
STORMWATER MAINTENANCE PLAN

for

MONTCLAIR GOLF CLUB

HALFWAY HOUSE, GOLF BUILDING ADDITION,

AND PARKING LOT IMPROVEMENTS

Township of West Orange

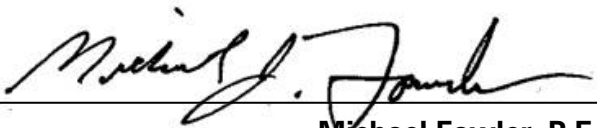
Essex County, New Jersey

Prepared For:

MONTCLAIR GOLF CLUB
25 Prospect Avenue
West Orange, New Jersey

Prepared By:

Langan Engineering and Environmental Services, Inc.
300 Kimball Drive
Parsippany, New Jersey 07054
NJ Certificate of Authorization No: 24GA27996400


Michael Fowler, P.E.
Professional Engineer License No. 24GE03239800

LANGAN

17 January 2024
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001039211

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1.0 INTRODUCTION

Langan Engineering & Environmental Services has prepared this maintenance plan for the stormwater management measures for the exterior improvements at Montclair Golf Club. This plan is intended for the owner of the stormwater facilities and contains preventative and corrective maintenance tasks and procedures to ensure the effective and reliable performance of the stormwater management measures.

The New Jersey Administrative Code 7:8-5.8 entitled "Maintenance Requirements" includes guidelines for this maintenance program and refers to the New Jersey Best Management Practices (BMP) Manual dated March 2021. Chapter 8, "Maintenance and Retrofit of Stormwater Management Measures" of the BMP manual addresses the requirements for the maintenance of a major development. Major development is defined in the aforementioned Code as any development that disturbs one or more acres of land or increases the impervious surface by one quarter of an acre or more.

2.0 MAINTENANCE OBJECTIVE

Maintenance procedures are required to preserve the intended operation and safe condition of a stormwater management measure. Regular maintenance will reduce the occurrence of problems and malfunctions. To be effective, maintenance shall be performed on a regular basis and include such routine procedures as the training of staff, periodic inspections, debris removal, upkeep of moving parts, and insect (mosquito) control.

Repair procedures are required to correct a problem or malfunction of the stormwater management measure and to restore the measure's intended operation. Based on the severity of the problem, repairs shall be conducted and include such procedures as structural repairs, insect (mosquito) control, debris removal (which decreases storage capacity), erosion repair, and snow and ice removal.

3.0 STORMWATER MANAGEMENT MEASURES

As shown on drawings CG100, CG101 and CG102, the stormwater facilities for this project include:

- 1 small-scale subsurface infiltration basins; and
- 1 porous asphalt pavement basin.

The stormwater management measures have adequate access for inspection and maintenance. Construction details of the stormwater facilities are shown on drawings CS502 and CS503.

4.0 MAINTENANCE PLAN

4.1 Responsible Party

The owner shall be responsible for the maintenance of the stormwater best management practices (BMPs) and conveyance system indicated on CG101 included with this plan. Contact information is as follows:

Montclair Golf Club
25 Prospect Avenue
West Orange, NJ 07006
Phone Number: 973-239-1800

As described in this maintenance plan, the Montclair Golf Club shall:

- Maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the project, including a record of all inspections and copies of all maintenance-related work;
- Evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and deed as needed;
- Retain and make 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 maintenance plan.

In the event the stormwater management facility becomes a danger to public safety or public health, or if it is in need of maintenance, the municipality shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have fourteen (14) days to effect maintenance and repair of the facility in a manner that is approved by the Municipal Engineer or his designee. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or County may immediately proceed to do so and shall bill the cost thereof to the responsible person.

4.2 Stormwater Management BMPs

The following tables summarize the stormwater management BMPs managing stormwater runoff for this project:

Table 1 – List of Stormwater Management BMPs

Basin	Basin Type	Invert El.	Max. Basin El.	Peak Water Surface Elevation		
				2-year	10-year	100-year
1	Subsurface Infiltration Basin (StormTech)	540.5 *	544.0 *	541.56	542.27	543.90
2	Porous Pavement	558.0 *	560.58 *	558.71	559.14	560.10

** Invert and maximum elevation represent bottom and top of stone in the StormTech system and porous pavement.*

Table 2 – Stormwater Management BMP Drain Times

Basin	Exfiltration Volume (CF)	Groundwater Mounding Height (ft)	Seasonal High Water Table Elevation (ft) *	Groundwater Mounding Elevation (ft)	Basin Invert (ft)	Duration of Infiltration (Max 72 hrs) (hrs)
1	265	1.38	538.33	539.71	540.5	2.4

* Supporting documentation for the seasonal high water table elevation located in Appendix E of the stormwater management report (submitted under separate cover) would suggest that the seasonal high water table is several feet below the bottom of the infiltration basins. However, for this project, it was assumed to be 2 feet below the basin invert.

4.3 Stormwater Management Facility Maintenance Tasks and Schedule

4.3.1 Subsurface Infiltration Basins

Short-Term Measures (Once every 3 Months or after storm exceeding 1 inch of rainfall)

1. Maintain contributing drainage area.
 - Remove trash and debris and dispose off-site, as required.
 - Stabilize and mow area as required. Remove clippings.
 - Ensure that activities in the drainage area minimize oil/grease and sediment entry to the system.
2. Inspect the inlet structures.
 - Remove debris manually and dispose off-site, as required.
 - Note any channels, soil exposure, or other evidence of erosion.
 - Note any damage to structures.
3. Inspect the outlet structure.
 - Remove debris manually and dispose off-site, as required.
 - Note any damage to structure.
4. Inspect infiltration portion of basin.
 - Remove debris if necessary by jet cleaning and dispose off-site, as required.
 - Note dewatering time. Facility should drain within the durations included in Table 2 of this report.

Medium-Term Measures (Once Every Six Months)

1. Inspect the inlet structure.
 - Repair/reinforce eroded areas, as required.
 - Repair any damage to structures.
2. Inspect the outlet structure.

- Repair any damage to structure.
3. Inspect the infiltration basin.
 - Jet clean if there is sediment build up or signs of clogged stone. Remove debris and dispose off-site, as required.
 - Note dewatering time. Facility should drain within the durations included in Table 2 of this report.

Long-Term Measures (Once Every Year)

1. Inspect infiltration basin.
 - Jet clean if there is sediment build up or signs of clogged stone. Remove debris and dispose off-site, as required.
 - Note dewatering time. Facility should drain within the durations included in Table 2 of this report.

4.3.2 Porous Pavement

Short-Term Measures (Once every 3 Months or after storm exceeding 1 inch of rainfall)

1. Maintain contributing drainage area.
 - Remove trash and debris and dispose off-site, as required.
 - Stabilize and mow area as required. Remove clippings.
 - Ensure that activities in the drainage area minimize oil/grease and sediment entry to the system.
2. Inspect the outlet structure.
 - Remove debris manually and dispose off-site, as required.
 - Note any damage to structure.
3. Inspect porous pavement.
 - Remove debris and soil if necessary by hand and dispose off-site, as required.
 - Vacuum sweep porous pavement once every 3 months (4 times a year). Sweeping must be followed by high-pressure power washing. All dislodged material must be promptly removed.

Medium-Term Measures (Once Every Six Months)

1. Inspect the outlet structure.
 - Repair any damage to structure.
2. Inspect the porous pavement.
 - Remove debris and soil if necessary by hand and dispose off-site, as required.

Long-Term Measures (Once Every Year)

1. Inspect porous pavement
 - Inspect surface course for cracking, subsidence, spalling, erosion, deterioration and unwanted vegetation. Remedial actions to be taken immediately. Herbicides must not be applied.

Additional Measures

1. The first annual maintenance must be performed in the spring.
2. Maintenance must additionally be performed in the autumn, after the fallen leaves are collected and removed.
3. Each spring, after the last snow or ice event, the infiltration rate of the surface course must be tested in accordance with the methods of either ASTM C1701 or C1781, as corresponds to the post-construction test performed for the system. At least 3 locations must be tested. One of the locations must be in an area where sediment is most likely to be deposited, such as, but not limited to, a parking lot entrance. The other test locations must be evenly spaced across the system surface. The locations and results obtained must be recorded in the maintenance plan for future reference and compared to the as-built testing results as a metric for determining if a system requires corrective action.
4. Storage Bed Drain Time
 - a. The approximate drain time for the maximum design storm runoff volume below the top of the surface course must be indicated in the maintenance manual.
 - b. If the actual drain time is significantly different from the design drain time, the components and groundwater levels must be evaluated and appropriate measures taken to return the pervious paving system to minimum and maximum drain time requirements.
 - c. If the system fails to drain the maximum design storm volume within 72 hours, corrective action must be taken.
5. Cold Weather Maintenance
 - a. Care must be taken when removing snow from the surface course; pervious paving surface courses may be damaged by snowplows or loader buckets set too low to the ground or not equipped with a rubber blade guard. Sand, grit or cinders may not be used on surface courses for snow/ice control.
 - b. De-icing chemicals may not be used on pervious concrete less than one year old.

- c. De-icers containing magnesium chloride, calcium magnesium acetate or potassium acetate may never be used on pervious concrete.

4.3.3 Stormwater Conveyance System

Short-Term Measures (once a year or after a storm exceeding 1-inch of rainfall)

1. All conveyance systems including inlets, manholes, concrete chambers and pipes are expected to accumulate debris and sediment over time.
2. Perform cleanout using confined-space procedures and equipment as required by OSHA regulations.
3. A thorough cleaning of the system can be performed by either manual methods or by a vacuum truck. Sediment removal shall occur when the conveyance system is reasonably dry. Disposal of debris, trash, sediment and other waste material should be done at the appropriate disposal/recycling sites and in compliance with all applicable local, state and federal waste guidelines.
4. All structural components must be inspected for cracking, subsidence, breaching, wearing, and deterioration. The condition of surrounding and above lying materials shall be inspected for evidence of potential failures or deterioration.
5. Inspect outlet protection and replace/replenish rip-rap as necessary. Identify areas of erosion at outlets and remediate with additional rip-rap placement in accordance with approved drawings for this project and The Standards for Soil Erosion and Sediment Control in New Jersey.

Any disposal of debris, trash, sediment, and other waste material shall be done at suitable disposal/recycling sites and in compliance with all applicable local, county, state and federal waste management regulations.

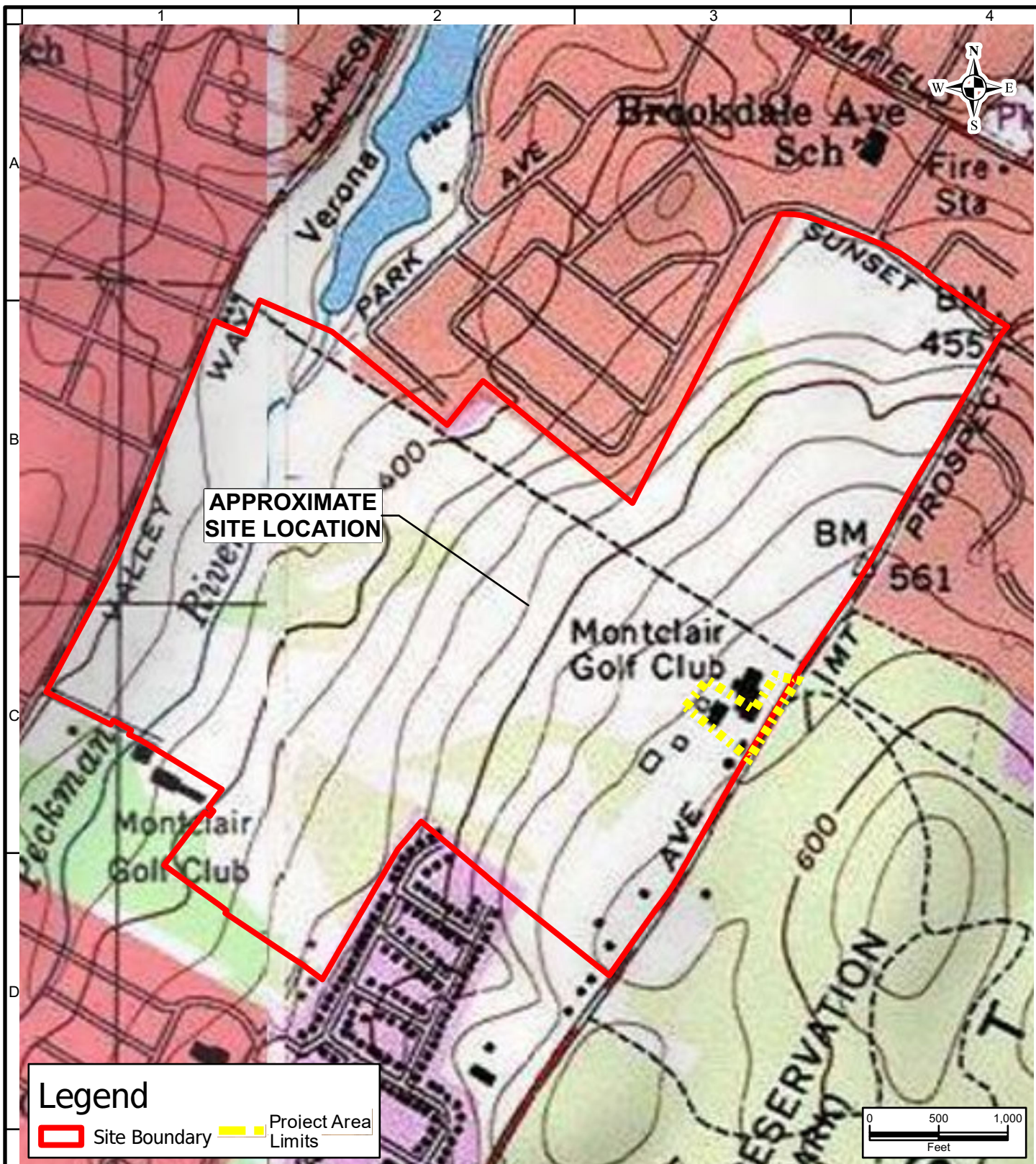
4.4 Maintenance Checklists and Logs

Maintenance checklists for each stormwater management measure are available in Appendix A. Maintenance logs (to be completed subsequent to each inspection) can be found in Appendix B.

5.0 AS-BUILT DRAWINGS

Once the stormwater facilities are constructed, copies of the as-built drawings/plans of the facilities shall be included in Appendix C of this plan.

FIGURES



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Project
**MONTCLAIR GOLF CLUB
HALFWAY HOUSE, GOLF BUILDING
ADDITION, & PARKING LOT
IMPROVEMENTS**
BLOCK No. 151, LOT Nos. 1, 5, 7, 11,
14, 15.01, 23, 24, 37, 41, 45.01 & 49
WEST ORANGE
BLOCK No. 601, LOT Nos. 1
VERONA
ESSEX COUNTY NEW JERSEY

Drawing Title
SITE LOCATION

Project No.
001039208
Date
01/12/2024
Scale
1:1,000
Drawn By
Site Analyzer
Submission Date
01/12/2024

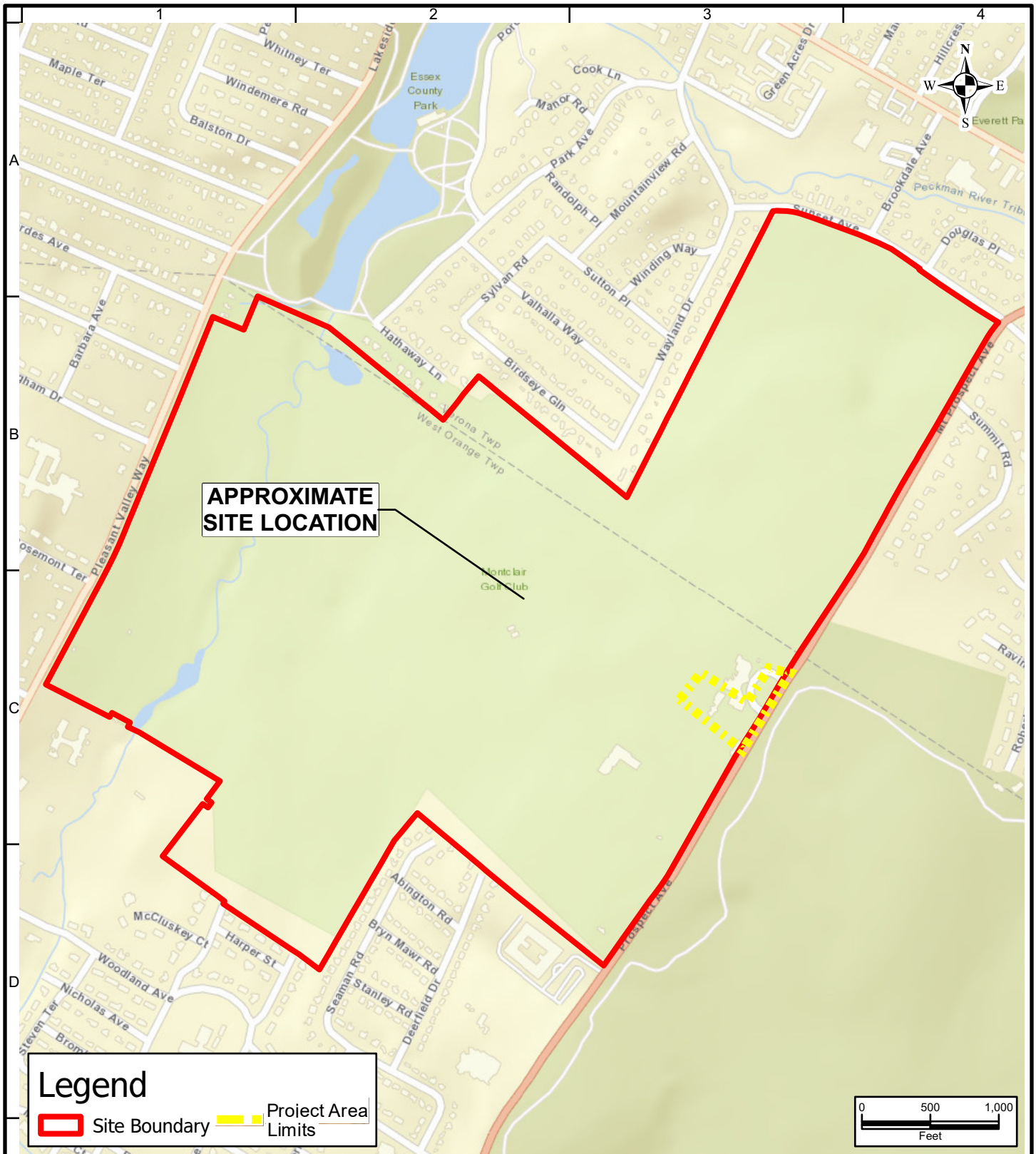
Figure
1
Sheet 1 of 16



Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community, Esri Community Maps Contributors, NYC OpenData, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS; Esri, DigitalGlobe, Earthstar Geographics, CNES/Airbus DS, GeoEye, USDA FSA, USGS, AeroGrid, IGN, IGP, and the GIS User Community

LANGAN 300 Kimball Drive 4th Floor Parsippany NJ 07054-2172 T: 973-560-4900 F: 973-560-4901 www.langan.com Langan Engineering & Environmental Services, Inc. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. Langan International Collectively known as Langan	Project MONTCLAIR GOLF CLUB HALFWAY HOUSE, GOLF BUILDING ADDITION, & PARKING LOT IMPROVEMENTS BLOCK No. 151, LOT Nos. 1, 5, 7, 11, 14, 15.01, 23, 24, 37, 41, 45.01 & 49 WEST ORANGE BLOCK No. 601, LOT Nos. 1 VERONA ESSEX COUNTY NEW JERSEY	Drawing Title AERIAL	Project No. 001039208	Figure 2
			Date 01/12/2024	
			Scale 1:1,000	
			Drawn By Site Analyzer	Sheet 2 of 16
			Submission Date 01/12/2024	

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Spatial Reference: WGS 1984 Web Mercator Auxiliary Sphere



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Langan International
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Project
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HALFWAY HOUSE, GOLF BUILDING
ADDITION, & PARKING LOT
IMPROVEMENTS**

BLOCK No. 151, LOT Nos. 1, 5, 7, 11,
14, 15.01, 23, 24, 37, 41, 45.01 & 49
WEST ORANGE
BLOCK No. 601, LOT Nos. 1
VERONA
ESSEX COUNTY NEW JERSEY

Drawing Title
VICINITY MAP

Project No.
001039208

Date
01/12/2024

Scale
1:1,000

Drawn By
Site Analyzer

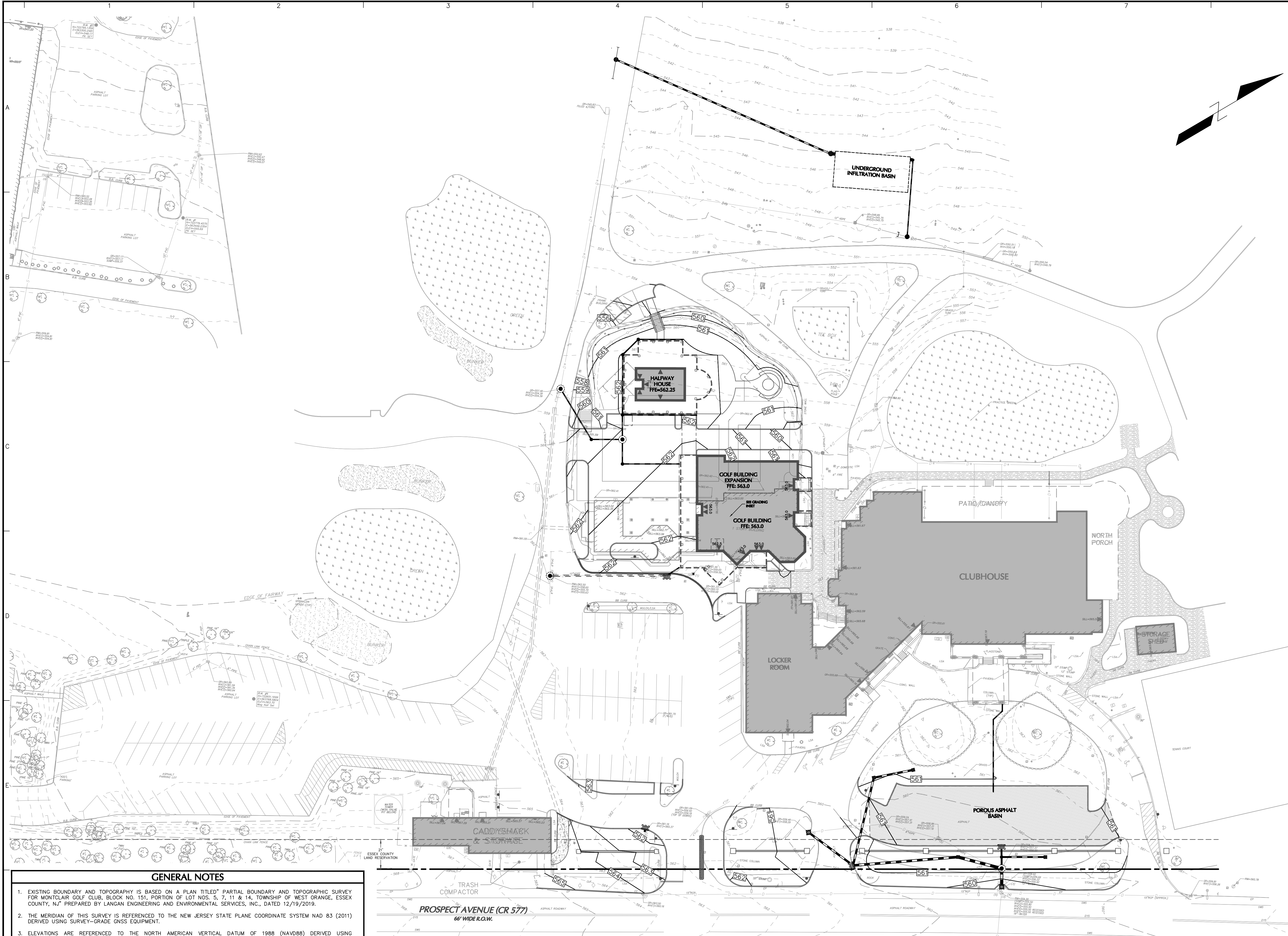
Submission Date
01/12/2024

Figure

3

Sheet 3 of 16

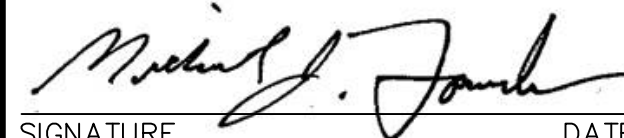
DRAWINGS

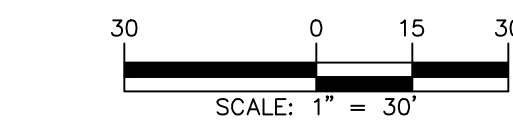


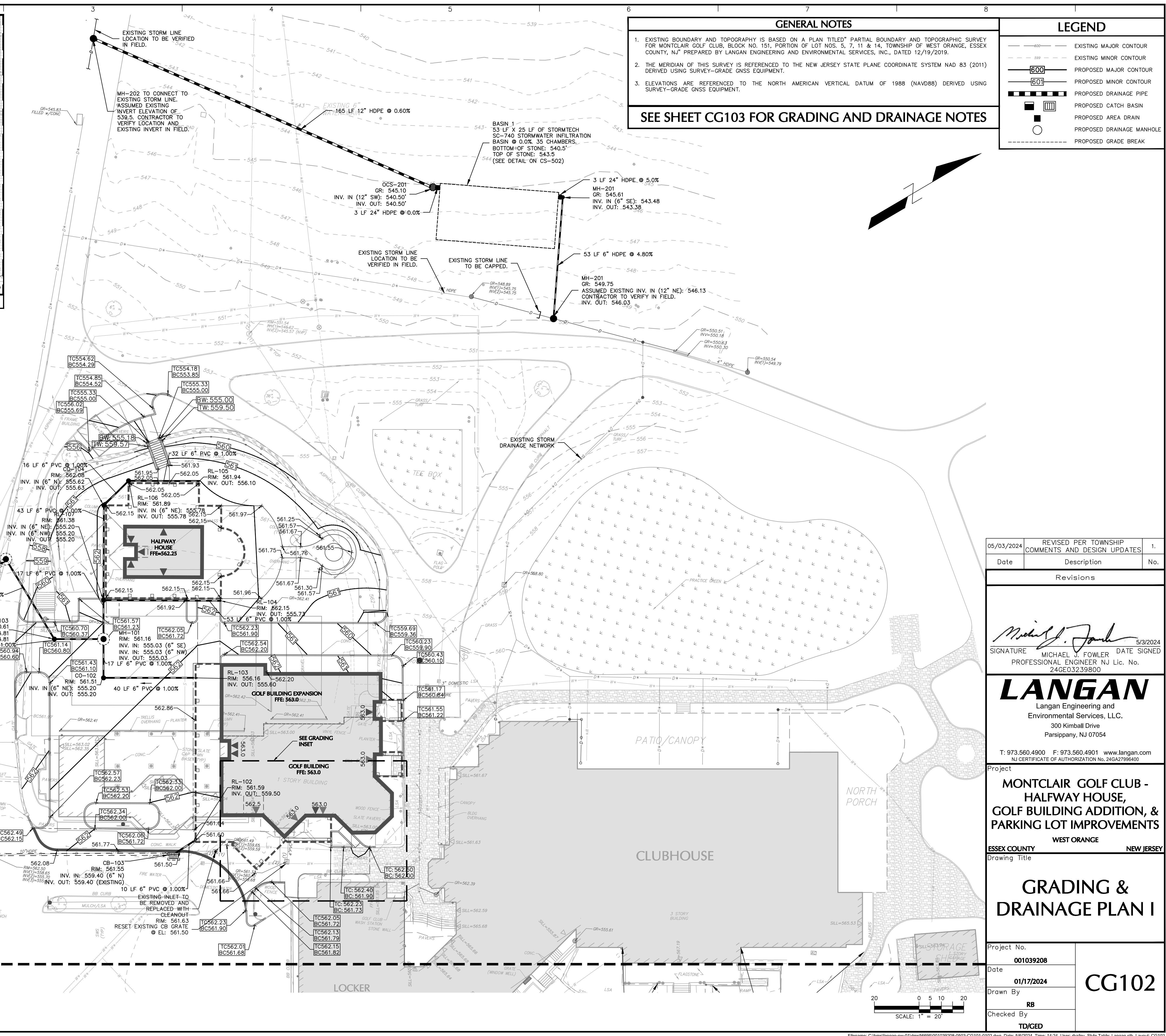
GENERAL NOTES

- EXISTING BOUNDARY AND TOPOGRAPHY IS BASED ON A PLAN TITLED "PARTIAL BOUNDARY AND TOPOGRAPHIC SURVEY FOR MONTCLAIR GOLF CLUB, BLOCK NO. 151, PORTION OF LOT NOS. 5, 7, 11 & 14, TOWNSHIP OF WEST ORANGE, ESSEX COUNTY, NJ" PREPARED BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC., DATED 12/19/2019.
- THE MERIDIAN OF THIS SURVEY IS REFERENCED TO THE NEW JERSEY STATE PLANE COORDINATE SYSTEM NAD 83 (2011) DERIVED USING SURVEY-GRADE GNSS EQUIPMENT.
- ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) DERIVED USING SURVEY-GRADE GNSS EQUIPMENT.

SEE SHEET CG103 FOR GRADING AND DRAINAGE NOTES

05/03/2024	REVISED PER TOWNSHIP COMMENTS AND DESIGN UPDATES	1.
Date	Description	No.
Revisions		
 SIGNATURE MICHAEL J. FOWLER PROFESSIONAL ENGINEER NJ Lic. No. 24GE03239800		
LANGAN Langan Engineering and Environmental Services, LLC. 300 Kimball Drive Parsippany, NJ 07054		
T: 973.560.4900 F: 973.560.4901 www.langan.com NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400		
Project MONTCLAIR GOLF CLUB - HALFWAY HOUSE, GOLF BUILDING ADDITION, & PARKING LOT IMPROVEMENTS		
ESSEX COUNTY NEW JERSEY		
Drawing Title OVERALL GRADING & DRAINAGE PLAN		
Project No. 001039208		CG101
Date 01/17/2024		
Drawn By RB		
Checked By TD/GED		





CG102

CG102

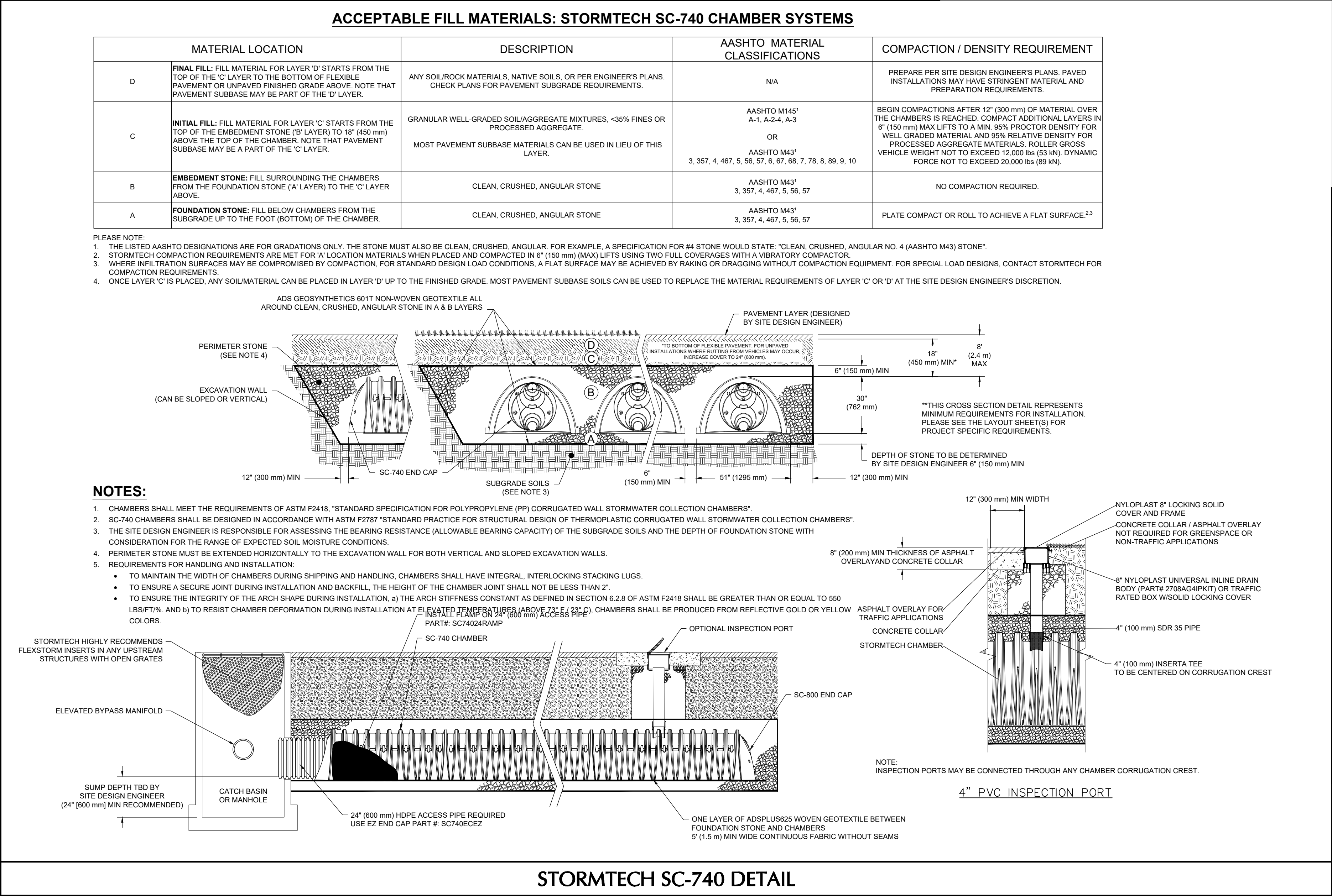
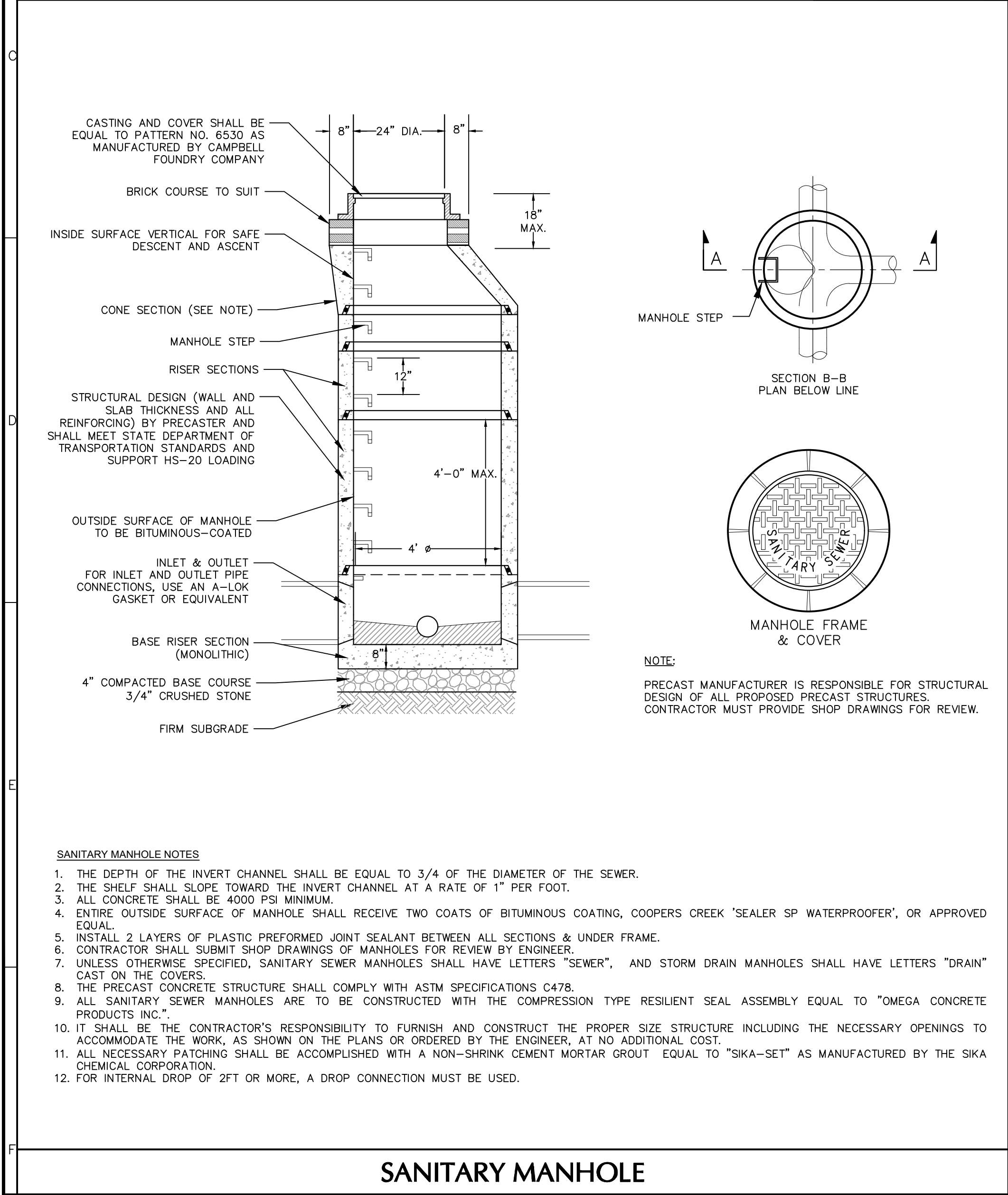
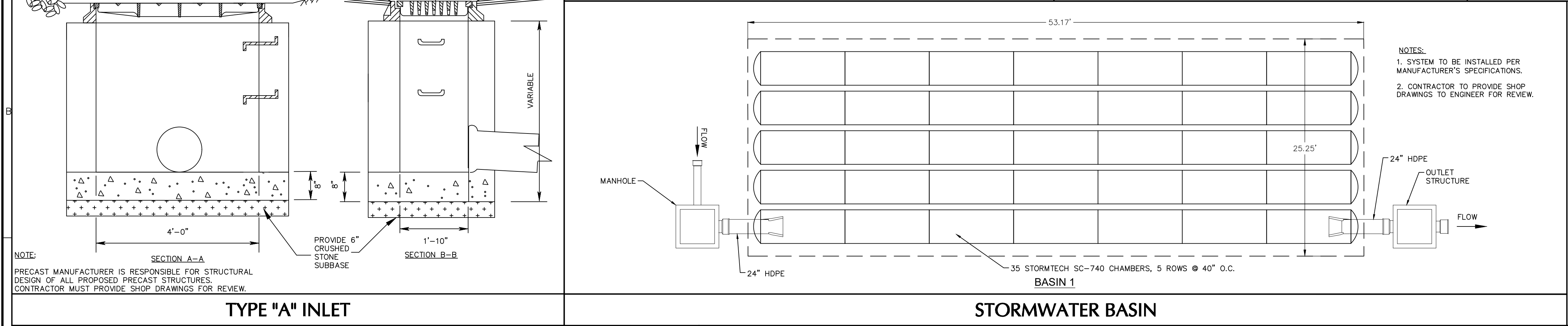
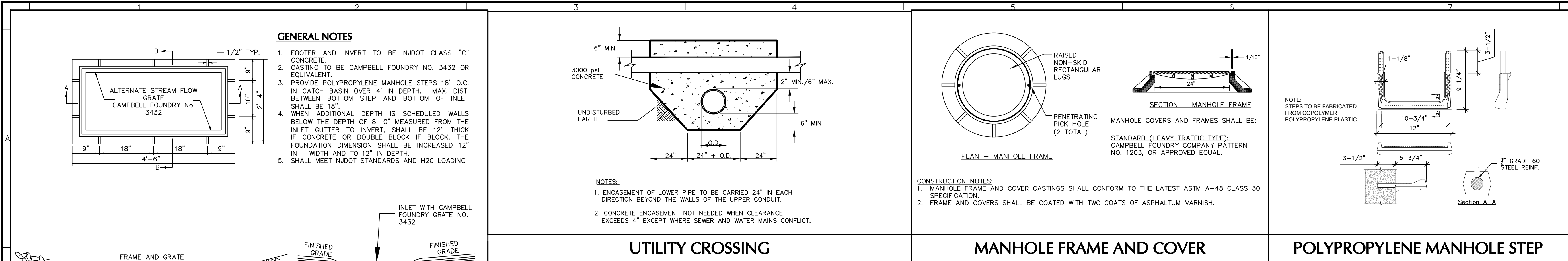


102.dwg Date: 5/6/2024 Time: 14:25 User: rbailey Style Table: lannan.stb Layout: CG10

10. SITE FILL SHALL CONSIST OF MATERIAL FROM APPROVED ONSITE SOURCES OR APPROVED OFFSITE MATERIAL. THE

RM = RIM ELEVATION
 RL = ROOF LEADER
 TC = TOP OF CURB
 TW = TOP OF WALL

 PROPOSED DRAINAGE MANHOLE
 ----- PROPOSED GRADE BREAK



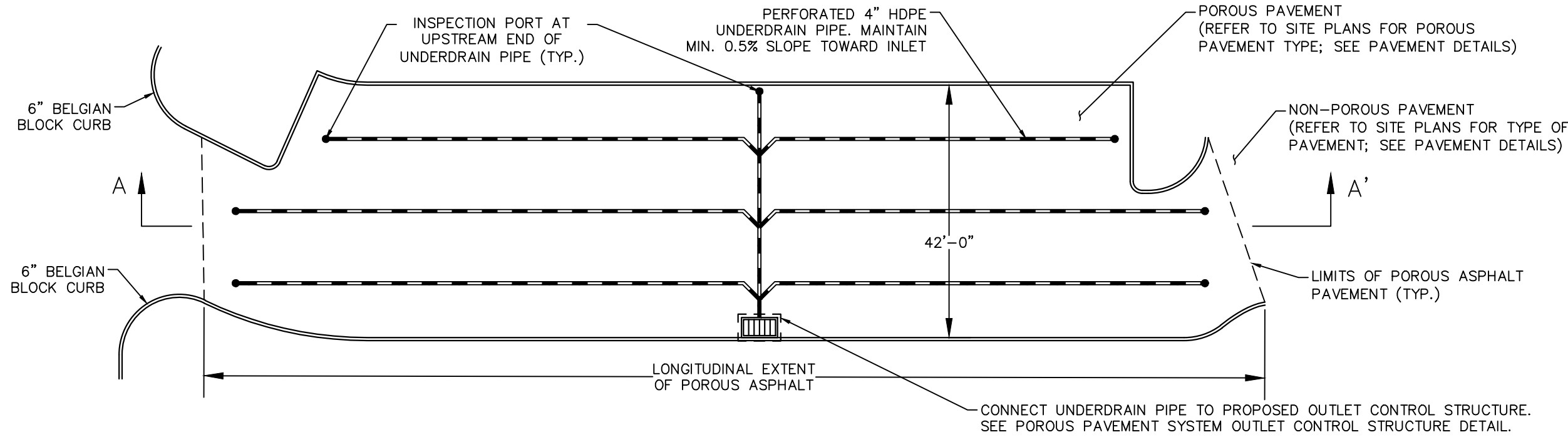
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NJ CERTIFICATE OF AUTHORIZATION No. 24GE032796400

Montclair Golf Club - Halfway House, Golf Building Addition, & Parking Lot Improvements
WEST ORANGE NEW JERSEY

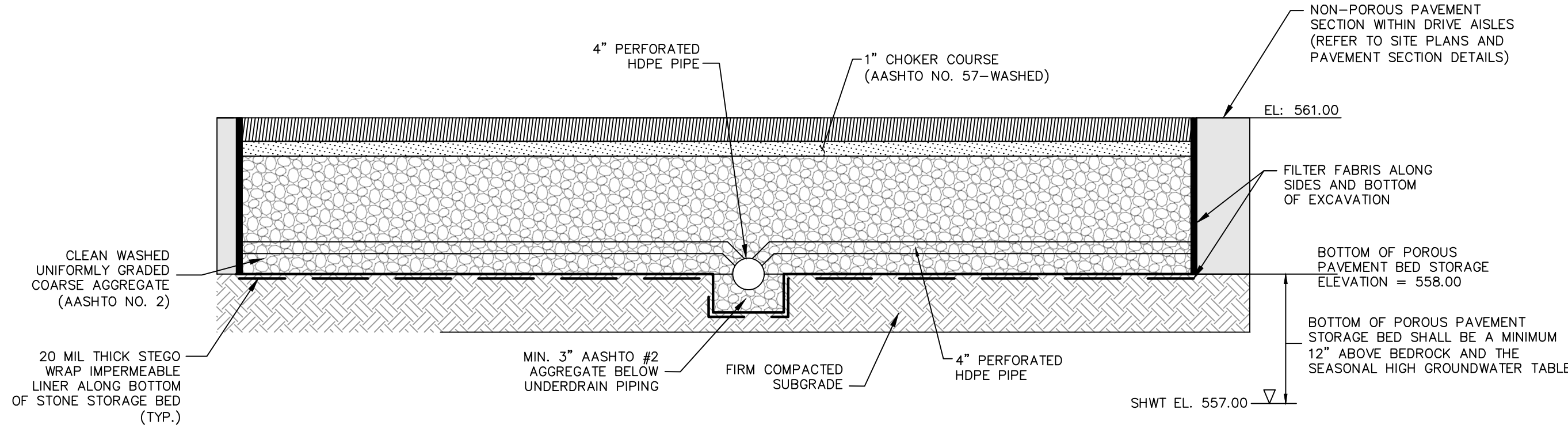
DETAILS II

Project No. **001039208**
Date **01/17/2024**
Drawn By **RB**
Checked By **TD/GED**

CS502



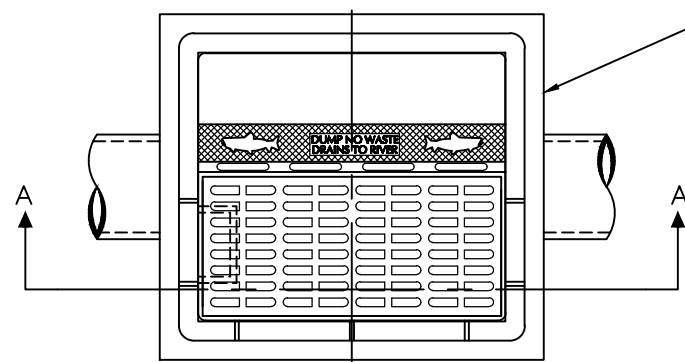
PLAN VIEW



SECTION A-A

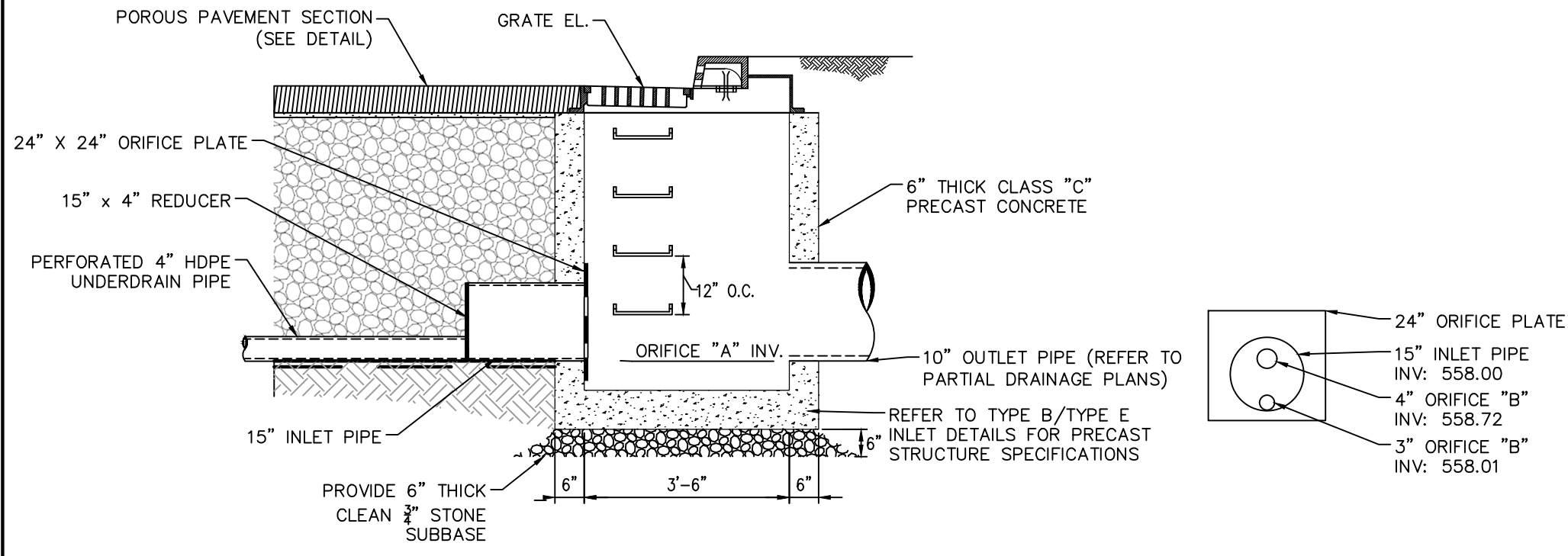
N.T.S.

TYPICAL POROUS PAVEMENT CROSS SECTION DETAIL



PLAN VIEW

	ORIFICE "A"		ORIFICE "B"		INLET PIPE		OUTLET PIPE		GRATE EL.
	SIZE	INVERT	SIZE	INVERT	SIZE	INVERT	SIZE	INVERT	
OCS-101	3" DIA.	558.01	4" DIA.	558.72	12" HDPE	558.00	18" HDPE	558.00	561.00

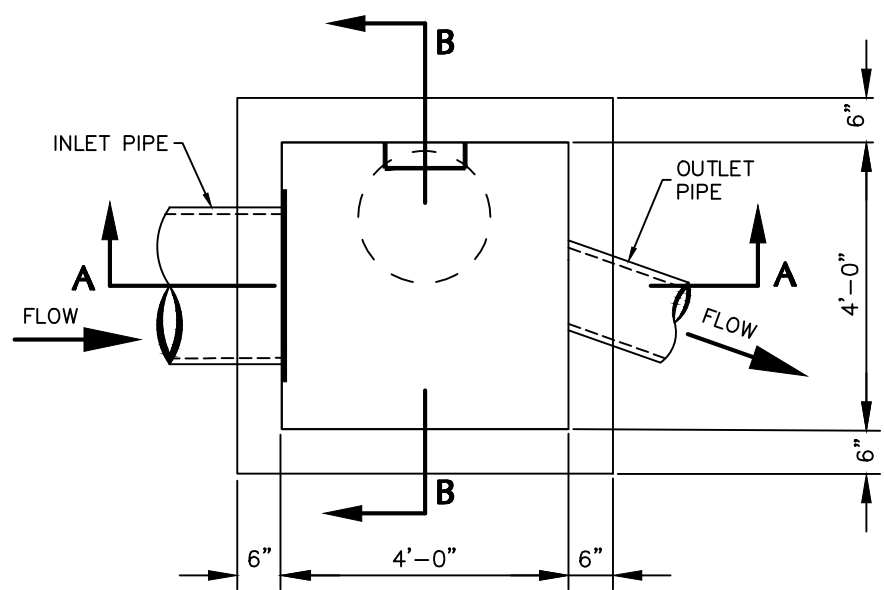


SECTION A-A

ORIFICE PLATE

N.T.S.

POROUS PAVEMENT SYSTEM OUTLET CONTROL STRUCTURE

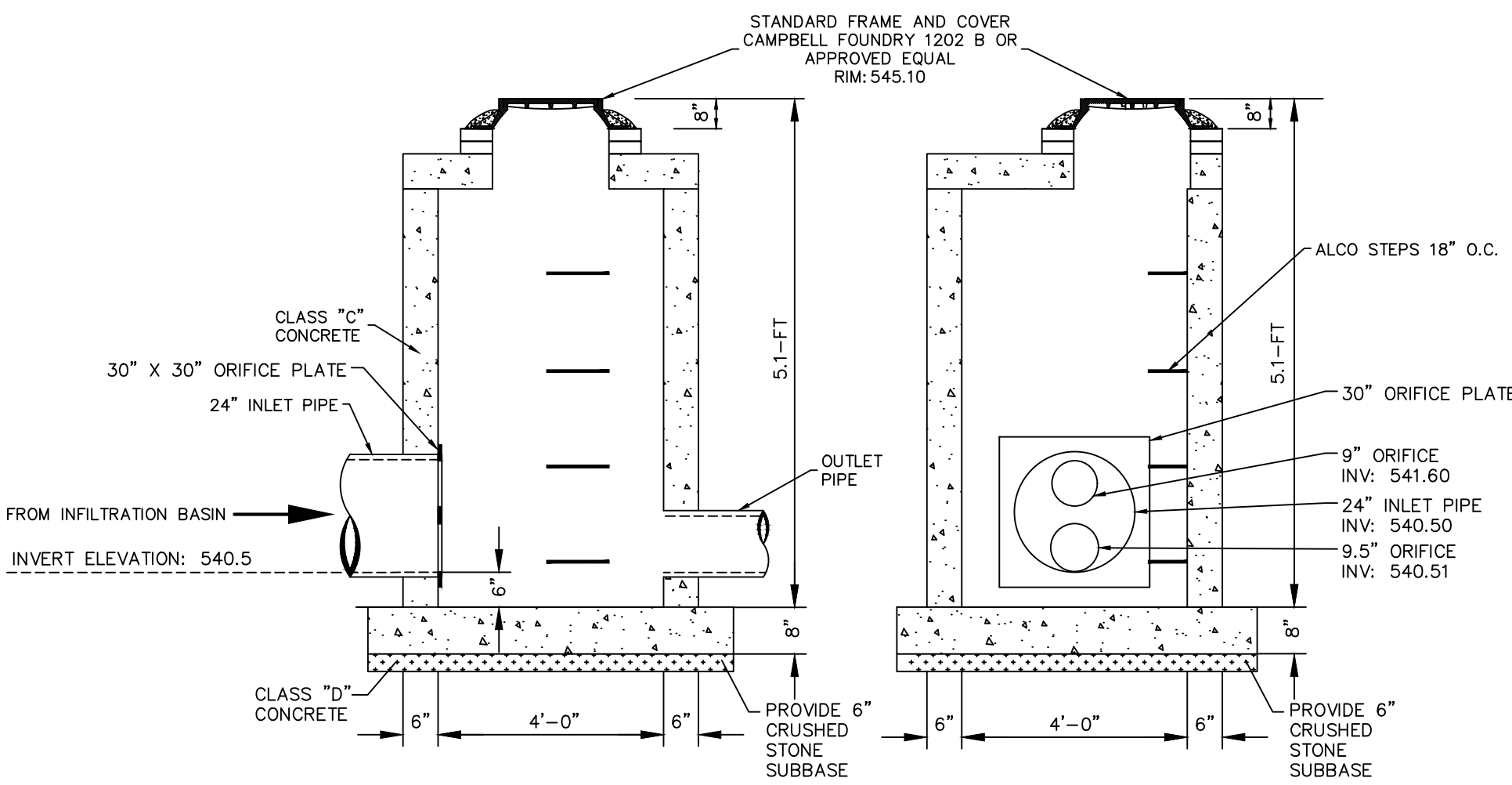


PLAN

GENERAL NOTES

- FOOTER AND INVERT TO BE NJDOT CLASS "C" CONCRETE.
- IF WALL CONSTRUCTION OTHER THAN CONCRETE THE WALLS SHALL BE PLASTERED BOTH INSIDE AND OUTSIDE WITH 1/2" THICK CEMENT PLASTER.
- CASTING TO BE CAMPBELL FOUNDRY NO. 1202B OR EQUIVALENT.
- PROVIDE ALUMINUM ALCO STEPS 6061T6 18" O.C. IN CATCH BASIN OVER 4' IN DEPTH. MAX. DIST. BETWEEN BOTTOM STEP AND BOTTOM OF INLET SHALL BE 18".
- WHEN ADDITIONAL DEPTH IS SCHEDULED WALLS BELOW THE DEPTH OF 8'-0" MEASURED FROM THE INLET OUTER TO INVERT, SHALL BE 12" THICK IF CONCRETE OR DOUBLE BLOCK IF BLOCK. THE FOUNDATION DIMENSION SHALL BE INCREASED 12" IN WIDTH AND TO 12" IN DEPTH.
- SHALL MEET NJDOT STANDARDS AND H20 LOADING

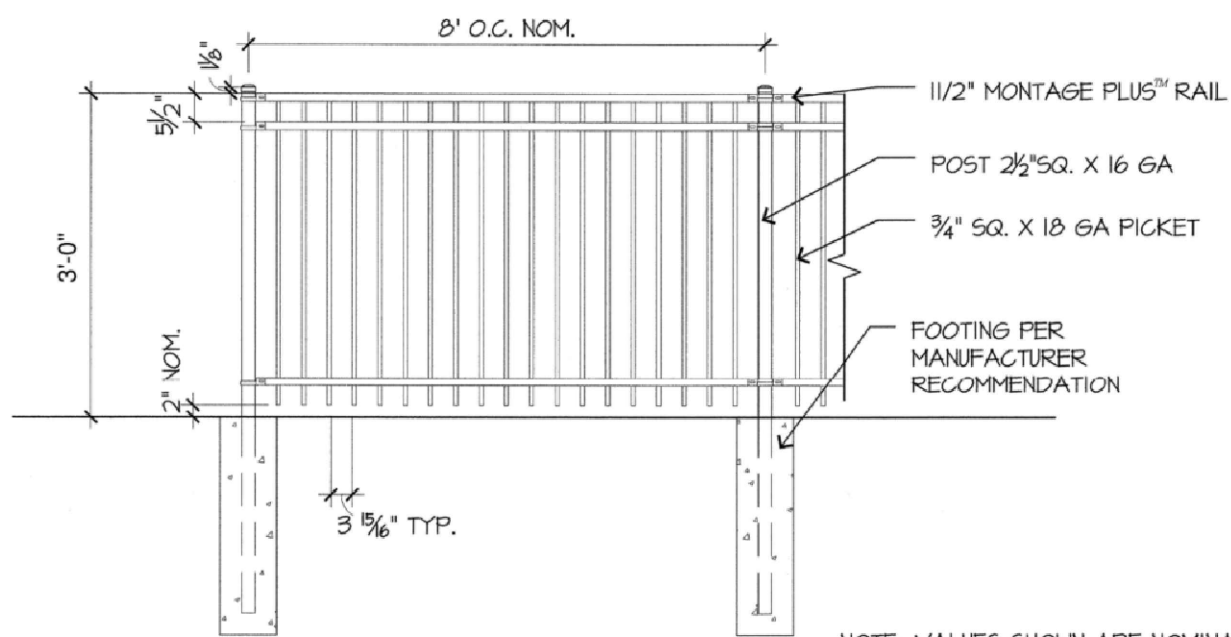
	ORIFICE "A"		ORIFICE "B"		INLET PIPE		OUTLET PIPE		GRATE EL.
	SIZE	INVERT	SIZE	INVERT	SIZE	INVERT	SIZE	INVERT	
OCS-201	9.5" HDPE	540.51	9" HDPE	541.60	24" HDPE	540.50	12" HDPE	540.50	545.10



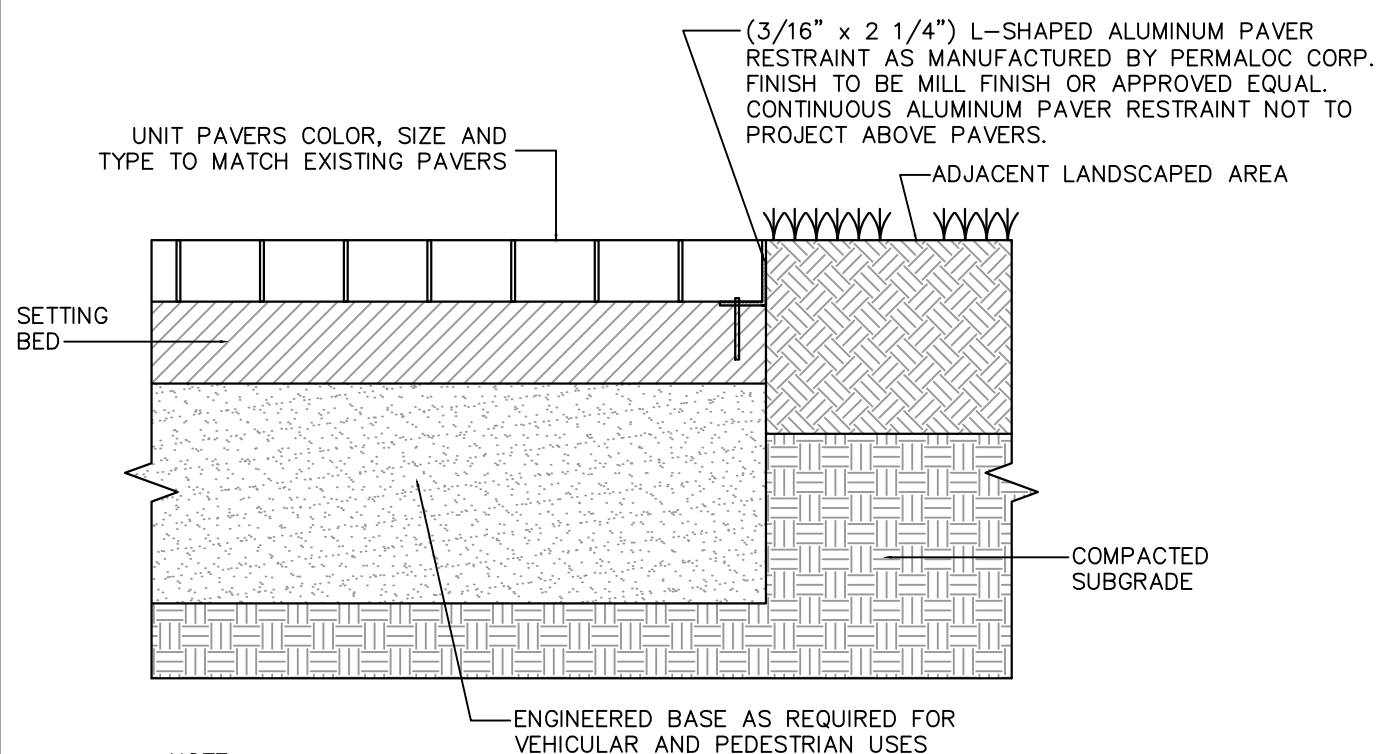
SECTION A-A

SECTION B-B

UNDERGROUND INFILTRATION BASIN OUTLET CONTROL STRUCTURE



3' HIGH METAL FENCE



NOTE:
PAVER EDGE RESTRAINT TO INCLUDE STEEL EDGING FLUSH CURB AND RAISED CURB.

PAVERS

05/03/2024	REVISED PER TOWNSHIP COMMENTS AND DESIGN UPDATES	1.
Date	Description	No.

Revisions

Michael J. Fowler 5/3/2024
SIGNATURE MICHAEL J. FOWLER DATE SIGNED
PROFESSIONAL ENGINEER NJ Lic. No. 24GE03239800

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Project
**MONTCLAIR GOLF CLUB -
HALFWAY HOUSE,
GOLF BUILDING ADDITION, &
PARKING LOT IMPROVEMENTS**

WEST ORANGE NEW JERSEY

ESSEX COUNTY

Drawing Title

DETAILS III

Project No.	CS503
001039208	
Date	
01/17/2024	
Drawn By	RB
Checked By	
TD/GED	

APPENDIX A

MAINTENANCE CHECKLISTS

MAINTENANCE CHECKLIST FOR SUBSURFACE INFILTRATION BASIN 1

**Montclair Golf Club
Halfway House, Golf Building Addition,
& Parking Lot Improvements
Township of West Orange
Essex County, New Jersey**

**NOTE: INSPECTIONS TO BE EVALUATED DURING A PERIOD OF
DRY AND WARM WEATHER AT THE PROJECT SITE**

Yes	No	Maintenance Evaluation	Action(s) Required if Answer "Yes"
☐	☐	Is there a buildup of sediment (in excess of two inches), trash, debris or any other stormwater pollution in inlet/outlet structures or within the basin?	Remove sediment, trash, debris, etc. when the basin is dry and dispose of in accordance with local, state and federal requirements.
☐	☐	Are there visible signs of cracking (wider than half an inch), damage or deterioration on the outlet structure and/or inlet structures?	Repair any cracks/damage to structures or replace structure. Consult an engineer if necessary to assess the damage.
☐	☐	Has the drain time for volume of water contained in the recharge volume portion of basin changed?	Jet clean infiltration basin and dispose of soil in accordance with local, state and federal requirements.

MAINTENANCE CHECKLIST FOR POROUS ASPHALT

**Montclair Golf Club
Halfway House, Golf Building Addition,
& Parking Lot Improvements
Township of West Orange
Essex County, New Jersey**

**NOTE: INSPECTIONS TO BE EVALUATED DURING A PERIOD OF
DRY AND WARM WEATHER AT THE PROJECT SITE**

Yes	No	Maintenance Evaluation	Action(s) Required if Answer "Yes"
☐	☐	Is there a buildup of sediment (in excess of two inches), trash, debris or any other stormwater pollution in inlet/outlet structures or within the basin?	Remove sediment, trash, debris, etc. when the basin is dry and dispose of in accordance with local, state and federal requirements.
☐	☐	Are there visible signs of cracking (wider than half an inch), damage or deterioration on the outlet structure and/or inlet structures?	Repair any cracks/damage to structures or replace structure. Consult an engineer if necessary to assess the damage.
☐	☐	Has the drain time for volume of water contained in the recharge volume portion of basin changed?	Jet clean infiltration basin and dispose of soil in accordance with local, state and federal requirements.
☐	☐	Is there visible sediment or debris build up on or within the voids of the porous pavement?	Vacuum the porous pavement surface and dispose of soil in accordance with local, state and federal requirements.

MAINTENANCE CHECKLIST FOR STORMWATER CONVEYANCE SYSTEMS

**Montclair Golf Club
Halfway House, Golf Building Addition,
& Parking Lot Improvements
Township of West Orange
Essex County, New Jersey**

NOTE: INSPECTIONS TO BE EVALUATED DURING A PERIOD OF DRY AND WARM WEATHER AT THE PROJECT SITE

Yes	No	Maintenance Evaluation	Action(s) Required if Answer "Yes"
☐	☐	Is there a buildup of sediment (in excess of two inches), trash, debris or any other stormwater pollution at any catch basin or manhole?	Remove sediment, trash, debris or any other stormwater pollution and evaluate on-site upstream systems. Dispose debris in accordance with local, state and federal requirements.
☐	☐	Is there standing water?	Evaluate downstream systems for clogging or trash sediment buildup.
☐	☐	Are there visible signs of cracking (wider than half an inch), damage or deterioration to any of the structures?	Consult engineer to determine safety and/or stability of the system.
☐	☐	Are there any root intrusions or any other vegetation within catch basins, outlet control structures or storm manholes?	Remove roots and dispose vegetation in accordance with local, state and federal requirements.
☐	☐	Are ladder rungs in manholes or outlet structures damaged, missing or misaligned?	Repair or replace using project specifications
☐	☐	Are and covers or grates missing, damaged or only partially in place at any catch basin or manhole?	Repair or replace using project specifications.

APPENDIX B

MAINTENANCE LOGS

**MAINTENANCE LOG FOR SUBSURFACE
INFILTRATION BASIN 1**

**Montclair Golf Club
Halfway House, Golf Building Addition,
& Parking Lot Improvements
Township of West Orange
Essex County, New Jersey**

INSTRUCTIONS:

**THIS LOG SHALL BE UPDATED TO INCLUDE ALL MAINTENANCE
PERFORMED AT A SPECIFIC STORMWATER MANAGEMENT
MEASURE.**

DATE	PERSON CONDUCTING MAINTENANCE	AREA OF MAINTENANCE	PROBLEM(S) FOUND	ACTION(S) TAKEN

MAINTENANCE LOG FOR POROUS PAVEMENT

Montclair Golf Club
Halfway House, Golf Building Addition,
& Parking Lot Improvements
Township of West Orange
Essex County, New Jersey

INSTRUCTIONS:

THIS LOG SHALL BE UPDATED TO INCLUDE ALL MAINTENANCE
PERFORMED AT A SPECIFIC STORMWATER MANAGEMENT
MEASURE.

DATE	PERSON CONDUCTING MAINTENANCE	AREA OF MAINTENANCE	PROBLEM(S) FOUND	ACTION(S) TAKEN

**MAINTENANCE LOG FOR
STORMWATER MANAGEMENT SYSTEM**

**INSTRUCTIONS:
THIS LOG SHALL BE UPDATED TO INCLUDE ALL
MAINTENANCE PERFORMED AT A SPECIFIC
STORMWATER MANAGEMENT MEASURE.**

**Montclair Golf Club
Halfway House, Golf Building Addition,
& Parking Lot Improvements
25 Prospect Avenue
West Orange, Essex County, New Jersey 07052**

DATE	PERSON CONDUCTING MAINTENANCE	AREA OF MAINTENANCE	PROBLEM(S) FOUND	ACTION(S) TAKEN

APPENDIX C

**AS-BUILT DRAWINGS
(TO BE PROVIDED ONCE CONSTRUCTION IS
COMPLETED)**

APPENDIX D

BMP MAINTENANCE COST

Montclair Golf Club
Halfway House, Golf Building Addition,
Parking Lot Improvements
Township of West Orange
Essex County, New Jersey

STORMWATER CONVEYANCE SYSTEM MAINTENANCE COSTS (Pipes and Inlets)	
Task	Cost
Inspect conveyance systems for clogging, excessive debris and sediment accumulation (Assume annually)	\$150
Inspect conveyance systems for clogging, excessive debris and sediment accumulation after every storm exceeding 1 inch of rainfall (Assume 8 times a year at \$150 per occurrence)	\$1,200
Inspect all structural components (Assume annually)	\$150
Jet vacuum cleaning of stormwater conveyance system to remove debris and sediment accumulation (Assume annually)	\$1,600
Sub-Total	\$3,100

STORMWATER MANAGEMENT SYSTEM MAINTENANCE COSTS (Underground Infiltration Basin)	
Task	Cost
Inspect basin for clogging, excessive debris and sediment accumulation (Assume 4 times a year at \$150 per inspection)	\$600
Inspect basin for clogging, excessive debris and sediment accumulation after every storm exceeding 1 inch of rainfall (Assume 8 times a year at \$150 per occurrence)	\$1,200
Remove Debris and Sediment accumulation (Assume annually)	\$1,500
Inspect all structural components (Assume annually)	\$150
Jet vacuum cleaning of stormwater management system to remove debris and sediment accumulation (Assume annually)	\$1,600
Underground Infiltration Sub-Total	\$5,050
(Porous Pavement)	
Task	Cost
Inspect basin for clogging, excessive debris and sediment accumulation (Assume 4 times a year at \$150 per inspection)	\$600
Inspect basin for clogging, excessive debris and sediment accumulation after every storm exceeding 1 inch of rainfall (Assume 8 times a year at \$150 per occurrence)	\$1,200
Remove Debris and Sediment accumulation (Assume annually)	\$1,000
Inspect all structural components (Assume annually)	\$150
Jet vacuum cleaning of stormwater management system to remove debris and sediment accumulation (Assume annually)	\$1,600
Porous Pavement Sub-Total	\$4,550

TOTAL BMP MAINTENANCE COST \$8,150

Assumptions:

- (1) The Best Management Practices Inspection rate is \$50 per hour.
- (2) Jet vacuum services are \$400 per hour where 1,800 feet of pipe can be cleaned per hour. A minimum of 4 hours must be charged per visit.
- (3) Eight storm events with rainfall that exceeds 1 inch occur per year (NJ average annual total rainfall=45 in).