



OPERATION AND MAINTENANCE MANUAL

For

490 Elizabeth Ave

BLOCK 514, LOT 34

Located in

TOWNSHIP OF FRANKLIN

SOMERSET COUNTY, NEW JERSEY

Prepared by

HAMMER LAND ENGINEERING
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(732) 899-0898

A handwritten signature in black ink, reading "Michael A. Rodrigues", is written over a solid black horizontal line.

Michael A. Rodrigues, PE
NJ Professional Engineer License # 48141

19201
July 23, 2020

X:\19201 ALPHA FC 490 Elizabeth Ave\Project Management\Reports\O and M Manual\2020-07-23 O&M Manual.docx

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I. INTRODUCTION

The subject property is approximately 5.50 acres and is known as Block 514, Lot 34 as shown on the tax maps of the Township of Franklin. This project site is bounded by Elizabeth Avenue to the east, Franklin High School property to the south, a residential property to the north and vacant wooded property to the east. A tributary to the Raritan River is located at the northwesterly corner of the site.

The project proposes to construct a off-warehouse building with associated loading docks, car parking, driveways, stormwater management facilities, utilities, landscaping and lighting.

II. BACKGROUND DATA

Please note that this report has been written pursuant to N.J.A.C. 7:8-5.8 Stormwater Management Maintenance Requirements.

Please refer to “Stormwater Management Report for 490 Elizabeth Ave” prepared by Hammer Land Engineering dated July 23, 2020 for location of the stormwater management facilities and the approximate drainage areas.

III. OWNERSHIP AND MAINTENANCE RESPONSIBILITY

Any future revisions to this Manual shall be recorded upon the deed of records for the property in question.

The following party shall be responsible for construction and maintenance of the on-site stormwater management facilities:

Executive Drive Investments, LLC
53 Knightsbridge Road, Suite 201
Piscataway, NJ 08854

This party shall be responsible for:

- a. Maintaining a detailed log of all perspective and corrective maintenance, including a record of all inspections and copies of all maintenance related work orders.
- b. Evaluating the effectiveness of the maintenance plan at least once per year and adjust the plan and deed as needed.
- c. Retaining and making available, upon request by any public entity with administrative, health, environmental, or safety authority over the site, the maintenance plan and the documentation required by ‘a’ and ‘b’ above.

IV. ROUTINE INSPECTION AND MAINTENANCE OF FACILITIES

For the proposed development, the Water Quality requirement (minimum runoff treatment to 80% TSS removal from a storm consisting of 1.25-in. of rainfall over 2 hours, or WQ storm event) will be satisfied via manufactured treatment device (ADS BaySaver Barracuda at 50% TSS Removal) and an extended detention basin (providing 60% TSS Removal).

The WQ storm event runoff from the proposed on-site pavements will be conveyed through the extended detention basin before receiving final treatment from the manufactured treatment device. The proposed extended detention basin is a combination of an above ground volume and an underground stormwater basin which consists of perforated, HDPE chambers within a crushed stone layer. This system is also designed to attenuate the flows from the 2, 10, and 100-year storm events.

The proposed extended detention basin and manufactured water quality treatment device will provide proper control of stormwater and water quality. Without proper routine inspection and maintenance, this stormwater management facilities may lose some or all of its capability.

Routine maintenance of this facility should be separated into two basic types. Functional maintenance is required to ensure safe and effective operation. This can be further broken down into the two categories of preventative and corrective maintenance. The Inspector shall be a Professional Engineer licensed in the State of New Jersey. The following are the preventative and corrective maintenance procedures that are to be performed on a routine basis:

1. Preventative Maintenance Procedures

The purpose of preventative maintenance inspections is to ensure that the stormwater management aspects of the facilities remain operational and safe at all times, while minimizing the need for corrective or emergency maintenance.

a. Vegetated Areas

Mowing and/or trimming of vegetation must be performed on a regular schedule based on specific site conditions. Grass should be mowed at least once a month during growing season. Vegetated areas must be inspected at least annually for erosion and scour. Vegetated areas should also be inspected at least once annually for unwanted growth, which should be removed with minimum disruption to the planting soil bed and remaining vegetation.

When establishing or restoring vegetation, biweekly inspections of vegetation health should be performed during the first growing season or until vegetation is established. Once established, inspections of vegetation health, density, and diversity should be performed at least twice annually during both the growing and non-growing seasons. The vegetative cover should be maintained at 85 percent. If vegetation has greater than 50 percent damage, the area should be reestablished in accordance with the original specifications and the inspection requirements presented above.

All use of fertilizers, mechanical treatments, pesticides and other means to assure optimum vegetation health should not compromise the intended purpose of the rain garden system. All vegetation deficiencies should be addressed without the use of fertilizers and pesticides whenever possible.

b. Sediment Removal and Disposal

The stormwater management facilities should be evaluated for excessive deposition of sediment. Accumulated sediment should be removed before it threatens the storage volume. Sediment removal should take place when the facilities are thoroughly dry. Consideration should be given to evacuating all standing water before de-silting activities are performed. This may be accomplished by means of pumping the water out. An appropriate stand-by pump should be available for this procedure. These tasks should be performed on a quarterly basis as well as after every storm exceeding one inch of rainfall. Should a recurrent problem develop, the inspector should identify the upstream sources of sediment and recommend required stabilization measures.

c. Removal and Disposal of Trash and Debris

A regularly scheduled program of debris and trash removal will reduce the chance of components becoming clogged and inoperable during storm events. Additionally, removal of trash and debris will prevent possible damage to vegetated areas and eliminate potential mosquito breeding habitats. Disposal of debris and trash should be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations. These tasks should be performed on a quarterly basis as well as after every storm exceeding one inch of rainfall.

d. Structural Components

All structural components must be inspected for cracking, subsidence, spalling, and deterioration at least annually.

e. Elimination of Potential Mosquito Breeding Habitats

The most effective mosquito control program is one that eliminates potential breeding habitats. Almost any stagnant pool of water can be attractive to mosquitoes, and the source of a large mosquito population. A maintenance program dedicated to eliminating potential breeding areas is certainly preferable to chemical means of controlling mosquitoes. The most important maintenance function, which can be performed in this case, is to make sure that all obstructions to natural flow patterns are removed before the stagnant water condition can develop.

f. Inspection

Regularly scheduled maintenance inspections of the facility should be performed by the consulting professional engineer at least once a year. These inspections are separate from the "Routine" inspections discussed above. The primary purpose of these inspections is to ascertain the operational condition and safety of the facilities. Inspections will also provide information on the effectiveness of regularly scheduled Preventative Maintenance Procedures and will help to identify where changes in the extent and scheduling of the procedures are warranted. Finally, the facilities inspections should also be used to determine the need for and timing of Corrective Maintenance procedures. It should be noted that, in addition to regularly scheduled inspections, the owners or their representatives should perform an informal inspection of the facilities during every visit to the site.

g. Reporting

The recording of all maintenance work and inspections provide valuable data on the facilities condition. Review of this information will also help to establish more efficient and beneficial maintenance procedures and practices. All recorded information should be directed to the owners of the facilities for review and subsequent follow-up on recommendations. Data obtained from informal inspections should be retained, however, this data does not have to be submitted to NJDEP.

2. Corrective Maintenance Procedures

a. Removal of Debris and Sediment

In the event of failure of the wet pond, sediment, debris and trash, which threaten the discharge capacity of the facilities, should be removed immediately and disposed of properly. Equipment and personnel must be available to perform the removal work on short notice. As noted previously, it

is recommended that all water be evacuated from the facilities before any significant amount of sediment or settled debris or trash is removed. The lack of an available disposal site should not delay the removal of trash, debris, and sediment. Temporary disposal sites should be utilized if necessary.

b. Structural Repairs

Structural damage to inlet structures and outlet structures from vandalism, flood events, or other causes must be repaired promptly. Equipment, materials and personnel must be available to perform these repairs on short notice. The immediacy of the repairs will depend upon the nature of the damage and its effects on the safety and operation of the facility. The consulting professional engineer should only undertake the analysis of structural damage and the design and performance of structural repairs.

c. Extermination of Mosquitoes

If neglected, the stormwater facilities can readily become an ideal mosquito breeding area. Extermination of mosquitoes will usually require the services of the County Mosquito Commission. If mosquito control in the facilities becomes necessary, the preventative maintenance program should also be re-evaluated, and more emphasis placed on control of mosquito breeding habitats.

d. Snow and Ice Removal

Accumulations of snow and ice can threaten the functioning of the facilities. Providing the equipment, material and personnel to monitor and remove snow and ice from these critical areas is necessary to assure the continued functioning of the facility during the winter months.

3. Summary of Maintenance Procedures

Preventative Maintenance

- a) Sediment Removal and Disposal
- b) Removal and Disposal of Trash and Debris
- c) Structural Components
- d) Elimination of Mosquito Breeding Habitats
- e) Inspection
- f) Reporting

Corrective Maintenance

- a) Removal of Debris and Sediment
- b) Structure Repairs
- c) Extermination of Mosquitoes
- d) Snow and Ice Removal

V. MAINTENANCE EQUIPMENT AND MATERIALS

The following is a list of the equipment and materials that may be required to maintain the stormwater facilities:

Transportation Equipment

- 1. Trucks for Transportation of Materials
- 2. Trucks for Transportation of Equipment
- 3. Vehicles for Transportation of Personnel

Debris, Trash and Sediment Removal Equipment

- 1. High-power vacuums
- 2. High-power washers
- 3. Portable Pump for Dewatering

Miscellaneous Equipment

- 1. Shovels
- 2. Wheel Barrows
- 3. Gloves
- 4. Standard Mechanics Tools
- 5. Tools for Maintenance of Equipment

Materials

- 1. Spare Parts for Equipment repair

VI. DESIGN INFORMATION

A. Manufactured Treatment Devices

Structure ID	PROP. WQ STR. #1
Manufacture & Model of MTD:	ADS BaySaver <i>Barracuda S4</i>
State Plane Coordinates:	(N) 615,001' (E) 478,513'
System Configuration (on-line/off-line):	ON-LINE
Design TSS Removal Rate:	50%
Water Quality Storm Peak Flowrate (1.25" rainfall over 2 hours, NJ Water Quality Storm event)	0.20 CFS
By-Pass Design Peak Flowrate (100-year storm discharge from extended detention basin)	22.10 CFS

B. Extended Detention System

Above Ground Detention State Plane Coordinates:		(N) 614,921 (E) 479,473			
Underground Detention Manufacture & Model:		ADS StormTech <i>MC-3500 Chambers</i>			
State Plan Coordinates:		(N) 614,774 (E) 478,870			
Number of Chambers:					
Underground Detention Manufacture & Model:		ADS StormTech <i>SC-710 Chambers</i>			
State Plan Coordinates:		(N) 614,938 (E) 478,981			
Number of Chambers		296			
Outlet Structure ID: Outflow devices:		OS#3 3" Orifice Inv. 71.50; 1'-5" Weir El. 72.40			
Design Storm Frequency	Water Quality	2-year	10-year	25-year	100-year
Rainfall Depth	1.25 in. (2 Hours)	3.34 in. (24 Hour)	5.01 in. (24 Hour)	6.15 in. (24 Hour)	8.21 in. (24 Hour)
Design Inflow Volume (Ac.-ft)	0.317	1.288	2.216	2.886	4.137
Peak Discharge Flowrate (cfs)	0.20	2.96	8.12	12.32	20.22
Peak Water Surface Elevation	72.36	73.11	73.81	74.28	75.03
Center-of-Mass Detention Time (minutes)	699.5	460.6	321.6	267.6	209.7
Design Full Drain Down Time (hours)	46	60	61	61	62

APPENDIX A – MAINTENANCE WORK ORDER AND CHECK LIST FOR STORMWATER
MANAGEMENT FACILITIES

**Maintenance Work Order and Checklist
for
Stormwater Management Facilities**

Name of Facility: _____

Location: _____ Date: _____

Crew: _____ Work Started: date _____ time _____

Equipment: _____ Work Completed: date _____ time _____

Weather: _____ Total Manhours of Work: _____

A. Preventative Maintenances

Work Item	Items Required (√)	Items Done (√)	Comments & Special Instructions
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1. Grass Cutting

A. Bottoms			
B. Embankments and Side Slopes			
C. Perimeter Areas			
D. Access Areas and Roads			
E. Other:			

2. Grass Maintenance

A. Fertilizing			
B. Re-Seeding			
C. De-Thatching			
D. Pest Control			
E. Other:			

3. Vegetative Cover

A. Fertilizing			
B. Pruning			
C. Pest Control			
D. Other:			

4. Trash and Debris Removal

A. Bottoms			
B. Embankments and Side Slopes			
C. Perimeter Areas			
D. Access Areas and Roads			
E. Inlets			
F. Outlets and Trash Racks			
G. Other:			

5. Sediment Removal

A. Inlets			
B. Outlets and Trash Racks			
C. Bottoms			
D. Underground Pipes			
E. Other:			

6. Mechanical Components

A. Valves			
B. Sluice Gates			
C. Pumps			
D. Fence Gates			
E. Locks			
F. Access Hatches			
G. Other:			

7. Elimination of Potential Mosquito Breeding Habitats

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8. Pond Maintenance

A. Debris & Trash Removal			
B. Weed Removal			
C. Other:			

B. Corrective Maintenance

Work Item	Items Required (√)	Items Done (√)	Comments & Special Instructions
1. Removal of Debris & Sediment			
2. Structural Repairs			
3. Dam, Embankment & Slope Repairs			
4. Dewatering			
5. Pond Maintenance			
6. Control of Mosquitoes			
7. Erosion Repair			
8. Fence Repair			

9. Elimination of Trees, Brush, Roots and Animal Burrows			
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10. Snow & Ice Removal			
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C. Aesthetic Maintenance

Work Item	Items Required (√)	Items Done (√)	Comments & Special Instructions
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1. Graffiti Removal			
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2. Grass Trimming			
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3. Weeding			
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4. Other:			
-----------	--	--	--

Remarks (Refer to item No., If Applicable):

Work Order Prepared By: _____

Work Completed By: _____

APPENDIX B – MAINTENANCE LOG FOR STORMWATER MANAGEMENT FACILITIES

C. Aesthetic Maintenance

Work Item	(√) Completed									
1. Graffiti Removal										
2. Grass Trimming										
3. Weeding										
4. Other:										

Remarks (Refer to item No., If Applicable)

APPENDIX C – INSPECTION CHECKLIST FOR STORMWATER MANAGEMENT
FACILITIES

**Inspection Checklist
for
Stormwater Management Facilities**

Name of Facility: _____

Location: _____ Date: _____

Weather: _____

Facility Item	O.K. ¹	Routine ²	Urgent ³	Comments ⁴
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1. Embankments & Side Slopes

A. Vegetation				
B. Linings				
C. Erosion				
D. Settlement				
E. Sloughing				
F. Trash & Debris				
G. Seepage				
H. Aesthetics				
I. Other:				

APPENDIX D – INSPECTION LOG FOR STORMWATER MANAGEMENT FACILITES

C. Erosion										
D. Trash & Debris										
E. Other:										

6. Perimeter

A. Vegetation										
B. Erosion										
C. Trash & Debris										
D. Fences & Gates										
E. Aesthetics										
F. Other:										

7. Access Roads

A. Vegetation										
B. Road Surface										
C. Fence & Gates										
D. Erosion										
E. Aesthetics										
F. Other:										

8. Miscellaneous

A. Effectiveness of Exist. Maintenance Program										
B. Dam Inspection										
C. Potential Mosquito Habitats										
D. Mosquitoes										

¹ The item checked is in good condition, and the maintenance program is adequate.

² The item checked requires attention, but does not present an immediate threat to the facility function or other facility components

³ The item checked requires immediate attention to keep the facility operational or to prevent damages to other facility components:

APPENDIX E – ENGINEER'S ESTIMATE

ENGINEER'S ESTIMATE

PROJECT NAME: PIM Brands Building Expansion
MUNICIPALITY: Town of Kearny
PREPARED BY: HLE

DATE: 08/23/18
PROJECT NO. 17134
REVIEWED BY:

PREVENTATIVE MAINTAINENCE BASED ON SCHEDULING FREQUENCIES

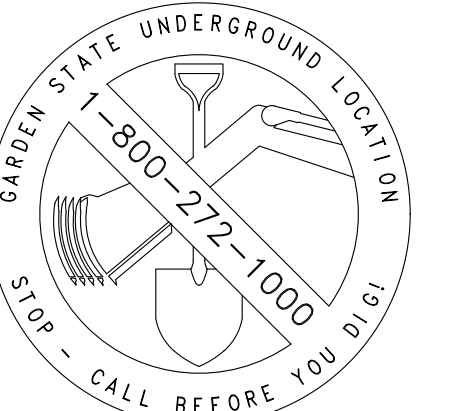
ITEM NO	DESCRIPTION	APPROX.		UNIT PRICE	TOTAL
		QTY	UNIT		
1	Inspection of Underground Baisns (Quart. & after 1" rainfall events)	4	EA.	\$500.00	\$2,000.00
2	General Trash and Debris Removal (12 per Yr.)	12	EA.	\$250.00	\$3,000.00
3	Sediment Removal (1 per Yr.)	1	EA.	\$500.00	\$500.00
4	Storm Sewer System Inspection (2 per Yr.)	2	EA.	\$750.00	\$1,500.00
5					\$0.00
6					\$0.00
7					\$0.00
8					\$0.00
9					\$0.00
Estimated Construction Cost					\$7,000.00
10 % Project Contingency Cost					\$700.00
Total Project Cost					\$7,700.00

Remarks:

APPENDIX F – CONSTRUCTION DETAILS

APPLICANT:
EXECUTIVE INVESTMENTS, LLC
53 KNIGHTSBRIDGE ROAD
SUITE 201
PISCATAWAY, NJ 08854

PROTECT YOURSELF
A PHONE CALL CAN BE
YOUR INSURANCE POLICY



WHAT YOU DON'T KNOW CAN HURT YOU.
THE STATE OF NEW JERSEY REQUIRES NOTIFICATION
OF EXCAVATORS, DESIGNERS, OR ANY PERSON
PREPARING TO DISTURB THE EARTH'S SURFACE
ANYWHERE IN THE STATE.

NO.	DATE	ISSUE OR REVISION	BY
REVISIONS			

PROJECT:
490 ELIZABETH AVENUE

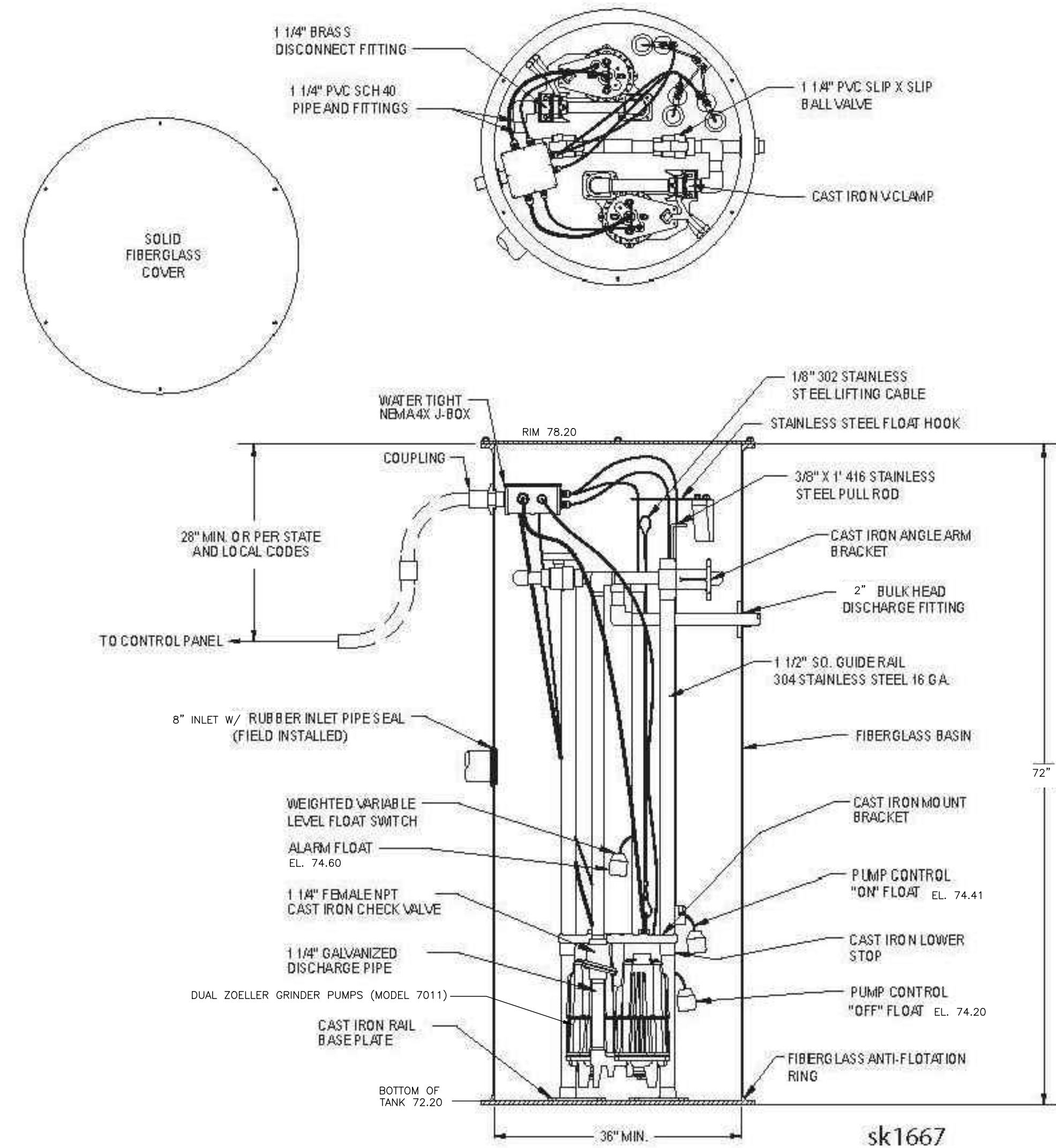
LOCATION:
BLOCK 514, LOT 34
TOWNSHIP OF FRANKLIN
SOMERSET COUNTY, NJ

DRAWING TITLE:
CONSTRUCTION DETAILS

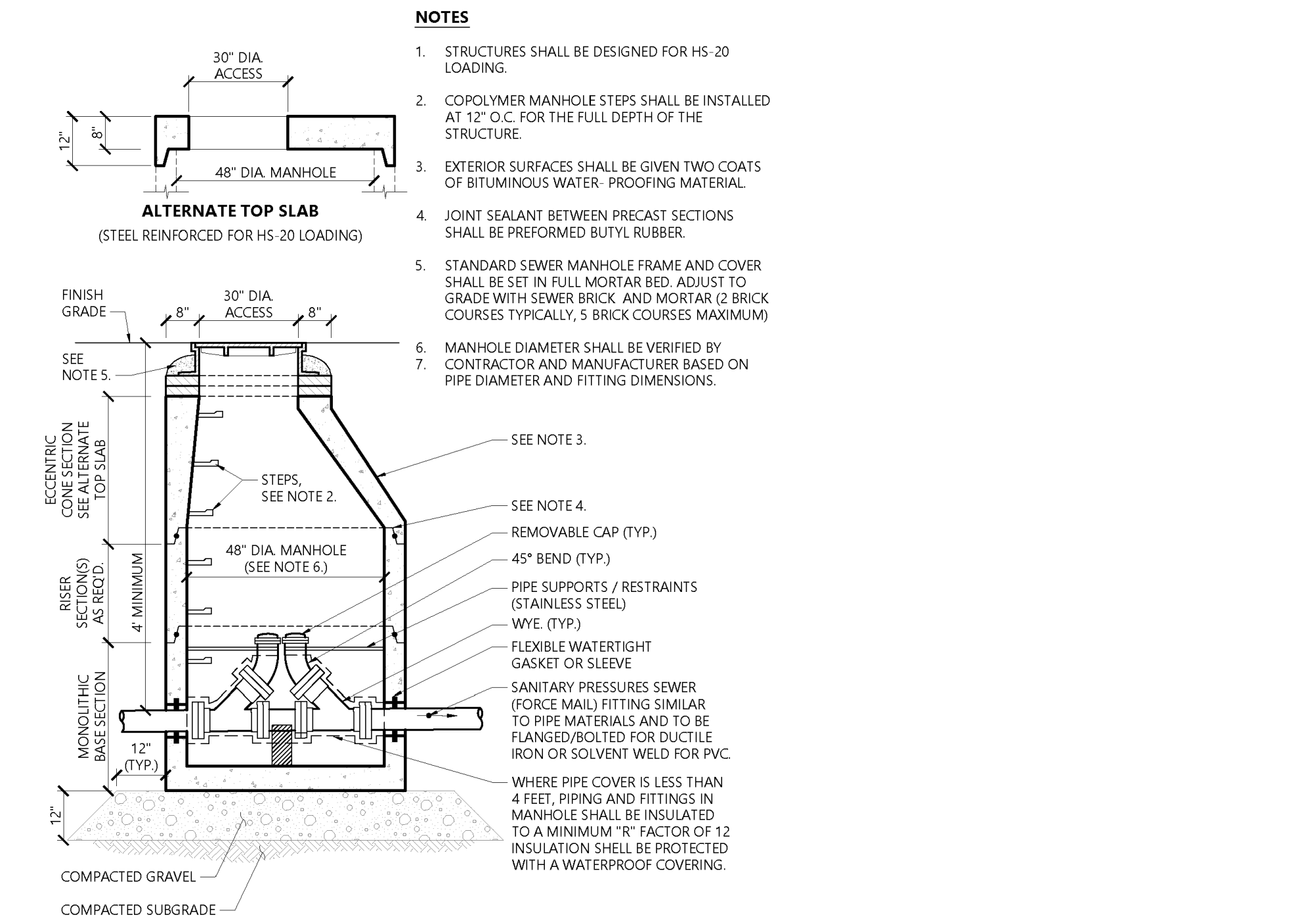
663 RARITAN ROAD, SUITE E
CRANFORD, NJ 07016
(TEL) 732 899 0898 (FAX) 888 712 4519
CERTIFICATE OF AUTHORIZATION #24GA28176300
HAMMERENGINEERING.COM

MICHAEL A. RODRIGUES
PROFESSIONAL ENGINEER
NJ LICENSE NUMBER 48141

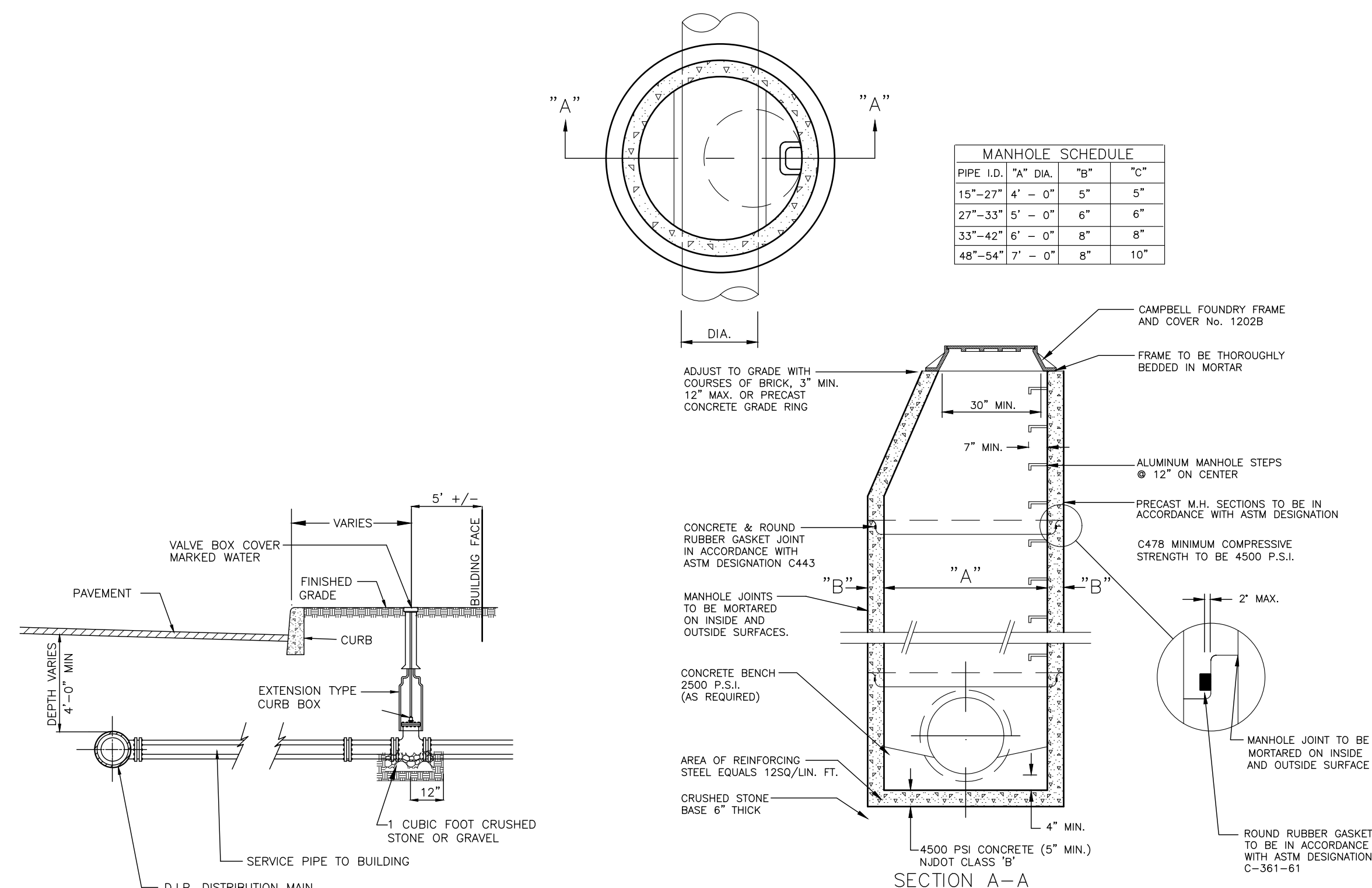
DRAWN BY: MDS	CHECKED BY: MAR	DRAWING NUMBER: SP-18
SCALE: AS NOTED		JOB NUMBER: 19201
DATE: 07.23.20		SHEET 18 OF 22



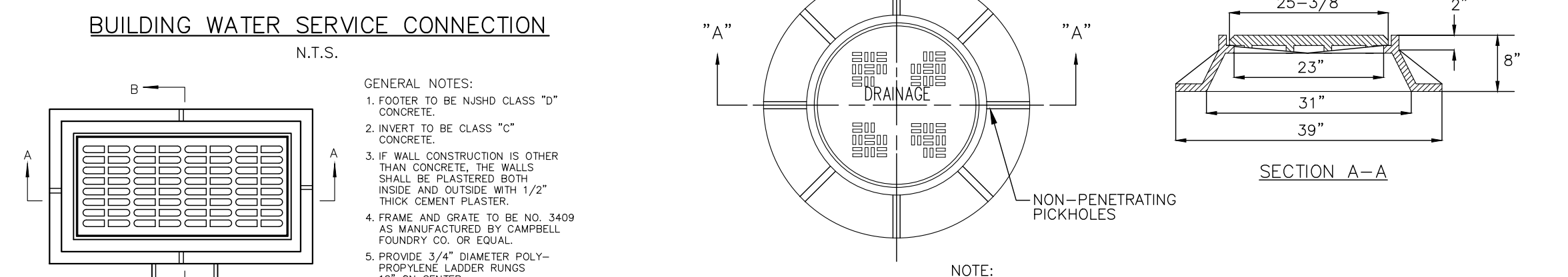
PUMP STATION - ZOELLER PRE-ASSEMBLED DUPLEX SYSTEM (TWO PUMPS)
NOT TO SCALE



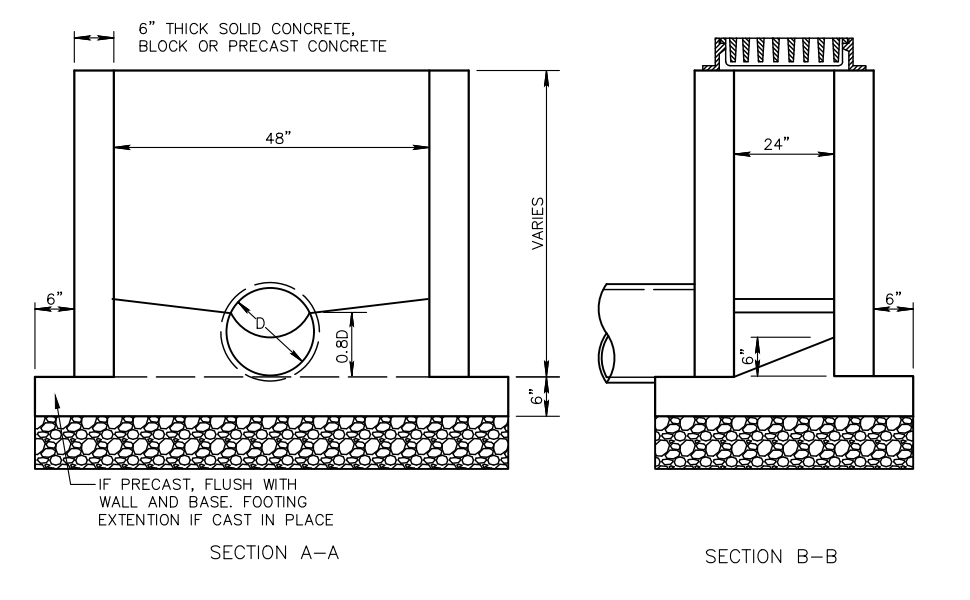
SEWER FORCEMAIN CLEANOUT MANHOLE
NOT TO SCALE



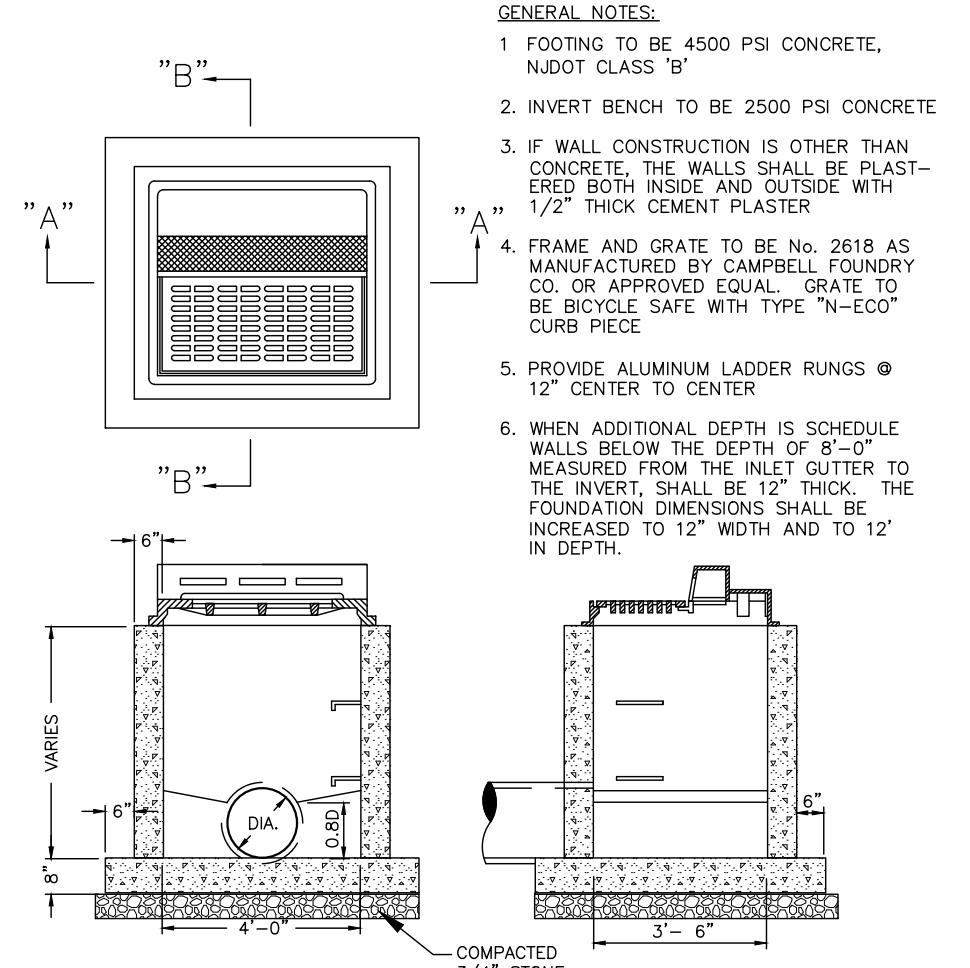
PRECAST STANDARD DRAINAGE MANHOLE
N.T.S.



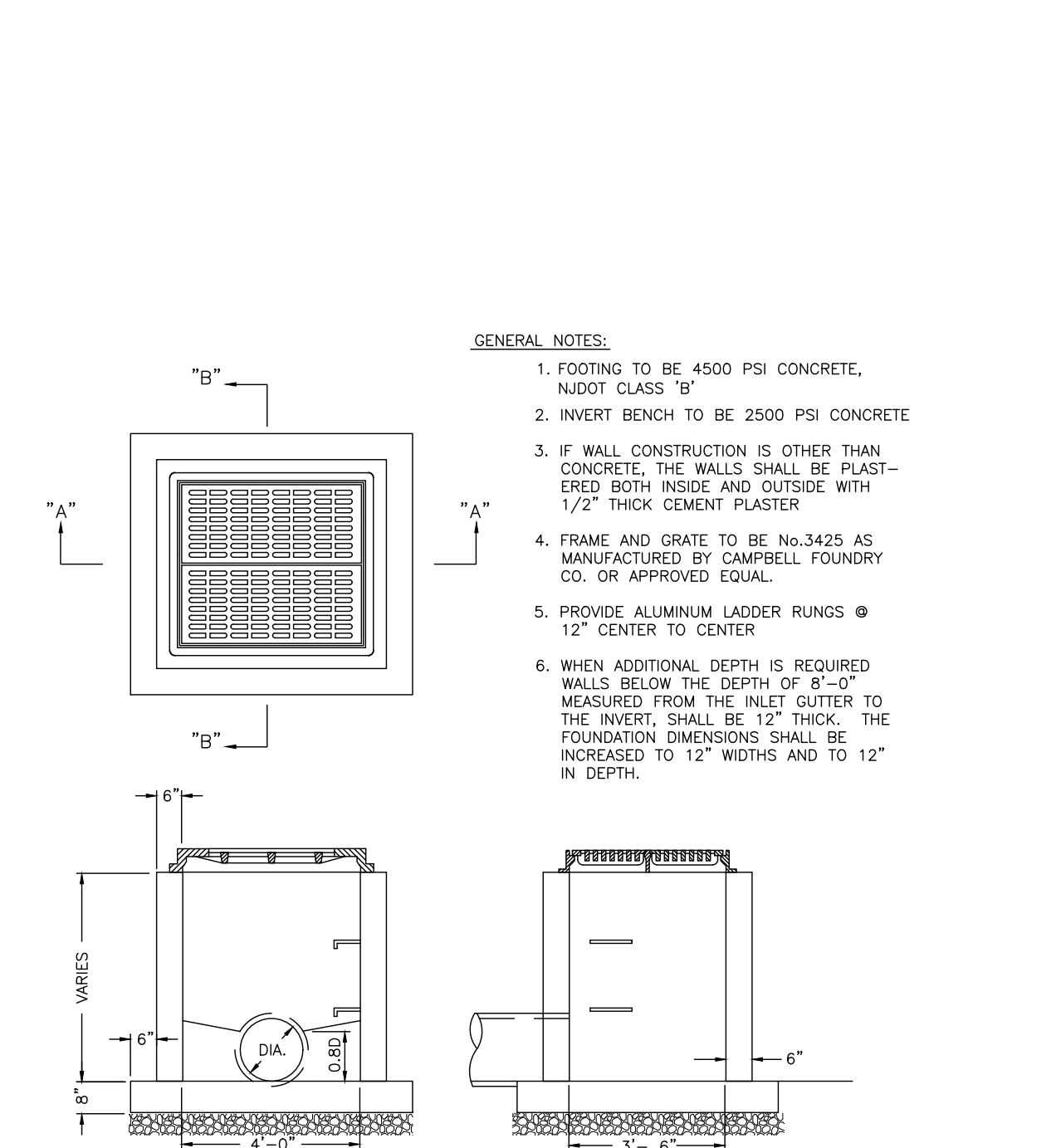
DRAINAGE MANHOLE FRAME AND COVER
N.T.S.



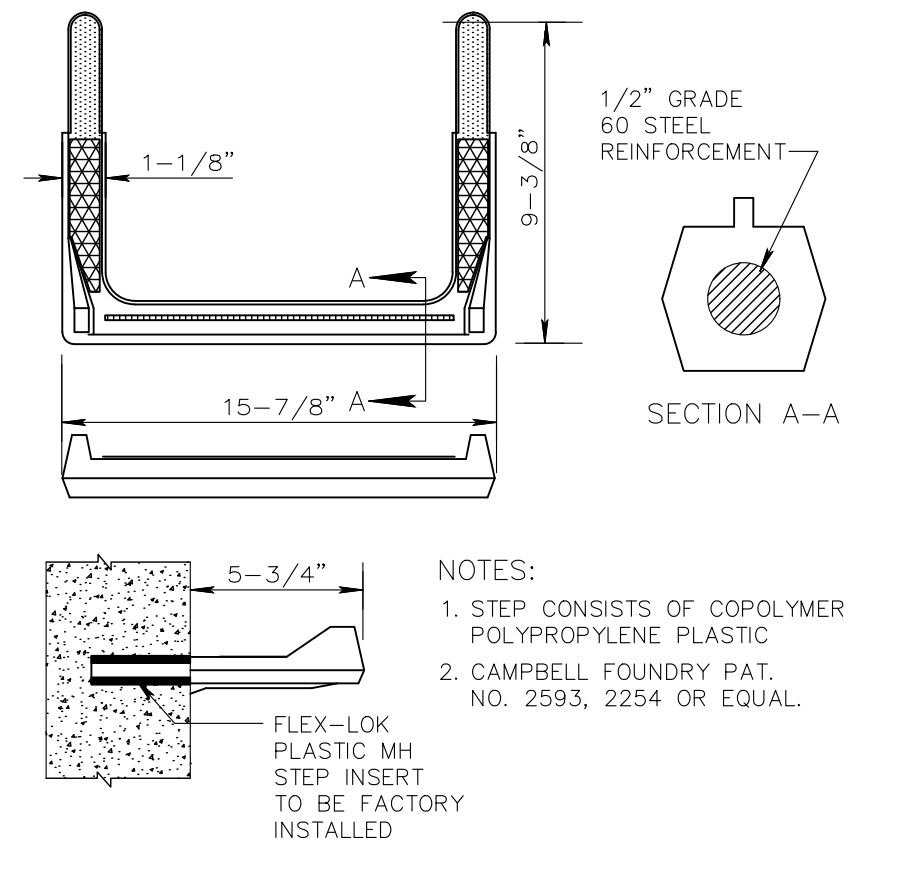
TYPE "A" INLET
WITH BICYCLE GRATE
N.T.S.



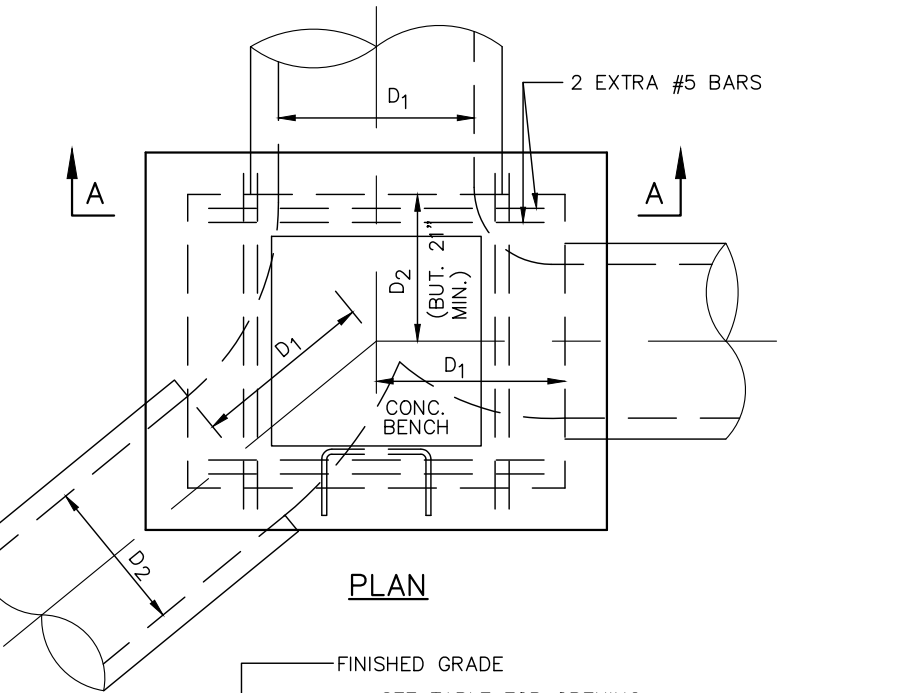
TYPE "B" INLET
WITH BICYCLE GRATE
N.T.S.



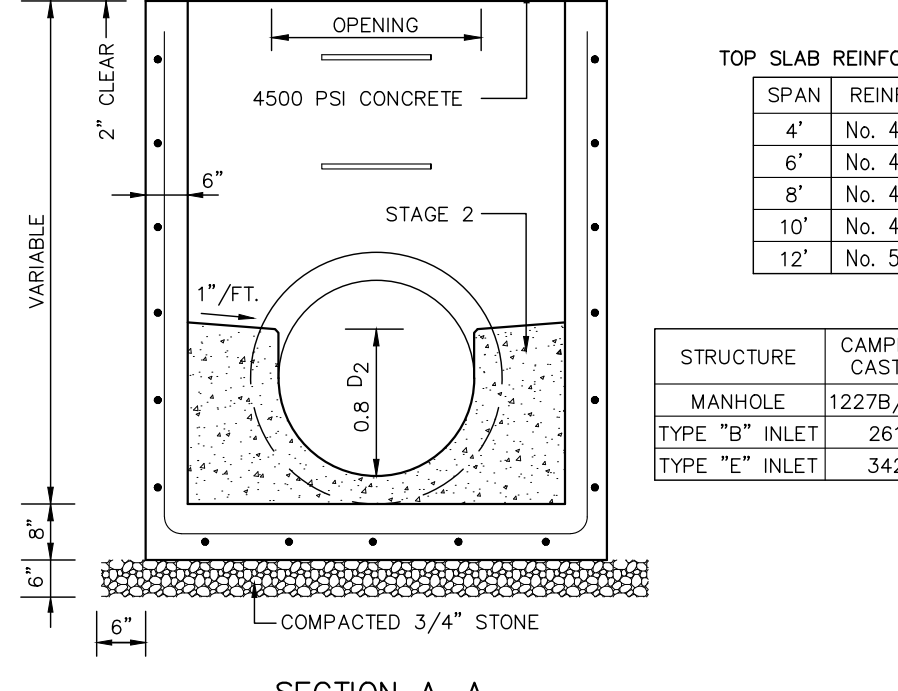
TYPE "E" INLET
WITH BICYCLE GRATE
N.T.S.



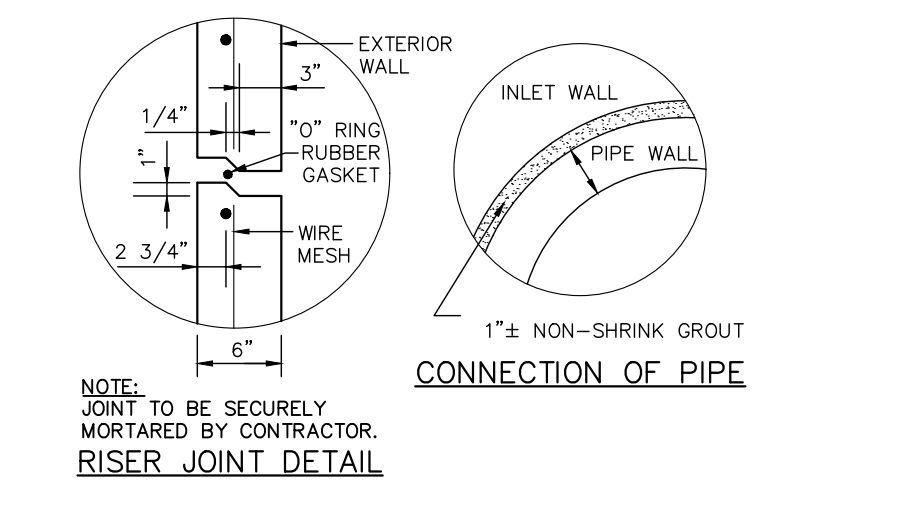
PLASTIC MANHOLE STEP
N.T.S.



PRECAST SPECIAL MANHOLE, TYPE "B" & TYPE "E" INLETS (FOR 36" AND LARGER PIPE)
NOT TO SCALE



CONNECTION OF PIPE



PRECAST SPECIAL MANHOLE RISER JOINT DETAIL

GENERAL NOTES:

- FOUNDATION AND WALLS TO BE 4500 PSI CONCRETE.
- INVERT TO BE 4500 PSI CONCRETE.
- REINFORCING BARS TO BE DEFORMED IN ACCORDANCE WITH THE LATEST A.S.T.M. STANDARDS.
- PROVIDE ALUMINUM LADDER RUNGS, 12" ON CENTER.
- WHEN THE DEPTH OF AN INLET EXCEEDS 10 FEET AS MEASURED FROM TOP OF GRATE TO INVERT, THE DEPTH OF THE BOTTOM OF THE INLET SHALL BE INCREASED TO 12".
- MINIMUM WALL REINFORCEMENT:

DEPTH BELOW TOP OF	HORIZONTAL REINFORCEMENT	VERTICAL REINFORCEMENT	WALL THICKNESS
0'-0" TO 1'-0"	#4 @ 10" C.C.	#4 @ 18" C.C.	6"
1'-0" TO 1'-11"	#4 @ 8" C.C.	#4 @ 18" C.C.	6"
1'-11" TO 2'-0"	#4 @ 6" C.C.	#4 @ 18" C.C.	6"

REINFORCING SHOWN FOR PRECAST INLETS IS THE MINIMUM REQUIRED. ADDITIONAL REINFORCING FOR HANDLING IS THE RESPONSIBILITY OF THE CONTRACTOR.

ALTERNATE REINFORCEMENT:

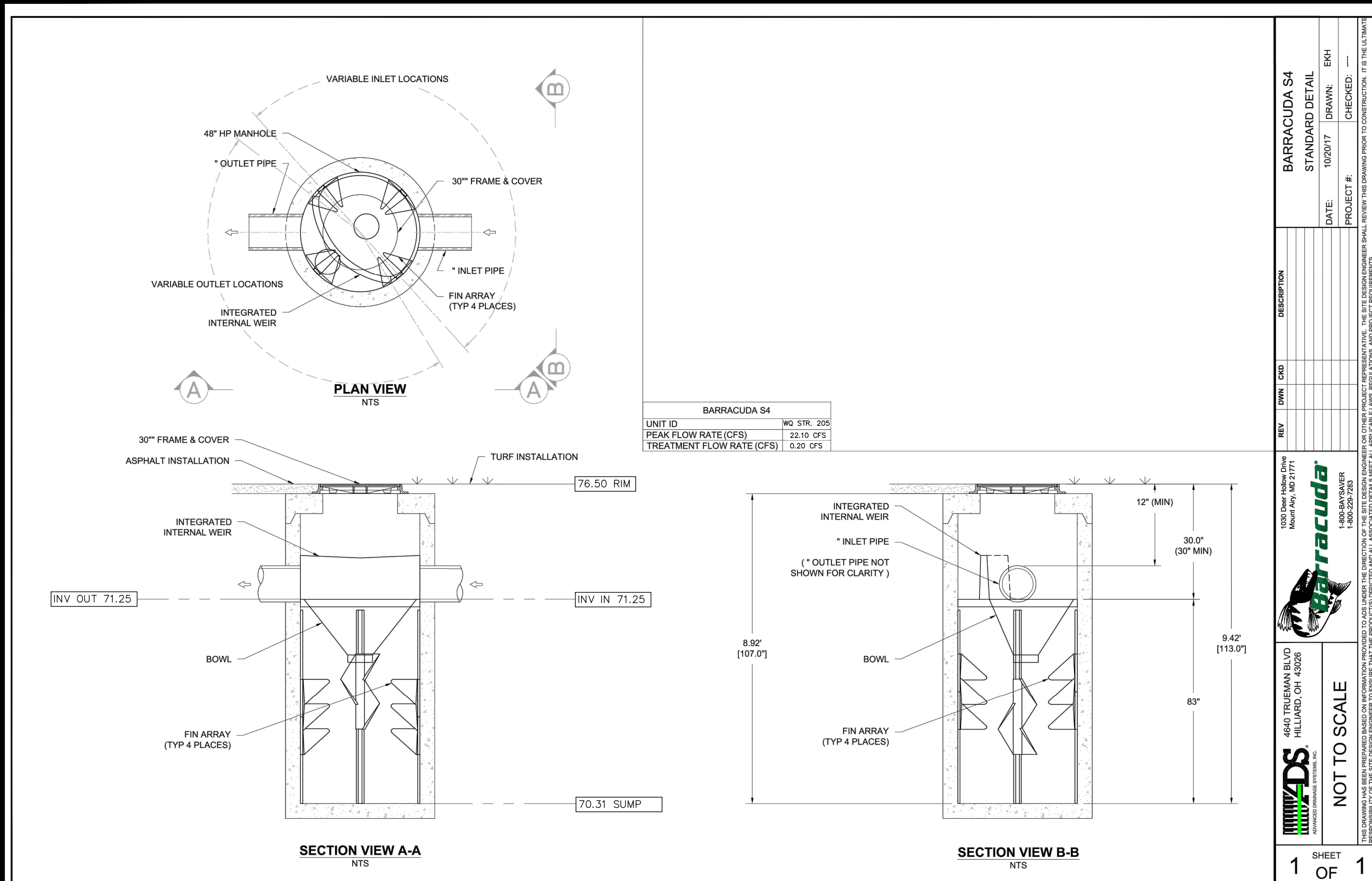
DEPTH BELOW TOP OF	WWR REINFORCEMENT
0' TO 10'-0"	WWR 3x6 W6 WIRES SPACED AT 3" TO RUN HORIZONTAL IN ALL CASES.
10'-1" TO 15'-0"	WWR 3x6 W6 ADD #3 BAR AT 18" HORIZONTAL.
15'-1" TO 20'-0"	WWR 3x6 W6 ADD #3 BAR AT 9" HORIZONTAL OR ADD #4 BAR AT 15" HORIZONTAL.

7. BOTTOM SURFACE TO BE LEFT ROUGH. INVERTS TO BE CONSTRUCTED IN STAGE 2.

MANHOLE SCHEDULE

PIPE I.D. "A" DIA.	"B"	"C"
15"-27"	4'-0"	5'-5"
27"-33"	5'-0"	6'-6"
33"-42"	6'-0"	8'-8"
48"-54"	7'-0"	10'-10"

X:\PROJECTS\490 ELIZABETH AVENUE\CONSTRUCTION DETAILS\27/24/2020\19201.DWG

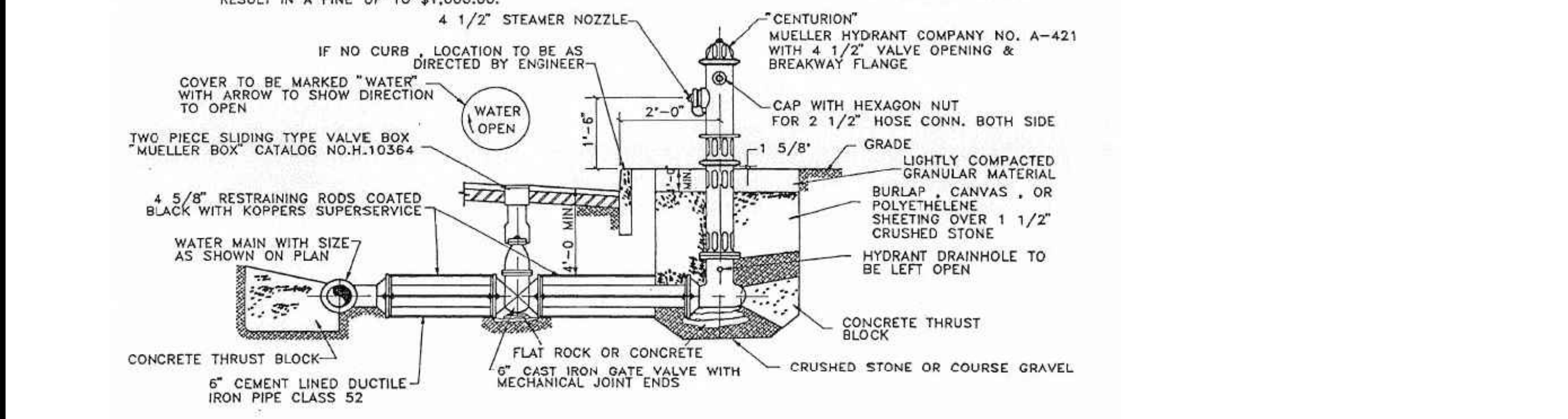


WATER QUALITY STRUCTURE BARRACUDA S4
N.T.S.

NOTE
AS PER ORD.1284 24 HRS. NOTICE SHALL BE GIVEN TO THE FRANKLIN TOWNSHIP WATER DIVISION PRIOR TO ANY EXTENSION OR INSTALLATION OF ANY WATER APPARATUS. NO PERSON EXCEPT A TOWNSHIP EMPLOYEE SHALL OPEN OR CLOSE ANY VALVES. FAILURE TO NOTIFY THE WATER DIVISION COULD RESULT IN A FINE UP TO \$1,000.00.

NOTE
HYDRANTS—
BLACK CAPS OR RINGS BEHIND CAPS = OUT OF SERVICE

FIRE HYDRANT COLOR CODING
RED BARRELS AND WHITE OR SILVER TOPS
RED CAPS — 8" MAIN
YELLOW CAPS — 8" MAIN
GREEN CAPS — 10" MAIN
BLUE CAPS — 12" MAIN

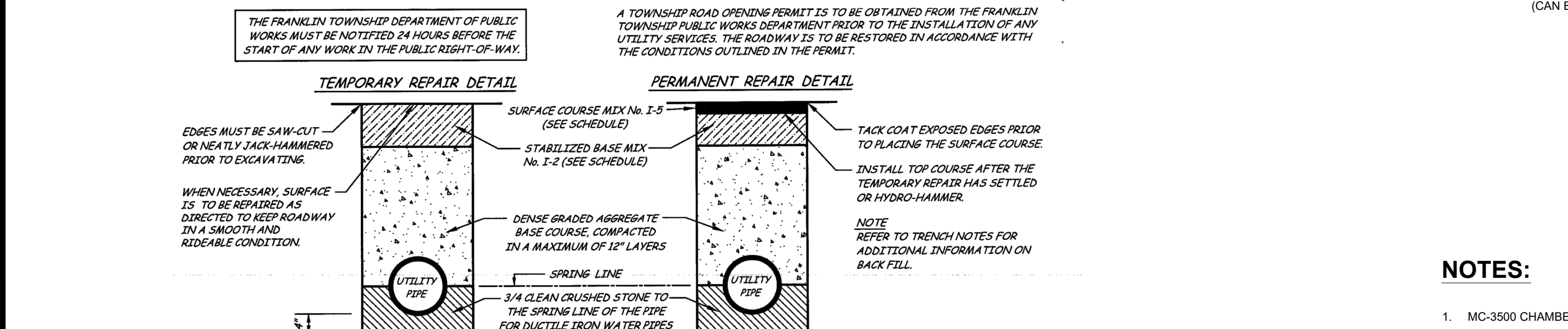


TYPICAL HYDRANT & VALVE INSTALLATION
N.T.S.

Fire hydrants must be flow tested by the Fire Prevention Department. Written request and appropriate fees must be submitted.

Fire hydrants must comply with detail, all threads must be lubricated, and all valves must be fully open prior to testing.

Each fire hydrant shall be marked with a standard U-channel post, 1 1/2" wide. The post shall be six (6) feet tall and be drilled into the ground 18-24 inches. The post shall have two (2) blue colored reflectors, three (3) inches in diameter. One reflector on each side of the post, facing traffic. The post shall be installed 24-30 inches before the fire hydrant, and slightly behind the hydrant.



SCHEDULE:

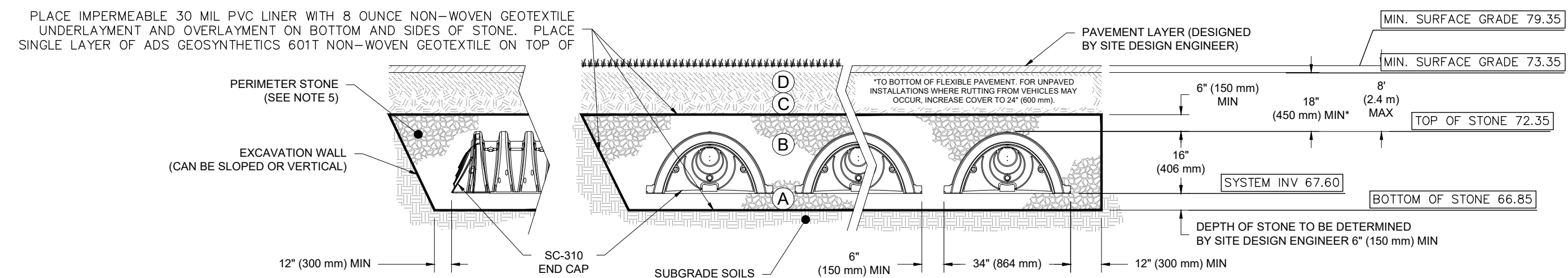
ROAD CLASS	USUAL PAV'T WIDTH	R.O.W. WIDTH	STABILIZED BASE	SURFACE COURSE	USE
LOCAL RESIDENTIAL	30 FEET	50 FEET	4"	1 1/2"	1
LOCAL INDUSTRIAL	40 FEET	60 FEET	4"	1 1/2"	2
COLLECTOR RESIDENTIAL	36 FEET	50 FEET	6"	2"	3
COLLECTOR INDUSTRIAL	42 FEET	66 FEET	7"	2"	4
MAJOR COLLECTOR	48 FEET	72 FEET	7"	2"	5
ARTERIAL	50 FEET	80 - 100 FEET	7"	2"	6

RESTORATION OF STREET OPENINGS
N.T.S.

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

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

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

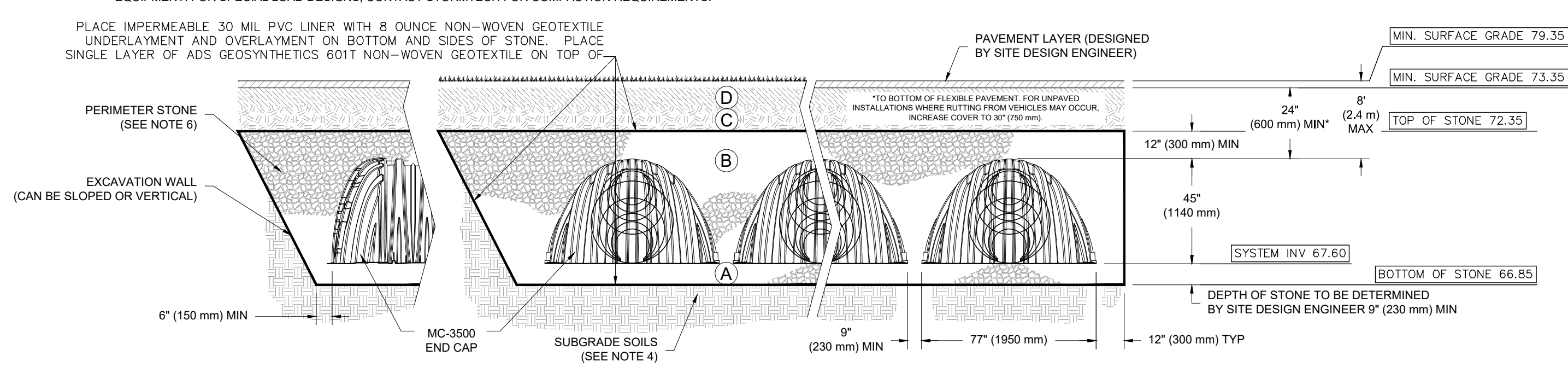
- SC-310 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

UNDERGROUND DETENTION BASIN ADS STORMTECH SC 310
N.T.S.

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 ¹ A-1, A-2-4, A-3 OR AASHTO M43 ² 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	AASHTO M43 ² 3, 4	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 ² 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2,3}

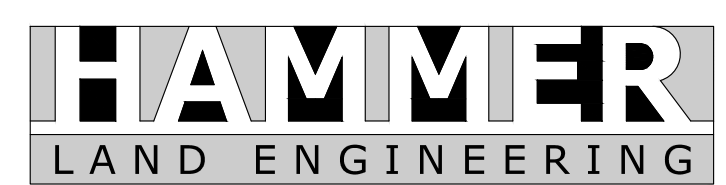
PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

- MC-3500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

UNDERGROUND DETENTION BASIN ADS STORMTECH MC-3500
N.T.S.



"THE WAY TO ENTITLEMENT"
GROUNDBREAKING RESULTS

APPLICANT:
EXECUTIVE INVESTMENTS, LLC
53 KNIGHTSBRIDGE ROAD
SUITE 201
PISCATAWAY, NJ 08854



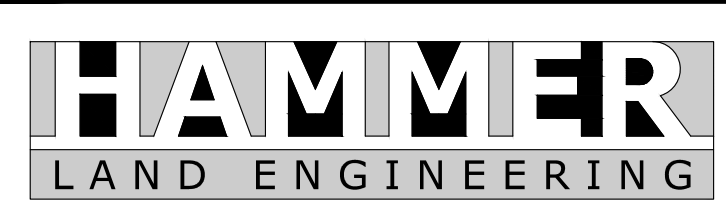
WHAT YOU DON'T KNOW CAN HURT YOU.
THE STATE OF NEW JERSEY REQUIRES NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE STATE.

REVISIONS

PROJECT:
490 ELIZABETH AVENUE

LOCATION:
BLOCK 514, LOT 34
TOWNSHIP OF FRANKLIN
SOMERSET COUNTY, NJ

CONSTRUCTION DETAILS



663 RARITAN ROAD, SUITE E
CRANFORD, NJ 07016
(TEL) 732.959.0898 (FAX) 888.712.4519
CERTIFICATE OF AUTHORIZATION #24GA28176300
HAMMERENGINEERING.COM

MICHAEL A. RODRIGUES
PROFESSIONAL ENGINEER
NJ LICENSE NUMBER 48141

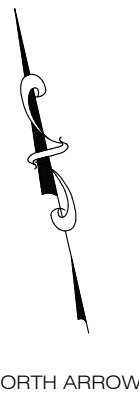
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SCALE: AS NOTED	DATE: 07.23.20	SHEET 19 OF 22

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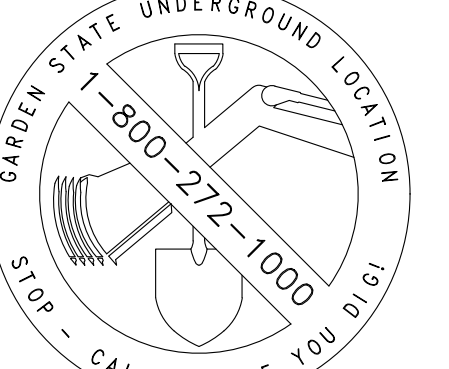
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APPENDIX G – DRAINAGE PLAN

APPLICANT:
EXECUTIVE INVESTMENTS, LLC
53 KNIGHTSBRIDGE ROAD
SUITE 201
PISCATAWAY, NJ 08854



PROTECT YOURSELF
A PHONE CALL CAN BE
YOUR INSURANCE



WHAT YOU DON'T KNOW CAN HURT YOU.
THE STATE OF NEW JERSEY REQUIRES NOTIFICATION
OF EXCAVATORS, DESIGNERS, OR ANY PERSON
PREPARING TO DISTURB THE EARTH'S SURFACE
ANYWHERE IN THE STATE.

NO.	DATE	ISSUE OR REVISION	BY
REVISIONS			

490 ELIZABETH AVENUE

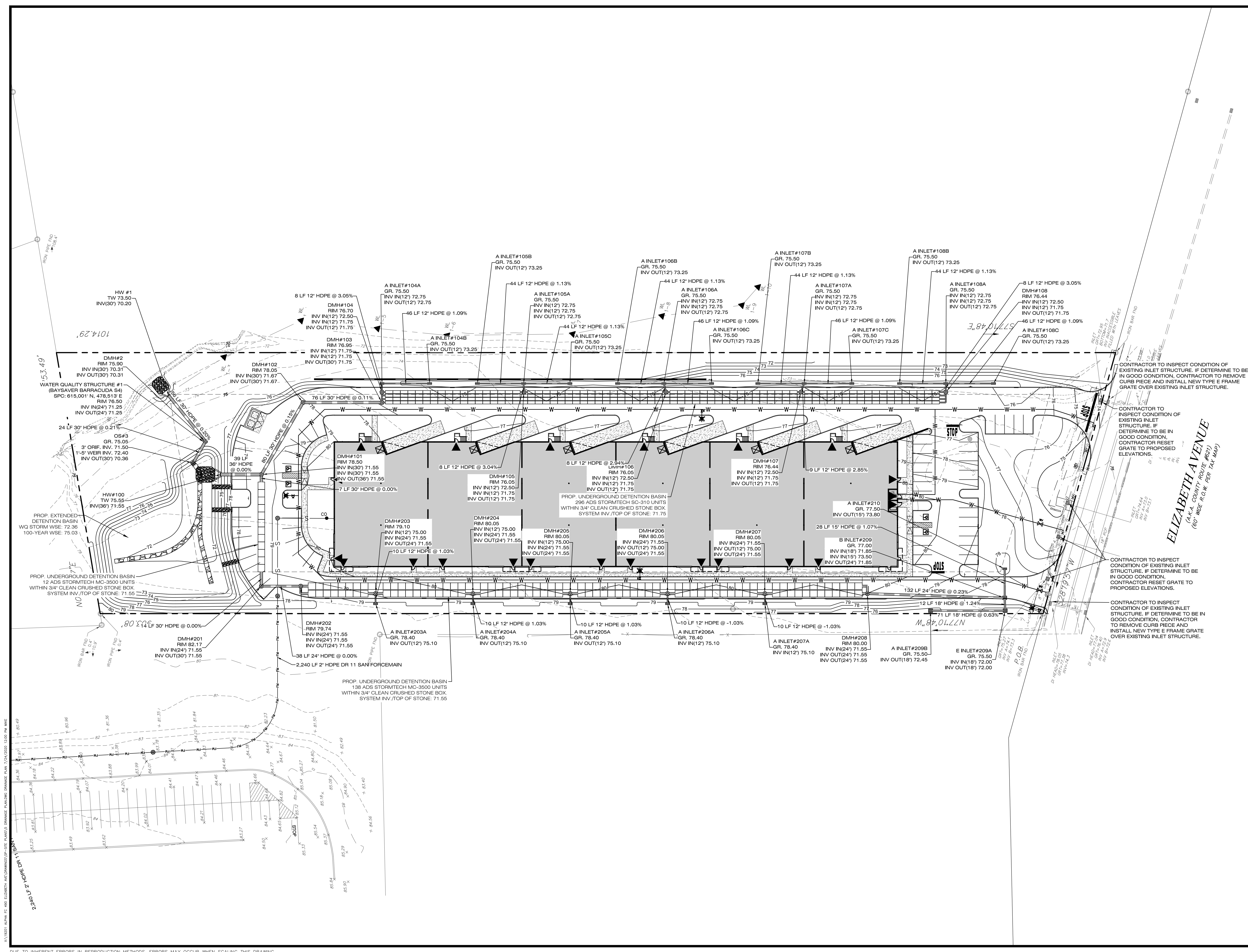
LOCATION:
BLOCK 514, LOT 34
TOWNSHIP OF FRANKLIN
SOMERSET COUNTY, NJ

DRAINAGE PLAN

663 RARITAN ROAD, SUITE E
CRANFORD, NJ 07016
(TEL) 732 899 0898 (FAX) 888 712 4519
CERTIFICATE OF AUTHORIZATION #24GA28176300
HAMMERENGINEERING.COM

MICHAEL A. RODRIGUES
PROFESSIONAL ENGINEER
NJ LICENSE NUMBER 48141

DRAWN BY: MDS	CHECKED BY: MAR	DRAWING NUMBER: SP-05
JOB NUMBER: 19201	DATE: 07.23.20	SHEET 5 OF 22



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DUE TO INHERENT ERRORS IN REPRODUCTION METHODS, ERRORS MAY OCCUR WHEN SCALING THIS DRAWING

APPENDIX H – MANUFACTURER’S O&M MANUAL

Maintenance Guide

BaySaver Barracuda

July 2017

One of the advantages of the BaySaver Barracuda is the ease of maintenance. Like any system that collects pollutants, the BaySaver Barracuda must be maintained for continued effectiveness. Maintenance is a simple procedure performed using a vacuum truck or similar equipment. The systems were designed to minimize the volume of water removed during routine maintenance, reducing disposal costs.

Contractors can access the pollutants stored in the manhole through the manhole cover. This allows them to gain vacuum hose access to the bottom of the manhole to remove sediment and trash. There is no confined space entry necessary for inspection or maintenance.

The entire maintenance procedure typically takes from 2 to 4 hours, depending on the size of the system, the captured material, and the capacity of the vacuum truck.

Local regulations may apply to the maintenance procedure. Safe and legal disposal of pollutants is the responsibility of the maintenance contractor. Maintenance should be performed only by a qualified contractor.

Inspection and Cleaning Cycle

Periodic inspection is needed to determine the need for and frequency of maintenance. You should begin inspecting as soon as construction is complete and thereafter on an annual basis. Typically, the system needs to be cleaned every 1-3 years.

Excessive oils, fuels or sediments may reduce the maintenance cycle. Periodic inspection is important.

Determining When to Clean

To determine the sediment depth, the maintenance contractor should lower a stadia rod into the manhole until it contacts the top of the captured sediment and mark that spot on the rod. Then push the probe through to the bottom of the sump and mark that spot to determine sediment depth.

Maintenance should occur when the sediment has reached the levels indicated in the Storage Capacity Chart.

BaySaver Barracuda Storage Capacities

Model	Manhole Diameter	Treatment Chamber Capacity	Standard Sediment Capacity (20" depth)	NJDEP Sediment Capacity (50% of standard depth)
S3	36"	212 gallons	0.44 cubic yards	0.22 cubic yards
S4	48"	564 gallons	0.78 cubic yards	0.39 cubic yards
S5	60"	881 gallons	1.21 cubic yards	0.61 cubic yards
S6	72"	1269 gallons	1.75 cubic yards	0.88 cubic yards
S8	96"	3835 gallons	3.10 cubic yards	1.55 cubic yards
S10	120"	7496 gallons	4.85 cubic yards	2.43 cubic yards

Maintenance Instructions

1. Remove the manhole cover to provide access to the pollutant storage. Pollutants are stored in the sump, below the bowl assembly visible from the surface. You'll access this area through the 10" diameter access cylinder.



2. Use a vacuum truck or other similar equipment to remove all water, debris, oils and sediment. See figure 1.
3. Use a high pressure hose to clean the manhole of all the remaining sediment and debris. Then, use the vacuum truck to remove the water.
4. Fill the cleaned manhole with water until the level reaches the invert of the outlet pipe.
5. Replace the manhole cover.
6. Dispose of the polluted water, oils, sediment and trash at an approved facility.
 - Local regulations prohibit the discharge of solid material into the sanitary system. Check with the local sewer authority for authority to discharge the liquid.
 - Some localities treat the pollutants as leachate. Check with local regulators about disposal requirements.
 - Additional local regulations may apply to the maintenance procedure.

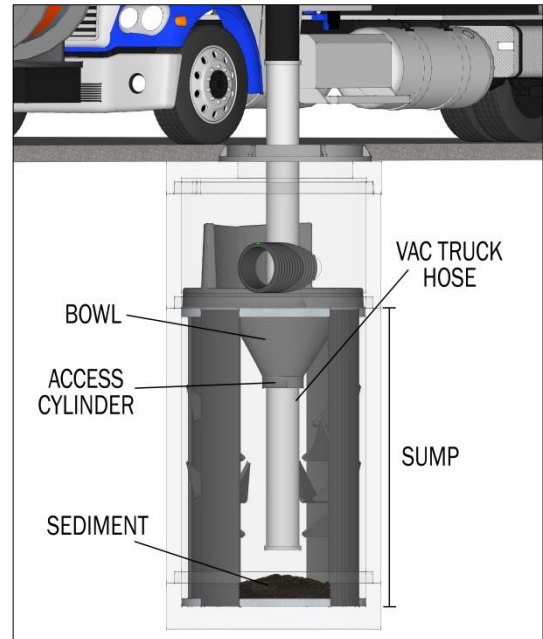


Figure 1