



PROJECT INFORMATION

SITE LOCATION:
176 GREENWOOD AVE / 50 N BROADWAY
EAST PROVIDENCE, RHODE ISLAND 02916
TAX MAP, GRID, PARCEL
TAX ID #09-2224-76 AND #09-2224-77

CLIENT/OWNER:
IGUS, INC.
257 FERRIS AVENUE
EAST PROVIDENCE RI 02916

ENGINEER:
EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC
301 METRO CENTER BOULEVARD, SUITE 102
WARWICK, RHODE ISLAND 02886
401-736-3440

GENERAL NOTES:

- 1. CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL EXCAVATION WORK IN ACCORDANCE WITH OSHA REGULATIONS.
2. THE SITE IS ZONED AS I1 INDUSTRIAL.
3. NO FEMA FLOODPLAIN EXIST IN THE AREA OF THE PROPOSED WORK ACCORDING TO FIRM MAP 44007C0328J DATED 2 OCTOBER 2015.
4. THE PREDOMINANT SOIL TYPES ARE UDORTMENTS AND URBAN LAND (UD, & UR), HYDROLOGIC SOIL TYPE D.
5. SITE ALTA SURVEY AND EXISTING TOPOGRAPHY WAS PERFORMED BY SITEC INC. AND PROVIDED IN ELECTRONIC FORMAT IN APRIL 2020. HORIZONTAL LOCAL DATUM WAS PROVIDED WITH ADJUSTMENT TO RHODE ISLAND STATE PLANE COORDINATE SYSTEM, NAD83. VERTICAL DATUM IS REFERENCED TO NAVD88.
6. EXISTING UNDERGROUND UTILITY INFORMATION PROVIDED BY SITEC INC. IN APRIL 2020. CONTRACTOR SHALL VERIFY THE PRESENCE, LOCATION, AND DEPTH OF ANY EXISTING UTILITIES AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING WORK.
7. UTILITIES MARKED "INFERRED" WITHIN THE PLANS SET WERE NOT FIELD LOCATED DURING THE SITE SURVEY AND ARE BASED ON KNOWN DOCUMENTATION INCLUDING SITE PHOTOGRAPHS, REMEDIAL ACTION WORK PLANS, AND CLIENT INTERVIEWS.
8. WETLAND DELINEATION PERFORMED BY MASON & ASSOCIATES ON MARCH 12, 2020.
9. THE CONTRACTOR SHALL CONTACT DIGSAFE AT 888-344-7233 THREE (3) WORKING DAYS PRIOR TO CONSTRUCTION.
10. IN THE CASE OF A DISCREPANCY BETWEEN THE SCALED AND FIGURED DIMENSIONS SHOWN ON THESE PLANS, THE FIGURED DIMENSIONS SHALL GOVERN.
11. FOR ALL STORM DRAIN PIPES, STRUCTURES, AND INLETS, THEIR LOCATION, LENGTH, AND INVERTS SHALL BE DEFINITELY DETERMINED IN THE FIELD BEFORE ORDERING. ALL PIPES AND STRUCTURES SHALL BE INSTALLED ON SUBGRADE IN ACCORDANCE WITH GEOTECHNICAL RECOMMENDATIONS OR ADDITIONAL SUPPORT MEASURES BY OTHERS.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE ENGINEER OF RECORD AT 401-736-3440 IN THE EVENT OF ANY DISCREPANCIES IN THE PLANS OR IN THE RELATIONSHIPS OF FINISHED GRADES TO EXISTING GRADES PRIOR TO BEGINNING WORK.
13. IT SHALL BE DISTINCTLY UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NATURALLY BE REQUIRED TO COMPLETE THE PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY TO PERFORM SUCH WORK.
14. ALL SAFETY MEASURES TO BE IMPLEMENTED DURING THE CONSTRUCTION OF THIS PROJECT ARE THE RESPONSIBILITY OF THE CONTRACTOR.
15. ALL CUT/FILL AND MATERIAL QUANTITIES AS SHOWN HEREIN ARE FOR INFORMATIONAL PURPOSES ONLY AS REQUIRED BY THE SEDIMENT CONTROL AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL VERIFY SUCH CALCULATIONS TO HIS OWN SATISFACTION.
16. AS REQUIRED, CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING LOCAL PERMITS FOR:
16.1. THE DISCONNECTION OF EXISTING SITE DRAINAGE COMPONENTS TO CITY OF EAST PROVIDENCE STORM DRAIN NETWORK INCLUDING TRAFFIC CONTROL
16.2. SITE ACCESS AND PLACEMENT OF EROSION AND SEDIMENT CONTROLS ON CITY PROPERTY ON GREENWOOD AVENUE SHOULDER.

GENERAL SEQUENCE OF CONSTRUCTION

- 1. OBTAIN NECESSARY CITY OF EAST PROVIDENCE PERMITS
2. CONDUCT PRE-CONSTRUCTION MEETING WITH SITE OWNER/REPRESENTATIVE AND ENGINEER.
3. OBTAIN SITE DIGSAFE TICKET.
4. CLEAR AND GRUB MINIMUM AREA NECESSARY TO INSTALL SEDIMENT CONTROLS. INSTALL ALL SEDIMENT CONTROLS AS SHOWN ON PLAN.
5. CONSTRUCT PROPOSED BMP-1, STORMWATER MANAGEMENT STRUCTURES/PIPING, AND NECESSARY FOUNDATION STRUCTURES.
6. CLEAR AND GRUB AREA REQUIRED FOR THE INSTALLATION OF STORMWATER MANAGEMENT FEATURES, SLOPE REGRADING, LINER INSTALLATION, OR EXCAVATED MATERIAL PLACEMENT.
8. INSTALL DEWATERING DEVICES AND ASSOCIATED SEDIMENT CONTROLS IN WETLAND 1.
9. CONSTRUCT OUTLET PROTECTION DEVICE
12. PERFORM WETLAND 1 SLOPE REGRADING AND LINER INSTALLATION.
13. INSTALL STORMWATER MANAGEMENT PIPING AND STRUCTURES.
14. RESTORE TEMPORARILY DISTURBED AREAS OF BIOLOGICAL AND RIVERBANK WETLAND.
15. REMOVE DEWATERING DEVICES.
16. PLACE, GRADE, AND COMPACT BACKFILL GENERATED FROM EXCAVATIONS.
16. PERFORM BMP-1 PLANTING IN ACCORDANCE WITH THE PLANTING PLAN PROVIDED ON SHEET C-501.
17. RESTORE AND SEED EARTHEN LANDFILL CAP IN DISTURBED AREAS AND EXISTING SINKHOLES.
18. INSTALL SECURITY FENCING.
19. RESTORE PAVEMENT AND CONSTRUCT PROPOSED CURB.
20. AFTER ACHIEVING 95% STABILIZATION WITH ESTABLISHED VEGETATION, REMOVE SEDIMENT CONTROL MEASURES FROM THE WORK AREA AND STABILIZE THE AREA WITH APPROVAL FROM THE ENGINEER.

ABBREVIATIONS

Table with 2 columns: ABBREVIATION and DESCRIPTION. Includes entries like APPROX, CMP, COMM, CONC, CPP, CY, DIA, ELEV, ELUR, ESC, EXE/EXIST, FEMA, FT, INV, NA, NAD 83, NAVD 88, OVHD/OH, PR, PERM, RCP, SD, SF, TEMP, TYP.

LEGEND

Table with 3 columns: DESCRIPTION, EXISTING, PROPOSED. Lists various symbols for manholes, poles, lines, fences, etc.

Professional Engineer Seal for Ronald Mack, No. 9823, Registered Professional Engineer.

IGUS, INC.
REMEDICATION OF LAND SUBSIDENCE AND STORMWATER MANAGEMENT
176 GREENWOOD AVE / 50 N BROADWAY
EAST PROVIDENCE, RHODE ISLAND

EA Engineering, Science, and Technology, Inc., PBC logo and address: 301 Metro Center Blvd, Suite 102, Warwick, Rhode Island 02886, (401) 736-3440.

RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
APPROVED WITH CONDITIONS AS SPECIFIED IN THE LETTER OF APPROVAL
DATED: AUG 01 2023 FILE # 22-0275
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
APPROVED PLANS MUST BE AT CONSTRUCTION SITE

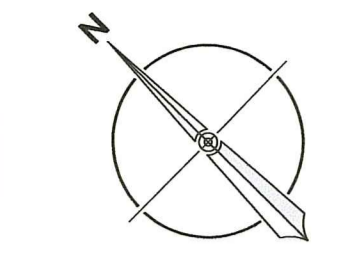
RI Environmental Management
JAN 05 2023
Office of Water Resources

SCALE AS SHOWN
FULL SIZE PLOT: 24" x 36"
DATE: MAY 2022
PROJECT NUMBER: 15995.01
G-002
SHEET: 2 OF 12

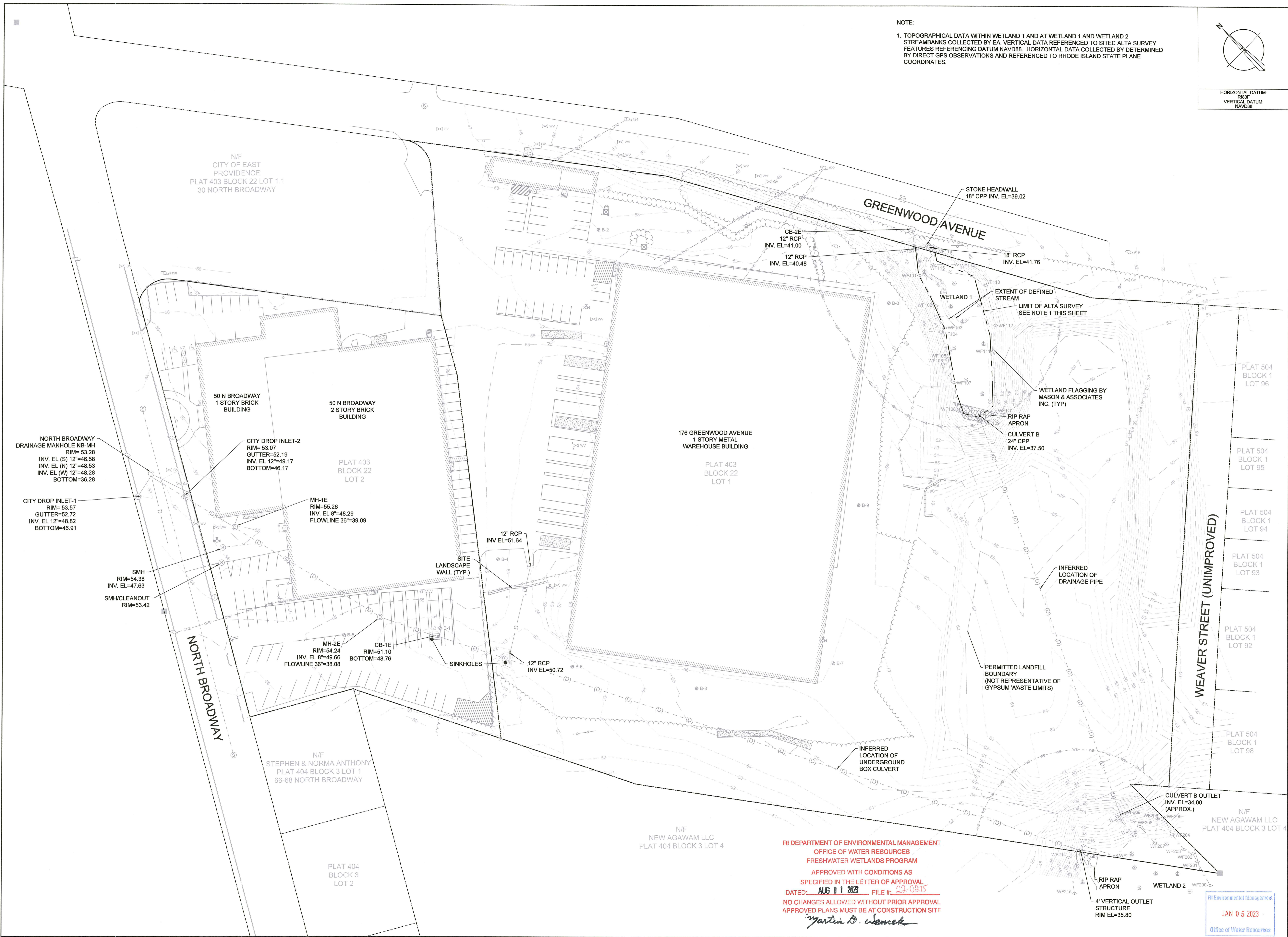
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PERMITTING DESIGN PLANS - NOT FOR CONSTRUCTION

NOTE:  
 1. TOPOGRAPHICAL DATA WITHIN WETLAND 1 AND AT WETLAND 1 AND WETLAND 2 STREAMBANKS COLLECTED BY EA. VERTICAL DATA REFERENCED TO SITEC ALTA SURVEY FEATURES REFERENCING DATUM NAVD88. HORIZONTAL DATA COLLECTED BY DETERMINED BY DIRECT GPS OBSERVATIONS AND REFERENCED TO RHODE ISLAND STATE PLANE COORDINATES.



HORIZONTAL DATUM: RIPS  
 VERTICAL DATUM: NAVD88



REVISIONS		DESCRIPTION
NO.	DATE	BY
1	2022/03	RM

DESIGN INFORMATION		DESIGNED BY:	WRB/DTC	DRAWN BY:	DTC	CHECKED BY:	RGM	PROJECT MANAGER:	FBP



IGUS, INC.  
 REMEDIATION OF LAND SUBSIDENCE AND STORMWATER MANAGEMENT  
 176 GREENWOOD AVE / 50 N BROADWAY  
 EAST PROVIDENCE, RHODE ISLAND  
 EXISTING CONDITIONS PLAN



www.eaest.com
GRAPHIC SCALE IN FEET 0 20 40 80
FULL SIZE PLOT: 24" x 36"
DATE: MAY 2022
PROJECT NUMBER: 15995.01
<b>C-101</b>
SHEET: 3 OF 12

RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
 OFFICE OF WATER RESOURCES  
 FRESHWATER WETLANDS PROGRAM  
 APPROVED WITH CONDITIONS AS  
 SPECIFIED IN THE LETTER OF APPROVAL  
 DATED: AUG 01 2023 FILE #: 22-0315  
 NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
 APPROVED PLANS MUST BE AT CONSTRUCTION SITE  
*Martin B. Wemcek*

RI Environmental Stipulations  
 JAN 05 2023  
 Office of Water Resources

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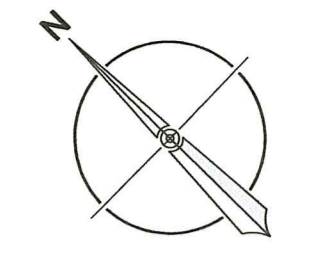




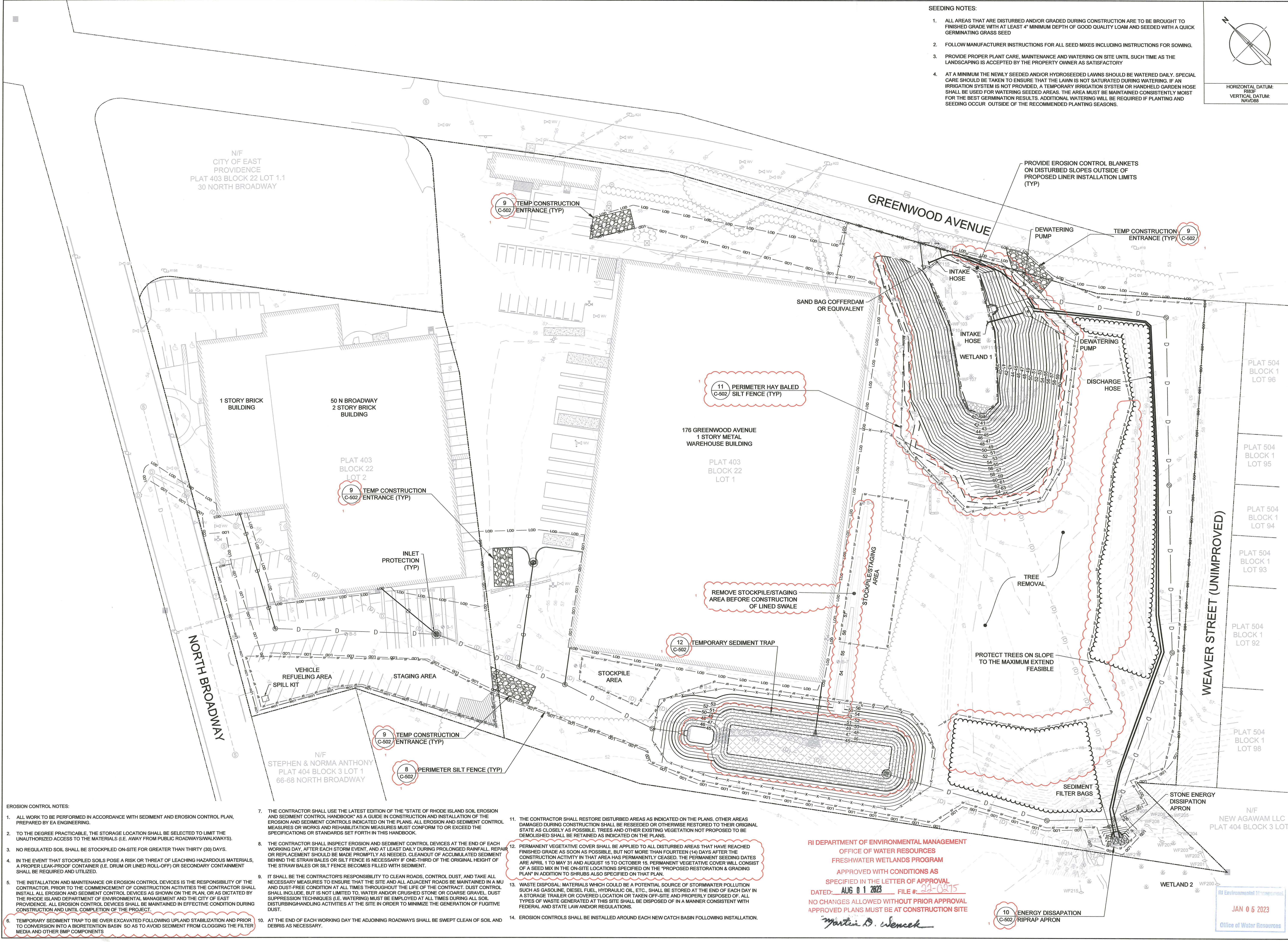


SEEDING NOTES:

1. ALL AREAS THAT ARE DISTURBED AND/OR GRADED DURING CONSTRUCTION ARE TO BE BROUGHT TO FINISHED GRADE WITH AT LEAST 4" MINIMUM DEPTH OF GOOD QUALITY LOAM AND SEEDED WITH A QUICK GERMINATING GRASS SEED
2. FOLLOW MANUFACTURER INSTRUCTIONS FOR ALL SEED MIXES INCLUDING INSTRUCTIONS FOR SOWING.
3. PROVIDE PROPER PLANT CARE, MAINTENANCE AND WATERING ON SITE UNTIL SUCH TIME AS THE LANDSCAPING IS ACCEPTED BY THE PROPERTY OWNER AS SATISFACTORY
4. AT A MINIMUM THE NEWLY SEEDED AND/OR HYDROSEEDED LAWNS SHOULD BE WATERED DAILY. SPECIAL CARE SHOULD BE TAKEN TO ENSURE THAT THE LAWN IS NOT SATURATED DURING WATERING. IF AN IRRIGATION SYSTEM IS NOT PROVIDED, A TEMPORARY IRRIGATION SYSTEM OR HANDHELD GARDEN HOSE SHALL BE USED FOR WATERING SEEDED AREAS. THE AREA MUST BE MAINTAINED CONSISTENTLY MOIST FOR THE BEST GERMINATION RESULTS. ADDITIONAL WATERING WILL BE REQUIRED IF PLANTING AND SEEDING OCCUR OUTSIDE OF THE RECOMMENDED PLANTING SEASONS.



HORIZONTAL DATUM: RISE  
VERTICAL DATUM: NAVD88



EROSION CONTROL NOTES:

1. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH SEDIMENT AND EROSION CONTROL PLAN, PREPARED BY EA ENGINEERING.
2. TO THE DEGREE PRACTICABLE, THE STORAGE LOCATION SHALL BE SELECTED TO LIMIT THE UNAUTHORIZED ACCESS TO THE MATERIALS (I.E. AWAY FROM PUBLIC ROADWAYS/WALKWAYS).
3. NO REGULATED SOIL SHALL BE STOCKPILED ON-SITE FOR GREATER THAN THIRTY (30) DAYS.
4. IN THE EVENT THAT STOCKPILED SOLIDS POSE A RISK OR THREAT OF LEACHING HAZARDOUS MATERIALS, A PROPER LEAK-PROOF CONTAINER (I.E. DRUM OR LINED ROLL-OFF) OR SECONDARY CONTAINMENT SHALL BE REQUIRED AND UTILIZED.
5. THE INSTALLATION AND MAINTENANCE OF EROSION CONTROL DEVICES IS THE RESPONSIBILITY OF THE CONTRACTOR. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES THE CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE PLAN, OR AS DICTATED BY THE RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT AND THE CITY OF EAST PROVIDENCE. ALL EROSION CONTROL DEVICES SHALL BE MAINTAINED IN EFFECTIVE CONDITION DURING CONSTRUCTION AND UNTIL COMPLETION OF THE PROJECT.
6. TEMPORARY SEDIMENT TRAP TO BE OVER EXCAVATED FOLLOWING UPLAND STABILIZATION AND PRIOR TO CONVERSION INTO A BIOTRETENTION BASIN SO AS TO AVOID SEDIMENT FROM CLOGGING THE FILTER MEDIA AND OTHER BMP COMPONENTS
7. THE CONTRACTOR SHALL USE THE LATEST EDITION OF THE "STATE OF RHODE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK" AS A GUIDE IN CONSTRUCTION AND INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS INDICATED ON THE PLANS. ALL EROSION AND SEDIMENT CONTROL MEASURES OR WORKS AND REHABILITATION MEASURES MUST CONFORM TO OR EXCEED THE SPECIFICATIONS OR STANDARDS SET FORTH IN THIS HANDBOOK.
8. THE CONTRACTOR SHALL INSPECT EROSION AND SEDIMENT CONTROL DEVICES AT THE END OF EACH WORKING DAY, AFTER EACH STORM EVENT, AND AT LEAST DAILY DURING PROLONGED RAINFALL. REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED. CLEANOUT OF ACCUMULATED SEDIMENT BEHIND THE STRAW BALES OR SILT FENCE IS NECESSARY IF ONE-THIRD OF THE ORIGINAL HEIGHT OF THE STRAW BALES OR SILT FENCE BECOMES FILLED WITH SEDIMENT.
9. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CLEAN ROADS, CONTROL DUST, AND TAKE ALL NECESSARY MEASURES TO ENSURE THAT THE SITE AND ALL ADJACENT ROADS BE MAINTAINED IN A MU AND DUST-FREE CONDITION AT ALL TIMES THROUGHOUT THE LIFE OF THE CONTRACT. DUST CONTROL SHALL INCLUDE, BUT IS NOT LIMITED TO, WATER AND/OR CRUSHED STONE OR COARSE GRAVEL. DUST SUPPRESSION TECHNIQUES (I.E. WATERING) MUST BE EMPLOYED AT ALL TIMES DURING ALL SOIL DISTURBING/HANDLING ACTIVITIES AT THE SITE IN ORDER TO MINIMIZE THE GENERATION OF FUGITIVE DUST.
10. AT THE END OF EACH WORKING DAY THE ADJOINING ROADWAYS SHALL BE SWEEPED CLEAN OF SOIL AND DEBRIS AS NECESSARY.

11. THE CONTRACTOR SHALL RESTORE DISTURBED AREAS AS INDICATED ON THE PLANS. OTHER AREAS DAMAGED DURING CONSTRUCTION SHALL BE RESEED OR OTHERWISE RESTORED TO THEIR ORIGINAL STATE AS CLOSELY AS POSSIBLE. TREES AND OTHER EXISTING VEGETATION NOT PROPOSED TO BE DEMOLISHED SHALL BE RETAINED AS INDICATED ON THE PLANS.
12. PERMANENT VEGETATIVE COVER SHALL BE APPLIED TO ALL DISTURBED AREAS THAT HAVE REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS PERMANENTLY CEASED. THE PERMANENT SEEDING DATES ARE APRIL 1 TO MAY 31 AND AUGUST 15 TO OCTOBER 15. PERMANENT VEGETATIVE COVER WILL CONSIST OF A SEED MIX IN THE ON-SITE LOCATIONS SPECIFIED ON THE "PROPOSED RESTORATION & GRADING PLAN" IN ADDITION TO SHRUBS ALSO SPECIFIED ON THAT PLAN.
13. WASTE DISPOSAL: MATERIALS WHICH COULD BE A POTENTIAL SOURCE OF STORMWATER POLLUTION SUCH AS GASOLINE, DIESEL FUEL, HYDRAULIC OIL, ETC., SHALL BE STORED AT THE END OF EACH DAY IN A STORAGE TRAILER OR COVERED LOCATION OR TAKEN OFF-SITE AND PROPERLY DISPOSED OF. ALL TYPES OF WASTE GENERATED AT THIS SITE SHALL BE DISPOSED OF IN A MANNER CONSISTENT WITH FEDERAL AND STATE LAW AND/OR REGULATIONS.
14. EROSION CONTROLS SHALL BE INSTALLED AROUND EACH NEW CATCH BASIN FOLLOWING INSTALLATION.

RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM  
APPROVED WITH CONDITIONS AS  
SPECIFIED IN THE LETTER OF APPROVAL  
DATED: AUG 01 2023 FILE #: 22-0975  
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
APPROVED PLANS MUST BE AT CONSTRUCTION SITE

*Martin D. Sencsek*

10 ENERGY DISSIPATION  
C-502 RIPRAP APRON

RI Environmental Management  
Office of Water Resources  
JAN 05 2023

DESIGN INFORMATION	
DESIGNED BY:	WRB/DTC
DRAWN BY:	DTC
CHECKED BY:	RGM
PROJECT MANAGER:	FBP

NO.	DATE	BY	DESCRIPTION
1	2023/05	RGM	ADDRESS REVISION COMMENTS

SEAL

IGUS, INC.  
REMEDICATION OF LAND SUBSIDENCE AND STORMWATER MANAGEMENT  
176 GREENWOOD AVE / 50 N BROADWAY  
EAST PROVIDENCE, RHODE ISLAND

EROSION & SEDIMENT CONTROL PLAN

EA Engineering, Science, and Technology, Inc., PBC  
301 Metro Center Blvd, Suite 102  
Warwick, Rhode Island 02886  
(401) 736-3440  
www.eaest.com

GRAPHIC SCALE IN FEET

FULL SIZE PLOT: 24" x 36"

DATE: MAY 2022

PROJECT NUMBER: 15995.01

C-105

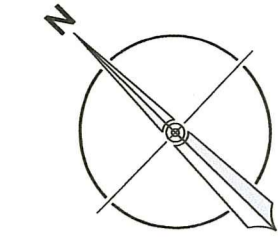
SHEET: 7 OF 12

PERMITTING DESIGN PLANS - NOT FOR CONSTRUCTION

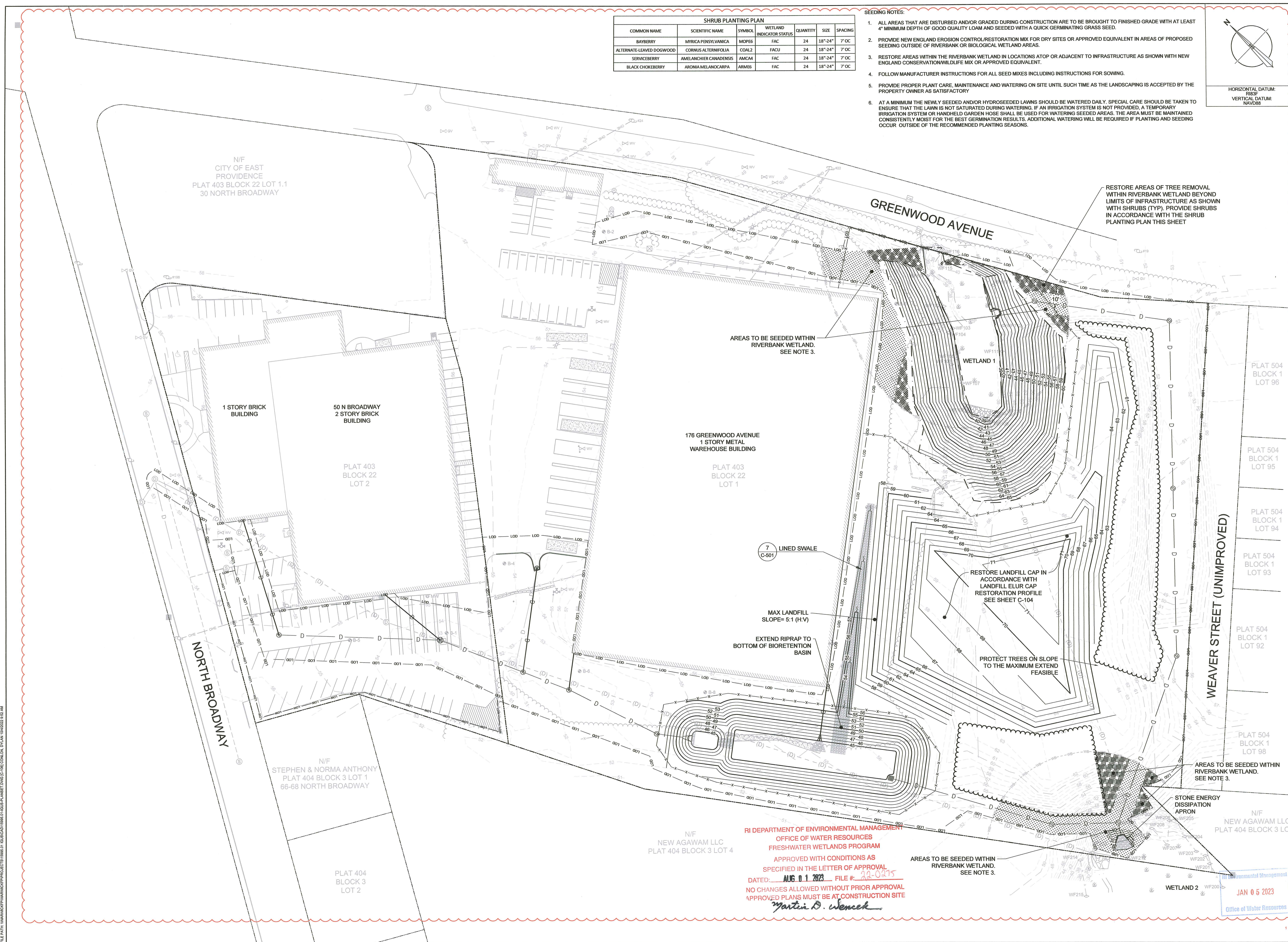
SHRUB PLANTING PLAN						
COMMON NAME	SCIENTIFIC NAME	SYMBOL	WETLAND INDICATOR STATUS	QUANTITY	SIZE	SPACING
BAYBERRY	MYRTICA PENNSYLVANICA	MOPE6	FAC	24	18" x 24"	7' OC
ALTERNATE-LEAVED DOGWOOD	CORNUS ALTERNIFOLIA	COAL2	FACU	24	18" x 24"	7' OC
SERVICEBERRY	AMELANCHIER CANADENSIS	AMCA4	FAC	24	18" x 24"	7' OC
BLACK CHOKEBERRY	ARONIA MELANOCARPA	ARME6	FAC	24	18" x 24"	7' OC

**SEEDING NOTES:**

- ALL AREAS THAT ARE DISTURBED AND/OR GRADED DURING CONSTRUCTION ARE TO BE BROUGHT TO FINISHED GRADE WITH AT LEAST 4" MINIMUM DEPTH OF GOOD QUALITY LOAM AND SEEDED WITH A QUICK GERMINATING GRASS SEED.
- PROVIDE NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DRY SITES OR APPROVED EQUIVALENT IN AREAS OF PROPOSED SEEDING OUTSIDE OF RIVERBANK OR BIOLOGICAL WETLAND AREAS.
- RESTORE AREAS WITHIN THE RIVERBANK WETLAND IN LOCATIONS ATOP OR ADJACENT TO INFRASTRUCTURE AS SHOWN WITH NEW ENGLAND CONSERVATION/WILDLIFE MIX OR APPROVED EQUIVALENT.
- FOLLOW MANUFACTURER INSTRUCTIONS FOR ALL SEED MIXES INCLUDING INSTRUCTIONS FOR SOWING.
- PROVIDE PROPER PLANT CARE, MAINTENANCE AND WATERING ON SITE UNTIL SUCH TIME AS THE LANDSCAPING IS ACCEPTED BY THE PROPERTY OWNER AS SATISFACTORY.
- AT A MINIMUM THE NEWLY SEEDD AND/OR HYDROSEEDD LAWNS SHOULD BE WATERED DAILY. SPECIAL CARE SHOULD BE TAKEN TO ENSURE THAT THE LAWN IS NOT SATURATED DURING WATERING. IF AN IRRIGATION SYSTEM IS NOT PROVIDED, A TEMPORARY IRRIGATION SYSTEM OR HANDHELD GARDEN HOSE SHALL BE USED FOR WATERING SEEDD AREAS. THE AREA MUST BE MAINTAINED CONSISTENTLY MOIST FOR THE BEST GERMINATION RESULTS. ADDITIONAL WATERING WILL BE REQUIRED IF PLANTING AND SEEDING OCCUR OUTSIDE OF THE RECOMMENDED PLANTING SEASONS.



HORIZONTAL DATUM:  
RIS3F  
VERTICAL DATUM:  
NAVD83



DESIGN INFORMATION		DESIGNED BY:	WRB/DTG	PROJECT MANAGER:	FBP
DRAWN BY:		DTC	CHECKED BY:	RGM	
DATE:		2022/03			
NO.:		1			
BY:		RGM			
DESCRIPTION:		ADDRESS REVISION COMMENTS			

**RONALD MACK**

No. **9823**

REGISTERED PROFESSIONAL ENGINEER

*Ronald Mack*

**IGUS, INC.**

**REMEDICATION OF LAND SUBSIDENCE AND STORMWATER MANAGEMENT**

**176 GREENWOOD AVE / 50 N BROADWAY**

EAST PROVIDENCE, RHODE ISLAND

**PROPOSED RESTORATION & GRADING PLAN**

**EA Engineering, Science, and Technology, Inc., PBC**

301 Metro Center Blvd, Suite 102  
Warwick, Rhode Island 02886  
(401) 736-3440

www.eaest.com

FULL SIZE PLOT: 24" x 36"

DATE: MAY 2022

PROJECT NUMBER: 15995.01

**C-106**

SHEET: 8 OF 12

RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM

APPROVED WITH CONDITIONS AS SPECIFIED IN THE LETTER OF APPROVAL  
DATED: AUG 01 2023 FILE # 22-0215  
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*Martin D. Wemch*

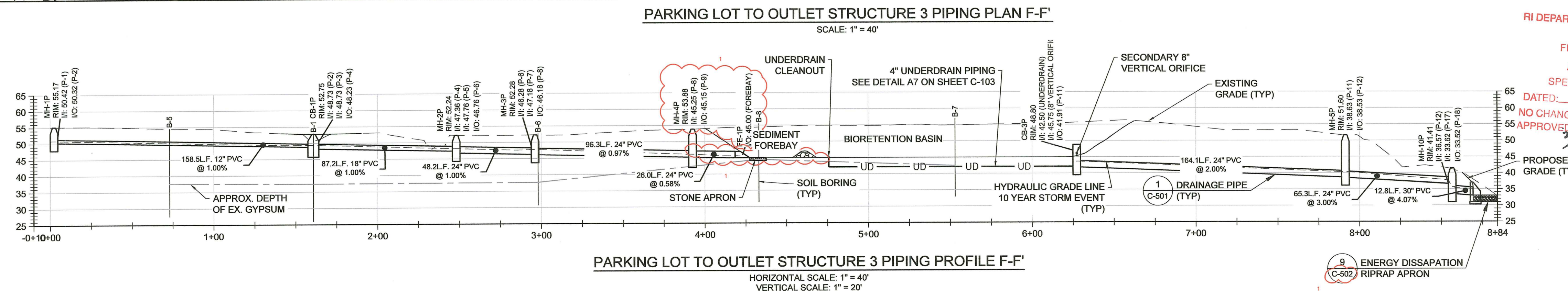
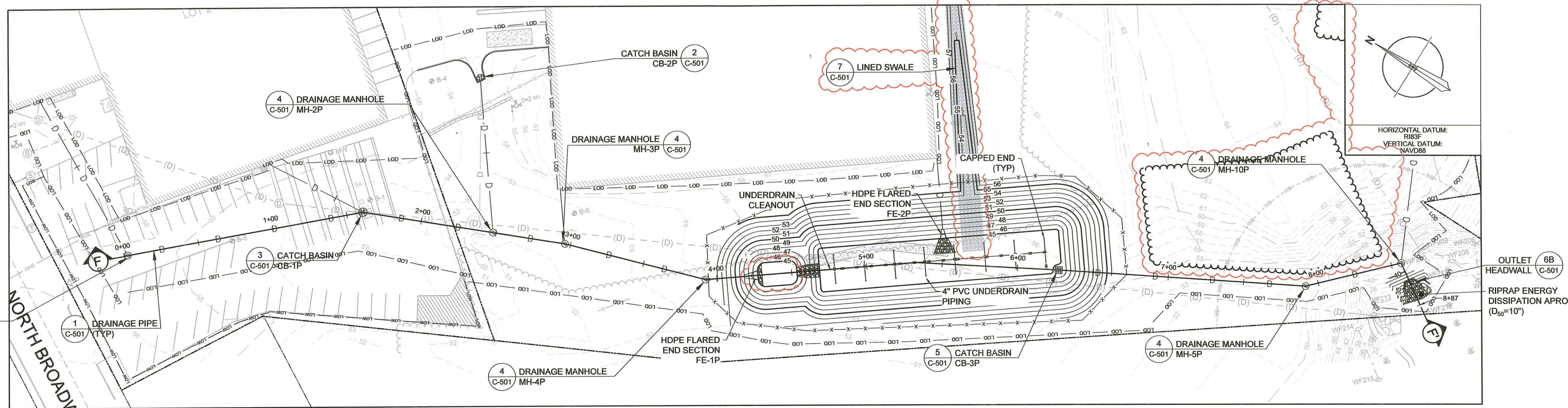
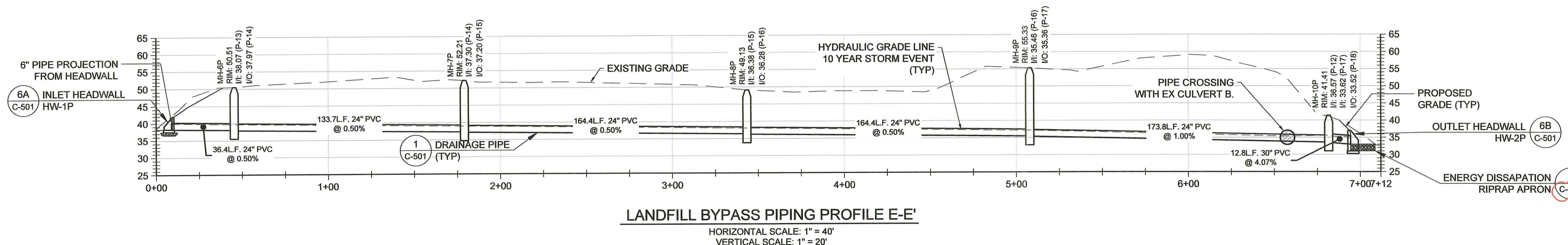
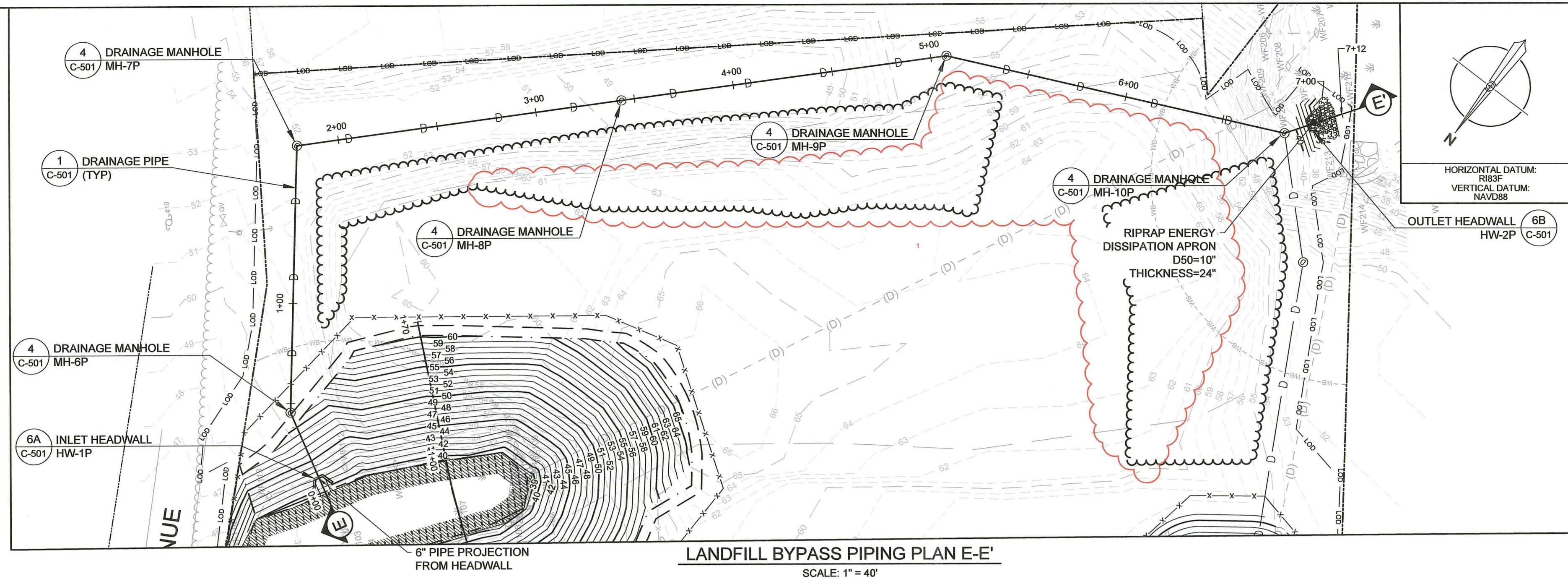
JAN 05 2023  
Office of Water Resources

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PERMITTING DESIGN PLANS - NOT FOR CONSTRUCTION

DRAIN PIPE TABLE						
PIPE I.D.	UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	LENGTH (FT)	UPSTREAM INVERT (FT)	DOWNSTREAM INVERT (FT)	MIN. SLOPE %
P-1	RL-1P	MH-1P	117.9	51.60	50.42	1.0%
P-2	MH-1P	CB-1P	159.5	50.32	48.73	1.0%
P-3	RL-2P	CB-1P	69.0	49.90	48.73	1.8%
P-4	CB-1P	MH-2P	87.2	48.23	47.36	1.0%
P-5	CB-2P	MH-2P	102.9	48.65	47.76	1.0%
P-6	MH-2P	MH-3P	48.2	46.76	46.28	1.0%
P-7	RL-3P	MH-3P	36.4	47.55	47.18	1.0%
P-8	MH-3P	MH-4P	96.3	46.18	45.25	1.0%
P-9	MH-4P	FE-1P	29.0	45.15	45.00	0.5%
P-10	RL-4P	FE-2P	47.0	47.55	45.00	5.4%
P-11	CB-3P	MH-5P	164.1	42.50	39.22	2.0%
P-12	MH-5P	MH-9P	65.3	39.12	37.16	3.0%
P-13	HW-1P	MH-6P	35.9	38.25	38.07	0.5%
P-14	MH-6P	MH-7P	133.7	37.97	37.30	0.5%
P-15	MH-7P	MH-8P	164.4	37.20	36.38	0.5%
P-16	MH-8P	MH-9P	164.4	36.28	35.46	0.5%
P-17	MH-9P	MH-10P	173.8	35.36	33.62	1.0%
P-18	MH-10P	HW-2P	12.8	33.52	33.00	4.1%

STRUCTURE TABLE					
STRUCTURE I.D.	INLET INVERT (FT)	INLET PIPE DIAMETER(S) (IN)	OUTLET INVERT (FT)	OUTLET PIPE DIAMETER (IN)	RIM/GROUND ELEVATION (FT)
CB-1P	48.73, 48.73	12, 12	48.23	18	52.75
CB-2P	N/A	N/A	48.65	12	51.86
CB-3P	N/A	N/A	42.50	24	48.80
MH-1P	50.42	12	50.32	12	55.17
MH-2P	47.36, 47.76	18, 12	46.76	24	52.24
MH-3P	46.28, 47.18	24, 12	46.18	24	52.28
MH-4P	45.25	24	45.15	24	53.88
MH-5P	39.22	24	39.12	24	51.60
MH-6P	38.07	30	37.97	30	50.51
MH-7P	37.30	30	37.20	30	52.21
MH-8P	36.38	30	36.28	30	49.13
MH-9P	35.46	30	35.36	30	55.33
MH-10P	33.62	30	33.52	30	41.13
RL-1P	N/A	N/A	51.60	12	54.25
RL-2P	N/A	N/A	49.90	12	55.50
RL-3P	N/A	N/A	47.55	12	54.10
RL-4P	N/A	N/A	47.55	12	56.75
FE-1P	45.00	24	N/A	N/A	47.00
FE-2P	45.00	12	N/A	N/A	47.00
HW-1P	N/A	N/A	38.25	30	42.00
HW-2P	33.00	30	N/A	N/A	37.00



NOTE:  
CONTRACTOR SHALL INSTALL ALL PROPOSED PIPING AND STRUCTURES IN ACCORDANCE WITH STRUCTURAL ENGINEER RECOMMENDATIONS.

REVISIONS

NO.	DATE	BY	DESCRIPTION
1	2022/03	RM	ADDRESS REVIEW COMMENTS

DESIGN INFORMATION

DESIGNED BY:	MRB/DTC
DRAWN BY:	DTC
CHECKED BY:	RM
PROJECT MANAGER:	FBP

**RONALD MACK**  
No. 8823  
REGISTERED PROFESSIONAL ENGINEER

IGUS, INC.  
REMEDICATION OF LAND SUBSIDENCE AND STORMWATER MANAGEMENT  
176 GREENWOOD AVE / 50 N BROADWAY  
EAST PROVIDENCE, RHODE ISLAND

STORMWATER PIPING PLAN & PROFILE SHEET 1

EA  
EA Engineering, Science, and Technology, Inc., PBC  
301 Metro Center Blvd, Suite 102  
Warwick, Rhode Island 02886  
(401) 736-3440  
www.east.com

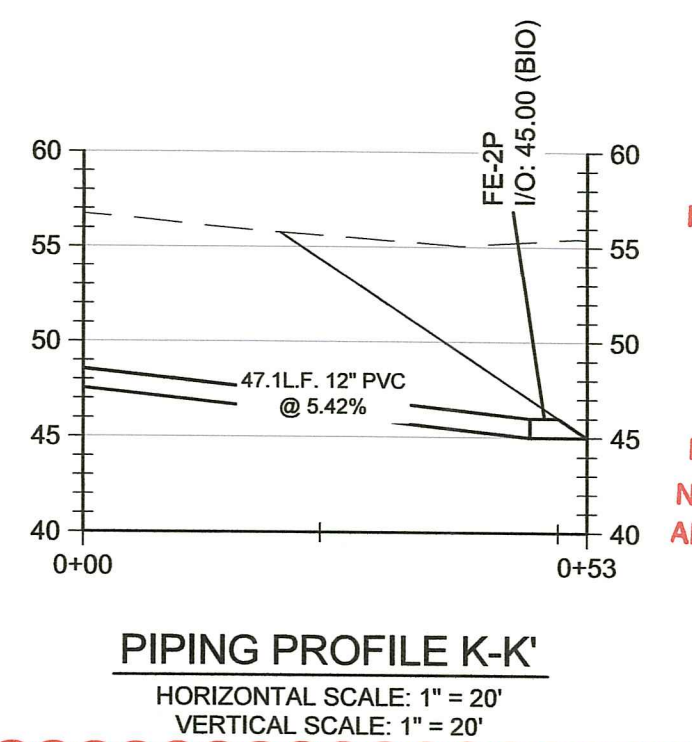
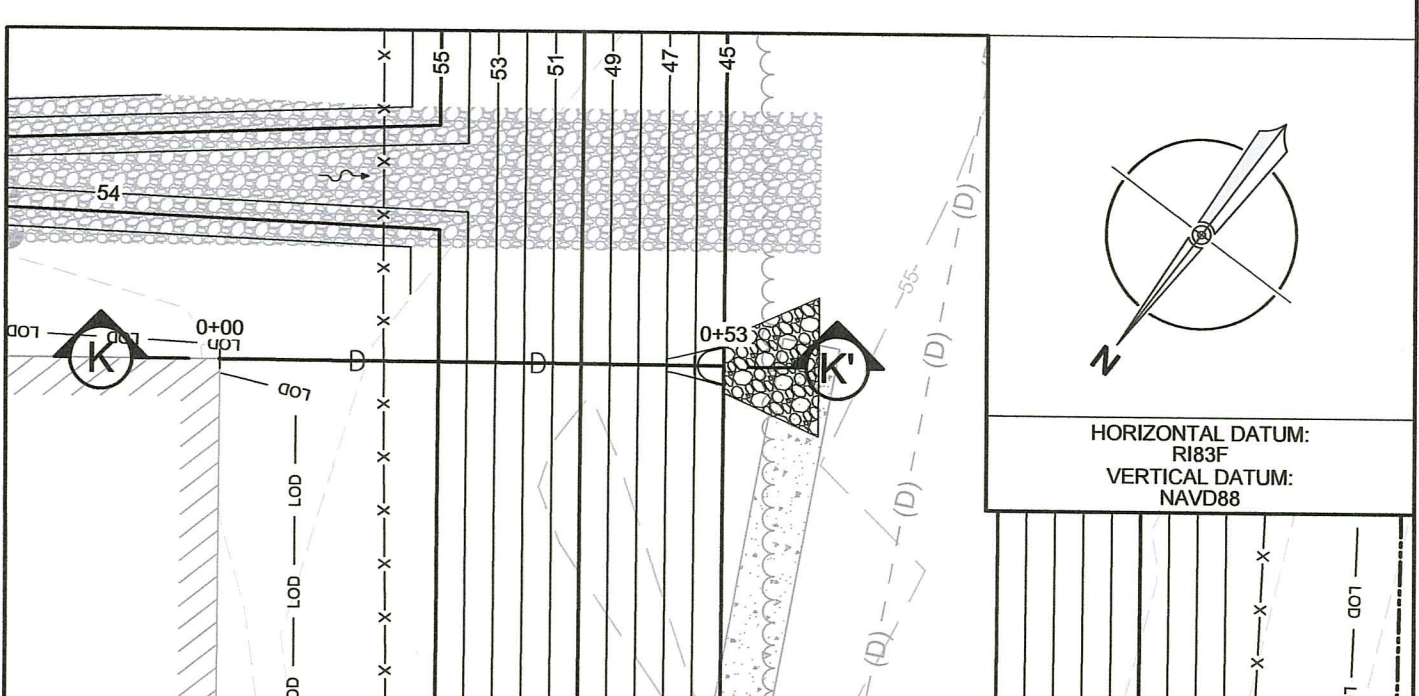
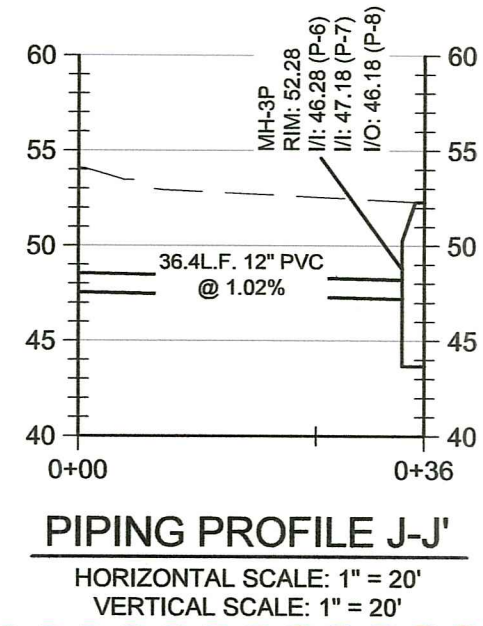
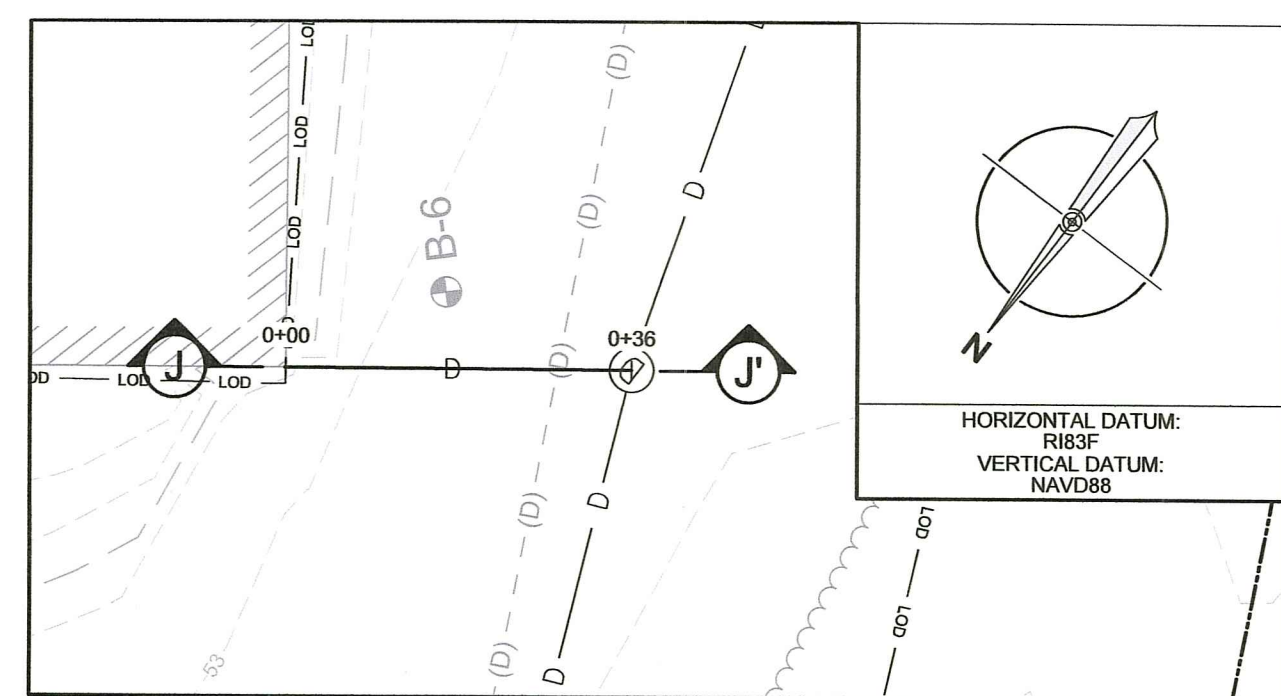
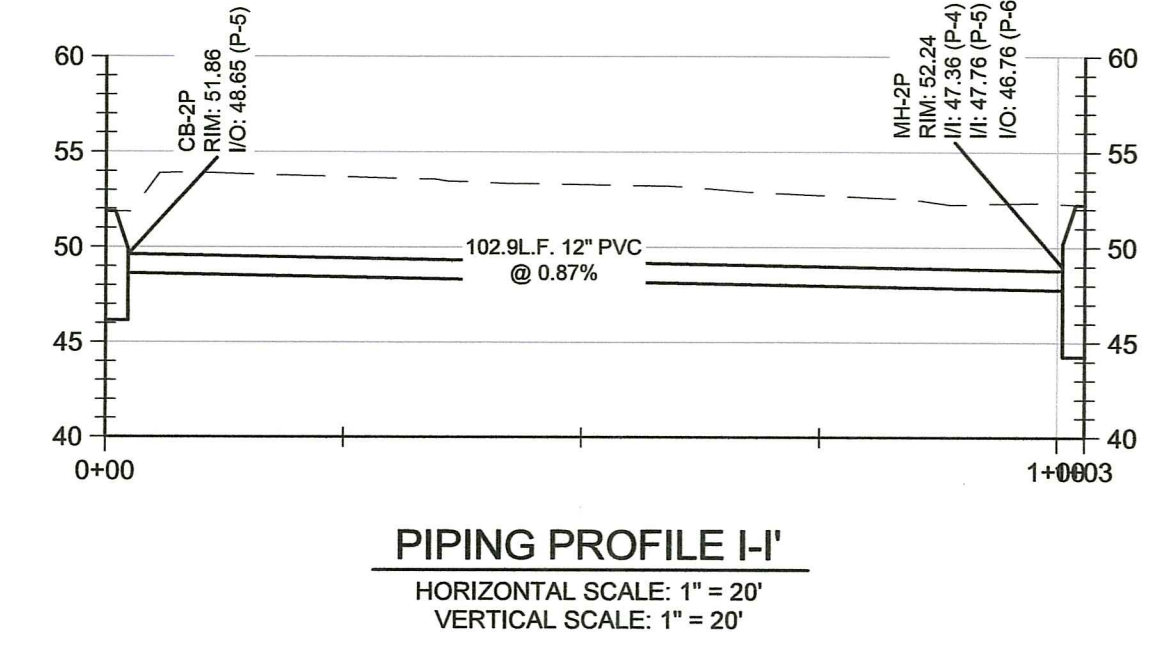
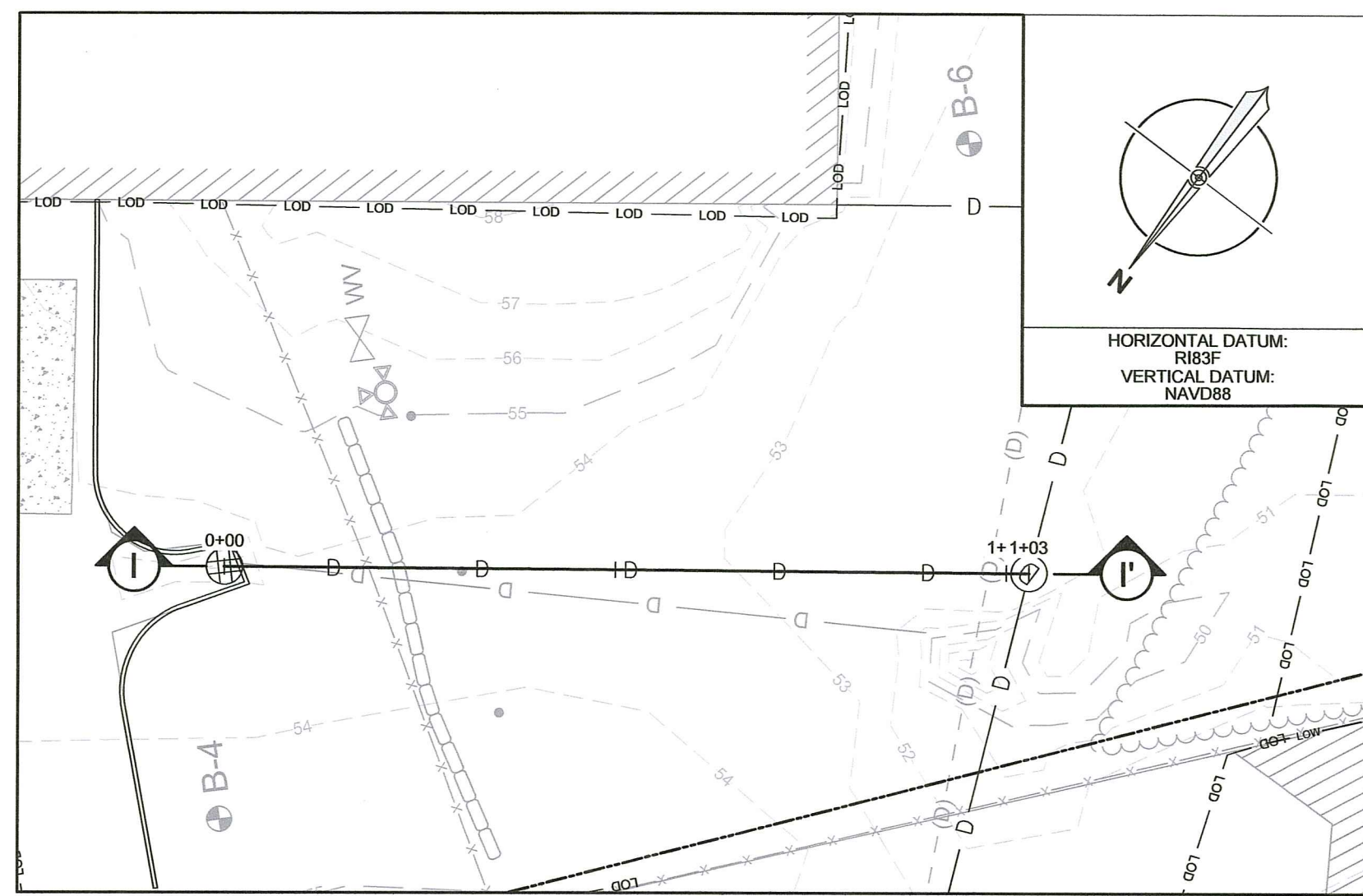
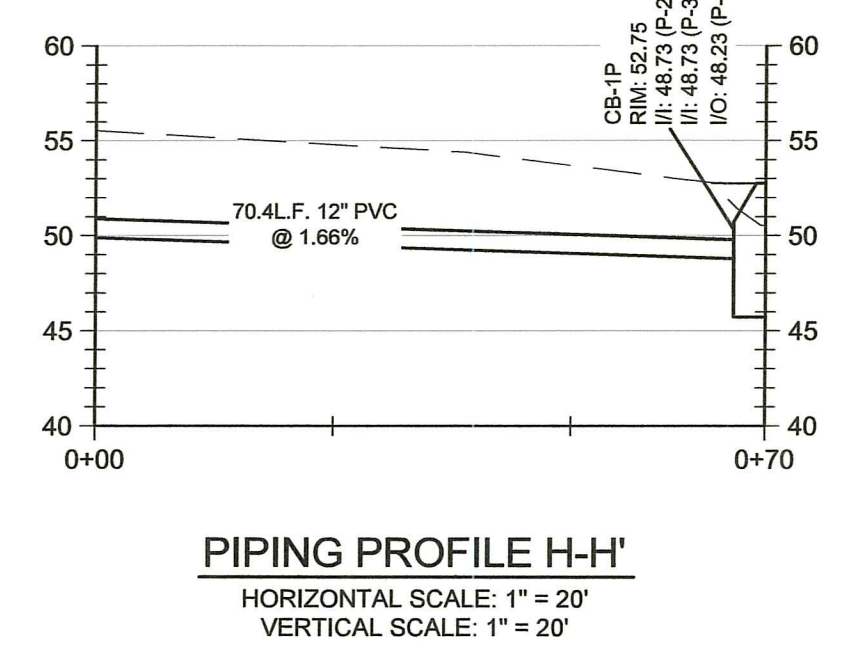
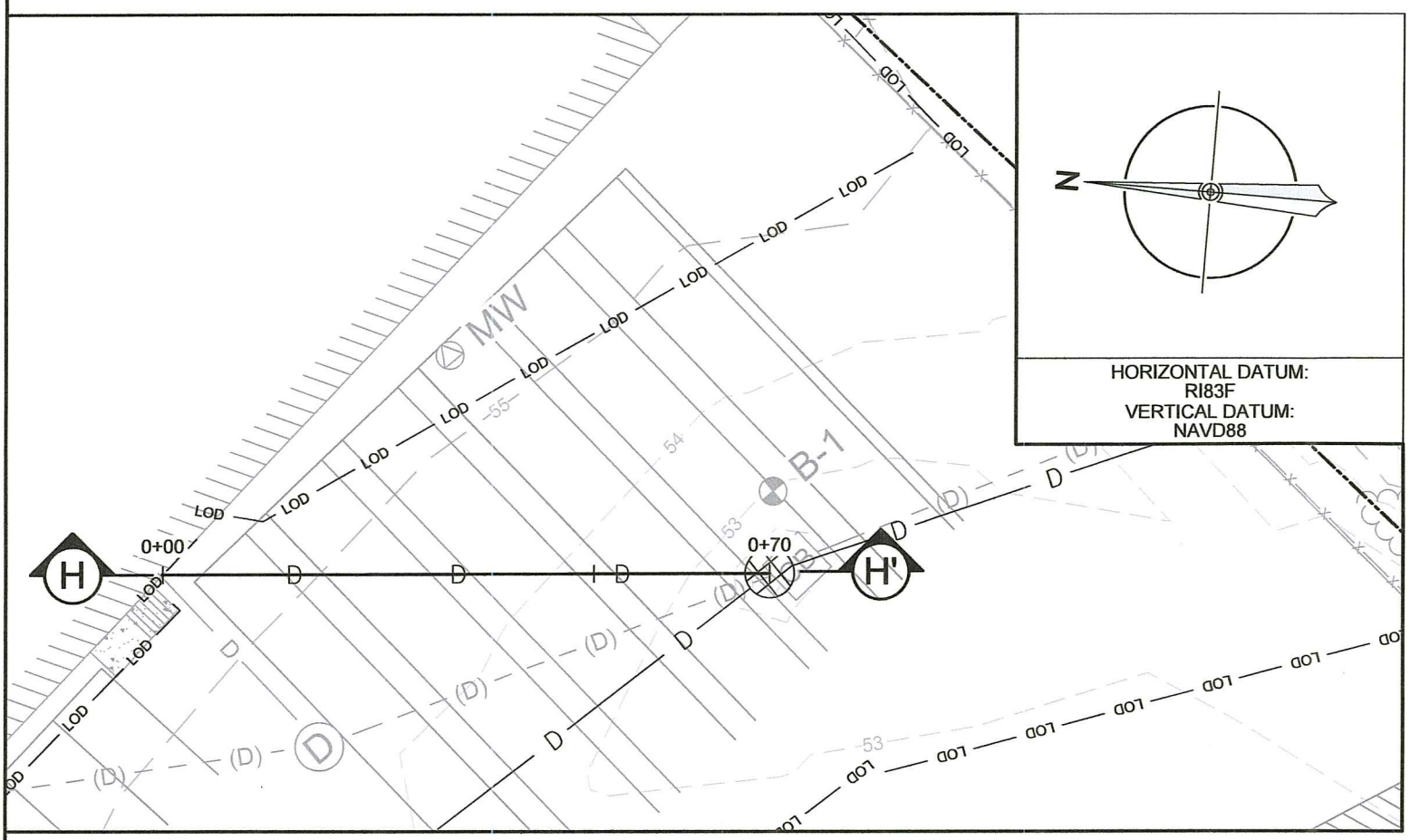
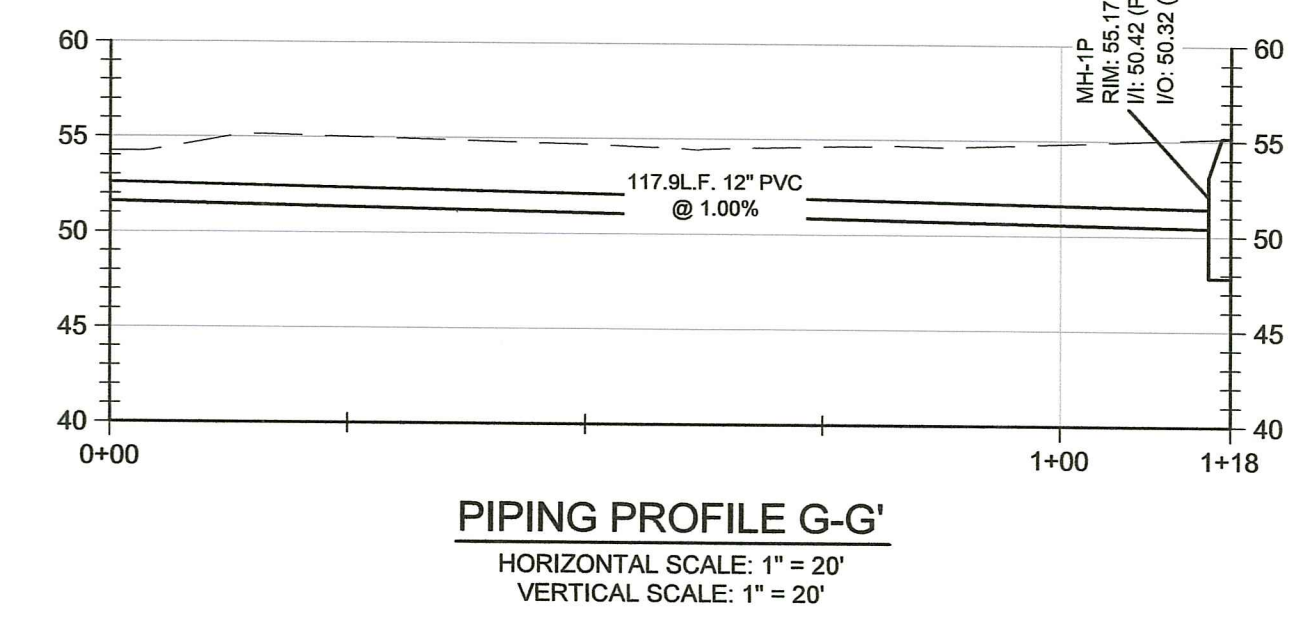
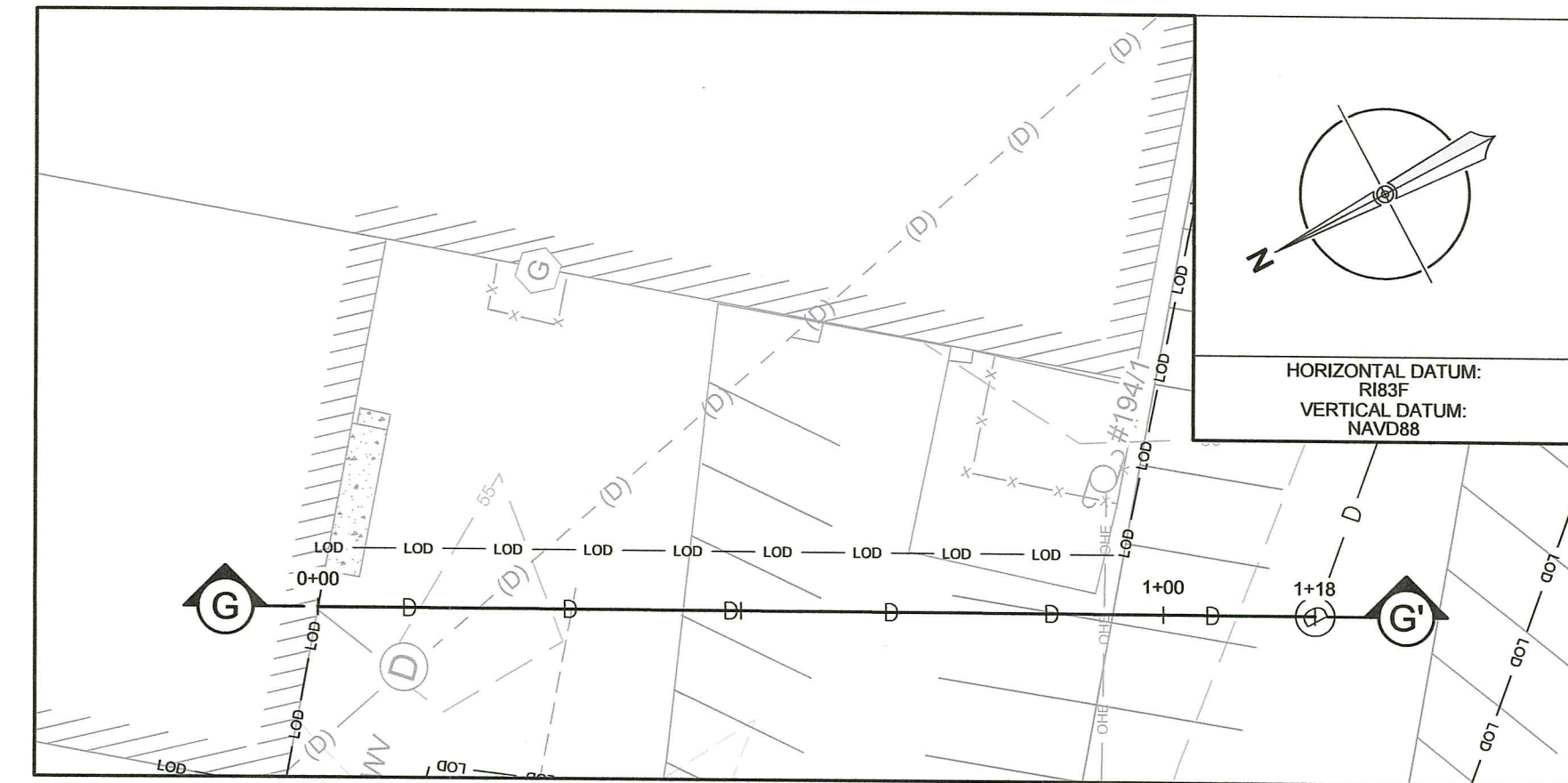
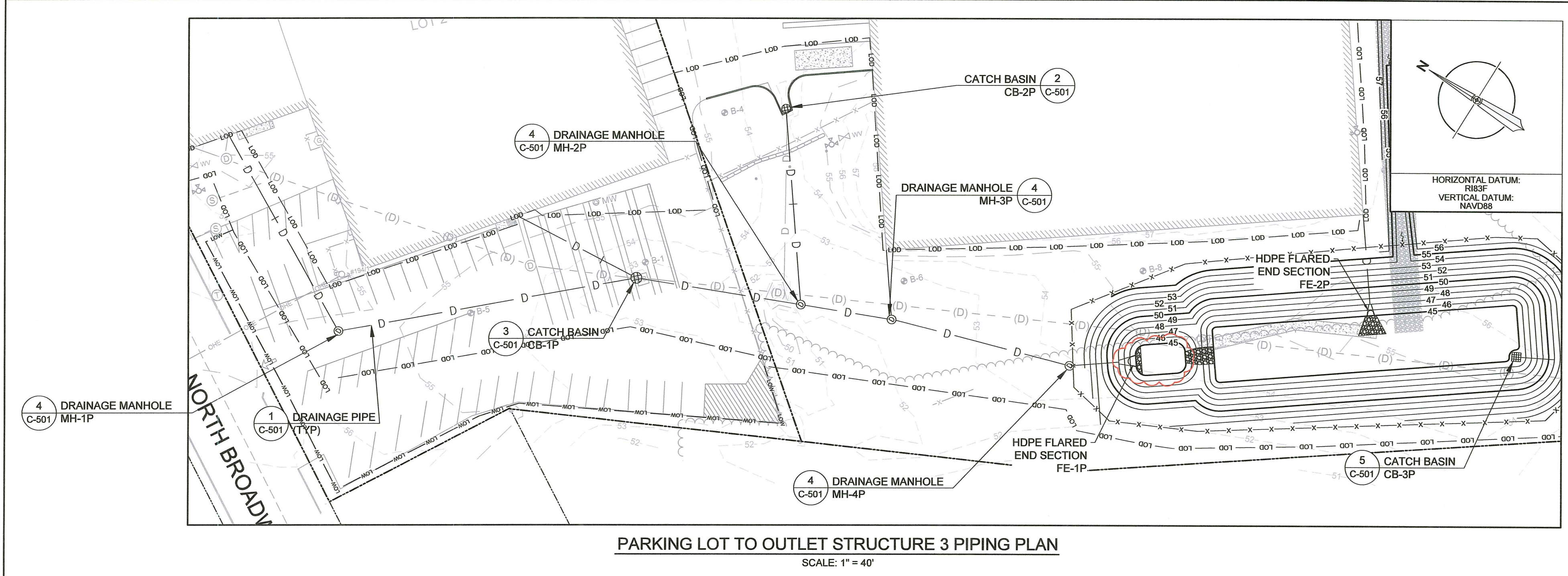
RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM  
APPROVED WITH CONDITIONS AS SPECIFIED IN THE LETTER OF APPROVAL  
DATED: AUG 01 2023 FILE #: 22-0275  
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
APPROVED PLANS MUST BE AT CONSTRUCTION SITE  
*Martin D. Wemcek*

Office of Water Resources  
JAN 05 2023

SCALE AS SHOWN  
FULL SIZE PLOT: 24" x 36"  
DATE: MAY 2022  
PROJECT NUMBER: 15995.01  
**C-301**  
SHEET: 9 OF 12

FILE PATH: \\MARACORP\PROJECTS\15995.01\SUBS\DWG\PLANSET\DWG\C-301 (CONSTR).DWG (PLOT: 15995.01.DWG)

PERMITTING DESIGN PLANS - NOT FOR CONSTRUCTION



RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM  
APPROVED WITH CONDITIONS AS  
SPECIFIED IN THE LETTER OF APPROVAL  
DATED: AUG 01 2023 FILE #: 32-0275  
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
APPROVED PLANS MUST BE AT CONSTRUCTION SITE

*Martin B. Wenczek*

STRUCTURE I.D.	INLET INVERT(S) (FT)	INLET PIPE DIAMETER(S) (IN)	OUTLET INVERT (FT)	OUTLET PIPE DIAMETER (IN)	RIM/GROUND ELEVATION (FT)
CB-1P	48.73, 48.73	12, 12	48.23	18	52.75
CB-2P	N/A	N/A	48.65	12	51.86
CB-3P	N/A	N/A	42.50	24	48.80
MH-1P	50.42	12	50.32	12	55.17
MH-2P	47.36, 47.76	18, 12	46.76	24	52.24
MH-3P	46.28, 47.18	24, 12	46.18	24	52.28
MH-4P	45.25	24	45.15	24	53.88
MH-5P	39.22	24	39.12	24	51.60
MH-6P	38.07	30	37.97	30	50.51
MH-7P	37.30	30	37.20	30	52.21
MH-8P	36.38	30	36.28	30	49.13
MH-9P	35.46	30	35.36	30	55.33
MH-10P	33.62	30	33.52	30	41.13
RL-1P	N/A	N/A	51.60	12	54.25
RL-2P	N/A	N/A	49.90	12	55.50
RL-3P	N/A	N/A	47.55	12	54.10
RL-4P	N/A	N/A	47.55	12	56.75
FE-1P	45.00	24	N/A	N/A	47.00
FE-2P	45.00	12	N/A	N/A	47.00
HW-1P	N/A	N/A	38.25	30	42.00
HW-2P	33.00	30	N/A	N/A	37.00

PIPE I.D.	UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	LENGTH (FT)	UPSTREAM INVERT (FT)	DOWNSTREAM INVERT (FT)	MIN. SLOPE %	DIA. (IN)
P-1	RL-1P	MH-1P	117.9	51.60	50.42	1.0%	12
P-2	MH-1P	CB-1P	158.5	50.32	48.73	1.0%	12
P-3	RL-2P	CB-1P	69.0	49.90	48.73	1.8%	12
P-4	CB-1P	MH-2P	87.2	48.23	47.36	1.0%	18
P-5	CB-2P	MH-2P	102.9	48.65	47.76	1.0%	12
P-6	MH-2P	MH-3P	48.2	46.76	46.28	1.0%	24
P-7	RL-3P	MH-3P	36.4	47.55	47.18	1.0%	12
P-8	MH-3P	MH-4P	96.3	46.18	45.25	1.0%	24
P-9	MH-4P	FE-1P	29.0	45.15	45.00	0.5%	24
P-10	RL-4P	FE-2P	47.0	47.55	45.00	5.4%	12
P-11	CB-3P	MH-5P	164.1	42.50	39.22	2.0%	24
P-12	MH-5P	MH-9P	65.3	39.12	37.16	3.0%	24
P-13	HW-1P	MH-6P	35.9	38.25	38.07	0.5%	30
P-14	MH-6P	MH-7P	133.7	37.97	37.30	0.5%	30
P-15	MH-7P	MH-8P	164.4	37.20	36.38	0.5%	30
P-16	MH-8P	MH-9P	164.4	36.28	35.46	0.5%	30
P-17	MH-9P	MH-10P	173.8	35.36	33.62	1.0%	30
P-18	MH-10P	HW-2P	12.8	33.52	33.00	4.1%	30

NOTE:  
CONTRACTOR SHALL INSTALL ALL PROPOSED PIPING AND FOUNDATIONS AND ASSOCIATED STRUCTURES IN ACCORDANCE WITH STRUCTURAL ENGINEER RECOMMENDATIONS.

IGUS, INC.  
REMEDIATION OF LAND SUBSIDENCE AND STORMWATER MANAGEMENT  
176 GREENWOOD AVE / 50 N BROADWAY  
EAST PROVIDENCE, RHODE ISLAND

STORMWATER PIPING PLAN & PROFILE SHEET II

EA Engineering, Science, and Technology, Inc., PBC  
301 Metro Center Blvd, Suite 102  
Warwick, Rhode Island 02886  
(401) 736-3440  
www.eaest.com

SCALE AS SHOWN  
FULL SIZE PLOT: 24" x 36"  
DATE: MAY 2022  
PROJECT NUMBER: 15995.01  
SHEET: 10 OF 12

DESIGN INFORMATION:  
DESIGNED BY: WRD/DT  
DRAWN BY: DTC  
CHECKED BY: RGM  
PROJECT MANAGER: FBP

REVISIONS:  
NO. BY DATE DESCRIPTION  
1. 15/05/2022

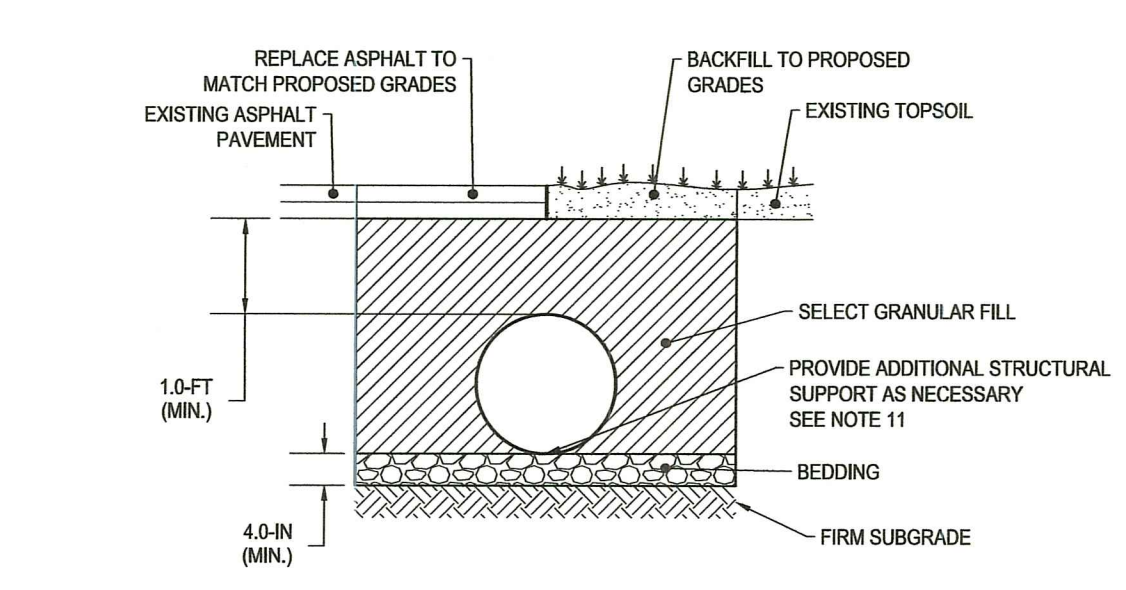
REGISTERED PROFESSIONAL ENGINEER  
No. 9823  
RONALD MACK

JAN 05 2023  
Office of Water Resources

C-302

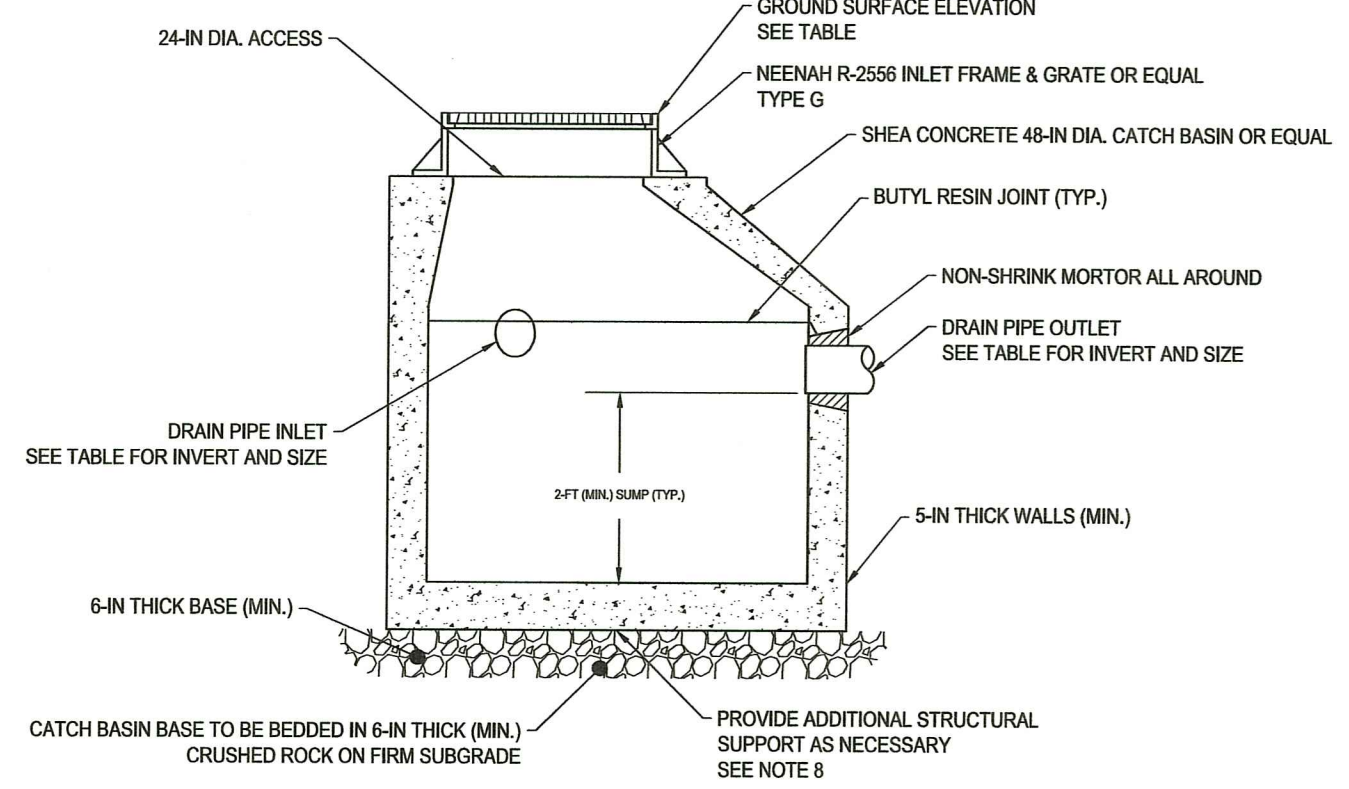
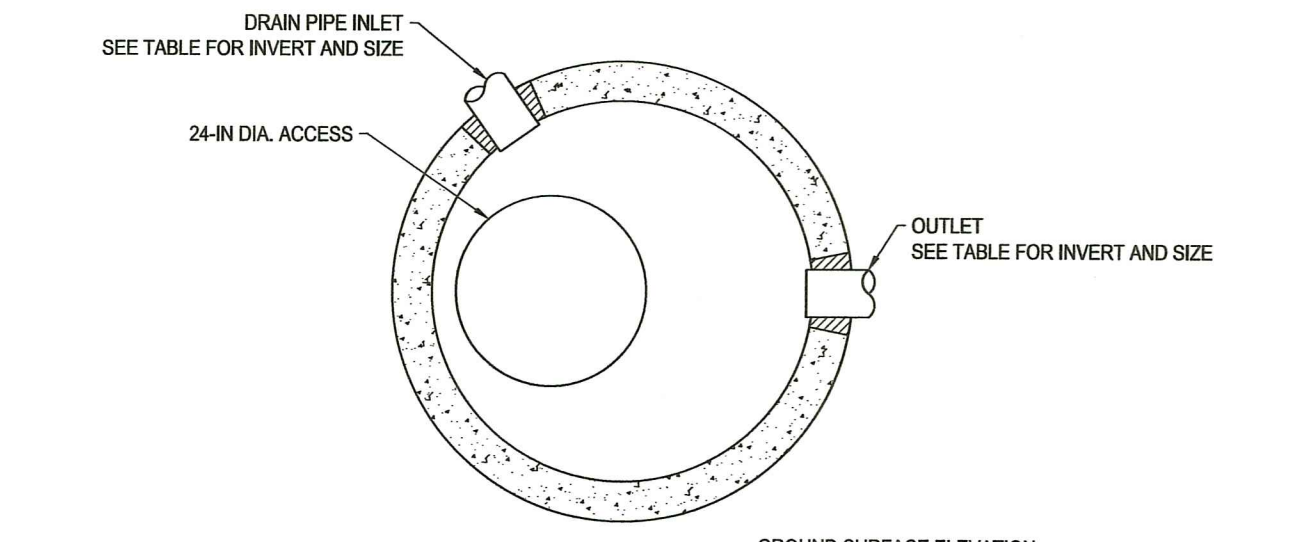
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PERMITTING DESIGN PLANS - NOT FOR CONSTRUCTION



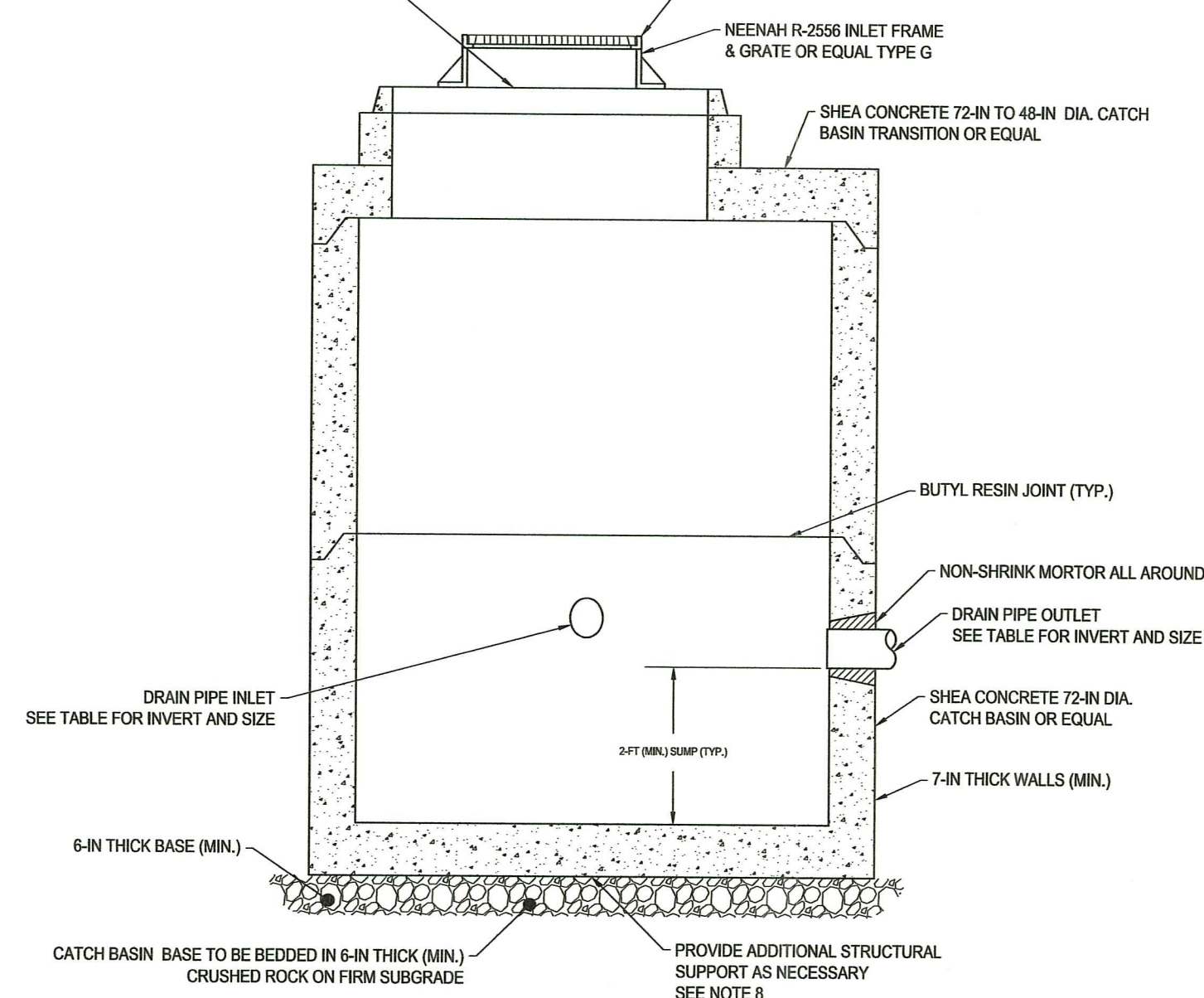
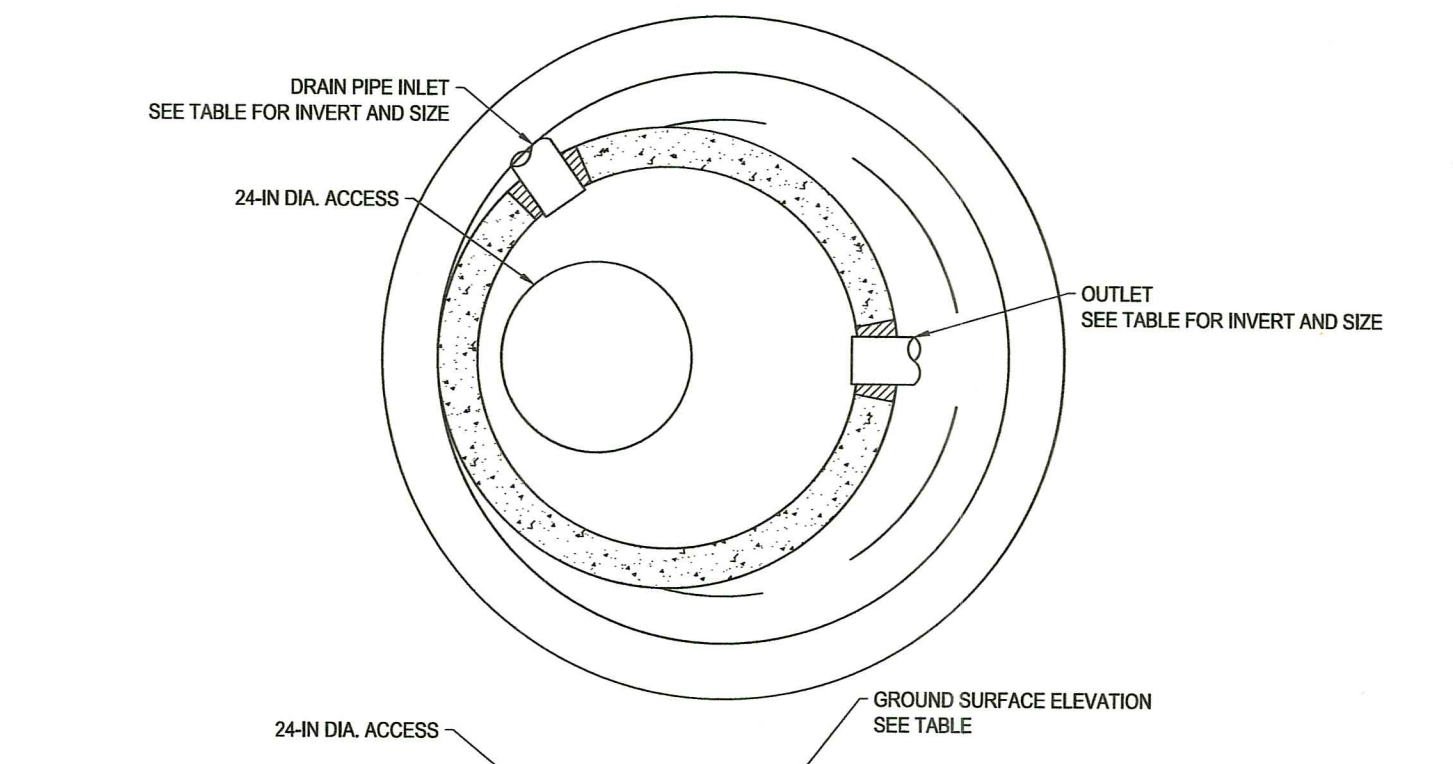
**1 DRAINAGE PIPE SECTION**  
 1/2" = 1'-0"  
 C-102, C-103, C-104, C-301

- NOTES:
- PIPE SHALL BE INSTALLED FOLLOWING ASTM D2231.
  - BEDDING SHALL BE CLASS 1, CLASS II, OR CLASS III MATERIAL WITH MINIMUM THICKNESS OF 4-INCHES.
  - SELECT GRANULAR FILL MATERIAL TO BE ASTM D2321 CLASS 2 OR APPROVED EQUAL. (COMPACTED TO MIN. 90% STANDARD DENSITY) MAXIMUM PARTICLE SIZE IS 1/2".
  - MINIMUM COVER SHALL BE 1-FT TO BOTTOM OF PAVEMENT.
  - MINIMUM TRENCH WIDTH SHALL BE EQUAL TO 1.5 TIMES THE PIPE DIAMETER WITH PLUS 12 RICHES.
  - ALL PIPE TO BE CENTER ADJUST OR EQUAL ADJUST.
  - PIPE BEDDING SHALL BE INSTALLED TO PROVIDE A STABLE AND UNIFORM SURFACE FOR THE INSTALLATION OF THE PIPE.
  - ALL SOIL TO BE IMPROVED TO MEET TO COMPLY WITH FEDERAL RESIDENTIAL DIRECT EXPLOSION CRITERIA PER FEDERAL REMEDIATION REGULATIONS, 2011 PROVISIONS.
  - ALL SOIL TO BE APPROVED BY THE ENGINEER PRIOR TO USE.
  - PROVIDE GEOTEXTILE TO PREVENT SOIL MIGRATION.
  - PROVIDE ADDITIONAL FOUNDATION SUPPORT WITH HELICAL PILES OR APPROVED EQUAL, WHEN PROPOSED IN GYPSUM FILL AS REQUIRED BY THE STRUCTURAL/GEOTECHNICAL ENGINEER.
  - RESTORE DISTURBED PAVEMENT TO MATCH EXISTING ASPHALT LAYER THICKNESS. RESTORE ASPHALT TO EXISTING GRADES UNLESS OTHERWISE NOTED.



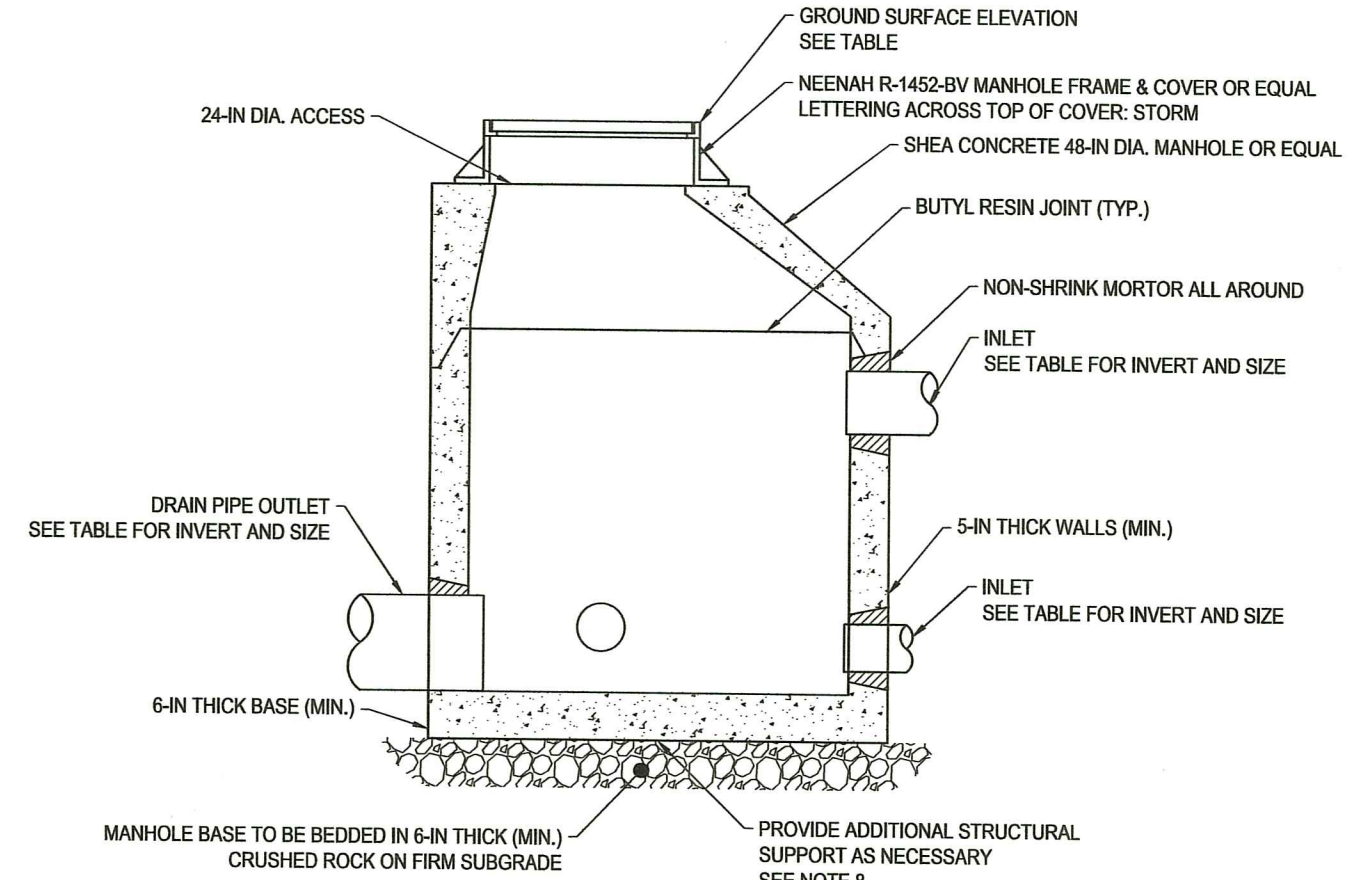
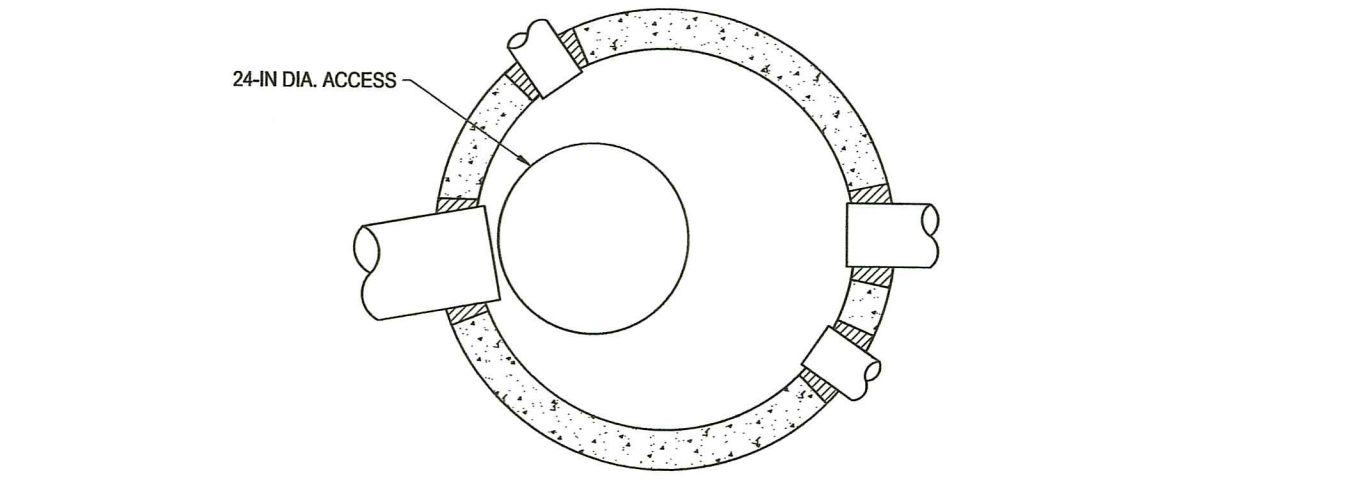
**2 CATCH BASIN - 48" Ø**  
 1/2" = 1'-0"  
 C-102, C-103, C-104, C-301

- NOTES:
- PROVIDE LIFTING HOLES OR DEVICES FOR ALL PRECAST SECTIONS. HOLES THRU WALLS SHALL BE PLUGGED WITH NEOPRENE OR RUBBER PLUG INSERTS, MORTARED FLUSH ON EACH SIDE OF WALL WITH NON-SHRINK GROUT. HOLES NOT COMPLETELY THRU WALL SHALL BE FILLED FLUSH WITH NON-SHRINK GROUT.
  - PROVIDE FLEXIBLE GASKET CONNECTOR BETWEEN PIPE AND CATCH BASIN STRUCTURE.
  - CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
  - REINFORCED STEEL SHALL CONFORM TO LATEST ASTM A118 SPECIFICATION, H-20 DESIGN LOADING PER AASHTO HS-20-44, AND PRECAST REINFORCED CONCRETE MANHOLE SECTIONS ASTM C418.
  - BUTYL RESIN JOINT SHALL CONFORM TO LATEST ASTM C890 SPECIFICATION.
  - PRECAST CATCH BASIN SHALL BE MANUFACTURED BY SHEA CONCRETE PRODUCTS OR APPROVED EQUAL.
  - SEE STRUCTURES TABLE ON THIS SHEET FOR RIM AND INVERT ELEVATIONS FOR ALL STRUCTURES.
  - PROVIDE ADDITIONAL FOUNDATION SUPPORT WITH HELICAL PILES OR APPROVED EQUAL, WHEN PROPOSED IN GYPSUM FILL.



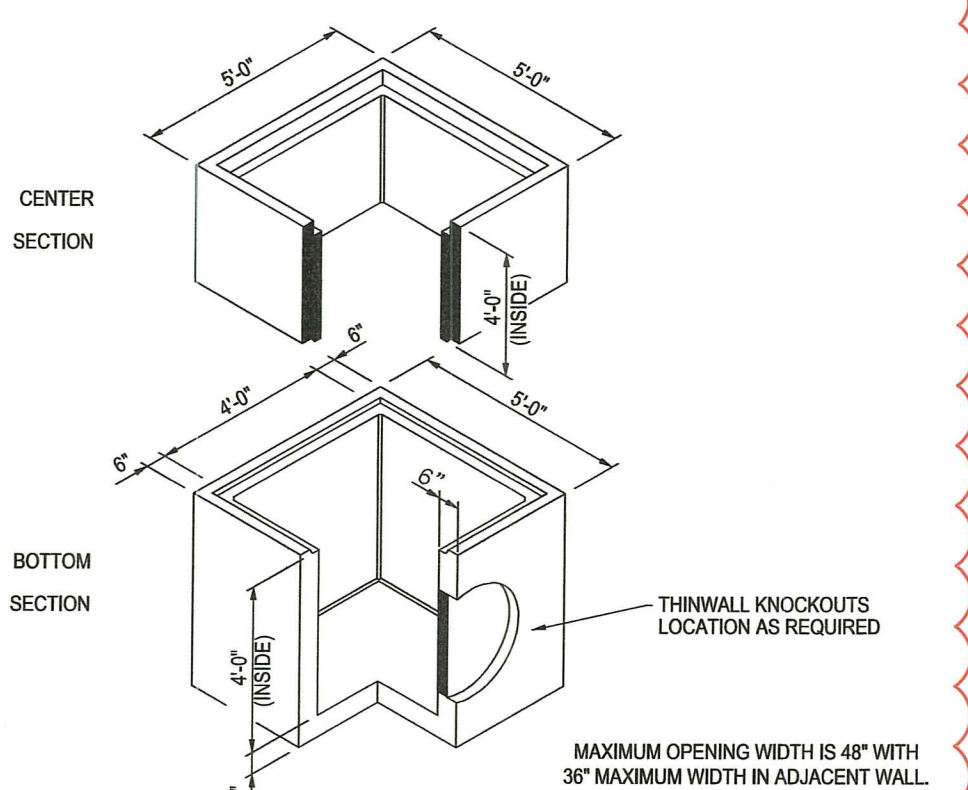
**3 CATCH BASIN - 72" Ø**  
 1/2" = 1'-0"  
 C-102, C-103, C-104, C-301

- NOTES:
- PROVIDE LIFTING HOLES OR DEVICES FOR ALL PRECAST SECTIONS. HOLES THRU WALLS SHALL BE PLUGGED WITH NEOPRENE OR RUBBER PLUG INSERTS, MORTARED FLUSH ON EACH SIDE OF WALL WITH NON-SHRINK GROUT. HOLES NOT COMPLETELY THRU WALL SHALL BE FILLED FLUSH WITH NON-SHRINK GROUT.
  - PROVIDE FLEXIBLE GASKET CONNECTOR BETWEEN PIPE AND CATCH BASIN STRUCTURE.
  - CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
  - REINFORCED STEEL SHALL CONFORM TO LATEST ASTM A118 SPECIFICATION, H-20 DESIGN LOADING PER AASHTO HS-20-44, AND PRECAST REINFORCED CONCRETE MANHOLE SECTIONS ASTM C418.
  - BUTYL RESIN JOINT SHALL CONFORM TO LATEST ASTM C890 SPECIFICATION.
  - PRECAST CATCH BASIN SHALL BE MANUFACTURED BY SHEA CONCRETE PRODUCTS OR APPROVED EQUAL.
  - SEE STRUCTURES TABLE ON THIS SHEET FOR RIM AND INVERT ELEVATIONS FOR ALL STRUCTURES.
  - PROVIDE ADDITIONAL FOUNDATION SUPPORT WITH HELICAL PILES OR APPROVED EQUAL, WHEN PROPOSED IN GYPSUM FILL.



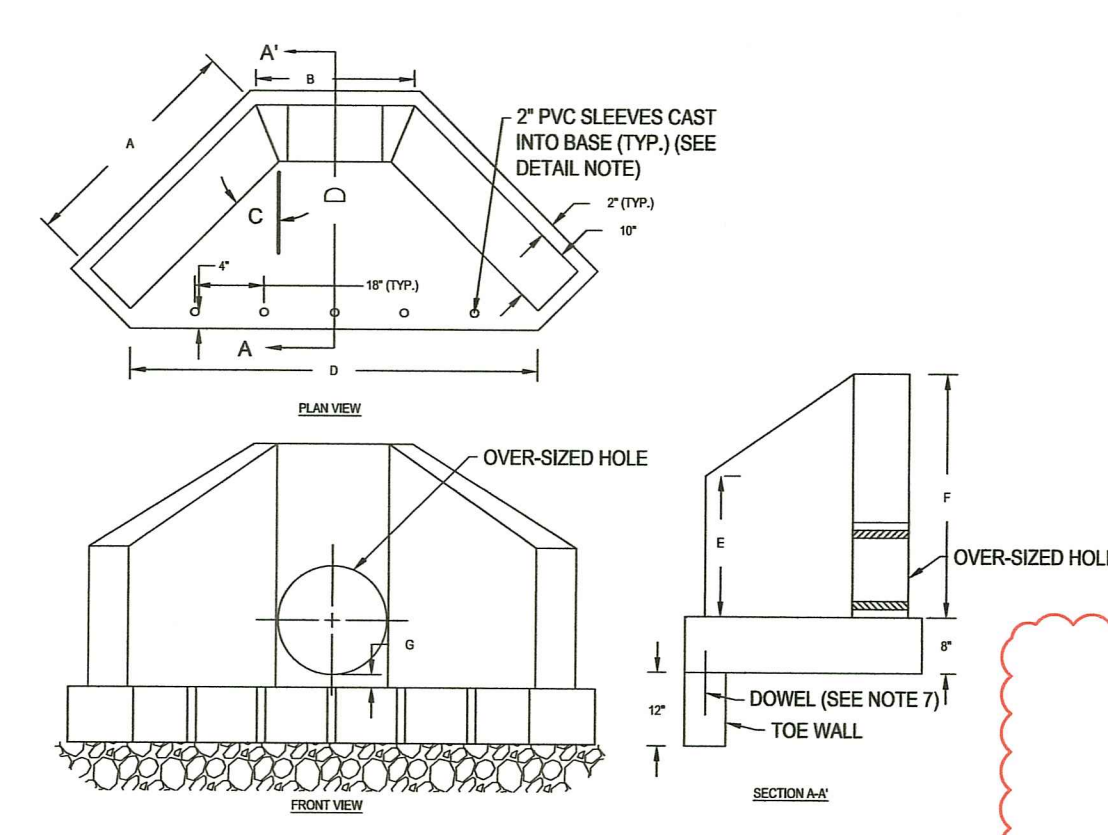
**4 DRAINAGE MANHOLE - 48" Ø**  
 1" = 1'-0"  
 C-102, C-103, C-104, C-301

- NOTES:
- PROVIDE LIFTING HOLES OR DEVICES FOR ALL PRECAST SECTIONS. HOLES THRU WALLS SHALL BE PLUGGED WITH NEOPRENE OR RUBBER PLUG INSERTS, MORTARED FLUSH ON EACH SIDE OF WALL WITH NON-SHRINK GROUT. HOLES NOT COMPLETELY THRU WALL SHALL BE FILLED FLUSH WITH NON-SHRINK GROUT.
  - PROVIDE FLEXIBLE GASKET CONNECTOR BETWEEN PIPE AND MANHOLE.
  - CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
  - REINFORCED STEEL SHALL CONFORM TO LATEST ASTM A118 SPECIFICATION, H-20 DESIGN LOADING PER AASHTO HS-20-44, AND PRECAST REINFORCED CONCRETE MANHOLE SECTIONS ASTM C418.
  - BUTYL RESIN JOINT SHALL CONFORM TO LATEST ASTM C890 SPECIFICATION.
  - PRECAST MANHOLE SHALL BE MANUFACTURED BY SHEA CONCRETE PRODUCTS OR APPROVED EQUAL.
  - SEE STRUCTURES TABLE ON THIS SHEET FOR RIM AND INVERT ELEVATIONS FOR ALL STRUCTURES.
  - PROVIDE ADDITIONAL FOUNDATION SUPPORT WITH HELICAL PILES OR APPROVED EQUAL, WHEN PROPOSED IN GYPSUM FILL.



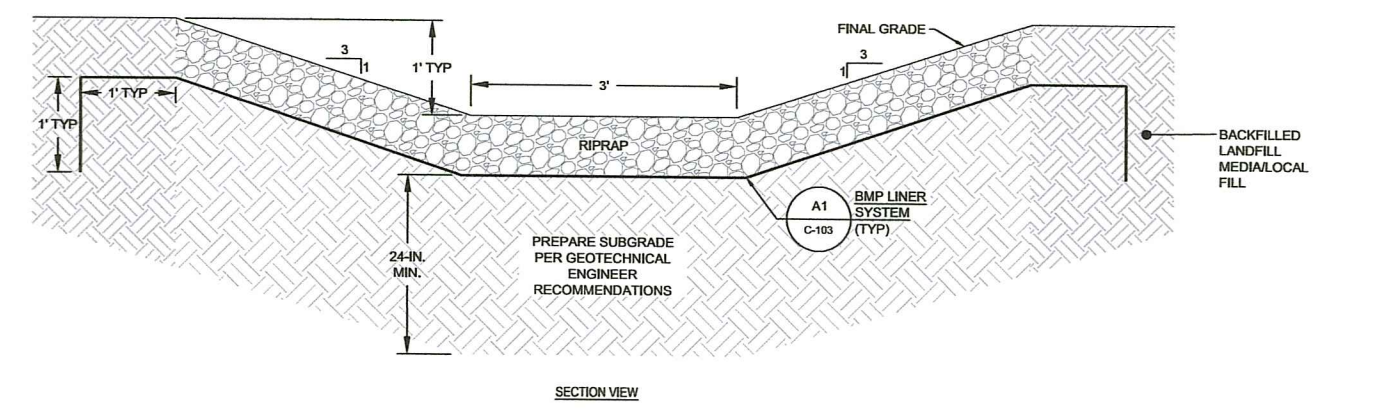
**5 SQUARE CATCH BASIN**  
 NTS  
 C-102, C-103, C-301

- NOTES:
- PROVIDE SQUARE BEEHIVE GRATE.
  - ALL CONCRETE SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF 4500 PSI.
  - REINFORCING STEEL SHALL COMPLY WITH ASTM A615 GRADE 60, A706 GRADE 60 OR A497 GRADE 70. BAR BENDING AND PLACEMENT SHALL COMPLY WITH THE LATEST ACI STANDARDS.
  - STANDARD STRUCTURAL DESIGN IS BASED ON AASHTO HS 20 WHEEL LOADING.
  - WATER TABLE IS AT 3'-0" BELOW GRADE FOR STANDARD STRUCTURAL DESIGN.
  - THE STANDARD DESIGN IS BASED ON THE TOP AT GRADE AND THE BASE AT 8'-0" MAX. BELOW GRADE.
  - THE STRUCTURE SHALL BE PLACED ON A COMPACTED GRANULAR BASE TO INSURE UNIFORM DISTRIBUTION OF SOIL PRESSURES.
  - SPECIAL DESIGNS BASED ON OTHER LOADINGS OR DEEPER INSTALLATION DEPTHS ARE AVAILABLE ON REQUEST.
  - KNOCKOUTS OR PIPE OPENINGS OR CAN BE PROVIDED IN THE SIZE AND LOCATIONS REQUIRED.
  - PROVIDE PRECAST OLDCASTLE 48" X 48" I.D. SQUARE CATCH BASIN OR APPROVED EQUAL.
  - PROVIDE ADDITIONAL FOUNDATION SUPPORT WITH HELICAL PILES OR APPROVED EQUAL WHEN PROPOSED IN GYPSUM FILL.



**6 HEAD WALL**  
 NTS  
 C-102, C-103, C-104, C-301

- NOTES:
- USE AIR CONCRETE CUSTOM PRECAST HEADWALL WITH APRON OR ENGINEER APPROVED EQUAL.
  - CONCRETE 28 DAY COMPRESSIVE STRENGTH = 4,000 PSI.
  - REINFORCEMENT REBAR GRADE 60 PER ASTM A615.
  - TOLERANCES TO CONFORM TO ASTM C890.
  - INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
  - EXPOSED EDGES TO BE CHAMFERED 1"x4".
  - 2-INCH DIAMETER PVC SLEEVES SHALL BE CAST INTO THE BASE OF THE HEADWALL AND TO BE USED AS GUIDES FOR DRILLING AND DOWELING (4) BARS INTO THE SEPARATE TOE WALL (8-INCHES DEEP) BY CONTRACTOR IN THE FIELD. DOWEL BARS TO BE SUPPLIED AND INSTALLED BY CONTRACTOR IN THE FIELD.
  - STRUCTURE SHALL BE INSTALLED ON 12-IN THICK (MIN.) CRUSHED ROCK BEDDING OVER WOVEN MONOFLAMMENT FABRIC OVER FIRM SUBGRADE.
  - PROJECT PIPE 2 INCHES BEYOND HEADWALL AS SHOWN ON PLAN.



**7 LINED SWALE**  
 NTS  
 C-106

- NOTES:
- PROVIDE RHODE ISLAND CLASS R-3 RIPRAP.
  - GEOMEMBRANE SHALL BE KEYED INTO SOIL WITH AN ANCHOR TRENCH AS SHOWN.
  - INSTALLATION SURFACES MUST BE FREE OF STONES, ORGANIC MATTER, IRREGULARITIES, PROTRUSIONS, LOOSE SOIL, OR ABRUPT CHANGES.

RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
 OFFICE OF WATER RESOURCES  
 FRESHWATER WETLANDS PROGRAM  
 APPROVED WITH CONDITIONS AS  
 SPECIFIED IN THE LETTER OF APPROVAL  
 DATED: AUG 01 2023 FILE #: 23-0275  
 NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
 APPROVED PLANS MUST BE AT CONSTRUCTION SITE  
*Martin D. Wenczek*

IGUS, INC.  
 REMEDIATION OF LAND SUBSIDENCE AND STORMWATER MANAGEMENT  
 176 GREENWOOD AVE / 50 N BROADWAY  
 EAST PROVIDENCE, RHODE ISLAND

DETAILS - STORMWATER INFRASTRUCTURE

**EA**  
 EA Engineering, Science,  
 and Technology, Inc., PBC  
 301 Metro Center Blvd, Suite 102  
 Warwick, Rhode Island 02886  
 (401) 736-3440  
 www.eaest.com

SCALE AS SHOWN  
 FULL SIZE PLOT: 24" x 36"  
 DATE: MAY 2022  
 PROJECT NUMBER: 15995.01  
**C-501**  
 SHEET: 11 OF 12

RI Environmental Management  
 Office of Water Resources  
 JAN 05 2023

FILE PATH: \\MARVIN\WORKSPACE\PROJECTS\15995.01 - IGUS\PLANSET\DWG\C-501.DWG, D:\AN\_1540222\_8\_64.AM

PERMITTING DESIGN PLANS - NOT FOR CONSTRUCTION

