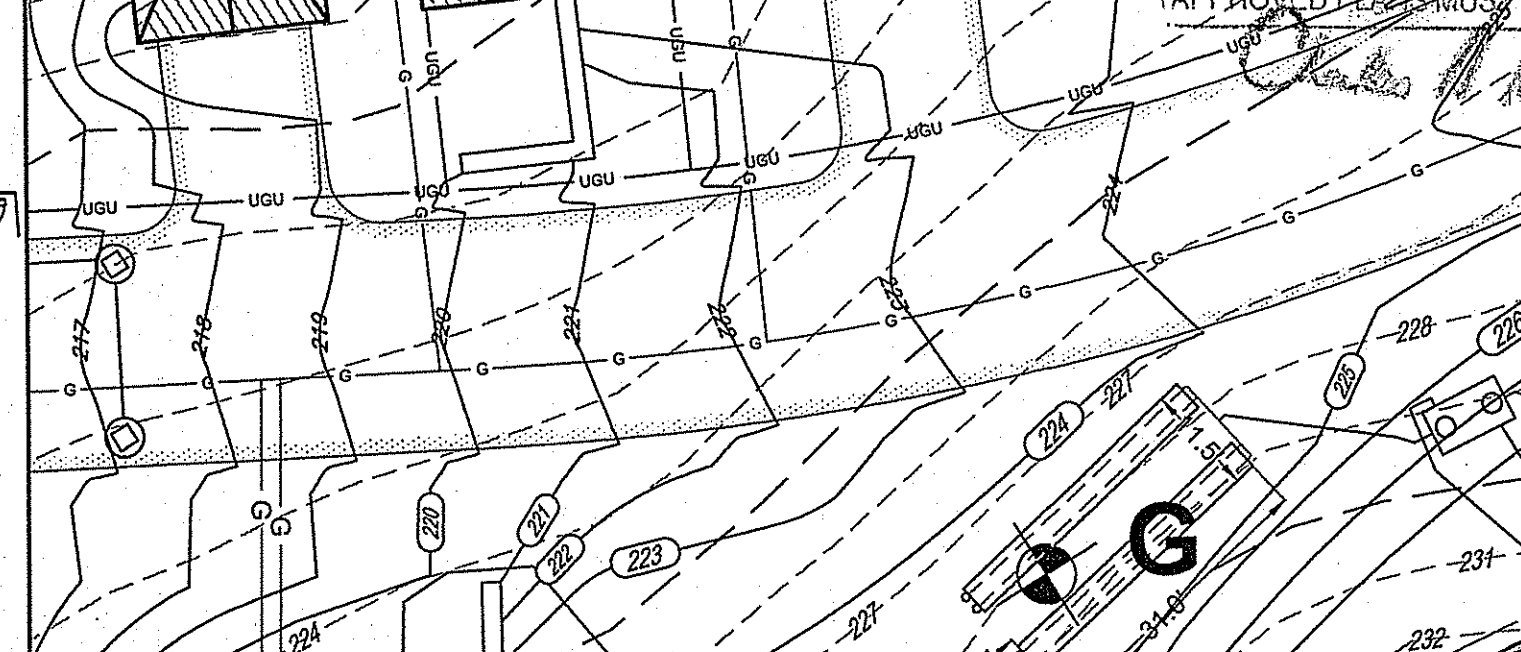
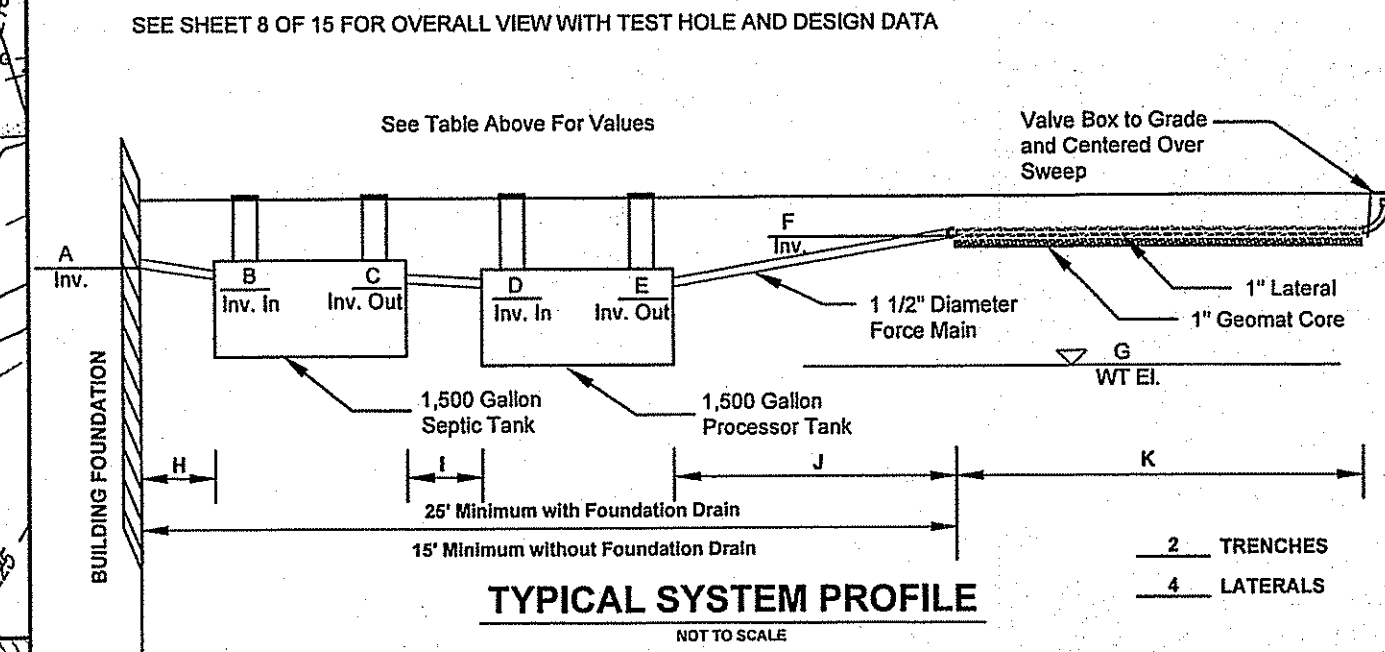
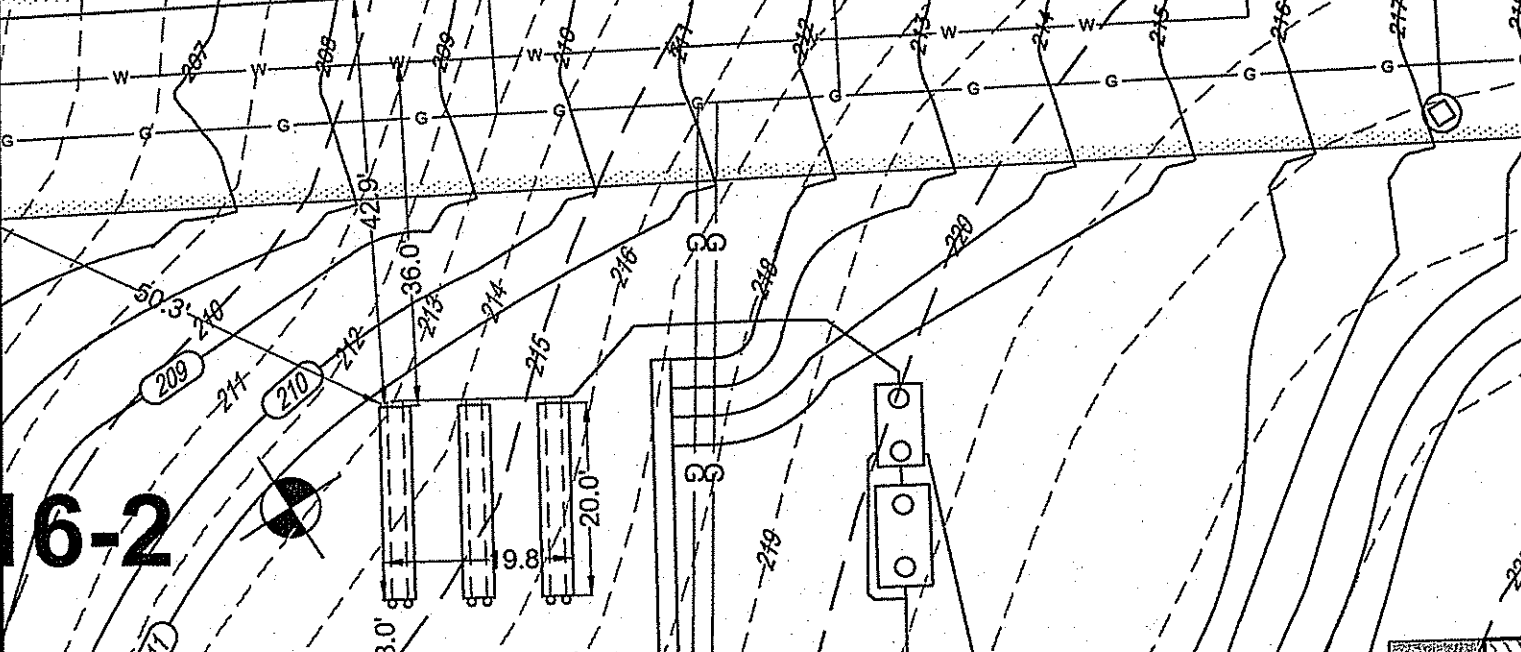
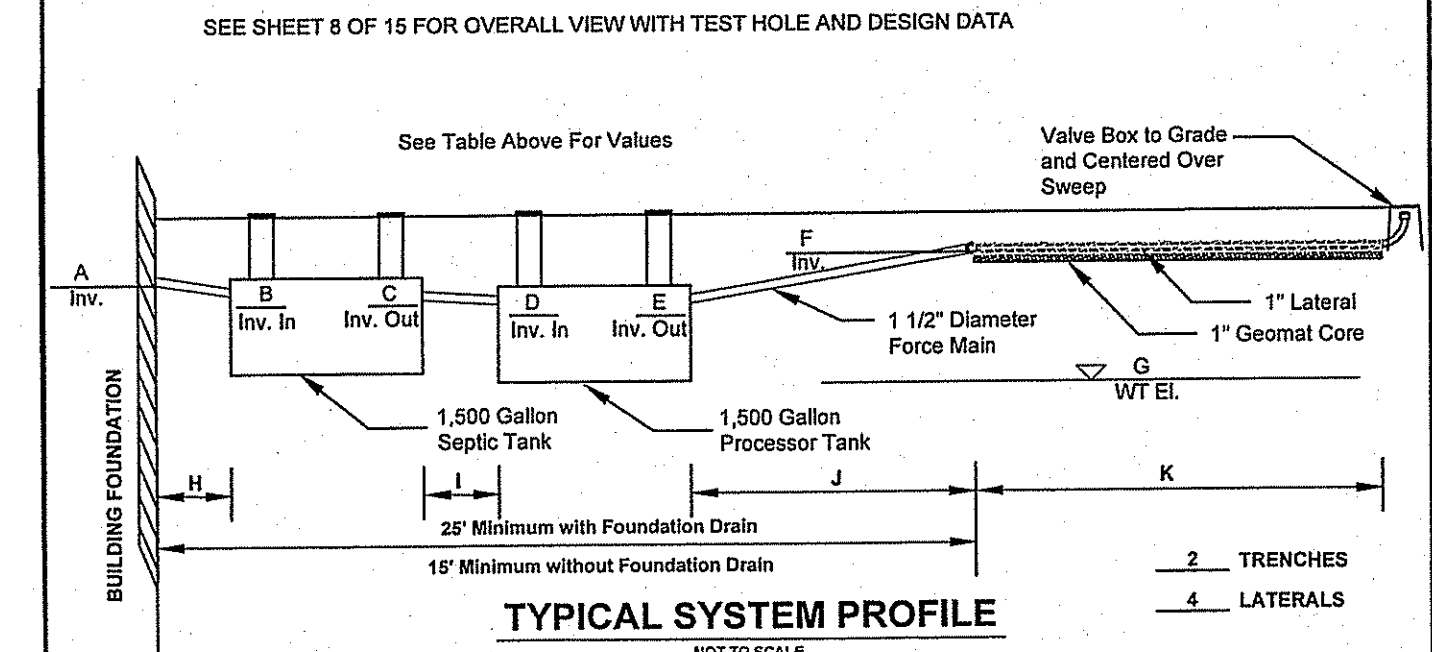
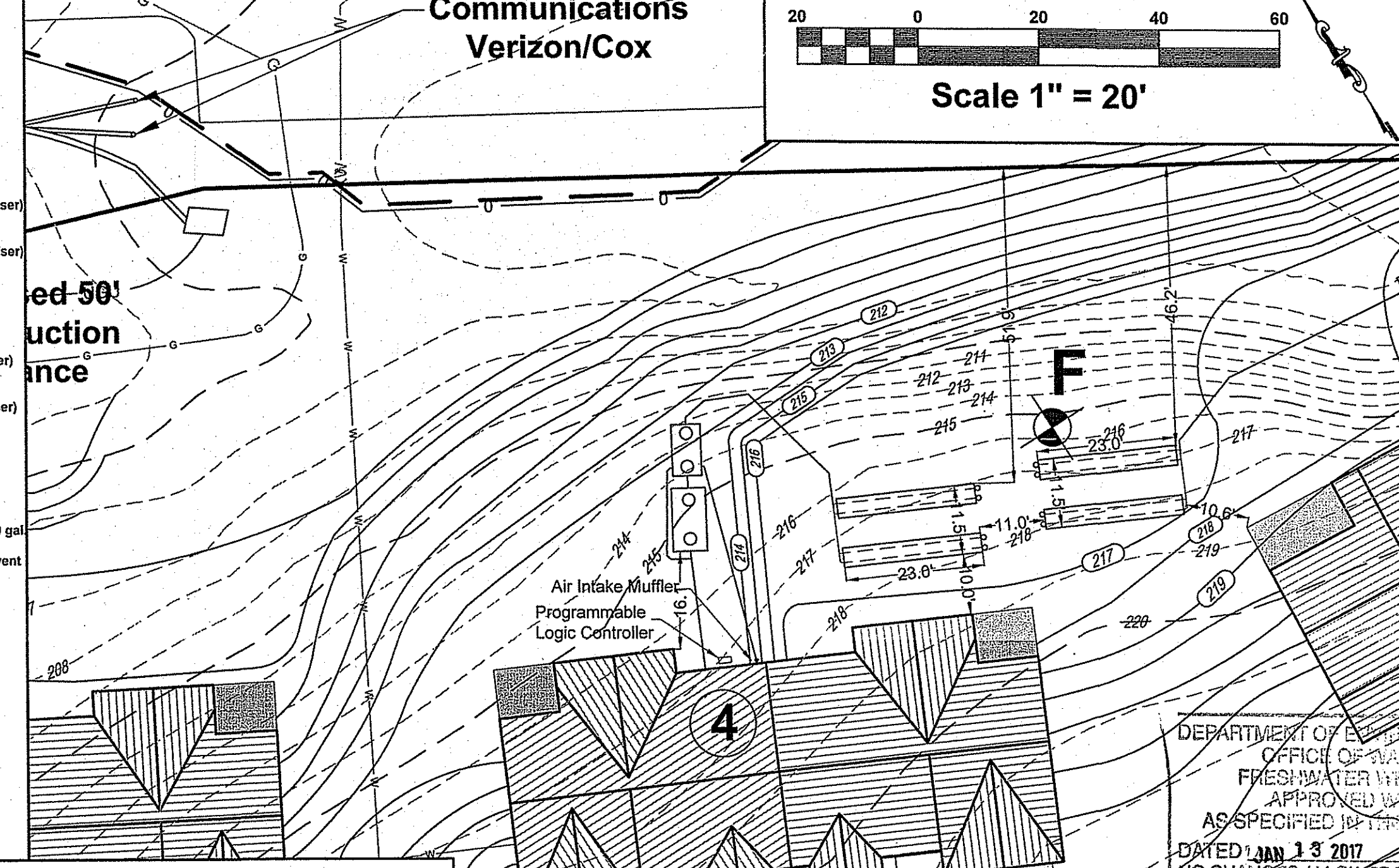
Discharge Pump Settings  
 Pump Model Number: Gould LSP03

Transport Line Size: 1-1/2"  
 PVC Transport Line to Field: 48 feet J  
 Maximum Design Flow: 0.75 gallons/orifice/vent = 36.00 gal  
 Transport Return: 3.67 gallons/vent  
 Design Dosage + Transport: 19.17 + 3.67 = 22.84 gallons/vent

GEOMAT - 3900  
 Mat Length: 23 K  
 Mat Width: 3.25  
 Manifold Length: 9.92  
 Number of Laterals: 4  
 Orifice Spacing: 2.0  
 Number of Orifices: 48  
 Loading Rate: 3.1 gallons/day

Field Invert Table  
 Existing Original Grade: 218.00  
 Finish Grade Min.: 216.50  
 Finish Grade Max.: 217.00

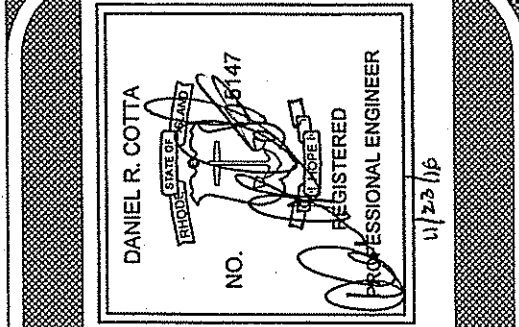
Invert Elevation: 216.00 F  
 Water Table Elevation = 211.33 G



ONSITE WASTEWATER TREATMENT  
 SYSTEM CONFIGURATIONS  
 LIBERTY HILL CONDOMINIUMS  
 LOCATED AT  
 400 SOUTH COUNTY TRAIL  
 EXETER, R.I.

Drawn By: P J F  
 Checked By: Dr C  
 Date: 10/21/2016  
 Scale: 1" = 20'

NO.	REVISION	BY	DATE



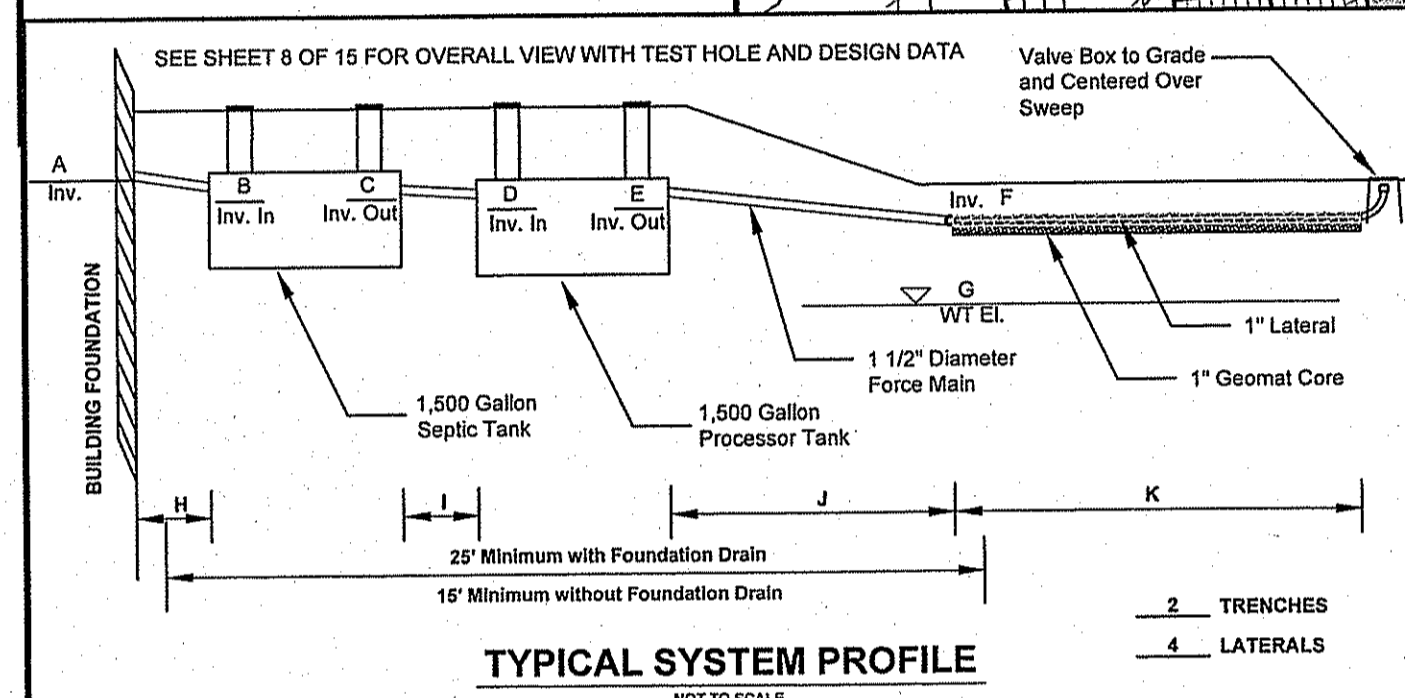
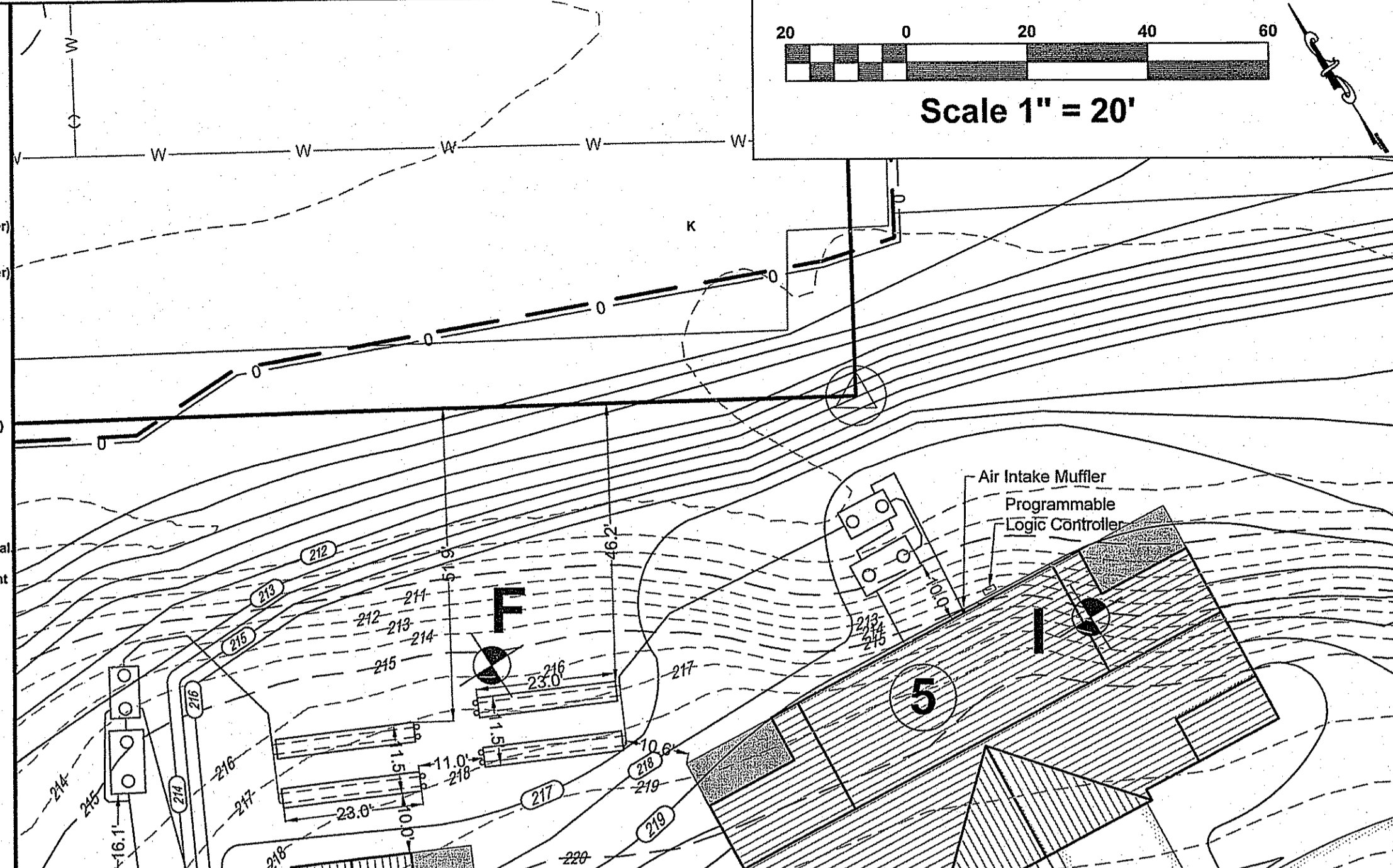
Environmental Management  
 DEC 25 2016  
 Office of Water Resources

**AMERICAN ENGINEERING, INC.**  
 DANIEL R. COTTA  
 Professional Engineer / Professional Land Surveyor  
 400 South County Trail - Suite A 201  
 Exeter, Rhode Island 02822  
 Phone (401) 294-4090 / Fax (401) 294-3625

Sheet  
**9**  
 of 15 sheets  
 Drawing No.  
 98165

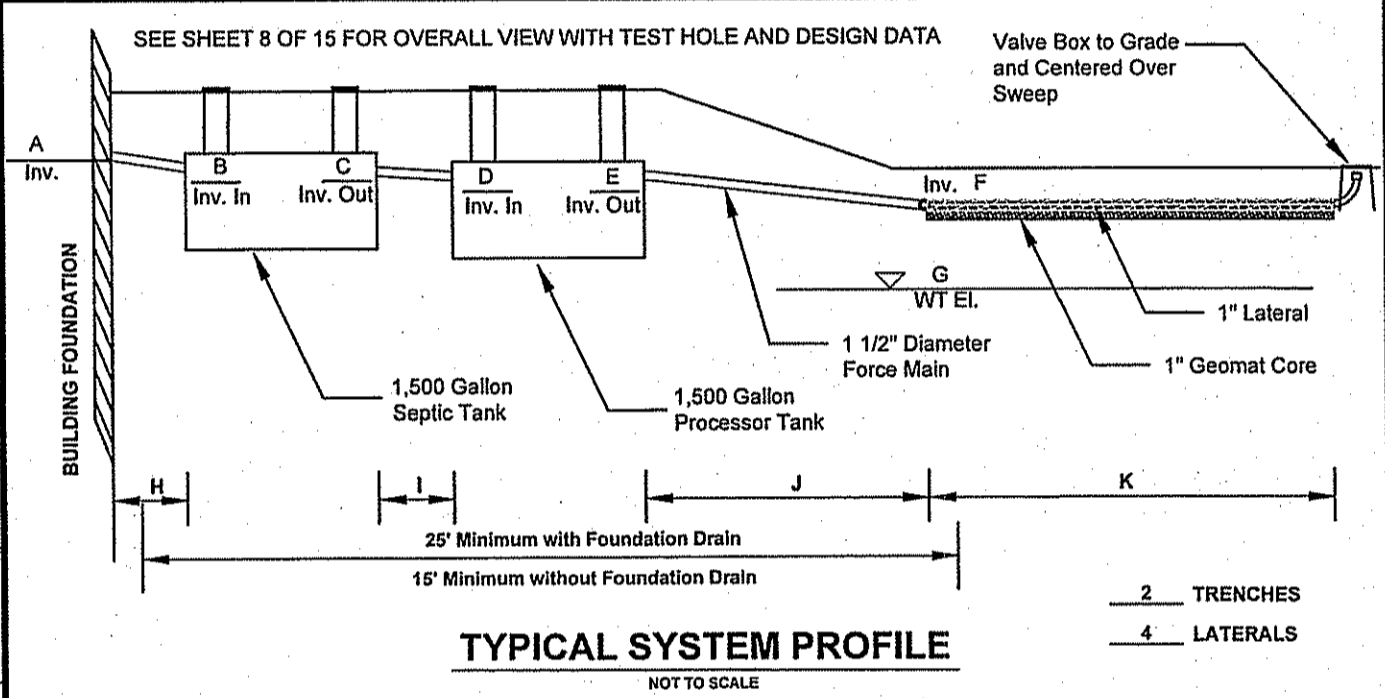
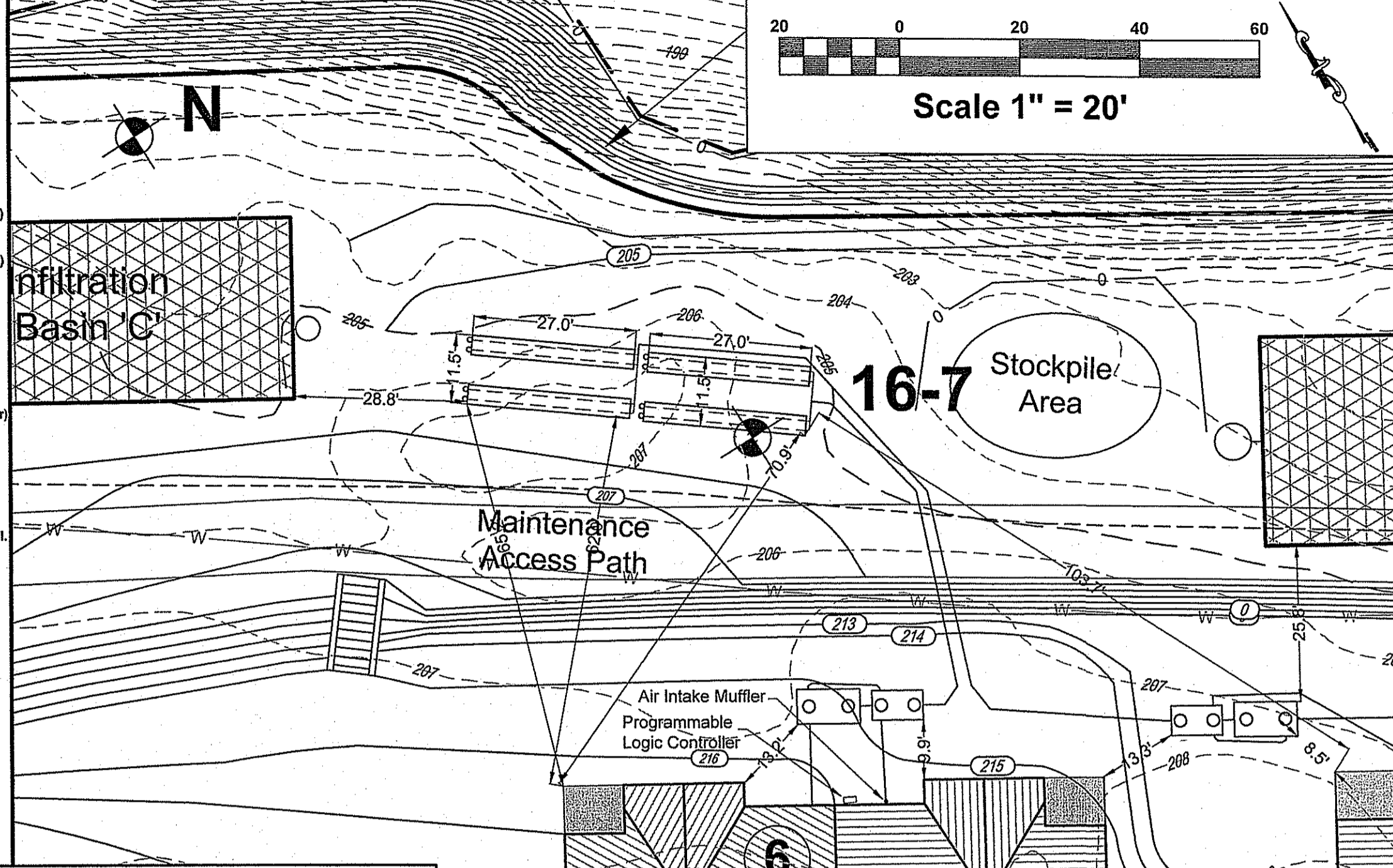
**System 5 Configuration**

Design Configuration	4 Bedroom Residential
Design Flow	400 gpd
SeptiTech Controller	M400 Panel
NEMA 4X Rated Controller Model	M400 Panel
Invert at Dwelling	Elev.= 216.04 A
4" PVC Lateral to Septic Tank	10 feet H
Septic Tank Settings	
Septic Tank Capacity	1500 gallon
Riser at Inlet End of Septic Tank	Elev.= 215.17 (15" Riser)
Invert at Septic Tank In	Elev.= 215.84 B
Invert at Septic Tank Out	Elev.= 215.69 C
Riser at Outlet End of Septic Tank	Elev.= 216.42 (21" Riser)
4" PVC Lateral to Processor Tank	12 feet I
SeptiTech Tank Settings	
Processor Tank Series	M400
Processor Tank Capacity	1000 gallon
Riser at Inlet End of Processor Tank	Elev.= 215.05 (21" Riser)
Invert at Processor Tank In	Elev.= 215.47 D
Invert at Processor Tank Out	Elev.= 215.47 E
Riser at Outlet End of Processor Tank	Elev.= 216.05 (21" Riser)
Discharge Pump Settings	
Pump Model Number	Gould LSP03
Transport Line Size	1-1/2"
PVC Transport Line to Field	48 feet J
Maximum Design Flow	0.75 gallons/orifice/vent = 38.00 gal
Transport Return	2.48 gallons/vent
Design Dosage + Transport	19.17 + 2.48 = 21.65 gallons/vent
GEOMAT - 3900	
Mat Length	23 K
Mat Width	3.25
Manifold Length	9.92
Number of Laterals	4
Orifice Spacing	2.0
Number of Orifices	48
Loading Rate	3.1 gallons/s/day
Field Invert Table	
Existing Original Grade	218.50
Finish Grade Min.	216.50
Finish Grade Max.	217.00
Invert Elevation	216.00 F
Water Table Elevation	211.83 G



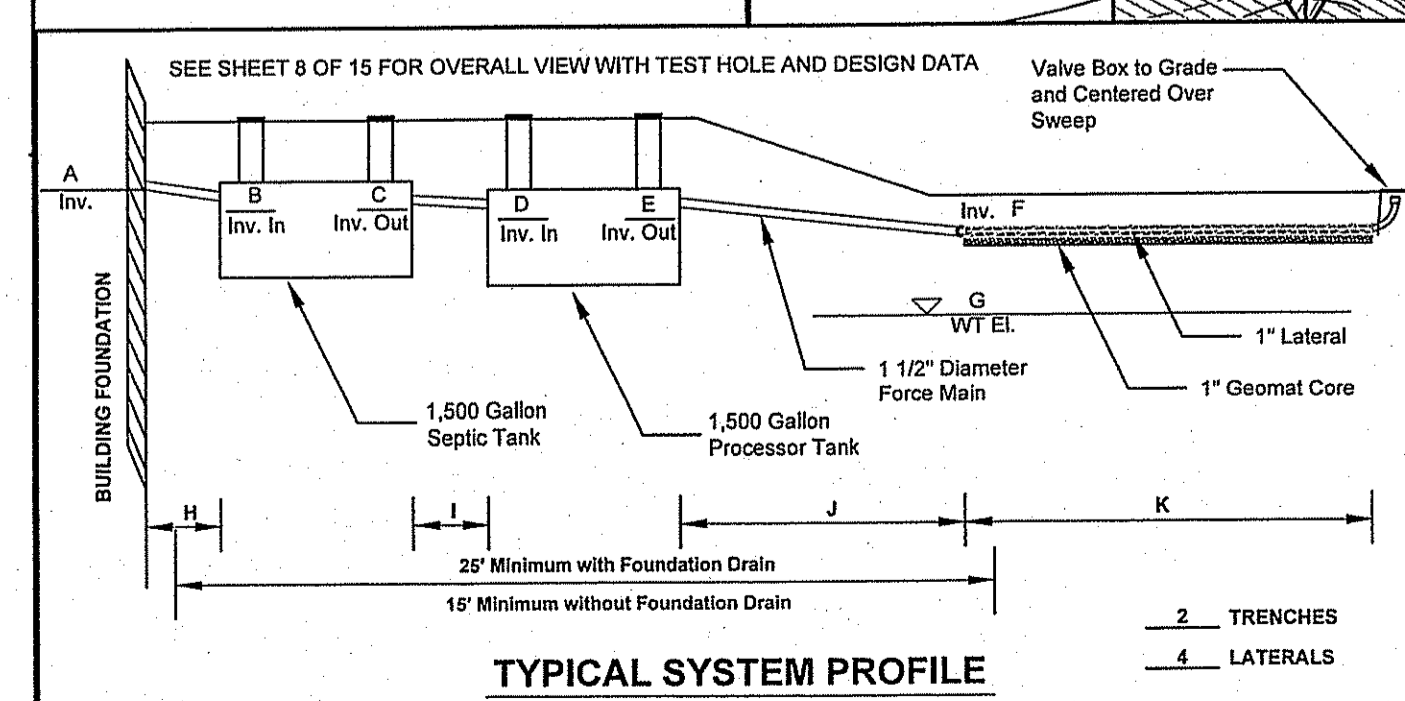
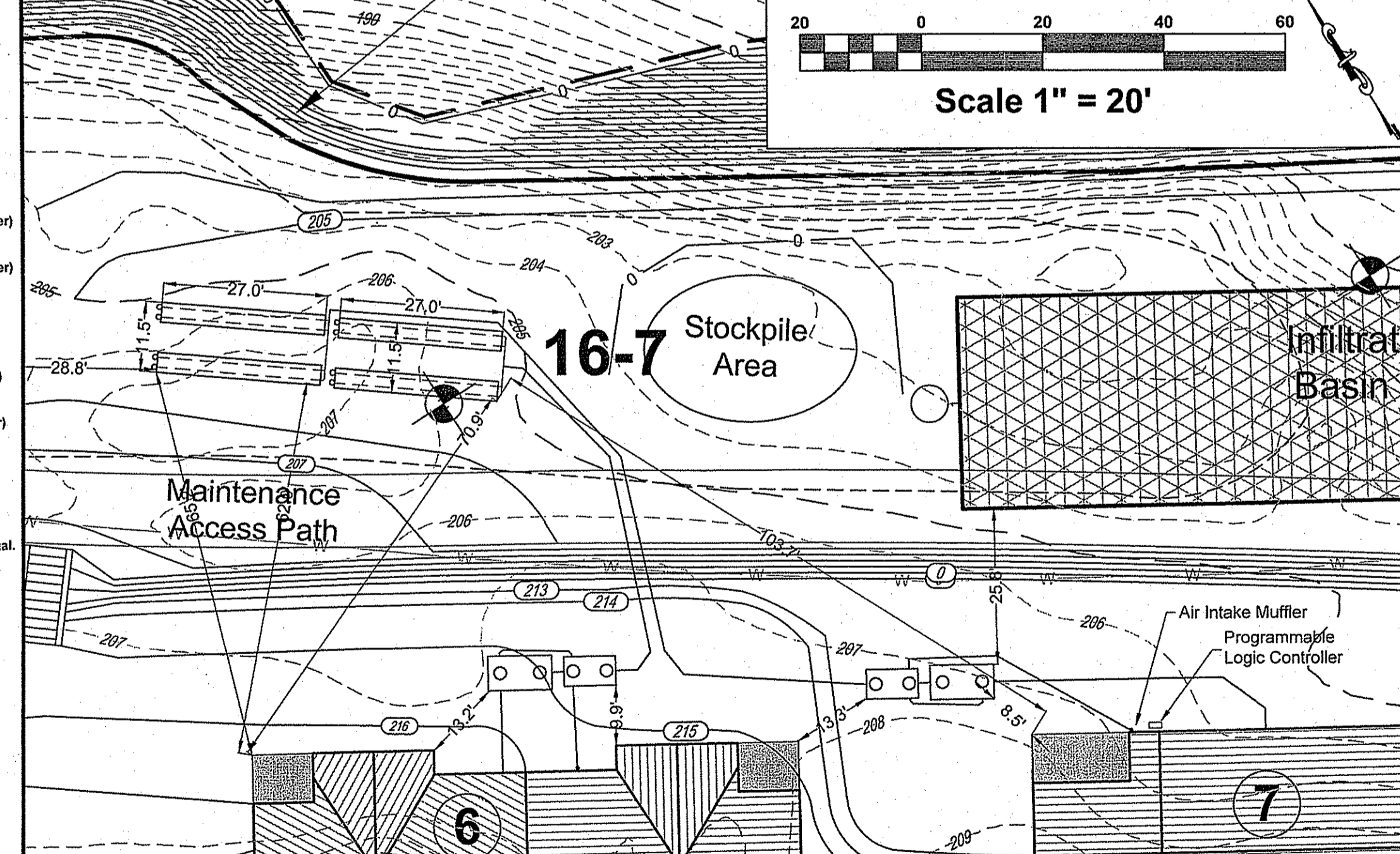
**System 6 Configuration**

Design Configuration	4 Bedroom Residential
Design Flow	400 gpd
SeptiTech Controller	M400 Panel
NEMA 4X Rated Controller Model	M400 Panel
Invert at Dwelling	Elev.= 213.33 A
4" PVC Lateral to Septic Tank	13 feet H
Septic Tank Settings	
Septic Tank Capacity	1500 gallon
Riser at Inlet End of Septic Tank	Elev.= 215.16 (15" Riser)
Invert at Septic Tank In	Elev.= 213.07 B
Invert at Septic Tank Out	Elev.= 212.82 C
Riser at Outlet End of Septic Tank	Elev.= 214.90 (12" Riser)
4" PVC Lateral to Processor Tank	2 feet I
SeptiTech Tank Settings	
Processor Tank Series	M400
Processor Tank Capacity	1000 gallon
Riser at Inlet End of Processor Tank	Elev.= 216.97 (16" Riser)
Invert at Processor Tank In	Elev.= 212.79 D
Invert at Processor Tank Out	Elev.= 212.79 E
Riser at Outlet End of Processor Tank	Elev.= 214.50 (10.5" Riser)
Discharge Pump Settings	
Pump Model Number	Gould LSP03
Transport Line Size	1-1/2"
PVC Transport Line to Field	64 feet J
Maximum Design Flow	0.75 gallons/orifice/vent = 42.00 gal
Transport Return	19.17 gallons/vent
Design Dosage + Transport	
GEOMAT - 3900	
Mat Length	27 K
Mat Width	3.25
Manifold Length	9.92
Number of Laterals	4
Orifice Spacing	2.0
Number of Orifices	56
Loading Rate	2.7 gallons/s/day
Field Invert Table	
Existing Original Grade	205.00
Finish Grade Min.	203.50
Finish Grade Max.	206.00
Invert Elevation	205.00 F
Water Table Elevation	199.33 G



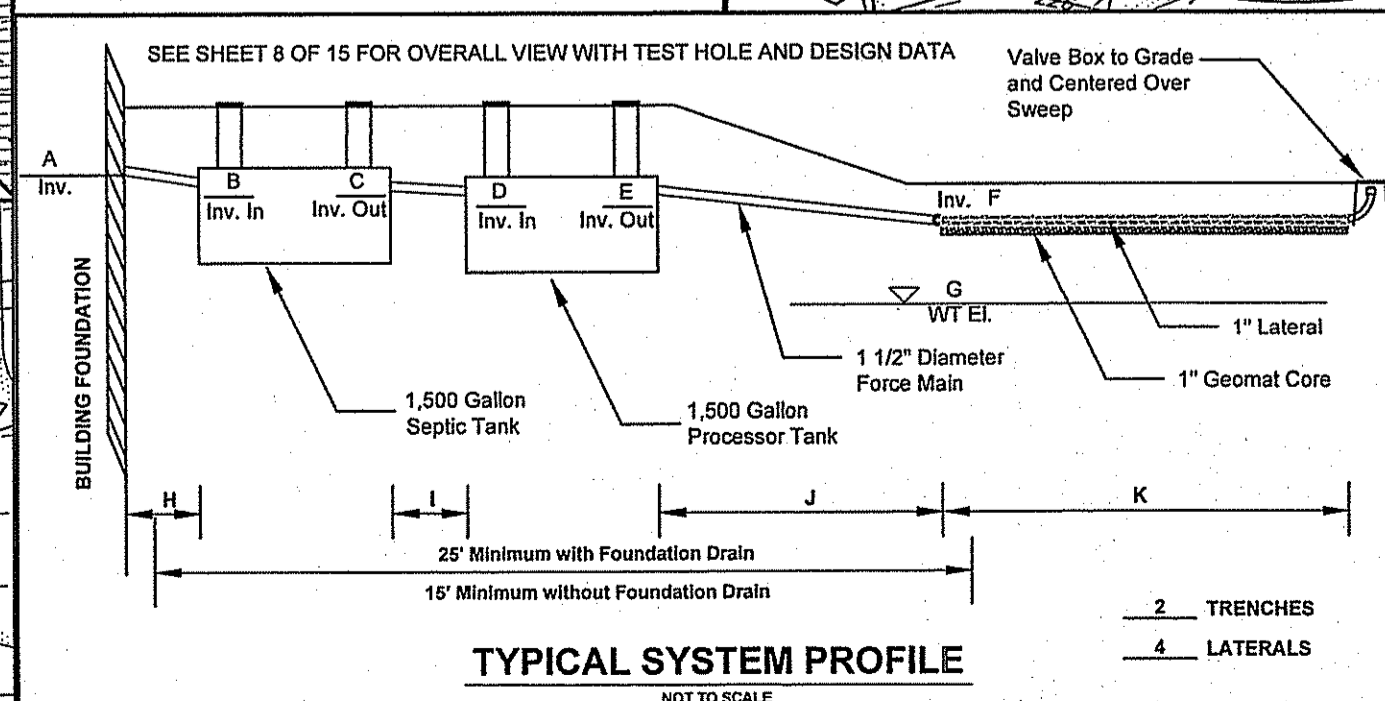
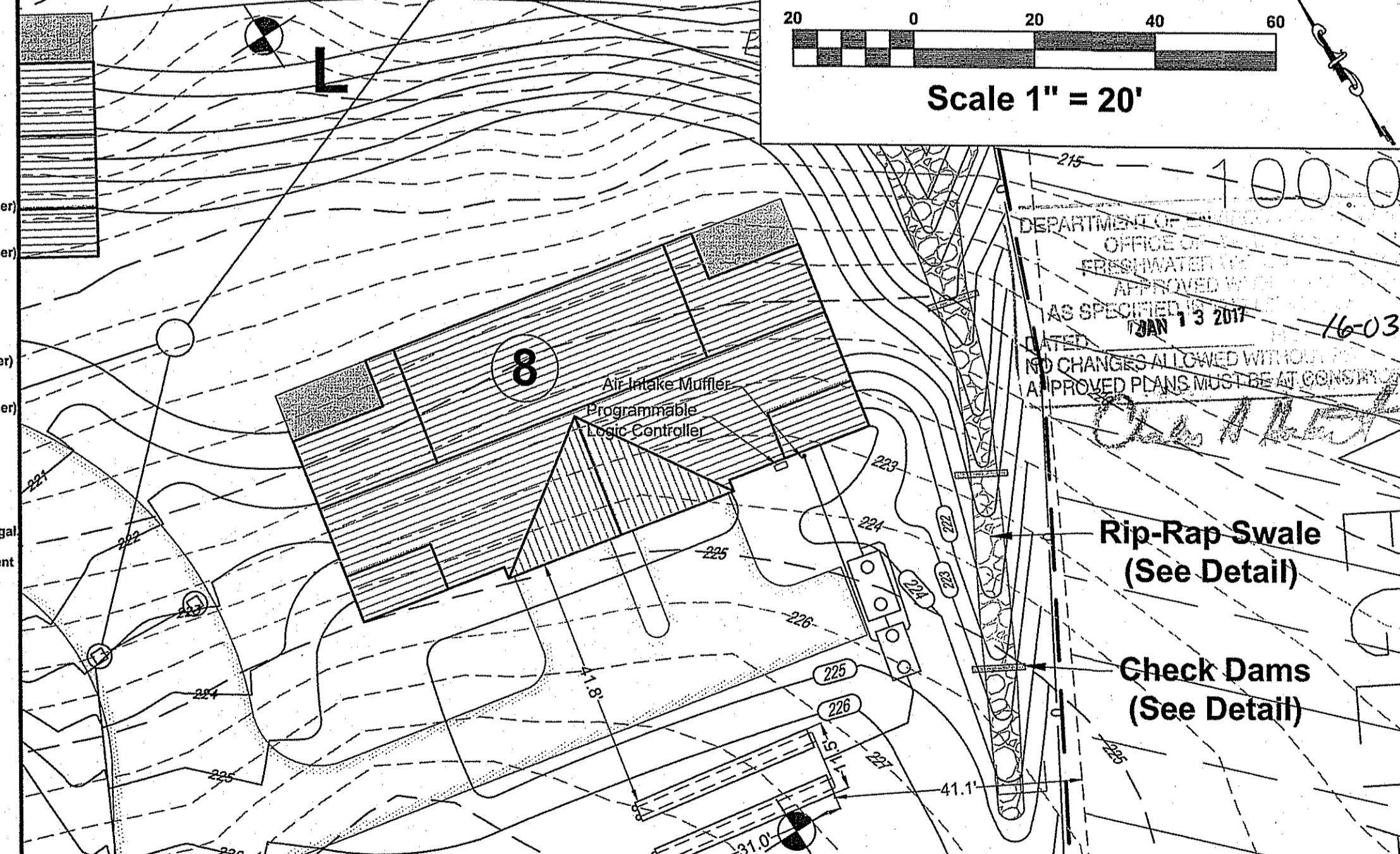
**System 7 Configuration**

Design Configuration	4 Bedroom Residential
Design Flow	400 gpd
SeptiTech Controller	M400 Panel
NEMA 4X Rated Controller Model	M400 Panel
Invert at Dwelling	Elev.= 212.34 A
4" PVC Lateral to Septic Tank	50 feet H
Septic Tank Settings	
Septic Tank Capacity	1500 gallon
Riser at Inlet End of Septic Tank	Elev.= 213.57 (18" Riser)
Invert at Septic Tank In	Elev.= 211.34 B
Invert at Septic Tank Out	Elev.= 211.09 C
Riser at Outlet End of Septic Tank	Elev.= 213.67 (18" Riser)
4" PVC Lateral to Processor Tank	2 feet I
SeptiTech Tank Settings	
Processor Tank Series	M400
Processor Tank Capacity	1000 gallon
Riser at Inlet End of Processor Tank	Elev.= 213.63 (21" Riser)
Invert at Processor Tank In	Elev.= 211.05 D
Invert at Processor Tank Out	Elev.= 211.05 E
Riser at Outlet End of Processor Tank	Elev.= 213.63 (21" Riser)
Discharge Pump Settings	
Pump Model Number	Gould LSP03
Transport Line Size	1-1/2"
PVC Transport Line to Field	128 feet J
Maximum Design Flow	0.75 gallons/orifice/vent = 42.00 gal
Transport Return	19.17 gallons/vent
Design Dosage + Transport	
GEOMAT - 3900	
Mat Length	27 K
Mat Width	3.25
Manifold Length	9.92
Number of Laterals	4
Orifice Spacing	2.0
Number of Orifices	56
Loading Rate	2.3 gallons/s/day
Field Invert Table	
Existing Original Grade	205.00
Finish Grade Min.	205.50
Finish Grade Max.	206.00
Invert Elevation	205.00 F
Water Table Elevation	199.33 G



**System 8 Configuration**

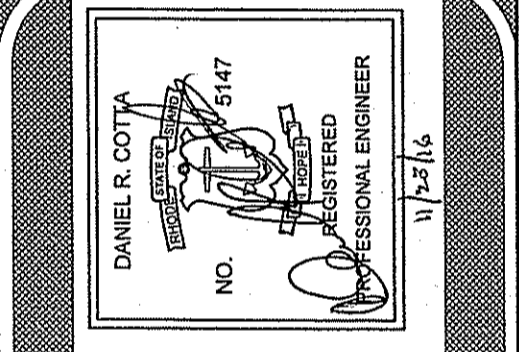
Design Configuration	4 Bedroom Residential
Design Flow	400 gpd
SeptiTech Controller	M400 Panel
NEMA 4X Rated Controller Model	M400 Panel
Invert at Dwelling	Elev.= 222.54 A
4" PVC Lateral to Septic Tank	20 feet H
Septic Tank Settings	
Septic Tank Capacity	1500 gallon
Riser at Inlet End of Septic Tank	Elev.= 224.17 (12" Riser)
Invert at Septic Tank In	Elev.= 222.34 B
Invert at Septic Tank Out	Elev.= 222.09 C
Riser at Outlet End of Septic Tank	Elev.= 224.42 (12" Riser)
4" PVC Lateral to Processor Tank	2 feet I
SeptiTech Tank Settings	
Processor Tank Series	M400
Processor Tank Capacity	1000 gallon
Riser at Inlet End of Processor Tank	Elev.= 224.63 (21" Riser)
Invert at Processor Tank In	Elev.= 222.05 D
Invert at Processor Tank Out	Elev.= 222.05 E
Riser at Outlet End of Processor Tank	Elev.= 224.88 (24" Riser)
Discharge Pump Settings	
Pump Model Number	Gould LSP03
Transport Line Size	1-1/2"
PVC Transport Line to Field	23 feet J
Maximum Design Flow	0.75 gallons/orifice/vent = 46.50 gal
Transport Return	2.11 gallons/vent
Design Dosage + Transport	19.17 + 2.11 = 21.28 gallons/vent
GEOMAT - 3900	
Mat Length	31 K
Mat Width	3.25
Manifold Length	9.92
Number of Laterals	4
Orifice Spacing	2.0
Number of Orifices	54
Loading Rate	2.3 gallons/s/day
Field Invert Table	
Existing Original Grade	228.50
Finish Grade Min.	226.00
Finish Grade Max.	226.00
Invert Elevation	225.50 F
Water Table Elevation	221.50 G



**ONSITE WASTEWATER TREATMENT SYSTEM CONFIGURATIONS**  
 LIBERTY HILL CONDOMINIUMS  
 LOCATED AT  
 400 SOUTH COUNTY TRAIL  
 EXETER, R.I.

Checked By: **DrC**  
 Drawn By: **PJF**  
 Scale: **1" = 20'**  
 Date: **10/21/2016**

NO.	REVISION	BY	DATE



Environmental Management  
 DEC 03 2016  
 Office of Water Resources

**AMERICAN ENGINEERING, INC.**  
 DANIEL R. COTTA Professional Engineer / Professional Land Surveyor  
 400 South County Trail - Suite A 201  
 Exeter, Rhode Island 02822  
 Phone (401) 294-4090 / Fax (401) 294-3625

Sheet  
**10**  
 of 15 sheets  
 Drawing No.  
**98165**

**System 9 Configuration**  
 4 Bedroom Residential  
 460 gpd

Design Configuration  
 Design Flow  
 SeptiTech Controller  
 NEMA 4X Rated Controller Model  
 M400 Panel

Invert at Dwelling  
 4" PVC Lateral to Septic Tank  
 Elev.= 227.72 A  
 23 feet H

Septic Tank Settings  
 Septic Tank Capacity  
 1500 gallon

Riser at Inlet End of Septic Tank  
 Elev.= 228.84 (9" Riser)  
 Invert at Septic Tank In  
 Elev.= 227.98 B  
 Invert at Septic Tank Out  
 Elev.= 227.01 C  
 Riser at Outlet End of Septic Tank  
 4" PVC Lateral to Processor Tank  
 Elev.= 228.84 (9" Riser)  
 2 feet I

SeptiTech Tank Settings  
 Processor Tank Series  
 M400  
 Processor Tank Capacity  
 1000 gallon

Riser at Inlet End of Processor Tank  
 Elev.= 228.80 (12" Riser)  
 Invert at Processor Tank In  
 Elev.= 226.97 D  
 Invert at Processor Tank Out  
 Elev.= 226.97 E  
 Riser at Outlet End of Processor Tank  
 Elev.= 228.80 (12" Riser)

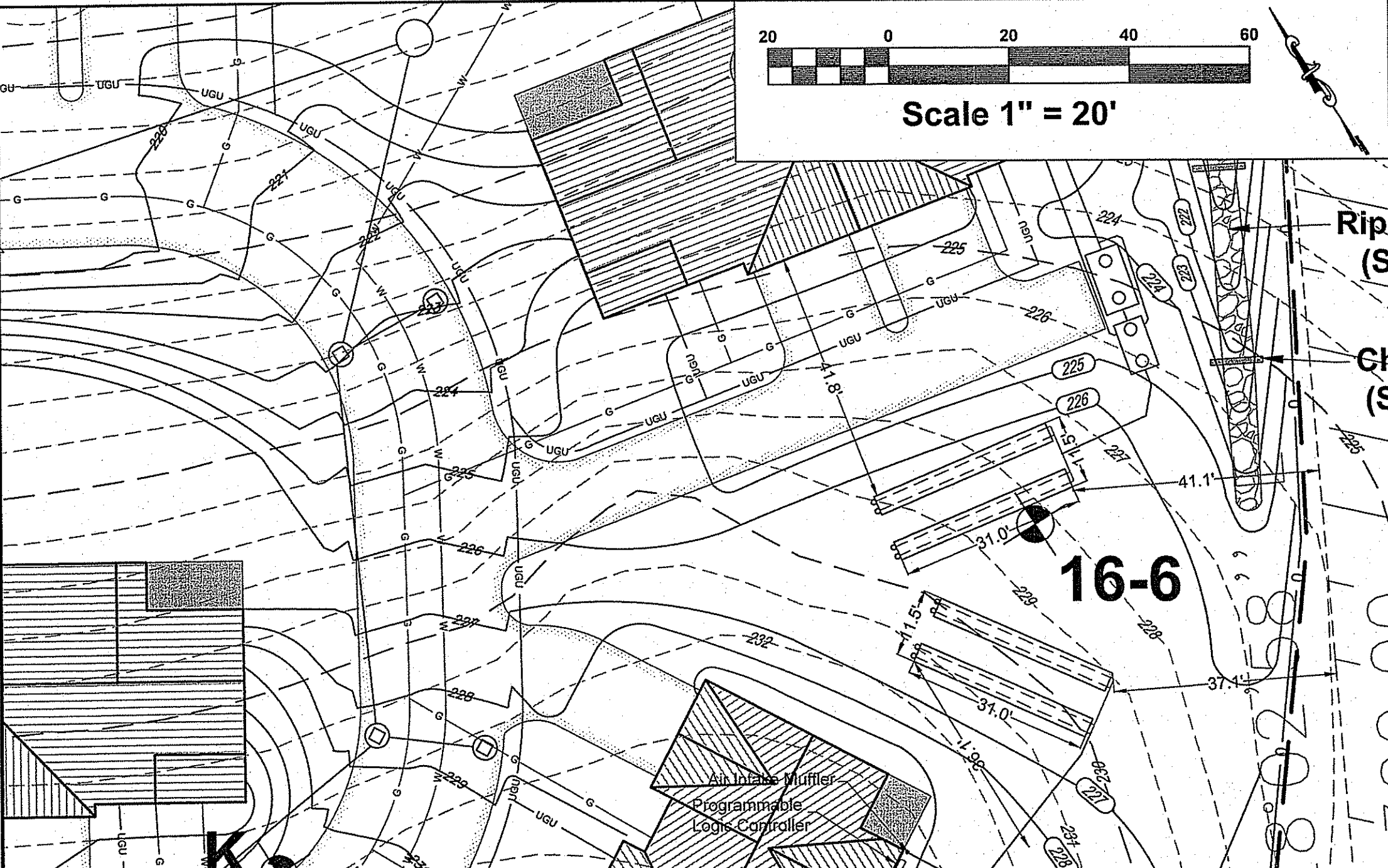
Discharge Pump Settings  
 Pump Model Number  
 Gould LSP03

Transport Line Size  
 1-1/2" J  
 PVC Transport Line to Field  
 34 feet J  
 Maximum Design Flow  
 0.75 gallons/orifice/vent = 48.60 gal  
 Design Dosage  
 19.17 gallons/vent

GEOMAT - 3900  
 Mat Length  
 31 K  
 Mat Width  
 3.25  
 Manifold Length  
 6.52  
 Number of Laterals  
 4  
 Orifice Spacing  
 2.0  
 Number of Orifices  
 64  
 Loading Rate  
 2.3 gallons/day

Field Invert Table  
 Existing Original Grade  
 231.00  
 Finish Grade Min.  
 226.50  
 Finish Grade Max.  
 227.00

Invert Elevation  
 226.00 F  
 Water Table Elevation =  
 223.00 G



**System 10 Configuration**  
 4 Bedroom Residential  
 460 gpd

Design Configuration  
 Design Flow  
 SeptiTech Controller  
 NEMA 4X Rated Controller Model  
 M400 Panel

Invert at Dwelling  
 4" PVC Lateral to Septic Tank  
 Elev.= 233.50 A  
 13 feet H

Septic Tank Settings  
 Septic Tank Capacity  
 1500 gallon

Riser at Inlet End of Septic Tank  
 Elev.= 234.54 (9" Riser)  
 Invert at Septic Tank In  
 Elev.= 233.21 B  
 Invert at Septic Tank Out  
 Elev.= 232.92 C  
 Riser at Outlet End of Septic Tank  
 4" PVC Lateral to Processor Tank  
 Elev.= 234.54 (9" Riser)  
 2 feet I

SeptiTech Tank Settings  
 Processor Tank Series  
 M400  
 Processor Tank Capacity  
 1000 gallon

Riser at Inlet End of Processor Tank  
 Elev.= 234.75 (12" Riser)  
 Invert at Processor Tank In  
 Elev.= 232.92 D  
 Invert at Processor Tank Out  
 Elev.= 232.92 E  
 Riser at Outlet End of Processor Tank  
 Elev.= 234.75 (12" Riser)

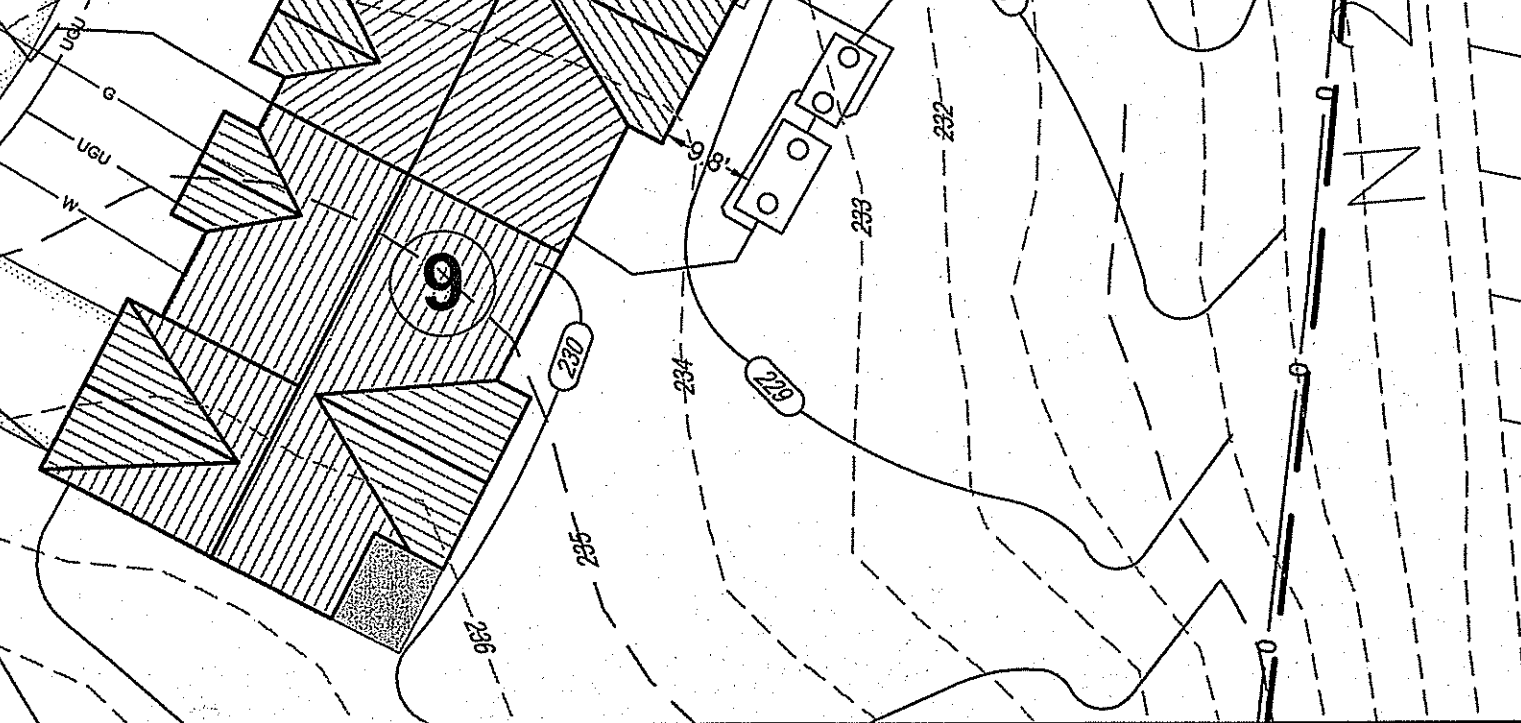
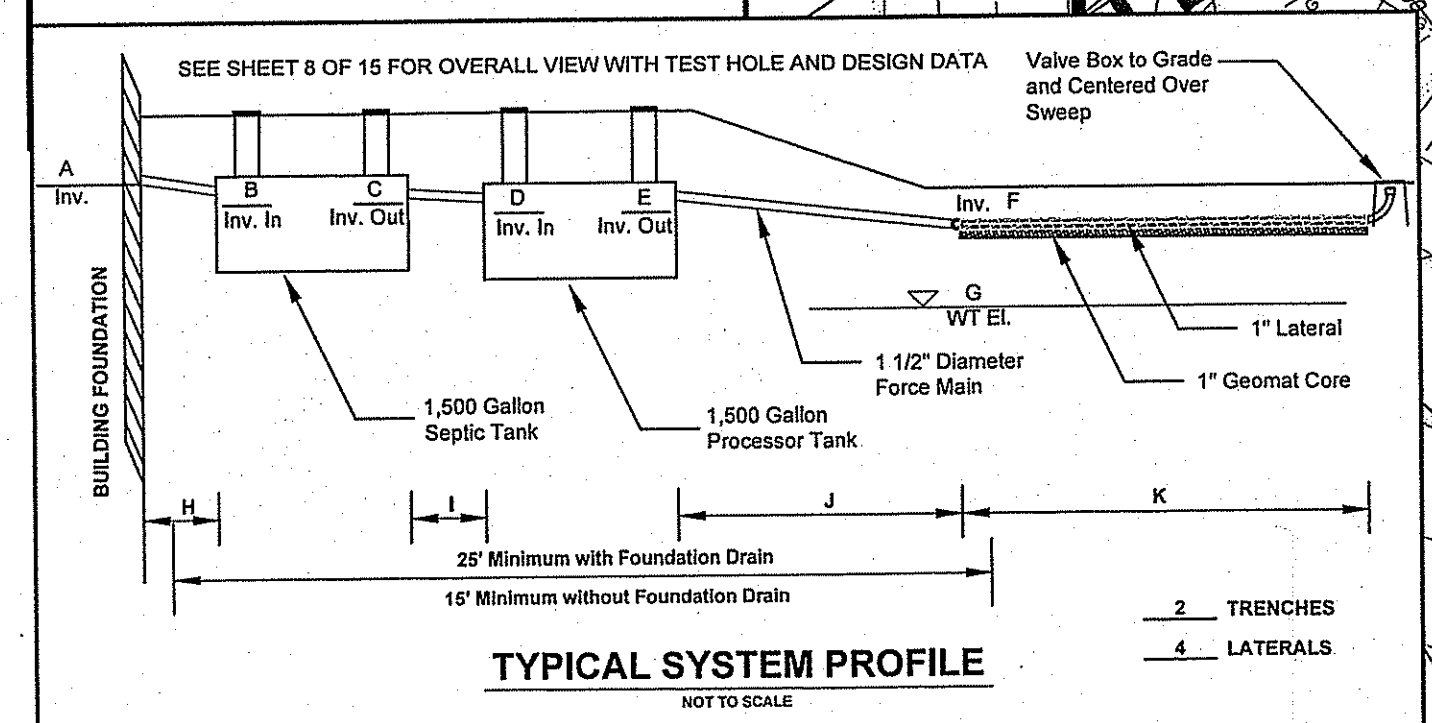
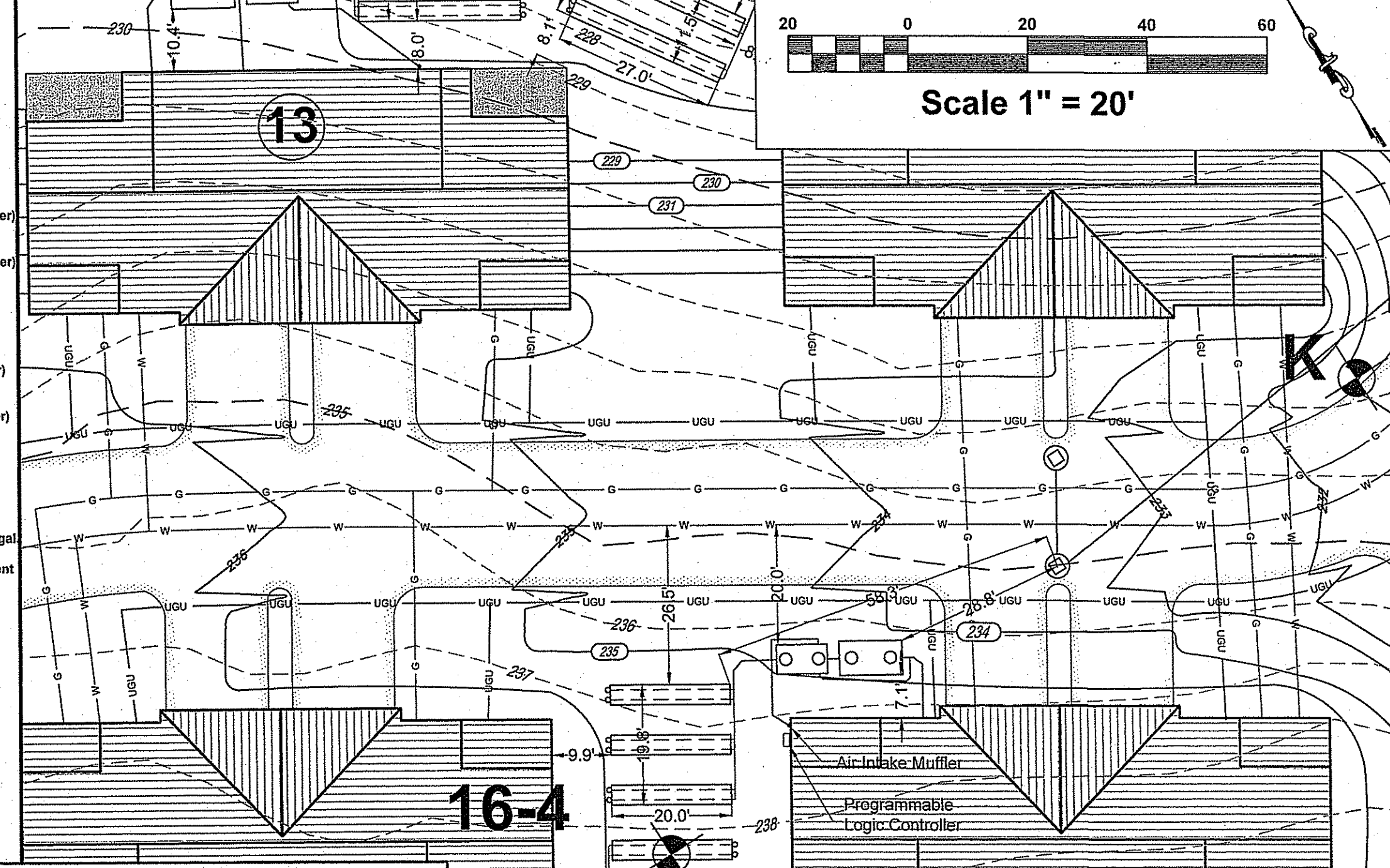
Discharge Pump Settings  
 Pump Model Number  
 Gould LSP03

Transport Line Size  
 1-1/2" J  
 PVC Transport Line to Field  
 11 feet J  
 Maximum Design Flow  
 0.75 gallons/orifice/vent = 45.00 gal  
 Design Dosage  
 19.17 + 1.01 = 20.18 gallons/vent

GEOMAT - 3900  
 Mat Length  
 20 K  
 Mat Width  
 3.25  
 Manifold Length  
 18.13  
 Number of Laterals  
 6  
 Orifice Spacing  
 2.0  
 Number of Orifices  
 60  
 Loading Rate  
 2.3 gallons/day

Field Invert Table  
 Existing Original Grade  
 238.00  
 Finish Grade Min.  
 235.50  
 Finish Grade Max.  
 236.00

Invert Elevation  
 235.00 F  
 Water Table Elevation =  
 229.50 G



**System 11 Configuration**  
 4 Bedroom Residential  
 460 gpd

Design Configuration  
 Design Flow  
 SeptiTech Controller  
 NEMA 4X Rated Controller Model  
 M400 Panel

Invert at Dwelling  
 4" PVC Lateral to Septic Tank  
 Elev.= 235.09 A  
 19 feet H

Septic Tank Settings  
 Septic Tank Capacity  
 1500 gallon

Riser at Inlet End of Septic Tank  
 Elev.= 236.29 (9" Riser)  
 Invert at Septic Tank In  
 Elev.= 234.71 B  
 Invert at Septic Tank Out  
 Elev.= 234.48 C  
 Riser at Outlet End of Septic Tank  
 4" PVC Lateral to Processor Tank  
 Elev.= 236.29 (9" Riser)  
 2 feet I

SeptiTech Tank Settings  
 Processor Tank Series  
 M400  
 Processor Tank Capacity  
 1000 gallon

Riser at Inlet End of Processor Tank  
 Elev.= 236.25 (12" Riser)  
 Invert at Processor Tank In  
 Elev.= 234.41 D  
 Invert at Processor Tank Out  
 Elev.= 234.41 E  
 Riser at Outlet End of Processor Tank  
 Elev.= 236.25 (12" Riser)

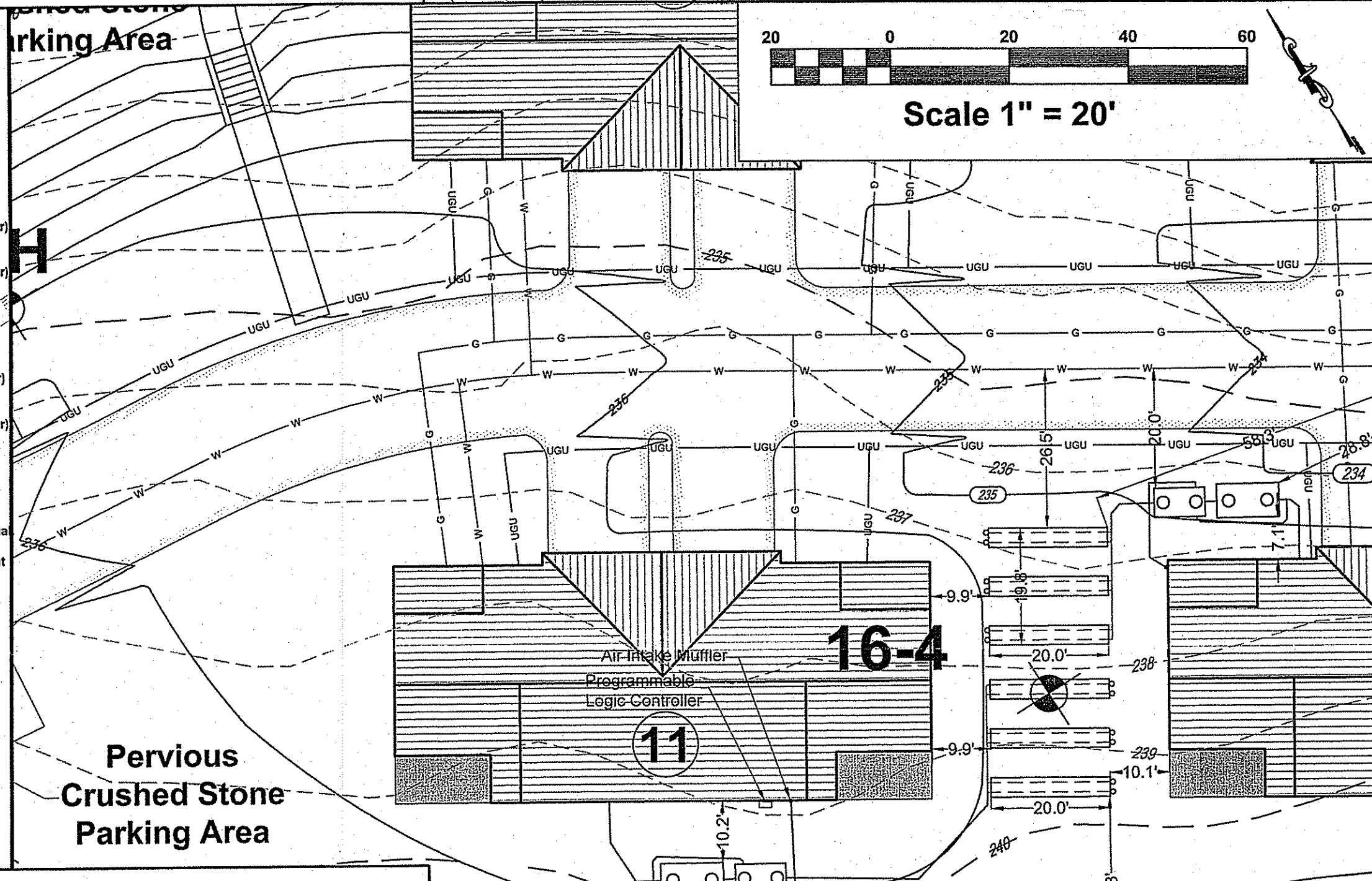
Discharge Pump Settings  
 Pump Model Number  
 Gould LSP03

Transport Line Size  
 1-1/2" J  
 PVC Transport Line to Field  
 41 feet J  
 Maximum Design Flow  
 0.75 gallons/orifice/vent = 46.50 gal  
 Design Dosage  
 19.17 + 3.76 = 22.93 gallons/vent

GEOMAT - 3900  
 Mat Length  
 20 K  
 Mat Width  
 3.25  
 Manifold Length  
 18.13  
 Number of Laterals  
 6  
 Orifice Spacing  
 2.0  
 Number of Orifices  
 60  
 Loading Rate  
 2.3 gallons/day

Field Invert Table  
 Existing Original Grade  
 240.00  
 Finish Grade Min.  
 235.50  
 Finish Grade Max.  
 235.00

Invert Elevation  
 235.00 F  
 Water Table Elevation =  
 231.50 G



**System 12 Configuration**  
 4 Bedroom Residential  
 460 gpd

Design Configuration  
 Design Flow  
 SeptiTech Controller  
 NEMA 4X Rated Controller Model  
 M400 Panel

Invert at Dwelling  
 4" PVC Lateral to Septic Tank  
 Elev.= 226.36 A  
 20 feet H

Septic Tank Settings  
 Septic Tank Capacity  
 1500 gallon

Riser at Inlet End of Septic Tank  
 Elev.= 227.29 (9" Riser)  
 Invert at Septic Tank In  
 Elev.= 226.99 B  
 Invert at Septic Tank Out  
 Elev.= 226.71 C  
 Riser at Outlet End of Septic Tank  
 4" PVC Lateral to Processor Tank  
 Elev.= 227.29 (9" Riser)  
 2 feet I

SeptiTech Tank Settings  
 Processor Tank Series  
 M400  
 Processor Tank Capacity  
 1000 gallon

Riser at Inlet End of Processor Tank  
 Elev.= 227.50 (12" Riser)  
 Invert at Processor Tank In  
 Elev.= 226.67 D  
 Invert at Processor Tank Out  
 Elev.= 226.67 E  
 Riser at Outlet End of Processor Tank  
 Elev.= 227.50 (12" Riser)

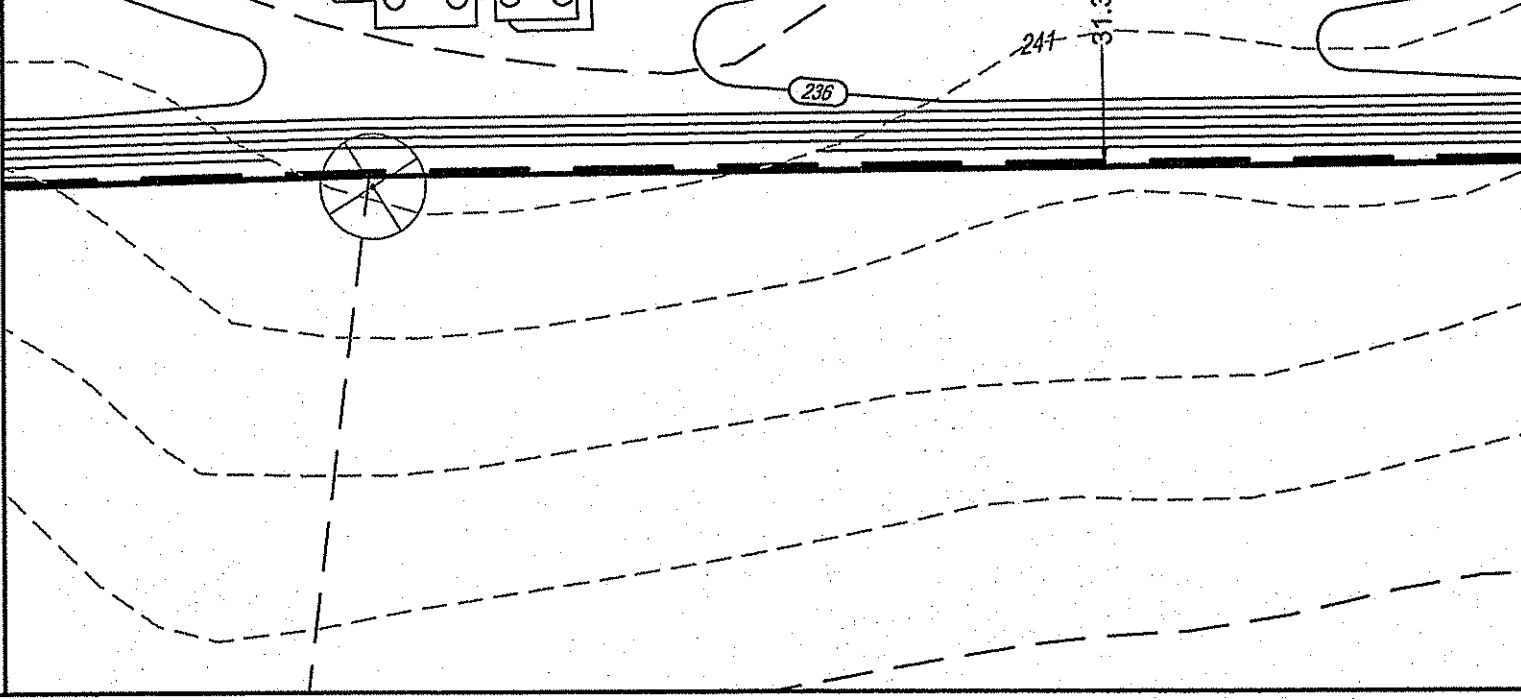
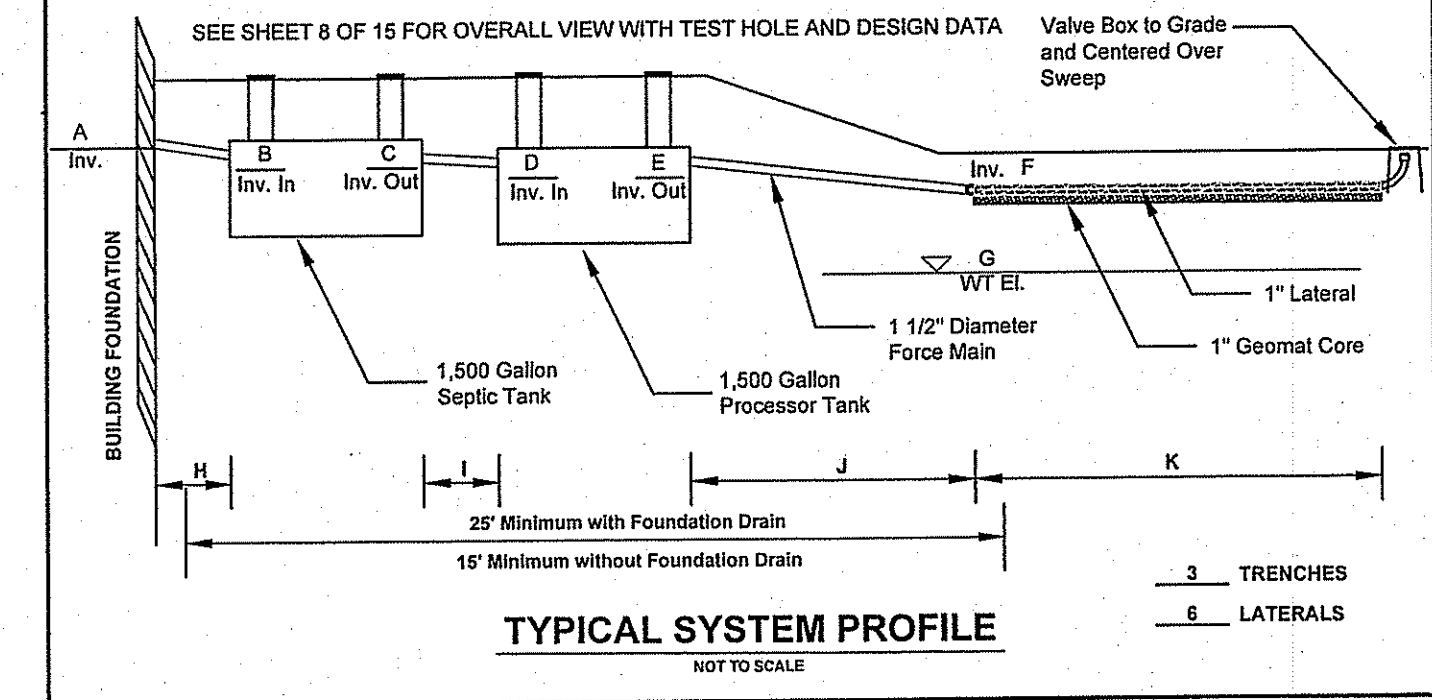
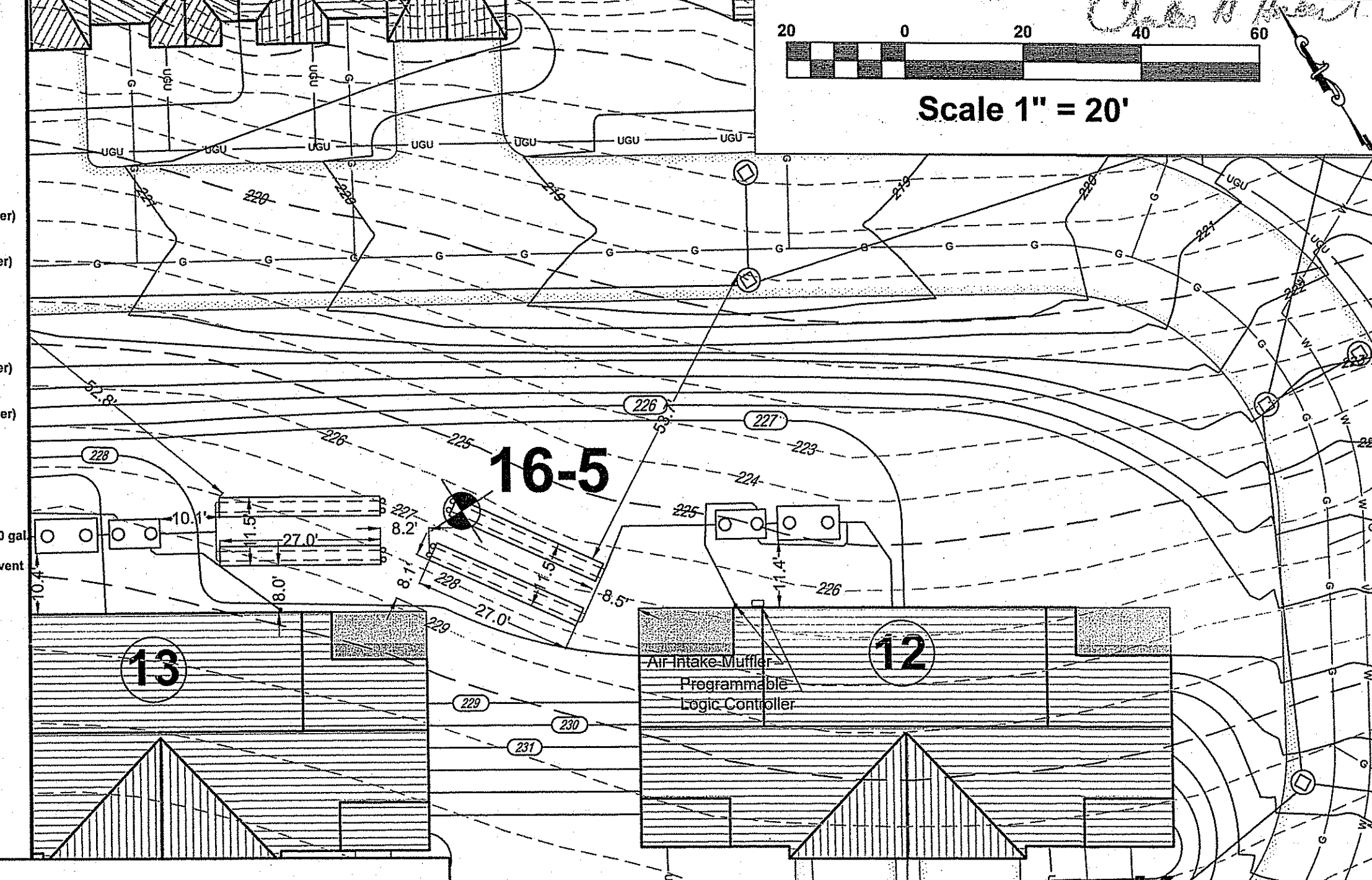
Discharge Pump Settings  
 Pump Model Number  
 Gould LSP03

Transport Line Size  
 1-1/2" J  
 PVC Transport Line to Field  
 44 feet J  
 Maximum Design Flow  
 0.75 gallons/orifice/vent = 42.00 gal  
 Design Dosage  
 19.17 + 2.20 = 21.37 gallons/vent

GEOMAT - 3900  
 Mat Length  
 27 K  
 Mat Width  
 3.25  
 Manifold Length  
 26.25  
 Number of Laterals  
 9  
 Orifice Spacing  
 2.0  
 Number of Orifices  
 81  
 Loading Rate  
 2.7 gallons/day

Field Invert Table  
 Existing Original Grade  
 227.75  
 Finish Grade Min.  
 222.00  
 Finish Grade Max.  
 227.50

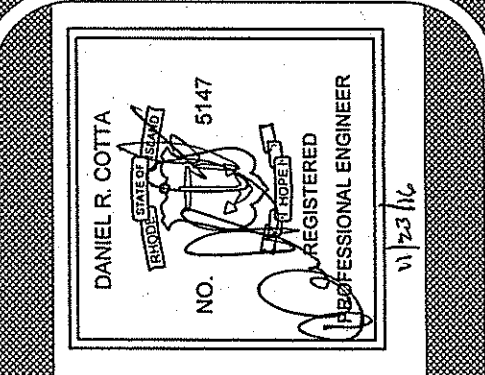
Invert Elevation  
 226.50 F  
 Water Table Elevation =  
 219.25 G



ONSITE WASTEWATER TREATMENT  
 SYSTEM CONFIGURATIONS  
 LIBERTY HILL CONDOMINIUMS  
 LOCATED AT  
 400 SOUTH COUNTY TRAIL  
 EXETER, R.I.

Drawn By: P.J.F. Checked By: DrC  
 Date: 10/21/2016  
 Scale: 1" = 20'

NO.	REVISION	BY	DATE

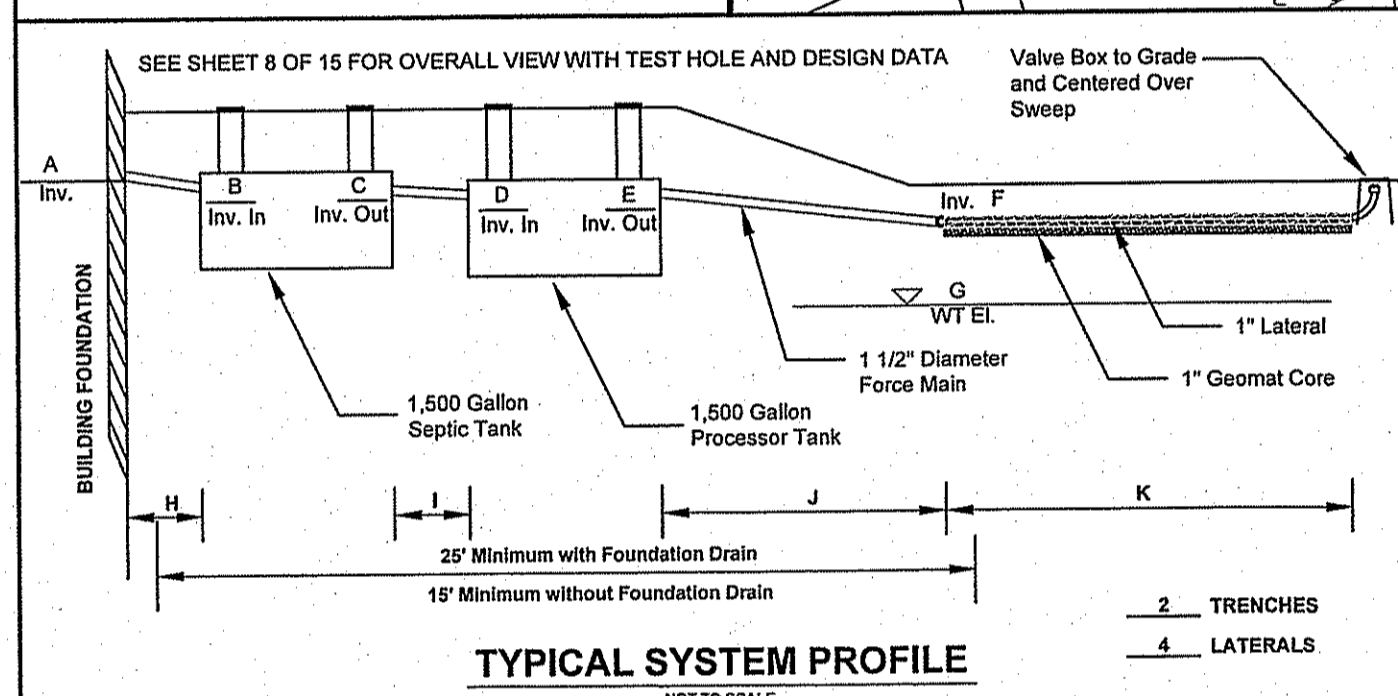
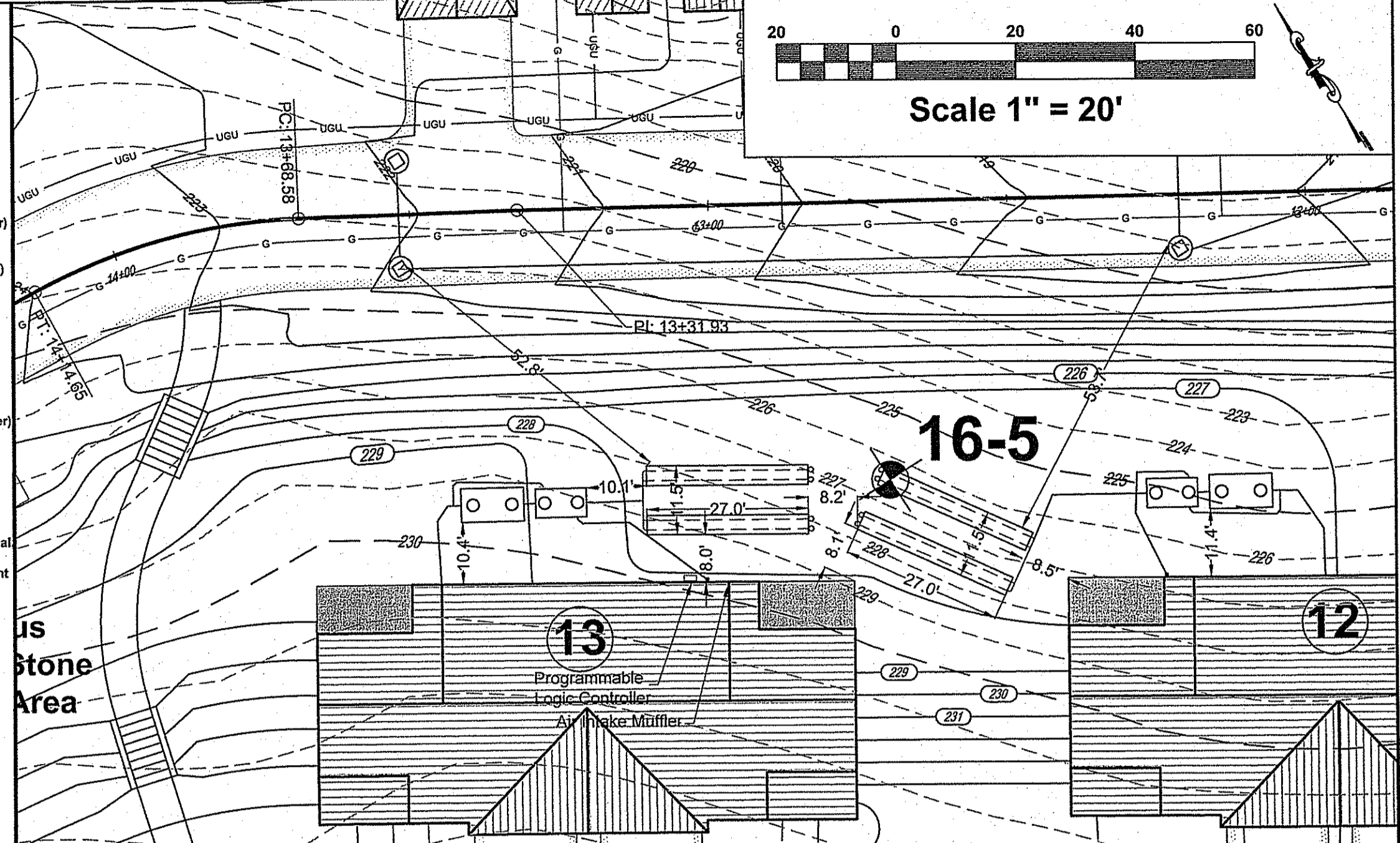


Environmental Management  
 DEC 05 2016  
 Office of Water Resources

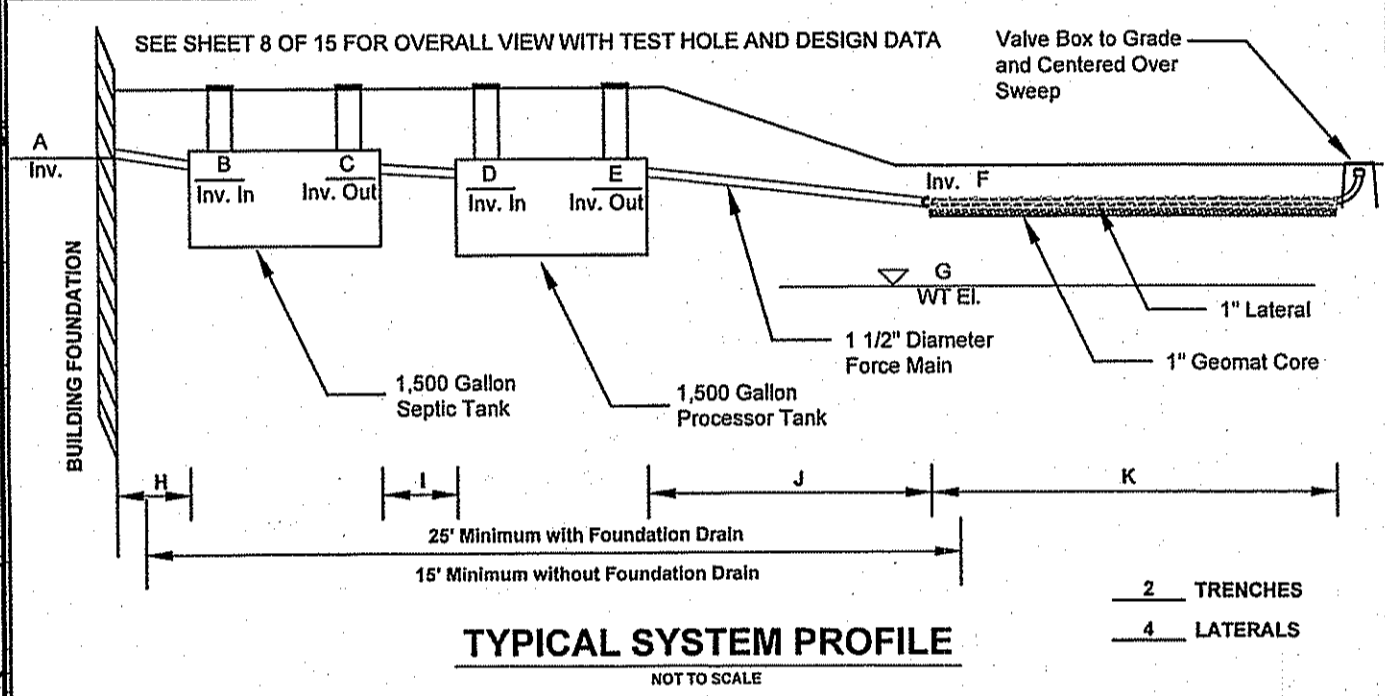
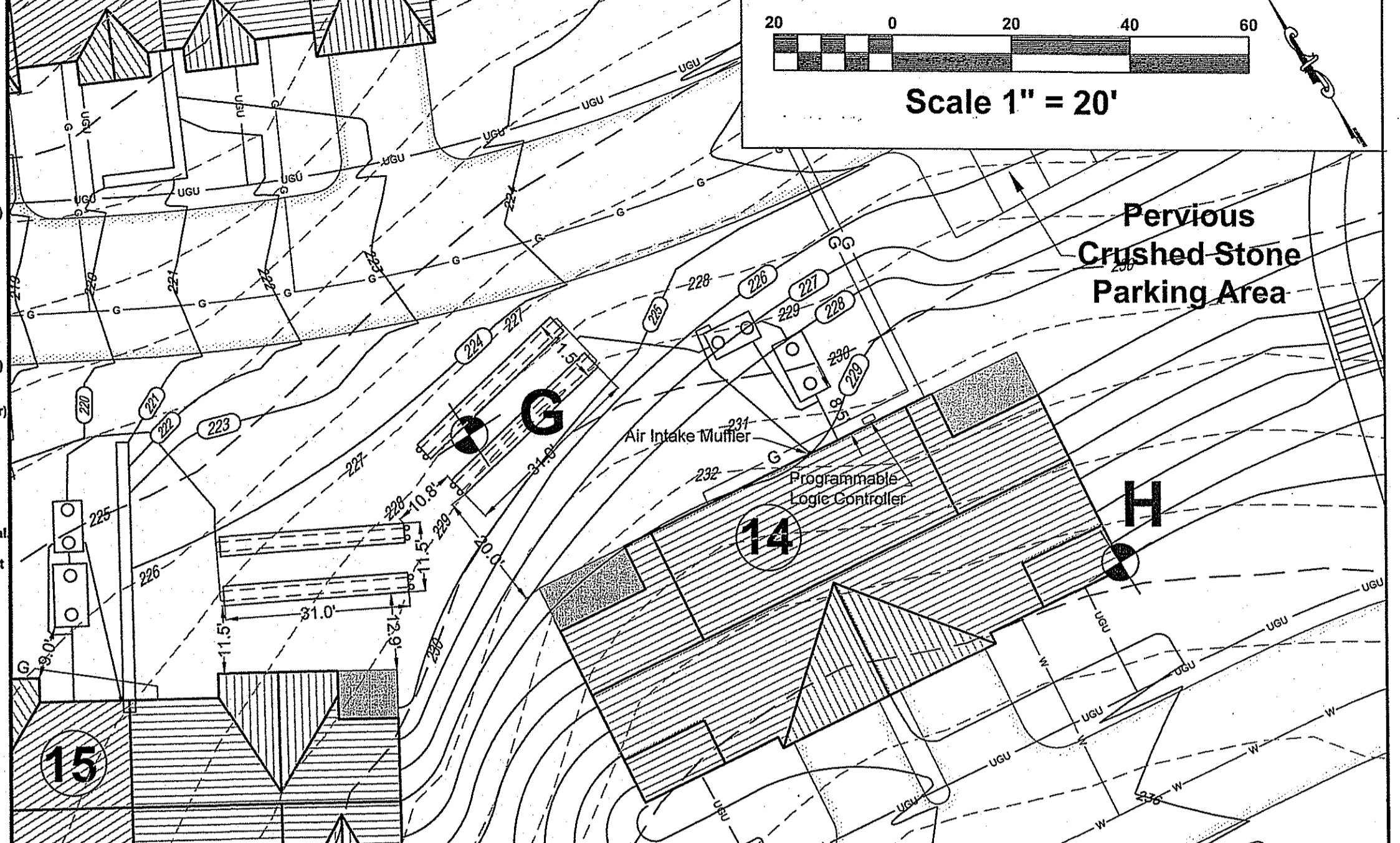
**AMERICAN ENGINEERING, INC.**  
 DANIEL R. COTTA  
 Professional Engineer / Professional Land Surveyor  
 400 South County Trail - Suite A 201  
 Exeter, Rhode Island 02822  
 Phone (401) 294-4090 / Fax (401) 294-3625

Sheet  
**11**  
 of 15 sheets  
 Drawing No.  
 98165

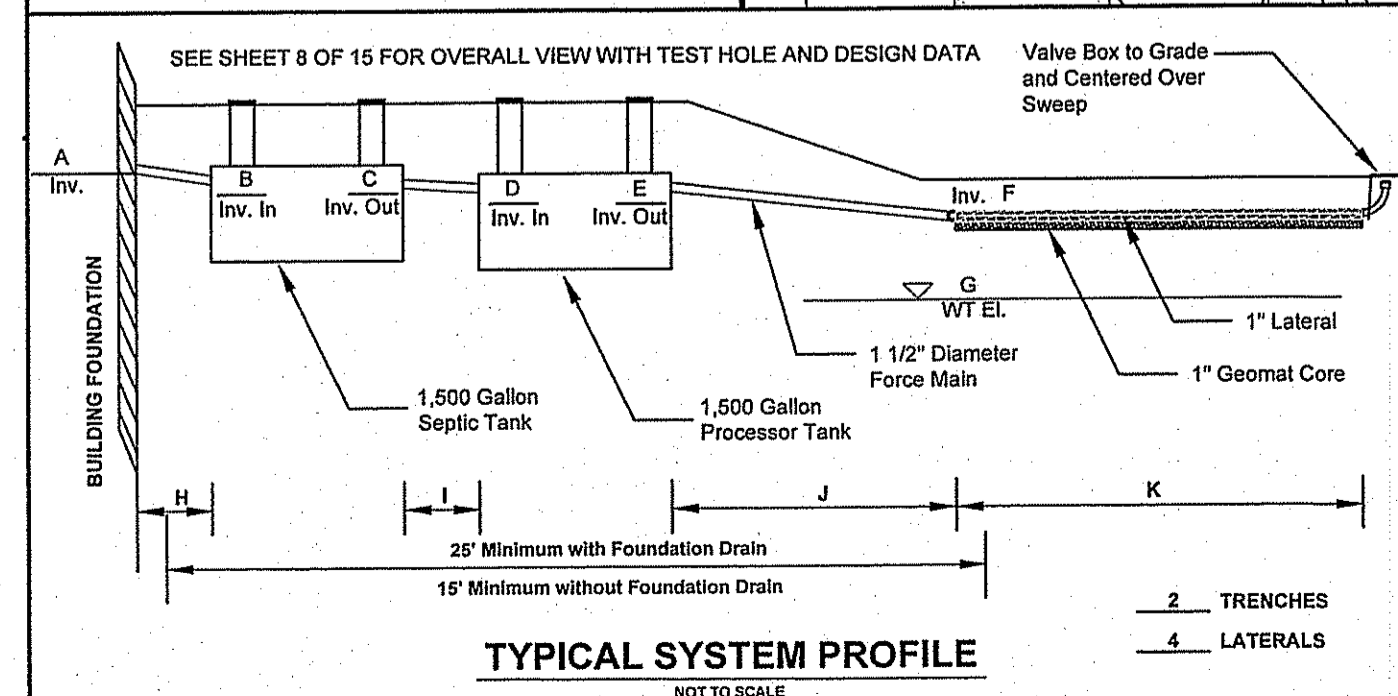
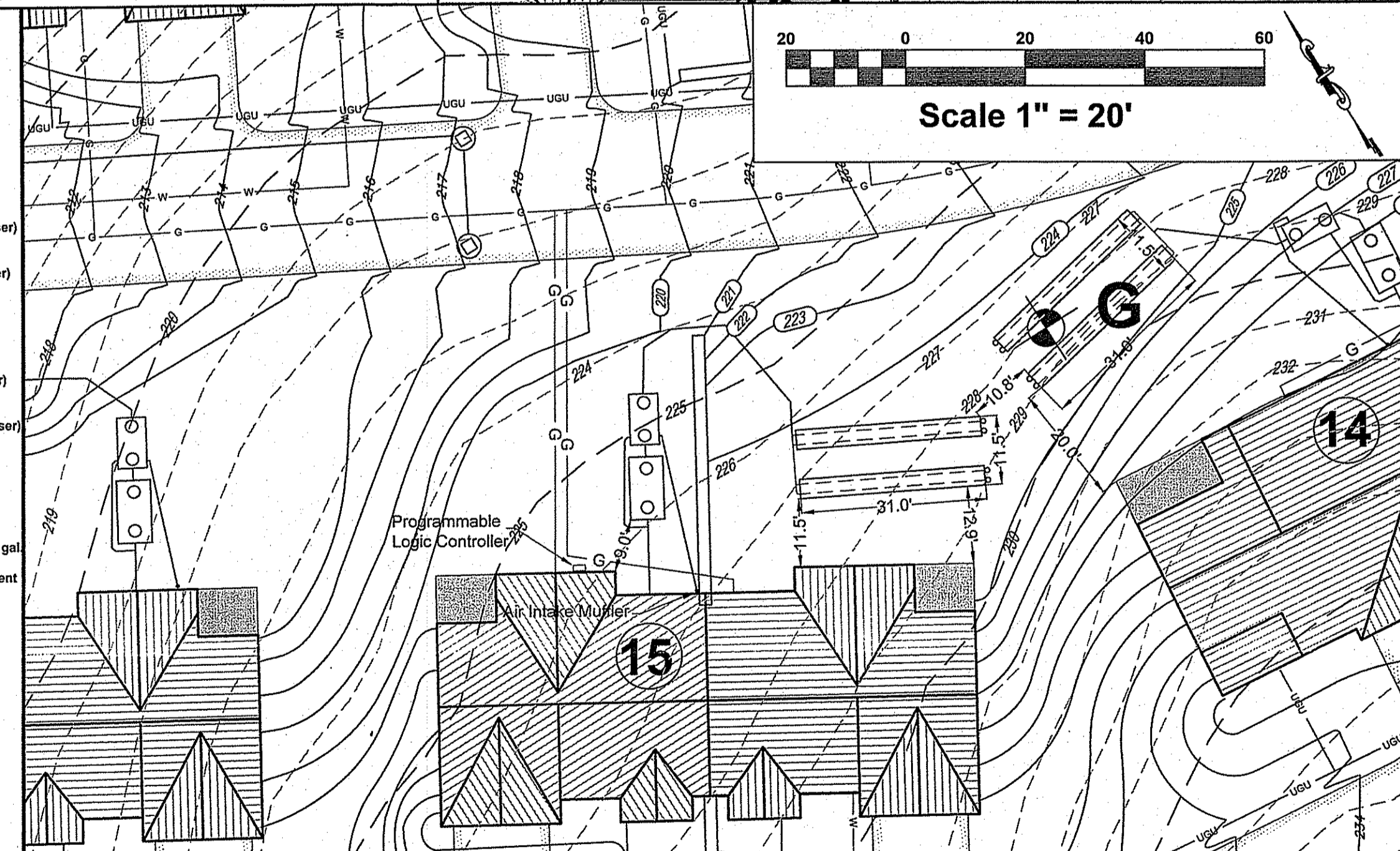
**System 13 Configuration**  
 4 Bedroom Residential  
 460 gpd  
 Design Configuration  
 Design Flow  
 SeptiTech Controller  
 NEMA 4X Rated Controller Model  
 M400 Panel  
 Invert at Dwelling  
 Elev. = 227.40 A  
 4" PVC Lateral to Septic Tank  
 15 feet H  
 Septic Tank Settings  
 Septic Tank Capacity  
 1500 gallon  
 Riser at Inlet End of Septic Tank  
 Elev. = 229.44 (18" Riser)  
 Invert at Septic Tank In  
 Elev. = 227.08 B  
 Invert at Septic Tank Out  
 Elev. = 226.93 C  
 Riser at Outlet End of Septic Tank  
 Elev. = 229.16 (18" Riser)  
 2 feet I  
 SeptiTech Tank Settings  
 Processor Tank Series  
 M400  
 Processor Tank Capacity  
 1000 gallon  
 Riser at Inlet End of Processor Tank  
 Elev. = 229.87 (15" Riser)  
 Invert at Processor Tank In  
 Elev. = 226.79 D  
 Invert at Processor Tank Out  
 Elev. = 226.79 E  
 Riser at Outlet End of Processor Tank  
 Elev. = 228.59 (16.5" Riser)  
 Discharge Pump Settings  
 Pump Model Number  
 Gould LSP03  
 Transport Line Size  
 1-1/2" J  
 PVC Transport Line to Field  
 9 feet J  
 Maximum Design Flow  
 0.75 gallons/orifice/level = 40.50 gal  
 Transport Return  
 1.56 gallons/level  
 Design Dosage + Transport  
 19.17 + 1.56 = 20.73 gallons/level  
 GEOMAT - 3900  
 Mat Length  
 27 K  
 Mat Width  
 3.25  
 Manifold Length  
 9.92  
 Number of Laterals  
 4  
 Orifice Spacing  
 2.0  
 Number of Orifices  
 66  
 Loading Rate  
 2.7 gallons/day  
 Field Invert Table  
 Existing Original Grade  
 229.00  
 Finish Grade Min.  
 227.50  
 Finish Grade Max.  
 228.00  
 Invert Elevation  
 227.00 F  
 Water Table Elevation = 220.50 G



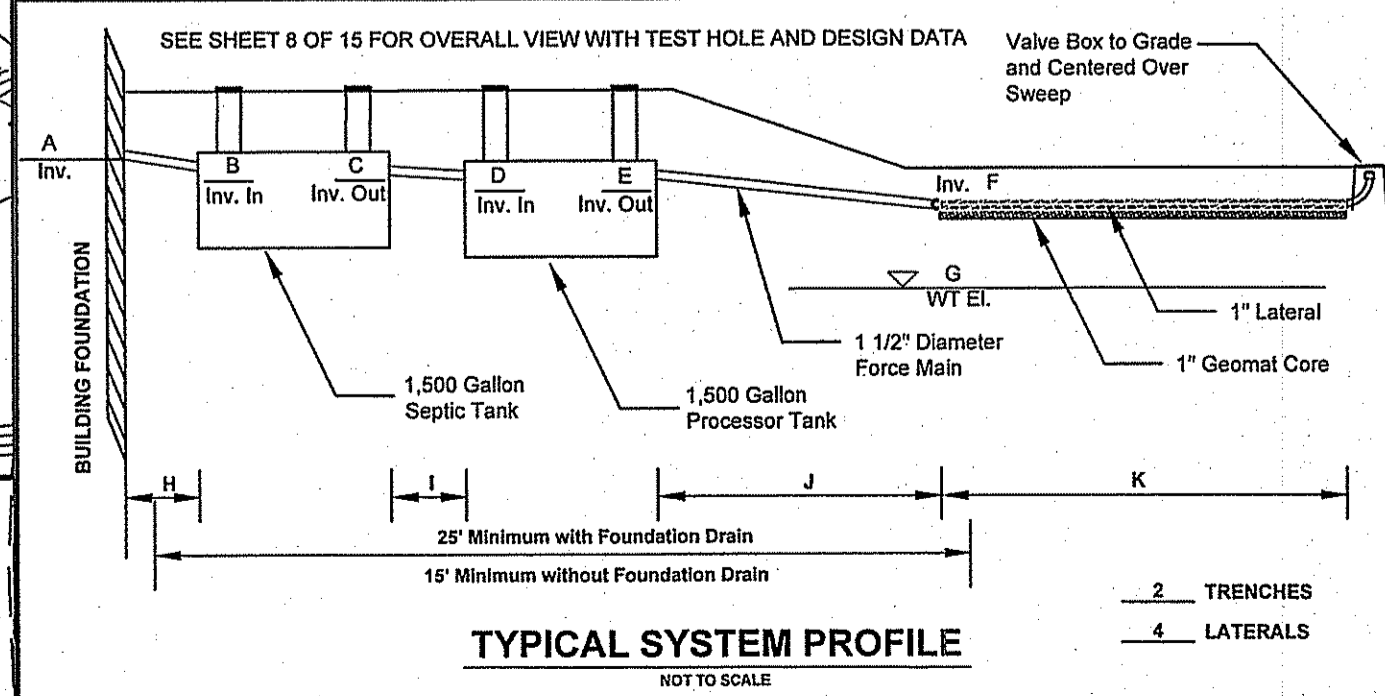
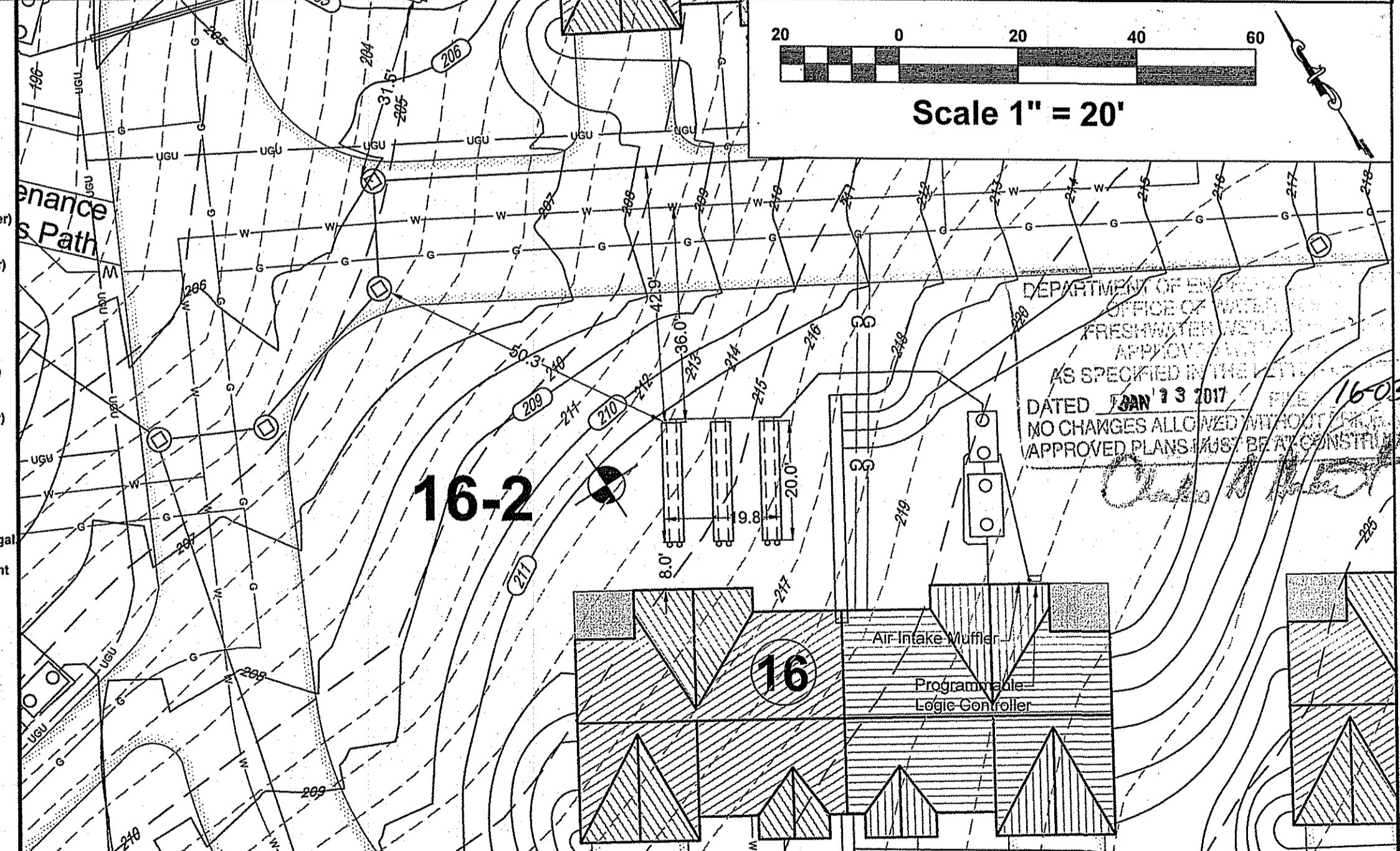
**System 14 Configuration**  
 4 Bedroom Residential  
 460 gpd  
 Design Configuration  
 Design Flow  
 SeptiTech Controller  
 NEMA 4X Rated Controller Model  
 M400 Panel  
 Invert at Dwelling  
 Elev. = 226.29 A  
 4" PVC Lateral to Septic Tank  
 10 feet H  
 Septic Tank Settings  
 Septic Tank Capacity  
 1500 gallon  
 Riser at Inlet End of Septic Tank  
 Elev. = 228.52 (21" Riser)  
 Invert at Septic Tank In  
 Elev. = 226.19 B  
 Invert at Septic Tank Out  
 Elev. = 225.94 C  
 Riser at Outlet End of Septic Tank  
 Elev. = 228.27 (18" Riser)  
 7 feet I  
 SeptiTech Tank Settings  
 Processor Tank Series  
 M400  
 Processor Tank Capacity  
 1000 gallon  
 Riser at Inlet End of Processor Tank  
 Elev. = 227.00 (10.5" Riser)  
 Invert at Processor Tank In  
 Elev. = 225.80 D  
 Invert at Processor Tank Out  
 Elev. = 225.80 E  
 Riser at Outlet End of Processor Tank  
 Elev. = 227.00 (10.5" Riser)  
 Discharge Pump Settings  
 Pump Model Number  
 Gould LSP03  
 Transport Line Size  
 1-1/2" J  
 PVC Transport Line to Field  
 25 feet J  
 Maximum Design Flow  
 0.75 gallons/orifice/level = 46.50 gal  
 Transport Return  
 2.39 gallons/level  
 Design Dosage + Transport  
 19.17 + 2.39 = 21.56 gallons/level  
 GEOMAT - 3900  
 Mat Length  
 31 K  
 Mat Width  
 3.25  
 Manifold Length  
 9.25  
 Number of Laterals  
 4  
 Orifice Spacing  
 2.0  
 Number of Orifices  
 64  
 Loading Rate  
 2.3 gallons/day  
 Field Invert Table  
 Existing Original Grade  
 229.00  
 Finish Grade Min.  
 224.25  
 Finish Grade Max.  
 224.75  
 Invert Elevation  
 223.75 F  
 Water Table Elevation = 220.33 G



**System 15 Configuration**  
 4 Bedroom Residential  
 460 gpd  
 Design Configuration  
 Design Flow  
 SeptiTech Controller  
 NEMA 4X Rated Controller Model  
 M400 Panel  
 Invert at Dwelling  
 Elev. = 219.10 A  
 4" PVC Lateral to Septic Tank  
 13 feet H  
 Septic Tank Settings  
 Septic Tank Capacity  
 1500 gallon  
 Riser at Inlet End of Septic Tank  
 Elev. = 229.67 (12" Riser)  
 Invert at Septic Tank In  
 Elev. = 218.84 B  
 Invert at Septic Tank Out  
 Elev. = 218.59 C  
 Riser at Outlet End of Septic Tank  
 Elev. = 220.42 (9" Riser)  
 2 feet I  
 SeptiTech Tank Settings  
 Processor Tank Series  
 M400  
 Processor Tank Capacity  
 1000 gallon  
 Riser at Inlet End of Processor Tank  
 Elev. = 229.39 (12" Riser)  
 Invert at Processor Tank In  
 Elev. = 218.55 D  
 Invert at Processor Tank Out  
 Elev. = 218.55 E  
 Riser at Outlet End of Processor Tank  
 Elev. = 220.29 (10.6" Riser)  
 Discharge Pump Settings  
 Pump Model Number  
 Gould LSP03  
 Transport Line Size  
 1-1/2" J  
 PVC Transport Line to Field  
 45 feet J  
 Maximum Design Flow  
 0.75 gallons/orifice/level = 46.50 gal  
 Transport Return  
 4.13 gallons/level  
 Design Dosage + Transport  
 19.17 + 4.13 = 23.30 gallons/level  
 GEOMAT - 3900  
 Mat Length  
 31 K  
 Mat Width  
 3.25  
 Manifold Length  
 9.92  
 Number of Laterals  
 4  
 Orifice Spacing  
 2.0  
 Number of Orifices  
 64  
 Loading Rate  
 2.3 gallons/day  
 Field Invert Table  
 Existing Original Grade  
 229.00  
 Finish Grade Min.  
 224.00  
 Finish Grade Max.  
 224.50  
 Invert Elevation  
 223.50 F  
 Water Table Elevation = 220.33 G

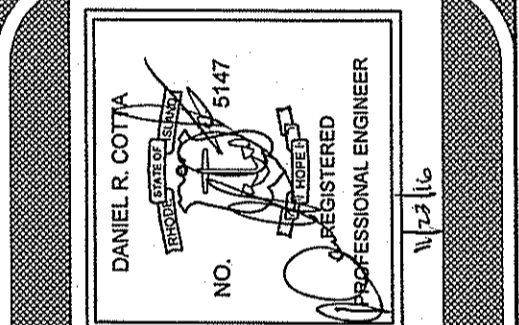


**System 16 Configuration**  
 4 Bedroom Residential  
 460 gpd  
 Design Configuration  
 Design Flow  
 SeptiTech Controller  
 NEMA 4X Rated Controller Model  
 M400 Panel  
 Invert at Dwelling  
 Elev. = 213.45 A  
 4" PVC Lateral to Septic Tank  
 8 feet H  
 Septic Tank Settings  
 Septic Tank Capacity  
 1500 gallon  
 Riser at Inlet End of Septic Tank  
 Elev. = 216.62 (18" Riser)  
 Invert at Septic Tank In  
 Elev. = 213.29 B  
 Invert at Septic Tank Out  
 Elev. = 213.04 C  
 Riser at Outlet End of Septic Tank  
 Elev. = 216.37 (16 Riser)  
 2 feet I  
 SeptiTech Tank Settings  
 Processor Tank Series  
 M400  
 Processor Tank Capacity  
 1000 gallon  
 Riser at Inlet End of Processor Tank  
 Elev. = 215.33 (18" Riser)  
 Invert at Processor Tank In  
 Elev. = 213.00 D  
 Invert at Processor Tank Out  
 Elev. = 213.00 E  
 Riser at Outlet End of Processor Tank  
 Elev. = 215.08 (15" Riser)  
 Discharge Pump Settings  
 Pump Model Number  
 Gould LSP03  
 Transport Line Size  
 1-1/2" J  
 PVC Transport Line to Field  
 41 feet J  
 Maximum Design Flow  
 0.75 gallons/orifice/level = 45.00 gal  
 Transport Return  
 1.19 gallons/level  
 Design Dosage + Transport  
 19.17 + 1.19 = 20.36 gallons/level  
 GEOMAT - 3900  
 Mat Length  
 31 K  
 Mat Width  
 3.25  
 Manifold Length  
 9.92  
 Number of Laterals  
 4  
 Orifice Spacing  
 2.0  
 Number of Orifices  
 60  
 Loading Rate  
 2.3 gallons/day  
 Field Invert Table  
 Existing Original Grade  
 216.50  
 Finish Grade Min.  
 211.00  
 Finish Grade Max.  
 211.60  
 Invert Elevation  
 216.50 F  
 Water Table Elevation = 208.50 G



ONSITE WASTEWATER TREATMENT  
 SYSTEM CONFIGURATIONS  
 LIBERTY HILL CONDOMINIUMS  
 LOCATED AT  
 400 SOUTH COUNTY TRAIL  
 EXETER, R.I.

Checked By: DrC  
 Date: 10/21/2016  
 Drawn By: PJF  
 Scale: 1" = 20'  
 NO. REVISION  
 BY DATE

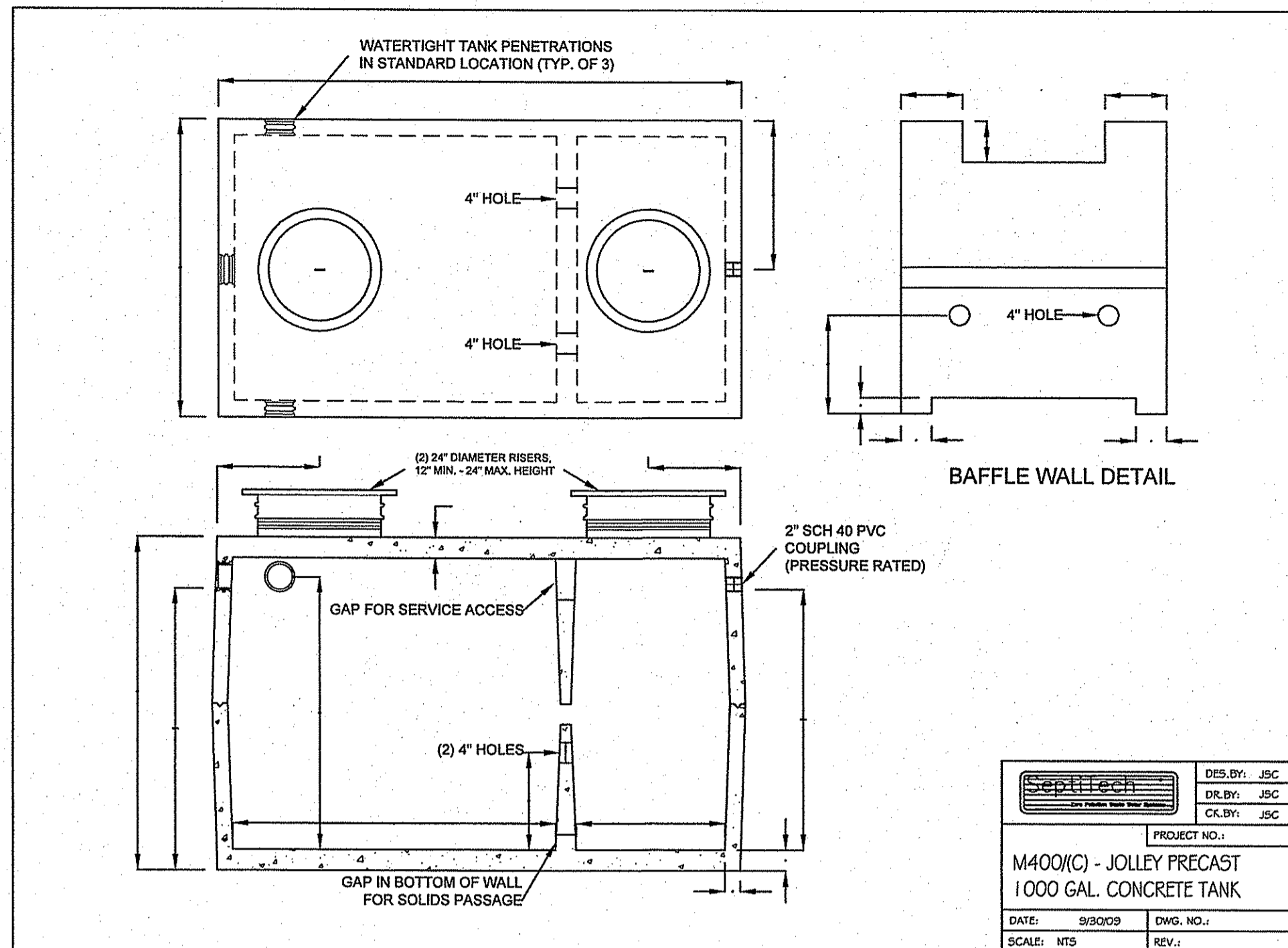


Environmental Management  
 DEC 05 2016  
 Office of Water Resources

AMERICAN ENGINEERING, INC.  
 DANIEL R. COTTA  
 Professional Engineer / Professional Land Surveyor  
 400 South County Trail - Suite A 201  
 Exeter, Rhode Island 02822  
 Phone (401) 294-4090 / Fax (401) 294-3625

Sheet  
 12  
 of 15 sheets  
 Drawing No.  
 98165

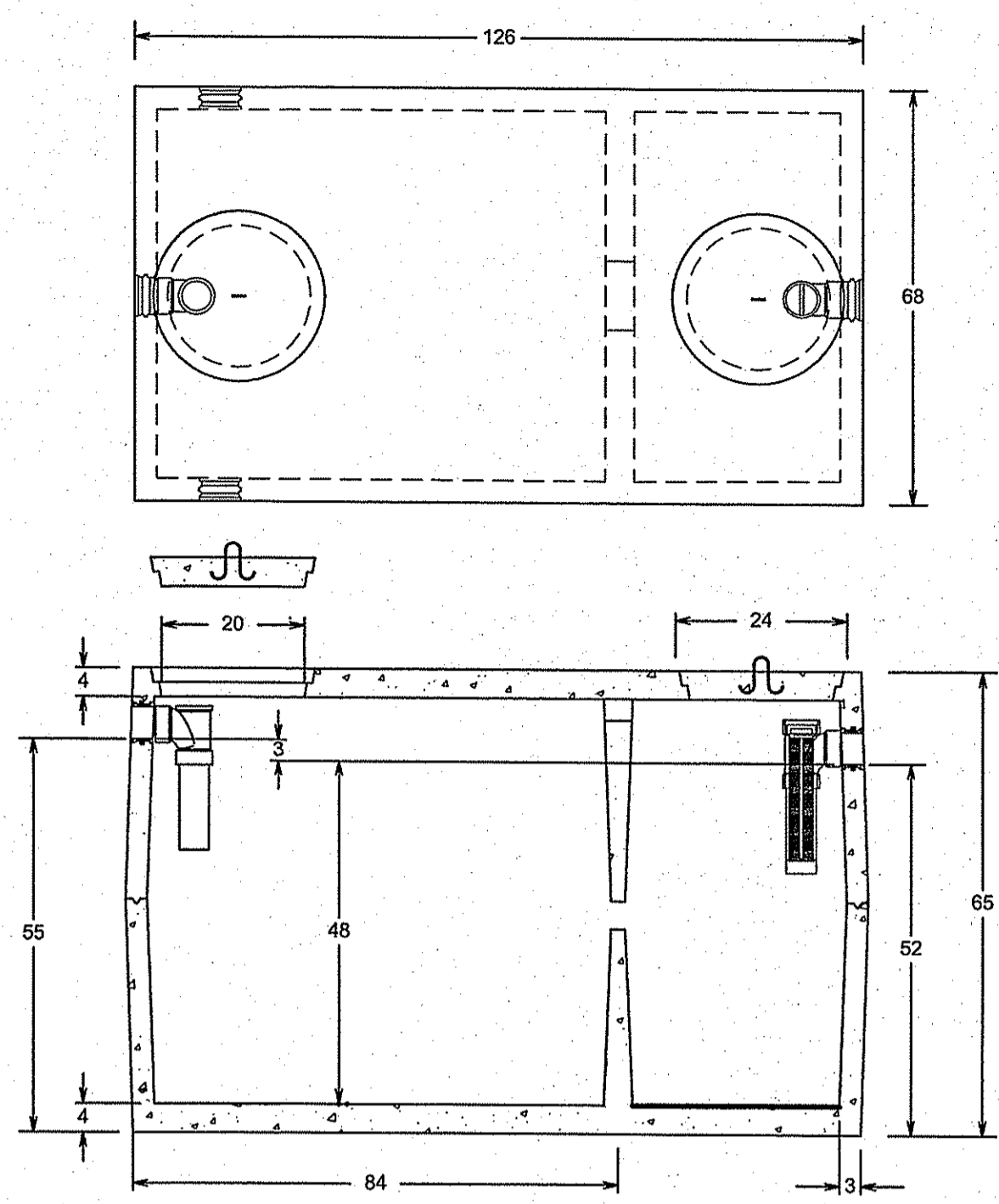
**SeptiTech M-400  
1000-GALLON PROCESSOR TANK**



NOTE: ACCESS LIDS SHALL WEIGH 59 lbs OR: SHALL BE TAMPER RESISTANT AND MECHANICALLY FASTENED, EACH ACCESS OPENING SHALL HAVE A LABEL STATING "ENTRANCE INTO THE TANK COULD BE FATAL".

ALL PRE-ASSEMBLED TANKS SHALL BE CERTIFIED WATER TIGHT BY THE MANUFACTURER. ALL TANKS ASSEMBLED ON-SITE SHALL BE CERTIFIED WATER TIGHT IN THE FIELD. CERTIFICATE BY MANUFACTURER OR FROM ON-SITE TESTING SHALL BE INCLUDED WITH BILL OF LADEN.

**1500 GALLON  
TWO COMPARTMENT  
SEPTIC TANK**



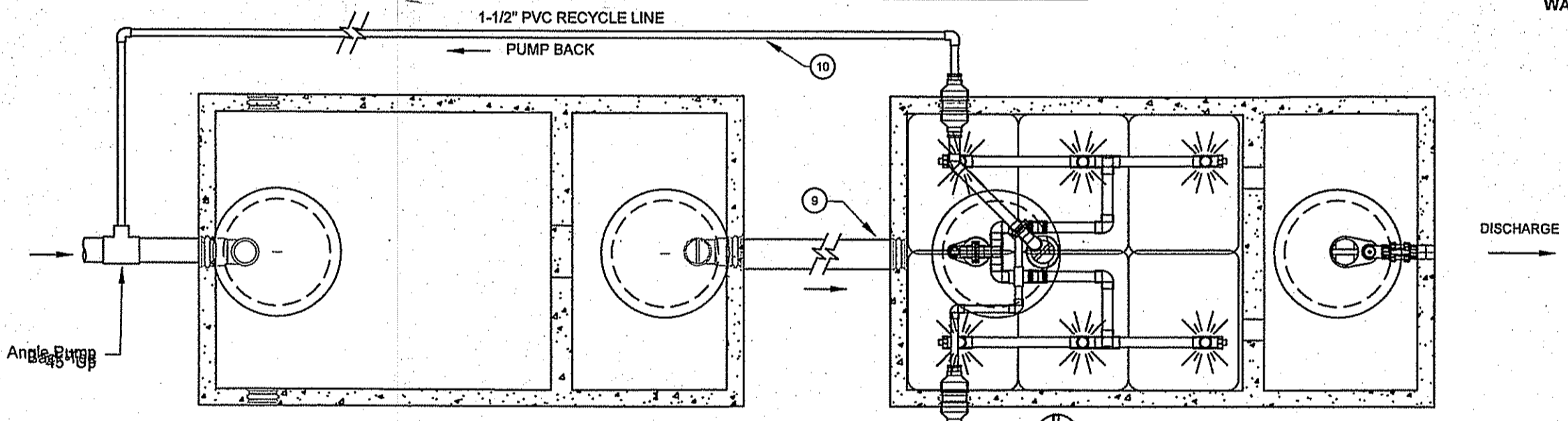
**DESIGN NOTES**

- 1) ALL JOINTS SEALED WITH BUTYL RUBBER SEALANT
- 2) ALL INLETS AND OUTLETS HAVE STATE APPROVED SEALS.
- 3) AVAILABLE OUTLET FILTER SHOWN.
- 4) MEETS ASTM C 1227-97A
- 5) CONCRETE STRENGTH 5000 PSI. MIN. 28 DAYS

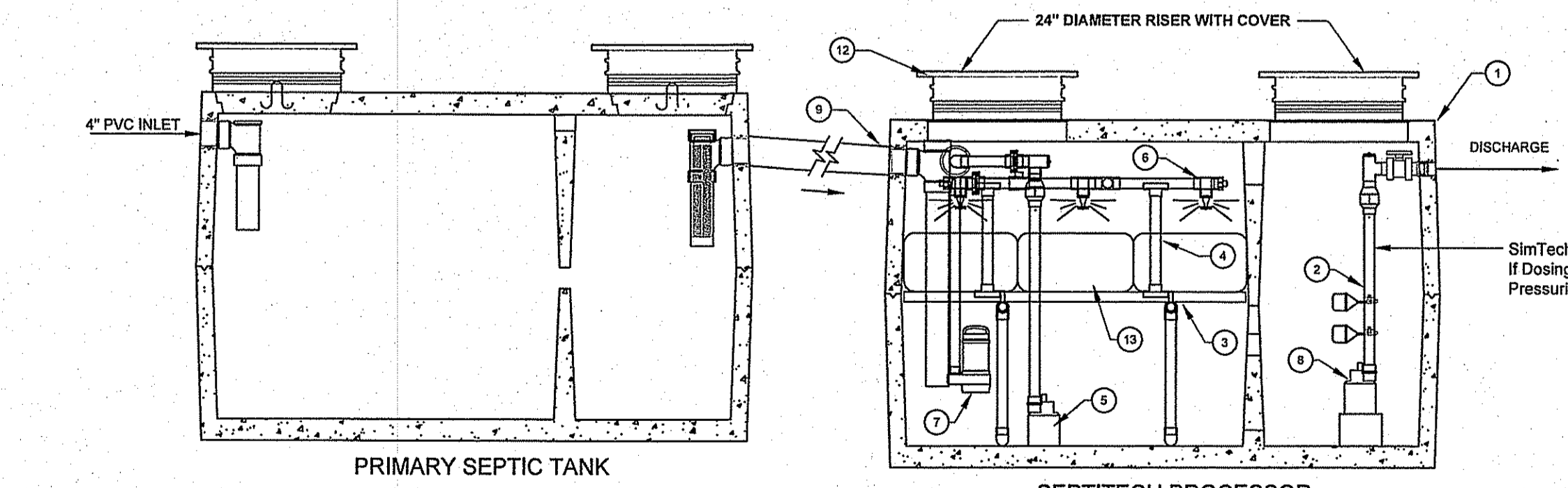
NOTE: ACCESS LIDS SHALL WEIGH 59 lbs OR: SHALL BE TAMPER RESISTANT AND MECHANICALLY FASTENED, EACH ACCESS OPENING SHALL HAVE A LABEL STATING "ENTRANCE INTO THE TANK COULD BE FATAL".

ALL PRE-ASSEMBLED TANKS SHALL BE CERTIFIED WATER TIGHT BY THE MANUFACTURER. ALL TANKS ASSEMBLED ON-SITE SHALL BE CERTIFIED WATER TIGHT IN THE FIELD. CERTIFICATE BY MANUFACTURER OR FROM ON-SITE TESTING SHALL BE INCLUDED WITH BILL OF LADEN.

**SeptiTech  
M400 PROCESSOR LAYOUT**



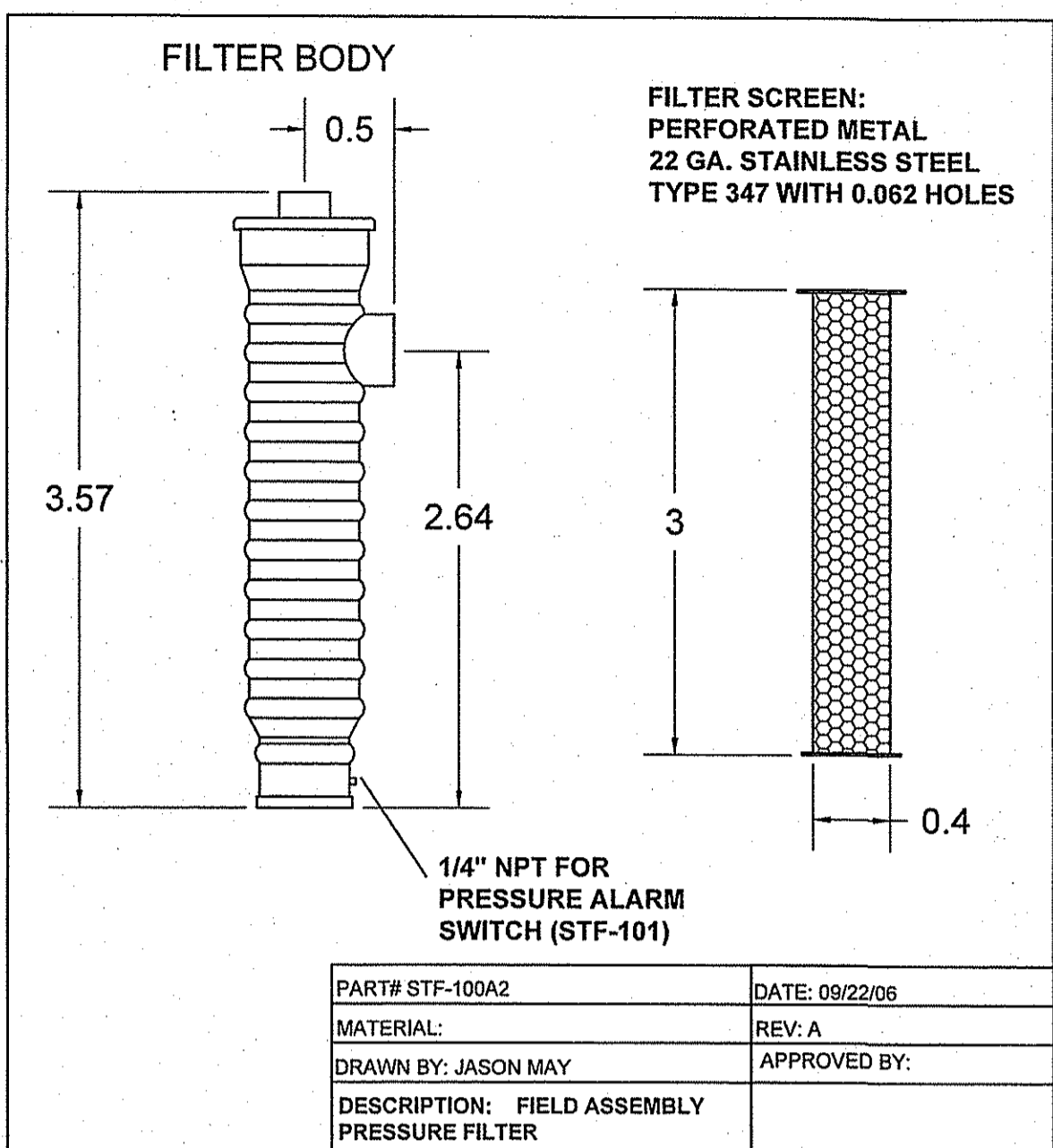
**PLAN VIEW**



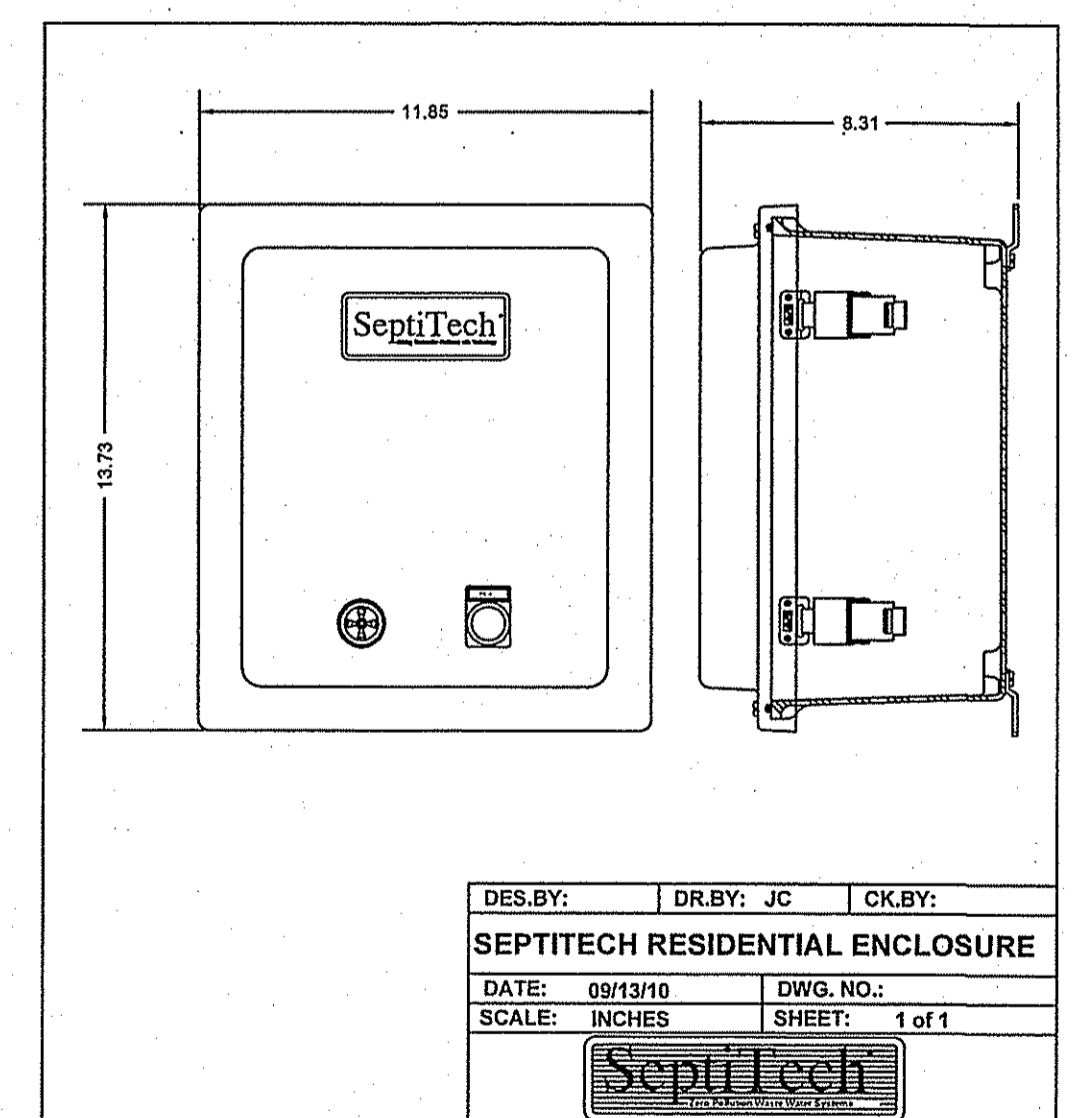
**SECTION VIEW**

1	1000 Gal. CONCRETE Tank	8	Discharge Pump
2	Discharge Assembly w/ SIMTECH Filter (if required)	9	Inlet Pipe
3	Support Structure	10	Pump Back Line
4	Spray Header Support Structure	11	Air Intake Line
5	Pump Back Assembly	12	Riser with Cover
6	Spray Header Assembly	13	Bio Media
7	Recirculation Pump		
ITEM	DESCRIPTION	ITEM	DESCRIPTION

**NOTE TO INSTALLER**  
The SeptiTech processor tank needs to be 1/2 filled with clean water prior to startup.



PART# STF-100A2	DATE: 09/22/06
MATERIAL:	REV: A
DRAWN BY: JASON MAY	APPROVED BY:
DESCRIPTION: FIELD ASSEMBLY PRESSURE FILTER	



DES.BY:	DR.BY: JC	CK.BY:
SEPTITECH RESIDENTIAL ENCLOSURE		
DATE: 09/13/10	DWG. NO.:	
SCALE: INCHES	SHEET: 1 of 1	

**GENERAL NOTES**

- Tank(s) shall not be installed at a depth any greater than 24-inches. Tank installations requiring a depth greater than 24-inches shall do so with prior approval by SeptiTech only.
- Tank(s) shall be installed with a minimum of 12-inches of compacted crushed stone bedding. Select fill shall be used for backfilling around tanks. Native material may be used if approved by the design engineer.
- Water Testing: Contractor is responsible for water testing the concrete tank(s) once the tank(s) installation has been completed and allowed to set overnight. Water testing shall be conducted in accordance with ASTM C1227.9.2. Installing contractor shall be responsible for providing clean water for the testing, filling the tanks, and pumping the tanks dry once testing is completed.
- Exterior Piping: Contractor is responsible for supplying and installing all exterior piping per SeptiTech installation drawings.
- Air Intake Piping: Air intake snorkel shall be installed within 100 feet of the processor tank. Air intake piping shall be installed such that a positive pitch is provided back towards the processor tank such that any condensation build up is free to drain.
- Pipe Insulation: Contractor is responsible for insulating all piping exterior to the SeptiTech processor including the discharge line from the processor to the disposal field. Contractor is also responsible for installing insulation over the top of the forcemain from the SeptiTech system to the disposal field if not buried below frost level in order to prevent freezing.
- Electrical: All electrical work is the responsibility of the contractor's licensed electrician and is not provided by SeptiTech.

**GENERAL NOTES:**

- 1) SEPTIC TANK TO BE PROVIDED WITH AN INLET TEE AND AN OUTLET TEE. MANHOLE COVER IS TO BE BROUGHT TO FINISH GRADE WITH THE RIM SET TO DIVERT SURFACE RUNOFF.
- 2) THE DRAINFIELD AREA IS TO BE KEPT DEBRIS FREE AND PLANTED TO GRASS.
- 3) TREES AND SHRUBS ARE TO BE KEPT A MINIMUM DISTANCE OF 10' FROM THE DRAINFIELD.
- 4) THERE ARE NO PUBLIC SEWERS WITHIN 200 FEET OF THE PROPERTY OTHER THAN SHOWN ON PLAN.
- 5) THERE ARE NO WELLS WITHIN 200 FEET OF THE PROPOSED OWTS OTHER THAN SHOWN ON PLAN.
- 6) THERE ARE NO OWTS WITHIN 200 FEET OF THE PROPOSED WELL OTHER THAN SHOWN ON PLAN.
- 7) THERE ARE NO DRAINS WITHIN 200 FEET OF THE PROPOSED OWTS OTHER THAN SHOWN ON PLAN.
- 8) THERE ARE NO PUBLIC WELLS WITHIN 500' OF THE PROPOSED OWTS OTHER THAN SHOWN ON PLAN.
- 9) THERE ARE NO OWTS WITH A FLOW GREATER THAN 1,000 gpd WITHIN 400' OF THE PROPOSED WELL OTHER THAN SHOWN ON PLAN.
- 10) THERE ARE NO WATERCOURSES, WETLANDS OR DRAINS WITHIN 200' OF THE PROPOSED OWTS OTHER THAN SHOWN ON PLAN.
- 11) ALL PRE-ASSEMBLED SEPTIC TANKS SHALL BE CERTIFIED WATER TIGHT BY THE MANUFACTURER. ALL TANKS ASSEMBLED ON-SITE SHALL BE CERTIFIED WATER TIGHT IN THE FIELD. CERTIFICATE BY MANUFACTURER OR FROM ON-SITE TESTING SHALL BE INCLUDED WITH BILL OF LADEN.
- 12) ALL GRAVITY LINES TO BE 4 INCH DIAMETER P.V.C. SCHEDULE 35 OR EQUAL. MINIMUM SLOPE OF 1%. SLOPES GREATER THAN 5% SHALL BE PROHIBITED. ALL PRESSURE LINES SHALL BE PVC (CLASS 200 MINIMUM).
- 13) THESE PLANS ARE FOR THE SOLE PURPOSE OF DESIGN, APPROVAL AND INSTALLATION OF THE PROPOSED ON-SITE WASTEWATER TREATMENT SYSTEM ONLY, AND HAS NOTHING TO DO WITH THE CONSTRUCTION OF THE PROPOSED BUILDING SHOWN OTHER THAN THE APPROXIMATE LOCATION AND ORIENTATION.
- 14) THE USE OF GARBAGE DISPOSALS IS STRICTLY PROHIBITED.
- 15) THE USE OF TUBS EQUAL TO OR GREATER THAN 100 GALLONS IS STRICTLY PROHIBITED.
- 16) ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE RIDEM ON-SITE WASTEWATER TREATMENT SYSTEMS REGULATIONS.
- 17) BILL OF LADEN SHALL BE PROVIDED TO THE DESIGNER FOR ALL SYSTEM COMPONENTS.
- 18) ACCESS LIDS SHALL WEIGH 59 lbs OR: SHALL BE TAMPER RESISTANT AND MECHANICALLY FASTENED. EACH ACCESS OPENING SHALL HAVE A LABEL STATING "ENTRANCE INTO THE TANK COULD BE FATAL".

**SHALLOW GALLEY NOTES:**

- 1) D-BOX TO BE 3 SQ. FT. MINIMUM, AND BE PROVIDED WITH A SUITABLE BAFFLE. D-BOX MUST BE HS-20 RATED.
- 2) AREA BETWEEN THE DISPERSAL TRENCHES SHALL REMAIN UNDISTURBED.
- 3) AREA OF CHAMBERS TO BE STRIPPED 10 FEET ON ALL SIDES OF ALL TREES, STUMPS, BOULDERS, AND BRUSH.
- 4) IF THE INVERT IS ABOVE ORIGINAL GRADE: PER RULE 33.5.1 THE LEACHFIELD AND FIVE (5) FEET BEYOND THE LEACHFIELD SHALL BE STRIPPED OF ALL TOPSOIL (A HORIZON), IN ORDER TO AVOID COMPACTION OF THE B SOIL HORIZON, ONLY TRACKED VEHICLES SHALL BE ALLOWED IN THIS AREA. PER RULE 33.5.2 PROPERLY COMPACTED GRAVEL THAT MEETS THE REQUIREMENTS OF RULE 32.12 SHALL BE PLACED THROUGHOUT THE EXCAVATION TO AN ELEVATION THAT WILL BE TWO (2) INCHES ABOVE THE TOP OF THE DISTRIBUTION LINES. DISPERSAL TRENCHES SHALL BE EXCAVATED OUT OF THE COMPACTED GRAVEL. THERE SHALL BE A MINIMUM SIX (6) INCH GRAVEL BASE LAYER MEETING THE REQUIREMENTS OF RULE 32.12 BELOW THE STONE.
- 5) NO GRADE WITHIN 10 FEET OF THE PROPOSED SYSTEM SHALL BE LOWER THAN THE INVERTS
- 6) NO SLOPE WITHIN 25 FEET OF THE PROPOSED SYSTEM SHALL BE GREATER THAN 3:1

**PRECAUTIONARY NOTES:**

- (A) THE PROPOSED PSND LOCATION SHALL BE STAKED OUT AND PROTECTED PRIOR TO ANY SITE PREPARATION ACTIVITIES.
- (B) PSND SHOULD NOT BE PLACED IN A DEPRESSIONAL AREA ON THE PROPERTY, WHERE STORM WATER IS LIKELY TO COLLECT DURING RAINFALL EVENTS.
- (C) A MINIMUM OF TEN (10) FEET SHOULD BE MAINTAINED BETWEEN PSND AND NEIGHBORING TREES AND SHRUBS. THE ROOT SYSTEMS OF WATER-LOVING TREES AND SHRUBS CAN CAUSE DAMAGE TO PSNDs.
- (D) UNDER NO CIRCUMSTANCES SHOULD HEAVY EQUIPMENT, VEHICLES, OR IMPERMEABLE SURFACES/MATERIALS BE ALLOWED OVER A FINISHED PSND. AT A MINIMUM, THIS WOULD RESULT IN POOR TREATMENT, MORE LIKELY SYSTEM FAILURE, BROKEN COMPONENTS, AND FINANCIAL EXPENSE TO THE HOME OWNER WILL RESULT.

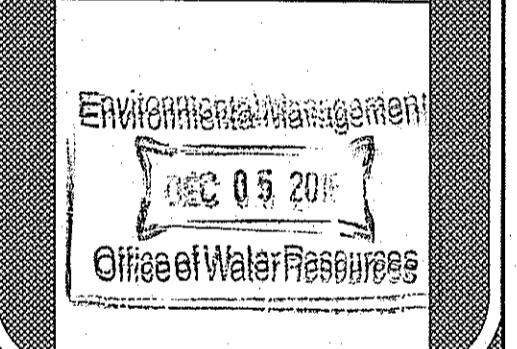
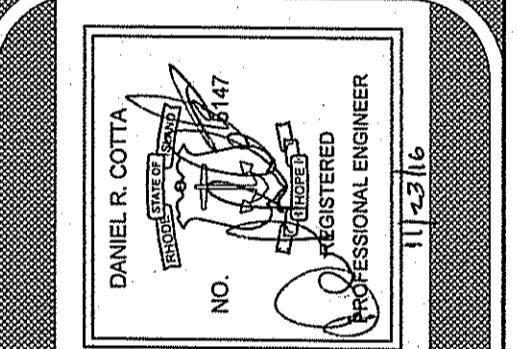
**GEOMAT NOTES:**

- 1) MAINTAIN DRAINFIELD INVERT GRADE ELEVATIONS FOR A MINIMUM OF 6". SLOPE NO GREATER THAN 3:1 BEYOND THE 5' TO ORIGINAL GRADE.
- 2) DRAINFIELD TO BE LAID IN NATURAL/UNDISTURBED SOIL. CARE SHOULD BE TAKEN WHEN REMOVING TOPSOIL, SO NOT TO DISTURB THE SUBSOIL.
- 3) ALL GRAVITY LINES TO BE 4 INCH DIAMETER P.V.C. SCHEDULE 35 OR EQUAL. MINIMUM SLOPE OF 1%. SLOPES GREATER THAN 5% SHALL BE PROHIBITED. ALL PRESSURE LINES SHALL BE PVC (CLASS 200 MINIMUM).

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WATER QUALITY  
APPROVED WITH THESE PLANS  
AS SPECIFIED IN THE LETTER  
DATED 09/13/2017 FILE 16-030  
NO CHANGES ALLOWED WITHOUT PREVIOUS  
APPROVED PLANS MUST BE AT CONSTRUCTION SITE

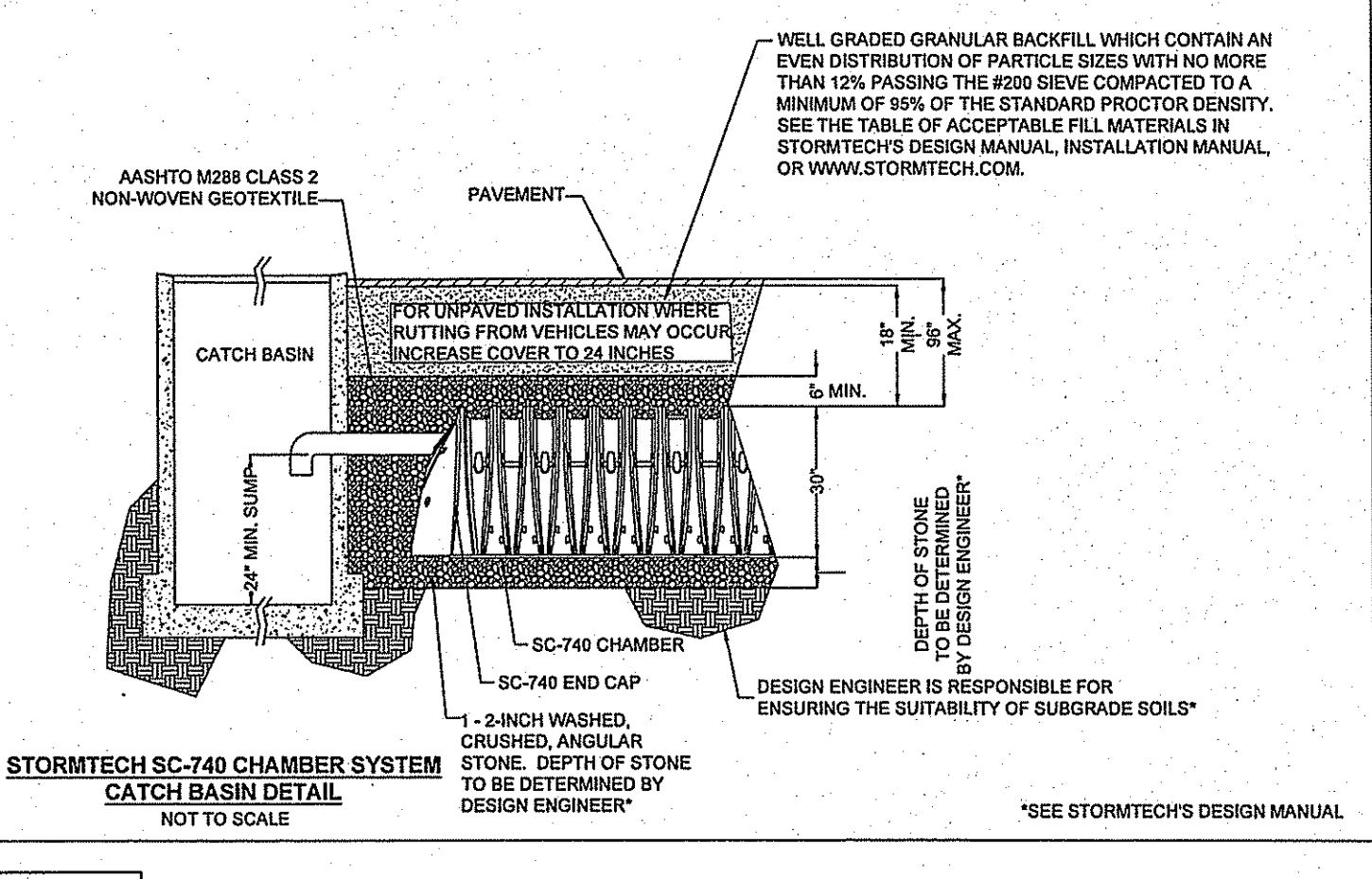
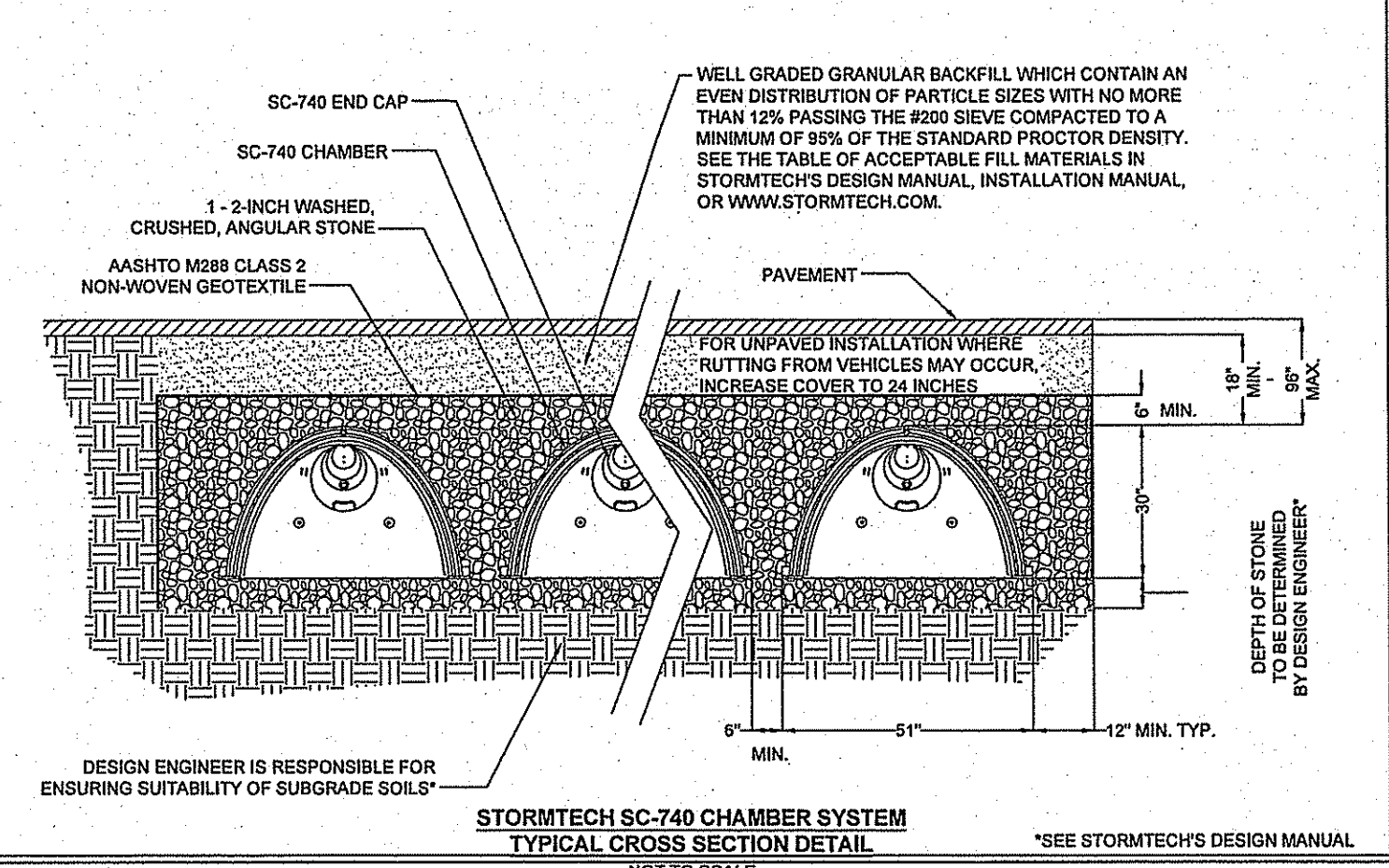
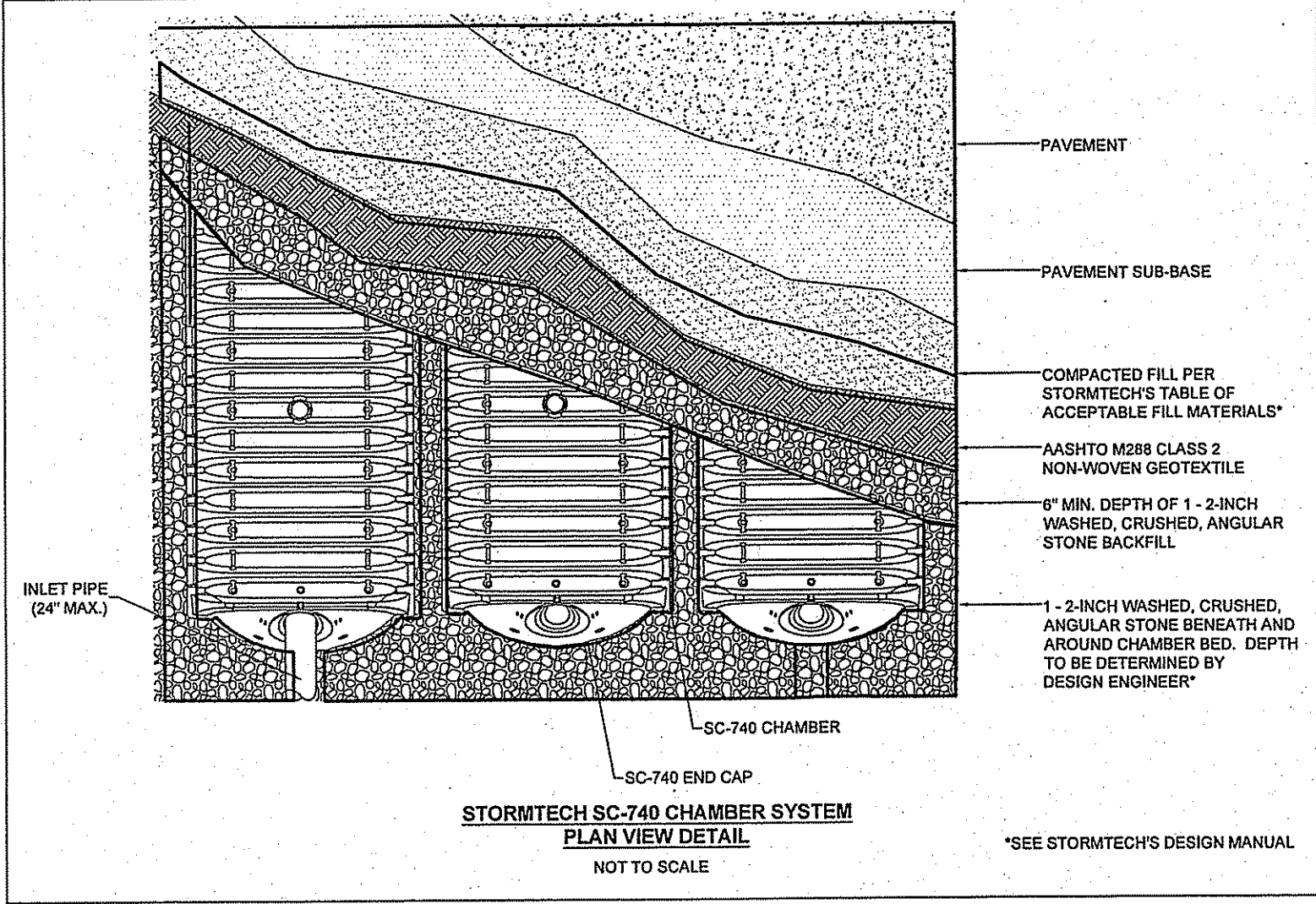
ONSITE WASTEWATER TREATMENT  
SYSTEM DETAILS  
FOR  
**LIBERTY HILL CONDOMINIUMS**  
LOCATED AT  
400 SOUTH COUNTY TRAIL  
EXETER, R.I.

Checked By: DrC	Date: 10/21/2016
Drawn By: PJF	Scale: As Shown
Scale: As Shown	NO. REVISION
NO. REVISION	BY DATE

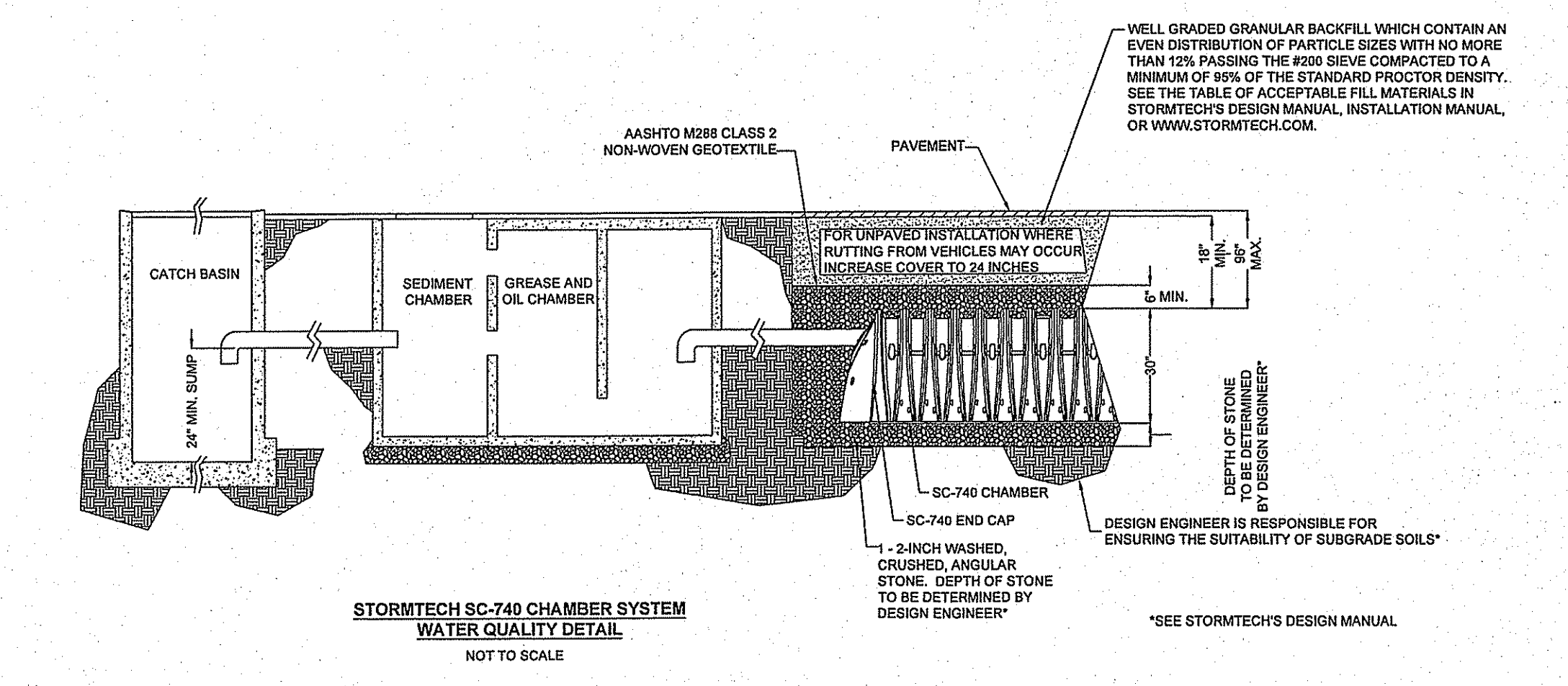
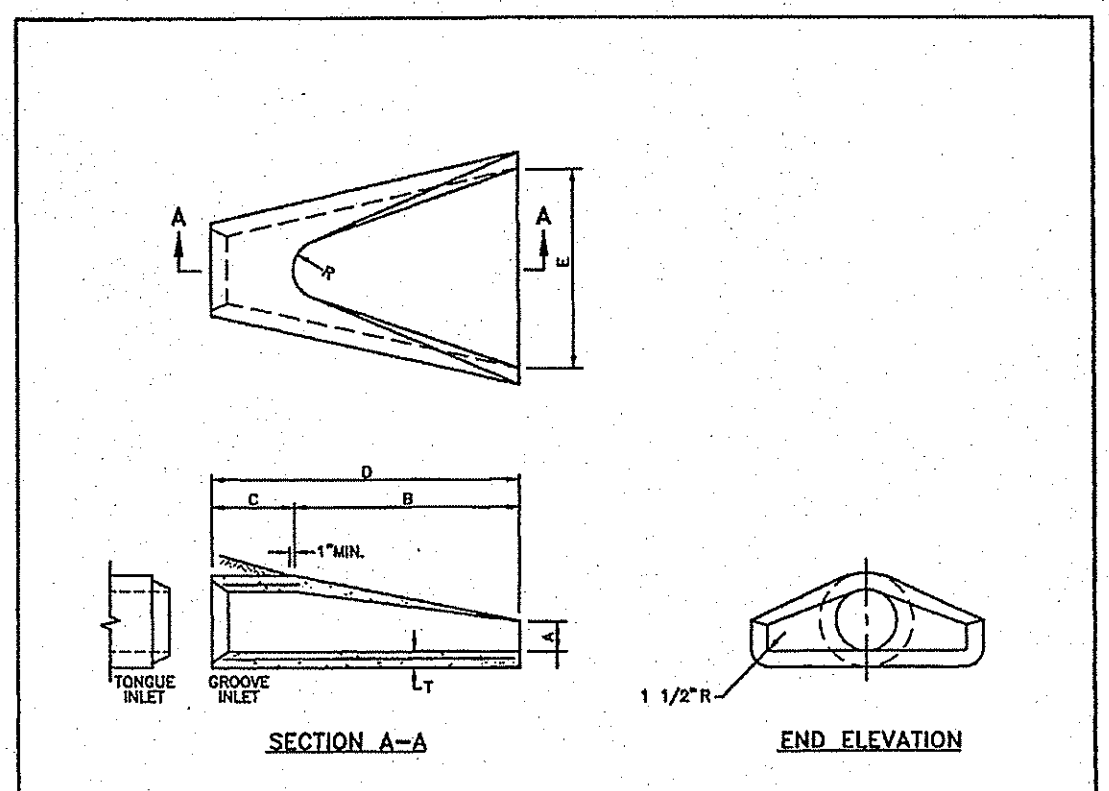
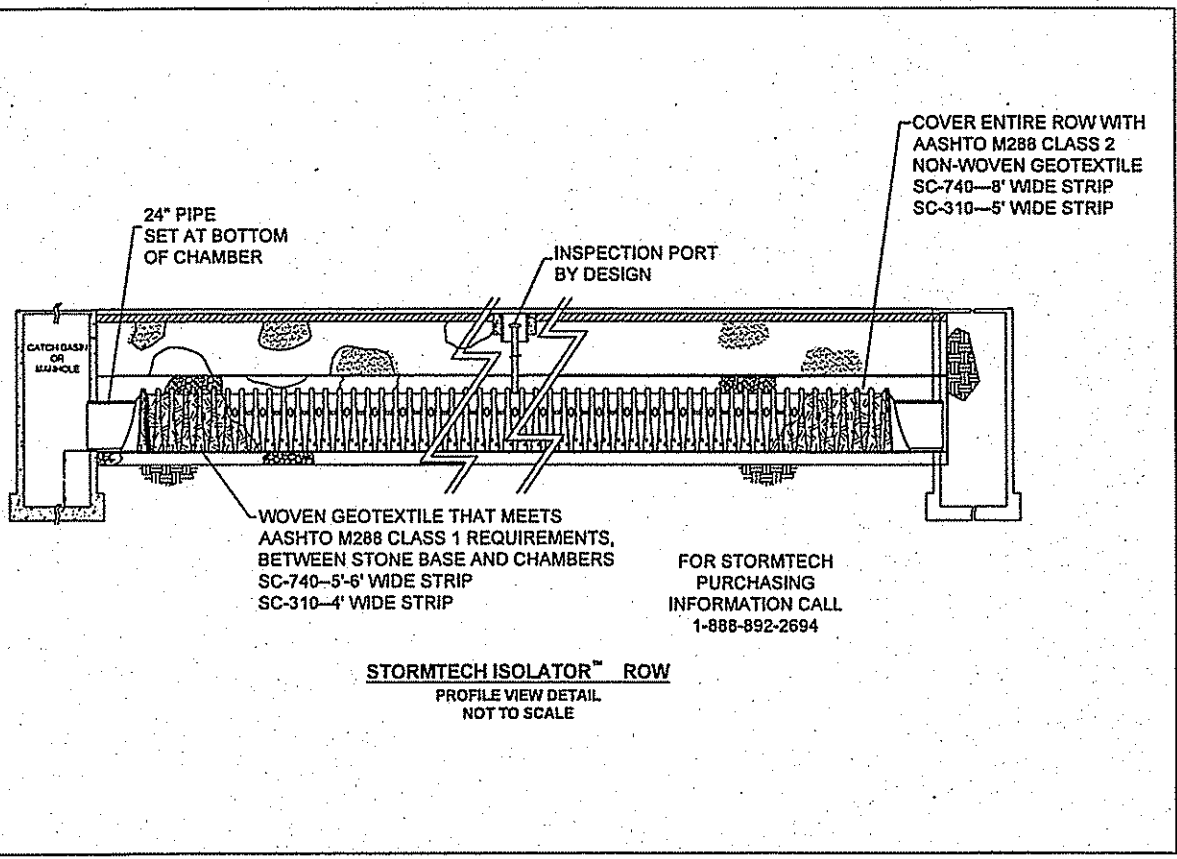
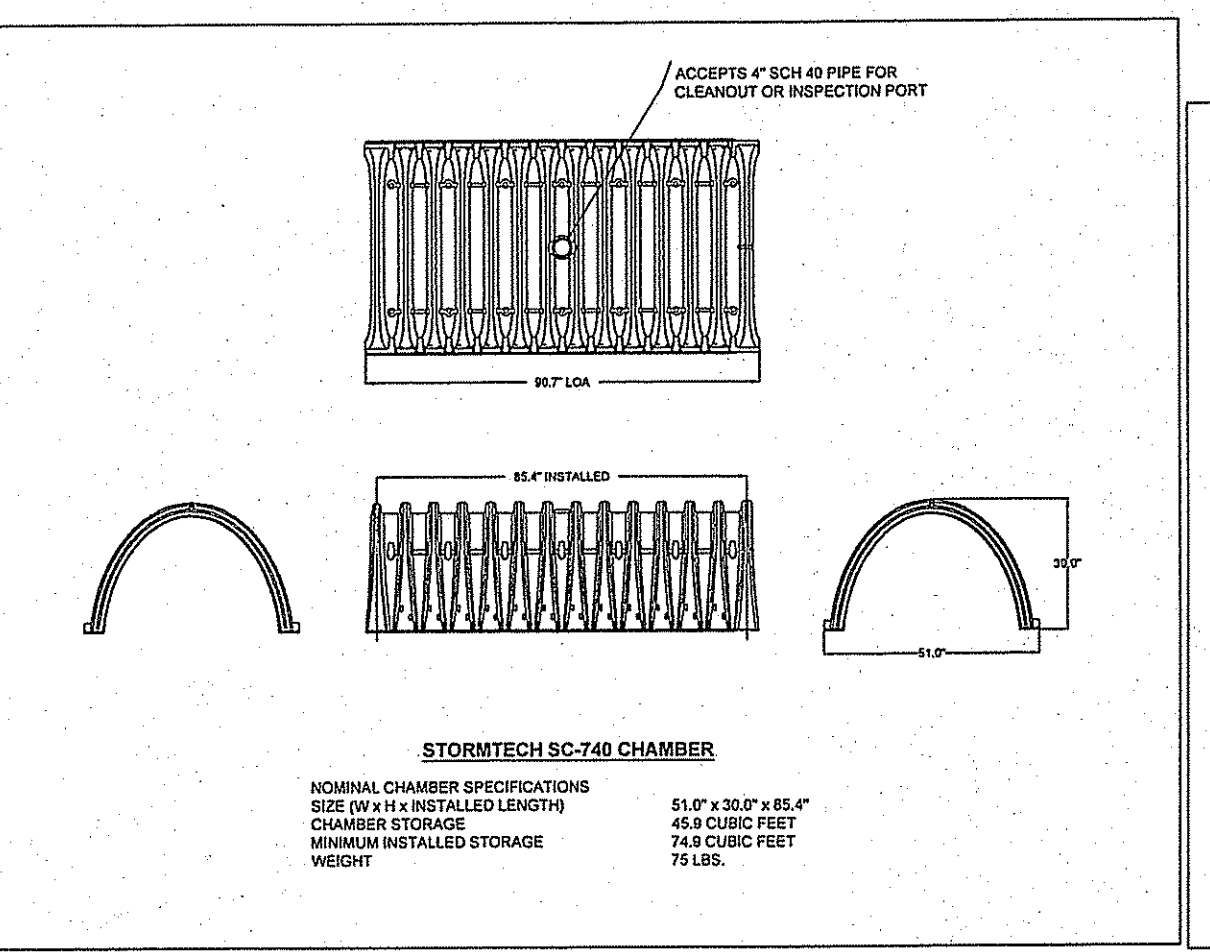
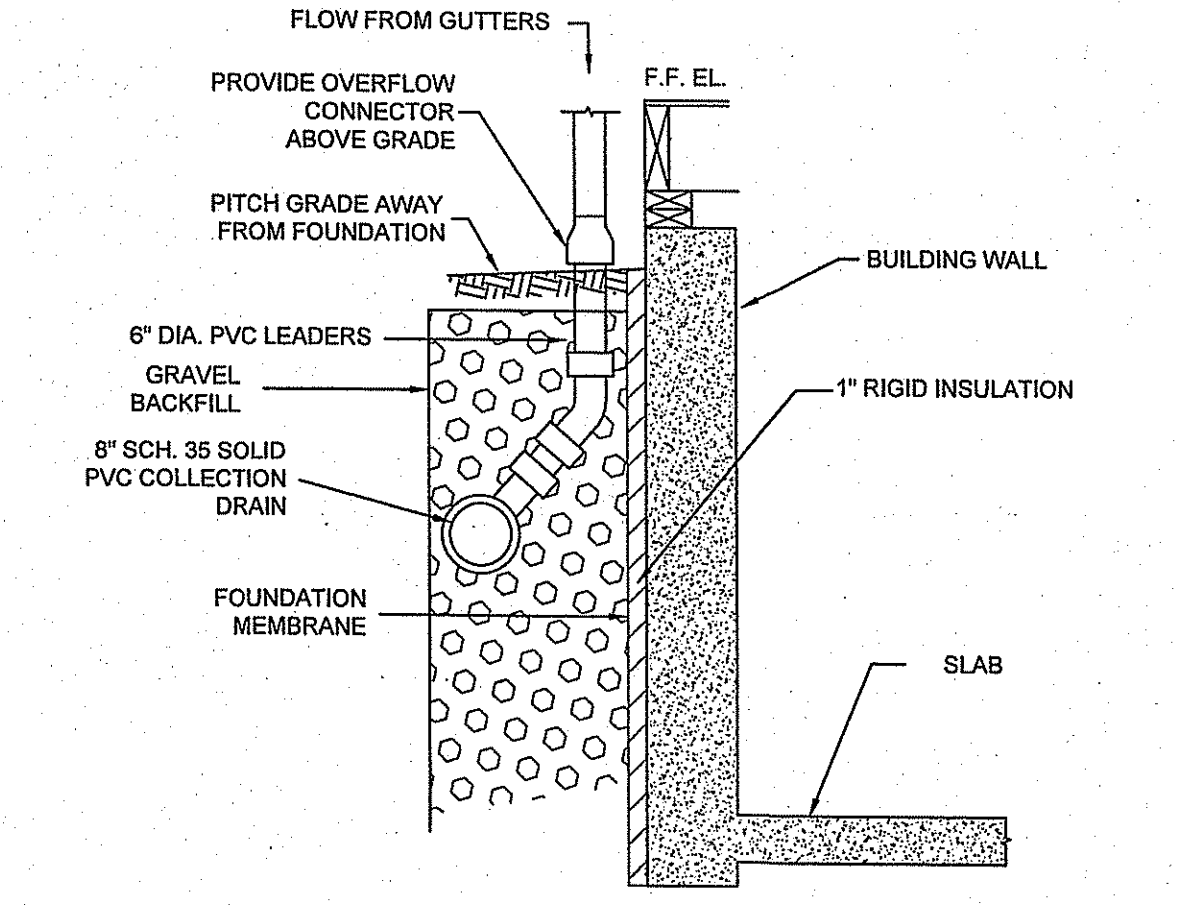
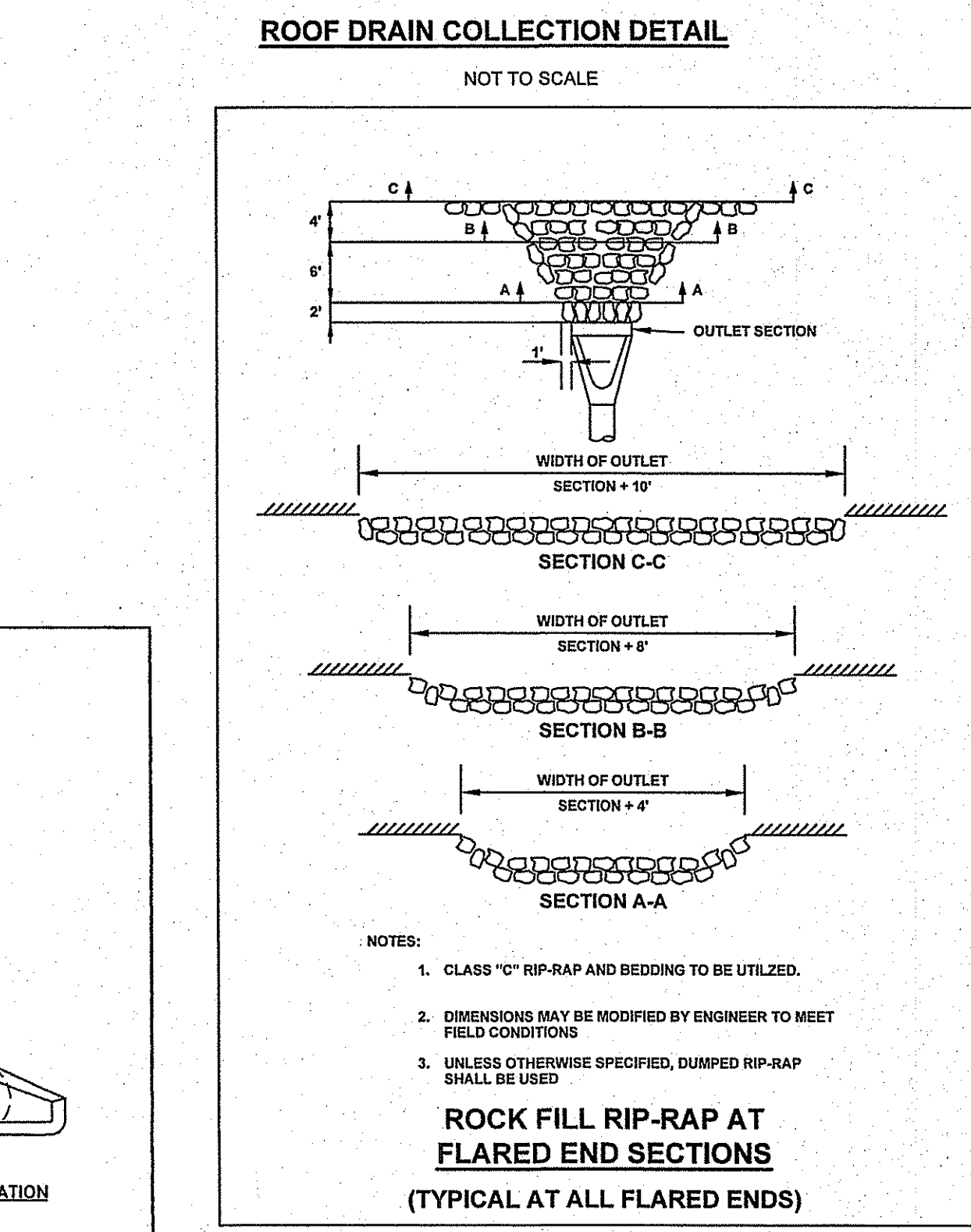
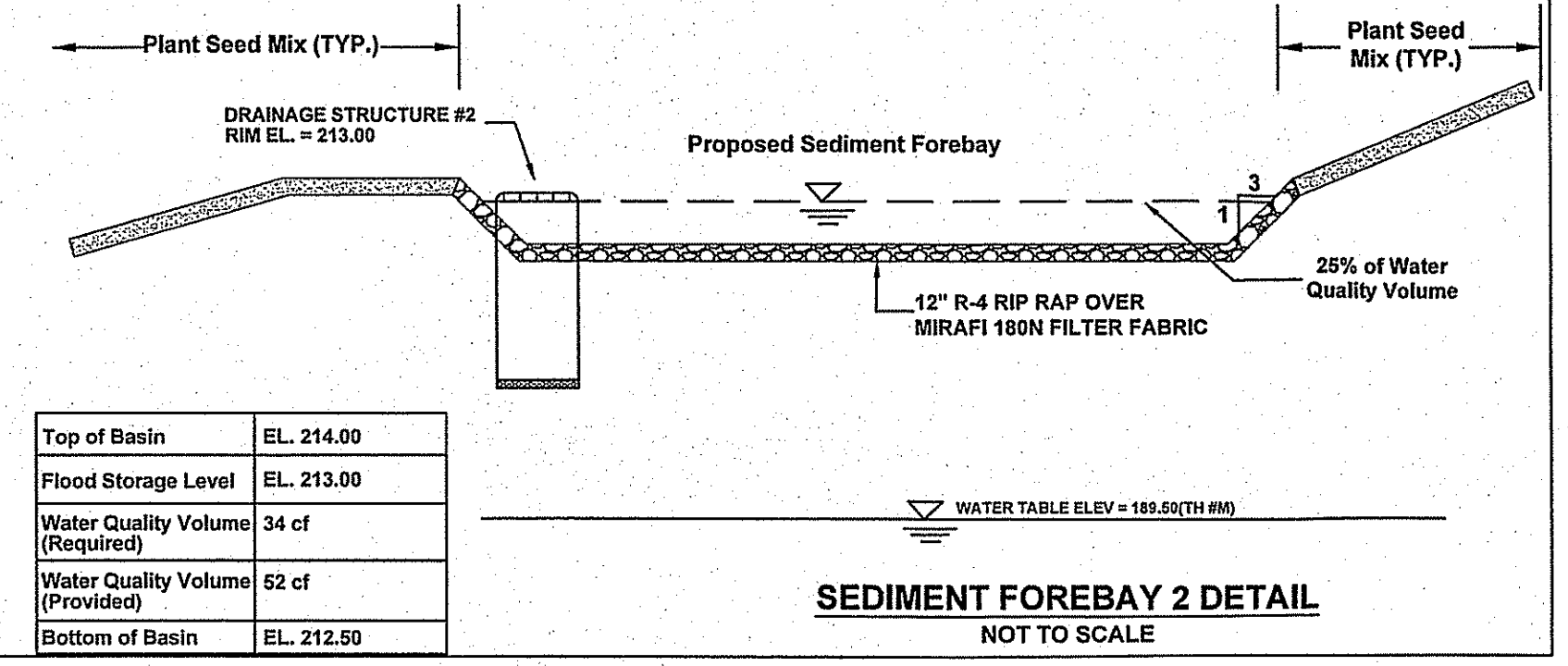
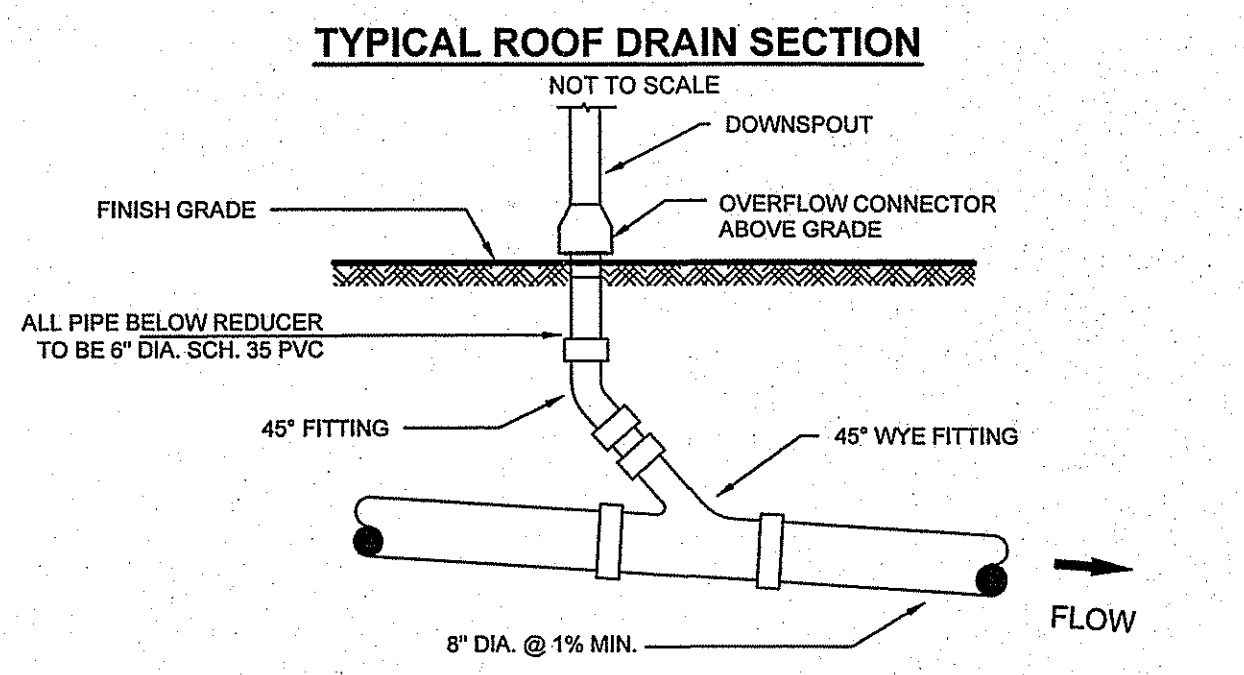
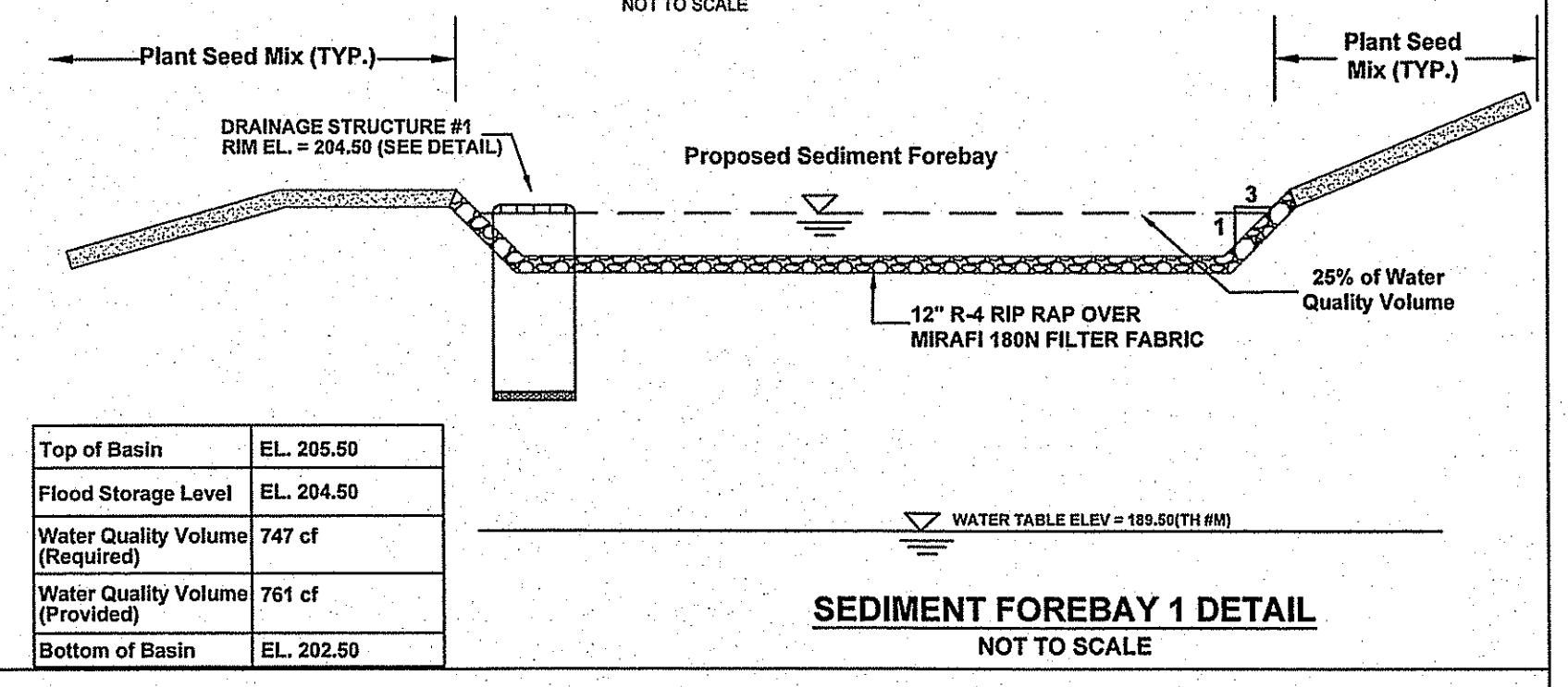
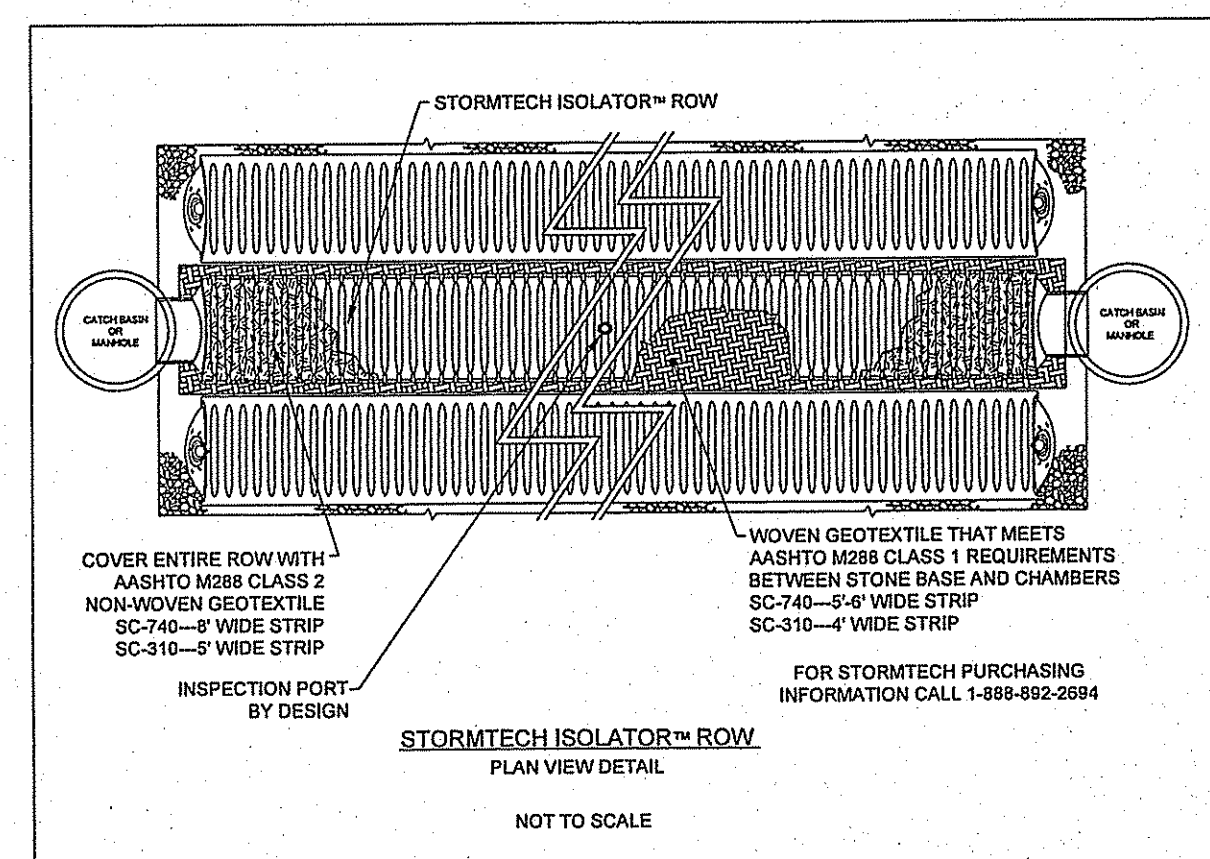


**AMERICAN ENGINEERING, INC.**  
Professional Engineer / Professional Land Surveyor  
Daniel R. Cotta  
400 South County Trail - Suite A 201  
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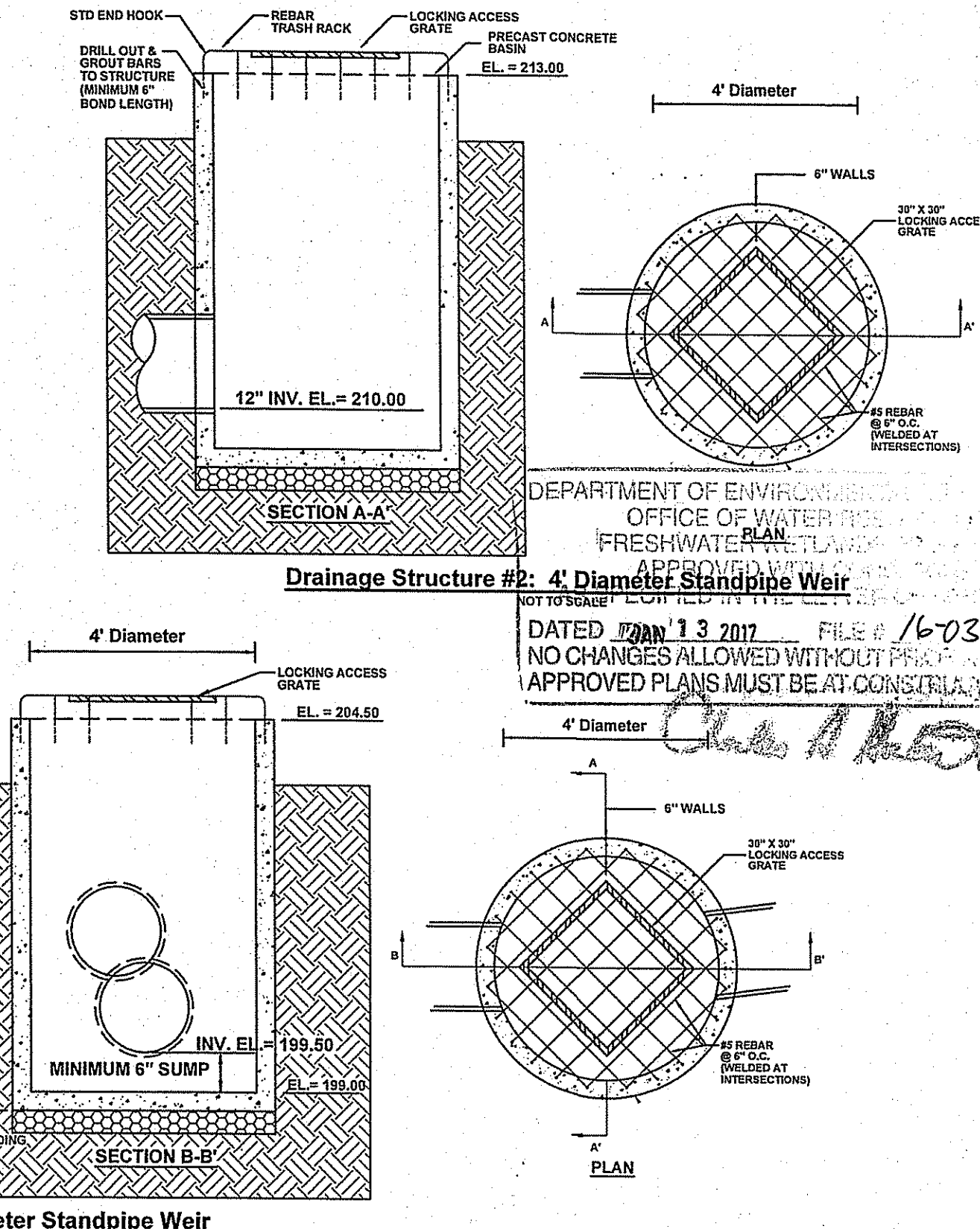
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Drawing No. 98165



INFILTRATION BASIN TABLE				
Infiltration Basin ID	A	B	C	D
Length Of Stone	135.09'	113.42'	85.32'	127.66'
Width Of Stone	44.25'	34.75'	30.00'	34.75'
Depth Of Stone	4'	4'	4'	4'
Depth Of Storage	2.5'	2'	2.25'	2.5'
Discharge Line Size	12"	24"	12"	24"
Rows Of Stormtech Chambers	9	7	6	7
Stormtech Chambers Per Row	19	16	12	18
Inv. In From CB's	187.50	194.00	199.25	200.50
Inv. Out	187.50	194.00	199.25	200.50
Top Of Chamber	188.50	195.50	200.25	202.00
Bottom Of Chamber	186.00	193.00	197.75	199.50
Top Of Stone	189.00	196.00	200.75	202.50
Bottom Of Stone	185.00	192.00	196.75	198.50
Water Table	182.00	187.00	190.00	192.50
Min. Cover	189.50	196.50	202.00	205.00
Max. Cover	195.00	198.00	205.00	206.00



DIMENSIONS										REINFORCEMENT	
DIA.	A	B	C	D	E	F	G	H	T	MIN. AREA OF EACH ROD (SQ. IN.)	NO. OF RODS PER FOOT (LONGITUDINAL)
1'-0"	4"	2'-0"	4'-0"	7'-0"	8'-0"	2'-0"	9"	2"	0.948	11	
1'-3"	4"	2'-3"	3'-10"	6'-11"	3'-0"	11"	2 1/2"	2"	0.950	12	
1'-6"	4"	2'-6"	3'-10"	6'-11"	3'-0"	12"	2 1/2"	3"	0.972	13	
2'-0"	4"	2'-0"	3'-10"	6'-11"	3'-0"	12"	2 1/2"	3"	0.984	13	
2'-3"	4"	2'-3"	3'-10"	6'-11"	3'-0"	12"	2 1/2"	3"	0.996	13	
2'-6"	4"	2'-6"	3'-10"	6'-11"	3'-0"	12"	2 1/2"	3"	1.008	13	
3'-0"	4"	2'-0"	3'-10"	6'-11"	3'-0"	12"	2 1/2"	3"	1.020	13	
3'-3"	4"	2'-3"	3'-10"	6'-11"	3'-0"	12"	2 1/2"	3"	1.032	13	
3'-6"	4"	2'-6"	3'-10"	6'-11"	3'-0"	12"	2 1/2"	3"	1.044	13	



**DRAINAGE DETAILS**  
FOR  
**LIBERTY HILL CONDOMINIUMS**  
LOCATED AT  
**400 SOUTH COUNTY TRAIL**  
**EXETER, R.I.**

Drawn By: **PJF** Checked By: **DIC**  
Scale: **AS SHOWN** Date: **10/21/2016**  
NO. REVISIONS  
BY DATE

**DANIEL R. COTTA**  
Professional Engineer / Registered Professional Engineer  
NO. 11213  
EXETER, R.I.

Environmental Manager  
**DEC 05 2016**  
Office of Water Resources

**AMERICAN ENGINEERING, INC.**  
Professional Engineer / Professional Land Surveyor  
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Sheet  
**14**  
of 15 sheets  
Drawing No. 98165

**NOTES SHOWN ON THIS SHEET ARE GENERAL. SEE APPENDIX 6 & 7 IN STORMWATER MANAGEMENT PLAN FOR MORE DETAILED SOIL EROSION AND SEDIMENT CONTROL MEASURES AND FOR A DETAILED OPERATION AND MAINTENANCE AGREEMENT.**

**EROSION CONTROL & SOIL STABILIZATION PROGRAM**

- DENUDED SLOPES SHALL NOT BE UNATTENDED OR EXPOSED FOR EXCESSIVE PERIODS OF TIME SUCH AS THE INACTIVE WINTER SEASON.
- ALL DISTURBED SLOPES EITHER NEWLY CREATED OR EXPOSED PRIOR TO OCTOBER 15 SHALL BE SEEDED OR PROTECTED BY THAT DATE FOR ANY WORK COMPLETED DURING EACH CONSTRUCTION PERIOD.
- THE TOPSOIL SHALL HAVE A SANDY LOAM TEXTURE RELATIVELY FREE OF SUBSTRATE MATERIAL, STONES, ROOTS, LUMPS OF SOIL, TREE LIMBS, TRASH OR CONSTRUCTION DEBRIS, AND SHALL CONFORM WITH R. I. STANDARD SPECIFICATION M. 20.
- THE SEED MIX SHALL BE INOCULATED WITHIN 24 HOURS, BEFORE MIXING AND PLANTING, WITH APPROPRIATE INOCULUM FOR EACH VARIETY.
- THE DESIGN MIX SHALL BE COMPRISED OF THE FOLLOWING:

**PERMANENT SEEDING MIXTURES:**

A - MOWED AREA: ALL FLAT OR SLOPES LESS THAN 3:1

MIXTURE	% BY WT.	SEEDING DATES
RED FESCUE	75	APRIL 1 - JUNE 15
KENTUCKY BLUEGRASS	15	AUG. 15 - OCT. 15
COLONIAL BENTGRASS	5	
PERENNIAL RYEGRASS	5	

TOTAL 100%/ACRE

**PERMANENT SEEDING MIXTURES:**

B - UNMOWED AREA OR INFREQUENTLY MOWED: FLAT OR SLOPES GREATER THAN 3:1

MIXTURE	% BY WT.	SEEDING DATES
RED FESCUE	75	APRIL 1 - JUNE 15
PERENNIAL RYEGRASS	15	AUG. 15 - OCT. 15
COLONIAL BENTGRASS	5	
BIRDFOOT TREFLOIL	5	

TOTAL 100%/ACRE

- TEMPORARY TREATMENTS SHALL CONSIST OF A HAY, STRAW OR FIBER MULCH OR PROTECTIVE COVERS SUCH AS A MAT OF FIBER LINING (BURFLAP, JUTE, FIBERGLASS NETTING, EXCELSIOR BLANKETS). THEY SHALL BE INCORPORATED INTO THE WORK AS WARRANTED OR AS ORDERED BY THE ENGINEER.
- HAY OR STRAW APPLICATIONS SHOULD BE IN THE AMOUNT OF 3000-4000 LBS./AC.
- ALL HAYBALES OR TEMPORARY PROTECTION SHALL REMAIN IN PLACE UNTIL AN ACCEPTABLE STAND OF GRASS OR APPROVED GROUND COVER IS ESTABLISHED. IF NEEDED, TEMPORARY SEEDING CAN BE USED TO HELP MINIMIZE EROSION. A TEMPORARY SEEDING GUIDE MUST BE INCLUDED AS A REFERENCE. THE FOLLOWING SPECIES ARE RECOMMENDED:

SPECIES	LBS./ACRE	LBS./1,000 SQ. FT.	SEEDING DATES
ANNUAL RYEGRASS	60	1.5	MAR. 15 - JUNE 15
PERENNIAL SUDAN GRASS	40	1.0	MAY 15 - AUGUST 15
MILLET	40	1.0	MAY 15 - AUGUST 15
WINTER RYE	120	3.0	AUGUST 15 - JUNE 15
OATS	120	3.0	MAR. 15 - JUNE 15
WEEPING LOVEGRASS	20	0.5	MAY 1 - JUNE 30

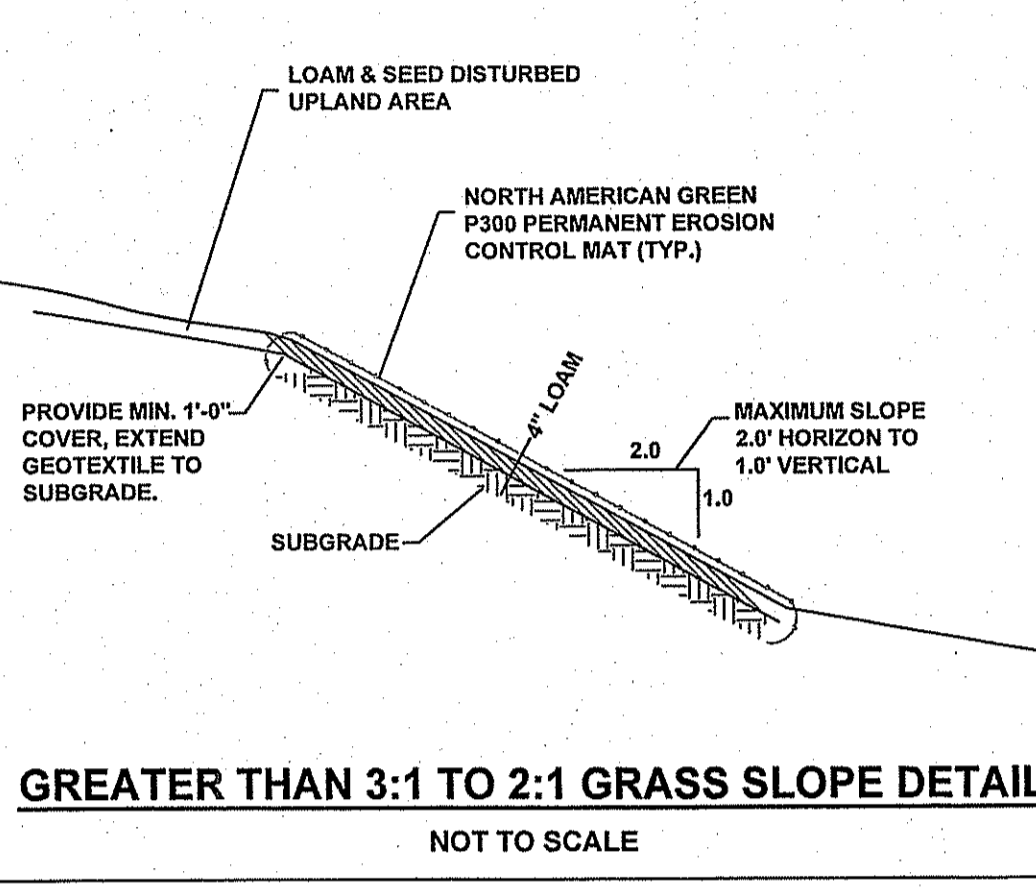
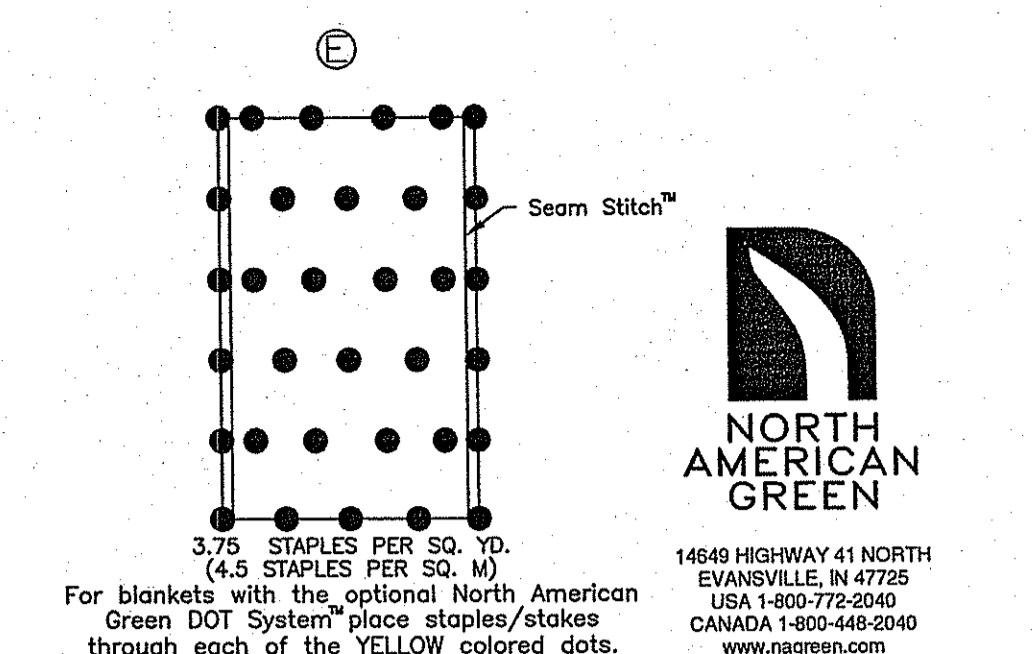
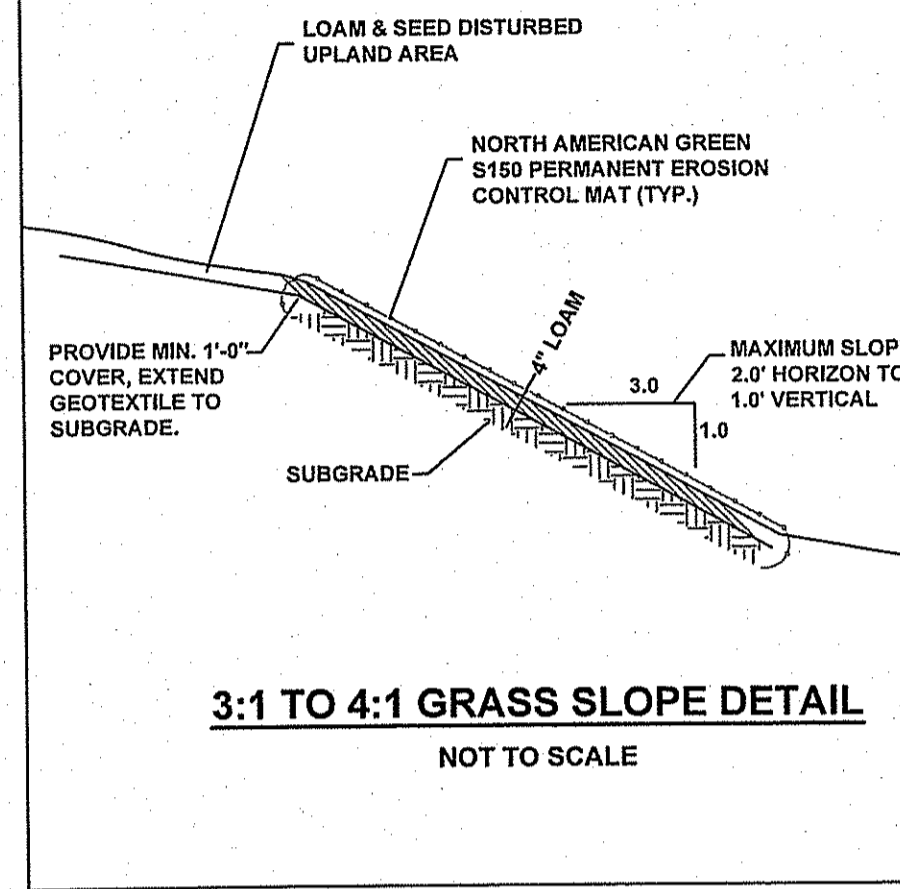
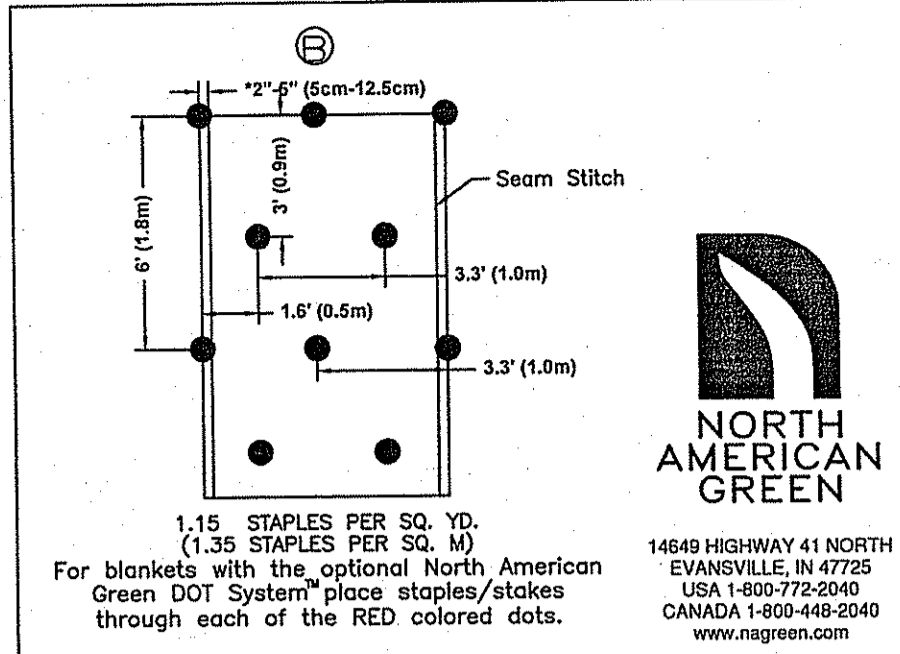
- THE CONTRACTOR MUST REPAIR AND OR RESEED ANY AREAS THAT DO NOT DEVELOP WITHIN THE PERIOD OF ONE YEAR AND HE SHALL DO SO AT NO ADDITIONAL EXPENSE.
- THE NORMAL ACCEPTABLE SEASONAL SEEDING DATES ARE APRIL 1ST THRU OCT. 15TH.
- ALL FILL SHALL BE THOROUGHLY COMPACTED UPON PLACEMENT IN STRICT CONFORMANCE WITH THE R.I.D.P.W. STANDARD SPECIFICATIONS SECTION 222.
- STABILIZATION OF ONE FORM OR ANOTHER AS DESCRIBED ABOVE SHALL BE ACHIEVED WITHIN 15 DAYS OF FINAL GRADING.
- STOCKPILES OF TOPSOILS SHALL NOT BE LOCATED NEAR WATERWAYS OR WETLANDS. THEY SHALL HAVE SIDE SLOPES NO GREATER THAN 30% AND STOCKPILES SHALL ALSO BE SEEDED AND STABILIZED.
- ON BOTH STEP AND LONG SLOPES CONSTRUCTION SHOULD BE GIVEN TO "CRIMPING" OR "TRACKING" TO TACK DOWN MULCH APPLICATIONS.
- REFERENCE THE SEDIMENTATION CONTROL PROGRAM AND ORDER OF PROCEDURE FOR PROPER COORDINATION.

**SEDIMENTATION CONTROL PROGRAM**

- ALL DISTURBED AREAS SUBJECT TO EROSION TENDENCIES WHETHER THEY ARE NEWLY FILLED OR EXCAVATED SHALL RECEIVE SUITABLE SLOPE PROTECTION.
- DURING CONSTRUCTION, THE CONTRACTOR AND/OR DEVELOPER SHALL BE RESPONSIBLE FOR MAINTAINING DRAINAGE AND RUNOFF FLOW DURING STORMS AND PERIODS OF RAINFALL.
- CARE SHALL BE TAKEN SO AS TO PREVENT ANY UNSUITABLE MATERIAL FROM ENTERING EITHER EXISTING OR PROPOSED DRAINAGE OR SEWER STRUCTURES.
- SEDIMENTATION CONTROL DEVICES SHALL BE INSPECTED PERIODICALLY AND AFTER PERIODS OF RAINFALL. SUCH DEVICES SHALL BE REPAIRED OR REPLACED AS NEEDED.
- CARE SHALL BE TAKEN SO AS NOT TO PLACE "REMOVED SEDIMENTS" WITHIN THE PATH OF EXISTING, NEWLY CREATED (BOTH TEMPORARY AND PERMANENT) OR PROPOSED WATERCOURSES OR THOSE AREAS SUBJECT TO STORM WATER FLOW.
- ADDITIONAL HAYBALES, SILT FENCE OR SANDBAGS SHALL BE LOCATED AS CONDITIONS WARRANT OR AS DIRECTED BY THE ENGINEER.
- REFERENCE THE "RHODE ISLAND EROSION AND SEDIMENT CONTROL HANDBOOK" PREPARED BY THE U.S. DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE, 1989, WITH ANY AMENDMENTS, AS A GUIDE.

**ORDER OF PROCEDURE**

- IMMEDIATELY UPON COMPLETION OF THE CLEARING AND GRUBBING OPERATION AND PRIOR TO ANY GRADING, TEMPORARY HAYBALES, SILT FENCE OR SANDBAGS SHALL BE PLACED OUTSIDE THE LIMITS OF DISTURBANCE AS SHOWN ON THE PLANS. (I.E. ALONG NEW ROADWAYS, STREAMBANKS, CRITICAL AREAS, ETC.)
- ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE PERIODICALLY CLEANED AND MAINTAINED AS PER THE RESPECTIVE PROGRAMS DURING THE CONSTRUCTION OR AS DIRECTED BY THE TOWN OR BY THE ENGINEER.
- IF WORK PROGRESS IS TO BE INTERRUPTED AT ANY TIME, REFERENCE EROSION AND SEDIMENTATION CONTROL PROGRAMS FOR TEMPORARY CONTROL.



**MAINTENANCE AND RESPONSIBILITY**

- THE CONSTRUCTION SUPERINTENDENT SHALL HAVE THE SOLE RESPONSIBILITY FOR THE DESIGN IMPLEMENTATION. HE SHALL ALSO BE RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION WORKERS AND SUB-CONTRACTORS ARE AWARE OF THE PROVISIONS OF THE PLAN AND THE ENGINEER'S REPORT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ASPECTS OF THE DESIGN PRIOR TO FINAL APPROVAL BY THE TOWN. DURING THAT TIME, ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHOULD BE CHECKED ON A WEEKLY BASIS AS WELL AS AFTER EACH SIGNIFICANT RAINFALL. ALL SUCH MEASURES SHOULD BE CLEANED OR REPLACED AS NECESSARY.
- REPLANTING, REGRADING OR OTHER REPAIRS NEEDED AS A RESULT OF EROSION AND SEDIMENTATION SHOULD BE DONE PROMPTLY.
- ALL VEGETATION NOT SURVIVING AT LEAST ONE FULL GROWING SEASON SHALL BE REPLACED AT THE OWNERS EXPENSE.
- UPON PROJECT COMPLETION, THE SITE OWNER SHALL ADHERE TO THE FOLLOWING MAINTENANCE RECOMMENDATIONS:

**A. MOWING:**

THE MOWING OF GRASS IN AND AROUND THE BASIN SHOULD BE DONE AT LEAST ONCE PER GROWING SEASON, PREFERABLY AFTER AUGUST 15 TO PROTECT GROUND NESTING BIRDS AND OTHER ANIMALS. MORE FREQUENT MOWINGS WILL BE REQUIRED FOR BASINS MAINTAINED AS RECREATIONAL OR OPEN SPACE FACILITIES. TRASH AND LITTER MUST BE REMOVED DURING MOWING OPERATIONS.

**B. INSPECTIONS:**

THE STRUCTURAL INTEGRITY OF THE BASIN, ESPECIALLY ANY IMPOUNDING STRUCTURES, SHOULD BE INSPECTED ON AN ANNUAL BASIS. IN ADDITION, THE INLETS FOR THE BASIN SHOULD ALSO BE INSPECTED ANNUALLY. ANY DEFICIENCIES MUST BE CORRECTED IMMEDIATELY AFTER OBSERVATION. THE BASIN AND ALL STRUCTURES SHOULD BE INSPECTED MORE OFTEN DURING THE FIRST YEAR OF OPERATION, ESPECIALLY AFTER LARGE STORMS, TO ENSURE PROPER STABILIZATION AND FUNCTION.

- EMBANKMENT SUBSIDENCE
- EROSION
- CRACKING
- TREE GROWTH
- OUTLET & SPILLWAY CONDITION
- SEDIMENT ACCUMULATION
- SLOPE STABILITY

ANY DEFICIENCY NOTED DURING THE INSPECTION WILL BE IMMEDIATELY REPAIRED OR REPLACED, IF ENCOUNTERED, TRASH, DEBRIS, ETC. SHOULD BE REMOVED FROM THE DRAINAGE SYSTEM AT LEAST TWICE A YEAR.

RESEEDING OF ANY ERODED OR BARE SPOTS IN OR AROUND THE BASIN MUST BE DONE IMMEDIATELY FOLLOWING EXAMINATIONS TO PREVENT SUBSEQUENT SOIL EROSION. MAINTAINING A FULLY VEGETATED BASIN WITH HEALTHY GRASS IS PARAMOUNT TO A SUCCESSFULLY OPERATING FACILITY.

**C. SEDIMENT REMOVAL:**

FOLLOWING CONSTRUCTION, THE POND AND BASIN ARE TO BE CLEANED OF ACCUMULATED SEDIMENT ONCE EVERY TEN YEARS. THE RESULTING POND CONDITION AFTER SEDIMENT REMOVAL MUST BE THE ORIGINAL DESIGN CONDITIONS.

ALL REMOVED SEDIMENT IS TO BE TESTED TO DETERMINE POLLUTANT CONTENT. THE SEDIMENT IS TO BE PROPERLY DISPOSED IN UPLAND AREAS BASED UPON THE TEST RESULTS AND LOCAL, STATE AND FEDERAL REGULATIONS.

**D. CATCH BASINS, MANHOLES AND DRAIN LINES:**

AN INSPECTION MUST OCCUR ON AN ANNUAL BASIS BY QUALIFIED PERSONNEL TO ENSURE PROPER OPERATION. THE INSPECTION SHOULD, AS A MINIMUM, CONCENTRATE ON THE FOLLOWING:

- DAMAGE TO GRATE/COVER
- EVIDENCE OF STANDING WATER
- DEBRIS REMOVAL
- STRUCTURAL ALIGNMENT/INTEGRITY

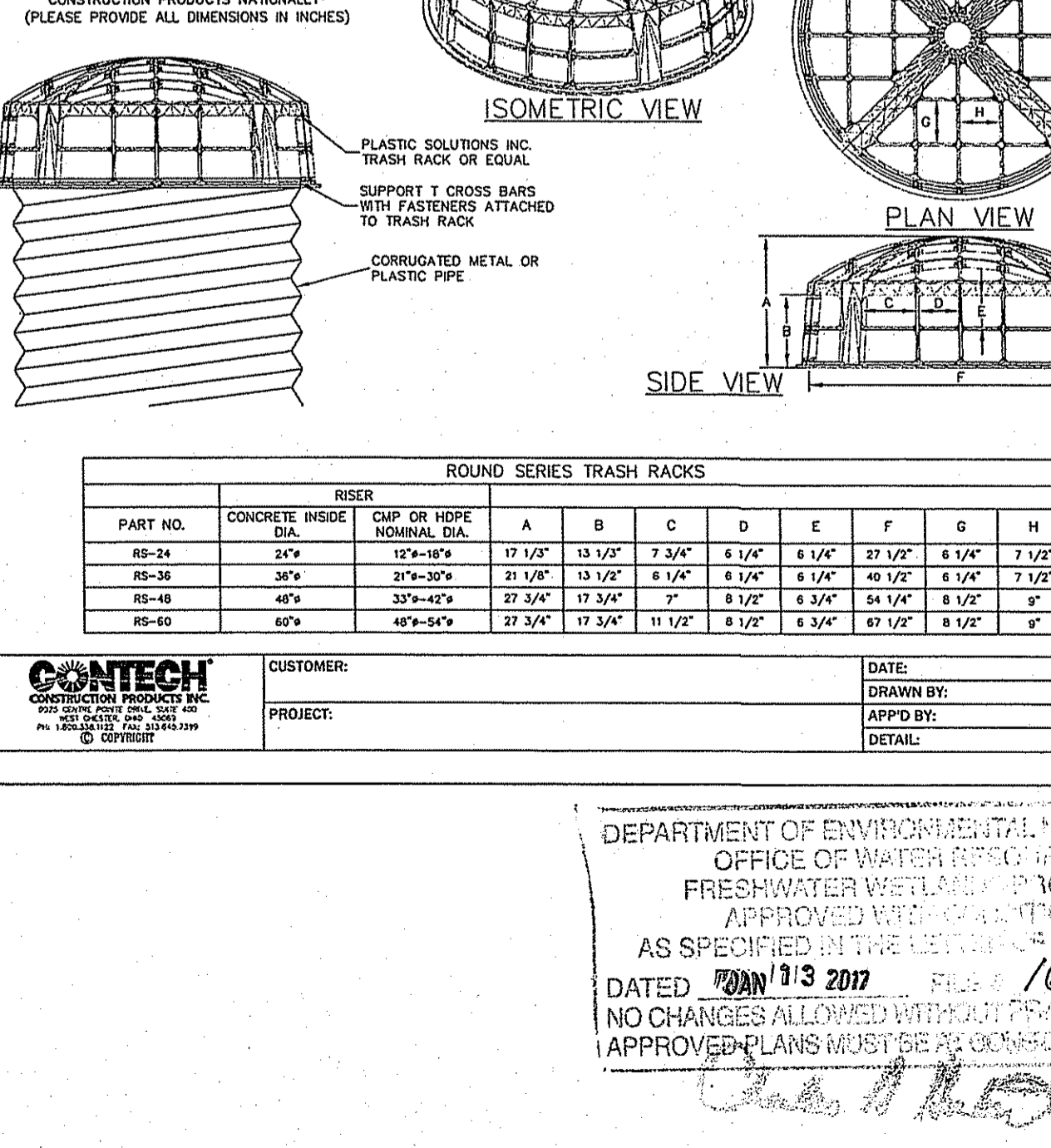
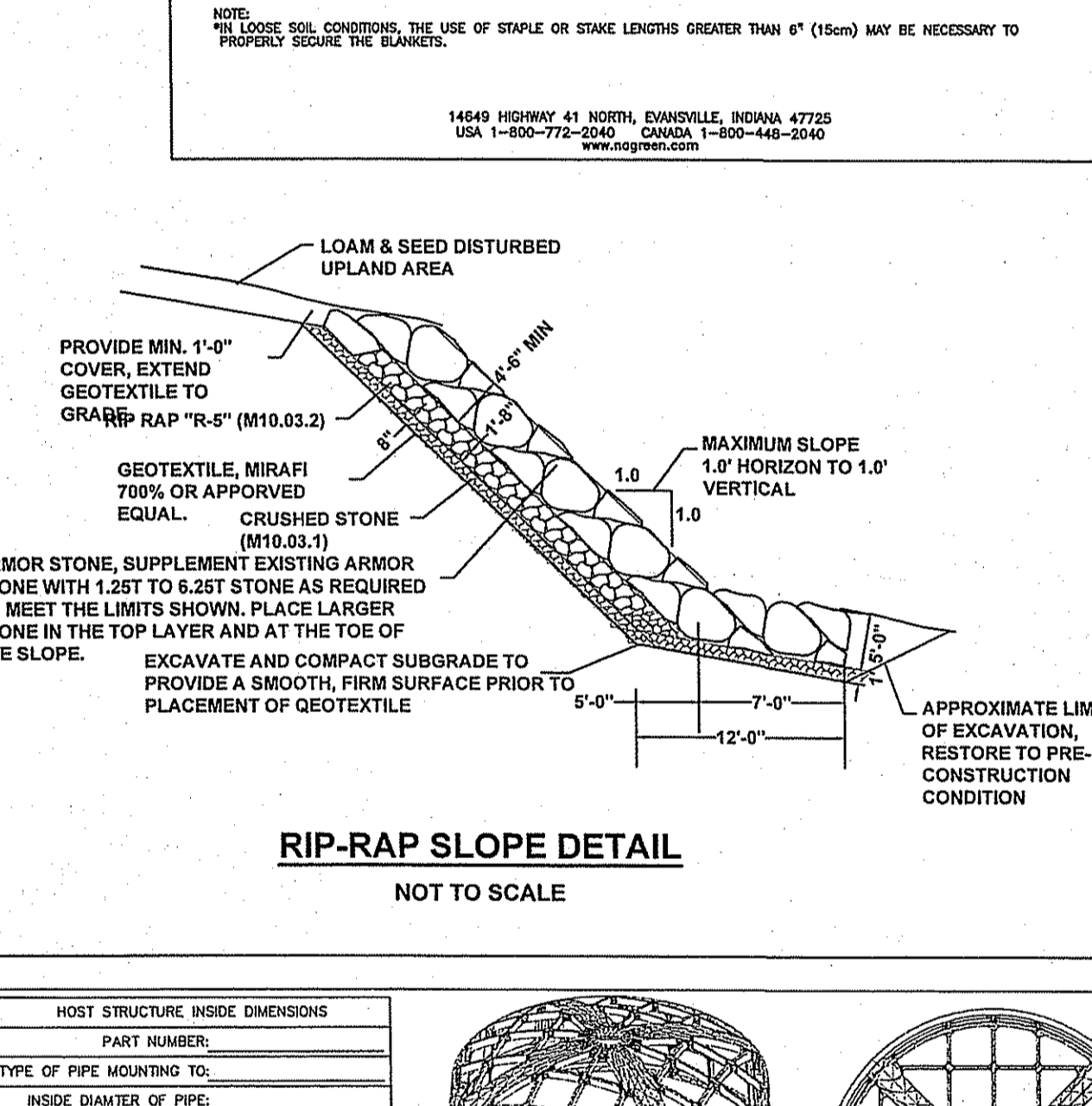
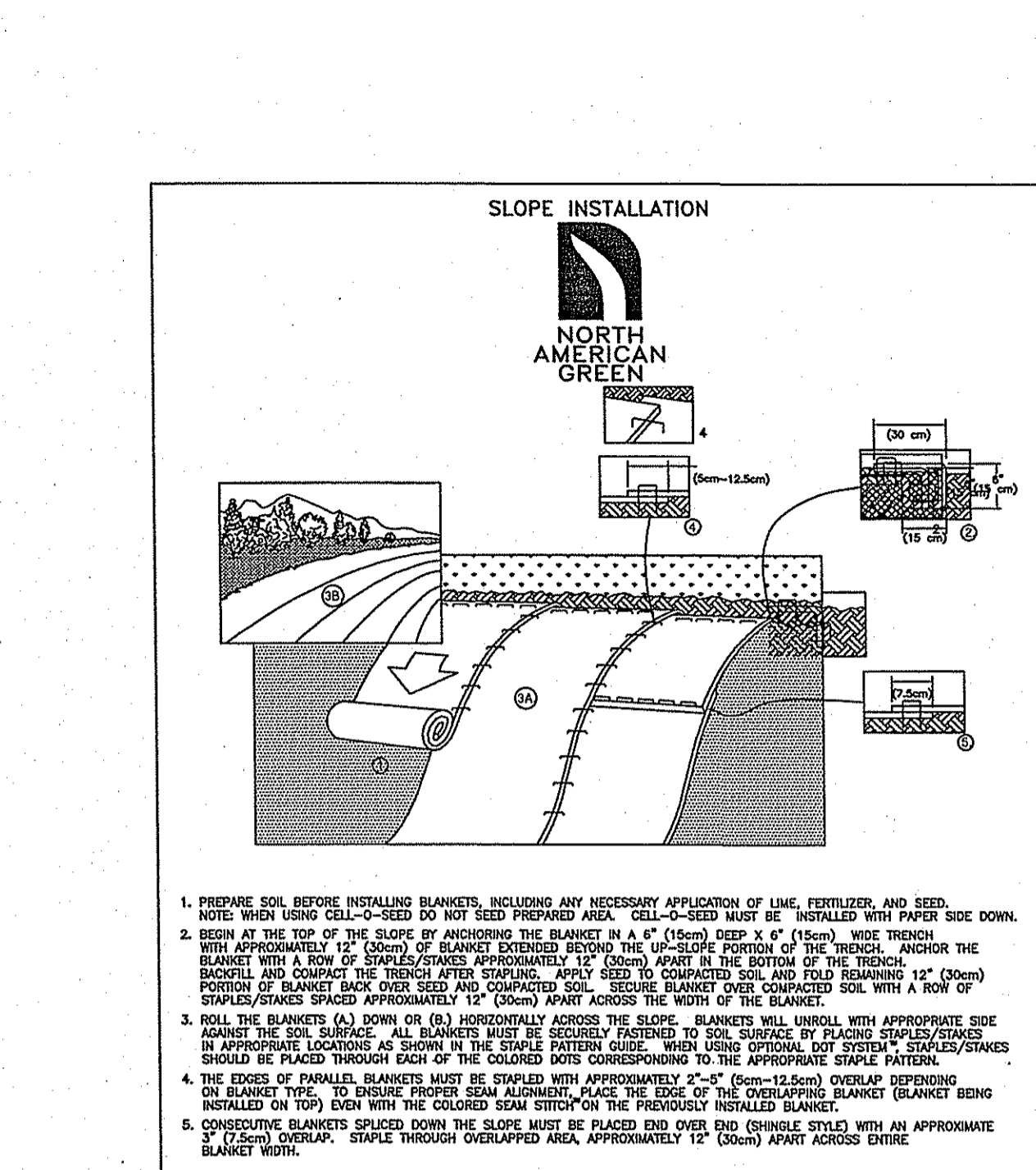
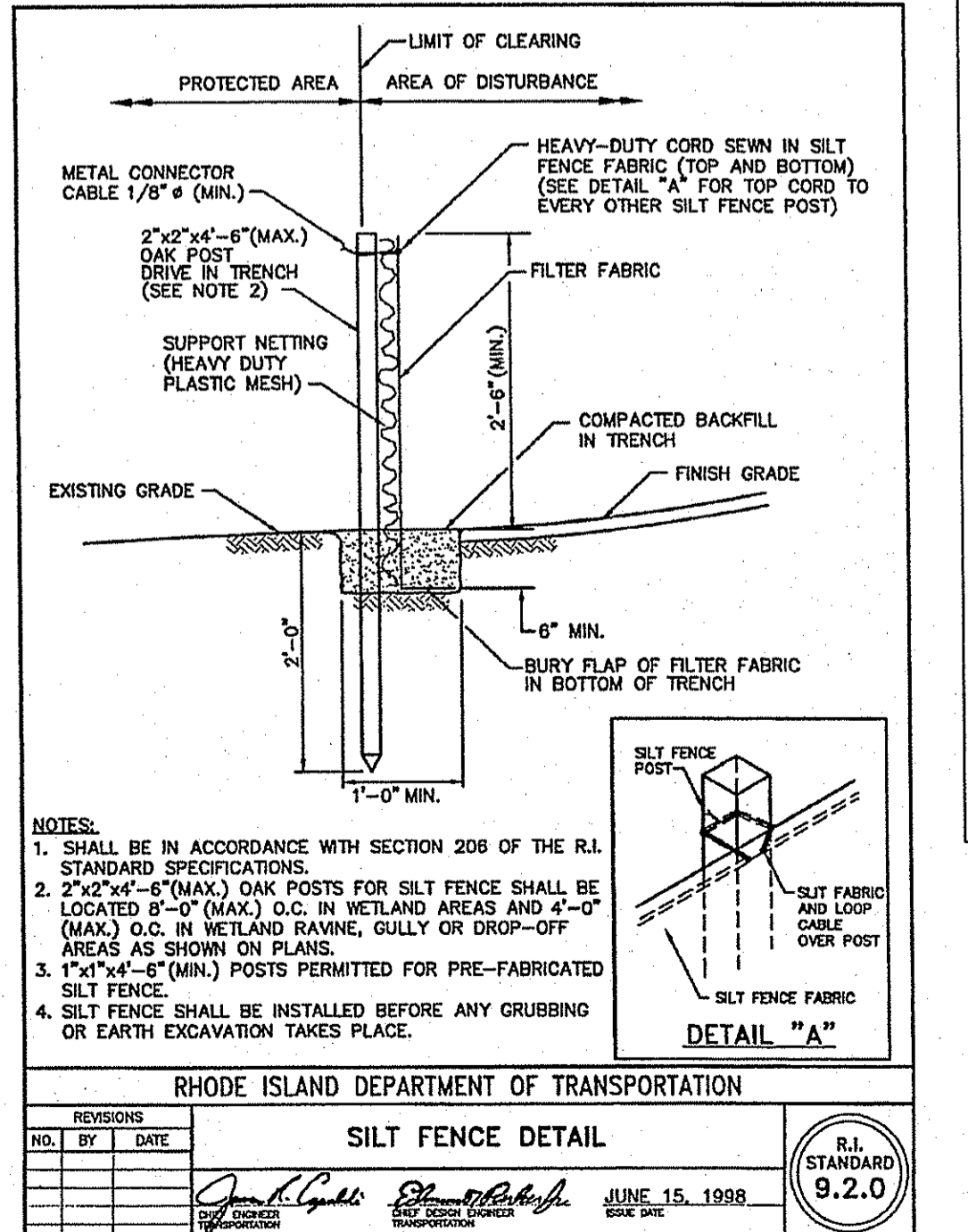
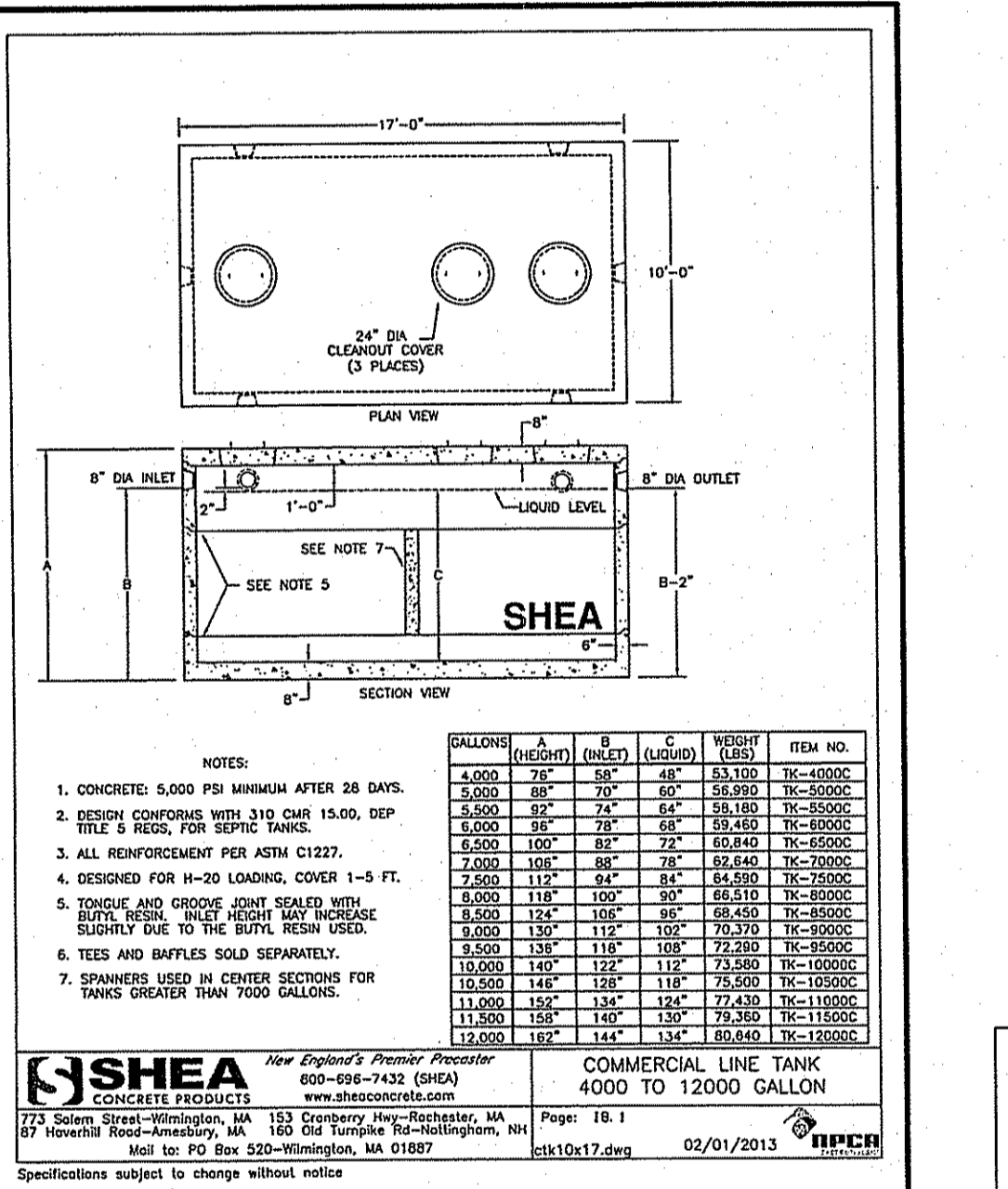
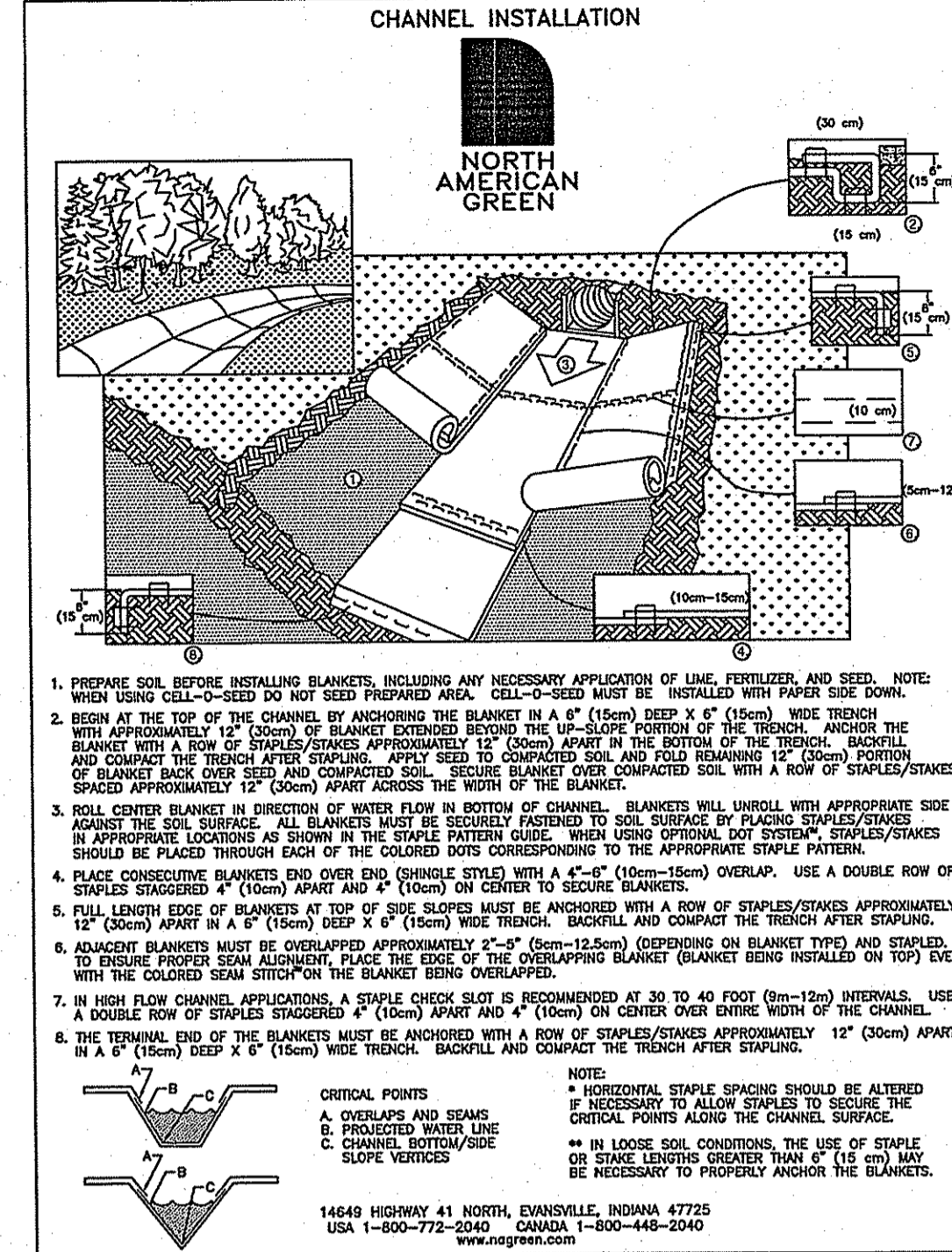
ANY DEFICIENCY NOTED DURING THE INSPECTION WILL BE IMMEDIATELY REPAIRED OR REPLACED.

**GENERAL NOTES**

- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ANY AND ALL PERMITS REQUIRED BY THE STATE OF RHODE ISLAND AND THE MUNICIPALITY PRIOR TO COMMENCING ANY WORK. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE INTEGRITY OF ALL EXISTING UTILITIES, STRUCTURES, AND ADJUTING PROPERTIES. THE COST OF ANY REPAIR OR REPLACEMENT OF DAMAGED ITEMS SHALL BE BORNE BY THE CONTRACTOR.
- THE CONTRACTOR SHALL COORDINATE ALL WORK WITH THE MUNICIPAL ENGINEERING DEPARTMENT AND ALL UTILITY INSTALLATIONS AND INSPECTIONS WITH THE APPROPRIATE UTILITY CO. A 48 HOUR ADVANCE NOTICE IS REQUIRED BEFORE WORK COMMENCEMENT.
- ALL WORK WITHIN THE STATES ROW WILL CONFORM TO RIDOT'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2013 AMENDED AUGUST 2013 AND STANDARD DETAILS, JUNE 15, 1998 AS AMENDED BY REVISION.
- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR QUANTITY TAKE OFF IN COMPUTING ANY ESTIMATES.
- EMBANKMENT SLOPES AND ALL DISTURBED AREAS ARE TO RECEIVE 4" OF TOPSOIL AND SEED. SEE EROSION CONTROL PROGRAM DETAILS.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION INDICATED ON THESE PLANS. THAT INCLUDES ANY CONSTRUCTION TO BRING UTILITIES TO THE SITE, ANY REPAIRS, ANY TRENCHING REQUIRED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL TEMPORARY SEDIMENTATION AND SOIL EROSION CONTROL MEASURES.
- THE LOCATION OF EXISTING UTILITIES AS SHOWN ARE APPROXIMATE AND SHOULD BE VERIFIED BY THE CONTRACTOR WITH THE APPROPRIATE UTILITY COMPANIES. CALL DIG-SAFE (800)225-4977
- IN ALL EXCAVATION AND PLACEMENT OF FILL THE CONTRACTOR SHALL PERFORM THE WORK IN FULL COMPLIANCE WITH THE R.I. STANDARD SPECIFICATION SECTION 202. Specifications subject to change without notice.

**INFILTRATION SYSTEM MAINTENANCE NOTES**

- THE OIL/WATER SEPARATORS SHALL BE MAINTAINED ON A CONTINUAL BASIS, AS NEEDED, AT MINIMUM, ANNUAL CLEANOUT OF ALL OIL/WATER SEPARATORS SHALL BE PERFORMED. MAINTENANCE OF THE DISPOSAL SYSTEM SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY ON WHICH THE SYSTEM IS LOCATED.
- A DISPOSAL SYSTEM MAINTENANCE REPORT, DETAILING ANY OPERATIONAL PROBLEMS AND SPILL OR DUMPING INCIDENTS FOR THE PREVIOUS 12 MONTH PERIOD, SHALL BE SUBMITTED TO THE UIC PROGRAM ON AN ANNUAL BASIS. THE MAINTENANCE REPORT SHALL BE DUE BY THE LAST DAY OF THE MONTH OF APRIL FOR EVERY YEAR THE DISPOSAL SYSTEM IS UTILIZED.
- ANY INADVERTENT OR DELIBERATE DISCHARGE OF WASTE OIL OR ANY OTHER POLLUTANT TO THE STORMWATER DISPOSAL SYSTEM REQUIRES IMMEDIATE NOTIFICATION OF THE UIC DEPARTMENT.
- ANY INCIDENT OF GROUNDWATER CONTAMINATION RESULTING FROM THE IMPROPER DISCHARGE OF CONTAMINANTS TO THE DISPOSAL SYSTEM SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. UIC RIDEM WILL REQUIRE THE PROPERTY OWNER TO REMEDIATE ANY INCIDENTS THAT MAY ADVERSELY IMPACT THE QUALITY OF THE GROUNDWATER.
- UPON TRANSFER OF THE PROPERTY THE FUTURE OWNER SHALL BE INFORMED AS TO LEGAL RESPONSIBILITY OF OPERATING THE DISPOSAL SYSTEM, AS INDICATED.
- THE STORMWATER INFILTRATION SYSTEMS SHALL BE PERIODICALLY INSPECTED AND MAINTAINED DURING CONSTRUCTION AND A MINIMUM OF TWICE PER YEAR UPON COMPLETION OF CONSTRUCTION.



**GENERAL DETAILS FOR LIBERTY HILL CONDOMINIUMS**  
LOCATED AT  
**400 SOUTH COUNTY TRAIL  
EXETER, R.I.**

Checked By: **DrC** Date: **10/21/2016**  
 Drawn By: **PJF** Scale: **AS SHOWN**  
 Revisions: 

NO.	REVISION	BY	DATE

DANIEL R. COTTA  
Professional Engineer  
No. 113-116

Environmental Management  
DEC 05 2016  
Office of Water Resources

**AMERICAN ENGINEERING, INC.**  
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Sheet **15** of 15 sheets  
Drawing No. **98165**